

Abstract Submitted  
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**Longitudinal cross sectional mixing images of the pipe flow with periodical branching flow injections**<sup>1</sup> TOSHIHISA UEDA, YOU SUNHO, NAOTAKA HIGUCHI, Keio University — Effect of periodical injection of branching flows on the mixing in a pipe flow is experimentally investigated. Glycerin is used as a working fluid. The glycerin flows in a steady state condition in the main flow pipe while the branching flow is injected periodically from three pipes equipped normal to the main flow pipe. The longitudinal cross sectional image of the mixing of main flow and branching flows is visualized by LIF method, inserting the Rodamine B in the first branching flow. When only one branching flow is periodically injected, the fluid injected from the side flow pipe is stretched and folded by the parabolic laminar flow velocity profile and then the length of the boundary increases linearly. When branching flow is injected from multiple side flow pipe, the mixing pattern becomes more complicated. As a result, the length of the boundary increases more rapidly compared to the linear increase. The results suggest that the multiple branching flow injection enhances the mixing although no element is inserted in the pipe.

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