

met. 1040 Vdet = -4.2 Object name is wrong!  
 1041 Vdet = -4.2 N bias is not 4.0

Dec. run start - day of testing & focus  
 /data/dec0215  
 Vac.0002 1.4" slit, 731.5 cm<sup>-1</sup>, Qbran, no gas, 8 nodes storemode  
 Vac.0003  
 C<sub>2</sub>H<sub>2</sub>.0004 C<sub>2</sub>H<sub>2</sub> change schelle angle so  
 at nominal focus 8 nodes Vac.0002 + 0003 won't serve  
 C<sub>2</sub>H<sub>2</sub> gas Wno = 731.5 as background for this  
 C<sub>2</sub>H<sub>2</sub>.0005 Same as above  
 C<sub>2</sub>H<sub>2</sub>.0006 2 TURNS IN ON PARABOLOID stretch less than  
 C<sub>2</sub>H<sub>2</sub>.0007 ~~XXXXXXXXXXXXXXXXXXXX~~  
 C<sub>2</sub>H<sub>2</sub>.0008 4 TURNS OUT (2 FROM IN IT. POSITION)  
 C<sub>2</sub>H<sub>2</sub>.0009 4 pixels  
 C<sub>2</sub>H<sub>2</sub>.0010 NOMINAL POSITION (2 BACK IN)  
 C<sub>2</sub>H<sub>2</sub>.0011 VAC  
 C<sub>2</sub>H<sub>2</sub>.0012 VAC  
 C<sub>2</sub>H<sub>2</sub>.0013 1.4" SLIT ~~WNO = 729.15~~ WNO = 729.15 cm<sup>-1</sup>  
 C<sub>2</sub>H<sub>2</sub>.0014 1" SLIT  
 C<sub>2</sub>H<sub>2</sub>.0015 0.8" SLIT  
 C<sub>2</sub>H<sub>2</sub>.0016 2" SLIT  
 C<sub>2</sub>H<sub>2</sub>.0017 3.1" SLIT  
 Vac.0018 empty gas cell 3.1" slit

5 Dec 02

VAC. 0019 2.1" slit vacuum in gas cell ( $W_{NO} = 729.15 \text{ cm}^{-1}$ )  
 VAC. 0020 1.4" slit  
 .0021 1.0" slit  
 .0022 0.8" slit  
 C2H2 .0023 0.8" SLIT  $W_{NO} = 1518 \text{ cm}^{-1}$   
 C2H2 .0024 1" SLIT  
 .0025 1.4" SLIT  
 .0026 2.1" SLIT  
 .0027 3.1" SLIT  
 VAC. 0028 3.1" SLIT still has lines H<sub>2</sub>O?  
 .0029 2.1" SLIT  
 .0030 1.4" SLIT  
 .0031 1" SLIT  
 .0032 0.8" SLIT

Wavenumber 810 /mslit  
 spikes .0033 16mslit, lens cap  
 peak 1 volt for a spike  
 spikes occur in regions at  $\approx 2.5 \text{ V}$

3hz - (-35dB)

Spikes .0034 open - room blackbody

Spikes .0035 dirty chopper

Spikes .0036 Matt's hand - messed up

Spikes .0037 Matt's hand

Read reset - sub 128 is defective - possibly too many converts  
 we don't understand read reset - sub 64

TG, MR, MM, NR, HR

06 DEC 02 UT

DIRECTORY (DEC 02/6)

SLOW START, TELESCOPE JUMPING 1.5" RANDOMLY (FREQ. <sup>EVERY</sup> 5 MIN.)

START BEKE SKITT FINDING @ 20:30 HST

FOCUS  $Z = -4.8$ ,  $T = 1.1$   $W_{NO} = 816$

(21:50 HST)

MOVED ECHELON DISPERSION SCREWDRIVER  
 ALSO 180° JUMPS, LESS OFTEN

BAND .1001

POSITIVE BEAM NEAR EDGE OF SLIT  
 GUIDED AFTER PAIR 4

WRONG OBJECT  
 & FEATURE

21:10  
 HST

BACK TO ENGINEERING, 2 1/2 MM H<sub>2</sub>O

PUP. 1002

PUPIL IMAGE, SEEMS WORSE THAN  
 HA 00.43 INIT. SETUP

WRONG OBJECT  
 & FEATURE

.1003

NO CHANGE  
 HA 00.00

.1004

INCREASED DEC BY 30° TO 49°  
 SLIGHT SAG

.1005

TO DEC -11°, MORE SAG UP/DOWN

.1006

SEEMS SYMM. ABOUT ZENITH  
 HA 00.00, MORE SAG

.1007

HA 02.00, SAG

.1008

HA 02.00, SAG

.1009

HA 00.00, SAG

MOVE ~~U & V~~ U & V

U = 0.0125, V = 0.0067

CURRENT

U = —, V = —

NEW

HEXECUI NOT ALLOWING CHANGE IN U & V

NEW COMMAND: # MOV U <sup>no space</sup> #

(LORGE)

06 DEC 02

R.P. 1010	ORIG	U	0.0125	V	0.0086
	NEW	U	0.0149	V	0.0076
		U	0.02		<del>0.01</del>
		U	0.01		
		U	0.014		
	FINAL	U	0.0134	V	0.01
			+		

DO EACH NIGHT  
HEXEQUI OPENS W/  
DEFAULTS

INST MODE WRONG  
(1010 & 1011)

.1011

ATAU.1012 180" JUMP DURING CALIBRATION

.1013 ANOTHER BIG JUMP E/W (65586 RA)  
16<sup>TH</sup> BIT

.1014 1 PAIR BEFORE JUMP

.1015 2 GOOD FRAMES THIS TIME

.1016 NODDING OFF SLIT, GUIDING OFF

.1017 NODDING OFF SLIT, GUIDING ~~STILL~~ STILL OFF

.1018 NODDING ON SLIT

COMPLETE

23:00 HST  $W_{NO} = 817.8$ ,  $T = -0.2$ ,  $Z = 4.8$

ATAU.1019 FINISHED 6 PAIRS, ERROR DURING 7

ALEX.1020 PAIR 3 HAD POSITIVE  
PAIR 4 HAD BOTH  
PAIR 6 GOOD  
JUMP IN PAIR 8, HAS NEGATIVE  
PAIR 10 GOOD  
JUMP IN PAIR 12, GOOD AT END

ALEX.1021 JUMPING A LOT, 1.5"  
PAIR 7 HAS GOOD NEGATIVE  
PAIR 15 GOOD, PAIR 16 GOOD

.1022 GOOD POSITIVE PAIR 3  
" " " 12  
PAIR 13 GOOD  
PAIR 14 ONLY NEGATIVE

FLAT.1019 <sup>MOVE</sup> TO  
FLAT.1020,  
SAME WITH HDR -  
#5 DID NOT  
ADVANCE

T15 SIDEBAR

06 DEC 02

23:50  
HST

TIT. 1023  
1024

GUIDING UNTIL PAIR 6, MORE JUMPING 15-16  
JUMP IN PAIR 8/9, 12

.1025

LITTLE GUIDING DONE, JUMP PAIR 5, 9; PAIR 10 GOOD  
PAIR 14 BAD, JUMP IN 16

T = -0.8

.1026

GUIDED TO RIGHT & JUMP DURING 14/15

.1027

MOVED 1/2" NORTH, GUIDING THROUGH PAIR 5

.1028

good at pair 11

00:30  
HST

Z = -5

ACM.1029 GOOD

00:50  
HST

$W_{NO} = 772.5$

ACM.1030 LITTLE BOUNCE IN PAIR 8  
PAIR 11 NOT GOOD

.1031

PAIR 4 JUMPED TWICE, JUMP IN PAIR 6

01:05  
HST

TIT. 1032 MOSTLY GOOD

1033

PAIR 5 OR 6 NOT GOOD

1034

PAIR 4 LOST TARGET, POOR PAIR 11, 12  
GOOD PAIR 14

1035

GOOD, TYPICAL SMALL JUMPS

01:40  
HST

$W_{NO} = 899.5$

TIT. 1036 PAIR 10-16 PROBLEMS GUIDING

TA.1037 LARGER NO

06 DEC 02

02:00  
HST

TIT. 1038 PAIR 5 BAD  
TIT. 1039 END SUM TO 8  
BAD UNTIL PAIR 4  
PAIR 8 POOR

.1040 PAIR 11 POOR/AVERAGE

.1041 BAD UNTIL PAIR 3  
BAD FROM PAIR 6-10

.1042 LOST TARGET ON PAIR 7  
PAIR 9 IMPROVING

.1043 PAIRS 1&2 BAD  
PAIR 14 STRANGE/BAD

.1044 BAD UNTIL PAIR 3  
BAD PAIR 14

02:50  
HST

ACM. 1045 BETTER FROM PAIR 5 ON; PAIR 4 POOR  
PAIR 15 POOR

.1046 GUIDING PAIR 1&3

.1047  $W_{NO} = 894 \text{ cm}^{-1}$  ( $C_2H_2$ )  
896.5060 IS IN BOTTOM ORDER  
PAIR 6 POOR

03:30  
HST

TIT. 1048 MOSTLY GOOD

.1049 GOOD ON PAIR 5  
BAD PAIR 14

.1050 MOVE UP SLIT 2" (SOUTH)  
JUMPING A LOT  
GOOD PAIR 6  
PAIR 15 POOR

$H_2O \sim 2 \text{ MM}$   
(1.75)

02:15  
HST

$\pm 3$   
SIDEBAR

MAY HAVE BEEN  
BORE SIGHT SHIFT

POSSIBLY NOT  
QUITE ON TARGET;  
STRONGER IN  
ACM. 1047

$T = -0.5$   
 $H_2O = 2 \text{ MM}$

$T = -1.0$

10% HUMIDITY

06 DEC 02

$Z \sim 0.1$

.1051

PAIR 4 POOR, 5 WORSE  
QUITE COLD & WINDY,  
LOOKING FOR CIRRUS

.1052

PAIR 6&7 POOR, ALSO 9&10

.1053

PAIR 14 BAD

04:00  
HST

CAL. 1054

$W_{NO} = 729.8 \text{ cm}^{-1}$   $Z = -5.3$   $T = -1.2^\circ\text{C}$   
 $\pm 500$  SIDEBAR

.1055

MOVED ECHELON PARABOLOID  
MOSTLY GOOD

.1056

GOOD AT PAIR 4 ONWARD

.1057

ENDSUM = 8

04:50  
HST

10.1058

GOOD AT PAIR 3  $T = -0.6^\circ\text{C}$

10.1059 X

ENDED EARLY; STARTED GETTING ONLY 3 ORDERS

.1060

GOOD AT PAIR 4  
GLITCH @ PAIR 9

.1061

MOSTLY GOOD

.1062

POSITIVE BEAM GETTING CLOSE TO EDGE | WEREN'T QUITE  
ON IT

.1063

MOVE NORTH ON SLIT, 3"

LOTS OF BAD PAIRS, SOMEHOW GOT IN ACCUM MODE  
GOOD AT PAIR 15, 16

.1064

MOSTLY GOOD pair 14 bad. actually has 18 pairs

06 DEC 02

05:45  
HST

CAL .1065

INCREASE NOD FROM  $4\frac{1}{2}$ " TO 6"  
IT = 0.28 S, 4 COMDDS  
GOOD AT PAIR 6

.1066

GOOD AT PAIR 3

05:55  
HST

10.1067

GOOD AT PAIR 3

.1068

GOOD AT PAIR 3  
THIN CLOUDS

.1069

PAIR 12 BAD, 15 BAD

.1070

skip = 1-4 skip = 16

.1071

skip = 1-2 DC rising might be losing first order

.1072

SOUTH BY 3" PRIOR TO .1072  
PAIR 12 IS BAD & 13 TOO  
 $\Delta 15$   
16 GOOD

.1073

GOOD

.1074

GOOD

.1075

LOST GUIDE STAR  
GOOD PAIR 5-7  
GUIDED SOUTH, PAIR 10  
PAIR 12 BAD, 13 BAD  
14 GOOD

.1076

GOOD = 3, 4, 5, 6, 8

.1077

NOTHING, STOPPED AFTER 7 PAIRS

.1078

VISUALLY POINTED BEFORE THIS ONE  
GOOD = 2, 3, 5, 6, 7, 8, 9, 10

06 DEC 02

07:30  
HST

10.1079

GOOD = 3, 5, 6, 7, 10, 11, 12, 15  
MOVED 3" SOUTH

.1080

GARBAGE

.1081

GARBAGE

.1082

So so between 4+7  
pair 10 marginal  
pairs 11 good  
13 good, 14, 15, 16  
-0.5C

.1083

good pairs - 3, 5-6, 8-9, 12-14,

3-guided  $S \sim 1.5$

.1084

good 3-12, 14, 16

.1085

good ~ 4, 8-12, 14-16

.1086

pair 4 moved south  
good pair 1-11

-0.4C

.1087

(may have started a bit prematurely) flat may be bad?  
good 4, 7, 16

.1088

good 3-9, 12-14, [15+16 only neg]

.1089

good 1, 4-8,

pair 11 (where did it go?)  
where did it go?  
must have gone to bed like we should a few  
hours ago!

07 DEC 02

21:30 HST Feb. 2001  $z = -4.7$  12 um hi-med looking at tub. spikes seem to be showing up.

~~2002~~

22:00 HST  $T = -0.1^{\circ}C$   $z = 4.9$  TILTED ECHELON PARABOLOID

ATAU.2002 LAST PAIR (4) GOOD

.2003 PAIR 1 GOOD  
\* NOISE VARYING, LOST TARGET  
NO REF STAR  
GARBAGE FROM PR 2 ON

.2004 GARBAGE  
(MIRROR CAME IN ON PAIR 4)

FOR A-TAU, GO -200, -213 TO FIND A GUIDE STAR

.2005

.2006 PAIR 1 GOOD  
PAIR 5 POOR

ADP .2007 NSUM = 4  
BOUNCE, 2<sup>ND</sup> DERIV.?  
PAIR 6 GOOD  
CAME S IN PAIR 7

$T = -0.5^{\circ}$   
~~Humidity~~  
~~z = 1.89~~  
 $z = 1.89$

.2008 BOUNCE AGAIN  
PAIR 8 GOOD, SKIP 1-7

.2009 PRETTY GOOD

.2010 BOUNCE ON PAIR 2  
 $x = 139.8$  GUIDE  
 $y = -290$

~~2011~~

"LOG-TAKER NEEDS TO CONDENSE NOTES."

07 DEC 02

$x = 5$  MM

THIN CLOUDS, MAYBE

SIDE ISS WHEN GOOD  
MOVE S<sup>N</sup> 3 PIX, PR 9

23:00 HST HYG. 2011 PAIR 7 GOOD, 12  
.2012 PAIR 3 POOR, 4  
.2013 BEST ONE

23:30 HST MOVED ECHELON PARABOLOID BACK TO CTR  
ATAU.2014 CHECKED FOCUS, KEPT  $z = 4.7$   
MISNAMED HYG. FILE  
 $W_{no} = 1044 \text{ cm}^{-1}$   
 $W_{no} = 1030 \text{ cm}^{-1}$

00:00 HST TIT. ~~###~~  
GAVE UP,  
GUIDING TOO BAD

00:45 HST  $W_{no} = 862 \text{ cm}^{-1}$  HUM. 76%  
TIT. 2015 BOUNCE, PAIR 12 GOOD, 15, 16  
.2016 " " VARYING WATER  
.2017  
.2018

CHANGE ECHELLE TO ORDER 5 (FROM 4)  
SKIP PRS 5, 6, 7; 8 GOOD  
SKIP = 1-12

moved south  $\approx 2''$   
nsum = 8

good = positive of pair 13  
pair 15, 16 = good  
skip 1-2

.2020

skip 11, spectral fringing?  
skip 12, -16 " " " " " "

.2021

skip 1-4  
skip 8-12  
13 has signal of spectral fringing (in spatial direction)  
14-16 " " " " " "

.2022

nsum = 4, nod = 5"N, go 1"S  
1-4 mostly good  
after 5, talking to telescope ~~and~~ died  
computer hung; nodding ceased; tel hung up; not coming back

~01:42

shut off analog power ~~and~~  
Came back after 4 minutes  
remainder garbage

.2023

skip 1-10  
positive of 11 = good  
12 = ok  
14 = good, 15-16 = good

86% Humidity  
6mm H<sub>2</sub>O

92% Humidity

92% humidity  
 $z = 0.23$

07 Dec 02  
 .2024 skip 1-4 5 → end = good 16 a little weird  
 .2025 skip 1-3 skip 9-10 rest good [92% hum. 43]  
 .2026 skip 4-? 10-15 data + odd fringing (odd 3 only 15 pairs?)  
 .2027 ~~skip~~ good @ 7 pair 12 bad pair 13 bad, pair 14 marginal  
 .2028 good 1-2 moved 8.5" S in pair 3 spike in 5

02:20 (HST) go to saturn; same setting setting up on South side w/ 30" S nod

Sat. 2029 cloud pair 13  
 Sat. 2030 skip 1-9 clouds coming in good 10-16 w/ some clouds

02:42 (HST)  $W_{NO} = 1161.2 \text{ cm}^{-1}$  Titan fishing for  $C_2H_2$  in  $C_4H_2$  forest

02:50 #ST CHECK FOCUS ON PROCYON (BS 2943)  $Z = -5.1$   
 PAIR 5/6 - INVOLVED  $\frac{1}{2}$ " S  
 PAIR 9 BAD, BOUNCE ON PR 14  
 .2032 PAIR 14 BOUNCE TO BE BORE SIGHT DISCOVERED MOVED; FIXED  $\tau = 0.210$

03:15 #ST TIT. ~~2033~~ NOT DOING WELL FINDING TITAN

AOR1. 2033 OUTRAGEOUSLY GOOD.  $\pm 1000$  SIDEBAR

TIT. 2034 ~~2034~~ 2-S INT. TIME; MOVE S 1" PAIR 2  $H_2O$  LINES VARYING;  $\tau < 0.2$  PRETTY GOOD  
 .2035 MOVE S 1" MORE; PR 7 VERY GOOD, 11 POOR & 14  
 .2036 skip pair 3, 5, 8; BEGIN S TRACK 1"/15 MIN.  
 .2037 1" MORE S ON SLIT  $\tau = 0.178$   
~~2037~~ SKIP = 1-ALL, CLOUDY STOPPED AFTER 7

04:20 #ST JUP. 2038 (MOVED X-DISP. DIAGONAL) 07 DEC 02  
 HI-LO MODE  $W_{NO} = 990 \text{ cm}^{-1}$  2.2" LONG SLIT  
 .2039 BARELY NEARING OFF; NEARLY AT PLANET CENTER  
 .2040 SPIKES IN PAIR 9  
 .2041

CAL. 2042 5" N NOD  
 2043 SKIP = 1-3; MOVED S PAIR 7; 33 SIDEBAR  
 2044  $W_{NO} = 840 \text{ cm}^{-1}$ ,  $Z = -5.3$  (GUESS), PAIR 7 BAD very good for pairs 12-15

JUP. 2045 GOOD  
 2046  
 2047  
 2048  
 2049  
 2050  $W_{NO} = 820 \text{ cm}^{-1}$   $+0.4^\circ$  N LOW-RES GRATING  
 2051 PAIR 2 JUMP, ALSO #8, 15 ONLY 15 PAIRS? WHY?  
 2052

$T = 3^\circ C$   
 $\tau = 0.140$

06:00 #ST CAL. 2053 MOD TO 5" N; READ ~~PAIR~~ B TWICE  
 2054 SKIP PAIR 6  
 2055 8" nod

.2056  $W_{NO} = 805 \text{ cm}^{-1}$ ; ENDED AFTER 9 TRASH PRS  
 JUP. 2057 NOD @ 30, CIRCUS BAD CIRCUS PAIR 5 MOSTLY  $H_2O$  ABS. FROM THEN ON  
 .2058 PAIR 6 GOOD, GOT ON JUPITER  
 .2059 CLOUDS, PAIR 9  
 .2060 CLOUDS; BIG CLOUD PAIRS 10, 15  
 .2061 cloud pair 6;  $W_{NO} = 807$  PROBABLY MORE ACCURATE

$\tau = .157$

06:50 #ST JUP. 2062  $W_{NO} = 793.5 \text{ cm}^{-1}$ , LONGER SLIT; BAD PAIR 10, 11 (SKIP)  
 2063 12 GOOD AGAIN  
 .2064  $W_{NO} = 782 \text{ cm}^{-1}$   
 .2065 ~~2065~~

07 DEC 02

07:20  
HST

UHYA .2066

$W_{no} = 752 \text{ cm}^{-1}$   
CLOUDS

PAIR 2 OK

85% HUMID.

08 DEC 02 MR, TG, MM, HR, NR

20:45  
HST

GUIDE SYSTEM UP & RUNNING AGAIN,  
STILL JUMPING OFTEN  
CCPS, NETWORK WENT DOWN AGAIN.  
SUMMIT NET UP OK.

$\tau = 0.027$  VERY DRY  
IS THAT REASONABLE?

21:00  
HST

ON TCS10  
BAND .3001

$W_{no} = 813 \text{ cm}^{-1}$

TILTED ECHELON PARABOLMID.  
PAIR 4, MOVED S 1.5"; 15 GOOD, GUIDING THROUGHOUT  
PAIR 2 GOOD

MISMARKED  
 $T = -2.8^{\circ}\text{C}$

CER .3003

450 E SIDEBAR; BOUNCE  
SKIP = 1-7; 8 GOOD  
" 12

.3004

PR 3 GOOD POSITIVE, 4 GOOD NEGATIVE, STOPPED AFTER 8

21:40  
HST

ABAU .3005

TERRIBLE BOUNCE

$\tau = 0.024$

.3006

HIGH ON SLIT, STILL HAVE BOUNCE GOOD!

.3007

PAIR 4 GOOD

.3008

$\text{H}_2\text{O}$  VAPOR CHANGE PR 10; 12 GOOD

.3009

0.6" N BEFORE THIS SET

.3010

PR 11 GOOD

PR 2, STRONG  $\text{H}_2\text{O}$  VARYING

$T = -3.4^{\circ}\text{C}$

.3011

Good

.3012

$\tau = 0.04$

22:45

HST

JIAU .3013

PRETTY GOOD!

.3014

IMPROV PR 3, MOVED 1/2" N

SKIP 8 - GLITCH, POSITIVE BEAM; 14 ALSO

.3015

SKIP = 1, 13 LOTS O' JUMP & BOUNCE  
BOUNCE, PR 15

.3016

SPIKE IN PR 8, BOUNCE PR 10

08 DEC 02

23:20  
HST

ATAU .3017

SKIP = 1-5, NSUM = 4,  $T = 269\text{K}$ !

~~.3018~~  
AAur .3018

ON AT PR 3

23:40  
HST

TIT .3019

WIND = 20 MPH,  $z = -5.8$ , ECHELON PARAB. TIPPED MORE  
 $W_{no} = 568 \text{ cm}^{-1}$  ( $\text{CH}_3\text{P}_2$ )

.3020

BOUNCE PR 10; SET DID NOT GO WELL (GUIDING)  
(1ST DERIV); ONLY LAST PAIR IS GOOD

.3021

PAIR 2 GOOD, 1ST-DERIV. BOUNCE  
SKIP PAIR 11

.3022

BAD BOUNCE PR 9, 10, 13, 14  
BOUNCE PR 2, 3

.3023

SKIP = 1-7; 8 GOOD

.3024

SKIP PAIR 9 - MATT WORRIES ABOUT LAST 1/2 OF THIS FILE

.3025

PAIR 5 DECENT; POSITIVE BEAM SLIGHTLY HIGH  
S ALONG SET AT PR 10; BAD SET VARIATION IN 12

.3026

S 1.5" BEFORE THIS SET; STILL BAD BOUNCE  
PAIR 9 OK 10 GOOD, BIG SKY ON 12 BUT OK SIGNAL

.3027

PAIR 14 GOOD, ALSO 15 - ALTOGETHER GOOD SET  
2<sup>ND</sup> DERIV. BOUNCE IN PAIR 2, BIG BOUNCE PAIR 8

.3028

PAIR 14 GOOD  
4 OK, SKIP PRS 1-3; GUIDING 7-12; PAIR 13 OK, 14 GOOD

.3029

01:00  
HST

.3027

PAIR 14 GOOD  
4 OK, SKIP PRS 1-3; GUIDING 7-12; PAIR 13 OK, 14 GOOD

.3030

$W_{no} = 548 \text{ cm}^{-1}$   
MOVED 1" S IN PAIR 2, GUIDING 4, 5  
2<sup>ND</sup> DERIV. BOUNCE IN PAIR 12

.3031

MOVE 1/2" S IN PR 8; GUIDING PRS 9 & 10  
WEAK SIGNAL PR 13; GOOD PR 15; COULD SKIP 11-14

.3032

MOVED 1/2" S BEFORE FILE, PR 5 GOOD  
LOST IT, PR 14

.3033

REALLY GOOD; SKIP 15

.3034

1/2" S DURING PR 2, SKIP 12; GOOD SET

.3035

LOST IT, PR 10; GOT IT, PR 14

.3036

S 1" DURING PR 2

.3037

$W_{no} = 557 \text{ cm}^{-1}$   
GARBAGE

02:50  
HST

ABAU .3038

$W_{no} = 587.03 \text{ cm}^{-1}$ , MOVED ECHELON DISP. (THROUGH NOMINAL)  
WRONG TRACK RATES, NEVER FOUND IT (TO OTHER SIDE)

.3039

NOTHING

.3040

2<sup>ND</sup> DERIV. BOUNCE; FOUND IT, PR 5

.3041

1/2" S PAIR 6

WINDS 20 MPH



08 DEC 02

MIDDLE SECT. BEST

02:40 HST ABAR. 3042 JP 3, 2<sup>ND</sup> DERIV. BOUNCE HORRIBLE; HIGH ON SLIT  
 3043 90% S BEFORE SET  
 12:55 HST ATAU. 3044 MOVED S 1.5" DURING PR 2; GUIDING THROUGH PR 5  
 2<sup>ND</sup> DERIV. BOUNCE PR 8

08:05 HST ZOMA. 3045 ALL GOOD.  
 3046 T = -4°C  
 3047 T = 0.025  
 3048  
 3049 PAIR 11 GUIDING N/S

23:40 HST CAL. 3050 GARBAGE DELETED!  
 3051 WHERE DID THIS FILE GO? PERHAPS CONT. ACCIDENTAL SAVE  
 3052 ON AT PR 2  
 3053 GOOD, GOOD

JUP. 3054 CUTOFF EARLY; WRONG NOD  
 3055 DOING SOME GUIDING IN FIRST 1/2; STILL SEARCHING PR 15  
 3056 FOUND AROUND PR 4  
 3057 LOTS OF JUMPING! WINDS ↓ TO 13 MPH  
 3058 STILL NOT KEEPING IT ON, AND YET MORE JUMPING  
 3059 PR 5 GOOD - PROBABLY CORRECT OR CLOSE TO  
 3060 BAD TIME GUIDING STILL

04:45 HST W<sub>NO</sub> = 814.424 cm<sup>-1</sup>  
 TIPPED ECHELON PARABOLOID BACK THROUGH NOMINAL TO H<sub>2</sub>S<sub>2</sub> SIDE  
 3061 GUIDING ON PR 2  
 3062  
 3063

05:00 HST CAL. 3064 LOOKS OK BY PR 3, GUIDING & NODDING OFF SLIT  
 3065 CH. NOD TO "ON SLIT"; END EARLY, NOT IN FOCUS (AFTER 10 PRS)  
 T = 0.014

55:20 HST W<sub>NO</sub> = 1350 cm<sup>-1</sup> (7 μm)  
 ADDN. BACK NODDING OFF SLIT; GUIDE TO RT FOR A WHILE

76:05 HST W<sub>NO</sub> = 871 cm<sup>-1</sup>  
 BACK TO... HST JUP. 3066 HOT SPOT, PR 1 ON  
 3067  
 3068 MATT DISCOVERS NEW "WATCH PA DISPLAY" METHOD OF JUMP-FIXING

08 DEC 02

06:25 HST JUP. 3069 STARTING TO LOSE HOT SPOT? PROBABLY FIXED  
 3070 SHIFT OVER 2" W TO RETURN TO HOT SPOT  
 3071  
 3072  
 3073 GUIDING

W<sub>NO</sub> = 927.5 cm<sup>-1</sup> H<sub>2</sub>  
 3074 QUICK LOOK DIED; ENDING PAIR 7  
 3075 BETTER-LOOKING CONTINUUM; BIG GUIDING ON PR 11; NOT ON  
 3076 ON AT PR 3 PR 7 HOT SPOT AT THIS λ IS TINY (REALLY OBVIOUS)  
 3077  
 3078  
 3079  
 3080  
 3081  
 3082  
 3083  
 3084 peaked up pair 9

09 Dec 2002 MR, TG, HR, NR

18:40 HST Humidity 11%  
 Temp -1°C T = 0.009!

19:00 β And Bore sight test  
 α = 43.91  
 α = 44.15 A  
 Jumps in drift in δ

19:13 T = -2.6°C  
 Focus = -5.2  
 α = 44.28

NOD = 4"

BAND. 4001 { σ = 813 cm<sup>-1</sup> Guiding at start Seeing bad  
 Good pair 7 } Echelon dispersion tipped

4002 { Guiding at start (RA trick not working)

N753811. 4003 { Got it at pair 4  
 Good from start } opt. invisible OBJECT MISNAMED IN HEADER  
 Getting good pair 7; Guiding pair 3 & 4 & 5 & 6. α = 45.15

19:34 NFW11.4004  
 CER. 4005  
 FOCUS=-5.4 .4006  
 T=-3.6°C SVS13.4007  
 .4008  
 20:20 .4009  
 T=0.031 .4010  
 .4011  
 20:44 .4012  
 .4013  
 T=-4.1°C .4014  
 21:06 .4015  
 .4016  
 21:25 atau.4017  
 Focus=-5.6 L15.4018  
 21:40 .4019  
 21:57 .4020

Good guiding: 1-3  
 guiding: 1-2  
 losing at last one  
 playing w/focus pair 5  
 FOCUS=-5.4  
 got it pair 1  
 peaking up pair 3-5  $\alpha=03.70$   
 spike pair 8  
 bounce 2nd derivative  
 guiding losing at pair 8  
 got it pair 11  
 good from start  
 guiding pair 12-16; skip: 13-15  
 positive on 16  
 Still bouncing  
 guiding 12-13 (approx.)  
 spike pair 16  
 nsum = 8  
 found at pair 2 jumps  
 lost it at pair 4  
 got it back pair 5  
 losing it @ 12; good 13; 16 poor  
 spike pair 3; good pair 5; guiding 6-7, 9  
 drifting NS: more N 1.5 pair 5; pos. beam falling off edge  
 spike pair 12  
 spike pair 8, 9, 13, 14  
 on it pair 2; moved N 1.0 pair 4; pair 13 poor;  
 bad bounce pair 16  
 bounce pair 4; bad bounce pair 5; bounce others too  
 pair 14 problem: talking to telescope tuned out?  
 came back + did pair 15 & 16  
 Maybe drifting high on slit; moved 0.55 pair 6;  
 jumped in pair 8; 9 & 10 jumped & bounce?;  
 13 bad bounce;  
 Nod = 3.5 N; nsum = 6; jumps pair 4;  
 nsum = 8; no guide star; guiding pair 6-7  
 pair 8 good; losing it at the end pair 15-16  
 guiding pair 1 - Stopped early after 12 pairs  
 never found it; GARBAGE  
 Some signal early on; pair 7-11 GARBAGE;  $\alpha=34.86$   
 found it @ pair 12;

Object misnamed in heads  
 2 is very good; Ceres

22:06 L15.4021  
 -3.7°C .4022  
 Focus=-5.4 .4023  
 .4024  
 .4025  
 22:50 .4026  
 22:53 LK15.4027  
 .4028  
 -4.0°C abaur.4029  
 .4030  
 .4031  
 23:30 .4032  
 .4033  
 .4034  
 .4035  
 .4036  
 .4037  
 .4038  
 00:20 HL tau  
 hltau. 4039  
 4040  
 4041  
 4042  
 4043  
 4044  
 4045  
 4046  
 4047  
 4048  
 4049  
 4050

{OK  
 moved 1.0 S  
 some guiding; mostly good  
 playing w/focus pair 3; 2=-5.4  $\alpha=35.59$   
 lost it; started to find it @ pair 8  
 skip 1-7; guiding pair 12; found positive  
 @ pair 14  
 most seems good  
 no continuum. guide star optical pointing only  
 peaking up at start negative beam only pair 15  
 pair 16 very poor, a little high in the slit  
 pair 8 1.0 south (since a little high in the slit)  
 Pretty good  
 Bounce (1st deriv) pairs 4-16 spikes: pair 5  
 glitch pair 9 (from 18)  
 bounce starting pair 3 moved S 0.3" during pair 7  
 bad bounce: pair 9-10  $\Rightarrow$  jump lat signal, so bounce looked bad  
 skip = 9, 10, 15  
 Lots of bounce. Pair 4 is good. moved 0.3" S in pair 8  
 Still bouncing;  
 moved 1" S during pair 9. pair 10 is pair. Guiding during 13  
 change nsum from 8 to 4 (water variation)  
 -3.8 C  
 guiding and jump through pair 7. moved 0.5" N. slight bounce  
 on accu a lot  
 guiding pair 1-5 with 0.5" S in pair 5  
 some guiding early. Good on pair 4. moved 0.5" S in 8  
 jumped on last pair  
 guiding pair 1-3; guiding pair 9-10  
 pair 6 poor pair 10 huge bounce  
 very good set moved 0.5" S after done.  
 good set  
 jumps  
 moved 1.0 South  
 cosmic ray in pair 9 along detector  
 bounce



Dec 10, 2002 MR, TG, HR.

black and shiny reversal

echelon screwdriver moved  
586.9 in middle  
humidity ~1% temp = -0.9  
Zau = 0.034 focus = -5.4

R Cas. wno = 587 H<sub>2</sub> S(1)  
rcas. 5001 pair 7+8 are good bounce  
NGC 7538 IRS 1 low on the slit pair 10 exceptional  
n7538il. 5002 moved 1" N before 5003, bad bounce pair 5  
5003 guiding EW  
5004 occasional bounce  
5005 drifting south

HST 19:30

Z = 0.022

changed focus to -5.6. Changed nod to 4.5 N

ceres. 5006 guiding at start stop after 8  
5007 guiding EW pair 3 moved 1" S during pair 5  
Echelle sag after moved - shifted the echelle to compensate

HST 20:20

SVS13. 5008 on it at start. some 1<sup>st</sup> deriv bounce. weak continuum  
sky variation. may have lost it during last half  
5009 Guiding. found it pair 4  
5010 bad bounce - pair 8  
5011 nsum = 8

Z = 0.033

changed focus to -5.7 T = -3.0 C  
small guide on pair 1 nodding on slit  
atau. 5012 nodding off slit  
atau. 5013 scan nsum = 4 (operator error)  
atau. 5014 end of 4th scan clouds?

T Tau

HST 21:20

htau. 5015 only 4 nods. Too high in slit. move 15" S before 5016  
5016 weak continuum. Guiding through pair 9  
5017 nsum = 8. Guiding. Too low in slit?  
5018 moved 0.4 W and adjusted rates before 5018. Trying autoguider  
some 1<sup>st</sup> deriv. bounce. Peaking first half.  
5019 sky variation - pair 6-7. guiding ~14  
move chopper wheel before 5020  
5020 clouds: pair 12-16 -> source still visible  
5021 moved 0.5" N before this one. slit position looks good  
5022 Program hung for a bit during pair 4.

HL Tau

2:30

htau. 5023 Very faint continuum autoguiding

htau. 5024

communications to stefan died after flat. no htau, just flat.  
Skip this file  
seemed good

htau. 5025

5026

5027

5028

5029

5030

5031

5032

5033

HST 23:20

Z = 0.034

T = -3.8 C

bad bounce. pair 3 some H<sub>2</sub>O variation  
strong 1<sup>st</sup> deriv bounce on pair 5, 7 and others.  
1<sup>st</sup> deriv bounce. cloud: pair 5 -> still see source  
peaking - pair 10-13 should skip them

Davidia

dav. 5034

HST: 23:54

started guiding pair 3 stopped at 8

HST 23:57

Change

to 949 cm<sup>-1</sup> & refocus on Davidia  
10 orders from 946-952.5 cm<sup>-1</sup>

HST 00:14

dav. 5035

new focus -5.5

new slit 1.4"

centered echelon dispersion screwdriver

pair 2 nod seems closer

pair 5 autoguider -> off

pair 6 good  
peaking during middle  
(feature wrong in header; should be C<sub>2</sub>H<sub>4</sub>)

dav. 5036

HST 00:25

Procyon

acm1. 5037

switch to next longer slit (~9")

acm1. 5038

recenter bore sight

Titan

HST 00:50

tit. 5039

5040

n nod = 8

n nod = 16

cloud @ 7? ; pair 8 fine

change nod to 4"

5041

skip = 1 (adjusting N/S)

image 21 skip = 11

5042

nsum = 8

@ pair 6 move 0.8" south & add a little S track rate  
(object name - incorrect)

DC offset in frame 16; ~~skip~~

5043

pair 11  
faint clouds starting

Dec 10, 2002 (cont)

HST 01:20

switch to 1024 cm<sup>-1</sup> covering ~ 1022 - 1026 cm<sup>-1</sup>  
(C<sub>2</sub>H<sub>2</sub>)

fit. 5044

nsum=4  
lines near 1024.5 are in 4th order  
clouds drifting in & out (better near pair 6?)  
better @ 11-12

.5045

clouds varying

.5046

clouds varying

abandon b/c of clouds \* go to C<sub>2</sub>H<sub>2</sub> a-branch

01:45

reset C<sub>2</sub>H<sub>2</sub> central 731.0 cm<sup>-1</sup>

border 729.9 → 732.7 cm<sup>-1</sup>

focus → -5.6 (colder & slightly longer λ)

fit. 5047

little spike (mostly in strong atmosphere)

→ in strong atmosphere lines

~ 0.03

fit. 5048

clouds more stable according to guider

.5049

~ pair 12 sky varies more

02:10 HST

Davida

dat. 5050

(not great airmass match)  
bounce. still spikes in strong atmospheric  
peaking ~ 10

.5051

@ 4 sky varying & need to peak

.5052

glitch @ pair 2, image 4

.5053

pair 10 cloud coming in; ok @ 13, but use

switch to 726 cm<sup>-1</sup> & shift echelon screws in

724.57 is in middle of 1st order

~ 0.033

.5054

peaking @ start

.5055

good @ pair 4

.5056

2nd derivative bounce

.5057

peaked up pair 4

bad spikes pair 7

Titan

03:05 HST

fit. 5058

pair 2nd derivative bounce

03:10

.5059

lost @ end, skip 13 →

3:15

.5060

skip=1-4 (peaking up)

.5061

started to find it @ pair 5

pair 8 pair 8 as good as it gets

shift echelon back to center

726.4 cm<sup>-1</sup> near center of 4th order

fit. 5062

clouds @ pair 8

Dec 10, 2002 (cont)

negative beam of bright line near,  
but not on, bad pixels

fit. 5063

.5064

.5065

3:55

Callisto

cal. 5066

Procyon

a.cmi. 5068

i.o. 5069

i.o. 5070

Where did

Procyon (5071) go?

a.cmi. 5072

a.cmi. 5073

Wno=1350, T=-4.4, Tau=0.034, Focus=-5.4  
nodding on slit (hmm?) - auto guiding  
pair 1 is bad. sky is varying. skip=9  
Good enough for calibration  
nsum=3. very faint. pair 1 is bad.  
sky variations. think I saw pos. in pair 7  
Think its there in accum.

Clouds, clouds, + more clouds

We gave up on the Tau setting!

Wno=1164.5, T=-4.4, Tau=0.049

skip 1-2 - guiding

peaking up, changing focus  
Stopped on pair 12 due to humidity

ZNSE Lens on dewar

first pair has weird wiggles  
& 2-

Fabry Perot fringes

Closed Early due to freezing fog

Dec 11, 2002: never open

12 Dec 02 ME, TG, JL, DM, BG

$\beta$  Peg bpsg. 6001 781  $\text{cm}^{-1}$  slit oriented E-W  
R(21) nod 4" E  
slit center 198181 in imaging  
had to turn Vdet down to -3.6 to do imaging  
& needed imaging to find star after rotating  
Put bias at -4.0. Focus at z-5.2  
Moved ~1" W in pair 5

Ceres cers. 6002 drifting up on slit. shift may have problems  
last pair has lost positive beam

CRL 618 crl. 6003 save while peaking on it real soon  
needing to guide W waiting 45 below nodes  
6004 change nod wait to 1.5 seems to be waiting 3.5  
6005 we think the disk write may be wasting time  
6006 dewar warming up (has been)

crl. 6007 1246.5  $\text{H}_2$ ,  $\text{SiO}$ ,  $\text{C}_x\text{H}_y$  gain = 50  
z = -4.8 nod = 4 E  
1242.6 - 1248.5  $\text{cm}^{-1}$  moved 0.7" E from  
moved 0.3" W around pair 11 fuzzer guide camera

6008 nsum  $\rightarrow$  6  
6009 moved  
6010

$\tau = 0.056$   
23:40 HST  
 $T = 2.5^\circ\text{C}$   
BN bn. 6011 about  $\frac{3}{2} \times$  crl nsum = 4 on it after 4 <sup>no use during</sup>  
really on it after 6  
6012 nsum  $\rightarrow$  6 CVF may have shifted or not been peaked

now at ~~1234~~ 1239.5  $\text{cm}^{-1}$ . Moved CVF. 1236.5 - 1242.6  $\text{cm}^{-1}$

HST 00:30 bn. 6013 peaking early, but signal always good. } wrong feature  
6014

CRL 618  
HST 00:55 crl. 6015 on it from the start. some peaking during first half  
some sky variation

6016  
6017  
6018 change to 1231.5  $\text{cm}^{-1}$  order 6 2.7 E Nod  
6019 peaking early on.  
6020  
6021

12 Dec 02 (cont'd)

crl. 6022 focus may have changed. More likely at edge of slit  
BN guiding around pair 13  
bn. 6023 moved up on slit in pair 5. guiding around pair 11  
6024

change grating to 1222  $\text{cm}^{-1}$  1216 - 1226  $\text{cm}^{-1}$   
bn. 6025 good  
CRL 618 crl. 6026

Echelle moved slightly. Lost 1 order  
peaking through first 3  
moved 0.3" N pair 4  
not very separated. Could be extended object?  
airmass climbing. 1.7 at end  $\rightarrow$  focus off?

IRC +10216 nodding off slit 10" E Focus -4.7  
03:40 HST i 10216. 6027 8 pairs. nsum = 6. on it pair 4  
 $T = 1.9^\circ\text{C}$

change to 1231.5  $\text{cm}^{-1}$   
.6028 lost it. stopped at 7. Garbage!  
.6029 moved along slit until pair 6

change to 1239.5  $\text{cm}^{-1}$ . 7<sup>th</sup> order. 1.4" wide slit still  
6030 good at start. Feature is wrong

Change to 1246.  $\text{cm}^{-1}$ .  
6031 good

change to hi-lo mode at 882  $\text{cm}^{-1}$ . moved X-d diagonal  
6032 good from start. used 1" wide slit gain at 50

change to 871.5  $\text{cm}^{-1}$  gain at 25 863.2 - 881.1  $\text{cm}^{-1}$

6033 glitch in pair 1. losing signal in pair 8  
hit cont by mistake. 10 pairs

12 Dec 02 (cont'd)

change to  $854.5 \text{ cm}^{-1}$   $846 - 863.2 \text{ cm}^{-1}$ 

i10216.6034 guiding in pair 3

change to  $837.5 \text{ cm}^{-1}$   $829.5 - 846$  focus at  $z = -4.9$ i10216.6035 slit is  $\sim 5''$  long, overlapping orders?change to  $824 \text{ cm}^{-1}$   $814.3 - 829.5 \text{ cm}^{-1}$  should be gaps.

i10216.6036 back to short slit. changed filter. on it at pair 4.

change to  $806 \text{ cm}^{-1}$   $799 - 814.3 \text{ cm}^{-1}$ 

.6037 pair 7 is best on it.

change to  $792 \text{ cm}^{-1}$   $784.5 - 799 \text{ cm}^{-1}$ .6038 focused to  $z = -4.8$ change to  $777.5 \text{ cm}^{-1}$   $770.5 - 784.5 \text{ cm}^{-1}$ 

6039 some guiding. Buffer toggle error on pair 7?

change to  $763.5 \text{ cm}^{-1}$   $757.3 - 770.5 \text{ cm}^{-1}$ 

6040 clouds are thick, or thin depends on your standards

change to  $751 \text{ cm}^{-1}$   $745 - 757.3 \text{ cm}^{-1}$ 

6041 overlapping orders. skip.

6042 pair 8 is best. had to move along slit.

change to  $739 \text{ cm}^{-1}$   $733.5 - 745 \text{ cm}^{-1}$ 

6043 not on it very well

6044 pair 7 is best. actually 9 pairs

change to  $724 \text{ cm}^{-1}$ 

6045 done!

13 Dec 02

MR, TG, JL, HR, OM, DG

P Peg

 $783. \text{ cm}^{-1}$   
off center.w/ echelon screwdriver so  $781.503$  is just

b19.7001

nod DE 3.5N

guiding through pair 4

end at pair 10

focus =  $-4.4$  $T = 7^\circ \text{C}$ 

19:50 HST TX Psc

txpsc. 7002

7003

1st ~~deriv~~ deriv bounce. lost it at end.  
offset guiding nsum=6 peaking at start  
on it pair 4 and better pair 6  
some 1st deriv bounce  
nsum=8

7004

20:15 HST Ceres

cer. 7005

7006

on it from start but good at pair 4. Guiding pair 15-16  
pair 3 is bad. pair 15 has weak negativechange to  $587 \text{ cm}^{-1}$   
focus is  $-4.8$  echelon tipped so  $585.5951$  in center $\bar{v} = 0.072$ 

cer. 7007

cer. 7008

 $\text{H}_2 \text{ S}(1)$ 

nsum=4

sky variation. pos only on pair 6

RY Tau

rytau. 7009

not found while peaking. auto guiding and looking at accu  
saw nothingHL Tau: not found. Go to  $\alpha$  Tau as boresight, focus, flux~~HL Tau. 7010~~  
 $\alpha$  Tau

atau. 7010

peaking until pair 5

V892 Tau

V892. 7011

hand guiding. Good on pair 3. 2nd deriv bounce

13 Dec 02 (Cont'd)

HST 20:35 0872.7012 2nd deriv bounce. Moved 0.4" N in pair 12  
 0876 .7013 moved 0.5" N ~~before~~ before 7013  
 some sky variation  
 .7014 moved 0.5" N before 7014. need to set rates  
 1st deriv bounce + 2nd deriv bounce  
 .7015 sky variation + 2nd deriv bounce  
 pair 6 is bad - drifted off 1st order slipped in  
 pair 11 is nice  
 .7016 moved N 0.3" during pair 11  
 .7017 moved N along slit in pair 13(?)  
 .7018 1st deriv bounce sky variations  
 .7019 more bounce  
 7020 Flat had buffer toggle error in shiny or 2nd sky  
 7021 bad bounce pair 3, 4, 5, 14, 16  
 sky variations 15  
 7022 peaking on it → pair  
 bad bounce pair 7, 8, 9, 10, 15, 16  
 7023 bounce + guiding through pair 4  
 lots of bounce  
 pair 13 is ok  
 bounce

HST 22:30 7024  
τ = 0.072

T Tau guiding

tttau. 7025 sky variations  
 7026 something in accum  
 7027 bounce 4? 7, 14  
 7028 very little in accum  
 7029 in accum  
 7030 good, relatively  
 7031 in accum

Orion Bar Dan's peak position (1950) 05:32:52.3 -05:27:10  
80" S nod

obar. 7032 maybe in accum  
 7033 2" W  
 7034 still at 2" W. nsum = 9  
 7035 2" E of 0 - cake!  
 7036 2" E + 6" N bounce. wanted to go south  
 7037 2" E + 6" S strong. velocity structure.  
 7038 2" E + 12" S fainter, possibly broad  
 7039 2" E + 18" S still there

obar. 7040 2" E + 24" S stopped after 11. not much there.  
 00:00 HST Davida 835.5 cm<sup>-1</sup> C<sub>2</sub>H<sub>6</sub> + ethene; covers 833.5-840.7 cm<sup>-1</sup>  
~~bar. 7041~~ 11 orders  
 No data; go to α-ori to refocus  
 00:12 α-ori refocus  
 aori. 7041 new focus = -4.5 5.6°C

00:22 HST Titan  
 lit. 7042 guider issues up to pair ~5 (2.5" nod)  
 lit. 7043 go back to 3" nod  
 Cancelled at nsum = 8 pair 1 - clouds?  
 end on pair 5 clouds, nsum too high  
 lit. 7044 nsum = 4 clouds  
 Clouds vary, lots! ... so to other setting  
 new setting = 730 cm<sup>-1</sup> centered  
 off blaze by ~0.2 cm<sup>-1</sup> (orders shifted to lower cm<sup>-1</sup>)  
 refocus z = -4.6 (4.8°C) (little hard to refocus on Titan)  
 lit. 7045 increase nod to 5" guided in pair 7 & 8 (strip)

~~lit. 7046~~ lit. 7046 very nice file  
nod = 4.5"

00:57 lit. 7047  
lit. 7048 good sets

01:10 Davida (atmos. calib.)  
nsum = 4  
don't guide  
(guider was messing with nod size earlier on non-sidereals)

dar. 7049  
7050  
7051  
7052  
2nd derivative bounce  
(use bounce = -1)

reset to ~725 cm<sup>-1</sup> 6 orders  
shifted to ~0.1 cm<sup>-1</sup> higher than center of blaze  
covering ~723 cm<sup>-1</sup> → 726.9 cm<sup>-1</sup>

01:35 HST dar. 7053 nod = 3" north  
7054 4.5" North seeing jumps around a little  
7055  
7056 (feature mislabeled)

at some point moved  
slit position  
up to position



13 Dec 02 (cont'd)  
01:50 Titan  
tit. 7057

little high on slit; leave as is & adjust before next slit.

- .7058
- .7059
- .7060
- .7061
- .7062

bounce  
bounce  
↓

(not quite on spot as prev)

go to  $737.5 \text{ cm}^{-1}$  & re-center blaze  
6 orders from  $735.5 \rightarrow 737.7 \text{ cm}^{-1}$   
skip 1-7 (acquiring)  
bounce!!!

- .7064
- .7065
- .7066
- .7067

(bounce throughout)

02:43 Callisto  
cal. 7068

(atmos. calib.)  
e pair ~~11-12~~ back focus, ~~11-12~~  
but leave same  
all prob. ok.

02:55 .7069  
.7070

Same setting, but shift echelon  
orders down  $\sim 0.1 \text{ cm}^{-1}$  or so

03:03 Cal. 7071  
.7072  
 $T \approx 0.075$  .7073

(better than 7071)

3:20 Titan  
tit. 7074  
tit. 7075  
tit. 7076  
tit. 7077

change settings:

central =  $746 \text{ cm}^{-1}$  (C<sub>3</sub>H<sub>8</sub> etc)  
(echelon orders still shifted over)  
(think we're shifted over a  
little further than ideal)  
(but go with it)

tit. 7078  
.7079  
7080

Callisto  
cal. 7081

.7082

skip = 1/m, rest fine  
(some pairs much better than others) bounce!  
skip = 5

(cont'd) 13-Dec-02

Reset to

Callisto  
cal. 7083

$\lambda_{no} \approx 587.0324$

cal. 7084

focusing  $Z = -9.0$   
pair skip pair 1-7

Jupiter  
7085 disappeared.

scanning moved across North Pole. Centered on Jup.  
2.3 E 17 N 1" W steps 55 total

jup. 7086

nsum = 4. stopped after 1 scan, coming on  $\sim 7$   
may need more north. Got too far off

7087

45 steps. nsum = 1. 4 scans. on it  $\sim 9$   
runs too slowly. Not off it at end

$\alpha$  Hya

ahya. 7088  
.7089

nsum = 1  
nsum = 4

$T = 5^\circ\text{C}$

change to  $1244 \text{ cm}^{-1}$  H<sub>2</sub>S(4). echelon centered on blaze  
Gain set to 50. Focus  $\Rightarrow z = -4.3$   
ahya. 7090 3" N rods ended at pair 9

Jupiter: Fished around & peaked on hot spot

jup. 7091 looks good.  
7092  
7093  
7094

Callisto was too faint at  $8 \mu\text{m}$

aleo. 7095 guiding. on it  $\rightarrow$  pair 4 shy variation pair 7  
7096 may have drifted off during last half

change to  $816 \text{ cm}^{-1}$  H<sub>2</sub>S(2) at  $814.424$   $Z = -4.6$   $T = 5.2^\circ\text{C}$   
Callisto

cal. 7097

Jupiter scan:  
jup. 7098

21 E 21 N from center  $-0.7''$  E 50 points  
on it around 20. see hot spot. scan is fast  
because we aren't writing position hdr.

13 Dec 02

Sup. 7099 14 E 19.5 N offset from center. 0.7" W steps  
 on it by 5  
 7100 16 E 18.5 N offset. 43 points. on it by 4  
 7101 19 E 18.5 N offset. 48 points on it by 5

x Hya

ahya. 7102 scan: 12 points. 0.7" W steps. 3.5 E 1.5 N offset  
 since the bore sight was for positive beam. 0.9 s ITime  
 nicely centered. 2 coadds

7103 8 scans. maybe drifting

7104 5.5 E 1.5 N offset. 0.5" steps. 20 points. 4 scans  
 near edge of slit.

scan 2 may have a jump

7105 5.5 E 0 N offset. more centered. EW rate not right  
 3<sup>rd</sup> scan has star in sky. so does 4<sup>th</sup>

7106 5.5 E 1.5 N

7107 2.1" slit 5.5 E 0 N

7108 3.1" slit

7109 1.4" slit. short slit. on edge of slit.

7110 1.4" slit. short slit.

7111 shortest slit. drifting off slit

sky. 7112 at zenith. blank sky reads

goto pupil mode

skypup. 7113 at zenith

7114 5°s of zenith

7115 4.92V on K mirror

tried rotating K and xl gratings - no big change  
 tried rotating slit wheel - changed pupil in a way  
 that suggests we were seeing some scattered light  
 in the pupil mirror system.  
 enough.

later found chopper part way in beam  
 don't know how it affected obs.

14 Dec 02 MF, TG, JL, DM, HE, DG

Scan flux standards to calibrate card

B Peg start at 12.5  $\mu\text{m}$   $N = -2.54$  m2.5 III  
 $800 \text{ cm}^{-1}$  1.4" slit

bpeg. 8001 3.0" nod along slit pair 2 good. guide to be sure

8002 scan 10" W @ .5"/step, 2"/step 2 scans

8003 repeat. quicklook was messed up

8004 "

$\alpha$  Ari:  $N = -0.8$  K2 III

aari. 8005 nod mode guiding during pairs 5-8  
 weird sky or badna pair 14

8006 scan mode 4 scans

8007 repeat "

go to  $892 \text{ cm}^{-1}$  11.2  $\mu\text{m}$

aari. 8008 scan 2 scans + may not have extras  
 died looking for star

aari. 8009 blank sky shorten scan

8010 star comes late in scan

8011 longer slit

go to  $1233 \text{ cm}^{-1}$  gain = 50

checked focus. was good

aari. 8012 nod mode guiding pair 4-6

8013 scan mode

go to  $1246 \text{ cm}^{-1}$  (actually 1247.5)

aari. 8014 nod mode

SVS 13

HST = 20:10  
 $\tau = \sim .08$

svs. 8015 very faint cont. offset guiding. in accum

8016 NSUM = 8

8017 good

14 Dec 02 cont

HL Tau Moved 0.4 W 1.3 S to peak on star

Alt. 8018 very faint. hand guiding. We may be offset guiding pair 12 definitely on it! peaked through 16

.8019 nsum=8. moved 0.5" S before 8019 some sky variation moved 1" S during pair 3. skip = 12 nothing to report. seems fine. looked good

HST 21:30 .8020 .8021 8022 8023

HST 22:05 8024 slight bounce no problems 8025 8026 slight 1st deriv bounce. some spikes in accum

B Ori

bori. 8027 nsum=4 on it on pair 4 and then 6. some guiding during pair 9, 10

.8028 peaking early changed focus starting pair 7 z = -4.4

HST 23:10 Titan (same setting) Cirrus; wind @ 16 mph

tit. 8029 (think we're getting it) (peak up in earlier frames) good @ pair 4 bounce

.8030 bounce through

.8031

.8032

~23:51 .8033

.8034

nod = 3.5"

guiding on pair 6

(Wrong feature was recorded; was C<sub>4</sub>H<sub>2</sub>)

gt to C<sub>6</sub>H<sub>2</sub> @ ~1233 cm<sup>-1</sup> 8 (maybe 9) orders covers 1229.5 → 1235 (or 1235.5 cm<sup>-1</sup>)

00:11 tit. 8035

peaking up 1-8 (None terrible) cirrus not too bad yet, but plenty of cirrus waiting for us in the west.

14 Dec 02 cont

00:20 tit. 8036 - good file; stable .8037 .8038

00:43 .8039

00:50 .8040 .8041

~00:08 .8042

01:15 Procyon

1:16 acmi. 8043 8044

gobs of CH<sub>4</sub> lines No sign of cirrus (yet...)

new set up C<sub>2</sub>H<sub>2</sub> CN center ~1327 cm<sup>-1</sup> difficult to find a long enough slit set slit to 3.0"

acmi. 8045 13 orders from 1323.3 cm<sup>-1</sup> upwards peaking up @ start pair 3 = good nsum = 2

refocusing; stay @ z = -4.4 sky within @ 8 nsum = 4

01:50 Titan.

tit. 8047

way too high on slit guiding @ 7 - think negative beam dominated this file better centered N-S on slit @ pair 10 cloud coming in.

tit. 8048

.8049

.8050

Give up on this setting for now... clouds badly varying Use collisto to refocus C ~ 748 cm<sup>-1</sup> (7 orders)

Callisto now covering 746-750.5 cm<sup>-1</sup> nsum = 4.7 nod = 4.0" N

02:36 cal. 8051

02:42 tit. 8052

.8053

good bounce some S. a little

14-Dec-2002 (cont)

02:52 hit. 8054  
hit. 8055  
hit. 8056 skip pair 1-3 (guiding issues)  
.8057  
~~8058~~

change setup to Callisto allene  
center = 755.5 cm<sup>-1</sup>; Folders 753.3-757.9 cm<sup>-1</sup>

hit. 8058  
.8059 end on pair 8 (lost quicklook & had  
to recover) (only lost a couple  
of minutes)

.8060  
.8061  
.8062 skip 1-3  
.8063 bit of bleed variation  
.8064

03:39 .8065

03:47 Callisto

Cal. 8067  
8068

3:58 returns on Callisto to 1164 cm<sup>-1</sup>  
12 orders

τ = .091 Cal. 8069 z = -4.5 nod = 3" N barely got both beams on slit

IO

04:15 io. 8070 peaking up thru pair 11  
io. 8071 Nsum = 8  
int time = 1 sec probably too short  
glitch pair 4, frame 7

04:26 io. 8072 2nd deriv bounce  
big sky (water) variation  
drifting north on slit

change wavelength 531 cm<sup>-1</sup>  
tipped echelon (cm<sup>-1</sup>)  
line @ 530.409 is at low freq end of order  
4 orders  
Focus = -4.9

14 Dec 2002 cont

io. 8073  
io. 8074 sky variations  
8075 clouds frame 12  
8076  
8077 clouds increasing  
8078  
8079  
8080 sky

05:25

return to Callisto

τ = .117

Cal. 8081 on Callisto pair 6  
Cal. 8082 drifting a little along slit

05:39

and back to Io

io. 8083 back on pair 9, skip 1-8  
guiding N/S pair 14

io. 8084  
io. 8085  
io. 8086 glitch pair 2  
io. 8087  
io. 8088

io. 8089

io. 8090

io. 8091

io. 8092

io. 8093

io. 8094

io. 8095

io. 8096 splices pair 10

io. 8097

moving to Callisto using offsets W 121.9 N -43.5 (from Spencer data)  
Dave changed Telescope track rate to that of Callisto.

but it should be east (121.9 E, -43.5 N)  
(helped by Dave) 119.6 E, -42.7 N ← Bill's Program Found it.

Cal. 8098 GARBAGE (SKY)

Cal. 8099 skip 1-5

14-DEC-2003 CONT.

cal. 8100

07:15

return to IO

io. 8101  
io. 8102  
io. 8103

skip pairs 1 and 2  
NSUM = 8

07:36

lower shutter raised

io. 8104  
io. 8105  
io. 8106

peaking thru pair 3

bounce  
losing some dc... (guiding)  
lost it towards end.

DONE!

07:55

air mass = 1.667  
 $\tau = 0.08$   
T = 278 K

15 Dec 02

(test directory)

noise. 9001

12:45a

. 9002

12:46

9003

12:48a

9004

12:49

9005

12:50

9006

12:51

9007

12:54

9008

12:55

9009

12:56

9010

9011

9012

9013

open slit through filter mask to make illum. range  
 $V_{det} = -3.51$   $IT = 0.1$   $ref = 8$   
 $V_{det} = -3.46$

-3.7

-3.8

-3.9

-4.0

-4.1

-4.2

-4.3

-4.4

-4.5

-4.0

-4.0

looked like reset level changed ~13

start to see excess noise  
definitely see excess noise  
noise at low counts

looks fairly quiet  
after a minute

above series at a rough guess of typ illum.  
dropped some illum by about 50%

12:59

9014

-4.0

1:00

9015

-4.0

1:02

9016

-4.0

1:03

9017

-3.5

1:05

9018

-3.6

1:06

9019

-3.7

1:06

9020

-3.8

1:07

9021

-3.9

1:08

9022

-4.0

1:09

9023

-4.1

1:10

9024

-4.2

1:11

9025

-4.3

1:12

9026

-4.4

1:13

9027

-4.5

1:14

9028

-4.0

@ 50% original illumination  
50% less again (i.e. 25% orig)

2x original illum

maybe some hint of excess noise  
definitely excess noise

looks quiet

GOING to 50% orig transmission

mislabeled with bias = "3"

1:16	9029	-4.0V
1:17	9030	-3.5
1:18	9031	-3.6
1:19	9032	-3.7
1:20	9033	-3.8
1:21	9034	-3.9
1:22	9035	-4.0
1:23	9036	-4.1
1:24	9037	-4.2
1:25	9038	-4.3
1:26	9039	-4.4
1:27	9040	-4.5
1:28	9041	-4.0

seeing some excess noise SPIKY  
SPIKY  
" SPIKY

NO SPIKES, buffer toggle error on 16

int time = 0.4 sec

1:29	9042	-4.0
1:30	9043	-4.0
1:31	9044	-3.5
1:32	9045	-3.6
1:33	9046	-3.7
1:34	9047	-3.8
1:34	9048	-3.9
1:35	9049	-4.0
1:36	9050	-4.1
1:37	9051	-4.2
1:37	9052	-4.3
1:38	9053	-4.4
1:39	9054	-4.5
1:43	9055	-4.0
1:44	9056	-4.1
1:45	9057	-4.2
1:45	9058	-4.3
1:46	9059	-4.4
1:47	9060	-4.5

int time = 0.4 sec  
Ncoadd = 2, buff toggle error fr. 12  
BTE frame 6, 11, 16  
BTE frame 7, 16  
int time = 0.5

barest hint of spiking  
clean SPIKING  
"

where pixel did not spike

lower light level to that from pvs run  
BTE 7  
labelled "4.7"

glitch frame 9

STOPPED went to -4.6V but no spikes

16 DEC UT SL, MR, TG, DJ, HR, DM, KA

Setup in pupil mode  
pup. 1501 pupil @ zenith & rods UT 4:52  
T<sub>20</sub> = 0.045  
Set up for S(2) Tilt ecliptic camera so 8140408 is @ edge  
Bpeg. 1502 813 cm<sup>-1</sup> 5:03 UT peaking thru pr 4, pr 5 good

Ceres

HST=19:10 cer. 1503 slight bounce  
1504  
move to SVS13 3.1W 1s 3.5W 2s  
SVS, 1505 start w/ Nsun=4 N400 1h  
5:10 UT 1:29 Am  
move @ 0.5" S during PR 4  
HST 19:30 1506 Nsun=8 water variation pr 8, 11 slight 2<sup>nd</sup> derivative bounce  
HST 19:37 1507 change Nsun to 4  
SVS 1508 bad bounce pr 9  
19:45 1509  
12:1 Am 1510 bounce (2<sup>nd</sup> deriv)  
19:52 1511 sky variation  
1512 drifted off got it @ pr 7 drifting up (N) on slit.  
may want to stop this for sum.

move to HLTau

20:09 HLTau 1513 1:38 Am MOVE N on slit PR 4 move N again PR 8 might leave this one out of sum. pr 10 is good

tau autoguiding off bthare 1514

HLTau 1514  
20:18 1515 fair amount of bounce  
1516 more bounce  
1518  
20:42 1519 weak signal pr 12 → end  
1520 bad sky variation pr 7  
1:35 1521  
1522 lost pairs

16 DEC 02 cont.  
 Move to 1B Aur  
 HST: 21:00 ABAR. 1523 glitch pair 4 autoguiding

.1524  
 .1525  
 .1526  
 1527  
 1528  
 1529

MOVE TO 2 tau  
 ATAV. 1530 MASSIVE GUIDING  
 .1531 GUIDING THRU PMR 6  
 PMR 7 GOOD  
 P.N. 7.8 45° (slit NE-SW) (CW looking down on TEXES)  
 SCANNING (skipped 1532, not h-wrapping... dird)  
 ATAV. 1533 → looks good.

GO TO BN:  
 object name wrong  
 atav. 1531 ← scan of BN 6-extra sky frames

GO TO ORION BAR scan 57 total points  
 obar. 1535 (+85.0, -183.4) step (+0.5, -0.5) start (-9 + 9)  
 shift along slit between scan 1 and scan 2

GO TO BN  
 bn. 1536 scan BN to check position accuracy  
 only 1 scan → need to move ~4 steps  
 move 5" east  
 bn. 1537 1 scan move 2" east

GO TO ORION BAR  
 obar. 1538 nod 80 south on bright spot in orion bar  
 line looks good

check position of BN (locks bar)  
 bn. 1539 scan bn (not detected)  
 bn. 1540 BN in center θ' C = SAO 132314  
 bn. 1541 mark guide center, and references for bright peak  
 scan orion bar (drifted 1/2" early) → BN  
 (on 3rd scan shifted SE)  
 at end of scan moved (0.9E, 0.5S) to get back to crosshairs

wrong name →

16 DEC 02 cont.

obar. 1542

Scan 3 (hits cross hairs 1/2" late) 1 step  
 obar. 1543 started ~~moved~~ on crosshairs at end.  
 04 48 30 scan 1 late (1/2"??) ↑  
 scan 2 late (1") S 105° < E  
 scan 3 late (-1.1")  
 scan 4 late (1/2") S 17" < E  
 moved (0.7E 0.7S) to get to sight

obar. 1544

scan 1 1/2" late  
 scan 2 1/2" late  
 scan 3 1/2" late  
 scan 4 1/2" late S 0.3 < E  
 moved (1.1E 0.9S) to get to sight

obar. 1545

1 right on  
 2 "  
 3 "  
 4 " S 0.3 < E  
 went back to x-hairs

obar. 1546

1 right on  
 S 0.4 > E → 1 1/2" late (3.4" SW of target)  
 3 1/2" late (to SW) ← star passes to SW.  
 4 ...  
 ei (moved 1.2 S 0.6 E)

obar. 1547

missed or getting shifted 1 0  
 2 0 crossed to SW of sight  
 3 1/2" late ↓ centered  
 4 1/2" late to X hairs  
 (0.8S to 0.2W)

obar. 1548

1 right 0 a little SW (1/2"??)  
 2 "  
 3 1/2" early "  
 4 overdate ~1" to SW

\* 1541-1548 → S(2) (85.0° -183.4°) bright spot  
 (1.9S 1.6W moved telescope)



16 DEC 02 cont

05:49: sighted on bn ... looked good

bn. 1549 1 scan: at (0,0) moved telescope (1.3W 0.3S) to sight  
Geo P OBAR 2 (182.2, -180.2 from BN) start at (-9, +9) 57 data points  
Obar2. 1550 (~~1.3~~ SW scan of area) 1 good

2 good  
3 good (1/2" SW)  
4 good  
50.4 > E  
(move telescope 1.8W 0.6S)

Obar2. 1551 1 good  
2 good  
3 1/2" early  
4 good (1" SW)

(move telescope 1.7W 0.6S)  
Obar2. 1552 1 good  
2 good  
3 1/2" early (1/2" SW)  
(move telescope 0.8W 0.4S) 1/2" early (1" SW)

Obar2. 1553 (1.14 Annular) 1 good  
2 good  
3 1/4" early (1/2" SW)  
move telescope 1.1W 0.4S 4 1/4" early ( " )

1554 1 good  
2 1/4" late  
3 1/2" late  
move telescope 0.4E 0.0S 4 1/2" late

ST 1555 1 good  
2 1/2" late  
3 1/2" late (1/2" NE)

HST 1556 move telescope 0.0E 0.6S 1 right on. 1.17 Am  
2 right on.  
4 1 late

UT 1557 need to move 0.6S 0E 1 right on  
need to move 0.7E 3 right on.

BN cut scan length to 37 positions from 67  
BN 1558 4 scans 1:24 AM 12:04 UT  
BN appears to be left of Ch 1 slit  
Moved to move 4" E at end  
OBar2 now 57 stars again  
OBar2. 1559 UT 12:12 12:27 AM

1 about 0.5" late  
2 about 1" late at start to end  
3 1.5" late at start to end  
4

OBar2. 1560 12:22 1:20 AM  
1 right on.  
3 0.5" late  
4 0.5" late  
OBar2. 1561 need to move 1.7E now move to OBar2 (1st point)  
12:32 UT 1:34 AM 1 about 2-3" late  
3 right on.  
4 " "

OBar2. 1562 12:41 UT 1:38 AM  
right on @ end.  
1 0.5" late  
3 0.5" late  
4 0.8" late

ended on @ end.  
move to beta Gem set in scan 3.5" W, 3.5 W  
step E, S 15 points, 4 scans.  
beta Gem 1563 1:02 AM 12:54 UT looks well centered.

beta Gem 1564 1:02 another one.  
End of scan on beta Gem  
ROTATE TUB BACK TO SLIT N-S.

Wno = 748 cm<sup>-1</sup> C3H8  
Calisto focus -4.5 - focus didn't change  
Cal. 1565 3.5" rod

Jup. 1566 C3H8 didn't actually happen

Jup. 1567 2 scans

Jup. 1568 ~~4 scans~~ 2 scans

Jup. 1569 4 scans sly's at the end  
Changed W no at beginning  
middle

16 Dec 02 (cont'd)

Jup. 1570 moved E ~~2.4~~ 2.4" before start 4 scans  
moved 3.5-4" east before

Jup. 1571

Cal. 1572 C3H8 still pair 6 good skip 1-5

Cal. 1573 nrod 8 moved 1" north on slit - bounce

Wno = 568 cm<sup>-1</sup> CH<sub>3</sub>  
focus = -4.7

Partially  
Grouped

Cal. 1574 nrod = 8

Cal. 1575

Jup. 1576 2 scans

Jup. 1577 4 scans

Jup. 1578 4 scans

Jup. 1579 4 scans

Cal. 1580 16 nod pairs

Wno = 1043.5 C<sub>6</sub>H<sub>6</sub>

Cal. 1581 calisto isn't bright enough  
focus = -4.1

Jup. 1581 one scan

Jup. 1582 offset farther north

1583

1584

1585

1586 not too good NS

1587 changed offset to 21E + 18N  
need more East

move to α Hyd

ahya. 1588 rod is pretty small

Change to My I (818.0556") Wno = 816

ahya. 1589 High on slit. moved S during pair 6

1590 moved S 1.5" before 1590. don't sum w/1589

1591 Good file. may have drifted N a bit

1592 nsum = 8. Peaking early and late

17 Dec 2002 HR, DJ, TG, PS, - MR

T<sub>220</sub> = 0.06 some cirrus

Echelon dispersion fixed to 586. 2059 new center

Normal slit length 2"

Start w/ Z = -4.5 279K Boresight same as last night

WNB = 587 slit N> BS 4" N

4:53 UT Bpeg. 2501 1:05 AM Black & Shiny reversed

peaking up early

Fixing black & shiny

5:04

cer. 2502 1:12 AM

or 2503 Move Ceres along the slit to get pairs

at all slit pairs. Every 2 pairs move down 1 arcsec

starting @ +2" (N) 1, 2, 3 @ 1st pos

move 1" S during 4. 5, 6 here

" " during 7. 8, 9 here

move 1" S during 10. 11, 12 here

after 12, peak up E-W. 13 good.

move 2" N for here during 15. - skip 15 not too clear

16 good.

move to SVS 13 1:3 AM @ 5:17 UT

5:22

SVS. 2504

peaking early autoguider on. telescope back off.

Abort scan. after PR 8 probably into a

couple of good frames.

telescope goes into shut off autoguider go to zenith.

SVS. 2505 1:38 AM

scan now 4 all pairs good

SVS. 2506 1:41 AM

Go to scan = 8 band bad on PR 14.

.2507

band

.2508

1:46 AM

T<sub>220</sub> = 0.053

move to α Tau start w/ red mode

6:10

Atau. 250

1:39 AM

good @ PR 6

Go to scan mode - scan start 11 pts 1" step.

Atau. 2511

Scan mode obs. 100% good

Go to AB Aur.

6:20

Abaur. 2512

1:41 AM

a little low on the slit.

move 0.5" N before starting

6:27 UT

Abaur. 2513

2514

1:54 AM

2515

1:53 AM

2516

2517

1:26 AM

2518

Rotate T<sub>220</sub> 450

slit now NE-SW.

move to α Tau BS 1547

Atau. 2519

2520

2521

2522

2523

bn. 2524

Obs. 2525

Obs. 2526

2527

bn 2528

8:23 UT Obs 2529

Obs 2530

8:39 Obs 2531

8:45 Obs 2532

8:52 Obs 2533

Scan of Atau → didn't scan far enough  
recon offset -4 +4 13 pts +1.4 -1.4  
offset -4.7 +4.7  
sk a bit off after a slit

1.2" late  
no shift right on afterwards  
started at (+85.6, -121.8 from BN)  
(bright spot) -9, -9 40 pts +0.7, -0.7  
1 on  
2 a little late (1/2 step) some sky variation in this one  
3 1/2 step late  
4 1 step late

S 0.3 < E  
move ~1" E.

1.25 AM  
1 right on.  
3 1 step late ~1" NE  
7 2 step late  
1.6E - 25  
1 ~1 step late  
2 1 late  
3 2 step late  
4 2.5 step late

move 1E over  
1 right on.  
2 ~0.5 steps late.  
3 ~0.5 step late  
4 ~0.5 step late.

no DE 0.2 <  
1 right  
3 1/2 late.  
4 1 late  
2 right on  
3 0.5 step late

slight sky variations.  
right on at end

9:00 UT obs 2534 2 0.5 steps late. Quick load done skip after scan 2 need to do obs.

9:06 obs 2535 1 right on. seems pretty bright 2 1/2 late. 4 1/2 late.

9:11 obs 2536 1 grating sand to slit. 3 1/2 late. 4 1/2 late.

9:11 obs 2537 right on. moved 0.4" S at end

9:06 bn. 2538 had telescope pointing problem, wrong button pushed, before after 2537. Go back to BN. Came in good

back to bar

9:37 obs. 2539 1.12 AM 1 right on. 2 1 step late. obs. 2540 1.11 1 right on. Spike return in scan 1

↑ broken in wire somewhere

9:50 obs. 2541 1 right on. 3 right on.

10:05 obs 2543 need to move 1" S 1" W @ end

move 0.5" W @ end

10:12 obs 2544 1.11 AM 1 right on. 2 0.5 steps late. 3 4. 4 0.3 steps late. some sky variation

10:19 obs 2545 move 0.8 W 0.6 S 1 right on. 3 right on. sky better

10:27 obs. 2546 move 1.5 W at end 2 right on. 4 right on.

10:34 obs. 2547 move 1" W 2 right on. 4 right on.

10:41 obs. 2548 3 1 step late. bn. 2549 4 1 step late. -9, +9 25 pt 1 right on. 2

Go to north pole. offset from BN 33.7 E 17.4 S to get to pl-2. Mod 60" N. 10:55 pt2. 2550 go to 2" E in pt 7 2" W in pt 11 possible weak broad line

11:07 mon r2. 2557 GO TO MON R2 1 R2 S1 as on + walter position offset +8 -18 skip -0.8 +1.8 14 stars

11:06 mon r2. 2552 1.12 AM 1.12 AM 28 stars 3 right on. 4 " "

11:12 .2553 no more needed 2 right on.

11:17 mon r2. 2554 3 1 early. 1 right on. 2 1 early. 3 1 step early. 1 right on. 3 right on.

11:28 mon r2. 2556 add pts. to note 31.

11:33 .2557

11:39 .2558 6 scans on (1.3 W moved telescope)

2559 grating shift during scan 1 scan 4: more grating bounce

2560

MOVE to PAGE

Agem. 2561 - scanning 1.7 E -1.7 N - perp. to the slit pretty faint

2562 scan

17 DEC 02 cont

MOVE TO  $\alpha$  Ori  
AORI. 2562 Scan stopped after 2. garbage,

AORI. 2563

rotate tube NS  
Go to 530  $\text{cm}^{-1}$  for Io SO2  
software skipped 2564 because wrong mode

2:45 HST Callisto 530  $\text{cm}^{-1}$  focus = -4.9  
cal. 2565  
cal. 2566

io.

2:53 io. 2567 skip 1-3 moved south

io. 2568

io. 2569

io. 2570

2571

2572

2573

2574

Callisto

cal. 2575

Shift to 1164.5  $\text{cm}^{-1}$ . echelon centered on blaze

10. 2576 2s int time, gain 50 z = -4.3  
playing with focus a bit: skip pair 3+4  
bounce

moved a little bit along slit  
pair 14 is odd. cloud? skip = 14  
some variation in H<sub>2</sub>O lines

$z=0.074$

2577

2578

2579

2580

2002 Dec 17

Procyon (divisor)

acmi. 2581

peaking. No, falling off slit.  
Good pairs: 8, 9... 16

Regulus (divisor for Procyon)

$z=0.056$

aleo. 2582

. 2583

skip = 1-5

Change to

531  $\text{cm}^{-1}$

gain = 25

cal. 2584

. 2585

moving south on slit.

Go to Callisto. z = ~~-4.8~~ -4.8

skip = 1, 2

Io

io. 2586

11. 2587

nsum = 8, some guiding

. 2588

Too high on slit. moving during pair 4. skip = 1-4

. 2589

. 2590

91

92

93

94

95

background varying ~ pair 12

18 Dec 2002 TG, MR, DJ, HR

Beta Peg  
bpeg. 3501  
3502  
moved echelon para. to blaze  
1247 cm<sup>-1</sup> Temp ~~10.2~~ z = -4.2  
gain = 50 peaked up COF  
garbage - chopper in the way  
peaking up  
high on slit

Ceres  
±80 on sidelas (Project - Ceres brightness at different dist. & wavelengths)

Cer. 3503  
guiding early skip 1-2  
change focus pair 5 went back to where we were.  
not very good

Cer. 3504.  
Pair 2 wind pause  
pair 7 good skip 1-6  
Temp = 3.4

SVS  
SVS. 3505 auto guiding. moved 0.5" MS during pair 2. skip = 1, 2  
nsum = 8

3506  
3507  
3508  
3509

T Tau  
ttau. 3510 starting without guide star  
3511 nsum = 8 guiding at start, moving some along slit  
3512 guiding  
3513 spikes in pair 3. CR hit? And pair 4 good at pair 4  
3514 guiding

21:30 Aldebaran  
WVD = 847 Worders 843.5 cm<sup>-1</sup> → 850.5 cm<sup>-1</sup> setup for C<sub>2</sub>H<sub>2</sub> / Allen @ 845.2459  
atmos (changed blaze a bit)  
(new focus = -4.6)

atau. 3515 orders have only a little gap  
w 849.58 cm<sup>-1</sup> 2nd from bottom  
atmos line in

18 Dec 2002

(don't want a good dings. calib. here)  
21:50 to Titan  
21:55 tit. 3516  
tit. 3517 ← ~~full looking~~ <sup>tiny bit of</sup> guiding  
tit. 3518 ~ pair 6-7 not quite as good  
tit. 3519 w/ pair on 2 a little odd (?)  
tit. 3520 slight bounce  
clear outside; possibly very thin cirrus (from looking @ moon)  
nsum = 4 throughout (could go higher?)  
(was! looked @ 3516 vs sun... huge SVR!)

22:18 Hygiea Asteroid #10 for atmos. cal.  
hyg. 3521 see bounce; little high ~~on slit~~ on slit  
move south during pair 4  
(cloud monitor says ~ stable)

hyg. 3522 dritter little high on slit @ pair 3 & corrected

.3523 losing signal towards end  
.3524 guiding a little  
.3525 pair 11 little bit of guiding  
(rest ~ 1/2" S before starting)

22:45 cont to WVD = 854 cm<sup>-1</sup> (2 lit. & Allen)  
Allen @ 853.5707 cm<sup>-1</sup>

leave blaze offset the same  
changed orders → get 5 orders from ~ 851.3 - 854.5  
hyg. 3526 (then signal b/c of change in orders)  
nod = 5" (long slit!!)

.3527 bounce = -0.1 @ pair 12  
but glitch @ pair 3

.3528 bounce...  
nsum = 6 (from 4)

.3529 nsum = 6  
guiding during... H<sub>2</sub>O varying a little bit

23:10 Titan  
tit. 3530 nsum = 4  
H<sub>2</sub>O line in sent order seems to have spatial variation?!?!?  
background rising (tiny bit)... cirrus starting up?

.3531 sky variation @ pair 5 →  
outlines @ 12-13 → clouds  
.3532 nsum = 2 to try to deal w/ cloud variation  
skip = 1, 2

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tit. 3533  
.3534  
.3535  
.3536

nsun=2 (GHI)  
skip=1-5 (check)  
nsun=4

variation probably  
was more than  
the cirrus

glitch @ 12

root & wno = 929 cm<sup>-1</sup>

8 orders from  
926 cm<sup>-1</sup> - 931.4 cm<sup>-1</sup>

23:45 tit. 3537  
.3538  
.3539  
.3540  
.3541  
.3542

little bounce?

up the time to 2 sec (nsun still = 4)

00:15 to β Ori  
bori. 3543  
00:29 .3544

(good focus)

new setup wno = 954 cm<sup>-1</sup>

9 orders from -951.2 - 957.8 cm<sup>-1</sup>

(same blaze offset as before)  
sludge south @ 7

12:45 bori. 3545  
.3546

Titan  
tit. 3547

Num=4, itim=2  
pause @ pair 11. (may just be quick look?)  
several pauses...

.3548  
.3549  
.3550  
.3551

skip 1-4

glitch @ pair 12

Titan change to C6H6 wno = 1043.5 cm<sup>-1</sup>  
7 orders from 1041.2 - 1046 cm<sup>-1</sup>

re-align echelon parabola  
start saving before we find it

tit. 3552

itim=1; nsun=4

skip=1-16 didn't find it  
go to star & check bore sight & focus

18-Dec-2002

02:00

go to α-CMA to check bore sight & focus  
new focus = -4.7  
acma. 3553

guiding par 5-10

(take 1 file - if we find  
Titan, will come back to  
α-CMA later)

02:10 back to Titan  
tit. 3554  
.3555

searching for it...  
still searching for it...

(Titan's just very big/very far lines)  
(never caught a whiff of it...)  
(redo some deg w/ guide camera)

02:20 go to wno = 1080 cm<sup>-1</sup>  
(attempt C<sub>2</sub>H<sub>2</sub> CN v<sub>9</sub>)

no Q, m @ 1075 cm<sup>-1</sup>  
@ count ramp, R @ 1082 cm<sup>-1</sup>

1077 → 1082.5 cm<sup>-1</sup>

(clean blaze camera)

having some trouble finding it  
try itim=2, nsun=1

still can't find Titan

(checked pointing w/ mirror)

02:35 back to α-CMA to refocus  
(to save time, no data taken)

end to wno = 922 cm<sup>-1</sup> 8 orders 919.5 - 924.8 cm<sup>-1</sup>  
(unfortunately all atm. lines near ends of orders)

α = 0.06

acma. 3556 nsun=4, itim=1

save white focus (not real bright)

new focus = 4.6

skip 1-10 (but some might be worth looking at)

Titan  
tit. 3557  
tit. 3558

02:57 time for handover to next project

Callisto  
cal. 3559  
cal. 3560

(cirrus stayed away throughout  
Titan... yay!)

Reset wno = 927 cm<sup>-1</sup>  
(don't move echelon parabola)

8 orders 924 - 929.5 cm<sup>-1</sup>  
cal. 3561 glitch @ 6

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cal. 3562  
 cal. 3563  
 Jupiter lining up a few hrs yet should be  
 Jup. 3564 guiding ~~at~~ through-out  
 .3565 good  
 .3566  
 .3567  
 .3568  
 .3569 guided pair 1-4  
 .3970  
 .3571

alpha hya

ahya. 3572 ended early pair 2 roddiv 30" north  
 .3573 " 3.5" north

04:10 reset  $\lambda$  to  $wv = 945.5 \text{ cm}^{-1}$  focus 2-4.6  
 9 orders

ahya. 3574

Callisto  
 Cal. 3575  
 cal. 3576  
 Cal. 3577

04:35 Jupiter Jup. 3578 moved north pair 2  
 .3579  
 .3580

wods .3581  
 .3582  
 .3583  
 .3584  
 .3585

Callisto cal. 3586 <sup>garbage</sup> enter file early (forgot to  
 change num)  
 cal. 3587  
 3588

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rest  
 wno 786.5  $\text{cm}^{-1}$   
 cal. 3589

focus = z = -4.8  
 really good file ... lots o' counts

$\mu$  Hya

muhya. 3590  
 .3591  
 .3592  
 .3593

skip 1-2  
 glitch @ 8



19 DEC 02 TG, MF, KNA, DJJ  
tried checking alignment - found no big problems  
went to 1247 ch-1 SC4) schp. put gain to 50

4:54 UT BPEG-4501 1:00 AM guiding early  
PR7 is good. so is PR8  
go to Ceres

5:00 UT CER. 4502  
.4503 1:12 AM Lost Ceres @ PR9  
coming back PR10

5:33 Go to SUS13  
SUS. 4504 1:22 AM guiding N 0.5" during PR4  
.4505 NSUM=8  
5:54 .4506 1:16 AM  
.4507

Go to T Tau

6:36 TTau. 4508 auto guiding  
.4509

Go to AB Aur z = -4.3 T = 1.2°C

abaur. 4510 guiding by hand  
peaking up at start (and middle)

.4511 ~~dropped on slit~~

.4512 Guided N during pairs 1-2 dropped on slit

.4513 Moved N during pairs 1-2  
moving N on slit

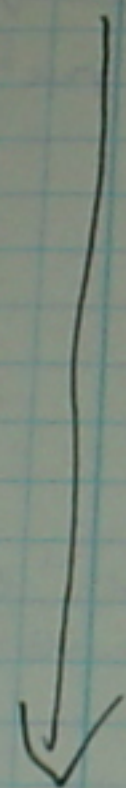
.4514 bad sky variation. weak signal through Fint 5  
bounce seen on strong atmospheric  
lost around pair 10-11.  
positive beam in 12

4515 NSUM=4

4516 some bounce

4517 still some bounce

slit is 1"



Turned TTB 45°  
MOVE TO alpha tau  
atau. 4518 ← with narrow slit

MOVE TO BN  
BN seems extended ← changed slit to 1.4"  
bn. 4519 mod 10N

MOVE TO OBAR BRIGHT SPOT +83.6 -187.8 from BN  
obar 4520 nodding 90S max telescope (33 E end of scan)  
start auto guiding NSUM=4

obar 4521 (0,0) from 12" slit bright spot (+83.6 -187.8) don't use!!  
(moved a 0.7 E end) from BN

4522 auto guiding on positive beam - a little NS drift ~ 1"  
4523 don't bin NS at 1" level  
4524

4525 (1W 1N) NSUM=8 some sky variation  
4526 (1W 1N) some bounce  
4527 (2W 2N)

4528 (2W 2N)

4529 (3W 3N)

4530 (3W 3N)

4531 (4W 4N) 1:44 AM

11:15 UT 4532 (4W 4N) cloud scatter jump up @ beginning (small cloud)

11:29 4533 (5W 5N)

11:41 4534 "

End SC4) on Obar go to alpha Cma  
alpha. 4535 mod 10" N (off slit) 8ms scan 4  
peaking during frames

12:00 alpha. 4536 offset -3.5, 3.5 step 0.5, -0.5, 1.5 etc. 4 scans  
Scan mode NSUM=4 for these  
buffer toggle error on last frame of flat.  
End after 1st scan.

[Use this as test if found for previous obs scan  
alpha. 4537 NSUM=1 4 scans

alpha. 4538 more slope w/ before last scan  
more slope east. 2 scans more w/ before scan 2

Slit still 45° we were @ Gain=50 for all (Z) obs.  
 Set up for SC2) pair is a slit.  
 nod mode 4 Nims 12 ins. 8 1/2" Bars Z -4.7  
 12:24 acm. 4539 SC2) line noded acm guiding to  
 compensate for pos tracking. PA 7 good.  
 Go to sun point - size as sun for 34)  
 acm. 4540 SCAN mode 4 scans.  
 Go to BN Obs mode NOD 10V  
 12:46 BN 4541 nodding 10" v off slit.  
 Observer NOD mode rf=1 1 scan=4, wave=16  
 Obs 4542 SW SN after offset at 83.6 -124.8 km BN 650 km  
 4543 SW SN 1.54 AM  
 4544 " " 1.57 AM

CHANGE  $\lambda = 531 \text{ cm}^{-1}$  Gain = 2.5  
 focus Z = -5.4  
 move echelon dispersion screwdriver 530.409  $\text{cm}^{-1}$   
 IS at short, low freq. side

MOVE TO CALLISTO  
 cal. 4545 nodding 5" N

MOVE TO ID  
 io. 4546  
 4547 nsum = 8 } Blg!!  
 4548 } shift between 47's, 48  
 4549 } shift between 48's, 49

SHIFTED 530.409 in even further toward edge

io. 4550 skip = 1, 2  
 4551  
 4552  
 4553 → HAS GOOD FLAT - FFT's properly  
 4554  
 4555  
 4556 guiding for a while (shifted from 4555)  
 57  
 58  
 59 stopped at pair 12

Go to Callisto

cal. 4560 nsum = 4 } fairly large shift  
 4561

Dec 20, 2002 UT MR, DJ, TG

WFO = 1247.5 cm<sup>-1</sup> H<sub>2</sub>S(4)  
gain = 50 slit = 1.4"  
echelon dispersion screwdriver centered on blaze.  
T = 3.4C t = .071

focus: z = -4.3

go to beta peg  
b peg, 5501  
guiding early

guiding early

go to ceres  
cer, 5502  
5503

bounce  
playing with focus  
bounce

moving to NGC 7538 IRS1  
N753811, 5504

guiding along slit  
pairs 1-4  
bounce

5505

moving to W31255  
W315, 5506

scan offset 5E  
scanning 7W 15 points  
nod weight may have been  
too short

5507

8 scans nod weight increased  
bounce - not too bad  
scan 4 had large cosmic rays

5508

5509

moving to alpha tau  
alpha tau 5510

scan same per. as for W3  
looks sharp  
low on slit

moving N 1.5 arc sec after scan 2  
5511  
5512

nod mode nod = 0.3"

T = 1°C

could Dec 20, 2002 UT

alpha tau 5513  
5514  
5515

Delta focus to -4.6  
seeing is poor  
peaking early  
playing with focus - pair 6-7  
stick with -4.6

move to AB Aur

alpha aur, 5516

autoguiding peaked up at start  
only 8 pairs  
in sum = 8

5517

5518

5519

5520

5521

stop fog coming in  
pair 12 last good pair 4

Close for fog.  
Refill Helium. N<sub>2</sub> low breaks, replace + fill  
focus unchanged z = -4.6 T = 0.9°C  
Gain = 50 (unchanged)  
1.03 Am. black & shiny reversed.

9:55 UT alpha tau, 5522

focus was good.

10:06 alpha aur, 5523

1.03 Am

10:18 5524

signal is dropping - came back up on last pr.  
after 0.5" w wave.

10:31

5525

slight bounce

10:44 alpha aur 5526

move to BN

shifted focus to -4.8 BN was not extended

bn, 5527

stopped after 12 pairs

change to 748.5 cm<sup>-1</sup>. Tipped dispersion screwdriver so 747.8 cm<sup>-1</sup>  
is in middle of order. Gain = 25 Focus = -5.0

bn, 5528

5529

5530

Go to Titan (next page)

20 Dec 2002

Titan

- tit. 5531  $\bar{\nu} = 748.5 \text{ cm}^{-1}$  Guiding at start  
 skip = 1, 3. bounce (2<sup>nd</sup> deriv).  
 .5532 guiding, but almost all good signal  
 .5533 some loss of signal from guiding  
 .5534 skip = 1, 4  
 .5535

Go to  $\beta$  Gem (flux calibrator)

bgem. 5536 peaking. bounce. lost at end.

change to  $972.5 \text{ cm}^{-1}$ 

bgem. 5537 peaking. pair 5 good.

Go to Titan. changed Int time to 1.5s

tit. 5538 odd striping in diff.

tit. 5539 change int time back to 1.0s

tit. 5540 striping is gone. peaking up at the end  
 may be drifting up on slit  
 move  $0.5''$  S before 5541

.5541

.5542

Go to Callisto

cal. 5543 change to 3" nod. <sup>on pair 8</sup> changed focus to  $Z=5$ ,  
 .5544 $\bar{\nu} \approx 917 \text{ cm}^{-1}$ 

Cal. 5545

4

Titan

tit. 5546

.5547

2 sec int.

t.t. 5548  $\bar{\nu} = 912$   
 .5549

Callisto

Cal. 5550

mg I

Cal. 5551

Callisto  $T = -0.4$   $\bar{\nu} = 816$ 

Cal. 5552

focus = -5.1 finished by pair 4

Go to  $\beta$  Gem

bgem. 5553

.5554

.5555

.5556

.5557

.5558

.5559

.5560

.5561

on it ~ pair 3

skip pair 3 - guided about south

may have drifted N on slit. Fixed by pair 8

 $\alpha$  Phx H:YA!

alpha. 5562

ok until ~ pair 12. That's when we  
 turned on autoguider

.5563

.5564

.5565

.5566

 $Z \rightarrow -5.0$ . dancing at edge of slit?maybe guider.  
 turned off guider

.5567

.5568

.5569

alpha. 5570

5571

chopper cuckoo sounded. skip = 1, 3  
 no cuckoo

21 DEC 02 UT KNA, MR, DG

$\nu_n = 896 \text{ cm}^{-1}$   
 echelon dispersion centered  
 $897-8920 \text{ cm}^{-1}$  in last order

cirrus

Bpeg 6501 (coo-coo sounded during 1<sup>st</sup> sky)  
 peaking up  
 high on slit, but probably ok  
 $z = -4.5$

move to R Ayr

ragr. 6502 cuckoo went off again - off by 1 step  
 seeing is poor

move to Ceres

cer. 6503  
 6504 guiding

sky variations  
 at 10% level

move to TX Psc

txpsc. 6505 peaked at start  
 6506  
 6507 guiding south during obs.  
 6508

move to R Cas

rcas. 6509 very bright. <sup>should have</sup> stopped after 8

move to Mira

ocet. 6510 nsum = 3 8 pairs

change to  $1231.5 \text{ cm}^{-1}$  Gain = 50, 1.4" slit, order 6  
 move to Ceres

cer. 6511 nodding off slit. Maybe a bad idea.  
 stopped after 4.

cer. 6512 nod 2.5" N - nodding on slit  
 need to adjust echelle.  
 ended after 3.

cer. 6513 on it at pair 4 (somewhat)  
 on it at pair 5 (good)  
 bad sky pair 12 - skip  
 not that good. see if CAL 618 is in the clear

move to CAL 618

cal. 6514 peaking at start, hand guiding  
 6515  
 6516  
 6517

MOVE to BN

bn. 6518 focus = -4.9 autoguiding  
 bn. 6519

change to  $780. \text{ cm}^{-1}$  Ne II  
 move echelon screwdriver so  $780.5038 \text{ cm}^{-1}$  is on high freq.  
 side. Gain = 25

bn. 6520 BN is not a good Ne II atmospheric  
 calibrator. 4" N nod saw pos & neg blobs.

Go to Hygiea Focus:  $z = -5.0$

hyg. 6521 sky varying towards end.  
 6522 very bad sky variation. mostly garbage  
 pair 16 was ok

Go to SVS 13

hyg. 6523 really SVS 13. Auto guiding  
 hyg. 6524 still really SVS 13.  
 sv's. 6525

21 Dec UT (cont'd)

move to HH 7

hh7. 6526 nod 20" N. Cloud. Garbage

move to T Tau

ttau. 6527 nod 3.5" N. autoguiding. something went wrong with guider. Threw a nod?

.6528 Good at pair 14  
.6529 bounce. trying guider again.

TURN TUB 45°  
go to tau

atau. 6530 get flux calibration for nod  
→ IN A CLOUD  
last pair not bad.

atau. 6531 start at (+5, -5) step -1, +1 11 points  
glitch during flat → use flatmode=old

Go to CAPELLA

caur. 6532 3AD CLOUD VARIATION  
early pair o.k.

6533 bad sky  
-checked bore sight on BN  
Move to OBAR (+83.6 -181.8) from BN

start scan (+20, -20) step (-1, +1)  
obar. 6534 → non-existent!!  
- 6535 2 scans & expecting line only source  
sky variation!!

obar. 6536 moved telescope (0.7E 0.2N to get to 0,0)  
sky variation (at least 20%)  
No line shifted onto ozone??

All scans went through 0,0  
move (0.3S, 0.2W)  
6537 sky variations  
Good scan!! → scan 2: little sky variation early in scan  
looks like a line. YAY!!  
possible emission in offset  
move tel. 0.4W 0.8S

change to start scan at (+35, -35) still step (-1, +1)  
dear. 6538 - BIG sky variation in 1st scan  
Cold emission in the 1st few scans be memory of bright part??

6539 changed nod weight to 3.5  
scan 2: ~1/2" off of (0,0)  
not convinced we are letting the array clear  
1st scan might not be have good sky - not contaminated!  
~~2nd scan went~~  
4th scan went through (0,0) 1/2 step early

6540 changed nod weight to 7  
is nod weight even being looked at!!  
it seems like it waited 7 secs between scans 1 and 2  
N is 1.7 > W  
move telescope: (2.2S)

MOVE to MONR2  
start +8.4, -18.2 from IRS1 step (-0.6, 1.3) 21 pair  
monr2. 6541

looked good  
didn't need to move

change start to (+14.4, -31.2) step (-0.6, 1.3) 21 points  
monr2. 6542 ended on bore sight

change start to (+11.4, -25.7)

6543 looked good  
6544 not seeing emission  
away from ionization front.

Go to Callisto

cal. 6545 scan. -0.5 E 0.5 N steps. some clouds.

cal. 6546 nodded observat

Go to Sirius

SKY IS MUCH BETTER  
variations w/i.

21DEC02. cont

Go to Sirius  
acma. 6547 nod mode

acma. 6548 scan (-0.5, 0.5) step  
sky variations scan 2  
" scan 4

SWITCH to H<sub>2</sub> SC(4) 1247 cm<sup>-1</sup>  
1.4" slit centered echelon on blaze  
gain = 50 z = -4.9

acma. 6549 nodding off slit. peaking at start. 6 pairs  
.6550 scan made.

Go to BN Bore sight was good. Moved tel. to 0.4 E - 0.2 N

bn. 6551 nod mode

MOVE to 0.3 NE moved telescope (0.3 E 0.9 S to get Ne II peak from H<sub>2</sub> PK)

obar. 6552 Nsum = 4 16 nods  
(5W, 5N)

obar. 6553 change Nsum = 8  
(5W, 5N) seeing looks bad AIRMASS 1.35

obar. 6554 (6W, 6N)

obar. 6555 (6W, 6N)

MOVE BACK TO BN had to move 1.6 e to get BN reference star on bore sight

bn. 6556 scan made. BN is a little high on slit

Change to PFP line  
PFP 2148.9 cm<sup>-1</sup> long slit mode  
order 11 gain = 50  
itime = 3 s

no focus changes made

manr2. ~~6557~~ scan made 41 steps 0.5W  
6557 started at IRS 177  
quicklook died. shooting blind

go to 820 cm<sup>-1</sup> in long slit mode  
Gain = 50 → mistake?

Jup. 6558 scan too short. ended after 1.  
quicklook died immediately.

Gain = 25? .6559 61 points 0.5" W steps with 30" E offset  
shooting blind ✓

change to 1184 cm<sup>-1</sup>, C60. Gain = 50 hi-med mode  
tried to center echelon orders  
Go to IRC +10216

orders nearly overlap  
110216. 6560 nod off slit 1 sec integration (source noise)  
moved during pair 6 z = -4.9

Go to U Hya

uhya. 6561 nodding on slit  
.6562

Go to Procyon

acmi. 6563 skip = 1, 2: guiding  
.6564 guiding early

change to 1.0" slit

acmi. 6565 good on pair 5. Lost on 11. Back on 12

back to 1.4" slit

acmi. 6566 scan. nsum = 4. on it too soon.  
0.5" steps

21 Dec 02 cont'd

acmi. 6567 scan. good one. nodwait too short?  
0.5" steps\*  
change to 1247.5. Gain = 50. CVP peaked.6568 stare made. Oops!  
.6569 stopped at 4. all good.  
except low on slit.

move to TW Hya -34° Dec!

twhya. 6570 auto guiding. sky variation. nothing obvious.

END OF RUN

start of June 2003

test subdirectory

17 JUNE UT

c2h2.0002 240  $\mu$ m slit 729.2  $\text{cm}^{-1}$  Q branch  
long gas cell pumped out. 1 sec.c2h2.0003 150  $\mu$ m wide slit nominal focus position  
.0004 2 turns in object = gas cell +2 } may be outgassing  
.0005 2 turns out from nominal -2  
.0006 Nominal 0.0007 flushed, refilled, + pumping while taking data. good focus.  
.0008 flushed, refilled, + pumping during data9 180  $\mu$ m slit10 240  $\mu$ m slit11 360  $\mu$ m slit12 540  $\mu$ m slit13 540  $\mu$ m14 360  $\mu$ m

15 240

16 180

17 150

vac.0012 flushed + pumping 150  $\mu$ m

13 180

14 240

15 360

16 540

c2h2over.0017 1318  $\text{cm}^{-1}$  H<sub>2</sub>O + C<sub>2</sub>H<sub>2</sub> 4sec. 540

18 540

19 360

20 240

21 180

22 150

h2o.0022 419.1  $\text{cm}^{-1}$  H<sub>2</sub>O (3 lines) 1 sec  
soifer filter: V=7596

23 360

24 spot on filter. slit not moving in same 240

25 180

26 150