

Abstract Submitted
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Measurement of interaction strength for spontaneous symmetric breaking in a parametrically modulated magneto-optical trap GEOL MOON, MYOUNG-SUN HEO, YONGHEE KIM, School of Physics, Seoul National University, HEUNG-RYOUL NOH, Department of Physics, Chonnam National University, WONHO JHE, School of Physics, Seoul National University, CENTER FOR NANO-LIQUID TEAM — We study on the attractive interaction between two atomic clouds, which leads to Spontaneous Symmetric Breaking (SSB) of atomic populations in the parametrically modulated magneto-optical trap (MOT). The parametric modulation is performed by periodically changing the intensity of laser beam along the axis of the anti-Helmholtz coils. In this parametrically modulated system, the two atomic clouds vibrate along the axis with the phase difference of π . The collective behavior observed in a single cloud of MOT also exists between the two clouds and the shadow effect which is one of the collective behavior brings about an attractive interaction between the two clouds. In special, this attractive interaction contributes to SSB which happens when the total atomic number is above a critical value. We measure the interaction strength by observing the change of vibration amplitude of each cloud. We also report on the various factors which affect the interaction strength between the two clouds.

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