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Two-Level Quantum Systems with Broken Inversion Symmetry

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We discuss the presence of a nontrivial emission at the Rabi frequency in the Jaynes-Cummings model (JC) with broken symmetry in the diagonal terms of dipole moment. JC is a theoretical model which describes the oscillating behavior of a two-level quantum system in a cavity, interacting with one resonant mode of the electromagnetic radiation at an optical frequency. Analytical results for the time-averaged radiation intensity in relevant physical situations are obtained at the first perturbative order in the symmetry violation parameter. Since the Rabi frequency is proportional to the strength of the coupling with the electromagnetic field, the effect can be used for frequency-tuned parametric amplification and generation of electromagnetic waves.

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