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**Melting mechanisms and shocked superheated alkali halide single crystals** DAVID A. BONESS, Department of Physics, Seattle University — Even after decades of experimental work, increasingly detailed MD simulations, and refined theoretical approaches, our understanding of the physics of melting remains incomplete at best. Consideration of superheating of solids has been important in studying the melting process through its frustration by means of surface constraint, lack of nucleation sites, and dynamic process. Mechanisms of Lindemann, of Born, of Mott, of Fecht, of Tallon, and of others have been investigated recently by MD simulations of Jin et al. [1] and by Luo et al. [2]. Reanalysis of experimental results on shocked single crystals of the alkali halides KBr and CsBr [3] (with our unpublished data on NaCl and KCl), in light of the recent MD superheating computations [1, 2], leads to a more complete picture of melting mechanisms on superheated dynamically compressed single crystals in the [100] orientation. These shock experiments combine temperature measurement of the region just behind the shock front with elastic wave propagation sampling of the entire shocked region of the crystal. [1]Z. H. Jin et al., Phys. Rev. Lett. 87, 055703 (2001). [2]S.-N. Luo et al., Phys. Rev. B 68, 134206 (2003). [3]D. A. Boness and J. M. Brown., Phys. Rev. Lett. 71, 2931 (1993).

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