

Abstract Submitted
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**Experimental Research on Turbulent Mixing Layer Flow with
Polymer Additives** TAO NING, BIN CHEN, FUDE GUO, State Key Laboratory
of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China

— We present the results of an experimental study of fluids with polymer additives mixed by a specially designed splitter plate in a vertical rectangular channel. This arrangement is perhaps the simplest in which mixing effects can drive instability in the fluid. The velocity ratio between high and low speed is 4:1 and the Reynolds number based on the velocity difference of two streams and hydraulic diameter of the channel ranges are from 22800 to 87120. The flow field and turbulent parameters of different concentration polymer additives are measured and compared with water flow, which shows that the dynamic development of mixing layer is greatly influenced by polymer additives. Our investigations reveal that similar with pure water case, the Reynolds stress and vorticity still concentrate in a coniform area of central mixing flow field part. But compared with pure water case, the coniform width of polymer additives case is larger which means the polymer additives will lead to the diffusion of coherent structure. The peak value of vorticity in different cross section will decrease with the development of mixing layer. Compared with pure water case, the vorticity is larger at the beginning of the mixing layer but decreases faster.

Tao Ning
State Key Laboratory of Multiphase Flow in Power Engineering,
Xi'an Jiaotong University, Xi'an, China

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