

2012A OT Major Changes

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2012A OT Major Changes

- “Smart” GCAL calibration lookup
- Automatic guide star selection
 - GMOS
 - GSAOI/GeMS

Automatic GCAL settings (smartGCAL)

- GCAL configuration and exposure tables integrated for:
 - GMOS-N/S
 - GNIRS
 - NIFS
 - NIRI (imaging flats only)

Cal Unit Smart Baseline Night Component
This will insert the night baseline calibration images into the sequence.

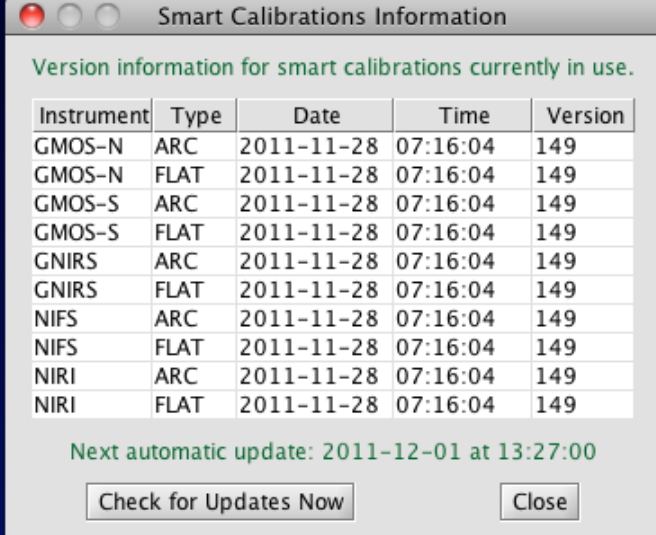
Class:

Data Label	Class	Cal Coadds	Cal Diffuser	Cal Exposure Time	Cal Filter	Cal Lamp	Cal Shutte
2012A-test-3-001	Nighttime Partner Calibration	1	IR	5.0	none	Ar arc	Closed
2012A-test-3-002	Nighttime Partner Calibration	1	IR	5.0	none	Ar arc	Closed
2012A-test-3-003	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-004	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-005	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-006	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-007	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open

Static Configuration

Instrument scientists maintain the GCAL tables and can update them any time.

- The OT is shipped with the latest set of tables, but automatically checks for updates once a day
- You may view version and last modified date of tables and manually check for updates
 - Help-> Smart Calibrations Info...
 - New tables will be downloaded if available



Smart Calibrations Information

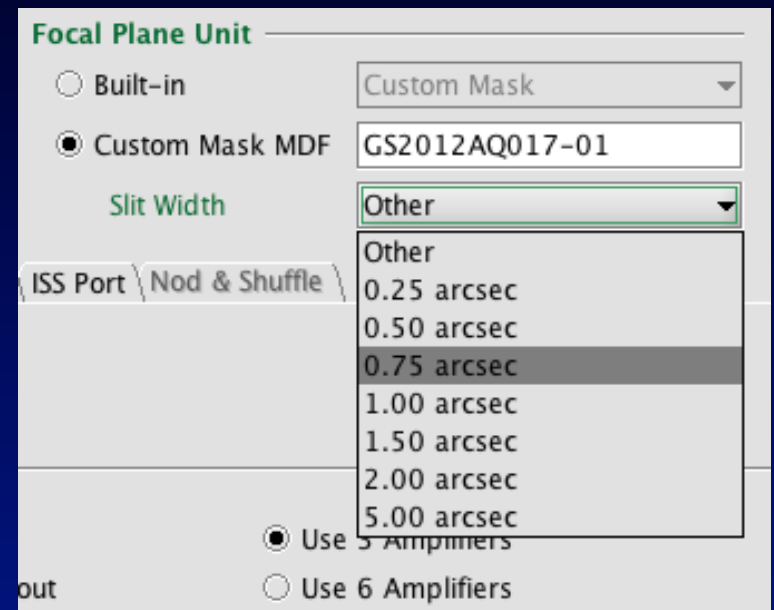
Version information for smart calibrations currently in use.

Instrument	Type	Date	Time	Version
GMOS-N	ARC	2011-11-28	07:16:04	149
GMOS-N	FLAT	2011-11-28	07:16:04	149
GMOS-S	ARC	2011-11-28	07:16:04	149
GMOS-S	FLAT	2011-11-28	07:16:04	149
GNIRS	ARC	2011-11-28	07:16:04	149
GNIRS	FLAT	2011-11-28	07:16:04	149
NIFS	ARC	2011-11-28	07:16:04	149
NIFS	FLAT	2011-11-28	07:16:04	149
NIRI	ARC	2011-11-28	07:16:04	149
NIRI	FLAT	2011-11-28	07:16:04	149

Next automatic update: 2011-12-01 at 13:27:00

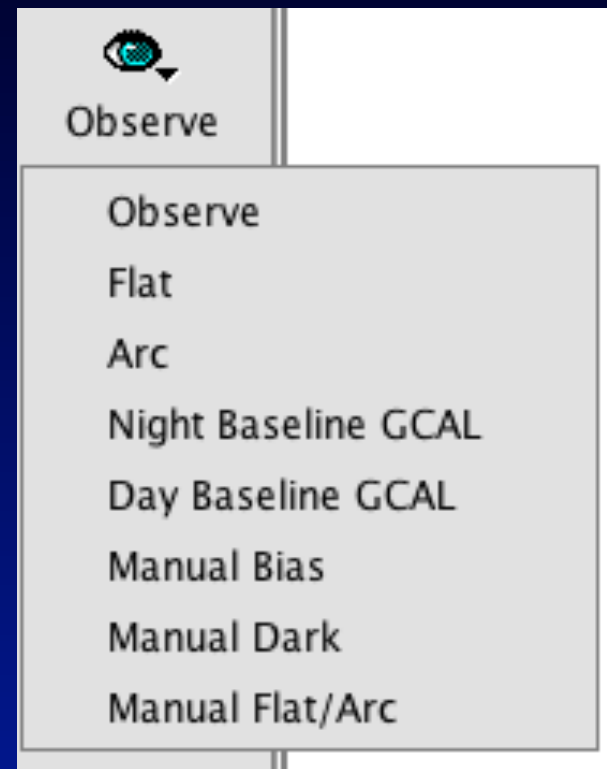
GMOS MOS slit width must be set manually for smartCALs to work

- New Slit Width menu below the Custom Mask MDF entry box in the GMOS instrument components
- Select the standard slit width closest to the widths of the slits in the mask
 - If slit size is in-between, selecting a slightly wider slit size will ensure that flats will not saturate
- We will work on having the OT read the slit width from the MDF file



SmartGCAL Nodes

- Flat
- Arc
- Night Baseline GCAL
- Smart Day Baseline GCAL
- “Baseline” defined in configuration tables



SmartGCAL Nodes

- Flat/Arc “smart” nodes
 - Creates flat(s) for the current configuration
 - If night basecal then class=partnerCal else class=programCal
 - Class can be set manually

This component contains the sequence of operations.

Title: Sequence

Data Label	Class	Expos
-001	Science	85.0
-002	Nighttime Program Calibration	5.3
-003	Nighttime Program Calibration	5.3
-004	Nighttime Program Calibration	5.3
-005	Nighttime Program Calibration	5.3
-006	Nighttime Program Calibration	5.3
-007	Nighttime Program Calibration	5.3
-008	Nighttime Program Calibration	5.3
-009	Nighttime Program Calibration	5.3
-010	Nighttime Program Calibration	5.3
-011	Nighttime Program Calibration	5.3
-012	Nighttime Partner Calibration	30.0

Base Sequence Component

This component contains the sequence of operations that gen

Title: Sequence

Data Label	Class	Exposure Time
-001	Science	300.0
-002	Nighttime Partner Calibration	3.0
-003	Nighttime Program Calibration	20.0

SmartGCAL Nodes

- Night Baseline GCAL
 - Selects/creates arcs and flat observes if night baseline calibration
 - Class=Nighttime Partner Calibration

Cal Unit Smart Baseline Night Component

This will insert the night baseline calibration images into the sequence.

Class

Data Label	Class	Cal Coadds	Cal Diffuser	Cal Exposure Time	Cal Filter	Cal Lamp	Cal Shutte
2012A-test-3-001	Nighttime Partner Calibration	1	IR	5.0	none	Ar arc	Closed
2012A-test-3-002	Nighttime Partner Calibration	1	IR	5.0	none	Ar arc	Closed
2012A-test-3-003	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-004	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-005	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-006	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open
2012A-test-3-007	Nighttime Partner Calibration	1	IR	5.0	NIR balance	IR grey body - high	Open

Static Configuration

SmartGCAL Nodes

- Day Baseline GCAL
 - Selects/creates arcs and flat observes if day baseline calibration
 - Class=Daytime Calibration

Science Program

- [1] GMOS-N Observation
- [2] NIFS Observation
- [3] GNIRS Observation
- [4] GMOS-S Day Calibration
 - Observing Conditions
 - RA: 00:00:00.000 Dec: 00:0
 - GMOS-S
 - Sequence
 - Day Baseline GCAL

This will insert the day baseline calibration images into the sequence.

Class

Data Label	Class	Cal Coadds	Cal Diffuser	Cal Exposure Time	Cal Filter	Cal Lamp	Cal Shutter
-001	Daytime Calibration	1	visible	2.0	none	CuAr arc	Closed

SmartGCAL - Other features

- Observation classes can be changed from the defaults using the Class menu
- Can see full sequence context

Class Automatic

Cal Filter	Cal Lamp	Cal Shutte	Static Configu
one	Ar arc	Closed	
one	Ar arc	Closed	
R balance	IR grey body - high	Open	
R balance	IR grey body - high	Open	

This will insert automatically configured flat calibrations into the sequence.

Configure Manually

Class Automatic

Data Label	Class	Exposure Time	Coadds	Disperser Lambda	Observing Wavelength	Cal Coadds	Cal Diffuser	Static Configuration
-001	Science	300.0		450.0	0.450			
-002	Nighttime Partner Calibration	3.0	1	450.0	0.450	1	visible	
-003	Nighttime Program Calibration	20.0	1	450.0	0.450	1	visible	
-004	Science	300.0	1	650.0	0.650			
-005	Nighttime Partner Calibration	3.0	1	650.0	0.650	1	visible	
-006	Nighttime Program Calibration	20.0	1	650.0	0.650	1	visible	

Show full execution sequence

SmartGCAL - Errors

An error message appears if a configuration is not supported

The screenshot displays the SmartGCAL configuration interface. On the left, a tree view shows the 'Science Program' with several observation steps. The 'Sequence' step is expanded, showing 'Observe (1X)' and 'Flat'. The main panel shows a configuration for dataset '-002' with a 'Class' of 'Science'. A red error message at the bottom states: 'Smart calibration mapping for dataset -002 is not defined. Please use the manual GCal calibration component instead.' A 'Static Configuration' label is visible on the right side of the main panel.

Science Program

- [1] GMOS-N Observation
- [2] NIFS Observation
- [3] GNIRS - night baseline
- [5] GNIRS - convert to manual
- [4] GMOS-S Day Calibration
- [6] Flamingos2 Observation
 - Observing Conditions
 - RA: 00:00:00.000 Dec: 00:00:00.000
 - Flamingos2
 - Sequence
 - Observe (1X)
 - Flat

This will insert automatically configured flat calibrations into the sequence.

Class

Data Label	Class
-002	Science

Static Configuration

Smart calibration mapping for dataset -002 is not defined. Please use the manual GCal calibration component instead.

Show full execution sequence

Configure manually option will convert a smart node to manual node(s)

Science Program

- [1] GMOS-N Observation
- [2] NIFS Observation
- [3] GNIRS - night baseline
 - Observing Conditions
 - RA: 00:00:00.000 Dec: 00:0
 - GNIRS
 - Sequence
 - Observe (1X)
 - Night Baseline GCAL
- [5] GNIRS - convert to manual
- [4] GMOS-S Day Calibration

This will insert the night baseline calibration images into the sequence.

Configure Manually Class Automatic

Data Label	Class	Exposure Time	Cal Coadds	Cal Diffuser	Cal Exposure Time	Cal Filter	Cal Lamp
-002	Nighttime Partner Calibration	5.0	1	IR	5.0	none	Ar arc
-003	Nighttime Partner Calibration	5.0	1	IR	5.0	none	Ar arc
-004	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-005	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-006	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-007	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-008	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi

Static Configuration

becomes

Science Program

- [1] GMOS-N Observation
- [2] NIFS Observation
- [3] GNIRS - night baseline
- [5] GNIRS - convert to manual
 - Observing Conditions
 - RA: 00:00:00.000 Dec: 00:0
 - GNIRS
 - Sequence
 - Observe (1X)
 - Manual Arc: Ar arc (2X)
 - Manual Flat: IR grey body - hi
 - [4] GMOS-S Day Calibration

This component contains the sequence of operations that generates the observation science data.

Title Sequence

Sequence \ Timeline \

Data Label	Class	Exposure Time	Cal Coadds	Cal Diffuser	Cal Exposure Time	Cal Filter	Cal Lamp
-001	Science	17.0					
-002	Nighttime Partner Calibration	5.0	1	IR	5.0	none	Ar arc
-003	Nighttime Partner Calibration	5.0	1	IR	5.0	none	Ar arc
-004	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-005	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-006	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-007	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi
-008	Nighttime Partner Calibration	7.0	1	IR	7.0	NIR balance	IR grey body - hi

Static Configuration

Considerations of Configure Manually

- If smart configuration undefined, default Manual Arc/Flat node created
- Important use case is to change the number of observes
- Can be used to tweak settings, but...
 - Beware if the node is in an *iterator*, the settings of the first iterator step will be used!
 - As now, be very careful of editing configurations once the observation is Ongoing so as to not change the configurations of observed steps

Bonus features!

- Readmode for GNIRS, NIFS, NIRI set automatically for cal exposures and shown in sequence table
- Text sequence view and timeline merged
 - Planned time and timeline calculations now the same

Bonus features!

The screenshot displays the Science Program Editor interface. The main window is titled "Science Program Editor - Science Program". The menu bar includes File, Edit, View, Go, and Help. The toolbar contains icons for Open, Back, Forward, Cut, Copy, Paste, Plot, Image, Libraries, and Queue. The left sidebar shows a tree view of the Science Program structure, including Observation, Group, Note, Component, Iterator, and Observe. The main content area is titled "Base Sequence Component" and contains a description: "This component contains the sequence of operations that generates the observation science data." The "Title" field is set to "Sequence". Below this, there is a "Sequence" tab and a "Timeline" view. The timeline shows a sequence of operations: Setup (6), -001 (7.18), -002 (7.18), and -003 (7.18). The total duration is 00:27:33. The main configuration area lists various parameters for the sequence, including dtaXOffset, filter, fpu, fpuMode, gainChoice, gainSetting, instrument, mosPreimaging, observingWavelength, port, posAngle, and stageMode. Below the parameters, there are two observation entries for -002 and -003, each with SCI test OBJECT and a duration of 300.0s. The -002 entry lists instrument filter r_G0326 and observingWavelength 0.630. The -003 entry lists instrument filter i_G0327. At the bottom right, there are buttons for Print, Export to XML, Save, and Close.

Base Sequence Component
This component contains the sequence of operations that generates the observation science data.

Title: Sequence

Sequence | Timeline

Setup -001 -002 -003

6 7.18 7.18 7.18

Total 00:27:33

dtaXOffset	0
filter	g_G0325
fpu	None
fpuMode	Builtin
gainChoice	Low
gainSetting	2
instrument	GMOS-S
mosPreimaging	No
observingWavelength	0.475
port	side-looking
posAngle	0.0
stageMode	Follow in XYZ(focus)

-002	SCI	test	OBJECT	300.0s
		Instrument		
		filter	r_G0326	
		observingWavelength	0.630	

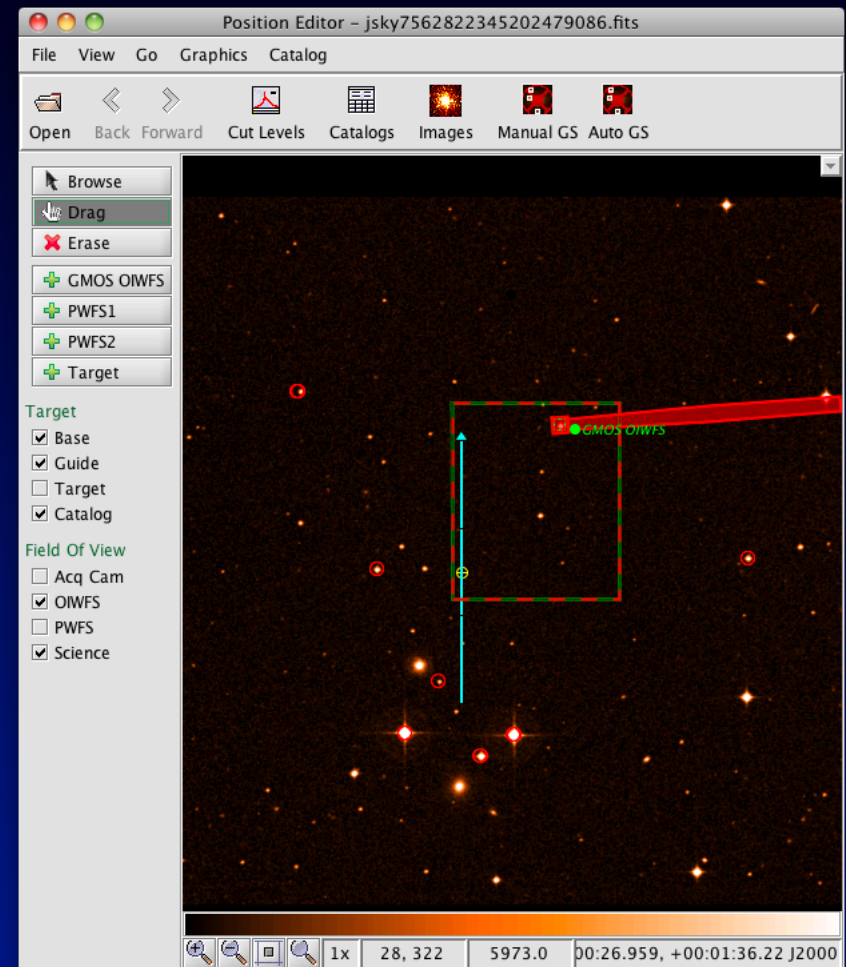
-003	SCI	test	OBJECT	300.0s
		Instrument		
		filter	i_G0327	

Print ... Export to XML ...

Save Close

Automated guide star selection for GMOS

- Define target
- Set conditions
 - Limiting magnitudes depend on conditions
- Click “Auto GS” in target component or TPE
- The brightest available UCAC3 guide star is selected
- Other candidates are shown



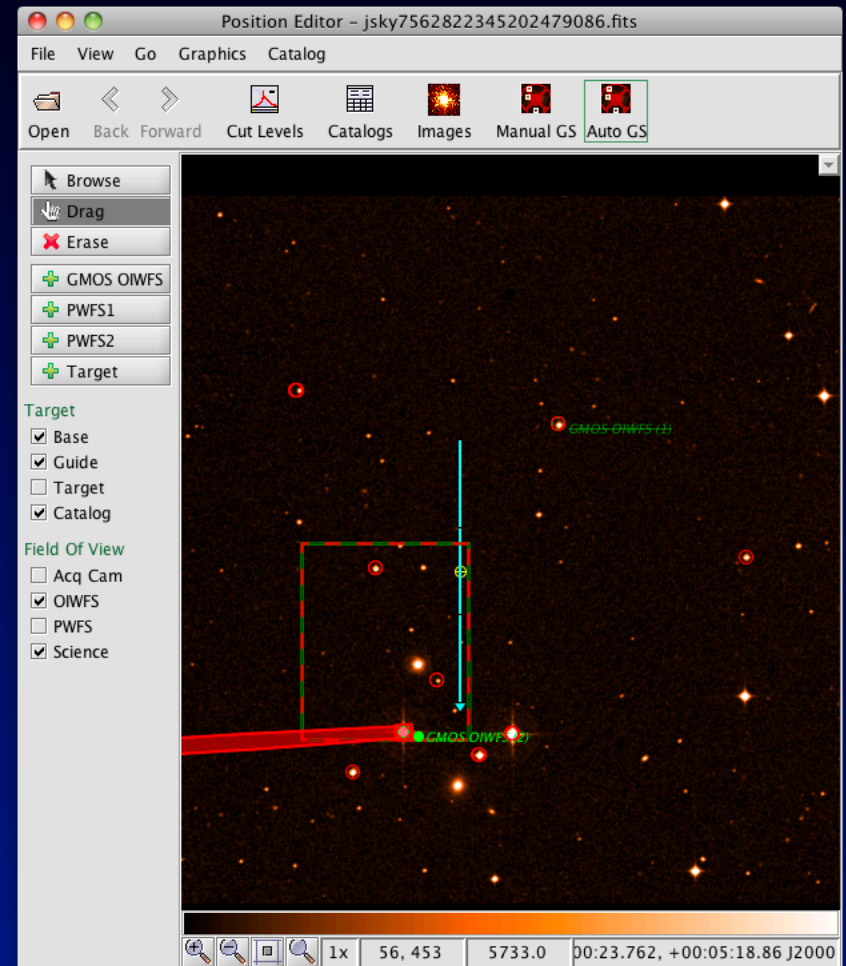
GMOS automated guide stars - PA options

- Can allow a +/-180 degree rotation via setting in the GMOS component

Position Angle

0 deg E of N

Allow $\pm 180^\circ$ change for guide star selection



GMOS automated guide star algorithm provides user feedback

- User is told if a brighter guide star is available under better conditions
- The user is informed if a brighter guide star is available at PA+/-180 and the option is not checked (can opt out of message)

Other OT changes

- Non-sidereal date calendar size and month bug
- Phase 2 checks with GMOS exposure time recommendations
- Fix GMOS gain settings in multiple sequences
- Update GNIRS read noise display
- Add initial GPI instrument component
- Email notifications will be sent when when observation status changes in SV programs