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Comparison of atomization characteristics of drop-in and conventional jet fuels[1] KUMARAN KANNAIYAN, REZA SADR, Texas A and M University at Qatar, MICRO SCALE THERMO-FLUIDS LAB TEAM — Surge in energy demand and stringent emission norms have been driving the interest on alternative drop-in fuels in aviation industry. The gas-to-liquid (GTL), synthetic paraffinic kerosene fuel derived from natural gas, has drawn significant attention as drop-in fuel due to its cleaner combustion characteristics when compared to other alternative fuels derived from various feedstocks. The fuel specifications such as chemical and physical properties of drop-in fuels are different from those of the conventional jet fuels, which can affect their atomization characteristics and in turn the combustion performance. The near nozzle liquid sheet dynamics of the drop-in fuel, GTL, is studied at different nozzle operating conditions and compared with that of the conventional Jet A-1 fuel. The statistical analysis of the near nozzle sheet dynamics shows that the drop-in fuel atomization characteristics are comparable to those of the conventional fuel. Furthermore, the microscopic spray characteristics measured using phase Doppler anemometry at downstream locations are slightly different between the fuels.

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