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Azimuthal separation in nearly back-to-back jet topologies in inclusive 2- and 3- jet events in pp collisions at $\sqrt{s}=13\text{TeV}$ (Article) [\(Open Access\)](#)

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Abstract

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A measurement for inclusive 2- and 3-jet events of the azimuthal correlation between the two jets with the largest transverse momenta, $\Delta\phi_{12}$, is presented. The measurement considers events where the two leading jets are nearly collinear (“back-to-back”) in the transverse plane and is performed for several ranges of the leading jet transverse momentum. Proton-proton collision data collected with the CMS experiment at a center-of-mass energy of 13TeV and corresponding to an integrated luminosity of 35.9fb⁻¹ are used. Predictions based on calculations using matrix elements at leading-order and next-to-leading-order accuracy in perturbative quantum chromodynamics supplemented with leading-log parton showers and hadronization are generally in agreement with the measurements. Discrepancies between the measurement and theoretical predictions are as large as 15%, mainly in the region $177^\circ < \Delta\phi_{12} < 180^\circ$. The 2- and 3-jet measurements are not simultaneously described by any of models. © 2019, CERN for the benefit of the CMS collaboration.

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