

KIC 005371776

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})
005371776-01	OBS	1557.01	3.295695	133.967589	1707.7	2.015	119.2	120.8	0.69	4723	3.41	138.51
005371776-02	OBS	1557.02	9.653486	134.856536	1335.9	3.064	57.3	59.3	0.69	4723	2.90	33.05
005371776-03	OBS	1557.03	5.315957	132.429109	944.9	1.175	34.0	43.7	0.69	4723	2.56	73.22
005371776-04	OBS	1557.04	1.499143	131.568877	239.8	1.533	20.6	23.2	0.69	4723	1.32	395.94

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005371776-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

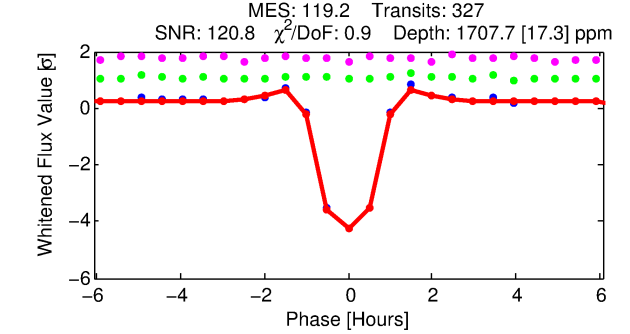
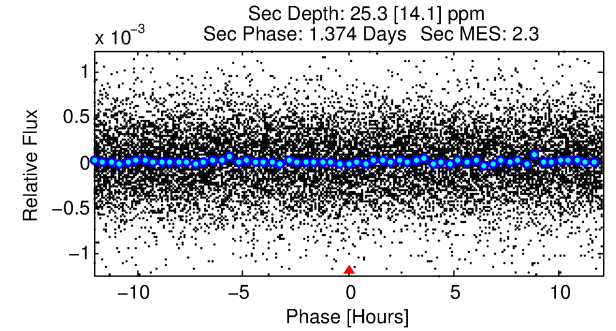
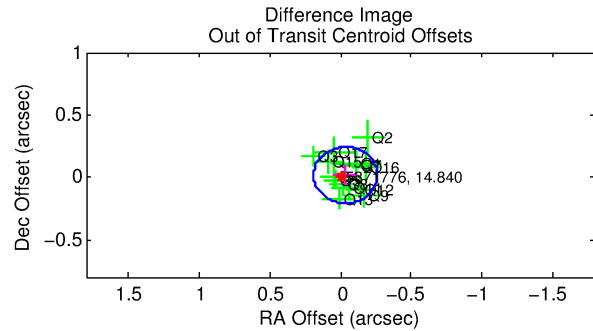
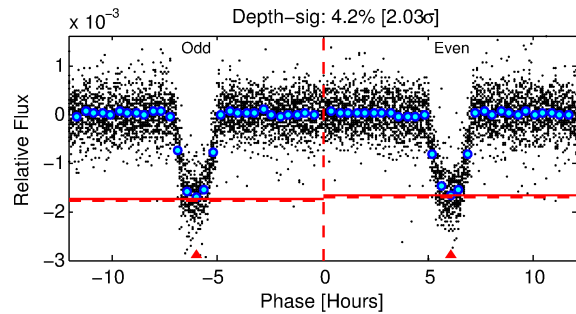
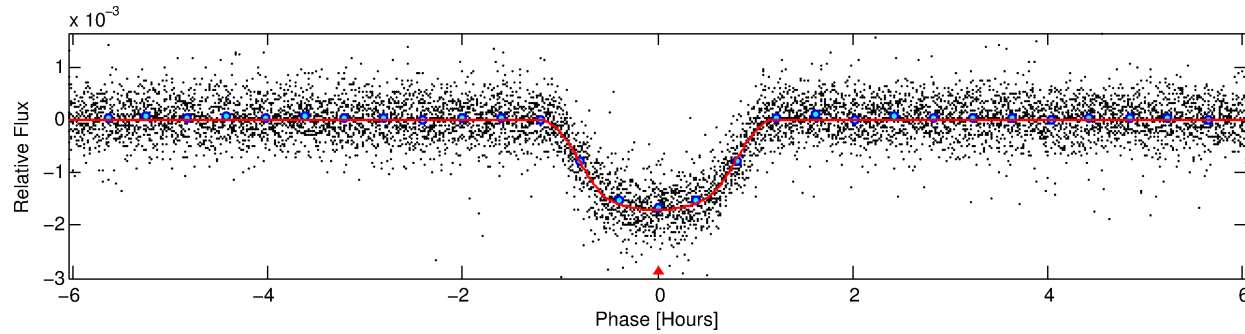
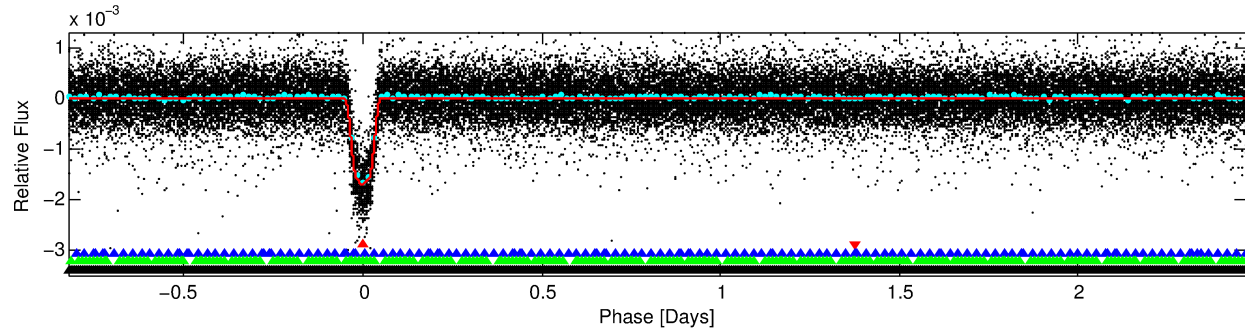
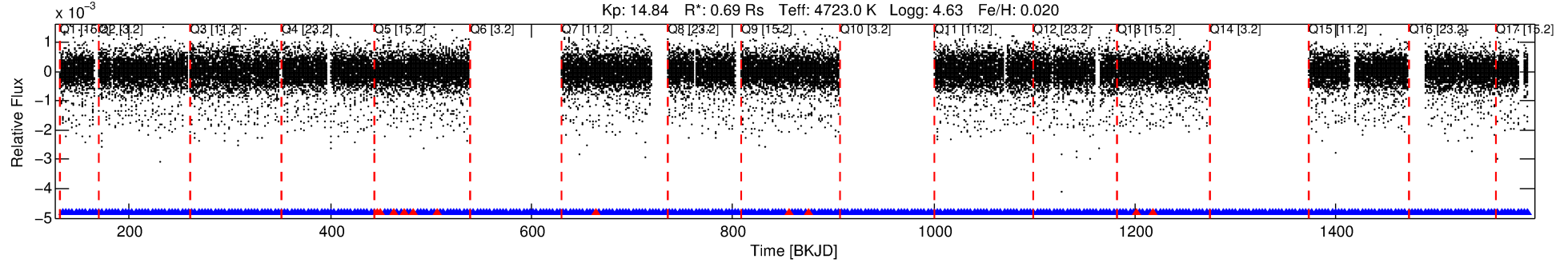
Ephemeris Match Information For 005371776-01

No Significant Match Found

DV One-Page Summary

KIC: 5371776 Candidate: 1 of 4 Period: 3.296 d
KOI: K01557.01 Name: Kepler-304b Corr: 0.951

Kp: 14.84 R*: 0.69 Rs Teff: 4723.0 K Logg: 4.63 Fe/H: 0.020



DV Fit Results:

Period = 3.29570 [0.00000] d
Epoch = 133.9676 [0.0003] BKJD
Rp/R* = 0.0452 [0.0014]
a/R* = 7.30 [0.74]
b = 0.87 [0.03]
Seff = 138.51 [16.00]
Teq = 875 [25] K
Rp = 3.41 [0.26] Re
a = 0.0392 [0.0023] AU
Ag = 1.84 [1.04] [0.81σ]
Teffp = 1576 [223] K [3.12σ]

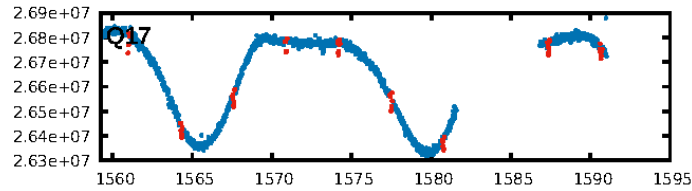
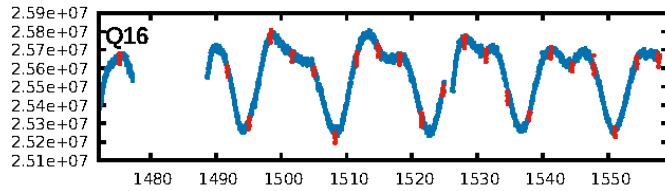
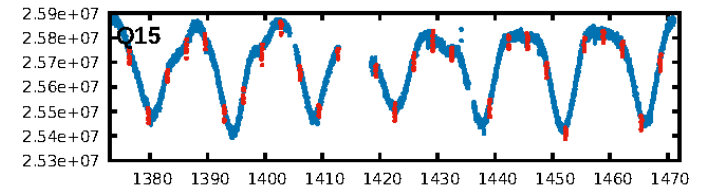
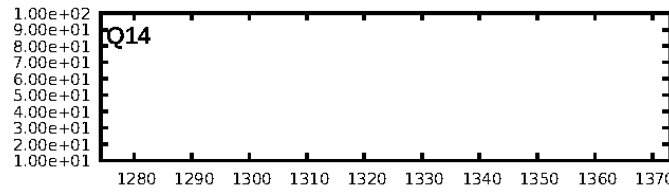
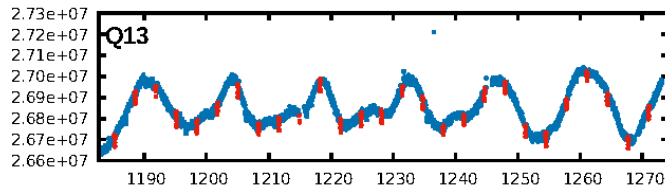
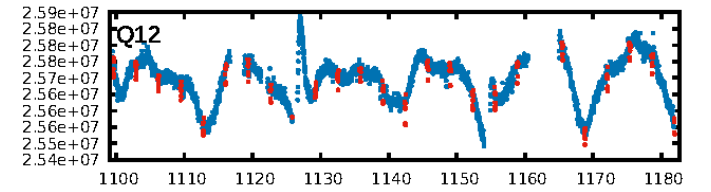
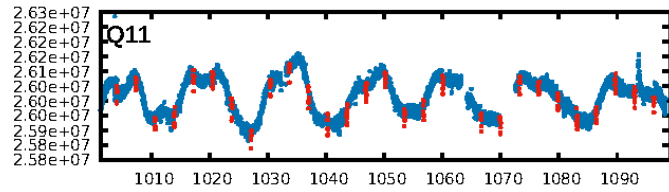
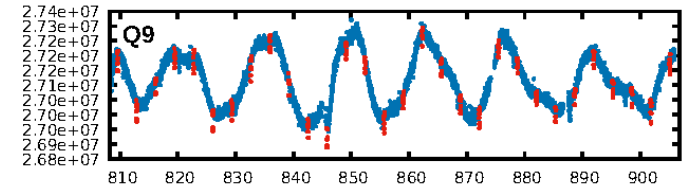
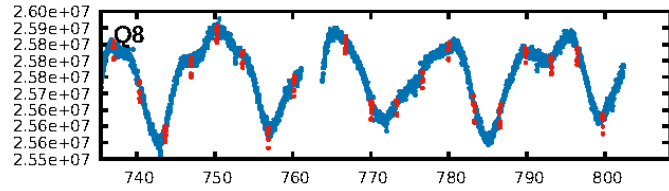
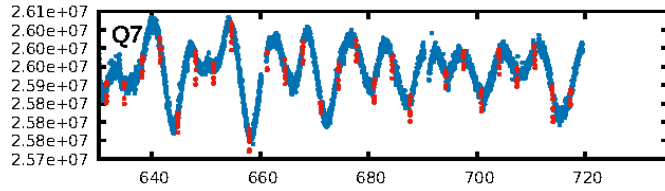
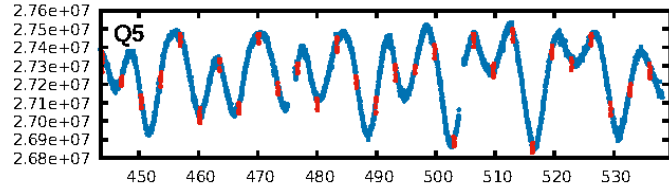
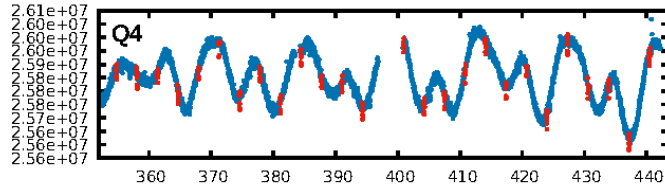
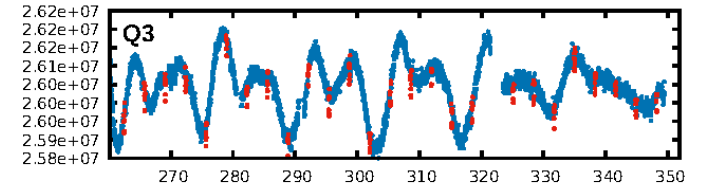
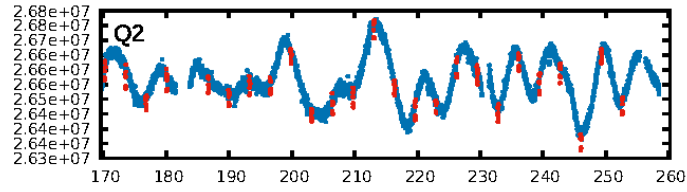
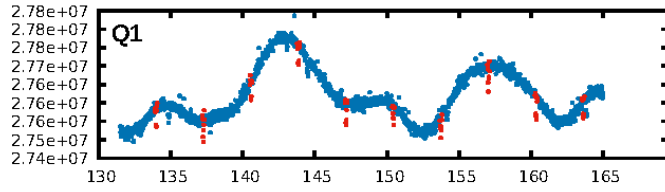
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.03σ]
LongPeriod-sig: 100.0% [20.79σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.96 [297/308]
GhostDiagnostic-chr: 4.368
Centroid-sig: 0.0%
Centroid-so: 0.141 arcsec [1.55σ]
OotOffset-rm: 0.038 arcsec [0.50σ]
KicOffset-rm: 0.071 arcsec [0.94σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
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DiffImageOverlap-fno: 1.00 [14/14]

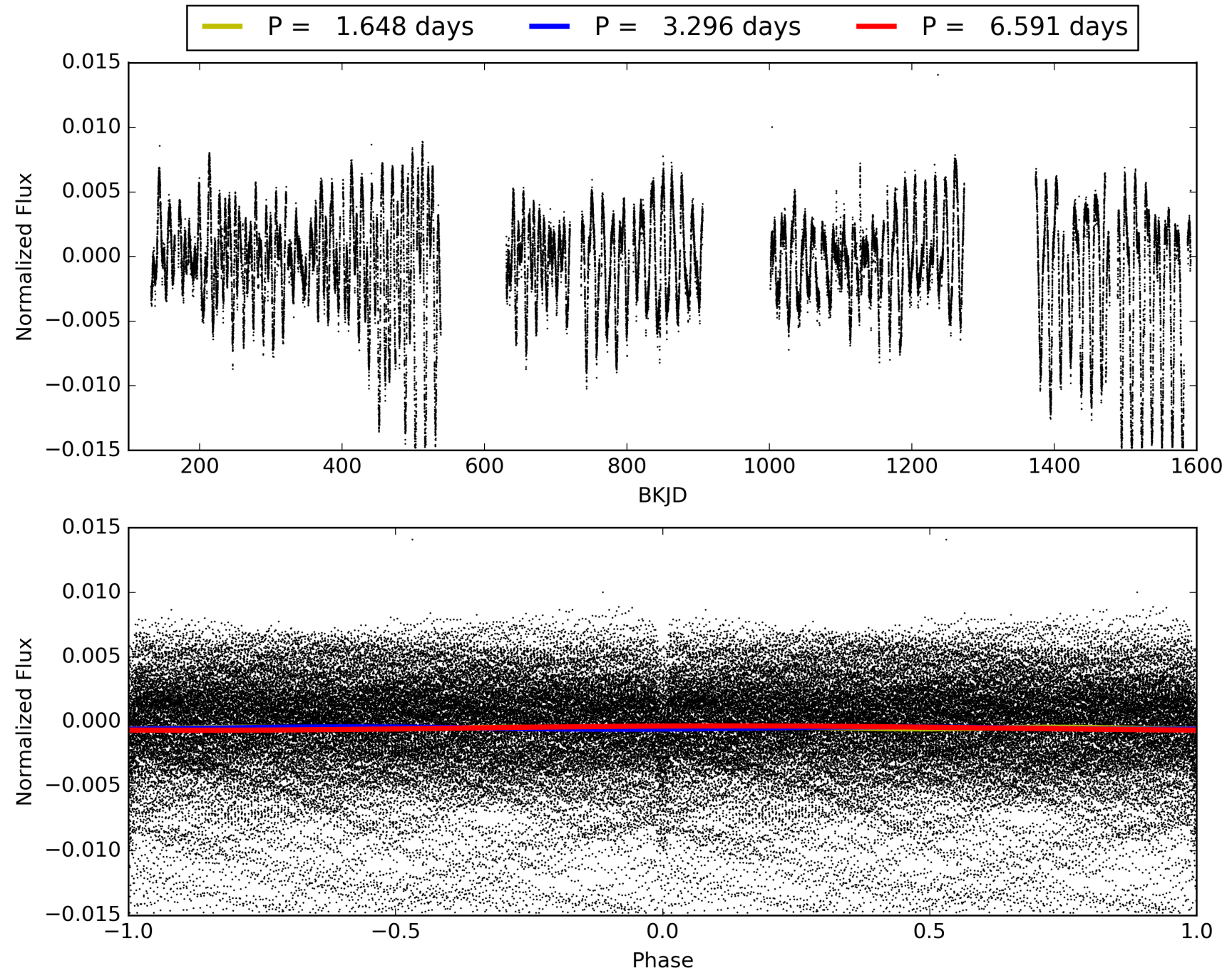
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005371776-01, PDC Light Curves

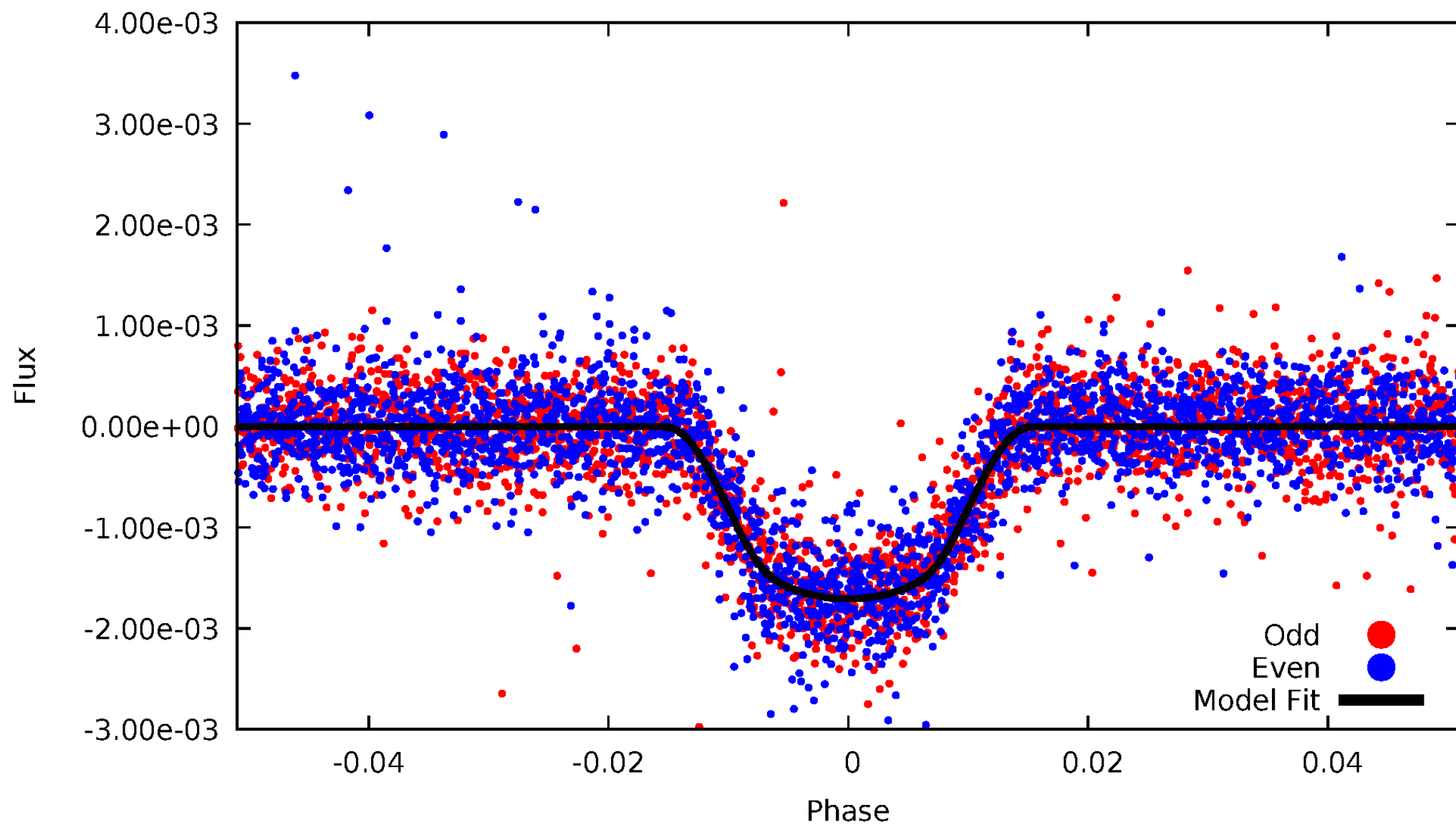


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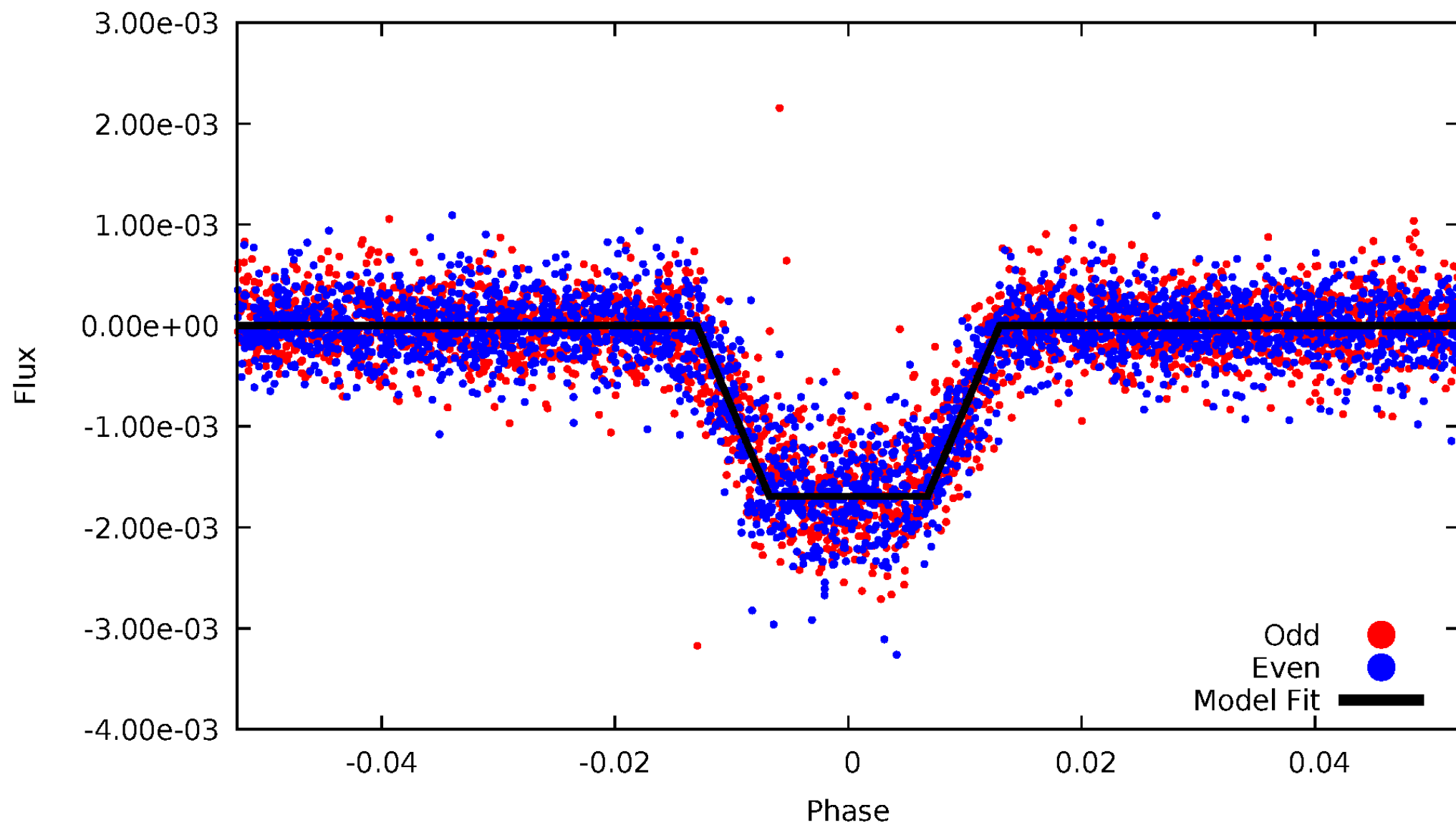
DV Odd/Even

TCE 005371776-01



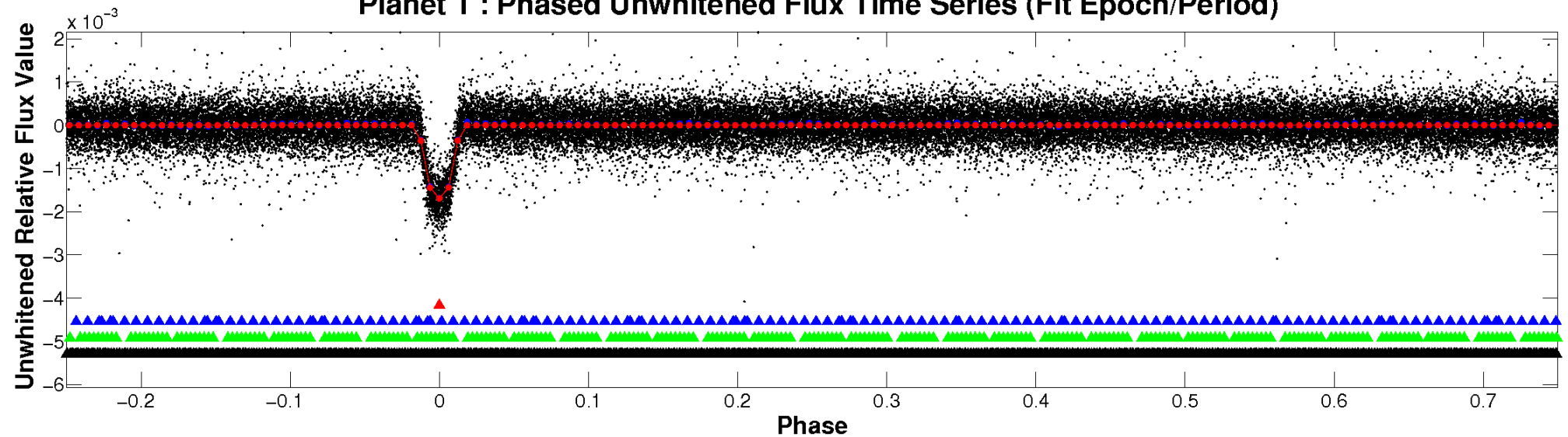
ALT Odd/Even

TCE 005371776-01

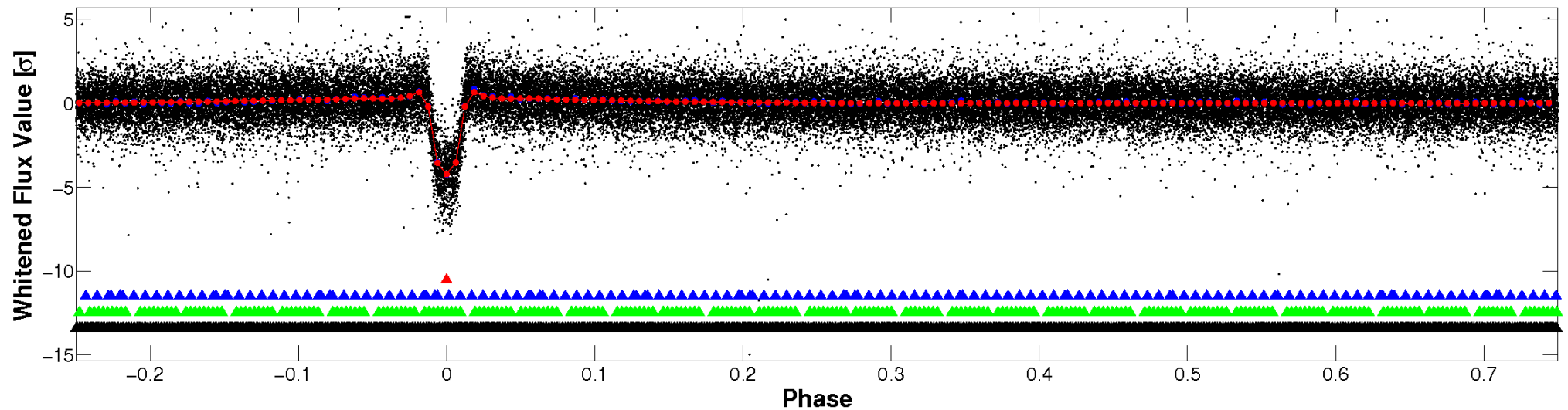


Non-Whitened Vs. Whitened Light Curve

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

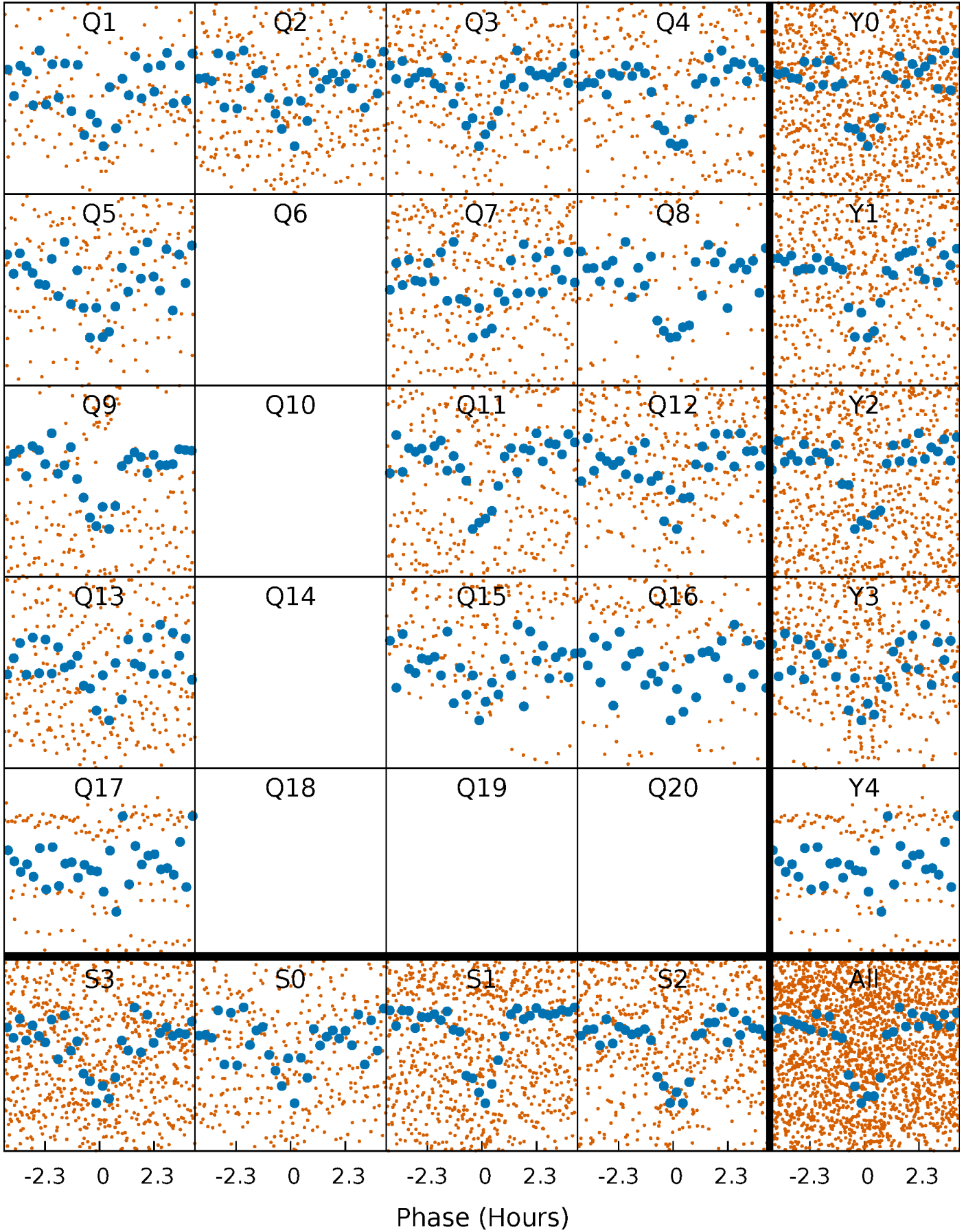


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



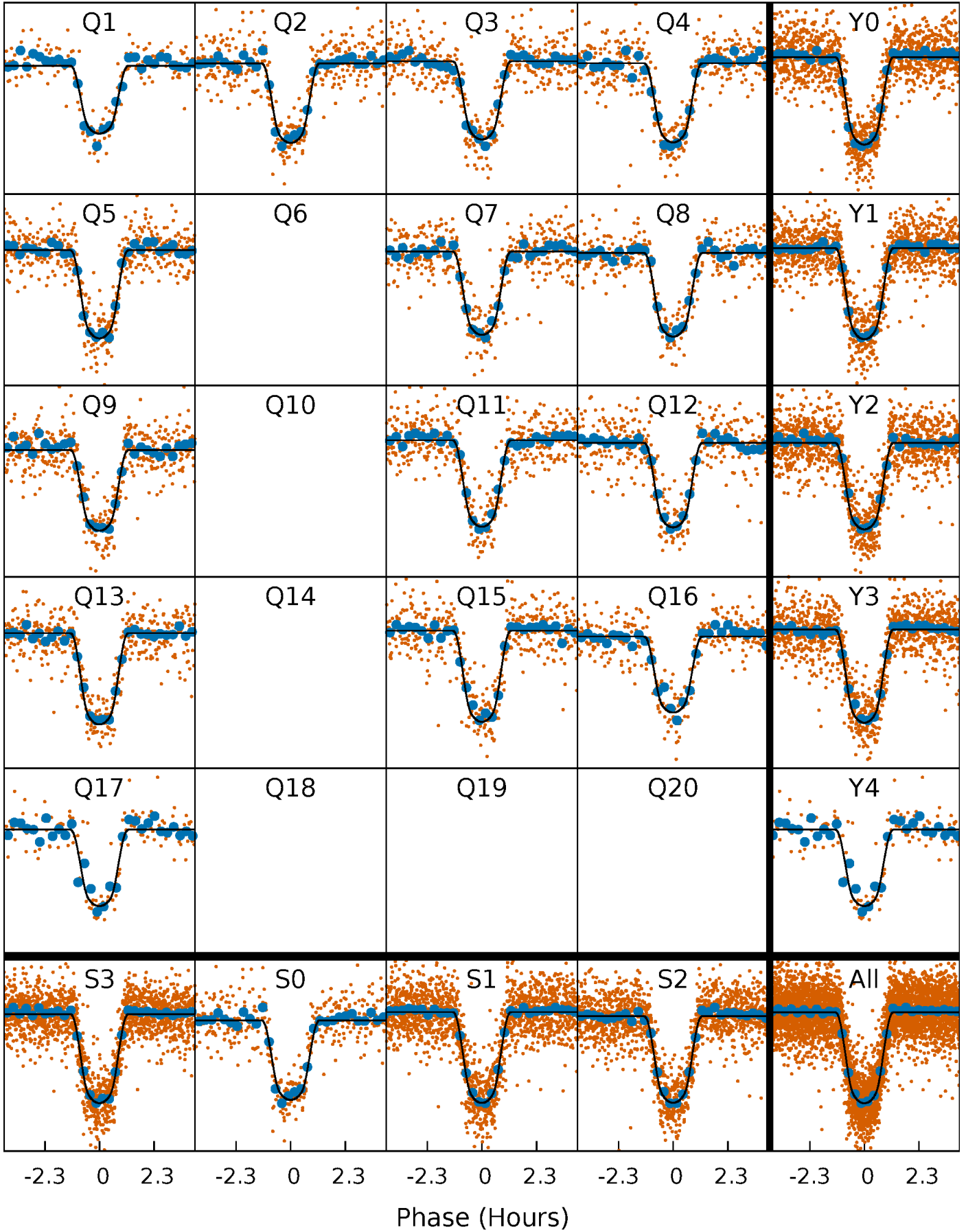
PDC Quarter-Phased Transit Curves

TCE 005371776-01 P= 3.295695 Days $T_0=133.967589$ (BKJD)



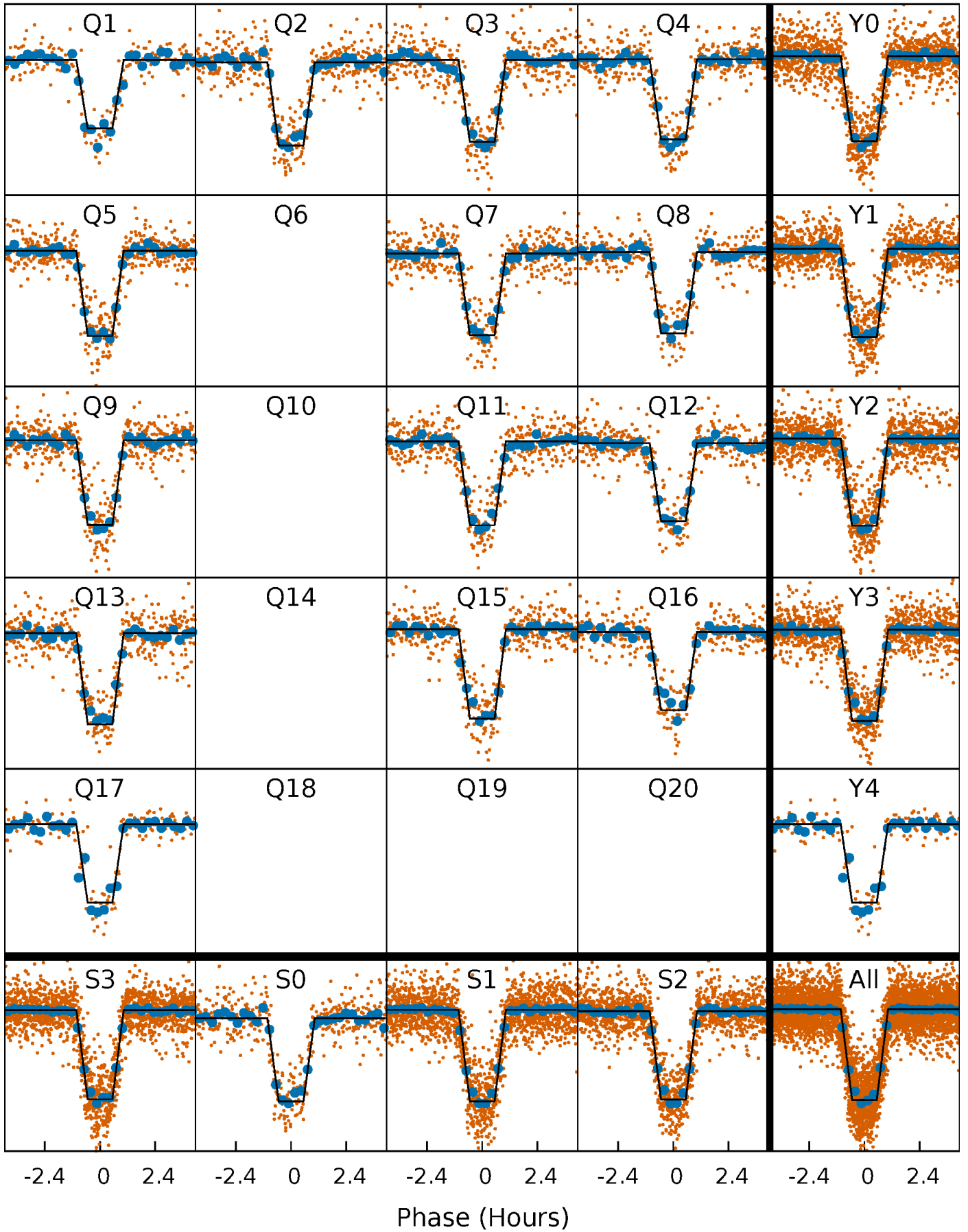
DV Quarter-Phased Transit Curves

TCE 005371776-01 P= 3.295695 Days $T_0=133.967589$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

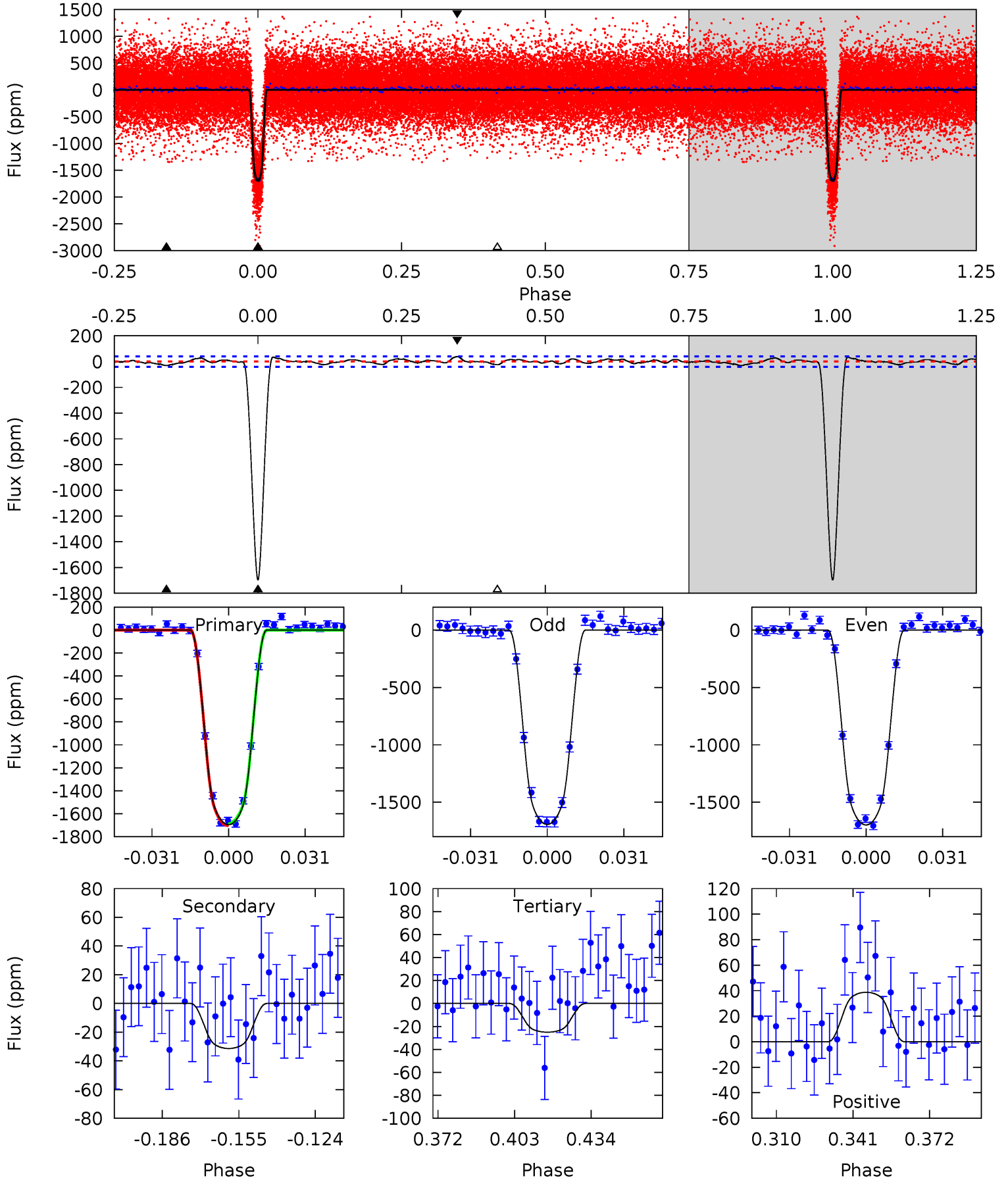
TCE 005371776-01 P= 3.295702 Days $T_0=133.966310$ (BKJD)



DV Model-Shift Uniqueness Test

005371776-01, P = 3.295695 Days, E = 130.671894 Days

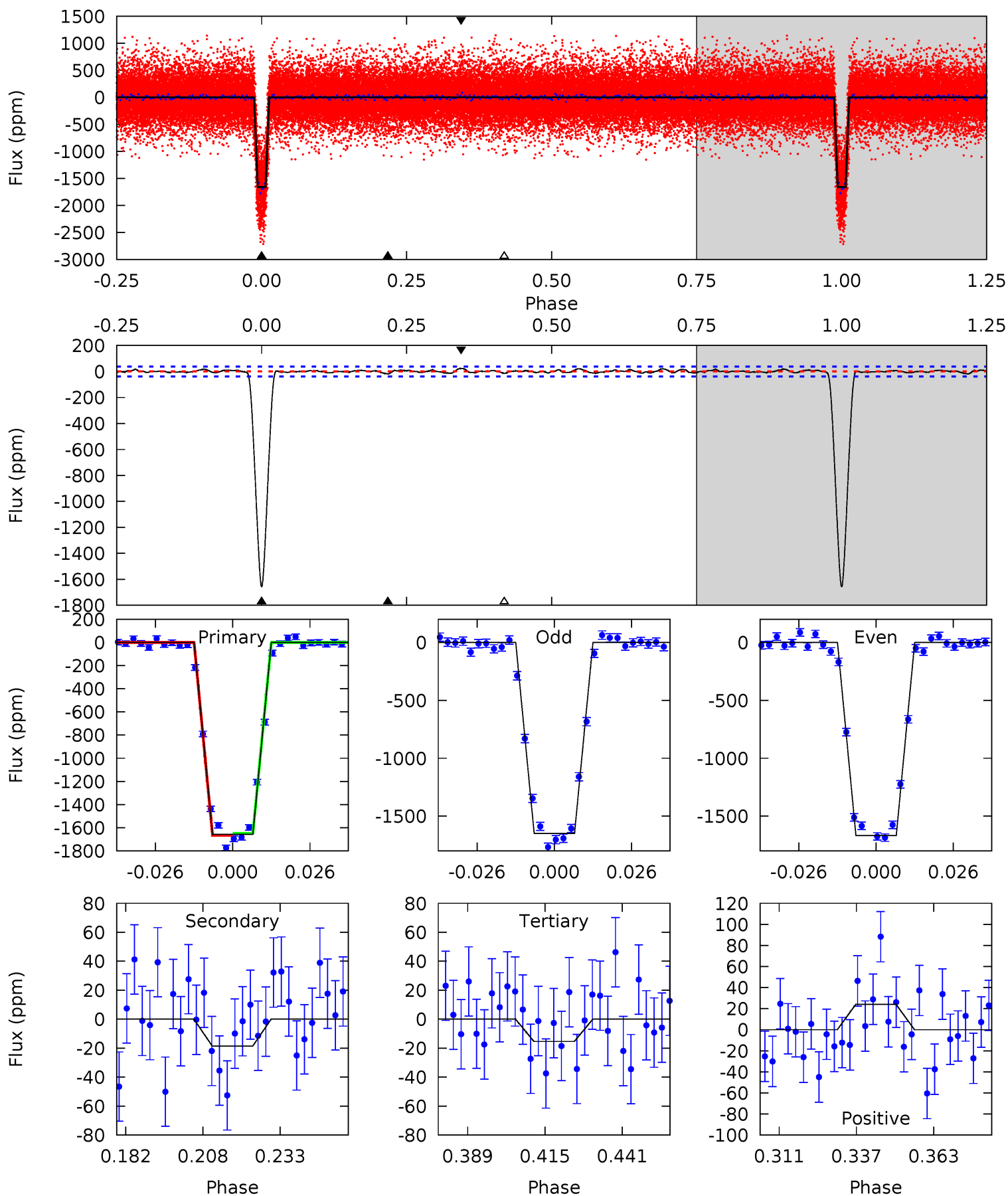
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
199.2	3.69	2.94	4.56	4.80	2.16	1.39	196.3	194.7	0.75	-0.87	0.28	1.00	0.02	0.92



Alt Model-Shift Uniqueness Test

005371776-01, P = 3.295702 Days, E = 130.670608 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
210.3	2.37	1.96	3.05	4.84	2.23	0.98	208.4	207.3	0.41	-0.69	1.19	1.00	0.01	1.03



Stellar Parameters For KIC 005371776

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4723^{+94}_{-94}	$4.628^{+0.012}_{-0.045}$	$0.020^{+0.150}_{-0.150}$	$0.691^{+0.049}_{-0.025}$	$0.760^{+0.031}_{-0.047}$	$3.248^{+0.212}_{-0.562}$
	+2%/-2%	+0%/-1%	+750%/-750%	+7%/-4%	+4%/-6%	+7%/-17%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 005371776-01 / KOI 1557.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-31 ± 9	$3.47^{+0.18}_{-0.15}$	1230^{+30}_{-26}	2437^{+90}_{-123}	$2.233^{+0.621}_{-0.659}$
Alt.	-19 ± 8	$3.16^{+0.16}_{-0.14}$	1231^{+30}_{-27}	2318^{+132}_{-181}	$1.557^{+0.754}_{-0.636}$

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 $A_{\text{obs}} \gg 1.0$

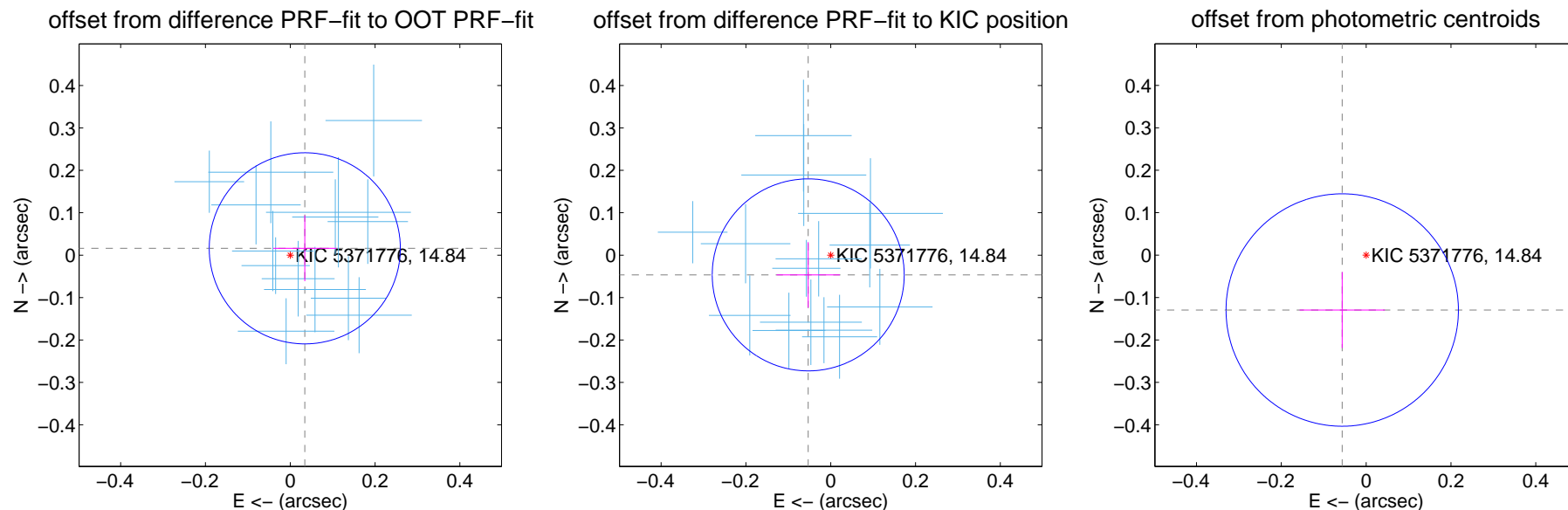
DV Centroid Data

Supplemental centroid analysis for 005371776-01. Kepler magnitude: 14.84. Transit SNR 120.78

There are 14 quarters with good PRF difference image offsets

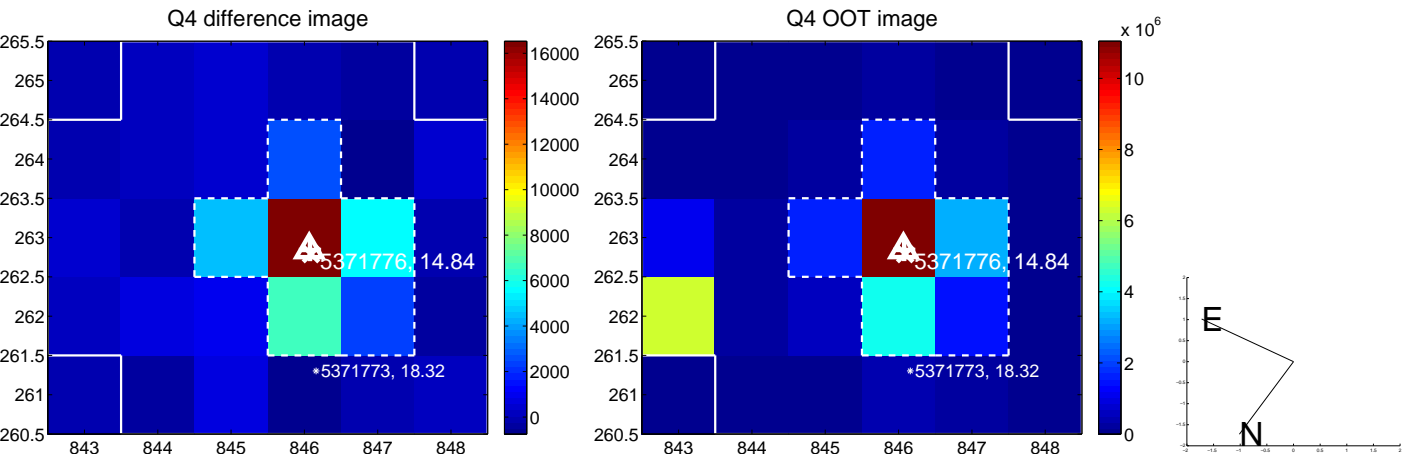
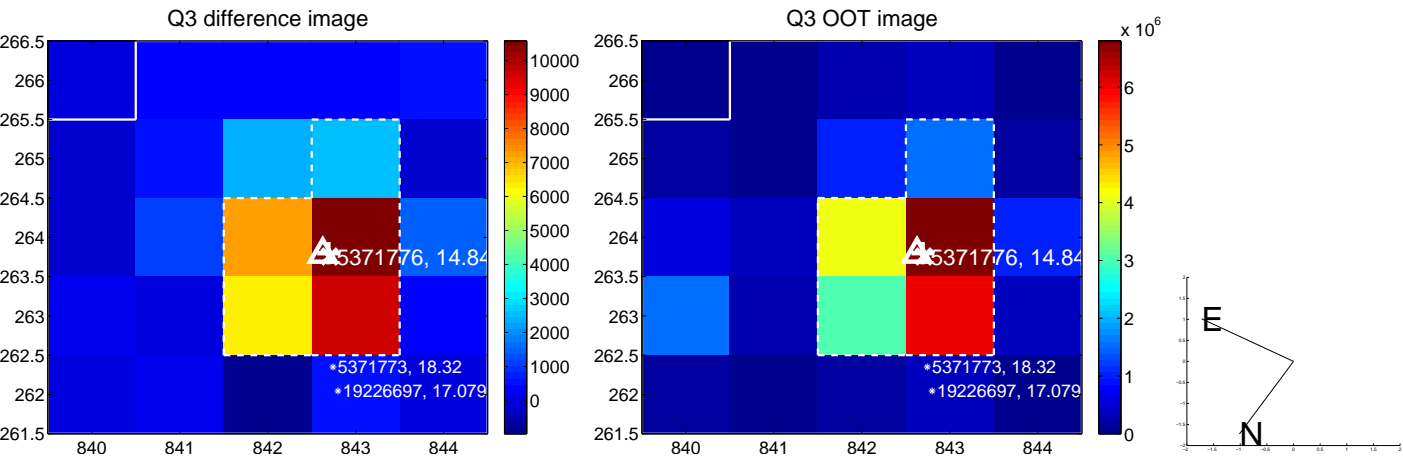
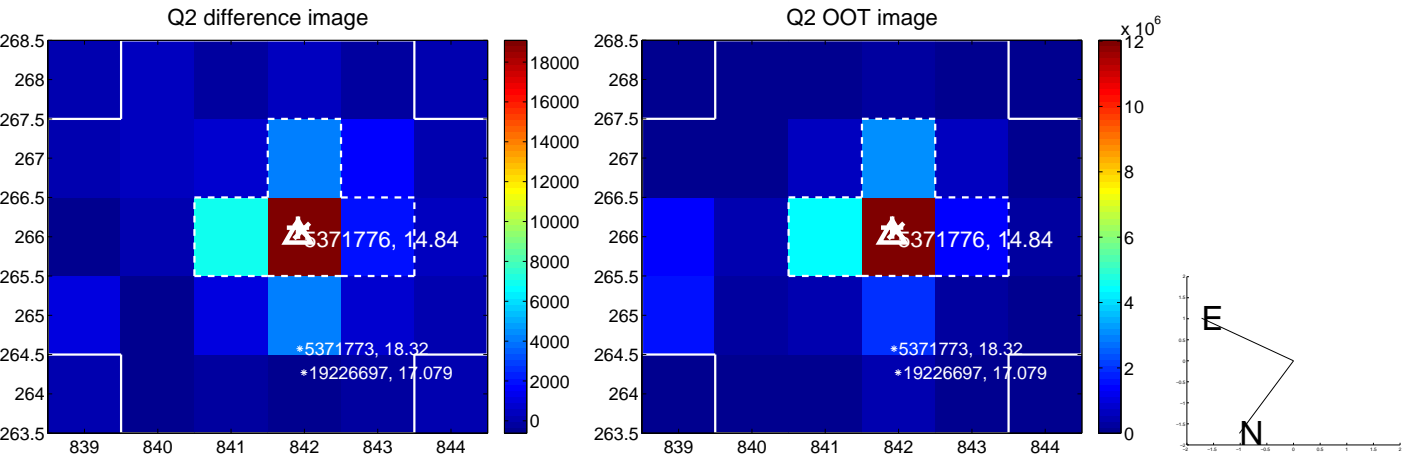
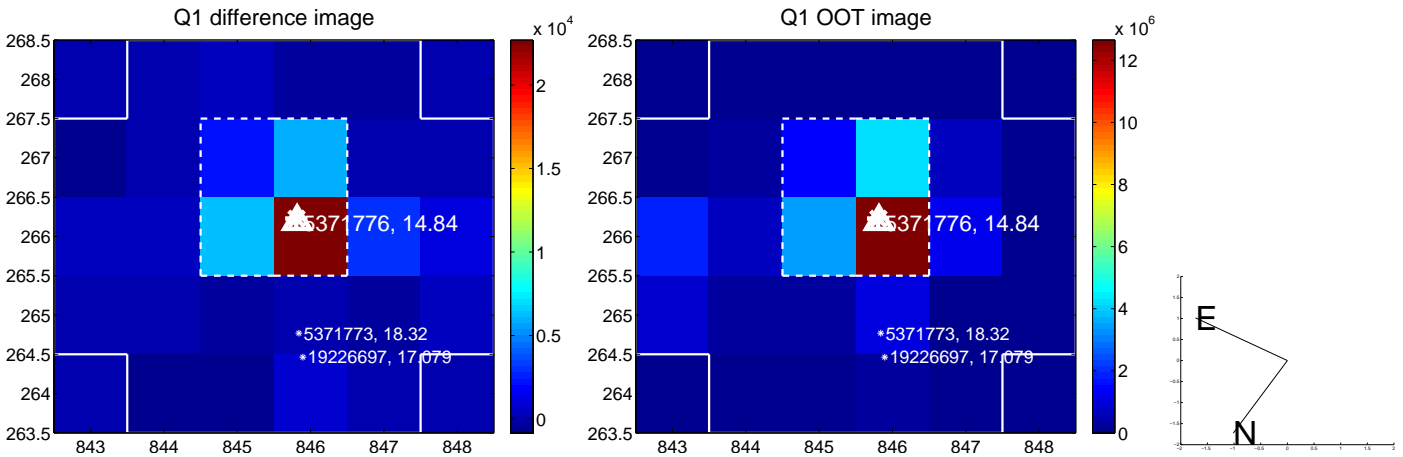
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.038 ± 0.075	0.50	-0.034 ± 0.075	0.016 ± 0.078
PRF-fit source offset from KIC position	0.071 ± 0.075	0.94	0.053 ± 0.075	-0.047 ± 0.077
photometric centroid source offset	0.14 ± 0.09	1.55	0.06 ± 0.10	-0.13 ± 0.09

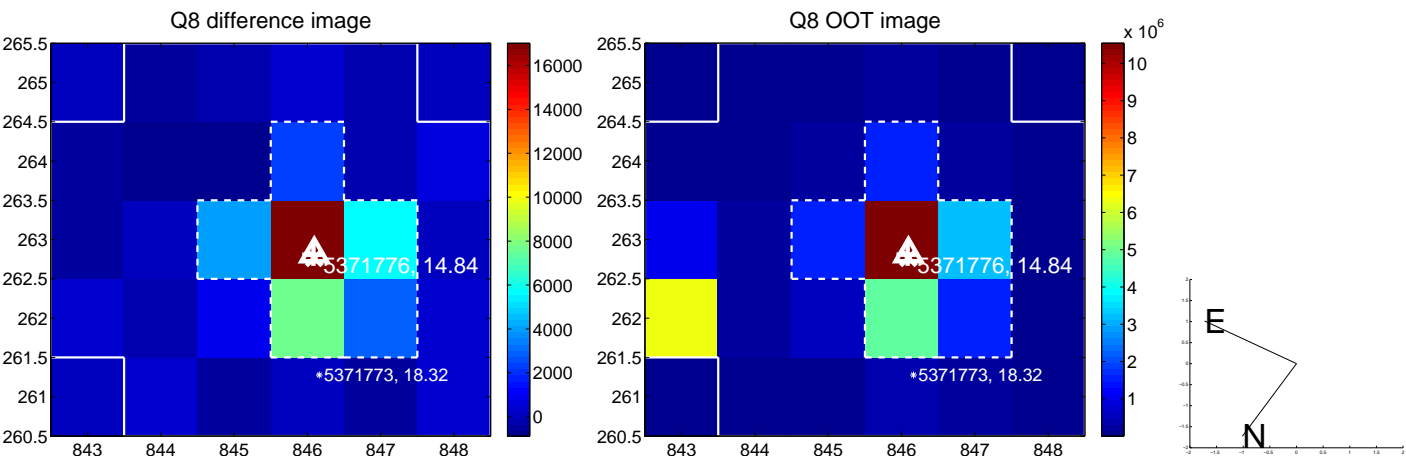
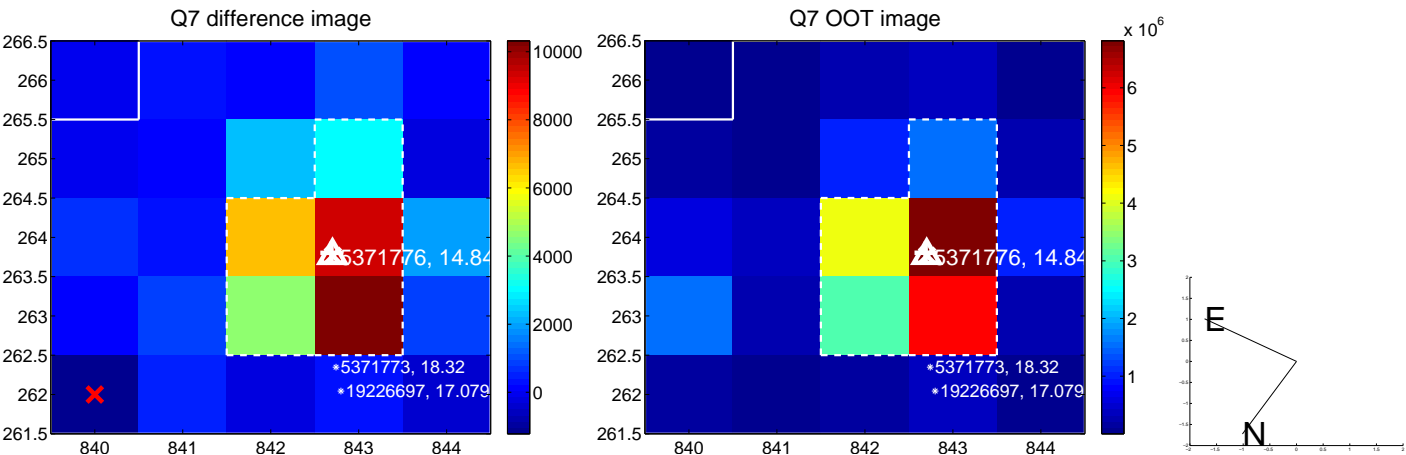
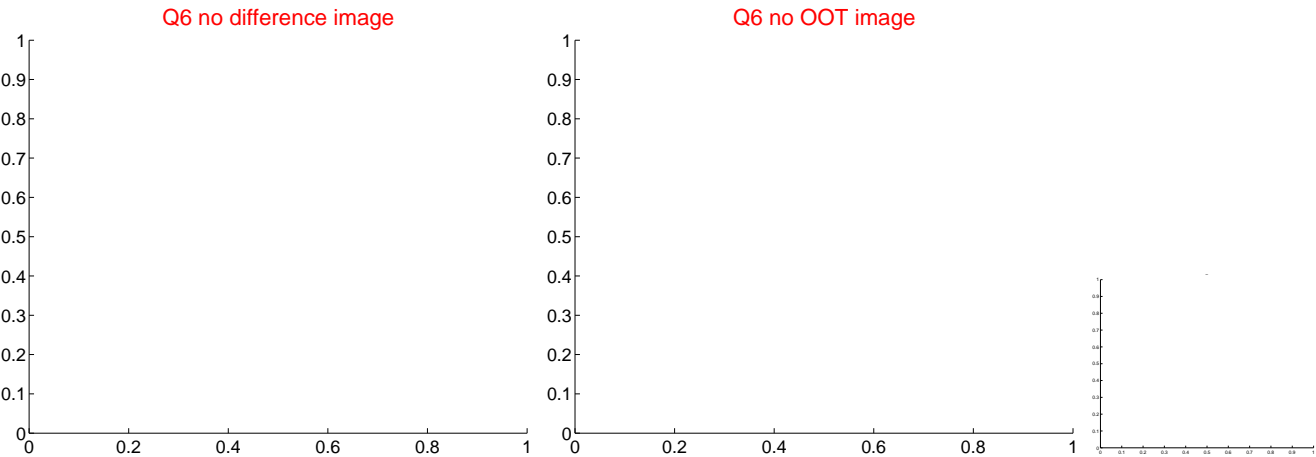
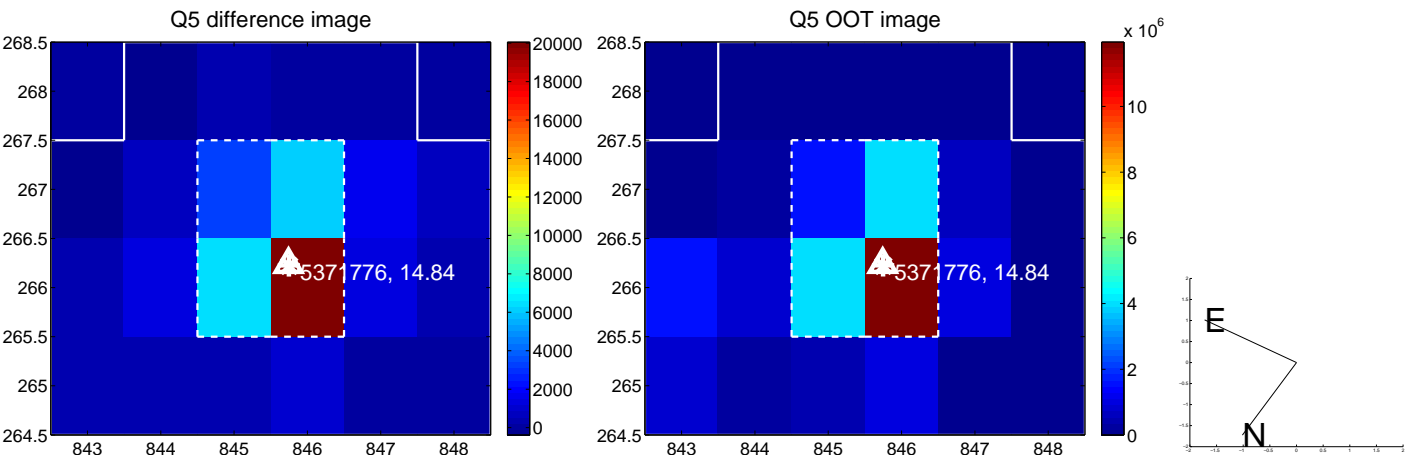


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

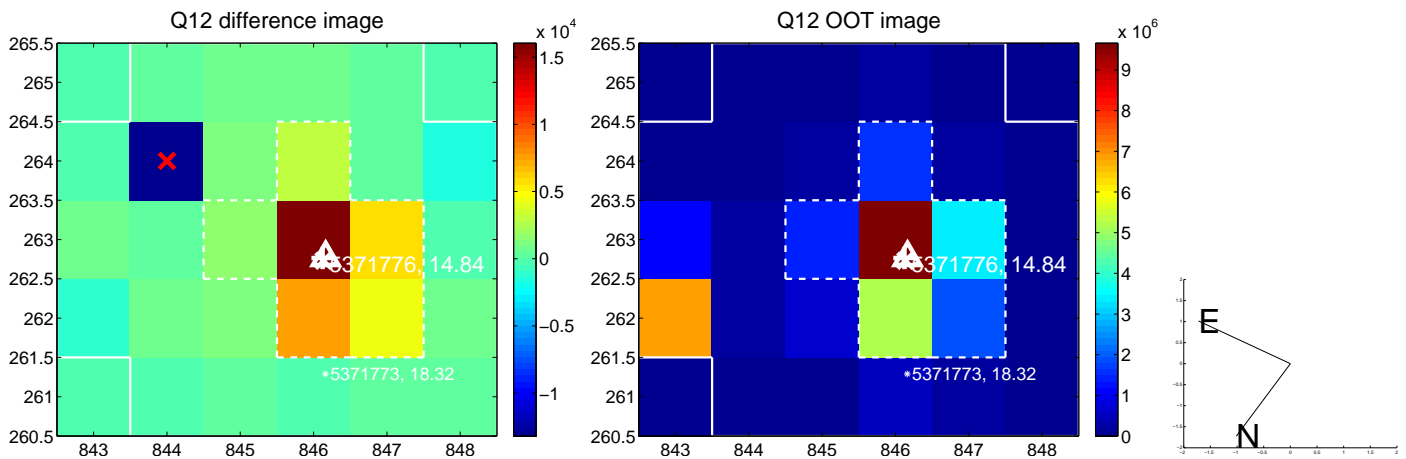
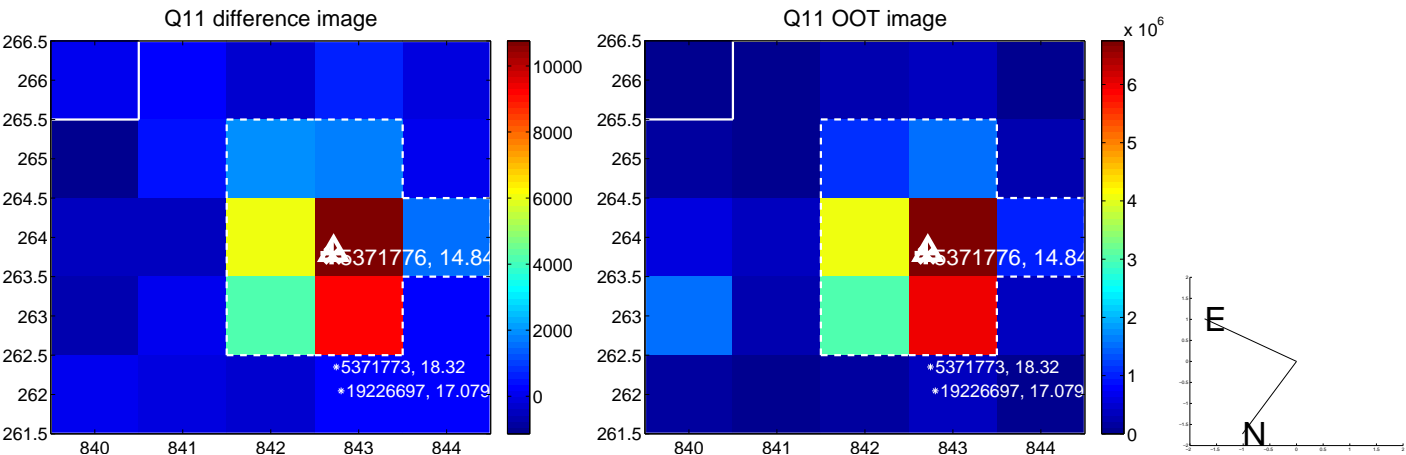
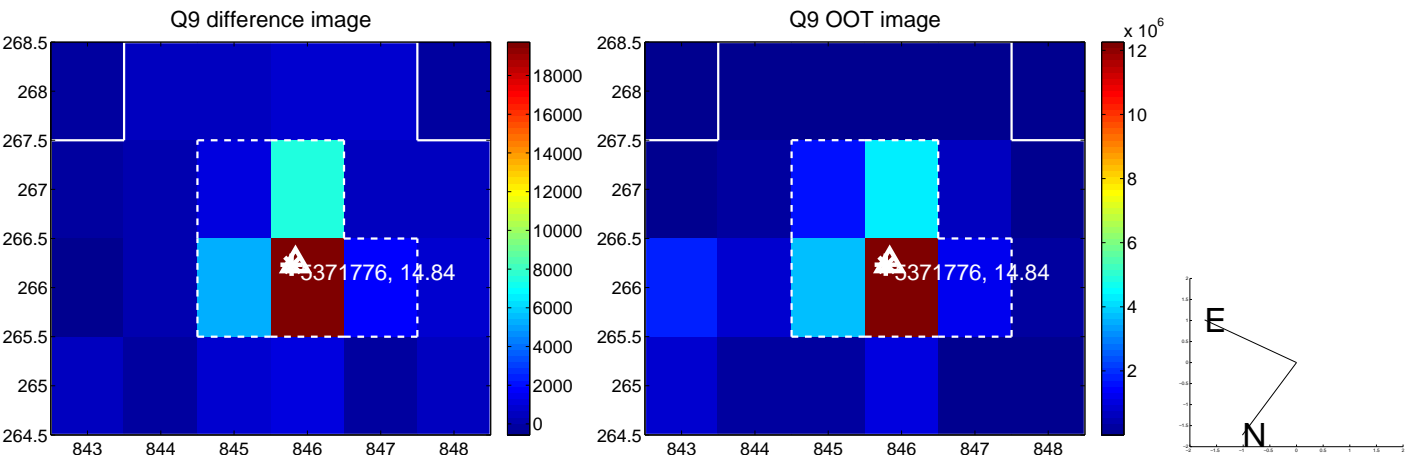
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



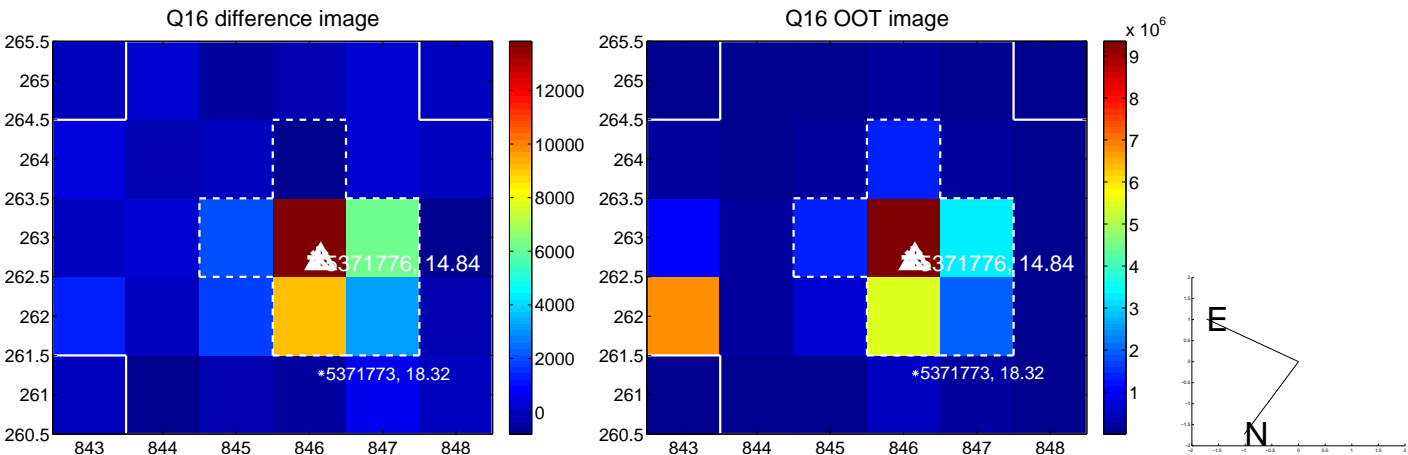
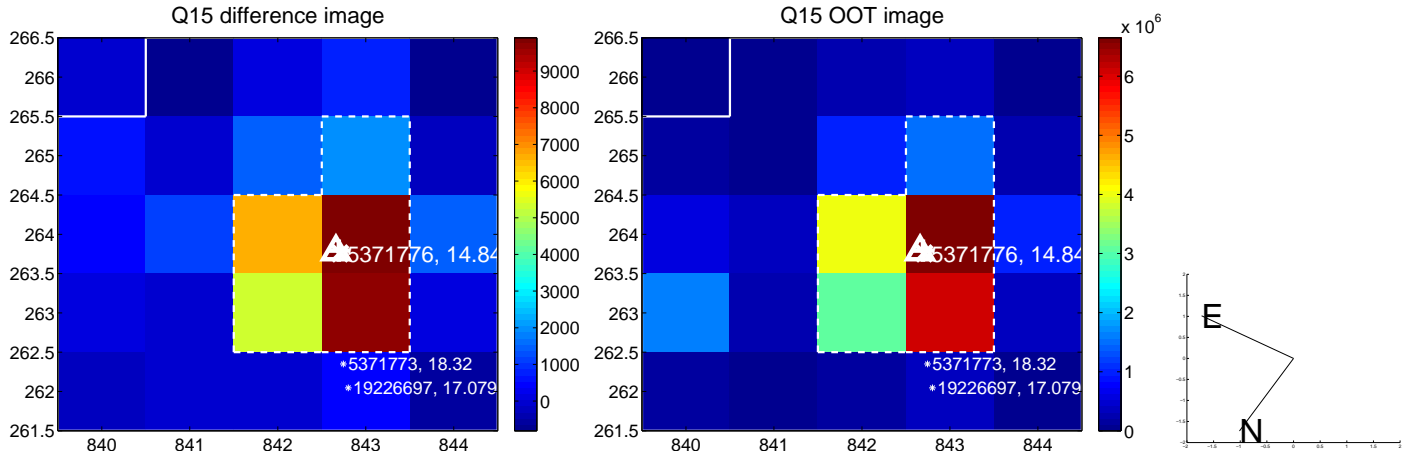
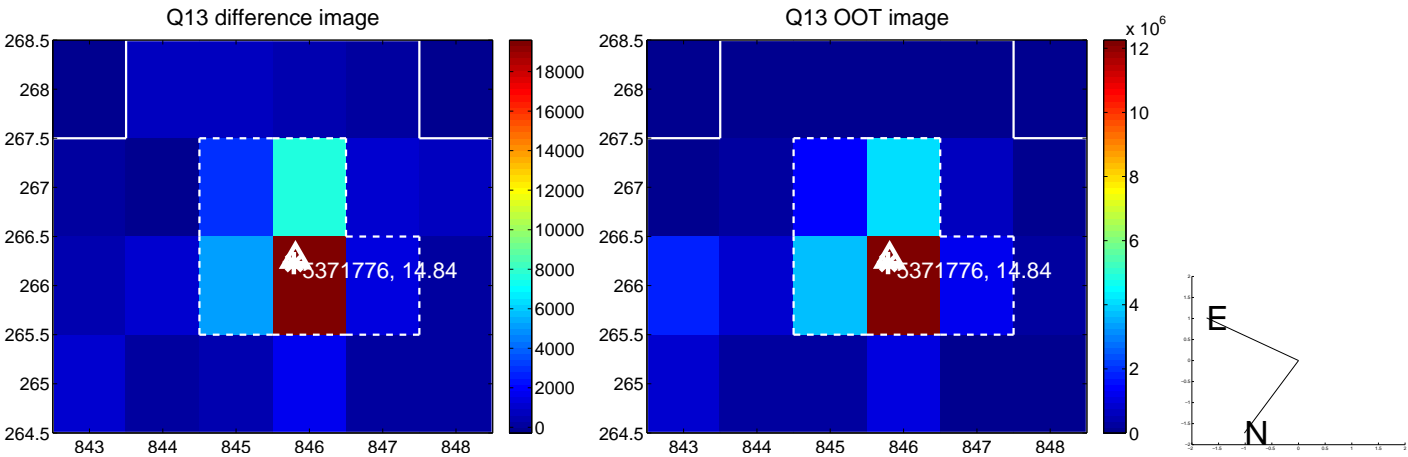
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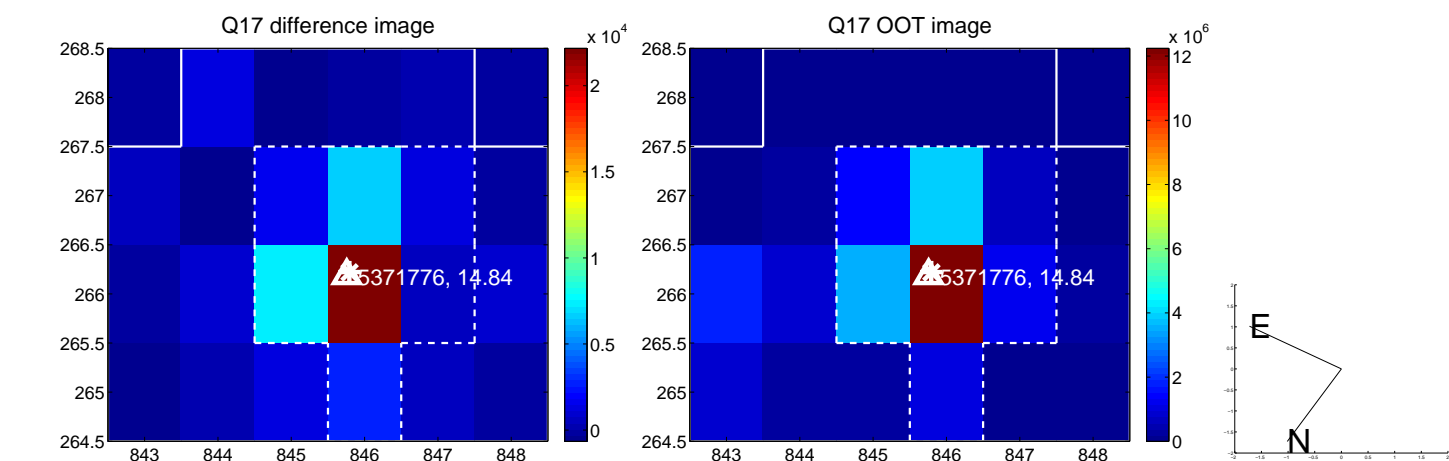
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



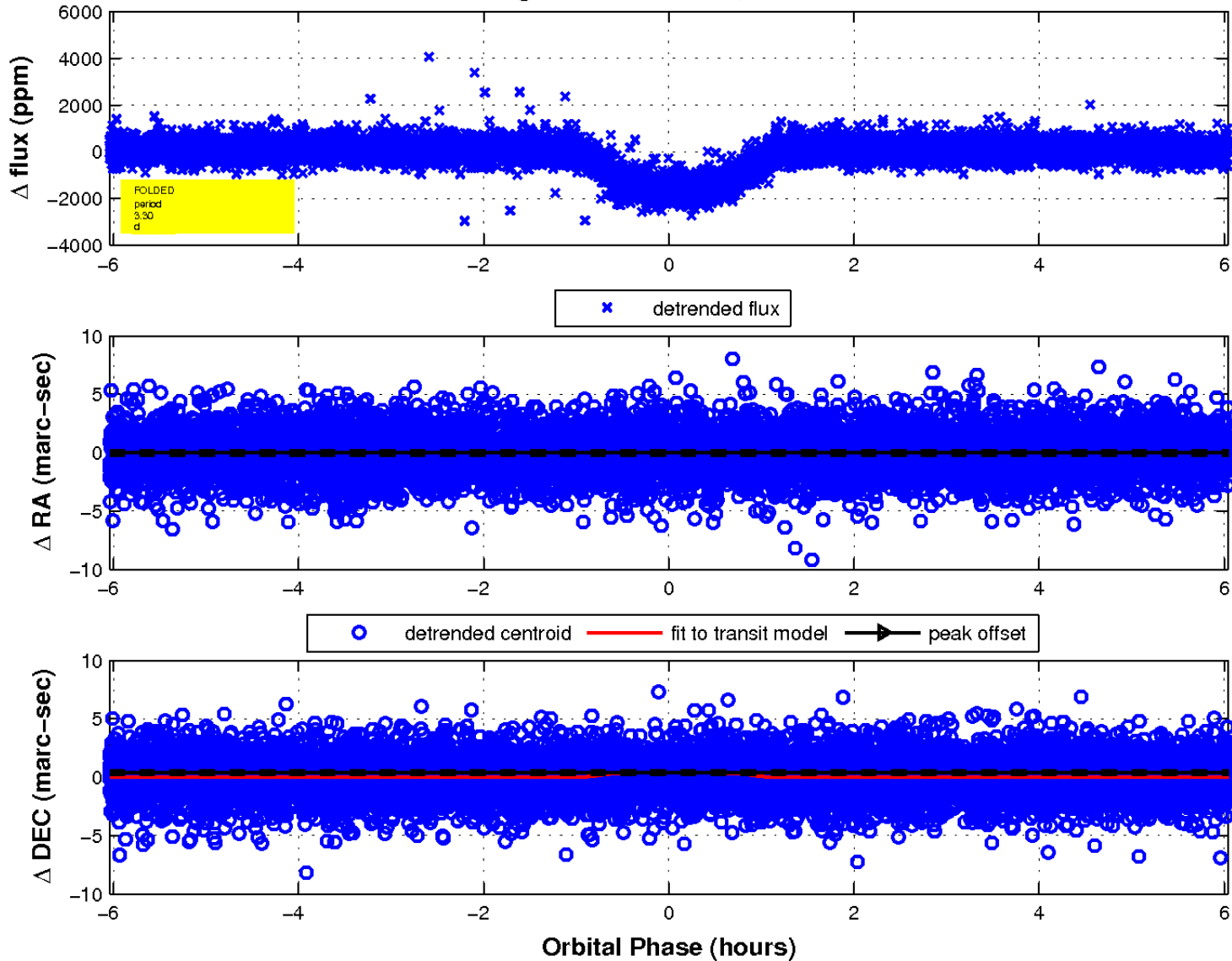
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

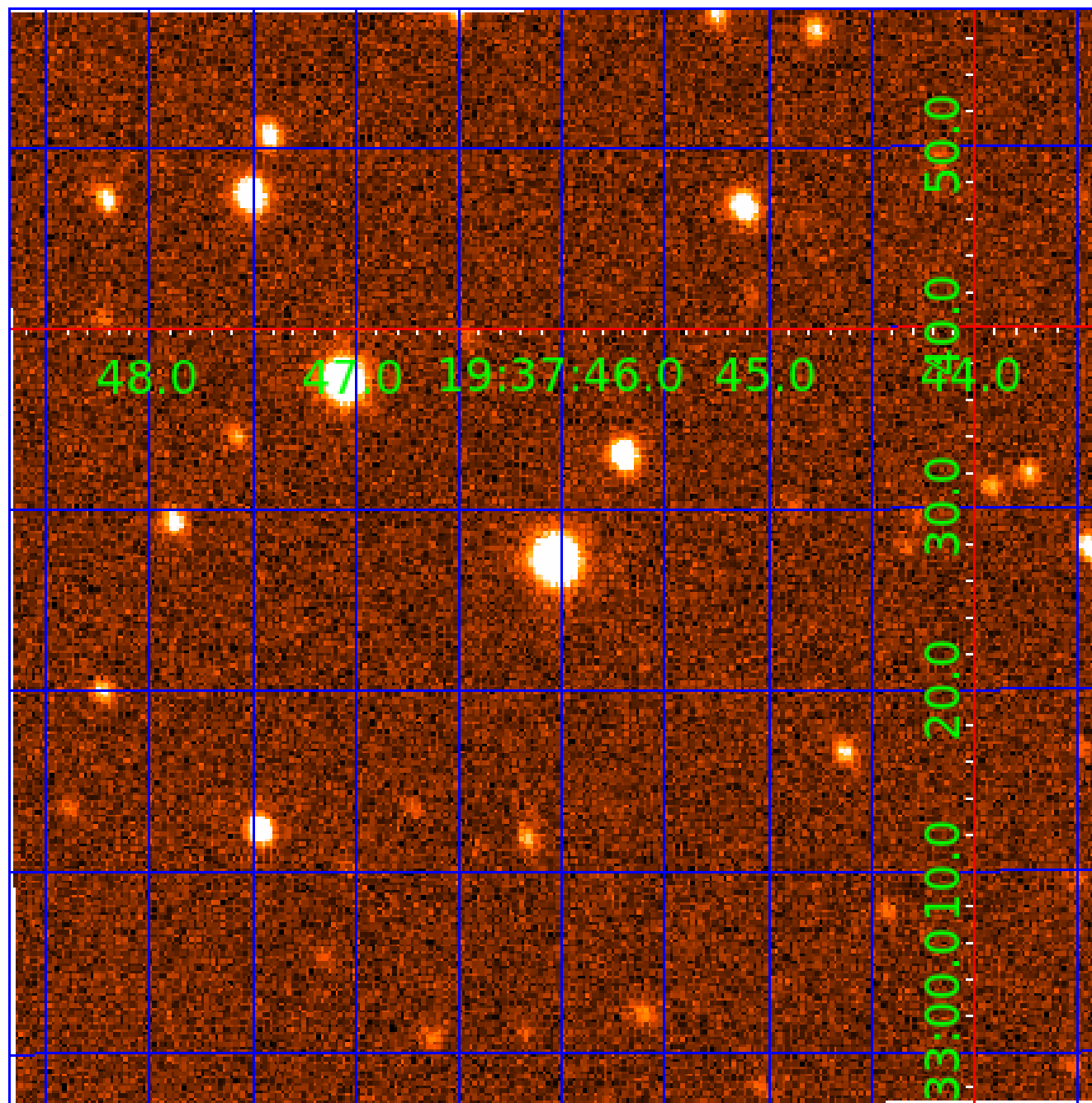


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 005371776

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
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005371776-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

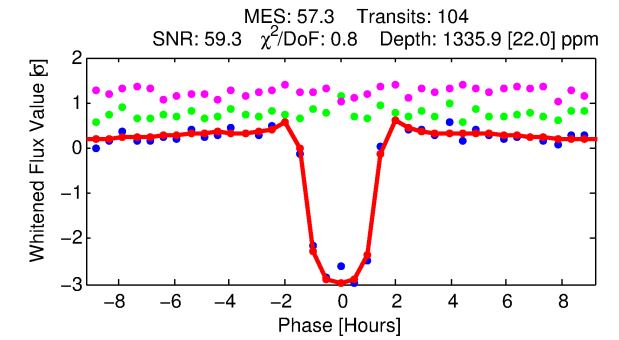
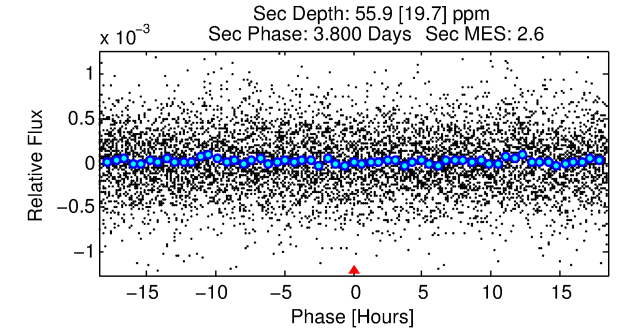
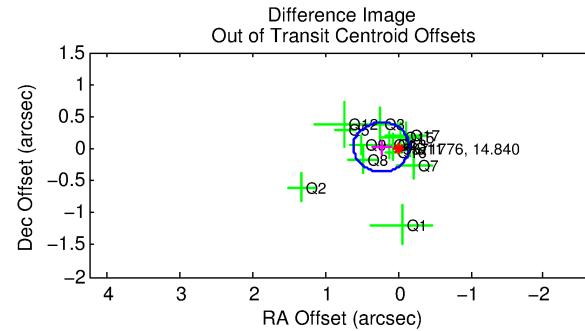
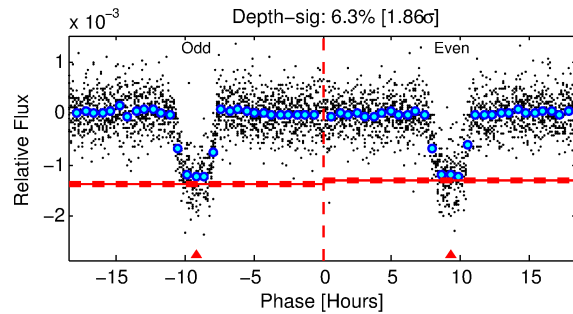
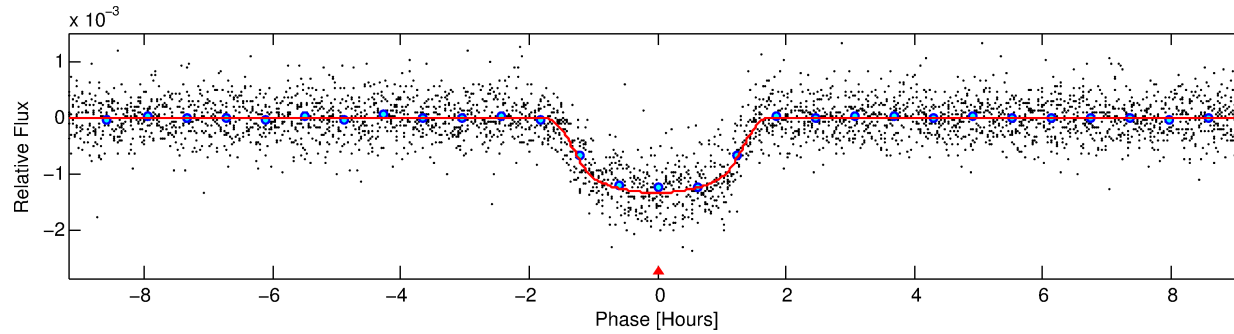
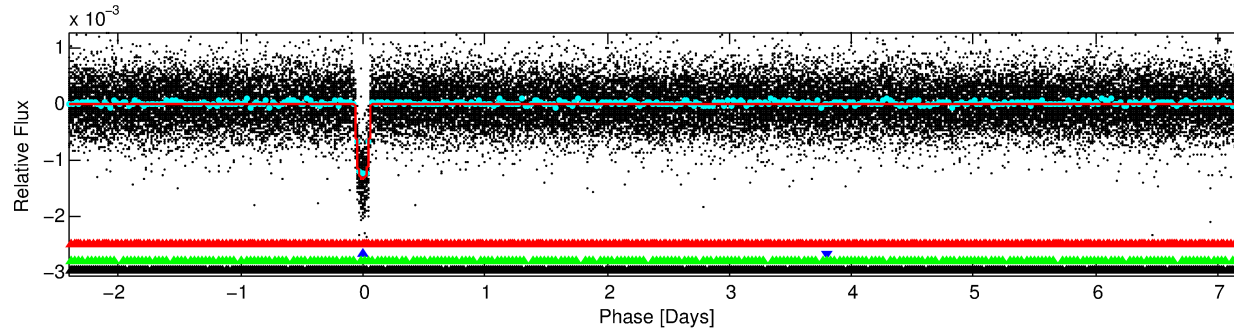
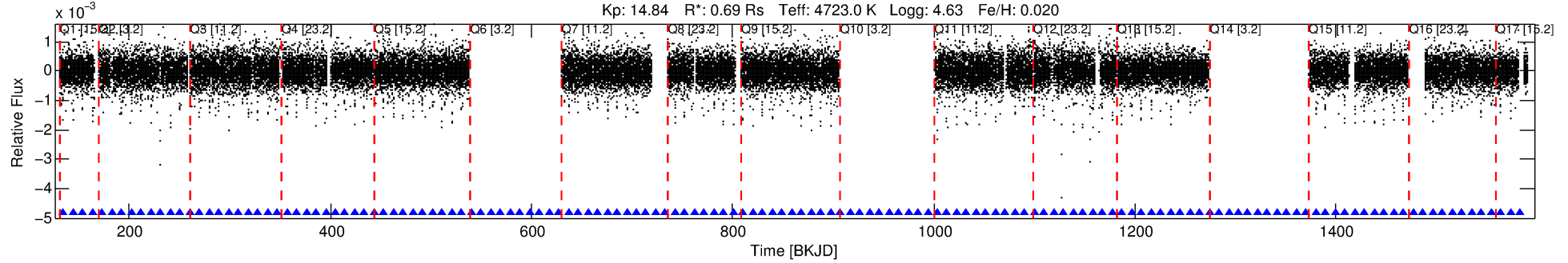
Ephemeris Match Information For 005371776-02

No Significant Match Found

DV One-Page Summary

KIC: 5371776 Candidate: 2 of 4 Period: 9.653 d
KOI: K01557.02 Name: Kepler-304d Corr: 0.972

Kp: 14.84 R*: 0.69 Rs Teff: 4723.0 K Logg: 4.63 Fe/H: 0.020



DV Fit Results:

Period = 9.65349 [0.00001] d
Epoch = 134.8565 [0.0009] BKJD
Rp/R* = 0.0384 [0.0030]
a/R* = 15.15 [3.97]
b = 0.83 [0.10]
Seff = 33.05 [3.82]
Teq = 611 [18] K
Rp = 2.90 [0.31] Re
a = 0.0803 [0.0047] AU
Ag = 23.61 [9.32] [2.43σ]
Teffp = 2084 [205] K [7.15σ]

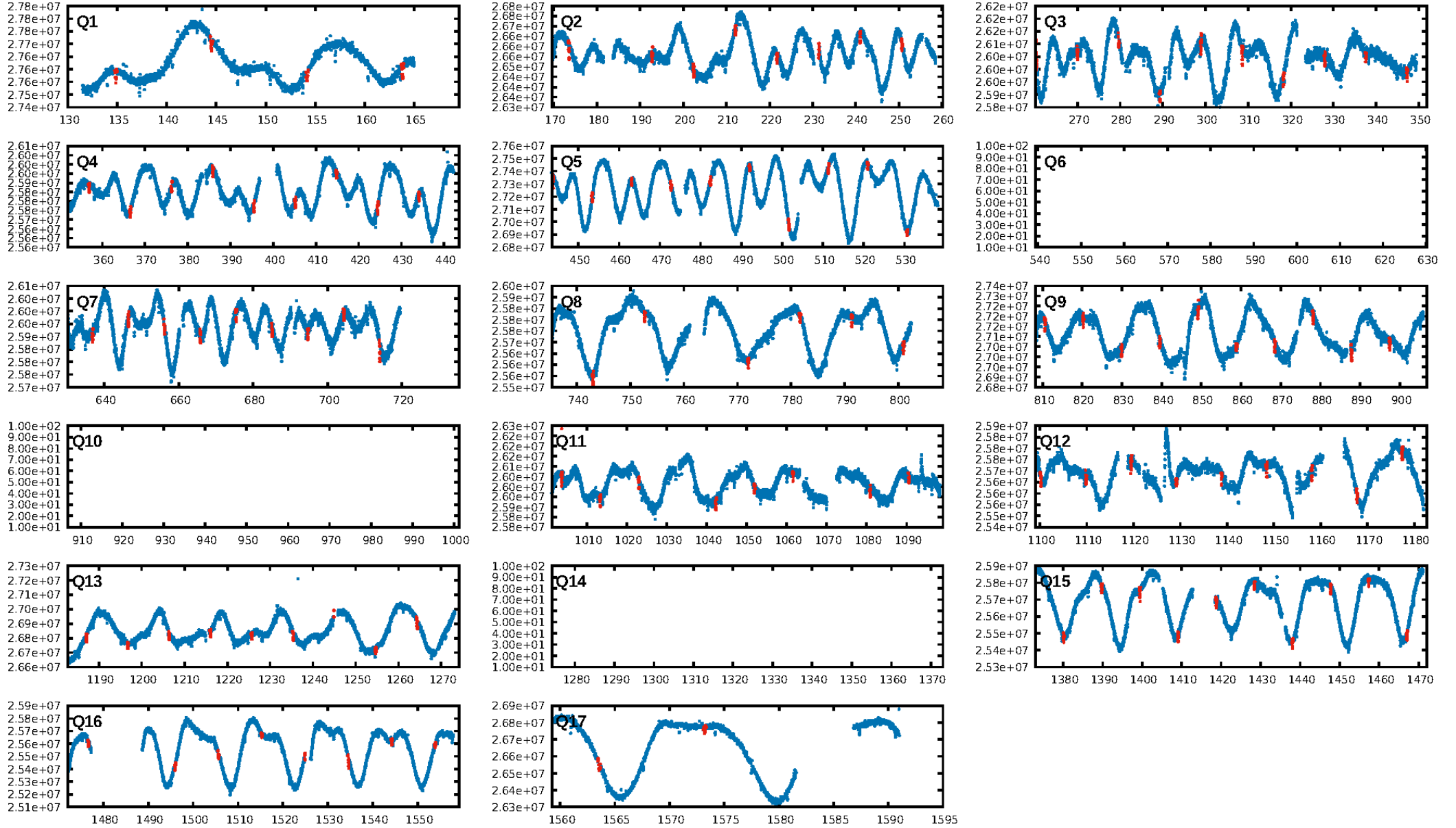
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.72σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 91.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [98/98]
GhostDiagnostic-chr: 5.678
Centroid-sig: 19.7%
Centroid-so: 0.075 arcsec [0.46σ]
OotOffset-rm: 0.230 arcsec [1.79σ]
KicOffset-rm: 0.324 arcsec [2.46σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.86 [12/14]

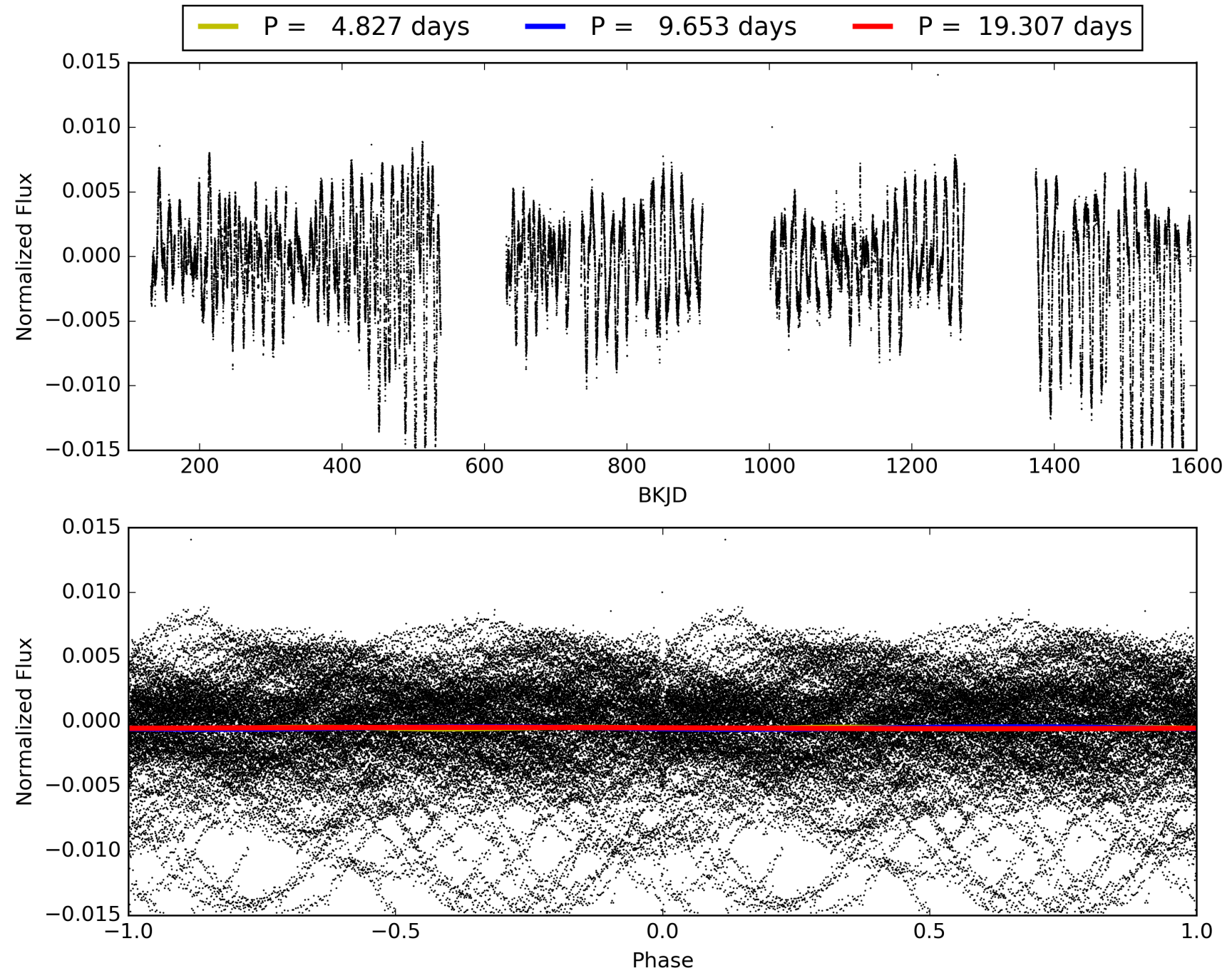
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:47:27 Z

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

TCE 005371776-02, PDC Light Curves

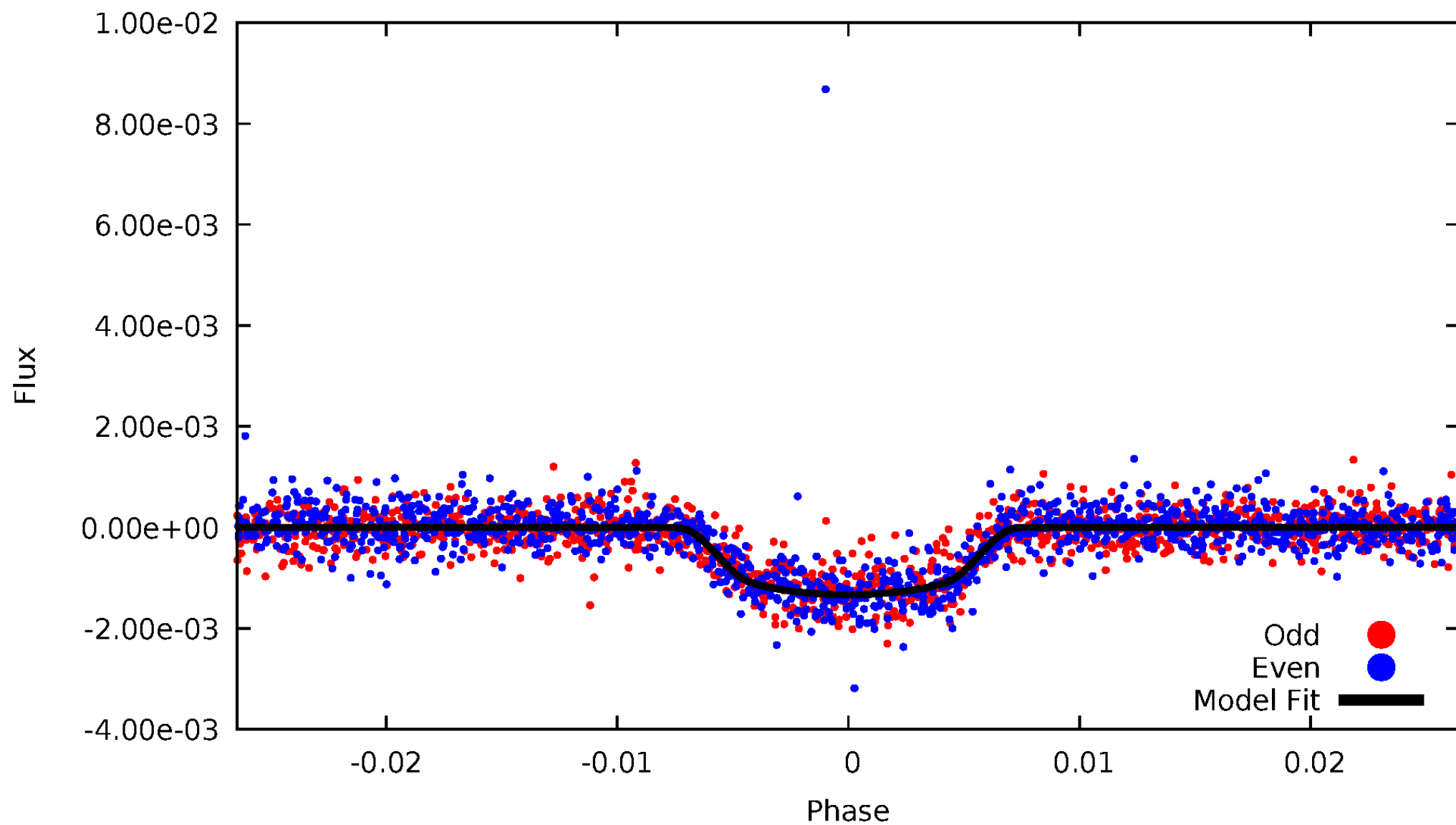


TCE 005371776-02



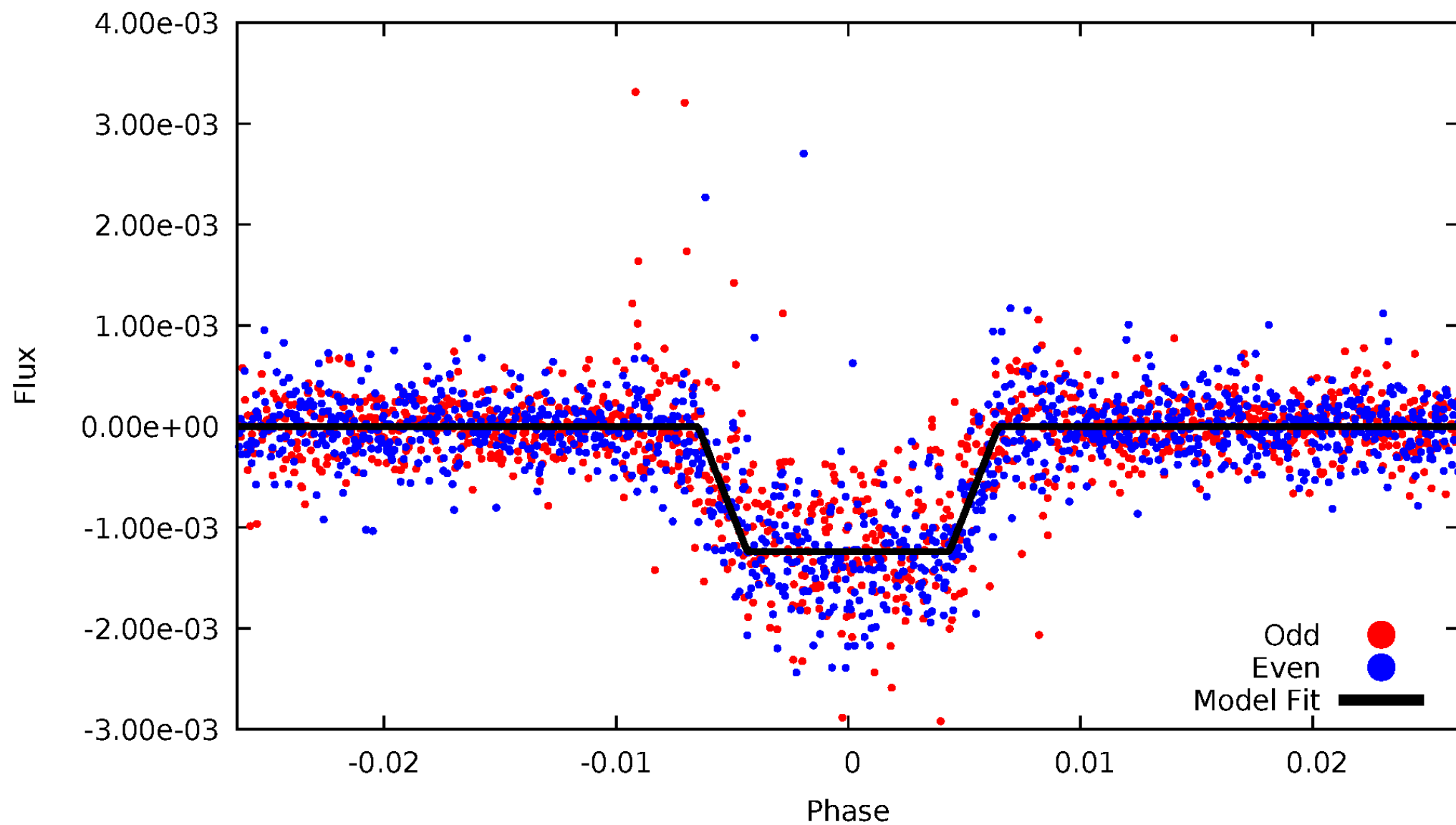
DV Odd/Even

TCE 005371776-02



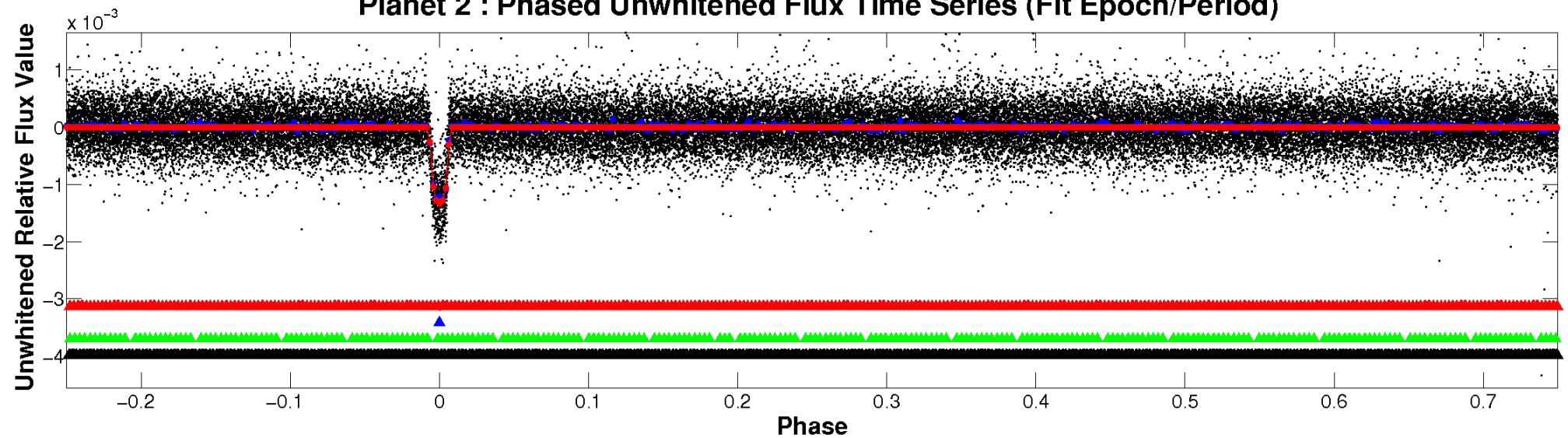
ALT Odd/Even

TCE 005371776-02

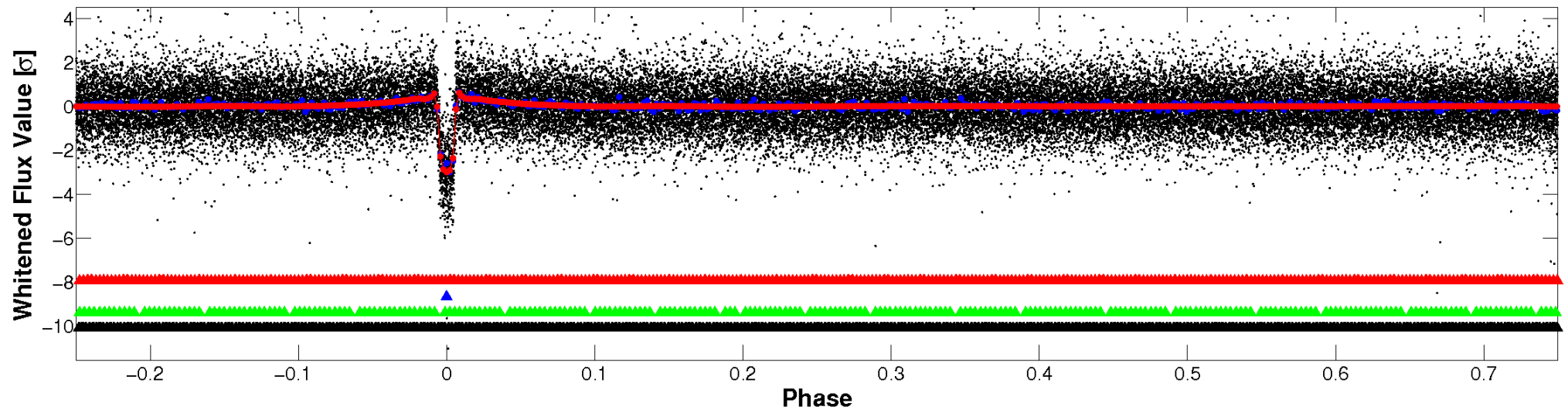


Non-Whitened Vs. Whitened Light Curve

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

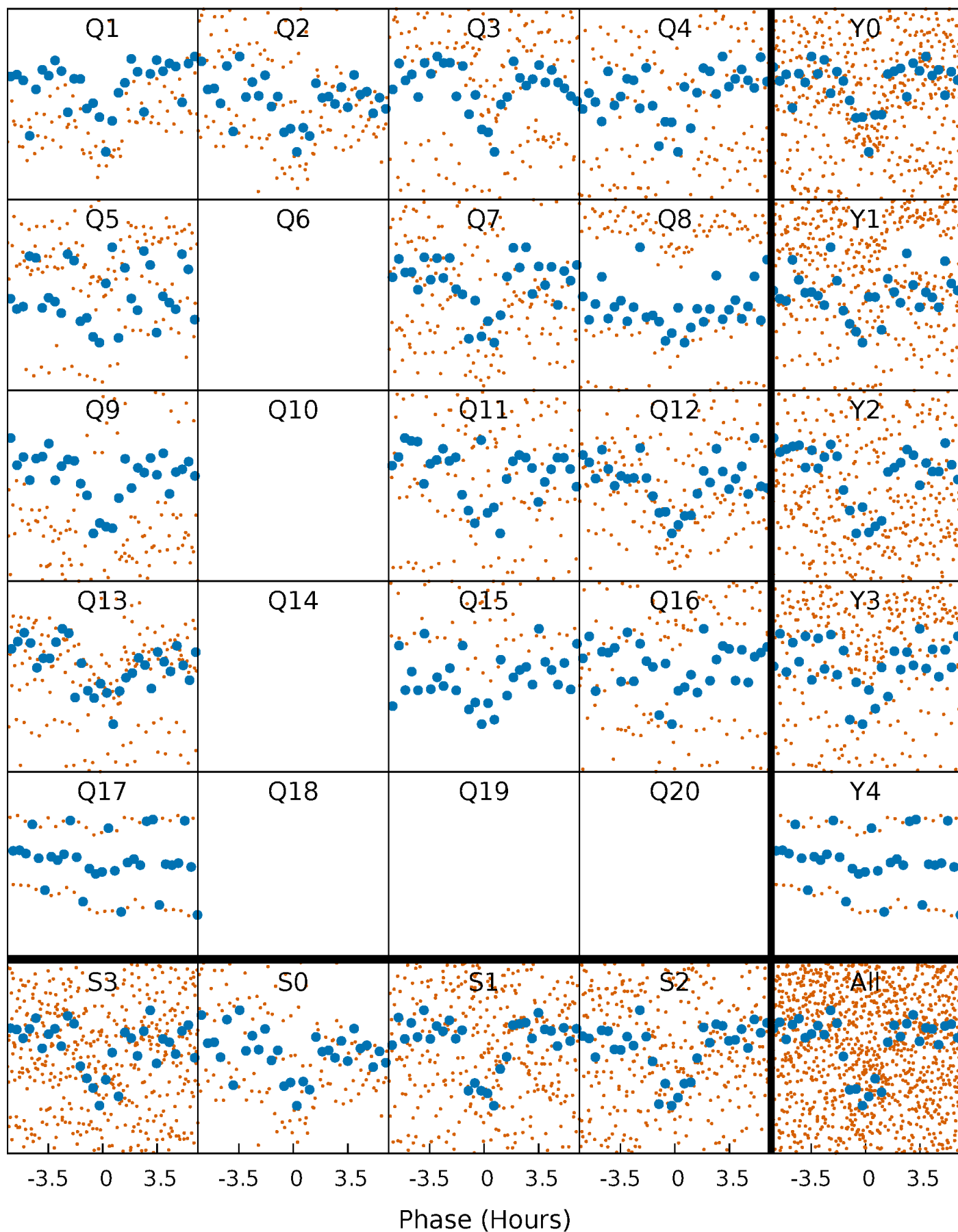


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



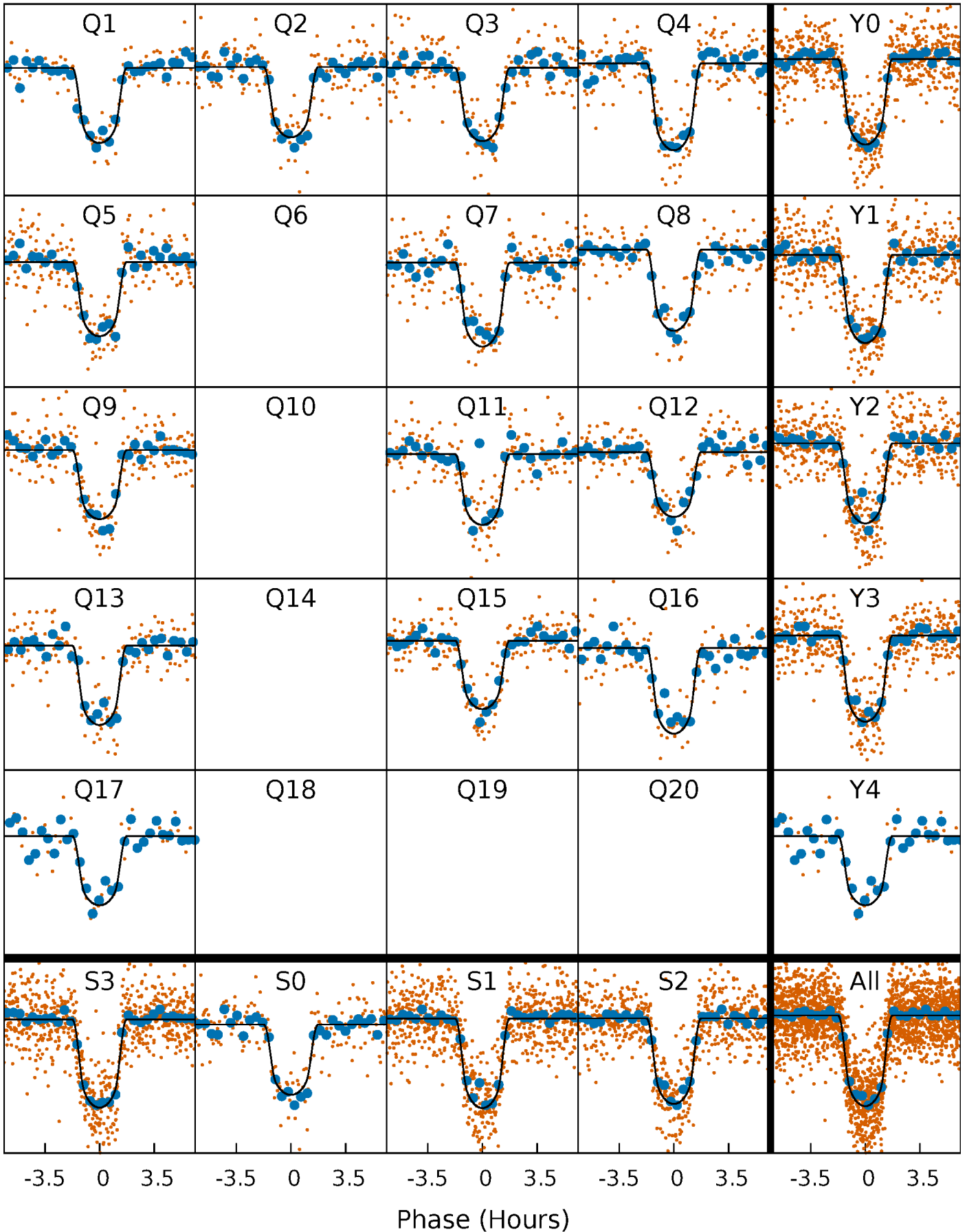
PDC Quarter-Phased Transit Curves

TCE 005371776-02 P= 9.653486 Days $T_0=134.856536$ (BKJD)



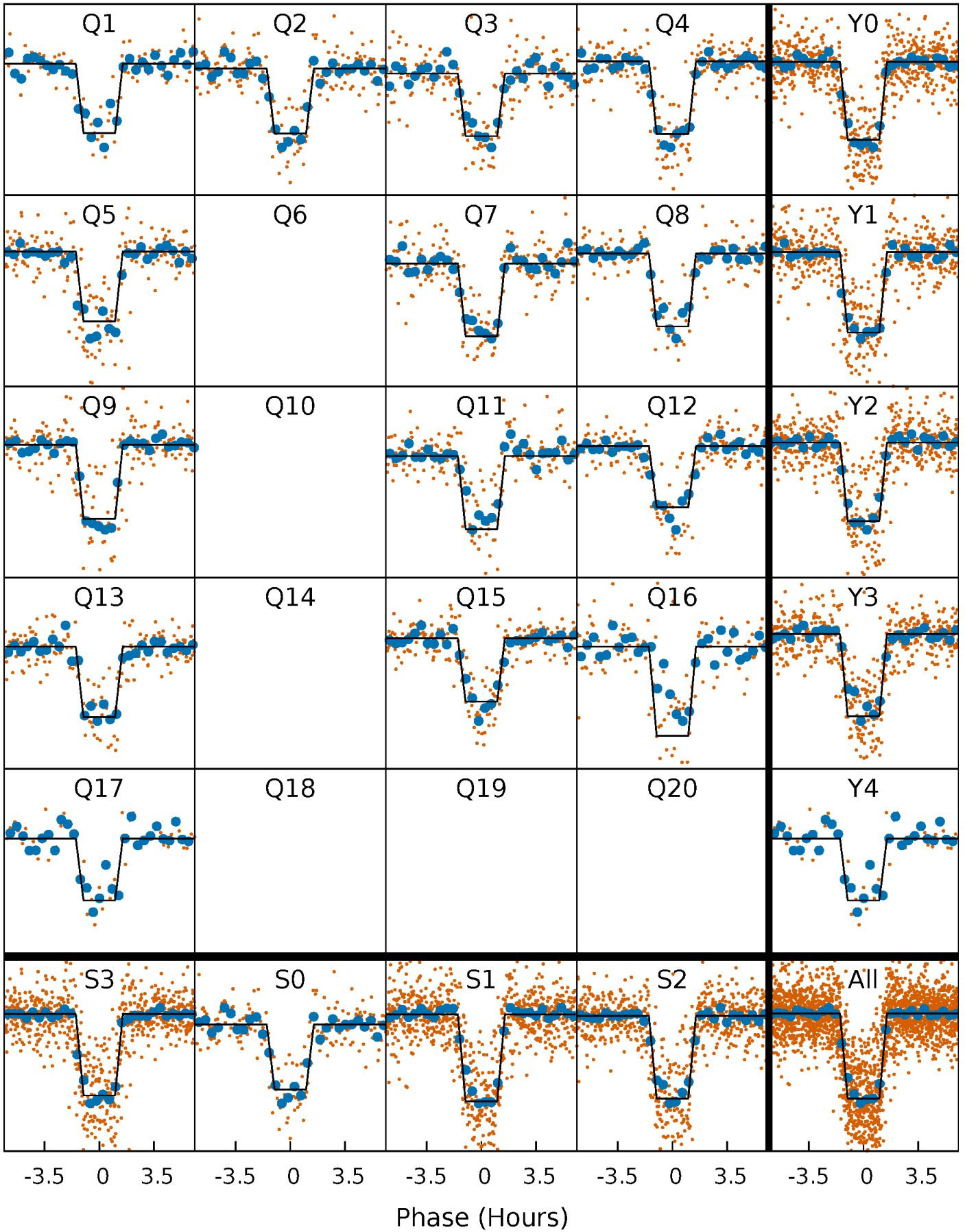
DV Quarter-Phased Transit Curves

TCE 005371776-02 P= 9.653486 Days $T_0=134.856536$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

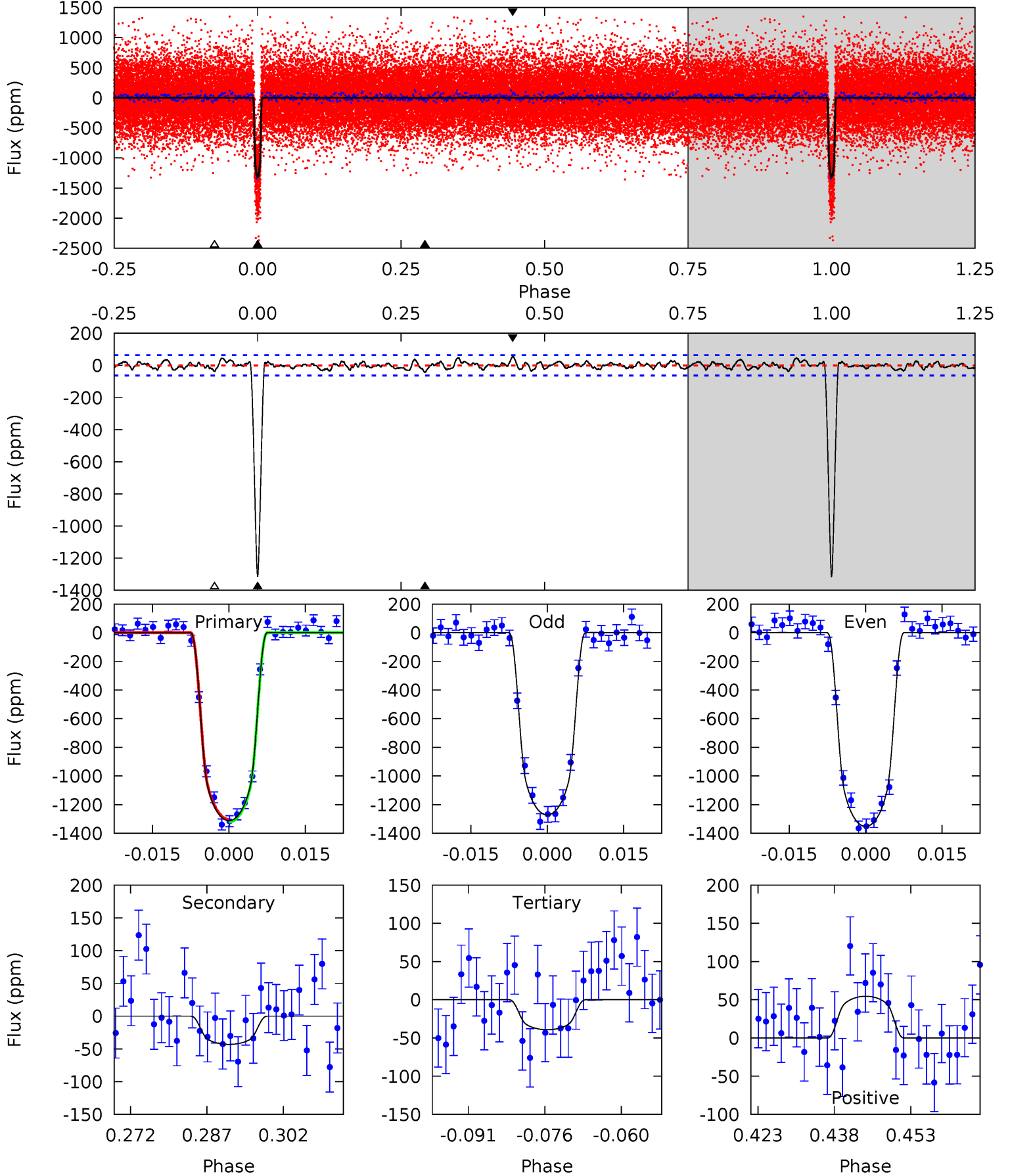
TCE 005371776-02 P= 9.653446 Days $T_0=134.859714$ (BKJD)



DV Model-Shift Uniqueness Test

005371776-02, P = 9.653486 Days, E = 125.203050 Days

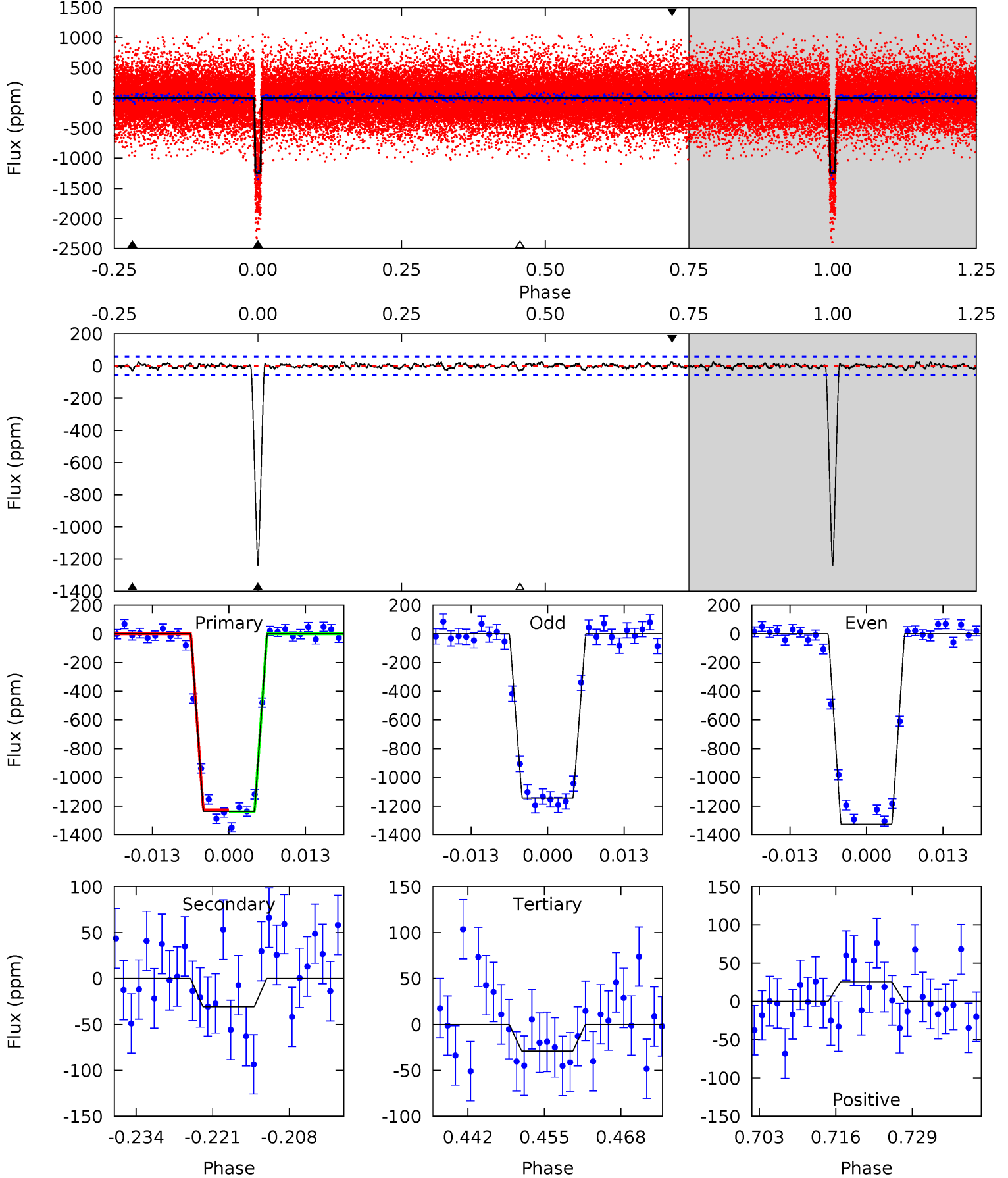
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
102.9	3.38	3.07	4.28	4.95	2.43	1.29	99.8	98.6	0.31	-0.89	3.16	1.00	0.04	0.71



Alt Model-Shift Uniqueness Test

005371776-02, P = 9.653446 Days, E = 125.206268 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
107.3	2.66	2.51	2.21	4.98	2.48	0.86	104.8	105.1	0.16	0.45	7.88	0.93	0.02	0.59



Stellar Parameters For KIC 005371776

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4723^{+94}_{-94}	$4.628^{+0.012}_{-0.045}$	$0.020^{+0.150}_{-0.150}$	$0.691^{+0.049}_{-0.025}$	$0.760^{+0.031}_{-0.047}$	$3.248^{+0.212}_{-0.562}$
	+2%/-2%	+0%/-1%	+750%/-750%	+7%/-4%	+4%/-6%	+7%/-17%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 005371776-02 / KOI 1557.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-43 ± 13	$2.97^{+0.24}_{-0.26}$	860^{+22}_{-19}	2679^{+115}_{-128}	18^{+6}_{-6}
Alt.	-31 ± 12	$2.71^{+0.26}_{-0.23}$	861^{+22}_{-20}	2618^{+130}_{-165}	15^{+7}_{-6}

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 $A_{\text{obs}} \gg 1.0$

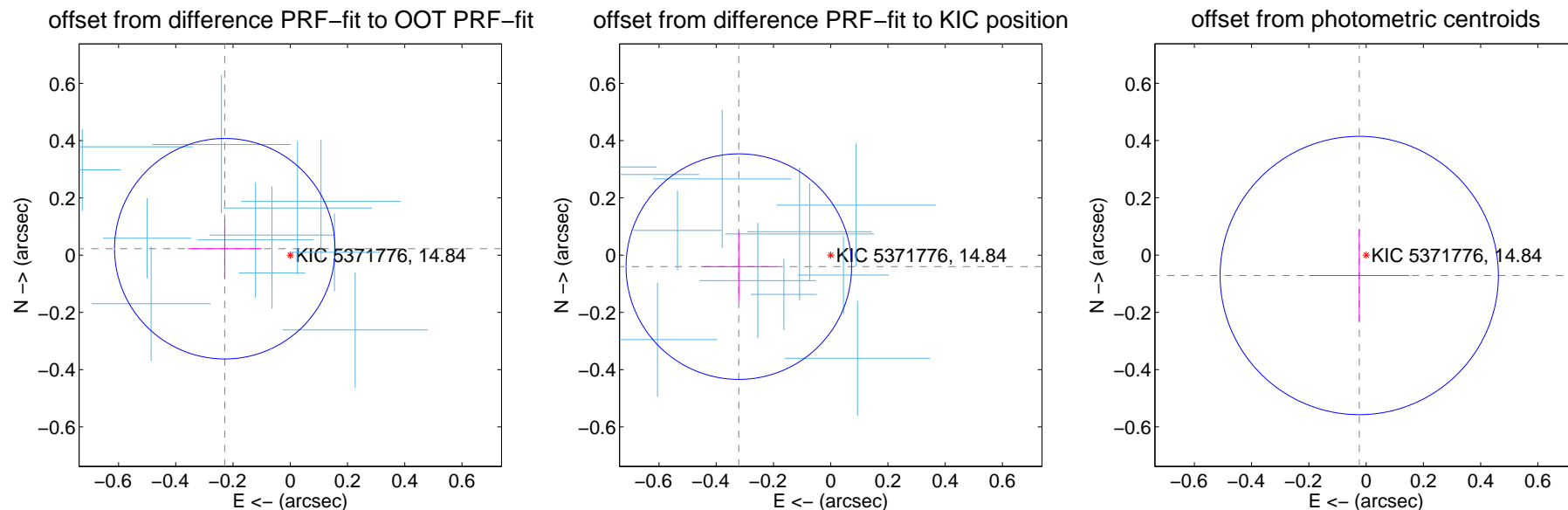
DV Centroid Data

Supplemental centroid analysis for 005371776-02. Kepler magnitude: 14.84. Transit SNR 59.32

There are 14 quarters with good PRF difference image offsets

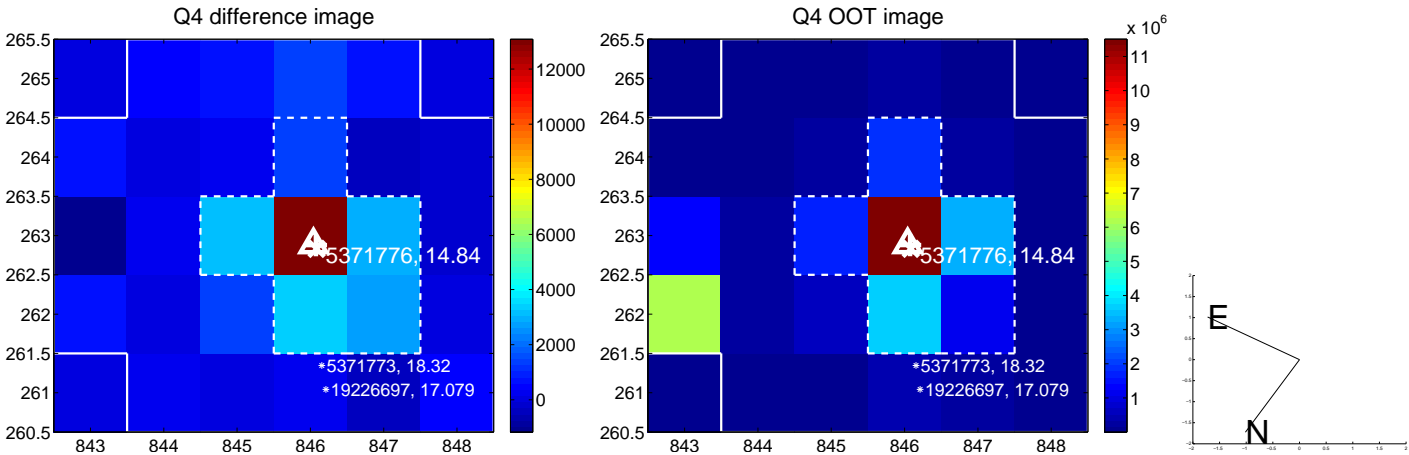
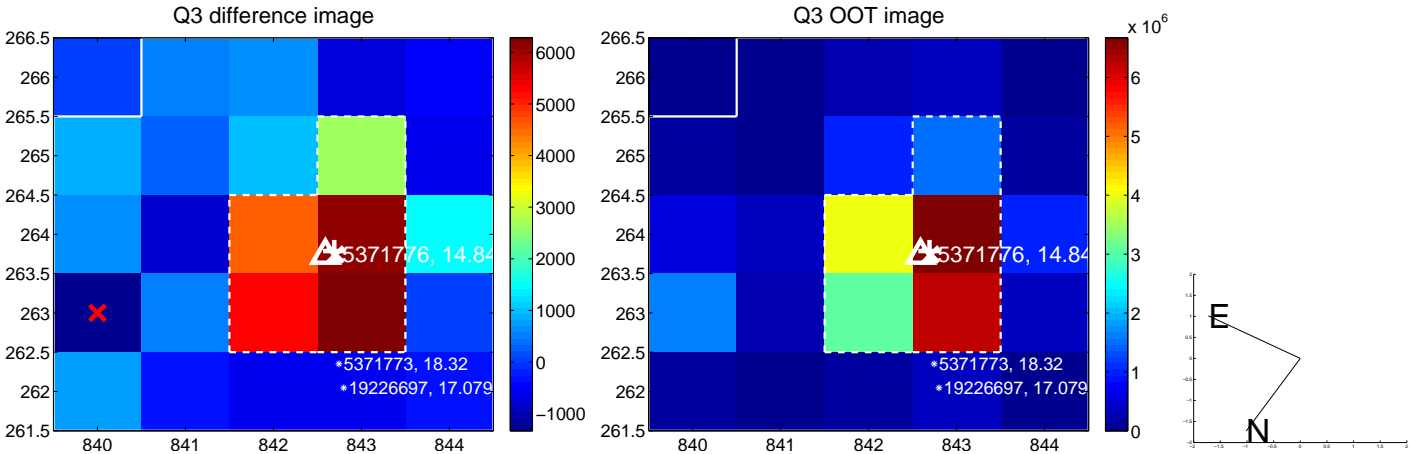
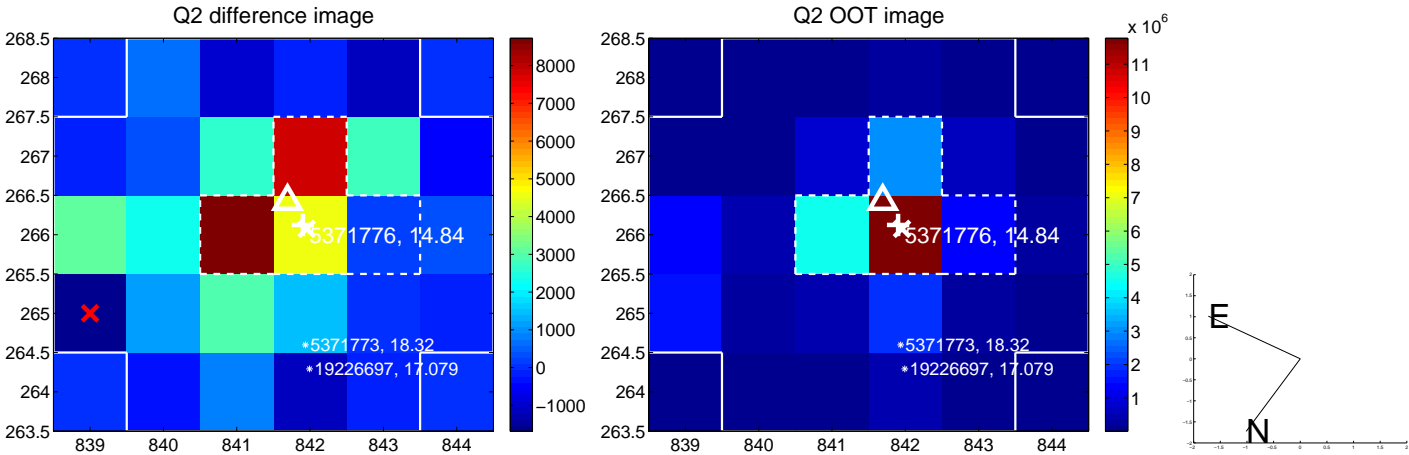
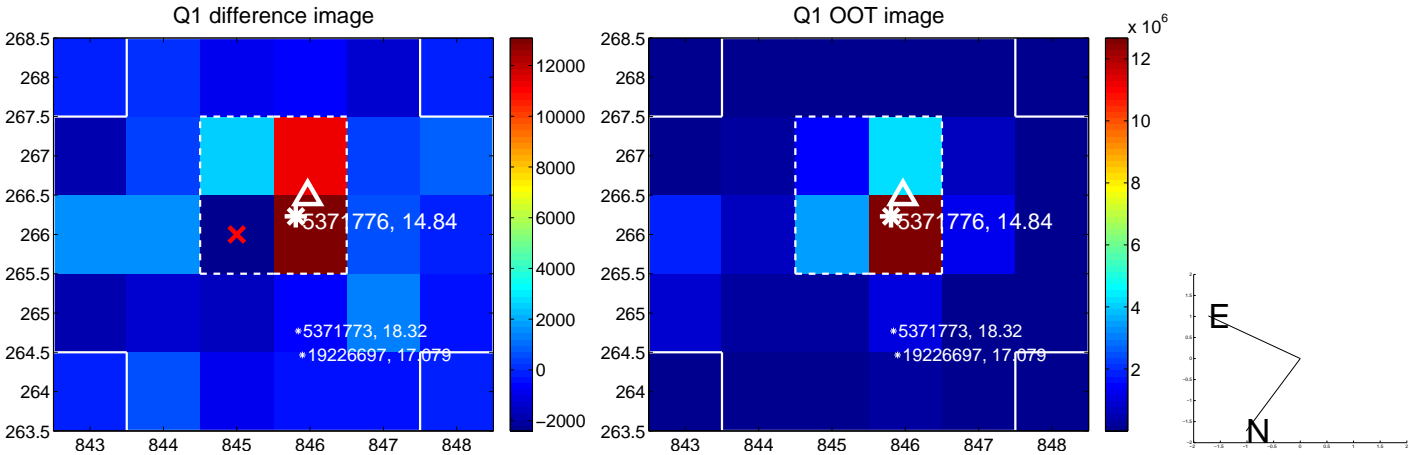
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.230 ± 0.128	1.79	0.229 ± 0.129	0.022 ± 0.102
PRF-fit source offset from KIC position	0.324 ± 0.131	2.46	0.321 ± 0.132	-0.040 ± 0.119
photometric centroid source offset	0.08 ± 0.16	0.46	0.02 ± 0.18	-0.07 ± 0.16

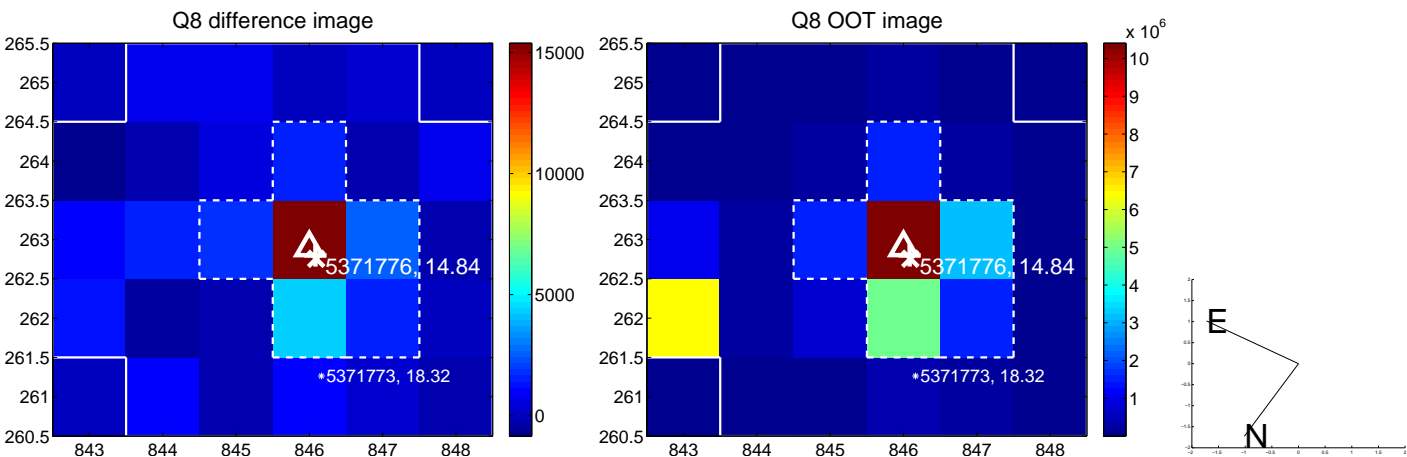
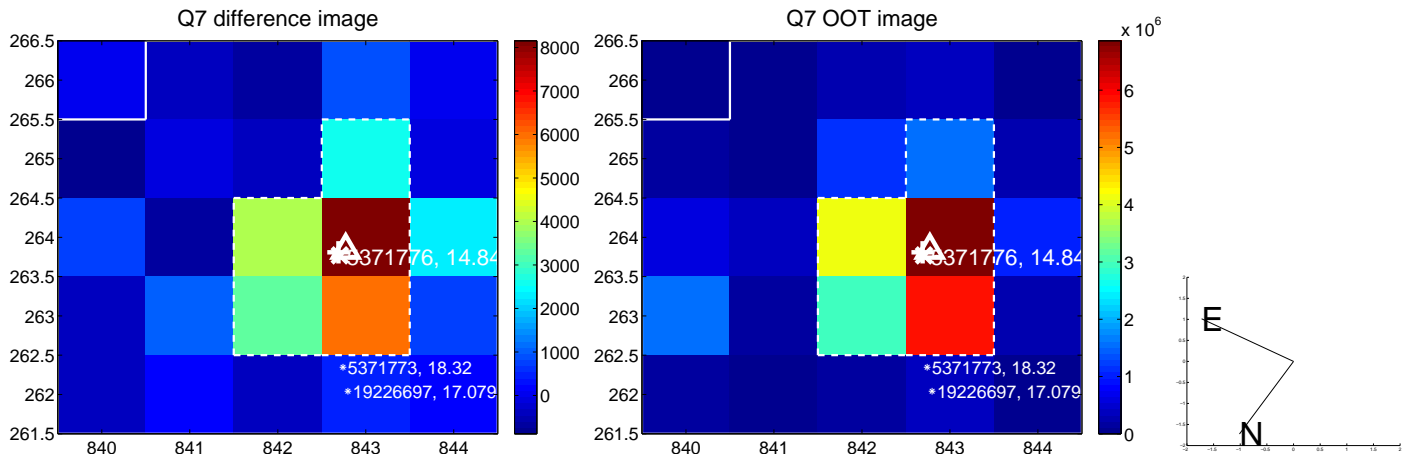
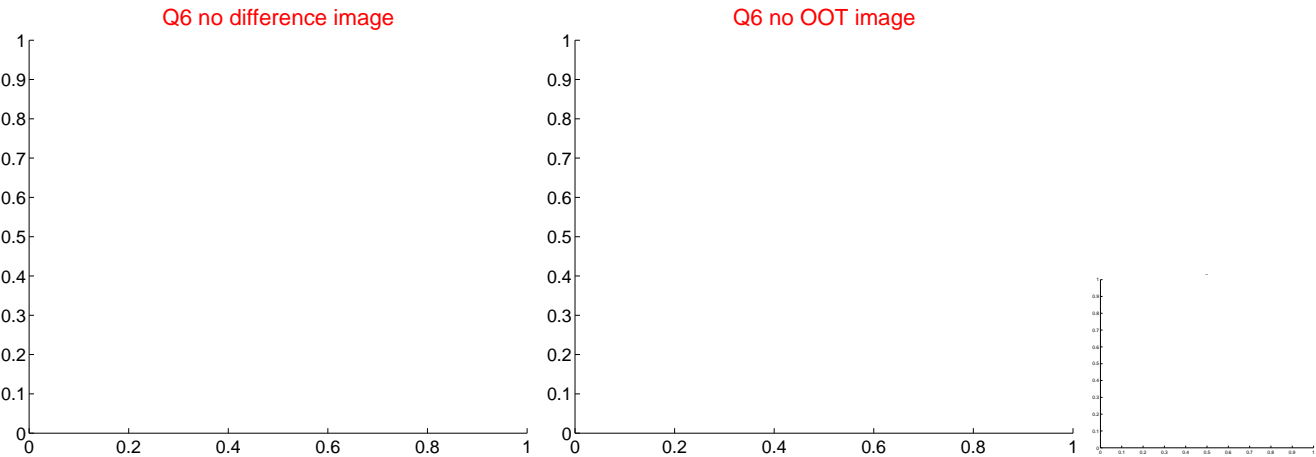
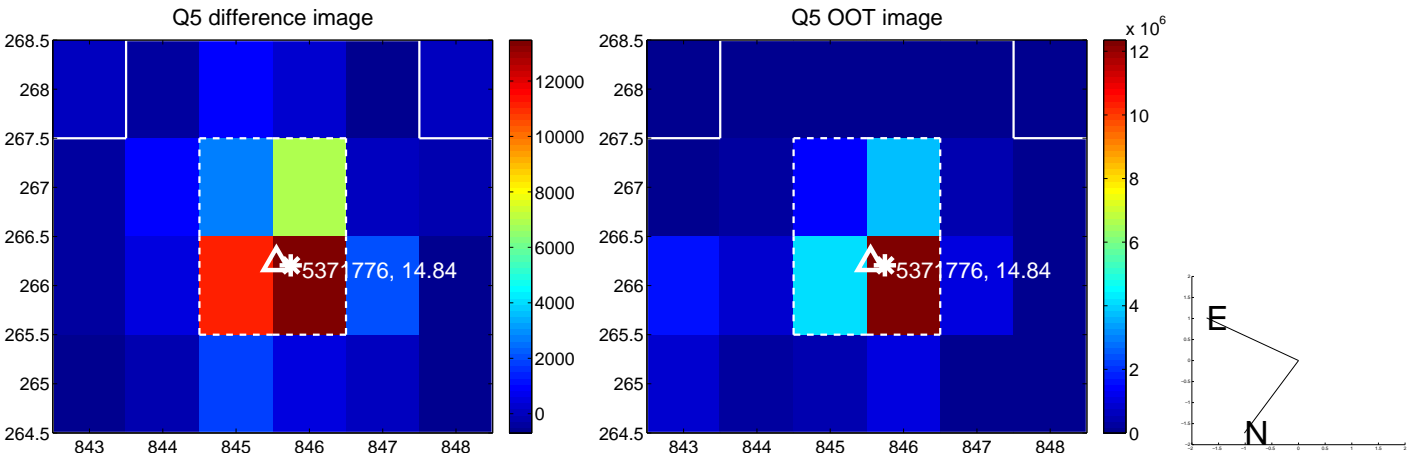


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

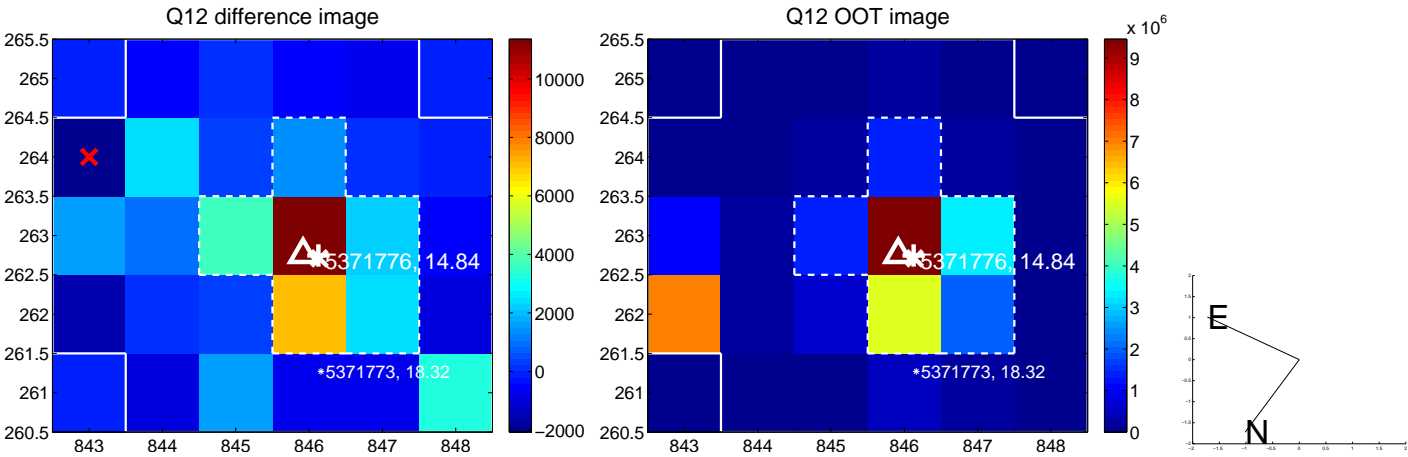
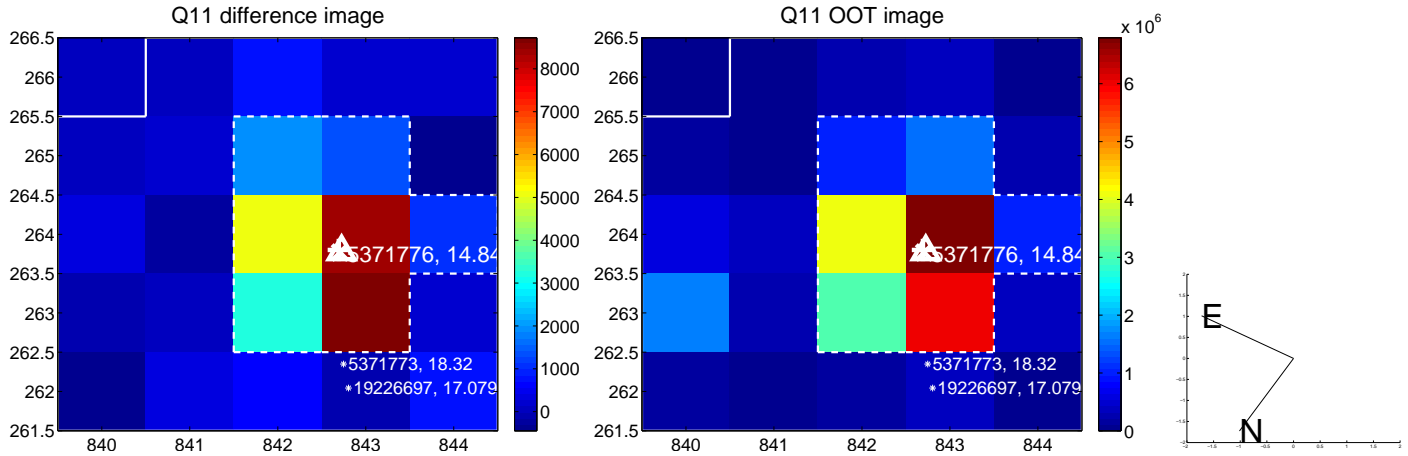
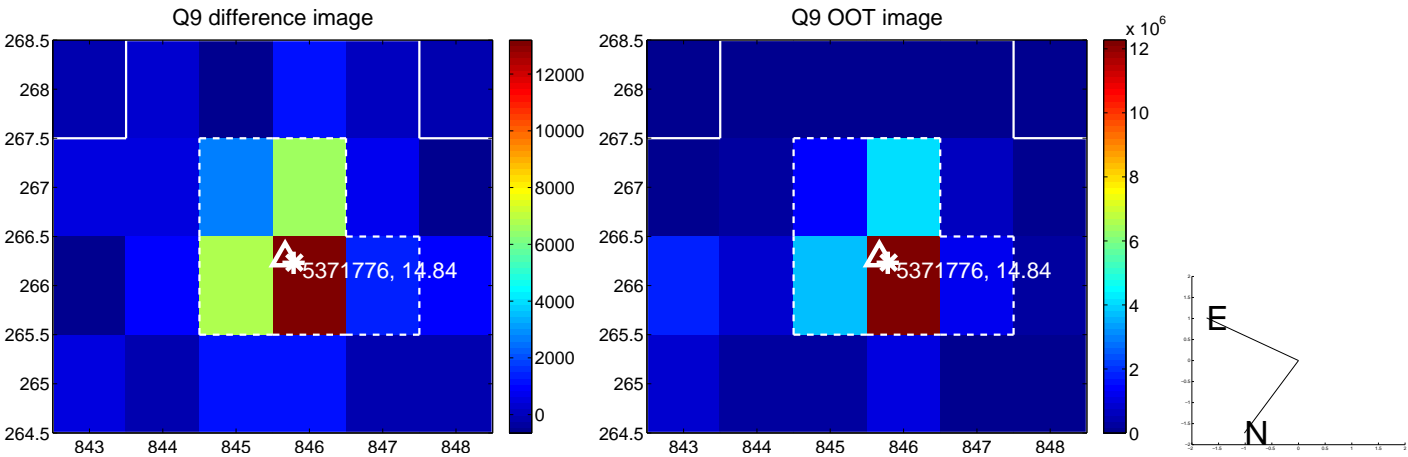
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



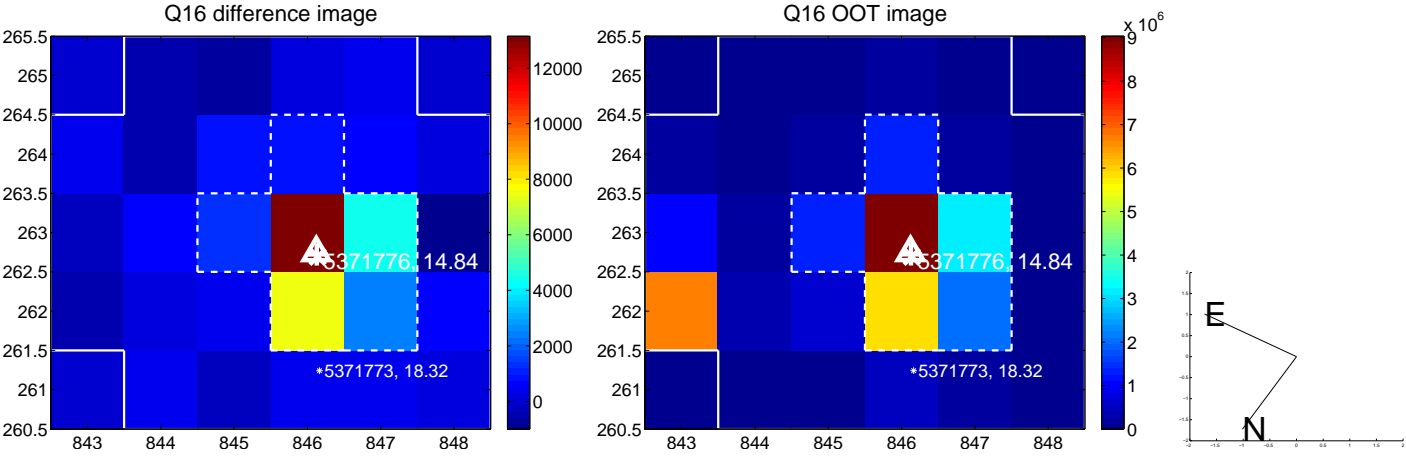
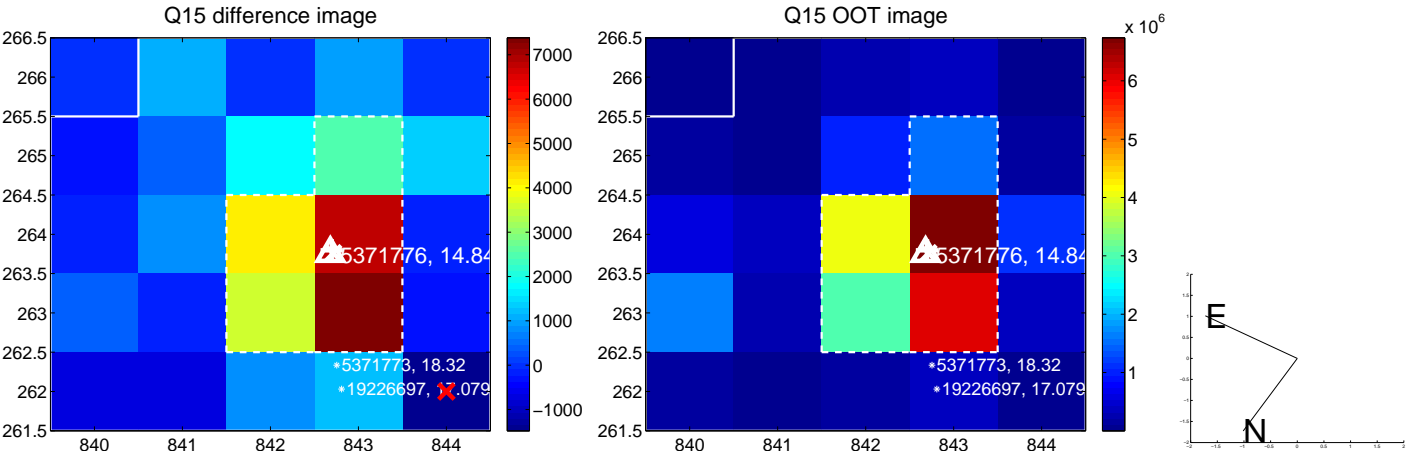
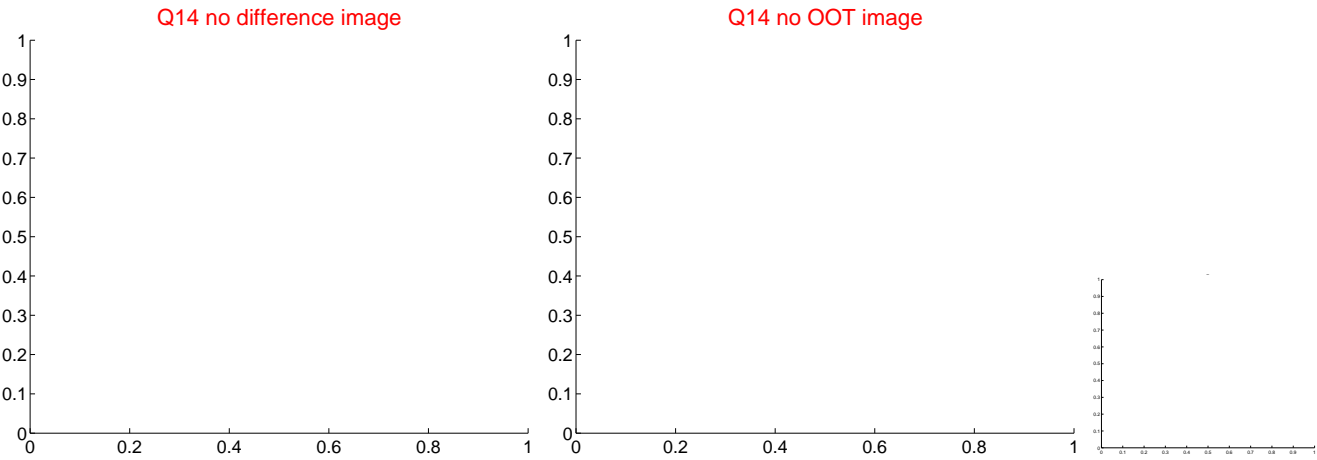
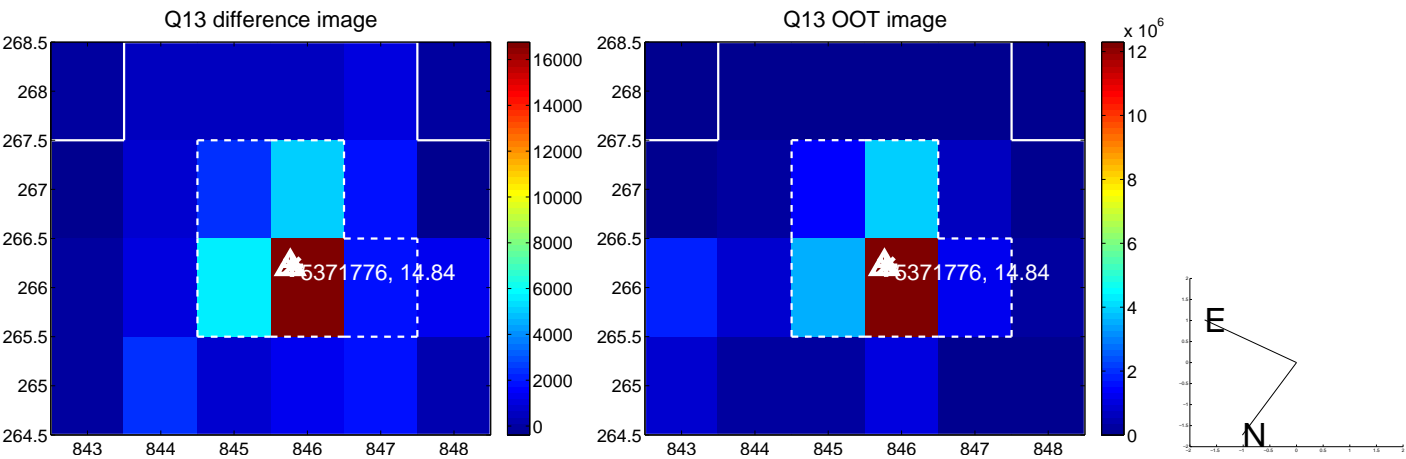
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



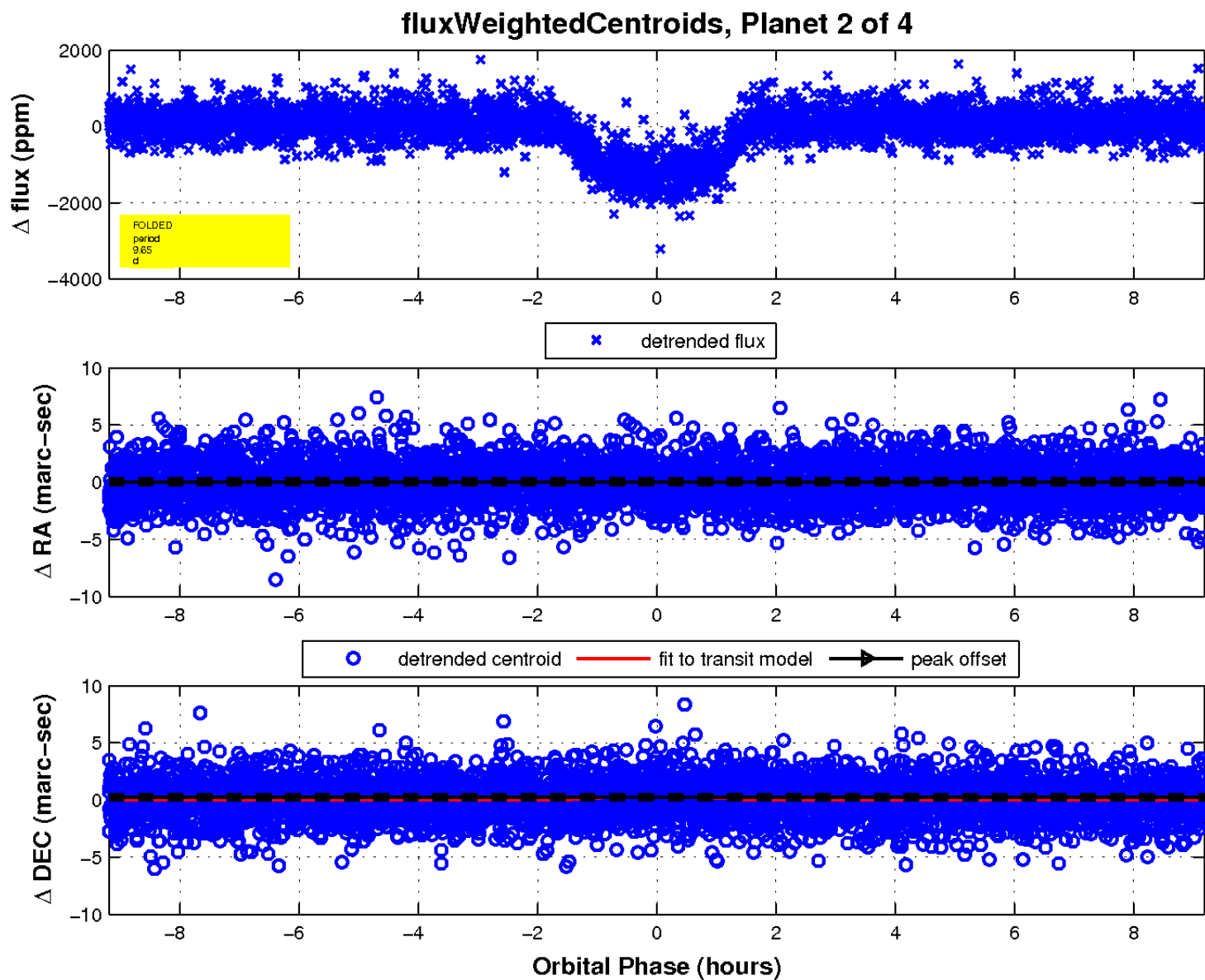
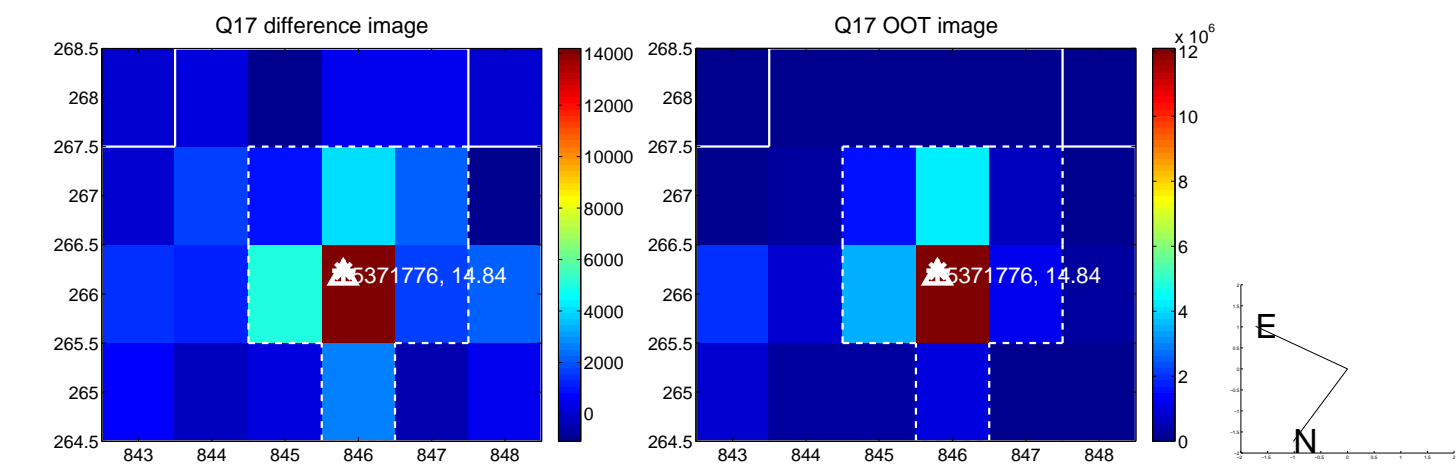
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

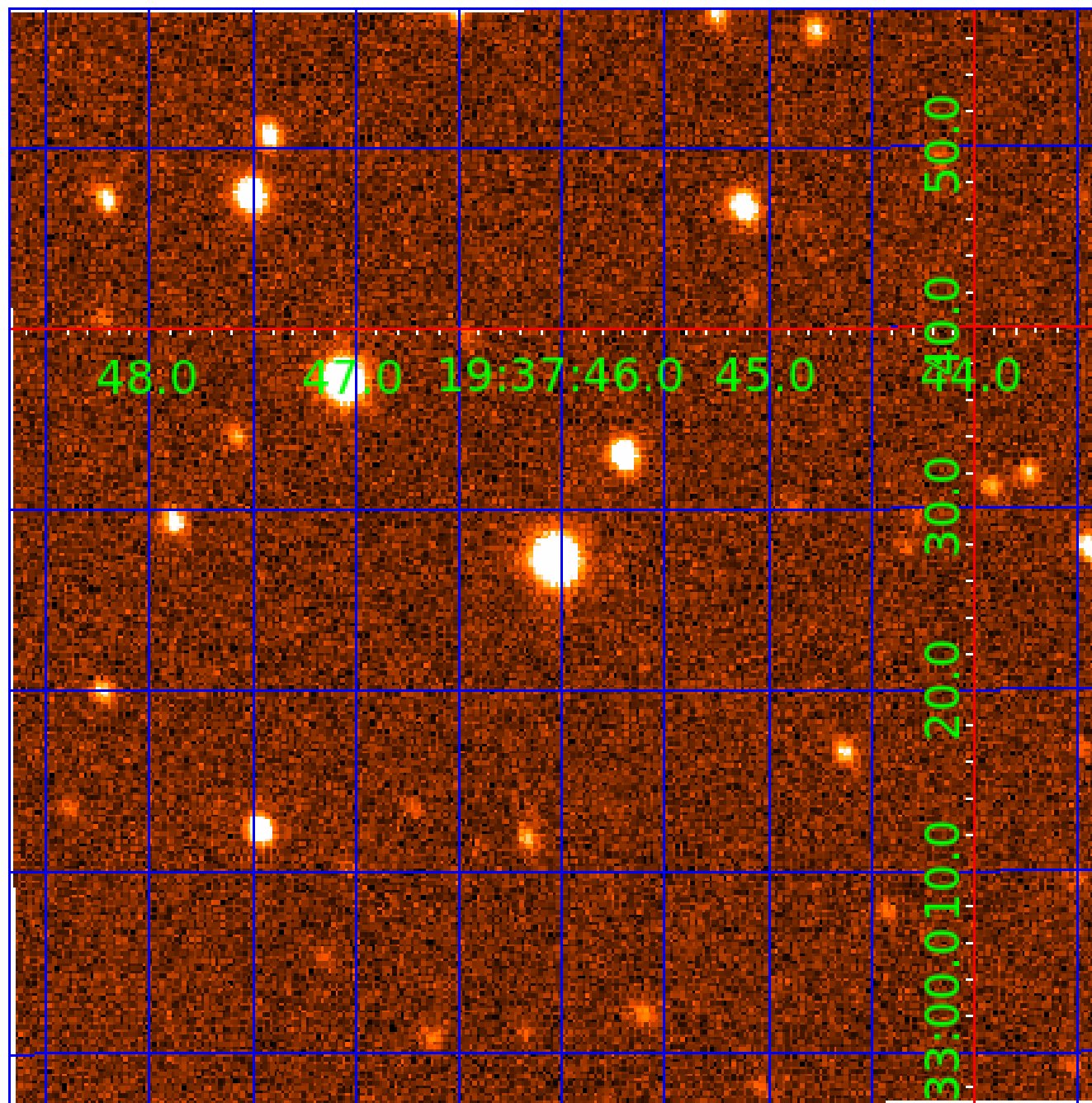


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005371776

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})
005371776-01	OBS	1557.01	3.295695	133.967589	1707.7	2.015	119.2	120.8	0.69	4723	3.41	138.51
005371776-02	OBS	1557.02	9.653486	134.856536	1335.9	3.064	57.3	59.3	0.69	4723	2.90	33.05
005371776-03	OBS	1557.03	5.315957	132.429109	944.9	1.175	34.0	43.7	0.69	4723	2.56	73.22
005371776-04	OBS	1557.04	1.499143	131.568877	239.8	1.533	20.6	23.2	0.69	4723	1.32	395.94

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005371776-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

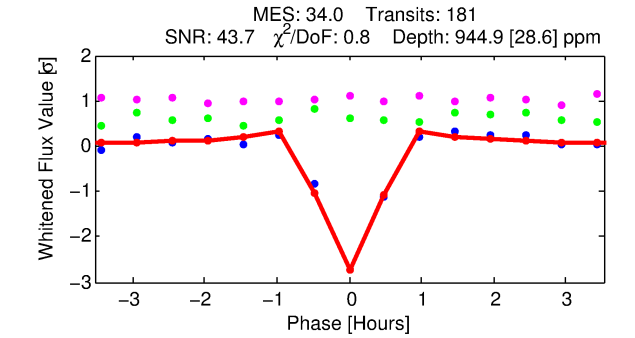
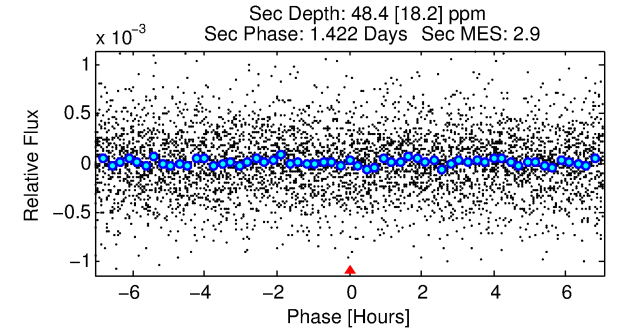
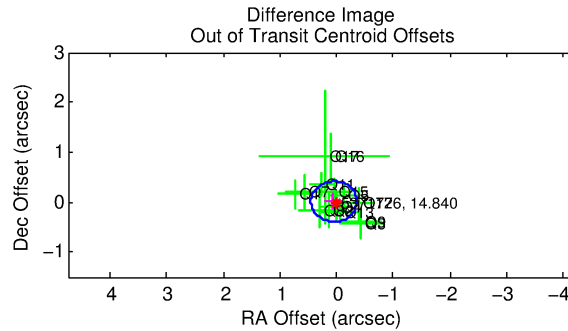
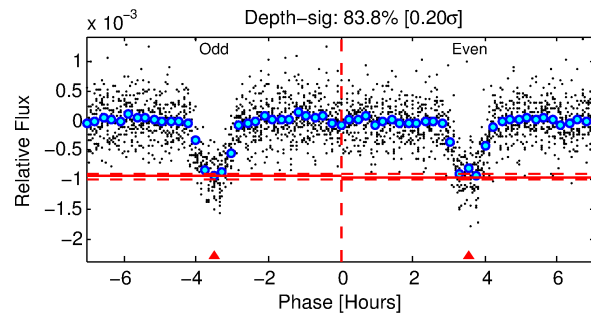
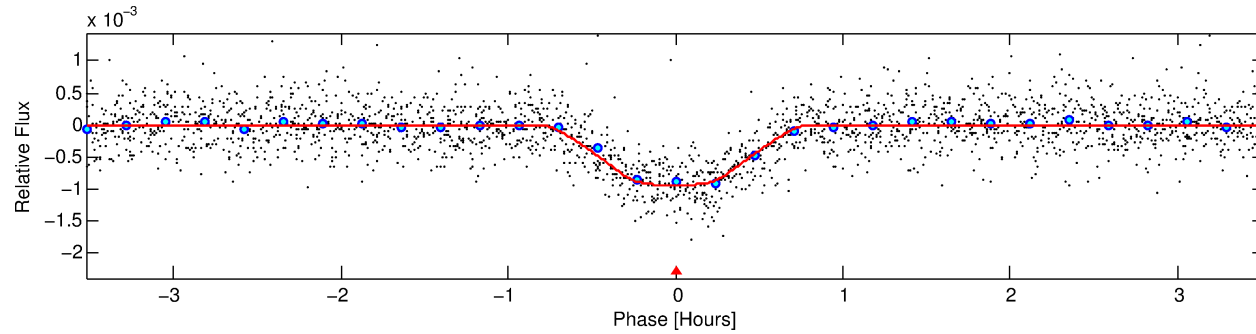
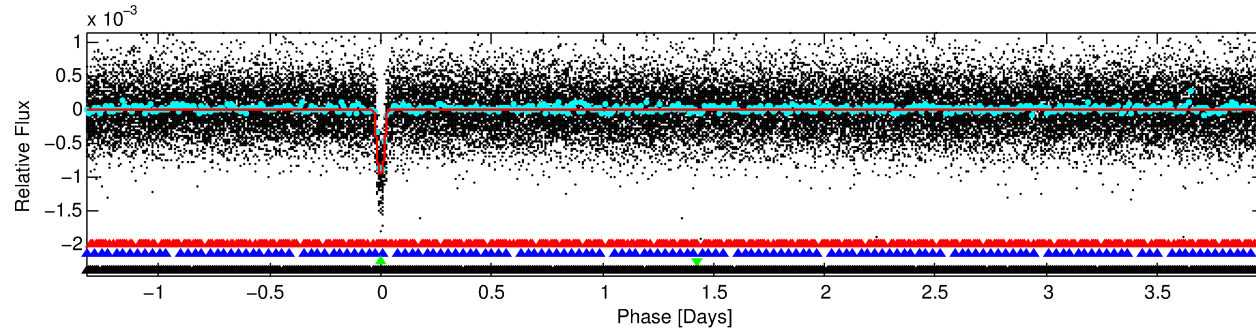
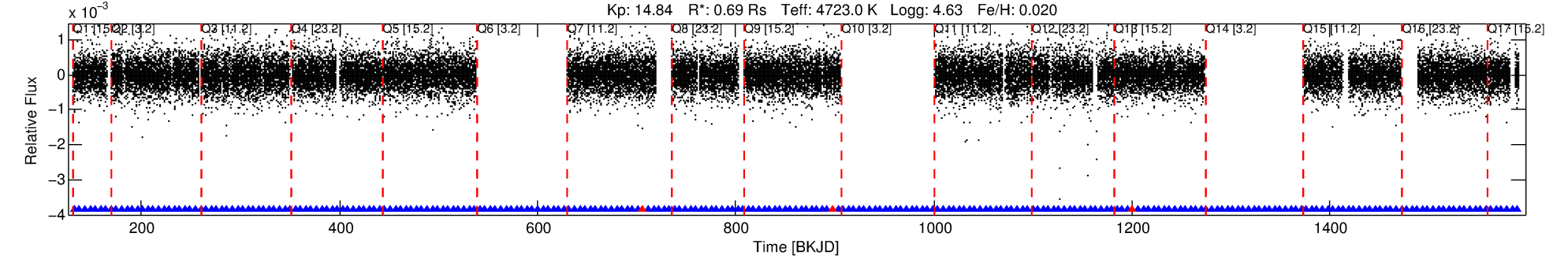
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005371776-03

No Significant Match Found

DV One-Page Summary

KIC: 5371776 Candidate: 3 of 4 Period: 5.316 d
KOI: K01557.03 Name: Kepler-304c Corr: 0.965



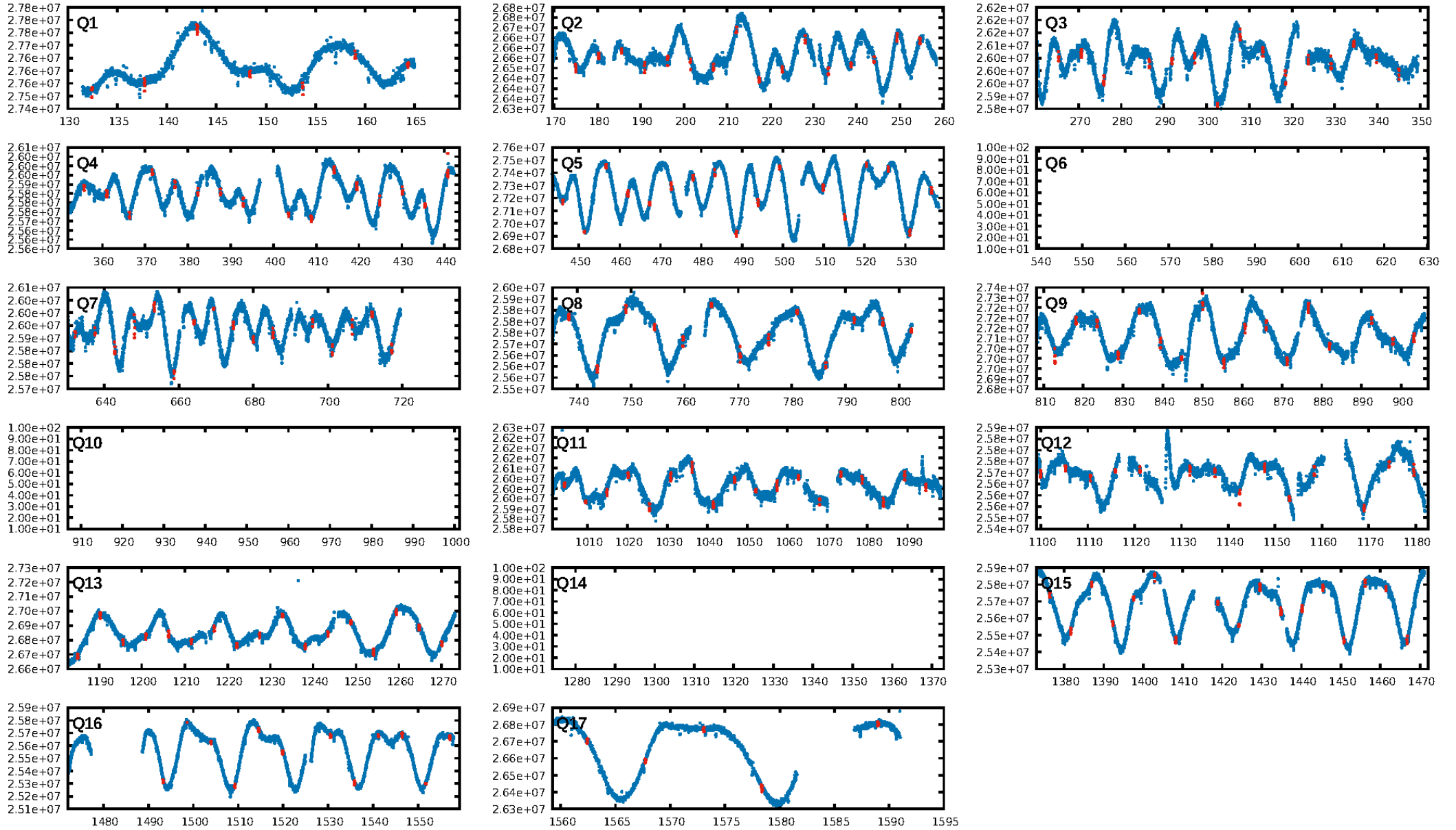
DV Fit Results:

Period = 5.31596 [0.00000] d
Epoch = 132.4291 [0.0005] BKJD
Rp/R* = 0.0340 [0.0068]
a/R* = 19.07 [13.17]
b = 0.87 [0.19]
Seff = 73.22 [8.46]
Teq = 746 [22] K
Rp = 2.56 [0.54] Re
a = 0.0539 [0.0032] AU
Ag = 11.79 [6.52] [1.65 σ]
Teffp = 2137 [295] K [4.70 σ]

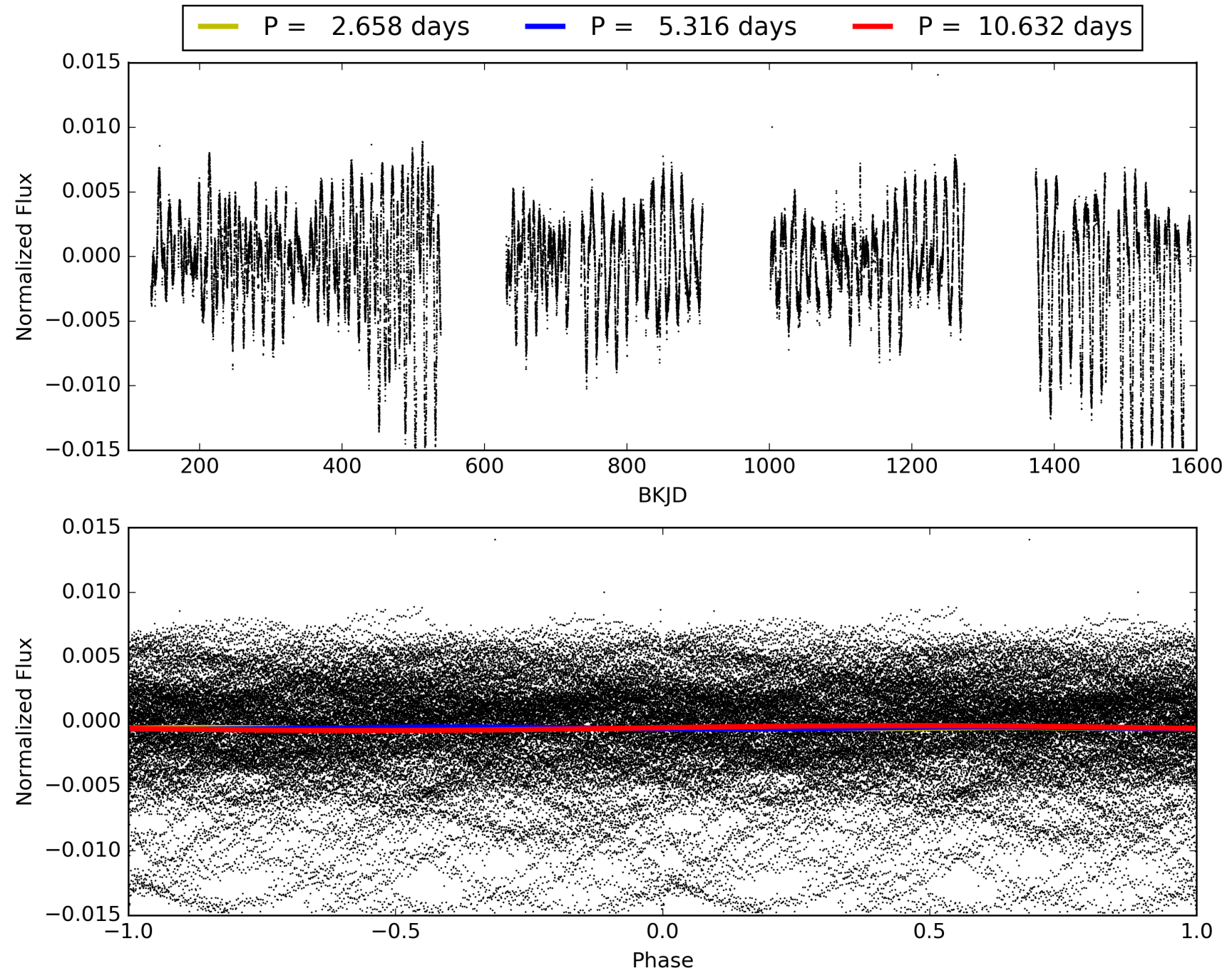
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.79 σ]
LongPeriod-sig: 100.0% [31.72 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 8.07e-242
RollingBand-fgt: 0.98 [167/170]
GhostDiagnostic-chr: 6.646
Centroid-sig: 0.0%
Centroid-so: 1.279 arcsec [4.36 σ]
OotOffset-rm: 0.053 arcsec [0.39 σ]
KicOffset-rm: 0.153 arcsec [1.13 σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 005371776-03, PDC Light Curves

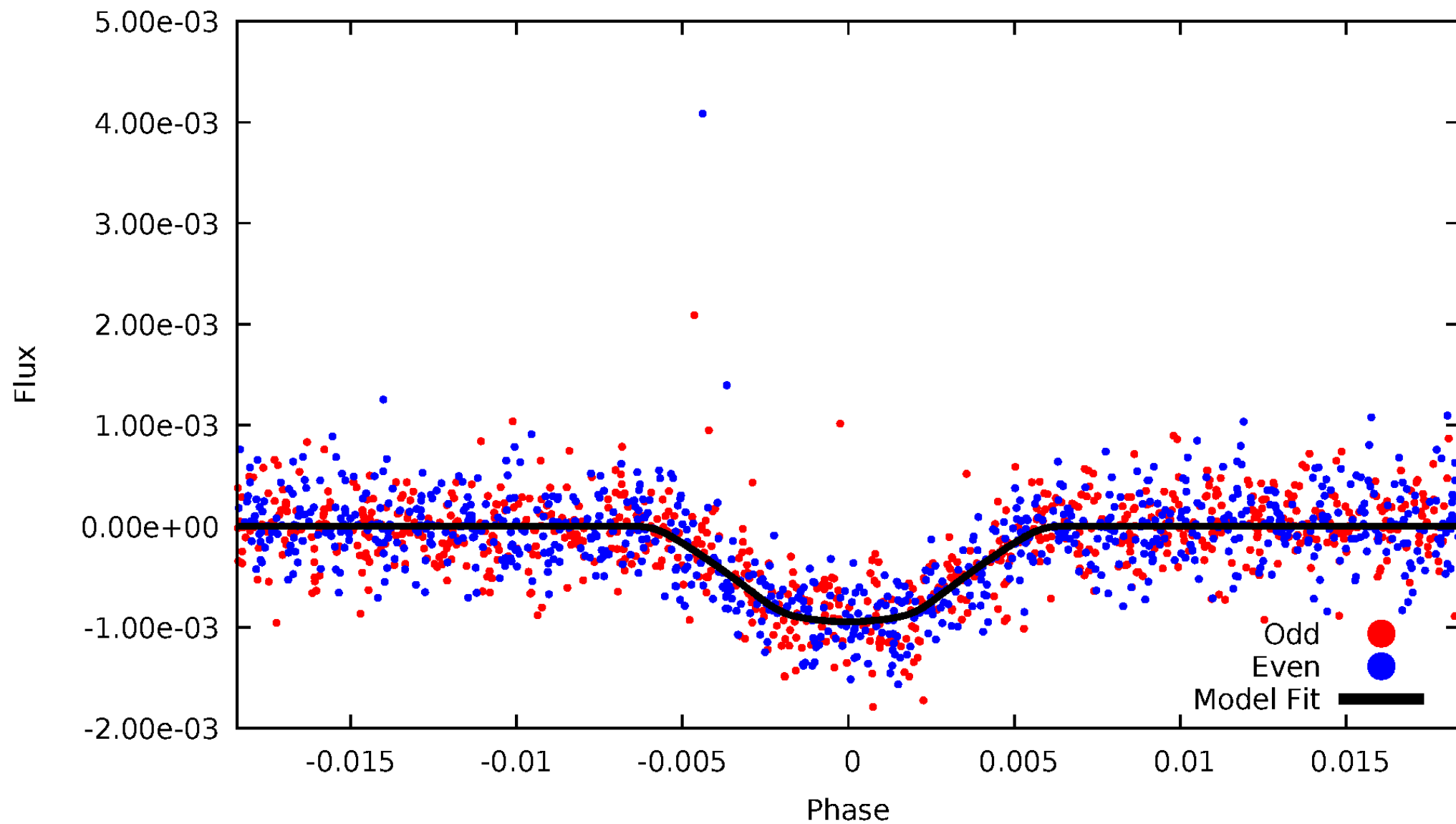


TCE 005371776-03



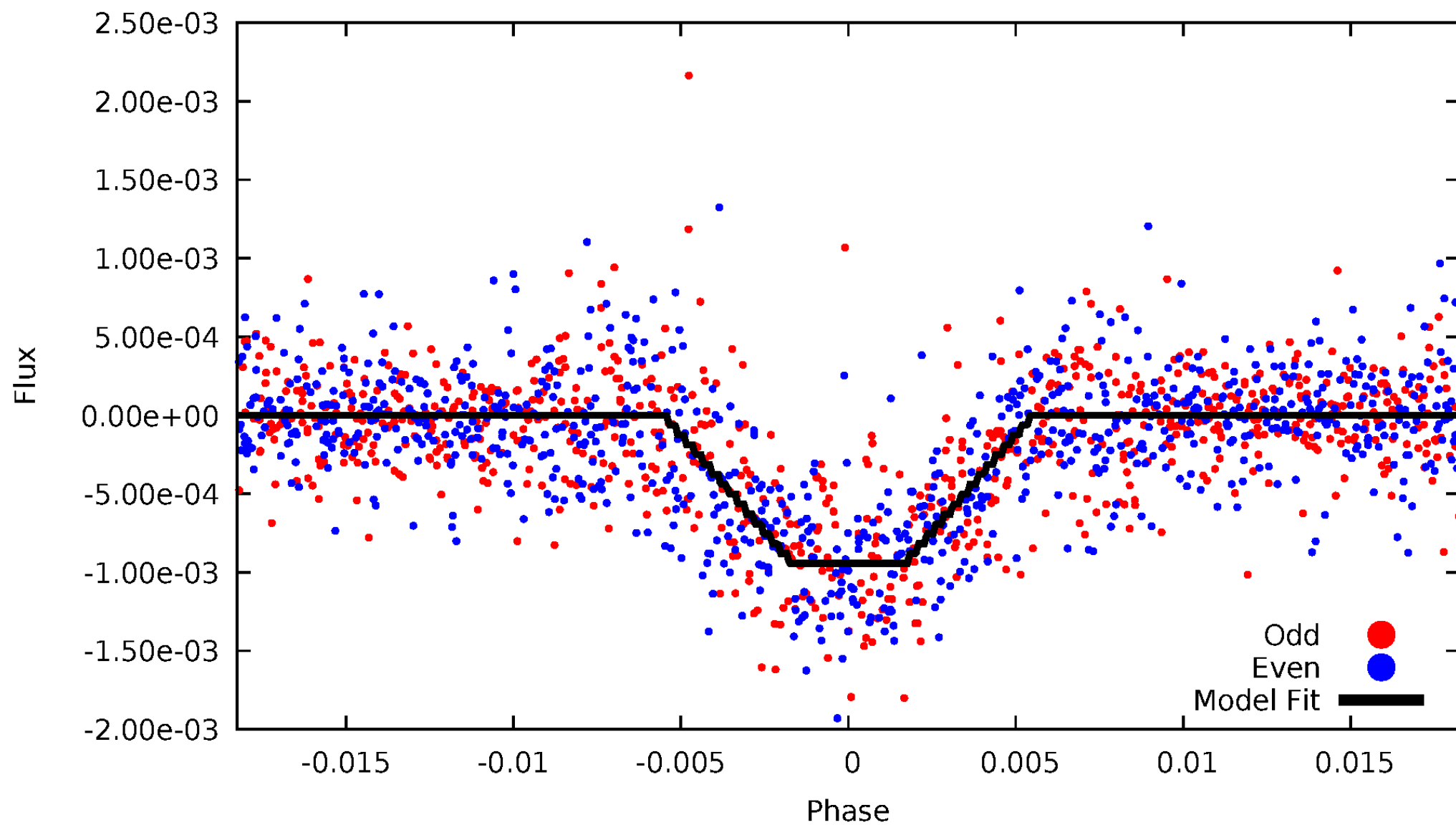
DV Odd/Even

TCE 005371776-03



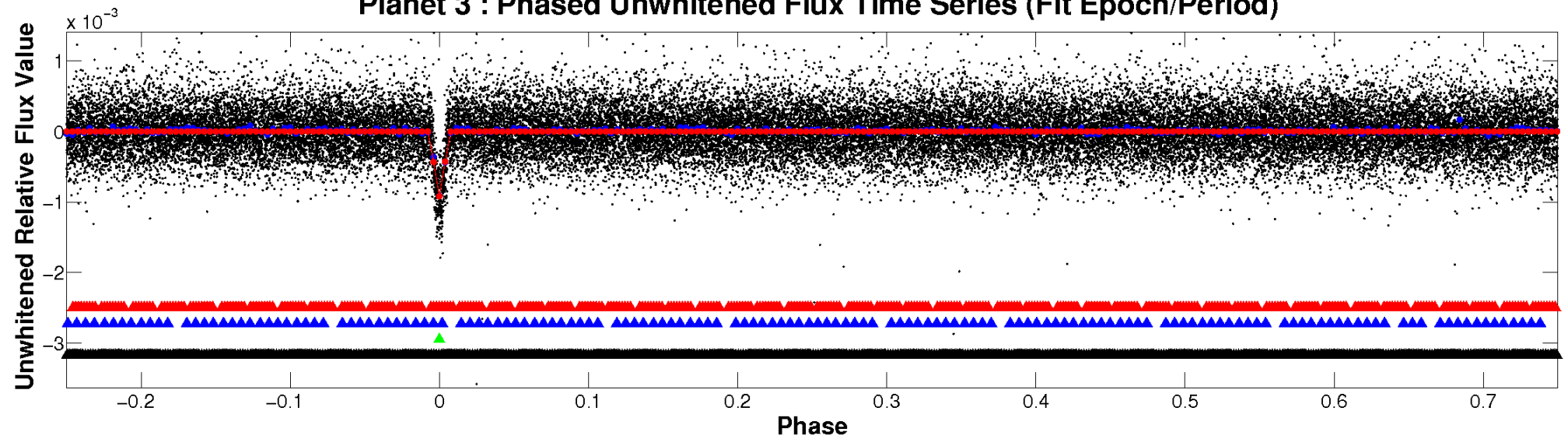
ALT Odd/Even

TCE 005371776-03

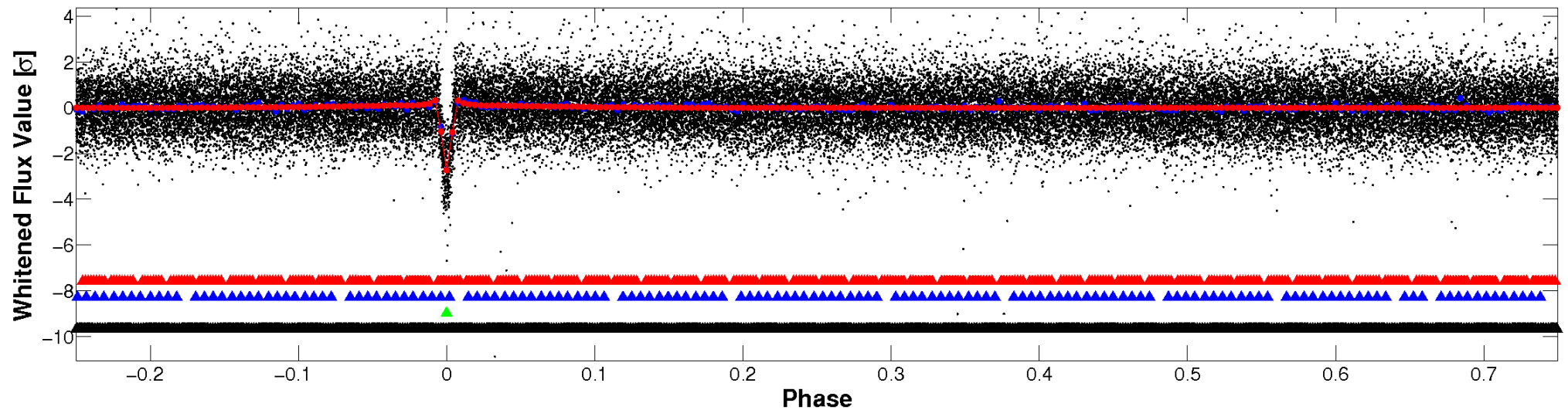


Non-Whitened Vs. Whitened Light Curve

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

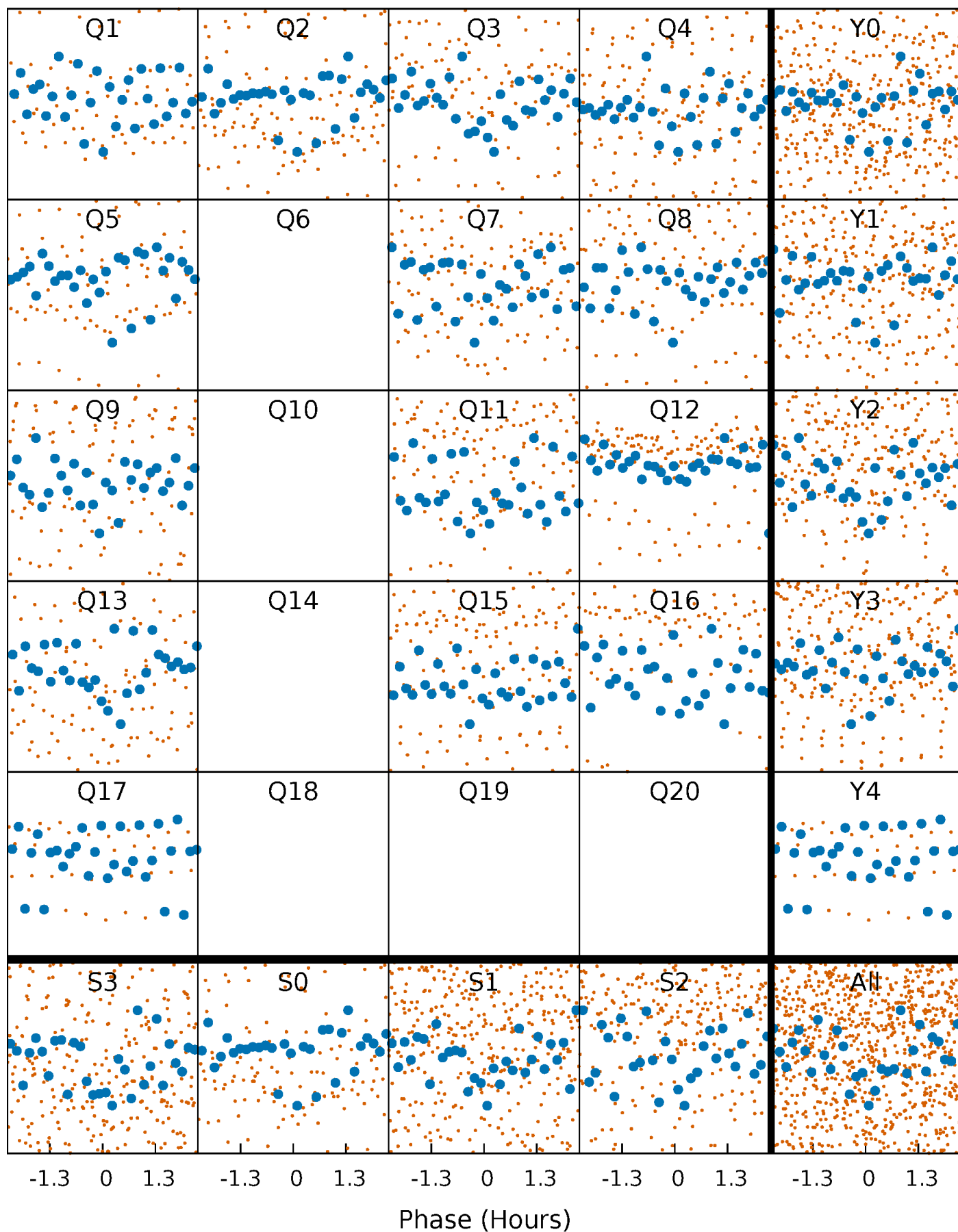


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



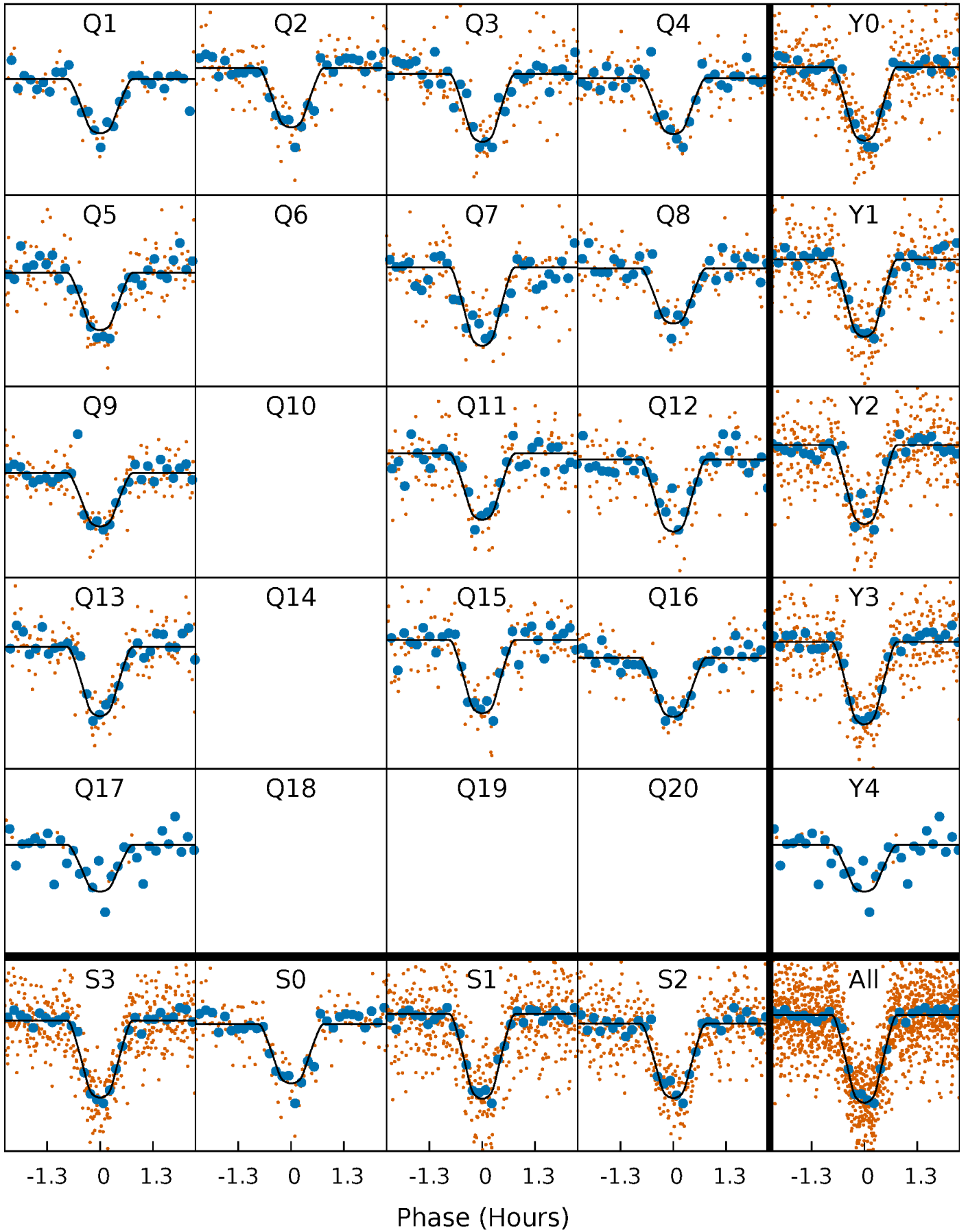
PDC Quarter-Phased Transit Curves

TCE 005371776-03 P= 5.315957 Days $T_0=132.429109$ (BKJD)



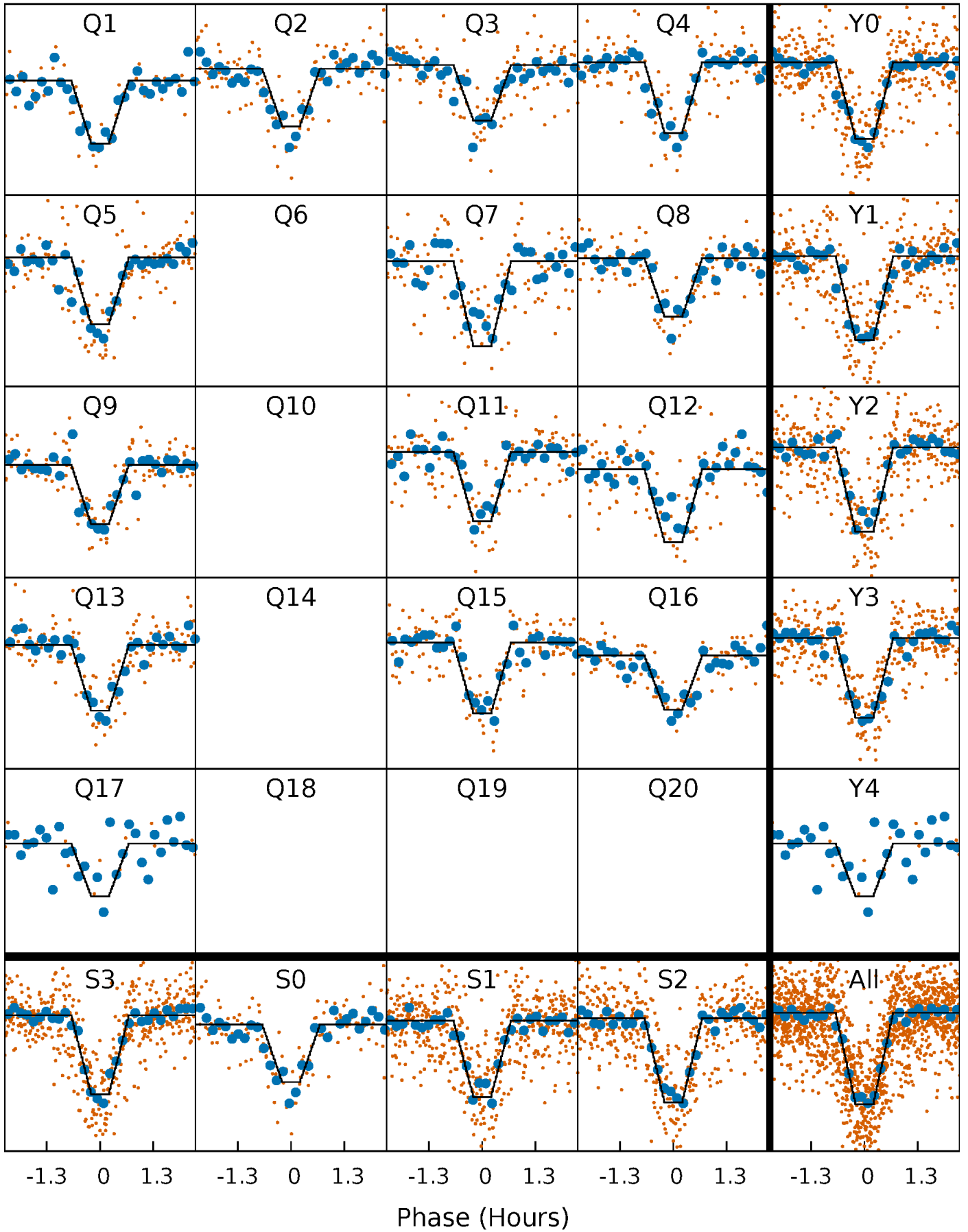
DV Quarter-Phased Transit Curves

TCE 005371776-03 P= 5.315957 Days $T_0=132.429109$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

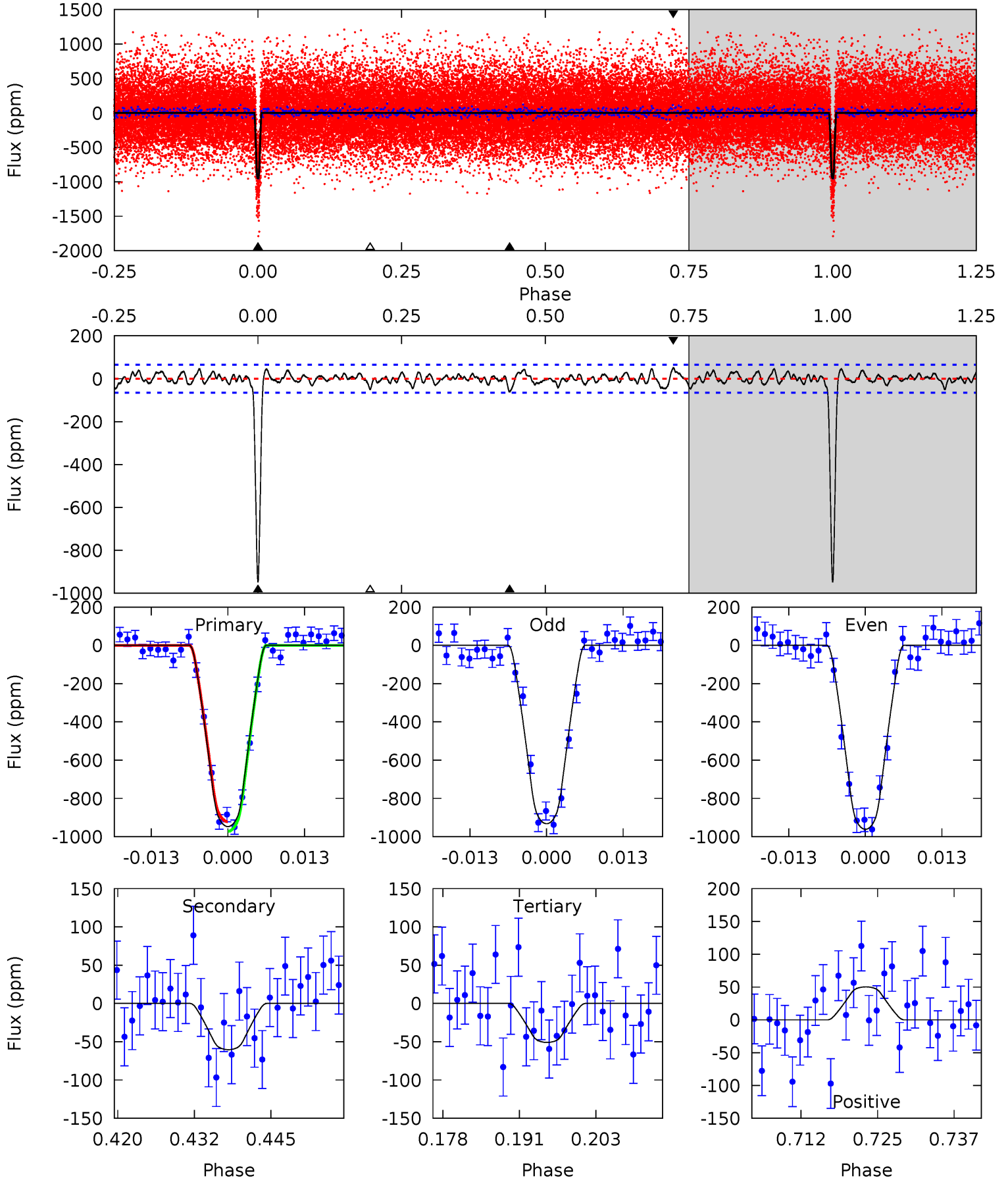
TCE 005371776-03 P= 5.315934 Days $T_0=132.432924$ (BKJD)



DV Model-Shift Uniqueness Test

005371776-03, P = 5.315957 Days, E = 127.113152 Days

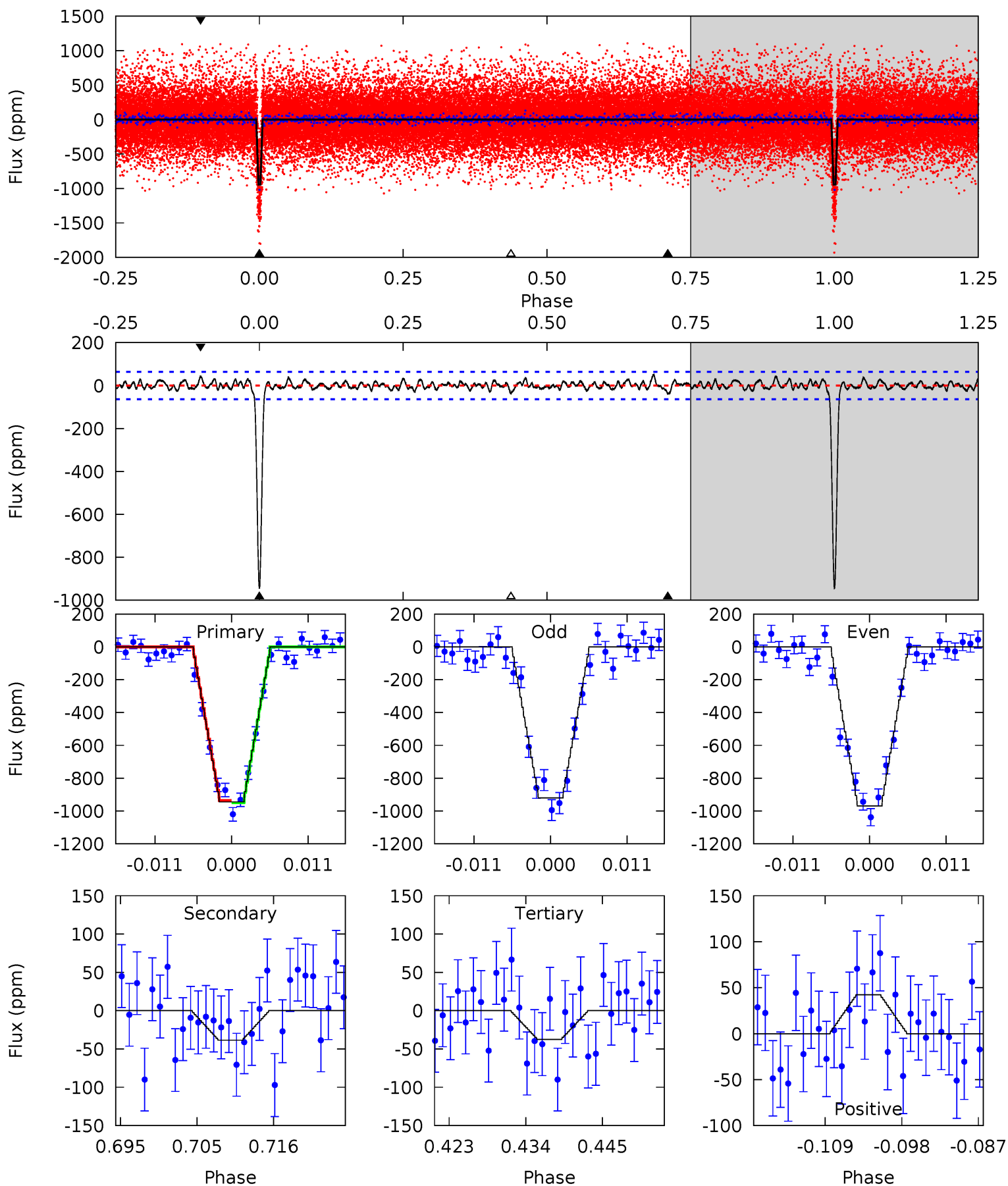
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
72.1	4.59	3.87	3.82	4.98	2.49	1.40	68.2	68.2	0.72	0.77	1.12	1.00	0.05	1.91



Alt Model-Shift Uniqueness Test

005371776-03, P = 5.315934 Days, E = 127.116990 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
74.0	3.02	2.94	3.32	5.01	2.55	1.07	71.1	70.7	0.08	-0.30	1.94	0.99	0.05	0.54



Stellar Parameters For KIC 005371776

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4723^{+94}_{-94}	$4.628^{+0.012}_{-0.045}$	$0.020^{+0.150}_{-0.150}$	$0.691^{+0.049}_{-0.025}$	$0.760^{+0.031}_{-0.047}$	$3.248^{+0.212}_{-0.562}$
	+2%/-2%	+0%/-1%	+750%/-750%	+7%/-4%	+4%/-6%	+7%/-17%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 005371776-03 / KOI 1557.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-60 ± 13	$2.64^{+0.52}_{-0.56}$	1052^{+25}_{-24}	2888^{+211}_{-176}	14^{+8}_{-5}
Alt.	-39 ± 13	$2.38^{+0.53}_{-0.54}$	1050^{+27}_{-22}	2785^{+245}_{-200}	11^{+8}_{-4}

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 $A_{\text{obs}} \gg 1.0$

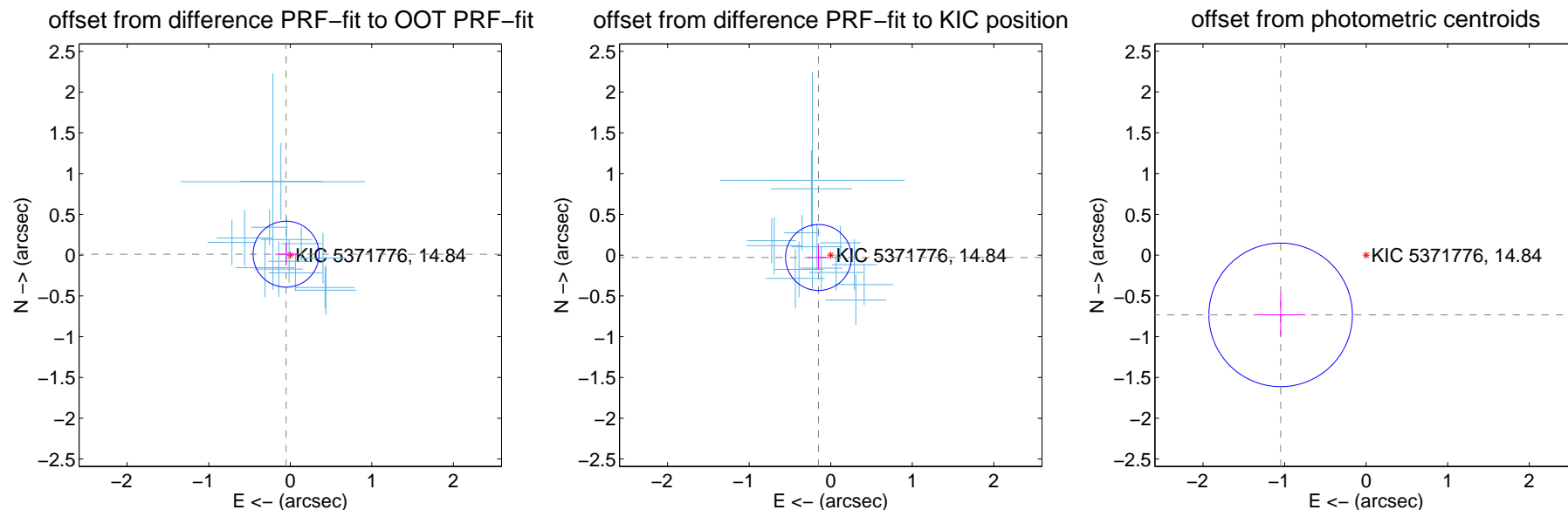
DV Centroid Data

Supplemental centroid analysis for 005371776-03. Kepler magnitude: 14.84. Transit SNR 43.66

There are 14 quarters with good PRF difference image offsets

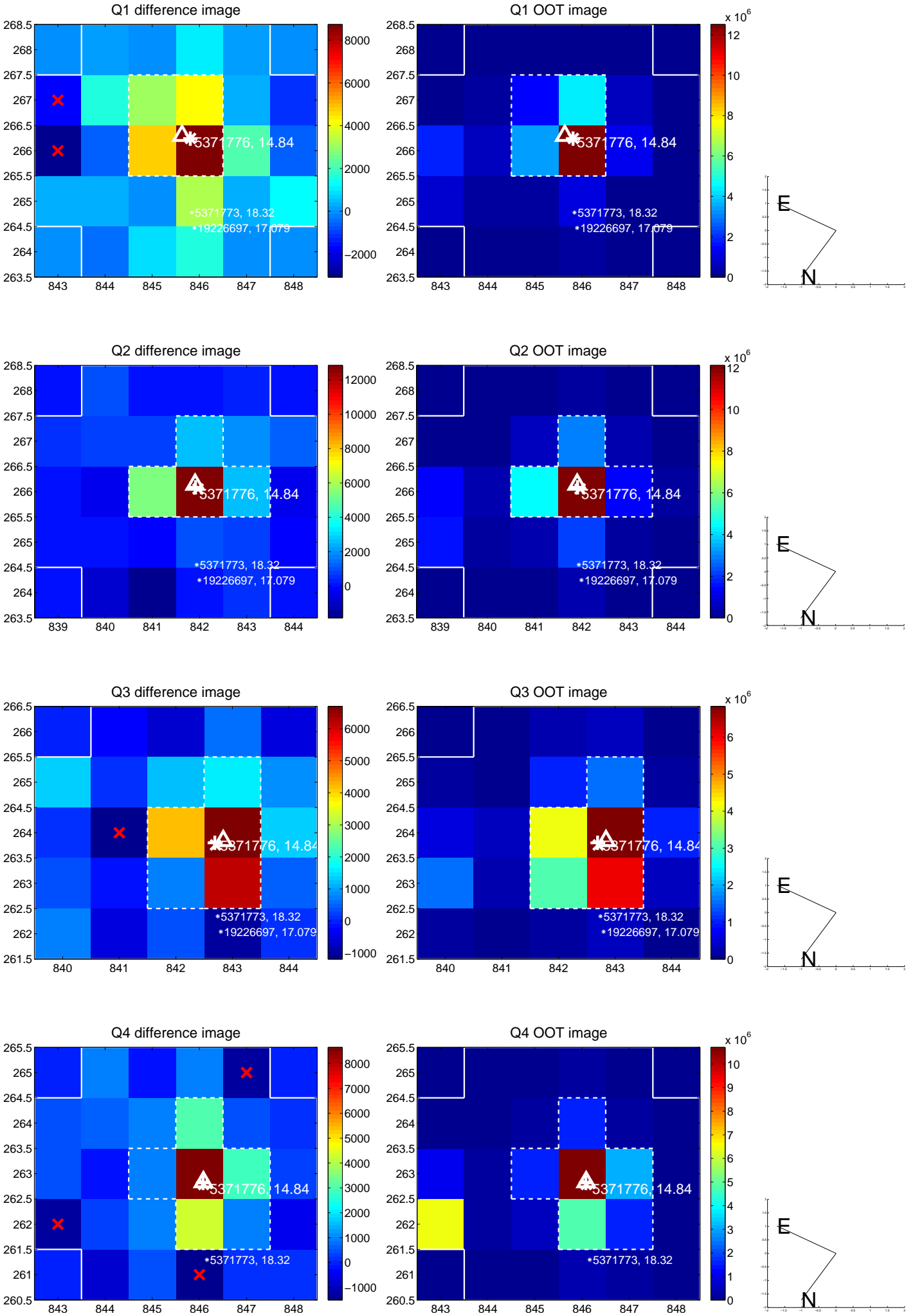
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.053 ± 0.135	0.39	0.051 ± 0.135	0.012 ± 0.140
PRF-fit source offset from KIC position	0.153 ± 0.135	1.13	0.150 ± 0.135	-0.028 ± 0.140
photometric centroid source offset	1.28 ± 0.29	4.36	1.05 ± 0.30	-0.73 ± 0.27

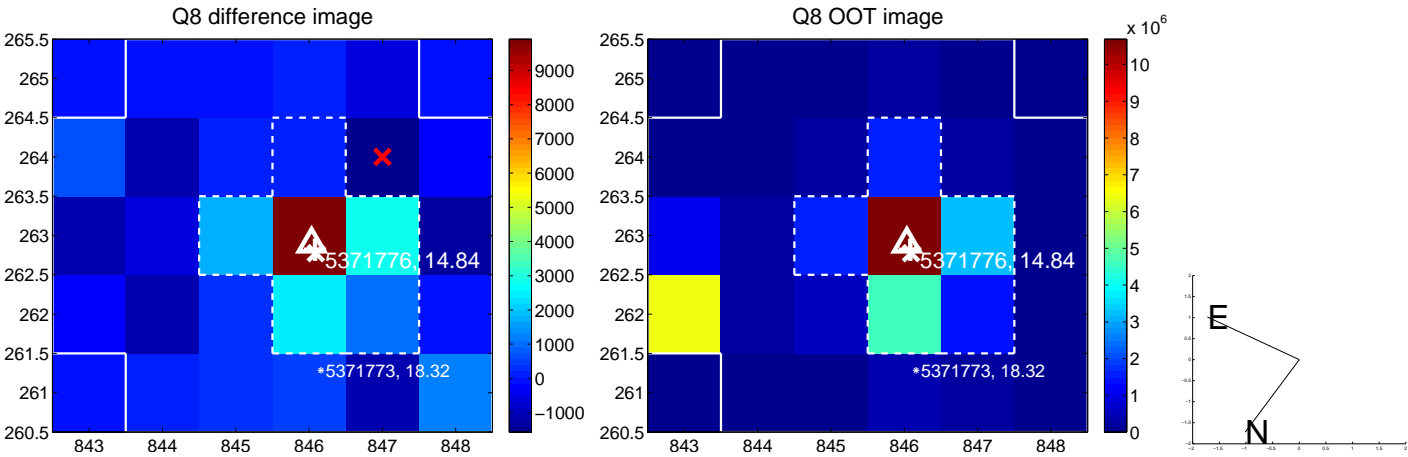
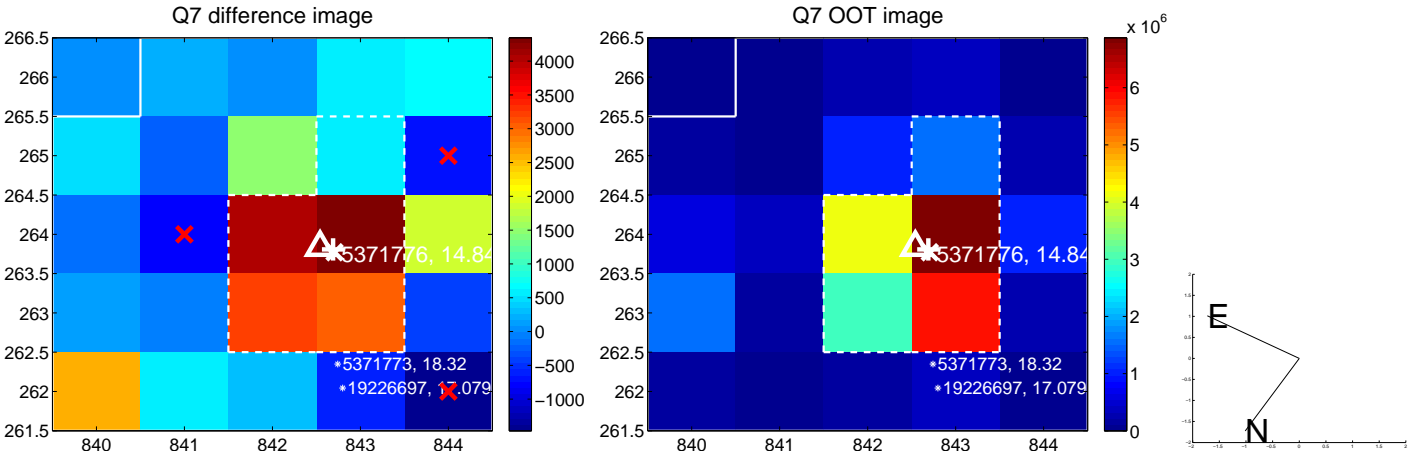
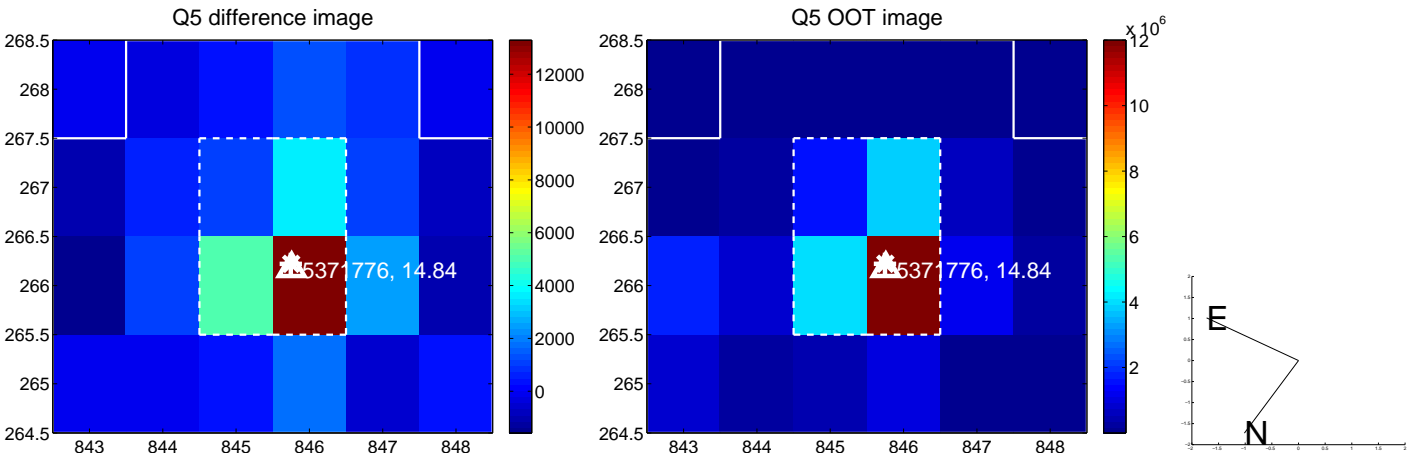


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

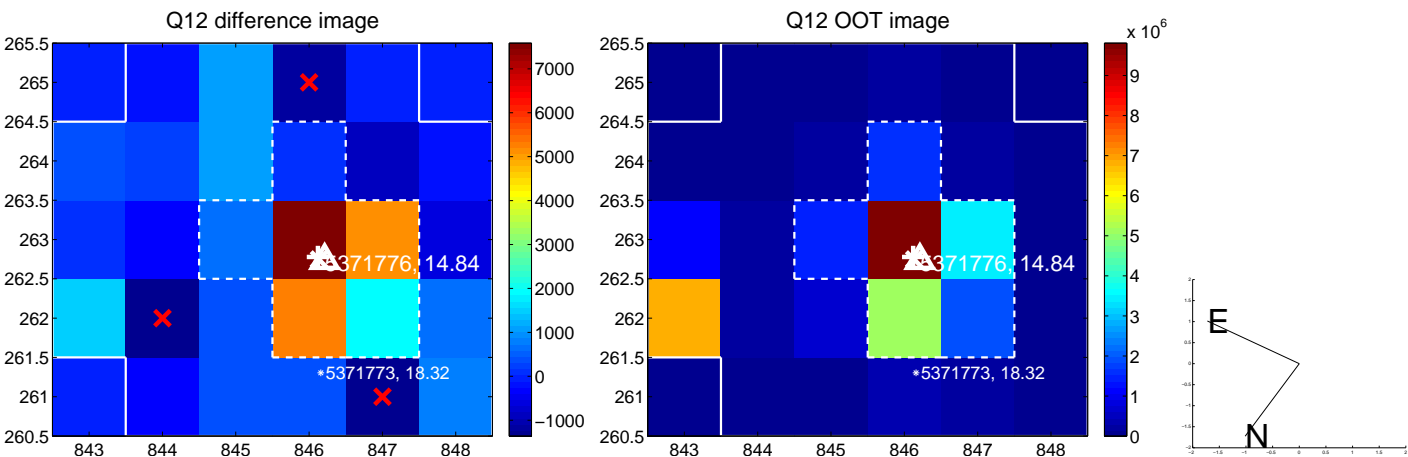
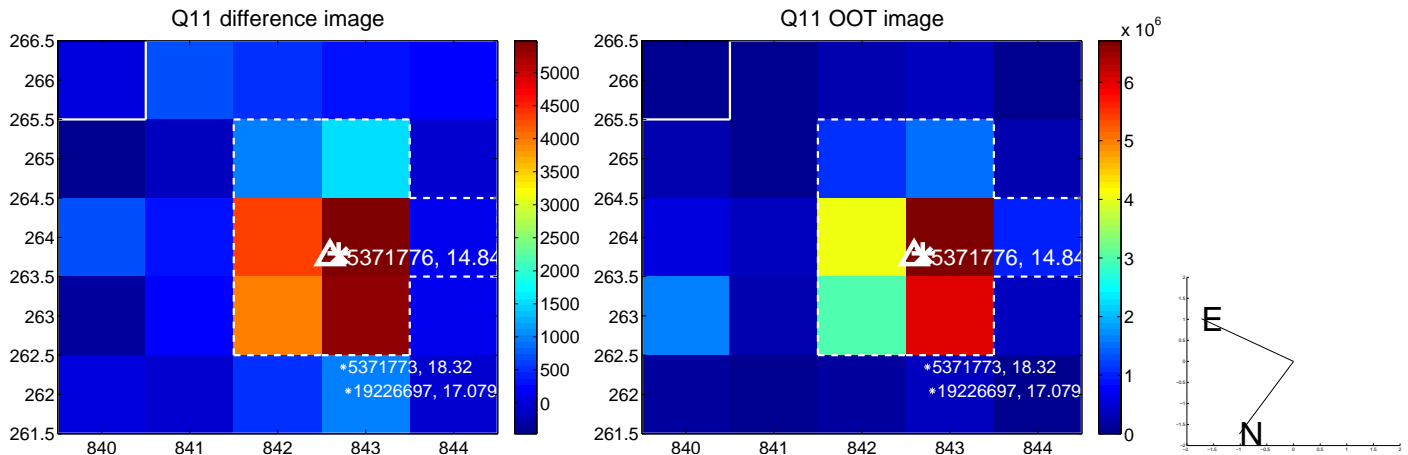
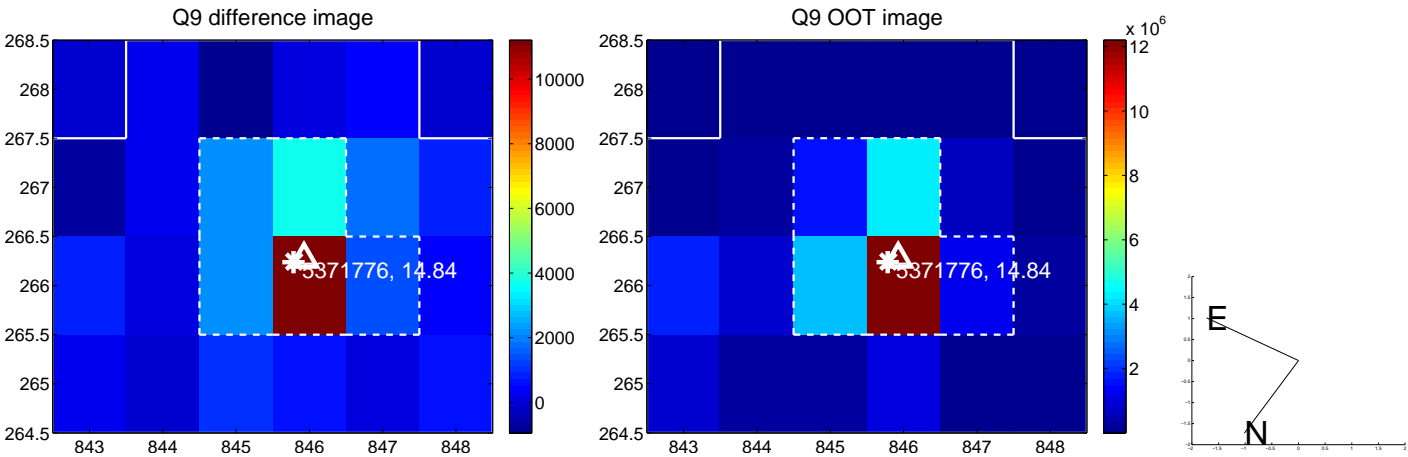
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



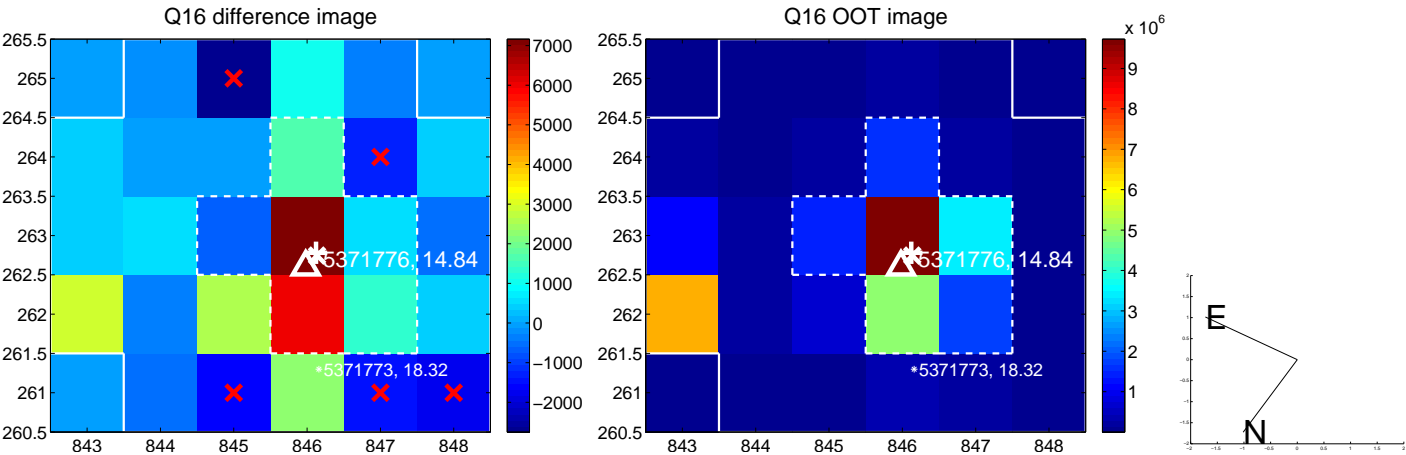
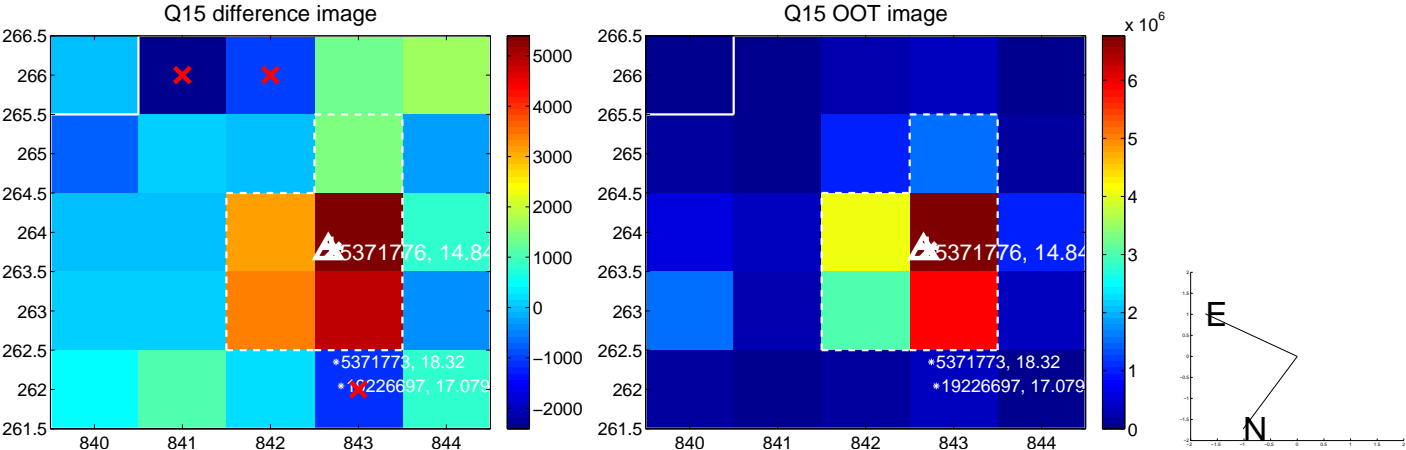
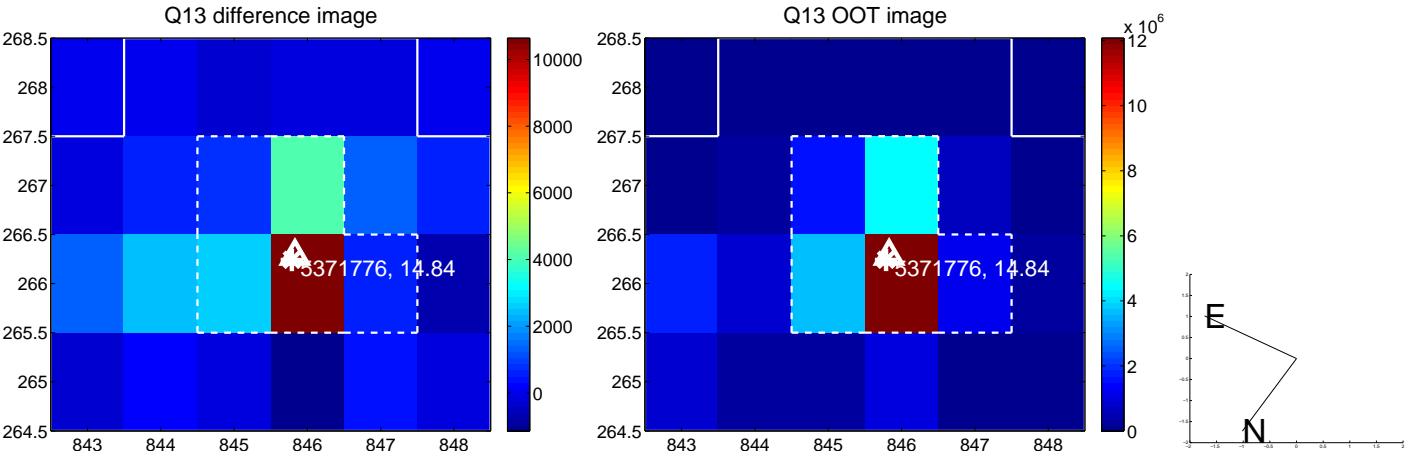
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



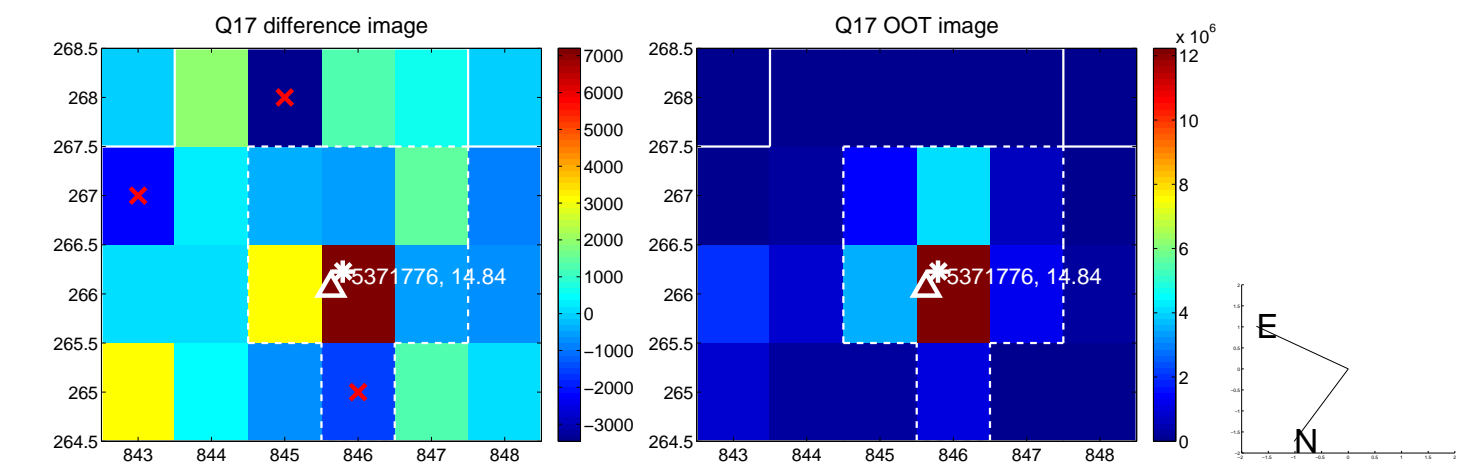
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



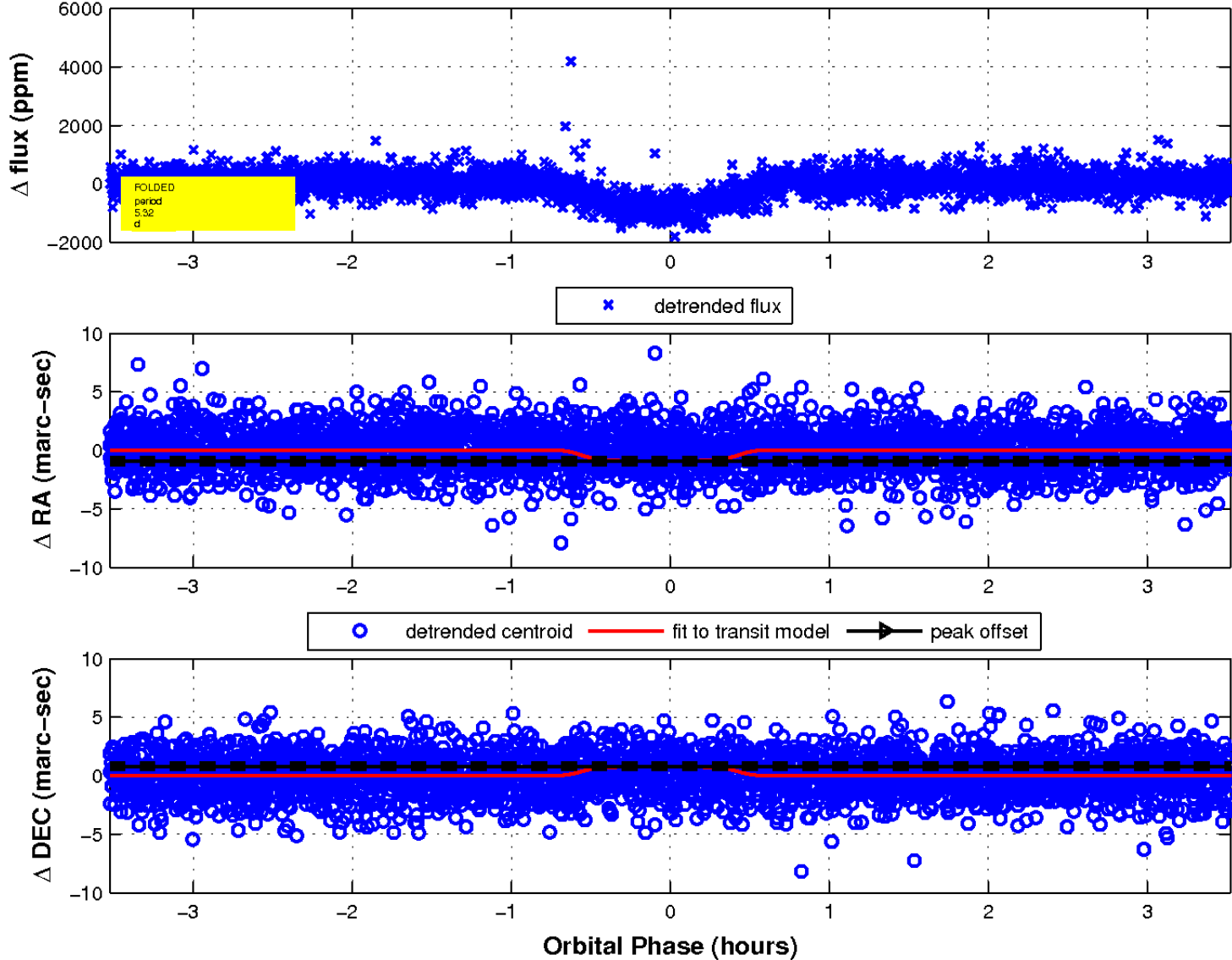
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

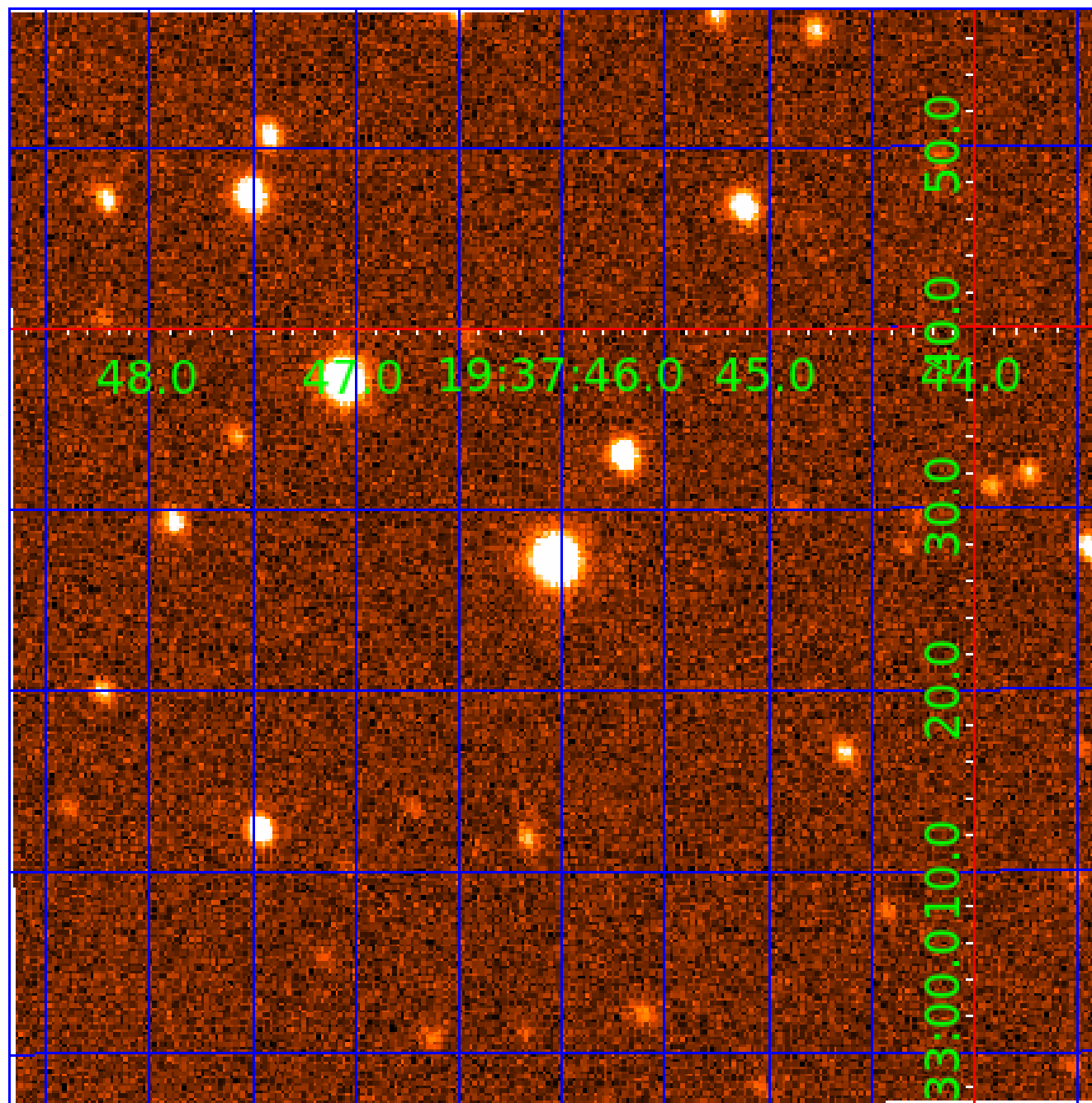


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 005371776

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})
005371776-01	OBS	1557.01	3.295695	133.967589	1707.7	2.015	119.2	120.8	0.69	4723	3.41	138.51
005371776-02	OBS	1557.02	9.653486	134.856536	1335.9	3.064	57.3	59.3	0.69	4723	2.90	33.05
005371776-03	OBS	1557.03	5.315957	132.429109	944.9	1.175	34.0	43.7	0.69	4723	2.56	73.22
005371776-04	OBS	1557.04	1.499143	131.568877	239.8	1.533	20.6	23.2	0.69	4723	1.32	395.94

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005371776-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005371776-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

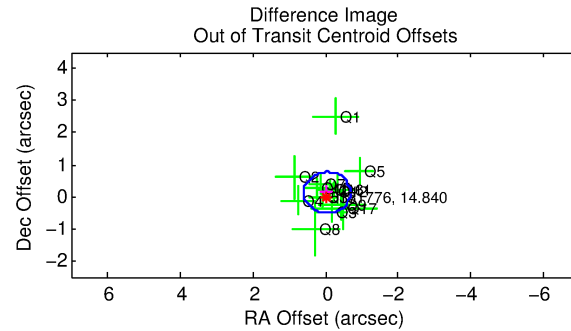
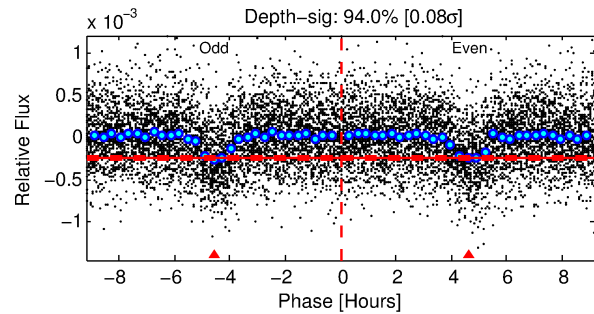
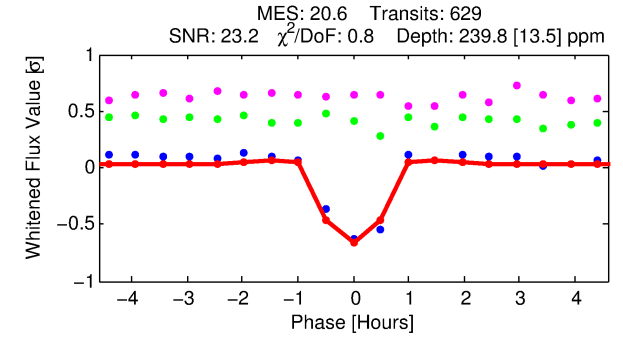
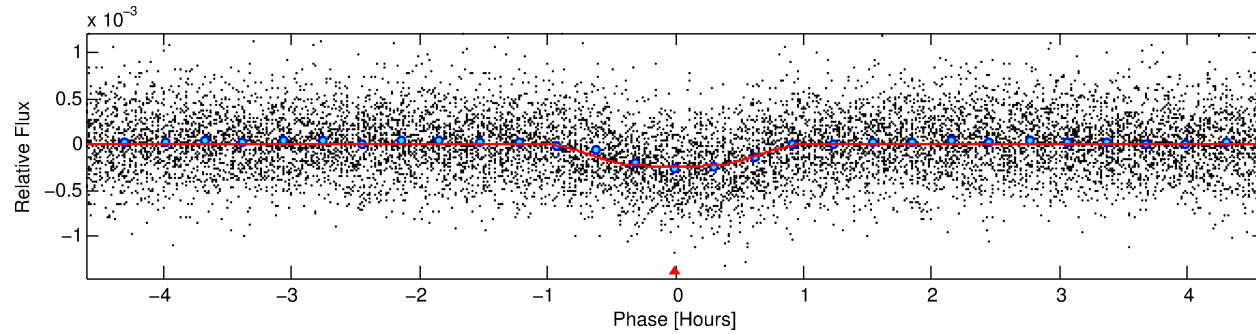
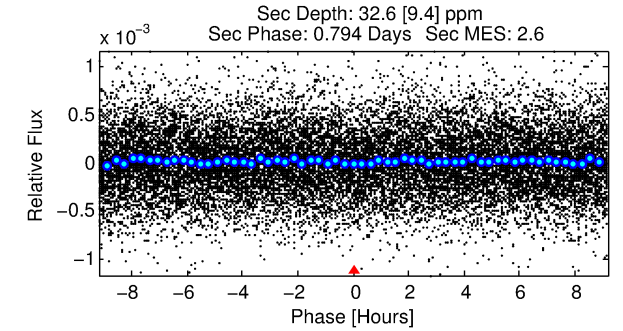
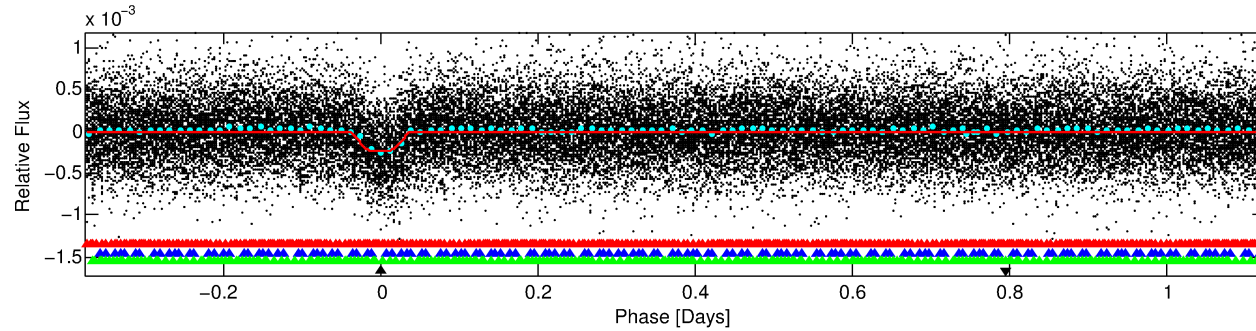
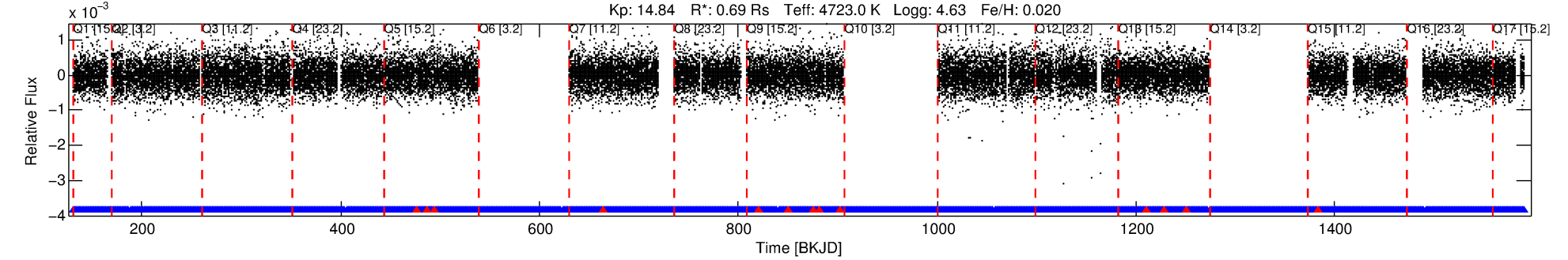
Ephemeris Match Information For 005371776-04

No Significant Match Found

DV One-Page Summary

KIC: 5371776 Candidate: 4 of 4 Period: 1.499 d

KOI: K01557.04 Corr: 0.959



DV Fit Results:

Period = 1.49914 [0.00000] d
Epoch = 131.5689 [0.0009] BKJD
 R_p/R^* = 0.0175 [0.0071]
 a/R^* = 3.68 [5.25]
 b = 0.90 [0.34]
 S_{eff} = 395.94 [45.74]
 T_{eq} = 1137 [33] K
 R_p = 1.32 [0.54] R_{e}
 a = 0.0232 [0.0014] AU
 A_g = 5.54 [4.81] [0.94σ]
 T_{eff} = 2698 [585] K [2.66σ]

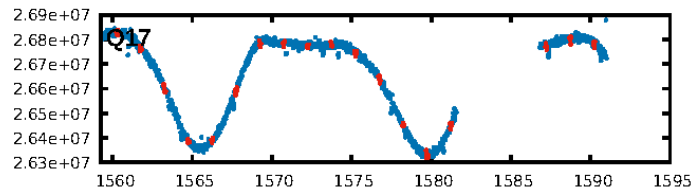
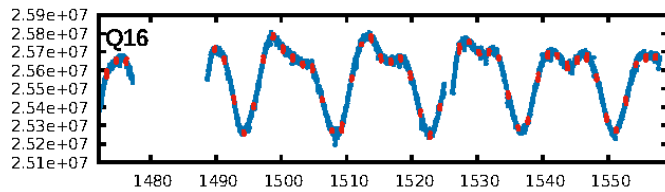
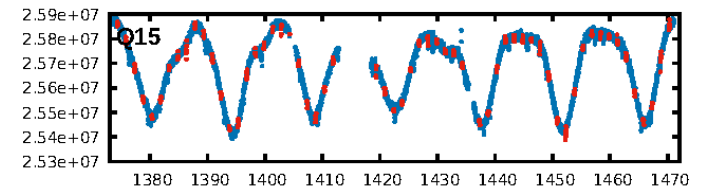
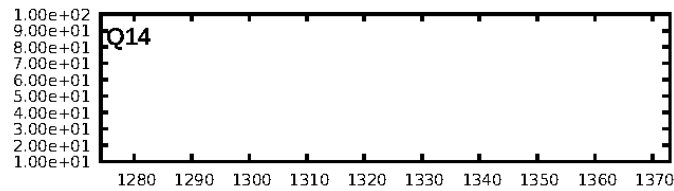
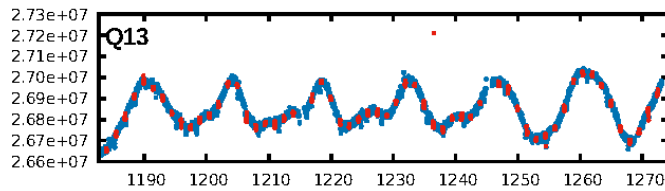
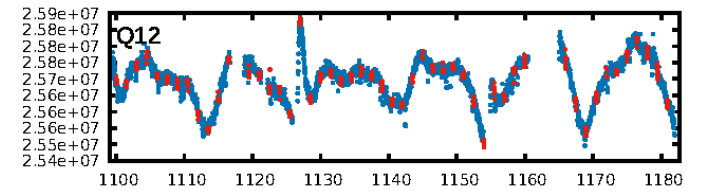
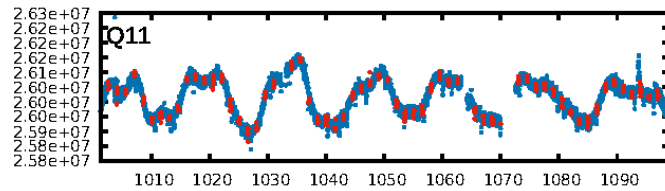
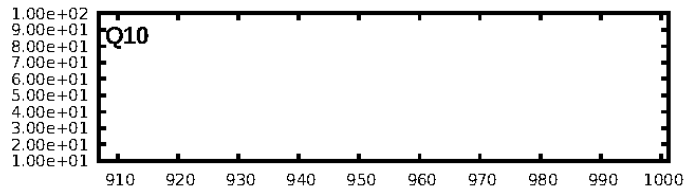
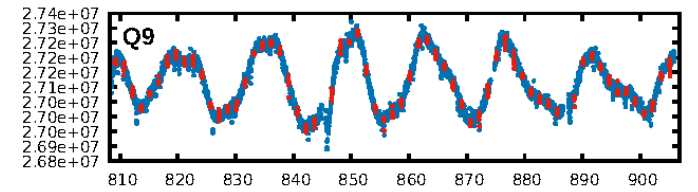
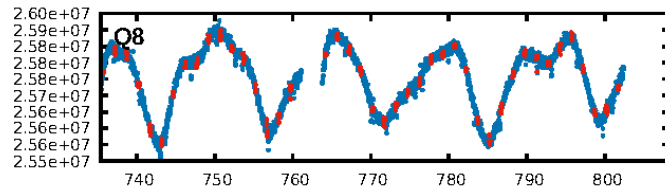
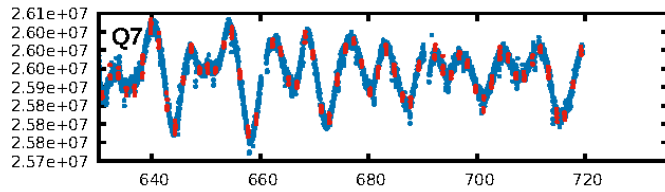
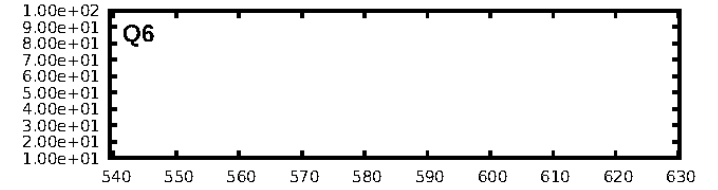
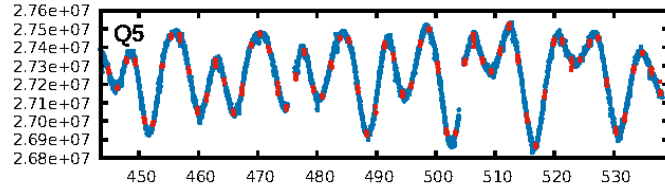
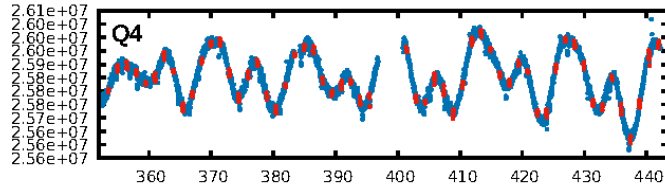
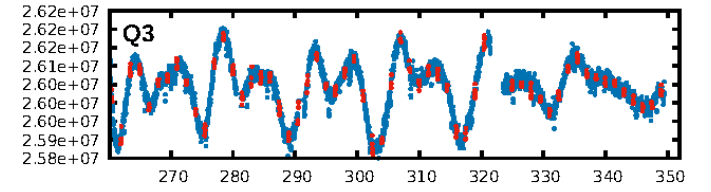
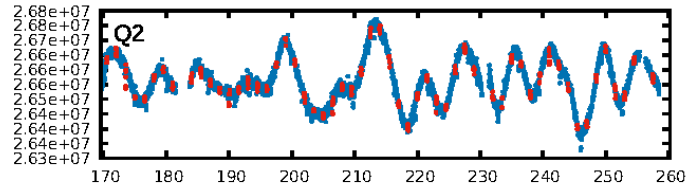
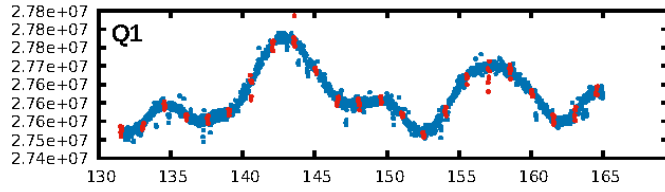
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [17.03σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.31e-90
RollingBand-fgt: 0.98 [579/592]
GhostDiagnostic-chr: 12.19
Centroid-sig: 63.6%
Centroid-so: 0.431 arcsec [0.82σ]
OotOffset-rm: 0.134 arcsec [0.63σ]
KicOffset-rm: 0.080 arcsec [0.48σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 1.00 [14/14]

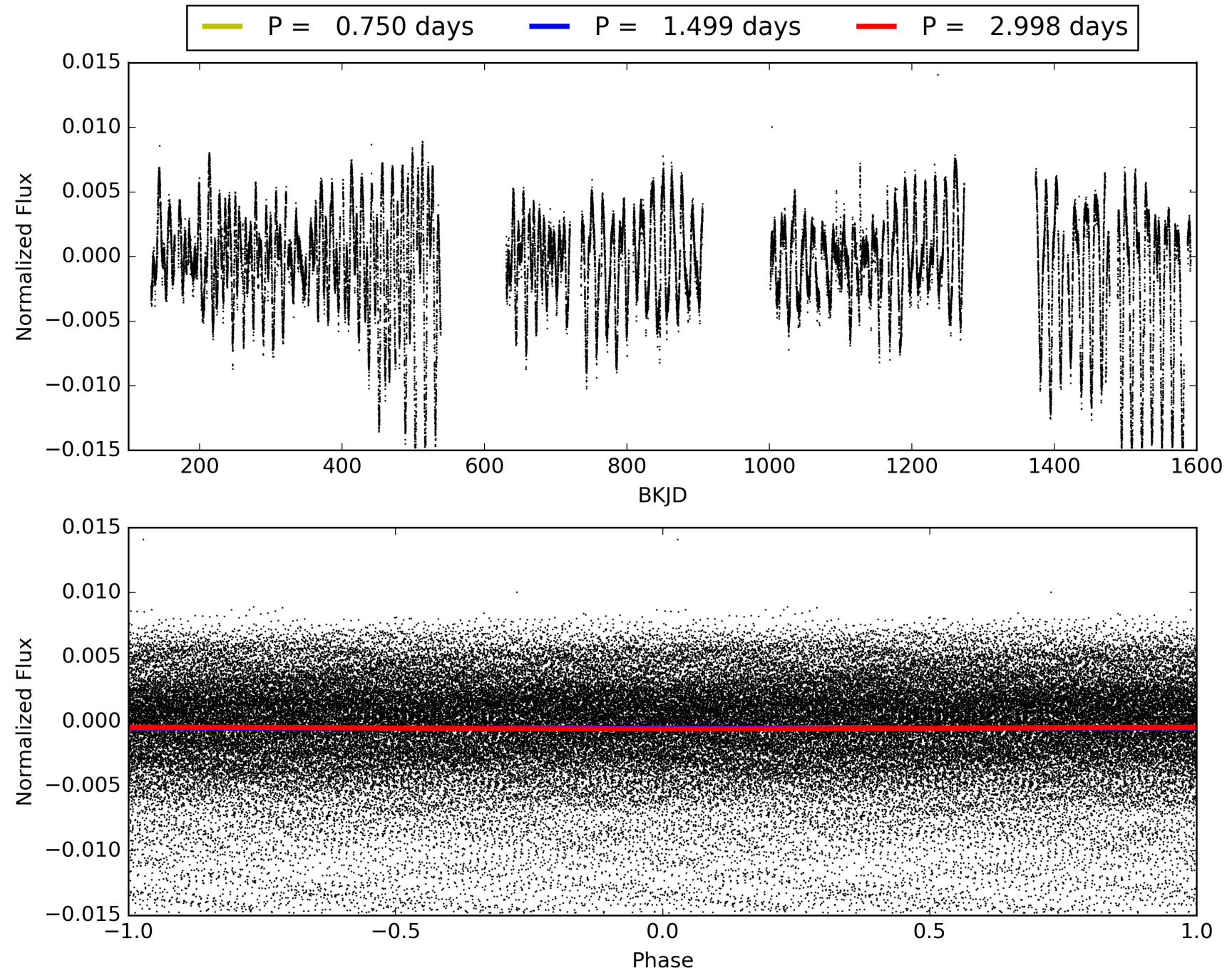
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:47:39 Z

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

TCE 005371776-04, PDC Light Curves

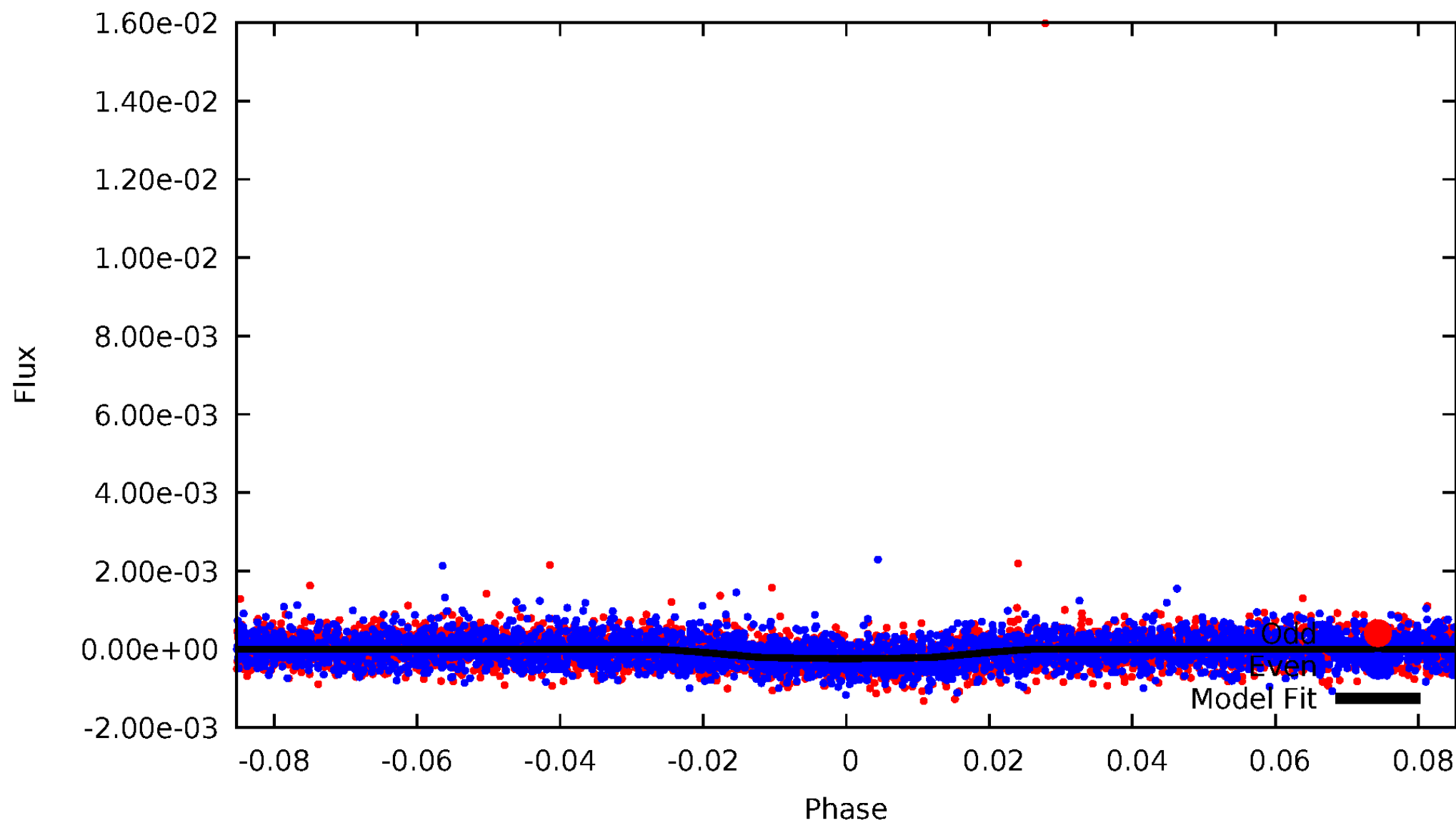


TCE 005371776-04



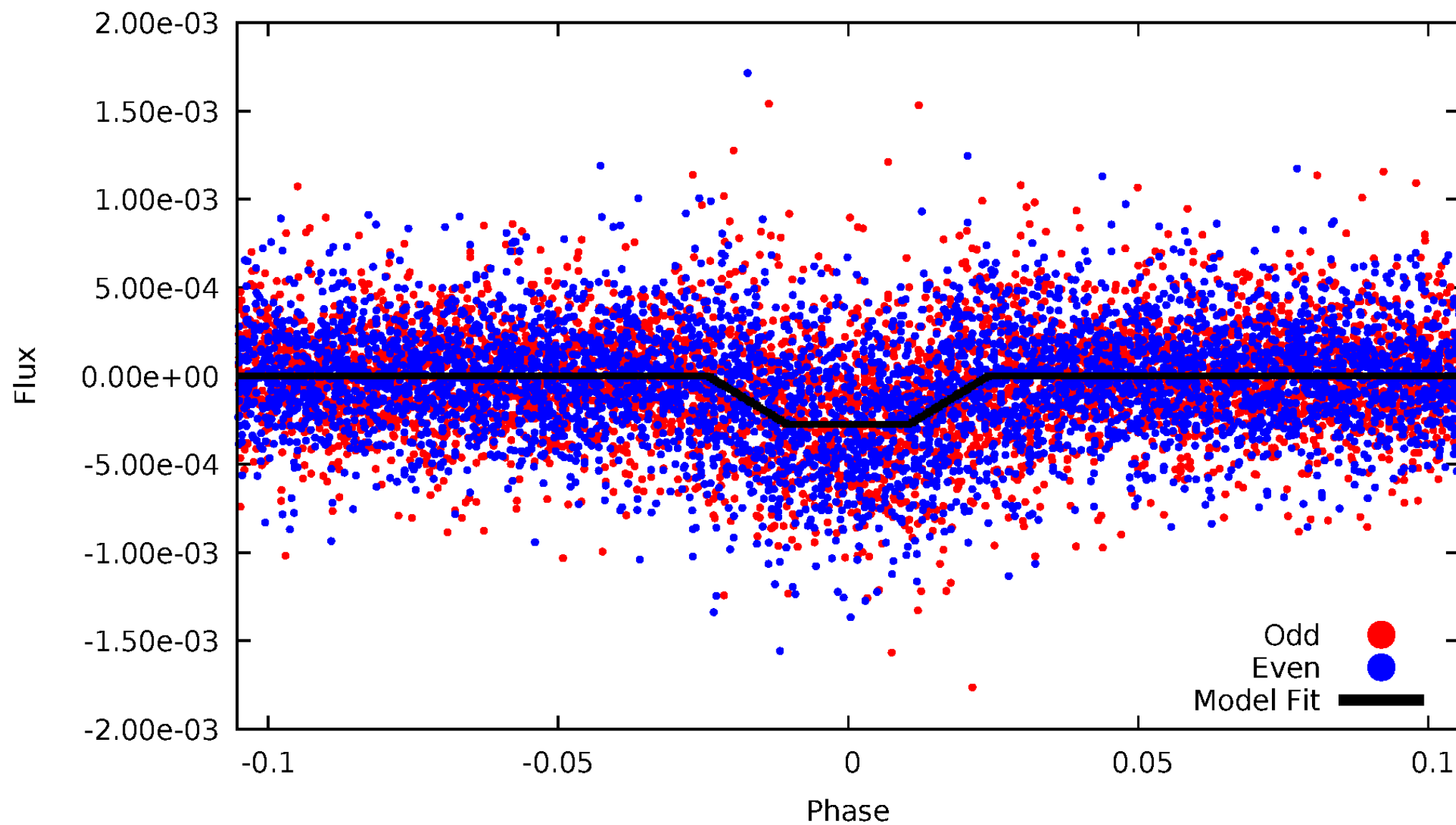
DV Odd/Even

TCE 005371776-04



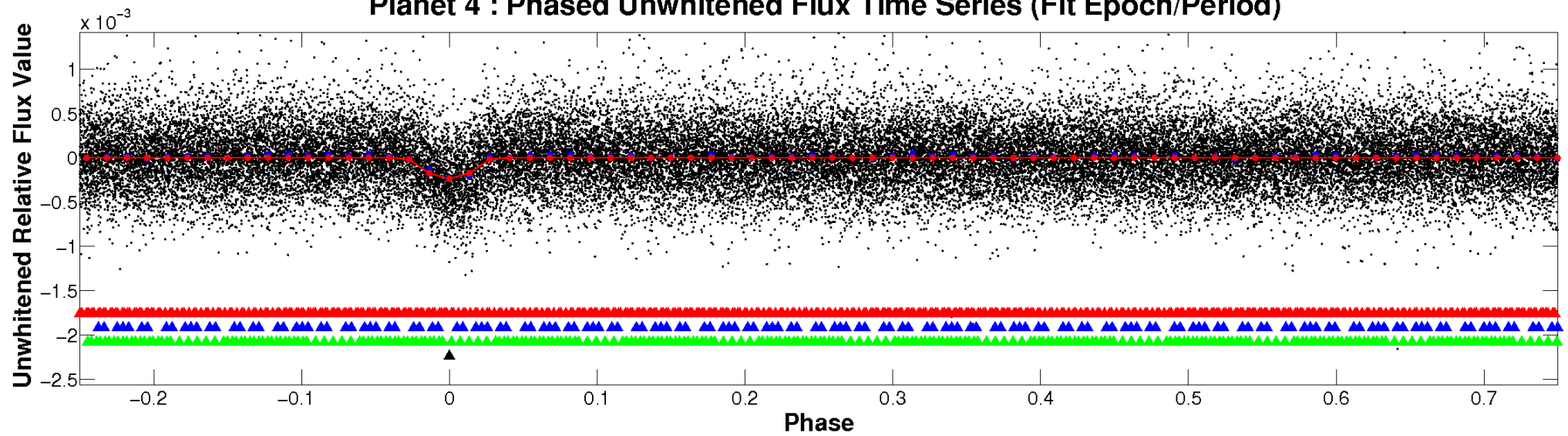
ALT Odd/Even

TCE 005371776-04

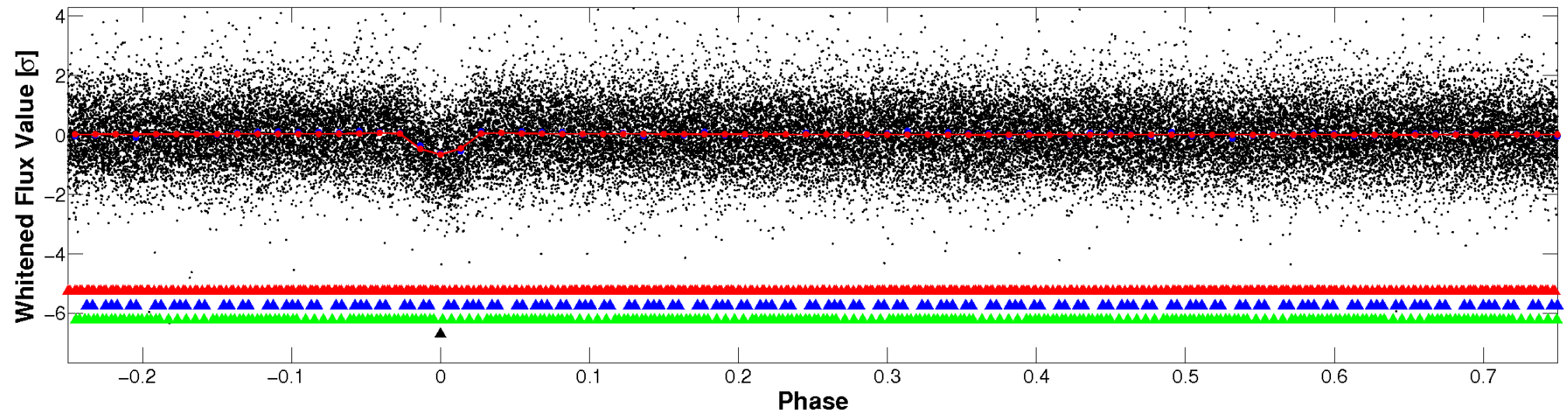


Non-Whitened Vs. Whitened Light Curve

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

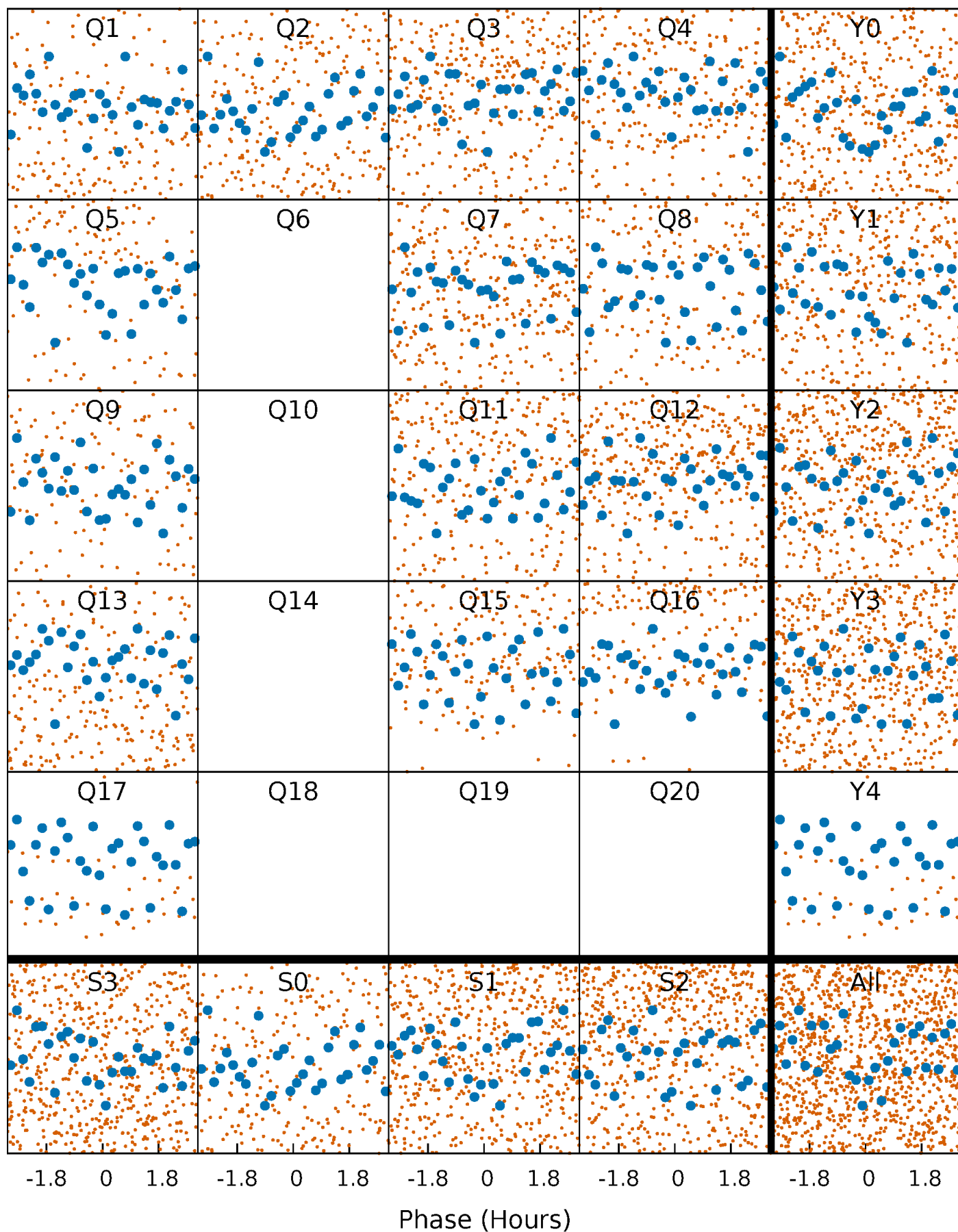


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



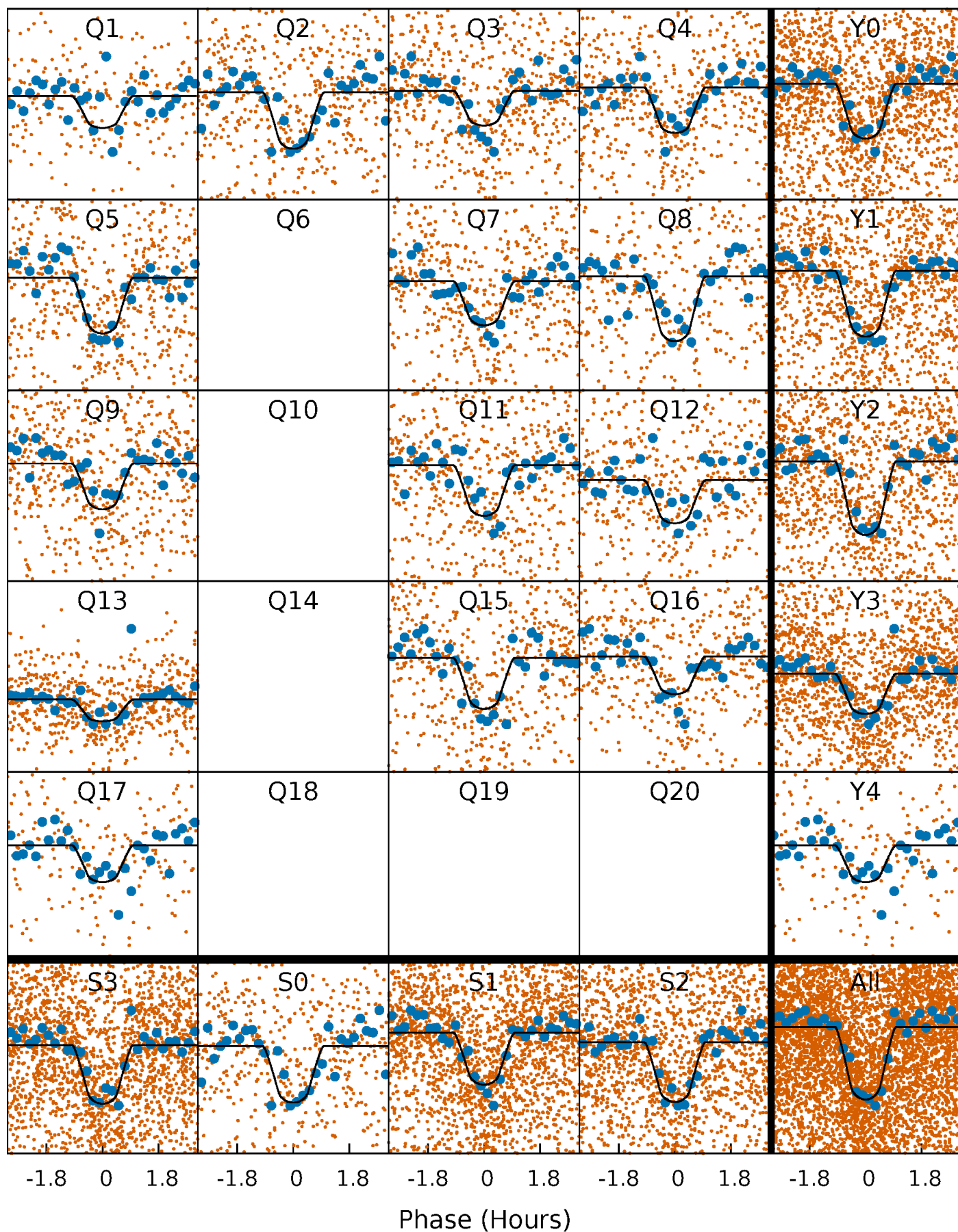
PDC Quarter-Phased Transit Curves

TCE 005371776-04 P= 1.499143 Days $T_0=131.568877$ (BKJD)



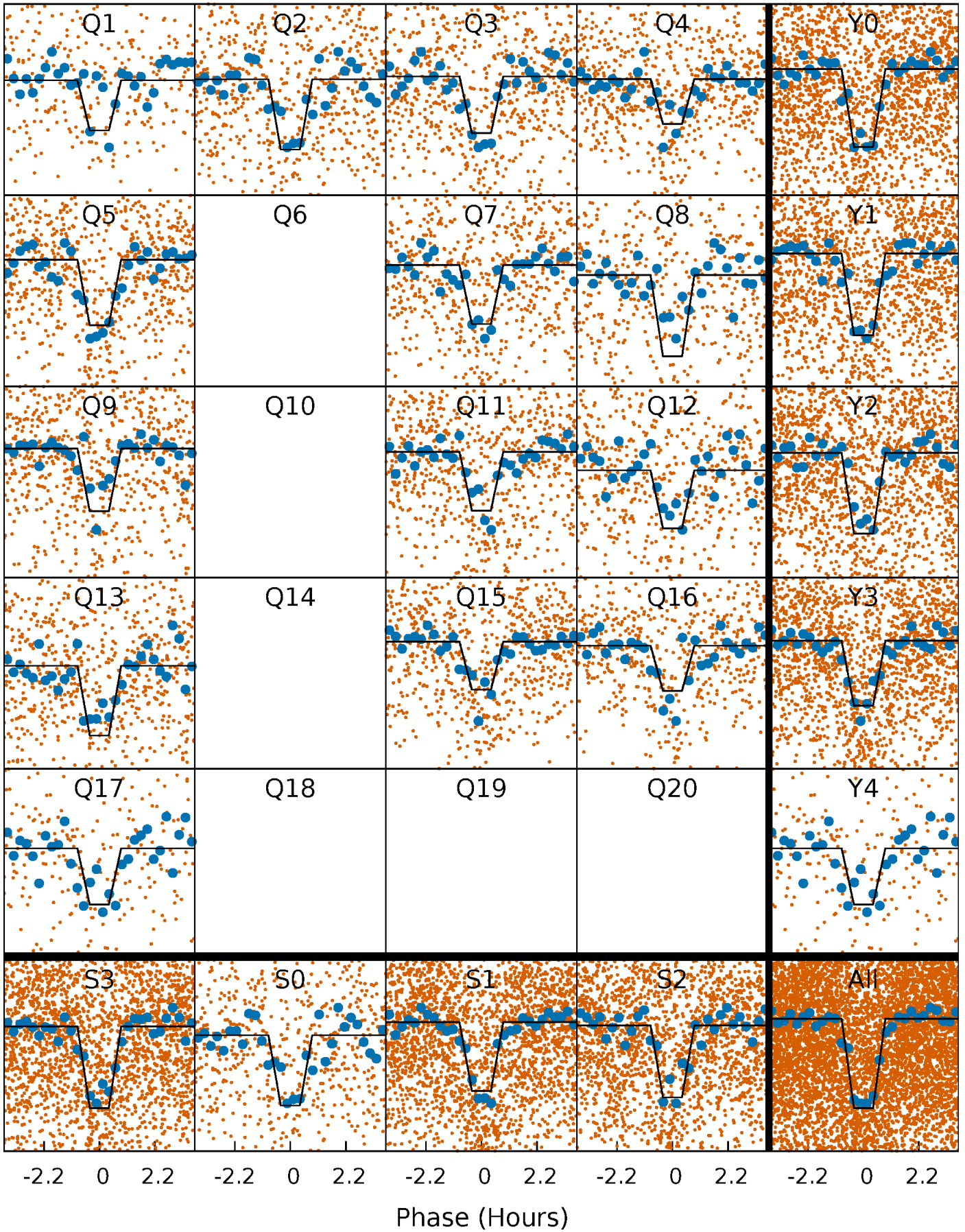
DV Quarter-Phased Transit Curves

TCE 005371776-04 P= 1.499143 Days $T_0=131.568877$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

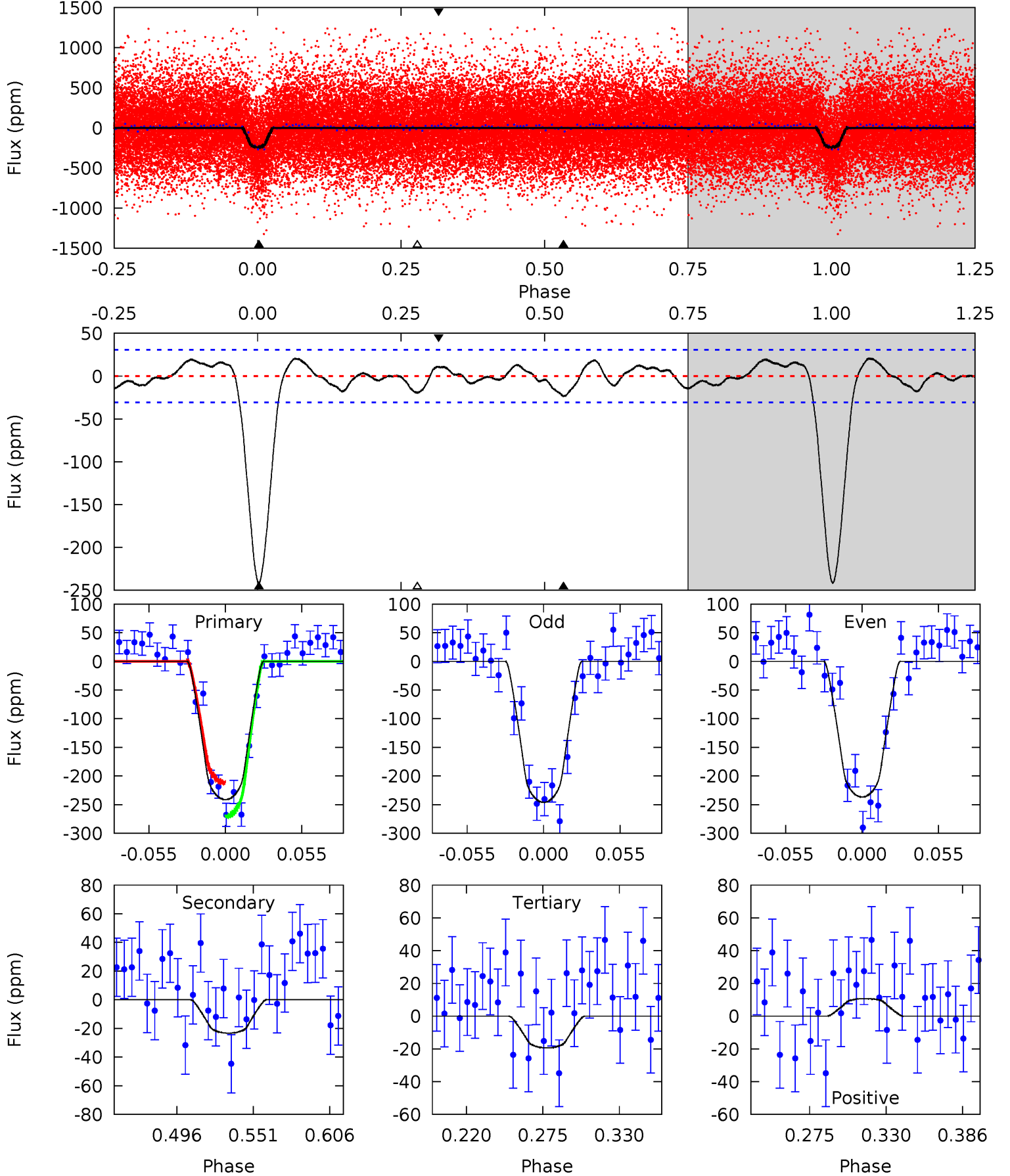
TCE 005371776-04 P= 1.499150 Days $T_0=131.569426$ (BKJD)



DV Model-Shift Uniqueness Test

005371776-04, P = 1.499143 Days, E = 130.069734 Days

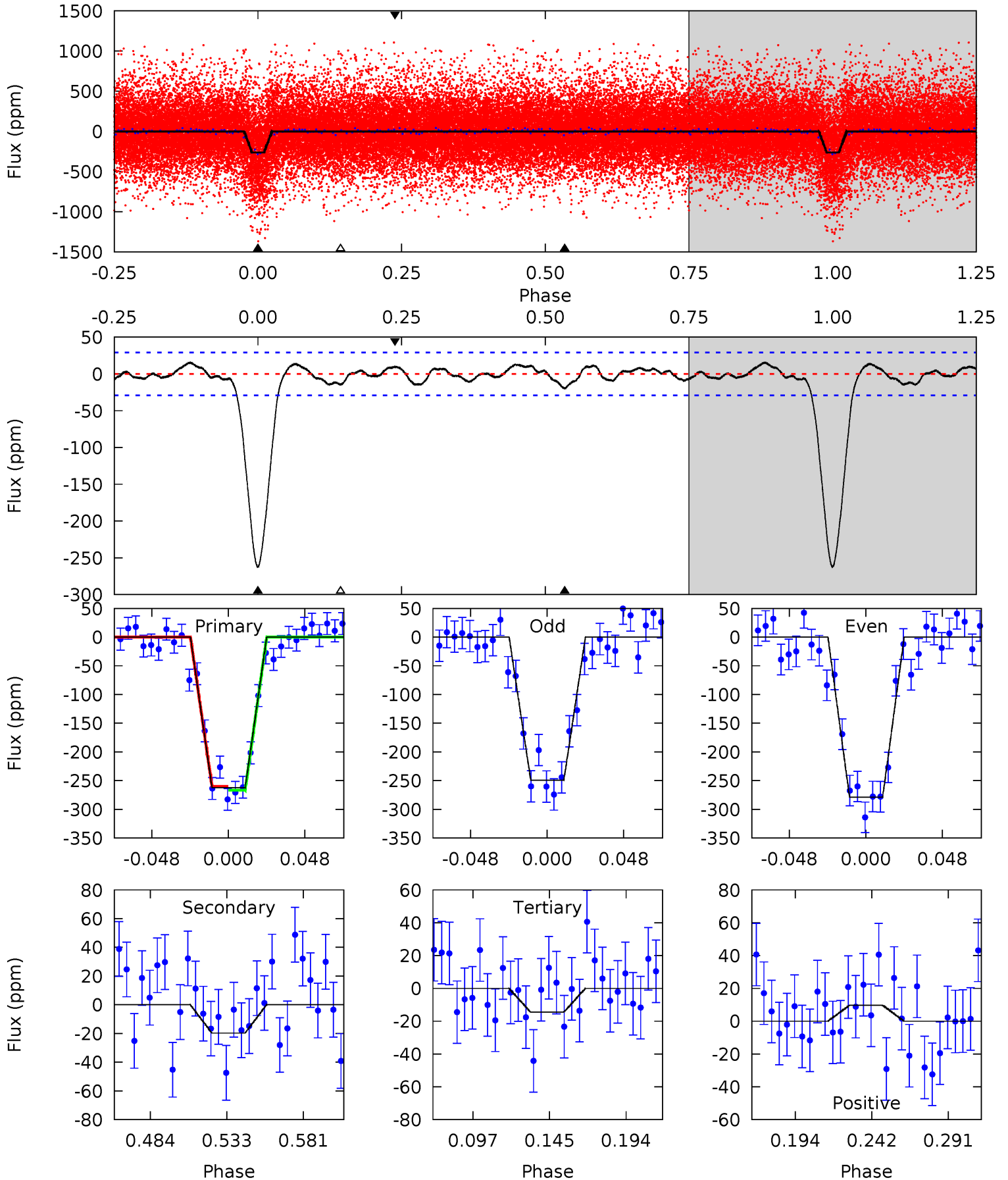
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.8	3.56	2.96	1.63	4.69	1.92	1.45	33.9	35.2	0.60	1.93	0.71	0.98	0.08	4.47



Alt Model-Shift Uniqueness Test

005371776-04, P = 1.499150 Days, E = 130.070276 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.5	3.19	2.35	1.56	4.71	1.97	1.15	40.1	40.9	0.84	1.63	2.39	1.01	0.06	0.55



Stellar Parameters For KIC 005371776

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4723^{+94}_{-94}	$4.628^{+0.012}_{-0.045}$	$0.020^{+0.150}_{-0.150}$	$0.691^{+0.049}_{-0.025}$	$0.760^{+0.031}_{-0.047}$	$3.248^{+0.212}_{-0.562}$
	+2%/-2%	+0%/-1%	+750%/-750%	+7%/-4%	+4%/-6%	+7%/-17%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 005371776-04 / KOI 1557.04

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-23 ± 7	$1.36^{+0.55}_{-0.56}$	1606^{+36}_{-39}	3020^{+568}_{-353}	$3.814^{+7.178}_{-2.127}$
Alt.	-20 ± 6	$1.31^{+0.57}_{-0.55}$	1601^{+37}_{-37}	2954^{+572}_{-334}	$3.313^{+6.513}_{-1.833}$

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 $A_{\text{obs}} \gg 1.0$

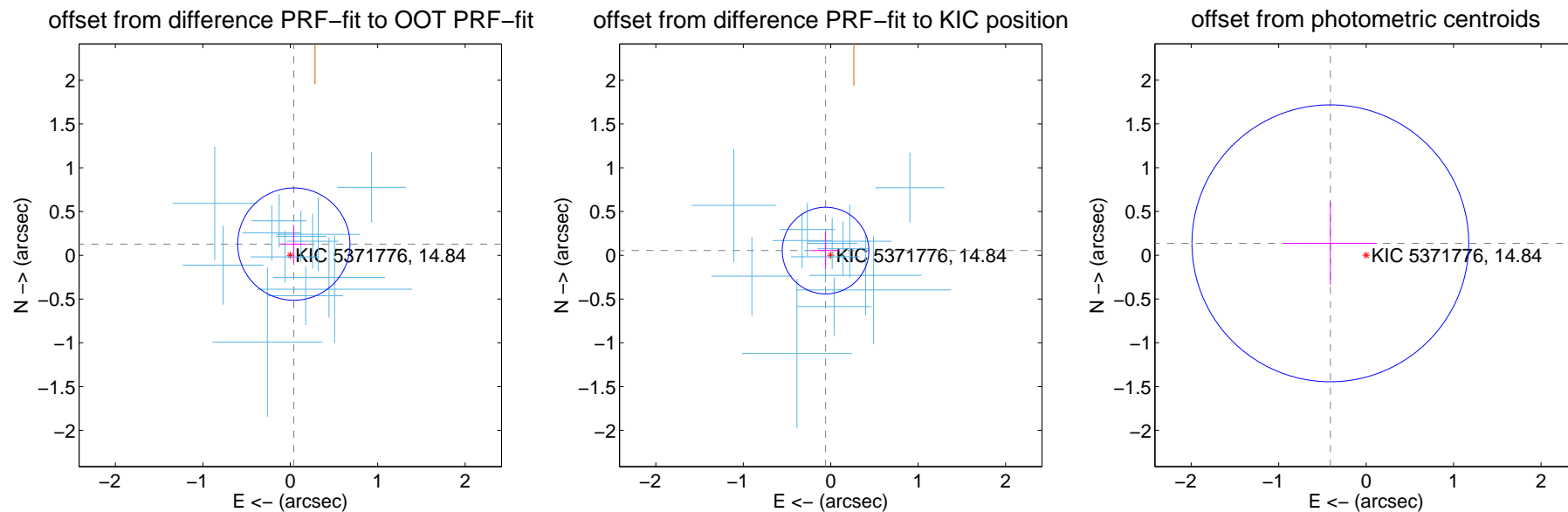
DV Centroid Data

Supplemental centroid analysis for 005371776-04. Kepler magnitude: 14.84. Transit SNR 23.16

There are 13 quarters with good PRF difference image offsets

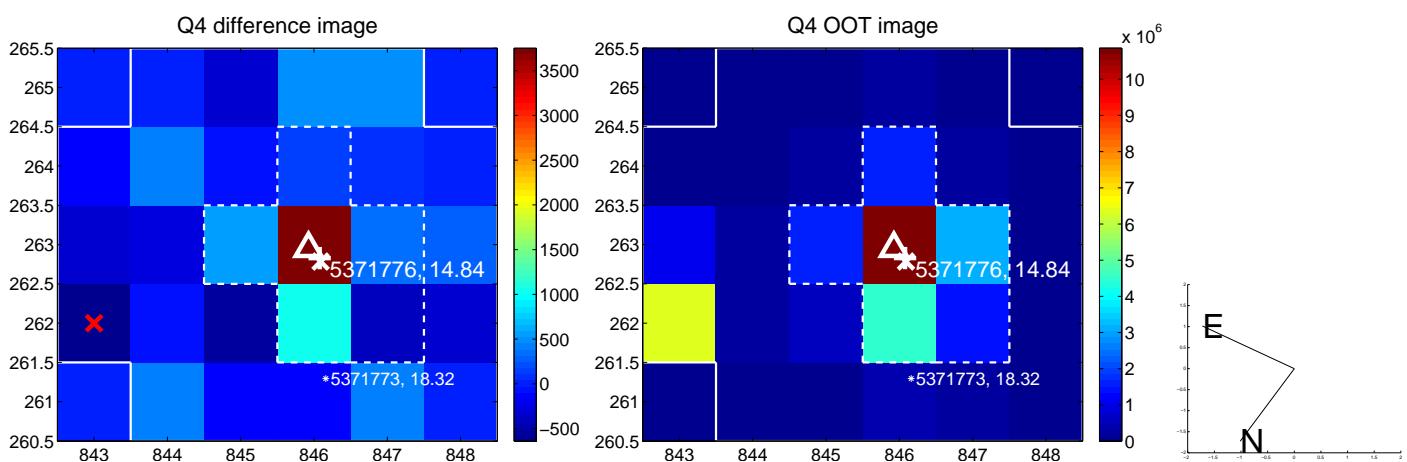
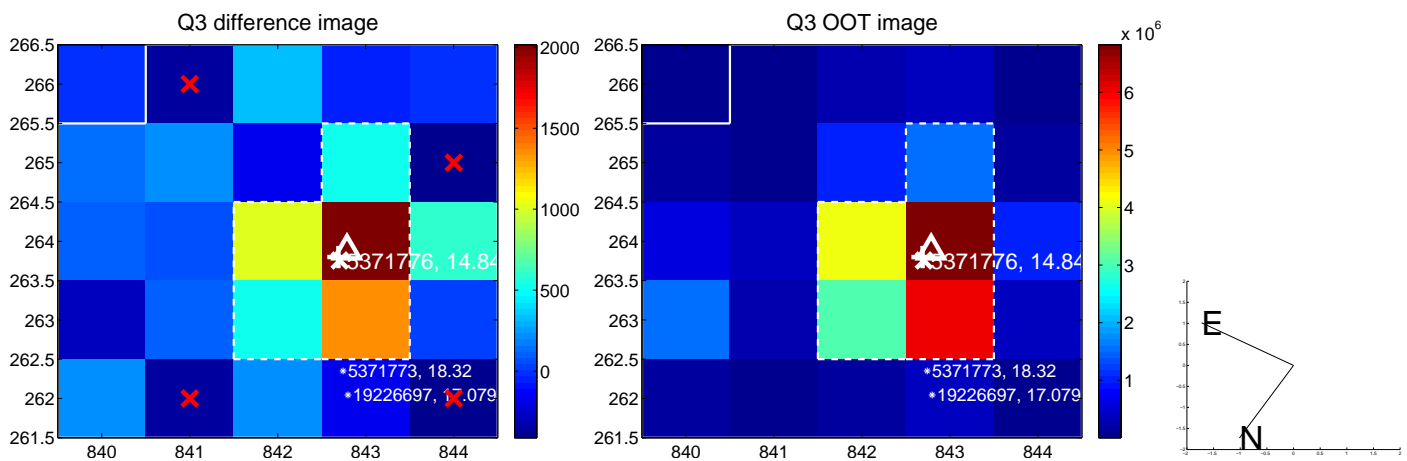
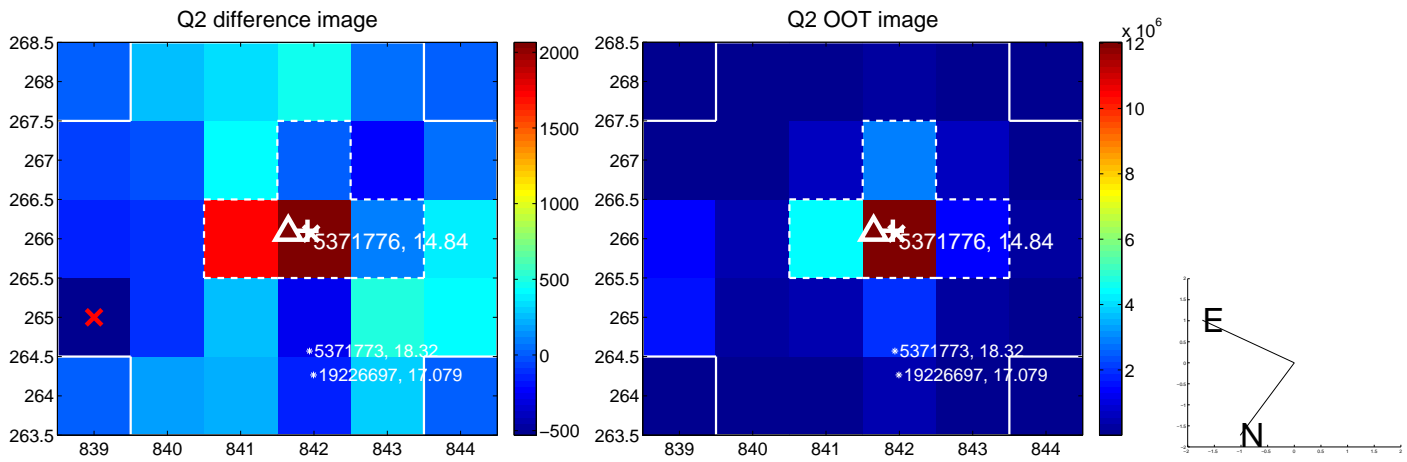
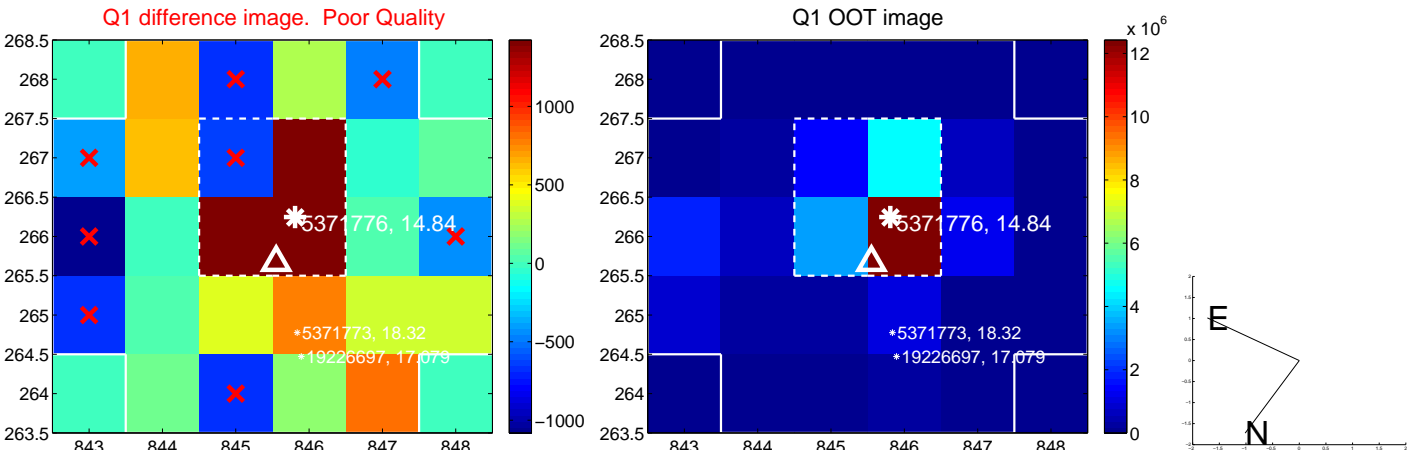
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.134 ± 0.214	0.63	-0.041 ± 0.146	0.128 ± 0.214
PRF-fit source offset from KIC position	0.080 ± 0.165	0.48	0.059 ± 0.156	0.054 ± 0.212
photometric centroid source offset	0.43 ± 0.53	0.82	0.41 ± 0.53	0.14 ± 0.47

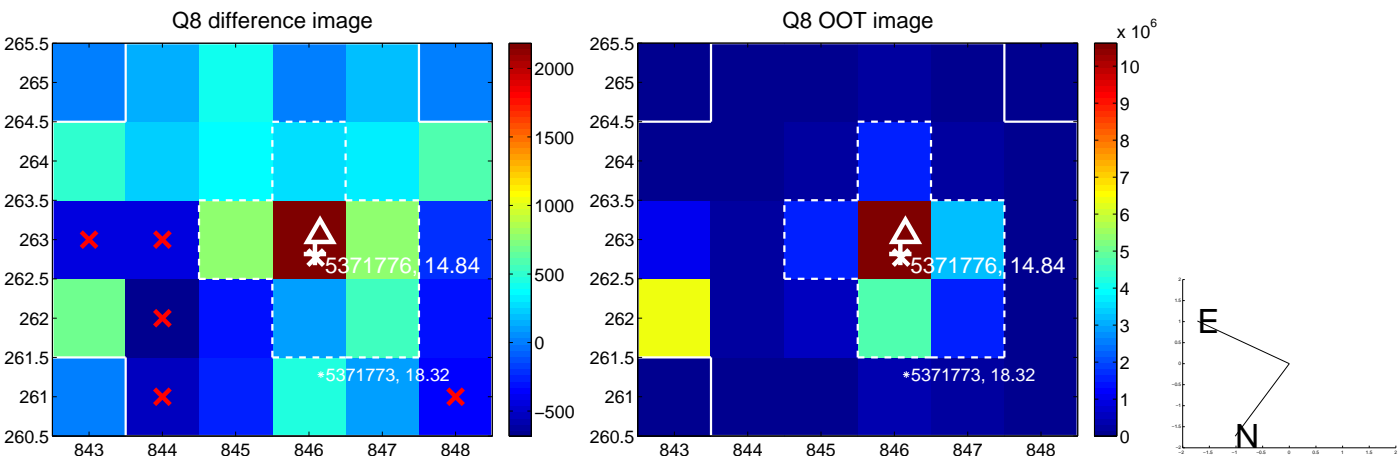
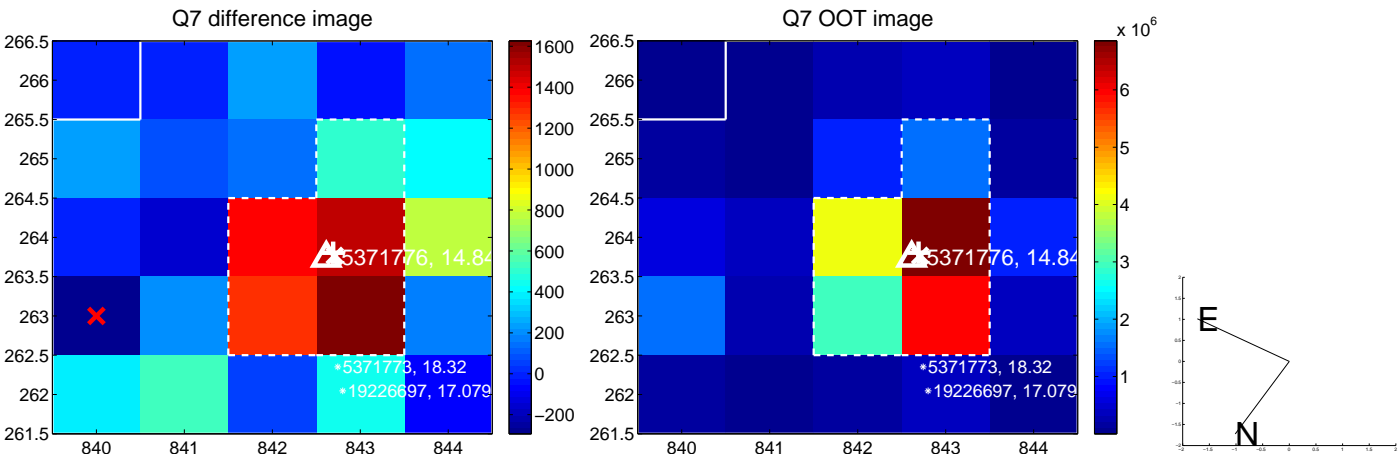
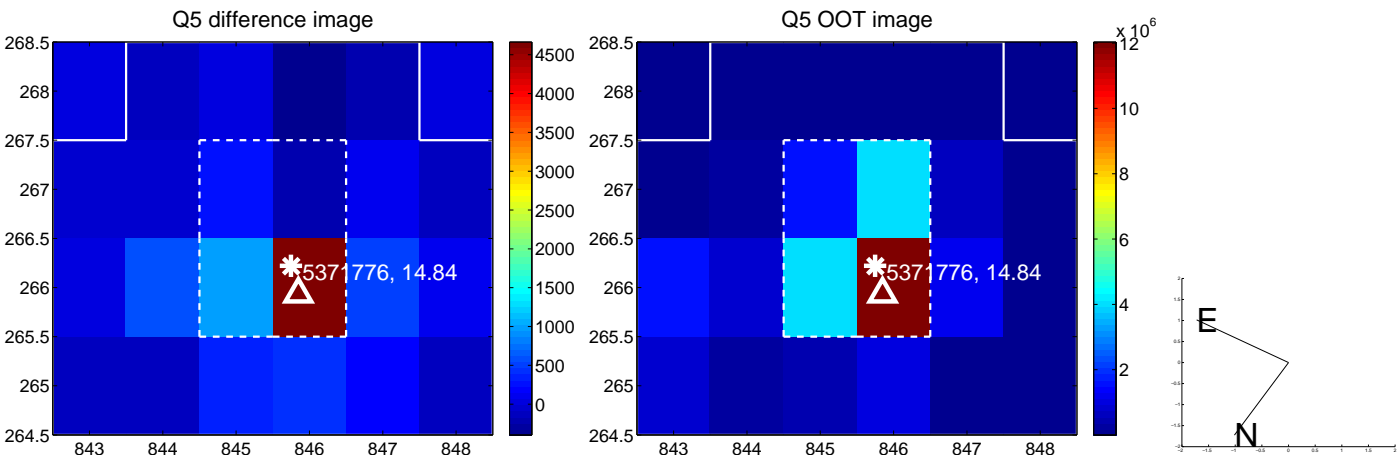


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

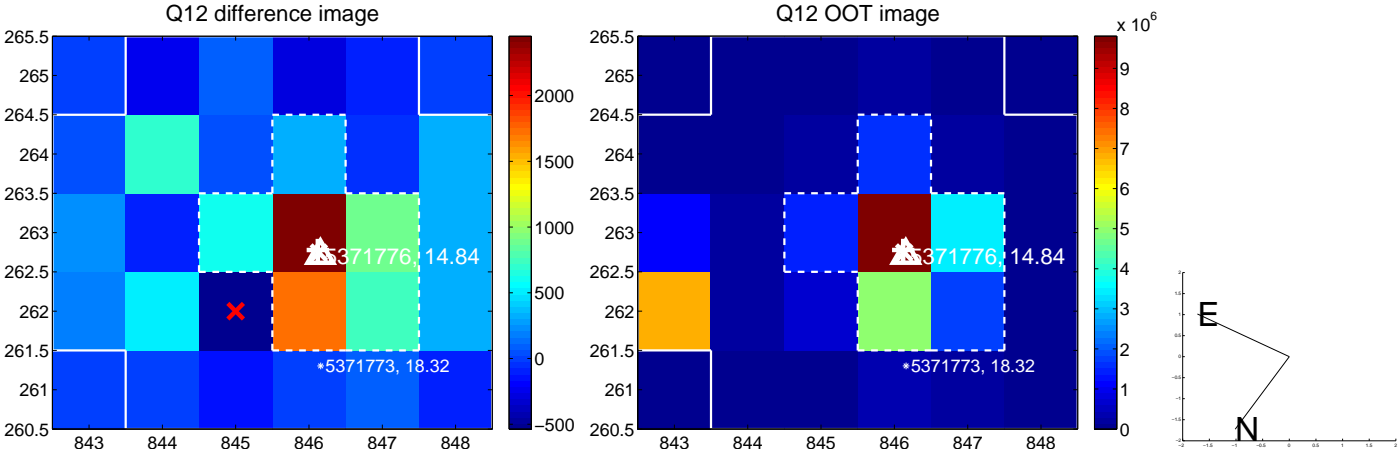
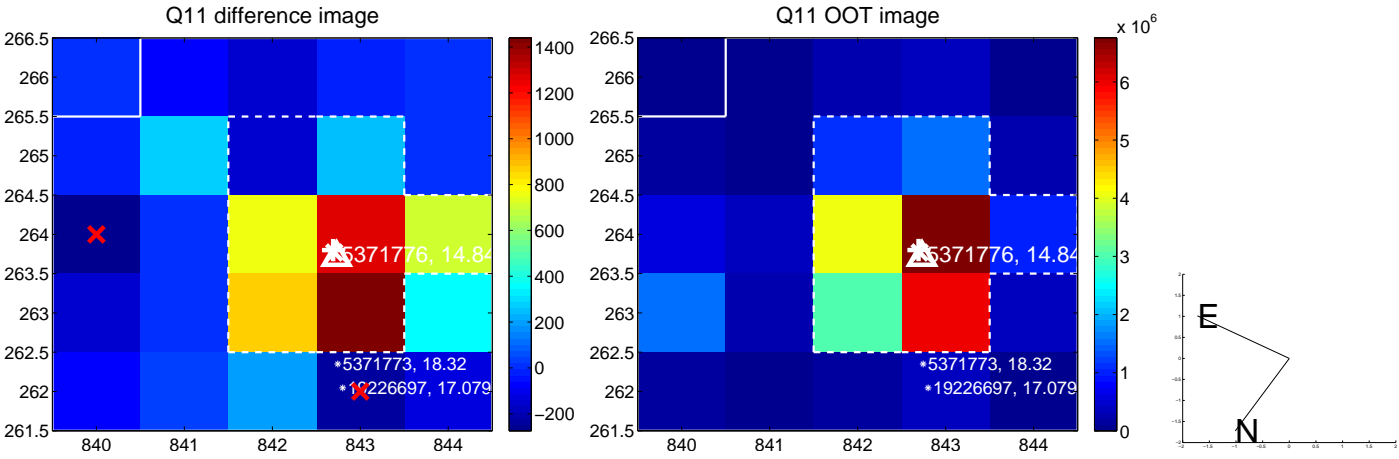
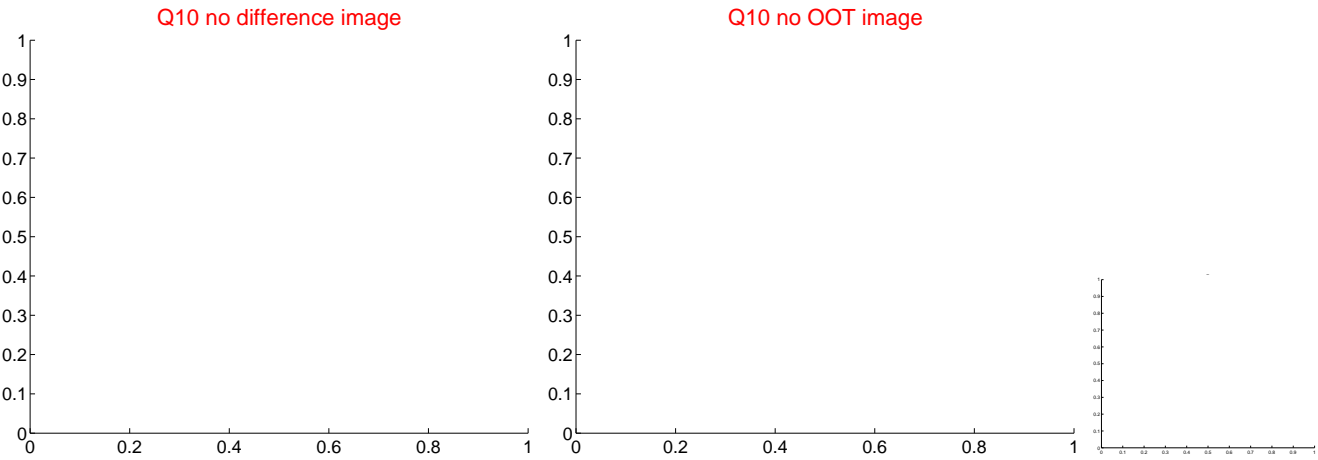
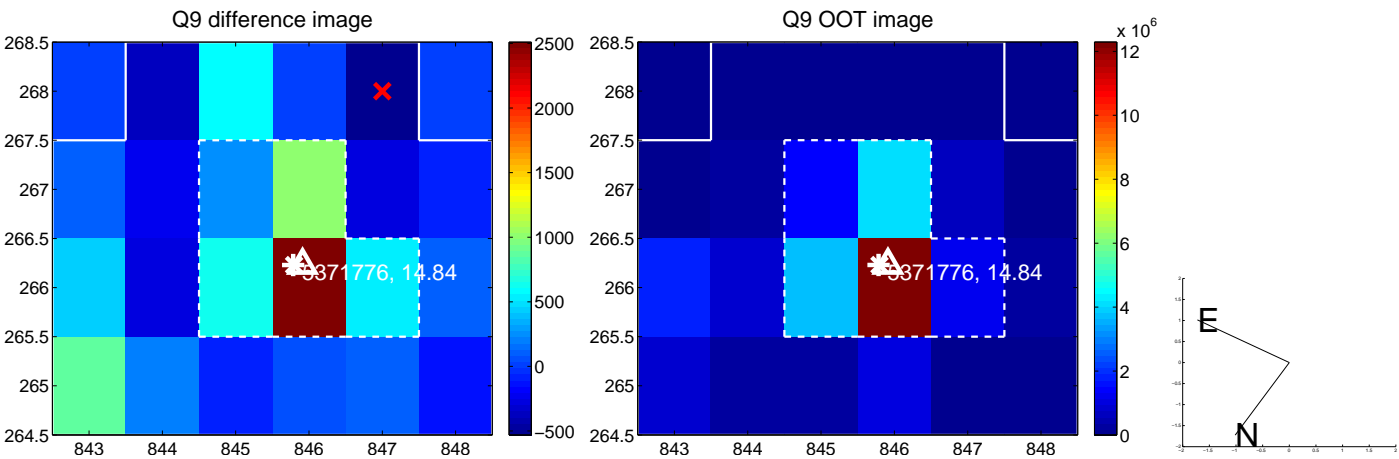
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



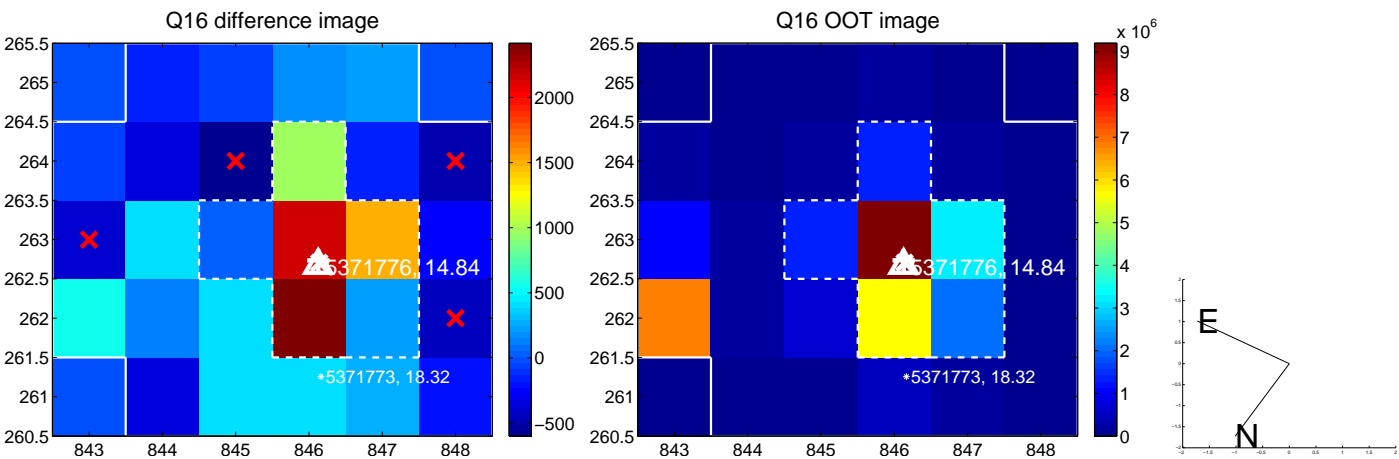
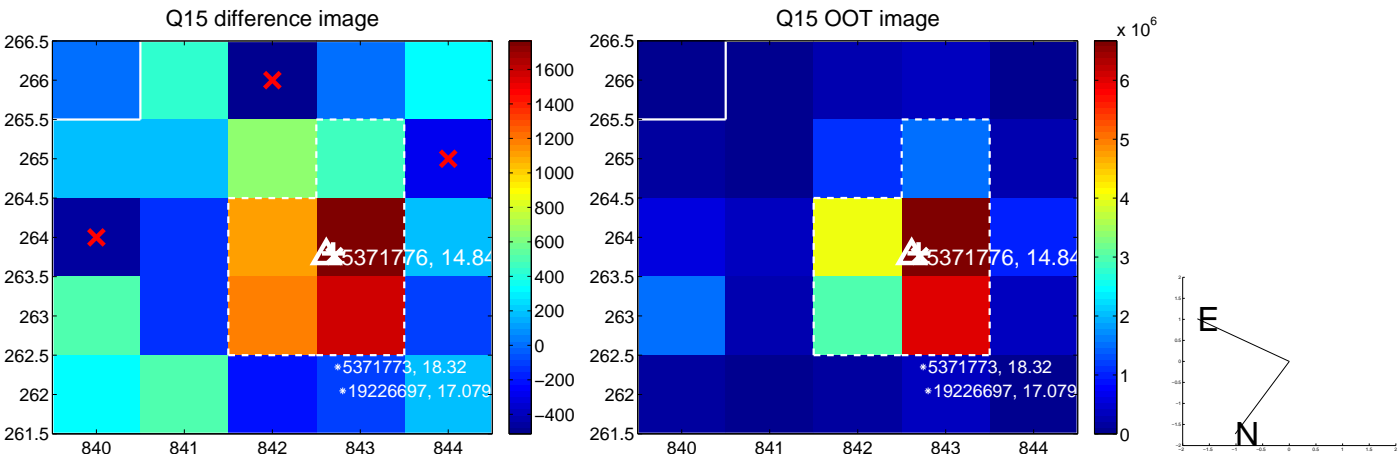
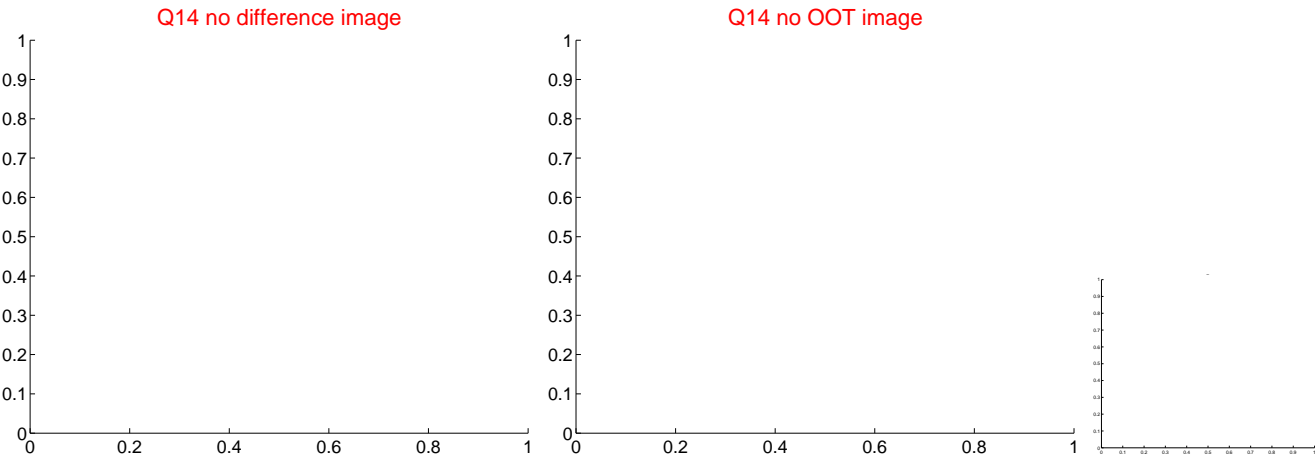
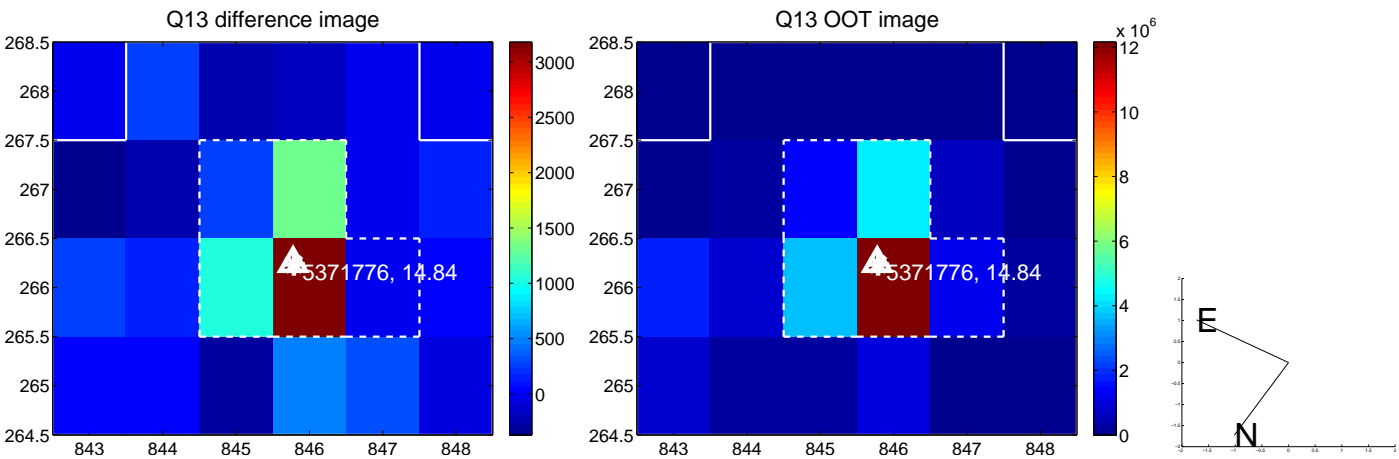
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



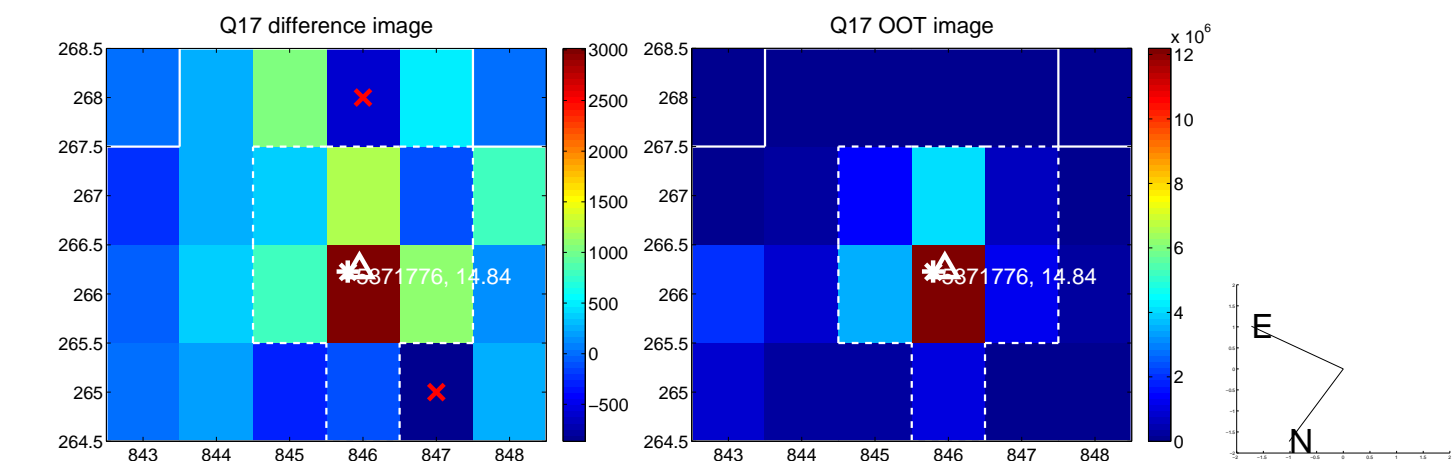
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



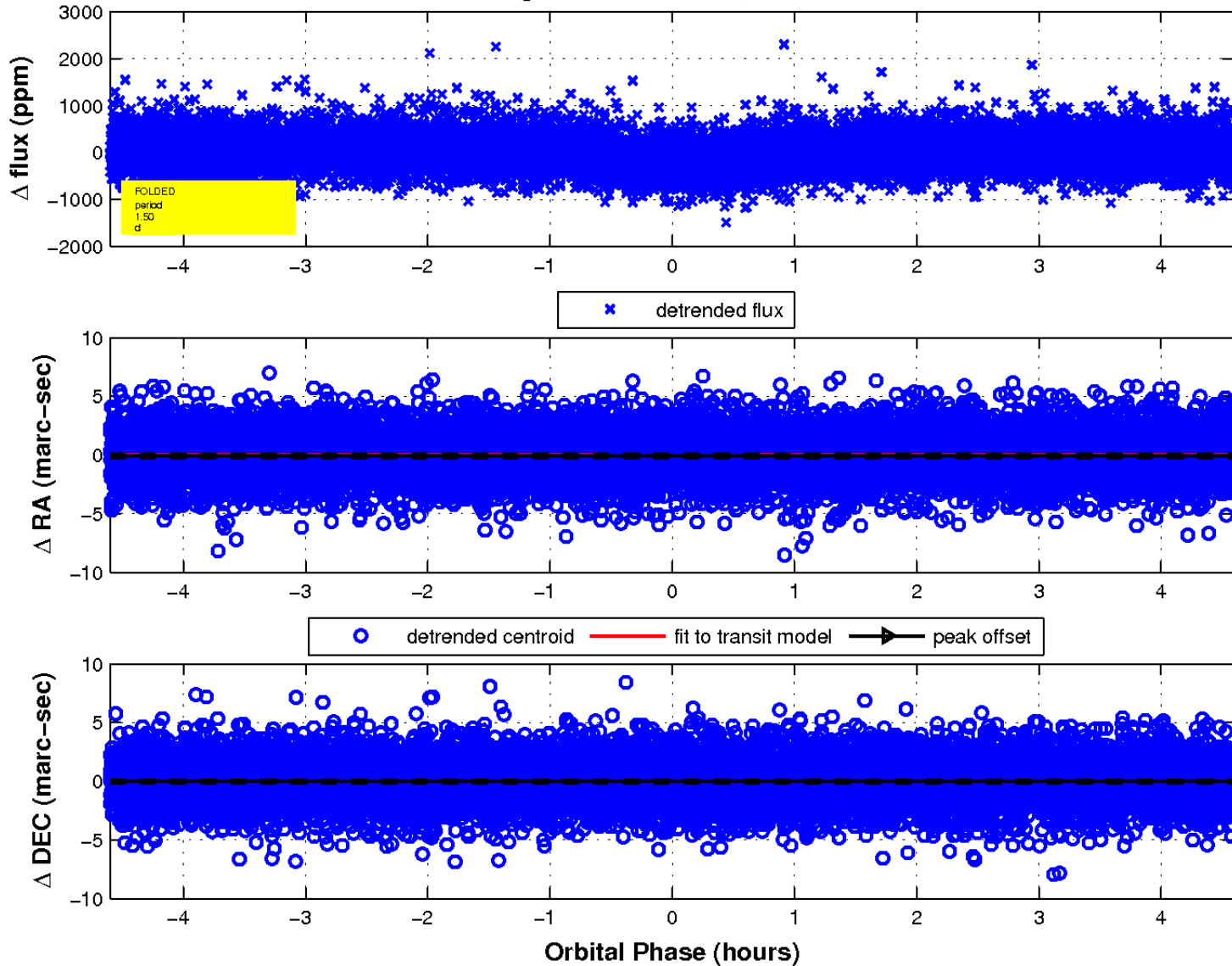
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

