

Four Level Dynamic in Rubidium-85 Magneto-Optical Trap

Thursday, May 21, 2015 8:30 AM (15 minutes)

We use the density matrix formulation to study the dynamic of atom-photon interaction of Rb-85 atoms under the cooling and repumping laser fields in a magneto-optical trap (MOT). The spontaneous emission process is taken into account using the fully-quantized theory. The obtained master equations are numerically solved for the four-level system including two levels of $5^2S_{1/2}F = 2, 3$ and two levels of $5^2P_{3/2}F = 3, 4$. The steady solution that naturally gives the probability of finding trapped atoms occupying each level in MOT is analyzed in detail.

Primary author: KAEWUAM, Rattakorn (Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand)

Co-authors: Dr CHATTRAPIBAN, Narupon (Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand); ANUKOOL, Waranont (Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand)

Presenters: KAEWUAM, Rattakorn (Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand); ANUKOOL, Waranont (Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand)

Session Classification: Atomic Physics, Quantum Physics, Molecular and Chemical Physics

Track Classification: Atomic Physics, Quantum Physics, Molecular and Chemical Physics