High-Resolution Hypernuclear Spectroscopy
Electron Scattering at JLab, Hall A

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Hypernuclear spectroscopy via electromagnetic induced reactions is a valuable and powerful way to study hypernuclei, hadronic systems with non-zero strangeness content, providing an alternative to the hadron induced reactions mainly studied so far. Electron-induced hypernuclear spectroscopy has been studied in Hall A at Jefferson Lab on three nuclei, ^{12}C, ^{16}O, and ^{9}Be with unprecedented resolution and with an improved particle identification system, using a RICH detector, in order to unambiguously identify kaons, thus allowing the measurement of high-quality, almost background-free, hypernuclear spectra. Two superconducting septum magnets were added to the existing apparatus in order to permit particle detection at very forward angle providing a reasonable counting rate. These studies have provided the first quantitative information on, for instance, core-excited states in hypernuclei. In the case of oxygen, a waterfall target has been employed allowing for the simultaneous measurement of hypernuclear production on oxygen and of elementary kaon-Lambda electro-production on protons: a crucial measurement to disentangle the contribution of the elementary reaction from the measured hypernuclear production cross section, yielding direct access to the nucleus-hypernucleus transition structure. Final results for ^{12}C and ^{16}O as well as preliminary results on ^{9}Be will be presented.