Abstract Submitted for the GEC13 Meeting of The American Physical Society

Spreading of atmospheric pressure plasma jet on a dielectric surface OLIVIER GUAITELLA, EMERIC FOUCHER, ANA SOBOTA, ANTOINE ROUSSEAU, LPP, Ecole Polytechnique, UPMC, Université Paris Sud-11, CNRS, Palaiseau, France — Atmospheric pressure plasma jets are intensively studied for their potential application in surface treatment as well as biomedical applications. For both applications fields it is essential to understand the dynamics of a plasma jet impinging onto a surface. In this work a plasma jet source is used in a coaxial geometry with a single dielectric barrier discharge configuration powered at 30 kHz. The impact of the plasma jet on various dielectric plates is monitored directly with fast iCCD imaging. The spreading of the discharge over the surface is analyzed by examining the re-ignition of plasma on the other side of the dielectric plate. Properties of the impinging jet are deduced from the limit of re-ignition of the secondary plasma. Special care has been taken to relate the characteristic of the plasma jet source with the spreading of the jet on the surface. The results exhibit a very interesting dynamics of the spreading of the jet which depends on the energy dissipated in the source but also on the dielectric permittivity of the dielectric plate target as well as the whole configuration surrounding the capillary pipes in which the discharge is propagating. These properties are important for controlling any process involving the use of a plasma jet.

> Olivier Guaitella LPP, Ecole Polytechnique, UPMC, Université Paris Sud-11, CNRS, Palaiseau, France

Date submitted: 15 Jun 2013

Electronic form version 1.4