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**Shock Wave Boundary Layer Interaction Control Using Pulsed DBD Plasma Actuators** ALEXANDRE LIKHANSKII, KRISTIAN BECKWITH, Tech-X Corporation — Flow separation in the shock wave boundary layer interaction (SWBLI) region significantly limits the development of supersonic inlets or scramjets. For past decades, scientists and engineers were looking for a way for active flow control of SWBLI. We will present our recent results of comprehensive simulations of SWBLI active control using pulsed nanosecond DBD plasma actuators at M=3. In the first part of simulations, we computed heat release from the ns pulse driven DBD plasma actuator to the flow using Tech-X plasma code Vorpal. This information has been consequently used in the simulations of SWBLI problem using Tech-X CFD code Nautilus. We compared baseline case with plasma actuators OFF to the case when plasma actuators were ON. We demonstrated strong perturbations in the region of SWBLI, suppression of flow separation and overall downstream increase of mass flow by ten percent when actuators are ON. We investigated the dependence of the results on the choice of different turbulence models and compared them to the laminar boundary layer case. We also performed parametric studies for different pulse repetition rates, pulse operation modes and DBD placement.

Alexandre Likhanskii
Tech-X Corporation

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