Abstract Submitted
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Spatio-temporal development of atmospheric pressure plasma filaments: influence of surface memory effects. S. CELESTIN, O. GUAITELLA, G. CANES-BOUSSARD, A. ROUSSEAU, LPTP, Ecole polytechnique, A. BOURDON, EM2C, Ecole Centrale, STREAMERS COLLABORATION — It has been recently shown in a cylindrical DBD that the current amplitude distribution function shows two different peak populations during positive half periods of the 50Hz high voltage (when the metallic inner electrode is positive) [1]. The high current population is caused by the simultaneous propagation of plasma filaments, the so called collective effect. In the present study, CCD imaging is coupled to electrical measurements; we show that, in a pin to plan DBD, the spatial shape of the plasma filaments in the gas gap depends strongly on the "history" of the events. The first peak impacts the dielectric surface close to the center (minimum pathway from the metallic electrode) and then propagates radially on the surface. The following peaks impact the dielectric with a larger radius. The branching of the plasma filament is also highly dependant on the "history" and increases with the current pulse.

[1] O. Guaitella, F. Thevenet, C. Guillard, A. Rousseau J. Phys. D : appl. Phys (2006).

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