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Volume 78, Issue 3, 1 March 2018, Article number 242Study of dijet events with a large rapidity gap between the two leading jets in pp collisions at $\sqrt{s}=7\text{TeV}$ (Article) ([Open Access](#))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, Ghete, V.M.^b, Hartl, C.^b, Hörmann, N.^b, Hrubec, J.^b, Jeitler, M.^b, König, A.^b, Krätschmer, I.^b, Liko, D.^b, Matsushita, T.^b, Mikulec, I.^b, Rabady, D.^b,[View additional authors](#) ∨^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Vienna, Austria^cInstitute for Nuclear Problems, Minsk, Belarus[View additional affiliations](#) ∨

Abstract

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Events with no charged particles produced between the two leading jets are studied in proton-proton collisions at $\sqrt{s}=7\text{TeV}$. The jets were required to have transverse momentum $p_{T\text{jet}} > 40\text{GeV}$ and pseudorapidity $1.5 < |\eta^{\text{jet}}| < 4.7$, and to have values of η^{jet} with opposite signs. The data used for this study were collected with the CMS detector during low-luminosity running at the LHC, and correspond to an integrated luminosity of 8pb^{-1} . Events with no charged particles with $p_T > 0.2\text{GeV}$ in the interval $-1 < \eta < 1$ between the jets are observed in excess of calculations that assume no color-singlet exchange. The fraction of events with such a rapidity gap, amounting to 0.5–1% of the selected dijet sample, is measured as a function of the p_T of the second-leading jet and of the rapidity separation between the jets. The data are compared to previous measurements at the Tevatron, and to perturbative quantum chromodynamics calculations based on the Balitsky–Fadin–Kuraev–Lipatov evolution equations, including different models of the non-perturbative gap survival probability. © 2018, CERN for the benefit of the CMS collaboration.

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