

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Quantum Monte Carlo simulation of the dissipative granular array** MUNEHISA MATSUMOTO, MATTHIAS TROYER, ETH Zuerich — We develop a new cluster algorithm for the dissipative granular arrays and apply it to the one-dimensional (1D) array. The problem in the simulation of the dissipative granular array arises from the competition between the phase difference terms and the on-site charging energy terms in the action. We divide these two kinds of terms into on-site terms and inter-site terms. A cluster update for the latter is combined with the Metropolis method for the former, being in the same spirit as was done for the resistively-shunted Josephson-junction array [1]. The on-site charging energy is calculated for the 1D array and its dependence on the strength of dissipation is discussed in comparison to several theoretical predictions [2]. [1] P. Werner and M. Troyer: Phys. Rev. Lett. 95 (2005) 060201. [2] K. B. Efetov and A. Tschersich: Europhys. Lett. 59 (2002) 114; A. Altland, L.I. Glazman, A. Kamenev: Phys. Rev. Lett 92 (2004) 026801.

Munehisa Matsumoto  
ETH Zuerich

Date submitted: 22 Dec 2006

Electronic form version 1.4