

Abstract Submitted  
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**STUDENT AWARD FINALIST: Study of Self-Absorbed Vacuum Ultraviolet Radiation during Pulsed Atmospheric Breakdown in Air<sup>1</sup>**  
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Texas Tech University — This paper describes recent experiments to investigate the role of self-produced vacuum ultraviolet (VUV) radiation in the physics of pulsed atmospheric breakdown. A unique apparatus was constructed which enables the detailed exploration of VUV light in the range 115 – 135 nm, which is emitted from breakdown between two point-point electrodes in an air environment at atmospheric pressure. Time-resolved diagnostics include VUV sensitive photomultipliers, intensified CCD imaging, optically isolated high voltage probes, and fast rise-time Rogowski current monitors. Temporally resolved spectroscopy from air breakdowns revealed VUV emission is released during the initial streamer phase before voltage collapse, with the majority of the emission lines identified from various atmospheric gases or surface impurities. Imaging of VUV radiation was performed which conserved the spatial emission profile, and distinct differences between nitrogen and oxygen VUV emission during onset of breakdown have been observed. Specifically, the self-absorption of HI, OI, and NI lines is addressed which elucidates the role of radiation transport during the photon-dominated streamer breakdown process.

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