

Abstract Submitted  
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**Experimental Study of LES Models in Turbulent Stratified Flows**

DUO XU, JUN CHEN, School of Mechanical Engineering, Purdue University — Stratification caused by density difference leads to significant changes of flow structure. To achieve accurate and realistic results of stratified turbulent flows in large-eddy simulation (LES), the behavior of subgrid-scale (SGS) models is crucial. In this study, two-dimensional high resolution velocity and scalar (density) dataset from a turbulent stratified jet, obtained through applying a combined Particle Image Velocimetry (PIV) and Planar Laser Induced Fluorescence (PLIF) technique, is used to study the behavior of SGS models. A strong correlation between SGS stress and scalar flux is observed. In particular, variations of turbulent Prandtl number in stable stratification and unstable stratification regions are explored from the experimental data.

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