

Jet Substructure Measurements at STAR

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In the past decade, there have been significant developments in jet measurements. Initially, the emphasis was primarily on measuring the jet production cross-sections in vacuum and their modification in the Quark-Gluon Plasma (QGP) medium. The current investigations have shifted towards probing jet substructure, aiming to understand the intricate interplay of the perturbative and the non-perturbative regimes of QCD during jet evolution. The STAR experiment has been pivotal throughout in conducting these measurements across various collision systems, including $p + p$, $p + A$, and $A + A$, in an energy range complimentary to the LHC. New results have explored the transition between the parton shower and hadronization in jet evolution using correlation measurements in $p + p$. Baseline measurements from STAR for several generalized angularities for jets in vacuum have allowed us to study the modifications to parton showering and fragmentation in the presence of the QGP medium. Extensions of these measurements using charm-meson tagged jets have explored the flavor dependence of such in-medium modifications. In this talk, we will delve into these recent findings on jets and their substructure derived using novel experimental techniques employed within STAR. We will also briefly discuss some proposed future jet measurements on the high luminosity datasets STAR will be collecting until 2025.

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