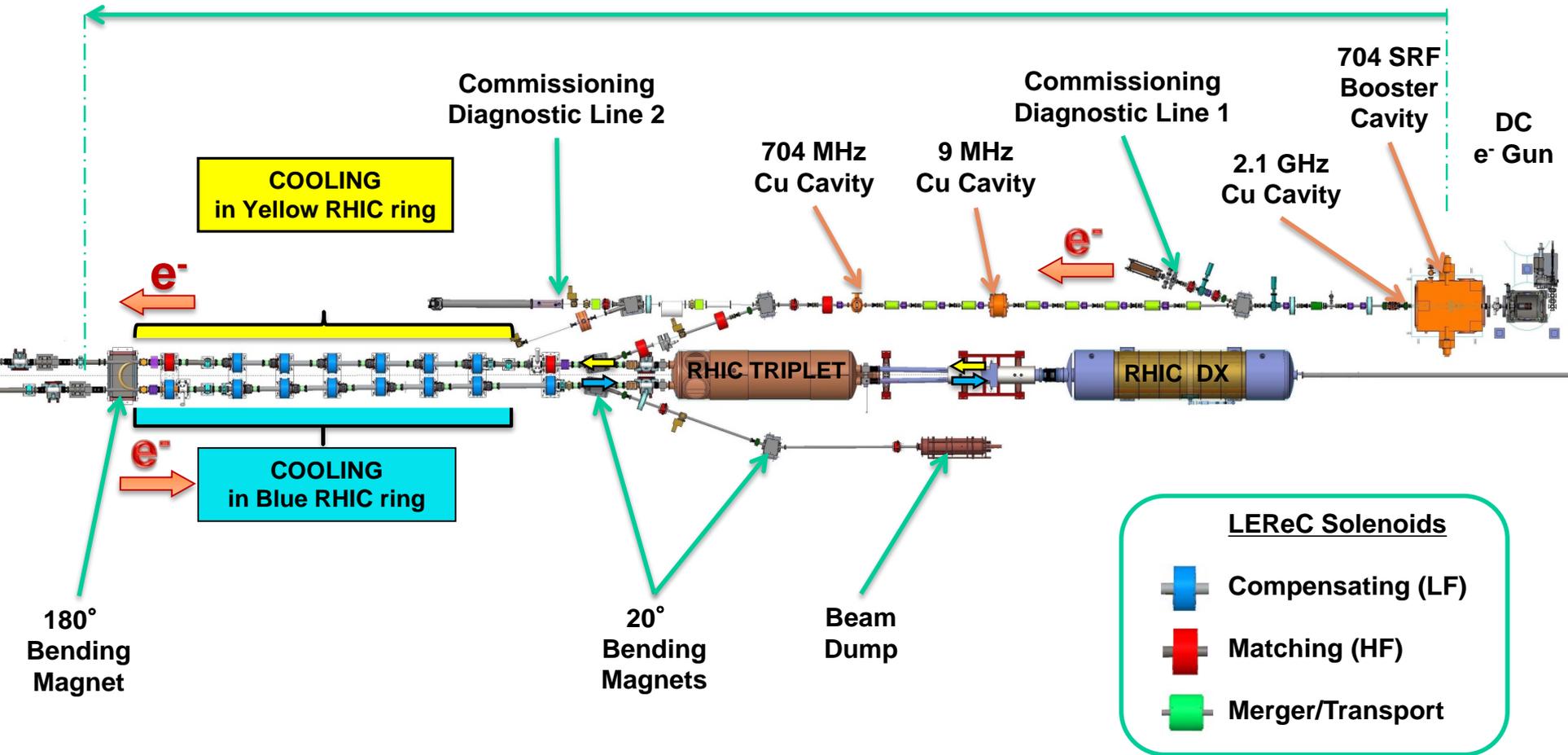


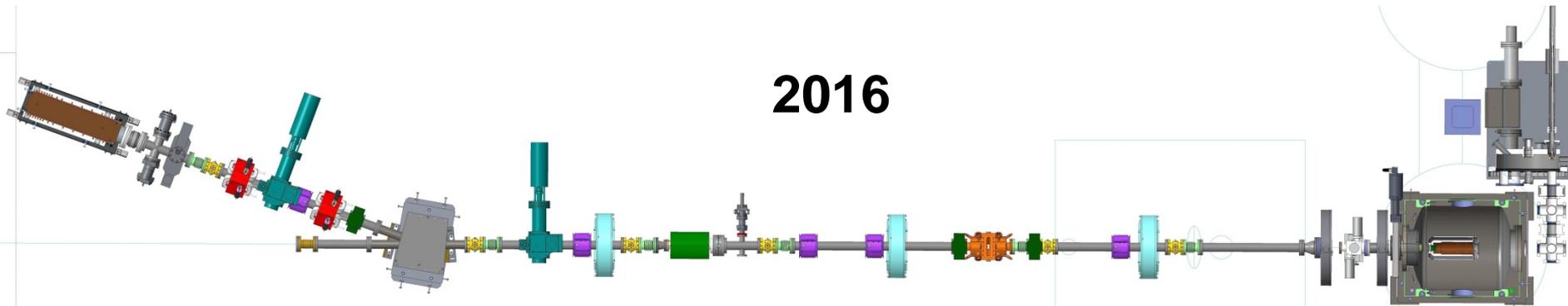
LEReC layout (compressed)

63.9 m to IP2



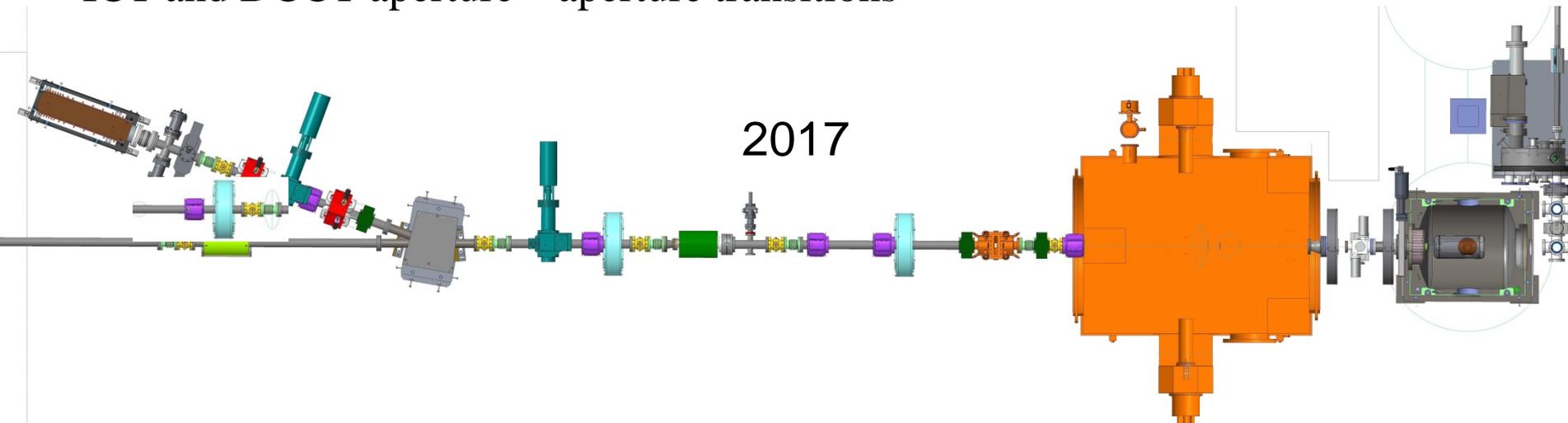
DC Gun Installation and Test Beam Line

2016



- # and location of correctors, corrector strength – power supply specifications
- # and location of BPM's, 1 BPM/solenoids, new button BPM design.
- Install 2.1 GHz Cavity in beam line during DC gun testing?
- ICT and DCCT aperture – aperture transitions

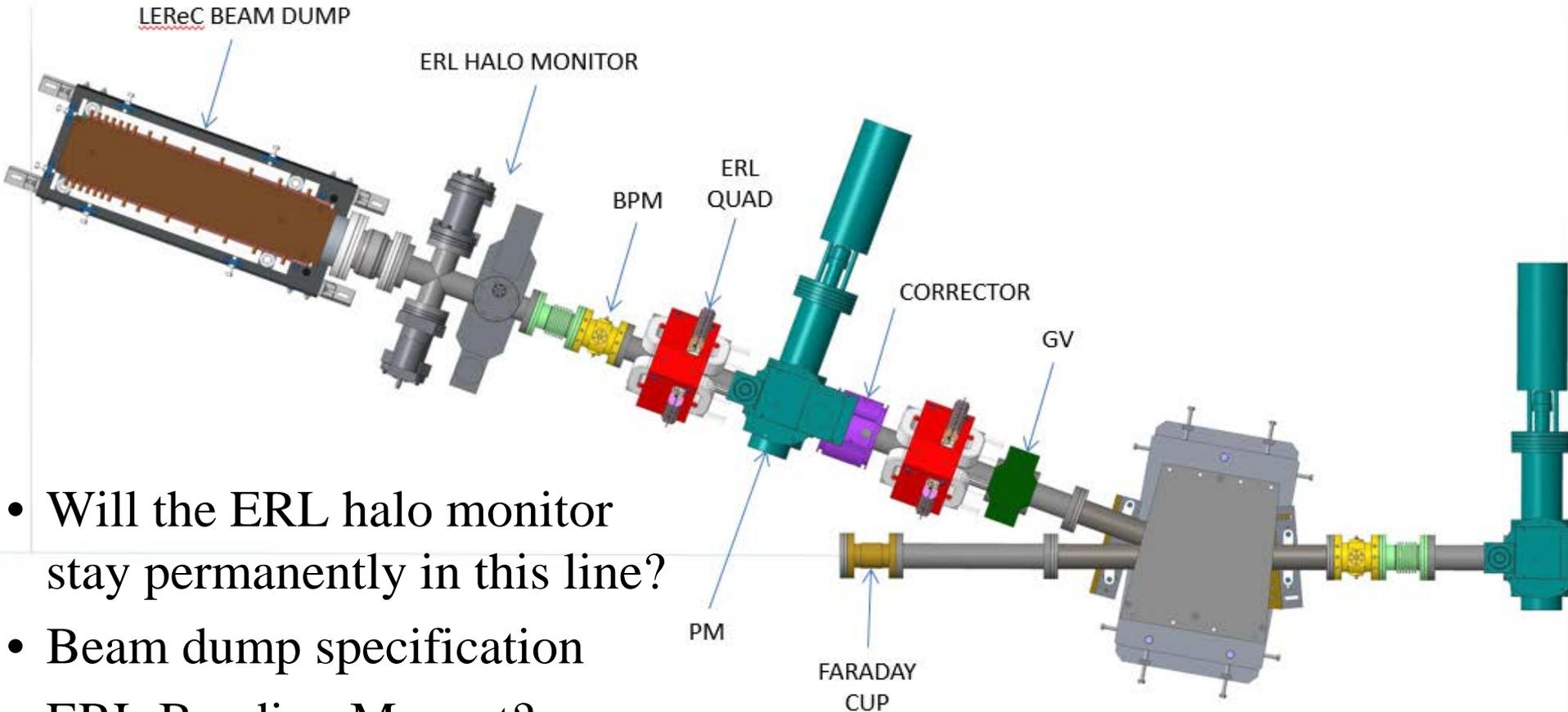
2017



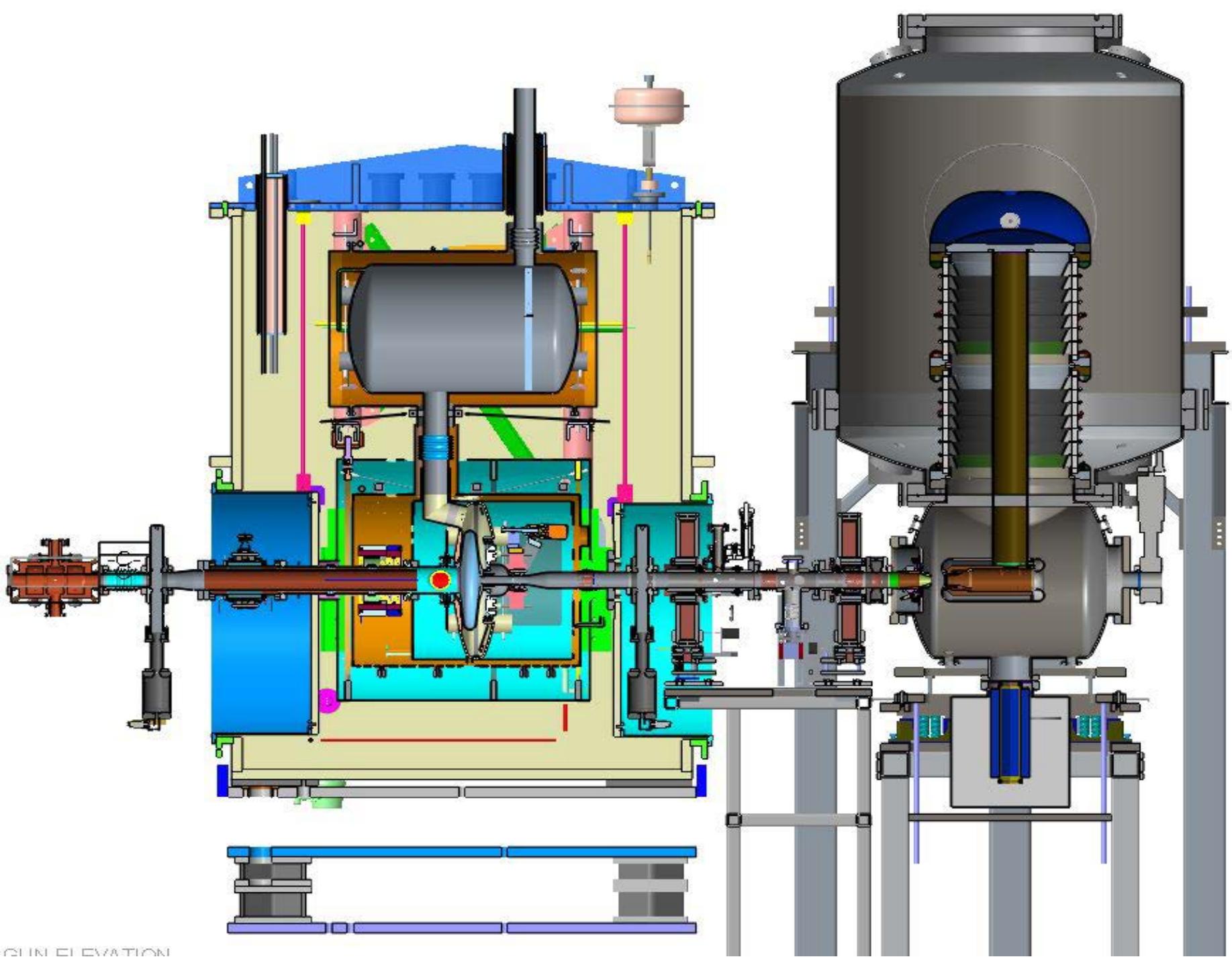
Low Energy RHIC electron Cooling

DC Gun Test Diagnostic Line 1

DC GUN DIAGNOSTIC LINE (2016)



- Will the ERL halo monitor stay permanently in this line?
- Beam dump specification
- ERL Bending Magnet?



DC Gun Status

Vacuum Chamber

- Complete/Vacuum Fired
- Cornell preparing for assembly
- Cornell Pre-survey vacuum chamber
- Flanges vacuum fired (BNL)

SF 6 Chamber

- Vendor acceptance testing this week
- CJ: Vendor visit
- Shipped to Cornell end of Month
- Cornell feedthrough HP testing
- **BNL Pressure Safety Review**
- **SF 6 Filling System Status**

Support Stands complete and at Cornell

Vacuum pumps, gauges, valves at Cornell

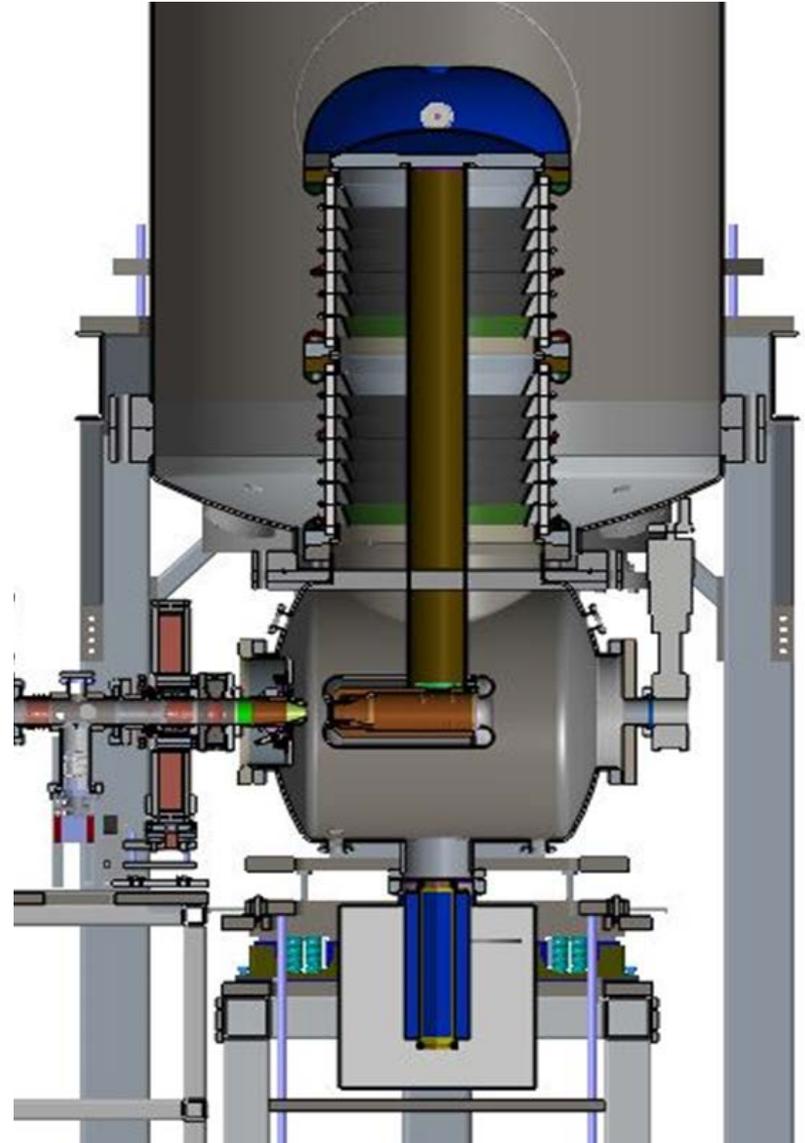
Spare High Voltage Insulators (2) first delivery in April (to Cornell)

Cathode components:

- Body + 1 end cap vacuum fired (BNL)
- 2nd end cap returned for cleaning, to be vacuum fired at Cornell
- Copper stalk being polished

Anode being re-machined (aperture)

Anode magnets complete



Cathode Systems

First production cathodes (2) being polished

First production fork complete

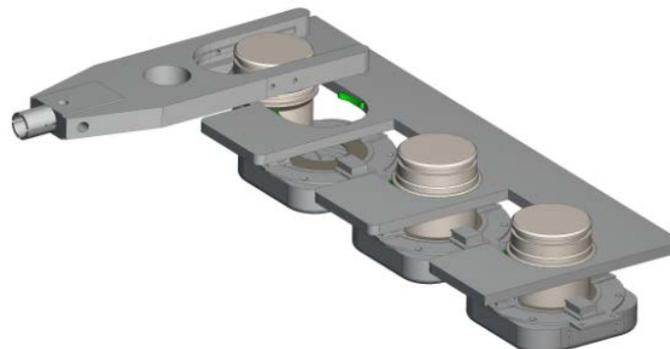
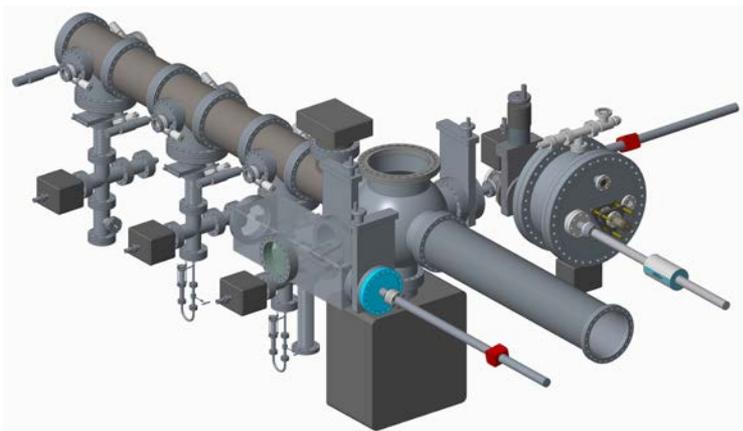
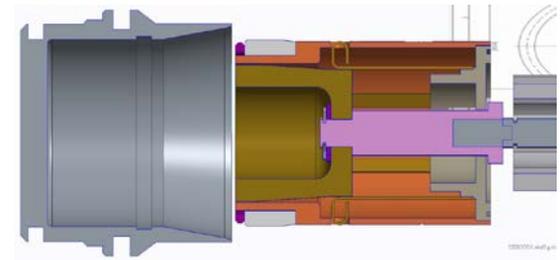
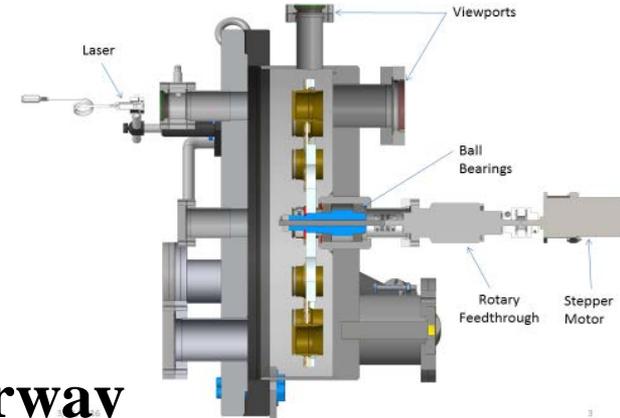
First production cathode heater in production

Cathode transporter design underway

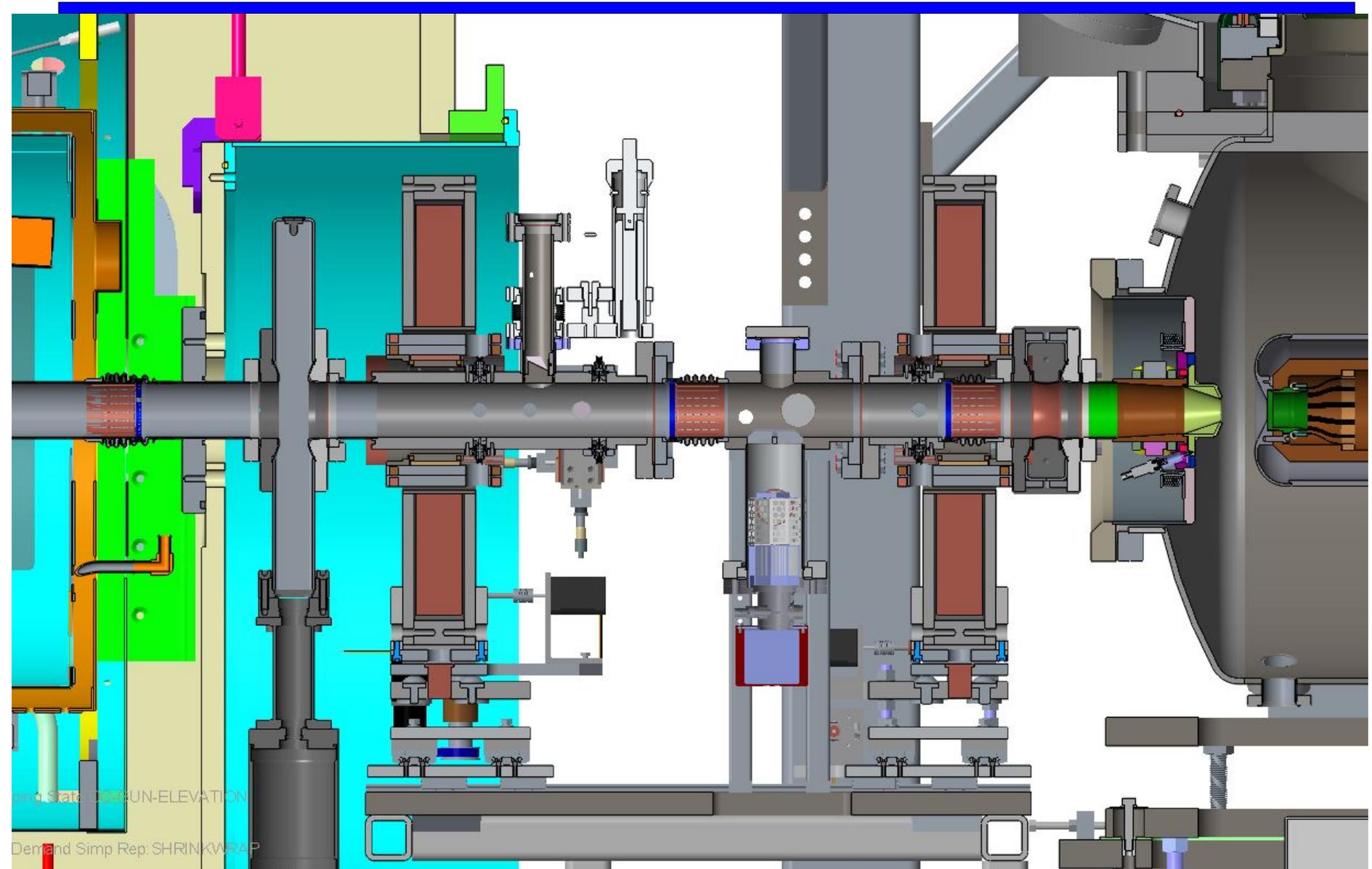
DC Gun Cathode insertion mechanism underway

(Update DC gun mode w/transporter/inserter)

Cathode production system start



Gun to SCRF Booster Transport Line

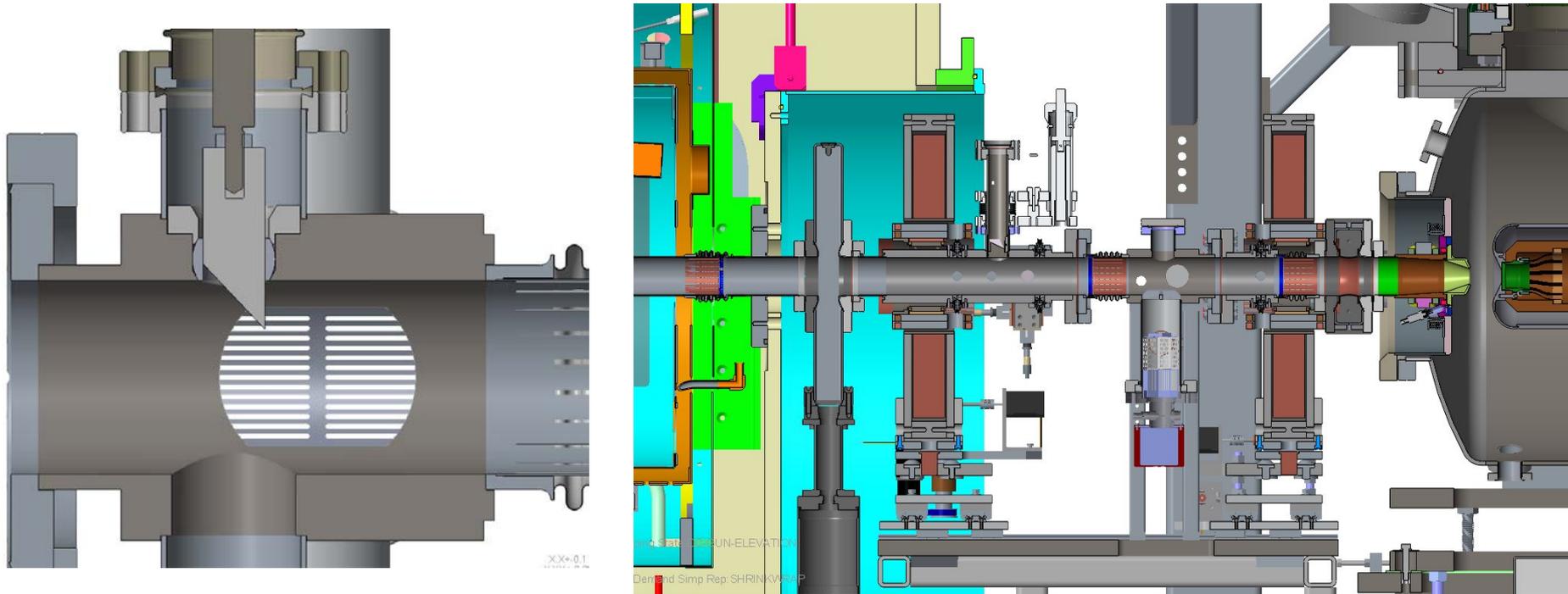


and State: GUN-ELEVATION
Demand Simp Rep: SHRINKWAP

Low Energy RHIC electron Cooling

Transport Line

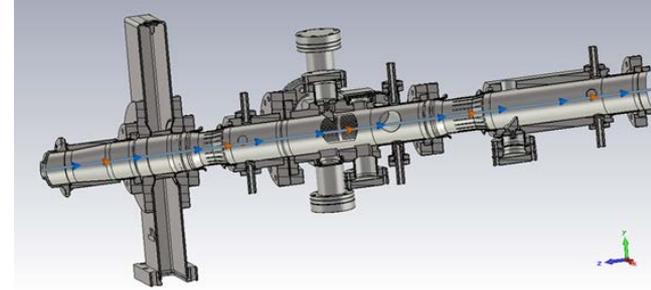
- Correctors redesigned to reduce sextupole components
- Solenoids (2) redesigned to increase aperture
- Remote positioning for solenoids being developed
- New large BPM buttons designed
- Laser mirrors relocated for off-center photo-cathode targeting
- Laser mirrors redesign to reduce impedance (smaller group later today)



Low Energy RHIC electron *Cooling*

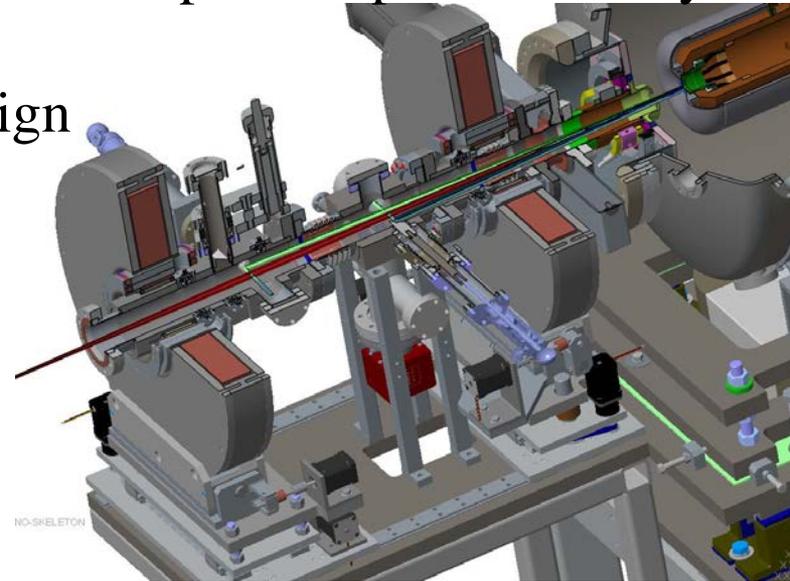
Transport Line – Next Steps

- Order large BPM buttons for entire project
- Solenoids complete fabrication drawings, approve, and purchase. PS specs.
- Correctors complete fabrication drawings, approve, and purchase for entire transport line. PS specs.



Complete design models

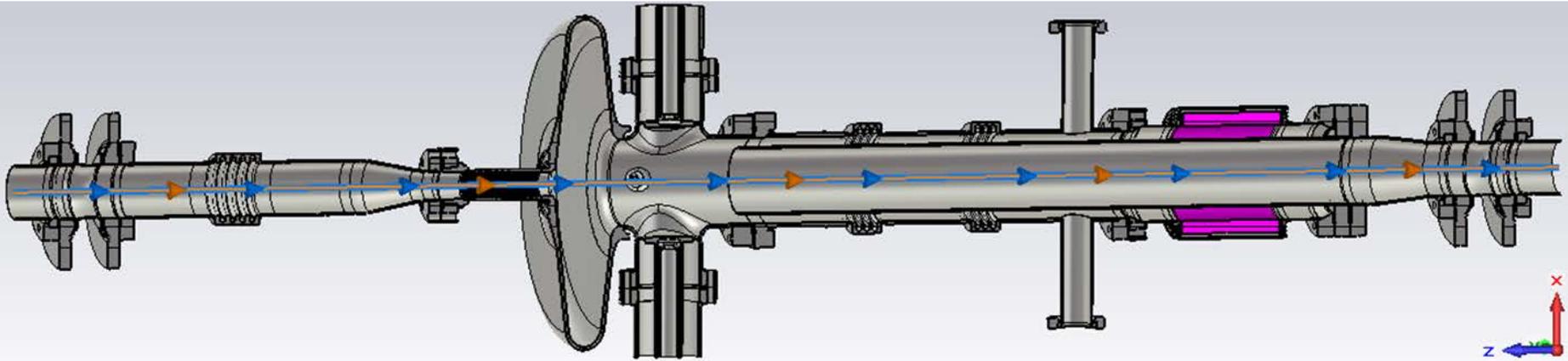
- Laser mirrors: complete impedance study
- Laser mirror windows: define window aperture, complete impedance study
- Complete profile monitor design
- Complete vacuum chambers and bellows design
- Complete remote positioning for solenoids
- Complete stand design



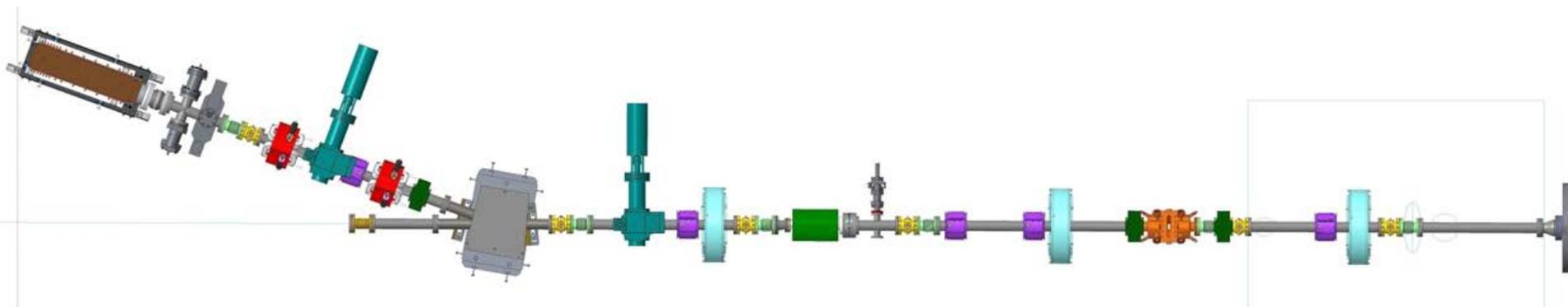
Booster Cavity

Booster cavity design modifications continue

- 2017 installation; but, interfaces must be defined for 2016 to locate flanges and position components.

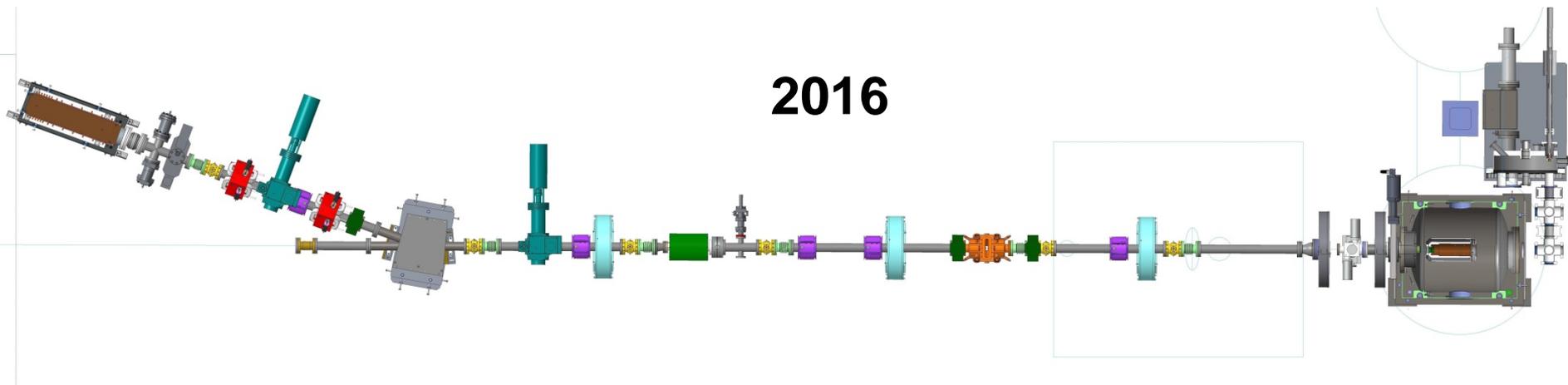


Transport Line Components



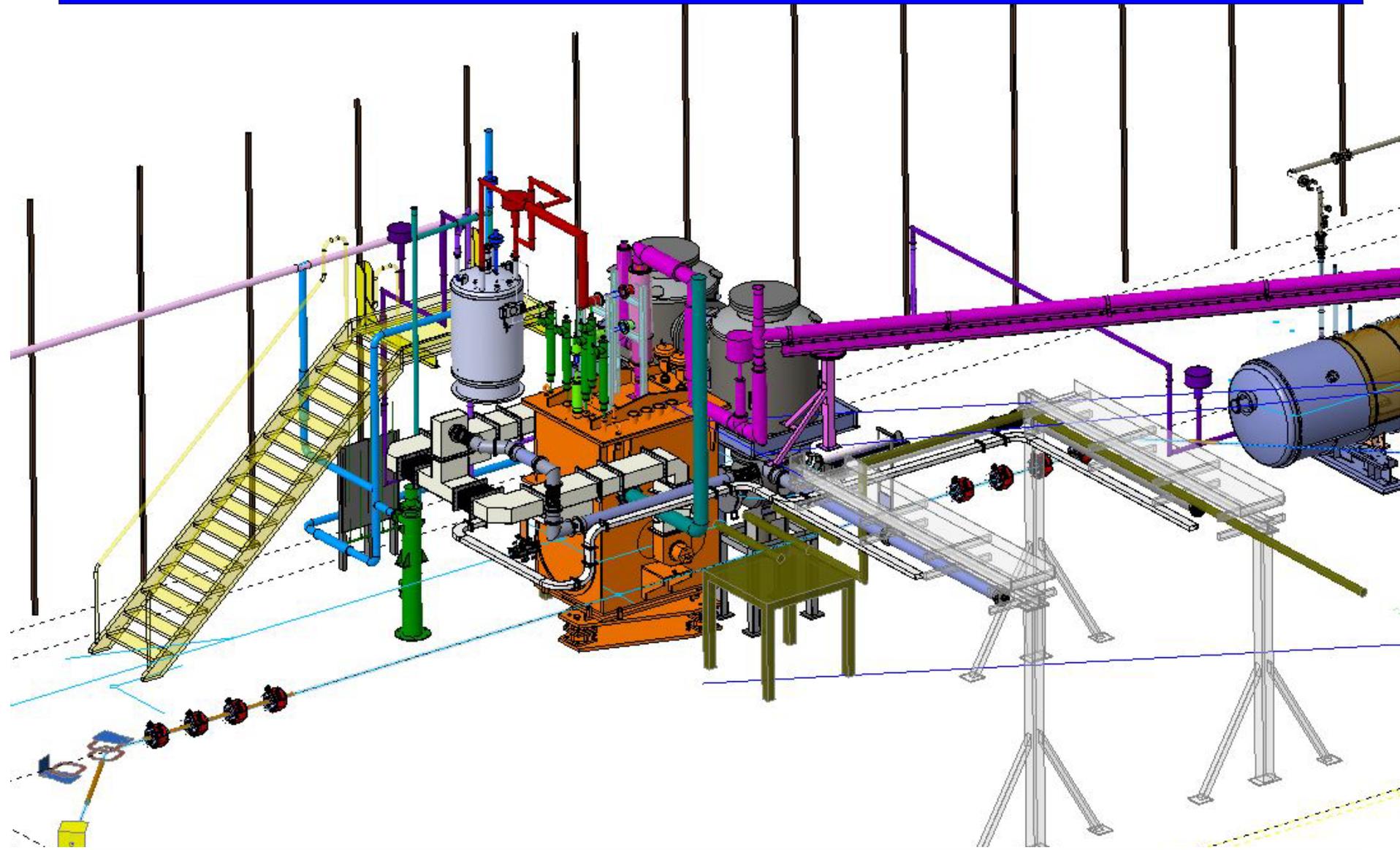
1. ERL Solenoids: Stands with new correctors
2. ERL Quadrupoles: Stands
3. ERL Dipole: aperture, vacuum chamber, stand
4. ERL buttons: New vacuum chambers and supports
5. ERL DCCT and ICCT: new vacuum chamber or transitions
6. ERL Profile Monitors: new vacuum chambers
7. ERL emittance slits: new chamber, new tungsten slits
8. ERL Halo monitor:

Vacuum Hardware and Controls



- # and location of bellows, pumps, and valves
- Procure for entire transport line.
- Complete new bellows design, procure for entire transport line.
- Design low impedance pump tees, procure for entire transport line.
- Transport P&ID.

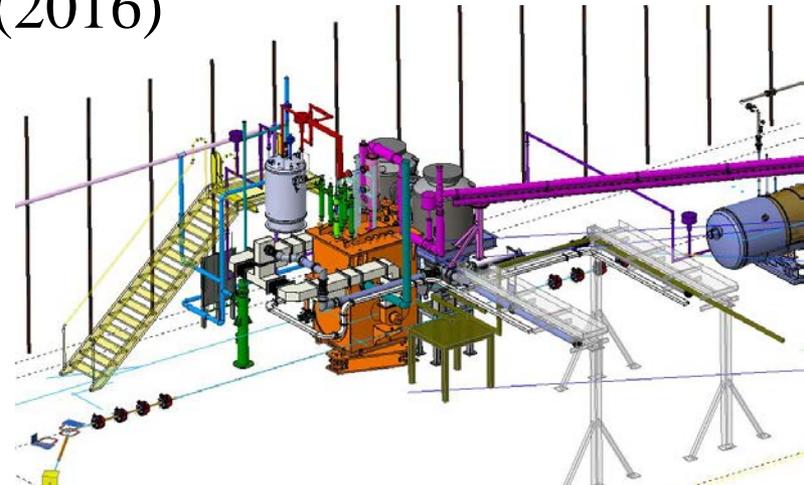
Support Systems



Low Energy RHIC electron Cooling

Support Systems

- Complete cryogenic system design, order components (2017 long lead)
- Complete RF transmission line layout – Booster cavity & 2.1 GHz, order components (2016, 2017)
- Complete work platform layout with clean area, temperature control?
- Complete laser transport layout, order components (2016)
- Complete laser table layout (2016)
- Water system requirements for warm RF cavities (2016) and SCRF FPC (2017)
- Complete cable tray layout DC gun area (2016)
- Complete cable tray: cooling section, transport line, diagnostics (2016)



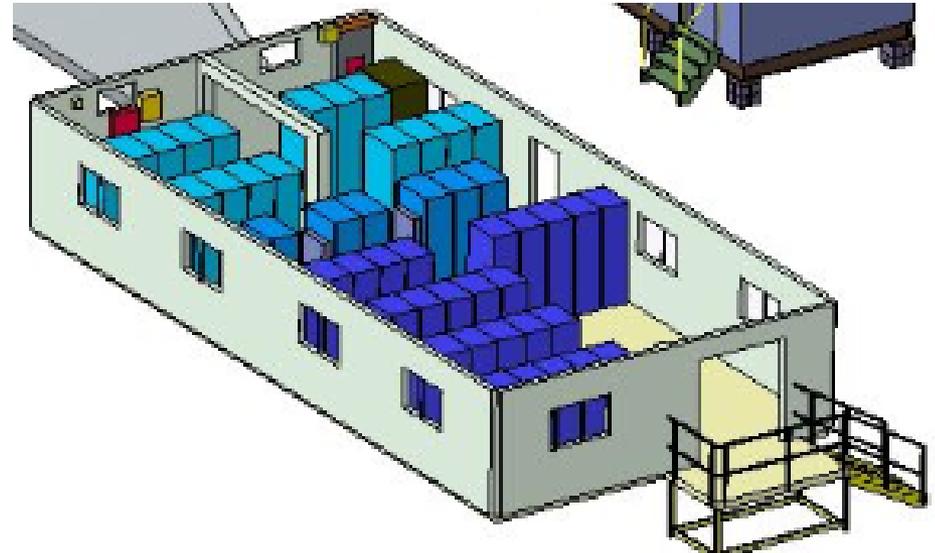
Support Systems

1002D (Brahms building)

- Internal/External cable tray installation
- Building/rack layout, assignments
- PS/Diagnostics installations
- Communications

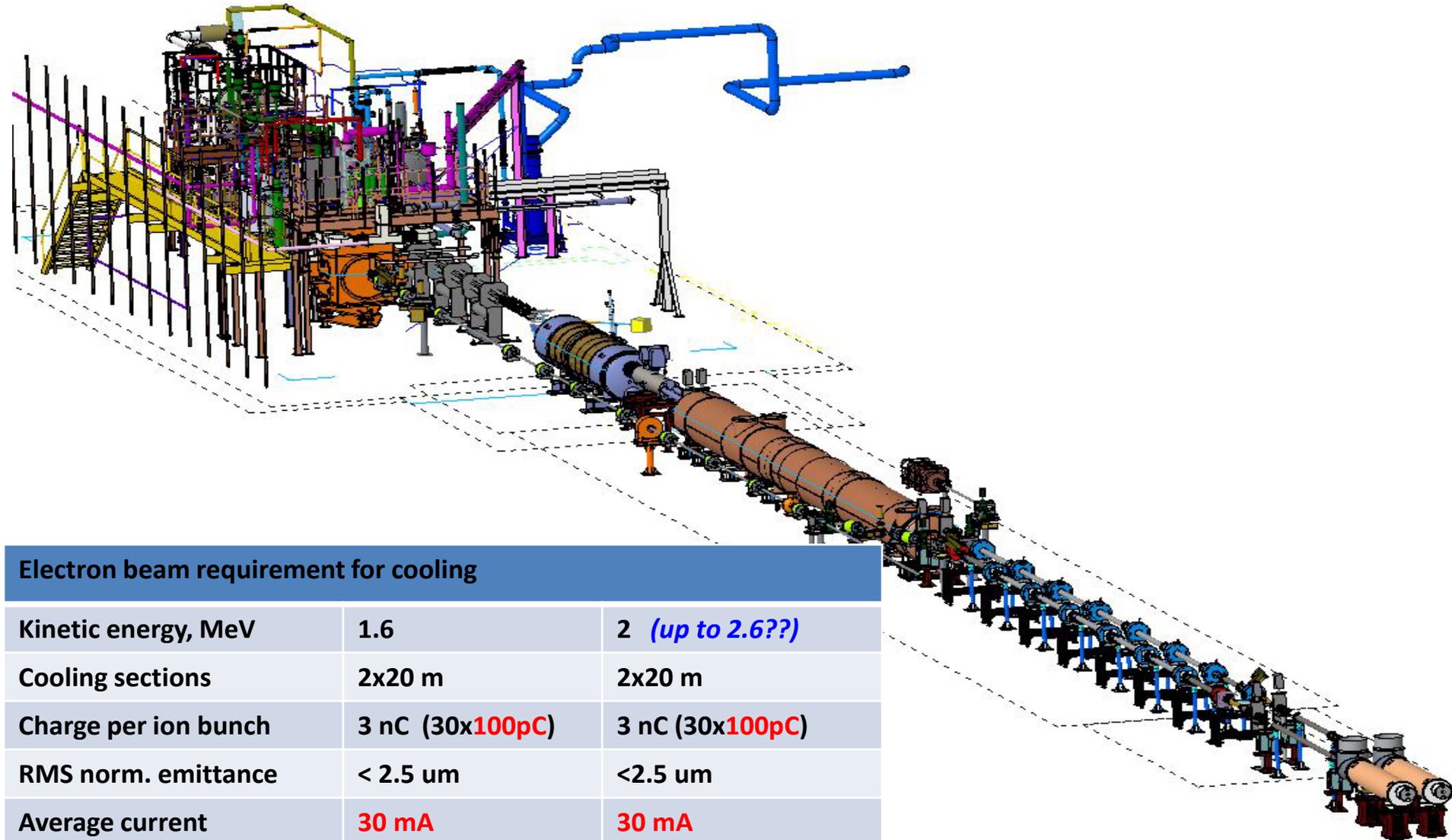


1002B: RF PA and transmission line installation





LEReC



Electron beam requirement for cooling		
Kinetic energy, MeV	1.6	2 (up to 2.6???)
Cooling sections	2x20 m	2x20 m
Charge per ion bunch	3 nC (30x100pC)	3 nC (30x100pC)
RMS norm. emittance	< 2.5 um	<2.5 um
Average current	30 mA	30 mA

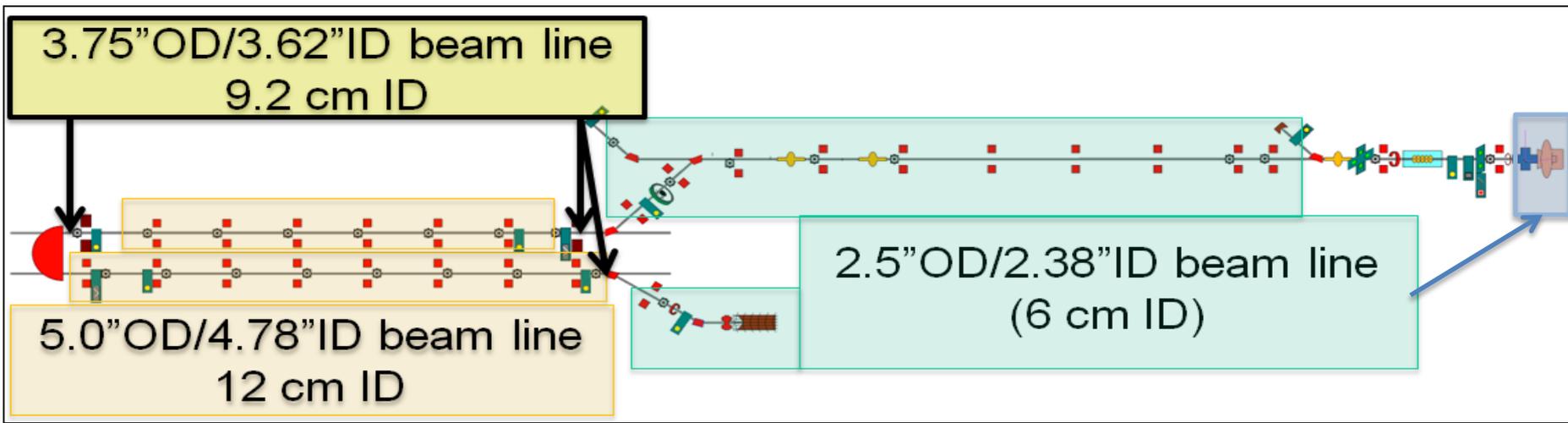
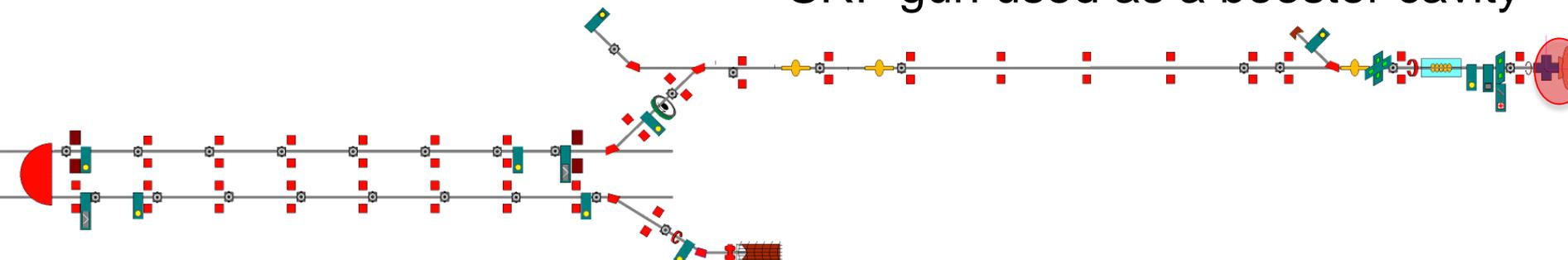
Low Energy RHIC electron Cooling

Overall Layout

64 m

IP2

LEReC-I (1.6-2MeV): Gun to dump
 SRF gun used as a booster cavity



Low Energy RHIC electron *Cooling*

Present Assignments

System	Device	Group	Scientific	Engineering		Design		
				Mechanical	Electrical			
DC Gun	DC Gun Coordination	Cornell	Dunham	Liaw	Bruno	Halinski		
DC Gun	Cathode Production	Instr. Division	Rao	Liaw		Jackson	Martin	
DC Gun	Cathode Insertion	Beam Ins/Comp		Liaw		DeMonte		
DC Gun	Power Supply	Cornell		Liaw	Bruno	Halinski		
DC Gun	Water cooling	Water	Scaduto	Liaw		Halinski		
DC Gun	Vacuum	Vacuum		Mapes		Halinski		
DC Gun Anode Assembly	Small Solenoid Magnet	ESF	Meng	Liaw	Bruno	Halinski		
DC Gun Anode Assembly	H & V Dipole Correctors	Cornell	Meng	Liaw	Bruno	Halinski		
DC Gun Anode Assembly	Vacuum Chamber	Cornell	Kewish	Nayak	Smart	Halinski		
DC Gun Anode Assembly	500 V Power Supply	PS			Bruno			
Gun to SCRF Booster Cavity	Beam Line Coordination		Kewish	Nayak		Halinski		
Gun to SCRF Booster Cavity	Vacuum Beam Line Chambers, Bellows, Valves	Vacuum	Kewish	Nayak	Smart	Halinski		
Gun to SCRF Booster Cavity	Vacuum pumps and guages	Vacuum		Nayak	Smart	Halinski		
Gun to SCRF Booster Cavity	Beam Line Solenoid	Beam I & C	Meng	Mahler	Bruno	Hamdi		
Gun to SCRF Booster Cavity	Beam Line H&V Correctors	Beam I & C	Meng	Mahler	Bruno	Hamdi		
Gun to SCRF Booster Cavity	Beam Line Q&SQ Correctors	Beam I & C	Meng	Mahler	Bruno	Hamdi		
Gun to SCRF Booster Cavity	Laser Room Optics Table	Beam I & C	Sheehy/Zhao	Bellavia	Zhao	Halinski		
Gun to SCRF Booster Cavity	Laser Light Transport	Beam I & C	Sheehy/Zhao	Bellavia	Zhao	Halinski		
Gun to SCRF Booster Cavity	Laser Vacuum Chamber - Mirror Drives		Sheehy/Zhao	Bellavia	Zhao	Halinski		
Gun to SCRF Booster Cavity	Laser Vacuum Chamber - Laser Optics Table		Sheehy/Zhao	Bellavia	Zhao	Halinski		
Gun to SCRF Booster Cavity	Laser Vacuum Chamber - Profile Monitor		Theiberger	Bellavia	Miller	Halinski		
Gun to SCRF Booster Cavity	Laser Vacuum Chamber and Vacuum Pumps			Nayak	Smart	Halinski		
Gun to SCRF Booster Cavity	Beam Position Monitors	Beam I & C	Theiberger	Nayak	Gassner	Halinski		
SCRF Booster Cavity	Cavity Modification Coordination	RHIC Mech	W. Xu	McIntyre	Smith	Seberg	Meier	
SCRF Booster Cavity	Upstream beam pipe modifications	RHIC Mech	W. Xu	McIntyre		Seberg	Meier	
SCRF Booster Cavity	Vacuum valves	Vacuum		Nayak	Smart			
SCRF Booster Cavity	FPC modification	RHIC Mech	Smith	McIntyre		Seberg		
SCRF Booster Cavity	Cryogenic installation	Cryo	Than	Orfin	Tallerico	Meier		
SCRF Booster Cavity	Solenoid repair	RHIC Mech	Smith	McIntyre		Seberg		
SCRF Booster Cavity	Cavity BCP	RHIC Mech	Smith	McIntyre		Seberg		
SCRF Booster Cavity	RF Power Supply	RF	Smith		Zaltsman			
SCRF Booster Cavity	LLRF	RF	Smith		Smith			
SCRF Booster Cavity	RF Wave Guide &/or Coax	RF	Zaltsman	Brutus	Zaltsman	TBD		