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论文

摆镜式IRST反射镜支架结构设计与优化

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摘要:

依据某复合型IRST系统的要求,设计了适合该系统的支架结构.以该结构质量最优和转动惯量最小为目标,对支架进行了以平面轴向厚度为变量,以模态频率和自重变形为约束的优化与分析.结果表明,在结构模态低阶频率和最大变形量变化极小的前提下,支架质量由原来的0.62kg减小到0.38kg,转动惯量由原来的0.0098kg·m^2减小到0.0056kg·m^2.

关键词: IRST 反射镜支架 结构设计 有限元分析 结构优化

Design and optimization of reflector bracket for moving mirror IRST

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Abstract:

We designed a bracket structure by request of some complex IRST. The aim of the structure optimization was to minimize the mass and moment of inertia. We completed the optimization and analysis in which we took the plane axis thickness as a variable and imposed restrictions on the mode frequency and deadweight distortion. The results show that the bracket mass reduces from 0.62kg to 0.38kg and the moment of inertia reduces from 0.0098kg·m^2 to 0.0056kg·m^2.

Keywords: IRST reflector bracket structure design finite element analysis structure optimization

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