ML006A Correlation Report

General information

- A part of C181A
- no GLT or KVN participation in this subproject
- Target: 3C279
- Session info: http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/
- Station feedback: http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/sessions/apr18/feedback_apr18.asc
- GBT calibration info (Tsys files for download) and other related information for this session can be found here: https://safe.nrao.edu/wiki/bin/view/GB/Observing/WbandVLBACal/C181
- *Special processing* was applied to all data in order to correlate mismatching frequency setups of ALMA and other GMVA stations. See details here.

Current Status

Correlation finished, data **released** on 12/12/2018.

A **second** data release, with a problem, spotted in the original release, corrected, was made on 31/01/2019.

A **third** data release, rerunning PolConvert with the latest (25.06.2019) ALMA QA2 release, was made on 01/10/2019.

Fringes

Station	Code	Fringes	Plots	Comments
Ef	B	**yes**	Fringe overview of all baselines (all of C181A) including Ef in LL (left for each baseline) and RR (right for each baseline). Legend: white - scheduled, but no data, blue - no fringe, red-green - fringes of different quality. D -- fourfit error, in this case due to mixing upper and lower subbands in the KVN compatibility mode, no real problem with the data. c181a_FRINGE_RfAnt_Ef_LLRR_AllSrc.pdf Examples of fourfit fringe plots: c181a_No0035_3C279_AB_LL.pdf, c181a_No0035_3C279_AB_LR.pdf, c181a_No0035_3C279_AB_RL.pdf, c181a_No0035_3C279_AB_RR.pdf Same for all antennas below unless otherwise noted.	In the plots EVN is "missing" all the baselines except to ALMA. This is due to a fourfit error, the baselines are missing only from some of the diagnostic plots, but are present in the final correlation products.
On	X	**yes**	c181a_FRINGE_RfAnt_On_LLRR_AllSrc.pdf c181a_No0032_3C279_AX_LL.pdf, c181a_No0032_3C279_AX_LR.pdf, c181a_No0032_3C279_AX_RL.pdf, c181a_No0032_3C279_AX_RR.pdf	In the plots EVN is "missing" all the baselines except to

Station	Code	Fringes	Plots	Comments
				ALMA. This is due to a fourfit error, the baselines are missing only from some of the diagnostic plots, but are present in the final correlation products.
Ys	Y	**n/a**	c181a_FRINGE_RfAnt_Ys_LLRR_AllSrc.pdf	no observation in this subproject due to bad weather
Mh	Z	**yes**	c181a_FRINGE_RfAnt_Mh_LLRR_AllSrc.pdf c181a_No0024_3C279_AZ_LL.pdf, c181a_No0024_3C279_AZ_LR.pdf, c181a_No0024_3C279_AZ_RL.pdf, c181a_No0024_3C279_AZ_RR.pdf	In the plots EVN is "missing" all the baselines except to ALMA. This is due to a fourfit error, the baselines are missing only from some of the diagnostic plots, but are present in the final correlation products.
Pv	P	**n/a**	c181a_FRINGE_RfAnt_Pv_LLRR_AllSrc.pdf	no observation in this subproject due to snow
VLBA: Br	b	**yes**	c181a_FRINGE_RfAnt_Br_LLRR_AllSrc.pdf	all VLBA stations were

Station	Code	Fringes	Plots	Comments
			preliminary: c181a_No0039_3C279_bG_LL.pdf, c181a_No0039_3C279_bG_LR.pdf, no RLfringe, c181a_No0039_3C279_bG_RR.pdf final: c181a_No0035_3C279_Ab_LL.pdf, c181a_No0035_3C279_Ab_LR.pdf, c181a_No0035_3C279_Ab_RL.pdf, c181a_No0035_3C279_Ab_RR.pdf c181a_No0052_3C279_bf_LL.pdf, c181a_No0052_3C279_bf_LR.pdf, c181a_No0052_3C279_bf_RL.pdf, c181a_No0052_3C279_bf_RR.pdf c181a_No0052_3C279_bG_LL.pdf, c181a_No0052_3C279_bG_LR.pdf, c181a_No0052_3C279_bG_RL.pdf, c181a_No0052_3C279_bG_RR.pdf c181a_No0052_3C279_bn_LL.pdf, c181a_No0052_3C279_bn_LR.pdf, c181a_No0052_3C279_bn_RL.pdf, c181a_No0052_3C279_bn_RR.pdf c181a_No0052_3C279_bo_LL.pdf, no LR fringe, c181a_No0052_3C279_bo_RL.pdf, c181a_No0052_3C279_bo_RR.pdf	starting recording late, software glitch: low data weight, possible other problems
VLBA: Fd	f	**yes**	c181a_FRINGE_RfAnt_Fd_LLRR_AllSrc.pdf preliminary: c181a_No0039_3C279_fG_LL.pdf, c181a_No0039_3C279_fG_LR.pdf, c181a_No0039_3C279_fG_RL.pdf, c181a_No0039_3C279_fG_RR.pdf final: c181a_No0035_3C279_Af_LL.pdf, c181a_No0035_3C279_Af_LR.pdf, c181a_No0035_3C279_Af_RL.pdf, c181a_No0035_3C279_Af_RR.pdf c181a_No0047_3C279_fm_LL.pdf, c181a_No0047_3C279_fm_RR.pdf, no LR or RL fringes c181a_No0052_3C279_bf_LL.pdf, c181a_No0052_3C279_bf_LR.pdf, c181a_No0052_3C279_bf_RL.pdf, c181a_No0052_3C279_bf_RR.pdf	all VLBA stations were starting recording late, software glitch: low data weight, possible other problems
VLBA: Kp	k	**no**	c181a_FRINGE_RfAnt_Kp_LLRR_AllSrc.pdf _____	all VLBA stations were starting recording late, software glitch: low data weight,

Station	Code	Fringes	Plots	Comments
				possible other problems no fringes detected
VLBA: La	l	**no**	c181a_FRINGE_RfAnt_La_LLRR_AllSrc.pdf _____	all VLBA stations were starting recording late, software glitch: low data weight, possible other problems no fringes detected
VLBA: Mk	m	**yes**	c181a_FRINGE_RfAnt_Mk_LLRR_AllSrc.pdf c181a_No0047_3C279_Am_LL.pdf, c181a_No0047_3C279_Am_LR.pdf, c181a_No0047_3C279_Am_RL.pdf, c181a_No0047_3C279_Am_RR.pdf c181a_No0047_3C279_fm_LL.pdf, c181a_No0047_3C279_fm_RR.pdf, no LR or RL fringes	all VLBA stations were starting recording late, software glitch: low data weight, possible other problems
VLBA: Nl	n	**yes**	c181a_FRINGE_RfAnt_Nl_LLRR_AllSrc.pdf preliminary: c181a_No0039_3C279_Gn_LL.pdf, c181a_No0039_3C279_Gn_RR.pdf, no LR or RL fringe final: c181a_No0035_3C279_An_LL.pdf, c181a_No0035_3C279_An_LR.pdf, c181a_No0035_3C279_An_RL.pdf, c181a_No0035_3C279_An_RR.pdf	all VLBA stations were starting recording late, software glitch: low data weight, possible other problems

Station	Code	Fringes	Plots	Comments
			c181a_No0052_3C279_bn_LL.pdf, c181a_No0052_3C279_bn_LR.pdf, c181a_No0052_3C279_bn_RL.pdf, c181a_No0052_3C279_bn_RR.pdf	
VLBA: Ov	o	**yes**	c181a_FRINGE_RfAnt_Ov_LLRR_AllSrc.pdf preliminary: c181a_No0039_3C279_Go_LL.pdf, no LR fringe, c181a_No0039_3C279_Go_RL.pdf, c181a_No0039_3C279_Go_RR.pdf final: c181a_No0035_3C279_Ao_LL.pdf, c181a_No0035_3C279_Ao_LR.pdf, c181a_No0035_3C279_Ao_RL.pdf, c181a_No0035_3C279_Ao_RR.pdf c181a_No0052_3C279_bo_LL.pdf, no LR fringe, c181a_No0052_3C279_bo_RL.pdf, c181a_No0052_3C279_bo_RR.pdf	all VLBA stations were starting recording late, software glitch: low data weight, possible other problems
VLBA: Pt	p	**yes**	c181a_FRINGE_RfAnt_Pt_LLRR_AllSrc.pdf c181a_No0029_3C279_Ap_LL.pdf, c181a_No0029_3C279_Ap_LR.pdf, c181a_No0029_3C279_Ap_RL.pdf, c181a_No0029_3C279_Ap_RR.pdf	all VLBA stations were starting recording late, software glitch: low data weight, possible other problems Taken out for several scans because of USNO observing.
GBT: Gb	G	**yes**	c181a_FRINGE_RfAnt_Gb_LLRR_AllSrc.pdf preliminary: c181a_No0039_3C279_bG_LL.pdf, c181a_No0039_3C279_bG_LR.pdf, no RL fringe, c181a_No0039_3C279_bG_RR.pdf	

Station	Code	Fringes	Plots	Comments
			c181a_No0039_3C279_fG_LL.pdf, c181a_No0039_3C279_fG_LR.pdf, c181a_No0039_3C279_fG_RL.pdf, c181a_No0039_3C279_fG_RR.pdf. c181a_No0039_3C279_Gn_LL.pdf, c181a_No0039_3C279_Gn_RR.pdf, no LR or RL fringe c181a_No0039_3C279_Go_LL.pdf, no LR fringe, c181a_No0039_3C279_Go_RL.pdf, c181a_No0039_3C279_Go_RR.pdf. final: c181a_No0035_3C279_AG_LL.pdf, c181a_No0035_3C279_AG_LR.pdf, c181a_No0035_3C279_AG_RL.pdf, c181a_No0035_3C279_AG_RR.pdf c181a_No0052_3C279_bG_LL.pdf, c181a_No0052_3C279_bG_LR.pdf, c181a_No0052_3C279_bG_RL.pdf, c181a_No0052_3C279_bG_RR.pdf	
ALMA: Aa	A	**yes**	c181a_FRINGE_RfAnt_Aa_LLRR_AllSrc.pdf c181a_No0024_3C279_AZ_LL.pdf, c181a_No0024_3C279_AZ_LR.pdf, c181a_No0024_3C279_AZ_RL.pdf, c181a_No0024_3C279_AZ_RR.pdf c181a_No0029_3C279_Ap_LL.pdf, c181a_No0029_3C279_Ap_LR.pdf, c181a_No0029_3C279_Ap_RL.pdf, c181a_No0029_3C279_Ap_RR.pdf c181a_No0032_3C279_AX_LL.pdf, c181a_No0032_3C279_AX_LR.pdf, c181a_No0032_3C279_AX_RL.pdf, c181a_No0032_3C279_AX_RR.pdf c181a_No0035_3C279_AB_LL.pdf, c181a_No0035_3C279_AB_LR.pdf, c181a_No0035_3C279_AB_RL.pdf, c181a_No0035_3C279_AB_RR.pdf c181a_No0035_3C279_Ab_LL.pdf, c181a_No0035_3C279_Ab_LR.pdf, c181a_No0035_3C279_Ab_RL.pdf, c181a_No0035_3C279_Ab_RR.pdf c181a_No0035_3C279_Af_LL.pdf, c181a_No0035_3C279_Af_LR.pdf, c181a_No0035_3C279_Af_RL.pdf, c181a_No0035_3C279_Af_RR.pdf c181a_No0035_3C279_AG_LL.pdf, c181a_No0035_3C279_AG_LR.pdf, c181a_No0035_3C279_AG_RL.pdf, c181a_No0035_3C279_AG_RR.pdf c181a_No0035_3C279_An_LL.pdf, c181a_No0035_3C279_An_LR.pdf, c181a_No0035_3C279_An_RL.pdf, c181a_No0035_3C279_An_RR.pdf c181a_No0035_3C279_Ao_LL.pdf, c181a_No0035_3C279_Ao_LR.pdf, c181a_No0035_3C279_Ao_RL.pdf, c181a_No0035_3C279_Ao_RR.pdf c181a_No0047_3C279_Am_LL.pdf, c181a_No0047_3C279_Am_LR.pdf, c181a_No0047_3C279_Am_RL.pdf, c181a_No0047_3C279_Am_RR.pdf	Observed in linear polarization, converted to circular polarization in post-correlation uning PolConvert. For technical reasons the atmospheric correction was applied twice -- both in original ALMA data and during the correlation. Although a special procedure was developed to compensate for this, we found that its application

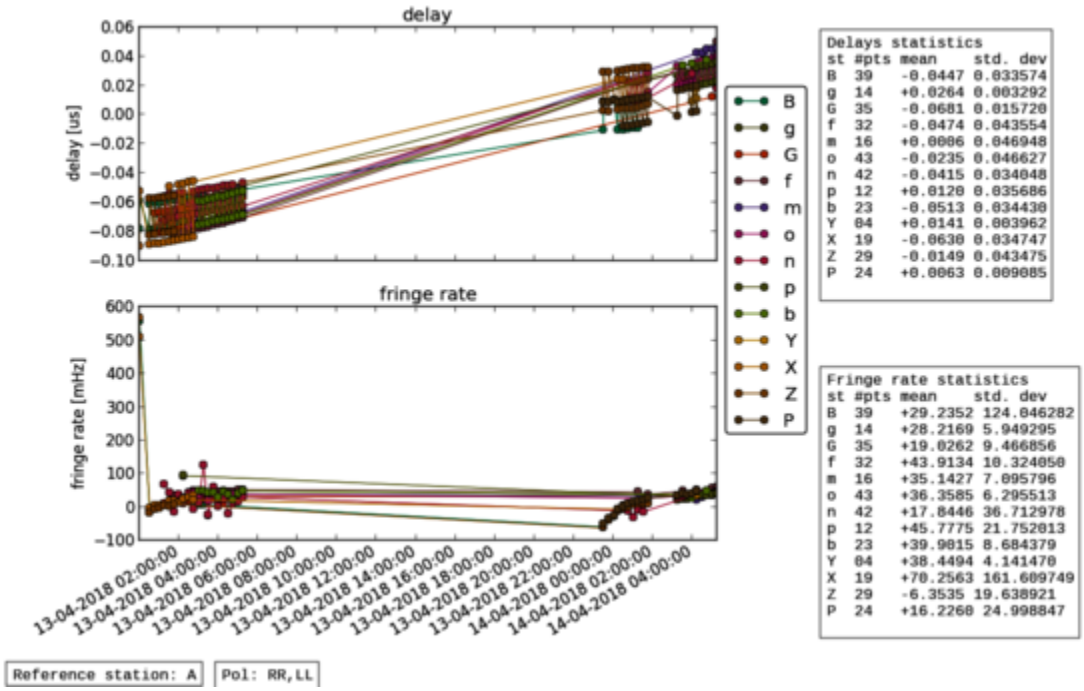
Station	Code	Fringes	Plots	Comments
				leads to other difficulties, in particular to abnormally high fringe rate jumps, so in the final production run the double atmospheric correction was left as is.

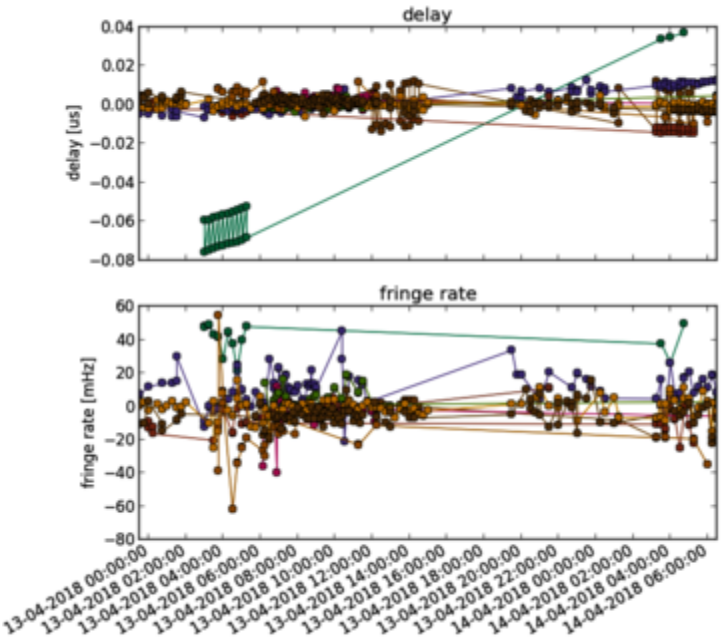
Notes

There were problems with some diagnostic plots of this experiment due to yet poorly understood errors of fourfit and other HOPS components. But this does not change the quality of the final correlation products. *(These issues were **fixed** in the second data release of 31/01/2019)*

Post-Correlation checks

Residuals





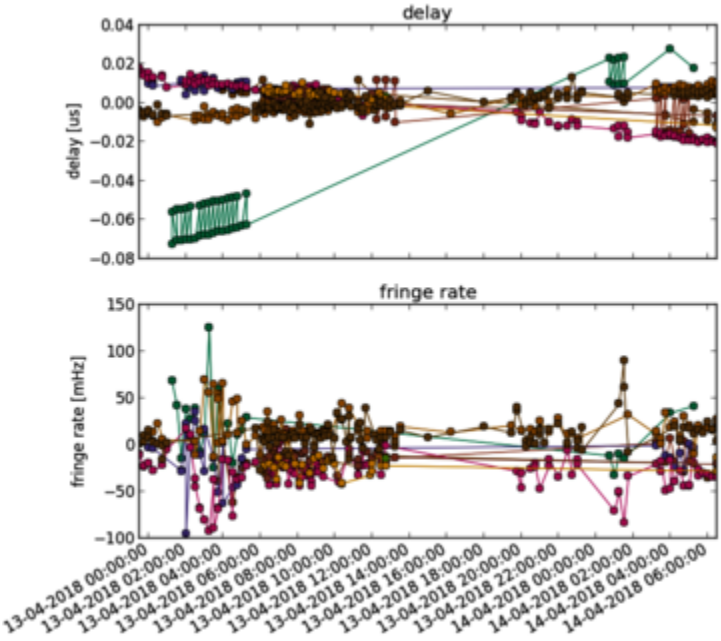
Delays statistics

st	#pts	mean	std. dev
A	23	-0.0513	0.034430
g	33	-0.0013	0.010218
G	34	-0.0082	0.005594
f	117	+0.0025	0.005835
k	72	+0.0020	0.002101
m	87	+0.0029	0.001888
l	44	-0.0001	0.001971
o	178	+0.0002	0.001707
n	34	+0.0031	0.005445
p	146	+0.0006	0.002504

Fringe rate statistics

st	#pts	mean	std. dev
A	23	+39.9015	8.684379
g	33	-2.7525	6.254399
G	34	-10.1830	8.066890
f	117	+11.0201	9.210507
k	72	-3.2568	7.244210
m	87	+1.1258	6.894335
l	44	+5.5312	6.094391
o	178	-0.9232	5.350922
n	34	-19.9907	18.900186
p	146	-5.2518	6.087969

Reference station: b | Pol: RR,LL



Delays statistics

st	#pts	mean	std. dev
A	42	-0.0415	0.034048
b	34	+0.0031	0.005445
g	21	-0.0034	0.010682
G	38	+0.0088	0.002032
f	145	-0.0004	0.011489
k	56	+0.0019	0.003200
m	01	+0.0033	0.000000
l	43	+0.0034	0.004171
o	129	-0.0008	0.005407
p	153	-0.0001	0.003733

Fringe rate statistics

st	#pts	mean	std. dev
A	42	+17.8446	36.712978
b	34	-19.9907	18.900186
g	21	-8.2203	10.479152
G	38	-14.8201	25.942944
f	145	-30.2861	19.234488
k	56	-11.5065	10.037862
m	01	-14.9800	0.000000
l	43	-22.4007	10.156859
o	129	+18.1331	14.907047
p	153	+10.3227	14.124263

Reference station: n | Pol: RR,LL

FITS completeness (pclist)

legend:

```
o -- station scheduled and fully accounted for in the fits file
42 (or another number) -- station scheduled, but data found
                          only for 42% of the scheduled interval
x -- station scheduled, but corresponding entry not found in the fits file
. -- station not scheduled
```

ml006a.fits:

		GB	EF	ON	YS	PV	MH	AA	AA	NL	FD	PT	LA	OV	KP	BR	MK
c181a_001D2D No0002	3C279 3mm_RDBE	.	o	o	x	x	o	x	x	.	.	.	.	.	.	.	.
c181a_003D2D No0004	3C279 3mm_RDBE	.	o	o	x	x	o	x	x	.	.	.	.	.	.	.	.
c181a_005D2D No0007	3C279 3mm_RDBE	.	o	o	x	x	o	42	42	.	.	.	.	.	.	.	.
c181a_007D2D No0009	3C279 3mm_RDBE	.	o	o	x	x	o	x	x	.	.	.	.	.	.	.	.
c181a_009D2D No0012	3C279 3mm_RDBE	o	o	o	x	x	o	o	o	.	.	.	.	.	.	.	.
c181a_011D2D No0015	3C279 3mm_RDBE	o	o	o	x	x	o	o	o	.	.	.	.	.	.	.	.
c181a_013D2D No0017	3C279 3mm_RDBE	o	o	o	x	x	o	o	o	.	.	.	.	.	.	.	.
c181a_015D2D No0019	3C279 3mm_RDBE	o	o	o	x	x	o	o	o	80	.	.	.	.	.	.	.
c181a_017D2D No0022	3C279 3mm_RDBE	o	o	o	x	x	o	o	o	66	.	.	.	.	.	.	.
c181a_019D2D No0024	3C279 3mm_RDBE	o	o	o	x	x	o	o	o	80	80	.	.	.	.	.	.
c181a_021D2D No0027	3C279 3mm_RDBE	o	o	o	x	x	.	o	o	66	66	.	.	.	.	.	.
c181a_023D2D No0029	3C279 3mm_RDBE	o	o	o	x	x	.	o	o	80	80	80	80	.	80	.	.
c181a_024D2D No0031	3C279 3mm_RDBE	o	o	o	x	x	.	o	o	66	66	x	66	80	66	.	.
c181a_025D2D No0032	3C279 3mm_RDBE	o	o	o	x	x	.	o	o	66	66	x	66	80	66	.	.
c181a_026D2D No0034	3C279 3mm_RDBE	o	o	.	x	x	.	o	o	66	66	x	66	85	66	85	.
c181a_027D2D No0035	3C279 3mm_RDBE	o	o	.	x	x	.	o	o	66	66	x	66	85	66	85	.
c181a_028D2D No0037	3C279 3mm_RDBE	o	.	.	x	x	.	95	95	66	66	x	66	85	66	85	.
c181a_029D2D No0038	3C279 3mm_RDBE	o	.	.	x	x	.	o	o	66	66	x	66	66	66	66	.
c181a_030D2D No0039	3C279 3mm_RDBE	o	.	.	x	x	.	o	o	66	66	x	66	66	66	66	.
c181a_032D2D No0042	3C279 3mm_RDBE	o	.	.	.	.	.	o	o	66	66	x	66	66	66	66	.
c181a_034D2D No0045	3C279 3mm_RDBE	o	.	.	.	.	.	o	o	66	66	x	66	90	66	90	x
c181a_036D2D No0047	3C279 3mm_RDBE	o	.	.	.	.	.	o	o	66	66	x	66	90	66	90	90
c181a_038D2D No0050	3C279 3mm_RDBE	o	.	.	.	.	.	o	o	66	66	x	66	90	66	90	90
c181a_040D2D No0052	3C279 3mm_RDBE	o	.	.	.	.	.	o	o	76	76	x	76	76	76	76	76