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**Spray visualization of alternative fuels at hot ambient conditions**

KUMARAN KANNAIYAN, Texas AM University at Qatar, REZA SADR, Texas AM University — Gas-to-Liquid (GTL) has gained significant interest as drop-in alternative jet fuel owing to its cleaner combustion characteristics. The physical and evaporation properties of GTL fuels are different from those of the conventional jet fuels. Those differences will have an effect on the spray, and in turn, the combustion performance. In this study, the non-reacting near nozzle spray dynamics such as spray cone angle, liquid sheet breakup and liquid velocity of GTL fuel will be investigated and compared with those of the conventional jet fuel. This work is a follow up of the preliminary study performed at atmospheric ambient conditions where differences were observed in the near nozzle spray characteristics between the fuels. Whereas, in this study the spray visualization will be performed in a hot and inert environment to account for the difference in evaporation characteristics of the fuels. The spray visualization images will be captured using the shadowgraph technique. A rigorous statistical analysis of the images will be performed to compare the spray dynamics between the fuels.

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