Max-Planck-Institut
für
Radioastronomie

Commissioning Activities and Outlook

Andreas Horneffer

for the LOFAR Magnetism KSP

Activities
(in the last half year)

Max-Planck-Institut für Radioastronomie

- one busy week
- first version of a detailed commissioning plan
- first science results
- work on direct transfer of calibration solutions
- some software issues solved/implemented
  - e.g. RM in BBS skymodel,
- other software issues found
  - e.g. missing parallactic rotation

4th Busy Week

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- Location: ASTRON
- Date: 6. – 10. June 2011
- 18 Participants in ASTRON plus 3 remote:

Björn	Adebahr		David	Mulcahy
Mike	Bell		Blazej	Wroczynski
Ger	de Bruyn		Aris	Nutsos
Alice	Di Vincenzo		Emanuela	Orru
Rene	Gießübel		Roberto	Pizzo
Marijke	Haverkorn		Thomas	Riller
George	Heald		Charlotte	Sobey
Andreas	Horneffer			
Marco	Iacobelli		James	Anderson
Jana	Köhler		Robert	Drzazga
Masaya	Kuniyoshi		Carlos	Sotomayor

Datasets

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1. NGC 4631
   - 7 hour observation with 3C286 as calibrator
   - same frequency coverage on NGC 4631 and calibrator
1. M51
   - 5 hour observation with 3C295 as calibrator
   - same frequency coverage on M51 and calibrator
1. Double-Double Radio Galaxy
   - 7 hour observation
1. Pulsars
   - some more Pulsars observed
1. PSR J0218+42
   - observation from our last BW
1. Fan Region of the Milky Way
   - observation from our last BW

Workgroups

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- imaging of NGC 4631 and M51 with selfcal and transfer of gain solutions from calibrator
- imaging of Double Double galaxy
- time resolved RM-Synthesis of pulsars
  - pulsar data
  - PSR J0218 imaging data
- RM-Synthesis of Fan Region data

NGC 4631:
Difference WENSS - Caltrans

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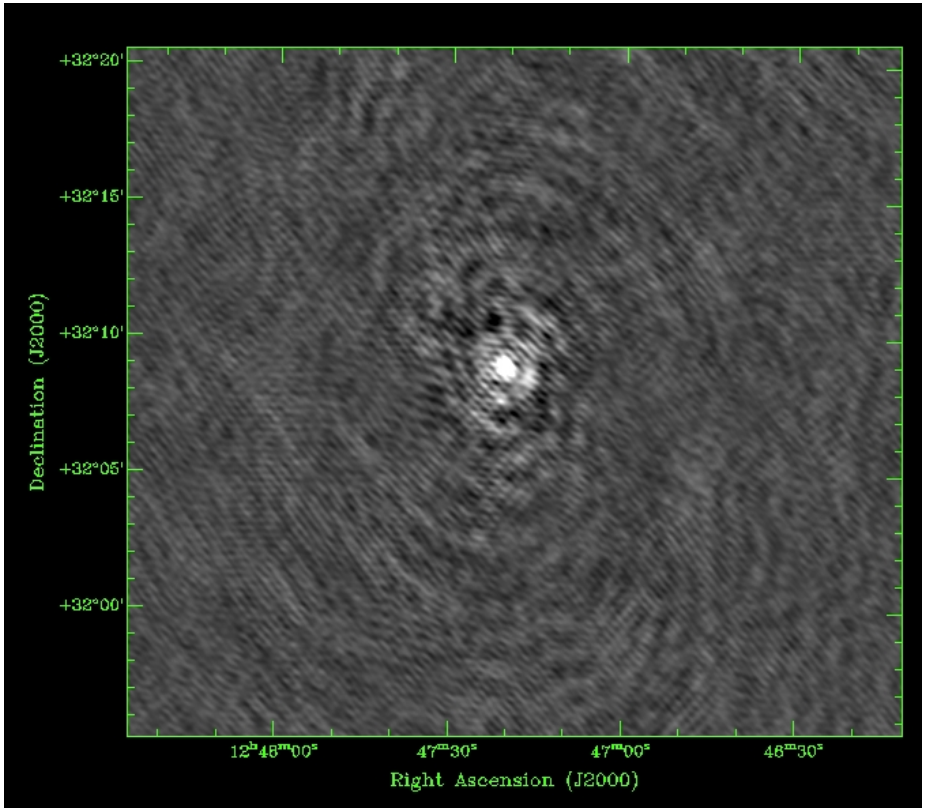
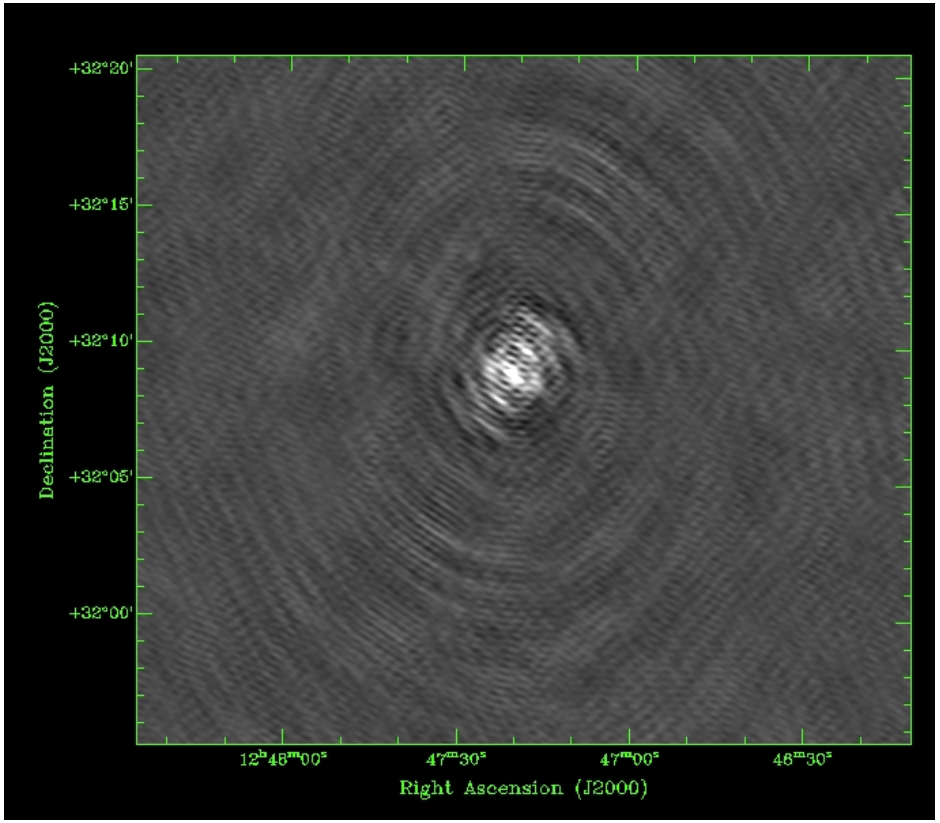


Solution Transfer



WENSS Selfcal

NGC 4631:
After Transfer and Scrubbing

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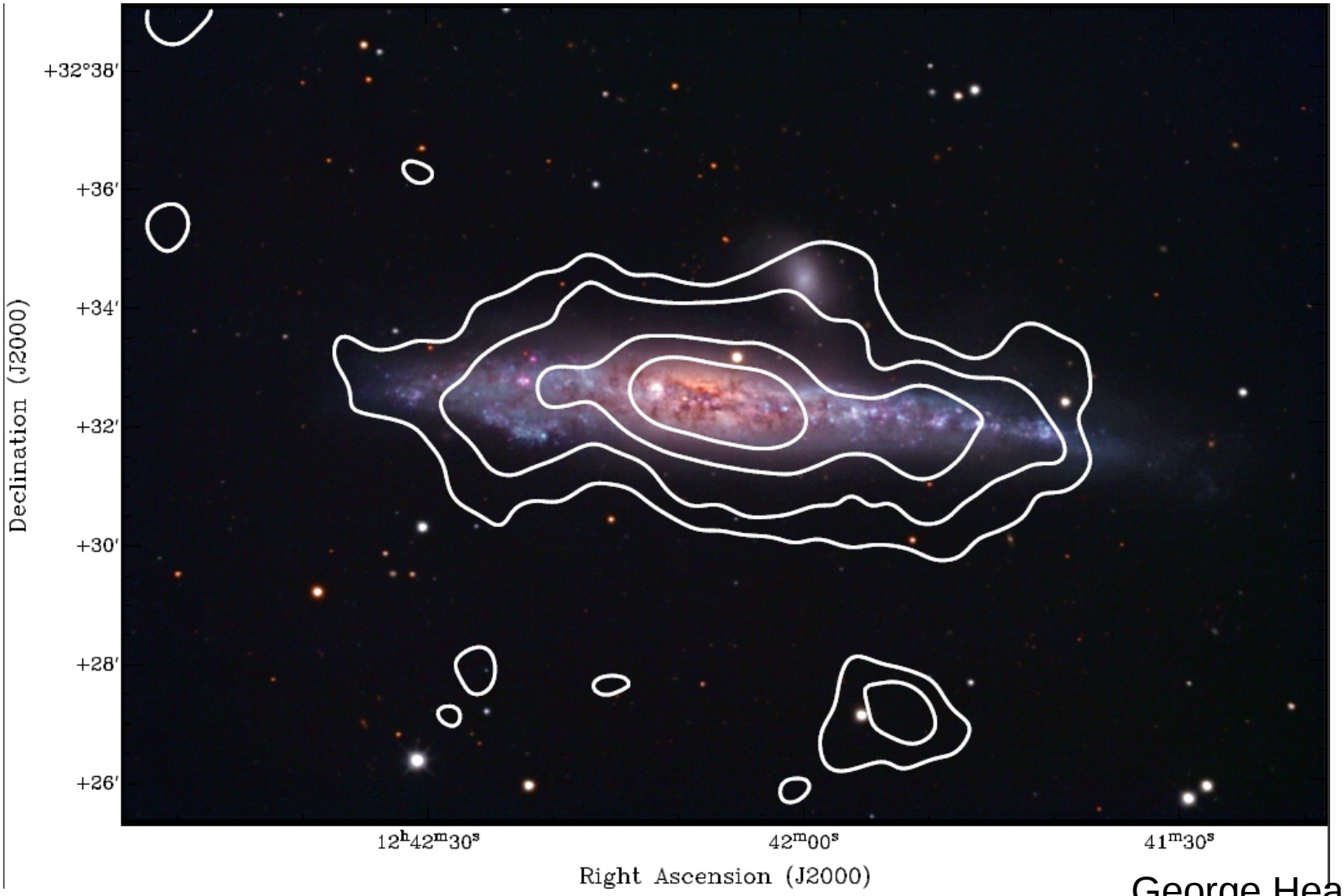

Fan Region: WSRT Results

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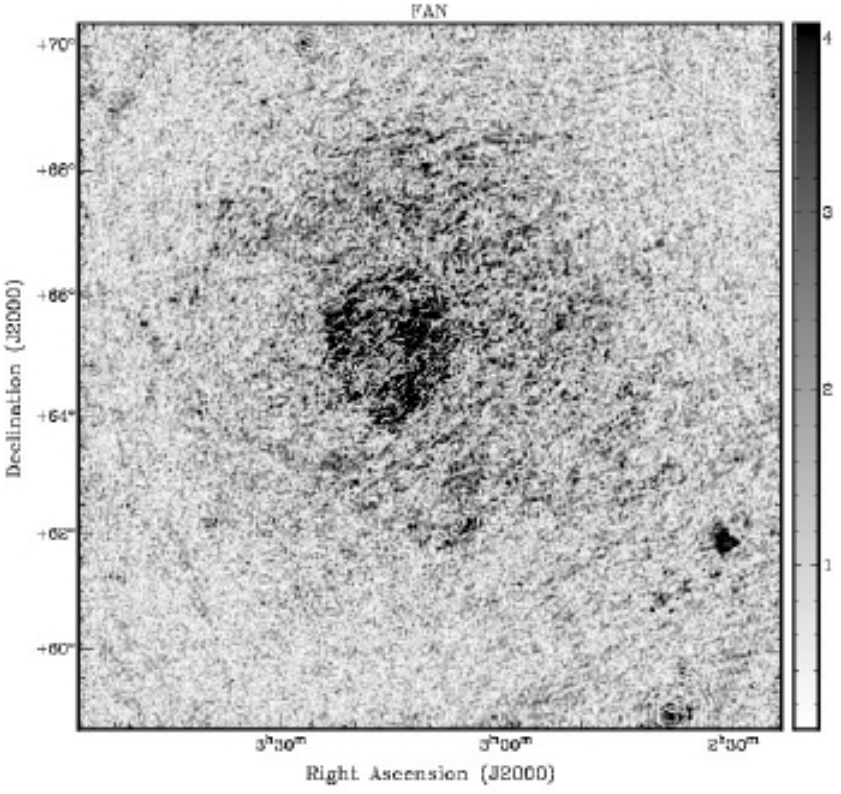
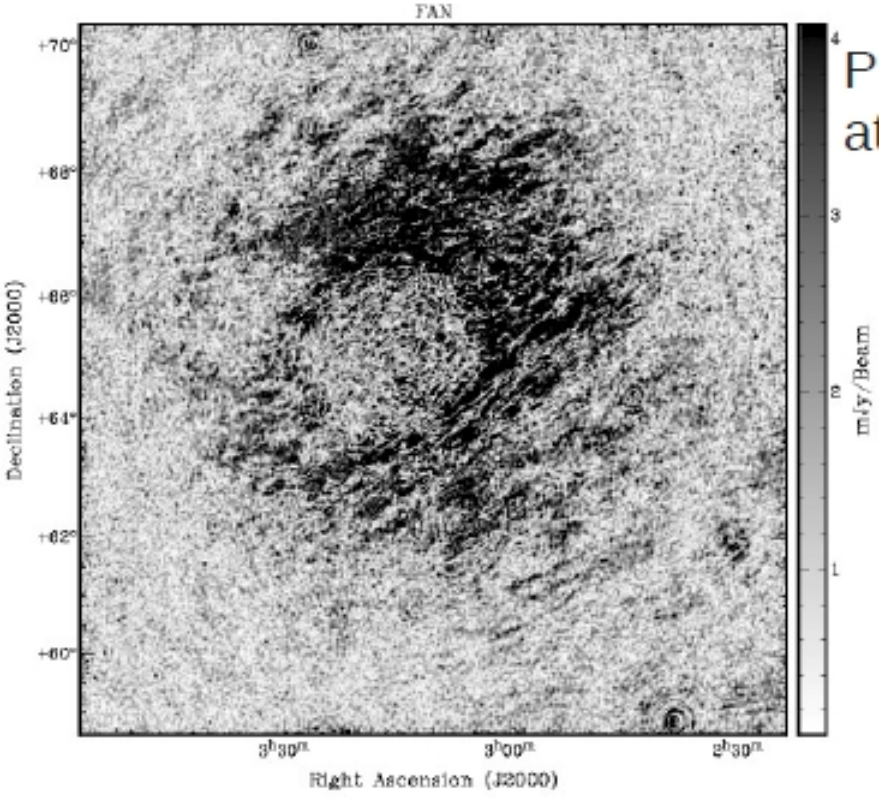
FD = -6 rad/m/m



FD = -2 rad/m/m



Fan Region: LOFAR Results

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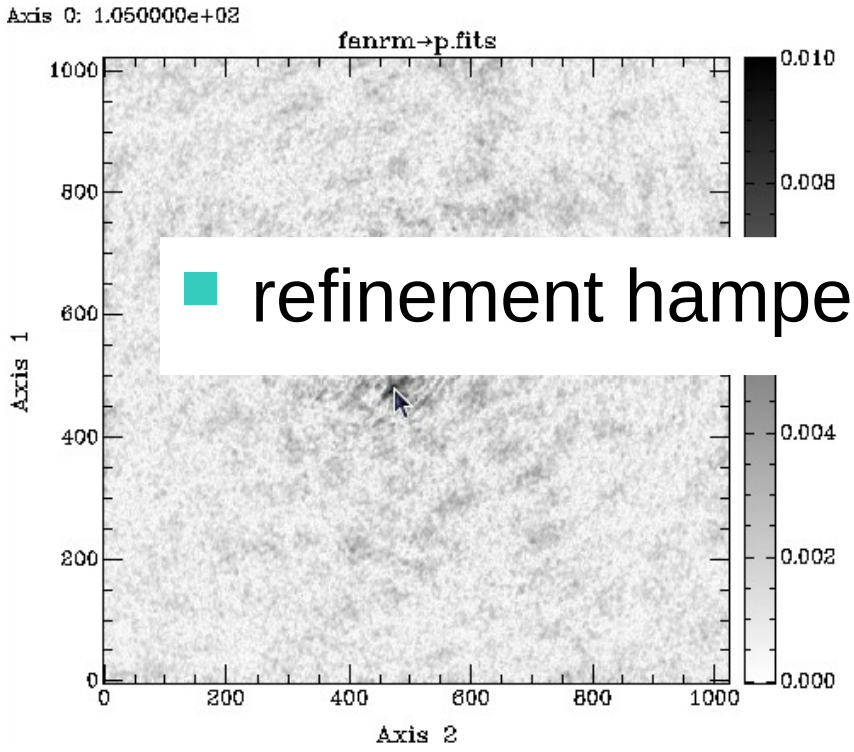
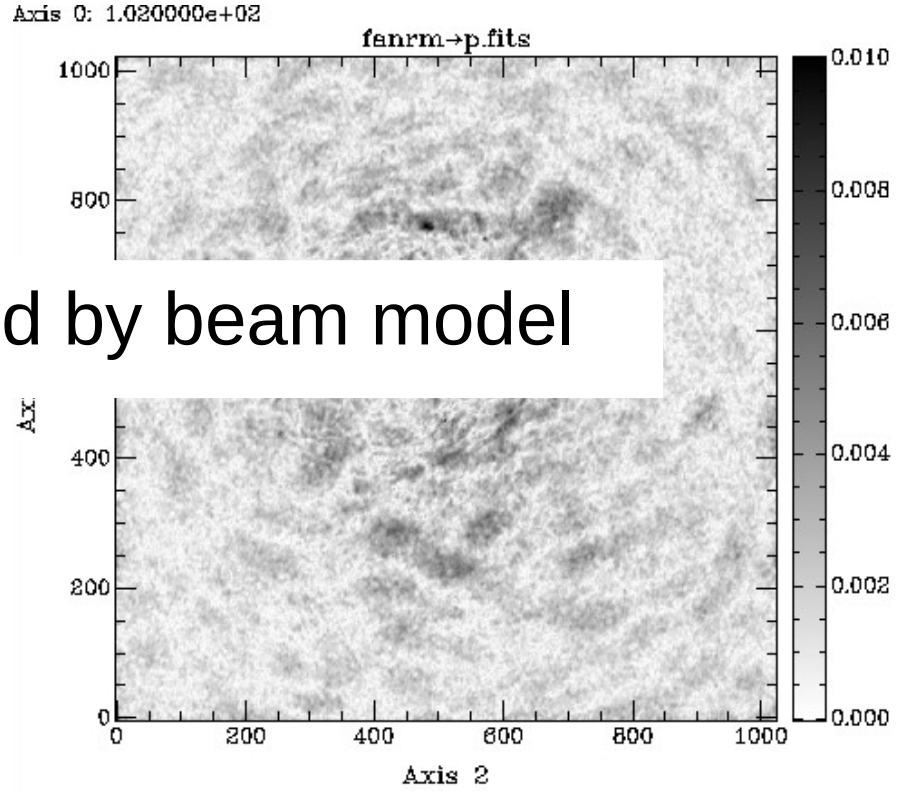
FD = -5 rad/m/m



FD = -2 rad/m/m



- refinement hampered by beam model

PSR 0218: RM-Synthesis

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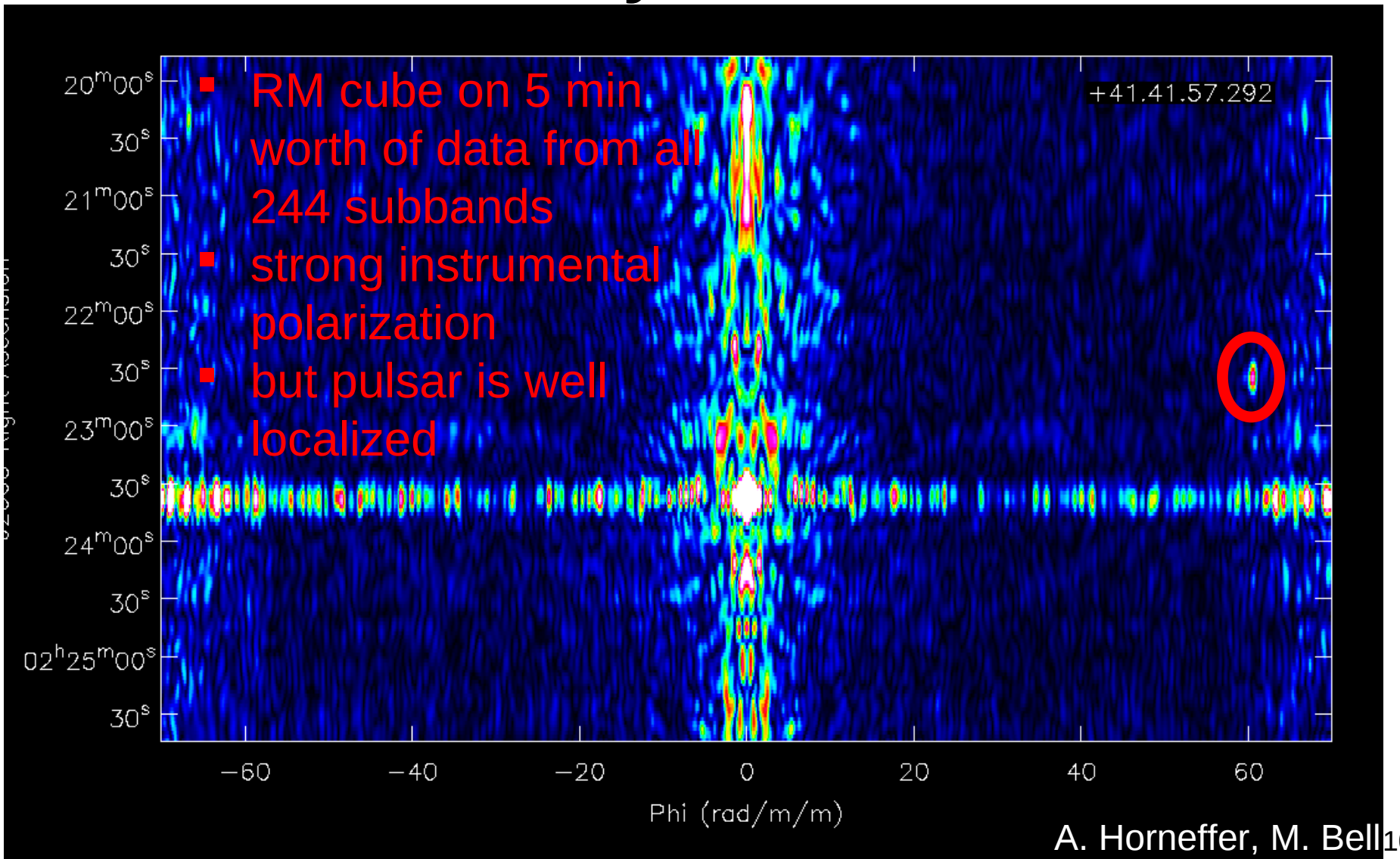

A. Horneffer, M. Bell

Pulsars to study the Ionosphere

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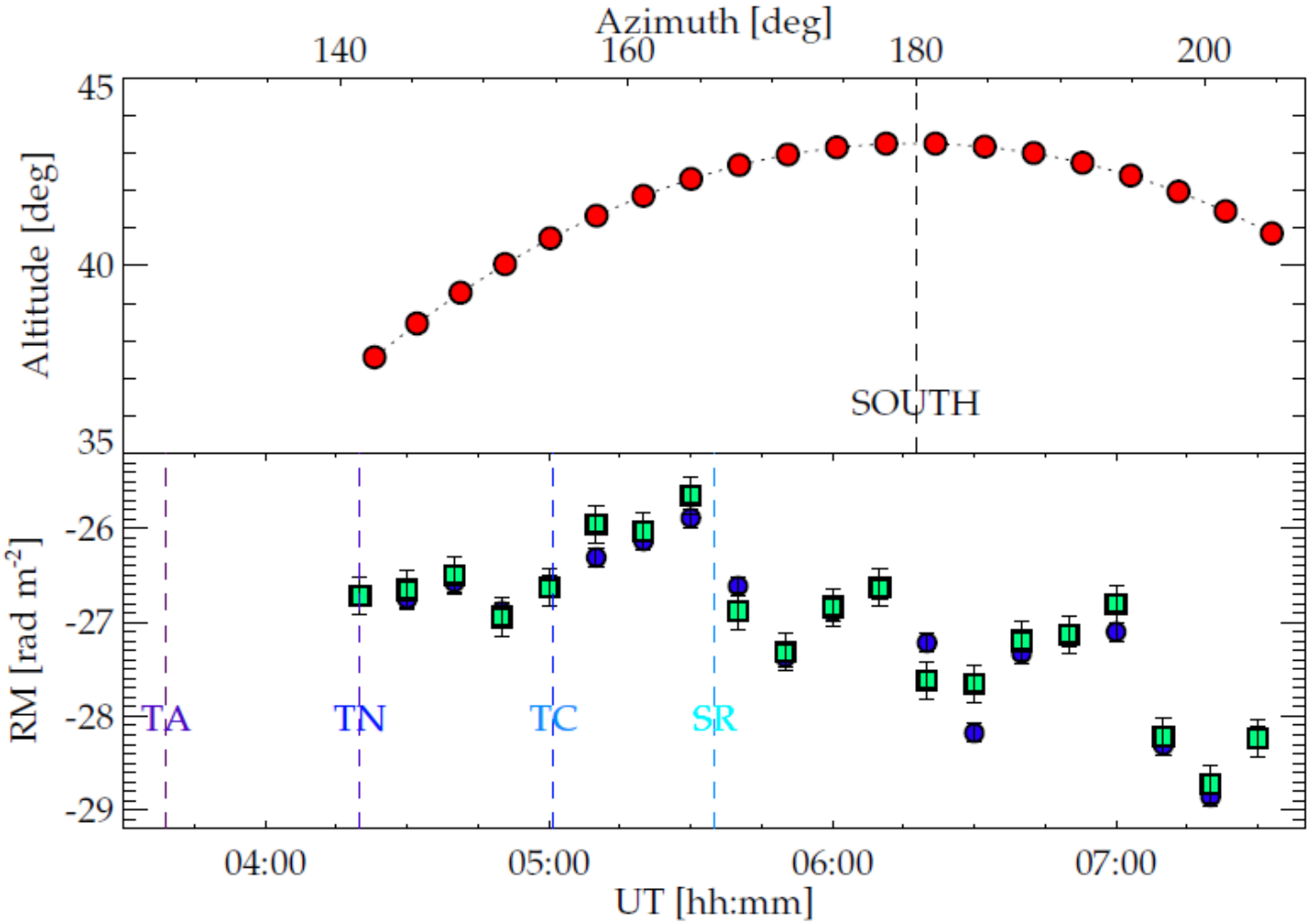

PSR 0834+06 3 min out of each 10 min, before and during sunrise

Gain Solutions Interpolation

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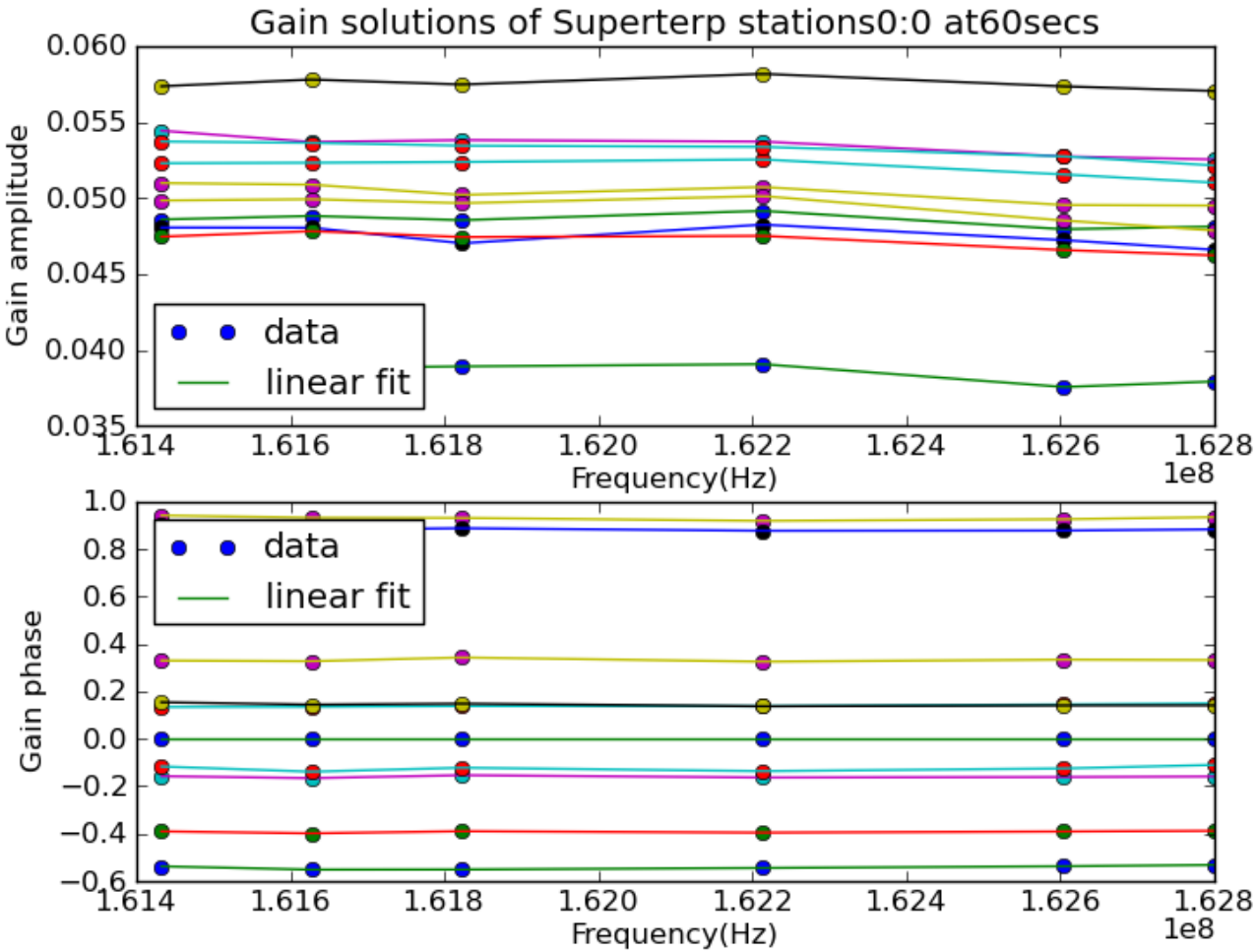

More on Results

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- A 2255 → talk by Roberto Pizzo
- Fan region → talk by Marco Iacobelly
- Giant Radio Galaxies → talk by Emanuela Orru
- M51 → talk by David Mulcahy
- Pulsars → talk by Charlotte Sobey
- NGC4631 → talk by Krzysztof Chyzy

Commissioning Plan

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- get an overview of what needs to be done
  - made a start: list of steps to get RM-Cubes with limited calibration and field of view.
- streamline the commissioning process:
  - show how the tasks interact.
  - targeted development of capabilities.
  - well defined tasks that can be carried out by a student and included in their thesis.
- students are expected to take over tasks

Commissioning Plan: Task Graph (Sept.)

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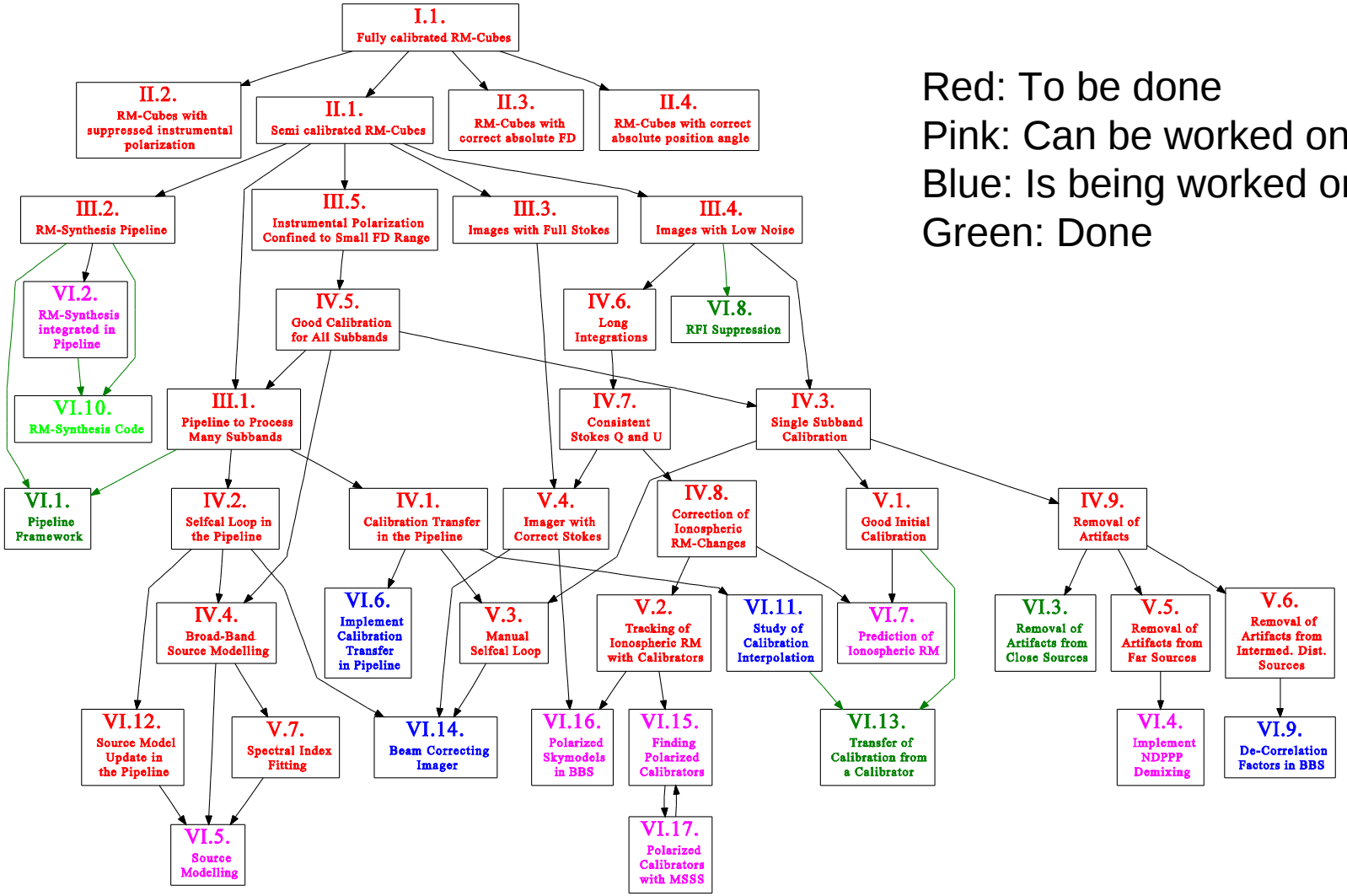

Red: To be done
Pink: Can be worked on
Blue: Is being worked on
Green: Done

Commissioning Plan: Task Graph (Nov.)

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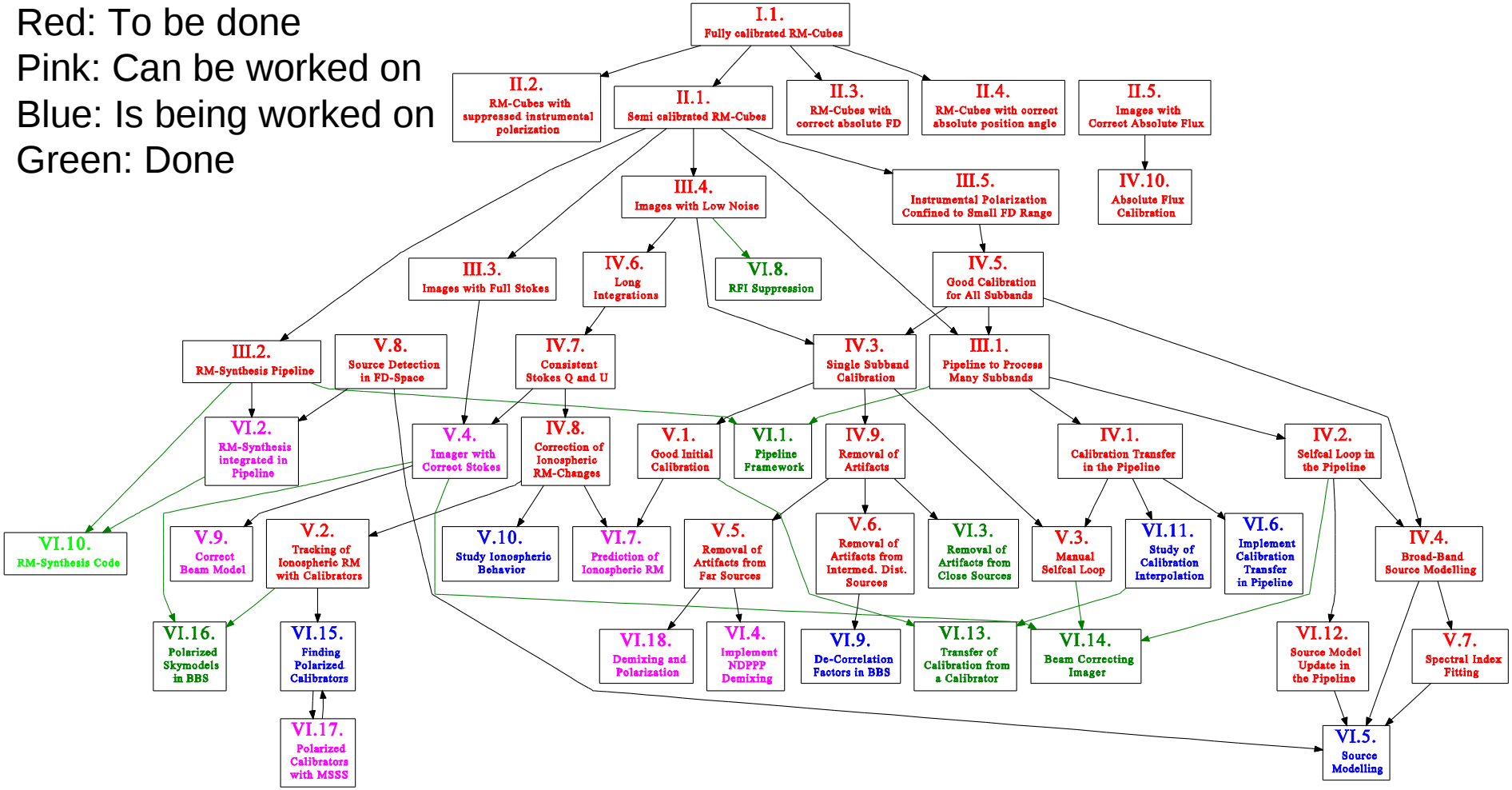
Red: To be done
Pink: Can be worked on
Blue: Is being worked on
Green: Done



Current Topics

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- transfer of calibration to different subbands and/or times
- prediction of Ionospheric RM
- get list of polarization calibrators
- study source modeling for polarization
- follow/study the update of the beam model
- new beam model
- include RM-Synthesis into the pipeline

Next Activities

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- continue working on commissioning tasks
- next busy week 23.-27. January 2012
  - focused on active commissioners
- compiling list of observations for students
  - need to write the proposals now
- help with MSSS
- next “general” busy week at end of MSSS?

Summary

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- made significant progress
  - first science results
  - commissioning plan
  - software
- need to stay concentrated
  - all students need to help with the commissioning
  - students need to concentrate on commissioning while working on a task
- be part of the community
  - take part in busy Wednesdays
  - report at Lofar Status Meetings

Personal Comments

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- Getting new data is (up to now) not a problem, processing (computing- and manpower) is more a problem.
  - If you need more commissioning data, ask me.
- Polarization that we see is real, but interpretation is difficult due to unclear calibration.
  - Especially for long observations.
- Don’t just work alone, keep us updated on your work and keep up-to-date on other peoples work.
  - As a minimum join the telecons!
- I’m not as unhappy about the process than other seem to be.
  - Progress might be slow, but there is progress!

Spare Slides

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PSR 0218: Beam-Correction

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- beam-correction increases signal from pulsar
- beam-correction does not fix wrong sign of RM
- little effect on instrumental polarization