

Observation of NCRI in Solid Helium-4 by using Rigid Double Pendulum Torsional Oscillator

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The period drop in the torsional oscillator (TO) containing solid helium-4^{1,2} was attributed to the shear modulus change³ that influences the rigidity of the TO cell. Although negligible in an ideally rigid torsional oscillator⁴, the influence of shear modulus effect can be amplified due to non-rigid structures in TOs.^{5,6,7} Therefore, it is essential to design a rigid TO in order to eliminate various elastic effects, and to examine whether the TO response is caused by the appearance of superfluidity or not. We made a rigid TO cell consisted with double torus of which resonant frequencies are 432Hz for in-phase and 1095Hz for out-of-phase. Here we will report the preliminary study on the frequency dependence of the TO response.

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