

MAR08-2007-000171

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Switching and phase transitions in a parametrically-excited cold atom trap.¹

WONHO JHE, Seoul National University

Stochastic dynamics of cold atoms in a modulated magneto-optical atom trap was investigated. The studies focused on the phenomena related to switching between the parametrically excited period-2 states. The rates of single-atom activated transitions were analyzed. When the atom density was increased, there were observed Ising-class phase transitions where the symmetric population of period-2 states was spontaneously broken [1,2]. Anomalous fluctuations in the decay of the unstable state were investigated [3].

[1] Kihwan Kim, Myoung-Sun Heo, Ki-Hwan Lee, Kiyoub Jang, Heung-Ryoul Noh, Doochul Kim, and Wonho Jhe, Phys. Rev. Lett. **97**, 036104 (2006).

[2] Kihwan Kim, Heung-Ryoul Noh, and Wonho Jhe, Phys. Rev. A, **71**, 033413 (2005).

[3] “Transient and fluctuation behavior of atomic population at unstable state in parametrically driven magneto-optical trap,” Myoung-Sun Heo, Yonghee Kim, Heung-Ryoul Noh, Mark Dykman and Wonho Jhe, in preparation.

¹This work was supported by the Creative Research Initiative of Korea.