

Abstract Submitted
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Study of ethanol and gasoline fuel sprays using mie-scatter and schlieren imaging¹ LAUREN BOUCHARD, Smith College, JOSHUA BITTLE, PAUL PUZINAUSKAS, The University of Alabama — Many cars today are capable of running on both gasoline and ethanol, however it is not clear how well optimized the engines are for the multiple fuels. This experiment looks specifically at the fuel spray in a direct injection system. The length and angle of direct injection sprays were characterized and a comparison between ethanol and gasoline sprays was made. Fuels were tested using a modified diesel injector in a test chamber at variable ambient pressures and temperatures in order to simulate both high and low load combustion chamber conditions. Rainbow schlieren and mie-scatter imaging were both used to investigate the liquid and vapor portions of the sprays. The sprays behaved as expected with temperature and pressure changes. There was no noticeable fuel effect on the liquid portion of the spray (mie-scatter), though the gasoline vapor spray angles were wider than ethanol spray angles (possible a result of the distillation curves of the two fuels).

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