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The Annular Two-phase Flow on Rod Bundle: The Effects of Spacers TOMOAKI KUNUGI, SON PHAM, ZENSAKU KAWARA, TAKEHIKO YOKOMINE, Department of Nuclear Engineering, Kyoto University — The annular two-phase flow on rod bundle keeps an important role in many heat exchange systems but our knowledge about it, especially the interaction between the liquid film flowing on the rods' surfaces and the spacers is very limited. This study is aimed to the investigation of how the spacer affects the disturbance waves of the flow in a 3x3 simulating BWR fuel rod bundle test section. Firstly, the characteristics of the disturbance waves at both upstream and downstream locations of the spacer were obtained by using reflected light arrangement with a high speed camera Phantom V7.1 (Vision Research Inc.) and a Nikon macro lens 105mm f/2.8. The data showed that the parameters such as frequency and circumferential coherence of the disturbance waves are strongly modified when they go through the spacer. Then, the observations at the locations right before and after the spacer were performed by using the back light arrangement with the same high speed camera and a Cassegrain optical system (Seika Cooperation). The obtained images at micro-scale of time and space provided the descriptions of the wavy interface behaviors right before and after the spacer as well as different droplets creation processes caused by the presence of this spacer.

Son Pham
Department of Nuclear Engineering, Kyoto University, Kyoto

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