

Sub-Aperture Calibration for Adaptive Optics - overview

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Milestones Schedule

Milestones Schedule		
M.0 Kick Off	t0	
M.1 Simulator Ready	t0 + 3m	Completed
M.2 Simulation completed	t0 + 6m	Completed
M.3 Optical setup designed	t0 + 5m	Completed
M.4 Optical test ready	t0 + 10m	Completed
M.5 Test completed	t0 + 20m	On going
M.6 Project completed	t0 + 24m	To Do

Scope

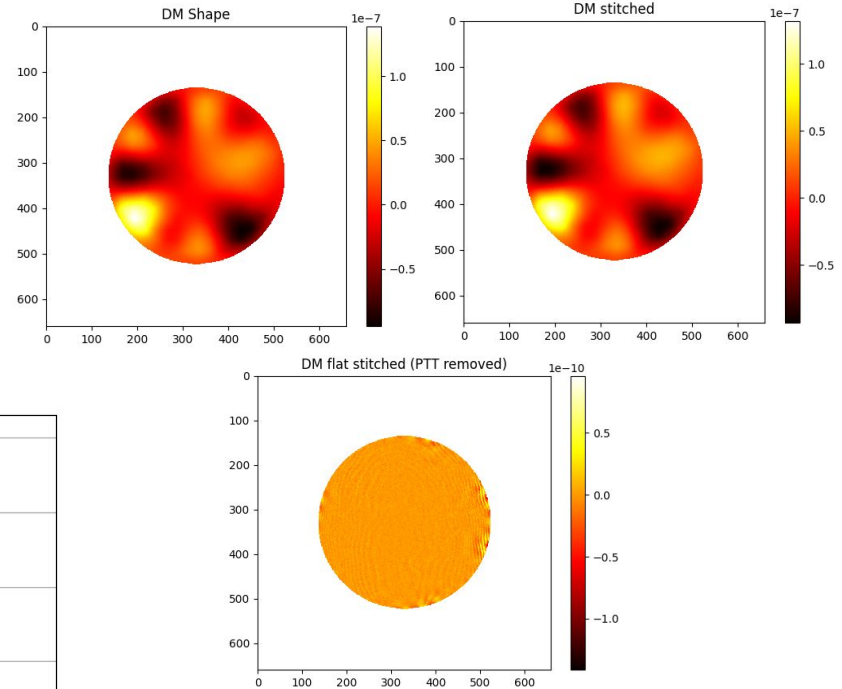
The aim of this project is to calibrate a DM by means of subaperture approach. The main goal is to reduce the optical test tower for future DM that are continuously increasing in size as well as the ground based telescopes

Budget

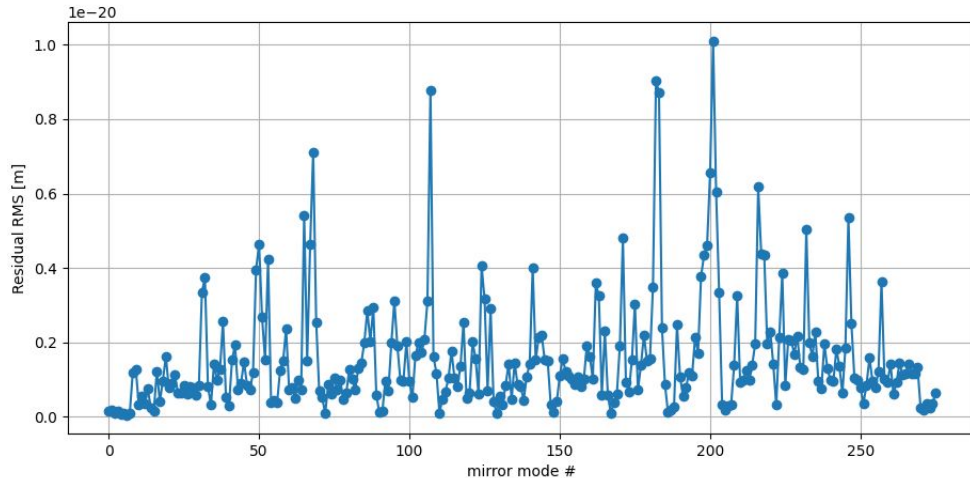
Budget		
Initial budget	19.7 k€	
Expense	9.0 k€	optomechanics

Simulation Results

The simulator foresees the complete simulation of a deformable mirror with 88 actuators. The codes allow to map the whole DM surface by mean of sub-apertures step. Contribution of misalignment and measurement noise are taken into account. The stitching process is then optimized and tested on the simulated DM's influence functions with very high accuracy and low residual error.



Rms Difference between retrieved and measured IFF



Optical test setup - preliminar results

The optical test setup is already designed, procured and mounted in OAA laboratory and is composed as follow:

1) fast acquisition interferometer with 1:1 optical relay to relocate the instrument pupil position; 2) ALPAO DM88 is the deformable mirror under test 3) motorized tip-tilt mirror and linear stages to perform the scan for the stitching data acquisition.

Preliminar measurement shows an inconsistency between common regions of different subaperture positions. This suggest a non good alignment between the scan axis direction and the reconstructed image reference system (i.e. the Interferometer CCD). An optical target will be used to evaluate the offset angle between the laboratory and interferometer reference systems in order to fine tune the stitching algorithm.

