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Generation of a flapping motion in a two-dimensional jet at low Reynolds numbers AKINORI MURAMATSU, College of Science and Technology, Nihon University, HOKUTO TSUCHIYA, Graduate School of Science and Technology, Nihon University — In the development of a turbulent two-dimensional jet, a varicose mode generates initially and the sinusoidal mode appears after that. While, it is found that the two-dimensional jet at low Reynolds number does not have the varicose mode. An experiment for the two-dimensional jet at low Reynolds numbers was performed. The Reynolds number was varied from 10 to 200. The jet is laminar when the Reynolds number is less than 60. If the Reynolds number exceeds 60, the jet is flapping. If the Reynolds number exceeds 150, the irregular fluctuations are generated in the jet after the jet is flapping. Next, a numerical simulation was performed for the two-dimensional jet at the Reynolds number of 300. When the spatio-temporally random disturbance is given at the issuing velocity, the flapping motion is generated. If the spatially symmetrical disturbance is given, the velocity fluctuation is generated at peak frequency corresponding to instability in the share layer. However, the velocity fluctuation decays immediately. If the spatially asymmetrical disturbance is given, the velocity fluctuation is generated at peak frequency of the order of 1/100 of the above frequency. The asymmetrical fluctuation rapidly grows and the higher frequencies are generated in the fluctuation.

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