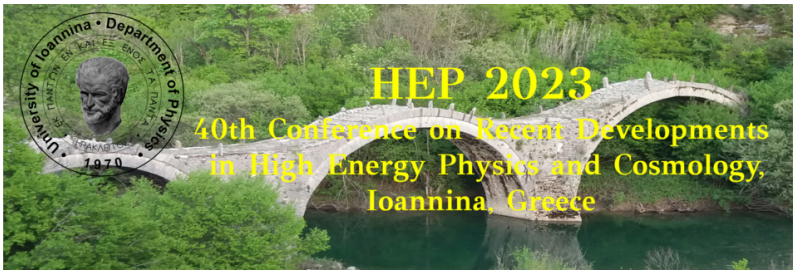

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Multi-differential measurement of the dijet cross section in proton-proton collisions at sqrt(s) = 13 TeV

Friday, 7 April 2023 18:20 (20 minutes)

A measurement of the dijet production cross section is reported based on an integrated luminosity of $36.3 fb^{-1}$ of proton-proton collision data collected in 2016 at $\sqrt{s} = 13$ TeV by the CMS detector at the CERN LHC. Jets are reconstructed with the anti-k_T algorithm for distance parameters of $R = 0.4$ and $R = 0.8$ and differential cross sections are measured as a function of the kinematic properties of the two jets with largest transverse momenta. Double-differential (2D) measurements are presented as a function of the largest absolute rapidity $|y|_{max}$ of the two jets and the dijet invariant mass $m_{1,2}$. Triple-differential (3D) measurements are presented as a function of the dijet rapidity separation y* , the total boost y_b of the dijet system, and either $m_{1,2}$ or the average dijet transverse momentum $p_{T_{1,2}}$ as the third variable. The measured cross sections are unfolded to correct for detector effects and are compared with fixed-order calculations derived at next-to-next-to-leading order in perturbative quantum chromodynamics. The impact of the 2D and 3D measurements on determinations of the parton distribution functions and the strong coupling constant is investigated, with the inclusion of the 3D cross sections yielding the more precise value of $\alpha_S(m_Z) = 0.1201 \pm 0.0020$.

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