



Report from Physics WG

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on behalf of the Physics WG
June 6, 2017

WG Activities

Subgroup Activities

1. News from Higgs/EW WG since Last General ILD Phone Mtg. (Graham, Junping)

- new analysis (full sim): **ZZ-fusion as well as update on ZH for anomalous HVV couplings@ 250 GeV** (Tomohisa, April 5 S&A)
- **γ H production @ 250 GeV** (Yumi Aoki, to be reported)
- Update on **$H \rightarrow WW^*$** (Mila, April 5 S&A)
- Update on **$H \rightarrow \mu\mu$** (Shin-ichi, May 24 S&A)
- Update on **mH using $H \rightarrow bb$** (Aliakbar Ebrahimi, April 5 S&A)
- update on **Polarimetry study** (Robert)
- publications: **Higgs self-coupling** analyses; **Higgs CP using $H \rightarrow \tau \tau$** ; ongoing

Subgroup Activities (continued)

2. News from BSM WG since Last General ILD Phone Mtg. (Mikael, Jackie)

(1) Light Higgsinos (Jackie Yan, et al) → analysis in the final stage (to be reported soon)

(2) SUSY parameter extraction from results of (1) (Suvi-Leena Lehtinen, H. Baer et al.)

- close to final → starting STC4 (May 10 S&A)

Paper for (1) and (2) in preparation

(3) Search for a Higgs-like scalar using Zh with $Z \rightarrow \mu\mu$ (Yan Wang, May 24 S&A)

Subgroup Activities (continued)

3. Report from Top/QCD WG (Roman, Hitoshi)



Top/QCD - Overview



Topic	Group	Comment
ee->tt Full leptonic, Matrix element	LAL/Tohoku	Ongoing analysis
ee->bb	LAL	Ongoing analysis, paper and PhD thesis in 2017
Top mass, ee->tty	IFIC	Ongoing analysis
Top mass Threshold, interpretation	MPP-MPG	Ongoing analysis
ee->tt Anomalous couplings using EFT	IFIC	Ongoing analysis
Top CPV couplings	IFIC/LAL/RWTH	Paper in preparation
ee->tt, continuum Fully hadronic	???	Under discussion: LAL internship and UCL London
Jet algorithms	IFIC	“Standing” item with several applications
QCD e.g. alpha_s	???	Open topic
t->ch	Warsaw	Ongoing analysis
t->cy	MPP	Ongoing analysis

- “Lightweight” organisation
 - Mail and personal Communication
 - “Actors know each other”
- Regular reports at s/w and Analysis meetings
- Good communication with theory and instrumentation groups
- Members of ILD Top/QCD play visible roles in promoting Top/QCD topics in several instances
- Top/QCD studies in ILD are backbone when demonstrating LC physics potential (w.r.t. Top/QCD)

Next major event:

Top@LC17, 7-9 June 2017 at CERN
Mainly organized by Philipp Roloff

Top/QCD - Recent news and future events

- ee->bb analysis reaches maturity and work on interpretation has started
 - About to become benchmark analysis in ILD
- Matrix element analysis
 - Further visit of Yo to LAL to condense ideas and recent findings into results for [top@LC17](#) and AWLC
- Advanced draft on CPV paper by Marcel (IFIC, LAL + Bernreuther)
- Top mass measurement using ee->tty (IFIC)
 - Issues with photon definition in generator and photon measurement in generator
- Comprehensive analysis of top couplings in EFT Framework
- F. Simon continued on extraction of top mass from threshold (rather phenomenologie)
- No news on anomalous top decays
 - Analyses may rather be CLIC oriented
- “QCD sector” of working group
 - Jet studies at Valencia (“standing item”)
 - Still no group working on α_s
 - Need to remind/assure community that GigaZ is still part of ILC program

All analyses/studies will be presented at top@LC17 and (at least partially) at AWLC17

Scheduled Conference Talks

1. EPS (July 5-12) talks

- Precision Higgs Measurements at the 250 GeV ILC: in light of staging → oral : [Tim Barklow](#)
- The Potential of the ILC for Discovering New Particles: ICFA support document → oral : [Jenny List](#)
- Toward Precision Top Quark Measurements in e^+e^- collisions: ILC/CLIC combined → oral : [Naomi van der Kolk](#)
- Precision EW (incl. TGC, etc.) → poster : [Robert Karl](#)
- “Semi-private” talks
 - Higgs: HVV → oral : [Tomohisa Ogawa](#)
 - Higgsinos → oral : [Suvi-Leena Lehtinen](#)
 - $e^+e^- \rightarrow bb$ → poster : [Sviatoslav Bilokin](#)
 - ...

2. APS DPF (1st week of Aug.)

- Essentially the same abstracts have been submitted as EPS. Speaker selection on going.

Scheduled Conference Talks

- 1. LCWS 2017 talks in Tuesday afternoon plenary physics session:
ILD is requested to offer a speaker for “New ILC/SiD results on BSM and bottom and top quark physics”.**

Staging Discussion

- LCC Physics WG is preparing a document on EFT interpretation of Higgs & TGC measurements @ 250 GeV => nearly finished
- still looking for example BSM points (!) with >3% deviations in Higgs couplings
- Parameter Group will meet this or next week

Physics focus schedule

May 6: ***General ILD meeting (today)***

Jun 7: Higgs/EW (Frank)

Jun 21: AWLC17 rehearsal (Jenny)

further schedule to be announced after physics conveners' meeting on June 14

also available on

<https://confluence.desy.de/display/ILD/ILD+Physics+Working+group>

Conveners' ML:

ild-physics-conveners@desy.de

Use this mailing list to send your talk request.

Backup