

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Mobility of solid ^4He JAMES DAY, JOHN BEAMISH, University of Alberta — Recent torsional oscillator measurements [1,2] on solid ^4He in the pores of Vycor and in bulk demonstrated non-classical rotational inertia and showed a decrease in period below about 200 mK, suggestive of a transition to a supersolid phase. It becomes interesting to see whether solid ^4He exhibits any of the other unusual flow properties of a superfluid. We have performed capacitive measurements on the mobility of solid ^4He in Vycor. By suddenly increasing the pressure in a cell containing a Vycor sample, we were able to monitor the pressure induced flow of solid ^4He in the pores. Near its melting temperature the solid ^4He does flow in/out of the pores, but the flow rate decreases rapidly with temperature, until no flow is observable below 700 mK. We do not see any flow at temperatures down to 25 mK, implying that either supersolid ^4He in Vycor does not flow in response to a large pressure difference or that superflow occurs at a rate far slower than the critical velocities observed by Kim and Chan. We have also begun work on pressure induced flow of bulk solid ^4He . This work was supported by the Natural Sciences and Engineering Research Council of Canada (NSERC). 1. E. Kim and M.H.W. Chan, Nature 427, 225 (2004). 2. E. Kim and M.H.W. Chan, Science 305, 1941 (2004).

James Day
University of Alberta

Date submitted: 30 Nov 2004

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