1154-46-1767   **Robert L Hingtgen*** (`rhingtgen@mercyhurst.edu`), 501 E 38th St., Erie, PA 16546. *Existence and Uniqueness of Solutions to the Weakly Nonlinear Schrodinger-Newton System.* Preliminary report.

The existence of a family of static spherically symmetric solutions to the Schrodinger-Newton system has been known since the late nineties. Numerical analysis strongly suggests that each solution is unique, corresponding to a number of zeroes on the half-line. The SN system can be viewed as a nonlinear perturbation of the one dimensional Hydrogen atom on the half-line. We show existence and uniqueness of static solutions for small values of the perturbation parameter via an implicit function theorem for Fredholm maps. (Received September 16, 2019)