Energy Calibration Overview

- Baseline design:
  - $\delta E/E \sim 1 \times 10^{-4}$ is required from physics
    - if better precision needed later $\Rightarrow$ redesign
  - Should have something like a 50m footprint
    - put this in your lattice designs
  - $dL/dE$ measurement needed somewhere
    - diagnostics downstream of IP will be important
    - need a decent extraction line environment (★)

- Redundant measurements will be necessary
  - cross-checks required
  - more than one technique/location
ECAL Needs and R&D Plan

• Design Studies (Lattice Locations, Run the Numbers)
  – Schemes:
    • BPM-based Spectrometer
    • WiSRD
    • Laser backscattered electron spectrometer
    • Polarization Rotation
  – We should be able to arrive at a consensus as to which methods are most promising!

• Evaluation of Operational issues
  – measurement time required
  – diagnostics provided (bunch-by-bunch?, etc.)
ECAL R&D II

• RF BPMS:
  – ECAL probably most demanding consumer (~20nm)
  – resolution, electronic stability, stability of null point
  – sensitivity to beam tilts
  – need experiments! (ATF?)

• “Straight Line” techniques
  – optical straightness monitor (Oxford)
  – stretched wire systems (CERN)
  – need experiments!

• Mechanical stability
  – nanomovers (technical demonstration needed)
ECAL R&D III

• Beam Tests Required
  – too many surprises in past experiences
  – careful design, iteration will be necessary
  – try to get as close as possible to LC conditions