

Abstract Submitted
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Effect of the interaction on growing / condensation processes of vapor bubbles injected in subcooled pool RYOTA HOSOYA, Div. Mechanical Engineering, Grad. School of Science & Technology, Tokyo University of Science, ICHIRO UENO, Dept. Mechanical Engineering, Fac. Science & Technology, Tokyo University of Science — We carry out an experimental study with a special interest on a growing and collapsing processes of vapor bubbles injected into a subcooled pool. In the present system, we extract the liquid-vapor interaction in the boiling phenomenon consisting of complex three-phase interactions. Vapor of distilled water is generated in the vapor generator apart from the pool, and then is injected to the pool at a designated degree of subcooling. The degree of subcooling of the pool is controlled from 8 to 80 K. Bubble growth and condensation processes are detected by a high-speed camera at frame rate up to 140,000 fps with backlight illumination. We successfully detect an instability arisen on the vapor bubble interface in prior to the abrupt condensation to collapse. We figure out occurring condition of such instability by evaluating a condensing rate as functions of the degree of subcooling and the vapor injection rate. We then pay our special attention to the interaction of adjacent vapor bubbles injected through two neighboring orifices. Effect of interaction between vapor bubbles is discussed considering a distance between the orifices, and the degree of subcooling.

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