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The spatiotemporal dynamics of a plasma streamer induced by nanosecond discharges at the water surface

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Plasma streamers produced by nanosecond discharges in dielectric media are known to be stochastic in nature. The dynamic of a streamer is highly sensitive to the electric field, among others. Streamer filamentation, produced by the communication of multiple streamers via electric fields and energetic photons, is always described as a stochastic phenomenon that depends on the propagation medium and on the physical and chemical properties of the streamer.

In this contribution, we will discuss the spatiotemporal dynamics of positive and negative streamers produced at the water surface. Temporal resolved ICCD imaging, resolution of 1 nanosecond, has revealed that the positive streamers are not stochastic but highly organised, and the negative streamers are rather homogeneous. The discharges behaviour is investigated under different of high voltage pulse, namely the amplitude and the width of the pulse. Results will be shown and discussed during this presentation.

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