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Bose-Einstein condensation and superfluidity in finite sized systems. ALI SHAMS, Department of Physics and Astronomy, University of Delaware, Newark, Delaware 19716, HENRY GLYDE, Department of Physics and Astronomy, University of Delaware, Newark, Delaware 19716 — We present results on the relationship between the superfluid fraction and the condensate fraction in finite sized systems of hard-core bosons. The systems are investigated using path integral Monte Carlo methods over a wide range of densities. While it is well known that in strongly interacting bose systems like liquid helium the condensate fraction is much smaller than the superfluid fraction, our results indicate that for finite sized systems and weak interaction, condensate fraction can actually exceed superfluid fraction. This is especially the case as we get closer to the superfluid transition temperature. Condensation in an interacting system can be suppressed both through increased correlation effects and decreased exchange effects. Our investigation also sheds light on the relative importance of these two depletion mechanisms.

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