

LOFAR's First 100 Pulsar Detections... ...and some weird LBA behaviour



Jason Hessels

on behalf of

Nico Vermaas, Ken Anderson, Aris Noutsos, Aris Karastergiou,
Masaya Kuniyoshi, Ben Stappers, Vishal Gajjar, Anastasia Alexov,
Vlad Kondratiev, Anya Bilous, Tom Hassall, Thijs Coenen, Sander ter
Veen, Joeri van Leeuwen, Andre Gunst, Yuan Tang, Ruud Overeem,
Arthur Coolen, Jan David Mol, and Patrick Weltevrede

Pulsar Busy Week 9

For summary, see talk 100804

- Aris K., Andre, Masaya, Jason: Effelsberg single station observations
- Anastasia: Pipeline and MoM interaction
- Nico: MoM observing
- Ben, Aris N.: Coherent dedispersion and voltage data
- Jason: Coordination, observing and analysis
- Joeri: B0809+74 single pulses, tied-array data
- Vishal, Vlad, Thijs: Search pipeline
- Vlad, Anastasia: Web summaries
- Anya, Vlad: LBA >20 MHz data
- Tom: Scattering data, analysis support
- Yuan, Ashish: general support
- Arthur, Ruud, Jan David: debugging
- Ken: pipeline framework
- Sander: triggering, data format support
- Patrick: writing to PSRFITS

Automated observing with MoM

My Account

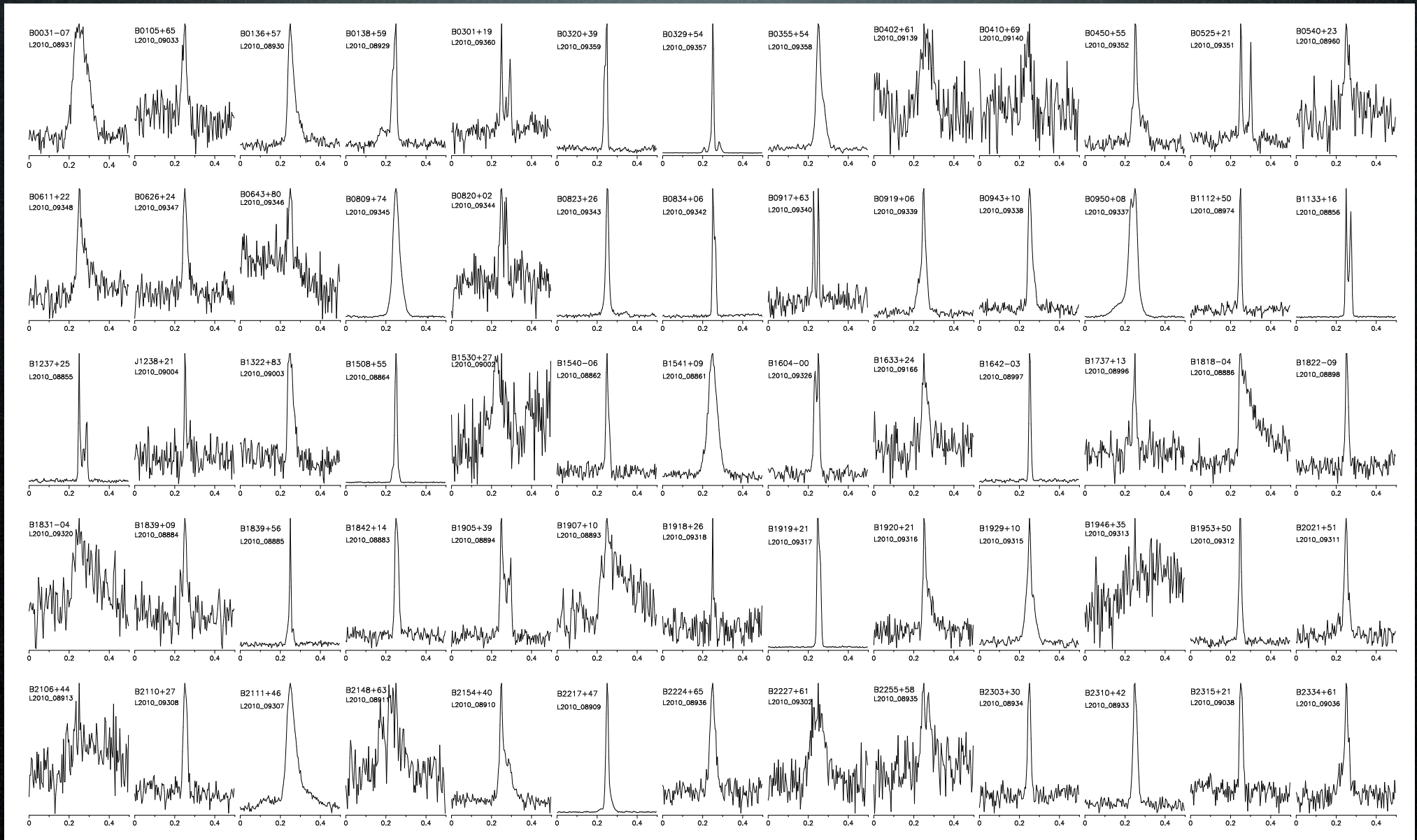
Project List Query List Project Explorer Preferences Admin

Copy selected Move selected Delete selected Change status Export XML

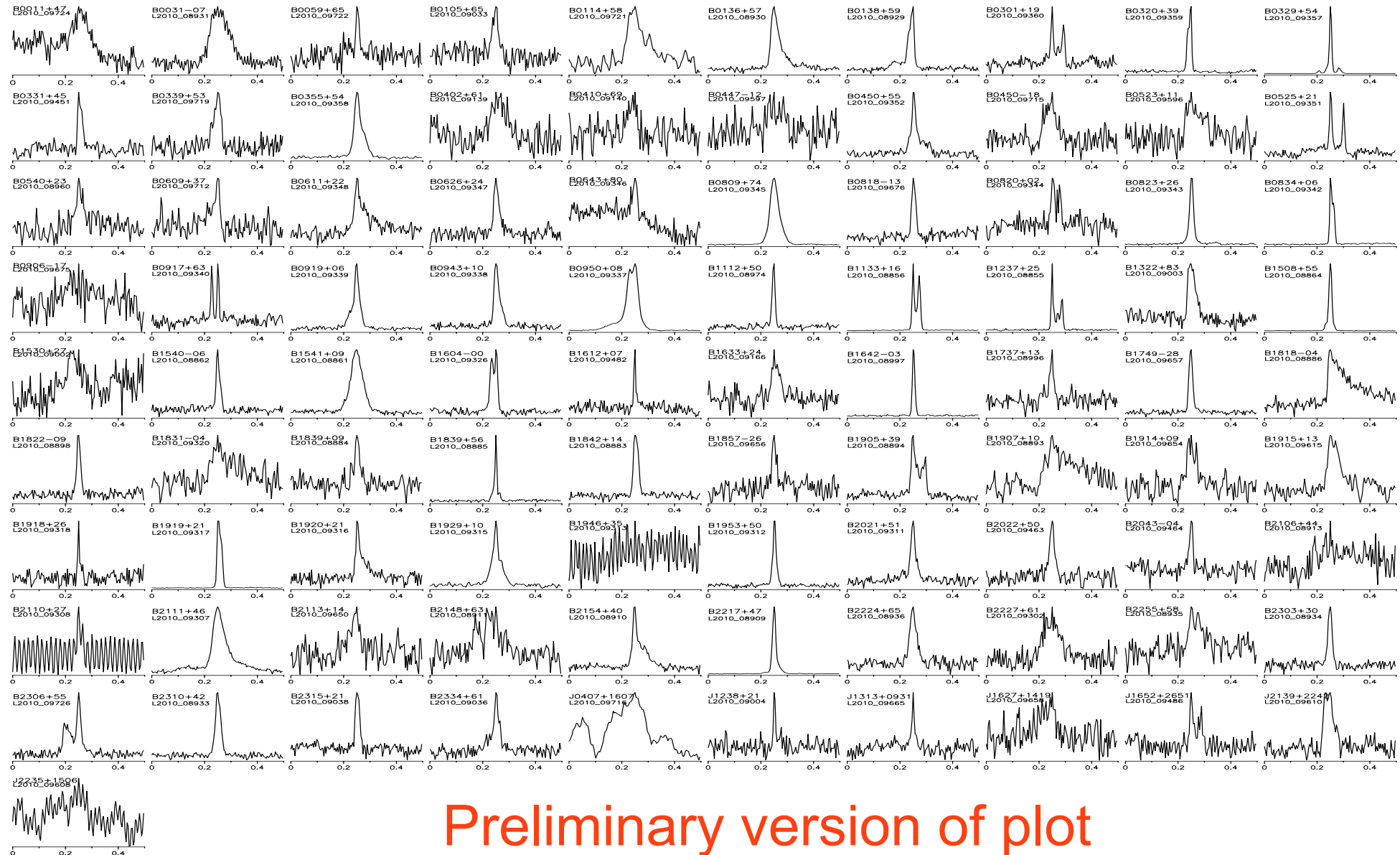
Project Explorer	Status	ID
<input type="checkbox"/> <input type="checkbox"/> Pulsars <input type="button" value="Add"/> <input type="button" value="Details"/>	active	Pulsars
<input type="checkbox"/> <input type="checkbox"/> TEMPLATES <input type="button" value="Add"/> <input type="button" value="Details"/>		Template observations
<input type="checkbox"/> <input type="checkbox"/> 100722_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observations from 100722
<input type="checkbox"/> <input type="checkbox"/> 100725_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observations on July 24-25, 2010
<input type="checkbox"/> <input type="checkbox"/> 100728_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observations on July 27-28, 2010 (48)
<input type="checkbox"/> <input type="checkbox"/> 100729_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observations on July 28-29, 2010 (41)
<input type="checkbox"/> <input type="checkbox"/> 100730_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observations from 100730
<input type="checkbox"/> <input type="checkbox"/> 100730-100801_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observation over the weekend 100730-100801
<input type="checkbox"/> <input type="checkbox"/> 100803_Obs <input type="button" value="Add"/> <input type="button" value="Details"/>		Observations from 100803
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Obs J1649+2533 (HBA) <input type="button" value="Add"/> <input type="button" value="Details"/>	finished	Obs J1649+2533 (HBA) at 2010-08-03T17:00:00 for 17 min
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Obs J1652+2651 (HBA) <input type="button" value="Add"/> <input type="button" value="Details"/>	finished	Obs J1652+2651 (HBA) at 2010-08-03T17:20:00 for 17 min
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Obs J1627+1419 (HBA) <input type="button" value="Add"/> <input type="button" value="Details"/>	finished	Obs J1627+1419 (HBA) at 2010-08-03T17:40:00 for 17 min
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Obs J1645+1012 (HBA) <input type="button" value="Add"/> <input type="button" value="Details"/>		Obs J1645+1012 (HBA) at

- Use templates and a simple shell script that makes .xml observing files which can be imported.
- Look-up table of pulsar positions.
- 200+ observations done in this way. Very robust.

Making our way to 100 pulsars...

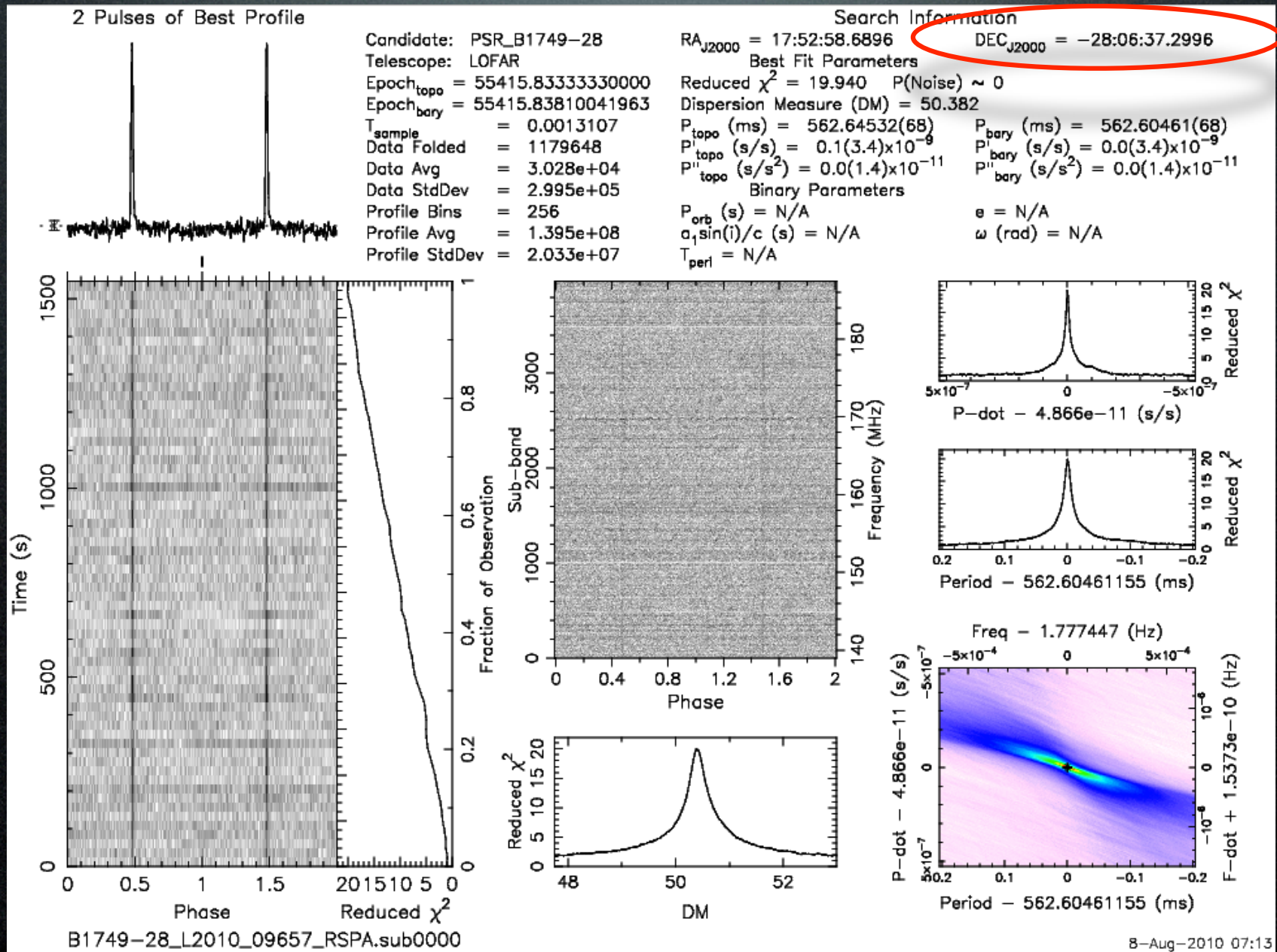


...and made it!



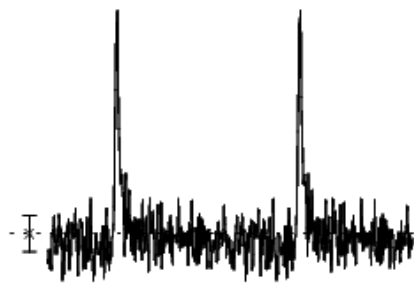
Preliminary version of plot

Observations at $ZA > 80\text{deg}$!



LBA Pointing Issue?!

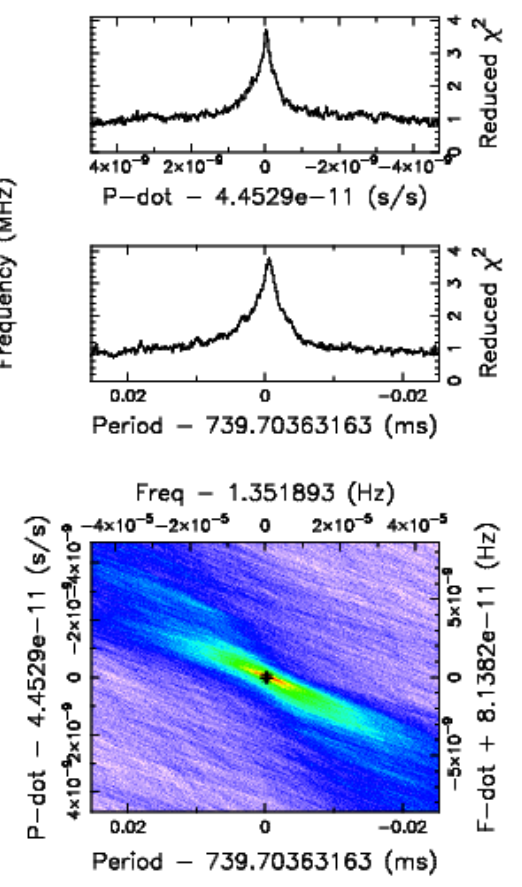
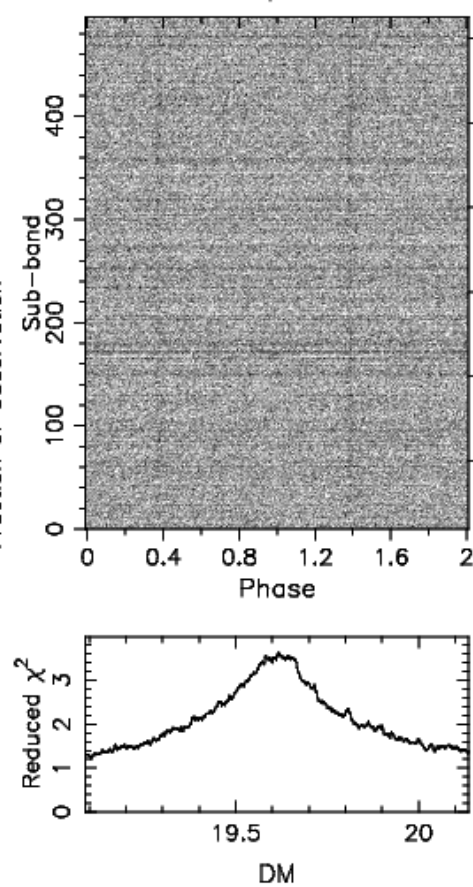
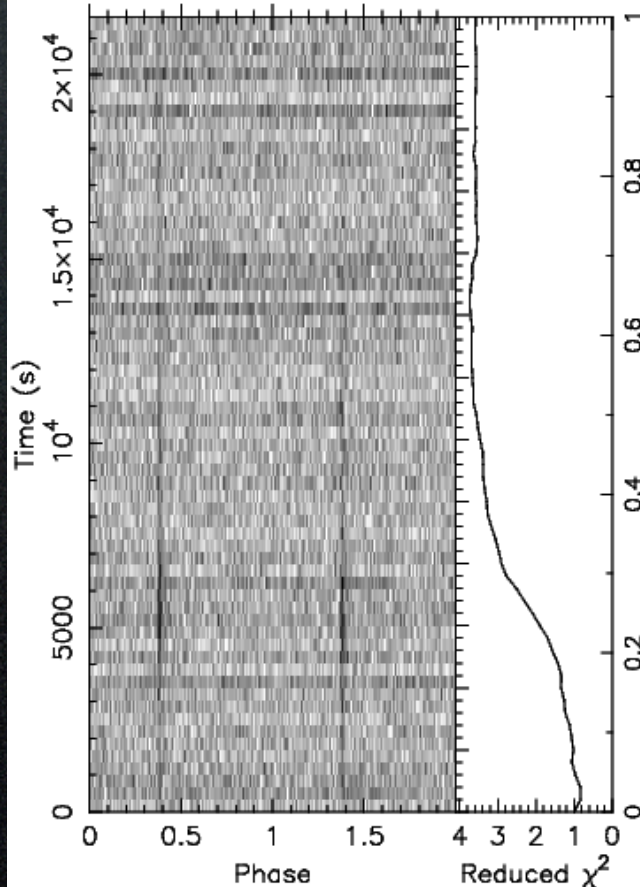
2 Pulses of Best Profile



Candidate: PSR_B1508+55
 Telescope: LOFAR
 Epoch_{topo} = 55425.63866900000
 Epoch_{bary} = 55425.63780330241
 T_{sample} = 0.0013107
 Data Folded = 16449536
 Data Avg = -121.3
 Data StdDev = 1.039e+05
 Profile Bins = 256
 Profile Avg = -7.781e+06
 Profile StdDev = 2.632e+07

Search Information

RA_{J2000} = 15:09:25.5837 DEC_{J2000} = 55:31:32.2252
 Best Fit Parameters
 Reduced χ^2 = 3.581 P(Noise) < 7.35e-75 ($\approx 18.3\sigma$)
 Dispersion Measure (DM) = 19.613
 P_{topo} (ms) = 739.72276(14) P_{bary} (ms) = 739.70343(14)
 P^I_{topo} (s/s) = 8.9(5.1)x10⁻¹¹ P^I_{bary} (s/s) = 4.5(5.1)x10⁻¹¹
 P^{II}_{topo} (s/s²) = -0.3(1.5)x10⁻¹⁴ P^{II}_{bary} (s/s²) = 0.0(1.5)x10⁻¹⁴
 Binary Parameters
 P_{orb} (s) = N/A e = N/A
 a₁sin(i)/c (s) = N/A ω (rad) = N/A
 T_{peri} = N/A



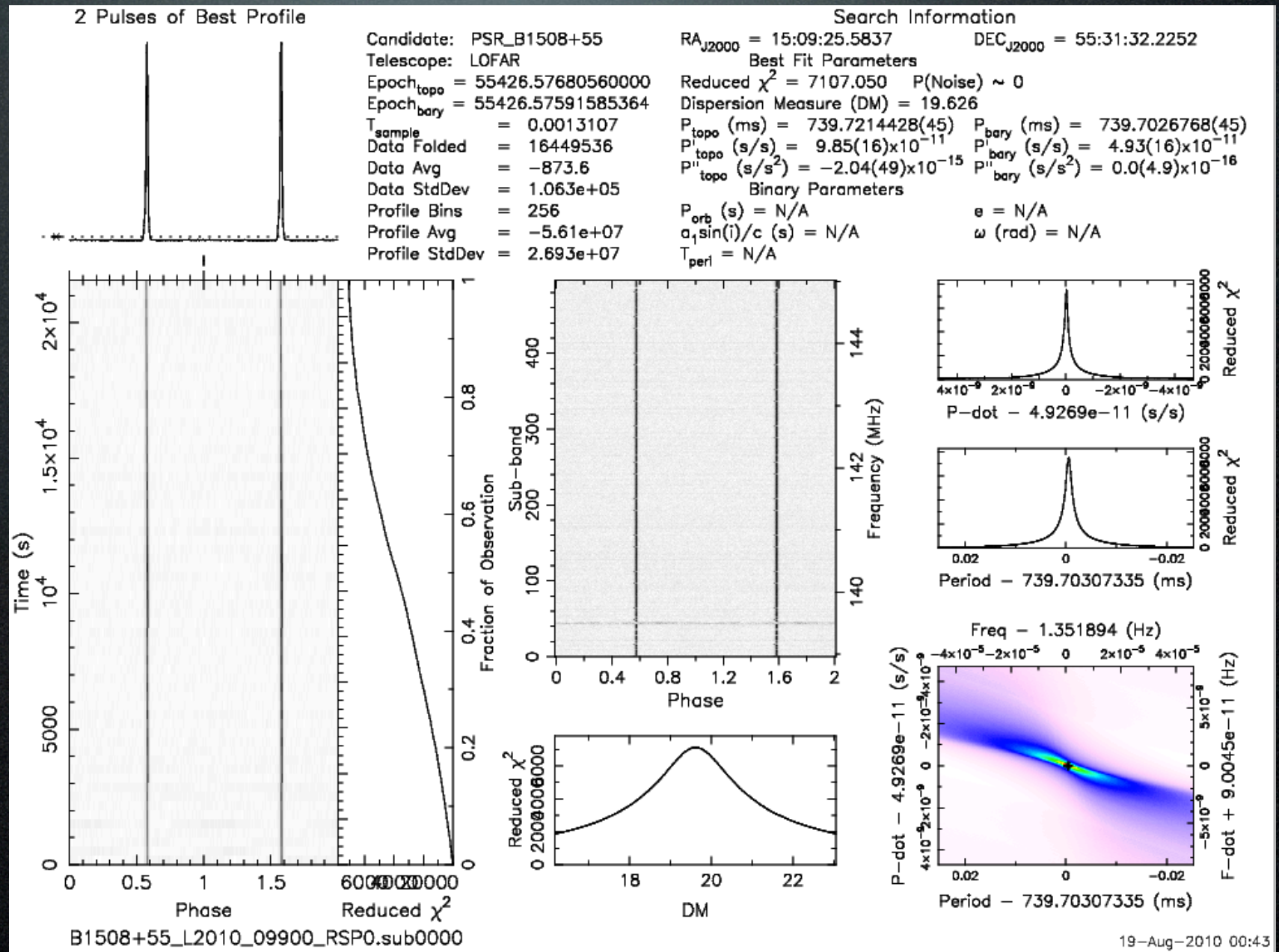
B1508+55_L2010_09891_RSP4.sub0000

18-Aug-2010 09:52

Transit

HBA tracking is fine

Transit



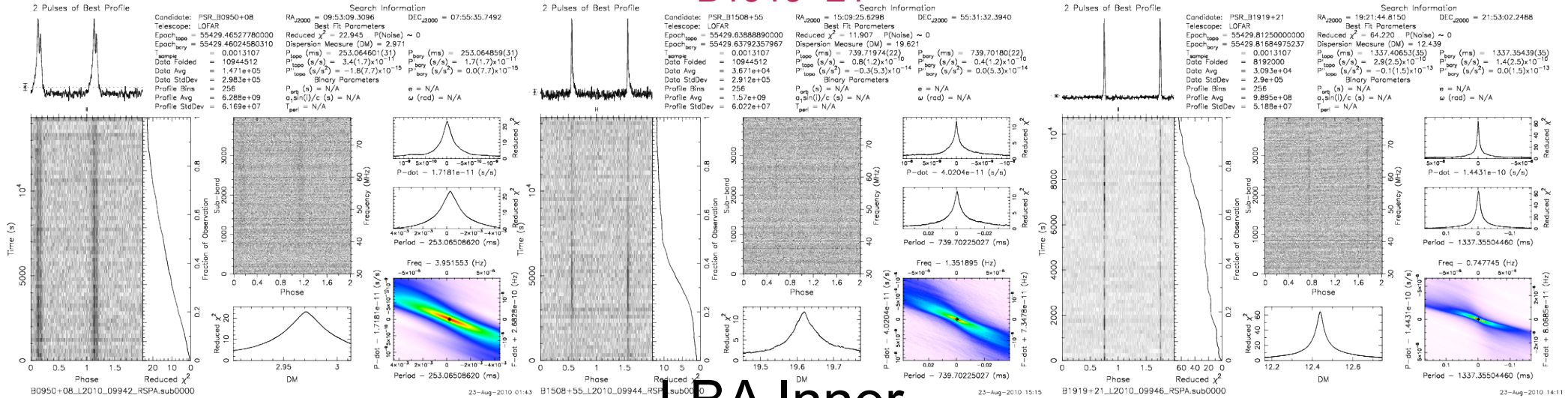
LBA Pointing Issue?!

LBA Outer

B0950+08

B1919+21

B1919+21



LBA Inner

B0950+08

B1919+21

B1919+21

