Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Experimental and simulation study of the OH radical generation in atmospheric pressure microwave plasma MARGARITA BAEVA, KRISTIAN RACKOW, JÖRG EHLBECK, INP Greifswald e.V., Germany — Hydroxil radicals play an important role in non-equilibrium plasmas for decomposition of gaseous pollutants, initiation of surface reactions, synthesis of methanol from methane, etc. Experimental and simulation studies of a coaxial microwave plasma source operating at 2.45 GHz in atmospheric pressure $H_2O/N_2/O_2$ gas are carried out. Optical emission spectroscopy is applied to observe the OH (A-X, 309 nm) emission intensity. The variation of the O_2 concentration allowed to look at the transition from the N_2 dominated emission spectrum to NO emission spectrum. The rotational temperature is obtained from simulated spectra of the N_2^+ first negative system and NO transitions at 248 nm and 272 nm. The experiment is completed with a global kinetic model delivering the electron density and temperature, the electric field amplitude, and the species densities for absorbed microwave power from 500 W up to 1000 W and gas temperatures between 3000 K and 5000 K. A 2D model of the plasma source based on Maxwell's equations is applied to obtain the distribution of the electric field and the absorbed power density.

Margarita Baeva
INP Greifswald e.V., Germany

Date submitted: 10 Jun 2010 Electronic form version 1.4