Writing Proposals and Scheduling

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Outline

- 1. How to plan an experiment
  - Scientific idea
  - Feasibility
  - Choice of the array and its configuration
  - Some useful tools for planning

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  - Scientific justification – general suggestions
  - Proposal submission tools

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  - Choice of the array and its configuration
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- 2. Writing an observing time proposal
  - Scientific justification – general suggestions
  - Proposal submission tools
- 3. Scheduling & observing file preparation
- 4. After the observations

How to plan an experiment

- Begin with a scientific idea
  - This is the fun part, but remember that the aim must be clear.

- Make a proper literature search

  has someone already observed our target(s)?

  - Use ADS, CDS, NED and observatory archives
  - Check data from different public surveys

Archives – L17

- Check the telescope archive for earlier observations of your targets
  - Need to re-observe?
  - Use existing data instead starting from scratch?
  - Use to justify feasibility

EVN, eVLBI	`archive.jive.nl`
(J)VLA, VLBA	`archive.nrao.edu`
MERLIN	`www.merlin.ac.uk/archive`
GMRT	`naps.ncra.tifr.res.in/goa/mt/search/basicSearch`
WSRT	`wow.astron.nl`
ATCA	`atoa.atnf.csiro.au/`

How to plan an experiment

1) Type of experiment

- Is it *continuum* or *spectral line*?
- If it is spectral line, which is the *frequency of the line*? Which is the *distance* of the target source? (Katharine's talk)
- Is it single or full *polarization*?

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2) Resolution and angular scales

$$\theta \sim \frac{\lambda}{D}$$

$$\theta_{\mathrm{LAS}} \sim \frac{1}{shortest\ \ baseline}$$

- How compact/extended is the target source?
- Which is the largest angular size we want to image?

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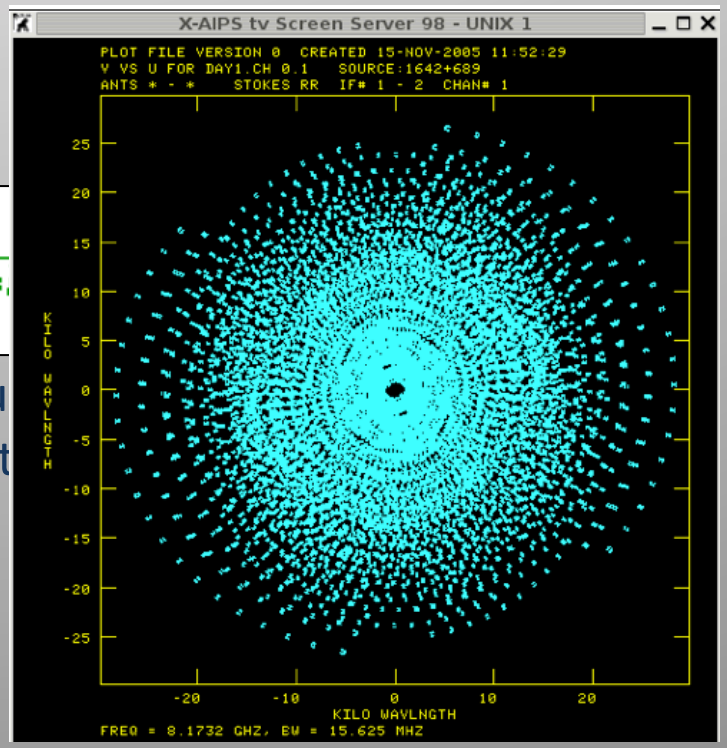
All scales need to be sampled



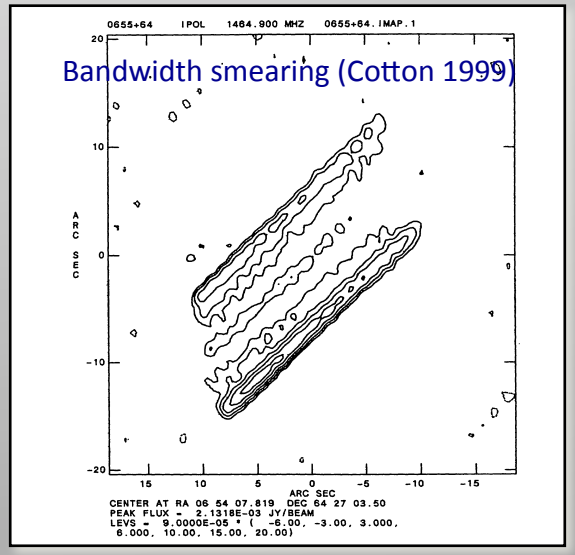
How to plan an experiment

3) Field of view

- How large is the field of view needed?

Is a wide field of view needed?

- Avoid bandwidth smearing -> need high spectral resolution – This is now the norm at most facilities



How to plan an experiment

3) Field of view

- How large is the field of view needed?

Table 7: Default frequencies for "continuum" app sampling

Band	Range[1] (GHz)	Default frequencies for continu IF pair A0/C0
4 m (4)	0.058-0.084	N.A.
90 cm (P)	0.23-0.47[2]	0.236 -- 0.492
20 cm (L)	1.0-2.0[3]	1.0 -- 1.5[2]
13 cm (S)	2.0-4.0	2.0 -- 3.0
6 cm (C)	4.0-8.0	4.5 -- 5.5
3 cm (X)	8.0-12.0	8.0 -- 9.0
2 cm (Ku)	12.0-18.0	13.0 -- 14.0
1.3 cm (K)	18.0-26.5	20.2 -- 21.2
1 cm (Ka)	26.5-40.0	32.0 -- 33.0
0.7 cm (Q)	40.0-50.0	40.0 -- 41.0

Subband Bandwidth and Spectral Resolution Options

Subband bandwidth & total velocity coverage		Full polarization products (RR, RL, LR, LL) $64n_{BIBP}$ spectral channels Channel spacing:		Dual polarization products (RR, LL) $128n_{BIBP}$ spectral channels Channel spacing:		Single polarization product (RR *or* LL) $256n_{BIBP}$ spectral channels Channel spacing:	
128 MHz	38400/v_{GHz} km/s	2000/n_{BIBP} kHz	600/n_{BIBP}/v_{GHz} km/s	1000/n_{BIBP} kHz	300/n_{BIBP}/v_{GHz} km/s	500/n_{BIBP} kHz	150/n_{BIBP}/v_{GHz} km/s
64	19200	1000 / n_{BIBP}	300 / n_{BIBP}	500 / n_{BIBP}	150 / n_{BIBP}	250 / n_{BIBP}	75 / n_{BIBP}
32	9600	500 / n_{BIBP}	150 / n_{BIBP}	250 / n_{BIBP}	75 / n_{BIBP}	125 / n_{BIBP}	37.5 / n_{BIBP}
16	4800	250 / n_{BIBP}	75 / n_{BIBP}	125 / n_{BIBP}	37.5 / n_{BIBP}	62.5 / n_{BIBP}	18.75 / n_{BIBP}
8	2400	125 / n_{BIBP}	37.5 / n_{BIBP}	62.5 / n_{BIBP}	18.75 / n_{BIBP}	31.25 / n_{BIBP}	9.375 / n_{BIBP}
4	1200	62.5 / n_{BIBP}	18.75 / n_{BIBP}	31.25 / n_{BIBP}	9.375 / n_{BIBP}	15.625/n_{BIBP}	4.687 /n_{BIBP}
2	600	31.25 / n_{BIBP}	9.375 / n_{BIBP}	15.625/n_{BIBP}	4.687 / n_{BIBP}	7.8125 / n_{BIBP}	2.344 / n_{BIBP}
1	300	15.625/n_{BIBP}	4.687 / n_{BIBP}	7.8125 / n_{BIBP}	2.344 / n_{BIBP}	3.906 / n_{BIBP}	1.172 / n_{BIBP}
0.5	150	7.8125 / n_{BIBP}	2.344 / n_{BIBP}	3.906 / n_{BIBP}	1.172 / n_{BIBP}	1.953 / n_{BIBP}	0.586 / n_{BIBP}
0.25	75	3.906 / n_{BIBP}	1.172 / n_{BIBP}	1.953 / n_{BIBP}	0.586 / n_{BIBP}	0.977 / n_{BIBP}	0.293 / n_{BIBP}
0.125	37.5	1.953 / n_{BIBP}	0.586 / n_{BIBP}	0.977 / n_{BIBP}	0.293 / n_{BIBP}	0.488 / n_{BIBP}	0.146 / n_{BIBP}
0.0625	18.75	0.977 / n_{BIBP}	0.293 / n_{BIBP}	0.488 / n_{BIBP}	0.146 / n_{BIBP}	0.244 / n_{BIBP}	0.073 / n_{BIBP}
0.03.25	9.375	0.488 / n_{BIBP}	0.146 / n_{BIBP}	0.244 / n_{BIBP}	0.073 / n_{BIBP}	0.122 / n_{BIBP}	0.037 / n_{BIBP}

Subband bandwidth and spectral resolution options. Note that the table entries refer to the spacing between spectral channels -- that spacing is *before* any frequency smoothing, so these channels are *not* independent.

- n_{BIBP} is the number of Baseline Board Pairs assigned to the subband.
- Each subband may have a different number of spectral channels and polarization products, and each may be tuned independently.
- There can be at most 16 subbands per baseband, and n_{BIBP} must be an integer: 1, 2, 3, 4, 5, ..., 64.

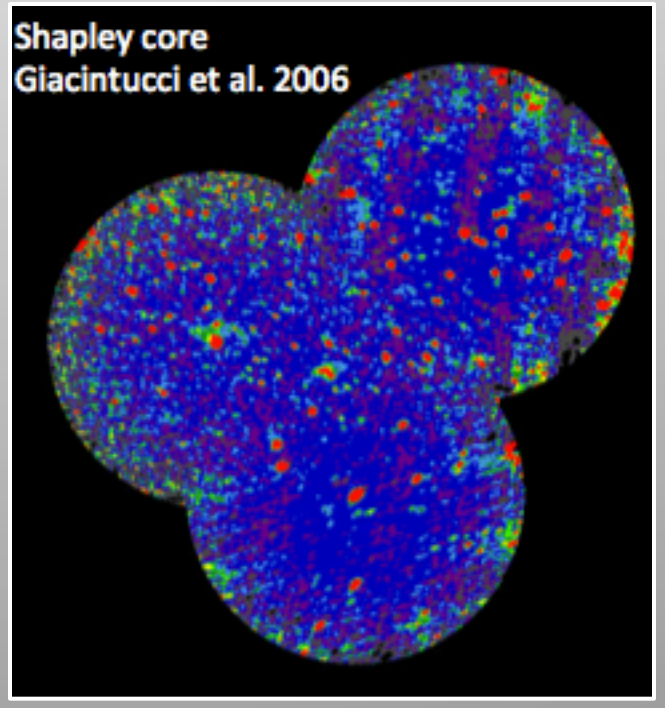
JVLA bands and correlator configurations

How to plan an experiment

3) Field of view

- How large is the field of view needed?
- Is one pointing enough or is *mosacing* necessary?

If the field we want to image is larger than the primary beam, then multiple pointing, i.e. mosaicing, may be necessary



How to plan an experiment

4) Frequency required

- Just one frequency or more? If more, should they be simultaneous?
- Frequency agility necessary?

How to plan an experiment

4) Frequency required

- Just one frequenc
- Frequency agility

Table 7: Default frequen

JVLA

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0.7 cm (Q)	40.0-50.0	

Table 1: Cycle-3 continuum observing capabilities of e-MERLIN

eMERLIN

	1.5 GHz (L-band)	5 GHz (C-band)	Comments
Freq. Range (GHz)	1.23-1.74	4.3-7.5	C-band range eventually will be extended, K-band added.
Resolution (mas)	150	40	Uniform weighting at central frequency
Maximum angular scale (arcsec)[1]	2.0	0.5	Natural weighting, good coverage.
Field of View (arcmin) 25-m dishes[2]	30	7	To primary beam FWHM.
Field of View (arcmin) including Lovell[2]	12	5	To primary beam FWHM.
Continuum sensitivity rms (μJy/bm) in 12 hr on-target, with Lovell	6	7	Good conditions, target above about Dec. 20 deg.
Continuum sensitivity rms (μJy/bm) in 12 hr on-target, no Lovell	12	13	
Astrometric performance (mas)	~2	~1	WRT the ICRF (typical 3-deg target-calibrator separation using VLBA Calibrator Survey)

How to plan an experiment

5) Brightness of the target source

$$S_{rms} = \frac{2kT_{sys}}{A_{eff}\sqrt{N_A(N_A-1)t_{\mathrm{int}}\Delta\nu}}$$

- Which sensitivity is needed to image the weakest features in our target source?
- How long is the integration time needed?
- Which bandwidth is necessary?

How to plan an experiment

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$$\sigma_{\mathrm{conf,VLSS}} = 29\left(\frac{\theta}{1''}\right)^{1.54}\left(\frac{\nu}{74\,\mathrm{MHz}}\right)^{-0.7}\ \mu\mathrm{Jy\ beam}^{-1}$$

$$\sigma_{\mathrm{conf,Condon}} = 1.2\left(\frac{\theta}{8''}\right)^{10/3}\left(\frac{\nu}{3.02\,\mathrm{GHz}}\right)^{-0.7}\ \mu\mathrm{Jy\ beam}^{-1}$$

How to plan an experiment

In summary

1) Type of experiment (continuum, spectral line, polarization)
2) Resolution, field of view , largest angular scales
3) Frequency
4) Brightness sensitivity
5) Source location in the sky (declination)

How to plan an experiment

In summary

1) Type of experiment (continuum, spectral line, polarization)
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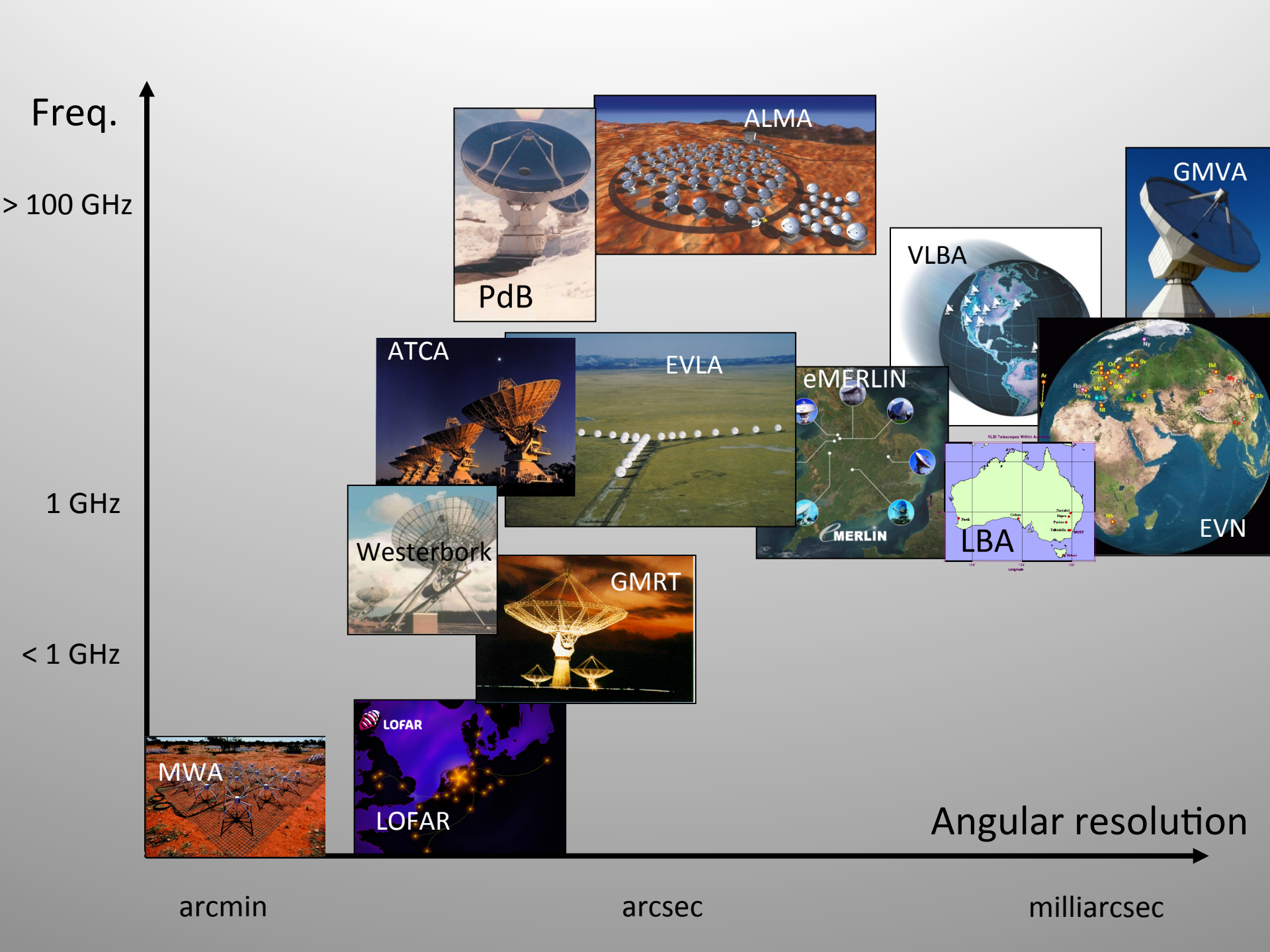
... lead to the choice of

a) the array (if VLBI => choice of the telescopes)
b) observing band
c) observing setup
d) total time on-source


Freq.
> 100 GHz
1 GHz
< 1 GHz
PdB
ALMA
GMVA
VLBA
ATCA
EVLA
eMERLIN
Westerbork
GMRT
LBA
EVN
MWA
LOFAR
LOFAR
Angular resolution
arcmin
arcsec
milliarcsec

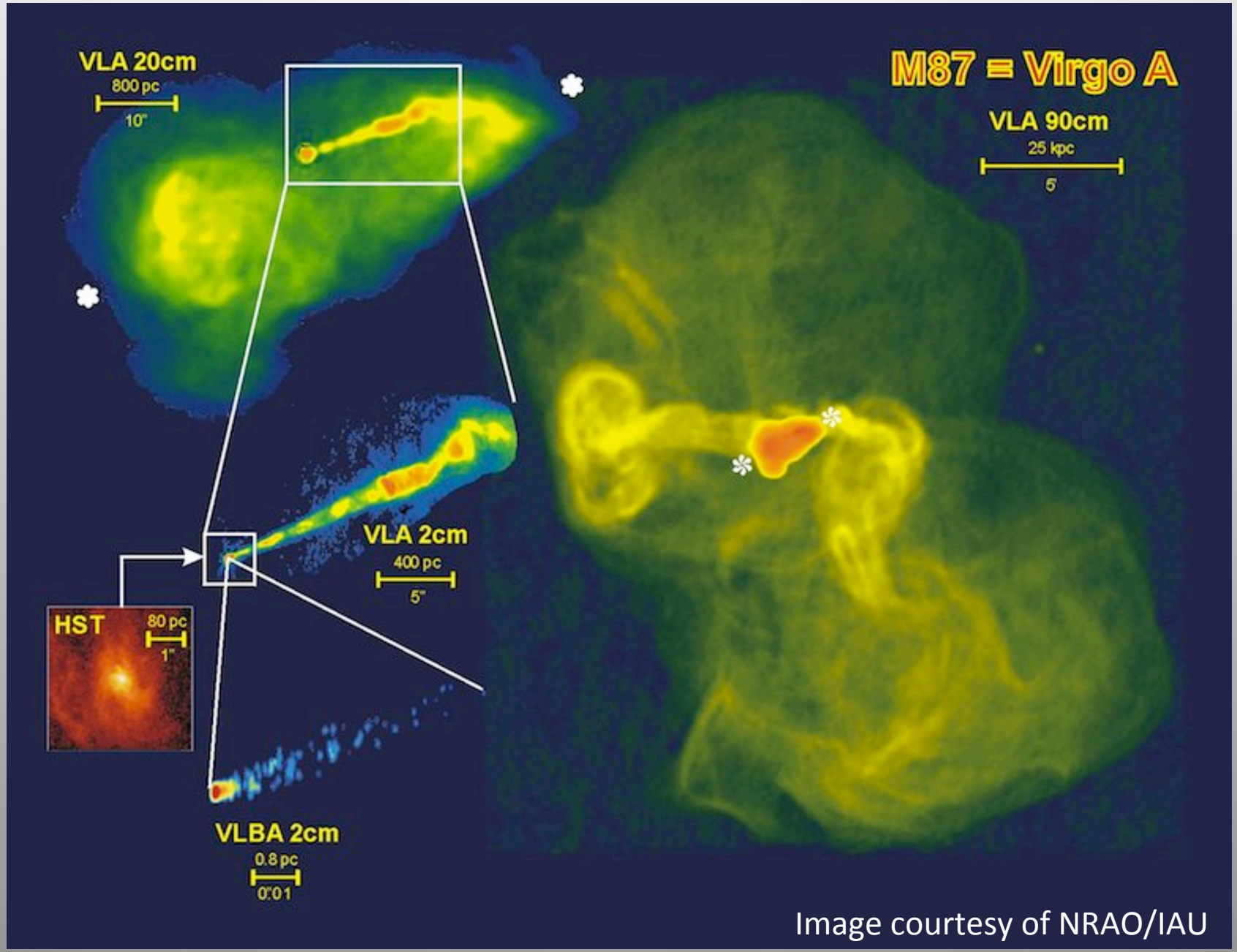
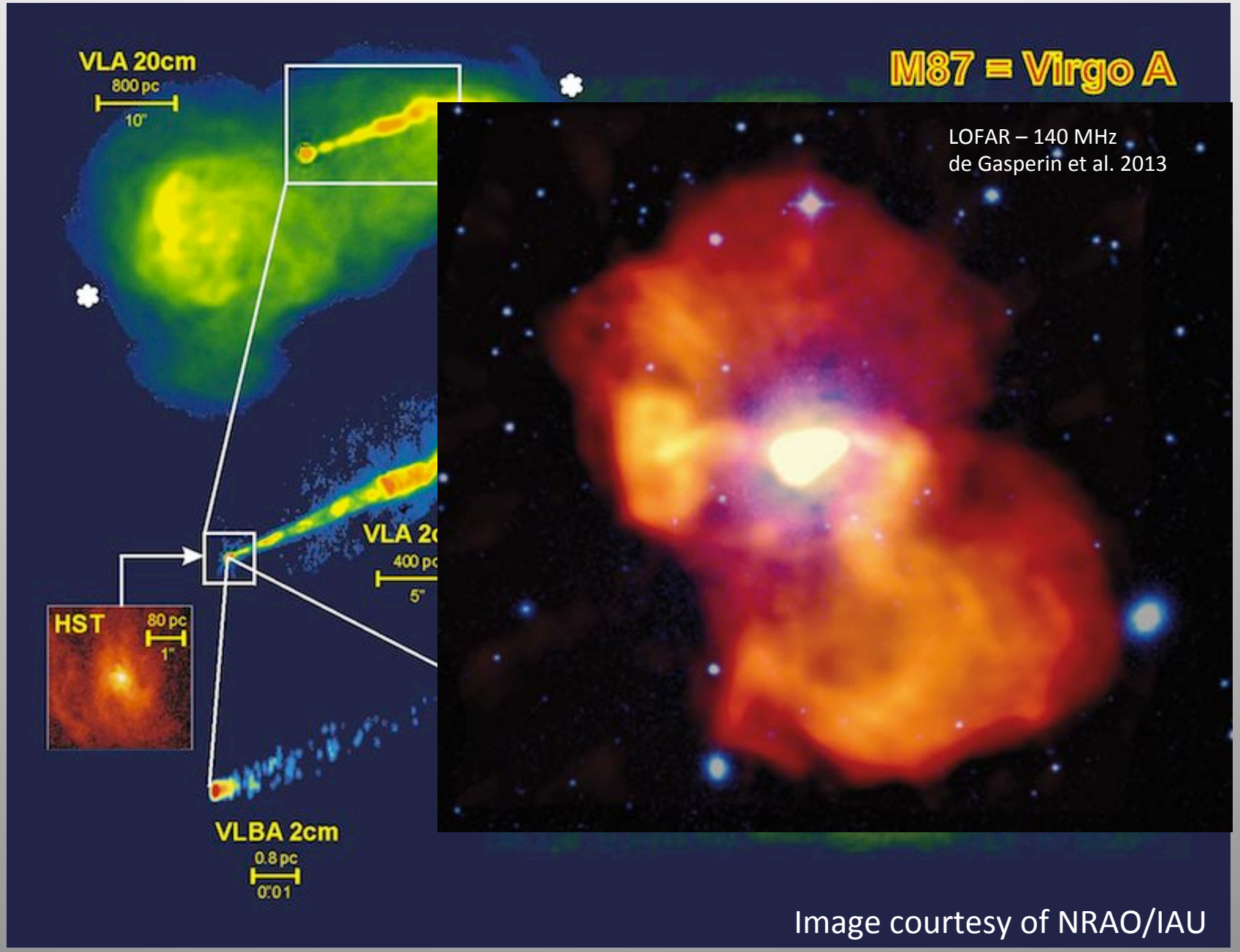


Image courtesy of NRAO/IAU


M87 = Virgo A
VLA 20cm
800 pc
10"
LOFAR – 140 MHz
de Gasperin et al. 2013
VLA 2
400 pc
5"
HST
80 pc
1"
VLBA 2cm
0.8 pc
0.01
Image courtesy of NRAO/IAU

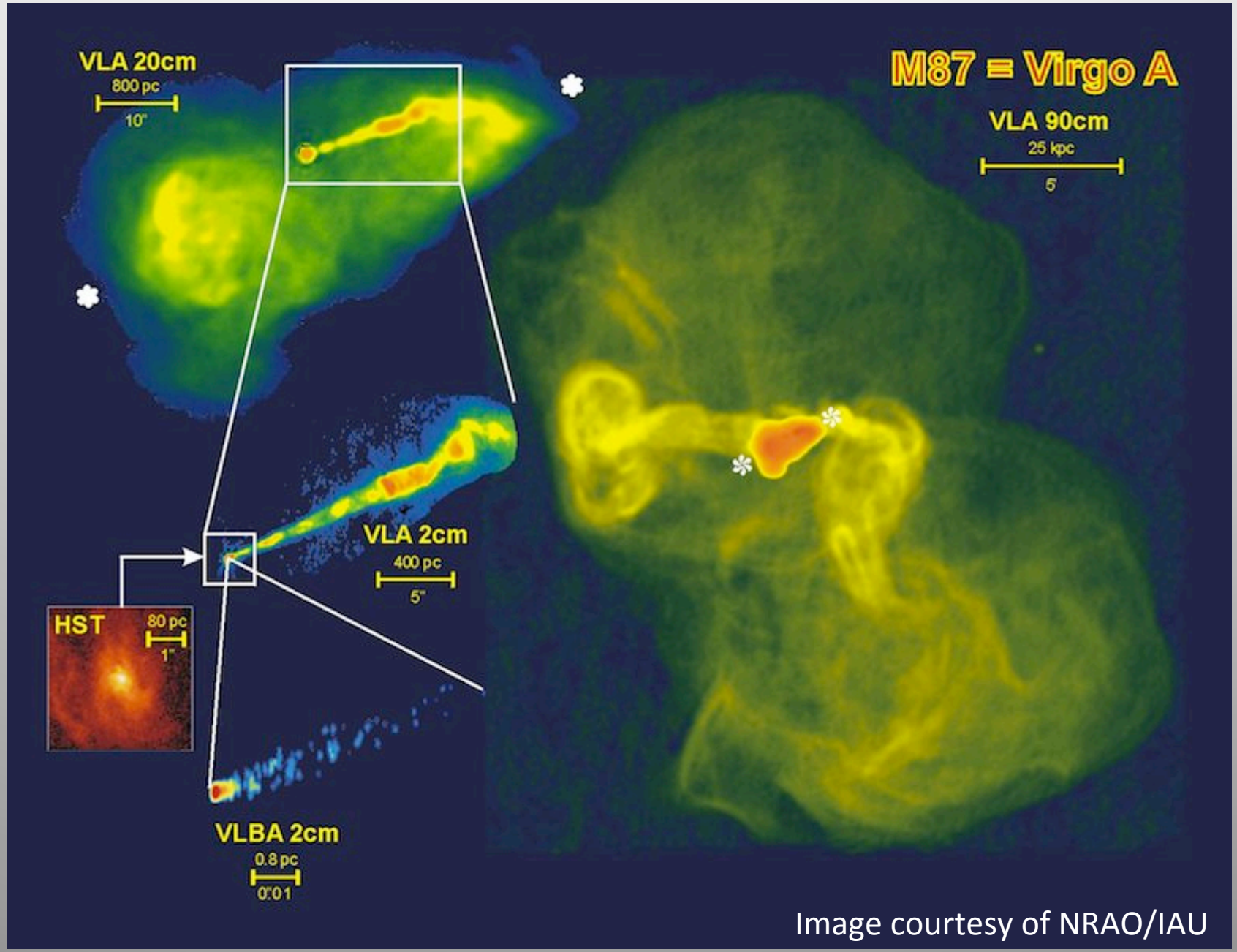


Image courtesy of NRAO/IAU

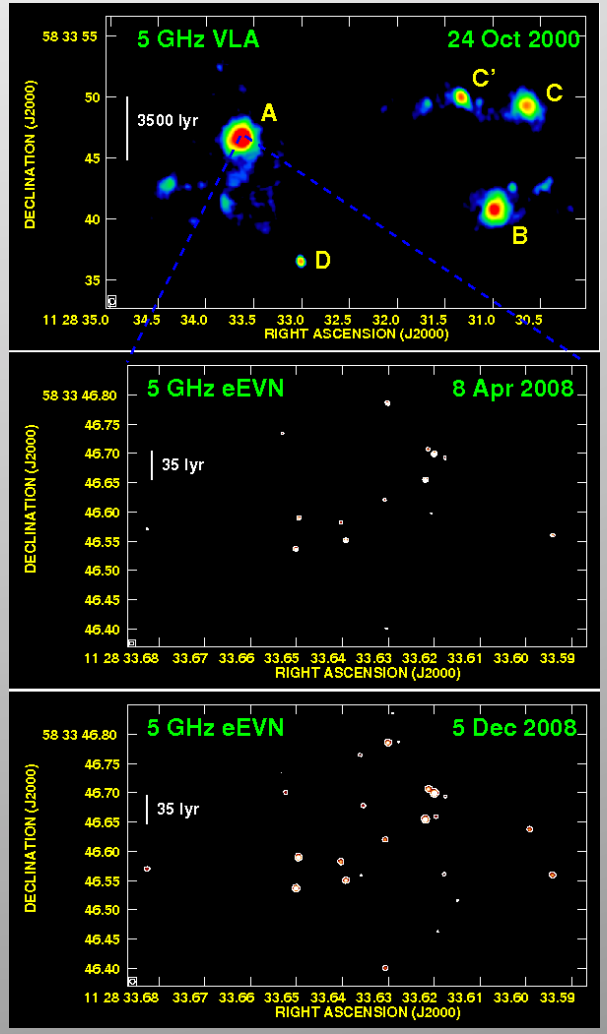
Further considerations

Calibration strategy

- Phase calibrators / phase-reference sources (see VLBI talk)
- Special needs:
  - Astrometry
  - Polarimetry (antenna leagake terms, EVPA)

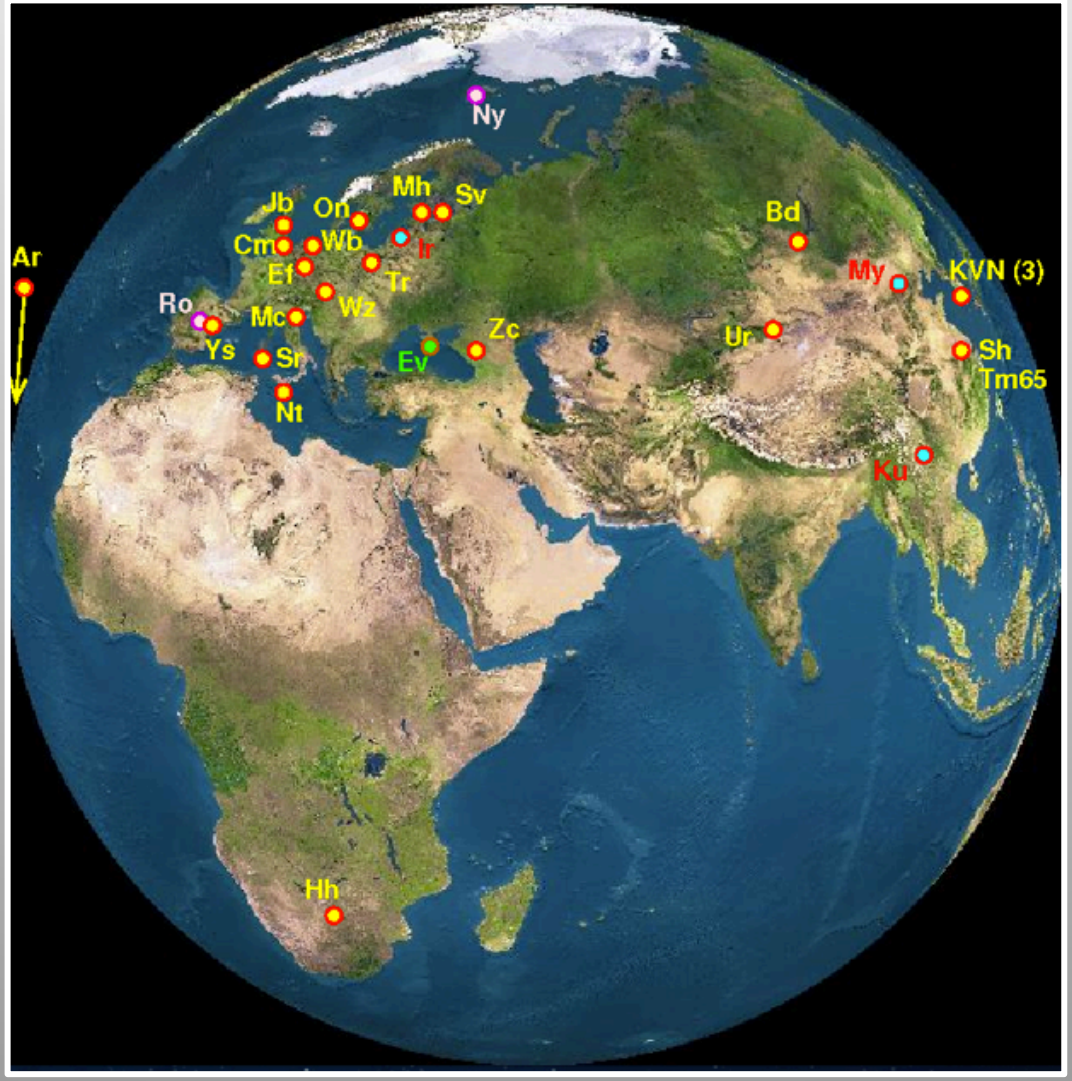
Scheduling constraints

- Fixed or dynamic?
- Need for dry atmosphere (at high freq.) or quiet ionosphere (at low freq.)?
- Distance from the Sun
- Coordinated observations with other instruments



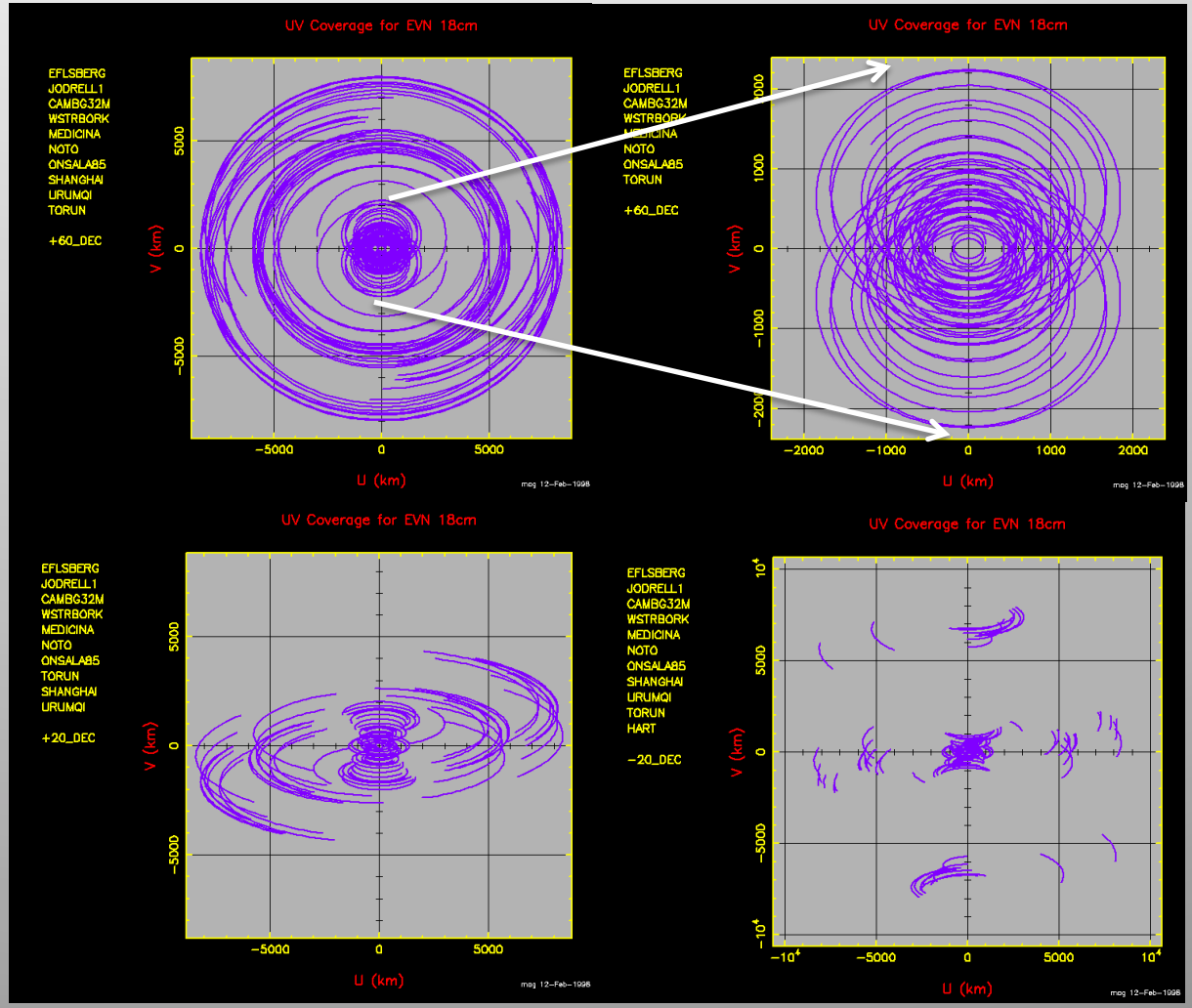
Perez-Torres et al.

Selection of telescopes for VLBI observations



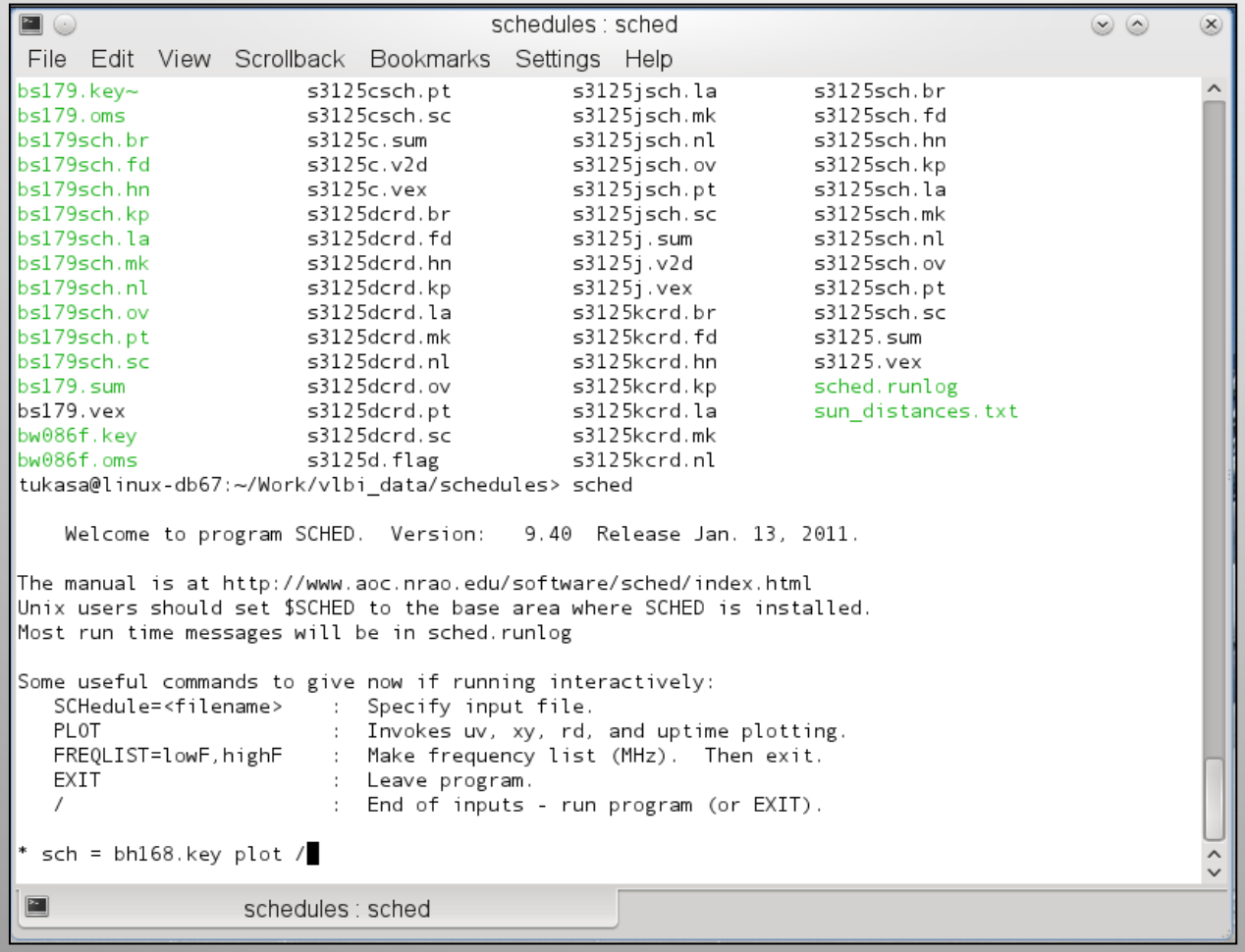
Selection of telescopes for VLBI observations

- Depending on the required angular resolution, sensitivity, and observing band one may choose EVN/eVLBI, VLBA, HSA, GMVA, LBA or global VLBI
- Check the u-v coverage (telescopes and duration of observations)

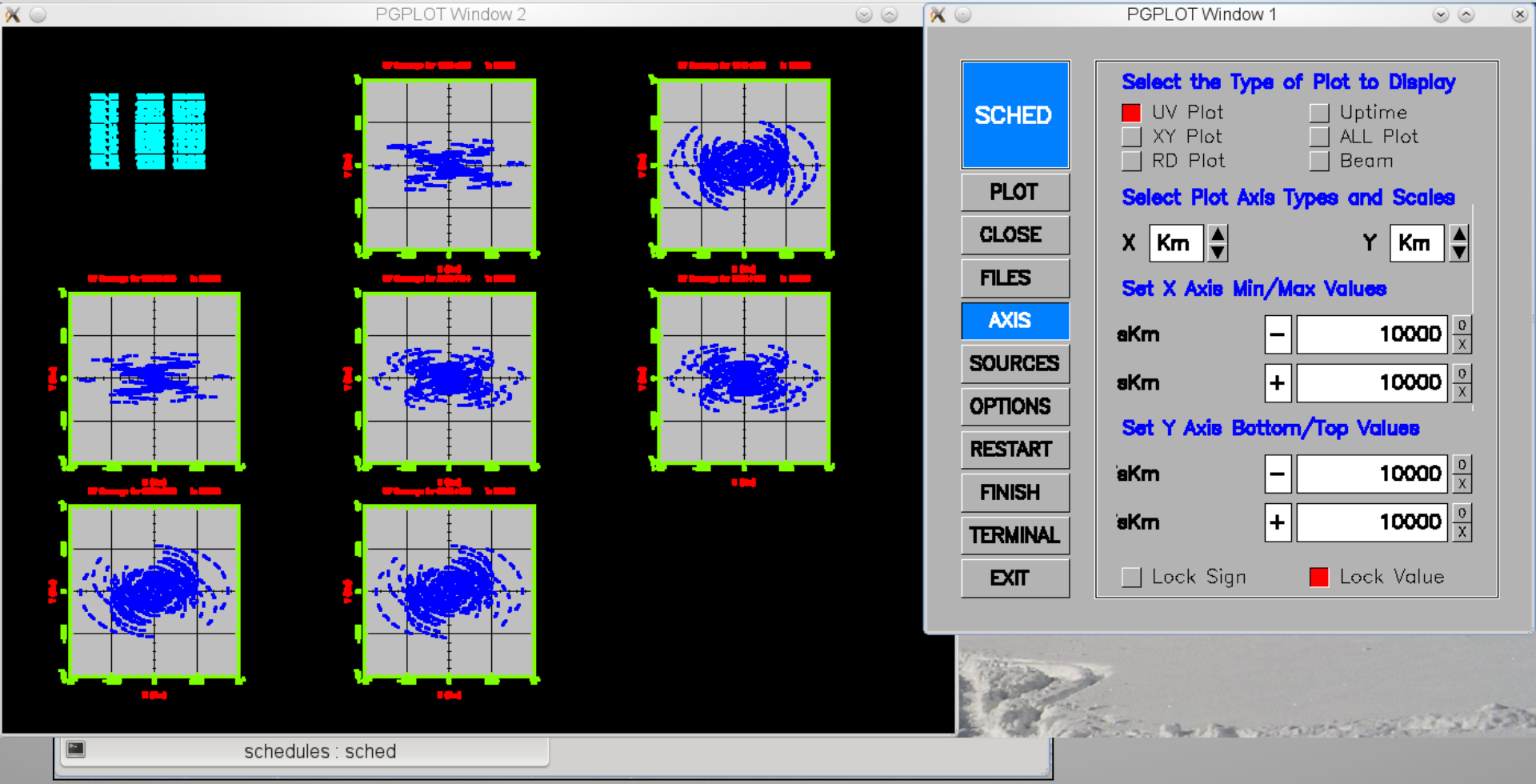


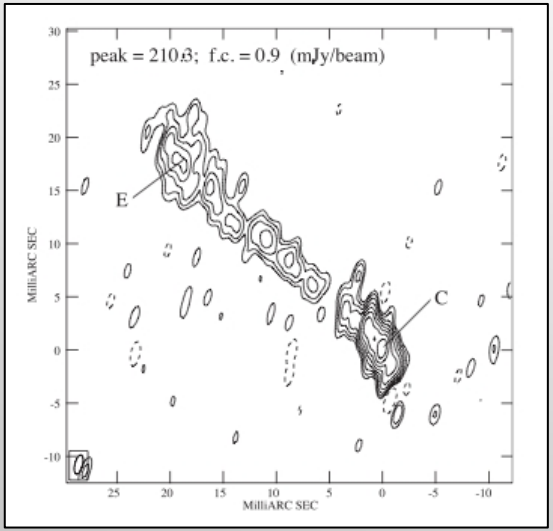
Examples of EVN (u,v) coverages

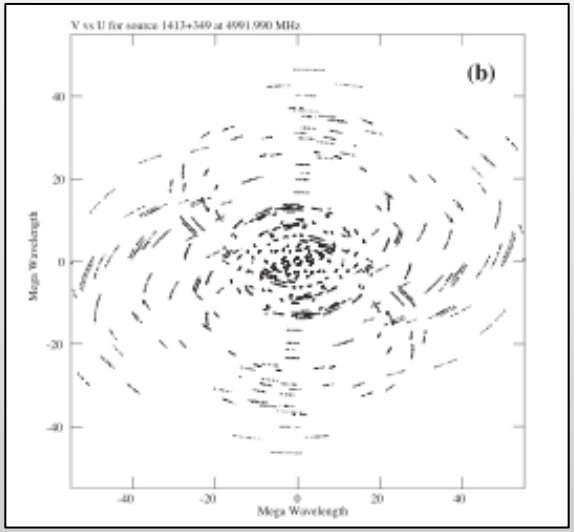
Sched for VLBI observations



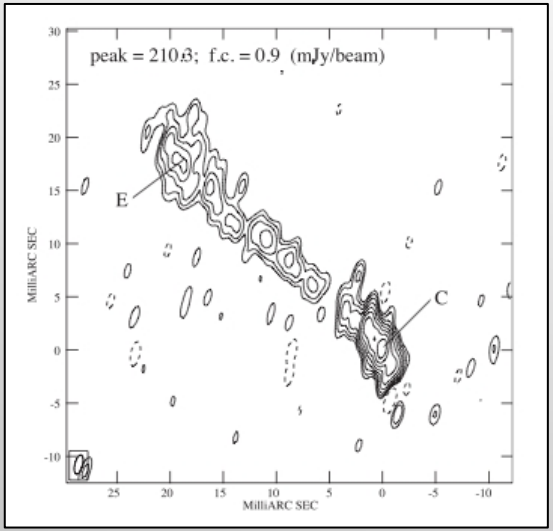
Sched for VLBI observations

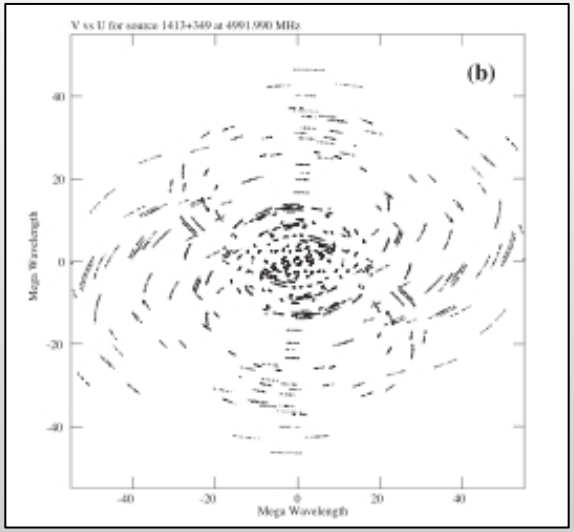






Dallacasa et al. 2013 – CSS radio source at 5 GHz, Global VLBI Array of 16 antennas, snapshot mode, total time on source 1.5 hr – Peak 209 mJy/beam





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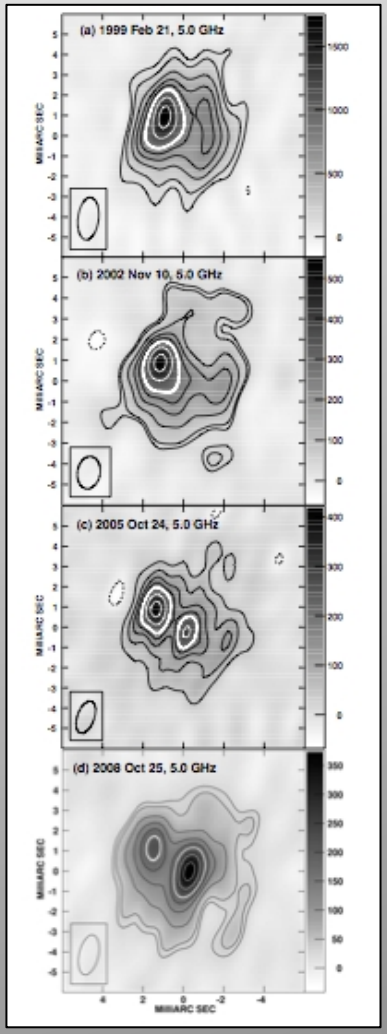

Bientenholz et al. 2010

Peaks ~ 1 mJy/beam

Table 1
VLBI Observations of SN 1986J

Date	Frequency (GHz)	Antennas[a]	Total Time (hr)	Recording Rate (Mbit s^{-1})
2005 Apr 25	22	VLBA, Ef, Gb, Y27	12	256
2005 Oct 24	5	VLBA, Ef, Gb, Y27, Jb, On, Wb, Tr	12	256
2006 Dec 3	8	VLBA, Ef, Gb, Y27	15	512
2006 Dec 10	22	VLBA, Ef, Gb, Y27	15	512
2008 Oct 26	5	VLBA, Ef, GB, Y27, Jb, Mc, Nt, Tr, Wb	18	512

Note. [a] VLBA, ten 25 m dishes of the NRAO Very Long Baseline Array; Ef, 100 m, MPIfR, Effelsberg, Germany; Gb, ~105 m, NRAO, Green Bank, WV, USA; Y27, equivalent diameter 130 m, NRAO, near Socorro, NM, USA; Jb, 76 m, Jodrell Bank, UK; Mc, 32 m, IdR-CNR, Medicina, Italy; Nt, 32 m, IdR-CNR, Noto, Italy; On, 20 m, Onsala Space Observatory, Sweden; Tr, 32 m, Torun, Poland; Wb, equivalent diameter 94 m, Westerbork, the Netherlands.

Writing an observing time proposal

General information

- Radio astronomical facilities announce a call for proposals one (i.e. ALMA) two (VLBA, GMVA, VLA, GMRT, WSRT, LOFAR, ATCA) or three (e-EVN) times per year
- ToOs are accepted at any time
- Different over-subscription factors at different observatories and at different LST ranges – keep this in mind

Writing an observing time proposal

A proposal consists of three parts

Cover sheet

It includes basic information, i.e. authors & affiliation, source list, requested time and a technical summary. It is generated by the web-based proposal submission tool.

Scientific justification

Be Clear and concise

Include the necessary background material needed to understand the scientific goal, but not more

Clearly explain how the scientific goal is achieved by making the proposed observations

Use clear, appropriate and readable figures

Avoid unnecessary repetition and jargon

Writing an observing time proposal

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It includes basic information, i.e. authors & affiliation, source list, requested time and a technical summary. It is generated by the web-based proposal submission tool.

Scientific justification

TAC Committees usually don't like:

Poorly justified sample sizes (why 10, or 20, or 100?)

Blind fishing

Vague statements

Non-astronomical statements

Proposals exceeding the given page limits

Writing an observing time proposal

Technical justification

- Justify the requested time and setup
- Required rms
- Required u-v coverage/selected array
- Required dynamic range
- Time needed for calibration
- Observational constraints

If non-standard setups or a very stringent scheduling is needed, it is a good idea to consult the observatory staff beforehand. It may turn out that what you are requesting is in fact impossible to do!!! May be important for VLBI observations

Some useful tools and links

- EVN sensitivity calculator: www.evlbi.org/cgi-bin/EVNcalc
- ALMA sensitivity calculator: http://almascience.eso.org/proposing/sensitivity-calculator
- VLA exposure calculator: https://obs.vla.nrao.edu/etc/
- ATCA CABB sensitivity calculator: www.narrabri.atnf.csiro.au/myatca/interactive_senscalc.html

VLA Exposure Calculator

Array Configuration	A
Number of Antennas	25
Number of Polarizations	Single / Dual
Type of Weighting	Natural / Robust
Frequency	0.0000 GHz
Receiver Band	Unspecified
Approximate Beam Size	Unknown
Digital Samplers	3 bit / 8 bit
Elevation	Zenith (90 degrees)
Average Weather	Winter
Calculation Type	Time / BW / Noise/Tb
Time on Source	0h 0m 0s
Total Time	0h 0m 0s
Bandwidth (Frequency)	0.0000 GHz
Bandwidth (Velocity)	0.0000 km/s
RMS Noise (units/beam)	100.0000 μJy
RMS Brightness (temp)	0.0000 mK

Help Save

v16A | 2015-08-25 10:18:14 MDT | build #190

$$S_{rms} = \frac{2kT_{sys}}{A_{eff}\sqrt{N_A(N_A-1)t_{\rm int}\Delta\nu}}$$

$$\sigma_{\rm conf,VLSS} = 29\left(\frac{\theta}{1''}\right)^{1.54}\left(\frac{\nu}{74\,\rm MHz}\right)^{-0.7}\ \mu\rm Jy\ beam^{-1}$$

EVN Calculator

EVN | e-EVN | VLBA | GLOBAL | GMVA — RESET GO

Observing band & data rate [Mbit/s]: L – 18cm | 1024

On-source integration time [min]: 150

Ef	Nt	My	Pv	Pa	Hn
Mc	Sh	Km	Ro70	Ho	Nl
On	Tm65	Sv	Ro34	Cd	Fd
Tr	Ur	Zc	Pb	Ap	La
Jb1	Mh	Bd	Ku	Go	Kp
Jb2	Ys	Wz	Ky	Gb	Pt
Cm	Sr	Ka	Kt	Y1	Ov
Wb	Ar	Ny	At	Y27	Br
W1	Hh	Tc	Mp	Sc	Mk

A simple guide:

- one station: SEFD
- two stations: baseline sensitivity
- more stations: image thermal noise

- field of view and EVN MkIV correlator limitations are given below

Number of spectral channels per subband, integration time [s], and maximum baseline length: 16 ch | 2 s | 10000 km (Full EVN)

Number of polarizations, subbands per polarizations, and bandwidth of a subband [MHz]: 2 pols | 8 sb | 16 MHz

Please select an array (N>2) and an observing band.

MkIV Correlator limitations no longer apply.

RESET GO

Some useful tools and links

- GMRT users observing help: www.gmrt.ncra.tif.res.in/gmrt_hpage/Users/Help/help.html
- Sched (useful for planning VLBI experiments): www.aoc.nrao.edu/~cwalker/sched/
- LOFAR tools: www.astron.nl/radio-observatory/lofar/lofar-tools/lofar-tools
- VLA Calibrator Manual: www.aoc.nrao.edu/~gtaylor/csource.html
- GMRT calibrator search page: www.gmrt.ncra.tifr.res.in/~astrosupp/calib/vlacal.html

Proposal submission & submission tools

- Electronic submission via web-based tools is now the norm
- Different tools for different observatories
  - EVN, eMERLIN, LOFAR: NorthStar (proposal.jive.nl)
  - VLBA, VLA: NRAO PST (my.nrao.edu)
  - ALMA Observing tool (download from www.almascience.org)
  - ATCA: OPAL(opal.atnf.csiro.au)
  - GMRT: naps(naps.ncra.tifr.res.in)
- Cover & technical justification to be filled on web, scientific justification to be uploaded.
- Changes are possible until the very last minute

Scheduling and observing file preparation

- After the acceptance of the proposal:
  - Preparation of the required observing files using observatory specific tools
  - Observatory staff checks the observing files and schedules the observations (either on a fixed date or dynamically)

- Observing file contains:
  - Array configuration
  - Receiver setups
  - Correlator setup
  - Scans of targets and calibrators
  - Constraints for dynamic scheduling

- Remember to:
  - Check the visibility of the targets and calibrators, and their separation on the sky
  - Duty cycles
  - Be extra careful if using non-standard receiver setups.
  - Be sure to observe all the required calibrators (flux, phase, polarization leakage and evpa, bandpass, fringe finder in VLBI observations…)

Search for calibrators

The VLA Calibrator Manual

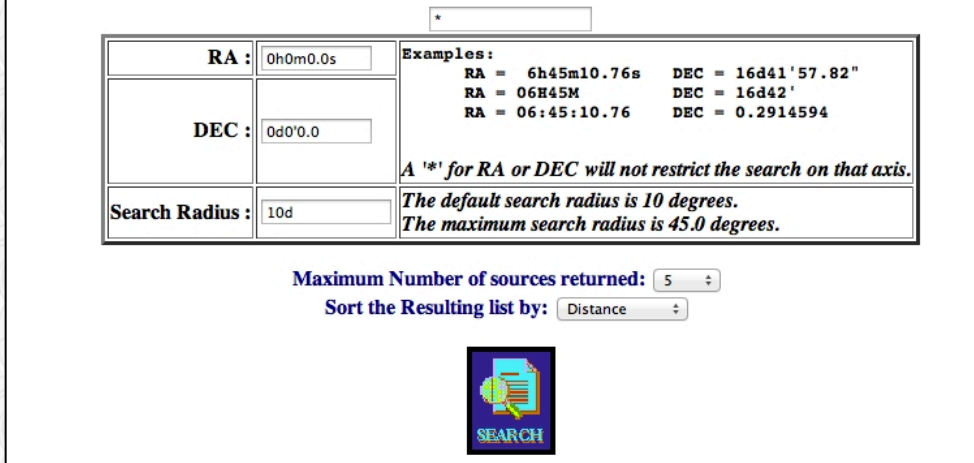
Hop to RA [01] [02] [03] [04] [05] [06] [07] [08] [09] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21]

```
IAU NAME EQUINOX  PC RA(hh,mm,ss)    DEC(ddd,mm,ss)   POS.REF ALT.NAME
=================================================================

0001+192   J2000  A 00h01m08.621563s  19d14'33.801860"  Aug01  JVAS
2358+189   B1950  A 23h58m34.865400s  18d57'51.753000"
-----------------------------------------------------
BAND        A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=====================================================
0.7cm    Q  W W W W       0.18

0003-174   J2000  T 00h03m21.9969s   -17d27'11.781"
0000-177   B1950  T 00h00m48.4200s   -17d43'54.000"
-----------------------------------------------------
BAND        A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=====================================================
 90cm    P  X S S S         7                        7
 20cm    L  X X X S       2.2                        7

0004+462   J2000  A 00h04m16.127651s  46d15'17.970010"  Aug01
0001+459   B1950  A 00h01m41.453100s  45d58'36.145000"
-----------------------------------------------------
BAND        A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=====================================================
0.7cm    Q  W W W W       0.12

0004+203   J2000  B 00h04m35.7576s    20d19'42.249"     May01  JVAS
0002+200   B1950  B 00h02m01.6329s    20d03'00.311"
-----------------------------------------------------
BAND        A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=====================================================
0.7cm    Q  W W W W       0.21

0005+544   J2000  A 00h05m04.363531s  54d28'24.926230"  Aug01
0002+541   B1950  A 00h02m29.056400s  54d11'43.187000"
```

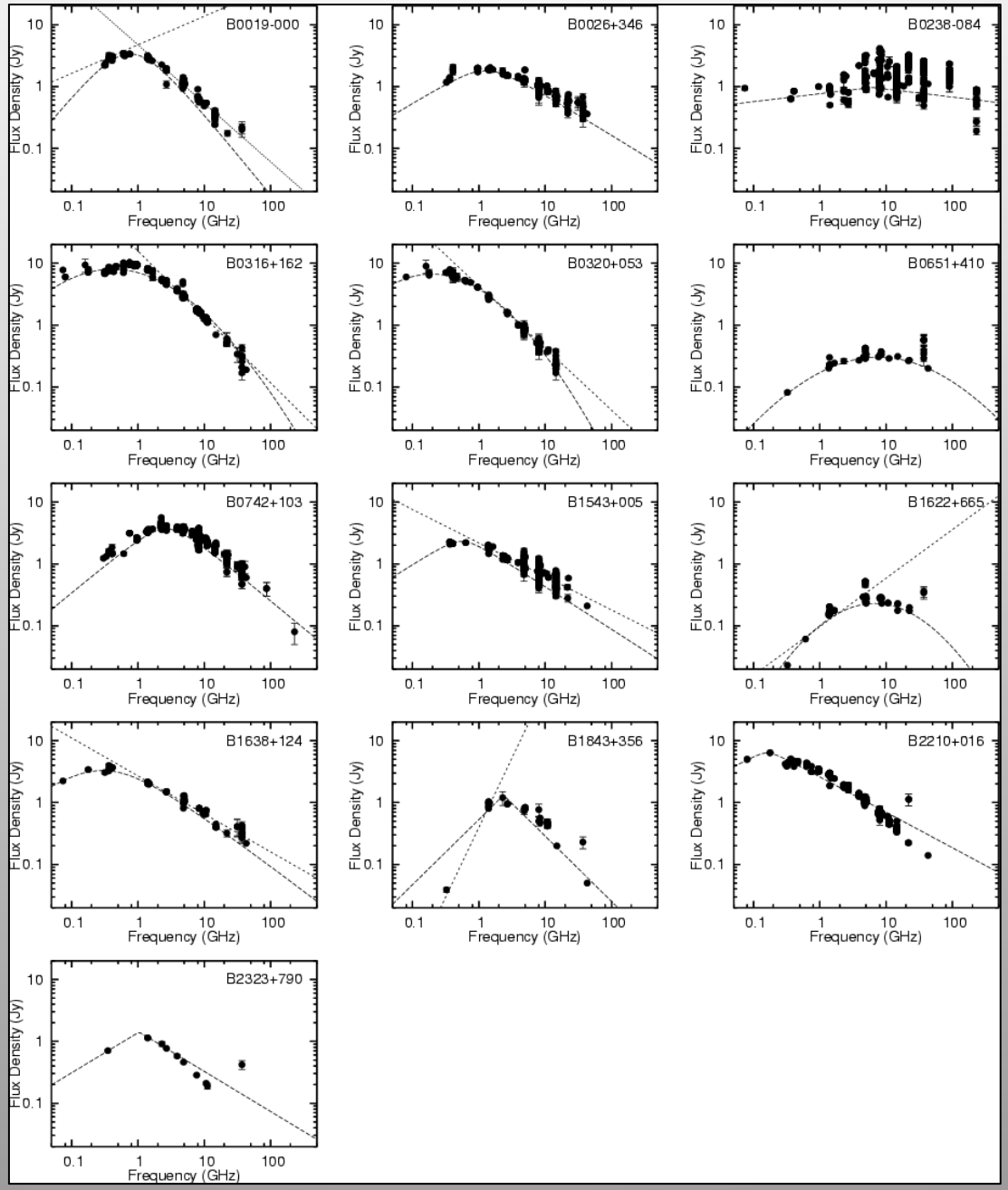
Continuum phase calibrators should be:

- Compact
- Strong at the observing frequency
- As close as possible to the target

VLBA Calibrators Search Form



Check images on NVSS, FIRST, VLSS image surveys

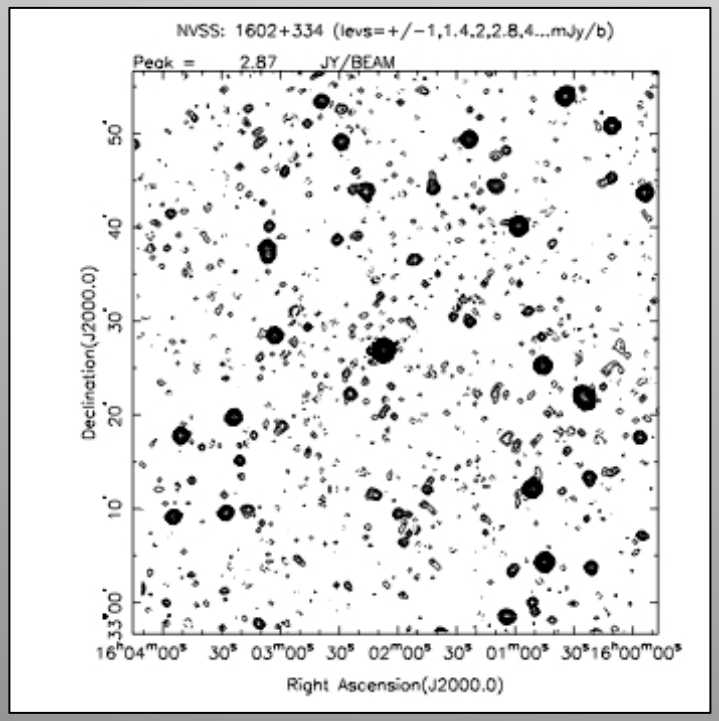

B0019-000
B0026+346
B0238-084
B0316+162
B0320+053
B0651+410
B0742+103
B1543+005
B1622+665
B1638+124
B1843+356
B2210+016
B2323+790
Flux Density (Jy)
Frequency (GHz)
10
1
0.1
0.1
1
10
100

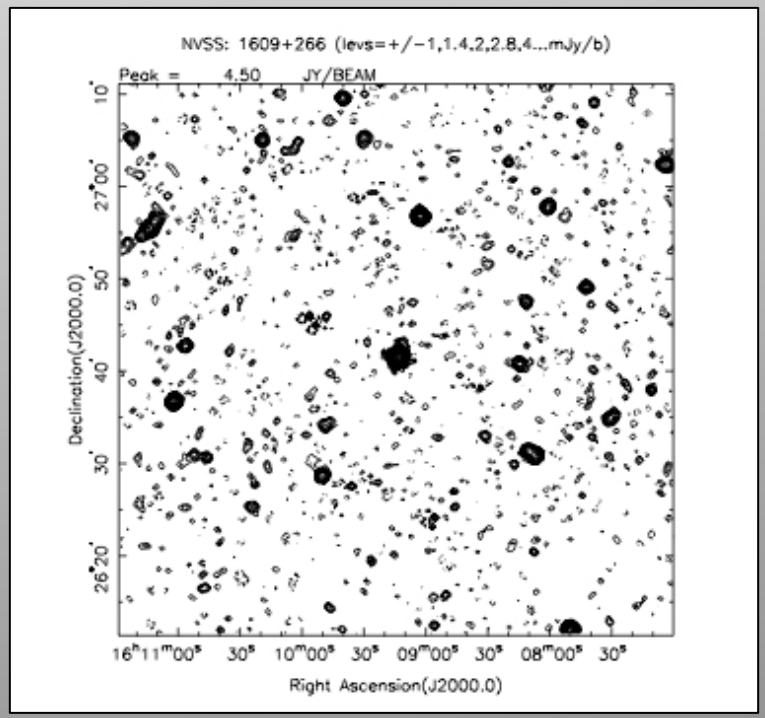
Example:
Calibrator search for GMRT observations of Abell 2142 at 610, 325, 240 MHz

RA_{J2000}=15 58 16.1 DEC_{J2000}=+27 13 29

```
1602+334   J2000  A 16h02m07.263468s  33d26'53.072670"  Aug01
1600+335   B1950  A 16h00m11.909300s  33d35'09.593000"
-------------------------------------------------------
BAND         A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=======================================================
 20cm    L   P P P P       2.60
  6cm    C   P P P P       2.00
3.7cm    X   P P P P       2.05
  2cm    U   P P P P       1.40
0.7cm    Q   W W W W       0.41                  visplot
```

```
1609+266   J2000  B 16h09m13.320753s  26d41'29.036380"  Aug01
1607+268   B1950  B 16h07m09.290100s  26d49'18.658000"
-------------------------------------------------------
BAND         A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=======================================================
 20cm    L   P P P P       4.83
  6cm    C   S P P P       1.70                    300
3.7cm    X   S P P P       0.85                    300
  2cm    U   X S S S       0.50                    300
0.7cm    Q   X X X X       0.0
```



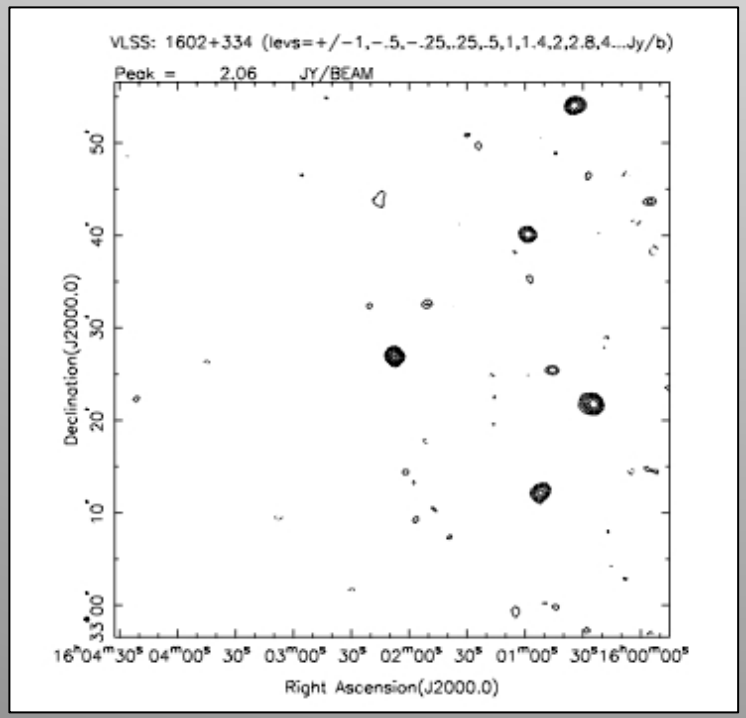


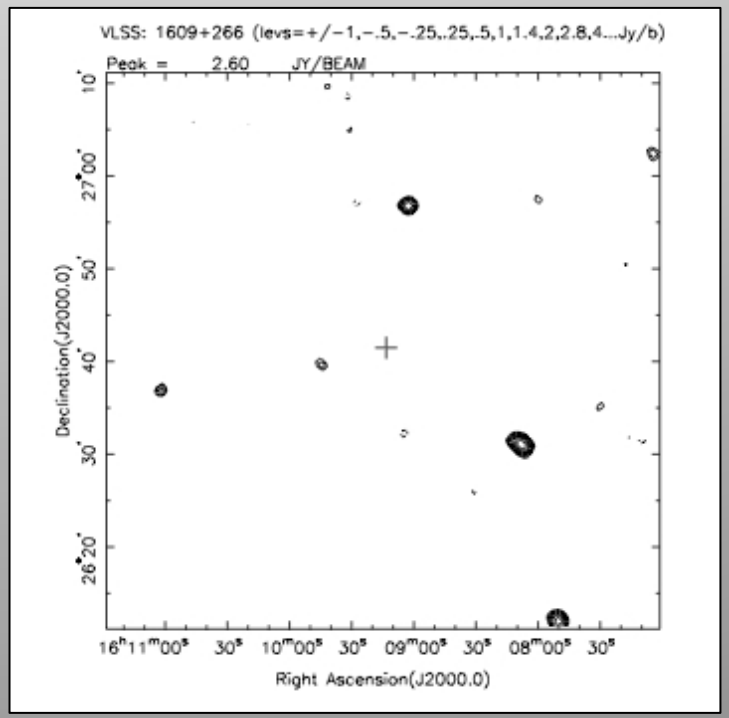
Example:
Calibrator search for GMRT observations of Abell 2142 at 610, 325, 240 MHz

RA_{J2000}=15 58 16.1 DEC_{J2000}=+27 13 29

```
1602+334   J2000  A 16h02m07.263468s  33d26'53.072670"  Aug01
1600+335   B1950  A 16h00m11.909300s  33d35'09.593000"
-------------------------------------------------------
BAND         A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=======================================================
 20cm    L   P P P P       2.60
  6cm    C   P P P P       2.00
3.7cm    X   P P P P       2.05
  2cm    U   P P P P       1.40
0.7cm    Q   W W W W       0.41                  visplot
```

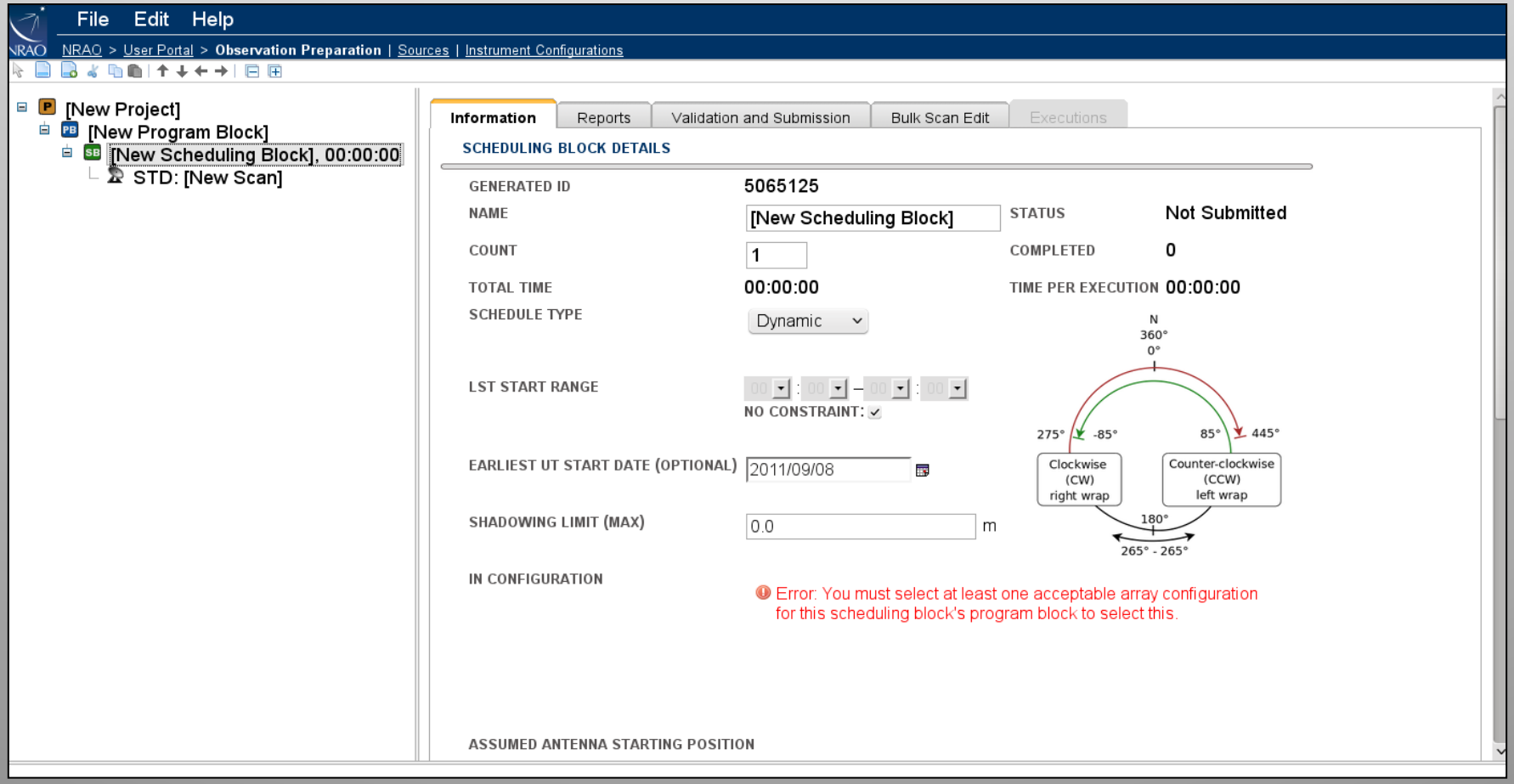
```
1609+266   J2000  B 16h09m13.320753s  26d41'29.036380"  Aug01
1607+268   B1950  B 16h07m09.290100s  26d49'18.658000"
-------------------------------------------------------
BAND         A B C D    FLUX(Jy)    UVMIN(kL)  UVMAX(kL)
=======================================================
 20cm    L   P P P P       4.83
  6cm    C   S P P P       1.70                    300
3.7cm    X   S P P P       0.85                    300
  2cm    U   X S S S       0.50                    300
0.7cm    Q   X X X X       0.0
```





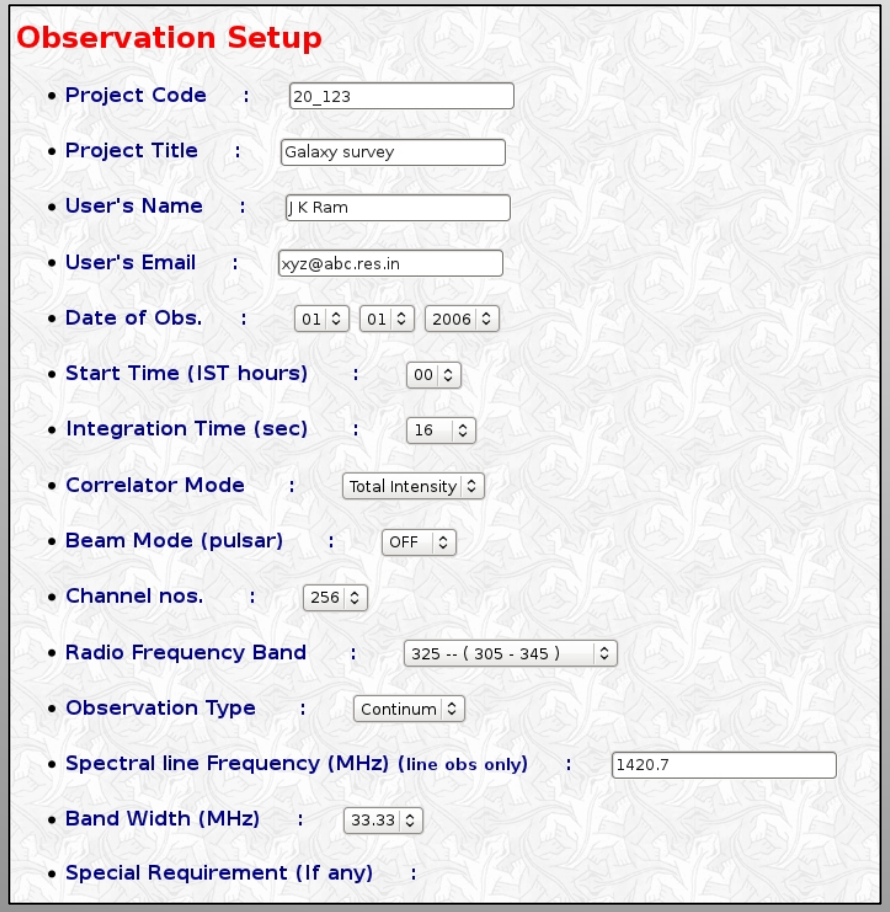
Examples of observing file preparation tools
OPT for EVLA

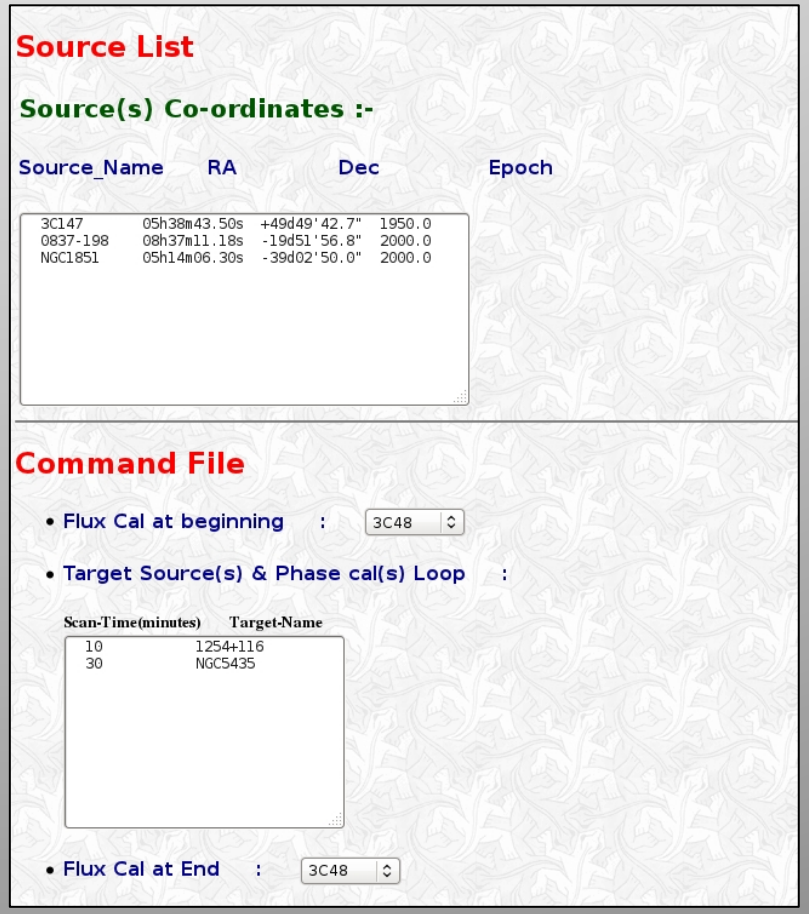
- Log in at `e2e.nrao.edu`



Examples of observing file preparation tools
Observing file creator for GMRT

- Go to `www.gmrt.ncra.tifr.res.in/gmrt_hpage/Users/Help/sys/setup.html`

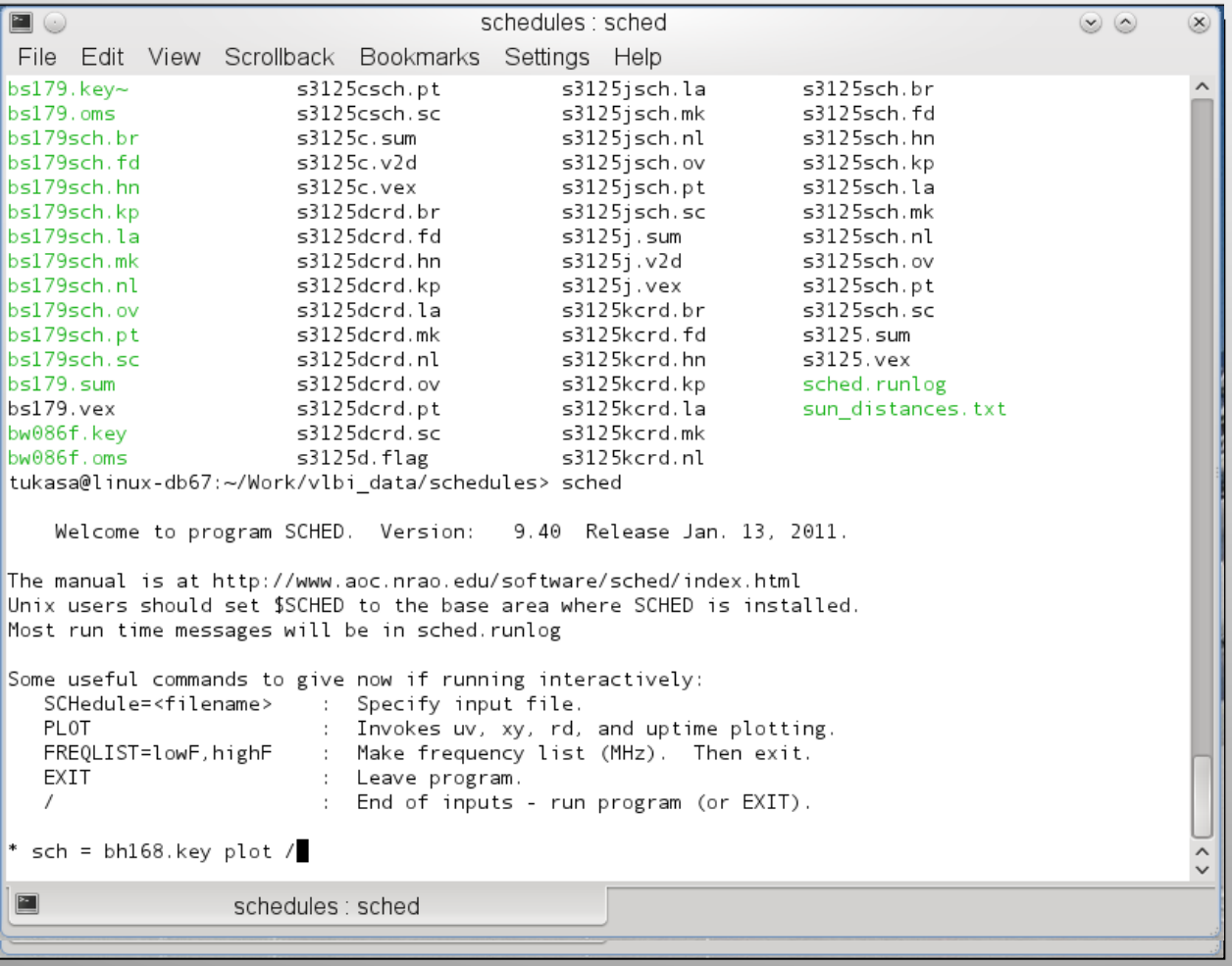




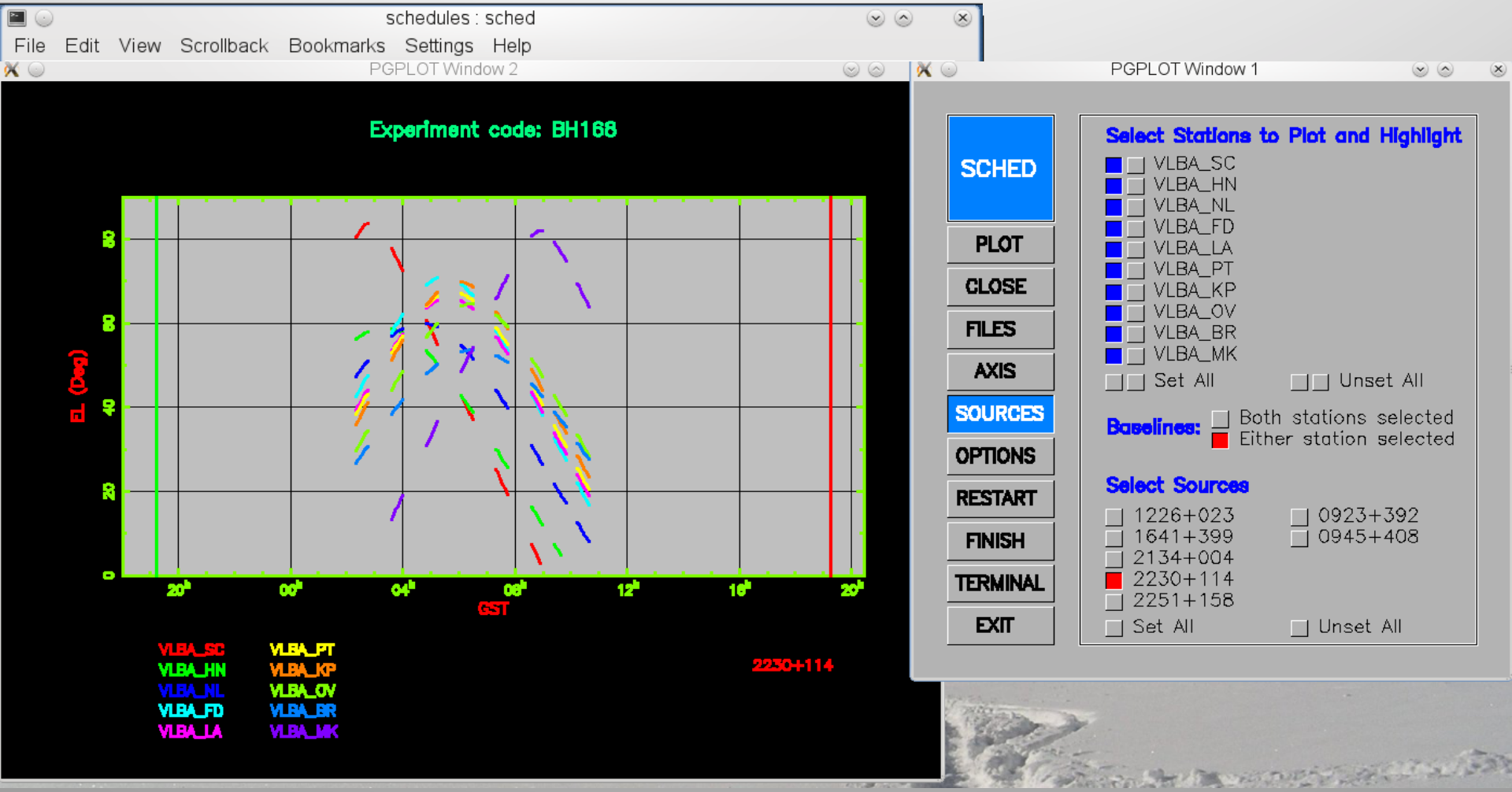
Sched for VLBI observations

- VLBI observing file (*schedule*) is prepared with a program called Sched, which makes control files for all the individual telescopes (www.aoc.nrao.edu/~cwalker/sched/)
- Sched handles automatically a lot of things like calculating the slewing times of different telescopes
- Since VLBI telescopes are distributed around the world, your source transits at different times at different telescopes sites. The schedule has to match the allocated UT slot, which corresponds to the requested GST range. Use sched to check source uptimes already when planning the experiment.
- If preparing VLBI schedule for the first time, seek help from an experienced user.
- Remember to schedule strong and compact "fringe-finder" sources several times during the observation. Try to schedule these when they are observable from all the antennas.
- Send <obscode>.key file to the observatory staff

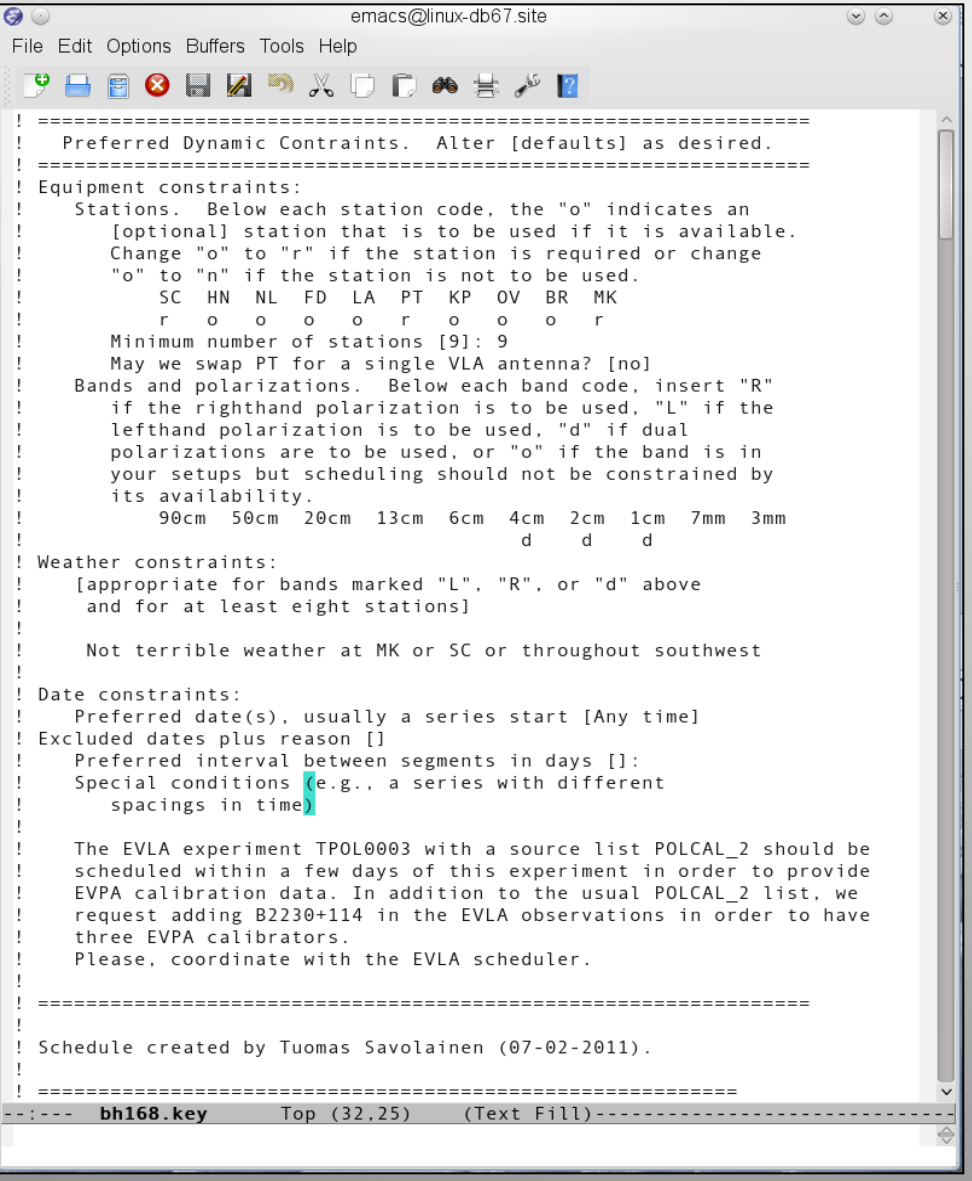
Sched for VLBI observations



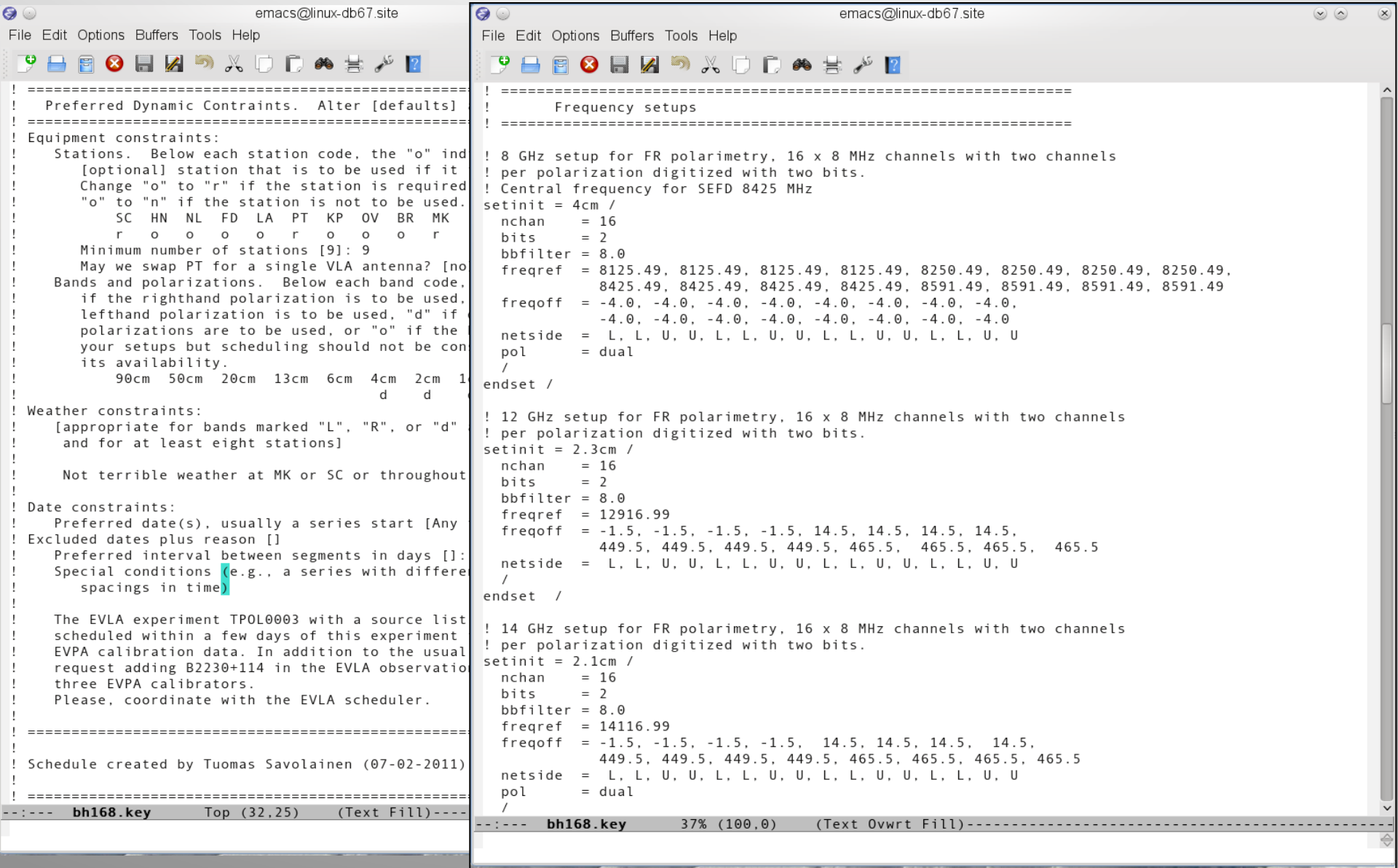
Sched for VLBI observations



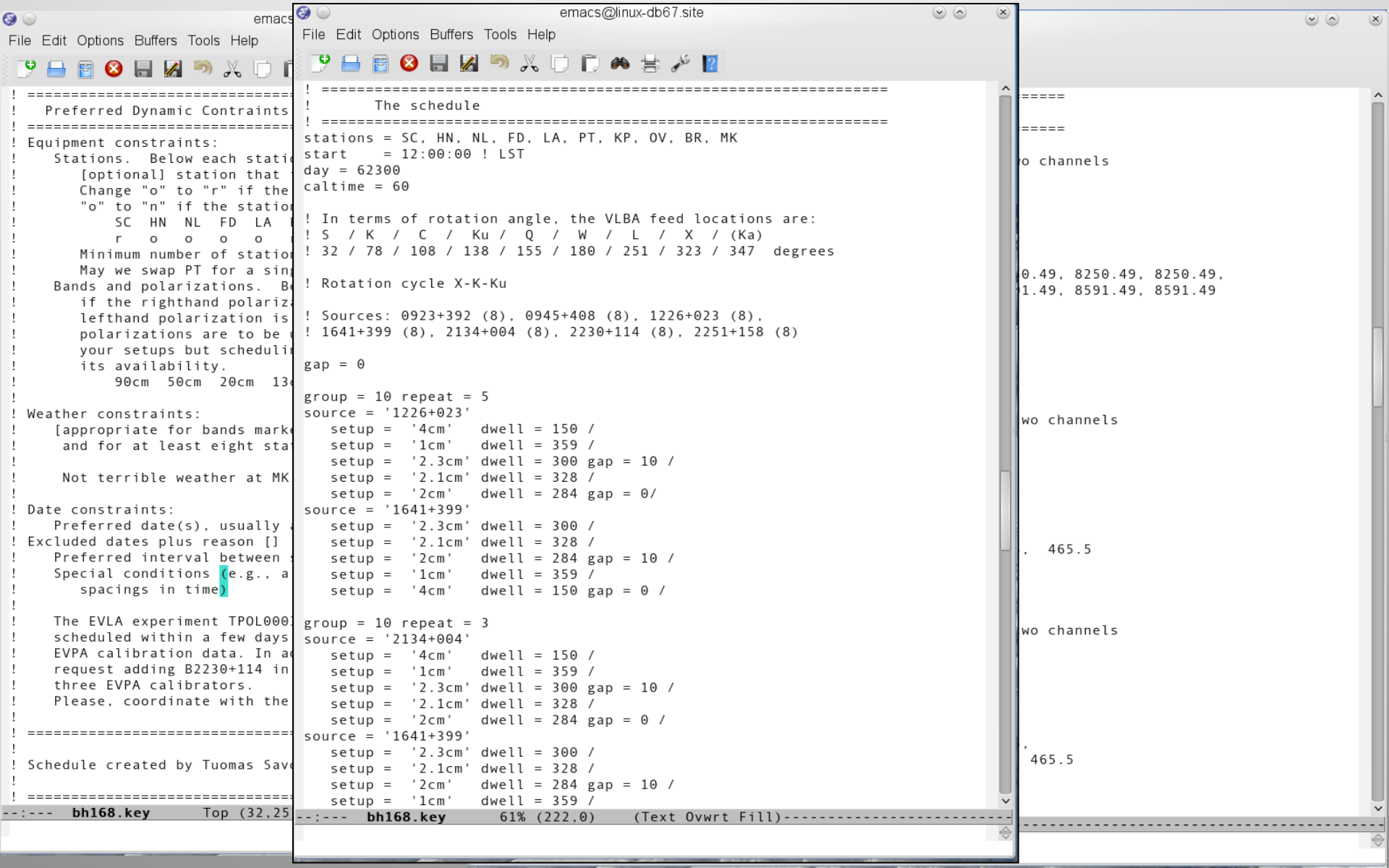
Sched for VLBI observations



Sched for VLBI observations



Sched for VLBI observations



After the observations

In most cases the raw data may be retrieved from the observatory machines.
At this point the the data reduction starts...

Day 1, Sunday September 6		
08:30		**Registration**
09:20	Robert Laing	**Opening/Welcome**
09:30	Neil Jackson	L1: A Gentle introduction to Radio Interferometry
10:15	Robert Laing	L2: Fundamentals of Radio Interferometry
11:00		**Break**
11:30	Robert Laing	T1: Fun with Fourier Transforms
12:15	John McKean	L3: Modern Radio Interferometers
13:00		**Lunch**
14:00	Anita Richards	L4: Data packages and formats
14:30	Andre Offringa	L5: Data editing and radio frequency interference
15:15	George Heald	L6: Calibration
16:00		**Tea**
16:30	Andy Biggs	T2: Data loading and editing
18:00	Robert Laing	Introduction to "Writing a Proposal" tutorials
18:15		**Close**

Future proposal deadlines

- EVN: 1 Oct 2015
- ATCA: 15 Dec 2015
- GMRT: 15 Jan 2016
- LOFAR: 9 Sep 2015
- EVLA, VLBA, GMVA: 1 Feb 2016
- ALMA: Spring 2016?
- IRAM PdB: 17 Sep 2015

WSRT/Apertif transition taking place – Array unavailable for observing time

GOOD LUCK WITH YOUR PROPOSAL PREPARATION!