Abstract Submitted
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**Modification of vortex shedding and turbulence statistics in a two-dimensional turbulent flow affected by polymers.**[1] RURI HIDEMA, KENGO FUKUSHIMA, HIROSHI SUZUKI, Department of Chemical Science and Engineering, Kobe University., FLUIDS AND PARTICLE ENGINEERING LABORATORY TEAM — An experimental study was performed to investigate the relationship between the extensional rheological properties of polymer solutions and vortex deformation in turbulent flow. In order to focus on the effect of extensional rheological properties of the fluids, polyethyleneoxide was added to two-dimensional (2D) turbulent flow. The 2D flow was self-standing flowing soap films that is relatively free from shear stresses. Therefore, the flow is advantageous as it examines the effect of the extensional rheological properties of polymers on the flow. In the study, the vortex shedding in 2D turbulent flow and turbulence statistics of the vortices in the flow were observed using interference patterns and particle image velocimetry (PIV). We found that the vortex shedding in the 2D flow was categorized into three types, and this was affected by the relaxation time of the polymer solutions. The modification of the vortices varied the energy transfer in 2D flows. We have also found that characteristic energy peak due to extensional rheology of the fluids.

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