

Metrology for segmented optics

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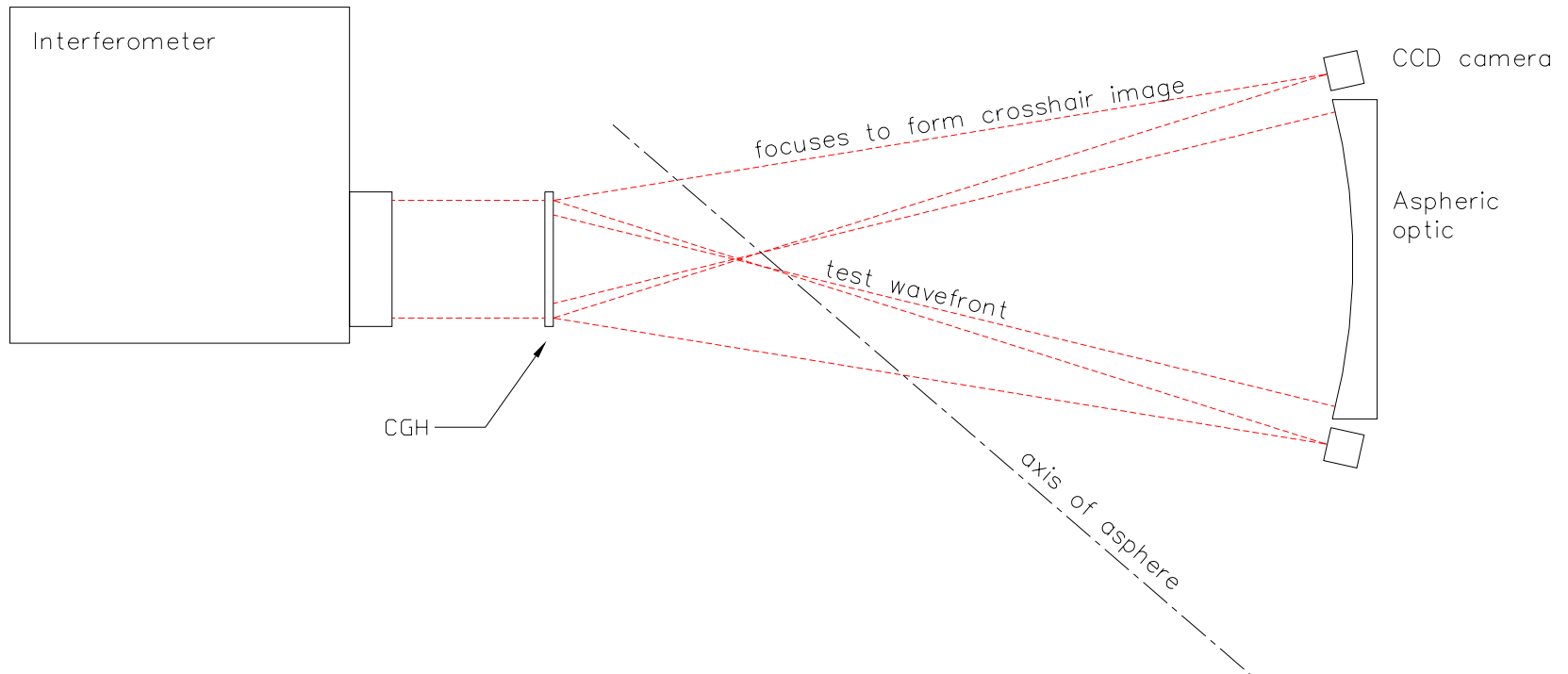
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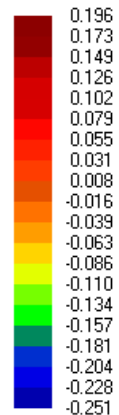
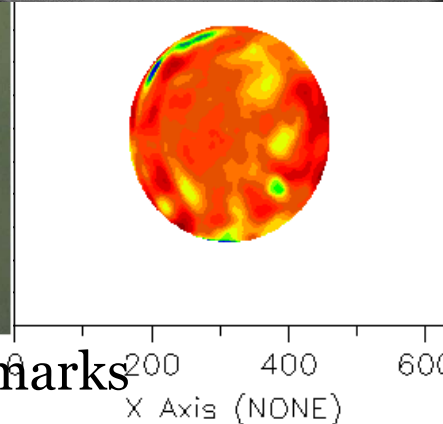
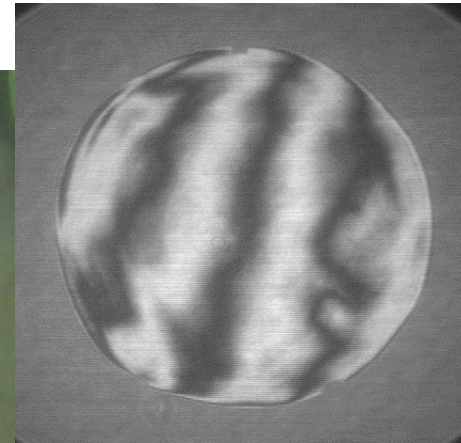
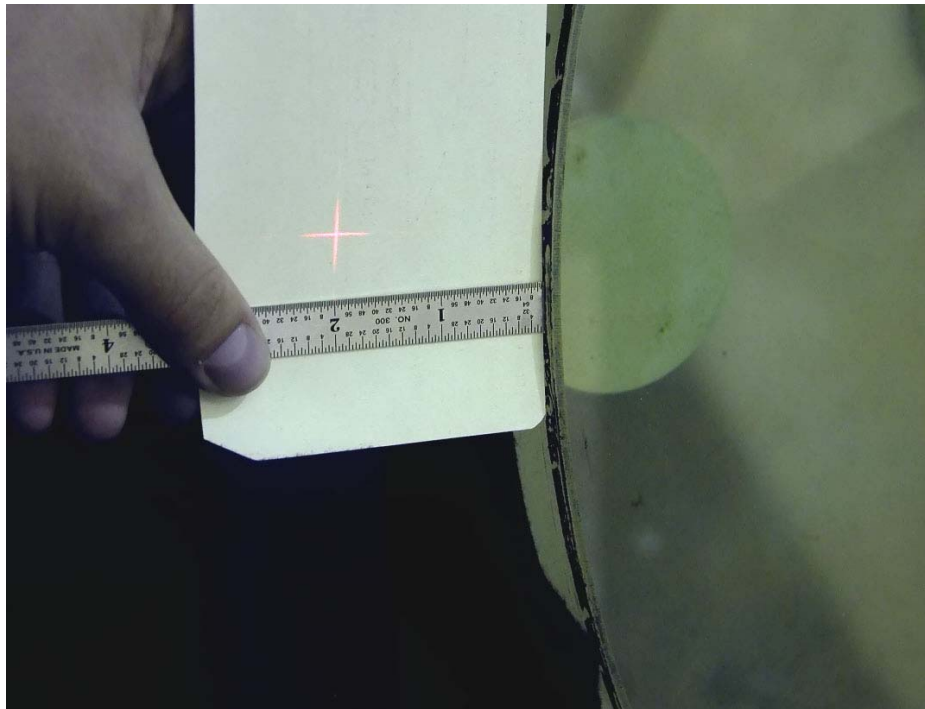
- Use of null lens, along with computer generated holograms for alignment
- Test plate with CGH (Feenix Pan)

CGH for alignment

- The basic idea – multiplex numerous holograms on a single substrate to provide both wavefront and alignment information.



CGH alignment of a 24-in off axis parabola (600-in ROC, 60 inches off axis)



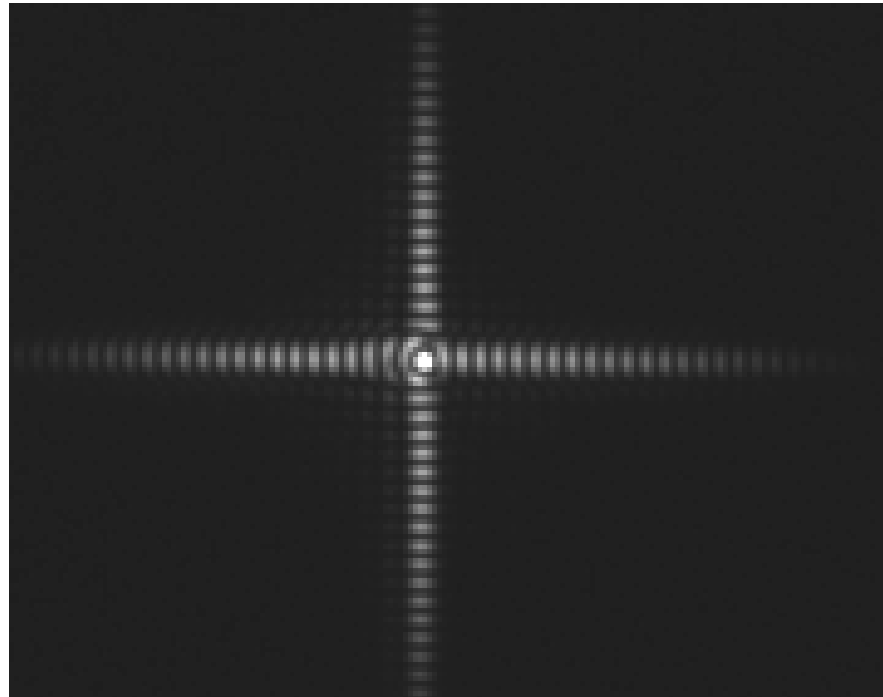
CGH null lens incorporates alignment marks

Easily align axis to 0.020" by eye

Range (FV) = 0.4478 waves, RMS = 0.0532 waves, Strehl = 0.8941
Analysis Aper: Pos[320, 240] Size[640, 480]

What limits the accuracy?

- In a controlled experiment, we used a CCD camera to provide measurements of fiducial locations to 10 microns. The limitation, our mechanical system for measuring the position of the camera.
- This image shows a CGH fiducial with 25 μm FWHM at a distance of 1.6 meters.



What next?

- Looking for funding to develop the technology
- Exploring other applications for CGH alignment:

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