Abstract Submitted
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Combustion LES with tabulated chemistry in the framework of
a novel compressible flow formulation YU LV, Mississippi State Univ — This
study introduces a new methodology of integrating tabulated chemistry into the
compressible flow formulation. In the classical method, fully conservation Navier-
Stokes equations are solved and the pressure is obtained through a linearization
relation. The novelty of the new approach lies in the treatment that the energy
equation is replaced by a pressure evolution equation, with which the pressure is
directly resolved. The proposed formulation is assessed with a number of test cases
covering different flame configurations. The convergence study shows that the new
approach is able to accurately reproduce the flame speed and flame profile. Our
assessment is further extended to the predictions of turbulent flames, for which
a classical Bunsen slot flame and the Sandia Flame D are considered. The LES
calculations are performed, and the simulation results are compared against the
experimental data. The accuracy of the proposed formulation will be discussed in
detail.

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