EoR KSP project LC0_019

Observations on NCP and 3C196

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LSM 9 Jan 2013

LC0_019 Cycle 0 observing plan

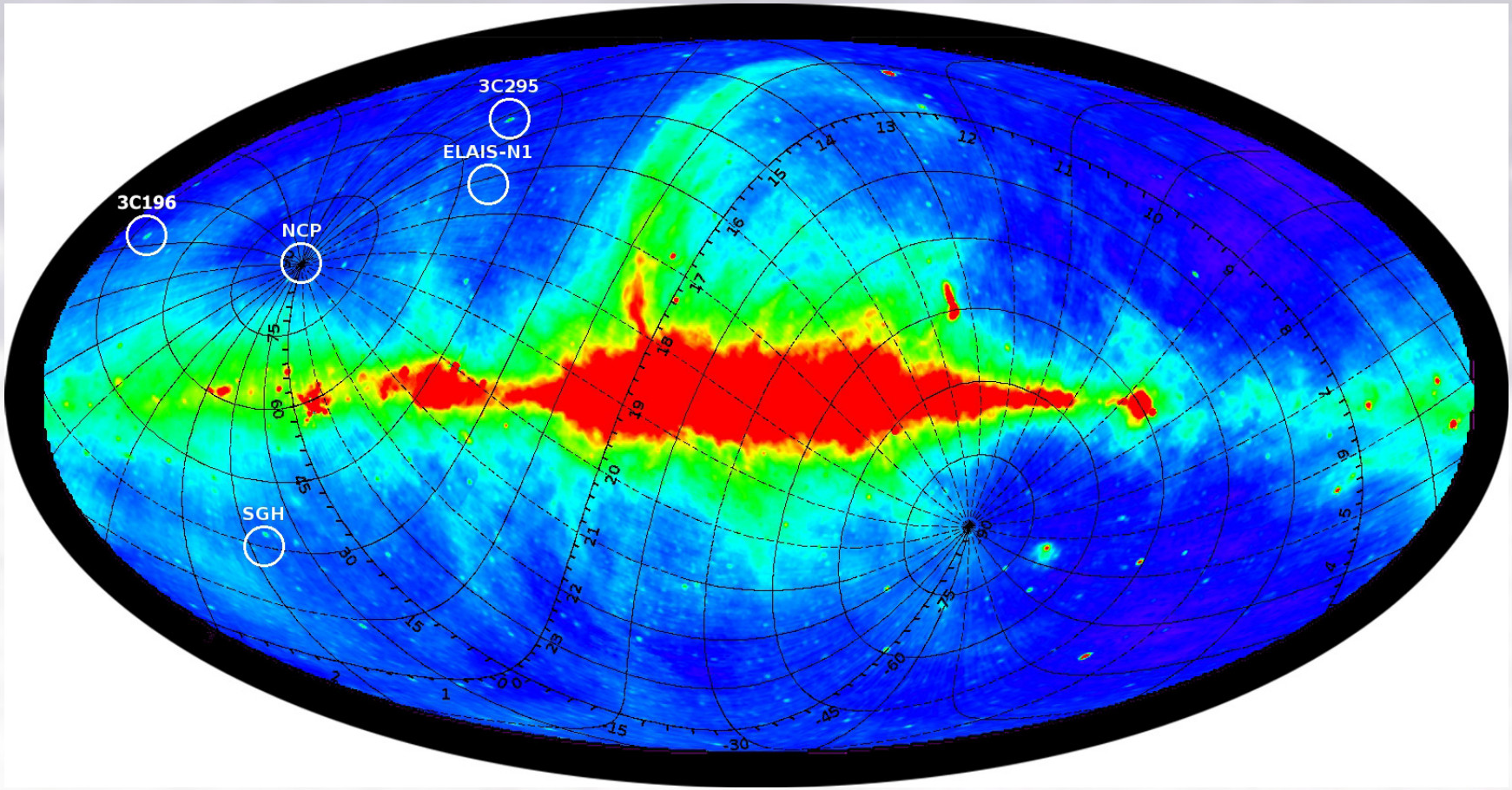
NCP ~ 300h ~ 20x 12-16h synthes es (HBA)
3C 196 ~ 200h ~ 30x 6-8 h syntheses (HBA)

Instrumental specs:
- 64ch/subband
- 2s integration
- (23-24)x2 = 46-48 core stations
- 11-13 remote stations
- 8-bit mode

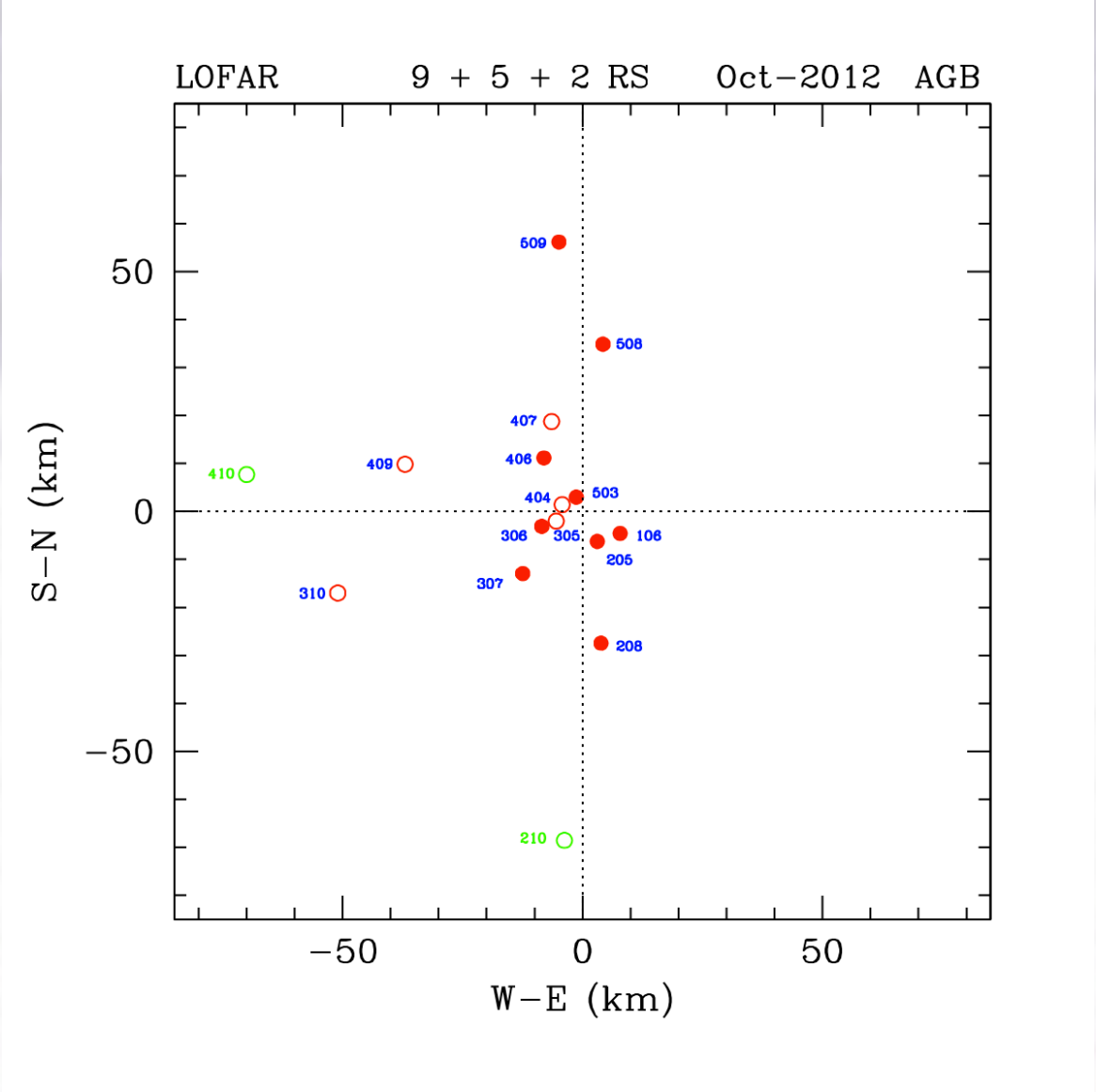
115-189 MHz (380 subbands) target field
(20 subbands) 6 flanking fields (hexagon)

40 – 90 TB raw datasets (depending on duration)

The 5 EoR KSP windows



Locations of 16 Remote Stations

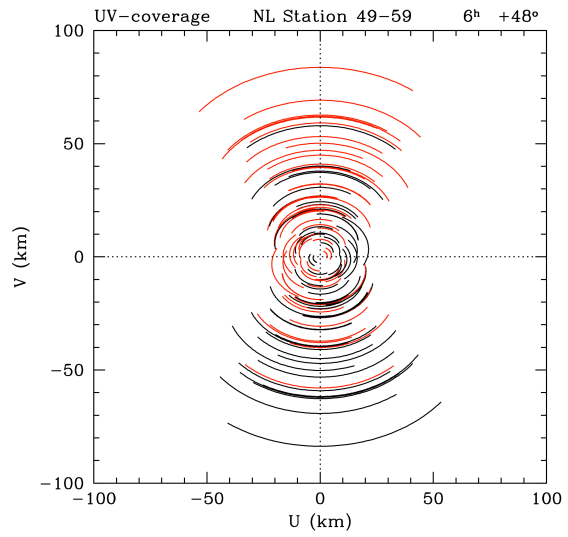


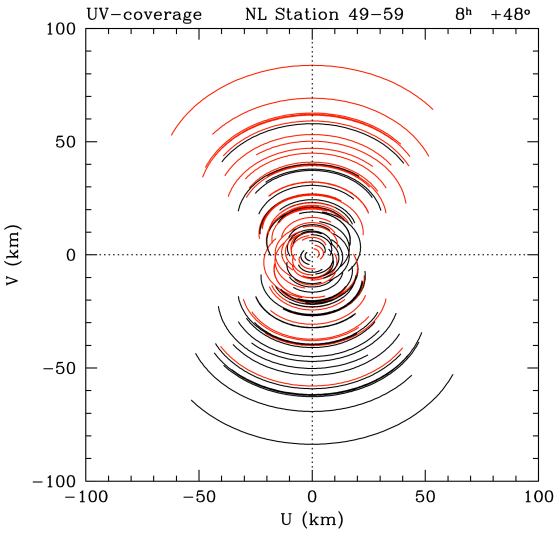
Latest additions

RS305 Nov 2012
RS407 Dec 1
RS409 Dec 21
RS310 Dec 21

Now 13 RS, but not all well calibrated..

3C196: 11 or 13 Remote Stations 6h vs 8h synthesis

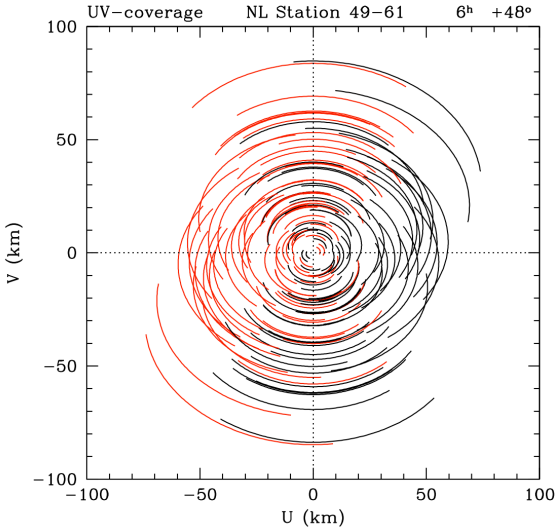


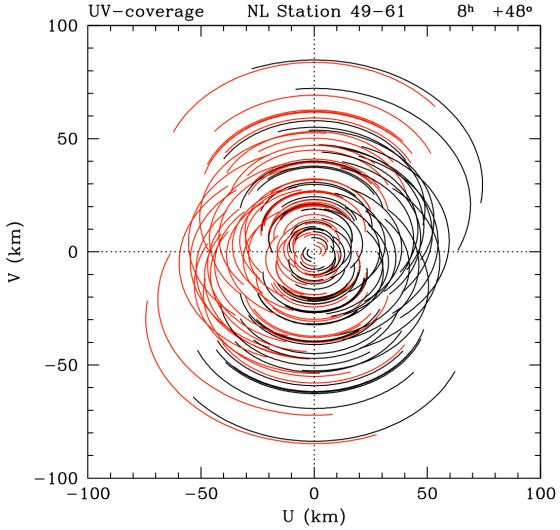


6h

← 11 # RS → 13

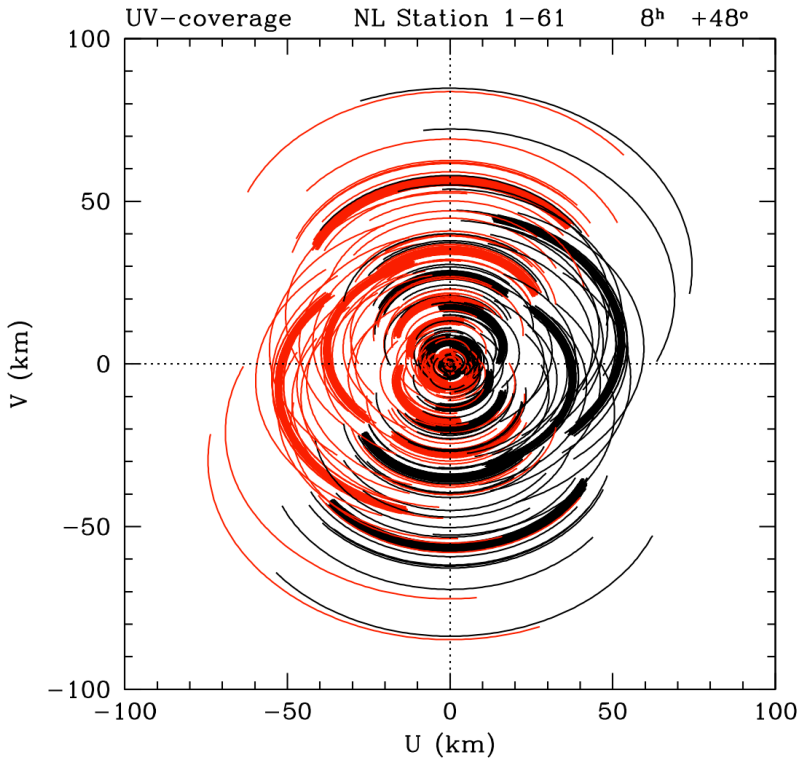
8h



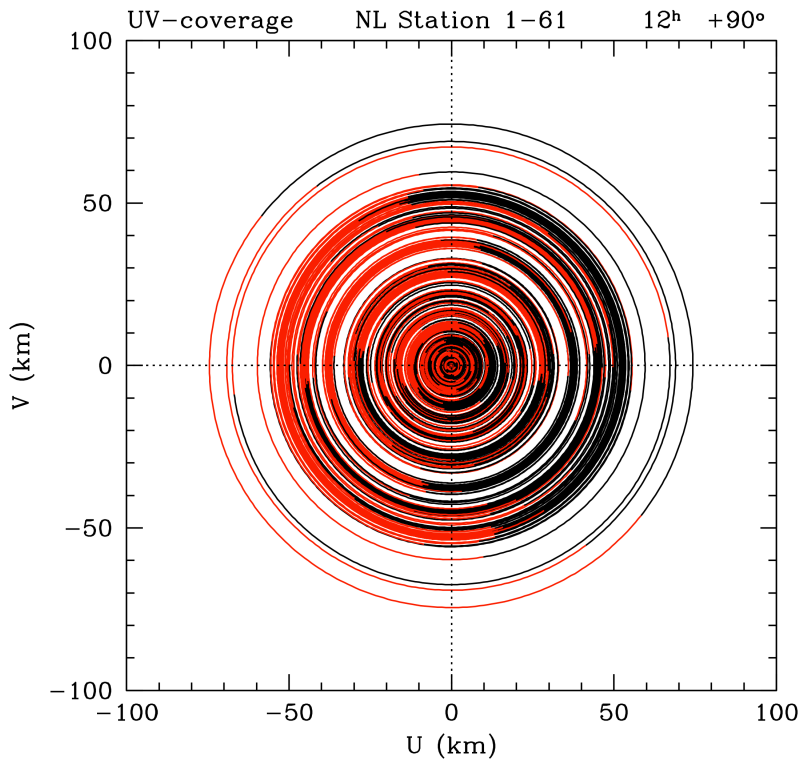


Comparison uv-coverage 3C196 and NCP

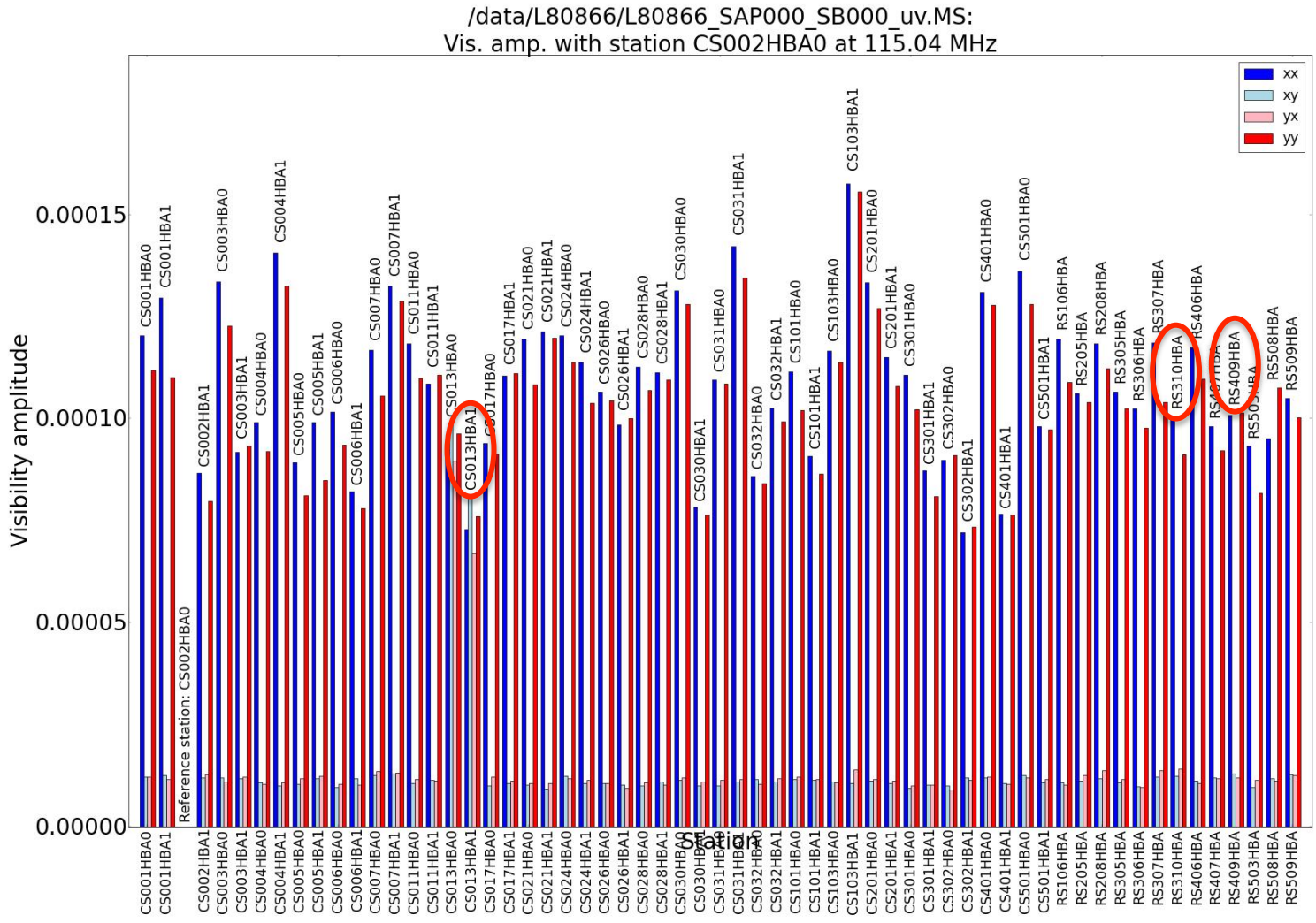
3C196 8h



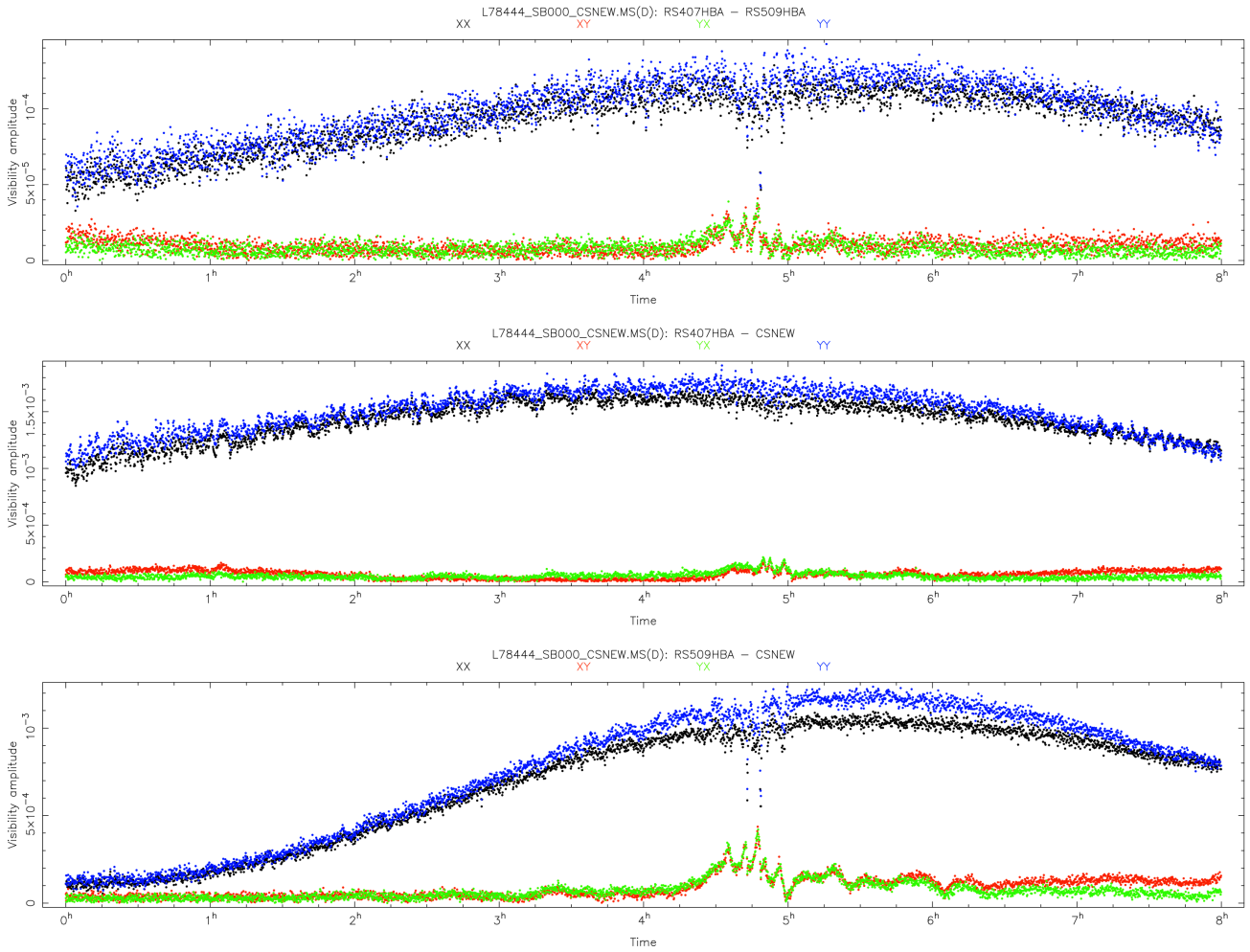
NCP 12h



3C48 (calibrator for NCP) L80866 7/8 Jan 2013



LC0_019 1st observation (L78444) 3C196 8h



RS407

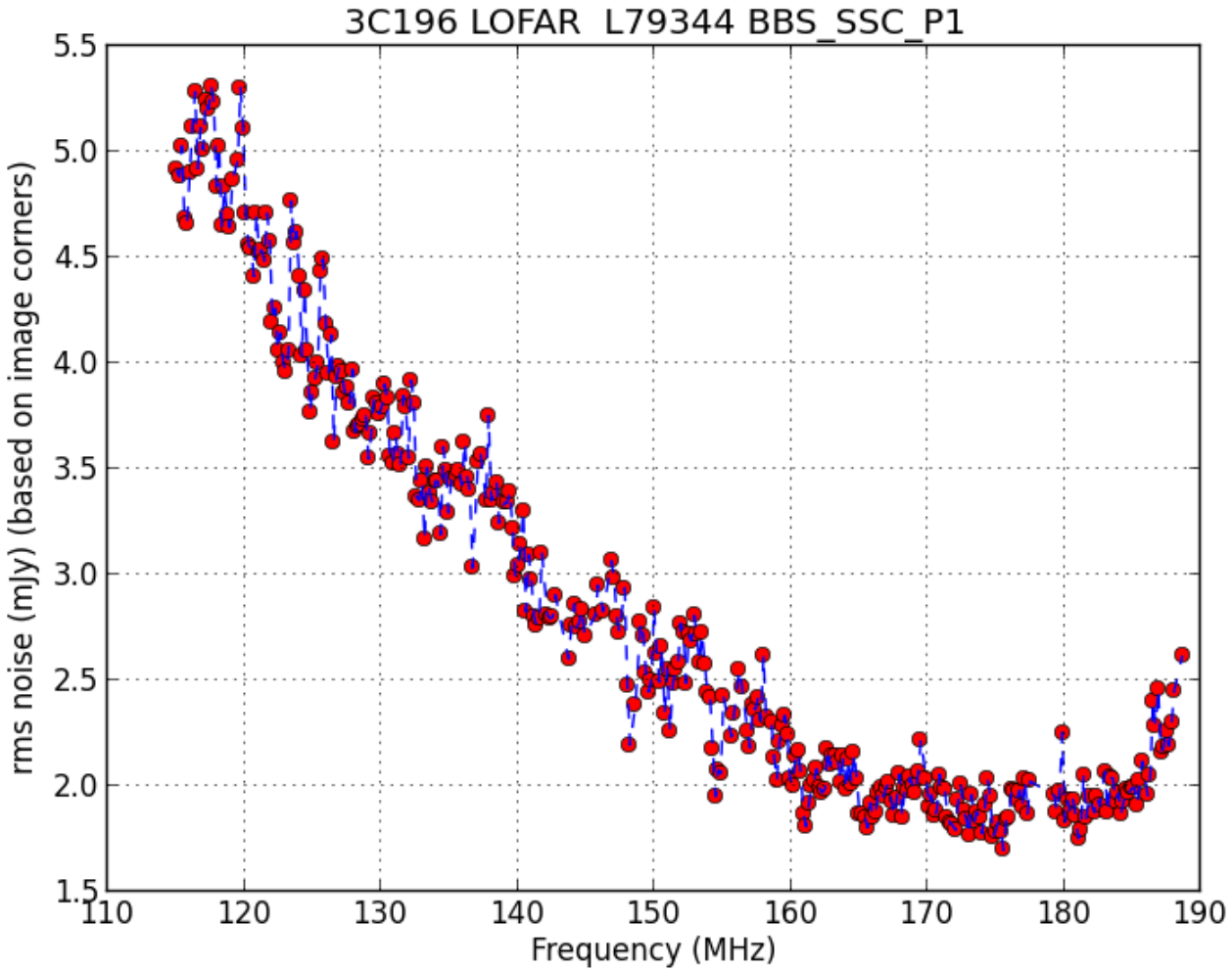
RS509

Added ST

Decorrelation in 10s data

rms noise per subband - frequency

Pandey



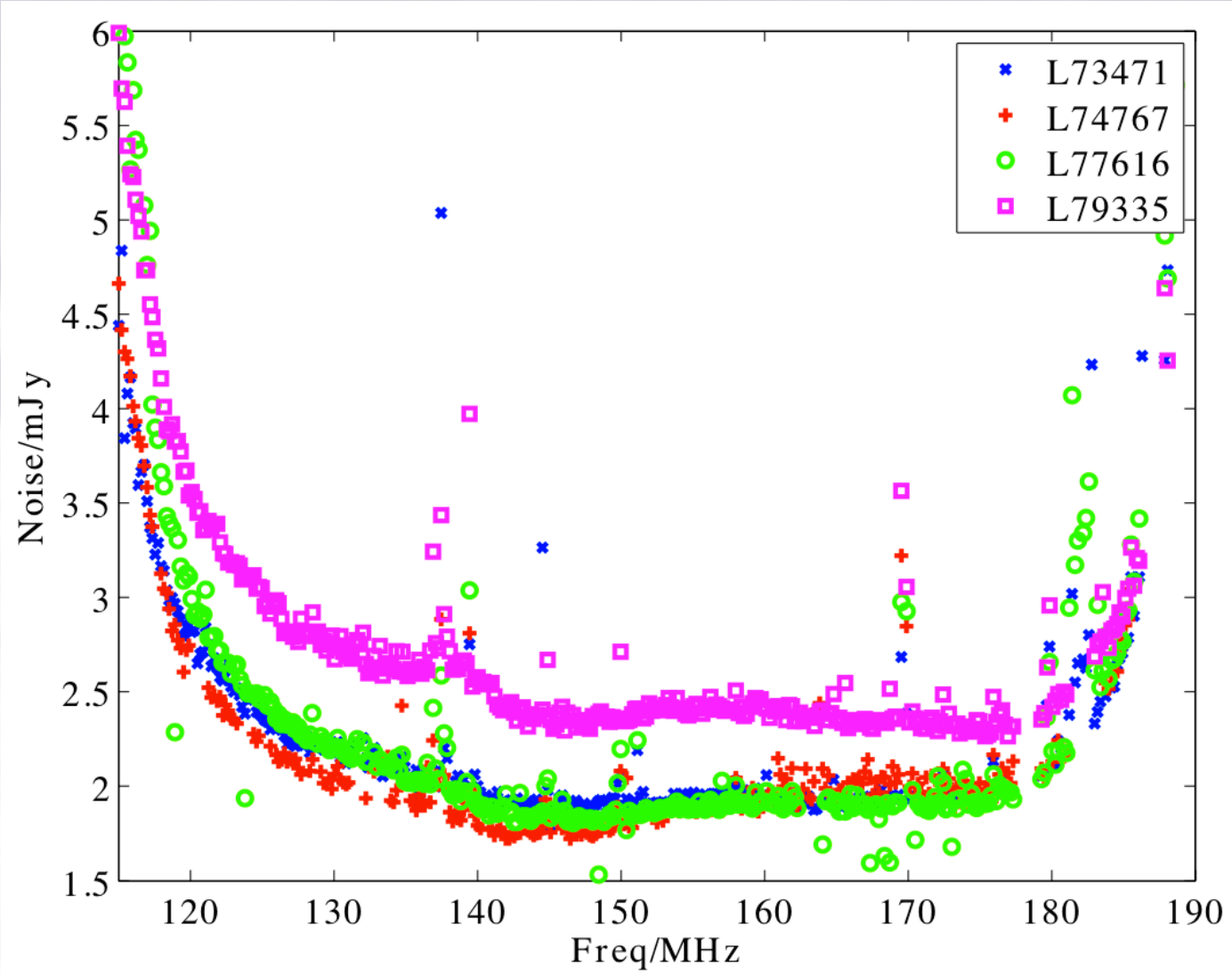
3C196

1 Dec 2012

BBS only (solve, subtract, correct)

rms noise per subband - frequency

Yatawatta



NCP

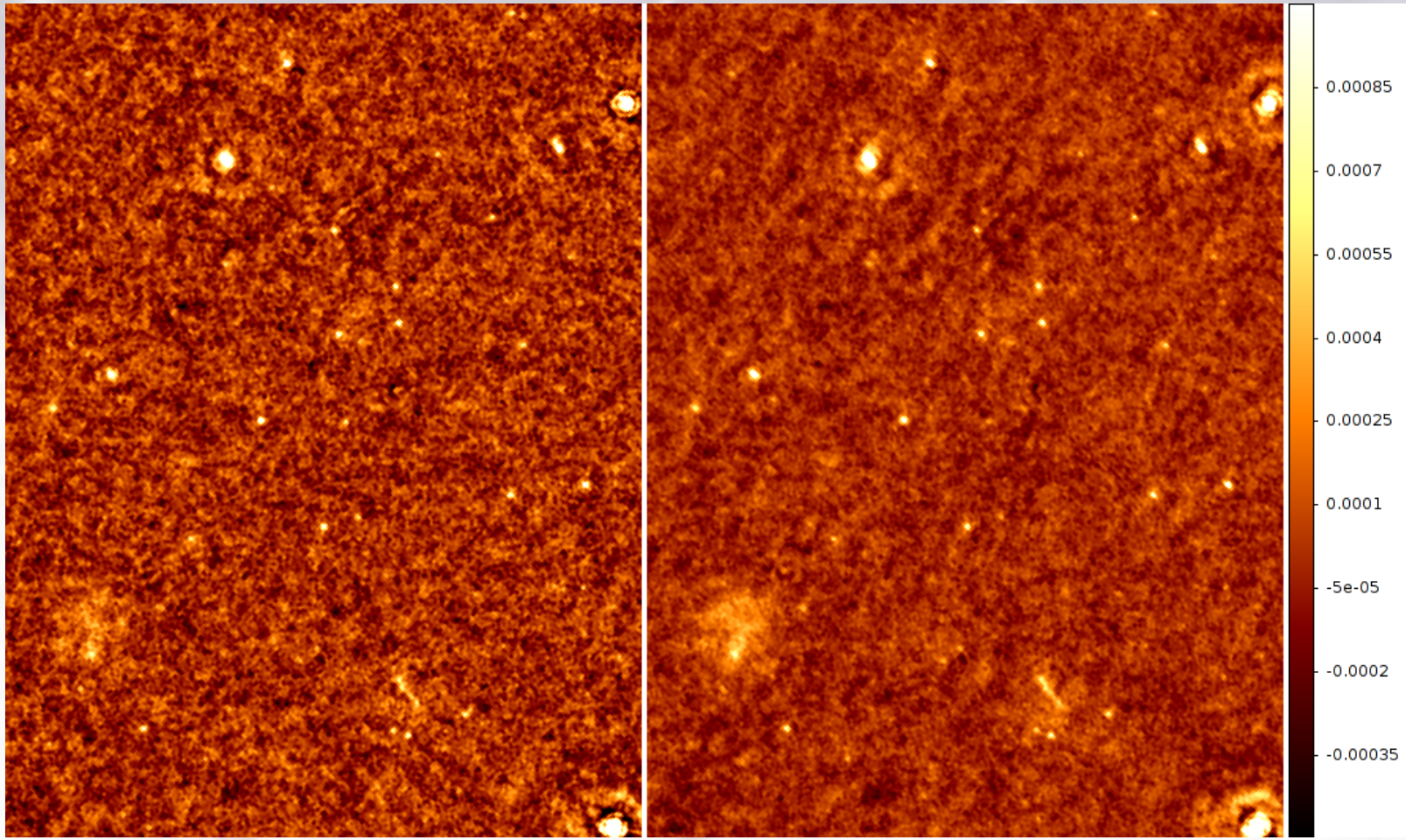
Nov/Dec 2012

3x12h
1x6.5h

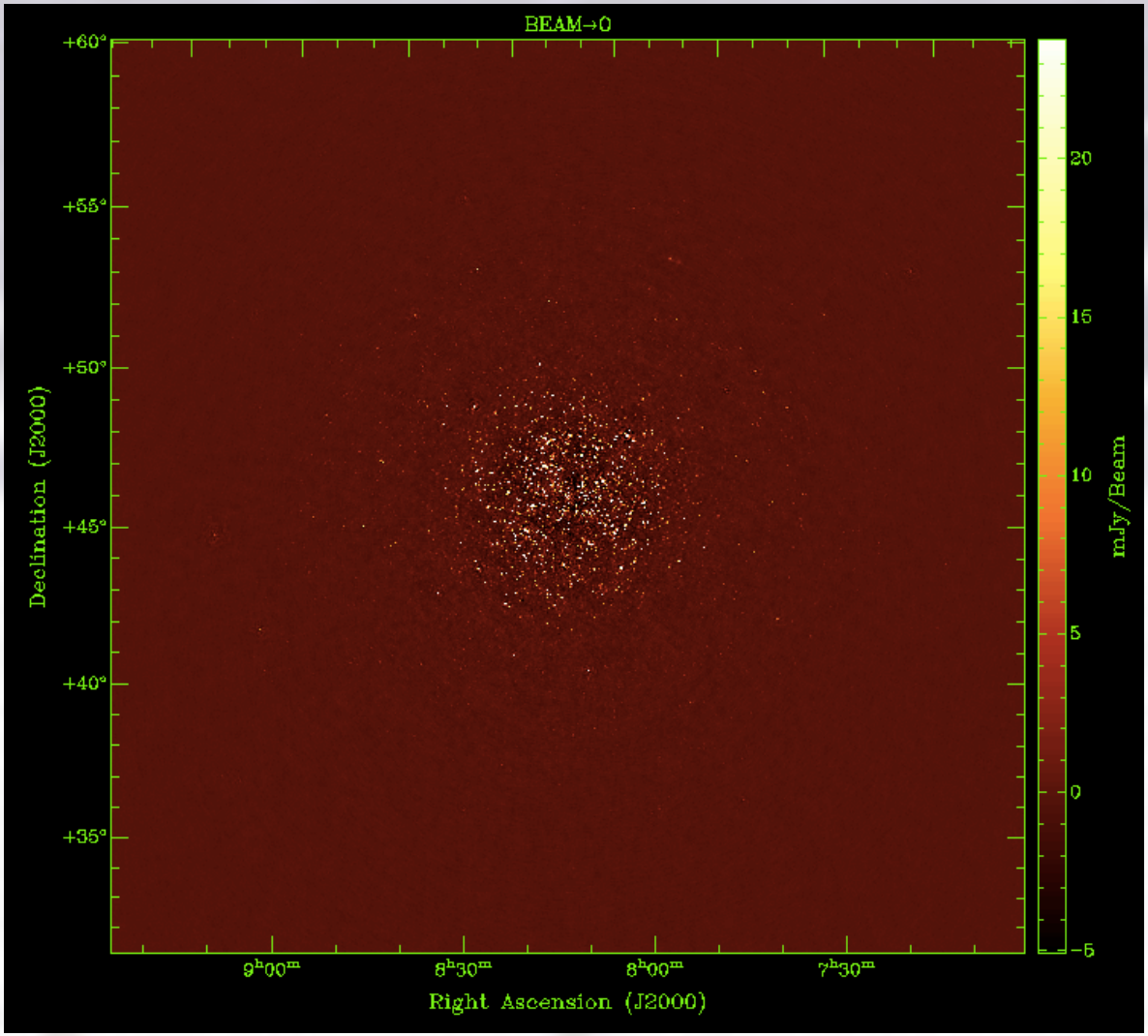
AfterBBS+
Sagecal

Improved images of (a very small part of) the NCP

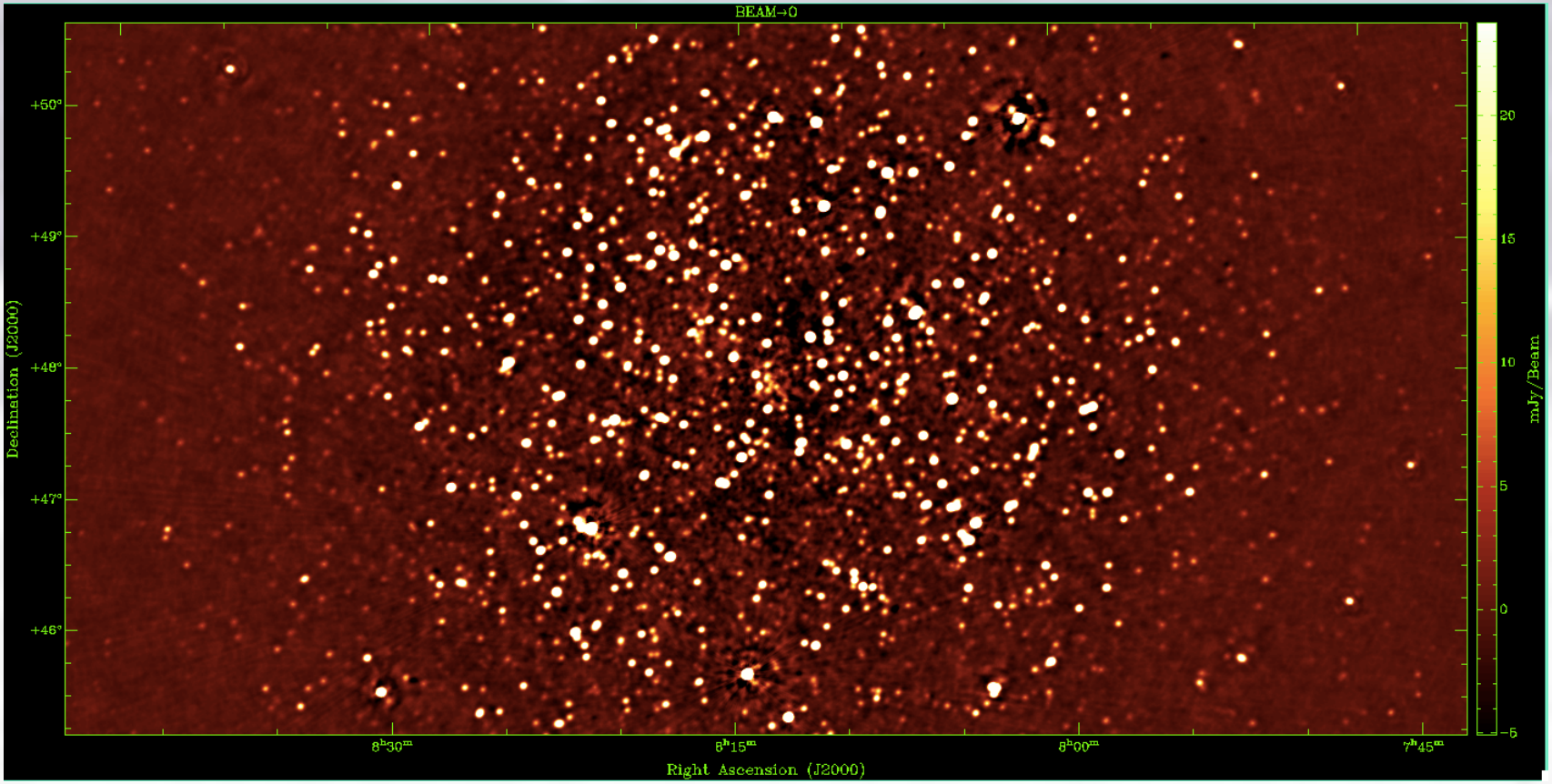
(12h) 110 µJy (42h) 65 µJy



3C196 core resolution 30x30 deg



3C196 core resolution L79344



Current observing summary

LC0_019 Observing log **blue → on EoR cluster,** **red → bad data**

	3C196	#h	C/i	NCP	#h	C/I	Comments
30/1 Dec	78444	7	C/I				**# Start Cycle0 on Fri/Sat**
1/2							
2/3							
3/4							
4/5							
5/6	78853	8		79335	6.5		L78853: many bad stats. NOT TX
6/7	79324	8	C				
7/8				79329	15		
8/9				79341	15		
9/10	79344	8	C/I				
10/11							
11/12							
12/13	80273	8					
13/14				80475	16		
14/15							
15/16							
16/17	80508	8					
17/18				80853	16		X,Y swaps 501,306 !? NOT TX!
18/19							
19/20	80898	8					with CS013,RS310,RS409 !
20/21							
21/22	80897	8	C/I				
22/23							
23/24							
24/25				80850	16		
25/26							
26/27							
27/28							
28/29	80895	8					
29/30	82609	8					no RS310
30/31							
31/1 Jan				80847	16		
1/2	82655	8					no RS310
2/3							
3/4							
4/5							
5/6	80893	8					
6/7							
7/8				80865	15		good RS310 !

Data products and formats

- Measurement Sets: raw, 'residual'

  15ch-2s, (12kHz = 24 km/s velocity resolution at 150 MHz)
  3ch-2s
  1ch-10s

- Imagecubes: small, large:

  20x20 deg, 2" pixels, 6" PSF 36000 x 36000 x 488 (370) → ~ 1 TB total (Stokes I)
  restored, apparent flux → science analysis
  6x6 deg, 40" pixels, 3' PSF 512 x 512 x 488 (370) → ~ 1 GB (IQUV)

- Residual visibilities in 'stripped' format (gridded?)

  to use in ML inversion
  to use in Foreground Fitting
  to use in PS estimation

What is next ?

Improved station calibration

Long baseline data for all bright sources

Ionospheric screen modelling

Image cube averaging and differencing

Full polarization analysis

Limits of sagecal and direction dependent calibration

etc etc