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A search for pair production of new light bosons decaying into muons in proton - proton collisions at 13 TeV (Article) (Open Access)

Sirunyan, A.M.[a], Tumasyan, A.[a], Adam, W.[b], Ambrogi, F.[b], Asilar, E.[b], Bergauer, T.[b], Brandstetter, J.[b], Dragicevic, M.[b], Erö, J.[b], Escalante Del Valle, A.[b], Flechl, M.[b], Frühwirth, R.[b], Ghete, V.M.[b], Hrubec, J.[b], Jeitler, M.[b], Krammer, N.[b], Krätschmer, I.[b], Liko, D.[b], Madlener, T.[b], Mikulec, I.[b], Rad, N.[b], Rohringer, H.[b],

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Abstract

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A search for new light bosons decaying into muon pairs is presented using a data sample corresponding to an integrated luminosity of 35.9fb^{-1} of proton-proton collisions at a center-of-mass energy s=13TeV, collected with the CMS detector at the CERN LHC. The search is model independent, only requiring the pair production of a new light boson and its subsequent decay to a pair of muons. No significant deviation from the predicted background is observed. A model independent limit is set on the product of the production cross section times branching fraction to dimuons squared times acceptance as a function of new light boson mass. This limit varies between 0.15 and 0.39 fb over a range of new light boson masses from 0.25 to 8.5 GeV. It is then interpreted in the context of the next-to-minimal supersymmetric standard model and a dark supersymmetry model that allows for nonnegligible light boson lifetimes. In both cases, there is significant improvement over previously published limits. © 2019 The Author(s)

SciVal Topic Prominence

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A search for pair production of new light bosons decaying into muons

Khachatryan, V. , Sirunyan, A.M. , Tumasyan, A.
(2016) Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics

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