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BROOKHAVEN NATIONAL LABORATORY

managed by Brookhaven Science Associates
for the U.S. Department of Energy

Memo

date: *January 20, 2004*

to: *E Lessard*

from: *J.W. Glenn*

subject: ***Review of DRAFT Statement of Work and Technical Specification for MECO Superconducting Magnet System.***

I have reviewed the 'DRAFT Statement of Work and Technical Specification for the Design, Fabrication, Installation and Test of the MECO Superconducting Magnet System, Revision Draft 3.0'. I have also looked at other documents from CERN on problems with irradiation of liquid nitrogen [LN].

General comments.

I am not comfortable to have this specification go out without a Cryogenic Safety Committee review. At some point a BNL review will be required and to say no this experiment can not run because it was not properly designed will be a political bomb; to have a major incident if it runs with our approval could precipitate a stand down and a re-review of many C-A cryogenic systems, loosing us possibly a year of operation; as happened with our SEB operation a few years ago. Another option is to have another body do the review and disassociate BNL but if there is a problem we need 'plausible deniability'.

The issue of liquid nitrogen cooling is not addressed in this specification. CERN will allow LN cooling of Aragon at the ATLAS experiment As given in their "ATLAS AOS Agreement On safety EXPLOSION RISK IN LIQUID NITROGEN" [attached] the levels are one thousandth what is anticipated at MECO; also extreme measures are taken, eg.: only 5 PPM of oxygen in the nitrogen. Also they have had a dewar explode at 900 Grey exposure, 18% of the annual exposure for MECO. I suggest that the spec request adequate sized heat shield piping to allow an adequate flow for 'constant' temp for gas He cooling or insulation be adequate for LXe cooling - or provisions be made for some alternately cooled heat shield. The magnet system should not be built so the only feasible way to cool it is with LN. Experimental conformation of various models and calculations would improve confidence, perhaps irradiation of some LN in the desired tubing at UCINRF reactor could be done.

Detailed comments.

Section 4.3 should include:
Rate of failure for the cryogenic containment vessels to calculate ODH classification. These vessels are not 'standard' so normal tables of failure rates are not useful.
Leak rate limits from the 'outside' and from the 'warm bore' volumes during maintenance to prevent excessive oxygen buildup toward a explosion hazard.
Buster disk and relief valve specs and locations.

Section 5.1 should include:
Warm-ups for O3 purges.
Number of quenches allowed.
Thermal capacity of the slow discharge resistors.

Section 5.4: What is the damage to the system if the quench protection system fails – major I expect. Thus a failure rate analysis may be appropriate.

Section 5.5: the reference of 3.2.5.1 does not make sense.

Section 5.9 Include this system in the

Section 5.10: The dump resistor need have adequate thermal mass.

Section 5.11: A spec on voltage ripple would reduce heat load.

Section 5.13: Combined modes should be considered.

Section 5.14; What is the implication of not having a code stamp?

cc: W Meng

ATLAS AOS
Agreement On safety

EXPLOSION RISK IN LIQUID NITROGEN

Prepared by :	*Checked by :*	*Approved by :*
G. Benincasa…..	**G. Benincasa**	**Technical Coordinator**

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AOS N. *12*

TIS -ATLAS
AGREEMENT ON SAFETY

1) SYSTEM-SUBSYSTEM-EQUIPMENT CONCERNED

-PBS name…Liquid Argon Calorimeter…..

-Description……Liquid Nitrogen cooling system of the LAr calorimeter……..

-Ref. Documents…TDR 2- CERN-LHCC 96/11……..

2) SAFETY ASPECTS CONSIDERED

-Short description…Risk of explosions in LN2 exposed to ionizing radiations
…….

- Ref. Documents……See Attached note……..

3) TIS POSITION

☐ **x** **Agreed(with or without comments)**

☐ **Agreed with restrictions(comments)**

☐ **Rejected(comments mandatory)**

Comments:…Risk is considered as very low, provided that the recommendations in the annexed note are strictly followed……..
……

4) SIGNATURES

Date:…22/01/2003…….

TIS Representative person (W. Weingarten)	for TC the Glimos (G. Benincasa)	for the system Project Leader (H. Oberlack)

Explosion Risks in Cryogenic Liquids Exposed to Ionising Radiation

J. Bremer

When liquid nitrogen is exposed to high ionizing radiation the oxygen impurities present in the nitrogen can transform to ozon. A sufficiently high concentration of ozon in liquid nitrogen can lead to an explosion when this ozon re-transforms spontaneously to oxygen.

Article written by Gregory and Nuttall lists a number of explosions that occurred and gives some rough numbers describing the process(CERN TIS-CFM/95-06):

Concentration of ozone in liquid nitrogen formed by transformation of 5000 ppm oxygen under a total radiation dose of 10^4 Gy: $1.65\ 10^3$ mg O_3 / m^3 N_2
(depends on total dose, not on dose rate)

Theoretical minimum O_3 concentration at which an explosion could occur:
4.4 mole% O_3 / N_2

O_3 concentration at which explosion has occurred
5.8 mole% O_3 / N_2

2

<u>What does this figures indicate for the liquid nitrogen volume in the ATLAS cavern:</u>

Total volume of liquid nitrogen present in the cavern under normal circumstances: 10 m^3 (non important figure). This liquid will be circulated through heat exchangers. The heat exchangers will have a total volume of about 0.8 m^3 of liquid nitrogen.

Radiation rate at heat-exchanger level: $5\ 10^1$ Gy/run year;

Initial O_2 concentration in the liquid nitrogen 10 ppm (nitrogen delivery 10 ppm)

Ozon formation depends linear on total dose. In total life time ATLAS we will have $1\ 10^3$ Gy.

Say we will start with the **high** O_2 concentration of 5000 ppm, then we will have in the nitrogen volume after 15 run years $1.65\ 10^2$ mg O_3 / m^3 N_2, equivalent to about
$2\ 10^{-5}$ mol % O_3.

We can thus conclude that even when we take a very high oxygen concentration at the beginning of the experiment (factor 500 higher), we arrive at ozon concentrations which are a factor 10^5 too small to (theoretically) create an ozon explosion.

3

We have however foreseen the following measurements to reduce even further the oxygen content in the liquid nitrogen present in the cavern:

- When nitrogen is filled from a truck into the storage tanks at the surface: nitrogen transfer line between truck and tank will be pumped vacuum before transfer;

- Liquid nitrogen transferred between storage vessel (at surface) and phase separator dewar (UX15 cavern) will pass through liquid Oxysorb filter (such a filter is already in function in the NA48 experiment);

- Once a year the PSD will be warmed up to about 150 K, to be sure that we start the run year with a clean nitrogen storage tank (no accumulation of O_2 or O_3).

COMMENTS BY C. Nuttal on 10/1/2003

I have looked at the estimations made by J. Bremer and if the assumptions he made (based on the paper by C. Gregory and myself) are correct then there would be little to fear. However it seems certain that explosions in cryogenic equipment have occurred at much lower doses than that cited by Bremer. M. Tavlet has experienced an explosion in a dewar containing LN2 at a total dose of only 900Gy. In another paper it is recommended that the O2 concentration be kept below 5ppm. The measures that J. Bremer has proposed should be carried out with the addition of:

- Delivery of LN2 to have certified O2 concentration of below 5ppm.
- Written instructions for the the transfer to the CERN Dewar should be drawn up and every operator should be trained to carry out the task exactly as per the instructions.
- There should be an on-line measurement of O2.
- Leaks on the system should be rigorously eliminated as this is one way that O2 can enter.
- Great care should be taken to eliminate mechanical shocks on the cryostat especially at the end of a run.

I am at your disposition for any further help or information you may require.

Regards

Bill

MECO-107
W. Molzon, B. Smith
May 14, 2003
Revised January 7 2004

Safety Considerations of Ozone Buildup in the MECO PS LN_2 System

This is to discuss the possible effects of ozone production in the nitrogen heat shield. The potential problem was first pointed out to us by Wuzheng Meng, for which we are grateful. The concern is that ozone will collect and, when warmed, revert to O_2 in an exothermic reaction that would release significant energy into the LN2 lines that trace the thermal shields. The concern is discussed in the paper of C.R. Gregory and C.W. Nuttall, CERN AT/95-06 (DI), attached as Appendix A.

In discussing some explosion accidents in cryogenics systems, the paper states "It soon became clear that significant quantities of ozone (O_3) were being produced during the irradiation of material samples and that the ozone generation was due to the action of ionizing radiation on the relatively small quantities of dissolved oxygen present in the liquid nitrogen. It appears that shock, local heating or even the presence of solid organic resins such as epoxies can trigger this type of explosion."

Of course, our system is not identical to systems described or referenced in the paper of Gregory and Nuttall. Understanding how our system would react depends on knowing the properties of ozone and its interaction with LN_2. Much information on ozone properties is given in Streng, Journal of Chemical and Engineering Data 6, 1961 (431), attached as appendix B.

Since explosion is a frightening word, it is useful to put this in perspective. First, we note that the explosions referred to only occurred when the ozone concentration in the LN_2 exceeded 4%; as we discuss below, the concentration in the MECO system under any of a number of possible operating scenarios would never exceed 0.04%. Streng reports explosions below this (without details) and apparently only when the fluid is not well mixed and high concentration regions existed. As discussed below, we don't see any scenario in which this can occur in our system. Second, even if the ozone did somehow spontaneously revert to O_2, it is not a personnel safety hazard, or even an issue of damage to the cryostat, or even an issue of rupture of the LN_2 cooling tubes, but only an issue of possible deformation of the heat shield. This itself we cannot tolerate, since it would be a significant loss of it caused a thermal short necessitating repairs.

Relevant to the question at hand is the vapor pressure of the produced ozone and the solubility in nitrogen. Absent some interaction that binds the ozone to the liquid nitrogen, the ozone will exist above the liquid at its saturated vapor pressure at 77 K, reduced by the fractional concentration in the liquid. It will also exist in whatever gas bubbles are produced by the heat transferred from the heat shield to the liquid nitrogen. A paper by Hanson and Mauersberger (J. Chemical Physics 85, 1986 (4669)) gives measurements of the vapor pressure of liquid or solid ozone in the relevant temperature range. It follows the relationship $\log [P/(1\ \text{torr})] = 10.460 - 1021.6/T$. The pressure at 77 K is about 2 mTorr. Most relevant to our situation is the solubility of ozone in liquid nitrogen; Streng reports the solubility to be in the range of 4-5% (molar), measured by a number of groups.

The rate of production of ozone in LN_2 depends on the concentration of O_2 and on the amount of energy deposited. In the range of concentration relevant to us, the rate is given by

$$R(e) = R_o e + (8{,}05 + 1.29 \log e).$$

R is the production rate in units of molecules per 100 eV of deposited energy, R_0 is the production rate in pure O_2 (12.9) and e is the fractional oxygen concentration. This gives typical yields of a few molecules per 100 eV for O_2 concentrations of 10-10,000 ppm. Commercial liquid nitrogen typically has an O_2 concentration of below 10 ppm. We would handle the LN_2 carefully to insure that excess oxygen is not dissolved in the nitrogen, for example by exposing the liquid to a volume of air in the storage dewar.

To give a sense of the size of the problem, consider a concentration of 10,000 ppm O_2, well above what we expect. With a radiation dose rate of 20 μW/gm, 10 kg of LN_2 exposed to that radiation, and 10^7 seconds of running, the total amount of ozone produced is 1.14 moles, about 50 grams. For O_2 concentration of 10 ppm, the amount produced is about half that. The energy released in converting $2O_3$ to $3O_2$ is 3000 J/gm.

We can imagine operating the LN_2 cooling system in a number of ways. In all of these, the nitrogen flows through relatively small cooling tubes that are attached to the thermal shield. Flow is maintained either by pumping or by convection. The typical velocity is about 10 cm/s, assuming cooling tubes with ID=0.5 cm.

1. Method 1 is to operate with a conventional liquid recycling system, venting the gas that is produced during the cooling process and replenishing the LN_2 from commercial tanks as it is evaporated. The oxygen concentration will increase by preferential vaporization of nitrogen. If the oxygen in the produced vapor is at the saturated vapor pressure of oxygen at 77 K, then the equilibrium oxygen concentration in the buffer volume will be higher than the oxygen concentration in the supplied gas by the ratio of the partial pressure of nitrogen to that of oxygen at the operating temperature. That will increase the equilibrium oxygen concentration in the liquid by about a factor of 4, since the saturated vapor pressure of oxygen at 77 K is about 200 Torr.

   Table 1 below is a spreadsheet that allows the calculation of the resulting ozone concentration assuming no ozone is evaporated. For example, if we have a 500 liter (400kg) storage buffer, irradiate a 10 kg mass at a radiation level of 20 □W/gm, run for 10^7 s, and assume the production rate is 2.4 molecules per 100 eV (typical for oxygen concentration of 40 ppm or 4 times a delivered concentration of 10 ppm), we would develop a molar density of a small fraction of a percent in the fully mixed buffer volume. This is well below the saturated solubility of ozone in LN_2. Even if the 10 kg remains in the irradiated region, the ozone concentration is only about 0.14%, well below the level at which it would start to precipitate out as a solid. In fact, the LN_2 is well mixed because of the continuous circulation and we expect the lower concentration to apply.

Total mass [gm]	Irrad. mass [gm]	Rad. [J/s/gm]	ozone prod.rate [mol./eV]	Time [s]	ozone prod. rate [mole/s]	ozone prod. [moles]	ozone conc. [mole %]
4.0E+05	1.0E+04	2.0E-05	0.024	1.0E+07	5.0E-08	0.50	3.5E-03

Table 1. Spreadsheet showing the calculation of the amount of ozone produced in 10^7 running at full intensity.

   It is rather easy to monitor the ozone concentration in liquid by fully vaporizing a fraction of the liquid and passing it through an ozone monitor (basically an absorption spectrophotometer). At the end of the running, the ozone-contaminated liquid would be thrown away (vented into the parking lot) and clean LN2 flowed through the system. It could

then be verified that no ozone is present in the effluent, to ensure that the system is clean before it is warmed.

Ozone concentrations as small as a few ppm can be readily measured since it has a high absorption cross section for UV light.

2. Method 2 is to operate a totally closed re-circulating system (condensing the returned gas) so that the oxygen level (and hence the highest possible ozone level) can never get above the level in the delivered gas, far below the level at which ozone can condense. Here, we would eventually get to an ozone level of no more than the delivered concentration of oxygen, of order 10 PPM, far below the concentration necessary for it to precipitate out. Periodically, this LN_2 would be thrown away (vented into the parking lot). Again, the ozone concentration in the liquid could be monitored.

3. Method 3 is to operate with a single-pass system; this is the default operation. The cost of this option depends on what fraction of the LN_2 can be vaporized during the pass. Table 3 below is a spreadsheet that allows different assumptions to be tested. The cost of LN_2 is taken to be about $0.07 per liter. The heat load on the nitrogen system for the PS is about 130 W (it is significantly higher in the other magnets). Assuming the exit LN_2 flow has quality 0.5 (50% gas by mass), then the cost per day to vent all the LN_2 that is used to cool the PS is about $10, a negligible cost. In this scenario, the ozone concentration in the system is always negligible. Again, the ozone concentration in the vented nitrogen (gas plus liquid) could be monitored easily.

Nitrogen Flow	Power [J/s]	LN2 frac. vaporized	1/LHV [moles/J]	Flow [moles/s]	Flow [m3/s]	O3 prod. [mole/s]	Outlet Conc. [moles/m3]	cost [$/day]
	130	0.50	1.72E-04	4.47E-02	1.57E-06	6.20E-08	0.0396	9.74

Table 2. The table is a spreadsheet showing the cost of a single-pass option for running the LN_2 cooling system.

These three methods for operating the LN_2 cooling system in a safe way rely on two assumptions.

One assumption is that there is not a small, uncirculated volume of LN_2 in the highly irradiated area, in which a higher ozone concentration is built up, and that this region is not periodically flushed out, and that the ozone does not diffuse into neighboring regions. Hence, it is important to design the LN_2 distribution so that a stagnant region will not develop. Certainly most of the liquid that is irradiated must also be flowing. If not, that region of the magnet would not have its thermal heat shield cooled and the temperature of that region of the shield would increase, LN_2 would be vaporized, and either flow would start or the pressure would rise. It would seem to be difficult to design a system where signification stagnation could develop.

The second assumption is that there is not some anomalous adsorption of ozone on the tubing material. There is no evidence that we have been able to find that there is such adsorption on stainless steel. We can try to estimate how much might occur. Surface scientists with whom we have consulted state that once an adsorbed surface layer is more than a few (3-4) atomic layers thick, the surface has the characteristics of the bulk adsorbed material, and can then be treated as if the substrate has no effect. In that case, bulk solid ozone properties (including solubility in LN_2) would apply. Since the O_3 concentration in the liquid is always very far below the saturated concentration, it would no longer build up. For a very conservative estimate of the amount of ozone that might exist as an adsorbed layer, we assume a 35 Angstrom layer (8 molecules thick) that covers the interior of tubing with an ID of 0.5 cm, about 600 feet long (1 foot of tubing per square foot of heat shield). The calculation of the energy

release is given in the spreadsheet below; it is only about 80 Joules, even with the conservative assumptions above.

Density [gm/cm^3]	Atomic #	Avagaodro's number	Atomic Vol [cm^3]	Layer Thick. [Angstrom]
1	48	6.00E+23	8.00E-23	4.31

Calculation of thickness of atomic layer.

Length [feet]	ID [cm]	Thickness [cm]	Ozone Vol [cm^3]	Density [gm/cm^3]	Mass [gm]	Energy [J]
600	0.5	3.50E-07	0.026	1	0.026	78

Gas Vol [m^3]	Pressure [Pa]	R [J/K/mole]	T [K]	Moles	Temp Rise [K]	Press. Rise [Pa]	Press. Rise [PSI]
0.0046	100000	8.4	100	0.55	6.2	6181	0.91

Table 3. The table is a spreadsheet showing a calculation of the amount of ozone that might be adsorbed on the inner surface of the cooling tubing and the amount of energy released if it spontaneously converted to O_2. It also shows the pressure rise in the tubing assuming that the event occurred when the tubing was filled with gaseous nitrogen at 100 K and all the energy went into heating the nitrogen.

This would not be a damage hazard even if it converted to O_2 explosively. Table 3 shows the calculation of the pressure rise in the tubing system, assuming it is closed and filled with nitrogen at 100 K and atmospheric pressure when the event happened. Note that the increase in the number of gas molecules is negligible, since less than 0.001 moles of O_2 are produced, and the volume contains 0.55 moles of N_2.

We conclude that there is more than one way of operating the magnets safely with LN_2 cooling loops tracing the thermal radiation intercept. The default operation mode is simple and inexpensive.

Acknowledgement
We thank Wuzheng Meng for pointing out the phenomenon, for providing the reference, and for useful discussions. We thank Ed Lessard and Wuzheng Meng for pointing out an error in our earlier version.

Appendix A

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

CERN AT/95-06 (DI)
CERN TLS-CFM/95-06

Explosion Risks in Cryogenic Liquids Exposed to Ionising Radiation

C. R Gregory, C. W. Nuttall

Abstract

Explosions in cryogenic fluids were first reported in the early 1950's. Numerous papers have been presented describing these explosions and proposing mechanisms as to their cause. The majority of these incidents have occurred in dewars and cryogenic systems containing liquid nitrogen which have been exposed to ionizing radiation.

It is now widely accepted that the explosions are caused by the very rapid decomposition of ozone, which is formed by the action of ionising radiation on oxygen dissolved in liquid nitrogen.

There is also evidence that oxides of nitrogen are formed and although it is not suggested that these compounds are the primary cause of explosions they do seem to play a catalytic role in the formation of ozone, as indeed they do in the formation of ozone in atmospheric reactions.

This paper is aimed at drawing the attention of designers of cryogenic systems in the LHC areas to the problem, in order that precautions can be taken at the design stage to reduce, or eliminate, the dangers of such explosions.

CONTENTS

1 Introduction

2 Historic

3 Explosions

4 Physical Properties of Cryogenic Fluids

4.1 General

4.2 Critical Explosive Concentrations.

5 Ozone formation

6 Cryostat Construction

7 Removal of ozone

8 Discussion

9 Acknowledgements

10 References

1 INTRODUCTION

Cryogenic fluids such as *Liquid Nitrogen , Argon and Helium* have been used for many years to provide low temperature environments for experimental and other purposes because they are inert, non flammable, non toxic and generally regarded as posing little hazard.

However under certain conditions explosions [1, 2, 3] have occurred, including some at CERN, notably in liquid nitrogen systems, after exposure to ionising radiation, for which, at the time, there was no explanation. Explosions have occurred in cryostats that have been subjected to doses of gamma radiation in the order of 10^4 Gy[4] , neutron fluxes of 10^{12} n.cm^{-2} sec^{-1}. for a matter of two to three hours[5], and irradiation by a beam of 20 μA of 2.0 MeV electrons for 4 minutes[3].

Radiation levels in the proposed LHC experimental areas will be much higher than those reached in existing LEP areas with projected integrated doses in the order of 2,3 . 10^5 Gy.yr^{-1}, and neutron fluxes of 10^9 n.cm^{-2}.sec^{-1} [6]. These values give cause for concern, particularly in the case of gamma radiation, as they are of the same magnitude as those reported in the literature where explosions have occurred.

The mechanisms of these explosions are very complex and are not yet fully understood. In this paper we review the existing literature on the subject and suggest precautions that may be required, or, further work that may be necessary to minimize explosion hazards in the LHC. Other explosions in liquefied gas containers have been caused by overpressure coupled with insufficient pressure relief, "roll-over" of the contents, or superheating resulting in the eventual catastrophic boiling of the contents. It is not intended in this paper to treat these phenomena as they are common to all cryogenic systems and are accounted for (or should be) in the design of all CERN systems.

2 HISTORIC

It might be supposed that chemical reactivity ceases at temperatures below about 100 K , but, on the contrary, many significant chemical syntheses have been described in which some operation requiring cryogenic temperatures forms a vital part of the procedure [7] .

The study of chemical reactivity at cryogenic temperatures is not new, the first experiments being reported at the end of the last century, when these fluids became available in sufficiently large quantities.

Large scale use of cryogenic fluids began in the early 1950's with the advent of the space and nuclear industries, their low cost and widespread availability has seen a multitude of uses in many fields.

3 EXPLOSIONS

As more research work was carried out, during the 1950's, into the effects of radiation on materials at cryogenic temperatures, explosions were reported for which there were no apparent explanations[3,5,8,9]. At first it was thought that the cryostat exhausts had become blocked by the formation of ice or as a result of design or operational errors, but it gradually became clear that some form of radiochemical reaction was taking place.

Liquid nitrogen was mainly used as the cooling media for these experiments, and therefore attention became focused on the possible contaminants. Commercial liquid nitrogen when delivered is usually relatively pure, however, it may easily become contaminated if it is allowed to come into contact with air. Due to their higher boiling points, oxygen and water vapour from the air are condensed and become dissolved in the liquid nitrogen.

It soon became clear that significant quantities of ozone (O_3) were being produced during the irradiation of material samples and that the ozone generation was due to the action of ionizing radiation on the relatively small quantities of dissolved oxygen present in the liquid nitrogen.

The generation of ozone during the operation of an experiment is of special interest not only because of the relatively high yields of ozone which are produced when oxygen is subjected to irradiation, but in particular due to the toxic and explosive properties of the gas.

As well as the production of ozone the irradiation of liquid nitrogen may also result in the formation of oxides of nitrogen (N_2O, NO, NO_2, N_2O_4 and N_2O_5) [10,11] and indeed the presence of a "sludge" of oxides of nitrogen has been reported at the bottom of liquid nitrogen cryostats after irradiation[4]. It is considered that the oxides of nitrogen are not the cause of the explosions but they seem to enhance the yield of ozone by a catalytic effect.

It has been suggested that "active" nitrogen, consisting of atoms and excited molecules of nitrogen, may be formed and be responsible for the explosions, but this is thought unlikely as it is so reactive that the molecules will not accumulate.

Violent explosions have occurred in experiments being conducted in cryostats of liquid nitrogen, and also in small, open glass vessels containing only milligram quantities of ozone. Sufficient explosive power is generated to shatter the internal components of cryostats or cryogenic containers. It appears that shock, local heating or even the presence of solid organic resins such as epoxies can trigger this type of explosion.

4 PHYSICAL PROPERTIES OF CRYOGENIC FLUIDS

4.1 General

The physical properties of the principal inert cryogenic fluids, together with those of oxygen, ozone and the principal oxides of nitrogen are given in Table 1.

FLUID	Boiling Pt. K (@1 atm.)	Melting Pt. K (@1 atm.)
Nitrogen (N_2)	77.35	63
Argon (Ar)	87.29	83.2
Helium (He)	4.22	-
Oxygen (O_2)	90.18	54.75
Ozone (O_3)	161.3	80.7
Nitrous Oxide (N_2O)	182.3	170.7
Nitric Oxide (NO)	122	112
Nitrogen Dioxide (NO_2/N_2O_4)	294.3	263.7
Nitrogen Pentoxide (N_2O_5)	320	303

Table 1: Boiling and melting points of liquefied gases

Since liquid oxygen is less volatile than either liquid nitrogen or argon, oxygen enrichment occurs as the liquid nitrogen boils off. If the cryostat is refilled before all the nitrogen has been allowed to boil off, then any condensed oxygen will remain. This is even more pronounced in the case of ozone. Therefore any ozone absorbed in either liquid nitrogen or argon will remain in solution as a dissolved solid.

Liquid oxygen and ozone have a pronounced blue colour and this colour has been reported by many workers in liquid nitrogen after irradiation.

At ambient temperature ozone is known to be unstable, it decomposes spontaneously if only relatively slowly. However the rate of decomposition is increased by the catalytic action of certain metals, the presence of other gases (e.g. NO), or by ionising radiation.

At temperatures below 90 K ozone is stable and does not decompose spontaneously, but under certain conditions it can decompose with explosive violence.

Explosions occur as ozone is rapidly reduced to oxygen (at a lower energy state) i.e. forming oxygen and releasing a large quantity of energy[12].

$$O_3 \rightarrow 3/2\ O_2$$

$$\Delta H = -3\ kJ.g^{-1}$$

This energy of explosion, or decomposition, is similar to the experimental value for the energy of explosion of TNT which has been measured as 4.686 $kJ.g^{-1}$ [13]. Also the speed of detonation of pure ozone and TNT are very similar, at about 6000 $m.s^{-1}$.

4.2 Critical Explosive Concentrations

Chen et al.[5] postulate that the concentration of ozone needs to reach some critical value before explosions can take place. Cook et a1.[14] state that phase separation occurs giving a layer rich in ozone which enhances the probability of explosion.

Streng[15] found that this phase separation is dependent not only upon the concentration, but also upon the temperature of the mixture of O_2/O_3, N_2/O_3 or Ar/O_3. Experimental work carried out by the French "Commissariat a 1'energie atomique (CEA)" [16] confirms this earlier work, but explosions have been observed in Ar/O_3 mixtures at ozone concentrations below the values proposed by Streng.

	Temperature K	Theoretical min.O_3 concentration Mole % (Streng)	O_3 Concentration Mole % at which explosion occurred (CEA)
Oxygen	78.4	6.3	6.4
Nitrogen	77.0	4.4	5.8
Argon	85.0	8.3	4.9

Table 2: Ozone concentrations required to cause explosion

5 OZONE FORMATION

The amount of ozone formed in liquid nitrogen - oxygen mixtures exposed to ionising radiation was measured by Riley[17]. and later by Gault[18]. It was found that G(e), the number of ozone molecules formed per 100 eV, could be expressed as

$$G(e) = Goe + (8{,}05 + 1{,}29\log e)$$

This is valid for oxygen concentrations in the range 52 - 8,75. 10^4 ppm, where Go is the ozone yield, 12.5 molecules/100eV, from pure oxygen at 77 K, and shows that ozone production is relatively efficient even for low oxygen concentrations. For example, ozone formation in liquid nitrogen containing 10^4 ppm oxygen, 5.7 molecules/ 100eV, is only 2.2 times that found in nitrogen containing 52ppm oxygen, 2.6 molecules/ 100eV.

The formation of ozone in liquid argon is thought to be similar to that of liquid nitrogen , but to date little concrete work has been carried out to verify this.

Experiments by Sears J. T. et a1.[19], suggest that the formation of ozone is dependent on dose at low doses but independent of dose rate, however, the steady state concentration of ozone was dependent on dose rate. This is also suggested in a theoretical study carried out by Brereton12. Impurities also play a complex role and can radically affect the steady-state yield of ozone.

Table 3, gives the concentrations of ozone and oxides of nitrogen formed in various technical and liquefied gases on irradiation as found by Dmitriev [20]. The impurity concentrations (O_2?) of the inert gases was assumed to be 0.5%.

Irradiated medium	O_3 concentration at $E = 10^4$ Gy. ($mg.m^{-3}$)	NO_2 concentration at $E = 10^4$ Gy . ($mg .m^{-3}$)
Gaseous Oxygen	$9.40 .10^2$	9.7
Liquid Oxygen	$2.7 .10^5$	$2.28 .10^3$
Air	$4.02 .10^2$	$2.90 .10^2$
Liquid Air	$1.5 .10^5$	$5 .10^4$
Gaseous Nitrogen	45	11
Liquid Nitrogen	$1.65 .10^3$	$1.17 .10^3$
Argon	$1.34 .10^2$	$1.05 .10^{-1}$
Helium	8	$1.3.10^{-2}$

Table 3. Ozone formation in technical & liquefied gases

It is evident from table 3 that the ozone produced when liquefied gases are irradiated is of the order 100 times more than for the same gases at ambient temperatures and that oxides of nitrogen are formed, albeit in much smaller concentrations than ozone. Nevertheless oxides of nitrogen may play an important role in the reactions leading to the formation of ozone.

6. CRYOSTAT CONSTRUCTION

A number of reports in the literature suggest that the materials used in the construction of the cryostats play an important role in the formation of ozone and that this formation must be, at least in part, due to surface reactions.

Work carried out by Douglas J. E. et a1. [21] , show that the production of ozone can be dependent on the material in contact with the fluid in the cryostat.

Unsaturated organic compounds react with ozone to produce ozonides, which are subject to sudden decomposition[22], and as araldite and polystyrene, which both contain double bonds, are known to play important catalytic roles in the decomposition of ozone[4], this may be due to the formation of ozonides. Careful consideration should be given to their employment, and that of similar compounds, in cryostats.

Ozone may concentrate at the interface of the liquid surface and the vessel wall due to the preferential evaporation of the liquid nitrogen. It is important to chose materials with low wetting properties to limit this phenomena.

7. REMOVAL OF OZONE

Catalytic decomposition, or removal of ozone has been studied at ambient temperatures, but little work has been carried out into these processes at cryogenic temperatures.

Studies by d'Emel' Yanova et al [23,24] and Dewanckel et al.[25], into the catalytic decomposition of ozone in solution, in either liquid oxygen or nitrogen, indicate that platinum, palladium and to a lesser extent silver and copper are efficient at reducing ozone to oxygen. Certain metal oxides may also be employed to destroy ozone.

Activated carbon has a high adsorptive capacity for ozone even from dilute solutions, but this should not be considered as there is a risk of accumulating relatively large quantities of ozone, with the consequent risk of explosion when warming up the system.

8. DISCUSSION

It has been shown at CERN, and at other places, that explosions in cryogenic liquids can occur when these are exposed to ionising radiation. This radiation may be gamma rays, electrons or neutrons. The cryogenic liquid in which most explosions have taken place has been liquid nitrogen, with a few in liquid argon. The mechanism for the explosions is almost certainly the explosive decomposition of ozone, initiated by shock, or by the presence of polymeric materials in the construction of the cryostat or the presence of foreign matter such as dust particles acting as catalysts. The ozone is formed by the irradiation of oxygen impurities dissolved in the cryogenic liquid. There is some evidence that nitrogen plays a role in the reactions leading to the formation of ozone, but the preponderance of explosions in liquid nitrogen systems may simply be due to the fact that many more liquid nitrogen systems have been exposed to ionising radiation than have, for instance, liquid argon systems.

The quantity of ozone formed is a function of the total dose and very much less a function of the initial oxygen content. The effect of the dose rate is less clearly understood.

The above mechanism appears to represent a serious risk to the cryogenic systems being proposed for the LHC experiments, since quantities of cryogenic liquids will be found in zones of high radiation (e.g. EM Calorimeter end caps). The total annual dose will fall within the range known to create dangerous amounts of ozone in liquid nitrogen, or, argon and the complexity of the system could well facilitate the contamination of the cryogens by oxygen unless special precautions are taken.

It is of primary importance that these problems be addressed at the design stage, to reduce the potential danger by minimising the quantity of oxygen within the radiation field, for example using closed cycle secondary circuits filled with pure liquids cooled by heat exchange with commercial liquid nitrogen not exposed to ionising radiation.

It would be wise to monitor continuously the oxygen level in the cryogens exposed to ionising radiation and it may be necessary to design in systems for the removal of ozone as it is formed should the studies show that the risk to the cryogenic systems in the LHC experiments is such that it cannot be accepted.

This report has concentrated on the experimental areas where liquid nitrogen and argon will be present, for it is in these systems that most explosions have occurred. As far as we are aware there have

been no reported incidents due to the problem of ozone formation and explosive decomposition in irradiated liquid helium. However there have been reports of ozone formation and explosion in solid air condensed on external cold sots of liquid helium cryogenic systems exposed to ionising radiation[27]. This problem should be taken into account in the design and operation of the cryogenic systems of the LHC machine.

As stated above, the total dose plays an important role in the formation of ozone, although the effects of dose rate and oxygen concentration are less clearly defined. The role played by nitrogen oxides in the formation of ozone is also unclear, as although these compounds do not appear to be the source of explosions, they may catalyse the formation of ozone. Further experimental work into the effects of dose rates and oxygen concentration would be of great value, as would work on the risks in liquid argon systems as much less information exists on this latter subject.

9. ACKNOWLEDGEMENTS

We are indebted to S. Brereton, of Lawrence Livermore Laboratory, L. C. Cadwallader of Idaho National Engineering Laboratory and G. Bon Mardion, of Commissariat a l'energie atomique, service des basses temperatures, for their contributions with respect to bibliographic references. These have enabled us to do a more complete search than we would other wise have been able to do. Also T. Ninikoski, L. Leistam and K. Potter for their help and encouragement.

10 REFERENCES

1. Niinikoski T. CERN. Memo to C. W. Nuttall,17th- June 1994.

2. Bochirol L. et al.. A cryogenic device for irradiation in liquid nitrogen, Cryogenics, September 1960.

3. Loomis J. S. et al. Ozone hazards incurred by electron van de GRAAFF operation, Nuc. Inst. & Methods, 15,1962.

4. Walker P. T. Explosions in irradiated liquid nitrogen, LJKAEA, research group, Harwell, January 1961.

5. Chen C. W. et al. On the cause of explosions in reactor cryostats for liquid nitrogen, Cryogenics, April 1969.

6. ATLAS Technical Proposal, CERN/LHCC/94-43, 15th December 1994.

7. McGee H. A. et al. Cryochemistry, Cryogenics, September 1962.

8. Cottrell W. B. ORNL Report CF 58-7-97(1958).

9. Heyne L. The consentration of oxygen in nitrogen cryostats for reactor irradiations, Cryogenics, December 1962.

10. Junk G. et al, The presence of N3+and N4+ in the mass spectra of molecular nitrogen. J. of Am. Chem. Soc. Vol 80, p. 2908,1958.

11. Kelly R et al, The kinetics of the decay of nitrogen atoms as determined from chemical measurements of atom concentrations as a function of pressure. Can. J. Chem. Vol. 37, p. 62,1959.

12. Brereton S. J. Explosion hazard in liquid nitrogen cooled fusion systems, Paper, Idaho National Engineering Lab.

13. F. P. Lees, Loss Prevention in the process Industries Butterworths, London, 1983.

14. Cook G. A. et al. Explosion limits of oxone-oxygen mixtures, Ind. & Eng. Chem. 48, 4,736-741, April 1956.

15. Streng A. G. Tables of ozone properties. J. of Chem. and Engineering data, 6, No 3, 431 - 436, July 1961.

16. Dewanckel B. Explosibilite de l'ozone en solution dans l'oxygene, l'azote et l'argon liquides. Centres d'etudes nucleaires de Grenoble. Service des basses temperatures, Note SBT/CT/82 - 95. Mars 1982.

17. Riley J. F. Radiolysis of liquid oxygen and oxygen - nitrogen at 770K,

18. USAEC Report ORNL - 3488, 42 - 43.1963.

19. Gault J. D. et al, Ozone formation by the radiolysis of liquid nitrogen; Calculation and measurement. Nuclear safety, Vol. 14, No 5, September -October 1973.

20. Sears J. T. et al, Radiolytic formation and decomposition of ozone. J. of Physical Chem. Vol. 72, No 4, April 1968.

21. Dmitriev M. T. Formation of ozone and nitrogen oxides in technical and liquefied gases under irradiation conditions. J. of Applied Chem. of the USSR Vol. 41, No 1, January 1968.

22. Douglas J. E. et al, Peculiarities of ozone formation in electron irradiation of nitrogen - oxygen mixtures. J. Chem. Phys. p. 1416, November 1959.

23. Enryclopedie des gaz, L'air Liquide, Elsevier science pub B. V. Amsterdam. 1976.

24. Emel' Yanova G. I. et al, Low temperature heterogeneous catalytic decomposition of concentrated liquid ozone. Russian J. of Phys. Chem., January 1964.

25. Emel'Yanova G. I. et al, Mechnism and kinetics of low temperature catalytic decomposition of liquid ozone on platinum and palladium. Russian J. of Phys. Chem. October 1965.

26. Dewanckel et al, Destruction catalytique de l'ozone en solution dans l'oxygene liquide. Centres d'etudes nucleaires de Grenoble. Service des basses temperatures, Note SBT/CT/81- 82, octobre 1981.

26. Niinikoski T. Memo to C. W. Nuttall, 26th- September 1994.

27. Cadwallader L. C. Cryogenic system operating experience review for fusion applications. Idaho National Engineering Laboratory, EGG-FSP- 10048, January 1992.

Lessard, Edward T

From: Meng, Wuzheng
Sent: Tuesday, December 30, 2003 4:00 PM
To: Lessard, Edward T; Makdisi, Yousef I; Pile, Philip H
Cc: Phillips, David B; Pendzick, Alexander F; Meng, Wuzheng
Subject: Status of Ozone Issue

Ozone_yield.doc (33 KB) appendix.xls.xls (477 KB)

Ed, Yousef, and Phil,

After Dana alerted the ozone issue in MECO PS 80K shield on Dec 2002, I have studied many documents, and in March 03 I came up with a estimate of 9 gram O3 captured inside system after 1st year (1000 hr) run. (I assumed that O3 essentially does not boil away, because its boiling point 162K is much higher than N2 77K.)

During June 3 MECO safety audition, Brad Smith (MIT) gave a presentation "Ozone Buildup Issue". He used Bill Molzon's calculation to state that there will be 10 gram ozone boil away during 1000 hr. He also showed a sketch which suggests after the run, the liquid can be "flushed" out of the system.

On 12/12/03, during the MECO weekly telephone conference, Bill Molzon made two points: 1) ozone would be a problem because it exists in the LN2 as fine powders, and will be flushed out; 2) if GHe is used in shield, temperature gradient will be a problem, since this is a special solenoid (with target heating). I suggested Bill (or Brad) write up some articles to show the experimental safety committee. He seemed to agree.

Attached are two files which I have been working on since June. I have discussed with Ed several times. I used 1000 lines Excel spreadsheet to calculate the parameters: after 1000 hours, total ozone produced will be 9 gram; total ozone boil-off through the vents will be 2 gram; so that there will be 7 gram O3 remaining in the system (in copper pipes). This is about 21 KJ energy, if we use high purity LN2 (with 52 ppm O2 mole fraction). I also mentioned what went wrong in Brad(Bill)'s calculation, gently.

Ed suggests I publish it as our ES&F division tech note. I will appreciate if you make any comments, from the content to wordings.

Thanks for your time.

Wuzheng

Ozone Yield in PS 80 K Shield

W. Meng

(12/29/2003)

Background

On E940 (MECO) safety meeting (December 2002), Dana Beavis raised a question about possible explosion risks due to the activation of liquid nitrogen in the production solenoid (PS) 80 K shield. I was appointed by Ed Lessard to study this issue. I acquired many documents from Ed, Dana, and late on, from Don Crabb (University of Virginia).

Regardless the fact that the mechanisms of these explosions are very complex and are not yet fully understood, it is now widely accepted that these explosions are caused by the very rapid decomposition of ozone, which is formed by the action of ionizing radiation on oxygen dissolved in liquid nitrogen. The decomposition (from O3 to O2) generates 3 kJ for 1gram ozone at very rapid speed. Most explosions in the reactors happened during the warm up (for maintenance) while liquid nitrogen boiled off and the temperature was rising. Some explosions (in reactors and polarized beam targets) happened during the low temperature operations only if the ozone concentration achieved the critical point (4.4 mole %).

Ozone and oxygen do not disappear from the vents easily, simply because of their physical properties: oxygen's boiling point (90.18 K) is much higher than the nitrogen (77.35 K); ozone's melting point (80.7 K) and boiling point (161.3 K) are all higher than the liquid nitrogen temperature.

Calculations

In my early estimate, I just simply used ozone yield rate in Ref [1][2]: in high purity liquid nitrogen (52 ppm O2), 2.6 O3 molecules are produced under 100 eV radiation dose (mainly due to gamma and fast neutrons); I came up with 9 gram ozone in PS 80 K system after 1000 hour beam time.

In this note, I try to estimate the ozone yield under the considerations of possible ozone boil off and fresh liquid nitrogen flowing in. The detailed computations are in a separate Excel spreadsheet (filename: appendix.xls).

Reference 18 [1] in CERN note [2] was based on the accident analysis done by University of Missouri. The experiment setup mainly consists a cryostat (without refill), vent tubes and Drager gas-analysis apparatus which was used to determine the amount of ozone presented in the cryostat by measuring the ozone vapor concentration in the vent. The total net volume of the cryostat was 7.8 liter, and the boil off took 13 hours for a

single cycle (without refill during the study). Initial impurity 0.005 (O_2 mole fraction) in the liquid nitrogen was assumed [1].

From the theory, the partial vapor pressure of ozone above the liquid nitrogen-ozone solution was calculated according to the following equation [1]:

$$P = Po * \exp[C*X(N2)] * X(O3) \quad (1)$$

where C is a constant related to the mole volume of ozone and the solubility parameters of nitrogen and ozone; it was mentioned that the best number (by fitting) is C=7.0; X(N2) and X(O3) are the mole fractions of nitrogen and ozone in the liquid mixture, respectively; Po is the pure ozone vapor pressure at 77 K.

Part I of the Appendix lists the available pure ozone vapor pressure data from references [3], [4] and [5]. I choose the fitted crystalline ozone equation from [5]

$$\text{Log } P = 10.460 - 1021.6/T \quad (2)$$

to get the pure ozone vapor pressure at liquid nitrogen temperature, since this is the only equation based on the measured data covers the low temperature range (from 66 K to 87 K).

In Part II of the Appendix, I computed the conversion factor from the ozone vapor relative pressure in the vent (in ppm), to the boil off rate (in gram/hour). The amount of ozone expelled from the vent is proportional to its vapor pressure except a constant. I then use this constant for evaluating Column P, in Part III of the Appendix.

In Part III of the Appendix, it calculated each parameter in the time interval of one hour, up to 1000 hours (assuming one fiscal year beam period):

Column B is the time, marked as the end of each hour.

Column C is the constant in equation (1) above;

Column D is the energy deposition in the unit of 100 eV per liter liquid per hour (18 μW/g was assumed as the radiation specific dose [6]);

Column E is the liquid (N_2 and O_2) volume in liter. It begins with 13.4 liter (MIT assumed 10.7 kg liquid nitrogen, with the density of 0.8 in the PS 80 K system); as time goes on, it reduces slightly, due to the production of ozone;

Column F is the oxygen mole fraction at the end of each hour. It begins with 52 ppm impurity, and also slightly reduces due to the production of ozone. The same impurity is assumed for the incoming fresh liquid portion;

Column G is the nitrogen mole fraction at the end of each hour, with the consideration of slight reduction due to accumulated ozone volume;

Column H is the electron fraction of the oxygen ε defined in Ref [1]; it begins with 59 ppm (equivalent to 52 ppm mole fraction);

Column I is the ozone forming rate at the end of each hour, in the unit of molecules per 100 eV energy deposition, as a function of ε, based on the equation (5) in Ref [1];

Column J is the ozone yield rate averaged over each hour, in the unit of molecules per hour, based on the modification of equation (10) in Ref [1]; and I have neglected its variation within one hour period;

Column K is the integrated ozone molecules from initial time t=0 to the end of each hour, after taking the boil off into account;

Column L is the ozone mole fraction at the end of each hour;

Column M is the pure ozone vapor pressure at liquid nitrogen temperature (77.35 K), in unit of mm mercury height (torr). The constant was interpolated by using equation (2) in this note (see the discussion above, and Ref [5]);

Column N is the ozone vapor pressure above the liquid, according to equation (4) in Ref [1] (or equation (1) in this note), in the unit of torr;

Column O is the ozone vapor pressure above the liquid normalized to one atmosphere pressure (760 mm Hg height), in the unit of ppm;

Column P is the ozone mass boil off rate averaged over each hour according to the early discussion in this note, in the unit of gram per hour.

As shown in summary cells, J1045, K1045 and P1045, after 1000 hours beam period, the total ozone produced will be around 9 gram, the total ozone boil off will be 2 gram, and the remaining ozone in the system will be around 7 gram.

Above calculation agrees with our previous simple estimate on the yield (in which the boil off ozone was ignored, and the incoming fresh liquid portion was also ignored). It basically agrees with the prediction from Univ. of Missouri's experiment: "…no appreciable amount of ozone is given off until the very end of the cycle, when the vapor pressure is such that concentrations are greater than 10 ppm in the vent gas. **This means that, if a system is refilled while appreciable liquid nitrogen remains, essentially all the ozone formed goes to the next cycle**"[1].

In Ref [7], author used pure ozone pressure data (Po=0.002 torr) from Ref [5] to estimate ozone boil off in MECO case, by applying on the ideal gas law directly; therefore, the ozone boil off (10 gram, after 1000 hours) was over estimated. If we use high purity

liquid nitrogen in the PS system, the ozone will not reach the high concentration until near the end of the warm up; only towards that time, X(N2) approaches zero and X(O3) approaches to 1, as stated in equation (1) above, and the ozone vapor pressure P then approaches to the pure ozone vapor pressure Po. Ozone boil off rate actually is an indirect measure of its concentration in the liquid.

Issues

Above calculations show that the ozone concentration in the liquid is well below the critical level (see Appendix Column L), so that it is unlikely that explosion would occur during the operation (low temperature). The concern now is what could happen during the warm up for annual maintenance. Can 7gram ozone inside PS system cause potential risk during the warm up process? We need to address engineering studies. According to Ref [2], the energy (21 kJ, if high purity liquid nitrogen is used) will be released in a rapid speed (6000 m/s). We may argue that it would not damage the cryostat wall. Could it damage the 80 K shield, which is not designed for resisting much force? If the deformation causes the copper sheet to contact the coil cover or the cryostat wall, or locally compress the super-insulation layers too much, then the magnet will not be cooled down for the second year operation. Such "warm spot" problem has no simple solutions, and large equipment protection is part of our safety issues. Ref [7] also described an interesting idea of purging the 80 K system (copper pipes) before the warm up; the feasibility needs to be evaluated and developed, since this might have the impact on the engineering design of the magnet.

References:

[1] J. D. Gault, K.W. Logan, and H.R. Danner, Ozone Formation by the Radiolysis of Liquid Nitrogen: Calculation and Measurement. Nuclear Safety, Vol. 14, No. 5, 1973.

[2] C.R. Gregory, C.W. Nuttal, Explosion Risks in Cryogenic Liquids Exposed to Ionizing Radiation. CERN AT/95-06 (DI).

[3] A.C. Jenkins, C.M. Birdsall, The Vapor Pressures and Critical Constants of Pure Ozone. The Journal of Chemical Physics, Vol. 20, No. 7, 1952.

[4] Anna Lise Spangenberg, Z. physik. Chem. 119, 419 (1926).

[5] D. Hanson, K. Mauersberger, The Vapor Pressure of Solid and Liquid Ozone, J. Chem. Phys. 85(8), 15 October 1986.

[6] Peter Yamin, private communication.

[7] B. Smith, Ozone Buildup Issue, MECO Safety Presentation, 6/3/2003.

Appendix of "Ozone Yield in PS 80 K Shield"

Part I -- Pure Ozone Vapor Pressure --- Po

Available Data	**Temperature Range**
Spangenbery: logPo = -6919.8/T + 1.75 logT -0.8239 T +146.56	**81 K to 90 K**
Jenkins/Birdsall: logPo = 8.25313 - 814.941587/T - 0.001966943 T	**90 K to 216 K**
Gault et al: logPo = 8.25 -815/T - 0.002 T (simplified from above)	
Hanson and Mauersberger: log Po = 10.460 - 1021.6/T	**66 K to 87 K**

Po = 0.0018 torr (to be used in Part III column M)
(T=77.35 K)

Part II -- Ozone Boil Off Rate -- (Which is Related to Ozone Vapor Pressure)

Quantity of Ozone Vapor (in pressure-volume units: mbar-lt) Expelled through Vent per ho

Since V(O3)=V(N2)=V(O2) -- assume all kinds vapor uniformly mixed at the vent exit --

PV = P(O3) * (0.64/4.604) * 3600
= P(O3)*5.00E2 (torr-lt)
= P(O3)*6.656E2 (mbar-lt)
P(O3) is Not Po!

LN2 Boil Off Rate = 127 (Watt)/199.3 (J/g) = 0.64 g/sec
density(N2) = 4.604 g/lt (at T=77.35 K)
1 torr = 1.333 mbar
P(O3) = ozone vapor pressure above the liquid (in torr)
(Part III column N below)

O3 Boil Off Mass (in gram/hour) --

M(O3) = PV * m/(RT) = P(O3) *6.656E2 * 48 /83.14/300

= P(O3) * 4.97 (gram/hour)
(to be used in Part III column P)

M(O3) = ozone boil off mass/hour
V (Volume) = 6.66E+02 liter (per hour)
m (O3 mass/mol)= 48 gram/mole
R (const) = 83.14 mbar-lt/mol/K
T (temp) = 77.35 K

Part III -- Computation of Ozone Production, Boil Off, and Accumulation in MECO PS 80 K System

symbol	t	C	A	Vo	X(O2)	X(N2)	e (epsilon)	G(e)	n(O3)	N(O3)	X(O3)	Po	P(O3)	P(O3)/P(atm)	M(O3)
name	Time	Constant	Energy Depositio	Liquid Volume	O2 mole fraction	N2 mole fraction	O2 electron fraction	O3 form rate	O3 yield rate	integrated O3	O3 mole fraction	pure O3 pressure	O3 pressure	ratio to standard	O3 boil-off rate
unit	(hour)		(100eV/lt/hr)	(liter)				(molecules/100eV)	(molecules/hr)	(molecules)	at time=t	at 77 K (torr)	above liquid (torr)	(ppm)	(gram/hour)
0	7	3.23482E+18	13.4	0.000052	0.999948	5.94286E-05	2.599196782	0	0	0	0.0018	0	0	0	0
1	7	3.23482E+18	13.4	0.000052	0.999948	5.94286E-05	2.599196782	1.12666E+20	1.12666E+20	4.88589E-07	0.0018	9.64095E-07	0.001268546	4.79155E-06	
2	7	3.23482E+18	13.39999472	5.2E-05	0.999947511	5.94285E-05	2.599196508	1.12666E+20	2.25272E+20	9.76918E-07	0.0018	1.92767E-06	0.002536406	9.58051E-06	
3	7	3.23482E+18	13.39998944	5.19999E-05	0.999947023	5.94285E-05	2.599196234	1.12666E+20	3.37818E+20	1.46499E-06	0.0018	2.89072E-06	0.003803582	1.43669E-05	
4	7	3.23482E+18	13.39998416	5.19999E-05	0.999946535	5.94285E-05	2.59919596	1.12666E+20	4.50304E+20	1.95279E-06	0.0018	3.85326E-06	0.005070073	1.91507E-05	
5	7	3.23482E+18	13.39997889	5.19999E-05	0.999946047	5.94285E-05	2.599195687	1.12666E+20	5.62729E+20	2.44034E-06	0.0018	4.81527E-06	0.00633588	2.39319E-05	
6	7	3.23482E+18	13.39997362	5.19999E-05	0.99994556	5.94284E-05	2.599195413	1.12666E+20	6.75095E+20	2.92763E-06	0.0018	5.77676E-06	0.007601003	2.87105E-05	
7	7	3.23482E+18	13.39996835	5.19998E-05	0.999945073	5.94284E-05	2.59919514	1.12666E+20	7.87401E+20	3.41466E-06	0.0018	6.73774E-06	0.008865443	3.34866E-05	
8	7	3.23482E+18	13.39996309	5.19998E-05	0.999944586	5.94284E-05	2.599194866	1.12666E+20	8.99646E+20	3.90143E-06	0.0018	7.69819E-06	0.0101292	3.826E-05	
9	7	3.23482E+18	13.39995783	5.19998E-05	0.999944099	5.94283E-05	2.599194593	1.12666E+20	1.01183E+21	4.38793E-06	0.0018	8.65813E-06	0.011392274	4.30309E-05	
10	7	3.23482E+18	13.39995257	5.19998E-05	0.999943612	5.94283E-05	2.59919432	1.12666E+20	1.12396E+21	4.87418E-06	0.0018	9.61755E-06	0.012654666	4.77992E-05	
11	7	3.23482E+18	13.39994731	5.19997E-05	0.999943126	5.94283E-05	2.599194048	1.12666E+20	1.23602E+21	5.36017E-06	0.0018	1.05764E-05	0.013916376	5.25649E-05	
12	7	3.23482E+18	13.39994206	5.19997E-05	0.99994264	5.94283E-05	2.599193775	1.12666E+20	1.34803E+21	5.8459E-06	0.0018	1.15348E-05	0.015177404	5.73281E-05	
13	7	3.23482E+18	13.39993681	5.19997E-05	0.999942154	5.94282E-05	2.599193503	1.12665E+20	1.45998E+21	6.33137E-06	0.0018	1.24927E-05	0.016437752	6.20887E-05	
14	7	3.23482E+18	13.39993156	5.19997E-05	0.999941669	5.94282E-05	2.59919323	1.12665E+20	1.57186E+21	6.81659E-06	0.0018	1.345E-05	0.017697419	6.68467E-05	
15	7	3.23482E+18	13.39992631	5.19996E-05	0.999941184	5.94282E-05	2.599192958	1.12665E+20	1.68369E+21	7.30154E-06	0.0018	1.44069E-05	0.018956405	7.16021E-05	
16	7	3.23482E+18	13.39992107	5.19996E-05	0.999940699	5.94281E-05	2.599192686	1.12665E+20	1.79546E+21	7.78624E-06	0.0018	1.53632E-05	0.020214711	7.6355E-05	
17	7	3.23482E+18	13.39991583	5.19996E-05	0.999940214	5.94281E-05	2.599192414	1.12665E+20	1.90716E+21	8.27067E-06	0.0018	1.6319E-05	0.021472338	8.11053E-05	
18	7	3.23482E+18	13.39991059	5.19996E-05	0.99993973	5.94281E-05	2.599192142	1.12665E+20	2.01881E+21	8.75485E-06	0.0018	1.72743E-05	0.022729286	8.58531E-05	
19	7	3.23482E+18	13.39990536	5.19995E-05	0.999939246	5.94281E-05	2.599191871	1.12665E+20	2.1304E+21	9.23877E-06	0.0018	1.8229E-05	0.023985554	9.05982E-05	
20	7	3.23482E+18	13.39990013	5.19995E-05	0.999938762	5.9428E-05	2.599191599	1.12665E+20	2.24193E+21	9.72243E-06	0.0018	1.91833E-05	0.025241145	9.53409E-05	
21	7	3.23482E+18	13.3998949	5.19995E-05	0.999938278	5.9428E-05	2.599191328	1.12665E+20	2.35339E+21	1.02058E-05	0.0018	2.0137E-05	0.026496057	0.000100081	
22	7	3.23482E+18	13.39988967	5.19995E-05	0.999937795	5.9428E-05	2.599191057	1.12665E+20	2.4648E+21	1.0689E-05	0.0018	2.10902E-05	0.027750291	0.000104818	
23	7	3.23482E+18	13.39988445	5.19994E-05	0.999937312	5.94279E-05	2.599190786	1.12665E+20	2.57615E+21	1.11719E-05	0.0018	2.20429E-05	0.029003848	0.000109553	
24	7	3.23482E+18	13.39987923	5.19994E-05	0.999936829	5.94279E-05	2.599190515	1.12665E+20	2.68744E+21	1.16545E-05	0.0018	2.29951E-05	0.030256728	0.000114286	
25	7	3.23482E+18	13.39987401	5.19994E-05	0.999936346	5.94279E-05	2.599190244	1.12665E+20	2.79867E+21	1.21369E-05	0.0018	2.39468E-05	0.031508931	0.000119016	
26	7	3.23482E+18	13.3998688	5.19994E-05	0.999935864	5.94279E-05	2.599189973	1.12665E+20	2.90985E+21	1.2619E-05	0.0018	2.48979E-05	0.032760459	0.000123743	
27	7	3.23482E+18	13.39986359	5.19993E-05	0.999935382	5.94278E-05	2.599189703	1.12665E+20	3.02096E+21	1.31009E-05	0.0018	2.58486E-05	0.03401131	0.000128468	
28	7	3.23482E+18	13.39985838	5.19993E-05	0.9999349	5.94278E-05	2.599189433	1.12665E+20	3.13201E+21	1.35825E-05	0.0018	2.67987E-05	0.035261486	0.00013319	
29	7	3.23482E+18	13.39985317	5.19993E-05	0.999934418	5.94278E-05	2.599189162	1.12665E+20	3.243E+21	1.40638E-05	0.0018	2.77483E-05	0.036510986	0.000137909	
30	7	3.23482E+18	13.39984797	5.19993E-05	0.999933937	5.94277E-05	2.599188892	1.12665E+20	3.35394E+21	1.45449E-05	0.0018	2.86975E-05	0.037759812	0.000142626	
31	7	3.23482E+18	13.39984277	5.19992E-05	0.999933456	5.94277E-05	2.599188623	1.12664E+20	3.46481E+21	1.50257E-05	0.0018	2.96461E-05	0.039007964	0.000147341	
32	7	3.23482E+18	13.39983757	5.19992E-05	0.999932975	5.94277E-05	2.599188353	1.12664E+20	3.57563E+21	1.55063E-05	0.0018	3.05941E-05	0.040255441	0.000152053	
33	7	3.23482E+18	13.39983238	5.19992E-05	0.999932495	5.94276E-05	2.599188083	1.12664E+20	3.68639E+21	1.59866E-05	0.0018	3.15417E-05	0.041502245	0.000156762	
34	7	3.23482E+18	13.39982719	5.19992E-05	0.999932014	5.94276E-05	2.599187814	1.12664E+20	3.79708E+21	1.64667E-05	0.0018	3.24888E-05	0.042748376	0.000161469	
35	7	3.23482E+18	13.39982200	5.19991E-05	0.999931534	5.94276E-05	2.599187544	1.12664E+20	3.90772E+21	1.69465E-05	0.0018	3.34353E-05	0.043993833	0.000166174	
36	7	3.23482E+18	13.39981681	5.19991E-05	0.999931054	5.94276E-05	2.599187275	1.12664E+20	4.0183E+21	1.7426E-05	0.0018	3.43813E-05	0.045238618	0.000170875	
37	7	3.23482E+18	13.39981163	5.19991E-05	0.999930575	5.94275E-05	2.599187006	1.12664E+20	4.12882E+21	1.79053E-05	0.0018	3.53269E-05	0.046482731	0.000175575	
38	7	3.23482E+18	13.39980644	5.19991E-05	0.999930096	5.94275E-05	2.599186737	1.12664E+20	4.23928E+21	1.83844E-05	0.0018	3.62719E-05	0.047726173	0.000180271	
39	7	3.23482E+18	13.39980127	5.1999E-05	0.999929617	5.94275E-05	2.599186469	1.12664E+20	4.34968E+21	1.88632E-05	0.0018	3.72164E-05	0.048968943	0.000184965	
40	7	3.23482E+18	13.39979609	5.1999E-05	0.999929138	5.94275E-05	2.5991862	1.12664E+20	4.46003E+21	1.93417E-05	0.0018	3.81604E-05	0.050211041	0.000189657	
41	7	3.23482E+18	13.39979092	5.1999E-05	0.999928659	5.94274E-05	2.599185932	1.12664E+20	4.57031E+21	1.982E-05	0.0018	3.91039E-05	0.051452469	0.000194346	
42	7	3.23482E+18	13.39978575	5.1999E-05	0.999928181	5.94274E-05	2.599185663	1.12664E+20	4.68054E+21	2.0298E-05	0.0018	4.00469E-05	0.052693227	0.000199033	
43	7	3.23482E+18	13.39978058	5.19989E-05	0.999927703	5.94274E-05	2.599185395	1.12664E+20	4.7907E+21	2.07757E-05	0.0018	4.09893E-05	0.053933315	0.000203717	
44	7	3.23482E+18	13.39977542	5.19989E-05	0.999927225	5.94273E-05	2.599185127	1.12664E+20	4.90081E+21	2.12533E-05	0.0018	4.19313E-05	0.055172734	0.000208398	
45	7	3.23482E+18	13.39977025	5.19989E-05	0.999926748	5.94273E-05	2.599184859	1.12664E+20	5.01086E+21	2.17305E-05	0.0018	4.28727E-05	0.056411483	0.000213077	
46	7	3.23482E+18	13.3997651	5.19989E-05	0.999926271	5.94273E-05	2.599184591	1.12664E+20	5.12085E+21	2.22075E-05	0.0018	4.38137E-05	0.057649563	0.000217754	
47	7	3.23482E+18	13.39975994	5.19988E-05	0.999925794	5.94273E-05	2.599184324	1.12664E+20	5.23078E+21	2.26843E-05	0.0018	4.47541E-05	0.058886975	0.000222428	
48	7	3.23482E+18	13.39975479	5.19988E-05	0.999925317	5.94272E-05	2.599184056	1.12664E+20	5.34065E+21	2.31607E-05	0.0018	4.5694E-05	0.060123719	0.000227099	
49	7	3.23482E+18	13.39974963	5.19988E-05	0.99992484	5.94272E-05	2.599183789	1.12664E+20	5.45047E+21	2.3637E-05	0.0018	4.66334E-05	0.061359795	0.000231768	
50	7	3.23482E+18	13.39974449	5.19988E-05	0.999924364	5.94272E-05	2.599183522	1.12663E+20	5.56022E+21	2.4113E-05	0.0018	4.75724E-05	0.062595204	0.000236435	
51	7	3.23482E+18	13.39973934	5.19987E-05	0.999923888	5.94271E-05	2.599183255	1.12663E+20	5.66992E+21	2.45887E-05	0.0018	4.85108E-05	0.063829945	0.000241098	
52	7	3.23482E+18	13.3997342	5.19987E-05	0.999923413	5.94271E-05	2.599182988	1.12663E+20	5.77956E+21	2.50642E-05	0.0018	4.94487E-05	0.06506402	0.00024576	
53	7	3.23482E+18	13.39972906	5.19987E-05	0.999922937	5.94271E-05	2.599182721	1.12663E+20	5.88914E+21	2.55394E-05	0.0018	5.0386E-05	0.066297429	0.000250419	
54	7	3.23482E+18	13.39972392	5.19987E-05	0.999922462	5.94271E-05	2.599182455	1.12663E+20	5.99866E+21	2.60144E-05	0.0018	5.13229E-05	0.067530172	0.000255075	
55	7	3.23482E+18	13.39971879	5.19986E-05	0.999921987	5.9427E-05	2.599182188	1.12663E+20	6.10812E+21	2.64891E-05	0.0018	5.22593E-05	0.06876225	0.000259729	
56	7	3.23482E+18	13.39971366	5.19986E-05	0.999921512	5.9427E-05	2.599181922	1.12663E+20	6.21752E+21	2.69635E-05	0.0018	5.31952E-05	0.069993662	0.00026438	
57	7	3.23482E+18	13.39970853	5.19986E-05	0.999921038	5.9427E-05	2.599181656	1.12663E+20	6.32687E+21	2.74378E-05	0.0018	5.41306E-05	0.07122441	0.000269029	
58	7	3.23482E+18	13.3997034	5.19986E-05	0.999920564	5.94269E-05	2.59918139	1.12663E+20	6.43616E+21	2.79117E-05	0.0018	5.50654E-05	0.072454493	0.000273675	
59	7	3.23482E+18	13.39969828	5.19985E-05	0.99992009	5.94269E-05	2.599181124	1.12663E+20	6.54538E+21	2.83854E-05	0.0018	5.59998E-05	0.073683912	0.000278319	
60	7	3.23482E+18	13.39969316	5.19985E-05	0.999919616	5.94269E-05	2.599180858	1.12663E+20	6.65456E+21	2.88589E-05	0.0018	5.69336E-05	0.074912668	0.00028296	
61	7	3.23482E+18	13.39968804	5.19985E-05	0.999919143	5.94269E-05	2.599180592	1.12663E+20	6.76367E+21	2.93321E-05	0.0018	5.7867E-05	0.07614076	0.000287599	
62	7	3.23482E+18	13.39968293	5.19985E-05	0.999918669	5.94268E-05	2.599180327	1.12663E+20	6.87272E+21	2.9805E-05	0.0018	5.87998E-05	0.077368189	0.000292235	
63	7	3.23482E+18	13.39967781	5.19985E-05	0.999918197	5.94268E-05	2.599180062	1.12663E+20	6.98172E+21	3.02777E-05	0.0018	5.97322E-05	0.078594956	0.000296869	
64	7	3.23482E+18	13.3996727	5.19984E-05	0.999917724	5.94268E-05	2.599179797	1.12663E+20	7.09065E+21	3.07502E-05	0.0018	6.0664E-05	0.07982106	0.0003015	
65	7	3.23482E+18	13.3996676	5.19984E-05	0.999917251	5.94267E-05	2.599179531	1.12663E+20	7.19953E+21	3.12223E-05	0.0018	6.15953E-05	0.081046503	0.000306129	
66	7	3.23482E+18	13.39966249	5.19984E-05	0.999916779	5.94267E-05	2.599179267	1.12663E+20	7.30836E+21	3.16943E-05	0.0018	6.25262E-05	0.082271284	0.000310755	
67	7	3.23482E+18	13.39965739	5.19984E-05	0.999916307	5.94267E-05	2.599179002	1.12663E+20	7.41712E+21	3.2166E-05	0.0018	6.34565E-05	0.083495404	0.000315379	
68	7	3.23482E+18	13.39965229	5.19983E-05	0.999915836	5.94267E-05	2.599178737	1.12662E+20	7.52582E+21	3.26374E-05	0.0018	6.43863E-05	0.084718863	0.00032	
69	7	3.23482E+18	13.3996472	5.19983E-05	0.999915364	5.94266E-05	2.599178473	1.12662E+20	7.63447E+21	3.31086E-05	0.0018	6.53157E-05	0.085941662	0.000324619	
70	7	3.23482E+18	13.3996421	5.19983E-05	0.999914893	5.94266E-05	2.599178208	1.12662E+20	7.74306E+21	3.35795E-05	0.0018	6.62445E-05	0.087163801	0.000329235	
71	7	3.23482E+18	13.39963701	5.19983E-05	0.999914422	5.94266E-05	2.599177944	1.12662E+20	7.85159E+21	3.40502E-05	0.0018	6.71728E-05	0.08838528	0.000333849	
72	7	3.23482E+18	13.39963192	5.19982E-05	0.999913952	5.94265E-05	2.59917768	1.12662E+20	7.96006E+21	3.45206E-05	0.0018	6.81006E-05	0.0896061	0.00033846	
73	7	3.23482E+18	13.39962684	5.19982E-05	0.999913481	5.94265E-05	2.599177416	1.12662E+20	8.06848E+21	3.49908E-05	0.0018	6.9028E-05	0.090826261	0.000343069	
74	7	3.23482E+18	13.39962176	5.19982E-05	0.999913011	5.94265E-05	2.599177152	1.12662E+20	8.17684E+21	3.54608E-05	0.0018	6.99548E-05	0.092045763	0.000347675	
75	7	3.23482E+18	13.39961668	5.19982E-05	0.999912541	5.94265E-05	2.599176889	1.12662E+20	8.28514E+21	3.59304E-05	0.0018	7.08811E-05	0.093264607	0.000352279	
76	7	3.23482E+18	13.3996116	5.19981E-05	0.999912071	5.94264E-05	2.599176625	1.12662E+20	8.39338E+21	3.63999E-05	0.0018	7.18069E-05	0.094482794	0.00035688	
77	7	3.23482E+18	13.39960653	5.19981E-05	0.999911602	5.94264E-05	2.599176362	1.12662E+20	8.50156E+21	3.6869E-05	0.0018	7.27322E-05	0.095700322	0.000361479	
78	7	3.23482E+18	13.39960145	5.19981E-05	0.999911133	5.94264E-05	2.599176099	1.12662E+20	8.60969E+21	3.7338E-05	0.0018	7.36571E-05	0.096917194	0.000366076	
79	7	3.23482E+18	13.39959639	5.19981E-05	0.999910664	5.94264E-05	2.599175836	1.12662E+20	8.71776E+21	3.78066E-05	0.0018	7.45814E-05	0.098133409	0.00037067	
80	7	3.23482E+18	13.39959132	5.198E-05	0.999910195	5.94263E-05	2.599175573	1.12662E+20	8.82577E+21	3.82751E-05	0.0018	7.55052E-05	0.099348968	0.000375261	
81	7	3.23482E+18	13.39958626	5.198E-05	0.999909727	5.94263E-05	2.59917531	1.12662E+20	8.93372E+21	3.87433E-05	0.0018	7.64285E-05	0.10056387	0.00037985	
82	7	3.23482E+18	13.3995812	5.198E-05	0.999909259	5.94263E-05	2.599175047	1.12662E+20	9.04162E+21	3.92112E-05	0.0018	7.73514E-05	0.101778117	0.000384436	
83	7	3.23482E+18	13.39957614	5.198E-05	0.999908791	5.94262E-05	2.599174785	1.12662E+20	9.14945E+21	3.96789E-05	0.0018	7.82737E-05	0.102991708	0.00038902	
84	7	3.23482E+18	13.39957108	5.19979E-05	0.999908323	5.94262E-05	2.599174522	1.12662E+20	9.25723E+21	4.01463E-05	0.0018	7.91955E-05	0.104204645	0.000393602	
85	7	3.23482E+18	13.39956603	5.19979E-05	0.999907856	5.94262E-05	2.59917426	1.12662E+20	9.36496E+21	4.06135E-05	0.0018	8.01169E-05	0.105416927	0.000398181	
86	7	3.23482E+18	13.39956098	5.19979E-05	0.999907389	5.94262E-05	2.599173998	1.12661E+20	9.47262E+21	4.10804E-05	0.0018	8.10377E-05	0.106628555	0.000402757	

87	7	3.23482E+18	13.39955593	5.19979E-05	0.999906922	5.94261E-05	2.599173736	1.12661E+20	9.58023E+21	4.15471E-05	0.0018	8.1958E-05	0.107839529	0.000407331
88	7	3.23482E+18	13.39955089	5.19978E-05	0.999906455	5.94261E-05	2.599173474	1.12661E+20	9.68778E+21	4.20135E-05	0.0018	8.28779E-05	0.109049849	0.000411903
89	7	3.23482E+18	13.39954585	5.19978E-05	0.999905989	5.94261E-05	2.599173213	1.12661E+20	9.79527E+21	4.24797E-05	0.0018	8.37972E-05	0.110259516	0.000416472
90	7	3.23482E+18	13.39954081	5.19978E-05	0.999905522	5.9426E-05	2.599172951	1.12661E+20	9.90271E+21	4.29457E-05	0.0018	8.47161E-05	0.111468531	0.000421039
91	7	3.23482E+18	13.39953577	5.19978E-05	0.999905057	5.9426E-05	2.59917269	1.12661E+20	1.00101E+22	4.34113E-05	0.0018	8.56344E-05	0.112676893	0.000425603
92	7	3.23482E+18	13.39953074	5.19977E-05	0.999904591	5.9426E-05	2.599172428	1.12661E+20	1.01174E+22	4.38768E-05	0.0018	8.65523E-05	0.113884603	0.000430165
93	7	3.23482E+18	13.3995257	5.19977E-05	0.999904125	5.9426E-05	2.599172167	1.12661E+20	1.02247E+22	4.4342E-05	0.0018	8.74697E-05	0.115091661	0.000434724
94	7	3.23482E+18	13.39952068	5.19977E-05	0.99990366	5.94259E-05	2.599171906	1.12661E+20	1.03319E+22	4.48069E-05	0.0018	8.83865E-05	0.116298068	0.000439281
95	7	3.23482E+18	13.39951565	5.19977E-05	0.999903195	5.94259E-05	2.599171646	1.12661E+20	1.0439E+22	4.52716E-05	0.0018	8.93029E-05	0.117503824	0.000443835
96	7	3.23482E+18	13.39951063	5.19976E-05	0.999902731	5.94259E-05	2.599171385	1.12661E+20	1.05461E+22	4.57361E-05	0.0018	9.02188E-05	0.118708929	0.000448387
97	7	3.23482E+18	13.39950561	5.19976E-05	0.999902266	5.94259E-05	2.599171124	1.12661E+20	1.06532E+22	4.62003E-05	0.0018	9.11342E-05	0.119913384	0.000452937
98	7	3.23482E+18	13.39950059	5.19976E-05	0.999901802	5.94258E-05	2.599170864	1.12661E+20	1.07601E+22	4.66642E-05	0.0018	9.20491E-05	0.121117189	0.000457484
99	7	3.23482E+18	13.39949557	5.19976E-05	0.999901338	5.94258E-05	2.599170604	1.12661E+20	1.0867E+22	4.71279E-05	0.0018	9.29635E-05	0.122320344	0.000462028
100	7	3.23482E+18	13.39949056	5.19975E-05	0.999900875	5.94258E-05	2.599170343	1.12661E+20	1.09739E+22	4.75914E-05	0.0018	9.38774E-05	0.123522851	0.000466571
101	7	3.23482E+18	13.39948555	5.19975E-05	0.999900411	5.94257E-05	2.599170083	1.12661E+20	1.10807E+22	4.80546E-05	0.0018	9.47908E-05	0.124724708	0.00047111
102	7	3.23482E+18	13.39948055	5.19975E-05	0.999899948	5.94257E-05	2.599169824	1.12661E+20	1.11875E+22	4.85176E-05	0.0018	9.57037E-05	0.125925917	0.000475647
103	7	3.23482E+18	13.39947554	5.19975E-05	0.999899485	5.94257E-05	2.599169564	1.12661E+20	1.12942E+22	4.89803E-05	0.0018	9.66161E-05	0.127126478	0.000480182
104	7	3.23482E+18	13.39947054	5.19975E-05	0.999899022	5.94257E-05	2.599169304	1.12661E+20	1.14008E+22	4.94428E-05	0.0018	9.75281E-05	0.128326391	0.000484714
105	7	3.23482E+18	13.39946554	5.19974E-05	0.99989856	5.94256E-05	2.599169045	1.1266E+20	1.15074E+22	4.9905E-05	0.0018	9.84395E-05	0.129525657	0.000489244
106	7	3.23482E+18	13.39946054	5.19974E-05	0.999898098	5.94256E-05	2.599168786	1.1266E+20	1.16139E+22	5.0367E-05	0.0018	9.93504E-05	0.130724275	0.000493772
107	7	3.23482E+18	13.39945555	5.19974E-05	0.999897636	5.94256E-05	2.599168526	1.1266E+20	1.17204E+22	5.08287E-05	0.0018	0.000100261	0.131922247	0.000498297
108	7	3.23482E+18	13.39945056	5.19974E-05	0.999897174	5.94256E-05	2.599168267	1.1266E+20	1.18268E+22	5.12902E-05	0.0018	0.000101171	0.133119573	0.000502819
109	7	3.23482E+18	13.39944557	5.19973E-05	0.999896712	5.94255E-05	2.599168008	1.1266E+20	1.19331E+22	5.17514E-05	0.0018	0.00010208	0.134316252	0.000507339
110	7	3.23482E+18	13.39944059	5.19973E-05	0.999896251	5.94255E-05	2.59916775	1.1266E+20	1.20394E+22	5.22124E-05	0.0018	0.000102989	0.135512286	0.000511857
111	7	3.23482E+18	13.3994356	5.19973E-05	0.99989579	5.94255E-05	2.599167491	1.1266E+20	1.21456E+22	5.26732E-05	0.0018	0.000103898	0.136707675	0.000516372
112	7	3.23482E+18	13.39943062	5.19973E-05	0.99989533	5.94254E-05	2.599167233	1.1266E+20	1.22518E+22	5.31337E-05	0.0018	0.000104806	0.137902419	0.000520885
113	7	3.23482E+18	13.39942564	5.19972E-05	0.999894869	5.94254E-05	2.599166974	1.1266E+20	1.2358E+22	5.35939E-05	0.0018	0.000105713	0.139096518	0.000525395
114	7	3.23482E+18	13.39942067	5.19972E-05	0.999894409	5.94254E-05	2.599166716	1.1266E+20	1.2464E+22	5.40539E-05	0.0018	0.00010662	0.140289973	0.000529903
115	7	3.23482E+18	13.3994157	5.19972E-05	0.999893949	5.94254E-05	2.599166458	1.1266E+20	1.257E+22	5.45137E-05	0.0018	0.000107527	0.141482784	0.000534409
116	7	3.23482E+18	13.39941073	5.19972E-05	0.999893489	5.94253E-05	2.5991662	1.1266E+20	1.2676E+22	5.49732E-05	0.0018	0.000108433	0.142674952	0.000538912
117	7	3.23482E+18	13.39940576	5.19971E-05	0.99989303	5.94253E-05	2.599165942	1.1266E+20	1.27819E+22	5.54325E-05	0.0018	0.000109339	0.143866476	0.000543412
118	7	3.23482E+18	13.3994008	5.19971E-05	0.99989257	5.94253E-05	2.599165684	1.1266E+20	1.28877E+22	5.58915E-05	0.0018	0.000110244	0.145057358	0.000547911
119	7	3.23482E+18	13.39939583	5.19971E-05	0.999892111	5.94252E-05	2.599165427	1.1266E+20	1.29935E+22	5.63503E-05	0.0018	0.000111148	0.146247597	0.000552406
120	7	3.23482E+18	13.39939088	5.19971E-05	0.999891653	5.94252E-05	2.59916517	1.1266E+20	1.30992E+22	5.68089E-05	0.0018	0.000112052	0.147437194	0.0005569
121	7	3.23482E+18	13.39938592	5.1997E-05	0.999891194	5.94252E-05	2.599164912	1.1266E+20	1.32049E+22	5.72672E-05	0.0018	0.000112956	0.14862615	0.000561391
122	7	3.23482E+18	13.39938097	5.1997E-05	0.999890736	5.94252E-05	2.599164655	1.1266E+20	1.33105E+22	5.77252E-05	0.0018	0.000113859	0.149814464	0.000565879
123	7	3.23482E+18	13.39937601	5.1997E-05	0.999890278	5.94251E-05	2.599164398	1.1266E+20	1.34161E+22	5.8183E-05	0.0018	0.000114762	0.151002137	0.000570365
124	7	3.23482E+18	13.39937107	5.1997E-05	0.99988982	5.94251E-05	2.599164141	1.12659E+20	1.35216E+22	5.86406E-05	0.0018	0.000115664	0.152189169	0.000574849
125	7	3.23482E+18	13.39936612	5.1997E-05	0.999889362	5.94251E-05	2.599163885	1.12659E+20	1.3627E+22	5.90979E-05	0.0018	0.000116565	0.153375561	0.00057933
126	7	3.23482E+18	13.39936118	5.19969E-05	0.999888905	5.94251E-05	2.599163628	1.12659E+20	1.37324E+22	5.9555E-05	0.0018	0.000117467	0.154561313	0.000583809
127	7	3.23482E+18	13.39935624	5.19969E-05	0.999888448	5.9425E-05	2.599163372	1.12659E+20	1.38378E+22	6.00118E-05	0.0018	0.000118367	0.155746425	0.000588285
128	7	3.23482E+18	13.3993513	5.19969E-05	0.999887991	5.9425E-05	2.599163115	1.12659E+20	1.3943E+22	6.04684E-05	0.0018	0.000119267	0.156930899	0.000592759
129	7	3.23482E+18	13.39934636	5.19969E-05	0.999887535	5.9425E-05	2.599162859	1.12659E+20	1.40483E+22	6.09248E-05	0.0018	0.000120167	0.158114733	0.000597231
130	7	3.23482E+18	13.39934143	5.19968E-05	0.999887078	5.9425E-05	2.599162603	1.12659E+20	1.41534E+22	6.13809E-05	0.0018	0.000121066	0.159297929	0.0006017
131	7	3.23482E+18	13.3993365	5.19968E-05	0.999886622	5.94249E-05	2.599162347	1.12659E+20	1.42585E+22	6.18367E-05	0.0018	0.000121965	0.160480486	0.000606167
132	7	3.23482E+18	13.39933157	5.19968E-05	0.999886166	5.94249E-05	2.599162092	1.12659E+20	1.43636E+22	6.22924E-05	0.0018	0.000122863	0.161662406	0.000610631
133	7	3.23482E+18	13.39932665	5.19968E-05	0.999885711	5.94249E-05	2.599161836	1.12659E+20	1.44686E+22	6.27477E-05	0.0018	0.000123761	0.162843688	0.000615093
134	7	3.23482E+18	13.39932173	5.19967E-05	0.999885256	5.94248E-05	2.599161581	1.12659E+20	1.45735E+22	6.32029E-05	0.0018	0.000124658	0.164024333	0.000619553
135	7	3.23482E+18	13.39931681	5.19967E-05	0.9998848	5.94248E-05	2.599161325	1.12659E+20	1.46784E+22	6.36578E-05	0.0018	0.000125555	0.165204341	0.00062401
136	7	3.23482E+18	13.39931189	5.19967E-05	0.999884346	5.94248E-05	2.59916107	1.12659E+20	1.47832E+22	6.41124E-05	0.0018	0.000126452	0.166383713	0.000628465
137	7	3.23482E+18	13.39930698	5.19967E-05	0.999883891	5.94248E-05	2.599160815	1.12659E+20	1.4888E+22	6.45668E-05	0.0018	0.000127347	0.167562448	0.000632917
138	7	3.23482E+18	13.39930206	5.19966E-05	0.999883437	5.94247E-05	2.59916056	1.12659E+20	1.49927E+22	6.5021E-05	0.0018	0.000128243	0.168740548	0.000637367
139	7	3.23482E+18	13.39929715	5.19966E-05	0.999882982	5.94247E-05	2.599160305	1.12659E+20	1.50974E+22	6.54749E-05	0.0018	0.000129138	0.169918013	0.000641814
140	7	3.23482E+18	13.39929225	5.19966E-05	0.999882529	5.94247E-05	2.599160051	1.12659E+20	1.5202E+22	6.59286E-05	0.0018	0.000130032	0.171094842	0.000646259
141	7	3.23482E+18	13.39928734	5.19966E-05	0.999882075	5.94247E-05	2.599159796	1.12659E+20	1.53065E+22	6.6382E-05	0.0018	0.000130926	0.172271037	0.000650702
142	7	3.23482E+18	13.39928244	5.19965E-05	0.999881621	5.94246E-05	2.599159542	1.12659E+20	1.5411E+22	6.68352E-05	0.0018	0.000131819	0.173446597	0.000655142
143	7	3.23482E+18	13.39927754	5.19965E-05	0.999881168	5.94246E-05	2.599159287	1.12658E+20	1.55155E+22	6.72882E-05	0.0018	0.000132712	0.174621523	0.00065958
144	7	3.23482E+18	13.39927265	5.19965E-05	0.999880715	5.94246E-05	2.599159033	1.12658E+20	1.56199E+22	6.77409E-05	0.0018	0.000133605	0.175795816	0.000664016
145	7	3.23482E+18	13.39926776	5.19965E-05	0.999880263	5.94245E-05	2.599158779	1.12658E+20	1.57242E+22	6.81934E-05	0.0018	0.000134497	0.176969475	0.000668449
146	7	3.23482E+18	13.39926286	5.19965E-05	0.99987981	5.94245E-05	2.599158525	1.12658E+20	1.58284E+22	6.86456E-05	0.0018	0.000135388	0.178142502	0.00067288
147	7	3.23482E+18	13.39925798	5.19964E-05	0.999879358	5.94245E-05	2.599158272	1.12658E+20	1.59327E+22	6.90976E-05	0.0018	0.000136279	0.179314896	0.000677308
148	7	3.23482E+18	13.39925309	5.19964E-05	0.999878906	5.94245E-05	2.599158018	1.12658E+20	1.60368E+22	6.95493E-05	0.0018	0.00013717	0.180486657	0.000681734
149	7	3.23482E+18	13.39924821	5.19964E-05	0.999878454	5.94244E-05	2.599157765	1.12658E+20	1.61409E+22	7.00008E-05	0.0018	0.00013806	0.181657787	0.000686158
150	7	3.23482E+18	13.39924333	5.19964E-05	0.999878003	5.94244E-05	2.599157511	1.12658E+20	1.6245E+22	7.04521E-05	0.0018	0.000138949	0.182828285	0.000690579
151	7	3.23482E+18	13.39923845	5.19963E-05	0.999877552	5.94244E-05	2.599157258	1.12658E+20	1.6349E+22	7.09031E-05	0.0018	0.000139839	0.183998152	0.000694998
152	7	3.23482E+18	13.39923357	5.19963E-05	0.999877101	5.94244E-05	2.599157005	1.12658E+20	1.64529E+22	7.13539E-05	0.0018	0.000140727	0.185167388	0.000699414
153	7	3.23482E+18	13.3992287	5.19963E-05	0.99987665	5.94243E-05	2.599156752	1.12658E+20	1.65568E+22	7.18045E-05	0.0018	0.000141615	0.186335993	0.000703828
154	7	3.23482E+18	13.39922383	5.19963E-05	0.999876199	5.94243E-05	2.5991565	1.12658E+20	1.66606E+22	7.22548E-05	0.0018	0.000142503	0.187503969	0.00070824
155	7	3.23482E+18	13.39921897	5.19962E-05	0.999875749	5.94243E-05	2.599156247	1.12658E+20	1.67644E+22	7.27048E-05	0.0018	0.00014339	0.188671314	0.000712649
156	7	3.23482E+18	13.3992141	5.19962E-05	0.999875299	5.94243E-05	2.599155994	1.12658E+20	1.68681E+22	7.31547E-05	0.0018	0.000144277	0.18983803	0.000717056
157	7	3.23482E+18	13.39920924	5.19962E-05	0.999874849	5.94242E-05	2.599155742	1.12658E+20	1.69718E+22	7.36043E-05	0.0018	0.000145163	0.191004117	0.000721461
158	7	3.23482E+18	13.39920438	5.19962E-05	0.9998744	5.94242E-05	2.59915549	1.12658E+20	1.70754E+22	7.40536E-05	0.0018	0.000146049	0.192169575	0.000725863
159	7	3.23482E+18	13.39919952	5.19961E-05	0.99987395	5.94242E-05	2.599155238	1.12658E+20	1.71789E+22	7.45027E-05	0.0018	0.000146934	0.193334404	0.000730263
160	7	3.23482E+18	13.39919467	5.19961E-05	0.999873501	5.94241E-05	2.599154986	1.12658E+20	1.72824E+22	7.49516E-05	0.0018	0.000147819	0.194498606	0.00073466
161	7	3.23482E+18	13.39918982	5.19961E-05	0.999873052	5.94241E-05	2.599154734	1.12658E+20	1.73858E+22	7.54002E-05	0.0018	0.000148703	0.19566218	0.000739055
162	7	3.23482E+18	13.39918497	5.19961E-05	0.999872604	5.94241E-05	2.599154482	1.12657E+20	1.74892E+22	7.58486E-05	0.0018	0.000149587	0.196825126	0.000743448
163	7	3.23482E+18	13.39918012	5.19961E-05	0.999872155	5.94241E-05	2.599154231	1.12657E+20	1.75926E+22	7.62967E-05	0.0018	0.00015047	0.197987445	0.000747838
164	7	3.23482E+18	13.39917528	5.1996E-05	0.999871707	5.9424E-05	2.599153979	1.12657E+20	1.76958E+22	7.67447E-05	0.0018	0.000151353	0.199149138	0.000752226
165	7	3.23482E+18	13.39917043	5.1996E-05	0.999871259	5.9424E-05	2.599153728	1.12657E+20	1.77991E+22	7.71923E-05	0.0018	0.000152236	0.200310204	0.000756612
166	7	3.23482E+18	13.3991656	5.1996E-05	0.999870812	5.9424E-05	2.599153477	1.12657E+20	1.79022E+22	7.76398E-05	0.0018	0.000153118	0.201470644	0.000760995
167	7	3.23482E+18	13.39916076	5.1996E-05	0.999870364	5.9424E-05	2.599153226	1.12657E+20	1.80053E+22	7.8087E-05	0.0018	0.000153999	0.202630459	0.000765376
168	7	3.23482E+18	13.39915593	5.19959E-05	0.999869917	5.94239E-05	2.599152975	1.12657E+20	1.81084E+22	7.85339E-05	0.0018	0.00015488	0.203789648	0.000769754
169	7	3.23482E+18	13.3991511	5.19959E-05	0.99986947	5.94239E-05	2.599152724	1.12657E+20	1.82114E+22	7.89806E-05	0.0018	0.000155761	0.204948212	0.00077413
170	7	3.23482E+18	13.39914627	5.19959E-05	0.999869023	5.94239E-05	2.599152474	1.12657E+20	1.83143E+22	7.94271E-05	0.0018	0.000156641	0.206106151	0.000778504
171	7	3.23482E+18	13.39914144	5.19959E-05	0.999868577	5.94239E-05	2.599152223	1.12657E+20	1.84172E+22	7.98734E-05	0.0018	0.00015752	0.207263466	0.000782876
172	7	3.23482E+18	13.39913662	5.19958E-05	0.999868131	5.94238E-05	2.599151973	1.12657E+20	1.852E+22	8.03194E-05	0.0018	0.000158399	0.208420158	0.000787245
173	7	3.23482E+18	13.3991318	5.19958E-05	0.999867685	5.94238E-05	2.599151722	1.12657E+20	1.86228E+22	8.07651E-05	0.0018	0.000159278	0.209576225	0.000791611
174	7	3.23482E+18	13.39912698	5.19958E-05	0.999867239	5.94238E-05	2.599151472	1.12657E+20	1.87255E+22	8.12107E-05	0.0018	0.000160156	0.21073167	0.000795976
175	7	3.23482E+18	13.39912216	5.19958E-05	0.999866794	5.94237E-05	2.599151222	1.12657E+20	1.88282E+22	8.1656E-05	0.0018	0.000161034	0.211886491	0.000800338
176	7	3.23482E+18	13.39911735	5.19958E-05	0.999866348	5.94237E-05	2.599150973	1.12657E+20	1.89308E+22	8.2101E-05	0.0018	0.000161911	0.21304069	0.000804697
177	7	3.23482E+18	13.39911254	5.19957E-05	0.999865903	5.94237E-05	2.599150723	1.12657E+20	1.90334E+22	8.25458E-05	0.0018	0.000162788	0.214194266	0.000809055
178	7	3.23482E+18	13.39910773	5.19957E-05	0.999865458	5.94237E-05	2.599150473	1.12657E+20	1.91359E+22	8.29904E-05	0.0018	0.000163664	0.215347221	0.00081341
179	7	3.23482E+18	13.39910293	5.19957E-05	0.999865014	5.94236E-05	2.599150224	1.12657E+20	1.92383E+22	8.34348E-05	0.0018	0.00016454	0.216499554	0.000817762
180	7	3.23482E+18	13.39909812	5.19957E-05	0.99986457	5.94236E-05	2.599149975	1.12657E+20	1.93407E+22	8.38789E-05	0.0018	0.000165415	0.217651266	0.000822112
181	7	3.23482E+18	13.39909332	5.19956E-05	0.999864125	5.94236E-05	2.599149725	1.12657E+20	1.94431E+22	8.43228E-05	0.0018	0.00016629	0.218802357	0.00082646
182	7	3.23482E+18	13.39908853	5.19956E-05	0.999863682	5.94236E-05	2.599149476	1.12656E+20	1.95454E+22	8.47664E-05	0.0018	0.000167164	0.219952827	0.000830806
183	7	3.23482E+18	13.39908373	5.19956E-05	0.999863238	5.94235E-05	2.599149228	1.12656E+20	1.96476E+22	8.52098E-05	0.0018	0.000168038	0.221102677	0.000835149
184	7	3.23482E+18	13.39907894	5.19956E-05	0.999862795	5.94235E-05	2.599148979	1.12656E+20	1.97498E+22	8.56529E-05	0.0018	0.000168911	0.222251907	0.00083949
185	7	3.23482E+18	13.39907415	5.19955E-05	0.999862352	5.94235E-05	2.59914873	1.12656E+20	1.98519E+22	8.60959E-05	0.0018	0.000169784	0.223400518	0.000843828
186	7	3.23482E+18	13.39906936	5.19955E-05	0.999861909	5.94235E-05	2.599148482	1.12656E+20	1.9954E+22	8.65386E-05	0.0018	0.000170657	0.22454851	0.000848165
187	7	3.23482E+18	13.39906458	5.19955E-05	0.999861466	5.94234E-05	2.599148233	1.12656E+20	2.0056E+22	8.6981E-05	0.0018	0.000171529	0.225695883	0.000852498
188	7	3.23482E+18	13.39905979	5.19955E-05	0.999861024	5.94234E-05	2.599147985	1.12656E+20	2.01579E+22	8.74232E-05	0.0018	0.0001724	0.226842637	0.00085683
189	7	3.23482E+18	13.39905501	5.19955E-05	0.999860581	5.94234E-05	2.599147737	1.12656E+20	2.02598E+22	8.78652E-05	0.0018	0.000173271	0.227988773	0.000861159
190	7	3.23482E+18	13.39905024	5.19954E-05	0.999860139	5.94233E-05	2.599147489	1.12656E+20	2.03617E+22	8.8307E-05	0.0018	0.000174142	0.229134291	0.000865486
191	7	3.23482E+18	13.39904546	5.19954E-05	0.999859698	5.94233E-05	2.599147241	1.12656E+20	2.04635E+22	8.87485E-05	0.0018	0.000175012	0.230279192	0.000869811
192	7	3.23482E+18	13.39904069	5.19954E-05	0.999859256	5.94233E-05	2.599146993	1.12656E+20	2.05652E+22	8.91898E-05	0.0018	0.000175882	0.231423476	0.000874133
193	7	3.23482E+18	13.39903592	5.19954E-05	0.999858815	5.94233E-05	2.599146746	1.12656E+20	2.06669E+22	8.96308E-05	0.0018	0.000176751	0.232567143	0.000878453
194	7	3.23482E+18	13.39903115	5.19953E-05	0.999858374	5.94232E-05	2.599146498	1.12656E+20	2.07685E+22	9.00716E-05	0.0018	0.00017762	0.233710193	0.00088277
195	7	3.23482E+18	13.39902639	5.19953E-05	0.999857933	5.94232E-05	2.599146251	1.12656E+20	2.08701E+22	9.05122E-05	0.0018	0.000178488	0.234852628	0.000887085
196	7	3.23482E+18	13.39902163	5.19953E-05	0.999857493	5.94232E-05	2.599146004	1.12656E+20	2.09717E+22	9.09525E-05	0.0018	0.000179356	0.235994446	0.000891398
197	7	3.23482E+18	13.39901687	5.19953E-05	0.999857052	5.94232E-05	2.599145757	1.12656E+20	2.10731E+22	9.13926E-05	0.0018	0.000180223	0.237135649	0.000895709
198	7	3.23482E+18	13.39901211	5.19952E-05	0.999856612	5.94231E-05	2.59914551	1.12656E+20	2.11745E+22	9.18325E-05	0.0018	0.00018109	0.238276237	0.000900017
199	7	3.23482E+18	13.39900736	5.19952E-05	0.999856172	5.94231E-05	2.599145263	1.12656E+20	2.12759E+22	9.22721E-05	0.0018	0.000181956	0.239416211	0.000904323
200	7	3.23482E+18	13.3990026	5.19952E-05	0.999855733	5.94231E-05	2.599145017	1.12656E+20	2.13772E+22	9.27115E-05	0.0018	0.000182822	0.240555569	0.000908626
201	7	3.23482E+18	13.39899786	5.19952E-05	0.999855293	5.94231E-05	2.59914477	1.12655E+20	2.14785E+22	9.31507E-05	0.0018	0.000183688	0.241694314	0.000912928
202	7	3.23482E+18	13.39899311	5.19952E-05	0.999854854	5.9423E-05	2.599144524	1.12655E+20	2.15797E+22	9.35896E-05	0.0018	0.000184553	0.242832445	0.000917227
203	7	3.23482E+18	13.39898836	5.19951E-05	0.999854415	5.9423E-05	2.599144277	1.12655E+20	2.16808E+22	9.40283E-05	0.0018	0.000185417	0.243969963	0.000921523
204	7	3.23482E+18	13.39898362	5.19951E-05	0.999853977	5.9423E-05	2.599144031	1.12655E+20	2.17819E+22	9.44668E-05	0.0018	0.000186281	0.245106867	0.000925818
205	7	3.23482E+18	13.39897888	5.19951E-05	0.999853538	5.9423E-05	2.599143785	1.12655E+20	2.18829E+22	9.4905E-05	0.0018	0.000187145	0.246243159	0.00093011
206	7	3.23482E+18	13.39897415	5.19951E-05	0.9998531	5.94229E-05	2.599143539	1.12655E+20	2.19839E+22	9.5343E-05	0.0018	0.000188008	0.247378838	0.000934399
207	7	3.23482E+18	13.39896941	5.1995E-05	0.999852662	5.94229E-05	2.599143294	1.12655E+20	2.20849E+22	9.57808E-05	0.0018	0.000188871	0.248513905	0.000938687
208	7	3.23482E+18	13.39896468	5.1995E-05	0.999852224	5.94229E-05	2.599143048	1.12655E+20	2.21857E+22	9.62183E-05	0.0018	0.000189733	0.249648361	0.000942972
209	7	3.23482E+18	13.39895995	5.1995E-05	0.999851787	5.94229E-05	2.599142803	1.12655E+20	2.22866E+22	9.66556E-05	0.0018	0.000190594	0.250782205	0.000947255
210	7	3.23482E+18	13.39895523	5.1995E-05	0.999851349	5.94228E-05	2.599142557	1.12655E+20	2.23873E+22	9.70927E-05	0.0018	0.000191456	0.251915438	0.000951535
211	7	3.23482E+18	13.3989505	5.1995E-05	0.999850912	5.94228E-05	2.599142312	1.12655E+20	2.2488E+22	9.75295E-05	0.0018	0.000192317	0.25304806	0.000955813
212	7	3.23482E+18	13.39894578	5.19949E-05	0.999850476	5.94228E-05	2.599142067	1.12655E+20	2.25887E+22	9.79661E-05	0.0018	0.000193177	0.254180072	0.000960089
213	7	3.23482E+18	13.39894106	5.19949E-05	0.999850039	5.94227E-05	2.599141822	1.12655E+20	2.26893E+22	9.84025E-05	0.0018	0.000194037	0.255311474	0.000964362
214	7	3.23482E+18	13.39893635	5.19949E-05	0.999849603	5.94227E-05	2.599141577	1.12655E+20	2.27899E+22	9.88386E-05	0.0018	0.000194896	0.256442266	0.000968634

215	7	3.23482E+18	13.39893163	5.19949E-05	0.999849167	5.94227E-05	2.599141333	1.12655E+20	2.28904E+22	9.92745E-05	0.0018	0.000195755	0.257572449	0.000972903
216	7	3.23482E+18	13.39892692	5.19948E-05	0.999848731	5.94227E-05	2.599141088	1.12655E+20	2.29908E+22	9.97102E-05	0.0018	0.000196614	0.258702023	0.000977169
217	7	3.23482E+18	13.39892221	5.19948E-05	0.999848295	5.94226E-05	2.599140844	1.12655E+20	2.30912E+22	0.000100146	0.0018	0.000197472	0.259830988	0.000981434
218	7	3.23482E+18	13.3989175	5.19948E-05	0.99984786	5.94226E-05	2.599140599	1.12655E+20	2.31915E+22	0.000100581	0.0018	0.000198329	0.260959344	0.000985696
219	7	3.23482E+18	13.3989128	5.19948E-05	0.999847424	5.94226E-05	2.599140355	1.12655E+20	2.32918E+22	0.000101016	0.0018	0.000199186	0.262087093	0.000989955
220	7	3.23482E+18	13.3989081	5.19947E-05	0.999846989	5.94226E-05	2.599140111	1.12655E+20	2.33921E+22	0.000101451	0.0018	0.000200043	0.263214234	0.000994213
221	7	3.23482E+18	13.3989034	5.19947E-05	0.999846555	5.94225E-05	2.599139867	1.12654E+20	2.34922E+22	0.000101885	0.0018	0.000200899	0.264340767	0.000998468
222	7	3.23482E+18	13.3988987	5.19947E-05	0.99984612	5.94225E-05	2.599139623	1.12654E+20	2.35924E+22	0.000102319	0.0018	0.000201755	0.265466694	0.001002721
223	7	3.23482E+18	13.39889401	5.19947E-05	0.999845686	5.94225E-05	2.599139938	1.12654E+20	2.36924E+22	0.000102753	0.0018	0.000202261	0.266592014	0.001006971
224	7	3.23482E+18	13.39888932	5.19947E-05	0.999845252	5.94225E-05	2.599139136	1.12654E+20	2.37925E+22	0.000103187	0.0018	0.000203465	0.267716727	0.00101122
225	7	3.23482E+18	13.39888463	5.19946E-05	0.999844818	5.94224E-05	2.599138893	1.12654E+20	2.38924E+22	0.000103621	0.0018	0.000204319	0.268840834	0.001015466
226	7	3.23482E+18	13.39887994	5.19946E-05	0.999844385	5.94224E-05	2.59913865	1.12654E+20	2.39923E+22	0.000104054	0.0018	0.000205173	0.269964336	0.001019709
227	7	3.23482E+18	13.39887526	5.19946E-05	0.999843951	5.94224E-05	2.599138406	1.12654E+20	2.40922E+22	0.000104487	0.0018	0.000206026	0.271087232	0.001023951
228	7	3.23482E+18	13.39887058	5.19946E-05	0.999843518	5.94224E-05	2.599138163	1.12654E+20	2.4192E+22	0.00010492	0.0018	0.000206879	0.272209523	0.00102819
229	7	3.23482E+18	13.3988659	5.19945E-05	0.999843085	5.94223E-05	2.599137921	1.12654E+20	2.42918E+22	0.000105353	0.0018	0.000207732	0.27333121	0.001032427
230	7	3.23482E+18	13.39886122	5.19945E-05	0.999842653	5.94223E-05	2.599137678	1.12654E+20	2.43915E+22	0.000105785	0.0018	0.000208584	0.274452292	0.001036661
231	7	3.23482E+18	13.39885655	5.19945E-05	0.99984222	5.94223E-05	2.599137435	1.12654E+20	2.44911E+22	0.000106217	0.0018	0.000209435	0.27557277	0.001040893
232	7	3.23482E+18	13.39885188	5.19945E-05	0.999841788	5.94223E-05	2.599137193	1.12654E+20	2.45907E+22	0.000106649	0.0018	0.000210286	0.276692644	0.001045123
233	7	3.23482E+18	13.39884721	5.19945E-05	0.999841356	5.94222E-05	2.59913695	1.12654E+20	2.46902E+22	0.000107081	0.0018	0.000211137	0.277811915	0.001049351
234	7	3.23482E+18	13.39884254	5.19944E-05	0.999840924	5.94222E-05	2.599136708	1.12654E+20	2.47897E+22	0.000107513	0.0018	0.000211987	0.278930583	0.001053577
235	7	3.23482E+18	13.39883788	5.19944E-05	0.999840493	5.94222E-05	2.599136466	1.12654E+20	2.48891E+22	0.000107944	0.0018	0.000212837	0.280048649	0.0010578
236	7	3.23482E+18	13.39883322	5.19944E-05	0.999840062	5.94222E-05	2.599136224	1.12654E+20	2.49885E+22	0.000108375	0.0018	0.000213686	0.281166111	0.001062021
237	7	3.23482E+18	13.39882856	5.19944E-05	0.999839631	5.94221E-05	2.599135982	1.12654E+20	2.50879E+22	0.000108806	0.0018	0.000214535	0.282282972	0.001066239
238	7	3.23482E+18	13.3988239	5.19943E-05	0.9998392	5.94221E-05	2.599135741	1.12654E+20	2.51871E+22	0.000109236	0.0018	0.000215383	0.283399231	0.001070456
239	7	3.23482E+18	13.39881925	5.19943E-05	0.999838769	5.94221E-05	2.599135499	1.12654E+20	2.52864E+22	0.000109667	0.0018	0.000216231	0.284514889	0.00107467
240	7	3.23482E+18	13.3988146	5.19943E-05	0.999838339	5.94221E-05	2.599135258	1.12654E+20	2.53855E+22	0.000110097	0.0018	0.000217079	0.285629945	0.001078881
241	7	3.23482E+18	13.39880995	5.19943E-05	0.999837909	5.9422E-05	2.599135016	1.12653E+20	2.54846E+22	0.000110527	0.0018	0.000217926	0.286744401	0.001083091
242	7	3.23482E+18	13.3988053	5.19943E-05	0.999837479	5.9422E-05	2.599134775	1.12653E+20	2.55837E+22	0.000110956	0.0018	0.000218772	0.287858257	0.001087298
243	7	3.23482E+18	13.39880066	5.19942E-05	0.999837049	5.9422E-05	2.599134534	1.12653E+20	2.56827E+22	0.000111386	0.0018	0.000219618	0.288971512	0.001091503
244	7	3.23482E+18	13.39879602	5.19942E-05	0.99983662	5.9422E-05	2.599134293	1.12653E+20	2.57817E+22	0.000111815	0.0018	0.000220464	0.290084167	0.001095706
245	7	3.23482E+18	13.39879138	5.19942E-05	0.999836191	5.94219E-05	2.599134052	1.12653E+20	2.58806E+22	0.000112244	0.0018	0.000221309	0.291196224	0.001099906
246	7	3.23482E+18	13.39878674	5.19942E-05	0.999835762	5.94219E-05	2.599133812	1.12653E+20	2.59794E+22	0.000112673	0.0018	0.000222154	0.292307681	0.001104105
247	7	3.23482E+18	13.39878211	5.19941E-05	0.999835333	5.94219E-05	2.599133571	1.12653E+20	2.60782E+22	0.000113101	0.0018	0.000222998	0.293418539	0.001108301
248	7	3.23482E+18	13.39877748	5.19941E-05	0.999834905	5.94218E-05	2.599133331	1.12653E+20	2.6177E+22	0.00011353	0.0018	0.000223842	0.294528799	0.001112494
249	7	3.23482E+18	13.39877285	5.19941E-05	0.999834476	5.94218E-05	2.59913309	1.12653E+20	2.62757E+22	0.000113958	0.0018	0.000224685	0.295638461	0.001116686
250	7	3.23482E+18	13.39876822	5.19941E-05	0.999834048	5.94218E-05	2.59913285	1.12653E+20	2.63743E+22	0.000114386	0.0018	0.000225528	0.296747525	0.001120875
251	7	3.23482E+18	13.3987636	5.19941E-05	0.99983362	5.94218E-05	2.59913261	1.12653E+20	2.64729E+22	0.000114813	0.0018	0.000226371	0.297855991	0.001125062
252	7	3.23482E+18	13.39875897	5.1994E-05	0.999833193	5.94217E-05	2.59913237	1.12653E+20	2.65714E+22	0.000115241	0.0018	0.000227213	0.298963861	0.001129246
253	7	3.23482E+18	13.39875435	5.1994E-05	0.999832765	5.94217E-05	2.59913213	1.12653E+20	2.66699E+22	0.000115668	0.0018	0.000228054	0.300071133	0.001133429
254	7	3.23482E+18	13.39874974	5.1994E-05	0.999832338	5.94217E-05	2.599131891	1.12653E+20	2.67683E+22	0.000116095	0.0018	0.000228895	0.30117781	0.001137609
255	7	3.23482E+18	13.39874512	5.1994E-05	0.999831911	5.94217E-05	2.599131651	1.12653E+20	2.68667E+22	0.000116521	0.0018	0.000229736	0.30228389	0.001141787
256	7	3.23482E+18	13.39874051	5.19939E-05	0.999831485	5.94216E-05	2.599131412	1.12653E+20	2.6965E+22	0.000116948	0.0018	0.000230576	0.303389374	0.001145962
257	7	3.23482E+18	13.3987359	5.19939E-05	0.999831058	5.94216E-05	2.599131172	1.12653E+20	2.70633E+22	0.000117374	0.0018	0.000231416	0.304494263	0.001150136
258	7	3.23482E+18	13.3987313	5.19939E-05	0.999830632	5.94216E-05	2.599130933	1.12653E+20	2.71615E+22	0.0001178	0.0018	0.000232255	0.305598556	0.001154307
259	7	3.23482E+18	13.39872669	5.19939E-05	0.999830206	5.94216E-05	2.599130694	1.12653E+20	2.72597E+22	0.000118226	0.0018	0.000233094	0.306702255	0.001158476
260	7	3.23482E+18	13.39872209	5.19939E-05	0.99982978	5.94215E-05	2.599130455	1.12653E+20	2.73578E+22	0.000118652	0.0018	0.000233932	0.307805359	0.001162642
261	7	3.23482E+18	13.39871749	5.19938E-05	0.999829355	5.94215E-05	2.599130217	1.12653E+20	2.74559E+22	0.000119077	0.0018	0.00023477	0.308907869	0.001166807
262	7	3.23482E+18	13.39871289	5.19938E-05	0.999828929	5.94215E-05	2.599129978	1.12652E+20	2.75539E+22	0.000119502	0.0018	0.000235607	0.310009786	0.001170969
263	7	3.23482E+18	13.3987083	5.19938E-05	0.999828504	5.94215E-05	2.599129739	1.12652E+20	2.76519E+22	0.000119927	0.0018	0.000236444	0.311111109	0.001175129
264	7	3.23482E+18	13.39870371	5.19938E-05	0.999828079	5.94214E-05	2.599129501	1.12652E+20	2.77498E+22	0.000120352	0.0018	0.000237281	0.312211838	0.001179287
265	7	3.23482E+18	13.39869912	5.19937E-05	0.999827655	5.94214E-05	2.599129263	1.12652E+20	2.78476E+22	0.000120776	0.0018	0.000238117	0.313311975	0.001183442
266	7	3.23482E+18	13.39869453	5.19937E-05	0.99982723	5.94214E-05	2.599129025	1.12652E+20	2.79454E+22	0.0001212	0.0018	0.000238953	0.314411519	0.001187595
267	7	3.23482E+18	13.39868994	5.19937E-05	0.999826806	5.94214E-05	2.599128787	1.12652E+20	2.80432E+22	0.000121624	0.0018	0.000239788	0.315510471	0.001191746
268	7	3.23482E+18	13.39868536	5.19937E-05	0.999826382	5.94213E-05	2.599128549	1.12652E+20	2.81409E+22	0.000122048	0.0018	0.000240623	0.316608831	0.001195895
269	7	3.23482E+18	13.39868078	5.19937E-05	0.999825958	5.94213E-05	2.599128311	1.12652E+20	2.82385E+22	0.000122472	0.0018	0.000241457	0.317706599	0.001200041
270	7	3.23482E+18	13.3986762	5.19936E-05	0.999825535	5.94213E-05	2.599128073	1.12652E+20	2.83361E+22	0.000122895	0.0018	0.000242291	0.318803776	0.001204186
271	7	3.23482E+18	13.39867163	5.19936E-05	0.999825112	5.94213E-05	2.599127836	1.12652E+20	2.84337E+22	0.000123318	0.0018	0.000243124	0.319900363	0.001208328
272	7	3.23482E+18	13.39866706	5.19936E-05	0.999824689	5.94212E-05	2.599127599	1.12652E+20	2.85311E+22	0.000123741	0.0018	0.000243957	0.320996358	0.001212467
273	7	3.23482E+18	13.39866249	5.19936E-05	0.999824266	5.94212E-05	2.599127361	1.12652E+20	2.86286E+22	0.000124163	0.0018	0.000244479	0.322091764	0.001216605
274	7	3.23482E+18	13.39865792	5.19935E-05	0.999823843	5.94212E-05	2.599127124	1.12652E+20	2.8726E+22	0.000124586	0.0018	0.000245622	0.323186579	0.00122074
275	7	3.23482E+18	13.39865335	5.19935E-05	0.999823421	5.94212E-05	2.599126887	1.12652E+20	2.88233E+22	0.000125008	0.0018	0.000246453	0.324280805	0.001224873
276	7	3.23482E+18	13.39864879	5.19935E-05	0.999822999	5.94211E-05	2.59912665	1.12652E+20	2.89206E+22	0.00012543	0.0018	0.000247285	0.325374442	0.001229004
277	7	3.23482E+18	13.39864423	5.19935E-05	0.999822577	5.94211E-05	2.599126414	1.12652E+20	2.90178E+22	0.000125852	0.0018	0.000248115	0.326467489	0.001233133
278	7	3.23482E+18	13.39863967	5.19935E-05	0.999822155	5.94211E-05	2.599126177	1.12652E+20	2.9115E+22	0.000126273	0.0018	0.000248946	0.327559948	0.001237259
279	7	3.23482E+18	13.39863511	5.19934E-05	0.999821733	5.94211E-05	2.59912594	1.12652E+20	2.92121E+22	0.000126694	0.0018	0.000249775	0.328651819	0.001241384
280	7	3.23482E+18	13.39863056	5.19934E-05	0.999821312	5.9421E-05	2.599125704	1.12652E+20	2.93092E+22	0.000127116	0.0018	0.000250605	0.329743102	0.001245506
281	7	3.23482E+18	13.39862601	5.19934E-05	0.999820891	5.9421E-05	2.599125468	1.12652E+20	2.94062E+22	0.000127536	0.0018	0.000251434	0.330833796	0.001249625
282	7	3.23482E+18	13.39862146	5.19934E-05	0.99982047	5.9421E-05	2.599125232	1.12651E+20	2.95032E+22	0.000127957	0.0018	0.000252262	0.331923904	0.001253743
283	7	3.23482E+18	13.39861692	5.19933E-05	0.99982005	5.9421E-05	2.599124996	1.12651E+20	2.96001E+22	0.000128377	0.0018	0.00025309	0.333013424	0.001257858
284	7	3.23482E+18	13.39861237	5.19933E-05	0.999819629	5.94209E-05	2.59912476	1.12651E+20	2.9697E+22	0.000128798	0.0018	0.000253918	0.334102358	0.001261971
285	7	3.23482E+18	13.39860783	5.19933E-05	0.999819209	5.94209E-05	2.599124524	1.12651E+20	2.97938E+22	0.000129217	0.0018	0.000254745	0.335190706	0.001266082
286	7	3.23482E+18	13.39860329	5.19933E-05	0.999818789	5.94209E-05	2.599124289	1.12651E+20	2.98906E+22	0.000129637	0.0018	0.000255572	0.336278467	0.001270191
287	7	3.23482E+18	13.39859876	5.19933E-05	0.99981837	5.94209E-05	2.599124053	1.12651E+20	2.99873E+22	0.000130057	0.0018	0.000256398	0.337365643	0.001274298
288	7	3.23482E+18	13.39859422	5.19932E-05	0.99981795	5.94208E-05	2.599123818	1.12651E+20	3.00839E+22	0.000130476	0.0018	0.000257224	0.338452233	0.001278402
289	7	3.23482E+18	13.39858969	5.19932E-05	0.999817531	5.94208E-05	2.599123582	1.12651E+20	3.01805E+22	0.000130895	0.0018	0.000258049	0.339538238	0.001282504
290	7	3.23482E+18	13.39858516	5.19932E-05	0.999817112	5.94208E-05	2.599123347	1.12651E+20	3.02771E+22	0.000131314	0.0018	0.000258874	0.340623658	0.001286604
291	7	3.23482E+18	13.39858064	5.19932E-05	0.999816693	5.94208E-05	2.599123112	1.12651E+20	3.03736E+22	0.000131732	0.0018	0.000259698	0.341708494	0.001290701
292	7	3.23482E+18	13.39857611	5.19931E-05	0.999816274	5.94207E-05	2.599122878	1.12651E+20	3.04701E+22	0.000132151	0.0018	0.000260522	0.342792745	0.001294797
293	7	3.23482E+18	13.39857159	5.19931E-05	0.999815856	5.94207E-05	2.599122643	1.12651E+20	3.05665E+22	0.000132569	0.0018	0.000261346	0.343876413	0.00129889
294	7	3.23482E+18	13.39856707	5.19931E-05	0.999815438	5.94207E-05	2.599122408	1.12651E+20	3.06628E+22	0.000132987	0.0018	0.000262169	0.344959497	0.001302981
295	7	3.23482E+18	13.39856255	5.19931E-05	0.99981502	5.94207E-05	2.599122174	1.12651E+20	3.07591E+22	0.000133405	0.0018	0.000262992	0.346041999	0.00130707
296	7	3.23482E+18	13.39855804	5.19931E-05	0.999814602	5.94206E-05	2.599121939	1.12651E+20	3.08554E+22	0.000133822	0.0018	0.000263814	0.347123917	0.001311156
297	7	3.23482E+18	13.39855353	5.1993E-05	0.999814185	5.94206E-05	2.599121705	1.12651E+20	3.09516E+22	0.000134239	0.0018	0.000264636	0.348205253	0.001315241
298	7	3.23482E+18	13.39854902	5.1993E-05	0.999813768	5.94206E-05	2.599121471	1.12651E+20	3.10477E+22	0.000134656	0.0018	0.000265457	0.349286006	0.001319323
299	7	3.23482E+18	13.39854451	5.1993E-05	0.999813351	5.94206E-05	2.599121237	1.12651E+20	3.11438E+22	0.000135073	0.0018	0.000266278	0.350366178	0.001323403
300	7	3.23482E+18	13.39854001	5.1993E-05	0.999812934	5.94205E-05	2.599121003	1.12651E+20	3.12399E+22	0.00013549	0.0018	0.000267099	0.351445768	0.001327481
301	7	3.23482E+18	13.3985355	5.1993E-05	0.999812517	5.94205E-05	2.599120769	1.12651E+20	3.13358E+22	0.000135906	0.0018	0.000267919	0.352524776	0.001331557
302	7	3.23482E+18	13.39853 1	5.19929E-05	0.999812101	5.94205E-05	2.599120536	1.12651E+20	3.14318E+22	0.000136322	0.0018	0.000268738	0.353603204	0.00133563
303	7	3.23482E+18	13.39852651	5.19929E-05	0.999811685	5.94205E-05	2.599120302	1.1265E+20	3.15277E+22	0.000136738	0.0018	0.000269558	0.354681051	0.001339701
304	7	3.23482E+18	13.39852201	5.19929E-05	0.999811269	5.94204E-05	2.599120069	1.1265E+20	3.16235E+22	0.000137154	0.0018	0.000270376	0.355758318	0.00134377
305	7	3.23482E+18	13.39851752	5.19929E-05	0.999810853	5.94204E-05	2.599119836	1.1265E+20	3.17193E+22	0.00013757	0.0018	0.000271195	0.356835005	0.001347837
306	7	3.23482E+18	13.39851303	5.19928E-05	0.999810438	5.94204E-05	2.599119603	1.1265E+20	3.1815E+22	0.000137985	0.0018	0.000272012	0.357911112	0.001351902
307	7	3.23482E+18	13.39850854	5.19928E-05	0.999810022	5.94204E-05	2.59911937	1.1265E+20	3.19107E+22	0.0001384	0.0018	0.00027283	0.35898664	0.001355964
308	7	3.23482E+18	13.39850405	5.19928E-05	0.999809607	5.94203E-05	2.599119137	1.1265E+20	3.20064E+22	0.000138815	0.0018	0.000273647	0.360061589	0.001360025
309	7	3.23482E+18	13.39849957	5.19928E-05	0.999809193	5.94203E-05	2.599118904	1.1265E+20	3.2102E+22	0.000139229	0.0018	0.000274463	0.361135959	0.001364083
310	7	3.23482E+18	13.39849509	5.19928E-05	0.999808778	5.94203E-05	2.599118671	1.1265E+20	3.21975E+22	0.000139644	0.0018	0.000275279	0.36220975	0.001368139
311	7	3.23482E+18	13.39849061	5.19927E-05	0.999808364	5.94203E-05	2.599118439	1.1265E+20	3.2293E+22	0.000140058	0.0018	0.000276095	0.363282964	0.001372192
312	7	3.23482E+18	13.39848613	5.19927E-05	0.999807949	5.94202E-05	2.599118207	1.1265E+20	3.23884E+22	0.000140472	0.0018	0.00027691	0.3643556	0.001376244
313	7	3.23482E+18	13.39848166	5.19927E-05	0.999807536	5.94202E-05	2.599117974	1.1265E+20	3.24838E+22	0.000140885	0.0018	0.000277725	0.365427658	0.001380293
314	7	3.23482E+18	13.39847719	5.19927E-05	0.999807122	5.94202E-05	2.599117742	1.1265E+20	3.25791E+22	0.000141299	0.0018	0.000278539	0.366499139	0.001384341
315	7	3.23482E+18	13.39847272	5.19927E-05	0.999806708	5.94202E-05	2.59911751	1.1265E+20	3.26744E+22	0.000141712	0.0018	0.000279353	0.367570043	0.001388386
316	7	3.23482E+18	13.39846825	5.19926E-05	0.999806295	5.94201E-05	2.599117278	1.1265E+20	3.27696E+22	0.000142125	0.0018	0.000280167	0.368640371	0.001392428
317	7	3.23482E+18	13.39846379	5.19926E-05	0.999805882	5.94201E-05	2.599117047	1.1265E+20	3.28648E+22	0.000142538	0.0018	0.00028098	0.369710123	0.001396469
318	7	3.23482E+18	13.39845933	5.19926E-05	0.999805469	5.94201E-05	2.599116815	1.1265E+20	3.29599E+22	0.000142951	0.0018	0.000281792	0.370779299	0.001400508
319	7	3.23482E+18	13.39845487	5.19926E-05	0.999805057	5.94201E-05	2.599116583	1.1265E+20	3.3055E+22	0.000143363	0.0018	0.000282604	0.371847899	0.001404544
320	7	3.23482E+18	13.39845041	5.19925E-05	0.999804644	5.94201E-05	2.599116352	1.1265E+20	3.315E+22	0.000143775	0.0018	0.000283416	0.372915924	0.001408578
321	7	3.23482E+18	13.39844596	5.19925E-05	0.999804232	5.942E-05	2.599116121	1.1265E+20	3.32445E+22	0.000144187	0.0018	0.000284227	0.373983374	0.00141261
322	7	3.23482E+18	13.3984415	5.19925E-05	0.99980382	5.942E-05	2.59911589	1.1265E+20	3.33399E+22	0.000144599	0.0018	0.000285038	0.37505025	0.00141664
323	7	3.23482E+18	13.39843705	5.19925E-05	0.999803408	5.942E-05	2.599115659	1.1265E+20	3.34348E+22	0.000145011	0.0018	0.000285849	0.376116551	0.001420667
324	7	3.23482E+18	13.39843261	5.19925E-05	0.999802997	5.942E-05	2.599115428	1.12649E+20	3.35296E+22	0.000145422	0.0018	0.000286659	0.377182278	0.001424693
325	7	3.23482E+18	13.39842816	5.19924E-05	0.999802586	5.94199E-05	2.599115197	1.12649E+20	3.36244E+22	0.000145833	0.0018	0.000287468	0.378247431	0.001428716
326	7	3.23482E+18	13.39842372	5.19924E-05	0.999802175	5.94199E-05	2.599114966	1.12649E+20	3.37191E+22	0.000146244	0.0018	0.000288277	0.379312012	0.001432737
327	7	3.23482E+18	13.39841928	5.19924E-05	0.999801764	5.94199E-05	2.599114736	1.12649E+20	3.38138E+22	0.000146655	0.0018	0.000289086	0.380376019	0.001436756
328	7	3.23482E+18	13.39841484	5.19924E-05	0.999801353	5.94199E-05	2.599114505	1.12649E+20	3.39084E+22	0.000147065	0.0018	0.000289894	0.381439453	0.001440773
329	7	3.23482E+18	13.3984104	5.19924E-05	0.999800943	5.94198E-05	2.599114275	1.12649E+20	3.4003E+22	0.000147475	0.0018	0.000290702	0.382502315	0.001444788
330	7	3.23482E+18	13.39840597	5.19923E-05	0.999800532	5.94198E-05	2.599114045	1.12649E+20	3.40975E+22	0.000147885	0.0018	0.000291509	0.383564605	0.0014488
331	7	3.23482E+18	13.39840154	5.19923E-05	0.999800123	5.94198E-05	2.599113815	1.12649E+20	3.4192E+22	0.000148295	0.0018	0.000292316	0.384626323	0.001452811
332	7	3.23482E+18	13.39839711	5.19923E-05	0.999799713	5.94198E-05	2.599113585	1.12649E+20	3.42864E+22	0.000148705	0.0018	0.000293122	0.38568747	0.001456819
333	7	3.23482E+18	13.39839268	5.19923E-05	0.999799303	5.94197E-05	2.599113355	1.12649E+20	3.43808E+22	0.000149114	0.0018	0.000293929	0.386748045	0.001460825
334	7	3.23482E+18	13.39838826	5.19922E-05	0.999798894	5.94197E-05	2.599113126	1.12649E+20	3.44751E+22	0.000149523	0.0018	0.000294734	0.38780805	0.001464829
335	7	3.23482E+18	13.39838384	5.19922E-05	0.999798485	5.94197E-05	2.599112896	1.12649E+20	3.45693E+22	0.000149932	0.0018	0.000295539	0.388867484	0.00146883
336	7	3.23482E+18	13.39837942	5.19922E-05	0.999798076	5.94197E-05	2.599112667	1.12649E+20	3.46636E+22	0.000150341	0.0018	0.000296344	0.389926348	0.00147283
337	7	3.23482E+18	13.39837 5	5.19922E-05	0.999797667	5.94196E-05	2.599112437	1.12649E+20	3.47577E+22	0.000150749	0.0018	0.000297148	0.390984642	0.001476827
338	7	3.23482E+18	13.39837059	5.19922E-05	0.999797259	5.94196E-05	2.599112208	1.12649E+20	3.48519E+22	0.000151157	0.0018	0.000297952	0.392042367	0.001480822
339	7	3.23482E+18	13.39836618	5.19921E-05	0.999796851	5.94196E-05	2.599111979	1.12649E+20	3.49459E+22	0.000151565	0.0018	0.000298756	0.393099522	0.001484816
340	7	3.23482E+18	13.39836177	5.19921E-05	0.999796443	5.94196E-05	2.59911175	1.12649E+20	3.50399E+22	0.000151973	0.0018	0.000299559	0.394156108	0.001488806
341	7	3.23482E+18	13.39835736	5.19921E-05	0.999796035	5.94195E-05	2.599111521	1.12649E+20	3.51339E+22	0.000152381	0.0018	0.000300361	0.395212126	0.001492795
342	7	3.23482E+18	13.39835295	5.19921E-05	0.999795627	5.94195E-05	2.599111293	1.12649E+20	3.52278E+22	0.000152788	0.0018	0.000301163	0.396267575	0.001496782

343	7	3.23482E+18	13.39834855	5.19921E-05	0.99979522	5.94195E-05	2.599111064	1.12649E+20	3.53217E+22	0.000153195	0.0018	0.000301965	0.397322456	0.001500766
344	7	3.23482E+18	13.39834415	5.1992E-05	0.999794813	5.94195E-05	2.599110836	1.12649E+20	3.54155E+22	0.000153602	0.0018	0.000302766	0.39837677	0.001504749
345	7	3.23482E+18	13.39833975	5.1992E-05	0.999794406	5.94194E-05	2.599110607	1.12648E+20	3.55093E+22	0.000154009	0.0018	0.000303567	0.399430516	0.001508729
346	7	3.23482E+18	13.39833536	5.1992E-05	0.999793999	5.94194E-05	2.599110379	1.12648E+20	3.5603E+22	0.000154415	0.0018	0.000304368	0.400483695	0.001512707
347	7	3.23482E+18	13.39833096	5.1992E-05	0.999793593	5.94194E-05	2.599110151	1.12648E+20	3.56967E+22	0.000154822	0.0018	0.000305168	0.401536307	0.001516683
348	7	3.23482E+18	13.39832657	5.19919E-05	0.999793186	5.94194E-05	2.599109923	1.12648E+20	3.57903E+22	0.000155228	0.0018	0.000305967	0.402588353	0.001520657
349	7	3.23482E+18	13.39832218	5.19919E-05	0.99979278	5.94193E-05	2.599109695	1.12648E+20	3.58838E+22	0.000155634	0.0018	0.000306766	0.403639832	0.001524628
350	7	3.23482E+18	13.3983178	5.19919E-05	0.999792374	5.94193E-05	2.599109467	1.12648E+20	3.59774E+22	0.000156039	0.0018	0.000307565	0.404690746	0.001528598
351	7	3.23482E+18	13.39831341	5.19919E-05	0.999791969	5.94193E-05	2.59910924	1.12648E+20	3.60708E+22	0.000156445	0.0018	0.000308363	0.405741094	0.001532565
352	7	3.23482E+18	13.39830903	5.19919E-05	0.999791563	5.94193E-05	2.599109012	1.12648E+20	3.61642E+22	0.00015685	0.0018	0.000309161	0.406790877	0.00153653
353	7	3.23482E+18	13.39830465	5.19918E-05	0.999791158	5.94193E-05	2.599108785	1.12648E+20	3.62576E+22	0.000157255	0.0018	0.000309958	0.407840095	0.001540494
354	7	3.23482E+18	13.39830028	5.19918E-05	0.999790753	5.94192E-05	2.599108558	1.12648E+20	3.63509E+22	0.00015766	0.0018	0.000310755	0.408888748	0.001544455
355	7	3.23482E+18	13.3982959	5.19918E-05	0.999790348	5.94192E-05	2.599108331	1.12648E+20	3.64442E+22	0.000158064	0.0018	0.000311552	0.409936837	0.001548413
356	7	3.23482E+18	13.39829153	5.19918E-05	0.999789944	5.94192E-05	2.599108104	1.12648E+20	3.65374E+22	0.000158469	0.0018	0.000312348	0.410984362	0.00155237
357	7	3.23482E+18	13.39828716	5.19918E-05	0.99978954	5.94192E-05	2.599107877	1.12648E+20	3.66306E+22	0.000158873	0.0018	0.000313144	0.412031324	0.001556325
358	7	3.23482E+18	13.39828279	5.19917E-05	0.999789135	5.94191E-05	2.59910765	1.12648E+20	3.67237E+22	0.000159277	0.0018	0.000313939	0.413077722	0.001560277
359	7	3.23482E+18	13.39827843	5.19917E-05	0.999788731	5.94191E-05	2.599107423	1.12648E+20	3.68168E+22	0.000159681	0.0018	0.000314734	0.414123557	0.001564227
360	7	3.23482E+18	13.39827406	5.19917E-05	0.999788328	5.94191E-05	2.599107197	1.12648E+20	3.69098E+22	0.000160084	0.0018	0.000315528	0.415168829	0.001568176
361	7	3.23482E+18	13.3982697	5.19917E-05	0.999787924	5.94191E-05	2.59910697	1.12648E+20	3.70028E+22	0.000160487	0.0018	0.000316322	0.416213539	0.001572122
362	7	3.23482E+18	13.39826534	5.19917E-05	0.999787521	5.9419E-05	2.599106744	1.12648E+20	3.70957E+22	0.00016089	0.0018	0.000317116	0.417257686	0.001576066
363	7	3.23482E+18	13.39826099	5.19916E-05	0.999787118	5.9419E-05	2.599106518	1.12648E+20	3.71886E+22	0.000161293	0.0018	0.000317909	0.418301272	0.001580008
364	7	3.23482E+18	13.39825663	5.19916E-05	0.999786715	5.9419E-05	2.599106292	1.12648E+20	3.72814E+22	0.000161696	0.0018	0.000318702	0.419344296	0.001583947
365	7	3.23482E+18	13.39825228	5.19916E-05	0.999786313	5.9419E-05	2.599106066	1.12648E+20	3.73742E+22	0.000162098	0.0018	0.000319494	0.420386759	0.001587885
366	7	3.23482E+18	13.39824793	5.19916E-05	0.99978591	5.94189E-05	2.59910584	1.12647E+20	3.74669E+22	0.0001625	0.0018	0.000320286	0.421428661	0.00159182
367	7	3.23482E+18	13.39824359	5.19915E-05	0.999785508	5.94189E-05	2.599105615	1.12647E+20	3.75595E+22	0.000162902	0.0018	0.000321077	0.422470003	0.001595754
368	7	3.23482E+18	13.39823924	5.19915E-05	0.999785106	5.94189E-05	2.599105389	1.12647E+20	3.76522E+22	0.000163304	0.0018	0.000321868	0.423510784	0.001599685
369	7	3.23482E+18	13.3982349	5.19915E-05	0.999784704	5.94189E-05	2.599105164	1.12647E+20	3.77447E+22	0.000163706	0.0018	0.000322659	0.424551005	0.001603614
370	7	3.23482E+18	13.39823056	5.19915E-05	0.999784303	5.94188E-05	2.599104938	1.12647E+20	3.78373E+22	0.000164107	0.0018	0.000323449	0.425590667	0.001607541
371	7	3.23482E+18	13.39822622	5.19915E-05	0.999783901	5.94188E-05	2.599104713	1.12647E+20	3.79297E+22	0.000164508	0.0018	0.000324239	0.426629769	0.001611466
372	7	3.23482E+18	13.39822189	5.19914E-05	0.9997835	5.94188E-05	2.599104488	1.12647E+20	3.80222E+22	0.000164909	0.0018	0.000325028	0.427668312	0.001615389
373	7	3.23482E+18	13.39821755	5.19914E-05	0.999783099	5.94188E-05	2.599104263	1.12647E+20	3.81146E+22	0.00016531	0.0018	0.000325817	0.428706296	0.001619309
374	7	3.23482E+18	13.39821322	5.19914E-05	0.999782699	5.94187E-05	2.599104038	1.12647E+20	3.82069E+22	0.00016571	0.0018	0.000326605	0.429743722	0.001623228
375	7	3.23482E+18	13.3982089	5.19914E-05	0.999782298	5.94187E-05	2.599103814	1.12647E+20	3.82992E+22	0.000166111	0.0018	0.000327393	0.43078059	0.001627144
376	7	3.23482E+18	13.39820457	5.19914E-05	0.999781898	5.94187E-05	2.599103589	1.12647E+20	3.83914E+22	0.000166511	0.0018	0.000328181	0.431816899	0.001631059
377	7	3.23482E+18	13.39820025	5.19913E-05	0.999781498	5.94187E-05	2.599103365	1.12647E+20	3.84836E+22	0.000166911	0.0018	0.000328968	0.432852652	0.001634971
378	7	3.23482E+18	13.39819592	5.19913E-05	0.999781098	5.94187E-05	2.59910314	1.12647E+20	3.85757E+22	0.00016731	0.0018	0.000329755	0.433887847	0.001638881
379	7	3.23482E+18	13.39819161	5.19913E-05	0.999780698	5.94186E-05	2.599102916	1.12647E+20	3.86678E+22	0.00016771	0.0018	0.000330541	0.434922485	0.001642789
380	7	3.23482E+18	13.39818729	5.19913E-05	0.999780299	5.94186E-05	2.599102692	1.12647E+20	3.87598E+22	0.000168109	0.0018	0.000331327	0.435956566	0.001646695
381	7	3.23482E+18	13.39818297	5.19913E-05	0.9997799	5.94186E-05	2.599102468	1.12647E+20	3.88518E+22	0.000168508	0.0018	0.000332112	0.436990092	0.001650599
382	7	3.23482E+18	13.39817866	5.19912E-05	0.999779501	5.94186E-05	2.599102244	1.12647E+20	3.89437E+22	0.000168907	0.0018	0.000332898	0.438023061	0.001654501
383	7	3.23482E+18	13.39817435	5.19912E-05	0.999779102	5.94185E-05	2.59910202	1.12647E+20	3.90356E+22	0.000169305	0.0018	0.000333682	0.439055474	0.0016584
384	7	3.23482E+18	13.39817004	5.19912E-05	0.999778703	5.94185E-05	2.599101797	1.12647E+20	3.91275E+22	0.000169704	0.0018	0.000334466	0.440087332	0.001662298
385	7	3.23482E+18	13.39816574	5.19912E-05	0.999778305	5.94185E-05	2.599101573	1.12647E+20	3.92192E+22	0.000170102	0.0018	0.00033525	0.441118635	0.001666193
386	7	3.23482E+18	13.39816144	5.19912E-05	0.999777907	5.94185E-05	2.59910135	1.12647E+20	3.9311E+22	0.0001705	0.0018	0.000336034	0.442149383	0.001670087
387	7	3.23482E+18	13.39815714	5.19911E-05	0.999777509	5.94184E-05	2.599101126	1.12647E+20	3.94027E+22	0.000170898	0.0018	0.000336816	0.443179577	0.001673978
388	7	3.23482E+18	13.39815284	5.19911E-05	0.999777111	5.94184E-05	2.599100903	1.12646E+20	3.94943E+22	0.000171295	0.0018	0.000337599	0.444209217	0.001677867
389	7	3.23482E+18	13.39814854	5.19911E-05	0.999776714	5.94184E-05	2.59910068	1.12646E+20	3.95859E+22	0.000171692	0.0018	0.000338381	0.445238302	0.001681754
390	7	3.23482E+18	13.39814425	5.19911E-05	0.999776317	5.94184E-05	2.599100457	1.12646E+20	3.96775E+22	0.000172089	0.0018	0.000339163	0.446266834	0.001685639
391	7	3.23482E+18	13.39813996	5.19911E-05	0.999775919	5.94183E-05	2.599100235	1.12646E+20	3.97689E+22	0.000172486	0.0018	0.000339944	0.447294813	0.001689522
392	7	3.23482E+18	13.39813567	5.1991E-05	0.999775523	5.94183E-05	2.599100012	1.12646E+20	3.98604E+22	0.000172883	0.0018	0.000340725	0.448322239	0.001693403
393	7	3.23482E+18	13.39813138	5.1991E-05	0.999775126	5.94183E-05	2.599099789	1.12646E+20	3.99518E+22	0.00017328	0.0018	0.000341505	0.449349112	0.001697281
394	7	3.23482E+18	13.3981271	5.1991E-05	0.999774729	5.94183E-05	2.599099567	1.12646E+20	4.00431E+22	0.000173676	0.0018	0.000342285	0.450375432	0.001701158
395	7	3.23482E+18	13.39812281	5.1991E-05	0.999774333	5.94183E-05	2.599099344	1.12646E+20	4.01344E+22	0.000174072	0.0018	0.000343065	0.451401201	0.001705033
396	7	3.23482E+18	13.39811853	5.19909E-05	0.999773937	5.94182E-05	2.599099122	1.12646E+20	4.02257E+22	0.000174468	0.0018	0.000343844	0.452426418	0.001708905
397	7	3.23482E+18	13.39811425	5.19909E-05	0.999773541	5.94182E-05	2.5990989	1.12646E+20	4.03169E+22	0.000174863	0.0018	0.000344623	0.453451083	0.001712775
398	7	3.23482E+18	13.39810998	5.19909E-05	0.999773146	5.94182E-05	2.599098678	1.12646E+20	4.04081E+22	0.000175259	0.0018	0.000345401	0.454475197	0.001716644
399	7	3.23482E+18	13.39810571	5.19909E-05	0.99977275	5.94182E-05	2.599098456	1.12646E+20	4.04992E+22	0.000175654	0.0018	0.000346179	0.455498761	0.00172051
400	7	3.23482E+18	13.39810144	5.19909E-05	0.999772355	5.94181E-05	2.599098235	1.12646E+20	4.05902E+22	0.000176049	0.0018	0.000346957	0.456521773	0.001724374
401	7	3.23482E+18	13.39809717	5.19908E-05	0.99977196	5.94181E-05	2.599098013	1.12646E+20	4.06812E+22	0.000176444	0.0018	0.000347734	0.457544236	0.001728236
402	7	3.23482E+18	13.3980929	5.19908E-05	0.999771566	5.94181E-05	2.599097791	1.12646E+20	4.07722E+22	0.000176838	0.0018	0.00034851	0.458566149	0.001732096
403	7	3.23482E+18	13.39808864	5.19908E-05	0.999771171	5.94181E-05	2.59909757	1.12646E+20	4.08631E+22	0.000177233	0.0018	0.000349287	0.459587511	0.001735954
404	7	3.23482E+18	13.39808437	5.19908E-05	0.999770777	5.9418E-05	2.599097349	1.12646E+20	4.0954E+22	0.000177627	0.0018	0.000350062	0.460608325	0.0017398 1
405	7	3.23482E+18	13.39808011	5.19908E-05	0.999770382	5.9418E-05	2.599097128	1.12646E+20	4.10448E+22	0.000178021	0.0018	0.000350838	0.46162859	0.001743664
406	7	3.23482E+18	13.39807586	5.19907E-05	0.999769989	5.9418E-05	2.599096907	1.12646E+20	4.11355E+22	0.000178414	0.0018	0.000351613	0.462648305	0.001747515
407	7	3.23482E+18	13.3980716	5.19907E-05	0.999769595	5.9418E-05	2.599096686	1.12646E+20	4.12263E+22	0.000178808	0.0018	0.000352387	0.463667473	0.001751365
408	7	3.23482E+18	13.39806735	5.19907E-05	0.999769201	5.94179E-05	2.599096465	1.12646E+20	4.13169E+22	0.000179201	0.0018	0.000353161	0.464686092	0.001755212
409	7	3.23482E+18	13.3980631	5.19907E-05	0.999768808	5.94179E-05	2.599096244	1.12646E+20	4.14075E+22	0.000179594	0.0018	0.000353935	0.465704163	0.001759058
410	7	3.23482E+18	13.39805885	5.19907E-05	0.999768415	5.94179E-05	2.599096024	1.12645E+20	4.14981E+22	0.000179987	0.0018	0.000354708	0.466721687	0.001762901
411	7	3.23482E+18	13.3980546	5.19906E-05	0.999768022	5.94179E-05	2.599095803	1.12645E+20	4.15886E+22	0.00018038	0.0018	0.000355481	0.467738663	0.001766742
412	7	3.23482E+18	13.39805036	5.19906E-05	0.999767629	5.94179E-05	2.599095583	1.12645E+20	4.16791E+22	0.000180772	0.0018	0.000356254	0.468755093	0.001770582
413	7	3.23482E+18	13.39804612	5.19906E-05	0.999767237	5.94178E-05	2.599095363	1.12645E+20	4.17695E+22	0.000181165	0.0018	0.000357026	0.469770976	0.001774419
414	7	3.23482E+18	13.39804188	5.19906E-05	0.999766845	5.94178E-05	2.599095143	1.12645E+20	4.18599E+22	0.000181557	0.0018	0.000357798	0.470786312	0.001778254
415	7	3.23482E+18	13.39803764	5.19906E-05	0.999766453	5.94178E-05	2.599094923	1.12645E+20	4.19503E+22	0.000181949	0.0018	0.000358569	0.471801103	0.001782087
416	7	3.23482E+18	13.39803341	5.19905E-05	0.999766061	5.94178E-05	2.599094703	1.12645E+20	4.20405E+22	0.00018234	0.0018	0.00035934	0.472815347	0.001785918
417	7	3.23482E+18	13.39802918	5.19905E-05	0.999765669	5.94177E-05	2.599094483	1.12645E+20	4.21308E+22	0.000182732	0.0018	0.00036011	0.473829047	0.001789747
418	7	3.23482E+18	13.39802495	5.19905E-05	0.999765278	5.94177E-05	2.599094263	1.12645E+20	4.2221E+22	0.000183123	0.0018	0.00036088	0.474842201	0.001793574
419	7	3.23482E+18	13.39802072	5.19905E-05	0.999764887	5.94177E-05	2.599094044	1.12645E+20	4.23111E+22	0.000183514	0.0018	0.00036165	0.47585481	0.001797399
420	7	3.23482E+18	13.39801649	5.19905E-05	0.999764496	5.94177E-05	2.599093824	1.12645E+20	4.24012E+22	0.000183905	0.0018	0.000362419	0.476866875	0.001801222
421	7	3.23482E+18	13.39801227	5.19904E-05	0.999764105	5.94176E-05	2.599093605	1.12645E+20	4.24912E+22	0.000184295	0.0018	0.000363188	0.477878395	0.001805042
422	7	3.23482E+18	13.39800805	5.19904E-05	0.999763714	5.94176E-05	2.599093386	1.12645E+20	4.25812E+22	0.000184686	0.0018	0.000363956	0.478889371	0.001808861
423	7	3.23482E+18	13.39800383	5.19904E-05	0.999763324	5.94176E-05	2.599093167	1.12645E+20	4.26712E+22	0.000185076	0.0018	0.000364724	0.479899804	0.001812678
424	7	3.23482E+18	13.39799961	5.19904E-05	0.999762934	5.94176E-05	2.599092948	1.12645E+20	4.27611E+22	0.000185466	0.0018	0.000365491	0.480909694	0.001816492
425	7	3.23482E+18	13.3979954	5.19904E-05	0.999762544	5.94175E-05	2.599092729	1.12645E+20	4.28509E+22	0.000185856	0.0018	0.000366258	0.48191904	0.001820305
426	7	3.23482E+18	13.39799119	5.19903E-05	0.999762154	5.94175E-05	2.599092511	1.12645E+20	4.29407E+22	0.000186245	0.0018	0.000367025	0.482927843	0.001824115
427	7	3.23482E+18	13.39798698	5.19903E-05	0.999761765	5.94175E-05	2.599092292	1.12645E+20	4.30305E+22	0.000186635	0.0018	0.000367791	0.483936105	0.001827923
428	7	3.23482E+18	13.39798277	5.19903E-05	0.999761375	5.94175E-05	2.599092074	1.12645E+20	4.31202E+22	0.000187024	0.0018	0.000368557	0.484943823	0.00183173
429	7	3.23482E+18	13.39797856	5.19903E-05	0.999760986	5.94175E-05	2.599091855	1.12645E+20	4.32099E+22	0.000187413	0.0018	0.000369323	0.485951	0.001835534
430	7	3.23482E+18	13.39797436	5.19903E-05	0.999760597	5.94174E-05	2.599091637	1.12645E+20	4.32995E+22	0.000187801	0.0018	0.000370088	0.486957636	0.001839336
431	7	3.23482E+18	13.39797016	5.19902E-05	0.999760208	5.94174E-05	2.599091419	1.12645E+20	4.3389E+22	0.00018819	0.0018	0.000370852	0.48796373	0.001843137
432	7	3.23482E+18	13.39796596	5.19902E-05	0.99975982	5.94174E-05	2.599091201	1.12644E+20	4.34786E+22	0.000188578	0.0018	0.000371617	0.488969283	0.001846935
433	7	3.23482E+18	13.39796176	5.19902E-05	0.999759432	5.94174E-05	2.599090983	1.12644E+20	4.3568E+22	0.000188966	0.0018	0.00037238	0.489974295	0.001850731
434	7	3.23482E+18	13.39795757	5.19902E-05	0.999759044	5.94173E-05	2.599090765	1.12644E+20	4.36574E+22	0.000189354	0.0018	0.000373144	0.490978767	0.001854525
435	7	3.23482E+18	13.39795338	5.19902E-05	0.999758656	5.94173E-05	2.599090548	1.12644E+20	4.37468E+22	0.000189742	0.0018	0.000373907	0.491982699	0.001858317
436	7	3.23482E+18	13.39794919	5.19901E-05	0.999758268	5.94173E-05	2.59909033	1.12644E+20	4.38362E+22	0.000190129	0.0018	0.000374669	0.492986091	0.001862107
437	7	3.23482E+18	13.397945	5.19901E-05	0.99975788	5.94173E-05	2.599090113	1.12644E+20	4.39254E+22	0.000190517	0.0018	0.000375432	0.493988944	0.001865895
438	7	3.23482E+18	13.39794081	5.19901E-05	0.999757493	5.94172E-05	2.599089895	1.12644E+20	4.40147E+22	0.000190904	0.0018	0.000376193	0.494991257	0.001869681
439	7	3.23482E+18	13.39793663	5.19901E-05	0.999757106	5.94172E-05	2.599089678	1.12644E+20	4.41038E+22	0.000191291	0.0018	0.000376955	0.495993032	0.001873465
440	7	3.23482E+18	13.39793245	5.19901E-05	0.999756719	5.94172E-05	2.599089461	1.12644E+20	4.4193E+22	0.000191677	0.0018	0.000377716	0.496994267	0.001877247
441	7	3.23482E+18	13.39792827	5.199E-05	0.999756333	5.94172E-05	2.599089244	1.12644E+20	4.42821E+22	0.000192064	0.0018	0.000378476	0.497994965	0.001881027
442	7	3.23482E+18	13.3979241	5.199E-05	0.999755946	5.94172E-05	2.599089027	1.12644E+20	4.43711E+22	0.00019245	0.0018	0.000379236	0.498995124	0.001884804
443	7	3.23482E+18	13.39791992	5.199E-05	0.99975556	5.94171E-05	2.599088811	1.12644E+20	4.44601E+22	0.000192836	0.0018	0.000379996	0.499994746	0.00188858
444	7	3.23482E+18	13.39791575	5.199E-05	0.999755174	5.94171E-05	2.599088594	1.12644E+20	4.4549E+22	0.000193222	0.0018	0.000380755	0.50099383	0.001892354
445	7	3.23482E+18	13.39791158	5.199E-05	0.999754788	5.94171E-05	2.599088377	1.12644E+20	4.46379E+22	0.000193608	0.0018	0.000381514	0.501992377	0.001896126
446	7	3.23482E+18	13.39790741	5.19899E-05	0.999754403	5.94171E-05	2.599088161	1.12644E+20	4.47268E+22	0.000193993	0.0018	0.000382273	0.502990387	0.001899895
447	7	3.23482E+18	13.39790325	5.19899E-05	0.999754017	5.9417E-05	2.599087945	1.12644E+20	4.48156E+22	0.000194378	0.0018	0.000383031	0.503987861	0.001903663
448	7	3.23482E+18	13.39789908	5.19899E-05	0.999753632	5.9417E-05	2.599087729	1.12644E+20	4.49044E+22	0.000194763	0.0018	0.000383788	0.504984798	0.001907429
449	7	3.23482E+18	13.39789492	5.19899E-05	0.999753247	5.9417E-05	2.599087513	1.12644E+20	4.49931E+22	0.000195148	0.0018	0.000384546	0.505981199	0.001911192
450	7	3.23482E+18	13.39789076	5.19899E-05	0.999752862	5.9417E-05	2.599087297	1.12644E+20	4.50817E+22	0.000195533	0.0018	0.000385303	0.506977065	0.001914954
451	7	3.23482E+18	13.39788661	5.19898E-05	0.999752477	5.9417E-05	2.599087081	1.12644E+20	4.51703E+22	0.000195917	0.0018	0.000386059	0.507972395	0.001918713
452	7	3.23482E+18	13.39788245	5.19898E-05	0.999752093	5.94169E-05	2.599086865	1.12644E+20	4.52589E+22	0.000196301	0.0018	0.000386815	0.50896719	0.001922471
453	7	3.23482E+18	13.3978783	5.19898E-05	0.999751709	5.94169E-05	2.59908665	1.12644E+20	4.53474E+22	0.000196685	0.0018	0.000387571	0.509961451	0.001926226
454	7	3.23482E+18	13.39787415	5.19898E-05	0.999751325	5.94169E-05	2.599086434	1.12644E+20	4.54359E+22	0.000197069	0.0018	0.000388326	0.510955176	0.001929998
455	7	3.23482E+18	13.39787	5.19898E-05	0.999750941	5.94169E-05	2.599086219	1.12643E+20	4.55243E+22	0.000197453	0.0018	0.000389081	0.511948368	0.001933731
456	7	3.23482E+18	13.39786586	5.19897E-05	0.999750558	5.94168E-05	2.599086004	1.12643E+20	4.56127E+22	0.000197836	0.0018	0.000389835	0.512941025	0.001937481
457	7	3.23482E+18	13.39786172	5.19897E-05	0.999750174	5.94168E-05	2.599085788	1.12643E+20	4.5701E+22	0.000198219	0.0018	0.000390589	0.513933149	0.001941228
458	7	3.23482E+18	13.39785758	5.19897E-05	0.999749791	5.94168E-05	2.599085573	1.12643E+20	4.57893E+22	0.000198602	0.0018	0.000391343	0.51492474	0.001944974
459	7	3.23482E+18	13.39785344	5.19897E-05	0.999749408	5.94168E-05	2.599085359	1.12643E+20	4.58776E+22	0.000198985	0.0018	0.000392096	0.515915798	0.001948717
460	7	3.23482E+18	13.3978493	5.19897E-05	0.999749025	5.94167E-05	2.599085144	1.12643E+20	4.59658E+22	0.000199368	0.0018	0.000392849	0.516906322	0.001952459
461	7	3.23482E+18	13.39784517	5.19896E-05	0.999748643	5.94167E-05	2.599084929	1.12643E+20	4.60539E+22	0.00019975	0.0018	0.000393601	0.517896315	0.001956198
462	7	3.23482E+18	13.39784103	5.19896E-05	0.99974826	5.94167E-05	2.599084715	1.12643E+20	4.6142E+22	0.000200132	0.0018	0.000394353	0.518885775	0.001959935
463	7	3.23482E+18	13.3978369	5.19896E-05	0.999747878	5.94167E-05	2.5990845	1.12643E+20	4.62301E+22	0.000200514	0.0018	0.000395105	0.519874703	0.001963671
464	7	3.23482E+18	13.39783278	5.19896E-05	0.999747496	5.94167E-05	2.599084286	1.12643E+20	4.63181E+22	0.000200896	0.0018	0.000395856	0.520863099	0.001967404
465	7	3.23482E+18	13.39782865	5.19896E-05	0.999747115	5.94166E-05	2.599084072	1.12643E+20	4.6406E+22	0.000201277	0.0018	0.000396607	0.521850965	0.001971135
466	7	3.23482E+18	13.39782453	5.19895E-05	0.999746733	5.94166E-05	2.599083858	1.12643E+20	4.64939E+22	0.000201659	0.0018	0.000397357	0.522838299	0.001974865
467	7	3.23482E+18	13.39782041	5.19895E-05	0.999746352	5.94166E-05	2.599083644	1.12643E+20	4.65818E+22	0.00020204	0.0018	0.000398107	0.523825102	0.001978592
468	7	3.23482E+18	13.39781629	5.19895E-05	0.999745971	5.94166E-05	2.59908343	1.12643E+20	4.66696E+22	0.000202421	0.0018	0.000398857	0.524811376	0.001982318
469	7	3.23482E+18	13.39781217	5.19895E-05	0.99974559	5.94165E-05	2.599083216	1.12643E+20	4.67574E+22	0.000202802	0.0018	0.000399606	0.525797118	0.001986041
470	7	3.23482E+18	13.39780806	5.19895E-05	0.999745209	5.94165E-05	2.599083002	1.12643E+20	4.68451E+22	0.000203182	0.0018	0.000400355	0.526782332	0.001989762

471	7	3.23482E+18	13.39780394	5.19894E-05	0.999744828	5.94165E-05	2.599082789	1.12643E+20	4.69328E+22	0.000203562	0.0018	0.000401103	0.527767015	0.001993482
472	7	3.23482E+18	13.39779983	5.19894E-05	0.999744448	5.94165E-05	2.599082575	1.12643E+20	4.70204E+22	0.000203943	0.0018	0.000401851	0.528751169	0.001997199
473	7	3.23482E+18	13.39779573	5.19894E-05	0.999744068	5.94165E-05	2.599082362	1.12643E+20	4.7108E+22	0.000204323	0.0018	0.000402598	0.529734794	0.002000914
474	7	3.23482E+18	13.39779162	5.19894E-05	0.999743688	5.94164E-05	2.599082149	1.12643E+20	4.71955E+22	0.000204702	0.0018	0.000403346	0.530717891	0.002004628
475	7	3.23482E+18	13.39778752	5.19894E-05	0.999743308	5.94164E-05	2.599081936	1.12643E+20	4.7283E+22	0.000205082	0.0018	0.000404092	0.531700459	0.002008339
476	7	3.23482E+18	13.39778341	5.19893E-05	0.999742929	5.94164E-05	2.599081723	1.12643E+20	4.73704E+22	0.000205461	0.0018	0.000404839	0.532682499	0.002012048
477	7	3.23482E+18	13.39777932	5.19893E-05	0.99974255	5.94164E-05	2.59908151	1.12643E+20	4.74578E+22	0.00020584	0.0018	0.000405585	0.533664011	0.002015756
478	7	3.23482E+18	13.39777522	5.19893E-05	0.99974217	5.94163E-05	2.599081297	1.12642E+20	4.75452E+22	0.000206219	0.0018	0.00040633	0.534644996	0.002019461
479	7	3.23482E+18	13.39777112	5.19893E-05	0.999741792	5.94163E-05	2.599081085	1.12642E+20	4.76325E+22	0.000206598	0.0018	0.000407075	0.535625453	0.002023164
480	7	3.23482E+18	13.39776703	5.19893E-05	0.999741413	5.94163E-05	2.599080872	1.12642E+20	4.77197E+22	0.000206976	0.0018	0.00040782	0.536605383	0.002026866
481	7	3.23482E+18	13.39776294	5.19892E-05	0.999741034	5.94163E-05	2.59908066	1.12642E+20	4.7807E+22	0.000207355	0.0018	0.000408564	0.537584787	0.002030565
482	7	3.23482E+18	13.39775885	5.19892E-05	0.999740656	5.94162E-05	2.599080448	1.12642E+20	4.78941E+22	0.000207733	0.0018	0.000409308	0.538563664	0.002034263
483	7	3.23482E+18	13.39775477	5.19892E-05	0.999740278	5.94162E-05	2.599080235	1.12642E+20	4.79812E+22	0.000208111	0.0018	0.000410052	0.539542015	0.002037958
484	7	3.23482E+18	13.39775068	5.19892E-05	0.9997399	5.94162E-05	2.599080023	1.12642E+20	4.80683E+22	0.000208488	0.0018	0.000410795	0.54051984	0.002041652
485	7	3.23482E+18	13.3977466	5.19892E-05	0.999739522	5.94162E-05	2.599079811	1.12642E+20	4.81553E+22	0.000208866	0.0018	0.000411538	0.54149714	0.002045343
486	7	3.23482E+18	13.39774252	5.19891E-05	0.999739145	5.94162E-05	2.5990796	1.12642E+20	4.82423E+22	0.000209243	0.0018	0.00041228	0.542473915	0.002049032
487	7	3.23482E+18	13.39773844	5.19891E-05	0.999738768	5.94161E-05	2.599079388	1.12642E+20	4.83292E+22	0.00020962	0.0018	0.000413022	0.543450164	0.00205272
488	7	3.23482E+18	13.39773437	5.19891E-05	0.99973839	5.94161E-05	2.599079176	1.12642E+20	4.84161E+22	0.000209997	0.0018	0.000413764	0.544425889	0.002056405
489	7	3.23482E+18	13.39773029	5.19891E-05	0.999738014	5.94161E-05	2.599078965	1.12642E+20	4.8503E+22	0.000210374	0.0018	0.000414505	0.54540109	0.002060089
490	7	3.23482E+18	13.39772622	5.19891E-05	0.999737637	5.94161E-05	2.599078753	1.12642E+20	4.85897E+22	0.000210751	0.0018	0.000415246	0.546375766	0.002063771
491	7	3.23482E+18	13.39772216	5.1989E-05	0.99973726	5.9416E-05	2.599078542	1.12642E+20	4.86765E+22	0.000211127	0.0018	0.000415986	0.547349919	0.00206745
492	7	3.23482E+18	13.39771809	5.1989E-05	0.999736884	5.9416E-05	2.599078331	1.12642E+20	4.87632E+22	0.000211503	0.0018	0.000416726	0.548323548	0.002071128
493	7	3.23482E+18	13.39771402	5.1989E-05	0.999736508	5.9416E-05	2.59907812	1.12642E+20	4.88498E+22	0.000211879	0.0018	0.000417465	0.549296653	0.002074803
494	7	3.23482E+18	13.39770996	5.1989E-05	0.999736132	5.9416E-05	2.599077909	1.12642E+20	4.89365E+22	0.000212255	0.0018	0.000418205	0.550269236	0.002078477
495	7	3.23482E+18	13.3977059	5.1989E-05	0.999735756	5.9416E-05	2.599077698	1.12642E+20	4.9023E+22	0.00021263	0.0018	0.000418943	0.551241296	0.002082149
496	7	3.23482E+18	13.39770184	5.19889E-05	0.999735381	5.94159E-05	2.599077488	1.12642E+20	4.91095E+22	0.000213005	0.0018	0.000419682	0.552212834	0.002085818
497	7	3.23482E+18	13.39769779	5.19889E-05	0.999735006	5.94159E-05	2.599077277	1.12642E+20	4.9196E+22	0.000213381	0.0018	0.00042042	0.55318385	0.002089486
498	7	3.23482E+18	13.39769373	5.19889E-05	0.999734631	5.94159E-05	2.599077066	1.12642E+20	4.92824E+22	0.000213755	0.0018	0.000421157	0.554154344	0.002093152
499	7	3.23482E+18	13.39768968	5.19889E-05	0.999734256	5.94159E-05	2.599076856	1.12642E+20	4.93688E+22	0.00021413	0.0018	0.000421894	0.555124316	0.002096816
500	7	3.23482E+18	13.39768563	5.19889E-05	0.999733881	5.94158E-05	2.599076646	1.12642E+20	4.94551E+22	0.000214505	0.0018	0.000422631	0.556093767	0.002100477
501	7	3.23482E+18	13.39768159	5.19888E-05	0.999733506	5.94158E-05	2.599076436	1.12641E+20	4.95414E+22	0.000214879	0.0018	0.000423368	0.557062698	0.002104137
502	7	3.23482E+18	13.39767754	5.19888E-05	0.999733132	5.94158E-05	2.599076226	1.12641E+20	4.96277E+22	0.000215253	0.0018	0.000424104	0.558031107	0.002107795
503	7	3.23482E+18	13.3976735	5.19888E-05	0.999732758	5.94158E-05	2.599076016	1.12641E+20	4.97138E+22	0.000215627	0.0018	0.000424839	0.558998996	0.002111451
504	7	3.23482E+18	13.39766946	5.19888E-05	0.999732384	5.94158E-05	2.599075806	1.12641E+20	4.98E+22	0.000216001	0.0018	0.000425574	0.559966365	0.002115105
505	7	3.23482E+18	13.39766542	5.19888E-05	0.99973201	5.94157E-05	2.599075596	1.12641E+20	4.98861E+22	0.000216374	0.0018	0.000426309	0.560933214	0.002118757
506	7	3.23482E+18	13.39766138	5.19887E-05	0.999731637	5.94157E-05	2.599075387	1.12641E+20	4.99722E+22	0.000216748	0.0018	0.000427044	0.561899544	0.002122407
507	7	3.23482E+18	13.39765735	5.19887E-05	0.999731264	5.94157E-05	2.599075177	1.12641E+20	5.00582E+22	0.000217121	0.0018	0.000427778	0.562865354	0.002126055
508	7	3.23482E+18	13.39765332	5.19887E-05	0.999730891	5.94157E-05	2.599074968	1.12641E+20	5.01441E+22	0.000217494	0.0018	0.000428511	0.563830646	0.002129701
509	7	3.23482E+18	13.39764929	5.19887E-05	0.999730518	5.94156E-05	2.599074759	1.12641E+20	5.023E+22	0.000217866	0.0018	0.000429245	0.564795419	0.002133345
510	7	3.23482E+18	13.39764526	5.19887E-05	0.999730145	5.94156E-05	2.599074549	1.12641E+20	5.03159E+22	0.000218239	0.0018	0.000429977	0.565759673	0.002136987
511	7	3.23482E+18	13.39764123	5.19887E-05	0.999729772	5.94156E-05	2.59907434	1.12641E+20	5.04017E+22	0.000218611	0.0018	0.00043071	0.566723409	0.002140628
512	7	3.23482E+18	13.39763721	5.19886E-05	0.9997294	5.94156E-05	2.599074132	1.12641E+20	5.04875E+22	0.000218983	0.0018	0.000431442	0.567686627	0.002144266
513	7	3.23482E+18	13.39763319	5.19886E-05	0.999729028	5.94156E-05	2.599073923	1.12641E+20	5.05733E+22	0.000219355	0.0018	0.000432173	0.568649328	0.002147902
514	7	3.23482E+18	13.39762917	5.19886E-05	0.999728656	5.94155E-05	2.599073714	1.12641E+20	5.06589E+22	0.000219727	0.0018	0.000432905	0.569611512	0.002151537
515	7	3.23482E+18	13.39762515	5.19886E-05	0.999728284	5.94155E-05	2.599073505	1.12641E+20	5.07446E+22	0.000220099	0.0018	0.000433636	0.570573178	0.002155169
516	7	3.23482E+18	13.39762114	5.19886E-05	0.999727913	5.94155E-05	2.599073297	1.12641E+20	5.08302E+22	0.00022047	0.0018	0.000434366	0.571534328	0.002158799
517	7	3.23482E+18	13.39761713	5.19885E-05	0.999727542	5.94155E-05	2.599073089	1.12641E+20	5.09157E+22	0.000220841	0.0018	0.000435096	0.572494962	0.002162428
518	7	3.23482E+18	13.39761311	5.19885E-05	0.99972717	5.94154E-05	2.59907288	1.12641E+20	5.10012E+22	0.000221212	0.0018	0.000435826	0.573455079	0.002166055
519	7	3.23482E+18	13.39760911	5.19885E-05	0.9997268	5.94154E-05	2.599072672	1.12641E+20	5.10867E+22	0.000221583	0.0018	0.000436555	0.574414681	0.002169679
520	7	3.23482E+18	13.3976051	5.19885E-05	0.999726429	5.94154E-05	2.599072464	1.12641E+20	5.11721E+22	0.000221953	0.0018	0.000437284	0.575373766	0.002173302
521	7	3.23482E+18	13.3976011	5.19885E-05	0.999726058	5.94154E-05	2.599072256	1.12641E+20	5.12575E+22	0.000222324	0.0018	0.000438013	0.576332337	0.002176923
522	7	3.23482E+18	13.39759709	5.19884E-05	0.999725688	5.94154E-05	2.599072049	1.12641E+20	5.13428E+22	0.000222694	0.0018	0.000438741	0.577290393	0.002180541
523	7	3.23482E+18	13.39759309	5.19884E-05	0.999725318	5.94153E-05	2.599071841	1.12641E+20	5.14281E+22	0.000223064	0.0018	0.000439468	0.578247933	0.002184158
524	7	3.23482E+18	13.3975891	5.19884E-05	0.999724948	5.94153E-05	2.599071633	1.1264E+20	5.15133E+22	0.000223433	0.0018	0.000440196	0.57920496	0.002187773
525	7	3.23482E+18	13.3975851	5.19884E-05	0.999724578	5.94153E-05	2.599071426	1.1264E+20	5.15985E+22	0.000223803	0.0018	0.000440923	0.580161472	0.002191386
526	7	3.23482E+18	13.39758111	5.19884E-05	0.999724209	5.94153E-05	2.599071218	1.1264E+20	5.16837E+22	0.000224172	0.0018	0.000441649	0.58111747	0.002194997
527	7	3.23482E+18	13.39757712	5.19883E-05	0.999723839	5.94152E-05	2.599071011	1.1264E+20	5.17688E+22	0.000224542	0.0018	0.000442375	0.582072955	0.002198606
528	7	3.23482E+18	13.39757313	5.19883E-05	0.99972347	5.94152E-05	2.599070804	1.1264E+20	5.18538E+22	0.000224911	0.0018	0.000443101	0.583027927	0.002202213
529	7	3.23482E+18	13.39756914	5.19883E-05	0.999723101	5.94152E-05	2.599070597	1.1264E+20	5.19388E+22	0.000225279	0.0018	0.000443827	0.583982385	0.002205818
530	7	3.23482E+18	13.39756515	5.19883E-05	0.999722732	5.94152E-05	2.59907039	1.1264E+20	5.20238E+22	0.000225648	0.0018	0.000444552	0.584936331	0.002209422
531	7	3.23482E+18	13.39756117	5.19883E-05	0.999722364	5.94152E-05	2.599070183	1.1264E+20	5.21087E+22	0.000226016	0.0018	0.000445276	0.585889764	0.002213023
532	7	3.23482E+18	13.39755719	5.19882E-05	0.999721996	5.94151E-05	2.599069977	1.1264E+20	5.21936E+22	0.000226384	0.0018	0.000446	0.586842685	0.002216622
533	7	3.23482E+18	13.39755321	5.19882E-05	0.999721627	5.94151E-05	2.59906977	1.1264E+20	5.22784E+22	0.000226752	0.0018	0.000446724	0.587795094	0.00222022
534	7	3.23482E+18	13.39754923	5.19882E-05	0.999721259	5.94151E-05	2.599069563	1.1264E+20	5.23632E+22	0.00022712	0.0018	0.000447448	0.588746991	0.002223815
535	7	3.23482E+18	13.39754526	5.19882E-05	0.999720892	5.94151E-05	2.599069357	1.1264E+20	5.24479E+22	0.000227488	0.0018	0.000448171	0.589698377	0.002227409
536	7	3.23482E+18	13.39754129	5.19882E-05	0.999720524	5.94151E-05	2.599069151	1.1264E+20	5.25326E+22	0.000227855	0.0018	0.000448893	0.590649252	0.002231
537	7	3.23482E+18	13.39753732	5.19882E-05	0.999720157	5.9415E-05	2.599068945	1.1264E+20	5.26172E+22	0.000228222	0.0018	0.000449616	0.591599616	0.00223459
538	7	3.23482E+18	13.39753335	5.19881E-05	0.999719789	5.9415E-05	2.599068739	1.1264E+20	5.27018E+22	0.000228589	0.0018	0.000450338	0.592549469	0.002238178
539	7	3.23482E+18	13.39752938	5.19881E-05	0.999719422	5.9415E-05	2.599068533	1.1264E+20	5.27864E+22	0.000228956	0.0018	0.000451059	0.593498813	0.002241764
540	7	3.23482E+18	13.39752542	5.19881E-05	0.999719056	5.9415E-05	2.599068327	1.1264E+20	5.28709E+22	0.000229323	0.0018	0.00045178	0.594447646	0.002245348
541	7	3.23482E+18	13.39752146	5.19881E-05	0.999718689	5.94149E-05	2.599068121	1.1264E+20	5.29554E+22	0.000229689	0.0018	0.000452501	0.59539597	0.00224893
542	7	3.23482E+18	13.3975175	5.19881E-05	0.999718323	5.94149E-05	2.599067916	1.1264E+20	5.30398E+22	0.000230056	0.0018	0.000453221	0.596343784	0.00225251
543	7	3.23482E+18	13.39751354	5.1988E-05	0.999717956	5.94149E-05	2.59906771	1.1264E+20	5.31242E+22	0.000230422	0.0018	0.000453941	0.597291089	0.002256088
544	7	3.23482E+18	13.39750959	5.1988E-05	0.99971759	5.94149E-05	2.599067505	1.1264E+20	5.32085E+22	0.000230787	0.0018	0.000454661	0.598237885	0.002259664
545	7	3.23482E+18	13.39750563	5.1988E-05	0.999717225	5.94149E-05	2.599067299	1.1264E+20	5.32928E+22	0.000231153	0.0018	0.00045538	0.599184173	0.002263238
546	7	3.23482E+18	13.39750168	5.1988E-05	0.999716859	5.94148E-05	2.599067094	1.1264E+20	5.3377E+22	0.000231519	0.0018	0.000456099	0.600129952	0.002266811
547	7	3.23482E+18	13.39749773	5.1988E-05	0.999716493	5.94148E-05	2.599066889	1.1264E+20	5.34612E+22	0.000231884	0.0018	0.000456817	0.601075223	0.002270381
548	7	3.23482E+18	13.39749378	5.19879E-05	0.999716128	5.94148E-05	2.599066684	1.12639E+20	5.35454E+22	0.000232249	0.0018	0.000457535	0.602019987	0.00227395
549	7	3.23482E+18	13.39748984	5.19879E-05	0.999715763	5.94148E-05	2.599066479	1.12639E+20	5.36295E+22	0.000232614	0.0018	0.000458253	0.602964243	0.002277517
550	7	3.23482E+18	13.3974859	5.19879E-05	0.999715398	5.94147E-05	2.599066275	1.12639E+20	5.37135E+22	0.000232978	0.0018	0.00045897	0.603907992	0.002281081
551	7	3.23482E+18	13.39748196	5.19879E-05	0.999715034	5.94147E-05	2.59906607	1.12639E+20	5.37976E+22	0.000233343	0.0018	0.000459687	0.604851234	0.002284644
552	7	3.23482E+18	13.39747802	5.19879E-05	0.999714669	5.94147E-05	2.599065865	1.12639E+20	5.38815E+22	0.000233707	0.0018	0.000460403	0.605793969	0.002288205
553	7	3.23482E+18	13.39747408	5.19878E-05	0.999714305	5.94147E-05	2.599065661	1.12639E+20	5.39655E+22	0.000234071	0.0018	0.00046112	0.606736198	0.002291764
554	7	3.23482E+18	13.39747015	5.19878E-05	0.999713941	5.94147E-05	2.599065457	1.12639E+20	5.40493E+22	0.000234435	0.0018	0.000461835	0.607677921	0.002295321
555	7	3.23482E+18	13.39746621	5.19878E-05	0.999713577	5.94146E-05	2.599065253	1.12639E+20	5.41332E+22	0.000234799	0.0018	0.000462551	0.608619138	0.002298876
556	7	3.23482E+18	13.39746228	5.19878E-05	0.999713213	5.94146E-05	2.599065048	1.12639E+20	5.4217E+22	0.000235162	0.0018	0.000463265	0.60955985	0.002302429
557	7	3.23482E+18	13.39745836	5.19878E-05	0.99971285	5.94146E-05	2.599064844	1.12639E+20	5.43007E+22	0.000235526	0.0018	0.00046398	0.610500056	0.002305981
558	7	3.23482E+18	13.39745443	5.19878E-05	0.999712487	5.94146E-05	2.599064641	1.12639E+20	5.43844E+22	0.000235889	0.0018	0.000464694	0.611439758	0.00230953
559	7	3.23482E+18	13.39745051	5.19877E-05	0.999712123	5.94146E-05	2.599064437	1.12639E+20	5.44681E+22	0.000236252	0.0018	0.000465408	0.612378954	0.002313078
560	7	3.23482E+18	13.39744658	5.19877E-05	0.99971176	5.94145E-05	2.599064233	1.12639E+20	5.45517E+22	0.000236615	0.0018	0.000466121	0.613317646	0.002316623
561	7	3.23482E+18	13.39744266	5.19877E-05	0.999711398	5.94145E-05	2.59906403	1.12639E+20	5.46353E+22	0.000236977	0.0018	0.000466834	0.614255834	0.002320167
562	7	3.23482E+18	13.39743875	5.19877E-05	0.999711035	5.94145E-05	2.599063826	1.12639E+20	5.47188E+22	0.000237339	0.0018	0.000467547	0.615193519	0.002323709
563	7	3.23482E+18	13.39743483	5.19877E-05	0.999710673	5.94145E-05	2.599063623	1.12639E+20	5.48023E+22	0.000237702	0.0018	0.000468259	0.616130699	0.002327249
564	7	3.23482E+18	13.39743092	5.19876E-05	0.999710311	5.94144E-05	2.59906342	1.12639E+20	5.48857E+22	0.000238064	0.0018	0.000468971	0.617067376	0.002330787
565	7	3.23482E+18	13.39742701	5.19876E-05	0.999709949	5.94144E-05	2.599063217	1.12639E+20	5.49691E+22	0.000238425	0.0018	0.000469683	0.61800355	0.002334323
566	7	3.23482E+18	13.3974231	5.19876E-05	0.999709587	5.94144E-05	2.599063014	1.12639E+20	5.50525E+22	0.000238787	0.0018	0.000470394	0.618939222	0.002337857
567	7	3.23482E+18	13.39741919	5.19876E-05	0.999709225	5.94144E-05	2.599062811	1.12639E+20	5.51358E+22	0.000239148	0.0018	0.000471105	0.619874391	0.00234139
568	7	3.23482E+18	13.39741528	5.19876E-05	0.999708864	5.94144E-05	2.599062608	1.12639E+20	5.5219E+22	0.00023951	0.0018	0.000471815	0.620809057	0.00234492
569	7	3.23482E+18	13.39741138	5.19875E-05	0.999708503	5.94143E-05	2.599062405	1.12639E+20	5.53022E+22	0.000239871	0.0018	0.000472525	0.621743222	0.002348448
570	7	3.23482E+18	13.39740748	5.19875E-05	0.999708142	5.94143E-05	2.599062203	1.12639E+20	5.53854E+22	0.000240231	0.0018	0.000473234	0.622676885	0.002351975
571	7	3.23482E+18	13.39740358	5.19875E-05	0.999707781	5.94143E-05	2.599062	1.12639E+20	5.54685E+22	0.000240592	0.0018	0.000473944	0.623610047	0.0023555
572	7	3.23482E+18	13.39739968	5.19875E-05	0.999707421	5.94143E-05	2.599061798	1.12638E+20	5.55516E+22	0.000240952	0.0018	0.000474652	0.624542707	0.002359023
573	7	3.23482E+18	13.39739579	5.19875E-05	0.99970706	5.94143E-05	2.599061596	1.12638E+20	5.56346E+22	0.000241313	0.0018	0.000475361	0.625474867	0.002362544
574	7	3.23482E+18	13.3973919	5.19875E-05	0.9997067	5.94142E-05	2.599061393	1.12638E+20	5.57176E+22	0.000241673	0.0018	0.000476069	0.626406526	0.002366063
575	7	3.23482E+18	13.39738801	5.19874E-05	0.99970634	5.94142E-05	2.599061191	1.12638E+20	5.58006E+22	0.000242033	0.0018	0.000476777	0.627337684	0.00236958
576	7	3.23482E+18	13.39738412	5.19874E-05	0.99970598	5.94142E-05	2.59906099	1.12638E+20	5.58835E+22	0.000242392	0.0018	0.000477484	0.628268343	0.002373095
577	7	3.23482E+18	13.39738023	5.19874E-05	0.99970562	5.94142E-05	2.599060788	1.12638E+20	5.59664E+22	0.000242752	0.0018	0.000478191	0.629198502	0.002376609
578	7	3.23482E+18	13.39737635	5.19874E-05	0.999705261	5.94141E-05	2.599060586	1.12638E+20	5.60492E+22	0.000243111	0.0018	0.000478897	0.630128161	0.00238012
579	7	3.23482E+18	13.39737246	5.19874E-05	0.999704902	5.94141E-05	2.599060384	1.12638E+20	5.61319E+22	0.00024347	0.0018	0.000479604	0.631057321	0.002383863
580	7	3.23482E+18	13.39736858	5.19873E-05	0.999704543	5.94141E-05	2.599060183	1.12638E+20	5.62147E+22	0.000243829	0.0018	0.000480309	0.631985983	0.002387137
581	7	3.23482E+18	13.39736471	5.19873E-05	0.999704184	5.94141E-05	2.599059982	1.12638E+20	5.62974E+22	0.000244188	0.0018	0.000481015	0.632914145	0.002390643
582	7	3.23482E+18	13.39736083	5.19873E-05	0.999703825	5.94141E-05	2.59905978	1.12638E+20	5.638E+22	0.000244546	0.0018	0.00048172	0.633841809	0.002394147
583	7	3.23482E+18	13.39735696	5.19873E-05	0.999703466	5.9414E-05	2.599059579	1.12638E+20	5.64626E+22	0.000244905	0.0018	0.000482424	0.634768975	0.002397649
584	7	3.23482E+18	13.39735308	5.19873E-05	0.999703108	5.9414E-05	2.599059378	1.12638E+20	5.65451E+22	0.000245263	0.0018	0.000483129	0.635695643	0.00240115
585	7	3.23482E+18	13.39734921	5.19872E-05	0.99970275	5.9414E-05	2.599059177	1.12638E+20	5.66277E+22	0.000245621	0.0018	0.000483833	0.636621814	0.002404648
586	7	3.23482E+18	13.39734535	5.19872E-05	0.999702392	5.9414E-05	2.599058976	1.12638E+20	5.67101E+22	0.000245978	0.0018	0.000484536	0.637547487	0.002408144
587	7	3.23482E+18	13.39734148	5.19872E-05	0.999702034	5.9414E-05	2.599058775	1.12638E+20	5.67925E+22	0.000246336	0.0018	0.000485239	0.638472663	0.002411639
588	7	3.23482E+18	13.39733762	5.19872E-05	0.999701677	5.94139E-05	2.599058575	1.12638E+20	5.68749E+22	0.000246693	0.0018	0.000485942	0.639397343	0.002415132
589	7	3.23482E+18	13.39733375	5.19872E-05	0.999701319	5.94139E-05	2.599058374	1.12638E+20	5.69573E+22	0.000247051	0.0018	0.000486644	0.640321526	0.002418622
590	7	3.23482E+18	13.39732989	5.19872E-05	0.999700962	5.94139E-05	2.599058174	1.12638E+20	5.70395E+22	0.000247408	0.0018	0.000487346	0.641245212	0.002422111
591	7	3.23482E+18	13.39732604	5.19871E-05	0.999700605	5.94139E-05	2.599057974	1.12638E+20	5.71218E+22	0.000247764	0.0018	0.000488048	0.642168403	0.002425598
592	7	3.23482E+18	13.39732218	5.19871E-05	0.999700249	5.94138E-05	2.599057773	1.12638E+20	5.7204E+22	0.000248121	0.0018	0.000488749	0.643091098	0.002429084
593	7	3.23482E+18	13.39731833	5.19871E-05	0.999699892	5.94138E-05	2.599057573	1.12638E+20	5.72861E+22	0.000248477	0.0018	0.00048945	0.644013297	0.002432567
594	7	3.23482E+18	13.39731448	5.19871E-05	0.999699536	5.94138E-05	2.599057373	1.12638E+20	5.73683E+22	0.000248834	0.0018	0.000490151	0.644935002	0.002436048
595	7	3.23482E+18	13.39731063	5.19871E-05	0.999699179	5.94138E-05	2.599057173	1.12638E+20	5.74503E+22	0.00024919	0.0018	0.000490851	0.645856211	0.002439528
596	7	3.23482E+18	13.39730678	5.1987E-05	0.999698823	5.94138E-05	2.599056974	1.12637E+20	5.75324E+22	0.000249546	0.0018	0.00049155	0.646776926	0.002443006
597	7	3.23482E+18	13.39730293	5.1987E-05	0.999698467	5.94137E-05	2.599056774	1.12637E+20	5.76143E+22	0.000249901	0.0018	0.00049225	0.647697147	0.002446482
598	7	3.23482E+18	13.39729909	5.1987E-05	0.999698112	5.94137E-05	2.599056574	1.12637E+20	5.76963E+22	0.000250257	0.0018	0.000492949	0.648616873	0.002449956

599	7	3.23482E+18	13.39729525	5.1987E-05	0.999697756	5.94137E-05	2.599056375	1.12637E+20	5.77782E+22	0.000250612	0.0018	0.000493647	0.649536106	0.002453428
600	7	3.23482E+18	13.39729141	5.1987E-05	0.999697401	5.94137E-05	2.599056175	1.12637E+20	5.786E+22	0.000250967	0.0018	0.000494346	0.650454845	0.002456898
601	7	3.23482E+18	13.39728757	5.19869E-05	0.999697046	5.94137E-05	2.599055976	1.12637E+20	5.79418E+22	0.000251322	0.0018	0.000495044	0.651373091	0.002460366
602	7	3.23482E+18	13.39728374	5.19869E-05	0.999696691	5.94136E-05	2.599055777	1.12637E+20	5.80236E+22	0.000251677	0.0018	0.000495741	0.652290844	0.002463833
603	7	3.23482E+18	13.3972799	5.19869E-05	0.999696336	5.94136E-05	2.599055578	1.12637E+20	5.81053E+22	0.000252031	0.0018	0.000496438	0.653208104	0.002467298
604	7	3.23482E+18	13.39727607	5.19869E-05	0.999695982	5.94136E-05	2.599055379	1.12637E+20	5.8187E+22	0.000252386	0.0018	0.000497135	0.654124872	0.00247076
605	7	3.23482E+18	13.39727224	5.19869E-05	0.999695628	5.94136E-05	2.59905518	1.12637E+20	5.82686E+22	0.00025274	0.0018	0.000497831	0.655041147	0.002474221
606	7	3.23482E+18	13.39726842	5.19869E-05	0.999695273	5.94136E-05	2.599054981	1.12637E+20	5.83502E+22	0.000253094	0.0018	0.000498527	0.655956931	0.002477681
607	7	3.23482E+18	13.39726459	5.19868E-05	0.999694919	5.94135E-05	2.599054783	1.12637E+20	5.84318E+22	0.000253448	0.0018	0.000499223	0.656872223	0.002481138
608	7	3.23482E+18	13.39726077	5.19868E-05	0.999694566	5.94135E-05	2.599054584	1.12637E+20	5.85133E+22	0.000253801	0.0018	0.000499918	0.657787024	0.002484593
609	7	3.23482E+18	13.39725695	5.19868E-05	0.999694212	5.94135E-05	2.599054386	1.12637E+20	5.85947E+22	0.000254155	0.0018	0.000500613	0.658701333	0.002488047
610	7	3.23482E+18	13.39725313	5.19868E-05	0.999693859	5.94135E-05	2.599054188	1.12637E+20	5.86761E+22	0.000254508	0.0018	0.000501308	0.659615152	0.002491498
611	7	3.23482E+18	13.39724931	5.19868E-05	0.999693505	5.94134E-05	2.599053989	1.12637E+20	5.87575E+22	0.000254861	0.0018	0.000502002	0.66052848	0.002494948
612	7	3.23482E+18	13.3972455	5.19867E-05	0.999693152	5.94134E-05	2.599053791	1.12637E+20	5.88389E+22	0.000255214	0.0018	0.000502695	0.661441317	0.002498396
613	7	3.23482E+18	13.39724169	5.19867E-05	0.9996928	5.94134E-05	2.599053593	1.12637E+20	5.89201E+22	0.000255566	0.0018	0.000503389	0.662353665	0.002501842
614	7	3.23482E+18	13.39723788	5.19867E-05	0.999692447	5.94134E-05	2.599053395	1.12637E+20	5.90014E+22	0.000255919	0.0018	0.000504082	0.663265523	0.002505287
615	7	3.23482E+18	13.39723407	5.19867E-05	0.999692095	5.94134E-05	2.599053198	1.12637E+20	5.90826E+22	0.000256271	0.0018	0.000504774	0.664176891	0.002508729
616	7	3.23482E+18	13.39723026	5.19867E-05	0.999691742	5.94133E-05	2.599053	1.12637E+20	5.91637E+22	0.000256623	0.0018	0.000505467	0.66508777	0.00251217
617	7	3.23482E+18	13.39722646	5.19867E-05	0.99969139	5.94133E-05	2.599052802	1.12637E+20	5.92449E+22	0.000256975	0.0018	0.000506159	0.665998161	0.002515608
618	7	3.23482E+18	13.39722265	5.19866E-05	0.999691038	5.94133E-05	2.599052605	1.12637E+20	5.93259E+22	0.000257327	0.0018	0.00050685	0.666908062	0.002519045
619	7	3.23482E+18	13.39721885	5.19866E-05	0.999690687	5.94133E-05	2.599052408	1.12637E+20	5.9407E+22	0.000257678	0.0018	0.000507541	0.667817475	0.00252248
620	7	3.23482E+18	13.39721505	5.19866E-05	0.999690335	5.94133E-05	2.59905221	1.12636E+20	5.94879E+22	0.00025803	0.0018	0.000508232	0.6687264	0.002525913
621	7	3.23482E+18	13.39721126	5.19866E-05	0.999689984	5.94132E-05	2.599052013	1.12636E+20	5.95689E+22	0.000258381	0.0018	0.000508922	0.669634837	0.002529345
622	7	3.23482E+18	13.39720746	5.19866E-05	0.999689633	5.94132E-05	2.599051816	1.12636E+20	5.96498E+22	0.000258732	0.0018	0.000509613	0.670542786	0.002532774
623	7	3.23482E+18	13.39720367	5.19865E-05	0.999689282	5.94132E-05	2.599051619	1.12636E+20	5.97306E+22	0.000259083	0.0018	0.000510302	0.671450248	0.002536202
624	7	3.23482E+18	13.39719988	5.19865E-05	0.999688931	5.94132E-05	2.599051422	1.12636E+20	5.98114E+22	0.000259433	0.0018	0.000510991	0.672357223	0.002539628
625	7	3.23482E+18	13.39719609	5.19865E-05	0.99968858	5.94132E-05	2.599051226	1.12636E+20	5.98922E+22	0.000259784	0.0018	0.00051168	0.673263711	0.002543052
626	7	3.23482E+18	13.39719231	5.19865E-05	0.999688823	5.94131E-05	2.599051029	1.12636E+20	5.99729E+22	0.000260134	0.0018	0.000512369	0.674169712	0.002546474
627	7	3.23482E+18	13.39718852	5.19865E-05	0.99968788	5.94131E-05	2.599050833	1.12636E+20	6.00536E+22	0.000260484	0.0018	0.000513057	0.675075227	0.002549894
628	7	3.23482E+18	13.39718474	5.19865E-05	0.99968753	5.94131E-05	2.599050636	1.12636E+20	6.01343E+22	0.000260834	0.0018	0.000513745	0.675980256	0.002553313
629	7	3.23482E+18	13.39718096	5.19864E-05	0.99968718	5.94131E-05	2.59905044	1.12636E+20	6.02149E+22	0.000261183	0.0018	0.000514432	0.676884799	0.002556729
630	7	3.23482E+18	13.39717718	5.19864E-05	0.99968683	5.9413E-05	2.599050244	1.12636E+20	6.02954E+22	0.000261533	0.0018	0.00051512	0.677788857	0.002560144
631	7	3.23482E+18	13.3971734	5.19864E-05	0.999686481	5.9413E-05	2.599050047	1.12636E+20	6.03759E+22	0.000261882	0.0018	0.000515806	0.678692429	0.002563557
632	7	3.23482E+18	13.39716963	5.19864E-05	0.999686132	5.9413E-05	2.599049851	1.12636E+20	6.04564E+22	0.000262231	0.0018	0.000516493	0.679595517	0.002566968
633	7	3.23482E+18	13.39716586	5.19864E-05	0.999685782	5.9413E-05	2.599049656	1.12636E+20	6.05368E+22	0.00026258	0.0018	0.000517179	0.680498119	0.002570377
634	7	3.23482E+18	13.39716209	5.19863E-05	0.999685434	5.9413E-05	2.59904946	1.12636E+20	6.06172E+22	0.000262929	0.0018	0.000517864	0.681400238	0.002573785
635	7	3.23482E+18	13.39715832	5.19863E-05	0.999685085	5.94129E-05	2.599049264	1.12636E+20	6.06975E+22	0.000263277	0.0018	0.000518549	0.682301872	0.002577191
636	7	3.23482E+18	13.39715455	5.19863E-05	0.999684736	5.94129E-05	2.599049069	1.12636E+20	6.07778E+22	0.000263626	0.0018	0.000519234	0.683203022	0.002580594
637	7	3.23482E+18	13.39715079	5.19863E-05	0.999684388	5.94129E-05	2.599048873	1.12636E+20	6.08581E+22	0.000263974	0.0018	0.000519919	0.684103688	0.002583996
638	7	3.23482E+18	13.39714703	5.19863E-05	0.99968404	5.94129E-05	2.599048678	1.12636E+20	6.09383E+22	0.000264322	0.0018	0.000520603	0.685003871	0.002587397
639	7	3.23482E+18	13.39714327	5.19863E-05	0.999683692	5.94129E-05	2.599048482	1.12636E+20	6.10185E+22	0.00026467	0.0018	0.000521287	0.685903571	0.002590795
640	7	3.23482E+18	13.39713951	5.19862E-05	0.999683344	5.94128E-05	2.599048287	1.12636E+20	6.10986E+22	0.000265017	0.0018	0.00052197	0.686802788	0.002594191
641	7	3.23482E+18	13.39713575	5.19862E-05	0.999682996	5.94128E-05	2.599048092	1.12636E+20	6.11787E+22	0.000265365	0.0018	0.000522653	0.687701522	0.002597586
642	7	3.23482E+18	13.397132	5.19862E-05	0.999682649	5.94128E-05	2.599047897	1.12636E+20	6.12587E+22	0.000265712	0.0018	0.000523336	0.688599775	0.002600979
643	7	3.23482E+18	13.39712824	5.19862E-05	0.999682302	5.94128E-05	2.599047702	1.12636E+20	6.13387E+22	0.000266059	0.0018	0.000524018	0.689497544	0.00260437
644	7	3.23482E+18	13.39712449	5.19862E-05	0.999681955	5.94128E-05	2.599047508	1.12636E+20	6.14187E+22	0.000266406	0.0018	0.0005247	0.690394833	0.002607759
645	7	3.23482E+18	13.39712075	5.19861E-05	0.999681608	5.94127E-05	2.599047313	1.12635E+20	6.14986E+22	0.000266753	0.0018	0.000525382	0.691291639	0.002611147
646	7	3.23482E+18	13.397117	5.19861E-05	0.999681261	5.94127E-05	2.599047118	1.12635E+20	6.15785E+22	0.000267099	0.0018	0.000526063	0.692187964	0.002614532
647	7	3.23482E+18	13.39711326	5.19861E-05	0.999680915	5.94127E-05	2.599046924	1.12635E+20	6.16583E+22	0.000267446	0.0018	0.000526744	0.693083809	0.002617916
648	7	3.23482E+18	13.39710951	5.19861E-05	0.999680568	5.94127E-05	2.59904673	1.12635E+20	6.17381E+22	0.000267792	0.0018	0.000527424	0.693979172	0.002621298
649	7	3.23482E+18	13.39710577	5.19861E-05	0.999680222	5.94127E-05	2.599046535	1.12635E+20	6.18178E+22	0.000268138	0.0018	0.000528104	0.694874055	0.002624678
650	7	3.23482E+18	13.39710203	5.19861E-05	0.999679876	5.94126E-05	2.599046341	1.12635E+20	6.18975E+22	0.000268484	0.0018	0.000528784	0.695768458	0.002628057
651	7	3.23482E+18	13.3970983	5.1986E-05	0.99967953	5.94126E-05	2.599046147	1.12635E+20	6.19772E+22	0.000268829	0.0018	0.000529463	0.69666238	0.002631433
652	7	3.23482E+18	13.39709456	5.1986E-05	0.999679185	5.94126E-05	2.599045953	1.12635E+20	6.20568E+22	0.000269175	0.0018	0.000530142	0.697555823	0.002634808
653	7	3.23482E+18	13.39709083	5.1986E-05	0.999678839	5.94126E-05	2.599045759	1.12635E+20	6.21364E+22	0.00026952	0.0018	0.000530821	0.698448787	0.002638181
654	7	3.23482E+18	13.3970871	5.1986E-05	0.999678494	5.94126E-05	2.599045566	1.12635E+20	6.22159E+22	0.000269865	0.0018	0.000531499	0.699341271	0.002641552
655	7	3.23482E+18	13.39708337	5.1986E-05	0.999678149	5.94125E-05	2.599045372	1.12635E+20	6.22954E+22	0.00027021	0.0018	0.000532177	0.700233276	0.002644921
656	7	3.23482E+18	13.39707965	5.19859E-05	0.999677804	5.94125E-05	2.599045179	1.12635E+20	6.23748E+22	0.000270554	0.0018	0.000532855	0.701124803	0.002648289
657	7	3.23482E+18	13.39707592	5.19859E-05	0.99967746	5.94125E-05	2.599044985	1.12635E+20	6.24543E+22	0.000270899	0.0018	0.000533532	0.702015851	0.002651654
658	7	3.23482E+18	13.3970722	5.19859E-05	0.999677115	5.94125E-05	2.599044792	1.12635E+20	6.25336E+22	0.000271243	0.0018	0.000534209	0.702906421	0.002655018
659	7	3.23482E+18	13.39706848	5.19859E-05	0.999676771	5.94125E-05	2.599044599	1.12635E+20	6.26129E+22	0.000271587	0.0018	0.000534885	0.703796513	0.00265838
660	7	3.23482E+18	13.39706476	5.19859E-05	0.999676427	5.94124E-05	2.599044406	1.12635E+20	6.26922E+22	0.000271931	0.0018	0.000535561	0.704686128	0.00266174
661	7	3.23482E+18	13.39706104	5.19859E-05	0.999676083	5.94124E-05	2.599044213	1.12635E+20	6.27714E+22	0.000272275	0.0018	0.000536237	0.705575265	0.002665099
662	7	3.23482E+18	13.39705733	5.19858E-05	0.999675739	5.94124E-05	2.59904402	1.12635E+20	6.28506E+22	0.000272619	0.0018	0.000536913	0.706463925	0.002668456
663	7	3.23482E+18	13.39705362	5.19858E-05	0.999675396	5.94124E-05	2.599043827	1.12635E+20	6.29298E+22	0.000272962	0.0018	0.000537588	0.707352108	0.00267181
664	7	3.23482E+18	13.39704991	5.19858E-05	0.999675052	5.94123E-05	2.599043634	1.12635E+20	6.30089E+22	0.000273305	0.0018	0.000538262	0.708239814	0.002675163
665	7	3.23482E+18	13.3970462	5.19858E-05	0.999674709	5.94123E-05	2.599043442	1.12635E+20	6.3088E+22	0.000273648	0.0018	0.000538937	0.709127045	0.002678515
666	7	3.23482E+18	13.39704249	5.19858E-05	0.999674366	5.94123E-05	2.599043249	1.12635E+20	6.3167E+22	0.000273991	0.0018	0.00053961	0.710013799	0.002681864
667	7	3.23482E+18	13.39703879	5.19858E-05	0.999674023	5.94123E-05	2.599043057	1.12635E+20	6.3246E+22	0.000274334	0.0018	0.000540284	0.710900077	0.002685212
668	7	3.23482E+18	13.39703508	5.19857E-05	0.99967368	5.94123E-05	2.599042864	1.12635E+20	6.33249E+22	0.000274676	0.0018	0.000540957	0.71178588	0.002688558
669	7	3.23482E+18	13.39703138	5.19857E-05	0.999673338	5.94122E-05	2.599042672	1.12635E+20	6.34038E+22	0.000275019	0.0018	0.00054163	0.712671207	0.002691902
670	7	3.23482E+18	13.39702768	5.19857E-05	0.999672996	5.94122E-05	2.59904248	1.12634E+20	6.34827E+22	0.000275361	0.0018	0.000542303	0.713556059	0.002695244
671	7	3.23482E+18	13.39702399	5.19857E-05	0.999672654	5.94122E-05	2.599042288	1.12634E+20	6.35615E+22	0.000275703	0.0018	0.000542975	0.714440437	0.002698584
672	7	3.23482E+18	13.39702029	5.19857E-05	0.999672312	5.94122E-05	2.599042096	1.12634E+20	6.36403E+22	0.000276044	0.0018	0.000543646	0.71532434	0.002701923
673	7	3.23482E+18	13.3970166	5.19856E-05	0.99967197	5.94122E-05	2.599041905	1.12634E+20	6.3719E+22	0.000276386	0.0018	0.000544318	0.716207769	0.00270526
674	7	3.23482E+18	13.39701291	5.19856E-05	0.999671628	5.94121E-05	2.599041713	1.12634E+20	6.37977E+22	0.000276727	0.0018	0.000544989	0.717090724	0.002708595
675	7	3.23482E+18	13.39700922	5.19856E-05	0.999671287	5.94121E-05	2.599041521	1.12634E+20	6.38763E+22	0.000277069	0.0018	0.000545566	0.717973205	0.002711928
676	7	3.23482E+18	13.39700553	5.19856E-05	0.999670946	5.94121E-05	2.59904133	1.12634E+20	6.39549E+22	0.00027741	0.0018	0.000546633	0.718855212	0.00271526
677	7	3.23482E+18	13.39700185	5.19856E-05	0.999670605	5.94121E-05	2.599041138	1.12634E+20	6.40335E+22	0.00027775	0.0018	0.000547	0.719736746	0.00271859
678	7	3.23482E+18	13.39699817	5.19856E-05	0.999670264	5.94121E-05	2.599040947	1.12634E+20	6.4112E+22	0.000278091	0.0018	0.000547767	0.720617808	0.002721918
679	7	3.23482E+18	13.39699449	5.19855E-05	0.999669923	5.9412E-05	2.599040756	1.12634E+20	6.41905E+22	0.000278432	0.0018	0.000548339	0.721498396	0.002725244
680	7	3.23482E+18	13.39699081	5.19855E-05	0.999669583	5.9412E-05	2.599040565	1.12634E+20	6.42689E+22	0.000278772	0.0018	0.000549008	0.722378512	0.002728568
681	7	3.23482E+18	13.39698713	5.19855E-05	0.999669243	5.9412E-05	2.599040374	1.12634E+20	6.43473E+22	0.000279112	0.0018	0.000549676	0.723258156	0.002731891
682	7	3.23482E+18	13.39698345	5.19855E-05	0.999668902	5.9412E-05	2.599040183	1.12634E+20	6.44257E+22	0.000279452	0.0018	0.000550344	0.724137328	0.002735212
683	7	3.23482E+18	13.39697978	5.19855E-05	0.999668563	5.9412E-05	2.599039992	1.12634E+20	6.4504E+22	0.000279792	0.0018	0.000551012	0.725016029	0.002738531
684	7	3.23482E+18	13.39697611	5.19855E-05	0.999668223	5.94119E-05	2.599039802	1.12634E+20	6.45823E+22	0.000280131	0.0018	0.000551168	0.725894257	0.002741848
685	7	3.23482E+18	13.39697244	5.19854E-05	0.999667883	5.94119E-05	2.599039611	1.12634E+20	6.46605E+22	0.000280471	0.0018	0.000552347	0.726772015	0.002745163
686	7	3.23482E+18	13.39696877	5.19854E-05	0.999667544	5.94119E-05	2.599039421	1.12634E+20	6.47387E+22	0.00028081	0.0018	0.000553013	0.727649302	0.002748477
687	7	3.23482E+18	13.39696511	5.19854E-05	0.999667205	5.94119E-05	2.59903923	1.12634E+20	6.48168E+22	0.000281149	0.0018	0.00055368	0.728526118	0.002751789
688	7	3.23482E+18	13.39696144	5.19854E-05	0.999666866	5.94119E-05	2.59903904	1.12634E+20	6.48949E+22	0.000281488	0.0018	0.000554346	0.729402463	0.002755099
689	7	3.23482E+18	13.39695778	5.19854E-05	0.999666527	5.94118E-05	2.59903885	1.12634E+20	6.4973E+22	0.000281827	0.0018	0.000555012	0.730278339	0.002758407
690	7	3.23482E+18	13.39695412	5.19853E-05	0.999666188	5.94118E-05	2.59903866	1.12634E+20	6.5051E+22	0.000282165	0.0018	0.000555677	0.731153745	0.002761714
691	7	3.23482E+18	13.39695047	5.19853E-05	0.99966585	5.94118E-05	2.59903847	1.12634E+20	6.5129E+22	0.000282503	0.0018	0.000556342	0.732028681	0.002765019
692	7	3.23482E+18	13.39694681	5.19853E-05	0.999665511	5.94118E-05	2.59903828	1.12634E+20	6.52069E+22	0.000282842	0.0018	0.000557006	0.732903147	0.002768322
693	7	3.23482E+18	13.39694316	5.19853E-05	0.999665173	5.94118E-05	2.59903809	1.12634E+20	6.52848E+22	0.000283179	0.0018	0.000557671	0.733777145	0.002771623
694	7	3.23482E+18	13.3969395	5.19853E-05	0.999664835	5.94117E-05	2.599037901	1.12634E+20	6.53627E+22	0.000283517	0.0018	0.000558335	0.734650673	0.002774923
695	7	3.23482E+18	13.39693585	5.19853E-05	0.999664497	5.94117E-05	2.599037711	1.12634E+20	6.54405E+22	0.000283855	0.0018	0.000558998	0.735523733	0.00277822
696	7	3.23482E+18	13.39693221	5.19852E-05	0.99966416	5.94117E-05	2.599037522	1.12633E+20	6.55183E+22	0.000284192	0.0018	0.000559661	0.736396325	0.002781516
697	7	3.23482E+18	13.39692856	5.19852E-05	0.999663822	5.94117E-05	2.599037332	1.12633E+20	6.5596E+22	0.00028453	0.0018	0.000560324	0.737268448	0.00278481
698	7	3.23482E+18	13.39692492	5.19852E-05	0.999663485	5.94117E-05	2.599037143	1.12633E+20	6.56737E+22	0.000284867	0.0018	0.000560986	0.738140104	0.002788103
699	7	3.23482E+18	13.39692127	5.19852E-05	0.999663148	5.94116E-05	2.599036954	1.12633E+20	6.57513E+22	0.000285203	0.0018	0.000561649	0.739011292	0.002791393
700	7	3.23482E+18	13.39691763	5.19852E-05	0.999662811	5.94116E-05	2.599036765	1.12633E+20	6.5829E+22	0.000285544	0.0018	0.00056231	0.739882013	0.002794682
701	7	3.23482E+18	13.396914	5.19852E-05	0.999662475	5.94116E-05	2.599036576	1.12633E+20	6.59065E+22	0.000285877	0.0018	0.000562972	0.740752266	0.002797969
702	7	3.23482E+18	13.39691036	5.19851E-05	0.999662138	5.94116E-05	2.599036387	1.12633E+20	6.5984E+22	0.000286213	0.0018	0.000563633	0.741622053	0.002801255
703	7	3.23482E+18	13.39690673	5.19851E-05	0.999661802	5.94116E-05	2.599036198	1.12633E+20	6.60615E+22	0.000286549	0.0018	0.000564293	0.742491374	0.002804538
704	7	3.23482E+18	13.39690309	5.19851E-05	0.999661466	5.94115E-05	2.59903601	1.12633E+20	6.6139E+22	0.000286885	0.0018	0.000564954	0.743360227	0.00280782
705	7	3.23482E+18	13.39689946	5.19851E-05	0.99966113	5.94115E-05	2.599035821	1.12633E+20	6.62164E+22	0.000287221	0.0018	0.000565614	0.744228615	0.0028111
706	7	3.23482E+18	13.39689583	5.19851E-05	0.999660794	5.94115E-05	2.599035633	1.12633E+20	6.62937E+22	0.000287557	0.0018	0.000566273	0.745096537	0.002814379
707	7	3.23482E+18	13.39689221	5.19851E-05	0.999660458	5.94115E-05	2.599035445	1.12633E+20	6.63711E+22	0.000287892	0.0018	0.000566933	0.745963994	0.002817655
708	7	3.23482E+18	13.39688858	5.1985E-05	0.999660123	5.94115E-05	2.599035256	1.12633E+20	6.64483E+22	0.000288227	0.0018	0.000567592	0.746830985	0.00282093
709	7	3.23482E+18	13.39688496	5.1985E-05	0.999659788	5.94114E-05	2.599035068	1.12633E+20	6.65256E+22	0.000288563	0.0018	0.00056825	0.747697511	0.002824203
710	7	3.23482E+18	13.39688134	5.1985E-05	0.999659452	5.94114E-05	2.59903488	1.12633E+20	6.66028E+22	0.000288897	0.0018	0.000568908	0.748563572	0.002827474
711	7	3.23482E+18	13.39687772	5.1985E-05	0.999659118	5.94114E-05	2.599034692	1.12633E+20	6.66799E+22	0.000289232	0.0018	0.000569566	0.749429169	0.002830744
712	7	3.23482E+18	13.3968741	5.1985E-05	0.999658783	5.94114E-05	2.599034504	1.12633E+20	6.6757E+22	0.000289567	0.0018	0.000570224	0.750294301	0.002834012
713	7	3.23482E+18	13.39687049	5.19849E-05	0.999658448	5.94114E-05	2.599034317	1.12633E+20	6.68341E+22	0.000289901	0.0018	0.000570881	0.75115897	0.002837278
714	7	3.23482E+18	13.39686688	5.19849E-05	0.999658114	5.94113E-05	2.599034129	1.12633E+20	6.69111E+22	0.000290235	0.0018	0.000571538	0.752023174	0.002840542
715	7	3.23482E+18	13.39686327	5.19849E-05	0.99965778	5.94113E-05	2.599033941	1.12633E+20	6.69881E+22	0.000290569	0.0018	0.000572194	0.752886915	0.002843804
716	7	3.23482E+18	13.39685966	5.19849E-05	0.999657446	5.94113E-05	2.599033754	1.12633E+20	6.70651E+22	0.000290903	0.0018	0.00057285	0.753750193	0.002847065
717	7	3.23482E+18	13.39685605	5.19849E-05	0.999657112	5.94113E-05	2.599033567	1.12633E+20	6.7142E+22	0.000291237	0.0018	0.000573506	0.754613008	0.002850324
718	7	3.23482E+18	13.39685244	5.19849E-05	0.999656778	5.94113E-05	2.599033379	1.12633E+20	6.72188E+22	0.00029157	0.0018	0.000574161	0.75547536	0.002853582
719	7	3.23482E+18	13.39684884	5.19848E-05	0.999656445	5.94112E-05	2.599033192	1.12633E+20	6.72957E+22	0.000291904	0.0018	0.000574816	0.756337249	0.002856837
720	7	3.23482E+18	13.39684524	5.19848E-05	0.999656111	5.94112E-05	2.599033005	1.12633E+20	6.73725E+22	0.000292237	0.0018	0.000575471	0.757198677	0.002860091
721	7	3.23482E+18	13.39684164	5.19848E-05	0.999655778	5.94112E-05	2.599032818	1.12633E+20	6.74492E+22	0.00029257	0.0018	0.000576125	0.758059642	0.002863343
722	7	3.23482E+18	13.39683804	5.19848E-05	0.999655445	5.94112E-05	2.599032631	1.12632E+20	6.75259E+22	0.000292903	0.0018	0.000576779	0.758920145	0.002866593
723	7	3.23482E+18	13.39683445	5.19848E-05	0.999655113	5.94112E-05	2.599032445	1.12632E+20	6.76026E+22	0.000293235	0.0018	0.000577433	0.759780187	0.002869842
724	7	3.23482E+18	13.39683085	5.19848E-05	0.99965478	5.94111E-05	2.599032258	1.12632E+20	6.76792E+22	0.000293568	0.0018	0.000578086	0.760639767	0.002873089
725	7	3.23482E+18	13.39682726	5.19847E-05	0.999654448	5.94111E-05	2.599032071	1.12632E+20	6.77558E+22	0.0002939	0.0018	0.000578739	0.761498887	0.002876334
726	7	3.23482E+18	13.39682367	5.19847E-05	0.999654115	5.94111E-05	2.599031885	1.12632E+20	6.78323E+22	0.000294232	0.0018	0.000579392	0.762357546	0.002879577

727	7	3.23482E+18	13.39682008	5.19847E-05	0.999653783	5.94111E-05	2.599031699	1.12632E+20	6.79088E+22	0.000294564	0.0018	0.000580044	0.763215744	0.002882819
728	7	3.23482E+18	13.39681649	5.19847E-05	0.999653451	5.94111E-05	2.599031512	1.12632E+20	6.79853E+22	0.000294896	0.0018	0.000580696	0.764073482	0.002886058
729	7	3.23482E+18	13.39681291	5.19847E-05	0.99965312	5.9411E-05	2.599031326	1.12632E+20	6.80617E+22	0.000295227	0.0018	0.000581347	0.76493076	0.002889296
730	7	3.23482E+18	13.39680933	5.19846E-05	0.999652788	5.9411E-05	2.59903114	1.12632E+20	6.81381E+22	0.000295559	0.0018	0.000581999	0.765787578	0.002892533
731	7	3.23482E+18	13.39680575	5.19846E-05	0.999652457	5.9411E-05	2.599030954	1.12632E+20	6.82144E+22	0.00029589	0.0018	0.000582649	0.766643937	0.002895767
732	7	3.23482E+18	13.39680217	5.19846E-05	0.999652126	5.9411E-05	2.599030768	1.12632E+20	6.82907E+22	0.000296221	0.0018	0.0005833	0.767499836	0.002899
733	7	3.23482E+18	13.39679859	5.19846E-05	0.999651795	5.9411E-05	2.599030583	1.12632E+20	6.83669E+22	0.000296552	0.0018	0.00058395	0.768355277	0.002902232
734	7	3.23482E+18	13.39679502	5.19846E-05	0.999651464	5.94109E-05	2.599030397	1.12632E+20	6.84432E+22	0.000296882	0.0018	0.0005846	0.769210258	0.002905461
735	7	3.23482E+18	13.39679144	5.19846E-05	0.999651133	5.94109E-05	2.599030211	1.12632E+20	6.85193E+22	0.000297213	0.0018	0.000585249	0.770064781	0.002908689
736	7	3.23482E+18	13.39678787	5.19845E-05	0.999650803	5.94109E-05	2.599030026	1.12632E+20	6.85955E+22	0.000297543	0.0018	0.000585898	0.770918846	0.002911915
737	7	3.23482E+18	13.3967843	5.19845E-05	0.999650472	5.94109E-05	2.599029841	1.12632E+20	6.86716E+22	0.000297873	0.0018	0.000586547	0.771772453	0.002915139
738	7	3.23482E+18	13.39678074	5.19845E-05	0.999650142	5.94109E-05	2.599029655	1.12632E+20	6.87476E+22	0.000298203	0.0018	0.000587195	0.772625602	0.002918361
739	7	3.23482E+18	13.39677717	5.19845E-05	0.999649812	5.94108E-05	2.59902947	1.12632E+20	6.88236E+22	0.000298533	0.0018	0.000587844	0.773478294	0.002921582
740	7	3.23482E+18	13.39677361	5.19845E-05	0.999649482	5.94108E-05	2.599029285	1.12632E+20	6.88996E+22	0.000298863	0.0018	0.000588491	0.774330528	0.002924801
741	7	3.23482E+18	13.39677005	5.19845E-05	0.999649153	5.94108E-05	2.5990291	1.12632E+20	6.89755E+22	0.000299192	0.0018	0.000589139	0.775182305	0.002928019
742	7	3.23482E+18	13.39676649	5.19844E-05	0.999648823	5.94108E-05	2.599028915	1.12632E+20	6.90514E+22	0.000299521	0.0018	0.000589786	0.776033626	0.002931234
743	7	3.23482E+18	13.39676293	5.19844E-05	0.999648494	5.94108E-05	2.599028731	1.12632E+20	6.91273E+22	0.00029985	0.0018	0.000590432	0.77688449	0.002934448
744	7	3.23482E+18	13.39675937	5.19844E-05	0.999648165	5.94108E-05	2.599028546	1.12632E+20	6.92031E+22	0.000300179	0.0018	0.000591079	0.777734897	0.00293766
745	7	3.23482E+18	13.39675582	5.19844E-05	0.999647836	5.94107E-05	2.599028361	1.12632E+20	6.92789E+22	0.000300508	0.0018	0.000591724	0.778584849	0.002940871
746	7	3.23482E+18	13.39675227	5.19844E-05	0.999647507	5.94107E-05	2.599028177	1.12632E+20	6.93546E+22	0.000300837	0.0018	0.00059237	0.779434345	0.002944079
747	7	3.23482E+18	13.39674872	5.19844E-05	0.999647179	5.94107E-05	2.599027992	1.12632E+20	6.94303E+22	0.000301165	0.0018	0.000593015	0.780283385	0.002947286
748	7	3.23482E+18	13.39674517	5.19843E-05	0.999646851	5.94107E-05	2.599027808	1.12631E+20	6.95059E+22	0.000301493	0.0018	0.00059366	0.78113197	0.002950492
749	7	3.23482E+18	13.39674162	5.19843E-05	0.999646522	5.94107E-05	2.599027624	1.12631E+20	6.95815E+22	0.000301821	0.0018	0.000594305	0.7819801	0.002953695
750	7	3.23482E+18	13.39673808	5.19843E-05	0.999646194	5.94106E-05	2.59902744	1.12631E+20	6.96571E+22	0.000302149	0.0018	0.000594949	0.782827776	0.002956897
751	7	3.23482E+18	13.39673454	5.19843E-05	0.999645866	5.94106E-05	2.599027256	1.12631E+20	6.97326E+22	0.000302477	0.0018	0.000595593	0.783674996	0.002960097
752	7	3.23482E+18	13.396731	5.19843E-05	0.999645539	5.94106E-05	2.599027072	1.12631E+20	6.98081E+22	0.000302804	0.0018	0.000596237	0.784521763	0.002963296
753	7	3.23482E+18	13.39672746	5.19843E-05	0.999645211	5.94106E-05	2.599026888	1.12631E+20	6.98836E+22	0.000303132	0.0018	0.00059688	0.785368075	0.002966492
754	7	3.23482E+18	13.39672392	5.19842E-05	0.999644884	5.94106E-05	2.599026705	1.12631E+20	6.9959E+22	0.000303459	0.0018	0.000597523	0.786213934	0.002969687
755	7	3.23482E+18	13.39672038	5.19842E-05	0.999644557	5.94105E-05	2.599026521	1.12631E+20	7.00343E+22	0.000303786	0.0018	0.000598165	0.787059339	0.002972881
756	7	3.23482E+18	13.39671685	5.19842E-05	0.99964423	5.94105E-05	2.599026337	1.12631E+20	7.01097E+22	0.000304113	0.0018	0.000598807	0.78790429	0.002976072
757	7	3.23482E+18	13.39671332	5.19842E-05	0.999643903	5.94105E-05	2.599026154	1.12631E+20	7.0185E+22	0.000304439	0.0018	0.000599449	0.788748789	0.002979262
758	7	3.23482E+18	13.39670979	5.19842E-05	0.999643576	5.94105E-05	2.599025971	1.12631E+20	7.02602E+22	0.000304766	0.0018	0.000600091	0.789592835	0.00298245
759	7	3.23482E+18	13.39670626	5.19842E-05	0.99964325	5.94105E-05	2.599025788	1.12631E+20	7.03354E+22	0.000305092	0.0018	0.000600732	0.790436428	0.002985636
760	7	3.23482E+18	13.39670274	5.19841E-05	0.999642924	5.94104E-05	2.599025604	1.12631E+20	7.04106E+22	0.000305418	0.0018	0.000601372	0.791279569	0.002988821
761	7	3.23482E+18	13.39669921	5.19841E-05	0.999642597	5.94104E-05	2.599025421	1.12631E+20	7.04857E+22	0.000305744	0.0018	0.000602013	0.792122258	0.002992004
762	7	3.23482E+18	13.39669569	5.19841E-05	0.999642272	5.94104E-05	2.599025239	1.12631E+20	7.05608E+22	0.00030607	0.0018	0.000602653	0.792964495	0.002995185
763	7	3.23482E+18	13.39669217	5.19841E-05	0.999641946	5.94104E-05	2.599025056	1.12631E+20	7.06358E+22	0.000306396	0.0018	0.000603293	0.793806281	0.002998365
764	7	3.23482E+18	13.39668865	5.19841E-05	0.99964162	5.94104E-05	2.599024873	1.12631E+20	7.07109E+22	0.000306721	0.0018	0.000603932	0.794647615	0.003001543
765	7	3.23482E+18	13.39668514	5.19841E-05	0.999641295	5.94103E-05	2.59902469	1.12631E+20	7.07858E+22	0.000307046	0.0018	0.000604571	0.795488498	0.003004719
766	7	3.23482E+18	13.39668162	5.1984E-05	0.999640969	5.94103E-05	2.599024508	1.12631E+20	7.08607E+22	0.000307372	0.0018	0.00060521	0.79632893	0.003007894
767	7	3.23482E+18	13.39667811	5.1984E-05	0.999640644	5.94103E-05	2.599024325	1.12631E+20	7.09356E+22	0.000307696	0.0018	0.000605848	0.797168912	0.003011066
768	7	3.23482E+18	13.3966746	5.1984E-05	0.99964032	5.94103E-05	2.599024143	1.12631E+20	7.10105E+22	0.000308021	0.0018	0.000606486	0.798008443	0.003014237
769	7	3.23482E+18	13.39667109	5.1984E-05	0.999639995	5.94103E-05	2.599023961	1.12631E+20	7.10853E+22	0.000308346	0.0018	0.000607124	0.798847524	0.003017407
770	7	3.23482E+18	13.39666758	5.1984E-05	0.99963967	5.94102E-05	2.599023779	1.12631E+20	7.11601E+22	0.00030867	0.0018	0.000607761	0.799686156	0.003020575
771	7	3.23482E+18	13.39666408	5.1989E-05	0.999639346	5.94102E-05	2.599023597	1.12631E+20	7.12348E+22	0.000308994	0.0018	0.000608398	0.800524337	0.003023741
772	7	3.23482E+18	13.39666058	5.1989E-05	0.999639022	5.94102E-05	2.599023415	1.12631E+20	7.13095E+22	0.000309318	0.0018	0.000609035	0.80136207	0.003026905
773	7	3.23482E+18	13.39665707	5.1989E-05	0.999638698	5.94102E-05	2.599023233	1.12631E+20	7.13841E+22	0.000309642	0.0018	0.000609672	0.802199353	0.003030067
774	7	3.23482E+18	13.39665357	5.1989E-05	0.999638374	5.94102E-05	2.599023051	1.12631E+20	7.14587E+22	0.000309966	0.0018	0.000610308	0.803036187	0.003033228
775	7	3.23482E+18	13.39665008	5.1989E-05	0.99963805	5.94102E-05	2.599022869	1.1263E+20	7.15333E+22	0.00031029	0.0018	0.000610943	0.803872573	0.003036387
776	7	3.23482E+18	13.39664658	5.19839E-05	0.999637726	5.94101E-05	2.599022688	1.1263E+20	7.16078E+22	0.000310613	0.0018	0.000611578	0.80470851	0.003039545
777	7	3.23482E+18	13.39664309	5.19838E-05	0.999637403	5.94101E-05	2.599022506	1.1263E+20	7.16823E+22	0.000310936	0.0018	0.000612213	0.805543999	0.003042701
778	7	3.23482E+18	13.3966396	5.19838E-05	0.99963708	5.94101E-05	2.599022325	1.1263E+20	7.17568E+22	0.000311259	0.0018	0.000612848	0.80637904	0.003045855
779	7	3.23482E+18	13.39663611	5.19838E-05	0.999636757	5.94101E-05	2.599022144	1.1263E+20	7.18312E+22	0.000311582	0.0018	0.000613482	0.807213634	0.003049007
780	7	3.23482E+18	13.39663262	5.19838E-05	0.999636434	5.94101E-05	2.599021963	1.1263E+20	7.19056E+22	0.000311905	0.0018	0.000614116	0.80804778	0.003052158
781	7	3.23482E+18	13.39662913	5.19838E-05	0.999636111	5.941E-05	2.599021782	1.1263E+20	7.19799E+22	0.000312227	0.0018	0.00061475	0.808881479	0.003055307
782	7	3.23482E+18	13.39662565	5.19838E-05	0.999635789	5.941E-05	2.599021601	1.1263E+20	7.20542E+22	0.00031255	0.0018	0.000615383	0.809714731	0.003058454
783	7	3.23482E+18	13.39662216	5.19837E-05	0.999635467	5.941E-05	2.59902142	1.1263E+20	7.21284E+22	0.000312872	0.0018	0.000616016	0.810547536	0.0030616
784	7	3.23482E+18	13.39661868	5.19837E-05	0.999635144	5.941E-05	2.599021239	1.1263E+20	7.22027E+22	0.000313194	0.0018	0.000616649	0.811379895	0.003064744
785	7	3.23482E+18	13.3966152	5.19837E-05	0.999634822	5.941E-05	2.599021058	1.1263E+20	7.22768E+22	0.000313516	0.0018	0.000617281	0.812211808	0.003067886
786	7	3.23482E+18	13.39661173	5.19837E-05	0.999634501	5.94099E-05	2.599020878	1.1263E+20	7.2351E+22	0.000313837	0.0018	0.000617913	0.813043275	0.003071027
787	7	3.23482E+18	13.39660825	5.19837E-05	0.999634179	5.94099E-05	2.599020697	1.1263E+20	7.24251E+22	0.000314159	0.0018	0.000618544	0.813874296	0.003074166
788	7	3.23482E+18	13.39660478	5.19837E-05	0.999633858	5.94099E-05	2.599020517	1.1263E+20	7.24991E+22	0.00031448	0.0018	0.000619176	0.814704871	0.003077303
789	7	3.23482E+18	13.39660131	5.19836E-05	0.999633536	5.94099E-05	2.599020336	1.1263E+20	7.25731E+22	0.000314801	0.0018	0.000619807	0.815535001	0.003080439
790	7	3.23482E+18	13.39659784	5.19836E-05	0.999633215	5.94099E-05	2.599020156	1.1263E+20	7.26471E+22	0.000315122	0.0018	0.000620437	0.816364687	0.003083573
791	7	3.23482E+18	13.39659437	5.19836E-05	0.999632894	5.94098E-05	2.599019976	1.1263E+20	7.2721E+22	0.000315443	0.0018	0.000621067	0.817193927	0.003086705
792	7	3.23482E+18	13.3965909	5.19836E-05	0.999632573	5.94098E-05	2.599019796	1.1263E+20	7.27949E+22	0.000315764	0.0018	0.000621697	0.818022723	0.003089835
793	7	3.23482E+18	13.39658744	5.19836E-05	0.999632253	5.94098E-05	2.599019616	1.1263E+20	7.28688E+22	0.000316084	0.0018	0.000622327	0.818851075	0.003092964
794	7	3.23482E+18	13.39658397	5.19836E-05	0.999631932	5.94098E-05	2.599019436	1.1263E+20	7.29426E+22	0.000316404	0.0018	0.000622956	0.819678983	0.003096091
795	7	3.23482E+18	13.39658051	5.19835E-05	0.999631612	5.94098E-05	2.599019257	1.1263E+20	7.30164E+22	0.000316724	0.0018	0.000623585	0.820506447	0.003099217
796	7	3.23482E+18	13.39657706	5.19835E-05	0.999631292	5.94097E-05	2.599019077	1.1263E+20	7.30901E+22	0.000317044	0.0018	0.000624213	0.821333467	0.003102341
797	7	3.23482E+18	13.3965736	5.19835E-05	0.999630972	5.94097E-05	2.599018897	1.1263E+20	7.31638E+22	0.000317364	0.0018	0.000624842	0.822160044	0.003105463
798	7	3.23482E+18	13.39657014	5.19835E-05	0.999630652	5.94097E-05	2.599018718	1.1263E+20	7.32375E+22	0.000317684	0.0018	0.000625469	0.822986178	0.003108583
799	7	3.23482E+18	13.39656669	5.19835E-05	0.999630333	5.94097E-05	2.599018539	1.1263E+20	7.33111E+22	0.000318003	0.0018	0.000626097	0.823811869	0.003111702
800	7	3.23482E+18	13.39656324	5.19835E-05	0.999630013	5.94097E-05	2.599018359	1.1263E+20	7.33847E+22	0.000318323	0.0018	0.000626724	0.824637118	0.003114819
801	7	3.23482E+18	13.39655979	5.19834E-05	0.999629694	5.94097E-05	2.59901818	1.1263E+20	7.34583E+22	0.000318642	0.0018	0.000627351	0.825461924	0.003117935
802	7	3.23482E+18	13.39655634	5.19834E-05	0.999629375	5.94096E-05	2.599018001	1.12629E+20	7.35318E+22	0.000318961	0.0018	0.000627978	0.826286288	0.003121049
803	7	3.23482E+18	13.3965529	5.19834E-05	0.999629056	5.94096E-05	2.599017822	1.12629E+20	7.36052E+22	0.000319279	0.0018	0.000628604	0.827110211	0.003124161
804	7	3.23482E+18	13.39654945	5.19834E-05	0.999628737	5.94096E-05	2.599017643	1.12629E+20	7.36787E+22	0.000319598	0.0018	0.00062923	0.827933692	0.003127271
805	7	3.23482E+18	13.39654601	5.19834E-05	0.999628419	5.94096E-05	2.599017465	1.12629E+20	7.3752E+22	0.000319916	0.0018	0.000629855	0.828756731	0.00313038
806	7	3.23482E+18	13.39654257	5.19834E-05	0.9996281	5.94096E-05	2.599017286	1.12629E+20	7.38254E+22	0.000320235	0.0018	0.00063048	0.829579329	0.003133487
807	7	3.23482E+18	13.39653913	5.19833E-05	0.999627782	5.94095E-05	2.599017107	1.12629E+20	7.38987E+22	0.000320553	0.0018	0.000631105	0.830401486	0.003136592
808	7	3.23482E+18	13.39653569	5.19833E-05	0.999627464	5.94095E-05	2.599016929	1.12629E+20	7.3972E+22	0.000320871	0.0018	0.00063173	0.831223203	0.003139696
809	7	3.23482E+18	13.39653226	5.19833E-05	0.999627146	5.94095E-05	2.59901675	1.12629E+20	7.40452E+22	0.000321188	0.0018	0.000632354	0.832044479	0.003142798
810	7	3.23482E+18	13.39652883	5.19833E-05	0.999626828	5.94095E-05	2.599016572	1.12629E+20	7.41184E+22	0.000321506	0.0018	0.000632978	0.832865315	0.003145899
811	7	3.23482E+18	13.39652539	5.19833E-05	0.999626511	5.94095E-05	2.599016394	1.12629E+20	7.41916E+22	0.000321823	0.0018	0.000633601	0.833685712	0.003148998
812	7	3.23482E+18	13.39652197	5.19833E-05	0.999626193	5.94094E-05	2.599016216	1.12629E+20	7.42647E+22	0.000322141	0.0018	0.000634224	0.834505668	0.003152095
813	7	3.23482E+18	13.39651854	5.19832E-05	0.999625876	5.94094E-05	2.599016038	1.12629E+20	7.43378E+22	0.000322458	0.0018	0.000634847	0.835325185	0.00315519
814	7	3.23482E+18	13.39651511	5.19832E-05	0.999625559	5.94094E-05	2.59901586	1.12629E+20	7.44108E+22	0.000322775	0.0018	0.00063547	0.836144263	0.003158284
815	7	3.23482E+18	13.39651169	5.19832E-05	0.999625242	5.94094E-05	2.599015682	1.12629E+20	7.44838E+22	0.000323091	0.0018	0.000636092	0.836962902	0.003161376
816	7	3.23482E+18	13.39650827	5.19832E-05	0.999624926	5.94094E-05	2.599015504	1.12629E+20	7.45567E+22	0.000323408	0.0018	0.000636714	0.837781102	0.003164467
817	7	3.23482E+18	13.39650485	5.19832E-05	0.999624609	5.94094E-05	2.599015327	1.12629E+20	7.46297E+22	0.000323724	0.0018	0.000637335	0.838598863	0.003167556
818	7	3.23482E+18	13.39650143	5.19832E-05	0.999624293	5.94093E-05	2.599015149	1.12629E+20	7.47026E+22	0.00032404	0.0018	0.000637956	0.839416186	0.003170643
819	7	3.23482E+18	13.39649801	5.19831E-05	0.999623976	5.94093E-05	2.599014972	1.12629E+20	7.47754E+22	0.000324357	0.0018	0.000638577	0.840233072	0.003173728
820	7	3.23482E+18	13.3964946	5.19831E-05	0.99962366	5.94093E-05	2.599014794	1.12629E+20	7.48482E+22	0.000324672	0.0018	0.000639198	0.841049519	0.003176812
821	7	3.23482E+18	13.39649118	5.19831E-05	0.999623344	5.94093E-05	2.599014617	1.12629E+20	7.4921E+22	0.000324988	0.0018	0.000639818	0.841865529	0.003179894
822	7	3.23482E+18	13.39648777	5.19831E-05	0.999623029	5.94093E-05	2.59901444	1.12629E+20	7.49937E+22	0.000325304	0.0018	0.000640438	0.842681101	0.003182975
823	7	3.23482E+18	13.39648436	5.19831E-05	0.999622713	5.94092E-05	2.599014263	1.12629E+20	7.50664E+22	0.000325619	0.0018	0.000641057	0.843496237	0.003186054
824	7	3.23482E+18	13.39648095	5.19831E-05	0.999622398	5.94092E-05	2.599014086	1.12629E+20	7.5139E+22	0.000325934	0.0018	0.000641676	0.844310936	0.003189131
825	7	3.23482E+18	13.39647755	5.19831E-05	0.999622083	5.94092E-05	2.599013909	1.12629E+20	7.52116E+22	0.000326249	0.0018	0.000642295	0.845125198	0.003192207
826	7	3.23482E+18	13.39647414	5.1983E-05	0.999621768	5.94092E-05	2.599013732	1.12629E+20	7.52842E+22	0.000326564	0.0018	0.000642914	0.845939023	0.003195281
827	7	3.23482E+18	13.39647074	5.1983E-05	0.999621453	5.94092E-05	2.599013555	1.12629E+20	7.53568E+22	0.000326879	0.0018	0.000643532	0.846752413	0.003198353
828	7	3.23482E+18	13.39646734	5.1983E-05	0.999621138	5.94091E-05	2.599013379	1.12629E+20	7.54292E+22	0.000327194	0.0018	0.00064415	0.847565367	0.003201424
829	7	3.23482E+18	13.39646394	5.1983E-05	0.999620824	5.94091E-05	2.599013202	1.12628E+20	7.55017E+22	0.000327508	0.0018	0.000644767	0.848377885	0.003204493
830	7	3.23482E+18	13.39646055	5.1983E-05	0.999620509	5.94091E-05	2.599013026	1.12628E+20	7.55741E+22	0.000327822	0.0018	0.000645384	0.849189967	0.00320756
831	7	3.23482E+18	13.39645715	5.1983E-05	0.999620195	5.94091E-05	2.599012849	1.12628E+20	7.56465E+22	0.000328136	0.0018	0.000646001	0.850001615	0.003210626
832	7	3.23482E+18	13.39645376	5.19829E-05	0.999619881	5.94091E-05	2.599012673	1.12628E+20	7.57188E+22	0.00032845	0.0018	0.000646618	0.850812827	0.00321369
833	7	3.23482E+18	13.39645037	5.19829E-05	0.999619567	5.94091E-05	2.599012497	1.12628E+20	7.57912E+22	0.000328764	0.0018	0.000647234	0.851623605	0.003216753
834	7	3.23482E+18	13.39644698	5.19829E-05	0.999619253	5.9409E-05	2.599012321	1.12628E+20	7.58634E+22	0.000329077	0.0018	0.00064785	0.852433948	0.003219814
835	7	3.23482E+18	13.39644359	5.19829E-05	0.99961894	5.9409E-05	2.599012145	1.12628E+20	7.59356E+22	0.000329391	0.0018	0.000648465	0.853243857	0.003222873
836	7	3.23482E+18	13.3964402	5.19829E-05	0.999618626	5.9409E-05	2.599011969	1.12628E+20	7.60078E+22	0.000329704	0.0018	0.000649081	0.854053332	0.00322593
837	7	3.23482E+18	13.39643682	5.19829E-05	0.999618313	5.9409E-05	2.599011793	1.12628E+20	7.608E+22	0.000330017	0.0018	0.000649695	0.854862374	0.003228986
838	7	3.23482E+18	13.39643344	5.19828E-05	0.999618	5.9409E-05	2.599011618	1.12628E+20	7.61521E+22	0.00033033	0.0018	0.00065031	0.855670981	0.00323204
839	7	3.23482E+18	13.39643006	5.19828E-05	0.999617687	5.94089E-05	2.599011442	1.12628E+20	7.62242E+22	0.000330643	0.0018	0.000650924	0.856479156	0.003235093
840	7	3.23482E+18	13.39642668	5.19828E-05	0.999617375	5.94089E-05	2.599011267	1.12628E+20	7.62962E+22	0.000330955	0.0018	0.000651538	0.857286897	0.003238144
841	7	3.23482E+18	13.3964233	5.19828E-05	0.999617062	5.94089E-05	2.599011091	1.12628E+20	7.63682E+22	0.000331268	0.0018	0.000652152	0.858094206	0.003241193
842	7	3.23482E+18	13.39641993	5.19828E-05	0.99961675	5.94089E-05	2.599010916	1.12628E+20	7.64402E+22	0.00033158	0.0018	0.000652765	0.858901082	0.003244241
843	7	3.23482E+18	13.39641655	5.19828E-05	0.999616438	5.94089E-05	2.599010741	1.12628E+20	7.65121E+22	0.000331892	0.0018	0.000653378	0.859707526	0.003247287
844	7	3.23482E+18	13.39641318	5.19827E-05	0.999616125	5.94088E-05	2.599010566	1.12628E+20	7.6584E+22	0.000332204	0.0018	0.00065399	0.860513537	0.003250332
845	7	3.23482E+18	13.39640981	5.19827E-05	0.999615814	5.94088E-05	2.599010391	1.12628E+20	7.66558E+22	0.000332515	0.0018	0.000654603	0.861319117	0.003253375
846	7	3.23482E+18	13.39640644	5.19827E-05	0.999615502	5.94088E-05	2.599010216	1.12628E+20	7.67276E+22	0.000332827	0.0018	0.000655214	0.862124265	0.003256416
847	7	3.23482E+18	13.39640308	5.19827E-05	0.99961519	5.94088E-05	2.599010041	1.12628E+20	7.67994E+22	0.000333138	0.0018	0.000655826	0.862928982	0.003259455
848	7	3.23482E+18	13.39639971	5.19827E-05	0.999614879	5.94088E-05	2.599009866	1.12628E+20	7.68711E+22	0.00033345	0.0018	0.000656437	0.863733267	0.003262493
849	7	3.23482E+18	13.39639635	5.19827E-05	0.999614568	5.94088E-05	2.599009691	1.12628E+20	7.69428E+22	0.000333761	0.0018	0.000657048	0.864537122	0.00326553
850	7	3.23482E+18	13.39639299	5.19826E-05	0.999614257	5.94087E-05	2.599009517	1.12628E+20	7.70144E+22	0.000334072	0.0018	0.000657659	0.865340546	0.003268564
851	7	3.23482E+18	13.39638963	5.19826E-05	0.999613946	5.94087E-05	2.599009342	1.12628E+20	7.70861E+22	0.000334382	0.0018	0.000658269	0.866143539	0.003271597
852	7	3.23482E+18	13.39638627	5.19826E-05	0.999613635	5.94087E-05	2.599009168	1.12628E+20	7.71576E+22	0.000334693	0.0018	0.000658879	0.866946102	0.003274629
853	7	3.23482E+18	13.39638292	5.19826E-05	0.999613325	5.94087E-05	2.599008994	1.12628E+20	7.72292E+22	0.000335003	0.0018	0.000659489	0.867748235	0.003277659
854	7	3.23482E+18	13.39637956	5.19826E-05	0.999613014	5.94087E-05	2.59900882	1.12628E+20	7.73007E+22	0.000335313	0.0018	0.000660098	0.868549938	0.003280687

855	7	3.23482E+18	13.39637621	5.19826E-05	0.999612704	5.94086E-05	2.599008645	1.12628E+20	7.73721E+22	0.000335624	0.0018	0.000660707	0.869351212	0.003283713
856	7	3.23482E+18	13.39637286	5.19825E-05	0.999612394	5.94086E-05	2.599008471	1.12628E+20	7.74436E+22	0.000335933	0.0018	0.000661316	0.870152057	0.003286738
857	7	3.23482E+18	13.39636951	5.19825E-05	0.999612084	5.94086E-05	2.599008298	1.12627E+20	7.75149E+22	0.000336243	0.0018	0.000661924	0.870952472	0.003289762
858	7	3.23482E+18	13.39636617	5.19825E-05	0.999611774	5.94086E-05	2.599008124	1.12627E+20	7.75863E+22	0.000336553	0.0018	0.000662532	0.871752459	0.003292783
859	7	3.23482E+18	13.39636282	5.19825E-05	0.999611465	5.94086E-05	2.59900795	1.12627E+20	7.76576E+22	0.000336862	0.0018	0.00066314	0.872552017	0.003295803
860	7	3.23482E+18	13.39635948	5.19825E-05	0.999611155	5.94086E-05	2.599007776	1.12627E+20	7.77289E+22	0.000337171	0.0018	0.000663747	0.873351146	0.003298822
861	7	3.23482E+18	13.39635614	5.19825E-05	0.999610846	5.94085E-05	2.599007603	1.12627E+20	7.78001E+22	0.00033748	0.0018	0.000664354	0.874149848	0.003301839
862	7	3.23482E+18	13.3963528	5.19825E-05	0.999610537	5.94085E-05	2.599007429	1.12627E+20	7.78713E+22	0.000337789	0.0018	0.000664961	0.874948121	0.003304854
863	7	3.23482E+18	13.39634946	5.19824E-05	0.999610228	5.94085E-05	2.599007256	1.12627E+20	7.79425E+22	0.000338098	0.0018	0.000665567	0.875745967	0.003307868
864	7	3.23482E+18	13.39634613	5.19824E-05	0.999609919	5.94085E-05	2.599007083	1.12627E+20	7.80136E+22	0.000338407	0.0018	0.000666173	0.876543386	0.00331088
865	7	3.23482E+18	13.39634279	5.19824E-05	0.999609611	5.94085E-05	2.59900691	1.12627E+20	7.80847E+22	0.000338715	0.0018	0.000666779	0.877340377	0.00331389
866	7	3.23482E+18	13.39633946	5.19824E-05	0.999609302	5.94084E-05	2.599006737	1.12627E+20	7.81557E+22	0.000339023	0.0018	0.000667384	0.878136941	0.003316899
867	7	3.23482E+18	13.39633613	5.19824E-05	0.999608994	5.94084E-05	2.599006564	1.12627E+20	7.82267E+22	0.000339332	0.0018	0.000667989	0.878933079	0.003319906
868	7	3.23482E+18	13.3963328	5.19824E-05	0.999608686	5.94084E-05	2.599006391	1.12627E+20	7.82977E+22	0.000339639	0.0018	0.000668594	0.87972879	0.003322912
869	7	3.23482E+18	13.39632947	5.19823E-05	0.999608378	5.94084E-05	2.599006218	1.12627E+20	7.83686E+22	0.000339947	0.0018	0.000669198	0.880524074	0.003325916
870	7	3.23482E+18	13.39632615	5.19823E-05	0.99960807	5.94084E-05	2.599006045	1.12627E+20	7.84395E+22	0.000340255	0.0018	0.000669802	0.881318933	0.003328918
871	7	3.23482E+18	13.39632283	5.19823E-05	0.999607763	5.94084E-05	2.599005873	1.12627E+20	7.85104E+22	0.000340562	0.0018	0.000670406	0.882113366	0.003331919
872	7	3.23482E+18	13.3963195	5.19823E-05	0.999607455	5.94083E-05	2.5990057	1.12627E+20	7.85812E+22	0.00034087	0.0018	0.00067101	0.882907373	0.003334918
873	7	3.23482E+18	13.39631618	5.19823E-05	0.999607148	5.94083E-05	2.599005528	1.12627E+20	7.8652E+22	0.000341177	0.0018	0.000671613	0.883700955	0.003337915
874	7	3.23482E+18	13.39631287	5.19823E-05	0.999606841	5.94083E-05	2.599005355	1.12627E+20	7.87227E+22	0.000341484	0.0018	0.000672216	0.884494112	0.003340911
875	7	3.23482E+18	13.39630955	5.19822E-05	0.999606534	5.94083E-05	2.599005183	1.12627E+20	7.87934E+22	0.00034179	0.0018	0.000672818	0.885286844	0.003343905
876	7	3.23482E+18	13.39630623	5.19822E-05	0.999606227	5.94083E-05	2.599005011	1.12627E+20	7.88641E+22	0.000342097	0.0018	0.00067342	0.886079151	0.003346898
877	7	3.23482E+18	13.39630292	5.19822E-05	0.999605921	5.94082E-05	2.599004839	1.12627E+20	7.89347E+22	0.000342404	0.0018	0.000674022	0.886871034	0.003349889
878	7	3.23482E+18	13.39629961	5.19822E-05	0.999605614	5.94082E-05	2.599004667	1.12627E+20	7.90053E+22	0.00034271	0.0018	0.000674623	0.887662492	0.003352879
879	7	3.23482E+18	13.3962963	5.19822E-05	0.999605308	5.94082E-05	2.599004495	1.12627E+20	7.90759E+22	0.000343016	0.0018	0.000675225	0.888453527	0.003355867
880	7	3.23482E+18	13.39629299	5.19822E-05	0.999605002	5.94082E-05	2.599004323	1.12627E+20	7.91464E+22	0.000343322	0.0018	0.000675826	0.889244138	0.003358853
881	7	3.23482E+18	13.39628969	5.19821E-05	0.999604696	5.94082E-05	2.599004151	1.12627E+20	7.92168E+22	0.000343628	0.0018	0.000676426	0.890034325	0.003361838
882	7	3.23482E+18	13.39628638	5.19821E-05	0.99960439	5.94082E-05	2.59900398	1.12627E+20	7.92873E+22	0.000343933	0.0018	0.000677026	0.890824089	0.003364821
883	7	3.23482E+18	13.39628308	5.19821E-05	0.999604084	5.94081E-05	2.599003808	1.12627E+20	7.93577E+22	0.000344239	0.0018	0.000677626	0.89161343	0.003367802
884	7	3.23482E+18	13.39627978	5.19821E-05	0.999603779	5.94081E-05	2.599003637	1.12627E+20	7.94281E+22	0.000344544	0.0018	0.000678226	0.892402348	0.003370782
885	7	3.23482E+18	13.39627648	5.19821E-05	0.999603474	5.94081E-05	2.599003465	1.12626E+20	7.94984E+22	0.000344849	0.0018	0.000678825	0.893190844	0.00337376
886	7	3.23482E+18	13.39627319	5.19821E-05	0.999603169	5.94081E-05	2.599003294	1.12626E+20	7.95687E+22	0.000345154	0.0018	0.000679424	0.893978917	0.003376737
887	7	3.23482E+18	13.39626989	5.19821E-05	0.999602864	5.94081E-05	2.599003123	1.12626E+20	7.96389E+22	0.000345459	0.0018	0.000680023	0.894766568	0.003379712
888	7	3.23482E+18	13.3962666	5.1982E-05	0.999602559	5.9408E-05	2.599002952	1.12626E+20	7.97092E+22	0.000345764	0.0018	0.000680621	0.895553797	0.003382686
889	7	3.23482E+18	13.3962633	5.1982E-05	0.999602254	5.9408E-05	2.599002781	1.12626E+20	7.97793E+22	0.000346068	0.0018	0.000681219	0.896340605	0.003385658
890	7	3.23482E+18	13.39626001	5.1982E-05	0.99960195	5.9408E-05	2.59900261	1.12626E+20	7.98495E+22	0.000346373	0.0018	0.000681817	0.897126991	0.003388628
891	7	3.23482E+18	13.39625673	5.1982E-05	0.999601645	5.9408E-05	2.599002439	1.12626E+20	7.99196E+22	0.000346677	0.0018	0.000682414	0.897912956	0.003391597
892	7	3.23482E+18	13.39625344	5.1982E-05	0.999601341	5.9408E-05	2.599002269	1.12626E+20	7.99897E+22	0.000346981	0.0018	0.000683011	0.8986985	0.003394564
893	7	3.23482E+18	13.39625016	5.1982E-05	0.999601037	5.9408E-05	2.599002098	1.12626E+20	8.00597E+22	0.000347285	0.0018	0.000683608	0.899483623	0.00339753
894	7	3.23482E+18	13.39624687	5.19819E-05	0.999600733	5.94079E-05	2.599001927	1.12626E+20	8.01297E+22	0.000347589	0.0018	0.000684204	0.900268325	0.003400494
895	7	3.23482E+18	13.39624359	5.19819E-05	0.99960043	5.94079E-05	2.599001757	1.12626E+20	8.01996E+22	0.000347892	0.0018	0.0006848	0.901052608	0.003403456
896	7	3.23482E+18	13.39624031	5.19819E-05	0.999600126	5.94079E-05	2.599001587	1.12626E+20	8.02696E+22	0.000348195	0.0018	0.000685396	0.90183647	0.003406417
897	7	3.23482E+18	13.39623703	5.19819E-05	0.999599823	5.94079E-05	2.599001416	1.12626E+20	8.03394E+22	0.000348499	0.0018	0.000685991	0.902619912	0.003409376
898	7	3.23482E+18	13.39623376	5.19819E-05	0.999599519	5.94079E-05	2.599001246	1.12626E+20	8.04093E+22	0.000348802	0.0018	0.000686586	0.903402935	0.003412334
899	7	3.23482E+18	13.39623048	5.19819E-05	0.999599216	5.94078E-05	2.599001076	1.12626E+20	8.04791E+22	0.000349105	0.0018	0.000687181	0.904185538	0.00341529
900	7	3.23482E+18	13.39622721	5.19818E-05	0.999598913	5.94078E-05	2.599000906	1.12626E+20	8.05489E+22	0.000349407	0.0018	0.000687775	0.904967723	0.003418244
901	7	3.23482E+18	13.39622394	5.19818E-05	0.999598611	5.94078E-05	2.599000736	1.12626E+20	8.06186E+22	0.00034971	0.0018	0.00068837	0.905749488	0.003421197
902	7	3.23482E+18	13.39622067	5.19818E-05	0.999598308	5.94078E-05	2.599000566	1.12626E+20	8.06883E+22	0.000350012	0.0018	0.000688963	0.906530834	0.003424148
903	7	3.23482E+18	13.3962174	5.19818E-05	0.999598006	5.94078E-05	2.599000397	1.12626E+20	8.0758E+22	0.000350315	0.0018	0.000689557	0.907311762	0.003427098
904	7	3.23482E+18	13.39621414	5.19818E-05	0.999597704	5.94078E-05	2.599000227	1.12626E+20	8.08276E+22	0.000350617	0.0018	0.00069015	0.908092272	0.003430046
905	7	3.23482E+18	13.39621087	5.19818E-05	0.999597401	5.94077E-05	2.599000058	1.12626E+20	8.08972E+22	0.000350919	0.0018	0.000690743	0.908872364	0.003432993
906	7	3.23482E+18	13.39620761	5.19818E-05	0.9995971	5.94077E-05	2.598999888	1.12626E+20	8.09667E+22	0.00035122	0.0018	0.000691336	0.909652038	0.003435938
907	7	3.23482E+18	13.39620435	5.19817E-05	0.999596798	5.94077E-05	2.598999719	1.12626E+20	8.10362E+22	0.000351522	0.0018	0.000691928	0.910431295	0.003438881
908	7	3.23482E+18	13.39620109	5.19817E-05	0.999596496	5.94077E-05	2.59899955	1.12626E+20	8.11057E+22	0.000351824	0.0018	0.00069252	0.911210134	0.003441823
909	7	3.23482E+18	13.39619784	5.19817E-05	0.999596195	5.94077E-05	2.59899938	1.12626E+20	8.11751E+22	0.000352125	0.0018	0.000693111	0.911988556	0.003444763
910	7	3.23482E+18	13.39619458	5.19817E-05	0.999595893	5.94076E-05	2.598999211	1.12626E+20	8.12445E+22	0.000352426	0.0018	0.000693703	0.912766561	0.003447702
911	7	3.23482E+18	13.39619133	5.19817E-05	0.999595592	5.94076E-05	2.598999042	1.12626E+20	8.13139E+22	0.000352727	0.0018	0.000694294	0.913544149	0.003450639
912	7	3.23482E+18	13.39618808	5.19817E-05	0.999595291	5.94076E-05	2.598998873	1.12626E+20	8.13832E+22	0.000353028	0.0018	0.000694884	0.914321321	0.003453574
913	7	3.23482E+18	13.39618483	5.19816E-05	0.999594991	5.94076E-05	2.598998705	1.12626E+20	8.14525E+22	0.000353328	0.0018	0.000695475	0.915098077	0.003456508
914	7	3.23482E+18	13.39618158	5.19816E-05	0.99959469	5.94076E-05	2.598998536	1.12625E+20	8.15218E+22	0.000353629	0.0018	0.000696065	0.915874417	0.003459441
915	7	3.23482E+18	13.39617833	5.19816E-05	0.999594389	5.94076E-05	2.598998367	1.12625E+20	8.1591E+22	0.000353929	0.0018	0.000696654	0.916650341	0.003462372
916	7	3.23482E+18	13.39617509	5.19816E-05	0.999594089	5.94075E-05	2.598998199	1.12625E+20	8.16602E+22	0.000354229	0.0018	0.000697244	0.917425849	0.003465301
917	7	3.23482E+18	13.39617184	5.19816E-05	0.999593789	5.94075E-05	2.59898803	1.12625E+20	8.17293E+22	0.000354529	0.0018	0.000697833	0.918200942	0.003468229
918	7	3.23482E+18	13.3961686	5.19816E-05	0.999593489	5.94075E-05	2.598997862	1.12625E+20	8.17984E+22	0.000354829	0.0018	0.000698421	0.91897562	0.003471155
919	7	3.23482E+18	13.39616536	5.19815E-05	0.999593189	5.94075E-05	2.598997694	1.12625E+20	8.18675E+22	0.000355129	0.0018	0.00069901	0.919749883	0.003474079
920	7	3.23482E+18	13.39616212	5.19815E-05	0.999592889	5.94075E-05	2.598997525	1.12625E+20	8.19365E+22	0.000355429	0.0018	0.000699598	0.920523732	0.003477002
921	7	3.23482E+18	13.39615889	5.19815E-05	0.99959259	5.94074E-05	2.598997357	1.12625E+20	8.20055E+22	0.000355728	0.0018	0.000700186	0.921297166	0.003479924
922	7	3.23482E+18	13.39615565	5.19815E-05	0.999592291	5.94074E-05	2.598997189	1.12625E+20	8.20745E+22	0.000356027	0.0018	0.000700773	0.922070186	0.003482844
923	7	3.23482E+18	13.39615242	5.19815E-05	0.999591991	5.94074E-05	2.598997021	1.12625E+20	8.21434E+22	0.000356326	0.0018	0.000701361	0.922842792	0.003485762
924	7	3.23482E+18	13.39614919	5.19815E-05	0.999591692	5.94074E-05	2.598996854	1.12625E+20	8.22123E+22	0.000356625	0.0018	0.000701947	0.923614985	0.003488679
925	7	3.23482E+18	13.39614596	5.19815E-05	0.999591393	5.94074E-05	2.598996686	1.12625E+20	8.22811E+22	0.000356924	0.0018	0.000702534	0.924386763	0.003491594
926	7	3.23482E+18	13.39614273	5.19814E-05	0.999591095	5.94074E-05	2.598996518	1.12625E+20	8.235E+22	0.000357222	0.0018	0.00070312	0.925158129	0.003494507
927	7	3.23482E+18	13.39613951	5.19814E-05	0.999590796	5.94073E-05	2.598996351	1.12625E+20	8.24187E+22	0.000357521	0.0018	0.000703706	0.925929081	0.003497419
928	7	3.23482E+18	13.39613628	5.19814E-05	0.999590498	5.94073E-05	2.598996183	1.12625E+20	8.24875E+22	0.000357819	0.0018	0.000704292	0.926699621	0.00350033
929	7	3.23482E+18	13.39613306	5.19814E-05	0.999590199	5.94073E-05	2.598996016	1.12625E+20	8.25562E+22	0.000358117	0.0018	0.000704877	0.927469748	0.003503239
930	7	3.23482E+18	13.39612984	5.19814E-05	0.999589901	5.94073E-05	2.598995848	1.12625E+20	8.26248E+22	0.000358415	0.0018	0.000705462	0.928239462	0.003506146
931	7	3.23482E+18	13.39612662	5.19814E-05	0.999589603	5.94073E-05	2.598995681	1.12625E+20	8.26935E+22	0.000358713	0.0018	0.000706047	0.929008765	0.003509052
932	7	3.23482E+18	13.3961234	5.19813E-05	0.999589306	5.94073E-05	2.598995514	1.12625E+20	8.27621E+22	0.000359011	0.0018	0.000706631	0.929777655	0.003511956
933	7	3.23482E+18	13.39612019	5.19813E-05	0.999589008	5.94072E-05	2.598995347	1.12625E+20	8.28306E+22	0.000359308	0.0018	0.000707215	0.930546134	0.003514859
934	7	3.23482E+18	13.39611697	5.19813E-05	0.999588711	5.94072E-05	2.59899518	1.12625E+20	8.28991E+22	0.000359605	0.0018	0.000707799	0.931314201	0.00351776
935	7	3.23482E+18	13.39611376	5.19813E-05	0.999588413	5.94072E-05	2.598995013	1.12625E+20	8.29676E+22	0.000359903	0.0018	0.000708382	0.932081857	0.00352066
936	7	3.23482E+18	13.39611055	5.19813E-05	0.999588116	5.94072E-05	2.598994847	1.12625E+20	8.30361E+22	0.0003602	0.0018	0.000708965	0.932849102	0.003523558
937	7	3.23482E+18	13.39610734	5.19813E-05	0.999587819	5.94072E-05	2.59899468	1.12625E+20	8.31045E+22	0.000360496	0.0018	0.000709548	0.933615937	0.003526454
938	7	3.23482E+18	13.39610413	5.19813E-05	0.999587522	5.94071E-05	2.598994513	1.12625E+20	8.31729E+22	0.000360793	0.0018	0.000710131	0.934382236	0.003529349
939	7	3.23482E+18	13.39610093	5.19812E-05	0.999587226	5.94071E-05	2.598994347	1.12625E+20	8.32412E+22	0.00036109	0.0018	0.000710713	0.935148373	0.003532242
940	7	3.23482E+18	13.39609773	5.19812E-05	0.999586929	5.94071E-05	2.59899418	1.12625E+20	8.33095E+22	0.000361386	0.0018	0.000711295	0.935913976	0.003535134
941	7	3.23482E+18	13.39609452	5.19812E-05	0.999586633	5.94071E-05	2.598994014	1.12625E+20	8.33778E+22	0.000361682	0.0018	0.000711876	0.936679169	0.003538025
942	7	3.23482E+18	13.39609132	5.19812E-05	0.999586337	5.94071E-05	2.598993848	1.12625E+20	8.3446E+22	0.000361978	0.0018	0.000712457	0.937443953	0.003540913
943	7	3.23482E+18	13.39608813	5.19812E-05	0.99958604	5.94071E-05	2.598993682	1.12624E+20	8.35142E+22	0.000362274	0.0018	0.000713038	0.938208327	0.0035438
944	7	3.23482E+18	13.39608493	5.19812E-05	0.999585745	5.9407E-05	2.598993516	1.12624E+20	8.35823E+22	0.00036257	0.0018	0.000713619	0.938972291	0.003546686
945	7	3.23482E+18	13.39608173	5.19811E-05	0.999585449	5.9407E-05	2.59899335	1.12624E+20	8.36505E+22	0.000362866	0.0018	0.000714199	0.939735847	0.00354957
946	7	3.23482E+18	13.39607854	5.19811E-05	0.999585153	5.9407E-05	2.598993184	1.12624E+20	8.37186E+22	0.000363161	0.0018	0.000714779	0.940498993	0.003552453
947	7	3.23482E+18	13.39607535	5.19811E-05	0.999584858	5.9407E-05	2.598993018	1.12624E+20	8.37866E+22	0.000363456	0.0018	0.000715359	0.941261732	0.003555334
948	7	3.23482E+18	13.39607216	5.19811E-05	0.999584563	5.9407E-05	2.598992852	1.12624E+20	8.38546E+22	0.000363751	0.0018	0.000715938	0.942024061	0.003558213
949	7	3.23482E+18	13.39606897	5.19811E-05	0.999584268	5.9407E-05	2.598992687	1.12624E+20	8.39226E+22	0.000364046	0.0018	0.000716517	0.942785983	0.003561091
950	7	3.23482E+18	13.39606578	5.19811E-05	0.999583973	5.94069E-05	2.598992521	1.12624E+20	8.39905E+22	0.000364341	0.0018	0.000717096	0.943547497	0.003563968
951	7	3.23482E+18	13.3960626	5.19811E-05	0.999583678	5.94069E-05	2.598992356	1.12624E+20	8.40584E+22	0.000364636	0.0018	0.000717675	0.944308603	0.003566842
952	7	3.23482E+18	13.39605941	5.1981E-05	0.999583383	5.94069E-05	2.59899219	1.12624E+20	8.41263E+22	0.00036493	0.0018	0.000718253	0.945069301	0.003569716
953	7	3.23482E+18	13.39605623	5.1981E-05	0.999583089	5.94069E-05	2.598992025	1.12624E+20	8.41941E+22	0.000365225	0.0018	0.00071883	0.945829592	0.003572588
954	7	3.23482E+18	13.39605305	5.1981E-05	0.999582794	5.94069E-05	2.59899186	1.12624E+20	8.42619E+22	0.000365519	0.0018	0.000719408	0.946589476	0.003575458
955	7	3.23482E+18	13.39604987	5.1981E-05	0.9995825	5.94068E-05	2.598991695	1.12624E+20	8.43297E+22	0.000365813	0.0018	0.000719985	0.947348954	0.003578326
956	7	3.23482E+18	13.3960467	5.1981E-05	0.999582206	5.94068E-05	2.59899153	1.12624E+20	8.43974E+22	0.000366107	0.0018	0.000720562	0.948108024	0.003581194
957	7	3.23482E+18	13.39604352	5.1981E-05	0.999581912	5.94068E-05	2.598991365	1.12624E+20	8.44651E+22	0.0003664	0.0018	0.000721139	0.948866689	0.003584059
958	7	3.23482E+18	13.39604035	5.19809E-05	0.999581619	5.94068E-05	2.5989912	1.12624E+20	8.45328E+22	0.000366694	0.0018	0.000721715	0.949624947	0.003586923
959	7	3.23482E+18	13.39603718	5.19809E-05	0.999581325	5.94068E-05	2.598991035	1.12624E+20	8.46004E+22	0.000366987	0.0018	0.000722291	0.950382799	0.003589786
960	7	3.23482E+18	13.39603401	5.19809E-05	0.999581032	5.94068E-05	2.598990871	1.12624E+20	8.46679E+22	0.000367281	0.0018	0.000722867	0.951140246	0.003592647
961	7	3.23482E+18	13.39603084	5.19809E-05	0.999580739	5.94067E-05	2.598990706	1.12624E+20	8.47355E+22	0.000367574	0.0018	0.000723442	0.951897286	0.003595506
962	7	3.23482E+18	13.39602767	5.19809E-05	0.999580445	5.94067E-05	2.598990542	1.12624E+20	8.4803E+22	0.000367867	0.0018	0.000724017	0.952653922	0.003598364
963	7	3.23482E+18	13.39602451	5.19809E-05	0.999580153	5.94067E-05	2.598990377	1.12624E+20	8.48705E+22	0.000368159	0.0018	0.000724592	0.953410153	0.003601221
964	7	3.23482E+18	13.39602135	5.19809E-05	0.99957986	5.94067E-05	2.598990213	1.12624E+20	8.49379E+22	0.000368452	0.0018	0.000725166	0.954165979	0.003604076
965	7	3.23482E+18	13.39601819	5.19808E-05	0.999579567	5.94067E-05	2.598990049	1.12624E+20	8.50053E+22	0.000368744	0.0018	0.00072574	0.9549214	0.003606929
966	7	3.23482E+18	13.39601503	5.19808E-05	0.999579275	5.94067E-05	2.598989885	1.12624E+20	8.50727E+22	0.000369037	0.0018	0.000726314	0.955676416	0.003609781
967	7	3.23482E+18	13.39601187	5.19808E-05	0.999578982	5.94066E-05	2.598989721	1.12624E+20	8.514E+22	0.000369329	0.0018	0.000726888	0.956431029	0.003612631
968	7	3.23482E+18	13.39600871	5.19808E-05	0.99957869	5.94066E-05	2.598989557	1.12624E+20	8.52073E+22	0.000369621	0.0018	0.000727461	0.957185238	0.00361548
969	7	3.23482E+18	13.39600556	5.19808E-05	0.999578398	5.94066E-05	2.598989393	1.12624E+20	8.52745E+22	0.000369913	0.0018	0.000728034	0.957939042	0.003618327
970	7	3.23482E+18	13.3960024	5.19808E-05	0.999578107	5.94066E-05	2.598989229	1.12624E+20	8.53418E+22	0.000370204	0.0018	0.000728606	0.958692444	0.003621173
971	7	3.23482E+18	13.39599925	5.19807E-05	0.999577815	5.94066E-05	2.598989065	1.12624E+20	8.5409E+22	0.000370496	0.0018	0.000729179	0.959445442	0.003624017
972	7	3.23482E+18	13.3959961	5.19807E-05	0.999577523	5.94066E-05	2.598988902	1.12624E+20	8.54761E+22	0.000370787	0.0018	0.000729751	0.960198036	0.00362686
973	7	3.23482E+18	13.39599296	5.19807E-05	0.999577232	5.94065E-05	2.598988738	1.12623E+20	8.55432E+22	0.000371079	0.0018	0.000730322	0.960950228	0.003629701
974	7	3.23482E+18	13.39598981	5.19807E-05	0.999576941	5.94065E-05	2.598988575	1.12623E+20	8.56103E+22	0.00037137	0.0018	0.000730894	0.961702018	0.003632541
975	7	3.23482E+18	13.39598666	5.19807E-05	0.99957665	5.94065E-05	2.598988411	1.12623E+20	8.56773E+22	0.000371661	0.0018	0.000731465	0.962453405	0.003635379
976	7	3.23482E+18	13.39598352	5.19807E-05	0.999576359	5.94065E-05	2.598988248	1.12623E+20	8.57443E+22	0.000371951	0.0018	0.000732035	0.963204389	0.003638216
977	7	3.23482E+18	13.39598038	5.19807E-05	0.999576068	5.94065E-05	2.598988085	1.12623E+20	8.58113E+22	0.000372242	0.0018	0.000732606	0.963954972	0.003641051
978	7	3.23482E+18	13.39597724	5.19806E-05	0.999575777	5.94064E-05	2.598987922	1.12623E+20	8.58783E+22	0.000372532	0.0018	0.000733176	0.964705153	0.003643884
979	7	3.23482E+18	13.3959741	5.19806E-05	0.999575487	5.94064E-05	2.598987759	1.12623E+20	8.59452E+22	0.000372823	0.0018	0.000733746	0.965454932	0.003646716
980	7	3.23482E+18	13.39597097	5.19806E-05	0.999575197	5.94064E-05	2.598987596	1.12623E+20	8.6012E+22	0.000373113	0.0018	0.000734315	0.96620431	0.003649547
981	7	3.23482E+18	13.39596783	5.19806E-05	0.999574907	5.94064E-05	2.598987433	1.12623E+20	8.60788E+22	0.000373403	0.0018	0.000734884	0.966953287	0.003652376
982	7	3.23482E+18	13.3959647	5.19806E-05	0.999574617	5.94064E-05	2.59898727	1.12623E+20	8.61456E+22	0.000373693	0.0018	0.000735453	0.967701863	0.003655203

983	7	3.23482E+18	13.39596157	5.19806E-05	0.999574327	5.94064E-05	2.598987108	1.12623E+20	8.62124E+22	0.000373982	0.0018	0.000736022	0.968450038	0.003658029
984	7	3.23482E+18	13.39595844	5.19806E-05	0.999574037	5.94063E-05	2.598986945	1.12623E+20	8.62791E+22	0.000374272	0.0018	0.00073659	0.969197813	0.003660854
985	7	3.23482E+18	13.39595531	5.19805E-05	0.999573748	5.94063E-05	2.598986783	1.12623E+20	8.63458E+22	0.000374561	0.0018	0.000737158	0.969945188	0.003663677
986	7	3.23482E+18	13.39595218	5.19805E-05	0.999573458	5.94063E-05	2.59898662	1.12623E+20	8.64125E+22	0.00037485	0.0018	0.000737726	0.970692162	0.003666498
987	7	3.23482E+18	13.39594906	5.19805E-05	0.999573169	5.94063E-05	2.598986458	1.12623E+20	8.64791E+22	0.000375139	0.0018	0.000738293	0.971438737	0.003669318
988	7	3.23482E+18	13.39594594	5.19805E-05	0.99957288	5.94063E-05	2.598986296	1.12623E+20	8.65457E+22	0.000375428	0.0018	0.000738861	0.972184912	0.003672137
989	7	3.23482E+18	13.39594282	5.19805E-05	0.999572591	5.94063E-05	2.598986134	1.12623E+20	8.66122E+22	0.000375717	0.0018	0.000739427	0.972930688	0.003674954
990	7	3.23482E+18	13.3959397	5.19805E-05	0.999572302	5.94062E-05	2.598985972	1.12623E+20	8.66787E+22	0.000376006	0.0018	0.000739994	0.973676064	0.003677769
991	7	3.23482E+18	13.39593658	5.19804E-05	0.999572014	5.94062E-05	2.598985581	1.12623E+20	8.67452E+22	0.000376294	0.0018	0.00074056	0.974421042	0.003680583
992	7	3.23482E+18	13.39593346	5.19804E-05	0.999571725	5.94062E-05	2.598985648	1.12623E+20	8.68116E+22	0.000376582	0.0018	0.000741126	0.97516562	0.003683396
993	7	3.23482E+18	13.39593035	5.19804E-05	0.999571437	5.94062E-05	2.598985486	1.12623E+20	8.6878E+22	0.000376871	0.0018	0.000741691	0.975909801	0.003686206
994	7	3.23482E+18	13.39592723	5.19804E-05	0.999571149	5.94062E-05	2.598985324	1.12623E+20	8.69444E+22	0.000377159	0.0018	0.000742257	0.976653582	0.003689016
995	7	3.23482E+18	13.39592412	5.19804E-05	0.999570861	5.94062E-05	2.598985163	1.12623E+20	8.70107E+22	0.000377446	0.0018	0.000742822	0.977396966	0.003691824
996	7	3.23482E+18	13.39592101	5.19804E-05	0.999570573	5.94061E-05	2.598985001	1.12623E+20	8.7077E+22	0.000377734	0.0018	0.000743386	0.978139952	0.00369463
997	7	3.23482E+18	13.39591791	5.19804E-05	0.999570286	5.94061E-05	2.59898484	1.12623E+20	8.71433E+22	0.000378022	0.0018	0.000743951	0.978882541	0.003697435
998	7	3.23482E+18	13.3959148	5.19803E-05	0.999569998	5.94061E-05	2.598984678	1.12623E+20	8.72095E+22	0.000378309	0.0018	0.000744515	0.979624731	0.003700239
999	7	3.23482E+18	13.39591169	5.19803E-05	0.999569711	5.94061E-05	2.598984517	1.12623E+20	8.72757E+22	0.000378596	0.0018	0.000745079	0.980366525	0.00370304
1000	7	3.23482E+18	13.39590859	5.19803E-05	0.999569423	5.94061E-05	2.598984356	1.12623E+20	8.73419E+22	0.000378883	0.0018	0.000745642	0.981107922	0.003705841

8.976983959	6.956960938	2.020023021
total O3 (gram) produced	total O3 (gram) remained in PS	total O3 boiled off (gram)