

# MA008 Correlation Report

## General

- Session info: <http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/>
- Station feedback: [http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/sessions/apr17/feedback\\_apr17.asc](http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/sessions/apr17/feedback_apr17.asc)
- ALMA QA2: 2016.1.01216.V
- This experiment has ALMA with 32x62.5MHz, VLBA with 2x128MHz channels, and most of the EVN with 1x512MHz channels.
- Two EVN stations (Yebeas, Pico Veleta) observed in an incorrect backend mode, with a 32 MHz polyphase filterbank. Due to the issue at Yebeas and Pico, three correlations were performed:
  - a) standard ALMA correlation setup (58 MHz bands)
  - b) narrower band correlation setup (32 MHz bands)
  - c) emulated standard ALMA correlation setup (58 MHz bands), accomplished via a mixed-bandwidth correlation with additional postprocessing of all baselines to Yebeas and Pico Veleta to reconstruct 58 MHz bands
- The FITS files are delivered in two variants due to the problems with Pico and Yebeas that were outlined above:
  - **ma008.fits**: Standard correlation (a). Although visibility data contains Pico and Yebeas .
  - **ma008\_merged.fits**: Special correlation with post-processing (c). The Yebeas and Pico 32 MHz bands were correlated as narrower bands that covered ALMA target 58 MHz bands, and these narrower bands were then combined post-correlation to form the desired 58MHz output bands. Notes: Scan No0030 is too short. It was only partially processed earlier at correlation time. Unfortunately this scan could not be re-correlated due to a computing cluster issue that caused widespread data loss of station recordings from multiple experiments. Apart of scan No0030 the other scans are complete.

## Status

| What  | Date                               |
|---|------------------------------------|
| Correlation of 58 MHz sub-bands finished  | 9.8.2017                           |
| Conversion to HOPS  | 9.8.2017                           |
| Fourfit fringe fitting  | 9.8.2017                           |
| Correlation of 32 MHz and mixed sub-bands finished  | 20.8.2017                          |
| Conversion to FITS with -u (union) option   | 4.9.2017                           |
| PCList check  | 4.9.2017                           |
| aedit plots, alist v6 residual rate and delay plots   | 4.9.2017                           |
| re-run polconvert with latest QA2 solutions (pc2)   | 9.11.2017                          |
| Material sent to PI   | (pending final ALMA QA2 solutions) |
| re-run with fixed difx2difx.py converter (fix autocorr glitches), re-run latest polconvert with final QA2 solutions | 14.1.2018                          |
| package for PI  | 18.1.2018                          |

## Fringes

| Station | Code | Fringes | Plots | Comments   |
|---------|------|---------|-------|--|
| AA      | A    | yes     |       |  |
| Br      | b    | yes     |       |  |
| Fd      | f    | yes     |       |  |
| Kp      | k    | yes     |       |  |
| La      | l    | yes     |       |  |
| Mk      | m    | no      |       | wide fringe search but no fringes found                                    |
| NI      | n    | yes     |       |  |
| Ov      | o    | no      |       |  |
| Pt      | p    | poor    |       |  |
| Ef      | E    | yes     |       | Effelsberg DBBC2   |
| Eb      | B    | yes     |       | Effelsberg RDBE  |
| On      | X    | yes     |       |  |
| Ys      | Y    | yes     |       | polyphase FB mode, fringes in 32 MHz and reconstructed 58 MHz correlations |
| Pv      | P    | yes     |       | polyphase FB mode, fringes in 32 MHz and reconstructed 58 MHz correlations |
| Mh      | Z    | no      |       | faulty configuration   |

Fringe plots: 58 MHz correlation (c) plots, plotted with Effelsberg as reference ([No0028 Effelsberg PDF](#)), Pico ([No0011 Pico PDF](#)), ALMA ([No0028 ALMA PDF](#)), VLBA Fd ([No0060 VLBA-FD PDF](#))

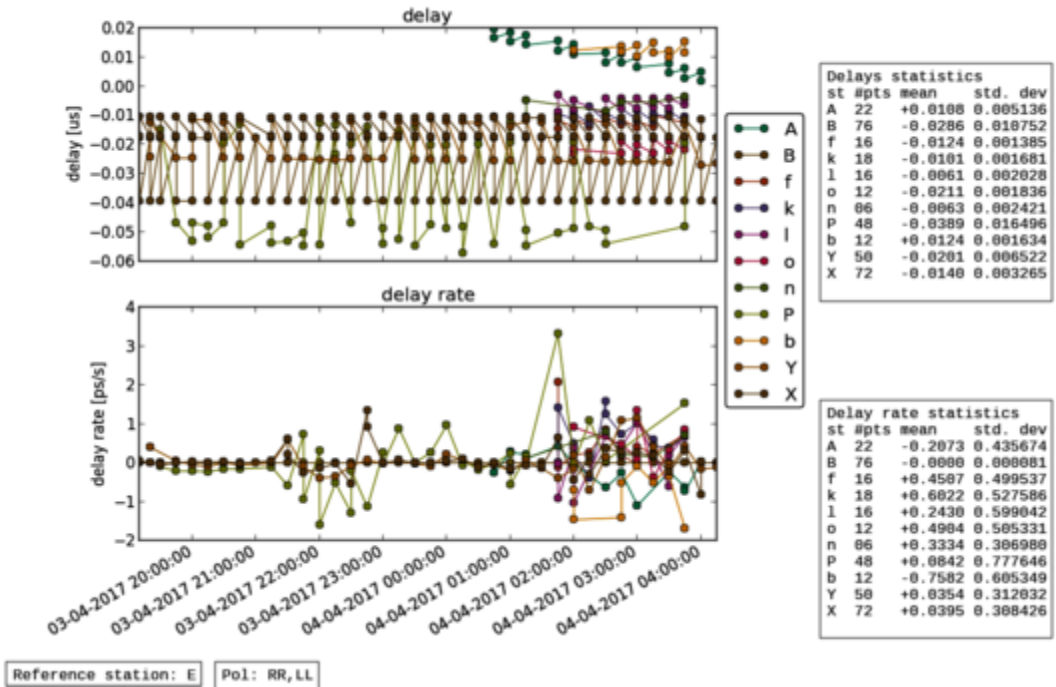
## Notes

- In case (c) the additional processing consisted of, first, correlation with 58 MHz bands and several narrower bands that fitted the Pico/Yebes recorded bands (e.g., 32 MHz, 24 MHz, 2 MHz and similar), secondly, after correlation passing the visibility data through a post-processing script to form 58 MHz bands on the affected baselines using the narrow bands (i.e., combining visibilities in frequency domain from 32 + 24 + 2 MHz bands), thirdly, spectrally averaging inside the 58 MHz bands from 3712 channels per band to the final goal of 116 channels per band that matches the originally intended correlation mode.
- Yebes began recording 20 seconds late in every scan

## Post-Correlation checks

### Residuals

reference E (Effelsberg), pols RR and LL



### FITS completeness (plist)

Legend:

- o: station is included in the FITS-file (data is complete)
- x: expected station is missing in the FITS-file
- number: percentage of job time in the FITS-file compared to expected time.

|          | EF     | EB    | ON      | YS | PV | MH | AA | NL | FD | PT | LA | KP | OV | BR | MK |
|----------|--------|-------|---------|----|----|----|----|----|----|----|----|----|----|----|----|
| ma008_01 | No0001 | 3C273 | 3mm_ddc | o  | o  | o  | o  | o  | 93 | .  | .  | .  | .  | .  | .  |
| ma008_02 | No0002 | 3C273 | 3mm_ddc | o  | o  | o  | 93 | o  | 93 | .  | .  | .  | .  | .  | .  |
| ma008_03 | No0003 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_04 | No0004 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_05 | No0005 | 3C273 | 3mm_ddc | o  | o  | 51 | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_06 | No0006 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_07 | No0007 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 40 | .  | .  | .  | .  | .  | .  |
| ma008_08 | No0008 | 3C273 | 3mm_ddc | o  | o  | o  | 95 | o  | 95 | .  | .  | .  | .  | .  | .  |
| ma008_09 | No0009 | 3C279 | 3mm_ddc | o  | o  | o  | 95 | o  | 95 | .  | .  | .  | .  | .  | .  |
| ma008_10 | No0010 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_11 | No0011 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_12 | No0012 | 3C273 | 3mm_ddc | o  | o  | o  | o  | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_13 | No0013 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_14 | No0014 | 3C273 | 3mm_ddc | o  | o  | o  | 95 | o  | 95 | .  | .  | .  | .  | .  | .  |
| ma008_15 | No0015 | 3C279 | 3mm_ddc | o  | o  | o  | 95 | o  | 95 | .  | .  | .  | .  | .  | .  |
| ma008_16 | No0016 | 3C273 | 3mm_ddc | o  | o  | o  | o  | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_17 | No0017 | 3C273 | 3mm_ddc | o  | o  | o  | 25 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_18 | No0018 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |
| ma008_19 | No0019 | 3C273 | 3mm_ddc | o  | o  | o  | 96 | o  | 96 | .  | .  | .  | .  | .  | .  |



ma008\_70 No0070 3C279 3mm\_ddc . . . . . o o o o o o o o  
ma008\_71 No0071 3C273 3mm\_ddc . . . . . o o o o o o o o  
ma008\_72 No0072 3C273 3mm\_ddc . . . . . o o o o o o o o  
ma008\_73 No0073 3C273 3mm\_ddc . . . . . o o o o o o o o