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Search for Exotic Long-Lived Particles in the Compact Muon Solenoid (CMS) SUHO KIM, Florida State University, COMPACT MUON SOLENOID COLLABORATION —

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Search for Exotic Long-Lived Particles in the Compact Muon Solenoid (CMS) SUHO KIM, Florida State University, COMPACT MUON SOLENOID COLLABORATION — With increasing center-of-mass energy, high-energy physics has seen enormous development in the past decades. Discovery of the Higgs Boson at Large Hadron Collider (LHC) in CERN, led to discovery of all constituents in the standard model (SM). In spite of its success, the SM suffers from the naturalness problem. To solve the issue, one needs to look for physics Beyond Standard Model (BSM). Among the various particles postulated by multiple BSM models, long-lived neutral scalar particles are investigated. The analysis looks for Displaced Vertices (DV) in LHC data, which are signatures of long-lived scalar particles due to its neutral electric charge and tracker lifetime. In this analysis, the DV candidates are constructed in the form of the Regions Of Interest (ROIs) in the tracker. The ROIs are then scored by Machine-Learning (ML) tools, which are trained with the Monte-Carlo (MC) simulated events. The analysis uses data obtained from the Compact Muon Solenoid (CMS), one of the general detectors of LHC located in CERN.

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