

Dynamics of particle emission probed by femtoscopic correlations in the STAR experiment

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One of methods to study the properties of hot and dense nuclear matter created in high-energy nuclear collisions is femtoscopic measurements. This method provides information about space-time characteristics of the particle emission region, which has a size and lifetime of the order of 10^{-15} m and 10^{-23} s, respectively. From non-identical particle correlations, one can obtain information about asymmetry in the emission process between those two kinds of particles. Such an emission asymmetry gives knowledge of which type of particles, on average, are emitted earlier and from which region of the source. Using different combinations of pion, kaon, and proton pairs, one can obtain complete knowledge on geometric and dynamic (emission time) properties of the particle emitting source. Such investigation could provide information about differences among the emissions of light mesons (pions), strange mesons (kaons), and baryons (protons).

In this poster, the STAR results on femtoscopic observables of various particle combinations of pions, kaons, and protons from Au+Au collisions at Beam Energy Scan program will be presented.