Abstract Submitted
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Effect of Rotation on Elastic Moduli of Solid Helium[1] KEIYA SHIRAHAMA, TOMOYA TSUIKI, Department of Physics, Keio University, Japan, DAISUKE TAKAHASHI, Center for Liberal Arts and Sciences, Ashikaga Institute of Technology, Japan, SATOSHI MURAKAWA, Cryogenic Research Center, University of Tokyo, Japan, YUICHI OKUDA, KIMITOSHI KONO, The Center for Emergent Matter Science, RIKEN, Japan — The response of torsional oscillator (TO) containing solid helium to the rotation was strong evidence for a possible supersolid phase. However, many experiments without rotation show that TO response comes from the change in the elasticity of solid, not from supersolidty. This situation calls for experiment for studying the elasticity of solid helium under rotation. If the elasticity of solid helium is affected by rotation, TO response under rotation may be also explained by the elasticity of solid helium.We performed direct measurements of elasticity of solid helium under rotation. We used quarter-circle shape PZT transducers and measured the shear and Youngs moduli of annular solid samples. When we applied sufficiently low strain, the shear modulus was independent of rotation velocity. On the other hand, when we applied high strain, we observed a decrement of shear modulus at most 16 % at rotation of 4 rad/s of the total change without rotation. But it seems difficult to explain TO result by our result due to the different scale of strain applying to solid in each measurement.We will discuss the result in terms of a dislocation model which is often referred to describe the elastic property of solid helium.

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