

Abstract Submitted
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Discontinuous Galerkin Method for Combustion YU LV,
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— Over recent years, the discontinuous Galerkin (DG) method has found increased interest in application to advection-dominated hyperbolic flows. However, extending DG to combustion introduces several challenges that are associated with the treatment of diffusion-dominated multi-species transport, non-uniform thermal properties, and the consideration of complex and stiff reaction chemistry. By considering all of these aspects, a DG-formulation for multi-species combustion has been developed. After presenting the numerical method and demonstrating higher-order convergence properties, this formulation is applied to relevant combustion problems, involving multi-species mixing, deflagration, and detonation-systems. Results are compared against solutions from conventional finite-volume/finite-difference-schemes, and potential benefits of the DG-method for combustion are discussed.

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