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Femtoscopic study of coupled-channel baryon-baryon interactions with S=-2

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We investigate the momentum correlation functions of S = -2 baryon pairs ($p\Xi^-$ and $\Lambda\Lambda$) produced in high-energy nuclear collisions. The momentum correlation function reflects the baryon-baryon interaction at low energies and the source function. We use the interaction potentials obtained from recent lattice QCD calculations at nearly physical quark masses and the static Gaussian source model. We take account of the Coulomb potential and coupled-channel effects including the threshold difference. Coupled-channel effects generate the cusp structure and high-momentum tail in the $\Lambda\Lambda$ correlation function and enhance the $p\Xi^$ correlation function at small relative momenta. Recently obtained experimental data of the correlation functions of $p\Xi^-$ and $\Lambda\Lambda$ pairs are simultaneously described by the coupled-channel baryon-baryon interactions from lattice QCD.

Primary authors: OHNISHI, Akira; Dr KAMIYA, Yuki (CAS Key Laboratory of Theoretical Physics, Institute of Theoretical Physics, Chinese Academy of Sciences); Dr SASAKI, Kenji (Center for Infectious Disease Educationand Research (CiDER), Osaka University); Dr FUKUI, Tokuro (RIKEN Nishina Center); Prof. HATSUDA, Tetsuo (RIKEN Interdisciplinary Theoretical and Mathematical Science Program (iTHEMS)); Prof. HYODO, Tetsuo (Tokyo Metropolitan University); Dr MORITA, Kenji (National Institutes for Quantum and Radiological Science and Technology, Rokkasho Fusion Institute); Prof. OGATA, Kazuyuki (RCNP, Osaka University)

Presenter: OHNISHI, Akira

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