ILD Software Status

open issues for ILD production

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Outline

- Towards a test production
- Generator
- Simulation
- Reconstruction
- Monte Carlo Production
- Summary and Outlook

Timeline for a test production

- plan to soon create one more test-release of iLCSoft: **v01-19-05**
  - with all known issues fixed
  - ideally by the end of this week
- re-create test samples
  - single particles
  - uds
  - selected physics channels
- have one final round of testing/validation
- create final *production* release (at least for simulation)

last chance to find issues before production is started !

Open Issues for iLCSoft v01-19-05 (from last meeting)

- BeamCalReco currently turned off
  - will address this after the test production
- minor points in geometry of ILD_l/s5 models:
  - position of HCalRing (aligned w/ EcalEndcap front face) (FIXED)
  - correct position of LHCal (closer to LumiCal ?) (Checked to be OK)
- need to finalize the calibration for the ILD_ls5 models
  - mostly done - need some final checks !
- switched back to SiTracking with slightly worse efficiency at low pt (20-deg issue)
  - will keep this for now and continue to investigate/improve

Background overlay for Test-production

- plan to overlay two types of background:
- pair background
  - e^+e^- pairs that actually are reconstructable in VXD and FTD
  - created tool to produce corresponding files with SGV
- aa_lowpt ($\gamma\gamma \rightarrow$ hadrons)
  - recently fixed generator: Γ_ρ, ...
  - prepared generator files with bb, bw, wb, ww samples (beam/virtual γ)
- bg-overlay is implemented in MC-production system
  - need to test the new mechanism
- generated one bunch train of pair-bg tracks (MB)

Samples for Test Production

- uds-events, E=30-500 GeV, (10k)
- $\gamma, K_L^0, \pi^0, K_S^0$, p=1-100 GeV, (20k)
- $\mu^{+-}, \pi^{+-}, e^{+-}, K^{+-}, p^{+-}$, p=0.2-150 GeV (100k)
- μ^{+-} at fixed p and θ values
- γ, 10 GeV, $\theta = 5^\circ - 14^\circ$
- aa_lowpt and pair-bg, 500GeV
- 100k events of bb, cc, qq at 91 GeV
- 100 k events of 6b, 6c, 6s, 6d, 6u at 500 GeV
- 6f_ttbar semi-leptonic and hadronic, 500 GeV
- $H \rightarrow$ invisible and $H\mu^+\mu-$, 250 GeV
- 2f_z_l, 500 GeV (for tau study)
- $H\mu^+\mu-$, 500 GeV

Iterate on physics samples for test production

- discussion planned in Physics Conveners Meeting on Friday

Generators

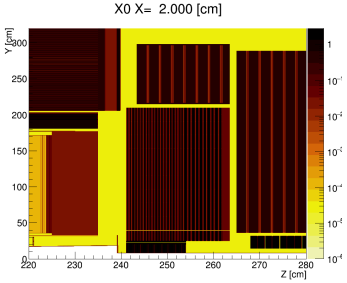
- nothing new wrt. Whizard since last meeting
  - still iterating with authors on last few remaining issues
  - e.g. pt-kick still not correct
- will prepare O(100) bunch trains of Guinepig pairs files
  - need 4 CPU days per train, 600 GB total
- will create **seeable_pairs** files for bg-overlay from these

not needed for test production

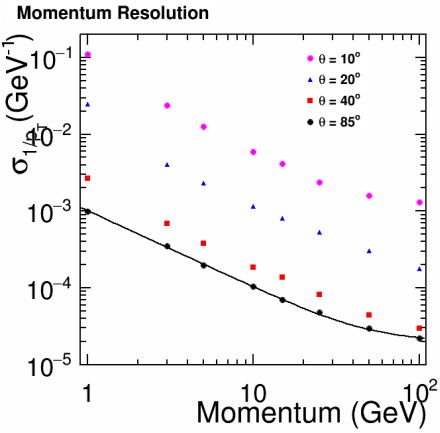
Simulation

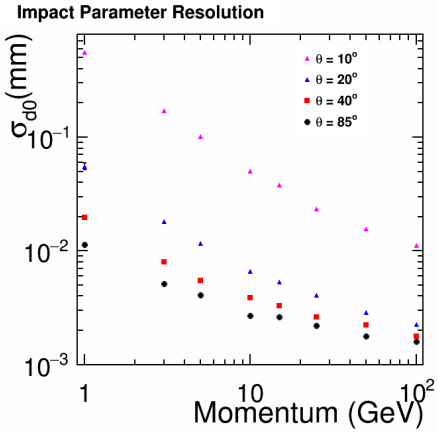
- fixed HCalRing layout: now aligned with HCalEndcap rather than barrel
- fixed small issue with Ecal layer positions for *DDRec*

- added step length in SimCalorimeterHit
- requested two weeks ago by the SDHcal group
  - updated DDG4/DDSim
  - extended LCIO SimCalorimeterHit with
  - `SimCalorimeterHit::getLengthCont(int i)`



Reconstruction: Tracking resolution (v01-19-05-pre06)

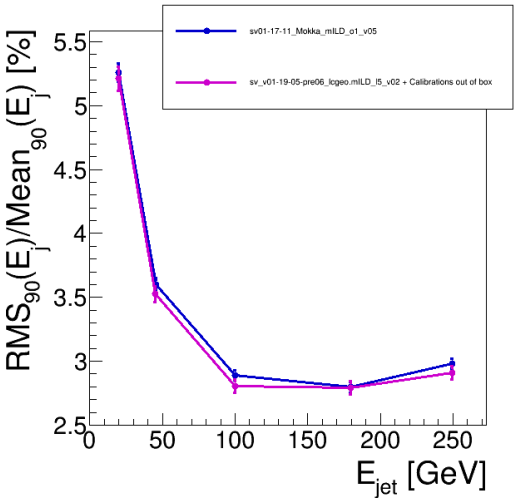




achieve expected good tracking resolution

Reconstruction: PFA performance

- have first set of calibration constants for ILD_l5_o1_v02 model
  - achieve good JER resolution with this
  - some final iteration needed



Summary and Outlook

- very close to tag next iLCSoft release v01-19-05 for last test production
  - hope to get this done today or tomorrow
- need some final tests and adjustments before the test production can be started with single particles and calibration samples
- *physics samples* will follow soon