Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

**Pic Modeling of a Closed Drift Ion Source for Material Surface Processing** PAUL SCHOESSOW, Tech-X Corporation, JOHN CARY[1], Tech-X Corporation, DENIS SHAW, Advanced Energy Industries, PETER STOLTZ, Tech-X Corporation — The closed drift ion source is a technology that uses a DC discharge in a gas cell (Ar, $O_2$) to produce a uniform, linear 300-1500 eV ion beam for in-line surface treatment and cleaning of materials. Maximum ion beam currents are on the order of 1 A / meter of source length. A permanent dipole magnet forms a magnetic circuit with the ferromagnetic cathode enclosure, producing a focusing field in the ion extraction gap that confines electrons. The focusing field shape is controlled by the beveling of the gap. We have developed 2- and 3- dimensional PIC models of the closed drift ion source using the OOPIC Pro and Vorpal codes. We will present numerical results on the ion beam properties, including the ion energy spectrum on the target, and compare them to measurements. We will also investigate possible design modifications such as to the magnetic field shape and discharge electrode geometry that might lead to increased ion current.

[1]also University of Colorado

Paul Schoessow
Tech-X Corporation

Date submitted: 25 Jul 2005 Electronic form version 1.4