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Time Resolved Single Wire Aluminum Optical Spectroscopy Experiments[1] KATE BLESENER, SERGEY PIKUZ, TATIANA SHELKOVENKO, ISAAC BLESENER, DAVID CHALENSKI, DAVID HAMMER, Cornell University, YITZHAK MARON, VLADIMIR BERNSHTAM, Weizmann Institute of Science — We are exploring the conditions of plasmas generated by current-driven explosions of single fine aluminum wires, including temperatures, electron density, ionization state, and potentially magnetic field, using time-resolved emission spectroscopy at visible wavelengths. The experiments are being carried out with 15μm to 75μm Al wires driven by the 10kA, 500ns rise time LCP3 pulser. To determine the magnetic field, a new diagnostic method is being developed which makes use of Zeeman-effect-produced differences in the line shapes of two fine structure components of a multiplet that are equally broadened by Stark and Doppler effects. This method has been demonstrated at the Weizmann Institute of Science in laser-produced plasmas with lower energy densities [1].

[1] E. Stambulchik, *et al.* Phys. Rev. Lett. **98**, 225001 (2007).

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