

Abstract Submitted
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LES Of A Model Aircraft Combustor: Spray Model Assumptions And Pollutant Formation¹ EDWARD KNUDSEN, SHASHANK, Stanford University, HEINZ PITTSCH, RWTH Aachen University — Large eddy simulations of NASA's Lean Direct Injection spray combustor are performed. Fuel spray is described using Lagrangian particles, and combustion is modeled using a multi-regime flamelet approach. Particular emphasis is placed on analyzing how spray model assumptions affect pollutant predictions. This analysis is performed by running a series of cases that employ different spray evaporation models, different spray cone angles, and different bulk air flow rates. Results demonstrate that both CO and NO are leading order sensitive to the details of the spray formulation. Temperature is also shown to be leading order sensitive to the spray formulation, while major species such as CO₂ and H₂O are less sensitive. These results highlight the difficulty of validating pollutant models with liquid fueled experiments that are subject to spray modeling uncertainty.

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