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Timothy D Andersen* (tim@va.wagner.com), Hampton, VA 23666. *Exact solution to the 1d one component Coulomb gas at fixed energy.*

The one dimensional one component plasma has applications to one dimensional particle systems with logarithmic interactions such as charges in a single channel wire or vortex filaments in a fluid convection stream. The exact integral of this plasma in the canonical ensemble with a gaussian confining potential has already been computed. In this talk, I derive the exact volume of the phase space of the plasma of N particles at fixed energy without a confining potential using a microcanonical ensemble and show that, as in the two-dimensional case, it has negative temperature states, suggesting that one dimensional turbulence can occur from vortex/electron clustering. (Received September 13, 2011)