Application Note

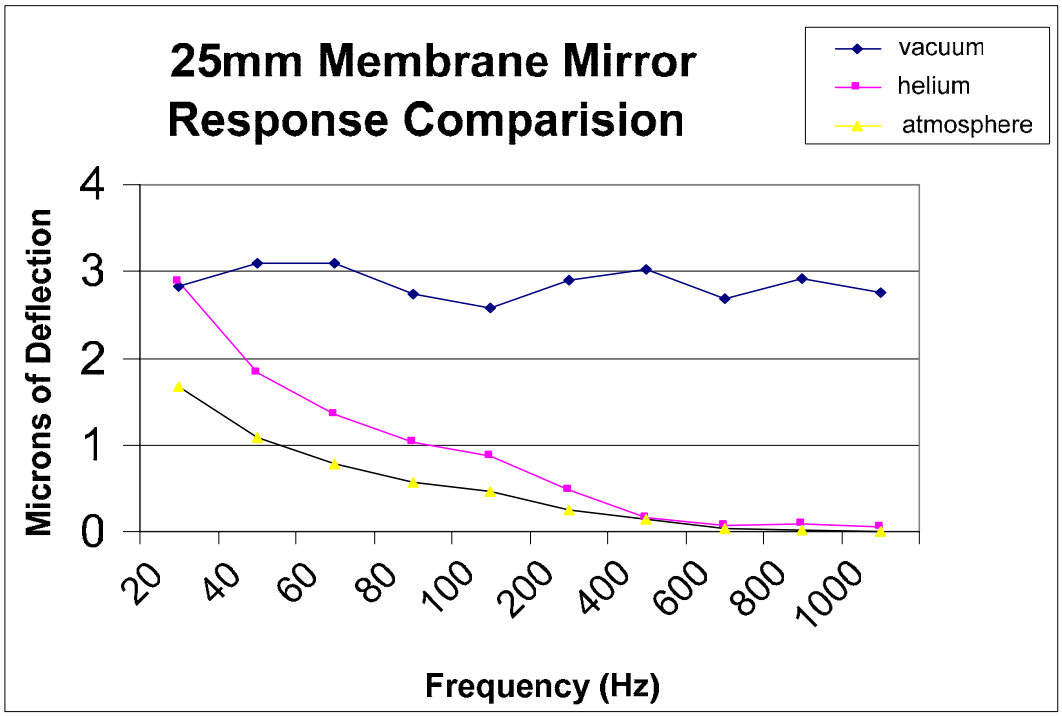
AN002: Deformable Mirror Operation in a Vacuum

Introduction

AgilOptics tested select deformable mirrors in a vacuum environment. Generally, vacuum operations are much better and the frequency response and throw of the mirror are greatly improved. Some resonance effects have been noticed at frequencies above 1 kHz and these are being studied. No high voltage effects such as inter-actuator arcing were noted.

Results

The figure below shows the response of a 25mm diameter, 36 actuator mirror where all actuators are being simultaneously energized (focus mode.)



For comparison, operation under one atmosphere of air is also plotted, as well as one atmosphere of helium. Note that for optical corrector applications, the optical path difference correction is twice the deflection numbers shown.

What Can Deformable Mirrors Do?

- Correct Optical Aberrations
- Laser Beam Shaping
- Optical Image Enhancement

Deformable mirrors are revolutionizing laser and optical systems by replacing static components with dynamic optics. Deformable mirrors (DM) are adaptive optics with dynamic faces able to optimize or change the characteristics of reflected light for a specific application. With time-varying control, a DM can focus a beam at several different points at different times or it can replace a lens in an optical system. Deformable Mirrors can improve optical images in telescopes, cameras, and other imaging systems.

For further information and discussion about how deformable mirrors work and how they will solve your optical problems see the manuals for HVDD, Clarifi, and the application notes available on the Web.

http://www.agiloptics.com/AppNotes.htm

http://www.agiloptics.com/downloads.htm