

SENDAI INTERNATIONAL SYMPOSIUM  
ON  
**Strangeness**  
in Nuclear and Hadronic Systems  
— SENDAI08 —

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**Title**

*Current status of the G0 parity violation experiment carried out at Jefferson Laboratory.*

**Abstract:**

Among experiments looking for strangeness in nuclear systems, electron scattering parity-violation type experiments aim mainly at measuring the strange quark contributions to the form factors of the proton. They can be accessed by measuring asymmetry in longitudinally polarized electron elastic scattering on hydrogen. The parity-violating asymmetry is measured at the  $\sim 10^{-7}$  level of accuracy, and when combined with the electromagnetic form factors of the proton, the strange form factors can be determined. The full separation of form factors according to quark flavour requires measurements at forward angle on hydrogen and at backward angle on proton and deuteron. The experimental setups used for the G0 experiment in the two different configurations will be described. The status of the analysis and the current results will be presented and discussed in relation with other experiments past and planned.

The G0 forward angle measurement<sup>(2)</sup> detected the recoil proton with a segmented detector covering, for one incident energy, different  $Q^2$  bins ranging from 0.1 to 1.0 (GeV/c)<sup>2</sup>. This measurement provided a linear combination of strange magnetic and strange electric form factors for each  $Q^2$ . In the backward angle configuration, electrons were detected and just one  $Q^2$  value was covered at a given incident energy. Due to time limitation, only two cases have been studied:  $Q^2 \sim 0.63$  and 0.23 (GeV/c)<sup>2</sup>. These values were chosen to be directly comparable with results from other experiments. By combining backward and forward configuration measurements it is possible to extract separately the electric and the magnetic strange form factors. The measurements are complete. The analysis, still in progress, will be described.

A few comments will also be made regarding some other aspects of physics accessible in simultaneous measurements: neutral current in  $N\Delta$  transition, parity violation in inclusive  $\pi^-$  production and  $2\gamma$  contribution to elastic scattering.

<sup>1</sup> (see <http://www.npl.uiuc.edu/exp/G0/>)

<sup>2</sup> Armstrong, D.S. *et al.*, Phys. Rev. Lett. **95**, 092001 (2005).