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Inclusive Spectrum of Fully Reconstructed Jets in Central Au+Au Collisions at sqrt(s)=200 GeV by the STAR Collaboration

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Jets are collimated sprays of particles arising from the fragmentation of hard-scattered partons in high-energy collisions.
In collisions of heavy nuclei, jets serve as probes of the hot and dense nuclear matter created, and the study of the modification of their structure due to interaction with the surrounding medium (known as “jet quenching”) is an important tool for understanding the medium properties.
One can learn much about jet quenching from studying single particles and few-particle correlations, however, only full jet reconstruction can lead to a comprehensive understanding of jet quenching and corresponding medium properties.
Due to the large and fluctuating background, full jet reconstruction in
heavy-ion collisions is an extremely challenging task. In this talk, we present a new measurement of the inclusive spectrum of fully reconstructed jets in central Au+Au collisions at sqrt(s)=200 GeV, by the STAR collaboration at RHIC. We utilize an experimental technique in which the jet reconstruction is stable against emission of an additional soft hadron (”infrared safety”), even in the high-multiplicity environment of such events. The large combinatorial background is suppressed by a threshold cut on the leading hadron of each jet candidate. This cut is however unsafe against collinear splitting of hard partons (i.e. a true jet may be rejected for certain splitting configurations), and its systematics are explored. The influence of the background density fluctuations on the inclusive jet spectrum is then corrected by an iterative unfolding technique based on Bayes’s Theorem.
We compare this measurement to the jet spectrum in p+p and d+Au collisions, and to model predictions.

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