

# KIC 007137952

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007137952-01	OBS	No	0.549626	131.982651	90.1	2.537	12.3	11.7	1.80	7626	1.93	39296.79
007137952-02	OBS	No	2.208389	132.676339	309.4	10.630	9.5	13.6	1.80	7626	5.06	6151.95
007137952-03	OBS	No	62.500549	173.356863	854.7	5.618	8.2	7.4	1.80	7626	6.19	71.33
007137952-04	OBS	No	34.232633	153.226382	719.2	7.007	7.5	7.2	1.80	7626	5.11	159.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007137952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
007137952-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007137952-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
007137952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

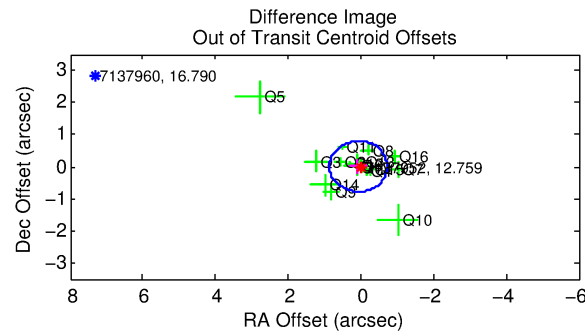
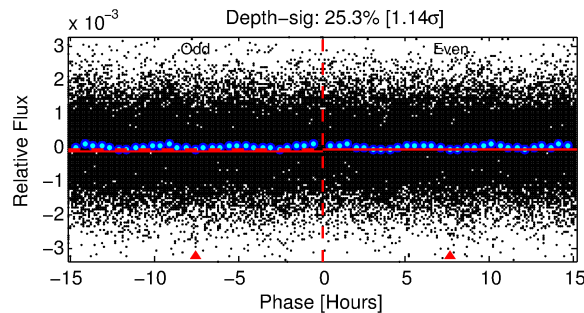
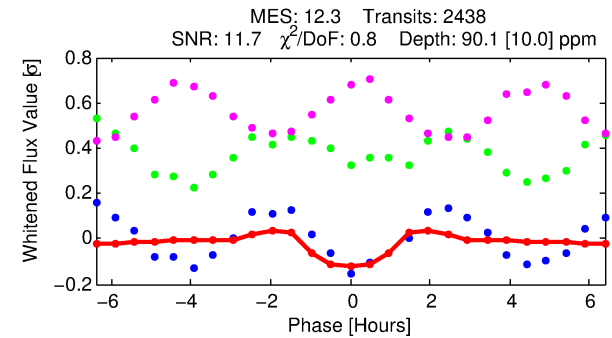
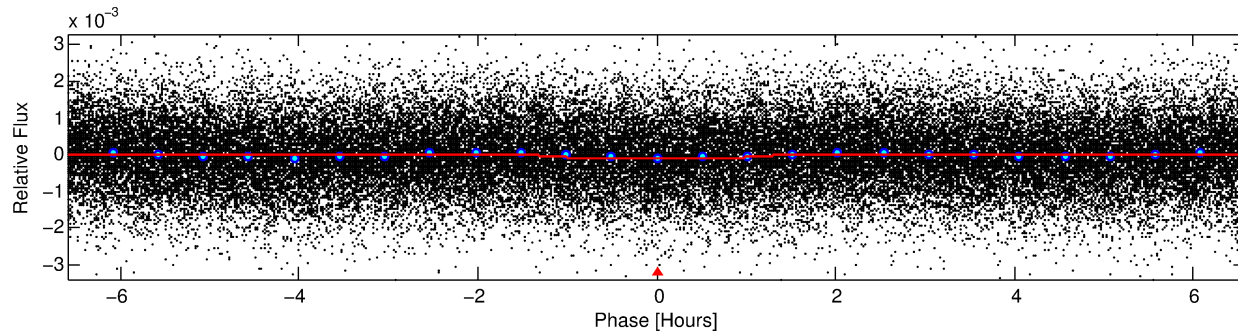
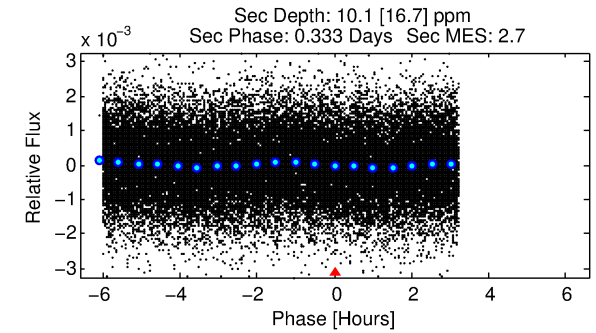
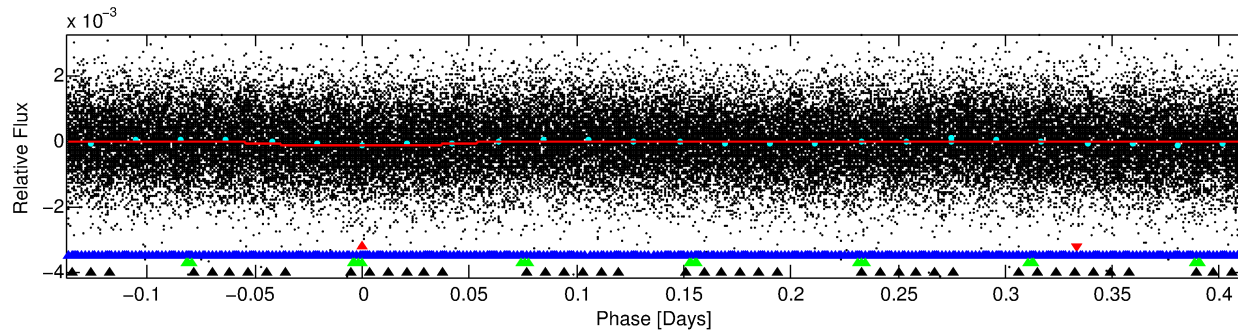
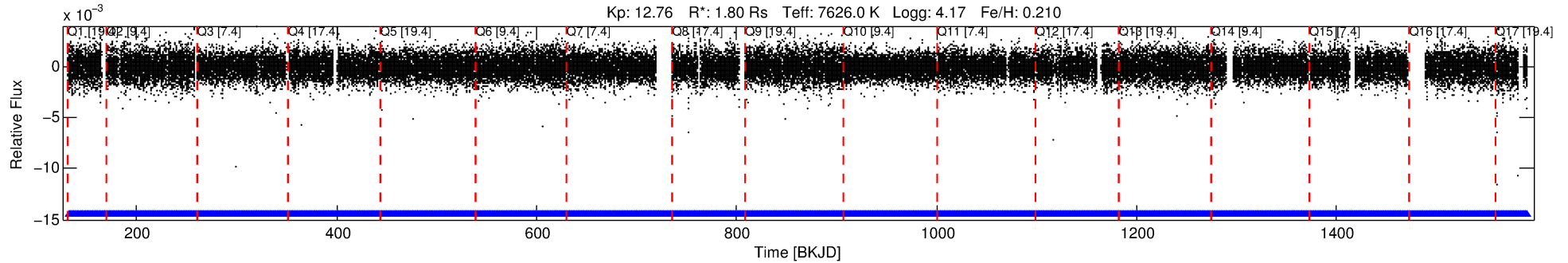
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007137952-01

No Significant Match Found

# DV One-Page Summary

KIC: 7137952 Candidate: 1 of 4 Period: 0.550 d



## DV Fit Results:

Period = 0.54963 [0.00001] d  
Epoch = 131.9827 [0.0022] BKJD  
Rp/R\* = 0.0098 [0.0052]  
a/R\* = 1.27 [1.59]  
b = 0.86 [1.01]  
Seff = 39296.79 [16056.49]  
Teq = 3590 [367] K  
Rp = 1.93 [1.18] Re  
a = 0.0158 [0.0041] AU  
Ag = 0.37 [0.74] [-0.85σ]  
Teffp = 4328 [2135] K [0.34σ]

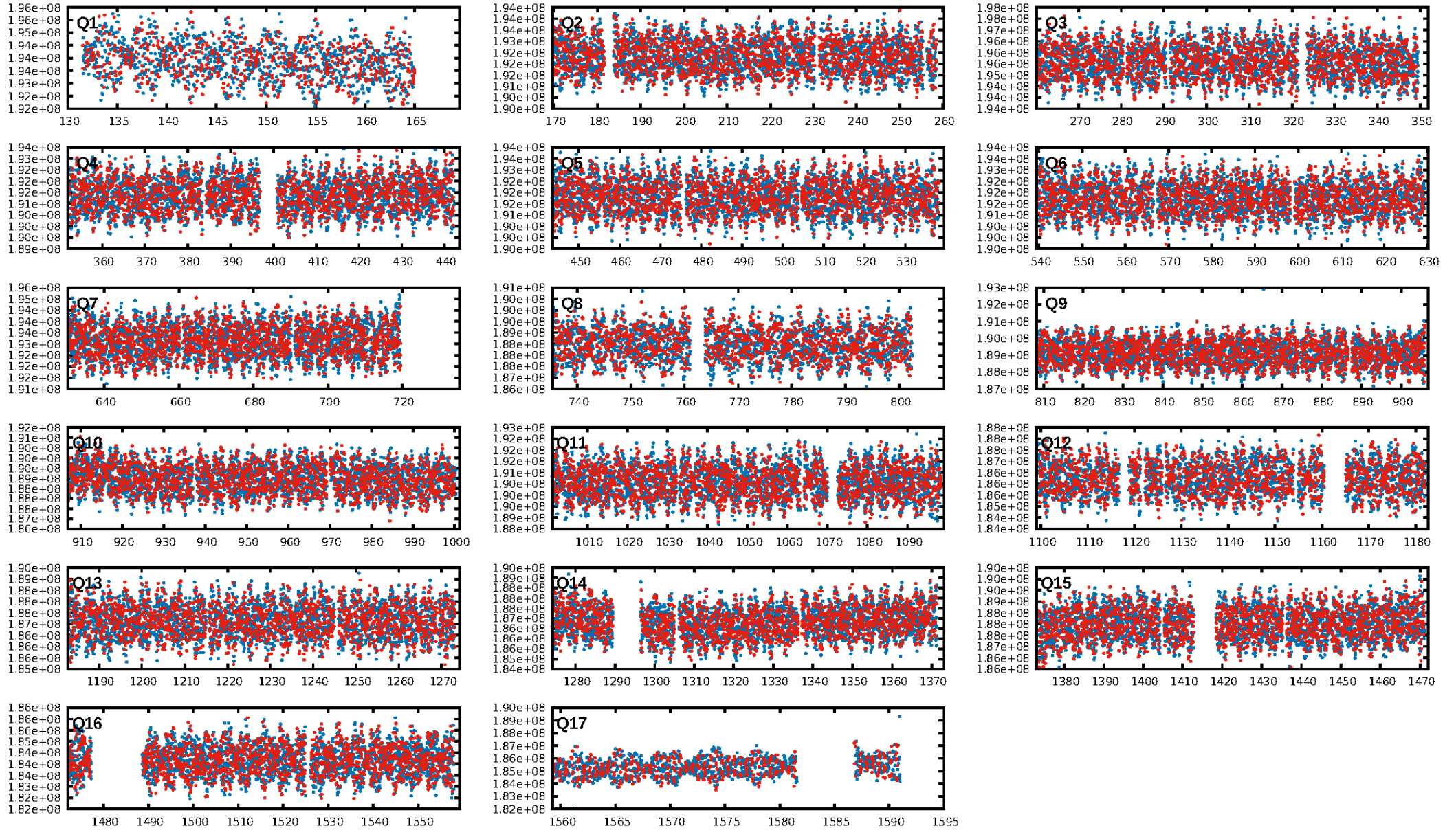
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [3.64σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.99e-21  
RollingBand-fgt: 1.00 [2328/2328]  
GhostDiagnostic-chr: 1.099  
Centroid-sig: 0.0%  
Centroid-so: 0.297 arcsec [2.22σ]  
OotOffset-rm: 0.077 arcsec [0.29σ]  
KicOffset-rm: 0.205 arcsec [0.80σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.69 [11/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:11:17 Z

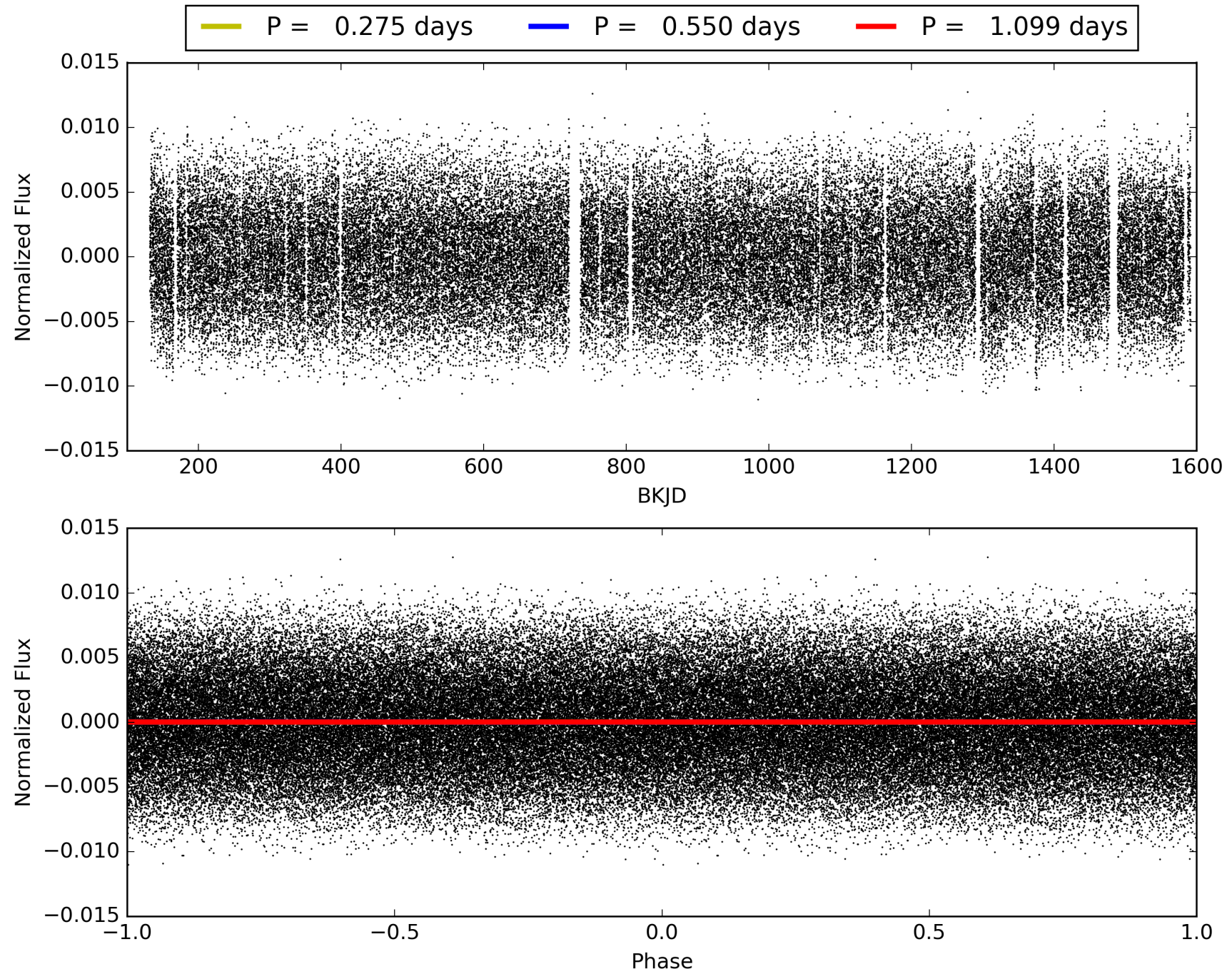
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007137952-01, PDC Light Curves





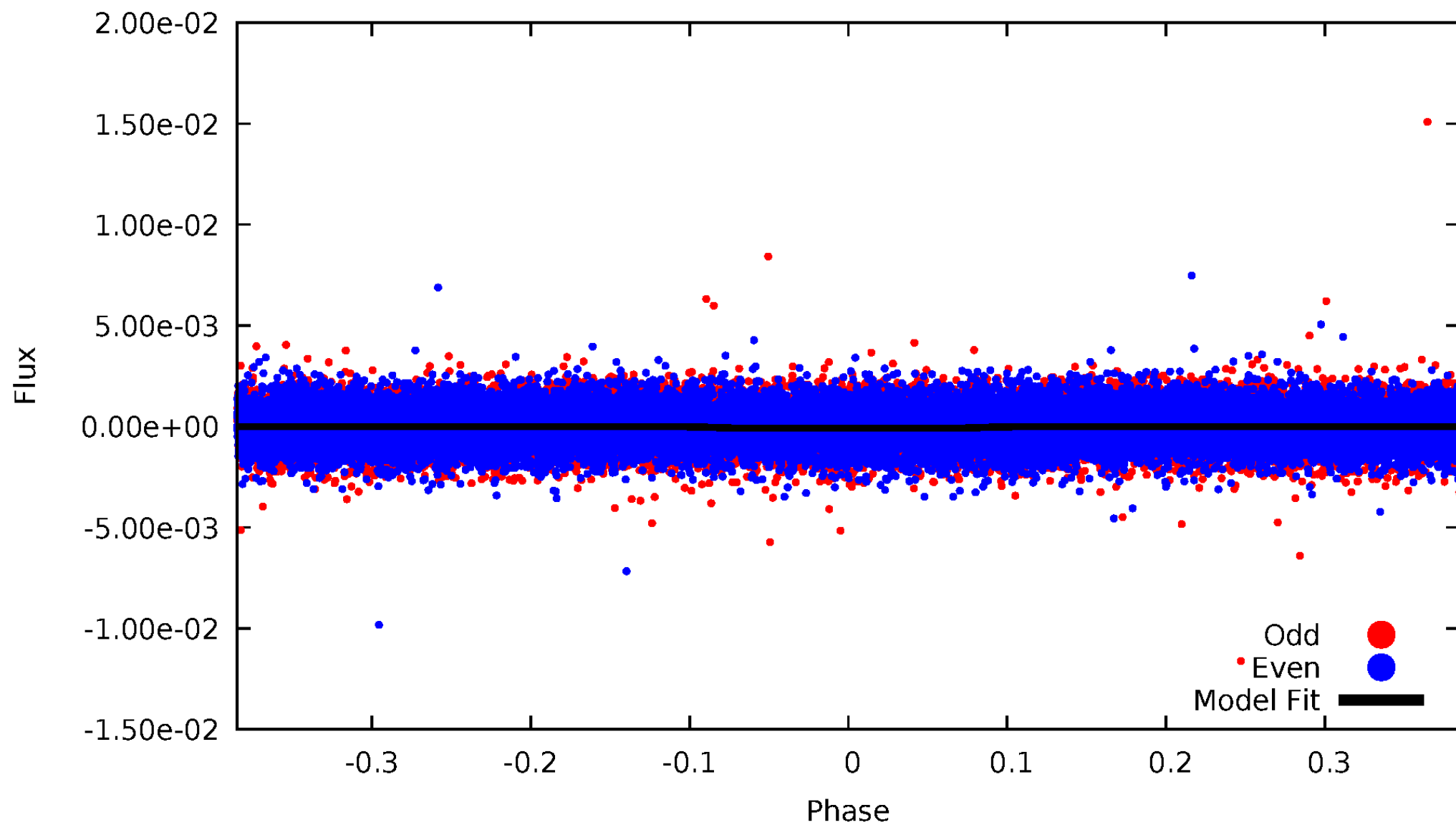
TCE 007137952-01





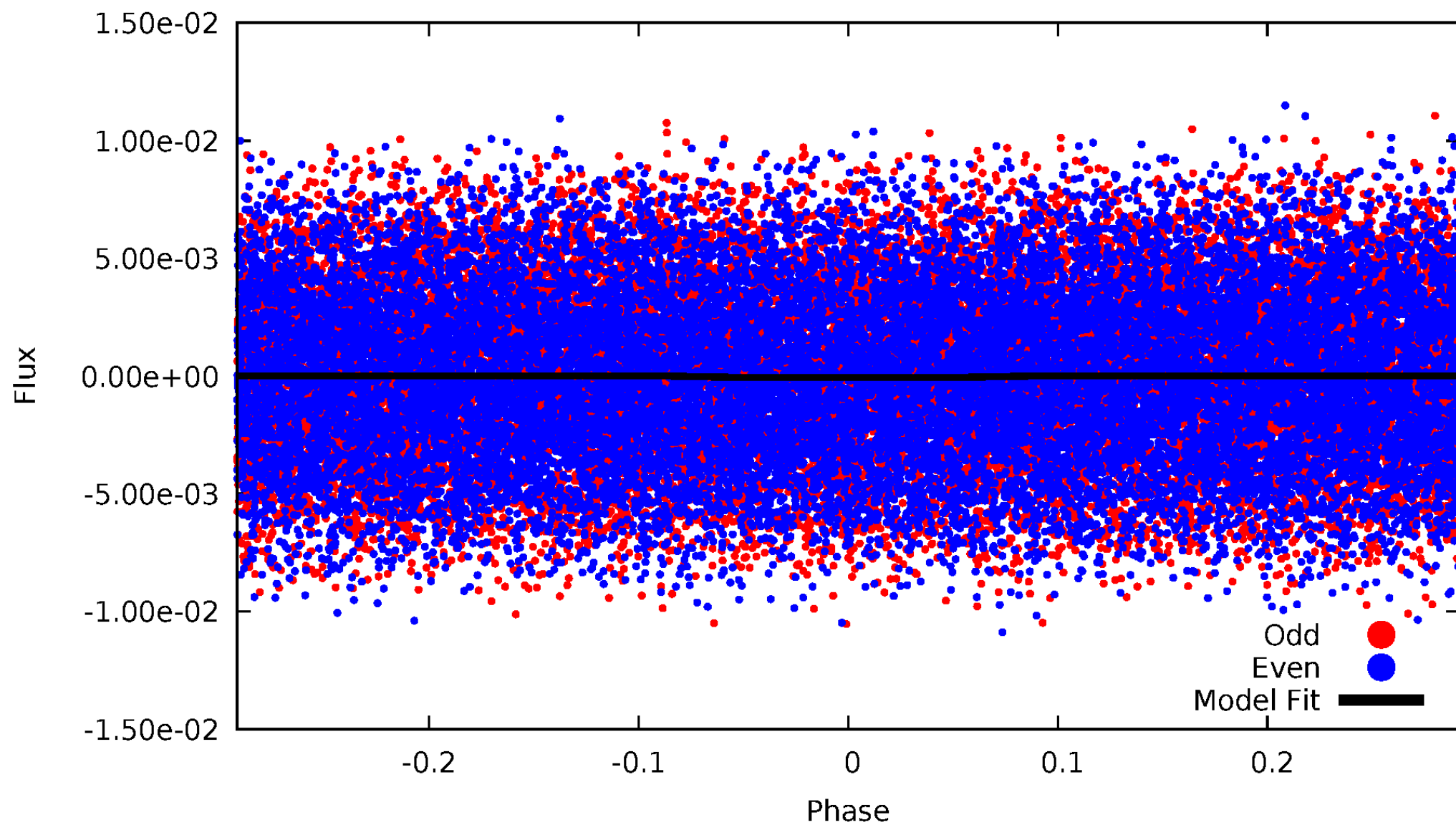
# DV Odd/Even

TCE 007137952-01



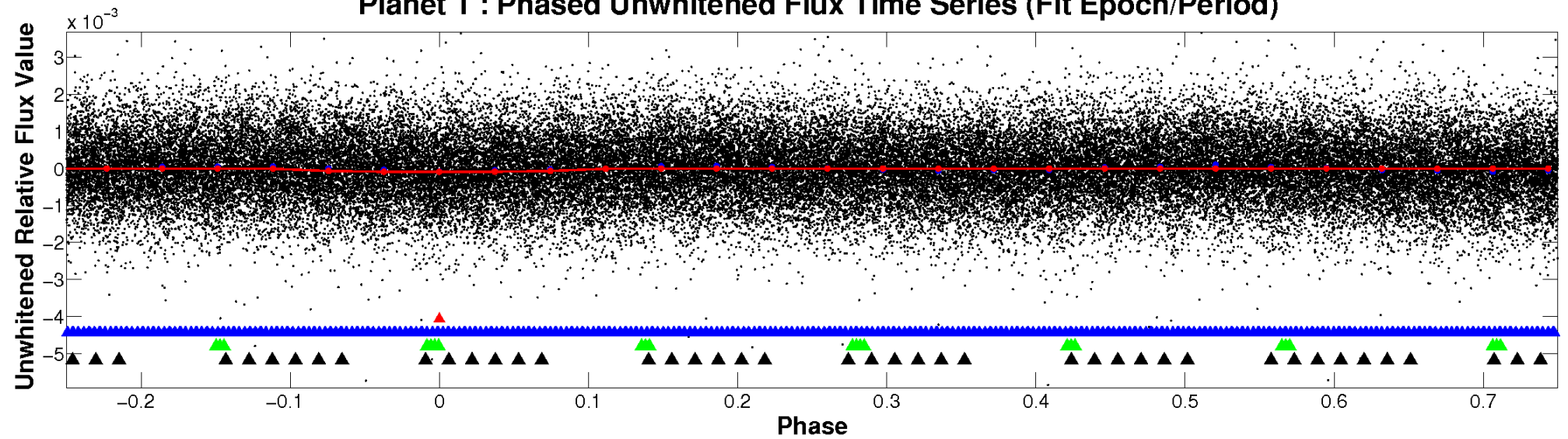
# ALT Odd/Even

TCE 007137952-01

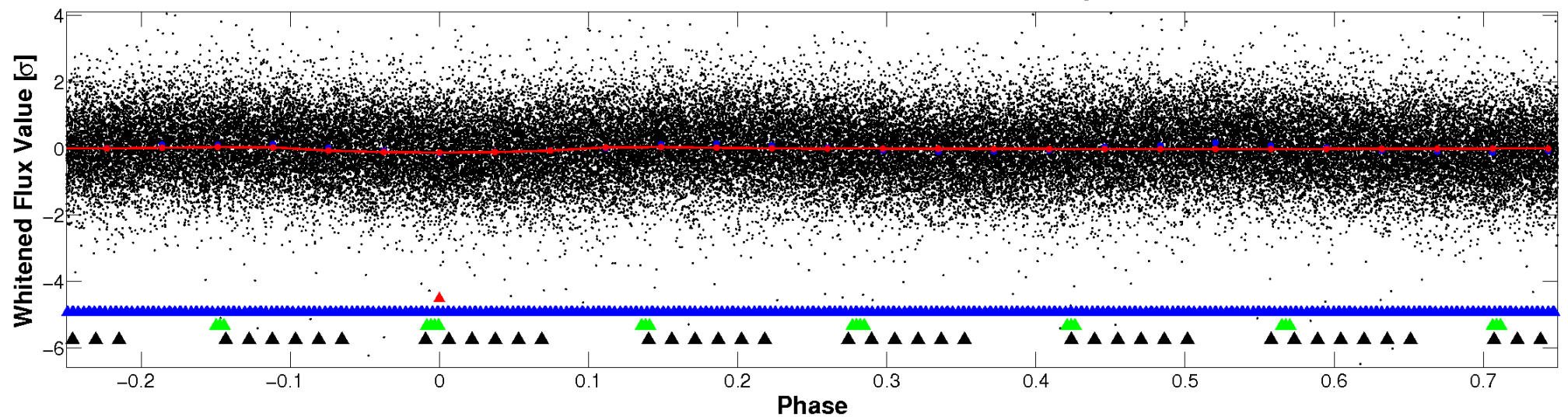


# Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



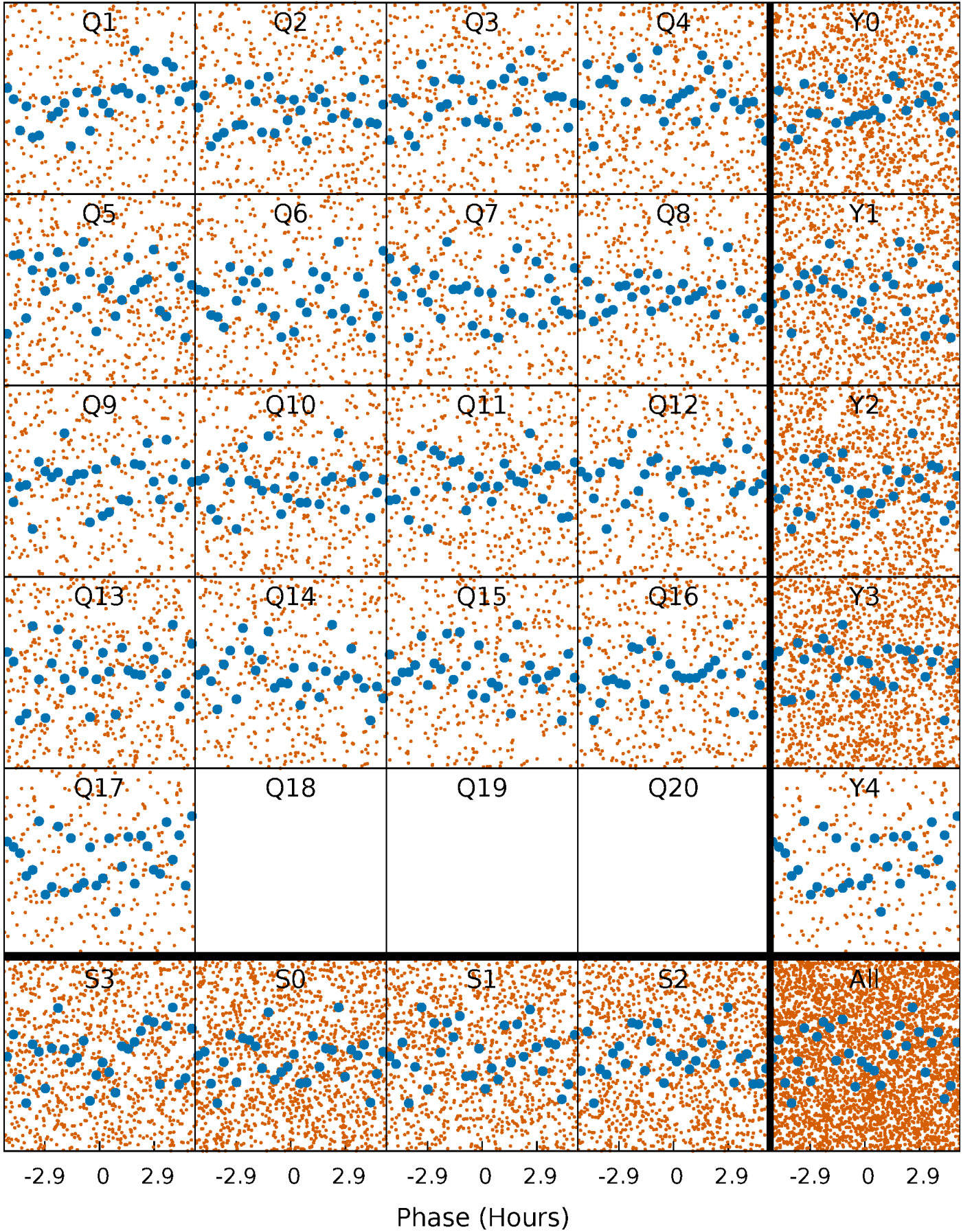
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





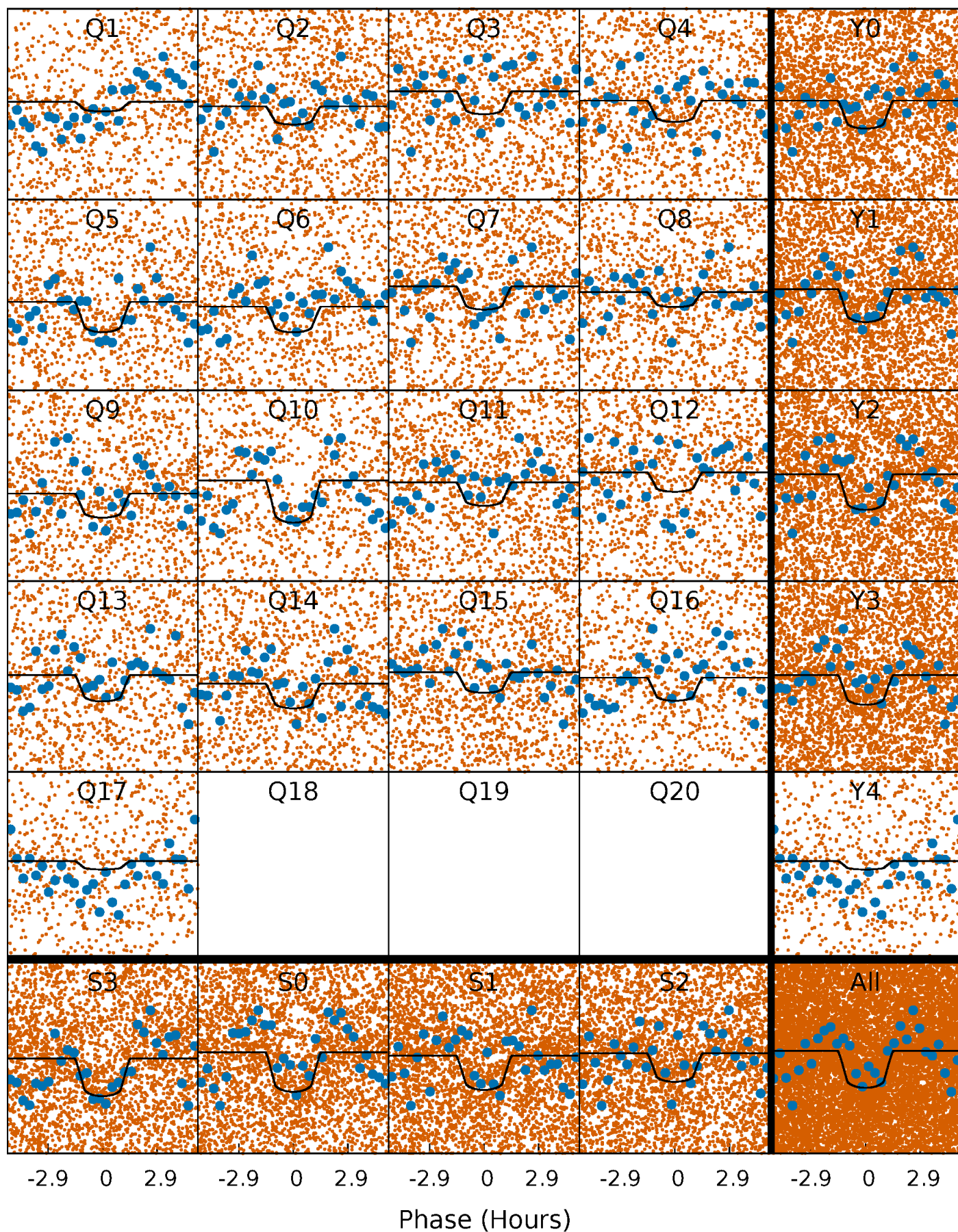
# PDC Quarter-Phased Transit Curves

TCE 007137952-01 P= 0.549626 Days  $T_0=131.982651$  (BKJD)



# DV Quarter-Phased Transit Curves

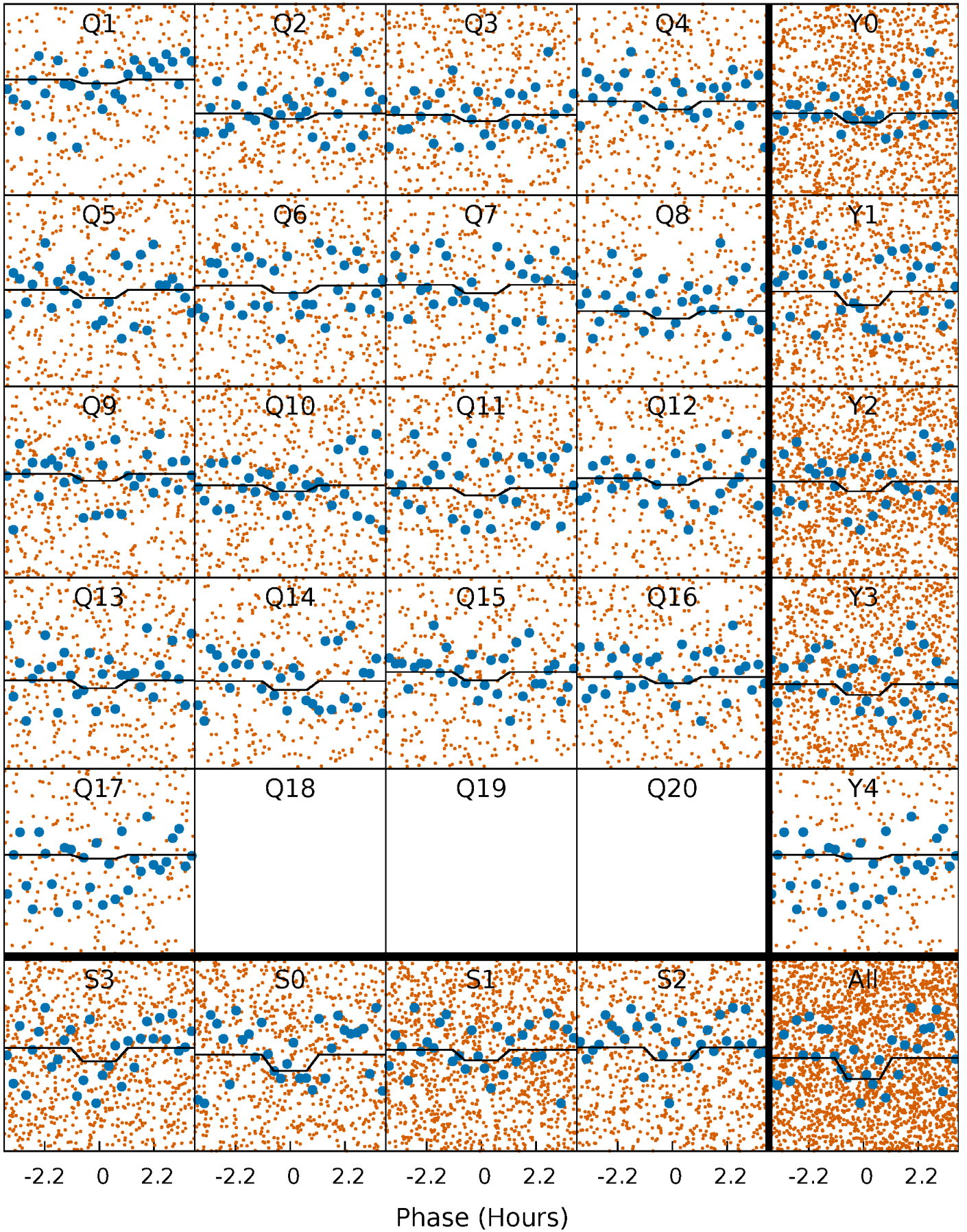
TCE 007137952-01 P= 0.549626 Days  $T_0=131.982651$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007137952-01 P= 0.549633 Days  $T_0=131.974523$  (BKJD)

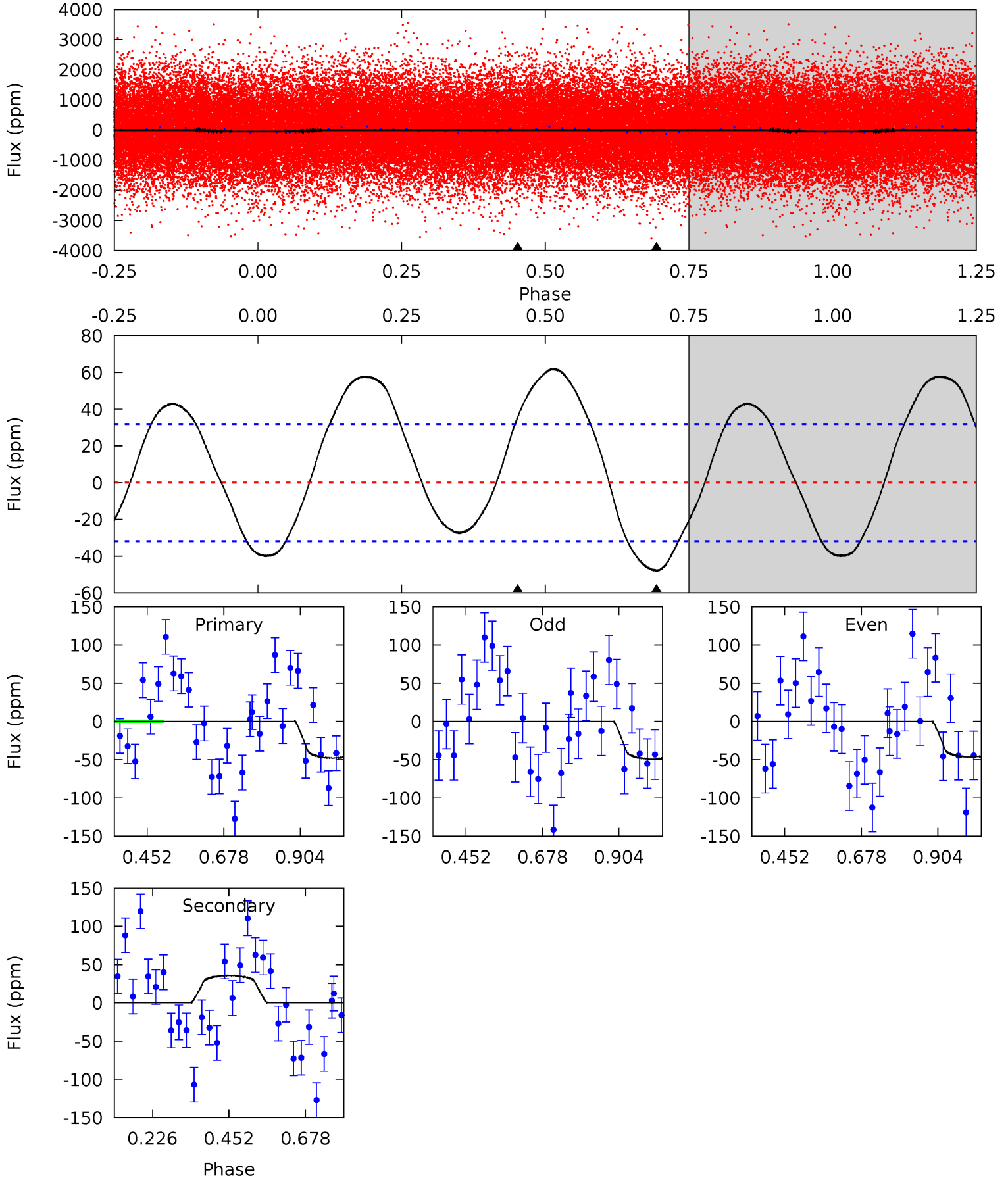




# DV Model-Shift Uniqueness Test

007137952-01, P = 0.549626 Days, E = 131.433025 Days

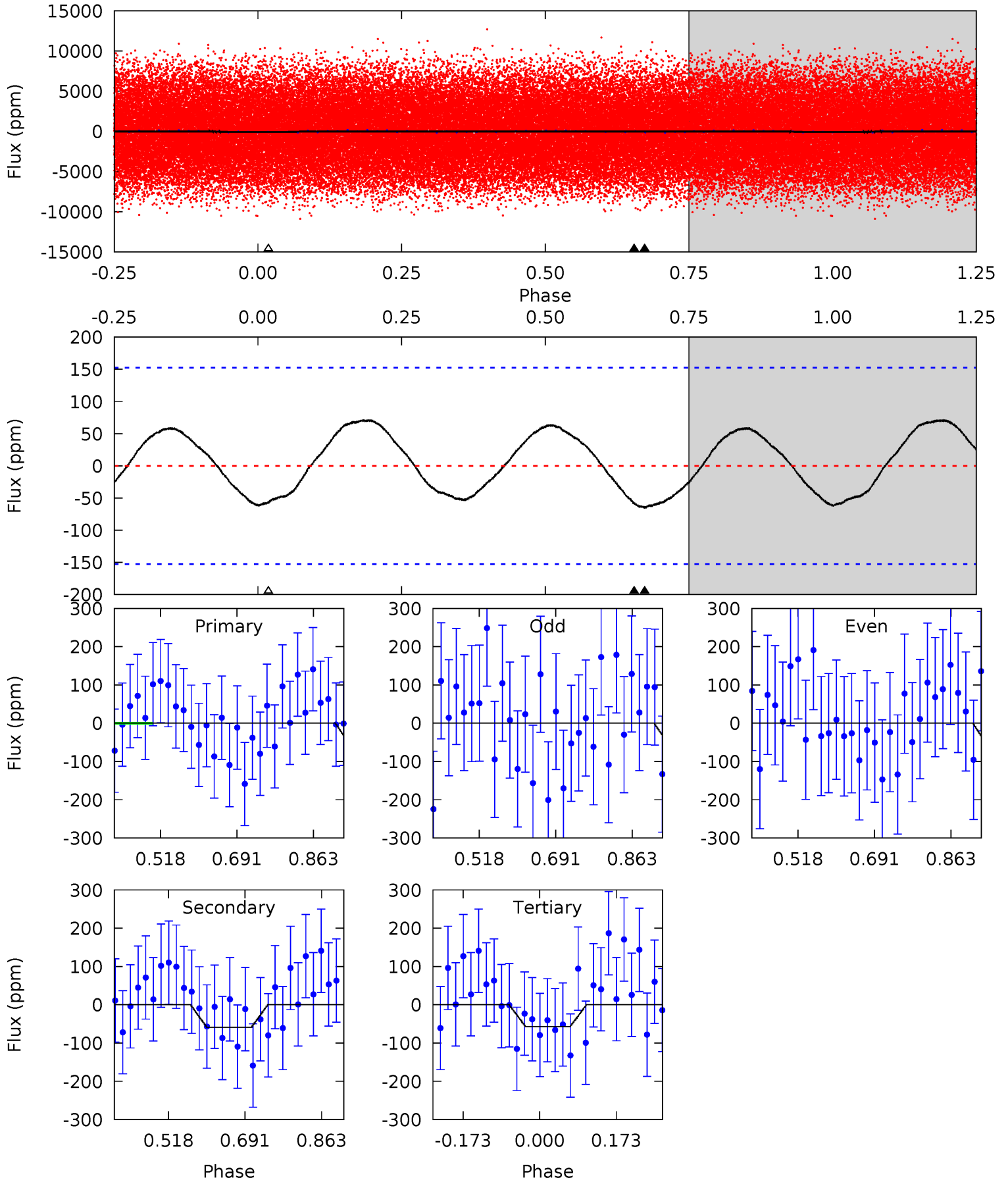
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.59	-4.89	0	0	4.39	1.21	4.98	6.59	6.59	-4.89	-4.89	0.18	1.12	0.56	0.77



# Alt Model-Shift Uniqueness Test

007137952-01, P = 0.549633 Days, E = 131.424890 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.90	1.71	1.67	0	4.45	1.36	1.23	0.23	1.90	0.05	1.71	0.05	1.11	0.52	0.14



### Stellar Parameters For KIC 007137952

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7626^{+211}_{-342}$	$4.168^{+0.084}_{-0.196}$	$0.210^{+0.150}_{-0.400}$	$1.797^{+0.567}_{-0.243}$	$1.740^{+0.204}_{-0.250}$	$0.423^{+0.157}_{-0.220}$
	+3%/-4%	+2%/-5%	+71%/-190%	+32%/-14%	+12%/-14%	+37%/-52%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007137952-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$36 \pm 7$	$2.10^{+1.08}_{-1.10}$	$5083^{+358}_{-298}$	$-6053^{+806}_{-2693}$	$-1.128^{+0.651}_{-4.012}$
Alt.	$-59 \pm 34$	$1.69^{+1.11}_{-0.88}$	$5087^{+385}_{-289}$	$6784^{+4698}_{-2254}$	$2.518^{+9.073}_{-1.852}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



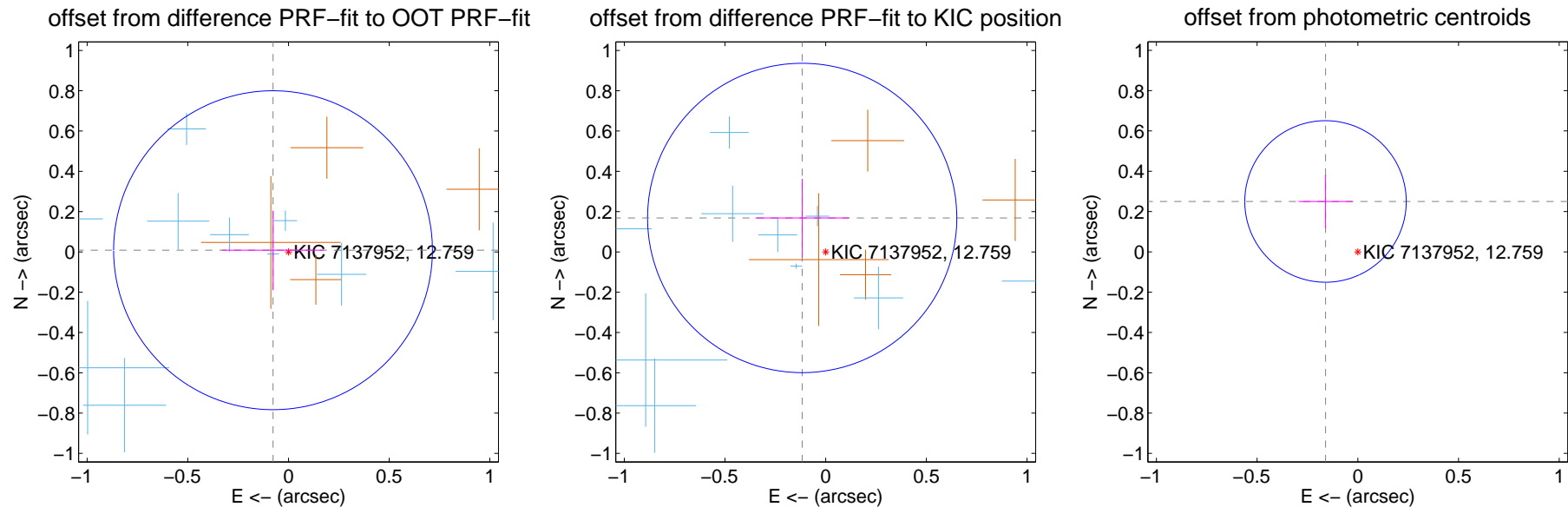
## DV Centroid Data

Supplemental centroid analysis for 007137952-01. Kepler magnitude: 12.76. Transit SNR 11.65

There are 11 quarters with good PRF difference image offsets

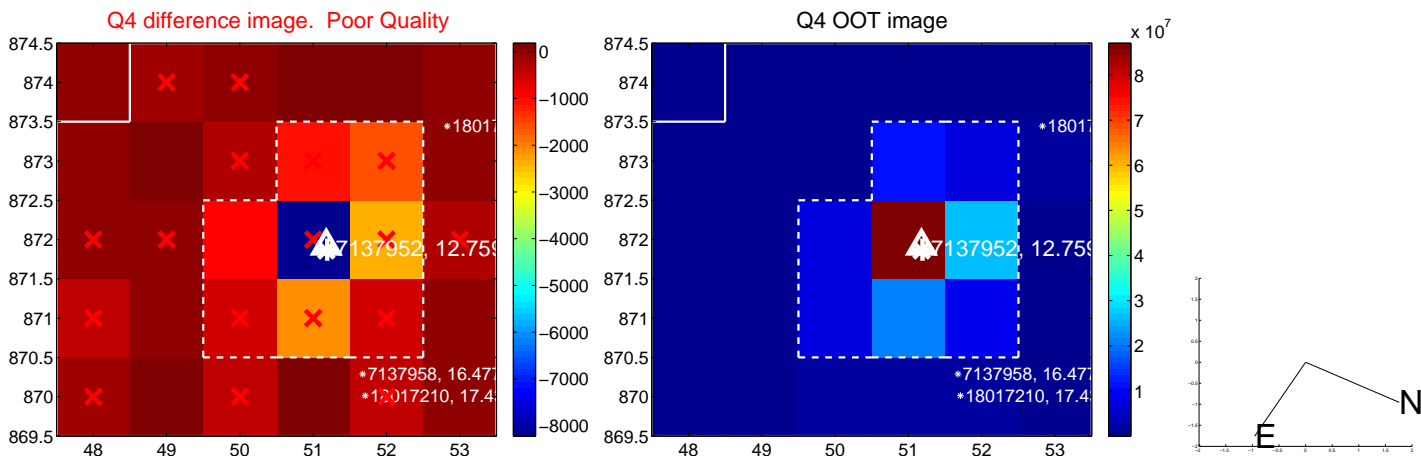
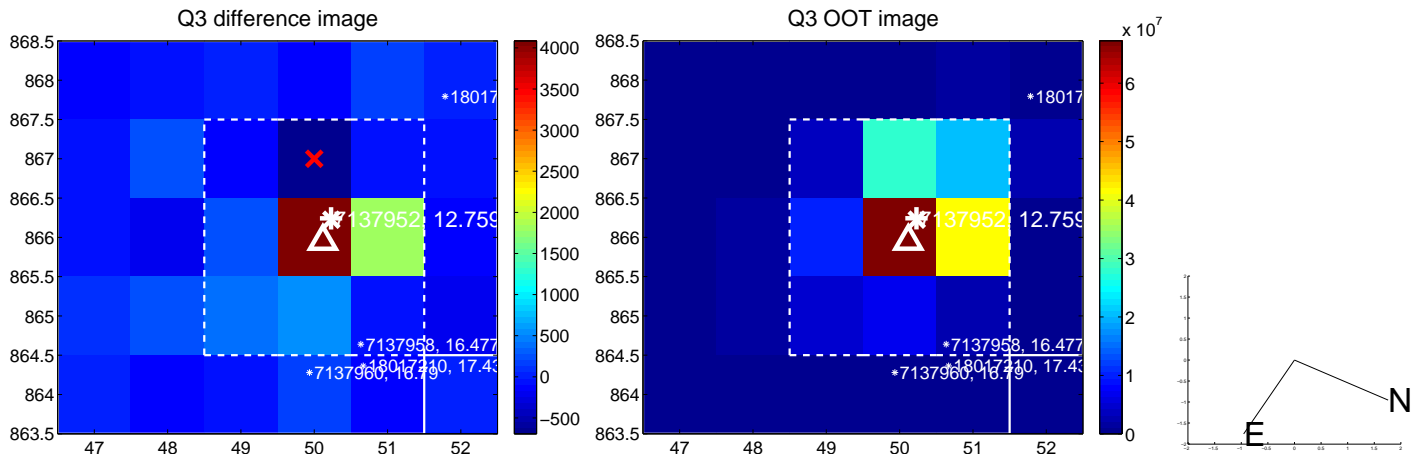
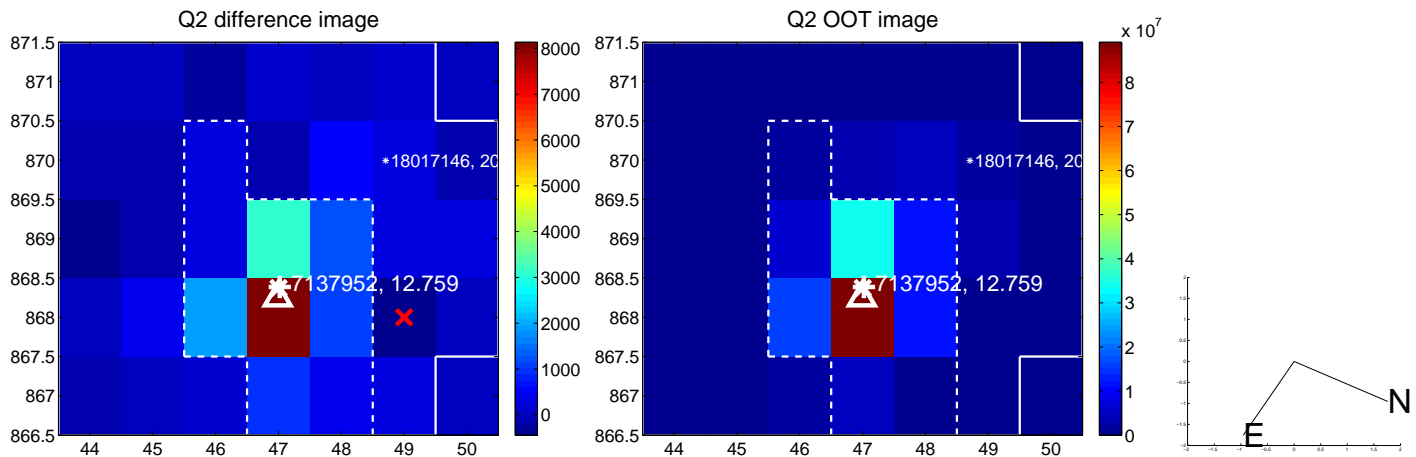
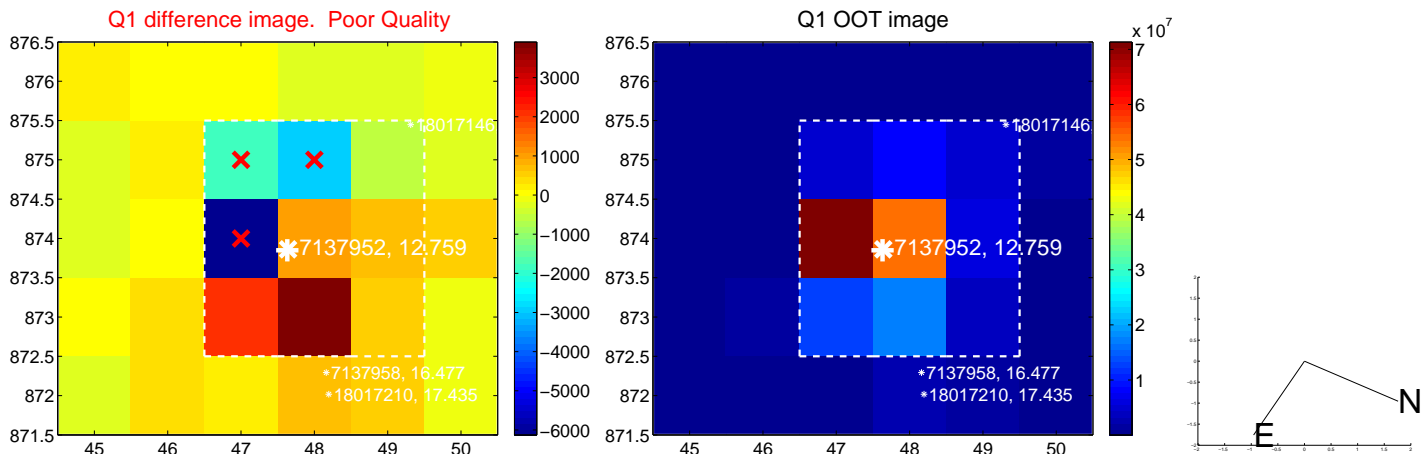
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.077 \pm 0.264$	0.29	$0.077 \pm 0.253$	$0.008 \pm 0.197$
PRF-fit source offset from KIC position	$0.205 \pm 0.256$	0.80	$0.117 \pm 0.232$	$0.169 \pm 0.194$
photometric centroid source offset	$0.30 \pm 0.13$	2.22	$0.16 \pm 0.13$	$0.25 \pm 0.13$

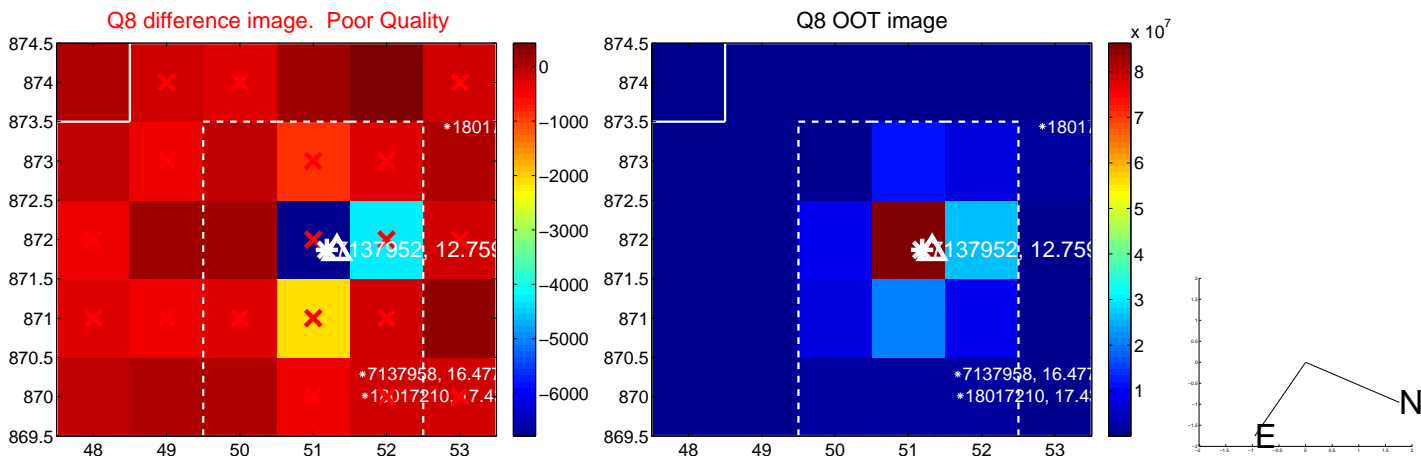
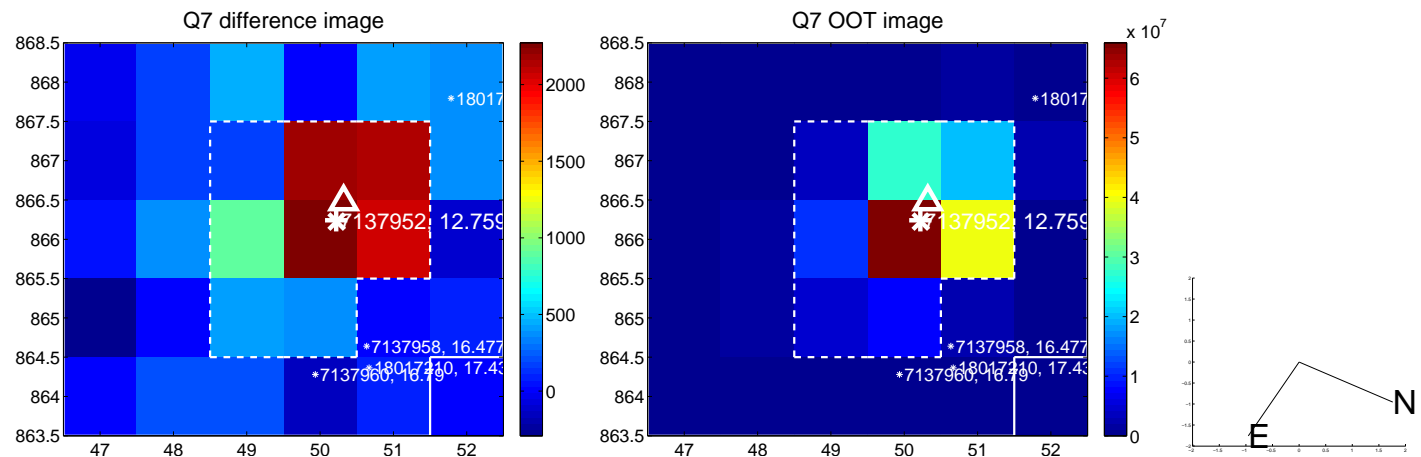
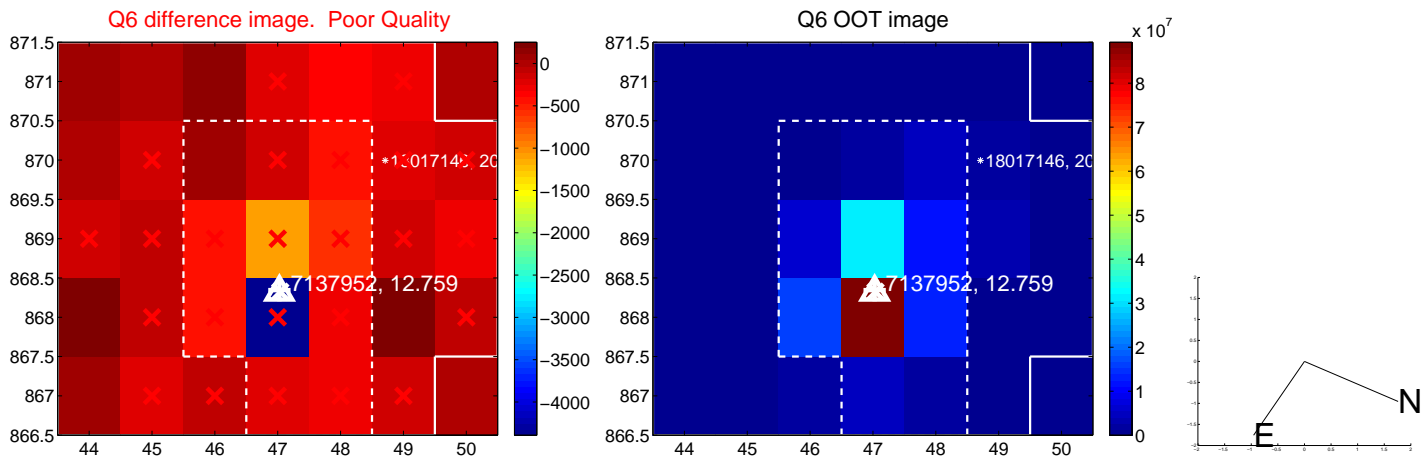
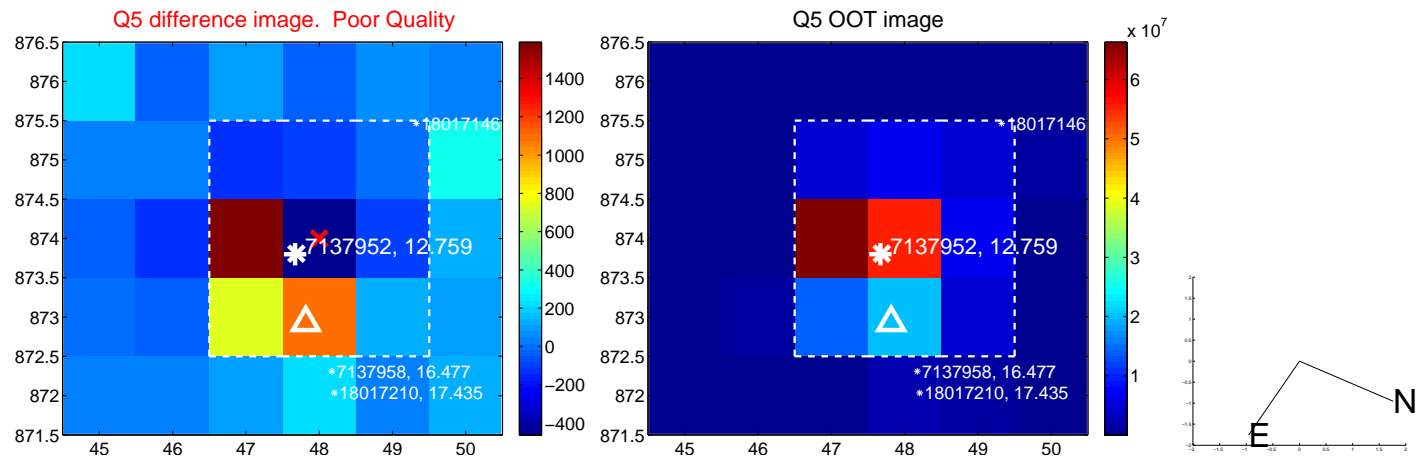


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

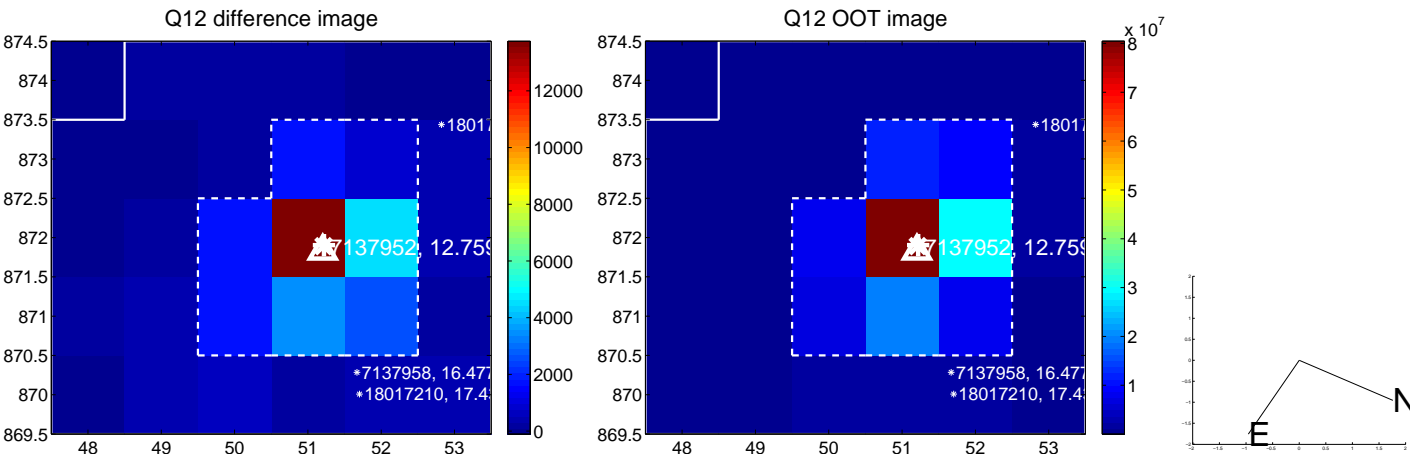
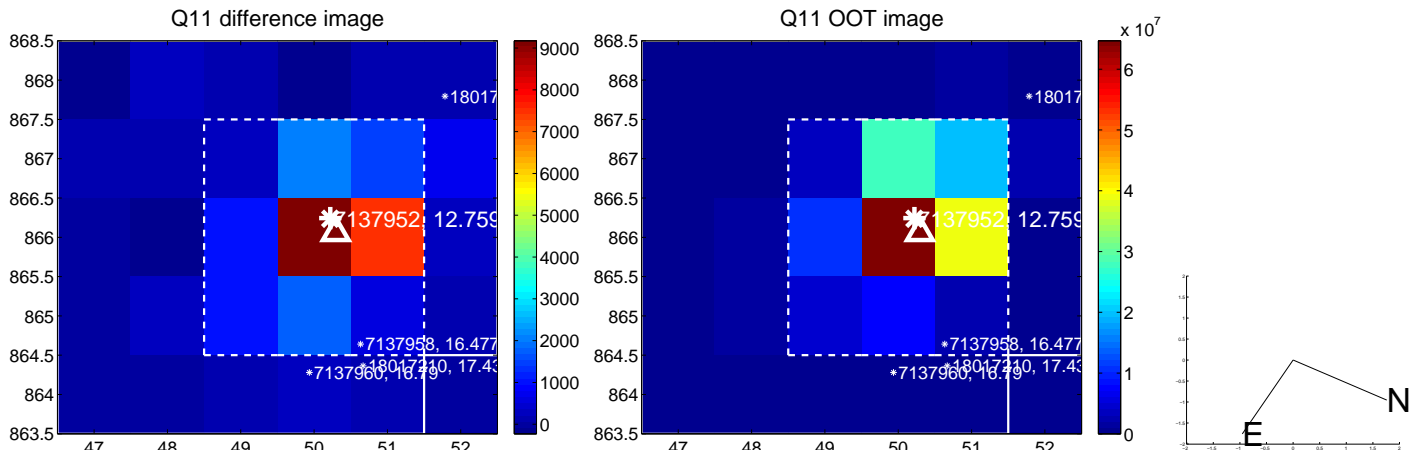
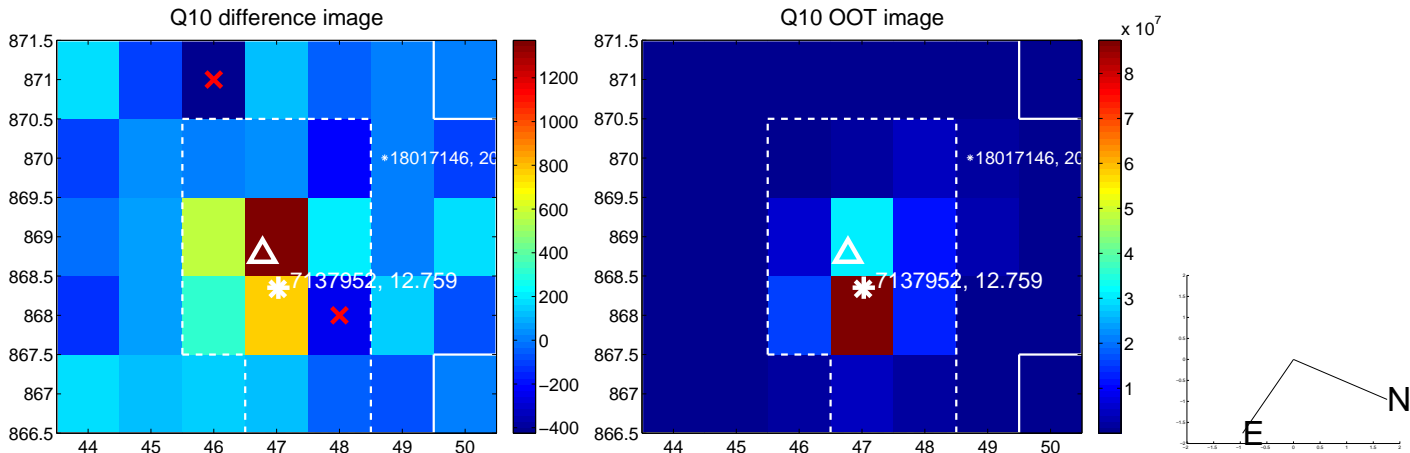
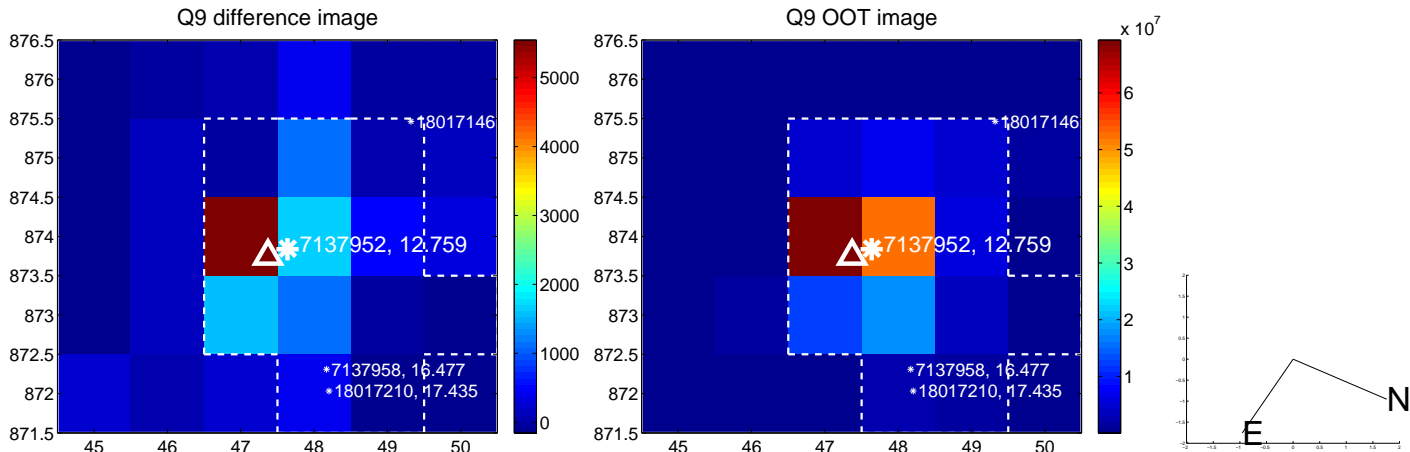


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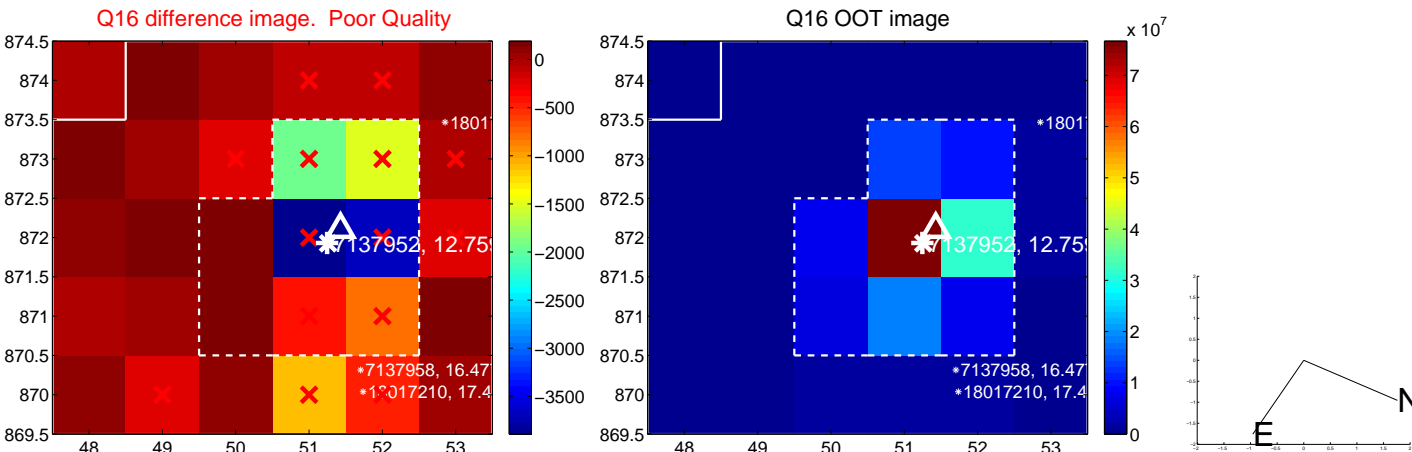
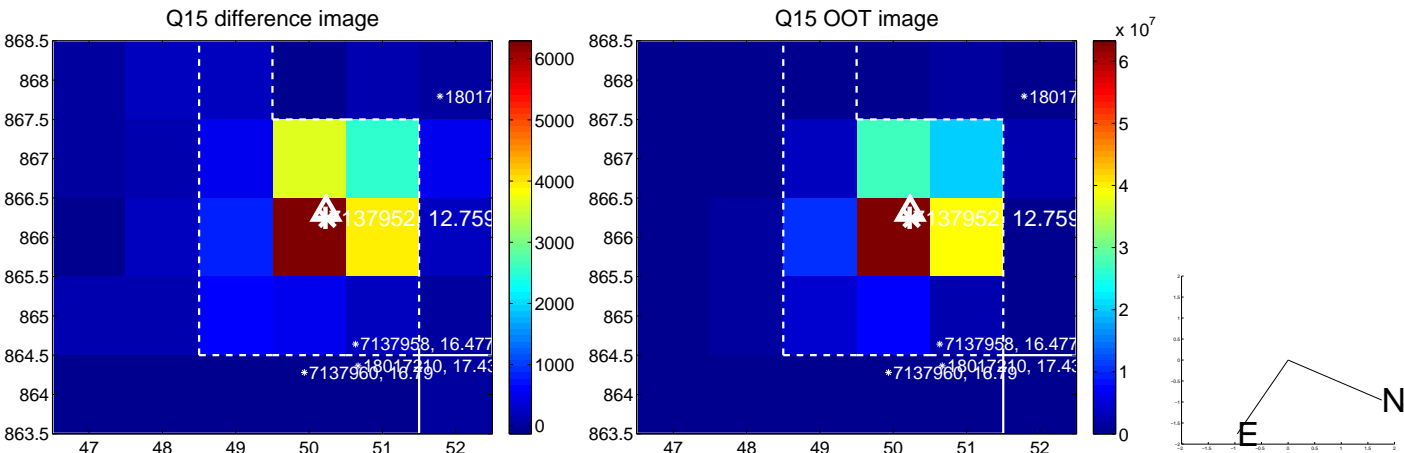
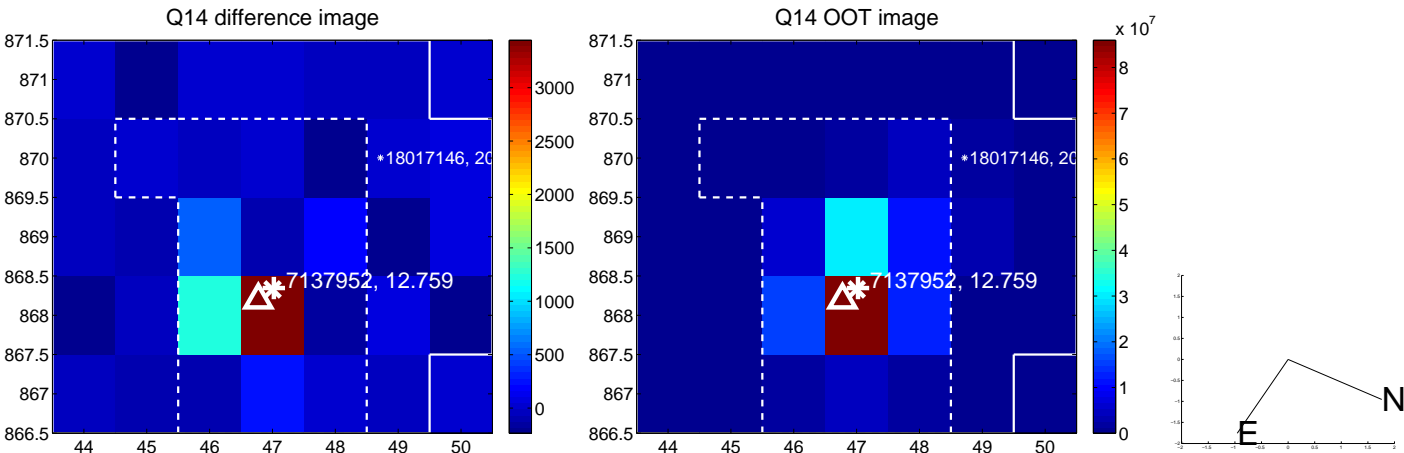
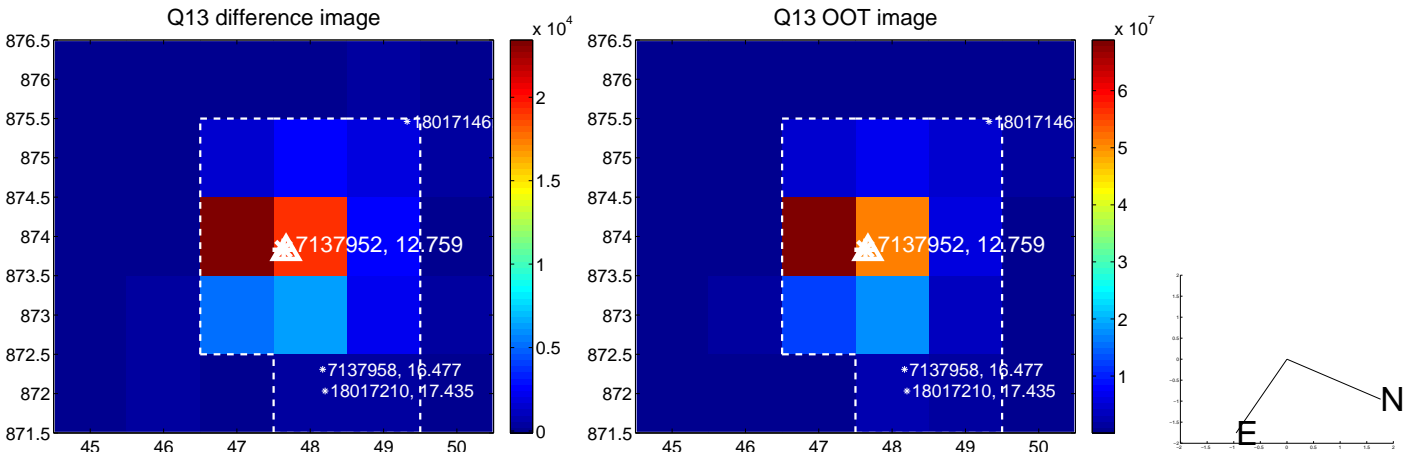




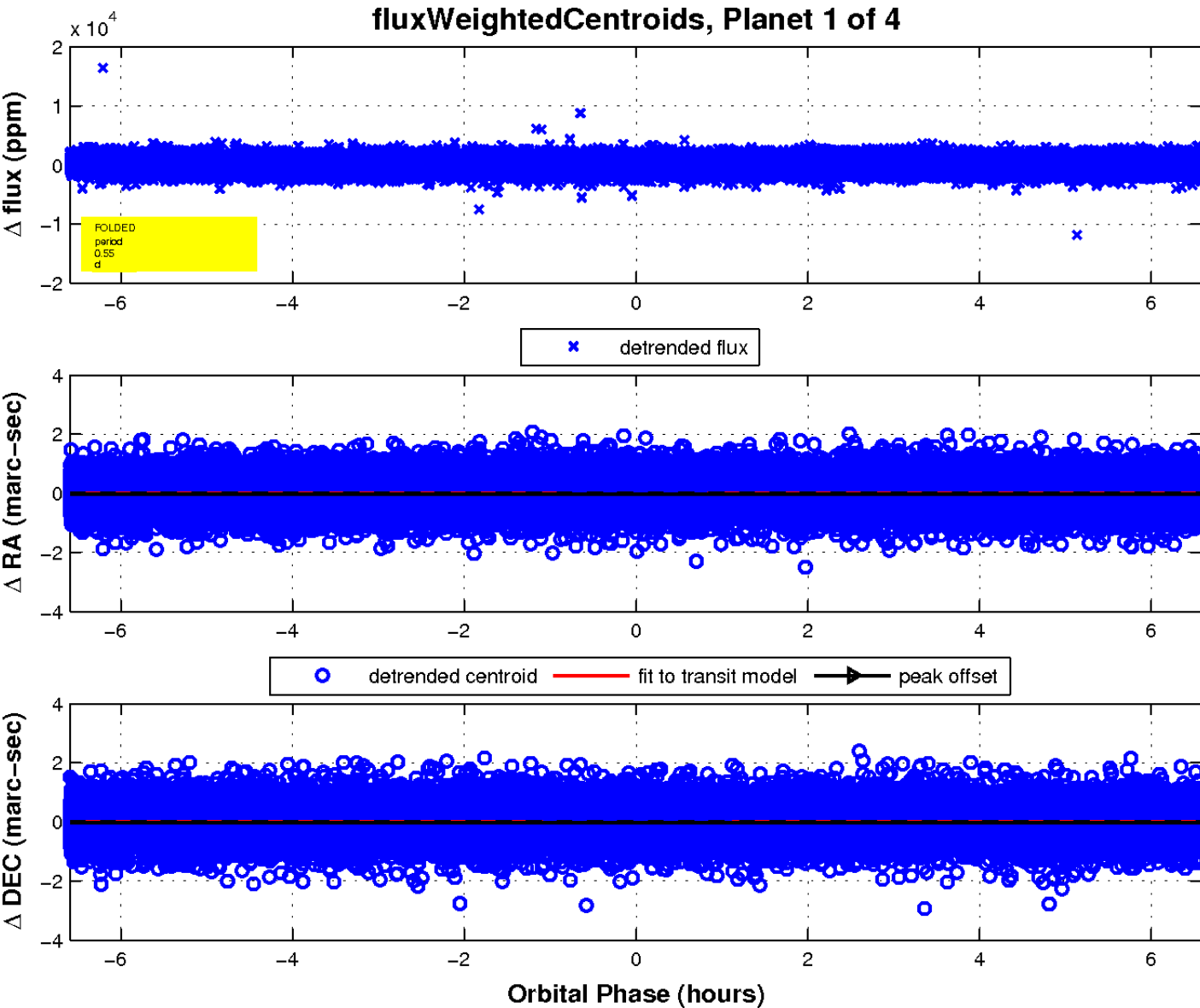
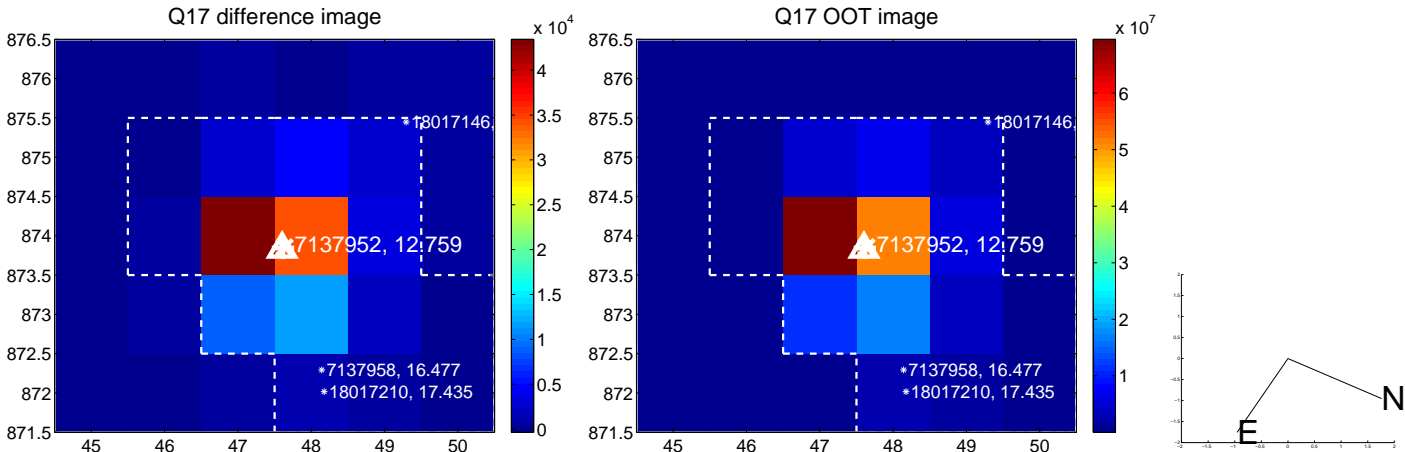
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

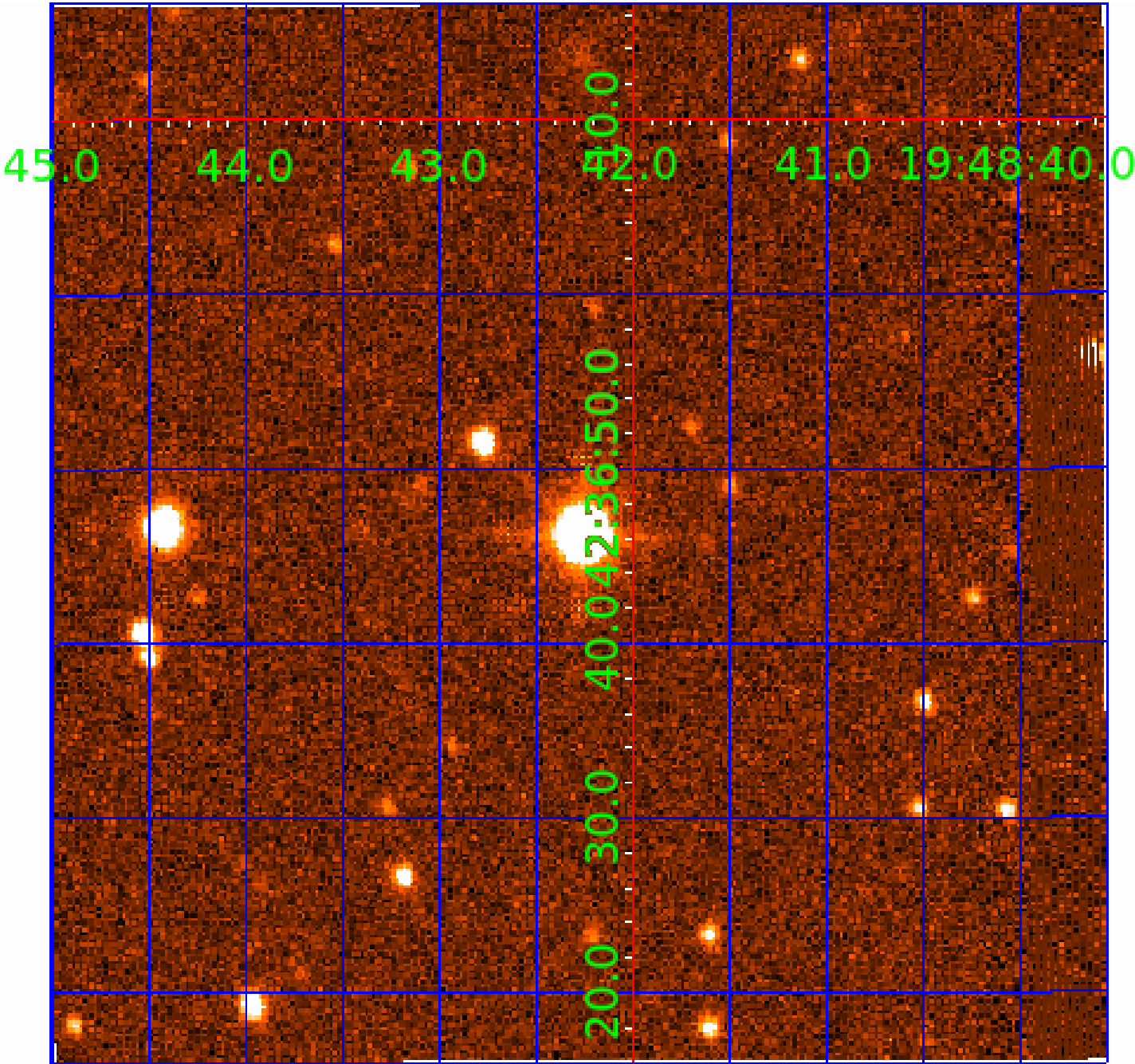


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007137952

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007137952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
007137952-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007137952-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
007137952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

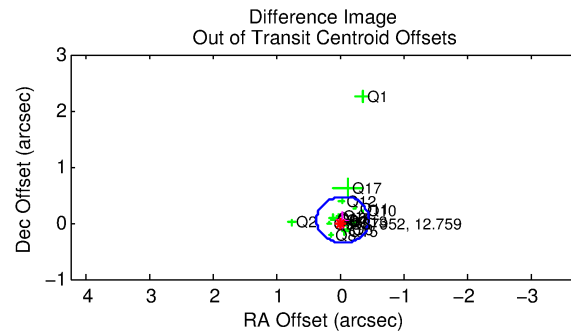
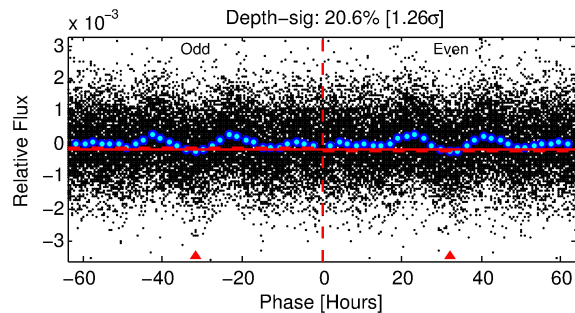
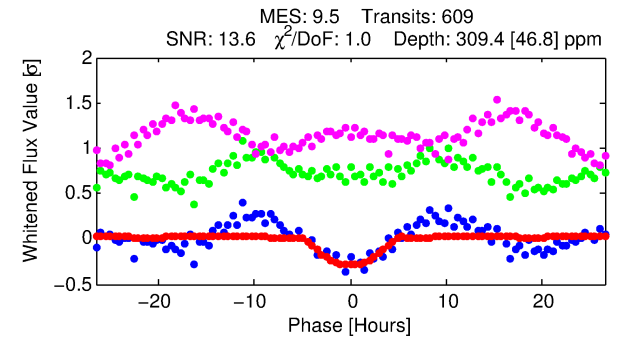
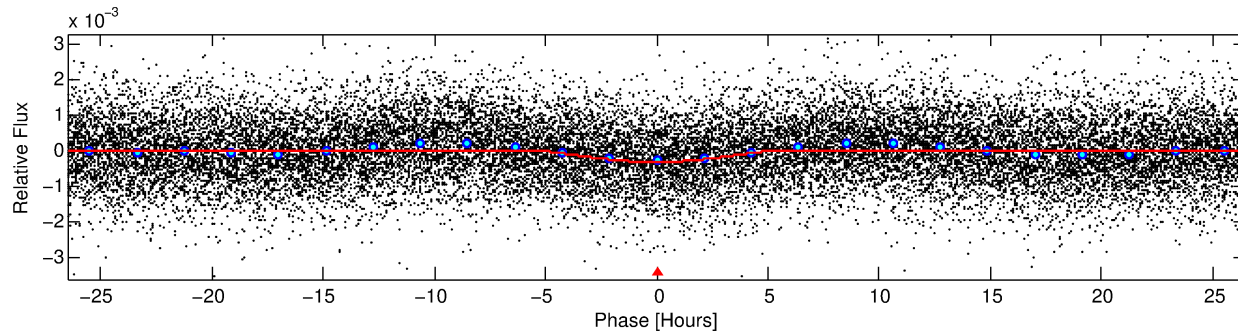
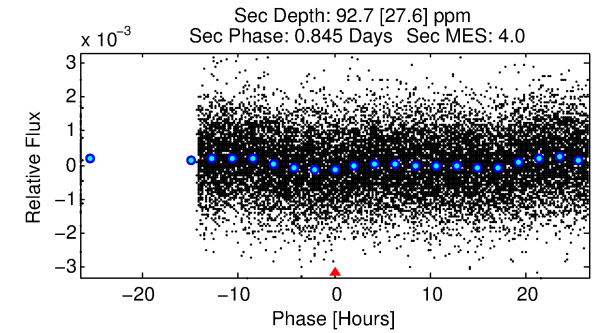
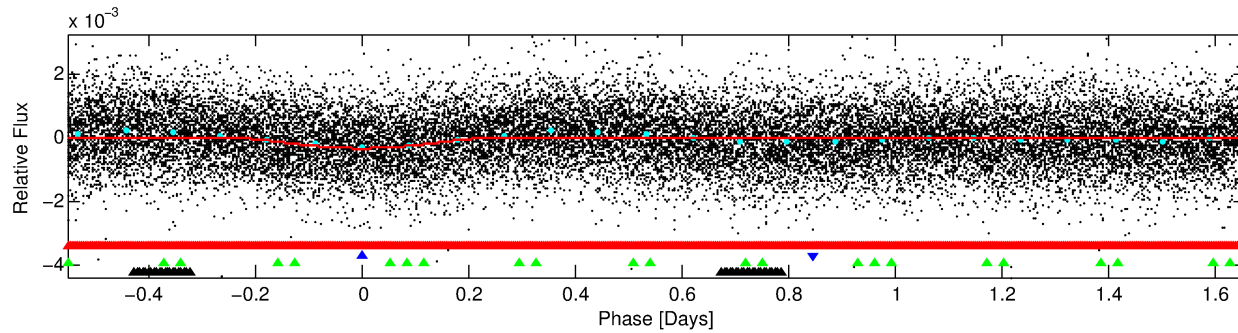
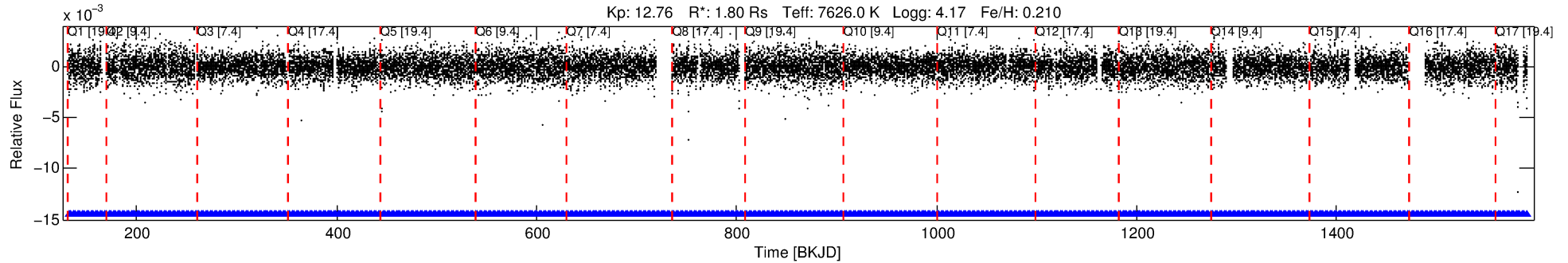
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007137952-02

No Significant Match Found

# DV One-Page Summary

KIC: 7137952 Candidate: 2 of 4 Period: 2.208 d



## DV Fit Results:

Period = 2.20839 [0.00005] d  
Epoch = 132.6763 [0.0182] BKJD  
Rp/R\* = 0.0258 [0.0237]  
a/R\* = 1.09 [0.02]  
b = 0.99 [0.04]  
Seff = 6151.95 [2513.66]  
Teq = 2258 [231] K  
Rp = 5.06 [4.91] Re  
a = 0.0399 [0.0103] AU  
Ag = 3.17 [6.01] [0.36σ]  
Teffp = 4659 [2175] K [1.10σ]

## DV Diagnostic Results:

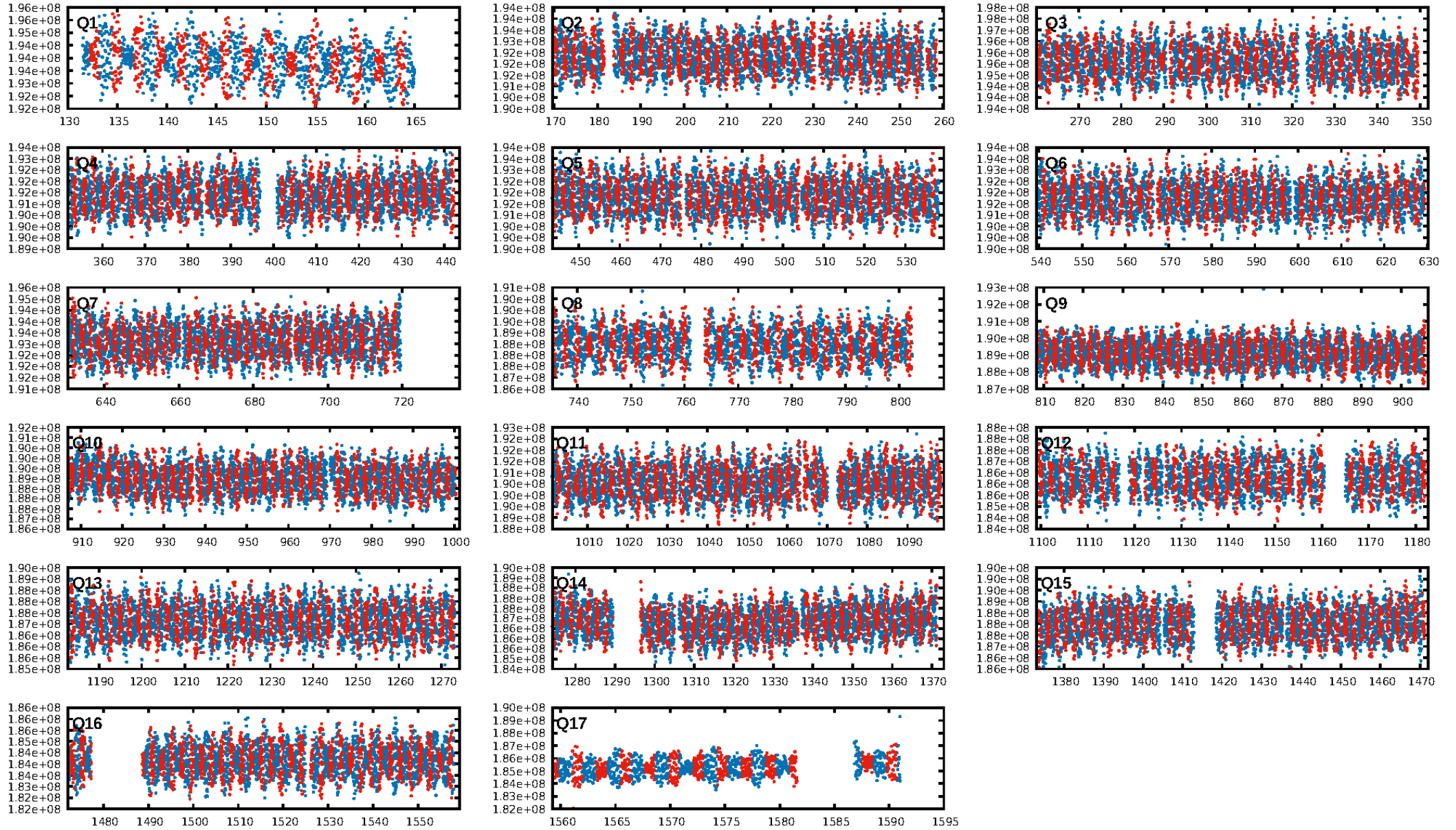
ShortPeriod-sig: 100.0% [3.64σ]  
LongPeriod-sig: 100.0% [60.37σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.44e-12**  
RollingBand-fgt: 1.00 [582/582]  
GhostDiagnostic-chr: 1.82  
Centroid-sig: 36.9%  
Centroid-so: 0.090 arcsec [1.59σ]  
OotOffset-rm: 0.061 arcsec [0.45σ]  
KicOffset-rm: 0.107 arcsec [1.01σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:11:30 Z

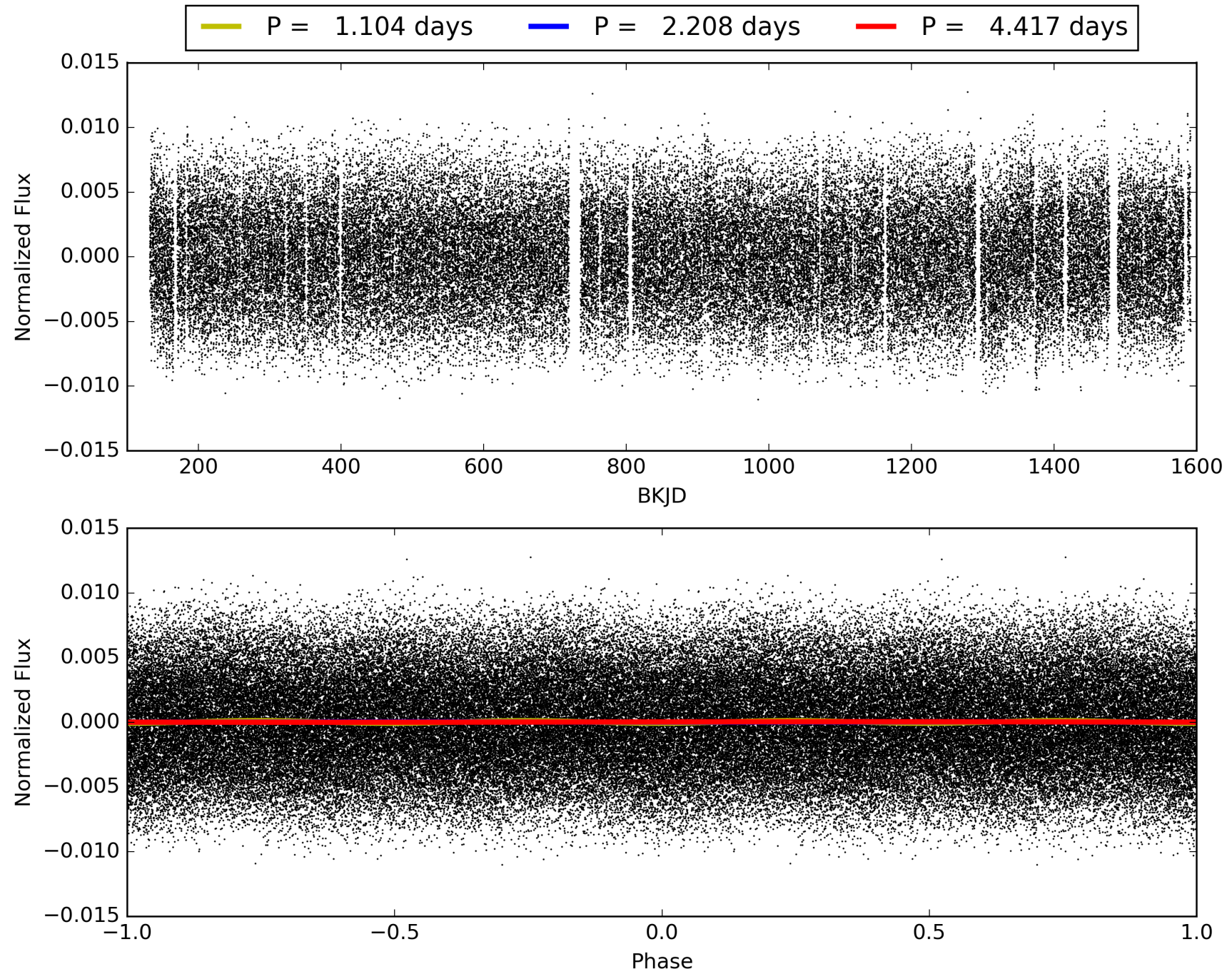
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007137952-02, PDC Light Curves

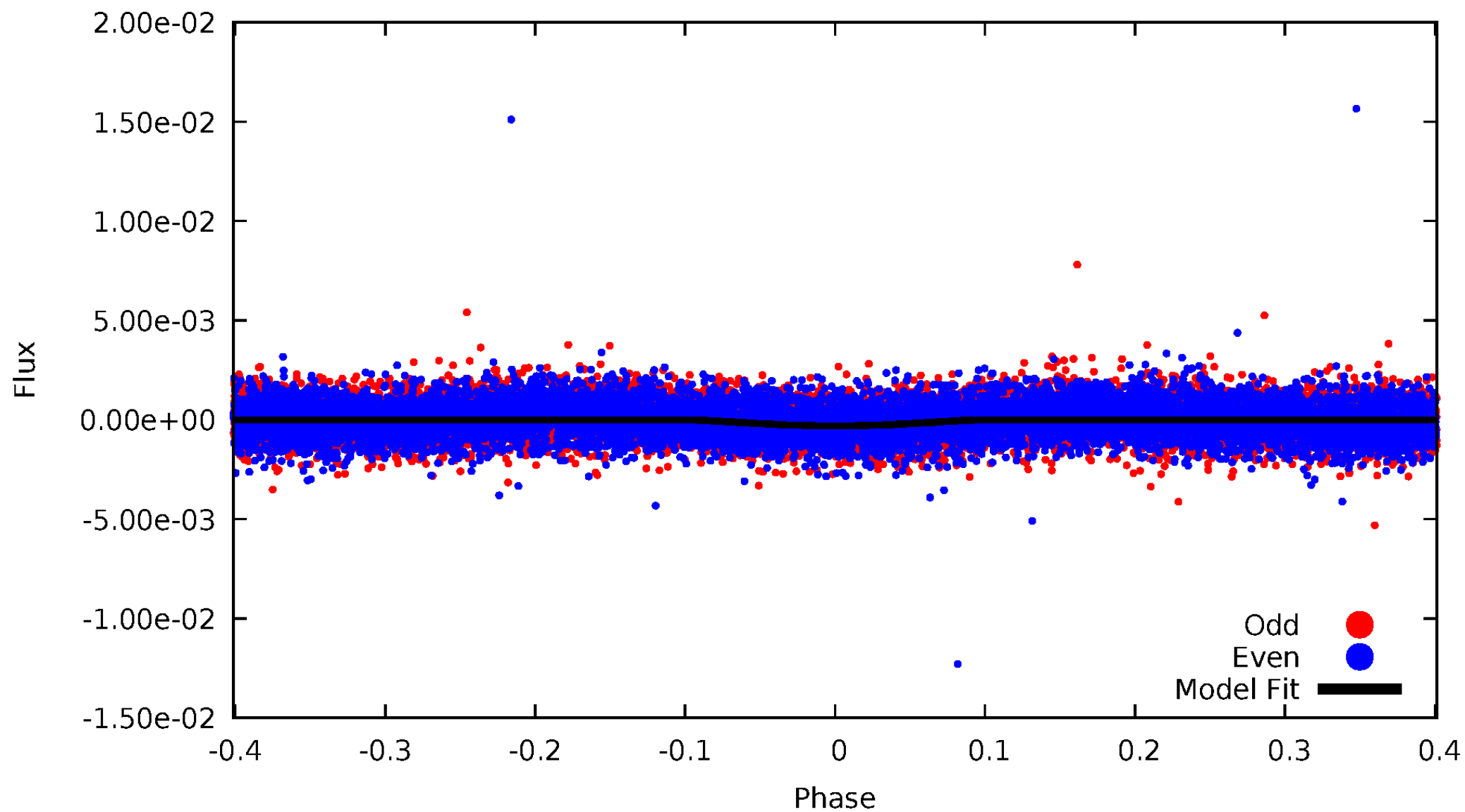


TCE 007137952-02



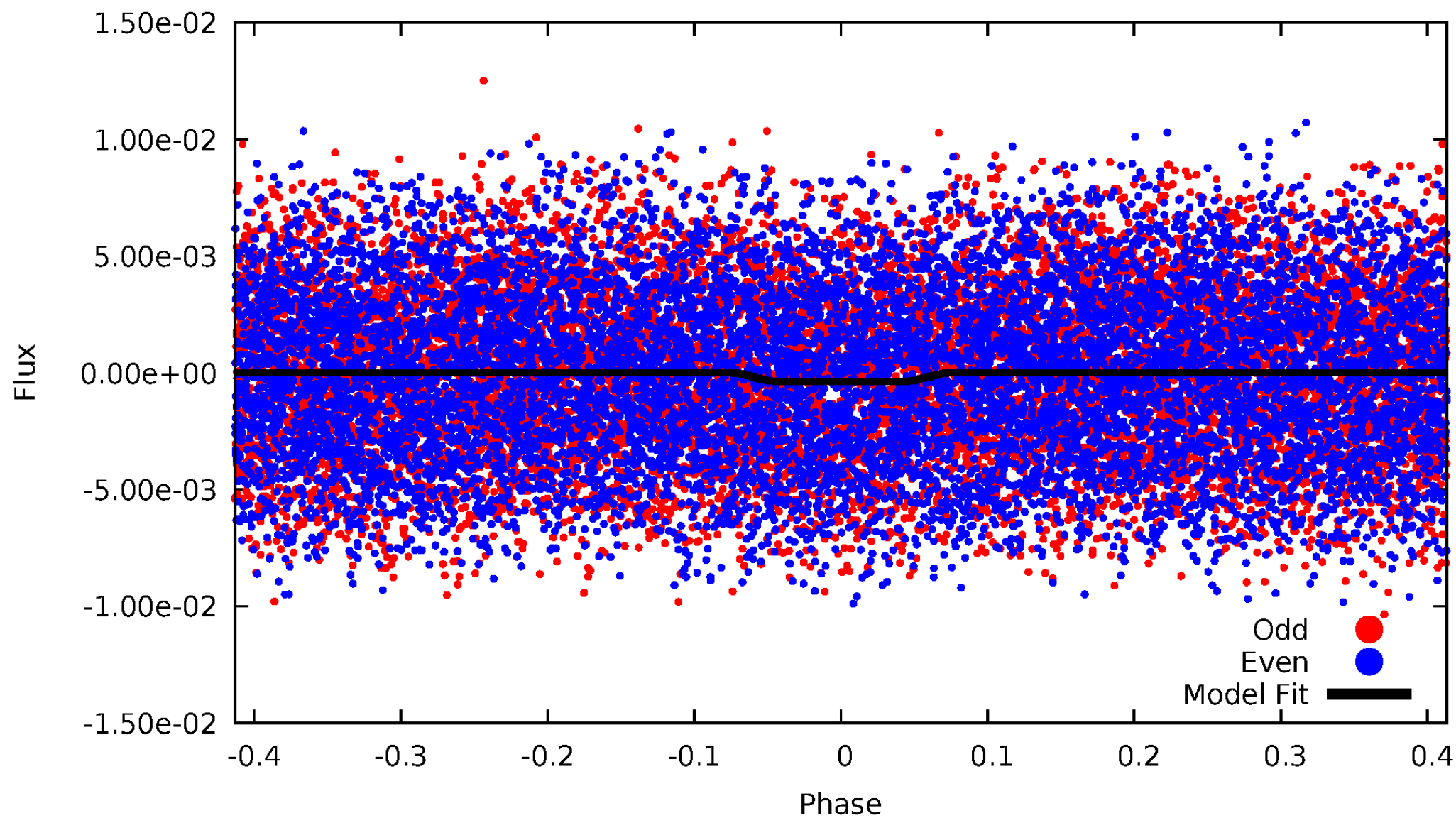
# DV Odd/Even

TCE 007137952-02



ALT Odd/Even

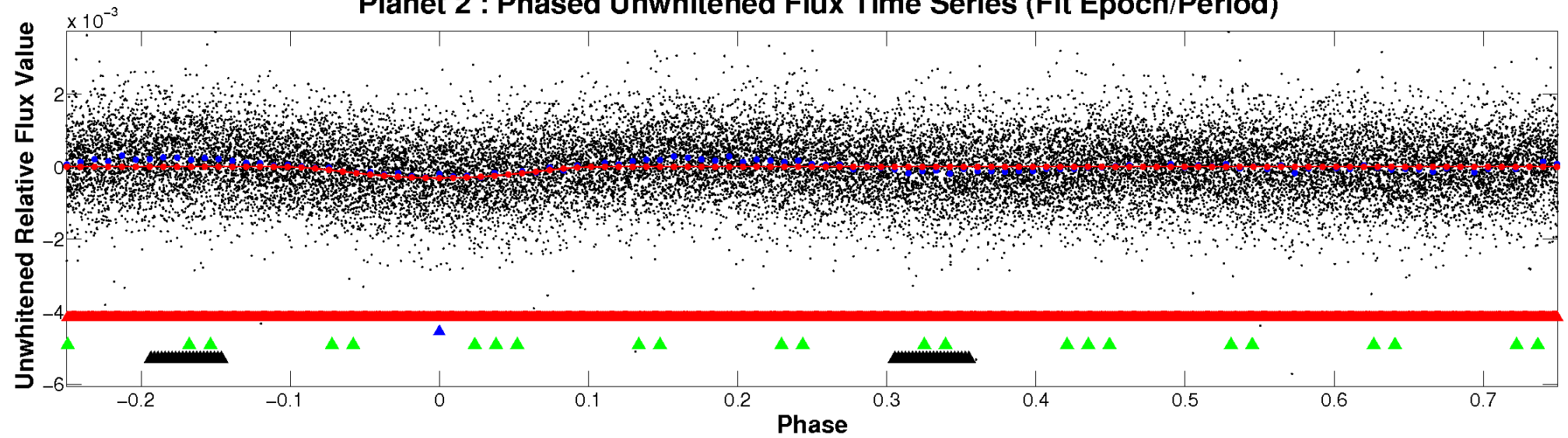
TCE 007137952-02



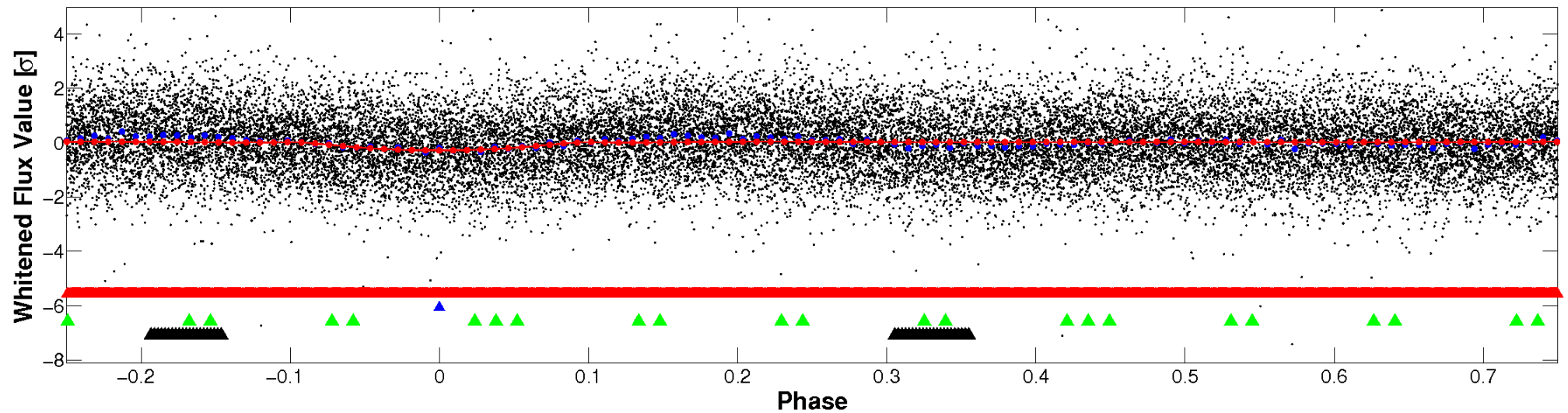


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

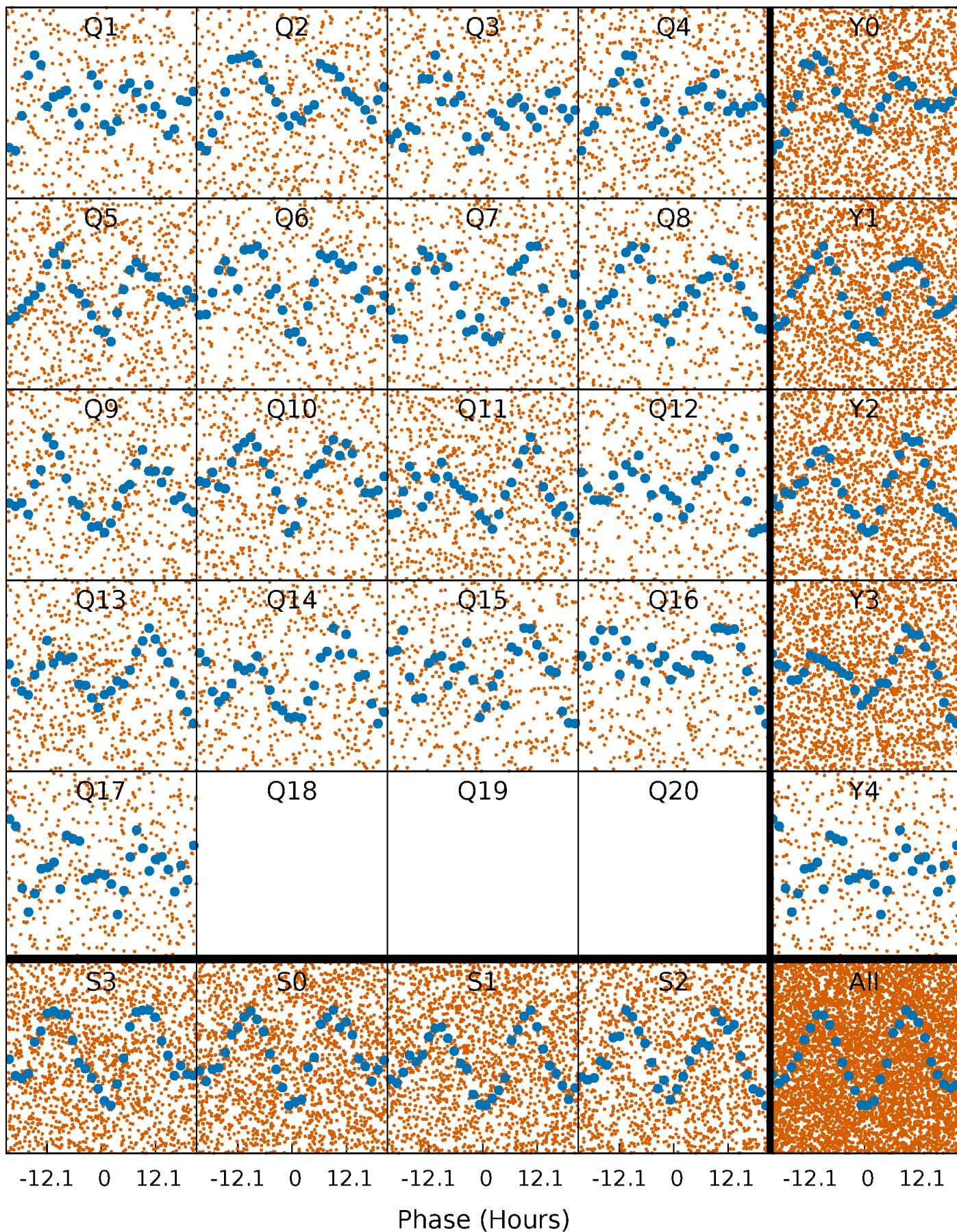


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

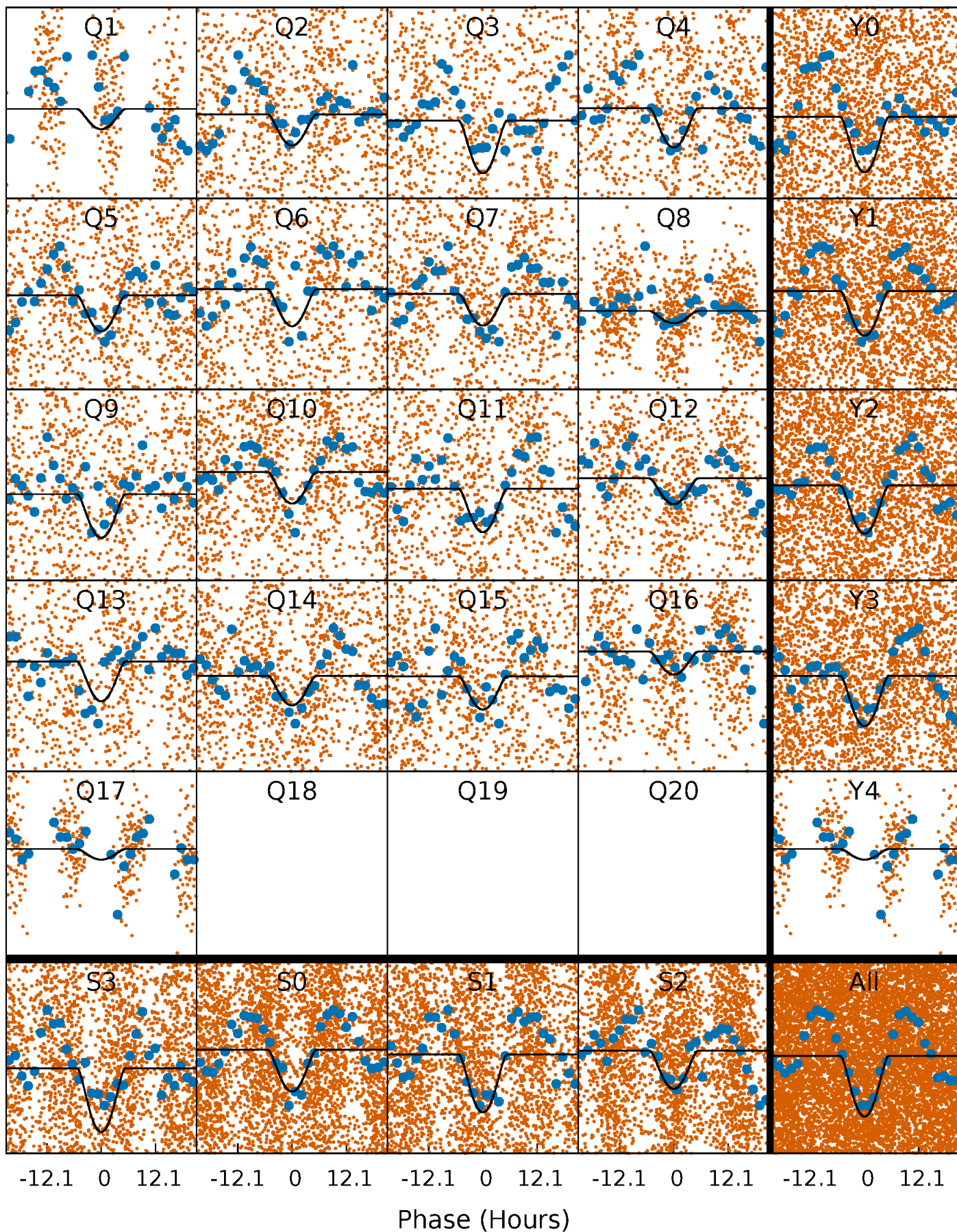
TCE 007137952-02   P= 2.208389 Days    $T_0=132.676339$  (BKJD)





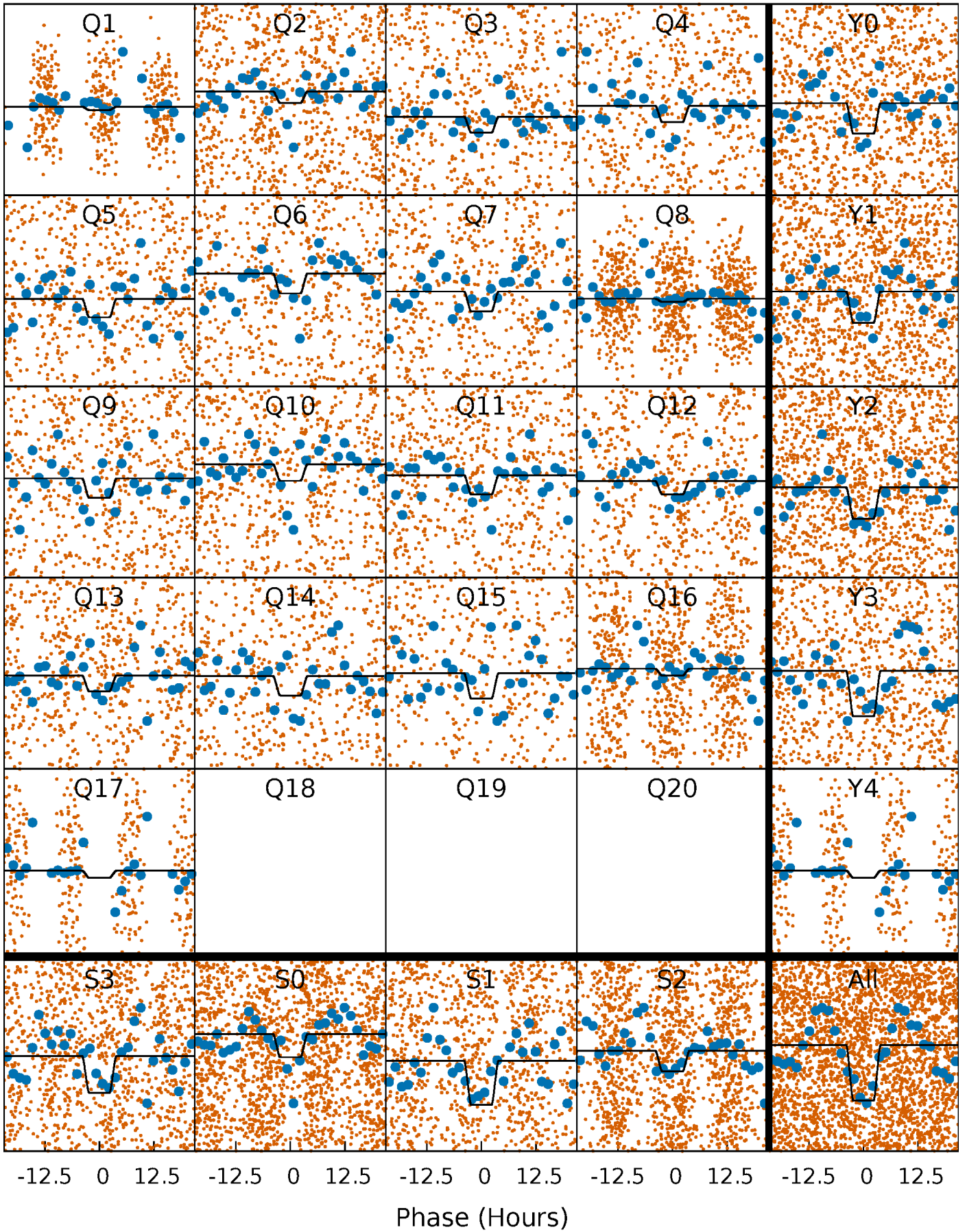
# DV Quarter-Phased Transit Curves

TCE 007137952-02   P= 2.208389 Days    $T_0=132.676339$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007137952-02 P= 2.208341 Days  $T_0=132.696838$  (BKJD)

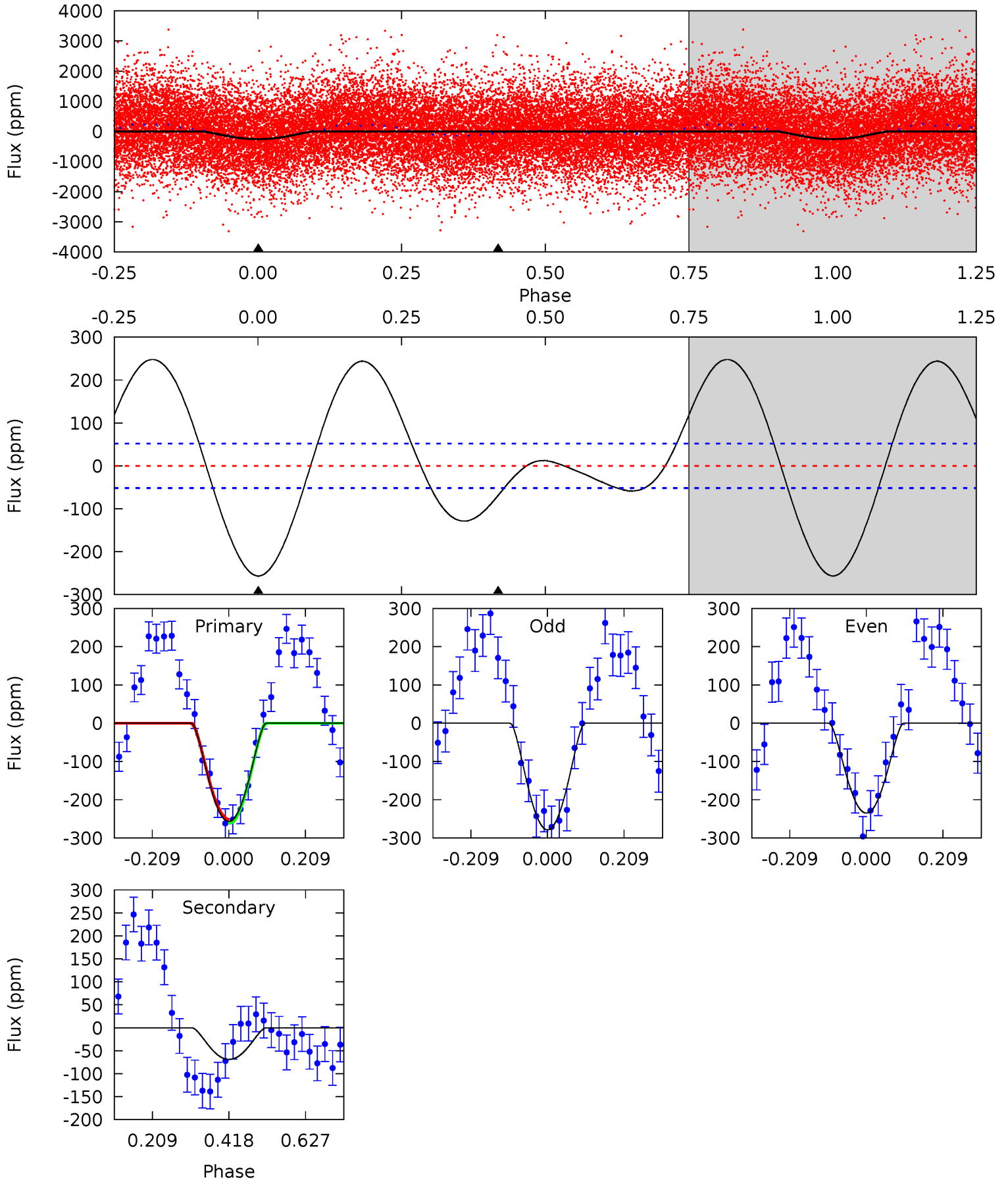




# DV Model-Shift Uniqueness Test

007137952-02, P = 2.208389 Days, E = 130.467950 Days

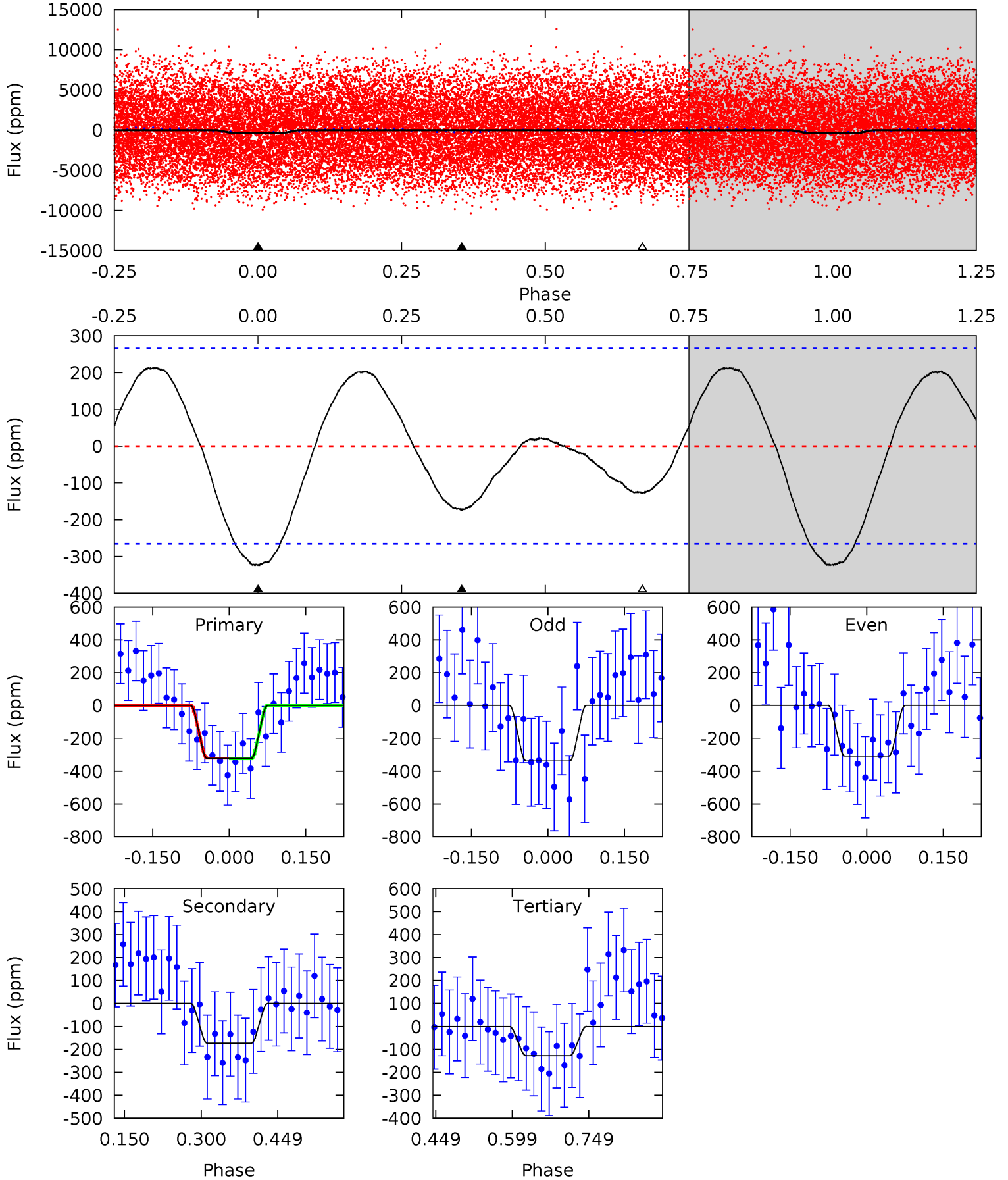
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	5.87	0	0	4.41	1.26	8.13	21.9	21.9	5.87	5.87	1.86	1.15	0.49	0.41



# Alt Model-Shift Uniqueness Test

007137952-02, P = 2.208341 Days, E = 130.488497 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.45	2.92	2.14	0	4.48	1.44	2.09	3.31	5.45	0.77	2.92	0.25	0.87	0.40	0.03



### Stellar Parameters For KIC 007137952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7626^{+211}_{-342}$	$4.168^{+0.084}_{-0.196}$	$0.210^{+0.150}_{-0.400}$	$1.797^{+0.567}_{-0.243}$	$1.740^{+0.204}_{-0.250}$	$0.423^{+0.157}_{-0.220}$
	+3%/-4%	+2%/-5%	+71%/-190%	+32%/-14%	+12%/-14%	+37%/-52%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007137952-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-69 \pm 12$	$6.18^{+4.54}_{-3.86}$	$3183^{+224}_{-192}$	$3970^{+2235}_{-987}$	$1.547^{+9.171}_{-1.056}$
Alt.	$-173 \pm 59$	$5.11^{+4.29}_{-3.11}$	$3181^{+224}_{-175}$	$5198^{+3588}_{-1295}$	$4.940^{+29.340}_{-3.549}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

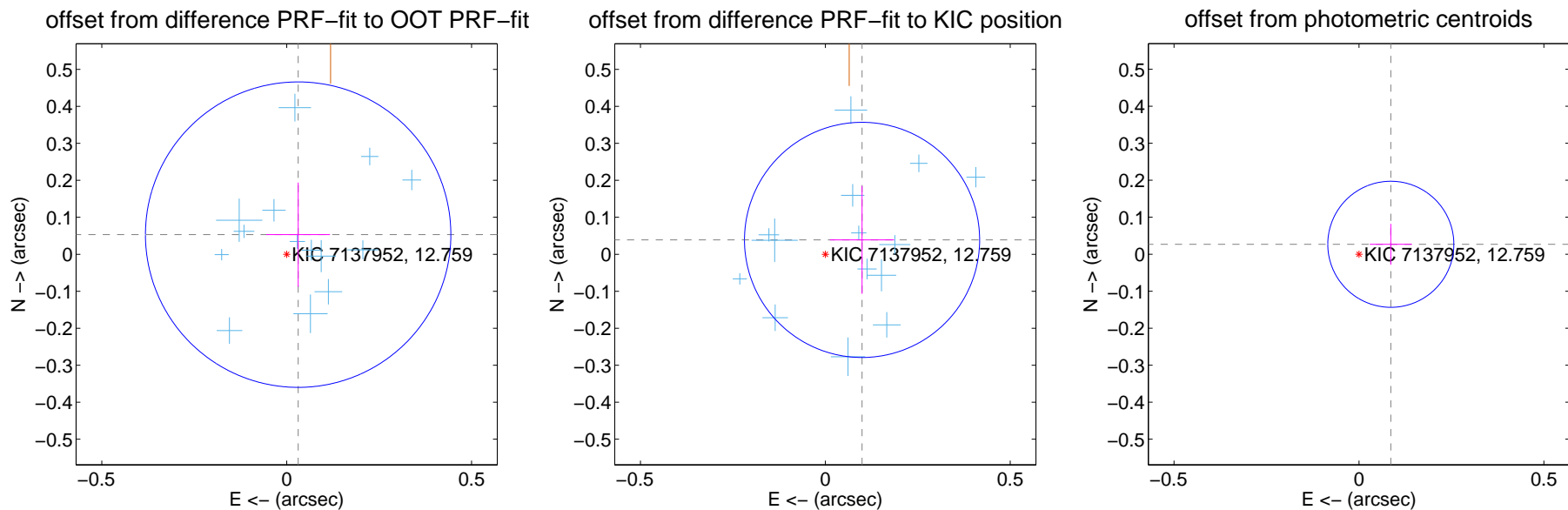
## DV Centroid Data

Supplemental centroid analysis for 007137952-02. Kepler magnitude: 12.76. Transit SNR 13.63

There are 16 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

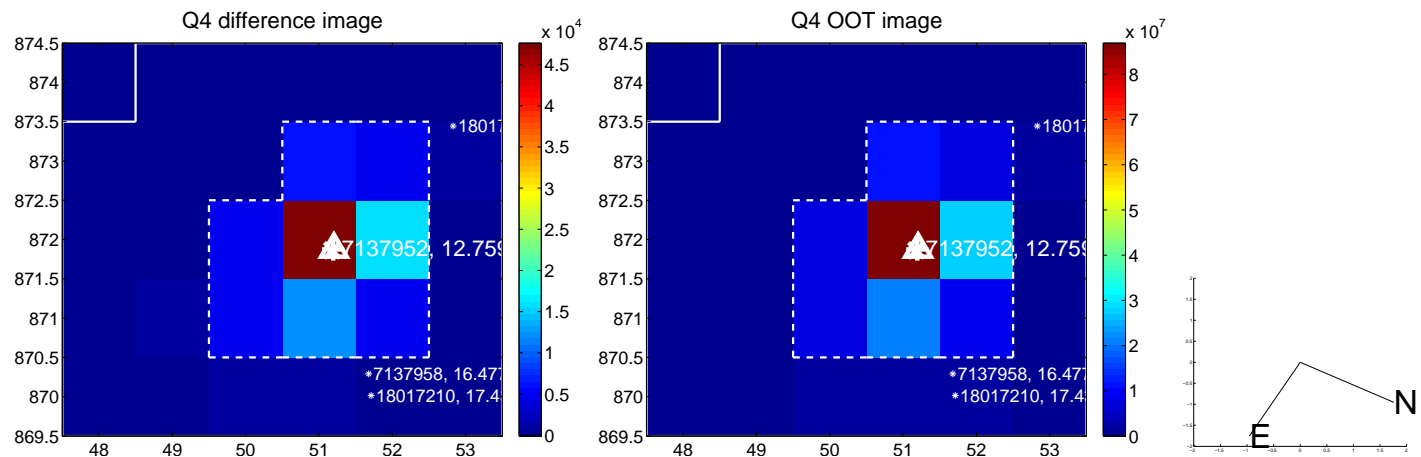
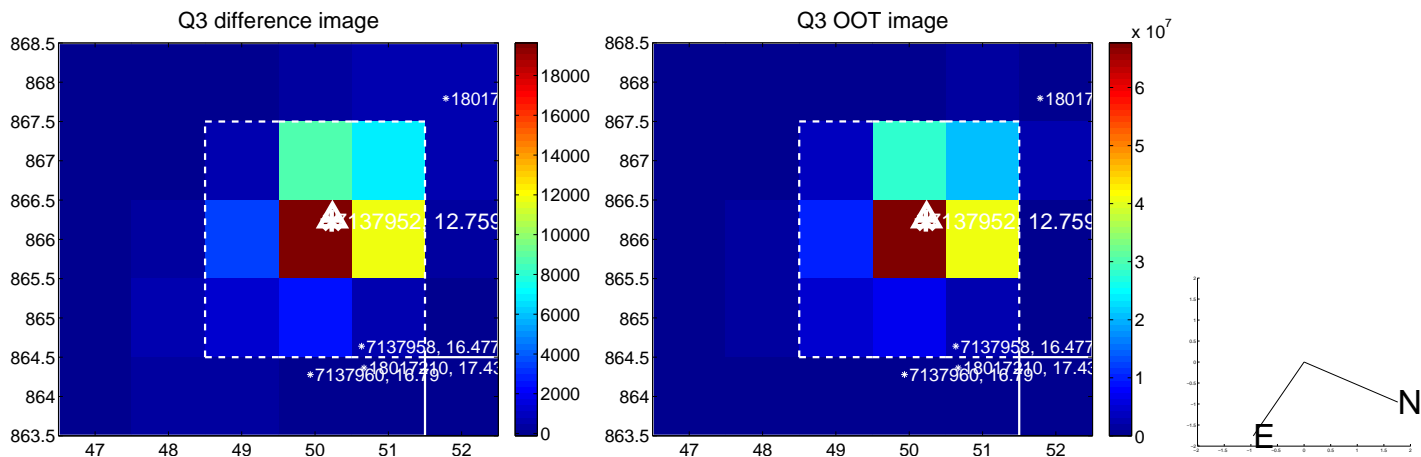
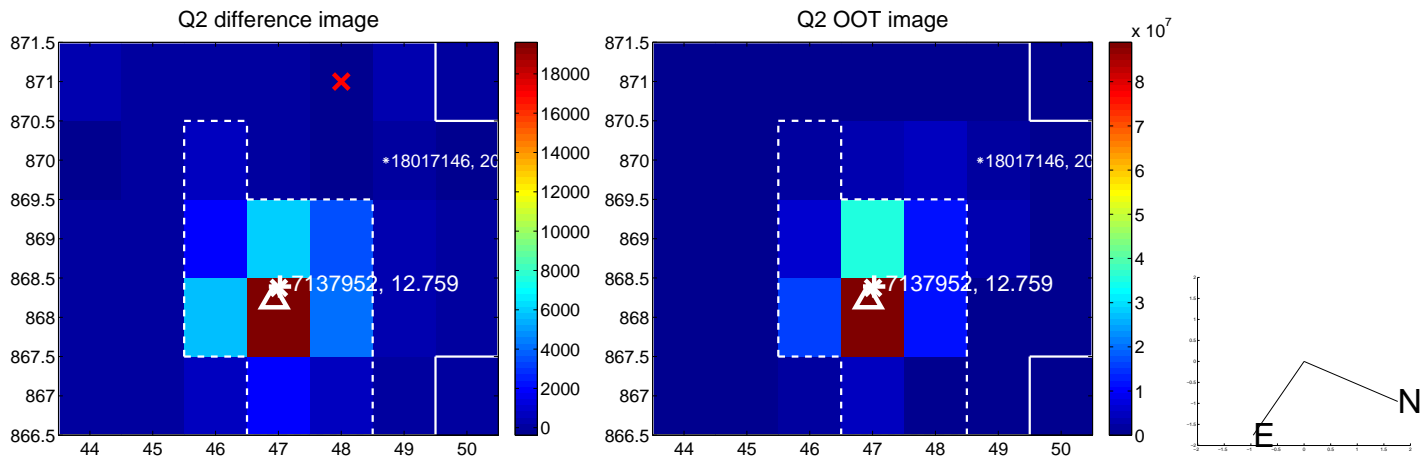
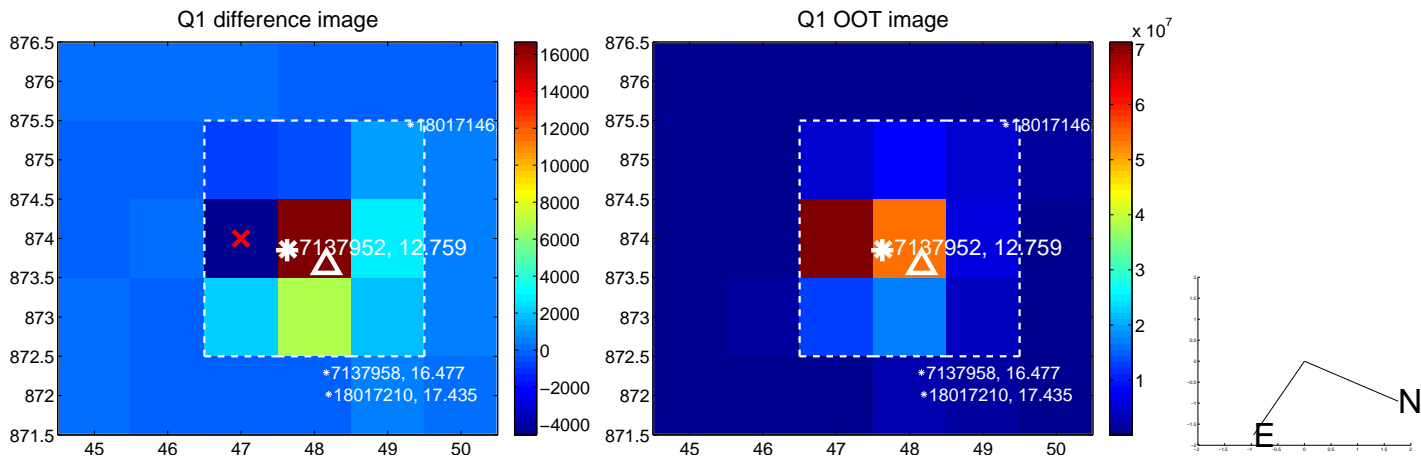
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.061 \pm 0.138$	0.45	$-0.031 \pm 0.086$	$0.053 \pm 0.141$
PRF-fit source offset from KIC position	$0.107 \pm 0.106$	1.01	$-0.099 \pm 0.087$	$0.039 \pm 0.146$
photometric centroid source offset	$0.09 \pm 0.06$	1.59	$-0.09 \pm 0.06$	$0.03 \pm 0.06$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

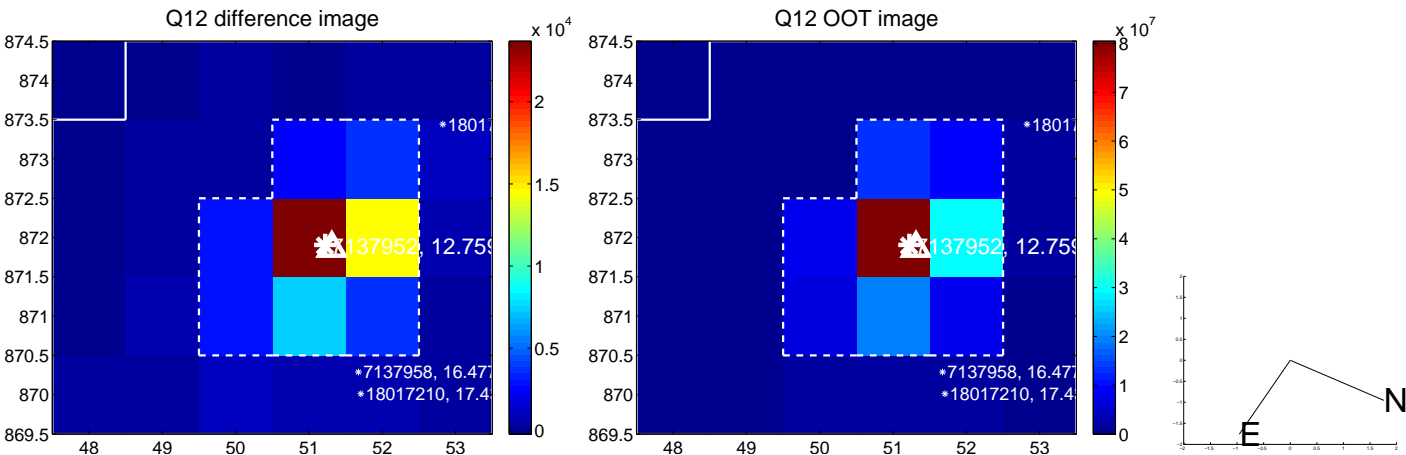
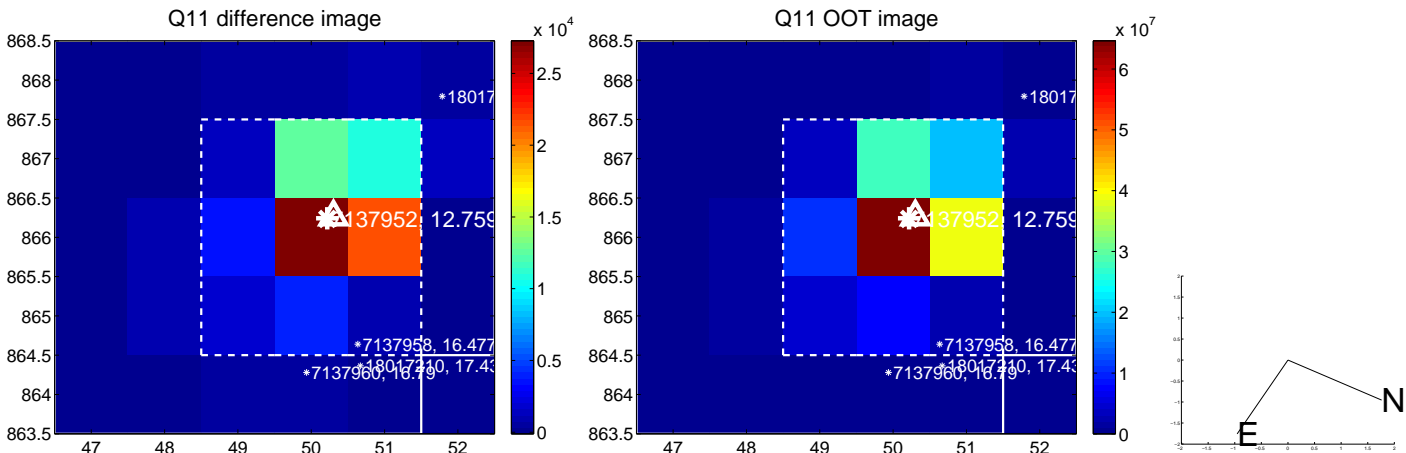
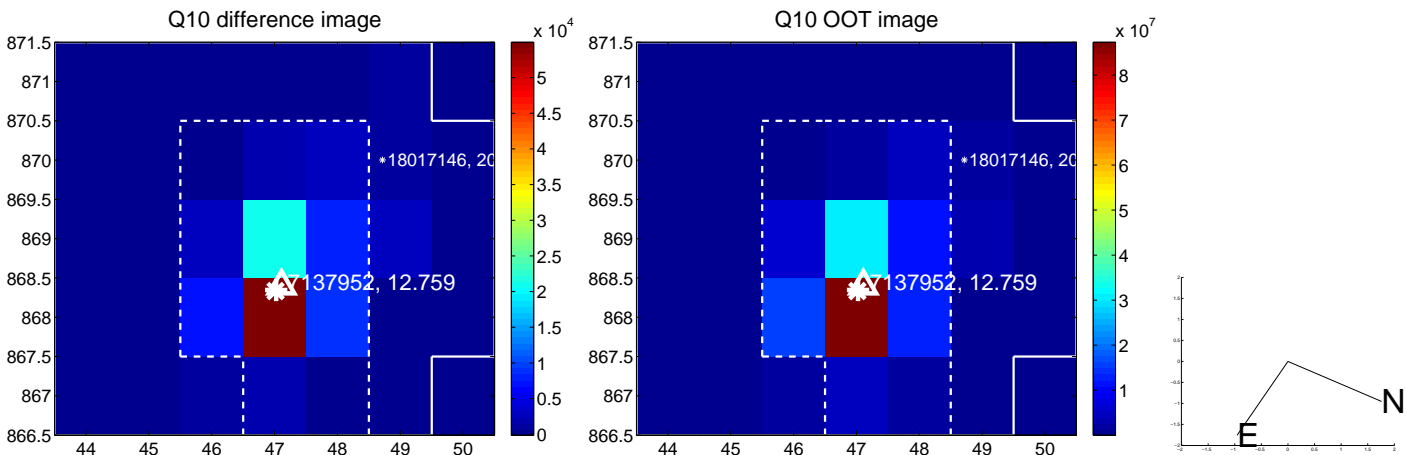
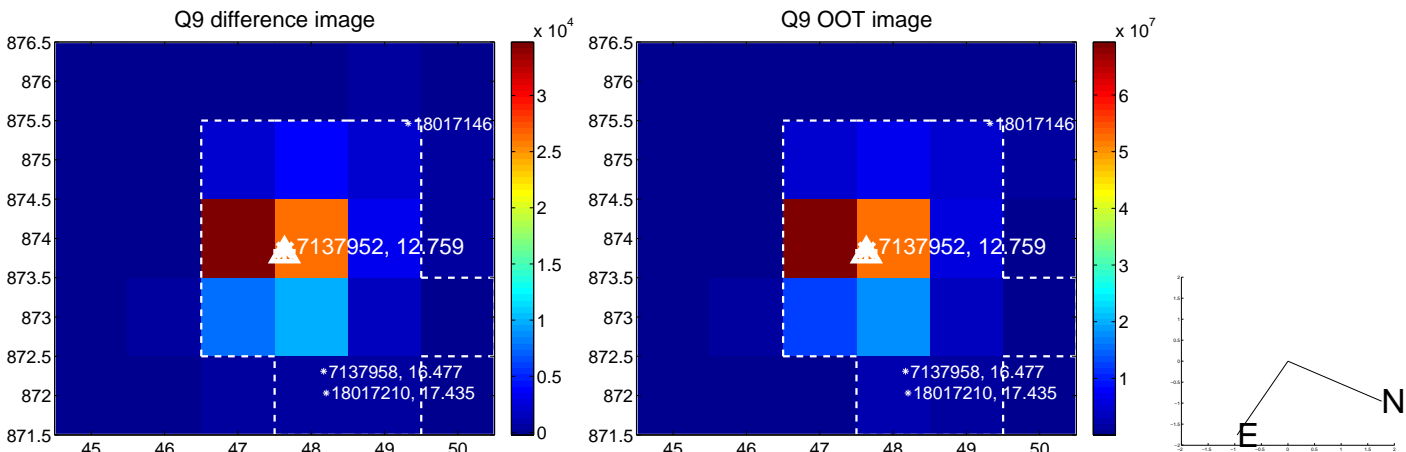


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

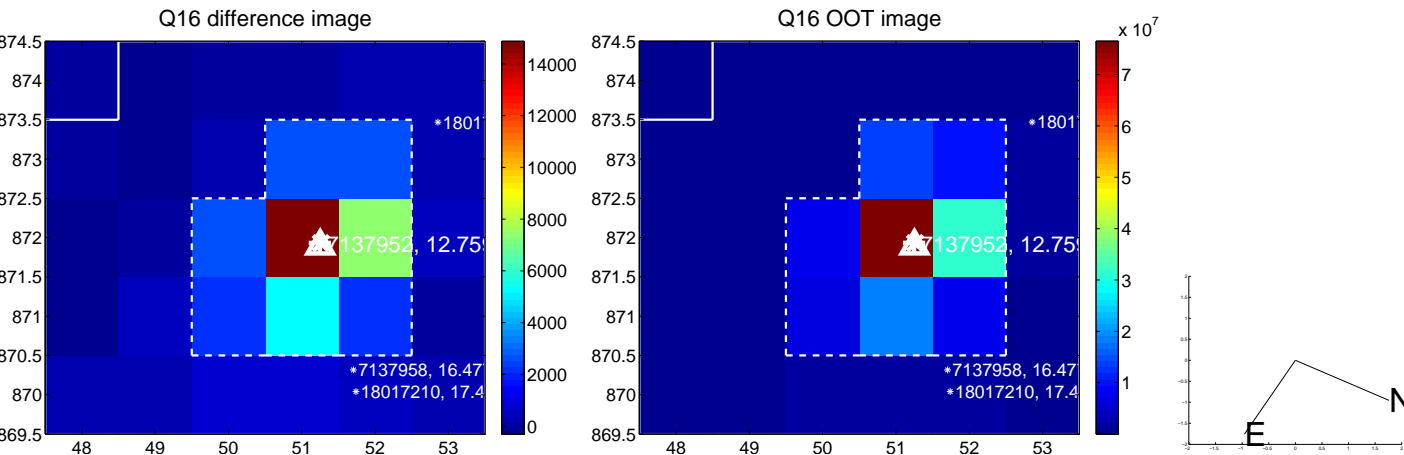
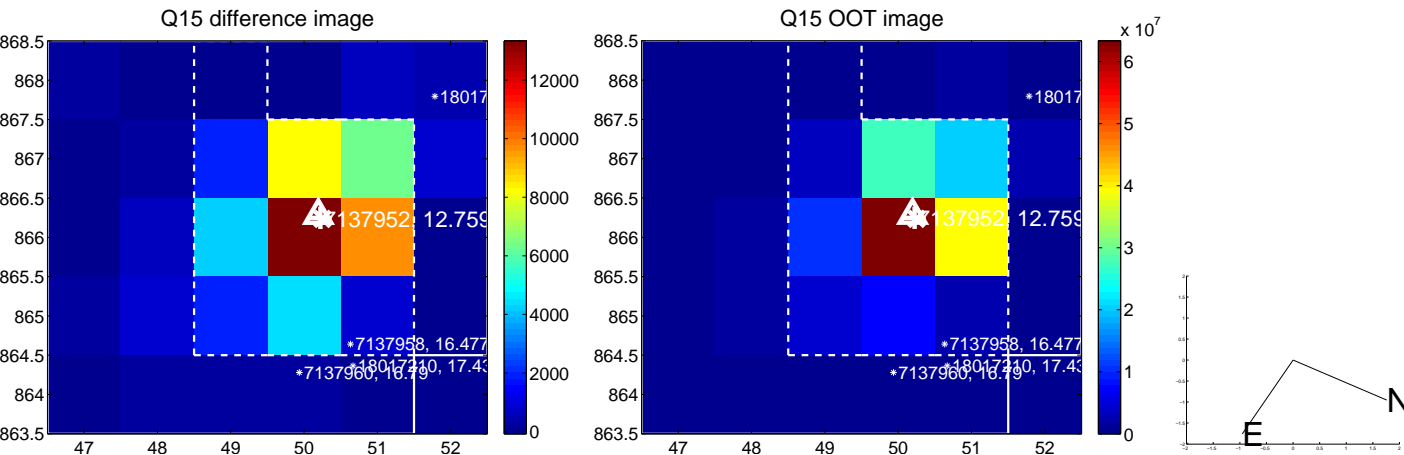
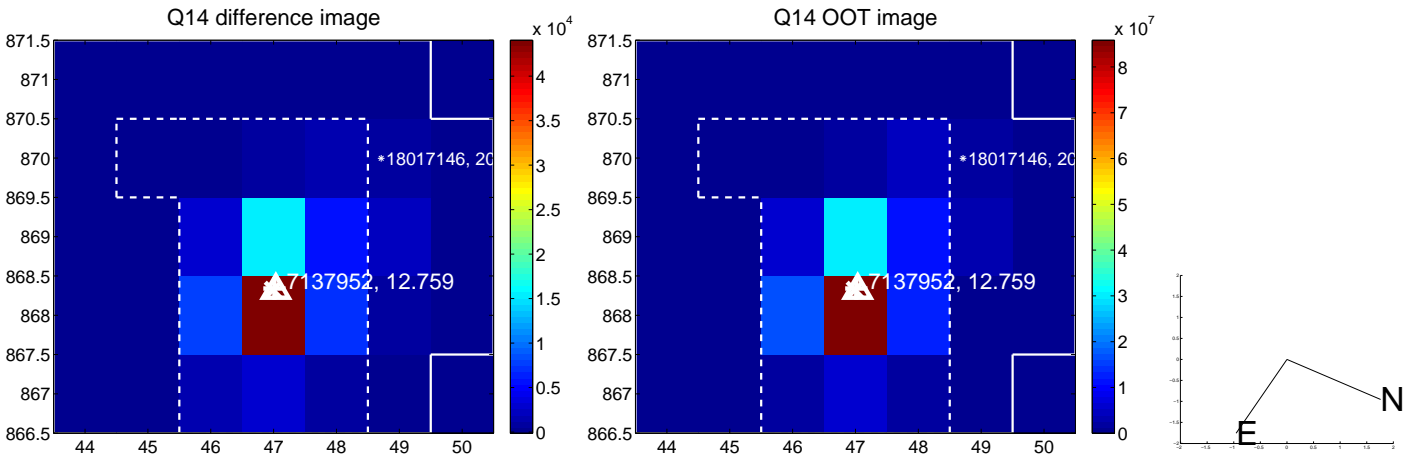
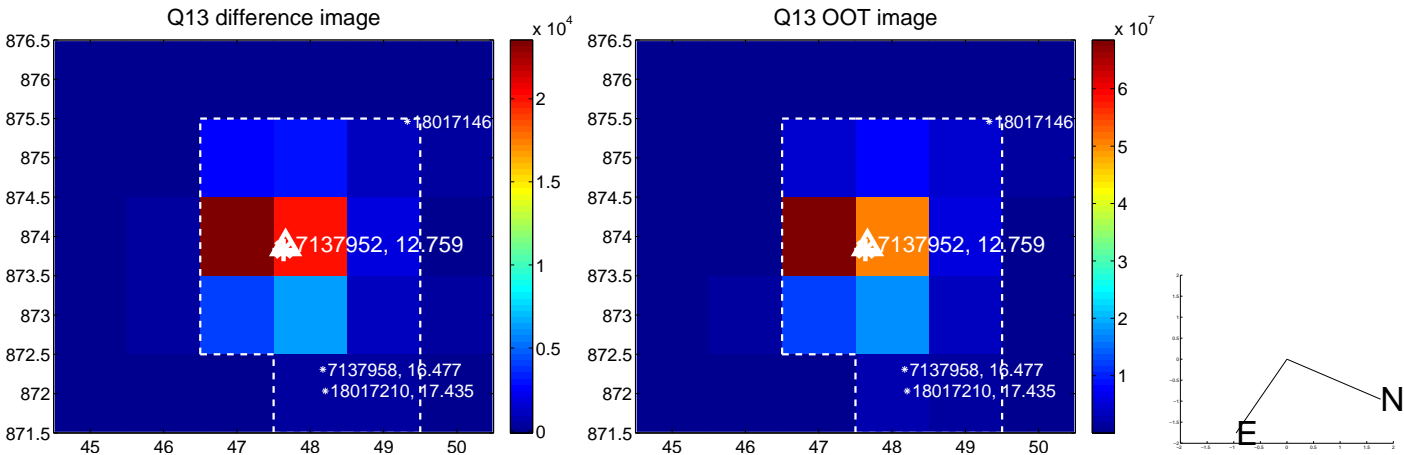




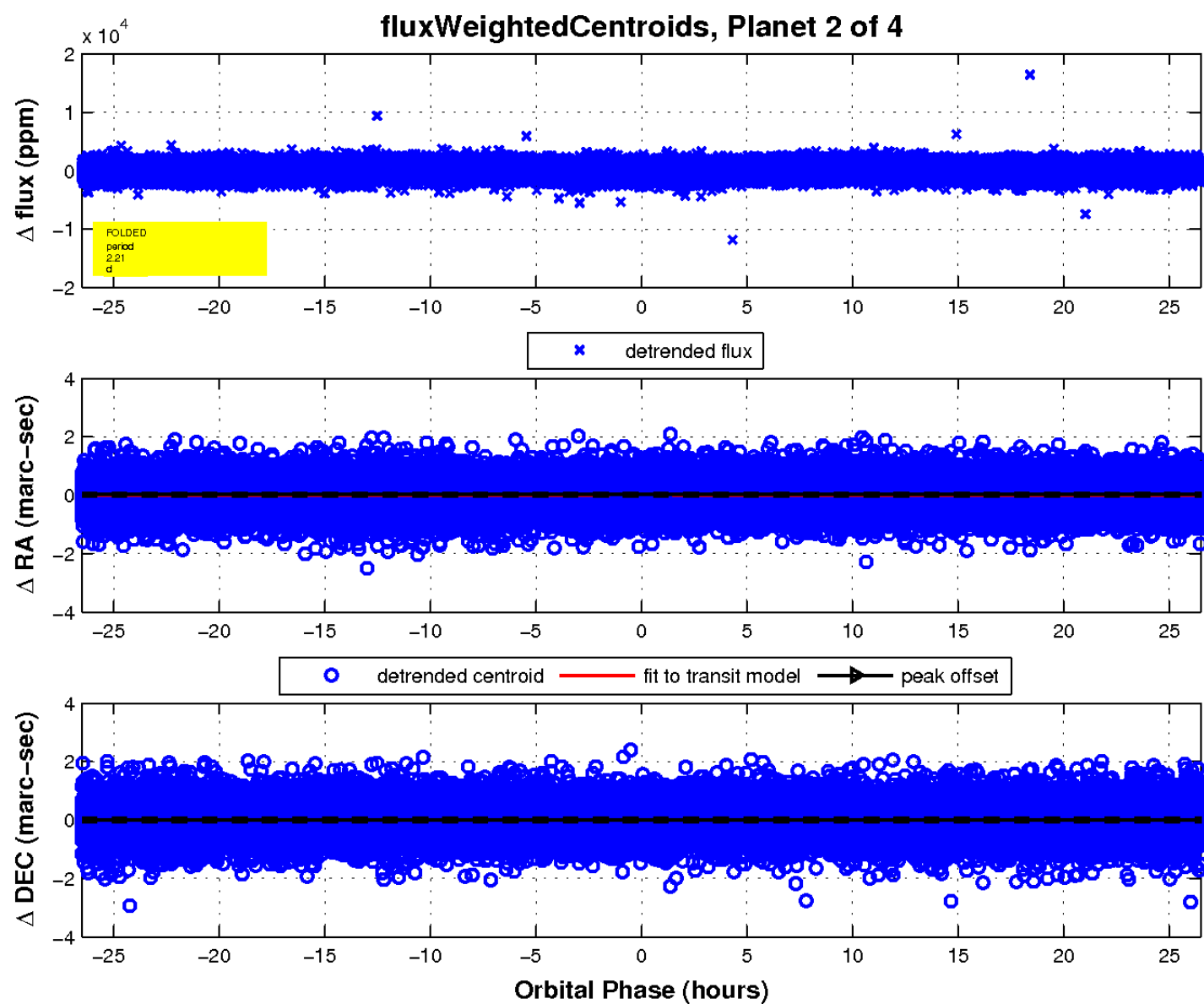
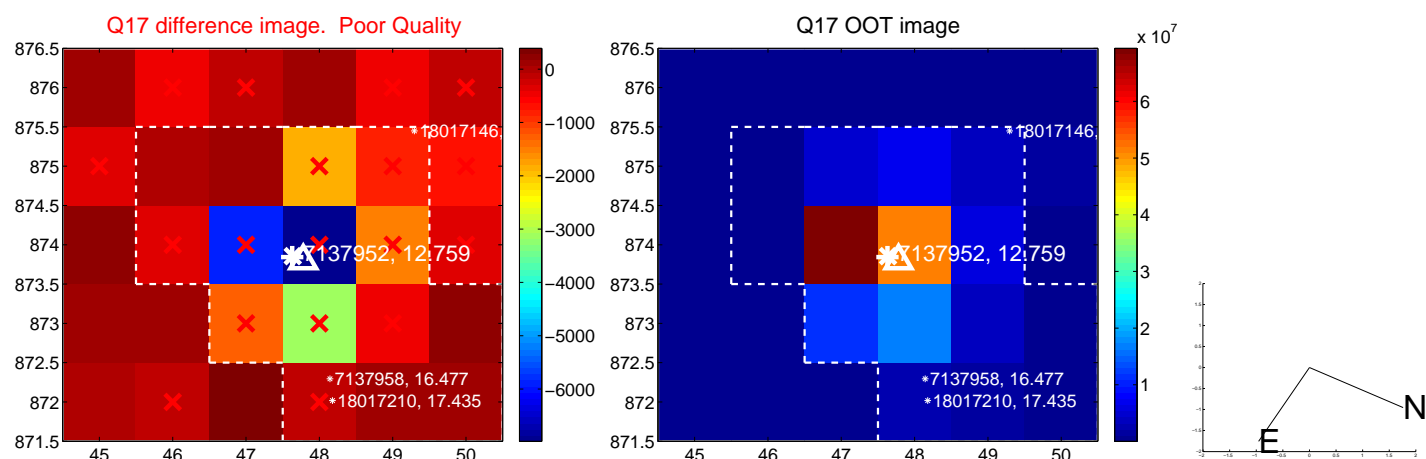
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



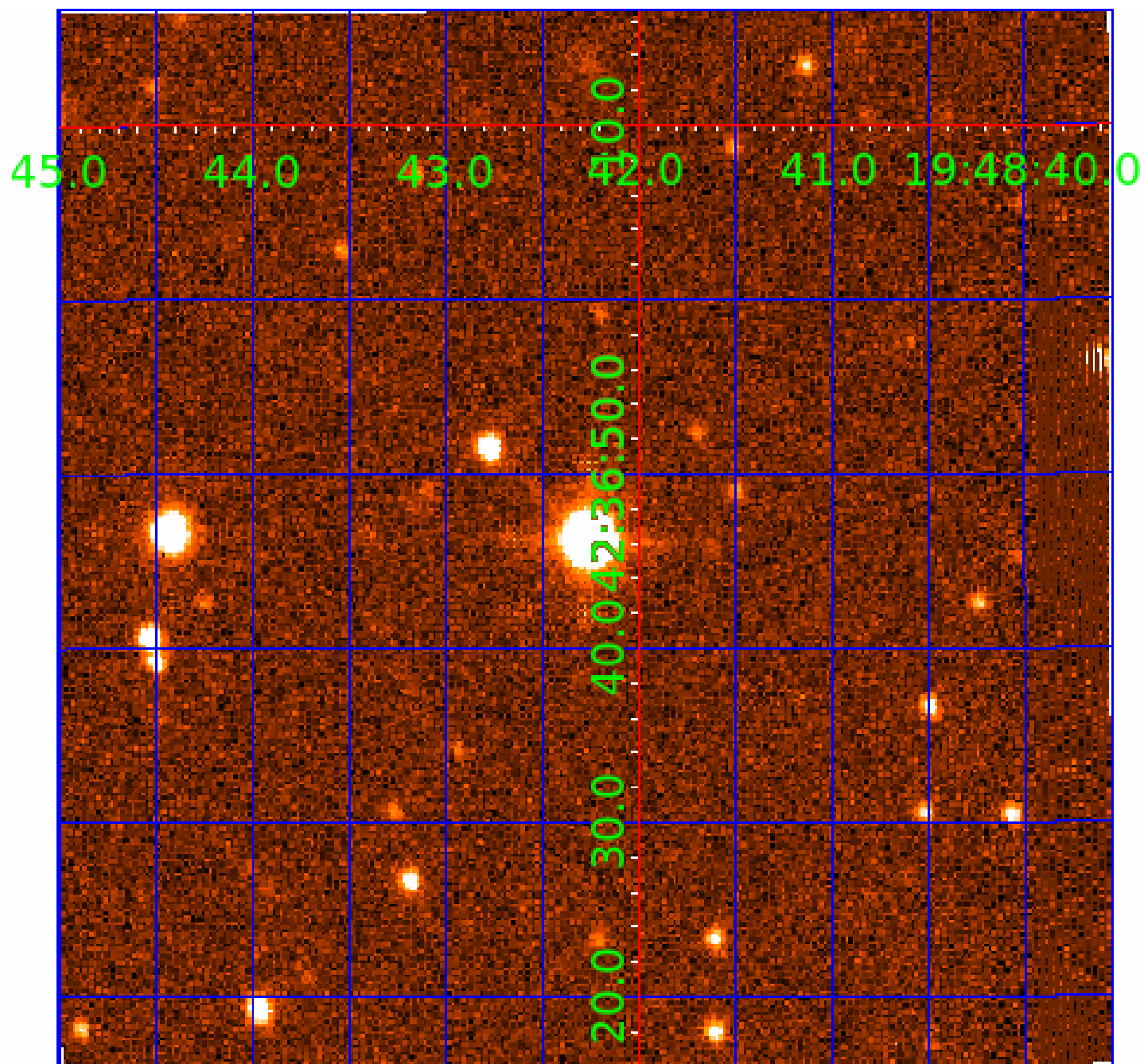
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 007137952

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007137952-01	OBS	No	0.549626	131.982651	90.1	2.537	12.3	11.7	1.80	7626	1.93	39296.79
007137952-02	OBS	No	2.208389	132.676339	309.4	10.630	9.5	13.6	1.80	7626	5.06	6151.95
007137952-03	OBS	No	62.500549	173.356863	854.7	5.618	8.2	7.4	1.80	7626	6.19	71.33
007137952-04	OBS	No	34.232633	153.226382	719.2	7.007	7.5	7.2	1.80	7626	5.11	159.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007137952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
007137952-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007137952-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
007137952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

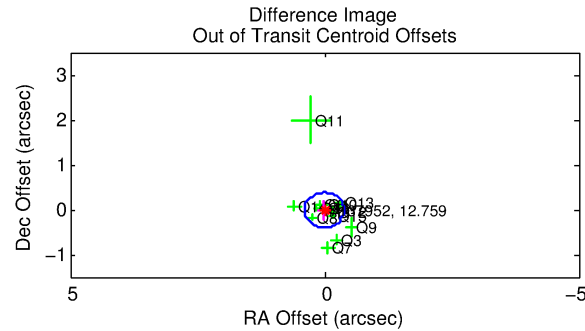
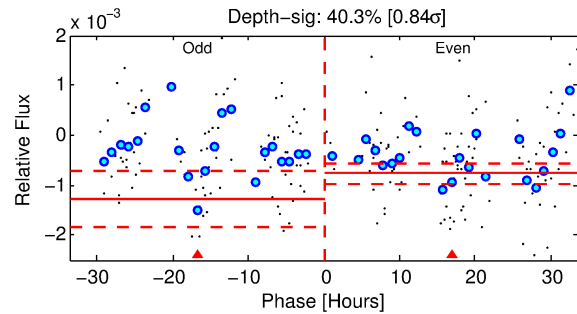
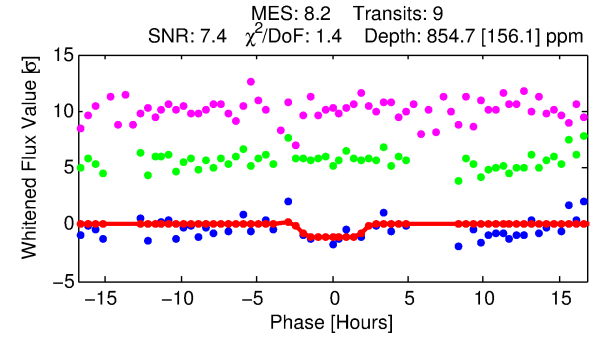
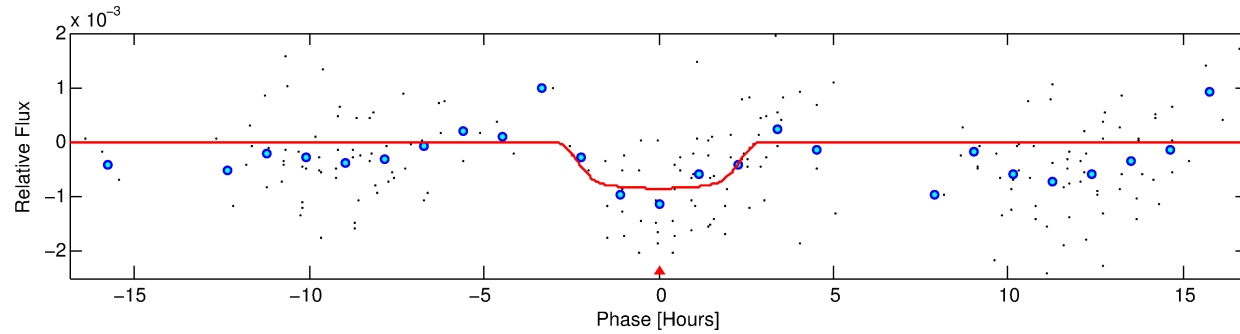
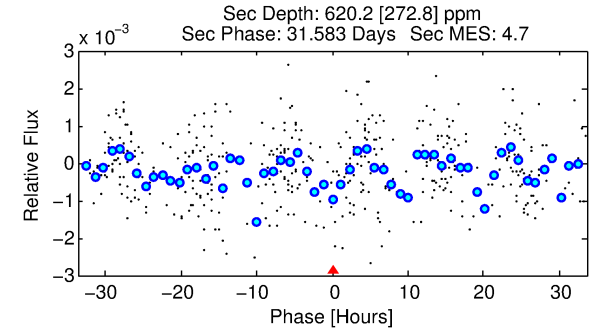
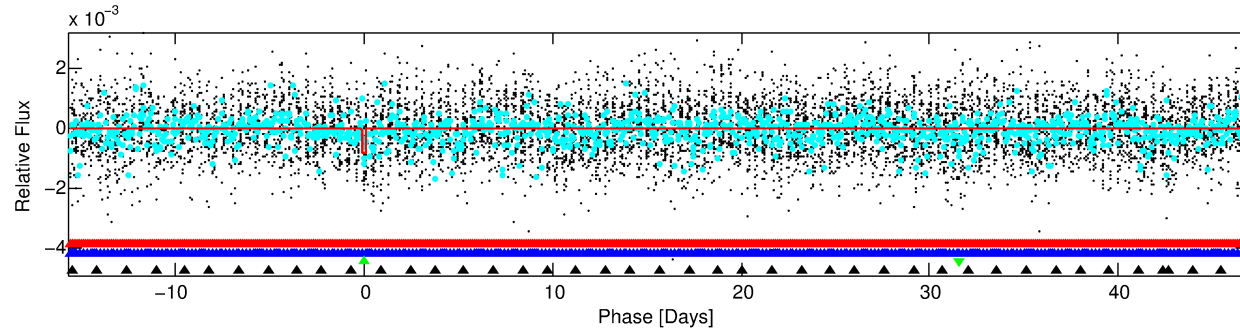
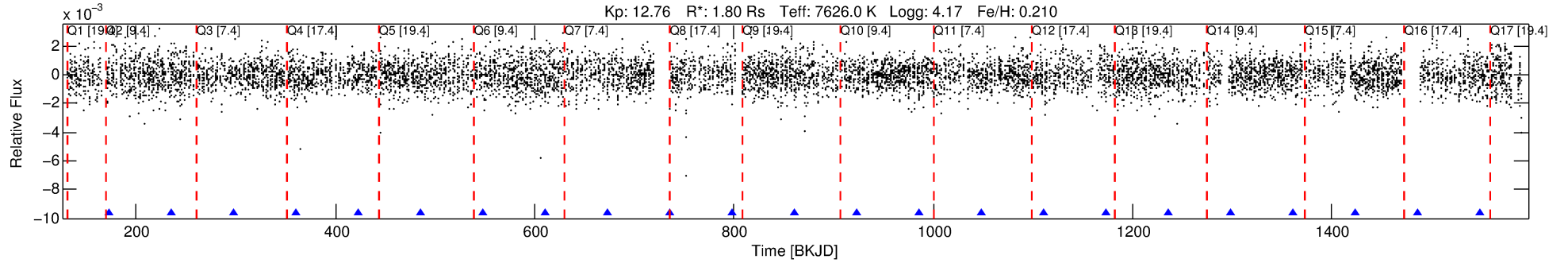
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007137952-03

No Significant Match Found

# DV One-Page Summary

KIC: 7137952 Candidate: 3 of 4 Period: 62.501 d



## DV Fit Results:

Period = 62.50055 [0.00210] d  
Epoch = 173.3569 [0.0331] BKJD  
Rp/R\* = 0.0316 [0.0049]  
a/R\* = 39.49 [28.61]  
b = 0.92 [0.12]  
Seff = 71.33 [29.14]  
Teq = 741 [76] K  
Rp = 6.19 [2.17] Re  
a = 0.3704 [0.0958] AU  
Ag = 1220.31 [793.72] [1.54σ]  
Teffp = 6772 [958] K [6.27σ]

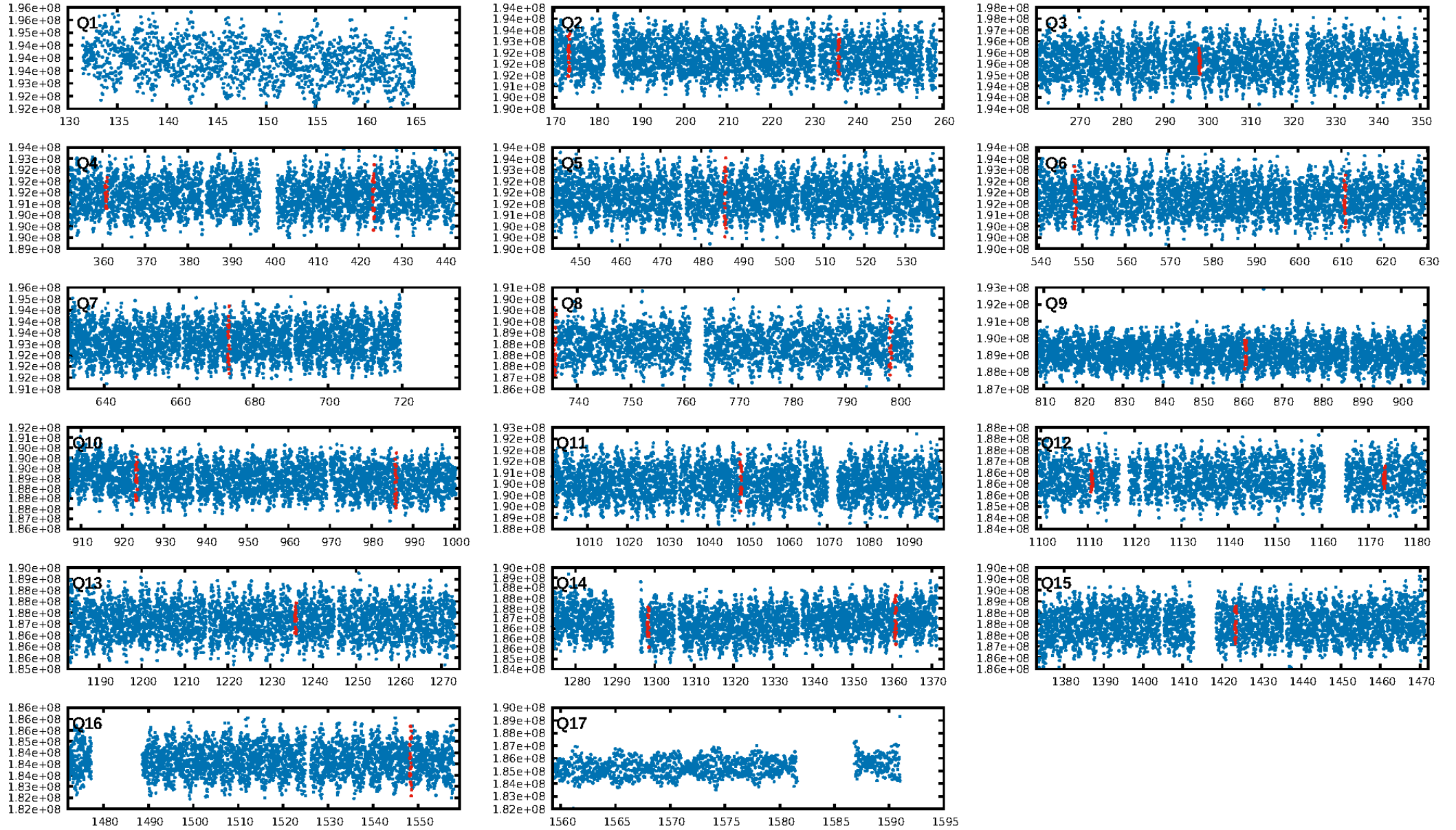
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [75.54σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 2.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 4.30e-09**  
RollingBand-fgt: 1.00 [9/9]  
**GhostDiagnostic-chr: 0.6973**  
Centroid-sig: 0.6%  
Centroid-so: 0.203 arcsec [1.74σ]  
OotOffset-rm: 0.019 arcsec [0.15σ]  
OotOffset-st: 3/4/4/2 [13]  
KicOffset-rm: 0.042 arcsec [0.28σ]  
KicOffset-st: 3/4/4/2 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 0.00 [0/15]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:11:37 Z

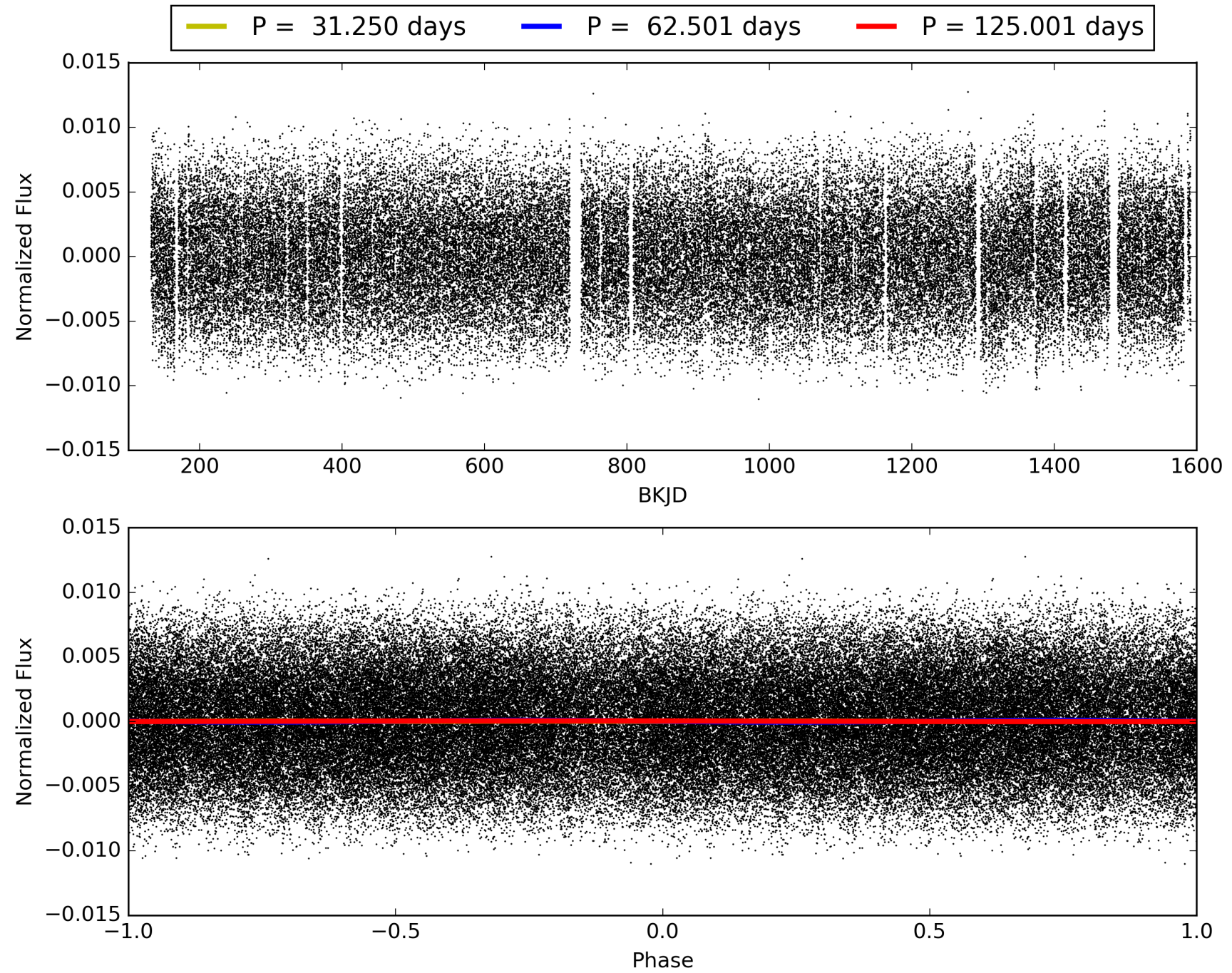
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007137952-03, PDC Light Curves



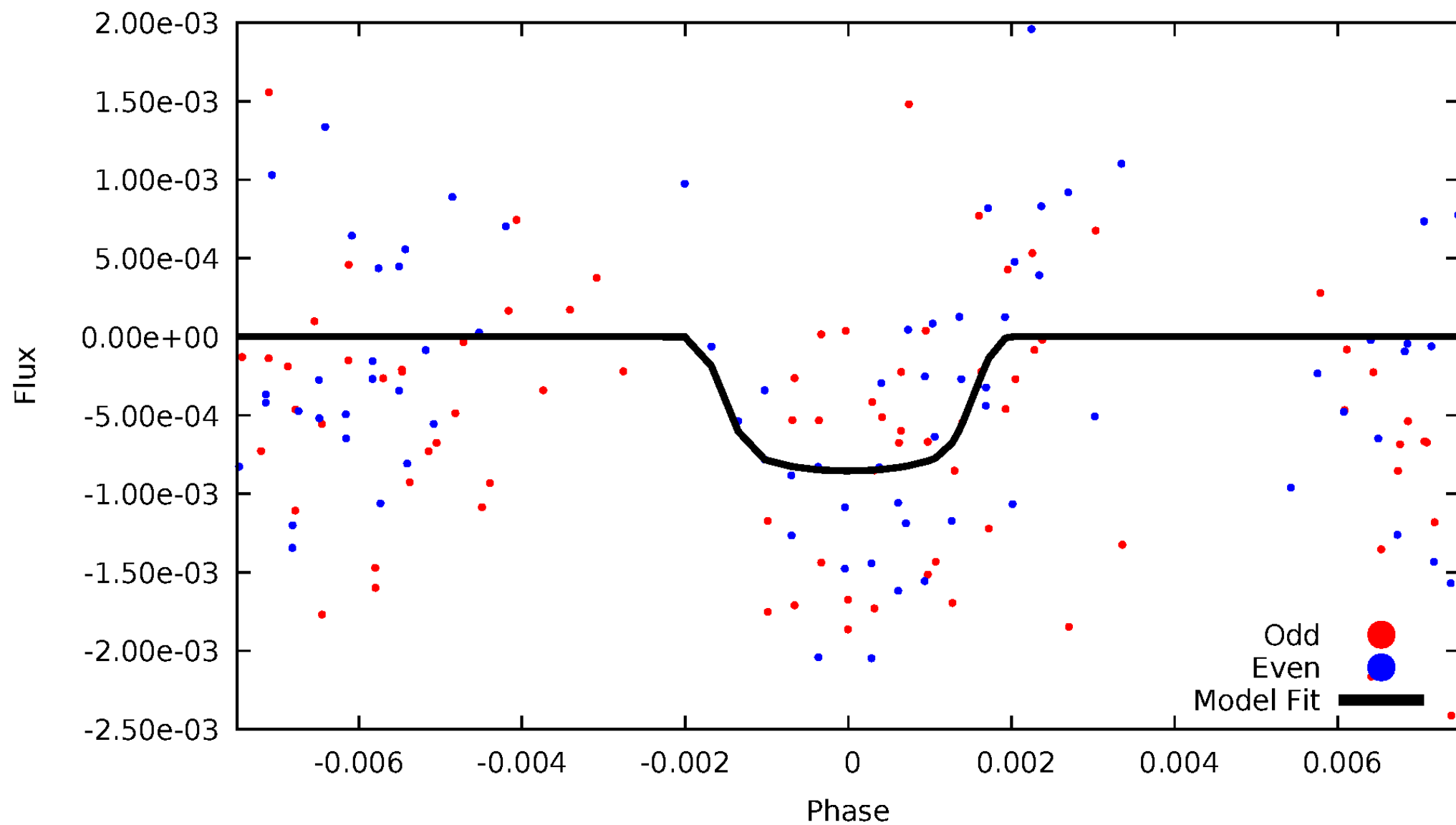


# TCE 007137952-03



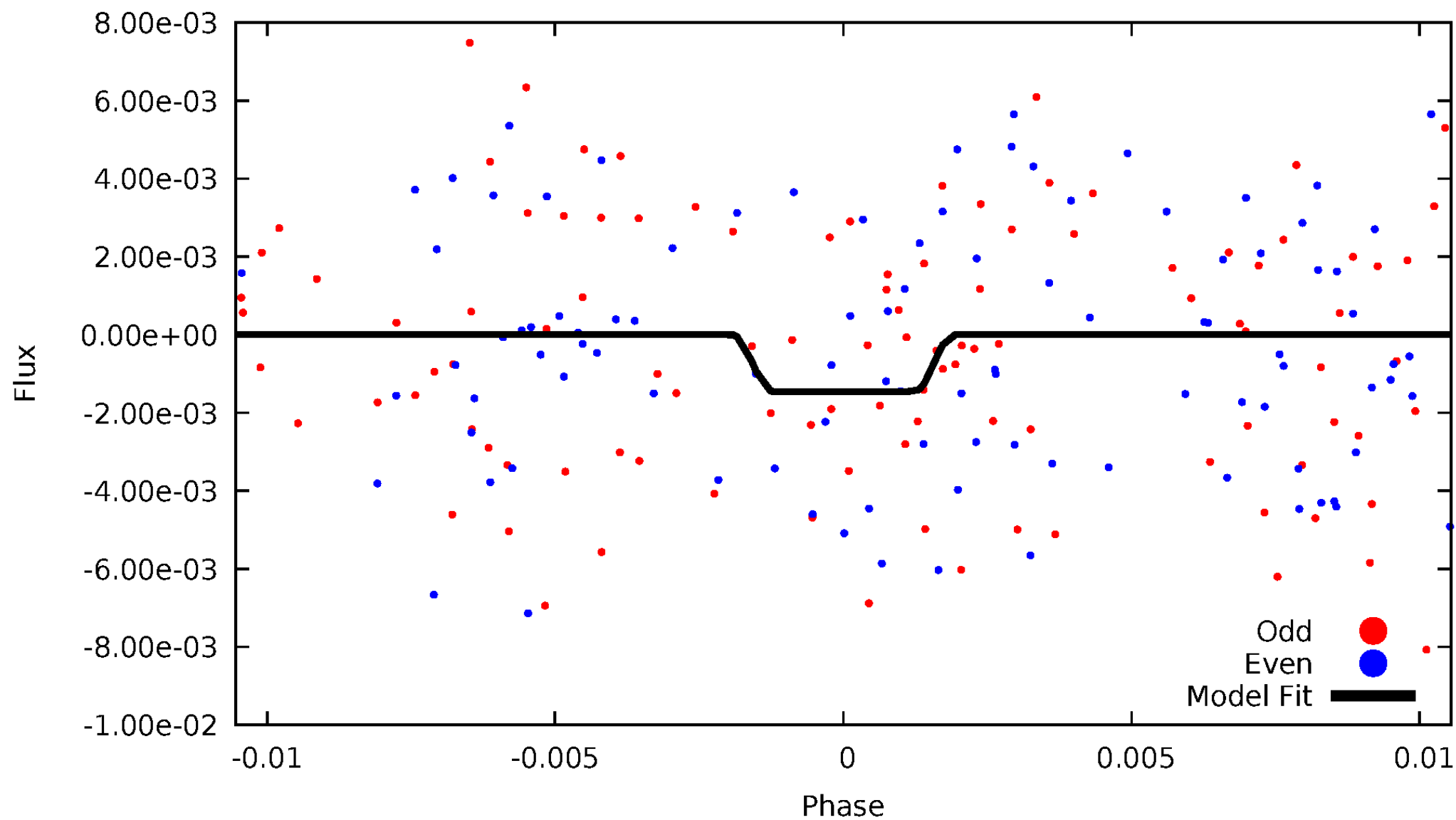
# DV Odd/Even

TCE 007137952-03



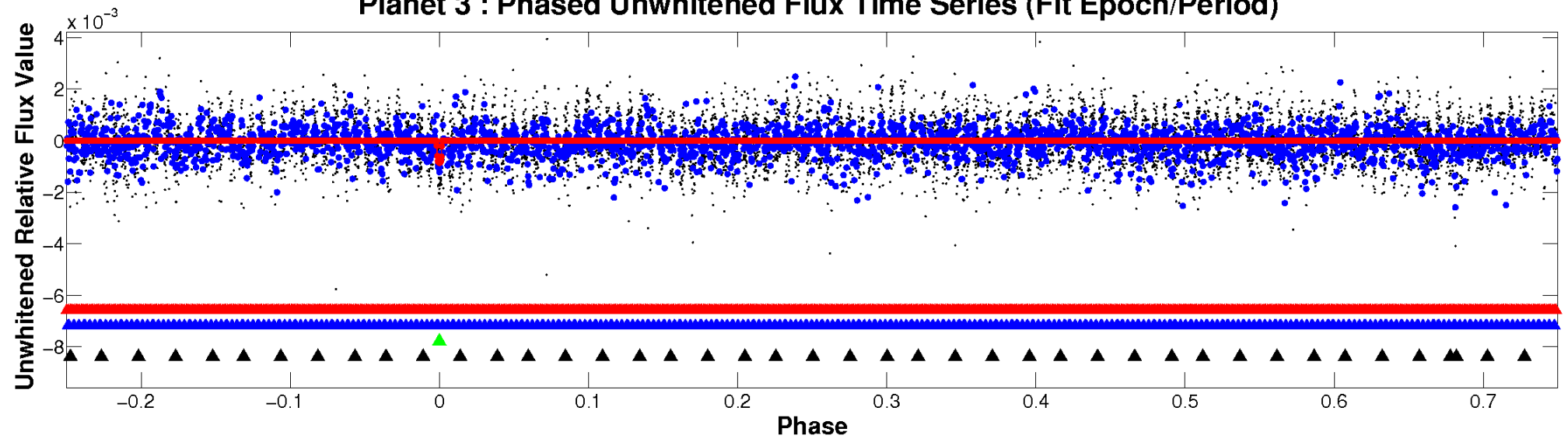
# ALT Odd/Even

TCE 007137952-03

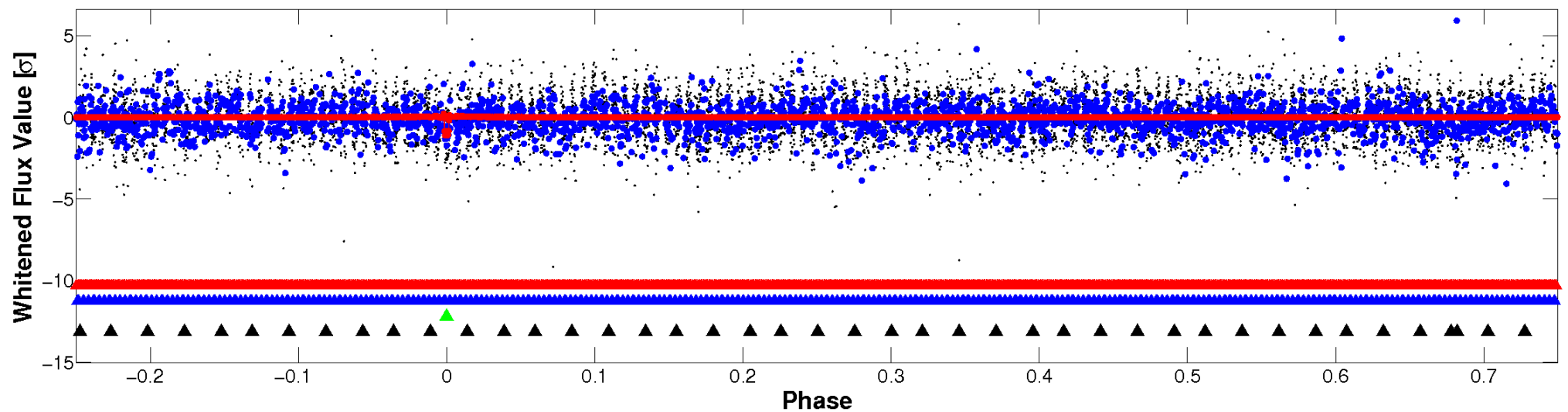


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



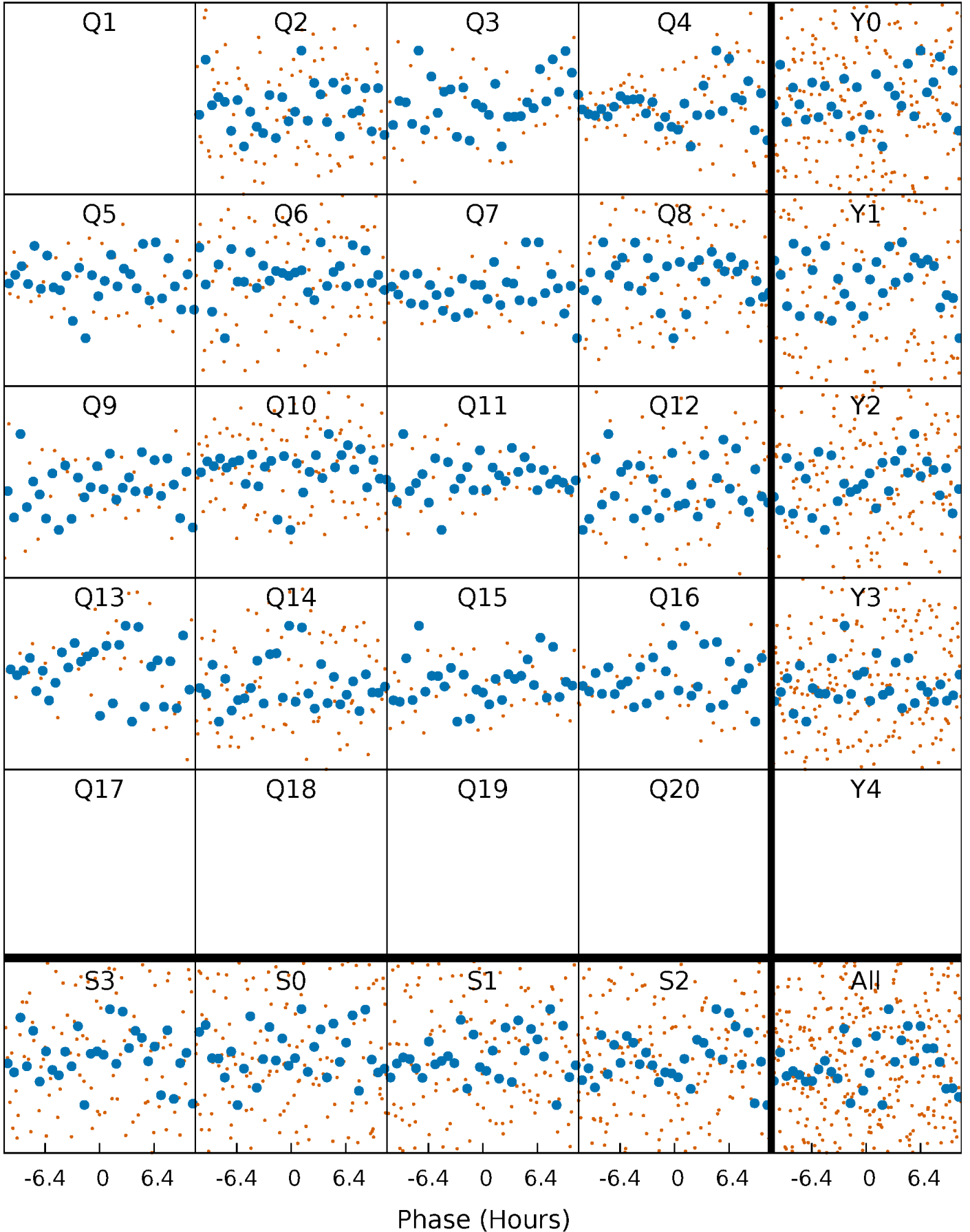
Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





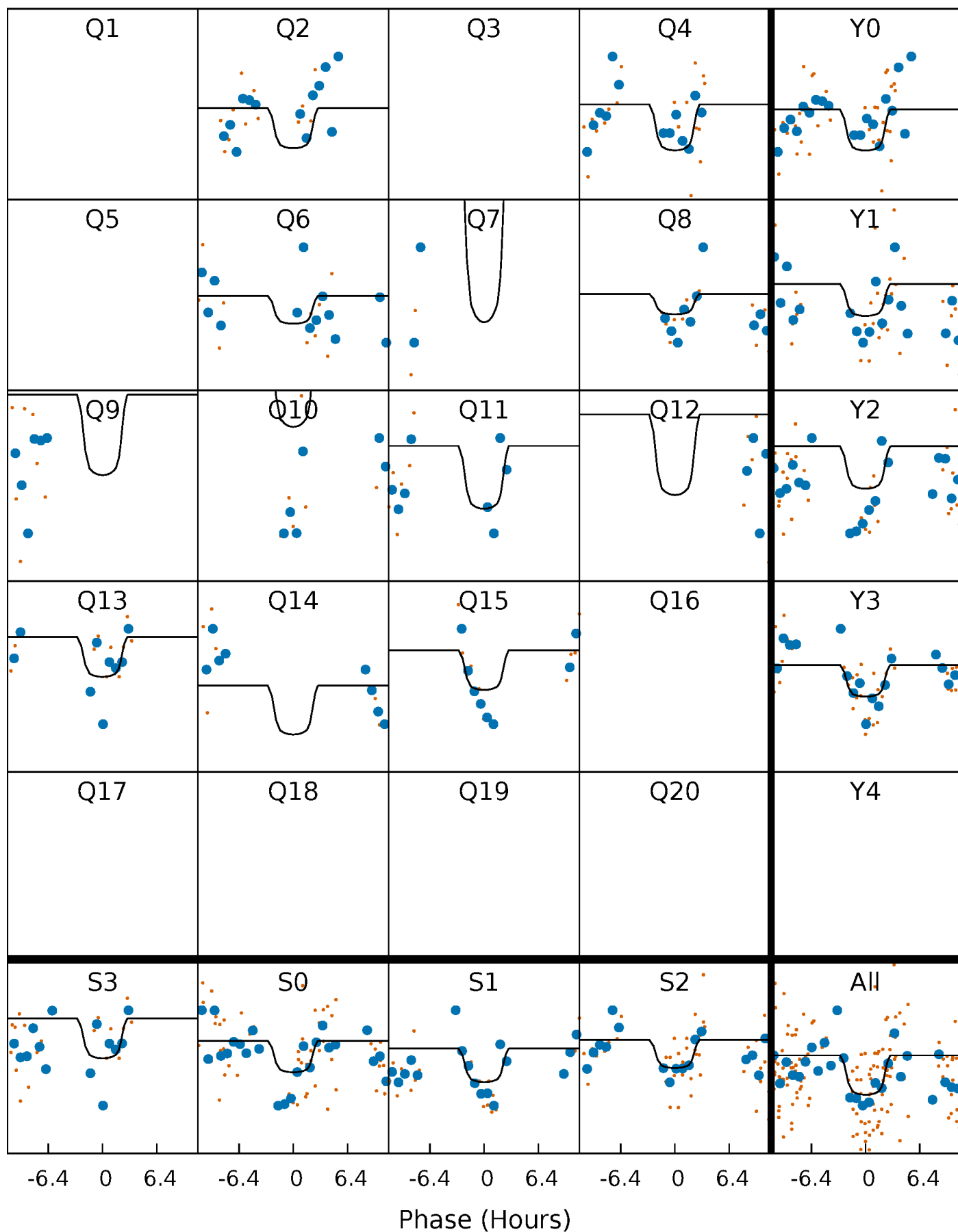
# PDC Quarter-Phased Transit Curves

TCE 007137952-03   P= 62.500549 Days    $T_0=173.356863$  (BKJD)



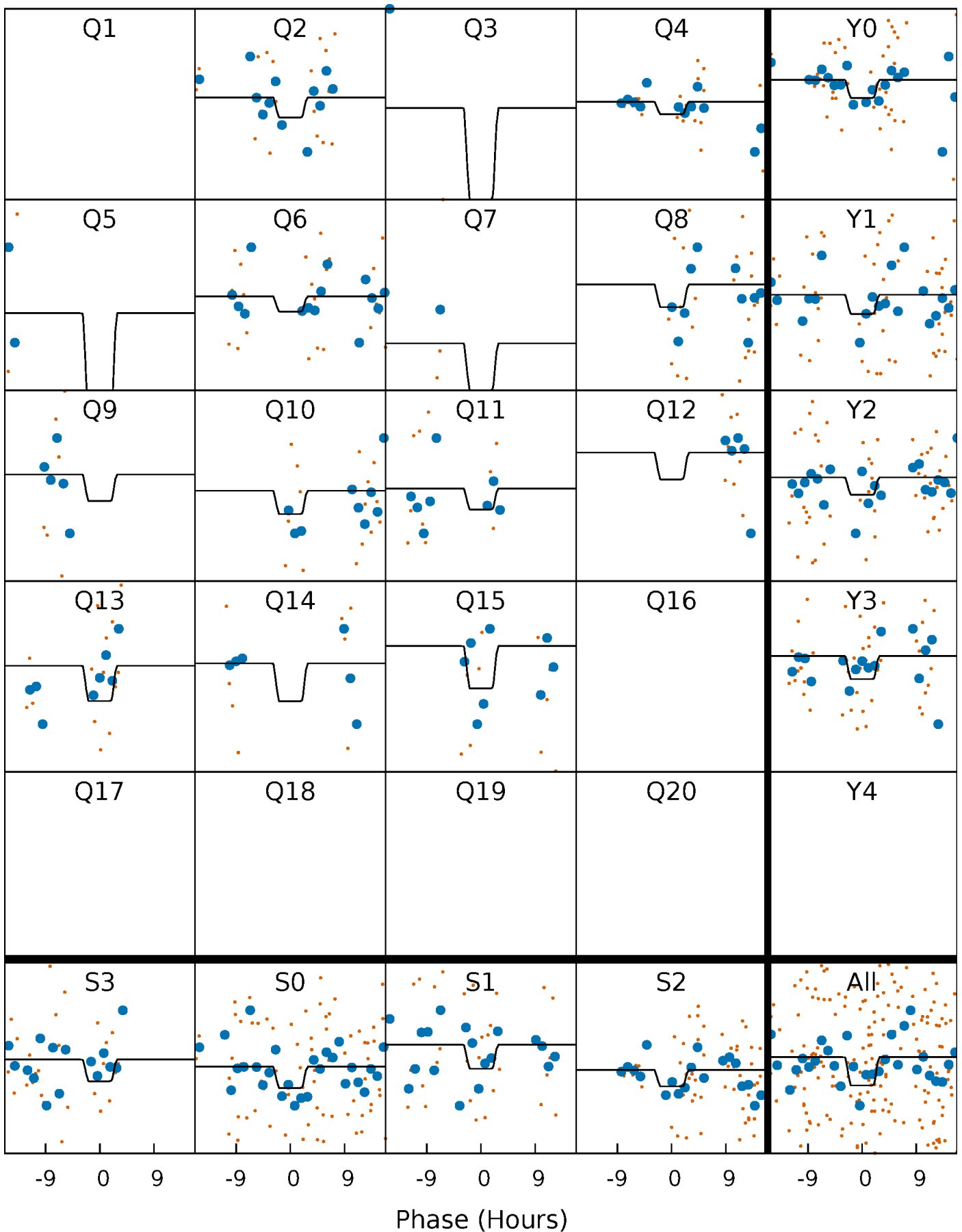
# DV Quarter-Phased Transit Curves

TCE 007137952-03 P= 62.500549 Days  $T_0=173.356863$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

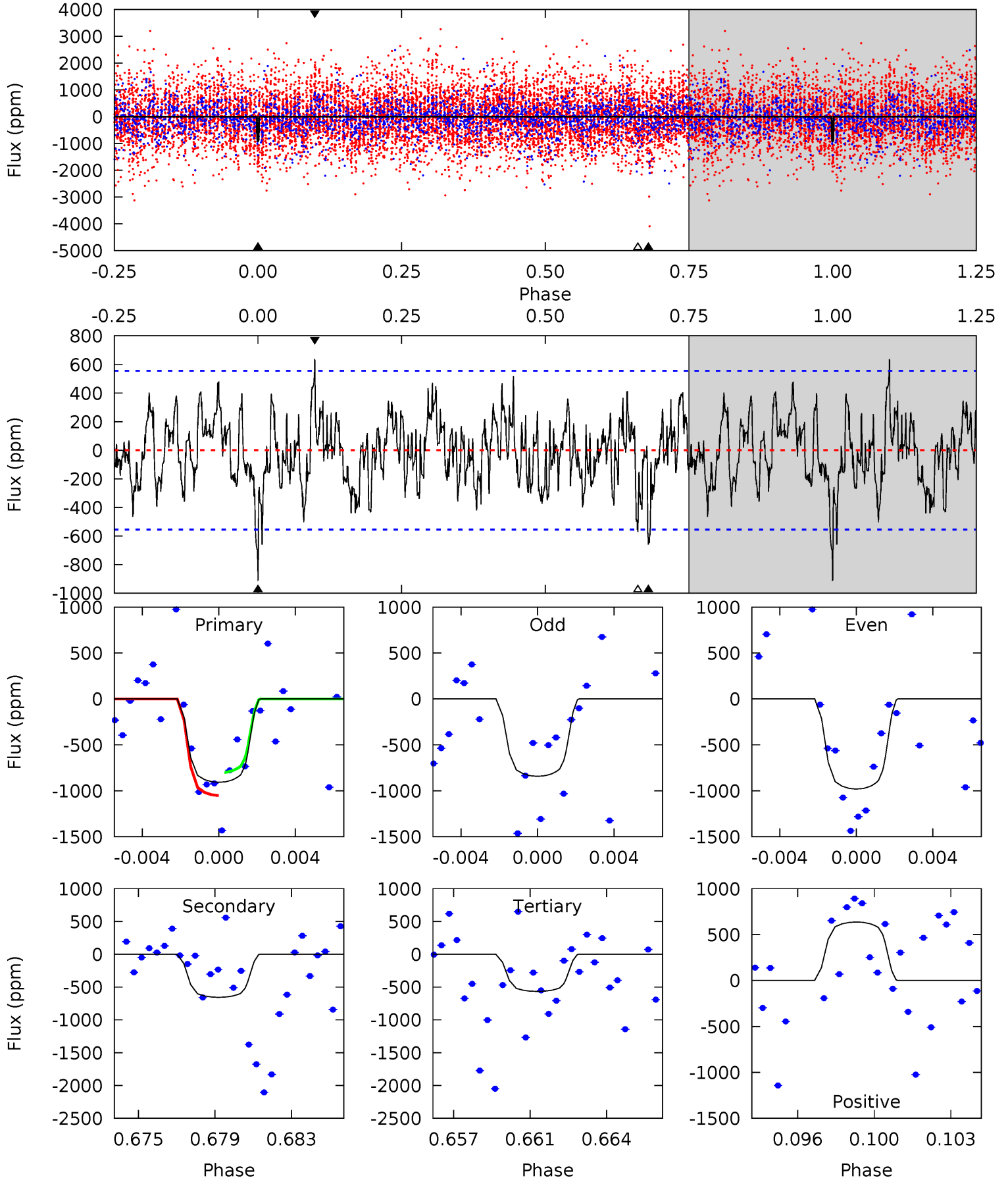
TCE 007137952-03 P= 62.506010 Days  $T_0=173.257833$  (BKJD)



# DV Model-Shift Uniqueness Test

007137952-03, P = 62.500549 Days, E = 110.856314 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.52	6.16	5.32	5.97	5.21	2.90	1.89	3.20	2.55	0.84	0.18	0.66	1.22	0.41	1.12

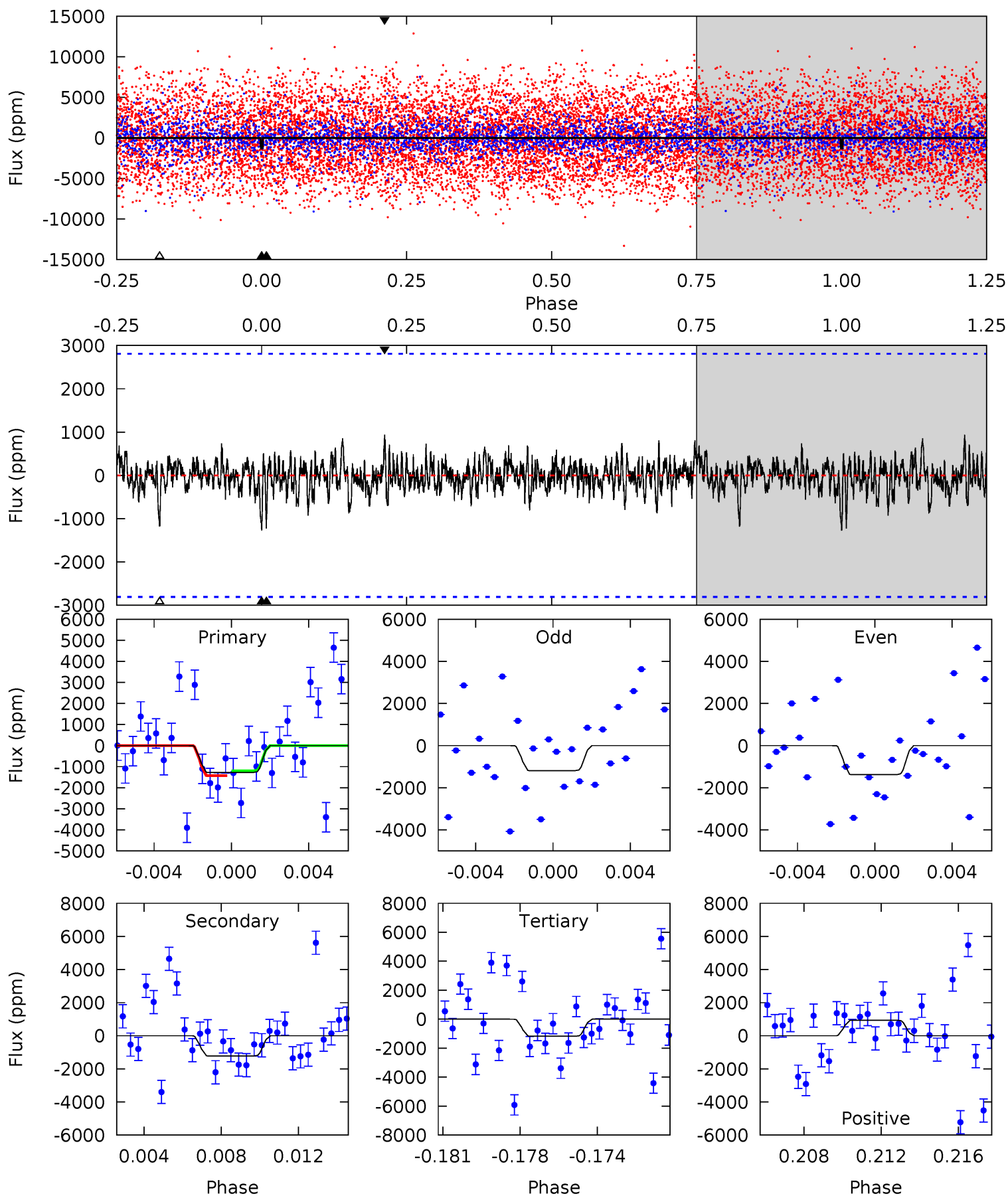




# Alt Model-Shift Uniqueness Test

007137952-03, P = 62.506010 Days, E = 110.751823 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.37	2.27	2.18	1.74	5.21	2.89	0.51	0.18	0.63	0.08	0.53	0.17	1.04	0.42	0.20



### Stellar Parameters For KIC 007137952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7626^{+211}_{-342}$	$4.168^{+0.084}_{-0.196}$	$0.210^{+0.150}_{-0.400}$	$1.797^{+0.567}_{-0.243}$	$1.740^{+0.204}_{-0.250}$	$0.423^{+0.157}_{-0.220}$
	+3%/-4%	+2%/-5%	+71%/-190%	+32%/-14%	+12%/-14%	+37%/-52%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007137952-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-656 \pm 107$	$6.35^{+1.33}_{-1.20}$	$1044^{+78}_{-61}$	$6731^{+792}_{-589}$	$1192^{+634}_{-382}$
Alt.	$-1224 \pm 539$	$7.66^{+1.53}_{-1.21}$	$1047^{+74}_{-62}$	$7182^{+1134}_{-1137}$	$1506^{+998}_{-742}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

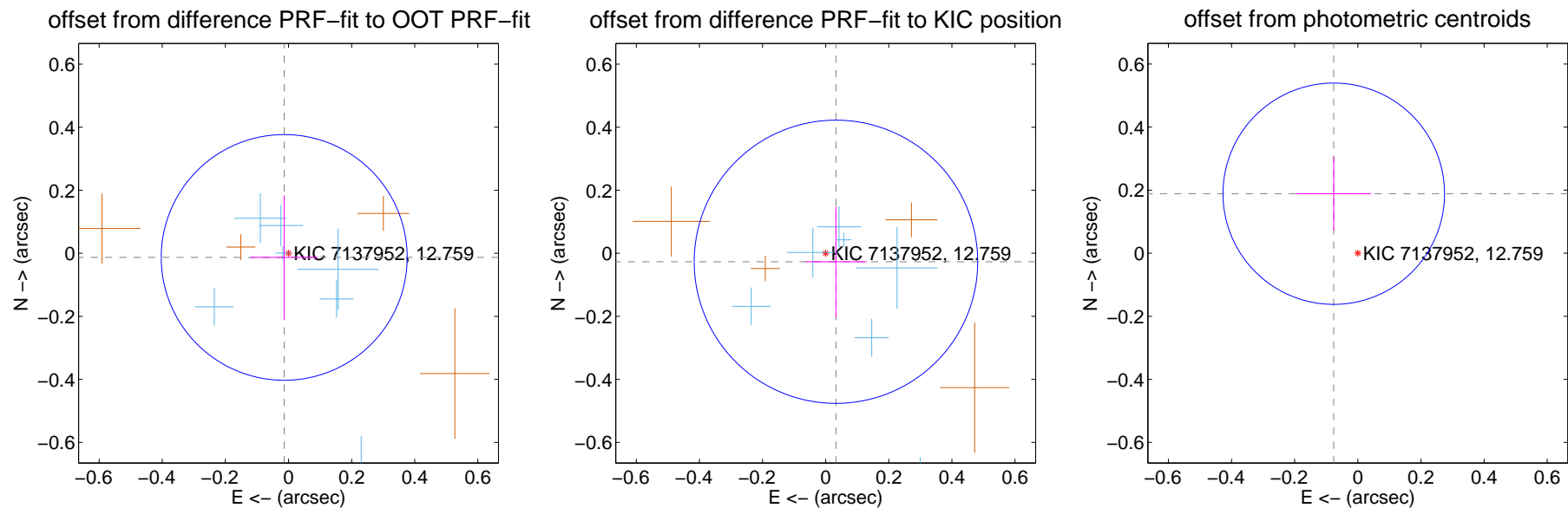
## DV Centroid Data

Supplemental centroid analysis for 007137952-03. Kepler magnitude: 12.76. Transit SNR 7.42

There are 8 quarters with good PRF difference image offsets

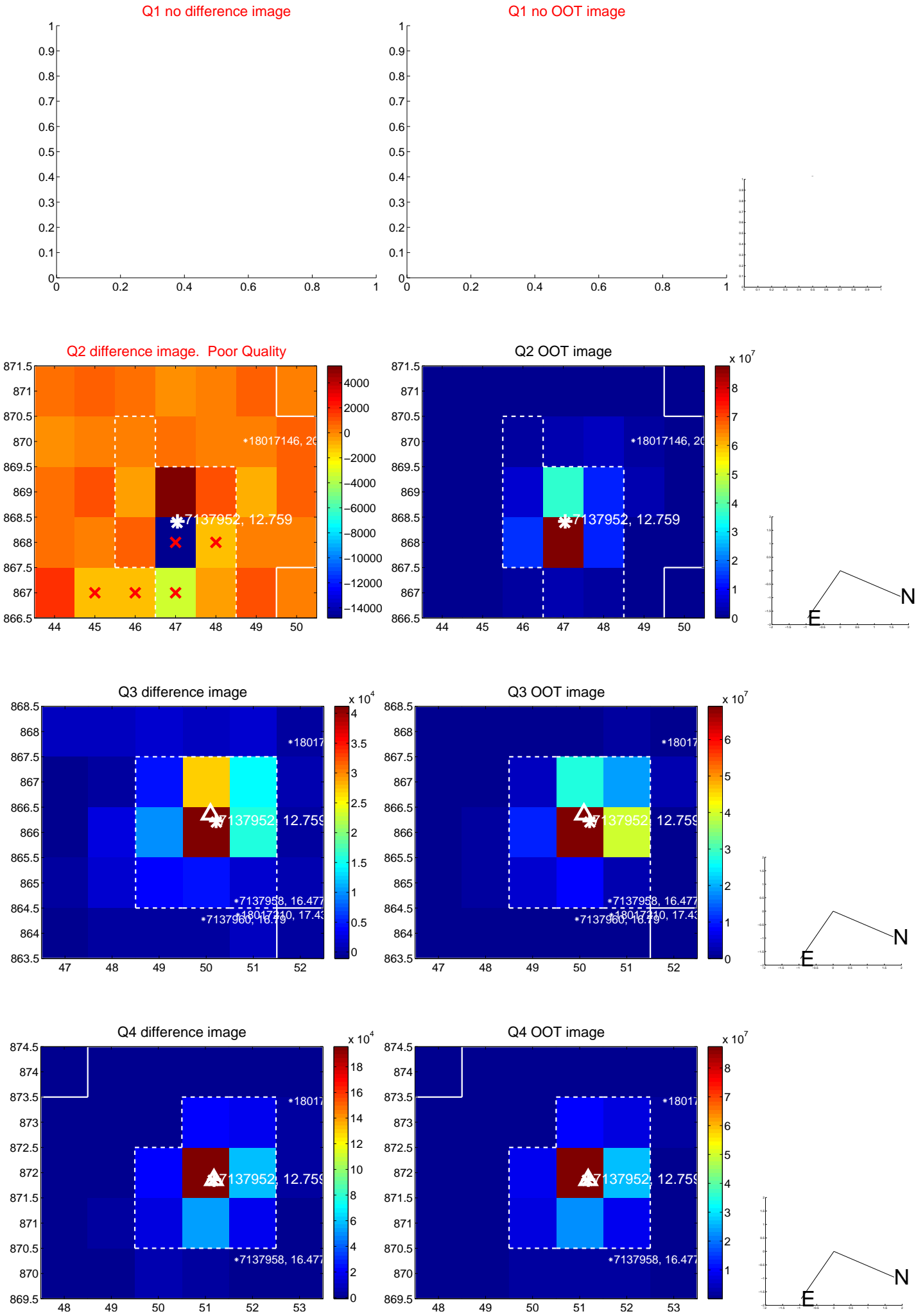
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.019 \pm 0.130$	0.15	$0.014 \pm 0.107$	$-0.013 \pm 0.197$
PRF-fit source offset from KIC position	$0.042 \pm 0.150$	0.28	$-0.033 \pm 0.097$	$-0.027 \pm 0.175$
photometric centroid source offset	$0.20 \pm 0.12$	1.74	$0.08 \pm 0.12$	$0.19 \pm 0.12$

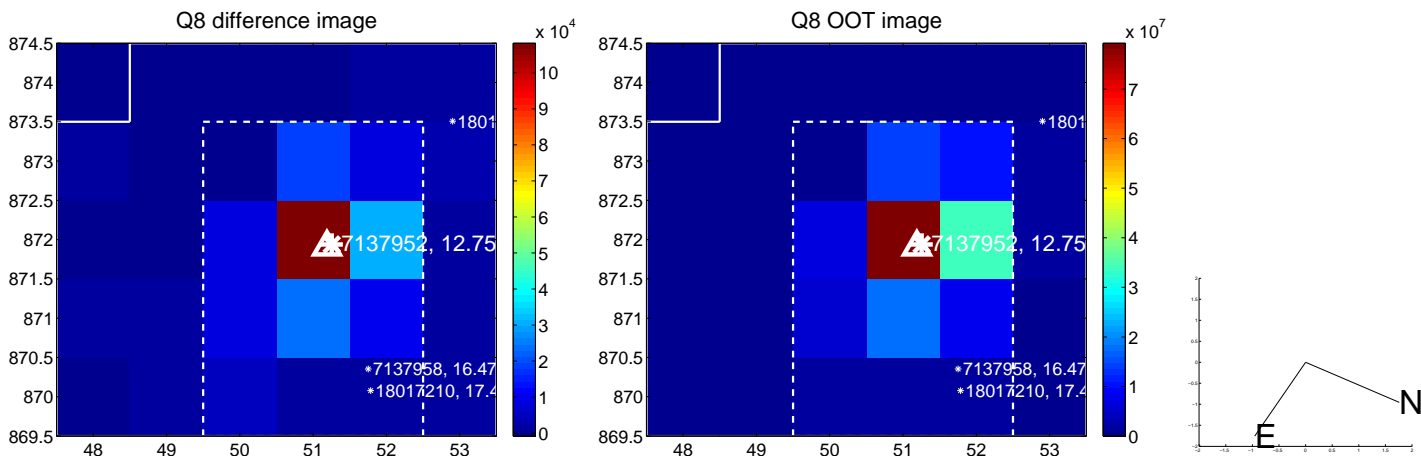
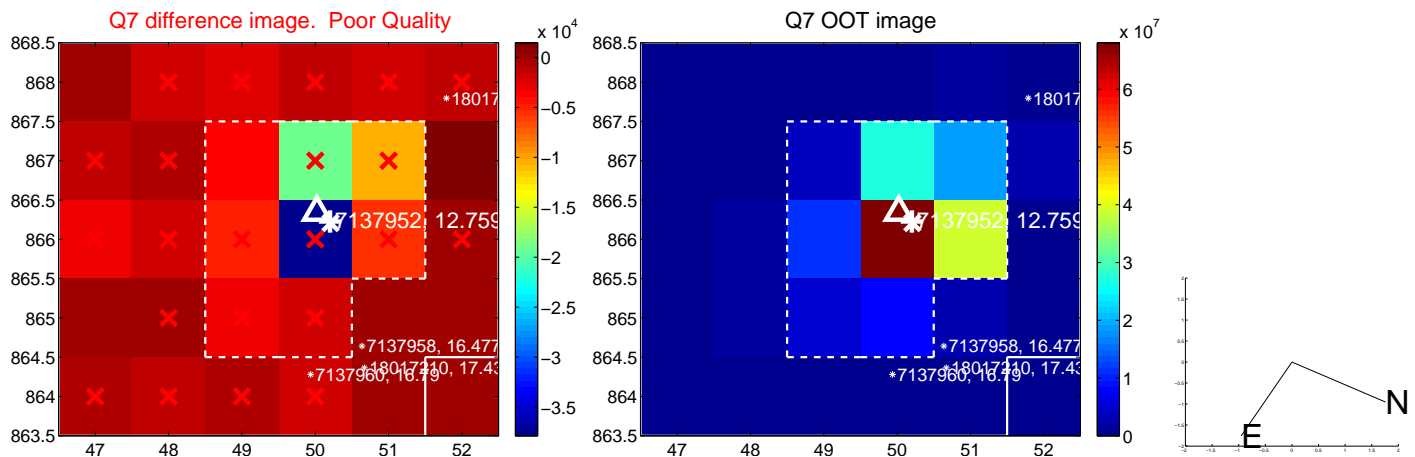
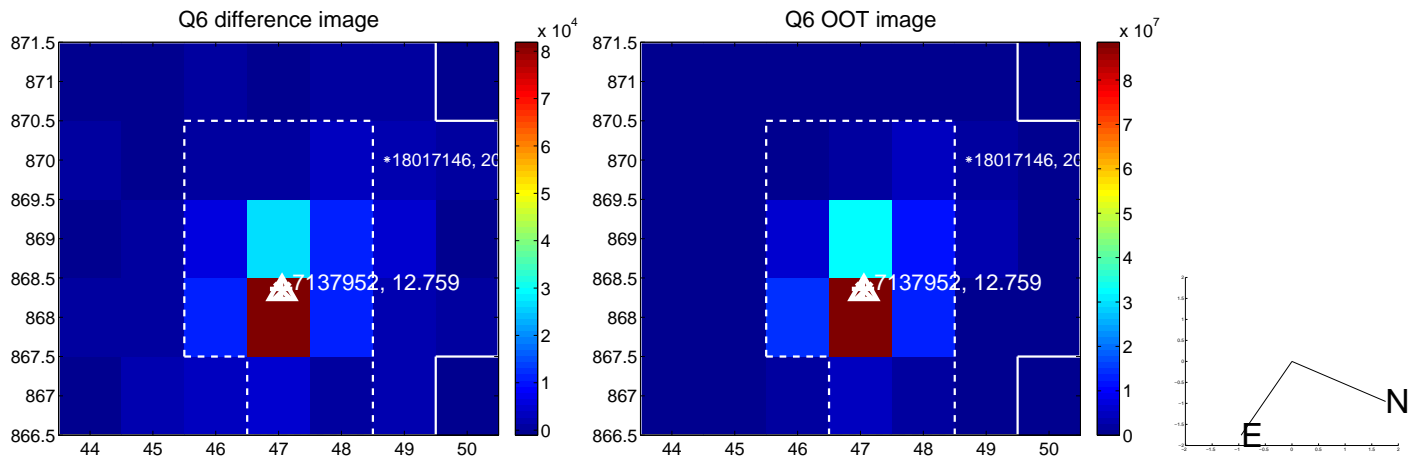
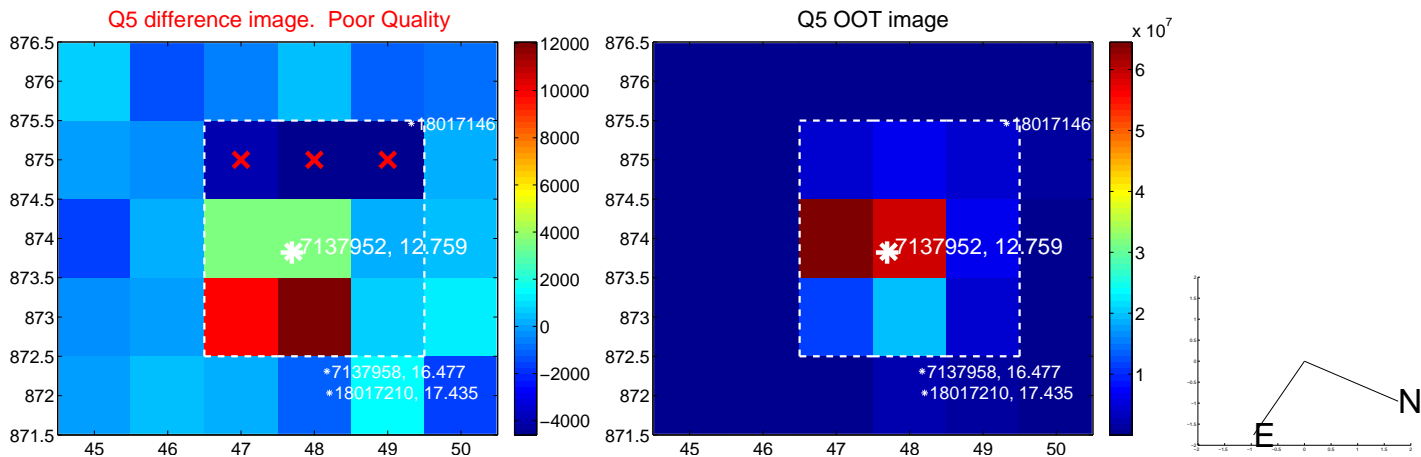


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

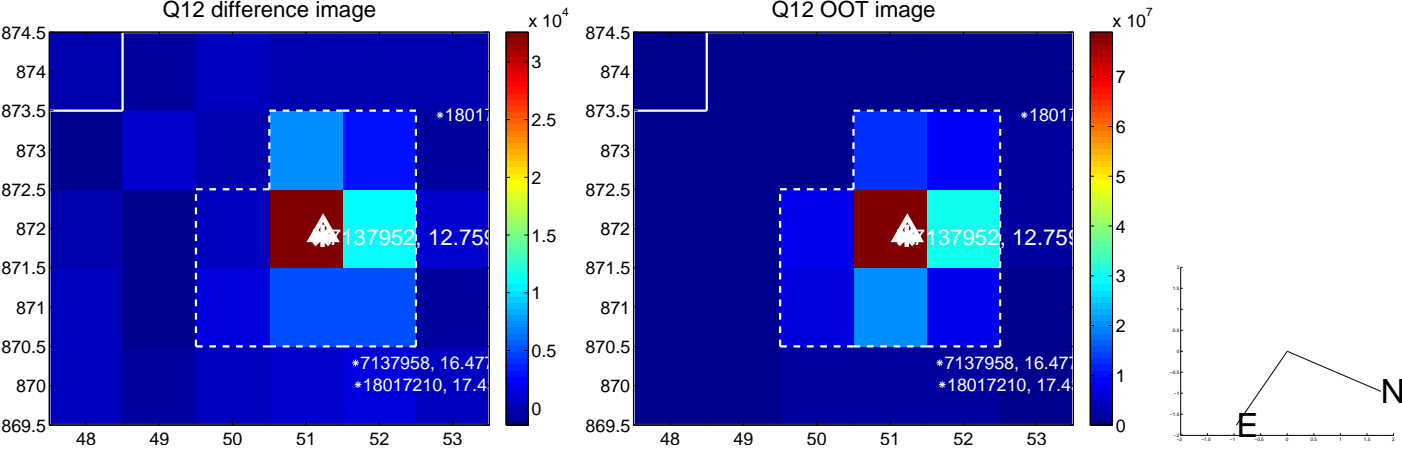
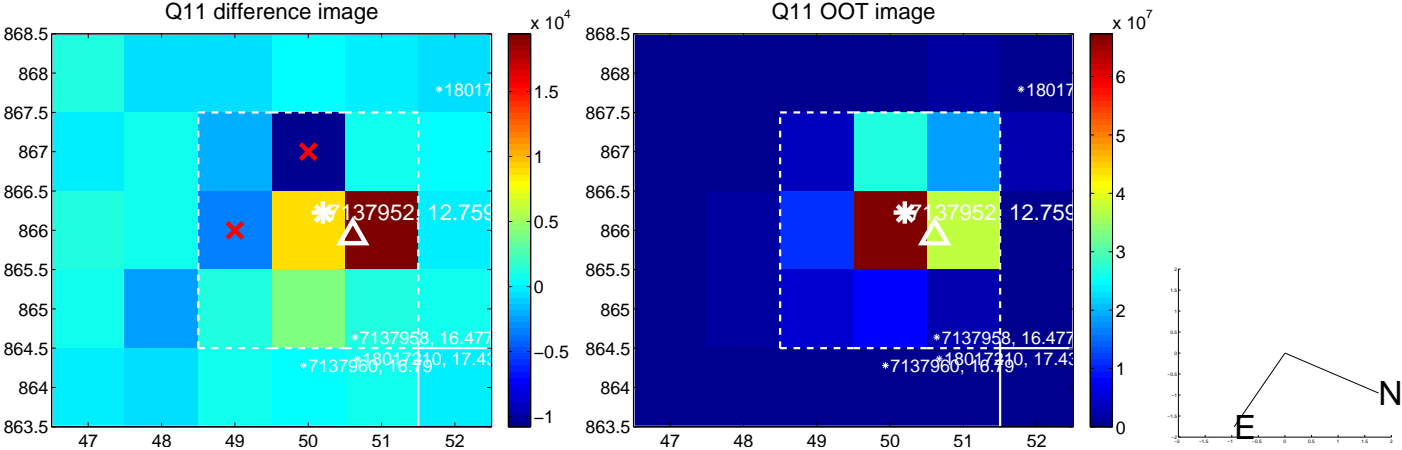
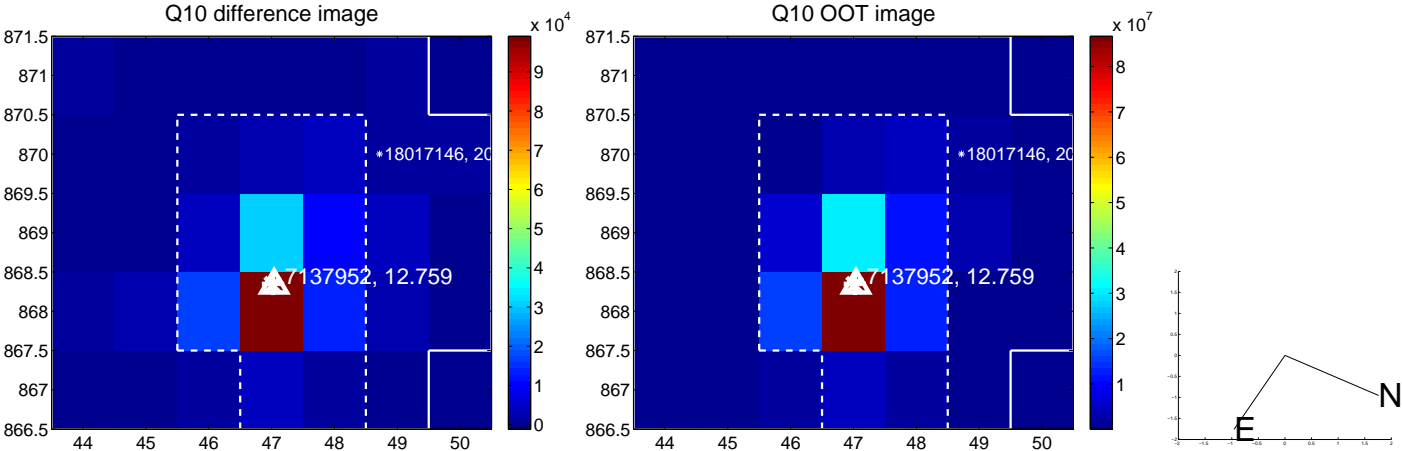
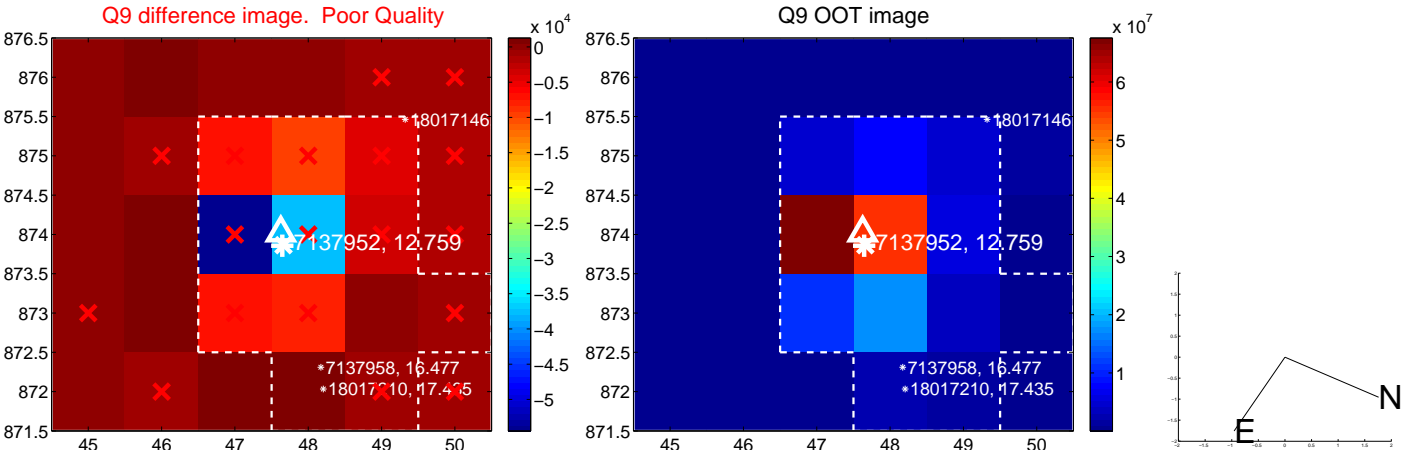


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

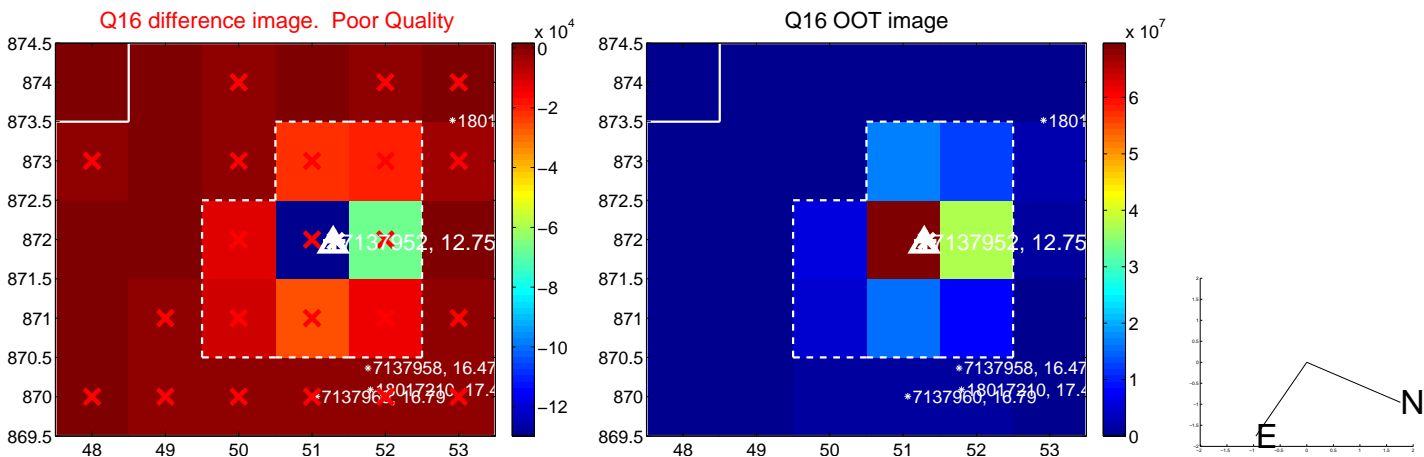
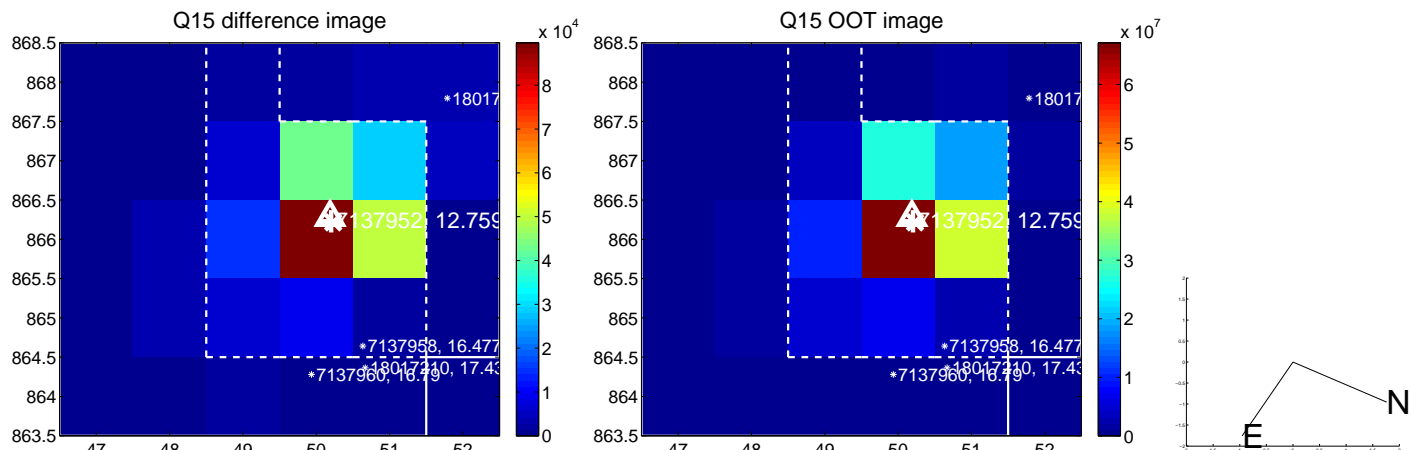
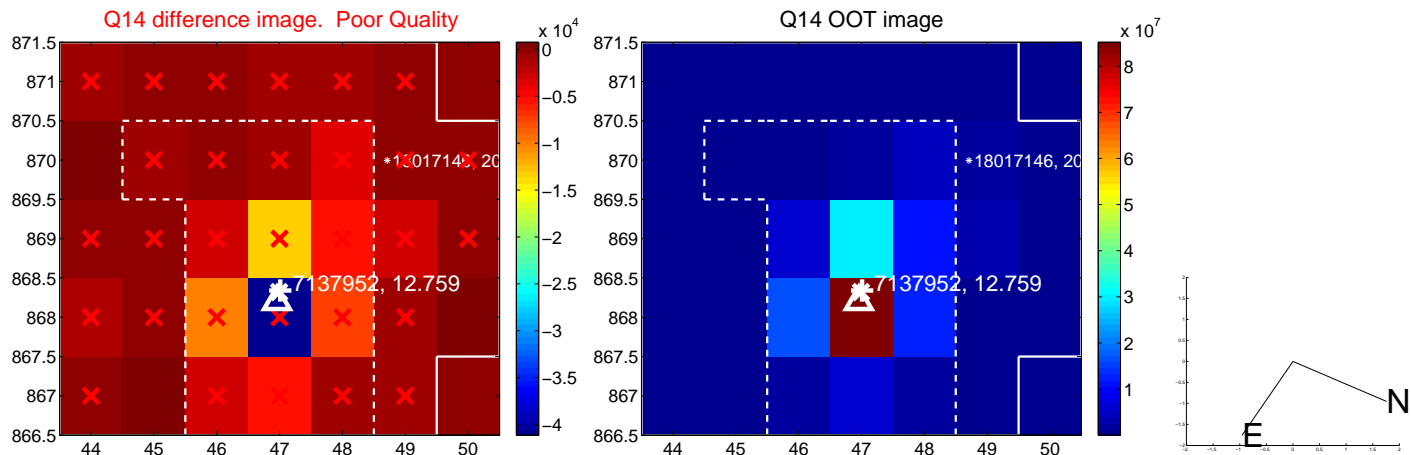
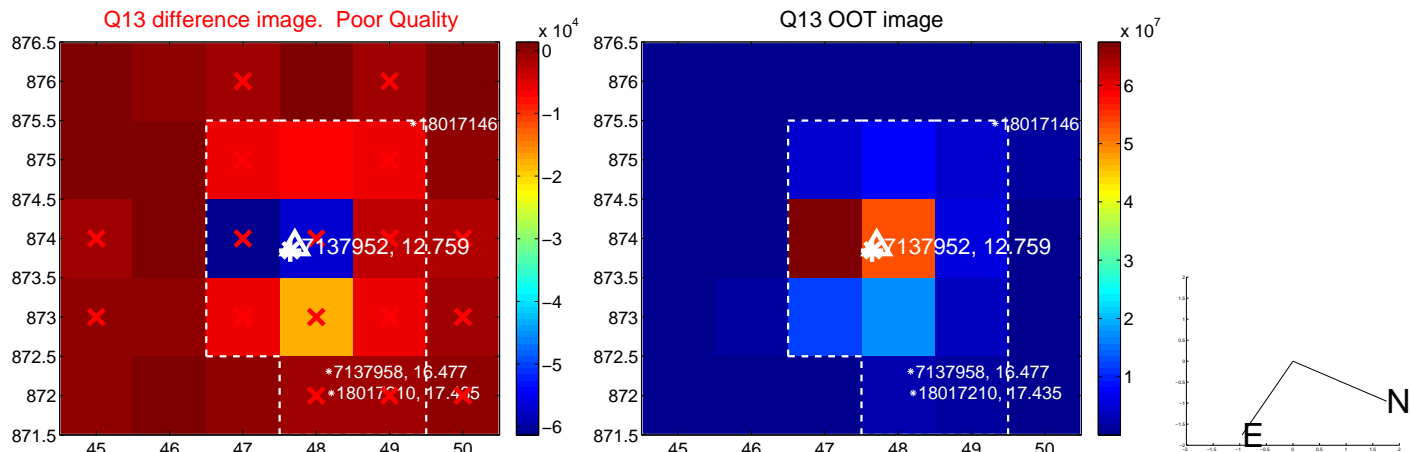




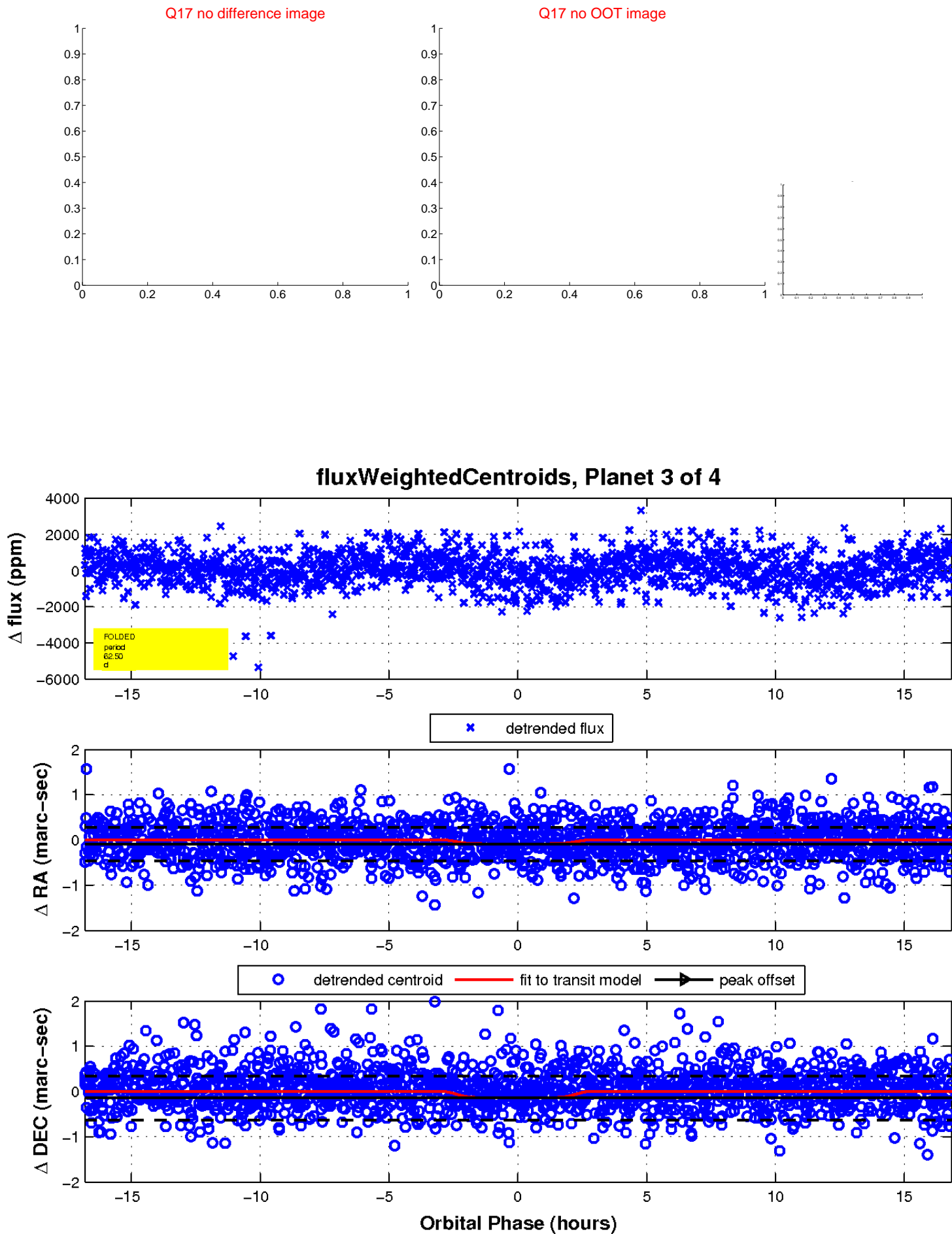
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

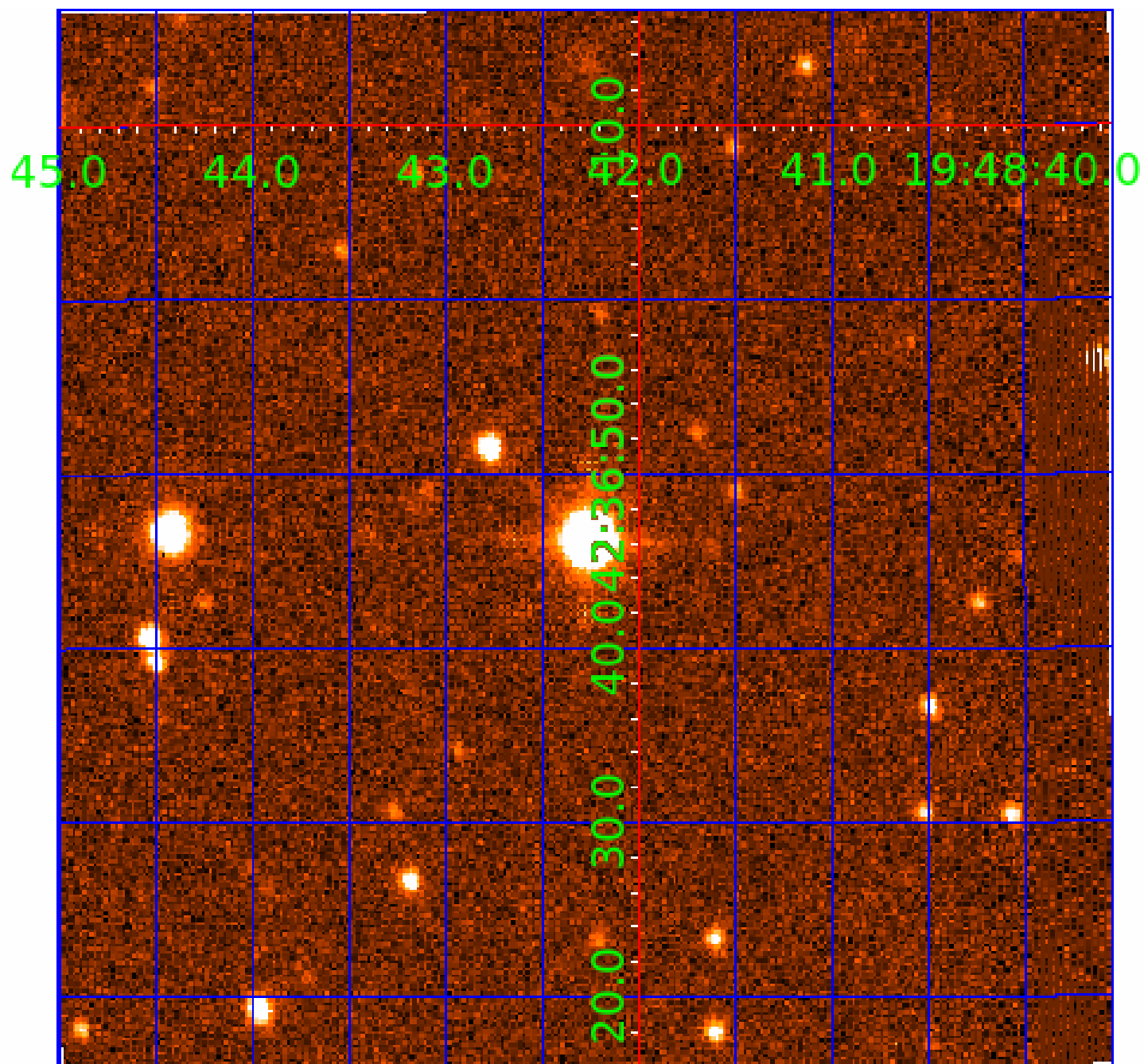


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007137952

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007137952-01	OBS	No	0.549626	131.982651	90.1	2.537	12.3	11.7	1.80	7626	1.93	39296.79
007137952-02	OBS	No	2.208389	132.676339	309.4	10.630	9.5	13.6	1.80	7626	5.06	6151.95
007137952-03	OBS	No	62.500549	173.356863	854.7	5.618	8.2	7.4	1.80	7626	6.19	71.33
007137952-04	OBS	No	34.232633	153.226382	719.2	7.007	7.5	7.2	1.80	7626	5.11	159.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007137952-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
007137952-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007137952-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
007137952-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

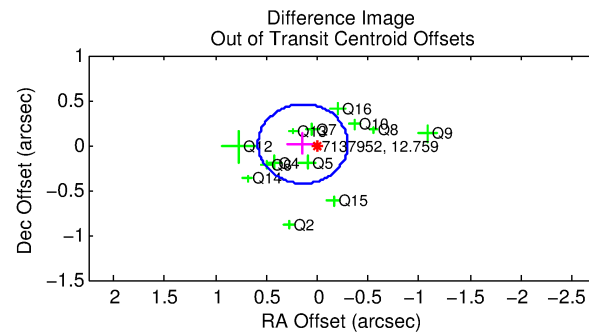
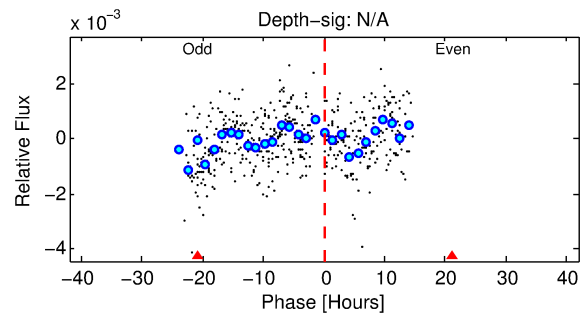
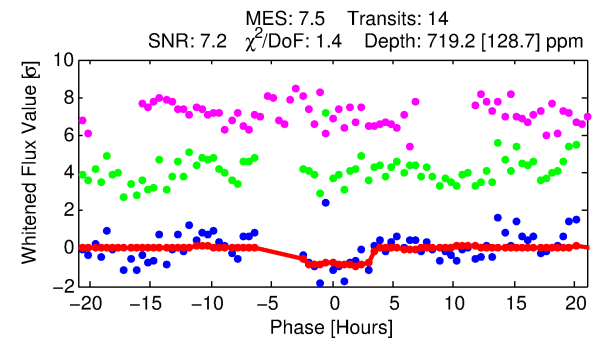
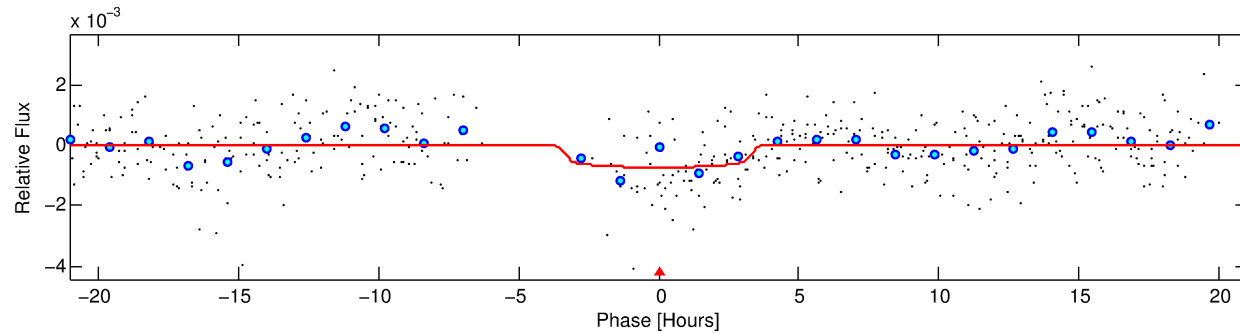
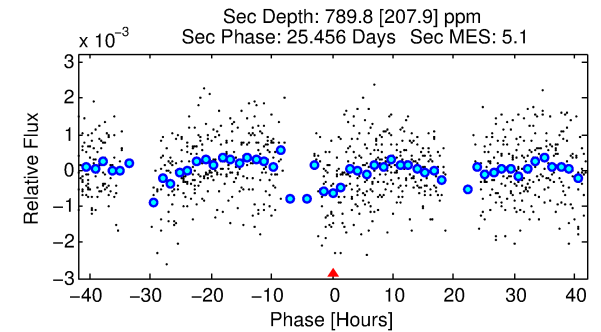
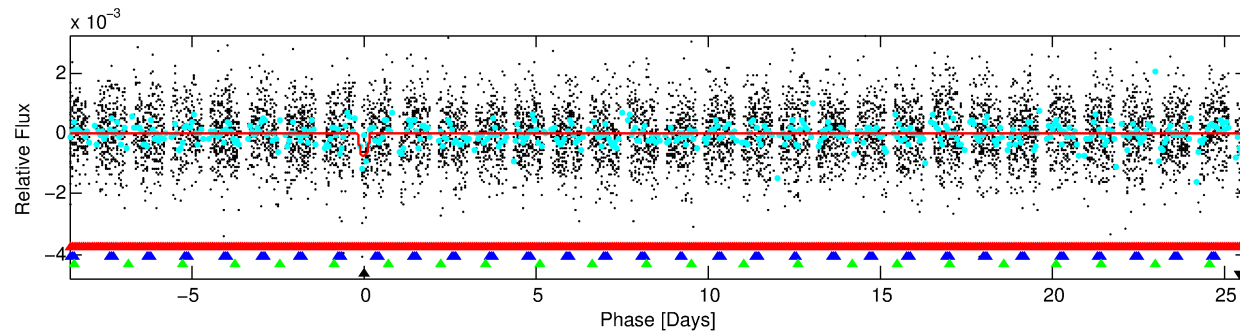
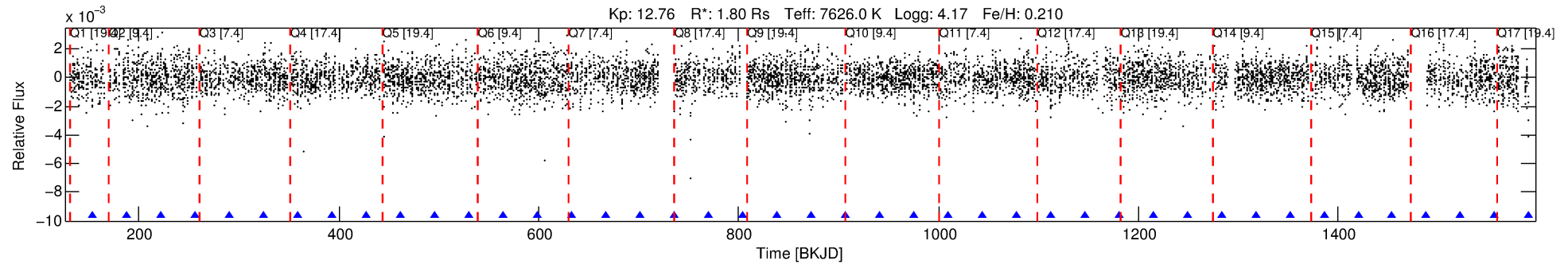
Ephemeris Match Information For 007137952-04

No Significant Match Found



# DV One-Page Summary

KIC: 7137952 Candidate: 4 of 4 Period: 34.233 d



## DV Fit Results:

Period = 34.23263 [0.00103] d  
Epoch = 153.2264 [0.0795] BKJD  
Rp/R\* = 0.0261 [0.0257]  
a/R\* = 29.68 [192.81]  
b = 0.65 [5.49]  
Seff = 159.17 [65.04]  
Teq = 906 [93] K  
Rp = 5.11 [5.30] Re  
a = 0.2479 [0.0641] AU  
Ag = 1022.21 [2070.86] [0.49σ]  
Teffp = 7918 [3960] K [1.77σ]

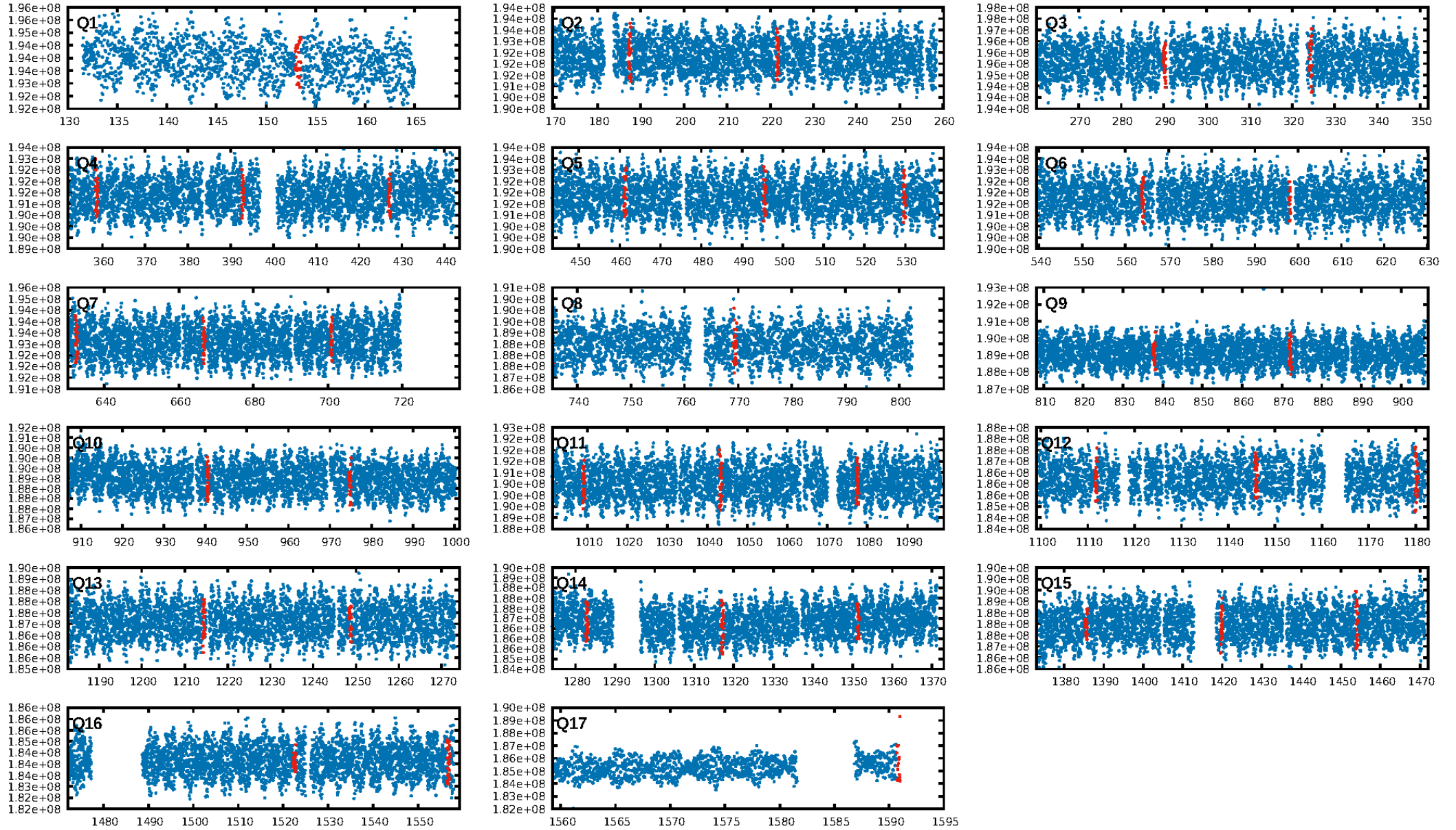
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [60.37σ]  
LongPeriod-sig: 100.0% [75.54σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.17e-07  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: 1.616  
Centroid-sig: 0.1%  
Centroid-so: 0.149 arcsec [1.65σ]  
OotOffset-rm: 0.142 arcsec [0.97σ]  
KicOffset-rm: 0.129 arcsec [0.84σ]  
OotOffset-st: 4/2/4/3 [13]  
KicOffset-st: 4/2/4/3 [13]  
DiffImageQuality-fgm: 0.85 [11/13]  
DiffImageOverlap-fno: 0.00 [0/15]

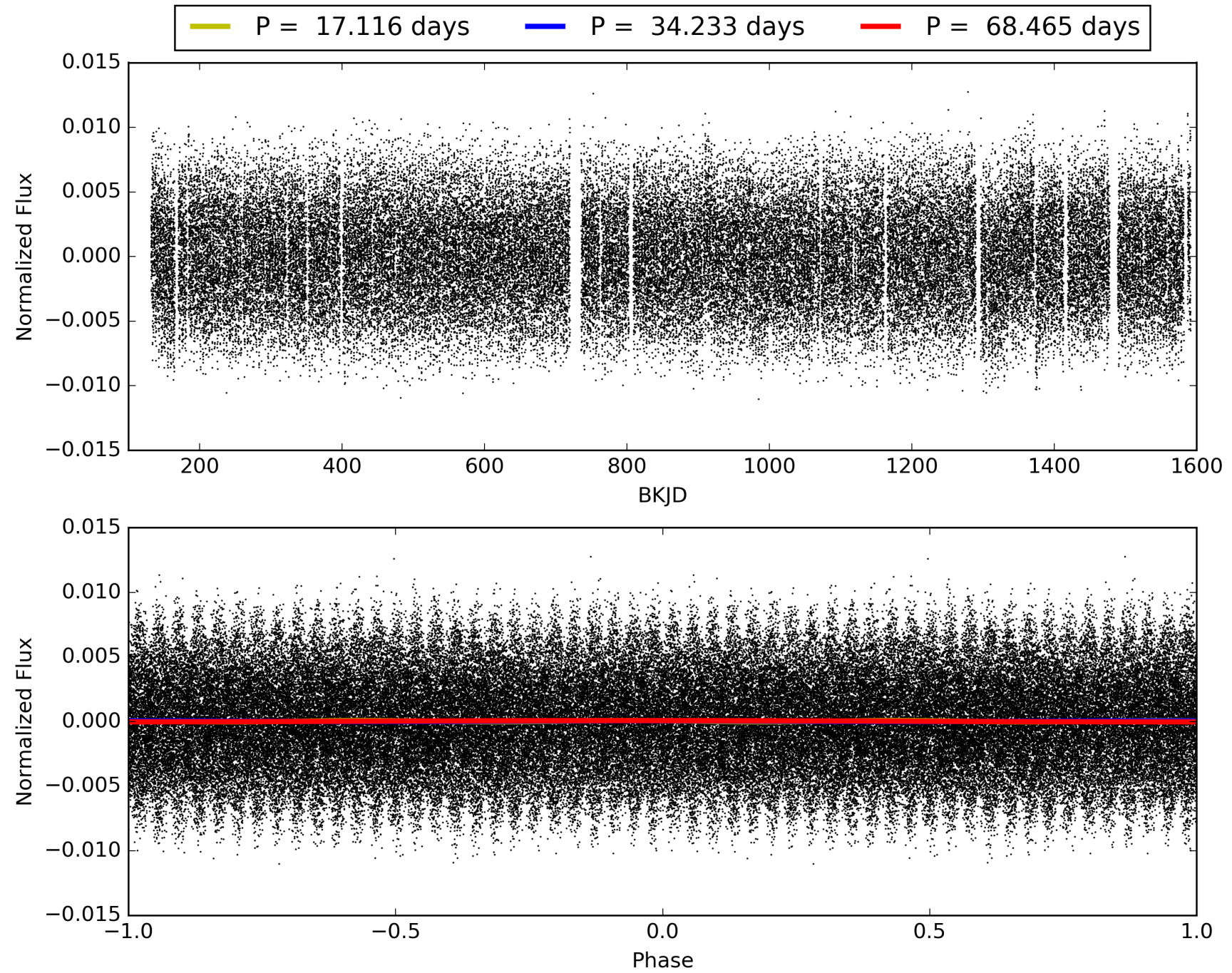
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:11:40 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007137952-04, PDC Light Curves

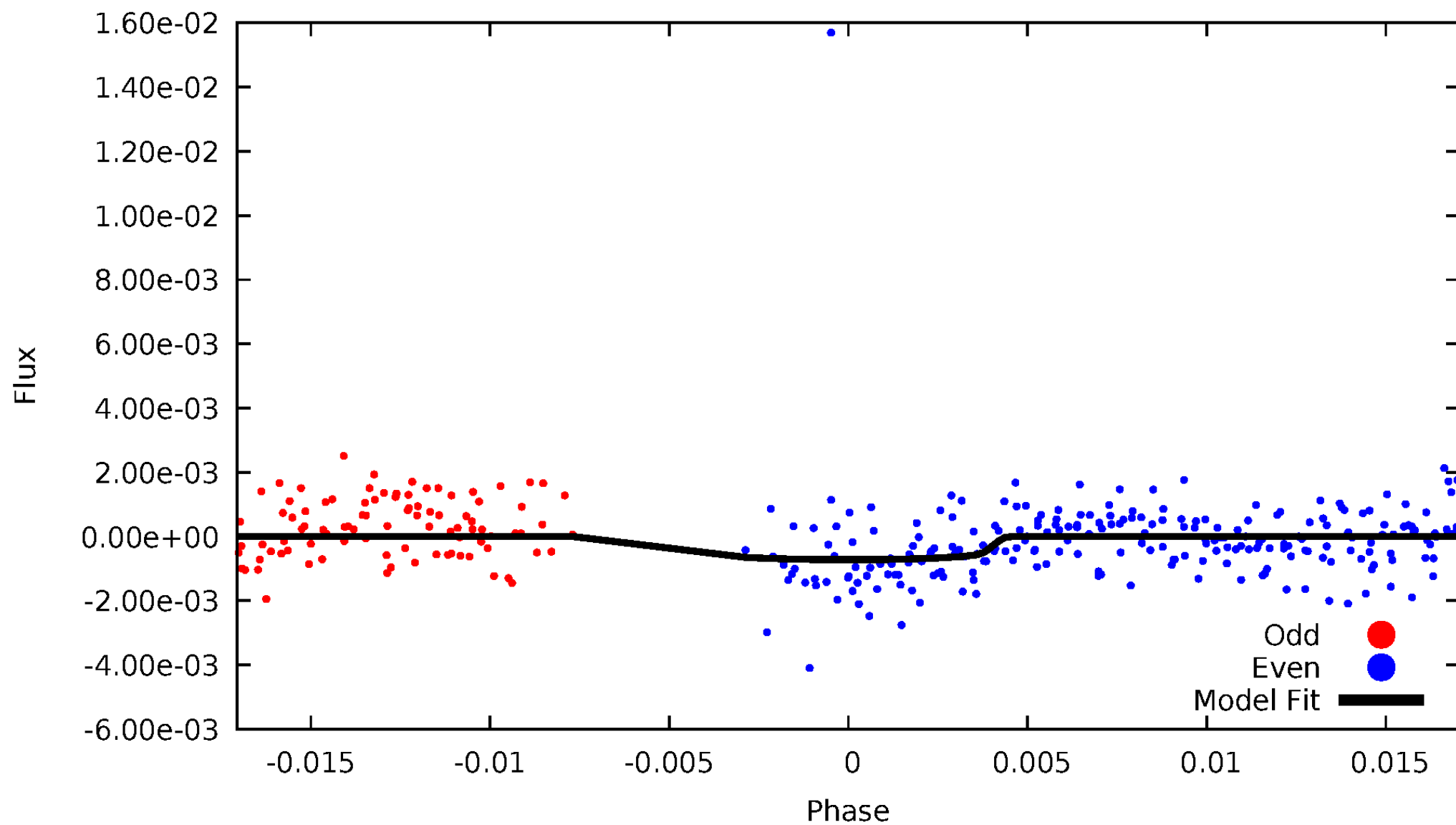


TCE 007137952-04



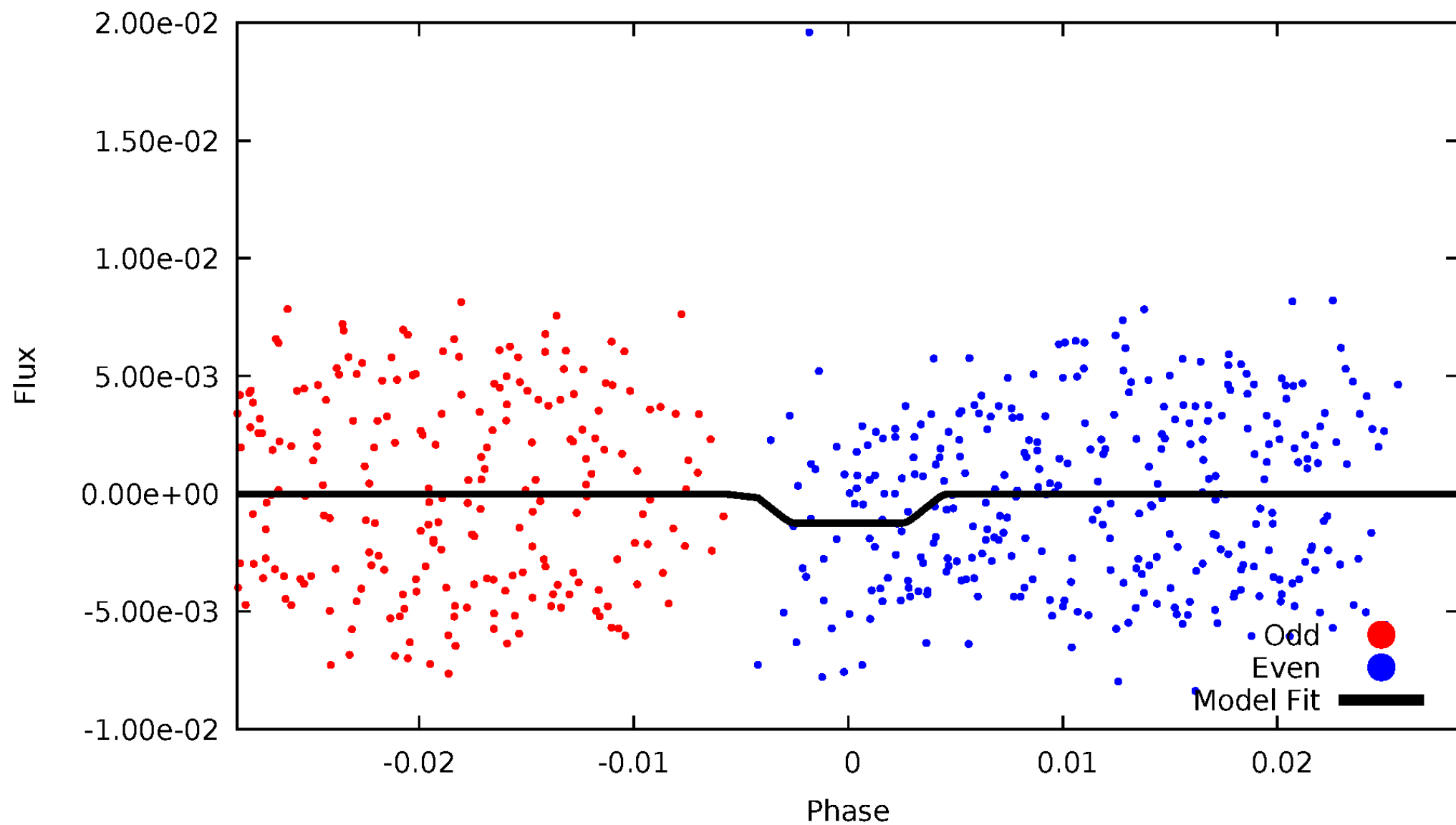
# DV Odd/Even

TCE 007137952-04



# ALT Odd/Even

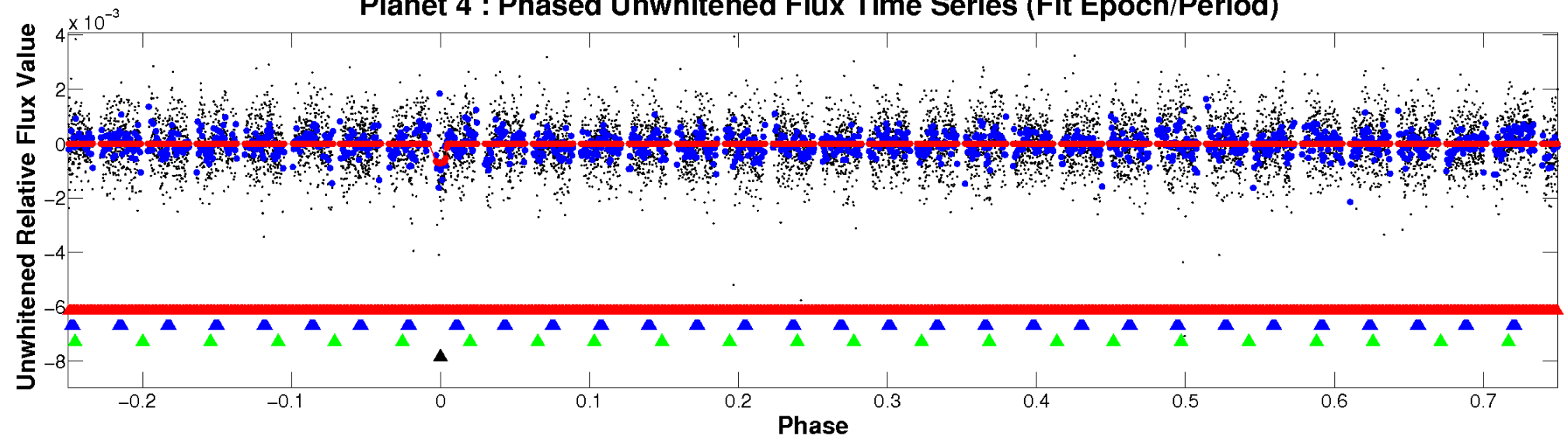
TCE 007137952-04



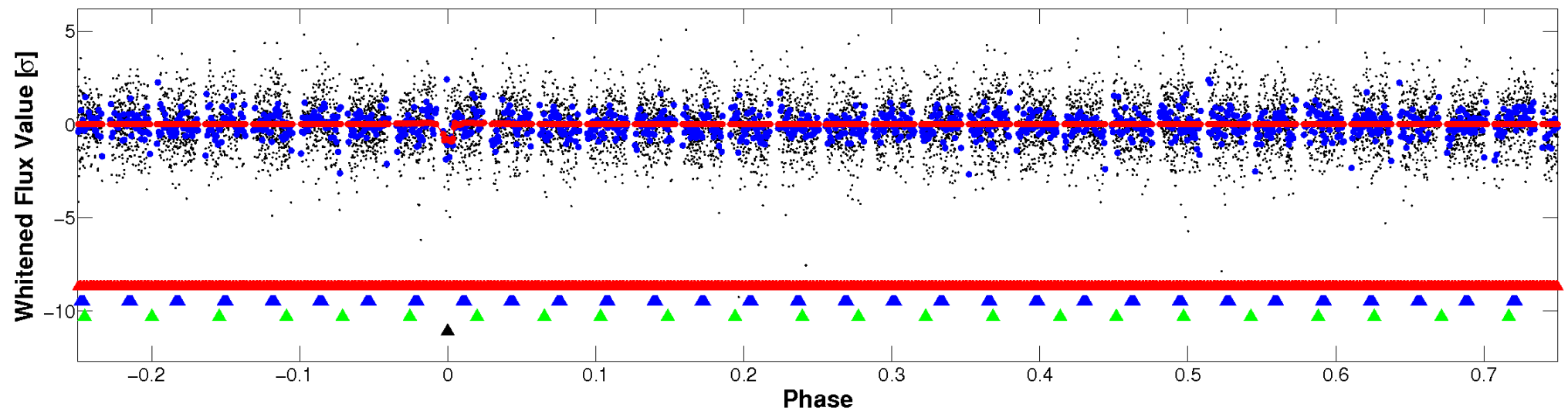


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

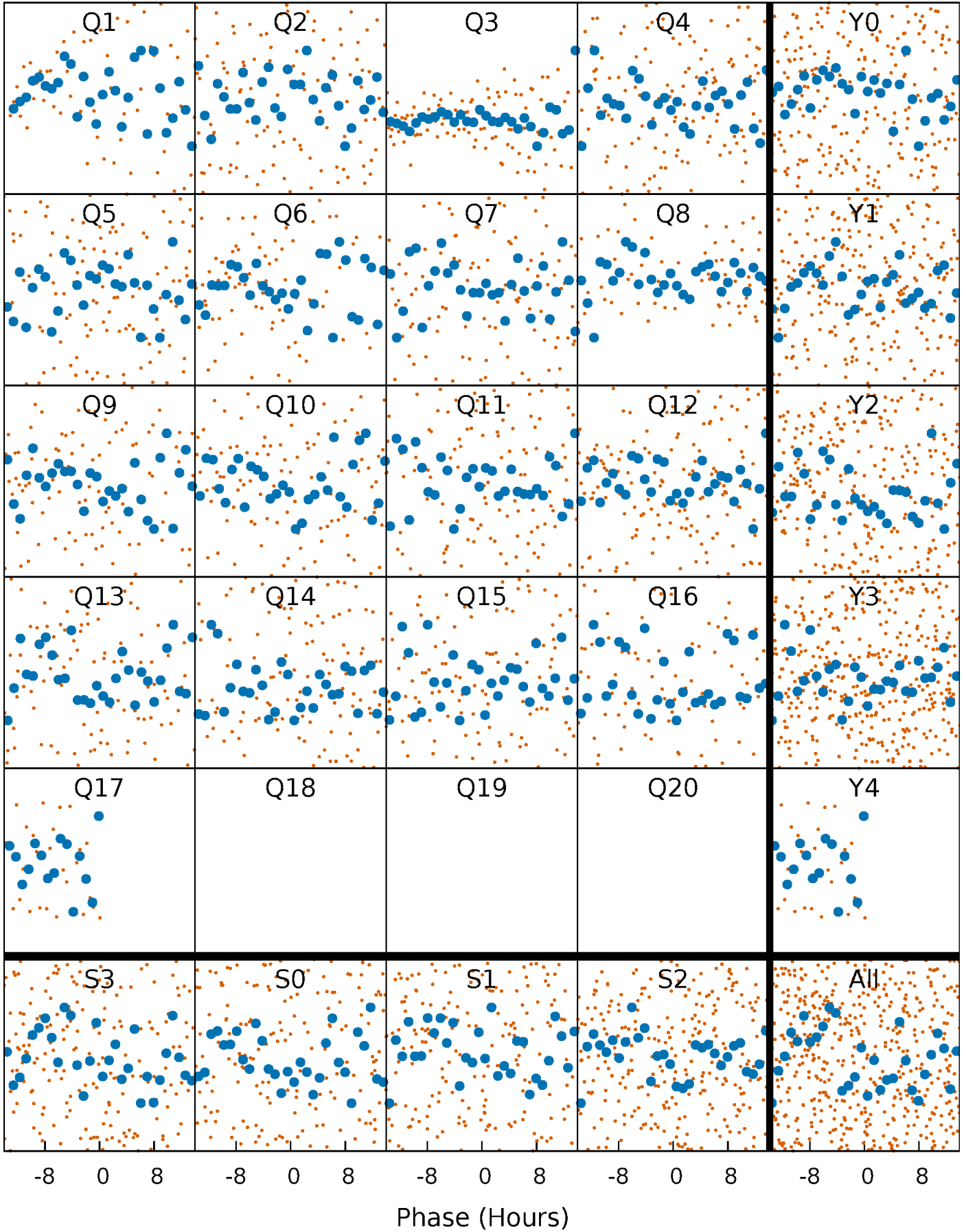


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



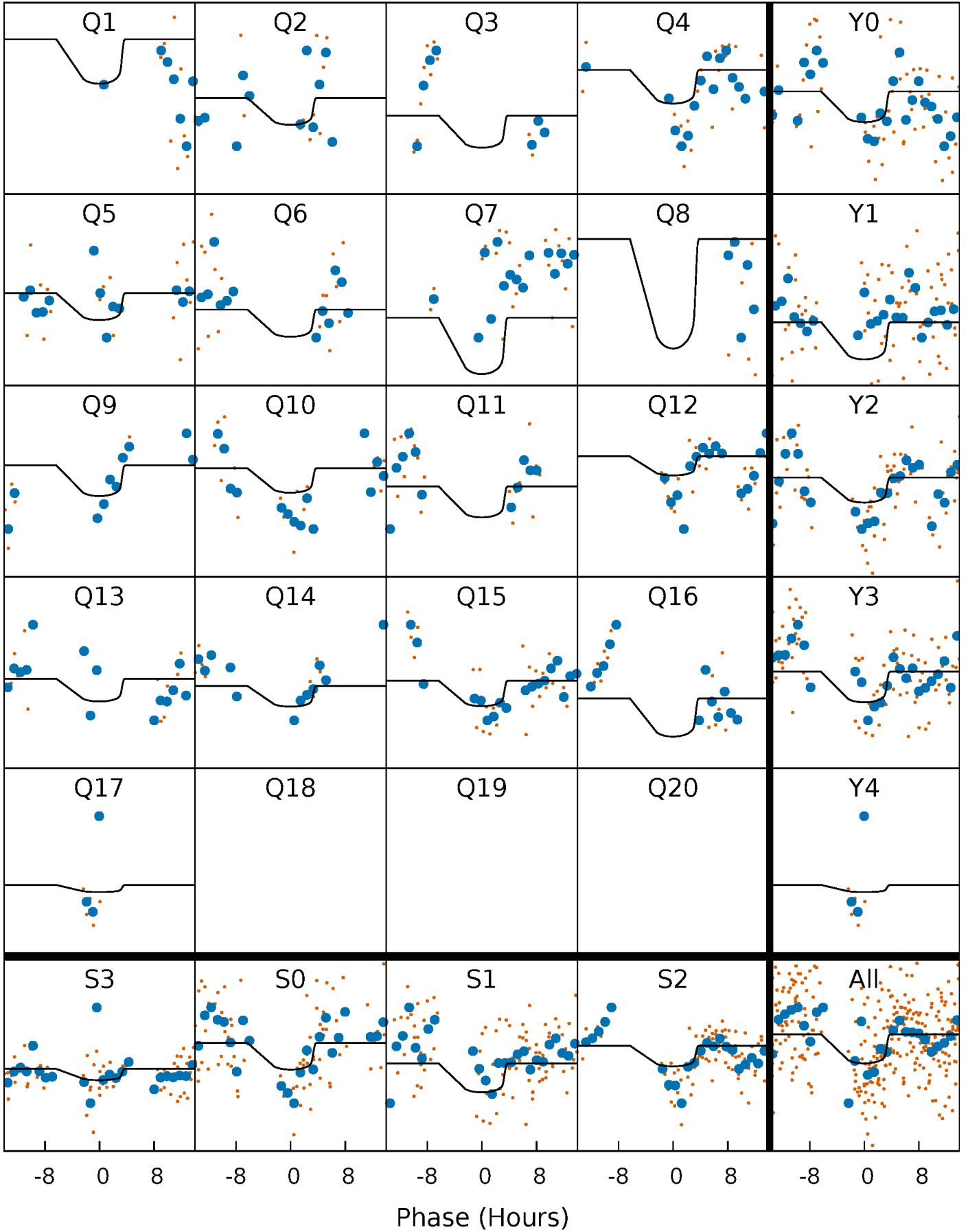
# PDC Quarter-Phased Transit Curves

TCE 007137952-04   P= 34.232633 Days    $T_0=153.226382$  (BKJD)



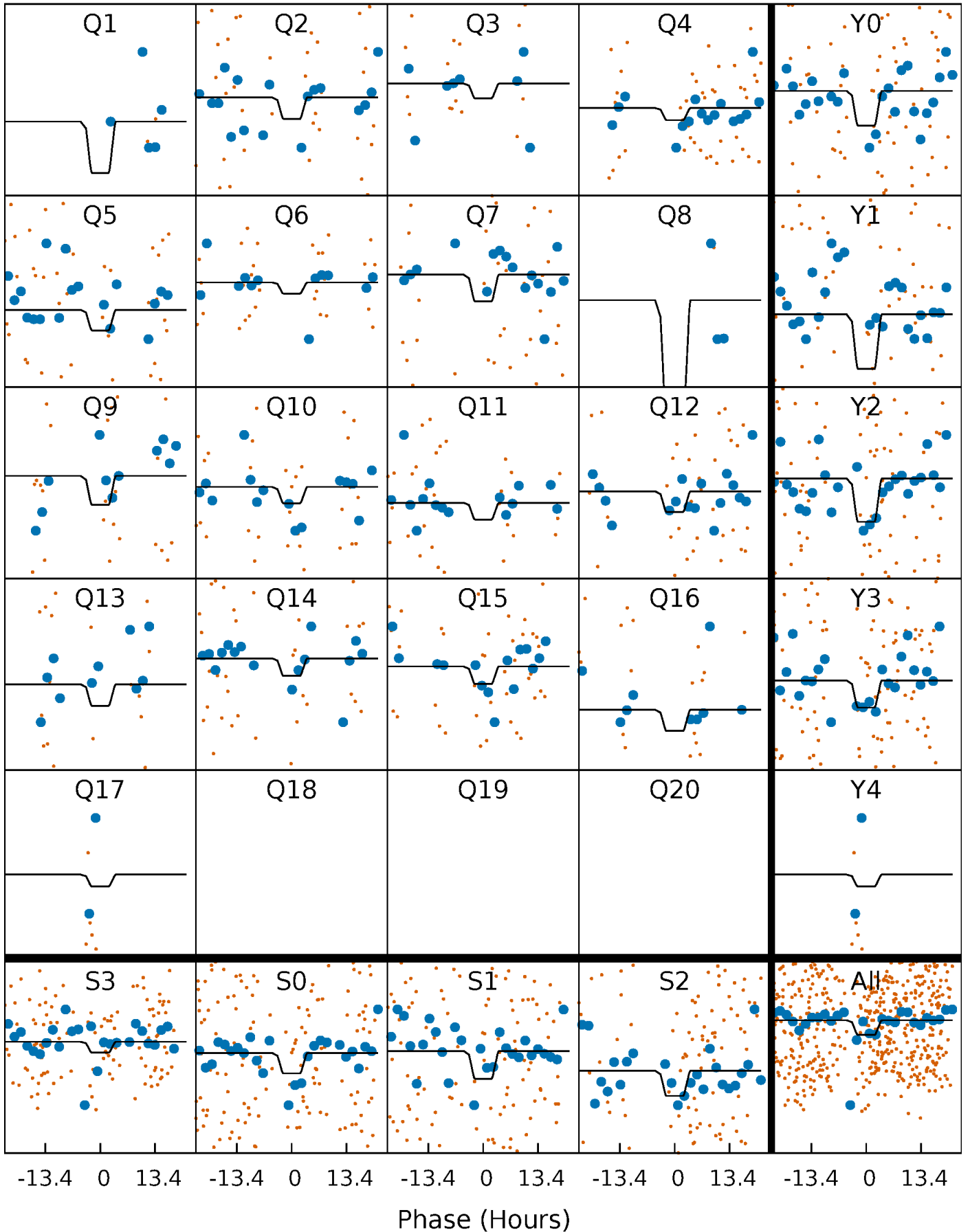
# DV Quarter-Phased Transit Curves

TCE 007137952-04   P= 34.232633 Days    $T_0=153.226382$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

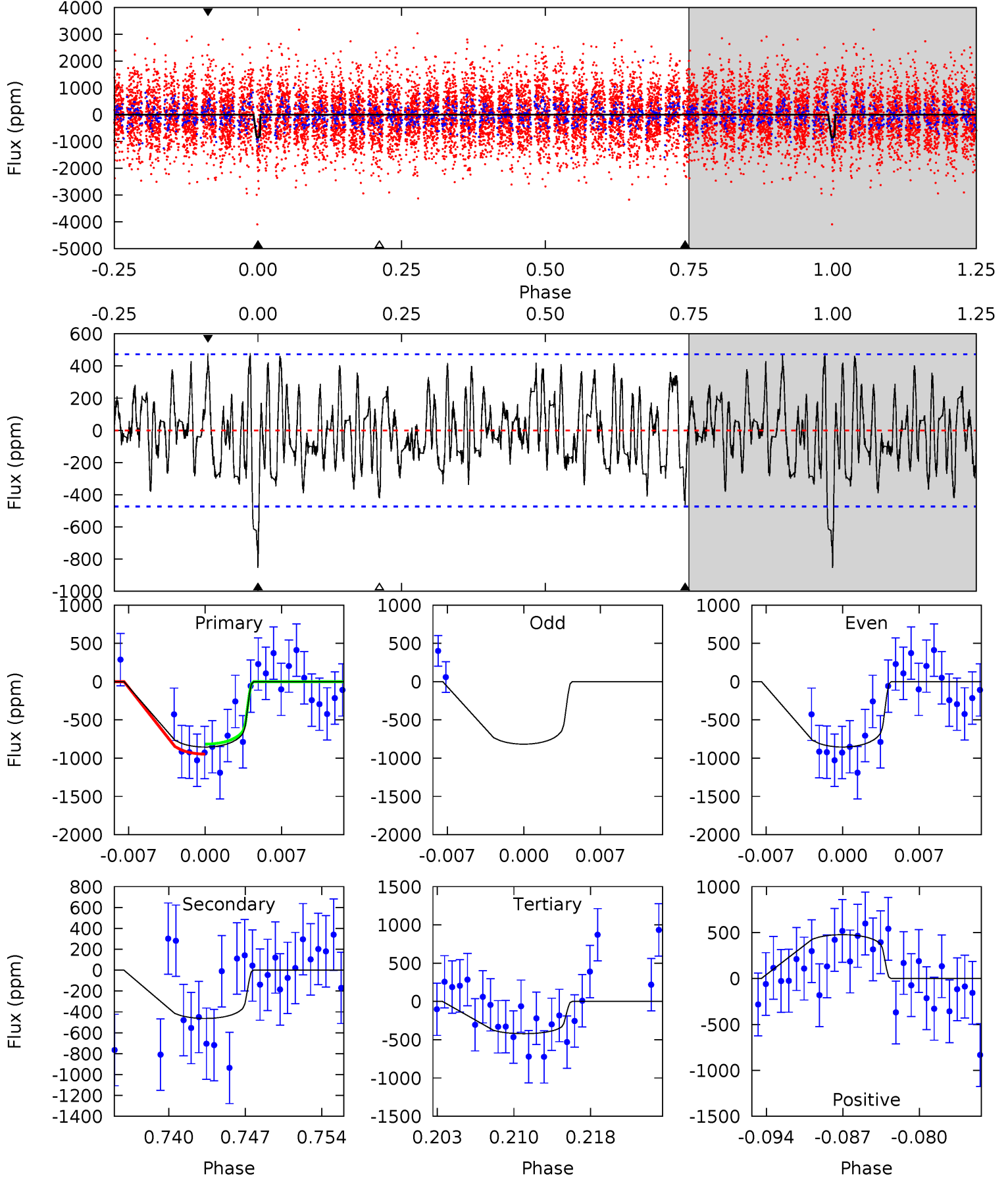
TCE 007137952-04   P= 34.235320 Days    $T_0=153.159617$  (BKJD)



# DV Model-Shift Uniqueness Test

007137952-04, P = 34.232633 Days, E = 118.993749 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.19	4.98	4.53	5.13	5.09	2.68	1.94	4.67	4.06	0.45	-0.15	0.27	1.12	0.36	0.60

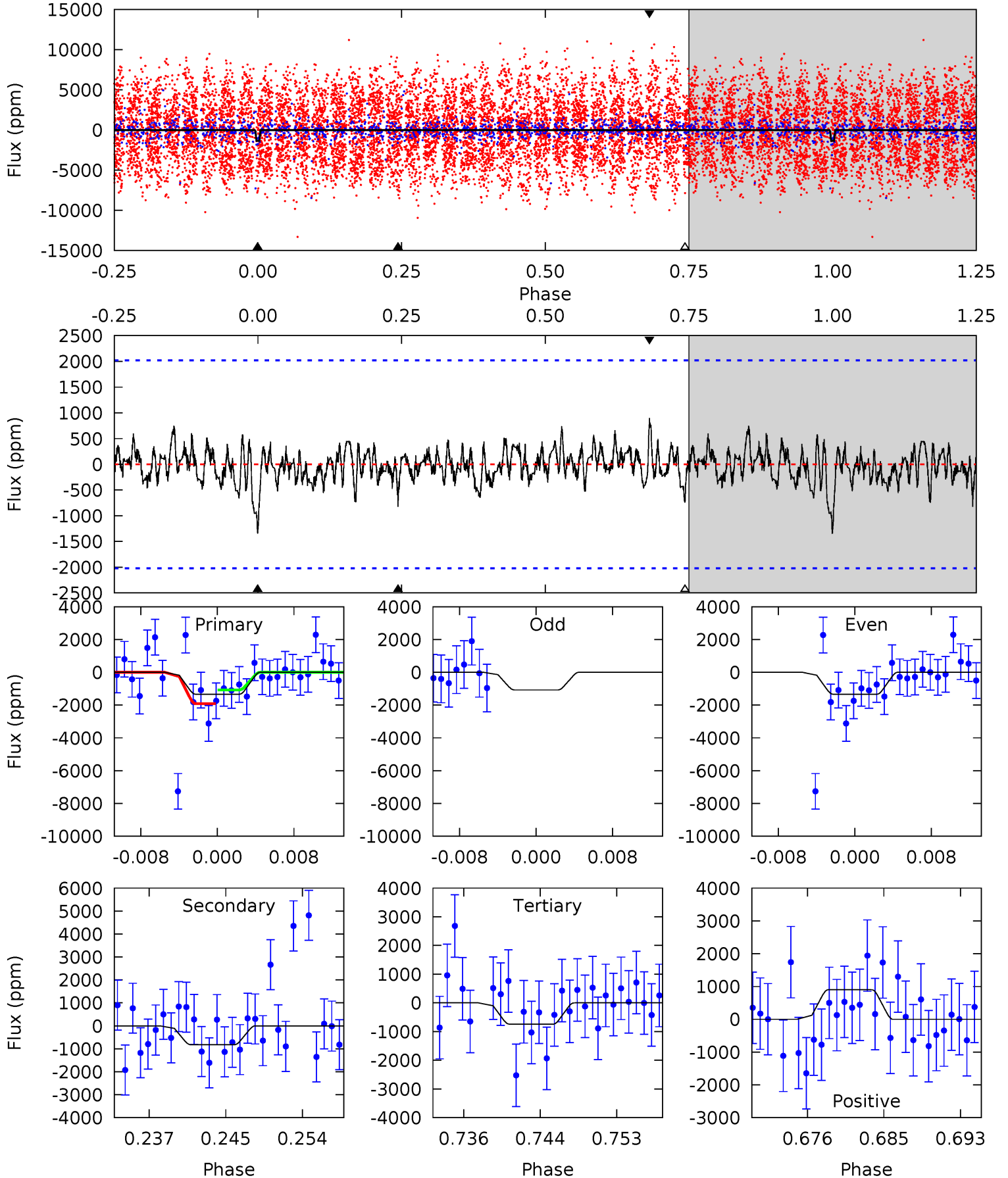




# Alt Model-Shift Uniqueness Test

007137952-04, P = 34.235320 Days, E = 118.924297 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.35	2.06	1.86	2.25	5.06	2.63	0.63	1.49	1.10	0.20	-0.19	0.43	1.29	0.40	0.89



### Stellar Parameters For KIC 007137952

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7626^{+211}_{-342}$	$4.168^{+0.084}_{-0.196}$	$0.210^{+0.150}_{-0.400}$	$1.797^{+0.567}_{-0.243}$	$1.740^{+0.204}_{-0.250}$	$0.423^{+0.157}_{-0.220}$
	+3%/-4%	+2%/-5%	+71%/-190%	+32%/-14%	+12%/-14%	+37%/-52%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007137952-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-463 \pm 93$	$6.15^{+4.90}_{-3.85}$	$1274^{+90}_{-73}$	$6174^{+5645}_{-1423}$	$391^{+2544}_{-268}$
Alt.	$-822 \pm 399$	$7.98^{+4.97}_{-4.65}$	$1281^{+86}_{-75}$	$6302^{+4197}_{-1399}$	$414^{+1783}_{-278}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

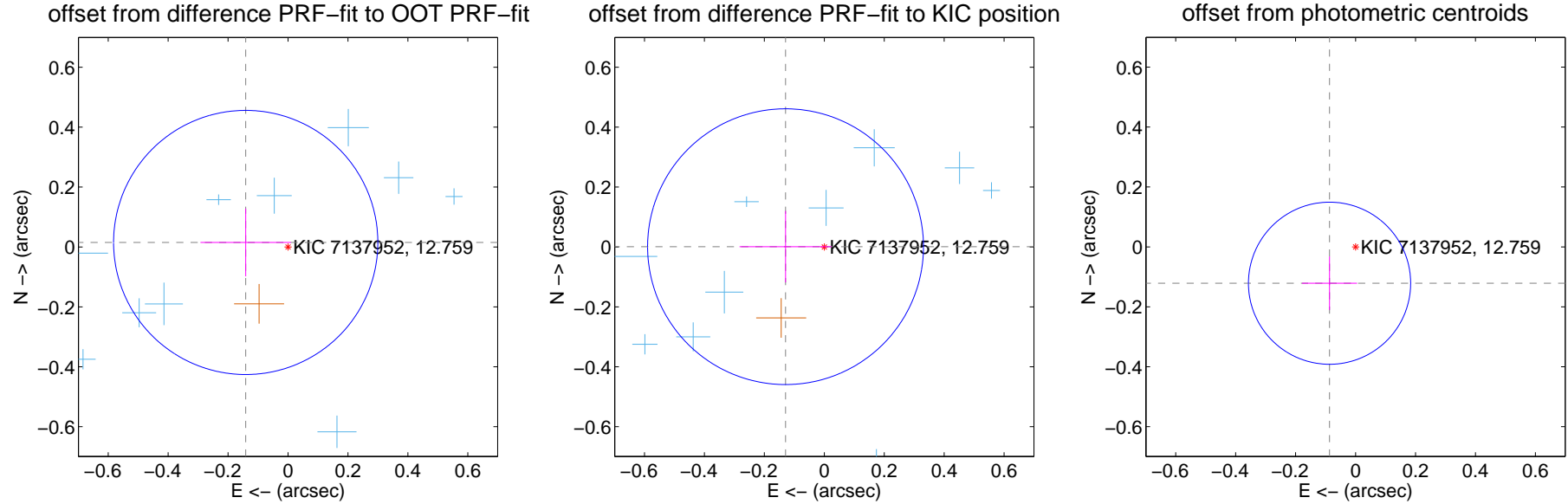
## DV Centroid Data

Supplemental centroid analysis for 007137952-04. Kepler magnitude: 12.76. Transit SNR 7.24

There are 11 quarters with good PRF difference image offsets

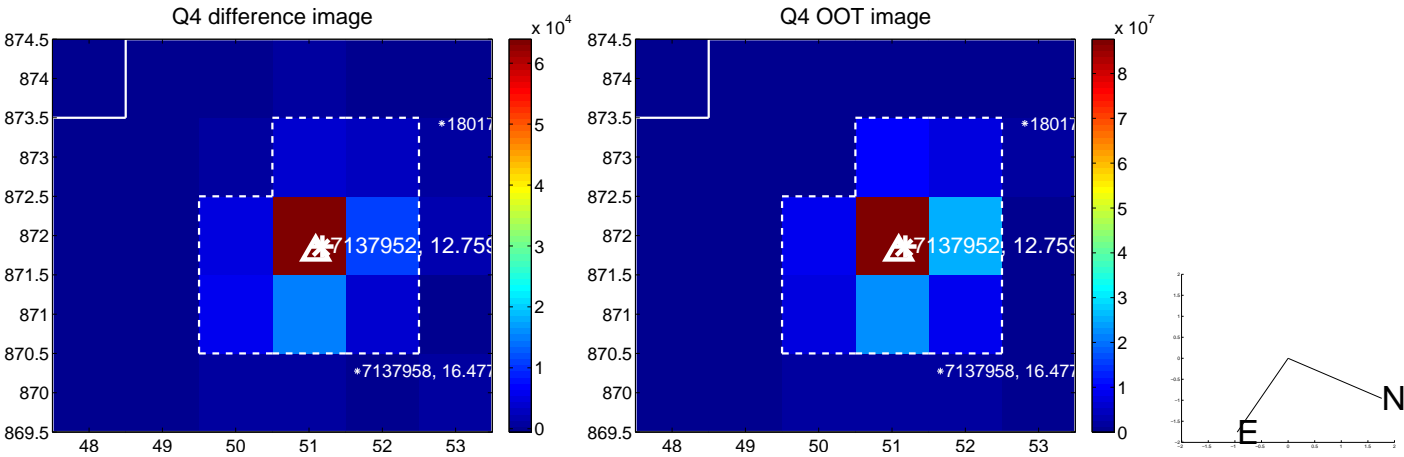
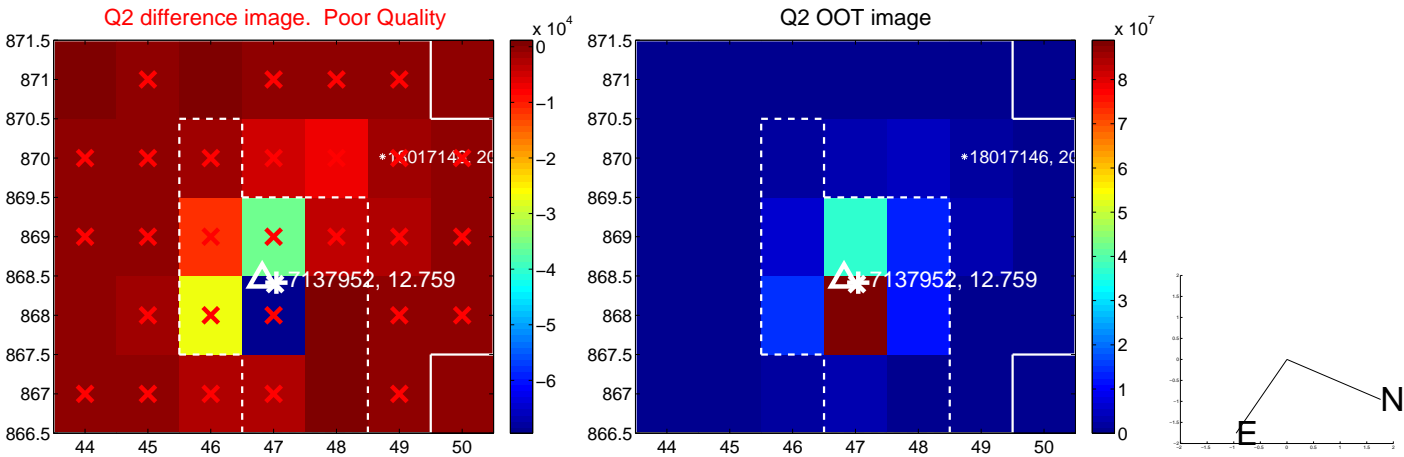
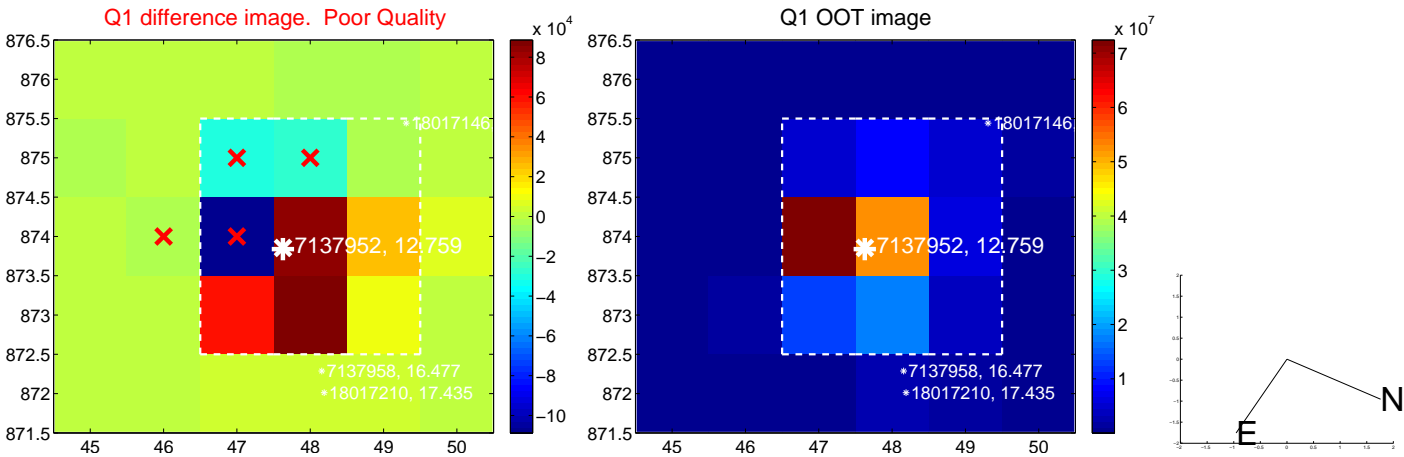
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.142 \pm 0.147$	0.97	$0.141 \pm 0.151$	$0.015 \pm 0.113$
PRF-fit source offset from KIC position	$0.129 \pm 0.153$	0.84	$0.129 \pm 0.154$	$0.001 \pm 0.119$
photometric centroid source offset	$0.15 \pm 0.09$	1.65	$0.09 \pm 0.09$	$-0.12 \pm 0.09$

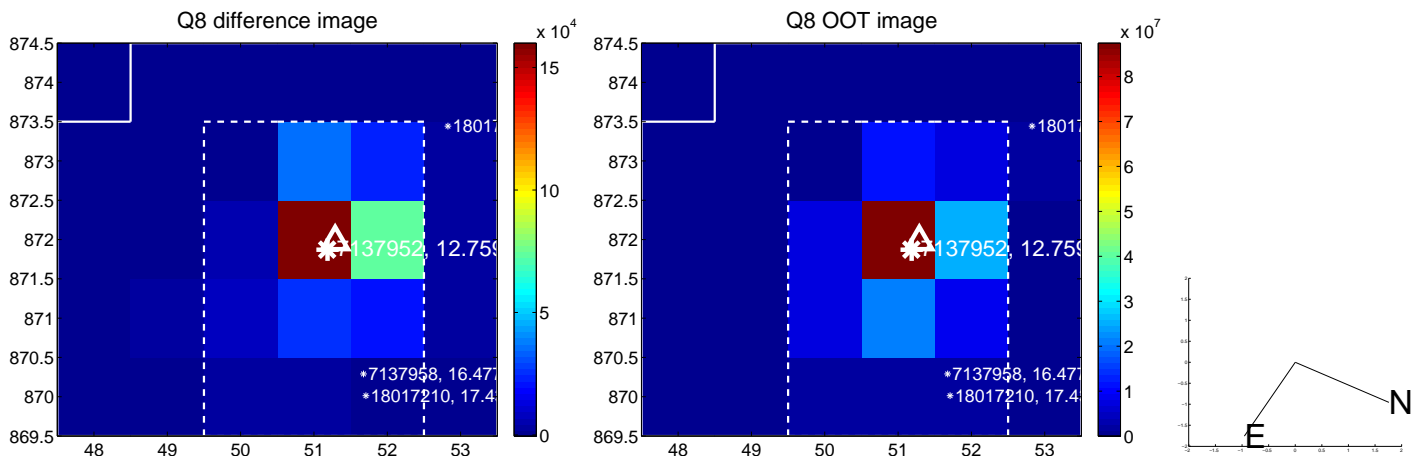
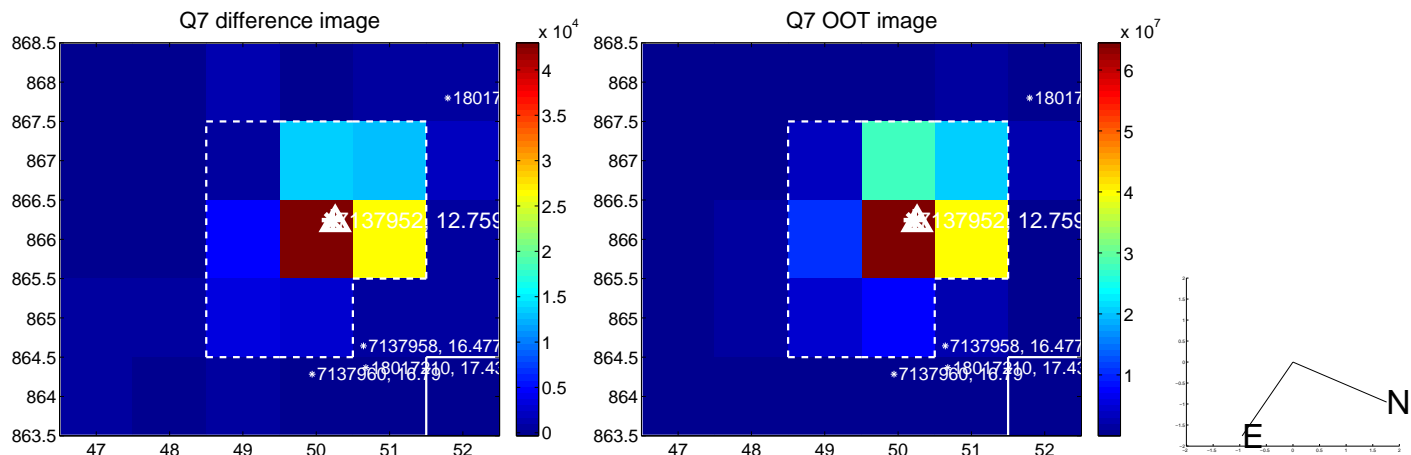
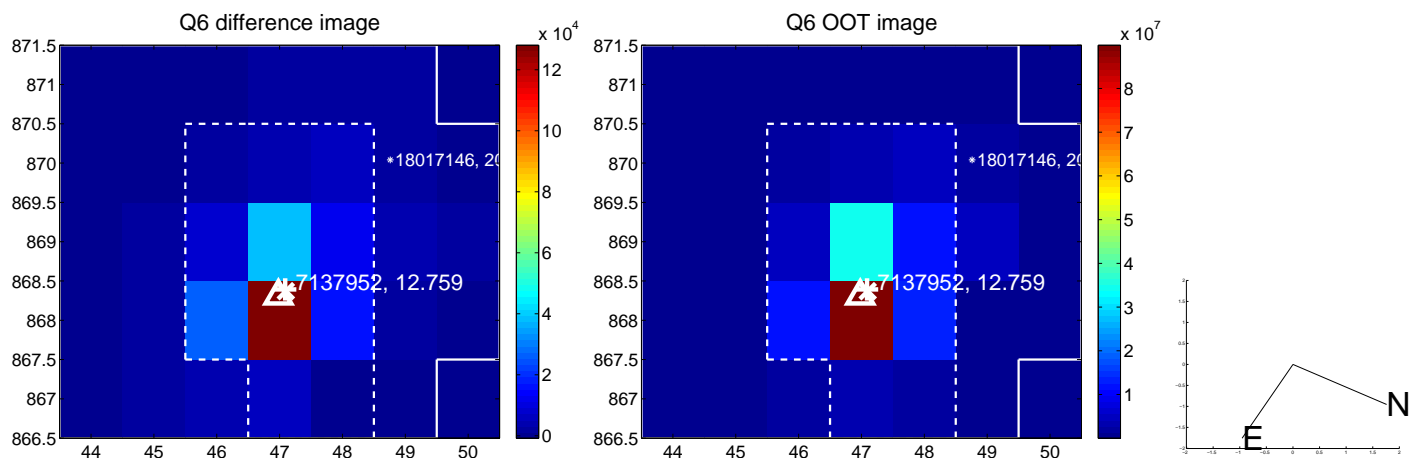
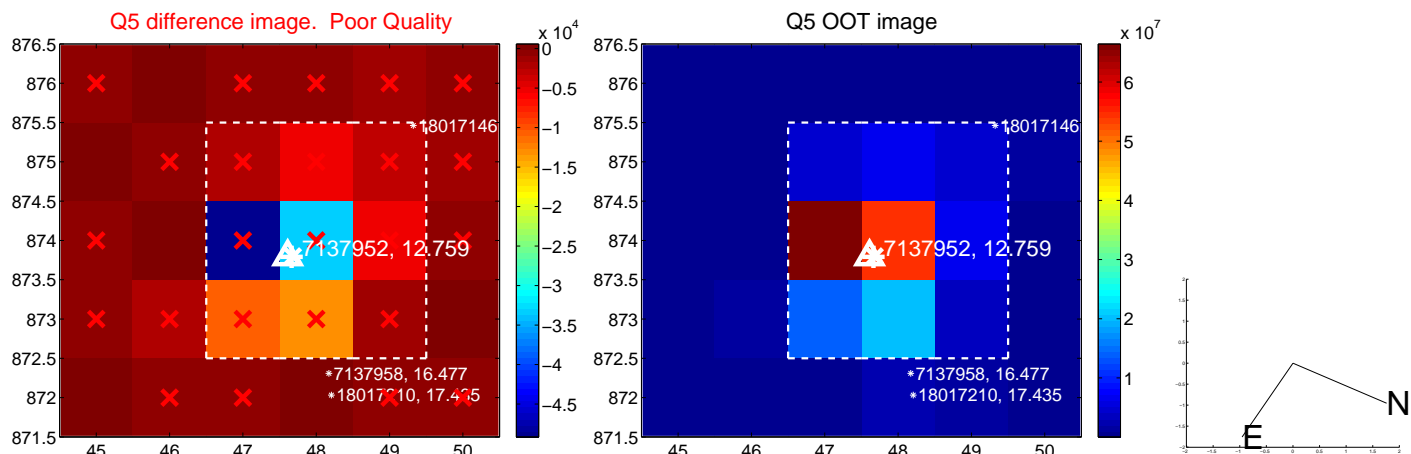


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

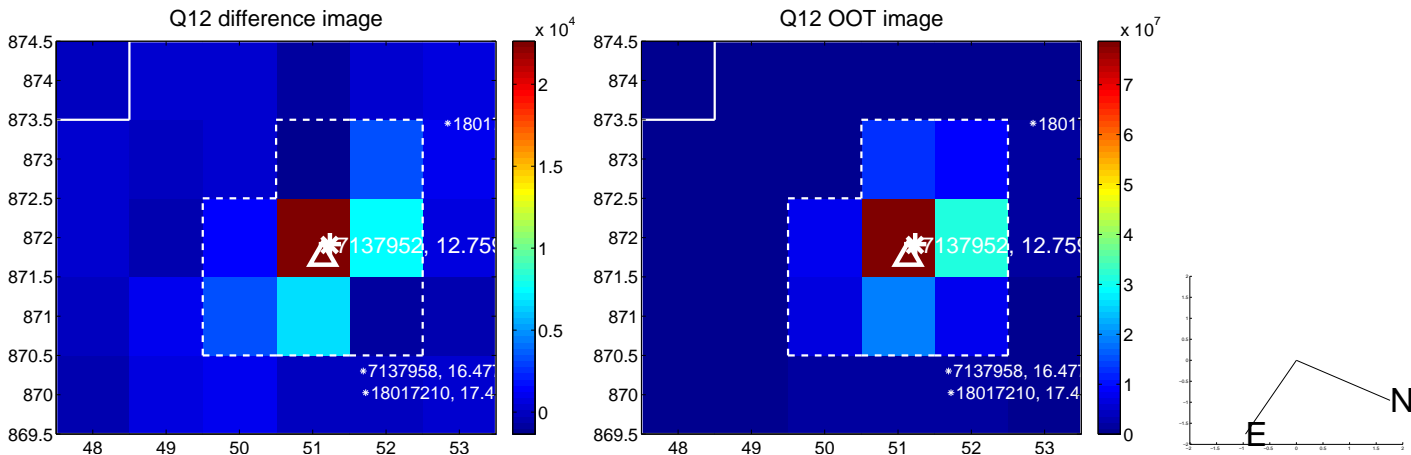
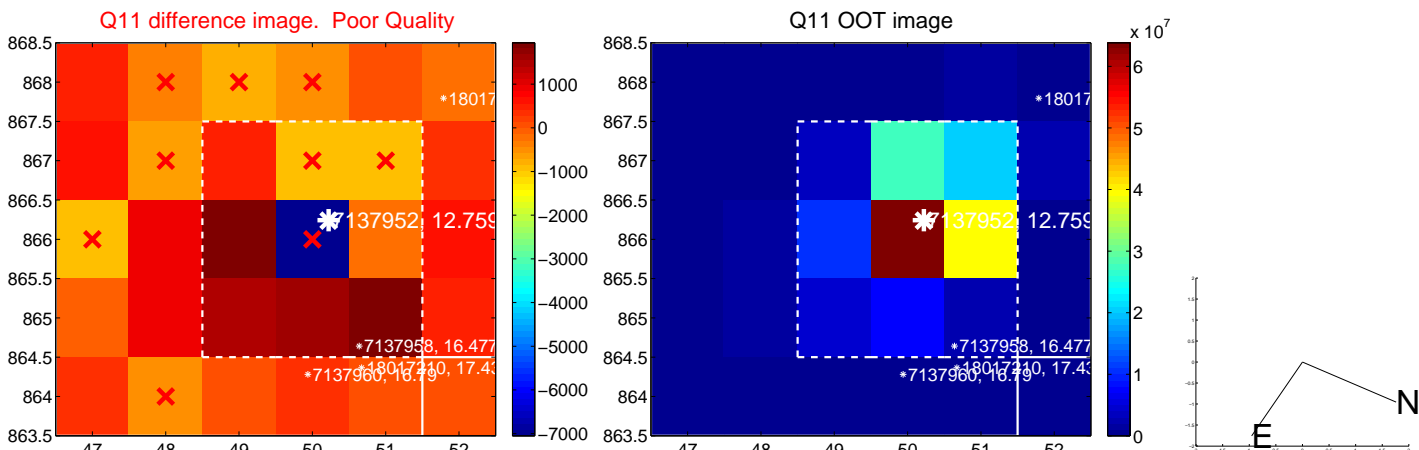
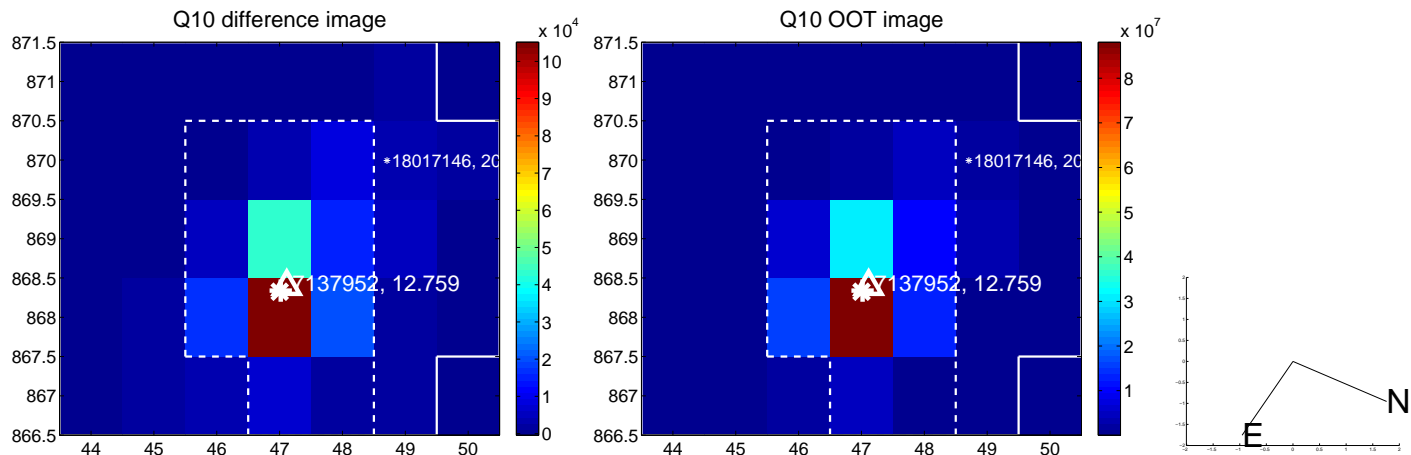
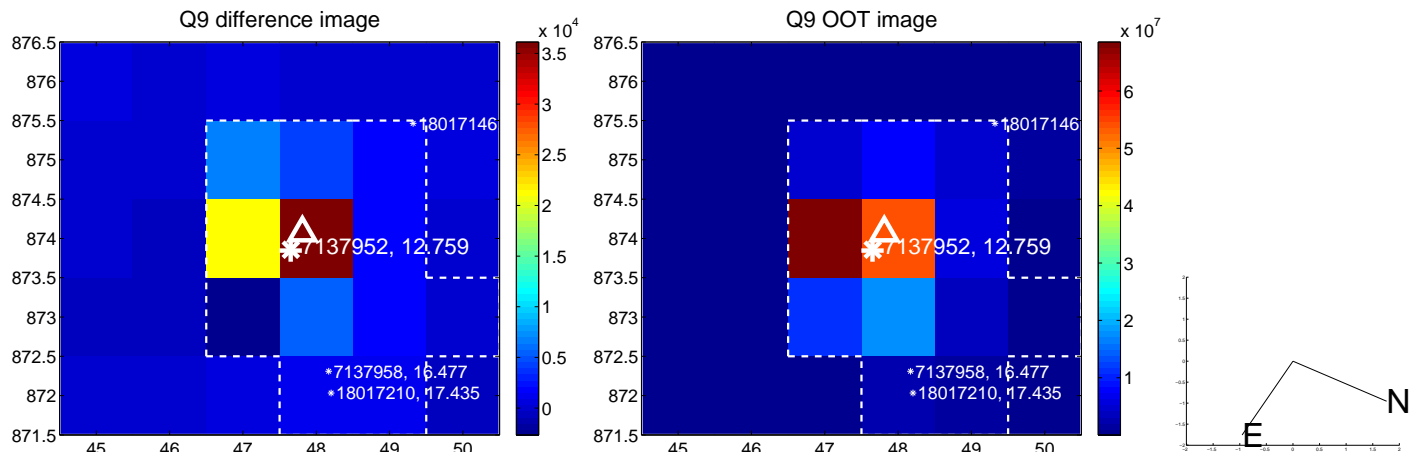
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

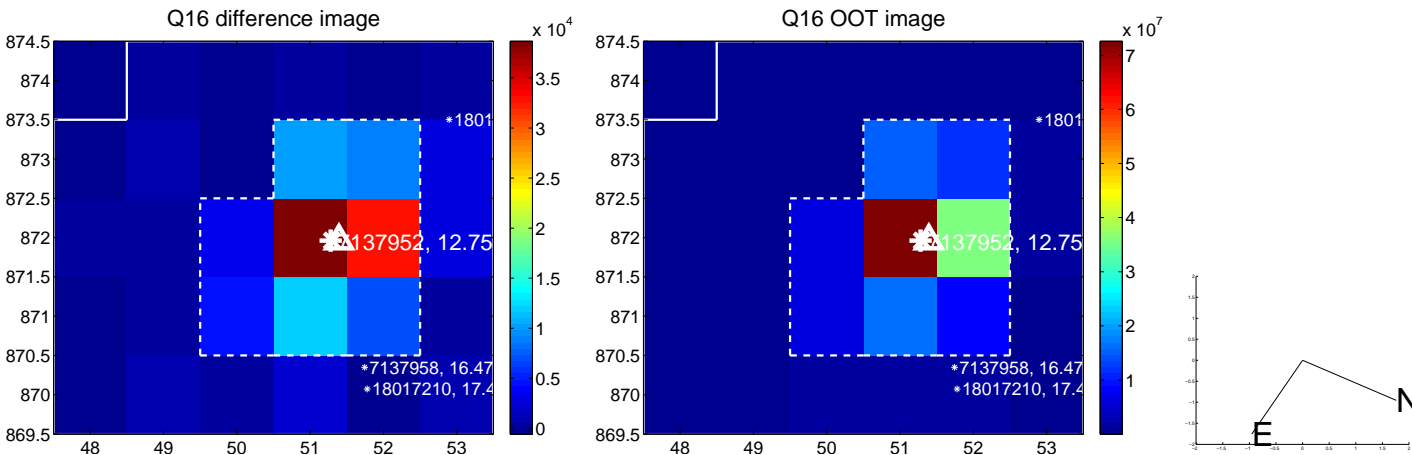
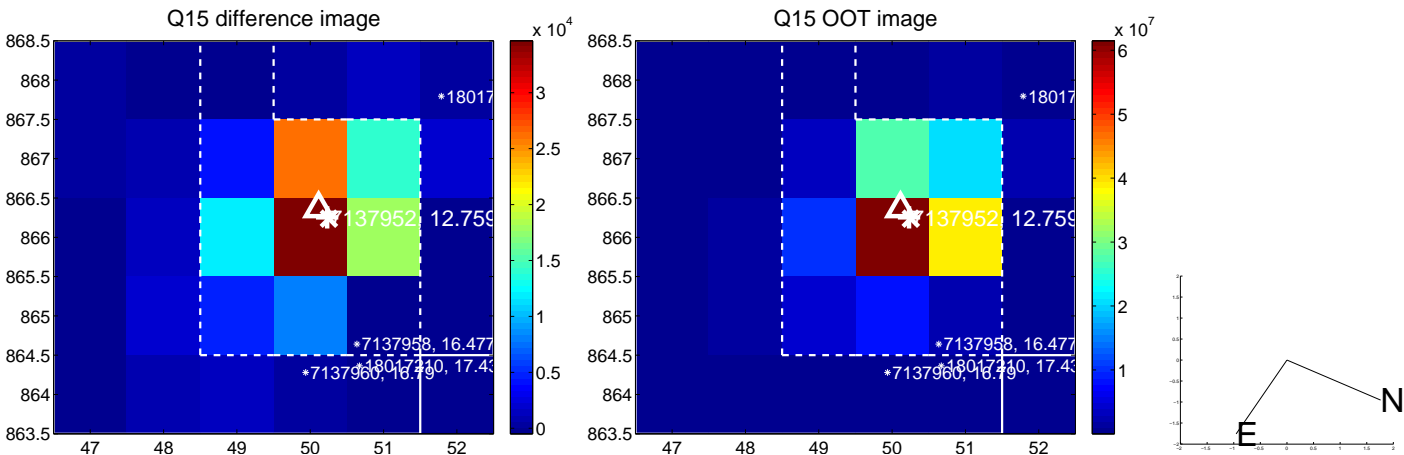
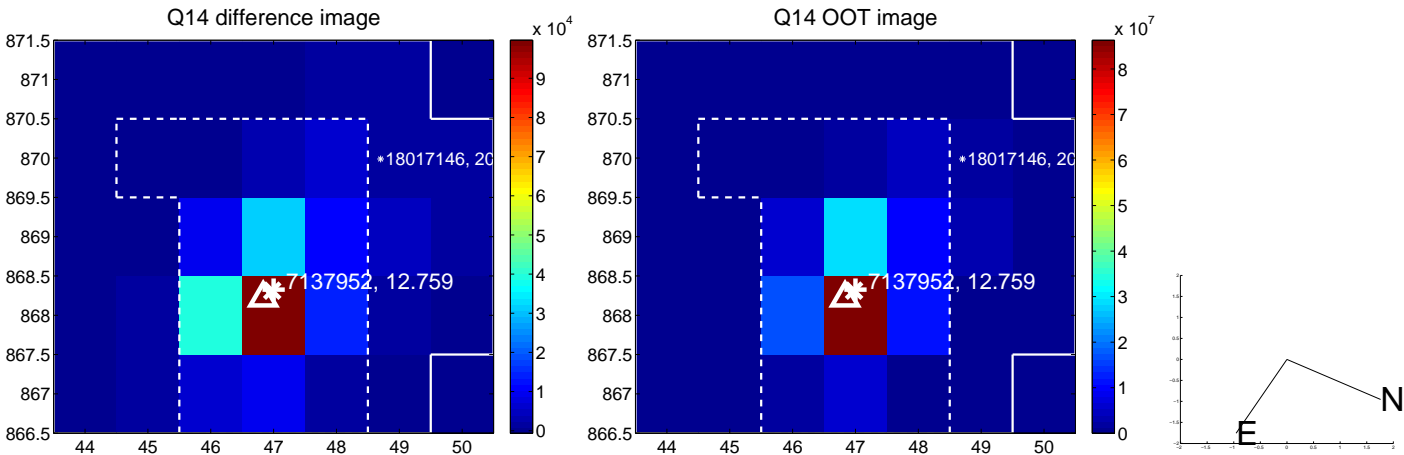
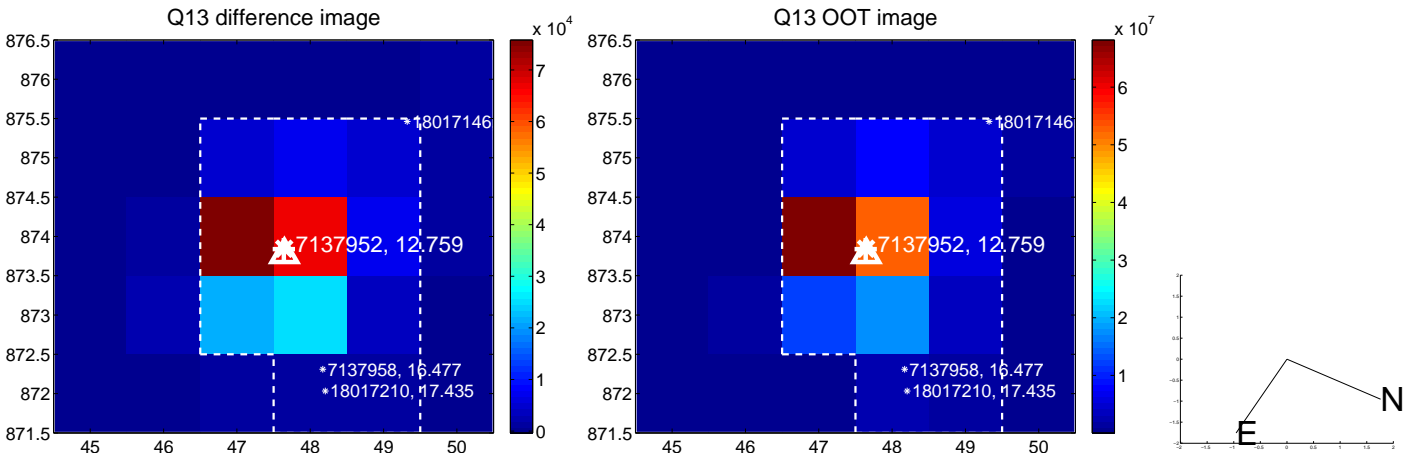


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

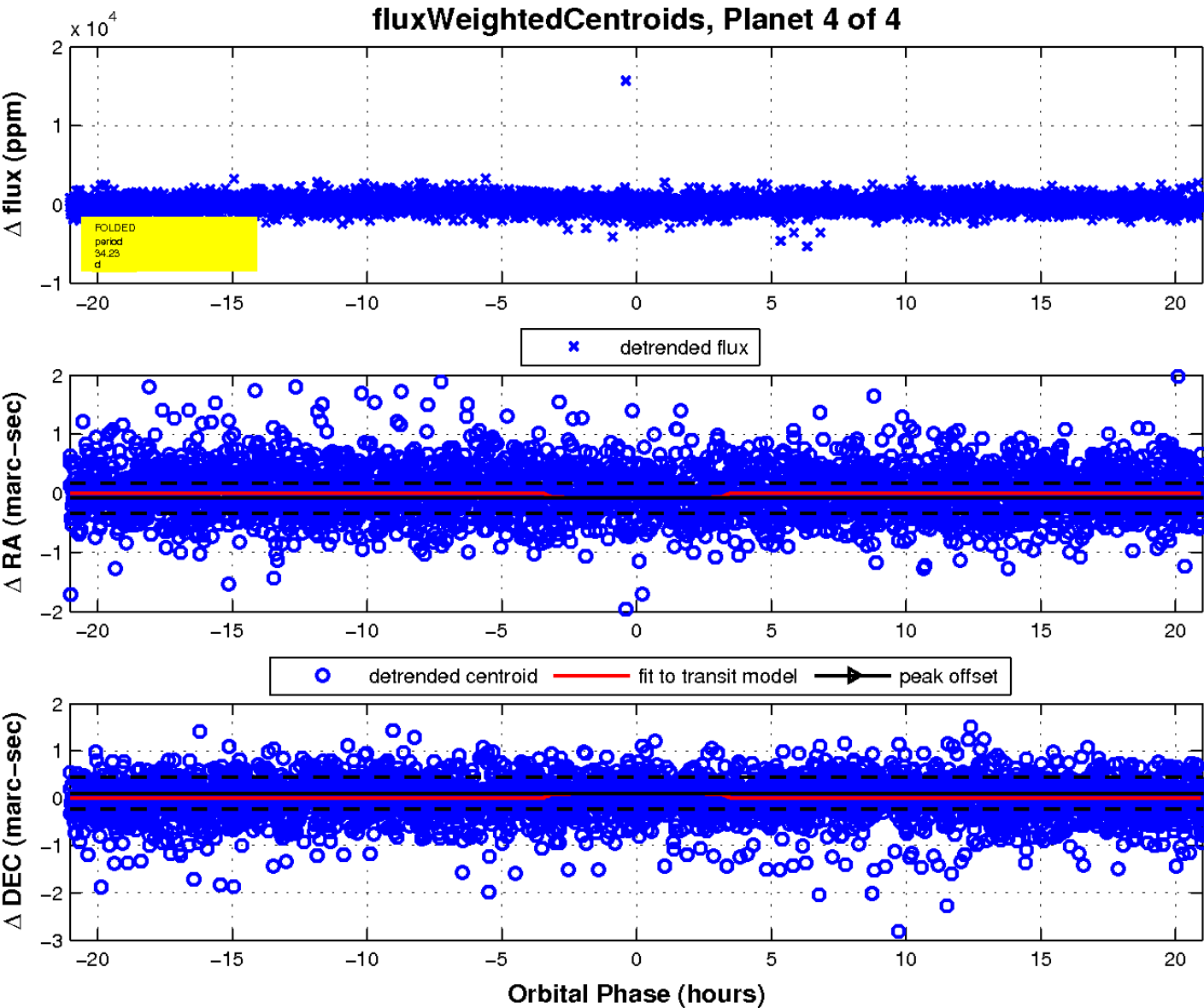
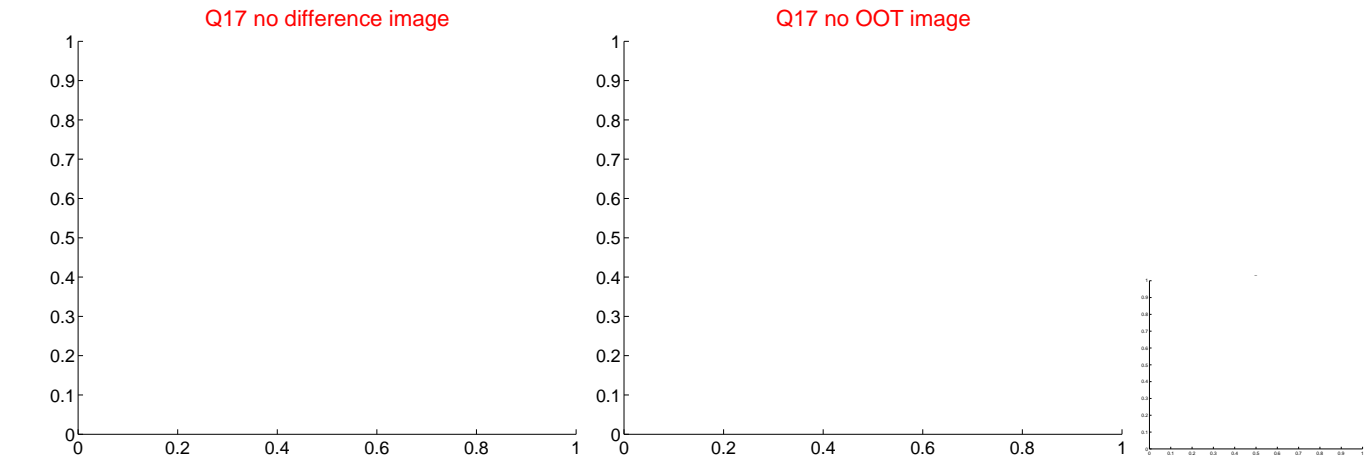




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

