The G0 Experiment

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The contribution of strange quarks to the internal structure of the proton gives direct insight into the non-perturbative quark-antiquark sea. In particular, the determination of the strange quark contribution to the proton electromagnetic form factors, G_E^S and G_M^S, give the charge and magnetization distribution of the strange quarks within the nucleon. These form factors can be determined through experiments measuring the parity-violating effect in elastic electron-proton scattering, which results from the interference between the neutral weak and electromagnetic scattering amplitudes.

The G0 experiment is one such experiment performed at Jefferson lab. The G0 collaboration has completed its first phase of the experiment, where a longitudinally polarized electron beam is scattered off a liquid hydrogen target. The recoil protons, scattered into forward angles, are measured to determine a linear combination of G_E^S and G_M^S. Currently, the experiment is in the middle of its backward angle run. The superconducting magnetic spectrometer is rotated 180^o around the beamline to detect backward scattered elastic and quasi-elastic electrons from liquid hydrogen and liquid deuterium targets, respectively. The backward angle results, when combined with the forward angle results, will kinematically separate the charge and magnetic form factors.

Recent experiments are in agreement that at $Q^2 = 0.1$ GeV^2 the strange quark contributions to the structure of the proton are small. Furthermore, a view of the Q^2 dependence of the parity-violating asymmetry is beginning to emerge.

An overview of the G0 experiment including an update on the current run will be presented together with a summary of recent measurements.