Pyramid Wavefront Sensors for the Detection of Small Phase discontinuities

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Abstract

Pyramid wavefront sensors are unique in their ability to detect signal across the gap between adjoining segments in a segmented mirror. This signal has been shown to be proportional to the phase discontinuity between the segments. In this work, we show how to calibrate a pyramid wavefront sensor with a spatial light modulator, and use the resulting calibration curve to detect small phase discontinuities. This work is performed in the context of the CaNaPy experiment, which aims to use laser guide stars for adaptive optics at visible wavelengths, and for which one of the experiments will be to carry out an on-sky test of detecting misalignments of segmented mirrors.

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