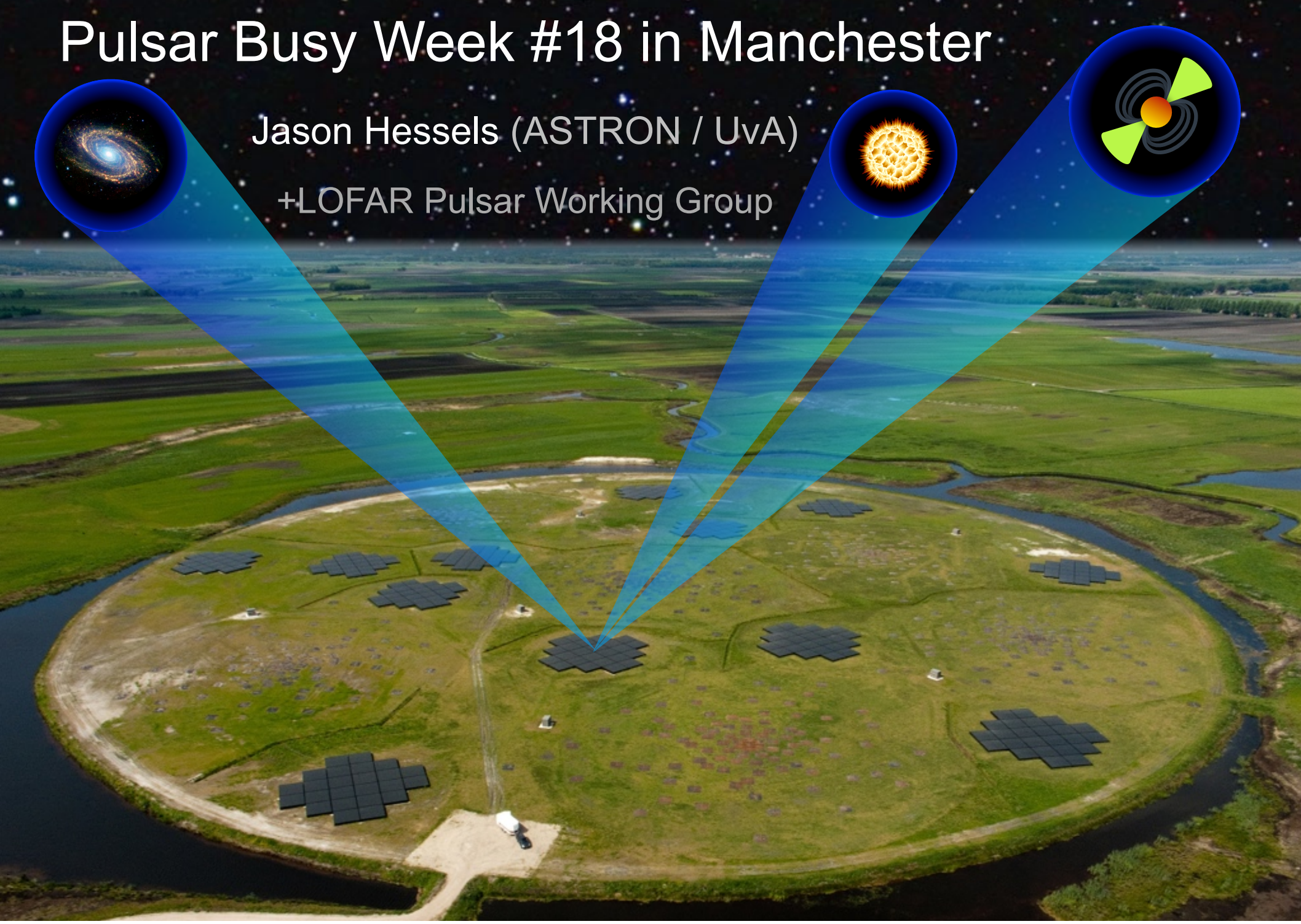
Pulsar Busy Week #18 in Manchester

Jason Hessels (ASTRON / UvA)

+LOFAR Pulsar Working Group



Participants

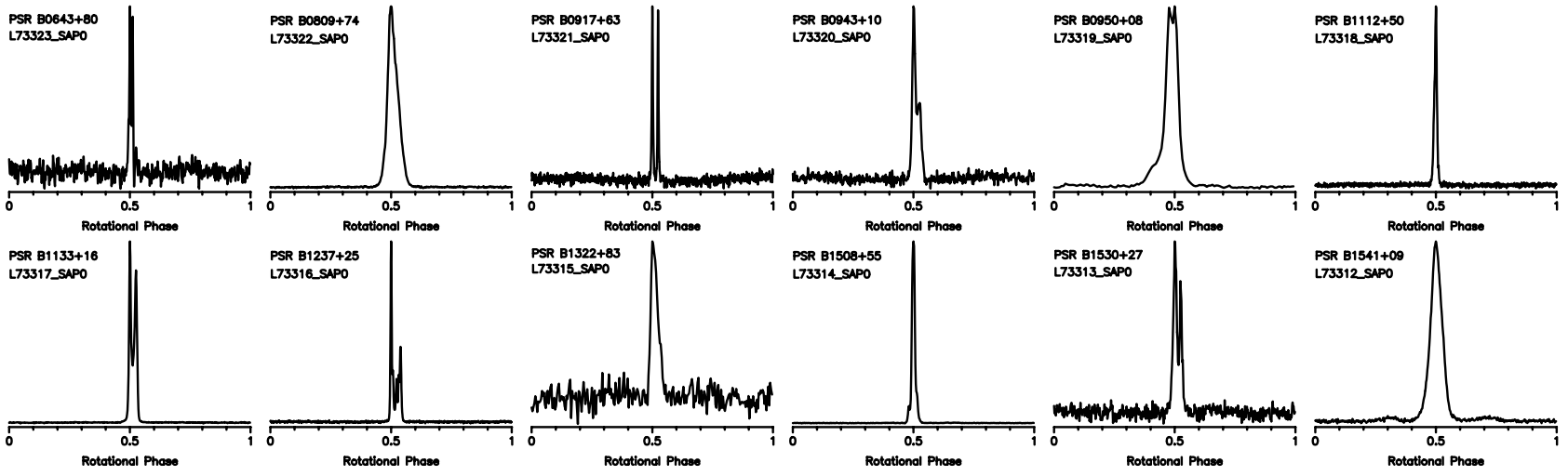
- Anya Bilous
- Aris Karastergiou
- Aris Noutsos
- Ben Stappers
- Charlotte Sobey
- Jason Hessels
- Joeri van Leeuwen
- Kimon Zagkouris
- Maciej Serylak
- Maura Pilia
- Patrick Weltevrede
- Thijs Coenen
- Tom Hassall
- Sally Cooper
- Sander ter Veen
- Vlad Kondratiev

Papers

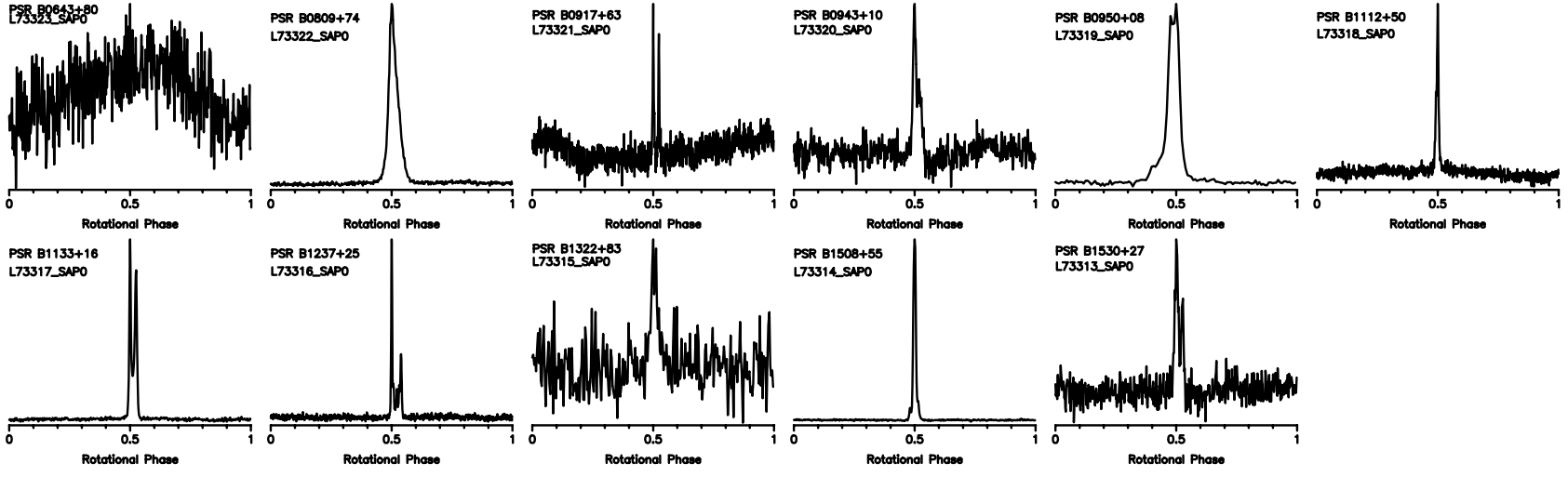
- LOFAR pulsar reference - A&A published
- Wideband simultaneous observations - A&A published
- B0943+10 simultaneous XMM - Science in press
- B0809+74 drifting - A&A submitted
- Ionospheric RM calibration - A&A submitted
- Ultra-low-frequency pulses - early draft
- Profiles of 100 pulsars - early draft
- B0823+26 switching on - early draft
- Pilot pulsar surveys - early draft

In General, Best Data Yet

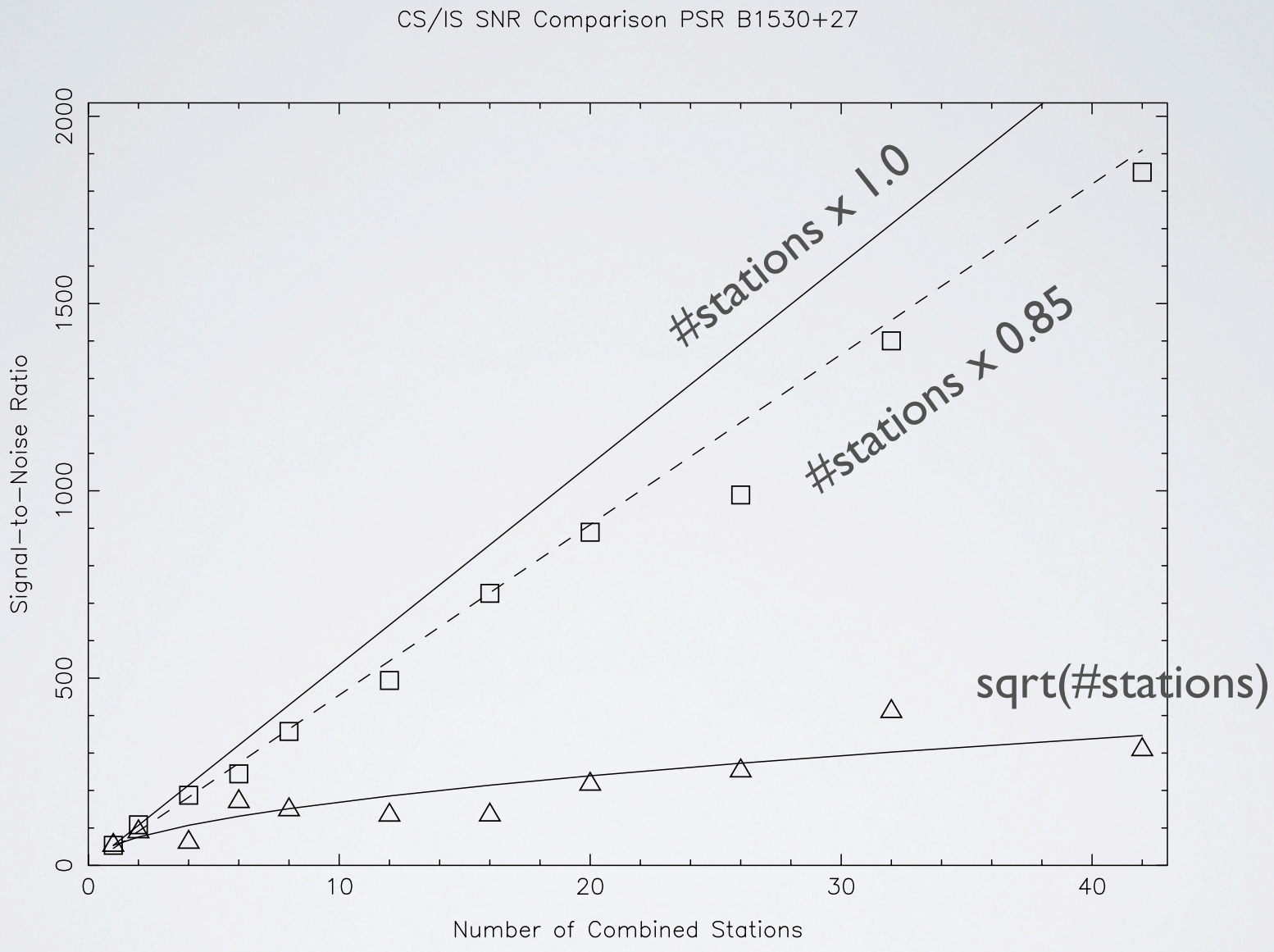
Coherent



Incoherent

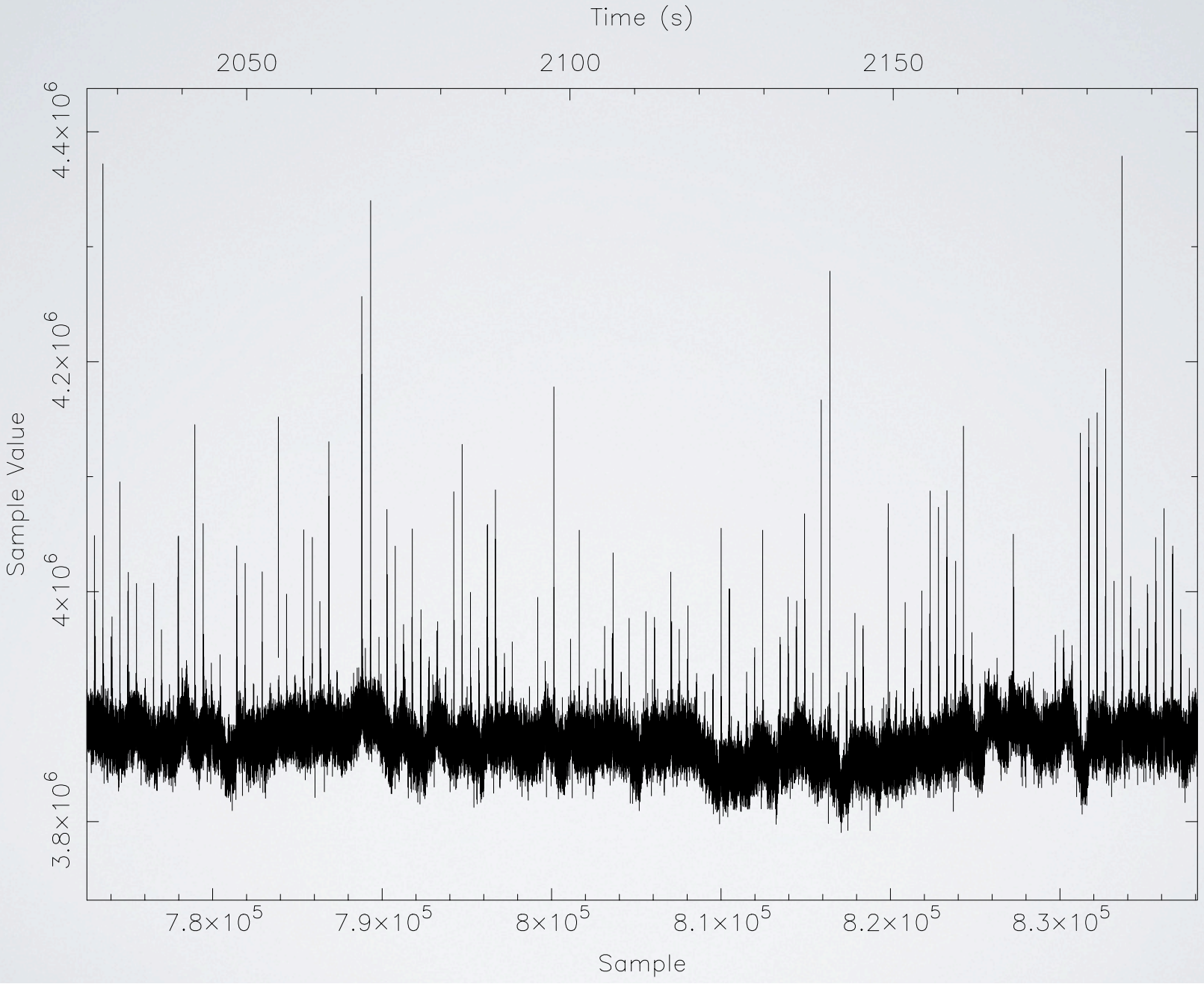


Sensitivity Scaling of Core Tied-Array Beams



Modestly Bright Pulsar

LBA Single Pulses from B0809+74

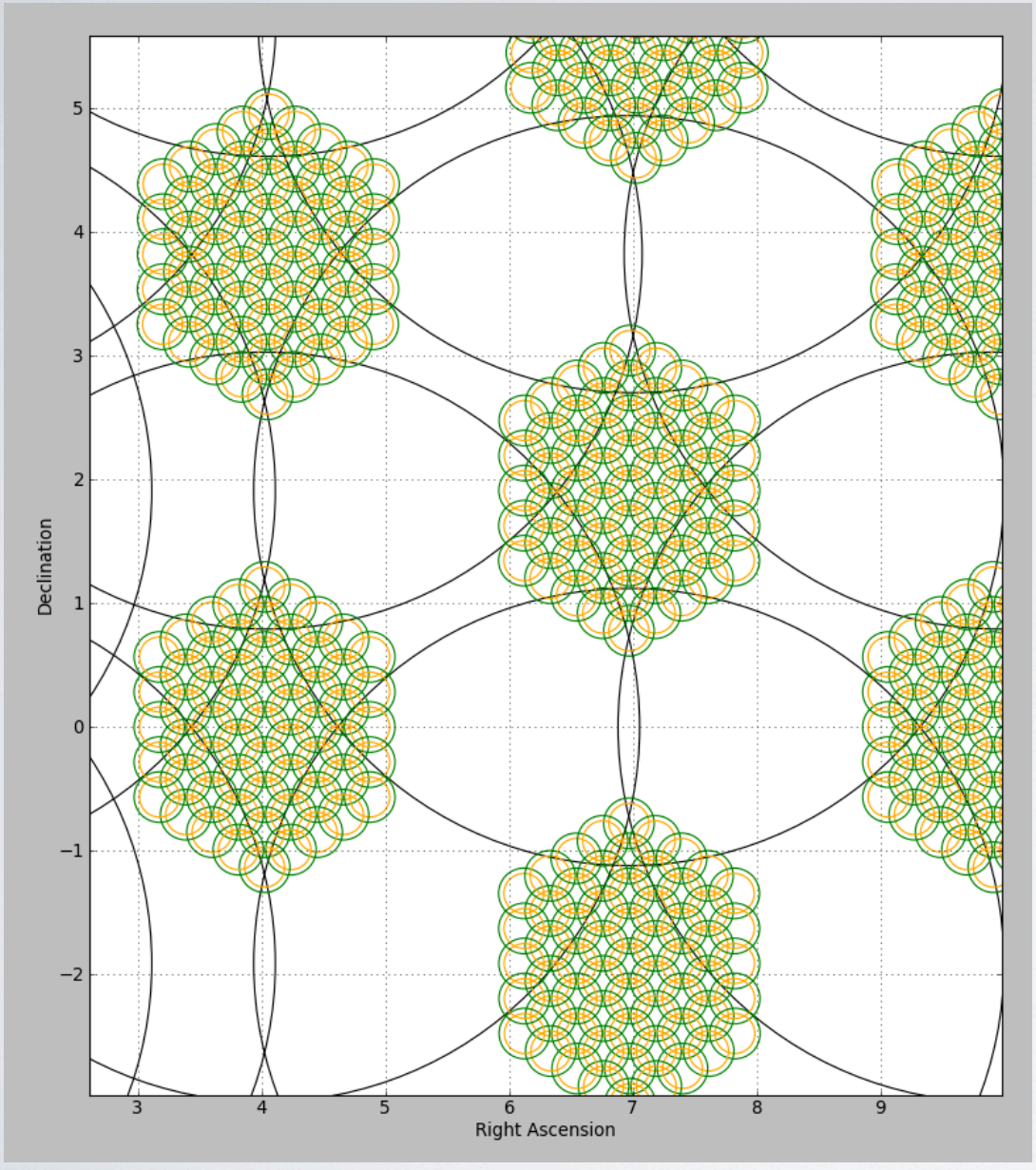


LOFAR Tied-Array All-Sky Survey (LOTAAS)

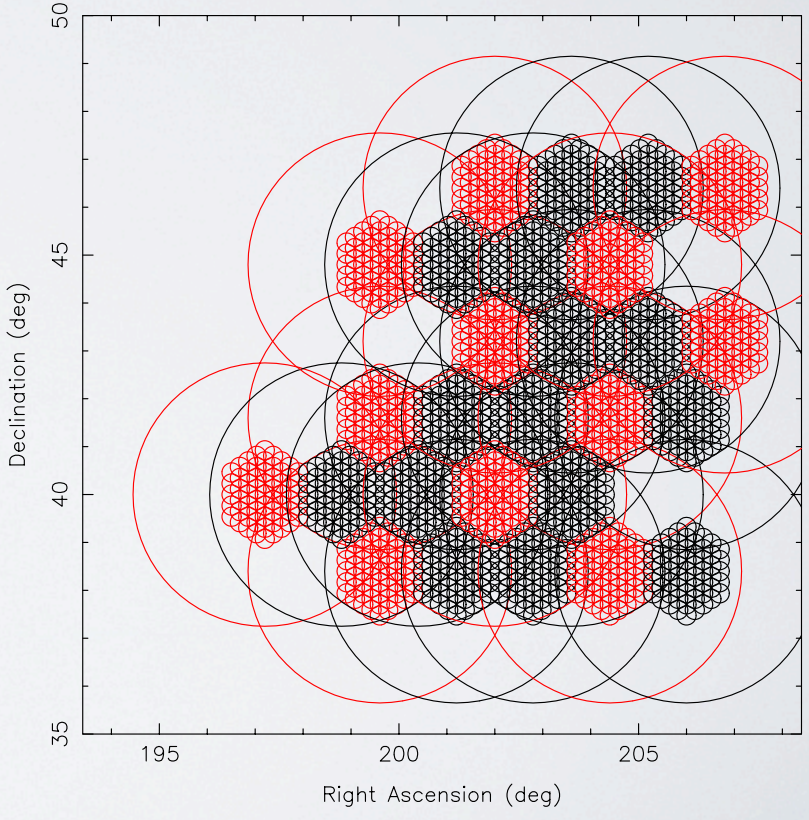
- Use 8-bit mode
- 3 SAPs of 32MHz each
- 1hr per pointing (1.5hr all-sky by end... new param. space)
- 0.49ms time resolution, 6kHz frequency channels
- Find millisecond pulsars out to DM ~ 50 pc cm-3
- 219 tied-array beams, 3 incoherent beams
- 12 sq deg. total per ptg. from tied-array beams
- 60 sq deg. total per ptg. from incoherent beams
- Sparse coverage of North. Hem. takes ~333 pointings
- Dense coverage of North. Hem. takes ~1000 pointings

~12hrs of Cycle0 observations taken already

LOFAR Tied-Array All-Sky Survey (LOTAAS)



- ~2x more sensitive than LOTAS (coh. pilot survey)
- ~2x more sensitive than LPPS (incoh. pilot survey)



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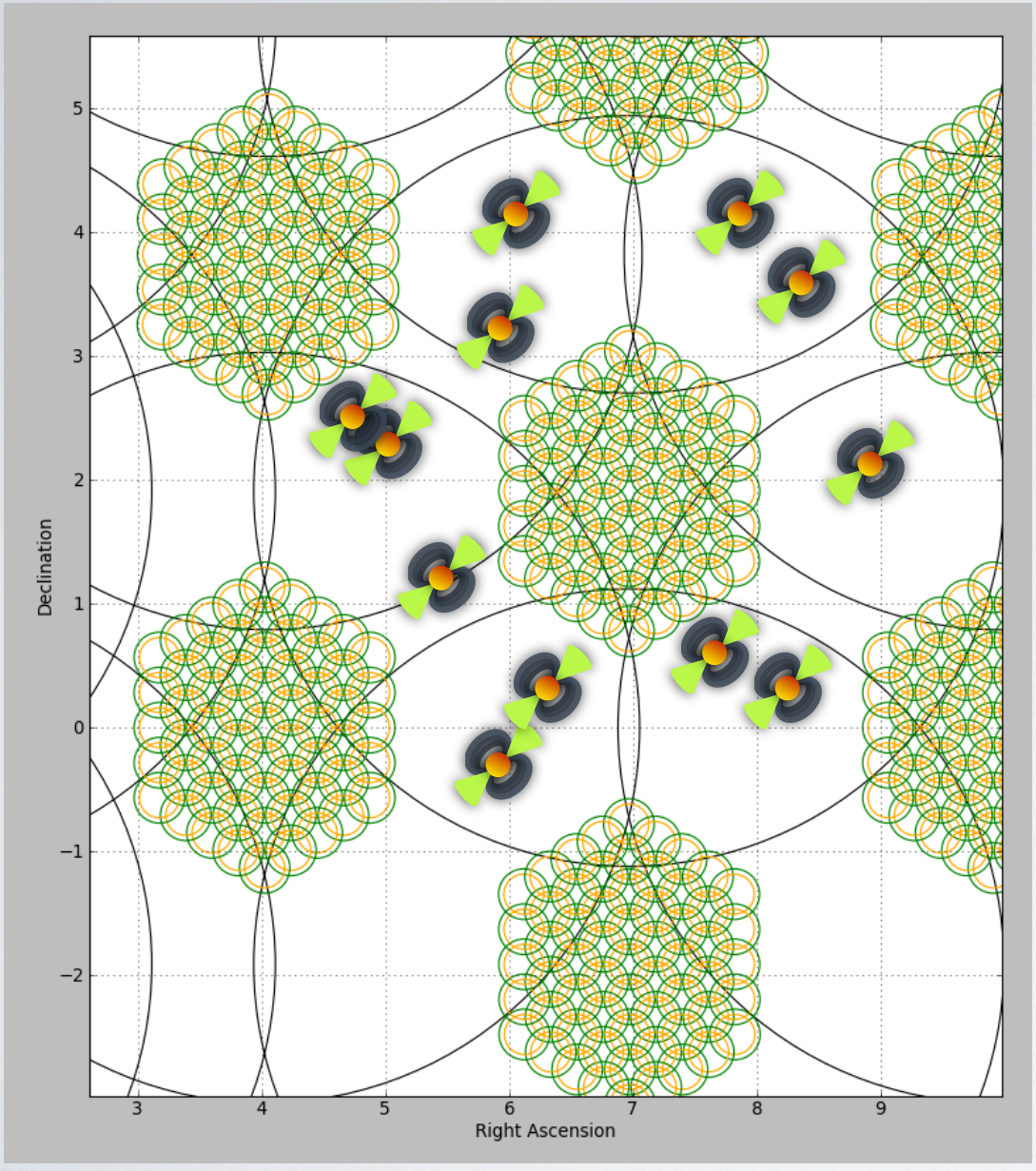

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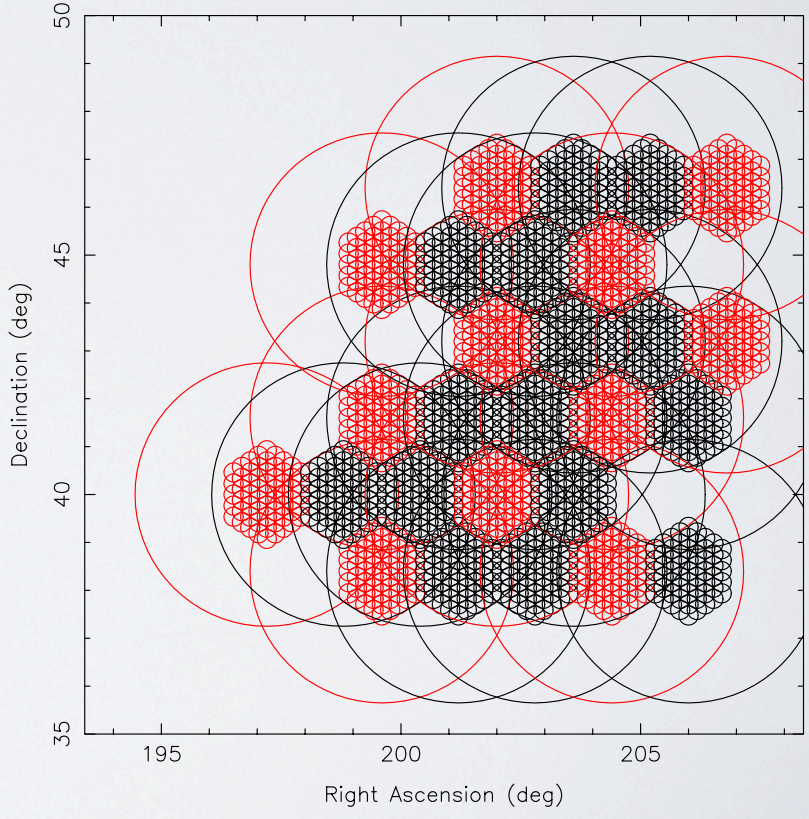

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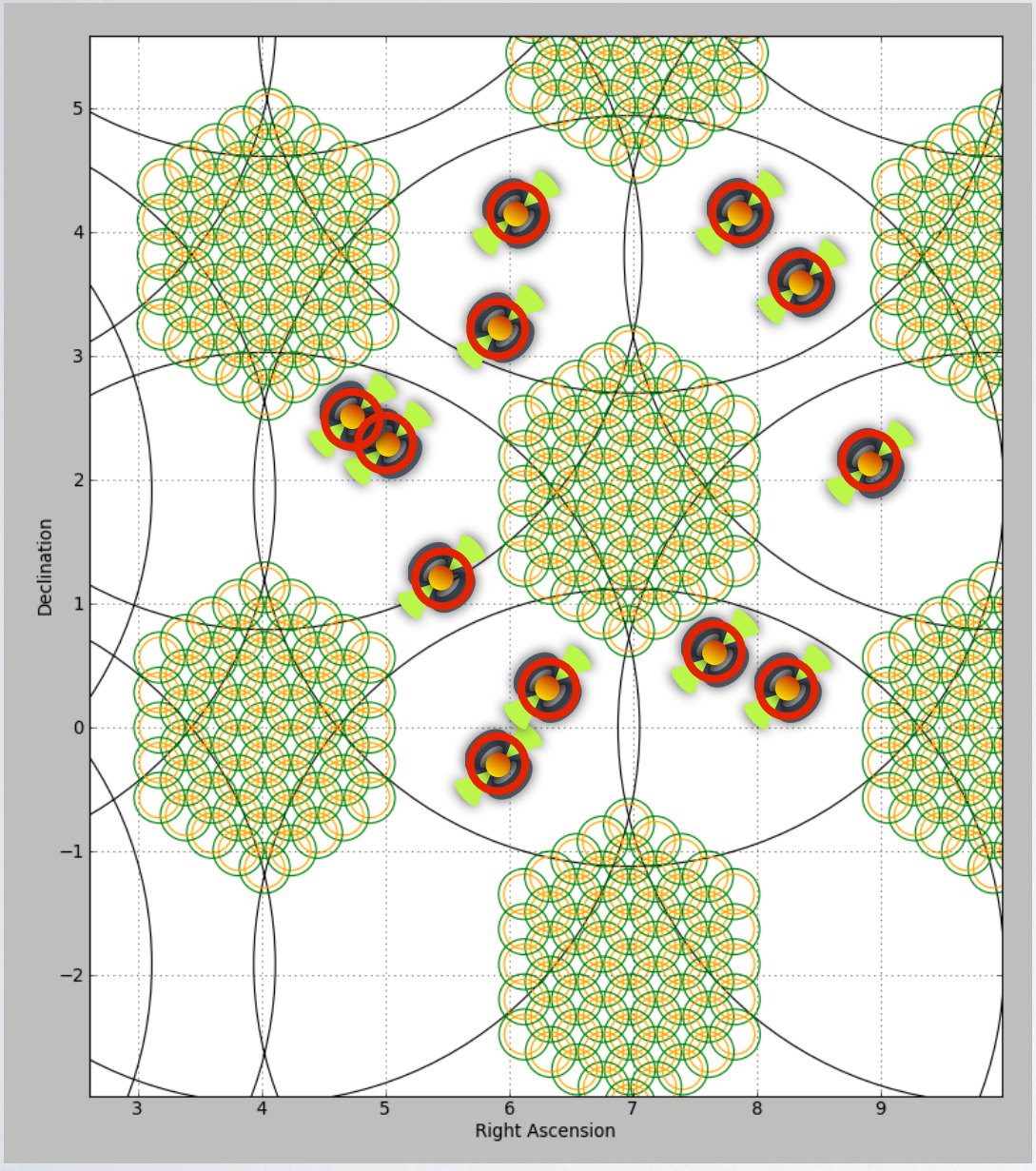

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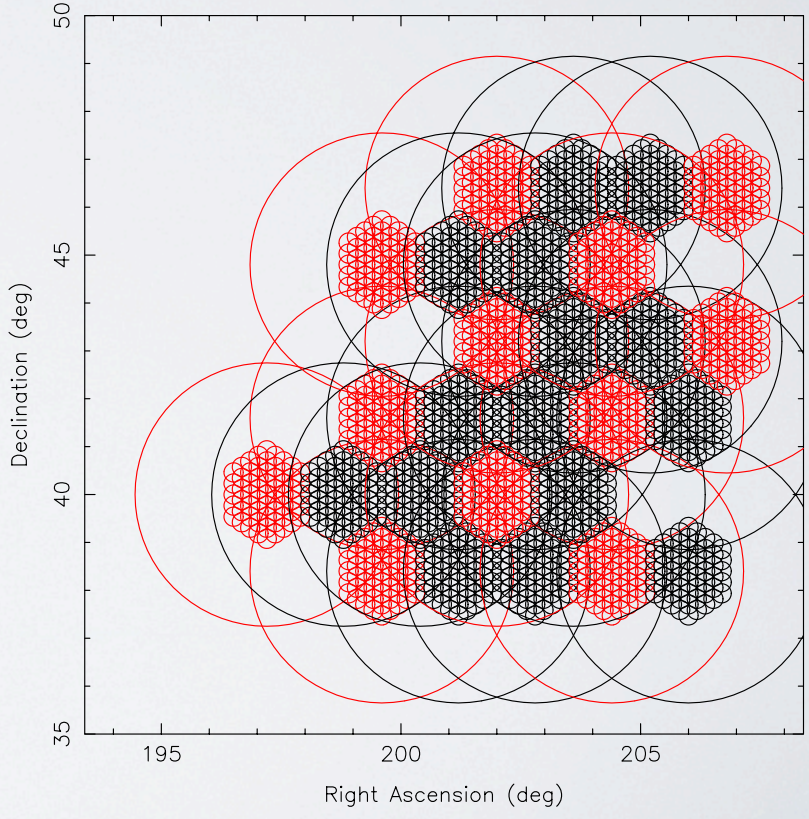

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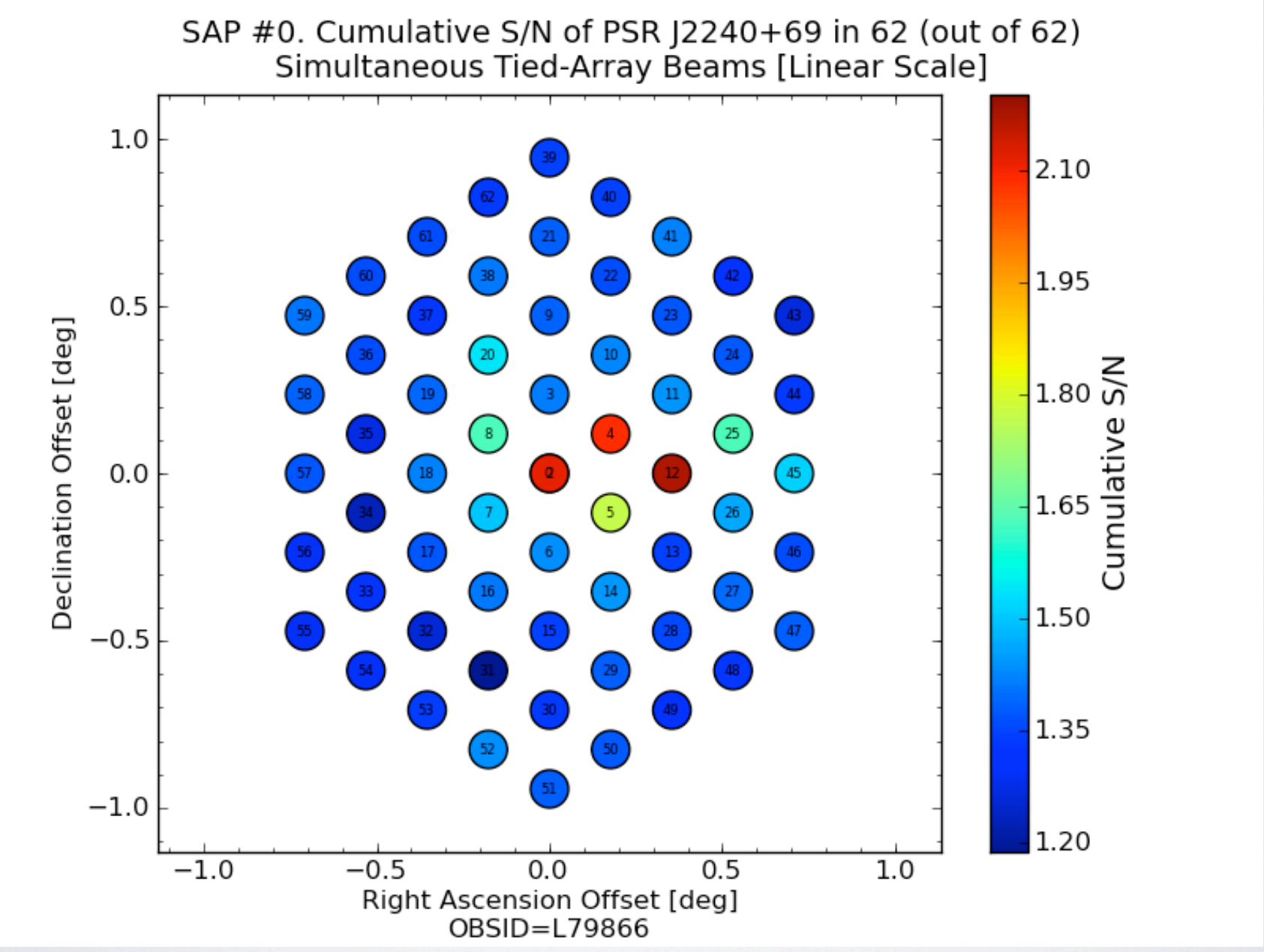


Organization

LOFAR PWG Cycle0 Observations

File Edit View Insert Format Data Tools Help All changes saved in Drive

jhessels@gmail.com

Comments Share

1 other viewer

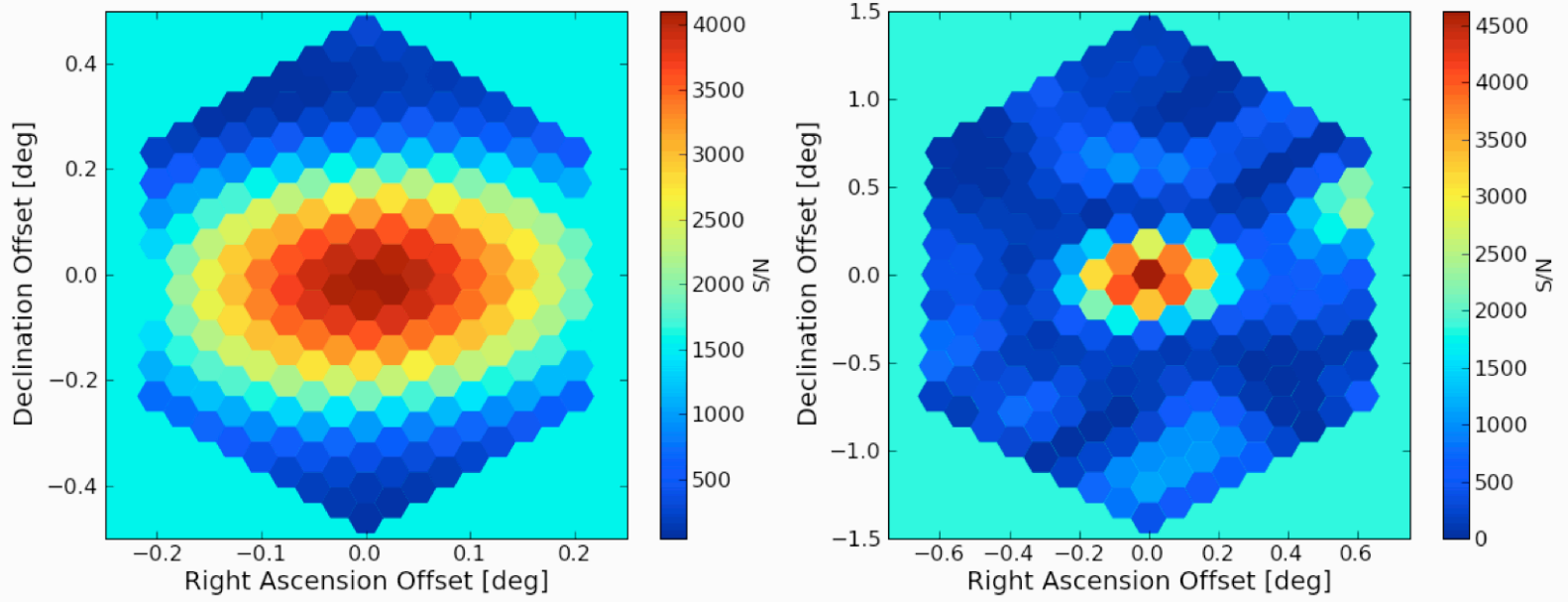
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	**Source**	**Project**	**Proposer**	**Antenna**	**N Zone**	**Stations**	**Dwell**	**Mode**	**OCD**	**Bits**	**N Pol**	**# Beams**	**# SAPs**	**#TAB Rings**	**Ring Space**	**T Int**	**T Res**
2				**LBA/HBA**		**ST, FC, DU, ALL**	**(s)**	**CS, IS, CV**							**(rad)**		**(ms)**
3	Surv. Ptg.	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915
4	**Source**	**Project**	**Proposer**	**Antenna**	**N Zone**	**Stations**	**Dwell**	**Mode**			**N Pol**	**# Beams**	**# SAPs**			**T Int**	**T Res**
5				**LBA/HBA**		**ST, FC, DU, ALL**	**(s)**	**CS, IS, CV**									**(ms)**
6	P0035A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	68	3	4	0.003566	6	0.4915
7	P0038A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	68	3	4	0.003566	6	0.4915
8	P0040A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	68	3	4	0.003566	6	0.4915
9	P0043A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	68	3	4	0.003566	6	0.4915
10	P0046A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	68	3	4	0.003566	6	0.4915
11	P0048A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	68	3	4	0.003566	6	0.4915
12	P0127A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915
13	P0129A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915
14	P0132A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915
15	P0134A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915
16	P0137A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915
17	P0140A	LC0_034	Jason	HBA	1	ST	3600	CS+IS	NO	8	1	74	3	4	0.003566	6	0.4915

Extra Slides

Wish list for de Kerstman

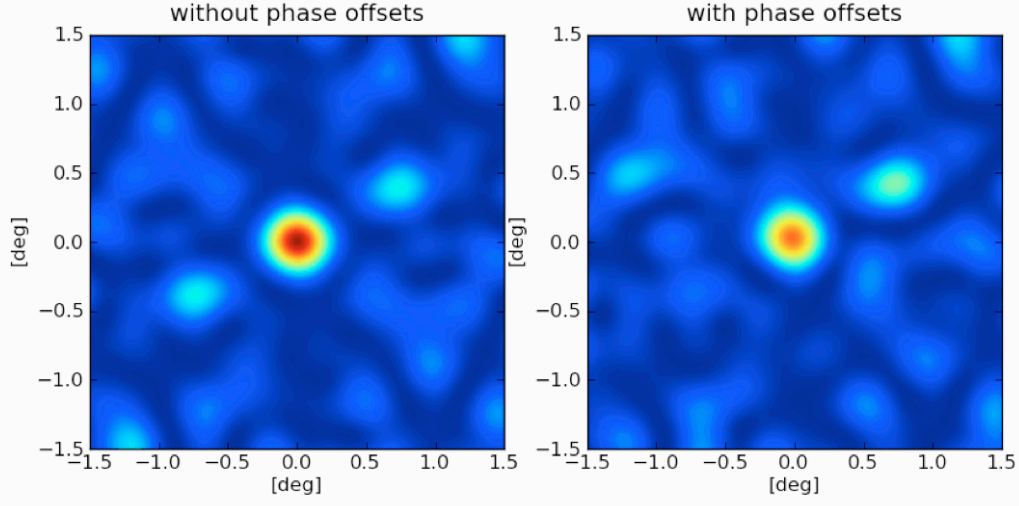
- Parallel observations
- Online RFI excision
- Real-time searches imbedded in the correlator

Superterp Tied-Array Beam Mapping



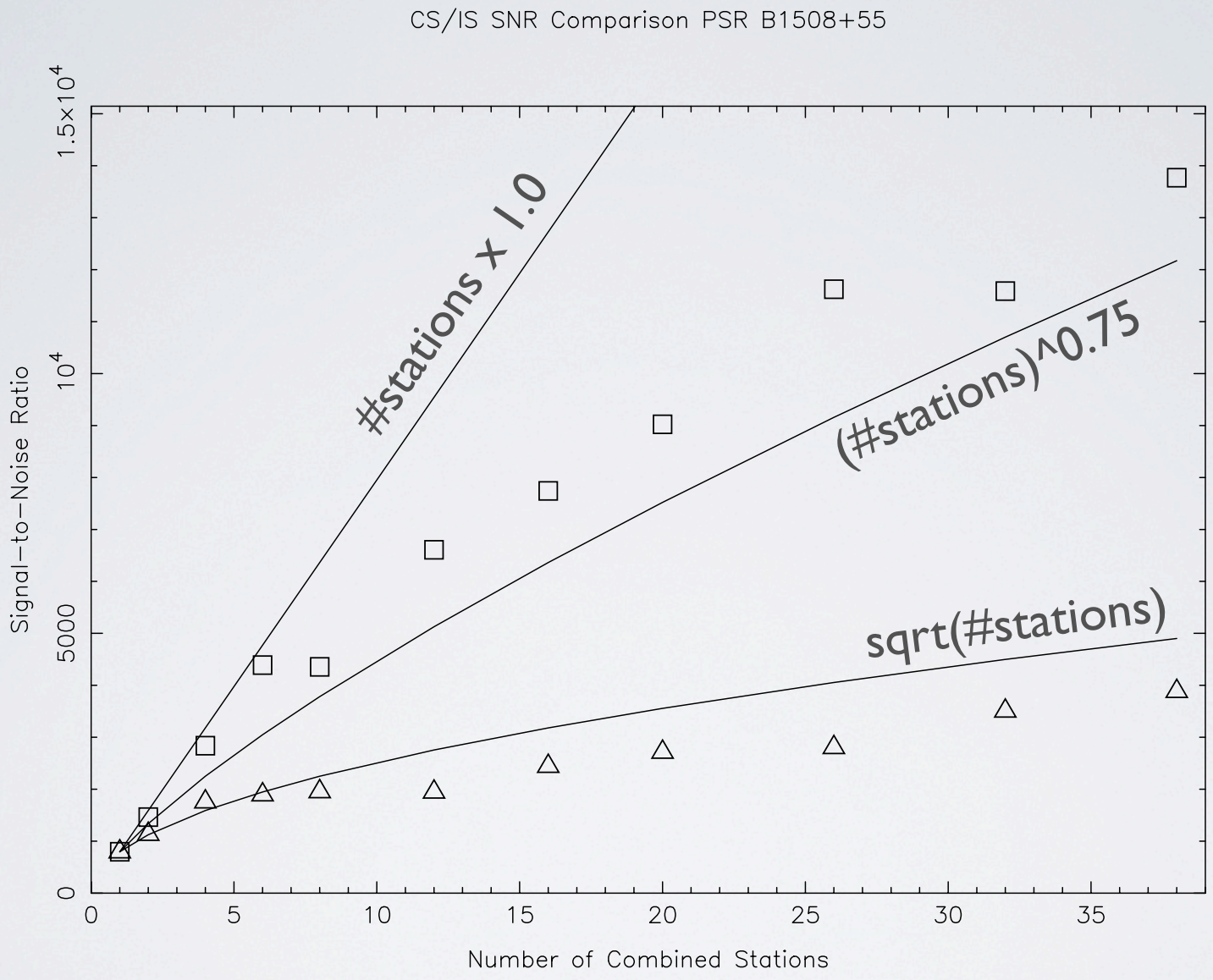
PSR B0329+54

HA = -2hr



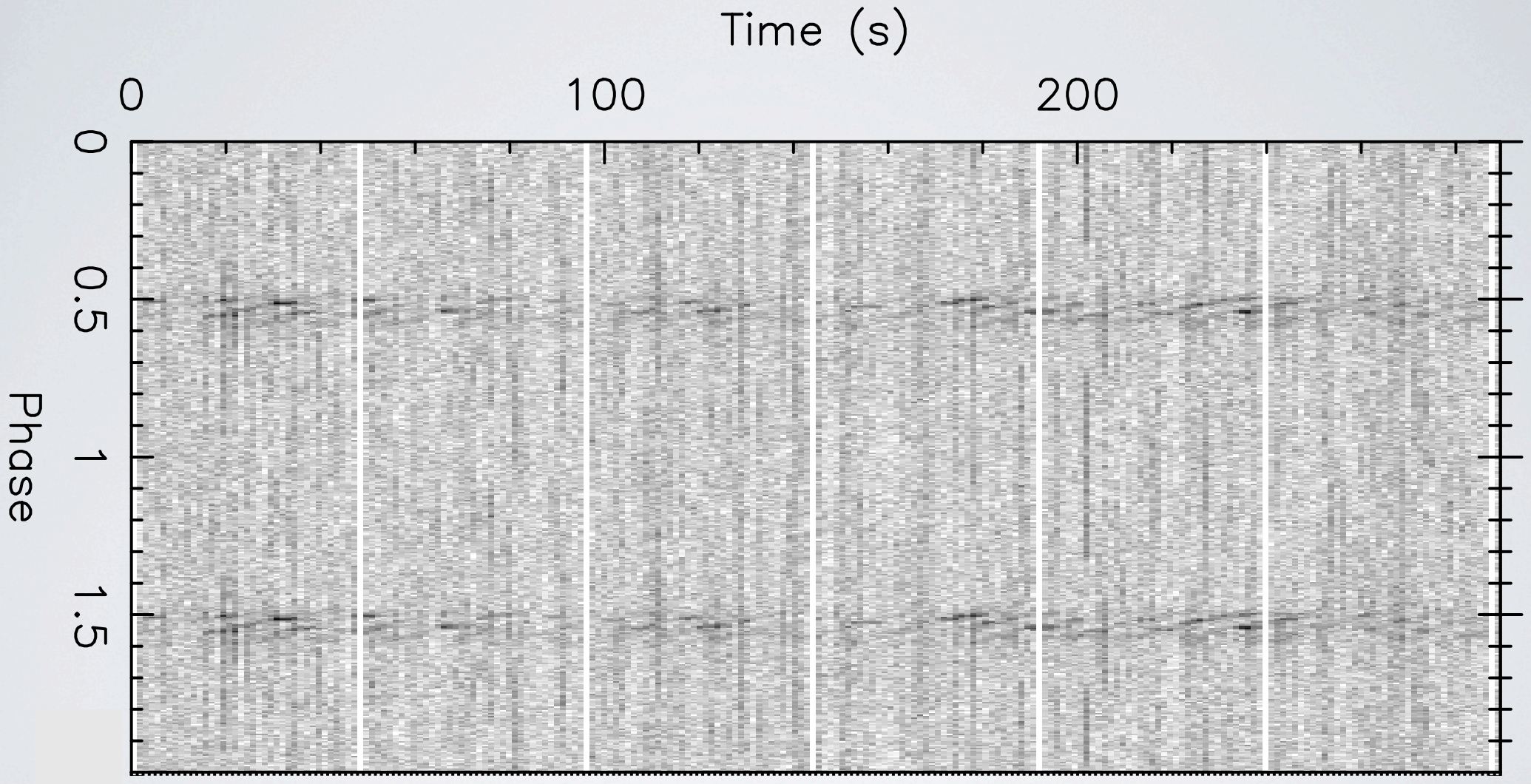
Shows that a "tune-up" is needed

Sensitivity Scaling of Core Tied-Array Beams

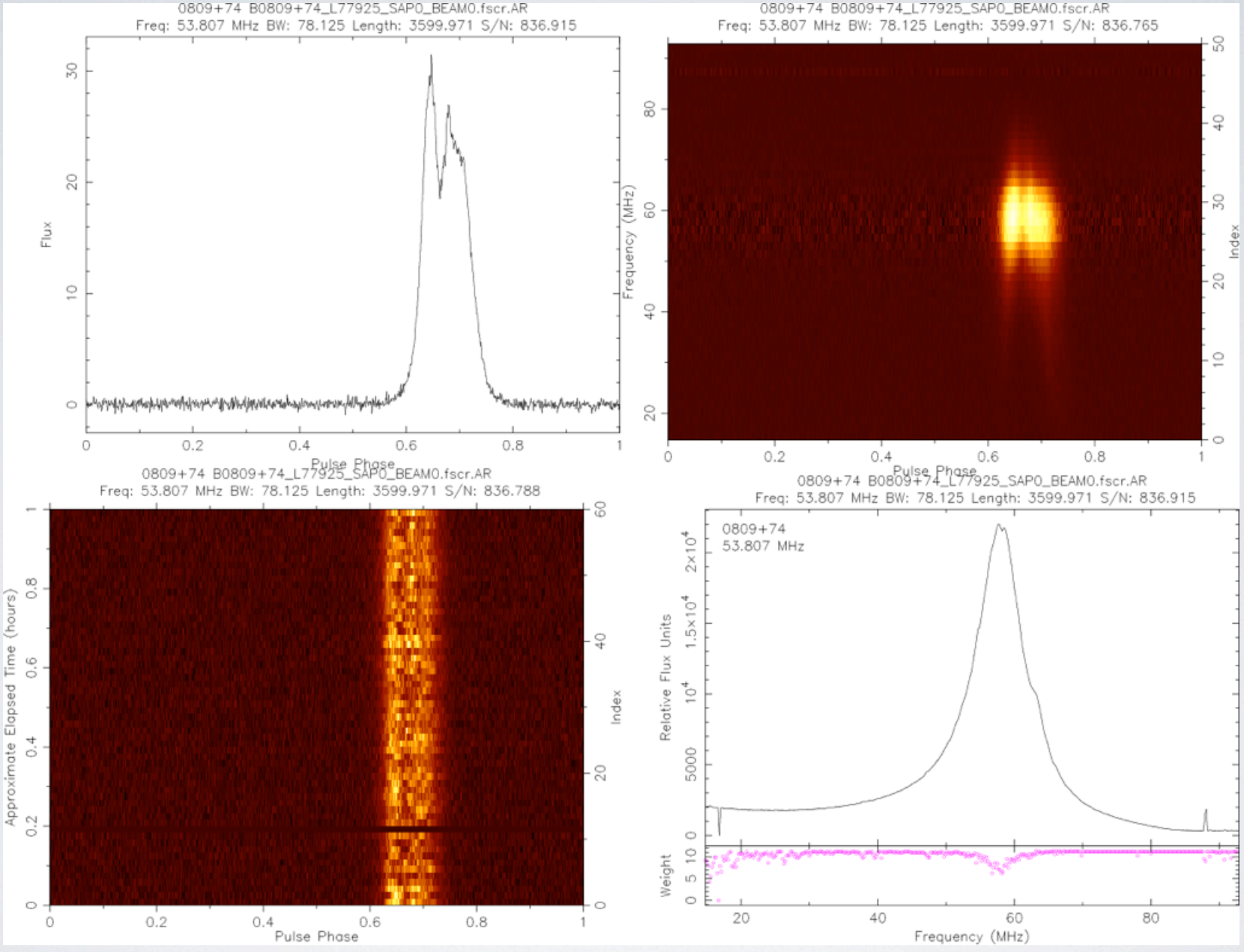


Very Bright Pulsar

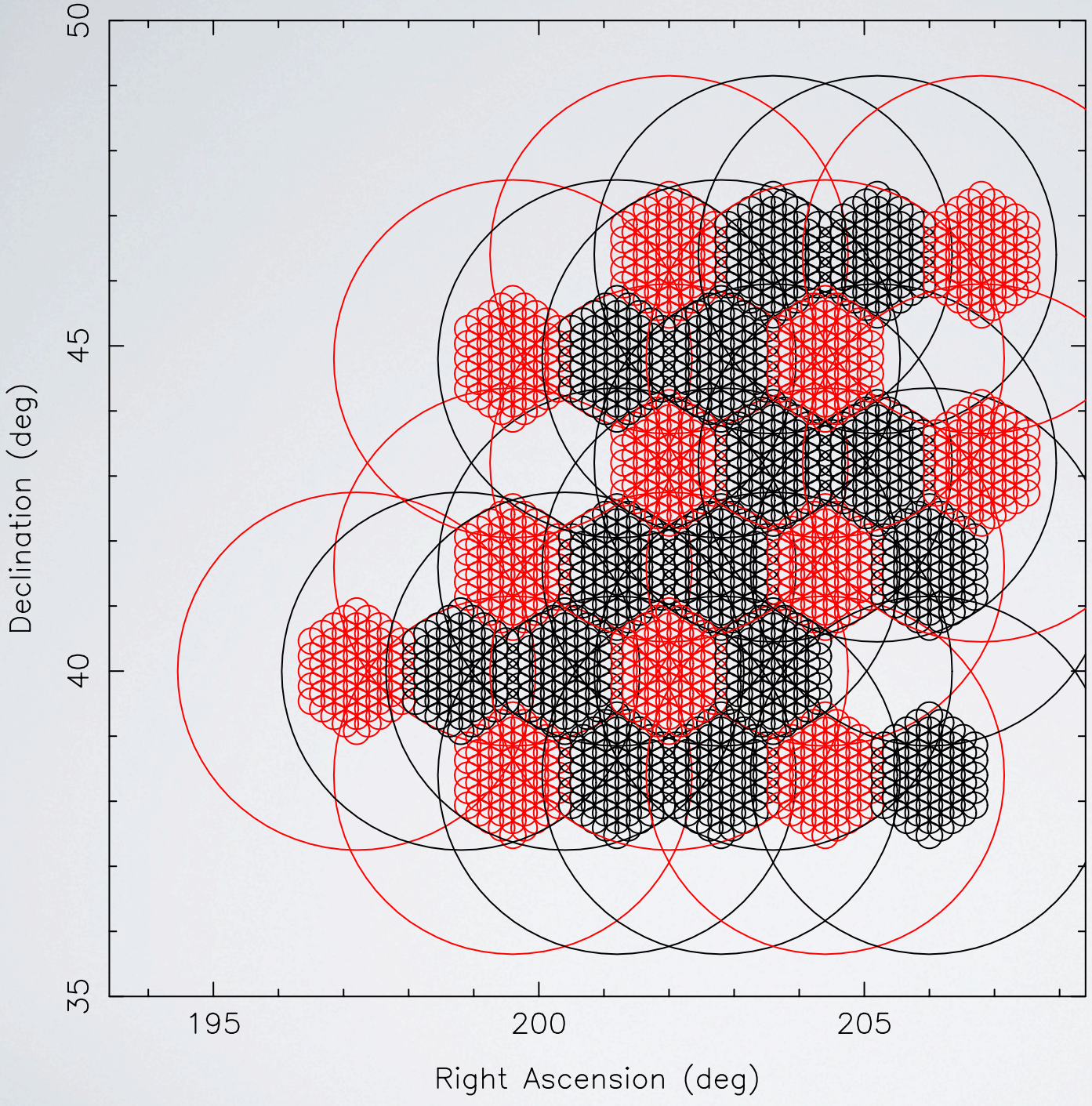
LBA Single Pulses from B0809+74



LBA B0809+74

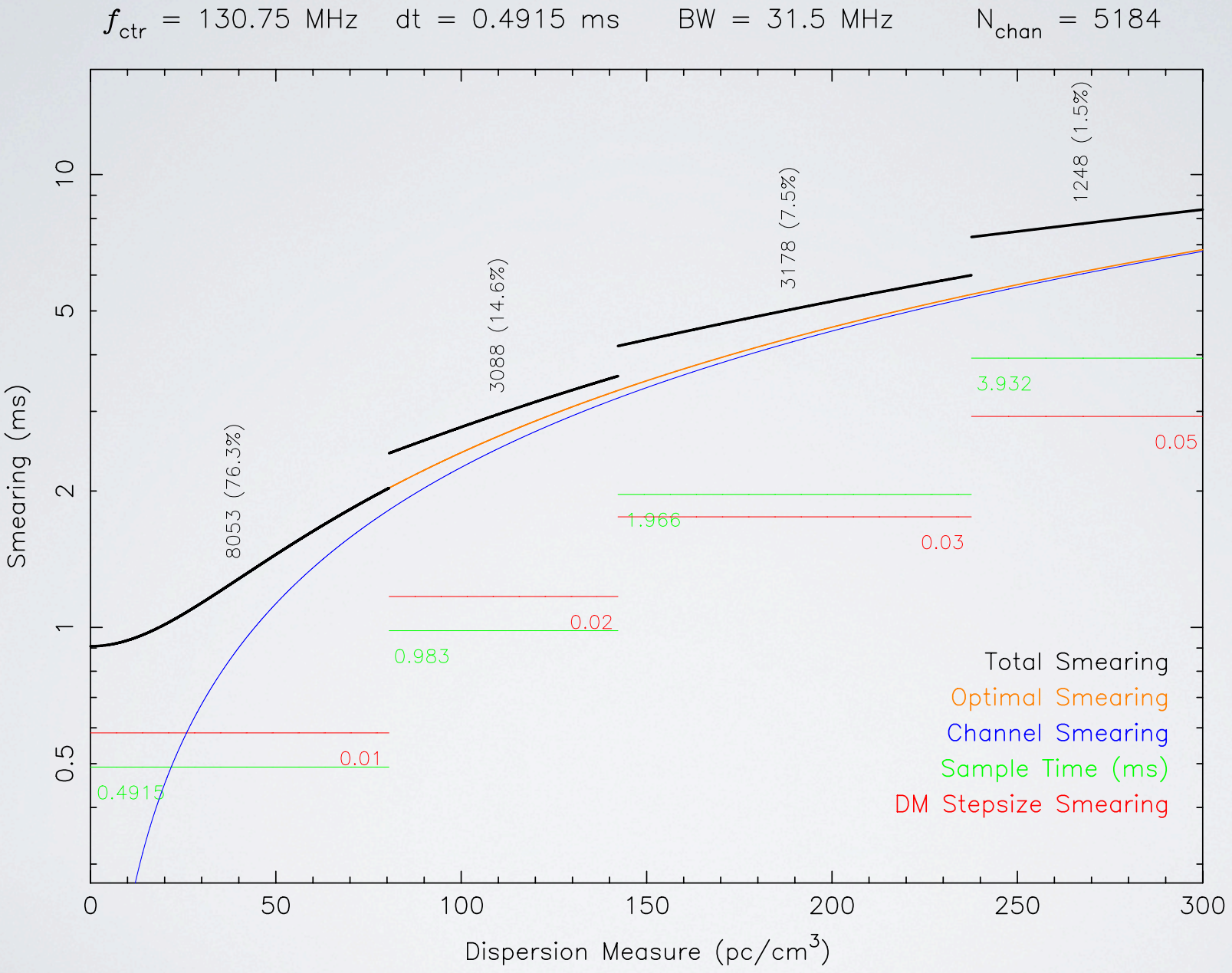


Also using 8-bit mode to go from 15-95MHz



LOTAAS Sparse Sampling

LOFAR Tied-Array All-Sky Survey (LOTAAS)



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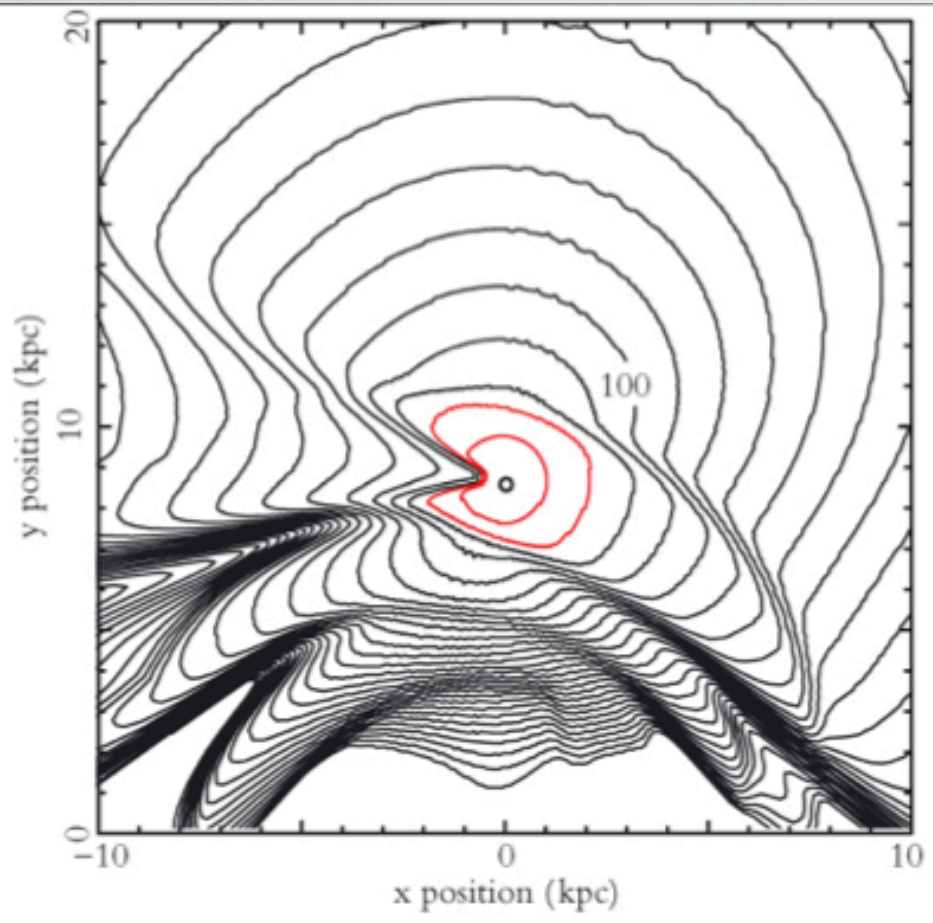
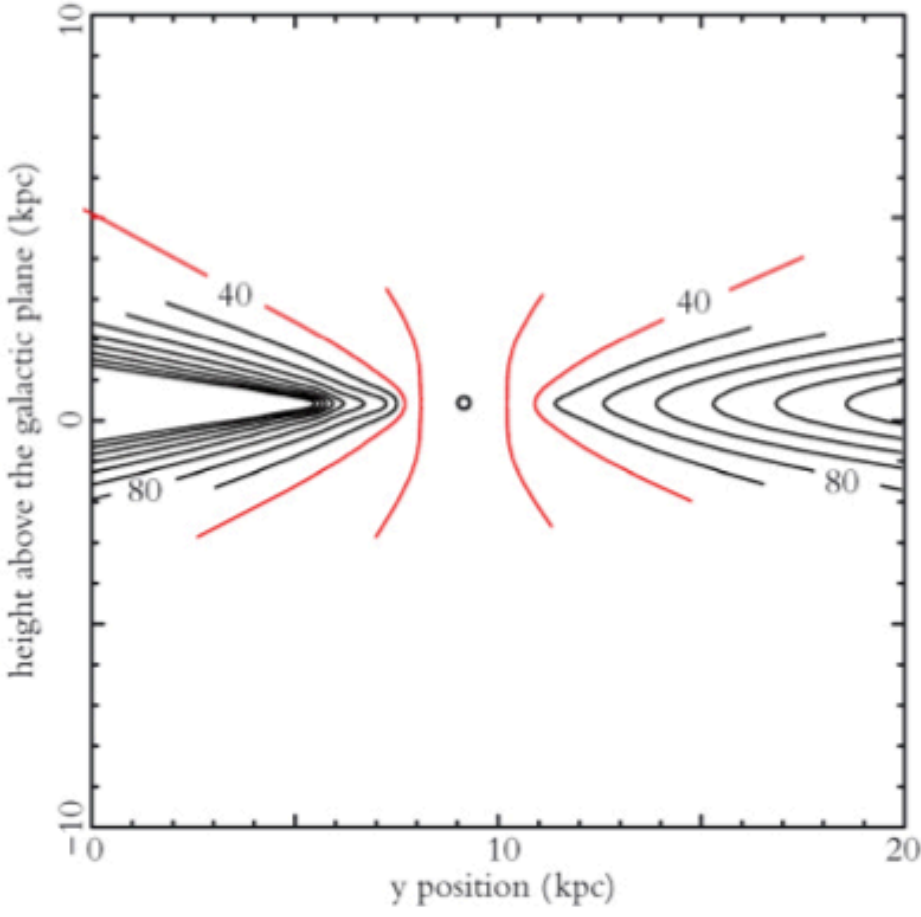


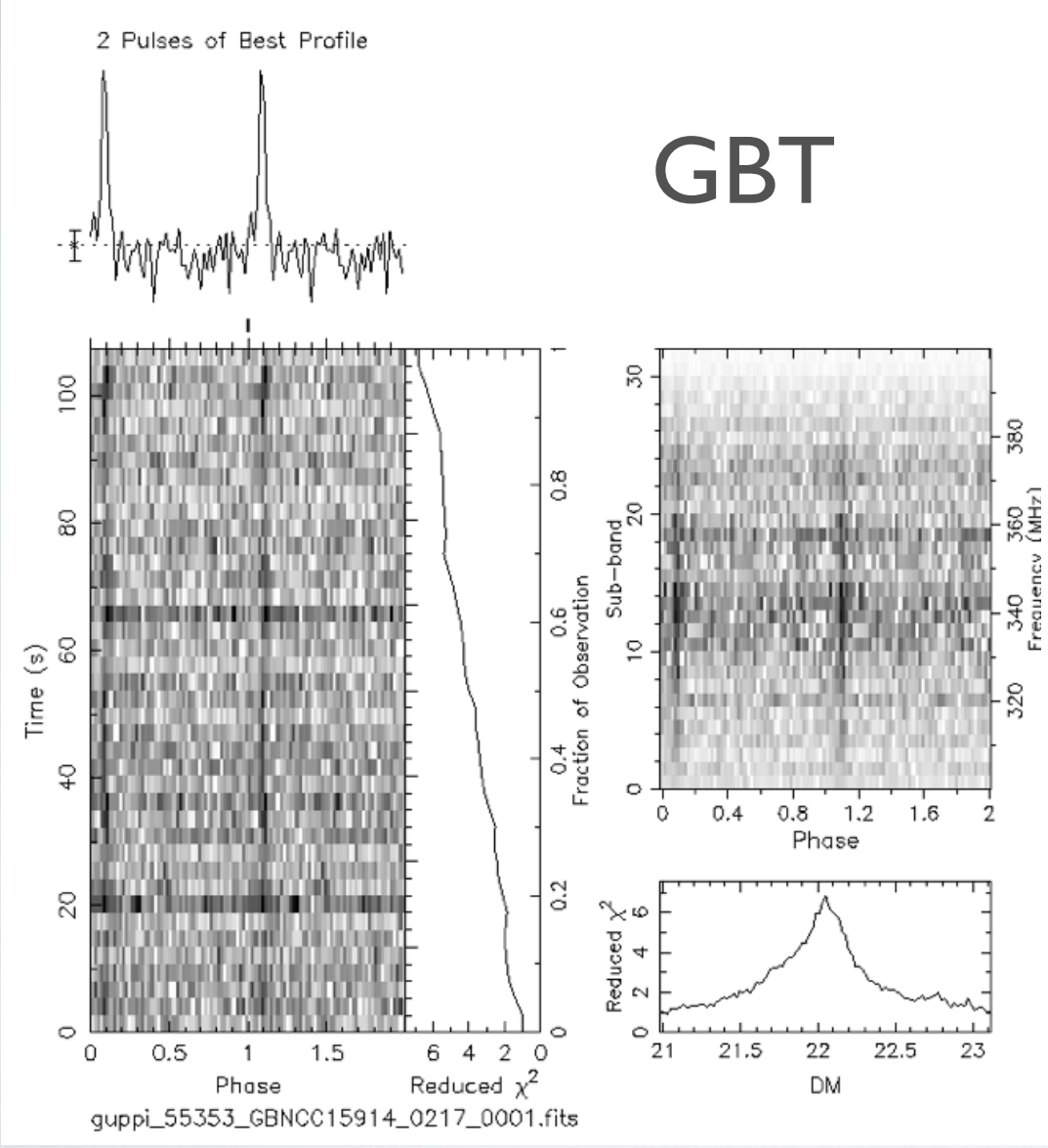


Pilot LOFAR Pulsar Surveys

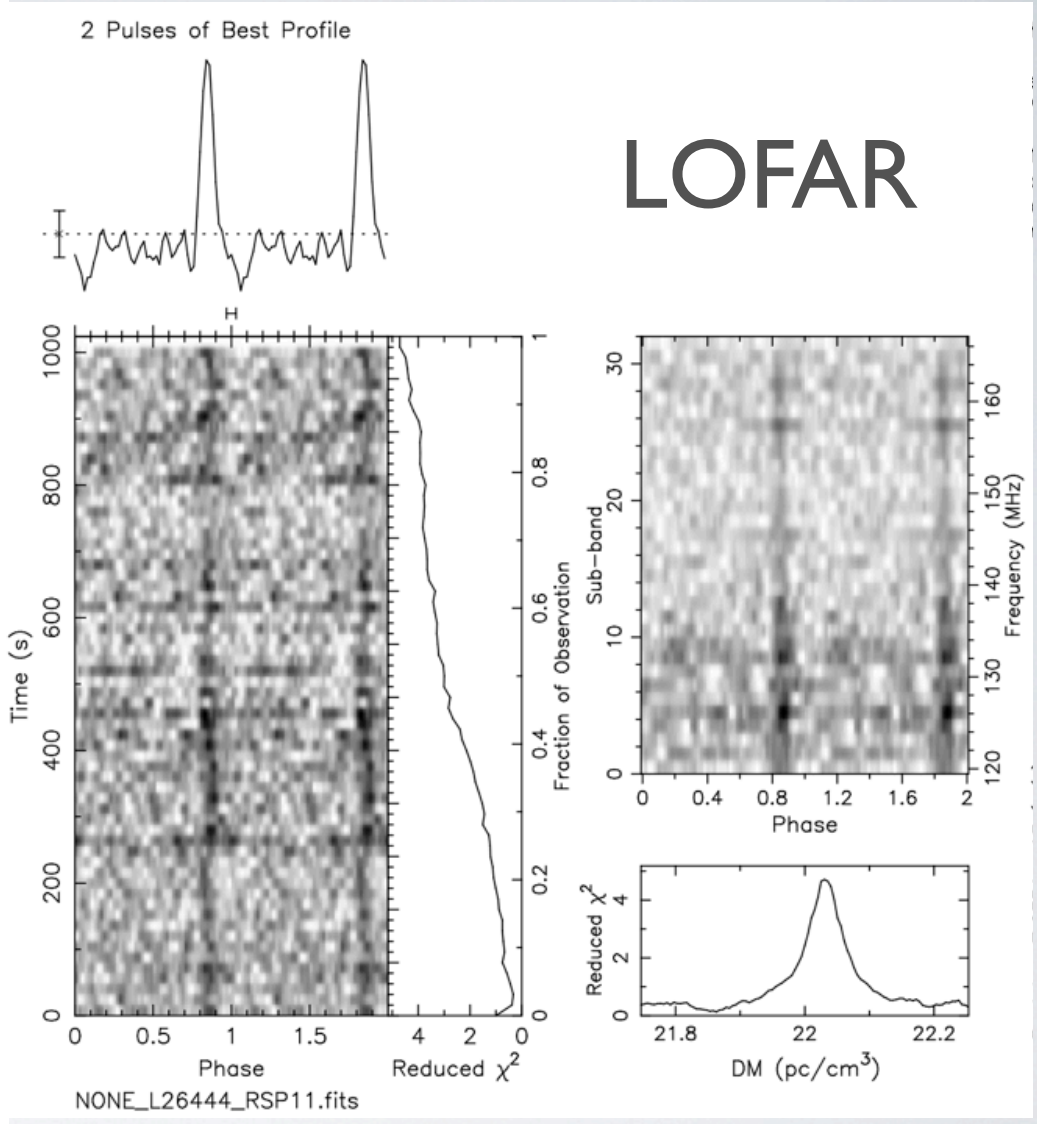
- LPPS (incoherent survey): ~1/2 of North. Hem., 7 SAPs, 1 hour pointings.
- LOTAS (coherent survey): ~1000 sq deg., 19 TABs, 17-minute pointing.
- Processing near completion, still lots of candidates to inspect.
- So far 5 independent discoveries of very recent GBT discoveries at 350MHz.

Pilot LOFAR Pulsar Surveys

GBT



LOFAR



24-ms Pulsar!