

The First Gamma-ray Spectroscopic Study of *sd*-shell Hypernucleus, ${}_{\Lambda}^{19}\text{F}$

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The first γ -ray spectroscopy of *sd*-shell hypernucleus, ${}_{\Lambda}^{19}\text{F}$, is performed in June, 2015 at the J-PARC K1.8 beam line (J-PARC E13). Precise energy levels of ${}_{\Lambda}^{19}\text{F}$ can be revealed by measured γ rays in this experiment. Especially, the strength of ΛN spin-spin interaction in *sd*-shell hypernucleus is obtained through the energy spacing of the ground-state doublet of the hypernucleus. By comparing its strength between the *s*, *p*, and *sd*-shell hypernuclei, a radial dependence of ΛN interaction is investigated. The hypernucleus is produced through the (K^-, π^-) reaction with the beam momentum of 1.8 GeV/c. In very preliminary results, we observed two γ rays, and their energies are 315.8 ± 0.4 keV and 895.3 ± 0.3 keV where the uncertainties are only statistical.

KEYWORDS: *sd*-shell hypernucleus, γ -ray spectroscopy, J-PARC E13, ΛN interaction

1. Introduction

The γ -ray spectroscopic study of Λ -hypernuclei is a powerful tool to determine its energy levels precisely. An experimental technique to use Germanium (Ge) detectors with a high energy resolution is necessary to resolve energy splitting of non-zero spin states of a core-nucleus. Since 1998, γ rays