

ECFA Higgs/Top/EW Factory WG 1 - Physics Potential



Higgs Top Electroweak

14 November 2023



Chris Hays, Karsten Köneke, Fabio Maltoni

ECFA-WHF-WG1-HTE-conveners@cern.ch

ECFA Higgs/Electroweak/Top Factory Workshop Series

Based on the **recommendations of the Update of the European Strategy for Particle Physics**, the **European Committee for Future Accelerators (ECFA)** has decided to organise a series of **workshops on physics studies, experiment design and detector technologies towards a future electron-positron Higgs/EW/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 strategy item.

To set up the relevant structures and to define a path towards such workshops, an International Advisory Committee (IAC) has been formed. It suggested to establish **three Working Groups**, led by conveners from both experiment and theory:

- [WG 1: Physics Potential](#)
 - Conveners: Juan Alcaraz (CIEMAT - Madrid), Jenny List (DESY), Fabio Maltoni (UC Louvain / Bologna) and Jorge de Blas (Univ. Granada)
- **WG 2: Physics Analysis Methods**
 - Conveners: Patrizia Azzi (INFN-Padova / CERN), Fulvio Piccinini (INFN Pavia) and Dirk Zerwas (IJCLab/DMLab)
- **WG 3: Detector R&D**
 - Starting off, as [Detector R&D Roadmap documents](#) are finished now ([Synopsis](#) and [Full Document\(10.17181/CERN.XDPL.W2EX\)](#))

[Informational Kick-off Meeting](#) was held online on Friday 18th June 2021.

Time frame: March 2021 – ~December 2024

Top-level indico page: <https://indico.cern.ch/event/1044297/>

Working Group 1 - Physics Potential

WG 1 activities ([indico](#)) and organization ([twiki](#)):

Subgroups:

- **WG1-PREC (Precision in theory & experiment):**
 - Conveners: Ayres Freitas (Pittsburgh), Paolo Azzurri (Pisa), Adrian Irlles (Valencia), Andreas Meyer (DESY)
ecfa-whf-wg1-prec-conveners @cern.ch
- **WG1-GLOB (Global interpretations in (SM)EFT and UV complete models):**
 - Conveners: Sven Heinemeyer (IFCA/IFT), Alexander Grohsjean (DESY), Junping Tian (Tokyo), Marcel Vos (Valencia), Jorge de Blas (Granada) ecfa-whf-wg1-glob-conveners @cern.ch
- **WG1-HTE (HIGGS-TOP-EW and connection with (HL-)LHC):**
 - Conveners: Chris Hays (Oxford), Karsten Köneke (Freiburg), Fabio Maltoni (Louvain)
ecfa-whf-wg1-hte-conveners @cern.ch
- **WG1-FLAV (Heavy Flavours):**
 - Conveners: David Marzocca (Trieste), Stephane Monteil (Clermont Ferrand), Pablo Goldenzweig (KIT)
ecfa-whf-wg1-flav-conveners @cern.ch
- **WG1-SRCH (Feebly interacting particles, direct low mass searches):**
 - Conveners: Roberto Franceschini (Rome III), Rebeca Gonzalez (Uppsala), Filip Zarnecki (Warsaw)
ecfa-whf-wg1-srch-conveners @cern.ch

WG1 Seminar series, workshops, etc, see [this indico](#) category

Subgroup on Higgs-Top-EW and connection with HL-LHC (HTE)

Organization:

- Group meetings: WG1-HTE
- egroup [mailing list](#)
 - You can also subscribe to the egroups of the groups; just search in egroups for “ECFA-WHF-WG1”.
- Conveners: Chris Hays (Oxford), Karsten Köneke (Freiburg), Fabio Maltoni (Louvain)
- Convener's email: [ecfa-whf-wg1-hte-conveners @cern.ch](mailto:ecfa-whf-wg1-hte-conveners@cern.ch)
 - **Please don't hesitate to talk to us for any ideas, suggestions, questions!**

Mandate:

- Identify measurements that the **(HL-)LHC** can perform in order to increase the physics potential of a future Higgs/Top/EW Factory.
 - High-precision inclusive measurements
 - Differential measurements, e.g., at high p_T
 - ...
- The physics potential of an e^+e^- HTE factory will also be compared to the potential of other future colliders.

You can find all our events, meetings, and workshops in our [HTE indico category](#).
Thus far, 5 workshops...

2nd ECFA Workshop on Higgs/EW/Top Factory

2023 ECFA e^+e^- Workshop in Paestum, Italy

11 – 13 October 2023:

<https://agenda.infn.it/event/34841/>

- About 140 participants
- Status of Working Group activities
 - Focus topics (→ see later)
- Discussions of future plans
- Interactions between theory and experiments
- ...



SECOND • ECFA • WORKSHOP
on e^+e^- Higgs / Electroweak / Top Factories

11-13 October 2023
Paestum / Salerno / Italy

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

Next “overall” workshop planned for ~same time in 2024

The big picture – Timelines

ECFA study coherent with
next European Strategy Update

- Provisionally expected in **2026-2027**
 - ⇒ expect **strategy inputs** to be due in **late 2025**
 - ⇒ **2 years remaining for ECFA study**

Note: Also CEPC will know ~mid 2025, if they get on the next five year plan in China!!!

2020 UPDATE OF THE EUROPEAN STRATEGY
FOR PARTICLE PHYSICS

by the European Strategy Group



Focus Topics

1	HtoSS — $e^+e^- \rightarrow Zh: h \rightarrow s\bar{s}$ ($\sqrt{s} = 240/250$ GeV) (JdB)
2	ZHang — ZH angular distributions and CP studies (JdB)
3	Hself — Determination of the Higgs self-coupling (JdB)
4	Wmass — Mass and width of the W boson from the pair-production threshold cross section lineshape and from decay kinematics ($\sqrt{s} = 158 - 380$ GeV)
5	WWdiff — Full studies of WW and $e\nu W$ ($\sqrt{s} = 240/250, 365$ GeV) (JdB)
6	TTthres — Top threshold: Detector-level simulation study of $e^+e^- \rightarrow t\bar{t}$ at a typical threshold-scan energy ($\sqrt{s} = 350, 365$ GeV) and threshold scan optimisation (JL)
7	LUMI — Precision luminosity measurement
8	EXscalar — New exotic scalars
9	LLPs — Long-lived particles
10	EXtt — Exotic top decays (FM)
11	CKMWW — CKM matrix elements from W decays (PK)
12	BKtautau — $B^0 \rightarrow K^{0*}\tau^+\tau^-$ (PK)
13	TwoF — EW precision: 2-fermion final states ($\sqrt{s} = M_Z$ and beyond) (PK)
14	BCfrag and Gsplit — Heavy quark fragmentation and hadronisation, gluon splitting and quark-gluon separation

Focus topics are intended to encompass a wide range of activities spanning

- theory & experiment,
- analysis & algorithm development,
- detector requirements & optimisation

Working on a document describing each of the 14 focus topics:

- Written by existing core expert teams (~5-10 people each)
- 2-4 pages for each, describing why it is interesting, where we stand, and what needs to be further looked into
- Goal: put it on the arXiv by December

Next:

- Series of working meeting for each topic (~12-18 months)
- Aim for at least one small-author paper from each topic

Overall: accumulate critical mass working on each topic, reaching publications on timescale of ECFA study!
Get engaged in your topic(s) of interest!

Focus Topics

Collaborative resources:

<https://indico.cern.ch/event/1044297/>

ECFA
European Committee for Future Accelerators

31 May 2021 to 30 September 2025
Europe/Zurich timezone

Overview and Activities

- WG1 group activities
- WG2 group activities
- WG3 group activities
- Focus Topics**
- Committees
- E-groups

Overview and Activities

Based on the recommendations of the European Strategy for Future Accelerators (ECFA) has launched a series of works detector technologies towards a future electron-positron High Energy (HE) project, to share challenges and expertise on this high-priority strategy item.

To set up the relevant structures and to define a path towards a future HE project, the **International Advisory Committee (IAC)** was formed, which established three Working Groups (WG1, WG2, WG3).

For information on the ECFA study activities, please see the ECFA website:
<https://gitlab.in2p3.fr/ecfa-study/ECFA-HiggsTopEW-Factories/>

FocusTopics

The ECFA Higgs / Top / Electroweak Factory study has been set up to expand the e^+e^- community, bringing people together across the various e^+e^- projects to share expertise and tools and to work coherently on scientific and technical topics.

The focus topics are specific areas in which the ECFA study could reach significantly beyond the state-of-the-art understanding of the physics potential of future e^+e^- Higgs / top / EW factories. The topics do not aim to comprehensively map the physics program of a future Higgs factory. Instead, they should serve to:

- complete the current overall picture where (most) necessary;
- give guidance to people who would like to contribute to the ECFA study;
- highlight processes particularly suitable for studying the interplay of the three working areas of the ECFA study: physics potential, analysis methods, and detector performance.

The topics can therefore act as a vehicle for new engagement and collaboration. They are intended as a basis that could be expanded later. The initiative should build on existing analysis tools and samples that can be shared among the projects and developed cooperatively, and it therefore highlights where existing examples, including analysis code and datasets, could be taken as a starting point, particularly by new entrants. All experimental simulation studies are strongly encouraged to use the KEY4HEP framework. This will translate into new tools usable by the whole community and thoroughly tested, and will improve already existing or interfaced tools.

Focus Topics index:

- **HtoSS:** $e^+e^- \rightarrow Zh: h \rightarrow ss$
- **ZHang:** ZH angular distributions and CP studies
- **Hself:** Determination of the Higgs self-coupling
- **Wmass:** Mass and width of the W boson
- **WWdiff:** Full studies of WW and evW
- **TTthresh:** Top threshold - detector-level studies of $e^+e^- \rightarrow t\bar{t}$
- **LUMI:** Precision luminosity measurement
- **EXscalar:** New exotic scalars

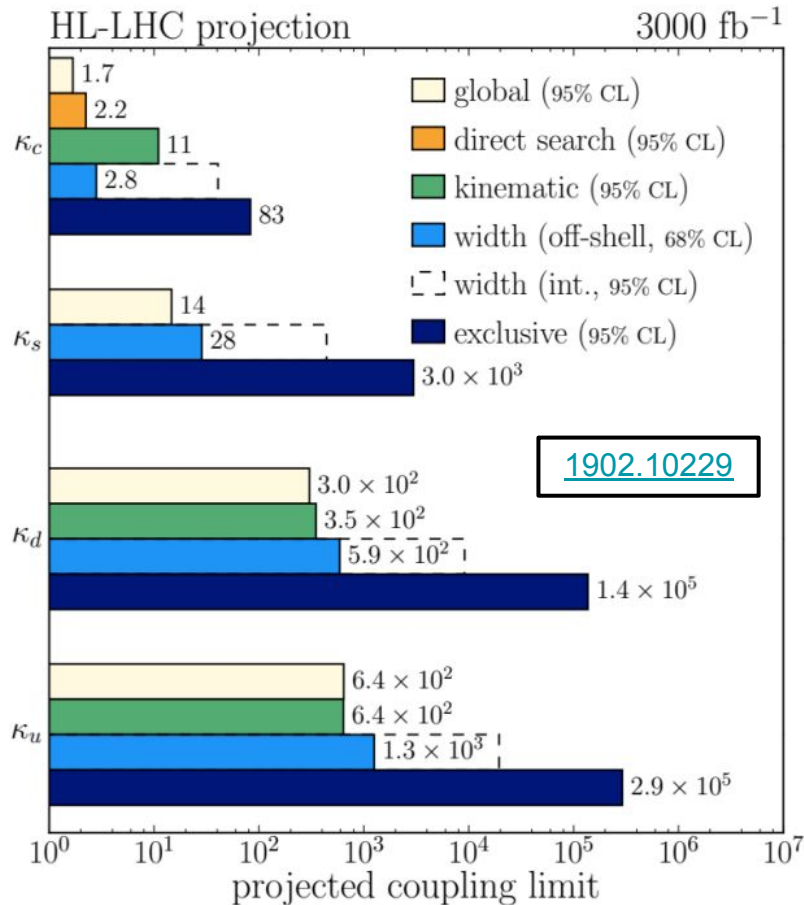
Higgs Top EW factories

- WG1 physics performance
 - WG1-FLAV
 - WG1-GLOB
 - WG1-HTE
 - WG1-PREC
 - WG1-SRCH
- WG2 Physics analysis methods
- WG3 Detector R&D
- Focus Topics
 - HtoSS
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 - TTthresh
 - LUMI
 - EXscalar
 - LLPs
 - EXtt
 - CKMWW
 - BKtautau
 - TwoF
 - BCfrag/Gsplit

Contacts and email lists to subscribe to are listed on these pages

Focus Topic Examples: HtoSS

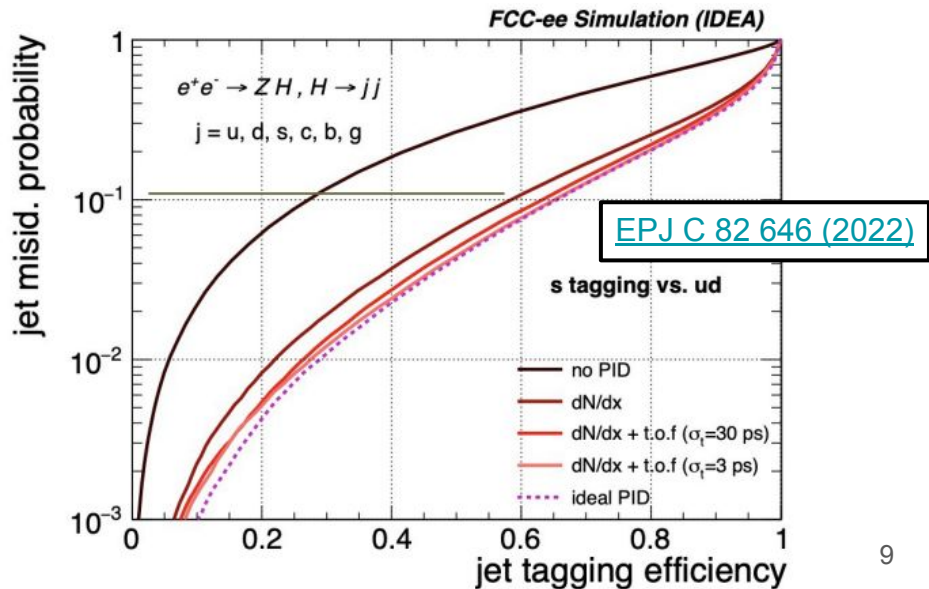
See also [Caterina Vernieri's slides at ECFA workshop in Paestum](#)



Light Yukawas out of reach at (HL-)LHC

(Nearly) within reach at e⁺e⁻ collider:

- Need strange jet tagging!
- Which needs excellent PID & ML

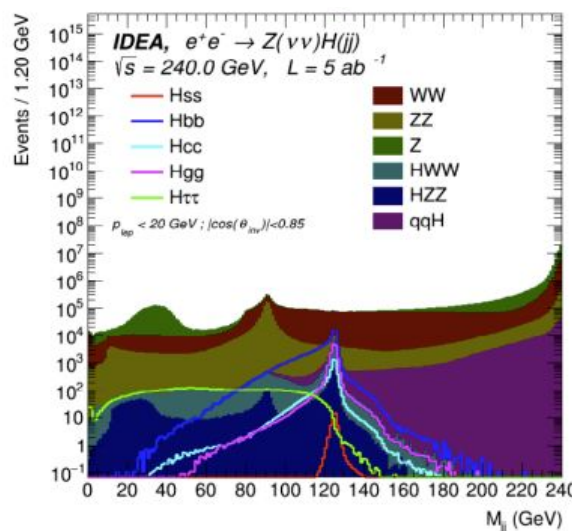
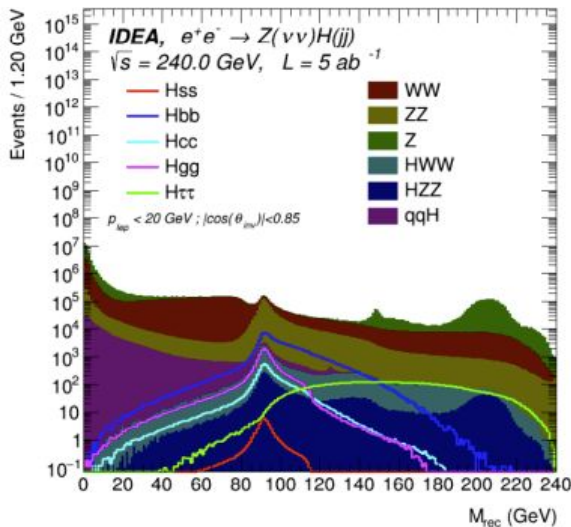


Focus Topic Examples: HtoSS

See also [Caterina Vernieri's slides at ECFA workshop in Paestum](#)

Possible constraints on Hss coupling $\sqrt{s} = 240/250$ GeV:

- ILD: combined limit with 900/fb (i.e. half dataset): $\kappa_s < 6.74$ at 95% CL [2203.07535](#)
- FCC-ee: Z(vv)H only limit with 5/ab and 2 IPs: $\text{BR}(H \rightarrow ss) < 1.3$ at 95% CL



[Loukas Gouskos, FCC-ee Week London 2023](#)

- CEPC: Z(vv/l)H limit with 20/ab: $\text{BR}(H \rightarrow ss) < 3 \times \text{SM}$ at 95% CL

[2310.03440](#)

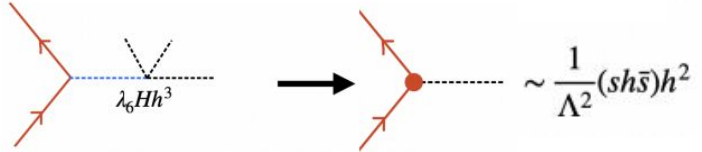
Focus Topic Examples: HtoSS

1 HtoSS — $e^+e^- \rightarrow Zh: h \rightarrow s\bar{s}$ ($\sqrt{s} = 240/250$ GeV) (JdB)

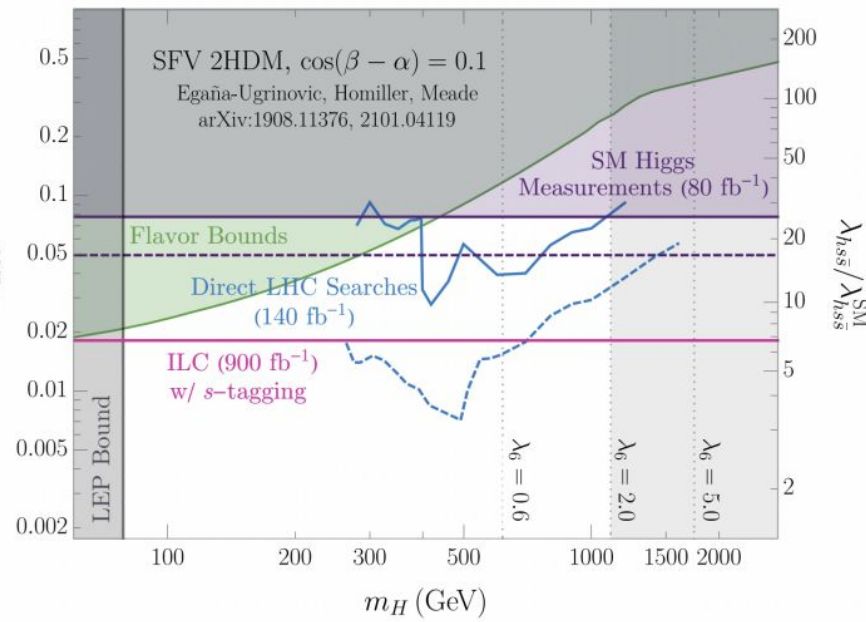
Expert Team: John Alison, Matthew Basso, Valentina Cairo, Valerio Dao, Loukas Gouskos, Karsten Köneke, Yotam Soreq, Taikan Suehara, Caterina Vernieri

Next steps:

- Refine analyses and explore more avenues
- Study detector benchmarks
 - Complementarity in different PID systems
 - Reconstruction of V_0 s
 - Strange tagging and s/\bar{s} separation
- Map results into pheno models:
 - e.g.: **Spontaneous Flavor Violation**: New physics can couple in a strongly flavor dependent way if it is aligned in the down-type quark or up-type quark sectors
 - Allows for large couplings of additional Higgs to strange/light quarks
 - No flavor-changing neutral currents



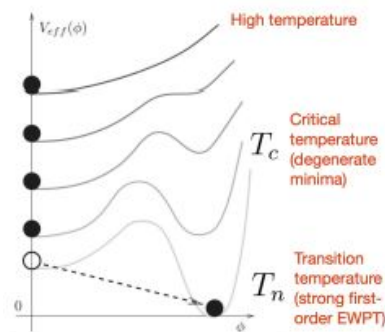
P. Meade



Focus Topic Examples: ZHang

Goals:

- Determination of ZH coupling
- Access to CP-properties of H



See also [Gudrid Moortgat-Pick's slides at ECFA workshop in Paestum](#)

Why important? Are there additional sources for CP violation in Higgs sector?

- Baryogenesis: creation of the asymmetry between matter and anti-matter in the universe requires a strong first-order electroweak phase transition (EWPT)
- First-order EWPT does not work in the SM:
The amount of CP violation in the SM (induced by the CKM phase) is not sufficient to explain the observed asymmetry between matter and anti-matter in the universe
- First-order EWPT can be realised in extended Higgs sectors could give rise to detectable gravitational wave signal

⇒ Search for additional sources of CP violation

Focus Topic Examples: ZHang

From experiment: H125 is not pure CP-odd.

- But we do not know that it is pure CP-even

CP-odd coupling effect is suppressed in HVV, but at the same level as CP-even in Hff

- ATLAS and CMS already put various constraints on these!
→ see other talks in this workshop

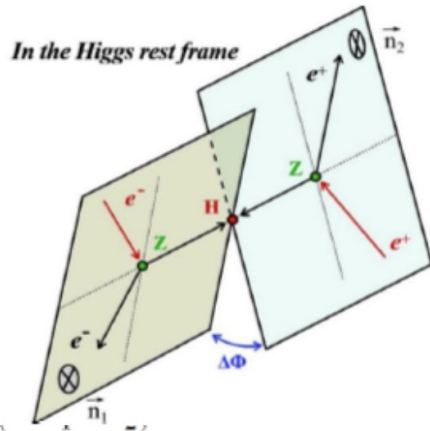
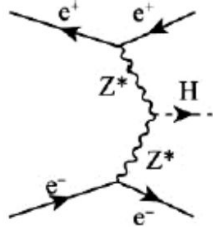
Next: two examples as teasers

Focus Topic Examples: ZHang

See also [Gudrid Moortgat-Pick's slides at ECFA workshop in Paestum](#)

Work in progress!

unpolarized beams: ZZ-fusion



$$\text{sgn}(\sin \Phi) = \frac{\mathbf{q}_1 \cdot (\hat{\mathbf{n}}_1 \times \hat{\mathbf{n}}_2)}{|\mathbf{q}_1 \cdot (\hat{\mathbf{n}}_1 \times \hat{\mathbf{n}}_2)|}$$

$$\hat{\mathbf{n}}_1 = \frac{\mathbf{q}_{e_i^-} \times \mathbf{q}_{e_f^-}}{|\mathbf{q}_{e_i^-} \times \mathbf{q}_{e_f^-}|}$$

$$\hat{\mathbf{n}}_2 = \frac{\mathbf{q}_{e_i^+} \times \mathbf{q}_{e_f^+}}{|\mathbf{q}_{e_i^+} \times \mathbf{q}_{e_f^+}|}$$

	\sqrt{s}	beam polarisation	$\int \mathcal{L} dt$ (baseline)
ILC	0.1 - 1 TeV	e-: 80% e+: 30% (20%)	2 ab ⁻¹ @ 250 GeV 0.2 ab ⁻¹ @ 350 GeV 4 ab ⁻¹ @ 500 GeV 8 ab ⁻¹ @ 1 TeV

Collider	pp	pp	pp	e ⁺ e ⁻	e ⁺ e ⁻	e ⁺ e ⁻	e ⁺ e ⁻	e ⁻ p	γγ	μ ⁺ μ ⁻	μ ⁺ μ ⁻	target
E (GeV)	14,000	14,000	100,000	250	350	500	1 TeV	1,300	125	125	3,000	(theory)
\mathcal{L} (fb ⁻¹)	300	3,000	30,000	250	350	500	8 ab⁻¹	1,000	250	20	1,000	
HZZ/HWW	4.0·10 ⁻⁵	2.5·10 ⁻⁶	✓	3.9·10 ⁻⁵	2.9·10 ⁻⁵	1.3·10 ⁻⁵	1.6·10⁻⁵	✓	✓	✓	✓	< 10 ⁻⁵
Hγγ	-	0.50	✓	-	-	-	-	-	0.06	-	-	< 10 ⁻²
HZγ	-	~1	✓	-	-	-	~1	-	-	-	-	< 10 ⁻²
Hgg	0.12	0.011	✓	-	-	-	-	-	-	-	-	< 10 ⁻²
Ht̄t	0.24	0.05	✓	-	-	0.29	0.08	✓	-	-	✓	< 10 ⁻²
Hττ	0.07	0.008	✓	0.01	0.01	0.02	0.06	-	✓	✓	✓	< 10 ⁻²
Hμμ	-	-	-	-	-	-	-	-	-	✓	-	< 10 ⁻²

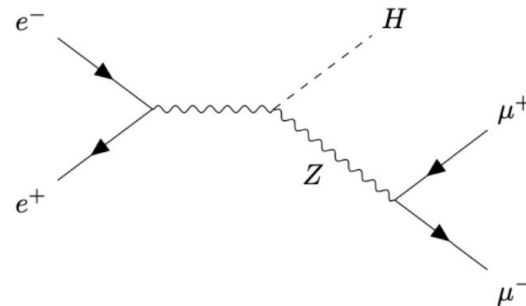
Focus Topic Examples: ZHang

See also [Gudrid Moortgat-Pick's slides at ECFA workshop in Paestum](#)

Work in progress!

transversely-polarized beams: HZ

$$\begin{aligned}
 |\mathcal{M}|^2 = & (1 - P_-^3 P_+^3)(\cos^2 \alpha \mathcal{A}_{\text{CP-even}} + \sin 2\alpha \mathcal{A}_{\text{CP-mix}} + \sin^2 \alpha \mathcal{A}_{\text{CP-odd}}) \\
 & + (P_-^3 - P_+^3)(\cos^2 \alpha \mathcal{B}_{\text{CP-even}} + \sin 2\alpha \mathcal{B}_{\text{CP-mix}} + \sin^2 \alpha \mathcal{B}_{\text{CP-odd}}) \\
 & + \sum_{mn}^{1,2} P_-^m P_+^n \left(\cos^2 \alpha \mathcal{C}_{\text{CP-even}}^{mn} + \sin 2\alpha \mathcal{C}_{\text{CP-mix}}^{mn} + \sin^2 \alpha \mathcal{C}_{\text{CP-odd}}^{mn} \right)
 \end{aligned}$$



$$e^+ e^- \rightarrow HZ, Z \rightarrow \mu^+ \mu^-$$

$(P_{e^-}^T, P_{e^+}^T)$	Luminosity [fb^{-1}]	$\sin 2\alpha$ limit	c_{AZZ} limit
(80%, 30%)	2000	-	[-0.31,0.31]
(80%, 30%)	5000	[-0.62,0.62]	[-0.12,0.12]
(90%, 40%)	2000	[-0.79,0.79]	[-0.15,0.15]
(90%, 40%)	5000	[-0.39,0.39]	[-0.09,0.09]

so far only $\sqrt{s}=250$ GeV....
 not yet exploited at higher energies
 not yet exploited ZZ-fusion

.....work in progress.....

you are welcome!

Focus Topic Examples: ZHang

2 ZHang — ZH angular distributions and CP studies (JdB)

Expert Team: Cheng Li, Chris Hays, Gudrid Moortgat-Pick, Ivanka Bozovic, Jorge de Blas, Ken Mimasu, Markus Klute, Sandra Kortner

Topics being discussed:

- Reconstruction of production and decay angles
- CP-violation in H-Z coupling
- Higgs couplings in HZ production
- CP-odd observables
- Global context, CP-conserving SMEFT,...

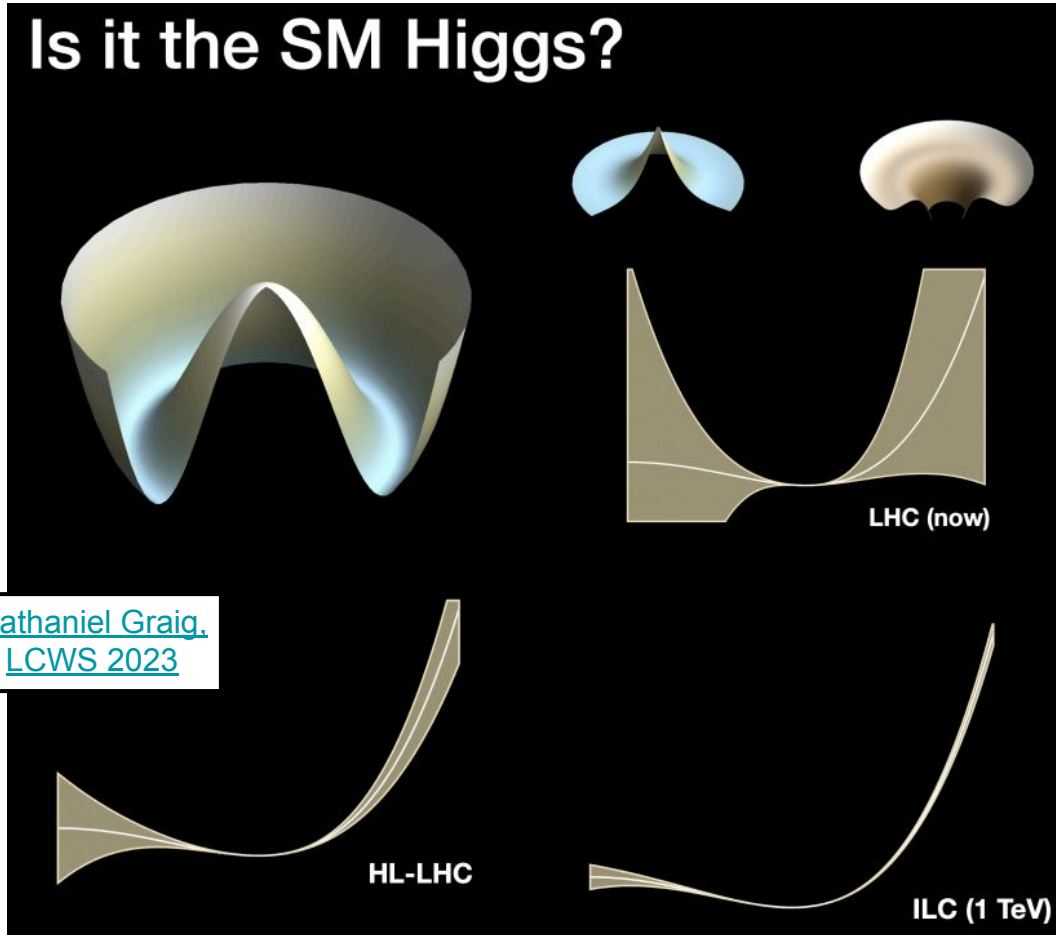
Many areas of work needed in:

- Pheno
- MC
- Reco
- ...

Focus Topic Examples: Hself

See also [Junping Tian's slides at ECFA workshop in Paestum](#)

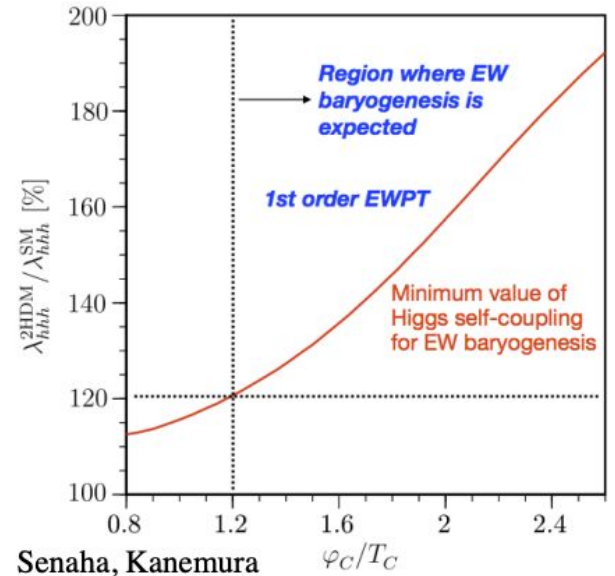
Is it the SM Higgs?



[Nathaniel Graig, LCWS 2023](#)

Also:

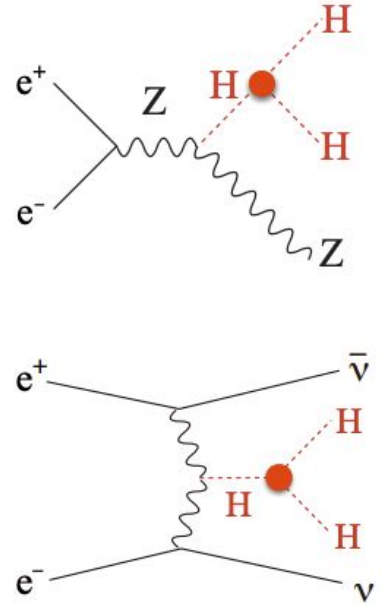
- $O(1)$ deviation of λ_{HHH} (preferred in certain BSMs)
- Light degrees of freedom, i.e., extra Higgs bosons



Focus Topic Examples: Hself

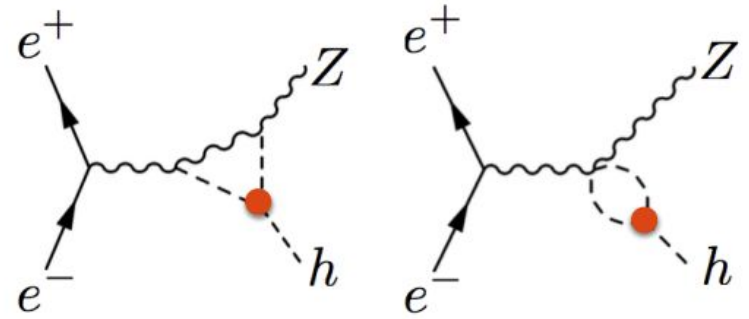
At e^+e^- collider:

$\sqrt{s} \gtrsim 500 \text{ GeV}$



$\sigma_{HH} \sim O(0.1) \text{ fb}$

$\sqrt{s} \gtrsim 240\text{-}250 \text{ GeV}$

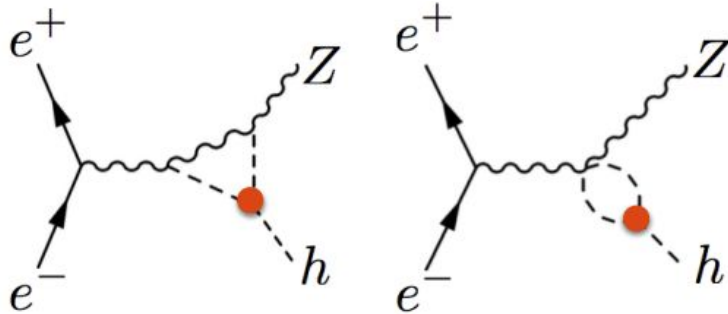


$\delta\sigma_{ZH} \sim O(1\%)$

Focus Topic Examples: Hself

See also [Junping Tian's slides at ECFA workshop in Paestum](#)

Questions related to single-Higgs processes

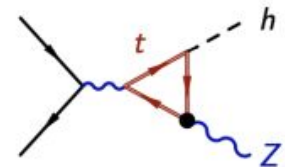


$$\delta_{\sigma}^{240} = 100 (2\delta_Z + 0.014\delta_h) \%$$

[Matthew McCullough, 1312.3322](#)

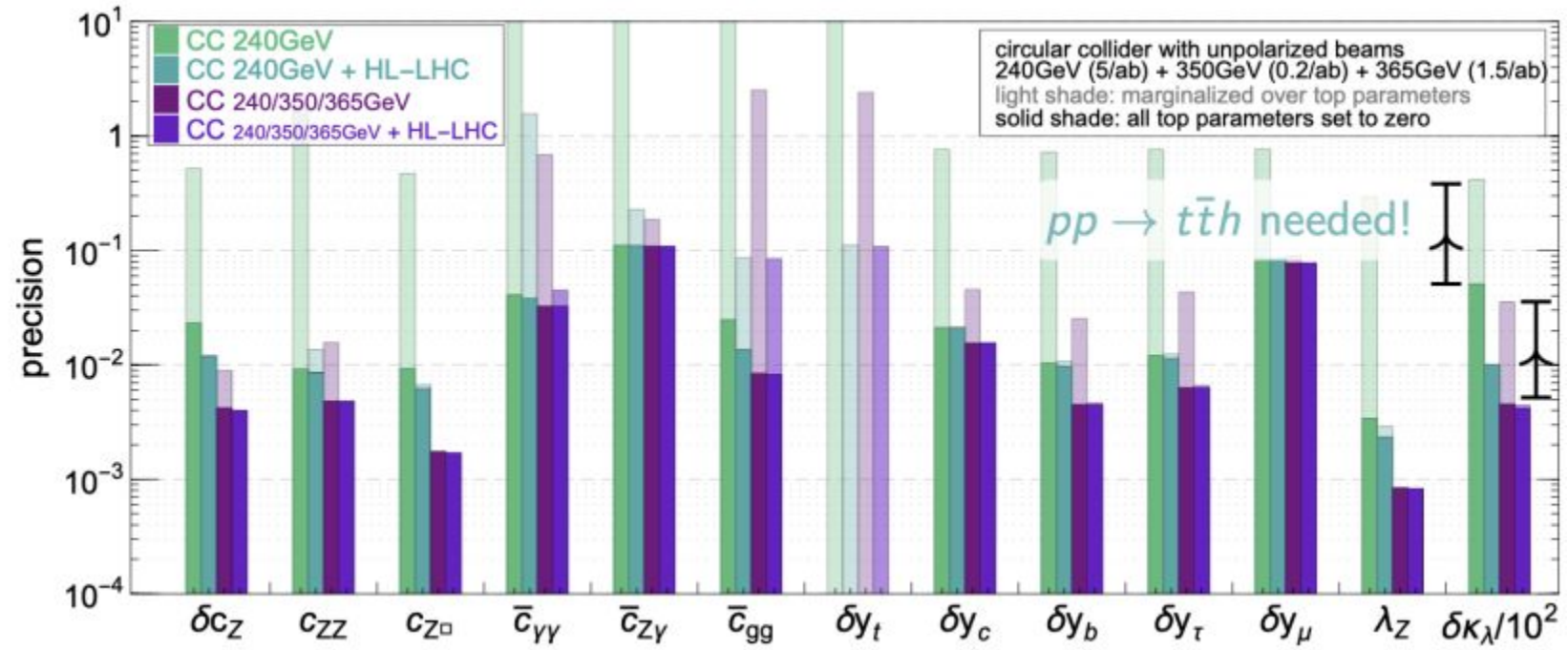
- If only δh is deviated $\rightarrow \delta h \sim 28\%$
- If both δz and δh deviated $\rightarrow \delta h \sim 90\%$
- $\delta\sigma$ could receive contributions from many other sources
 - $\delta h \sim 500\%$ at 250 GeV only; [Gu, et al, arXiv:1711.03978]
 - $\delta h \sim 50\% + 350/500\text{GeV}$ [Peskin, Yong, Tian, paper in preparation]
- Can we lift the degeneracies by new observables, e.g. ZHang?
- What if we include other NLO effects as well, e.g. top?

Higgs
[Vrionidou, Zhang, '18]
[see also Boselli et al '18]



Focus Topic Examples: Hself

Top-quark uncertainties can impede Higgs precision!



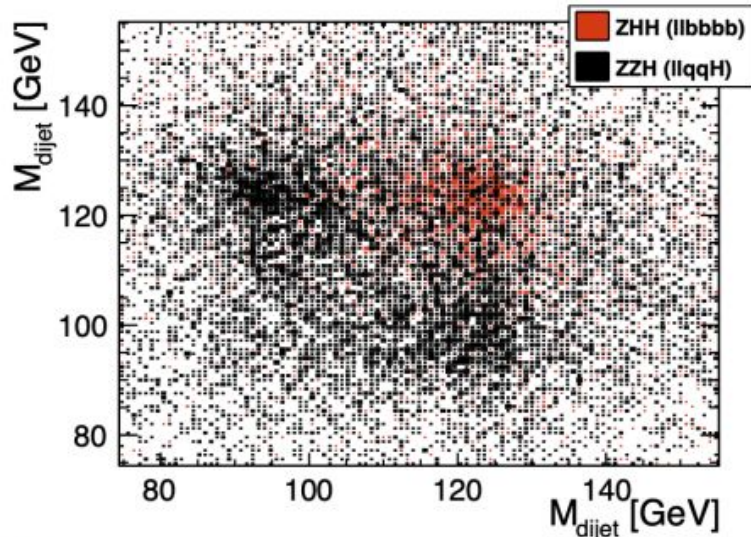
[Durieux, Gu, Vyrionidou, Zhang, '18](#)

[Jung, Lee, Perello, Tian, Vos, '20](#)

Focus Topic Examples: Hself

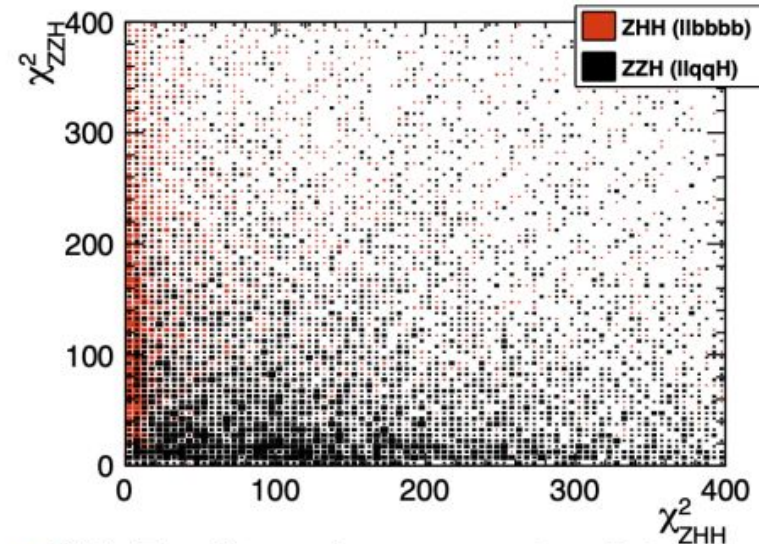
A lot of improvements possible on the analysis side, e.g.:

- Flavor tagging, jet clustering, kinematic fitting, matrix element method, machine learning, ...



- Pre-fitted dijet-masses show large overlap between signal (ZHH) and background (ZZH)

→



- With ErrorFlow → larger separation of signal (ZHH) and background (ZZH)

Focus Topic Examples: Hself

3 Hself — Determination of the Higgs self-coupling (JdB)

Expert Team: Junping Tian; Gauthier Durieux, Jose Goncalo, Sven Heinemeyer, Michael Peskin, Philipp Roloff, Roberto Salerno

Some items in the focus topic note:

- Theory: beyond the SMEFT
- Single-Higgs: lifting the degeneracies
- Di-Higgs production: advancing the analysis technique

Summary

Many more Higgs-related presentations in Paestum, have a look:

14:00 **New physics searches with 2-fermion final states** *Mr Koushi Nagae et al.* [📎](#)
Sala Mercurio, Hotel Ariston 14:00 - 14:14

Experimental prospects for indirect BSM searches in $e^+e^- \rightarrow q\bar{q}$ ($q=c,b,s$) processes at Higgs Factories [📎](#)
Dr Adrian Irlin

Flavor, Colliders, and the Z-pole: Opportunities for probing new physics at FCC-ee *Benjamin Stefanek* [📎](#)
Sala Mercurio, Hotel Ariston 14:44 - 14:58

15:00 **Flavor changing Higgs and Z decays at FCC-ee [zoom]** *Michele Tammaro*
Sala Mercurio, Hotel Ariston 15:06 - 15:20

Poster session + Tea
Hotel Ariston, Paestum 15:30 - 16:00

16:00 **Search for Invisible Decays of the Higgs Boson at the ILC Using key4HEP** *Carsten Hensel* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 16:00 - 16:16

Challenges and Solutions in Reconstructing Higgs Decays to Heavy Flavour Jets *Leonhard Reichenbach* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 16:26 - 16:42

17:00 **Novel b -hemisphere jet charge tagger at FCC-ee** *Lars Roehrig* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 16:52 - 17:08

Electroweak couplings of light quark at future linear colliders [zoom] *Yuichi Okugawa* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 17:18 - 17:34

14:00 **BSM Triple Higgs couplings at ILC/CLIC** *Sven Heinemeyer* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 14:00 - 14:16

Optimizing the Higgs self-coupling measurement at ILC and C³ *Bryan Bliewert et al.* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 14:20 - 14:36

Precise predictions for the trilinear Higgs coupling in arbitrary models *Johannes Braathen* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 14:40 - 14:56

15:00 **$(g-2)_{\mu}$ and SUSY Dark Matter at ILC/CLIC** *Sven Heinemeyer* [📎](#)
Sala Mercurio, Hotel Ariston, Paestum 15:00 - 15:16

EFT analysis of Higgs naturalness & search strategies at a future electron-positron collider (canceled) *Shaouly Bar-Shalom*

Summary

Many more Higgs-related presentations in Paestum, have a look!

- <https://agenda.infn.it/event/34841/timetable/?view=standard>

Three focus topics are directly Higgs related

- Paper describing each topic in 2-3 pages on the arXiv this year
 - Overview of topic
 - Description of what the targets are, and what remains to be done

Get engaged in the effort to prepare for the next update of the European Strategy for Particle Physics...

... and because it is really interesting!

<https://gitlab.in2p3.fr/ecfa-study/ECFA-HiggsTopEW-Factories/-/wikis/FocusTopics>

