Abstract Submitted
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Quantitative characterization of streamer branching in air through 3D simulations UTE EBERT, CWI Amsterdam and Eindhoven Univ Techn, NL, JANNIS TEUNISSEN, CWI Amsterdam, NL, and KU Leuven, BE, BEHNAZ BAGHERI, CWI Amsterdam, NL — Branching is an essential element in the evolution of space charge driven streamer discharges; it creates the corona of streamer channels that decreases the electric field in the streamer filled region. We investigate branching of positive streamers in air through 3D simulations with the afivo-streamer code [https://gitlab.com/MD-CWI-NL/afivo-streamer]. Here electrons and ions are treated as densities, but the fewer and far traveling photons (that cause photo-ionization) are treated as quantized entities, i.e., discretely. Their inherent randomness accelerates the dynamic destabilization of wide streamer tips and causes branching, in a stochastic manner. We characterize the distribution of streamer branching: the length of the parent streamer till branching, the diameter ratio of the daughter streamers, their angles relative to each other and to the parent, and their velocities, and we compare our predictions with experimental observations.

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