Recent Results From The BLAST Experiment

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The BLAST experiment, at the MIT-Bates Linear Accelerator Center, was designed to study in a systematic manner the spin-dependent electromagnetic interaction in few-nucleon systems at momentum transfers below 1 $(GeV/c)^2$. The experiment utilizes the polarized stored electron beam of the Bates South Hall Ring, highly polarized internal gas targets of H and D, and a symmetric detector configuration. BLAST makes simultaneous measurements of several reaction channels with different combinations of beam and target polarizations. Frequently changing the beam helicity and the target polarisation (vector for H, both vector and tensor for D) minimizes systematic errors. BLAST beam-target polarization asymmetries can be used to extract the nucleon and deuterium form factors as well as study few body physics and pion production.

The experiment will be described in detail. Results and comparisons to calculations and existing data will be presented for the proton form factor ratio G_E^p/G_M^p measured through elastic scattering from H, and for the neutron form factors G_E^n and G_M^n measured via quasielastic scattering from D. Measurements of T_{20} and T_{11} for scattering from the deuteron and of pion production will also be presented.