

Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Phase Resolved OES of Coaxial Microplasma Jet Operated in He or Ar JAN BENEDIKT, Ruhr-University Bochum, SVEN HOFMANN, NIKOLAS KNAKE, HENRIK BÖTTNER, RÜDIGER REUTER, ACHIM VON KEUDELL, VOLKER SCHULZ-VON DER GATHEN — The study of excitation mechanism of a coaxial microplasma jet with a hollow capillary as an inner electrode and a ceramic tube surrounded by a metal ring as the outer electrode. The jet is operated in He and Ar gas and electrical measurements, optical emission spectroscopy and space and phase resolved wavelength integrated optical spectroscopy are use for ist analysis. Four different modes are distinguished with He as plasma forming gas. The α discharge in annular space between the electrodes, observed at low applied voltages, is very similar to the discharge in jets with parallel electrodes. As the voltage increases a γ discharge appears, first localized at the tipp of the capillary. As the voltage increases further the γ discharge appears in the annular space as well. A hollow cathode plasma is observed at any voltage used on the symmetry axis of the jet. Only one mode of plasma operation is observed in argon gas with distinctively different behavior. We hypothesize that it is comparable to a single microdischarge of a filamentary dielectric barrier discharge.

Jan Benedikt

Date submitted: 11 Jun 2010

Electronic form version 1.4