Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Examination of flamelet differential molecular diffusion models in oxy-fuel turbulent jet flames CHAO HAN, Purdue University, ROBERT BARLOW, Sandia National Laboratories, HAIFENG WANG, Purdue University — Flamelet modeling of a series of oxy-fuel turbulent jet flames is conducted to examine the models capability for predicting the turbulence-chemistry interactions and the effect of differential molecular diffusion. There are two sets of the oxy-fuel jet flames, A series and B series. The A series includes three flames with a fixed Re and different Da, and the B series includes three flames with a fixed Da and different Re. These flames enable us to analyze the scaling of turbulence-chemistry interactions and differential molecular diffusion with respect to Re and Da, respectively. The modeling results are carefully compared with the experimental data for a critical assessment of the model. The models capability to reproduce the scaling with respect to Re and Da is also examined in detail.

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Date submitted: 22 Jul 2016 Electronic form version 1.4