U.S. Collaboration Meeting: NLC Injector Systems Activities

FNAL, LBNL, LLNL, SLAC

October 3-7, 2000
SLAC

J. C. Sheppard
NLC US Collaboration Meeting,
SLAC, October 3-7, 2000
NLC Injector Systems
Collaboration Meeting Agenda
(all meetings in Rm. 1, Bldg. 212)
Wednesday, October 4, 2000

Damping Ring Instrumentation
1430 OTR Profile Monitors: J. Frisch
1500 Beam Position Monitors: S. Smith
1615-1815 180 Hertz Operation
General Considerations: J. Sheppard

180 Hz Rings:
   Hardware Implications: J. Corlett & M. Ross
   Lattice Thoughts: A. Wolski
   Joint Meeting w/ Accel. Phys.: 1700-1815

Thursday October 5, 2000
1330-1530: Polarized Positrons and Source Laser:
            Schultz, van Bibber, Sheppard

Friday October 6, 2000
0900-1000: Central Injector Considerations:
            Kuchler, Ives, Sheppard
Tentative Work Plan: Need an “existence” proof design for Snowmass
Initially adopt two, parallel, 90 Hz rings to provide
programmatic separation of hi/lo operation
Assume that the beam pulse formats are identical albeit
potentially different bunch populations and bunchlengths
for the two programs (?background considerations)
Hardware specified by February 1, 2001, in time for layouts and
costing by April 1, 2001
Need to justify choice of two rings versus something different
Thursday, October 5, 2000: Polarized Positrons and Source Laser

Polarized Positrons:
Mercury Laser: Ray Beach, LLNL

Path to Design:

0. Literature Search, incl. alternative methods

1. Determine gamma requirements (E, N, phase space) from design/simulation of the gamma-to-polarized e+ production, collimation, collection, and capture process

2. ?Need and experiment to confirm any piece of (1.)? (is this being taken care of by Omori et al.?)

3. Scope out gamma production (a) compton plus assoc. accel. sys. (b) undulator plus assoc. accel. sys.

4. Assess feasibility, cost, schedule for (3.)

5. Does (4.) require a systems demonstration?
Thursday, October 5, 2000: Polarized Positrons and Source Laser

Polarized Positrons, cont’d.

Main difference between compton gamma laser and gamma-gamma laser is the per cent-ish efficiency of converting from polarized gammas to polarized positrons; if efficiency is about 1%, might be D.O.A. We are having a look and will make the comparison (between compton and undulator sys.)

Source Laser:

Discussed laser requirements, asked for help in assessing the urgency to begin. Should be able to have a technology readiness review with the LLNL experts (tba)
Friday, October 6, 2000 w/ Conv. Fac.

Central Injector Discussion

(1) Transport line down to main linac @ Fermilab: (in the works a la P. Emma)

(2) Need to know per meter tunnel costs plus minimum tunnel bend radii for TBM, also costs for smaller tunnel bend using different tunneling techniques. Important for cost optimizations

(3) Will update CD 04 tunnel length and power requirements for S-band and 120 Hz/180 Hz with present information

(4) Looking at double damping rings; cost for side-by-side layout versus stacked in one vault; D. Atkinson is primary contact to Conv. Fac. but will apprise S. Anderson of activities. Will discuss DR layouts with Conv. Fac. Prior to ISG (11/14/00)

(5) Discussion of Central Injector layouts; talked about timing-hence-layout constraints imposed by use of a single prelinac
The full set of collaboration presentation

Vugraphs are available on the web: see
October Collaboration Meeting Presentations by:
   J. Frisch
   A. Young
   A. Wolski
   R. Beach
   S. Anderson

Also see Second MAC Meeting Presentations by

   J. Sheppard
   D. Schultz
   J. Corlett