

Abstract Submitted
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Study of Higgs and Vector Portals to Dark Matter¹ TAMER ELKA-FRAWY, MEHDI RAHMANI, MARCUS HOHLMANN, Florida Institute of Technology, CMS COLLABORATION COLLABORATION — A study of long-lived dark matter particles is performed for a dark Z boson that either couples directly to quarks and leptons or mixes kinetically with the standard model Z boson. Production via a vector portal and the Higgs portal are considered. The impact of additionally mixing the standard model Higgs with a dark Higgs boson on the production and decays of the dark Z is evaluated. Specifically, decays with a final state of displaced dimuons are considered where the dark Z and the dark Higgs decay directly to a dimuon or indirectly via dark scalars or fermions to an even number of dimuons. These can give rise to final states with large muon multiplicities. The production and total cross sections of the processes of interest as well as decay widths and decay lengths are calculated using analytical methods and Monte Carlo simulation. The sensitivity for such searches in Runs 2 and 3 of the Large Hadron Collider is discussed. Kinematics of the displaced dimuons is also investigated.

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Tamer Elkafrawy
Florida Institute of Technology

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