论文

基于LabVIEW的连续变量相位检测系统

周武林,黄春晖

(福州大学 物理与信息工程学院,福州 350108)

摘要：

构造了一种连续变量相位检测平台.发射端采用相位调制器产生连续的相移,接收端使用零差探测器测量光场的正则相位,选用NI的高性能数据采集卡PCI6111E控制整个系统.使用LabVIEW虚拟仪器模块化编程技术,包括PID控制、DAQmx数据采集和三角拟合,缩短系统开发时间,提高编程效率.通过琼斯矩阵理论推导和实验验证了连续变量相位检测系统的可行性,结果表明零差探测器输出电压与相位调制器输入电压成余弦关系,为连续变量量子密钥分配研究提供了一种新方法.

关键词：　连续变量　零差检测　相位检测　LabVIEW

Continuous Variable Phase Detection System Based on LabVIEW

ZHOU Wu-lin,HUANG Chun-hui

(College of Physics and Information Engineering,Fuzhou University,Fuzhou 350108,CHINA)

Abstract:

A new continuous variable phase detection platform was built.In the proposed platform,electro-optic modulator was used as the transmitter to produce continuous phase shift,homodyne detection circuit was used as the receiver to measure the phase of the light field,and high performance NI data acquisition card PCI6111E was used to control the entire system.The LabVIEW program technologies,including PID control,DAQmx data acquisition and triangle fit,which can reduce system development time,were used to improve the programming efficiency.The feasibility of the continuous variable phase detection system was validated by Jones matrix theory and experiments,which shows the cosine relation between the output voltage of homodyne detection and the input voltage of phase modulator.The new scheme provides a new approach for continuous variable quantum key distribution.

Keywords: Continuous variable　Homodyne detection　Phase detection　LabVIEW

通讯作者：黄春晖（1959-）,男,教授,主要研究方向为量子通信与集成电路设计.Email:hchfzu@163.com

作者简介：

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