

Pion at various stages of heavy-ion collisions

Evgeni Kolomeitsev (BLTP JINR)

Pions as the lightest hadrons are the most abundant particles produced in heavy-ion collisions. Their yield and momentum distributions are determined in part at the hydrodynamics stage of a collision and turn to be very sensitive to viscous effects. Therefore, incorporation of these effects has to be done in a well-control way so that the applicability of hydrodynamic equations is verified.

It is demonstrated that constraints on viscous terms criteria used in various modern hydrodynamical codes do not always guarantee the applicability of hydrodynamics equations and the better constraints are proposed and tested. In collisions at very high energy, a pion-rich system is created in the mid-rapidity region. There is some experimental evidence that at later stages of collisions, the system could be in proximity to the Bose-Einstein condensation in selected multipion events. One of the signals of it would be an increase in particle number fluctuations. The influence of pion-pion interactions on the cross-variances of various particle species is demonstrated to be important for a reliable comparison between theory and experiment.