

Abstract Submitted  
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**An Investigation of a Hybrid Mixing Model for PDF Simulations of Turbulent Premixed Flames**<sup>1</sup> HUA ZHOU, SHAN LI, HU WANG, ZHUYIN REN, Tsinghua Univ — Predictive simulations of turbulent premixed flames over a wide range of Damkholder numbers in the framework of Probability Density Function (PDF) method still remain challenging due to the deficiency in current micro-mixing models. In this work, a hybrid micro-mixing model, valid in both the flamelet regime and broken reaction zone regime, is proposed. A priori testing of this model is first performed by examining the conditional scalar dissipation rate and conditional scalar diffusion in a 3-D direct numerical simulation dataset of a temporally evolving turbulent slot jet flame of lean premixed H<sub>2</sub>-air in the thin reaction zone regime. Then, this new model is applied to PDF simulations of the Piloted Premixed Jet Burner (PPJB) flames, which are a set of highly shear turbulent premixed flames and feature strong turbulence-chemistry interaction at high Reynolds and Karlovitz numbers.

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