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Title:Mixed states in Rabi waves and quantum nanoantennas

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Abstract:The mixed states of Rabi waves in a one-dimensional chain of two-level quantum dots (QDs) with tunnel coupling between neighbor QDs are theoretically considered. The propagation of Rabi waves is described by a  $2 \times 2$  statistical operator depending on two spatial and one temporal variables. For a statistical operator the generalized Bloch equations are derived. The eigenmodes of the statistical operator are considered, the general solution of the initial problem is obtained, and the frequency spectrum of the induced current is investigated. The high-frequency part of the spectrum corresponds to a Mollow triplet, but is distinct from the last one as it is the continuous spectral band located on both sides of the transition frequency. The low-frequency part is caused by tunnel current and includes a dc-component and continuous ac-band in the vicinity of the Rabi oscillation frequency. The application of Rabi waves to the electrically controlled quantum nanoantennas of terahertz range is considered.

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