Contribution ID: **683** Type: **Oral**

Probing jet hadrochemistry modification with measurements of π, K, and p in jets and the underlying event in pp and Pb–Pb collisions at $\sqrt{s_{\mathrm{NN}}}$ = 5.02 TeV with ALICE

Tuesday 8 April 2025 11:30 (20 minutes)

Measurements of jet substructure observables in heavy-ion collisions provide powerful constraints on the microscopic mechanisms of interactions between energetic partons and the QGP. Though there has been remarkable progress in measuring inclusive charged-particle jet substructure observables, a complete understanding of the identified particle production inside jets (jet hadrochemistry) and its modification in heavy-ion collisions remains elusive. Jet quenching models predict modifications to jet hadrochemical composition in heavy-ion collisions, arising from both jet-medium interactions and altered particle production in the jet wake. Measurements of identified particles in jets can help discriminate between different proposed jet-medium interaction mechanisms.

Enabled by the excellent PID capabilities of ALICE, we present the first measurements of π, K, and p ratios within jets and in the underlying event as a function of particle transverse momentum in pp and Pb–Pb collisions at $\sqrt{s_{\mathrm{NN}}}$ = 5.02 TeV. This study aims to advance our understanding of soft particle production mechanisms and distinguish modified jet fragmentation from bulk medium effects.

Category

Experiment

Collaboration (if applicable)

ALICE

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Session Classification: Parallel session 18

Track Classification: Jets