

Abstract Submitted
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Bose-Einstein crystal phase of cold gases with momentum dependent interaction XIAOPENG LI, W. VINCENT LIU, CHUNGWEI LIN, Department of Physics and Astronomy, University of Pittsburgh — Motivated by the experiments of dipolar quantum gases, we study a system of bosons with long range interaction in the regime between superfluid and Wigner crystal phases. From the analysis of low energy fluctuations based on effective field theory and Bogoliubov approaches, the uniform Bose-Einstein state is found unstable toward crystalline order for a class of potentials which has minima at finite values in momentum space. Further variational calculation shows that a new phase, Bose-Einstein crystal, is of lower energy than both uniform BEC and Wigner crystal states.

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