

## Absence of temperature dependence of the lattice constant of solid $^4\text{He}$ .

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Classical explanation of supersolidity in solid helium is based on existence of vacancies, that are thought to persist down to the lowest temperatures. Most measurements indicate that vacancies should be frozen-out below  $\sim 1$  K and helium atoms should form a commensurate crystal. Following a preliminary experiment, we plan simultaneous high-precision measurements of the dielectric constant (easily translated into the density) and the lattice constant of helium crystal to test the commensurability of the solid. In the earlier measurements, however, we found that the temperature variation of the lattice constant, recorded from very low temperatures up to 1.2 K, is much weaker than reported previously [1]. We plan to obtain new experimental data before the conference.

1. B. A. Fraass, P. R. Granfors and R. O. Simmons, *Phys. Rev.* **B 39**, 124 (1989).