Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Study of surface processes in N_2-O_2 plasmas CARLOS D. PINTASSILGO[1], IPFN - Laboratorio Associado, IST, Lisboa, Portugal, VASCO GUERRA, IPFN - Laboratorio Associado, IST, Lisboa, Portugal — In this work we present a theoretical study of the role of surface kinetics in N_2-O_2 plasmas. For this purpose, we have considered a low-pressure pulsed discharge in air produced in a pyrex tube and the corresponding afterglow, by coupling a kinetic model for the gas phase with a mesoscopic kinetic model to describe the heterogeneous reactions that may occur as a result of the plasmas interaction with the wall. While the gas phase model includes the interplay of different kinetics (electrons, vibrations, metastables and ions), the surface model takes into account adsorption in physisorption and chemisorption sites, thermal desorption, surface diffusion of physisorbed atoms, and both Langmuir-Hinshelwood and Eley-Rideal recombination mechanisms. Our research will report on the relevant populating mechanisms of NO, resulting from both gas-phase and surface reactions. A special attention will be given to specific operating conditions (pressure, gas input power, etc) where surface processes play a relevant role. Model results will be compared to recent measurements of heterogeneous production of this species under plasma exposure.

[1]also at Faculdade de Engenharia, Universidade do Porto, Porto, Portugal

Carlos D. Pintassilgo
IPFN - Laboratorio Associado, IST, Lisboa, Portugal

Date submitted: 08 Jun 2010 Electronic form version 1.4