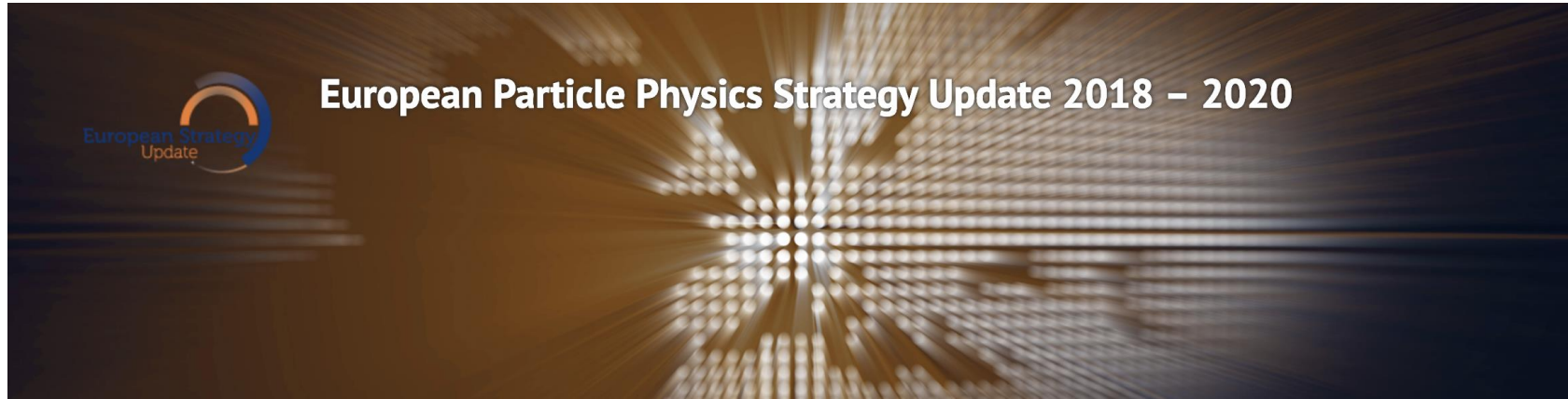


European Particle Physics Strategy Update: Electroweak Session



Beate Heinemann (DESY & Universität Freiburg)

Keith Ellis (Durham University)



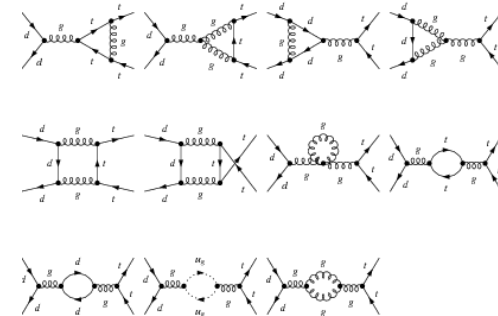
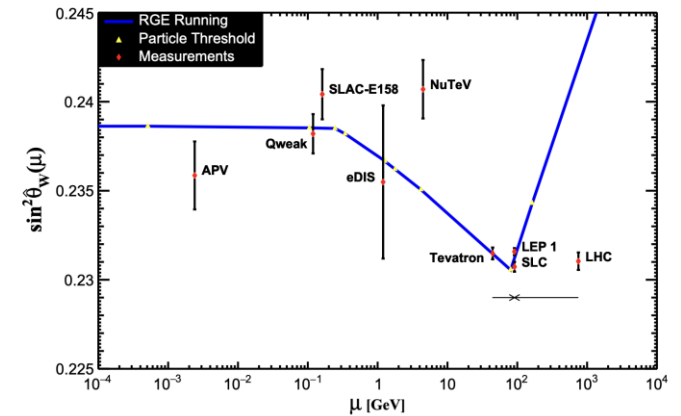
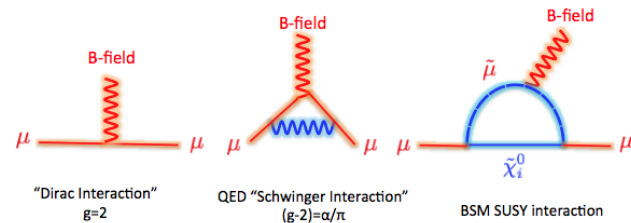
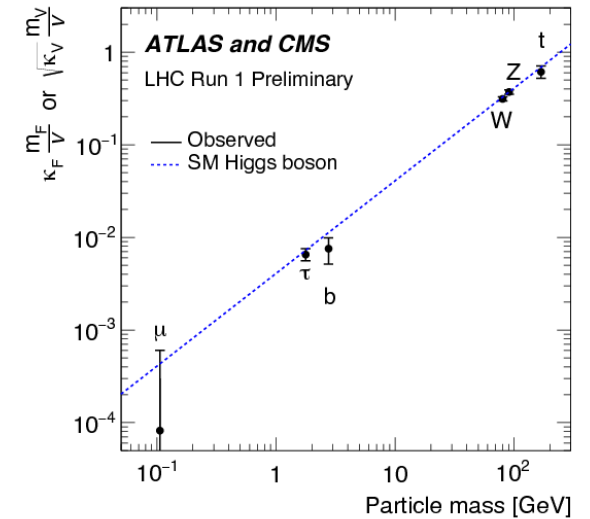
Submitted Contributions: 21

#	Title	Submitter
29	CEPC Input to the ESPP 2018 - Physics and Detector	Manqi Ruan
41	Further searches of the Higgs scalar sector	Rubbia Secretariat
42	The Physics Beyond Colliders Study at CERN	Claude Vallee
50	Particle physics applications of the AWAKE acceleration scheme	Matthew Wing
77	The International Linear Collider. A Global Project	Juan Fuster Verdú
89	Future strategies for the discovery and the precise measurement of the Higgs self coupling	Patrick Janot
92	PROSPECT OF THE IN2P3 COMMUNITY INVOLVED IN THE ILC PROJECT	Marc Winter
99	Synergies between a U.S.-based Electron-Ion Collider and the European research in Particle Physics	Daniel Boer
100	Precision calculations for high-energy collider processes	Thomas Kurt Gehrman
101	Theory Requirements and Possibilities for the FCC-ee and other Future High Energy and Precision Frontier Lepton Colliders	Alain Blondel
114	Monte Carlo event generators for high energy particle physics event simulation	Mike Seymour
118	The MUonE experiment	Clara Matteuzzi
120	Muon Colliders	Nadia Pastrone
131	Enhancing the LBNF/DUNE Physics Program	Roberto Petti
135	Future Circular Collider - The Integrated Programme (FCC-int)	Michael Benedikt
136	Future Circular Collider - The High-Energy LHC (HE-LHC)	Michael Benedikt
145	The Compact Linear e ⁺ e ⁻ Collider (CLIC): Physics Potential	Philipp Roloff
152	The physics potential of HL-LHC	Michelangelo Mangano
159	Exploring the Energy Frontier with Deep Inelastic Scattering at the LHC	Max Klein
160	The physics potential of HE-LHC	Michelangelo Mangano
163	Quantum Chromodynamics: Theory - Input for the European Particle Physics Strategy Update	Francesco Hautmann

All submissions, see <https://indico.cern.ch/event/765096/contributions/>

Major Themes of Submissions

- Higgs boson precision measurements and di-Higgs searches
 - Electron-positron colliders: ILC, CEPC, CLIC, FCC-ee
 - Electron-proton collider: LHeC, FCC-eh
 - Hadron Colliders: HL-LHC, HE-LHC and FCC-hh
 - Muon Collider
- Precision EWK measurements
 - W mass: HL-LHC, e+e- colliders (ILC, CEPC, CLIC, FCC-ee)
 - Z pole measurements: CEPC, FCC-ee
 - Dibosons: HL-LHC, ILC, FCC-ee
 - $\sin^2\theta_W$: HL-LHC, EIC, DUNE, LHeC
- Electromagnetic interactions:
 - g-2: MuonE
 - Strong-field QED: AWAKE, LUXE
- Theory:
 - QCD
 - Monte Carlo
 - High Precision calculations
 - Requirements for FCC-ee



Agenda for Granada: Generic Aspects

- HL-LHC forms basis
 - main question: what do other colliders add?
- Program focusses on scientific information
 - Goal is that talks discuss the scientific interest and/or scientific potential
- Chose to have one joint session with accelerator group on e^+e^- colliders
 - Discuss both technical aspects and physics potential
- Agenda aims to reflect all submissions
- Allocate a lot of time for discussion: 1/3 of total time

CERN Council Open Symposium on the Update of

European Strategy for Particle Physics

13-16 May 2019 - Granada, Spain



Physics Preparatory Group

Halina Abramowicz (Chair)
Shoji Asai Beate Heinemann
Stan Bentvelsen Xinchou Lou
Caterina Biscari Krzysztof Redlich
Marcela Carena Leonid Rivkin
Jorgen D'Hondt Paris Sphicas
Keith Ellis Brigitte Vachon
Belen Gavela Marco Zito
Gian Giudice Antonio Zoccoli

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Eugení Graugés

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Big Questions for Granada

- How well can the Higgs boson couplings to fermions, gauge bosons and to itself be probed at current and future colliders?
- How do precision electroweak observables inform us about the Higgs boson properties and/or BSM physics?
- What progress is needed in theoretical developments in QCD and EWK to fully capitalize on the experimental data?
- What is the best path towards measuring the Higgs potential?

Agenda for Monday Afternoon (May 13th)

- Session 1:

Understand prospects of HL-LHC

- Prospects for Higgs and EW measurements at HL-LHC: **Patrizia Azzi**
- QCD uncertainties on Higgs and other EWK observables: **Fabrizio Caola**
- What can we learn about our Universe from Higgs and EWK observables?: **Riccardo Ratazzi**
- Discussion

Big Picture

- Coffee

- Session 2: (joint with accelerator track of EPPSU)

- Overview and technical challenges of proposed Higgs factories: **Daniel Schulte**
- Capability of future machines for precision Higgs physics (exp): **Maria Cepeda**
- Discussion

Comparison of future machines: apples to apples

Agenda for Tuesday Afternoon (May 14th)

- Session 3:

Precision EWK measurements (non-Higgs) and calculations

- Electroweak Precision Measurements at future colliders and other experiments (g-2, alpha_em, MW, MZ, sin2thetaW...) **Marc Lancaster**
- Precision Electroweak calculations (Giga-Z, WW, HBRs, etc): **Stefan Dittmaier**
- Understanding the EWK potential and its role in our Universe: **Geraldine Servant**
- Discussion

- Coffee

Higgs self-coupling:
theory and experiment

- Session 4:

- Path towards measuring the Higgs potential: **Elisabeth Petit**
- Interpretation of Higgs and EWK data in EFT framework: **Jorge de Blas**
- Discussion

Big Picture

Conclusion

- Electroweak Session will be very important topic for future of particle physics
 - Electroweak symmetry breaking still a big mystery!
- Many submissions received related to future colliders and other/smaller experiments
- Session is focussed on understanding what can be learned from precision measurements of electroweak sector
 - Close physics connections to BSM, dark sector and flavour
 - Close technical connections to accelerators, instrumentation & computing
- We hope for constructive scientific discussions in Granada