

Abstract Submitted  
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**Calculation of phase-dependent optical absorption in materials**

LORIN BENEDICT, JOHN KLEPEIS, FREDERICK STREITZ, Lawrence Livermore National Lab — We calculate the optical absorption spectra of different phases of various materials (Al, Bi, Fe) in an effort to support work in which optical constants are measured during the course of a shock compression experiment. In addition to showing that the optical properties of various solid phases of a given material are quite different, we compute the optical properties of Al across its solid-to-liquid transition and show that a prominent peak in the spectrum of the solid smoothly disappears as the temperature is raised above  $T_{\text{melt}}$ . This is in agreement with earlier measurements on solid and liquid Al, but is in disagreement with a more recent measurement on the liquid. Our results suggest that in situ optical constants measurements may be used as a diagnostic for the shock melting of Al.

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