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Volume 2019, Issue 2, 1 February 2019, Article number 74Search for new physics in final states with a single photon and missing transverse momentum in proton-proton collisions at $\sqrt{s}=13$ TeV (Article)[\(Open Access\)](#)Sirunyan, A.M.^a, Tumasyan, A.^a, Adam, W.^b, Ambrogio, 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,gv}, Ghete, V.M.^b, Hrubec, J.^b, Jeitler, M.^{b,gv}, Krammer, N.^b, Krätschmer, I.^b, Liko, D.^b, Madlener, T.^b, Mikulec, I.^b, Rad, N.^b, ...[View additional authors](#) ^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Wien, Austria^cInstitute for Nuclear Problems, Minsk, Belarus[View additional affiliations](#)

Abstract

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A search is conducted for new physics in final states containing a photon and missing transverse momentum in proton-proton collisions at $\sqrt{s}=13$ TeV, using the data collected in 2016 by the CMS experiment at the LHC, corresponding to an integrated luminosity of 35.9 fb^{-1} . No deviations from the predictions of the standard model are observed. The results are interpreted in the context of dark matter production and models containing extra spatial dimensions, and limits on new physics parameters are calculated at 95% confidence level. For the two simplified dark matter production models considered, the observed (expected) lower limits on the mediator masses are both 950 (1150) GeV for 1 GeV dark matter mass. For an effective electroweak-dark matter contact interaction, the observed (expected) lower limit on the suppression parameter Λ is 850 (950) GeV. Values of the effective Planck scale up to 2.85–2.90 TeV are excluded for between 3 and 6 extra spatial dimensions. [Figure not available: see fulltext.]. © 2019, The Author(s).

SciVal Topic Prominence

Topic: jets | production | parton shower

Prominence percentile: 99.875

Author keywords

[Beyond Standard Model](#) [Dark matter](#) [Hadron-Hadron scattering \(experiments\)](#)

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