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Time-Resolved Aluminum Monoxide Emission Measurements in Laser-Induced Plasma DAVID SURMICK, CHRISTIAN PARIGGER, University of Tennessee Space Institute — Laser-induced plasmas are useful for diagnostic applications in a wide variety of fields. One application is the creation of laser-induced plasmas on the surface of an aluminum sample to simulate an aluminized flame. In this study, aluminum monoxide emissions are measured to characterize the temperature along the laser-induced plasma as a function of time delay following laser-induced optical breakdown. The breakdown event is achieved by focusing 1064 nanometer laser radiation from an Nd:YAG laser onto the surface of an aluminum sample. Light from the plasma is dispersed with the use of a Czerny-Turner spectrograph, and time resolved emission spectra are recorded with an intensified, gated detector. Temperatures are inferred from the diatomic molecular emissions by fitting the experimentally collected to theoretically calculated spectra using a Nelder-Mead algorithm. For computation of synthetic spectra we utilize accurate line strengths for selected AlO molecular bands. Atomic emissions from aluminum are also investigated in our study of laser-induced plasma.

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