

Abstract Submitted  
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**Plasma spectroscopy of hydrogen Balmer Series of in laboratory air** LAUREN SWAFFORD, CHRISTIAN PARIGGER, University of Tennessee Space Institute — Stark-broadened emission profiles for the hydrogen alpha and beta Balmer series lines in plasma are measured to characterize electron density and temperature. Plasma is generated using a typical LIBS arrangement that employs a focused a Q-switched ND:YAG laser, operating at a fundamental wavelength of 1064 nm. The temporal evolution of the hydrogen Balmer series lines are explored using LIBS. Plasma measurements are taken following laser-induced optical breakdown in laboratory air. Electron density is primarily inferred from Stark-broadened, emission experimental data collected at various time delays. Boltzmann plots are used to infer the electron temperature for well defined Balmer series lines. Due to the presence of nitrogen and oxygen in air, hydrogen alpha and beta lines become discernible from background radiation 0.4  $\mu$ s and 1.4  $\mu$ s, respectively.

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