The 23rd International Conference on Few-Body Problems in Physics (FB23)



Contribution ID: 135 Type: 1.Plenary

Next generation hypernuclear spectroscopy with the (e,e'K+) reaction at Jefferson Lab

 Λ hypernuclear spectroscopy is useful for investigating the Λ -nucleon (Λ N) interaction. High resolution missing-mass spectroscopy for Λ hypernuclei was established at Jefferson Lab by means of the $(e,e'K^+)$ reaction. We are preparing a next-generation experiment in which Λ hypernuclei with a wide mass range, $\Lambda = 6$ -208, will be measured at JLab's Experimental Hall C. The beam time is planned to start in 2027. High-momentum resolution spectrometers HES and HKS are expected to allow us to achieve an energy resolution of 0.6 MeV (FWHM) and a total energy accuracy of 0.07 MeV. Such a high accuracy measurement would give us new insights for Λ N charge symmetry breaking and isospin dependent Λ NN three body interaction. In addition, we aim to study deformation and cluster structures of core nuclei by using the Λ in hypernuclei as a probe. For example, tri-axially deformation states in 26 Mg will be investigated through high resolution spectroscopy of $^{27}_{\Lambda}$ Mg.

I will review the hypernuclear physics program at Jefferson Lab.

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Session Classification: Plenary

Track Classification: Strange and exotic matter, including hypernuclear physics