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论文

利用交叉克尔效应制备六光子纠缠态

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摘要:

利用弱非线性的交叉克尔介质和对强相干探测场的动量积分零拍探测,呈现了一个关于制备六光子最大纠缠态的方案,如实现制备Dicke态和W态.在本方案中,只要相干探测光场的强度足够大时,对交叉克尔介质的非线性强度要求可以较弱,因而当前实验技术条件上均能满足本方案的要求.考虑到目前实验上实现单光子很是相对困难的,在信号模上仅用弱的相干光替代单光子源,从而进一步增强了本方案的实验可行性.

关键词: 交叉克尔非线性 零拍探测 纠缠态

Simple Scheme for Preparation of Six-photon Entangled States via Cross-Kerr Medium

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Abstract:

A scheme is presented for preparing maximally entangled states among six modes.The scheme only utilizes weak cross-Kerr nonlinearity and momentum quadrature homodyne measurements on the probe mode of intense coherent light fields.It is relatively easy to generate Dicke states and W states of light fields in the scheme.It is not necessary that the cross-Kerr nonlinearity is very large,as long as the coherent light is bright enough.Therefore,this scheme is within the reach of current technology.In addition,only weak coherent light beams,with which single-photon sources have been replaced in the signal modes,are needed in the present scheme since it is difficult to realize single-photon sources in experiments.

Keywords: Cross-Kerr nonlinearity Homodyne measurement Entangled state

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