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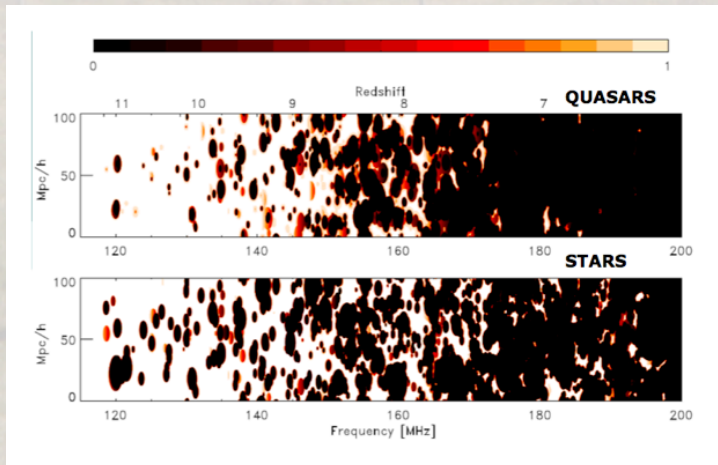
The LOFAR EoR Key Science Project: Experience with LC0/LC1 and wishes for the future

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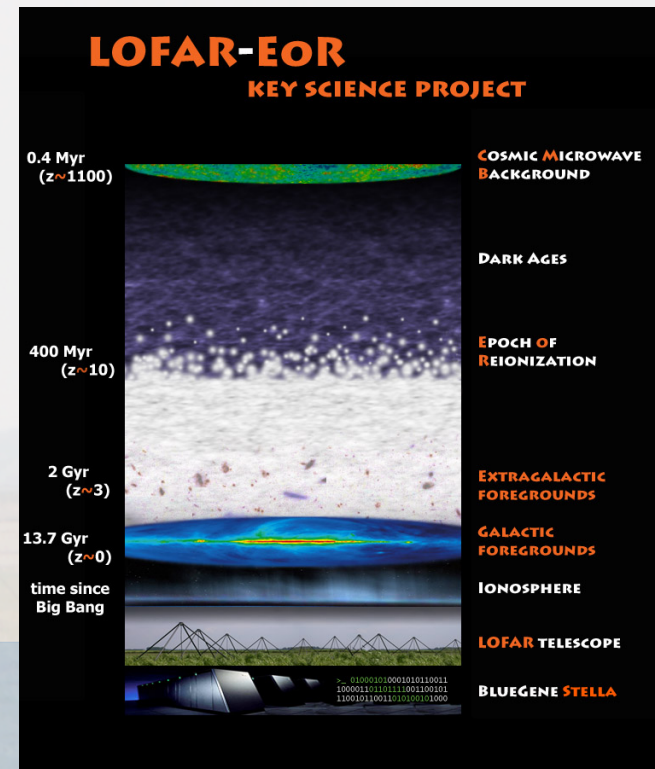
Main science goals of the LOFAR EoR project

- Statistical detection of global signal; z-evolution
- Measure underlying dark matter density spectrum
- Statistical characterization of ionization bubbles
- The environment of high z QSOs / SMBH
- Constrain the sources: stars, QSOs or ...
- Study 21cm forest to high z radio sources (if any)
- Cross correlation with other probes: CMB, Ly- α ,



Rajat Thomas (2009)

115 - 190 MHz
z = 11.4 - 6.4



Vibor Jelic (2010)

This will take 600 - 3000h
of LOFAR HBA observing

Experience with LOFAR (operations) (1)

- Scheduling & Observing: Projects LC0_019 (640h) and LC1_039 (500h)

Excellent communications with RO staff

Useful & fast feedback: email + on-line 'autoplots' (see next slide)

Long wait for observations with IS (→ high resolution models)

- Initial data processing (CEP1 and CEP2)

Not applicable to our projects (raw data went 'straight' to EoR cluster)

- Datatransfer, archiving & data access (by us and others)

Cycle 0: problems in startup phase (Jan-Feb 2013)

Cycle 1: major issues with LTA-Target (Nov2013 - Feb2014)

Experience with LOFAR (operations) (2)

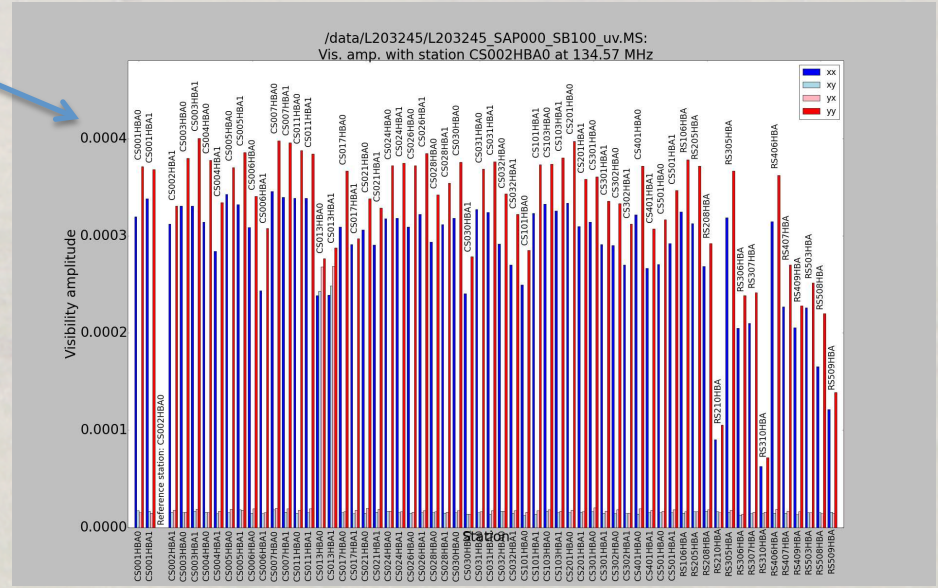
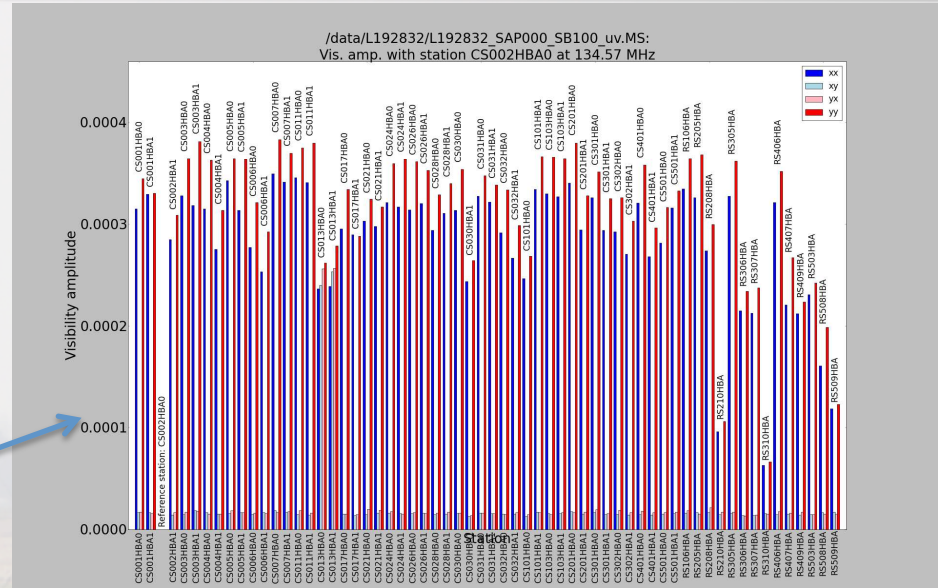
- Data quality

Very constant quality but not optimal (persistent large gain differences between stations)

e.g. 15Dec2013
13Feb 2014

- Data volume:

Cycle 0: allocation completed
Cycle 1: not completed
(NCP: ~ 220h out of 300h allotted)



Some wishes for the near future Cycle 2 , 3

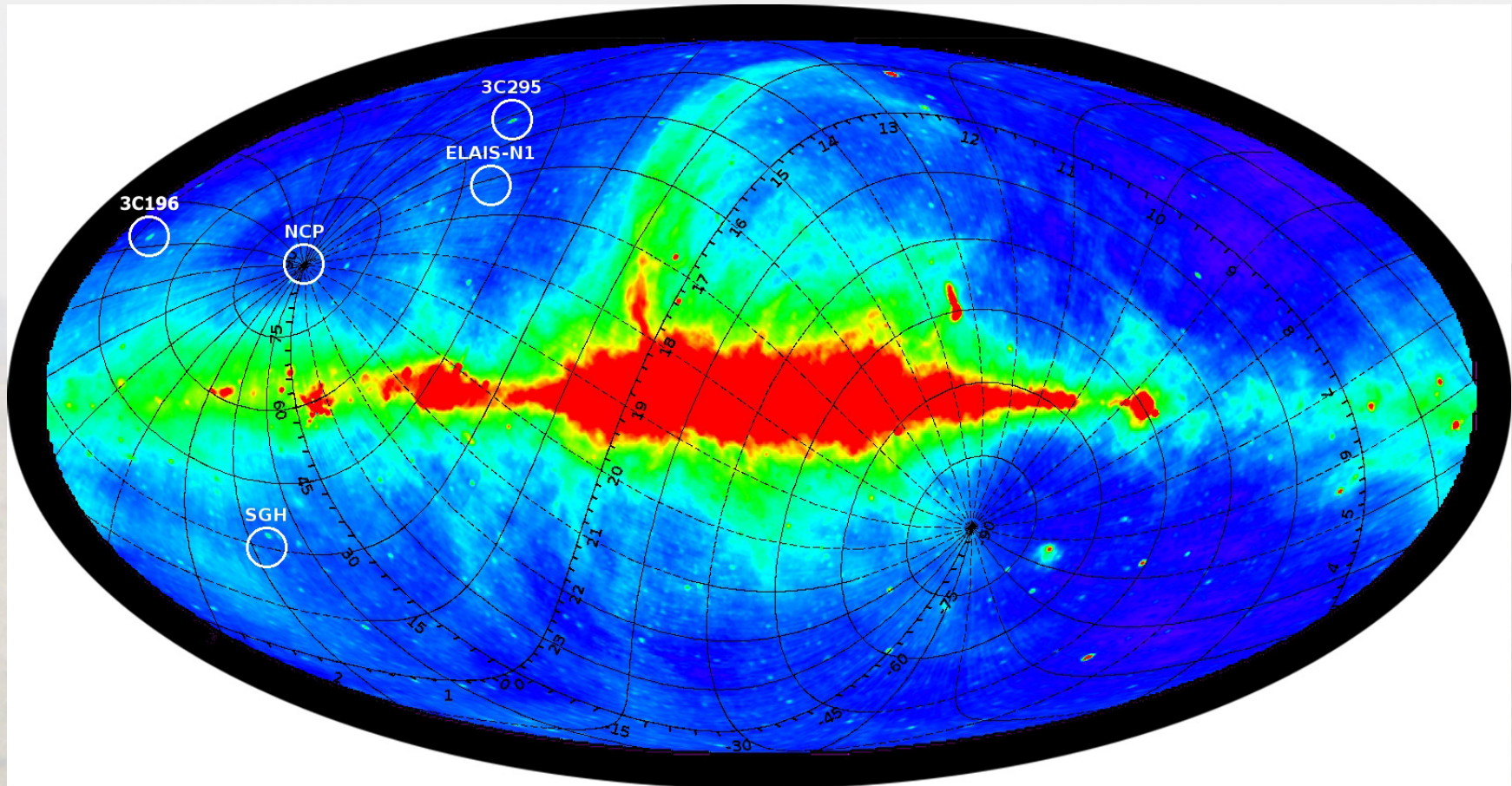
- Enable observations in RCU mode6 (160-240 MHz):
(EoR project needs 180-200 MHz ($z_{\text{HI}} = 6-7$))
- Improve station gains: sensitivity factor 1.5 between best/worst station
- routine monitoring of station beams ('Brentjens-Heald' holography mode)
- 'rotate' CS013 (45 deg dipole misorientation)
- reliable access to LOFAR archives (TARGET and/or SARA)







Location of our 5 EoR windows



Haslam et al, 408 MHz (1981)