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论文

ZEMAX辅助分析斜方棱镜面形误差对出射光平行度的影响

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摘要：

介绍一种根据出射光平行度要求计算斜方棱镜面形误差的方法。根据忽略局部光圈数的简化分析模型，获得面形误差对应光圈数与相关球面半径的关系，通过几何处理方法，求得一定面形误差对应的球面半径与平面倾角的关系，将斜方棱镜的工作面倾斜一定角度，运用折射定理，将具体面形误差转化为相应平面的倾斜角度，得到出射光相对于理想光轴的倾斜角度及其关系式，并在ZEMAX中建立斜方棱镜的两种模型。根据ZEMAX仿真结果，给出了各个工作面形误差分配方案，得出随着光束口径的增大，斜方棱镜反射工作面和折射工作面面形误差对出射光偏折角影响规律不同等结论。

关键词： 斜方棱镜面形误差;ZEMAX辅助分析;出射光平行度

ZEMAX auxiliary analysis for effect of rhombic prism surface shape error on parallelism of emergent beam

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Abstract:

A calculation method to calculate the surface shape error of rhombic prism according to parallelism demand of emergent beam is introduced. The relation of the surface shape error to f-number and relevant spherical radius was achieved according to the reducing analysis model ignoring the local f-number. Two kinds of rhombic prism model are established by ZEMAX. According to the simulation results from ZEMAX, the correctness and limitation of the former methods are proved and analyzed. The results are used to analyze the effect of the surface shape error of the rhombic prism on parallelism of the emergent beam. The assignation plan of the surface shape error for each working surface is presented. A conclusion that the effects of surface shape errors of the refractive and reflective surfaces on the deviation angle of the emergent beam are different with the increase of the incident beam diameter is achieved.

Keywords: surface shape error of rhombic prism; ZEMAX auxiliary analysis; parallelism of emergent beam

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