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Pyrometry temperature studies of shocked tin including investigations exploring surface defects, anvil diameter and the integration with emissivity diagnostics CAROLINE SHENTON-TAYLOR, JAMES DE'ATH, THOMAS OTA, AWE — Accurate temperature measurement of shock-loaded systems continues to present experimental challenges. With short measurable time durations diagnostic methods are almost exclusively restricted to optical techniques. By preventing full sample pressure unloading, through the use of an anvil, partial release temperature measurements can be deduced from multiple wavelength optical pyrometry. This paper presents our recent studies of tin shocked to 28GPa including investigations exploring surface defects, anvil dimensions and the integration with emissivity diagnostics. The results indicate that a ring groove, 5mm across and with a nominal machined depth of 50 microns, acts to enhance the measured temperature by approximately 150K. Additionally on reducing the LiF anvil diameter from 20mm to 15mm, comparable partial release temperatures were observed. With the anticipated development of multiple anvil target designs, the smaller anvil diameter is desirable.

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