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Measuring the Higgs Self-coupling at the International Linear Collider — •Claude Dürig — DESY, Hamburg Germany

Since the discovery of the Higgs boson at the LHC in 2012, the precise exploration of the Higgs sector is one of the key goals of future particle collider experiments. A planned next generation particle collider project is represented by the International Linear Collider (ILC), offering model-independent precision measurements of particle properties. The Higgs physics programme of the ILC includes a model-independent precision measurement of the Higgs self-coupling, which can either verify the SM mechanism of electroweak symmetry breaking or uncover new physics. At a centre-of-mass energy of 500GeV information on the Higgs self-coupling can be extracted from a model-independent cross-section measurement of double Higgs-strahlung ZHH. However, the small signal production cross section poses challenges to the detector and event reconstruction techniques.

The prospects of the Higgs self-coupling measurement at the ILC in the context of a 20-year-long physics programme are studied in a full detector simulation for a 125GeV Higgs boson, using TDR detector parameters. In this presentation, recent results of the Higgs self-coupling measurement and its connection to new physics are outlined. We also discuss the prospects of an 1TeV energy upgrade, which offers complementary capabilities for the observation of double Higgs production and the Higgs self-coupling. This contribution gives an overview of the study, focussing on the application of kinematic fits.

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