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Polarimetry of NIST NG-C Neutron Beam for the aCORN Experiment

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The aCORN experiment measured the electron-antineutrino angular correlation coefficient (the 'a'coefficient) in free neutron decay on the NG-C neutron beam at the National Institute of Standards and Technology (NIST). Though the NIST neutron beams are expected to be unpolarized, an earlier run of the experiment found a small polarization on the NG-6 beamline. The aCORN measurement is quite sensitive to neutron polarization, and the beam polarization was used as a blind on the aCORN results. To unveil the blind, the beam polarization was measured using a 3He cell polarized by spin-exchange optical pumping (SEOP). After a brief overview of the aCORN experiment, the neutron polarimetry system will be discussed.

Summary

For the aCORN experiment, the small polarization of the NG-C neutron beam at NIST was measured using a SEOP-based 3He spin filter.

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