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Full next-to-leading-order corrections to the Higgs strahlung process from electron-positron collisions in the Inert Higgs Doublet Model

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We present the cross section of the Higgs strahlung, $e^+e^- \rightarrow hZ^0$, at the full next-leading order in the Inert Higgs Doublet Model (IHDM) at the future Higgs factories. We systematically calculated both weak and QED corrections by using FeynArts/FormCalc to compute both the weak and the one-loop virtual corrections and Feynman Diagram Calculation (FDC) to evaluate the real photon emission. We evaluated the contribution of the new physics on the radiation corrections in this process for three typical collision energies of future electron-positron colliders: 250 GeV, 500 GeV and 1 TeV, taking into account the theoretical and the experimental constraints. We have found a sizeable deviations of the IHDM radiation corrections from the Standard model NLO values, those deviations are within the detection potentials of the future Higgs factories. In the light of these results, we suggest three interesting benchmark points of IHDM for the futures Higgs facilities.

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