Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Torsional oscillator measurements on solid helium in a partially blocked annular channel[1] DUK YOUNG KIM, SANG-IL KWON, HYOUNGSOON CHOI, EUNSEONG KIM, KAIST, CSQR AND DEPARTMENT OF PHYSICS TEAM — We employed a torsional oscillator technique to investigate the non-classical response of solid helium. We grow solid helium samples within an annular channel that is divided by two Vycor blocks. The melting pressure of helium in narrow pores of Vycor glass is elevated up to about 37 bar due to the strong confinement. This effect is used to engineer various combinations of adjacent helium states. When a helium sample is prepared in the pressure range of 25 and 37 bar a solid-liquid-solid sandwich is formed in and outside the Vycor. Non-classical rotational inertia fraction (NCRIF) of 0.02% is observed under this circumstance below about 200mK. For the pressure higher than 37 bar Vycor glasses in the channel can be utilized as partial blocks and the strength of blockage can be modified by gas adsorption on to the pore wall. Supersolid behavior with a number of different partial blockages will be presented.

[1]This work is supported by Creative Research Initiative of MOST/KOSEF.

Eunseong Kim
KAIST

Date submitted: 21 Nov 2008 Electronic form version 1.4