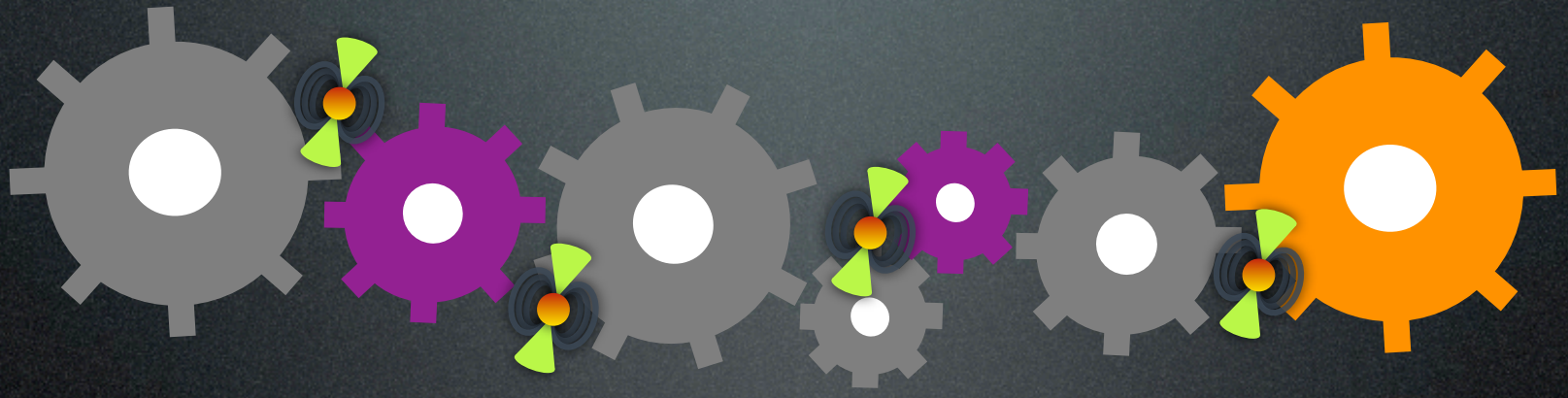
Pulsar Busy Week 8: Superterp Single Clock Tests and More...



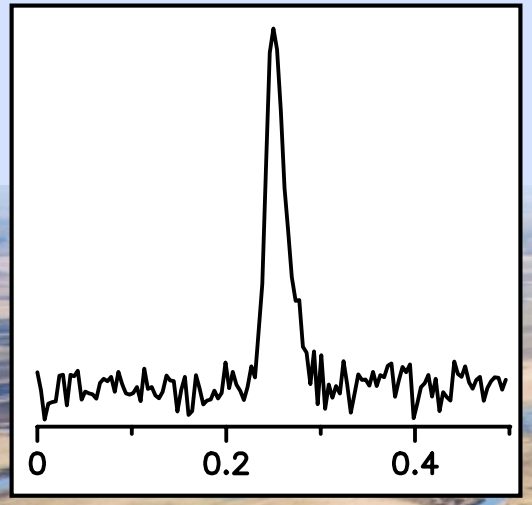
Jason Hessels
on behalf of
Ben Stappers, Anastasia Alexov, Vlad Kondratiev, Thijs Coenen, Sander ter Veen, Aris Noutsos, Joeri van Leeuwen, John Romein, Andre Gunst, Chris Broekema, Michiel Brentjens, etc.

Pulsar Busy Week 8

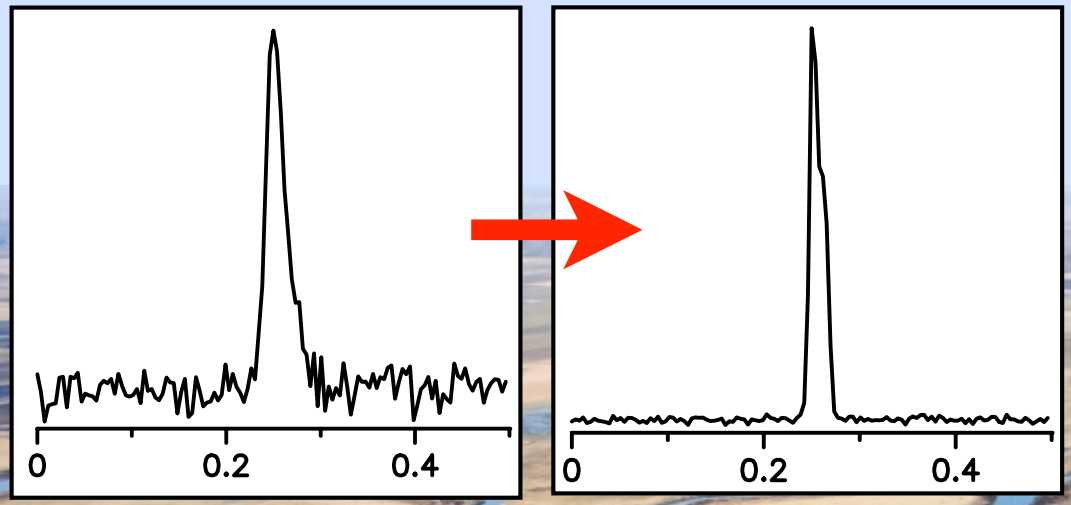
- Test newly implemented Single Clock (thanks Andre et al.!).
- Use Single Clock to make first “tied-array” (i.e. coherent summation) observations.
- Make observations for the LOFAR opening (MSP, Crab Img+PSR, Geminga, Multi-station beams, Anomalously intensive pulses in LBA, thick screen scattering)

Adding Stations

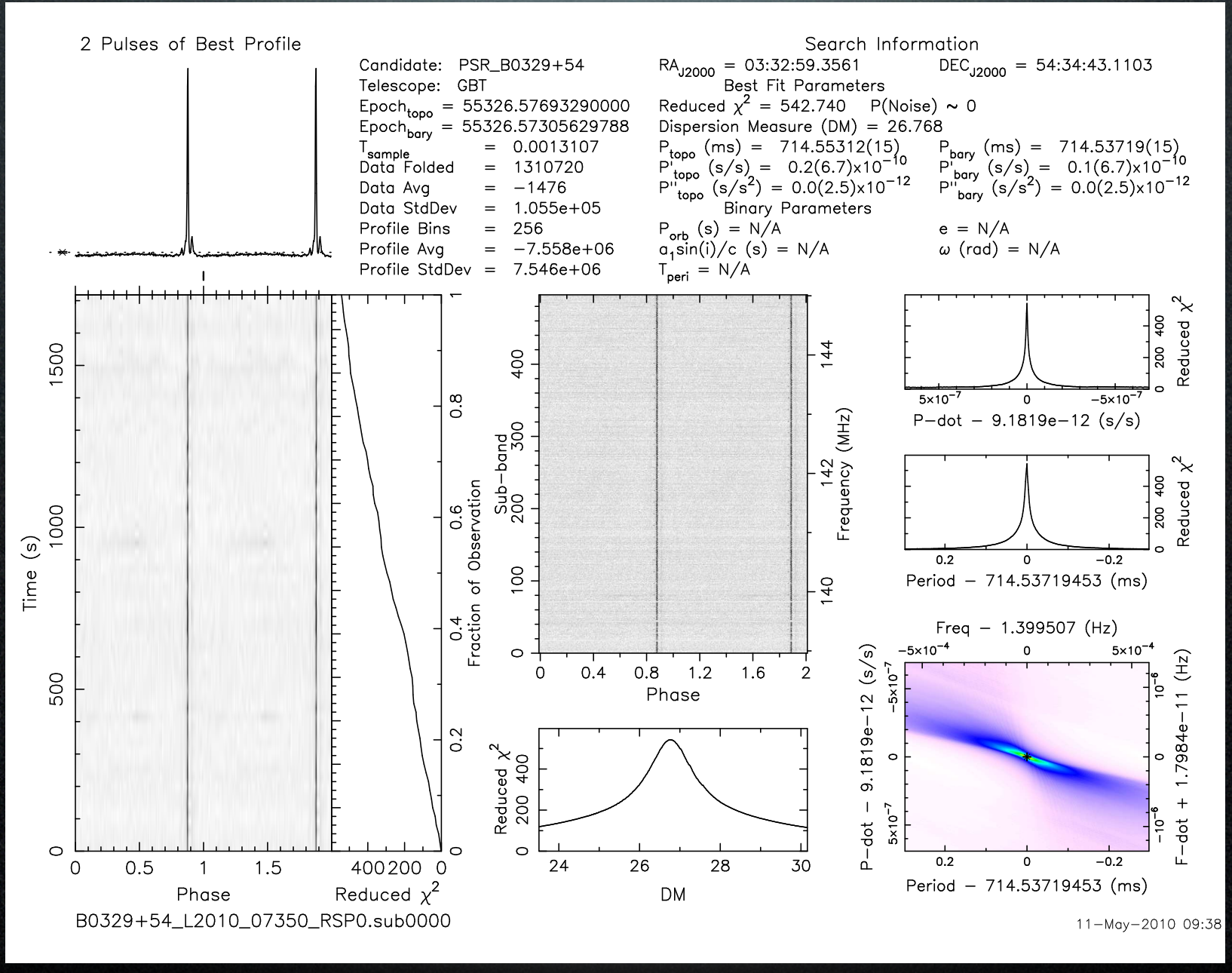
Incoherent sum



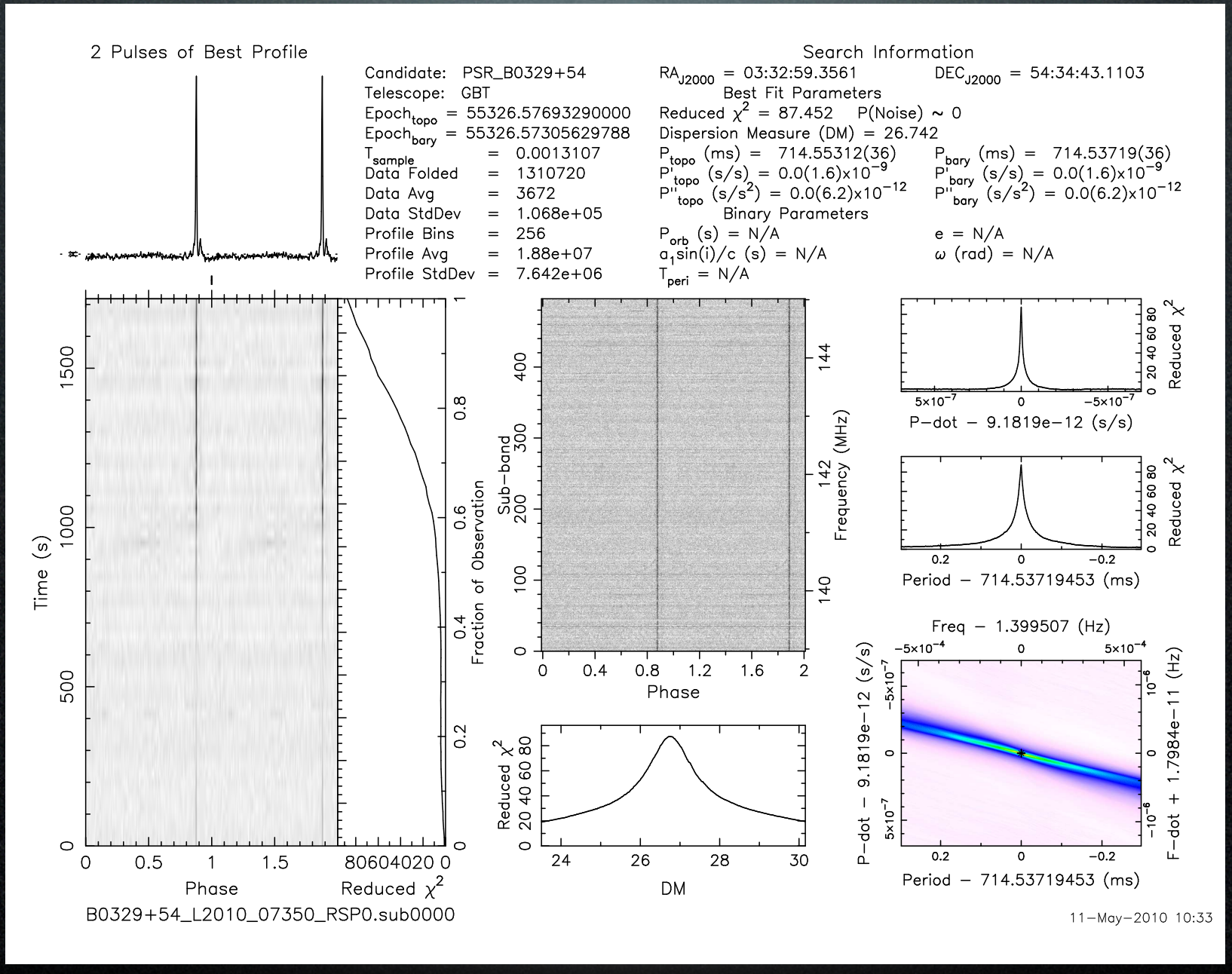
Tied-array beam



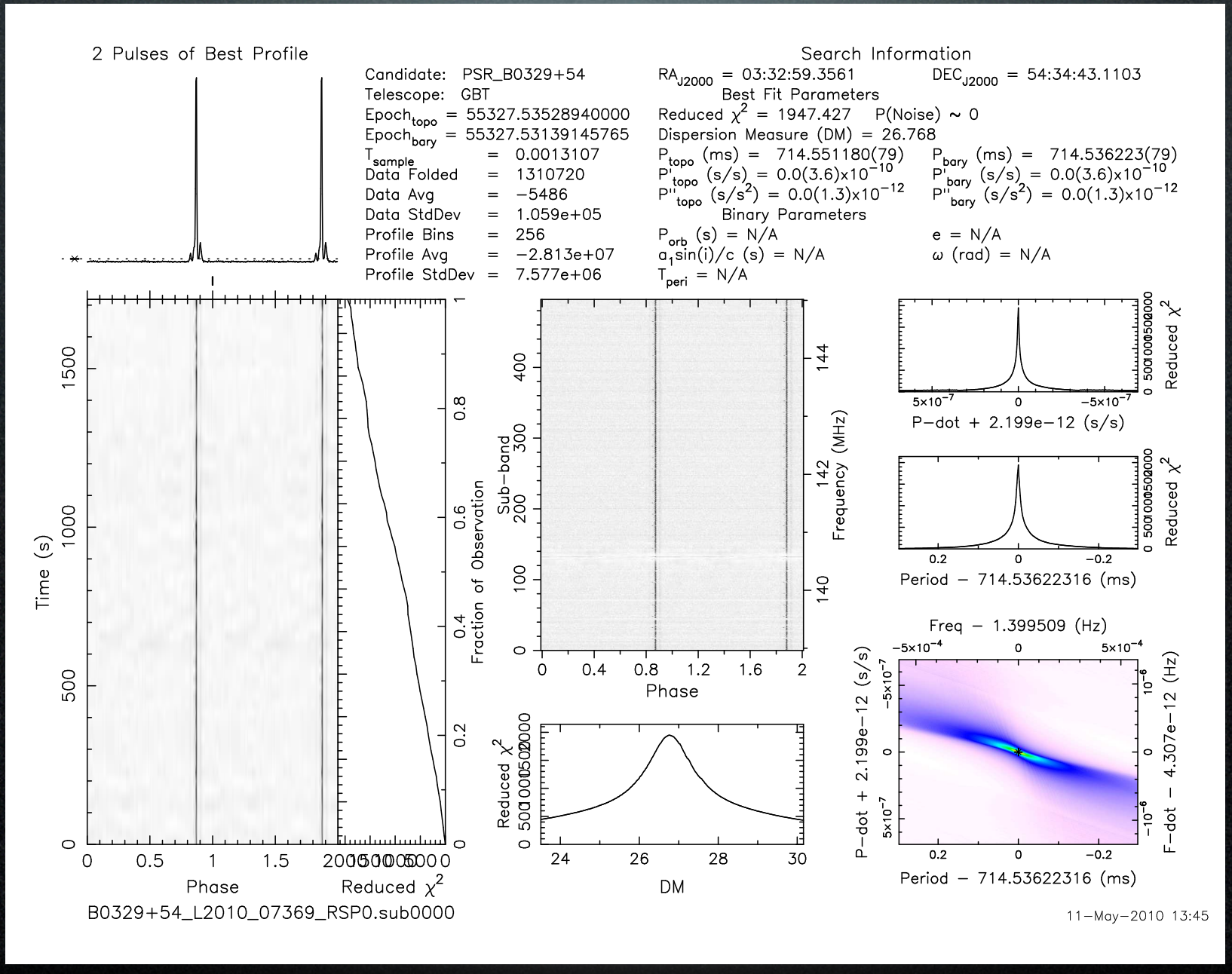
Incoherent Sum. before Single Clock



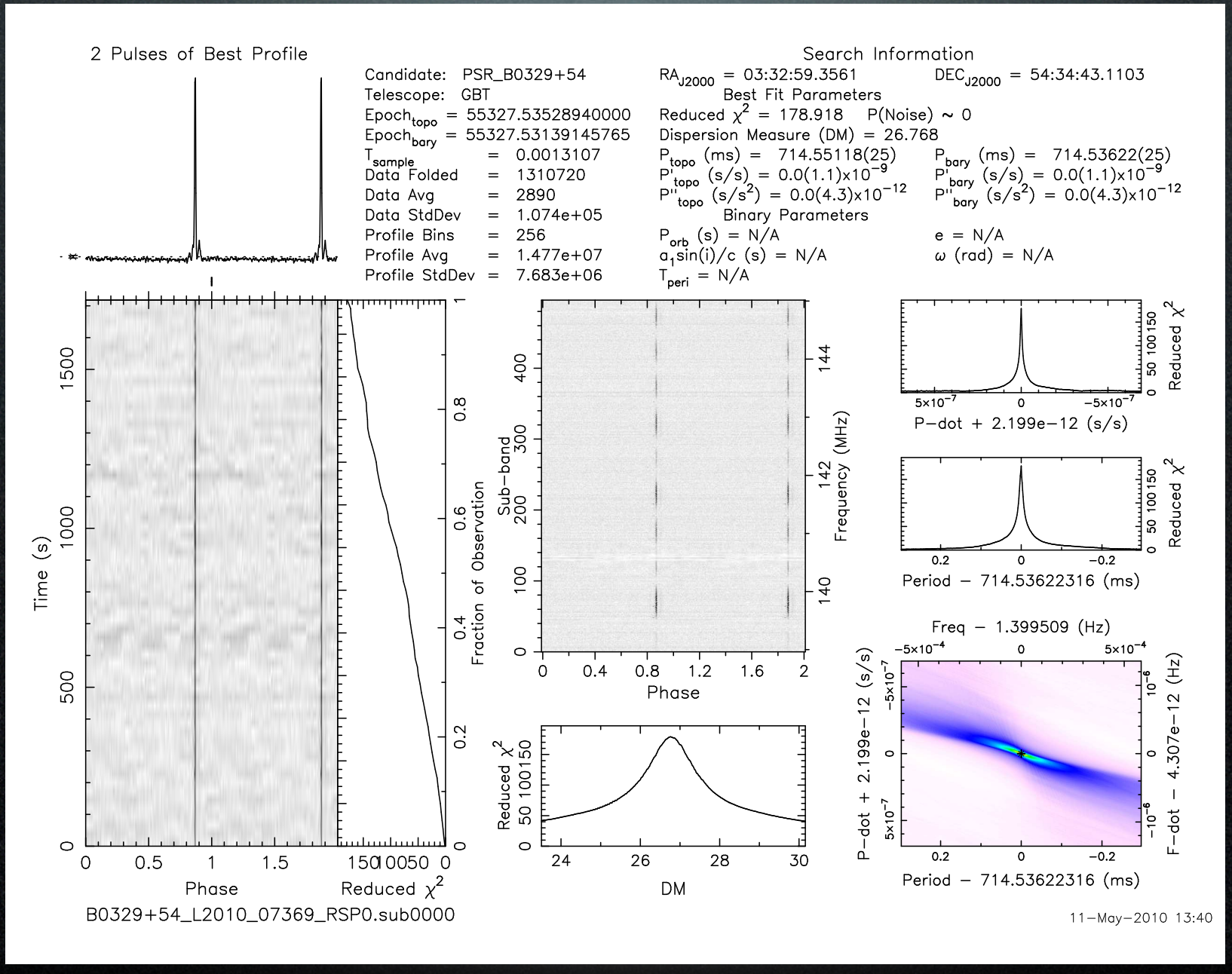
Coherent Sum. before Single Clock



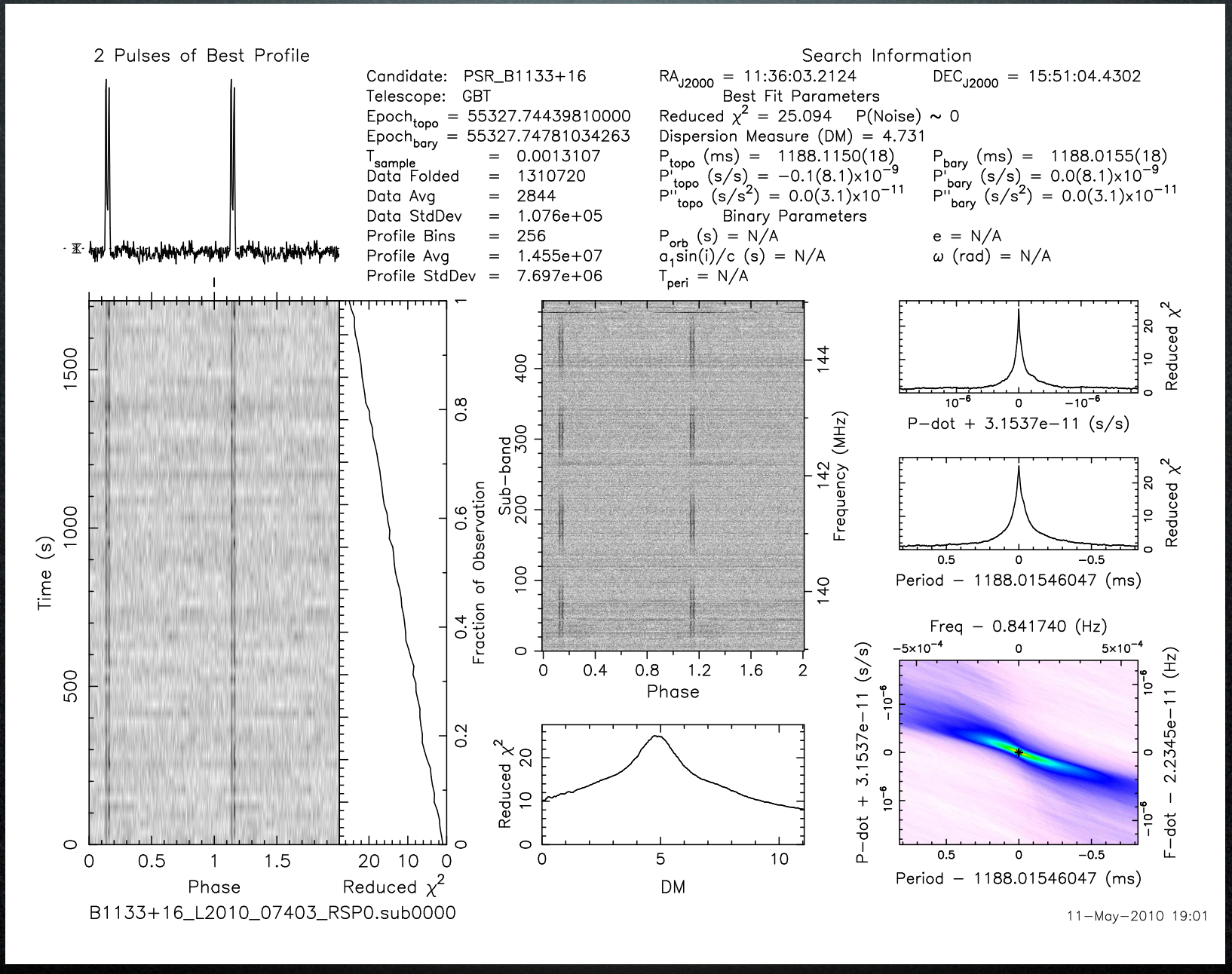
Incoherent Sum. after Single Clock



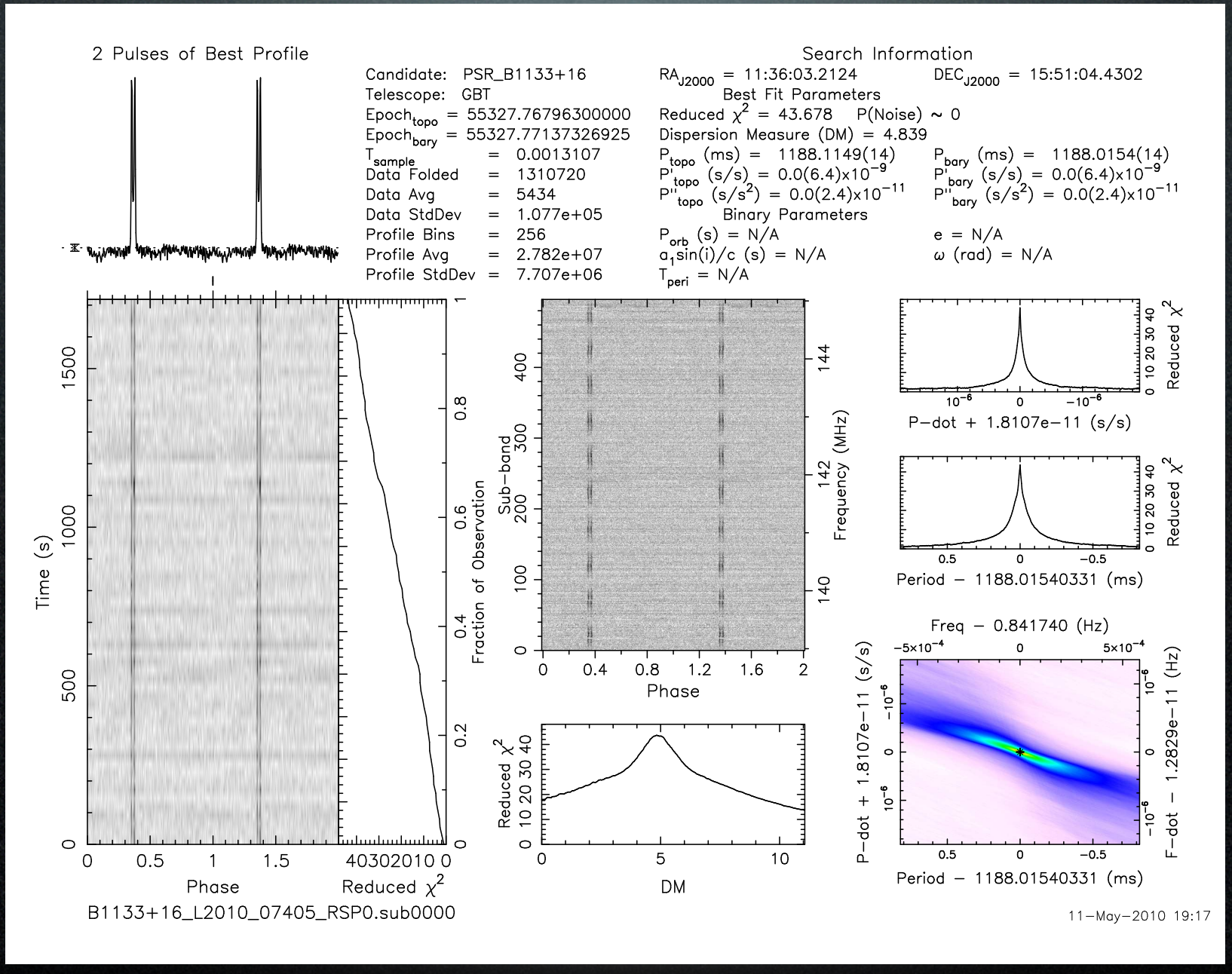
Coherent Sum. after Single Clock



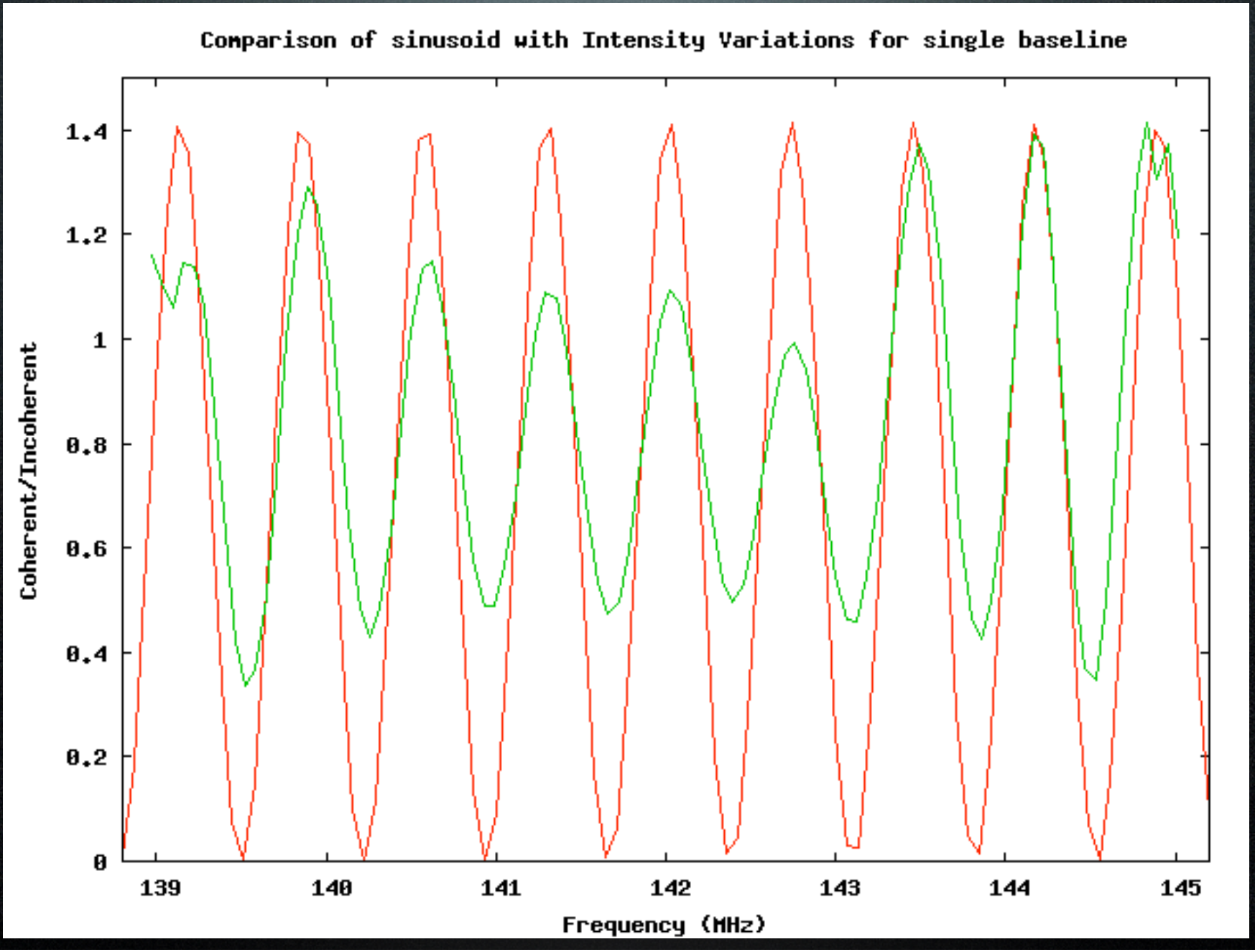
Coherent Sum. after Single Clock (CS005-6)



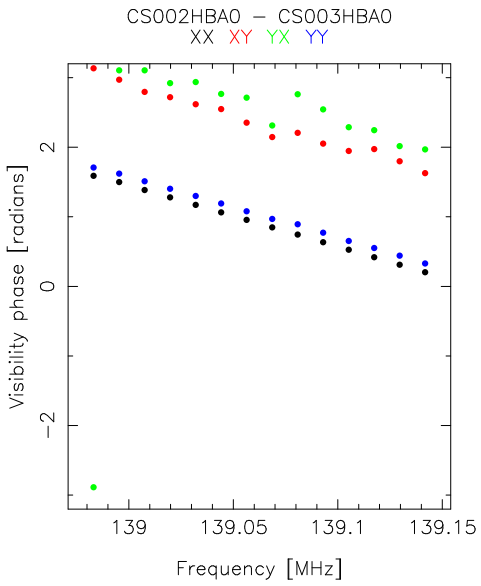
Coherent Sum. after Single Clock (CS003-5)

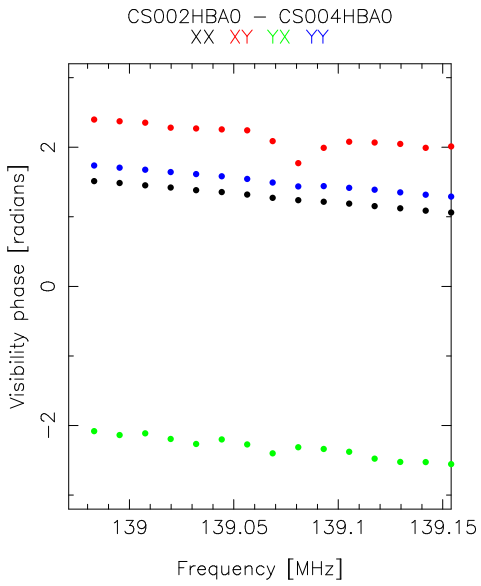


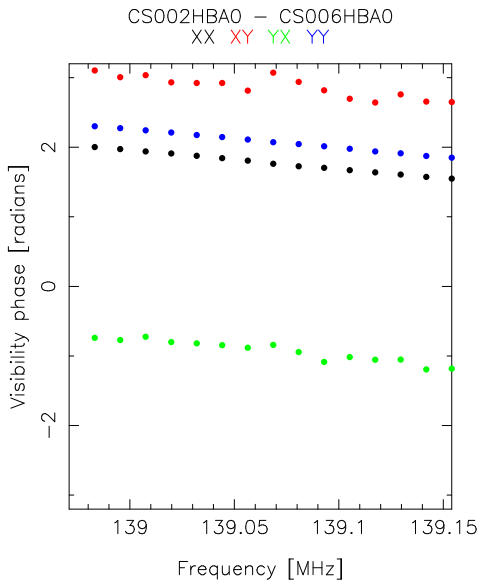
Coherent Sum. after Single Clock (CS003-5)

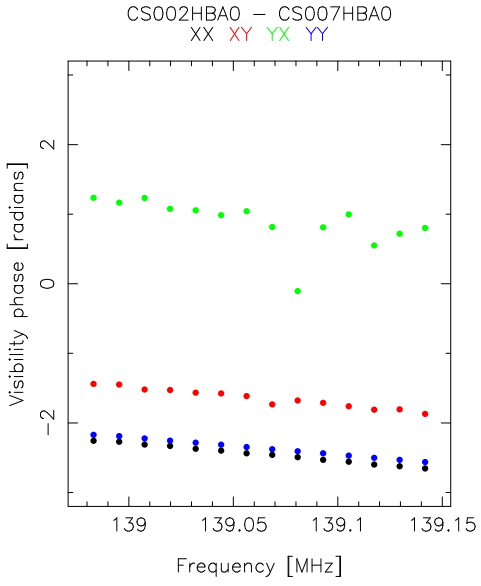


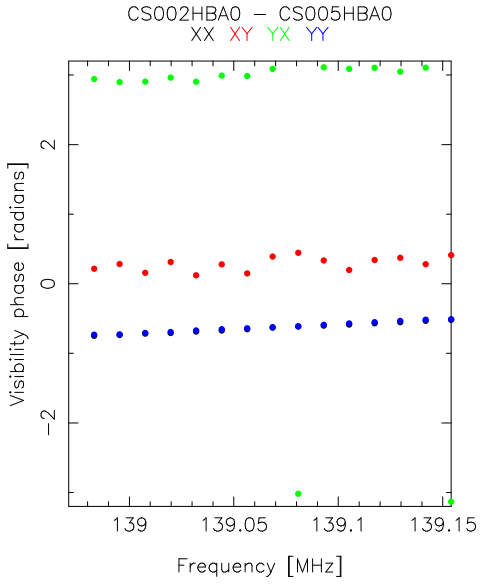
Crab Phases vs. Freq.: Pre delay corr.

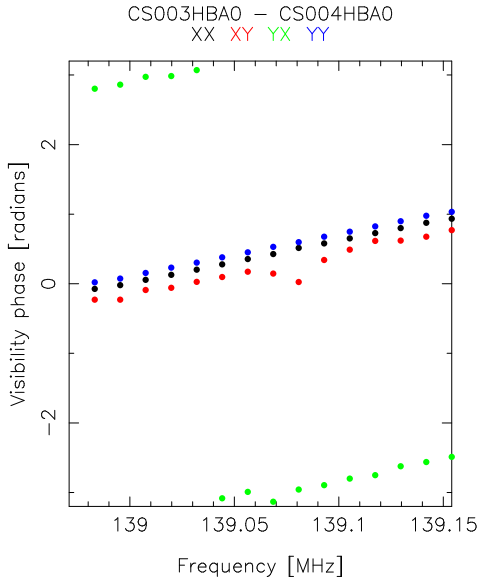




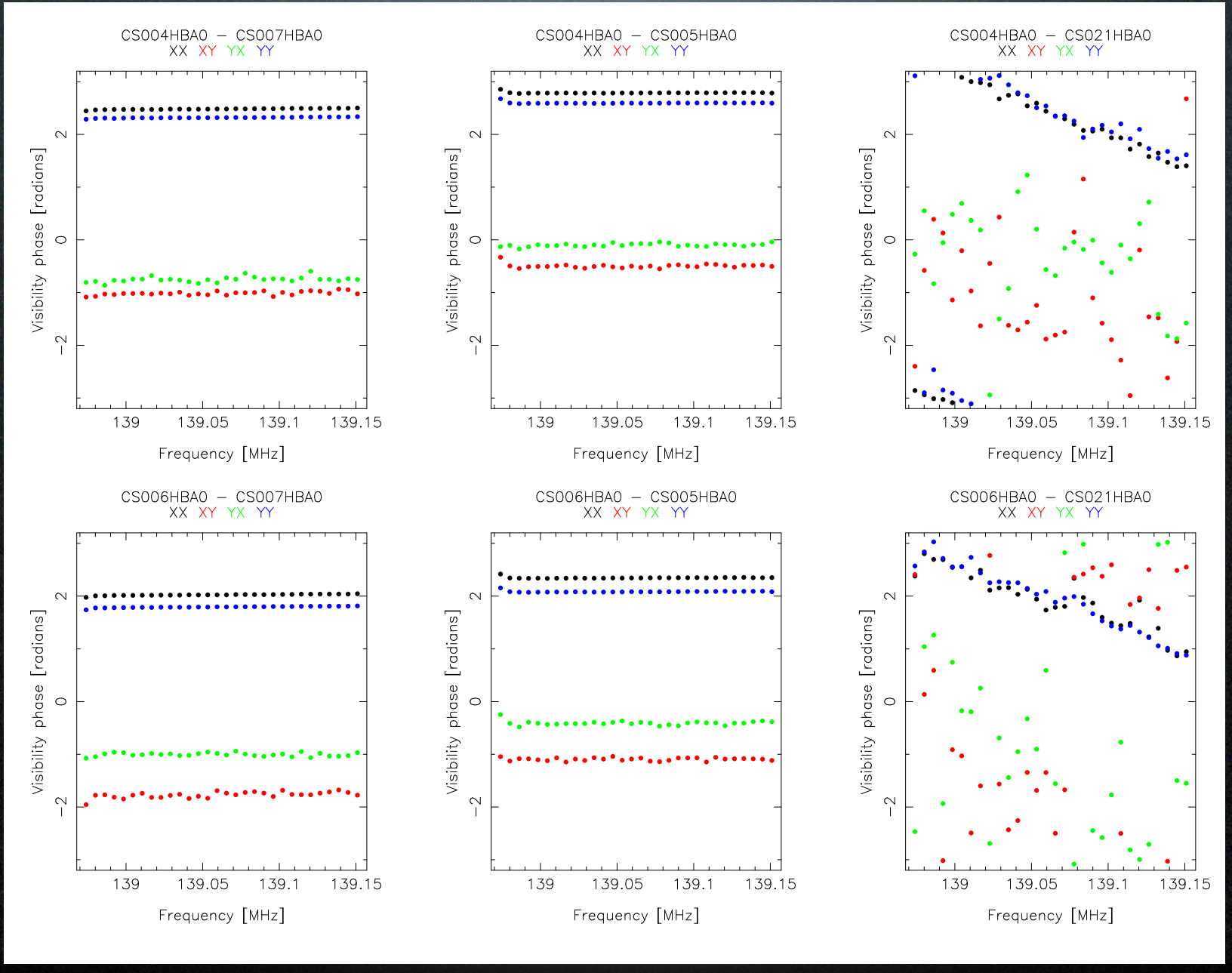




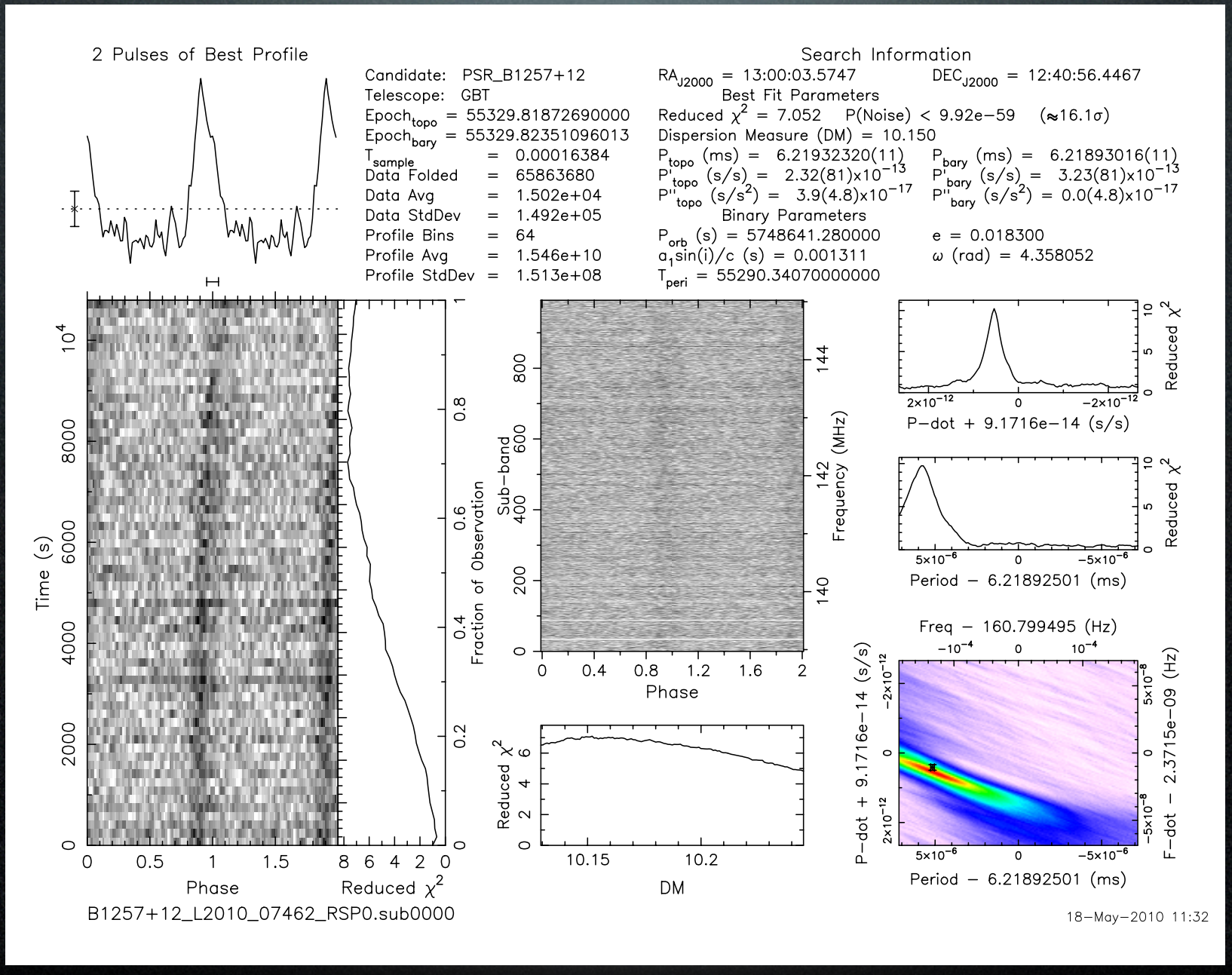




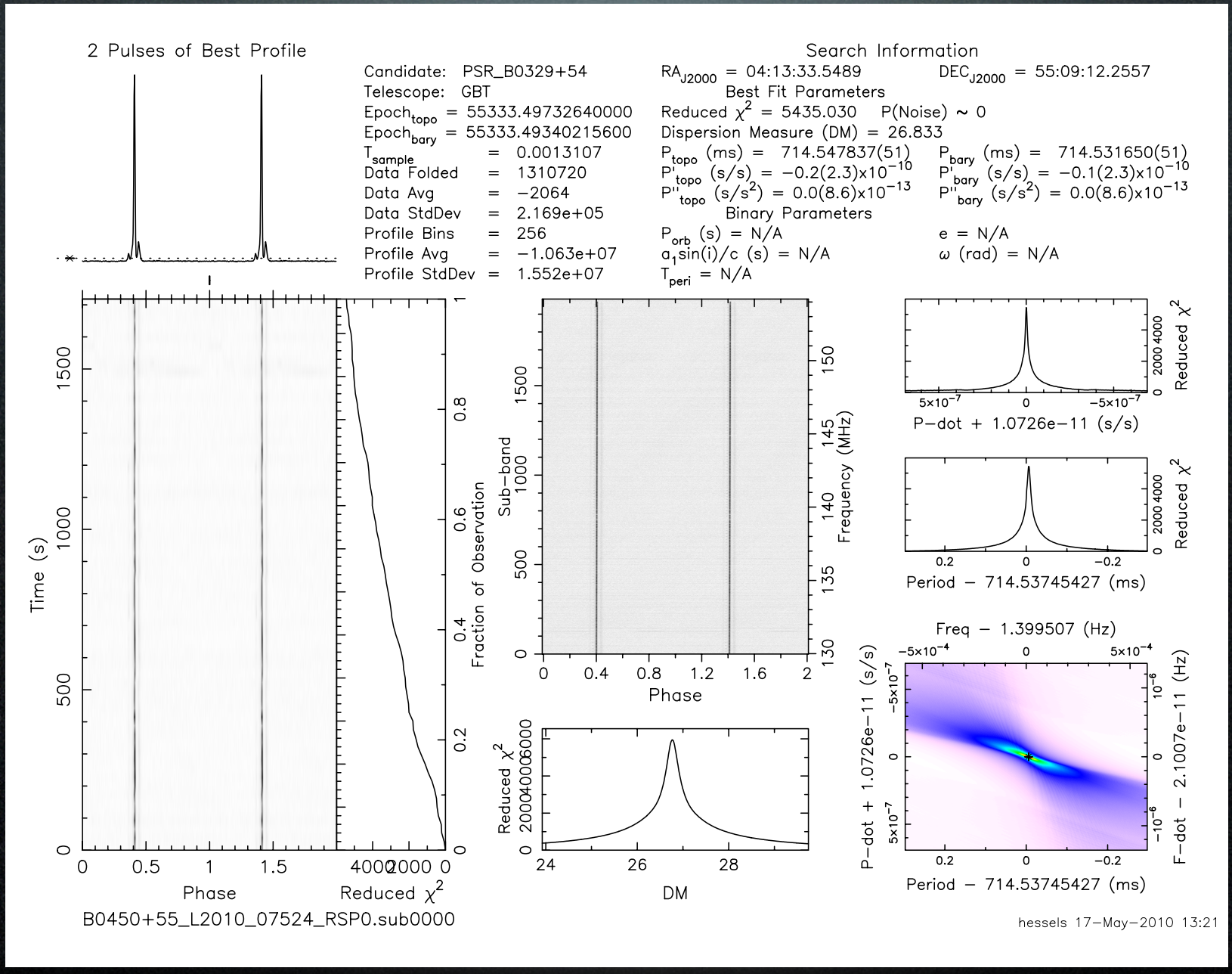
Crab Phases vs. Freq.: Post delay corr.



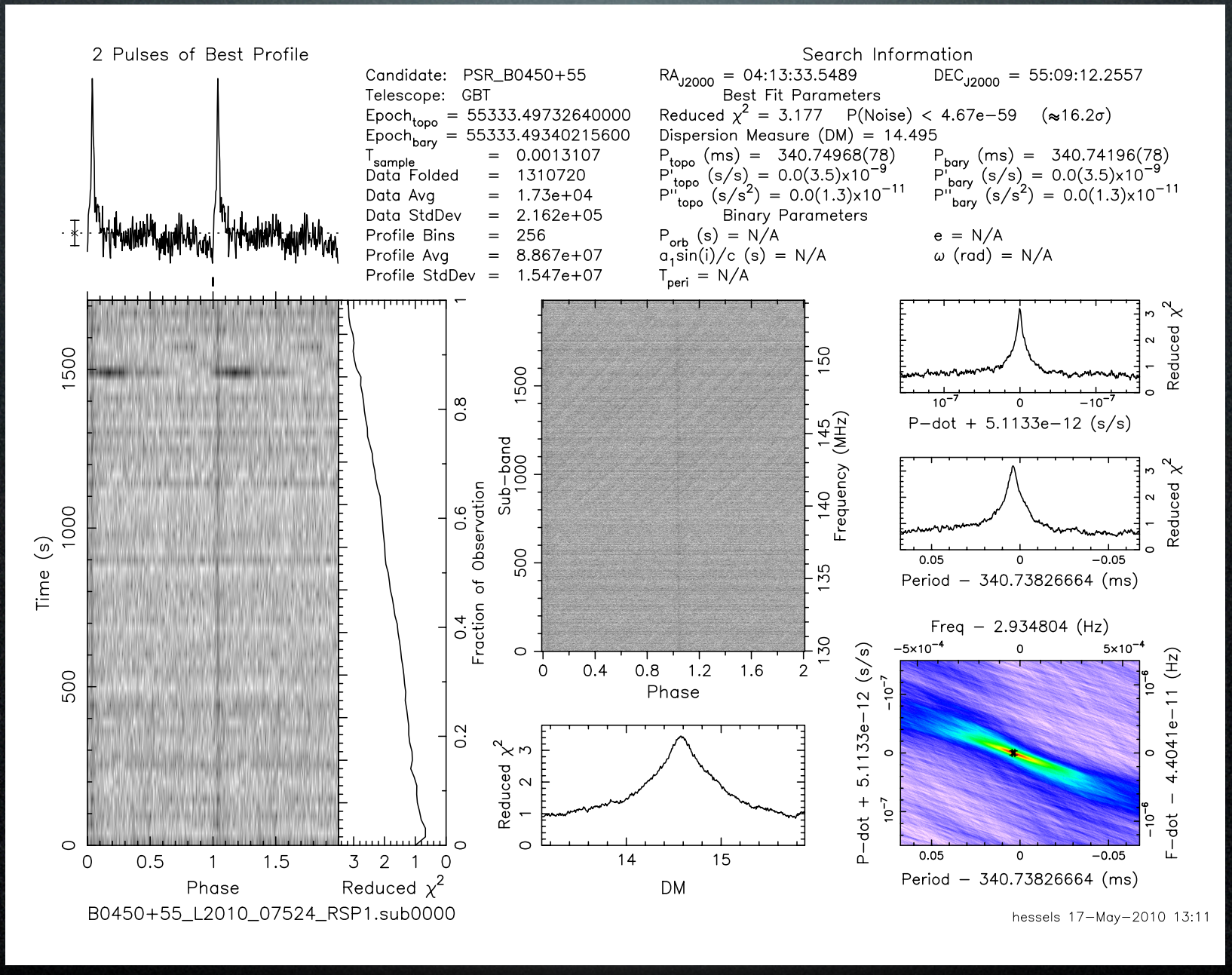
“Planet Pulsar” B1257+12



Using two station beams: beam 1



Using two station beams: beam 2



Suggestions/Issues

- Webpage with SAS/MAC schedule available (avoid processing conflicts)
- Issues with the scheduler --> how do we make our lives easier?
- Moving data around --> need to be systematized!
- Moving data to the archive --> Joeri to look into this more

Summary

- Now seem very close to being able to form LOFAR's first multi-station tied-array beam.
- Michiel B. has created software to "tune" the system by fitting for delays to all stations.
- Coherently combined Superterp will be more sensitive than entire array combined incoherently.
- Lots of observations done in preparation for opening and science meeting. Results coming in!