Generating Fiducial Cuts for CLAS E5 KRISTEN GREENHOLT,
GERARD GILFOYLE, University of Richmond, CLAS COLLABORATION — The
Thomas Jefferson National Accelerator Facility, located in Newport News, Virginia,
is home to CLAS (CEBAF Large Acceptance Spectrometer) which observes the scattering effects of high-energy collisions of an electron beam and a proton or deuteron
target. When data are collected with CLAS, one of the properties measured is the
cross-section, which is proportional to the number of events and the efficiency and
inversely proportional to the solid angle. The efficiency, or acceptance of the detector, is the ratio between the data one expects to observe in an ideal detector and the
data that we actually measure with the real CLAS detector. In outlying azimuthal
regions, the efficiency is less clearly understood, which leads to measurements which
are reliant on the conditions of the detector itself. In order to analyze data which
fall in regions of stable and well-understood efficiency, we generated fiducial cuts on
CLAS. Our fiducial cuts fit a function to the edges of regions of stable efficiency.
These cuts enable us to focus on the data with good acceptance/efficiency. When
examining at the fiducial cuts, we required stable efficiency, or flat regions, a good
visual fit, a minimized chi squared, and a reasonable behavior in each in azimuthal
versus polar angle plane for each electron-momentum bin. Generating these fiducial
cuts enables us to focus on data from CLAS where the efficiency of the detector is
well understood.

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