Abstract Submitted
for the GEC17 Meeting of
The American Physical Society

**Comparison of Zero Dimensional Plasma Chemistry Model with Ozone Absorption Spectroscopy Measurements**[1] RYAN T. SMITH[2], EFE KEMANECI, Theoretische Elektrotechnik Ruhr-Universitt Bochum, BJOERN OFFERHAUS, FRIDERIKE KOGELHEIDE, NIKITA BIBINOV, PETER AWAKOWICZ, Allgemeine Elektro- und Plasmatechnik Ruhr-Universitt Bochum, RALF PETER BRINKMANN, Theoretische Elektrotechnik Ruhr-Universitt Bochum, KATHARINA STAPELMANN[3], Nuclear Engineering - North Carolina State University — Results from zero dimensional computer simulations are compared to absorption spectroscopy measurements of Ozone within the gas phase of a Surface Dielectric Barrier Discharge (SDBD) and a Volumetric Dielectric Barrier Discharge (VDBD). The simulation model consists of two interdependent zero dimensional models that span two time scales and spatial regimes. The model incorporates 53 reactive species and 624 reactions to simulate the chemical dynamics of an atmospheric pressure plasma discharge in humid Nitrogen/Oxygen mixtures. The separation of the reactive species into long and short lived species allows for speedy simulations of the gas phase dynamics while still being directly coupled to the discharge dynamics. Comparisons are made at varying gas mixtures, supplied voltage frequencies and amplitudes. Although the computational model does not provide spatially resolved results nor directly comparable results, generalizations can be obtained and predicted. Furthermore, this work easily leads to the expansion of the model to provide more accurate and physically representative results.

[1]SFB-TR 87/2
[2]Also Affiliated with Allgemeine Elektro- und Plasmatechnik Ruhr-Universitt Bochum
[3]Also Affiliated with Allgemeine Elektro- und Plasmatechnik Ruhr-Universitt Bochum

Ryan T. Smith
Theoretische Elektrotechnik Ruhr-Universitt Bochum

Date submitted: 02 Jun 2017 Electronic form version 1.4