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# Jet energy loss distributions and gradient tomography in heavy-ion collisions

Jet energy loss and transverse momentum broadening are caused by the interactions of jets with the quark-gluon plasma (QGP) in heavy-ion collisions. We employ the state-of-art Bayesian analysis to extract the jet energy loss distributions for single inclusive jets and gamma-triggered jets at $\sqrt{s}$ = 2.76 TeV and 5.02 TeV from experiments at the Large Hadron Collider (LHC). The extracted jet energy loss distributions have a large width, and the averaged jet energy loss has a slightly stronger logarithmic dependence on the initial jet energy. Our study shows there are on average a few out-of-cone jet medium scatterings during the jet propagation. On the other hand, the spatial gradient of jet transport coefficient $\hat{q}$ perpendicular to the propagation path can lead to a drift and asymmetry in parton transverse momentum distribution. Such an asymmetry is investigated within numerical solutions and real jet transport simulations according to the Boltzmann equation. We find it closely depends on the initial production positions and propagation length. The gradient tomography can be used to localized initial jet production and investigate jet-medium interaction in detail.

**Primary author:** Dr 贺, 亚运 (华南师范大学)

**Co-authors:** PANG, LongGang (Central China Normal University); Prof. WANG, Xin-Nian (Central China Normal University/Lawrence Berkeley National Laboratory)

**Presenter:** Dr 贺, 亚运 (华南师范大学)