

Abstract Submitted  
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**Correlation of Electron Temperature and Electron Density to Standard Turbulent Parameters in a Laser Induced Plasma**<sup>1</sup> S.D. ROBERSON, C. AKPOVO, E.D. MEZOLIN, J.A. JOHNSON III, Florida A&M University — Single pulse plasmas of several nanosecond duration are created at various pressures by a Nd-Yag laser focused on an air target inside a sealed chamber. The evolutions in time of various neutral and singly ionized lines were recorded at sampling rates between 5 and 10 GS/s. Standard calculations of turbulent parameters such as the characteristic frequency, chaotic dimensions, spectral index and turbulent fluctuation energy are performed for various time periods in the evolution of the plasma. A critical turbulent energy is determined at various densities in the sealed chamber. The electron temperature and electron density of the plasma are determined at various densities of the target gas. The possible relationships between electron density, electron temperature, and standard turbulent parameters are explored. These relationships are also qualitatively explained using a second-order phase transformation approach to the transition from a non-turbulent to a turbulent state.

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