

Calculation of Off Diagonal Long Range Order in Bulk Solid ${}^4\text{He}$

Bryan Clark and David Ceperley

*Department of Physics, University of Illinois at Urbana Champaign
Urbana, IL*

Experimental discoveries have found that bulk solid ${}^4\text{He}$ acts like a super-solid at low temperatures. Observations of non-classical rotation of inertia (NCRI) have prompted us to examine the nature of the off diagonal long range order (ODLRO) (equivalent to Bose-Einstein condensation, BEC) in bulk solid ${}^4\text{He}$ using Path Integral Monte Carlo. We do not find ODLRO in a perfect hcp crystal at the melting density. We also explore what this conveys about good variational trial wave functions to represent bulk solid ${}^4\text{He}$.

- [1] Kim and Chan, Science 305, 1941 (2004).