MG002 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: 2016.1.01116.V was used for polarization conversion
- This experiment has ALMA with 32x62.5MHz, VLBA with 2x128MHz channels, and most of the EVN with a 1x512MHz channel
- Two EVN stations (Yebes, Pico Veleta) observed in an incorrect backend mode, with a 32 MHz polyphase filterbank. Yebes had the correct backend mode in scans No0064 to No0067 but not in later scans.
- Due to the issue at Yebes 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 Yebes 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/Yebes 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. Correlation (c) was run twice, first for scans No0064 to No0067 where only Pico had the incorrect backend mode, then for other scans where both Pico and Yebes had the incorrect backend mode. Scans without Pico and Yebes were not re-correlated but were taken from standard correlation (a).
- The FITS files are delivered in two variants due to the problems with Pico and Yebes that were outlined above.
    - **mg002.fits**: Standard correlation (a) with Pico and Yebes excluded during correlation
    - **mg002_merged_set1.fits, mg002_merged_set2.fits**: Special correlation with post-processing (c). Note1: scan No0078 contained corrupted DiFX output data, and unfortunately a recorrelation of that scan is not possible, since raw recordings of this and other experiments have been lost due to a computing cluster file storage issue. Note2: Yebes (but not Pico) briefly had the correct backend mode during scans No0064 to No0067
      The output is unfortunately provided as two sets, that need to be merged in AIPS, as DiFX difx2fits is failing to combine into one FITS file the data from certain scans that have a differing number of antennas than other scans.

Status

What	Date
Correlation 2nd round finished	21.8.2017
Conversion to HOPS	5.9.2017
Fourfit fringe fitting	5.9.2017
Conversion to FITS with -u (union) option	5.9.2017
PCList check	5.9.2017
aedit plots, alist v6 residual rate and delay plots	5.9.2017
re-run with updated polconvert	18.12.2017
Material sent to PI	(pending final ALMA QA2 solutions)

Fringes

Station	Fringes	Comment
Ef	yes	Effelsberg DBBC2
Eb	yes	Effelsberg RDBE
On	yes	
Aa	yes	
Mh	no	faulty backend configuration
Pv	yes	LCP bad (2bit sample dist. 78%:0:0:22%), is OK in ma008 and mb007
Ys	yes	
Fd	yes	
La	yes	
Pt	yes	weak or no fringes
Nl	yes	
La	yes	
Kp	yes	
Ov	yes	
Mk	no	wide fringe search but no fringes found
Br	yes	

Fringes plotted on all baselines to Effelserg (No0134 Effelsberg PDF), and ALMA (No0140 ALMA PDF), and VLBA only (No0200 VLBA FD PDF).

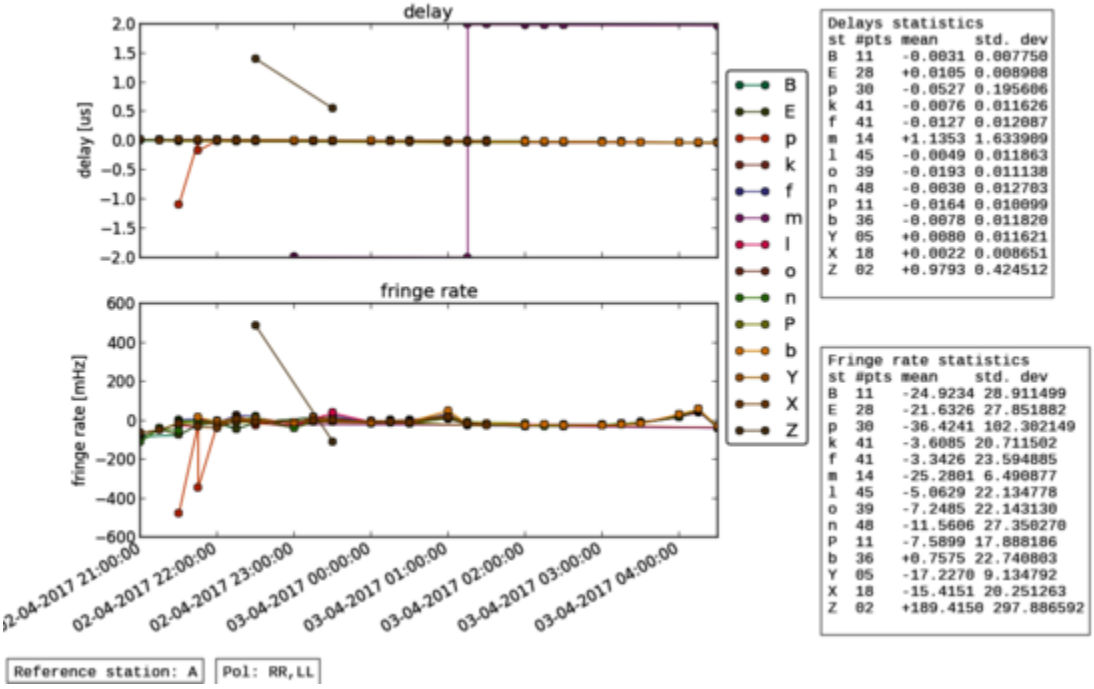
Notes

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; lost scans No0061 to No0063; recorded scans No0064 to No0067 in wideband mode as intendend; recorded scans No0068 until the end in 32 MHz polyphase filter bank mode
3. Pico restarted backend for scan 092-2100, bad sampler statistics in earlier scans

Post-Correlation checks

Residuals

reference A (ALMA), pols LL and RR, residuals in 32 MHz correlation run (a)



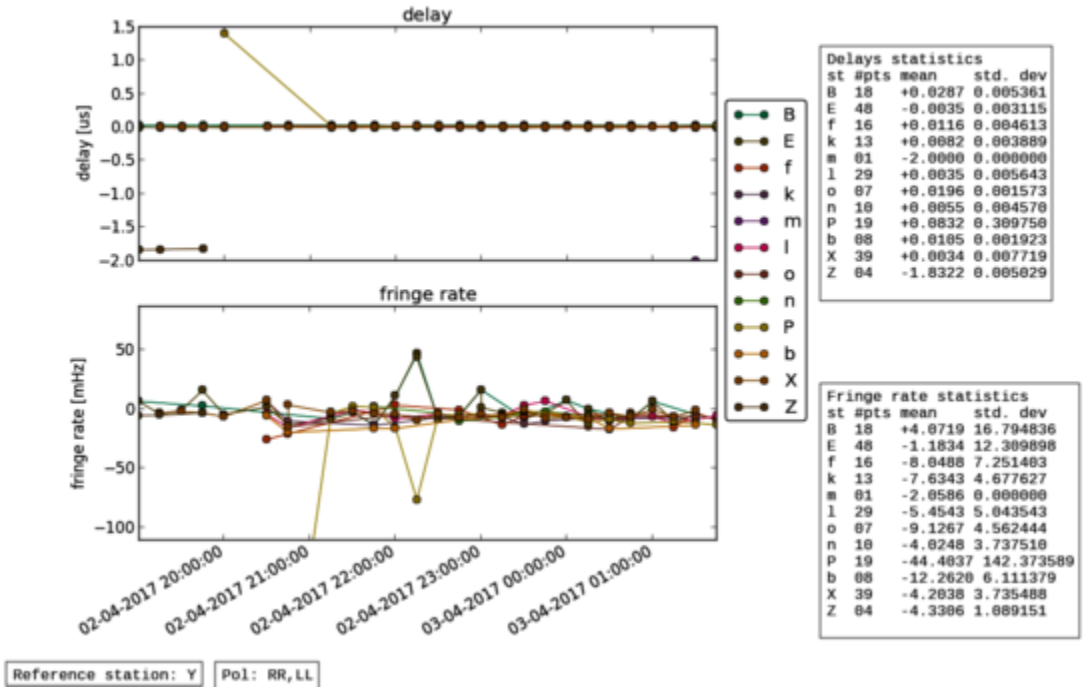
Delays statistics

st	#pts	mean	std. dev
B	11	-0.0031	0.007750
E	28	+0.0105	0.008908
p	30	-0.0527	0.195606
k	41	-0.0076	0.011626
f	41	-0.0127	0.012087
m	14	+1.1353	1.633909
l	45	-0.0049	0.011863
o	39	-0.0193	0.011138
n	48	-0.0030	0.012783
P	11	-0.0164	0.010099
b	36	-0.0078	0.011820
Y	05	+0.0080	0.011621
X	18	+0.0022	0.008651
Z	02	+0.9793	0.424512

Fringe rate statistics

st	#pts	mean	std. dev
B	11	-24.9234	28.911499
E	28	-21.6326	27.851882
p	30	-36.4241	102.382149
k	41	-3.6085	20.711502
f	41	-3.3426	23.594885
m	14	-25.2801	6.490877
l	45	-5.0629	22.134778
o	39	-7.2485	22.143130
n	48	-11.5606	27.350270
P	11	-7.5899	17.888186
b	36	+0.7575	22.740803
Y	05	-17.2270	9.134792
X	18	-15.4151	20.251263
Z	02	+189.4150	297.886592

reference Y (Yebes), pols LL and RR, residuals in 32 MHz correlation run (a)



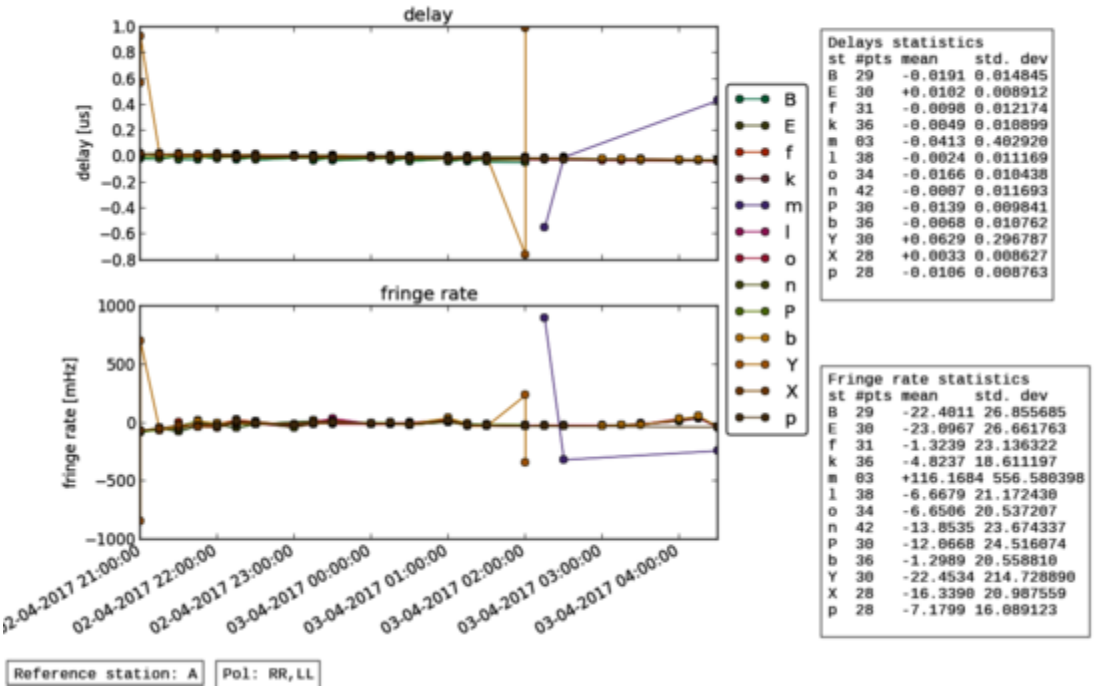
Delays statistics

st	#pts	mean	std. dev
B	18	+0.0287	0.005361
E	48	-0.0035	0.003115
f	16	+0.0116	0.004613
k	13	+0.0082	0.003889
m	01	-2.0000	0.000000
l	29	+0.0035	0.005643
o	07	+0.0196	0.001573
n	10	+0.0055	0.004570
P	19	+0.0832	0.309750
b	08	+0.0105	0.001923
X	39	+0.0034	0.007719
Z	04	-1.8322	0.005029

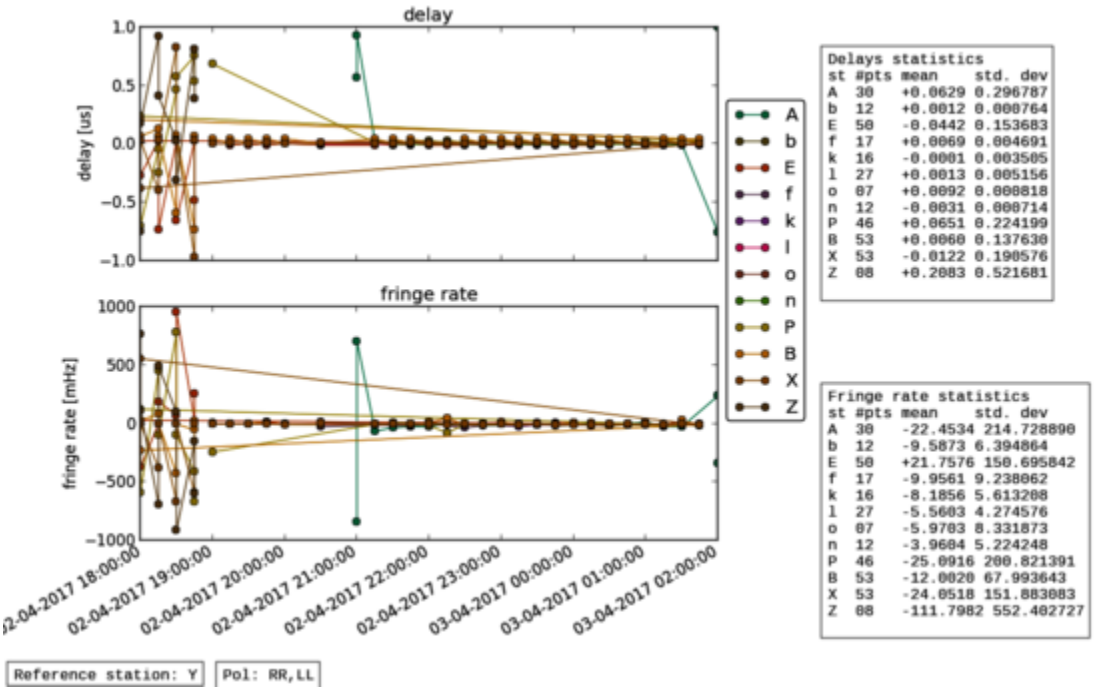
Fringe rate statistics

st	#pts	mean	std. dev
B	18	+4.0719	16.794836
E	48	-1.1834	12.309898
f	16	-8.0488	7.251403
k	13	-7.6343	4.677627
m	01	-2.0586	0.000000
l	29	-5.4543	5.043543
o	07	-9.1267	4.562444
n	10	-4.0248	3.737510
P	19	-44.4037	142.373589
b	08	-12.2620	6.111379
X	39	-4.2038	3.735488
Z	04	-4.3306	1.089151

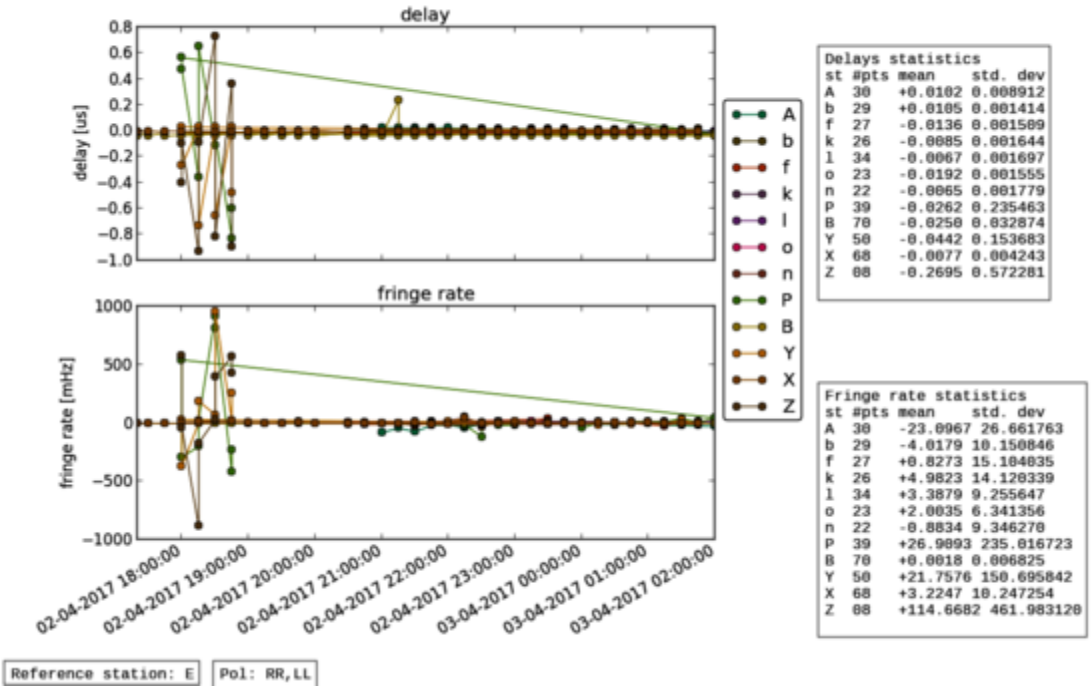
reference A (ALMA), pols LL and RR, residuals in 58 MHz correlation run (c)



reference Y (Yebes), pols LL and RR, residuals in 58 MHz correlation run (c)



reference E (Effelsberg), pols LL and RR, residuals in 58 MHz correlation run (c)



Delays statistics

st	#pts	mean	std. dev
A	30	+0.0102	0.008912
b	29	+0.0105	0.001414
f	27	-0.0136	0.001509
k	26	-0.0085	0.001644
l	34	-0.0067	0.001697
o	23	-0.0192	0.001555
n	22	-0.0065	0.001779
P	39	-0.0262	0.235463
B	70	-0.0250	0.032874
Y	50	-0.0442	0.153683
X	68	-0.0077	0.004243
Z	08	-0.2695	0.572281

Fringe rate statistics

st	#pts	mean	std. dev
A	30	-23.0967	26.661763
b	29	-4.0179	10.150846
f	27	+0.8273	15.104035
k	26	+4.9823	14.120339
l	34	+3.3879	9.255647
o	23	+2.0035	6.341356
n	22	-0.8834	9.346270
P	39	+26.9093	235.016723
B	70	+0.0018	0.006825
Y	50	+21.7576	150.695842
X	68	+3.2247	10.247254
Z	08	+114.6682	461.983120

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	ON	YS	PV	MH	NL	FD	PT	LA	KP	OV	BR	AA	MK
mg002_01	No0061	OJ287 3mm_ddc	o	o	o	x	x	93	.	.	.	.	.	.	.	.	.
mg002_02	No0062	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_03	No0063	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_04	No0064	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_05	No0065	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_06	No0066	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_07	No0067	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_08	No0068	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_09	No0069	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_10	No0070	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_11	No0071	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_12	No0072	OJ287 3mm_ddc	o	o	o	x	x	95	.	.	.	.	.	.	.	.	.
mg002_13	No0075	J0510+18 3mm_ddc	o	o	o	x	x	x	o	o	o	o	o	o	o	.	.
mg002_14	No0078	J0510+18 3mm_ddc	o	o	o	x	x	x	o	o	o	o	o	o	o	.	.
mg002_15	No0081	OJ287 3mm_ddc	o	o	o	x	x	x	o	.	.	.	.	.	.	o	.
mg002_16	No0084	J0510+18 3mm_ddc	.	.	.	.	.	.	.	o	o	o	o	o	o	.	.
mg002_17	No0087	OJ287 3mm_ddc	o	o	o	x	x	50	o	.	.	.	.	.	.	o	.
mg002_18	No0090	J0510+18 3mm_ddc	.	.	.	.	.	.	.	o	o	o	o	o	o	.	.
mg002_19	No0093	OJ287 3mm_ddc	o	o	o	x	x	95	o	o	o	o	.	.	.	o	.
mg002_20	No0096	OJ287 3mm_ddc	o	o	o	x	x	95	o	o	o	o	o	.	o	o	.
mg002_21	No0099	J0510+18 3mm_ddc	o	o	o	x	x	.	o	o	o	o	o	o	o	o	.

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mg002_22 No0102    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_23 No0105    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_24 No0108    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  x  .
mg002_25 No0111 J0510+18 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  o  o
mg002_26 No0112 1055+018 3mm_ddc o  o  o  x  x  o  .  .  .  .  .  .  .  .  .
mg002_27 No0115    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_28 No0118    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_29 No0121    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  x  .
mg002_30 No0124 J0510+18 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  o  .
mg002_31 No0125 1055+018 3mm_ddc o  o  o  x  x  16 .  .  .  .  .  .  .  .  .
mg002_32 No0128    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_33 No0131    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_34 No0134    OJ287 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  x  o
mg002_35 No0137 1055+018 3mm_ddc o  o  o  x  x  95 o  o  o  o  o  o  o  o  .
mg002_36 No0140    OJ287 3mm_ddc o  o  o  x  x  .  o  o  o  o  o  o  o  o  o
mg002_37 No0143    OJ287 3mm_ddc o  o  o  x  x  .  o  o  o  o  o  o  o  o  o
mg002_38 No0146 1055+018 3mm_ddc o  o  o  x  x  .  o  o  o  o  o  o  o  x  .
mg002_39 No0149    OJ287 3mm_ddc o  o  .  x  x  .  o  o  o  o  o  o  o  o  o
mg002_40 No0152    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  o  o
mg002_41 No0155    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  o  o
mg002_42 No0158 1055+018 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  x  .
mg002_43 No0161    OJ287 3mm_ddc .  .  .  .  .  .  o  o  x  o  o  o  o  o  x
mg002_44 No0164    OJ287 3mm_ddc .  .  .  .  .  .  o  o  x  o  o  o  o  o  x
mg002_45 No0167    OJ287 3mm_ddc .  .  .  .  .  .  o  o  x  o  o  o  o  o  x
mg002_46 No0170 1055+018 3mm_ddc .  .  .  .  .  .  o  o  x  o  o  o  o  x  x
mg002_47 No0173    OJ287 3mm_ddc .  .  .  .  .  .  o  o  x  o  o  o  o  o  x
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mg002_49 No0179 1055+018 3mm_ddc .  .  .  .  .  .  o  o  73 o  o  o  o  o  73
mg002_50 No0182    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
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mg002_52 No0188    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_53 No0191 1055+018 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_54 No0194    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_55 No0197    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_56 No0200    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_57 No0203 1055+018 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_58 No0206    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_59 No0209    OJ287 3mm_ddc .  .  .  .  .  .  o  o  o  o  o  o  o  .  o
mg002_60 No0210    OJ287 3mm_ddc .  .  .  .  .  .  x  x  x  x  x  x  x  .  o
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