Stanford Linear Accelerator Center

SLAC EPICS Projects

Yesteryear, Today, and Tomorrow

Present ESD EPICS

- PEP-II RF – 8 VXI-based stations
- Bunch Injection
- Damping Ring RF – Allen Bradley support

- Bucket-wise luminosity monitor
- NLC Test Accelerator – 2 VME IOCs
    - 60/120 Hz pulsed operation
- PEP-II Tune tracker

- Other SLAC EPICS Projects
    - Longitudinal Feedback – John Fox's group
    - SPEAR III upgrade (Ongoing)
   - BaBar – Slow control – many IOCs.

EPICS Tools and Applications

- StripTool is now a sine qua non of the control room
- Channel Archiver being mated to Oracle for speed and flexibility
- VDCT (newest Database Configuration Tool) now treated as a reliable tool.
- EDM (newest Display Manager) now available at SLAC for test
- Alarm Handler in use
- Strong core of EPICS developers, growing as we speak.
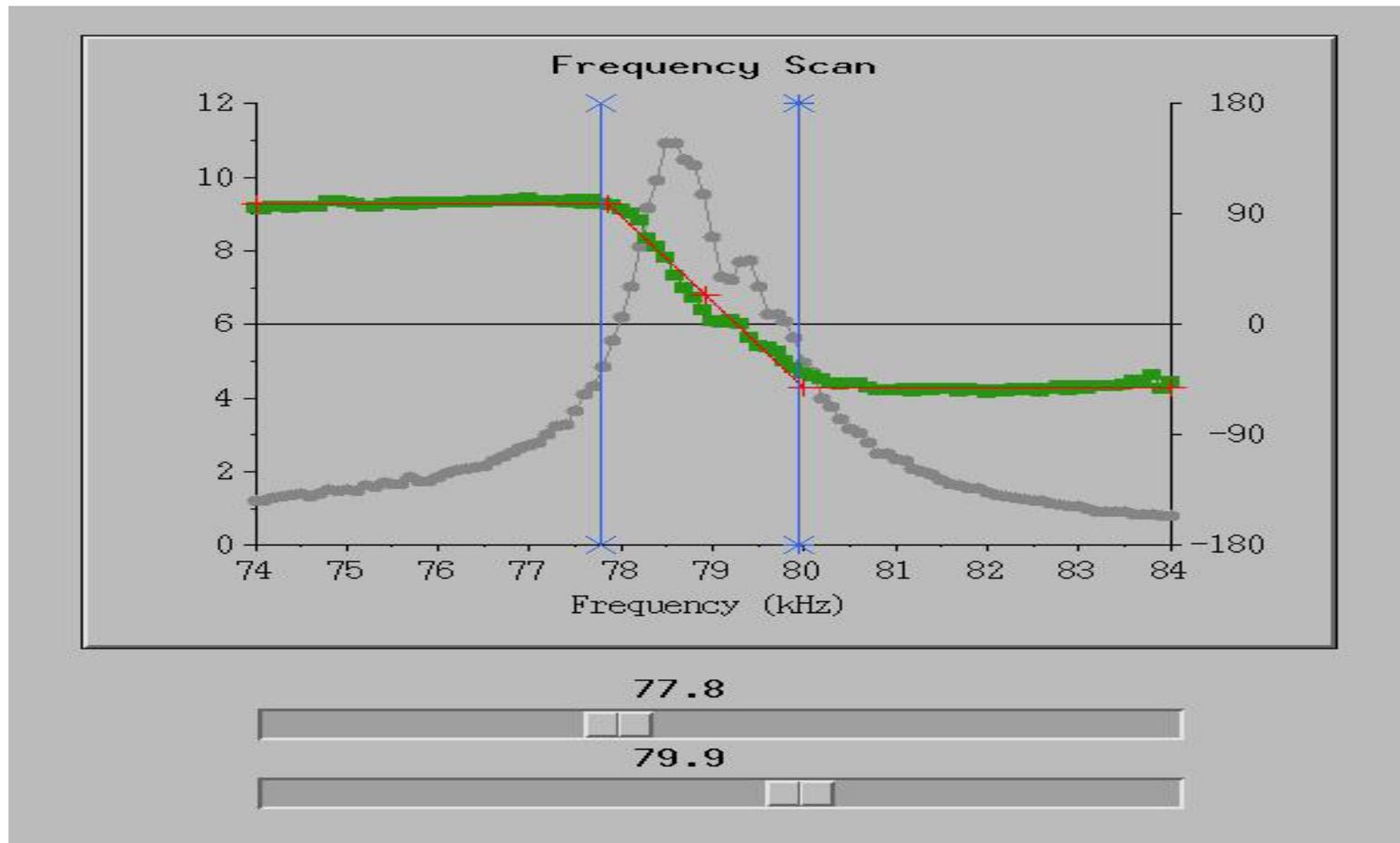
Fill and luminosity data
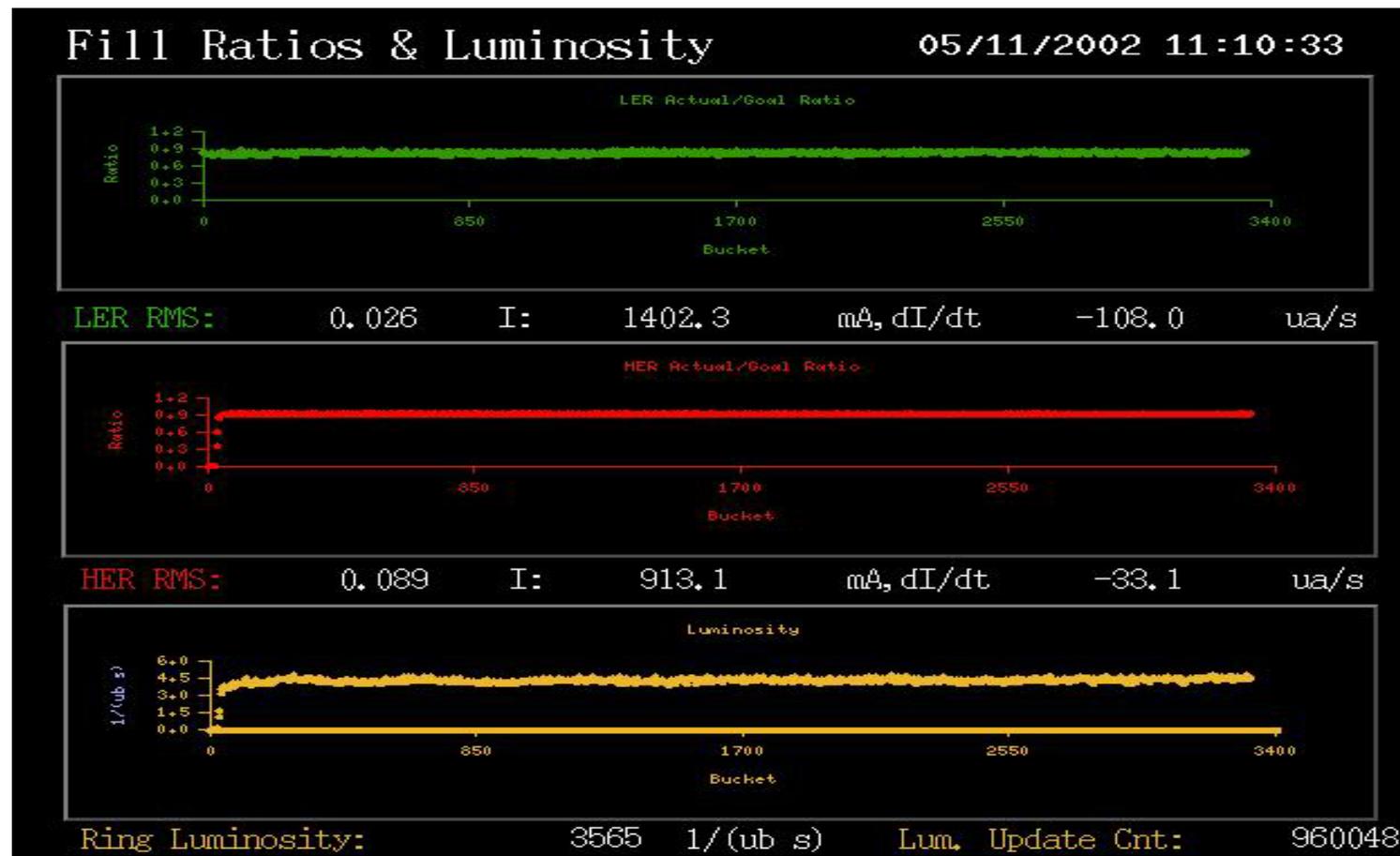
NLC Test Acc. Upgrade

- Veetest & Labview (½ Hertz)

- EPICS replacement
  - Two new IOCS
  - 60 Hz RF control
    - Scanning ADC fault data
    - Complex subroutine records

PEP-II Tune Tracker

ESD EPICS Devices

- Allen Bradley – DCM-based

- GPIB – ethernet LAN and Industry Pack

- Shared Memory – Bit3

- Many SLAC-specific RF VXI-based modules

- CAMAC hardware and drivers from TJNAF

- VSAM (Slow analog)– BaBar and NLCTA

- ADC, TDC, DAC, Dig. I/O – NLC Test Accelerator

Current ESD Epics Projects

- **NLC 8-Pack Support (Due end of Autumn)**
  - Next Step for the NLC Test Accelerator
  - New ADCs, RF Control
- **General GPIB support (Wishlist)**
  - Replacing HPUX-based GPIB support
- **PEP-II RF upgrade (Due end of Summer)**
  - More RF stations, enhanced VXI RF modules

Current EPICS Plans

- Upgrade PEP-II RF IOCs from niCpu030 to PPC VXI Controllers
- Move all production to 3.13.6 during the summer
- Provide SNL/SEQ support
- Continue to coordinate SLAC-wide EPICS
- Look seriously at RTEMS
- Switch to VDCT
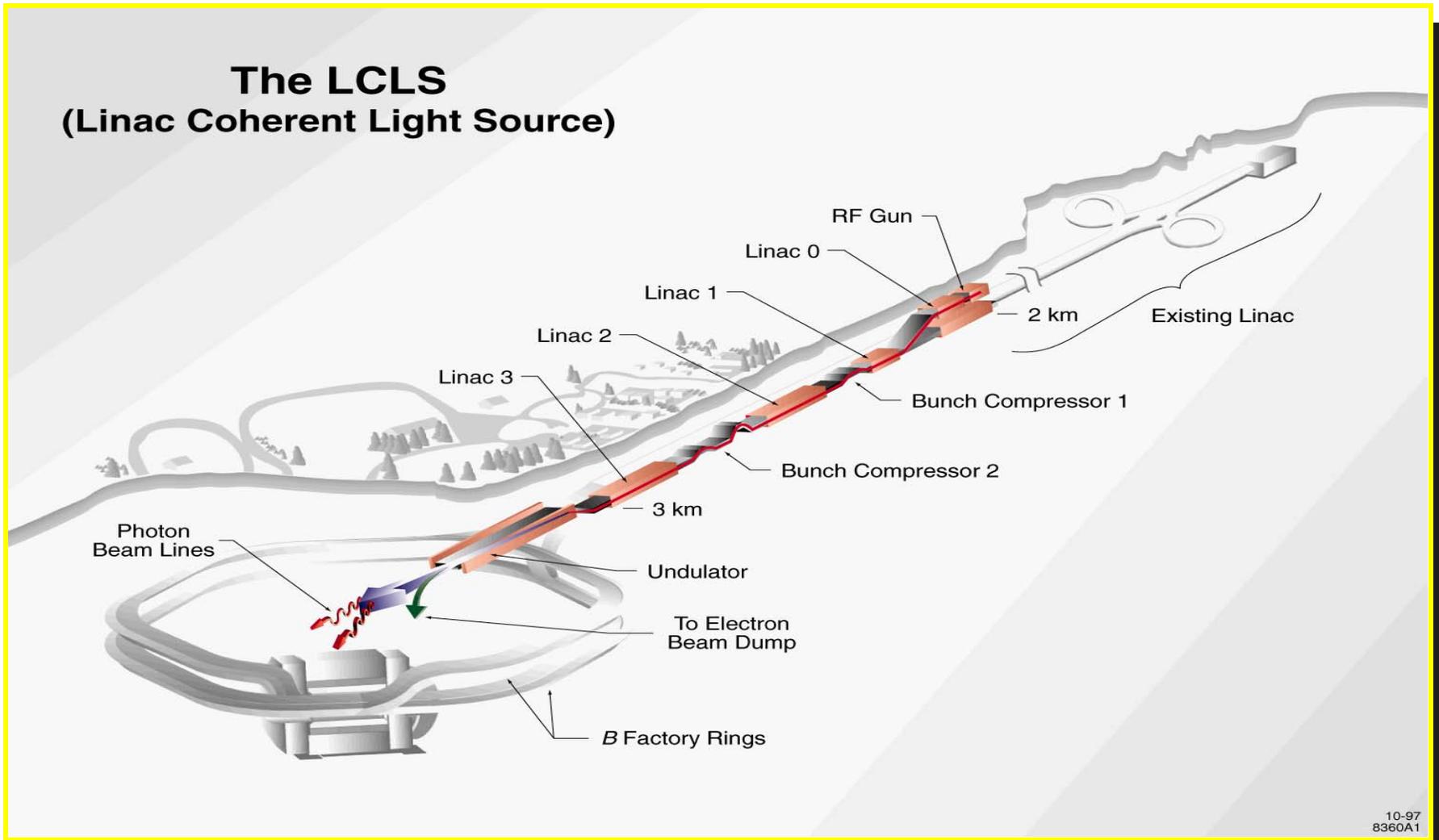- Keep abreast of 3.14 readiness
- Provide SLAC EPICS training

Linear Coherent Light Source

- Just passed CD-1 Lehman review
- SLAC/LLBL/LLNL/Argonne collaboration
- 270 Million dollar project
- Construction start 2006/ready 2008
  - When do we get first real money?
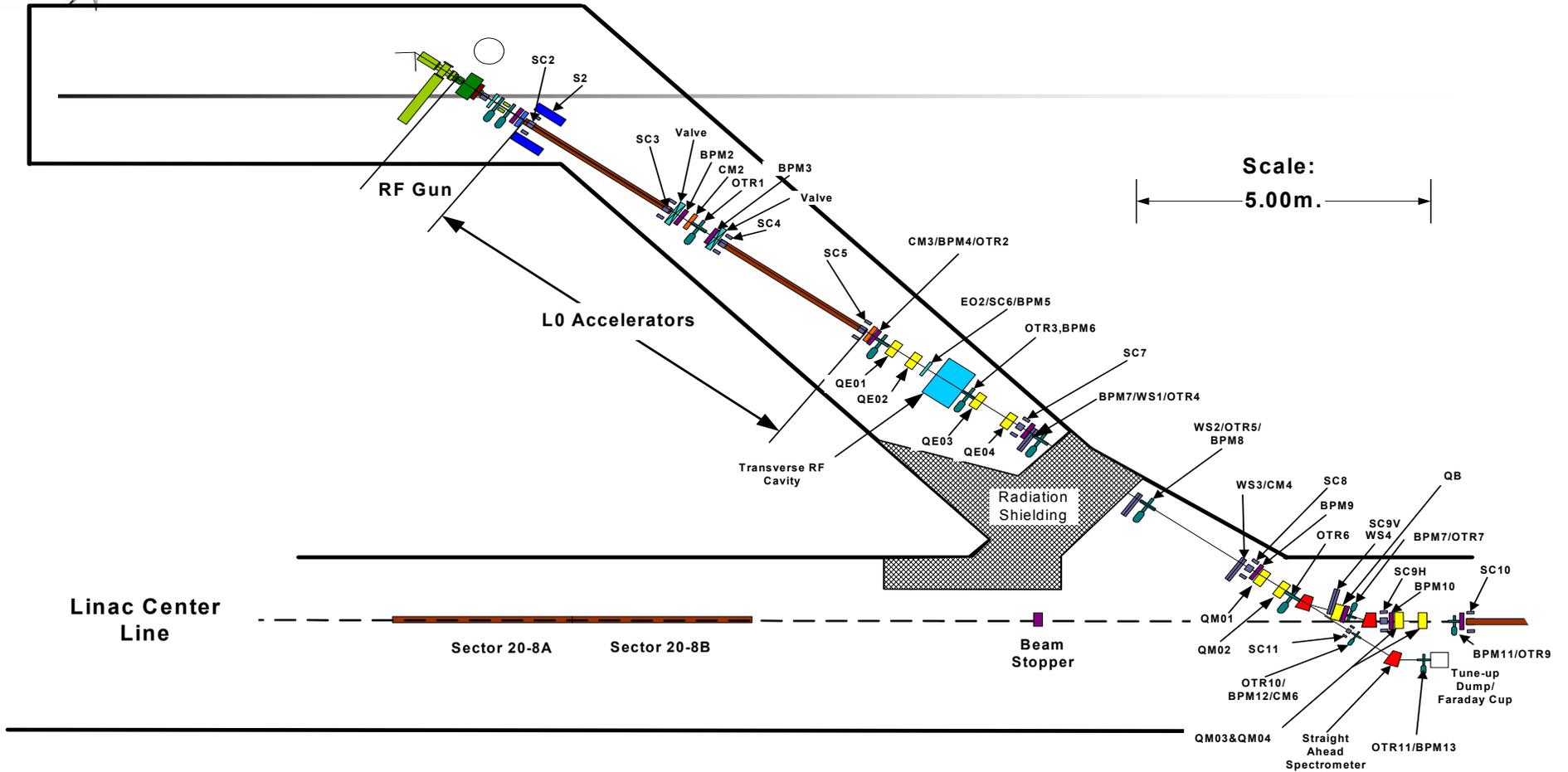- EPICS to be used wherever reasonable
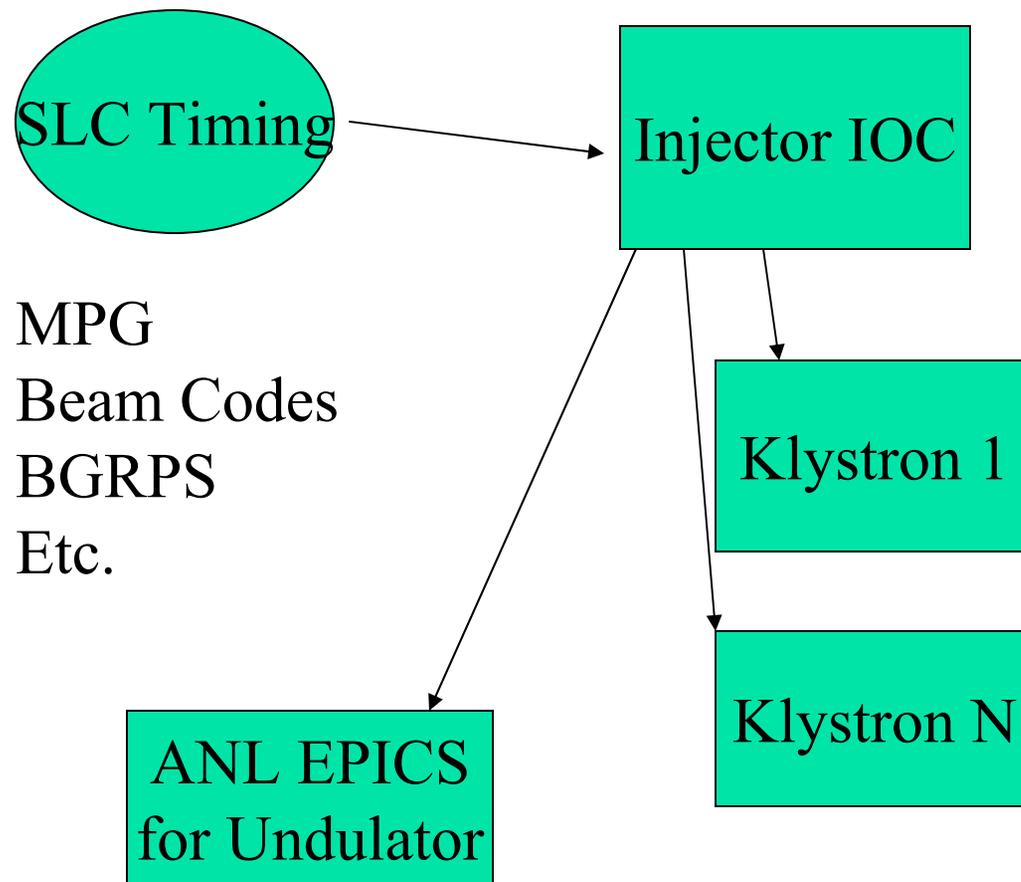
The LCLS
(Linac Coherent Light Source)

LCLS Injector Parts

LCLS Injector in EPICS

SLC Timing

Injector IOC

Klystron 1

Klystron N

ANL EPICS
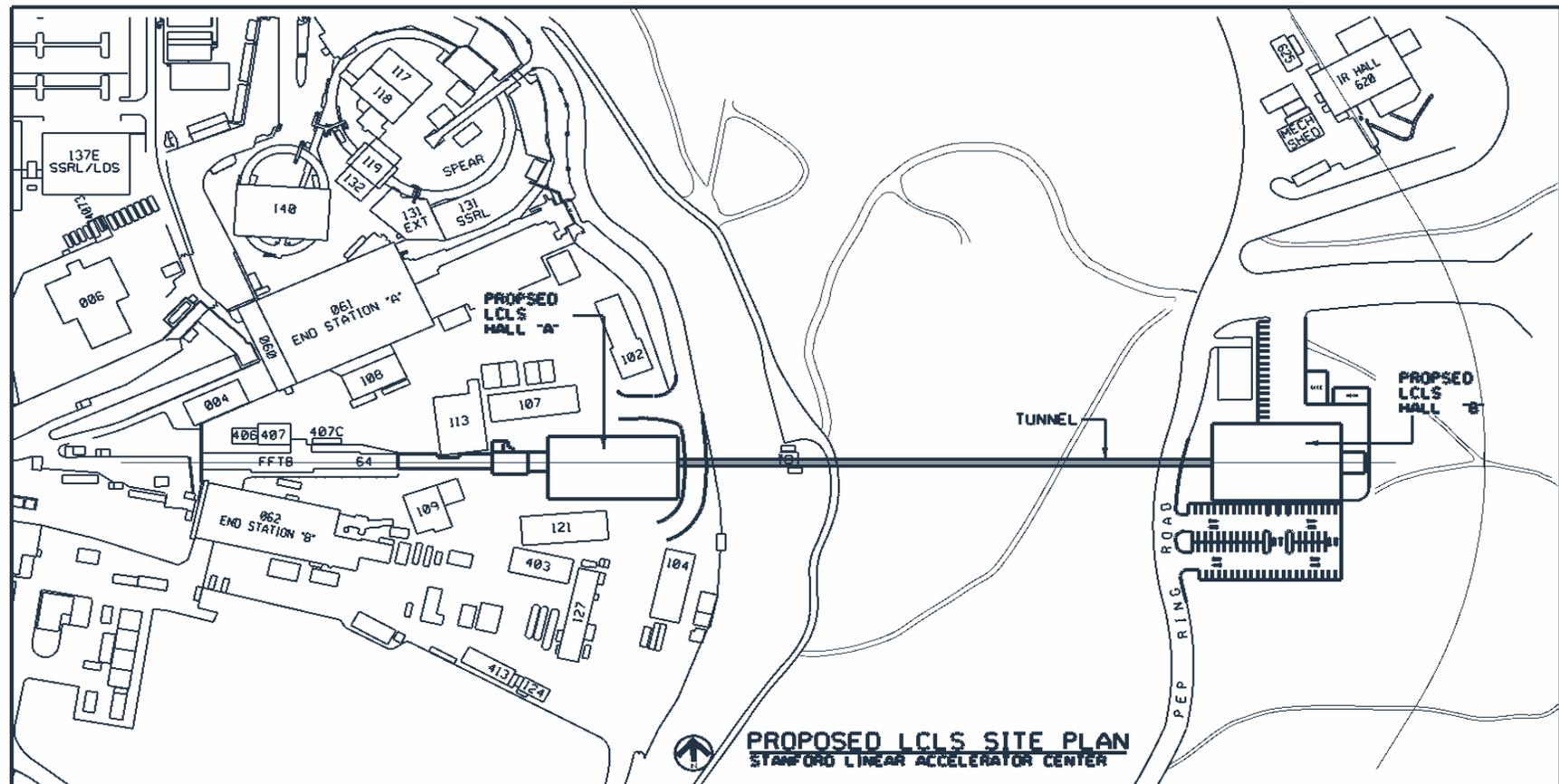for Undulator

MPG
Beam Codes
BGRPS
Etc.

Timing slave to SLC
Timing master for
Klystron IOCs

Evaluate APS / SNS
timing systems

All Klystrons either
fully SLC or fully
EPICS!

LCLS Site Plan

PROPOSED LCLS SITE PLAN
STANFORD LINEAR ACCELERATOR CENTER

LCLS Undulator Controls

- Supplied by Argonne APS - lock, stock, and barrel
  - Employs and extends designs from LEUTL (Low Energy Undulator Test Line)
  - All EPICS, 16 VME IOCs
- Argonne and SLAC EPICS groups will coordinate efforts during the whole project
  - Timing
  - Machine Protection
  - Networking
  - Global Feedbacks
  - EPICS Details
    - VME Crates, CPU types
    - Naming Convention
    - Database and screen design
  - Commissioning and integration