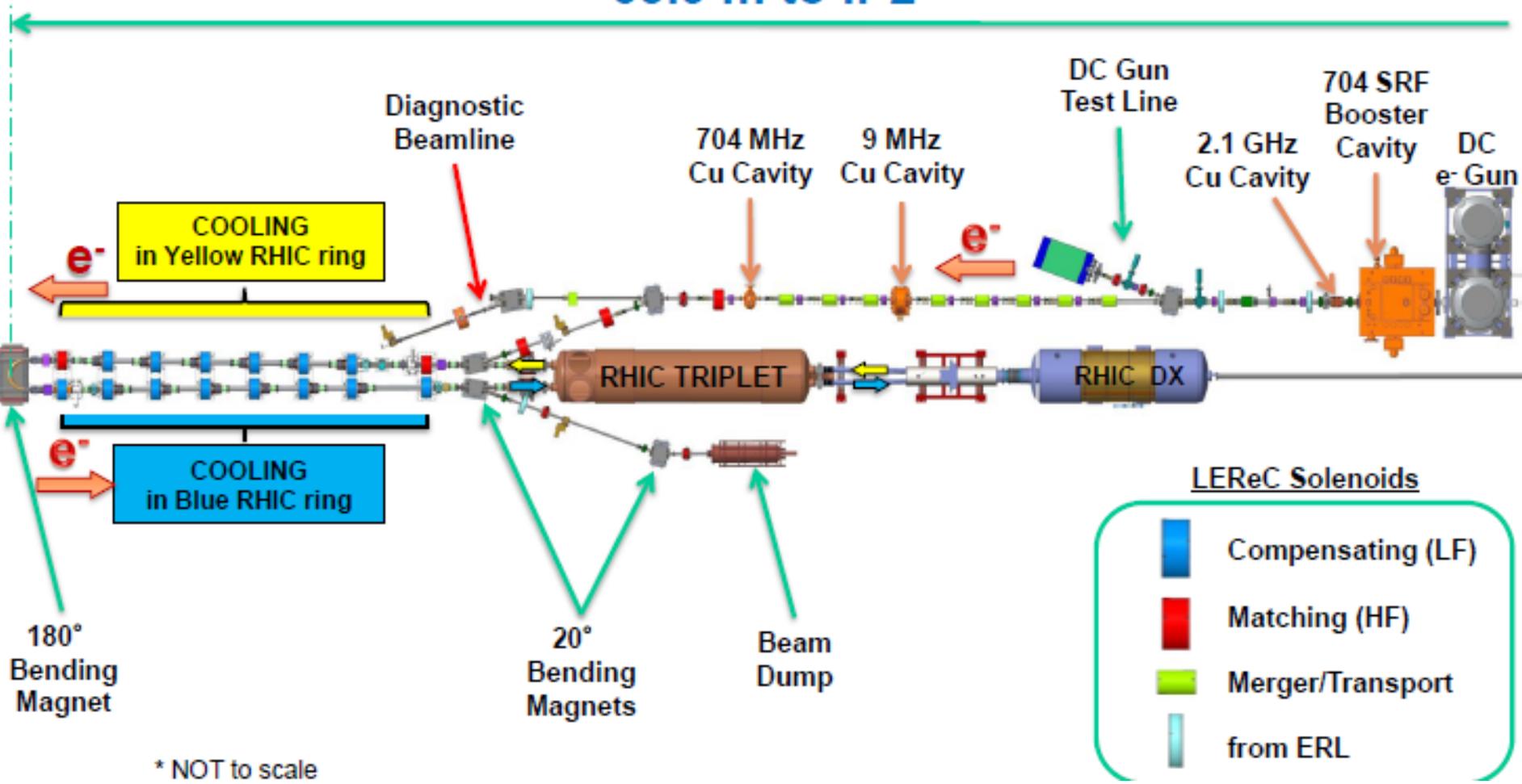


LEReC System

63.9 m to IP2



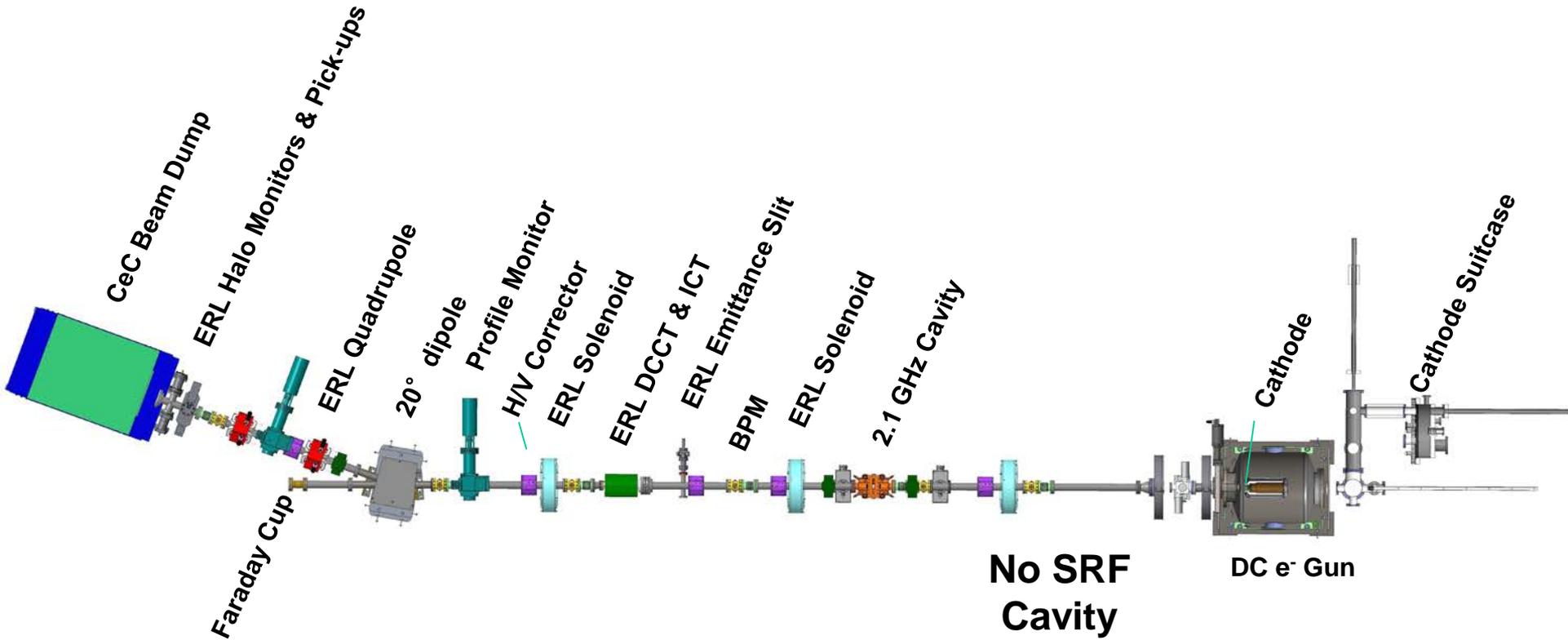
Project Schedule



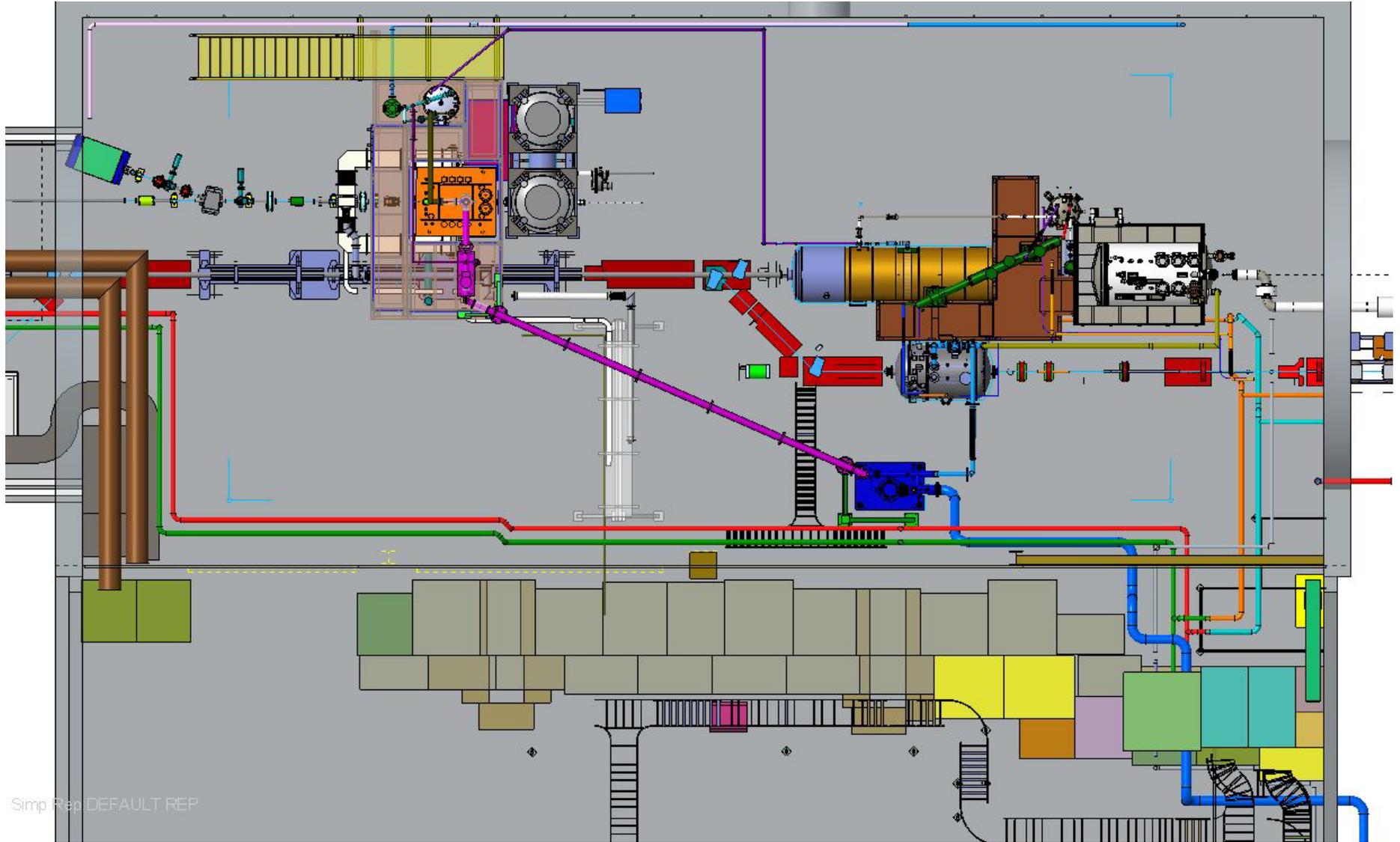
- 2015 shutdown **COMPETE!**
 - Move beam line equipment from IP 01:00
 - Install cooling section beam line
- 2016 shutdown
 - Install and condition DC Gun, ~~Install beam transport line~~
 - Install warm RF cavities
 - New: Install upstream transport line and laser systems
- **Run 2017: Commission 400kV electron beam from DC Gun**
- 2017 shutdown
 - Install SCRF Booster Cavity, transport beam line to RHIC, diagnostic beamline, install high power (ERL) beam dump
- **Run 2018: Commission SCRF Cavity commission entire LEReC beamline to 2 MeV**



LEReC Injection section 2016



2017 DC Gun & Booster Cavity Installation Layout

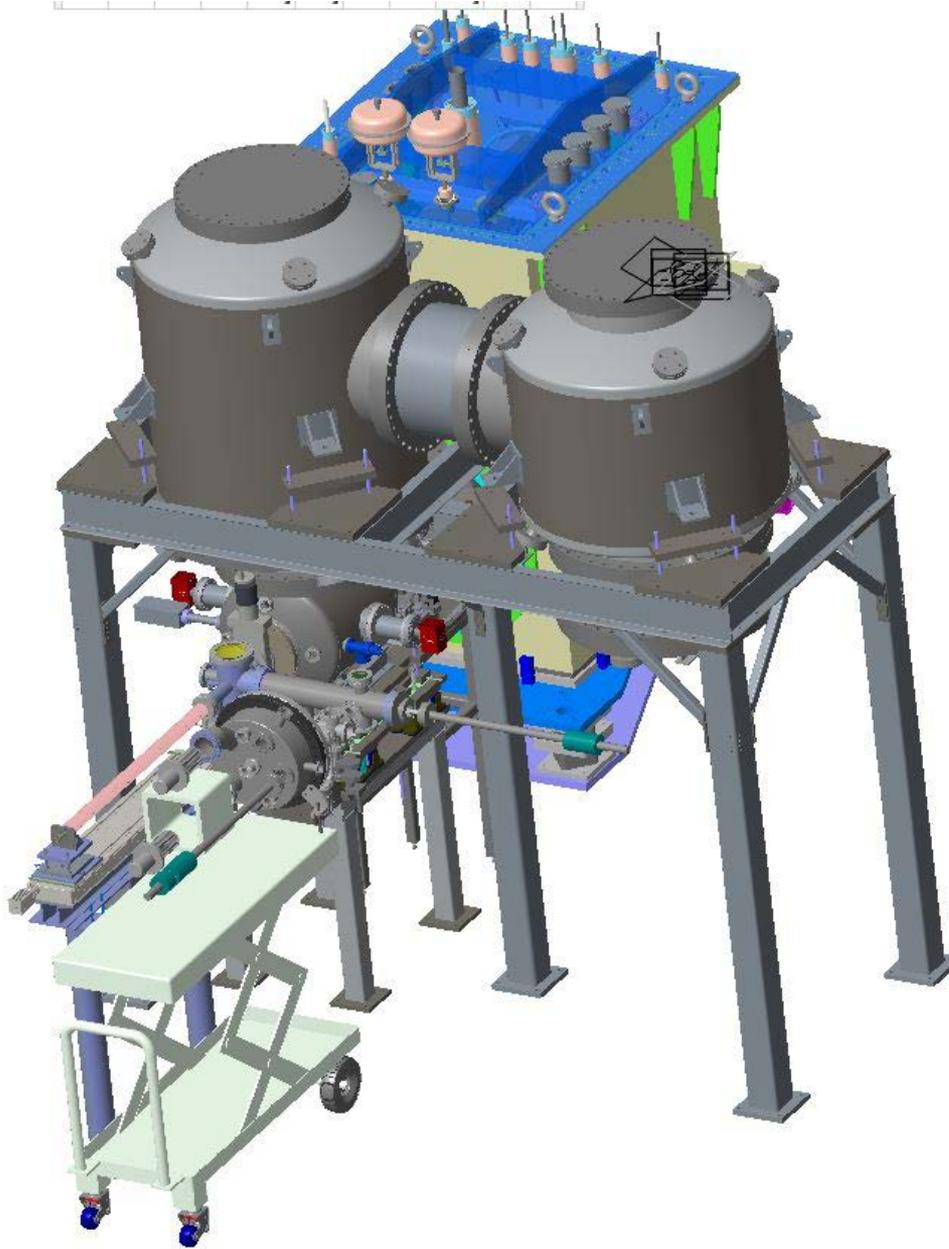


Simp Rep DEFAULT REP



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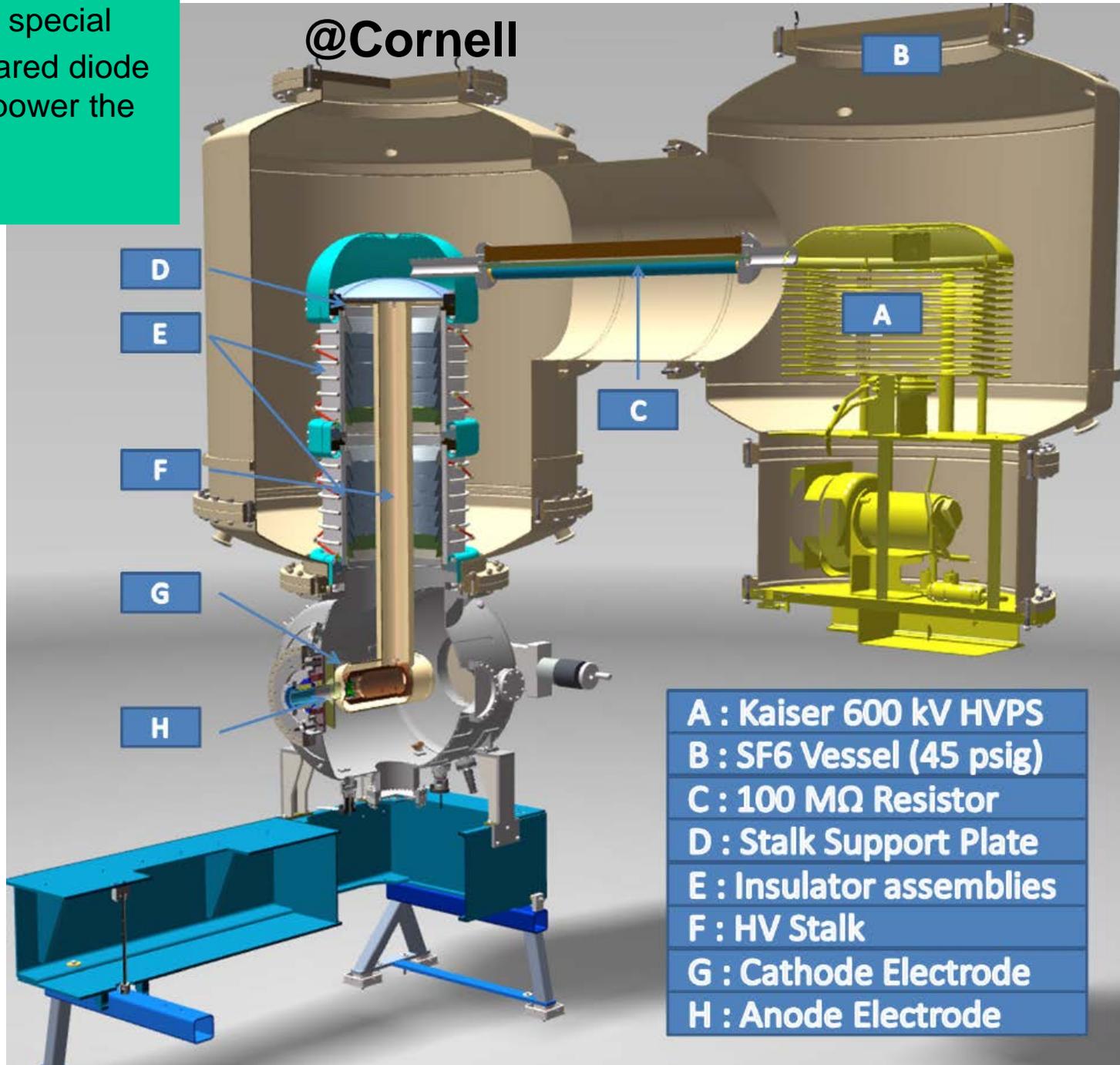


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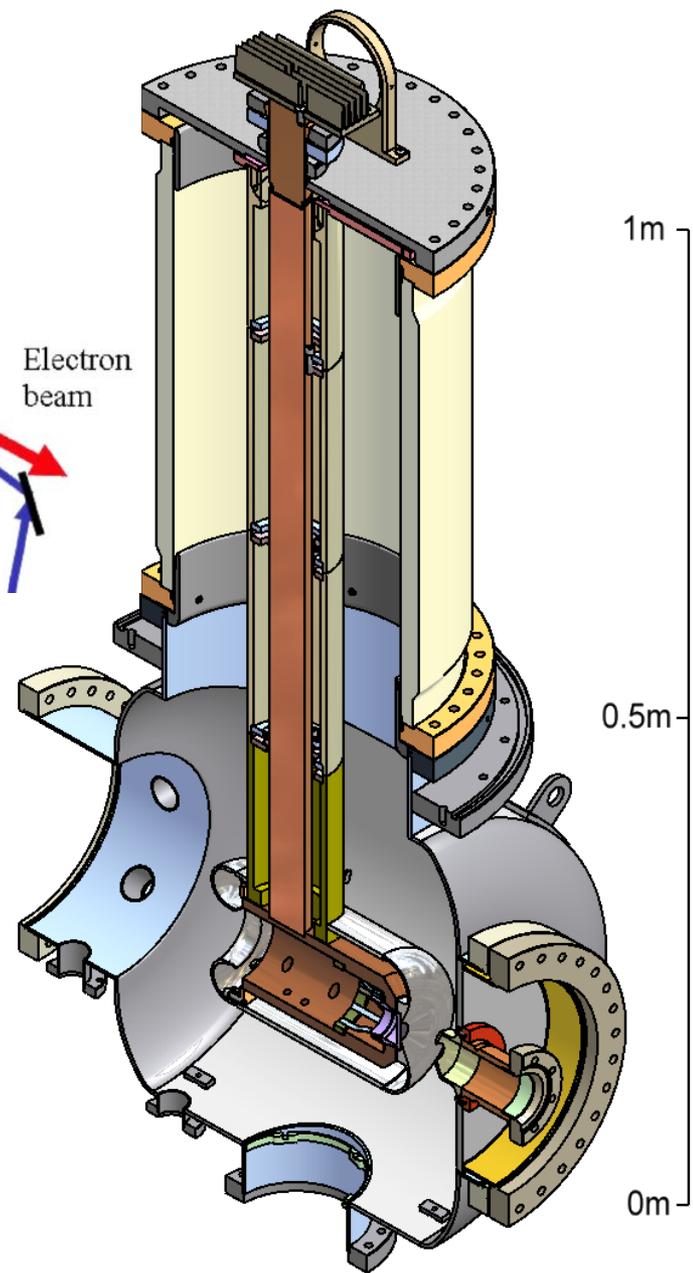
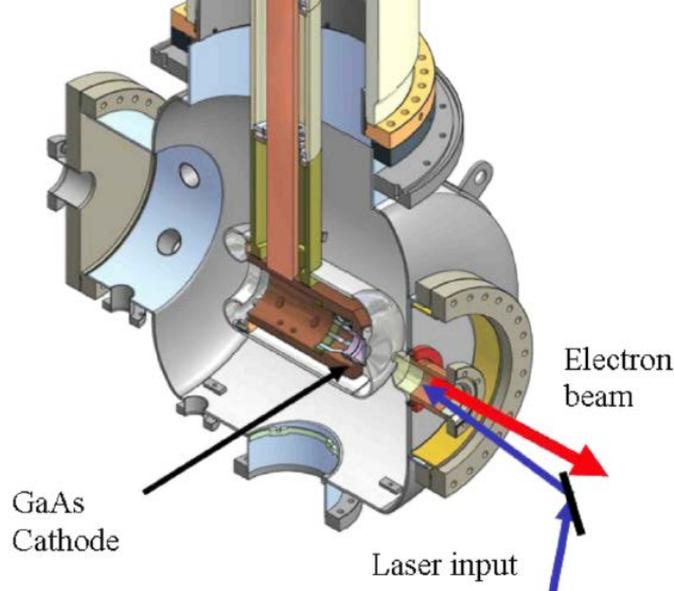
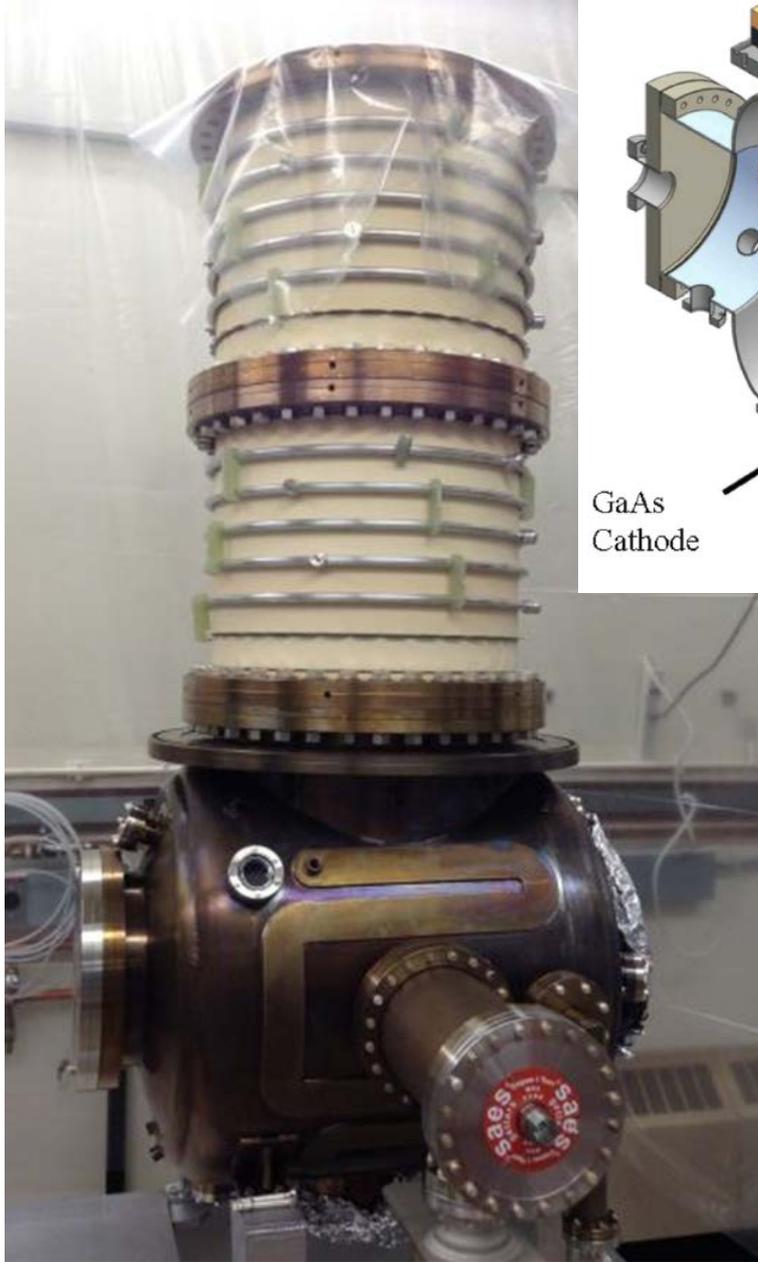
@Cornell

- DC Gun system has special Controls, including infrared diode laser and photocell to power the floating ammeter.



- A : Kaiser 600 kV HVPS
- B : SF6 Vessel (45 psig)
- C : 100 M Ω Resistor
- D : Stalk Support Plate
- E : Insulator assemblies
- F : HV Stalk
- G : Cathode Electrode
- H : Anode Electrode





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750 kV, 100 mA HVPS



- Insulating core transformer technology
- 62 circuit boards, each delivering 100 mA at 12.5 kV, stacked in series – 24 pf total capacitance
- Pressurized SF₆ insulation
- External high power, high frequency (~ 100 kHz) drive and control circuitry





DC Gun Assembly at Cornell

All parts except cathode stalk at Cornell

Cornell clean room prepping parts

Critical BNL tasks

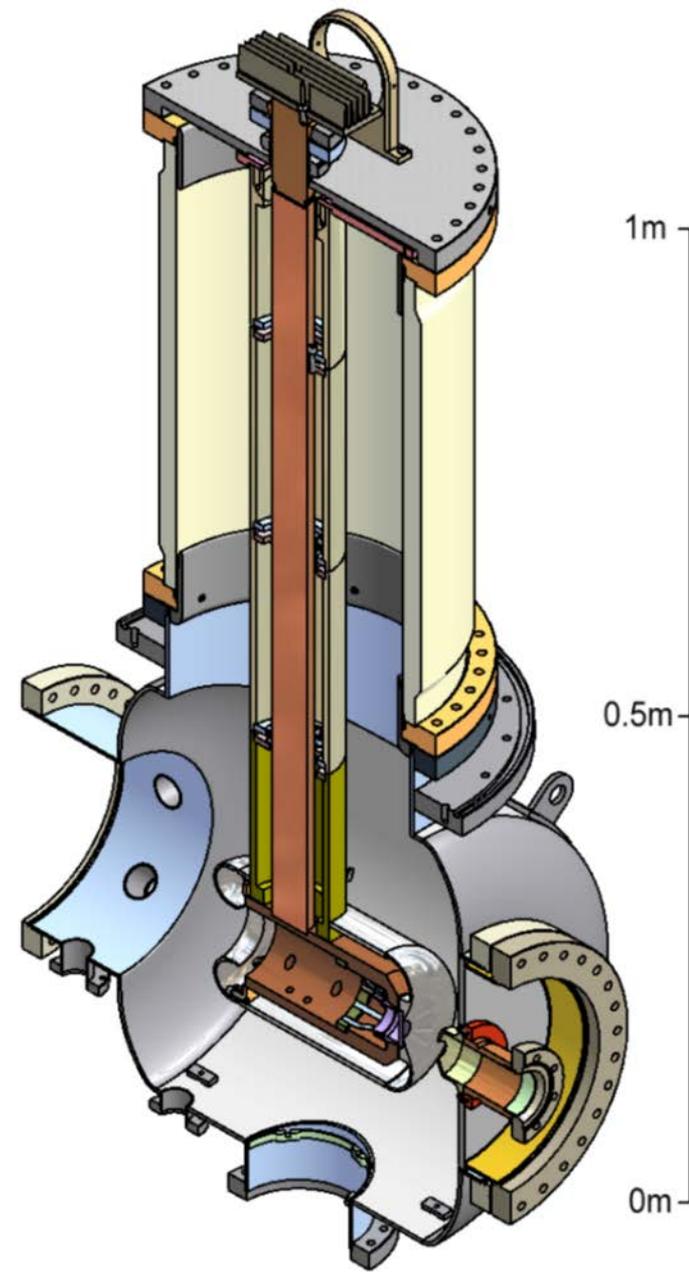
- Order bake-out blankets
- Visit during cathode stalk survey/install
(survey, RHIC Mech.)
- Visit after bake-out during SF6 chamber
install. (PS Mech.)
- Visit during commissioning/HV conditioning
(PS, controls)



DC Gun Assembly at BNL

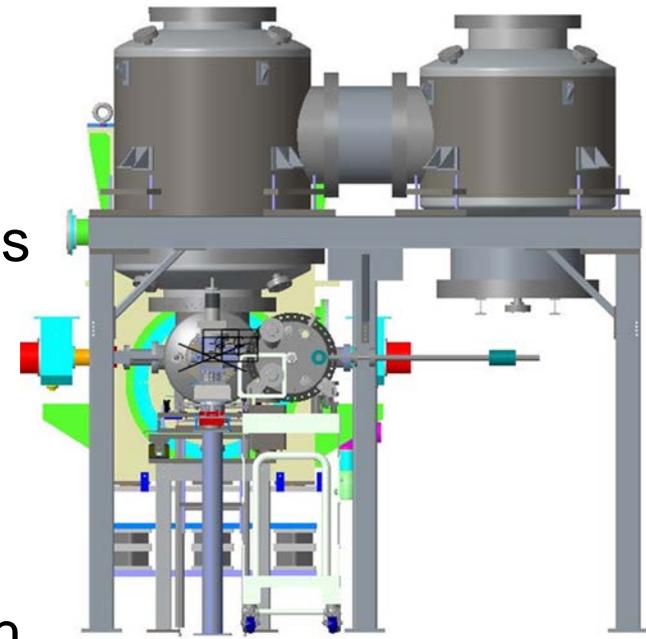
Will be shipped as an assembly without the cathode stark installed.

- Clean room prepare parts (should arrive from Cornell cleaned and bagged).
- Move into 912 cleanroom.
- Install top flange assembly with cathode assy. (need small crane, check height)
- Align cathode assy.
- Close up vacuum vessel.
- Leak check



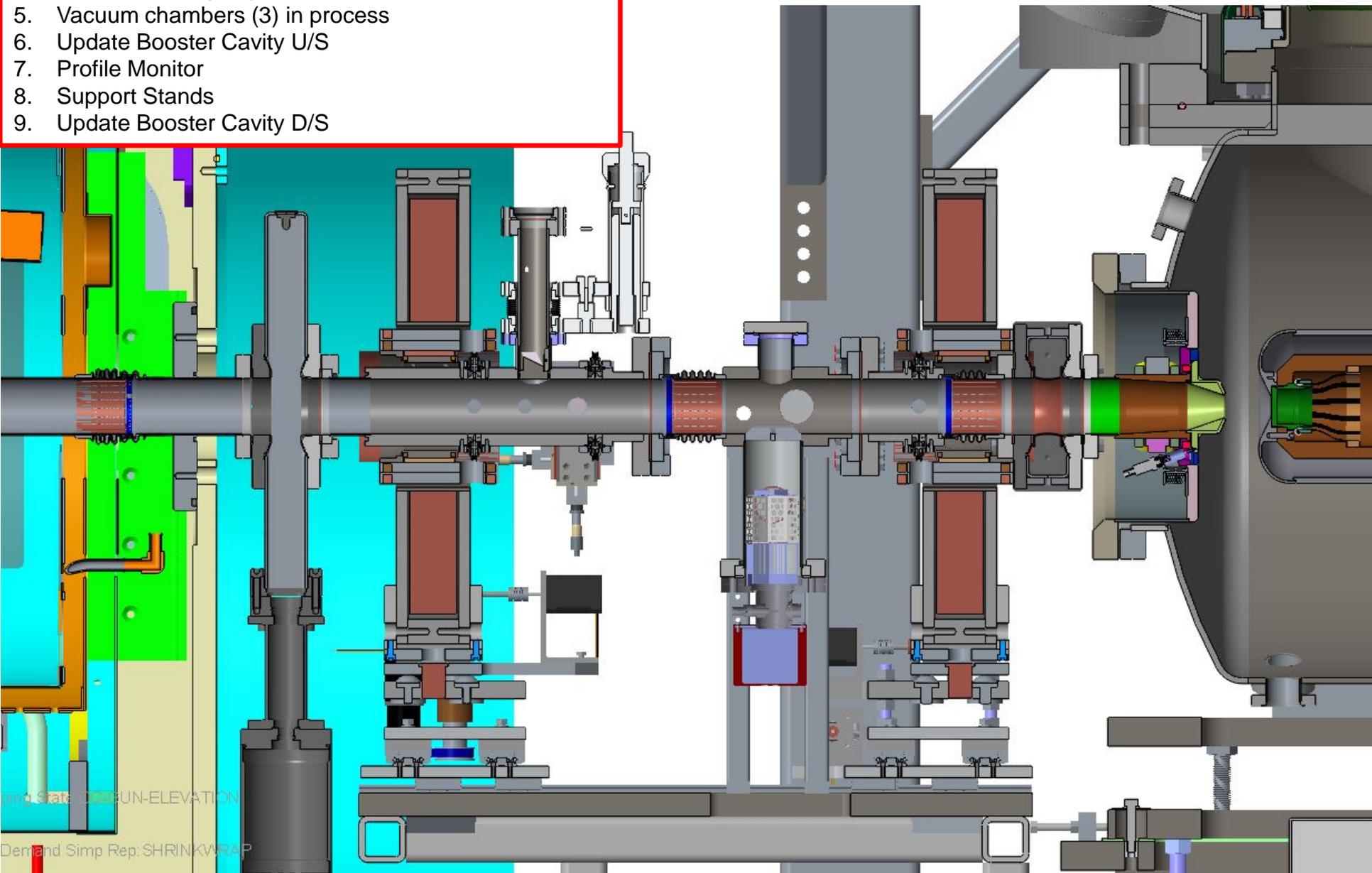
DC Gun Installation at IP02:00

- Survey IP02:00 locate gun
- Survey IP02:00 locate gun and PS support points
- Install redheads for gun and PS support frames
- (Slowly) move assembled gun from 912 to IP02:00
- Rig into position, bolt down stand, Survey into beamline position
- Set-up vacuum system and bake-out, establish 10-11 vacuum
- **Set-up power supply, access controls, water, power, MPS, condition cavity to 500kV (at night, on weekends)**

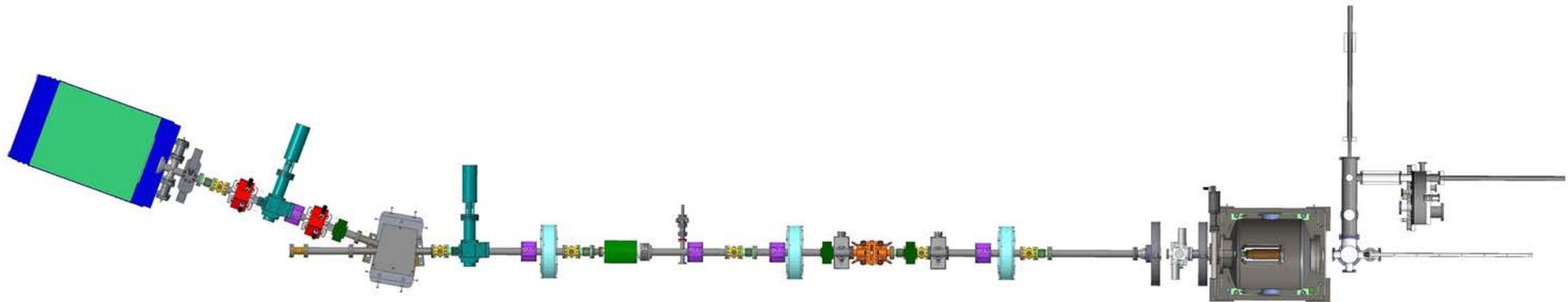


Status:

1. Solenoid drawings complete, checking
2. Corrector drawings complete, checking
3. Mirror drawing complete, checking
4. Mirror assembly in process
5. Vacuum chambers (3) in process
6. Update Booster Cavity U/S
7. Profile Monitor
8. Support Stands
9. Update Booster Cavity D/S



- GtB transport: 2 solenoids, 8 correctors, Profile Monitor, 2 laser mirrors, 2 BPM's, Phase detectors, clearing electrodes
- 1 year section: ERL solenoid, corrector magnet, BPM
- 2.1 GHz Cavity, wave guide
- 2 ERL solenoids, 4 H/V corrector magnets, 2 ERL quadrupoles
- CeC 45o dipole magnet
- Diagnostics:
 - DCCT and ICT from ERL (internal RF shielding)
 - 2 Profile Monitors from ERL (new vacuum chambers)
 - Emittance slit drive (new vacuum chamber and slits)
- Vacuum: Pumps, bellows, valves, 5 bake-out sections



“Warm” RF Cavities

2 or 3 RF Cavities will be installed during the shutdown so they can be tested and commissioned by 2017.

- 2.1 GHz RF Cavity (new) 3 cell cavity with motorized tuner

Delivery in June 2016

Tuner design almost approved

PA delivery June 2016, wave guide power transport

- 704 MHz RF Cavity (new) 1 cell cavity with motorized tuner

Delivery in September 2016

Tuner being designed

PA delivery

9 MHz (Bouncer) Cavity from RHIC spare



Cognizant Engineers

Project Engineer: Tuozzolo

- Cathode system: Liaw, Tuozzolo
- Laser System: Zhao
- 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
- Warm RF Cavities: Zaltsman, Smith, Brutus, DeSanto

LEReC Webpage: (C. Hoffman)

http://www.c-ad.bnl.gov/esfd/LE_RHICeCooling_Project/LEReC.htm

