

First ECFA WORKSHOP.

Contribution ID: 87

Type: **Parallel session talk**

Measuring the Higgs Trilinear Self-Coupling at the FCC-ee

The determination of the Higgs self-couplings are of primary importance in particle physics and cosmology. Here we will report on our investigation of the measurement of the Standard Model Higgs trilinear self-coupling parameter at the FCC-ee using single Higgs production channels, via its production cross section. We have introduced several Higgs boson production channels at $\sqrt{s} = 240, 365$ GeV, used improved Monte Carlo samples and a new orthogonal categorization of events. We used inclusive Higgsstrahlung (leptonic and hadronic) and exclusive vector boson fusion channels in a combined analysis to extract the sensitivity on the respective cross sections as well as on the trilinear self-coupling. We show that the signal strength modifiers used to estimate the precision on the Higgsstrahlung and vector boson fusion production cross sections could be measured with sub-percent and percent precision at the FCC-ee under the assumption that the decay of the Higgs boson follows the Standard Model expectation. In a similar manner, we extracted the Higgs boson trilinear self-coupling κ_λ using one-loop corrections to the leading order Feynman diagrams of Higgsstrahlung and vector boson fusion. Results are obtained assuming all couplings except for κ_λ are set to the Standard Model values.

Primary authors: Mr HARRINGER, Nico (CNRS/IN2P3 - LLR, École polytechnique); Dr SALERNO, Roberto Salerno (CNRS/IN2P3 - LLR, École polytechnique); LEMMON, Roy (Daresbury Laboratory (GB)); Dr SASIKUMAR, Swathi (Max-Planck-Institute for Physics)

Presenter: Dr SASIKUMAR, Swathi (Max-Planck-Institute for Physics)

Session Classification: WG1: joined HTE & GLOB session

Track Classification: WG1-HTE+GLOB - Physics Potential: Higgs, top and EW joint with Global Interpretations