

Minutes 5 12 16 meeting

Mapes, Miller, Kayran, Fedotov, Gassner, Hamdi, Bruno, Mahler, Weiss, Hammons, Arno, Nayak, Fite, Bellavia

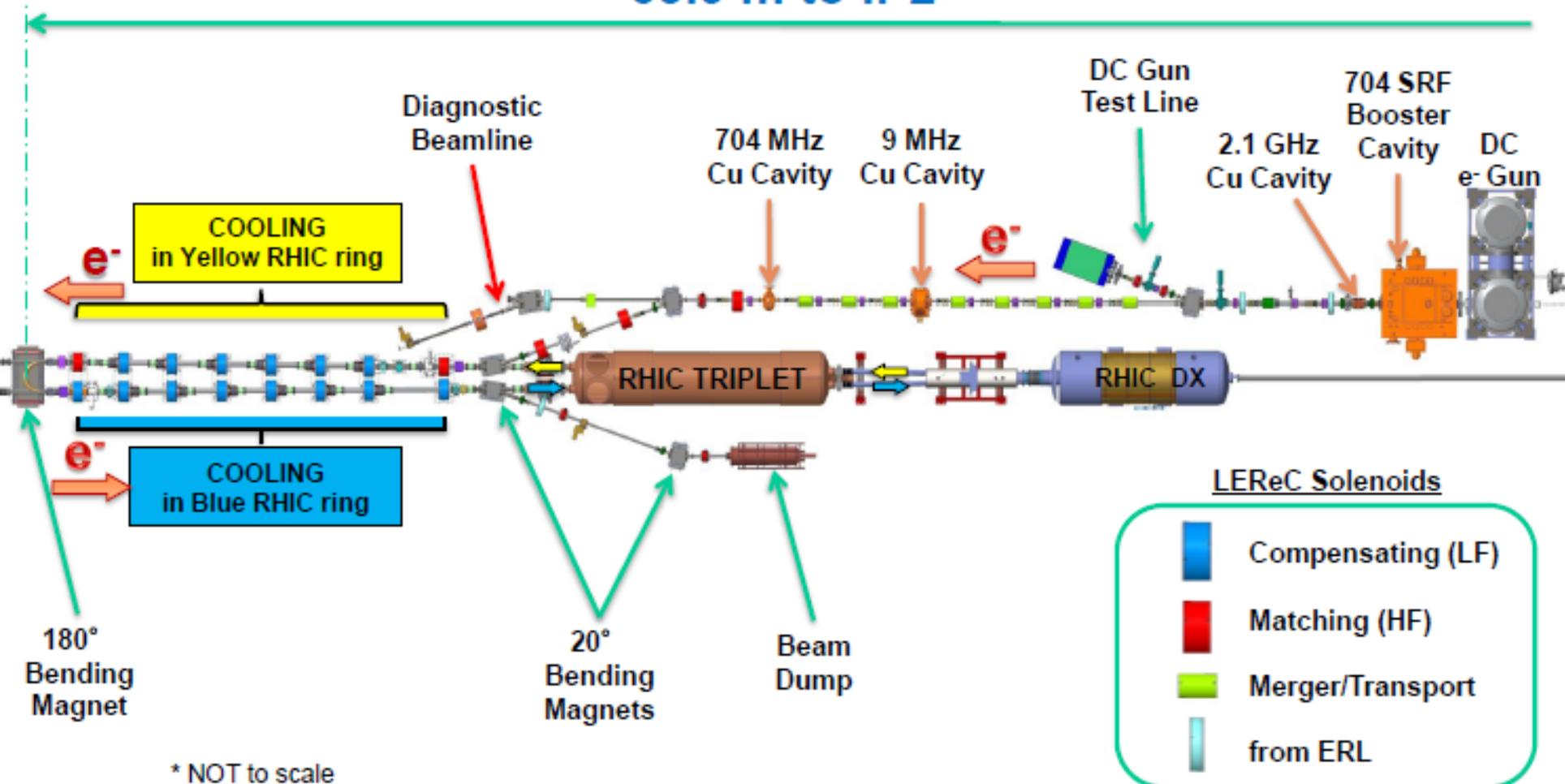
- The layout shown in the meeting was updated earlier today. The following slide shows the latest which provides a little more clearance between the dump and the wall. Some discussion on moving the gun and beam line assembly further upstream – drawings are finalized and checked on cryogenics and being checked on waveguide and cable tray position – don't move the gun. (Tuozzolo)
- Also noted that the “safety” 36” clearance walk through will be by going under the beam dump line. The stands will be bridged in the area under the quads and PM to provide clear ground level clearance similar to the RHIC beamline for CeC – photo below.
- Some changes for the beam dump line. The quadrupole will be moved as close to the 45° dipole as possible and will share the chamber weldment with the dipole. This will make the 2.5” OD beam tube okay for use in this line. (Kayran)
- George and Karem will make sure the ERL quad works in this dump line.
- Toby noted that the ERL LE PM has a large aperture with 6” conflat flanges, an adapter will be needed. Beam impedance (with nice transitions) will not be a concern in the dump line.
- Mike recommended adding a non-shielded gate valve at the beginning of the line. Therefore, after the dipole comes the quadrupole, then gate valve, then bellows, then corrector (over bellows?) then LE Profile monitor.
- The ion pump will be moved to the PM chamber.
- The halo monitor specifications will be discussed in the afternoon LEReC beam instrumentation meeting.
- The solenoid magnets drawings for GtB will be approved this week and the requisition will start.
- 6 H/V correctors are needed – 2 for the GtB with quad and skew quad correctors underneath and 4 more of the same for the rest of the transfer line without the quad and skew quad correctors. The support bracket for the correctors without quad and skew quad still needs to be designed.
- The standard shielded bellows drawing has been forwarded to vendors for estimates.



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LEReC System

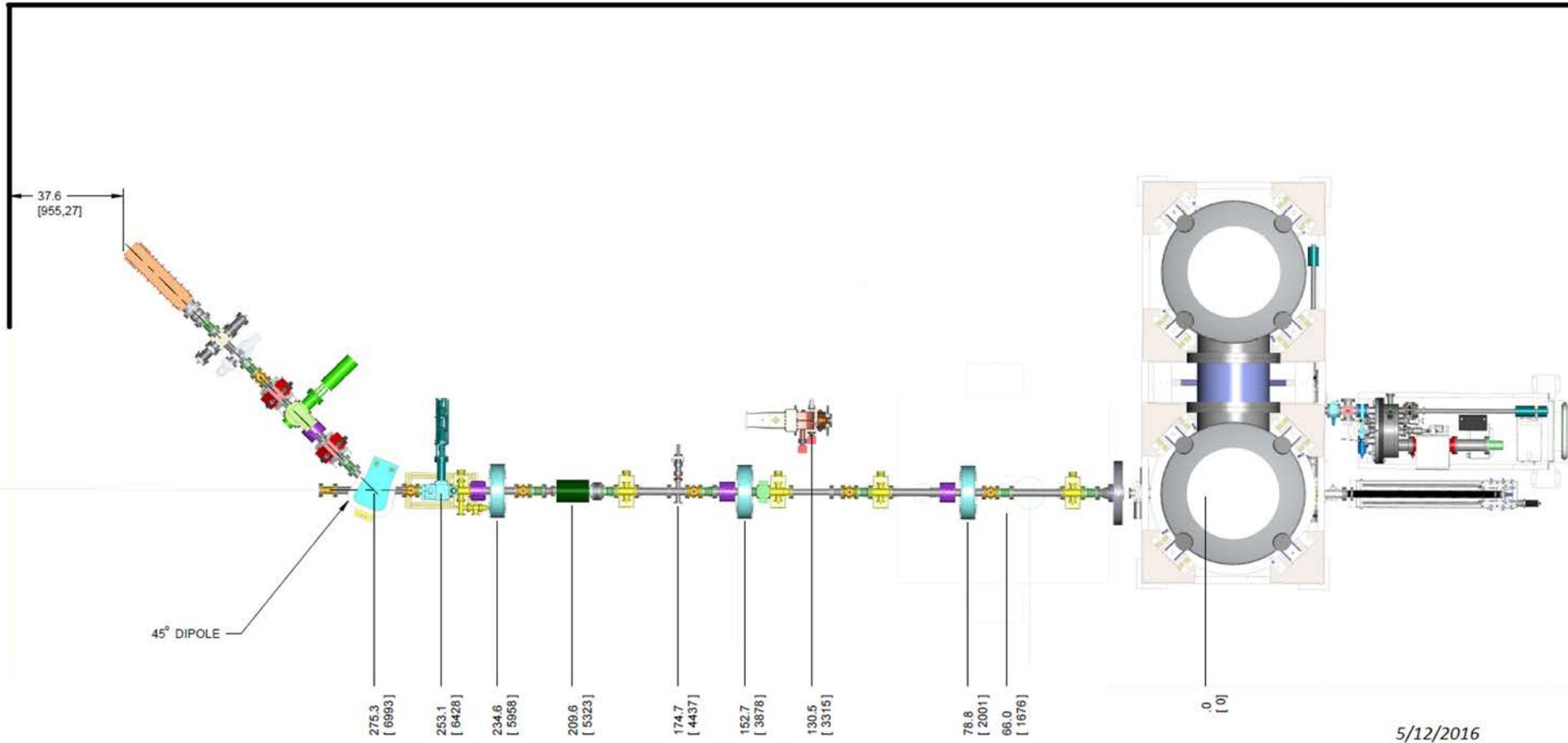
63.9 m to IP2



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9:55AM 5 12 16 layout (more space for walk through)



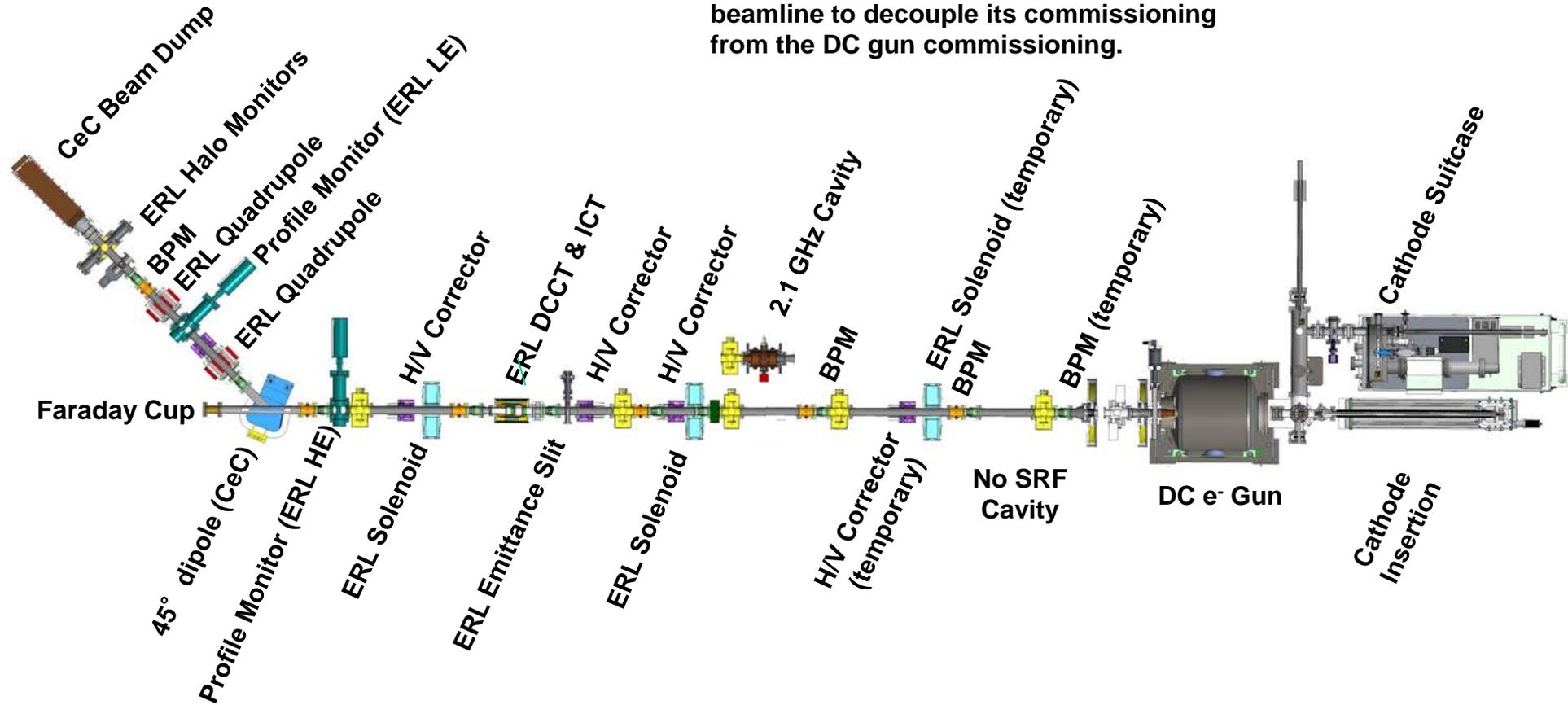
5/12/2016



LEReC Injection section 2016 (5/2/16)

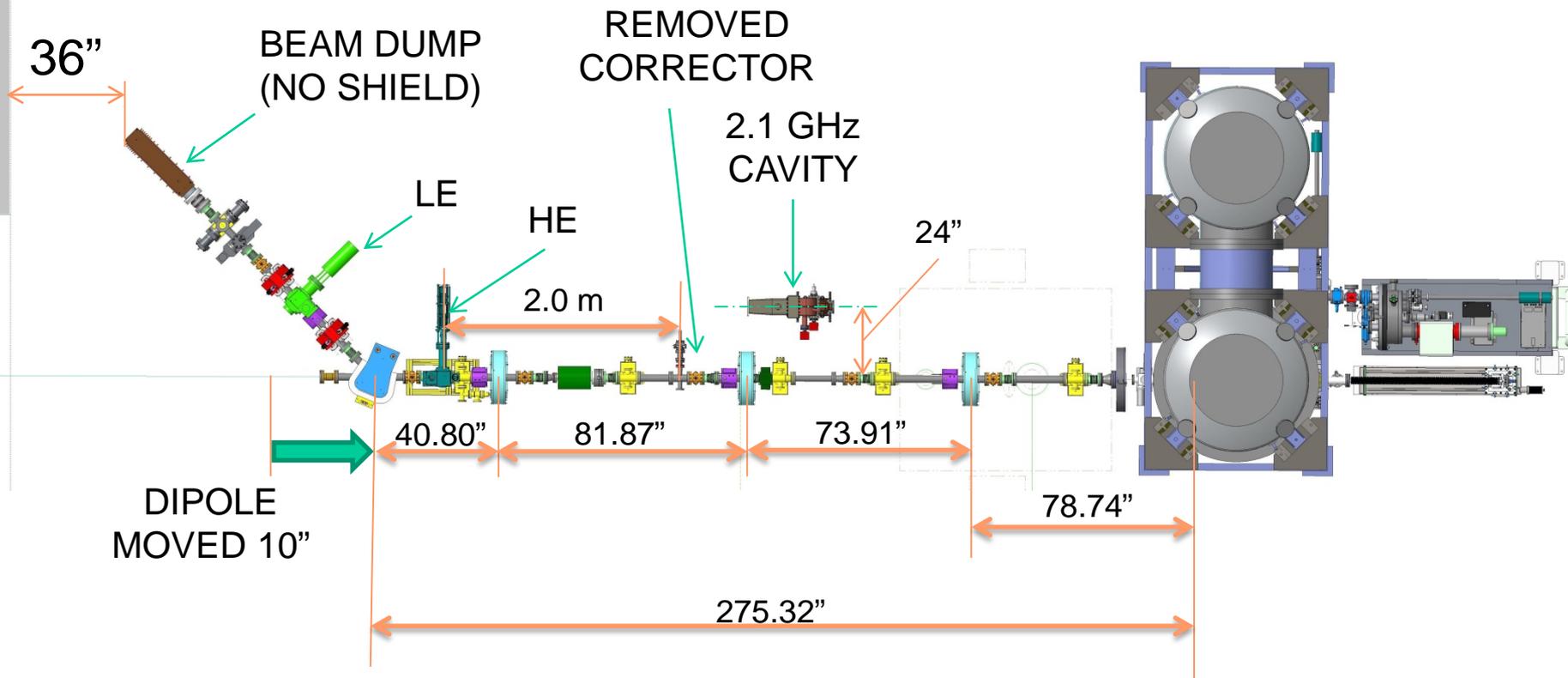
2.1 GHz Cavity:

The cavity will be installed next to the beamline to decouple its commissioning from the DC gun commissioning.



LEReC Injection section 2016 (5/12/16)

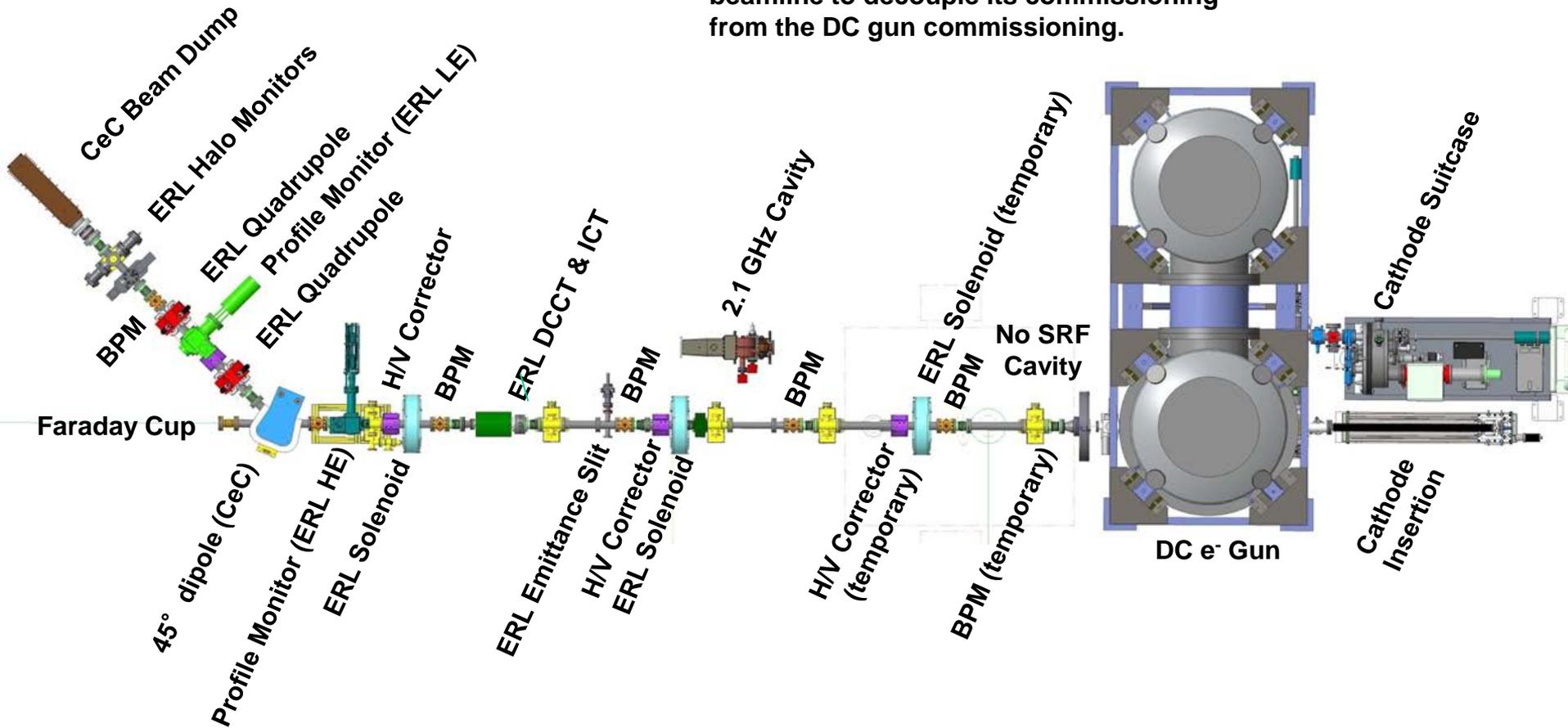
Now slightly outdated



LEReC Injection section 2016 (5/12/16)

2.1 GHz Cavity:

The cavity will be installed next to the beamline to decouple its commissioning from the DC gun commissioning.



Component Status

Magnets:

- (3ea) ERL solenoids – removed, sent to magnet measurement
- (6ea) H/V Corrector magnets – New GtB aircooled design
- (2ea) ERL quadrupoles – remove, need magnet measurement - no
- (1) CeC 45° dipole magnet – new vacuum chamber (beam impedance analysis?)
- Magnet base, survey adjustment hardware, and stands for the all above.

Beam Dump

- CeC design dump (isolated faraday cup - yes)



Component Status

Diagnostics:

- DCCT and ICT from ERL (internal RF shielding analyzed) any further modifications - **no**
- (1) ERL HE Profile Monitors (new internal RF shield for vacuum chamber, ferrites, new larger YAG screen) any further modifications?
- (1) ERL LE Profile Monitors – **no shields, some internal modification**
- (1) Emittance slit drive (new vacuum chamber and slit shape)
- (1) ERL Halo Monitor (**same vacuum chamber**)
- (1) Faraday cup (ceramic insulated vacuum flange?) 1 watt limit?

Laser Systems:

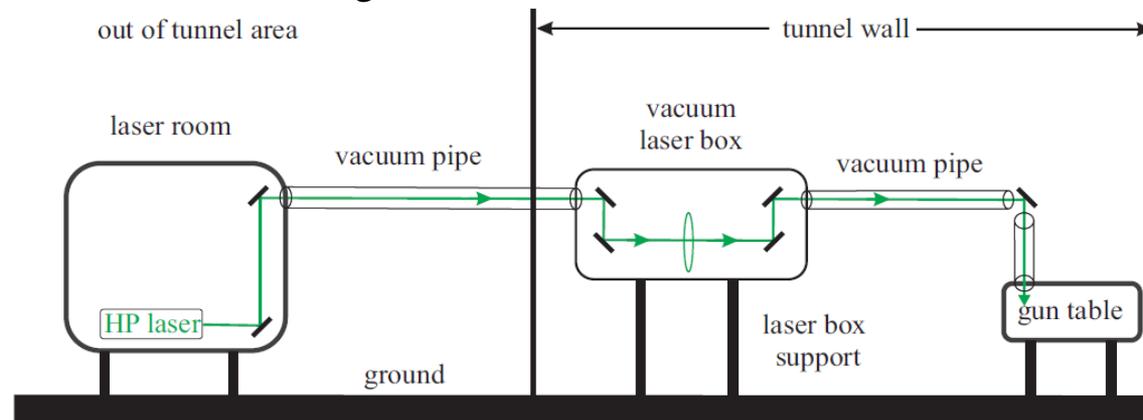
- Laser building modifications
- Transport line (**yesterday's work platform meeting**)
- In tunnel optics table



Minutes, 5 11 2016 Platform meeting:

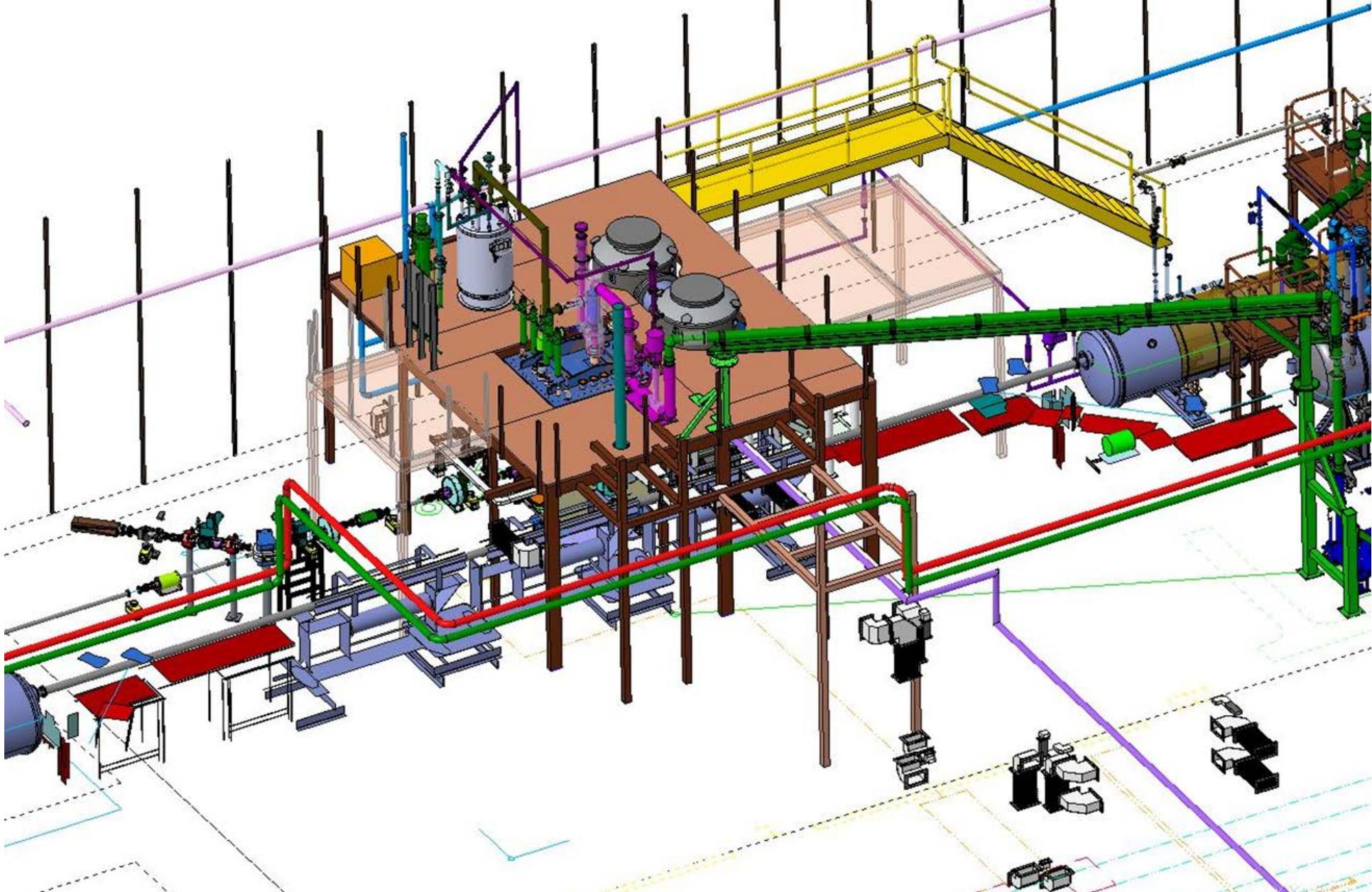
(Tuozzolo, Folz, Phillips, Zhao, Sheehy, Soria, Meier, Bellavia, Smith, Zaltsman)

- Relocated cryogenics components to make level platform/ceiling, Victor is checking the drawings ready to release
- Dave will investigate a straighter run for the laser transport. Brian/Zhi are ok with 3 – 90o bends at the wall.
- Zhi stated that a laser tuning assembly is needed on the laser transport some where close to the wall. Sketch below was provided after the meeting.



- Steve found a commercial in vacuum 90° laser bend, Bob will lay it into the model.
- Bob will give Kevin cable tray and wave guide run distances between Booster cavity and the 1002B PS +
- Bob will provide a model to Charlie/Dave for a cleanroom vendor to review for consideration of filtered air handling units.





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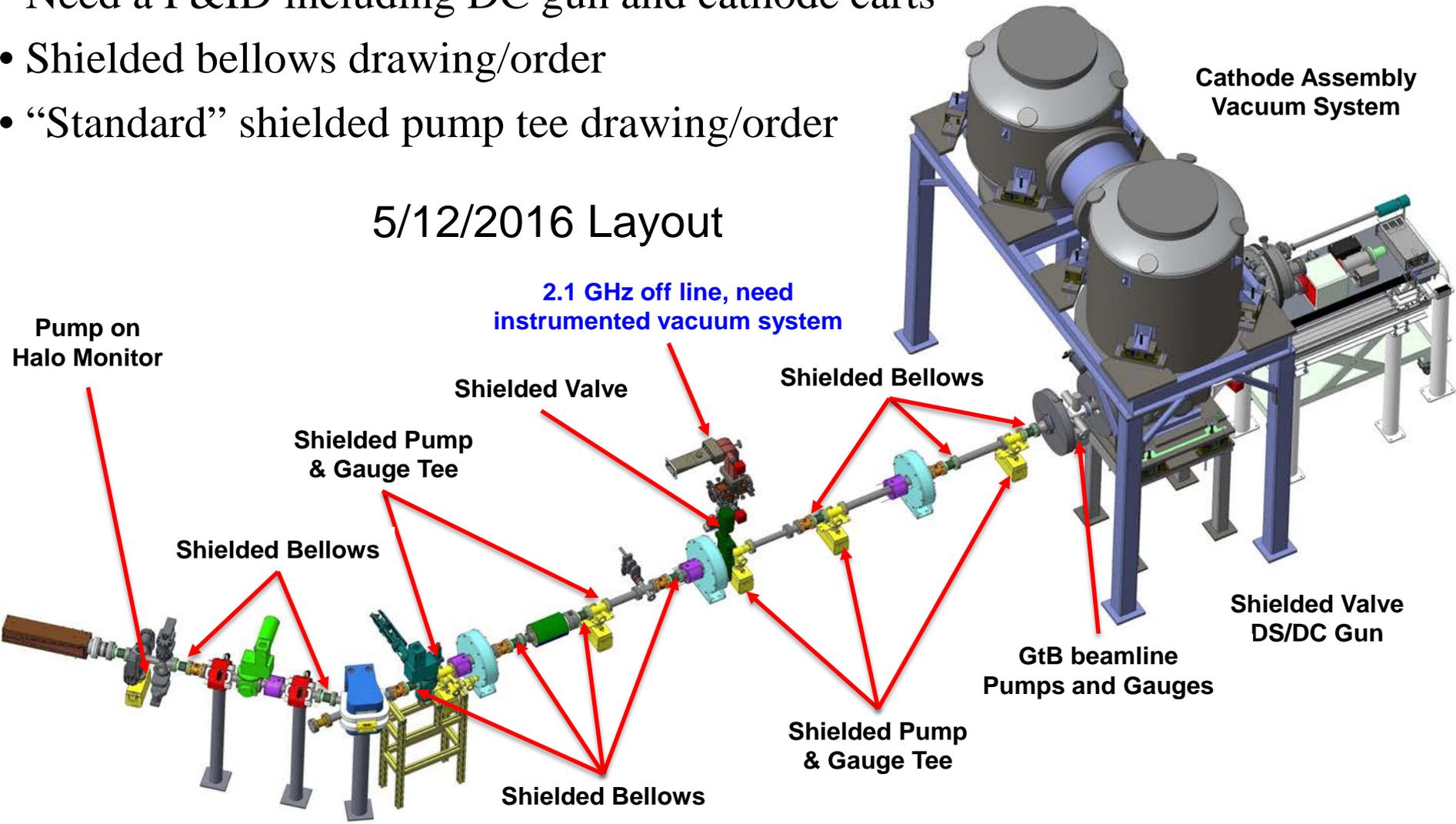


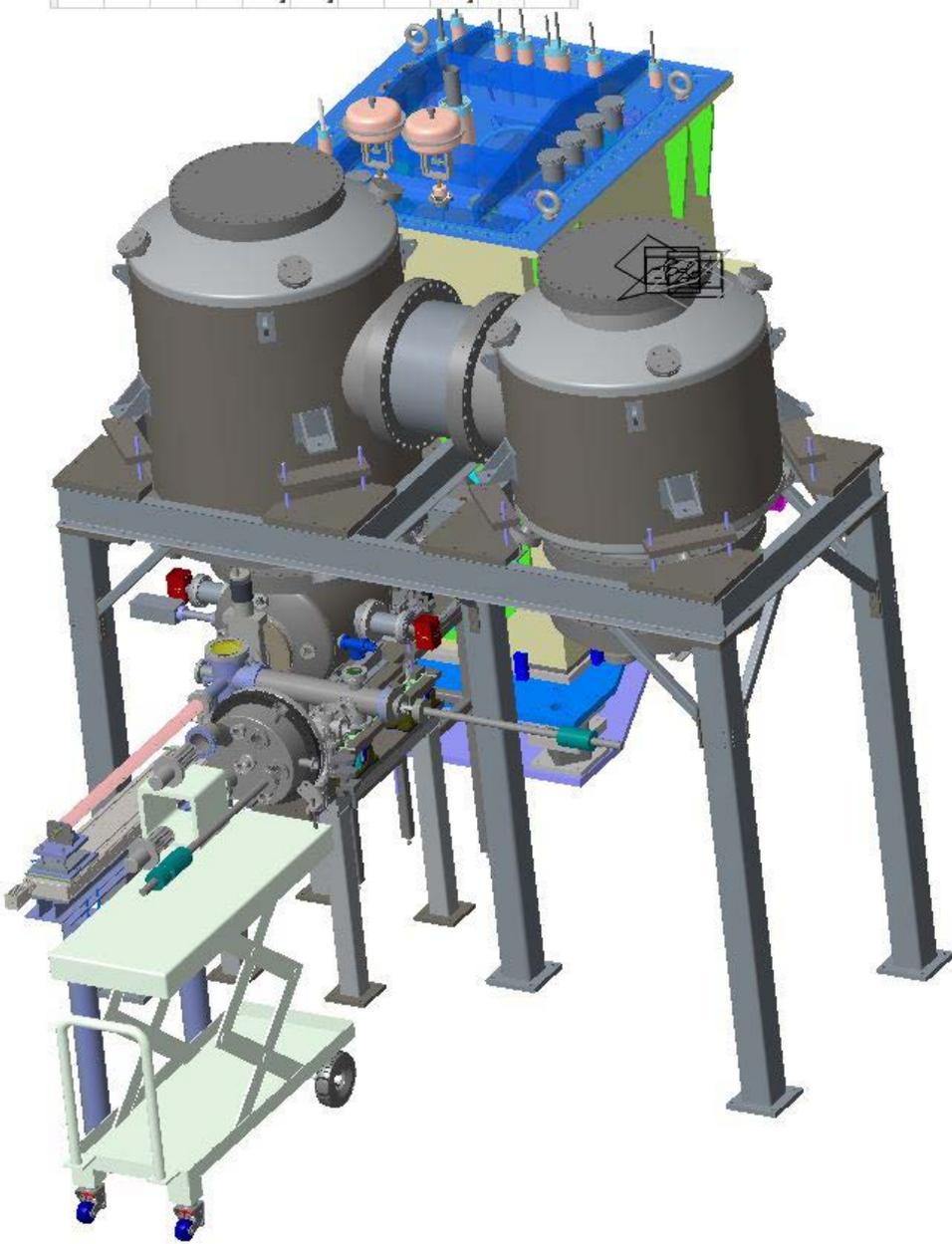
Vacuum Components

- Need a P&ID including DC gun and cathode carts
- Shielded bellows drawing/order
- “Standard” shielded pump tee drawing/order

5/12/2016 Layout

2.1 GHz off line, need
instrumented vacuum system





DC Gun Vacuum

- Ion pump and NEG
- Bake-out 150-200C
- Extractor vacuum gauge
- Remote bleed valve for HV conditioning
- 1 shielded, 1 non-shielded valve

Cathode Systems Vacuum

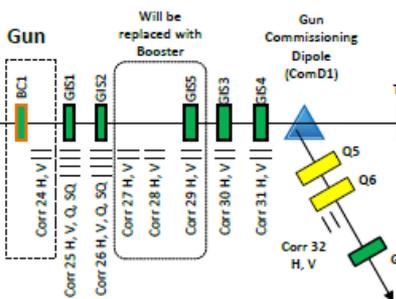
- Bake-out 150-200C
- Vacuum gauges and pumps
- Plug in cables for transport cart pumps and gauges – remote monitoring
- Bake-able Vacuum “load lock” with remote monitoring and remote temperature control
- Valves w/interlocked controls (local MPS)
- Tunnel switches for interlocked “load lock” valves



Gun Section

- 1 p.s. Kaiser High Voltage ps for gun
- 1 p.s. High Voltage Anode Bias ps. Does this go into the tunnel? Need specs from Cornell
- 1 p.s. (BC1). Need I. Need L. Guess at 6A from CJ. Using ERL BiRa 20V, 6A p.s.
- 2 p.s.'s (Corr 24), using Cornell V & I spec of ps = 12V & 1A. Need R & L & I. So we will be using ERL BiRa 20V, 2A ps's.
- 6 p.s.'s (GIS1-GIS5 & GICS1) using ERL Sol's. Need L & I. Purchase new GEN 60-12.5 p.s.'s.
- 12 p.s.'s (Corr 27-32). Using ERL CeC correctors. Need R & L & I. Assume we use ERL BiRa 20V, 6A
- 8 p.s.'s (Corr 25H, V, Q, SQ & Corr 26H, V, Q, SQ). Have magnet specs from George M e-mail 3/30/16. ERL SHIM ps's 15V 10A, limit 100W.
- 1 p.s. ComD1. CeC 45° dipole. Purchase new GEN 100ppm ps. 16V 150A
- 2 p.s.'s. Q5 & Q6. ERL Quads. Need V & I. Use ERL 15V 10A SHIM ps (limit 100W), taking quad from ERL?

Gun Injection



Transport Section

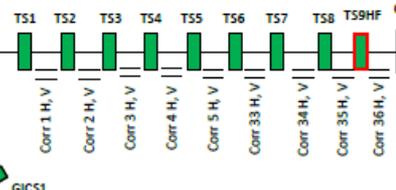
- 8 p.s.'s ERL SHIM 15V 10A (limit 100W each) for 8 Sol magnets (TS1-8). These magnets are 100G @ 6.1A. They may become 200G.
- 18 p.s.'s for 9 ERL/CeC Corrector (Corr1-5 & 33-36) magnets. Need V & I, For now using 18 ERL BiRa 20V 6A p.s.'s.
- 1 p.s. for High Field Solenoid (TS9). Same specs as HFMS in cooling section. Must still purchase.
- 1 p.s. for one Quad, Q3, Use ERL 15V 10A SHIM ps (limit 100W), taking quad from ERL?

Merger Section

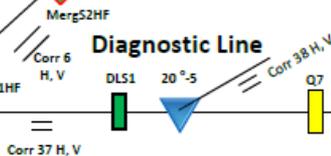
- 2 p.s.'s 30V 25A for two 100G Solenoid Magnets (MergS1HF & MergS2HF). Must still purchase
- 2 p.s.'s needed for one Corrector magnet (Corr 6). Need V & I, For now using 2 ERL 20V 6A BiRa p.s.'s.
- 2 p.s.'s, ERL Kepco BOP GL 50V 20A or new CAEN 20V 5A for 20° magnets. Merger Section has 20°-1 on its own p.s. and 20°-2 on its own p.s. 20°-1 will also have a new laminated magnet. There is a possibility of using a shunt p.s. on 20°-1 but this is not included in count now.

Make laminated magnet with trim winding??

Transport Line

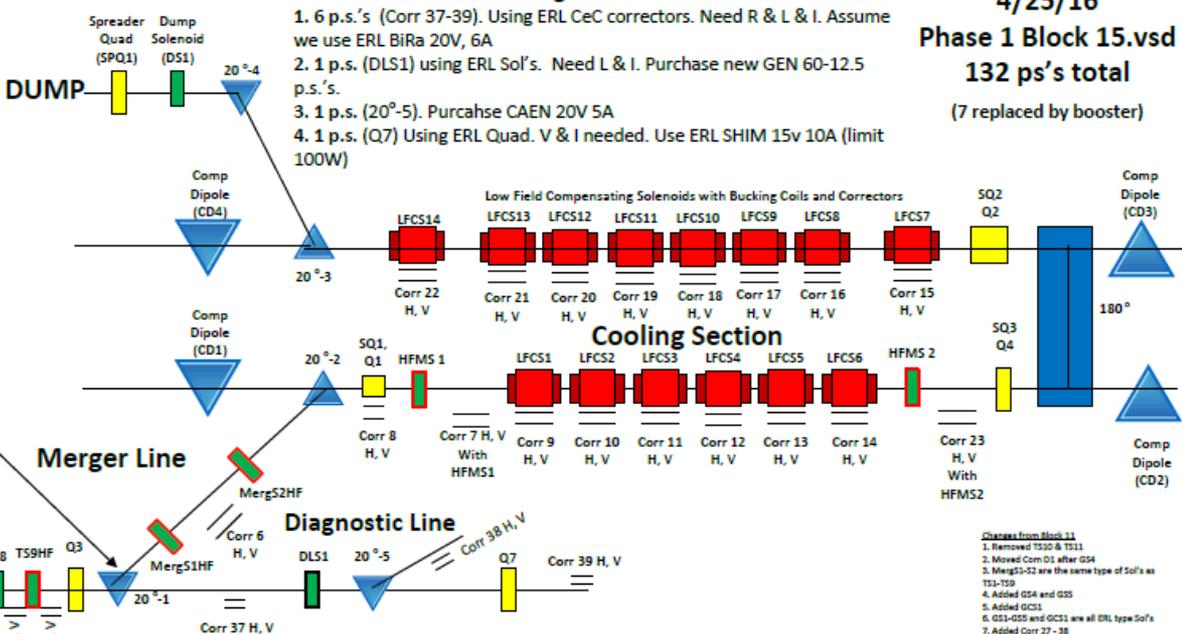


Merger Line



Diagnostic Line

- 6 p.s.'s (Corr 37-39). Using ERL CeC correctors. Need R & L & I. Assume we use ERL BiRa 20V, 6A
- 1 p.s. (DLS1) using ERL Sol's. Need L & I. Purchase new GEN 60-12.5 p.s.'s.
- 1 p.s. (20°-5). Purchase CAEN 20V 5A
- 1 p.s. (Q7) Using ERL Quad. V & I needed. Use ERL SHIM 15v 10A (limit 100W)



Cooling Section

- 1 p.s. for Skew Quad (SQ1) V & I needed. Use ERL SHIM 15v 10A (limit 100W)
- 1 p.s. for Quad (Q1) V & I needed. Use ERL SHIM 15v 10A (limit 100W)
- 2 ps's for Corr 8 (V&I needed). Use ERL SHIM 15v 10A (limit 100W)
- 2 p.s.'s 30V 25A for High Field Matching Solenoids (HFMS1-2). Received
- 4 p.s.'s for HFMS Correctors (Corr 7 & 23), need real Mag V & I. For now using ERL 15V 10A SHIMS
- 1 p.s. 150V 22A for LFCSc1-6 cores 6 in series. Received.
- 1 p.s. 150V 22A for LFCScbc1-6 buck coils (2x) 6 in series. Received.
- 28 p.s.'s 20V 2A BIRA MCOR for Correctors (Corr 9-22) with LFCs magnets.
- 1 p.s. for SQ3 V & I needed. Use ERL SHIM 15v 10A (limit 100W)
- 1 p.s. for Q4 V & I needed. Use ERL SHIM 15v 10A (limit 100W)
- 1 p.s. for 180° magnet. Have LSII p.s. in house. Assembling it. Add FWD to COTS ps?
- 1 p.s. for SQ2 V & I needed. Use ERL SHIM 15v 10A (limit 100W)
- 1 p.s. for Q2 V & I needed. Use ERL SHIM 15v 10A (limit 100W)
- 1 p.s. for Compensating Dipoles (CD1-4). All 4 in series. Use one kepco 50V 20A p.s.
- 1 p.s. 30V 25A for LFCSc7 core single. Purchase new GEN 30-25
- 1 p.s. 30V 25A for LFCScb7 buck coils 2 in series from one magnet. Purchase new GEN 30-25.
- 1 p.s. 150V 22A for LFCSc8-13 cores 7 in series. Received.
- 1 p.s. 150V 22A for LFCScbc8-13 buck coils (2x) 7 in series. Received.
- 1 p.s. 30V 25A for LFCSc14 core single. Received.
20. 1 p.s. 30V 25A for LFCScbc14 buck coils 2 in series from one magnet. Received

Dump

- 1 p.s. needed for one Spreader Quad Magnet (SPQ1), No V & I, told to use ERL 15V 10A SHIM p.s.
- 1 p.s. 60V 12.5A needed for Dump Solenoid (DS1). Use ERL Solenoid
- 1 p.s. Dump Section has 20°-3&4 in series on one 50V 20A kepco or one 20V 5A CAEN p.s.

4/25/16

Phase 1 Block 15.vsd
132 ps's total
(7 replaced by booster)

- Changes from Block 14
1. Removed TS20 & TS21
 2. Moved Com D1 after Q4
 3. MergS1-52 are the same type of Sol's as TS1-TS9
 4. Added Q56 and Q55
 5. Added GCS1
 6. GIS1-GIS5 and GICS1 are all ERL type Sol's
 7. Added Corr 27 - 38
 8. Added Q, SQ only to Corr 25 and Corr 26
 9. Added BC1
 10. TS1-TS9 and MergS1-52 are new Sol's. Use Karlin's design
 11. Include High Voltage Anode Bias ps for gun, need info from Karl Smolenko
 12. Include Kaiser HV p.s. for Gun

Gun Section

1. **1 p.s.** Kaiser High Voltage ps for gun
2. **1 p.s.** High Voltage Anode Bias ps. Does this go into the tunnel? Need specs from Cornell
3. **1 p.s.** (BC1). Need I. Need L. Guess at 6A from CJ. Using ERL BiRa 20V, 6A p.s.
4. **2 p.s.'s** (Corr 24), using Cornel V & I spec of ps = 12V & 1A. Need R & L & I. So we will be using ERL BiRa 20V, 2A ps's.
5. **6 p.s.'s** (GIS1-GIS5 & GICS1) using ERL Sol's. Need L & I. Purchase new GEN 60-12.5 p.s.'s.
6. **12 p.s.'s** (Corr 27-32). Using ERL CeC correctors. Need R & L & I. Assume we use ERL BiRa 20V, 6A
7. **8 p.s.'s** (Corr 25H, V, Q, SQ & Corr 26H, V, Q, SQ). Have magnet specs from George M e-mail 3/30/16. ERL SHIM ps's 15V 10A, limit 100W.
8. **1 p.s.** ComD1. CeC 45° dipole. Purchase new GEN 100ppm ps. 16V 150A
9. **2 p.s.'s.** Q5 & Q6. ERL Quads. Need V & I. Use ERL 15V 10A SHIM ps (limit 100W), taking quad from ERL?

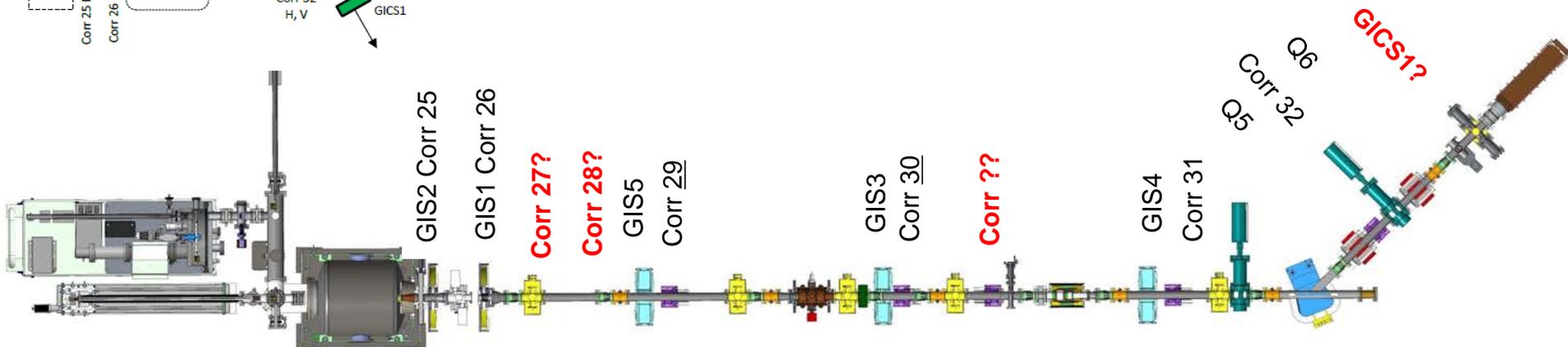
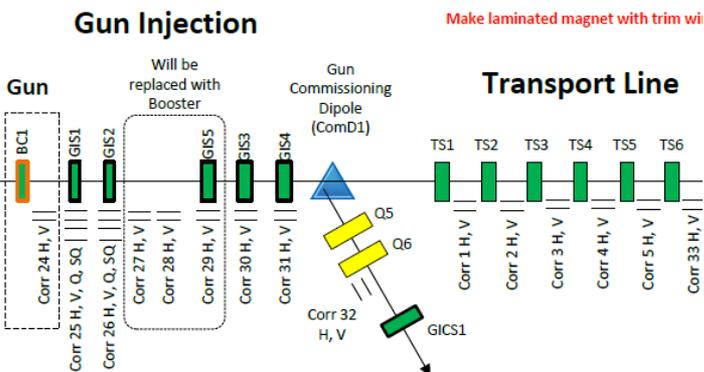
- Need PS for clearing electrodes
- Need to update – **one less corrector**
- Need to clarify H/V corrector count

Correctors 27 and 28

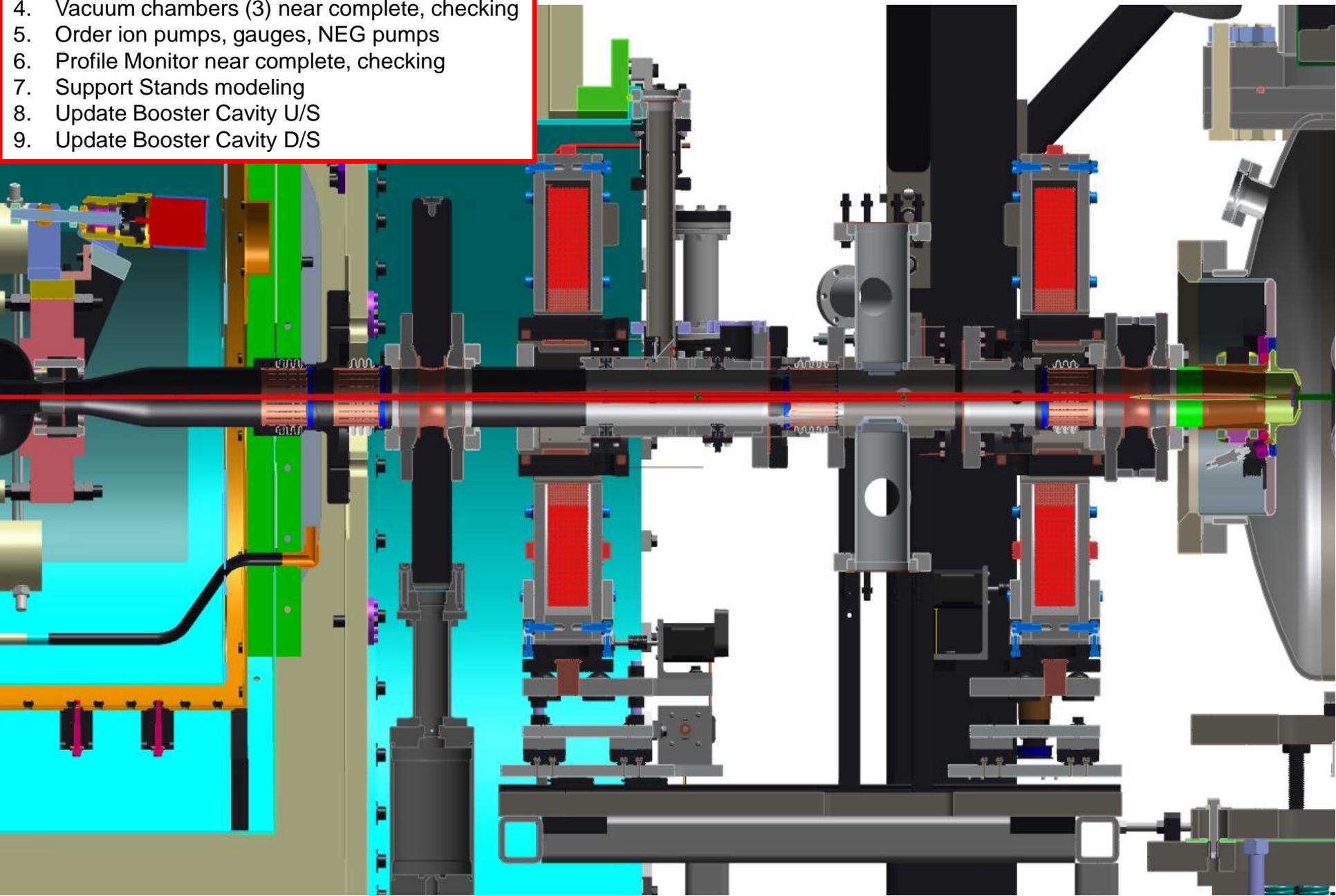
Corrector between GIS3 and GIS4

Mu metal shielding will be used so more correctors are not needed.

- Solenoid at end of dump line? - **no**



1. Solenoid drawings complete, checked, order
2. Corrector drawings complete, (Bakeout)
3. Mirror assembly complete, checking
4. Vacuum chambers (3) near complete, checking
5. Order ion pumps, gauges, NEG pumps
6. Profile Monitor near complete, checking
7. Support Stands modeling
8. Update Booster Cavity U/S
9. Update Booster Cavity D/S





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Component Status

Other:

2.1 GHz Cavity (off beamline)

- 1002B PA, ACS interlock, wave guide, tuner drive, stand

704 MHz Cavity (in place, on beamline)

- 1002B PA, ACS interlock, wave guide, tuner drive, stand

9 MHz RHIC Cavity (in place, on beamline)





Cognizant Engineers

Project Engineer: Tuozzolo

- Cathode system: Liaw, Tuozzolo, Hamdi,
- Laser System: Zhao, Sheehy
- DC Gun: Liaw, Costanzo, Halinski Cornell – Karl Smolenski Cornell
- Power Supplies: Bruno
- GtB Transport Line: Nayak, Halinski
- Magnets: Mahler
- Beam Diagnostics: Miller, Gassner, Weiss
- Vacuum: Mapes, Steszyn
- Beam Dump: Fite, Corbin
- Warm RF Cavities: Zaltsman, Smith, Brutus, DeSanto
- Controls: Jamilkowski, Costanzo

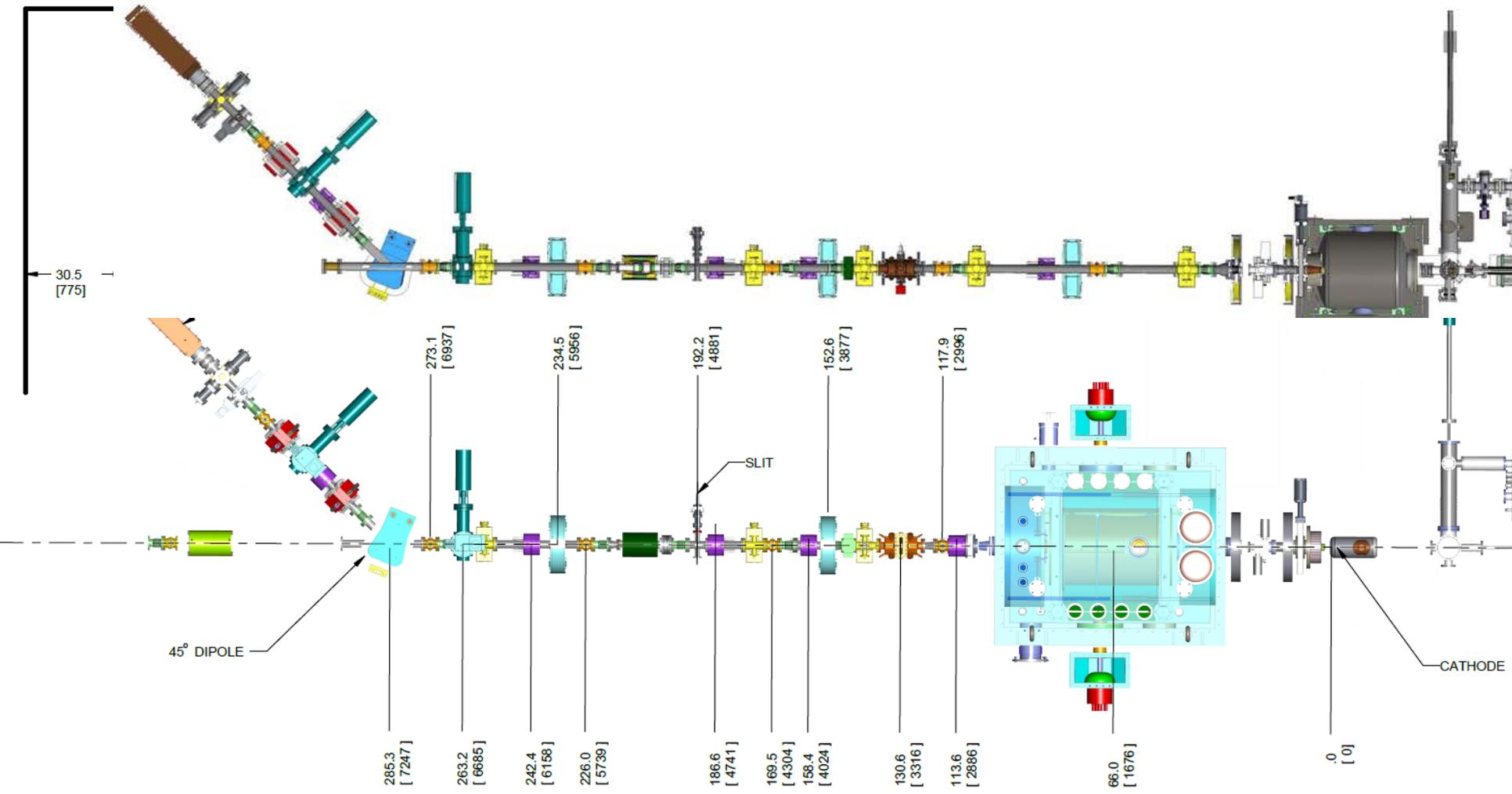


Cognizant Engineers

Project Engineer: Tuozzolo

- Cathode system: Liaw, Tuozzolo, Hamdi, deMonte
- Laser System: Zhao, Sheehy, Bellavia, Taddonio
- DC Gun: Liaw, Costanzo, Halinski Cornell – Karl Smolenski Cornell
- Power Supplies: Bruno
- GtB Transport Line: Nayak, Halinski
- Magnets and mu metal: Mahler
- Beam Diagnostics: Miller, Gassner, Weiss
- Vacuum: Mapes, Weiss, Steszyn
- Beam Dump: Fite, Corbin
- Warm RF Cavities: Zaltsman, Smith, Brutus, DeSanto
- Controls: Jamilkowski, Costanzo, Altibanous





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Office of Science
U.S. DEPARTMENT OF ENERGY

Vacuum Components

- Need a P&ID including DC gun and cathode carts
- Shielded bellows drawing/order
- “Standard” shielded pump tee drawing/order

5/2/2016 Layout

