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Supersolidity of Solid <sup>4</sup>He Confined in 25 Angstrom Nanopores<sup>1</sup> KEIYA SHIRAHAMA, HITOMI YOSHIMURA, YOSHIYUKI SHIBAYAMA, Keio University — There has been growing consensus that dislocations play an important role on the supersolid behaviors observed in torsional oscillator experiments for solid <sup>4</sup>He. When solid He is confined in nanopores, dislocations may not exist, or even if they exist their motion is suppressed, and supersolidity should therefore be greatly modified. Study of solid 4He in confined geometries may therefore give an important clue to elucidate the mechanism of supersolidity. Earlier studies of solid 4He in Vycor by Kim and Chan [1] found no difference in the supersolid behaviors from bulk solid. We have performed torsional oscillator experiments for solid 4He in a porous Gelsil glass that has nanopores of 25 angstroms in diameter. We have observed an increase in oscillator frequency indicating supersolidity below 200 mK. This result suggests that the existence of dislocations is not a necessary condition for supersolidity. [1] E. Kim, M. H. W. Chan, Nature 427, (2004) 225.

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Keiya Shirahama Keio University

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