

Abstract Submitted
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Nonlinear Plasma Effects in Natural and HF-Perturbed Subauroral Ionosphere¹ EVGENY MISHIN, Space Vehicles Directorate, Air Force Research Laboratory — This presentation describes nonlinear plasma effects in the plasmasphere and subauroral ionosphere during magnetospheric substorms and injections of high-power HF radio waves. First, we present magnetically-conjugate Cluster-DMSP-Polar satellite observations of substorm Sub-Auroral Ion Drifts (SAID), showing that the SAID channel is a turbulent boundary layer formed via a short circuit of the substorm-injected plasmoid by the plasmasphere. Then, an overview of HF modification experiments at the High-Frequency Active Auroral Program (HAARP) heating facility is given, including recently discovered artificial plasma layers. We show that their formation can be explained in terms of an ionization wave sustained by suprathermal electrons accelerated by the excited plasma turbulence.

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