Temperature-dependent study of Bose gases: Crossover from three- to one-dimensional behavior

KWANGSIK NHO, Center for Simulational Physics, University of Georgia, DOERTE BLUME, Department of Physics, Washington State University — Using the finite-temperature path integral Monte Carlo method, we investigate the crossover of Bose gases from three- to one-dimensional behavior by increasing the trap anisotropy. The interaction between particles is modeled by hardcore potential with $s$-wave scattering length $a_{sc}$. Specifically, we monitor the energetics, the superfluid fraction, and structural properties as a function of temperature $T$, scattering length $a_{sc}$, and the trap anisotropy parameter.

Supported by the NSF

Kwangsik Nho
University of Georgia

Date submitted: 08 Feb 2005