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High Speed Imaging of Diesel Fuel Sprays[1] JA'KIRA JACKSON, Alabama Agricultural Mechanical University, JOSHUA BITTLE, The University of Alabama — Fuel sprays primarily serve as methods for fuel distribution, fuel/air mixing, and atomization. In this research, a constant pressure flow rig vessel is being tested at various pressures and temperatures using n-heptane. The experiment requires two imaging techniques: color Schlieren and Mie-scatter. Schlieren captures density gradients in a spray which includes both liquid and vapor phases while Mie-scatter is only sensitive to the liquid phase of the fuel spray. Essentially, studies are mainly focused on extracting the liquid boundary from the Schlieren to possibly eliminate the need for acquiring the Mie-Scatter technique. Four test conditions (combination of low and high pressure and temperatures) are used in the application to attempt to find the liquid boundary independent of the Mie-scatter technique. In this pursuit the following methods were used: a color threshold, a value threshold, and the time variation in color. All methods provided some indication of the liquid region but none were able to capture the full liquid boundary as obtained by the Mie-scatter results.

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