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**Selective interaction between microbubbles and modulating waves in a Taylor-Couette flow** TOMOAKI WATAMURA, YUJI TASAKA, YUICHI MURAI, Hokkaido University — Modifications of a coherent vortical structure by dispersed microbubbles have been investigated in a vertical Taylor-Couette flow, which is the flow generated between coaxial-rotating double cylinders. Radii of the inner and outer cylinders are 95 mm and 105 mm, respectively. The radius ratio and aspect ratio are 0.905 and 20, respectively. Flow mode in the experiments represents wavy vortex flow and modulated wavy vortex flow. Hydrogen bubbles with 60 $\mu$m in the mean diameter were generated by water electrolysis and dispersed from a platinum-wire electrode mounted at the bottom of the fluid layer. Maximum void fraction estimated by input power is smaller than 0.01%. Velocity distribution of microbubbles in a Taylor vortex array is determined by image analysis, and show preferential distribution and motion in the oscillating vortex tube. The fluctuation power of the basic wave was increased by adding microbubbles, while the power of its modulation was decreased. The gradient of the azimuthal velocity in the radial direction, i.e. origin of skin frictional drag acting on the cylinder walls, was decreased. These modifications of flow structure represent the suppression of the flow transition, due to the excitation of the basic wave oscillation and increase of momentum transfer by bubble swarm.

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