

MB007 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
- ALMA QA2: 2016.1.00413.V used for polarization conversion (files are included in the data export folder)
- This experiment has ALMA with 32x62.5MHz, VLBA with 2x128MHz channels, and most of the EVN with a 1x512MHz channel
- Two EVN stations (Yebees, Pico Veleta) observed in an incorrect backend mode, with a 32 MHz polyphase filterbank.
- Due to the issue at Yebees 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 Yebees and Pico Veleta to reconstruct 58 MHz bands
- The details of correlation run (c) are: the experiment was correlated with 58 MHz bands and several narrower bands that fitted the Pico/Yebees recorded bands (e.g., 32 MHz, 24 MHz, 2 MHz and similar). After correlation the visibility data were ran through a post-processing script in order to form 58 MHz bands from the narrow bands (i.e., combining visibilities in frequency domain from e.g. 32 + 24 + 2 MHz bands). This step included spectrally averaging inside the 58 MHz bands from a total of 3712 channels per band down to the final 116 channels per band that matched the originally intended correlation mode.
- The FITS files are delivered in two variants due to the problems with Pico and Yebees that were outlined above:
 - **mb007.fits**: Standard correlation (a)
 - **mb007_merged.fits**: Special correlation with post-processing (c)

Status

What	Date
Correlation 2nd round finished	19.8.2017
Conversion to HOPS	4.9.2017
Fourfit fringe fitting	4.9.2017
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
rerun polconvert	10.11.2017
Release to PI	14.11.2017
re-processing of correlation (c) to fix Pico polarization and a difx2difx postprocessing error affecting autocorrelations	14.1.2018
Re-release to PI	16.1.2018

Fringe search:

Station	Code	Fringes	Plots	Comments
AA	A	yes		
Gb	G	yes		
Br	b	yes		
Fd	f	yes		
Kp	k	yes		
La	l	yes		
Mk	m	yes		
NI	n	yes		
Ov	o	yes		
Pt	p	yes		
Ef	B	yes		Effelsberg DBBC2
Eb	E	yes		Effelsberg RDBE
Ys	Y	yes		fringes in 32 MHz correlation run, and in 58 MHz -emulated run
Pv	P	yes		fringes in 32 MHz correlation run, and in 58 MHz -emulated run

Fringes in e.g. scans No0023 and No0082 on ALMA baselines in 32 MHz correlation run ([No0023 PDF](#) all but GB and Mk in this scan; [No0082 PDF](#) with GB and Mk), likewise in 58 MHz correlation run ([No0023 DF](#), [No0082 PDF](#))

Notes:

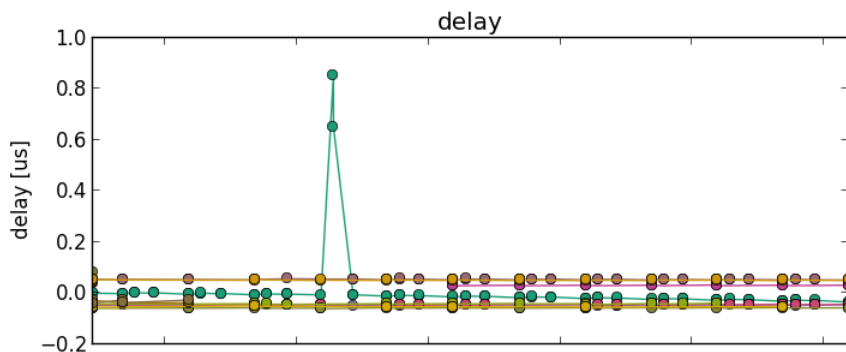
1. In case (c) the additional processing consisted of, first, correlation with 58 MHz bands and several narrower bands that fitted the Pico/Yebes recorded bands (e.g., 32 MHz, 24 MHz, 2 MHz and similar), secondly, after correlation passing the visibility data through a post-processing script to form 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.
2. Yebes began recording 20 seconds late in every scan

Post-Correlation checks

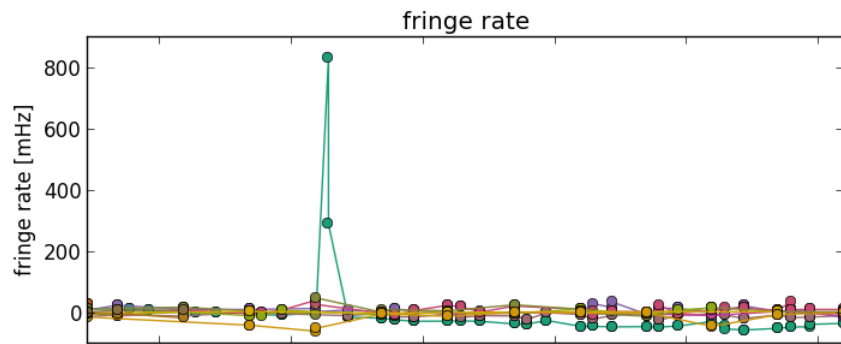
Residuals

reference G (GBT) pols RR and LL

Notes:



Delays statistics			
st	#pts	mean	std. dev
A	69	+0.0070	0.130494
B	02	+0.0672	0.013006
E	02	+0.0387	0.002128
f	55	+0.0526	0.001234
k	39	-0.0473	0.001365
m	14	+0.0293	0.001105
l	53	-0.0465	0.001063
o	24	-0.0594	0.001013
n	23	-0.0431	0.001141
p	12	-0.0544	0.001383
b	22	+0.0498	0.001026
Y	04	-0.0367	0.004183
P	05	-0.0329	0.005127

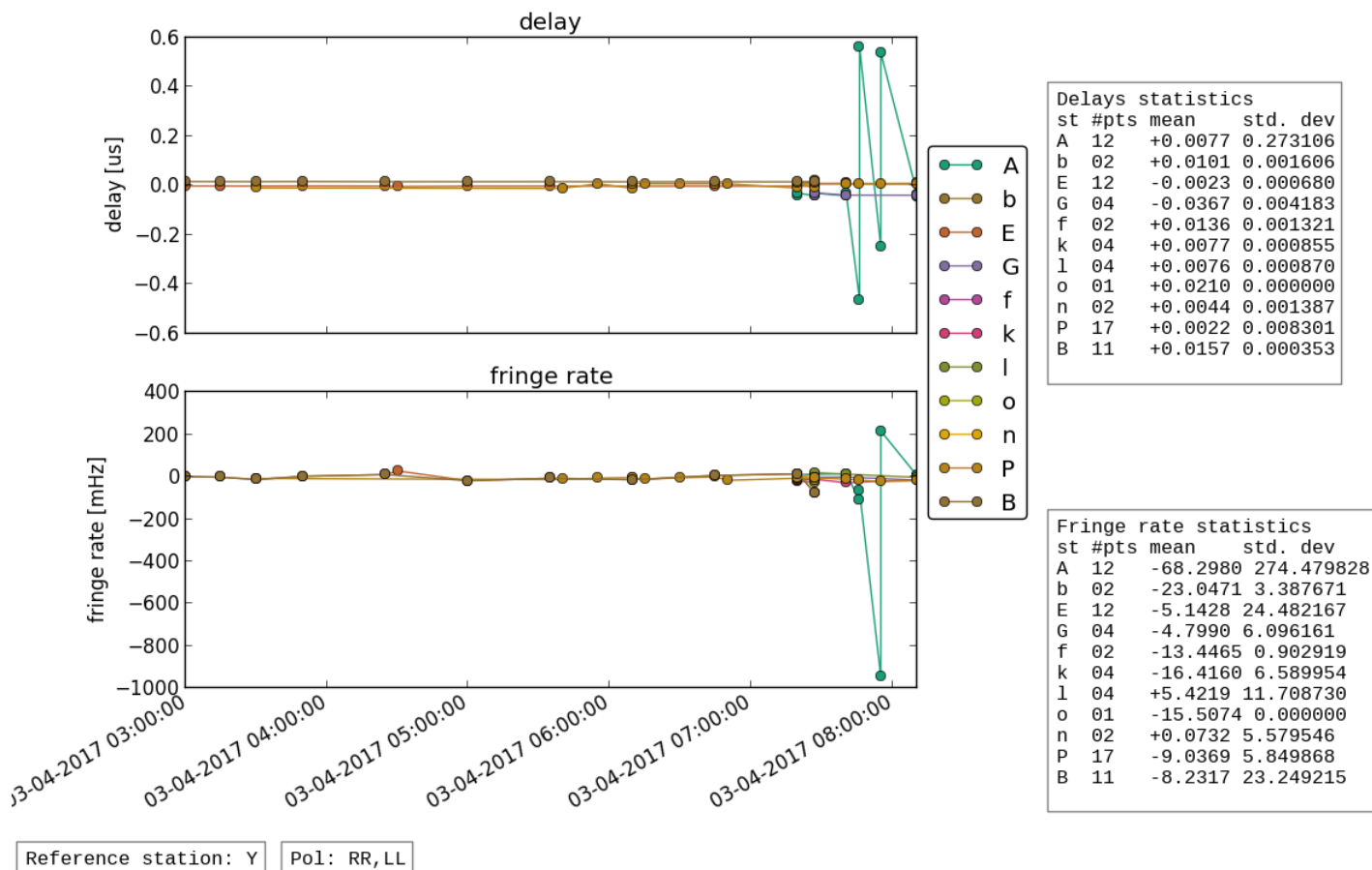


Fringe rate statistics			
st	#pts	mean	std. dev
A	69	-5.3517	110.495962
B	02	+30.2429	0.010509
E	02	+30.2770	0.010811
f	55	-8.1956	6.723552
k	39	+9.8624	10.476902
m	14	-1.4834	4.533072
l	53	+9.6552	11.014737
o	24	+10.9482	12.612372
n	23	+1.6139	8.094761
p	12	+3.2236	2.073630
b	22	-14.1161	20.037005
Y	04	-4.7990	6.096161
P	05	+7.2721	2.993229



Reference station: G | Pol: RR,LL

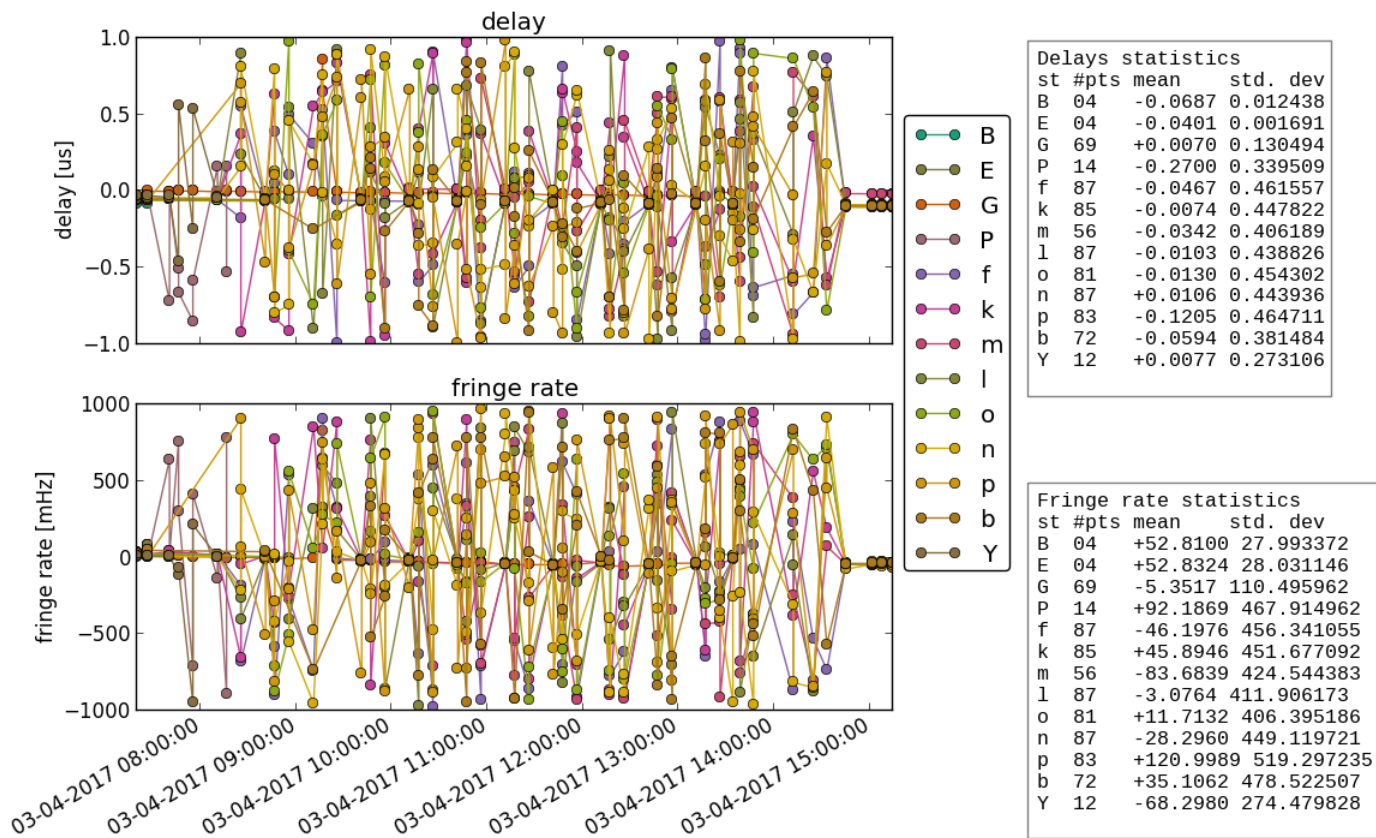
reference Y (Yebes), pols RR and LL

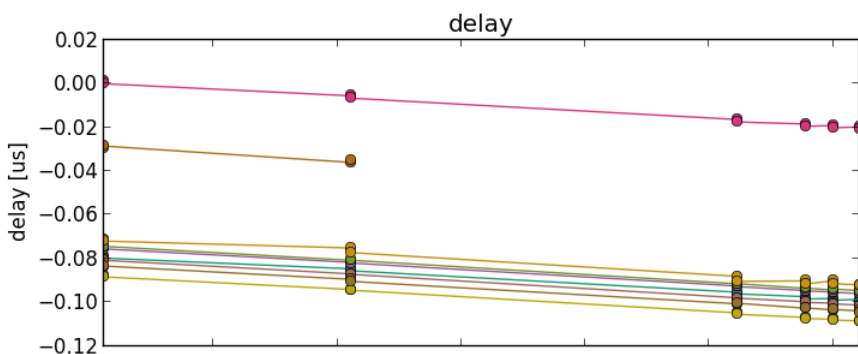


reference A (ALMA), pols RR and LL

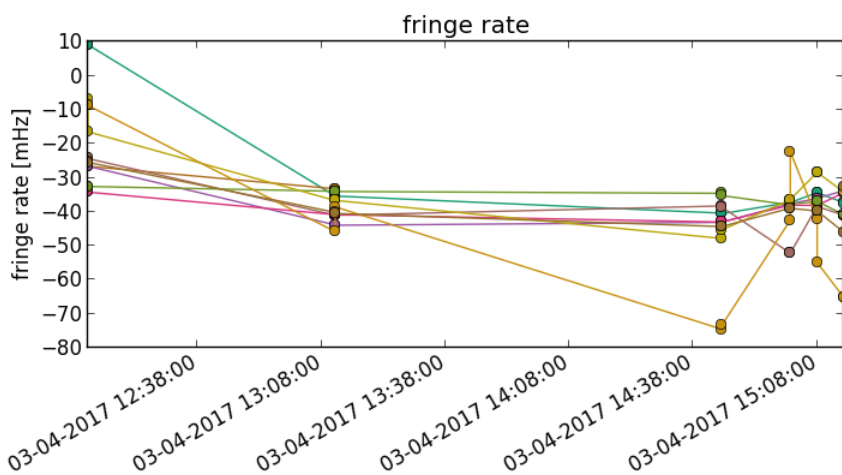
Note: Calibrator scans have stable delay and rate residuals scans have stable delay and rate residual. The large scatter happens on Sgr A only, and on long baselines (and not only with ALMA). This was verified in HOPS aedit.

all sources incl. Sgr A* (below)





Delays statistics			
st	#pts	mean	std. dev
b	12	-0.0927	0.007646
G	04	-0.0323	0.003263
f	12	-0.0947	0.007872
k	12	-0.0894	0.007856
m	12	-0.0136	0.007952
l	12	-0.0882	0.007775
o	12	-0.1019	0.007848
n	12	-0.0852	0.008124
p	12	-0.0975	0.007862



Fringe rate statistics			
st	#pts	mean	std. dev
b	12	-29.2542	17.299371
G	04	-29.9051	3.305022
f	12	-39.2087	8.139461
k	12	-36.8022	5.840886
m	12	-38.0626	3.182347
l	12	-36.1424	2.729285
o	12	-32.2800	10.898903
n	12	-45.1174	21.980082
p	12	-37.9959	6.521451

Reference station: A | Pol: RR,LL

FITS completeness (pclist)

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	YS	PV	AA	NL	FD	PT	LA	KP	OV	BR	GB	MK
mb007_01	No0001	1749+096	3mm_ddc	o	o	95	.	.	.	.	.	.	.	.	.	.	.
mb007_02	No0002	1749+096	3mm_ddc	o	o	o	.	.	.	.	.	.	.	.	.	.	.
mb007_03	No0003	NRA0530	3mm_ddc	o	o	88	o	.	.	.	.	.	.	.	.	.	.
mb007_04	No0004	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.
mb007_05	No0005	NRA0530	3mm_ddc	o	o	88	o	.	.	.	.	.	.	.	.	.	.
mb007_06	No0006	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.
mb007_07	No0007	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.
mb007_08	No0008	NRA0530	3mm_ddc	o	o	88	o	.	.	.	.	.	.	.	.	.	.
mb007_09	No0009	SGRA	3mm_ddc	o	o	o	o	.	.	.	.	.	.	.	.	.	.
mb007_10	No0010	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.
mb007_11	No0011	NRA0530	3mm_ddc	o	o	o	o	.	.	.	.	.	.	.	.	.	.
mb007_12	No0012	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.
mb007_13	No0013	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.
mb007_14	No0014	NRA0530	3mm_ddc	o	o	88	o	.	.	.	.	.	.	.	.	.	.
mb007_15	No0015	SGRA	3mm_ddc	o	o	96	o	.	.	.	.	.	.	.	.	.	.

Notes:

