

XIV Polish Workshop on Relativistic Heavy-Ion Collisions: Interplay between soft and hard probes of heavy-ion collisions



Contribution ID: 13

Type: Oral

Geometry and Dynamics in Heavy-ion Collisions Seen by the Femtoscopy in the STAR Experiment

Sunday 7 April 2019 11:20 (20 minutes)

Geometry and dynamics of the particle-emitting source in heavy-ion collisions at high energies can be inferred via femtoscopy method. Two-particle correlations at small relative momentum exploit Quantum Statistics and the Final State Interactions which allow one to study the space-time characteristics of the source of the order of 10–15 fm and 10–23 s, respectively. The RHIC Beam Energy Scan (BES) program covers a significant part of the QCD Phase Diagram using collisions of Au nuclei for eight beam energies in the range from 7.7 to 200 GeV, which baryon-rich region should be studied via baryon femtoscopy. Thus, two-baryon measurements together with two-meson and meson-baryon correlations provide complementary information about the source characteristics.

In this talk, the STAR preliminary results on femtosopic observables of various particle combinations of protons, pions, kaons and lambdas from Au+Au collisions at BES energies will be presented. Determining how the properties of the particle-emitting source depend on collision energy is an important step towards understanding the physics of heavy-ion collisions. The BES program provides the possibility to study the energy dependence of the source sizes for various collision centralities. In addition to the source size, the measurements of non-identical particle combinations provide information about space-time asymmetries in emission process.

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Session Classification: Session VI