Search for a disordered (glassy) phase in solid ³He

A.A. Lisunov, **V.A. Maidanov**, V.Yu. Rubanskyi, E.Ya. Rudavskii, S.P. Rubets, A.S. Rybalko, and V.A. Tikhiyi

B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkov, Ukraine

A disordered (glassy) state has been searched for in solid ³He deformed in the course of the experiment through precise measurements of pressure. The analysis of the temperature dependence of the crystal pressure measured at a constant volume shows that the main contribution to the pressure is made by the phonon subsystem, with the influence of the disordered phase being very weak. Annealing of the deformed crystal does not affect this state. The results obtained differ greatly from the corresponding data for solid ⁴He measured in the region of supersolid effects, where a pressure excessive in comparison with the phonon one was registered. The excess pressure had a quadratic dependence on temperature, which is typical of a disordered system. Absence of the distinct excess pressure in solid ³He is yet unclear; some speculative interpretations are suggested.