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Measurement and Analysis of CN Violet System in Laser-Induced Plasma SULTAN A. BEHERY, CHRISTIAN G. PARIGGER, University of Tennessee Space Institute — Pulsed, infrared Nd:YAG laser radiation is utilized to ablate material from carbon-containing samples in air. Time-resolved measurements of the micro-plasma show well-developed diatomic spectra of the CN violet system. Of Interest are interferences from the C_2 Deslandres D'Azambuja system in the CN spectra, as previously noted in experiments with CO_2 laser radiation focused into CO_2 gas expanding into air. The recombination emission spectra from diatomic species, e.g., CN or C_2, clearly indicate temperatures in excess of 6000 Kelvin. Studies of the CO_2 TEA laser-induced micro-plasmas show these highly excited, high-temperature molecular transitions several tens of microseconds after plasma generation, mixed with signatures of Stark-broadened atomic lines. Spectroscopic fitting with accurate molecular line strengths of superposed emission spectra is of current interest, including study of the C_2 Deslandres D'Azambuja system near the 4-4 band of the CN $\Delta v = 0$ sequence of the CN $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ Violet System. In addition, discussed are physics phenomena associated with laser-induced optical breakdown. Laser-induced plasma applications include characterization of carbon and nitrogen containing materials.

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