

Observation of metastable hcp solid helium

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We have produced and observed hcp solid helium below its melting pressure near $T_0 \approx 1.1$ K. A piezo-electric transducer (PZT) matching the anisotropic longitudinal wavesurface is used to focus a sound wave into a crystal of known orientation. The initial pressure P_0 in the crystal is chosen 0.6 bar above the melting pressure to avoid surface melting at the interface with the PZT during sound emission. The density map near acoustic focus is monitored using an interferometric imaging technique.

Minimum density achieved at focus corresponds to a pressure at least 2.4 bar below the static melting pressure.

This opens the way to the further investigations of the stability limit of hcp solid helium and of its properties.