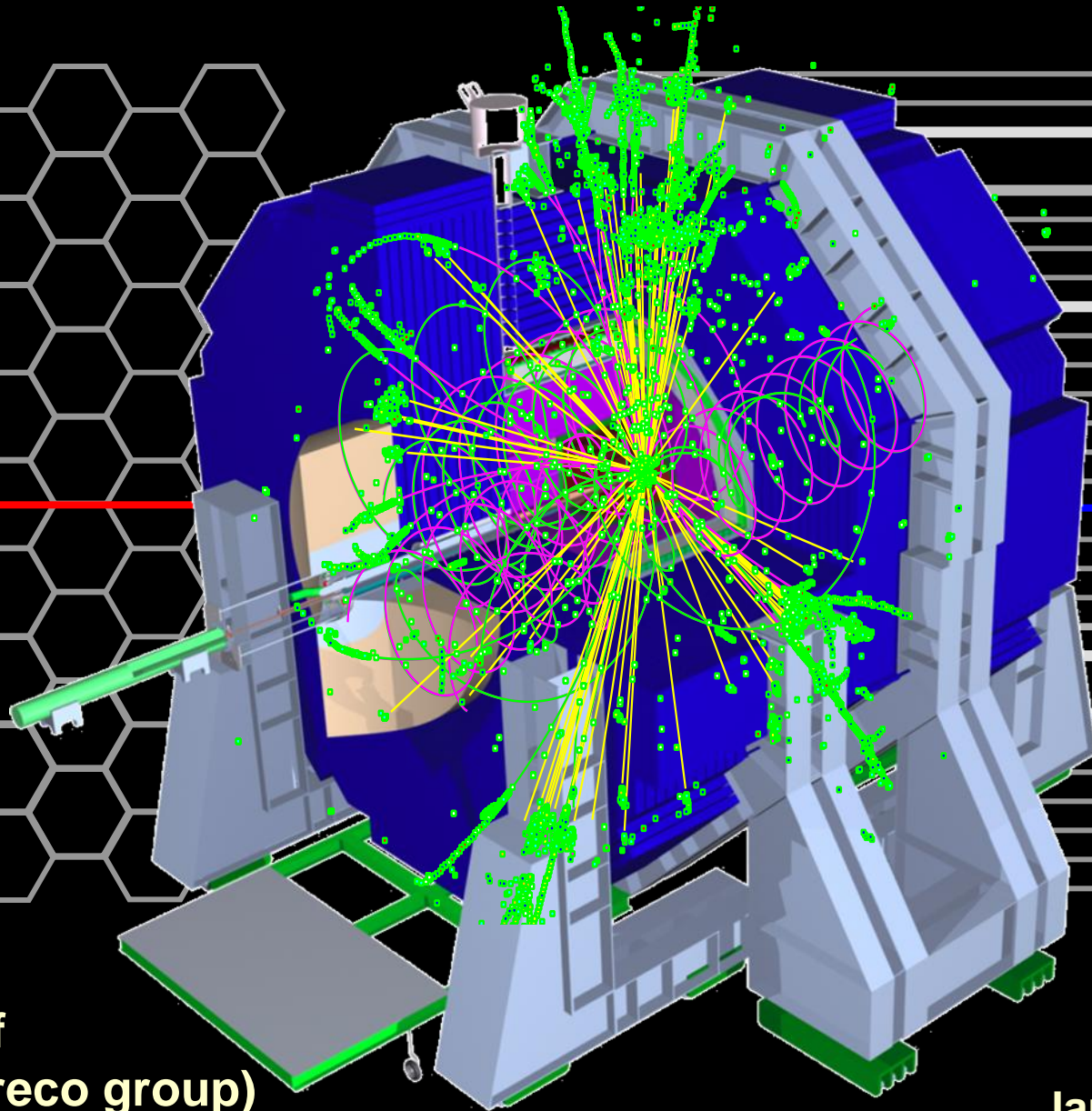


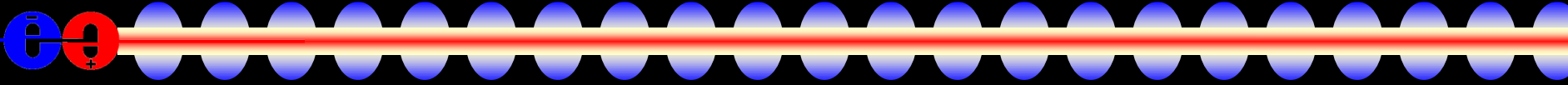
ALCPG software: status and future plans



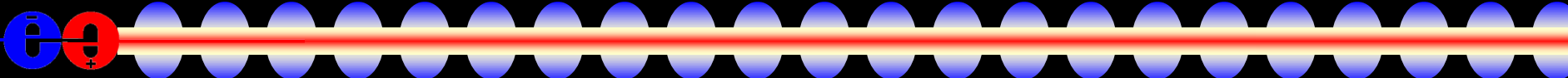
Norman Graf
(for the sim/reco group)

SiD Meeting
SLAC
January 17, 2013

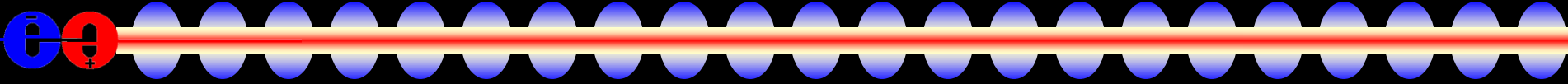
The DBD and beyond

- 
- ILC DBD has been the primary focus of our group
 - Heard a number of talks presenting the status of our DBD efforts, both production and analysis.
 - A lot of work done by a small number of dedicated individuals who deserve a lot of credit.
 - Have also been supporting the needs of HPS
 - real data requirements mostly orthogonal to MC challenge, but will be useful for upcoming Ecal TB
 - Gearing up to support Snowmass 2013 efforts
 - Preparing for common software development

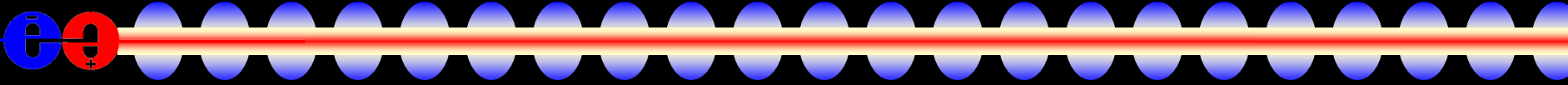
DBD Deliverables

- 
- Results **included** / **not included** in the DBD
 - Full simulation of realistic detector design including support structures.
 - No overall detector optimization, essentially LOI
 - No detailed engineering of vias, cooling, etc.
 - Approximations of gross supports and dead areas in sim
 - Detailed RPC multiplicity and inefficiencies not included
 - Overlay of correct admixture of expected beam-related backgrounds.
 - Anti-DiD field not included
 - Full tracker hit digitization and ab initio track finding and fitting.
 - Final fit still matrix element, not full Kalman
 - Full reconstruction using slicPandora & LCFIPlus.
 - Used out-of-the box, not tuned or optimized

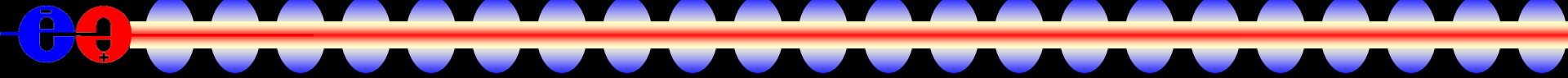
The Grid

- 
- SiD relied on use of Grid via ILCDirac.
 - Many thanks to Stephane Poss.
 - 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
 - most of the computing off-shored
 - But when it works it works very well.
 - See talk by Jan Strube.

Snowmass 2013

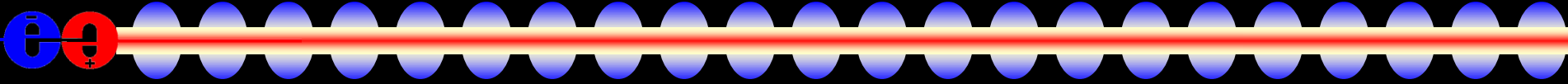
- 
- The ALCPG sim/reco group will be providing support for physics and detector studies to be conducted leading up to and during the ~one week workshop.
 - To facilitate studies by new groups and individuals we need to make things as easy as possible to generate or access detector designs and MC events.
 - Will use the DBD experience as a guide, but will need to further optimize, automate and robustify processes.
 - Need to make component tests more rigorous
 - Need to implement some integrated event-level tests.
 - Would like to include some ~analysis tests.

Snowmass 2013

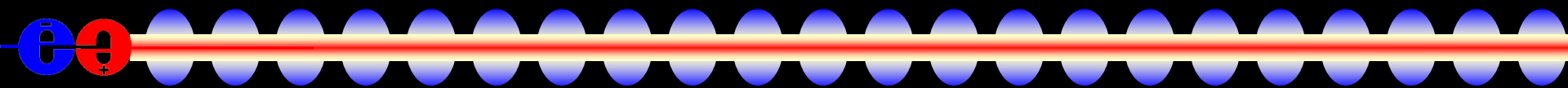


- Will start by thoroughly documenting DBD and related event samples and provide easy access.
 - Can't expect everyone to have Grid credentials or belong to the correct VO.
 - Will provide access to DBD and related event samples via ftp from SLAC nfs disks.
- Request that benchmarking analysis code is released, forming an example for analysis workflow.
 - Would also help ILC community immensely in next TLA.
- Will work with physics groups to make sure event samples, when generated, have common characteristics (e.g. parton evolution)

Snowmass 2013

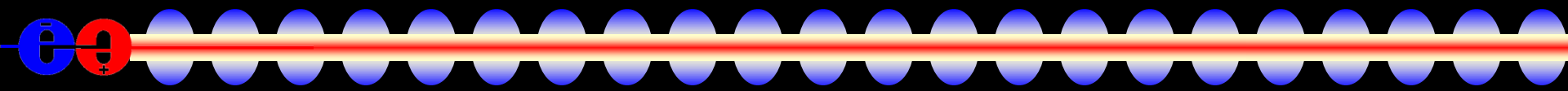
- 
- Will need to document standard MC event generation and make sure it is robust.
 - Need improvements to basic infrastructure
 - JAS, AIDA, Wired, etc. have long lists of bug reports and feature requests.
 - Resurrecting and improving fastMC code and functionality.
 - Improvements to better reflect performance of fully simulated and reconstructed events
 - More flexible to investigate “what if” scenarios
 - Documenting procedures for defining and characterizing new detectors.
 - Implementing support for new detector geometries/ readouts
 - e.g. optical photon parameters for crystal calorimeters
 - Identifying resources to be used for this exercise.
 - both manpower and Grid Computing and Storage Elements

and beyond...



- Techniques developed for SiD @ ILC and CLiC are also being used for Muon Collider studies.
- Additions to slic & GeomConverter specific to MuC
 - e.g. tapered endcap calorimeters
 - “In-Sensitive” detector readouts to kill background particles
 - clearly outside of time windows
 - re-entering tungsten masks or leaving detector
 - Optical photon properties for dual-readout crystal calorimetry
- Background overlay and timing cut functionality developed and tested at CLiC directly applicable.
 - will it scale to expected level of background
- Supporting MuC studies leading up to and at the Snowmass 2013 meeting.

and further beyond...



- Software workshop at CERN identified issues of common concern to the LC community.
- General consensus to work towards a common simulation application
- Work closely with other efforts (e.g. AIDA WP2)
- Working meeting of developers at CERN in 2 weeks
 - DESY: Frank Gaede
 - CERN: Jan Strube
 - KEK: Akiya Miyamoto
 - SLAC: Norman Graf

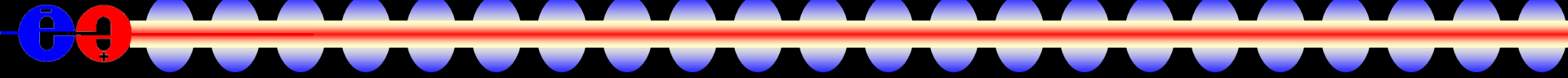
Future Plans

- 
- Whither lcsim?

Future Plans

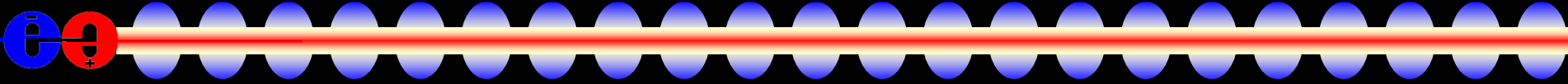
- 
- Wither lcsim?

Summary



- Large amount of work done to complete the DBD.
 - Benefitted enormously from the CLiC CDR effort
 - Reconstruction of high energy and high background events
 - Automation of Grid submission of jobs
 - Despite better automation wrt LOI, still manpower intensive
 - Wasn't pretty, but it worked.
- Next milestone is Snowmass2013
- Code also being used by HPS, focus on real data
- Beginning to work towards achieving the goals set forth at the CERN common software meeting.

Other users

- 
- HPS experiment at Jlab has adopted the lcsim software for its simulation and reconstruction.
 - Test run took place earlier this year.
 - Real data places different requirements on both the simulation and reconstruction software.
 - Conditions database improved
 - Full 3D field map being implemented
 - Runge-Kutta stepper implemented
 - Alignment code being implemented
 - ...