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Testing a Liquid EOS Model Against Cu Data S.D. CROCKETT, C.W. GREEFF, J.D. JOHNSON, Los Alamos National Laboratory — We model the free energy of a liquid near melting by postulating that ΔS_V, the entropy difference between solid and liquid at fixed volume, is independent of pressure, and that the melting curve follows the Lindemann law. We show that these two assumptions are consistent with the frequently used scaling assumption $c_v(V,T) = f(T/T_m(V))$, where $T_m(V)$ is the melting temperature. Using a solid free energy determined from *ab initio* phonon frequencies, we apply these assumptions to liquid Cu. We show that they are consistent with the Hugoniot sound speed data. We investigate the consequences of typical variations of ΔS_V for shock melting. We also investigate models for the shear modulus and the residual deviatoric stress in the shocked state.

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