Abstract Submitted
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Collective Excitations in Quasi-2D and 3D Condensates DAN LOBSER, ANDREW BARENTINE, HEATHER LEWANDOWSKI, ERIC CORNELL, JILA, National Institute of Standards and Technology and Department of Physics, University of Colorado, Boulder, Colorado 80309-0440 — Collective motion of a Bose-Einstein condensate has been a system of interest since the discovery of BEC. Boltzmann proved that the monopole mode of a thermal gas in an isotropic, harmonic and 3D trap is undamped [1, 2]. BECs are not classical gases and their weakly interacting nature causes damping in a 3D monopole mode. However, experimental limitations have precluded studies of this behavior in very spherical traps. Quantum gases confined to lower dimensions exhibit remarkable physical properties such as the Berezkinskii-Kosterlitz-Thouless transition or the Tonks-Girardeau gas. Confinement effects in a quasi-2D condensate are predicted to shift the frequency of the monopole mode [3]. One correction in particular connects a small frequency shift with certain quantum corrections [4]. Current results of our studies in 2D and 3D will be presented.

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Dan Lobser
JILA, National Institute of Standards and Technology and
Department of Physics, University of Colorado,
Boulder, Colorado 80309-0440

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