The LOFAR view on NGC 5033

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Image Credit: Adam Block, Mt. Lemmon SkyCenter, University of Arizona

Setup of the observations

- Cycle 2 (LC2_009)
- HBA low (110 – 190 MHz)
- 8 hour observation
- 366 subbands on target
- Observations of calibrator 3C295 at the same frequencies as the target
- 2nd beam on calibrator 3C286

Science aims

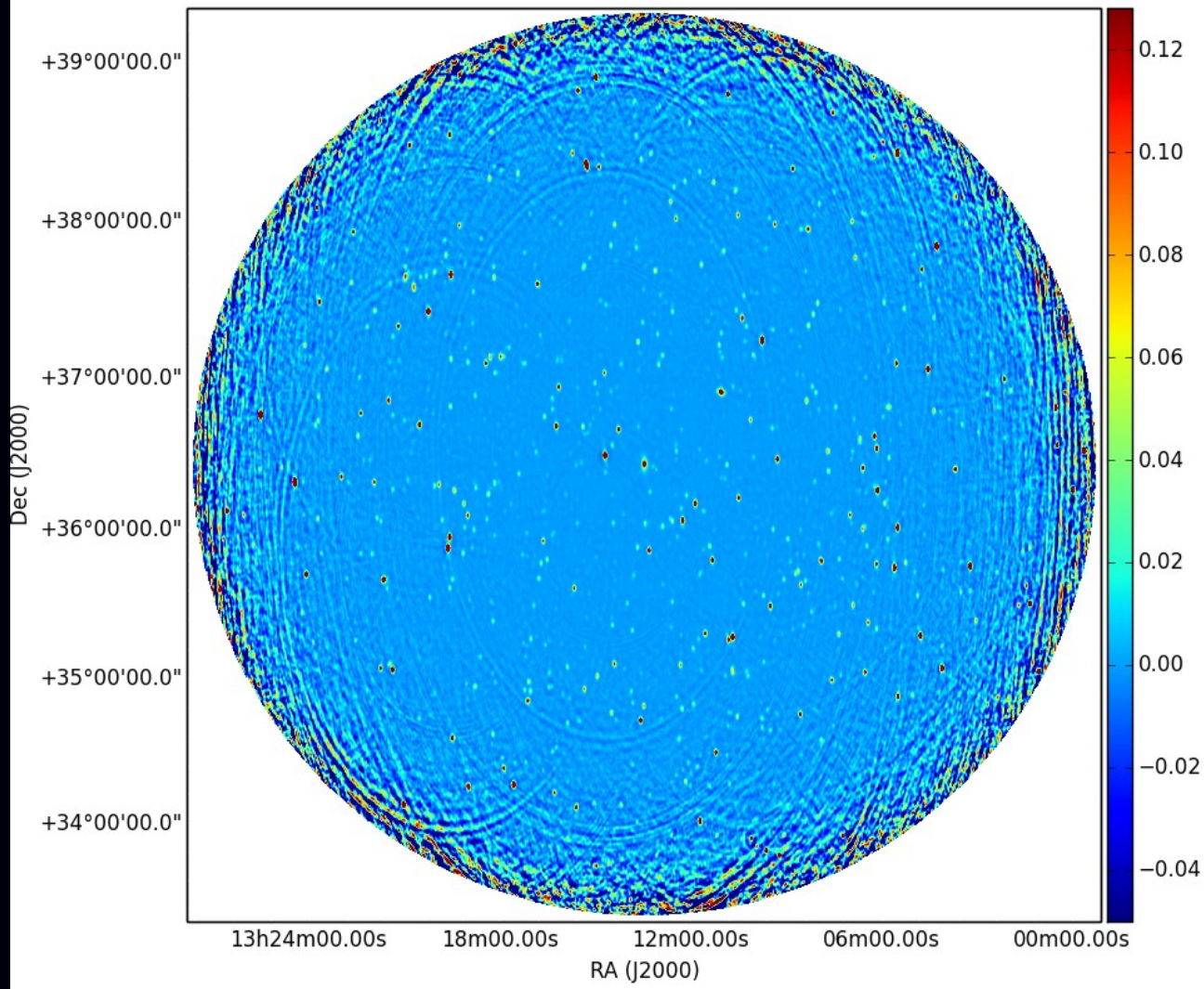
- NGC 5033: nearby Spiral with large angular extend and peculiar features
- Far-infrared - radio correlation
- Transport of Cosmic Rays
- Spectral Index
- Extent of the Halo

Image Credit: Adam Block, Mt. Lemmon SkyCenter, University of Arizona

Calibration and Imaging strategy

- Amplitude calibration
- Divide 366 subbands into chunks of 12 subbands and into three large blocks
- Selfcal 12 subbands from each block to get a good skymodel for each block (Imaging with AWImager)
- Use this skymodel for the whole block
- Make one final image in CASA

Field around NGC 5033 - WSRT

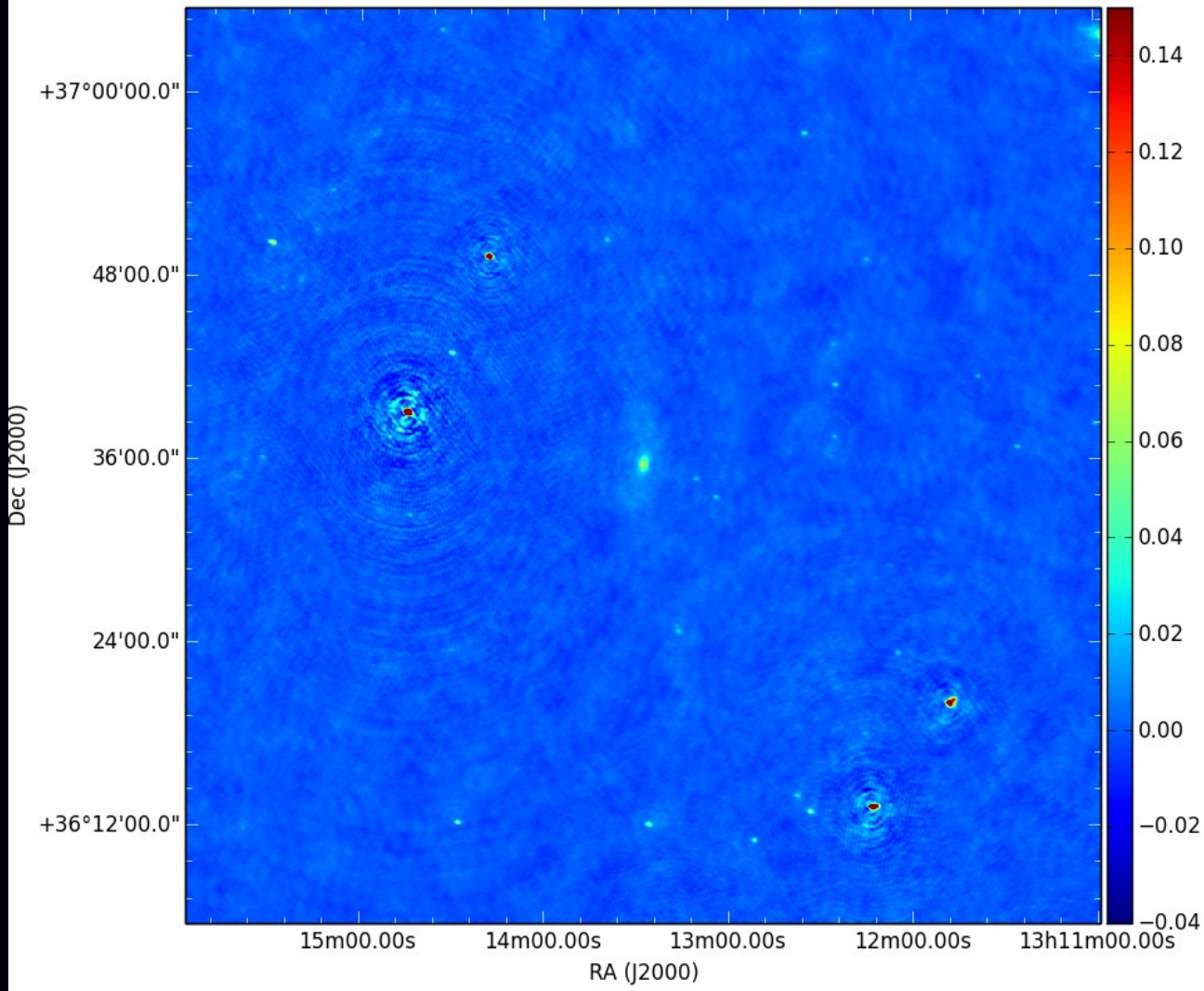


ASTRON's self-calibration script

Beam:
19” x 15”

Flux:
1.2 Jy

Noise:
0.002 Jy

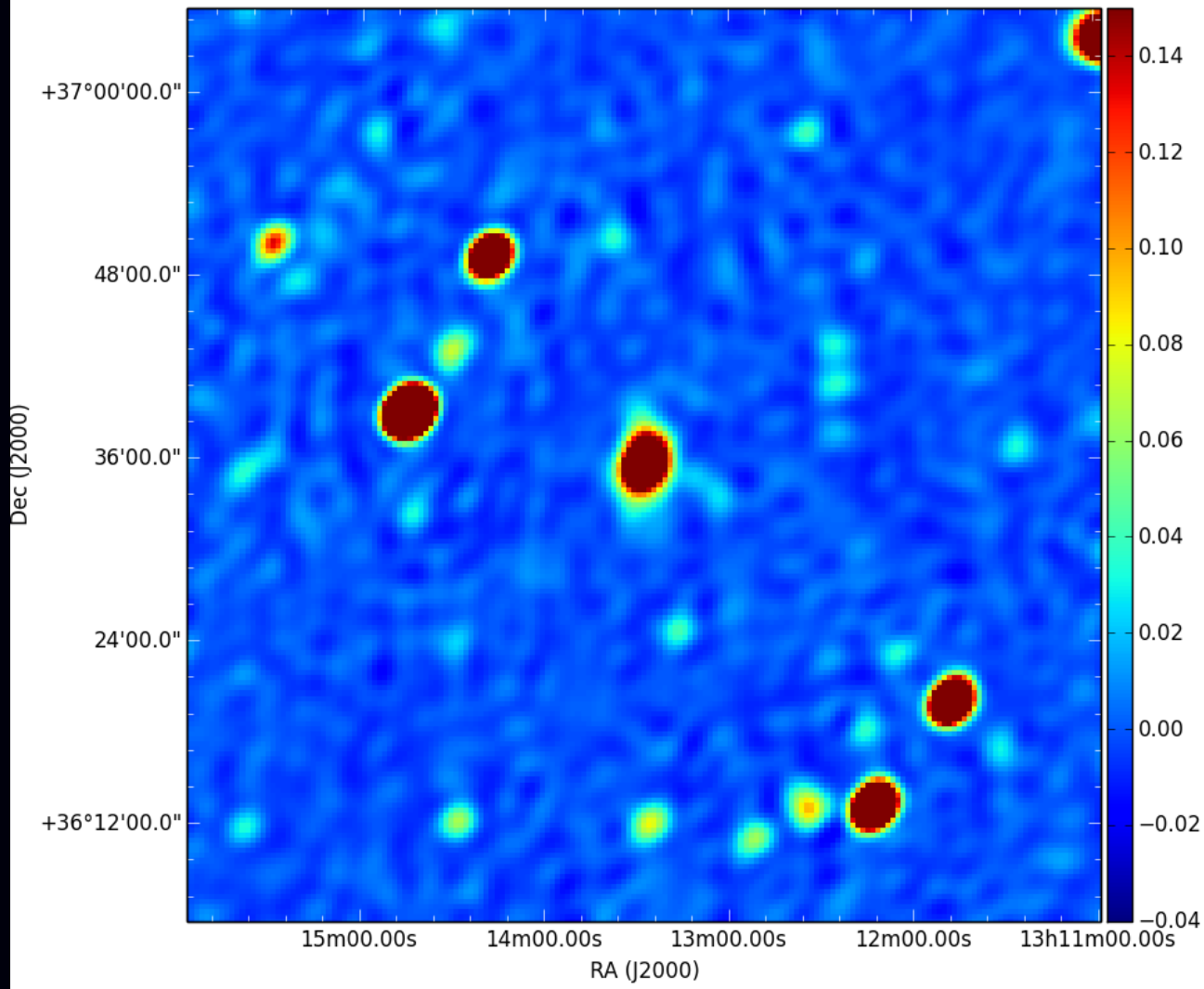


Selfcal-Cycle 0

Beam:
128” x 106”

Flux:
0.9 Jy

Noise:
0.005 Jy

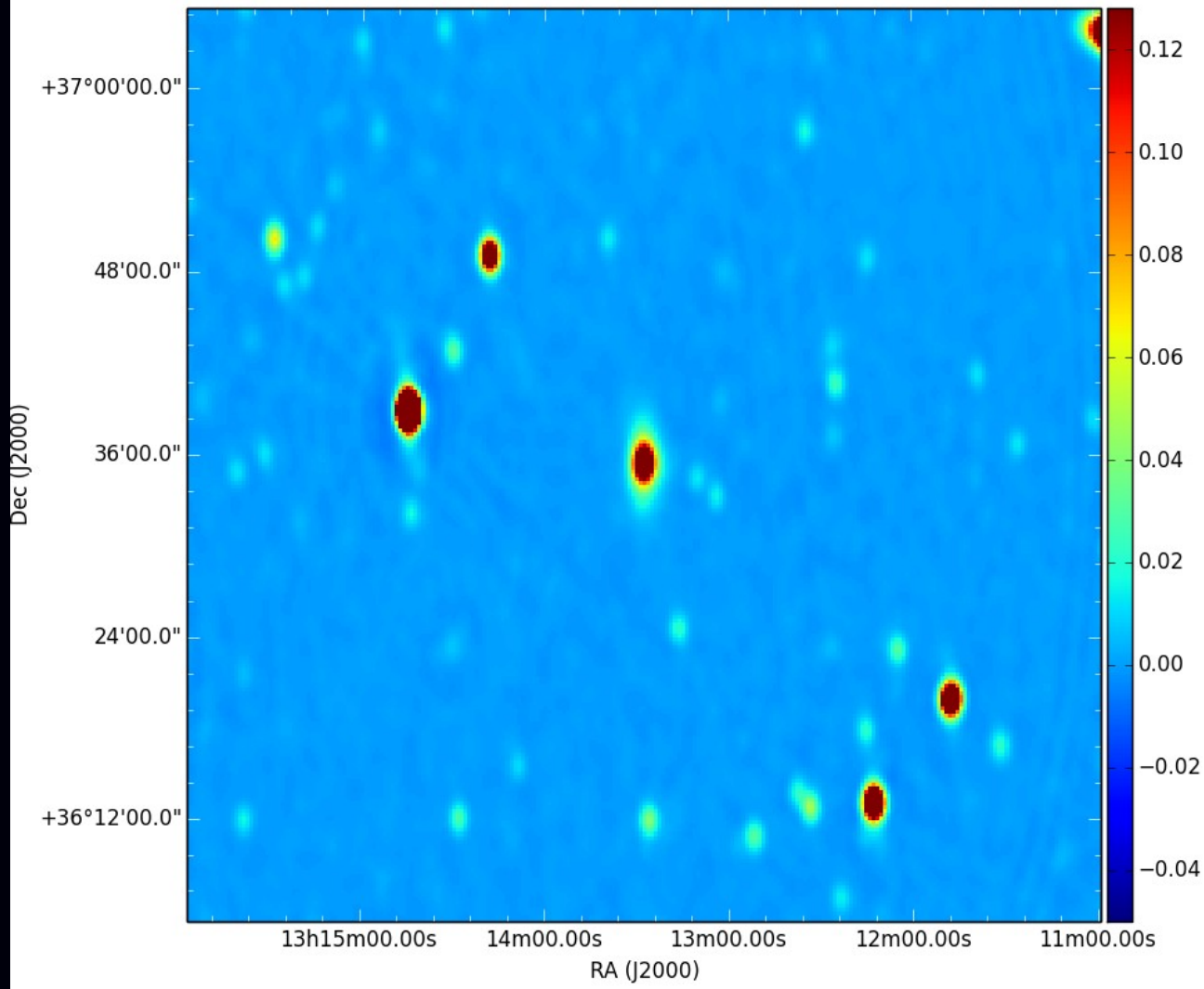


WSRT image – Zoom-in

Beam:
85” x 52”

Flux:
0.7 Jy

Noise:
0.001 Jy

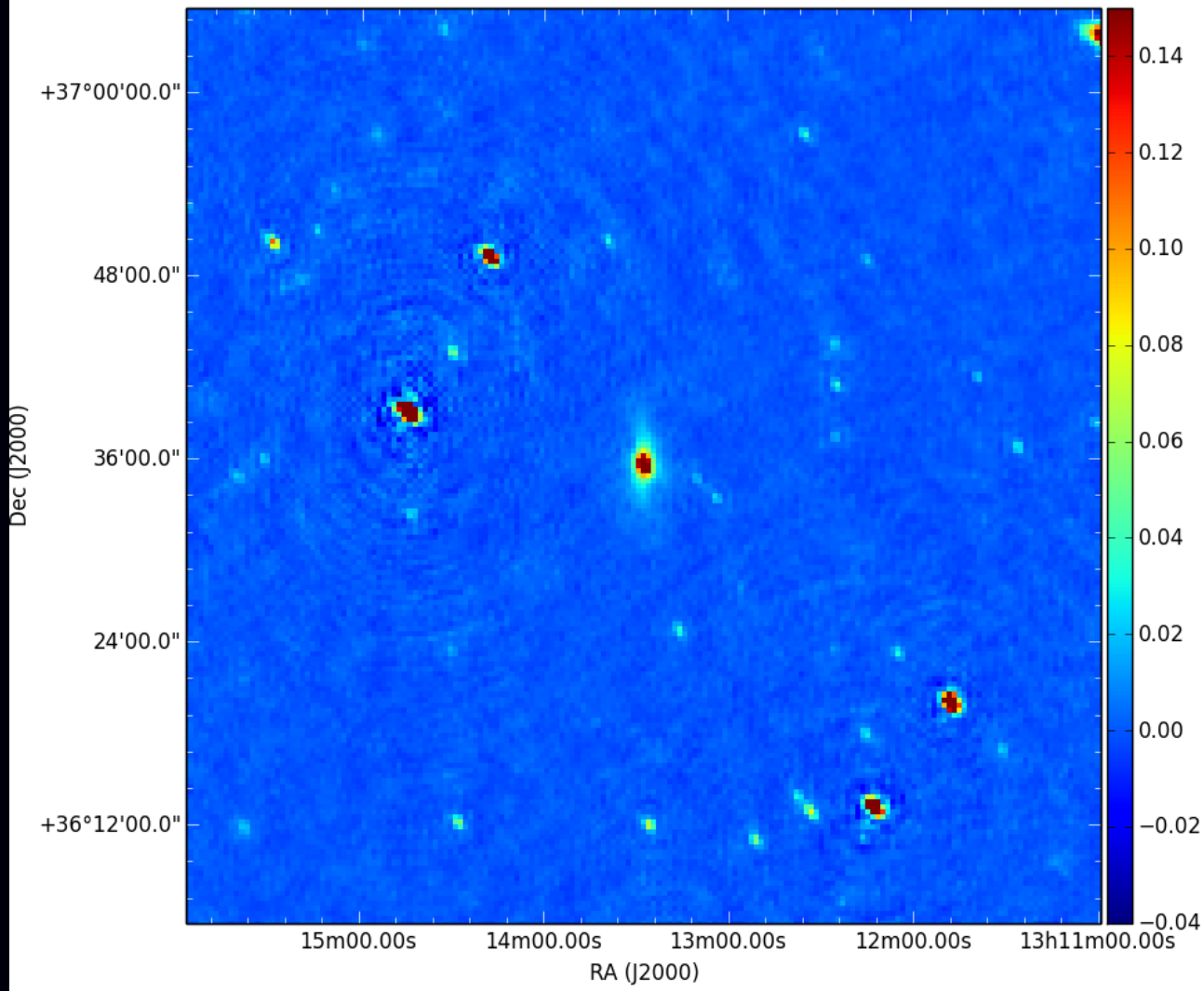


Selfcal-Cycle 2

Beam:
52” x 29”

Flux:
1.0 Jy

Noise:
0.003 Jy



Summary and Outlook

- Continue data reduction of NGC 5033 HBA data set, including direction dependent calibration
- Analysis towards science aims: Transport of Cosmic Rays, Synchrotron intensity, Spectral index maps, far-infrared – radio correlation
- Cycle 3 HBA observations of NGC 5055 due in April
- Cycle 4 LBA proposal for NGC 5033 and NGC 5055