



Status Report on the Alignment Activities at SLAC

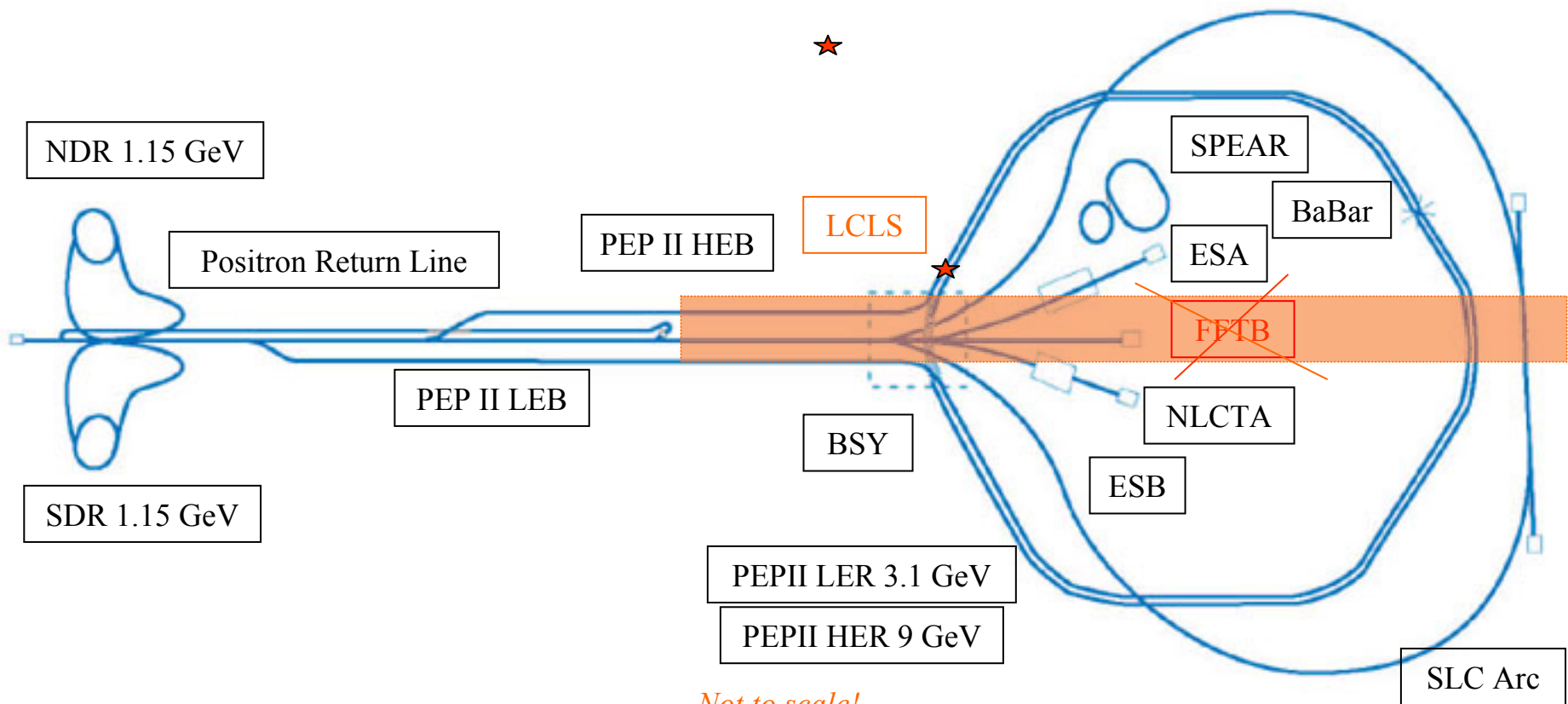
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Stanford Linear Accelerator Center,
Stanford, CA, USA



Talk Outline

- SLAC Site Overview
- SLAC Projects
 - PEP-II and BaBar
 - SPEAR3
 - GLAST
 - LCLS
 - SABER
- AEG R&D
 - Instrumentation
 - Software
 - GIS

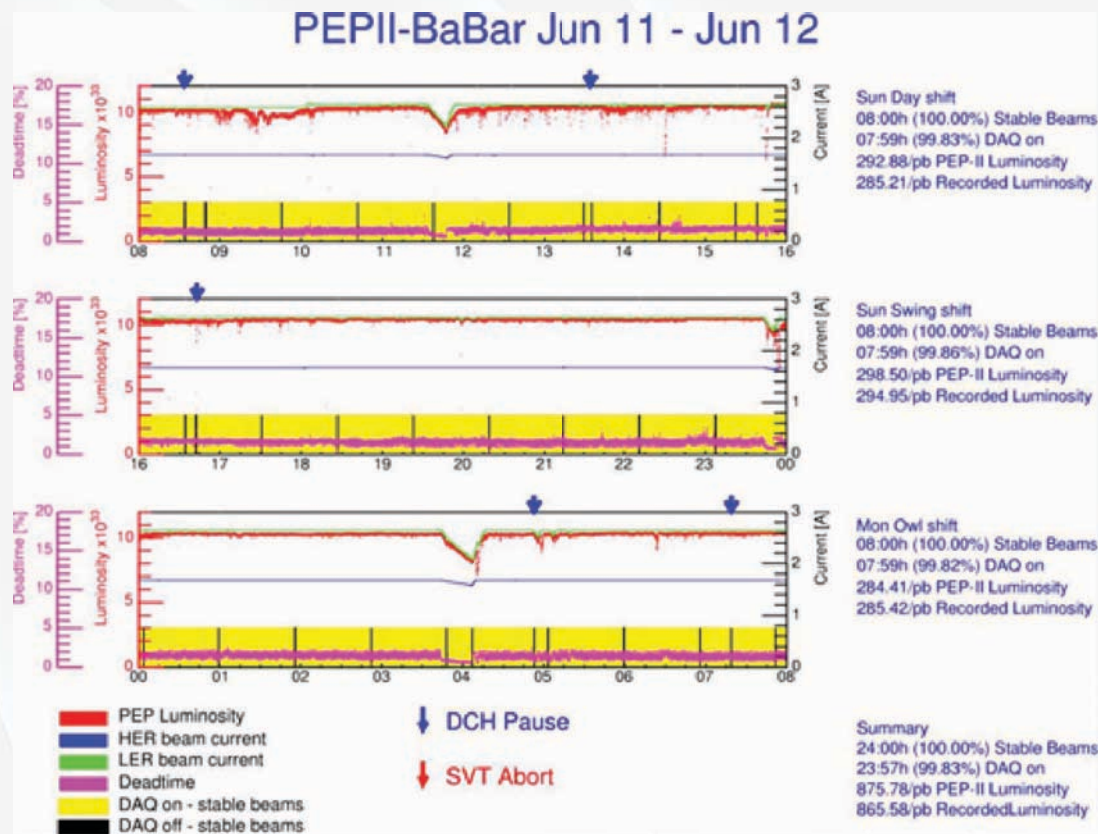
SLAC/SSRL Site



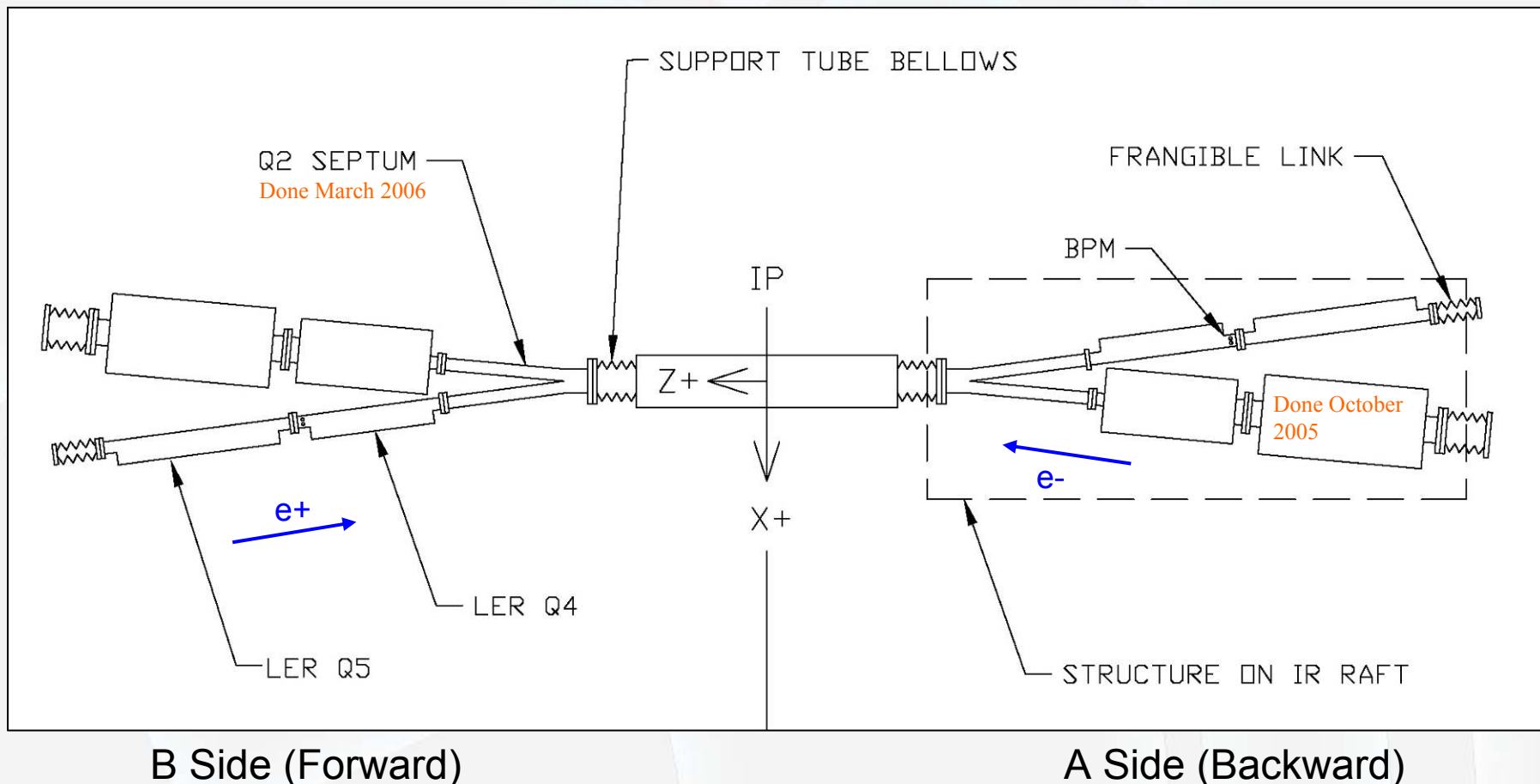
Not to scale!

PEP-II Asymmetric *B* Factory

- Current Performance
 - > 3x peak luminosity
 - > 5x integrated luminosity
- Ring Upgrades
 - Vacuum Chambers
 - BPMs
 - HER RF Stations
- Future
 - 2006 Downtime:
 - August to November
 - Run 6:
 - December 2006-August 2007
 - 2007 Downtime:
 - September to November
 - Run 7:
 - December 2007-September 2008



IR2 Vacuum Chambers



From John Seeman Downtime Presentation

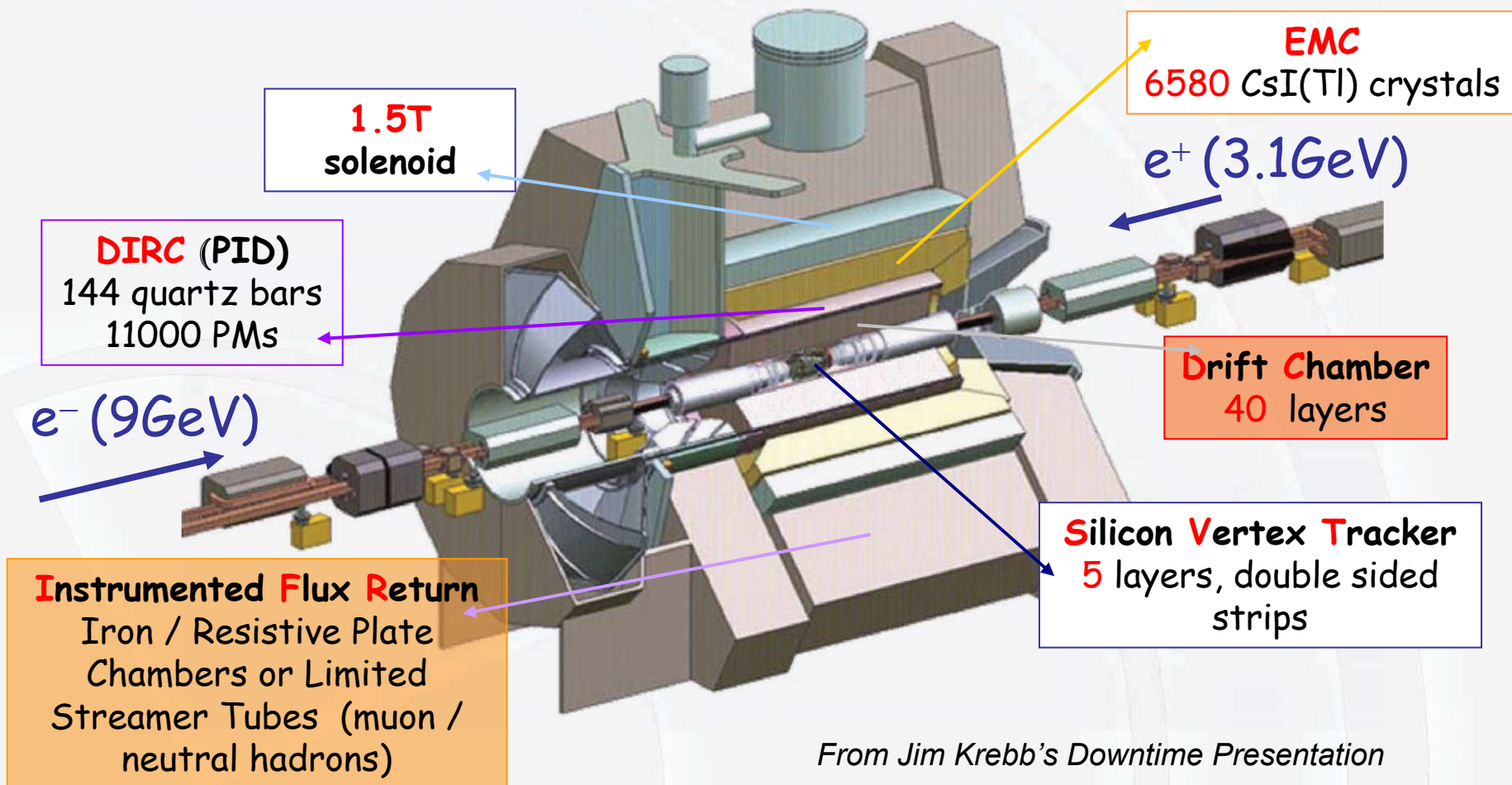
Q2 Chamber As-Built Survey



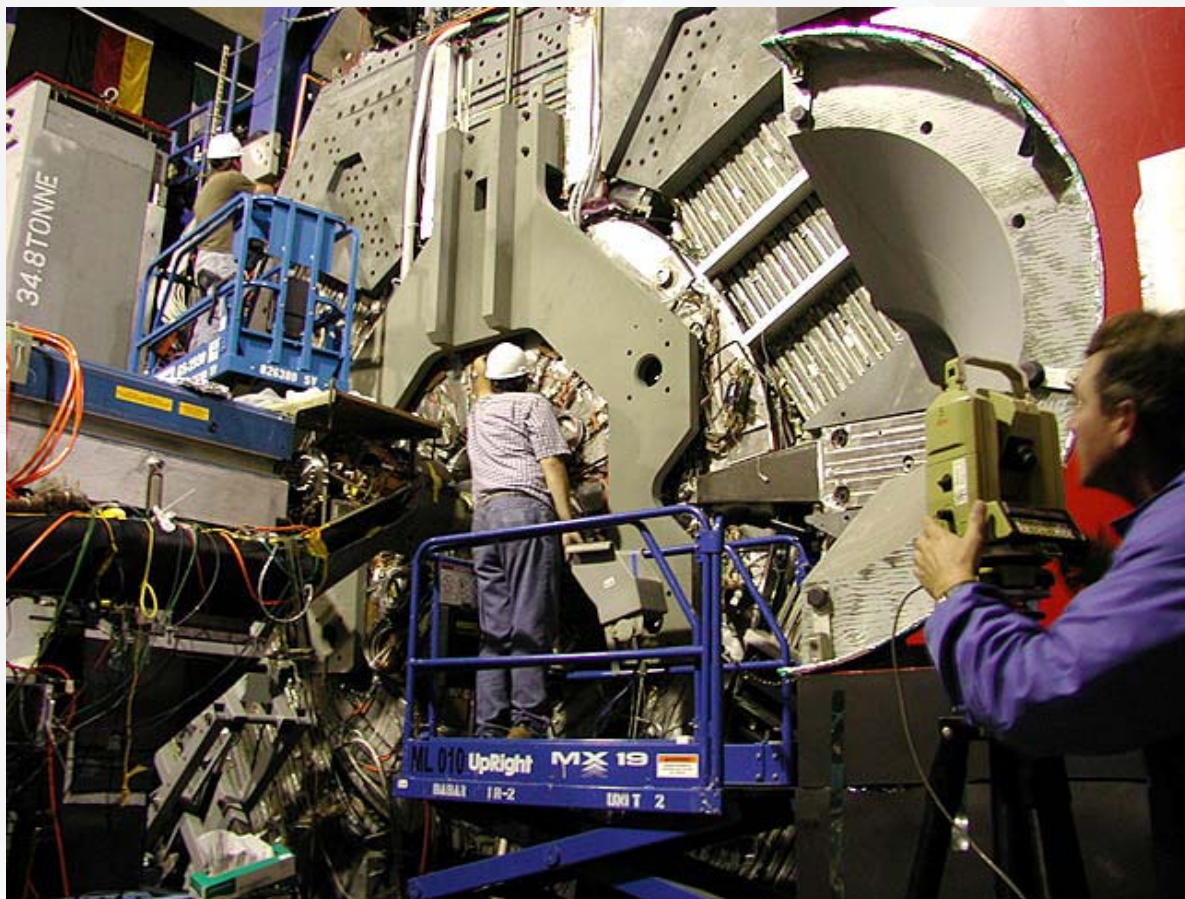
HER Q5 Chamber Fiducialization



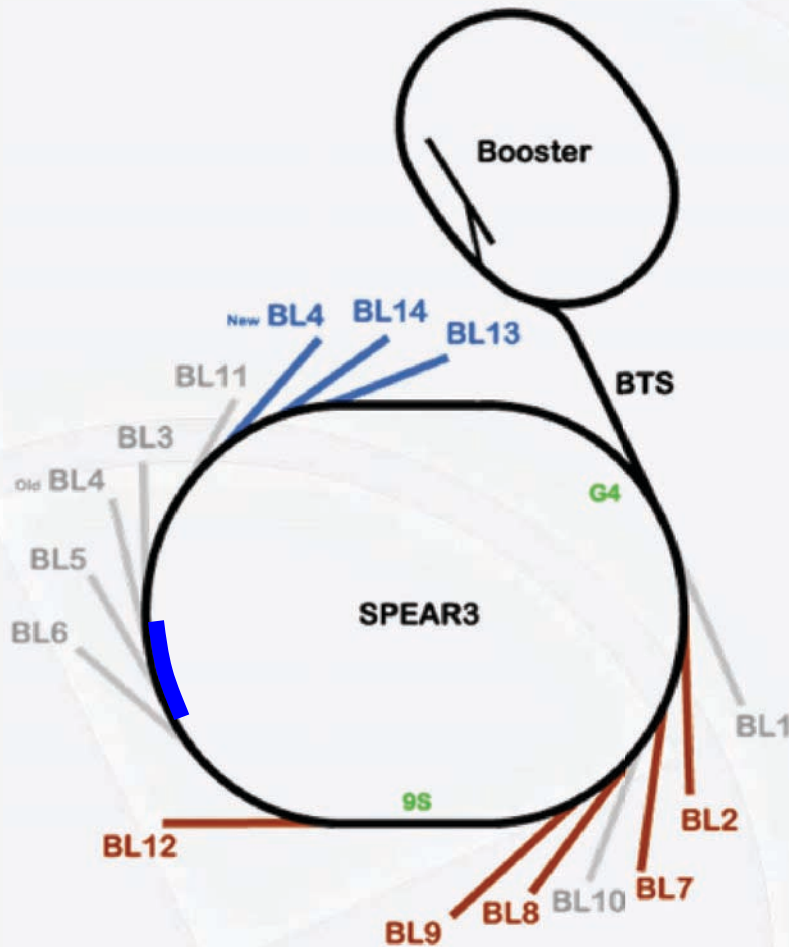
BaBar Upgrades



BaBar Survey



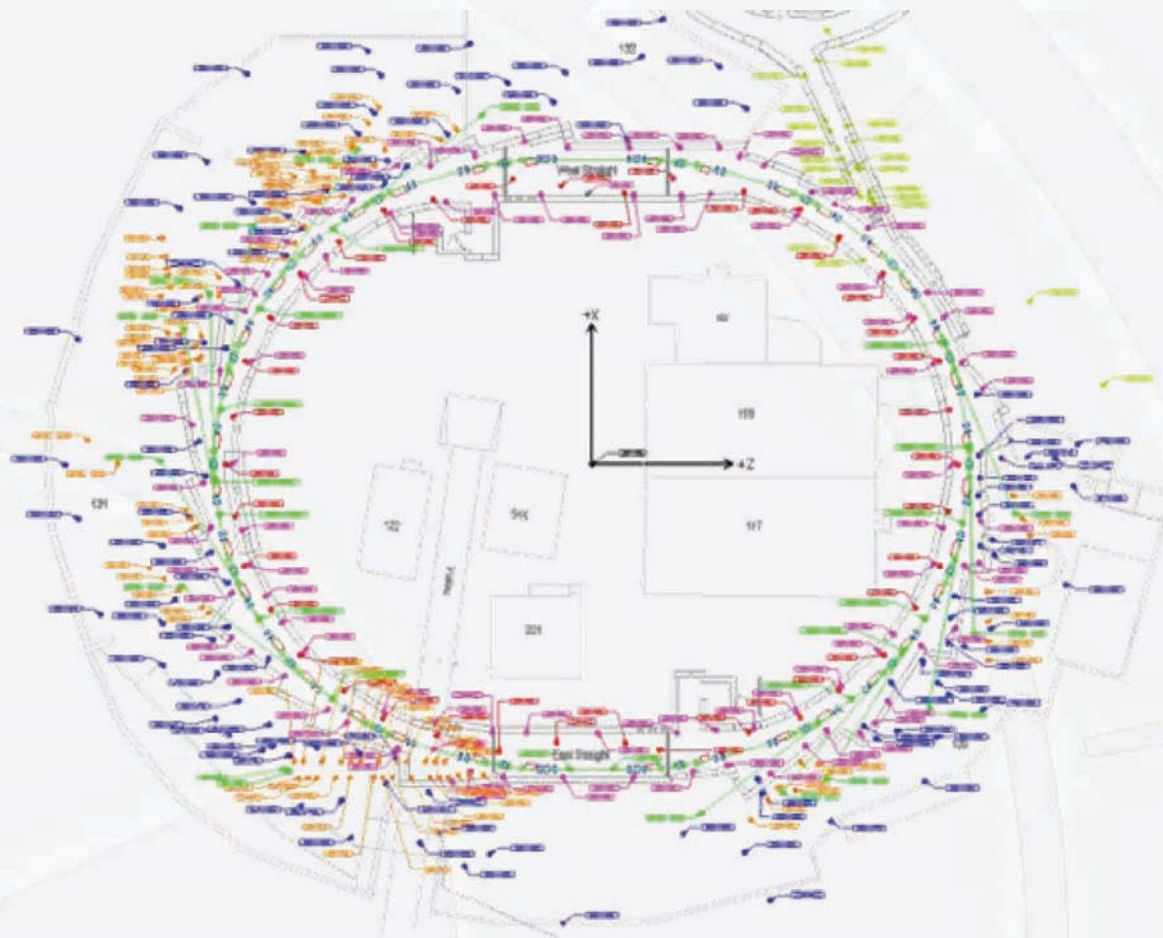
SPEAR3



- 2005 Downtime
 - Booster moves
 - Ring mapping
- July 05: HLS set-up #1
- Nov 05: HLS set-up #2
- 2006 Downtime
 - 9S Chicane with U22
 - G4 SLM H1 mask move
 - Plug lines for future BLs
 - Support to BL upgrades
 - Ring mapping

SPEAR3 9S Installation

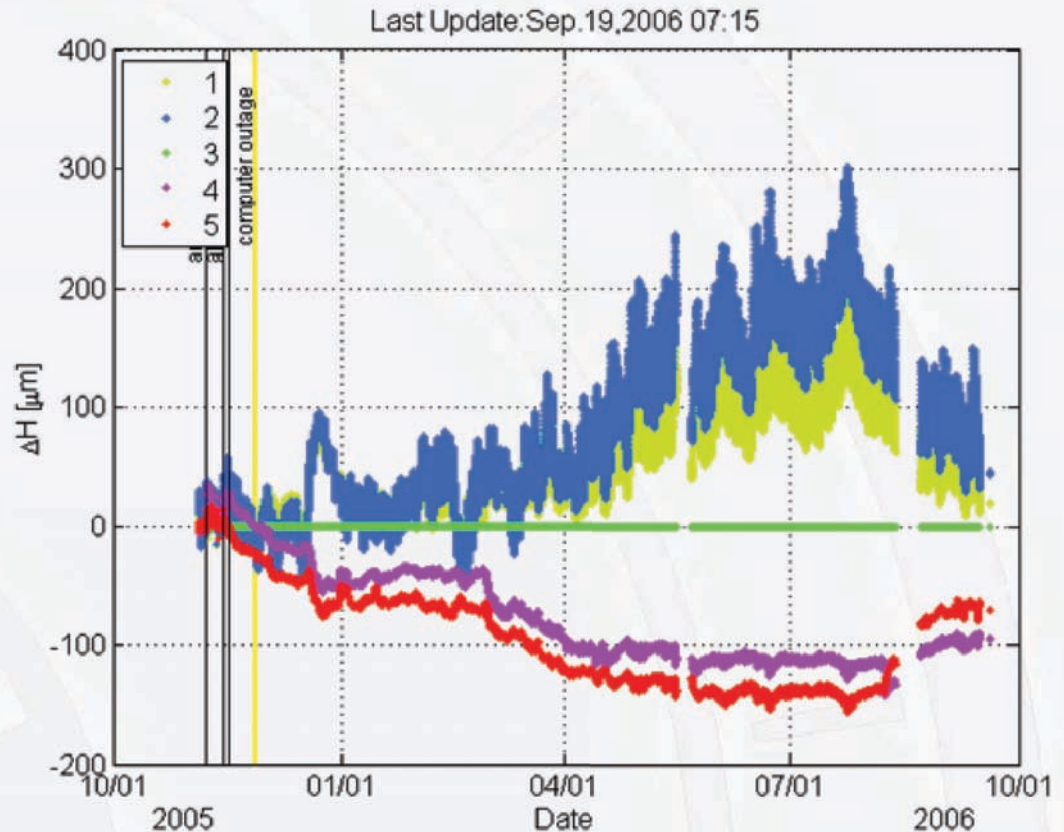




SPEAR3 HLS set-up



Sensor 3 is chosen as reference and the data are filtered over a 15 minute period.



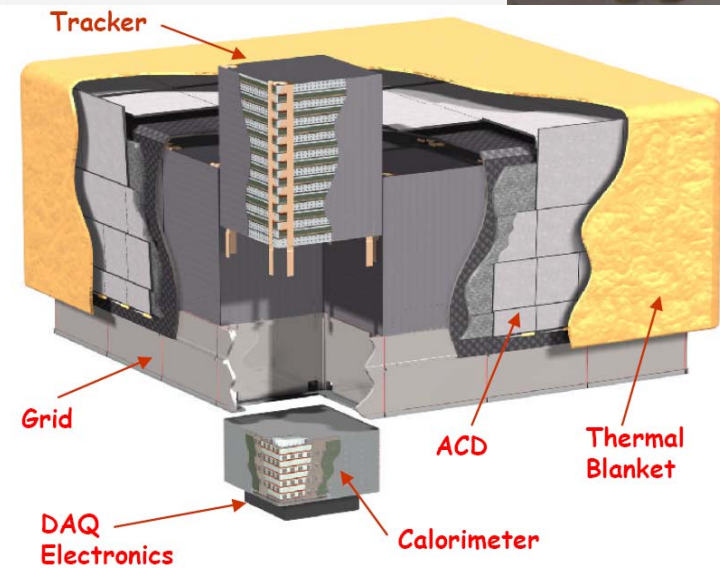
http://www-group.slac.stanford.edu/met/Align/Spear3/SPEAR_WWW/nov05/autoplot.html



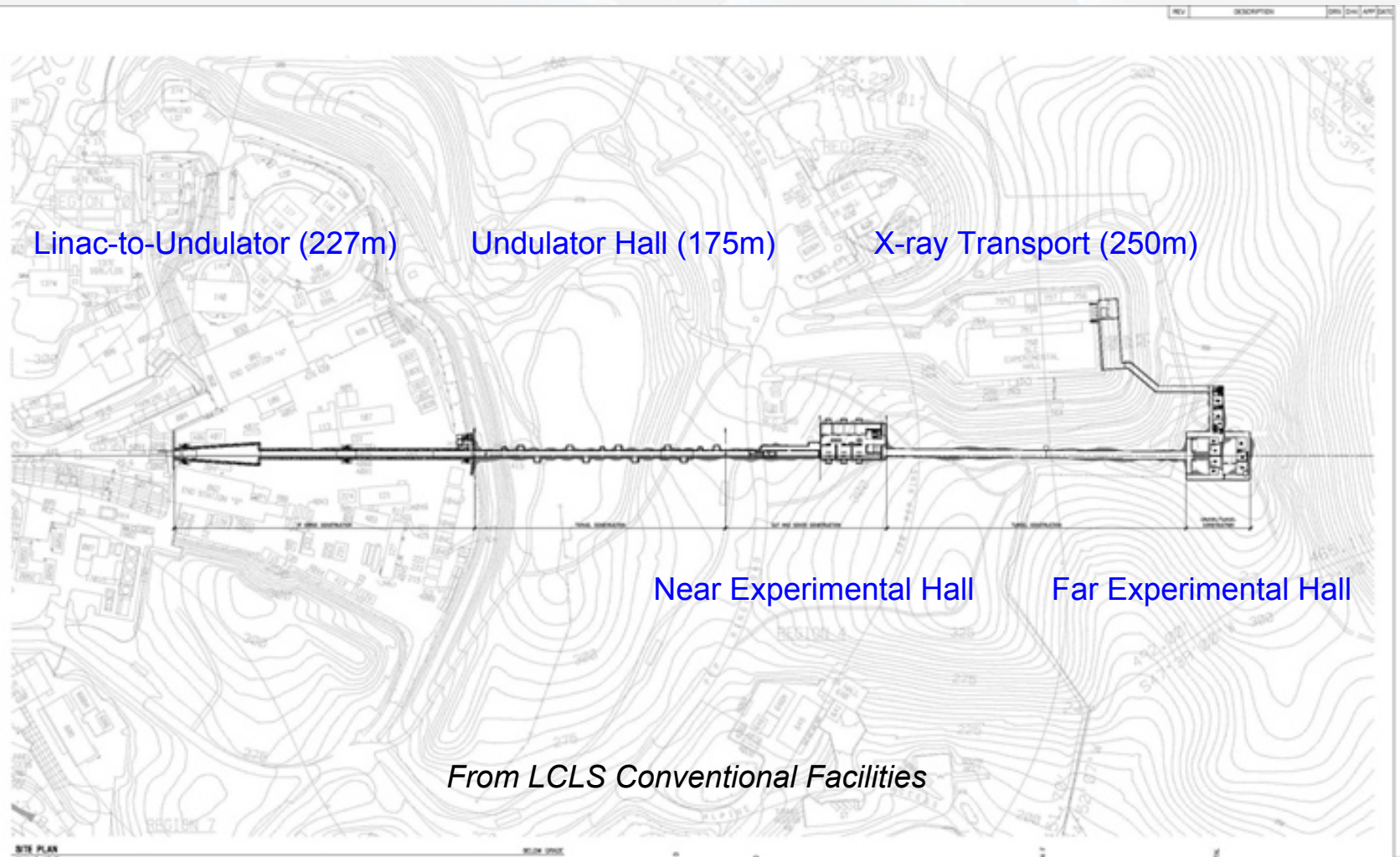
GLAST LAT

- GLAST (Gamma-ray Large Area Space Telescope) consists of 2 instruments:
 - The Large Area Telescope (LAT)
 - The Gamma-ray Burst Monitor (GBM)
- 2002-2005: QC and fiducialization of GLAST trackers in Pisa, Italy
- 2004 - 2006: Assembly at SLAC in Building 33
 - Room Network and Laser Tracker Standard Deviations Study
 - Stand and Grid Survey
 - Tracker Survey: 2, 6, 8 and 16
 - Extra Surveys: AntiCoincidence Detector surfaces, electronic boxes, radiator brackets, heat pipes
- May 2006: Sent from SLAC to the Naval Research Laboratory in Washington D.C. for environmental testing
 - Radiator survey
- Launch scheduled Fall 2007 from Kennedy Space Center in Florida

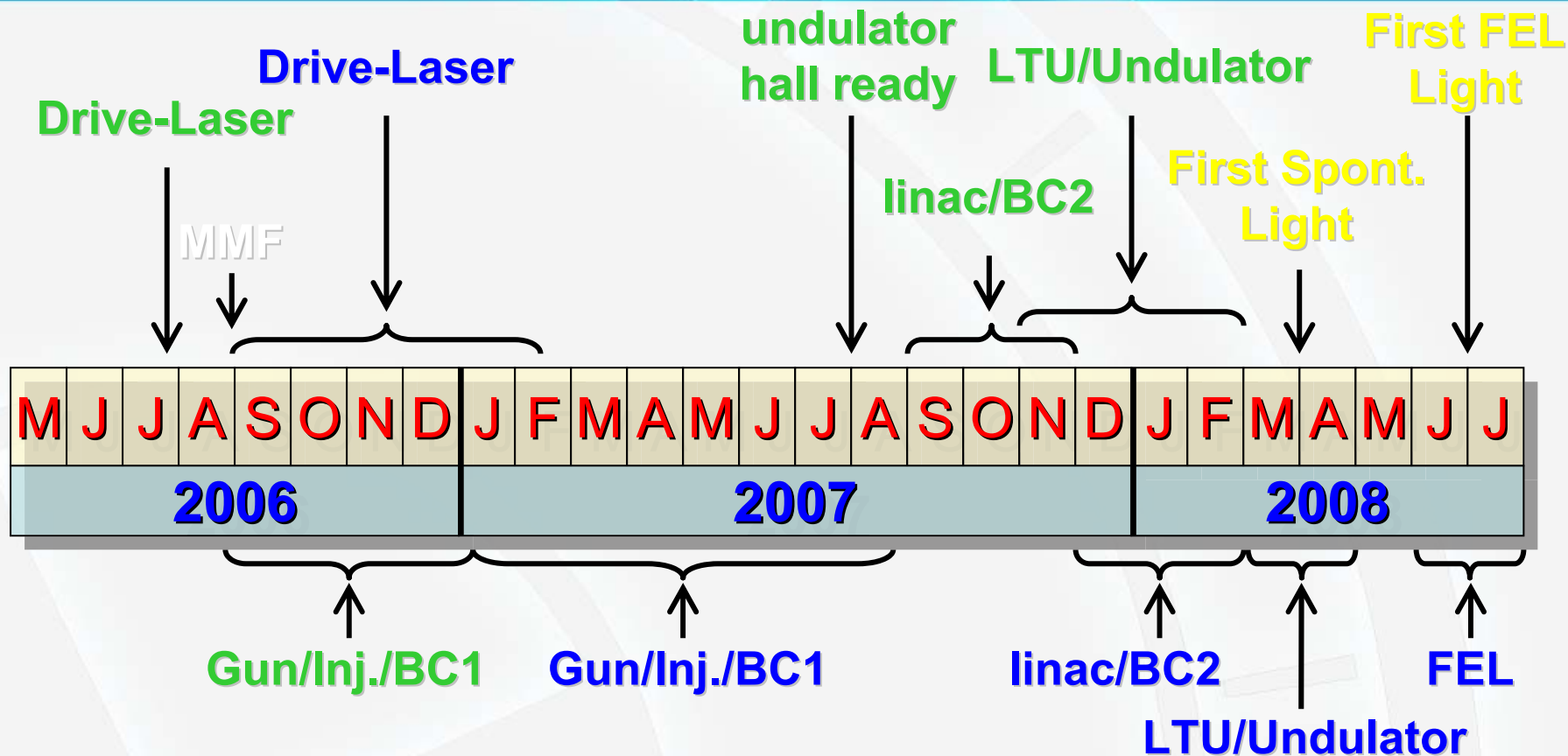
LAT Tracker Survey



LCLS: Extension to linac



LCLS Time-Line



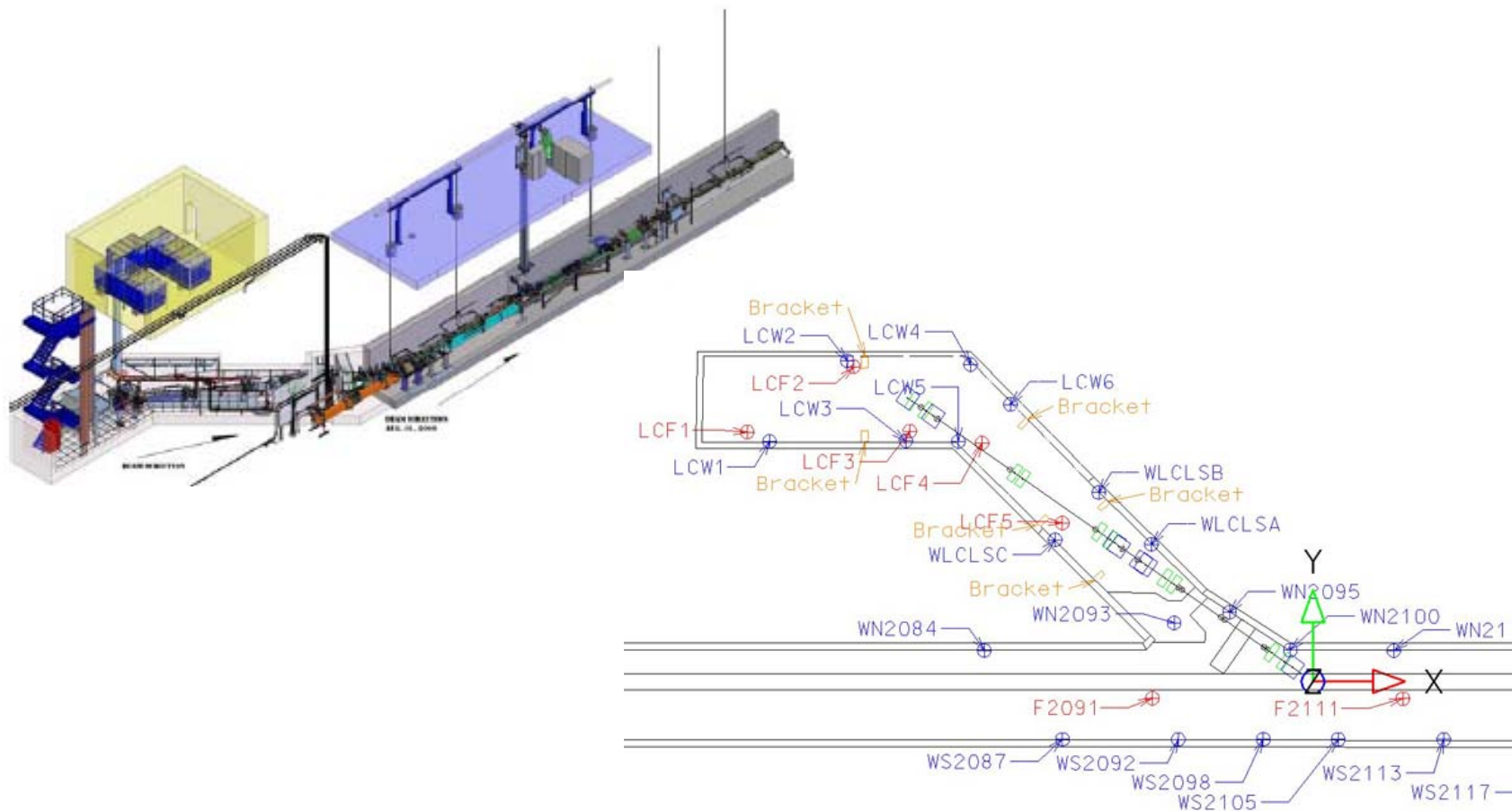
From John Galayda DOE Status Meeting August 2006
Installation in green; Commissioning in blue



LCLS Survey Activities

- Support to Conventional Facilities
 - Coordinate systems
 - Monument installation
- Support to MMF set-up
 - QC Kugler and Dover benches
- Alignment in Injector Vault
 - Field alignment for laser and GTL
 - QC Gun/Solenoid assembly
- Survey of existing linac
 - Linac laser alignment retrofit
 - Gyro and long distances observations
- Planning and R&D studies for Undulator
 - Monitoring systems (WPM and HLS)
 - Portable HLS and wire
 - Plummet studies

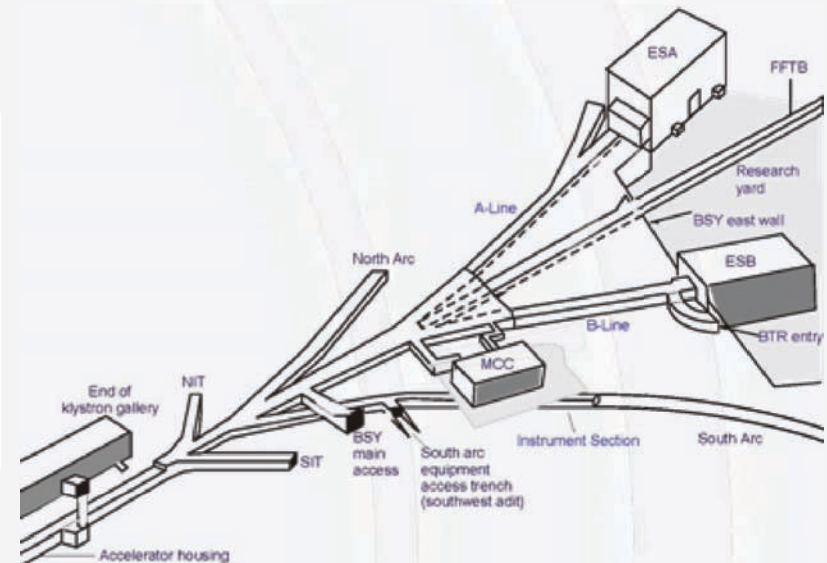
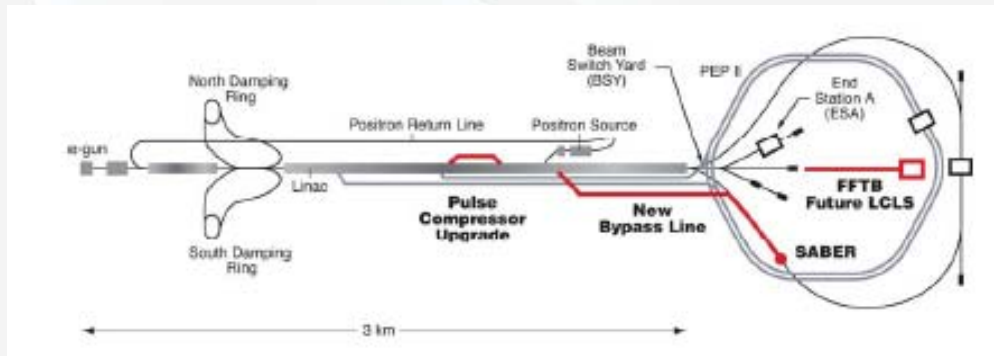
LCLS Injector Vault



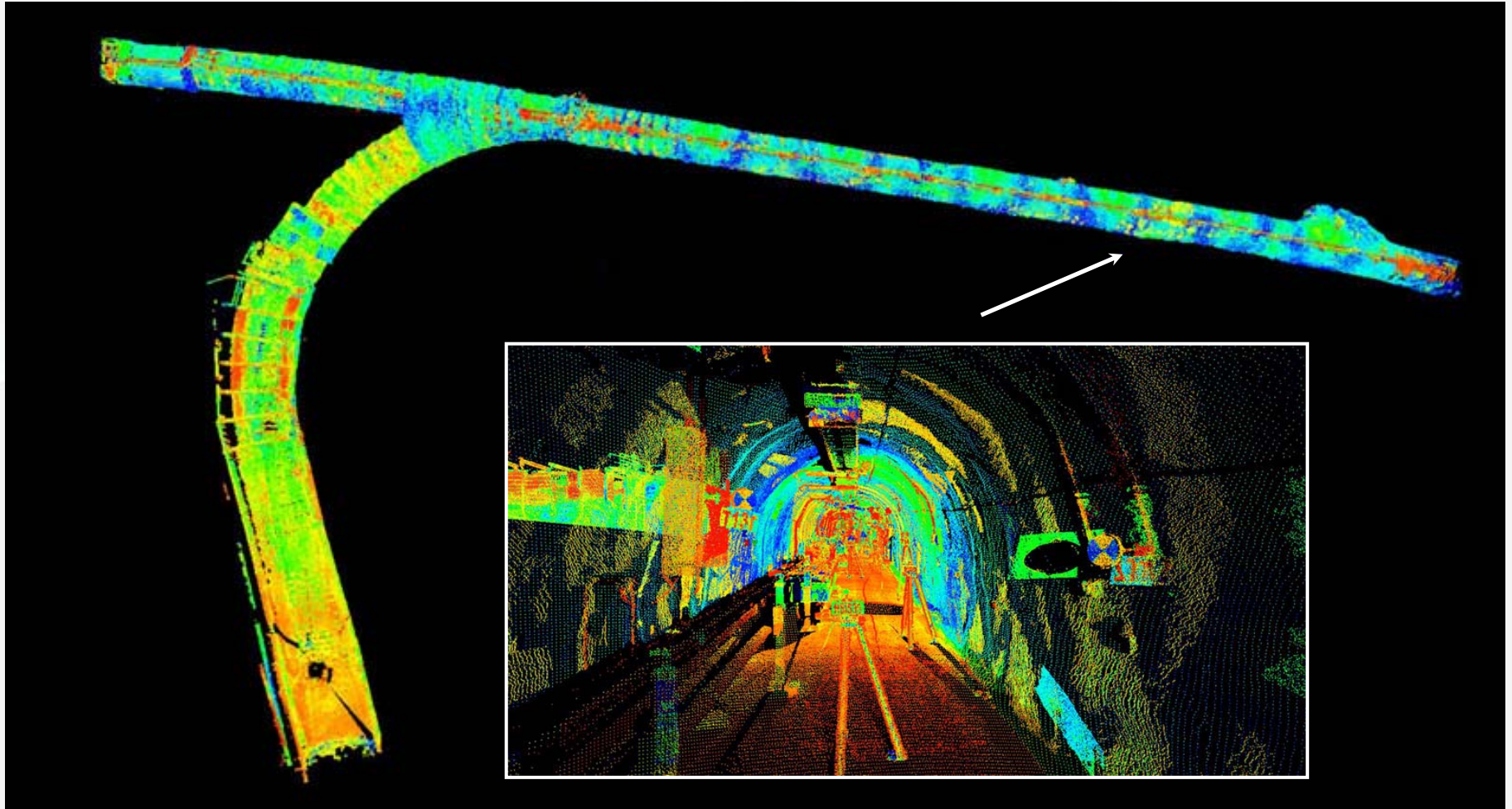
SABER

South Arc Beam Experimental Region

- SABER is a high energy electron and positron beam line intended as a replacement for FFTB.
- SABER is designed in 3 steps:
 - An electron/positron compressor in linac sector 10
 - A bypass line (linac sectors 20-30)
 - A 70 m long straight section of the south arc of SLC (Instrument Section)



SABER As-Built Survey



SABER Magnets Survey





Instrumentation

- Total Stations:
 - 4 TC2002
 - 2 TDA5005
 - 1 Leica TCRA1105
- Laser Trackers: 2 FARO Xi
- Robotic Arms: 3 FARO Platinum Arms: 4, 8 and 12 ft
- Automatic Levels: 2 Leica DNA03 and 2 Trimble DiNi12
- Optical Tooling: Brunson and K&E jig transits, site levels and borescopes
- Miscellaneous:
 - 4 Fogle WPS-2D
 - Capacitive and ultrasound HLS sensors
 - 1 portable HLS system
 - 1 autocollimator Elcomat 2000
 - 4 HP/Agilent interferometers
 - 2 gyro-theodolites Gyromat 2000
 - 6 optical plummets
 - Inclinometers
- Laser Scanner: Z+F Imager 5003
- GPS: 1 Trimble NetRS and 3 Leica SR-530

- Description
 - Network Analysis: LEGO
 - Interface Tool: LEGOServer
 - Visualization Tool: SIMS and MicroLEGO
 - Management Tool: WinGEONET
- Ongoing developments for field data capture with mobile devices operating under the .NET Compact Framework

Graphics Information System



Conclusion

