

Abstract Submitted  
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**Multidimensional Plasma Sheath Modeling Using The Three Fluid Plasma Model** ROBERT LILLY, URI SHUMLAK, University of Washington, Aerospace and Energetics Research Program — There has been renewed interest in the use of plasma actuators for high speed flow control applications. In the plasma actuator, current is driven through the surrounding weakly ionized plasma to impart control moments on the hypersonic vehicle. This expanded study employs the three-fluid (electrons, ions, neutrals) plasma model as it allows the capture of electron inertial effects, as well as energy and momentum transfer between the charged and neutral species. Previous investigations have typically assumed an electrostatic electric field. This work includes the full electrodynamics. Past work was conducted in 1- and 2-D. In this work, the problem is expanded to 3-D with the fluid equations extended from euler to Braginskii.

Robert Lilly  
University of Washington, Department of Aeronautics and Astronautics

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