

March 5

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Installing and aligning FM1. Back mirror did not mount properly in first go, but Ken/Todd has made adjustments to mount.

Calibration bench was raised (on legs) ~2cm to provide extra range on motors and compensate for missing chief X-ray axis → 5mm.

RMD aligned with scope:
height ok (black mark on back of RMD)
center of hole to left of white M17 = -153600

Optical alignment declared done.

Final alignment

M1 = -3300

Az = -9.24472

M2 = 4565

Ee = -2.69833

M3 = 259000

M4 = 25900

M5 = 25900

M6 = 27740

Rest = 0

Move RMD to center of beam
M17 = -160500

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M2 = 4565
M6 = 27740

5 Move Roll to 0

SETPOS #3 0

SETPOS 3 30000

MOVE 3 30000 → No change in M3

10 SETPOS 3 60000 → No movement, but value of M3 updated to 60000

SETPOS 3 90000

M3 120000

M3 150000

M3 180000

15 M3 210000

Repeating motor movement in yaw to check how it moves

20 First run # 75036 - 75046

Even this demonstrates very poor ~~per~~ performance (but much better!)

25 Move to best determined AZ & EL

@ M3 = 259000 Run 75047

30 AZ = +9 IS = AZ = +10.24
EL = -2.79 EP = -2.93

M1 = -3300

M2 = 4563

M3 = 259000

M4 = 25900

M5 = 25900

M6 = 27681

AZ = 15.81
EE = -2.84

pitchyaw 41

(pitchyaw 40 unusable)

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Need to attach xls-file: FMI.xls

BMD measurements:

- Pitchyaw
- precession without correcting AZ & EL
- " " with " " "
- Full flood, scan in X, full E-range (ghosts)

We tried to put on plate for binocular measurements, but washers on spider are in the way

Used lead ~~p~~ stripes for now.

Ball position to mount binocular measurement
 M3 = 49000
 (See run # 75082)

Go back to X-scan position
 M3 = -101000
 U = 100 kVp
 I = 0.2 mA

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Exercising m2 after lubrication

Run# 75091 - 75096 (steps of 20, three negative, three positive)

Run# 75097 - 75102 (repeat)

- 75114 (repeat)

- 75122 (steps of 2)

- 75128 (step of 5)

Realigning optic with pin hole mirror on back and roll at "null", meaning sextant 4 "face" east.

When Todd left scope: Az = -34 El = 17.6

Trying to move optic out of way to look with retoculim onto scope (vice versa). Did run# 75126 to conserve motor positions, but ^{should be} m1 = 3300 when optic ^{is} at beam center.

Motors reset: m1 = 3300 ⇒ m1 = 0

m2 = 4950ish ⇒ m2 = 0

m3 = 56000 ⇒ m3 = 0

Reset m1 wrong, should have been -3300

Rescanning slit alignment.

Horizontal run# 75158 - 75167 (Center m15 = 1200)

Vertical run# 75170 - 75190 (Center m7/8 = 50)

Redoing optic scope alignment using ^{Continued to page}

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horizontal value

75192

Doing PSF horizontal and vertical scan with the Ge and slit. Variable width scan.

Horizontal scan #75193 (full aperture), #75194-75214

Vertical scan #75215 (full aperture), #75216-75236

$m3 = 0$ (sextant 1 facing control room)

Doing pitch scan run# 75240 - 75260 (center ~ 2670")

Doing yaw scan run# 75261 - 75281 (center ~ -15")

Redoing yaw for more points run# 75282 - 75302

Max appears to be ~ Az = 15", El = 20" at $m3 = 0$

read off the screen

Rolling to $m3 = 60000$ and repeating pitch and

yaw scan: run# 75309 - 75324

run# 75325 - 75345, repeat run# ~~75346 - 75366~~

repeat run# 75346 - 75366

Doing PSF scan. Vertical run# 75367 - 75388

Horizontal run# 75389 - 75410

$m3 = 120000$

Doing PSF scan vertical run# 75411 - 75432

horizontal run# 75433 - 75454

$m3 = 0$

Move M2 & M6 to get to best AZ/EL (according to Jason's analysis)

→ Goal: Pitch = 9 mdeg, Yaw = -11 mdeg

→ Achieved: AZ = -11.55, EL = 18.94

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Reset position controller $m1 \approx .5500 \Rightarrow m1 = 0$
 $m2 \approx 1/00 \Rightarrow m2 = 0$

7 March 2011, 5:00am

CWF 10-10066

installed Aperture Plate #4

had to rotate to 180000 to install (M3)

roll back to 0 afterwards (plate is upside down)

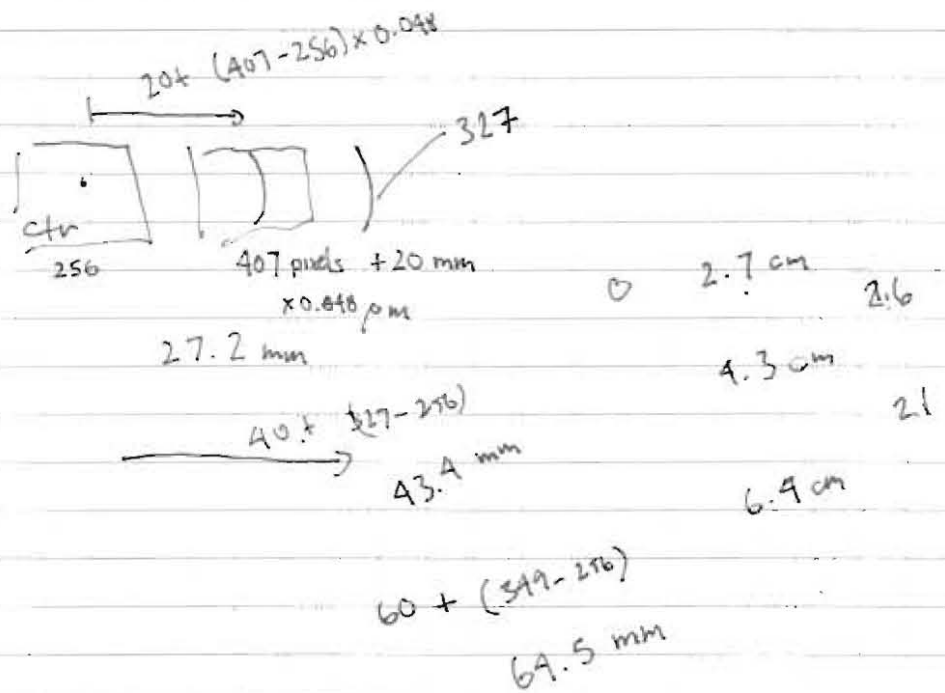
adjust A2 EL back to status values

was -10.3, 8.3 before installation

currently -18.4, 49.2

now -11.0, 8.8

RMD runs



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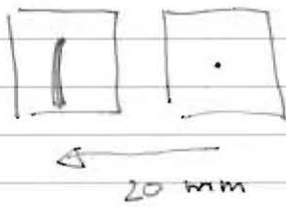
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191

-25.52



203 -42.5



203 199

-62.7

-42.5

-25.52

-62.7

+69.5

+43.4

+27.2

Rotate to 60° and back to 0 (V3)
 $\Delta = -16.7$, $EL = 10.1$

March 7: Moving motors to zero and re-installing slit unit + detectors.

Vacuum running high at ~13 Torr likely due to leaky pipe. Re-installed slits and detectors (6e, SDD). Cables tied down to reduce movement.

CWE 10-1000 still installed with binocular plates. No coarse aperture stop. No fine aperture stop.

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Distance from Ge to back of slit is $\sim 30m \pm 2m$

————— || — SDD ————— || ————— $\sim 40m \pm 2m$

Moving to locate direct beam $m1 = -14500$

Scan one/two direct beams $m3 = 26060$ (but changing)

Integrator over all direct beam ^{holes} $m15 = 64000$

Locate Ge and SDD $m16 = 65200$ (but may change)

Scanning 1mm slit over $m3 = 26060$ direct beam hole run# 75520-75550

Vertical 1mm 75538-75557 $m15 = 56000$

Vertical 1mm 75568-75583 $m3 = 26060$ ^{Error reading}

Vertical 1mm ~~75584~~ - 75604 $m3 = 26900$

Vertical 1mm 75605-75625 $m3 = 39780$ (~~600-2604~~ + (2690-2606))

Horizontal 1mm 75626-75644 $m3 = 39780$

Having located these two holes, will now doing integration over all 12 holes to gauge if they are all the same size. Scanning each hole in turn, starting with $m3 = 26900$

and moving positive: Run# 75646-75658

Now scanning detectors across fixed slit (9max 1mm)

Run# 75668-75759 ($m1 = -18500, m3 = 26900, m15 = 24000$)

Run# 75763-75798 ~~Center - 18000 (m16)~~

Center Ge $\sim m16 = 18000$, SDD $\sim m16 = -54000$ for these $m15$ settings

Doing vertical scans on Ge edge and over full SDD chip

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SDD vertical: Run# 75798-75848

Ge vertical edge: Run# 75849-75838

Redu SDD vertical, smaller ^{hori} slits Run# 75839-75858

7:10 pm

Ken and Finn worked on the yaw stage. Looked at it and rolled it. Tightened coupling

Seems to be moving fairly smoothly with ~5-8 ~~ms~~ msec offsets sometimes for 1st movements in one direction, but goes back to original position with ~5 msec after repeated motion

7:40 pm Binocular Scan ⁵⁶⁴ ⁵⁶¹⁰ ⁹⁵¹⁸

CWE 10-10066 in. At 7:40 roll do ^{vertical} ~~horizontal~~ slit scan using Ge after ^{All together}

adjusting Az & El to: ~~Az~~ = -11 & El = +9
75862 -> 75879

- Horizontal scan of rings. ~~75~~ Binocular scan
Run # " :



11:25 pm } Az = -11, El = +9 for motor 2 @ -110
Scan 2-200 200 10 10 } Motor 6 26695
Yaw scan, Run 76040

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Full Flood All Layers

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Scan 6 22695 30695 200 10

Run # 76062

Binocular Aperture Plate Removed - Start Full Flood

11:50 pm

Night long scans

to set 21 kHz

→ max @ 14 kHz

yaw pitch
version roll

I0003 (It was I0002) - source current

Scan 2 -320 80 10 30

setpos 6 26695

start Run: 76104

Detector opening 12mm x 12mm

GE Detector

~~Parameters~~

2:00 AM

Processing stalled at run 76266 or after 76267

Current task: move 3 30000

Last directory created in Run 76000-76999 was

Run 76267 at 1:36 AM

Aborted script @ MOVE 3 30000 (step 13 of command script)

→ motor 3 (roll) seems to move

(how far?) but the command doesn't complete

→ going from position 30000 to 60000

Labview script hangs up

* Seems clear that MOVE command is problematic

- labview stalls @ MOVE 3 30000 (at least when/after it goes to position 60000)

Run 76267 continues original script; no runs occurred during hiccup, so run data is still a continuous series of runs that can be inferred from the script

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Run # 76821 has huge count rate ($\sim 1.8 \times 10^6$ cts)

compared to others ($\lesssim 10^4$ cts/s).

This run was part of Pitch scan (scan 6 22695 30695
200 30).

Note: all scans from run #76267 were done

~~scans~~ at different roll angles (Motor 3)

Motor 3 ^{zero} position had ~ 1 degree offset, but it was NOT

implemented in M3 position because we used SETPOS for M3 instead of MOVE,

Throughout the measurements. Your motor 2's center shifted \Rightarrow count vs motor 2 position's peak is shifted, but data analysis is fine bec

\rightarrow By looking at the data file, it is one of the rare and known cases where counts are somehow multiplied by 256 \Rightarrow fixable by analysis

Doing direct beam scans/runs without aperture plate

run 77/71 -

With various apertures (detector slit) and beam currents

Run # 77/71 ($12 \times 12 \text{ mm}^2$, $I = 0.03 \text{ mA}$)

Run # 77/72 ($8 \times 8 \text{ mm}^2$, $I = 0.03 \text{ mA}$)

Run # 77/73 ($4 \times 4 \text{ mm}^2$, $I = 0.03 \text{ mA}$)

Run # 77/74 ($4 \times 4 \text{ mm}^2$, $I = 0.1 \text{ mA}$)

Run # 77/75 ($4 \times 4 \text{ mm}^2$, $I = 0.2 \text{ mA}$)

Run # 77/76 ($8 \times 8 \text{ mm}^2$, $I = 0.2 \text{ mA}$)

Run # 77/77 ($8 \times 8 \text{ mm}^2$, $I = 0.1 \text{ mA}$)

Run # 77/78 ($12 \times 12 \text{ mm}^2$, $I = 0.1 \text{ mA}$)

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Run# 77179 (12x12mm², I=1mA)

Run# 77180 (8x8mm², I=1mA)

Run# 77181 (4x4mm², I=1mA)

Run# 77182 (4x4mm², I=3mA)

Run# 77183 (4x8mm², I=1.5mA)

Run# 77184 (4x12mm², I=1mA)

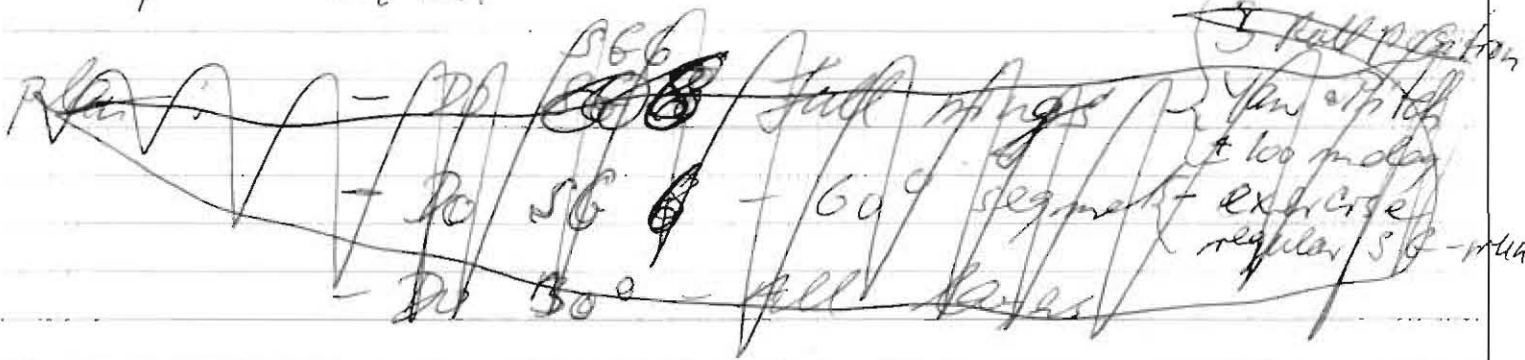
Run# 77185 (4x4mm², I=3mA)

Run# 77186 (8x4mm², I=1.5mA)

Run# 77187 (12x4mm², I=1mA)

1:30 PM - 8/3/2011

4x4 @ 3
4x8 @ 1.5
4x12 @ 1
4x4 @ 3
8x4 @ 1.5
12x4 @ 1



14:50 PM: Installed 10-10068 (A1) - 566

15:24 PM: Messed with YAW motor settings with Dan. Lowered start speed and increased acceleration - seemed to help.

7:30 PM
 Chuck and Jason looked at the Ge DPS settings to see if they were set roughly optimally based on the observation from the Full Flood measurements that we had. Slow/Fast? Indication that they fast threshold was set too high. Chuck performed auto tune fast/slow thresholds but then set the fast back to where it was at S1.

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Ge Detector Setup

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3:40 pm

It seems that the slow threshold was also auto changed, but not set back to where it was. The new ~~slow~~ slow threshold was 6.649

Previously ^{for FMO} we had: ~~the fast~~ (see conf. 0106201.44)

- Fast thresh = 31
- Slow thresh = 3.519
- Fast Peaking = 400
- Slow Peaking = 400 us
- Flat top = 0.00 us

Not sure when the fast was set to 31 but we may have tried playing with it when we had noise issues and its possible this wasn't logged during FMO. Nicolas might also have adjusted the settings.

With 55.6 Full Annulus in the beam and $I = 0.3 \text{ mA}$ we have a rate of 19.25 kHz & dead time = 16.78% with the old FMO settings of 31 / 3.519 Fast / Slow

At 41 FT ~~the~~ the rate drops to 16 kHz & 2.2% deadtime

At 51 FT 14.9 kHz & no dead time given higher slow than fast counts

It seems clear that we must have been using 51 up to now which is way too high

At 29 FT 20.0 kHz & 20.9% DT

33 FF 18.7 kHz & 14% DT

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I now decrease the ST to 3g (4keV)

FT=31 19.24 kHz 16g DT

ST = 2.5g, FT=31

19.24 kHz, 15.6g DT

ST = 2.0g FT=31

19.3 kHz 15.1g DT

ST = 1.5g FT=31 ⇒ begin seeing noise

19.24 kHz 14.0g DT

Decide on ~~FT~~ Slow Approach = 3g which is ~4keV. This is possible because the noise is much better now than ever before.

Make 30 sec runs over several settings

Run ~~77230~~ ST=3.0g FT=31

19.96 kHz
15.9g DT

77231 ST=3.0g FT=29

19.77 kHz
20.0g DT

77232 ST=3.0g FT=33

18.3 kHz
12.9g

77233 ST=3.0g FT=27

21.6 kHz
27.8g

77234 ST=3.0g FT=35

19.8 kHz
10.0g

77235 ST=3.0g FT=37

17.2 kHz
6.7g

no run made FT=39

16.7 kHz
3.4g

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Switch to 80 MHz

77236	ST = 3.0	FT = 31	25.4 ^g 21.1A17 ⁺
77237		FT = 35	15.3 18.8K
77238		FT = 27	54.3 ^g 31.5K
77239		FT = 41	5.6 ^g 17.0K
77240		FT = 45	0.6 ^g 16-3K

Go back to 20 MHz

77241		FT = 35	17.75K 9.9 ^g
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~~77242~~ Same settings but w/ filters

77247	No filter		
77248	low FA in (0.3mA)		
77249	FB in (5mA) 10mA		
77250	FC in (5mA) 30sec		
77251	FD in (5mA)		

Leave DPS Ge settings at

ST = 3.0 g 4.0us peaking. 0.2us stop ^{flat}

FT = 35 400 peaking

77252 FC in (1mA)

77253 FC in (0.03mA)

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Doing yaw and pitch scans with SGB

Run# 77258 - 77278	(Yaw)	} m3 = 890
Run# 77279 - 77299	(Pitch)	

Run# 77300 - 77320	(Yaw)	} m3 = 60890
Run# 77321 - 77341	(Pitch)	

Run# 77342 - 77362	(YAW)	} m3 = 120890
Run# 77363 - 77383	(PITCH)	

Full Illumination Systematics
Measurement Plan ; Current = 0.03mA

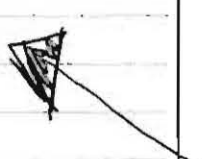
1) All measurements performed around ~~nominal~~ nominal cell (m3 = 0)

1) Old Ge PPS settings ("on-axis" as performed last night)
Az = -11, El = 9 mdeg
Slit width = 12 x 12 mm

m7 = 6000
m8 = -6000
m9 = 6000
m10 = -6000
m15 = 1200
m3 = 0

60 sec

Run # 77386



2) New Ge PPS settings ~~same~~
repeat 1) settings Run # 77387

3) SDD repeat 1) ; Scanned SDD to find center
Peak: 77500
slit size: 6 x 6 ; Run # 77430

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4) with New Ge setting
Scan ~~1~~ ¹⁺¹⁵⁺¹⁶ - 400 400 50 30 Run# 77432-77448

(i.e. scan optic to look for systematics but have to scan detector and detector slit along with it)

also 12 x 12 mm; Roll: M330

5) Scan 3 - 5000 5000 500 30

(i.e. coll. optic to check for spider Ge on auto collimator systematics Run# 77449-77469)

6) Scan 2 - 200 200 10 30

Roll: M330

Run# 77470-77510 redo

Run# 77511-77551

7) Direct Beam with Ge & SDD

8) rest motors at preset offset positions

mt=14500, m3=26900, m16=62800, m15=64000, 12x12, 6x6, mt6=14300

detector lowered 1 mm

Run# 77553 (12x12, Ge, 0.03mA)

Run# 77554 (6x6, SDD, 0.03mA)

Run# 77565 (6x6, SDD, 0.3mA)

Run# 77567 (12x12, Ge, 0.3mA)

Run# 77568 (12x12, Ge, 1mA)

Run# 77569 (6x6, SDD, 1mA)

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Resetting motion controller $m^2 = -94 \Rightarrow m2 = 0$

$m3 = 840 \Rightarrow m3 = 0$

$m15 = 1200 \Rightarrow m15 = 0$

$m16 = -4800 \Rightarrow m16 = 0$

Means distance ~~from~~ to move for direct beam measurement is now

$m1 \Rightarrow -14500$ $m3 \Rightarrow 26060$ $m15 = 62800$ $m16 = 62800$ (be)

$m16 = -9900$ (SD)

Fine aperture plate (60° full flood), coarse aperture and beam monitor installed. During installation of BM, auto-collimator was touched (upper north west corner), such that readout value changed 7.2 units in Azi.

Direct beam, max current on BM, small collimator hole run # 77577

Removed small collimator hole plate

Variable width scan of PSF

Open aperture Background
77578, 77579

Run # 77580 - 77636

Move yaw to + 43 mdeg from finite aligned so that the middle radius in $\$12$ points to the source.

Az = 32 mdeg El = 9 mdeg

(Motor 2 = 40, Motor 6 = 26520)

Now repeat variable 57 step PSF scan for all 6 sextants.

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~~Signature~~

Run # "??"

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Morning Shift Plan

1) If extra time in morning do ~~57~~ step PSF on Sextant 1 at

+22 mdeg \rightarrow +73 mdeg

from Finite On-axis Az/El

ie ~~not~~ yaw/pitch to

Az = 11 mdeg

Az = 62 mdeg

El = 9 mdeg

El = 9 mdeg

2) Start choosing aperture plates and perform planned sets of measurements from spreadsheet.

3) Variable with example is on notepad on desktop.

Perform variable with PSF yaw scans @ 9 yaw positions for Sextant 1 and 3 yaw positions for sextants 2-6

Fit in spreadsheet

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2a) Perform direct beam measurements (do this first)

2b) Perform basic Vertical/Horizontal Yaw/Pitch setup

2c) Perform other planned measurements

2e) IF you have ~30 min with nothing else to do until help is available for Aperture plate changes then perform 57 step variable width scans

We do all 10 even Radial Aperture Sub Groups over next ~36 hours

All are done with 60 deg

Radial Azimuth Fine Aperture Stop

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Note: We do not have time to do 60/30 degree sectors given shortened run time.

Before starting Radial Subgroups, it would be nice to test out PSF yaw on Sextant 1, All Layers

Do this in ~10 mdeg steps over -100 to +100 mdeg

Early AM bonus measurement

3/9/11 - 6:10 AM

From previous page, performing #1) PSF scan on Sector 1

@ Az = 11 mdeg, El = 9 mdeg (m2 = 13, m3 = 0, m6 = 26450)

Run 77991 - 78049 (yaw position + 22 mdeg)

@ Az = 62, El = 9 (Az = 63.2, El = 8.97
m2 = 67, m3 = 0, m6 = 26480)

Run 78050 - 78108

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3/9/11 7:50 AM ~~Run 78107~~

Starting PSF scans for 21 yaw positions that correspond to $A_z = -110, -100, \dots, 80, 90$ mdeg, all elevations ~9 mdeg

$A_z = -110$: Run 78107 - ~~78167~~ 78125

~~78100~~ Adapted → doing fine sampling of PSF

★ realized need to do coarse (7-step) PSF scans here, so inputting new script which will do

Use $m_b = 26450$ for all & move yaw (-2) by 10 mdeg shifts from -110 to 90

Sextant
1

8:45 AM : Run 78146 - 78313
168 runs

coarse PSF Yaw scans with 10 mdeg Yaw step size

11:19 am : Roll - scan at 1300 & 43 mdeg yaw (32 in A_z)

to check sextant alignment

Run# 78314 - 78324 (Slits in wrong place)

Redo Run# 78325 - 78335

12:12p Installed Plate SCWE10-10070 (SG8)

Direct Beam Measurement. Script SG8 Direct Measurement Pitch

Run# 78347 - 78355 (Current too high), pitch scan

~~Run# 78356~~ (redundant to last), horizontal

Direct beam Ge, 1mA run# 78358

Direct beam SDD, 30mA run# 78359

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Hori Direct beam Ge, 2.5mA run# 78360 - 78370

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Hori redo Direct beam Ge, 6mA run# 78371 - 78381

Hori Direct beam Ge, 6mA run# 78382 - 78392

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Not centered. Scanning roll run# 78400 - 78415

Run# 78415, ~~quadrant~~ ~~beam~~ Ge (1mA), $m3 = 26750$

Run# 78490, direct beam SDD (30mA), $m3 = 26750$

Redoing pitch scan run# 78441 - 78449 (Ge, 1mA)

Yaw scan run# 78450 - 78458 (Ge, 1mA)

Direct beam procedure: 3/9/11, 1:57 PM

- Go to roll 26.06°
- Horizontal scan using Ge. SDD size 1.5 x 20 mm
- Go to center
- Roll scan ($\pm 5^\circ$ step 0.5°) using Ge

Go to center. 1mA 30mA

- Measure direct beam ~~size~~ using Ge & SDD

~~size~~ 20x20 8x8

6x6 done above
but future use likely
8x8

Doing yaw scan with PSF coarse scan at each point

Current set to 1.5mA

Yaw PSF at aligned SG8 run# 78462 - 78469, Az = -16, El = 9

- 11 - run# 78470 - 78477 az = 119, el = 9

- 11 - 78478 - 78485 az = 87, el = 9

- 11 - 78486 - 78493 az = 61, el = 9

- 11 - 78494 - 78501 az = 32 continued to page 9

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11 - 78502 - 78509 az=23 el=9

-11- 78510 - 78517 az=12 el=9

Above had wrong sign in YAW

-11- 78518 - 78525 az=-11 el=9

Doing a check of where SDD is located so we can do these measurements with it as well

Horizontal scan run# 78545 - 78577 (center @ m/s=62800)

Vertical scan run# 78578 - 78607 (center @ m/s=0)

PSF SDD S68 run# 78608 - 78615 az=-13, el=9

Coarse PSF SDD S68 run# 78616 - 78623 az=-31, el=10
Redo checksum SDD run# 78629

Coarse PSF Ge S68 run# 78625 - 78632 az=-31, el=10

Coarse PSF Ge S68 run# 78633 - 78640 az=-43, el=9

~~SDD~~ SDD run# 78641 - 78648 az=-43, el=9

11 Ge run# 78649 - 78656 az=-53, el=9

1 SDD run# 78657 - 78664 az=-53, el=9

Ge run# 78665 - 78672 az=-83, el=9

SDD run# 78673 - 78680 az=-83, el=9

Ge run# 78681 - 78688 az=-107, el=9

SDD run# 78689 - 78696 az=-107, el=9

Ge run# 78697 - 78704 az=-133, el=9

SDD run# 78705 - 78712 az=-133, el=9

Change to sextant 2, m3=60000

Ge run# 78713 - 78720 az=+16, el=9

Ge run# 78721 - 78728 az=49, el=9

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Ge run# 78729 - 78736 az=-55, el=9

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Ge run# 78737 - 78744 az=-88, el=9

Sextant 2

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Sextant 4 { Ge run# 78745-78752 az=-73, el=9
Ge run# 78753-78760 az=-55, el=9
Ge run# 78761-78768 az=-88, el=9

7:00 PM set pos 3 180000

Sextant # { 48 run # 78769-78776 az=-45, el=9
run # 78777-78784 az=-55, el=9
run # 78785-78792 az=-85, el=9

7:24 PM set pos 3 240000

Sextant 5 run # 78793 - ~~78799~~ 78800 az=-46, el=9
run # 78801 - 78808 az=-54, el=9
run # 78809 - 78816 az=-85, el=9

7:06 PM set pos 3 300000

Sextant 6 run # 78817 - 78824 az=-44, el=9
run # 78825 - 78832 az=-54, el=9
run # 78833 - 78840 az=-85, el=9

9:11 PM Xrayoff

turn the right mast key

Press RESET Button

Roll FM 1 to 180°

Remove SG

Install SG 14

Insert key

Twist button

Enable HV on screen

Xray on

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5614

SETPOS 3

MOVE 6

Set $A_8 = -10.4$ mdeg $EL = 8.6$ mdeg

500

9:55pm: Runs 78841 - 78849 $A_8 = 73$, $EL = 9.25$

10:04am = Runs 78850 - 78857 31 $EL = 9$

10:15am Runs 78858 - 78865 H1 $EL = 9$

Runs 78866 - 78873 -11 $EL = 9$

Runs 78874 - 78880 -34.3 $EL = 9.6$

Runs 78881 - 78888 -54 $EL = 9$

Runs 78889 - 78896 -60 $EL = 9$

Runs 78897 - 78904 -84 $EL = 9$

Runs 78905 - 78912 -138 $EL = 9$

Runs 78913 - 78920 -192 $EL = 9$

Switch to Ge

Run 78922 Rate check ~1/K

Runs 78923 - 78929 ³⁰ 72, 9

Runs 78930 - 78937 ^{31 38} 31, 9

11:52am Runs 78938 - 78945 ^{39 46} -11, 9

Runs 78946 - 78953 ^{47 54} -37, 9

Runs 78954 - 78961 ^{55 62} -54, 9

Runs 78962 - 78969 ^{63 70} -83, 9

" 78970 - 78977 ^{71 78} -138, 9

12:32pm " 78978 - 78985 ^{79 86} -191, 9

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12:40 AM Setpos 3 60000

Sextant 2 Runs 7898⁸⁷~~5~~ - 7899~~4~~ AR = -34, e1 = 9

Runs 7899~~5~~ - 79002 -54, 9

Runs 79003 - 79010 -60, 9

Sextant 3 Setpos 3 120000 1:06 AM

Runs 79011 - 79018 -35, 9

Runs 79019 - 79026 -54, 9

1:22 AM 79027 - -61, 9

Sextant 4 Setpos 3 180000 1:29 AM

Runs 79035 - 79042 -33, 9

79043 - 79050 -52, 9

79051 - 79058 -60, 9

Sextant 5 Setpos 3 240000 1:52 AM

Runs 79059 - 79066 -33, 9

79067 - 79074 -55, 9

79075 - 79082 -60, 9

Sextant 6 Setpos 3 300000 2:19 AM

Runs 79083 - 79090 -34, 9

~~79091~~ 79091 - 79098 -54, 9

79099 - 79106 -60, 9

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3AM - 3/10/11

Aperture plate removed, redoing ~~fine~~ ^{fine} PSF ~~scans~~ scans for each sextant (full flood), centered on SG 12 so that Az needs to be -43 mdeg from optic-aligned position

m3 = 0 : Sextant 1) m2 = -70, m6 = 26450
Az = -55.1, El = 9.6

Run 79107 - 79165 (~~59~~ ⁵⁹ ~~ms~~ ms)

Sextant 2) m2 = -34, m6 = 26380
Az = -55, El = -4.8

Run ~~79166~~ 79166 - 79224

Sextant 3) m2 = -24, m6 = 26120
Az = -46.2, El = -13.7

Run 79225 - 79283

Sextant 4) m2 = -24, m6 = 26200
Az = -32.2, El = -8.8

Run 79284 - 79342

Sextant 5) m2 = -40, m6 = 26350
Az = -31.1, El = 4.6

Run 79343 - 79401

Sextant 6) m2 = -40, m6 = 26500
Az = -39.4, El = 13.1

Run 79402 - 79460

Run 79461 - check count rate in center of PSF to make sure above rates not too high

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8:02 AM

Direct Beam

Installing aperture no. CWF 10-10068-566

Run 79462 - 79470

Reduce current from 2.5 A to 1 A + redo

Run 79471 - 79479

Script SG6-direct beam - Pitch - SI - Ge

Script SG6-direct-Horiz. - SI - Ge

→ Run 79480 - 79481 ABORTED, current too low

set to 2.5 A: Run 79482 - 79492

Again, 1/6 A current: Run 79493 - 79503

Vertical Scan @ 6 A: Run 79504 - 79514

SDD Direct beam @ 30 A: Run 79515 - 79516

SDD crashed computer

9:24 Direct Beam Measurements Horizontal SG-6 79517

Centered to 67800 - M15 Scan ± 5° @ 0.5° @ 5 sec

Run # 79549

Direct Beam Measurements Repeat Ge + SDD NA

79571 Direct Beam Measurements Pitch Ge SG6
79580

79581 Direct Beam Measurements Yaw Ge SG6
79589

TURNED OFF X-RAYS TO RESTART SDD

Course PSF M2=0 M6 27680
79590 - 92=-12 E=8

Direct Beam Measurements Ge + SDD Repeat
79590 - 79591

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Coarse PSF Yaw 566 Sextant 1 m3=0

5 Ge 79594 - 79601 az = 35 el = 8.4
SDD 79602 - 79609

Ge 79650 - 79657 (Rescan in ID50) az = 13 el = 7.6
SDD 79616 - 79625 checksum = 79657 az = 13 el = 9.0

10 GE 79634 - 79641 az = -11 el = 8.4
SDD 79642 - 79649

15 GE 79658 - 79665 az = -33 el = 8.7
SDD 79666 - 79673

Ge 79674 - 79681 az = -41 el = 8.9
SDD 79682 - 79689

20 Ge 79690 - 79697 az = -53 el = 9.4
SDD 79698 - 79705

Ge 79706 - 79713 az = -81 el = 2.8
SDD 79714 - 79721

25 Ge 79722 - 79729 az = -97 el = 8
SDD 79730 - 79737

30 Ge 79738 - 79745 az = -111 el = 8.1
SDD 79746 - 79753

Sextant 2 m3 = 60000
Ge 79754 - 79761 az = -35 el = 5

35 Ge 79762 - 79769 az = -43 el = -4.9

Ge 79770 - 79777 az = -54 el = -4.6

Sextant 3 m3 = 120000
~~az = -74 el = -11~~

40 Ge 79778 - 79785 az = -24 el = -12.6

Ge 79786 - 79793 az = -32 el = -12.7

45 Ge 79794 - 79801 az = -45 el = -12.3

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Continued from page ³ Coarse PSF Yaw SG6

Sextant 4 $m^3 = 180000$
Ge 79807-79809 $a_2 = -12$ $EL = -8.2$

Ge 79810-79817 $a_2 = -21$ $EL = -8.1$

Ge 79818-79825 $a_2 = -32$ $el = -7.9$

Sextant 5 $m^3 = 240000$
Ge 79826-79833 $a_2 = -10$ $el = 4.4-4.2$

Ge 79834-79841 $a_2 = -20$ $el = 4.7$

Ge 79842-798⁴⁹₅ $a_2 = -31$ $el = 4.7$

Sextant 6 $m = 300000$
Ge 79850-79857 $a_2 = -22$ $el = 12.2$

Ge 79858-79865 $a_2 = -33$ $el = 12.6$

Ge ~~79872-79874~~ 79866-79873 $a_2 = -41$ $el = 12.7$

Doing direct beam

Horizontal scan 79875-79887

Roll scan run# 79888-79908 (m^3 center = 26900)

Direct Ge run# 79909

Direct SDD run# 79910

CWE 10-10068 (A1), SG6 removed

CWE 10-10069 (A1), SG20 installed

SG20 may not be fully illuminated by beam, so doing a few steps in X of optic and detector at full aperture.

Nominal focus/optic position run# 79917 (~57 kcps)

5mm west of nominal focus/optic position run# 79918

10mm —||— run# 79919

15mm —||— run# 79920

Continued to page -500
 $m^3 = -77700$
 $m^3 = -5000$
~63 kcps
~671

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Scanning in steps of 0.5um run# 79921-79983

Found that the outer layers of subgroup 20 was ~~slightly~~ obscured. Object values for SG20 are as follows

m1=0 => -1000 m16_{GE} = -10000

m15 = => -10000 m16_{SDD} = -82700

SG20 SDD current 6mA

SG20 Ge current 1mA

PSE course your scan

Ge

run 7999~~8~~⁸⁰⁰⁰² - ~~79999~~

could be checked. az = -10, el = 8.7

SDD

run 80003-80004

az = -10, el = 8.7

7:00 pm - March 6, 2011

SDD current = 6mA run 80017 - 80018

az = -32, el = 8.9

SDD current = 6mA run 80020 - 80026

az = -214, el = 8.9

SDD — " — run 80028 - 80034

az = -149, el = 8.9

SDD — " — run 80036 - 80042

az = -82, el = 8.9

SDD — " — run 80044 - 80050

az = -53, el = 8.9

SDD — " — run 80052 - 80058

az = -10, el = 9.1

SDD — " — run 80060 - 80066

az = 21, el = 8.9

SDD — " — run 80068 - 80074

az = 52, el = 9.6

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Sextant 2; M3 = 60000

SDD	Rnh 80076 - 80082	az = -84; EL = 9.1
-	Rnh 80089 - 80090	az = -55; EL = 8.9
-	Rnh 80092 - 80098	az = -34; EL = 8.9

Sextant 3; M3 = 120000

SDD	Rnh 80100 - 80106	az = -73; EL = 9.0
-	Rnh 80108 - 80114	az = -45; EL = 9.0
-	Rnh 80116 - 80122	az = -24; EL =

Sextant 4; M3 = 180000 9:13 PM

SDD	Rnh 80123 - 80129	az = -61; EL = 9
	80130 - 80138 80138	az = -33; EL =
	80139 - 80146	az = -11; EL =

Sextant 5 M3 = 240000

Target az = -59.4, -30.8, -10.0

Recentering az to -59.4 then running march 10 - those scan.txt

80146 - 80170

Sextant 6 M3 = 300000 10:26 PM

centering on -69.4 az, running 3 scan script

80171 - 80194

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10:48 pm Change plate

Xrayoff

~~10:58~~ SETPOS 3 180002

put on plate 65 of SG 4

ae = -10.5, el = 9.3 m3 = 0 m2 = -10 m6 = 27671

Check flux: run 40 80195

11:50 PM SETPOS 10

Running Jason's script for sextant 1 after inputting SG 4, m2 = -10, m6 = 27671

80196 - 80323

Note: SDD - data not good known script

3/11/11 1:47

SG 4 at position 55.2, -39.2, -34.4

at goal = -55.2, -39.2, -34.4 after Sextant

10400 } Moved SDD into beam, run 40 gave 1.7×10^4 cts/s
80324

Trying GE: m6 = 0, 80325 3.2×10^4 cts/s

10400: 60325 2.5×10^4

SETPOS 16 -72700 SDD 80327 1.2×10^4 cts

Sextant 2: runs 80328 - 80343 ae = -55, el = -4

runs 80344 - 80359 ae = -57, el = -5

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runs 80360 - 80375

Sextant 3: 80423

runs: 80376 - ~~80424~~ Az = -44.3 el = -13.3

~~runs: ~~80423~~ ~~80423~~ Az = -32.9 el = 9.1~~

~~runs: ~~80474~~ - ~~80522~~ Az = el =~~

Sextant 4:

runs: 80424 - 80471 Az = -32.9 el = -9.1

Sextant 5:

runs: 80472 - 80519 Az = -30.5 el = +4.2

Sextant 6:

runs: 80520 - 80567 Az = -40.7 el = +12.6

3/11/11 - 6:58 AM

SG10

~~SPD IN REFLECTED BEAM GAGE 35104 17.5%~~

~~Sextant 2~~

Sextant 1: ~~runs 80553~~ - aligned optics ~~test~~:

M2 = -25, M6 = 27806, Az = -10.7, El = 9.

Runs: 80609 - 80736
(128 Runs)

Note: SPD data not good
Error in slope

Sextant 2: runs 80737 - 80784

Az = -55, El = -6.4

S # 3: runs 80785 - 80832

SPD Az = -45.6 El = -12.5

⇒ Reduced Isource to 7 and 15 mA

for checksum and scan ~~data~~ b/c count rate too high

S # 4: runs 80833 - 80881

Az = -32.3, El = -8.2

S # 5: runs 80882 - 80929

Az = -30.5, El = 4.3

S # 6: runs 80930 - 80978

Az = -40.4, El = 12.7

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Current set to ~~I 1000~~ ¹⁰⁰⁰ (100 mA) for SDD checks

SG10 Sextant 1 : Redo SDD Scans Az = -10, El = 8
Rms # 80983 - 81006

SG 4

Sextant 1 : Redo SDD Scan Az = -11, El = 9
Rms # 81009 - 81031

Uninstalled A7 and installed A2A and A2B on
CWE 10-10066 ⇒ SG12

SG12 Direct Beam

81032 - 81065 az = -10.7 el = 4.1

81066 - 81067 m3 = 26800

Check sum	I 150	→ 1.88 x 10 ⁴	Ge	81068 - 81069
	I 1200	→ 0.4 x 10 ⁴	SDD	81070 - 81076

Course Aperture

81077 - 81084 Ge az = 64 el = 9

81085 - 81092 SDD

81093 - ~~81100~~
81099 Ge az = 22 el = 10

81100 - 81106 SDD

81107 - 81120 Ge + 1B az = -15 el = 11

81121 - 81127 SDD Missed 1B redos

81132 - 81147 Ge + 1B az = -16, el = 8.5

81148 - 81167 Ge + 1B az = -33, el = 9

81168 - 81174 SDD az = -33, el = 8.9

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Sextant 1

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Rate too high due to ~~error~~ current input error

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81175-81182 Ge az = -53, el = 8.5

81193-81202 SDD az = -53, el = 8.5

81203-81210 Ge redo az = -53, el = 8.5

81211-81219 Ge az = -83, el = 9

81220-81226 SDD

Using new script from Jason. Now we align to AZ=100, EL=0 and insert relevant script

Started script on run# 81227-81234 (1B, 4) > 13h

Ge run# 81235-81242 (2B, 4) ~ 2h

-10- run# 81243-81250 (1B, 3) > 8h eps

=10- run# 81251-81258 (2B, 3) 13h eps

-10- run# 81259-81266 (2B, 2) 2h eps

run# 81267-81274 (1B, 2) 4h eps

run# 81275-81282 (1B, 2)

run# 81283-81290 (2B, 2)

run# 81291-81298 (1B, 1) 2h eps

run# 81299-81306 (2B, 1) 22h eps

run# 81307-81314 (2B, 0) ~ 20h eps

run# 81315-81322 (2B, 0)

run# 81323-81330 (2B, -1)

run# 81331-81338 (2B, -1) 20h eps

run# 81339-81344 ()

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Aborted to restart after fixing script errors

Missing 1B and SDD in all of these

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(Re) Started script ^{with} after AZ = 100, EL = 0

5	Ge	run# 81341 - 81348	(1B, 4)
	Ge	run# 81349 - 81356	(2B, 4)
	Ge	run# 81357 - 81364	(1B, 3)
10	Ge	run# 81365 - 81372	(2B, 3)
	Ge	run# 81373 - 81380	(2B, 2)
	Ge	run# 81381 - 81388	(1B, 2)
15	SDD	run# 81389 - 81396	(1B, 2)
	SDD	run# 81397 - 81404	(2B, 2)
20	Ge	run# 81405 - 81412	(1B, 1)
	Ge	run# 81413 - 81420	(2B, 1)
	Ge	run# 81421 - 81428	
25	SDD	run# 81429 - 81436	
	SDD	run# 81437 - 81443	

81444 instead?
Last SDD measurement
should be 8 runs

76

Direct beam measurements

Horizontal scan run# 81477 - 81489

Roll scan run# 81490 - 81510

Ge direct beam run# 81511, SDD direct beam run# 81512

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Sector 2, SG12

Ge run# 81514 - 81529

(20,

Sector 3, SG12

Psf scan, Ge

100.9, -0.8

3/12/11 12:16 AM

run 81530 - 81545

Sector 4 SG12 12:32 AM

Psf scan, Ge

81546 - 81561

Sector 5 SG12 12:50 AM

~~Psf scan~~ Psf scan, Ge

81562 - 81577

Sector 6 SG12

1:11 am

PSF scan, Ge

~~81578~~ 81578 - 81583

Dir beam ~~81594~~

Hor : # 81594 - 81606

Roll : # 81606 - 81626

Ge dir : # 81627, SPD dir : 81628

~~SG12~~ SG16

March 12, 02:16 AM

Direct beam measurement

Horizontal scan

run# ~~81630~~ 81630 - 81642

Roll scan

run# 81643 - 81663

Ge direct beam run# 81664

SDD direct beam run# 81665

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