Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Observation of novel sub-Doppler trap structures in a magneto optical trap DAHYUN YUM, YONGHEE KIM, MYOUNG-SUN HEO, SOYONG SHIN, Seoul National University, KIHWAN KIM, University of Innsbruck , HEUNG-RYOUL NOH, Chonnam University, WONHO JHE, Seoul National University — Last decades of accomplishments in atomic physics are triggered by the invention of laser cooling and trapping technique of magneto optical trap. The studies on this trap revealed that there exist two kinds of forces therein so-called, Doppler and sub-Doppler force. We have found that with different detuning of trap laser between z axis and transverse axes, the normal sub-Doppler trap located at the center fades out while a pair of new sub-Doppler traps appear symmetrically with respect to the center. Varying the experimental conditions such as the trap frequency and the difference of detuning, the depth and the separation of this new structure are measured and compared with theoretical calculation.

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Date submitted: 27 Jan 2006 Electronic form version 1.4