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Volume 2017, Issue 2, 1 February 2017, Article number 135Searches for invisible decays of the Higgs boson in pp collisions at $\sqrt{s} = 7, 8, \text{ and } 13 \text{ TeV}$ (Article)The CMS collaboration, Khachatryan, V.^a, Sirunyan, A.M.^a, Tumasyan, A.^a, Adam, W.^b, Asilar, E.^b, Bergauer, T.^b, Brandstetter, J.^b, Brondolin, E.^b, Dragicevic, M.^b, Erö, J.^b, Flechl, M.^b, Friedl, M.^b, Frühwirth, R.^{b,ggp}, Ghetta, V.M.^b, Hartl, C.^b, Hörmann, N.^b, Hrubec, J.^b, Jeitler, M.^{b,ggp}, König, A.^b,[View additional authors](#) [v](#)^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Wien, Austria^cInstitute for Nuclear Problems, Minsk, Belarus[View additional affiliations](#) [v](#)

Abstract

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Searches for invisible decays of the Higgs boson are presented. The data collected with the CMS detector at the LHC correspond to integrated luminosities of 5.1, 19.7, and 2.3 fb⁻¹ at centre-of-mass energies of 7, 8, and 13 TeV, respectively. The search channels target Higgs boson production via gluon fusion, vector boson fusion, and in association with a vector boson. Upper limits are placed on the branching fraction of the Higgs boson decay to invisible particles, as a function of the assumed production cross sections. The combination of all channels, assuming standard model production, yields an observed (expected) upper limit on the invisible branching fraction of 0.24 (0.23) at the 95% confidence level. The results are also interpreted in the context of Higgs-portal dark matter models.

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