Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Bose-Glass to Superfluid Transition in the 3d Boson Hubbard Model: z=d PETER HITCHCOCK, ERIK SORENSEN, McMaster University — Recent experiments on cold atomic gases in disordered optical lattices (Schulte *et al.* PRL 95, 170411 (2005)) have renewed interest in the bose-glass to superfluid phase transition in the boson Hubbard model. The dynamical critical exponent z is of central importance to understanding this transition, yet its value at $d > 2$ remains unclear. We present a Monte Carlo study of this transition in the three dimensions. Simulations are performed on the classical (3 + 1) dimensional link-current representation using the geometrical worm algorithm. Finite-size scaling analysis (on lattices as large as 16x16x16x512 sites) of the superfluid stiffness and the compressibility is consistent with the value z = 3 for the dynamical critical exponent, in agreement with existing scaling and renormalization group arguments that z = d. We calculate a value of $\nu = 0.66(2)$ for the correlation length exponent, satisfying the relation $\nu \geq 2/d$ as an equality.

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Date submitted: 16 Jan 2006 Electronic form version 1.4