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Superfluid to normal phase transition in strongly correlated bosons in two and three dimensions JUAN CARRASQUILLA, MARCOS RIGOL, Georgetown University — Using quantum Monte Carlo simulations, we investigate the finite temperature phase diagrams of hardcore bosons in two- and three-dimensional lattices. To determine the phase boundaries, we perform a finite-size-scaling analysis of the condensate fraction and/or the superfluid stiffness. We then discuss how these phase diagrams can be measured in experiments with trapped ultracold gases, where the systems are inhomogeneous. For that, we introduce a method based on the measurement of the zero-momentum occupation, which is adequate for experiments dealing with both homogeneous and trapped systems, and compare it with previously proposed approaches.

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