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Measurement of associated Z plus charm production in proton-proton collisions at root s=8TeV

By: [Sirunyan, AM](#) (Sirunyan, A. M.)^[2]; [Tumasyan, A](#) (Tumasyan, A.)^[2]; [Adam, W](#) (Adam, W.)^[3]; [Ambrogio, F](#) (Ambrogio, F.)^[3]; [Asilar, E](#) (Asilar, E.)^[3]; [Bergauer, T](#) (Bergauer, T.)^[3]; [Brandstetter, J](#) (Brandstetter, J.)^[3]; [Brondolin, E](#) (Brondolin, E.)^[3]; [Dragicevic, M](#) (Dragicevic, M.)^[3]; [Ero, J](#) (Ero, J.)^[3] ...[More](#)

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Abstract

A study of the associated production of a Z boson and a charm quark jet (Z + c), and a comparison to production with a b quark jet (Z + b), in pp collisions at a centre-of-mass energy of 8 TeV are presented. The analysis uses a data sample corresponding to an integrated luminosity of 19.7 fb⁻¹, collected with the CMS detector at the CERN LHC. The Z boson candidates are identified through their decays into pairs of electrons or muons. Jets originating from heavy flavour quarks are identified using semileptonic decays of c or b flavoured hadrons and hadronic decays of charm hadrons. The measurements are performed in the kinematic region with two leptons with p_T(l) > 20 GeV, vertical bar eta(l)vertical bar < 2.1, 71 < m(ll) < 111 GeV, and heavy flavour jets with p_T(jet) > 25 GeV and vertical bar eta(jet)vertical bar < 2.5. The Z + c production cross section is measured to be sigma(pp -> Z + c + X) B(Z -> l(+)l(-)) = 8.8 +/- 0.5 (stat) +/- 0.6 (syst) pb. The ratio of the Z+c and Z+b production cross sections is measured to be sigma(pp -> Z+c+X)/sigma(pp -> Z+b+X) = 2.0 +/- 0.2 (stat) +/- 0.2 (syst). The Z+c production cross section and the cross section ratio are also measured as a function of the transverse momentum of the Z boson and of the heavy flavour jet. The measurements are compared with theoretical predictions.

Keywords

KeyWords Plus: HADRON COLLIDERS; NNLO QCD; Z DECAYS; LHC; ALGORITHMS

Author Information

Reprint Address: Sirunyan, AM (reprint author)

+ Yerevan Phys Inst, Yerevan, Armenia.

Addresses:

+ [1] CERN, CH-1211 Geneva 23, Switzerland

+ [2] Yerevan Phys Inst, Yerevan, Armenia

[3] Inst Hochenergiephys, Vienna, Austria

[4] Inst Nucl Problems, Minsk, BELARUS

+ [5] Natl Ctr Particle & High Energy Phys, Minsk, BELARUS

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