

Notes from WFS Alignment discussion meeting 3/9/98

AOW/WFS/AJL/1.0/9/98/WFS alignment discussion

Version date: 4/9/98

wht-naomi-46

Present: SPW, MW, PTP, AJL

The overall WFS alignment concept is to get the mechanical axes correct, using pentaprism, micro-alignment telescope and measuring machine as appropriate. Then bring optics to the mechanical system.

(Note pupil is rotated by 90 in WFS from OMC because of the pickoff mirrors).

PTP proposed method for aligning pickoff by progressive scraping of 3point mount. This can work to sub-micron accuracy. Newport screws actually proposed do not usually perform as well as described in catalogue.

The component requiring '1/100th turn' alignment we were all concerned about is the top pick-off fold mirror.

Current spec gives 24um adjustment at lenslets. Allowing for the fact that we now have a movable DM, the real requirement is probably ~70um. 70um would also correspond to 0.2 arcsec in image, but should be repeatable.

Can we extend plate on which mirror is mounted vertically to increase lever arm? Does this block any access or cabling. or foul electronics?

This may not be necessary if we reduce spec to 7um (idea is that DM motion can take out the gross error if we allocate +/-0.5mm of its 2mm range to this).

Rotation of pick-off plate: needs invar mount but Tully is having trouble sourcing small amounts of invar.

Action: SPW to check if RGO have some spare invar.

Pick-off motion adjustment will be done by shims on its mounting. Shim baseline is 150mm, leading to shim requirement of ~25um.

Collimating lens. OK by standard techniques.

Filters are in collimated beam well away from camera entrance, so we cannot blank camera properly with filter wheel. Therefore it was confirmed that we need the electronic dark slide and must ensure CCD head box is light tight.

Ghosts: see notes from CDR. Need filters perpendicular to 2 armin to make ghosts fall onto image. It was agreed to try this rather than a big tilt.

Actions:

PTP to check ADC mount size and clearance: original lens was 25mm and cell inner diameter is 28mm. Change barrel to 25mm. (dwg 3205). Axial length of ADC barrel is 22mm, with 0.5deg wedge.

SPW: Check ghosting from ADC in one subap.

PTP: Check ADC mount - in CDR it looks like it is attached to bearing, which is peculiar, but may be OK in later drawings.

PTP: Check there is arrangement for shims to align ADC. Accuracy needs to be ± 23 arcmin.

Lenslets. An alignment jig is needed.

Actions.

PTP: Check individual rotation alignments (may be A1 v A1)

PTP: Check lenslet mounts for stress and stability.

PTP: Check that there are alignment tool drawings as these were supposedly in the A4 remit.

Do we need CCD with 15mm chip to help with alignment of lenslets?

The only external lens mount is for relay lens in camera, we mount all the other optics.

SPW prefers screw-in retainment of lenses over bonding.

Beamsplitter adjustment: kinematic mount with 3 ballended screws.

Critical alignment is with CCD and compensating plate as there is more tolerance in binned mode. Need 2um alignment of head, using micrometer. May need differential micrometer, but this may be achievable with normal micrometer.

Action on Ron Humphreys: What is the centroiding algorithm for 2CCD mode? Does it really allow us to relax tolerances in any dimension?

Calibration unit.

Currently there is no means to align pinhole to lens axis. What accuracy is needed? SPW guess 200um. Cal source overfills lenslet array.

Action PTP: Redesign WFS cal unit mount anyway as currently it is mounted on cover plate.

Alignment targets also ought to key directly to baseplate.

Action PTP: Check WFS hanging points are OK