

Evidence for Critical Velocity Ionization in an Ionospheric Release Experiment

G. Murphy and **J. Wang**, (Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109) **B.D. Green** and **G. Caledonia** (Physical Sciences Inc, Andover, MA 01810)

A CIV experiment conducted as "part of a 1991 shuttle mission released four gases through specially designed nozzles. The gases (NO, Xc, Ne, and CO₂) were chosen such that some of them have a critical ionization velocity V_c greater than the cloud velocity relative to the rest plasma frame while others have a V_c less than the cloud velocity. The gases were injected approximately perpendicular to the magnetic field into the orbital velocity vector direction, Diagnostics for the experiment consisted of a set of photometers and a plasma probe which were both mounted in the shuttle bay. Plasma probe observations are examined for evidence of critical velocity ionization. In particular, plasma noise at the lower hybrid frequency, believed to be a prerequisite for energy transfer between newly created ions and the superthermal electrons, is observed in cases where the gas ionization potential is well below the CIV threshold. Evidence for an ionization front and electric field at the boundary between the neutral cloud and the ambient plasma is also presented.