

Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Streamer propagation in air near and on curved dielectrics.¹

ANNA DUBINOVA, UTE EBERT, Centrum Wiskunde Informatica — We simulate propagation of a positive streamer in air around a curved dielectric with a pronounced shading effect. In our setup a positive streamer is launched at the tip of a pin anode and propagates towards a grounded plate cathode. On the way of the streamer propagation path we place a curved dielectric body (e.g., a dielectric ball) of a diameter larger than the streamer diameter. This obstacle makes a streamer move around it. At the corner of the dielectric a surface streamer has a choice of moving along the surface or moving away from it. We explore physical mechanisms that can force a surface streamer to move all the way around a curved dielectric in air and nitrogen-oxygen mixtures. The potential candidates are secondary electron emission such as photoemission or field emission, higher dielectric permittivity, surface charge, lack of photoionization (in pure nitrogen). The problem is relevant for high-voltage technology, where surface streamers are often to be avoided.

¹This research is supported by ABB Corporate Research.

Anna Dubinova
Centrum Wiskunde
Informatica

Date submitted: 10 Jun 2016

Electronic form version 1.4