

# Bidirectional membrane deformable mirror

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We present a membrane electrostatic deformable mirror which can operate bidirectionally. The electrostatic actuation of membranes is a well known class of deformable mirrors. They became popular because of their properties of good optical power, limited power consumption, achromaticity, a good dynamic behavior and low cost. Nevertheless, their major limitation is the limited optical power which limits their use in some applications. Moreover, the electrostatic actuation is unidirectional allowing the membrane to be pulled, again limiting the optical power of the mirror.

We overcame these drawbacks with a unique mirror design that comprises actuators on both sides of the membrane. Moreover, the electrodes on the top side are conductive and transparent. We propose two different membrane mirror configurations which improve the typical performances: the first device has a transparent electrode on the top side[1] (see Fig.1) and a second device with electrodes transparent patterned in the top side active region. The advantages compared to the state of the art technique for electrostatic mirror are measured and presented. The operating wavelengths are from 300nm to the infrared region.

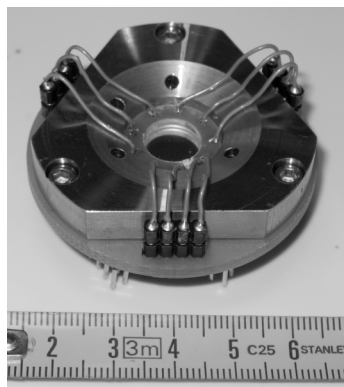


Fig 1: Prototype of bidirectional actuated membrane mirror.

## References

- [1] Stefano Bonora and Luca Poletto, *Push-pull membrane mirrors for adaptive optics*, Optics Express, Vol. 14, Issue 25, pp. 11935-11944

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