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Effect of control parameters of traveling-wave blowing and suction on relaminarization phenomenon in fully developed turbulent Taylor-Couette flow HIROYA MAMORI, The University of Electro-Communications, KOHEI OGINO, KOJI FUKUDOME, Tokyo University of Science, NAOYA FUKUSHIMA, Tokai University, MAKOTO YAMAMOTO, Tokyo University of Science — Direct numerical simulations of turbulent Taylor-Couette flows are performed to investigate the effect of control parameters of a traveling wave control. A traveling wave-like blowing and suction is imposed on inner or outer cylinder walls. The control is aiming the torque reduction effect. A parametric study is conducted to clarify the range of the control effect. A result shows a range of not only torque reduction but also relaminarization phenomenon of turbulent flow. In the inner wall control case, for example, the relaminarization phenomenon occurs, when the wave travels in corotating direction, the wavelength is long, and a wavespeed is faster than the wall velocity of the inner cylinder. We will also discuss the influence of the traveling wave on the Taylor vortex.

Hiroya Mamori
The University of Electro-Communications

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