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A Scheme for Generating Cluster States via Raman Interaction

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Abstract: A scheme for generating cluster states via Raman interaction is proposed. In the scheme, we firstly prepare cluster states of multi-cavities with information encoded in the coherent states and then generate cluster states of multi-atoms, which encode the information in the ground states of Λ-type atoms. The advantages of our scheme are that the atomic spontaneous radiation can be efficiently reduced since the cavity frequency is largely detuned from the atomic transition frequency and the Hadamard gate operation of the coherent states is replaced by measuring the coherent states.

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Key words: cluster states, Raman interaction, Λ-type three-level atom, coherent states

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