

Abstract Submitted  
for the GEC14 Meeting of  
The American Physical Society

**Simulating the inception of pulsed discharges around needle electrodes**<sup>1</sup> JANNIS TEUNISSEN, Centrum Wiskunde & Informatica, The Netherlands, SHE CHEN, Tsinghua University, China, LUUK HEIJMANS, Eindhoven University of Technology, The Netherlands, RONG ZENG, Tsinghua University, China, SANDER NIJDAM, Eindhoven University of Technology, The Netherlands, UTE EBERT, Centrum Wiskunde & Informatica and Eindhoven University of Technology, The Netherlands — When a positive voltage pulse is applied to a sharp electrode, an *inception cloud* can form around the electrode tip. This is an almost spherically expanding ionized region. As recently demonstrated in experiments by S. Chen, L. Heijmans and S. Nijdam, the properties of these inception clouds depend on the gas mixture and on the voltage pulse. We present a 3D particle model to simulate the initial stage of pulsed discharges near needle electrodes. With this model, we investigate how the properties of inception clouds (growth velocity, maximum size, time of destabilization) depend on the gas mixture and voltage pulse, and we compare with the experiments mentioned above.

<sup>1</sup>JT was supported by STW project 10755, SC by China Scholarship Council 201306210141.

Jannis Teunissen  
Centrum Wiskunde & Informatica, The Netherlands

Date submitted: 13 Jun 2014

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