Software Coordinators Report

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ILD Phone Meeting, Dec 4, 2018

Outline

- Generator
- Simulation
- Reconstruction
- Monte Carlo Production

Generator M.Berggren, J.Tian

- problem with uds,cc,bb reported in Arlington is fixed:
  - Whizard LCIO output had used used wrong unit for *MCParticle::time*: mm/c -> ns
  - fixed in Whizard HEAD version
- checking of new uds,cc,bb di-jet samples
  - found some differences (3 sigma) for meson multiplicity (pi+-)
  - higher in new samples
  - **under investigation** (compare to LEP data)

To Do

- validation of Whizard w/ LCIO format for planned 250 GeV production
- eventually create *production release*
  - early next year

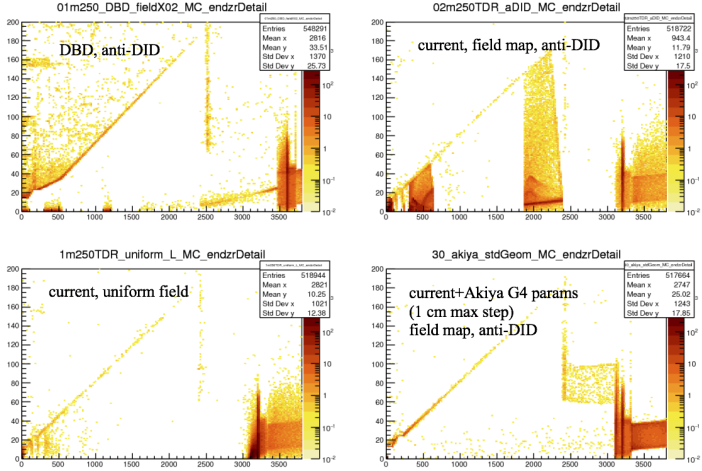
- progress in pair-bg simulation:
  - investigating reason for killed/stopped tracks in the beam pipe:
  - particles stopped due to too many loops
  - 'cured' with smaller maxStepLength (10mm)
- did more detailed checks (see next slides)
- creation of *new pair-bg simulation* files **ongoing**

NB: this is important input to

- data rate estimates (DAQ and storage)
- tracking performance studies

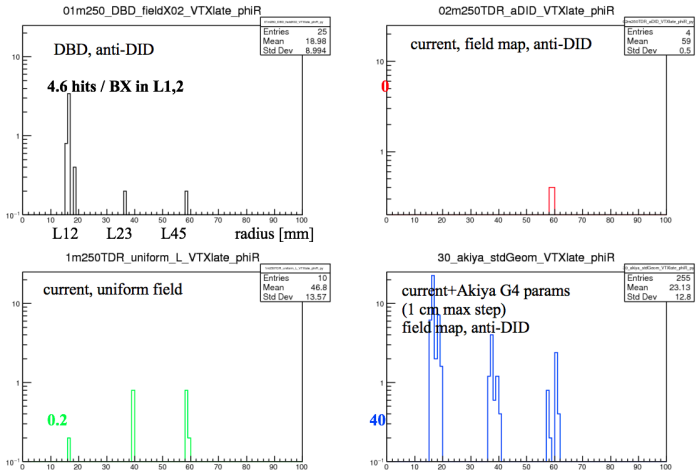
Simulation - pair bg D.Jeans, A.Miyamoto

End points of MC particles : z vs. r

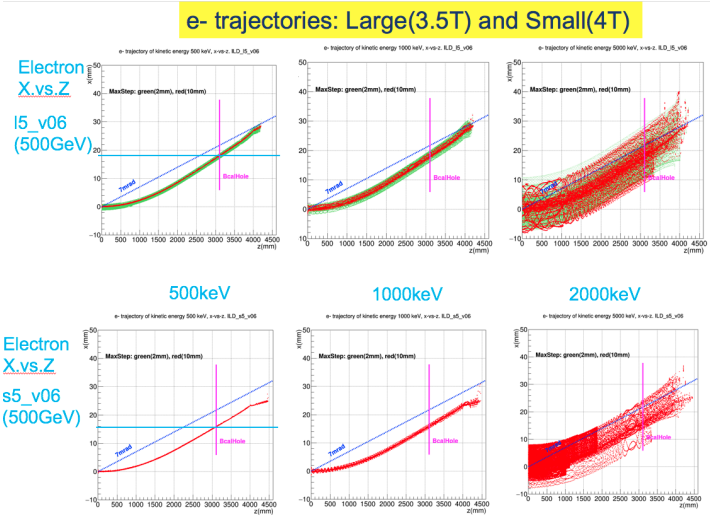


pair bg simulation

Late hits in Vertex detector per bunch crossing



Simulation - pair bg D.Jeans, A.Miyamoto

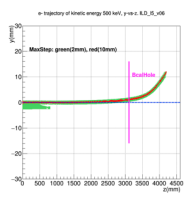


Simulation - pair bg D.Jeans, A.Miyamoto

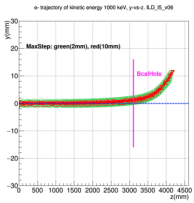
e- trajectories: Large(3.5T) and Small(4T)

Electron
Y.vs.Z

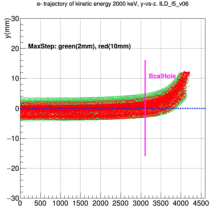
l5_v06
(500GeV)



500keV



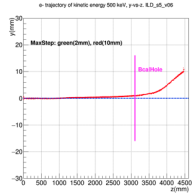
1000keV

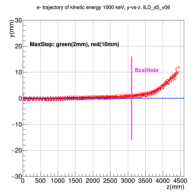


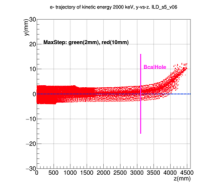
2000keV

Electron
Y.vs.Z

s5_v06
(500GeV)







Simulation - pair bg D.Jeans, A.Miyamoto

- Low energy e- were simulated by Geant4 gun.
  - Fixed kinetic energy
  - Uniform random for theta < pi/2, phi < 2pi
  - 10k of e- were simulated

Number of SimHits (energy in keV)

E(keV)	VXD	SIT	TPC	FTD
E1000	0	0	0	0
E2000	0	0	0	0
E3000	0	0	0	0
E5000	0	0	0	0
E10000	50729	284	581	3

E(keV)	BCal	ECal	HCal
E1000	0	0	0
E2000	0	0	0
E3000	0	0	2
E5000	6	0	7
E10000	35	30	23

Ecut > 1 MeV
is safe enough

- updated PandoraAnalysis for new uds,cc,bb files
- updated ILDConfig to make JER plots w/ and w/o neutrinos
- photon energy correction for gaps (phi,z) developed by D.Jeans
  - should be integrated in PandoraPFA eventually
  - for now we need steering files to apply on the produced samples
  - will redo the uds JER with this correction applied
- working on calibration and steering files for ILD_l5_v03 (SciEcal)
- LCFIVertex fixes released
  - beam constraints
  - flavor tagging parameters
- developed first thoughts on implementing a *proto-type* for a **parallel Marlin**

Monte Carlo Production A. Miyamoto, H. Ono

- started production of pending samples:
- additional samples requested for Bhabha and nunu events
  - issue w/ pre-staging large file sets at DESY-SE addressed:
  - split the production in smaller chunks to have **enough disk buffering capacity**
  - **production ongoing**

- missing 1 TeV $t\bar{t}$-events
  - resource estimate for storage: **200 TB !!**
    - almost same as total 500 GeV production
    - original large statistics sample had been produced for Higgs self-coupling analysis
  - will produce ~**5% of the sample**, as only needed as bg for one benchmark