

io. 3549  
.3550  
.3551

-0.0065 1-16

Callisto

cal. 3552  
cal. 3553

Io

io. 3554  
.3555  
.3556  
.3557  
.3558  
.3559  
.3560  
.3561  
.3562

bounce

randomly  
through out

notes 0.0075 - 0.0013

Callisto

cal. 3563  
cal. 3564

Io

io. 3565  
.3566  
.3567  
.3568  
.3569  
.3570  
.3571

bad bounce

Callisto

cal. 3572  
.3573

Finished!!

Start Oct 09

Test subdirectory

Looking at C<sub>2</sub>H<sub>2</sub> gas cell at Q-branch. Gony for focus.

c2h2.0001 - starting point  
.0002 - 2 turns counterclockwise  
.0003 - back to starting point. shorter gas cell.

medium made on c2h2. use pinhole

c2h2.0004

9:40 after cleanup: gas cell with C<sub>2</sub>H<sub>2</sub> back  
pinhole still in, pressure of gas cell going  
up, lines get blocked c2h2.0005

c2h2.0006 - after pumping

c2h2.0007 - two (2) turns on eddell.  
paraboloid clockwise

c2h2.0008 - ignore

c2h2.0009 - two (2) turns counter-  
clockwise → back to HOS+

c2h2.0010 - two (2) more turns counter-  
clockwise

c2h2.0011 - one (1) turn clockwise  
→ final position is one (1)  
turn counterclockwise from  
"start point" (0008 + 0009)

c2h2.0012 - ignore

→ note: c2h2.0000 - c2h2.0012 were done with  
Vdet = -4.0V and object = "fake",  
feature = "ozone" and usaveno0 = "1000.0"  
→ so these three header info are wrong!



2262.0013 - gone to in 777, heads info 1 On

2262.0014 - hi and made now

2262.0015 - called still take out a looking at room during keyboard, and probable asked of this

room.0016 - two (2) turns clockwise

room.0017 - two (2) turns counter clockwise back to start (like 2262.0015)

room.0018 - two (2) more turns counter clockwise

2262.0019 - some sitting at room 0018 but with C-46 instead of 28

room.0020 - two (2) more turns counter clockwise with room / 28 illumination

2262.0021 - some sitting at room 0020 but with C-46 instead of 28

h20.0023 - some sitting at room 0020 and 2262.0022 but at 1344 cm<sup>2</sup> (h20)

h20.0024 - two (2) turns in ~~clockwise~~ clockwise direction (with 2 turns in counter clockwise direction for start)

h20.0025 - ignore

h20.0026 - two (2) more turns clockwise + back to start position

1.01  
2.30

rest.0027 only string the cord when rest

rest.0028 only after rest with analog power off

Tom only present on Oct for public information. Start at 1329 cm<sup>2</sup> to turn 28, fixed ~~with~~ set (log = 82)

h20.0029 pressure = 293 mbar pump all the time

change to 1368 cm<sup>2</sup>

h20.0030 pressure = 290 mbar pump for 28

change to 797 cm<sup>2</sup>

h20.0031 pressure = 322 mbar pump for 28 repeat

change to 546.7 cm<sup>2</sup>

h20.0032 322 mbar

change to 721.5 cm<sup>2</sup> use C-46 pump all the time

2262.0034 297 mbar 52 turns in look for best repeat

0035 278 mbar repeat

0036 278 mbar lines getting weak



- c2h2.0013 - gone to cal TTT, heads info is OK
- c2h2.0014 - low med mode now
- c2h2.0015 - c2h2 cell takes out → looking at room (wrong keyword?), used pic hole instead of slit
- room.0016 - two (2) turns clockwise
- room.0017 - two (2) turns counter clockwise back to 'start' (file c2h2.0015)
- room.0018 - two (2) more turns counter clockwise
- c2h2.0019 - same setting as room 0018 but with C<sub>2</sub>H<sub>2</sub> instead of BB
- room.0020 - two (2) more turns counter clockwise [c2h2.0021 is garbage] with room / BB illumination
- c2h2.0022 - same setting as room 0020 but with C<sub>2</sub>H<sub>2</sub> instead of BB
- h2o.0023 - same setting as room 0020 and c2h2.0022 but at 1374 cm<sup>-1</sup> (h<sub>2</sub>O)
- h2o.0024 - two (2) turns in ~~clockwise~~ clockwise direction (not 2 turns in counter clockwise direction from start)
- h2o.0025 - ignore
- h2o.0026 - two (2) more turns clockwise → back to start position

9 Oct 87  
09:30 HT

read.0027

reset.0028

only storing the read before reset  
analog power off.  
only after reset with analog power off

- Turn analog power on. Got line profile information. Start at 1374 cm<sup>-1</sup>. Use Gain = 50, fixed ~~width~~ <sup>length</sup> slit (ang = 80).
- h2o.0029 pressure = 293 mTorr pumping all the time  
change to 1260 cm<sup>-1</sup>
- h2o.0030 pressure = 290 mTorr pumping. poor S/N  
change to 797 cm<sup>-1</sup>
- h2o.0031 pressure = 327 mTorr pumping per S/N repeat.  
.0032
- change to 546.4 cm<sup>-1</sup>
- h2o.0033 277 mTorr  
change to 730.5 cm<sup>-1</sup>. use C<sub>2</sub>H<sub>2</sub>. pump all the time.
- c2h2.0034 274 mTorr 32 scans, so look for best. repeat  
0035 278 mTorr repeat.  
0036 278 mTorr lines getting weak.



of 09/10 For Entire run, EW has electronics in West.

pupil. 1000 instrp = 0 NS - Electronics south of Dewar  
 1001 90 EW - Electronics west of dewar  
 1002 90  
 1003 tests of pass-schraen problem  
 1005 |  
 1006 |  
 1007 |  
 1008 |

Go to 248 cm<sup>1</sup> HC2 R(12) T<sub>200</sub> = .20  
Go to EP Agr

Center up on Tommy's setting. Blaze on plots disagrees with instrument.

sky. 1009 to check pipe's blaze

sky. 1010 moved paraboloid to make sure not on wrong echelon order. Very weak. Not a good move.

sky. 1011 after adjusting K-mirror from ~0.022 to 0.030

Set EW bersight. Crosshair B @ 399, 123  
 $\delta = 748 \text{ cm}^1$  focus is -1.78 Pore Temp 4.7 and air temp = 3.0  
 After focus, peak up again. Crosshair B @ 415, 123

epagr. 1012 doing a little peaking.

Move to N/S slit. Back to EP Agr for N/S bersight

Peak up on EP Agr. Crosshair A @ 438, 95 (hor, ver)

epagr. 1013 Pretty cruddy, but who cares.

Go to Jupiter. Put center of planet on bersight. Use scan parameters from Tommy's file.  
 step = 0.7 W ON offset = 28E -19 N

Jup. 1014 not off<sup>s</sup> limit. Too much sky at start stopped after 1 scan. 1st deriv bounce

Change offset 21E -21N Change to 70 (step)

Jup 1015 Looks good. Bit of 1<sup>st</sup> deriv bounce.

.1016 Too much off southern edge of planet. Stopped after 2 scans.

.1017 Moved N 1" at end of scan 1. some sort of grating shift during scan 1 near frame 8. scan 2 looks like coming on a little early.

1018 Changed offset to add 3 steps to East (21E  $\Rightarrow$  23E) In scan 2, looks like some motion along slit near frame 30-35(?). Seeing?

1019 At end of scan 2, move 1" N. seeing too much sky at off slit. At end of scan 3, move another 1" N.

cal. 1020 Not mode. peaking.  
.1021 more guiding move 0.5" along slit around pair 9.  
.1022

change to 17  $\mu\text{m}$  for Uranus S(1).  
Go to TX PSC. Can't find it. Go to Mira. Found it.  
Change focus to -1.98. Adjust bersight.

net. 1023 negative beam off  
.1024 nice

Go to Juno for telluric \* pointing.

juno. 1025  $\pm 90$  on sidebar

Go to Uranus. Use 0.5 W 0.0N steps. Offset 4E ON  
7.16 points

uran. 1026 see nothing

Change to nod mode. See line in accum. nodding off.

Find offset guide star. Re center Uranus.

uran. 1027 see it now, but only after several scans

Go back to scanning



Uran. 1028

Uran. 1029 after scans had to move 4" E 2" N

1030

1031

1032

have to move 2" W + guided ~2" W

1033

4 scans trying to guide at beginning of each scan but note there is differential in tracking between Uranus + guide star.

1034

maybe better guiding

1035

1036

needed to have 12" NE

1037

moved TV in too soon, trashed extra steps

1038

making 1" N after each scan

1039

Go to X Tau for platescale + autoguide tests

alpha Tau. 1040

alpha Tau. 1041 overlapping orders and longer nod

Go to 1240 am<sup>-1</sup> for H<sub>2</sub>O<sub>2</sub> on Mars

alpha Tau. 1042

focus -1.68 (vs. -1.98 at 12pm)

Mars. 1043

ignore. nod mode

2 scan file

Mars. 1044

scan <sup>28</sup> 32x 0.5" E start 7" W 2.5" N

Mars. 1045

5" W 2.5" N

Mars. 1046

32x 0.5 (good) 6" W 2.5" N

4 scans

Mars. 1047

Mars. 1048

Mars. 1049

Mars. 1050

Mars. 1051

Stop after 1 scan to change starting pt 7.5" W

Mars. 1052

start at 8" W, 2.5" S

stop after 1 scan

Mars. 1053

9.5" W, 2.5" S

Mars. 1054

Mars. 1055

Mars. 1056

Go to alpha Cma for atmosphere and maybe flux

alpha Cma. 1057

guiding on 1<sup>st</sup> 6

nodding

alpha Cma. 1058

Try scanning for flux

alpha Cma. 1059

alpha Cma. 1060

alpha Cma. 1061

} ignore stopped early

good (although poor S/N)

Back to nodding, but guiding going haywire

alpha Cma. 1062

alpha Cma. 1063

alpha Cma. 1064

Good night



Oct 11, 2009 - this is night 2

epag. 1065 EP Agr instrument is N-S  
measured focus (-1.481) and  
position in setting 1247

noticed that we had to go E-W  
→ changed instrument orientation  
→ went back to EP Agr and try to  
point. ~~Long~~ Long time no success.

finally managed: Goresight crosshair N-S  
was (430; 640) at pos A. Goresight  
crosshair B in E-W orientation is (417; 110)

went to Jupiter and started scans

Jup. 2001 - Jup 2004 ignore: (one scan  
each, not centered in wavelength)

corrected wavelength setting to offset  
the 12441 also like to the edge of the  
chip (setting 1247, CV filter (captionized))

Jup 2005 - 1 scan N→S across the  
Jup 2006 - 4 scans N→S across the  
planet along its meridian

- After these scans went back  
to Jupiter on TV class. Jupiter  
was offset by 4.5" west, 2.5" north  
→ adjusted tracking rates

Jup 2007 - repeat of Jup. 2006 with intro  
tracking rates

Jup. 2008 - repeat of Jup. 2007 after opti-  
mizing tracking rates again. Jupiter  
was off after Jup 2007 by 3.9" East  
and 0.0" North

Jup. 2009 - 4 scans with 4" East offset  
→ after scans are completed,  
Jupiter was off 1" East but  
still again in N-S

Jup 2010 - 4 scans with 8" East (might be  
9" East effectively after the offset  
after Jup. 2009  
After the scan, Jupiter was off  
by 4" West and 1" N

Jup. 2011: 4 scans with 8" West (done  
after re-centering on Planet  
center). After completion the  
planet was off another 4" West

cel. 2012: trying to observe Callisto - ignore

acas. 2013: Went to Alp car. Seeing only  
little flux. During observation,  
Q1000 died → no possibility to  
peak.

Nodding test with Autoguide on, static,  
10 and 20 arc sec nods. In 20 arc sec  
nod throw setup, it actually nodded 19 arc  
sec. Tested while nodding and walking from  
A to B position with telescope offsets  
Test done @ ~920 cm<sup>2</sup>

Results from both of autoguide by Dave:  
plate scale and rotation is fine and un-  
changed

Worked long slit mask to align nodding with  
slit

went to NGC 1068 @ 2:00 on HST



- ngc.2016 NGC1068 in long-slit mode  
seeing continuum alright but  
flats are saturated
- ngc.2017 same but  $v_{det} = -3.6$
- ngc.2018 --
- ngc.2019 --
- ngc.2020 --
- ngc.2021 same but 3" north
- eur.2022 autoguiding and peaking, bad
- eur.2023 same as eur.2022 but lots of  
good pairs, Europa is standard for  
NGC1068
- eur.2024 more good nod pairs
- changed instrument orientation back to N-S
  - went to Mars, setting 1233, optimized for  
1230-1236  $\text{cm}^{-1}$ , CVF optimized
- Mars.2025 ignore - wrong scan settings
- Mars.2026 2 scans, Mars too far west
- Mars.2027 4 scans, fine but slightly too  
and centered on disk
- Mars.2028 - Mars 2023 4 scans each at different  
offset positions. Note that Mars  
drifts, mostly in E-W direction.  
Partly compensated by large offsets  
at the beginning of each file.  
But there will be E-W drifts  
during the scans too

- acma.2034 - acma.2045 Sirius is the same  
settings as Mars.  
Nodded observations  
with autoguiding.  
16 nod pairs each  
file. Looks good.
- 05:45 HST close up - good night.

Loop for Oct. 12 2009 - see electronic  
log file

Oct 13, 2009

instrument is in E-W position, E-Box  
~~was~~ towards control room as in the  
previous nights

First object is EP Aquarius for pointing  
and focus

epagr.4000 nodding test observations  
in  $H_2$  line @ 187  $\text{cm}^{-1}$   
→ Focus - 1.8

Cromhar B @ 394 130

epagr.4001 decreased nod throw

Went to Callisto

Cal. 4002 Focus adjusted to -1.7

cal. 4003 Callisto is well centered  
→ go to Jupiter



io. 3549  
.3550  
.3551

-0.0065 1-16

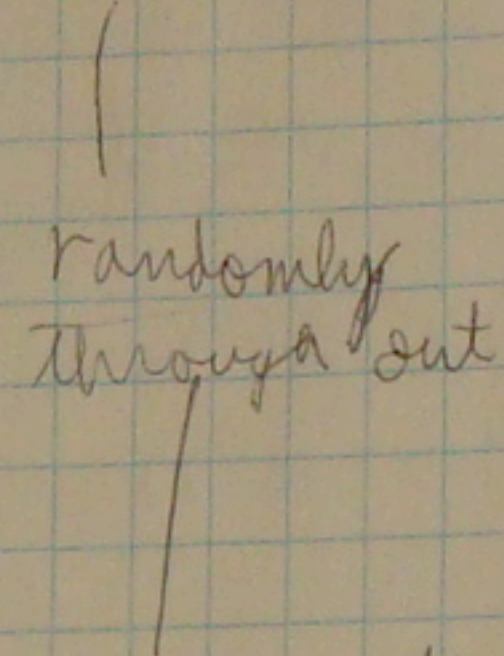
Callisto

cal. 3552  
cal. 3553

Io

io. 3554  
.3555  
.3556  
.3557  
.3558  
.3559  
.3560  
.3561  
.3562

bounce



rates 0.0075 - 0.0013

Callisto

cal. 3563  
cal. 3564

Io

io. 3565  
.3566  
.3567  
.3568  
.3569  
.3570  
.3571

bad bounce



Callisto

cal. 3572  
.3573

Finished!!

Start Oct 09

Test subdirectory.

Looking at C<sub>2</sub>H<sub>2</sub> gas cell at Q-branch. Gony for focus.

c2h2.0001 - starting point  
.0002 - 2 turns counterclockwise  
.0003 - back to starting point. shorter gas cell.

medium made on c2h2. use pinhole.

c2h2.0004

19:40 after dinner: gas cell with C<sub>2</sub>H<sub>2</sub> back  
pinhole still in, pressure of gas cell going  
up, lines get broader c2h2.0005

c2h2.0006 - after pumping  
c2h2.0007 - two (2) turns on echelle  
paraboloid clockwise

c2h2.0008 - ignore

c2h2.0009 - two (2) turns counter-  
clockwise → back to host

c2h2.0010 - two (2) more turns counter-  
clockwise

c2h2.0011 - one (1) turn clockwise  
→ final position is one (1)  
turn counterclockwise from  
"start point" (0006, 0009)

c2h2.0012 - ignore

→ note: c2h2.0000 - c2h2.0012 were done with  
Vdet = -4.0V and object = "fake", ~~100~~  
feature = "ozone" and wavelength = "1000.0"  
→ so these three header info are wrong!



- c2h2.0013 - gone to use TTT, heads info is OK
- c2h2.0014 - hi-med mode now
- c2h2.0015 - c2h2 cell taken out → looking at room (wrong keyword<sup>ol</sup>, used pic hole instead of slit)
- room.0016 - two (2) turns clockwise
- room.0017 - two (2) turns counter clockwise back to 'start' (file c2h2.0015)
- room.0018 - two (2) more turns counter clockwise
- c2h2.0019 - same setting as room.0018 but with c2h2 instead of BB
- room.0020 - two (2) more turns counter clockwise with room / BB illumination [c2h2.0021 is garbage]
- c2h2.0022 - same setting as room.0020 but with C2H2 instead of BB
- h2o.0023 - same setting as room.0020 and c2h2.0022 slit at 1374 cm<sup>-1</sup> (h<sub>2</sub>O)
- h2o.0024 - two (2) turns in ~~clockwise~~ clockwise direction (with 2 turns in counter clockwise direction from start)
- h2o.0025 - ignore
- h2o.0026 - two (2) more turns clockwise → back to start position

9-Oct 09:30 HIT

- read.0027 only storing the read before reset. analog power off.
- reset.0028 only after reset with analog power off

Turn analog power on. Got line profile information. Start at 1374 cm<sup>-1</sup>. Use Gain = 50, fixed ~~width~~<sub>length</sub> slit (ang = 80).

h2o.0029 pressure = 293 mTorr pumping all the time.

change to 1260 cm<sup>-1</sup>

h2o.0030 pressure = 290 mTorr pumping, poor S/N

change to 797 cm<sup>-1</sup>

h2o.0031 pressure = 327 mTorr pumping poor S/N repeat.  
.0032

change to 546.4 cm<sup>-1</sup>

h2o.0033 277 mTorr

change to 730.5 cm<sup>-1</sup>. Use C<sub>2</sub>H<sub>2</sub>, pump all the time.

c2h2.0034	274 mTorr	32 scans, so look for best, repeat
.0035	278 mTorr	repeat.
.0036	278 mTorr	lines getting weak.



For Entire run, EW has electronics in West.

pupil 1000 instep = 0 NS - Electronics south of Dewar  
 1001 90 EW - Electronics west of dewar  
 1002 90  
 1003 tests of pairspace problem  
 1005 |  
 1006 |  
 1007 |  
 1008 |

Go to 248 cm<sup>1</sup> HCNI R(12)  $T_{\text{cell}} = .20$   
 Go to EP Agr

Center up on Tommy's setting. Blaze on plots disagrees with instrument.

sky. 1009 to check pipe's blaze

sky. 1010 moved paraboloid to make sure not on wrong echelon order. Very weak. Not a good move after adjusting K-mirror from  $\sim 0.022$  to  $0.630$

$\delta = 748 \text{ cm}^{-1}$  set EW bore sight. Crosshair B @ 399, 123  
 focus is  $-1.78$  Pore Temp 4.7 and air temp = 3.0  
 After focus, peak up again. Crosshair B @ 415, 123

epage. 1012 doing a little peaking.

Move to N/S slit. Back to EP Agr for N/S bore sight

Peak up on EP Agr. Crosshair A @ 438, 95 (hor, ver)

epage. 1013 Pretty cruddy, but who cares.

Go to Jupiter. Put center of planet on bore sight. Use scan parameters from Tommy's file.  
 step = 0.7 W ON offset = 28E -19 N

Jup. 1014 not off link. Too much sky at start  
 Stopped after 1 scan. 1st deriv bounce  
 Change offset 21E -21N Change to 70 (step)

Jup. 1015 Looks good. Bit of 1<sup>st</sup> deriv bounce.

.1016 Too much off southern edge of planet. Stopped after 2 scans.

.1017 Moved N 1" at end of scan 1. some sort of grating shift during scan 1 near frame 8. scan 2 looks like coming on a little early.

1018 Changed offset to add 3 skys to East (21E  $\Rightarrow$  23E)  
 In scan 1, looks like some motion along slit near frame 30-35(?). Seeing?

1019 At end of scan 2, move 1" N. seeing too much sky at off slit.  
 At end of scan 3, move another 1" N.

cal. 1020 Nod mode. peaking.  
 .1021 more Guiding move 0.5" along slit around pair 9.  
 .1022

Change to 17  $\mu\text{m}$  for Uranus S(1).  
 Go to TX Psc. Can't find it. Go to Mira. Found it.  
 Change focus to  $-1.98$ . Adjust bore sight.

nat. 1023 negative beam off  
 .1024 nice

Go to Juno for telluric + pointing.

juno. 1025  $\pm 90$  on sidebar

Go to Uranus. Use 0.5 W 0.0N steps. Offset 4E 0N  
 716 points

uran. 1026 see nothing

Change to nod mode. See line in accum. nodding off.

Find offset guide star. Re center Uranus.

uran. 1027 see it now, but only after several nods.

Go back to scanning



Uran. 1028

Uran. 1029 after scans had to move 4" E 2" N

1030 have to move 2" W + guided ~ 2" N  
1031  
1032

1033 4 scans trying to guide at beginning of each scan but note there is differential in tracking between Uranus + guide star.

1034 maybe better guiding

1035  
1036 needed to move 2" NE

1037 moved TV in too soon, trashed extra steps

1038 needing 1" N after each scan

1039

Go to  $\alpha$  Tau for platescale + autoguider tests

$\alpha$ tau. 1040

$\alpha$ tau. 1041 overlapping orders and longer nod

Go to 1240 am<sup>1</sup> for H<sub>2</sub>O<sub>2</sub> on Mars

$\alpha$ tau. 1042

focus -1.68 (vs. -1.98 at 12pm)

Mars. 1043 ignore. nod mode

2 scan/file Mars. 1044 scan <sup>28</sup> 32x 0.5" E start 7" W 2.5" N

Mars. 1045 5" W 2.5" N

Mars. 1046 32x 0.5 (good) 6" W 2.5" N

4 scans Mars. 1047

Mars. 1048

Mars. 1049

Mars. 1050

Mars. 1051

Stop after 1 scan to change starting pt  
7.5" W

Mars. 1052 start at 8" W, 2.5" S stop after 1 scan  
Mars. 1053 9.5" W, 2.5" S

Mars. 1054

Mars. 1055

Mars. 1056

Go to  $\alpha$  Cma for atmosphere and maybe flux

$\alpha$ cma. 1057 guiding on 1<sup>st</sup> 6 nodding  
 $\alpha$ cma. 1058

Try scanning for flux

$\alpha$ cma. 1059 } ignore stopped early

$\alpha$ cma. 1060 }  
 $\alpha$ cma. 1061 good (although poor S/N)

Back to nodding, but guiding going haywire

$\alpha$ cma. 1062

$\alpha$ cma. 1063

$\alpha$ cma. 1064

Good night



Oct 11, 2009, this is night 2  
 epags. 1065 EP Agr instrument is N-S  
 measured focus (-1.481) and  
 position in setting 1247

noticed that we had to go E-W  
 → changed instrument orientation  
 → went back to EP Agr and try to  
 point. ~~Long~~ Long time no success.

Finally managed: Goresight crosshair N-S  
 was (430; 64) at pos A Goresight  
 crosshair B in E-W orientation is (477; 110)

went to Jupiter and started scans

Jup. 2001 - Jup. 2004 ignore. (one scan  
 led, not centered in wavelength)

Corrected wavelength setting to offset  
 the 1244.1 also like to the edge of the  
 chip (setting 1247, CV filter optimized)

Jup. 2005 - 1 scan N-S across the

Jup. 2006 - 4 scans N-S across the  
 planet along its meridian

- After these scans went back  
 to Jupiter on TV cam. Jupiter  
 was offset by 4.5" west, 2.5" north  
 → adjusted tracking rates

Jup. 2007 - repeat of Jup. 2006 with better  
 tracking rates

Jup. 2008 - repeat of Jup. 2007 after opti-  
 mizing tracking rates again. Jupiter  
 was off after Jup. 2007 by 3.9" East  
 and 0.0" North.

Jup. 2009 - 4 scans with 4" East offset  
 → after scans are completed,  
 Jupiter was off 1" East but  
 fixed again in N-S

Jup. 2010: 4 scans with 8" East (might be  
 9" East effectively after the offset  
 after Jup. 2009  
 After the scan, Jupiter was off  
 by 4" West and 1" N

Jup. 2011: 4 scans with 8" West (done  
 after re-centering on Planet  
 center). After completion the  
 planet was off another 4" West

Feb. 2012: trying to observe Callisto - ignore

Mar. 2013: Went to Alp car. Seeing only  
 little flux. During observation,  
 Qlook did → no possibility to  
 peak.

Nodding test with Autoguide on, 1stic,  
 10 and 20 arcsec nods. In 20 arcsec  
 nod throw setup, it actually nodded 19 arc-  
 sec. Tested while nodding and walking from  
 A to B position with telescope offsets  
 Test done @ ~920 am

Results from test of autoguide by Dave:  
 plate scale and rotation is fine and un-  
 changed

Tested long-slit mode to align nodding with  
 slit

went to NBC 1068 @ 2:00 on HST



- ngc.2016 NGC1068 in long-slit mode seeing continuum alright but flats are saturated
- ngc.2017 same but v-det = -3.6
- ngc.2018 --
- ngc.2019 --
- ngc.2020 --
- ngc.2021 same but 3" north
- eur.2022 autoguiding and peaking, bad
- eur.2023 same as eur.2022 but lot of good pairs, Europa is standard for NGC1068
- eur.2024 more good nod pairs
- changed instrument orientation back to N-S
  - went to Mars, setting 1233, optimized for 1230-1236  $\text{cm}^{-1}$ , CVF optimized
- Mars 2025 ignore - wrong scan settings
- Mars 2026 2 scans, Mars too far west
- Mars 2027 4 scans, fine but slightly too and centered on disk
- Mars 2028 - Mars 2033 4 scans each at different offset positions. Note that Mars drift, mostly in E-W direction. Partly compensated by large offset at the beginning of each file but there still is E-W drift during the scans too

acma.2034 - acma.2045 Sirius in the same settings as Mars. Nodded observations with autoguiding. 16 nod pairs each file. Looks good.

05:45 HST close up - good night.

Loop for Oct, 12 2009 - see electronic log file

Oct 13, 2009

instrument is in E-W position, E-Box ~~was~~ towards control room as in the previous nights

First object is EP Aquarius for pointing and focus

epagr.4000 nodding test observations in  $H_2$  line @  $387 \text{ cm}^{-1}$   
 → focus - 1.8

Cronhar 3 @ 394 130

epagr.4001 decreased nod throw

Went to Callisto

cel.4002 focus adjusted to -1.7

cel.4003 Callisto is well centered  
 → go to Jupiter



Jup. 4003 First file on Jupiter, central scan, 2 scans

After 4004, Jupiter was off  
11.8"E, -0.6"N

Jup. 4004 offset - 4"E, ~~offset was~~  
~~corrected~~ →

Jup. 4005 offset - 8"E, afterwards no correction to position

Jup. 4006 offset 4"E, 2.0"E 0.9"N corrected afterwards

Jup. 4007 offset 8"E, perfectly centered after the scans

Cal. 4008 Callisto again, nodding observations 16 nodes, peaking

Cal. 4009 Callisto, 16 nodes

Adjusting instrument to Jupiter setting 747

Cal. 4010 Callisto nodding observations in 747. Re-focusing to -1.8

Cal. 4011 (unchanged) and peaking for all files

Cal. 4012

Cronhar. B 404 134

Jup. 4013 Line coverage is bad, had to move paraboloid and reduce  
Cal. 4010-4012 are km?

Jup. 4014 new scans with optimized setups. Between 4013 and 4014 Jupiter was offset by 72" E

offset was corrected and backrest tweaked to improve before 4014 was started

After 4014 was done, Jupiter was off 3.9"E - corrected

Jup. 4015 2.4"E 1.5"N offset after this file

Jup. 4016 3.0"W 1.2"S offset after this file

Jup. 4017 3.0"W 1.5"N offset after this file

Jup. 4018 3.0"W 0"N offsets after this file

Cal. 4019 Callisto as calibrator for this & Jup. Nodding observations.

Cal. 4020 This should replace files 4010-4012

Cal. 4021

Jup. 4022 Back on Jupiter in the same setting to collect more data, 4022 interrupted after 3 scans

1.8"E, 0.9"N offset found after this file  
Jup. 4023 1.2"E offset after this file

Jup. 4024 1.5"E offset found after this file

Jup. 4025 16.5"E offset found after this file

Jup. 4026 halfway through scan 4 grating shifted?  
5.1"E, 1.8"N offset found after this scan.

Juno. 4027 Juno at H<sub>2</sub> SC(2) for Uranus observations



uran. 4028 Uranus H<sub>2</sub> (S<sub>2</sub>) in aod-mode and auto guiding

4029 same, 1" N offset after this file

4029D same, no offset found afterwards

4031 same

4032 same, 1.5" E offset found after this

4033 ignore (~~skip~~ guiding failed)

4034 fine (offset not checked)

4035 -0.5" N offset found after this

4036 fine (offsets not checked)

4037 0.3" E, 0.9" N offset found after this

4038 fine (offsets not checked)

4039 0.9" E, 0.9" N offset found after this

4040 -0.6" E, 0.3" N offset found after this

4041 -0.6" E, 0.9" N ...

4042 0.3" E, 0" N ...

4045 not checked?

4044 0" E, 0.3" N ...

4045 not checked

4046 dome got in the way halfway 1.2" E offset after 4046

Went to v. Aur.

aur. 4047 H<sub>2</sub> 814 cm<sup>-1</sup> hi-med mode

aur. 4048 :: changed to long-slit mode for the ~~sketch~~ observation at Ne II 780.42

ngc 1068. 4049 starting nodding observation on ~~some~~ target and wave-length as last night

.4050

.4051 same, but various offset positions N-S for mapping

.4052

.4053

.4054

aur. 4055 Standard for NGC 1068 - ignore 4055!

aur. 4056 ok

aur. 4057 went to Sirius to get back in hi-med mode and setting for mass

aur. 4058 ok

aur. 4059 ok

mar. 4060 - ignore, started on plate, so sky and flat are unusable

.4061 scan is ok but not centered

.4062 nice scan

.4065 so far all scans done in "normal-flat" mode



mars. 4066 switched to mars flat = 4  
 :  
 mars. 4071 last mars scans  
 acma. 4072 Sirius as standard for Mars  
 acma. 4073 again  
 5:11 HST close done - done

Oct 14, 2009

start with Callisto in the 730  $\text{cm}^{-1}$   
 setting for Jupiter  
 cal. 5000 focus is -1.6, object peaked  
 cal. 5001 This is a scan on Jupiter,  
 despite the filename, 2 scans  
 5002 same! Paul reported  
 an offset of 13.5 E, -2.1 N off  
 this file? 2 scans  
 prep. 5003 Redoing central scans (4)  
 5004 Note the grating drift  
 0.9° E offset after this file  
 5005 1.2° E, 1.2° N offset after this file  
 6<sup>th</sup> row is slipping off array → correcting  
 5006 first file after echelle grating  
 corrected, 0.8° E, 1.5° N offset  
 after this file  
 5007 3° E, 0° N offset after this file  
 5008 4.2° E, 1.5° N offset after this file  
 5009 3.0° E, 0.9° N offset after this file  
 5010 4.5° E, 1.2° N — —  
 5011 4.8° E, 0.9° N offset after this file  
 gang. 5012 Ganymede as standard in  
 : 730  $\text{cm}^{-1}$  setting, nodding  
 : observations  
 gang. 5014



gany. 5015 Ganyuich on Standard in  
 setting  $950 \text{ cm}^{-1}$   
 :  
 gany. 5017  
 jup. 5018 Gadr on Jupto in setting  
 $950 \text{ cm}^{-1}$  and scanning  
 jup. 5019  $1.5^\circ \text{E}, 1.8^\circ \text{N}$  offset after this file  
 5020  $1.2^\circ \text{W}, 0.9^\circ \text{N}$  — " —  
 5021 no offsets found  
 5022  $1.2^\circ \text{E}$  offset found after this file  
 5023  $2.4^\circ \text{E}, 1.8^\circ \text{N}$  — " —  
 5024  $3^\circ \text{E}, 0^\circ \text{N}$  — " —  
 5025  $1.5^\circ \text{E}, 1.8^\circ \text{N}$  — " —  
 5026  $1.5^\circ \text{E}, 0.9^\circ \text{N}$  — " —  
 5027 Ok  
 5028 does not exist  
 5029 ignore (software problems)  
 5030  $3^\circ \text{E}, 1.5^\circ \text{N}$  offset found after file  
 5031  $3.6^\circ \text{E}, 0.9^\circ \text{N}$  — " —  
 5032  $6.9^\circ \text{E}, 1.5^\circ \text{N}$  — " —  
 5033  $11.1^\circ \text{E}, 2.1^\circ \text{N}$  — " —

reached high airman → go to  
 standard site

apia. 5034 not enough flux ( $\text{AR} = 1.7$ )  
 apu. 5035  $\approx \text{Per}$   
 change to  $1246 \text{ cm}^{-1}$  ( $\text{H}_2$  (S41)) for  
 Uranus  
 apu. 5036 changed Tacu ( $-1.75$ )  
 and optimized C/F wave.  
 → standard for Uranus  
 quit after 12 pairs  
 jno. 5037 went back to Jno because  
 it's bright, quit after 8 pairs  
 Uran. 5038 Uranus, autoguiding  
 → autoguiding failed  
 → ignore file  
 Uran. 5039 guiding worked but after  
 file was done offset of  
 $2.4^\circ \text{E}$  and  $2.9^\circ \text{N}$  found  
 5040  $0.8^\circ \text{E}, 1.9^\circ \text{N}$  offset after ucoob  
 5041  $2.5^\circ \text{E}, 0.6^\circ \text{N}$  — " —  
 5042  $4.6^\circ \text{E}, 0.7^\circ \text{N}$  — " —  
 5043  $5.9^\circ \text{E}, 1.4^\circ \text{N}$  — " —  
 5044  $1.2^\circ \text{E}, -0.9^\circ \text{N}$  — " —

note: all offsets other than 5044 are  
 wrong! They include the guiding  
 and then tracking errors and  
 refraction!

moved to  $\times \text{Tar}$ , no signal, lost  
 control of irons and did a dirty  
 reset.



~~atan. 5045 no flux~~

After 1hr - 1.5hr of trying to get flux decided to get into imaging mode. Cassini hair was way off. Was Uranus

atan. 5045 finally flux Cent +

Had to shutdown ROBS again. Motor problems, Motor ghu had to be restarted

acma. 5046 acma in 1369  $cm^{-1}$  setting

mas. 5047 Scanning Mars in 1369  $cm^{-1}$

mas. 5048 Mars is drifting slowly west

mas. 5049 moved 1" E between scans 2 and 3

mas. 5050  $\alpha$

mas. 5051  $\alpha$

5:05 AST end of night

Oct. 15, 2009

Had to fill the at the start of the night. Ice in Helium line  $\rightarrow$  Had to take off TEXES to warm up the transfer tube attached to TEXES and file again. Lost some time.

mp. 6001 Jupiter in setting 1231  $cm^{-1}$  slit is in N-S orientation for G. Ostrow projects

.6002 stopped after 3rd scan and change N-S offset

.6003 4.8" E offset found after this file

{ .6004 stopped after 1st scan and changed N-S offset  
.6005 OK  
.6006 7" E, -6" N offset found after this file }

WRONG ENTRY IN NOTES FILE

.6004 OK

.6005 stopped after 1st scan and moved N-S

.6006 7" E, -6" N offset found afterwards stopped after one scan too?

.6007 OK

cal. 6008 Calisto as standard in 1231  $cm^{-1}$

6007 OK, 1231  $cm^{-1}$  setting

6008 OK, 1231  $cm^{-1}$  setting

6009 missing!

6010 stopped because BL not working 748  $cm^{-1}$  setting



- cal. 6011 748 cm<sup>-1</sup> setting
- cal. 6012 - " - changed focus to -1.9 (was -1.6)
- Jup. 6013 Jup. to sea, stopped after 1 sea to change offset
- .6014 Stopped after 2 seas to increase # of steps
- .6015 ok
- .6016 ok
- .6017 ok
- .6018 ignore, changed to 1247 cm<sup>-1</sup>
- 6019 ok, 1247 cm<sup>-1</sup>
- 6020 ok, - - -
- 6021 stopped after 1 sea to change offsets
- 6022 ok
- Juno. 6023 ok, Juno in 1247 cm<sup>-1</sup>  
→ changed to E-W orientation
- Juno. 6024 E-W orientation, Gave sight B crosshair @ 421 115 stopped after 12 nodpairs
- Uran. 6025 unknown offsets after this Uranus S(4) nodding ok
- 6026 not checked for offsets

- Uran. 6027 no offsets found after this file
- 6028 not checked for offsets
- 6029 no offsets found after this file
- 6020 not checked for offsets
- 6021 not checked for offsets
- 6032 interrupted due to dome shutter being in the way
- 6033 not checked for offsets
- 6034 Uranus was totally off after this file

Moved to Mira, Gave sight file

Focus looks a bit fluffy but could have been extended shell of Mira

Move on to Capella (α Aur)  
 Aur. 6035 hi-med mode 1247 cm<sup>-1</sup>  
 Aur. 6036 long slit mode, 780.42 cm<sup>-1</sup>

new crosshair B @ 428, 126

- IC342. 6037 IC342 scanning operation in long-slit mode
- 6038 - " -
- 6039 - " -
- 6040 - " -

pointing after 6040 fine



ic342.6041 nodding observations on IC342  
@ variable coordinates

6042 - " -

eur. 6043 Europa as standard for IC342  
in long-slit mode

acma.6044 Sirius in hi-med mode @  
1240 cm<sup>-1</sup> for Mars

Borelight, Cronhair A @ 390 104

Mars.6045 0 Mars-scans on various  
6046 0 E-W offsets  
6047 -2 ok  
6048 1 ok  
6049 1 ok  
6050 -2 ok  
6051 -3 ok  
6052 1 wrong offset, ignore  
6053 1 ok  
6054 1 ok  
6055 -3 ok  
6056 -5 ok  
6057 -5 ok  
6058 -2 ok

flight drift  
in a.c.  
compensated  
by adapting  
E-W offset

5:17 AET END OF NIGHT

Oct 16, 2009

Jup. 7001 This is Callisto - at 1231 cm<sup>-1</sup>  
in hi-med mode

Jup. 7002 This is Callisto - at 1231 cm<sup>-1</sup>  
in hi-med mode

Jup. 7003 Scan of Jupyter at 1231 cm<sup>-1</sup>,  
stopped after one scan:  
Focus is -1.65

7004 Ok but stopped after two scans

7005 stopped after one scan

7006 Ok but stopped after one scan

7007 Ok, 1 scan { Note large } { setup  
7008 Ok, 2 scans { drift of } { for more  
7009 Ok, 2 scans { the planet } { scans and  
7010 Ok, 1 scan { then stopped

7011 Ok, 1 scan

7012 ~~ok~~, ignore! bad data

7013 Ok 1 scan, changed to 1247 cm<sup>-1</sup>

7014 stopped after two scans

7015 - " -

7016 - " -

7017 stopped after one scan

7018 - " - | large offsets found  
7019 - " - | -> changed rate!



jup. 7020 stopped after two scans  
 jup. 7021 stopped after one scan  
 no 7022  
 cal. 7023 Callisto in Jupiter ~~Setup~~ Setup  
 → ignore 7023  
 cal. 7024 stopped early @ load died  
 cal. 7025 lost target → ignore  
 cal. 7026 lost target → ignore  
 7027 ok  
 7028 ok  
 7029 ok, changed to 1280 cm<sup>-1</sup>  
 7030 ok  
 jup. ~~7030~~ Jupiter scan in 1280 cm<sup>-1</sup>  
 jup. 7031 stopped after 1 scan  
 jup. 7032 4 scans  
 jup. 7033 stopped after 1 scan  
 jup. 7034 3 scans?  
 jup. 7035 1 scan offset -27, -1  
 jup. 7036 1300 cm<sup>-1</sup>  
 jup. 7037 4th scan shutter  
 jup. 7038 stop after 1 scan  
 jup. 7039 offset -16, 0  
 juno. 7040  
 juno. 7041

Go to 814.42 for Uranus  
 juno. 7042  
 Go to Uranus  
 Uran. 7043 gain = 25 autoguiding  
 Uran. 7044  
 Uran. 7045  
 Uran. 7046 gain = 50  
 Uran. 7047 adjust position N"E, "S  
 Uran. 7048  
 Uran. 7049  
 Uran. 7050  
 Uran. 7051 adjust  
 Uran. 7052 seems to be drifting faster  
 but Uranus came ~~one~~ center field  
 Go to d Bar (flux std) L = 0.50  
 aper. 7053  
 Go to [Net II] long slit  
 aper. 7054  
 Go to IC 342  
 ic342.7055 center bright!  
 Try scanning offset 6.5"S, step 21 x 0.7"N  
 ic342.7056 galaxy is in A beam position,  
 not center  
 ic342.7057 for an extra flat



Oct 17 2009

(see electronic notes)

807 cm<sup>-1</sup> for H<sub>2</sub>O in IR Tau

804.802 in order 3

808.036 in order 6

atau. 8056

atau. 8057

atau. 8058

Try IR Tau

drtau. 8059 nothing

8060 1" N

8061 1" S

8062 2" S

8063 3" S

8064 2" N

-8075

never found  $\nabla$

ic342.8077 on optical bright spot(?)

ic342.8078 7" W

ic342.8079 3.5" W

ic342.8080

ic342.8081

ic342.8082

shift echelon passers to see red side