Isaac Newton Group

Requirements for a NAOMI Status Mimic

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Chapter 1 Introduction

This document outlines the requirements for a MIMIC for the NAOMI system which will provide graphically, an overview of the NAOMI hardware system and the current state of the light path through the instrumentation.

Chapter 2 Requirements

2.1 The MIMIC Overview Display

The NAOMI overview MIMIC display will look as follows when displayed upon the OCS display.

The use of italics in the following sections refer to components in the overview MIMIC diagram displayed below.
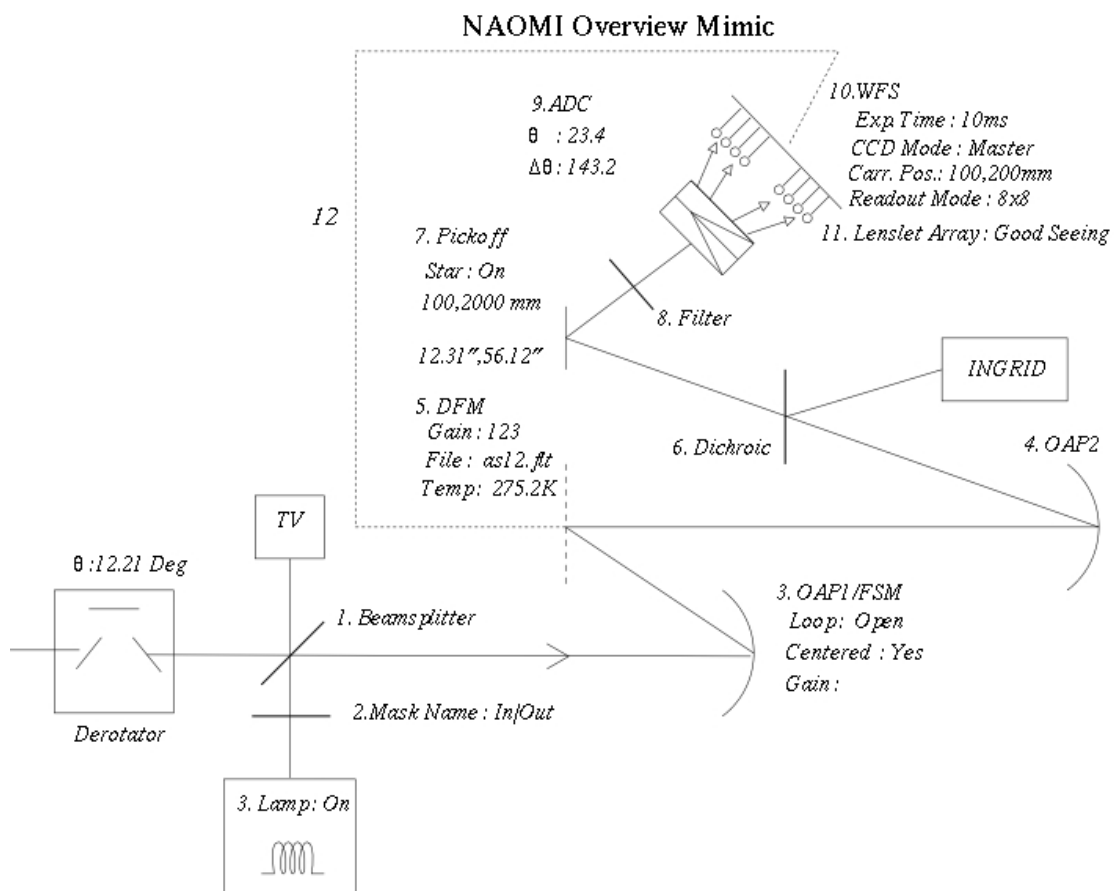
2.2 Nasmyth Derotator Angle

The drawing object displaying the *Derotator* will be used to display the current angle è in degrees of the Nasmyth derotator. This value will be extracted from the TCS.

2.3 Beamsplitter

The *Beamsplitter* may be positioned either *in* or *out* of the optical train. When positioned in the *in* position, the optical path will be graphically shown to reach the *TV* <u>otherwise</u> the light path will <u>not</u> reach the TV.

The *beamsplitter* will be displayed graphically by a diagonal line which intersects the light path when in the *in* position.

The *Beamsplitter* <u>must</u> be in the *in* position in order for light originating from the *Calibration Lamp* to contribute to the optical path.

The *Beamsplitter* is labelled as item [1] on the MIMIC diagram.

2.4 Focal Plane *Mask*

The *Focal Plane Mask* may be in either the *in* or *out* position. This will be represented by a horizontal line inserted into the light path. There needs to be the provision to be able to specify the name of a label associated with the *mask.*

The position of the *Focal Plane Mask* <u>does not</u> affect the *Calibration Lamp's* ability to contribute light to the optical path.

The *Focal Plane Mask* is labelled as item [2] on the MIMIC diagram.

2.5 OAP1/Fast Steering Mirror

There are a number of status values associated with the *Fast Steering Mirror* (*FSM)* or *Off Axis Parabola 1 (OAP1)* these are outlined in the following sections.

The *Fast Steering Mirror* is labelled as item [3] on the MIMIC diagram.

2.5.1 The *Loop* Status

The *Loop* status will be set to either *Open* or *Closed* depending upon the current state of the AO loop. This information will have it's origins in the NAOMI EPM.

2.5.2 Gain

This will display the current *Gain* setting associated with the *Fast Steering Mirror.*

2.5.3 Centred

This status value will be set to either *Yes* or *No* depending on whether or not the *Fast Steering Mirror* is centred or not.

When the *FSM* is centred, additional information will be displayed which will indicate the x and y tilt position of the *FSM* <u>only</u> when the AO loop is closed.

2.6 The *OAP2*

The *OAP2* is a static entity which does not dynamically modify the optical path in anyway.

The *OAP2* is labelled as item [4] on the MIMIC diagram

2.7 Deformable Mirror (*DFM*)

There will be a number of status values associated with the *Deformable Mirror* (*DFM).*

The *Deformable Mirror* is labelled as item [5] on the MIMIC diagram.

Note : The DFM will be displayed diagrammatically by a vertical dashed line consisting of 8 dashes with a gap equal to two dashes located in the centre of the line.

2.7.1 The *Gain* Setting

This will display the current *Gain* setting associated with the *DFM*.

2.7.2 The *Mirror Flat Configuration* File

This is the name of the currently loaded *Mirror Flat* configuration file. This information will be extracted from the EPM.

2.7.3 The *DFM* Temperature

This status value will display the temperature of the *DFM* in degrees kelvin.

2.8 The *Dichroic*

This will display the name of the current *Dichroic* which in use. The *Dichroic* will be a 10 position cassette which maps onto modifiable, user specified logical values representing the names of the actual dichroics physically residing in the cassette.

The *Dichroic* is labelled as item [6] on the MIMIC diagram.

2.9 The *Pickoff* Mechanism

There are a number of status items associated with the *Wave Front Sensor Pickoff* mechanism to be displayed upon the MIMIC.

The *Pickoff* is labelled as item [7] on the MIMIC diagram.

2.9.1 The *Artificial Star* Status

The *Artificial Star* status will be used to indicate whether or not an *artificial star* is being provided through the use of a calibration lamp.

2.9.2 The *Pickoff Position (microns)*

The actual position of the *Pickoff Probe* will be displayed in engineering units (*microns*).

2.9.3 The *Pickoff Position* (arcsec)

The actual position of the *Pickoff Probe* will be displayed in *arcsec*.

2.10 The *Wavefront Sensor Filter*

This will be the name of the *Filter* currently deployed by the *Wave Front Sensor*. The actual filter names displayed will be user configurable.

The *Wavefront Sensor Filter* is labelled as item [8] on the MIMIC diagram.

2.11 The NAOMI *ADC*

The current settings of NAOMI's *Atmospheric Dispersion Corrector* (*ADC)* will be displayed. There will be two status values associated with the *ADC*; the *vector angle* and *magnitude angle*.

The *ADC* is labelled as item [9] on the MIMIC diagram.

2.11.1 Vector Angle èT

A four digit real number indicating the *vector* angle in degrees.

2.11.2 Magnitude Angle Äè

A four digit real number indicating the *magnitude* angle in degrees.

2.12 The *Wave Front Sensor*

There are a number of status items associated with the *Wave Front Sensor*. These are outlined in the following subsections.

The *Wavefront Sensor* is labelled as item [10] on the MIMIC diagram.

2.12.1 The *WFS Exposure Time*

This is the exposure time in *milliseconds* for the WFS camera.

2.12.2 The *WFS CCD Mode*

The WFS CCD Mode may be set to either *Slave* or *Master.*

2.12.3 The *WFS Carriage Position*

This is the actual position of the *WFS Carriage Position* displayed in *mm.*

The source of this information will be found in the NAOMI mechanism EPICS system.

2.12.4 The *WFS CCD Readout Mode*

This status item indicates the *current read out mode* of the WFS CCD. There are a number of different readout modes; *8x8, 4x4* and *quad cell*.

The labels will associated with each readout mode will be user configurable.

2.13 The *Lenslet Array*

This status item will be used to reflect the *Lenslet Array* currently deployed. The labels associated with the various *lenslet arrays* will be user configurable but in the first instance, they will be set to one of the following; *Good Seeing, Bad Seeing, Faint Star* or *Doublet.*

The *Lenslet Array* is labelled as item [11] on the MIMIC diagram.

2.14 The Light Path

There are no instrument components which can obstruct the optical path through the instrumentation. It can be assumed that providing light enters the NAOMI system through the *derotator,* light will ultimately reach the science detector and the *WFS.*

2.15 The WFS Control Path

When the AO loop is <u>closed</u>, a control path will displayed upon the MIMIC between the *WFS* and the *DFM.* This is labelled as item [12] on the MIMIC diagram and will be represented by a dashed green line.