

Abstract Submitted
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Atomic coherences of on-resonant and off-resonant two-photon absorptions in ladder-type atomic system¹ HAN SEB MOON, Pusan National University, HEUNG-RYOUL NOH, Chonnam National University — We report the physical origins of the on-resonant and off-resonant two-photon absorption (TPA) in an open ladder-type atomic system of the $5S_{1/2}(F = 1)$ - $5P_{3/2}(F' = 0, 1, 2)$ - $5D_{5/2}(F'' = 1, 2, 3)$ transitions in ^{87}Rb atoms. When the on-resonant TPA including electromagnetically induced transparency (EIT) was transformed into the off-resonant TPA according to the coupling laser frequency detuning, we clarified the dynamics of the atomic coherences by decomposing into the two-photon coherence (TC) and the crossover coherence (CC) terms mixed between one-photon coherence (OC) and TC terms. The physical origins of the two TPAs were completely different; the cause of the on-resonant TPA was the CC term, and that of the off-resonant TPA was the TC term.

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