

High accuracy spectroscopy of 3- and 4-body Lambda hypernuclei at Jefferson Lab

Tuesday, 28 June 2022 16:06 (1 minute)

Missing-mass spectroscopy by using the $(e, e' K^+)$ reaction was developed at Jefferson Lab (JLab). The energy resolution of 0.5 to 1 MeV/ c^2 in FWHM is achievable thanks to a high quality beam provided by JLab and high resolution spectrometers dedicated to hypernuclear measurements. In addition, one of important features is an accurate energy calibration by using Λ and Σ^0 productions from a proton target, leading to the energy accuracy of $|\Delta B_\Lambda| < 100$ keV.

We are preparing for experiments in which light to heavy mass targets will be used [E12-19-002 ($A = 3, 4$), E12-15-008 ($A = 40, 48$), E12-20-013 ($A = 208$)]. I will present an experimental overview and the expected results for $^3_\Lambda\text{H}$ ($1/2^+$ or $3/2^+$) and $^4_\Lambda\text{H}$ (1^+) measurements which have been approved by JLab PAC last year. We aim to measure Λ binding energies of these Λ hypernuclei with the energy accuracy of less than 100 keV to investigate a puzzle of contradiction between the lifetime and binding energy of hypertriton, and to study the ΛN charge symmetry breaking.

Primary author: Dr GOGAMI, Toshiyuki (Kyoto University)

Presenter: Dr GOGAMI, Toshiyuki (Kyoto University)

Session Classification: 6; Poster session