

Abstract Submitted
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Investigating the guiding of streamers in nitrogen/oxygen mixtures with 3D simulations¹ JANNIS TEUNISSEN, Centrum Wiskunde & Informatica, The Netherlands, SANDER NIJDAM, Eindhoven University of Technology, The Netherlands, EIICHI TAKAHASHI, National Institute of Advanced Industrial Science and Technology, Japan, UTE EBERT, Centrum Wiskunde & Informatica and Eindhoven University of Technology, The Netherlands — Recent experiments by S. Nijdam and E. Takahashi have demonstrated that streamers can be guided by weak pre-ionization in nitrogen/oxygen mixtures, as long as there is not too much oxygen (less than 1%). The pre-ionization was created by a laser beam, and was orders of magnitude lower than the density in a streamer channel. Here, we will study the guiding of streamers with 3D numerical simulations. First, we present simulations that can be compared with the experiments and confirm that the laser pre-ionization does not introduce space charge effects by itself. Then we investigate topics as: the conditions under which guiding can occur; how photoionization reduces the guiding at higher oxygen concentrations and whether guided streamers keep their propagation direction outside the pre-ionization.

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