Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Re-investigating Solid Helium under DC Rotation with a Rigid Torsional Oscillator JAEWON CHOI, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea, TOMOYA TSUIKI, Department of Physics, Keio University, Yokohama, Kanagawa, Japan, DAISUKE TAKAHASHI, Department of General Education, Ashikaga Institute of Technology, Ashikaga, Tochigi, Japan, KEIYA SHIRAHAMA, Department of Physics, Keio University, Yokohama, Kanagawa, Japan, KIMITOSHI KONO, Quantum Condensed Phase Research Team, RIKEN, Wako, Saitama, Japan, HYOUNG-SOON CHOI, EUNSEONG KIM, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea — The resonant period drop observed in a torsional oscillator (TO) containing solid helium first interpreted as the signature of supersolid is now generally accepted as the shear modulus change of solid helium at low temperature. However, there are still several aspects in solid helium that remain unresolved. For instance, the striking DC rotation effect on the TO experiments was observed without altering the shear modulus of solid helium. The DC rotation is not expected to change the elastic property of solid helium while it can destroy superfluidity. Therefore, the DC rotation effect was considered as the strong evidence of superfluidity in solid helium. Here, we re-examine the effect of DC rotation by utilizing a rigidly constructed TO. Previous DC rotation experiments were performed with a TO exhibiting high reduction ratio of the period, which can be attributed to non-ideal construction of the TO. It is plausible that the resonance period and dissipation of non-ideal TO can be more susceptible to environmental vibration caused by the DC rotation. The response of the rigid TO under DC rotation will be reported to test the validity of the previous interpretation thoroughly.

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Date submitted: 05 Nov 2015 Electronic form version 1.4