

Abstract Submitted
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Studies of Flame Stability and Thermal Choking Limits in Scramjets with Hydrogen, Methane, and Ethylene Fuels WENHAI LI, TTC Technologies, Inc., LADEINDE FOLUSO, Department of Mechanical Engineering, Stony Brook University — A few results on flame stability and thermal choking in a simplified model of the scramjet engine will be presented for hydrogen, methane, and ethylene fuels which are injected in crossflow to a supersonic airflow in a combustor. The parameter space investigated includes a range of air stagnation temperatures (T_0), jet-to-freestream momentum flux ratios (J), and the three fuels. The analysis is done via the large-eddy simulation and within the context of the flamelet approach. Preliminary results show that hydrogen and ethylene have similar thermal choking limits in terms of T_0 and J , while the methane flames are quite difficult to maintain under the current test conditions.

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