Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Time-resolved Spectral Investigations of Pulsed Atmospheric Dielectric Surface Flashover Discharges[1] KLAUS FRANK, GEORGE LAITY, ANDREAS NEUBER, GARRETT ROGERS, LYNN HATFIELD, JAMES DICKENS, MAGNE KRISTIANSEN, ANDREW FIERRO, Texas Tech University — In an attempt to identify the mechanisms leading to pulsed dielectric surface flashover in atmospheric conditions, a surface flashover event occurring on a magnesium fluoride (MgF_2) window was studied. The electrode configuration and the applied pulsed voltage level were chosen such that the generated electric field was symmetric with respect to the centerline between the electrodes. Sharpened stainless steel electrodes (estimated tip radius of 200μm) are attached to springs which press down onto the MgF_2 surface a distance of 8 mm apart. Diagnostics include time resolved emission spectroscopy in the VUV range and gated ICCD optical imaging of streamer progression during the first 30 nanoseconds of breakdown (with 3 nanosecond resolution) in the visible wavelength range. One important parameter on which the streamer formation and the subsequent breakdown strongly depends is the gas type and/or the gas composition. That is why the streamer formation was recorded for gated intervals from 3 to 50 ns in lab air, standard nitrogen, oxygen and SF_6. The results are compared to those ones in purified air, oxygen and nitrogen.

[1]This work was supported by the Air Force Office of Scientific Research.

Klaus Frank
Texas Tech University

Date submitted: 14 Jun 2010 Electronic form version 1.4