



LOFAR Technical Status Meeting, May 18/19 2009

ASTRON, Dwingeloo

Brief report at the LSM, May 27 2009

Ger de Bruyn

for all presentations: see <http://www.lofar.org/operations/>

section: Meetings and Workshops

# LOFAR Technical Status Meeting: program & goals



## Motivations



	Monday, May 18	Tuesday, May 19
9:00 AM	Welcome (Vermeulen)	
9:30 AM	Introduction and Timelines (Wise)	Proposal Support (Polatidis)
10:00 AM	Roll-out Status (Vogt)	Commissioning Plans (Wise)
10:30 AM	Hardware Status (Gunst)	MSSS Specifications (de Bruyn)
11:00 AM	Coffee	Coffee
11:30 AM	Bands, Beams, and Bits (Brentjens)	Long-baseline Issues (Lehway)
12:00 PM	CEP Performance (Broekema)	Surveys
12:30 PM	Archive Status (Holtjes)	Magnetism
1:00 PM	Lunch	EoR
1:30 PM	Lunch	Transients
2:00 PM	Calibration Status (de Bruyn)	Pulsars
2:30 PM	Imaging Sensitivities (Nijboer)	Cosmic Rays
3:00 PM	LOFAR Observing Modes (Wise)	Solar and Space Weather
3:30 PM	Discussion (Beck)	Single Station Modes
4:00 PM	Coffee	Discussion (Jackson)
4:30 PM	Imaging Pipeline (Nijboer)	Wrap-up (Wise)
5:00 PM	Pulsar Pipeline (Hessels)	KSP Working Groups
5:30 PM	VHECR Pipeline (Horneffer)	
6:00 PM	Discussion (Fender)	
6:30 PM	End of Day I	End of Day II
7:00 PM	Borrel	
7:30 PM		
8:00 PM		

- Prepare for call for proposals
- Assess planned technical capabilities
- Synchronize activities roll-out
- Review current commissioning plans
- Inventory KSP commissioning projects
- Allocate available commissioners



# Commissioning teams / working groups

The following list is slightly updated from the one presented by Michael. Membership is open for anyone that wants to seriously work on these issues over the next >6 months. Contact chairs !

**Beam modeling:** Johan Hamaker, Sarod Yatawatta, Stefan Wijnholds, Michiel Brentjens, Ronald Nijboer

**Ionosphere:** Jan Noordam, Ger de Bruyn, Bas van der Tol, Huib Intema, James Anderson, Anna Scaife, Joris van Zwieten, Mamta Panday, (Maaijke Mevius),..

**Polarization:** Marijke Haverkorn, Ger de Bruyn, George Heald, James Anderson, Aris Noutsos, Anna Scaife, Enno Middelberg,..

**GSM/LSM:** John Swinbank, Niruj Mohan, Bart Scheers, Sarod Yatawatta, Ger van Diepen, Michael Wise

**Data Quality & Monitoring:** Pandey, Jason Hessels, Evert Rol, Fabien Batejat, Jan Noordam, Michael Wise

**Long Baselines:** John Conway, James Anderson, Jean-Mathias Griessmeijer, Hans-Rainer Kloeckner, Philippe Zarka, Annette Haas, Jan Noordam, Ger de Bruyn

**More teams?** e.g. imaging aspects ?

# Tasks and working modes

## Tasks:

- Prepare inventory of issues and status of the subject
- short-term and long term planning
- coordinating relevant commissioning observations
- assess need for simulations
- exercise, test (&develop) software (MeqTrees, BBS, Matlab,..)
- interact with other 'overlapping' teams

## Reporting:

- via LSM (once a month) and brief 'standardized memos'
- communicate decisions to management (Wise,Nijboer)



## Commissioning phases

We can distinguish 3 different phases for commissioning activities:

- Before MSSS: **Jun-Oct 2009** from 1  $\Rightarrow$  20 stations
- During MSSS: **Nov-Jan 2010** 20 stations (+ 3-5 European)
- After MSSS: **Feb-Aug 2010** 30  $\Rightarrow$  40 stations

Assuming start of regular LOFAR observing in Sep 2010 ?

# MSSS - some basic numbers (Nijboer, March09)

	60 MHz	150 MHz
Bandwidth	8 MHz	8 MHz
Observing time per FoV	36 times 5 minutes	12 times 5 minutes
FoV	106 deg <sup>2</sup>	19.4 deg <sup>2</sup>
FWHM	11.6 deg	4.97 deg
PSF resolution (10 km)	82.5 arcsec	33.0 arcsec
Correlator time resolution	1 s	1 s
Correlator freq resolution	0.76 kHz	0.76 kHz
Uv data size	762 Gbyte	678 Gbyte
Post DP <sup>3</sup> time res.	5 s	5 s
Post DP <sup>3</sup> freq res.	21.3 kHz	42.6 kHz
Post DP <sup>3</sup> uv data size	~ 4.76 Gbyte	~ 2.12 Gbyte
# channels per image cube	Tbd	Tbd
# pixels per image plane	2048 x 2048 ?	2048 x 2048 ?
Total image size	Tbd	Tbd

Table 1: Specifications per pointing / FoV

- 2048 squared plane ~ 16.8 MByte

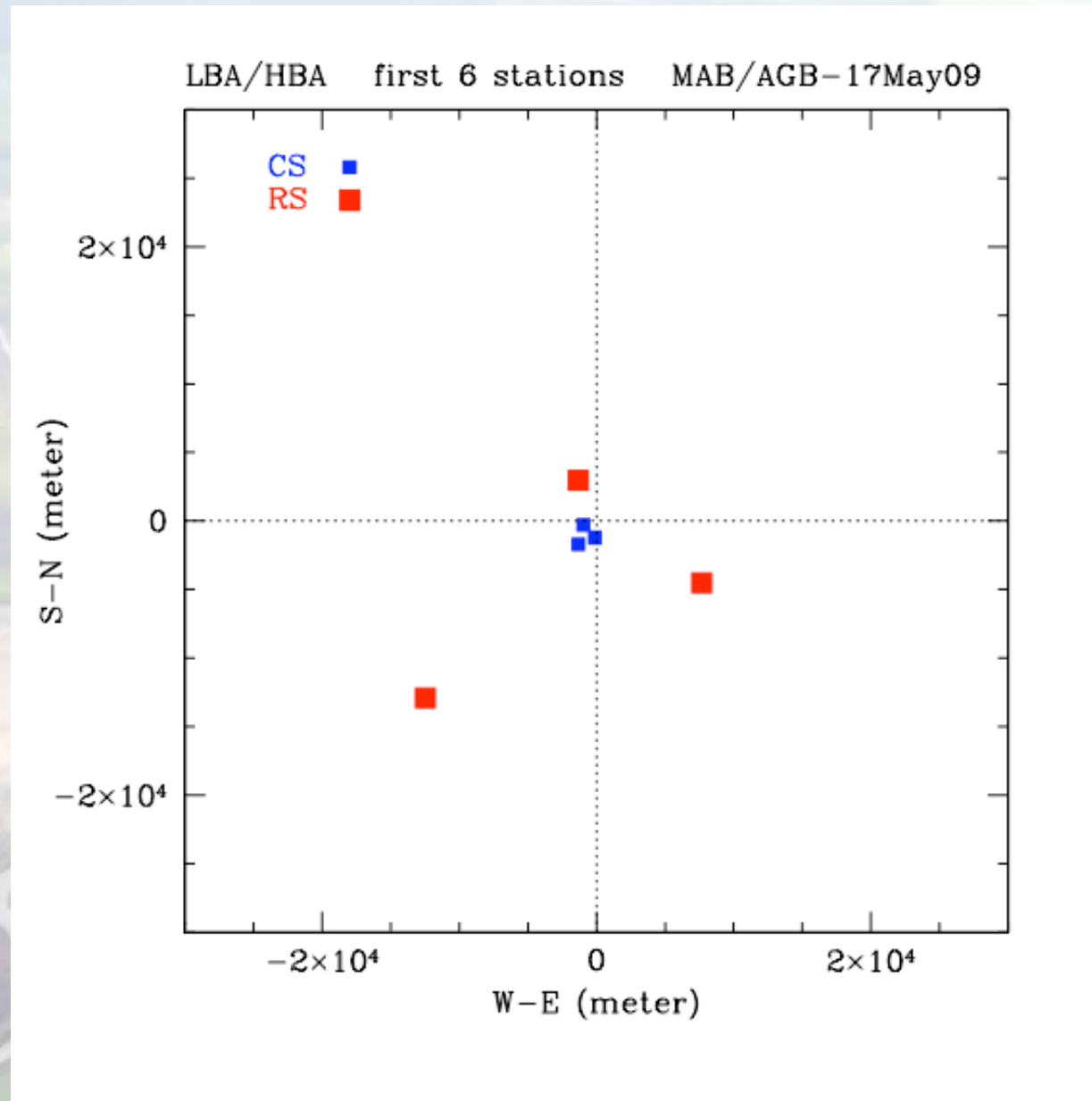
# MSSS - some basic numbers (Nijboer, March09)

Frequency (MHz)	Area (sq. deg.)	Rms (mJy)	BW (MHz)	Sources / FoV	Int. time (hrs)	# pointings	Tot. obs. (days)	Tot. sources
60	20262	5.37	8	6062	3	609.1	19.0	1.18e+6
150	20262	0.499	8	5768	1	3346	34.9	6.14e+6

- # sources @  $5 \sigma$  thermal noise
  - Multiple freq. planes &  $30 \sigma$ : few times  $1e+5$
- Total obs. Time (100% eff.): 53.9 days or 7.7 weeks
- At 50% eff.: 15.4 weeks or 3.4 months
  
- Not taken into account:
  - Nyquist sampling yields another factor 1.5 in sensitivity
    - (or 2.25 in observing time)
  - Tapering of HBA stations for near sidelobe reduction

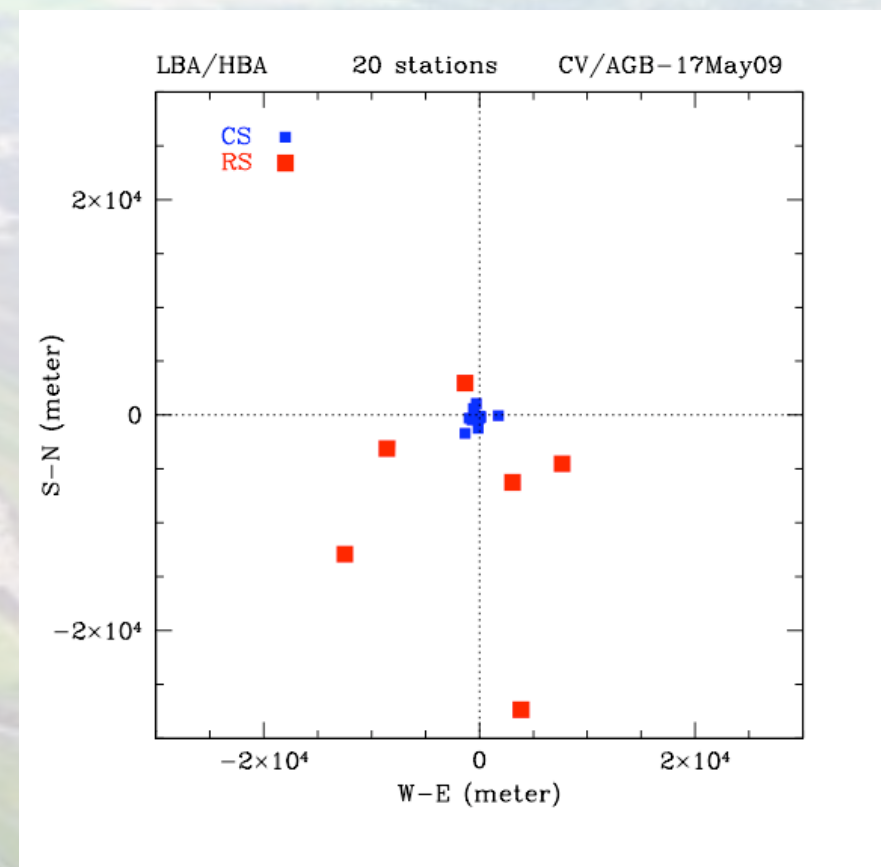
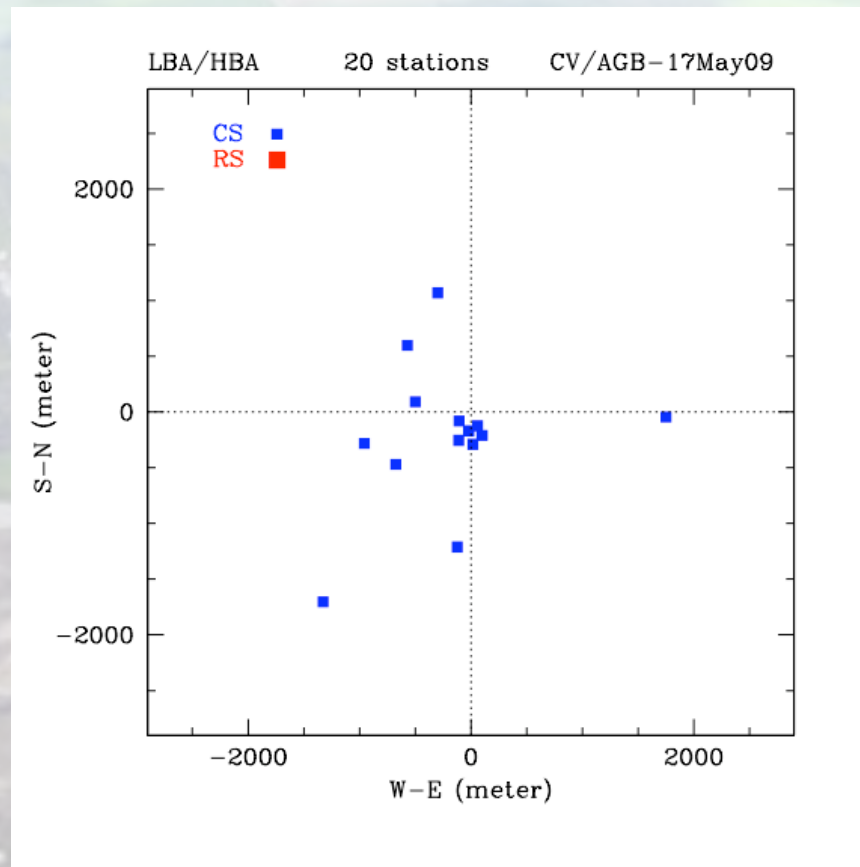


# Early array configuration: 6 stations, late Jul09 ?

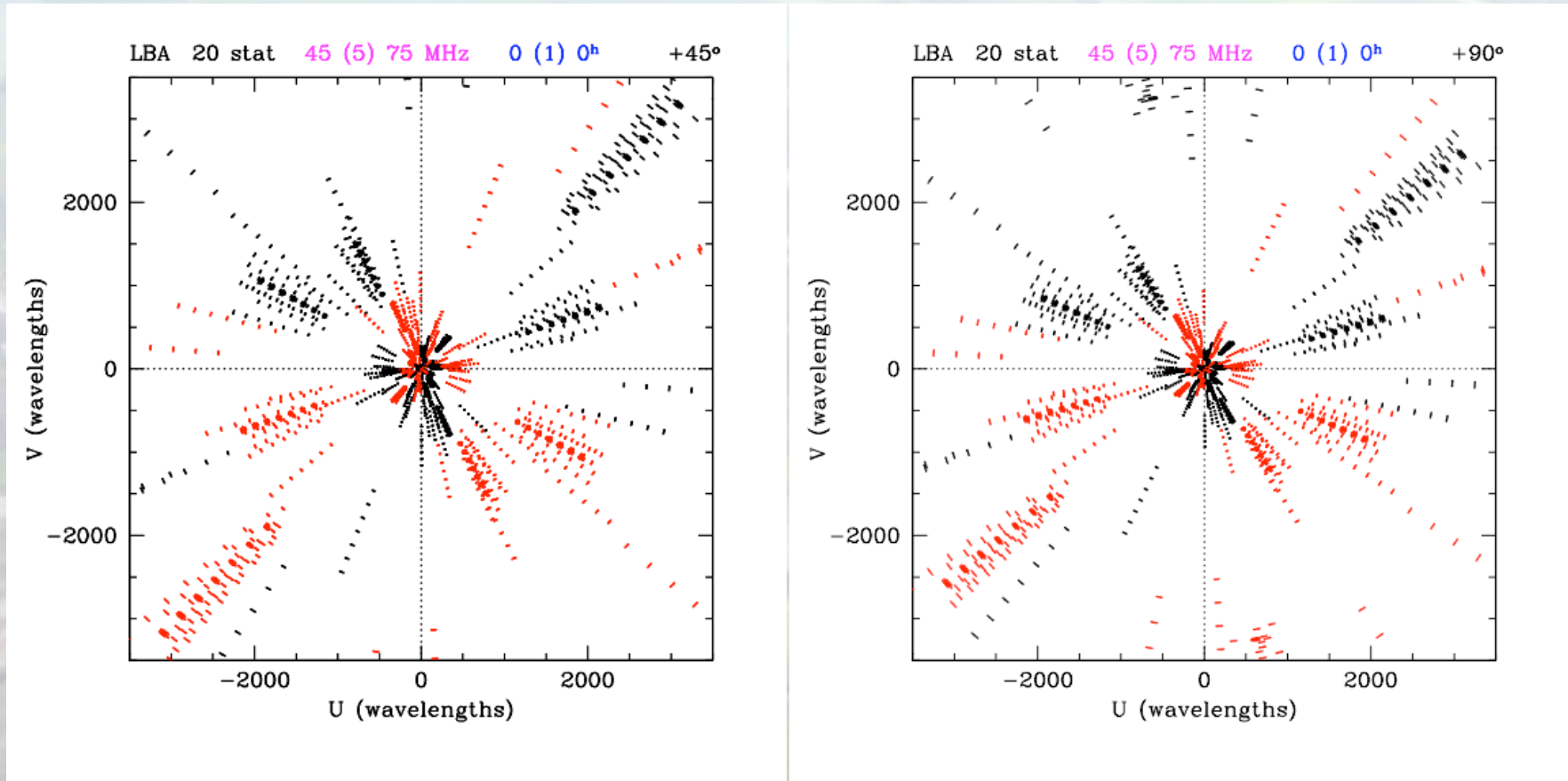




# MSSS configuration: 20 stations, Oct09



# LOFAR20 uv-coverages for LBA-band



snapshot (1 cut, 5m) + very broadband (30 MHz)