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Parametric Excitation in a Magneto-optical Trap with Modulating the Magnetic Field Gradient CHANG-WOO LEE, YONGHEE KIM, MYOUNG-SUM HEO, WONHO JHE, Seoul National University — Parametric resonance is a very interesting and important mechanism in diverse systems from physics to biology. Recently there have been a lot of researches related to the parametric excitation in the magneto-optical trap system. However, the previous investigations were conducted by modulating only the cooling laser intensity. While the study using intensity modulation showed the limit cycle motion and Hopf bifurcation, the magnetic field gradient modulation revealed much more interesting phenomena such as period doubling, chaos, and so on. We have studied the transition problems between two attractors in period doubling area which are much far from equilibrium and could not be understood by the method used in limit cycle motion. The magnetic field modulation methods could give quantitative comprehension of transition problems in the non-equilibrium system that has not been studied.

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