

Abstract Submitted
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Variation in supersolid signal amplitude: possible cell dependence

JOHN REPPY, Cornell University — The aim of the present experiment is to test a hypothesis that plastic deformation of solid TO samples may occur during cooling and is the source of disorder in supersolid samples showing large NCRIFs. Cells with a rigid design tend to exhibit rather small supersolid signals even when the surface to volume ratio is large, while the largest signals were observed in cells where one end wall of the cell consists of a flexible diaphragm. The displacement of such a diaphragm by an applied force allows the possibility of a controlled deformation of the solid within the cell. In the first attempt at an experiment of this type, the initial signals were rather large even without any special efforts. Subsequent deformation the solid at a temperature of 200 mK did result in a 20% increase in the NCRIF. This cell may have been sufficiently flexible so that the unavoidable pressure changes upon cooling were sufficient to produce changes in the cell shape large enough to produce a plastic deformation of the solid. The next cell will have a stiffer diaphragm to test this idea. This work has been supported under NSF DMR-0605864.

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