

The APEX Program

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APEX Workshop 2009

Center for Functional Nanomaterials

BNL, December 4-5 2008

APEX operations statistics

Run	Scheduled/Planned %	Beam/scheduled % (availability)
Run-3	80	65
Run-4	90	84
Run-5	84	83
Run-6	89	86
Run-7	92	72 (physics: 49%)
Run-8	97	83.4 (physics: 59%)
Run-9	98	82.9 (physics: 54%)

Old accounting

“Ops” accounting

Run-9 APEX average availability: 83% (ops accounting)
 Run-9 Operations time at store : 54%

Run-9 statistics in details

Run9 date	scheduled interval	scheduled duration (h)	actual interval	actual duration (h)	APEX hours(OpLog)	Failure hours	APEX/scheduled %
17-Mar	2300-0700	8	2346-0700	7.23	6.92	0.32	86.5%
25-Mar	0600-1800	12	1010-1738	9.47	3.85	4.87	32.1%
31-Mar	2000-0800	12	2000-0830	12.50	12.37	0.13	103.1%
8-Apr	0700-1900	12	0700-1658	9.97	8.15	2.80	67.9%
28-Apr	1900-0700	12	1845-0700	12.25	11.58	0.67	96.5%
4-May	0900-1600	7	1638-2142	5.03	5.07	0.00	72.4%
12-May	1900-0700	12	1900-0700	12	11.75	0.25	97.9%
20-May	0700-1900	12	0700-1130	4.5	4.5	7.5	37.5%
26-May	1900-0700	12	1900-0900	14	13.67	0.3	113.9%
4-Jun	0700-1900	12	0728-1915	11.78	11.12	2.25	92.7%
10-Jun	1200-2400	12	1257-2347	10.87	8.25	3.25	68.8%
16-Jun	1900-0700	12	1900-0700	12.00	11.18	0.82	93.2%
24-Jun	0700-2100	14	0700-2125	14.42	12.97	2.23	92.6%
4-Jul	1000-1000	24	1009-1000	23.85	20.15	2.92	84.0%
5-Jul	1000-1000	24	1000-1000	24	21.78	2.22	90.8%
totals		197		183.87	163.31	30.53	82.9%

Run-9 overview

<http://www.c-ad.bnl.gov/APEX/APEX2009/>

APEX Sessions	APEX elogs	APEX Results
March 17-18 2009	Elog1 Elog2	Summary Polarimeter-study
March 25 2009	Elog1	Summary Polarimeter-study DX-D0-study
March 31 – April 1 2009	Elog1 Elog2 Elog3	Summary IR-corrections Spin-tune-study
April 8 2009	Elog1	Summary
Overall apex PLAN for the 100 GeV run		
April 28-29	Elog1 Elog2	Polarimeter-study DA PS-Beam-Noise Beam-Beam-Wires
May 4 2009	Elog	Summary DX-D0
May 12-13	Elog1 Elog2	Summary Space-charge-Beam-beam Bunch-length-limit Off-mom-beta-beat Long-range-beam-beam
May 20 2009	Elog	Summary Off-momentum-beta-beat
May 26-27 2009	Elog1 Elog2	Summary Nonlinear-chrom Long-range-Beam-beam DX-D0 Impedance Linear-optics-correction Polarimeter-studies pp94-ramp-test
June 4 2009	Elog	
June 9-10 2009	Elog	Summary
June 16 2009	Elog	Summary
June 23-24 2009	Elog	Summary
End-of-run-studies July 4=5	Elog	Summary

APEX Run-9: studies with 250 and 100GeV PP

Operations		ORM
Operations		Nonlinear chromaticity
Operations		IR nonlinear corrections
08-29 08-10	0A	Polarimeter studies
09-10	0A	BTF - BBQ calibration
08-27	0A	Beta measurements
Development		pp93lowbeta (at 250 GeV)
09-05	0A	Dx-D0 study
09-22	0A	Spin tune vs. orbit
08-17	0A	pp93low beta preparation and commissioning
09-26	0B	DA with AC dipole (injection)
07-19 07-20	0A	Noise PS
08-08	1A	Long range beam-beam
09-17	1A	Space charge an beam-beam
09-21	1A	Bunch length limit
09-06	1A	Off momentum beta-beat
08-27	0A	Linear optics corrections
Development		pp94nearInt commissioning
		Spin flippers

APEX Schedule End of Run-9 July 4-5

<p>pp94nearInt 250 GeV Ramp development Move Q closer to integer BBQ</p>	<p>Ramps 100 GeV BBQ</p>	<p>Store 100 GeV</p>	<p>Ramps 100 GeV</p>	<p>Injection</p>	
<p>Development pp94nearInt Bai + Ptitsyn + team + operations</p>	<p>Yellow transmission Schoefer, Fischer operations</p>	<p>BBLR Fischer Calaga</p>	<p>Main PS Transient Schultheiss</p>	<p>Spin Flippers Bai, Roser</p>	
10am	midnight	6am	9am	noon	4pm

<p>Store 100 GeV</p>	<p>Injection Store</p>	<p>Ramp+ store 100 GeV</p>	<p>Store 100 GeV</p>	<p>Store 100 GeV BBQ</p>			
<p>Spin Tune Bai Ptitsyn</p>	<p>Linear Optics Correction Wang Bai</p>	<p>Blow-up Emittance Schoefer</p>	<p>Beta* Measure Ptitsyn</p>	<p>IR Octupole Pilat Marr</p>	<p>Polarimeter Huang +team</p>		
4pm	10pm	midnight	2am	4am	7am	8am	10am ?

APEX Run-9: what did not get done...

only bigger "ticket items"

09-04	0A	Beta* squeeze to 0.5m (at 100 GeV)	
09-07	1C	Transverse impedance localization	
09-12	09-13	1A	Tune feedback with beams in collision

09-23 [ATR Emittance – Quadrupole Scans](#)

09-24 [ATR Flags – Reference Images](#)

09-25 [Study interference pattern of multiple spin resonance crossing at RHIC](#)

09-26 [Measure DA using AC dipole](#)

09-27 [Investigation of Space Charge Effects on Polarization](#)

Plans for Run-10

- ❖ Studies with Au-Au
- ❖ Studies with Au in preparation for Run-11 (PP)
- ❖ Studies for and at low energy
- ❖ Studies in injectors (Au and PP)
- ❖ Studies towards future projects

Budget guess → 20-25 weeks cold operations (~15-20 weeks of physics)

APEX Program discussion → this workshop

Deadline December 5, 2009 for:

- ❖ Submission of new proposals
- ❖ Communication status and intentions for Run-8 and Run-9 study proposals

Meeting AEAC → 2nd or 3rd week in December