Tracking Group Testbeam Needs

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UC Santa Cruz
SLAC Linear Collider Workshop
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Poll of Tracking Groups

Tracking groups were polled in Fall, 2002 (> 1 year ago)

Most groups responded at some level; some not in advanced enough phase to be able to say anything too concrete

Nonetheless, trends arose that give good picture of upcoming needs

Some tracking groups anticipated need for US testbeam facilities as early as January 2004, but now it’s clear that needs won’t arise until 2005
What about Cosmics / Lasers?

Much useful work can be done with cosmic muons and/or with lasers

Can study:
- Track resolution
- Two-track separation
- Non-linear effects

But cosmics have low rates and do not address multiple-track issues

And lasers do not address delta-rays, multiple scattering, track curvature, or Landau fluctuations
Beam Requirements

Primary need is for several GeV/c $\pi/\mu$ to limit multiple scattering and showering for resolution studies (5 out of 7 responding groups)

Several groups also interested in momentum-analyzed non-relativistic hadrons for dE/dX and PID studies

Rep-rate not that carefully thought out yet, but requests ranged between 1 kHz and 1 MHz
Running Periods and Duration

All groups request ~2 week runs (1 wk setup, 1 wk actual running with various conditions

Requests vary from once/year to 2-3 times/year, with intervals to be used for studying acquired data

Anticipation of need for first beams now a bit vague, but probably some in 2005 and most in 2006.
Facilities Requests

One group (MIT) will use local beams (BATES e\textsuperscript{-})

At this point, other groups cite proximity as only concern

Requested services (roughly in order of demand):

- Large-bore (25 cm) 5T magnet
- Fast trigger
- Spectrometer
- External trajectory definition (combine silicon/TPC tests?)
- Particle identification
- Gas supply and servicing
High-Field Magnets

DESY in possession of a 30cm bore x 60cm axis high-field (5T) magnet

Currently exploring ways to implement magnet on test-beam lines  Nope, can’t do!

➡️ North American facility? Would be nice to explore possibilities (FNAL?)
**Guesstimate Use Schedule**  
**(North-American Groups)**

For 3-year period 2003-5; corrected for under-reporting

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ANTICIPATED WEEKS OF RUNNING</th>
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<tbody>
<tr>
<td>2004</td>
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<tr>
<td>2005</td>
<td>16</td>
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<td>2006</td>
<td>24</td>
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Tracking group anticipates testbeam needs beginning in 2005

Very rough guesstimate is ~40 weeks of facilities time during 3-year R&D phase

High-field magnet facility is a notable request of the tracking group