Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Stochastic phenomena in parametrically driven magneto-optically trapped atomic system YONGHEE KIM, MYOUNG-SUN HEO, WONHO JHE, Seoul National University, HEUNG-RYOUL NOH, Chonnam National University — Stochastic dynamics of periodically driven cold atom system was investigated. The studies focused on the phenomena between the parametrically excited period-2 states. The transition rates of single atom activated by the stochastic process were measured. When atom number increased or additional bias field applied, we observed symmetric population of period-2 states was broken. In number varying case, mean field Ising-type phase transition was observed. The other case which additional bias field exerted, hysteretic response was occurred. In addition, the transient phenomena of atomic population near the unstable state have been observed. Relevant asymptotic behavior of relaxation rate has been quantitatively measured and anomalous fluctuation qualitatively discussed.

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Date submitted: 01 Feb 2008 Electronic form version 1.4