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

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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 a center-of-mass energy spread not much larger than the Higgs boson width of  $\sim 4$  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  $10 \text{ ab}^{-1}$  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.

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### Collaboration / Activity

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