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摘要: 针对自适应光学系统非共光路像差检测中遇到的若干实际问题, 设计了基于多通道相位差异法的波前探测器, 用于在不对光路进行任何改变的前提下定量测量自适应光学系统的第一像面到成像相机之间的像差。与前人的双通道相位差异波前探测器相比, 该方法对波前具有更强的约束力, 从而能够对目标光源的形状容忍力更强, 理论上对波前求解的精度更高。将该方法应用于1.23 m口径自适应光学系统的非共光路的静态像差测量, 取得了良好的效果, 为光路装调带来了极大的方便。将测得的像差直接用于变形镜的初始偏置, 大大提高了成像质量。

关键词: 相位差异 波前探测 自适应光学 非共光路检测

## Calibration of no-common path aberration in AO system by multi-channel phase-diversity

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Abstract: A multi channel Phase Diversity(PD) processing method is designed aiming at some practical problems of the no common path static aberration calibration in an Adaptive Optics (AO) system. The method could be used to measure the aberration between the first image plane and the imaging CCD focused plane without changing the optical path. Compared with a traditional double channel PD detector, the multi channel PD method has stronger restriction to the calculation of wave front. So it has more endurance for the form of object source, much accuracy for wavefront calculation and more measuring ranges. The method has been used to measure the no common path aberration of AO system in a 1.23 m telescope, and a good measuring result is obtained. The obtained result is taken as the offset of a Deformable Mirror(DM) to redress the static aberration, and the image resolution becomes much better.

Keywords: Phase-Diverse(PD) wave-front aberration adaptive optics Calibration of no-common path aberration

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