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Assessing the Effects of Magnetic Fields on the Photomultiplier Tubes in the SANE FORREST SMITH — As nuclear physicists work to understand the behavior of the quarks and gluons that comprise nucleons, polarization has become increasingly important. The Spin Asymmetries of the Nucleon Experiment (SANE) at Jefferson Lab used polarization of both beam and target in electron-proton scattering. While the beam can be produced in a polarized state, the target was polarized by way of a strong magnet. This magnet's field was non-negligible outside of the intended region, and this study examined the field and assessed its effect on photomultiplier tubes (PMTs) used in SANE. The magnetic field was mapped with reference to the location of the PMTs, and a statistical analysis of run data from SANE was done using the physics analysis framework developed ROOT. It was concluded that the magnetic field caused, on average, a 3.3% $\pm$ 1.8% loss in PMT signal due to the bending of electrons. This minor, but statistically significant, effect is consistent with prior, cursory estimates and solidifies the viability of coming results from SANE. These results also provide a good characterization for the PMTs' performance in a magnetic field and will benefit future experiments in which they are used.

Forrest Smith

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