

CeC Engineering

J. Tuozzolo
(CeC Project Engineer)

- Presentation Schedule
- System Specifications
- Project Schedule Overview/Staged Installation.
- IP 2:00 location, preparation work.
- Engineering overview, progress to date.

Schedule and Systems Engineers

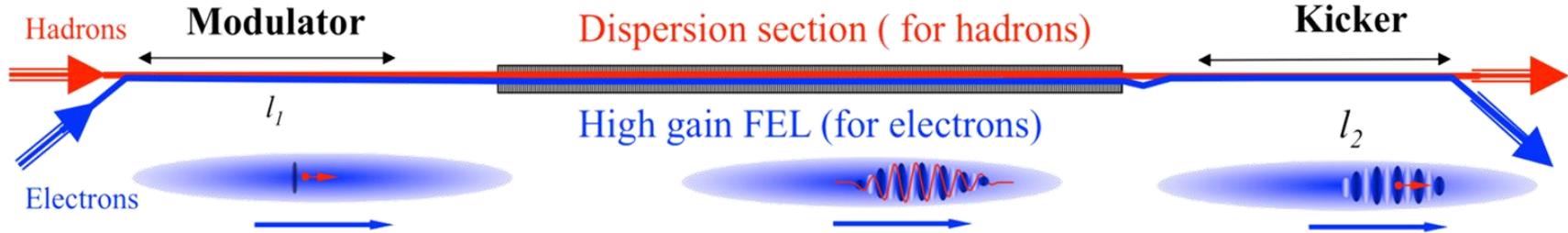
Talks:

- 1:30 - 1:50 CeC PoP Overall Layout, System Specs. and Phase I/II Speaker: Tuozzolo
1:50 - 2:10 SRF and RF Transmitters and LLRF Speakers: Belomestnykh/Zaltsman
2:10 - 2:30 SCRF Cavity Design Speaker: Skaritka
2:30 - 2:50 Cryogenics Speakers Than/Soria
2:50 - 3:10 eGun Laser System and Wiggler Light Detector Speaker: Sheehy
3:10 - 3:30 Magnets, Power Supplies, Vacuum Speakers: G. Mahler/R. Lambiase/M. Mapes
3:30 - 3:50 Beam Diagnostics Speaker: D. Gassner/T. Miller
3:50 - 4:10 Civil Construction Speaker: Charles Folz

Other major systems:

- CeC layout, engineering design and analysis – J.C. Brutus
Cavity Tuners, Power Coupler, Laser Port – J.C. Brutus
RF Buncher and Buncher Tuner Preparation – R. Todd, L. DeSanto, C. Folz, J.C. Brutus
Beam Dumps – L. Snyderstrup

Economical Version of CeC (I. Pinayev)



In the modulator and kicker sections the electrons have the same speed as ions ($v_e = v_{Au}$).
 In the FEL section the electrons are slower than ions but group velocity of the density modulation is equal or higher to the ions velocity (setting limitations on the wiggler parameter).

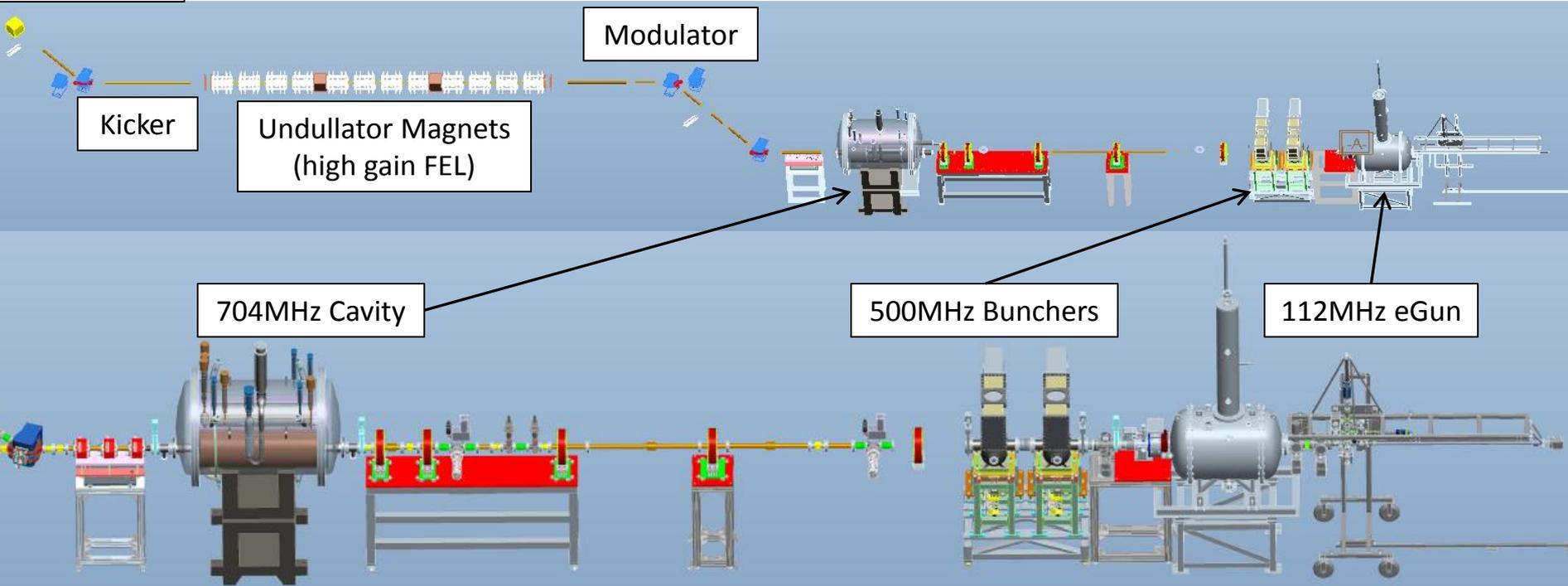
The ions experience ballistic motion with dispersion $D = L_{FEL} / \gamma^2$

	Parameter	Units	Value		Parameter	Units	Value	
Phase 1 Gun Commissioning	Electron Energy	MeV	2.5		Phase 2 System Operations	Electron Energy	MeV	21.8
Phase 1 Gun Commissioning	Repetition Rate	Hz	10		Phase 2 System Operations	Repetition Rate	kHz	78.3
Phase 1 Gun Commissioning	Charge per bunch	nC	1 to 5		Phase 2 System Operations	Charge per bunch	nC	1 to 5
Phase 1 Gun Commissioning	Peak current	uA	0.05		Phase 2 System Operations	Peak current	mA	0.4
Phase 1 Gun Commissioning	Beam Power (Max)	W	0.2		Phase 2 System Operations	Beam Power (Max)	kW	8.5

Beam Line Layout



Beam Dump

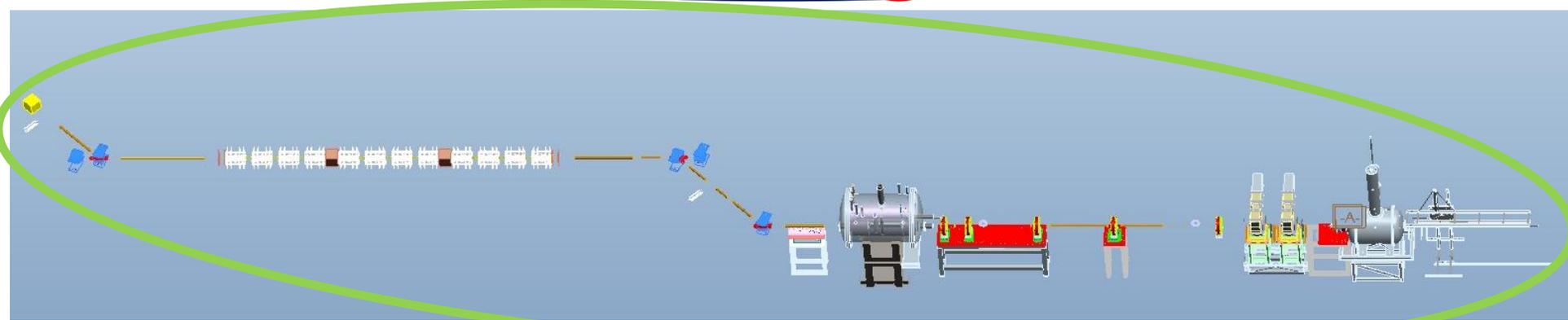
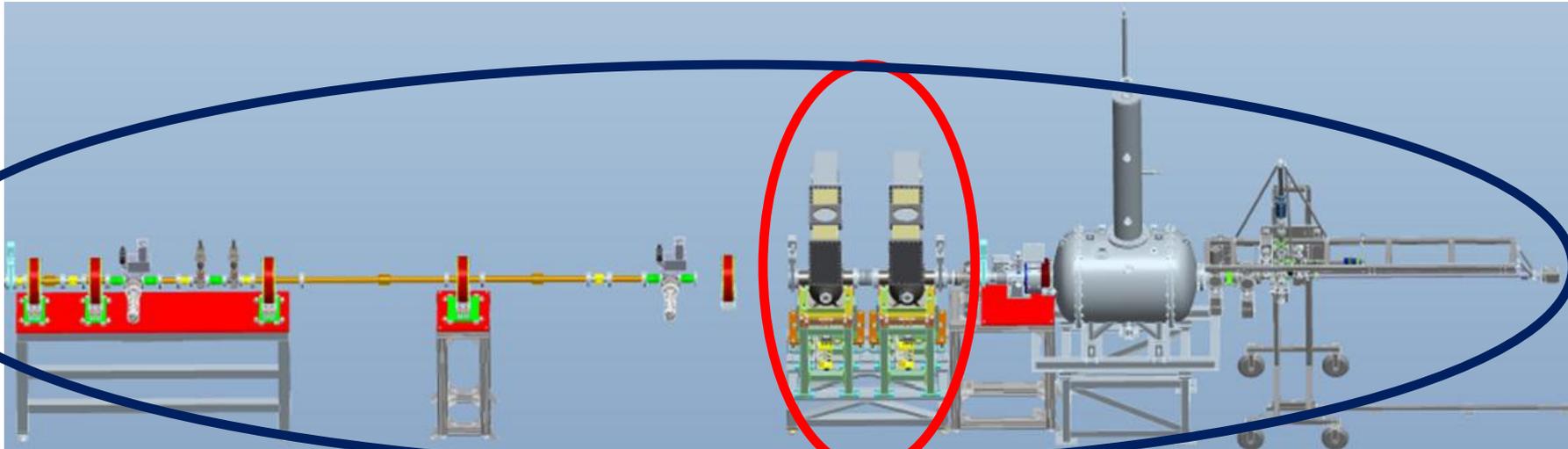


CeC PoP Installation Schedule

Phase 0 2012/13 : Buncher installation, commission system

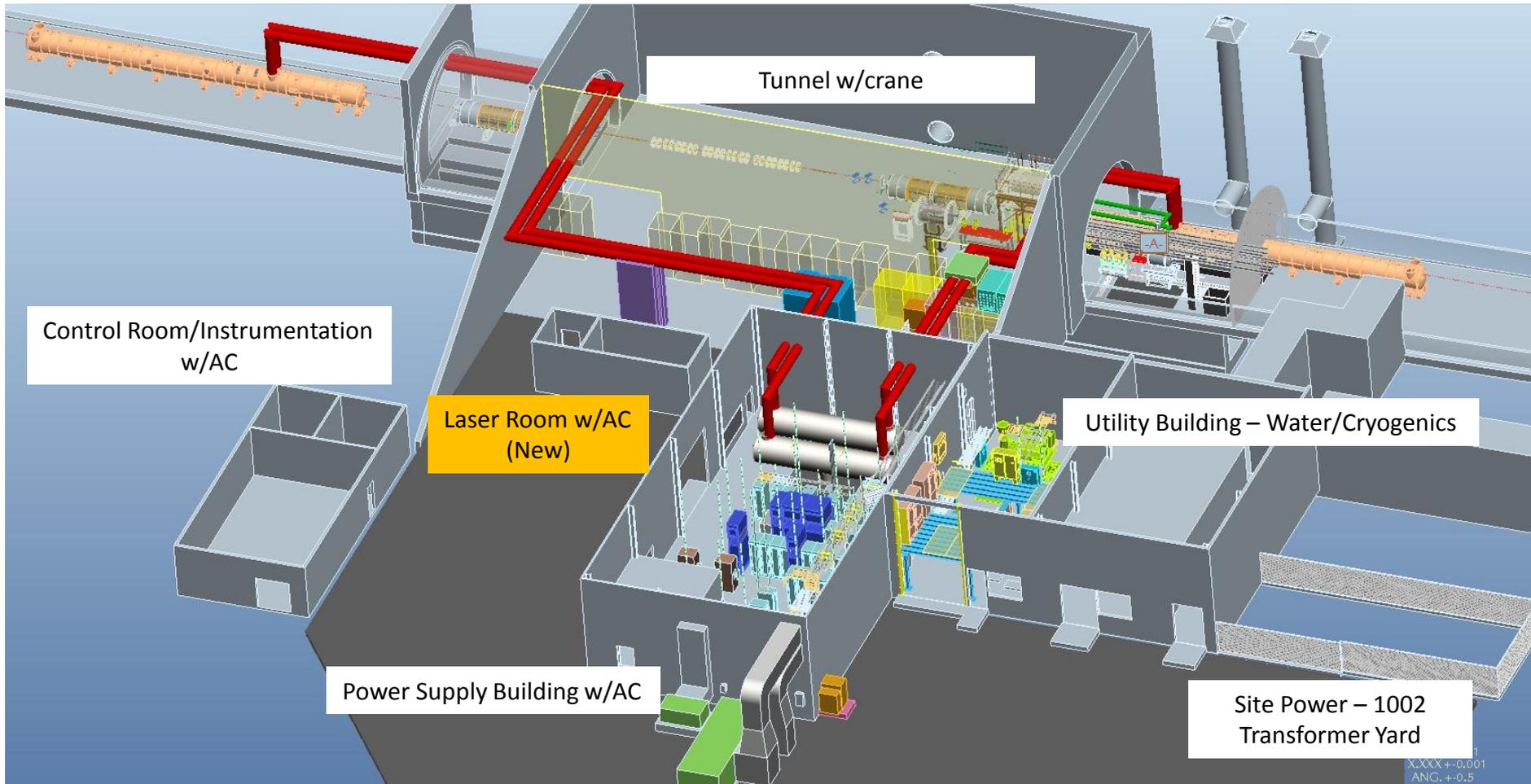
Phase 1 2013/14 : Gun Line installation, commission w/beam

Phase 2 2014/15 : CeC PoP Complete, commission w/beam



Location, Location, Location

RHIC 2:00 IP, BRAHMS and AnDY out, CeC PoP in.



Location, Location, Location

RHIC 2:00 IP

- Large open experimental area with crane
- Good access removable shield door.
- Available space in both ring support buildings.
- Existing utilities, communication, and cable trays.
- Fire protection systems installed.
- Cryogenic tap installed.



Tunnel w/crane



Utility Building – Water/Cryogenics



Power Supply Building w/AC



Site Power – 1002 transformer yard



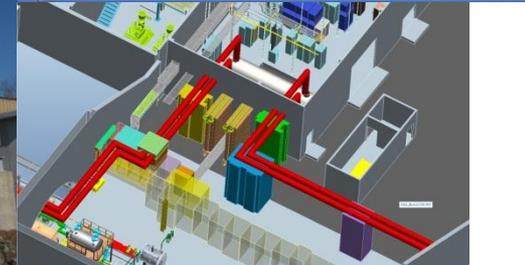
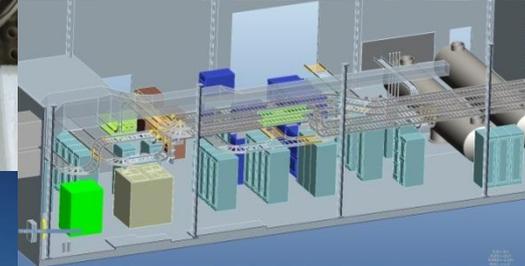
Water Systems



CeC PoP 2012

Building Preparation completed:

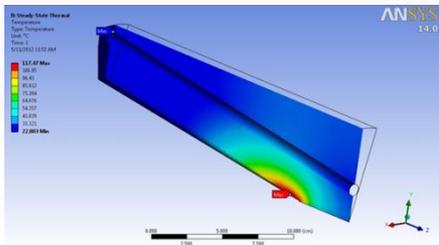
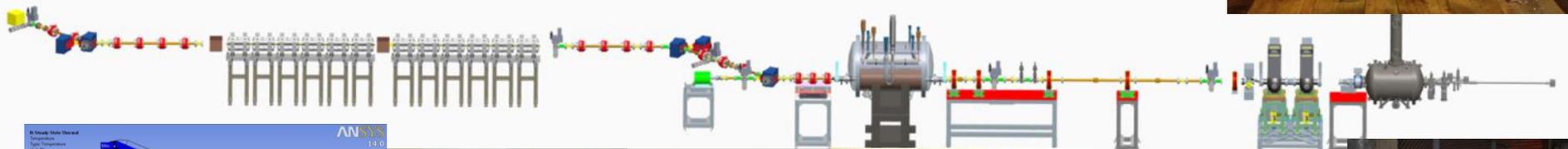
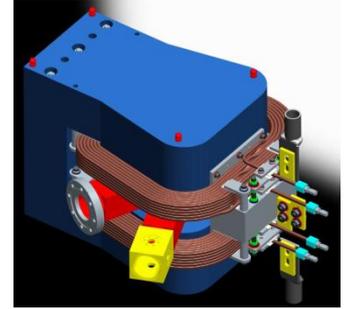
- Remove Brahms Shielding from 02:00 IP (Folz)
- Cooling water tower/water pumps installed (Scaduto, deBoer)
- 1002B RF Coax run laid out, coax ordered (Folz, Randazzo)
- New large cable/cryogenic pipe penetrations (Folz)
- Cable tray and conduit installation underway 1002A and B (Folz)
- Area survey complete (Karl, Ilardo)
- Laser room design and bids (Folz)



CeC PoP Phase 2

704 MHz Linac/22 MeV beamline

- 704 MHz Cavity contract (Skaritka, Belomestnykh)
- 2K Cryogenic vacuum pumps in house (Than)
- RF Amplifier specification complete, bids received (Zaltsman)
- Wiggler Magnet prototype development underway (Mahler, BINP)
- 8 kW beam dump preliminary heating analysis. (Snydstrup)
- Dipole and quadrupole magnets and PS specs complete. (Mahler, Lambiase)
- Beam instrumentation preliminary design. (Gassner)
- Vacuum chamber, pumps, controls preliminary design. (Mapes)
- Cryogenic piping preliminary design. (Than, Orfin)



Summary

Co-ordination meetings and system documentation are underway.

CeC Lattice has been frozen, preliminary beamline design complete.

Major component specifications have been defined.

Major components (RF PS/Cavities, Magnets/PS, Cryogenic systems) have been ordered.

Site preparation is well underway.

500 MHz buncher cavity assembly/installation well underway.

Cryogenic helium recovery system installation underway.

