Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Solid ^{4}He probed by both torsional oscillator and ultrasound[1]
HARRY KOJIMA, Rutgers University, IZUMI IWASA, Kanagawa University, JOHN GOODKIND, UCSD — The interpretation of observed anomalous increases in the frequencies of torsional oscillators (TO) containing solid ^{4}He confined in Vycor nanopores as evidence for emergence of a supersolid phase has been met recently by conflicting experiments. Yet questions remain on the origin of the observed TO anomalies in bulk solid ^{4}He samples. To search for the origin, we are carrying out simultaneous measurements of 10 MHz longitudinal ultrasound and TOs (250 $\sim$ 1100 Hz) on identical solid ^{4}He samples. Temperature dependence of velocity and attenuation of ultrasound and that of amplitude and frequency of TO are measured. At the temperatures, where TO anomalies occur, anomalies in sound velocity and attenuation also appear. When solid ^{4}He is doped with 20 ppm ^{3}He, the tempeature of TO anomaly tracks that of ultrasound. Interpretation of these observations in terms of the motion of dislocation lines will be presented.

[1]Research supported by NSF.

Haruo Kojima
Rutgers University

Date submitted: 08 Nov 2012 Electronic form version 1.4