Check-list towards a new 250 GeV ILD MC production

Generator

- **physics:**
  - define samples:
    - DBD
      + WIMP analysis samples (signal & background)?
      + Higgsinos? Jackies or Hales?
    - how about 6f? Not generated for DBD at 250 GeV, but processes like WWZ and vvWW etc should in principle be open?
    - general purpose Bhabhas?
    - question from Daniel: status of tau polarisation in Whizard2 => can be checked on existing small test samples
      transverse tau polarisation: Akiya did some work, unclear status
  - **Number of events for each processes. Especially large Xsect. processes, such as 2f, 1f, 3f.**
  - Radiative return to Z events. Generate separately or generate all process together.
  - **Naming convention of whizard2 samples and directory structure ok up to 4f, iterate 6f**
- **general:**
  - **verify batch mode**
  - **tag Whizard version?**
- **ee:**
  - generate events
    - 2f
    - 4f
    - 6f
- **ea / ae / aa:**
  - create lumi spectra and z-position of vertex distributions => done
  - generate events!
- **aa overlay : waiting for Tim... => remind.... => produced, on Dirac**
- **seeable pairs: fine, on Dirac**

Simulation

- **selection / adjustment of DD4HEP detector model**
  - **use the existing ILD_l5_vo2 => no validation needed**
- create ddsim steering / config files for 250 GeV
- z vertex distributions for ee / ea / ae / aa => Remi has put them in ILDConfig:
  - https://github.com/iLCSoft/ILDConfig/blob/master/StandardConfig/production/Documentation/ProductionSettings.md#250-gev-vertex-parameters-for-250-seta-beam
- verify that photon cluster position effect is not due to cell geometry problem => expected? Then calibration issue?
  - simulate full pairs => done **=> tune BeamCal reco!**
  - need to create BeamCal bg-map for large (and small) 250 GeV models
    - w/ and w/o anti-DID
    - for standard reco use same as for 500 GeV (w/ anti-DID ?)
- simulate seeable pairs
- simulate aa overlay
- simulate single particles for calibration => verify that LumiCal / LHCal are covered!

Reconstruction

- **solution unknown**:
  - muon reconstruction failure at costheta = 0.6 => needs 4 FTE weeks =>Moritz
  - photon cluster position / angle bias => theta "just" a calibration/correction issue, phi unclear? => Daniel
  - photon energy calibration consistent with Pandora calibration
    => needs deep thinking on Pandora calibration strategy, Daniel will take a look once tautau benchmark is done
  - z0/d0 errors in fwd region => on a good way, fix requires time?
- **solution / procedure known:**
  - tune BeamCal reconstruction ongoing (Moritz)
  - calibrate LumiCal & LHCal ???
  - update parameters for beam spot constraint (LCFI)
- **validation!**

Production

- **disk space (Cannot use tape back-end anymore) => estimate need: ~200 TB**
  => mc-opt3 currently is 600-700 TB => 1 detector model = 350 TB
  keep only 10% of REC files (but all SIM files) => 25% less ?
  (hybrid simulation, reco only SiW + AHCAL)
- **Installation of DESY new disk ?**
- Save sim files of all events, but save REC files only for a fraction of events => implemented by Akiya
- **Required statistics : 2ab-1 for each channel?**
  Estimate required disk space and CPU times for required statistics.
  How about the large cross-section channel? (2f, 4f)
  How about the 6f samples?
- update production scripts
  - make sure whizard2 lcio file splitting works=> Confirmed(Akiya)
  - Update for new directory structure and file name conventions.
    Revisit file name convention : "wizard2" as "w2"?
    ==> (Akiya) Same as the previous productions. Namely no generator name in production files.
  - simulate aa_lowpt and seeable pair background files. Update scripts to 250 GeV background files.
    ==> (Akiya) Small number of background files will be produced with ILCSoft/ILDConfig v02-00-02, for validation.(Done. 100evtsx20files produced)
- Need small whizard2 samples of various process type for development of production scripts.
  ==> (Akiya) Small samples (2f, 4f, aa_2f, 3f/5f) have been produced. Modifying production scripts to adapt new naming convention.

- Save tar-gzipped log files on tape directory.
- File save location : DESY-SRM as primary and KEK-SRM as secondary.
- BG samples situation

	Gen TDR	Gen Set A	SIM TDR	Sim Set A
aa_lowpt	Produced	Available on DIRAC (Tim)	Produced	small test sample w. v02-00-02 produced
seeable pair	No	Available on DIRAC (Mikael)	No	small test sample w. v02-00-02 produced
IP smear	No			Known, beging used in production
Nb of ExpBg			Available	Not yet

Solved issues (for new productions)

- muon reconstruction failure at costheta = 0.8 => TPC hits in simulation
- TPC point resolution