Report from the recent imaging busy weeks

John McKean

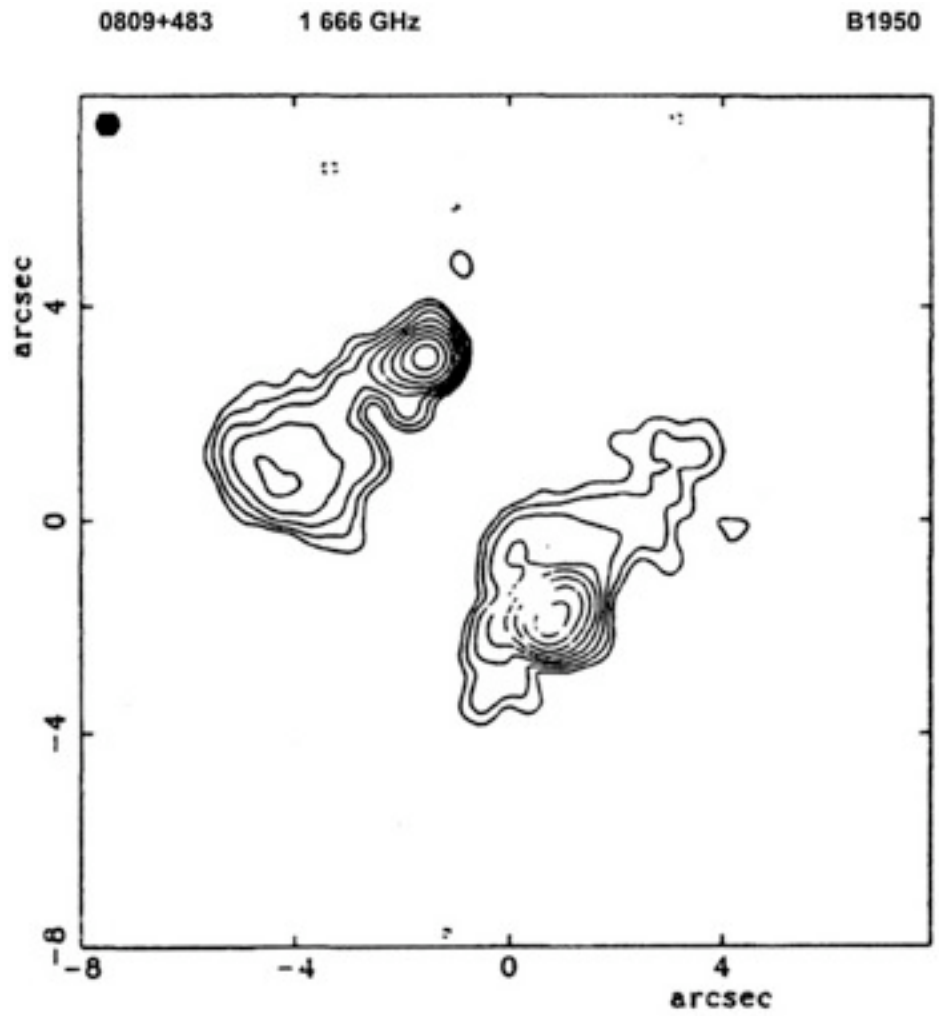
Fabien Batejat
Annalisa Bonafede
Marcus Brüggen
Judith Croston
Francesco de Gasperin
Roger Deane
Chiara Ferrari
Tim Garn
Elzbieta Kuligowska
George Miley
Matteo Murgia
Emanuela Orru
Isabella Prandoni
Roberto Pizzo
Reinout van Weeren
Olaf Wucknitz
Niruj Mohan

The Data

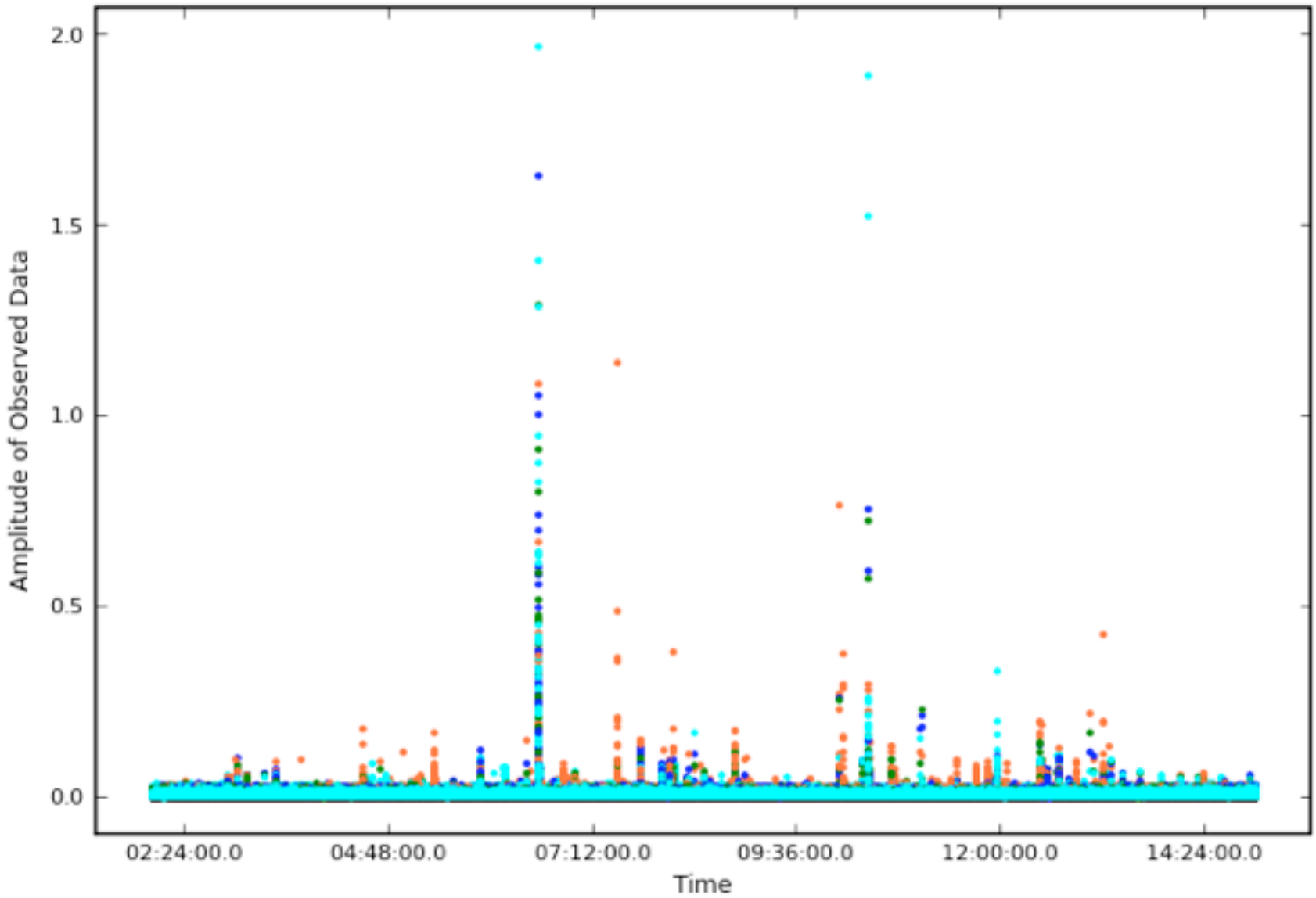
3C196 (~150 Jy at 60 MHz)

- 13 hour observation of 3C196
- 30--80 MHz
- 5 Dutch stations and Effelsberg
- 24 MHz bandwidth (non-continuous)
- 120 subands (256 channels)
- 3 second visibility integrations
- 300 Gb size

Being used to test flagging, bandpass and imaging pipeline.

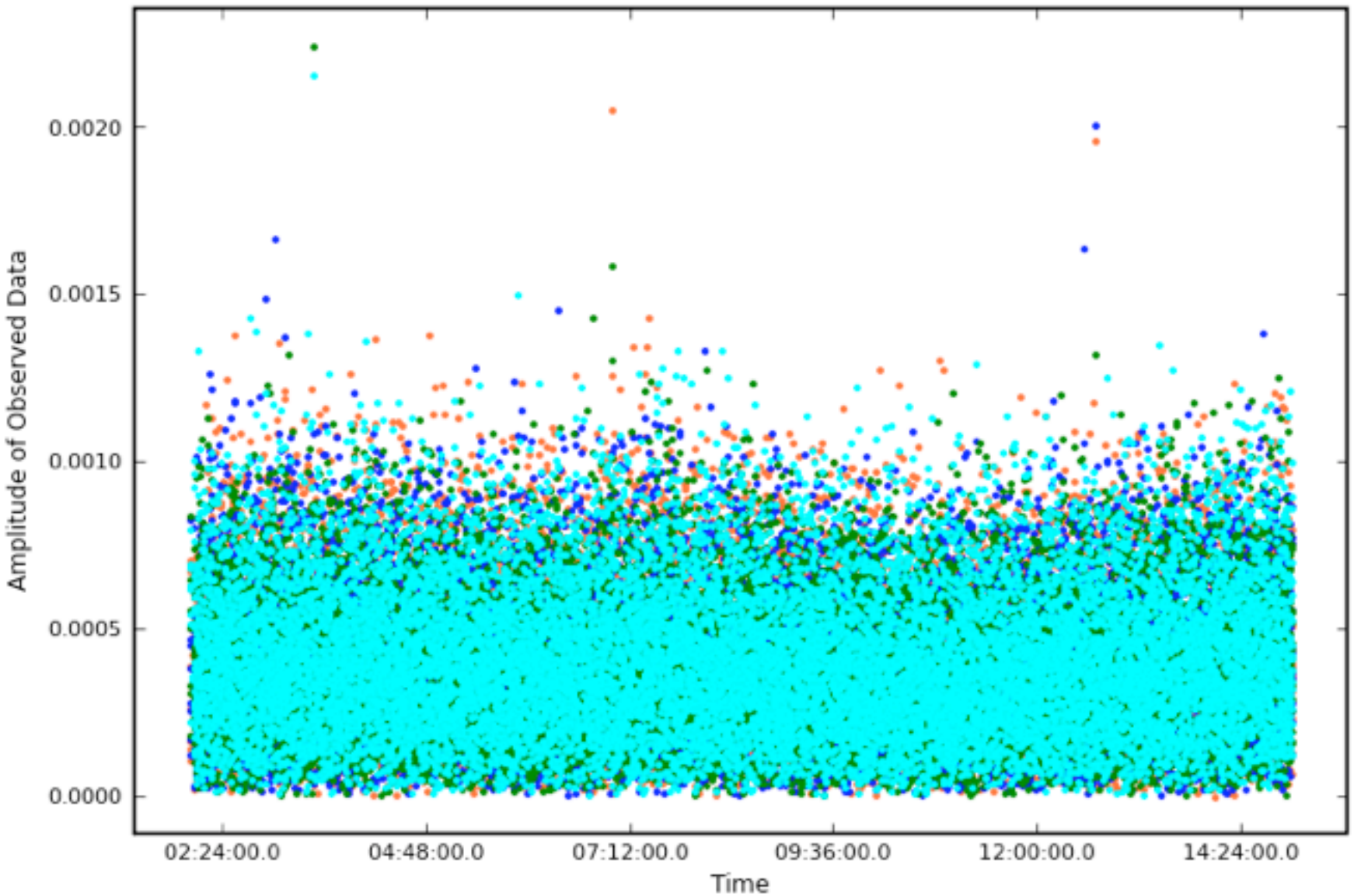


The raw data...



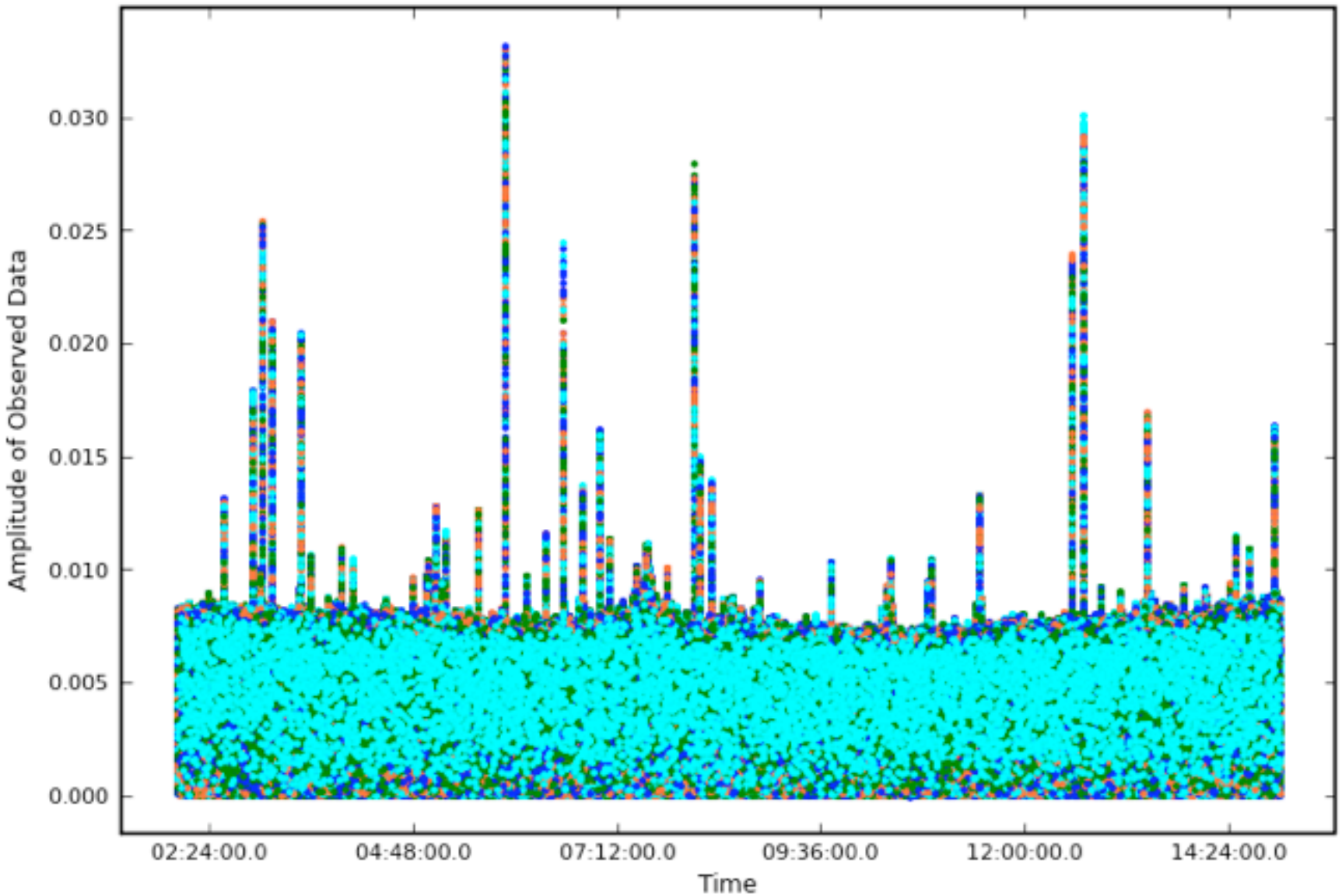
(by Chiara Ferrari, Emanuela Orru, Roberto Pizzo)

After flagging and compression



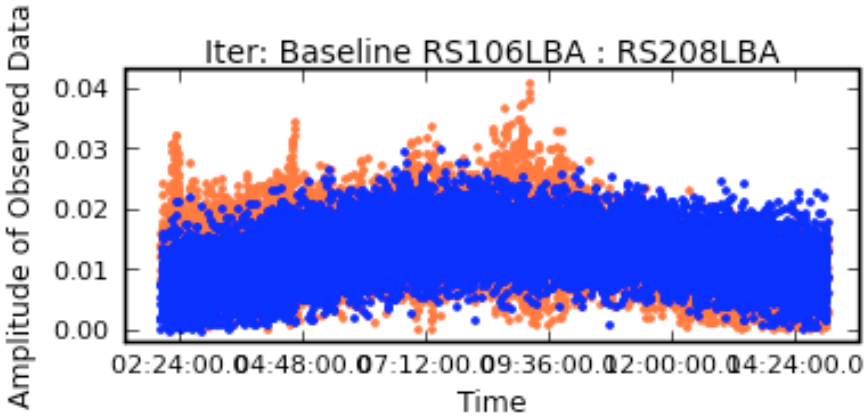
(by Chiara Ferrari, Emanuela Orru, Roberto Pizzo)

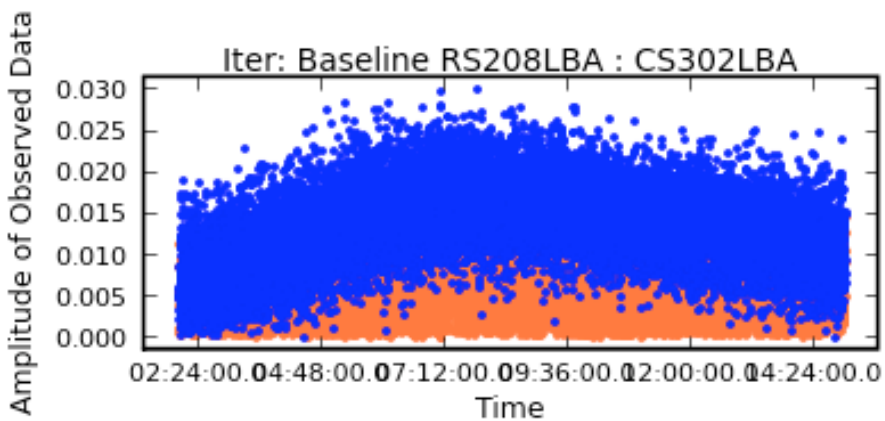
But what if you don't compress...

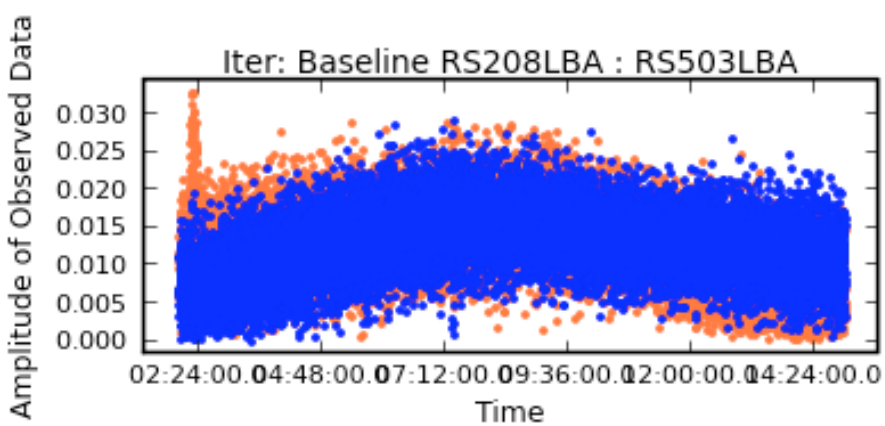


(by Chiara Ferrari, Emanuela Orru, Roberto Pizzo)

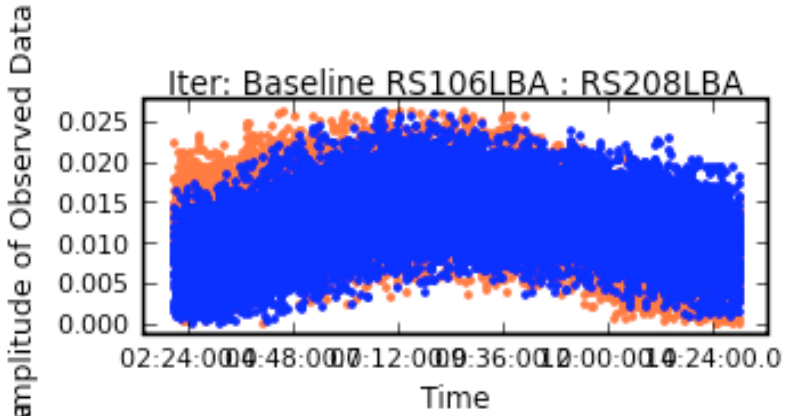
CmfMadMadMad

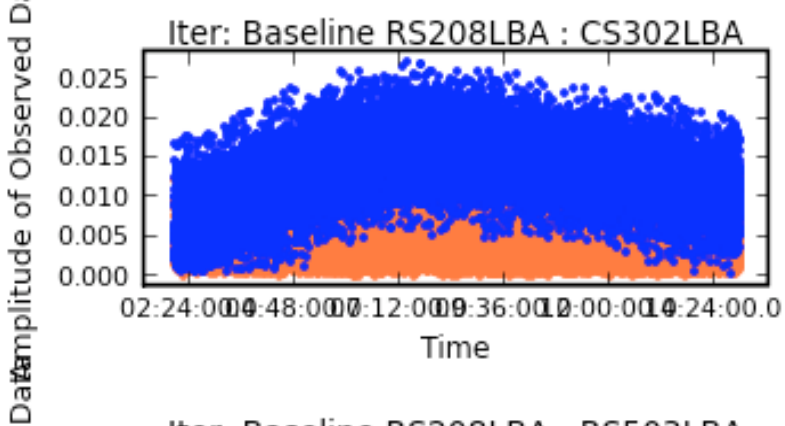


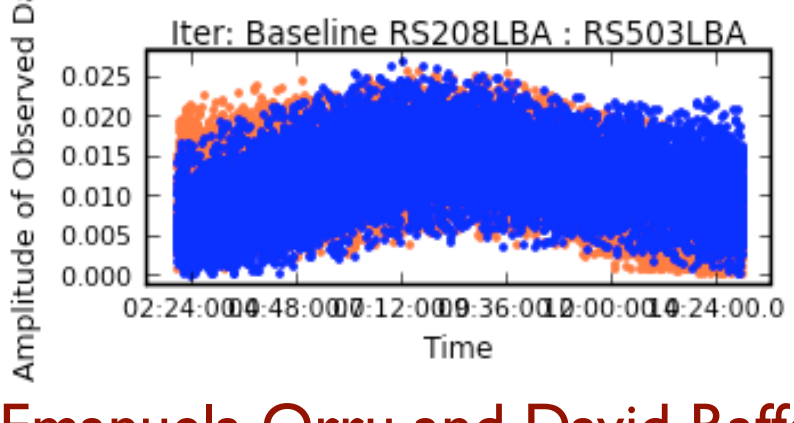




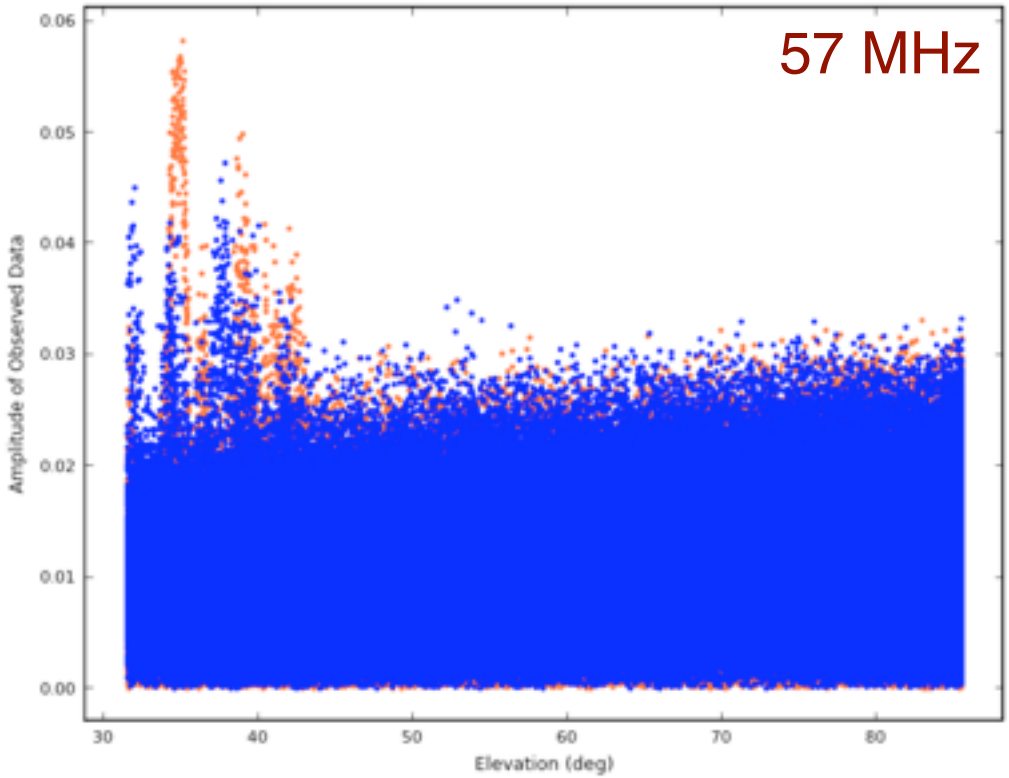
MadMadMadMad

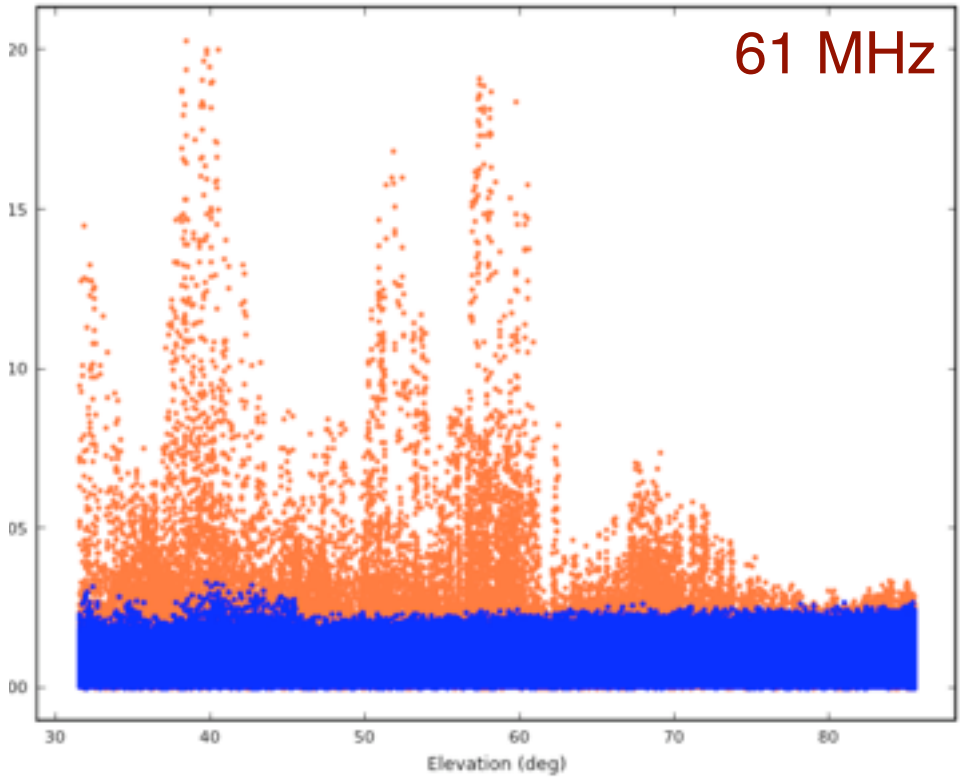


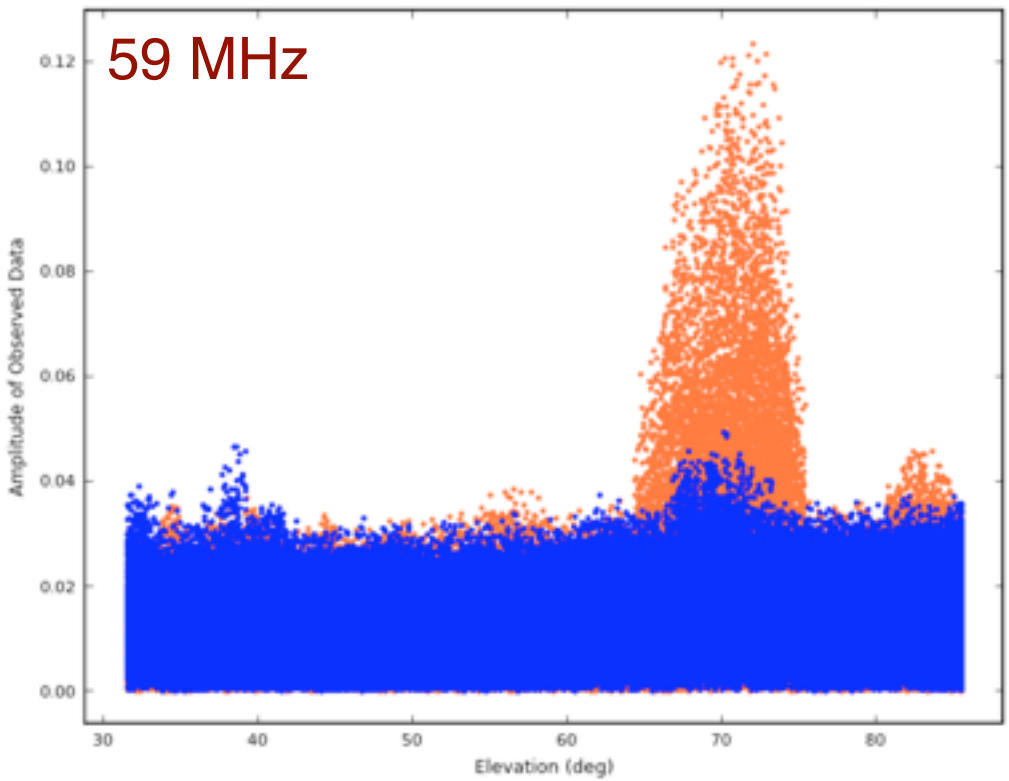




(by Emanuela Orru and David Rafferty)

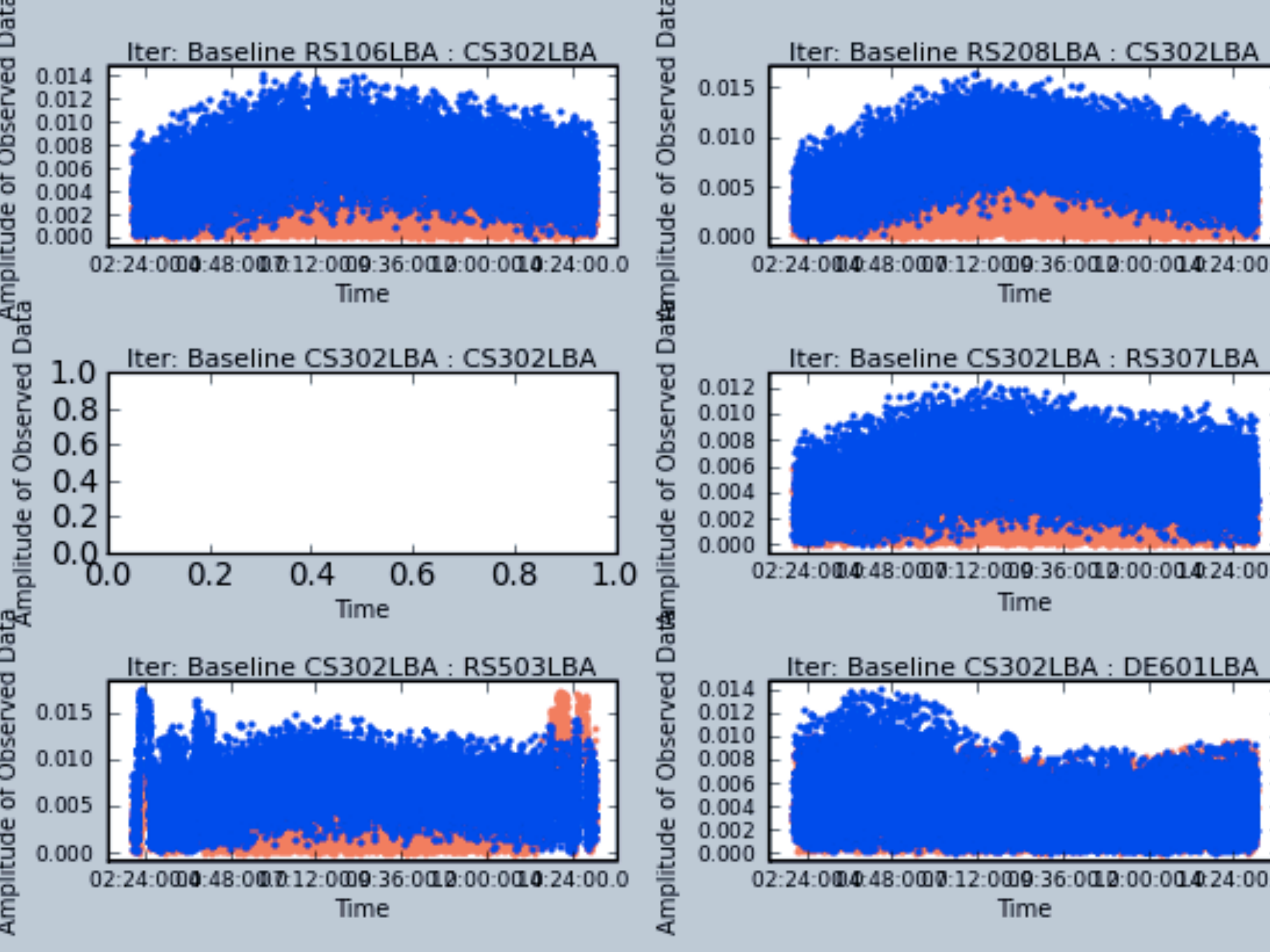


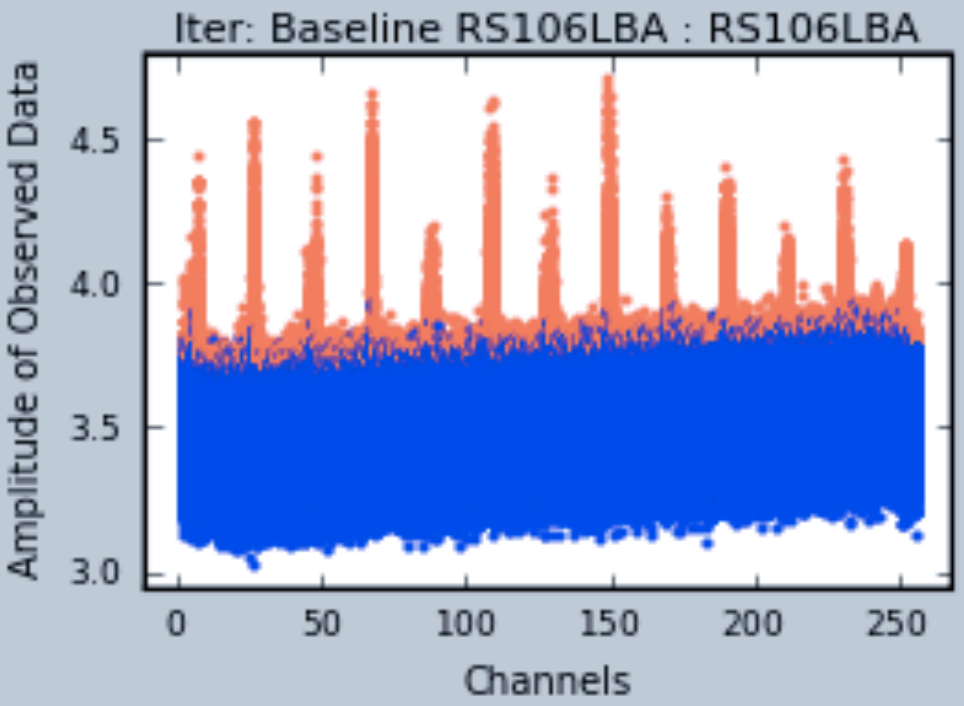


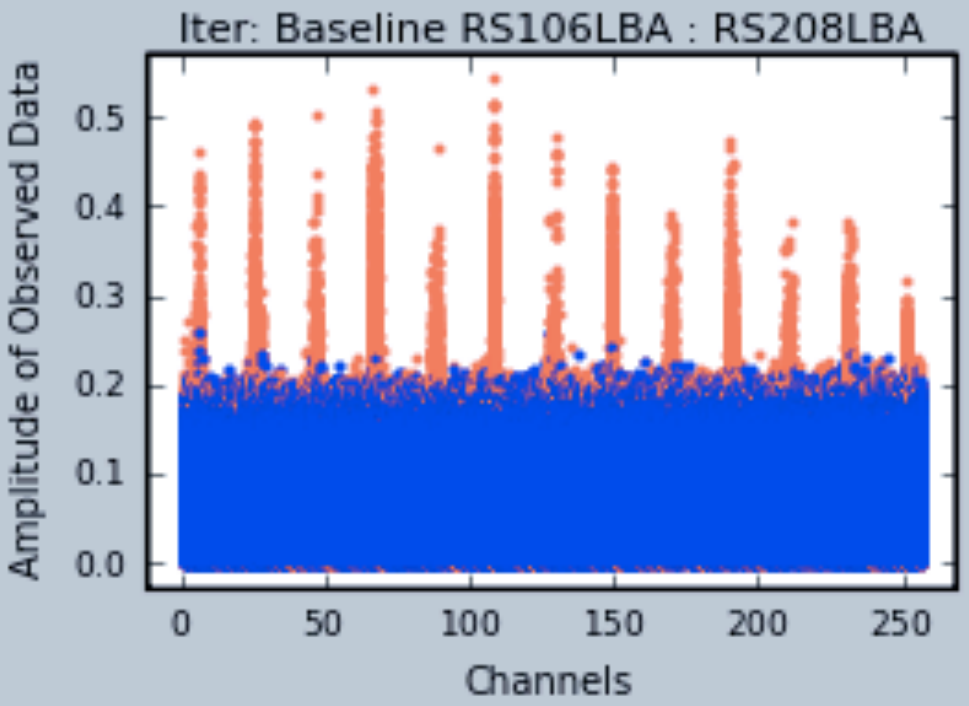


All 120 sub bands processed using Mad x 4 in 80 minutes.

Currently testing a new flagger (Offringa).

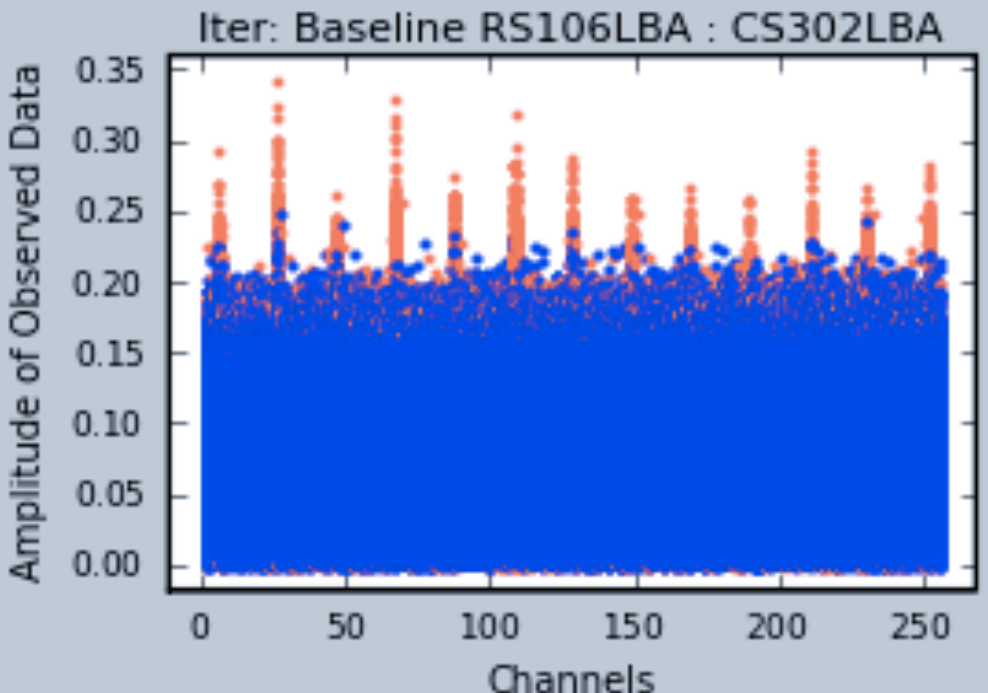

Iter: Baseline RS106LBA : CS302LBA
Iter: Baseline RS208LBA : CS302LBA
Iter: Baseline CS302LBA : CS302LBA
Iter: Baseline CS302LBA : RS307LBA
Iter: Baseline CS302LBA : RS503LBA
Iter: Baseline CS302LBA : DE601LBA
Amplitude of Observed Data
Time

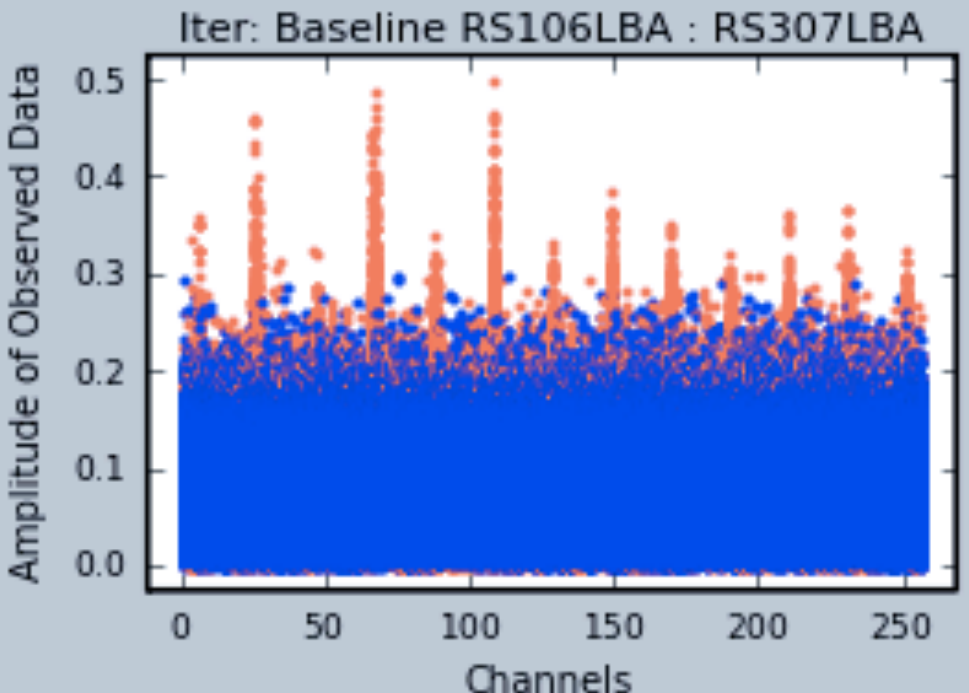




A frequency dependent ‘comb’ RFI?

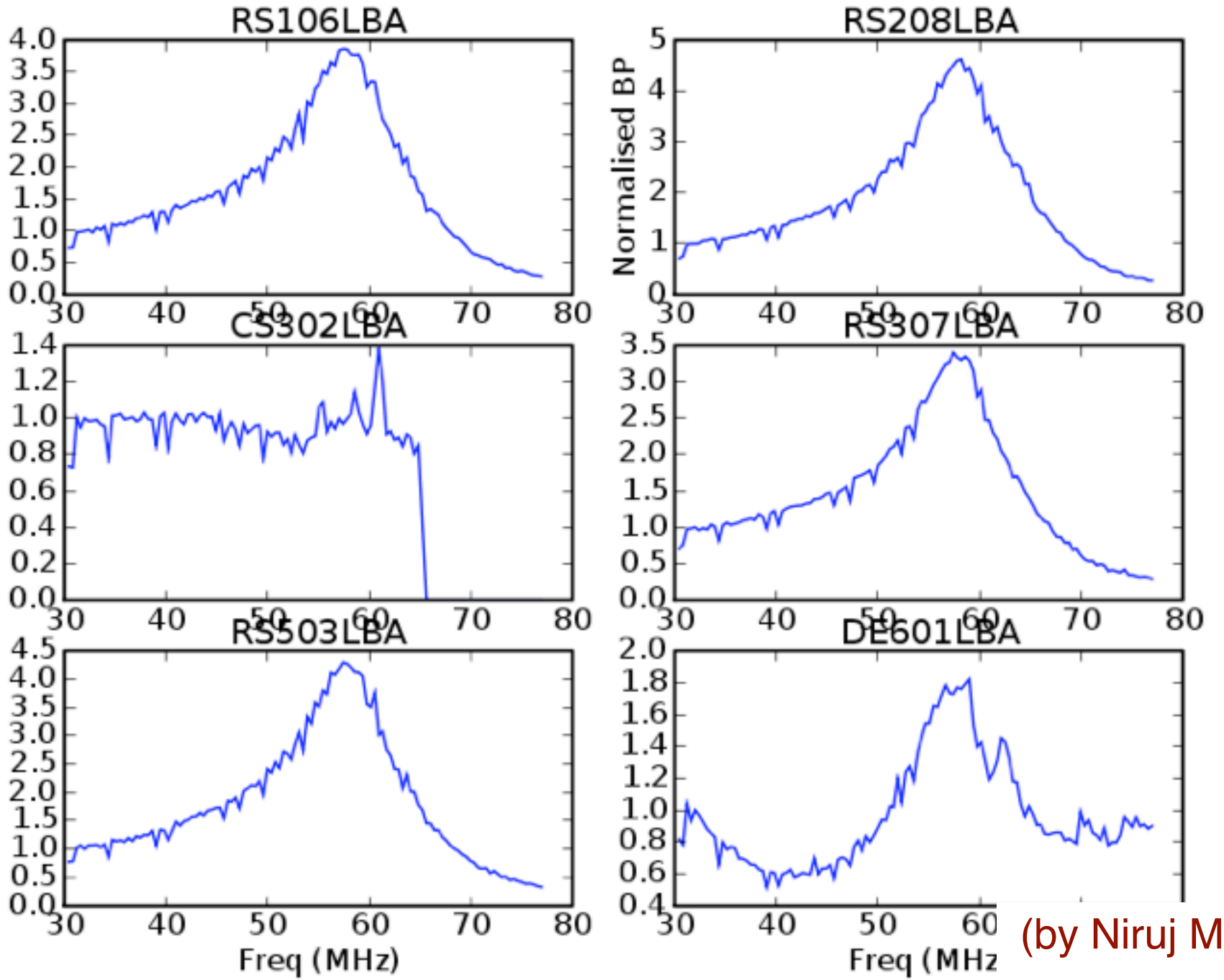
Not all sub-bands effected!





The bandpass (including the effect of the station beam)

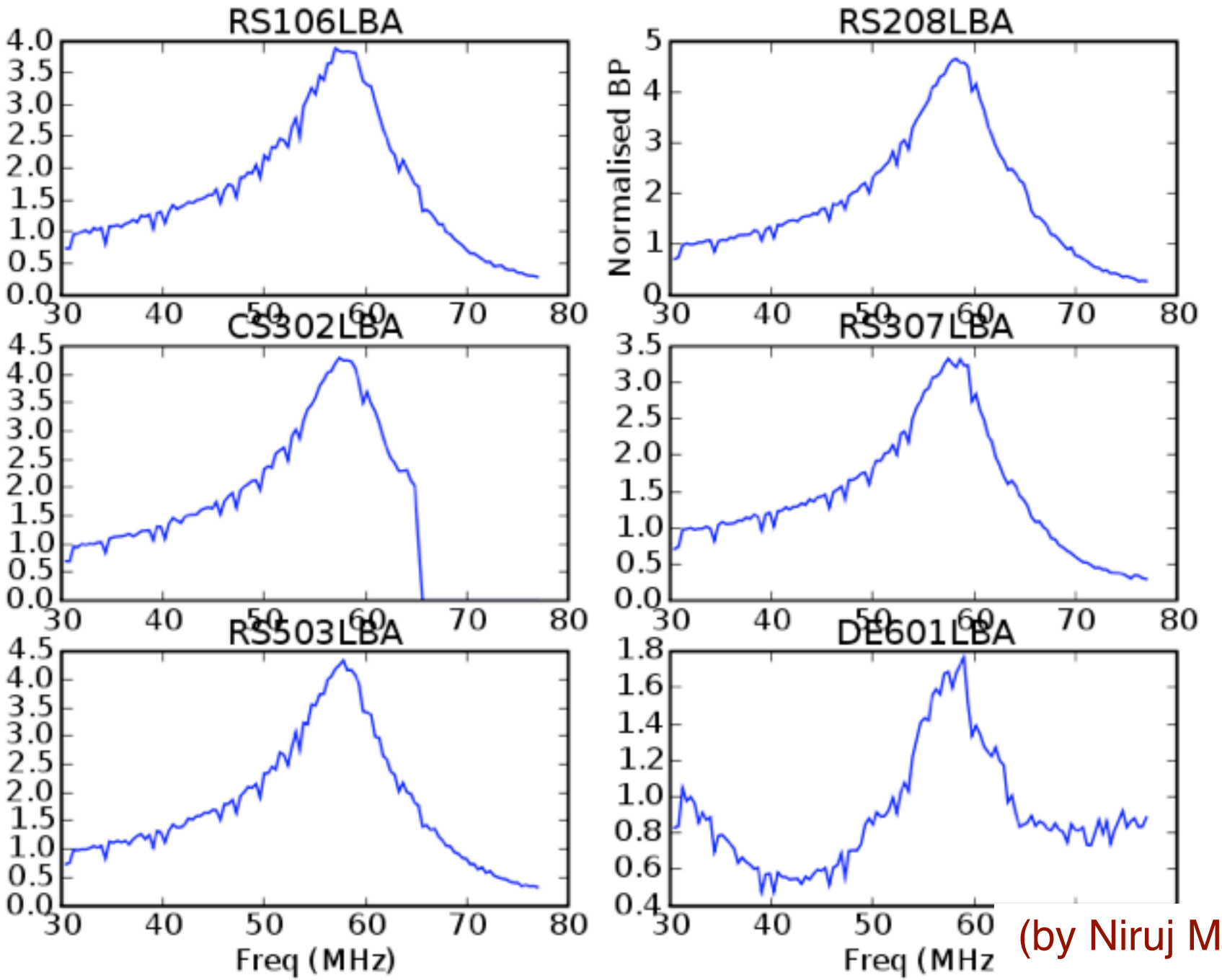
XX



(by Niruj Mohan)

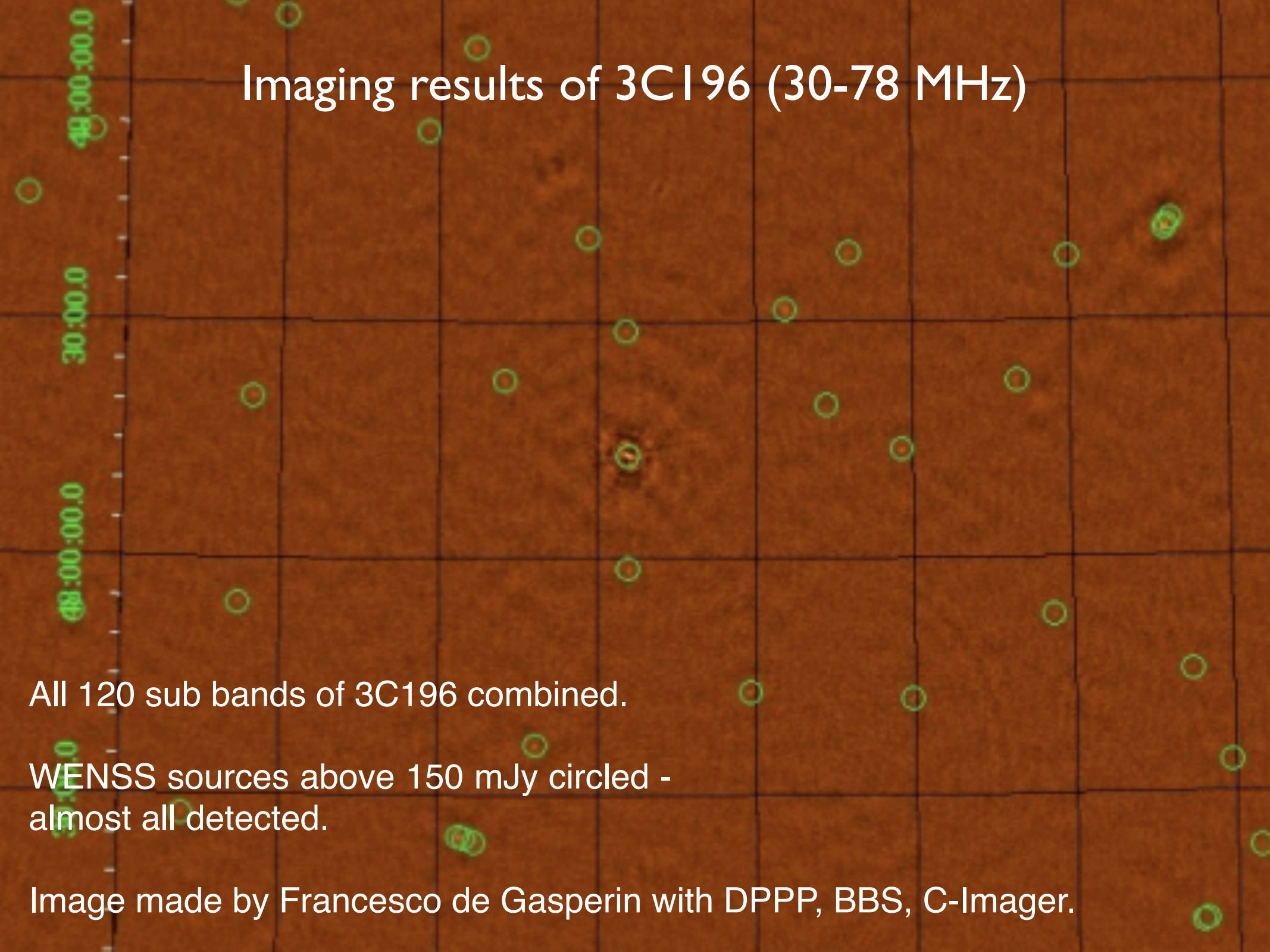
The bandpass (including the effect of the station beam)

YY



(by Niruj Mohan)

Imaging results of 3C196 (30-78 MHz)



All 120 sub bands of 3C196 combined.

WENSS sources above 150 mJy circled -
almost all detected.

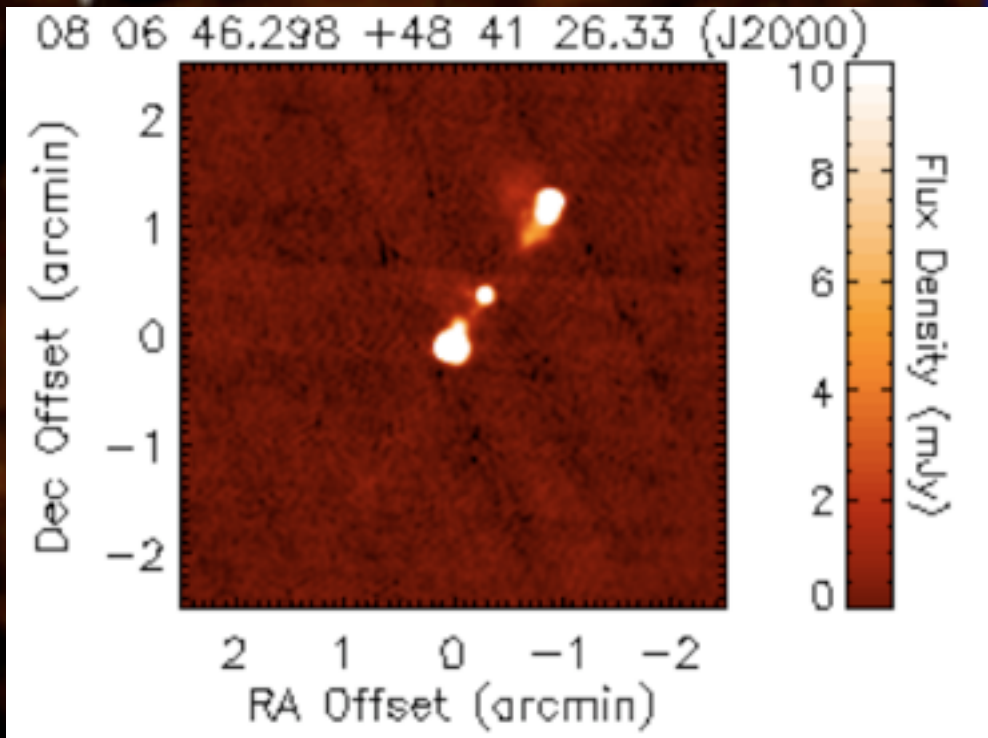
Image made by Francesco de Gasperin with DPPP, BBS, C-Imager.

Detecting extended structure

121.900 121.800 121.700 121.600 121.500 121.400

48.750 48.700

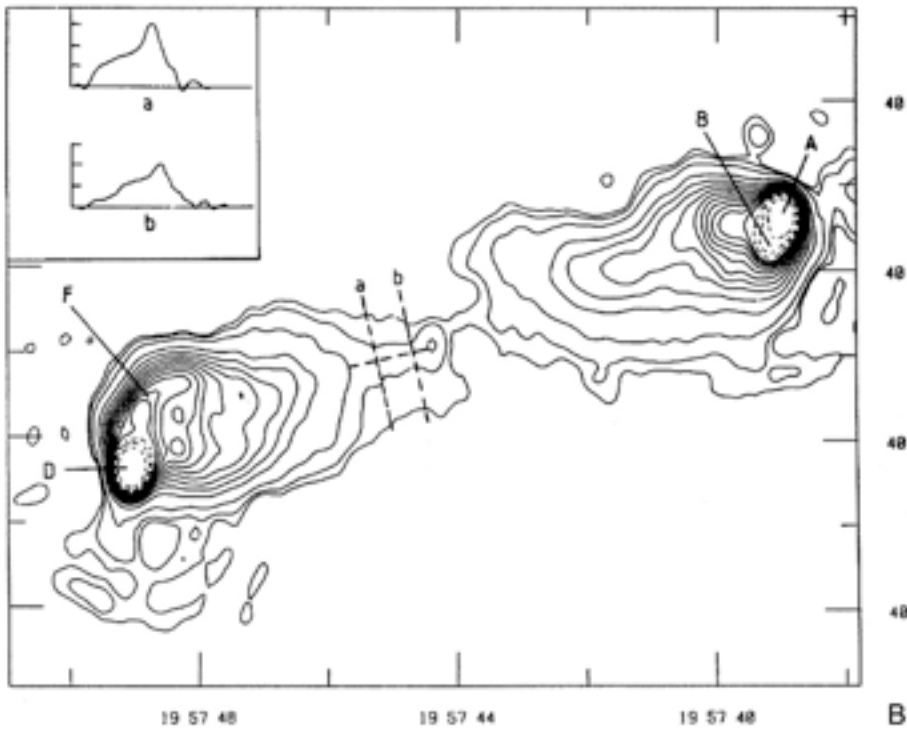
FIRST map =>



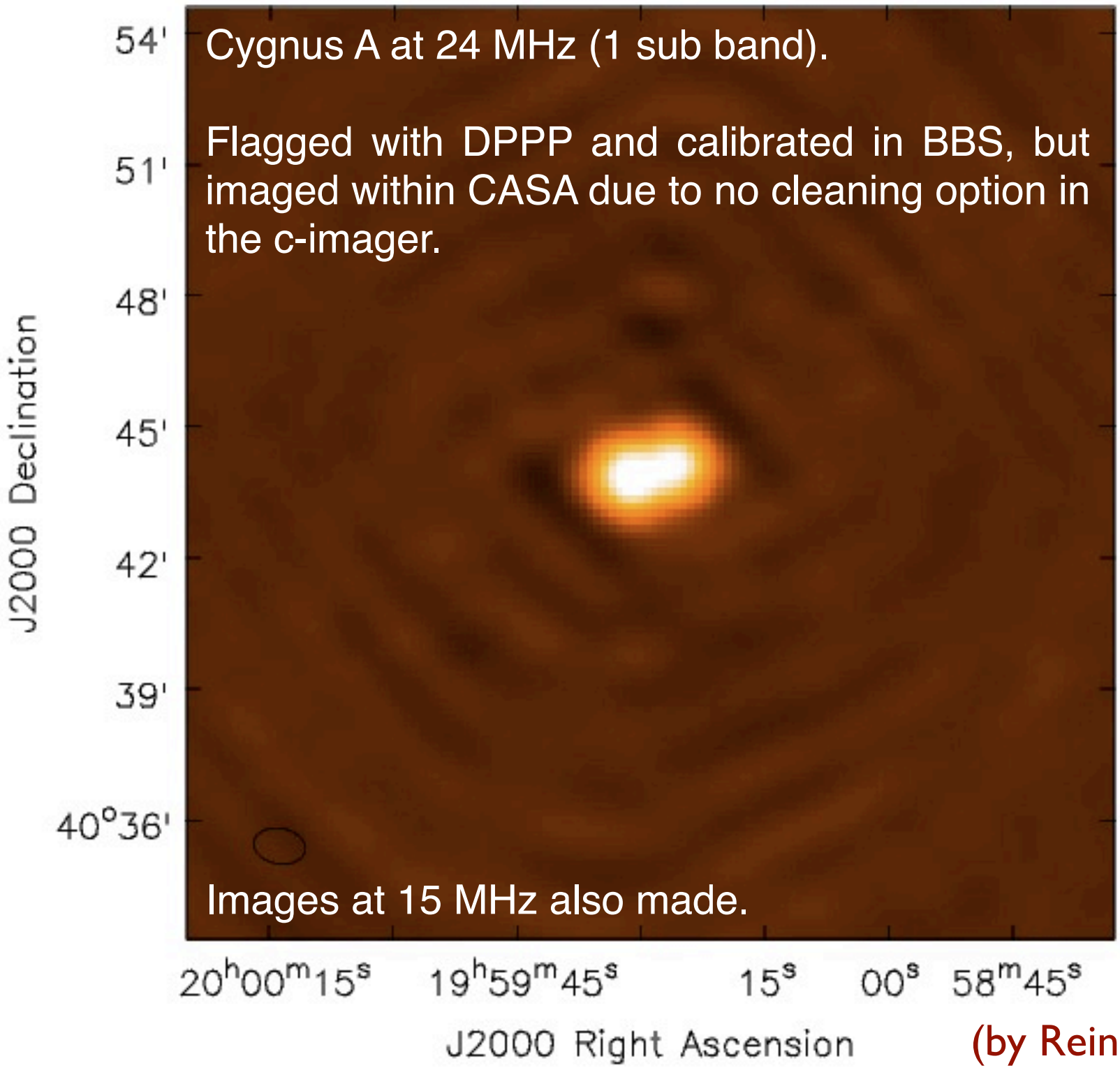
The other dataset

Cygnus A (~22000 Jy at 15 MHz)

48 hour observation of Cygnus A (day and night)
10--35 MHz
5 Dutch stations and Effelsberg
24 MHz bandwidth (continuous)
120 subands (256 channels)
1 second visibility integrations
3.5 Tb size!!



Want to find the best sub-bands (rfi free) for the survey.



(by Reinout van Weeren)

Summary

This is just some of the results from the imaging busy weeks.

Flagging - Multiple runs with the flaggers were tested.
4 runs with Madflagger seemed to work best.
Still some RFI at low elevations on the short baselines.
Some sub-bands showed RFI peaks in regular freq. intervals.

Calibration - Need more baselines to test BBS further.
The bandpass at 30-78 MHz was found (w/ beam).

Imaging - "Reliable" images of all sub-bands are now routinely made.
We are detecting extended structure with LOFAR!

Pipeline - Continues to be tested, but looks good.
Stable and usable with the new processing cluster.

Low frequencies - Looks feasible, but more details to follow.

and one more thing...

We have a cookbook for reducing LOFAR data in DPPP, BBS and the imager (by Tim Garn and Louise Ker).

http://usg.lofar.org/forum/index.php?topic=159.0

The 3 imaging busy weeks have trained 23 new LOFAR commissioners.