Software Coordinators Report

F.Gaede, DESY

ILD Meeting, Apr 8, 2020

Outline

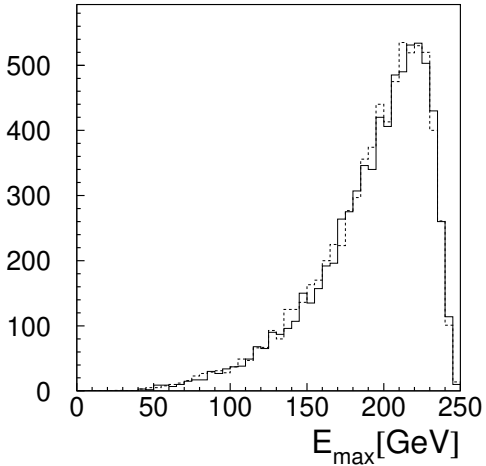
- Generator
- Reconstruction
- Monte Carlo Production

report from *ILD Software Convenors Meeting* today

- issue in recent test production of $HZ \to H\mu\mu$ sample:
- had set μ mass to zero (as done in DBD/IDR samples)
  - with new Whizard/Pythia interface this causes crashes if μ is decayed in simulation
  - need to produce samples with correct μ-mass in Whizard steering file
- open question:
  - what to do with the e-mass ?
  - should it be also set to the correct mass ?
    - seems to be already Whizard default...
  - potential issue in Bhabha cross section when changing the default
- will create also a $HZ \to Hee$
  - w/ and w/o $m_e = 0$
  - check physics: Bremsstrahlung etc.

- accidentally had turned off FSR in $HZ \to H\mu\mu$ samples
  - regenerated with correct setting
  - **need to be simulated and reconstructed**

- MB has checked samples wrt to zero quark masses
- observe small differences between samples w/ and w/o zero quark masses
  - see plot on the right:
  - E of leading hadron in $H \to bb$ events w/ and w/o $m_b = 0$
- differences believed to be small enough
- also, unclear which is more *physically correct*
- to be decided ...



Reconstruction

- some necessary fixes and improvements for reconstruction needed:
- small bias in γ calibration observed (see talk by D.Jeans):
  - $+0.58\%$ in barrel
  - -0.52% in endcap
- will **adjust calibration constants accordingly**

- issue in dE/dx computation (see talk U.Einhaus)
  - ionization in Geant4 changed slightly
  - bug fix in TPC simulation that had caused missing hits
- **need re-tuning of dE/dx computation**
- **need re-fitting of dE/dx for PID**

Monte Carlo Production A.Miyamoto, H.Ono

- need to reproduce the $HZ \to H\mu\mu$ sample
- need to produce $HZ \to Hee$ samples w/ and w/o $m_e = 0$

- then will produce di-jet calibration samples with *uds*, *cc* and *bb*
  - using new ILDConfig with **reconstruction/calibration issues fixed**

- idea: reconstruct these with **all three detector options:**
  - provided that the reconstruction and calibration is available

model	Hcal	Ecal
ILD_l5_o1_v02	analog	silicon
ILD_l5_o2_v02	semi-digital	silicon
ILD_l5_o3_v02	analog	scintilator