

KIC 008540644

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})
008540644-01	OBS	No	424.067879	510.156755	747.9	5.571	10.6	7.9	0.58	4577	3.04	0.16
008540644-02	OBS	No	487.408958	340.505484	887.1	10.435	15.9	12.4	0.58	4577	2.35	0.13
008540644-03	OBS	No	523.966880	269.926098	533.2	8.532	14.0	9.4	0.58	4577	1.45	0.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008540644-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008540644-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008540644-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

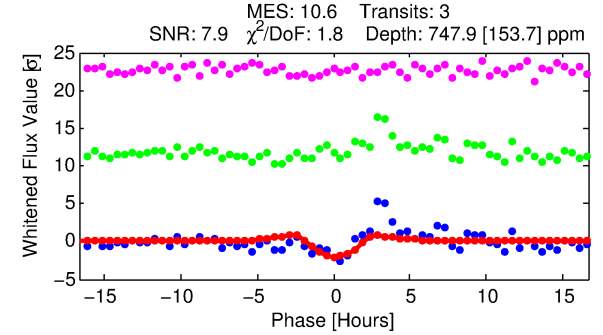
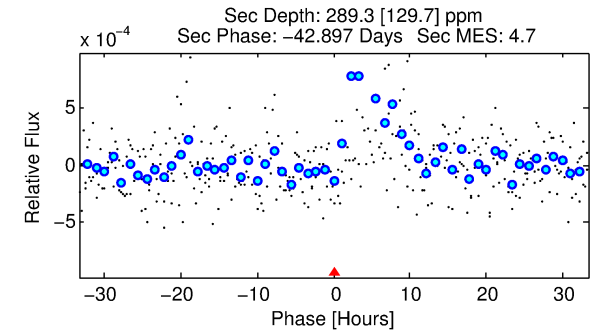
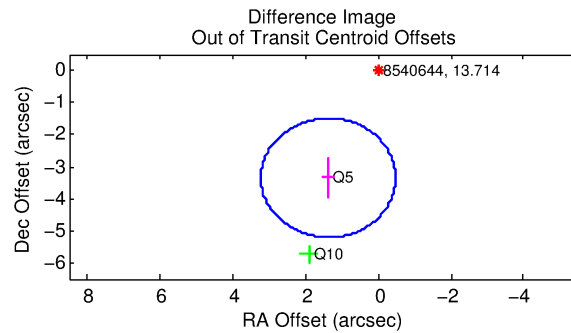
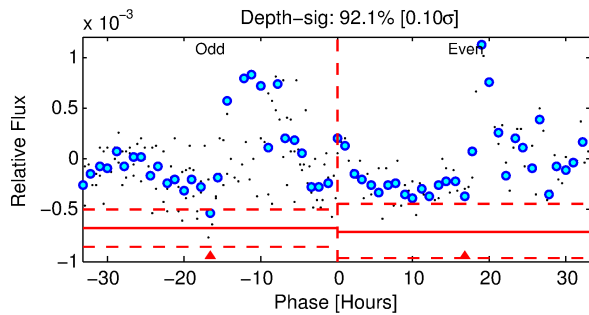
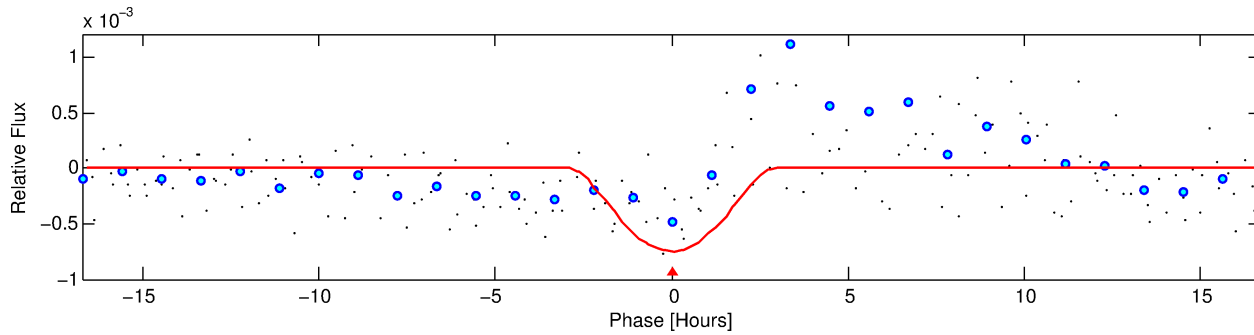
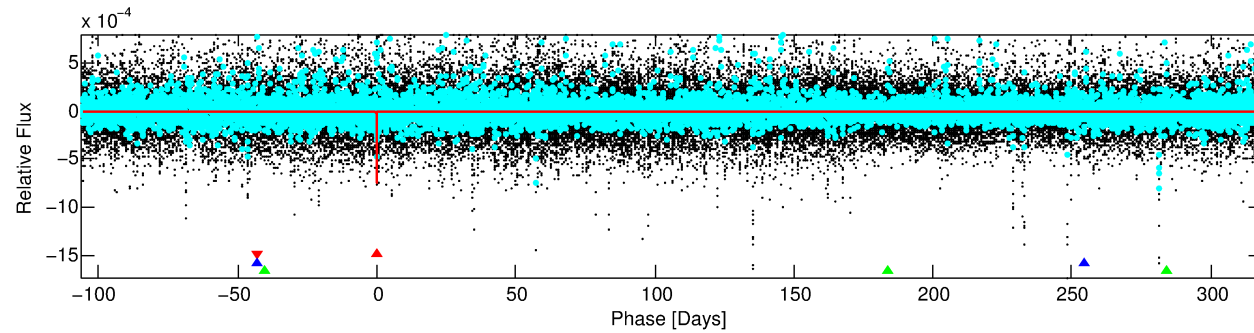
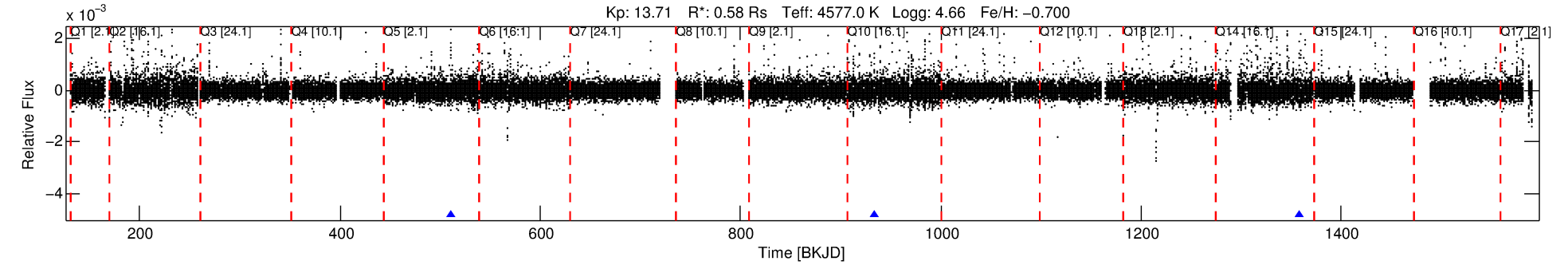
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008540644-01

No Significant Match Found

DV One-Page Summary

KIC: 8540644 Candidate: 1 of 3 Period: 424.068 d



DV Fit Results:

Period = 424.06788 [0.01312] d
Epoch = 510.1568 [0.0127] BKJD
Rp/R* = 0.0477 [0.1808]
a/R* = 193.63 [198.73]
b = 0.99 [0.28]
Seff = 0.16 [0.02]
Teq = 161 [6] K
Rp = 3.04 [11.55] Re
a = 0.9185 [0.0622] AU
Ag = 14507.45 [110288.38] [0.13 σ]
Teffp = 2734 [5197] K [0.50 σ]

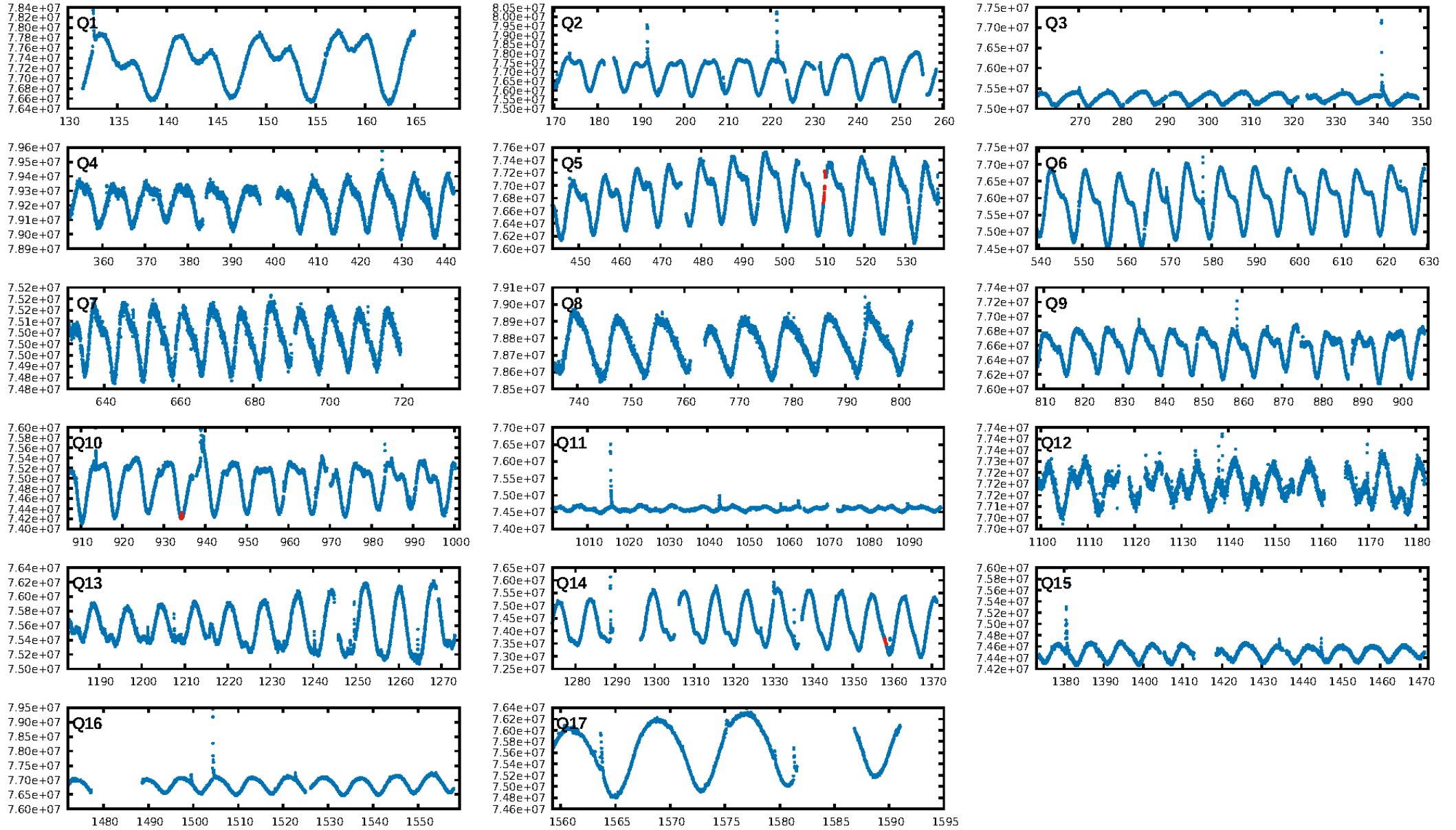
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [128.51 σ]
ModelChiSquare2-sig: 3.8%
ModelChiSquareGof-sig: 59.9%
Bootstrap-pfa: 7.23e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8184
Centroid-sig: 39.3%
Centroid-so: 9.145 arcsec [1.03 σ]
OotOffset-rm: 3.621 arcsec [5.87 σ]
KicOffset-rm: 7.182 arcsec [49.21 σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

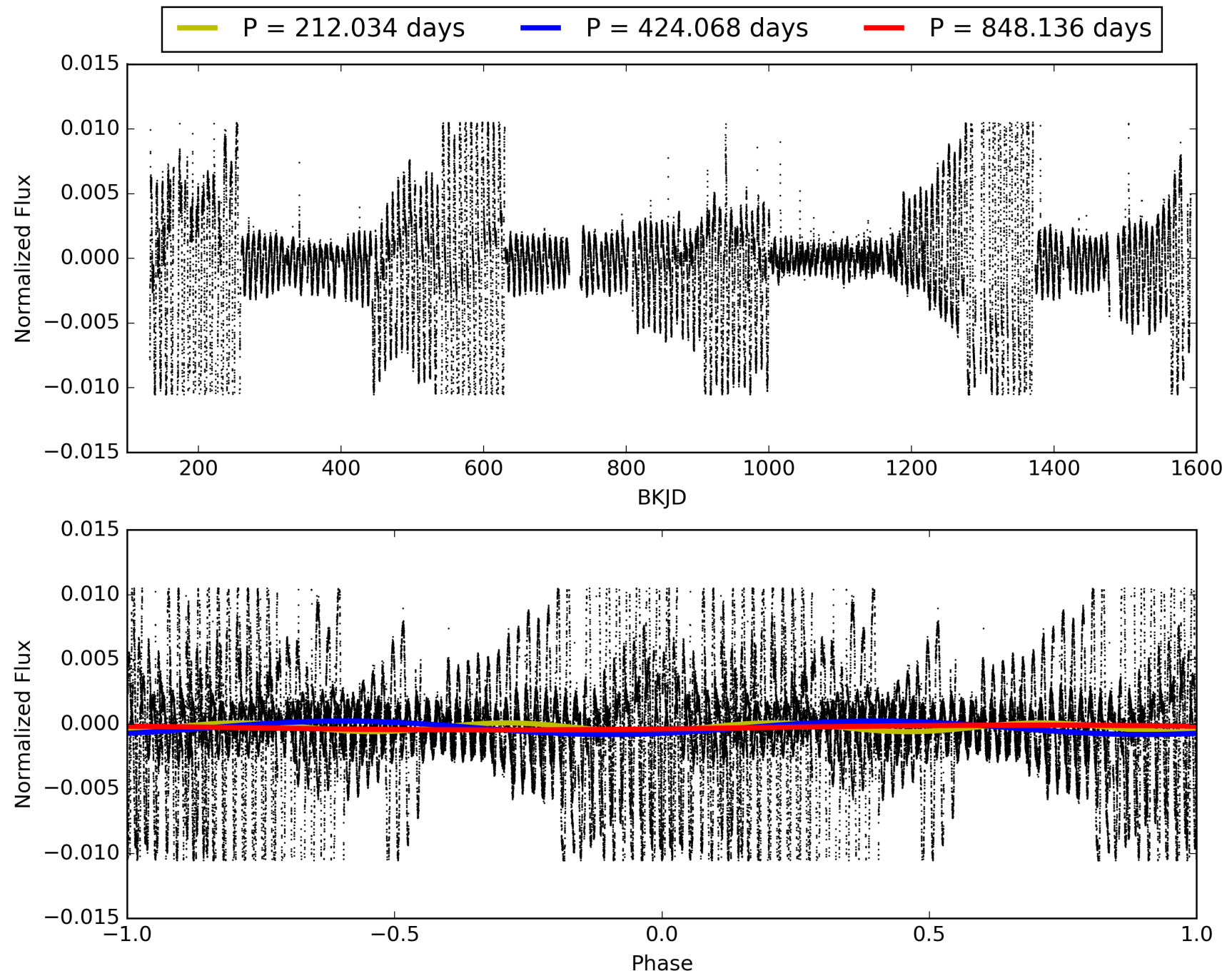
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008540644-01, PDC Light Curves

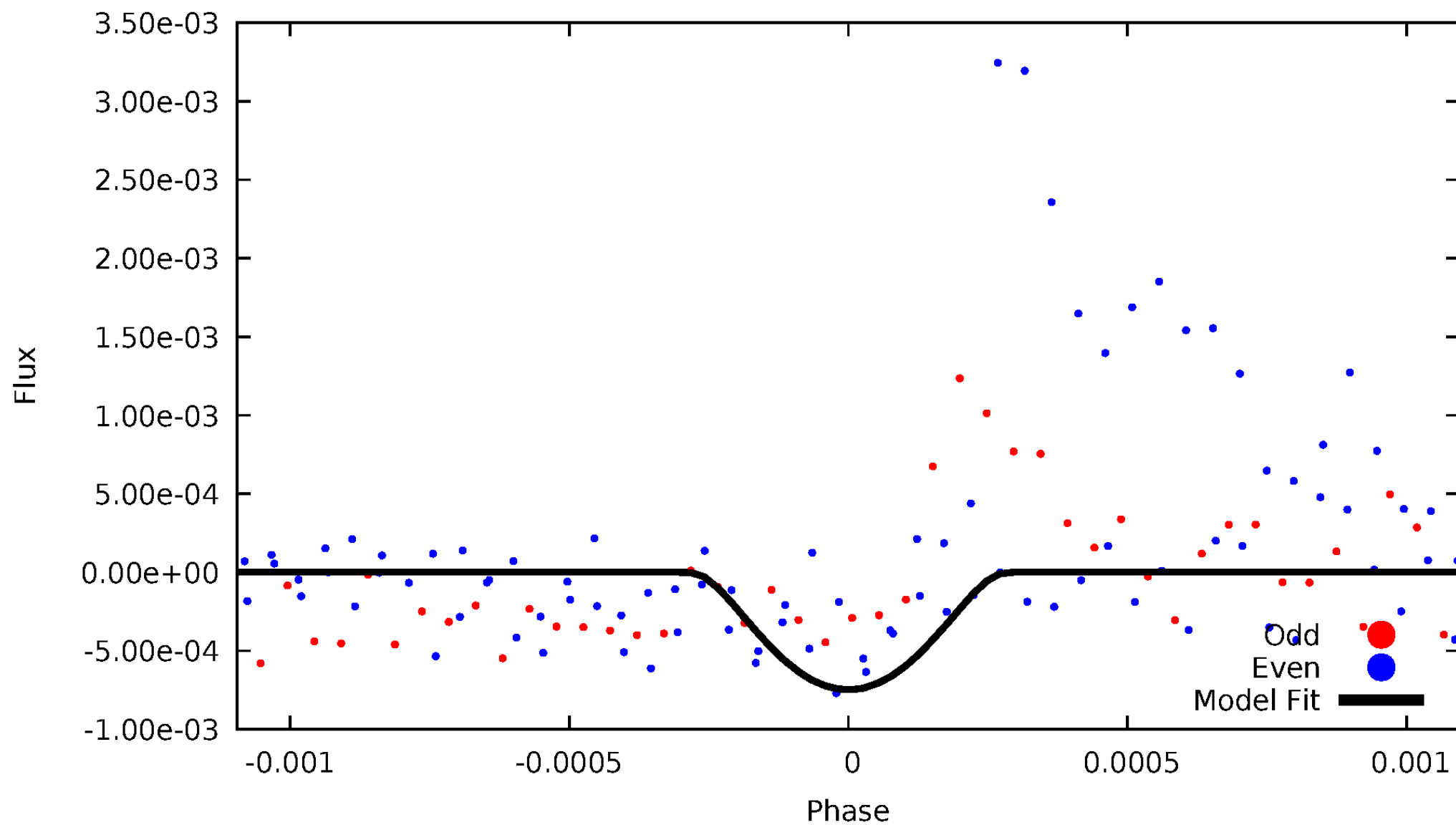


TCE 008540644-01



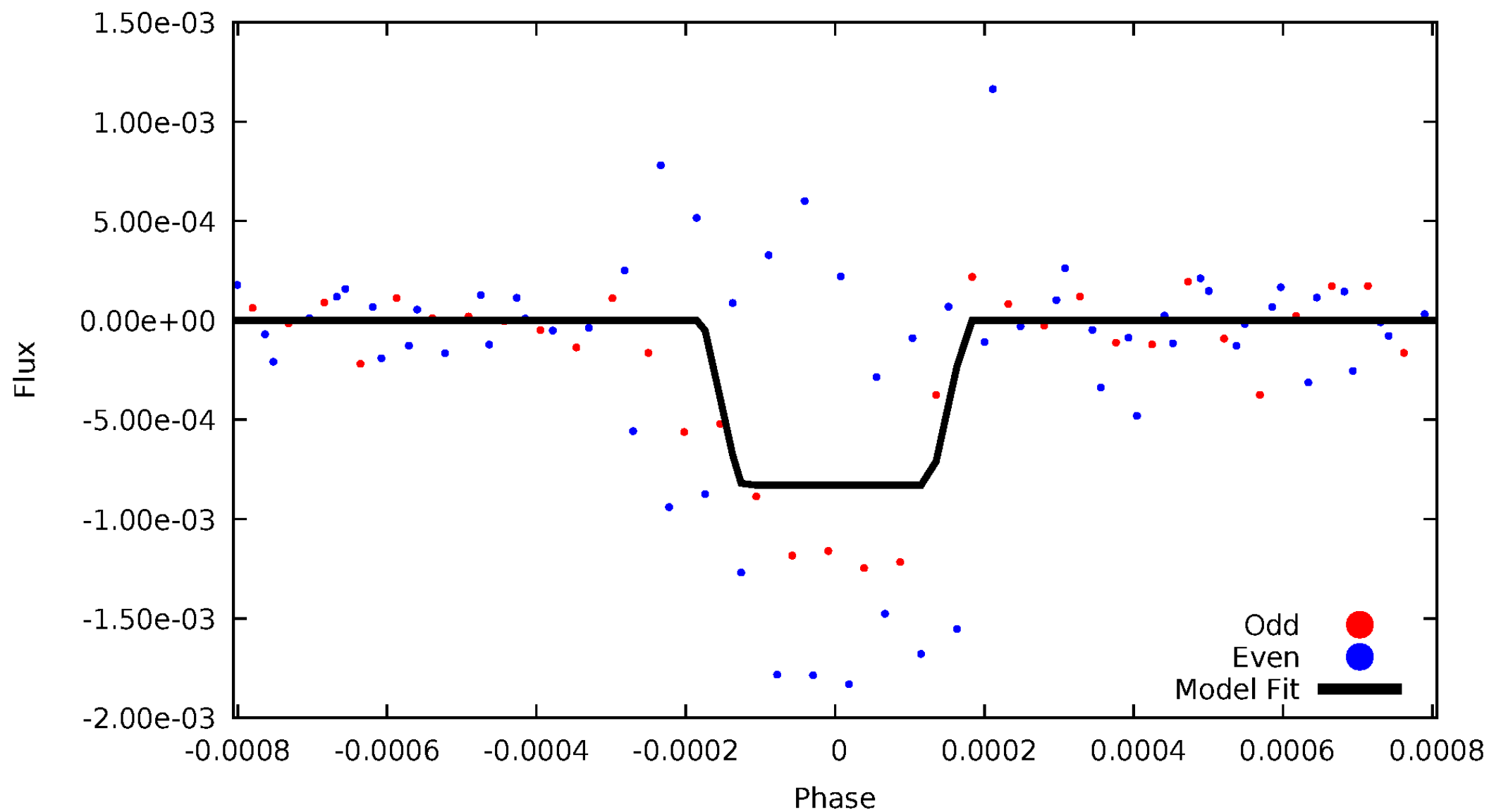
DV Odd/Even

TCE 008540644-01

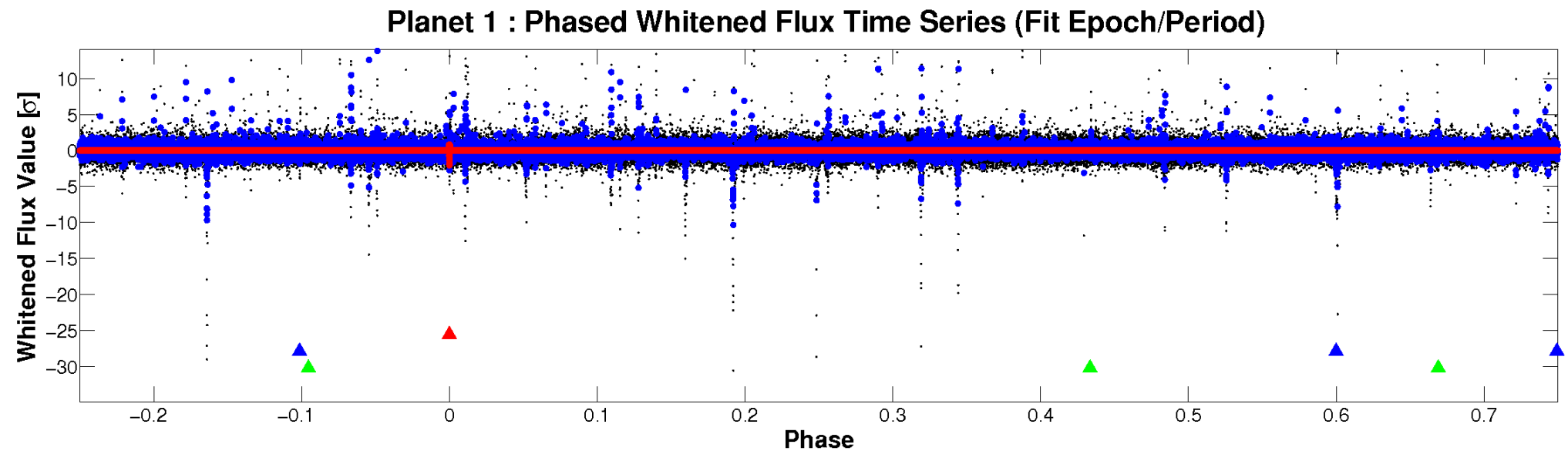
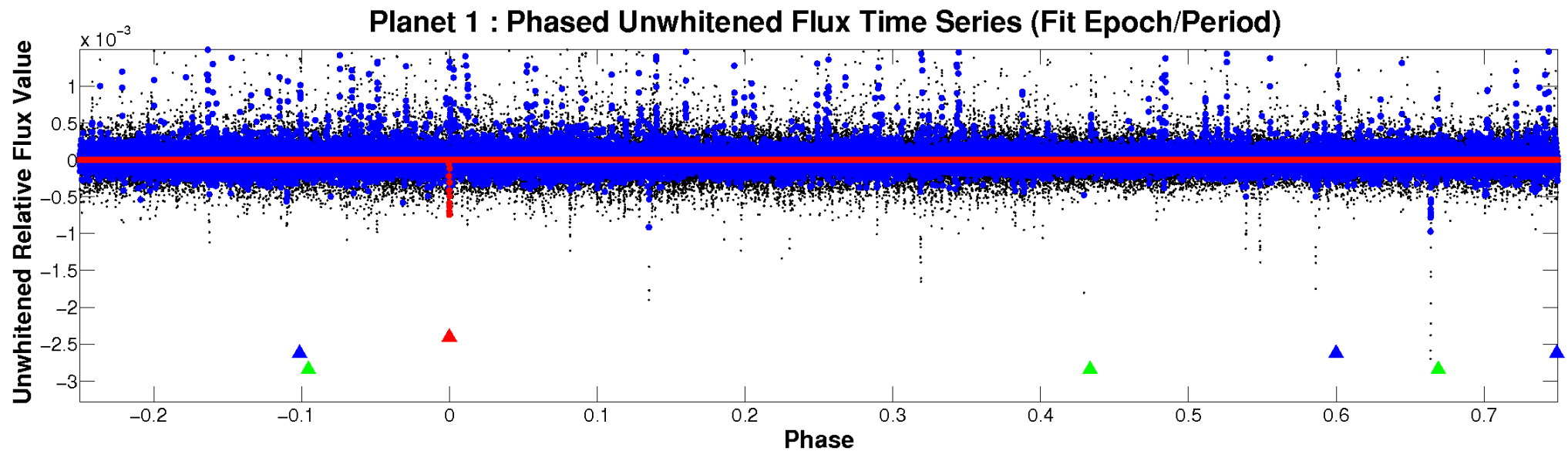


ALT Odd/Even

TCE 008540644-01

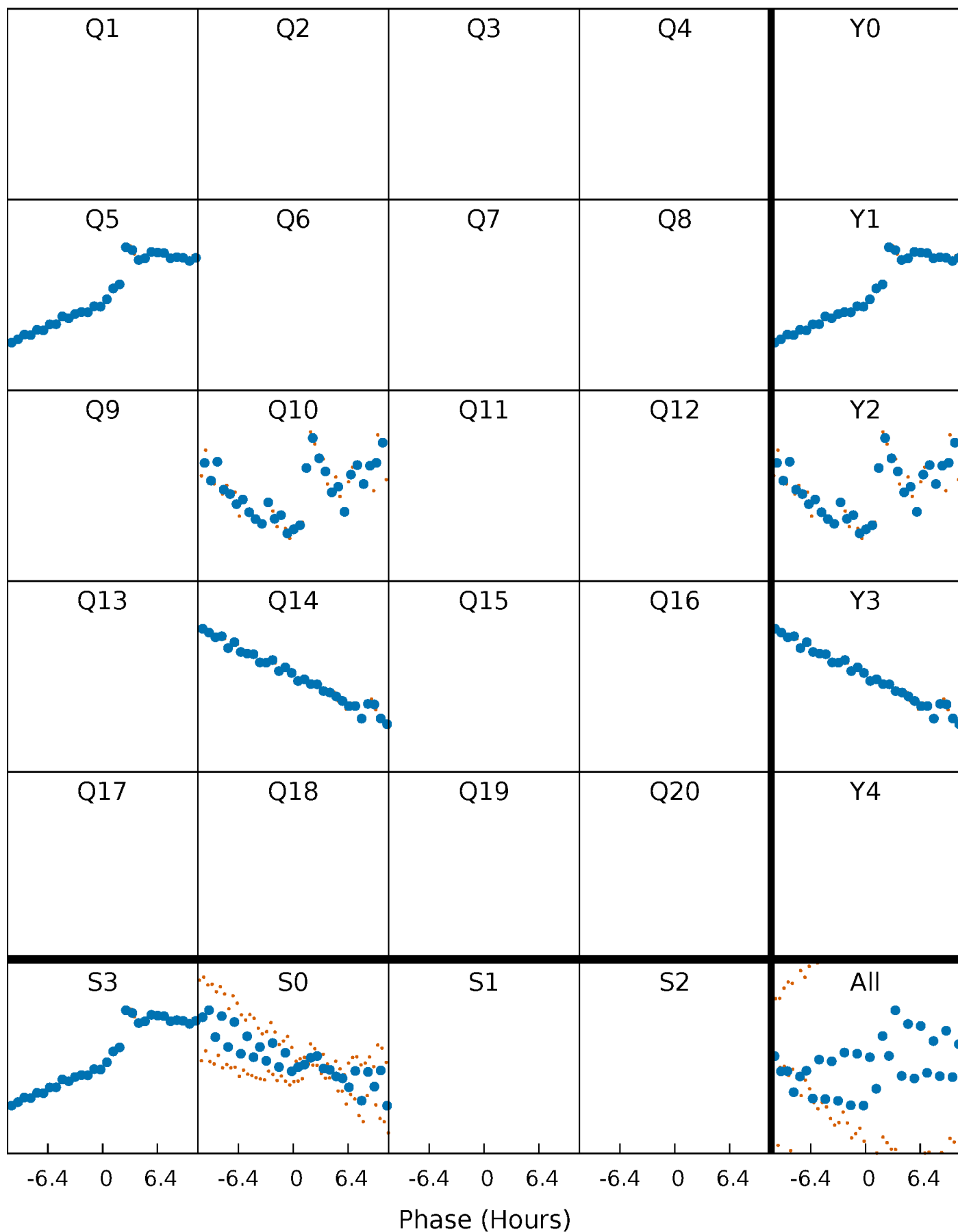


Non-Whitened Vs. Whitened Light Curve



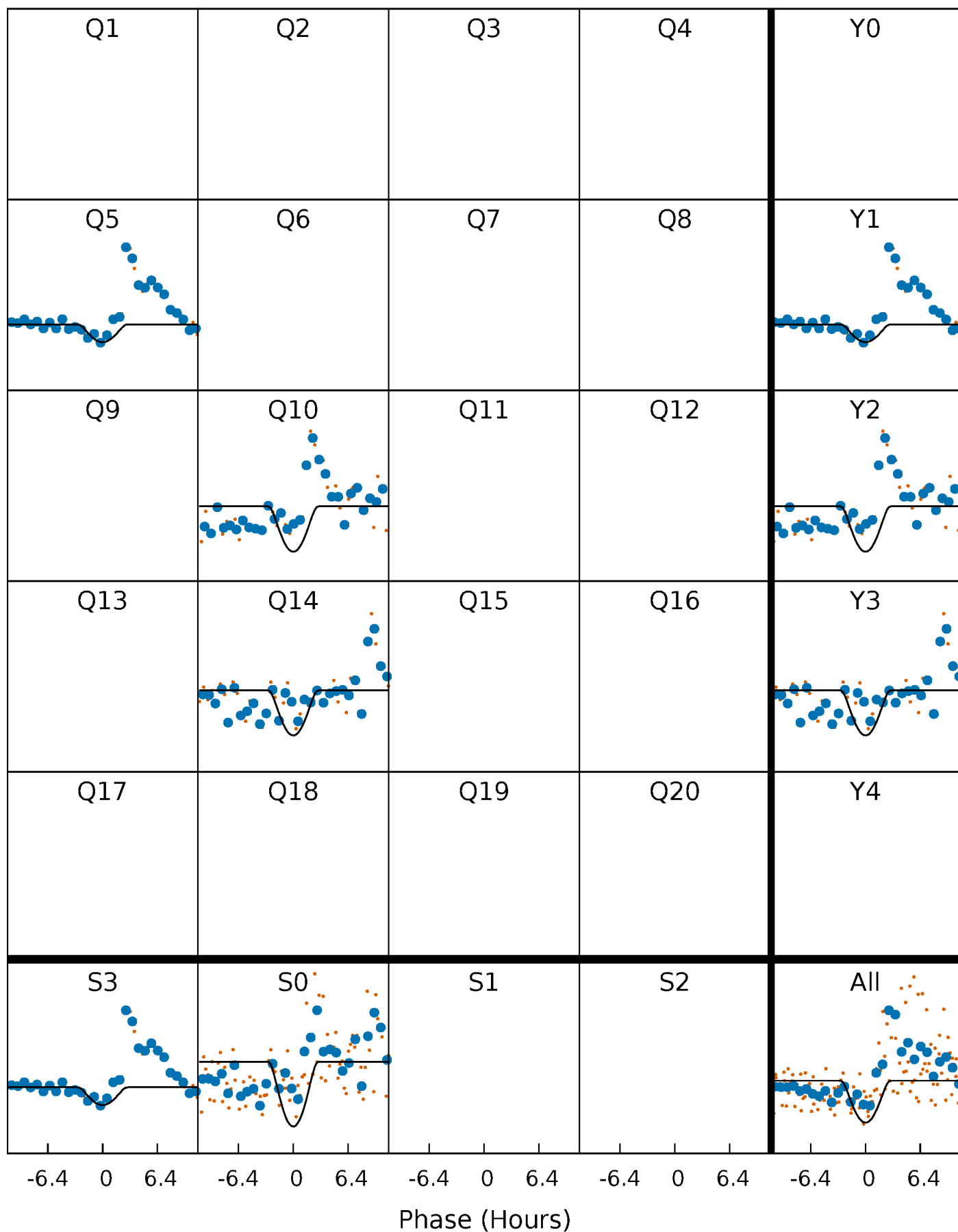
PDC Quarter-Phased Transit Curves

TCE 008540644-01 P=424.067880 Days $T_0=510.156755$ (BKJD)



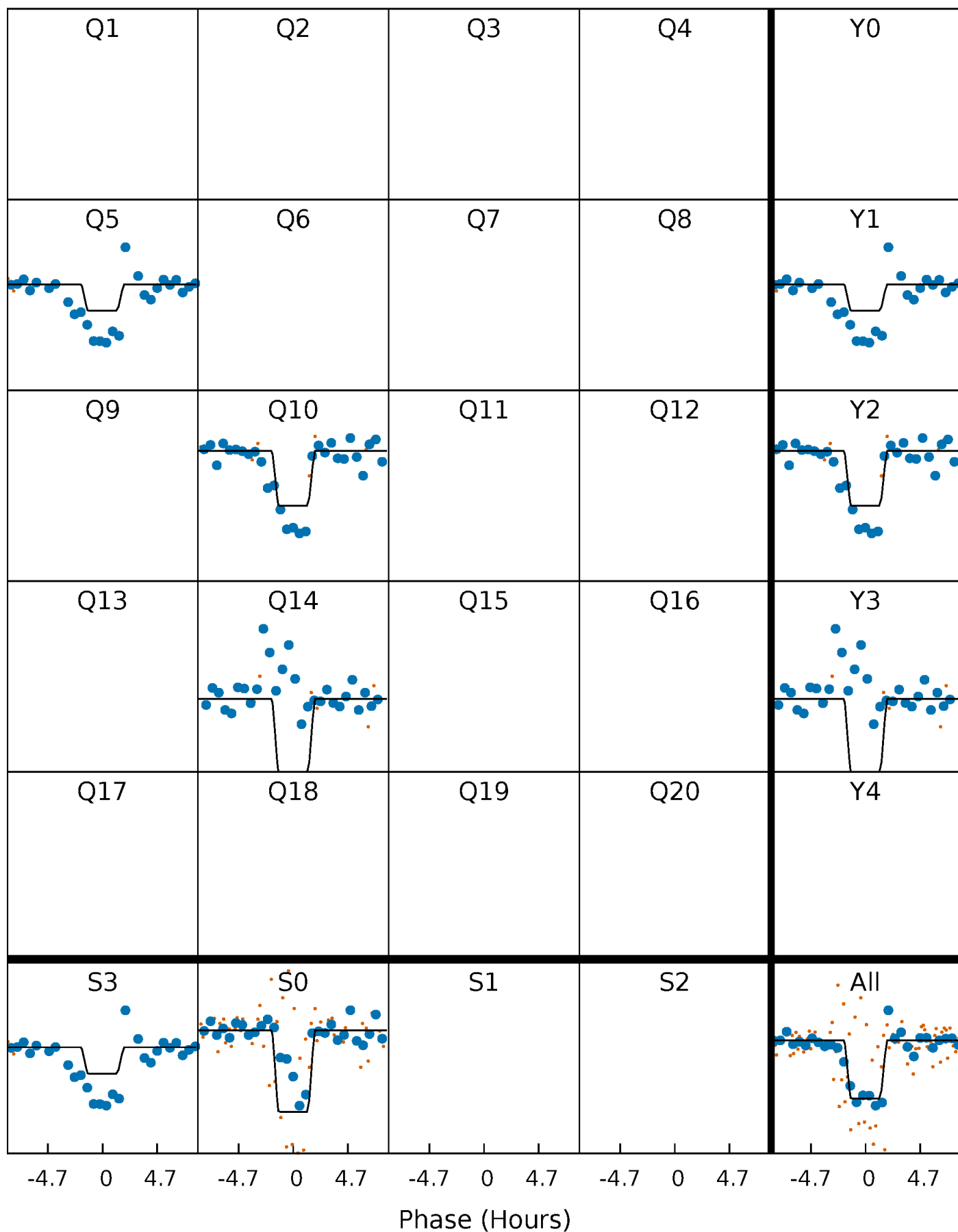
DV Quarter-Phased Transit Curves

TCE 008540644-01 P=424.067880 Days $T_0=510.156755$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

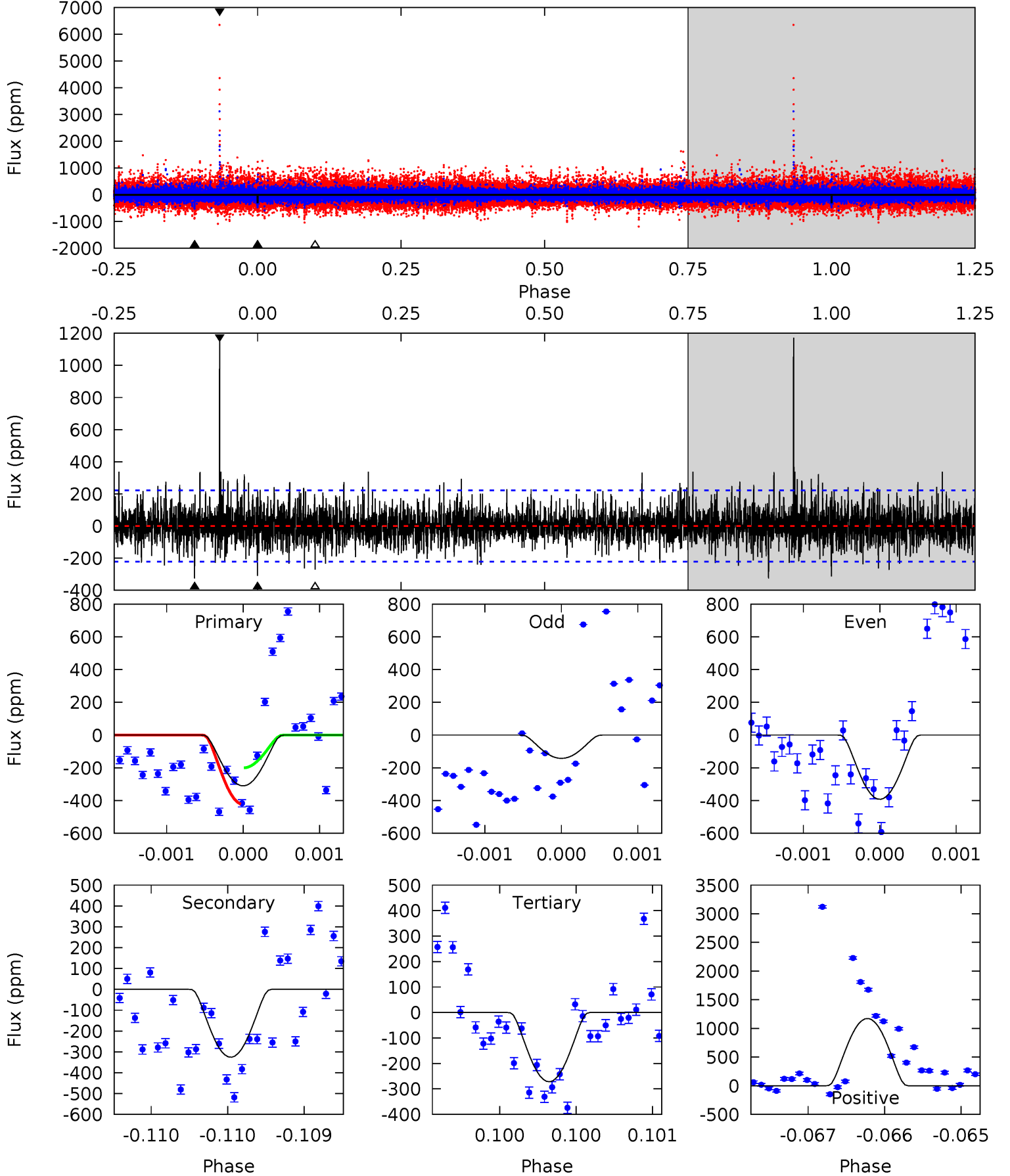
TCE 008540644-01 P=424.050860 Days $T_0=510.180647$ (BKJD)



DV Model-Shift Uniqueness Test

008540644-01, P = 424.067880 Days, E = 86.088875 Days

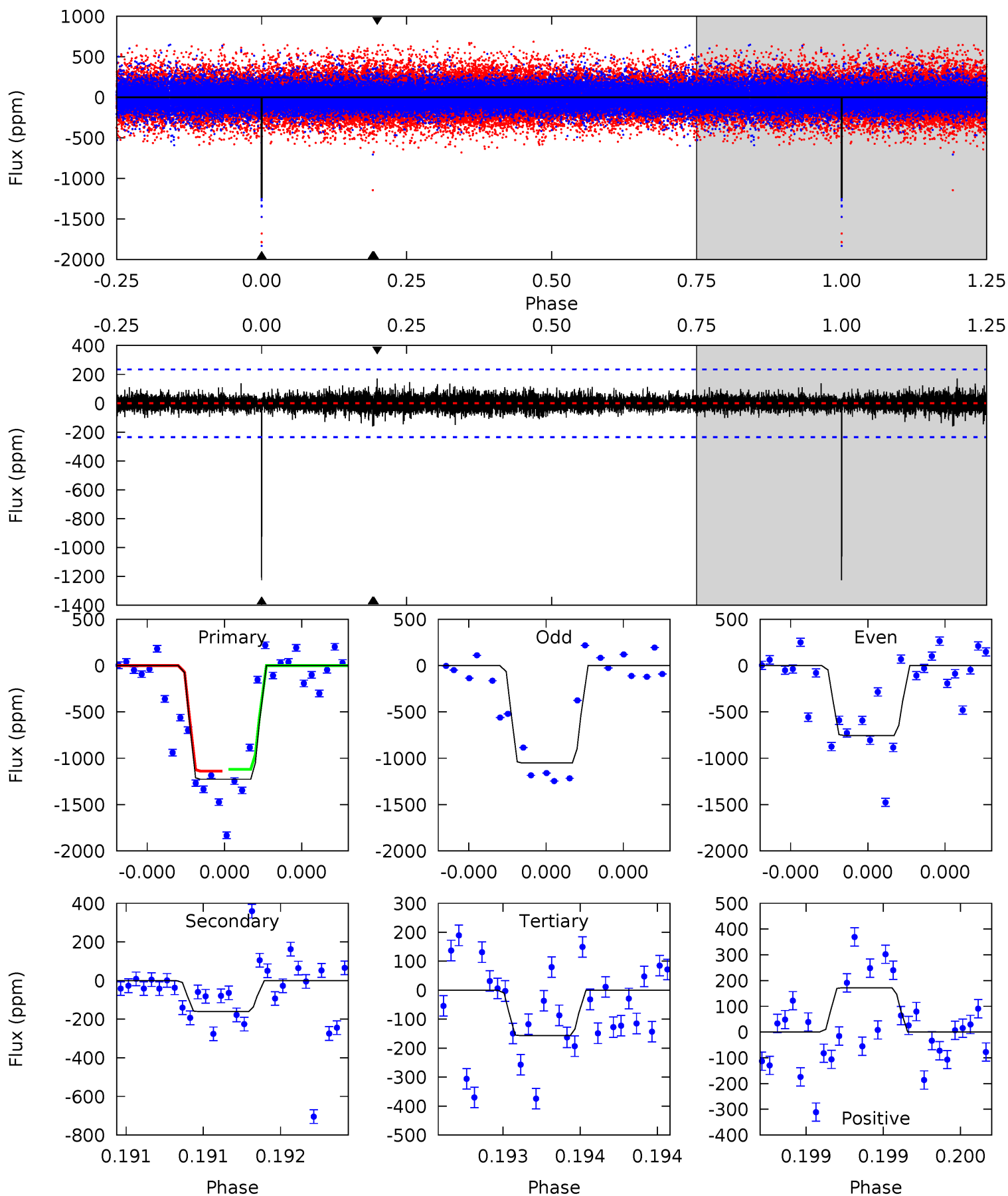
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.77	8.15	6.80	29.4	5.56	3.45	1.91	0.97	-21.6	1.35	-21.2	1.68	0.92	0.78	2.77



Alt Model-Shift Uniqueness Test

008540644-01, $P = 424.050860$ Days, $E = 86.129787$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.4	3.84	3.76	4.12	5.64	3.58	0.75	25.7	25.3	0.09	-0.28	3.66	0.83	0.12	0.20



Stellar Parameters For KIC 008540644

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4577^{+137}_{-137}	$4.663^{+0.054}_{-0.032}$	$-0.700^{+0.300}_{-0.300}$	$0.585^{+0.047}_{-0.047}$	$0.574^{+0.061}_{-0.033}$	$4.042^{+0.923}_{-0.517}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-8%	+11%/-6%	+23%/-13%
Source	PHO1	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 008540644-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-325 ± 40	$8.60^{+8.98}_{-6.11}$	224^{+8}_{-8}	2472^{+1005}_{-378}	2031^{+23639}_{-1550}
Alt.	-160 ± 42	$8.00^{+8.17}_{-5.55}$	224^{+7}_{-7}	2310^{+833}_{-337}	1154^{+11349}_{-891}

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 $A_{obs} \gg 1.0$

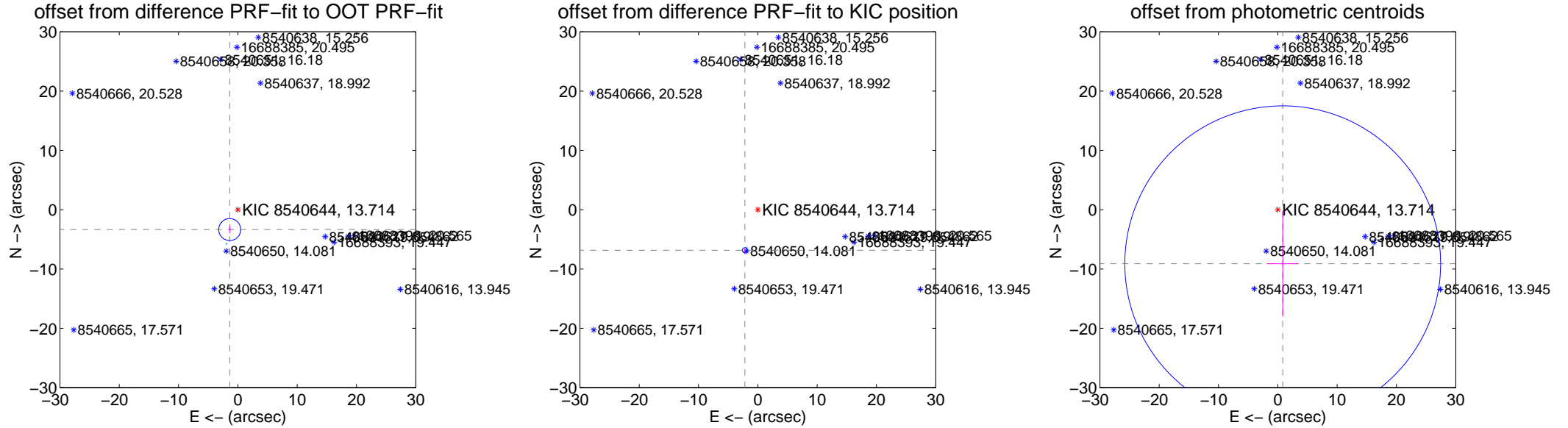
DV Centroid Data

Supplemental centroid analysis for 008540644-01. Kepler magnitude: 13.71. Transit SNR 7.90

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.68 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.621 ± 0.617	5.87	1.375 ± 0.155	-3.350 ± 0.610
PRF-fit source offset from KIC position	7.182 ± 0.146	49.21	2.185 ± 0.136	-6.842 ± 0.147
photometric centroid source offset	9.14 ± 8.87	1.03	-0.83 ± 2.71	-9.11 ± 8.91

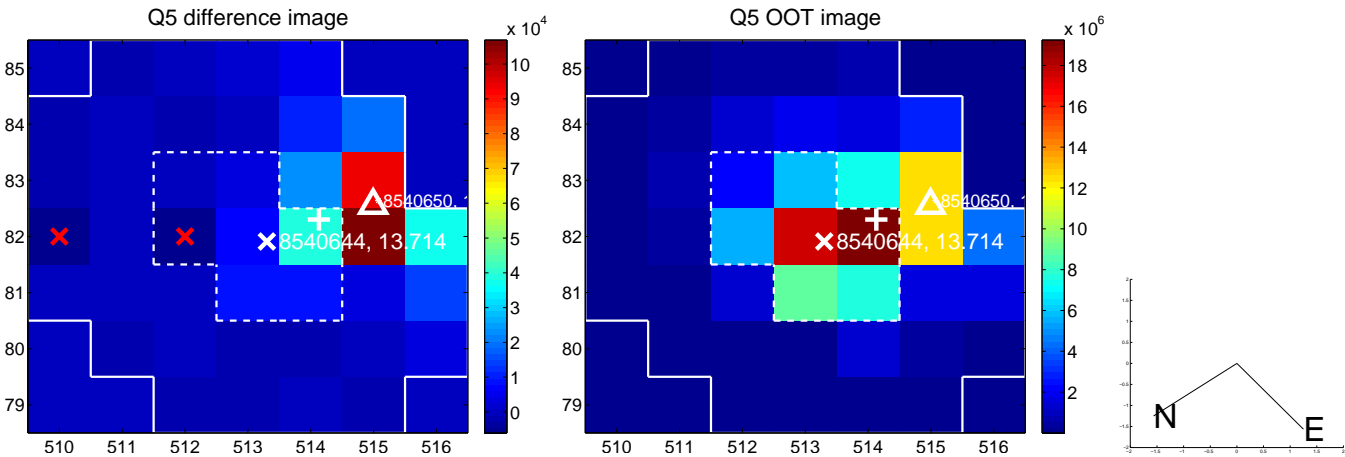


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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.

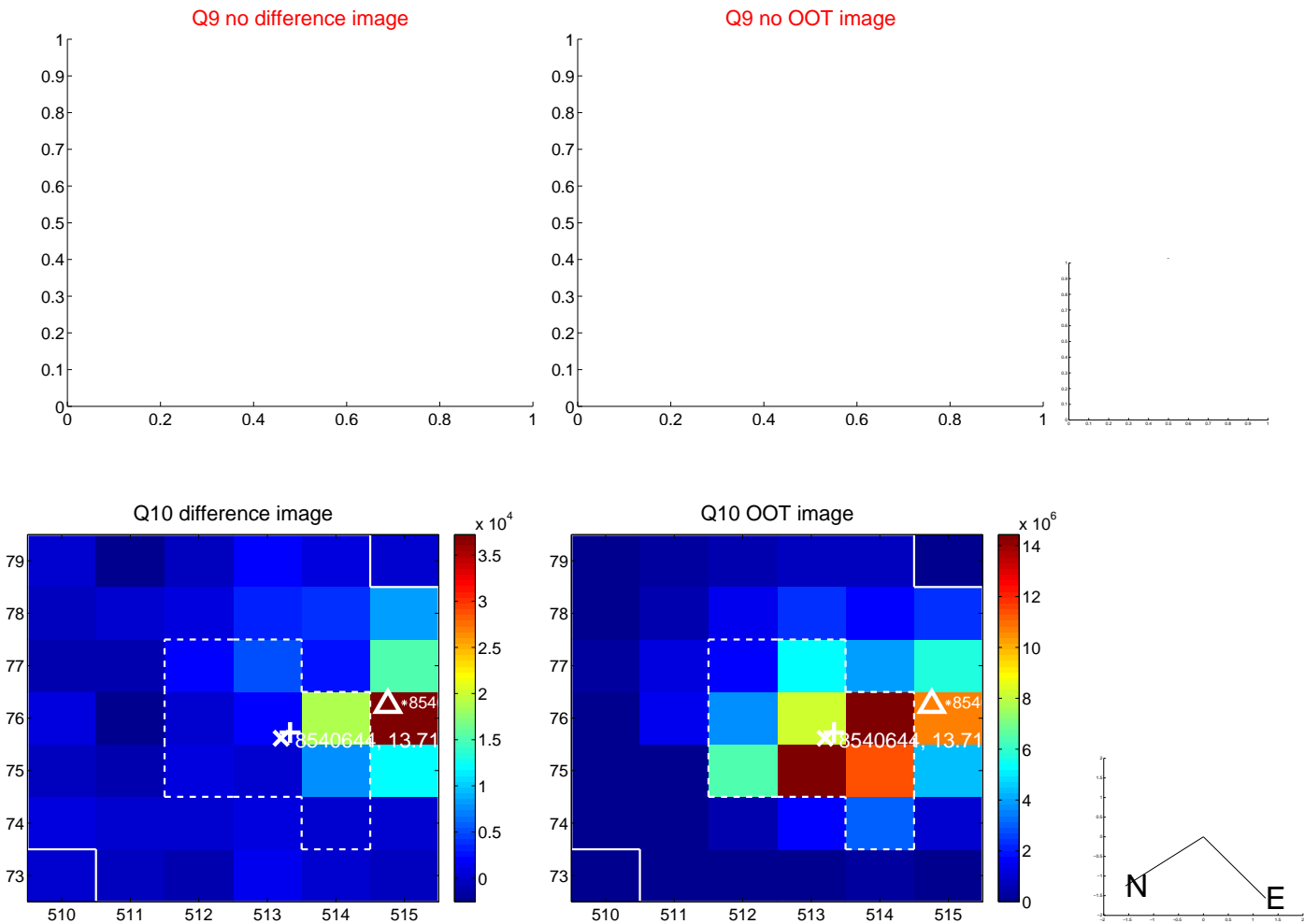
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



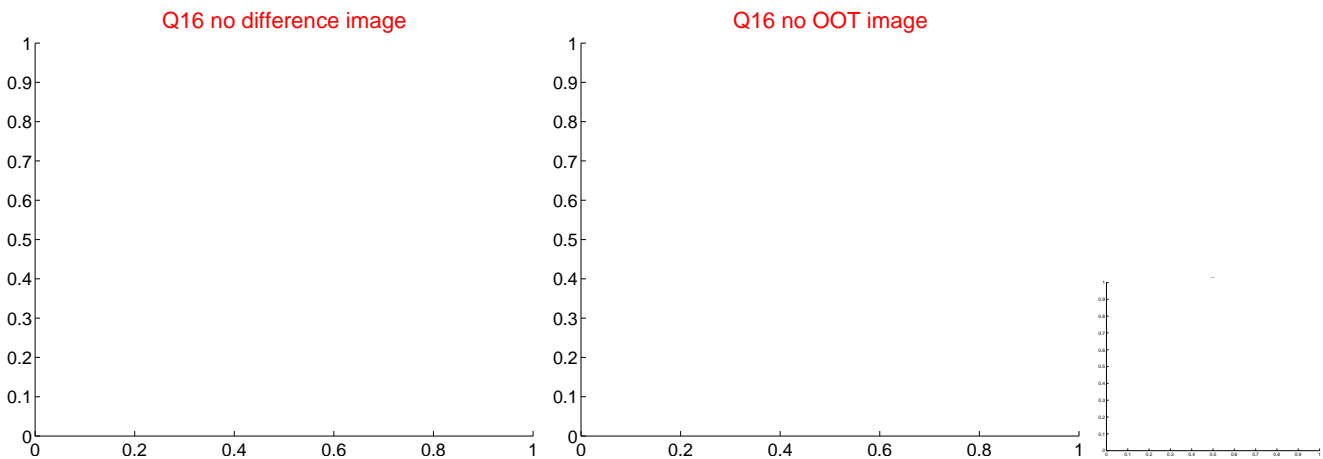
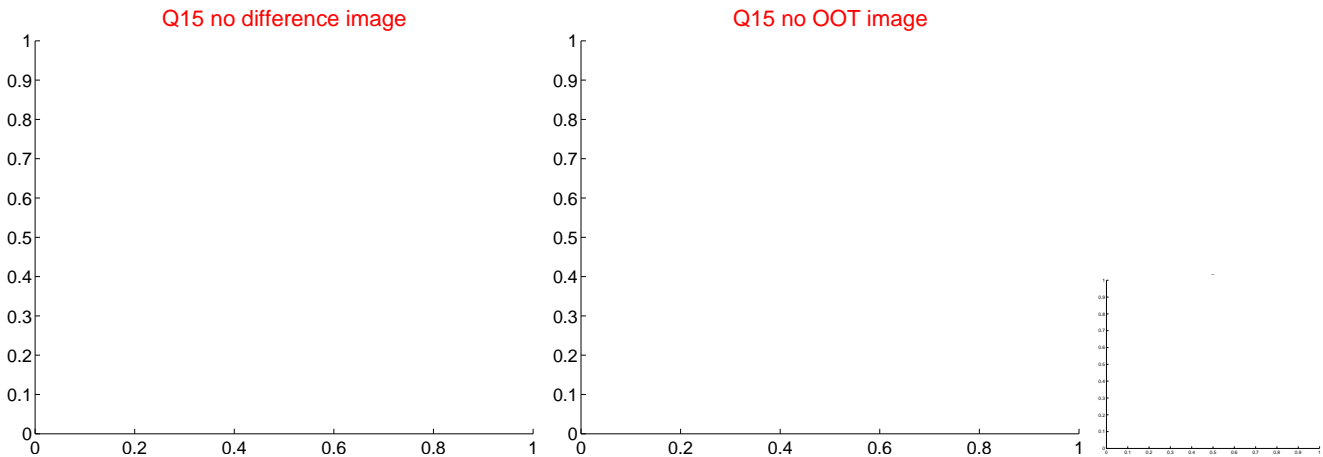
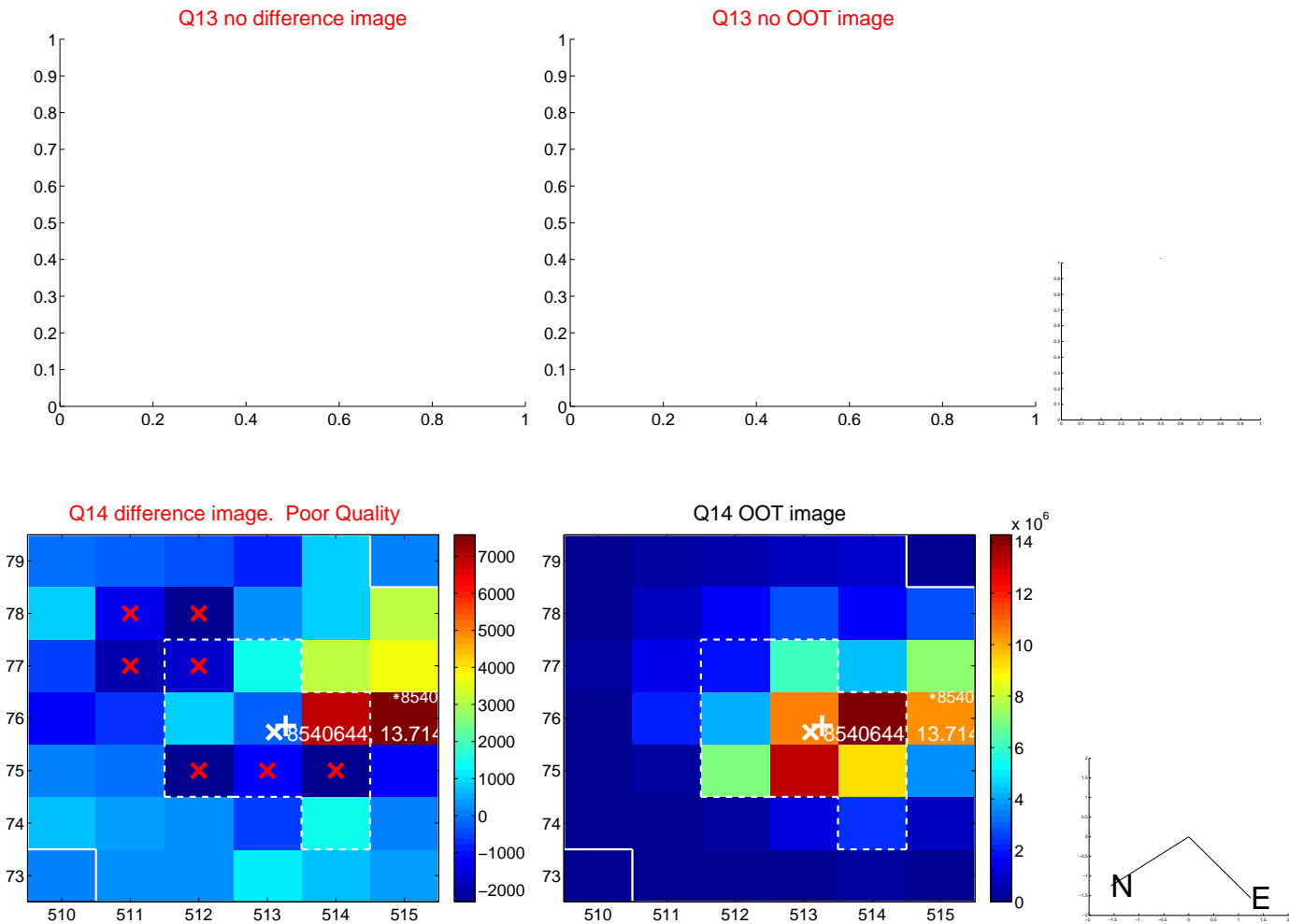
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



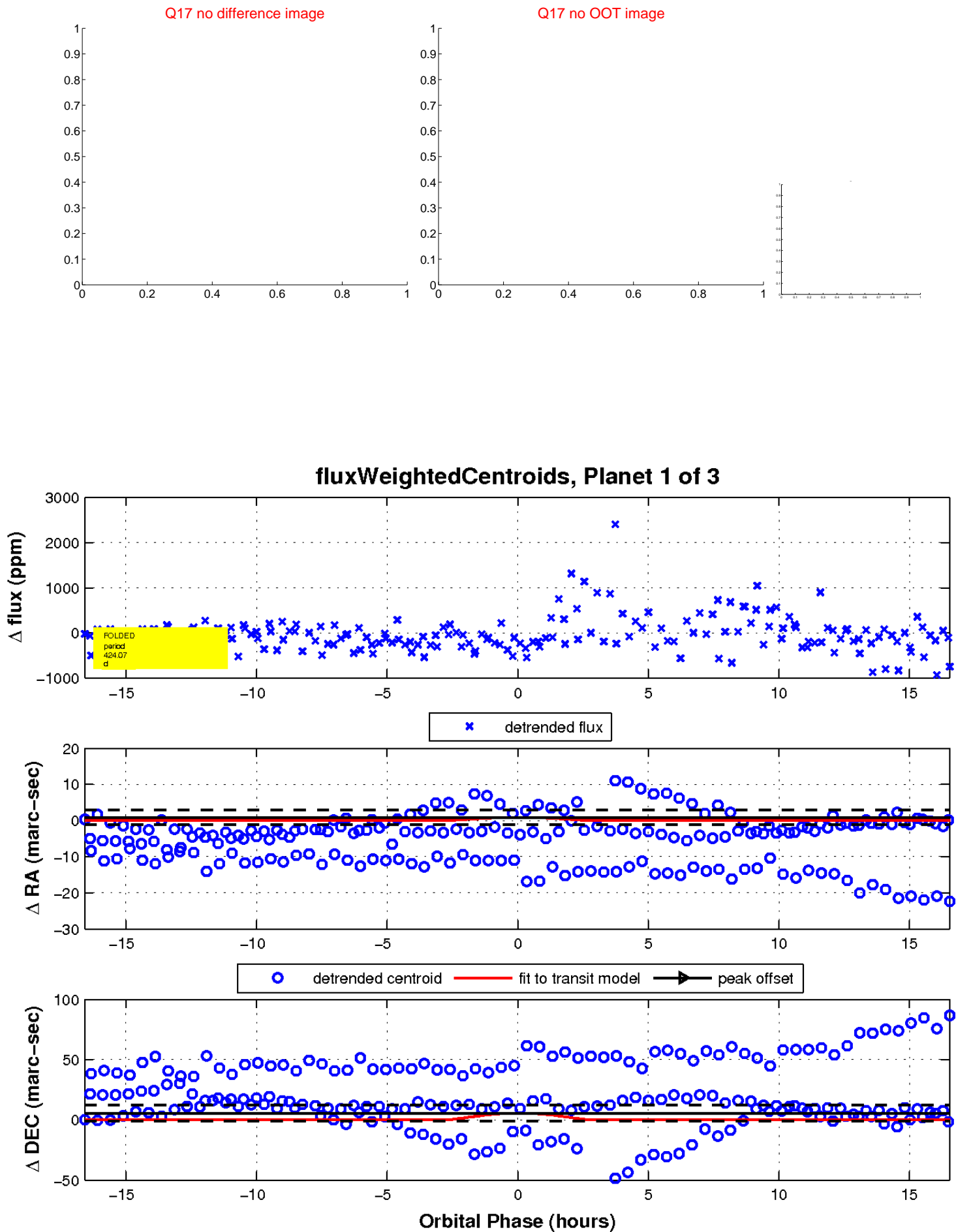
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

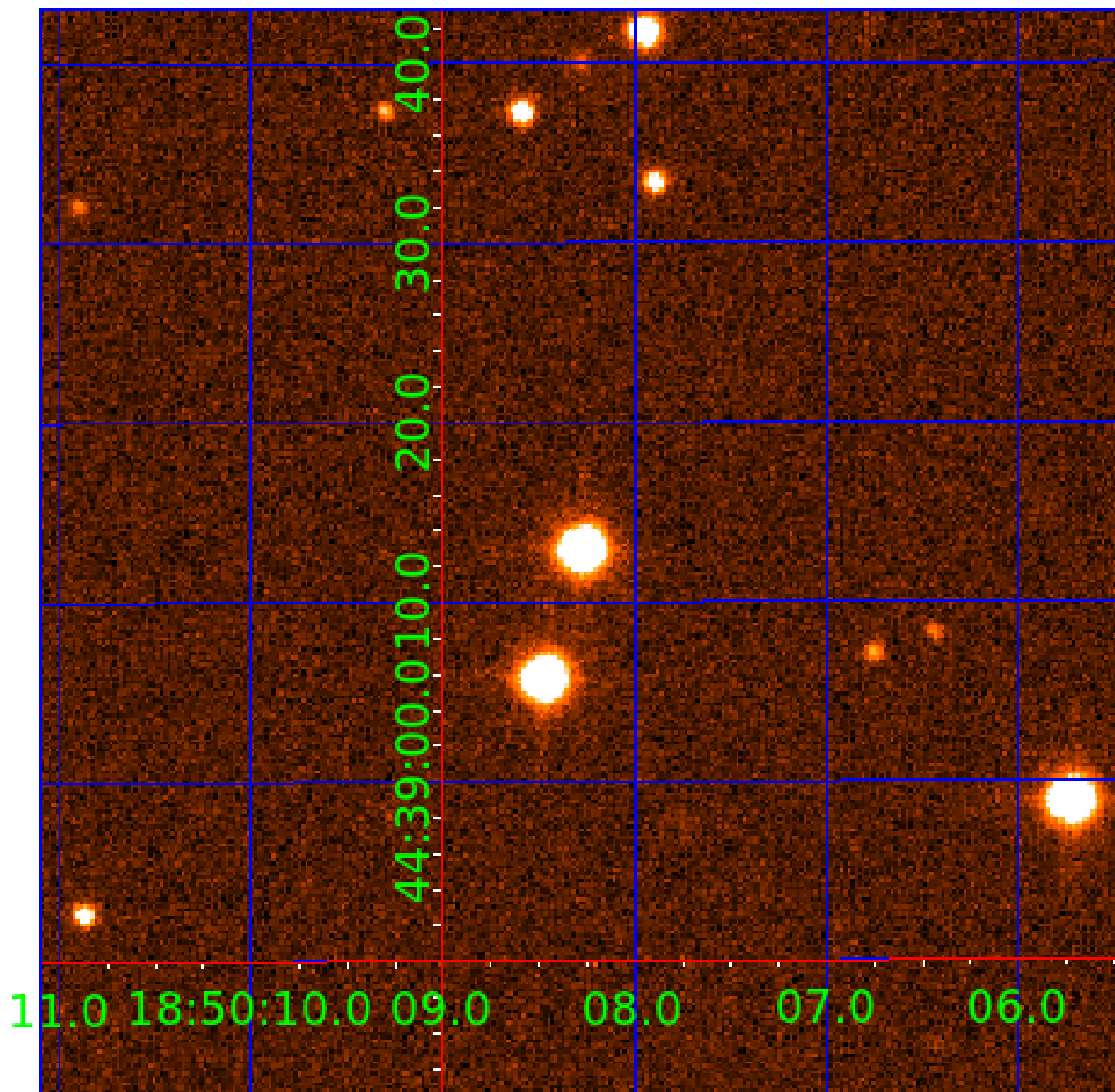


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008540644

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})
008540644-01	OBS	No	424.067879	510.156755	747.9	5.571	10.6	7.9	0.58	4577	3.04	0.16
008540644-02	OBS	No	487.408958	340.505484	887.1	10.435	15.9	12.4	0.58	4577	2.35	0.13
008540644-03	OBS	No	523.966880	269.926098	533.2	8.532	14.0	9.4	0.58	4577	1.45	0.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008540644-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008540644-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008540644-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

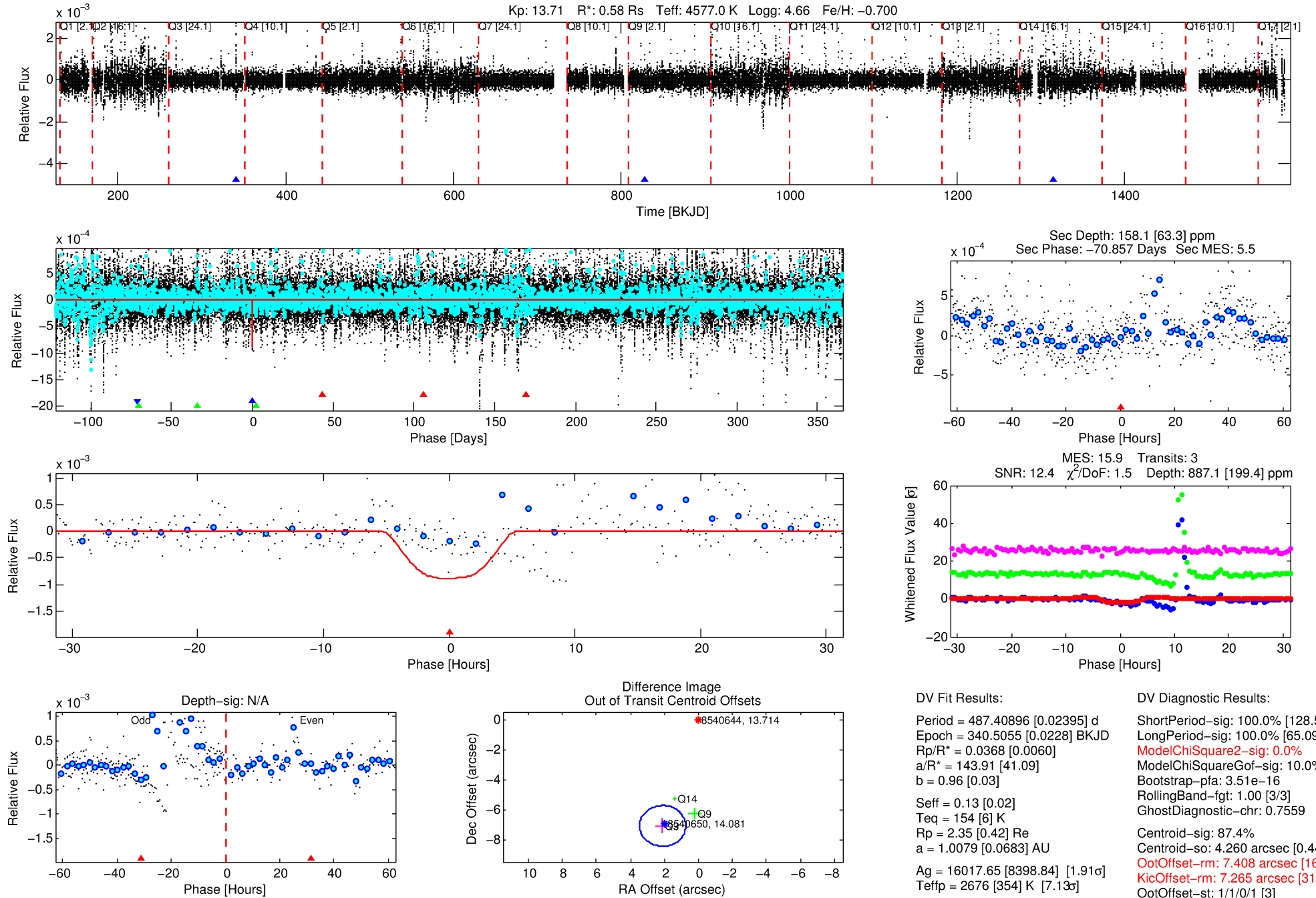
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008540644-02

No Significant Match Found

DV One-Page Summary

KIC: 8540644 Candidate: 2 of 3 Period: 487.409 d



DV Fit Results:

Period = 487.40896 [0.02395] d
Epoch = 340.5055 [0.0228] BKJD
Rp/R* = 0.0368 [0.0060]
a/R* = 143.91 [41.09]
b = 0.96 [0.03]
Seff = 0.13 [0.02]
Teq = 154 [6] K
Rp = 2.35 [0.42] Re
a = 1.0079 [0.0683] AU
Ag = 16017.65 [8398.84] [1.91σ]
Teffp = 2676 [354] K [7.13σ]

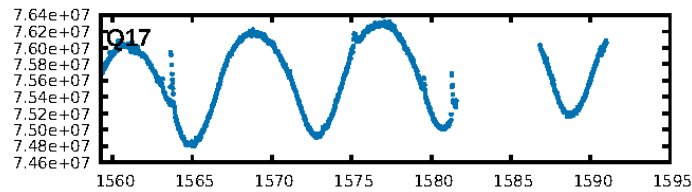
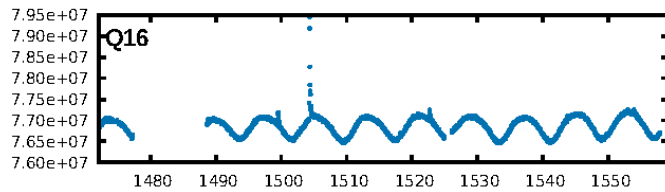
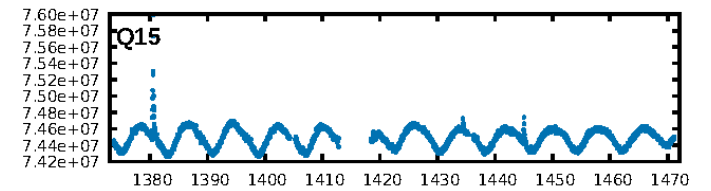
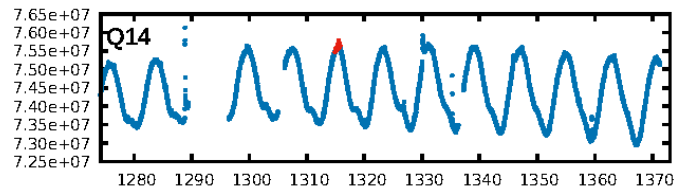
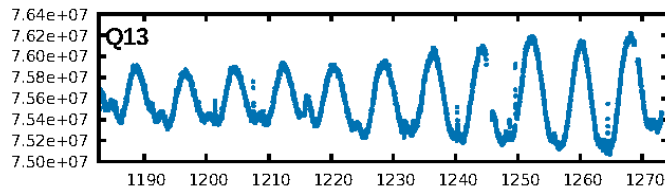
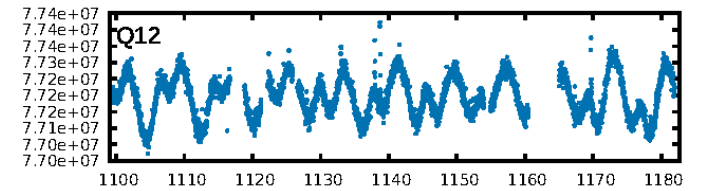
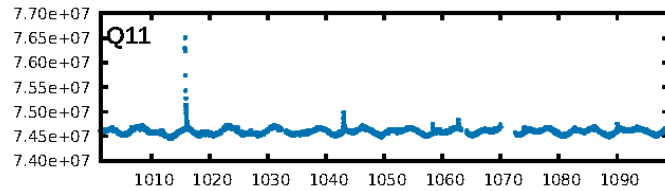
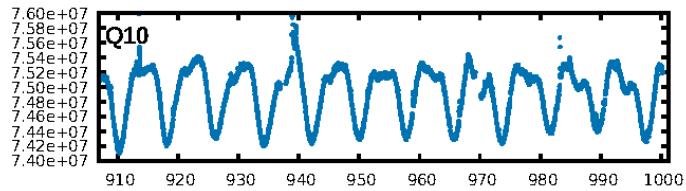
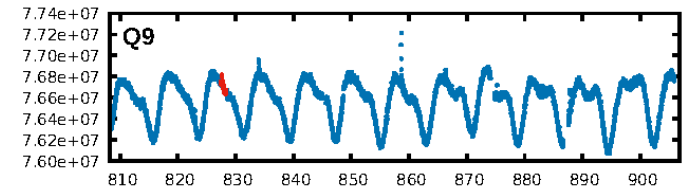
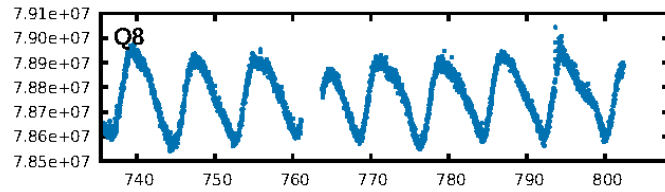
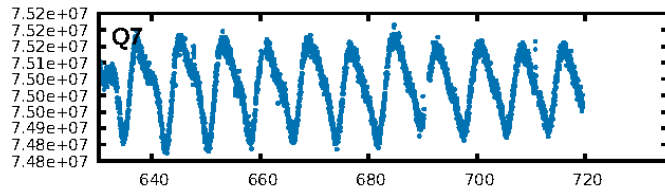
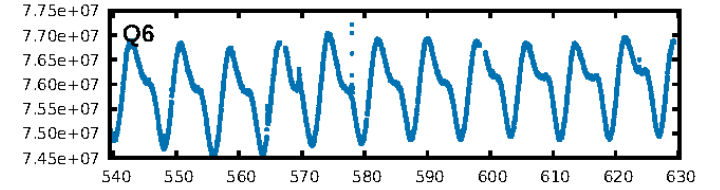
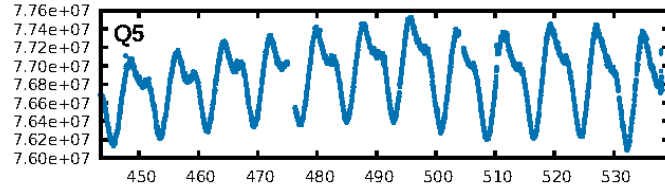
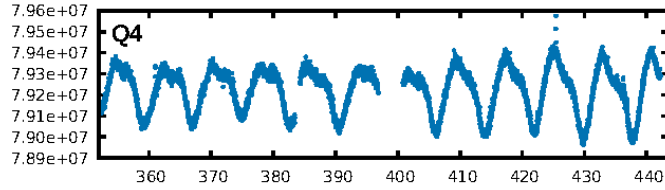
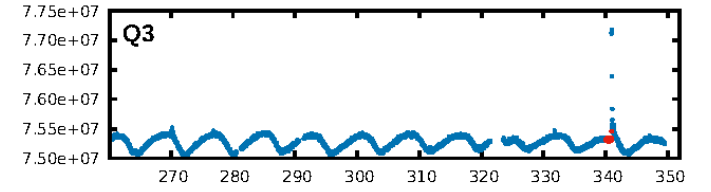
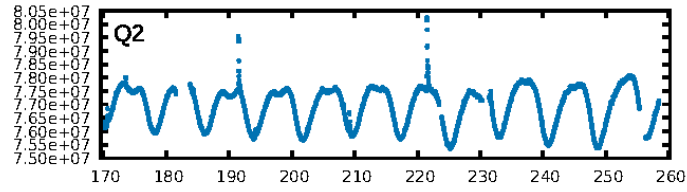
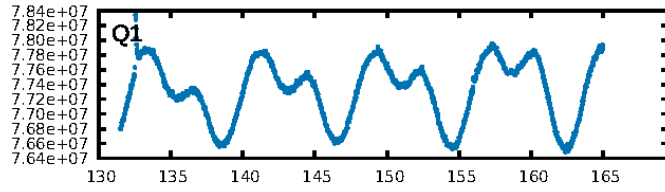
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [128.51σ]
LongPeriod-sig: 100.0% [65.09σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 10.0%
Bootstrap-pfa: 3.51e-16
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.7559
Centroid-sig: 87.4%
Centroid-so: 4.260 arcsec [0.44σ]
OotOffset-rm: 7.408 arcsec [16.36σ]
KicOffset-rm: 7.265 arcsec [31.22σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

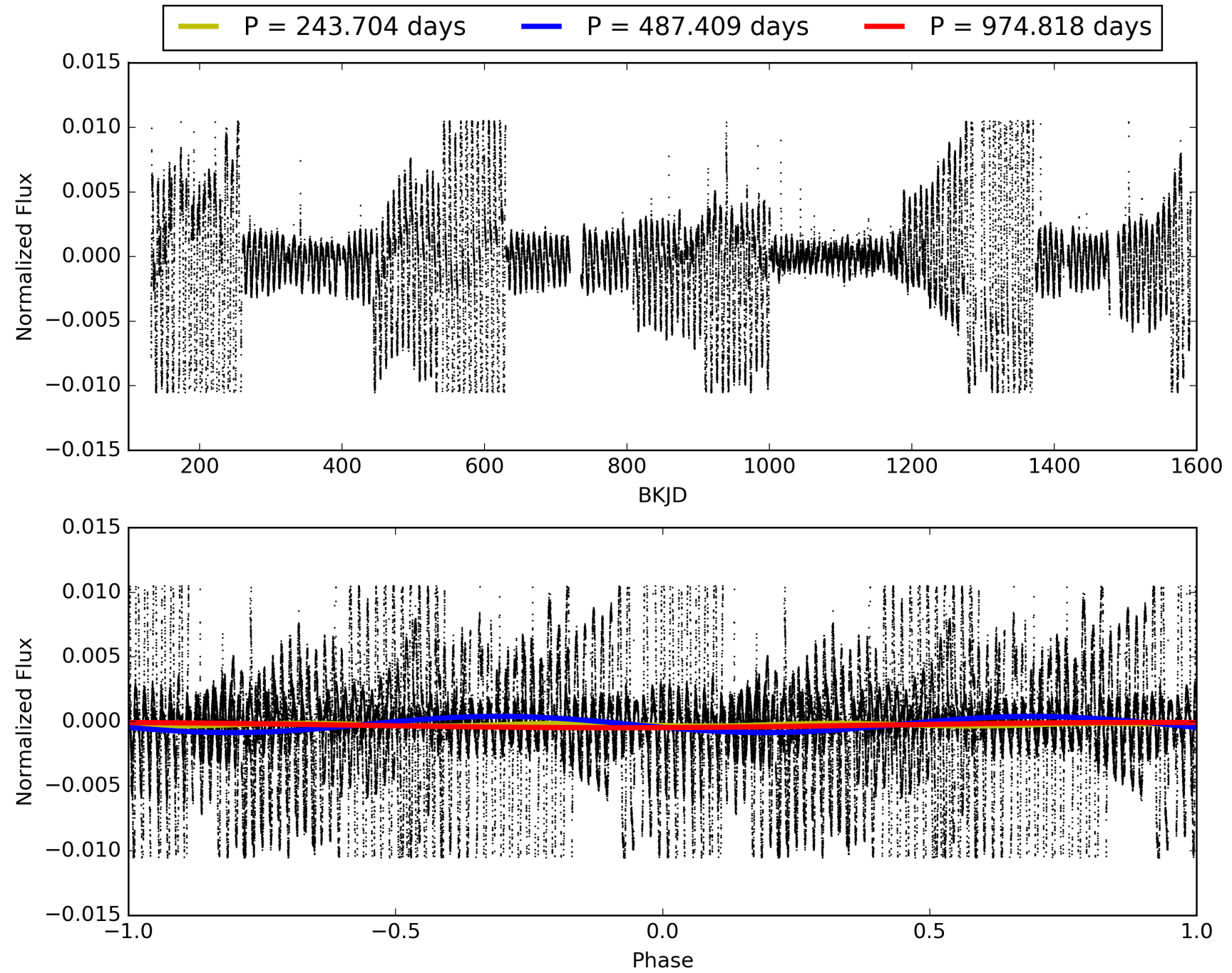
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:57:14 Z

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

TCE 008540644-02, PDC Light Curves

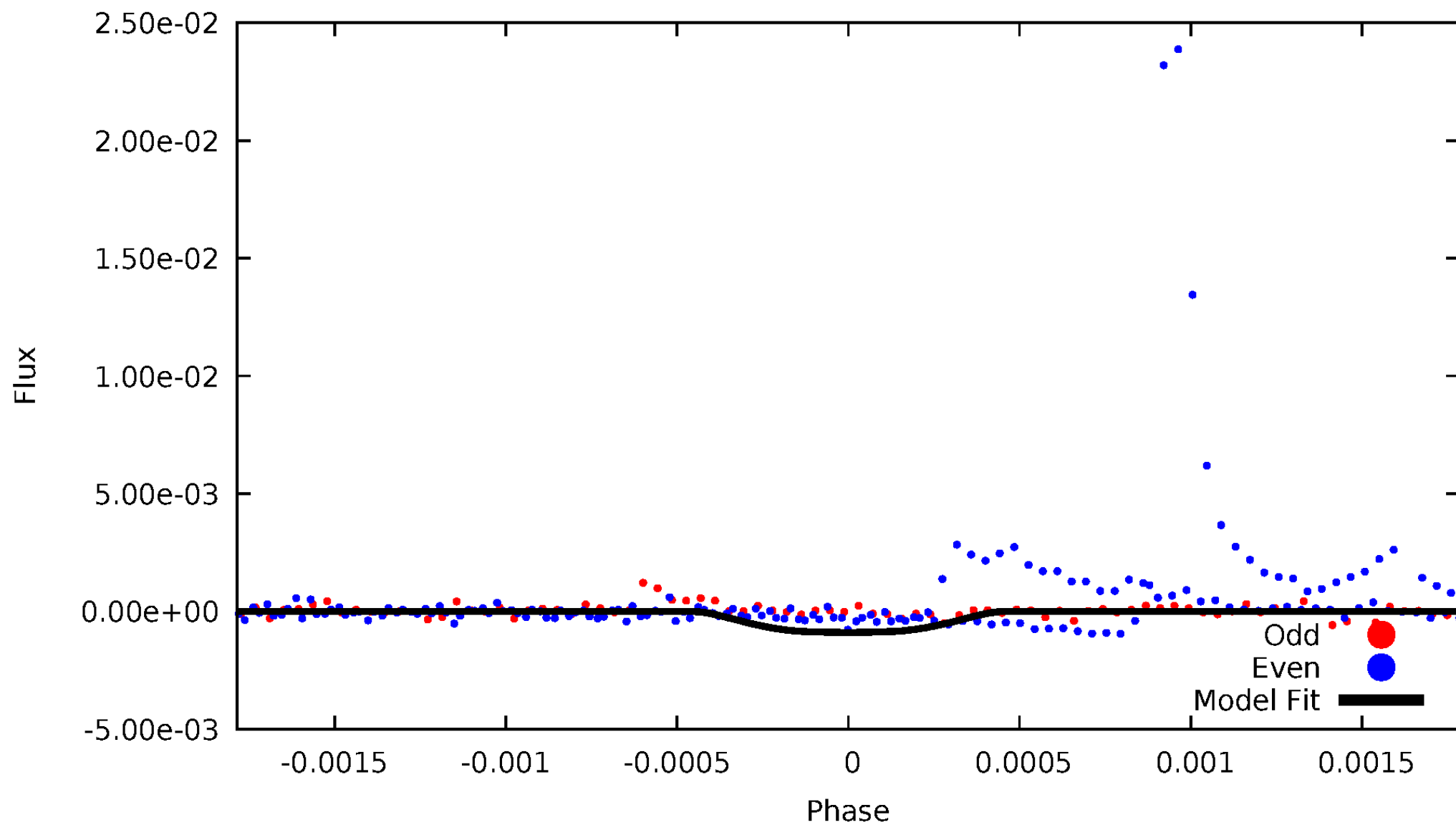


TCE 008540644-02



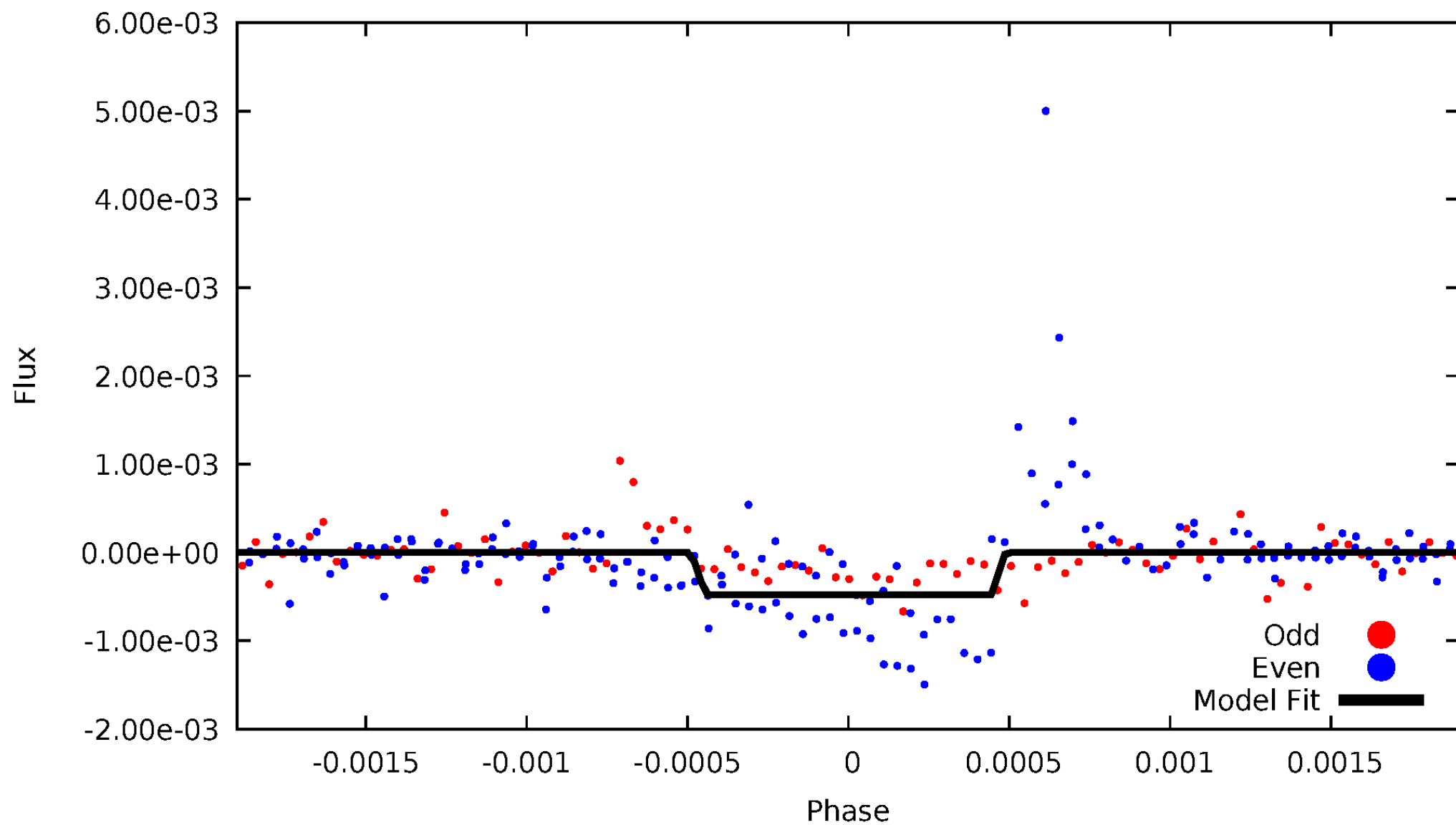
DV Odd/Even

TCE 008540644-02



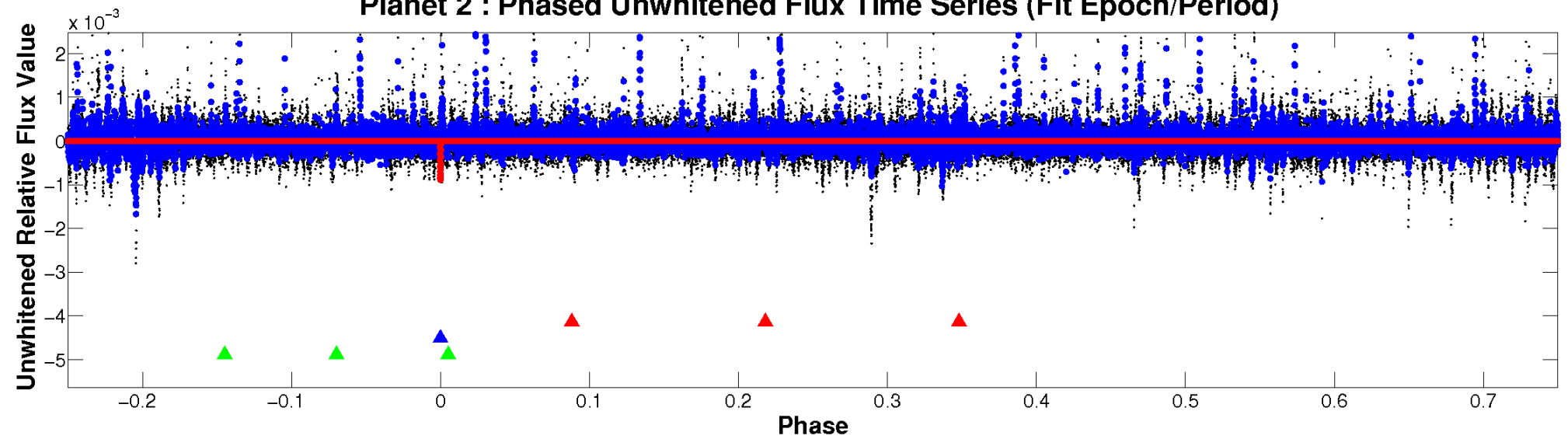
ALT Odd/Even

TCE 008540644-02

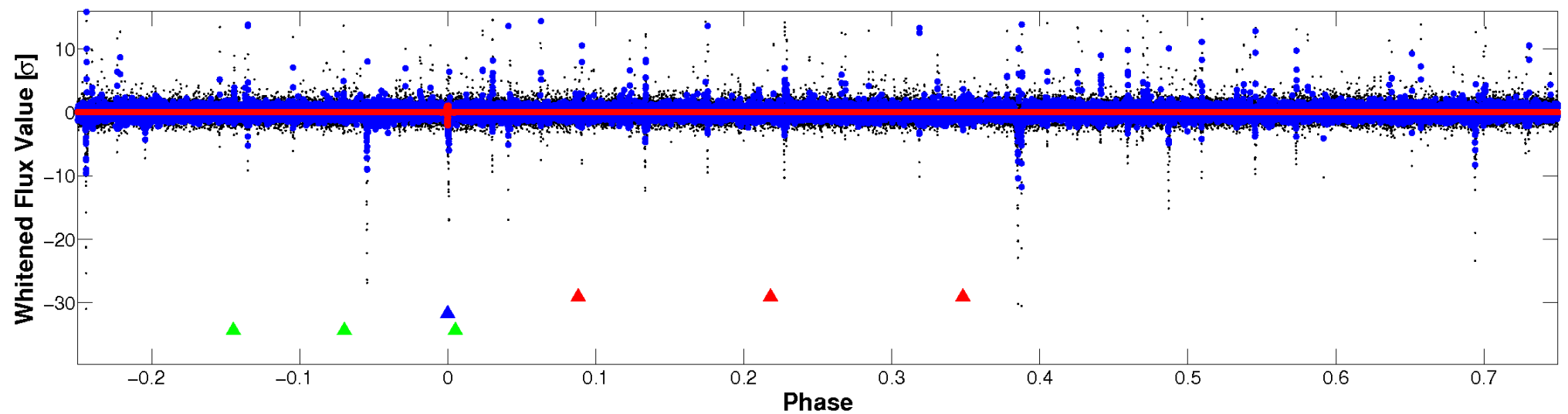


Non-Whitened Vs. Whitened Light Curve

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

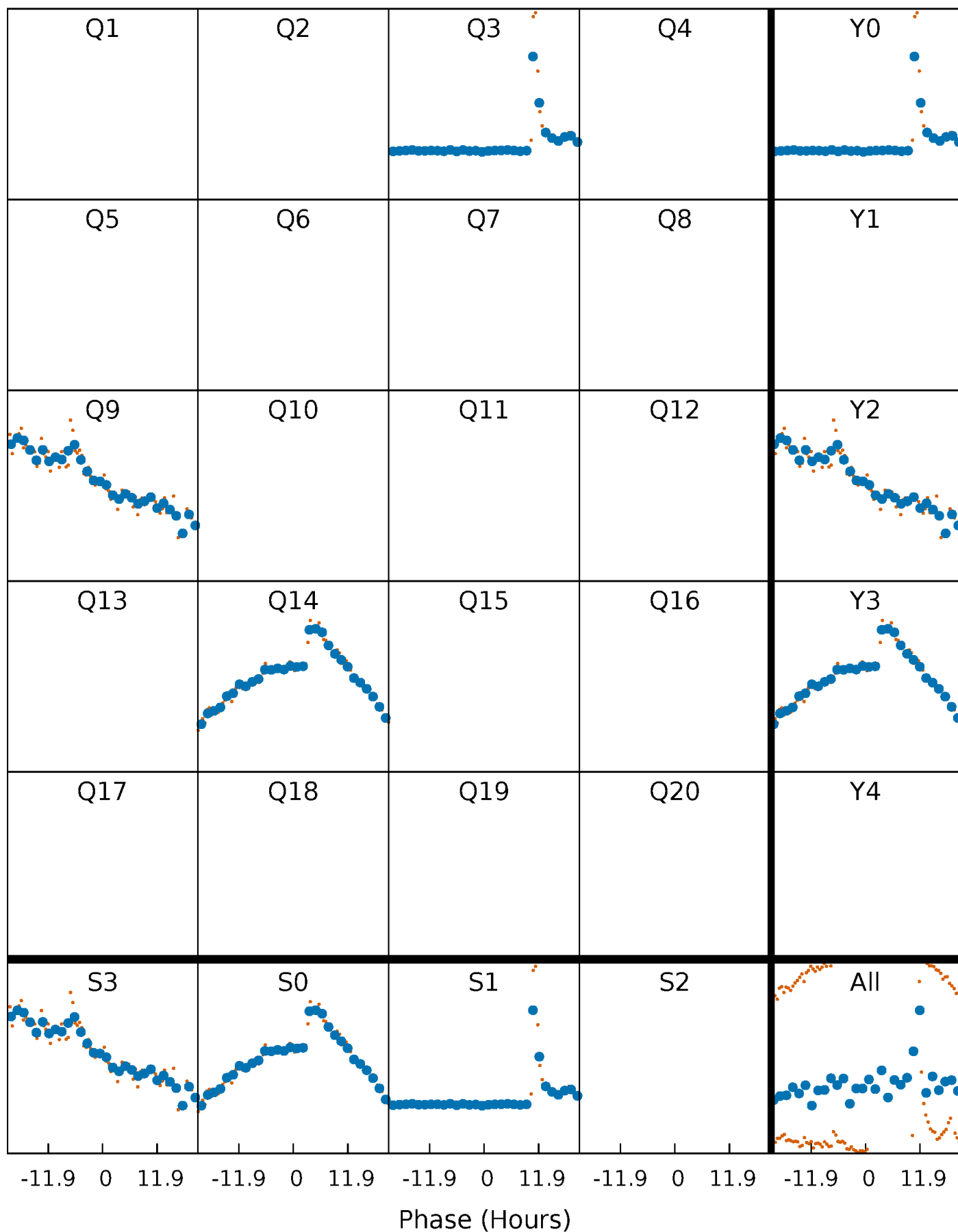


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



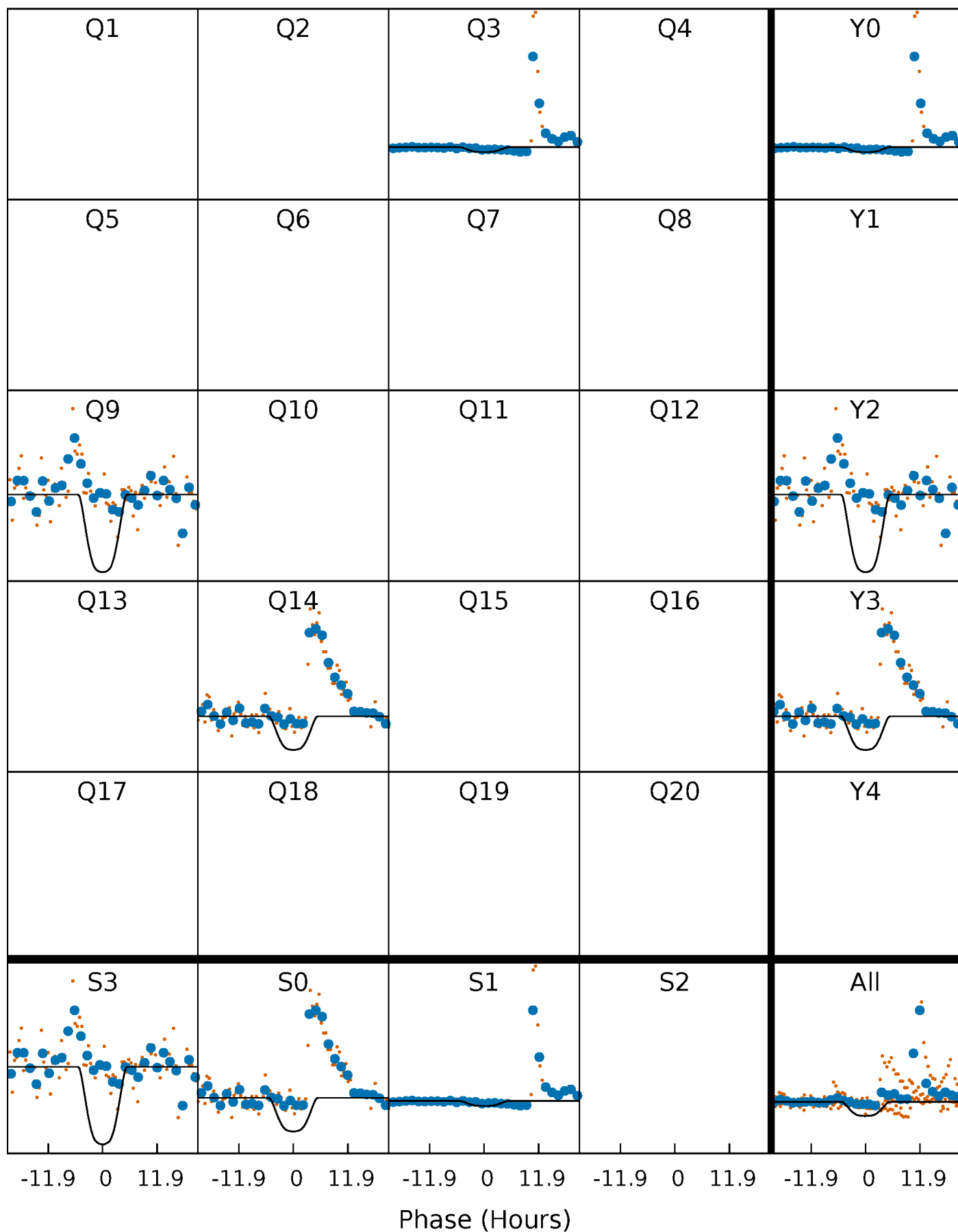
PDC Quarter-Phased Transit Curves

TCE 008540644-02 P=487.408958 Days $T_0=340.505484$ (BKJD)



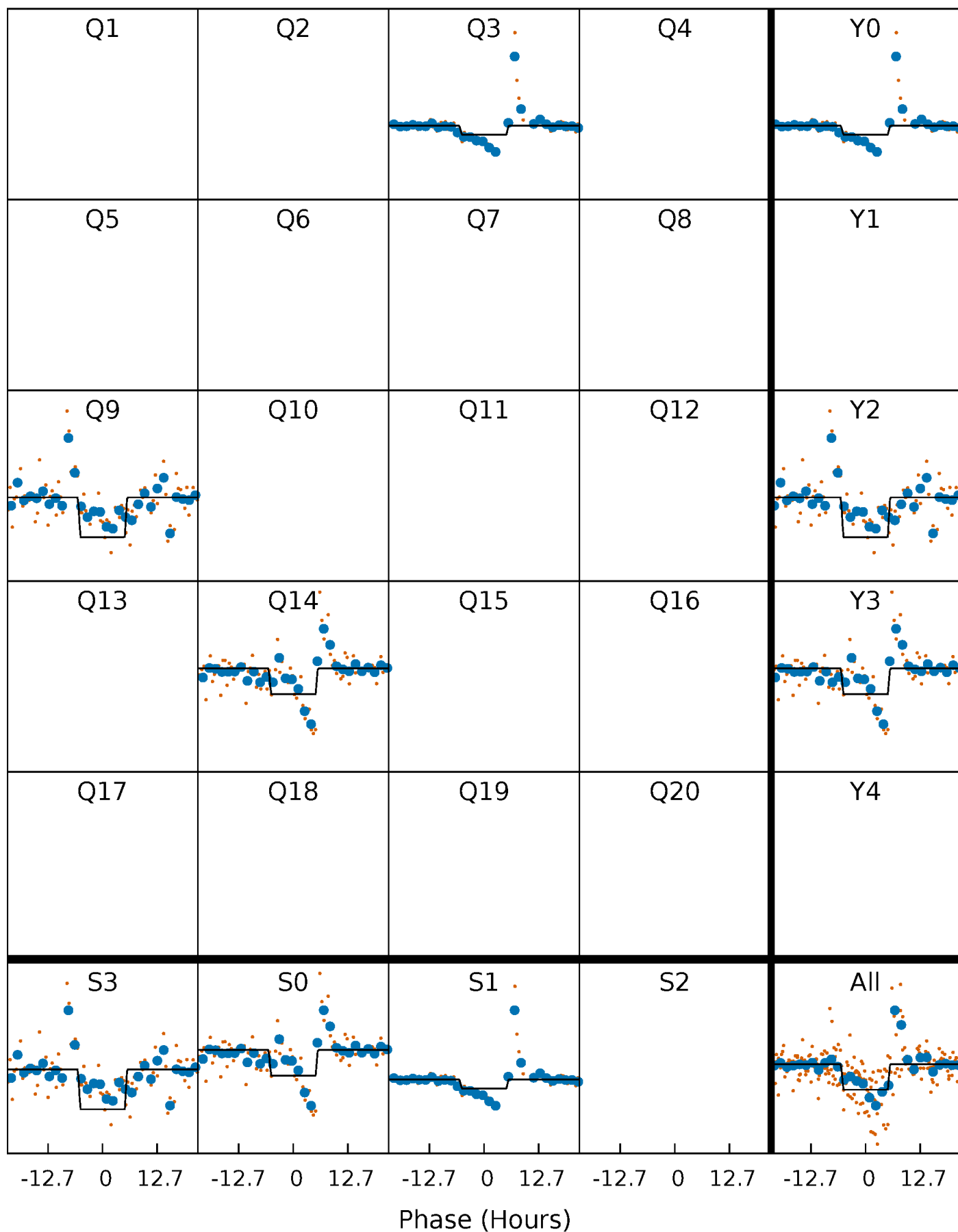
DV Quarter-Phased Transit Curves

TCE 008540644-02 $P=487.408958$ Days $T_0=340.505484$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

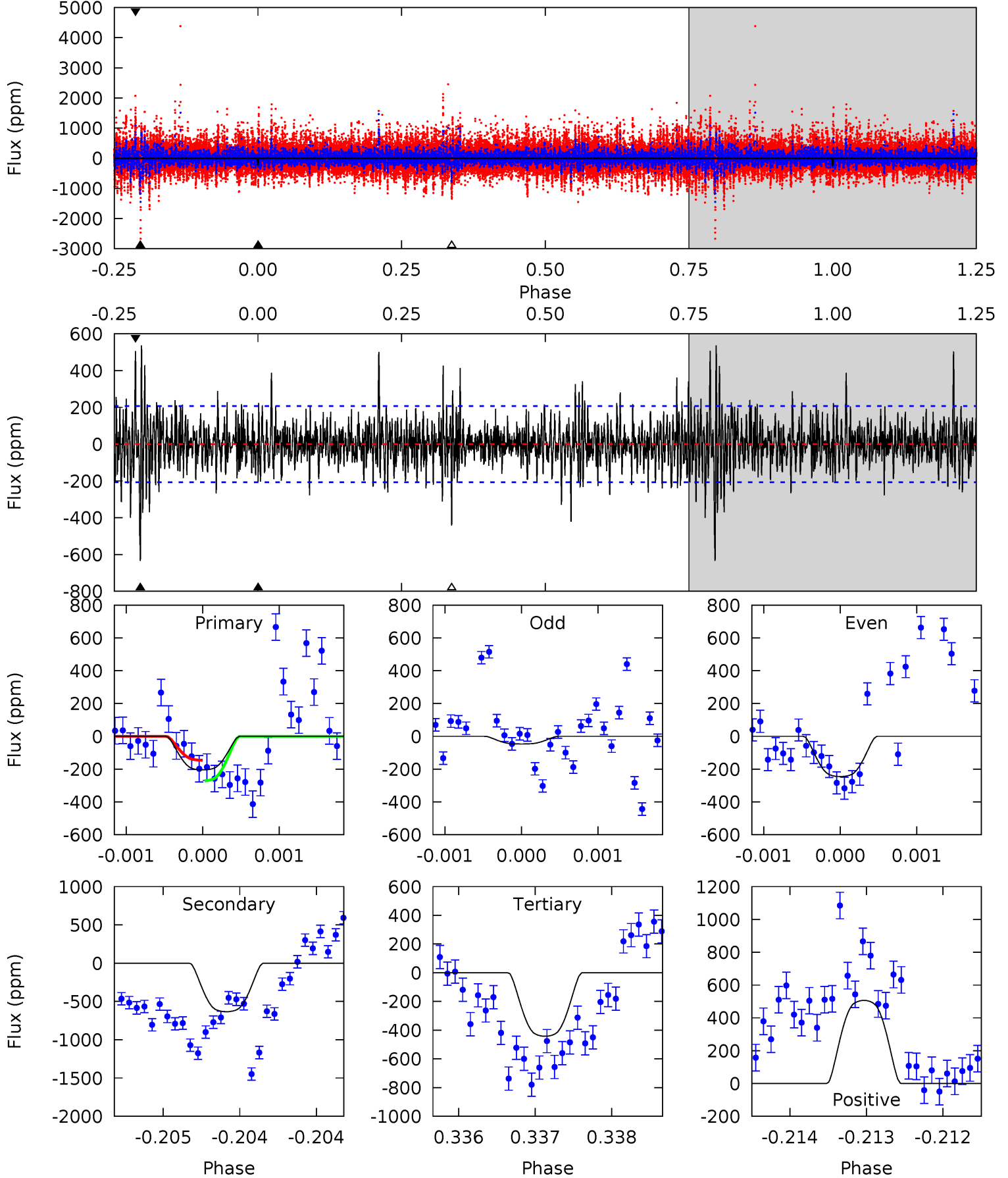
TCE 008540644-02 P=487.251861 Days $T_0=340.716674$ (BKJD)



DV Model-Shift Uniqueness Test

008540644-02, P = 487.408958 Days, E = 340.505484 Days

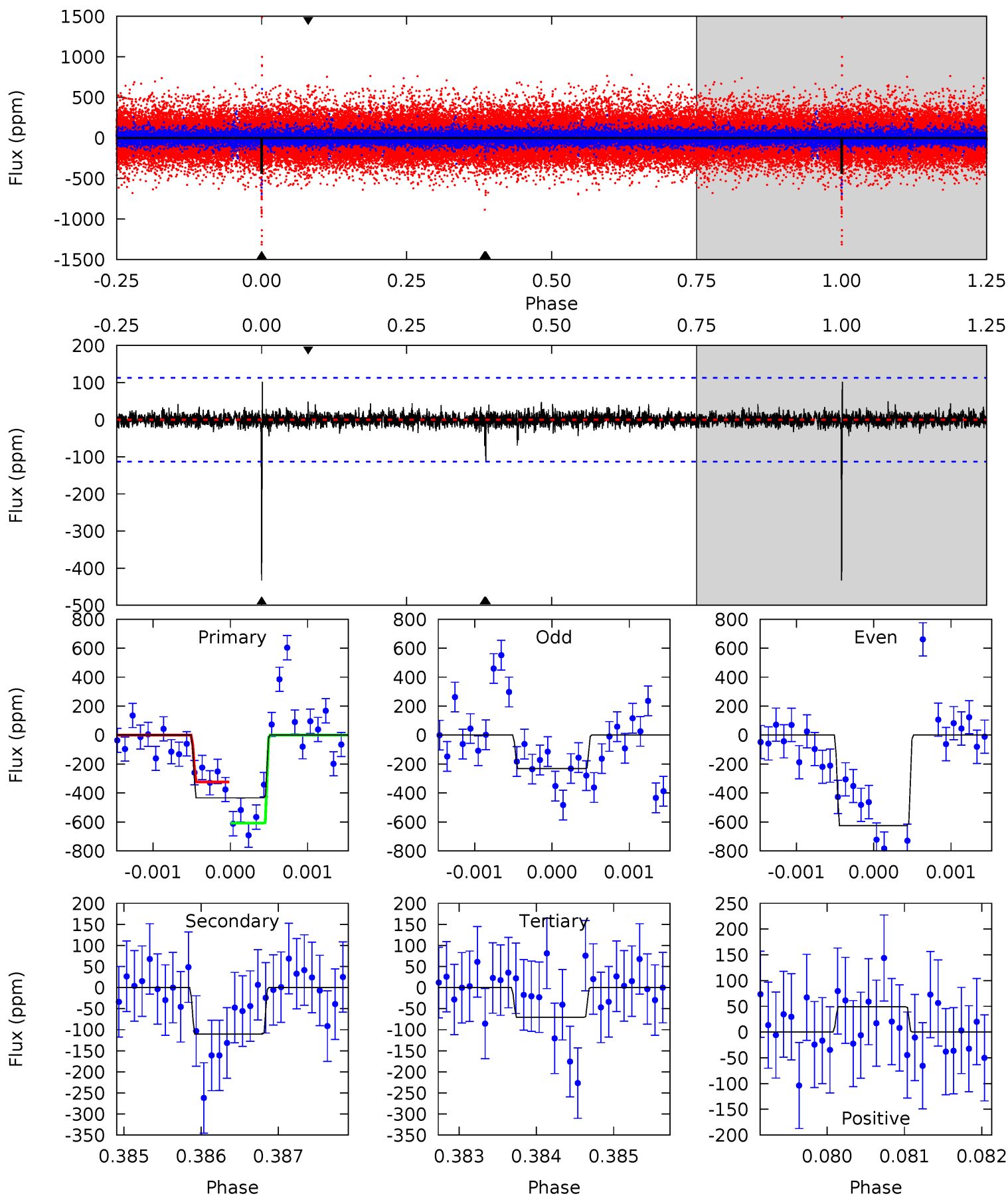
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.40	16.7	11.7	13.3	5.46	3.31	2.56	-6.26	-7.94	5.04	3.36	1.66	2.46	0.46	1.67



Alt Model-Shift Uniqueness Test

008540644-02, P = 487.251861 Days, E = 340.716674 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.9	5.33	3.40	2.36	5.45	3.30	0.49	17.5	18.6	1.92	2.97	9.31	1.19	0.19	6.87



Stellar Parameters For KIC 008540644

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4577^{+137}_{-137}	$4.663^{+0.054}_{-0.032}$	$-0.700^{+0.300}_{-0.300}$	$0.585^{+0.047}_{-0.047}$	$0.574^{+0.061}_{-0.033}$	$4.042^{+0.923}_{-0.517}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-8%	+11%/-6%	+23%/-13%
Source	PHO1	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 008540644-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-634 ± 38	$2.35^{+0.40}_{-0.40}$	214^{+8}_{-7}	3972^{+290}_{-232}	65687^{+30448}_{-18364}
Alt.	-110 ± 21	$1.40^{+0.35}_{-0.39}$	214^{+7}_{-8}	3536^{+410}_{-299}	32242^{+28961}_{-13317}

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 $A_{obs} \gg 1.0$

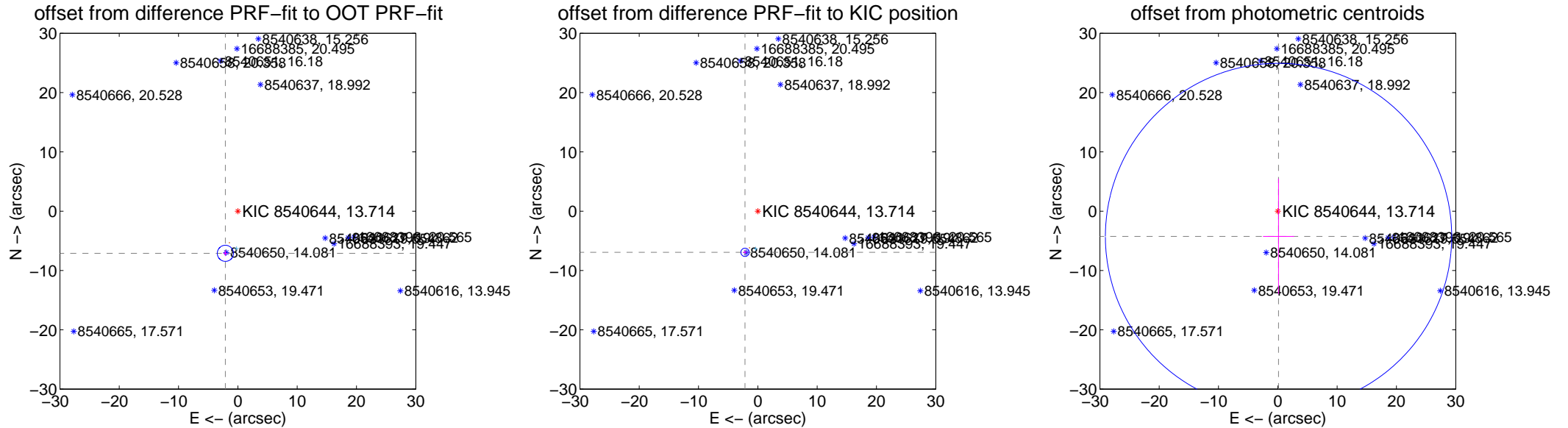
DV Centroid Data

Supplemental centroid analysis for 008540644-02. Kepler magnitude: 13.71. Transit SNR 12.37

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.85 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.408 \pm 0.453	16.36	2.103 \pm 0.361	-7.103 \pm 0.452
PRF-fit source offset from KIC position	7.265 \pm 0.233	31.22	2.162 \pm 0.348	-6.936 \pm 0.181
photometric centroid source offset	4.26 \pm 9.73	0.44	-0.12 \pm 2.62	-4.26 \pm 9.73



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- σ uncertainty. Blue circle: three- σ . 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.

Q1 no difference image



Q1 no OOT image



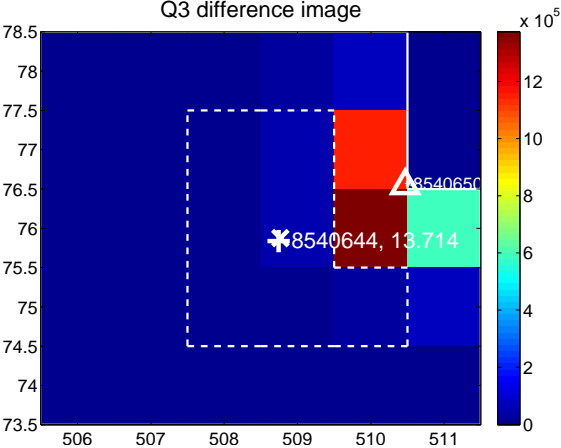
Q2 no difference image



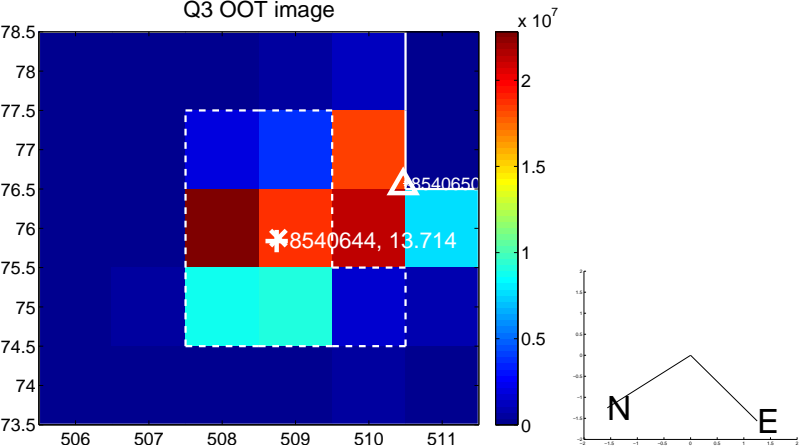
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



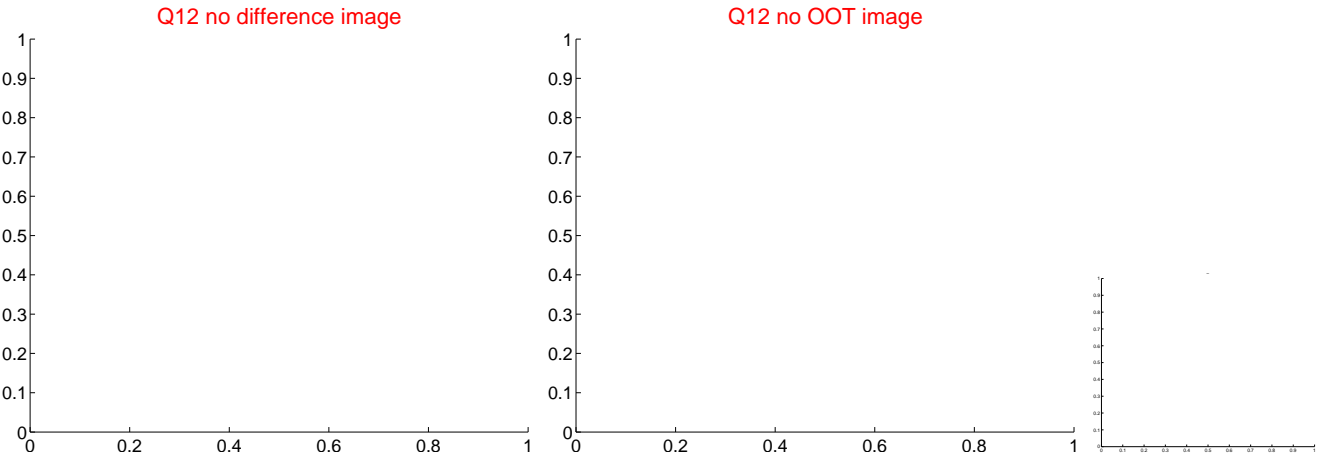
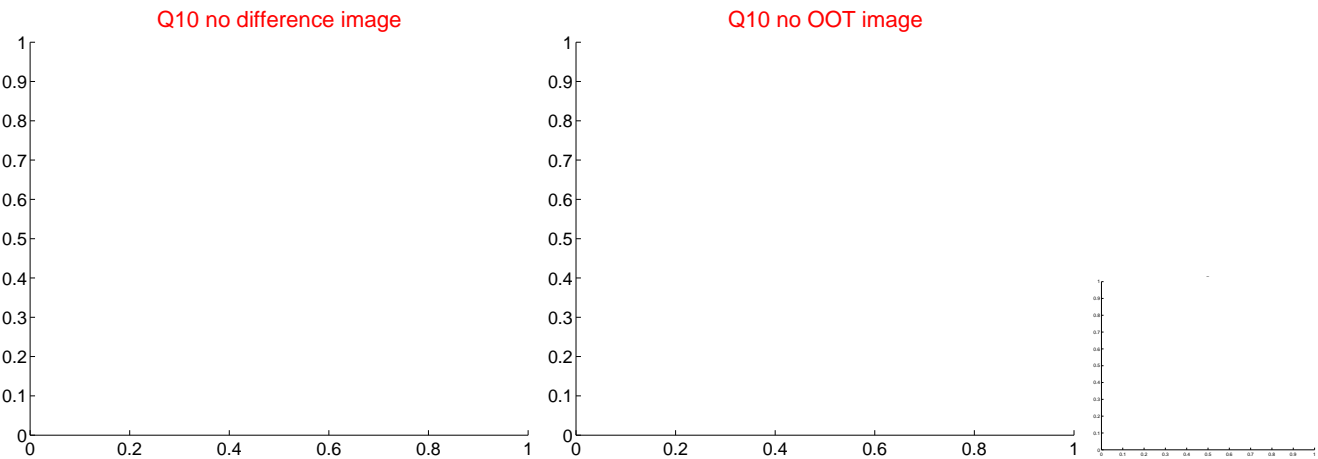
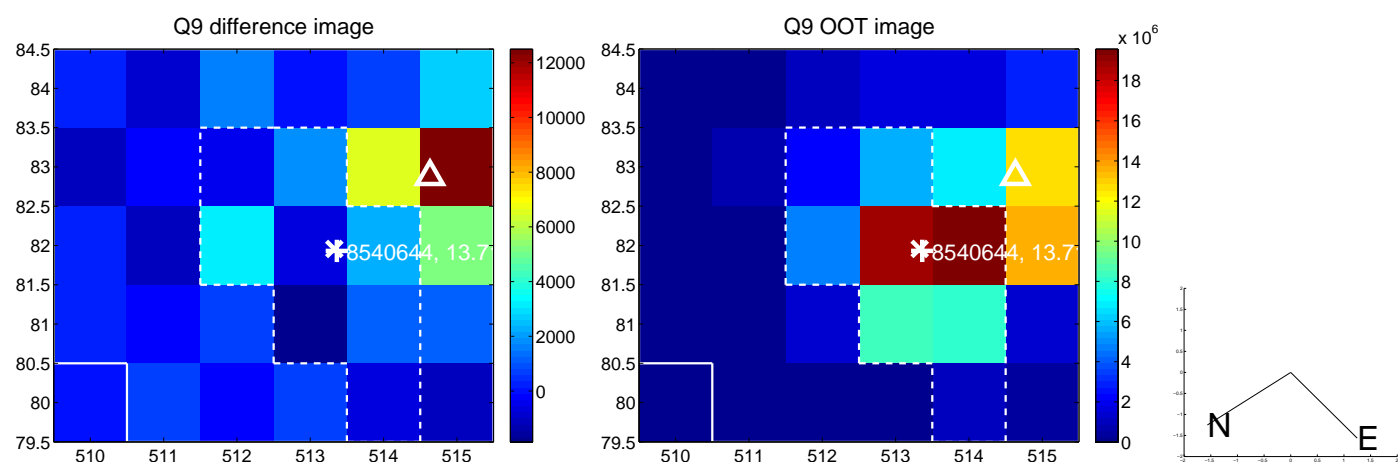
Q4 no OOT image



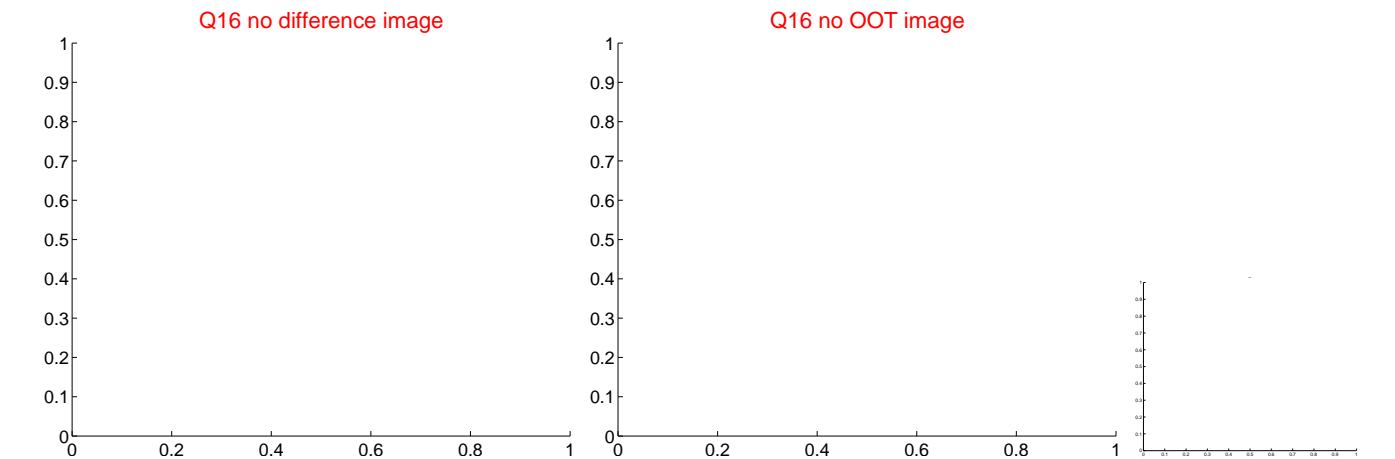
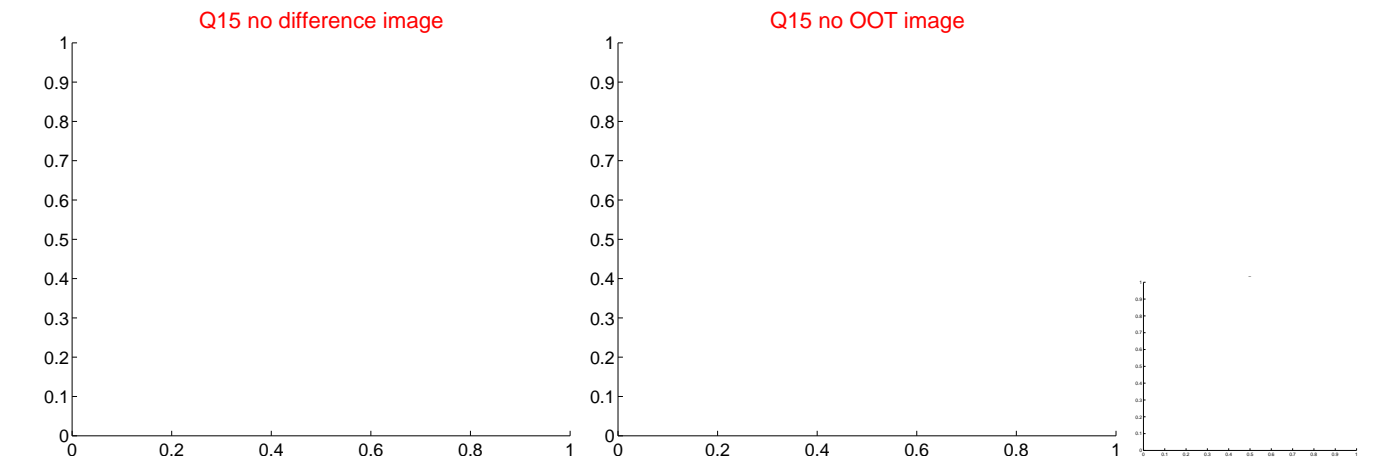
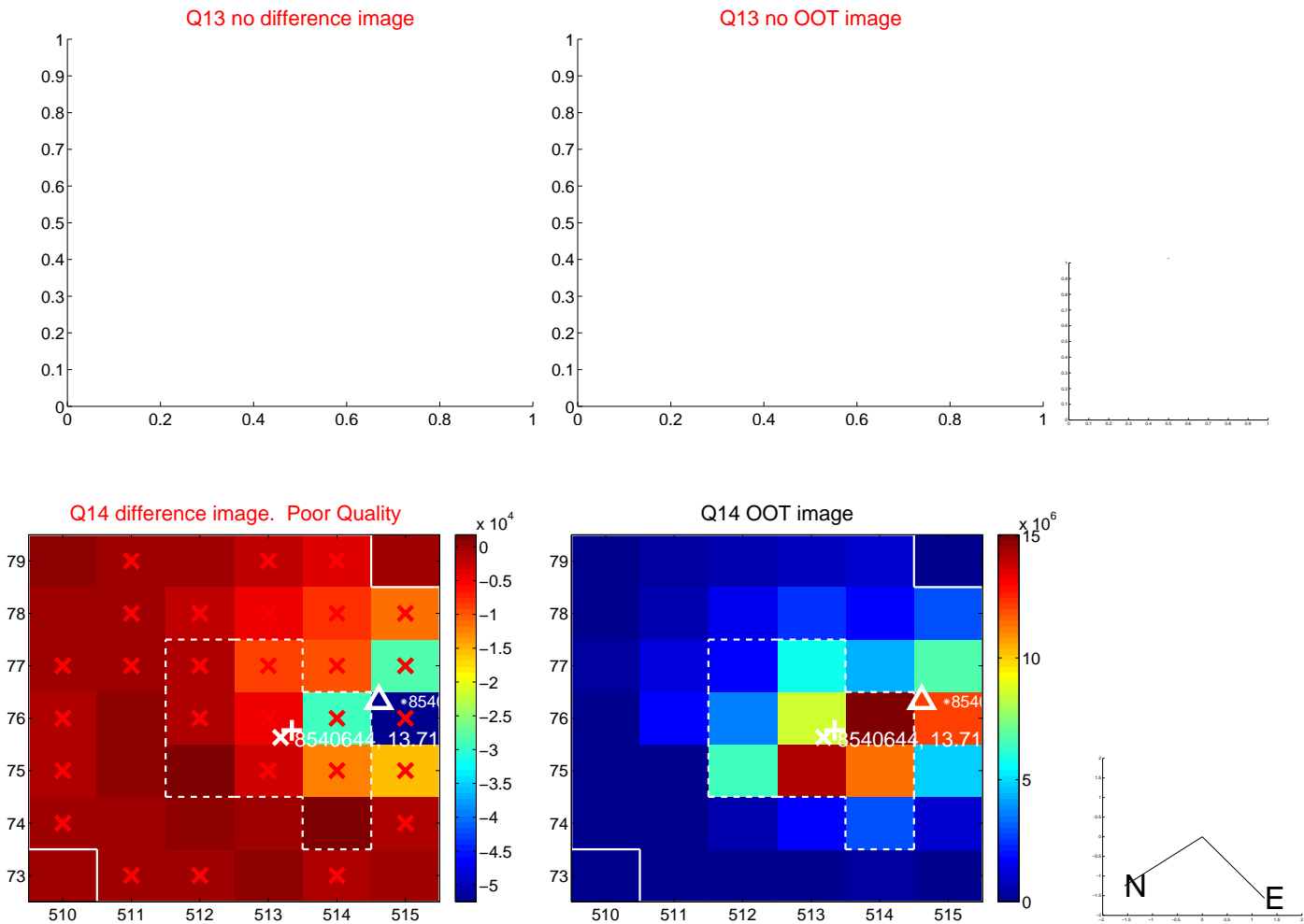
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



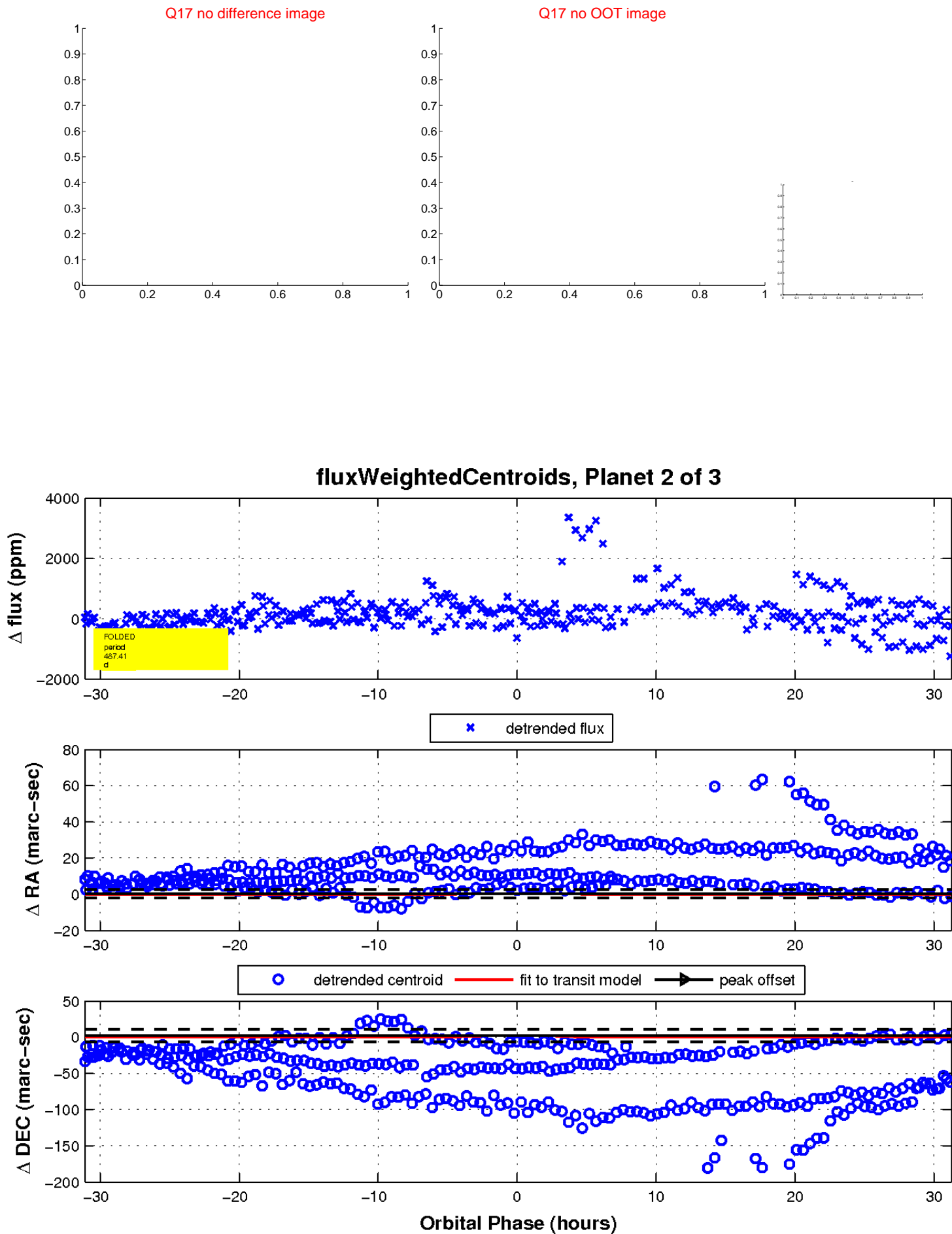
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

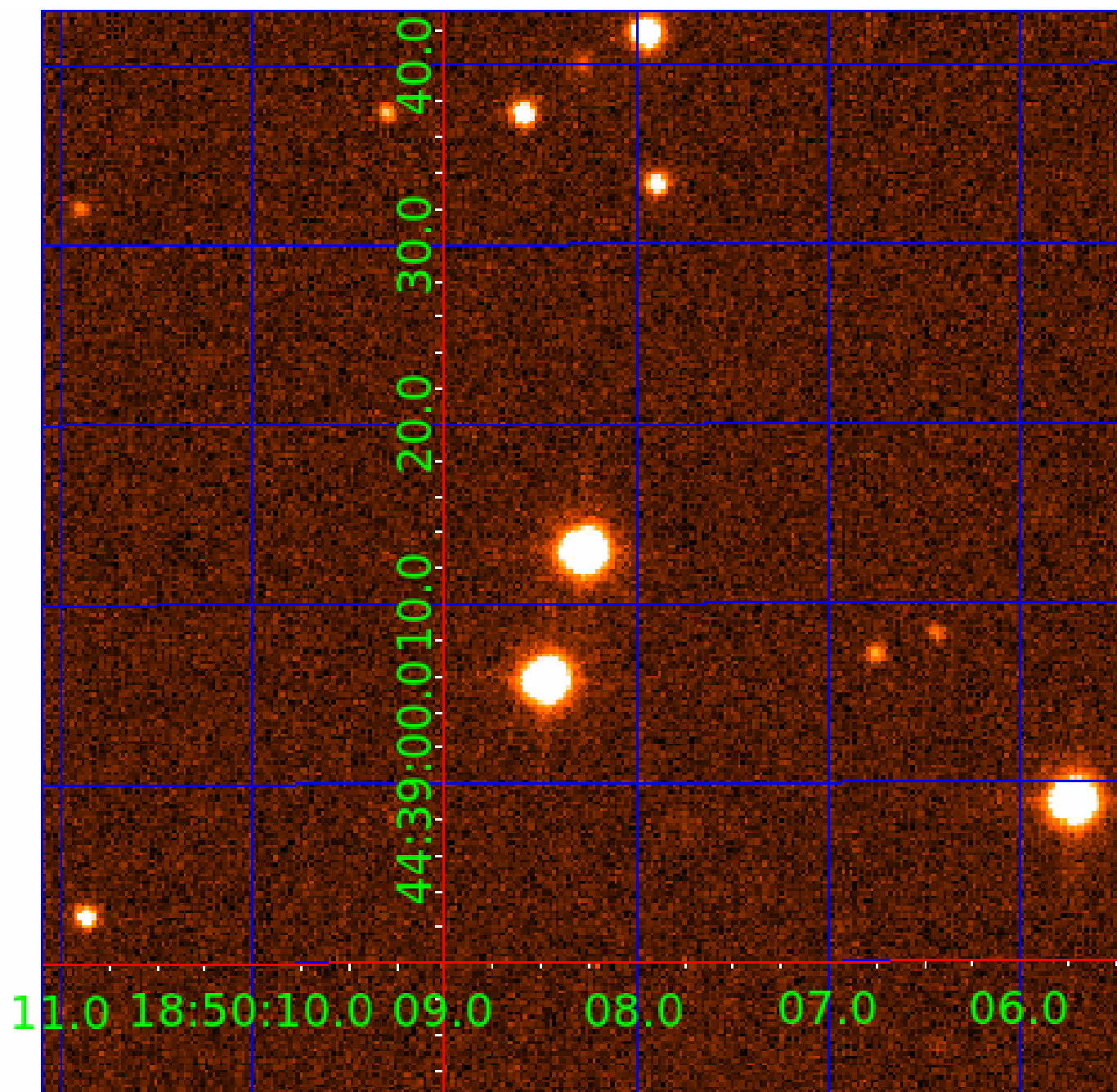


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008540644

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})
008540644-01	OBS	No	424.067879	510.156755	747.9	5.571	10.6	7.9	0.58	4577	3.04	0.16
008540644-02	OBS	No	487.408958	340.505484	887.1	10.435	15.9	12.4	0.58	4577	2.35	0.13
008540644-03	OBS	No	523.966880	269.926098	533.2	8.532	14.0	9.4	0.58	4577	1.45	0.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008540644-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008540644-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008540644-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

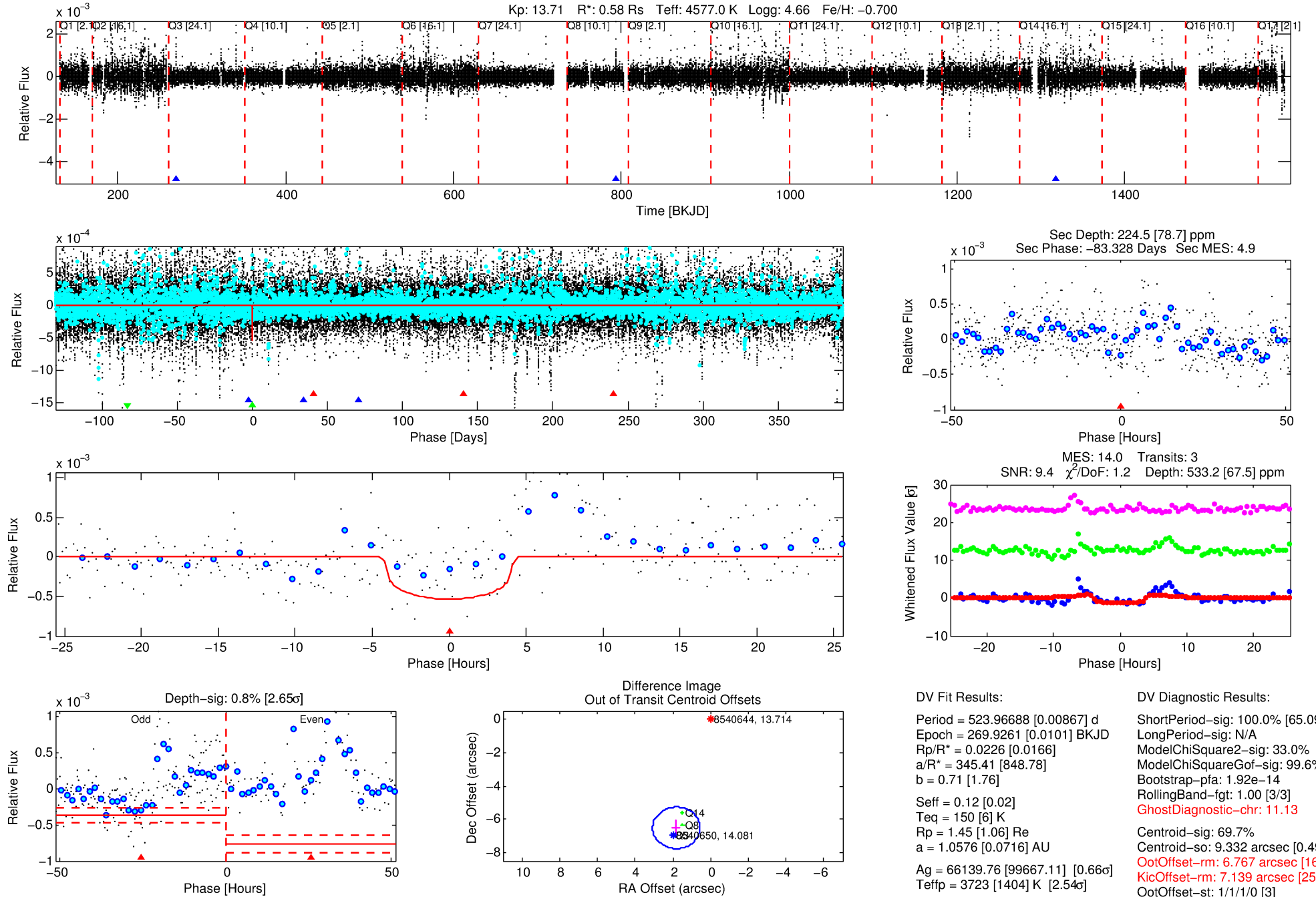
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008540644-03

No Significant Match Found

DV One-Page Summary

KIC: 8540644 Candidate: 3 of 3 Period: 523.967 d



DV Fit Results:

Period = 523.96688 [0.00867] d
 Epoch = 269.9261 [0.0101] BKJD
 Rp/R* = 0.0226 [0.0166]
 a/R* = 345.41 [848.78]
 b = 0.71 [1.76]
 Seff = 0.12 [0.02]
 Teq = 150 [6] K
 Rp = 1.45 [1.06] Re
 a = 1.0576 [0.0716] AU
 Ag = 66139.76 [99667.11] [0.66σ]
 Tefp = 3723 [1404] K [2.54σ]

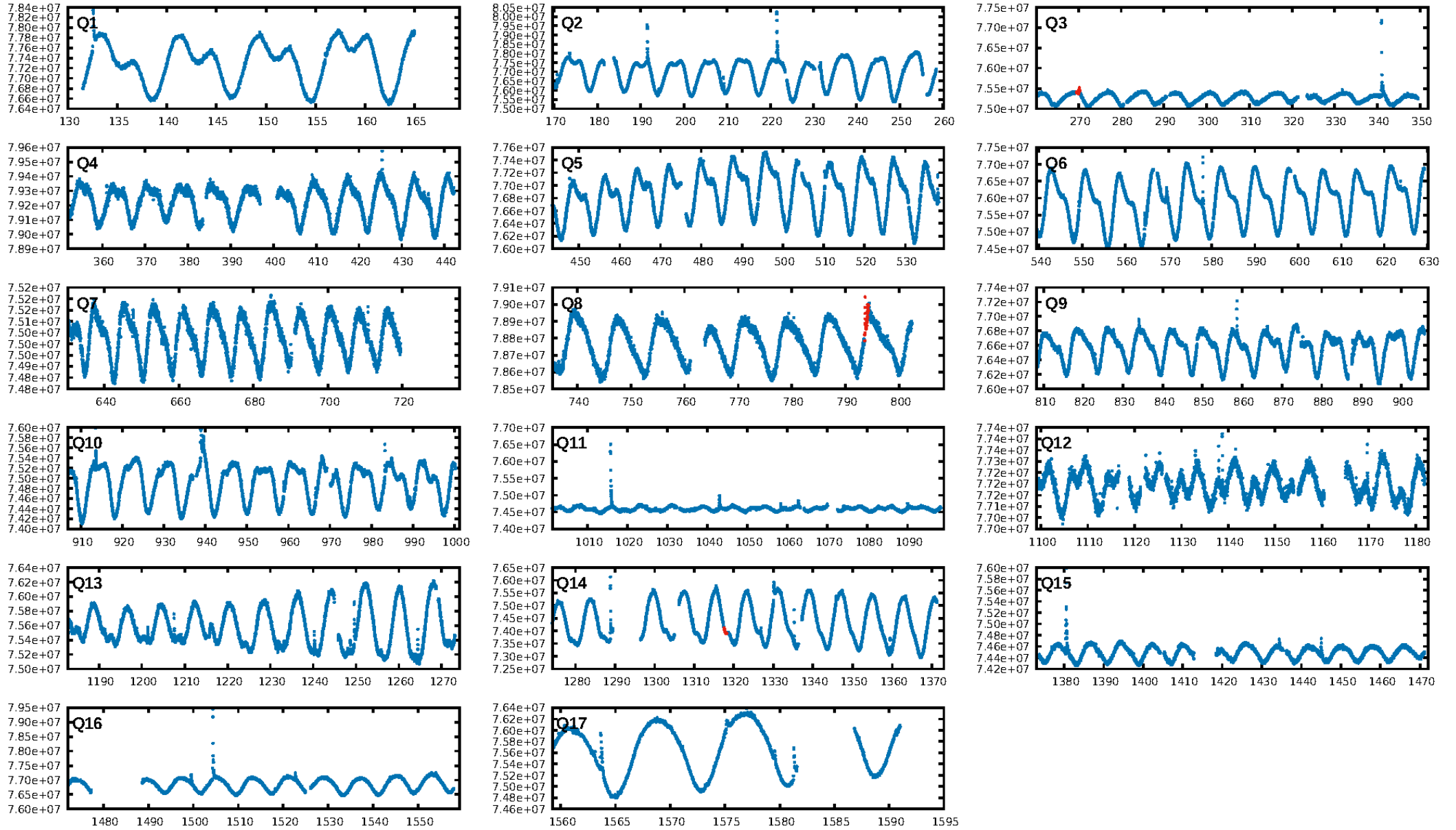
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [65.09σ]
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 33.0%
 ModelChiSquareGof-sig: 99.6%
 Bootstrap-pfa: 1.92e-14
 RollingBand-fgt: 1.00 [3/3]
 GhostDiagnostic-chr: 11.13
 Centroid-sig: 69.7%
 Centroid-so: 9.332 arcsec [0.49σ]
 OotOffset-rm: 6.767 arcsec [16.23σ]
 KicOffset-rm: 7.139 arcsec [25.73σ]
 OotOffset-st: 1/1/1/0 [3]
 KicOffset-st: 1/1/1/0 [3]
 DiffImageQuality-fgm: 1.00 [3/3]
 DiffImageOverlap-fno: 1.00 [3/3]

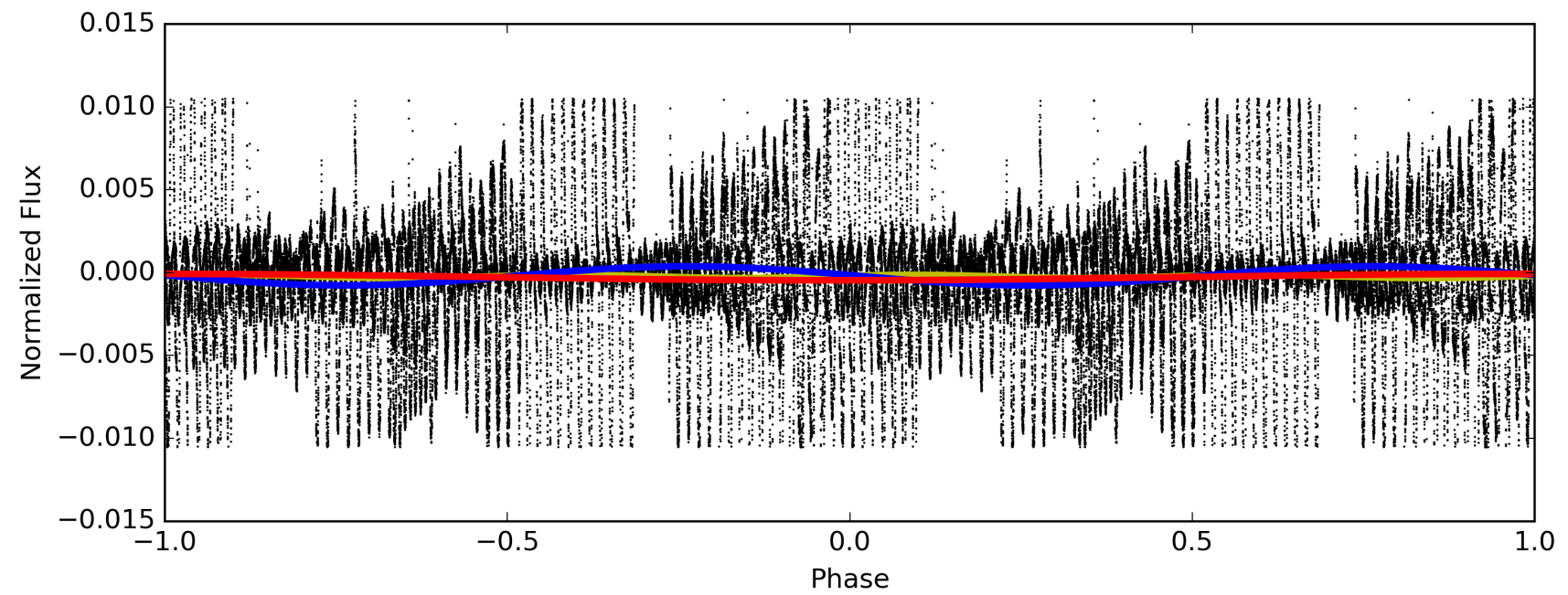
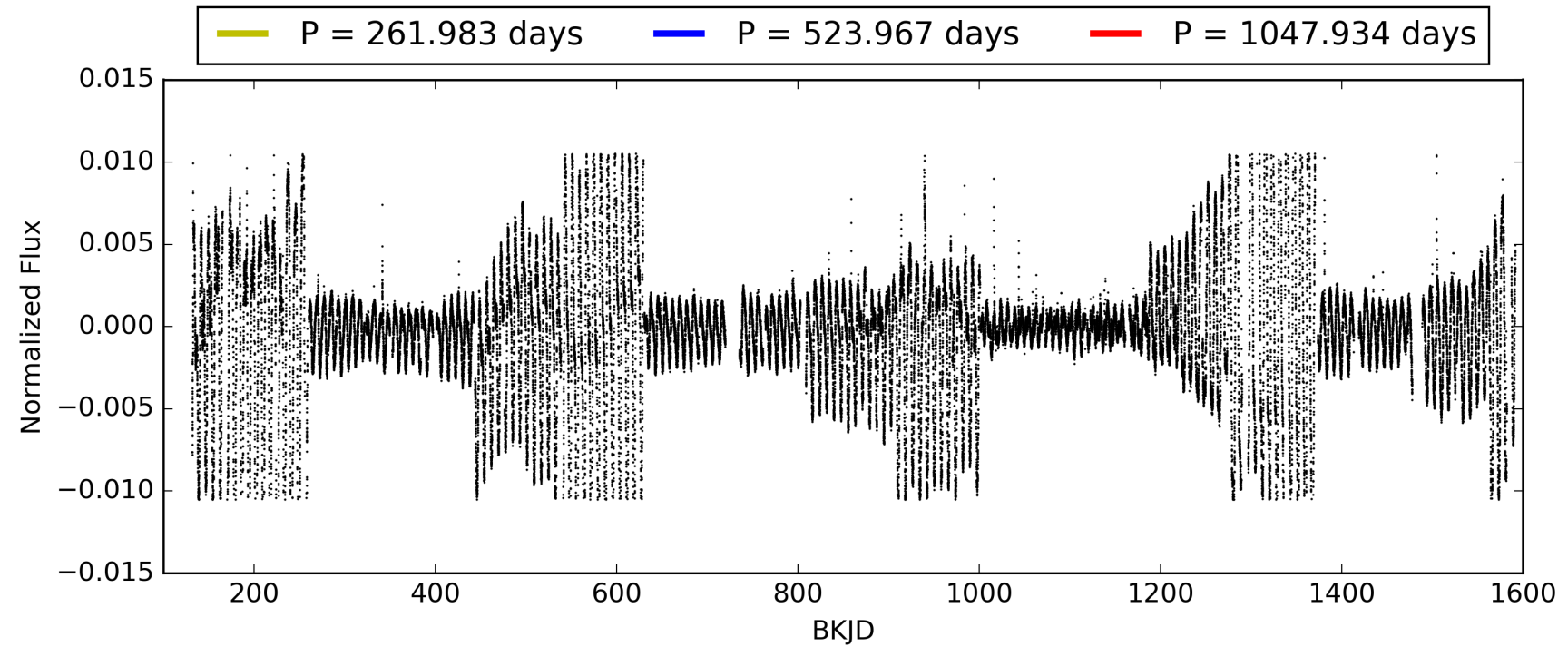
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:57:26 Z

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

TCE 008540644-03, PDC Light Curves

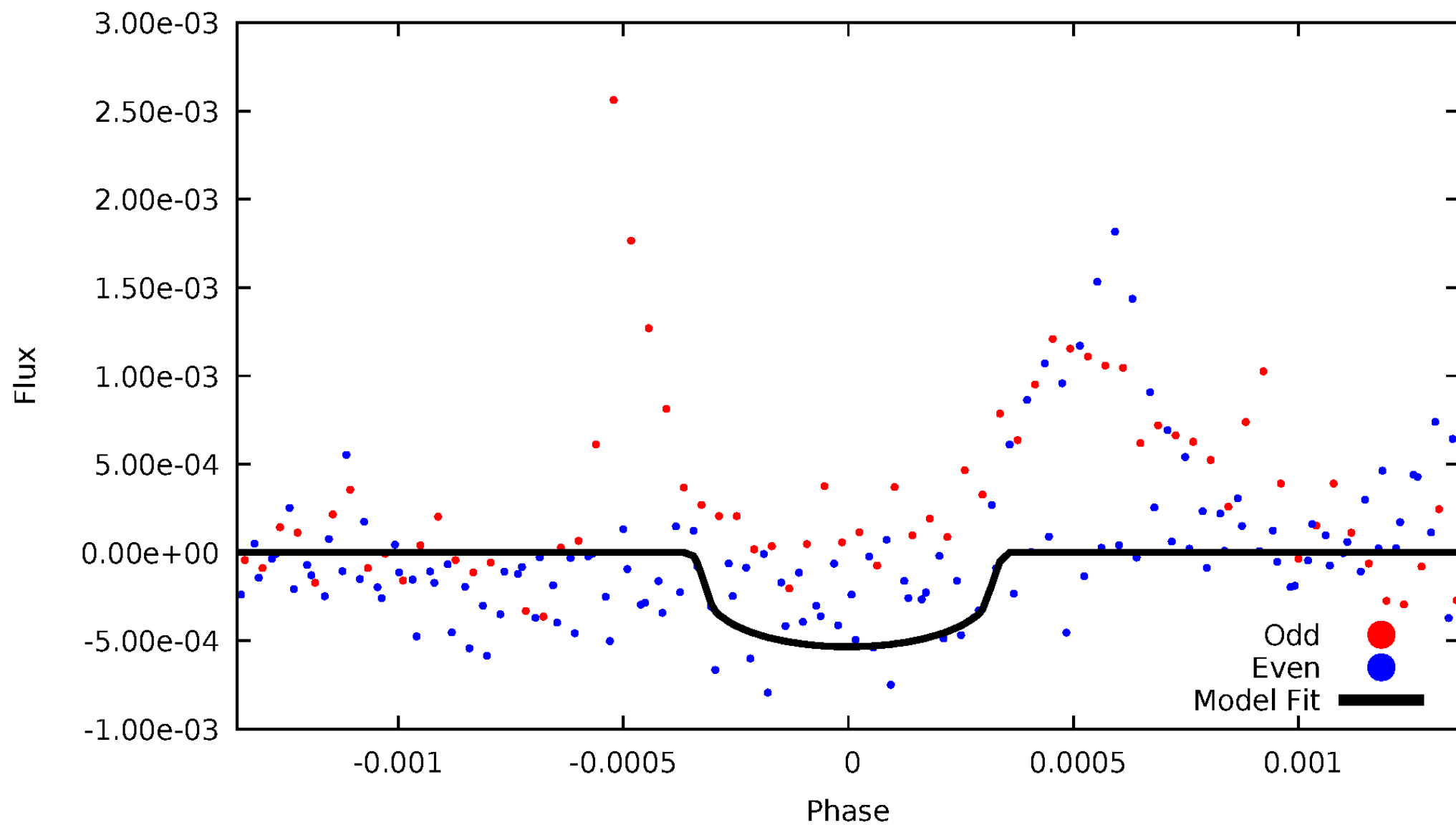


TCE 008540644-03



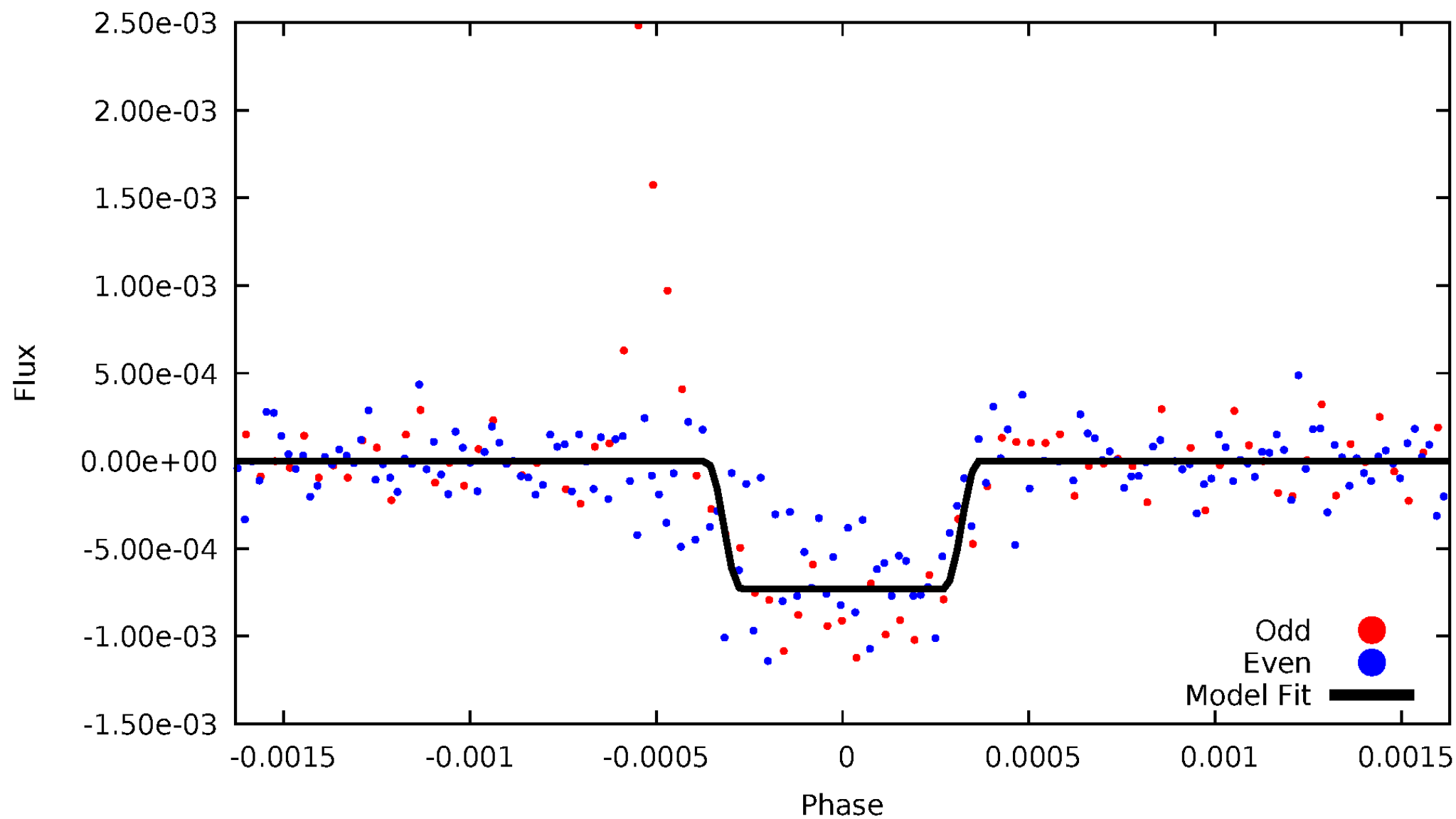
DV Odd/Even

TCE 008540644-03



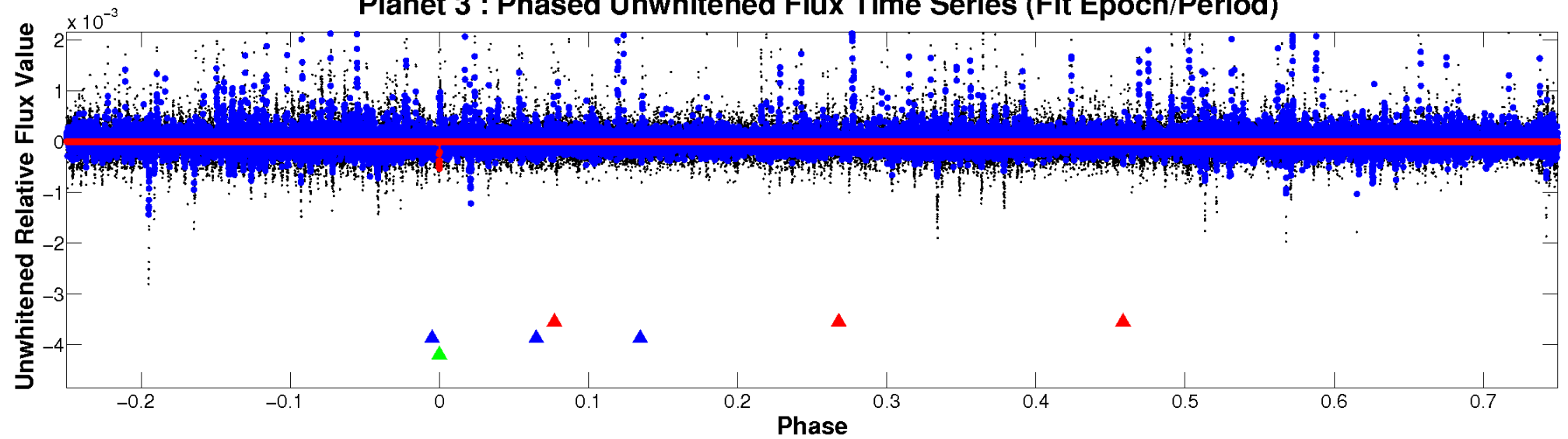
ALT Odd/Even

TCE 008540644-03

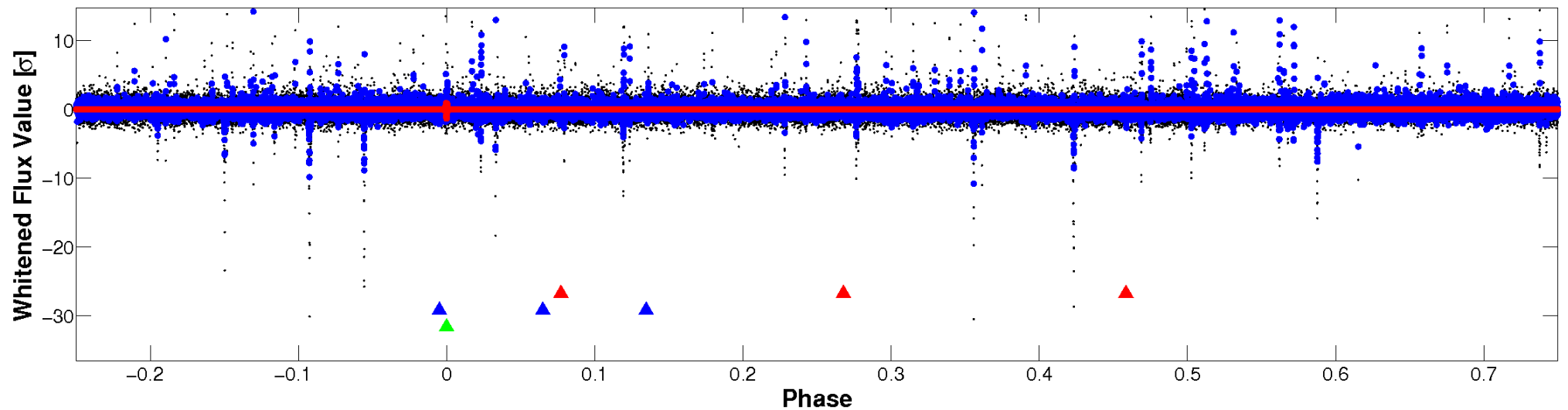


Non-Whitened Vs. Whitened Light Curve

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

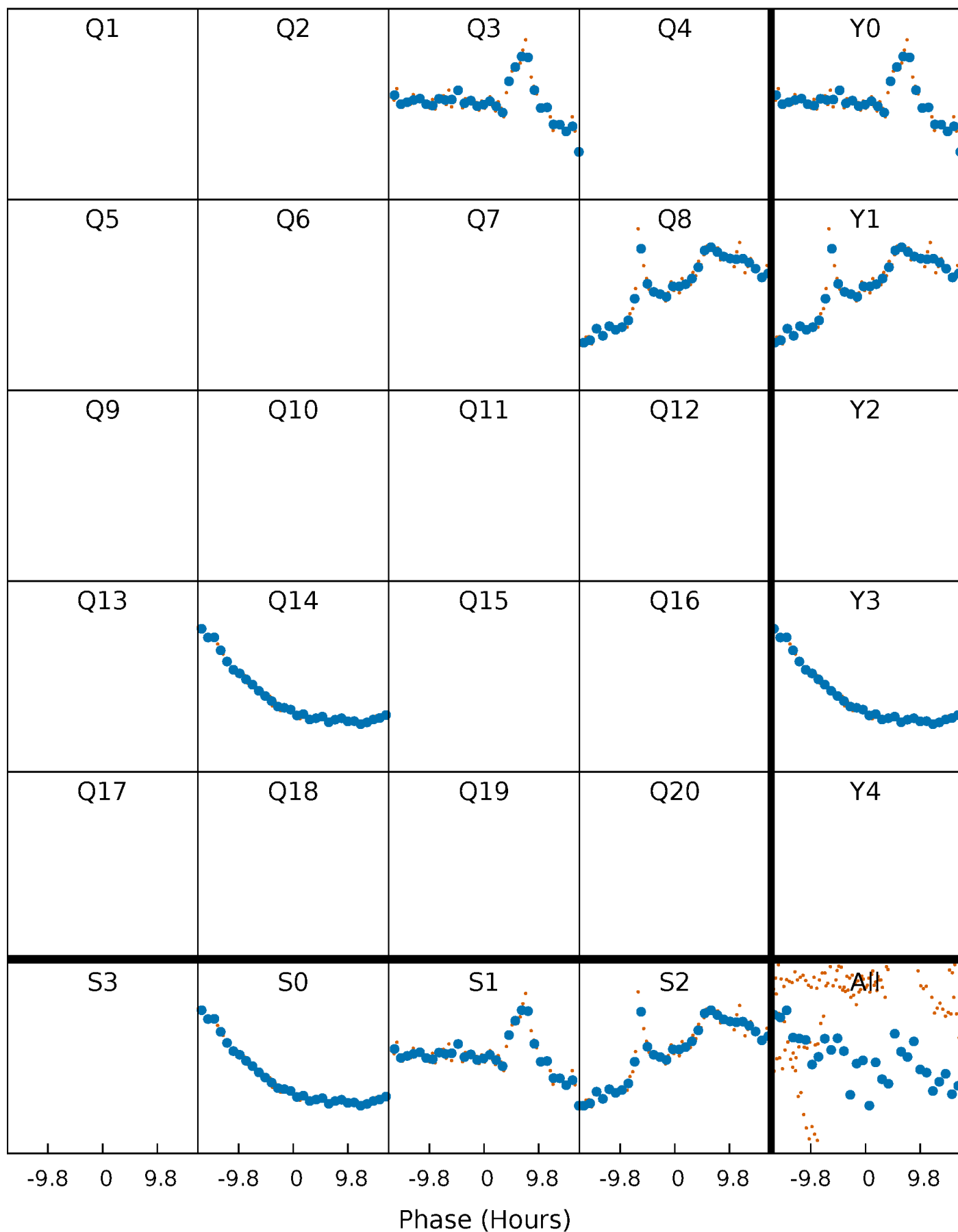


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



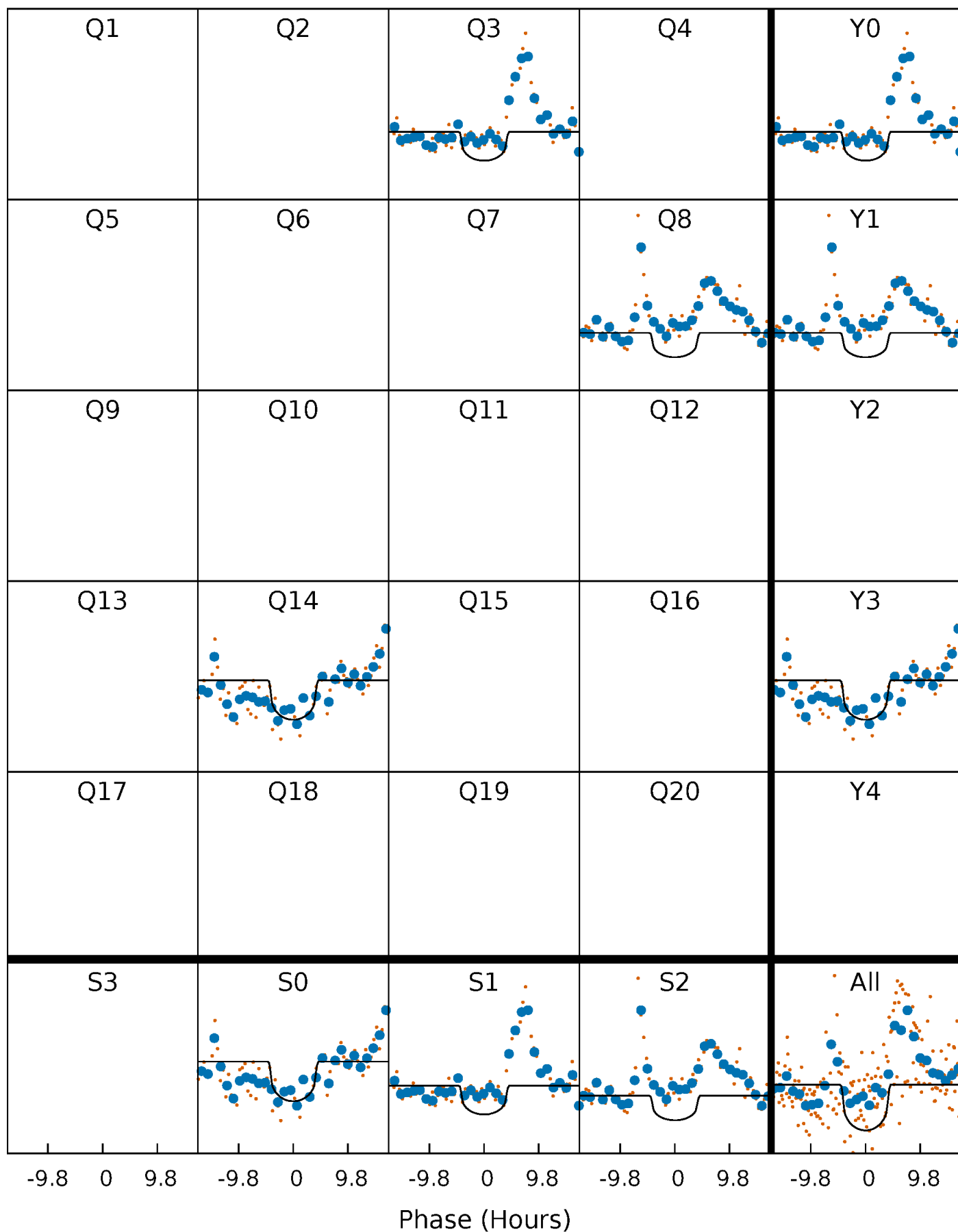
PDC Quarter-Phased Transit Curves

TCE 008540644-03 $P=523.966880$ Days $T_0=269.926098$ (BKJD)



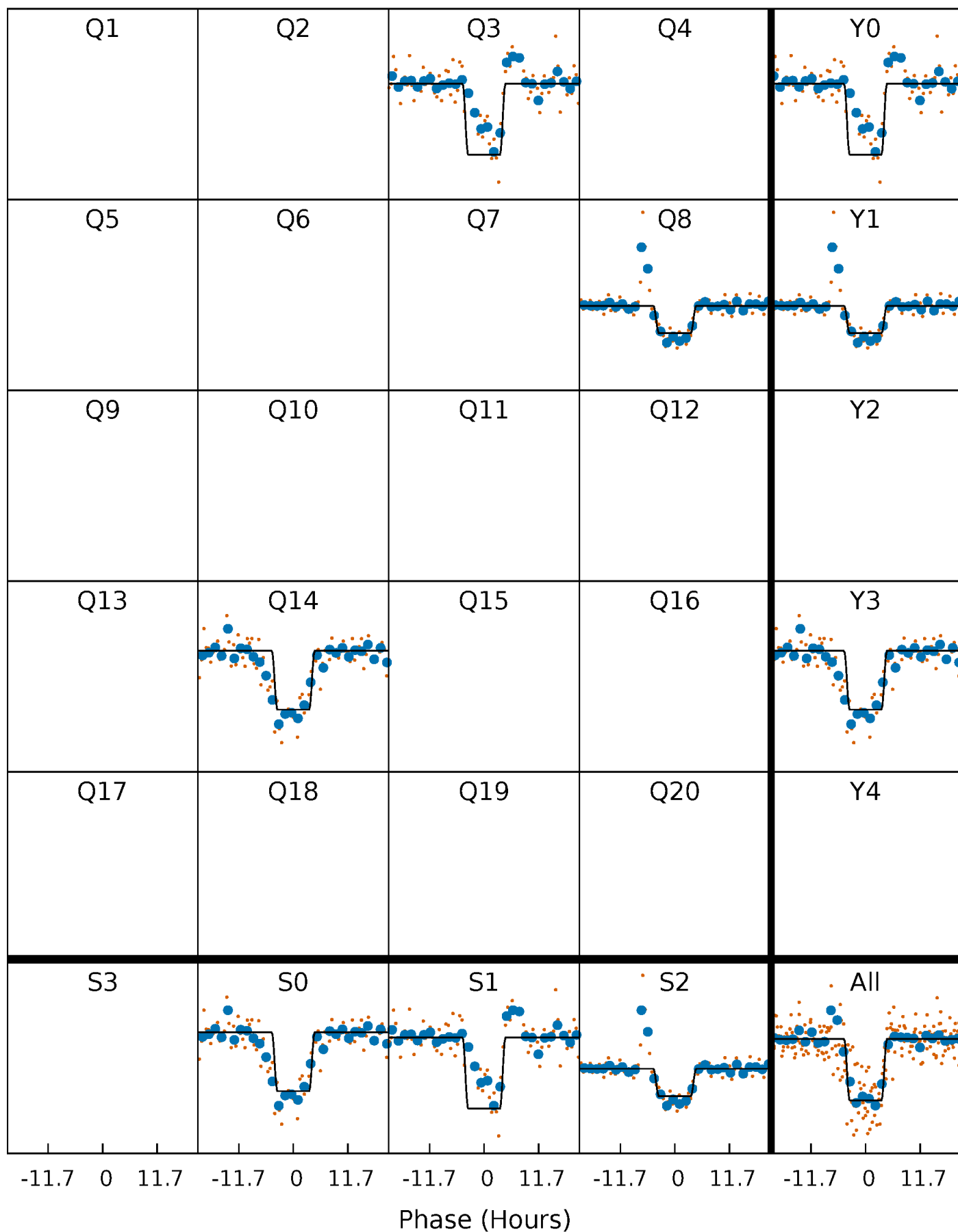
DV Quarter-Phased Transit Curves

TCE 008540644-03 $P=523.966880$ Days $T_0=269.926098$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

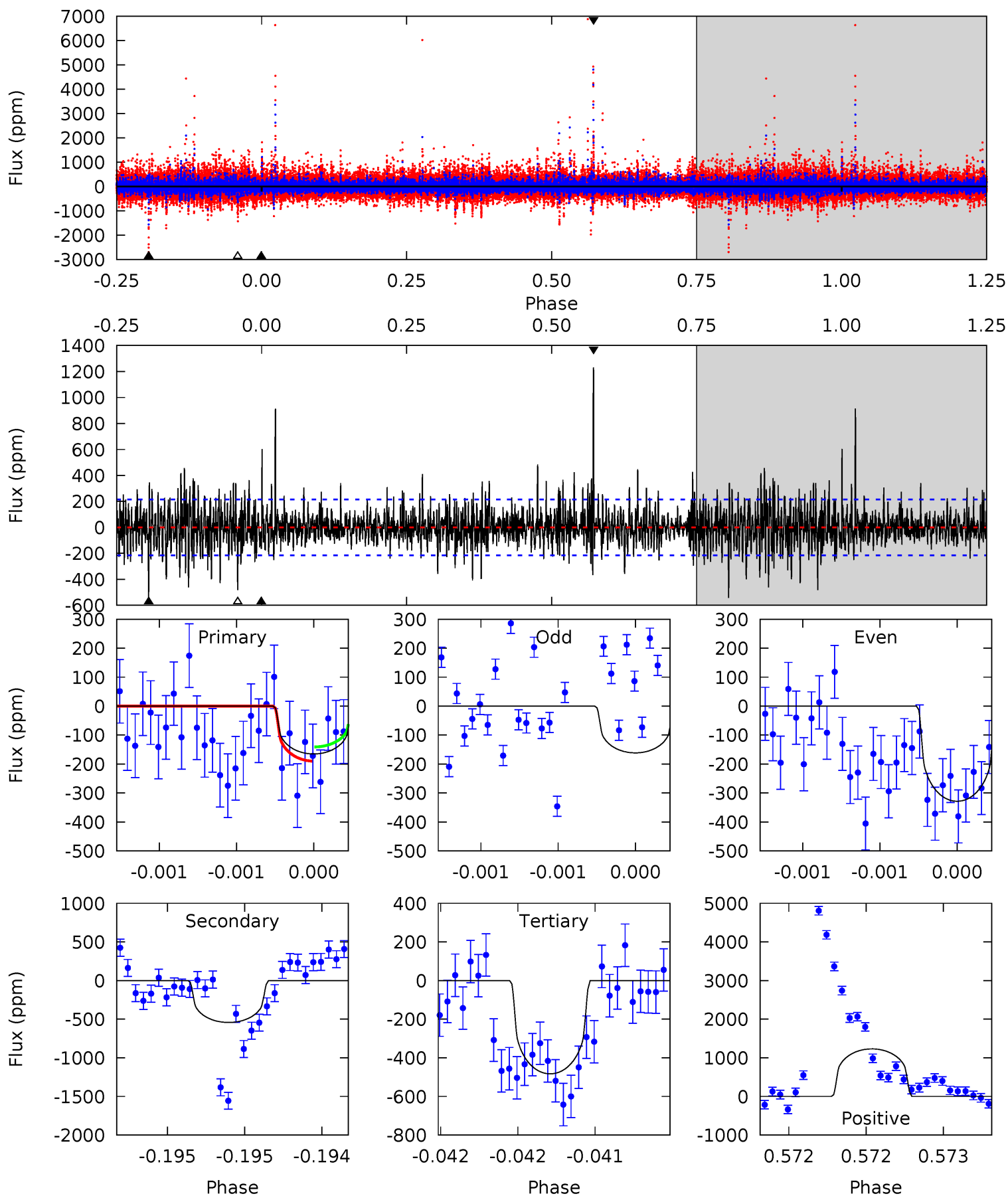
TCE 008540644-03 P=523.964157 Days $T_0=269.942636$ (BKJD)



DV Model-Shift Uniqueness Test

008540644-03, P = 523.966880 Days, E = 269.926098 Days

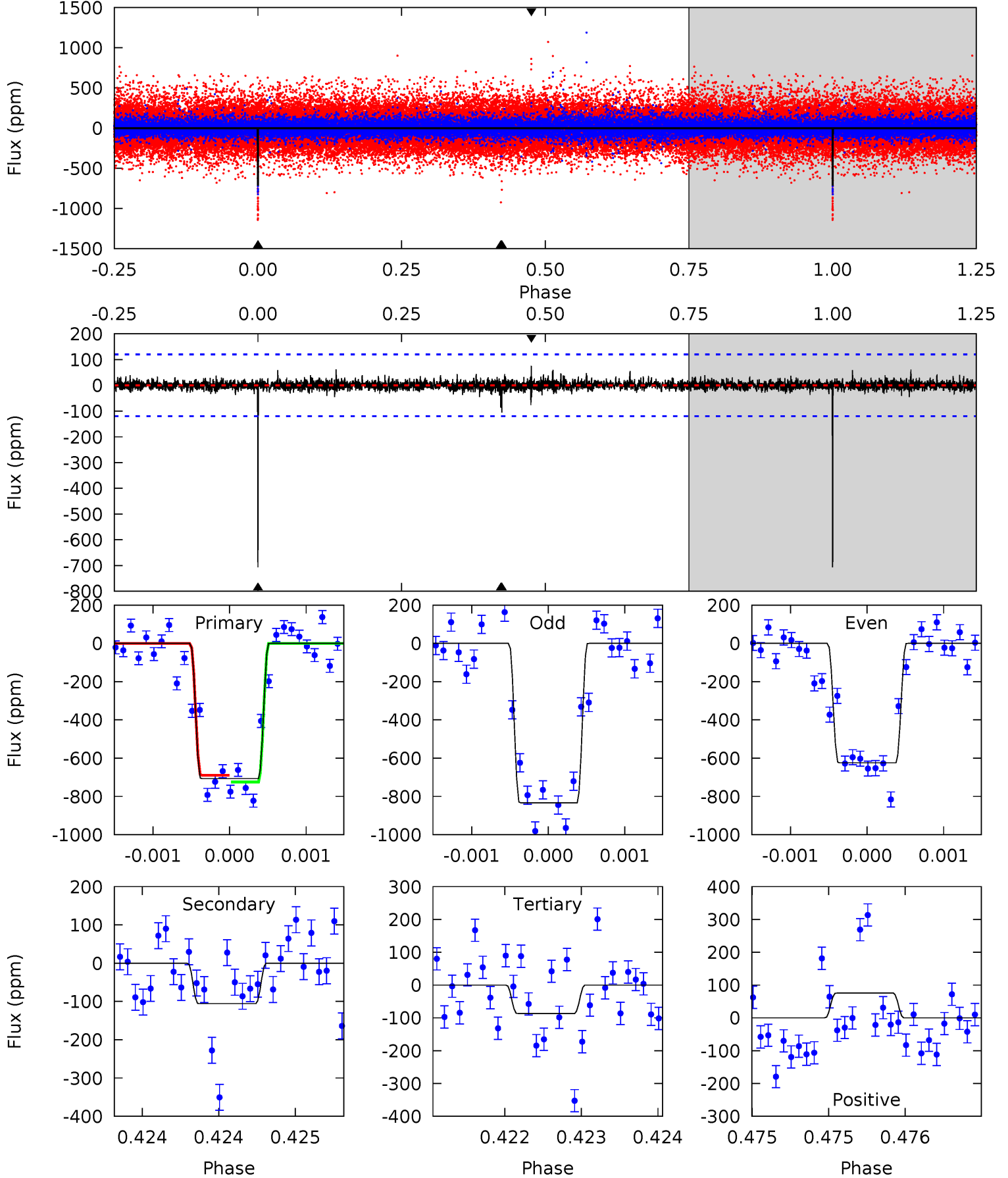
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.24	13.9	12.4	31.6	5.52	3.39	3.02	-8.15	-27.3	1.53	-17.7	1.51	1.17	0.69	0.62



Alt Model-Shift Uniqueness Test

008540644-03, P = 523.964157 Days, E = 269.942636 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.5	4.85	3.98	3.46	5.51	3.38	0.50	28.5	29.0	0.87	1.39	4.33	0.88	0.10	0.81



Stellar Parameters For KIC 008540644

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4577^{+137}_{-137}	$4.663^{+0.054}_{-0.032}$	$-0.700^{+0.300}_{-0.300}$	$0.585^{+0.047}_{-0.047}$	$0.574^{+0.061}_{-0.033}$	$4.042^{+0.923}_{-0.517}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-8%	+11%/-6%	+23%/-13%
Source	PHO1	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 008540644-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-542 ± 39	$1.53^{+1.02}_{-0.84}$	209^{+7}_{-7}	4531^{+2002}_{-764}	$142475^{+533041}_{-89851}$
Alt.	-106 ± 22	$1.79^{+1.07}_{-0.95}$	209^{+8}_{-7}	3228^{+914}_{-412}	20085^{+69105}_{-12499}

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

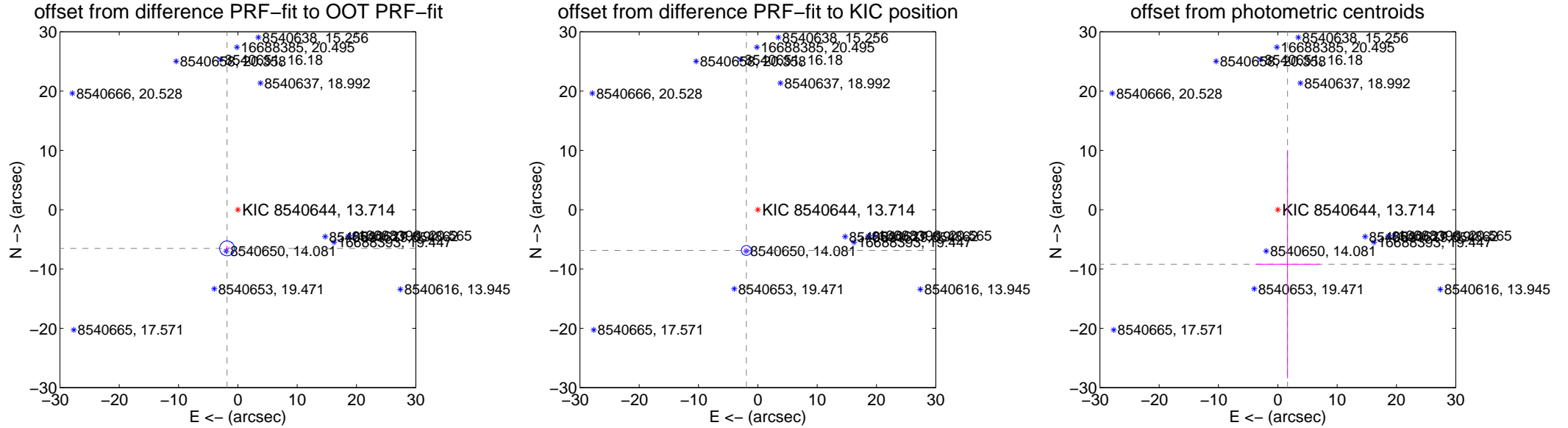
DV Centroid Data

Supplemental centroid analysis for 008540644-03. Kepler magnitude: 13.71. Transit SNR 9.43

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.75 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.767 ± 0.417	16.23	1.820 ± 0.208	-6.518 ± 0.429
PRF-fit source offset from KIC position	7.139 ± 0.277	25.73	1.938 ± 0.181	-6.871 ± 0.246
photometric centroid source offset	9.33 ± 18.99	0.49	-1.64 ± 5.40	-9.19 ± 19.26



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- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000 are from the UKIRT catalog.

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

Q1 no difference image



Q1 no OOT image



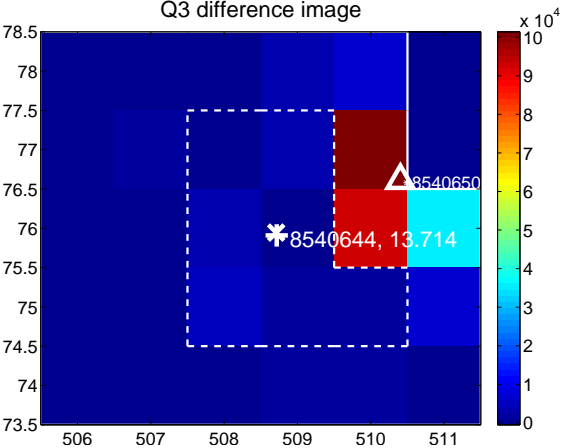
Q2 no difference image



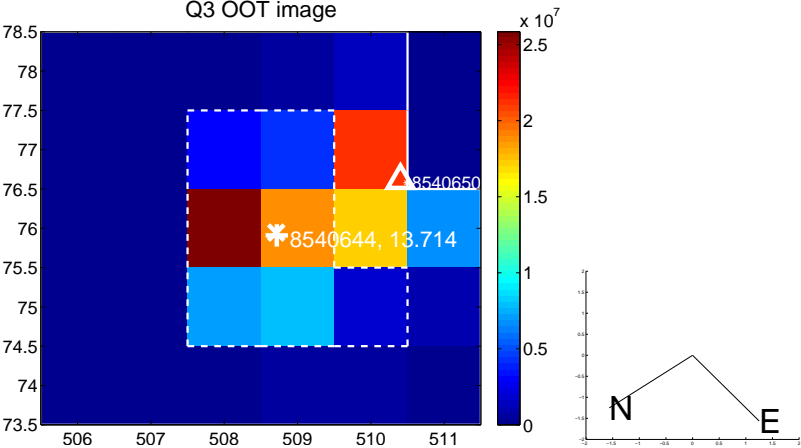
Q2 no OOT image



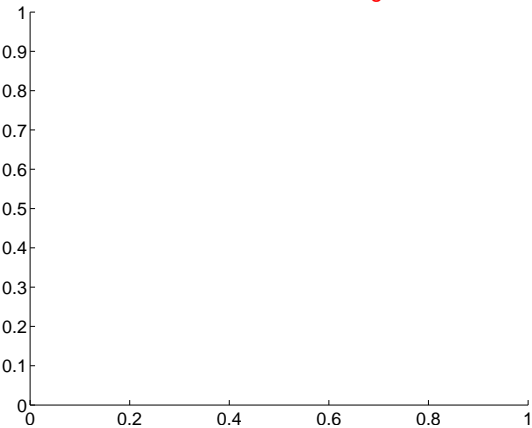
Q3 difference image



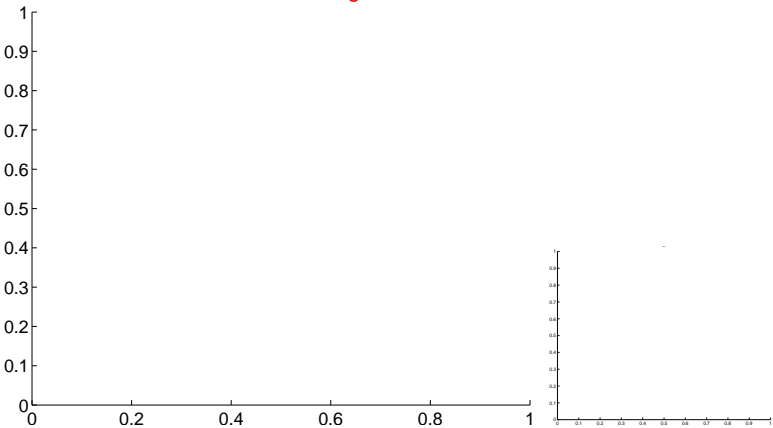
Q3 OOT image



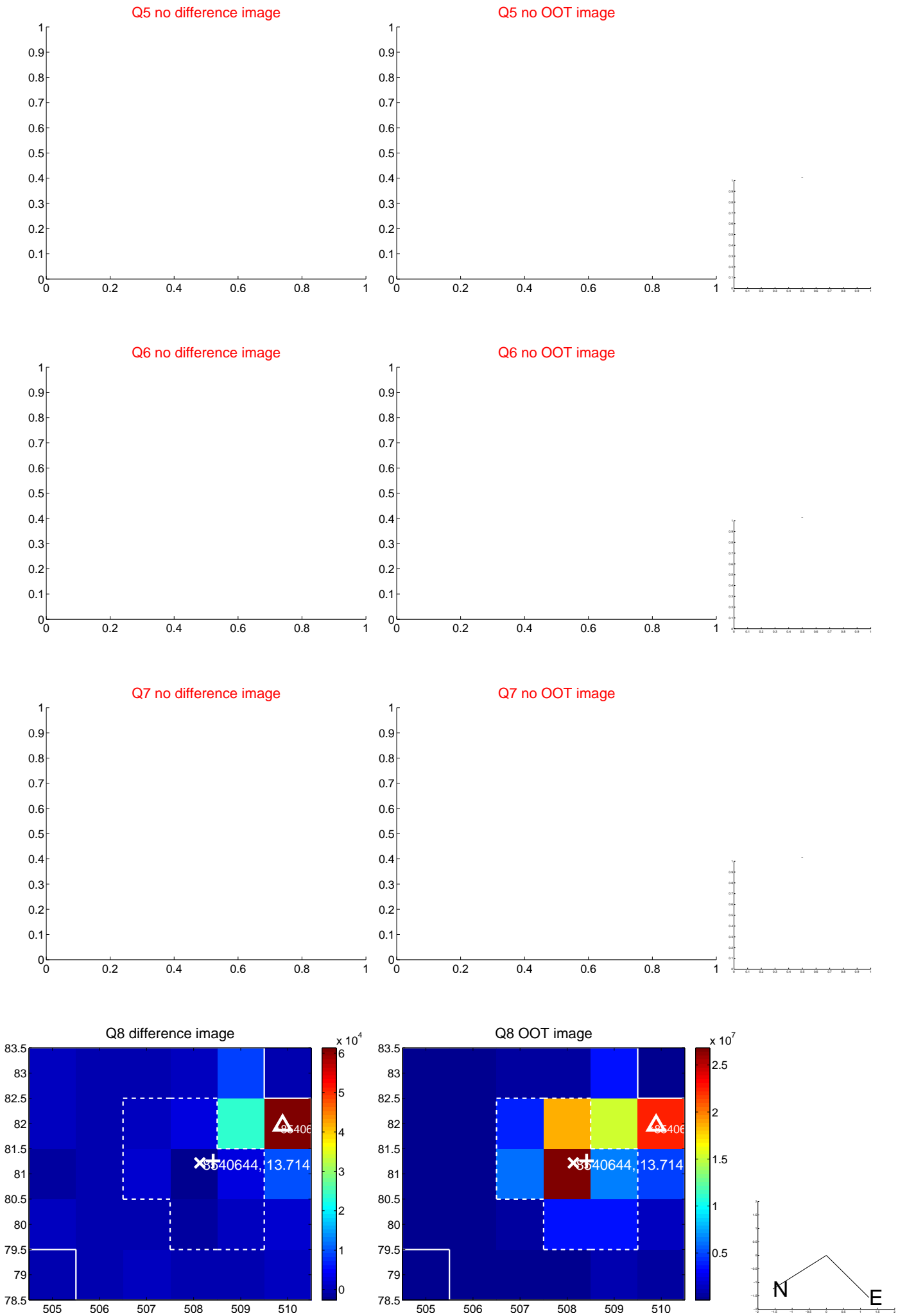
Q4 no difference image



Q4 no OOT image



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.

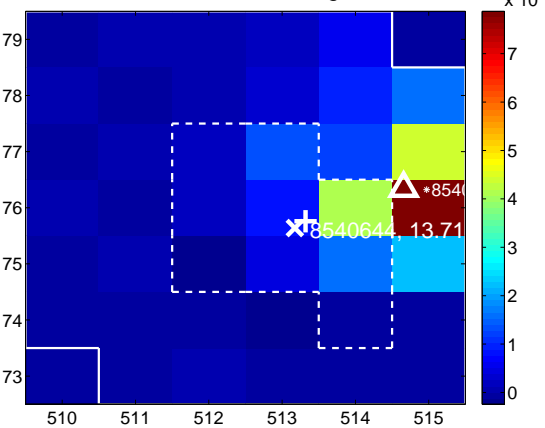
Q13 no difference image



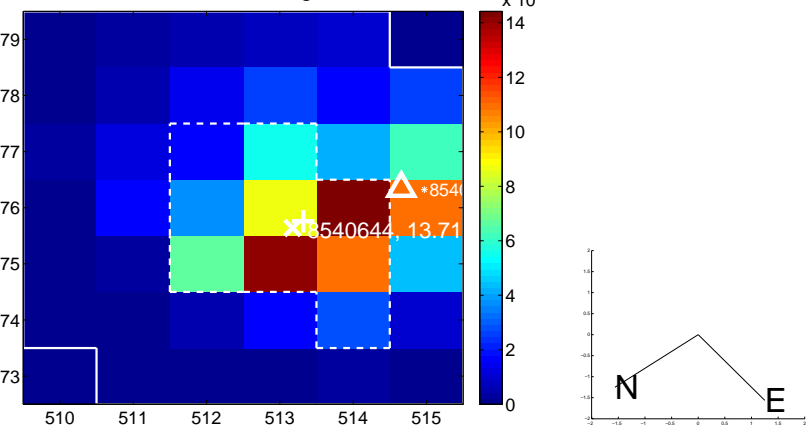
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



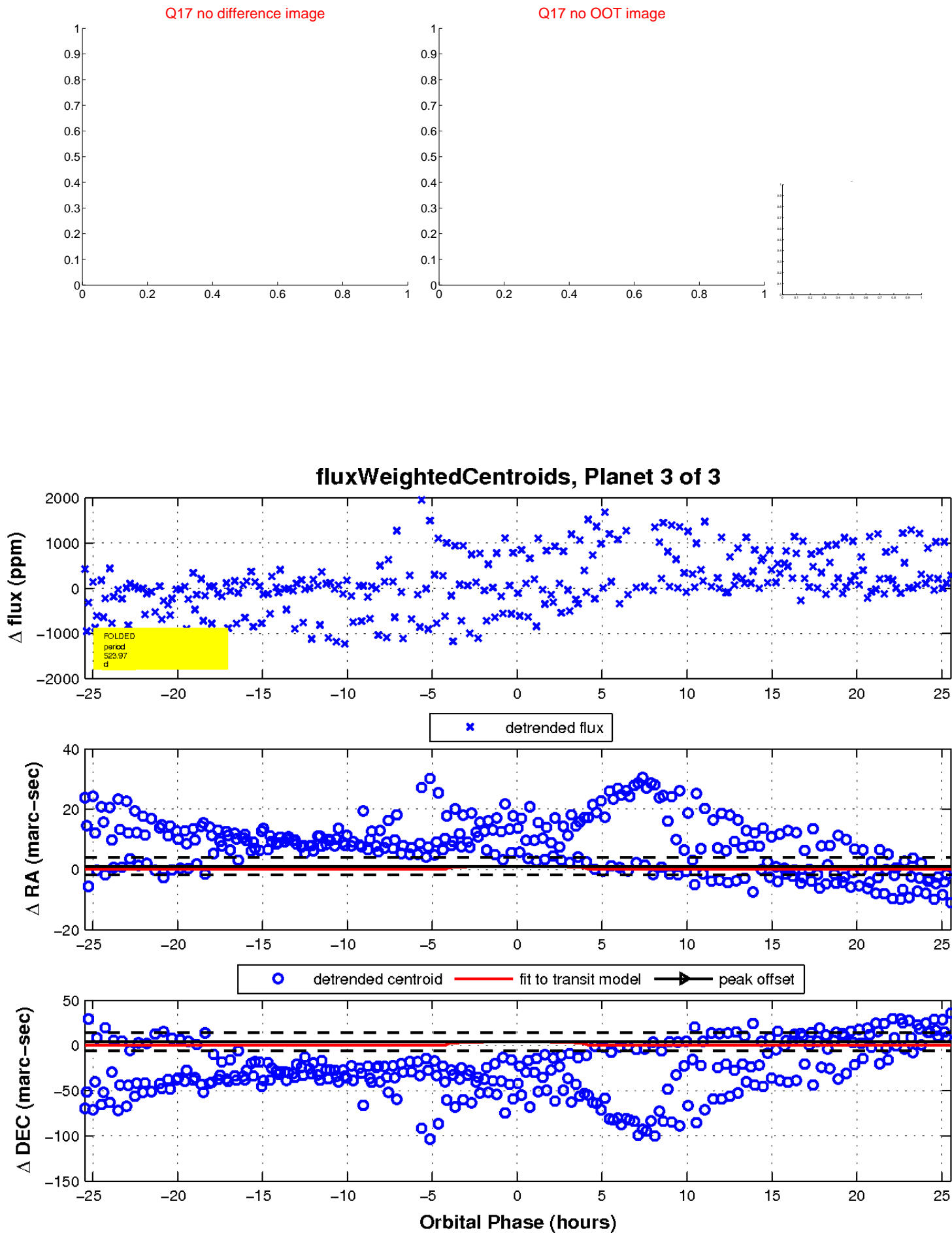
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

