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Search for contact interactions and large extra dimensions in the dilepton mass spectra from proton-proton collisions at √s=13 TeV (Article)

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Abstract

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A search for nonresonant excesses in the invariant mass spectra of electron and muon pairs is presented. The analysis is based on data from proton-proton collisions at a center-of-mass energy of 13 TeV recorded by the CMS experiment in 2016, corresponding to a total integrated luminosity of 36 fb^{-1}. No significant deviation from the standard model is observed. Limits are set at 95% confidence level on energy scales for two general classes of nonresonant models. For a class of fermion contact interaction models, lower limits ranging from 20 to 32 TeV are set on the characteristic compositeness scale Λ. For the Arkani-Hamed, Dimopoulos, and Dvali model of large extra dimensions, the first results in the dilepton final state at 13 TeV are reported, and values of the ultraviolet cutoff parameter Λ_T below 6.9 TeV are excluded. A combination with recent CMS diphoton results improves this exclusion to Λ_T below 7.7 TeV, providing the most sensitive limits to date in nonhadronic final states.[Figure not available: see fulltext.] © 2019, The Author(s).

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