

Abstract Submitted  
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**Pulsed surface discharges in nitrogen and in air: experiments and simulations**<sup>1</sup> ANNA DUBINOVA, Centrum Wiskunde en Informatica, Amsterdam, Netherlands, DIRK TRIENEKENS, Eindhoven University of Technology, Eindhoven, Netherlands, UTE EBERT, Centrum Wiskunde en Informatica, Amsterdam, Netherlands, SANDER NIJDAM, Eindhoven University of Technology, Eindhoven, Netherlands — We study positive streamer discharges in nitrogen and in air propagating near or on the surface of a dielectric rod. The discharge is launched from a needle, and propagates towards a dielectric rod which is placed directly under the needle. In some cases, when the discharge attaches to the rod it moves along it with a velocity larger than in the gas without the rod, and in other cases it moves more slowly. We aim at understanding this dynamics of streamer interaction with dielectrics and the mechanisms of streamer propagation along the surface. We have developed a cylindrically symmetric model based on the fluid streamer model in local field approximation. Our model allows us to analyze the interplay of photoionization, photoelectron emission from the rod and dielectric polarization of the rod, and voltage pulse shape, amplitude and repetition frequency. We compare the morphology and the velocity of the simulated surface streamers with those measured in dedicated experiments. In the experiments, we use stroboscopic imaging with an ICCD camera to retrieve streamer velocity and shape.

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