



Max-Planck-Institut
für
Radioastronomie

Polarization Busy Week 23.-27. January 2012

Andreas Horneffer



Participants and Work Plan

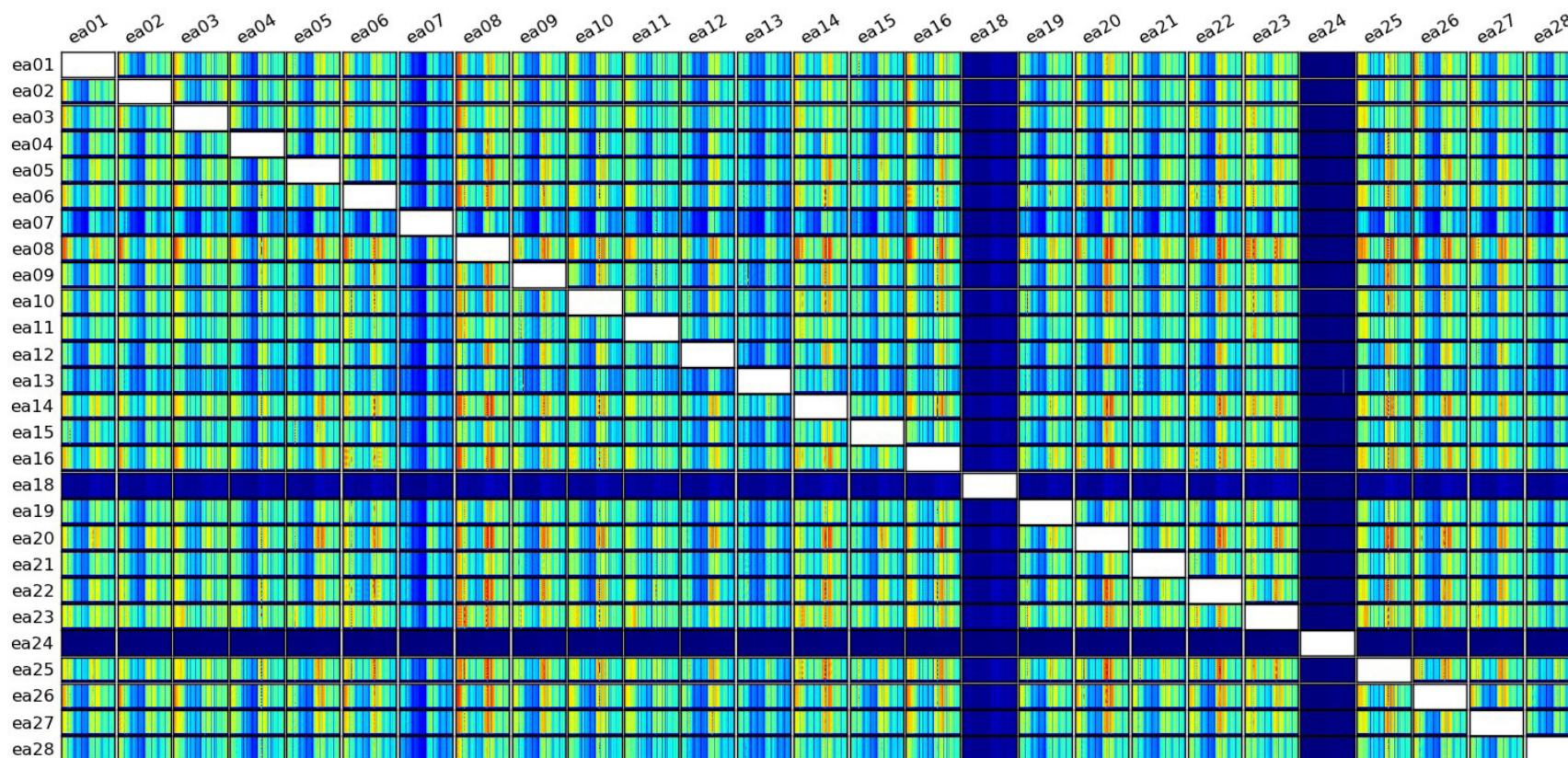
- Location:
ASTRON
- Date:
23.-27. 1. 2012
- 15 Participants
at ASTRON
- 3 remote

First Name	Last Name	Work Plans
Andreas	Horneffer	Beam-Model test
Emanuela	Orru	Sagecal
Charlotte	Sobey	Pulsars
Marco	Iacobelli	Fan-Region data
David	Mulcahy	Calib-interpol
Carlos	Sotomayor	MSSS
Anna	Scaife	Low-Dec data
Wojciech	Jurusik	NGC 4631
Rosita	Paladino	pyBDSM
Blazej	Nikiel-Wroczynski	Pulsar imaging
Robert	Drzazga	M81/M82
Arpad	Miskolczi	MS-Inspector
Masaya	Kuniyoshi	Pulsar Calibration
Roberto	Pizzo	RM-Synthesis tools test
George	Heald	MSSS
External		
Mike	Bell	RM-Synthesis Pipeline
Carl	Shneider	Simulations
Hendrik	Junelwitz	RM-Synthesis Pipeline



Arpad: MSInspector

- plots visibilities, for a quick overview of the data quality





David Mulcahy: Gain Interpolation

■ Motivation:

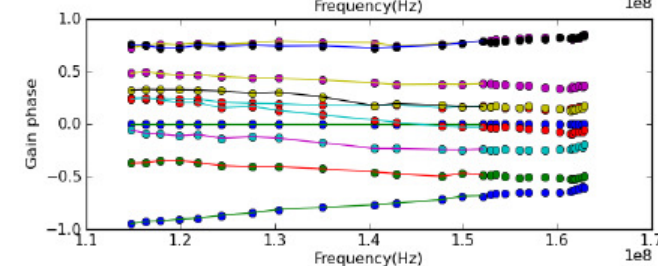
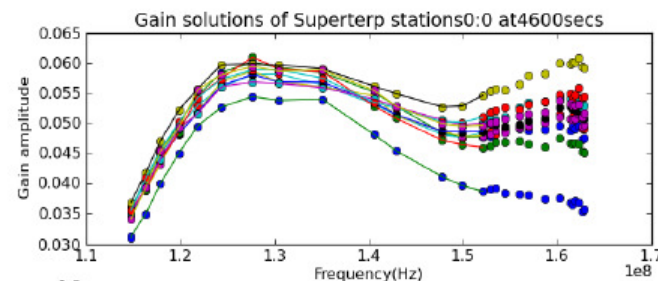
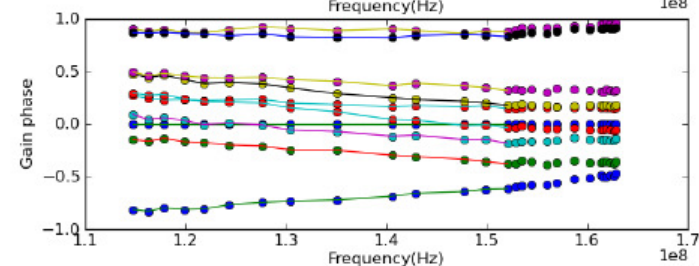
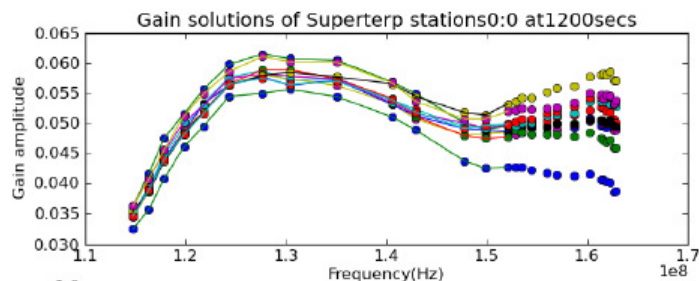
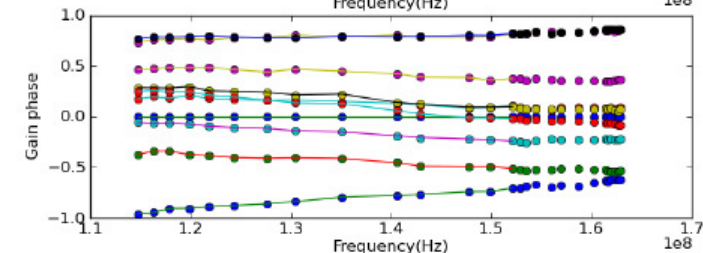
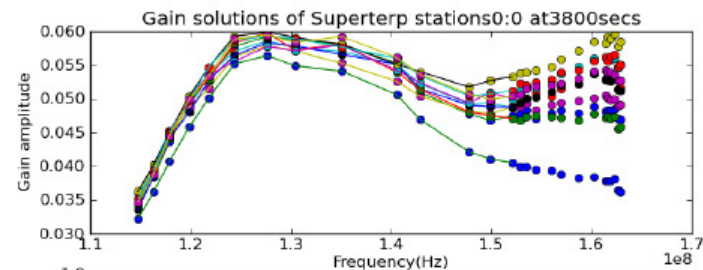
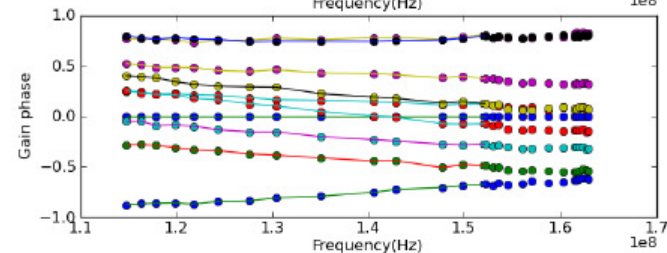
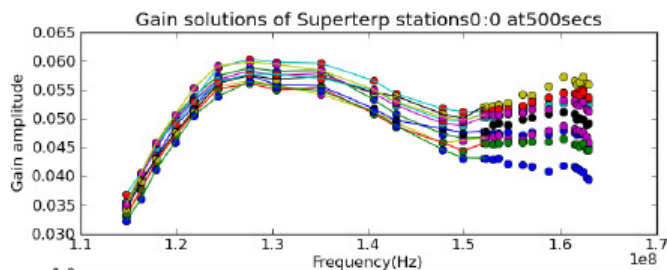
- Transfer of calibration solutions from a calibrator to a target works well.
- But one to one transfer “wastes” half the bandwidth.
- By interpolating the gains in frequency only a fraction of the bandwidth is needed for the calibrator.

■ Approach

- retrieve gains from calibrator instrument table
- interpolate them to target frequency
- generate new instrument table

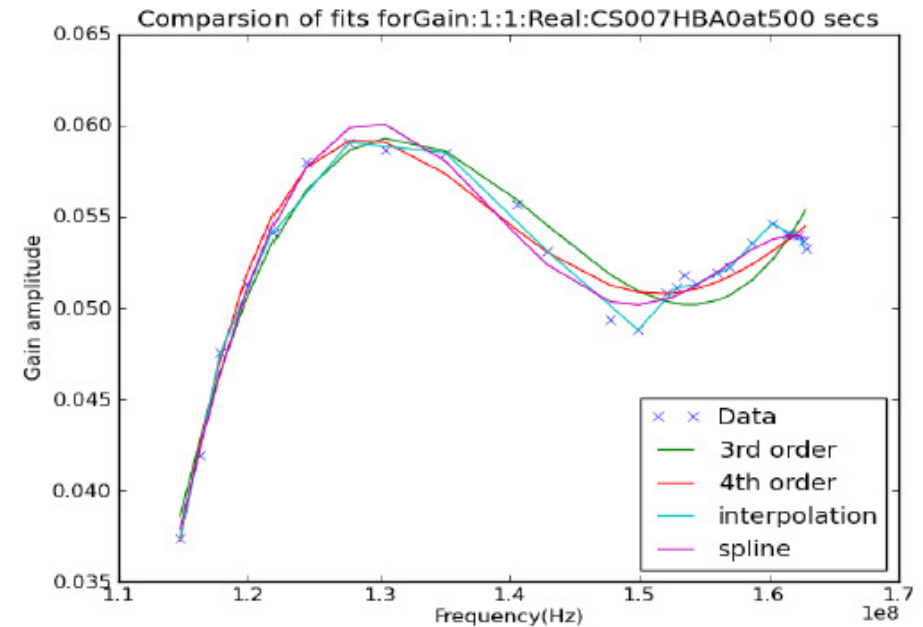
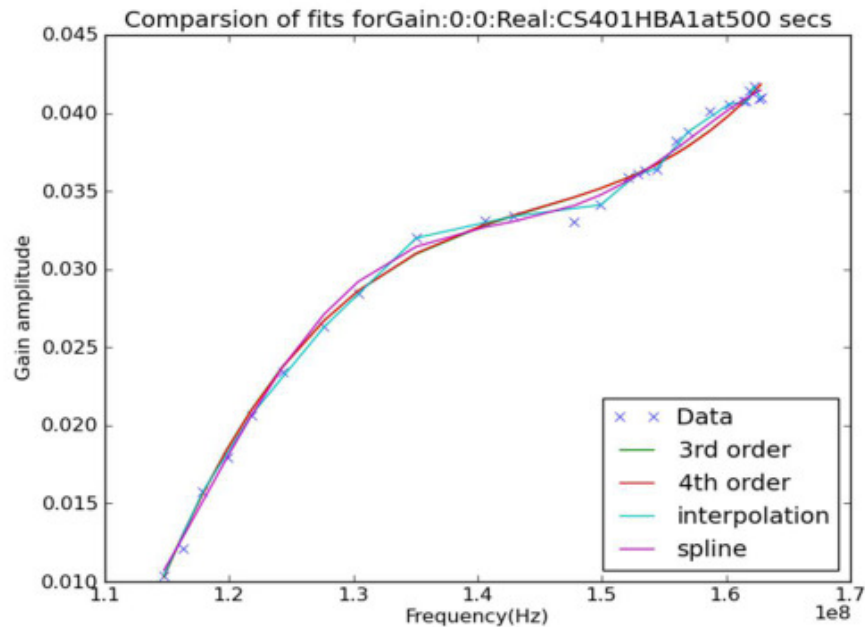


Gain Interpolation Calibrator Gains



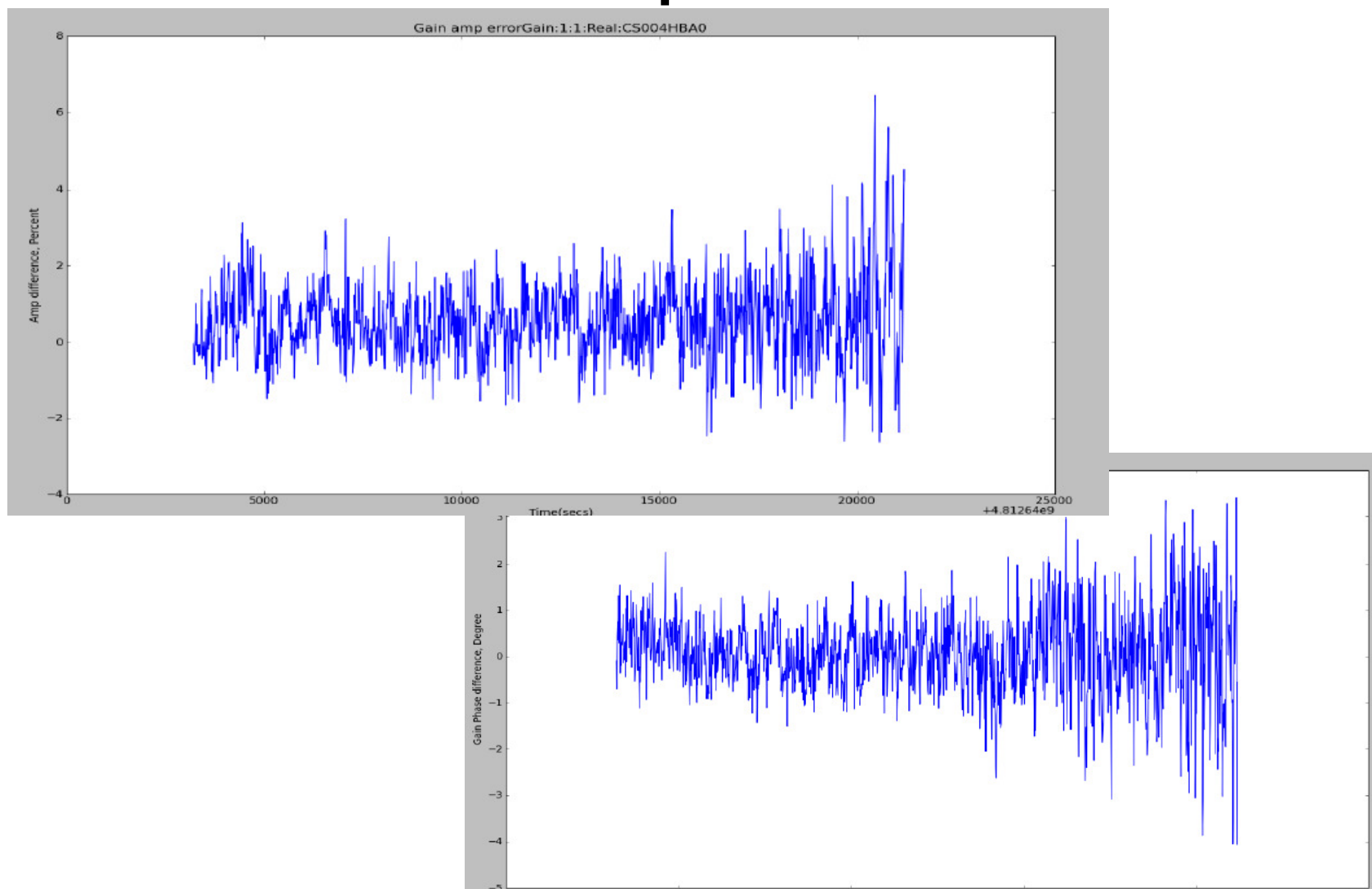


Gain Interpolation Interpolation Methods



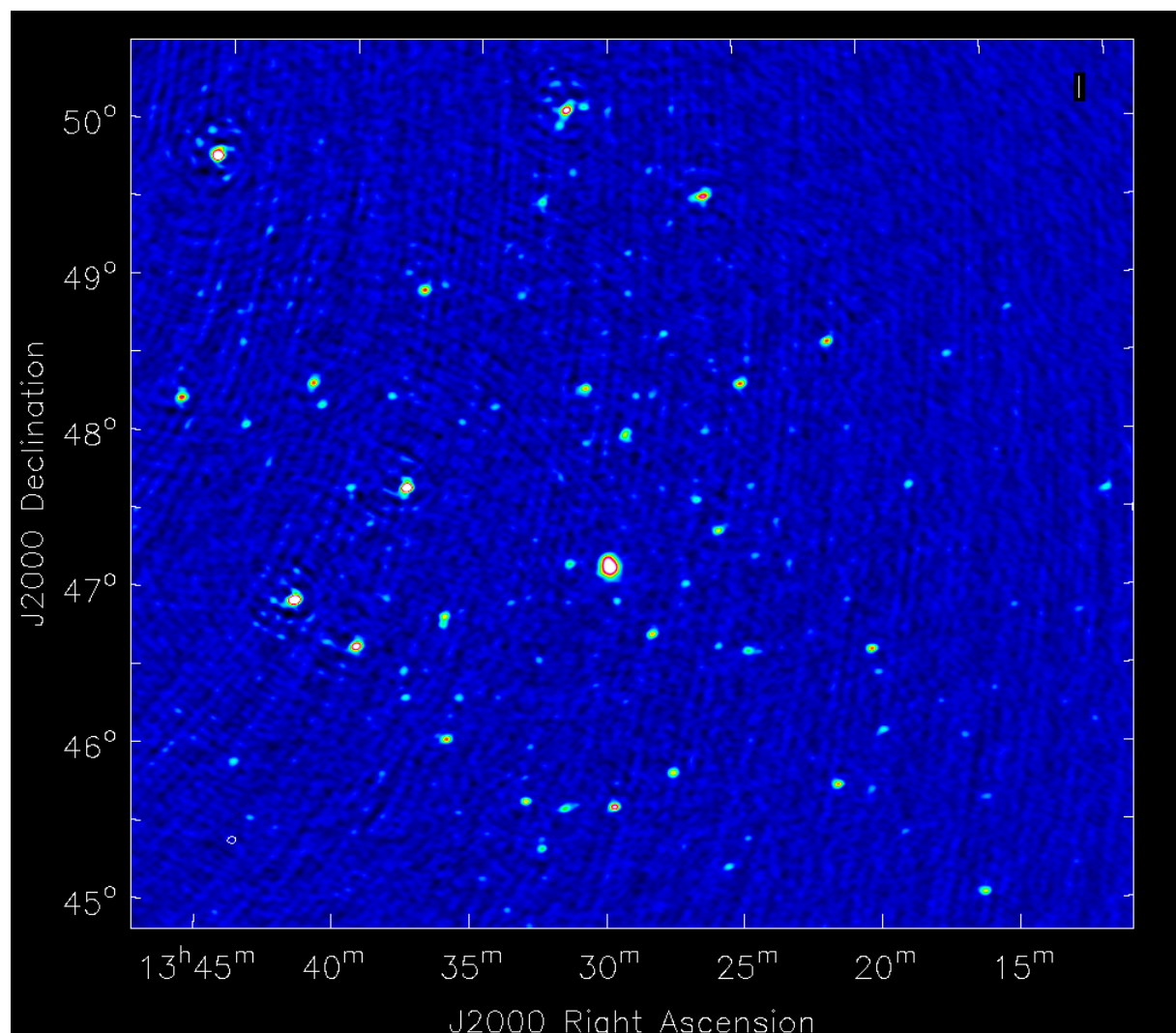


David Mulcahy: Gain Interpolation





Gain Interpolation: Result Image





Rosita Paladino: Finding Polarized Sources

- Tested PyBDSM, Pyse and Buildsky
- Pyse does not handle IQUV images at all.
- Buildsky can find sources in I, Q, U and V separately, but puts flux in I column.
- pyBDSM can find polarized flux to sources found in total power.
 - But sources modeled with multiple components get the same polarized flux for all components. (Polarized flux of one component is not subtracted from residual image.) E.g.:

format = Name, Type, Ra, Dec, I, Q, U, V,

s0, POINT, 13:31:07.656, +46.58.53.098, **4.304e+00**, **-3.542e+00**, **-1.174e+00**, -2.225e-06,

s1, POINT, 13:31:08.236, +46.58.56.357, **2.795e+00**, **-3.542e+00**, **-1.174e+00**, -2.225e-06,

- David Rafferty is working on updating pyBDSM



Marco Iacobelli: Fan Region

- New observation of the Fan region
- Check improvement of data quality
- Problems using new beam-model in development version of BBS. (BBS crashed)

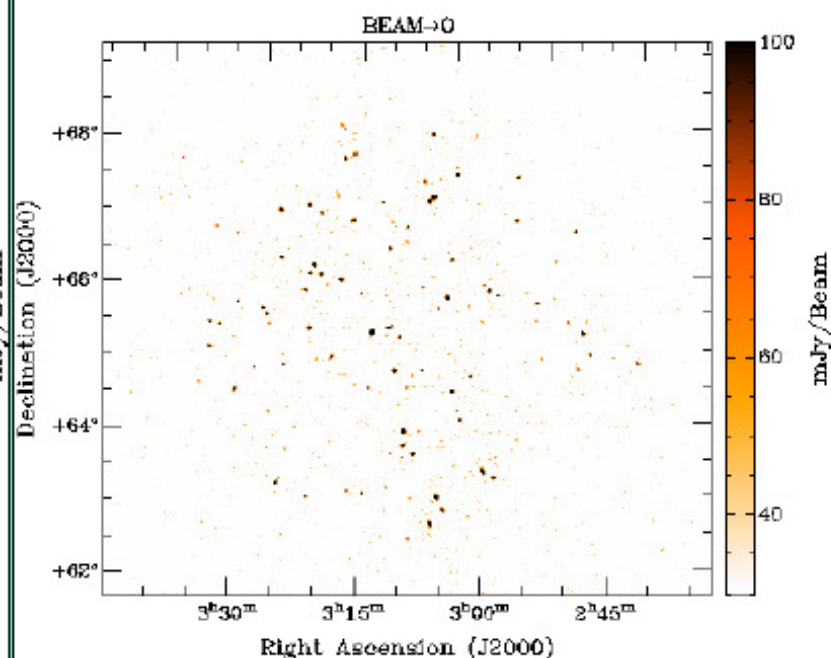
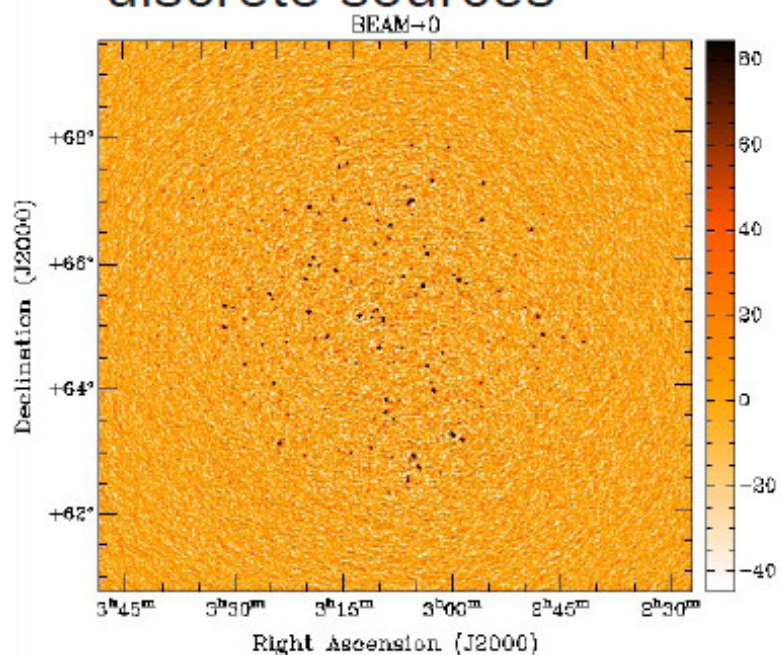
- Further goals:
 - Get a good reference RM-cube
 - Study ionosphere by comparing (correlating) RM-cubes to reference RM-cube



Marco Iacobelli: Fan Region

Stokes I only CS maps

Noise in this single SB is ~ 15 mJy/beam; slightly better than previous observation, but about a factor 50 above the expected (estimated) thermal noise (~ 0.3 mJy/beam) two extended features around discrete sources



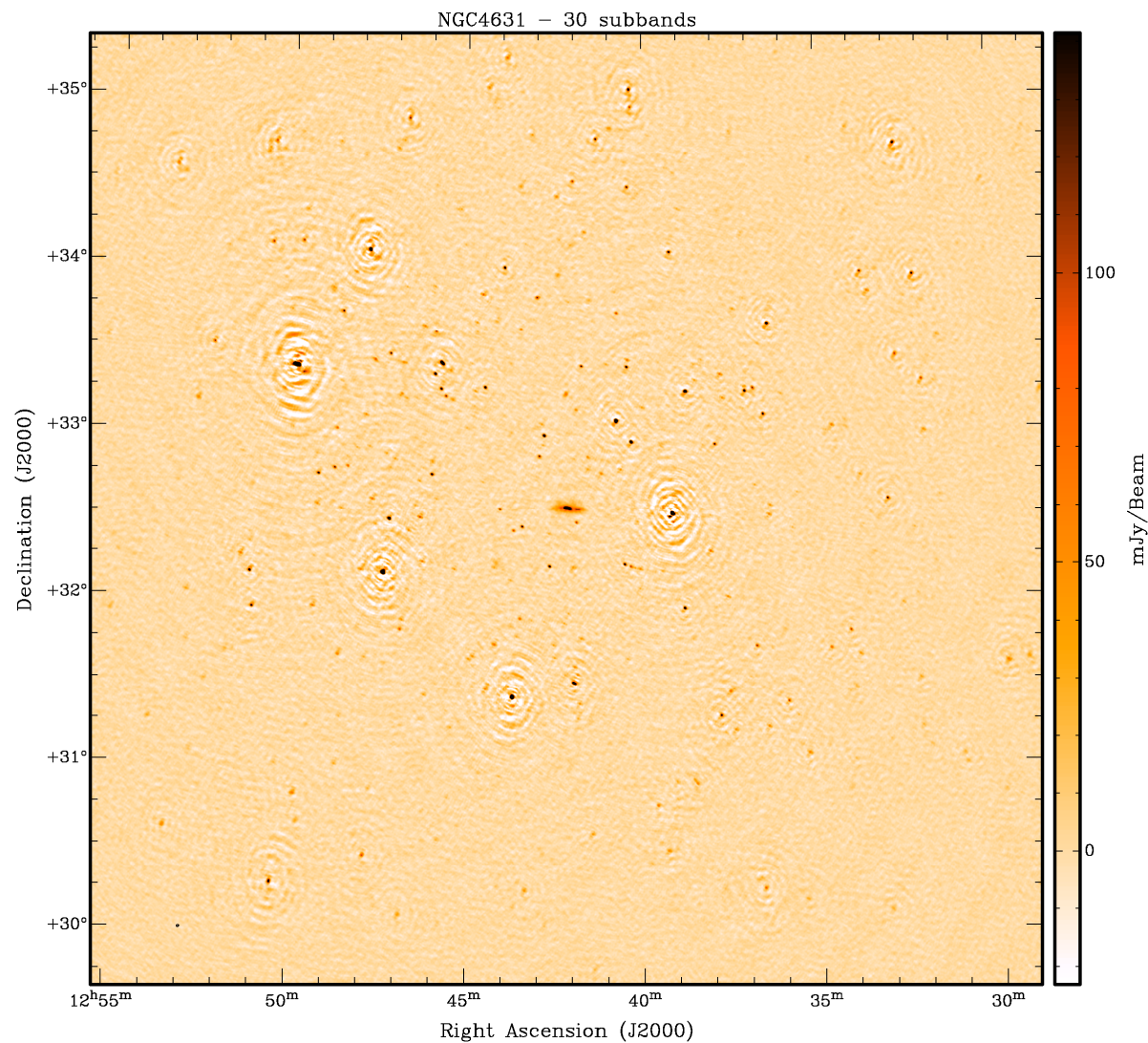


Wojciech Jurusik: NGC 4631

- continued working on data from last busy week
- now 30 subbands calibrated
- 3.5 mJy noise in combined map,
(4.5 mJy noise close to NGC 4631)

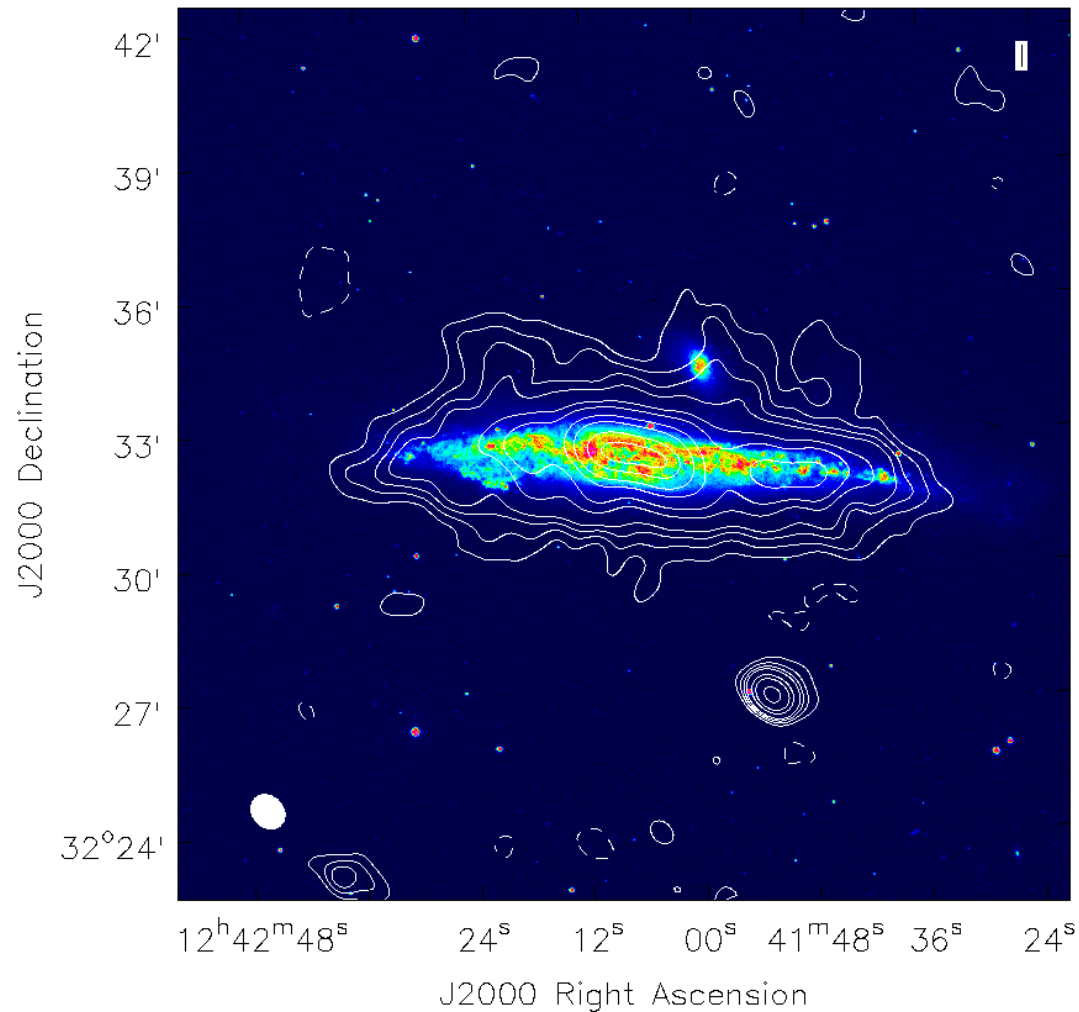


NGC 4631 Wide Field





NGC 4631: LOFAR Contours on DSS





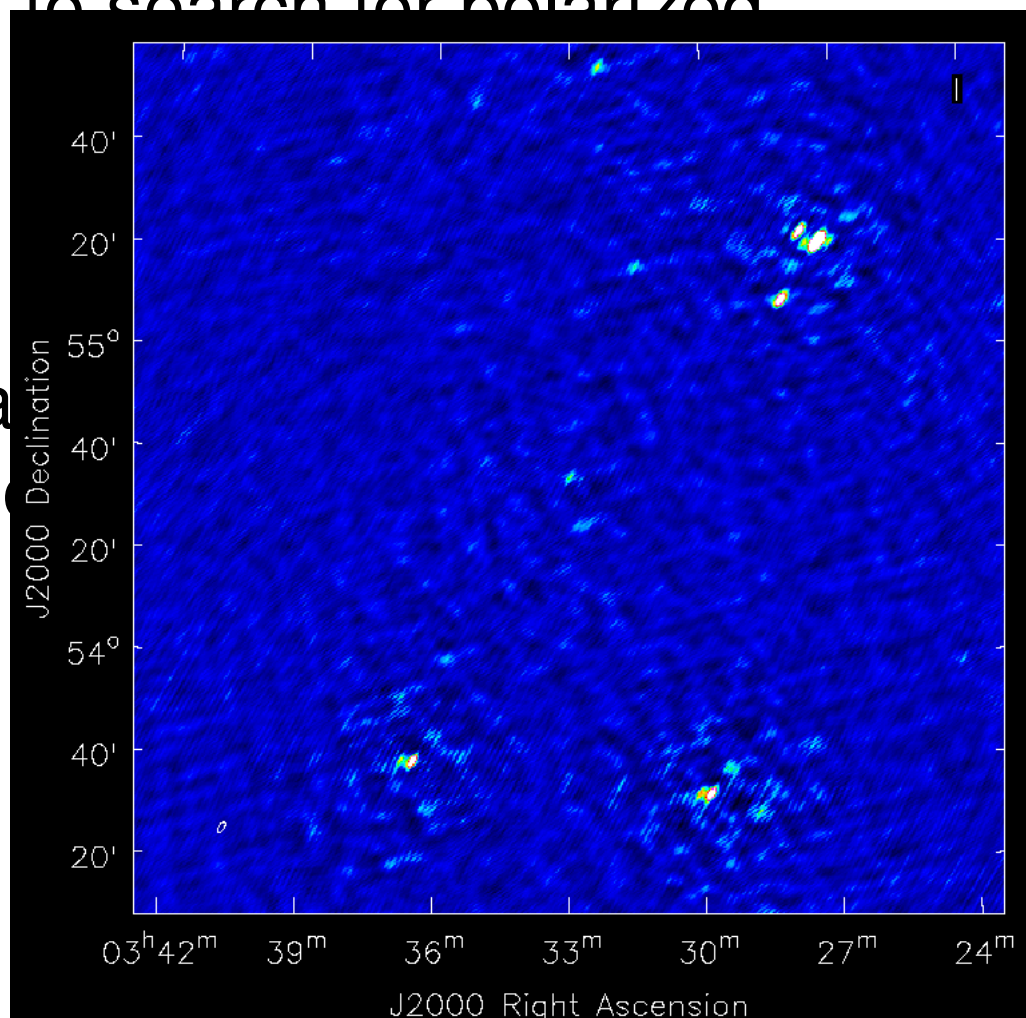
Blazej Nikiel-Wroczyński: Calibrator Search

-
- Imaging of pulsars to search for polarized calibrators.
 - Two observations: PSR B0329+54 and PSR B1929+10
 - First calibration was not too successful, the data needs to be demixed.



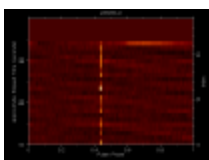
Blazej Nikiel-Wroczyński: Calibrator Search

- Imaging of pulsars to search for polarized calibrators.
- Two observations: PSR B1929+10
- First calibration was not possible because the signals needed to be demixed.

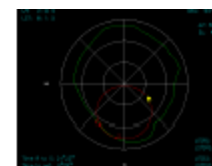




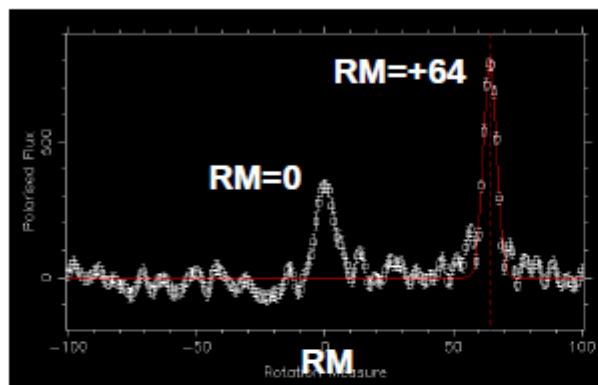
Masaya Kuniyoshi: Calibration of Pulsar data



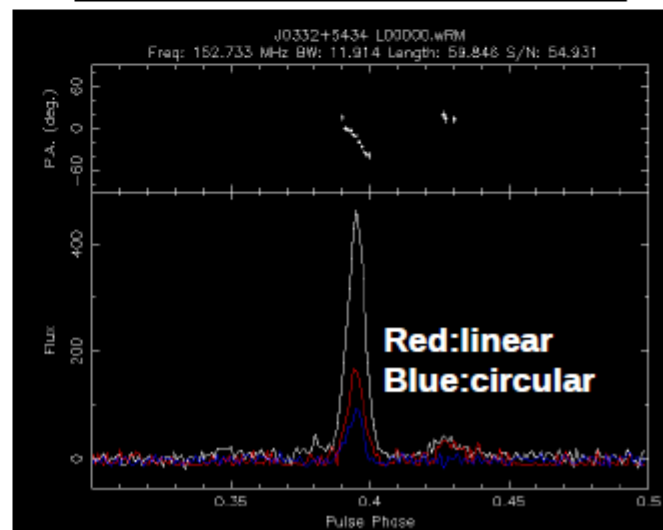
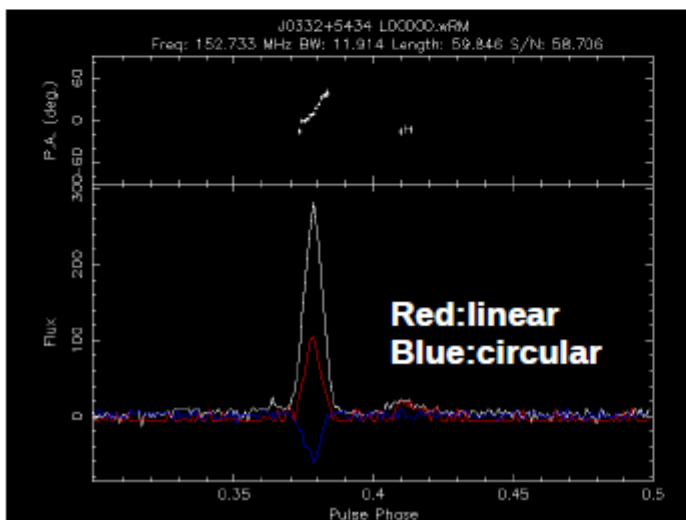
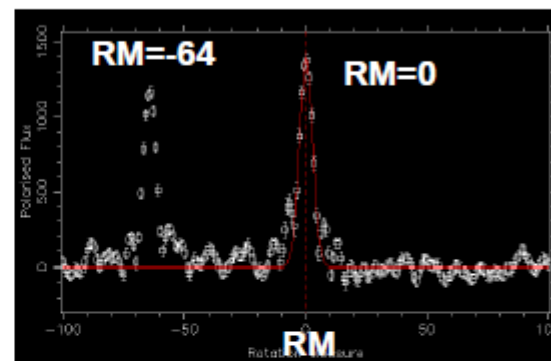
psr0329+54 (2011 12/15 02:00:01 UT)
Az=302 deg, EL=50 deg



Before E Jones calibration



After E Jones calibration





Other Work

-
- Charlotte studied single pulses in PSR B0823+06, which was caught “switching on”.
 - Robert continued working M81 data
 - Anna studied our low-declination data and helped with MSSS
 - Carlos studied gain variability of MSSS calibrator sources.
 - Manu tested using sagecal.
 - Roberto, Manu and Marco compared different RM-Synthesis programs
 - Mike and Henrik worked on getting our RM-Synthesis software onto the cluster
 - and I tested the new beam model → Busy Thursday