Output Rate of Atomic Four-Wave Mixing in Two-Component Bose-Einstein Condensate

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Abstract: In this letter, following the proposal of Heurich, et al. [Phys. Rev. A63 (2001) 033605], we analyze and discuss output rate of atomic four-wave mixing in the two-component Bose-Einstein condensate under the condition of the steady state. The results show that the magnitude of the signal beam increases with the increase of the intensity of the probe beam, up to a saturated value, then it decreases as the probe beam increases. The influence of the interaction range on the signal beam is also predicted. In particular, it is worth while pointing out that in contrast to the previous solutions, our obtained analytical solutions are of very simple and explicit forms, which open the door for further investigating the related physical mechanisms.

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