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**Analysis of an Electrostatic Spray Injector** MATTHEW RYAN, JONATHAN TENNIS, United States Military Academy, CHOL-BUM KWEON, United States Army Research Laboratory, MICHAEL BENSON, BRET VAN POPPEL, United States Military Academy — The objective of the current research is to assess the effects of electrostatic injector designs and charge energy on the spray break-up process. Electrostatic injectors have a potential to improve the liquid fuel spray atomization at low fuel pressures. The application areas include carbureted and port fuel injections in small engines to improve fuel-air mixing. In this study, two different electrostatic injector designs are tested in an ambient chamber with four optical windows. Shadowgraphy and Mie scattering techniques are used to measure the major spray parameters such as spray patterns, spray angles, and liquid fuel penetration length. Shadowgraphy with a micro zoom lens is used to measure droplet distributions and droplet pressures. An analysis of the results is presented to inform electrostatic injector design.

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