Contribution ID: **178** Type: **Poster**

A few new experimental results on particle correlations

The study of the correlations among the particles emitted from the overlapping region of the colliding nuclei gives the information about the conditions in the early stage of the collision and the system evolution. The analysis of correlations and fluctuations in the relativistic nuclear collisions addresses fundamental aspects of the quantum chromodynamics (QCD) and, therefore, to the properties of strongly-interacting matter at extreme density and temperature.
In this work we present the study of correlations between physical quantities describing the behaviour of different charged particle types providing information on the formation of a new phase of the highly excited and dense nuclear matter. In this analysis were used the experimental results obtained in Au-Au and proton-proton collisions at with the BRAHMS experiment at RHIC. Using the usual methods from statistics and probability theory, we introduce a linear correlation coefficient for the longitudinal and transverse momentum components and for rapidity and transverse momentum for all charged particles (, , and) produced and detected with the BRAHMS experiment. For proving the existence of anomalous states in nuclear matter, unusual correlations between the longitudinal and transverse momenta should be observed in the rapidity range -0.1 < y < 3.5. It is, also, proposed that the change in pT spectra at high rapidities could be one of the possible signals of QGP formation. These results are compared with others obtained in a large energy range, from the JINR Dubna Synchrophasotron, up to CERN SPS, for symmetric and asymmetric collisions. Interesting anomal states of the nuclear matter can be observed.

Primary author: VELICA, Stefania (Faculty of Physics, University of Bucharest)

Presenter: VELICA, Stefania (Faculty of Physics, University of Bucharest)

Track Classification: Correlations and fluctuations