

Inelastic Background for CREX

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The Calcium Radius EXperiment (CREX) took place at Jefferson Lab in Hall A from December 2019 to September 2020 and measured the parity-violating asymmetry (A_{PV}) on ^{48}Ca using an electroweak interaction probe. An accurate measurement of this tiny (ppm level) asymmetry requires thorough understanding and control of systematic errors including backgrounds and corrections. One of the potential sources of background event contamination comes from inelastically scattered electrons. Although the first excited state of ^{48}Ca is relatively far away (3.831 MeV) from the ground state, the kinematics of the CREX measurement, combined with the natural fluctuations in the beam energy, make it challenging to efficiently reject unwanted inelastic events. The $\sim 10^{-4}$ relative momentum resolution of the Hall A High-Resolution Spectrometers (HRSs), together with monitored precision alignment of the flux-integrating quartz detectors, allows us to geometrically exclude most of the inelastic events from the quartz acceptance. In this talk, we will discuss the inelastic background analysis, corrections, and errors for the CREX A_{PV} measurement.