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Measurement of Higgs couplings and mass in e+e- collisions at CLIC (sqrt-s 350 GeV – 3 TeV)

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A linear e+e- collider running at center-of-mass energies in the range from 350 GeV to 3 TeV provides excellent possibilities for Higgs precision measurements. Precison Higgs (and top) measurements can be performed around 350 GeV, where the Higgs is studied in a model-independent way through its recoil against a Z boson in the Higgsstrahlung process, providing not only an accurate mass measurement but also direct measurements of the branching ratios for most boson and fermion decay modes, including possible decays to invisible particles. At higher energies, the Higgs boson coupling to top quarks and the Higgs self-coupling can also be measured. For CLIC these are studied at 1.4 TeV in Higgs production through WW fusion. At even higher energies the rising WW fusion cross section, together with the higher machine luminosity, allows for the measurement of very small branching ratios. At the ultimate CLIC energy of 3 TeV this provides good precision for the Higgs coupling to muons and a currently unchallenged precision at the 10% level for the Higgs self-coupling. The prospects for these measurements at CLIC are summarized in the talk. They are based on detailed detector simulation studies including overlay of background from physics processes and beam-induced backgrounds.

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