

COVER INFORMATION

Station: NOEMA (Code Nn )  
Experiment: Fringe test GMVA Oct. 2022  
Exp. Code: f222a

Schedule Version: 2.00  
Processed by SCHED version: 11.80 Release 11.8; September 2022

PI: Global mm-VLBI Array (GMVA)

Address: Max-Planck-Institut fuer Radioastronomie  
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Observing mode: 4096-8-2

Notes: must use SCHED 11.6 or 11.8  
VLBA at 86+43 GHz

Reference: A10 our N05

Comparison A09 our N17

8 antennas phased (A1 removed)

Caution: we were on the synthesizer  
R&S SMA 100A until Sun 9 Oct 2022

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Schedule for NOEMA (Code Nn )  
Fringe test GMVA Oct. 2022

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 LST EL AZ HA UP ParA Dwell Early Disk TPStart  
Stop UT gBytes SYNC

--- Thu 6 Oct 2022 Day 279 ---

Next scan frequencies: 86012.00 86012.00  
Next BBC frequencies: 512.00 512.00  
Next scan bandwidths: 512.00 512.00

12 00 00	3C345	13 24 09	53.3	79.7	-3.3	-65.6	0	12 00 00	0	12 00 00
12 05 00	---	13 29 10	54.2	80.3	-3.2	-65.9	300	155	12 00 01	155
12 15 00	3C345	13 39 12	55.9	81.7	-3.1	-66.4	580	185	12 15 00	185
12 20 00	---	13 44 13	56.8	82.4	-3.0	-66.6	300	309	12 15 01	309
12 30 00	3C345	13 54 14	58.6	83.8	-2.8	-67.0	580	309	12 30 00	309
12 35 00	---	13 59 15	59.5	84.5	-2.7	-67.2	300	464	12 30 01	464
12 45 00	3C345	14 09 17	61.3	86.0	-2.6	-67.5	580	464	12 45 00	464
12 50 00	---	14 14 18	62.2	86.8	-2.5	-67.6	300	618	12 45 01	618
13 00 00	3C345	14 24 19	63.9	88.4	-2.3	-67.7	580	618	13 00 00	618
13 05 00	---	14 29 20	64.8	89.3	-2.2	-67.8	300	773	13 00 01	773
13 15 00	3C345	14 39 22	66.6	91.0	-2.1	-67.8	580	927	13 15 00	927
13 20 00	---	14 44 23	67.5	92.0	-2.0	-67.7	300	927	13 15 01	927
13 30 00	3C345	14 54 24	69.3	94.0	-1.8	-67.5	580	1082	13 30 00	1082
13 35 00	---	14 59 25	70.2	95.0	-1.7	-67.3	300	1082	13 30 01	1082
13 45 00	3C345	15 09 27	71.9	97.4	-1.6	-66.7	580	1082	13 45 00	1082
13 50 00	---	15 14 28	72.8	98.6	-1.5	-66.3	300	1237	13 45 01	1237
14 00 00	3C345	15 24 29	74.6	101.5	-1.3	-65.1	580	1237	14 00 00	1237
14 05 00	---	15 29 30	75.5	103.0	-1.2	-64.4	300	1391	14 00 01	1391
14 15 00	3C345	15 39 32	77.2	106.7	-1.1	-62.5	580	1391	14 15 00	1391
14 20 00	---	15 44 32	78.0	108.8	-1.0	-61.2	300	1546	14 15 01	1546
14 30 00	3C345	15 54 34	79.7	113.9	-0.8	-57.9	580	1546	14 30 00	1546
14 35 00	---	15 59 35	80.5	116.9	-0.7	-55.6	300	1700	14 30 01	1700
14 45 00	3C345	16 09 37	82.0	124.6	-0.6	-49.6	580	1700	14 45 00	1700
14 50 00	---	16 14 37	82.7	129.6	-0.5	-45.5	300	1855	14 45 01	1855
15 05 00	BLLAC	16 29 40	32.2	420.2	-5.6	-56.7	591	2010	15 05 00	2010
15 10 00	---	16 34 41	33.0	420.8	-5.5	-57.2	300	2010	15 05 01	2010
15 15 00	BLLAC	16 39 42	33.8	421.4	-5.4	-57.7	280	2010	15 15 00	2010
15 20 00	---	16 44 42	34.6	421.9	-5.3	-58.2	300	2164	15 15 01	2164

Top 3k, phase mark  
P=0.7  
-0.8

Condition unstable,  
drops  
Top 95%  
p=0.4

17:00 cut

1641+399 39 54 10.81489 \* 39 48 36.99396 39 46 18.24177 0.03  
 J164258.8+39 /aux/vlb056a/p459kri/sched-11.8tst/catalogs/sources.vlba  
 \* 3C345 ICRF3 X/S astro solution, 49912 observations.

22 00 39.362504 \* 22 02 43.291371 22 03 39.995318 0.01  
 VR422201 J2202+4216 /aux/vlb056a/p459kri/sched-11.8tst/catalogs/sources.gsfc  
 \* BLLAC 42 02 08.59075 \* 42 16 39.97988 42 23 25.18819 0.00  
 2200+420 GSPC 2016a X/S astro solution, 52189 observations.  
 JZ202+42

SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE

Scan hours are for recording scans only.  
 Baseline hours are only counted for scans above horizon at both ends.  
 Setup file Frequency sets Observing hours  
 Source (duplicates not shown) Scan Baseline  
 3C345 86ghz.set 1 3 4 5 6 1.000 15.000  
 BLLAC 86ghz.set 1 3 4 5 6 0.667 10.000

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)  
 3C345 70.2  
 BLLAC 127.9

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 60deg F\*(-0.6) where F is in GHz.  
 For common VLBI bands, this is:  
 327 MHz 117. deg  
 610 MHz 81. deg  
 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  
 43.0 GHz 6. deg

Schedule for NOEMA (Code Nn ) Page 3  
 Fringe test GMVA Oct. 2022  
 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.

Stop UT	Source	LST	Start / Stop	Early Dwell	Disk GBytes	TPStart SYNC
---	Thu	6 Oct 2022	Day 279 ---	---	---	---
15 30 00	BLLAC	16 54 44	36.1 423.1 -5.1	580	2164	15 30 00
15 35 00	---	16 59 45	36.9 423.7 -5.1	300	2319	15 30 01
15 45 00	BLLAC	17 09 46	38.5 424.9 -4.9	580	2319	15 45 00
15 50 00	---	17 14 47	39.4 425.4 -4.8	300	2473	15 45 01
16 00 00	BLLAC	17 24 49	41.0 426.6 -4.6	580	2473	16 00 00
16 05 00	---	17 29 50	41.8 427.2 -4.6	300	2628	16 00 01
16 15 00	BLLAC	17 39 51	43.5 428.3 -4.4	580	2628	16 15 00
16 20 00	---	17 44 52	44.3 428.9 -4.3	300	2782	16 15 01
16 30 00	BLLAC	17 54 54	46.0 430.0 -4.1	580	2782	16 30 00
16 35 00	---	17 59 55	46.8 430.6 -4.1	300	2937	16 30 01
16 45 00	BLLAC	18 09 56	48.5 431.7 -3.9	580	2937	16 45 00
16 50 00	---	18 14 57	49.3 432.3 -3.8	300	3092	16 45 01

SETUP FILE INFORMATION:

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

==== Setup file: 86ghz.set  
 Matching groups in 3mrfreq\_RDBE.dat:  
 noema\_3mm from Dec. 2020: uses R2DBE with 8Gbps

Setup group: 6 Station: NOEMA Total bit rate: 4096  
 Format: VDFIF Bits per sample: 2 Sample rate: \*\*\*\*\*  
 Number of channels: 2 DBE type: Speedup factor: 1.00

Disk used to record data.

1st LO= 85500.00 85500.00  
 Net SB= U  
 IF SB= U  
 Pol. = RCP LCP  
 BBC = 1 2  
 BBC SB= U U  
 IF = A1 B3

The following frequency sets based on these setups were used.  
 Frequency Set: 5 Setup file default. Used with PCAL = off  
 LO sum= 86012.00 86012.00  
 BBC fr= 512.00 512.00  
 Bandwd= 512.00 512.00  
 Matching frequency sets: 5

Track assignments are:  
 track1= 1, 2  
 barrel=roll\_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	(B1950)	Source position (RA/Dec)	(Date)	Error (mas)
J1642+3948	16 41 17.606233	* 16 42 58.809970	16 43 43.578088	0.04

COVER INFORMATION

Station: NOEMA (Code Nn )  
 Experiment: GMVA Oct. 2022  
 Exp. Code: c222a

Schedule Version: 6.00  
 Processed by SCHED version: 11.80 Release 11.8; September 2022

PI: Global mm-VLBI Array (GMVA)

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Observing mode: 4096-8-2

Notes: must use SCHED 11.6 or 11.8  
 VLBA at 86+43 GHz

Schedule for NOEMA (Code Nn )

GMVA Oct. 2022  
 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	LST	AZ	HA	UP	Para	Early Dwell	Disk GBytes	TPStart SYNC
---	Thu	6 Oct 2022	Day	279	---				
Next scan frequencies:	86012.00	86012.00							
Next BBC frequencies:	512.00	512.00							
Next scan bandwidths:	512.00	512.00							
17 00 00	BLLAC	18 24 59	51.0	73.4	-3.6	-67.4	0	0	17 00 00
17 03 00	---	18 27 59	51.6	73.7	-3.6	-67.7	180	93	17 00 01
17 05 30	CYG_A	18 30 30	73.1	95.3	-1.5	-69.4	87	93	17 05 30
17 11 30	---	18 36 31	74.2	96.7	-1.4	-69.0	360	278	17 05 31
17 15 00	CYG_A	18 40 01	74.8	97.6	-1.3	-68.7	190	278	17 15 00
17 22 20	---	18 47 22	76.1	99.6	-1.2	-67.9	440	505	17 15 01
17 30 00	BLLAC	18 55 04	56.2	76.8	-3.1	-69.7	398	505	17 30 00
17 33 00	---	18 58 04	56.7	77.2	-3.1	-70.0	180	598	17 30 01
17 35 50	CYG_A	19 00 55	78.5	104.2	-1.0	-65.7	107	598	17 35 50
17 43 10	---	19 08 16	79.7	107.4	-0.9	-63.8	440	824	17 35 51
17 45 00	CYG_A	19 10 06	80.0	108.2	-0.8	-63.2	90	824	17 45 00
17 52 20	---	19 17 27	81.3	112.3	-0.7	-60.4	440	1051	17 45 01
18 00 00	BLLAC	19 25 09	61.5	80.3	-2.6	-71.8	398	1051	18 00 00
18 03 00	---	19 28 09	62.0	80.7	-2.6	-72.0	180	1144	18 00 01
18 06 20	CYG_A	19 31 30	83.5	123.5	-0.5	-51.6	138	1144	18 06 20
18 13 40	---	19 38 51	84.5	132.4	-0.4	-43.9	440	1371	18 06 21
18 15 00	CYG_A	19 40 11	84.7	134.4	-0.3	-42.2	60	1371	18 15 00
18 21 00	---	19 46 12	85.4	144.8	-0.2	-32.8	360	1556	18 15 01
18 30 00	K3-50A	19 55 14	78.9	172.0	-0.1	-6.9	502	1556	Stopped
18 30 15	---	19 55 29	78.9	172.2	-0.1	-6.6	15	1556	
18 33 35	CYG_A	19 58 49	86.2	175.9	-0.0	-3.8	166	1556	18 33 35
18 40 55	---	20 06 10	86.0	196.3	0.1	15.3	440	1783	18 33 36
18 45 00	CYG_A	20 10 16	85.7	206.5	0.2	24.8	225	1783	18 45 00
18 52 20	---	20 17 37	85.0	221.3	0.3	38.3	440	2010	18 45 01
19 00 00	2023+335	20 25 18	79.2	179.2	-0.0	-0.7	390	2010	19 00 00
19 03 00	---	20 28 19	79.2	182.5	0.0	2.1	180	2102	19 00 01
19 06 20	CYG_A	20 31 40	83.1	239.1	0.5	53.8	126	2102	19 06 20
19 13 40	---	20 39 01	81.9	245.0	0.6	58.5	440	2329	19 06 21

Phases stable, Top 80k

Top 80k

p=0.95

p=0.97

Schedule for NOEMA (Code Nn )

Page 3

GMVA Oct. 2022
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Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Table with columns: Stop UT, Source, LST, Day, Start/Stop (EL/AZ), HA, UP, Para, Dwell, Early, Disk, GBytes, TFStart, SYNC. Includes handwritten checkmarks and notes like 'V Imp 300' and 'VP=0.8'.

Schedule for NOEMA (Code Nn )

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GMVA Oct. 2022
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.

Table with columns: Stop UT, Source, LST, Day, Start/Stop (EL/AZ), HA, UP, Para, Dwell, Early, Disk, GBytes, TFStart, SYNC. Includes handwritten notes like 'Passage Nuageux' and 'Scan 1 passage KZ plus box'.

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Schedule for NOEMA (Code Nn ) Page 6  
 GMVA Oct. 2022  
 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 IO sum (band edge).  
 SYNC: Time correlator is expected to sync up.

Start UT	Source	LST	Start / Stop EL AZ	HA	UP	Para	Early Dwell	Disk GBytes	TPStart SYNC
05 20 00	3C111	06 47 00	61.9 269.5	2.5		64.7	682	10553	05 20 00
05 28 00	---	06 55 02	60.5 270.9	2.6		64.7	480	10800	05 20 01
05 40 00	3C111	07 07 04	58.3 272.9	2.8		64.5	700	10800	05 40 00
05 48 00	---	07 15 05	56.9 274.2	2.9		64.4	480	11048	05 40 01
06 00 00	3C84	07 27 07	46.1 288.6	4.1		64.4	682	11048	06 00 00
06 08 00	---	07 35 08	44.8 289.6	4.2		63.7	480	11295	06 00 01
06 20 00	3C111	07 47 10	51.2 278.9	3.5		63.3	683	11295	06 20 00
06 28 00	---	07 55 11	49.8 280.0	3.6		62.9	480	11542	06 20 01
06 40 00	3C111	08 07 13	47.7 281.7	3.8		62.3	700	11542	06 40 00
06 48 00	---	08 15 15	46.3 282.8	3.9		61.8	480	11790	06 40 01
07 00 00	3C84	08 27 17	36.2 295.7	5.1		59.0	684	11790	07 00 00
07 08 00	---	08 35 18	34.9 296.6	5.2		58.3	480	12037	07 00 01
07 20 00	3C111	08 47 20	40.8 287.0	4.5		59.8	684	12037	07 20 00
07 28 00	---	08 55 21	39.4 288.1	4.6		59.3	480	12284	07 20 01
07 40 00	3C111	09 07 23	37.4 289.6	4.8		58.4	700	12284	07 40 00
07 48 00	---	09 15 25	36.1 290.7	4.9		57.8	480	12532	07 40 01
08 00 00	3C84	09 27 27	26.9 303.1	6.1		52.9	685	12532	08 00 00
08 08 00	---	09 35 28	25.7 304.1	6.2		52.0	480	12779	08 00 01
08 20 00	3C111	09 47 30	30.8 294.9	5.5		55.1	686	12779	08 20 00
08 28 00	---	09 55 31	29.5 295.9	5.6		54.4	480	13026	08 20 01
08 40 00	3C111	10 07 33	27.6 297.5	5.8		53.3	700	13026	08 40 00
08 48 00	---	10 15 34	26.3 298.6	5.9		52.6	480	13274	08 40 01
09 00 00	3C84	10 27 36	18.3 311.0	7.1		45.9	687	13274	09 00 00
09 08 00	---	10 35 38	17.3 312.1	7.2		44.9	480	13521	09 00 01
09 20 00	3C111	10 47 40	21.4 302.9	6.5		49.4	688	13521	09 20 00
09 28 00	---	10 55 41	20.3 304.0	6.6		48.5	480	13768	09 20 01
09 40 00	3C111	11 07 43	18.5 305.7	6.8		47.2	700	13768	09 40 00
09 48 00	---	11 15 44	17.3 306.8	6.9		46.3	480	14016	09 40 01
10 00 00	3C111	11 27 46	15.7 308.6	7.1		45.0	700	14016	10 00 00
10 08 00	---	11 35 48	14.5 309.7	7.3		44.0	480	14263	10 00 01

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

==== Setup file: 86ghz.set  
 Matching groups in 3mmfreq\_RDBE.dat:  
 noema\_3mm from Dec. 2020: uses R2DBE with 8Gbps

Setup group: 15 Station: NOEMA  
 Format: VDFIF Bits per sample: 2  
 Number of channels: 2 DBE type:  
 Total bit rate: 4096  
 Sample rate: \*\*\*\*\*  
 Speedup factor: 1.00

Disk used to record data.

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Schedule for NOEMA (Code Nn ) Page 5  
 GMVA Oct. 2022  
 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 IO sum (band edge).  
 SYNC: Time correlator is expected to sync up.

Start UT	Source	LST	Start / Stop EL AZ	HA	UP	Para	Early Dwell	Disk GBytes	TPStart SYNC
01 20 00	CYG_A	02 46 21	20.6 307.6	6.8		48.1	460	7441	01 20 00
01 28 20	---	02 54 42	19.4 308.7	6.9		47.2	500	7698	01 20 01
01 40 00	CTA102	03 06 24	23.8 263.1	4.5		46.2	632	7698	01 40 00
01 43 00	---	03 09 25	23.3 263.7	4.6		46.3	180	7791	01 40 01
01 45 50	CYG_A	03 12 15	17.0 311.2	7.2		45.1	103	7791	01 45 50
01 51 50	---	03 18 16	16.2 312.0	7.3		44.3	360	7976	01 45 51
02 00 00	CYG_A	03 26 27	15.1 313.2	7.4		43.3	470	7976	02 00 00
02 08 00	---	03 34 29	14.1 314.3	7.6		42.3	480	8224	02 00 01
02 20 00	CTA102	03 46 31	16.7 270.3	5.2		46.6	654	8224	02 20 00
02 23 00	---	03 49 31	16.1 270.9	5.3		46.6	180	8317	02 20 01
02 25 50	CYG_A	03 52 22	11.9 316.9	7.9		39.9	104	8317	02 25 50
02 31 50	---	03 58 23	11.2 317.8	8.0		39.1	360	8502	02 25 51
02 45 00	3C111	04 11 35	83.3 165.9	-0.1		-12.7	602	8502	02 45 00
02 50 00	---	04 16 36	83.4 174.4	-0.1		-5.1	300	8657	02 45 01
03 00 00	3C84	04 26 37	77.7 261.4	1.1		70.2	496	8657	03 00 00
03 07 20	---	04 33 59	76.4 263.4	1.2		71.0	440	8883	03 00 01
03 15 00	3C111	04 41 40	82.3 213.8	0.4		30.2	381	8883	03 15 00
03 22 20	---	04 49 01	81.5 222.3	0.5		37.5	440	9110	03 15 01
03 30 00	3C84	04 56 42	72.4 268.4	1.6		72.0	395	9110	03 30 00
03 37 20	---	05 04 03	71.1 269.8	1.7		72.1	440	9337	03 30 01
03 45 00	3C111	05 11 45	78.3 240.5	0.9		51.9	406	9337	03 45 00
03 52 20	---	05 19 06	77.1 244.5	1.0		54.7	440	9564	03 45 01
04 00 00	3C84	05 26 47	67.0 273.5	2.1		71.8	412	9564	04 00 00
04 08 00	---	05 34 49	65.6 274.7	2.2		71.5	480	9811	04 00 01
04 20 00	3C111	05 46 50	72.5 255.6	1.4		61.1	677	9811	04 20 00
04 28 00	---	05 54 52	71.1 258.0	1.6		62.2	480	10058	04 20 01
04 40 00	3C111	06 06 54	69.0 261.2	1.8		63.3	700	10058	04 40 00
04 48 00	---	06 14 55	67.6 263.1	1.9		63.8	480	10306	04 40 01
05 00 00	3C84	06 26 57	56.4 281.5	3.1		68.8	682	10306	05 00 00
05 08 00	---	06 34 58	55.0 282.5	3.2		68.3	480	10553	05 00 01

Data is recorded on recorder 2  
 Mark 6 - 4124

lst LO= 85500.00 85500.00  
 Net SB= U U  
 IF SB = U U  
 Pol. = RCP LCP  
 BBC = 1 2  
 BBC SB= U U  
 IF = AL B3

The following frequency sets based on these setups were used.

Frequency Set: 5 Setup file default. Used with PCAL = off  
 LO sum= 86012.00 86012.00  
 BBC fr= 512.00 512.00  
 Bandwd= 512.00 512.00  
 Matching frequency sets: 5

Track assignments are:  
 track1= 1, 2  
 barrel=roll\_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
* CYG_A	19 57 44.440891	* 19 59 28.356568	20 00 15.334074	0.00
	40 35 46.36341	* 40 44 02.09723	40 47 59.28590	0.00
	From catalog imbedded in main SCHED input file.			
J0319+4130	03 19 29.567282	* 03 19 48.160112	03 21 18.979790	0.08
J036+413	41 19 51.91651	* 41 30 42.10364	41 35 35.54226	0.08
J031948.1+41	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.vlba			
* 3C84	ICRF3 X/S astro solution, 9222 observations.			
J0854+2006	08 51 57.250618	* 08 54 48.874930	08 56 05.514131	0.03
0851+202	20 17 58.41737	* 20 06 30.64082	20 01 24.76495	0.03
J085448.8+20	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.vlba			
* 0J287	ICRF3 X/S astro solution, 302899 observations.			
J2015+3710	20 13 37.014501	* 20 15 28.729787	20 16 19.315951	0.10
* 2013+370	37 01 44.45886	* 37 10 59.51474	37 15 22.94676	0.12
J201528.7+37	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.vlba			
	ICRF3 X/S astro solution, 258 observations.			
J2025+3343	20 23 12.987104	* 20 25 10.842104	20 26 04.249433	0.14
* 2023+335	33 33 10.52772	* 33 43 00.21436	33 47 38.71263	0.12
J202510.8+33	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.vlba			
2023+336	ICRF3 X/S astro solution, 413 observations.			
J2232+1143	22 30 07.803943	* 22 32 36.408901	22 33 44.255041	0.03
2230+114	11 28 22.81078	* 11 43 50.90406	11 50 57.60906	0.04
J223236.4+11	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.vlba			
* CTA102	ICRF3 X/S astro solution, 9867 observations.			
0415+379	04 15 00.610259	* 04 18 21.277233	04 19 52.702495	0.08
J0418+3801	37 54 19.28073	* 38 01 35.80020	38 04 51.88231	0.08
* 3C111	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.gsfc			
J0418+38	GSFC 2016a X/S astro solution, 151 observations.			
VR422201	22 00 39.362504	* 22 02 43.291371	22 03 39.991051	0.01
J2202+4216	42 02 08.59075	* 42 16 39.97988	42 23 25.21895	0.00
* BLLAC	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.gsfc			
J2200+420	GSFC 2016a X/S astro solution, 52189 observations.			
J2202+42				

SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE

Scan hours are for recording scans only.  
 Baseline hours are only counted for scans above horizon at both ends.  
 Source Setup file Frequency sets (duplicates not shown)  
 Observing hours Scan Baseline

CYG\_A 86ghz.set 1 3 4 5 6 15 23 44 5.978 284.194  
 43ghz.set 26 1.700 65.950  
 3C84 86ghz.set 1 3 4 5 6 15 23 1.044 70.867  
 43ghz.set 26 0.333 13.200  
 0J287 86ghz.set 15 23 44 2.672 65.663  
 43ghz.set 26 0.600 19.333  
 2013+370 86ghz.set 15 23 44 0.750 7.850  
 2023+335 86ghz.set 1 3 4 5 6 15 23 0.450 34.067  
 CTA102 86ghz.set 1 3 4 5 6 15 23 0.400 25.000  
 3C111 43ghz.set 1 3 4 5 6 15 23 2.061 164.705  
 86ghz.set 26 0.867 32.199  
 BLLAC 43ghz.set 1 3 4 5 6 0.150 2.250

POSITIONS OF ADDITIONAL SOURCES USED ONLY IN NON-RECORDING SCANS

An unused dummy source of a scan that becomes a geodetic segment will show up here.

Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
* K3-50A	19 59 50.110404	* 20 01 45.719000	20 02 37.988375	0.00
	33 24 19.26775	* 33 32 43.31900	33 36 43.25584	0.00
	From catalog imbedded in main SCHED input file.			
* P-IKTAU	03 50 43.830602	* 03 53 28.936700	03 54 44.253155	0.00
SIO-IKTAU	11 15 30.70717	* 11 24 21.34540	11 28 28.16844	0.00
IKTAU	3msources.pointing			
	SEST vel., proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	31.54	31.54	31.54	
* P-TXCAM	04 56 41.340435	* 05 00 51.127000	05 02 44.810580	0.00
SIO-TXCAM	56 06 29.52902	* 56 10 53.98000	56 12 45.00341	0.00
TXCAM	3msources.pointing			
	Baudry pos.			
	Doppler based on LSR frame and radio definition. Velocities:			
	7.50	7.50	7.50	
* P-UORI	05 52 50.912342	* 05 55 49.190000	05 57 09.853798	0.00
SIO-UORI	20 10 05.94572	* 20 10 30.72000	20 10 45.86806	0.00
	3msources.pointing			
	Baudry pos/vel; weak.			
	Doppler based on LSR frame and radio definition. Velocities:			
	-35.41	-35.41	-35.41	
* P-RCNC	08 13 48.479951	* 08 16 33.826000	08 17 47.843912	0.00
SIO-RCNC	11 52 51.69436	* 11 43 34.32000	11 39 30.01442	0.00
	3msources.pointing			
	Baudry pos, sest vel			
	Doppler based on LSR frame and radio definition. Velocities:			
	14.62	14.62	14.62	
* P-RLEO	09 44 52.229491	* 09 47 33.500000	09 48 45.254912	0.00
SIO-RLEO	11 39 39.78254	* 11 25 43.68000	11 19 33.86008	0.00
RLEO	3msources.pointing			
	Baudry pos, sest vel.			
	Doppler based on LSR frame and radio definition. Velocities:			
	2.56	2.56	2.56	
* P-V11110PH	18 34 57.588944	* 18 37 19.260000	18 38 22.879184	0.00
V11110PH	10 23 04.79465	* 10 25 42.20000	10 27 00.57226	0.00
	3msources.pointing			
	new Yebeas catalog			
	Doppler based on LSR frame and radio definition. Velocities:			
	-32.00	-32.00	-32.00	
* P-RRACL	19 55 00.251893	* 19 57 36.031400	19 58 46.428374	0.00
	-02 01 19.43280	* -01 53 12.40120	-01 49 28.73391	0.00
	3msources.pointing			
	SEST vel., proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	30.00	30.00	30.00	
* P-RCAS	23 55 52.329330	* 23 58 25.065300	23 59 35.489410	0.00

```

RCAS          51 06 38.29079 * 51 23 20.10220 51 31 00.25442 0.00
SIO-RCAS     3msources.pointing
Also not in P-, but is used in startup pointing. prop. motion corrected po
sitition
Doppler based on ISR frame and radio definition. Velocities:
24.00 24.00 24.00 24.00

* DR21       20 37 14.100724 * 20 39 01.020000 20 39 49.578324 0.00
42 12 11.02637 * 42 22 48.80000 42 27 49.99337 0.00
3msources.pointing
Revised VLA position at 7mm from Araya+ 2009

* SATURN     21 22 38.341268 * 21 25 24.688098 21 26 40.345014 0.00
-16 44 49.06993 * -16 31 50.10793 -16 25 58.06790 0.00
Planet. Position is for scan 1, center Earth.
Doppler based on geocentric frame and radio definition. Velocities:
0.00 0.00
Planetary motion used. Ref. MJD: 59858.7083
Rates: RA = -0.61752E+01 s/day Dec = -0.28419E+02 arcsec/day
EPHFILE: /aux/vlb056a/p459kri/sched-11.8tst/PLANETDATA/JPLEPH.421
    
```

SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE

Scan hours are for recording scans only.  
 Baseline hours are only counted for scans above horizon at both ends.

Source	Setup file	Frequency sets	Observing hours	Scan Baseline
		(duplicates not shown)		

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)
K3-50A	108.0
CYG A	106.7
3C84	130.7
OJ287	63.0
2013+370	110.3
2023+335	112.8
CTA102	145.6
3C111	122.5
BLLAC	127.8
P-IKTAU	134.2
P-TXCAM	109.3
P-UORI	104.4
P-RCNC	70.0
P-RLEO	48.3
P-VII11OPH	88.0
P-RRACL	106.7
P-RCAS	132.7
DR21	113.6
SATURN	125.0

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLEBA baselines at a solar distance of 60deg F<sup>-1</sup>(-0.6) where F is in GHz.

For common VLEBA bands, this is:

327 MHz	117. deg
610 MHz	81. deg
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
43.0 GHz	6. deg





COVER INFORMATION

Station: NOEMA (Code Nn )
Experiment: GMVA Oct. 2022
Exp. Code: c222b

Schedule Version: 6.00
Processed by SCHED version: 11.80 Release 11.8; September 2022

PI: Global mm-VLBI Array (GMVA)
Address: Max-Planck-Institut fuer Radioastronomie
Auf dem Huegel 69
53121 Bonn
Germany

Phone: 0049-228-525-295
EMAIL: tkriechbaum@mpi-fr-bonn.mpg.de
Fax: 0049-2257-301-106
Phone during observation: 0049-2257-301-155

Observing mode: 4096-8-2

Notes: must use SCHED 11.6 or 11.8
VLBA at 86+43 GHz

Schedule for NOEMA (Code Nn )

GMVA Oct. 2022

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.
IFStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source LST EL AZ HA UP PARA Dwell Early Disk IFStart
Stop UT Source LST EL AZ HA UP PARA Dwell Early Disk IFStart
SYNC

--- Fri 7 Oct 2022 Day 280 ---

Next scan frequencies: 86012.00 86012.00
Next BBC frequencies: 512.00 512.00
Next scan bandwidths: 512.00 512.00

Table with columns: Start UT, Source, LST, EL, AZ, HA, UP, PARA, Dwell, Early, Disk, IFStart, SYNC. Contains multiple rows of observation data with handwritten checkmarks and notes like 'Phases instable' and 'Phases improve'.

c222bsch.nn

Oct 03, 22 11:36

Schedule for NOEMA (Code Nn )

Page 4

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.

Table with columns: Start UT, Stop UT, Source, LST, Day, EL, AZ, HA, UP, Para, Dwell, Early, Disk, TPStart, SYNC. Includes handwritten notes like '90k Top' and 'P=0.98'.

Handwritten note: P = 0.98 Top = 1004

Handwritten note: (Manual Cloudout override)

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Oct 03, 22 11:36

Schedule for NOEMA (Code Nn )

Page 3

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.

Table with columns: Start UT, Stop UT, Source, LST, Day, EL, AZ, HA, UP, Para, Dwell, Early, Disk, TPStart, SYNC. Includes handwritten notes like 'Phase excellent' and 'P=0.98'.

Handwritten note: P = 0.98

Handwritten note: Top = 1004

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Schedule for NOEMA (Code Nn) GMVA Oct. 2022 Page 6

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	LST	Start / Stop EL AZ	HA	UP	Para	Early Dwell	Disk GBytes	TPStart SYNC
--- Sat 8 Oct 2022 Day 281 ---									
00 45 00	BLLAC	02 15 12	45.5 290.3	4.2		64.6	520	11934	00 45 00
00 51 00	---	02 21 13	44.5 291.0	4.3		64.1	360	12119	00 45 01
01 00 00	CTA102	02 30 14	30.1 256.2	3.9		44.9	483	12119	01 00 00
01 06 00	---	02 36 15	29.1 257.4	4.0		45.2	360	12305	01 00 01
01 15 00	BLLAC	02 45 17	40.5 293.7	4.7		61.9	485	12305	01 15 00
01 21 00	---	02 51 18	39.6 294.4	4.8		61.3	360	12490	01 15 01
01 30 00	BLLAC	03 00 19	38.1 295.5	4.9		60.5	520	12490	01 30 00
01 36 00	---	03 06 20	37.1 296.1	5.0		59.9	360	12676	01 30 01
01 45 00	BLLAC	03 15 22	35.7 297.2	5.2		59.0	520	12676	01 45 00
01 51 00	---	03 21 23	34.8 297.9	5.3		58.4	360	12861	01 45 01
02 00 00	CTA102	03 30 24	19.5 267.5	4.9		46.6	488	12861	02 00 00
02 06 00	---	03 36 25	18.5 268.5	5.0		46.6	360	13047	02 00 01
02 15 00	BLLAC	03 45 26	31.0 300.8	5.7		55.9	489	13047	02 15 00
02 21 00	---	03 51 27	30.1 301.5	5.8		55.2	360	13232	02 15 01
02 30 00	BLLAC	04 00 29	28.7 302.6	5.9		54.3	520	13232	02 30 00
02 36 00	---	04 06 30	27.9 303.4	6.0		53.6	360	13418	02 30 01
02 45 00	BLLAC	04 15 31	26.5 304.5	6.2		52.6	520	13418	02 45 00
02 51 00	---	04 21 32	25.6 305.2	6.3		51.9	360	13603	02 45 01
03 00 00	BLLAC	04 30 34	24.3 306.4	6.4		50.9	520	13603	03 00 00
03 06 00	---	04 36 35	23.5 307.2	6.5		50.2	360	13789	03 00 01
03 15 00	BLLAC	04 45 36	22.2 308.3	6.7		49.1	520	13789	03 15 00
03 21 00	---	04 51 37	21.4 309.1	6.8		48.4	360	13974	03 15 01
03 30 00	BLLAC	05 00 39	20.1 310.3	6.9		47.3	520	13974	03 30 00
03 36 00	---	05 06 40	19.3 311.1	7.0		46.5	360	14160	03 30 01
03 45 00	BLLAC	05 15 41	18.1 312.3	7.2		45.4	520	14160	03 45 00
03 51 00	---	05 21 42	17.3 313.2	7.3		44.6	360	14345	03 45 01
04 00 00	BLLAC	05 30 44	16.2 314.4	7.5		43.5	520	14345	04 00 00
04 06 00	---	05 36 45	15.4 315.3	7.6		42.7	360	14531	04 00 01
04 15 00	BLLAC	05 45 46	14.3 316.5	7.7		41.5	520	14531	04 15 00
04 21 00	---	05 51 47	13.6 317.4	7.8		40.7	360	14716	04 15 01

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Schedule for NOEMA (Code Nn) GMVA Oct. 2022 Page 5

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	LST	Start / Stop EL AZ	HA	UP	Para	Early Dwell	Disk GBytes	TPStart SYNC
--- Fri 7 Oct 2022 Day 280 ---									
21 15 01	BLLAC	22 44 38	82.2 256.8	0.7		69.7	368	9254	21 15 01
21 22 21	---	22 51 59	81.0 259.9	0.8		71.5	440	9481	21 15 02
21 30 01	BLLAC	22 59 41	79.6 262.4	0.9		72.8	440	9481	21 30 01
21 37 21	---	23 07 02	78.3 264.5	1.1		73.5	440	9708	21 30 02
21 45 01	BLLAC	23 14 43	77.0 266.3	1.2		74.1	440	9708	21 45 01
21 51 01	---	23 20 44	75.9 267.6	1.3		74.3	360	9893	21 45 02
22 00 00	BLLAC	23 29 45	74.3 269.4	1.4		74.5	519	9893	22 00 00
22 06 00	---	23 35 46	73.2 270.4	1.5		74.5	360	10079	22 00 01
22 15 00	BLLAC	23 44 47	71.6 271.9	1.7		74.4	520	10079	22 15 00
22 21 00	---	23 50 48	70.5 272.8	1.8		74.2	360	10264	22 15 01
22 30 00	BLLAC	23 59 50	68.9 274.2	1.9		73.9	520	10264	22 30 00
22 36 00	---	00 05 51	67.9 275.0	2.0		73.7	360	10450	22 30 01
22 45 00	BLLAC	00 14 52	66.3 276.2	2.2		73.3	520	10450	22 45 00
22 51 00	---	00 20 53	65.2 277.0	2.3		73.0	360	10635	22 45 01
23 00 00	BLLAC	00 29 54	63.6 278.1	2.4		72.5	520	10635	23 00 00
23 06 00	---	00 35 55	62.6 278.9	2.5		72.2	360	10821	23 00 01
23 15 00	BLLAC	00 44 57	61.0 280.0	2.7		71.6	520	10821	23 15 00
23 21 00	---	00 50 58	59.9 280.7	2.8		71.2	360	11006	23 15 01
23 30 00	BLLAC	00 59 59	58.3 281.8	2.9		70.6	520	11006	23 30 00
23 36 00	---	01 06 00	57.3 282.5	3.0		70.2	360	11192	23 30 01
23 45 00	BLLAC	01 15 02	55.7 283.5	3.2		69.5	520	11192	23 45 00
23 51 00	---	01 21 03	54.7 284.2	3.3		69.1	360	11377	23 45 01
--- Sat 8 Oct 2022 Day 281 ---									
00 00 01	CTA102	01 30 05	40.1 242.9	2.9		40.4	478	11377	00 00 01
00 06 01	---	01 36 06	39.2 244.4	3.0		41.0	360	11563	00 00 02
00 15 00	BLLAC	01 45 07	50.6 286.9	3.7		67.2	477	11563	00 15 00
00 21 00	---	01 51 08	49.5 287.6	3.8		66.7	360	11748	00 15 01
00 30 00	BLLAC	02 00 09	48.0 288.6	3.9		65.9	520	11748	00 30 00
00 36 00	---	02 06 10	47.0 289.3	4.0		65.4	360	11934	00 30 01

*Change ment Fichier 07 oct 2022*

*Change ment de Fichier*

*Band pass à la main*

*SETI END ; GO*

*à la fin à la main*

*En retard de 11s pour démarrage acquisition*

Schedule for NOEMA (Code Nn )

GMVA Oct. 2022

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 LST Day 281 --- Start / Stop EL AZ HA UP Para Dwell Early Disk TPStart Stop UT --- GBytes SYNC

Table with columns: Start UT, Source, LST, Day 281, Start/Stop EL/AZ/HA/UP, Para, Dwell, Early, Disk, TPStart, Stop UT. Includes handwritten notes like 'Focus on band edge', 'Tsys 100', and 'Secret NTP Server/polyfix'.

Secret NTP Server/polyfix

Schedule for NOEMA (Code Nn )

GMVA Oct. 2022

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 LST Day 281 --- Start / Stop EL AZ HA UP Para Dwell Early Disk TPStart Stop UT --- GBytes SYNC

Table with columns: Start UT, Source, LST, Day 281, Start/Stop EL/AZ/HA/UP, Para, Dwell, Early, Disk, TPStart, Stop UT. Includes handwritten notes like 'Tsys > 600', 'Tsys 1200', 'P=0.95', and 'RAIN' circled in blue.

RAIN

The following frequency sets based on these setups were used.

Frequency Set: 5 Setup file default. Used with PCAL = off
LO sum= 86012.00 86012.00
BBC fr= 512.00 512.00
Bandwd= 512.00 512.00
Matching frequency sets: 5

Track assignments are:
track1= 1, 2
barrel=roll\_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Table with columns: Source, (B1950), Source position (RA/Dec) (J2000), (Date), Error (mas). Lists various astronomical sources like J0423-0120, J0430+0521, etc.

SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE

Summary table for sources with columns: Source, Setup file, Frequency sets (duplicates not shown), Observing hours, Scan Baseline. Includes sources like 0420-014, 3C120, etc.

Schedule for NOEMA (Code Nn ) Page 9

UP: D => 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.
SYNC: Time correlator is expected to sync up.

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

Main observation schedule table with columns: Day, LST, Start/Stop, EL, AZ, HA, UP, Para, Dwell, Early, Disk, TPStart, GBytes, SYNC. Shows a sequence of observations from 12:00 to 14:52.

SETUP FILE INFORMATION:

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

Setup file: 86ghz.set
Matching groups in 3mmfired\_RDBE.dat:
noema\_3mm
Station: NOEMA
Total bit rate: 4096
Sample rate:\*\*\*\*\*
Speedup factor: 1.00

Disk used to record data.
1st LO= 85500.00 85500.00
Net SB= U U
IF SB = U U
Pol. = RCP LCP 2
BBC = 1
BBC SB= U U
IF = AL B3

POSITIONS OF ADDITIONAL SOURCES USED ONLY IN NON-RECORDING SCANS

An unused dummy source of a scan that becomes a geometric segment will show up here.

Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
J0319+4130		* 03 19 48.160112	03 21 18.994391	0.08
J0316+413		* 03 16 29.567282	03 21 18.994391	0.08
J0319+48.1+41		* 03 19 48.160112	03 21 18.994391	0.08
* 3C84		* 03 19 48.160112	03 21 18.994391	0.08
		* 41 30 42.103664	41 35 35.68791	0.08
		/aux/vlb056a/p459kri/sched-11.8tst/catalogs/sources.vlba		
		ICRF3 X/S astro solution, 9222 observations.		
P-WXPSC		* 01 06 25.988800	01 07 38.363804	0.00
* P-IRC+10011		* 01 06 25.988800	01 07 38.363804	0.00
P-IRC+10		* 12 35 52.72940	12 43 14.53021	0.00
		3mmsources.pointing		
		Mopra catalog, via Krichbaum, proper motion corrected pos. from Lynn		
		Doppler based on LSR frame and radio definition. Velocities:		
		8.00	8.00	0.00
* P-IKTAU		* 03 53 28.936700	03 54 44.266988	0.00
SIO-IKTAU		* 11 24 21.34540	11 28 28.21172	0.00
IKTAU		3mmsources.pointing		
		SEST vel., proper motion corrected pos. from Lynn		
		Doppler based on LSR frame and radio definition. Velocities:		
		31.54	31.54	0.00
* P-TXCAM		* 05 00 51.127000	05 02 44.839375	0.00
SIO-TXCAM		* 56 10 53.98000	56 12 45.11867	0.00
TXCAM		3mmsources.pointing		
		Baudry pos.		
		Doppler based on LSR frame and radio definition. Velocities:		
		7.50	7.50	0.00
* P-ORINEW2		* 05 35 14.500000	05 36 21.411082	0.00
SIO-ORINEW2		* -05 22 29.60000	-05 21 25.48471	0.00
ORINEW2		3mmsources.pointing		
		3mm test peakup @1MHz BW		
		Doppler based on LSR frame and radio definition. Velocities:		
		-2.99	-2.99	0.00
* P-UORI		* 05 55 49.190000	05 57 09.873097	0.00
SIO-UORI		* 20 10 30.72000	20 10 45.89700	0.00
		3mmsources.pointing		
		baudry pos/vel; weak.		
		Doppler based on LSR frame and radio definition. Velocities:		
		-35.41	-35.41	0.00
* P-BXCAM		* 05 46 44.290000	05 49 17.106740	0.00
		* 69 58 24.20000	69 58 40.82012	0.00
		3mmsources.pointing		
		Oan Yebs Sep 2018		
		Doppler based on LSR frame and radio definition. Velocities:		
		-4.00	-4.00	0.00
* P-APLYN		* 06 34 33.920000	06 36 37.087177	0.00
P-IRC+60169		* 60 56 26.200000	60 55 10.86076	0.00
		3mmsources.pointing		
		Oan Yebs Mar 2018		
		Doppler based on LSR frame and radio definition. Velocities:		
		-23.00	-23.00	0.00
* P-RCNC		* 08 16 33.826000	08 17 47.861878	0.00
		* 11 43 34.320000	11 59 29.99153	0.00
		3mmsources.pointing		
		Baudry pos, sest vel		
		Doppler based on LSR frame and radio definition. Velocities:		
		14.62	14.62	0.00
* P-RLEO		* 09 47 33.500000	09 48 45.269245	0.00
SIO-RLEO		* 11 25 43.680000	11 19 33.80948	0.00
RLEO		3mmsources.pointing		
		baudry pos, sest vel.		
		Doppler based on LSR frame and radio definition. Velocities:		
		91.4	91.4	0.00

2.56 2.56 2.56 2.56

* P-UHER	16 23 34.837197	* 16 25 47.640000	16 26 46.656657	0.00
SIO-UHER	19 00 17.76550	* 18 53 33.000000	18 50 39.19939	0.00
	3mmsources.pointing			
	MOPRA position and spectrum			
	Doppler based on LSR frame and radio definition. Velocities:			
	-15.00	-15.00	-15.00	0.00
* P-VILLOPH	18 34 57.588944	* 18 37 19.260000	18 38 22.863504	0.00
VILLOPH	10 23 04.79465	* 10 25 42.20000	10 27 00.51640	0.00
	3mmsources.pointing			
	new Yebs catalog			
	Doppler based on LSR frame and radio definition. Velocities:			
	-32.00	-32.00	-32.00	0.00
* P-RRAQL	19 55 00.251893	* 19 57 36.031400	19 58 46.413906	0.00
	-02 01 19.43280	* -01 53 12.40120	-01 49 28.78275	0.00
	3mmsources.pointing			
	SEST vel., proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	30.00	30.00	30.00	0.00
* P-RAQR	23 41 14.284707	* 23 43 49.460000	23 45 00.608166	0.00
SIO-RAQR	-15 33 43.47693	* -15 17 04.14000	-15 09 28.50554	0.00
RAQR	3mmsources.pointing			
	OAN Yebs catalog, Sep. 2018			
	Doppler based on LSR frame and radio definition. Velocities:			
	-28.00	-28.00	-28.00	0.00
* P-RCAS	23 55 52.329330	* 23 58 25.065300	23 59 35.482314	0.00
RCAS	51 06 38.29079	* 51 23 20.10220	51 31 00.44236	0.00
SIO-RCAS	3mmsources.pointing			
	Also not in P-, but is used in startup pointing. prop. motion corrected po			
	24.00	24.00	24.00	0.00
* DR21	20 37 14.100724	* 20 39 01.020000	20 39 49.557885	0.00
	42 12 11.02637	* 42 22 48.800000	42 27 50.03570	0.00
	3mmsources.pointing			
	Revised VLA position at 7mm from Araya+ 2009			
* SATURN	21 22 33.676027	* 21 25 20.032528	21 26 35.681981	0.00
	-16 45 08.80236	* -16 32 10.05411	-16 26 18.19321	0.00
	Planet. Position is for scan 1, center Earth.			
	Doppler based on geocentric frame and radio definition. Velocities:			
	0.00	0.00	0.00	0.00
	Planetary motion used. Ref. MJD: 59859.4306			
	Rates: RA = -0.61610E+01 s/day Dec = -0.25209E+02 arcsec/day			
	EPHFILE: /aux/vlb056a/p459kri/sched-11.8tst/PLANETDATA/JPLEPH.421			
SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE				
	Scan hours are for recording scans only.			
	Baseline hours are only counted for scans above horizon at both ends.			
	Source	Frequency sets	Observing hours	Scan Baseline
		(duplicates not shown)		
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)		
	3C84	131.5		
	0420-014	127.1		
	3C120	125.2		
	0J287	63.9		
	3C345	69.7		
	3C371	91.4		

CTA102 144.8  
 BLLAC 127.5  
 P-IRC+10011 172.3  
 P-IKTAU 135.1  
 P-IXCAM 110.0  
 P-ORINEW2 108.7  
 P-UORI 105.4  
 P-BXCAM 101.0  
 P-APLYN 97.2  
 P-RCNC 70.9  
 P-RIBO 49.2  
 P-UHER 57.8  
 P-VIIIIOPH 87.2  
 P-RRACL 105.8  
 P-RAQR 152.9  
 P-RCAS 132.9  
 DR21 113.2  
 SATURN 124.1

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:

327 MHz	117. deg
610 MHz	81. deg
1.6 GHz	45. deg
2.3 GHz	26. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg
43.0 GHz	6. deg





COVER INFORMATION

Station: NOEMA (Code Nn )  
 Experiment: GMVA Oct. 2022  
 Exp. Code: c222c

Schedule Version: 6.00  
 Processed by SCHED version: 11.80 Release 11.8; September 2022

PI: Global mm-VLBI Array (GMVA)

Address: Max-Planck-Institut fuer Radioastronomie  
 Auf dem Huegel 69  
 53121 Bonn  
 Germany

Phone: 0049-228-525-295  
 EMAIL: tkrichbaum@mpifr-bonn.mpg.de  
 Fax: 0049-2257-301-106  
 Phone during observation: 0049-2257-301-155

Observing mode: 4096-8-2

Notes: must use SCHED 11.6 or 11.8  
 VLBA at 86+43 GHz

Schedule for NOEMA (Code Nn )

GMVA Oct. 2022  
 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 LST EL AZ HA UP Para Early Disk TPStart  
 Stop UT Dwell GBytes SYNC

Start UT	Source	LST	EL	AZ	HA	UP	Para	Early Dwell	Disk GBytes	TPStart SYNC
--- Sat	8 Oct 2022	Day 281	---							
Next scan frequencies: 86012.00 86012.00										
Next BBC frequencies: 512.00 512.00										
Next scan bandwidths: 512.00 512.00										
15 00 00	2013+370	16 32 32	47.9	79.9	-3.7		-61.7	0	0	15 00 00
15 10 00	---	16 42 34	49.7	81.3	-3.6		-62.1	600	309	15 00 01
15 20 00	2013+370	16 52 35	51.5	82.8	-3.4		-62.5	580	309	15 20 00
15 30 00	---	17 02 37	53.2	84.3	-3.2		-62.8	600	618	15 20 01
15 40 00	BLLAC	17 12 39	39.0	65.2	-4.9		-61.0	548	618	15 40 00
15 50 00	---	17 22 40	40.6	66.4	-4.7		-62.0	600	927	15 40 01
16 00 00	2013+370	17 32 42	58.6	89.1	-2.7		-63.4	547	927	16 00 00
16 10 00	---	17 42 44	60.4	90.9	-2.6		-63.4	600	1237	16 00 01
16 20 00	2013+370	17 52 45	62.2	92.7	-2.4		-63.3	580	1237	16 20 00
16 30 00	---	18 02 47	63.9	94.7	-2.2		-63.0	600	1546	16 20 01
16 40 00	2013+370	18 12 49	65.7	96.9	-2.1		-62.6	580	1546	16 40 00
16 50 00	---	18 22 50	67.5	99.2	-1.9		-62.0	600	1855	16 40 01
17 00 00	2013+370	18 32 52	69.2	104.8	-1.7		-61.1	580	1855	17 00 00
17 10 00	---	18 42 54	71.0	104.7	-1.6		-59.9	600	2164	17 00 01
17 20 00	2013+370	18 52 55	72.7	108.0	-1.4		-58.3	580	2164	17 20 00
17 30 00	---	19 02 57	74.4	111.8	-1.2		-56.1	600	2473	17 20 01
17 40 00	BLLAC	19 12 58	59.3	78.9	-2.8		-71.0	546	2473	17 40 00
17 50 00	---	19 23 00	61.1	80.1	-2.7		-71.6	600	2782	17 40 01
18 00 00	2013+370	19 33 02	79.0	128.4	-0.7		-44.5	538	2782	18 00 00
18 10 00	---	19 43 03	80.3	136.8	-0.6		-37.7	600	3092	18 00 01
18 20 00	2013+370	19 53 05	81.4	147.3	-0.4		-28.9	580	3092	18 20 00
18 30 00	---	20 03 07	82.2	160.2	-0.2		-17.6	600	3401	18 20 01
18 40 30	2013+370	20 13 38	82.6	175.9	-0.0		-3.7	610	3401	18 40 30
18 50 30	---	20 23 40	82.5	191.3	0.1		10.1	600	3710	18 40 31
19 00 30	2013+370	20 33 42	81.9	205.4	0.3		22.6	580	3710	19 00 30
19 10 30	---	20 43 43	81.0	217.3	0.5		32.8	600	4019	19 00 31
19 20 20	2013+370	20 53 35	79.8	226.8	0.6		40.7	570	4019	19 20 20
19 30 20	---	21 03 37	78.4	234.4	0.8		46.7	600	4328	19 20 21

RAIN

Schedule for NOEMA (Code Nn )

Page 3

GMVA Oct. 2022

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.

Table with columns: Stop UT, Start UT, Source, LST, AZ, HA, UP, Para, Dwell, Early, Disk, GBytes, TPStart, SYNC. Includes data for Oct 8 and 9, 2022.

Handwritten notes: 'Arret Orange Salle de Control', 'File c222-acc-tulbc---cipb', 'Cancel Stop SETA Restart'.

Schedule for NOEMA (Code Nn )

Page 4

GMVA Oct. 2022

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.

Table with columns: Stop UT, Start UT, Source, LST, AZ, HA, UP, Para, Dwell, Early, Disk, GBytes, TPStart, SYNC. Includes data for Oct 9, 2022.

Handwritten notes: 'Spec Judging of Point beams ok', 'Total bit rate: 4096', 'Sample rate: \*\*\*\*\*', 'Speedup factor: 1.00'.

Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
POSITIONS OF SOURCES USED IN RECORDING SCANS				
J0423-0120	04 20 43.539845	* 04 23 15.800722	04 24 25.248281	0.03
* J0420-014	-01 27 28.70031	* -01 20 33.06561	-01 17 14.55680	0.03
J042315.8-01	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
	ICRF3 X/S astro solution, 79013 observations.			
J0854+2006	08 51 57.250618	* 08 54 48.874930	08 56 05.557956	0.03
0851+202	20 17 58.41737	* 20 16 30.64082	20 01 24.61684	0.03
J085448.8+20	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
* OJ287	ICRF3 X/S astro solution, 302899 observations.			
J2015+3710	20 13 37.014501	* 20 15 28.729787	20 16 19.262988	0.10
* J2013+370	37 01 44.45886	* 37 10 59.51474	37 15 22.99631	0.12
J201528.7+37	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
	ICRF3 X/S astro solution, 258 observations.			
VR422201	22 00 39.362504	* 22 02 43.291371	22 03 39.948521	0.01
J2202+4216	42 02 08.59075	* 42 16 39.97988	42 23 25.48532	0.00
* BLLAC	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.gsfc			
2200+420	GSFC 2016a X/S astro solution, 52189 observations.			
J2202+42				
SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE				
Scan hours are for recording scans only.				
Baseline hours are only counted for scans above horizon at both ends.				
Source	Setup file	Frequency sets (duplicates not shown)	Observing hours	Scan Baseline
0420-014	86ghz.set	18 26	0.600	21.600
	43ghz.set	29	0.300	13.500
OJ287	86ghz.set	7 18 26 47	1.956	79.199
	43ghz.set	29	1.000	35.733
2013+370	86ghz.set	1 3 4 5 6 7 18 26 47	6.550	461.944
	43ghz.set	29	2.033	80.599
BLLAC	86ghz.set	1 3 4 5 6 7 18 26 47	1.728	116.717
	43ghz.set	29	0.600	24.600
POSITIONS OF ADDITIONAL SOURCES USED ONLY IN NON-RECORDING SCANS				
An unused dummy source of a scan that becomes a geodetic segment will show up here.				
Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
* K3-50A	19 59 50.110404	* 20 01 45.719000	20 02 37.937066	0.00
	33 24 19.26775	* 33 32 43.319000	33 36 43.26726	0.00
	From catalog imbedded in main SCHED input file.			
J2025+3343	20 23 12.987104	* 20 25 10.842104	20 26 04.199720	0.14
* J2023+335	33 33 10.52772	* 33 43 00.21436	33 47 38.76464	0.12
J202510.8+33	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
2023+336	ICRF3 X/S astro solution, 413 observations.			
P-WXPSC	01 03 48.085796	* 01 06 25.988600	01 07 38.365143	0.00
* P-IRC+10011	12 19 50.82161	* 12 35 52.72940	12 43 14.58809	0.00
P-IRC+10	3msources.pointing			
	Mopra catalogue, via Krichbaum, proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	8.00	8.00	8.00	
* P-IKTAU	03 50 43.830602	* 03 53 28.936700	03 54 44.287041	0.00
SIO-IKTAU	11 15 30.70717	* 11 24 21.34540	11 28 28.24999	0.00
IKTAU	3msources.pointing			
	SET vel., proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	31.54	31.54	31.54	
* P-ORINEW2	05 32 47.020248	* 05 35 14.500000	05 36 21.437586	0.00

Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
POSITIONS OF SOURCES USED IN RECORDING SCANS				
J0423-0120	04 20 43.539845	* 04 23 15.800722	04 24 25.248281	0.03
* J0420-014	-01 27 28.70031	* -01 20 33.06561	-01 17 14.55680	0.03
J042315.8-01	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
	ICRF3 X/S astro solution, 79013 observations.			
J0854+2006	08 51 57.250618	* 08 54 48.874930	08 56 05.557956	0.03
0851+202	20 17 58.41737	* 20 16 30.64082	20 01 24.61684	0.03
J085448.8+20	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
* OJ287	ICRF3 X/S astro solution, 302899 observations.			
J2015+3710	20 13 37.014501	* 20 15 28.729787	20 16 19.262988	0.10
* J2013+370	37 01 44.45886	* 37 10 59.51474	37 15 22.99631	0.12
J201528.7+37	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
	ICRF3 X/S astro solution, 258 observations.			
VR422201	22 00 39.362504	* 22 02 43.291371	22 03 39.948521	0.01
J2202+4216	42 02 08.59075	* 42 16 39.97988	42 23 25.48532	0.00
* BLLAC	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.gsfc			
2200+420	GSFC 2016a X/S astro solution, 52189 observations.			
J2202+42				
SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE				
Scan hours are for recording scans only.				
Baseline hours are only counted for scans above horizon at both ends.				
Source	Setup file	Frequency sets (duplicates not shown)	Observing hours	Scan Baseline
0420-014	86ghz.set	18 26	0.600	21.600
	43ghz.set	29	0.300	13.500
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	43ghz.set	29	2.033	80.599
BLLAC	86ghz.set	1 3 4 5 6 7 18 26 47	1.728	116.717
	43ghz.set	29	0.600	24.600
POSITIONS OF ADDITIONAL SOURCES USED ONLY IN NON-RECORDING SCANS				
An unused dummy source of a scan that becomes a geodetic segment will show up here.				
Source	(B1950)	Source position (RA/Dec) (J2000)	(Date)	Error (mas)
* K3-50A	19 59 50.110404	* 20 01 45.719000	20 02 37.937066	0.00
	33 24 19.26775	* 33 32 43.319000	33 36 43.26726	0.00
	From catalog imbedded in main SCHED input file.			
J2025+3343	20 23 12.987104	* 20 25 10.842104	20 26 04.199720	0.14
* J2023+335	33 33 10.52772	* 33 43 00.21436	33 47 38.76464	0.12
J202510.8+33	/aux/vlb056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
2023+336	ICRF3 X/S astro solution, 413 observations.			
P-WXPSC	01 03 48.085796	* 01 06 25.988600	01 07 38.365143	0.00
* P-IRC+10011	12 19 50.82161	* 12 35 52.72940	12 43 14.58809	0.00
P-IRC+10	3msources.pointing			
	Mopra catalogue, via Krichbaum, proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	8.00	8.00	8.00	
* P-IKTAU	03 50 43.830602	* 03 53 28.936700	03 54 44.287041	0.00
SIO-IKTAU	11 15 30.70717	* 11 24 21.34540	11 28 28.24999	0.00
IKTAU	3msources.pointing			
	SET vel., proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	31.54	31.54	31.54	
* P-ORINEW2	05 32 47.020248	* 05 35 14.500000	05 36 21.437586	0.00

2023+335 111.7  
 BLLAC 127.2  
 P-IRC+10011 173.0  
 P-IKTAU 136.1  
 P-ORINWZ 109.6  
 P-RCNC 71.9  
 P-RLEO 50.2  
 P-VIIIIOPH 86.3  
 P-RRRQL 104.9  
 P-RAOR 152.0  
 P-RCAS 133.1  
 DR21 112.8

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  $60 \text{deg } F^{\circ} (-0.6)$  where  $F$  is in GHz.

For common VLBI bands, this is:

327 MHz 117. deg  
 610 MHz 81. deg  
 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  
 43.0 GHz 6. deg

COVER INFORMATION

Station: NOEMA (Code Nn )  
 Experiment: GMVA Oct. 2022  
 Exp. Code: c222d

Schedule Version: 6.00  
 Processed by SCHED version: 11.80 Release 11.8; September 2022

PI: Global mm-VLBI Array (GMVA)

Address: Max-Planck-Institut fuer Radioastronomie  
 Auf dem Huegel 69  
 53121 Bonn  
 Germany

Phone: 0049-228-525-295  
 EMail: tkrichbaum@mpifr-bonn.mpg.de  
 Fax: 0049-2257-301-106  
 Phone during observation: 0049-2257-301-155

Observing mode: 4096-8-2

Notes: must use SCHED 11.6 or 11.8  
 VLBA at 86+43 GHz

*New 9 antennas phased  
 (A1 included!)  
 Reference A10 on pad N05  
 Comparison A9 on pad N17  
 Using R&S SMA 100B Synthesizer!*

Schedule for NOEMA (Code Nn )

GMVA Oct. 2022  
 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 10 sum (band edge).  
 SYNC: Time correlator is expected to sync up.

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

Start UT	Source	LST	Start / Stop	EL	AZ	HA	UP	Para	Dwell	Early	Disk	TPStart
Stop UT	Source	LST	Start / Stop	EL	AZ	HA	UP	Para	Dwell	GBytes	SYNC	
---	Sun	9 Oct 2022	Day 282	---								
Next scan frequencies:		86012.00	86012.00									
Next BBC frequencies:		512.00	512.00									
Next scan bandwidths:		512.00	512.00									
17 30 00	CTA102	19 06 53	35.2 110.0	-3.4				-43.1	0	0	17 30 00	
17 36 00	---	19 12 54	36.2 111.3	-3.3				-42.6	360	185	17 30 01	X
17 45 00	0109+224	19 21 56	7.3 74.1	-5.9				-41.1	479	185	17 45 00	X
17 52 00	---	19 28 57	18.6 75.8	-5.7				-40.5	420	402	17 45 01	X
18 00 00	0109+224	19 36 58	19.9 77.1	-5.6				-40.8	460	402	18 00 00	X
18 07 00	---	19 43 59	21.1 78.2	-5.5				-40.1	420	618	18 00 01	X
18 15 00	0109+224	19 52 01	22.5 79.5	-5.4				-40.4	460	618	18 15 00	X
18 22 00	---	19 59 02	23.6 80.7	-5.2				-40.6	420	835	18 15 01	X
18 30 00	0109+224	20 07 03	25.2 82.0	-5.1				-40.9	460	835	18 30 00	X
18 37 00	---	20 14 04	26.4 83.1	-5.0				-50.1	420	1051	18 30 01	X
18 45 00	0109+224	20 22 06	27.8 84.5	-4.9				-50.2	460	1051	18 45 00	X
18 51 00	---	20 28 07	28.9 85.5	-4.8				-50.3	360	1237	18 45 01	X
19 00 00	CTA102	20 37 08	48.8 133.6	-1.9				-31.8	474	1237	19 00 00	X
19 06 00	---	20 43 09	49.6 135.6	-1.8				-30.6	360	1422	19 00 01	X
19 15 00	0109+224	20 52 11	33.2 89.6	-4.4				-50.6	473	1422	19 15 00	X
19 22 00	---	20 59 12	34.4 90.8	-4.2				-50.6	420	1639	19 15 01	X
19 30 00	0109+224	21 07 13	35.8 92.3	-4.1				-50.5	460	1639	19 30 00	X
19 37 00	---	21 14 14	37.1 93.5	-4.0				-50.4	420	1855	19 30 01	X
19 45 00	0106+013	21 22 16	24.2 113.4	-3.8				-40.8	432	1855	19 45 00	X
19 48 00	---	21 25 16	24.7 114.0	-3.7				-40.6	180	1948	19 45 01	X
19 50 10	0109+224	21 27 26	39.4 96.0	-3.8				-50.2	81	1948	19 50 10	X
19 55 10	---	21 32 27	40.3 97.0	-3.7				-50.0	300	2102	19 50 11	X
20 00 00	0109+224	21 37 18	41.2 97.9	-3.6				-49.9	270	2102	20 00 00	X
20 07 00	---	21 44 19	42.4 99.3	-3.5				-49.6	420	2319	20 00 01	X
20 15 00	0109+224	21 52 20	43.8 101.0	-3.3				-49.3	460	2319	20 15 00	X
20 21 00	---	21 58 21	44.9 102.2	-3.2				-49.0	360	2504	20 15 01	X
20 30 00	0106+013	22 07 23	31.2 123.3	-3.0				-36.5	490	2504	20 30 00	X
20 33 00	---	22 10 23	31.7 124.1	-3.0				-36.1	180	2597	20 30 01	X

*P=0.95  
 Top = 280k  
 P=0.95  
 Top  
 130k*

Schedule for NOEMA (Code Nn)

Page 3

GMVA Oct. 2022
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.

Table with columns: Stop UT, Source, LST, Day, Start/Stop (EL/AZ), HA, UP, Para, Dwell, Early, Disk, GBytes, TPStart, SYNC. Includes handwritten notes like 'Rain', 'A3', 'Polyex', and checkmarks.

Schedule for NOEMA (Code Nn)
GMVA Oct. 2022
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.
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Table with columns: Stop UT, Source, LST, Day, Start/Stop (EL/AZ), HA, UP, Para, Dwell, Early, Disk, GBytes, TPStart, SYNC. Includes handwritten notes like 'A3', 'A4', 'Think fog, Temp 400-500k, Phases very good (P = 0.95)'.

Handwritten note: Think fog, Temp 400-500k, Phases very good (P = 0.95)

1st LO= 85500.00 85500.00  
 Net SB= U U  
 IF SB= U U  
 Pol. = RCP LCP  
 BBC = 1 U  
 BBC SB= U U  
 IF = A1 B3

The following frequency sets based on these setups were used.

Frequency Set: 4 Setup file default. Used with PCAL = off  
 LO sum= 86012.00 86012.00  
 BBC fr= 512.00 512.00  
 Bandwd= 512.00 512.00  
 Matching frequency sets: 4

Track assignments are:  
 track1= 1, 2  
 barrel=roll\_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	(B1950)	Source position (RA/Dec)	(J2000)	(Date)	Error (mas)
J0108+0135		* 01 08 38.771105		01 09 49.515257	0.03
* J0106+013		* 01 35 00.31718		01 42 21.07088	0.03
J010838.7+01		/aux/v1b056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
		ICRF3 X/S astro solution, 55407 observations.			
J0112+2244		* 01 12 05.824716		01 13 20.188509	0.04
* J0109+224		* 22 44 38.78635		22 51 56.99743	0.04
J011205.8+22		/aux/v1b056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
		ICRF3 X/S astro solution, 5699 observations.			
J0319+4130		* 03 19 48.160112		03 21 19.035666	0.08
0316+413		* 41 30 42.10364		41 35 36.06296	0.08
J031948.1+41		/aux/v1b056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
		ICRF3 X/S astro solution, 9222 observations.			
J2232+1143		* 22 32 36.408901		22 33 44.213980	0.03
2230+114		* 11 43 50.90406		11 50 57.66949	0.04
J223236.4+11		/aux/v1b056a/p459kri/sched-11.8st/catalogs/sources.v1ba			
		ICRF3 X/S astro solution, 9867 observations.			

SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE

Scan hours are for recording scans only.  
 Baseline hours are only counted for scans above horizon at both ends.

Source	Frequency sets	Observing hours
0106+013	86ghz.set	Scan Baseline
	1 3 4 5 6 9 14	0.550
0109+224	86ghz.set	18.950
	1 3 4 5 6 9 14	5.767
3C84	86ghz.set	237.033
	1 3 4 5 6 9 14	18.900
CTA102	86ghz.set	0.333
	1 3 4 5 6	0.200

POSITIONS OF ADDITIONAL SOURCES USED ONLY IN NON-RECORDING SCANS

An unused dummy source of a scan that becomes a geodetic segment will show up here.

Source	Source position (RA/Dec)	(J2000)	(Date)	Error (mas)
P-WXPSC	* 01 06 25.988800		01 07 38.365862	0.00
* P-IRC+10011	* 12 35 52.72940		12 43 14.62515	0.00
P-IRC+10	3mresources.pointing			
	Mopra catalogue, via Krichbaum, proper motion corrected pos. from Lynn			
	Doppler based on LSR frame and radio definition. Velocities:			
	8.00 8.00			
* P-OCETI	* 02 19 20.806000		02 20 30.394935	0.00

Schedule for NOEMA (Code Nn ) Page 5

GMVA Oct. 2022  
 UP: D => 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	LST	EL	AZ	HA	UP	ParA	ParB	Early Dwell	Disk GBytes	TPStart SYNC
--- Mon	10 Oct 2022	Day 283	---								
02 35 00	0109+224	04 13 23	47.4	254.5	3.0	48.1	67	7636	02 35 00		
02 40 00	---	04 18 24	46.6	255.6	3.1	48.4	300	7791	02 35 01		
02 45 00	0109+224	04 23 25	45.7	256.7	3.2	48.7	280	7791	02 45 00		
02 51 00	---	04 29 26	44.7	258.0	3.3	49.1	360	7976	02 45 01		
03 00 00	0109+224	04 38 27	43.1	259.9	3.4	49.5	520	7976	03 00 00		
03 06 00	---	04 44 28	42.0	261.1	3.5	49.7	360	8162	03 00 01		
03 15 00	0109+224	04 53 29	40.4	262.9	3.7	50.0	520	8162	03 15 00		
03 21 00	---	04 59 30	39.4	264.0	3.8	50.2	360	8347	03 15 01		
03 30 00	0106+013	05 08 32	22.3	248.9	4.0	41.6	489	8347	03 30 00		
03 33 00	---	05 11 32	21.8	249.5	4.0	41.8	180	8440	03 30 01		
03 35 00	0109+224	05 13 33	36.9	266.7	4.0	50.4	69	8440	03 35 00		
03 40 00	---	05 18 34	36.0	267.6	4.1	50.5	300	8595	03 35 01		
03 45 00	0109+224	05 23 34	35.1	268.5	4.2	50.5	280	8595	03 45 00		
03 51 00	---	05 29 35	34.0	269.5	4.3	50.6	360	8780	03 45 01		
04 01 00	3C84	05 39 37	64.8	275.4	2.3	71.3	515	8780	04 01 00		
04 06 00	---	05 44 38	63.9	276.0	2.4	71.1	300	8935	04 01 01		
04 15 00	0109+224	05 53 39	29.8	273.7	4.7	50.4	455	8935	04 15 00		
04 21 00	---	05 59 40	28.7	274.7	4.8	50.3	360	9120	04 15 01		
04 30 00	0109+224	06 08 42	27.1	276.2	4.9	50.2	520	9120	04 30 00		
04 36 00	---	06 14 43	26.0	277.2	5.0	50.0	360	9306	04 30 01		
04 45 00	0109+224	06 23 44	24.4	278.7	5.2	49.8	520	9306	04 45 00		
04 51 00	---	06 29 45	23.4	279.7	5.3	49.6	360	9491	04 45 01		
05 00 00	0109+224	06 38 47	21.8	281.1	5.4	49.3	520	9491	05 00 00		
05 06 00	---	06 44 48	20.8	282.1	5.5	49.0	360	9677	05 00 01		
05 15 00	0109+224	06 53 49	19.2	283.6	5.7	48.7	520	9677	05 15 00		
05 21 00	---	06 59 50	18.2	284.5	5.8	48.4	360	9862	05 15 01		
05 30 00	0109+224	07 08 52	16.6	286.0	5.9	47.9	520	9862	05 30 00		
05 36 00	---	07 14 53	15.6	287.0	6.0	47.6	360	10048	05 30 01		
05 45 00	3C84	07 23 54	46.7	288.2	4.0	64.6	455	10048	05 45 00		
05 51 00	---	07 29 55	45.6	288.9	4.1	64.2	360	10233	05 45 01		

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

=====  
 Setup file: 86ghz.set  
 Matching groups in 3mffreq\_RDBE.dat:  
 noema\_3mm from Dec. 2020: uses R2DBE with 8Gbps

=====  
 Station: NOEMA  
 Format: VDIF  
 Bits per sample: 2  
 Number of channels: 2  
 DBE type:  
 Total bit rate: 4096  
 Sample rate:\*\*\*\*\*  
 Speedup factor: 1.00

Disk used to record data.

43.0 GHz 6. deg

0.00

-03 12 30.50456 \* -02 58 44.77920 -02 52 22.89944

3mresources.pointing  
 SEST spectrum, proper motion corrected pos. from Lynn  
 Doppler based on LSR frame and radio definition. Velocities:  
 46.00 46.00

\* P-TXCAM \* 04 56 41.340435 \* 05 00 51.127000 05 02 44.923087 0.00  
 SIO-TXCAM \* 56 06 29.52902 \* 56 10 53.98000 56 12 45.40136 0.00  
 TXCAM

Baudry pos.  
 Doppler based on LSR frame and radio definition. Velocities:  
 7.50 7.50

\* P-BXCAM \* 05 41 07.843169 \* 05 46 44.290000 05 49 17.255511 0.00  
 59 57 14.08212 \* 69 58 24.20000 69 58 41.02224 0.00  
 3mresources.pointing  
 Gan Yeves Sep 2018  
 Doppler based on LSR frame and radio definition. Velocities:  
 -4.00 -4.00

\* P-RAQR \* 23 41 14.284707 \* 23 43 49.460000 23 45 00.590968 0.00  
 SIO-RAQR \* -15 33 43.47693 \* -15 17 04.14000 -15 09 28.79091 0.00  
 RAQR  
 CAN Yeves catalog, Sep. 2018  
 Doppler based on LSR frame and radio definition. Velocities:  
 -28.00 -28.00

\* P-RCAS \* 23 55 52.329330 \* 23 58 25.065300 23 59 35.459651 0.00  
 RCAS \* 51 06 38.29079 \* 51 23 20.10220 51 31 00.99620 0.00  
 SIO-RCAS  
 3mresources.pointing  
 Also not in P, but is used in startup pointing. prop. motion corrected po  
 sition  
 Doppler based on LSR frame and radio definition. Velocities:  
 24.00 24.00

SOURCE SCAN SUMMARY FOR SOURCES LISTED ABOVE

Scan hours are for recording scans only.  
 Baseline hours are only counted for scans above horizon at both ends.  
 Source Observing hours  
 Setup file Frequency sets Scan Baseline  
 (duplicates not shown)

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)
0106+013	174.7
0109+224	163.5
3C84	133.3
CTA102	143.1
P-IRC+10011	173.7
P-OCETI	158.2
P-TXCAM	111.7
P-BXCAM	102.3
P-RAQR	151.1
P-RCAS	133.3

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 60deg F^(-0.6) where F is in GHz.  
 For common VLBI bands, this is:

327 MHz	117. deg
610 MHz	81. deg
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