Report of the EVN Scheduler for EVN sessions in the period 2003-2004

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This report contains a summary of the 6 EVN observing sessions held during the 2-year period 2003-2004. Statistical data is given in the form of tables, and this is followed by brief reports for each of the sessions. During this period 8 projects approved for observation (2 EVN-only and 6 Globals) became ineligible for scheduling, having failed to be scheduled in at least 2 suitable sessions due to lack of resources.

Headings used in the tables

N-OBS   The number of observations. A single proposal may result in several observations if it requires multiple epochs, frequencies or sources.

HOURS   Total number of observing hours scheduled using the EVN.

DAYS   Total number of observing days scheduled using the EVN.

T-BYTES   Total number of TBytes recorded at EVN telescopes (including Robledo), assuming 90% recording during the scheduled periods. This number also assumes a full track at all participating telescopes, and hence is an overestimate for projects involving Seshan, Urumqi, Hartebeesthoek, Robledo and Arecibo.

TB/TEL   Total number of TBytes recorded at a single telescope taking part in all the observations.

N-TEL   Average number of EVN telescopes (including Robledo) taking part in the observations.

Contents of the tables

Table 1   : the number of observations for all 6 sessions, giving TOTAL numbers, and subdivisions by experiment type (EVN-only, GLOBAL and Tests), whether Continuum or Spectral Line and by Correlator (Bonn, EVN-JIVE and VLBA).

Tables 2-7 : the statistics for each of the 6 observing sessions.

Table 8   : as for Table 1 but for User Projects only (excluding test observations)

Tables 9-16: User Projects broken down into subdivisions of EVN+MERLIN and different observing wavelengths.

Table 17   : Scheduling efficiency statistics

(1) feb03-oct04	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	136	1407.2	58.6	891.8	117.6	7.3
EVN-only	62	810.2	33.8	553.7	66.4	8.2
GLOBAL	40	473.0	19.7	207.6	35.2	5.3
Tests etc.	34	124.0	5.2	130.5	16.0	8.0
Continuum	98	933.0	38.9	742.7	96.7	7.4
Spec. Line	38	474.2	19.8	149.1	20.9	7.2
Bonn-Corr.	8	127.5	5.3	139.8	17.4	7.6
EVN-Corr.	107	1057.2	44.0	664.8	83.8	7.8
VLBA-Corr.	21	222.5	9.3	87.2	16.5	4.6

(2) feb03	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	6	58.5	2.4	27.7	4.8	5.5
EVN-only	1	16.0	0.7	11.6	1.7	7.0
GLOBAL	2	32.0	1.3	8.3	1.6	5.0
Tests etc.	3	10.5	0.4	7.8	1.5	5.3
Bonn-Corr.	0	0.0	0.0	0.0	0.0	0.0
EVN-Corr.	4	26.5	1.1	19.4	3.1	5.8
VLBA-Corr.	2	32.0	1.3	8.3	1.6	5.0

(3) may03	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	31	338.5	14.1	196.0	24.9	7.7
EVN-only	21	237.0	9.9	135.3	15.7	8.0
GLOBAL	5	83.0	3.5	44.0	6.9	6.4
Tests etc.	5	18.5	0.8	16.7	2.3	8.0
Bonn-Corr.	2	24.5	1.0	26.4	2.5	10.5
EVN-Corr.	28	302.0	12.6	162.1	21.1	7.6
VLBA-Corr.	1	12.0	0.5	7.5	1.2	6.0

(4) oct03	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	22	233.5	9.7	187.1	23.1	8.0
EVN-only	10	144.0	6.0	117.3	13.0	9.3
GLOBAL	7	65.5	2.7	38.9	6.3	5.7
Tests etc.	5	24.0	1.0	30.9	3.8	8.4
Bonn-Corr.	2	48.0	2.0	39.8	5.0	8.0
EVN-Corr.	15	136.0	5.7	115.1	13.0	8.7
VLBA-Corr.	5	49.5	2.1	32.2	5.1	5.6

(5) feb04	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	21	160.5	6.7	131.7	16.3	8.0
EVN-only	8	99.0	4.1	80.8	9.7	8.4
GLOBAL	4	42.5	1.8	21.8	3.2	6.8
Tests etc.	9	19.0	0.8	29.1	3.4	8.1
Bonn-Corr.	1	4.0	0.2	3.3	0.8	4.0
EVN-Corr.	20	156.5	6.5	128.4	15.5	8.1
VLBA-Corr.	0	0.0	0.0	0.0	0.0	0.0

(6) may04	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	23	251.7	10.5	153.8	19.3	7.7
EVN-only	8	98.2	4.1	60.9	6.8	8.0
GLOBAL	9	129.5	5.4	66.5	9.7	6.7
Tests etc.	6	24.0	1.0	26.4	2.7	8.7
Bonn-Corr.	0	0.0	0.0	0.0	0.0	0.0
EVN-Corr.	20	213.2	8.9	132.5	16.4	7.7
VLBA-Corr.	3	38.5	1.6	21.3	2.9	7.3

(7) oct04	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	33	364.5	15.2	195.5	29.3	6.2
EVN-only	14	216.0	9.0	147.8	19.5	7.9
GLOBAL	13	120.5	5.0	28.1	7.4	3.5
Tests etc.	6	28.0	1.2	19.6	2.4	8.0
Bonn-Corr.	3	51.0	2.1	70.3	9.0	6.7
EVN-Corr.	20	223.0	9.3	107.3	14.6	7.7
VLBA-Corr.	10	90.5	3.8	17.9	5.6	3.0

(8) User Projects	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	103	1287.2	53.6	764.6	102.4	7.0
EVN-only	62	810.2	33.8	553.7	66.4	8.2
GLOBAL	40	473.0	19.7	207.6	35.2	5.3
Short obs.	1	4.0	0.2	3.3	0.8	4.0
Bonn-Corr.	8	127.5	5.3	139.8	17.4	7.6
EVN-Corr.	74	937.2	39.0	537.6	68.5	7.7
VLBA-Corr.	21	222.5	9.3	87.2	16.5	4.6

(9) EVN+MERLIN	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	16	229.5	9.6	154.5	17.2	9.2
EVN-only	15	218.5	9.1	144.2	16.1	9.2
GLOBAL	1	11.0	0.5	10.3	1.1	9.0
5 CM	6	91.0	3.8	16.8	2.0	8.3
6 CM	2	26.0	1.1	33.0	3.9	8.5
18 CM	8	112.5	4.7	104.7	11.3	10.0

(10) 1.3 cm	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	8	119.0	5.0	79.1	10.0	7.6
EVN-only	7	111.0	4.6	77.0	9.6	8.0
GLOBAL	1	8.0	0.3	2.1	0.4	5.0

(11) 5 cm	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	16	181.0	7.5	26.1	4.4	7.2
EVN-only	16	181.0	7.5	26.1	4.4	7.2
GLOBAL	0	0.0	0.0	0.0	0.0	0.0

(12) 6 cm	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	29	384.5	16.0	319.1	41.8	7.7
EVN-only	16	208.0	8.7	220.6	25.9	9.0
GLOBAL	12	172.5	7.2	95.2	15.1	6.2
Short obs.	1	4.0	0.2	3.3	0.8	4.0

(13) 3.6 cm + S/X	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	7	93.5	3.9	51.0	8.4	5.4
EVN-only	1	24.0	1.0	17.4	2.5	7.0
GLOBAL	6	69.5	2.9	33.6	5.9	5.2

(14) 18/21 cm	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	30	385.2	16.1	270.1	32.3	8.1
EVN-only	19	250.7	10.4	207.0	23.1	8.8
GLOBAL	11	134.5	5.6	63.1	9.1	6.7

(15) 30 cm	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	3	35.5	1.5	5.6	0.9	6.0
EVN-only	3	35.5	1.5	5.6	0.9	6.0
GLOBAL	0	0.0	0.0	0.0	0.0	0.0

(16) 90 cm	N-OBS	HOURS	DAYS	T-BYTES	TB/TEL	N-TEL
TOTAL	10	88.5	3.7	13.6	4.6	2.9
EVN-only	0	0.0	0.0	0.0	0.0	0.0
GLOBAL	10	88.5	3.7	13.6	4.6	2.9

(17) SESSION	LENGTH (days)	SCHEDULED (days) VLBI + CAL	EFFICIENCY	REASONS FOR LOW EFFICIENCY
feb03	17	2.4 + 0.3	16 %	Effelsberg broken azimuth track
may03	21	14.1 + 0.6	70 %	
oct03	18	9.7 + 0.9	59 %	External scheduling constraints
feb04	16	6.7 + 0.6	46 %	Short session, lack of GBT
may04	21	10.5 + 0.5	52 %	GST bunching
oct04	22	15.2 + 0.9	73 %	
TOTAL	115	58.6 + 3.9	54 %	
(TOTAL	98	56.2 + 3.6	61 %	excluding feb03)

CAL includes scheduled amplitude calibration periods

Reports on individual sessions

2003 Session 1: Feb 06 - Feb 27

Wavelengths: 1.3cm 3.6/13cm 18/21cm

This was largely cancelled due to the withdrawal of Effelsberg, where a crack in the azimuth track was discovered just before the session. Two global projects (GP034 at 1.3cm, GC023A at 3.6 cm) were observed since Effelsberg was not deemed to be critical for them. One EVN-only user project was observed (EI005A at 1.3 cm). This was the first of 2 planned, closely-spaced epochs, and the 70m DSS63 antenna at Robledo could be scheduled at the last minute to replace Effelsberg (courtesy of Pam Wolken at JPL). Other test observations were observed without Effelsberg.

2003 Session 2: May 22 - June 12

Wavelengths: 18/21 cm 6 (+3.6) cm 5 cm 1.3 cm
+MERLIN

This session was extra long (21 days), and large in consumption (370 thin tapes and 18 MK5A disk-packs), to make up for the decimation of Session 1 following the failure of Effelsberg due to the azimuth track problem. This was also the first session where 4 different wavelength sections were scheduled, following approval of this at the previous CBD meeting. A fifth wavelength, 3.6cm, was also inserted in the 6cm part for frequency-agile antennas. This capability is extremely useful for reducing waiting time between proposal submission and observation. Projects were scheduled strictly, only those with grades better than 1.5 getting on. Since this was the last session with EVN+MERLIN at 18/21cm until 2005, there were a number of projects with grades > 1.5 which remained for many sessions afterwards in the queue.

2003 Session 3: Oct 23 - Nov 10

Wavelengths: 3.6/13 cm 6 cm 18/21 cm

This session was of more normal length (18 days) and consumption (295 tapes). It contained two projects with external scheduling constraints (one together with the CHANDRA X-ray satellite and one using geodetic VLBI stations) which led to a rather large inefficiency in the use of time in the 3.6/13cm section. An "ad hoc" target of opportunity project at 3.6 cm ("Afterglow of GRB 030329") could be accommodated in the 6 cm part of the session. This session also marked the first use of the Jodrell Lovell Telescope for VLBI at 6 cm; uncertainties led to some disarray in guidance to PIs making schedules for 6 cm projects. Effelsberg recorded using Mk5A disk-packs for all projects to be correlated at the EVN and Bonn correlators, in order to gain experience of MK5 operations.

At the beginning of the session a questionnaire was sent out to the PIs of all the projects, requesting feedback on any problems they experienced making their schedules and suggestions for improvements in the process. They were asked to comment especially on the clarity or otherwise of the block schedule, usefulness of the PI Instructions document, the SCHED program and depositing schedules on vlbeer in Bologna. 7 out of 14 PIs replied, with generally positive comments, and some individual suggestions for improvements.

2004 Session 1: Feb 10 - Feb 26

Wavelengths: 1.3cm 3.6cm 6cm 18/21cm (+ tests at 5cm and 30cm)
+MERLIN

This was a relatively short session, mainly due to a lack of "schedulable" projects. This was partly because most of the backlog at the session frequencies had already been worked off and partly because NRAO decided to severely ration GBT time to ca. 30h per session. All but 1 of the global projects had requested the GBT; in the end 36h were scheduled for a single proposal, GG053 A,B,C. The EVN had originally advertised 5cm and 30cm for this session but both were delayed until later sessions. A further unwelcome constraint (announced 8 December) was that the GBT was already heavily booked from Feb 5-20 for some critical GST ranges; this forced our highest rated project requiring the GBT (at 21 cm) to be scheduled at the end of the session. One project, denied use of the GBT (GM052A), was scheduled instead with the DSN 70m antennas at Goldstone and Madrid (at 3.6 cm) to avoid delaying it until later in the year. Although these antennas were not requested in the original proposal, the DSN scheduler was happy to accomodate such additional projects if considered worthy by the EVNPC.

A total of 249 "notional" tapes was scheduled, although Effelsberg recorded exclusively on MK5A disks for projects being correlated at JIVE or Bonn. In preparation for future 1 Gb/s observing, the NME experiments at all 4 wavelengths were observed at 512 Mb/s using a 1-bit sampling mode, to test the capabilities of the observatories to observe a wide-enough band for 1 Gb/s (2-bit sampling) recording. The original session "window" was to start on Thursday 5 Feb, but the actual start was on Tuesday 10 Feb, with a fringe test-tape scheduled 6 days before on Wednesday 4 Feb (at 1.3cm) giving a relatively long time for tape shipment to JIVE. An additional FTP fringe-test was scheduled at 6cm one day before the start of the 6cm session. The final user project finished on Monday 23 Feb (i.e. 14 day session). The remainder of the session window was used for making fringe tests with the new receivers at 5cm (Wb, Nt, together with Mc and Hh) and 30cm (Ur, Nt, together with Tr, On and Wb).

2004 Session 2: May 20 - June 10

Wavelengths: 6cm 30cm (UHF) 18/21cm
+MERLIN

The EVN had advertised the delayed 5cm for this session but, in the event, the MERLIN upgrade to 5cm was not ready in time, so this wavelength was postponed again (to October/November 2004). The Ur and Nt telescopes were scheduled for the first time at 30cm (UHF) this session. There was also another "first"; GM051 observed at 1238 and 1285 MHz using the 18/21cm receiver boxes at Wb, On, VLBA and GBT, and the 30cm (UHF) box at Eb. There were, in fact, a number of projects requiring non-standard set-ups in this session. Following concerns raised in the April TOG meeting about late and faulty schedules, selected PIs (those judged to have difficult schedules to make) were given advanced warning that their project was about to be scheduled, and encouraged to seek immediate assistance from the JIVE user support group. This session was scheduled throughout the entire advertised window although, alas, somewhat inefficiently due to a number of external constraints and, more importantly, because of a rather extreme "bunching" of required GST ranges for the proposed sources. Of 25 eligible projects, 22 days would have been needed in the range 16h-17h, and only 5 in the range 07h-08h; in the end, 17 projects using 17 days in the 1st range and 4 in the 2nd were scheduled, priority (as usual) being given to the highest-rated projects, but subject to other constraints. In this session, again, the GBT was not available for some of the time, due to prior commitments in May and "Maintenance weekday daytimes" mode. Arecibo also had few available times slots. Again, it proved possible to negotiate the addition of the Robledo 70m antenna (at 18cm) for one project (EB028B) which had not requested it in the proposal.

A problem with the JB Lovell Telescope was announced during the lead up to the session (April 23rd) resulting in an increased restriction on the frequency of telescope moves. (This resulted in a phase-reference cycle time of no less than 10 minutes, which is probably inadequate, at least for 6cm observation.) The Jodrell MK2 telescope was offered as an alternative for such observations. A new 6cm receiver for Urumqi was not available on time so it could not take part in this session. A total of 249 "notional tapes" was scheduled although some observatories recorded using MK5A disk-packs instead. A test 1Gb/s observation was also scheduled. No user projects using 1Gb/s could be scheduled since the disk-recording capacity at some observatories could not be guaranteed. Both the eligible 1Gb/s projects (at 6cm) required the Lovell Telescope using phase-referencing, so in any case it would not have been sensible to schedule them.

2004 Session 3: Oct 21 - Nov 12

Wavelengths: 90cm 6cm 1.3cm 5cm(+MERLIN)

This was quite a long session, and it was possible to work off a major part of the backlog of projects. It included a 90cm part, the first time this wavelength had been scheduled since MK4 recording was introduced. All eligible 90cm projects were scheduled, including a number of pulsar VLBI observations. Noto was unable to participate in these because correlation was at the VLBA (which has a working pulsar gate) and Noto could no longer record using tape. All eligible 5cm projects were scheduled, some together with MERLIN, or at least that part currently functioning with 5cm receivers. This was the first official EVN+MERLIN session at 5cm. One project which needed only Effelsberg and Onsala (because other antennas cannot reach red-shifted excited OH) was scheduled at the end of the session beyond the advertised session end window, so technically "outside the session". At 6cm the session included the first user 1Gbps projects. At 1.3cm a geodetic project was scheduled, designed to improve station locations for antennas which are not part of the regular geodetic network. (Unfortunately, one of these - JB Mark II - was not available on the day due to technical problems.)