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Parity Nonconservation in Cold Atomic Hydrogen[1] CORY RASOR, DYLAN YOST, Colorado State University — While parity was once thought to be a universal symmetry of nature, its violation is now considered one of the signatures of the weak force. Parity violating experiments in atomic systems have the unique opportunity to probe parameters of the standard model which would otherwise be inaccessible in scattering experiments. Specifically, parity nonconservation (PNC) measurements in atomic hydrogen allow for the measurement of the weak neutral coupling constants between nucleons and the electron at low momentum transfer. Measuring these constants would provide a stringent test of the Standard Model of Electroweak Interactions at low energy, and has potential to provide an indirect measurement of the dark Z boson, a proposed dark matter force carrier. Several groups have attempted such a measurement with little success. This talk will outline an experimental scheme which drastically reduces previous experimental uncertainties and provides reasonable statistics to extract the electron-proton spin independent weak neutral coupling constant, C_{2p}, to a fractional uncertainty of $\sim 1\%$. This scheme utilizes a cold (6 K) beam of atomic hydrogen and optically excites the 1S-2S transition via two-photons in preparation for the RF driven interaction region.

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