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**Quantum interference due to energy shifts and its effect on spontaneous emission** ZHENG-HONG LI, Institute for Quantum Science and Engineering (IQSE) and Department of Physics and Astronomy, Texas A&M University, DA-WEI WANG, HANG ZHENG, SHI-YAO ZHU, Beijing Computational Science Research Center, Beijing, China, M. SUHAIL ZUBAIRY, Institute for Quantum Science and Engineering (IQSE) and Department of Physics and Astronomy, Texas A&M University — The quantum interference in spontaneous emission is studied with the inclusion of counter rotating terms and energy shifts. The energy shifts come from the emission and then reabsorption of virtual photons as well as the real photon emission. We show that the quantum interference resulting from the energy shifts has significant influence on the effective decay rates of the two levels, even when the transition dipole elements are the same and the energy separation of the two levels is small. We also show that the energy shift has substantial influence on the spectrum emitted by the atom. The result is valid in the long time limit. The effect of the energy shift can be observed at the time scale of one over the atomic decay rate.

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