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Effect of Pulsed Plasma Jets on the Recovering Boundary Layer Downstream of a Reflected Shock Interaction[1] BENTON GREENE, NOEL CLEMENS, University of Texas System, PATRICK MAGARI, DANIEL MICKA, MATTHEUS UECKERMANN, Creare, LLC — Shock-induced turbulent boundary layer separation can have many detrimental effects in supersonic inlets including flow distortion and instability, structural fatigue, poor pressure recovery, and unstart. The current study investigates the effect of pulsed plasma jets on the recovering boundary layer downstream of a reflected shock wave-boundary layer interaction. The effects of pitch and skew angle of the jet as well as the heating parameter and discharge time scale are tested using several pulsing frequencies. In addition, the effect of the plasma jets on the undisturbed boundary layer at 6 mm and 11 mm downstream of the jets is measured. A pitot-static pressure probe is used to measure the velocity profile of the boundary layer 35 mm downstream of the plasma jets, and the degree of boundary layer distortion is compared between the different models and run conditions. Additionally, the effect of each actuator configuration on the shape of the mean separated region is investigated using surface oil flow visualization. Previous studies with lower energy showed a weak effect on the downstream boundary layer. The current investigation will attempt to increase this effect using a higher-energy discharge.

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