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Volume 2017, Issue 6, 1 June 2017Measurement of electroweak-induced production of $W\gamma$ with two jets in pp collisions at $\sqrt{s}=8$ TeV and constraints on anomalous quartic gauge couplings (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,gn}, Ghete, V.M.^b, Hartl, C.^b, Hörmann, N.^b, Hrubec, J.^b, Jeitler, M.^{b,gn}, König, A.^b,[View additional authors](#) [v](#)^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Wien, Austria^cNational Centre for Particle and High Energy Physics, Minsk, Belarus[View additional affiliations](#) [v](#)

Abstract

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A measurement of electroweak-induced production of $W\gamma$ and two jets is performed, where the W boson decays leptonically. The data used in the analysis correspond to an integrated luminosity of 19.7 fb^{-1} collected by the CMS experiment in $\sqrt{s}=8$ TeV proton-proton collisions produced at the LHC. Candidate events are selected with exactly one muon or electron, missing transverse momentum, one photon, and two jets with large rapidity separation. An excess over the hypothesis of the standard model without electroweak production of $W\gamma$ with two jets is observed with a significance of 2.7 standard deviations. The cross section measured in the fiducial region is $10.8 \pm 4.1(\text{stat}) \pm 3.4(\text{syst}) \pm 0.3(\text{lumi}) \text{ fb}$, which is consistent with the standard model electroweak prediction. The total cross section for $W\gamma$ in association with two jets in the same fiducial region is measured to be $23.2 \pm 4.3(\text{stat}) \pm 1.7(\text{syst}) \pm 0.6(\text{lumi}) \text{ fb}$, which is consistent with the standard model prediction from the combination of electroweak and quantum chromodynamics-induced processes. No deviations are observed from the standard model predictions and experimental limits on anomalous quartic gauge couplings $f_{M,0-7}/\Lambda^4$, $f_{T,0-2}/\Lambda^4$, and $f_{T,5-7}/\Lambda^4$ are set at 95% confidence level.[Figure not available: see fulltext.]. © 2017, The Author(s).

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