

First D0-tagged jet axes difference measurement in pp collisions at 5.02 TeV with ALICE

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Substructure measurements of jets containing heavy-flavor hadrons play an important role in testing pQCD calculations in proton-proton (pp) collisions and are critical tools for studying the quark-gluon plasma (QGP) created in heavy-ion collisions. We study three different D0-tagged jet axis definitions with varying degrees of sensitivity to wide-angle radiation: Standard, Soft Drop groomed (SD), and Winner-Takes-All (WTA). By considering the angular difference between different axes at relatively low jet momentum, we can study the radiation pattern inside the reconstructed jets and provide insight into the associated charm-quark fragmentation and hadronization processes. We present the first D0-tagged jet axes difference studies carried out in pp collisions at 5.02 TeV with the ALICE experiment at the LHC, for jets of transverse momentum $p_{T,\text{jet}} > 5 \text{ GeV}/c$ and D0 mesons with $p_{T,D0} > 2 \text{ GeV}/c$. The measurements of the radial distributions of D0 mesons with respect to the jet axis, $\Delta\phi(D,\text{jet})$, is reported. We also study the opening angle, $\Delta\theta_{\text{axis}}$, between various definitions for the axis of a D0-tagged jet. These measurements will serve as important groundwork for an in-depth understanding of charm-quark diffusion in the QGP.

Presenter: YEATS, Emma Rose (University of California Berkeley (US))

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