Recent studies on heavy-flavor femtoscopy in Au+Au collisions by STAR

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Heavy quarks are produced in hard partonic scatterings at the very early stage of heavy-ion collisions and they experience the whole evolution of the Quark-Gluon Plasma medium. Femtoscopic correlations, i.e. two-particle correlations at low relative momentum, are sensitive to the final-state interactions as well as to the extent of the region from which the correlated particles are emitted. A study of correlations between heavy-flavor mesons and identified charged hadrons could shed light on their interactions in the hadronic phase.

STAR has performed the first measurement of femtoscopic correlation between D^0-hadron pairs at mid-rapidity in Au+Au collisions at $\sqrt{s_{\rm NN}} = 200$ GeV. D^0 mesons are reconstructed via the $K^{\mp} - \pi^{\pm}$ decay channel using topological criteria enabled by the Heavy Flavor Tracker with excellent track pointing resolution. We will present the femtoscopic correlation functions between $D^0/\overline{D^0}$-$\pi^{\pm}$, $D^0/\overline{D^0}$-$K^{\pm}$ and $D^0/\overline{D^0}$-$p^{\pm}$ pairs for $D^0/\overline{D^0}$ with transverse momentum above 1 GeV/c in the $0-80\%$ centrality range. STAR results will be compared with existing theory predictions and its physics implications will also be discussed.