

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**Ultraviolet tomography of kink dynamics in a magnetoplasma-dynamic thruster** F. BONOMO, P. FRANZ, G. SPIZZO, L. MARRELLI, P. MARTIN, Consorzio RFX, Euratom-ENEA Association, Corso Stati Uniti, 4 - 35127 Padova, Italy, F. PAGANUCCI, P. ROSSETTI, M. SIGNORI, M. ANDRENUCCI, Centrospazio-ALTA, Via A. Gherardesca, 5 - 56121 Ospedaletto, Pisa, Italy, N. POMARO, Consorzio RFX, Euratom-ENEA Association, Corso Stati Uniti, 4 - 35127 Padova, Italy — We present the results of a project concerning the ultraviolet (UV) imaging of a plasma for space applications, produced in a magneto-plasmadynamic (MPD) thruster. MPD are a class of high power electric space propulsion devices that accelerate a plasma to high velocities ( $>10$  km/s), by exploiting the Lorentz force between the discharge electrical current and a self induced and externally applied magnetic field. The imaging system has been realized by inserting 3 arrays of UV-enhanced photodiodes (with built-in amplifiers) directly into the plastic structure of the anode. This advanced diagnostic design allows for a detailed tomographic reconstruction of the emissivity spatial structure, both in the axial direction  $z$  (corresponding to a wavenumber  $n$ ) and azimuthal direction (wavenumber  $m$ ) with high time resolution. A magneto-hydrodynamic (MHD) instability, with mode numbers  $m=1$  and  $n=1$  has been observed, which might affect the performances of the thruster.

P. Franz  
Consorzio RFX, Padova, Italy

Date submitted: 21 Jul 2005

Electronic form version 1.4