

Abstract Submitted
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Excitations of dipolar quantum droplets¹ RYAN WILSON, US Naval Academy, DANNY BAILLIE, P. BLAIR BLAKIE, University of Otago — A wave of exciting experiments with atomic Dysprosium and Erbium have demonstrated the stabilization of a collapsing dipolar Bose-Einstein condensate into long-lived droplet states, which can exist without the support of an external trapping potential. This stabilization is likely due to the unique effects of beyond mean-field quantum fluctuations in dipolar systems. We study the elementary excitations of these droplets using an appropriately modified Bogoliubov theory, for both trapped and free droplets. Interestingly, these droplets support fully self-localized excitations, the number of which is found to increase with decreasing scattering length. We analyze the properties of these excitations, and discuss their implications for modern experiments with dipolar gases.

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