

Abstract Submitted  
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**Measurements of Collective Modes Spanning the 3-D Superfluid to Mott-Insulator Transition** DAVID MCKAY, MATT WHITE, MATT PASIENSKI, YUTAKA MIYAGAWA, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — We report measurements on the collective modes of a  $^{87}\text{Rb}$  Bose-Einstein condensate transferred into a 3-D optical lattice. We measure the frequency and damping rates of dipole and quadrupole oscillations across a range of lattice depths, from the regime of pure superfluid to coexisting superfluid and Mott-insulator phases. We will discuss relevance to the transport properties of the Bose-Hubbard model, including possible bearing on the existence of a Bose metal. We will also comment on significance to recent predictions of collective mode frequencies for superfluid shells bounded by Mott-insulator phases.

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