Quantum Monte Carlo simulation of disordered Bose-Hubbard model in a 3D optical lattice[1] FEI LIN, SHENGQUAN ZHOU, MATTHEW PASIENSKI, BRIAN DEMARCO, DAVID CEPERLEY, University of Illinois at Urbana-Champaign — We perform large scale quantum Monte Carlo (QMC) simulations of disordered Bose-Hubbard model defined in a 3D optical lattice and confined in a spherical harmonic trap. Our system size is comparable to the experiment (60^3) [1], and our simulation temperature is as low as around 3 nK. We shall show QMC results on particle density distribution inside the trap, superfluid density as a function of disorder strength, and compare our condensate fraction to the experimentally measured values [1]. [1] M. White, M. Pasienski, D. McKay, S. Zhou, D. Ceperley, and B. DeMarco, arxiv.org/abs/0807.0446

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Date submitted: 20 Nov 2008   Electronic form version 1.4