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Temperature dependent shape of self-bound dipolar droplets[1]
MEHMET OKTEL, ENES AYBAR, Bilkent Univ. — Recently observed self-bound droplets of dipolar bosons display a novel form of equilibrium which is stabilized by fluctuations. We investigate the role of thermal fluctuations in addition to the quantum fluctuations in these systems and show that the equilibrium shape of the condensate is strongly affected even at low temperatures where the thermal depletion is of the order of zero temperature depletion and the condensate fraction remains high. As the temperature is raised from zero to $\sim gn_0/k_B$ the droplets become more prolate where gn_0 is the mean field short range interaction energy at the center of the droplets. The effect of temperature on the condensate shape can also be observed for stable $\epsilon_{dd} < 1$ dipolar trapped gases for ϵ_{dd} close to one.

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