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Signatures of the inert triplet model from vector boson fusion at a muon collider

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The Inert Triplet Model (ITM) is a much-studied Dark Matter model that extends the Standard Model (SM) of particle physics with a scalar SU(2) triplet having hypercharge Y = 0. The various DM experiments rule out a significant portion of the parameter space, cornering the model to an allowed region of TeV scale masses. The compressed mass spectrum of the scalars lead to displaced decays, which promise to be definitive Beyond the Standard Model (BSM) signatures. However, production rates of such heavy particles at the LHC is very low, and hence we focus on discovery signatures at a multi-TeV muon collider. Production of these BSM scalars via vector boson fusion (VBF) at the muon collider is studied for two centre-of-mass energies of 6 TeV and 10 TeV. Disappearing track signatures with Forward muons are analysed for the model, and sensitivity estimates are presented in multiple final states.

Designation

Student

Reference publication/preprint

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