
Deformable Mirror for large telescopes: ALPAO technology roadmap

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Abstract

Adaptive optics (AO) systems are now used in nearly all large telescopes. Over the past years the specialization of wavefront correctors has dramatically increased. General-purpose deformable mirrors (DM) are now replaced by a full range of devices. Some are optimized for single-stage correction where large amplitude of deformation is necessary (typically more than $15\mu\text{m p2v}$). Extreme AO (XAO) will push the number of actuators (currently up to 128×128), the speed and the resolution (typically below 0.1nm). Multi conjugate AO systems (MCAO) also requires open-loop stability in various operating condition, including change of temperature and gravity vector.

This paper presents the technology roadmap defined by ALPAO to meet all these requirements, including embedded electronics, stroke optimization, new materials and improved step response.

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