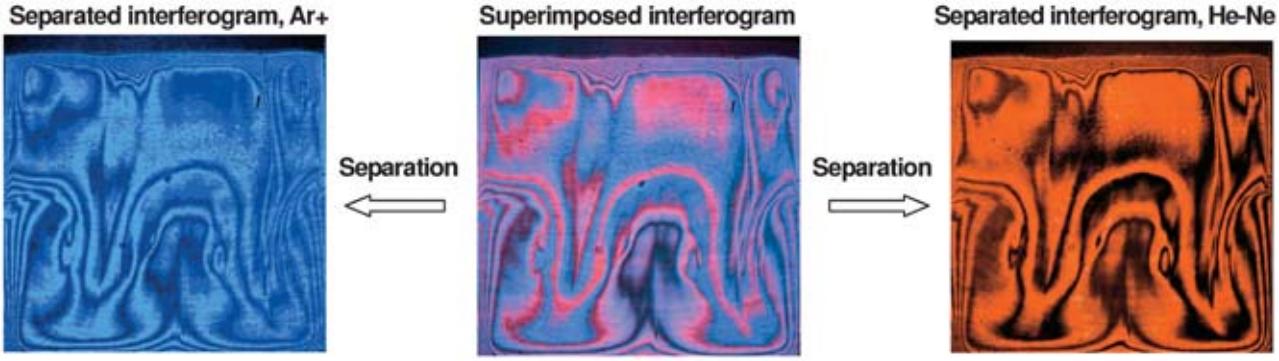
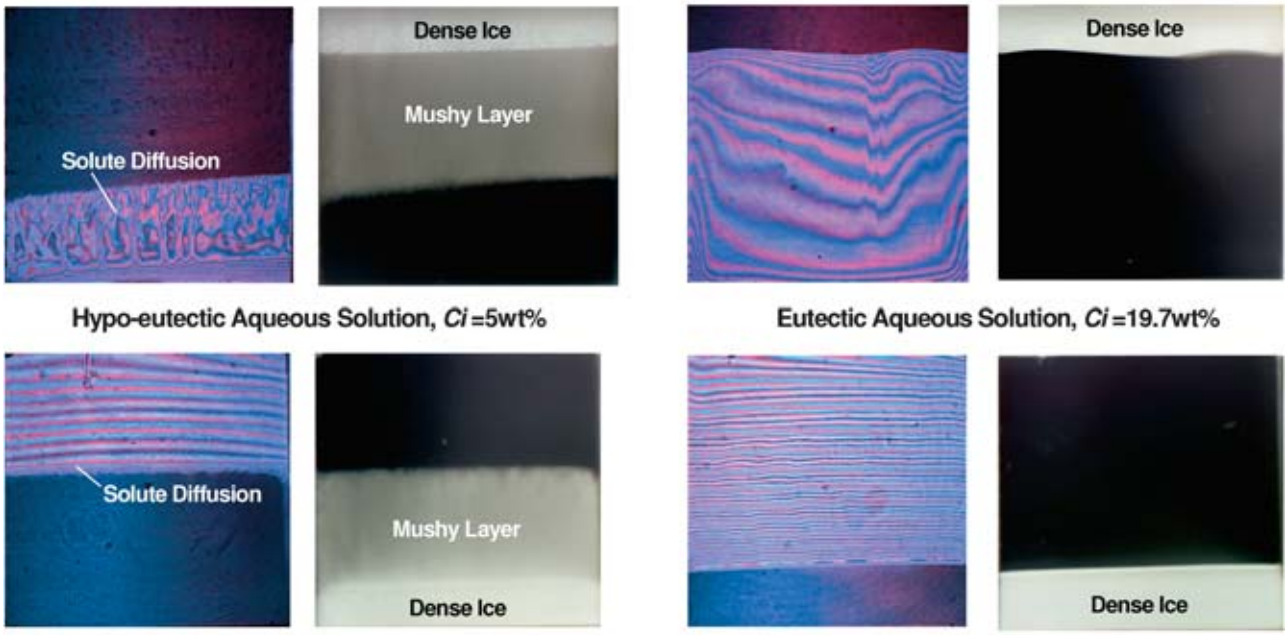
Superimposed and separated interferograms obtained by DWHI



Interferograms and Photographs during Solidification Process of Aqueous Solution of NH_4Cl



Visualization of Transient Solidification Process of Aqueous Solution by Dual Wavelength Holographic Interferometry

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The solidification process of an aqueous solution of NH_4Cl in a 2-D square cavity was visualized and measured using dual wavelength holographic interferometry (DWHI). The aqueous solution of NH_4Cl was cooled from the top or bottom wall of the cavity, and the initial concentration of NH_4Cl, Ci, was varied. The visualized results represent the followings:
(1) The ice-liquid mushy layer grows on the dense ice during the solidification process of Ci =5wt%, but in the case of Ci =19.7wt%, the mushy layer isn't observed and solid/liquid interface is sharp like pure substances.
(2) When the aqueous solution is cooled from the bottom wall, both temperature and concentration gradients stabilize the stratified configuration of the density field. However, in the case of cooling from the top wall, natural convection is caused by density differences and the solute diffusion is more conspicuous by this convection.