

Document number and version: ICD/OPT/MW/1.0/03/98/ OMC to WFS

wht-naomi-71

Purpose and scope: This ICD defines the optical interface between the opto-mechanical chassis (OMC) and the wavefront sensor (WFS). It defines the co-ordinates of the focus of the input beam to the WFS, the f-number, pupil location and the field coverage.

Approved by ROE:

Date:

Approved by RGO:

Date:

Approved by PE: R.A. Humphreys

Date: 14 May 1998

The following co-ordinate system is used in accordance with ROE drawing number 00A10I.

Origin: The nominal position of the WHT Nasmyth focus (at 150 mm above GHRIL table).

+ x axis: A horizontal line from the origin to the left when looking away from the telescope. The line is perpendicular to the telescope optical axis.

+ y axis: Vertical line through and above the origin.

+ z axis: Horizontal line through the origin away from the telescope and parallel to the telescope optical axis.

Horizontal-plane (azimuth) angles, θ , are measured from the + z axis; clockwise angles are negative.

Vertical-plane (elevation) angles, ϕ , are measured from the x-z plane. Angles are positive above the axis and negative below.

The optical interface requirements are given below.

For the on-axis focus between the OMC and WFS the following co-ordinates apply:

$$x = 182.54 \text{ mm}$$

$$y = 0.00 \pm 0.8 \text{ mm}$$

$$z = 819.00 \text{ mm.}$$

$$\theta \text{ (horizontal angle of optical axis at interface)} = 158.62 \pm 0.02 \text{ degrees}$$

$$\phi \text{ (vertical angle of optical axis at interface)} = 0.00 \pm 0.02 \text{ degree}$$

The error in focus position in the x-z plane is ± 5 mm along the optical axis.

f/ratio: 17.05

Linear field size for 2.9 arcminutes in output space: 61 mm diameter.

Pupil position: The system is nominally telecentric at this focus.

Reference Zeemax file: naomi_opt.zmx

Document number and version: ICD/MEC/MW/1.0/03/98/ OMC to WFS

Purpose and scope: This ICD defines the mechanical interface between the opto-mechanical chassis (OMC) and the wavefront sensor (WFS).

Approved by ROE:

Date:

Approved by RGO:

Date:

Approved by PE: R.A. Humphreys

Date: 14 May 1998

There is no mechanical interface as such between the OMC and WFS in that the two subsystems will not physically contact one another. Neither subsystem must exceed the boundaries set by ROE drawing number 00A03L; this drawing defines the space allocations on the GHRIL table.

Document number and version: ICD/OPT/MW/2.0/03/98/ OMC to Science Instrument

Purpose and scope: This ICD defines the optical interface between the opto-mechanical chassis (OMC) and the science instrument. It defines the co-ordinates of the focus of the input beam to the WFS, the f-number, pupil location and the field coverage.

Approved by ROE:

Date:

Approved by RGO:

Date:

Approved by PE: R.A. Humphreys

Date: 14 May 1998

The following co-ordinate system is used in accordance with ROE drawing number 00A10I.

Origin: The nominal position of the WHT Nasmyth focus (at 150 mm above GHRIL table).

+ x axis: A horizontal line from the origin to the left when looking away from the telescope. The line is perpendicular to the telescope optical axis.

+ y axis: Vertical line through and above the origin.

+ z axis: Horizontal line through the origin away from the telescope and parallel to the telescope optical axis.

Horizontal-plane (azimuth) angles, θ , are measured from the + z axis; clockwise angles are negative.

Vertical-plane (elevation) angles, ϕ , are measured from the x-z plane. Angles are positive above the axis and negative below.

The optical interface requirements are given below.

For the on-axis focus between the OMC and the science instrument, the following co-ordinates apply:

$x = 186.16 \text{ mm}$

$y = 0.00 \pm 0.8 \text{ mm}$

$z = 1957.39 \text{ mm}.$

θ (horizontal angle of optical axis at interface) = 65.28 ± 0.02 degrees

ϕ (vertical angle of optical axis at interface) = 0.00 ± 0.02 degree

The error in focus position in the x-z plane is ± 5 mm along the optical axis.

Linear field size for a field of view of 41×41 arcsec: $13.65 \text{ mm} \times 13.65 \text{ mm}.$

f/ratio: 16.42

Pupil position: 1101 mm beyond the focus

Exit pupil size: 67.7 mm diameter

Reference Zeemax file: naomi_ir.zmx

Document number and version: ICD/OPT/MW/1.1/04/98/Telescope to OMC/NCU

Purpose and scope: This ICD defines the optical interface between the telescope and the opto-mechanical chassis (OMC). Information is also given that limits the space available for the Nasmyth Calibration Unit; this additional information was incorporated in this version at the request of Tom Gregory. It has been added to the end of this document. The ICD defines the co-ordinate frame, the f-number, pupil size and location, and the field coverage.

Approved by ROE: Approval of change required. Date:
Approved by ING: Incorporates change requested by T. Gregory. Date: 12 May 1998
Approved by PE: R. A. Humphreys Date: 14 May 1998

The optical axis and the position of the Nasmyth focus define the co-ordinate frame used as a reference for NAOMI and by definition the co-ordinates of the Nasmyth focus are free of errors. Note that the tolerances for positioning NAOMI with respect to the Nasmyth focus depend in part on the alignment of the GHRIL optical bench to the Nasmyth focus; these tolerances are covered in ICD/OPT/RAH/1.0/05/98/ GHRIL bench to telescope.

The following co-ordinate system is provided primarily for information purposes.

Origin: The nominal position of the WHT Nasmyth focus (at 150 mm above GHRIL table).

+ x axis: A horizontal line from the origin to the left when looking away from the telescope. The line is perpendicular to the telescope optical axis.

+ y axis: Vertical line through and above the origin.

+ z axis: Horizontal line through the origin away from the telescope and parallel to the telescope optical axis.

Horizontal-plane (azimuth) angles, θ , are measured from the + z axis; clockwise angles are negative.

Vertical-plane (elevation) angles, ϕ , are measured from the x-z plane. Angles are positive above the axis and negative below.

The optical interface requirements are given below.

For the on-axis focus between the telescope and the OMC, the following co-ordinates apply:

$x = 0.00 \text{ mm}$ $y = 0.00 \text{ mm}$ $z = 0.00 \text{ mm}$.

θ (horizontal angle of optical axis at interface) = 0 degrees

ϕ (vertical angle of optical axis at interface) = 0 degrees

Linear field size for a field of view of 2.9 arcmin is 38.64 mm diameter.

f/ratio: 10.95

Exit pupil position: 12.850 m in front of the Nasmyth focus

Exit pupil size: 1.176 m diameter

Reference Zeemax file: wht.zmx

The following information is included at the request of Tom Gregory of the ING. This information is based on his measurements and it limits the space available for the NCU.

1. Distance from edge of the GHRIL table to the IR Image Derotator mounting flange = 445 mm.
2. Length of IR Image Derotator = 311 mm
3. Clearance between mounted IR Image Derotator and table edge = 134 mm.