Multiplicity Dependent Study of (Multi-)strange Hadrons in d+Au collisions using the STAR detector

Ishu Aggarwal
(for the STAR collaboration)

Strangeness enhancement has long been considered a signature of the quark-gluon plasma formation in heavy-ion collisions. Strangeness enhancement has also been observed in small systems at the LHC, but the underlying physics is not yet fully understood. This motivates studies of strange hadron production in small systems at RHIC, where the energy density of system is expected to be smaller than that at the LHC and therefore a hot and deconfined medium is less likely to be created. Investigating the multiplicity dependence of strange hadron production in small systems can naturally connect to peripheral heavy-ion collisions, and contribute to understanding the role of event multiplicity in strange hadron production. Study of rapidity asymmetry and nuclear modifiaction factors in d+Au collisions can also give insight on cold nuclear matter effects.

In this talk, we will present new measurements of (multi-)strange hadrons (K^0_S, Λ, Ξ and Ω) in d+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV, collected by STAR in 2016. We will analyze the multiplicity dependence of strange hadron transverse momentum (p_T) spectra, p_T-integrated yields dN/dy, average transverse momentum ($\langle p_T \rangle$), and yield ratios to pions. We will also present nuclear modification factors and rapidity asymmetry for these particles. We will discuss implications of our measurements on the possible formation of a hot and deconfined medium and the origin of strangeness enhancement in small systems.