

The role of high-pT particle identification in jet-underlying event correlations

Jet matter interaction remains a central question and a theoretical challenge in heavy-ion physics and might become important in high-multiplicity events in proton-proton collisions at top LHC energies. Full jet measurements at LHC are hoped to reconstruct the complete energy loss process and fragmentation of the hard parton in the medium. Since, jet reconstruction will be constrained to small cone sizes, study of the connection between jets and their underlying event could provide a differential tool combined with particle identification in a wide momentum range.

In this talk we address the physics motivation to build a novel particle identification detector, in the LHC upgrade program, that is able to identify charged hadrons in the momentum range ($10 \text{ GeV}/c < p_T < 30 \text{ GeV}/c$) on track-by-track basis, where the signatures of jet quenching are still expected to be observable. Furthermore, we discuss jet-underlying event correlations in dijet events, focusing on flavour composition and distribution with respect to the jet axes.

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