ference on Physics
ark Gluon Plasma

ICPAQGP-2010

Contribution ID : 27

Three-particle correlations at RHIC

Content :

Correlations among the produced particles provide a powerful tool to study the properties of the medium created in ultrarelativistic heavy-ion collisions.
The near-side "ridge" and the away-side "cone" structures observed in the central
Au+Au collision data has inspired various theoretical models to explain the particle production mechanism. Qualitatively most of the models give similar results when compared with the di-hadron correlations.
Three-particle correlation analysis will allow us to distinguish among these models having different physics mechanisms for particle production.
In this talk, we will present the 3-particle correlation data
for d+Au and Au+Au collisions at $\sqrt{s_{NN}}$=200 GeV from Relativistic Heavy Ion Collider (RHIC). The away-side conical emission of the associated particles
in azimuth (ϕ) with respect to a high transverse momentum ($p_{\perp}$) trigger particle in the data are found to be consistent with the "mach cone" scenario[1]. The cone angle is independent of $p_{\perp}$ of the associated particles.
On the other hand, it is observed that the 3-particle pseudorapidity (η) correlations of the near-side ridge particles are uniform not only with respect to
the trigger particle but also between themselves event-by-event.
In addition, the production of the ridge appears to be uncorrelated to the presence
of the narrow jet-like component [2].
The wealth of the 3-particle correlation data will provide further constraints on
the theoretical model calculations for the production mechanism of the cone and the ridge.

References:

[1] B.~I.~Abelev {\it et al.}, (STAR collaboration) Phys. Rev. Lett. {\bf 102}, 052302 (2009).
[2] B.~I.~Abelev {\it et al.}, (STAR collaboration) Phys. Rev. Lett. {\bf 105}, 022301 (2010).

Primary authors : Dr. NETRAKANTI, Pawan Kumar (Bhabha Atomic Research Center) ; Dr. WANG, Fuqiang (Purdue University) ; Dr. ULERY, Jason (U. Frankfurt)

Co-authors :

Presenter : Dr. NETRAKANTI, Pawan Kumar (Bhabha Atomic Research Center)

Session classification : --not yet classified--

Track classification : --not yet classified--

Type : --not specified--