Abstract Submitted
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Large-eddy simulation/probability density function modeling of local extinction and re-ignition in Sandia Flame E HAIFENG WANG, PAVEL POPOV, VARUN HIREMATH, STEVEN LANTZ, SHARADHA VISWANATHAN, STEPHEN POPE, Cornell University — A large-eddy simulation (LES)/probability density function (PDF) code is developed and applied to the study of local extinction and re-ignition in Sandia Flame E. The modified Curl mixing model is used to account for the sub-filter scalar mixing; the ARM1 mechanism is used for the chemical reaction; and the in- situ adaptive tabulation (ISAT) algorithm is used to accelerate the chemistry calculations. Calculations are performed on different grids to study the resolution requirement for this flame. Then, with sufficient grid resolution, full-scale LES/PDF calculations are performed to study the flame characteristics and the turbulence-chemistry interactions. Sensitivity to the mixing frequency model is explored in order to understand the behavior of sub-filter scalar mixing in the context of LES. The simulation results are compared to the experimental data to demonstrate the capability of the code. Comparison is also made to previous RANS/PDF simulations.

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