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Search for Vector-Like Fermions using missing transverse momentum and muons in a final state of pp-collisions in the HL-LHC and Phase-II CMS experiment

In this poster I will present the simulation of a signal that could be found in the High Luminosity Large Hadron Collider. The signal represents a candidate for dark matter (DM) , based on models with extra partciles from the known standard model particles, an extra vector-like fermion doublet and a scalar DM candidate. The signal is thought to be consistent with photon excesses coming from galaxy centers. The signature studied consists of one or two muons plus missing transverse momentum. With this criteria if no new physics is found, the existence of heavy fermion masses F above 130 GeV are excluded, assuming a difference in mass of $\Delta M(F, DM) = 20$ GeV and a branching ratio $BR(F \rightarrow \mu\chi)$ = 100%. Also, more area of parameter space can be excluded complementing Fermi-LAT and High Energy Stereoscopic System (HESS) experiments for gamma rays.

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