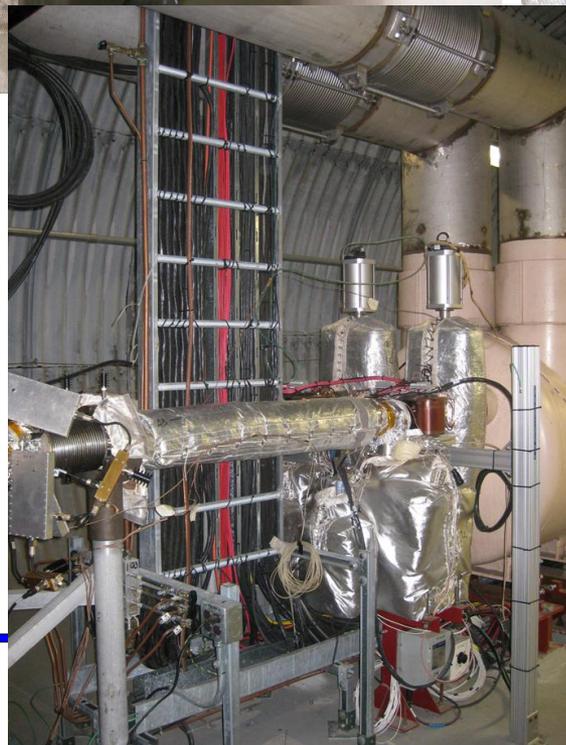
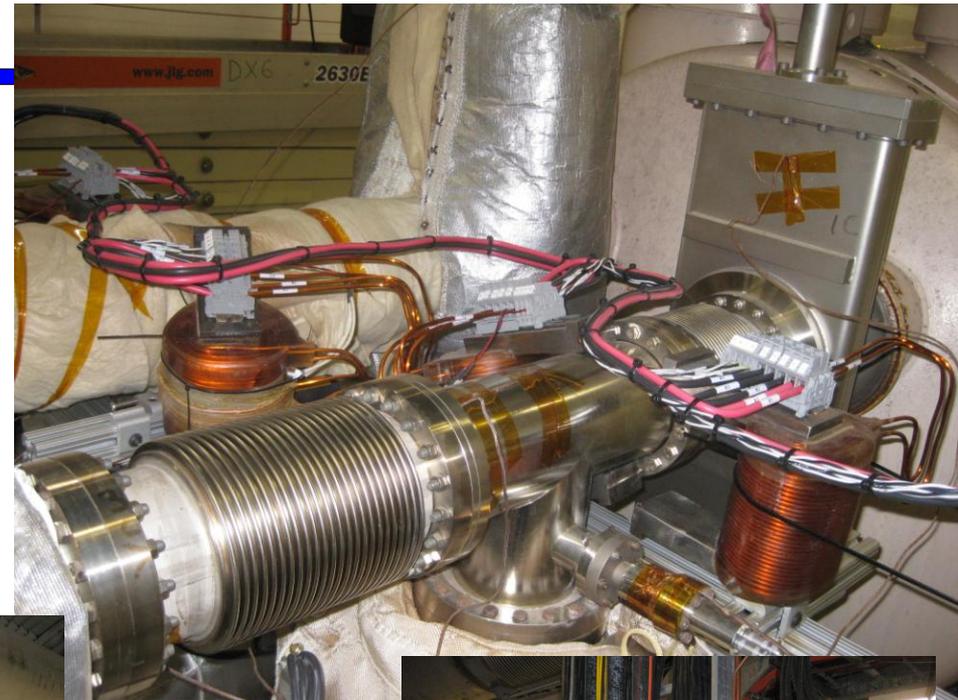
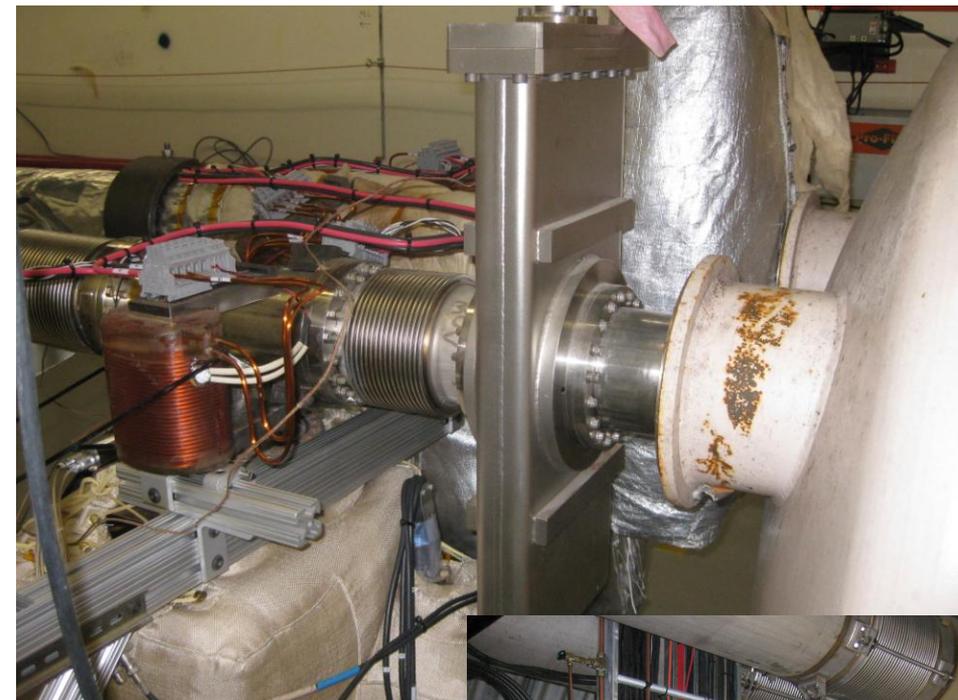


### 1. Cooling Section Magnets and Power Supplies

- Most of power supplies will be from ERL (R. Lambiase). Originally, all ERL PS's were available for use, now all except egun-to-dump PS's can be used.
- RL said that he still does not know all the magnets (e.g., chicane(s) and before the beam dump).
  
- Compensating Solenoids
  - Blue LF magnets (6) powered in series with 1 PS; Yellow (6) powered in series with 1 PS. R. Lambiase said that he may not have power supply for the 6 solenoids in each cooling section beam line. He will pick number of turns to match existing power supplies; he may select turns ratio suitable for adding shunts. This needs to be reviewed with G. Mahler and K. Hamdi (drawings or SOW updated?).
  - Primary field to be 100 ppm; bucking and correctors to be 1000 ppm.
  - Correctors located at each compensating solenoid will have individual PS's. R Lambiase said that we have these PS's.

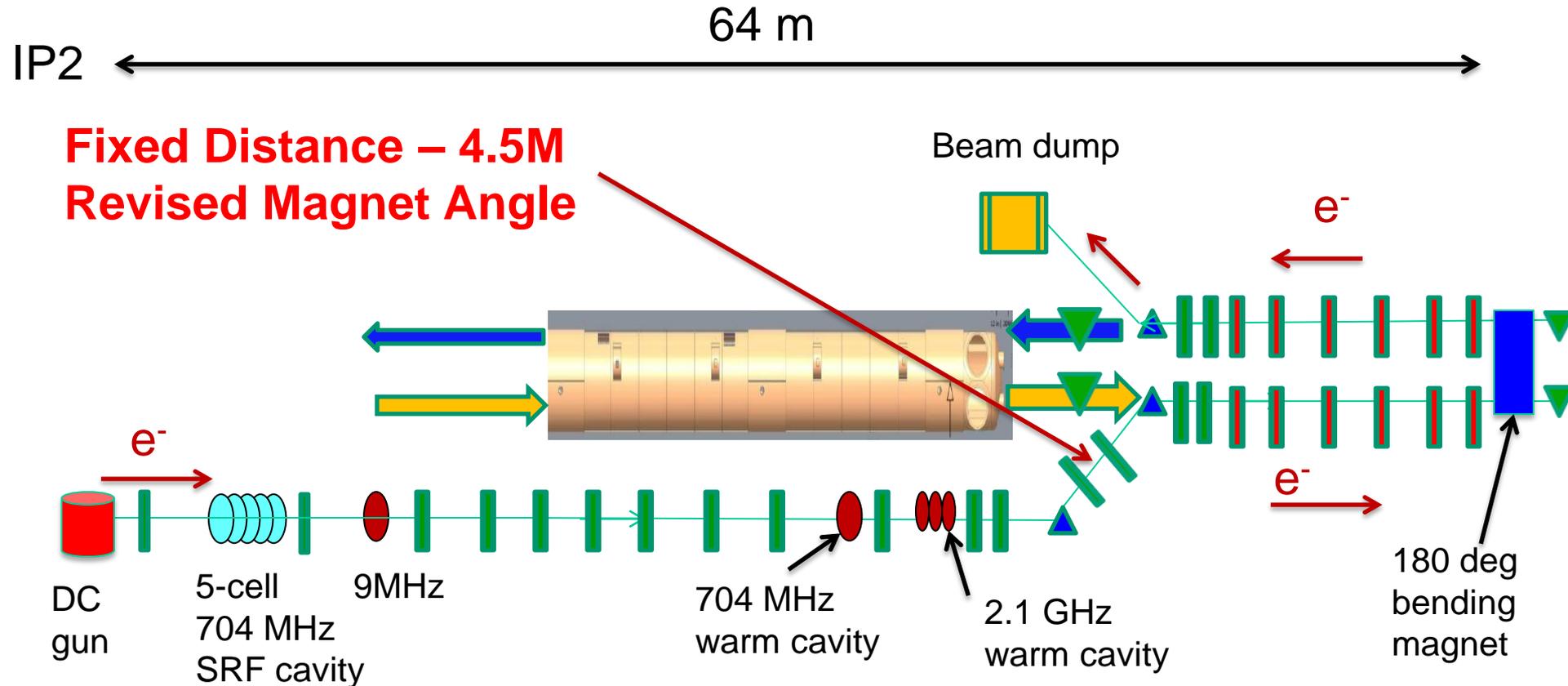
- Matching Solenoids
  - Specifications finalized from W. Meng (sheet 7)
  - Matching solenoids have individual PS's
  
- eBeam Transport (smaller diameter) Solenoids
  - Option suggested by G. Mahler: Use existing design (purchased) 800 Gauss ERL solenoids (could these be suitable for 1.0 kG?) instead of planned 1.5 kG water-cooled by using 3 magnets at 1.0 kG to replace 2 at 1.5kG.

2. Q4 Region 45 degree dipoles to be replaced by 20 degree dipoles. This line to be 4.5 m long. See sheet 5.

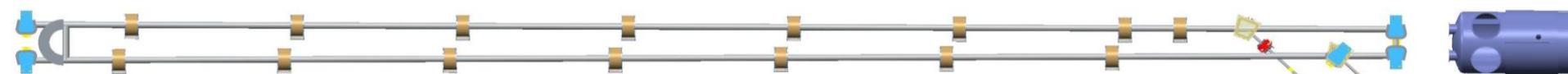
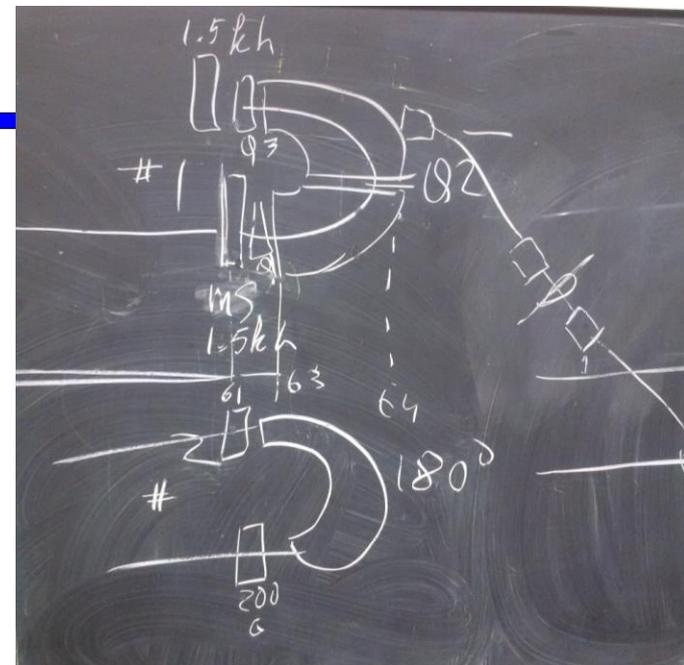
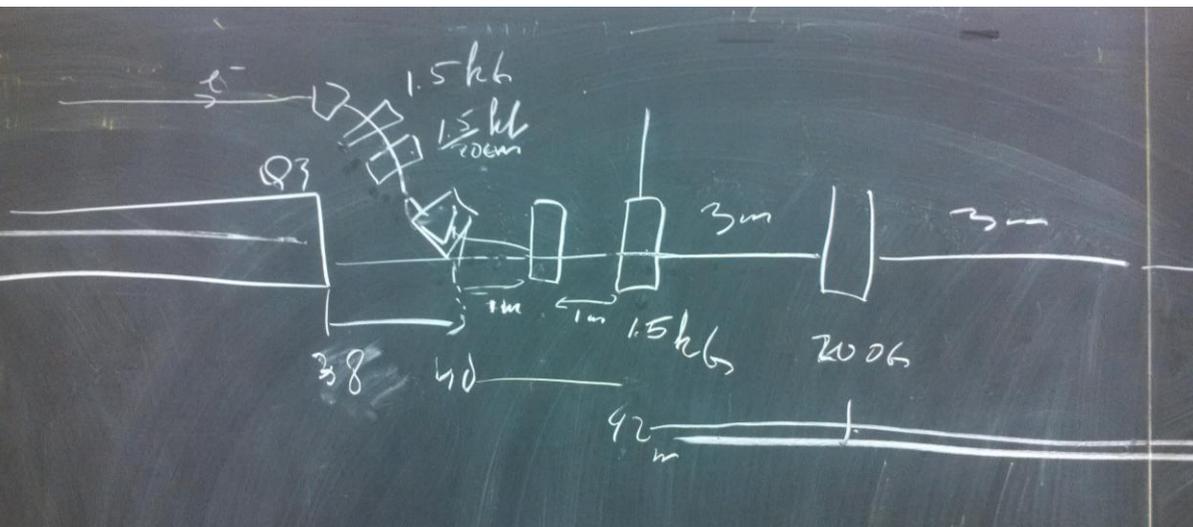


# LEReC-I (2MeV): Gun to dump

11/17/14

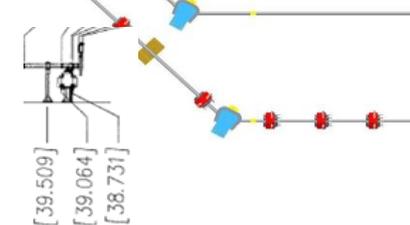


# Revised Cooling Section



Q3 Details: valve, bellows, 10 Hz corrector, RHIC BPM, ion pump, transition chamber, survey points.

NSLS I compensating dipoles and PS: specifications?



Magnet	Designation	Location	Aperture		Core		Operating			Main Power Supply Qty	Current Amps	Power kW	Trim Power Supply Qty	Current Amps	Power kW
			Gap cm	Width cm	Aperture cm	Length cm	Field kG	Qty	Grad. T/m						
Solenoid - Compensating	16S16	Cooling section (2 meter spacing)	N/A	N/A	16	16	0.20	16	N/A	16			0		
Solenoid - Matching Cool Sec	16S16	Cooling section (2 meter spacing)	N/A	N/A	16	16	1.50	8	N/A	8			0		
H & V Corrector Coil (0.2mrad)	16C16S	Cooling section compensating solenoids	16	16	N/A	coil in S	10 Gcm	16	N/A	0			32		
H & V Correctors (3mrad)	16C16	Cooling section	16	16	N/A	10	100 Gcm	4	N/A	0			8		

# Compensating Solenoids

1. Compensating Solenoid: Presently based on W. Meng's design for 0.20kG with bucking coils.
2. Compensating Solenoid : The separate leads for the bucking solenoid coils and the main solenoid coil on the magnet assembly terminal block.
3. Compensating Solenoid Power Supplies: It has not been determined whether each solenoid will require 1, 2, or 3 power supplies.
4. Spacing: Compensating solenoids will be spaced 3 meters apart.

• **Complete SCD's checked, SOW in review**

• **Layout BPM, Bellows, Chamber Flange.**

Attached files show the modified design, by mainly increasing the width (in radial direction R). Since the physical length along the Beam did not change, so that previous Horizontal/Vertical dipole correction coils design will remain the same.

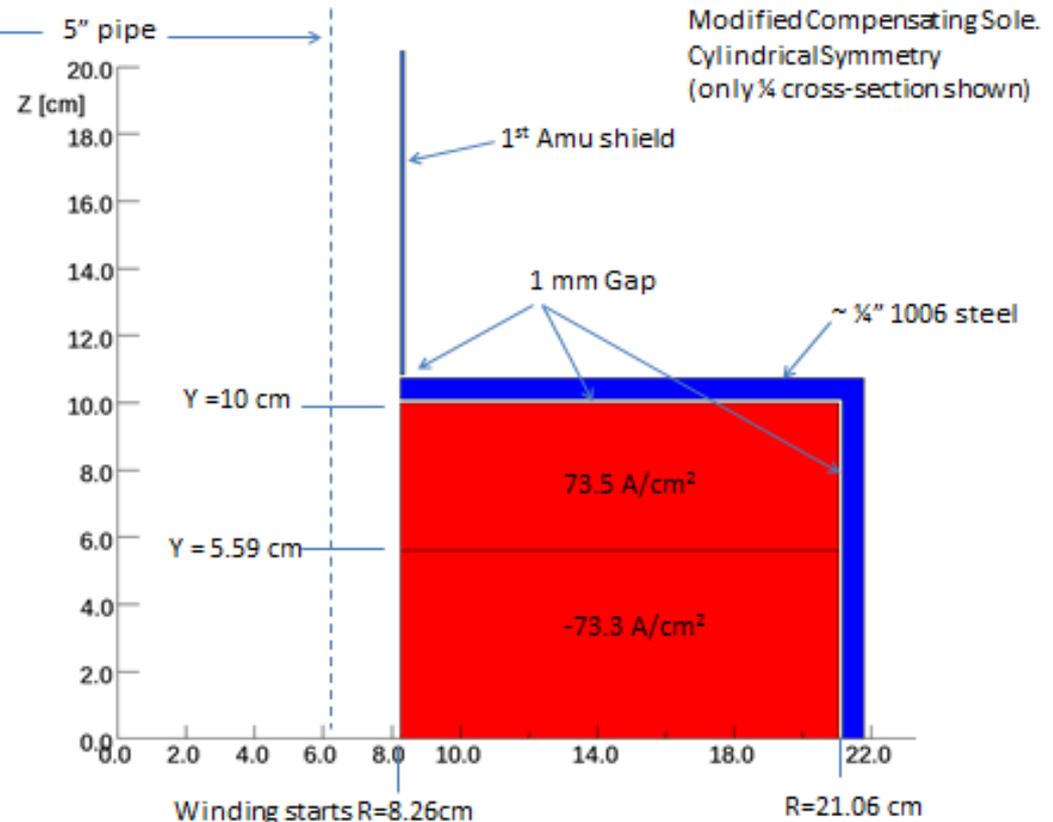
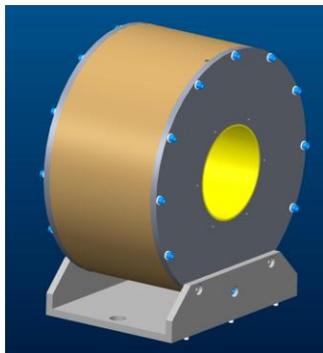
From the Excel file, the  $B_z < 1$  Gauss starts at  $Z = 19.7$  cm., where cooling will be effective.

The  $B^*2$  integral meets the required value ( $4E5$  Gauss<sup>2</sup> - cm).

The  $B_z$  integral is much more than 2000 Gauss-cm.

Please comment.

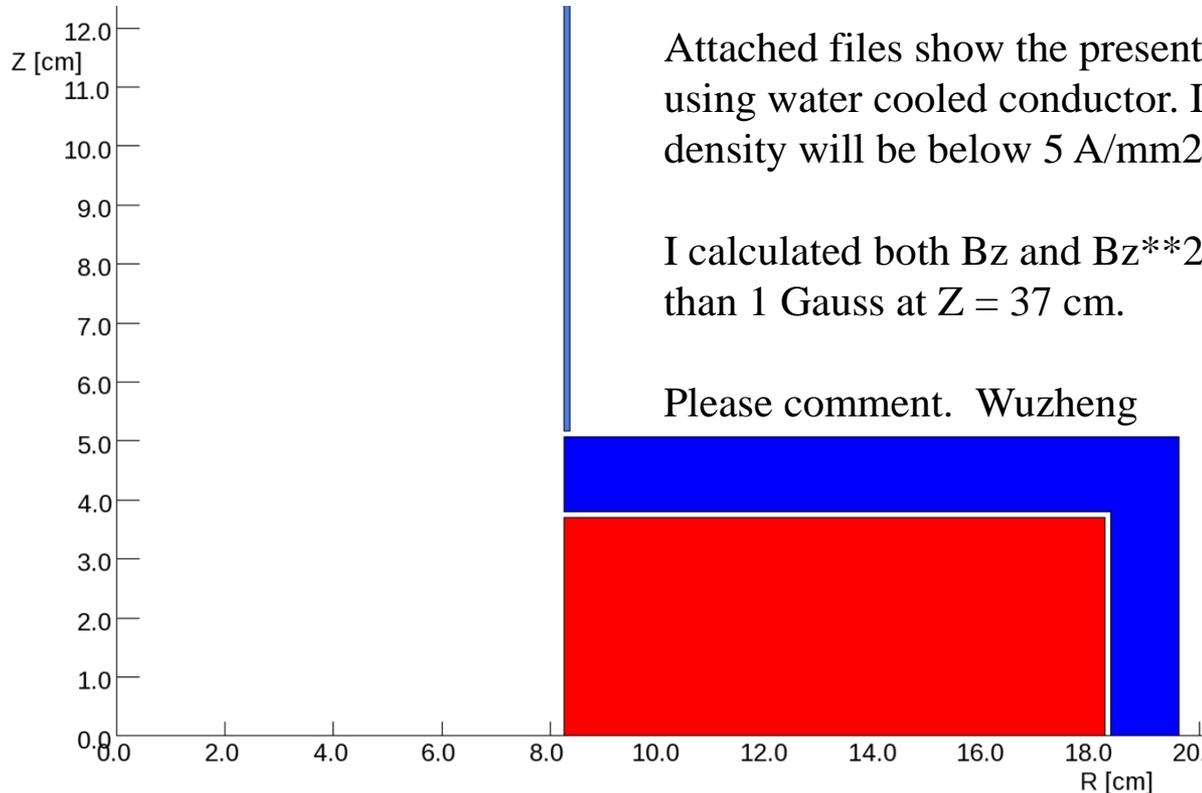
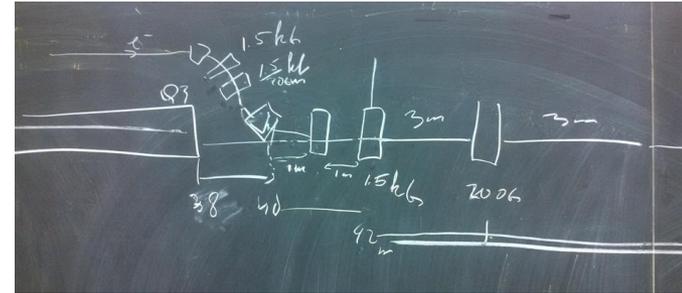
Wuzheng



# Magnet Analysis

## Matching Solenoid w/corrector

- 1.5 kG, magnetic length??
- Water cooled
- 2 required in cooling section w/o bucking coil
- Corrector 100 Gcm, present specification.



# Cooling Section BPM's

**SHEET 1 OF 3 SHEETS**

**A9111-2**    REV 018011  
Q3278

**SEE SHEET 2 OF 3 FOR WELDING INSTRUCTIONS**

**ENGRAVING SEE SHEET 3 OF 3**

**DETAIL F SCALE 2 : 1**

ITEM NO.	DESCRIPTION	QTY.
1	SUB ASSEMBLY	1
2	BUTTON 304 STN. STL	1
3	ENGRAVED FLANGE	1

**APPROVED**

TITLE: **SINGLE ENDED 50 OHM SMA**

MPF PRODUCTS INC.

PROPRIETARY AND CONFIDENTIAL	UNLESS OTHERWISE SPECIFIED:	MPF PRODUCTS INC.
ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MPF PRODUCTS INC. IS PROHIBITED.	FINISH: CONFLAT	DATE: 09/17/2013
READY ASSEMBLY USED ON:	DIMENSIONS & FIT IN INCHES: DECIMALS	SIZE: A
	ANGLER: MACH 1/2" MICRO PLACED DECIMAL	DWG. NO. A9111-2
	DO NOT SCALE DRAWING	REV: 018011
	ENG. APPL. W.J.	LAST SAVED DATE: Wednesday, April 17, 2013 15:46:24 AM

**A11823**    REV 0018111  
Q15206-1 REV D

DESCRIPTION: **MOVIE LEAK CHECK GROOVES TO 1.33 CF**

DATE: 2/21/2013    APPROVED: JB

**DETAIL J SCALE 2 : 2.5**

**QUOTATION**

TITLE: **HEADER**

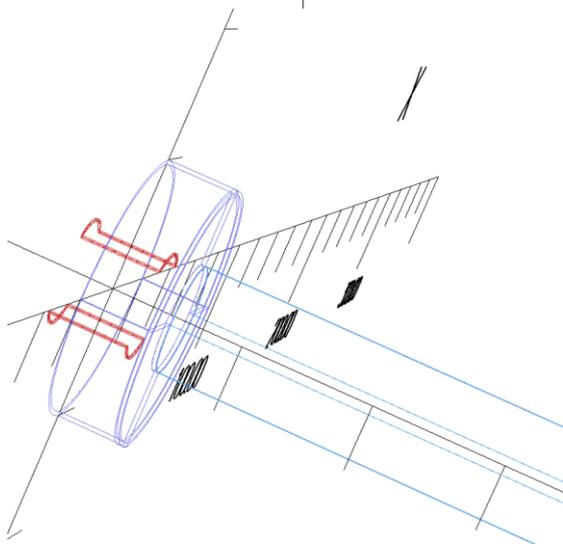
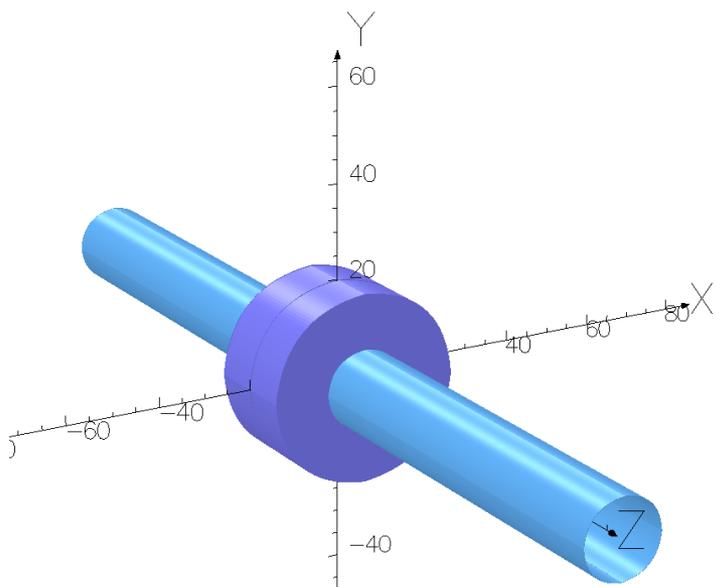
MPF PRODUCTS INC.

FINISH: 63 OR BETTER	DRAWN BY: JB	DATE: 12/13/2012	SIZE: A	DWG. NO. A11823	REV: A
CHECKED: WJ	ENG. APPL. JB	12/13/2012	LAST SAVED DATE: Friday, June 21, 2013 3:46:08 PM		05120911

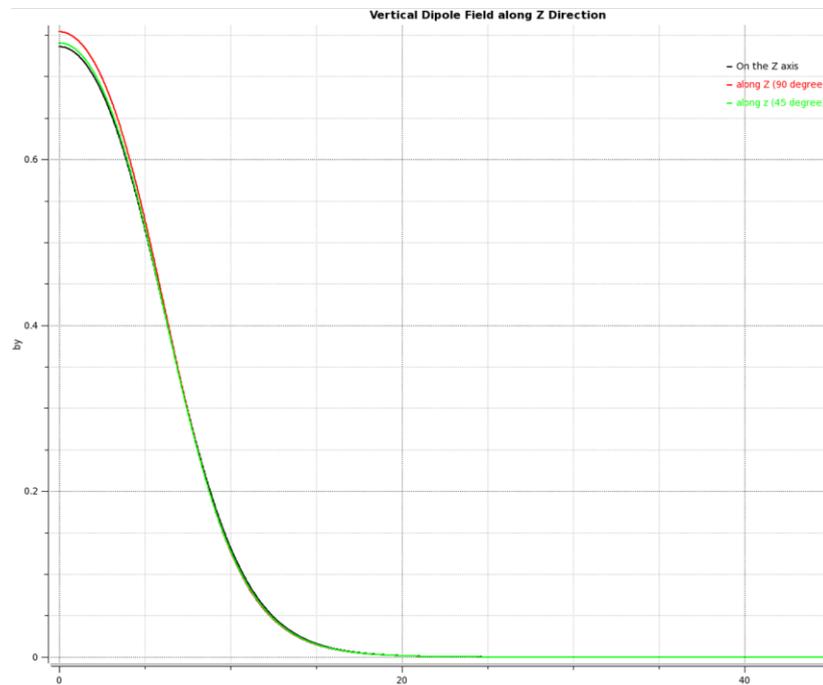
10 x 8.50 in

- Phone conference with MPF
- Larger diameter buttons on pick-up – 27 to 30 mm diameter
- Machined vacuum chamber, 304L, no threaded holes on flanges.
- Button hole size TBD microwave studio (D. Gassner).

# Compensating Solenoid Corrector



Dipole correction 10.24 A-T  
Per coil; Straight section  
Half-length:  $H1=6$  cm  
13 turns/.8 amps = 1 amp PS  
(AWG #18 = 0.98 A/mm<sup>2</sup>)



# Vacuum Chamber/System Requirements:

- 5" (12.7 cm) OD vacuum chamber, bake-out temperature.
- 4.87 ID button BPM (from CeC)
- No ion pump tees in the cooling section.
- One RHIC shielded bellows per solenoid
- Transitions to 10 cm aperture dipole magnets.
- Dipole magnet vacuum chambers.
- 6 Profile Monitors, screen size??

