

Abstract Submitted
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Observation of Nonclassical Rotational Inertia in Bulk Solid ^4He Confined to a Cylindrical Cavity¹ KEIYA SHIRAHAMA, MOTOSHI KONDO, SHUNICHI TAKADA, YOSHIYUKI SHIBAYAMA, Department of Physics, Keio University, Yokohama 223-8522, Japan — Recent observation of nonclassical rotational inertia (NCRI) in solid ^4He by Kim and Chan has attracted great interest in physics of supersolid, and motivated a number of theoretical studies. However, there have been surprisingly few experiments to pursue the nature of their observation. Thus, we have begun a torsional oscillator experiment for bulk solid ^4He . In order to study the effects of sample geometry and crystal quality, we employ a cylindrical cell, 8 mm high and 8 mm in diameter, which is mounted on an aluminum alloy torsion rod. The resonant torsion frequency is about 1750 Hz, which is 2 ~ 5 times the frequencies in the Kim and Chan's experiments. In a preliminary experiment we have observed an increase in the frequency below about 250 mK, indicating the existence of NCRI. The frequency shift shows a substantial driving amplitude dependence, which is also consistent with the previous observation.

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