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## Newly completed JLab experiment: Determine the unknown $\Lambda n$ interaction by investigating the possible $\Lambda nn$ resonance

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The newly completed JLab experiment E12-17-003 aimed to search for a possible  $\Lambda nn$  resonance using the  $3H(e, e' K^+)(\Lambda nn)$  reaction. If such a state does exist, the experiment will measure its binding (or excitation) energy and natural width. These measurements will provide extremely important and experimentally determined information, for the first time, that can be used to investigate the unknown  $\Lambda n$  interaction.

Direct  $\Lambda N$  scattering data is extremely important and needed based on the newly confirmed Charge-Symmetry-Breaking (CSB) at a level of 270keV from the binding energy difference observed between ground states of  $4\Lambda\text{He}$  and  $4\Lambda\text{H}$ . Especially, the  $\Lambda n$  data does not exist at all, thus the properties of  $\Lambda n$  interaction has been assumed to be identical to that of  $\Lambda p$  interaction. The resonance of  $\Lambda nn$  system can provide a unique and only experimental data that can be used to determine the unknown properties of  $\Lambda n$  interaction.

The presentation will give an overview of the physics motivation of the JLab experiment, the experimental technique, and the most updated analysis results which although may still be preliminary.

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