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Effects of Vacuum-Induced Coherence on One- and Two-Photon Absorption Spectra of Transient Process in a Y-Type System

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Abstract: We investigate the influence of the vacuum-induced coherence on one- and two-photon absorption of the transient process in a four-level Y-type atomic system. We find that the one- and two-photon transient absorption and amplification properties are quite sensitive to the vacuum-induced coherence. It is also shown that the one- and two-photon absorption spectra of the transient process can be dramatically affected by modulating the relative phase of the applied fields. By appropriately choosing the relative phase, the amplification of the probe field can be achieved.

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