

Abstract Submitted  
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**Mach Cones in Three-Dimensional Yukawa Crystals**<sup>1</sup> XIN QIAN, AMITAVA BHATTACHARJEE, Space Science Center, University of New Hampshire — Mach cones have been observed in two-dimensional dusty plasma experiments (D. Samsonov et al., *Phys. Rev. Lett.*, 83, 3649, 1999) and molecular dynamics (MD) simulations assuming that the dust particles interact via a Yukawa potential (Z. W. Ma and A. Bhattacharjee, *Phys. Plasmas*, 9, 3349, 2002). We present new simulation results of Mach cones in three-dimensional Yukawa crystals excited by external laser forcing. As is well known, these crystals can be of the bcc and fcc type, and experiments have produced crystals with both types coexisting. Under a variety of conditions, our simulations show stable three-dimensional Mach cones with a tent structure. While the two-dimensional projection of these cones resemble the multiple cone structure of two-dimensional cones, they need larger dust charge and higher-amplitude forcing for their excitation. We present results on the effect of melting on these Mach cones, and their structures in the near-field and far-field regions.

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