

Hunting for Inert Triplet Scalars at a Muon Collider

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The Inert Triplet Model (ITM) is a popular scenario with a neutral scalar Dark Matter (DM), along with an inert charged scalar in a compressed mass spectrum. The DM constraints corner the ITM to high TeV-scale mass range, the production of which is inefficient at the present and future iterations of the LHC. However, Vector Boson Fusion (VBF) at a future Muon Collider promises high production rate for the inert triplet scalars. The compressed mass spectrum leads to disappearing tracks for the charged scalars, which can be efficiently reconstructed over the beam-induced background (BIB). Exploiting the high-momentum Forward Muons from the VBF processes along with these disappearing tracks, we present a detailed analysis of signatures of the model, as well as luminosity projections for 5σ discovery.

Track type

Collider and BSM Physics

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