CALIBRATION AND IMAGING TIGER TEAM

Infrastructure

Generic Pipeline framework

Other tools

Selfcal

Standalone

RO selfcal pipeline

Facet Calibration

Development

Integration

Status

Results (prelim.)

Calibration

Features

Speed

Integration

AWImager 2.0

Features

Gridding speed

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Conclusion

Main deliverable of CITT is a user-friendly version of facet calibration procedure.

Pipeline draws together progress in all other CITT areas, so cumulative result of work across the team.

CITT wraps up in July 2015.

Future

Testing

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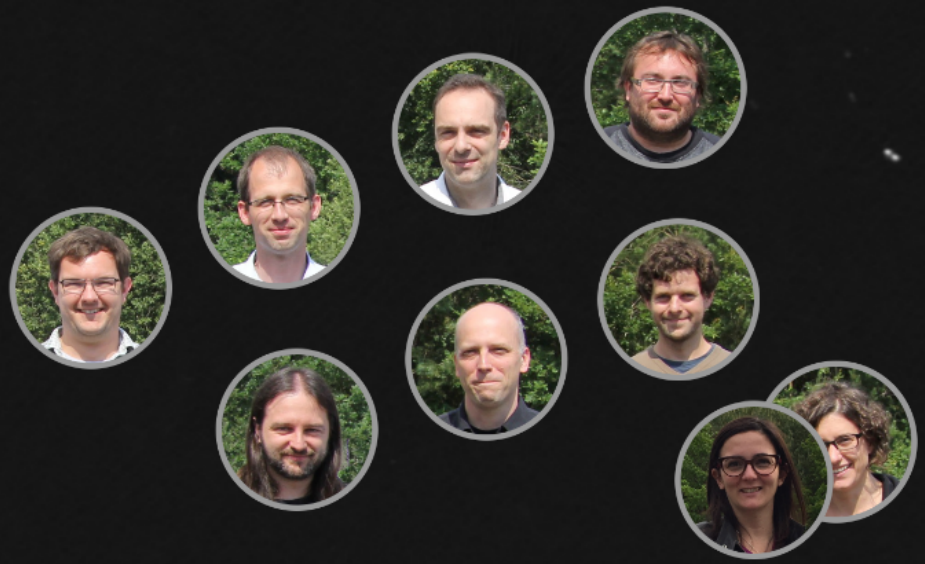
CITT2 (?)

Prezi

CALIBRATION AND IMAGING

TIGER TEAM



AWImager 2.0

Features

More robust, user friendly than awimager 1

Integrates with NRAO CASA 4.4

- Multiscale wideband clean

Pluggable / extensible

- Use your own A-term (beam)
- Choose different gridders

Gridding speed

Integration

Current status: AWImager 2 available on GITT branch on CEP4 and lltb.
IDG still in development, 'classic' gridder available and tested

Casacore 2.0 April 2015

NRAO Casa 4.4 May 2015

LOFAR 2.11 June 2015

AWImager 2 available on CEP3, next to AWImager 1

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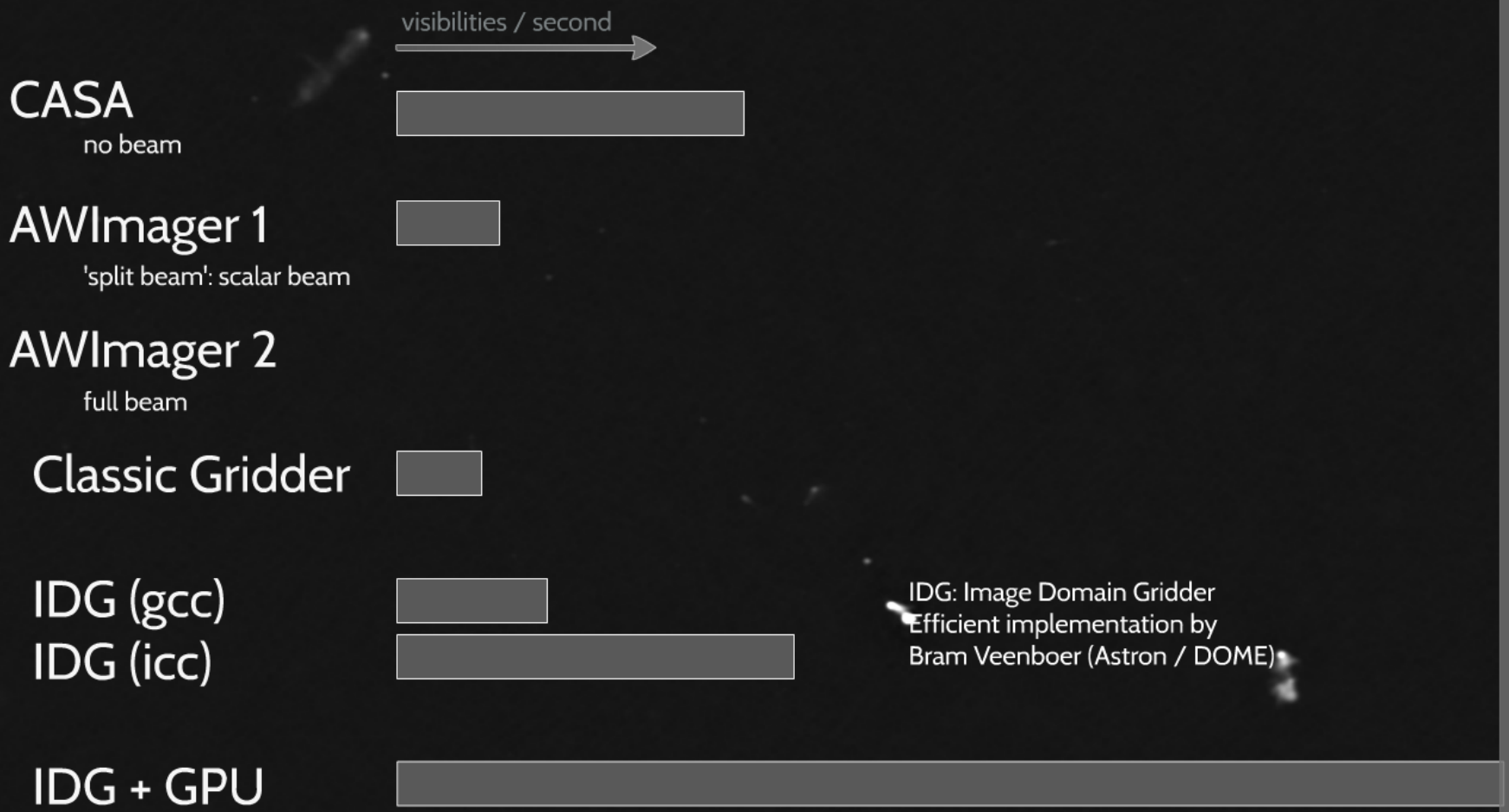
* benchmark to be verified



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Calibration

Features

Nondirectional gain calibration in DPPP

Full Jones / Diagonal / 'CommonScalarPhase'

Use sky model or MODEL_DATA
Beam can be applied to either (only single direction for MODEL_DATA)

To be added: sliding window calibration for better S/N

Speed

Calibration part at least 10x faster than BBS

New multithreaded predict 20x faster than BBS predict
Also multithreaded beam application

Memory required independent of number of sources.

Integration

Current status: DPPP gaincal available in Lofar and Lofim releases
Fast predict only on a branch, to be integrated

Fast gaincal

- Selfcal pipeline standalone ✔
- Selfcal pipeline RO version
- Facet calibration pipeline

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Standalone

Many options in selfcal.py

Tested and used by many astronomers!

Maintained on github for fast development cycles

Uses LSMTool for graphical feedback plots

https://github.com/nicolasvilchez/pyselfcal

RO selfcal pipeline

Black box version developed in RO pipeline framework

Current status: in commissioning

The RO pipeline framework is (too) hard to program

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Extension to the existing Lofar Pipeline Framework used by RO.

Create pipelines by writing down the steps as a parset.

Pipeline framework takes care of distributing steps over nodes.

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pipeline.steps=[ ph_shift , myscript , wsclean ]

ph_shift.control.type=dppp
ph_shift.argument.steps=[phaseshift]
ph_shift.argument.phaseshift.phasecenter= ...

myscript.control.executable= dijkema/stastuff.py
myscript.arguments=[-a, -f, mapfile]
```

All programs can be trivially embedded
sagecal, CohJones, wsclean, excon, losoto, ...

Other tools

LSMTool: https://github.com/darafferty/LSMTool
Tool for manipulating sky models

LoSoTo: https://github.com/revoltek/losoto
Set of tools for working with solutions (e.g. clock/tec separation)

SmartDemix DPPP step:
Currently being tested with new data set

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Development

Scheme developed by Reinout van Weeren. works for 1

Tested by Wendy Williams on Boötes field. works for 2

Further developed at Leiden Workshop 20-24 April '15

works for 7 (?)

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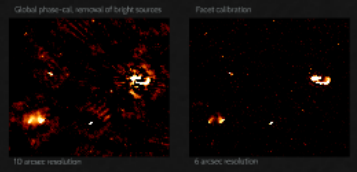
Status

Current scripts (in development) on github.
https://github.com/tammojan/facet-calibration

CITT will deliver a mostly automated version of this scheme in the generic pipeline framework.

Implementation in pipeline framework to be wrapped up in CITT work week (next week).

Results (prelim.)



Detail (30 x 30 arcmin) of Herschel-ATLAS NGP
Courtesy of Martin Hardcastle (Univ. of Hertfordshire)

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Organized by Tim Shimwell, Wendy Williams & Reinout van Weeren

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- Sarrvesh Sridhar M101
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- Reinout van Weeren A2256
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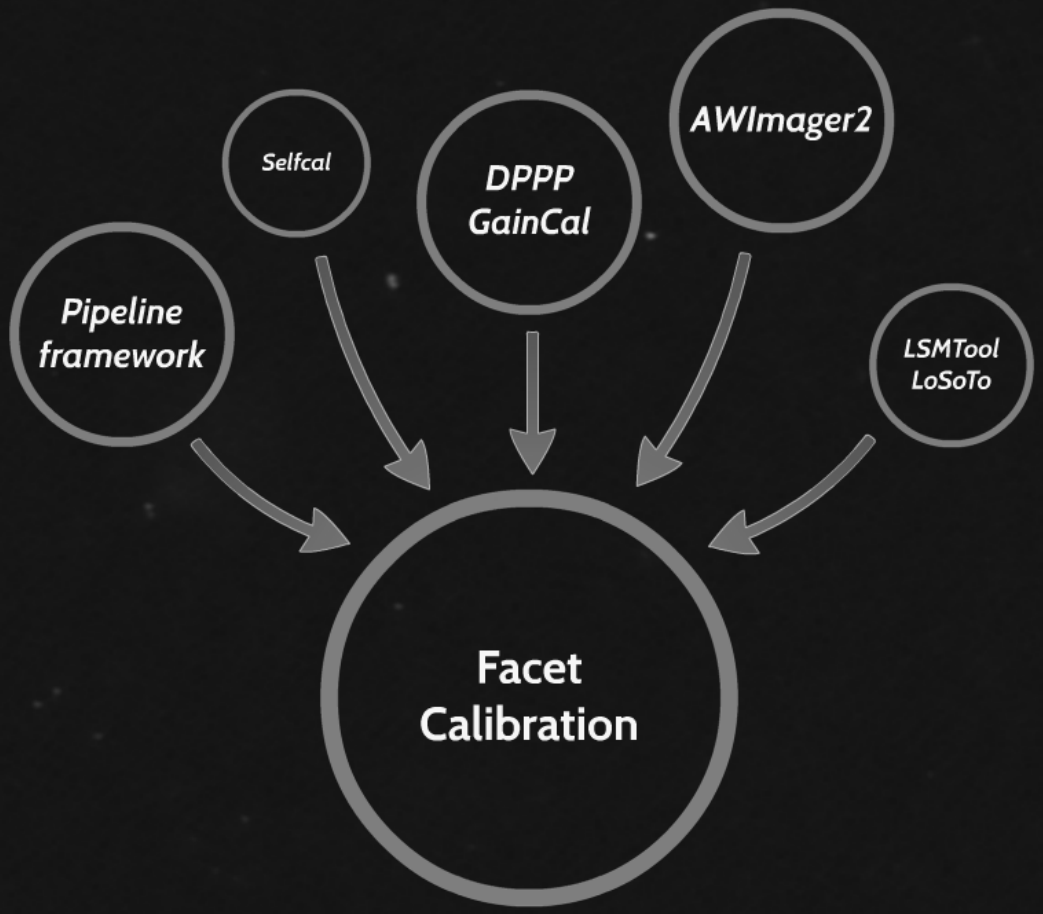

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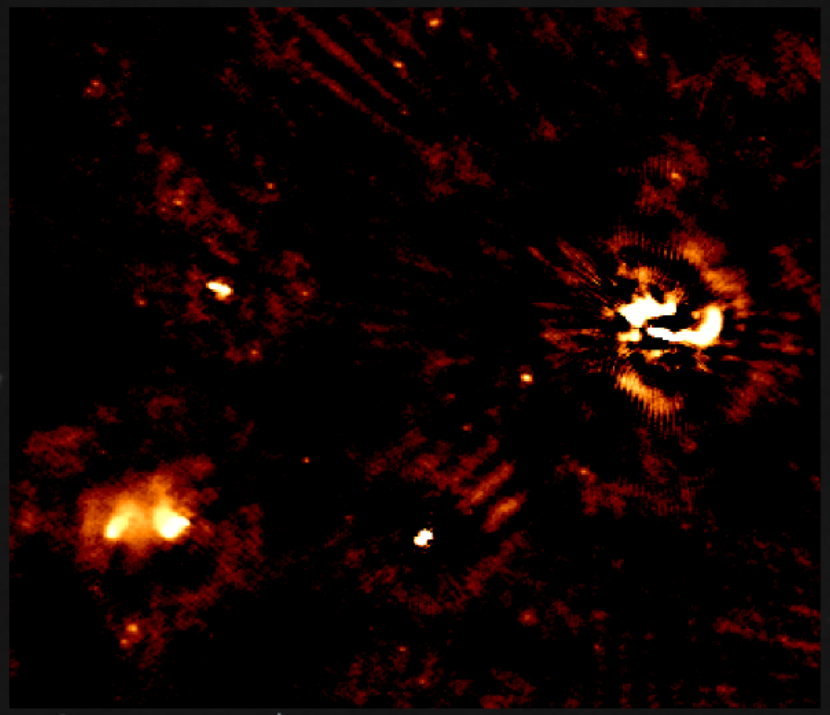
Global phase-cal, removal of bright sources



10 arcsec resolution

Facet calibration

6 arcsec resolution

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New pipeline framework will allow faster feedback

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CITT2 (?)

Follow-up project is being considered

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