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Troy, NY 12180. *Anomalous expansion and negative specific heat in quasi-2D plasmas.*

The electron magnetohydrodynamic (EMH) model for plasma vorticity allows for a one-component Coulomb ensemble to describe a confined plasma's statistics of electron columns. These columns, often studied in strict two-dimensions, can have significant 3D effects, causing deviations from 2D statistics. Two deviation results can be obtained from the statistics: (1) an anomalous expansion of the size of the ensemble at a specific "temperature" in the canonical (heat bath) case and (2) negative specific heat in the microcanonical (isolated ensemble) case. Both of these results can be derived in a mean-field limit of the interaction potential and are applicable to magnetic nuclear fusion experiments. (Received January 05, 2010)