Study of dijet events with a large rapidity gap between the two leading jets in pp collisions at root s=7 TeV

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Abstract

Events with no charged particles produced between the two leading jets are studied in proton-proton collisions at root s = 7 TeV. The jets were required to have transverse momentum p(T)(jet) > 40 GeV and pseudorapidity 1.5 < vertical bar eta(jet)vertical bar < 4.7, and to have values of eta(jet) with opposite signs. The data used for this study were collected with the CMSdetector during low-luminosity running at the LHC, and correspond to an integrated luminosity of 8 pb(-1). Events with no charged particles with p(T) > 0.2GeV 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 pT 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.

Keywords

KeyWords Plus: COLOR-SINGLET EXCHANGE; P(P)OVER-BAR COLLISIONS; (P)OVER-BAR-P COLLISIONS; SURVIVAL PROBABILITY; PHOTOPRODUCTION; HERA; SCATTERING; TEVATRON

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