

Software Coordinators Report

F.Gaede

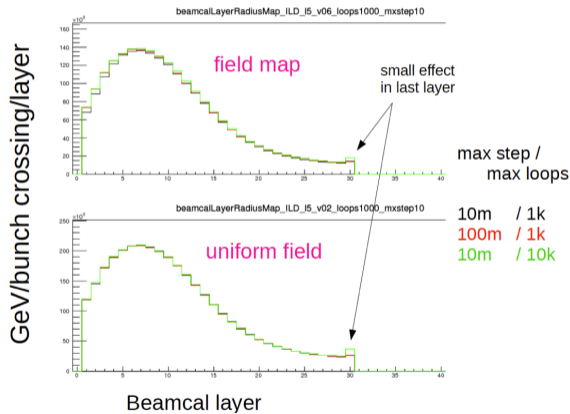
ILD Phone Meeting, Jul 2, 2018

- Generator
- Simulation
- Reconstruction
- Monte Carlo Production

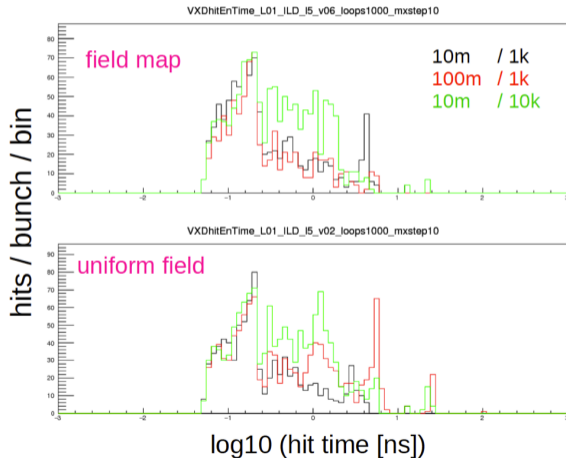
- preparation for additional and follow-up productions to 500 GeV DBD sample:
 - dedicated BSM samples (low mass difference SUSY, light Higgs, . . .)
 - 1 TeV background files (for selected 1 TeV channels)
 - 250 GeV full SM production
- status
 - 250 GeV pair-bg files put on the Grid
 - missing new $\gamma\gamma \rightarrow hadrons$ files (done at SLAC)
 - preparing input files for Swatie's and Yan's BSM analyses
 - 1 TeV generator input files for bg available on the Grid
 - *seeable pairs* and *aa_lowpt*
 - need to prepare steering files accordingly

- created new dedicated detector models for 1 TeV: *ILD_Is5_o1_v08/07*
 - w/ realistic fields: solenoid, anti-DID and fwd magnets
- checked recent bug fixes in DD4hep shapes:
 - non of these are used in ILD detector models
- fixed *minor bug* in DDG4 that had caused spurious hits outside of sensitive layers in ILD Si-trackers
 - checked tracking performance w/ fix: OK
 - not needed for current production

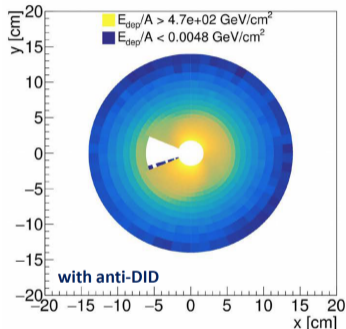
- study of pair bg w/ different field tracking parameters:
 - *MaxStepLength* and *MaxLoopNumber*
- BeamCal energy rather robust against parameter variations



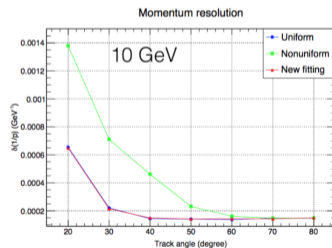
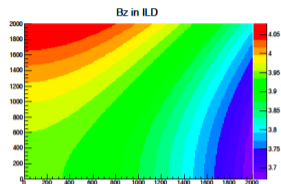
- study of pair bg w/ different field tracking parameters:
 - *MaxStepLength* and *MaxLoopNumber*
- observe variations of 2-3 in hit numbers in VXD L0/L1
 - work in progress ...



- preparing 1 TeV reconstruction steering files
 - need background map for BeamCal
 - requires pair-bg simulation w/ new detector models
ILD_ls5_o1_v08/07
- fixed issue in *IsolatedLeptonfinder* (J.Tian)
 - related to smearing of z-position of vertex
- preparing *ilcsoft patch release v02-00-02* once these changes are done



- current tracking performance studies are done with homogeneous B-Field and w/o pair background overlayed
- planned to study tracking performance with pair bg overlay and **realistic field map**
- demonstrated in principle w/ *KalTest*
- however current approach with *piece-wise helix fit* does not work in ILD tracking framework
 - due to switch to *track parameters in local coordinate frame*
 - **no straight forward solution - so far**
 - currently looking into **ACTS**



- producing additionally requested samples:
- flavor tag training samples
- 6q-jets (u,d,s,c,b):
 - 500 GeV, >100k events each, w/wo overlay, ILD_ls5_o1_v02
- some leftover 500 GeV SM-background samples
 - 2f_Z_nuNg, 2f_Z_bhabhaNg, 4f_lowmee: w overlay, ILD_ls5_o1_v02
- To be produced (requested at last S&A meeting, etc.)
 - aa_lowpt/seeablepairs : reconstruction w.o. overlay (500 GeV)
 - light Higgs like samples : waiting generator files.
 - low mass Higgsino : waiting generator files.
- 1 TeV vvqqqq :
 - BG simulation will start soon
 - Need new ilcsoft release with BCAL BG for reconstruction

Latest information in elog: <https://ild.ngt.ndu.ac.jp/elog/dbd-prod/>

- write chapter 7: **Physics and Detector Modelling**
 - *briefly* describe our main software tools that we use for the optimization studies
 - generators (Whizard)
 - DD4hep and DDSim
 - simulation models with **hybrid simulation**
 - digitization implementation
 - reconstruction algorithms
 - background overlay
 - ILCDirac Grid production

- contribute to detector performance section in chapter 8

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- 500 GeV standard model sample completed (ILD_Is5_o1_v02)
 - **benchmark analyses have started**
 - see talk K.Fujii

- ongoing activities:
 - preparation for 250 GeV and 1 TeV samples
 - study of pair background
 - tracking performance w/ realistic fields
 - some minor fixes for *ilcsoft patch release v02-00-02*