

Future hypernuclear studies at J-PARC and JLab

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At J-PARC, a project to extend the Hadron Experimental Hall is underway, where various nuclear and hadron physics experiments will be conducted. Among them, the precision spectroscopy of Λ hypernuclei stands as one of the flagship experiments. Recently, at JLab, new Λ hypernuclear experiments using electron beams have been approved, and hypernuclear spectroscopy will be vigorously pursued in the future at JLab Hall-C.

In bridging nuclear forces and the strong force based on QCD, it is essential to extend nuclear forces to baryonic interactions, and hypernuclear precision spectroscopy plays a crucial role in this endeavor. The hypernuclear spectroscopy studies using pion beams at J-PARC and the precision spectroscopy of hypernuclei using electron beams at JLab can complement each other, and both are indispensable for the precise study of charge symmetry breaking in hypernuclei. Moreover, hypernuclear precision spectroscopy is extremely important for resolving the hyperon puzzle, which relates to the mystery of heavy neutron stars.

This talk will focus on the extension project of the J-PARC Hadron Experimental Hall, with an emphasis on hypernuclear spectroscopy experiments, and discuss the physics that will be explored in conjunction with complementary studies at JLab.

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