

纳米三坐标测量机误差分离方法

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关键词: 纳米三坐标测量机 误差分离装置 设计 试验

摘要: 根据纳米三坐标测量机结构、误差分布特征和精度要求, 选用微型三光束平面激光干涉仪分离测量机误差。设计了误差分离装置, 实现了干涉仪平移、偏摆、俯仰和垂直高度的调整以及反射镜垂直角度的精密调整。从原理上分析了45°反射镜光路转折对干涉仪测量结果的影响, 实验结果证实了该装置可以实现标准量示值误差、导轨直线度线值误差和俯仰、偏摆、滚转误差的一次性分离, 减小传统仪器分离方法由于发热、振动和非实时测量带来的附加误差, 误差修正精度可以提高5倍。 Based on the Nano-CMM structure, error distribution characteristic and accuracy demand, the micro three light beam planar reflector laser interferometer was selected to separate the Nano-CMM error. The error separating device was designed to realize the accurate adjustment of parallel move, beat, pitch and height, and the horizontal angle between the reflectors. The influence on the measurement result of the interferometer, which is created by using the 45 degree reflector to deflect the beam, was analyzed on principle. The error separating results indicate that the single-time separating of the standard indicating error and the deviant, pitch and beat error of the guide strip can be realized by the device. The additive error created by the heat, vibration and non real-time measurement of the common instruments is decreased via the error separating device. The error correcting precision using this method is five times more than that of the ordinary method.

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