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Measurement of the azimuthal correlation of D^0 mesons with charged particles in pp collisions at $\sqrt{s} = $ **13.6 TeV with ALICE**

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The analysis of the azimuthal-angle correlation between D^0 mesons and charged particles is important for studying charm-quark production, which occurs in the early stages of high-energy collisions via hard scattering. After their production, charm quarks undergo a fragmentation process which results in a spray of hadrons after hadronization, quite collinear to the charm quark at high momentum. The azimuthal-angle correlation is characterized by near- and away-side peaks, associated with the fragmentation of the charm quark and the recoil-parton topology, respectively. The measurement of the peak yield and width offers insights into the amount of particles produced from the charm fragmentation and their angular displacement with respect to the charm quark, respectively.

In this study, we present p_{T}-differential measurements of the azimuthal-angle correlation between D^0 mesons and charged particles in pp collisions at $\sqrt{s} = $ 13.6 TeV, performed with the ALICE detector. Comparisons with previous studies at $\sqrt{s} = $ 5.02 TeV, $\sqrt{s} = $ 7 TeV, and $\sqrt{s} = $ 13 TeV suggest that the PYTHIA8 and POWHEG+PYTHIA8 models provide the best description of the data. The new measurement, obtained from the analysis of pp collisions collected by ALICE during the LHC Run 3, extends in transverse-momentum p_{T} reach the previous ones, and allows to better characterize the charm fragmentation process by setting more stringent and p_{T}-differential constraints to its modelling in event generators. The results will also be compared with those for D^+ and $\mathrm{D}_{\mathrm{s}}^+$ mesons to evaluate the consistency of charm fragmentation across species and to investigate the role of strangeness in charm hadronization.

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