

Probing Pb+Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV with spectator neutrons in AMPT model

Wednesday, 17 February 2016 16:50 (20 minutes)

In high energy heavy-ion collisions a precise knowledge of the initial state is required in order to describe properties of the strongly interacting medium. There is event by event geometric as well as quantum fluctuations in the initial condition of heavy-ion collisions. The standard technique of analyzing heavy-ion collisions in bins of centrality obtained from final state multiplicity averages out the various initial configurations and thus restricts the study to only a limited range of initial conditions. In this work, we propose an additional binning in terms of total spectator neutrons (L+R), which is sum of left (L) and right (R) going spectator neutrons in an event. This offers us a key control parameter to probe events with broader range of initial conditions providing us an opportunity to investigate events with rarer initial conditions which otherwise get masked when analyzed by centrality binning alone.

In this presentation, we will show correlations of initial state observable ε_2 and ε_3 and final state observable v_2 and v_3 in spectator neutron bins. We will present the standard scaling relation between v_2/ε_2 and $\frac{1}{S} \frac{dN_{ch}}{d\eta}$ in bins of spectator neutrons, which seems to break the usual behavior seen in centrality binning alone. The acoustic scaling relation between $\ln(v_n/\varepsilon_n)$ and transverse system size will also be presented in bins of spectator neutron. We would also discuss about the $\langle p_T \rangle$ in bins of L+R and centrality, which can be considered as a good probe to study the medium interactions in heavy-ion collisions.

Primary author: MOHANTY, Bedangadas (National Institute of Science Education and Research (IN))

Co-authors: HAQUE, Md. Rihan (NISER, Bhubaneswar(IN)); CHATTERJEE, Sandeep (Variable Energy Cyclotron Centre); BAIRATHI, Vipul (National Institute of Science Education and Research)

Presenter: MOHANTY, Bedangadas (National Institute of Science Education and Research (IN))

Session Classification: Session 13