

Wavefront Control System Calibration Procedure S-AB-P-130 Rev B

Intent:

This procedure creates a response matrix for the WCS. The response matrix is a critical piece to algorithms for controlling the wavefront of the EP system. This procedure should be executed prior to the shots, after the alignment of the beamline and at the request of system science or PI.

Prerequisites:

- WCS software startup has been performed per S-AB-P-127
- IRAT Laser startup has been performed per S-AB-P-040
- Beam is aligned, from the IRAT to the IRDP

Startup Procedure:

1	On the WCS GUI, open “options and parameters” (Screw Driver and Wrench icon).	<input type="checkbox"/>
<hr/>		
2	Select the Calibration tab.	<input type="checkbox"/>
<hr/>		
Browse to, then select the most recent correction “Flat File” which will be located in”		
3	<i>/u/epbl/WCS/Directory/Corrections/YYYYMMDD_HHMM.dat</i>	<input type="checkbox"/>
<i>Directory</i> is listed in the table at the end of the procedure.		
<hr/>		
Create a new folder for the “Calibration Data Save Directory” with today's date and time using this format:		
4	<i>/u/epbl/WCS/Directory/Calibrations/YYYYMMDD_HHMM</i>	<input type="checkbox"/>
<i>Directory</i> is listed in the table at the end of the procedure.		
<hr/>		
5	Select the Shack-Hartmann Sensor tab	<input type="checkbox"/>
<hr/>		
Browse to, then select the most recent ROI Pattern file located in:		
6	<i>/u/epbl/WCS/Directory/ROIs/ YYYYMMDD_HHMM.dat</i>	<input type="checkbox"/>
<i>Directory</i> is listed for each WFS in the table at the end of the procedure.		
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If the SHSSGUI is not running for this WFS, start the SHSS GUI by opening a new terminal window and typing:

7 **startSHSSGUI**

ID is listed for each WCS in the table at the end of the procedure.


Change the exposure time until all 77 spot are visible.

- The threshold should be set to 20 counts.
- 8 • Note: Click *Apply* after every attempt in order for the changes to take effect.


Click *Acquire Image* between attempts to set the exposure.

Repeat this empirical process until the edge spots are clearly visible.

9 In the Shack-Hartmann Sensor tab enter the exposure time from step 8 and click the *Apply* button.

10 Click on the calipers button  to display the screen that has an array of hexagons with embedded voltages (ie.: 92.64V) and circles.

11 Verify with the ALT that no personal are working around the beam and inform them that you are about to start the WCS Calibration.

Click the two gears button  (the start algorithm button). The WCS state window should read '*running*'. The hexagons and circles will start changing color (a light blue); additionally the voltages will start changing.

- 12 • The calibration is complete when all of the hexagons and circles turn white and the WCS state window says '*stopped*'.

Note: In case of an error during or after calibration, resolve the problem or contact System Science or an expert user.

(End of Procedure)

WCS

ID	DM Location	Directory	WFS Location	Computer Name
1	Beamline 1 Cavity	BL1	Beamline 1 IRDP	trinculo
2	Beamline 2 Cavity	BL2	Beamline 2 IRDP	galatea
3	Beamline 3 Cavity	BL3	Beamline 3 IRDP	himalia
4	Beamline 4 Cavity	BL4	Beamline 4 IRDP	despina
5	Upper Compressor	UC	Upper Compressor SPDP	lysithea
6	Lower Compressor	LC	Lower Compressor SPDP	thalassa
7	NA	PAD	PAD	TBD

Document Release:

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