

Extreme softness of crystallites in polycrystalline ^4He .

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We have measured the elastic moduli of solid ^4He between ~ 40 mK and ~ 1 K. The temperature dependence was traced both by measurements of the uniaxial modulus and of the acoustic resonance frequency. The measurements agree between themselves and demonstrate reduction of the shear modulus of a polycrystalline sample with increasing temperature down to $\sim 40\%$ of its value below ~ 40 mK. When analyzed using recent results of numerical calculations by Maris and Balibar [1], this indicates that the shear modulus of individual crystallites decreases to $\sim 8\%$ – lower even than softening observed in an ultra-pure sample [2].

1. H. J. Maris, S. Balibar, *J. of Low Temp. Phys.* **160**, 5 (2010).

2. X. Rojas, A. Haziot, V. Bapst, S. Balibar, H. J. Maris, *Phys. Rev. Lett* **105**, 145302 (2010).