

Metrology of Prototype Nano-laminate Deformable Mirrors

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Optics with small areal density will have broad applications in lightweight deployable optical systems such as large aperture space telescopes. Integrated actuation of nano-laminate (NL) optical surfaces can provide stand-alone membrane optics that can reach areal densities as low as 1 kg/m^2 . The objective of the project I am involved with is to evaluate the performance of these deformable mirrors (DM). The DM consists of a base layer upon which electrodes lay then a spring layer and finally a mirror layer on top; each layer is connected by posts. I used a laser profilometer to measure the relative displacement of the mirror layer in the rest position and then while actuated (by applying an electrical potential). The results I obtained from two different prototype designs will be presented. The measurements obtained show that the prototype deformable mirrors had an average mechanical stroke of 2.75 microns.