Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Modeling of RF breakdown in different atmospheres[1] ZORAN PETROVIC, MARIJA PUA, Institute of Physics, University of Belgrade, Serbia, ANTONIJE OREVI, School of Electrical Engineering, University of Belgrade, Serbia — Physical background of radio-frequency (RF) breakdown can be analyzed by observing evolution of electron swarm between two electrodes. That leads to Monte Carlo method as a superior technique for RF breakdown investigation. After analysis of voltage breakdown curve in argon [1], we are now focusing on RF breakdown in different planetary atmospheres. Starting point is gas mixture that represents air, consisting of 80% N_2 and 20% O_2. Peculiar feature of this mixture is appearance of the second minimum at lower pressures in voltage breakdown curve. This minimum is direct consequence of the secondary electron emission at electrodes by ion bombardment. By observing spatial plots of electrons concentration, mean energy and rate of ionization, we have analyzed how changes in pressure/voltage at fixed value of voltage/pressure determine the shape of the voltage breakdown curve. On the other hand, investigation of RF breakdown in atmosphere of Mars can address whether devices for power electronics and telecommunications may have problems due to an induced breakdown. As the pressure at Mars surface is low, it is close to the minimum of the breakdown curve and RF breakdown may be induced by relatively low voltages. [1] Puač et al, Plasma Sources Sci. and Technol. 27 (2018) 075013.

[1]Projects SASA 133 and 155

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Date submitted: 03 Jun 2019 Electronic form version 1.4