

Imaging Busy Week 26

18–21 April 2017

LSM 3 May 2017

Tammo Jan Dijkema

http://www.lofar.org/operations/doku.php?id=commissioning:imag_busy_week_26

Topics treated in busy week

- Image Domain Gridding
- Direction dependent constrained calibration in DPPP
- Phase screen calibration
- Prefactor + Factor
- PiLL

Participants:

Emanuela Orrù, Tammo Jan Dijkema, Andreas Horneffer, David Rafferty, Tim Shimwell, Francesco de Gasperin, Maaijke Mevius, André Offringa, Mary Knapp, Adam Stewart, Reinout van Weeren, Aleksandar Shulevski, Raymond Oonk, Jess Broderick, Huib Intema, Bas van der Tol

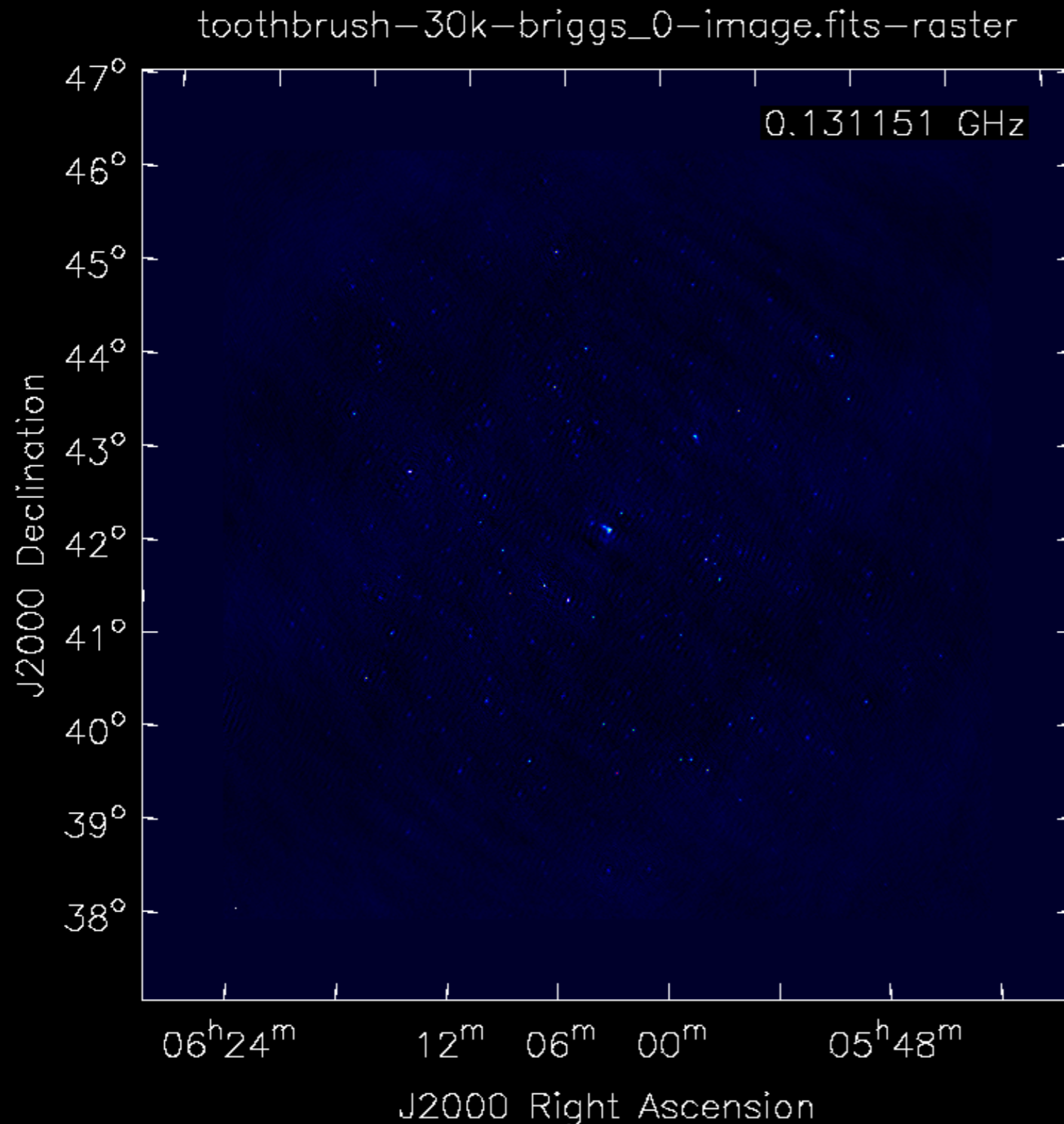
Image Domain Gridding

- Plug-in gridder for WSClean
- Produced a 30.000 x 30.000 image on CEP4
- Found an unexpected bottleneck in computing time
- Fixed some incorrect assumptions about usage
- Next focus: put in A-term

<https://gitlab.com/astron-idg> + latest WSClean

Developed by Bas v.d. Tol, Bram Veenboer, André Offringa

Image Domain Gridding



WSClean + IDG

- 30k image
- 1.2 arcsec
- 10° FOV
- 20 channels
- 4 major cycles

- CEP4 imaging node
 - 4 GPUs
 - 320 GB memory
 - gridding on GPU + CPU

- ~20 min. per major cycle

Developed by
Bas v.d. Tol
Bram Veenboer
André Offringa

DDECaI

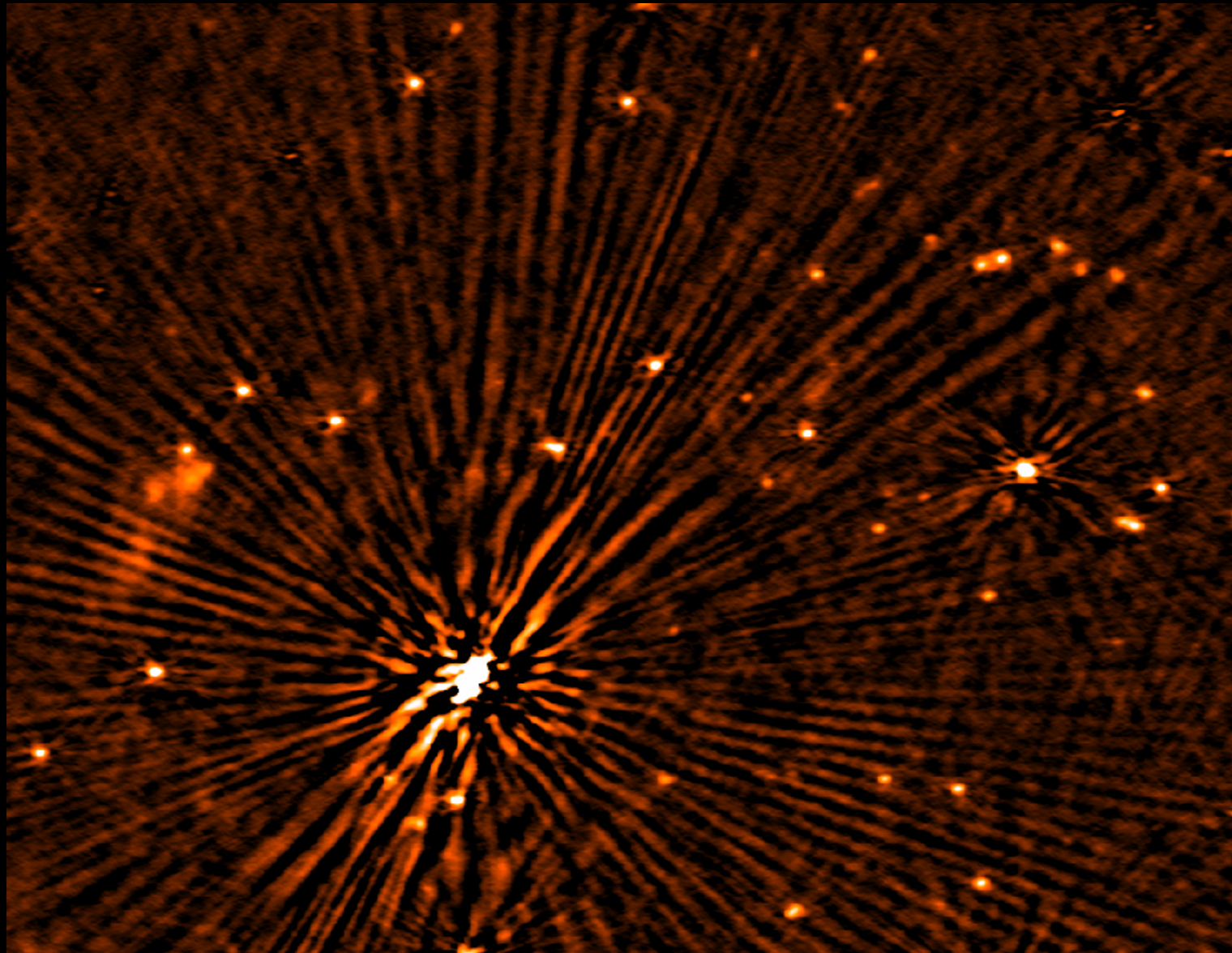
- Solve in multiple directions simultaneously (using an extension of stefcal)
- Optionally apply a constraint: TEC, TEC + phase, phase screen
- Output in H5Parm

In latest LOFAR trunk

Developed by Maaijke Mevius

Data from Francesco de Gasperin

DDECaI



DDECaI

- 11 directions
- LBA 42–66 MHz
- TEC fitted in each direction

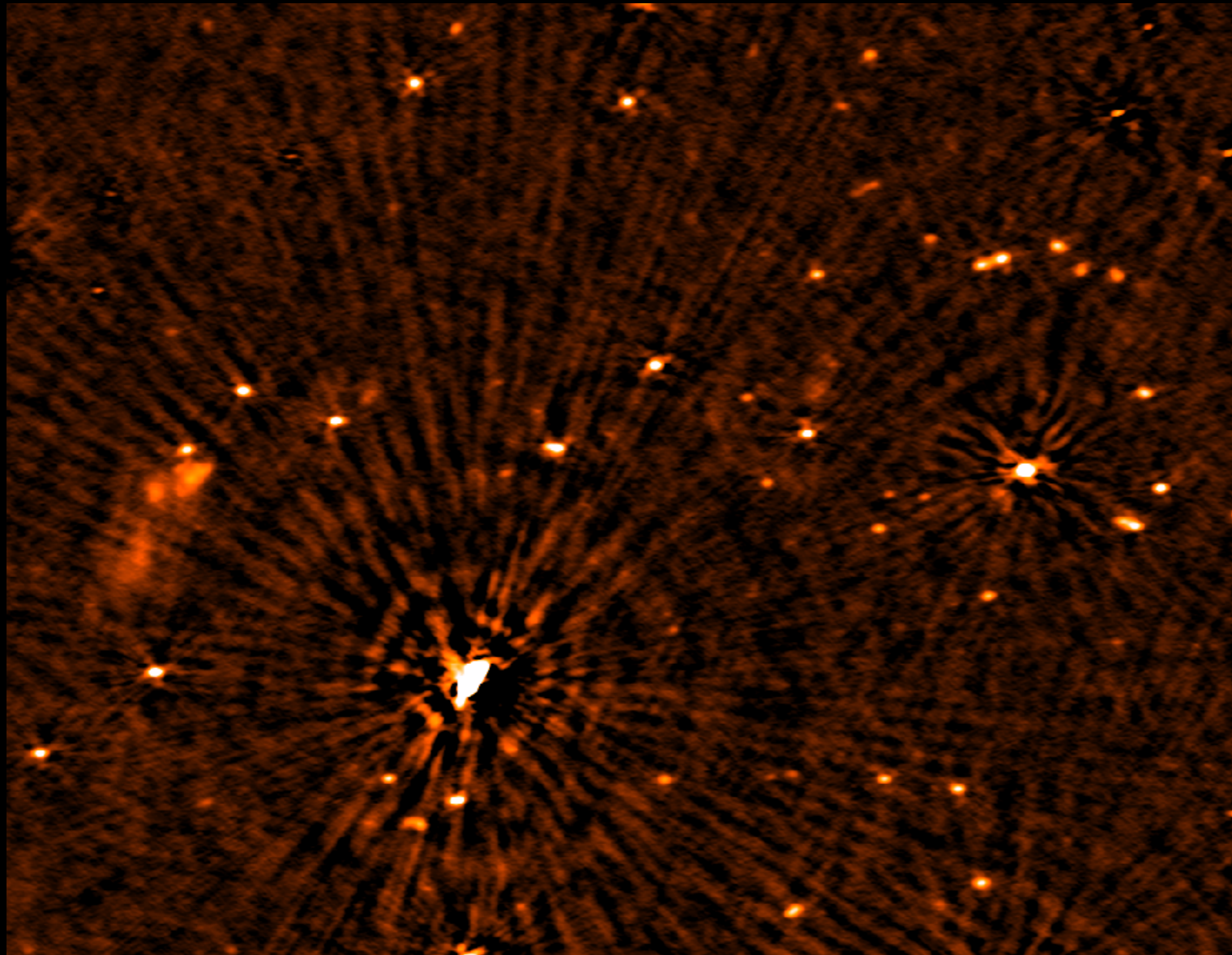
- Bright (~ 20 Jy) source

- Now 2–3 mJy/b rms noise

Commissioning: Francesco de Gasperin

Developed by
Tammo Jan Dijkema
André Offringa
Maaijke Mevius

DDECaI



DDECaI

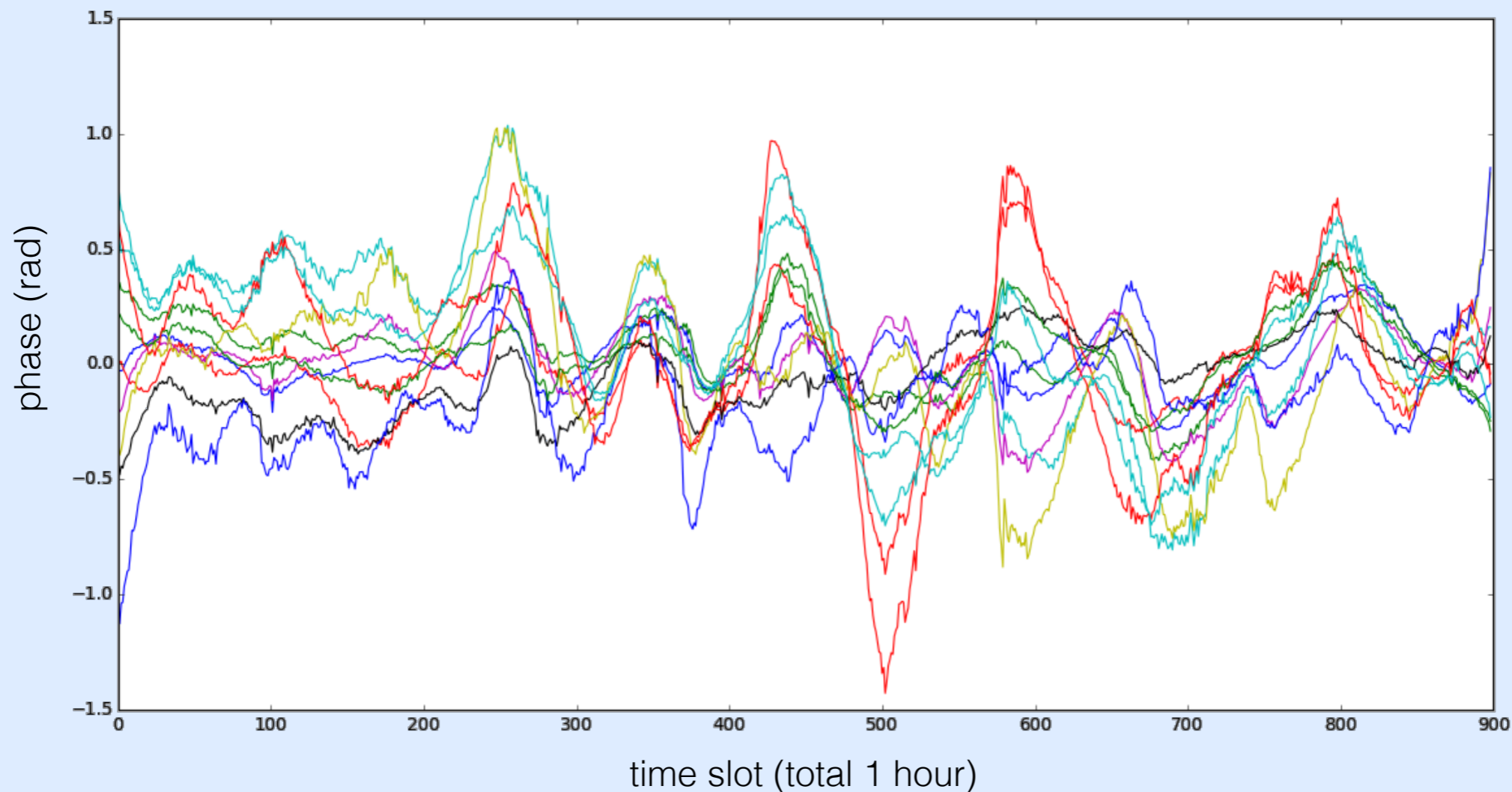
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DDECAL + phase screen

- First try fitting directly for phase screen
- Same LBA data set, fitted TEC screen in 11 directions
- No time correlation imposed



Developed by Maaijke Mevius
Data preparation by Francesco de Gasperin

- LBA pipeline developed by Francesco de Gasperin
- Reasonable LBA images produced 'out of the box'
- Direction independent calibration works
 - ~ 24h for calibration

<https://github.com/lofar-astron/PiLL/>

Developed by Francesco de Gasperin, Alexander Drabent
Tested by Mary Knapp, Adam Stewart

Prefactor + Factor

- Factor release 2.2 marked as stable
 - Release notes: see github page
 - Major change: use automasking from latest WSClean
- Factor can now be used by starting users
- Time for facet calibration + imaging typically 3 days
- Prefactor with faster initial subtract works
- Feature to predict clean components from WSClean

<https://github.com/lofar-astron/factor/>

Developed by David Rafferty, Andreas Horneffer

Lots of commissioning by Aleksandar Shulevski, Emanuela Orrù, many others

Conclusions, outlook

- Factor 'done'
- LBA direction independent 'done'
- Good progress in direction dependent calibration + imaging