Parity Violating Elastic Electron Nucleon Scattering:
Just how Strange is the Nucleon?

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The neutral weak current "competes" with the electromagetic current when electrons are scattered off of protons or neutrons (collectively called nucleons). But because the electromagnetic interaction conserves parity, and the neutral weak current doesn't, we can use this to measure the contribution of the neutral weak current. The nucleon is thought to be made up of 3 valence quarks - up, up and down for the proton (uud) and up, down, down for the neutron (udd). But there can be other quarks present in the nucleon if they come in quark-antiquark pairs. Does this sound strange? It is! The easiest of these "sea" quarks to detect is, in fact, the strange quark s, because it is the next lowest mass quark that isn't a u or d quark, so it can be distinguished from the valence quarks. The electromagnetic properties of nucleons are relatively well known. By measuring the neutral weak contribution in elastic electron-nucleon scattering and invoking isospin symmetry we can make a measurement of the strange quark content of the proton. The G^0 experiment recently unblinded the results of the backward angle running and has extracted the strange electric and magnetic form factors at two values of momentum transfer. A description of the experiment and results will be presented.

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