Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Finite-Element Modeling of Acoustic Modes in Solid ^{4}He[1] ANTHONY CLARK, JAY MAYNARD, MOSES CHAN, Penn State University — Using a finite-element method we have calculated the low-frequency eigenmodes of various torsional oscillators (TO) in the literature. To elucidate the relationship between the elasticity [1] and apparent nonclassical rotatation inertia (NCRI) of solid ^{4}He, we have investigated the dependence of the torsion mode on the shear modulus of ^{4}He. If we exclude supersolidity, we find the inferred increase in the shear modulus that is necessary to account for typical frequency shifts in TO studies is significantly larger than that reported in Ref. [1] and nearly unphysical. Experiments are in progress to understand the connection between NCRI and the increased shear modulus. [1] J. Day and J. R. Beamish, arXiv:0709.4666v1 (2007).

[1]This work is supported by NSF under grant DMR-0706339.

Anthony Clark
Penn State University

Date submitted: 26 Nov 2007 Electronic form version 1.4