

Abstract Submitted  
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**In-situ measurement of temperature during rapid thermite deflagrations**<sup>1</sup> JOHN DENSMORE, KYLE SULLIVAN, LLNL — Thermites are composite materials that consist of a fuel (metal) and oxidizer (metal oxide), that upon reaction can release a large amount of energy (20.8 kJ/cc for Al:CuO). The time scale for a thermite to release energy (ms) is much longer than a typical detonation ( $\mu$ s). In-situ temperature and/or thermal flux measurements can provide fundamental insight into the reaction mechanisms. This information can inform the design and optimization of energy transport during a deflagration, to optimize the energy release rate. To measure the temperature we use a burn tube apparatus and various pyrometry techniques to measure the spatial temperature field as a reaction proceeds towards completion. We show that system properties can be adjusted to achieve custom thermal properties.

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