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Layer-oriented adaptive optics for extended objects

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Abstract content :

A key feature of future adaptive-optical systems will be multi-conjugate (MCAO) correction. There are fundamentally two different approaches to MCAO – star-oriented and layer-oriented. Up to now, MCAO for extended objects uses exclusively a star-oriented approach, which is a natural extension of a conventional AO system. The field-size of a star-oriented MCAO system is however limited due to the difficulty involved in the tomographic reconstruction. We argue that extended objects – e.g. the retina and biological tissues – are ideal targets for layer-oriented MCAO systems because the wavefront distortions can be sensed continuously over the entire field-of-view. Interestingly, in a layer-oriented approach, the correction is improved with increasing field-sizes. A practical implementation, however, meets current technological limits in terms of detector sizes and read-out frequencies.

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