Superfluidity in highly-elongated Bose gases

KWANGSIK NHO, D. BLUME, Washington State University — The behaviors of Bose gases under highly-elongated confinement are investigated at finite temperature using the path integral Monte Carlo method. For varying asymmetry of the trap, we determine the superfluid density along the tight and weak confinement direction in response to an imposed rotation about different symmetry axis as a function of temperature. The decreased superfluid response to a rotation about the tight confinement direction, as compared to that to a rotation about the weak confinement direction, can be explained in terms of the moment of inertia. An experiment, which could measure these effects, is proposed.

D. Blume
Washington State University

Date submitted: 11 Mar 2005