



Contribution ID: 1079

Type: Parallel Session Talk

Jets and Jet-like Correlations in Heavy Ion and p+p Collisions at PHENIX

Thursday, 22 July 2010 09:40 (16 minutes)

Jets from heavy ion collisions provide a measurement of the medium-induced parton energy loss and the in-medium fragmentation properties, and therefore can significantly enhance our understanding of the energy loss mechanism and medium property. The medium modification effects are determined by comparing to a p+p baseline measurement. However the presence of high multiplicity backgrounds in heavy ion collisions inhibits the direct application of traditional jet reconstruction techniques.

Instead angular correlations between the hadronic fragments of energetic partons can be used to understand the hot dense matter produced in relativistic heavy ion collisions. The yield and shape modifications of the away side peaks as function of transverse momentum compared to p+p has been interpreted as a medium response to parton energy loss. Direct photon-hadron correlations are another excellent channel to study jets from heavy ion collisions. Photons do not interact strongly with the medium and thus the photon approximately balances the momentum of the opposing jet, allowing the measurement of the effective modification to the fragmentation function through jet energy loss in the medium. We will present the latest jet measurements by PHENIX for p+p and heavy ion collisions.

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Session Classification: 08 - Heavy Ion Collisions and Soft Physics at Hadron Colliders

Track Classification: 08 - Heavy Ion Collisions and Soft Physics at Hadron Colliders