论文

多光子J C模型中频率随时间变化场的反聚束效应

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摘要：

利用多光子J C模型，考虑场频率随时间以正弦函数形式作小量变化,在旋波近似下,研究了二能级原子通过多光子跃迁与单模辐射场相互作用系统中场的反聚束效应.利用数值计算方法给出反映场反聚束效应的二阶关联函数随时间的演化曲线.研究结果表明：场二阶关联函数的演化受场频率随时间正弦函数形式变化的调制,场频率振荡的幅值u越大调制作用越强,在场频率振荡的幅值u大于一定值后,场二阶关联函数随时间的演化呈现出周期性振荡特性，其振荡周期与场频率变化的周期一致.

关键词： 二能级原子　J-C模型　频率变化场　反聚束效应　two-level atom　Jaynes-Commings model frequency of field varying with time　antibunching effect

Antibunching Effect of Field with a Time varying Frequency in the Multiphoton Jaynes Cummings Model

Abstract:

Using the multiphoton Jaynes Cummings model,the antibunching effect of the field in the system of a two level atom interacting with the single mode coherent field through mutiphoton transition is studied.The frequency of the field varying with time in the form of sine is considered.The influences of amplitude and angular frequency of the field frequency variation on the antibunching effect of the field are discussed by numerical calculations.Calculation results indicate that the time evolution behavior of second order correlation function is modulated by the field frequency variation.The modulation intensity is enchanced as the amplitude u of field frequency variation increases,and when the amplitude u of field frequency variation is larger than a fixed value the time evolution of second order correlation function will display periodic oscillation behavior. Its oscillation frequency is in agreement with the angular frequency of field frequency variation.The antibunching effect of field decreases as the amplitude u of field frequency variation increases.

Keywords:

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