Abstract Submitted
for the GEC05 Meeting of
The American Physical Society

Ion Transport in Ion-Ion Plasmas[1] M. LAMPE, R.F. FERNSLER, S.P. SLINKER, S.G. WALTON, D. LEONHARDT, Plasma Physics Div., Naval Research Lab, G. JOYCE, George Mason University — When strongly electronegative source gases are used, the LAPPS e-beam-generated plasma device at NRL* is capable of producing a steady-state nearly electron-free positive ion / negative ion plasma. It is commonly thought that ion flux to a substrate, in such a plasma, is limited by thermal diffusion of ions in the core plasma. We present a new theoretical treatment which shows that strong ion flux occurs even in the limit of *zero* ion temperature, if a DC bias is applied to the substrate. We show how this ion current scales with source strength, bias voltage, ion temperature, and device geometry. The theory will be used to interpret experimental results from the LAPPS experiment.* *See adjacent paper, "Etching with Electron Beam-Generated Ion-Ion Plasmas," by S. G. Walton

[1]Supported by ONR

M. Lampe
Naval Research Laboratory

Date submitted: 15 Jun 2005 Electronic form version 1.4