Femtoscopic correlations of D^0 mesons with identified hadrons in Au-Au collisions at $\sqrt{s_{NN}}$ = 200 GeV at STAR

Priyanka Roy Chowdhury (for the STAR collaboration),
Warsaw University of Technology, Warsaw, Poland

Due to large mass, the charm quarks are produced early in the relativistic heavy-ion reactions and probe all stages of the evolution of the created medium – the Quark Gluons Plasma. Two-particle correlations at low relative momentum (the femtoscopic correlations) are sensitive to the interactions in the final state and a region from which correlated particles are emitted (so-called region of homogeneity). A study of such correlations of charmed mesons with identified hadrons could shed light on their interactions in the hadronic phase and the behavior of charm quarks during the partonic stage of the reactions.

We will present a study of femtoscopic correlations of D^0-π, D^0-K, D^0-proton pairs measured at mid-rapidity in the high-statistics Au-Au collision (run 2014) at $\sqrt{s_{NN}}$ =200 GeV at the STAR experiment. Analyzed dataset contains 600 M minimum-bias events where D^0 mesons are reconstructed at via the K^--π^+ decays using topological reconstruction enabled by the excellent track pointing resolution provided by the Heavy Flavor Tracker. Hadrons are selected and identified at midrapidity ($|\eta|<1$) using ToF and TPC. We will present the femtoscopic correlation function for 0-80% central events and D^0 transverse momentum $p_T > 1$ GeV/c.