

Generation and Annihilation of ^4He Negative Crystals

T. Takahashi, R. Nomura, and Y. Okuda

Department of Physics, Tokyo Institute of Technology, 2-12-1 O-okayama, Meguro, Tokyo 152-8551, Japan

When a relatively large ^4He crystal sticking on a vertical sample cell wall fell slowly along the wall, a number of small superfluid droplets or negative crystals spontaneously appeared in the host crystal. The negative crystals rose in the host crystal due to the buoyancy, and finally merged into bulk superfluid surrounding the host crystal. The rising velocity of the negative crystals was almost constant regardless of the host crystal's falling motion, even when the host stayed on a bottom of the cell. This indicates that the falling of the host crystal is the result of the crystallization in the lower parts of the host crystal and the melting in the upper part and that the rising of the negative crystals is also caused by the melting of the host crystal in the upper part of the negative crystal and by crystallization in the lower part.¹ We also observed that the rising of the negative crystal was accelerated by applying acoustic waves to the host crystal.

¹K. Yoneyama, R. Nomura and Y. Okuda, Phys. Rev. E **70**, 021606 (2004).