

## Deflection Effect on Mirror for Space Applications

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**Abstract :** Mirror optical performance can experience varying levels of stress and tolerances, which can have a notable impact on optical parametric systems. to ensure proper optical figure and position of mirror mounting within design tolerances, it is crucial to have a robust support structure in place for optical systems. The optical figure tolerance determines the allowable deviation from the ideal form of the mirror and the position tolerance determines the location and orientations of the optical axis of the optical systems. A variety of factors influence the optical figure of the mirror. Included are self-weight (Deflection), excitation from temperature change, temperature gradients and dimensional instability. This study employs an analytical approach and finite element method to examine the effects of stress resulting from mirror mounting on the wavefront passing through the mirror. The combined effect of tolerance and deflection on mirror performance is represented by an error budget. Numerical mirror mounting is presented to illustrate the space application of performance techniques.

**Keywords :** opto-mechanical, bonded optic, tolerance, self-weight distortion, Rayleigh criteria

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