
Segmented pupils and wavefront reconstruction noise propagation for PWFS

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Abstract

In this contribution we analyze the process of wavefront reconstruction over a segmented pupil with particular attention to the case of the pyramid sensor. The study considers different ways of representing the wavefront over the segmented pupil, especially whether to use independent bases for each segment, or a global base capturing all the segments. Using numerical simulation, we analyze each case in terms of noise propagation through the wavefront reconstruction process and evaluate the influence of key parameters such as the pyramid wfs modulation and the wfs bandwidth. Finally the study briefly considers the conventional SH sensor and compares the behavior of the two sensors.

Keywords: wavefront reconstruction, pyramid sensor, differential piston

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