

XXVIII International Workshop on Deep Inelastic Scattering and Related Subjects



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Studying hadronization at LHCb

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The LHCb experiment at the Large Hadron Collider (LHC) at CERN is suited for studying various aspects of the theory of strong interaction, Quantum Chromo-Dynamics. One area of active research is to understand how hadrons are formed from scattered quarks and gluons, collectively referred to as partons, in energetic proton-proton collisions. The hadronization process is a non-perturbative phenomenon unlike hard scattering of partons and their shower processes, and thus can only be learned from data such as jet substructure measurements. Equipped with a forward spectrometer covering pseudo-rapidity of $2.0 < \eta < 5.0$, the LHCb experiment achieves a transverse momentum resolution of $\Delta p_T / p_T < 1\%$ up to 200 GeV/c for charged tracks and a jet p_T resolution of $< 15\%$. This along with excellent particle identification capabilities offer a unique opportunity to measure with great precision hadronization variables defined to characterize multi-dimensional hadronization processes and their flavor dependence within jets. Recently published results for measurements of unidentified hadrons within light quark-initiated jets analyzed Run-I data with an integrated luminosity of 2 fb⁻¹ taken in p+p collisions at center-of-mass energy $\sqrt{s} = 8$ TeV. A larger dataset is available for $\sqrt{s} = 13$ TeV from Run-II data that enables measurements of identified hadrons for the first time. In addition, hadronization measurements within heavy flavor tagged jets are under way. This talk will present the published results as well as the status of ongoing measurements.

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