

Abstract Submitted
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On the melting temperature measurements of metals under shock compression by pyrometry CHENGDA DAI, JIANBO HU, HUA TAN, Institute of Fluid Physics, CAEP, LSD TEAM — The high-pressure melting temperatures are of interest in validating equation of state and modeling constitutive equation. The determination of melting temperatures for metals at megabars by pyrometry experiments is principally associated with the one-dimensional models for heat flow through dissimilar media: Grover-Urtiew model (J. App. Phys. 1974, 45: 146-152) and Tan-Ahrens model (High Press. Res. 1990, 2: 159-182). In the present work, we analyzed the insufficiency of Grover-Urtiew model in determining melting temperatures from observed interface temperatures. Based on the Tan-Ahrens model, we extracted the upper and lower bound on melting temperature at interface pressure, and proposed that the median of the both bounds was a good approximation to the melting temperatures at interface pressure. Pyrometry experiments were performed on tantalum, and the high-pressure melting temperatures were evaluated by application of the proposed approximation. The obtained results were compared with available theoretical calculations.

Chengda Dai
Institute of Fluid Physics, CAEP

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