Software Coordinators Report

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ILD SW&Ana Meeting, June 7, 2017

Outline

- Generator
- Simulation
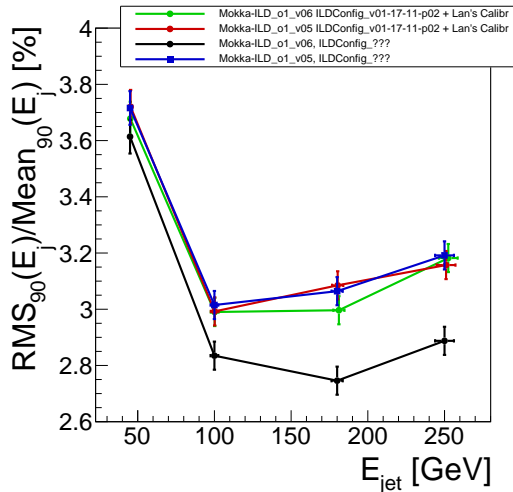- Reconstruction
- MC Production

Generator

- Whizard has now complete LCIO output incl. **spin information**
- will create some hadronic events
  - both with *stdhep* and *LCIO*
  - run these through ddsim/reconstruction with ILCDirac for comaprison

- work on Pythia interface ongoing
  - issue with wide m_W in 4q events

Simulation - recent activities/plans

- use **Tesla geometry** for Hcal barrel in MC mass production
  - with *hybrid readout*
  - will create also a *hybrid readout* for the Videau geometry
- make the **Ecal thicker**
- leave the **VXD and SIT geometries** *as is* for now
  - continue investigation of VXD cable routing (-> talk M.Berggren ILD meeting, yesterday)
- use **pixel readout in SIT** at the digitization level
  - details of single BX time stamping under study (Strasbourg)
- some progress in bg-simulations
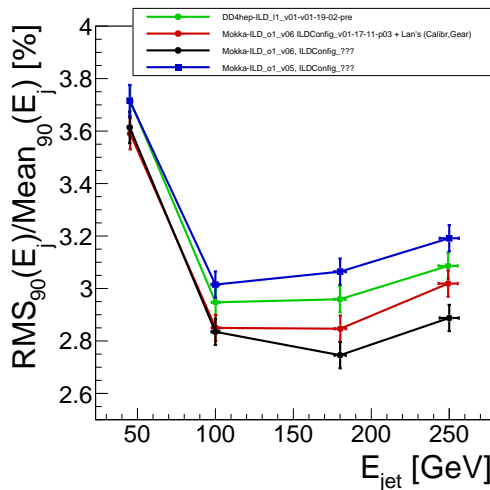 - study of differences w/ previous results ongoing

New IID simulation models in DD4hep

large DBD like	new smaller model	technology	Hcal geometry	Ecal
ILD_l1_v01	ILD_s1_v01	analog	Tesla	SiW
ILD_l2_v01	ILD_s2_v01	semi-digital	Videau	SiW
ILD_l4_v01	-	*both*	Tesla	SiW

- will create new simulation models ILD_l/s_n_**v02** with Ecal thickness increased by $\Delta_{thickness,Ecal} = 30.2mm$
- extend towards the inside - reduce TPC radius
  - reduce unused gaseous TPC volume w/o reducing the #layers

- JER with last *official* iLCSoft release with **Mokka** and corresponding *official* steering files: **v01-17-11-p02**
- observe **consistent JER for both models**: ILD_o1_v05 and ILD_o1_v06
  - yet worse than JER with ILD_o1_v06 with semi-private code and configuration

- results reproduced by S.Green w/ *official* reconstruction but *non-standard ILD simulation*:
  - no services, no guard ring in the Ecal, different range cuts
  - investigation continues . . .

Legend:
- Mokka-ILD_o1_v06 ILDConfig_v01-17-11-p02 + Lan's Calibr
- Mokka-ILD_o1_v05 ILDConfig_v01-17-11-p02 + Lan's Calibr
- Mokka-ILD_o1_v06, ILDConfig_???
- Mokka-ILD_o1_v05, ILDConfig_???

Plot axes: $RMS_{90}(E_j)/Mean_{90}(E_j)$ [%] vs E_{jet} [GeV]

Today's PRELIMINARY Status of JER with PandoraPFA

- **blue**: Mokka, standard sim/rec sw, buggy GEAR file
- **green**: DD4hep, standard sim/rec sw
- **red**: Mokka, standard sim/rec sw, *correct* GEAR file
- **black**: Mokka, *non-standard sim*, std. rec sw, *correct* GEAR file

- current DD4hep standard simulation and reconstruction *slightly worse* than best Mokka based sim/rec
  - continue to improve DD4hep (calibration, sw-compensation, etc . . .)

Legend:
- DD4hep-ILD_l1_v01-19-02-pre
- Mokka-ILD_o1_v06 ILDConfig_v01-17-11-p03 + Lan's (Calibr,Gear)
- Mokka-ILD_o1_v06, ILDConfig_???
- Mokka-ILD_o1_v05, ILDConfig_???

Axes: $RMS_{90}(E_j)/Mean_{90}(E_j)$ [%] vs E_{jet} [GeV]

Monte Carlo Production

- observed issue in **v01-16-02** w/ Overlay processor:
  - broken MCParticle record and MC-Truth information
  - if two or more BGOverlay files are used
  - fixed in v01-16-02-p01

- 'buggy version' was used in 250 GeV 2f qqbar sample produced for LAL
  - need to investigate if this is a problem
  - sample size is 30 TB, so only reprocess if really needed

- recent improvement of ILCDirac tool caused issue in file names
  - will be fixed …