**A Dipolar Bose-Einstein Condensate as an Anisotropic Superfluid**[1] RYAN WILSON, SHAI RONEN, JOHN BOHN, JILA and Department of Physics, University of Colorado, Boulder, Colorado 80309-0440, USA — We consider a harmonically trapped dipolar Bose-Einstein condensate that is polarized by an external field. For a range of dipole-dipole interaction strengths and polarization angles, we calculate the quasiparticle spectrum of this system. In a quasi-two dimensional geometry where the condensate is free to move in a plane, the condensate exhibits a continuous dispersion relation that depends on the direction of wave propagation with respect to the field. The gas therefore exhibits an anisotropic superfluid velocity, as defined by the Landau criterion. Even for a pancake-shaped trap where atoms are confined in all directions, we can identify a "discrete dispersion relation," with consequences for sound propagation in this kind of gas.

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