

# Summary of SLAC Physics Instrumentation Workshop

June 26, 2002

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## US IP Beam Instrumentation Effort

- Workshop organized by US Beam Instrumentation Working Group coordinators:
  - Mike Woods, Eric Torrence, David Cinabro
- Survey of current and possible techniques for Energy, Luminosity, and Polarization measurements
- Many active participants...
- “NLC-centric”

## Some Results

- Emphasis that  $dL/dE$  and/or energy spread needs to be well-measured to do precision physics
- “Straw-Man” ECal Proposal:
  - BPM-based spectrometer upstream of IP
    - possibility of absolute  $E$  measurement
  - Wisrd-style spectrometer downstream of IP
    - possibility of absolute  $E$  measurement
    - can also measure  $dL/dE$
  - Radiative Returns (Si forward tracking) used for luminosity-weighted measurement

Real  
Time

## R&D Plans

- US “Consortia” Forming for Accelerator, Detector R&D aimed at a LC
  - **Proposals were due already!** (Fall submission)
- **This round includes proposals for**
  - Mechanical stability demonstration for BPM Spect.
  - Electronic stability in addition, with beam test
  - Detector Simulations for Radiative Returns
  - Forward tracking studies (RR,  $dL/dE$ )
  - ?

## More open questions

- How well do we need to know Lumi pulse-by-pulse (bunch-by-bunch)?
  - (accelerator-driven)
- How well do we need to know absolute luminosity (<1%, certainly)
  - (physics-driven)
  - are LEP-style lumi monitors suited for environment?
- More studies needed on these issues, since they all factor into  $dL/dE$  questions

## Final Comments

Three Things are clear from past experience:

- **Beam tests are crucial**
  - too many surprises over the years
- **Redundant measurements are crucial**
  - unforeseen systematics lurk at every turn
- **Complete measurements are crucial**
  - something new is always learned from measuring something new

Precision physics takes meticulous planning

⇒ The systematic you anticipated is never the largest