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Model for Interaction Between Photon and Cold Atom in QED Cavity

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Abstract: A model has been established for the interaction between a single-mode optical field and a 2-energy-level cold atom with exact analytic solutions given. The processes of momentum and energy exchanges between the optical field and the cold atom due to the interaction between them are discussed in detail, and a formula has been given for the variation of momentum and energy exchange volumes with time t in dress state while both the effects of photon recoil and Doppler effect are taken into consideration.

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