

Abstract Submitted
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Study of Energy Dissipation in Solid ^4He Samples as Measured by Compound Torsion Pendulum¹ PATRYK GUMANN, MICHAEL KEIDERLING, DAVID RUFFNER, HARRY KOJIMA, Rutgers University — We have carried out a series of torsional oscillator experiments on solid ^4He containing ^3He -concentrations (with concentration $x_3 = 0.3, 3, 6, 12, 25$ ppm) using our compound torsional oscillator (TO). Our studies of the supersolid phenomenon focused on the energy dissipation change ($\sim \Delta Q^{-1}$) as x_3 was varied. The unique compound TO design allows observations of identical samples at two distinct frequencies ($f_1=493$ and $f_2=1165$ Hz). When normalized as $\Delta Q^{-1}/\Delta Q_{max}^{-1}(x_3)$ the data collapse onto a universal bell-shaped function of $T/T_{max}(x_3)$ except for the f_1 mode in the 12 and 25 ppm samples and the f_2 mode in the 25 ppm sample. A clear deviation of ΔQ^{-1} in both modes from the other values of x_3 suggests some additional mechanism for the extra dissipation present in the 25 ppm sample.

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