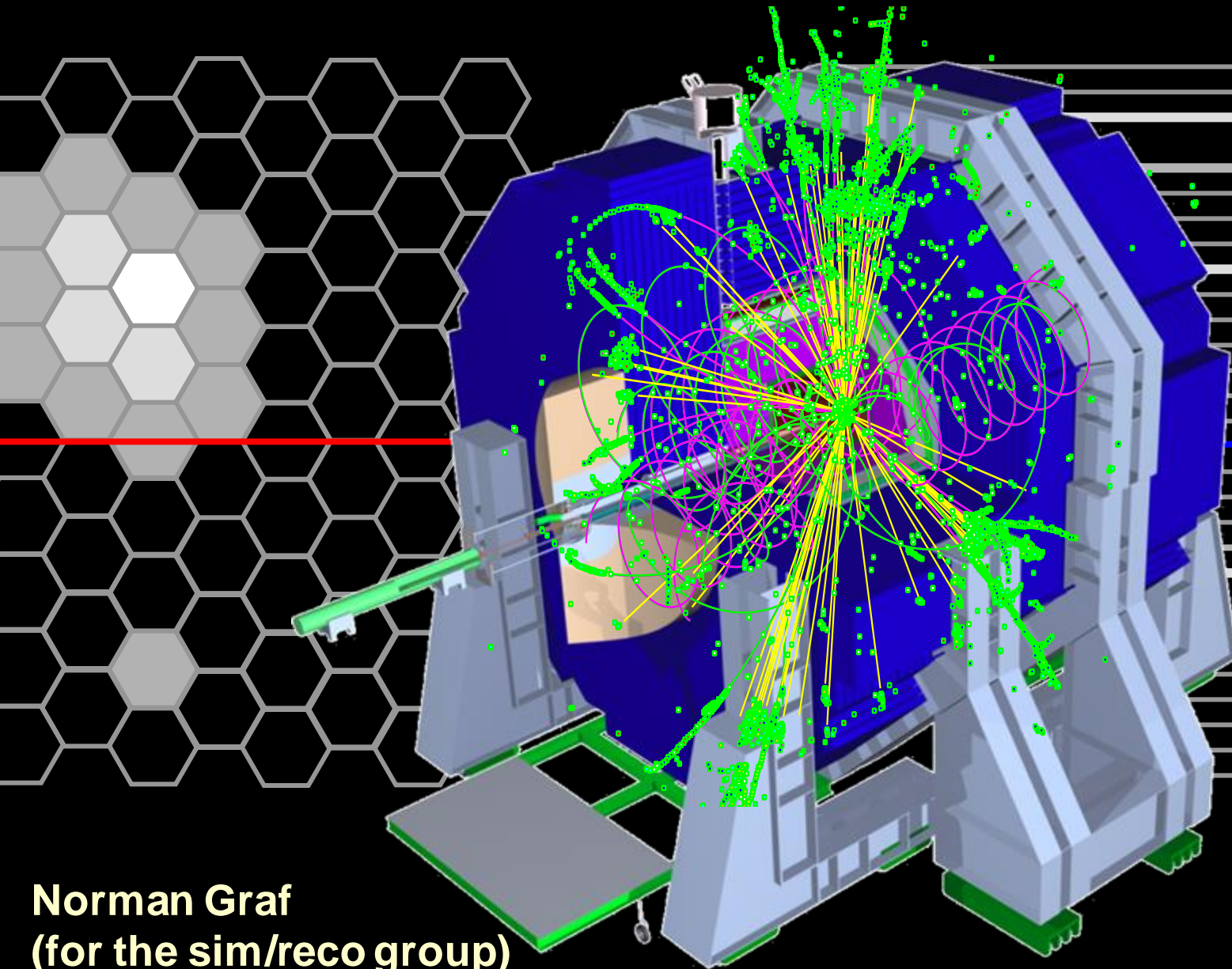


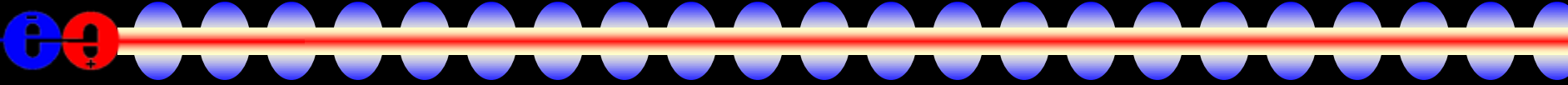
lcsim software: status and future plans



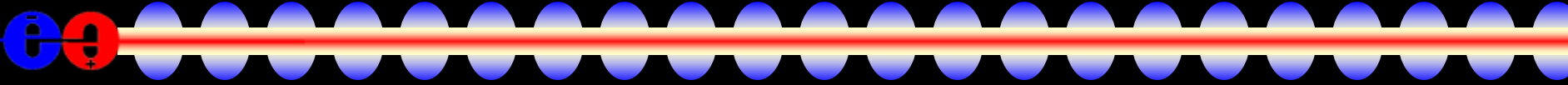
Norman Graf
(for the sim/reco group)

ECFA-LC
DESY
May 30, 2013

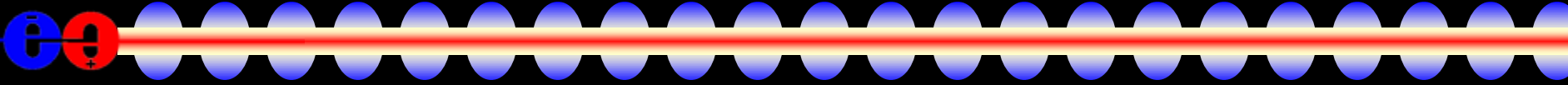
The DBD, Snowmass and beyond

- 
- ILC DBD has been the primary focus of our group
 - A lot of work done by a small number of dedicated individuals who deserve a lot of credit.
 - Robust set of end-to-end simulation tools
 - Grid submission, cataloging via ILCDirac
 - Will be supporting the needs of Ecal Testbeam
 - real data requirements mostly orthogonal to MC challenge
 - Conditions database improved
 - hexagonal pixels being implemented
 - Currently engaged in “Snowmass” 2013 efforts
 - Continued common software development

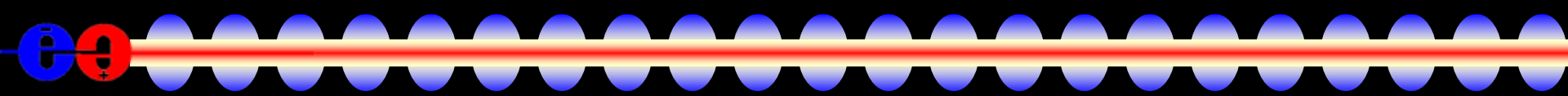
DBD Deliverables

- 
- Full simulation of realistic detector design including support structures.
 - Overlay of correct admixture of expected beam-related backgrounds.
 - Full tracker hit digitization and ab initio track finding and fitting.
 - Use of common LC tools
 - Full PFA reconstruction using slicPandora
 - Vertexing and flavor-tagging with LCFIPlus

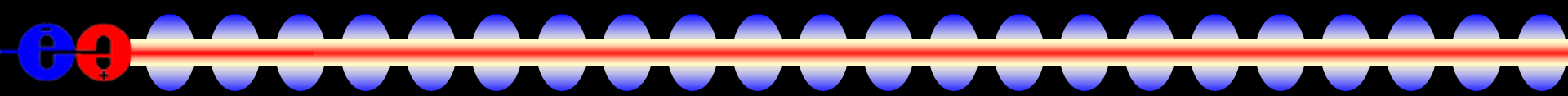
The Grid

- 
- SiD is making full use of Grid via ILCDirac.
 - LCG and OSG ILC VOs merged
 - Identifying OSG resources and making good use of them has been a challenge.
 - very idiosyncratic
 - large, steep and site-dependent learning curve
 - But when it works it works very well.

Snowmass 2013

- 
- The ALCPG sim/reco group is providing support for physics and detector studies to be conducted leading up to and during the ~one week workshop.
 - To facilitate studies by new groups and individuals we have tried to make things as easy as possible to generate or access detector designs and MC events.
 - Using the DBD experience as a guide.

Snowmass 2013

- 
- Providing fully simulated and reconstructed events at both 250GeV and 350GeV cms using the sidloi3 detector model (same as DBD), with tracking and PFA done. Awaiting flavor-tagging.

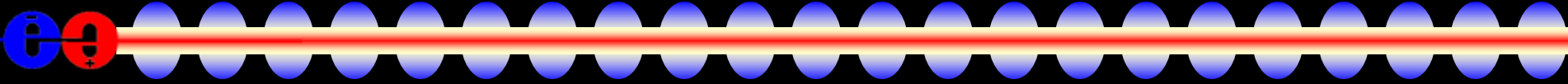
<https://confluence.slac.stanford.edu/pages/viewpage.action?pageId=138785074>

- Can't expect everyone to have Grid credentials or belong to the correct VO. Providing access to DBD and related event samples via ftp from SLAC nfs disks.

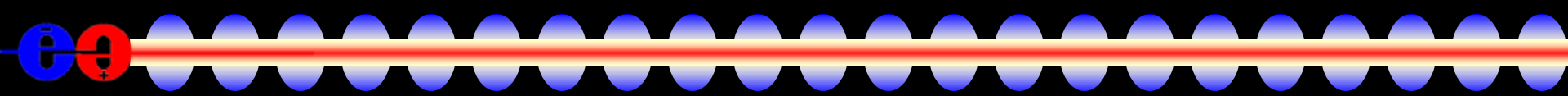
<ftp://ftp-lcd.slac.stanford.edu/ilc4/snowmass/ILC250/>

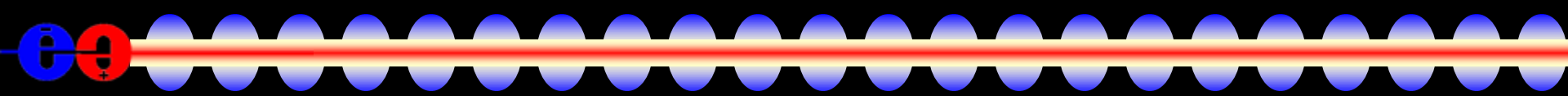
- Events at 350 expected soon.
- Would like to see physics benchmark analyses submitted to code repositories to provide examples for analysis and also to form basis for further detector optimization.

Detector Optimization

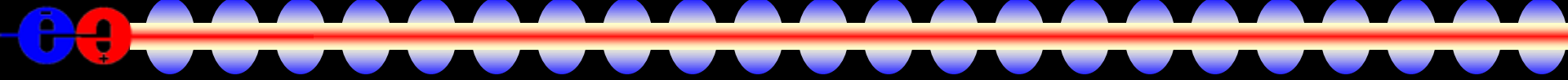
- 
- Starting to define a new series of detector models for SiD to explore areas of optimization
 - better performance
 - e.g. analog Hcal, Silicon Pixel Tracker, different aspect ratio
 - lower cost
 - e.g. reduce amount of silicon in Ecal
 - better engineering
 - e.g. layout of barrel staves and endcap doors for calorimetry
 - Need to revisit occupancy and timing studies
 - e.g. anti-DiD to reduce backgrounds

slic

- 
- Will be used for LC full detector response simulations
 - SimDist build and distribution system replaced with ILCSoft as part of moving towards more commonality in the software.
 - Working on improved, more realistic Sensitive Detector definitions (e.g. Ecal Testbeam).
 - Working to make sure DD4HEP works for us.
 - Updates to keep current with latest Geant4 release.

- 
- Used for detector digitization, track finding and fitting.
 - ftf and trf packages released
 - ftf being investigated as replacement for / addition to SeedTracker for pattern recognition.
 - trf being adapted to GeomConverter geometry
 - propagation, MCS and energy loss
 - trf being adapted to the LCIO track and hit models
 - Full Kalman fit

Summary



- Large amount of work done to complete the DBD.
- Next milestone is Snowmass 2013.
- Focus has been on using the existing software, few resources left over for improvements.
- Would like to use existing sim/reco/analysis tools to optimize SiD design.
 - reduce cost
 - improve performance
 - understand cost/benefit/risk
- Working towards more commonality in LC software.