Abstract Submitted
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Development of a Rotating Magnetized Plasma Device[1] DAVID COOKE, JAMES PATTON, REMINGTON REID, Air Force Rsch Lab-Albuquerque, ASHLEY STILES, Assurance Technology Corporation, PATRIK MORRISON, McMurry University, ANDREI KOCH, Worcester Polytechnic Institute — Momentum coupling in plasma is a mechanism that is central to a wide range of interesting and important phenomena, magnetosphere-ionosphere coupling, solar eruptions, the interaction of an electro-dynamic tether system in the Earth's ionosphere, and the Critical Ionization Velocity (CIV) mechanism are a few examples. One result of the Space Shuttle Tethered Satellite experiment, TSS-1R, was that the current-voltage response of the experiment in all orbit conditions fell into a narrow range of curves when parameterized as a plasma probe [Thompson, GRL,1998]. Another striking result was the lack of dependence on the Alfvén velocity or other electro-magnetic parameters. This result has led us to revisit the understanding of the speed with which an electric field propagates along the magnetic field using EM-PIC simulation and experiments in our new magnetized plasma chamber. Our initial experiment is a rotating plasma using a solenoidal magnetic field and a radial electric field, with pulsed differential rotation of the plasma column to study the strength of coupling and propagation speed. Characteristics of our 'first light' rotating plasma will be presented.

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