THE OPTICAL PERFORMANCE TEST AND ANALYSIS OF PRIMARY AND SECONDARY MIRRORS OF A CASSEGRAIN TELESCOPE

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Abstract: A Cassegrain telescope with 466 mm clear aperture is under developing. The optical surfaces of primary and secondary mirrors of this telescope are both aspherical surfaces. In general, it is necessary to use CGH or null lens for the optical performance test of the aspherical surface with interferometer or wavefront sensor. Whether using CGH or null lens, the technique for the alignment is challenging and complex. In this article, the new testing method and analysis algorithm called bench test is presented. The wavefront error of the residue manufactured form error and deformation caused by external force and the gravity effect will be analyzed according to the Zernike coefficients gained by rotating primary and secondary mirror individually. According to the Zernike coefficients for the residue form error for the primary and secondary mirror, the best orientation of the secondary mirror refer to primary mirror will be simulated by the optical software. After that, it is an efficient way to compensate the residual form error for the primary and secondary mirror to gain the best optical performance for the system.

Keyword：Cassegrain telescope, form error, CGH, null lens, bench test