



FY08 ILC Beam Tests in End Station A

SLAC ILC R&D Meeting, November 12, 2007

BPM energy spectrometer (T-474/491)
Synch Stripe energy spectrometer (T-475)
Collimator design, wakefields (T-480)
Smith-Purcell bunch length diagnostics (T-487)
Linac BPM prototypes
EMI (electro-magnetic interference)

(+ SiD collaboration, T. Nelson et al., would like 1 week of secondary beam for testing KPiX readout chip that would be used with Tracker and Calorimetry systems. FY08 upgrades would allow self-triggering with charge sharing corrections, address known noise problems, and have new new pulse shaping. Beam test would possibly be with prototype ECAL Si Detectors, rather than CDF Si strips.)

<http://www-project.slac.stanford.edu/ilc/testfac/ESA/esa.html>



ILC Beam Tests in End Station A

2006 Runs:

- i. January 5-9 commissioning run
- ii. April 24 – May 8, Run 1
- iii. July 7-19, Run 2

2007 Runs

- i. March 7-26, Run 3
- ii. July 4-8, T490 w/ 13.6 GeV LCLS beam
- iii. July 9-25, Run 4

+ requesting one or two runs in FY08:

- i. Tentative date for main run: requesting April 21 – May 8:
28.5 GeV beam, 1.6×10^{10} , 10Hz
- ii. Unclear if subsequent run is required; if so, likely to request for august and perhaps could be done using LCLS beam.



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FY08 Run Scheduling:

- Working on co-ordination request with accelerator operations and LCLS (Erickson, Seeman, Emma etc.)
- Radiation shielding issues in BTH West (formerly FFTB West):
 - Shielding for light pipe is being re-worked; expect ready in March
 - “sky shine” for radiation from Aline running to workers in BTH West is being evaluated by rad physics

ESA Preparations for FY08 run(s):

- B108 controls racks for ESA magnets need upgrade to satisfy electrical safety; currently being evaluated
- Earthquaking braces needed for concrete blocks added at end of “bunker” in ESA (were added because of T475 detector beampipe restriction for



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T474/T491 (incl. Linac prototype rf bpms) Work:

- 2 new NMR probes being provided by DESY Dubna
- Hall probe needs to be replaced (SLAC?)
- UK group to replace 3BPM7, which had brazing problems that limited its performance
- UK/Berkeley groups to provide additional channels for calibration tone system
- Rerouting signal cables for upstream Aline bpms to go to relocated processors and digitizers in ESA rather than Counting House
- Notre Dame / SLAC to upgrade interferometer system to monitor “straightness” between BPM stations over 10 meters. Optics modeling in progress to finalize design. Plan to include a ccd camera to monitor stability of interferometer laser pointing.
- NIM paper should be complete by end of November on 2006 data: BPMs 1-2, 3-5 and 9-11 in ESA, but not including spectrometer magnets and other 2007 upgrades (calibration tone system, Helmholtz coil calibration); Mark Slater is primary author. Bino Maiheu is starting a NIM paper on the 2007 data.
- New supports/movers for Linac rf BPMs 3,5; plan to use FFTB movers. Work in progress to remove these from BSY (*this work is covered by Adolphsen’s Linac WP*); need to replace BSY quad supports with T0 stages (from SLC FF) and support plates being made in Racine’s shop
- Johnny Ng working on vibration data analysis with recent measurements from geophones, and interferometer; working on plan with C. Hast (in consultation with G. Bowden, D. Walz and others) to reduce vibrations from LCW distribution to magnets and collimators



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T475 Work:

- Quartz fiber detector has been shipped back to U. Oregon to diagnose/fix signal ringing and crosstalk issues
- Evaluating an upgrade to utilize the visible SR light from the wiggler for beam setup + Evaluate for energy measurements; will include a monitor system with mirror (in vacuum) and imaging optics to a ccd camera; would have readout on local PC accessed via channel access on slac network. Working to co-ordinate ccd camera and readout work with T474 camera system for interferometer.

T480 Work:

- Completing analysis on existing data; awaiting improved BPM calibration and resolution from T474 analysis
- expect new collimators to be fabricated by UK for run in late april

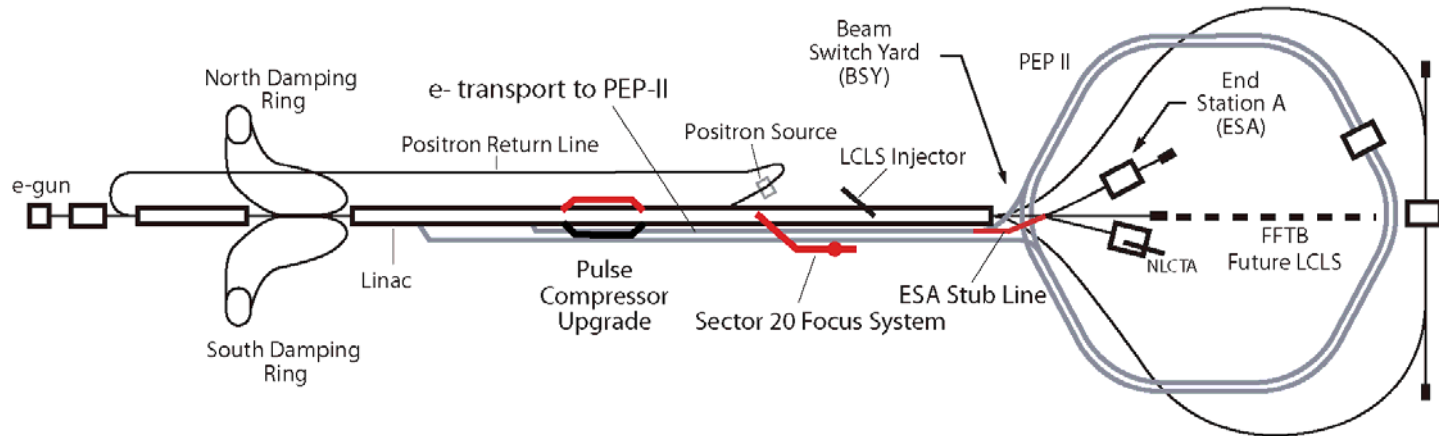
T487 Work :

- Analysis of 2007 data in progress
- Discussing plans to add polarization analysis of signal and to provide real-time analysis during data taking

EMI Studies:

- Nick Sinev plans to continue these studies; interest to test sensitivity of other electronics systems, in collaboration with other groups, to beam-induced EMI. Will test rf leakage from different connector feedthrus (bnc feedthru already tested) and rf cables.

Facilities for **AC**celerator Science and **EX**perimental Test Beams at SLAC **FACET** proposal submitted to Dept. of Energy, Sept. 2007

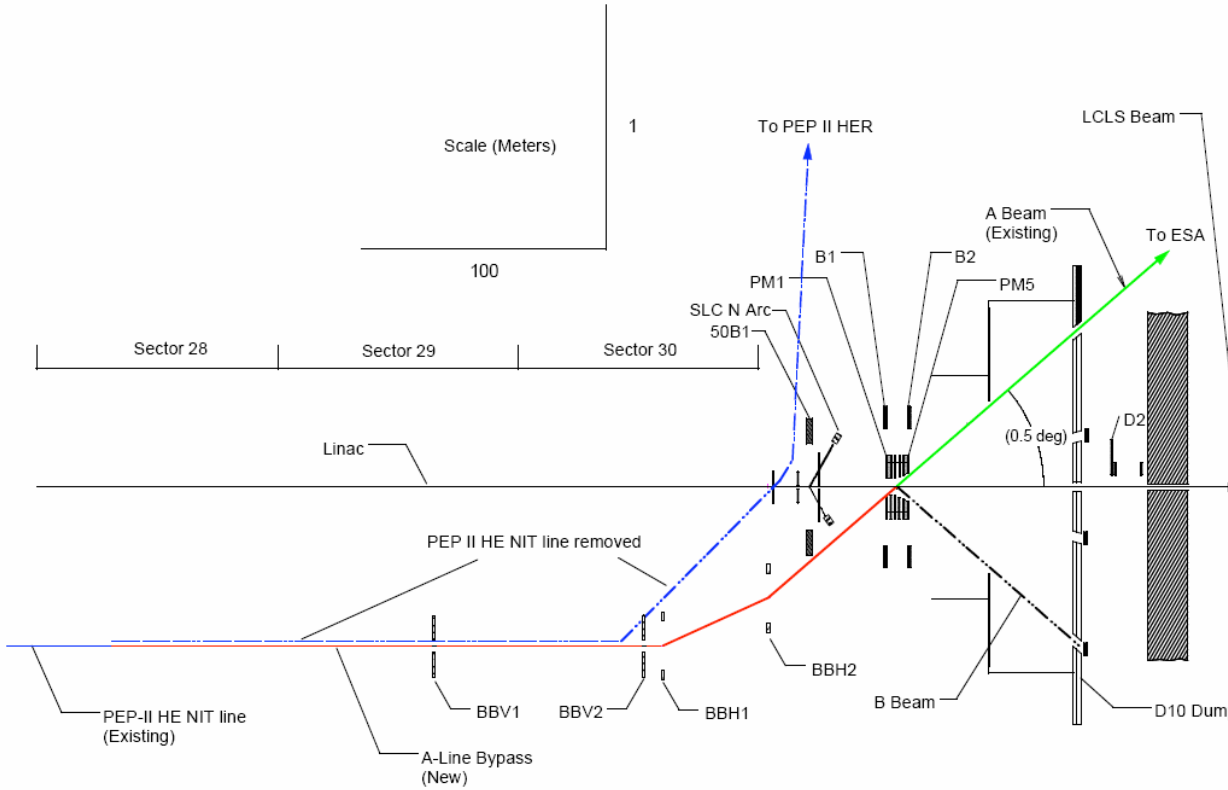


2 Experimental Regions:

1. 24 GeV beam to new Sector 20 Experimental Region for advanced accelerator physics: plasma and dielectric wakefield acceleration + other experiments requiring high energy densities
2. General purpose test beam facility in ESA: primary beams for accelerator research, secondary beams for detector R&D, beam dump experiments for radiation physics studies. Initially limited to 12-GeV electron beam, with later upgrade to 24 GeV.

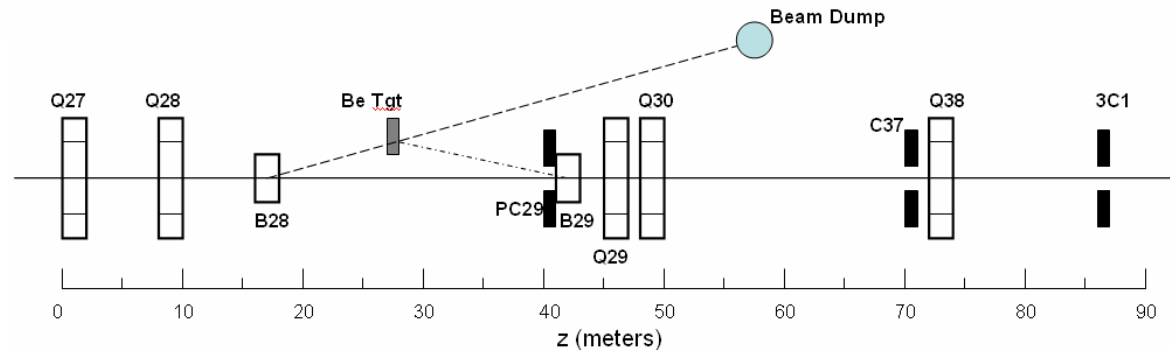


FACET Beamlines to ESA



Will re-use PEP-II HE NIT line, modified to connect to A-line in the Beam Switch Yard

Secondary Hadron production capability at end of the A-line before ESA (relocate existing Be target from BSY)





R. Arnold, K. Bane, L. Bentson, S. DeBarger, R. Erickson, T. Fieguth, J. Jaros, N. Li, D. MacFarlane, Y. Nosochkov, J. Seeman, T. Raubenheimer, D. Walz, and M. Woods

Stanford Linear Accelerator Center

Contributors to the discussion of the scientific case

Principal scientific contacts are underlined

Advanced Accelerator Research

H. Badakov², I. Blumenfeld¹, C. E. Clayton², A. Cook², F.-J. Decker¹, M.J. Hogan¹, C. Huang², R. Ischebeck¹, R.H. Iverson¹, C. Joshi², A. Kanareykin³, T. Katsouleas⁷, N. Kirby¹, W. Lu², K. A. Marsh², W. B. Mori², P. Muggli⁷, J.B. Rosenzweig², R.H. Siemann¹, M.C. Thompson⁴, R. Tikhoplav², G. Travish², D. Walz¹, X. Wang⁷, and M. Zhou²

Instrumentation and Detector Development

M. Breidenbach¹, C. Field¹, C. Hast¹, J. Jaros¹, L. Keller¹, D. Leith¹, T. Markiewicz¹, T. Nelson¹, T. Raubenheimer¹, J. Va'vra¹, and M. Woods¹

THz Radiation and Basic Energy Sciences

Y. Acremann⁵, A. Dobin⁶, S.J. Gamble⁸, A.M. Lindenberg^{5,9}, A. Nilsson¹⁰, H. Ogasawara¹, H. Siegmann⁵, and J. Stohr¹

¹Stanford Linear Accelerator Center

²University of California at Los Angeles

³Euclid TechLabs, LLC

⁴Lawrence Livermore National Laboratory

⁵Photon Ultrafast Laser Science and Engineering Center (PULSE), SLAC and Stanford University

⁶Seagate Technologies

⁷University of Southern California

⁸Department of Applied Physics, Stanford University

⁹Department of Materials Science, Stanford University

¹⁰X-ray Laboratory for Advanced Materials (XLAM), SLAC and Stanford University