

Heavy Flavor Jet Quenching in Pb–Pb Collisions Using JETSCAPE Framework

Thursday 4 September 2025 15:45 (15 minutes)

We investigate the quenching of b-jets and c-jets in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV using the JETSCAPE framework, incorporating multiple parton energy loss models including MATTER, LBT, and AdS/CFT. These models collectively capture both the perturbative and non-perturbative stages of in-medium jet evolution, enabling a comprehensive study of mass- and flavor-dependent jet quenching phenomena. We compute the nuclear modification factors (R_{AA}) for b-jets, c-jets, and inclusive jets, and analyze the double ratios $R_{AA}^{\text{b-jet}}/R_{AA}^{\text{inclusive}}$ and $R_{AA}^{\text{c-jet}}/R_{AA}^{\text{inclusive}}$ to isolate the impact of quark mass on energy loss. Furthermore, we perform a jet radius-dependent analysis to probe energy transport beyond the jet cone and modifications to jet substructure. Our results are compared to recent ATLAS measurements, providing key insights into the role of jet mass, and medium response in the quark-gluon plasma.

Author: Ms PRIYADARSHINI, Manaswini (Indian Institute of Technology Mandi (IN))

Co-authors: RATHORE, Anuraag (Indian Institute of Technology Mandi - IIT-Mandi (IN)); Mr KALANI, Jaideep (Indian Institute of Technology Mandi (IN)); PALNI, Prabhakar (Indian Institute of Technology Mandi (IN))

Presenter: Ms PRIYADARSHINI, Manaswini (Indian Institute of Technology Mandi (IN))

Session Classification: Parallel Session