

Probing Dark Matter with Disappearing Tracks at the LHC

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Models where dark matter is a part of an electroweak multiplet feature charged particles with macroscopic lifetimes due to the charged-neutral mass split of the order of pion mass. We have reinterpreted the latest ATLAS disappearing track search for models with DM of different spins: inert Two Higgs Doublet, Minimal Fermion Dark Matter and Vector Triplet Dark Matter models. We have found that with the disappearing track signature one can probe a vast portion of the parameter space, well beyond the reach of mono-jet searches. We have validated our analysis procedure and provide the upper limits on the cross-section and efficiencies in the lifetime - dark matter mass plane which can be used for an easy recast for similar classes of models. Moreover we provide the recasting code employed here, as part of the public LLP Recasting Repository.

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