Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Creating Only Isotropic Homogeneous Turbulence in Liquid Helium near Absolute Zero[1] G.G. IHAS, K.J. THOMPSON, G. LABBE, Department of Physics, University of Florida, PO Box 118440, Gainesville, FL 32607, P.V.E. MCCLINTOCK, Department of Physics, Lancaster University, Lancaster LA1 4YB, UK — Flow through a grid is a standard method to produce isotropic, homogeneous turbulence for laboratory study. This technique has been used to generate quantum turbulence (QT) above 1 K in superfluid helium[2] where QT seems to mimic classical turbulence. Efforts have been made recently[3] to make similar measurements near absolute zero, where there is an almost total absence of normal fluid and hence classical viscosity. This presents the difficulty that most motive force devices produce heat which overwhelms the phenomena being investigated. The process of designing and implimenting a "dissipation-free" motor for pulling a grid through superfluid helium at millikelvin temperatures has resulted in the development of new techniques which have broad application in low temperature research. Some of these, such as Meissner-affect magnetic drives, capacitive and inductive position sensors, and magnetic centering devices will be described. Heating results for devices which can move in a controlled fashion from very low speed up to 10 cm/s will be presented. Acknowledgement: We thank W.F. Vinen for many useful discussions.

[1]Work supported in part by US NSF DMR#0602778 and #1007937.
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Date submitted: 18 Nov 2011 Electronic form version 1.4