Abstract Submitted
for the GEC17 Meeting of
The American Physical Society

Electric field rebound of He plasma jets with positive and negative polarities on metal and dielectric targets PEDRO VIEGAS, LPP, Ecole Polytechnique, Palaiseau, France, ADAM OBRUSNIK, ZDENEK BONAVENTURA, Faculty of Science, Masaryk University, Brno, Czech Republic, ANNE BOURDON, LPP, Ecole Polytechnique, Palaiseau, France — In this work, simulations performed with a 2D fluid discharge model coupled with detailed kinetic schemes and flow calculations address the study of the dynamics of a helium plasma discharge with N_2 or O_2 admixtures propagating in a dielectric tube. At the exit of the tube, the discharge propagates as a free jet or interacts with a metallic or dielectric target, grounded or at a floating potential. The spatial distribution of the gas mixture at the exit of the tube is previously obtained through the flow calculation of helium flowing through the tube into the outside air. After the arrival of the ionization front at a target, the interaction is shown to be dependent on the features of the target and a rebound of electric field in both positive and negative polarities is observed in some cases. We focus on the calculation of electric field associated to plasma propagation in the tube and in the plasma plume, to gas-mixing at the end of the tube, to the interaction with the target and to the rebound, in different conditions (electrode inside or outside the tube, location of the target) for both positive and negative polarities. The characteristics of the electric field rebound and its dependence on the presence of target and on the type of target are studied in detail.

Pedro Viegas
LPP, Ecole Polytechnique, Palaiseau, France

Date submitted: 01 Jun 2017 Electronic form version 1.4