

# Four Level Dynamic in Rubidium-85 Magneto-Optical Trap

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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.

## Summary

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