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Observation of the spontaneously generated coherence effects in a laser-driven four-level system JIANBING QI, Penn State University — We study the spontaneously generated coherence effects in a four-level system coupled by three coherent fields. We use the Schrödinger equation to calculate the probability amplitudes of the wave function of the system and derive an analytical expression of the spontaneous emission spectrum. A variety of spontaneous emission spectral features can be obtained by controlling the amplitude of the coupling fields and the preparation of the initial quantum state of the system. Quantum interference effects, such as the spectral line enhancement, spectrum splitting, and quenching are observed. The number of spectral components, the spectral linewidth, and relative intensity can be very different depending on the physical parameters. The system can be realized in many atomic and molecular systems.

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