Calibration approach for LBA data

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Introduction

Data set ID: L60216

Setup:

Observed from: 23.06.2012/17:00:00.5 to 24.06.2012/00:59:58.5 (UTC) – 8 hours.

240 sub-bands; a calibrator pointing and 3 targets

40 SB on the calibrator 3C295, continous coverage 55 – 63 MHz

Target 1: VLSS J1431.8+1331
40 SB continous coverage 55 – 63 MHz

Target 2: VLSS J1515.1+0424, Abell 2048
40 SB continous coverage 55 – 63 MHz
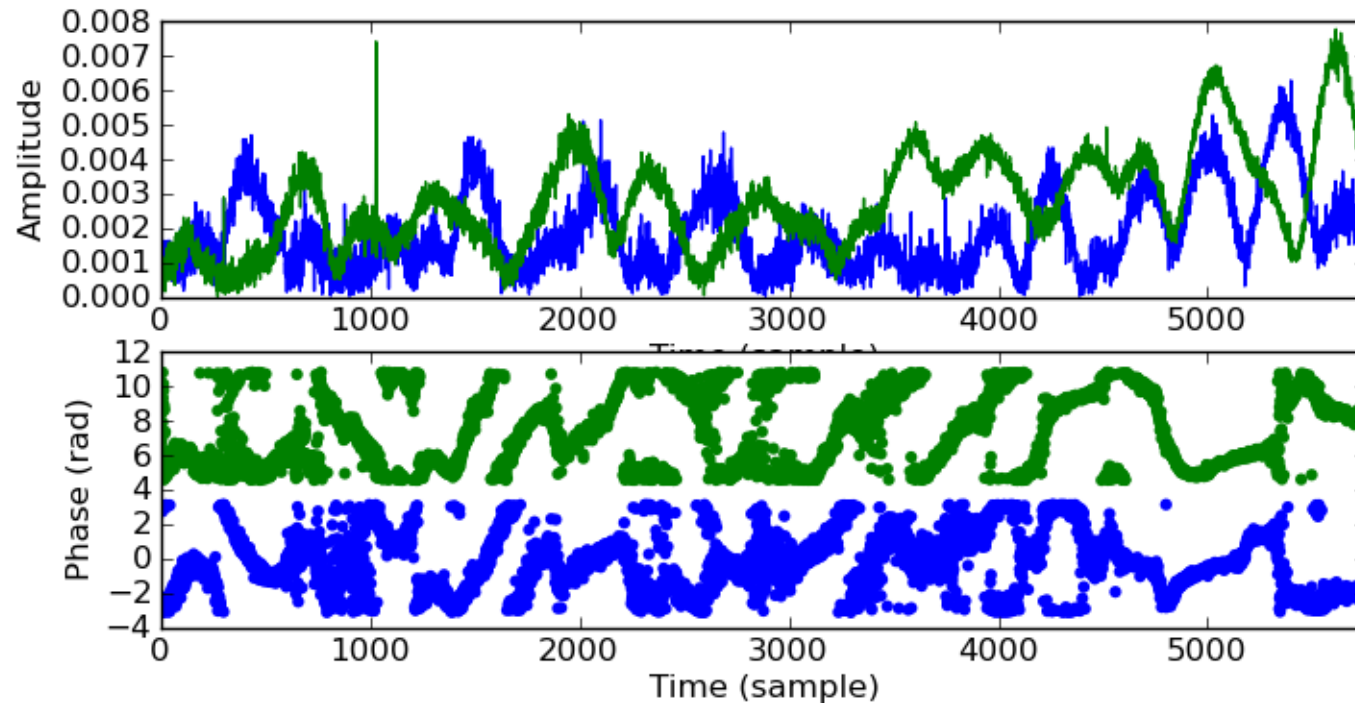
Target 3: NGC 6269
40 SB continous coverage 55 – 63 MHz

3C295
80 SB non – continous coverage: 30 – 55 MHz

(needed for clock/TEC separation, to be done in the future).

Pre-processing

Demixing for CasA, Cyg A and Vir A, averaging down to
4 channels per SB keeping the time resolution (~ 1 sec)

Cas A
+
Cyg A

on

CS002

Issues: processing speed a bottleneck: ~ 2 days per SB
parallel processing helps

Spotted a problem when demixing on few SB,
caused by the propagation of solutions, solved by GvD, Joris.

Processing

Strategy adapted from presentation by Reinout van Weeren on BW14 (Munich):
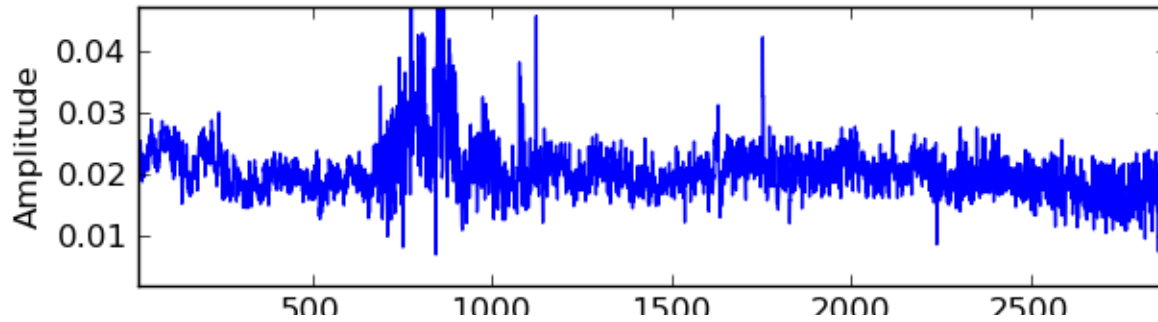
Process a calibrator SB:

Flag raw DATA and international stations, average(1 chan 5 sec), take out beam, convert to circular polarization(deals with Farraday rotation, better solutions), solve (Gain:0:0:*, Gain:1:1:*), correct solutions (set phase to 0).

Process corresponding target SB:

Flag raw DATA, average(1 chan 5 sec), transfer solutions from calibrator SB, apply
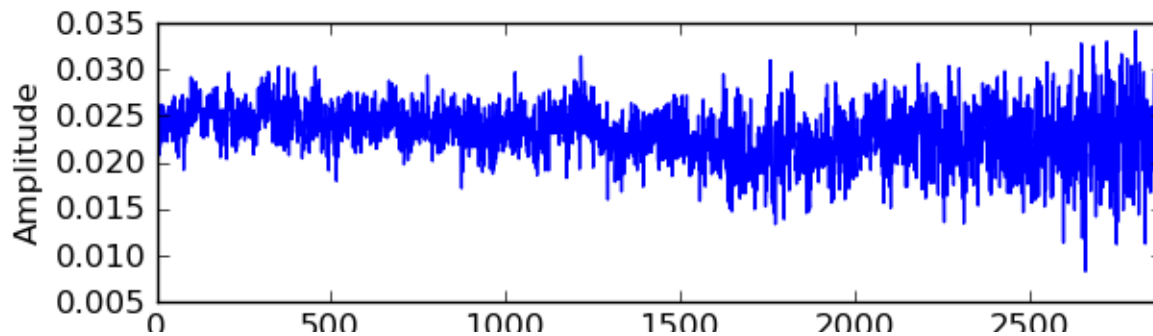amplitude solutions.

Concatenate (10) SBs, calibrate (Gain:0:0:Phase:*, Gain:1:1:Phase:*, solve mode PHASE).
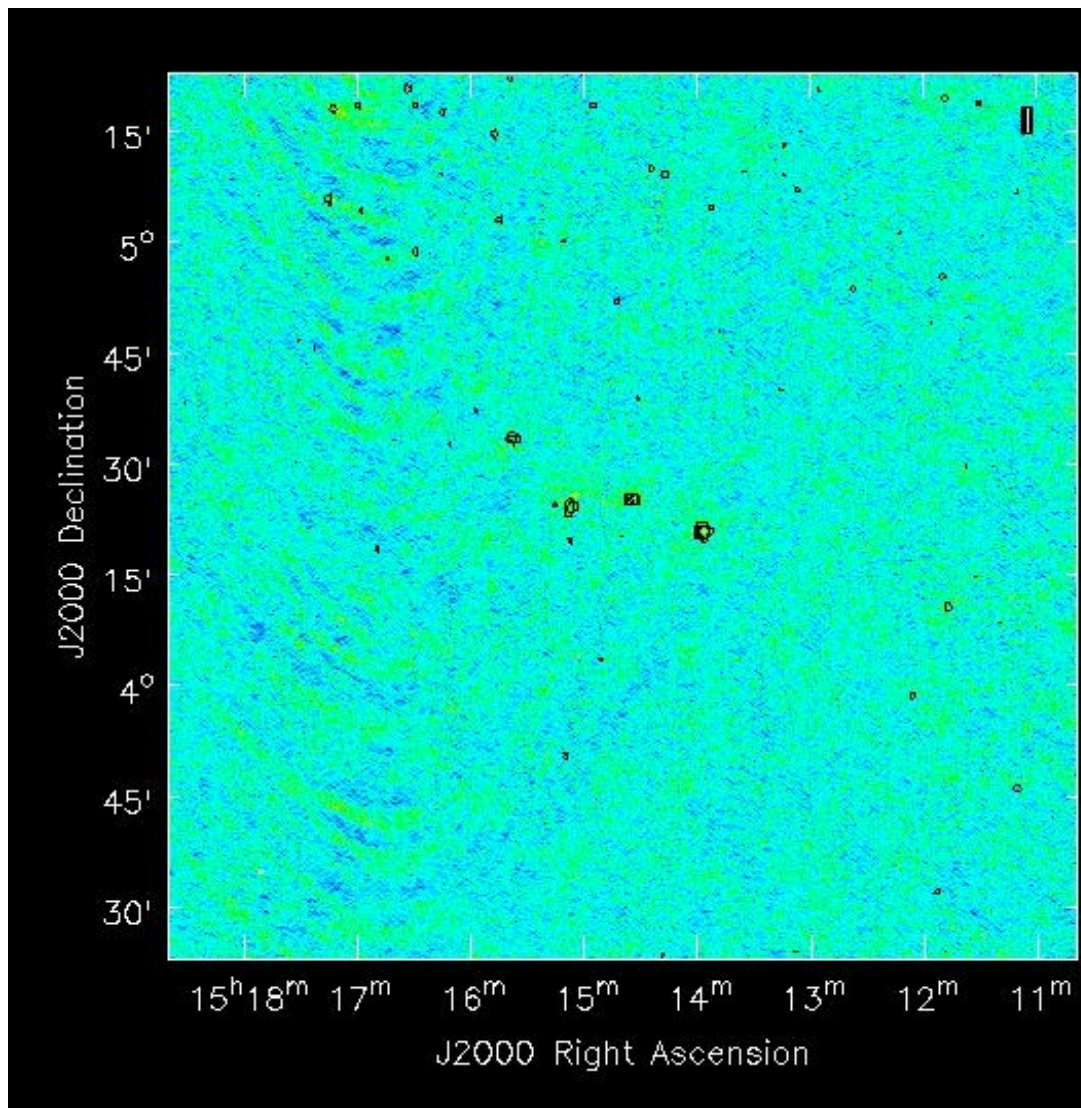Clip CORRECTED_DATA, average (time only, 10 sec), image and clean with CASA.

Solutions

Calibrator (3C295) solutions

Not converted to circular pol. before solving

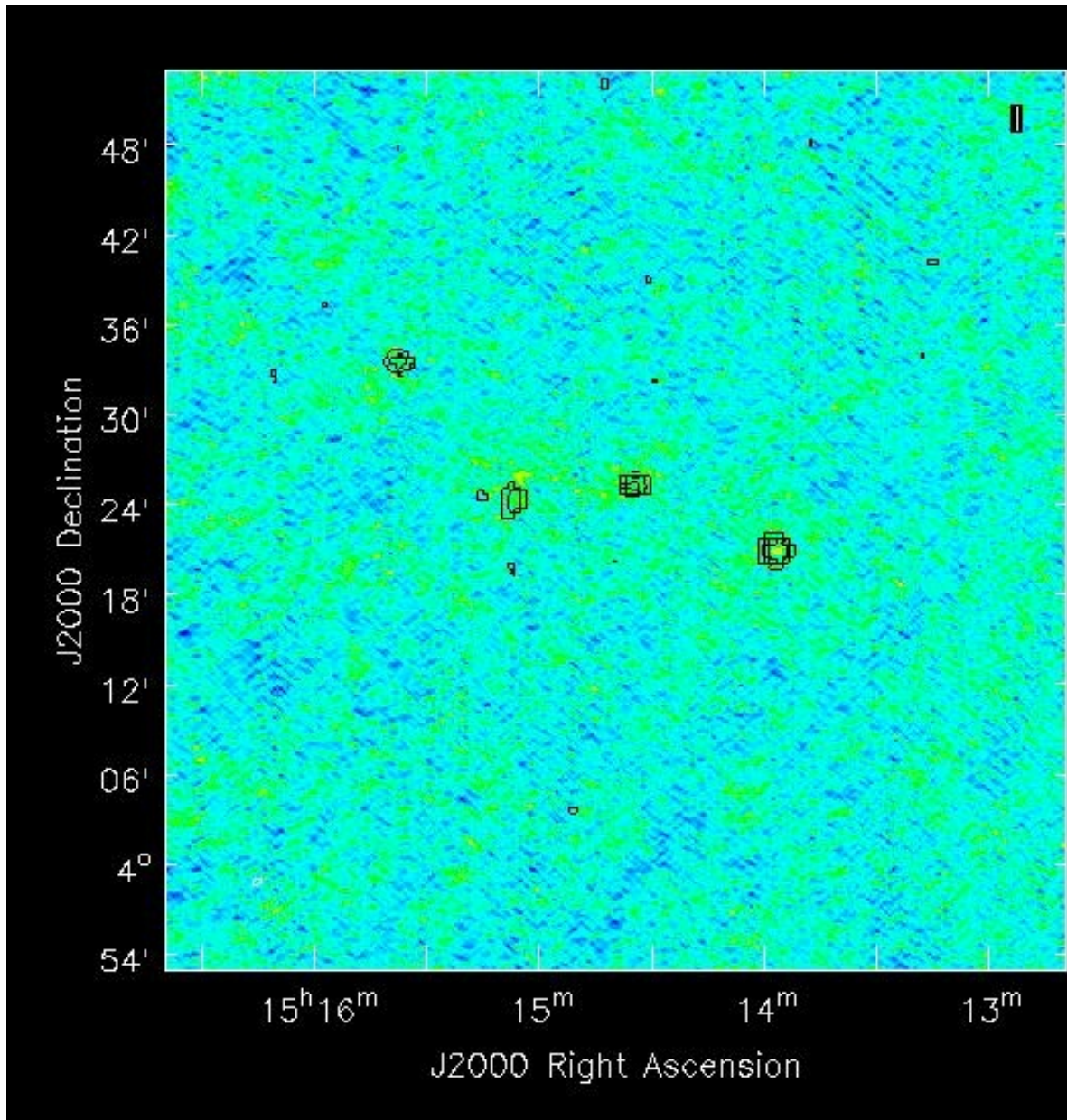**Converted to circular pol. before solving**

First Results

1 SB of A2048 @ 61 MHz

VLSS model, 8 deg across

Target detected,
noise 113 mJy/beam
35 x 22 arcsec beam.

3C 317 is a nuisance
Catalogued at 160 Jy @ 60 MHz

We pick up 43 Jy in 1SB

First Results

Zoom in on A2048 with
 VLSS contour overlay

To do:

Image 4 x 10 SBs

Repeat for other 2
targets

Do the clock/TEC
separation, ionospheric
screen using rest of
calibrator SBs.