BACK-TO-BACK DI-JET TRIGGERED MULTI-HADRON CORRELATIONS AS MEDIUM PROBES IN STAR

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Experimental studies of QCD medium created in ultra-relativistic heavy ion collisions at RHIC have supplied the evidences of jet-quenching, where significant amount of jet initial energy is being deposited in the created strongly interacting partonic medium. The effects of the jet-medium interactions are apparent, for instance, in the away-side distributions of associate hadrons in di-hadron azimuthal correlation studies. Believed to be due to the response of the medium to jets propagating through it, various physical mechanisms (mach cone shock wave, Cerenkov gluon radiation, jet deflection and others) have been proposed to explain the experimental observations.

In this talk, a new three-particle correlation technique from STAR is used to study jets and jet energy loss mechanisms in ultra-relativistic Au+Au collisions. We use a pair of approximately back-to-back high-pt hadrons to restrict the di-jet kinematics and study associated particles with respect to the di-hadron trigger. For the first time for soft associate hadrons, we show that the away-side correlation structure is also peaked in deta as well as dphi, which further confirms the di-jet nature of these events. By varying the away-side trigger threshold, we vary the 'surface bias' and the trigger bias on in-medium energy loss, thus providing differential measurements of the energy loss process. The measurements in Au+Au collisions are compared to a d+Au reference to quantify dijet suppression.