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Measurement of the Z / γ* → τ τ cross section in pp collisions at √s=13TeV and validation of τ lepton analysis techniques (Article) (Open Access)

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Abstract

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A measurement is presented of the Z / γ* → τ τ cross section in pp collisions at s=13TeV, using data recorded by the CMS experiment at the LHC, corresponding to an integrated luminosity of 2.3fb-1. The product of the inclusive cross section and branching fraction is measured to be σ(pp→ Z /γ*+X)B(Z /γ*→ τ τ)=1848±12(stat)±67(syst \,+\,lumi) pb, in agreement with the standard model expectation, computed at next-to-next-to-leading order accuracy in perturbative quantum chromodynamics. The measurement is used to validate new analysis techniques relevant for future measurements of τ lepton production. The measurement also provides the reconstruction efficiency and energy scale for τ decays to hadrons+ν τ final states, determined with respective relative uncertainties of 2.2 and 0.9%. © 2018, CERN for the benefit of the CMS collaboration.

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Funding details

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