

"Rolled edges and phasing of segmented telescopes"

To achieve the diffraction limit the segments in a segmented telescope must be correctly aligned to a fraction of a wavelength. This alignment is performed via optical measurements using starlight. We investigate the piston degree of freedom or phasing of the segments and the impact of rolled segment edges on the accuracy of the optical alignment. Three models for edges profiles are developed and fit to data from optic manufacturers. These profiles are then used along with a simplified model of a Shack-Hartmann optical sensor to determine their impact on phasing accuracy. The results can help estimate the residual phasing error and set requirements on segment polishing.