Extracting Oscillation Frequencies in Spontaneous Emission Rate of an Atom Between Two Mirrors

ZHAO Hai-Jun and DU Meng-Li

Institute of Theoretical Physics, the Chinese Academy of Sciences, Beijing 100080, China

Abstract: For an atom in a medium with refractive index n sandwiched between two parallel mirrors, we derive an analytical formula for the spontaneous emission rate based on Fermi's golden rule. The oscillations are not transparent in this formula. By performing Fourier transform on scaling variable measuring system size while holding system configuration fixed, we extracted the frequencies of many oscillations in this system. We show that these oscillations correspond to emitted photon closed-orbits going away from and returning to the emitting atom.

[Full text: PDF]

Close