Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Experimental and theoretical study of dynamic effects in low-frequency capacitively coupled discharges[1] DMITRY VOLOSHIN, OLEG BRAGINSKY, ALEXANDER KOVALEV, DMITRY LOPAEV, OLGA PROSHINA, TATYANA RAKHIMOVA, ANNA VASILIEVA, Institute of Nuclear Physics, Moscow State University, Russia — Investigation of the low frequency capacitive coupled RF discharge in Ar excited at 1.76 MHz is performed both experimentally and theoretically. Experimental measurements of electron concentration, discharge voltage and current are presented for a wide range of input power. The experimental current shape has non-sinusoidal, close to triangle form. Theoretical study is based on the Particle in cell with Monte-Carlo Collisions numerical simulation. The triangle shape of the discharge current is obtained even for the case of a symmetric discharge. This is caused by the dynamic structure of the discharge sheaths. The sheath edge motion is non-sinusoidal and non-symmetric. Other specific dynamic features of low-frequency discharge are discussed. The important role of secondary electrons in discharge maintenance and power balance is described. This study is crucial for further treatment of dual frequency discharges with corresponding low frequency value.

[1]This work was supported by Russian foundation of basic research 08-02-00465-a, Key science school ss-3322.2010.2, Government grant N 02.740.11.0235.

Dmitry Voloshin
Institute of Nuclear Physics, Moscow State University, Russia

Date submitted: 13 Jun 2010 Electronic form version 1.4