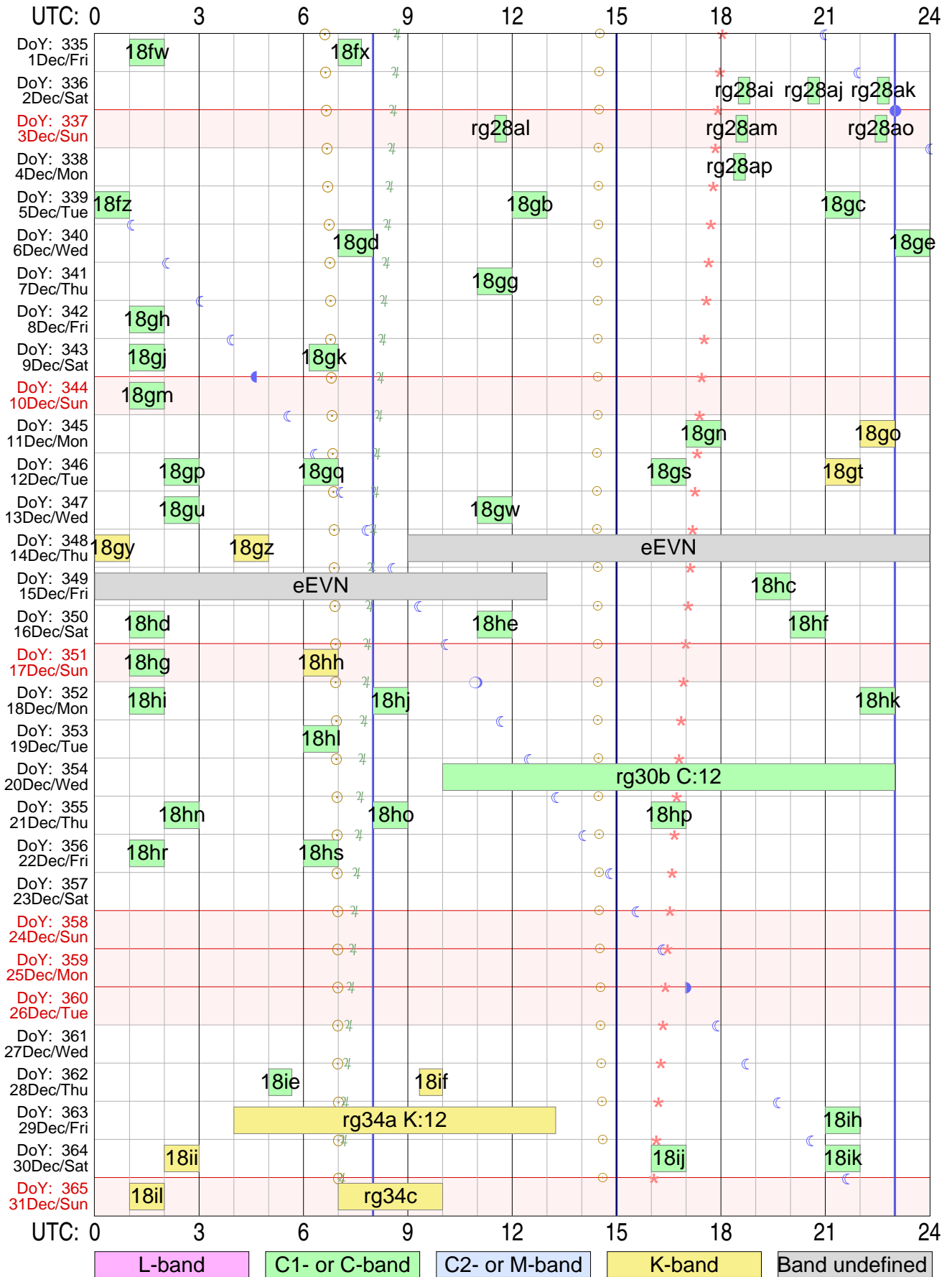


Tr VLBI plan for Dec 2017



Version: 2017.12.18

Sky events at Tr: ☉ Sunrise & sunset ☾☽ Transit of Moon ♃ Transit of Jupiter ★ Transit of Aries (0h ST)

Vertical lines in blue mark operator shift times at Tr

Total observing time: 98.4 hours in 55 experiments scheduled

Initial characters 'rk' are omitted from RA experiment names!

Strona zostawiona celowo pusta

RadioAstron & EVN Experiments

Dec 2017

Uytownik ftp dla logw i schedulw RA: grt

ftp://webinet.asc.rssi.ru

Przykad dla log files: cd GRT_log_files/2014_09/2014_09_01_raks08ak

Przykad dla sched files: cd schedule/grtsched/RAKS/rk08ak

Year = 2017, 2nd line is: Year	Date	UTstart	UTstop	Exper.	xxComment
Nr	D	M	<=Dur	Exper. name	Comment
1	1.12	1.0	18fw		C
2	1.12	0.7	18fx		L
3	2.12	0.3	rg28ai		L
4	2.12	0.3	rg28aj		L
5	2.12	0.3	rg28ak		L
6	3.12	0.3	rg28al		L
7	3.12	0.3	rg28am		L
8	3.12	0.3	rg28an		L
9	3.12	0.3	rg28ao		L
10	4.12	0.3	rg28ap		L
11	4.12	0.3	rg28aq		L
12	5.12	1.0	18fz		C
13	5.12	1.0	18ga		L
14	5.12	1.0	18gb		C
15	5.12	1.0	18gc		C->L
16	6.12	1.0	18gd		C
17	6.12	1.0	18ge		C
18	7.12	1.0	18gf		L
19	7.12	1.0	18gg		C
20	8.12	1.0	18gh		C
21	9.12	1.0	18gj		C
22	9.12	0.8	18gk		L
23	10.12	1.0	18gm		C
24	11.12	1.0	18gn		L
25	11.12	1.0	18go		K
26	12.12	1.0	18gp		C
27	12.12	1.0	18gq		C
28	12.12	1.0	18gs		L
29	12.12	1.0	18gt		K
30	13.12	1.0	18gu		C
31	13.12	1.0	18gw		C
32	13.12	1.0	18gx		L
33	14.12	1.0	18gy		K
34	14.12	1.0	18gz		K
35	15.12	1.0	18hc		C
36	16.12	1.0	18hd		C
37	16.12	1.0	18he		C
38	16.12	1.0	18hf		C
39	17.12	1.0	18hg		C

40	17.12	1.0	18hh	K
41	18.12	1.0	18hi	C
42	18.12	1.0	18hj	L
43	18.12	1.0	18hk	L
44	19.12	1.0	18hl	L
45	21.12	1.0	18hn	L
46	21.12	1.0	18ho	L
47	21.12	1.0	18hp	C
48	22.12	1.0	18hr	L
49	22.12	1.0	18hs	C
50	28.12	0.7	18ie	L
51	28.12	0.7	18if	K
52	29.12	9.3	rg34a	K K:12
53	29.12	1.0	18ih	L
54	30.12	1.0	18ii	K
55	30.12	1.0	18ij	C
56	30.12	1.0	18ik	C
57	31.12	1.0	18il	K
58	31.12	3.0	rg34c	K
59	14.12	28.0	eEVN	

Summer time (DST): Mar 26 to Oct 29, 2017
Total observing time: 89.1 hours in 59 experiments

Plik pdf tego dokumentu jest dost/epny w sieci pod adresem:

<http://paulo.astro.uni.torun.pl/~pw/VLBI/schedules/dec17.pdf>

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum= 4836.00 4836.00 4836.00 4836.00
BBC fr=  736.00 736.00  736.00  736.00
Bandwd=  16.00 16.00  16.00  16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.625438	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.63651	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.490152	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.38935	0.00
	./rg28ai_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	93.7

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 2 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 2

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.642862	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.61825	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.489281	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.38635	0.00
	./rg28aj_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	93.6

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 4 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 4

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.657440	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.60293	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.488573	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.38393	0.00
	./rg28ak_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun.
 SCHED provides warnings at individual scans for distances less than 10 degrees.
 The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	93.6

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.776383	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.47731	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.483431	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.36673	0.00
	./rg28al_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	93.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.837071	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.41334	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.481184	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.35924	0.00
	./rg28am_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	92.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 4 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 4

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.874525	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.37410	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.479900	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.35487	0.00
	./rg28ao_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun.
 SCHED provides warnings at individual scans for distances less than 10 degrees.
 The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	92.7

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 2 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 2

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.072999	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.17203	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 55.473940	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 10.33197	0.00
	./rg28ap_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
2209+236	92.0

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk18fwtr

RADIOASTRON AGN MONITORING

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Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN Monitoring

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are LO sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Fri 1 Dec 2017 Day 335 ---

----- C-band VLBI scans -----

Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

Table with 11 columns: Start UT, Stop UT, Source, LST, EL, AZ, HA, UP, ParA, Dwell, GBytes, SYNC. It lists observation times and parameters for source 0823+033.

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra6cm2.set

Setup group: 2 Station: TORUN Total bit rate: 256
Format: MKIV1:4 Bits per sample: 2 Sample rate: 32.000
Number of channels: 4 DBE type: Speedup factor: 1.00

Disk used to record data.

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 2 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 2

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.270769	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.98626	0.00
	fake circumpolar target for a TS to look at			
* 0823+033	08 23 13.540326	* 08 25 50.338355	08 26 46.436303	0.00
J0825+0309	03 19 15.40169	* 03 09 24.51995	03 05 49.72297	0.00
	./rk18fw_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 57025 observations, RA-A04-07, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun.
 SCHED provides warnings at individual scans for distances less than 10 degrees.
 The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0823+033	119.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 2 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 2

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 43.322674	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.93839	0.00
	fake circumpolar target for a TS to look at			
* 1044+719	10 44 49.735111	* 10 48 27.619927	10 49 42.137238	0.00
J1048+7143	71 59 26.88535	* 71 43 35.93838	71 37 37.95979	0.00
	./rk18fx_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 141793 observations, RA-A04-07,			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1044+719	109.2

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk18fztr

RADIOASTRON AGN MONITORING
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Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN Monitoring

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
Start UT    Source                      Start / Stop                      Early    Disk    TPStart
Stop UT                      LST        EL    AZ    HA    UP    ParA    Dwell    GBytes    SYNC
-----
```

--- Tue 5 Dec 2017 Day 339 ---

----- C-band VLBI scans -----

Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

00 00 00	0829+046	06 10 12	33.3	136.0	-2.4		-24.7	0	0	00 00 00
00 14 30	---	06 24 45	34.7	140.0	-2.1		-22.8	870	28	00 00 01
00 15 00	0829+046	06 25 15	34.8	140.1	-2.1		-22.7	24	28	00 15 00
00 29 30	---	06 39 47	36.1	144.3	-1.9		-20.6	870	56	00 15 01
00 30 00	0829+046	06 40 17	36.1	144.4	-1.9		-20.5	24	56	00 30 00
00 44 30	---	06 54 50	37.3	148.7	-1.6		-18.2	870	84	00 30 01
00 45 00	0829+046	06 55 20	37.4	148.8	-1.6		-18.2	24	84	00 45 00
01 00 00	---	07 10 22	38.5	153.4	-1.4		-15.7	900	112	00 45 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra6cm2.set

Setup group: 2	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.129927	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 46.11652	0.00
	fake circumpolar target for a TS to look at			
* 0829+046	08 29 10.894139	* 08 31 48.876958	08 32 45.484772	0.00
J0831+0429	04 39 50.82946	* 04 29 39.08580	04 25 55.80773	0.00
	./rk18fz_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 1604 observations, RA-A03-04			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source          Sun distance (deg)
0829+046        122.5

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz        45. deg
2.3 GHz        36. deg
5.0 GHz        23. deg
8.4 GHz        17. deg
15.0 GHz       12. deg
22.0 GHz        9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.257967	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.99650	0.00
	fake circumpolar target for a TS to look at			
* 2200+420	22 00 39.362504	* 22 02 43.291371	22 03 27.087537	0.00
J2202+4216	42 02 08.59073	* 42 16 39.97987	42 22 08.02737	0.00
BLLAC	./rk18gb_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 59417 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source          Sun distance (deg)
2200+420        97.1

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz        45. deg
2.3 GHz        36. deg
5.0 GHz        23. deg
8.4 GHz        17. deg
15.0 GHz       12. deg
22.0 GHz        9. deg

```


1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 1 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 1

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.356599	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.90888	0.00
	fake circumpolar target for a TS to look at			
* 0954+658	09 54 57.847936	* 09 58 47.245116	10 00 07.617218	0.00
J0958+6533	65 48 15.53882	* 65 33 54.81801	65 28 27.39835	0.00
	./rk18gc_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 13350 observations, fringe-finder for M			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0954+658	115.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =           RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.469044	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.81425	0.00
	fake circumpolar target for a TS to look at			
* 1357+769	13 57 42.117007	* 13 57 55.371538	13 57 54.689347	0.00
J1357+7643	76 57 53.35418	* 76 43 21.05098	76 38 02.12288	0.00
	./rk18gd_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 226762 observations, RA-A04-07, RA-A03-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1357+769	102.6

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =           RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.652844	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.67140	0.00
	fake circumpolar target for a TS to look at			
* 0823+033	08 23 13.540326	* 08 25 50.338355	08 26 46.636460	0.00
J0825+0309	03 19 15.40169	* 03 09 24.51995	03 05 48.52181	0.00
	./rk18ge_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 57025 observations, RA-A04-07, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0823+033    125.2

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```


1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.712432	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.62813	0.00
	fake circumpolar target for a TS to look at			
* 1101+384	11 01 40.567856	* 11 04 27.313945	11 05 25.761766	0.00
J1104+3812	38 28 42.95187	* 38 12 31.79894	38 06 34.53474	0.00
MRK421	./rk18gf_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17168 observations, RA-A04-07, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun.
 SCHED provides warnings at individual scans for distances less than 10 degrees.
 The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1101+384	102.0

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.794916	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.57054	0.00
	fake circumpolar target for a TS to look at			
* 1357+769	13 57 42.117007	* 13 57 55.371538	13 57 54.778479	0.00
J1357+7643	76 57 53.35418	* 76 43 21.05098	76 38 01.69158	0.00
	./rk18gg_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 226762 observations, RA-A04-07, RA-A03-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1357+769	102.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 44.959522	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.46321	0.00
	fake circumpolar target for a TS to look at			
* 1055+018	10 55 55.313729	* 10 58 29.605207	10 59 24.229353	0.00
J1058+0133	01 50 03.53709	* 01 33 58.82359	01 28 16.19104	0.00
	./rk18gh_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 8183 observations, RA-A03-04, RA-A02-12			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1055+018    90.7

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00  736.00  736.00  736.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 45.241153	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.30006	0.00
	fake circumpolar target for a TS to look at			
* 0234+285	02 34 55.589591	* 02 37 52.405678	02 38 56.558625	0.00
J0237+2848	28 35 11.40774	* 28 48 08.98999	28 52 45.39692	0.00
	./rk18gj_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 57147 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0234+285	146.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 4 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 4

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 45.300381	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.26854	0.00
	fake circumpolar target for a TS to look at			
* 1055+018	10 55 55.313729	* 10 58 29.605207	10 59 24.268087	0.00
J1058+0133	01 50 03.53709	* 01 33 58.82359	01 28 15.96085	0.00
	./rk18gk_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 8183 observations, RA-A03-04, RA-A02-12			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1055+018	91.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  1  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  1

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 45.514469	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 45.16096	0.00
	fake circumpolar target for a TS to look at			
* 1055+018	10 55 55.313729	* 10 58 29.605207	10 59 24.291049	0.00
J1058+0133	01 50 03.53709	* 01 33 58.82359	01 28 15.82255	0.00
	./rk18gm_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 8183 observations, RA-A03-04, RA-A02-12			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1055+018    92.7

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=          L          L          U          U
IF SB =          U          U          U          U
Pol.  =          RCP         LCP         RCP         LCP
BBC   =           1          2          1          2
BBC SB=          L          L          U          U
IF    =           C          A          C          A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum= 22236.00 22236.00 22236.00 22236.00
BBC fr=  736.00  736.00  736.00  736.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 46.490898	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.70843	0.00
	fake circumpolar target for a TS to look at			
* 2200+420	22 00 39.362504	* 22 02 43.291371	22 03 26.898086	0.00
J2202+4216	42 02 08.59073	* 42 16 39.97987	42 22 07.01752	0.00
BLLAC	./rk18gy_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 59417 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source          Sun distance (deg)
2200+420        91.5

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz        45. deg
2.3 GHz        36. deg
5.0 GHz        23. deg
8.4 GHz        17. deg
15.0 GHz       12. deg
22.0 GHz        9. deg

```



```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      L      L      U      U
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      L      L      U      U
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = 1MHz
LO sum= 22236.00 22236.00 22236.00 22236.00
BBC fr=  736.00  736.00  736.00  736.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 46.529710	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.68916	0.00
	fake circumpolar target for a TS to look at			
* 0657+172	06 57 07.785943	* 07 00 01.525541	07 01 04.321423	0.00
J0700+1709	17 13 35.02503	* 17 09 21.70122	17 07 40.65775	0.00
	./rk18gz_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 14255 observations, RA-A03-04, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0657+172    157.1

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 46.910092	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.49201	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 39.062811	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 32.29443	0.00
	./rk18hc_sources.radioastron			
	AGN, IDV, rfc_2013d Petrov, 2013, unpublished 65224 observations, RA-A04-07, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0235+164    138.7

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```

rk18hdr

RADIOASTRON AGN MONITORING

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Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
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Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN Monitoring

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Sat 16 Dec 2017 Day 350 ---

----- C-band VLBI scans -----

Next scan frequencies:	4836.00	4836.00	4836.00	4836.00							
Next BBC frequencies:	736.00	736.00	736.00	736.00							
Next scan bandwidths:	16.00	16.00	16.00	16.00							
01 00 00	0235+164	07 53 44	20.1	271.2	5.2		38.8	0	0	01 00 00	
01 14 30	---	08 08 17	17.9	274.1	5.5		38.7	870	28	01 00 01	
01 15 00	0235+164	08 08 47	17.9	274.2	5.5		38.7	24	28	01 15 00	
01 29 30	---	08 23 19	15.7	277.0	5.7		38.5	870	56	01 15 01	
01 30 00	0235+164	08 23 49	15.6	277.1	5.7		38.5	24	56	01 30 00	
01 44 30	---	08 38 21	13.5	280.0	6.0		38.1	870	84	01 30 01	
01 45 00	0235+164	08 38 52	13.4	280.1	6.0		38.1	24	84	01 45 00	
02 00 00	---	08 53 54	11.2	283.0	6.2		37.7	900	112	01 45 01	

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra6cm2.set

Setup group:	3	Station:	TORUN	Total bit rate:	256
Format:	MKIV1:4	Bits per sample:	2	Sample rate:	32.000
Number of channels:	4	DBE type:		Speedup factor:	1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 46.969600	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.46022	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 39.062036	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 32.28677	0.00
	./rk18hd_sources.radioastron			
	AGN, IDV, rfc_2013d Petrov, 2013, unpublished 65224 observations, RA-A04-07, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	138.4

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)	
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.070606	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.40607	0.00
	fake circumpolar target for a TS to look at			
* 0954+658	09 54 57.847936	* 09 58 47.245116	10 00 08.304902	0.00
J0958+6533	65 48 15.53882	* 65 33 54.81801	65 28 27.24462	0.00
	./rk18he_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 13350 observations, fringe-finder for M			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0954+658    121.1

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.161976	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.35713	0.00
	fake circumpolar target for a TS to look at			
* 0925+504	09 25 51.973728	* 09 29 15.440209	09 30 27.926498	0.00
J0929+5013	50 26 44.31059	* 50 13 35.98961	50 08 36.95975	0.00
	./rk18hf_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 223 observations, RA-A03-04, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0925+504    128.0

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```


1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.212430	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.33022	0.00
	fake circumpolar target for a TS to look at			
* 0234+285	02 34 55.589591	* 02 37 52.405678	02 38 56.500389	0.00
J0237+2848	28 35 11.40774	* 28 48 08.98999	28 52 45.63376	0.00
	./rk18hg_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 57147 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0234+285	139.3

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      L      L      U      U
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      L      L      U      U
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum= 22236.00 22236.00 22236.00 22236.00
BBC fr=  736.00  736.00  736.00  736.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.265021	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.30230	0.00
	fake circumpolar target for a TS to look at			
* 0823+033	08 23 13.540326	* 08 25 50.338355	08 26 46.897084	0.00
J0825+0309	03 19 15.40169	* 03 09 24.51995	03 05 46.82685	0.00
	./rk18hh_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 57025 observations, RA-A04-07, R			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0823+033    135.0

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00  736.00  736.00  736.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.465711	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.19777	0.00
	fake circumpolar target for a TS to look at			
* 0727-115	07 27 58.097813	* 07 30 19.112473	07 31 10.392738	0.00
J0730-1141	-11 34 52.58107	*-11 41 12.60063	-11 43 34.11581	0.00
	./rk18hi_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 155894 observations, RA-A04-07, RA-A03-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source          Sun distance (deg)
0727-115        136.2

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz        45. deg
2.3 GHz        36. deg
5.0 GHz        23. deg
8.4 GHz        17. deg
15.0 GHz       12. deg
22.0 GHz        9. deg

```


1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 4 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 4

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.540463	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.15996	0.00
	fake circumpolar target for a TS to look at			
* 1005+066	10 05 23.466064	* 10 08 00.816157	10 08 57.075599	0.00
J1008+0621	06 36 03.30797	* 06 21 21.21593	06 16 02.16422	0.00
	./rk18hj_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 317 observations, RA-A04-07, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1005+066	114.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =          U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=          L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  7  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  7

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.695523	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.08406	0.00
	fake circumpolar target for a TS to look at			
* 1357+769	13 57 42.117007	* 13 57 55.371538	13 57 55.635899	0.00
J1357+7643	76 57 53.35418	* 76 43 21.05098	76 37 58.38252	0.00
	./rk18hk_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 226762 observations, RA-A04-07, RA-A03-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1357+769    105.8

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  6  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  6

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.781617	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 44.04359	0.00
	fake circumpolar target for a TS to look at			
* 1222+216	12 22 23.408709	* 12 24 54.458394	12 25 47.532564	0.00
J1224+2122	21 39 23.03696	* 21 22 46.38857	21 16 46.94885	0.00
	./rk18hl_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 406 observations, RA-A04-07, RA-A03-04,			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1222+216	90.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rg30btr

RADIOASTRON IMAGING OF HIGH-REDSHIFT QUASARS

PI: Leonid Gurvits

Address: Joint Institute for VLBI in Europe

Observing mode: L-band, dual-pol

Schedule for TORUN (Code Tr)

Page 2

RadioAstron Imaging of high-redshift quasars

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC
--- Wed 20 Dec 2017 Day 354 ---										
Next scan frequencies:		4836.00	4836.00	4836.00	4836.00	4836.00				
Next BBC frequencies:		636.00	636.00	636.00	636.00	636.00				
Next scan bandwidths:		16.00	16.00	16.00	16.00	16.00				
12 23 30	0201+113	19 34 53	4.9	77.1	-6.5	-36.7	0	0	12 23 30	
12 33 00	---	19 44 24	6.3	78.9	-6.3	-37.0	570	18	12 23 31	
12 33 30	0201+113	19 44 54	6.4	79.0	-6.3	-37.0	24	18	12 33 30	
12 43 00	---	19 54 26	7.8	80.9	-6.2	-37.3	570	37	12 33 31	
12 43 30	0201+113	19 54 56	7.8	81.0	-6.2	-37.3	24	37	12 43 30	
12 53 00	---	20 04 28	9.3	82.9	-6.0	-37.5	570	55	12 43 31	
12 53 30	0201+113	20 04 58	9.3	83.0	-6.0	-37.5	24	55	12 53 30	
13 03 00	---	20 14 29	10.8	84.9	-5.8	-37.6	570	73	12 53 31	
13 03 30	0201+113	20 14 59	10.8	85.0	-5.8	-37.6	24	73	13 03 30	
13 13 00	---	20 24 31	12.3	86.8	-5.7	-37.7	570	91	13 03 31	
13 13 30	0201+113	20 25 01	12.3	86.9	-5.7	-37.8	24	91	13 13 30	
13 23 00	---	20 34 32	13.8	88.8	-5.5	-37.8	570	110	13 13 31	
13 23 30	0201+113	20 35 03	13.8	88.9	-5.5	-37.8	24	110	13 23 30	
13 33 00	---	20 44 34	15.3	90.8	-5.3	-37.8	570	128	13 23 31	
13 33 30	0201+113	20 45 04	15.3	90.9	-5.3	-37.8	24	128	13 33 30	
13 43 00	---	20 54 36	16.8	92.9	-5.2	-37.8	570	146	13 33 31	
13 43 30	0201+113	20 55 06	16.8	93.0	-5.2	-37.8	24	146	13 43 30	
13 50 30	---	21 02 07	17.9	94.4	-5.0	-37.7	420	160	13 43 31	
13 51 00	0201+113	21 02 37	18.0	94.5	-5.0	-37.7	24	160	13 51 00	
14 00 30	---	21 12 09	19.4	96.4	-4.9	-37.5	570	178	13 51 01	
14 01 00	0201+113	21 12 39	19.5	96.5	-4.9	-37.5	24	178	14 01 00	
14 09 30	---	21 21 10	20.7	98.3	-4.7	-37.4	510	194	14 01 01	
----- C-band VLBI scans. Space segment 02 -----										
14 10 00	0201+113	21 21 40	20.8	98.4	-4.7	-37.3	24	194	14 10 00	
14 25 00	---	21 36 43	23.0	101.6	-4.5	-36.9	900	223	14 10 01	

Schedule for TORUN (Code Tr)

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RadioAstron Imaging of high-redshift quasars

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Wed 20 Dec 2017 Day 354 ---										
14 25 30	0201+113	21 37 13	23.1	101.7	-4.5		-36.9	24	223	14 25 30
14 40 00	---	21 51 45	25.2	104.8	-4.2		-36.4	870	251	14 25 31
14 40 30	0201+113	21 52 15	25.3	104.9	-4.2		-36.3	24	251	14 40 30
14 55 00	---	22 06 48	27.4	108.1	-4.0		-35.6	870	279	14 40 31

----- C-band VLBI scans. Ground segment 02 -----										
14 55 30	0201+113	22 07 18	27.5	108.2	-4.0		-35.6	24	279	14 55 30
15 08 50	---	22 20 40	29.4	111.3	-3.7		-34.8	800	304	14 55 31
15 09 20	0201+113	22 21 10	29.4	111.4	-3.7		-34.8	24	304	15 09 20
15 18 50	---	22 30 41	30.8	113.6	-3.6		-34.2	570	323	15 09 21
15 19 20	0201+113	22 31 12	30.8	113.7	-3.6		-34.1	24	323	15 19 20
15 28 50	---	22 40 43	32.1	116.0	-3.4		-33.4	570	341	15 19 21
15 29 20	0201+113	22 41 13	32.2	116.1	-3.4		-33.4	24	341	15 29 20
15 38 50	---	22 50 45	33.5	118.5	-3.2		-32.6	570	359	15 29 21
15 39 20	0201+113	22 51 15	33.5	118.6	-3.2		-32.6	24	359	15 39 20
15 48 50	---	23 00 46	34.8	121.0	-3.1		-31.7	570	378	15 39 21
15 49 20	0201+113	23 01 16	34.8	121.1	-3.1		-31.7	24	378	15 49 20
15 58 50	---	23 10 48	36.0	123.5	-2.9		-30.7	570	396	15 49 21
15 59 20	0201+113	23 11 18	36.1	123.7	-2.9		-30.7	24	396	15 59 20
16 08 50	---	23 20 50	37.3	126.2	-2.7		-29.7	570	414	15 59 21

----- C-band VLBI scans. Space segment 03 -----										
16 10 00	0201+113	23 22 00	37.4	126.5	-2.7		-29.5	64	414	16 10 00
16 25 00	---	23 37 02	39.2	130.6	-2.5		-27.7	900	443	16 10 01
16 25 30	0201+113	23 37 32	39.2	130.8	-2.5		-27.7	24	443	16 25 30
16 40 00	---	23 52 05	40.8	134.9	-2.2		-25.7	870	471	16 25 31
16 40 30	0201+113	23 52 35	40.9	135.1	-2.2		-25.7	24	471	16 40 30
16 55 00	---	00 07 07	42.4	139.4	-2.0		-23.5	870	499	16 40 31

----- C-band VLBI scans. Ground segment 03 -----										
16 55 30	0201+113	00 07 37	42.4	139.5	-2.0		-23.4	24	499	16 55 30
17 08 50	---	00 21 00	43.7	143.7	-1.7		-21.3	800	524	16 55 31
17 09 20	0201+113	00 21 30	43.7	143.8	-1.7		-21.2	24	524	17 09 20
17 18 50	---	00 31 01	44.5	146.9	-1.6		-19.6	570	543	17 09 21

Schedule for TORUN (Code Tr)

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RadioAstron Imaging of high-redshift quasars

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Wed 20 Dec 2017 Day 354 ---										
17 19 20	0201+113	00 31 31	44.6	147.1	-1.6		-19.5	24	543	17 19 20
17 28 50	---	00 41 03	45.3	150.2	-1.4		-17.8	570	561	17 19 21
17 29 20	0201+113	00 41 33	45.4	150.3	-1.4		-17.7	24	561	17 29 20
17 38 50	---	00 51 04	46.0	153.5	-1.2		-15.9	570	579	17 29 21
17 39 20	0201+113	00 51 35	46.1	153.7	-1.2		-15.8	24	579	17 39 20
17 48 50	---	01 01 06	46.7	157.0	-1.1		-13.9	570	597	17 39 21
17 49 20	0201+113	01 01 36	46.7	157.1	-1.1		-13.8	24	597	17 49 20
17 58 50	---	01 11 08	47.2	160.5	-0.9		-11.8	570	616	17 49 21
17 59 20	0201+113	01 11 38	47.2	160.7	-0.9		-11.7	24	616	17 59 20
18 08 50	---	01 21 09	47.7	164.0	-0.7		-9.7	570	634	17 59 21
----- C-band VLBI scans. Space segment 04 -----										
18 10 00	0201+113	01 22 20	47.7	164.5	-0.7		-9.5	63	634	18 10 00
18 25 00	---	01 37 22	48.2	169.9	-0.5		-6.2	900	663	18 10 01
18 25 30	0201+113	01 37 52	48.2	170.1	-0.4		-6.1	24	663	18 25 30
18 40 00	---	01 52 25	48.5	175.4	-0.2		-2.8	870	691	18 25 31
18 40 30	0201+113	01 52 55	48.5	175.6	-0.2		-2.7	24	691	18 40 30
18 55 00	---	02 07 27	48.6	181.0	0.0		0.6	870	719	18 40 31
----- C-band VLBI scans. Ground segment 04 -----										
18 55 30	0201+113	02 07 57	48.6	181.2	0.1		0.7	24	719	18 55 30
19 08 50	---	02 21 19	48.4	186.1	0.3		3.8	800	744	18 55 31
19 09 20	0201+113	02 21 49	48.4	186.3	0.3		3.9	24	744	19 09 20
19 18 50	---	02 31 21	48.2	189.8	0.4		6.0	570	762	19 09 21
19 19 20	0201+113	02 31 51	48.2	190.0	0.5		6.1	24	762	19 19 20
19 28 50	---	02 41 23	47.9	193.5	0.6		8.2	570	781	19 19 21
19 29 20	0201+113	02 41 53	47.9	193.6	0.6		8.3	24	781	19 29 20
19 38 50	---	02 51 24	47.5	197.1	0.8		10.4	570	799	19 29 21
19 39 20	0201+113	02 51 54	47.5	197.2	0.8		10.5	24	799	19 39 20
19 48 50	---	03 01 26	47.0	200.6	0.9		12.5	570	817	19 39 21
19 49 20	0201+113	03 01 56	47.0	200.8	1.0		12.6	24	817	19 49 20
19 58 50	---	03 11 27	46.5	204.1	1.1		14.5	570	836	19 49 21

Schedule for TORUN (Code Tr)

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RadioAstron Imaging of high-redshift quasars

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```

-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST    EL    AZ    HA  UP  ParA  Dwell  GBytes  SYNC
-----

```

--- Wed 20 Dec 2017 Day 354 ---

```

19 59 20 0201+113    03 11 58 46.4 204.3 1.1    14.6   24    836 19 59 20
20 08 50 ---          03 21 29 45.8 207.5 1.3    16.4  570    854 19 59 21

```

----- C-band VLBI scans. Space segment 05 -----

```

20 10 00 0201+113    03 22 39 45.7 207.9 1.3    16.7   63    854 20 10 00
20 25 00 ---          03 37 42 44.6 212.9 1.5    19.4  900    883 20 10 01

```

```

20 25 30 0201+113    03 38 12 44.5 213.0 1.6    19.5   24    883 20 25 30
20 40 00 ---          03 52 44 43.3 217.6 1.8    22.0  870    911 20 25 31

```

```

20 40 30 0201+113    03 53 14 43.2 217.8 1.8    22.1   24    911 20 40 30
20 55 00 ---          04 07 47 41.8 222.2 2.1    24.3  870    938 20 40 31

```

----- C-band VLBI scans. Ground segment 05 -----

```

20 55 30 0201+113    04 08 17 41.8 222.4 2.1    24.4   24    938 20 55 30
21 05 30 ---          04 18 18 40.7 225.3 2.2    25.9  600    958 20 55 31

```

```

21 06 00 0201+113    04 18 48 40.7 225.5 2.2    25.9   24    958 21 06 00
21 15 30 ---          04 28 20 39.6 228.2 2.4    27.2  570    976 21 06 01

```

```

21 16 00 0201+113    04 28 50 39.6 228.4 2.4    27.3   24    976 21 16 00
21 25 30 ---          04 38 22 38.5 231.0 2.6    28.5  570    994 21 16 01

```

```

21 26 00 0201+113    04 38 52 38.4 231.2 2.6    28.5   24    994 21 26 00
21 35 30 ---          04 48 23 37.3 233.7 2.7    29.6  570   1012 21 26 01

```

```

21 36 00 0201+113    04 48 53 37.2 233.9 2.7    29.7   24   1012 21 36 00
21 45 30 ---          04 58 25 36.1 236.4 2.9    30.7  570   1031 21 36 01

```

```

21 46 00 0201+113    04 58 55 36.0 236.5 2.9    30.8   24   1031 21 46 00
21 55 30 ---          05 08 27 34.8 239.0 3.1    31.7  570   1049 21 46 01

```

----- scan on calibrator : 3C84 -----

```

21 57 00 3C84          05 09 57 68.4 248.7 1.8    48.4  -50   1049 21 57 00
22 04 30 ---          05 17 28 67.4 251.2 1.9    49.4  400   1063 21 57 01

```

```

22 06 00 0201+113    05 18 58 33.4 241.6 3.2    32.6  -52   1063 22 06 00
22 13 30 ---          05 26 30 32.4 243.4 3.4    33.3  398   1078 22 06 01

```


Schedule for TORUN (Code Tr) Page 6

RadioAstron Imaging of high-redshift quasars

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early   Disk   TPStart
Stop UT   LST      EL    AZ    HA  UP   ParA  Dwell  GBytes  SYNC
-----
```

--- Wed 20 Dec 2017 Day 354 ---

----- C-band VLBI scans. Space segment 06 -----

```
22 15 00  0201+113      05 28 00  32.2 243.8  3.4      33.4   84   1078  22 15 00
22 30 00  ---                05 43 02  30.2 247.4  3.6      34.5  900   1107  22 15 01

22 30 30  0201+113      05 43 32  30.1 247.5  3.6      34.5   24   1107  22 30 30
22 45 00  ---                05 58 05  28.1 250.8  3.9      35.4  870   1135  22 30 31

22 45 30  0201+113      05 58 35  28.0 250.9  3.9      35.4   24   1135  22 45 30
23 00 00  ---                06 13 07  25.9 254.2  4.1      36.2  870   1162  22 45 31
```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

===== Setup file: ra6cm2.set

```
Setup group: 16          Station: TORUN          Total bit rate: 256
Format: MARK5B          Bits per sample: 2      Sample rate: 32.000
Number of channels: 4    DBE type: DBBC_DDC    Speedup factor: 1.00
```

Disk used to record data.

```

1st LO=  4200.00  4200.00  4200.00  4200.00
Net SB=           U           U           L           L
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           5           1           5
BBC SB=           U           U           L           L
IF    =           A1          B1          A1          B1

```

The following frequency sets based on these setups were used.

```

Frequency Set: 18 Setup file default. Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   636.00   636.00   636.00   636.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets: 18

```

Track assignments are:

```

track1=  2, 4, 6, 8
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.107391	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.90320	0.00
	fake circumpolar target for a TS to look at			
* 0201+113	02 01 06.003329	* 02 03 46.657061	02 04 44.539732	0.00
J0203+1134	11 20 22.95394	* 11 34 45.40942	11 39 49.68849	0.00
	./rg30b_sources.radioastron AGN, HIGHz, rfc_2013d Petrov, 2013, unpublished 18135 observations, RA-A04-03, R			
0316+413	03 16 29.567283	* 03 19 48.160114	03 21 00.520325	0.00
J0319+4130	41 19 51.91847	* 41 30 42.10559	41 34 33.12189	0.00
* 3C84	./rg30b_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 15448 observations, RA-A04-04, RA-A03-0			

rk18hnr

RADIOASTRON AGN MONITORING
PI: *Yuri Kovalev*

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Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN Monitoring

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Thu 21 Dec 2017 Day 355 ---

----- C-band VLBI scans -----

Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

02 00 00	1222+216	09 13 37	41.6	112.0	-3.2		-36.7	0	0	02 00 00
02 19 30	---	09 33 10	44.3	117.1	-2.9		-35.0	1170	37	02 00 01
02 20 00	1222+216	09 33 40	44.4	117.2	-2.9		-35.0	24	37	02 20 00
02 39 30	---	09 53 13	46.9	122.6	-2.5		-32.9	1170	75	02 20 01
02 40 00	1222+216	09 53 43	47.0	122.7	-2.5		-32.8	24	75	02 40 00
03 00 00	---	10 13 47	49.4	128.7	-2.2		-30.2	1200	113	02 40 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra6cm2.set

Setup group: 6	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  7  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  7

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.297999	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.83135	0.00
	fake circumpolar target for a TS to look at			
* 1222+216	12 22 23.408709	* 12 24 54.458394	12 25 47.602881	0.00
J1224+2122	21 39 23.03696	* 21 22 46.38857	21 16 46.49524	0.00
	./rk18hn_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 406 observations, RA-A04-07, RA-A03-04,			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1222+216    92.2

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz     45. deg
2.3 GHz     36. deg
5.0 GHz     23. deg
8.4 GHz     17. deg
15.0 GHz    12. deg
22.0 GHz     9. deg

```

rk18hotr

RADIOASTRON AGN MONITORING
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Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN Monitoring

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source                Start / Stop                Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA Dwell  GBytes  SYNC
-----
```

--- Thu 21 Dec 2017 Day 355 ---

----- C-band VLBI scans -----

```
Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies:  736.00  736.00  736.00  736.00
Next scan bandwidths:  16.00   16.00   16.00   16.00
```

08 00 00	1005+066	15 14 36	13.2	262.9	5.1	36.8	0	0	08 00 00
08 14 30	---	15 29 08	11.0	265.8	5.3	37.0	870	28	08 00 01
08 15 00	1005+066	15 29 38	10.9	265.9	5.3	37.1	24	28	08 15 00
08 29 30	---	15 44 11	8.7	268.8	5.6	37.2	870	56	08 15 01
08 30 00	1005+066	15 44 41	8.6	268.9	5.6	37.2	24	56	08 30 00
08 44 30	---	15 59 13	6.5	271.8	5.8	37.1	870	84	08 30 01
08 45 00	1005+066	15 59 43	6.4	271.9	5.8	37.1	24	84	08 45 00
09 00 00	---	16 14 46	4.1	274.9	6.1	37.0	900	112	08 45 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra6cm2.set

Setup group: 3	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.368878	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.80669	0.00
	fake circumpolar target for a TS to look at			
* 1005+066	10 05 23.466064	* 10 08 00.816157	10 08 57.180099	0.00
J1008+0621	06 36 03.30797	* 06 21 21.21593	06 16 01.55445	0.00
	./rk18ho_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 317 observations, RA-A04-07, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1005+066    117.6

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz     45. deg
2.3 GHz     36. deg
5.0 GHz     23. deg
8.4 GHz     17. deg
15.0 GHz    12. deg
22.0 GHz     9. deg

```


1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.466193	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.77469	0.00
	fake circumpolar target for a TS to look at			
* 0954+658	09 54 57.847936	* 09 58 47.245116	10 00 08.664361	0.00
J0958+6533	65 48 15.53882	* 65 33 54.81801	65 28 27.25827	0.00
	./rk18hp_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 13350 observations, fringe-finder for M			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0954+658	123.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.575032	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.74147	0.00
	fake circumpolar target for a TS to look at			
* 1222+216	12 22 23.408709	* 12 24 54.458394	12 25 47.638122	0.00
J1224+2122	21 39 23.03696	* 21 22 46.38857	21 16 46.27262	0.00
	./rk18hr_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 406 observations, RA-A04-07, RA-A03-04,			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1222+216	93.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)
* FAKERA	11 57 21.769299 * 12 00 00.000000	12 00 48.635644	0.00
	85 16 41.77889 * 85 00 00.000000	84 53 43.72415	0.00
	fake circumpolar target for a TS to look at		
* 0925+504	09 25 51.973728 * 09 29 15.440209	09 30 28.182393	0.00
J0929+5013	50 26 44.31059 * 50 13 35.98961	50 08 36.90569	0.00
	./rk18hs_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 223 observations, RA-A03-04, RA-		

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0925+504    131.9

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz      9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.255971	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.52054	0.00
	fake circumpolar target for a TS to look at			
* 1005+066	10 05 23.466064	* 10 08 00.816157	10 08 57.365674	0.00
J1008+0621	06 36 03.30797	* 06 21 21.21593	06 16 00.46814	0.00
	./rk18ie_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 317 observations, RA-A04-07, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1005+066	124.6

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=          L          L          U          U
IF SB =          U          U          U          U
Pol.  =          RCP         LCP         RCP         LCP
BBC   =           1          2          1          2
BBC SB=          L          L          U          U
IF    =           C          A          C          A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 7 Setup file default. Used with PCAL = 1MHz
LO sum= 22236.00 22236.00 22236.00 22236.00
BBC fr=  736.00  736.00  736.00  736.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets: 7

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.299137	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.51742	0.00
	fake circumpolar target for a TS to look at			
* 1226+023	12 26 33.245835	* 12 29 06.699731	12 30 01.140081	0.00
J1229+0203	02 19 43.30547	* 02 03 08.59797	01 57 14.98471	0.00
3C273B	./rk18if_sources.radioastron			
3C273	AGN, rfc_2013d Petrov, 2013, unpublished 32011 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source          Sun distance (deg)
1226+023        90.7

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz        45. deg
2.3 GHz        36. deg
5.0 GHz        23. deg
8.4 GHz        17. deg
15.0 GHz       12. deg
22.0 GHz        9. deg

```



```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =           RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.645107	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.47590	0.00
	fake circumpolar target for a TS to look at			
* 1642+690	16 42 18.064877	* 16 42 07.848507	16 42 00.547868	0.00
J1642+6856	69 02 13.21708	* 68 56 39.75636	68 54 38.69627	0.00
	./rk18ih_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 18956 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1642+690    94.4

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz     45. deg
2.3 GHz     36. deg
5.0 GHz     23. deg
8.4 GHz     17. deg
15.0 GHz    12. deg
22.0 GHz     9. deg

```

rk18iitr

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Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/K-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN Monitoring

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Sat 30 Dec 2017 Day 364 ---

----- K-band VLBI scans -----

Next scan frequencies: 22236.00 22236.00 22236.00 22236.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

02 00 00	1226+023	09 49 06	29.0	132.4	-2.7		-26.3	0	0	02 00 00
02 14 30	---	10 03 38	30.6	136.2	-2.4		-24.6	870	28	02 00 01
02 15 00	1226+023	10 04 08	30.7	136.3	-2.4		-24.5	24	28	02 15 00
02 29 30	---	10 18 41	32.1	140.2	-2.2		-22.6	870	56	02 15 01
02 30 00	1226+023	10 19 11	32.2	140.4	-2.2		-22.5	24	56	02 30 00
02 44 30	---	10 33 43	33.5	144.4	-1.9		-20.5	870	84	02 30 01
02 45 00	1226+023	10 34 13	33.5	144.5	-1.9		-20.4	24	84	02 45 00
03 00 00	---	10 49 16	34.8	148.8	-1.7		-18.1	900	112	02 45 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra1cm2.set

Matching groups in ./rk18ii_freq.dat:

tr1cm

Setup group: 7	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      L      L      U      U
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      L      L      U      U
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 5 Setup file default. Used with PCAL = 1MHz
LO sum= 22236.00 22236.00 22236.00 22236.00
BBC fr= 736.00 736.00 736.00 736.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 5

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.696424	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.46671	0.00
	fake circumpolar target for a TS to look at			
* 1226+023	12 26 33.245835	* 12 29 06.699731	12 30 01.194798	0.00
J1229+0203	02 19 43.30547	* 02 03 08.59797	01 57 14.63849	0.00
3C273B	./rk18ii_sources.radioastron			
3C273	AGN, rfc_2013d Petrov, 2013, unpublished 32011 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1226+023	92.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	4100.00	4100.00	4100.00	4100.00
Net SB=	L	L	U	U
IF SB =	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	L	L	U	U
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
 LO sum= 4836.00 4836.00 4836.00 4836.00
 BBC fr= 736.00 736.00 736.00 736.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 3

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.835950	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.43781	0.00
	fake circumpolar target for a TS to look at			
* 0925+504	09 25 51.973728	* 09 29 15.440209	09 30 28.488571	0.00
J0929+5013	50 26 44.31059	* 50 13 35.98961	50 08 37.27777	0.00
	./rk18ij_sources.radioastron AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 223 observations, RA-A03-04, RA-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0925+504	137.3

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00  736.00  736.00  736.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.886324	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.42615	0.00
	fake circumpolar target for a TS to look at			
* 1642+690	16 42 18.064877	* 16 42 07.848507	16 42 00.575962	0.00
J1642+6856	69 02 13.21708	* 68 56 39.75636	68 54 38.36670	0.00
	./rk18ik_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 18956 observations, RA-A04-07, RA-A03-0			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
1642+690    94.5

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```



```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      L      L      U      U
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      L      L      U      U
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4 Setup file default. Used with PCAL = 1MHz
LO sum= 22236.00 22236.00 22236.00 22236.00
BBC fr=  736.00  736.00  736.00  736.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.926175	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.41656	0.00
	fake circumpolar target for a TS to look at			
* 0727-115	07 27 58.097813	* 07 30 19.112473	07 31 10.610527	0.00
J0730-1141	-11 34 52.58107	*-11 41 12.60063	-11 43 37.01438	0.00
	./rk18il_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 155894 observations, RA-A04-07, RA-A03-			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0727-115    143.1

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz     9. deg

```

RADIOASTRON MEGAMASER OBSERVATIONS

PI: *Willem Baan Alexei Alakoz*

Address: ASC Lebedev

Observing mode: K-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron Megamaser observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are LO sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Fri 29 Dec 2017 Day 363 ---

----- K-band VLBI scan of NGC4258 -----

```
Next scan frequencies: 22196.00 22196.00 22196.00 22196.00
Next BBC frequencies:   696.00   696.00   696.00   696.00
Next scan bandwidths:   16.00   16.00   16.00   16.00
```

```
12 15 00  NGC4258      20 01 50  24.3 -42.3  7.7      36.5    0      0  12 15 00
12 35 00  ---          20 21 54  22.3 -39.2  8.0      34.0  1200    38  12 15 01

12 35 30  NGC4258      20 22 24  22.3 -39.2  8.0      33.9    24     38  12 35 30
12 55 00  ---          20 41 57  20.5 -36.2  8.4      31.4  1170    76  12 35 31

12 55 30  NGC4258      20 42 27  20.4 -36.1  8.4      31.4    24     76  12 55 30
13 15 00  ---          21 02 00  18.8 -33.0  8.7      28.8  1170   113  12 55 31
```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra1cm2.set

```
Setup group:   4          Station: TORUN          Total bit rate: 256
Format: MARK5B Bits per sample: 2      Sample rate: 32.000
Number of channels: 4    DBE type: DBBC_DDC    Speedup factor: 1.00
```

Disk used to record data.

```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      U      U      L      L
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      5      1      5
BBC SB=      U      U      L      L
IF    =      A1     B1     A1     B1

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = off
LO sum= 22196.00 22196.00 22196.00 22196.00
BBC fr=  696.00  696.00  696.00  696.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2,  4,  6,  8
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.481031	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.49978	0.00
	fake circumpolar target for a TS to look at			
* 0716+714	07 16 13.029739	* 07 21 53.448474	07 23 57.383783	0.00
J0721+7120	71 26 15.17406	* 71 20 36.36340	71 18 18.53360	0.00
	./rg34a_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 42370 observations, RA-A04-07, RA-A03-0			
* NGC4258	12 16 29.364915	* 12 18 57.504600	12 19 49.484426	0.00
NGC4258_H2O	47 34 53.16919	* 47 18 14.30300	47 12 04.34103	0.00
	./rg34a_sources.radioastron H2O maser; positions from Herrnstein et al. 2005, RA-A04-05, RA-A03-10, RA-A02-1			
0923+392	09 23 55.319218	* 09 27 03.013939	09 28 10.417197	0.00
J0927+3902	39 15 23.56637	* 39 02 20.85177	38 57 26.21280	0.00
* 4C39.25	./rg34a_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 245863 observations, RA-A03-04, RA-A03-			
* 1150+497	11 50 47.999856	* 11 53 24.466639	11 54 19.553446	0.00
J1153+4931	49 47 50.09409	* 49 31 08.83012	49 24 56.57047	0.00
	./rg34a_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 1816 observations, RA-A03-04, RA-A02-12			

RADIOASTRON MEGAMASER OBSERVATIONS

PI: *Willem Baan Alexei Alakoz*

Address: ASC Lebedev

Observing mode: K-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron Megamaser observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 31 Dec 2017 Day 365 ---

----- K-band VLBI scan of space-ground clock/ delay calibrator -----

Next scan frequencies:	22196.00	22196.00	22196.00	22196.00
Next BBC frequencies:	696.00	696.00	696.00	696.00
Next scan bandwidths:	16.00	16.00	16.00	16.00

07 00 00	0716+714	14 53 52	43.1 -24.0	7.5	49.5	0	0	07 00 00
07 10 00	---	15 03 53	42.5 -23.2	7.7	47.6	600	19	07 00 01

----- K-band VLBI scan of ground-only delay calibrator -----

07 13 00	1150+497	15 06 54	60.2 -77.3	3.2	64.2	56	19	07 13 00
07 19 40	---	15 13 35	59.2 -76.4	3.3	63.8	400	32	07 13 01

----- K-band space-VLBI scans on NGC4258 -----

07 32 00	NGC4258	15 25 57	60.2 277.7	3.1	61.1	17	32	07 32 00
07 52 30	---	15 46 30	57.1 281.0	3.4	60.2	1230	71	07 32 01
07 53 00	NGC4258	15 47 00	57.0 281.1	3.5	60.1	24	71	07 53 00
08 13 45	---	16 07 49	54.0 284.2	3.8	58.9	1245	111	07 53 01
08 14 15	NGC4258	16 08 19	53.9 284.3	3.8	58.9	24	111	08 14 15
08 35 00	---	16 29 07	50.9 287.4	4.2	57.5	1245	151	08 14 16
08 35 30	NGC4258	16 29 37	50.8 287.4	4.2	57.5	24	151	08 35 30
08 56 15	---	16 50 26	47.9 290.4	4.5	55.9	1245	191	08 35 31
08 56 45	NGC4258	16 50 56	47.8 290.5	4.5	55.9	24	191	08 56 45
09 17 30	---	17 11 44	44.9 293.4	4.9	54.2	1245	231	08 56 46
09 18 00	NGC4258	17 12 14	44.9 293.5	4.9	54.1	24	231	09 18 00
09 38 45	---	17 33 03	42.0 296.4	5.2	52.3	1245	271	09 18 01
09 39 15	NGC4258	17 33 33	42.0 296.5	5.2	52.3	24	271	09 39 15
10 00 00	---	17 54 21	39.2 299.4	5.6	50.4	1245	311	09 39 16

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra1cm2.set

Setup group:	4	Station: TORUN	Total bit rate:	256
Format:	MARK5B	Bits per sample:	2	Sample rate: 32.000
Number of channels:	4	DBE type: DBBC_DDC	Speedup factor:	1.00

Disk used to record data.

```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      U      U      L      L
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      5      1      5
BBC SB=      U      U      L      L
IF    =      A1     B1     A1     B1

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = off
LO sum= 22196.00 22196.00 22196.00 22196.00
BBC fr=  696.00  696.00  696.00  696.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2,  4,  6,  8
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.985122	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 43.40187	0.00
	fake circumpolar target for a TS to look at			
* 0716+714	07 16 13.029739	* 07 21 53.448474	07 23 57.471387	0.00
J0721+7120	71 26 15.17406	* 71 20 36.36340	71 18 18.96808	0.00
	./rg34c_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 42370 observations, RA-A04-07, RA-A03-0			
* NGC4258	12 16 29.364915	* 12 18 57.504600	12 19 49.576667	0.00
NGC4258_H2O	47 34 53.16919	* 47 18 14.30300	47 12 03.99741	0.00
	./rg34c_sources.radioastron H2O maser; positions from Herrnstein et al. 2005, RA-A04-05, RA-A03-10, RA-A02-1			
* 1150+497	11 50 47.999856	* 11 53 24.466639	11 54 19.648790	0.00
J1153+4931	49 47 50.09409	* 49 31 08.83012	49 24 56.28865	0.00
	./rg34c_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 1816 observations, RA-A03-04, RA-A02-12			

fus14tr

HUNTING THE UNIDENTIFIED GAMMA-RAY SOURCES

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Observing mode: 6cm Continuum C-dual-1024-16-2-2

Schedule for TORUN (Code Tr) Page 2

Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are LO sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

---	Tue	2 Jan 2018	Day	2	---					
Next scan frequencies:		4898.49	4898.49	4898.49	4898.49	4930.49	4930.49	4930.49	4930.49	
		4962.49	4962.49	4962.49	4962.49	4994.49	4994.49	4994.49	4994.49	
Next BBC frequencies:		698.49	698.49	698.49	698.49	730.49	730.49	730.49	730.49	
		762.49	762.49	762.49	762.49	794.49	794.49	794.49	794.49	
Next scan bandwidths:		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
07 30 00	J141312+2121	15 31 50	54.9	212.6	1.3	20.3	0	0	07 30 00	
07 38 04	---	15 39 55	54.2	215.7	1.4	22.1	484	62	07 30 01	
07 38 24	J141320+2119	15 40 15	54.1	215.7	1.4	22.1	13	62	07 38 24	
07 46 28	---	15 48 20	53.4	218.6	1.6	23.7	484	124	07 38 25	
07 49 25	J0927+3902	15 51 18	27.1	299.6	6.4	42.2	0	124	07 49 25	
07 54 25	=4C39.25	15 56 19	26.5	300.4	6.5	41.7	300	163	07 49 26	
07 57 20	J142028+2702	15 59 14	58.2	224.5	1.6	28.2	8	163	07 57 20	
08 05 24	---	16 07 19	57.3	227.4	1.8	29.8	484	225	07 57 21	
08 05 44	J142039+2656	16 07 40	57.2	227.4	1.8	29.7	12	225	08 05 44	
08 13 48	---	16 15 45	56.3	230.2	1.9	31.2	484	287	08 05 45	
08 14 08	J142040+2649	16 16 05	56.1	230.2	1.9	31.1	11	287	08 14 08	
08 22 12	---	16 24 10	55.2	232.9	2.0	32.5	484	349	08 14 09	
08 22 32	J142045+2702	16 24 30	55.3	233.2	2.0	32.7	10	349	08 22 32	
08 30 36	---	16 32 36	54.4	235.9	2.2	33.9	484	411	08 22 33	
08 30 56	J142050+2705	16 32 56	54.4	236.0	2.2	34.0	13	411	08 30 56	
08 39 00	---	16 41 01	53.3	238.5	2.3	35.1	484	473	08 30 57	
08 39 20	J142051+2704	16 41 21	53.3	238.6	2.3	35.1	14	473	08 39 20	
08 47 24	---	16 49 26	52.2	241.0	2.5	36.1	484	535	08 39 21	

08 47 54	J142408+2918	16 49 56	54.4	242.4	2.4	37.6	8	535	08 47 54
08 55 58	---	16 58 02	53.3	244.8	2.6	38.5	484	597	08 47 55
08 58 25	J0927+3902	17 00 30	18.6	311.0	7.5	35.7	0	597	08 58 25
09 03 25	=4C39.25	17 05 30	18.1	311.8	7.6	35.1	300	635	08 58 26
09 06 20	J142417+8152	17 08 26	58.9	349.5	2.7	130.0	8	635	09 06 20
09 14 24	---	17 16 31	58.6	349.2	2.9	127.7	484	697	09 06 21
09 16 59	J141222+5020	17 19 07	61.5	283.3	3.1	66.1	8	697	09 16 59
09 25 03	---	17 27 12	60.3	284.4	3.2	65.5	484	759	09 17 00

Schedule for TORUN (Code Tr)

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Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Tue 2 Jan 2018 Day 2 ---										
09 25 33	J143217+5056	17 27 42	63.4	283.0	2.9		67.9	5	759	09 25 33
09 33 37	---	17 35 47	62.2	284.1	3.0		67.3	484	822	09 25 34
09 34 47	J144418+3643	17 36 57	56.1	258.6	2.9		47.2	4	822	09 34 47
09 42 51	---	17 45 03	54.9	260.5	3.0		47.6	484	884	09 34 48
09 43 11	J144425+3655	17 45 23	55.0	260.8	3.0		47.8	11	884	09 43 11
09 51 15	---	17 53 28	53.8	262.6	3.1		48.1	484	946	09 43 12
09 51 35	J144439+3645	17 53 48	53.7	262.5	3.1		47.9	11	946	09 51 35
09 59 39	---	18 01 54	52.4	264.3	3.3		48.2	484	1008	09 51 36
09 59 59	J144449+3655	18 02 14	52.5	264.5	3.3		48.3	11	1008	09 59 59
10 08 03	---	18 10 19	51.3	266.2	3.4		48.5	484	1070	10 00 00
10 09 27	J1642+3948	18 11 43	69.9	237.3	1.5		41.1	0	1070	10 09 27
10 14 27	=3C345	18 16 44	69.3	239.3	1.6		42.2	300	1108	10 09 28
10 15 57	J145133+3420	18 18 14	49.4	263.5	3.4		46.2	2	1108	10 15 57
10 24 01	---	18 26 19	48.2	265.3	3.6		46.4	484	1170	10 15 58
10 24 21	J145141+3430	18 26 39	48.3	265.5	3.6		46.5	11	1170	10 24 21
10 32 25	---	18 34 45	47.1	267.2	3.7		46.7	484	1232	10 24 22
10 32 45	J145143+3429	18 35 05	47.0	267.3	3.7		46.6	14	1232	10 32 45
10 40 49	---	18 43 10	45.8	268.9	3.8		46.7	484	1294	10 32 46
10 41 09	J145149+3430	18 43 30	45.8	269.0	3.8		46.7	13	1294	10 41 09
10 49 13	---	18 51 36	44.6	270.6	4.0		46.7	484	1356	10 41 10
10 50 48	J145839+6132	18 53 11	58.5	308.8	3.9		78.2	4	1356	10 50 48
10 58 52	---	19 01 16	57.5	309.2	4.0		76.8	484	1418	10 50 49
10 59 12	J145840+6124	19 01 36	57.4	309.0	4.0		76.6	11	1418	10 59 12
11 07 16	---	19 09 41	56.5	309.5	4.2		75.1	484	1481	10 59 13
11 09 16	J1642+3948	19 11 42	61.6	257.1	2.5		49.6	0	1481	11 09 16
11 14 16	=3C345	19 16 42	60.9	258.4	2.6		49.9	300	1519	11 09 17
11 16 11	J145916+2638	19 18 38	36.0	267.3	4.3		42.1	8	1519	11 16 11
11 24 15	---	19 26 43	34.8	269.0	4.4		42.2	484	1581	11 16 12
11 24 35	J145939+2630	19 27 03	34.7	268.9	4.4		42.1	11	1581	11 24 35
11 32 39	---	19 35 09	33.5	270.5	4.6		42.1	484	1643	11 24 36

Schedule for TORUN (Code Tr)

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Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop				Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

---	Tue	2 Jan 2018	Day	2	---					
11 32 59	J150001+2643	19 35 29	33.6	270.7	4.6		42.2	10	1643	11 32 59
11 41 03	---	19 43 34	32.4	272.2	4.7		42.2	484	1705	11 33 00
11 41 23	J150008+2635	19 43 54	32.3	272.2	4.7		42.1	11	1705	11 41 23
11 49 27	---	19 51 59	31.1	273.8	4.9		42.0	484	1767	11 41 24
11 49 47	J150038+2635	19 52 19	31.1	273.7	4.8		42.0	12	1767	11 49 47
11 57 51	---	20 00 25	29.9	275.3	5.0		41.9	484	1829	11 49 48
11 58 26	J150503+2028	20 01 00	25.8	270.0	4.9		39.8	6	1829	11 58 26
12 06 30	---	20 09 05	24.6	271.6	5.1		39.8	484	1891	11 58 27
12 07 10	J151702+2638	20 09 45	31.0	274.0	4.9		42.1	2	1891	12 07 10
12 15 14	---	20 17 51	29.8	275.5	5.0		41.9	484	1953	12 07 11
12 16 14	J151631+4349	20 18 51	41.5	291.1	5.0		50.9	2	1953	12 16 14
12 24 18	---	20 26 56	40.3	292.4	5.2		50.3	484	2015	12 16 15
12 25 18	J1642+3948	20 27 56	50.3	273.7	3.7		51.2	8	2015	12 25 18
12 30 18	=3C345	20 32 57	49.5	274.7	3.8		51.1	300	2054	12 25 19
12 32 13	J151949+6732	20 34 52	51.6	322.8	5.2		71.4	4	2054	12 32 13
12 40 17	---	20 42 58	50.9	323.2	5.4		69.9	484	2116	12 32 14
12 40 37	J151959+6732	20 43 18	50.8	323.2	5.4		69.8	14	2116	12 40 37
12 48 41	---	20 51 23	50.1	323.6	5.5		68.3	484	2178	12 40 38
12 49 06	J154353+6548	20 51 48	51.7	319.8	5.1		70.7	2	2178	12 49 06
12 57 10	---	20 59 53	50.9	320.3	5.3		69.2	484	2240	12 49 07
12 57 30	J154744+6550	21 00 13	51.3	320.1	5.2		69.9	8	2240	12 57 30
13 05 34	---	21 08 19	50.5	320.6	5.3		68.4	484	2302	12 57 31
13 05 54	J154831+6616	21 08 39	50.7	321.2	5.3		69.0	8	2302	13 05 54
13 13 58	---	21 16 44	49.9	321.7	5.5		67.5	484	2364	13 05 55
13 14 18	J155041+6532	21 17 04	49.8	320.5	5.4		67.1	5	2364	13 14 18
13 22 22	---	21 25 10	49.1	321.0	5.6		65.6	484	2426	13 14 19
13 22 42	J155058+6610	21 25 30	49.3	321.9	5.6		66.3	7	2426	13 22 42
13 30 46	---	21 33 35	48.6	322.4	5.7		64.8	484	2488	13 22 43
13 32 15	J1642+3948	21 35 04	40.4	285.5	4.9		48.9	0	2488	13 32 15
13 37 15	=3C345	21 40 05	39.6	286.3	4.9		48.6	300	2527	13 32 16

Schedule for TORUN (Code Tr)

Page 5

Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

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SYNC: Time correlator is expected to sync up.

```

-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
--- Tue   2 Jan 2018   Day   2 ---

13 39 40 J154415+8354  21 42 30  52.6 349.8  6.0      81.7    3    2527  13 39 40
13 47 44 ---          21 50 36  52.4 349.9  6.1      79.8   484    2589  13 39 41

13 48 04 J154545+8349  21 50 56  52.4 349.7  6.1      80.0   12    2589  13 48 04
13 56 08 ---          21 59 01  52.2 349.8  6.3      78.0   484    2651  13 48 05

13 57 08 J155137+7017  22 00 01  48.2 329.6  6.1      64.1    5    2651  13 57 08
14 05 12 ---          22 08 06  47.6 330.0  6.3      62.5   484    2713  13 57 09

14 05 32 J155231+7018  22 08 27  47.6 330.0  6.3      62.7   12    2713  14 05 32
14 13 36 ---          22 16 32  47.0 330.5  6.4      61.1   484    2775  14 05 33

14 14 06 J155201+6534  22 17 02  44.5 324.7  6.4      56.8    3    2775  14 14 06
14 22 10 ---          22 25 07  43.8 325.4  6.5      55.4   484    2837  14 14 07

14 23 00 J155313+5437  22 25 57  37.1 314.0  6.5      48.2   11    2837  14 23 00
14 31 04 ---          22 34 03  36.2 315.0  6.7      47.1   484    2899  14 23 01

```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: c1024.eofus

```

Setup group:    2          Station: TORUN          Total bit rate: 1024
Format: MARK5B          Bits per sample: 2      Sample rate: 32.000
Number of channels: 16   DBE type: DBBC_DDC    Speedup factor: 1.00

```

Disk used to record data.

1st LO=	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
Net SB=	L	L	U	U	L	L	U	U	U
	L	L	U	U	L	L	U	U	U
IF SB =	U	U	U	U	U	U	U	U	U
	U	U	U	U	U	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP	LCP
	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP	LCP
BBC =	1	5	1	5	2	6	2	6	6
	3	7	3	7	4	8	4	8	8
BBC SB=	L	L	U	U	L	L	U	U	U
	L	L	U	U	L	L	U	U	U
IF =	A1	B1	A1	B1	A1	B1	A1	B1	B1
	A1	B1	A1	B1	A1	B1	A1	B1	B1

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = off

LO sum=	4898.49	4898.49	4898.49	4898.49	4930.49	4930.49	4930.49	4930.49
	4962.49	4962.49	4962.49	4962.49	4994.49	4994.49	4994.49	4994.49
BBC fr=	698.49	698.49	698.49	698.49	730.49	730.49	730.49	730.49
	762.49	762.49	762.49	762.49	794.49	794.49	794.49	794.49
Bandwd=	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00

Matching frequency sets: 3

Track assignments are:

track1= 18, 26, 2, 10, 20, 28, 4, 12, 22, 30, 6, 14, 24, 32, 8, 16
barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
* J141222+5020	14 10 33.019398	* 14 12 22.870000	14 13 00.557288	0.00
	50 34 55.66572	* 50 20 54.20000	50 15 44.16917	0.00
* J141312+2121	14 10 52.610015	* 14 13 12.070000	14 14 00.902533	0.00
	21 35 09.32208	* 21 21 09.10000	21 16 07.18699	0.00
* J141320+2119	14 11 00.676951	* 14 13 20.150000	14 14 08.986970	0.00
	21 33 01.70161	* 21 19 01.80000	21 14 00.01827	0.00
* J142028+2702	14 18 13.838089	* 14 20 28.030000	14 21 14.866528	0.00
	27 16 41.65903	* 27 02 59.30000	26 58 02.37978	0.00
* J142039+2656	14 18 24.962170	* 14 20 39.220000	14 21 26.080693	0.00
	27 10 21.89482	* 26 56 40.00000	26 51 43.28488	0.00
* J142040+2649	14 18 26.060720	* 14 20 40.420000	14 21 27.318637	0.00
	27 02 57.04749	* 26 49 15.20000	26 44 18.53871	0.00
* J142045+2702	14 18 31.436705	* 14 20 45.600000	14 21 32.424979	0.00
	27 16 10.02643	* 27 02 28.40000	26 57 31.75748	0.00
* J142050+2705	14 18 36.084575	* 14 20 50.200000	14 21 37.006830	0.00
	27 18 53.93334	* 27 05 12.50000	27 00 15.91674	0.00

* J142051+2704	14 18 37.135641 27 18 06.58936	* 14 20 51.260000 * 27 04 25.20000	14 21 38.070127 26 59 28.63709	0.00 0.00
* J142408+2918	14 21 56.565139 29 31 33.62181	* 14 24 08.330000 * 29 18 00.60000	14 24 54.247363 29 13 06.54135	0.00 0.00
* J142417+8152	14 26 24.824372 82 05 29.67806	* 14 24 17.700000 * 81 52 02.70000	14 23 28.340802 81 46 59.84043	0.00 0.00
* J143217+5056	14 30 34.250064 51 09 14.76858	* 14 32 17.320000 * 50 56 03.80000	14 32 52.453411 50 51 12.77978	0.00 0.00
* J144418+3643	14 42 17.600357 36 56 35.71574	* 14 44 18.660000 * 36 43 57.60000	14 45 00.525355 36 39 22.17786	0.00 0.00
* J144425+3655	14 42 24.594930 37 07 56.18755	* 14 44 25.410000 * 36 55 18.40000	14 45 07.183686 36 50 43.05397	0.00 0.00
* J144439+3645	14 42 38.549854 36 58 11.81893	* 14 44 39.520000 * 36 45 34.70000	14 45 21.351208 36 40 59.64525	0.00 0.00
* J144449+3655	14 42 48.979212 37 07 46.22565	* 14 44 49.730000 * 36 55 09.60000	14 45 31.478859 36 50 34.69066	0.00 0.00
* J145133+3420	14 49 30.600403 34 33 04.68436	* 14 51 33.340000 * 34 20 47.60000	14 52 15.817564 34 16 20.66043	0.00 0.00
* J145141+3430	14 49 38.488006 34 42 47.49946	* 14 51 41.020000 * 34 30 30.80000	14 52 23.419820 34 26 03.96359	0.00 0.00
* J145143+3429	14 49 40.517385 34 41 59.19903	* 14 51 43.060000 * 34 29 42.60000	14 52 25.463707 34 25 15.80457	0.00 0.00
* J145149+3430	14 49 46.828523 34 42 47.28796	* 14 51 49.340000 * 34 30 31.00000	14 52 31.731857 34 26 04.31763	0.00 0.00
* J145839+6132	14 57 32.703747 61 43 57.09158	* 14 58 39.730000 * 61 32 02.90000	14 59 01.361202 61 27 38.93606	0.00 0.00
* J145840+6124	14 57 32.760946 61 36 53.47805	* 14 58 40.210000 * 61 24 59.30000	14 59 01.999226 61 20 35.36076	0.00 0.00
* J145916+2638	14 57 06.430812 26 50 12.02824	* 14 59 16.600000 * 26 38 18.00000	15 00 01.823265 26 34 01.68645	0.00 0.00
* J145939+2630	14 57 29.083581 26 42 11.56739	* 14 59 39.350000 * 26 30 18.70000	15 00 24.608252 26 26 02.85448	0.00 0.00
* J150001+2643	14 57 51.485075 26 55 11.62521	* 15 00 01.490000 * 26 43 19.90000	15 00 46.650075 26 39 04.42104	0.00 0.00
* J150008+2635	14 57 58.416183 26 46 58.16691	* 15 00 08.550000 * 26 35 06.80000	15 00 53.757586 26 30 51.49130	0.00 0.00
* J150038+2635	14 58 27.940299 26 47 08.15167	* 15 00 38.020000 * 26 35 18.30000	15 01 23.206050 26 31 03.55431	0.00 0.00
* J150503+2028	15 02 47.737377 20 39 48.04344	* 15 05 03.490000 * 20 28 11.80000	15 05 50.763816 20 24 03.78932	0.00 0.00
* J151631+4349	15 14 46.129794 44 00 49.91662	* 15 16 31.420000 * 43 49 51.50000	15 17 07.343241 43 45 51.82370	0.00 0.00
* J151702+2638	15 14 54.191381	* 15 17 02.570000	15 17 47.077686	0.00

	26 49 57.29944	* 26 38 59.90000	26 35 04.62837	0.00
* J151949+6732	15 19 20.187796	* 15 19 49.770000	15 19 57.440777	0.00
	67 43 43.80236	* 67 32 58.50000	67 28 59.48124	0.00
* J151959+6732	15 19 29.763931	* 15 19 59.330000	15 20 06.994754	0.00
	67 43 10.46901	* 67 32 25.70000	67 28 26.88335	0.00
* J154353+6548	15 43 23.685067	* 15 43 53.860000	15 44 01.745637	0.00
	65 58 02.63876	* 65 48 41.20000	65 45 13.99008	0.00
* J154415+8354	15 50 32.668794	* 15 44 15.800000	15 41 55.595995	0.00
	84 03 35.84545	* 83 54 28.00000	83 50 58.90315	0.00
* J154545+8349	15 51 56.469487	* 15 45 45.210000	15 43 26.932907	0.00
	83 58 14.64868	* 83 49 12.10000	83 45 45.06674	0.00
* J154744+6550	15 47 15.934039	* 15 47 44.550000	15 47 51.853640	0.00
	65 59 39.39322	* 65 50 32.00000	65 47 10.05885	0.00
* J154831+6616	15 48 05.579007	* 15 48 31.320000	15 48 37.552748	0.00
	66 25 37.24806	* 66 16 32.80000	66 13 11.89105	0.00
* J155041+6532	15 50 12.478109	* 15 50 41.780000	15 50 49.337948	0.00
	65 41 51.05519	* 65 32 54.50000	65 29 36.67719	0.00
* J155058+6610	15 50 32.756274	* 15 50 58.240000	15 51 04.375904	0.00
	66 19 25.72414	* 66 10 30.30000	66 07 12.79581	0.00
* J155137+7017	15 51 42.103563	* 15 51 37.210000	15 51 32.047235	0.00
	70 26 40.38383	* 70 17 48.30000	70 14 31.30455	0.00
* J155201+6534	15 51 32.633566	* 15 52 01.300000	15 52 08.620734	0.00
	65 43 39.73416	* 65 34 48.10000	65 31 32.11915	0.00
* J155231+7018	15 52 36.498145	* 15 52 31.180000	15 52 25.858591	0.00
	70 26 52.63507	* 70 18 03.90000	70 14 48.15998	0.00
* J155313+5437	15 52 00.323446	* 15 53 13.950000	15 53 38.030546	0.00
	54 46 39.84671	* 54 37 51.30000	54 34 38.26340	0.00
4C39.25	09 23 55.319215	* 09 27 03.013936	09 28 10.574201	0.30
* J0927+3902	39 15 23.56645	* 39 02 20.85186	38 57 26.03619	0.16
0923+392	/Users/mgirolet/sched/catalogs/sources.gsfc			
J0927+39	GSFC 2015a astro solution, unpublished 245753 observations.			
3C345	16 41 17.606228	* 16 42 58.809966	16 43 33.093193	0.76
* J1642+3948	39 54 10.81496	* 39 48 36.99402	39 46 38.93955	0.52
1641+399	/Users/mgirolet/sched/catalogs/sources.gsfc			
J1642+39	GSFC 2015a astro solution, unpublished 53430 observations.			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
J141222+5020	95.5
J141312+2121	80.9
J141320+2119	80.8
J142028+2702	82.3
J142039+2656	82.2

J142040+2649	82.1
J142045+2702	82.2
J142050+2705	82.2
J142051+2704	82.2
J142408+2918	82.7
J142417+8152	109.5
J143217+5056	93.1
J144418+3643	83.3
J144425+3655	83.4
J144439+3645	83.2
J144449+3655	83.3
J145133+3420	80.7
J145141+3430	80.8
J145143+3429	80.7
J145149+3430	80.7
J145839+6132	96.3
J145840+6124	96.3
J145916+2638	74.8
J145939+2630	74.7
J150001+2643	74.7
J150008+2635	74.6
J150038+2635	74.5
J150503+2028	70.1
J151631+4349	82.9
J151702+2638	71.7
J151949+6732	98.5
J151959+6732	98.5
J154353+6548	95.6
J154415+8354	108.7
J154545+8349	108.6
J154744+6550	95.3
J154831+6616	95.6
J155041+6532	94.9
J155058+6610	95.4
J155137+7017	98.4
J155201+6534	94.8
J155231+7018	98.4
J155313+5437	86.4
J0927+3902	143.3
J1642+3948	69.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

fus15tr

HUNTING THE UNIDENTIFIED GAMMA-RAY SOURCES
PI: *Marcello Giroletti*

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Phone: +39 051 639 9394
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Fax: +39 051 639 9431
Phone during observation: +39 347 906 6221

Observing mode: 6cm Continuum C-dual-1024-16-2-2

Schedule for TORUN (Code Tr) Page 2

Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

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SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

---	Tue	2 Jan 2018	Day	2	---					
Next scan frequencies:		4898.49	4898.49	4898.49	4898.49	4930.49	4930.49	4930.49	4930.49	
		4962.49	4962.49	4962.49	4962.49	4994.49	4994.49	4994.49	4994.49	
Next BBC frequencies:		698.49	698.49	698.49	698.49	730.49	730.49	730.49	730.49	
		762.49	762.49	762.49	762.49	794.49	794.49	794.49	794.49	
Next scan bandwidths:		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
23 30 00	J072526+8114	07 34 27	61.9	-0.5	0.1	178.2	0	0	23 30 00	
23 38 05	---	07 42 34	61.9	-1.1	0.2	175.6	485	62	23 30 01	
23 39 20	J073706+6536	07 43 49	77.5	-2.4	0.1	176.6	2	62	23 39 20	
23 47 25	---	07 51 55	77.4	-6.2	0.2	171.0	485	124	23 39 21	
23 47 45	J073708+6534	07 52 15	77.4	-6.4	0.2	170.7	13	124	23 47 45	
23 55 50	---	08 00 22	77.3	-10.1	0.4	165.2	485	187	23 47 46	

---	Start: Tue	2 Jan 2018	Day	2	--	Stop: Wed	3 Jan 2018	Day	3	---
23 56 45	J073319+5910	08 01 17	82.9	-28.7	0.4	145.8	3	187	23 56 45	
00 04 50	---	08 09 23	82.3	-35.0	0.6	137.8	485	249	23 56 46	
00 10 37	J0927+3902	08 15 11	71.1	131.2	-1.2	-35.5	0	249	00 10 37	
00 15 37	=4C39.25	08 20 12	71.7	133.7	-1.1	-33.9	300	287	00 10 38	
00 20 12	J072206+3616	08 24 48	70.0	218.7	1.0	27.7	92	287	00 20 12	
00 28 17	---	08 32 54	69.2	222.8	1.2	30.4	485	349	00 20 13	
00 28 37	J072334+3542	08 33 14	68.8	221.5	1.1	29.3	4	349	00 28 37	
00 36 42	---	08 41 21	68.0	225.3	1.3	31.7	485	412	00 28 38	
00 37 02	J072336+3535	08 41 41	67.9	225.3	1.3	31.6	11	412	00 37 02	
00 45 07	---	08 49 47	67.0	228.9	1.4	33.8	485	474	00 37 03	
00 45 27	J072411+3609	08 50 07	67.5	229.6	1.4	34.5	7	474	00 45 27	

00 53 32 ---	08 58 13	66.5	233.0	1.5	36.4	485	536	00 45 28
00 53 52 J072450+3536	08 58 33	66.1	232.1	1.5	35.6	6	536	00 53 52
01 01 57 ---	09 06 40	65.1	235.3	1.7	37.4	485	598	00 53 53
01 02 27 J071223+3313	09 07 10	61.6	236.9	1.9	36.9	3	598	01 02 27
01 10 32 ---	09 15 16	60.6	239.6	2.0	38.3	485	660	01 02 28
01 10 49 J071229+3312	09 15 33	60.5	239.7	2.0	38.3	10	660	01 10 49
01 18 54 ---	09 23 40	59.5	242.3	2.2	39.4	485	722	01 10 50

Schedule for TORUN (Code Tr)

Page 3

Hunting the unidentified gamma-ray sources

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TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Wed 3 Jan 2018 Day 3 ---										
01 19 34	J071304+2539	09 24 20	53.3	234.3	2.2		32.7	3	722	01 19 34
01 27 39	---	09 32 26	52.3	236.8	2.3		33.9	485	785	01 19 35
01 32 13	J2005+7752	09 37 01	41.8	366.3-10.5			-18.4	0	785	01 32 13
01 37 13	=2007+777	09 42 01	41.9	366.6-10.4			-19.4	300	823	01 32 14
01 41 27	J072201+3532	09 46 16	59.4	249.3	2.4		43.6	4	823	01 41 27
01 49 32	---	09 54 22	58.3	251.6	2.5		44.4	485	885	01 41 28
01 49 52	J072533+3546	09 54 43	58.9	251.0	2.5		44.4	6	885	01 49 52
01 57 57	---	10 02 49	57.7	253.3	2.6		45.1	485	947	01 49 53
01 58 39	J074040+3025	10 03 31	55.7	242.7	2.4		38.2	6	947	01 58 39
02 06 44	---	10 11 37	54.7	245.1	2.5		39.1	485	1010	01 58 40
02 07 04	J074114+3030	10 11 57	54.7	245.1	2.5		39.2	11	1010	02 07 04
02 15 09	---	10 20 04	53.6	247.4	2.6		40.0	485	1072	02 07 05
02 16 29	J074654+4532	10 21 24	64.2	268.5	2.6		58.9	23	1072	02 16 29
02 24 34	---	10 29 30	63.0	270.1	2.7		58.9	485	1134	02 16 30
02 24 54	J074729+4527	10 29 50	63.0	269.9	2.7		58.8	10	1134	02 24 54
02 32 59	---	10 37 57	61.8	271.5	2.8		58.8	485	1196	02 24 55
02 33 54	J082948+5108	10 38 52	70.4	277.0	2.1		71.6	9	1196	02 33 54
02 41 59	---	10 46 58	69.2	278.2	2.3		71.1	485	1258	02 33 55
02 45 20	J2005+7752	10 50 19	43.5	371.0	-9.2		-33.2	0	1258	02 45 20
02 50 20	=2007+777	10 55 20	43.6	371.3	-9.2		-34.2	300	1297	02 45 21
02 54 25	J082546+4034	10 59 26	61.5	259.3	2.5		50.9	6	1297	02 54 25
03 02 30	---	11 07 32	60.3	261.3	2.7		51.3	485	1359	02 54 26
03 03 05	J082817+3718	11 08 07	58.4	256.0	2.6		47.1	9	1359	03 03 05
03 11 10	---	11 16 13	57.2	258.1	2.8		47.6	485	1421	03 03 06
03 11 30	J082901+3718	11 16 34	57.3	258.0	2.8		47.5	11	1421	03 11 30
03 19 35	---	11 24 40	56.1	259.9	2.9		48.0	485	1483	03 11 31
03 20 20	J081823+2913	11 25 25	48.7	253.5	3.1		41.2	3	1483	03 20 20
03 28 25	---	11 33 31	47.5	255.4	3.2		41.7	485	1546	03 20 21
03 28 45	J081644+2851	11 33 51	46.9	255.5	3.3		41.6	6	1546	03 28 45
03 36 50	---	11 41 58	45.7	257.5	3.4		42.0	485	1608	03 28 46

Schedule for TORUN (Code Tr)

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Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop				Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

---	Wed	3 Jan 2018	Day	3	---					
03 37 10	J081733+2840	11 42 18	45.7	257.2	3.4		41.8	10	1608	03 37 10
03 45 15	---	11 50 24	44.5	259.0	3.5		42.2	485	1670	03 37 11
03 45 35	J081751+2843	11 50 44	44.5	259.1	3.5		42.2	12	1670	03 45 35
03 53 40	---	11 58 50	43.3	260.9	3.7		42.5	485	1732	03 45 36
03 54 00	J081754+2857	11 59 10	43.4	261.2	3.7		42.7	10	1732	03 54 00
04 02 05	---	12 07 17	42.2	263.0	3.8		42.9	485	1794	03 54 01
04 03 23	J0927+3902	12 08 35	59.3	258.9	2.7		49.3	0	1794	04 03 23
04 08 23	=4C39.25	12 13 36	58.6	260.2	2.8		49.5	300	1833	04 03 24
04 09 53	J083401+2409	12 15 06	39.9	256.9	3.7		39.9	6	1833	04 09 53
04 17 58	---	12 23 12	38.7	258.8	3.8		40.2	485	1895	04 09 54
04 18 18	J083415+2418	12 23 32	38.8	258.9	3.8		40.3	11	1895	04 18 18
04 26 23	---	12 31 39	37.6	260.7	3.9		40.5	485	1957	04 18 19
04 26 43	J083444+2447	12 31 59	38.0	261.1	3.9		40.8	7	1957	04 26 43
04 34 48	---	12 40 05	36.8	262.8	4.1		41.0	485	2019	04 26 44
04 35 08	J083551+2423	12 40 25	36.6	262.3	4.1		40.8	8	2019	04 35 08
04 43 13	---	12 48 32	35.4	264.1	4.2		41.0	485	2081	04 35 09
04 43 33	J083602+2428	12 48 52	35.4	264.1	4.2		41.0	12	2081	04 43 33
04 51 38	---	12 56 58	34.2	265.8	4.3		41.1	485	2144	04 43 34
04 51 58	J083618+2434	12 57 18	34.2	265.9	4.3		41.2	11	2144	04 51 58
05 00 03	---	13 05 24	33.0	267.6	4.5		41.3	485	2206	04 51 59
05 00 23	J083621+2408	13 05 44	32.7	267.3	4.5		41.1	8	2206	05 00 23
05 08 28	---	13 13 51	31.5	269.0	4.6		41.1	485	2268	05 00 24
05 08 48	J083631+2411	13 14 11	31.5	269.0	4.6		41.1	12	2268	05 08 48
05 16 53	---	13 22 17	30.2	270.7	4.7		41.1	485	2330	05 08 49
05 17 13	J083726+2424	13 22 37	30.5	270.7	4.7		41.2	9	2330	05 17 13
05 25 18	---	13 30 43	29.3	272.3	4.9		41.2	485	2392	05 17 14
05 26 37	J0927+3902	13 32 03	46.8	276.4	4.1		50.1	0	2392	05 26 37
05 31 37	=4C39.25	13 37 04	46.1	277.3	4.1		50.0	300	2431	05 26 38
05 33 12	J083454+6244	13 38 40	51.2	314.8	5.0		68.1	5	2431	05 33 12
05 41 17	---	13 46 46	50.3	315.4	5.2		66.7	485	2493	05 33 13

Schedule for TORUN (Code Tr)

Page 5

Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```

-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
--- Wed   3 Jan 2018   Day   3 ---

05 41 52 J080057+6630  13 47 21  48.5 323.0  5.7      64.8    5    2493  05 41 52
05 49 57 ---          13 55 27  47.8 323.5  5.9      63.3   485    2555  05 41 53

05 50 39 J081125+7500  13 56 09  51.6 335.4  5.7      74.7    3    2555  05 50 39
05 58 44 ---          14 04 16  51.1 335.6  5.8      73.0   485    2617  05 50 40

05 59 14 J081307+7843  14 04 46  52.2 341.3  5.8      77.9    4    2617  05 59 14
06 07 19 ---          14 12 52  51.8 341.5  6.0      76.0   485    2679  05 59 15

06 07 46 J081526+7524  14 13 19  50.9 336.3  5.9      72.3    2    2679  06 07 46
06 15 51 ---          14 21 26  50.5 336.6  6.1      70.6   485    2742  06 07 47

06 16 21 J085337+7221  14 21 56  52.0 330.7  5.4      74.9    3    2742  06 16 21
06 24 26 ---          14 30 02  51.4 331.0  5.6      73.2   485    2804  06 16 22

06 24 44 J085348+7223  14 30 20  51.4 331.0  5.6      73.2   11    2804  06 24 44
06 32 49 ---          14 38 26  50.9 331.3  5.7      71.5   485    2866  06 24 45

```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: c1024.eofus

```

Setup group:    2          Station: TORUN          Total bit rate: 1024
Format: MARK5B      Bits per sample: 2      Sample rate: 32.000
Number of channels: 16  DBE type: DBBC_DDC      Speedup factor: 1.00

```

Disk used to record data.

1st LO=	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
Net SB=	L	L	U	U	L	L	U	U	U
	L	L	U	U	L	L	U	U	U
IF SB =	U	U	U	U	U	U	U	U	U
	U	U	U	U	U	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP	LCP
	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP	LCP
BBC =	1	5	1	5	2	6	2	6	6
	3	7	3	7	4	8	4	8	8
BBC SB=	L	L	U	U	L	L	U	U	U
	L	L	U	U	L	L	U	U	U
IF =	A1	B1	A1	B1	A1	B1	A1	B1	B1
	A1	B1	A1	B1	A1	B1	A1	B1	B1

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = off

LO sum=	4898.49	4898.49	4898.49	4898.49	4930.49	4930.49	4930.49	4930.49
	4962.49	4962.49	4962.49	4962.49	4994.49	4994.49	4994.49	4994.49
BBC fr=	698.49	698.49	698.49	698.49	730.49	730.49	730.49	730.49
	762.49	762.49	762.49	762.49	794.49	794.49	794.49	794.49
Bandwd=	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00

Matching frequency sets: 3

Track assignments are:

track1= 18, 26, 2, 10, 20, 28, 4, 12, 22, 30, 6, 14, 24, 32, 8, 16

barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)	
* J071223+3313	07 09 07.944100 33 18 33.67587	* 07 12 23.440000 33 13 29.20000	07 13 34.427417 33 11 27.82946	0.00 0.00
* J071229+3312	07 09 14.204541 33 17 38.60937	* 07 12 29.670000 33 12 33.70000	07 13 40.646072 33 10 32.17251	0.00 0.00
* J071304+2539	07 10 00.150065 25 44 08.91283	* 07 13 04.480000 25 39 01.20000	07 14 11.421999 25 36 59.02036	0.00 0.00
* J072201+3532	07 18 42.731654 35 38 32.70548	* 07 22 01.380000 35 32 48.50000	07 23 13.484294 35 30 32.55266	0.00 0.00
* J072206+3616	07 18 46.561606 36 22 11.40866	* 07 22 06.420000 36 16 26.90000	07 23 18.963833 36 14 10.80036	0.00 0.00
* J072334+3542	07 20 15.478398 35 48 34.34956	* 07 23 34.290000 35 42 43.80000	07 24 46.448726 35 40 25.53398	0.00 0.00
* J072336+3535	07 20 17.712899 35 41 37.29549	* 07 23 36.330000 35 35 46.60000	07 24 48.417953 35 33 28.28777	0.00 0.00
* J072411+3609	07 20 52.460979 36 15 21.49621	* 07 24 11.970000 36 09 28.40000	07 25 24.380137 36 07 09.18037	0.00 0.00

* J072450+3536	07 21 32.166840 35 42 17.86953	* 07 24 50.710000 * 35 36 22.10000	07 26 02.767144 35 34 01.94081	0.00 0.00
* J072526+8114	07 16 03.766394 81 19 54.51712	* 07 25 26.400000 * 81 14 08.70000	07 28 51.576287 81 11 45.65889	0.00 0.00
* J072533+3546	07 22 14.741829 35 52 03.37502	* 07 25 33.500000 * 35 46 04.70000	07 26 45.632952 35 43 43.47366	0.00 0.00
* J073319+5910	07 29 02.152597 59 16 55.48618	* 07 33 19.310000 * 59 10 27.30000	07 34 52.770558 59 07 53.68893	0.00 0.00
* J073706+6536	07 32 17.866137 65 43 21.95577	* 07 37 06.880000 * 65 36 39.60000	07 38 52.003858 65 34 00.15102	0.00 0.00
* J073708+6534	07 32 19.733206 65 41 39.17409	* 07 37 08.560000 * 65 34 56.70000	07 38 53.614981 65 32 17.21054	0.00 0.00
* J074040+3025	07 37 30.602263 30 32 29.23935	* 07 40 40.050000 * 30 25 29.40000	07 41 48.762570 30 22 46.37249	0.00 0.00
* J074114+3030	07 38 05.376522 30 37 02.14074	* 07 41 14.890000 * 30 30 00.00000	07 42 23.624415 30 27 16.13413	0.00 0.00
* J074654+4532	07 43 19.446158 45 39 54.90045	* 07 46 54.360000 * 45 32 31.30000	07 48 12.289777 45 29 38.40100	0.00 0.00
* J074729+4527	07 43 54.858135 45 34 44.50389	* 07 47 29.510000 * 45 27 18.60000	07 48 47.341721 45 24 24.86634	0.00 0.00
* J080057+6630	07 56 09.938298 66 39 09.91407	* 08 00 57.730000 * 66 30 54.40000	08 02 42.186441 66 27 40.52179	0.00 0.00
* J081125+7500	08 05 19.287748 75 09 45.52472	* 08 11 25.520000 * 75 00 53.20000	08 13 38.335068 74 57 24.40291	0.00 0.00
* J081307+7843	08 05 49.307000 78 52 04.71348	* 08 13 07.780000 * 78 43 08.30000	08 15 46.555345 78 39 36.88256	0.00 0.00
* J081526+7524	08 09 17.062707 75 33 41.53189	* 08 15 26.950000 * 75 24 34.50000	08 17 41.008095 75 21 00.22303	0.00 0.00
* J081644+2851	08 13 40.414851 29 00 26.13087	* 08 16 44.840000 * 28 51 08.70000	08 17 51.615738 28 47 36.24737	0.00 0.00
* J081733+2840	08 14 29.869530 28 49 27.71269	* 08 17 33.990000 * 28 40 07.30000	08 18 40.653275 28 36 33.80009	0.00 0.00
* J081751+2843	08 14 47.356104 28 53 16.06995	* 08 17 51.530000 * 28 43 54.60000	08 18 58.211253 28 40 20.71227	0.00 0.00
* J081754+2857	08 14 50.183243 29 06 28.34840	* 08 17 54.630000 * 28 57 06.70000	08 19 01.408835 28 53 32.71972	0.00 0.00
* J081823+2913	08 15 18.420930 29 23 20.66001	* 08 18 23.180000 * 29 13 57.30000	08 19 30.068866 29 10 22.66861	0.00 0.00
* J082546+4034	08 22 26.137195 40 43 59.18963	* 08 25 46.270000 * 40 34 09.90000	08 26 58.657791 40 30 24.49005	0.00 0.00
* J082817+3718	08 25 02.441912 37 28 50.40824	* 08 28 17.150000 * 37 18 52.10000	08 29 27.570194 37 15 03.83540	0.00 0.00
* J082901+3718	08 25 46.648768	* 08 29 01.240000	08 30 11.614654	0.00

	37 28 05.98535	* 37 18 05.10000	37 14 15.90651	0.00
* J082948+5108	08 26 07.889881	* 08 29 48.050000	08 31 07.663299	0.00
	51 18 30.54807	* 51 08 27.70000	51 04 36.13774	0.00
* J083401+2409	08 31 04.095724	* 08 34 01.510000	08 35 05.710919	0.00
	24 20 10.06591	* 24 09 51.30000	24 05 57.55600	0.00
* J083415+2418	08 31 18.068845	* 08 34 15.620000	08 35 19.868665	0.00
	24 28 38.97002	* 24 18 19.40000	24 14 25.34739	0.00
* J083444+2447	08 31 46.554188	* 08 34 44.610000	08 35 49.036321	0.00
	24 58 08.11326	* 24 47 46.90000	24 43 52.18524	0.00
* J083454+6244	08 30 38.712219	* 08 34 54.750000	08 36 27.342297	0.00
	62 55 13.60795	* 62 44 54.10000	62 40 55.18285	0.00
* J083551+2423	08 32 53.880245	* 08 35 51.400000	08 36 55.630810	0.00
	24 34 07.84053	* 24 23 42.80000	24 19 46.78257	0.00
* J083602+2428	08 33 05.110190	* 08 36 02.700000	08 37 06.954951	0.00
	24 38 48.28169	* 24 28 22.60000	24 24 26.34178	0.00
* J083618+2434	08 33 20.629765	* 08 36 18.310000	08 37 22.596037	0.00
	24 44 55.06690	* 24 34 28.50000	24 30 31.91018	0.00
* J083621+2408	08 33 24.483698	* 08 36 21.690000	08 37 25.807149	0.00
	24 19 17.27350	* 24 08 50.50000	24 04 53.90367	0.00
* J083631+2411	08 33 34.733085	* 08 36 31.970000	08 37 36.097320	0.00
	24 21 44.55678	* 24 11 17.20000	24 07 20.38934	0.00
* J083726+2424	08 34 28.824045	* 08 37 26.220000	08 38 30.400084	0.00
	24 34 35.62914	* 24 24 05.20000	24 20 07.26043	0.00
* J085337+7221	08 48 28.788315	* 08 53 37.580000	08 55 28.987294	0.00
	72 32 39.85069	* 72 21 19.60000	72 16 57.28586	0.00
* J085348+7223	08 48 39.731990	* 08 53 48.710000	08 55 40.181181	0.00
	72 34 35.34078	* 72 23 14.50000	72 18 51.96620	0.00
4C39.25	09 23 55.319215	* 09 27 03.013936	09 28 10.601874	0.30
* J0927+3902	39 15 23.56645	* 39 02 20.85186	38 57 26.02752	0.16
0923+392	/Users/mgirolet/sched/catalogs/sources.gsfc			
J0927+39	GSFC 2015a astro solution, unpublished 245753 observations.			
2007+777	20 07 20.430197	* 20 05 30.998526	20 04 45.895801	0.03
* J2005+7752	77 43 58.12302	* 77 52 43.24755	77 56 01.09508	0.01
J2005+77	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 15597 observations.			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
J071223+3313	168.9
J071229+3312	168.9
J071304+2539	174.8
J072201+3532	165.9
J072206+3616	165.3

J072334+3542	165.6
J072336+3535	165.7
J072411+3609	165.2
J072450+3536	165.6
J072526+8114	121.5
J072533+3546	165.4
J073319+5910	143.0
J073706+6536	136.7
J073708+6534	136.7
J074040+3025	167.1
J074114+3030	167.0
J074654+4532	154.9
J074729+4527	154.9
J080057+6630	135.1
J081125+7500	126.9
J081307+7843	123.4
J081526+7524	126.4
J081644+2851	160.5
J081733+2840	160.3
J081751+2843	160.3
J081754+2857	160.2
J081823+2913	160.0
J082546+4034	153.8
J082817+3718	155.1
J082901+3718	155.0
J082948+5108	146.2
J083401+2409	157.1
J083415+2418	157.0
J083444+2447	156.9
J083454+6244	136.6
J083551+2423	156.7
J083602+2428	156.6
J083618+2434	156.6
J083621+2408	156.5
J083631+2411	156.5
J083726+2424	156.3
J085337+7221	127.8
J085348+7223	127.7
J0927+3902	143.8
J2005+7752	101.3

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

fus16tr

HUNTING THE UNIDENTIFIED GAMMA-RAY SOURCES

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Observing mode: 6cm Continuum C-dual-1024-16-2-2

Schedule for TORUN (Code Tr) Page 2

Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are LO sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC	

---	Thu 4 Jan 2018	Day	4	---							
Next scan frequencies:		4898.49	4898.49	4898.49	4898.49	4930.49	4930.49	4930.49	4930.49		
		4962.49	4962.49	4962.49	4962.49	4994.49	4994.49	4994.49	4994.49		
Next BBC frequencies:		698.49	698.49	698.49	698.49	730.49	730.49	730.49	730.49		
		762.49	762.49	762.49	762.49	794.49	794.49	794.49	794.49		
Next scan bandwidths:		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00		
		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00		
07 30 00	J130149+4740	15 39 43	64.7	273.4	2.6	62.7	0	0	07 30 00		
07 38 10	---	15 47 54	63.4	274.9	2.8	62.5	490	63	07 30 01		
07 38 30	J130155+4741	15 48 14	63.4	275.0	2.8	62.5	13	63	07 38 30		
07 46 40	---	15 56 26	62.2	276.4	2.9	62.3	490	126	07 38 31		
07 47 00	J130004+4802	15 56 46	62.0	277.4	2.9	62.7	6	126	07 47 00		
07 55 10	---	16 04 57	60.8	278.7	3.1	62.4	490	188	07 47 01		
07 55 30	J130117+4803	16 05 17	61.0	278.6	3.1	62.5	10	188	07 55 30		
08 03 40	---	16 13 28	59.7	279.9	3.2	62.1	490	251	07 55 31		
08 04 10	J130355+5106	16 13 58	61.4	285.2	3.2	67.1	4	251	08 04 10		
08 12 20	---	16 22 10	60.2	286.2	3.3	66.4	490	314	08 04 11		
08 16 36	J1642+3948	16 26 26	76.4	165.9	-0.3	-11.0	0	314	08 16 36		
08 21 36	=3C345	16 31 27	76.5	170.0	-0.2	-7.8	300	353	08 16 37		
08 25 11	J130150+3702	16 35 02	50.3	268.0	3.5	48.7	4	353	08 25 11		
08 33 21	---	16 43 14	49.0	269.6	3.7	48.7	490	415	08 25 12		
08 33 41	J130211+3657	16 43 34	49.0	269.5	3.7	48.6	11	415	08 33 41		
08 41 51	---	16 51 45	47.7	271.1	3.8	48.6	490	478	08 33 42		
08 42 11	J130303+3646	16 52 05	47.7	270.8	3.8	48.5	10	478	08 42 11		
08 50 21	---	17 00 17	46.5	272.4	3.9	48.4	490	541	08 42 12		

08 50 41	J130357+3652	17 00 37	46.6	272.4	3.9	48.5	10	541	08 50 41
08 58 51	---	17 08 48	45.4	274.0	4.1	48.4	490	604	08 50 42
08 59 11	J130524+3655	17 09 08	45.6	273.8	4.0	48.5	9	604	08 59 11
09 07 21	---	17 17 19	44.4	275.4	4.2	48.3	490	667	08 59 12
09 07 41	J130527+3635	17 17 39	44.1	275.1	4.2	48.1	10	667	09 07 41
09 15 51	---	17 25 51	42.9	276.6	4.3	47.9	490	729	09 07 42
09 16 11	J130528+3655	17 26 11	43.0	277.0	4.3	48.1	10	729	09 16 11
09 24 21	---	17 34 22	41.8	278.5	4.5	47.9	490	792	09 16 12

Schedule for TORUN (Code Tr)

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Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

---	Thu	4 Jan 2018	Day	4	---					
09 24 41	J130620+3630	17 34 42	41.6	278.0	4.5		47.6	8	792	09 24 41
09 32 51	---	17 42 54	40.4	279.5	4.6		47.4	490	855	09 24 42
09 33 11	J130623+3643	17 43 14	40.5	279.7	4.6		47.5	11	855	09 33 11
09 41 21	---	17 51 25	39.3	281.2	4.7		47.2	490	918	09 33 12
09 41 41	J130624+3642	17 51 45	39.3	281.2	4.7		47.2	13	918	09 41 41
09 49 51	---	17 59 56	38.0	282.6	4.9		46.9	490	981	09 41 42
09 53 07	J2005+7752	18 03 13	62.9	373.4	-2.0		-138.2	0	981	09 53 07
09 58 07	=2007+777	18 08 14	63.1	373.0	-1.9		-139.8	300	1019	09 53 08
10 00 02	J135304+6944	18 10 10	57.2	324.7	4.3		86.5	3	1019	10 00 02
10 08 12	---	18 18 21	56.5	324.8	4.4		84.7	490	1082	10 00 03
10 09 22	J132612+5211	18 19 31	47.5	299.4	4.9		58.4	4	1082	10 09 22
10 17 32	---	18 27 42	46.5	300.4	5.0		57.5	490	1145	10 09 23
10 17 57	J134750+5125	18 28 08	48.9	296.9	4.7		59.0	2	1145	10 17 57
10 26 07	---	18 36 19	47.8	297.9	4.8		58.2	490	1208	10 17 58
10 26 27	J134820+5141	18 36 39	47.9	298.2	4.8		58.4	10	1208	10 26 27
10 34 37	---	18 44 50	46.9	299.2	4.9		57.6	490	1271	10 26 28
10 34 57	J134826+5135	18 45 10	46.8	299.1	4.9		57.5	12	1271	10 34 57
10 43 07	---	18 53 22	45.7	300.1	5.1		56.6	490	1333	10 34 58
10 43 47	J132411+4753	18 54 02	40.3	299.2	5.5		51.3	6	1333	10 43 47
10 51 57	---	19 02 13	39.2	300.4	5.6		50.5	490	1396	10 43 48
10 54 26	J2005+7752	19 04 42	64.6	367.2	-1.0		-158.7	0	1396	10 54 26
10 59 26	=2007+777	19 09 43	64.7	366.7	-0.9		-160.5	300	1435	10 54 27
11 02 23	J132159+3219	19 12 41	26.7	289.0	5.8		42.2	6	1435	11 02 23
11 10 33	---	19 20 52	25.5	290.4	6.0		41.7	490	1497	11 02 24
11 11 03	J130959+3039	19 21 22	22.5	291.4	6.2		40.5	5	1497	11 11 03
11 19 13	---	19 29 33	21.4	292.8	6.3		40.0	490	1560	11 11 04
11 19 33	J131011+3024	19 29 53	21.2	292.7	6.3		39.9	10	1560	11 19 33
11 27 43	---	19 38 05	20.0	294.1	6.5		39.4	490	1623	11 19 34
11 28 23	J135154+2850	19 38 45	24.6	285.7	5.8		41.2	8	1623	11 28 23
11 36 33	---	19 46 56	23.4	287.2	5.9		40.9	490	1686	11 28 24

Schedule for TORUN (Code Tr)

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Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop				Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

---	Thu	4 Jan 2018	Day	4	---					
11 37 23	J133606+2057	19 47 46	15.0	284.9	6.2		38.4	4	1686	11 37 23
11 45 33	---	19 55 58	13.8	286.5	6.3		38.0	490	1749	11 37 24
11 45 53	J133612+2051	19 56 18	13.7	286.5	6.3		38.0	12	1749	11 45 53
11 54 03	---	20 04 29	12.5	288.0	6.5		37.6	490	1812	11 45 54
11 59 48	J2253+1608	20 10 15	41.1	123.0	-2.7		-31.6	0	1812	11 59 48
12 04 48	=3C454.3	20 15 16	41.8	124.4	-2.7		-31.1	300	1850	11 59 49
12 08 18	J185023+2631	20 18 47	58.8	220.2	1.5		25.7	3	1850	12 08 18
12 16 28	---	20 26 58	58.0	223.3	1.6		27.4	490	1913	12 08 19
12 17 13	J181450+2426	20 27 43	52.1	233.9	2.2		32.2	9	1913	12 17 13
12 25 23	---	20 35 54	51.1	236.4	2.3		33.3	490	1976	12 17 14
12 25 48	J180334+2445	20 36 19	49.9	240.2	2.5		35.0	3	1976	12 25 48
12 33 58	---	20 44 31	48.8	242.5	2.7		35.9	490	2038	12 25 49
12 34 18	J180335+2456	20 44 51	48.9	242.7	2.7		36.1	11	2038	12 34 18
12 42 28	---	20 53 02	47.8	245.0	2.8		36.9	490	2101	12 34 19
12 43 18	J180849+3520	20 53 52	56.3	255.0	2.7		45.3	4	2101	12 43 18
12 51 28	---	21 02 04	55.1	257.0	2.9		45.8	490	2164	12 43 19
12 51 58	J182400+3449	21 02 34	56.8	252.6	2.6		44.3	6	2164	12 51 58
13 00 08	---	21 10 45	55.7	254.8	2.8		44.9	490	2227	12 51 59
13 00 28	J182450+3454	21 11 05	55.8	254.7	2.8		45.0	10	2227	13 00 28
13 08 38	---	21 19 16	54.6	256.8	2.9		45.5	490	2290	13 00 29
13 12 01	J2005+7752	21 22 40	64.2	350.8	1.3		152.6	0	2290	13 12 01
13 17 01	=2007+777	21 27 41	64.1	350.3	1.4		150.9	300	2328	13 12 02
13 20 36	J185739+3623	21 31 16	58.7	253.4	2.6		45.6	6	2328	13 20 36
13 28 46	---	21 39 28	57.5	255.5	2.7		46.3	490	2391	13 20 37
13 29 06	J185915+3625	21 39 48	57.7	255.2	2.7		46.2	9	2391	13 29 06
13 37 16	---	21 47 59	56.5	257.3	2.8		46.7	490	2454	13 29 07
13 37 36	J185930+3707	21 48 19	57.0	258.3	2.8		47.5	6	2454	13 37 36
13 45 46	---	21 56 31	55.8	260.3	2.9		48.0	490	2517	13 37 37
13 46 06	J185949+3651	21 56 51	55.6	259.9	2.9		47.7	9	2517	13 46 06
13 54 16	---	22 05 02	54.4	261.8	3.1		48.0	490	2579	13 46 07

Schedule for TORUN (Code Tr)

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Hunting the unidentified gamma-ray sources

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```

-----
Start UT  Source          Start / Stop          Early   Disk   TPStart
Stop UT          LST      EL   AZ   HA  UP   ParA  Dwell  GBytes  SYNC
-----
--- Thu   4 Jan 2018   Day   4 ---

13 54 36 J190013+3701  22 05 22  54.5 262.1  3.1      48.2   10    2579  13 54 36
14 02 46 ---          22 13 33  53.3 263.9  3.2      48.4  490    2642  13 54 37

14 04 26 J193419+6001  22 15 14  67.2 303.8  2.7      89.8   5    2642  14 04 26
14 12 36 ---          22 23 25  66.2 303.9  2.8      88.1  490    2705  14 04 27

14 14 26 J201737+7902  22 25 15  61.8 347.7  2.1     137.5   7    2705  14 14 26
14 22 36 ---          22 33 27  61.5 347.1  2.3     134.9  490    2768  14 14 27

14 22 56 J201749+7902  22 33 47  61.5 347.1  2.3     134.9  13    2768  14 22 56
14 31 06 ---          22 41 58  61.3 346.6  2.4     132.4  490    2831  14 22 57

```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: c1024.eofus

```

Setup group:      2          Station: TORUN          Total bit rate: 1024
Format: MARK5B    Bits per sample: 2      Sample rate: 32.000
Number of channels: 16  DBE type: DBBC_DDC  Speedup factor: 1.00

```

Disk used to record data.

1st LO=	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
Net SB=	L	L	U	U	L	L	U	U	U
	L	L	U	U	L	L	U	U	U
IF SB =	U	U	U	U	U	U	U	U	U
	U	U	U	U	U	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP	LCP
	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP	LCP
BBC =	1	5	1	5	2	6	2	6	6
	3	7	3	7	4	8	4	8	8
BBC SB=	L	L	U	U	L	L	U	U	U
	L	L	U	U	L	L	U	U	U
IF =	A1	B1	A1	B1	A1	B1	A1	B1	B1
	A1	B1	A1	B1	A1	B1	A1	B1	B1

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = off

LO sum=	4898.49	4898.49	4898.49	4898.49	4930.49	4930.49	4930.49	4930.49
	4962.49	4962.49	4962.49	4962.49	4994.49	4994.49	4994.49	4994.49
BBC fr=	698.49	698.49	698.49	698.49	730.49	730.49	730.49	730.49
	762.49	762.49	762.49	762.49	794.49	794.49	794.49	794.49
Bandwd=	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00

Matching frequency sets: 3

Track assignments are:

track1= 18, 26, 2, 10, 20, 28, 4, 12, 22, 30, 6, 14, 24, 32, 8, 16

barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)	
* J130004+4802	12 57 50.103326	* 13 00 04.880000	13 00 52.088222	0.00
	48 18 13.88001	* 48 02 05.00000	47 56 06.03726	0.00
* J130117+4803	12 59 03.182910	* 13 01 17.560000	13 02 04.616800	0.00
	48 19 45.51509	* 48 03 38.00000	47 57 39.56803	0.00
* J130149+4740	12 59 35.147145	* 13 01 49.620000	13 02 36.716044	0.00
	47 56 33.40839	* 47 40 26.50000	47 34 28.39221	0.00
* J130150+3702	12 59 30.464089	* 13 01 50.970000	13 02 40.421535	0.00
	37 18 58.88287	* 37 02 51.90000	36 56 56.40307	0.00
* J130155+4741	12 59 40.662427	* 13 01 55.090000	13 02 42.168710	0.00
	47 58 03.00343	* 47 41 56.20000	47 35 58.12785	0.00
* J130211+3657	12 59 50.732902	* 13 02 11.210000	13 03 00.650657	0.00
	37 13 36.69598	* 36 57 30.10000	36 51 34.77941	0.00
* J130303+3646	13 00 42.836612	* 13 03 03.220000	13 03 52.624964	0.00
	37 02 27.49180	* 36 46 21.90000	36 40 27.02428	0.00
* J130355+5106	13 01 44.337811	* 13 03 55.580000	13 04 41.426821	0.00
	51 22 13.32120	* 51 06 08.90000	51 00 11.03116	0.00

* J130357+3652	13 01 36.918571 37 08 48.93497	* 13 03 57.060000 * 36 52 44.40000	13 04 46.371402 36 46 49.90967	0.00 0.00
* J130524+3655	13 03 04.236931 37 11 20.89725	* 13 05 24.050000 * 36 55 18.10000	13 06 13.234685 36 49 24.27857	0.00 0.00
* J130527+3635	13 03 07.742568 36 51 29.72646	* 13 05 27.710000 * 36 35 27.00000	13 06 16.954850 36 29 33.29679	0.00 0.00
* J130528+3655	13 03 09.063731 37 11 19.60006	* 13 05 28.860000 * 36 55 16.90000	13 06 18.038208 36 49 23.11670	0.00 0.00
* J130620+3630	13 04 00.185215 36 46 49.26316	* 13 06 20.010000 * 36 30 47.60000	13 07 09.199928 36 24 54.33398	0.00 0.00
* J130623+3643	13 04 03.363915 36 59 30.89842	* 13 06 23.070000 * 36 43 29.30000	13 07 12.213778 36 37 36.00129	0.00 0.00
* J130624+3642	13 04 04.528090 36 58 21.17463	* 13 06 24.240000 * 36 42 19.60000	13 07 13.386057 36 36 26.31589	0.00 0.00
* J130959+3039	13 07 37.585445 30 55 19.20260	* 13 09 59.580000 * 30 39 22.10000	13 10 49.612857 30 33 32.29036	0.00 0.00
* J131011+3024	13 07 49.130759 30 40 20.05373	* 13 10 11.210000 * 30 24 23.20000	13 11 01.275570 30 18 33.56166	0.00 0.00
* J132159+3219	13 19 40.884967 32 34 44.02625	* 13 21 59.980000 * 32 19 03.80000	13 22 48.883452 32 13 20.03868	0.00 0.00
* J132411+4753	13 22 04.234433 48 08 55.35325	* 13 24 11.660000 * 47 53 18.70000	13 24 56.087191 47 47 32.30168	0.00 0.00
* J132612+5211	13 24 09.661945 52 26 52.72407	* 13 26 12.020000 * 52 11 19.30000	13 26 54.511841 52 05 33.23413	0.00 0.00
* J133606+2057	13 33 43.468731 21 13 04.75667	* 13 36 06.870000 * 20 57 47.50000	13 36 57.388522 20 52 16.05029	0.00 0.00
* J133612+2051	13 33 49.388283 21 06 19.78284	* 13 36 12.840000 * 20 51 02.70000	13 37 03.377389 20 45 31.35311	0.00 0.00
* J134750+5125	13 45 54.455241 51 40 27.15524	* 13 47 50.400000 * 51 25 32.30000	13 48 30.480207 51 20 01.17033	0.00 0.00
* J134820+5141	13 46 25.263296 51 56 16.35158	* 13 48 20.680000 * 51 41 22.50000	13 49 00.560546 51 35 51.69939	0.00 0.00
* J134826+5135	13 46 30.705712 51 50 15.47096	* 13 48 26.230000 * 51 35 21.80000	13 49 06.151349 51 29 51.08874	0.00 0.00
* J135154+2850	13 49 37.838449 29 04 56.55982	* 13 51 54.430000 * 28 50 09.40000	13 52 42.324759 28 44 46.93110	0.00 0.00
* J135304+6944	13 51 57.023394 69 59 14.95529	* 13 53 04.900000 * 69 44 31.50000	13 53 26.900518 69 39 01.70283	0.00 0.00
* J180334+2445	18 01 31.489782 24 45 00.19818	* 18 03 34.480000 * 24 45 11.40000	18 04 16.732045 24 45 21.22318	0.00 0.00
* J180335+2456	18 01 32.864750 24 56 14.00750	* 18 03 35.590000 * 24 56 25.30000	18 04 17.745545 24 56 35.14160	0.00 0.00
* J180849+3520	18 07 03.422180	* 18 08 49.870000	18 09 26.069290	0.00

	35 20 06.71437	* 35 20 41.50000	35 20 59.19133	0.00
* J181450+2426	18 12 47.431157	* 18 14 50.930000	18 15 33.362687	0.00
	24 25 13.46242	* 24 26 13.90000	24 26 41.66205	0.00
* J182400+3449	18 22 12.437454	* 18 24 00.000000	18 24 36.609844	0.00
	34 48 17.90431	* 34 49 58.80000	34 50 40.78188	0.00
* J182450+3454	18 23 03.220678	* 18 24 50.670000	18 25 27.238524	0.00
	34 52 49.52766	* 34 54 34.10000	34 55 17.42676	0.00
* J185023+2631	18 48 22.720128	* 18 50 23.970000	18 51 05.592506	0.00
	26 28 16.98400	* 26 31 51.30000	26 33 14.91891	0.00
* J185739+3623	18 55 53.115227	* 18 57 39.240000	18 58 15.344769	0.00
	36 19 04.48432	* 36 23 10.20000	36 24 45.22825	0.00
* J185915+3625	18 57 28.866251	* 18 59 15.020000	18 59 51.137160	0.00
	36 20 57.22565	* 36 25 09.70000	36 26 47.20420	0.00
* J185930+3707	18 57 45.924782	* 18 59 30.850000	19 00 06.516716	0.00
	37 03 25.36670	* 37 07 39.00000	37 09 16.92972	0.00
* J185949+3651	18 58 03.948115	* 18 59 49.370000	19 00 25.219327	0.00
	36 47 06.77881	* 36 51 21.70000	36 53 00.10132	0.00
* J190013+3701	18 58 28.771804	* 19 00 13.910000	19 00 49.655701	0.00
	36 57 32.14010	* 37 01 48.80000	37 03 27.83884	0.00
* J193419+6001	19 33 31.822323	* 19 34 19.620000	19 34 34.143543	0.00
	59 54 58.13090	* 60 01 37.40000	60 04 09.27221	0.00
* J201737+7902	20 19 45.173646	* 20 17 37.570000	20 16 45.298600	0.00
	78 52 31.20084	* 79 02 01.20000	79 05 35.21194	0.00
* J201749+7902	20 19 57.367257	* 20 17 49.530000	20 16 57.166480	0.00
	78 53 26.57743	* 79 02 57.30000	79 06 31.58079	0.00
3C345	16 41 17.606228	* 16 42 58.809966	16 43 33.147624	0.76
* J1642+3948	39 54 10.81496	* 39 48 36.99402	39 46 38.19771	0.52
1641+399	/Users/mgirolet/sched/catalogs/sources.gsfc			
J1642+39	GSFC 2015a astro solution, unpublished 53430 observations.			
2007+777	20 07 20.430197	* 20 05 30.998526	20 04 45.827120	0.03
* J2005+7752	77 43 58.12302	* 77 52 43.24755	77 56 00.63996	0.01
J2005+77	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 15597 observations.			
3C454.3	22 51 29.519738	* 22 53 57.747938	22 54 49.931506	0.67
* J2253+1608	15 52 54.34810	* 16 08 53.56093	16 14 40.75609	0.70
2251+158	/Users/mgirolet/sched/catalogs/sources.gsfc			
J2253+16	GSFC 2015a astro solution, unpublished 40748 observations.			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
J130004+4802	106.7
J130117+4803	106.5
J130149+4740	106.3

J130150+3702	103.1
J130155+4741	106.3
J130211+3657	103.0
J130303+3646	102.8
J130355+5106	106.9
J130357+3652	102.6
J130524+3655	102.4
J130527+3635	102.3
J130528+3655	102.4
J130620+3630	102.1
J130623+3643	102.1
J130624+3642	102.1
J130959+3039	99.3
J131011+3024	99.2
J132159+3219	97.6
J132411+4753	102.8
J132612+5211	103.9
J133606+2057	90.2
J133612+2051	90.1
J134750+5125	100.5
J134820+5141	100.6
J134826+5135	100.5
J135154+2850	90.3
J135304+6944	106.8
J180334+2445	49.4
J180335+2456	49.6
J180849+3520	59.3
J181450+2426	48.4
J182400+3449	58.2
J182450+3454	58.2
J185023+2631	49.3
J185739+3623	59.1
J185915+3625	59.1
J185930+3707	59.9
J185949+3651	59.6
J190013+3701	59.8
J193419+6001	83.1
J201737+7902	102.3
J201749+7902	102.4
J1642+3948	70.2
J2005+7752	101.1
J2253+1608	69.2

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

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