

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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