Abstract Submitted
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Afterglow Behavior of Laser-Breakdown Atmospheric Helium Plasmas E. NEDANOVSKA, D. RILEY, W.G. GRAHAM, Queen's University, Belfast, L. HUWEL, T.J. MORGAN, Wesleyan University, T. MURAKAMI, Tokyo Institute of Technology — We present experimental and theoretical results on the temporal evolution of the electron density and temperature of a plasma formed by laser-induced breakdown in atmospheric helium. Plasma is created by a 9 ns, 140 mJ pulse from a Nd:YAG laser at 1064 nm and diagnosed with a separate laser using Thomson scattering with a 532 nm, 9 nm, 80 mJ probe beam during time delays ranging from 2 μs out to 22.5 μs. A zero-dimensional time-dependent global chemistry model is used to simulate the electron concentration, using pure helium and helium plus small amounts of humid air and molecular nitrogen. The effect of these small concentrations (1 ppm to 100 ppm) is significant and modifies the temporal decay behavior for both early and late times. Detailed analysis and comparisons with calculation will be presented at the conference.

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