

Abstract Submitted  
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**Helium Spectroscopy Studies on Anomalous Turbulent Lines using a Mach 50 Arc-Driven Shock Tube**<sup>1</sup> JAMES TITUS, CHAVIS RAYNOR, KYRON WILLIAMS, RICHARD APPARTAIM, JOSEPH JOHNSON, III, Florida A&M University — In astrophysical and fusion plasmas, there are anomalous spectral behaviors that are outside the normal predictions from quantum mechanics. To study these phenomena, we have built a Stainless-Steel Shock Tube capable of producing Mach 50 shock waves. Our diagnostics include pressure transducers and laser diodes for velocity measurements, 10 GHz sampling for good time resolution in neutral and ion density fluctuations along with streak spectra sampling as fast as one spectrum every 40ns. With these, we trace the evolution of changes in the optical spectra with turbulence. In our analysis, we are using the most recent techniques in turbulent physics from the quantum mechanics of many body systems to explain the influence of turbulence on optical spectra.

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James Titus  
Florida A&M University

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