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Vapor bubble condensation in Hele-Shaw cell submerged in subcooled pool MASAHIRO OKADA, Division of Mechanical Engineering, School of Science and Technology, Tokyo University of Science, Japan, TAKUMA HORI, Department of Mechanical Systems Engineering, Tokyo University of Agriculture and Technology, Japan, ICHIRO UENO, Research Institute for Science and Technology, Tokyo University of Science, Japan — Cooling technologies based on boiling heat transfer have attracted attentions as the heat-generation density of electronic devices increases. It is known that the microbubble emission boiling (MEB) can overcome critical heat flux under the specific subcooled condition; thus, MEB regime is expected to be applied to next-generation cooling devices. However, the occurrence condition of MEB has been not yet understood. Since MEB has the remarkable feature that vapor bubbles abruptly condense and collapse, it is of great importance to understand the effect of the condensation on the MEB. In order to focus on the condensation process of the vapor bubble, we inject vapor into a narrow gap region between two glass plates (Hele-Shaw cell) submerged in subcooled pool of water. The Hele-Shaw cell allows us to access clear visualization inside the vapor bubble. Special attention has been paid on the correlation between the condensation process of vapor bubble and energy exchange through the bubble surface.

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