



# Report from Physics WG

Keisuke Fujii  
on behalf of the Physics WG  
Aug 22, 2018

As Jenny already reported, the SCJ review started:

# **SCJ Review**

# ***SCJ Review Committee for ILC250***

## **Charge**

***For the 250 GeV ILC, review (i) physics case in HEP, (ii) scientific significance including other fields of science, (iii) merits for people and society, and (iv) various conditions regarding construction and operation of the facility***

## **Members**

1. Tadashi Kobayashi : philosophy
2. Tatsuyoshi Saijo : economy
3. Takaaki Kajita : Cosmic Ray
4. Hirokazu Tamura: Nuclear Physics
5. Masako Yoneda (**deputy chair**) : civil engineering
6. **Yasuhiro Iye (chair)** : Material Science
7. Mitsuru Uesaka : Accelerator Physics
8. Nanshi Sugiyama : Astronomy
9. Tomofumi Nagae : Nuclear Physics
10. Toshio Hirano : Biology

# SCJ Technical Subcommittee for ILC250

## Charge

***For the 250 GeV ILC, review (i) technical feasibility, (ii) cost estimate, (iii) economic ripple effects, and (iv) potential environmental effects***

## Members

1. Tatsuyoshi Saijo : economy
2. Masako Yoneda (**chair**) : Civil engineering
3. Yasuhiro Iye : Material Science
4. Masashi Kamon : Civil Engineering
5. Tohru Nakashizuka : Environmentology
6. Muneyoshi Mochizuki : Civil Engineering

## ***1st meeting on Aug. 10 (Joint Upper&Subcommittees Mtg.)***

- **ILC 250 Physics Case: KF**
- **ILC 250 Machine: Shin Michizono**
- **LCB: Tatsuya Nakada**
- **MEXT ILC Physics WG: Takashi Nakano**
- **MEXT ILC TDR Validation WG: Hideaki Yokomizo**
- **MEXT ILC HR WG: Takashi Nakano**

## ***2nd meeting on Aug. 21***

- **PIP: Masa Yamauchi (KEK DG)**
- **MEXT ILC Organization & Management WG:  
Shoken Miyama**
- **MEXT Due Process for Project Prioritization :  
Yoshiyuki Chihara from MEXT**

## ***3rd meeting on Aug 29:***

- **???**

## ***1st meeting on Aug. 10***

- **same**

## ***2nd meeting on Aug. 20***

- **Costing: Shin Michizono**
- **CFS: Masanobu Miyahara**

## ***3rd meeting on Aug 23:***

- **NRI report on Potential Technological Issues**
- **Economic Ripple Effects**

***ILD Physics WG  
Status and Plan***

# ***Benchmark Studies***

People are coming back from vacation  
and resuming benchmark analyses



# Updated list of benchmarks

## Physics Benchmarks - reminder



WG	Process	Physics	Detector	ECM	Who
Higgs & EW	H->bb	mass	JER, JES	500 GeV	Ali Ebrahimi (10%) + Junping Tian + <b>NN</b>
	ee->tautau	A_FB, tau-pol, A_LR	tau reco	500 GeV	Daniel Jiang + <b>Keita Yumino</b>
	H->mumu	BR	momentum resolution	500 GeV	Shin-ichi Kawada + <b>NN</b>
	H->invisible	BR ratio	JER, hermeticity	500 GeV	<b>Yu Kato</b> + <b>NN</b>
	WW->qql	MW, TGCs, beam pol.	JES, JER, electron mu	500 GeV	<b>Justin Anguiano, Mila Pandurovic</b> + <b>Elisabetta Gallo</b>
	vvqqqq	QGCs	JES/JER	1 TeV	Jakob Beyer + <b>NN</b>
	gamma Z->qq/ee/ mu mu	A_FB, sigma_tot, JES	photon, JER/JES, e, mu	500 GeV	<b>Takahiro Mizuno</b> + <b>JT</b>
Top, Bottom & QCD	tt->bhq	x-section, AFB	b-tag, vertex charge, PID	500 GeV	Sohail Amjad, <b>Adrian Irlas, Yuichi Okugawa</b> + <b>RP, RY</b>
	H->bb/cc/gg	BR	c-tag, b-tag, JER	500 GeV	<b>Ryo Yonamine</b> + <b>Masakazu Kurata</b>
BSM	low deltaM Higgsinos	natural SUSY	low-p tracking, PID, hermeticity	500 GeV	Swathi Sasikumar + <b>JL/MB</b>
	mono-photons	WIMPs / WISPs	photon reco, BeamCal	500 GeV	<b>Ahmed Mustahid</b> + <b>RY</b>
	Zh, mh < 125 GeV	limit on ZZh coupling	p res, e reco, JER, hermeticity	500 GeV	Yan Wang + <b>JL/MB</b>

One more new name assigned to some NN's!  
 Some are supervisors rather than active  
 analysts, so we need more active  
 analyzers almost everywhere.

# On-going actions

**To facilitate benchmark analyses, PCs are trying to**

- **enrich confluence pages for benchmark processes.**  
→ **Analyzers are urged to update relevant parts.**
- **An analysis code repository (GitHub) is ready now for individual benchmark analyses with templates.**  
→ **Analyzers are urged to commit relevant software.**
- **define more clearly what is going into IDR and its backup notes.**
- **resolve known issues about LCFIPlus, etc.**
- **monitor and help, if needed, individual benchmark analyses:**
- **encourage analyzers to make status reports on their benchmark analyses and tools in a S&A meeting:**

**Today**

- **Shin-ichi:  $H \rightarrow \mu\mu$**
- **Moritz: mono-photon WIMP search @ 500 GeV**
- **Ryo:  $tt \rightarrow 6q$**
- **Swathi:  $\gamma\gamma \rightarrow$  hadrons and BSM signatures with small  $\Delta m$**

WG	Process	Physics	Detector	ECM	Analyzers	Reviewers
Higgs & EW	H->bb	mass	JER, JES	500 GeV	Ali Ebrahimi (10%) + Junping Tian + <b>NN</b>	<b>Frank Simon</b>
	ee->tautau	A_FB, tau-pol, A_LR	tau-reco	500 GeV	Daniel Jeans + <b>Keita Yumino</b>	<b>Mikael Berggren</b>
	H->mumu	BR	momentum resolution	500 GeV	Shin-ichi Kawada + <b>NN</b>	<b>Ivanka Bozovic, Alexander Filip Zarnecki</b>
	H->invisible	BR limit	JER, hermeticity	500 GeV	<b>Yu Kato + NN</b>	<b>Marcel Vos</b>
	WW->qqlv	MW, TGCs, beam pol.	JES, JER, electron, mu	500 GeV	<b>Justin Anguiano, Mila Pandurovic Elisabetta Gallo</b>	<b>Klaus Desch, Subhasish Behera</b>
	vvqqqqq	QGCs	JES / JER	1 TeV	Jakob Beyer + <b>NN</b>	<b>Taikan Suehara</b>
	<b>gamma Z-&gt;qq/ee/mumu</b>	<b>A_LR, sigma_tot, JES</b>	<b>photon, JER/JES, e, mu</b>	<b>500 GeV</b>	<b>Takahiro Mizuno + JT</b>	<b>Matthew Wing</b>
Top, Bottom & QCD	tt->bbqqqq	x-section, AFB	b-tag, vertex charge, PID	500 GeV	Sohail Amjad, <b>Adrian Irlles, Yuichi Okugawa + RP, RY</b>	<b>Marcel Vos</b>
	<b>H-&gt;bb/cc/gg</b>	<b>BR</b>	<b>c-tag, b-tag, JER</b>	<b>500 GeV</b>	<b>Ryo Yonamine + Masakazu Kurata</b>	<b>Hiroaki Ono Frank Simon</b>
BSM	low deltaM Higgsinos	natural SUSY	low-p tracking, PID, hermeticity	500 GeV	Swathi Sasikumar + <b>JL/MB</b>	<b>Akimasa Ishikawa</b>
	mono-photons	WIMPs / WISPs	photon reco, BeamCal	500 GeV	<b>Ahmed Mustahid + RY</b>	<b>Alexander Filip Zarnecki Imad Laktineh</b>
	Zh, mh < 125 GeV	limit on ZZh coupling	p res, e reco, JER, hermeticity	500 GeV	Yan Wang + <b>JL/MB</b>	<b>Kiyotomo Kawagoe, Junping Tian</b> ]

# ***Proposed S&A meeting schedule***

***Aug. 22: Frank***

Sep. 5: Frank

Sep. 19: KF

...

***Weekly physics conveners' meeting every Tuesday  
at 13:00 CERN time***

**Conveners' ML:**

[ild-physics-conveners@desy.de](mailto:ild-physics-conveners@desy.de)

***Use this mailing list to send your talk request.***

# ***3-day Pre-meeting to LCWS in Arlington***

***Date: Oct. 19-21***

***Expected attendee:***

- physics and software conveners***
- benchmark analyzers***
- benchmark reviewers***
- others***

***Agenda page is being prepared now.***

***Please book your flights accordingly!***

# ***Higgs Couplings 2018: Nov. 26-30 in Tokyo***

Dear Colleagues,

We would like to remind the deadline for abstracts submission for parallel sessions in HC2018 in Tokyo is coming in 10 days. We have a budget to support for parallel session speaker, especially for young scientists.

If you would be interested in participating HC2018 and presenting your own result, please submit your abstract via following indico page:

<https://indico.cern.ch/event/732102/abstracts/>

Look forward to having your contribution.

Best regards,  
HC2018 local organizing committee