

Abstract Submitted
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Drag reduction on a three-dimensional model vehicle by a wire-to-plate DBD plasma actuator¹ DONGRI KIM, ZHI WU, HYUNGROK DO, HAECHEON CHOI, Seoul National University — We apply a wire-to-plate DBD plasma actuator to a three-dimensional model vehicle (Ahmed body) for drag reduction. With a thin wire (diameter of 11 μm) as an exposed electrode, the performance and efficiency enhance far more than those of the conventional plate-to-plate actuator. By varying the actuator length in the spanwise direction, the drag reduction up to 10% is obtained at the Reynolds number of 96,000 based on the free-stream velocity and model height. With surface-pressure and PIV measurements, it is shown that drag reduction occurs mainly due to entrainment induced by streamwise momentum addition and flow changes at the actuator ends, which significantly modify the evolution of the flow in the center region and corner vortices at the lateral sides of the slanted surface of the model. Other configurations of plasma actuator are being tested and their results will be also given in the presentation.

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