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Experimental Verification of a new Plasma Equilibrium State JEREMY BISHOP, AJAY SINGH, FARRELL EDWARDS, ERIC HELD, Utah State University — It has been shown that a "steady state equilibria of two-species collisionless plasmas have been found for symmetrical systems by varying the total energy subject to Maxwell's equations, momentum moment equations, and adiabatic equations of state, without imposing a quasineutrality condition"[1] We have undertaken the task of experimentally verifying that these equilibria exist. In order to do this we have received delivery of equipment from the University of Saskatchewan, consisting of the the components of the tokamak STOR – 1M. After restoration to working condition, we will modify the equipment to encourage the formation of the equilibrium state. Additional testing will be used to determine feasibility to applications such as neutron and/or power generation. Currently, we are in final preparation for vacuum testing, after which we will complete restoration of the electrical system including capacitor testing,a new optically isolated control system and installing required diagnostics. This will allow us to have first plasma in December 2006.

[1]W.F. Edwards and E.D. Held PRL **93**, 255001 (2004)

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