



Report from Physics WG

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on behalf of the Physics WG
July 19, 2017

General News

- ***Sviatoslav Bilokin passed his thesis defense yesterday! Congratulations!***
 - Takaaki Yasui is now at LAL, working on fully hadronic ttbar final states inheriting assets from Sviatoslav.
- ***ILC Joint Parameters WG is now converging on a single set of new beam parameters for the initial 250 GeV stage.***
- ***The JHEP community meeting will be held on July 22 (this week end) to discuss the Asai committee report on the 250 GeV physics case, the statement from the JHEPC, etc.***
 - I will report on this at the next S&A meeting on Aug.2.

**Subset of Benchmark Processes for
pilot MC production
with the new software chain**

***We need to make the 1st
250 GeV stage as
attractive as possible,
while keeping
reasonable balance with
the 500 GeV studies for
detector optimization.***

For physics simulation studies for 250 GeV, we would use DBD samples + new signal samples with the old framework until the new framework becomes fully functional including Whizard2 generators and validated to be at least as good as or better than the DBD time.

However, we need to test the new beam parameters with the factor of 1.6 higher luminosity at 250 GeV. This can be done with most relevant subset of physics processes and should be done in a relatively short time frame.

Before the verification of the new beam 250 GeV parameters, we had better start test production with the 500 GeV benchmark signal processes for comparison with the old framework.

*For longer term physics studies, we will need SM background samples at both 250 and 500 GeV, but **priority should be given to 250 GeV.***

For performance comparison (including the between L and S), we also need 500 GeV simulation results. → Priority should be given to benchmarking of (expensive) sub-detectors which is expected to survive machine upgrades.

***On going 500 GeV analyses
should be continued and
published.***

benchmark processes for detector optimisation

process	physics	detector	Ecm
$H \rightarrow cc$	BR	c-tag JER	any H.Ono
$H \rightarrow \mu\mu$	BR	high P tracking	500 GeV S.Kawada
$H \rightarrow \tau\tau$	BR, CP	τ reconstruction, PID track separation	250 GeV D.Jeans
$H \rightarrow bb$	M_H , BR	JES, JER b-tag	500 GeV A.Ebrahimi J.Tian
$H \rightarrow$ invisible $Z \rightarrow qq$	Higgs Portal	JER	250 GeV Y.Kato
$e\nu W \rightarrow e\nu qq$	M_W , TGC	JES, JER	500 GeV G.Willson
$t\bar{t} \rightarrow 6\text{-jet}$	top coupling A_{FB}	b-tag, JER jet charge	500 GeV S.Bilokin Y.Sato
$\chi_1^+ \chi_1^-, \chi_2^0 \chi_1^0$ near degenerated	natural SUSY	low P tracking PID	500 GeV T.Tanabe
γXX	WIMPs	Photon ER & ES Hermiticity	500 GeV M. Habermehl

in total 9 = 5 (Higgs) + 2 (EW) + 2 (BSM)

Physics conveners' will meet on July 26 to come up with two or three benchmark processes for the pilot run.

If you have your preference please send it to the conveners' mailing list:

ild-physics-conveners@desy.de

in time.

Physics focus schedule

Jul. 19 (Today): BSM (Akiya)

Jul. 26: Physics conveners' meeting

Aug. 2: Top/QCD (KF)

- - - - - Summer Break - - - - -

Aug. 30: Higgs/EW (Jenny)

Conveners' ML:

ild-physics-conveners@desy.de

Use this mailing list to send your talk request.