Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

**Ultrasound Propagation in the Normal State of Liquid $^3$He/ 98% Aerogel.**[1] H.C. CHOI, N. MASUHARA, B.H. MOON, P. BHUPATHI, M.W. MEISEL, Y. LEE, Microkelvin Laboratory, Department of Physics, U. of Florida, Gainesville, FL 32611, USA, N. MULDERS, Department of Physics and Astronomy, University of Delaware, Newark, DE 19716. USA — We studied the propagation of longitudinal sound in the normal state of liquid $^3$He/ 98% aerogel at 9.5 MHz. The absolute attenuation and sound velocity were determined by direct propagation of sound pulses through the medium. Our measurements cover a wide range of temperatures from 2 mK to 200 mK at three different pressures (10, 21 and 29 bars). As reported by Nomura *et al.*, the sound mode remains in the hydrodynamic limit down to 2 mK due to the impurity scattering off the aerogel. However, we observed a new feature in the high temperature range that the attenuation shows a minimum and increases at high temperature. The minimum ($T_M$) occurs around 60 mK at 10 bars and moves to 40 mK at 29 bars. For $T >> T_M$, the attenuation at high temperature shows a $T^{0.7}$ dependence for all pressures. We will discuss our observations in the framework of theories proposed by Higashitani *et al.* and Biot.

[1]Supported by an Alfred P. Sloan Research Fellowship (YL), NSF grants DMR-0239483 (YL) and DMR-0305371 (MWM).

Yoonseok Lee
University of Florida

Date submitted: 20 Nov 2006 Electronic form version 1.4