

Observation of Strange Dibaryon ($|S| = 3$)

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Dibaryons, exotic states composed of six quarks, have long been a subject of interest in understanding the strong interaction beyond conventional hadrons. Among these, strange dibaryons, which contain strange quarks, offer an important role of studying the hyperon-nucleon (YN) and hyperon-hyperon (YY) interactions. Of particular interest are the spin-0 H ($S = -2$) and the spin-2 $N\Omega$ ($S = -3$) dibaryon state, which are considered promising candidates for the strange dibaryon bound state. In heavy-ion collisions, two-particle femtoscopy is a powerful and unique method for extracting information about the spatio-temporal properties of the source, characterising the final state interactions (FSI), and searching for the possible bound states.

In this talk, we will present the measurement of the baryon-baryon correlation function for the $p\text{-}\Omega^-$ pair in Isobar (Ru+Ru, Zr+Zr) collisions. The correlation function is analyzed within the Lednicky-Lyuboshitz formalism. The extracted scattering length and effective range will be presented and compared with recent lattice QCD and effective-theory model calculations. Most importantly, the physics implications for the possible formation of a strange dibaryon ($S = -3$) bound state will be discussed.

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