Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Chemical kinetics in a helium humid air atmospheric pressure plasma[1] TOMOYUKI MURAKAMI, Tokyo Institute of Technology, TIMO GANS, DEBORAH O'CONNELL, W.G. GRAHAM, Queen's University Belfast — The results of a zero-dimensional, time-dependent numerical simulation of the chemical kinetics in an atmospheric pressure helium-air mixture plasma are reported. The system is driven with ionization pulses every 100 kHz. 58 species and 461 reactions are included in the simulation. Dry air and air with various molecular fractions of H2O are compared. Positive ions are the dominant ion species, with NO+ and H3O+.H2O being most pronounced. Some of the positively charged ions are strongly modulated at the driving frequency. The density of electrons and the total density of negative ion species are comparable. The main negative ion species are O2-, and O2-.H2O. The negative ions are only weakly modulated at the driving frequency. The main radical species, OH, H, O and O3, are also only weakly modulated. The effect of changes in the input parameters, particularly water humidity will be discussed

[1]Supported by Excellent Young Researcher Overseas Visit Program and Grant-in-Aid for Scientific Research C 20323818 from JSPS.

Tomoyuki Murakami
Tokyo Institute of Technology

Date submitted: 14 Jun 2010 Electronic form version 1.4