

## Status of preparation for production

F.Gaede

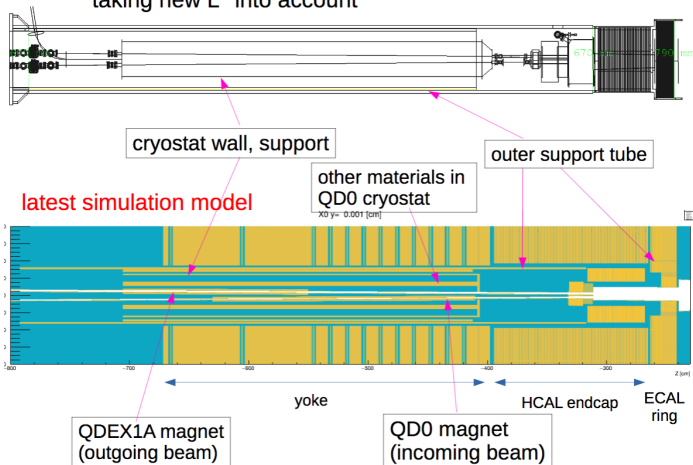
ILD Phone Meeting, Apr 3, 2018

- Activities since Ichinoseki ILD Meeting
  - Simulation
  - Reconstruction
- Current test production
  - first results
- Monte Carlo Test Production
- Time line and plans



- bug in *ddsim/DDG4* resulted in particles with **more than one parent** (assigned to grand parents)
  - fixed in DD4hep HEAD (M.Frank)
- also fixed inconsistent *end-points* of short lived particles/resonances (A.Sailer)
  - had caused an intermediate bug that prevented the simulation (**fixed**)
- fixed step limiting in *ddsim* (MF)
- added implementation of QD0 (and other downstream items) in simulation models

update model: simulate most material in detailed model,  
taking new L\* into account



- additional models for background studies:
  - **same detector geometry as v02 models**

model	B-Field	anti-DID	energy (fwd magnets)
ILD_I(s)5_v06	solenoid field map 3.5 (4) T	yes	500 GeV
ILD_I(s)5_v05	solenoid field map 3.5 (4) T	yes	250 GeV
ILD_I(s)5_v04	solenoid field map 3.5 (4) T	no	500 GeV
ILD_I(s)5_v03	solenoid field map 3.5 (4) T	no	250 GeV

- only created **o1-option**
- *still need 4 Tesla B-field map for small detector*

will be used for dedicated *background* and *tracking* studies

- not needed for 500 Gev optimization production

- fixed issue and improved *dEdxProcessor*
- implemented *BeamCalReconstruction*
- fixed *LCFIPlus* flavor tag for new simulation
  - adopted to smearing of z-position of vertex
  - still working on issue w/ vertex mass
- fixed problem in track reconstruction
- *missing* processor to write out TOF information for clusters
  - **to be done** (FG)

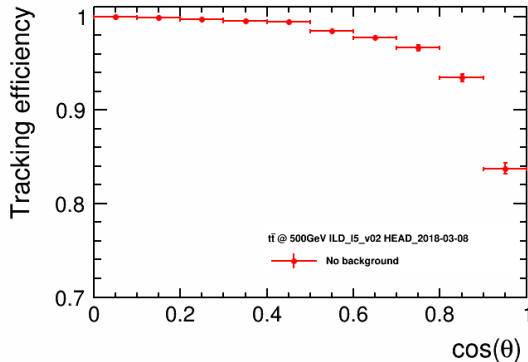
- major issue observed in tracking performance for recent version:  
HEAD-2018-03-08

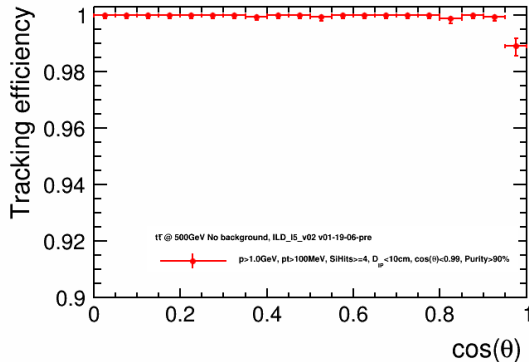
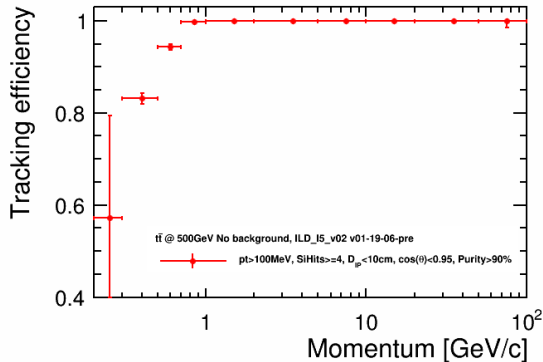
- very low *tracking efficiency*
- degraded *pull distributions*

- tracked down to new Geant4 field stepper

```
-SIM.field.stepper = "HelixSimpleRunge"  
+SIM.field.stepper = "G4ClassicalRK4"  
## Geant4 default !!
```

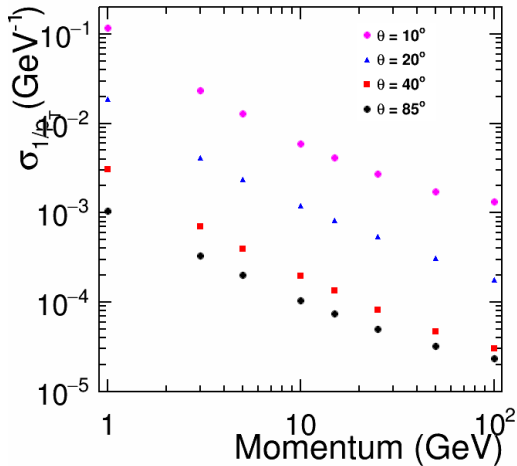
- fixed by moving back to **old stepper and parameters**



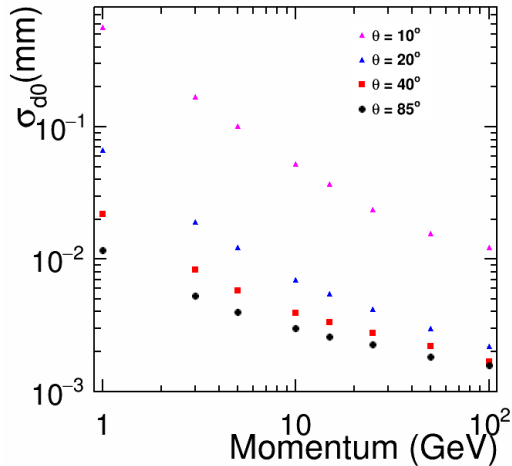




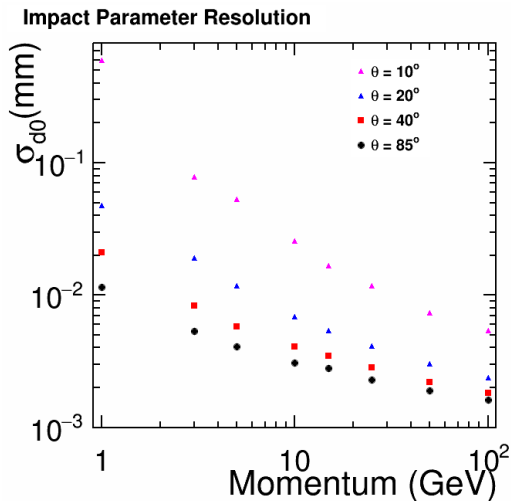
Momentum Resolution

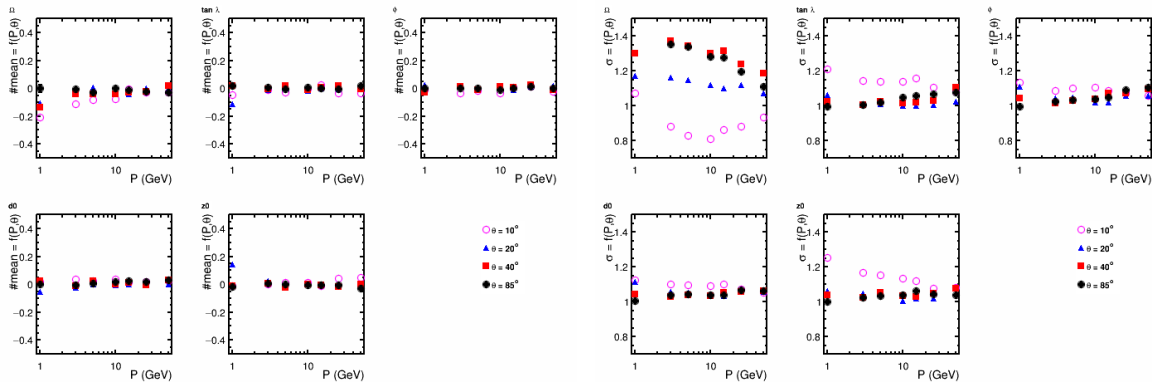


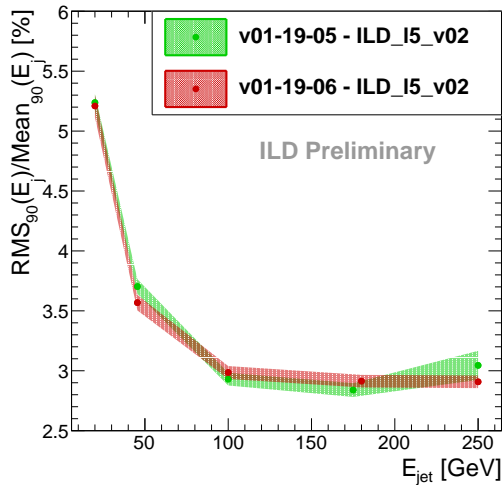
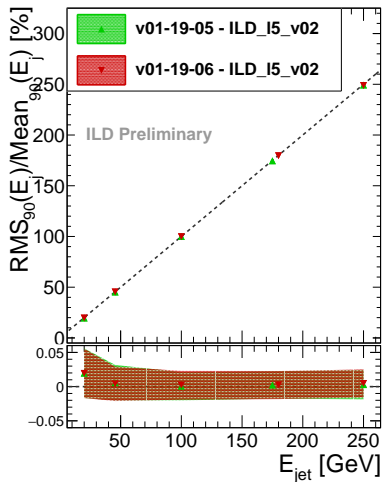
Impact Parameter Resolution



- continue study of *ConformalTracking* algorithm from CLICdp
- replaced all *strip* layers in FTD with *pixel* layers
  - assuming  $\sigma_{x,y} = 3 \mu m$
- observe significant improvement in *impact parameter resolution*
- **preliminary result**
- could be a significant improvement for ILD physics if confirmed

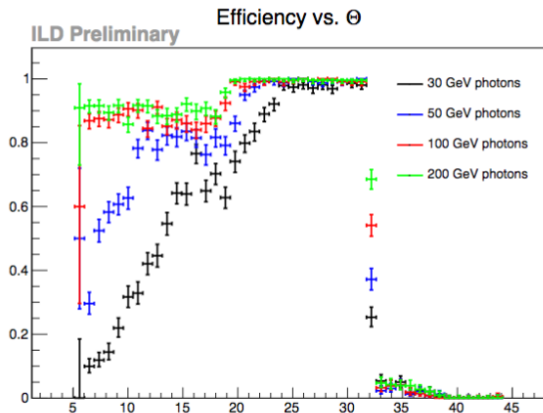






- have activated the new BeamCal reconstruction
- tuned parameters
- observe compatible efficiencies w/ and w/o **anti-DID**

need decision on which to use in optimization production



- Production with v01-19-06-p01 [ILCSoft/ILDConfig](#) has started since last weekend.
- Samples and production status ( as of noon of today )
  - **BKG files for overlay** : done
  - [uds](#) : creating [dst-merged](#)
  - **single-particles** : running production
  - **6f\_ttbar\_6jets** : creating [dst-merged](#)

More information in the MC production page of the ILD Confluence

<https://confluence.desy.de/display/ILD/Draft+plan+of+the+3rd+test+production>

Produced samples will be found in

[/ilc/prod/ilc/mc-opt-2/ild/dst-merged](#) ( no file yet )

[/ilc/prod/ilc/mc-opt.dsk/ild/dst](#)

- Issue:
  - [ILCDirac](#) **requires file name to be less than 127 characters.**  
To meet this constraint, the process name of single particle samples were shortened and they are now produced by [ILCDirac](#) production system

- all issues identified at Ichinoseki meeting addressed
- released *last* test production v01-19-06
- **tracking and PFA performance look OK**
- known open issues:
  - missing TOFProcessor
  - missing 4 T field map

## Outlook

- verify that all major performance benchmarks are OK
- implement missing items
  - fix reported bugs - if any - **your input is needed !!**
- try to get the production going **very soon**