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Search for neutral long-lived particles decaying in the CMS Muon System

A search for long-lived particles decaying in the CMS Muon System is presented. The search utilizes the full Run 2 dataset totaling 138 fb^{-1} of proton-proton collisions recorded by the CMS experiment at $\sqrt{s} = 13$ TeV. Hits in the Muon System are clustered together and properties of the cluster are used to reject backgrounds. The results of the search are interpreted using a Twin Higgs model, showing sensitivity to Higgs-mediated long-lived particle production with many final states, proper lifetimes up to 100m and masses from 0.01 to 55 GeV. A previously untested Dark Shower model is also interpreted, setting the first LHC limits for a dark QCD that couples to the Higgs in five different portals.

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