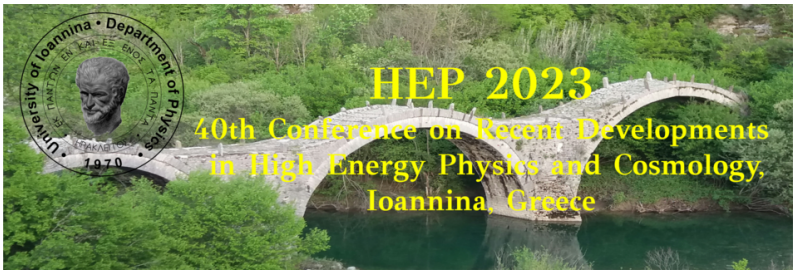


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# Measurement of azimuthal correlations of jets and determination of the strong coupling in pp collisions at 13 TeV with CMS

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A measurement is presented of the ratio observable $R_{\Delta\phi}$, which is related in a novel way to the azimuthal correlations among jets. It is defined as the fraction of the number of neighboring jets exceeding a minimal transverse momentum of 100 GeV within a 3-jet topology enforced through the allowed azimuthal angular separation of $2\pi/3 < \Delta\phi < 7\pi/8$ with respect to the number of inclusive jets with the same jet transverse momentum interval. The analysis is based on data from proton-proton collisions collected by the CMS experiment at a centre-of-mass energy of 13 TeV, corresponding to an integrated luminosity of 134.4 $fb^{-1}$. Experimental data are compared to predictions from simulations using Monte Carlo generators that include parton showers, hadronization, and multiparton interactions. Fixed-order predictions of perturbative quantum chromodynamics (QCD) at next-to-leading order, corrected for non-perturbative and electroweak effects, are also compared to the measurement. Within uncertainties, data and theory are in agreement. From this comparison the strong coupling constant at the scale of the Z boson mass is determined to be $\alpha_S(M_Z) = 0.1177^{+0.0116}_{-0.0071}$ using the NNPDF3.1 NLO PDF set, where the errors include the experimental, non-perturbative, PDF, electroweak and scale uncertainties. A test of the QCD predictions for the running of the strong coupling constant $\alpha_S(Q)$ at the TeV region showed no deviation from the expected behaviour.

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