

Inert Doublet Model at future e^+e^- colliders

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The Inert Doublet Model (IDM) is one of the simplest SM extensions and introduces four new scalar particles: H^\pm , A and H ; the lightest, H , is stable and hence a natural dark matter (DM) candidate. A set of benchmark points has been proposed, which are consistent with theoretical and experimental constraints and promise detectable signals at future colliders. Prospects for observing pair production of neutral or charged IDM scalars were studied for the leptonic final state, for different running energies of future e^+e^- colliders. The expected significance is mainly driven by the signal production cross section.

For high mass scenarios, discovery reach for the IDM charged scalar pair-production can be significantly increased when using the semi-leptonic final state. This was studied for the two high-energy CLIC stages using fast and full detector simulation. Taking into account the pile-up contribution from the beam-induced $\gamma\gamma$ events is crucial for the realistic estimate of the experimental sensitivity.

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