Abstract for an Invited Paper for the DNP10 Meeting of The American Physical Society

Recent progress in hypernuclear physics EMIKO HIYAMA, RIKEN

An important goal of hypernuclear physics is to establish a fundamental understanding of the baryon-baryon interactions. Since experimental data on hyperon-nucleon scattering are scarce and none exist for hyperon-hyperon scattering, spectroscopic studies on the structure of hypernuclei provide absolutely crucial information. Recently, extensive precision theoretical calculations for hypernuclei have been performed. Moreover, high-resolution gamma-ray experimental detailing hypernuclear spectroscopy have been developing rapidly. By comparing these theoretical and experimental results, one can obtain useful information regarding hyperon-nucleon interactions. In the case of double strangeness nuclei such as double Λ hypernuclei, recently we have three events by KEK-E373 emulsion data. In emulsion experiments, however, it is difficult to determine the spin- parity or even to know whether an observed even corresponds to a ground or excited state. Therefore, it is essential to compare the emulsion data with theoretical analyses to obtain a proper interpretation. By comparing observed data and theoretical calculation, we succeeded in identifying the states. In the future, we expect to have much data on strangeness S=-1 and S=-2 hypernuclei. In this talk, I shall report on recent progress in theoretical and experimental studies of hypernuclei and discuss future developments in this fields at J-PARC.