

Abstract Submitted
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The Fermi Statistics of a Weakly Excited Column of Granular Particles in a Vibrating Bed HOLLY KOKSTEIN, PAUL QUINN, Kutztown University of PA — A one dimensional experiment in granular dynamics is carried out to test the thermodynamic theory of weakly excited granular systems [Hayakawa and Hong, Phys. Rev. Lett. 78, 2764(1997)] where granular particles are treated as spinless Fermions. The density profile is measured and then fit to the Fermi distribution function, from which the global temperature of the system, T , is determined. Then the center of mass, $\langle z(T) \rangle$, and its fluctuations, $\langle z(T)^2 \rangle$, are measured and plotted as functions of T . The Fermi function fits the density profile fairly well, with the value of T being fairly close to the predicted value. The scaling behavior of $\langle z(T) \rangle$ and $\langle z(T)^2 \rangle$ is in fairly good agreement with the theory.

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