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Characterization of Laser Produced Underwater Plasma L. HUWEL, R. HAYDAR, T.J. MORGAN, Wesleyan University, W.G. GRAHAM, Queen's University, Belfast — Optical breakdown in water created by 10 ns pulsed Nd:YAG laser operating at λ =1064 nm was studied. Spatial and temporal information was obtained with two intensified CCD cameras while spectral data were recorded using a time-integrating spectrometer. We have studied three water samples with different impurity content (ultra-pure, distilled, and tap water) and followed the plasma evolution over a timespan of a few hundred nanoseconds. Images taken by the two synchronized cameras, systematically delayed relative to each other, show that the "center of emission intensity" in single plasma events moves toward the incoming laser beam. The emission is dominated by a broad, blackbody-like spectral feature with corresponding temperature of ca. 20000 K. Superimposed is a weak hydrogen Balmer-alpha line with a full width at half maximum exceeding 50 nm in some cases. Interpreted as purely Stark broadened, this width corresponds to electron densities well above 10^{19} cm^{-3}.

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