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Comparison of Global Sizing Velocimetry and Phase Doppler Anemometry measurements of alternative jet fuel sprays[1] REZA SADR, KUMARAN KANNAIYAN, Texas A&M University at Qatar — Atomization plays a crucial precursor role in liquid fuel combustion that directly affects the evaporation, mixing, and emission levels. Laser diagnostic techniques are often used to study the spray characteristics of liquid fuels. The objective of this work is to compare the spray measurements of Gas-to Liquid (GTL) jet fuels obtained using Global Sizing Velocimetry (GSV) and Phase Doppler Anemometry (PDA) techniques at global and local levels, respectively. The chemical and physical properties of GTL fuels are different from conventional jet fuels, owing to the difference in their production methodology. In this work, the experimental facility, the measurement techniques, and spray characteristics of two different GTL fuels are discussed and compared with those of Jet A-1 fuel. Results clearly demonstrate that although the global measurement gives an overall picture of the spray, fine details are obtained only through local measurements and complement in gaining more inferences into the spray characteristics. The results also show a close similarity in spray characteristics between GTL and Jet A-1 fuels.

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