



Contribution ID: 234

Type: **Asynchronous Talk**

Electron Yukawa from s-channel resonant Higgs production at FCC-ee

Measuring the electron Yukawa is impossible in Higgs boson decays, $H \rightarrow e^+e^-$, given the smallness of the electron mass that leads to a vanishingly small decay branching fraction. The only direct method to extract the Higgs-electron coupling is through resonant s-channel production in e^+e^- collisions running at the Higgs pole mass. Such a measurement is possible at the FCC-ee provided one can monochromatize the beams, leading to center-of-mass energy spread not much larger than the Higgs boson width of ~ 4 MeV, as well as having a prior accurate and precise knowledge of the Higgs boson mass, within MeV uncertainties. Under such conditions, a study combining 10 different Higgs decay modes indicates that a $\sim 1.3\sigma$ significance for the $e^+e^- \rightarrow H$ process can be reached, above the (much larger) backgrounds, for every 10 ab^{-1} of integrated luminosity per FCC-ee interaction point (IP). Depending on the number of IPs and years running at the Higgs pole, such a measurement will provide the only means known to access the electron Yukawa.

Primary author: D'ENTERRIA, David (CERN)

Presenter: D'ENTERRIA, David (CERN)

Session Classification: Electroweak Interactions Session 2

Track Classification: Electroweak Interactions