

# Measurement of the Higgs to invisible branching fraction at the FCC-ee

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The FCC-ee is the proposed first phase of a next generation particle collider the Future Circular Collider with the first phase having electrons and positrons collided. The analysis shows the expected sensitivity, using statistical errors only, to the branching fraction of Higgs to invisible decay for the ZH process at the e+e- Future Circular Collider running at centre-of-mass energies of  $\sqrt{s} = 240$  GeV and  $\sqrt{s} = 365$  GeV with integrated luminosities of  $10.8 \text{ ab}^{-1}$  and  $3 \text{ ab}^{-1}$  respectively. The decays of the Z to electrons, muons, b-quarks, c-quarks and lighter quarks were investigated. It is found that a 25% measurement is possible if a Standard Model branching fraction of 0.106% for the process  $H \rightarrow ZZ^* \rightarrow \nu\nu\nu$  is assumed. The  $Z \rightarrow qq$  channel has the best sensitivity. Additional new physics Higgs to invisible decays could be observed with a sensitivity of greater than  $5\sigma$  if the branching fraction exceeds 0.13% or could be excluded at 0.051% at 95% confidence level.

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