EXCITATION OF COHERENT STATES OF THE JAYNES – CUMMINGS MODEL

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S u m m a r y

We construct the Hamiltonian that exactly reproduces the character of the excitation spectrum of two modes of normal oscillations of the Jaynes – Cummings model. These modes serve as a quantum analog of the classical behavior of two interacting one-dimensional anharmonic oscillators, namely, a field oscillator and atomic one. The anharmonicity is caused by a nonlinearity of the interaction of oscillators and is manifested in the dependence of the frequency of these two modes on the number of excitations (i.e., on energy). It is shown that an external deterministic force, acting on the system during some time t_0, transfers it from the vacuum state to a coherent one or from one of the coherent states to another coherent one. The probability of transfer from the vacuum state to the coherent one with a given number of excitations is in fact given by the Poisson distribution of the number of excitations appeared in the 'atom-field“ system by the end of the external force acting period and is found to be proportional to the excitation time t_0.