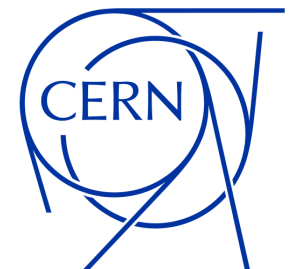


IDT-WG3 News



ilc international development team

Jenny List
ILC Europe meeting
28 Sep 2022



Refilling the gaps

Pending official sign-off by EB

- Speakers Bureau: Carsten Hensel (Rio de Janeiro) to replace Alain Bellerive -> SB meets him Thu
- Detector Technology group:
 - US candidate: Jinlong Zhang (ANL) -> Det Tech meets him today
 - Japan candidate: Shinya Narita (Iwate) -> Det Tech meets Oct 7 or 10
- Deputies - past scheme:
 - Hitoshi met ~bi-weekly with deputies, Claude & JL
 - Claude and JL communicated with Detector Technologies, MDI, Software and Physics Opportunities groups
- Future scheme:
 - your friendly WG3 chair would like to keep direct contact with groups :)
 - will nominate one deputy from each of the four groups:
 - Michael Peskin (Physics)
 - Daniel Jeans (Software)
 - Roman Pöschl (MDI)
 - NN (Detector - wait for refilling of group)

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To come over next weeks:

- re-sharpen mandate / goals / next steps of all groups
- re-define outside relationships (ECFA HF, ILC-Japan, C³)

Other WG3 news

Physics and events

- **Snowmass:**

- deadline for final versions of white papers this weekend (Sep 30)
- Michael Peskin plans to release v3 of the ILC Snowmass Whitepaper soon, probably in ~2 weeks (profiting from being also editor of the over Snowmass proceedings ;-)

=> please look at the current version on overleaf and make sure your topic is up-to-date!

- **WG3 Open Physics meetings:**

- last one Sep 15: well attended, ~35 people
- next **Oct 13**, <https://agenda.linearcollider.org/event/9682/>
topics (tbc): dark photon searches, top ew couplings, CPV Higgs

- **next LCWS at SLAC**

- at 99% CL: week of May 15 (incl ascension day May 18)

- **shorter term:**

- ECFA Higgs Factory WS next week in Hamburg => final slide
- C³ meeting Oct 13/14 <https://indico.slac.stanford.edu/event/7315/overview>
 - Thursday: accelerator R&D plan
 - Friday 9-noon PST: detector session

Picked up at FCCee WS on Polarisation, Energy Calibration and Monochromatisation

Talk by Guy Wilkinson on polarimeter requirements

Any residual longitudinal-polarisation will bias cross sections & forward-backward asymmetries (indeed, high longitudinal polarisation is actually useful, but we assume we are not in that regime – rather longitudinal polarisation is a nuisance).

Consider forward-backward asymmetry of $b\bar{b}$ at Z pole: $A_{\text{FB}}^b = \frac{3}{4} \mathcal{A}_e \mathcal{A}_b$

where in the SM $\mathcal{A}_e \approx 0.15$, $\mathcal{A}_b \approx 0.95 \Rightarrow A_{\text{FB}}^b \approx 0.11$

Now, if there is longitudinal polarisation, asymmetry becomes: $(A_{\text{FB}}^b)' = \frac{3}{4} \mathcal{A}'_e \mathcal{A}_b$

where $\mathcal{A}'_e = -\left(\frac{\mathcal{A}_e - P}{1 - \mathcal{A}_e P}\right)$ with $P = \frac{(P_z)_{e^-} - (P_z)_{e^+}}{1 - (P_z)_{e^-} (P_z)_{e^+}}$

and $(P_z)_{e^\pm}$ the longitudinal polarisation of the e^\pm .

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Consider forward So, if $(P_Z)_{e^-} = (P_Z)_{e^+}$ (no reason to be so) = 10^{-5} (ballpark guess)

where in the S

$$P = 2 \times 10^{-5} \Rightarrow \frac{(A_{FB}^b)' - A_{FB}^b}{A_{FB}^b} = 1.3 \times 10^{-4}$$

Now, if there is Statistical uncertainty on A_{FB}^b around 2×10^{-5} (relative), and QCD uncertainty which will probably be larger. Still, to be safe we would want to control P_Z to $< 10^{-5}$.

where $\mathcal{A}'_e = -$ How is this to be done ? Measurements must be made on colliding bunches, where scattering rates are lower. Can we sample all bunches ? Will it prove necessary to depolarise the physics bunches ? If so, we will still need to monitor residual effects.

and $(P_Z)_{e^\pm}$ the

Note also, that calculations required to transport the measurement of 3-vector at polarimeter to P_Z value at the interaction points. How can this be cross checked ?

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=> limitations from residual polarisation of nominally unpolarised beam is something we've been pointing out since several years (cf PhD thesis Robert Karl, Jakob Beyer)

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where $\mathcal{A}'_e =$

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ECFA Higgs Factory Workshop

Reminder

- next week at DESY Oct 5-7
- <https://indico.desy.de/event/33640/>
- mainly in-person, but zoom connection will be provided - as well as recordings

I'm really looking forward to seeing at least some of you again in person, after a looong time!!!

First ECFA WORKSHOP.

on e^+e^- Higgs / Electroweak / Top Factories
5-7 October 2022, DESY / Hamburg

Topics:

- Physics potential of future Higgs and electroweak/top factories
- Required precision (experimental and theoretical)
- EFT (global) interpretation of Higgs factory measurements
- Reconstruction and simulation
- Software
- Detector R&D

The European Committee for Future Accelerators (ECFA) organises a series of workshops on physics studies, experiment design and detector technologies towards a future electron-positron Higgs/Electroweak/Top factory.

The aim is to bring together the efforts of various e^+e^- projects, to share challenges and expertise, to explore synergies, and to respond coherently to this high-priority item of the European Strategy for Particle Physics

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