

KIC 010597648

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})
010597648-01	OBS	No	287.849313	333.405215	27.9	2.301	42.8	5.1	14.89	4500	7.83	66.51
010597648-02	OBS	No	247.620140	355.712970	6349.1	0.889	96.1	82.4	14.89	4500	127.91	81.29
010597648-03	OBS	No	535.898821	215.510914	2093.0	6.674	61.3	31.2	14.89	4500	139.39	29.04
010597648-04	OBS	No	390.278231	201.531959	2113.0	6.071	59.6	49.1	14.89	4500	139.93	44.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010597648-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010597648-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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.

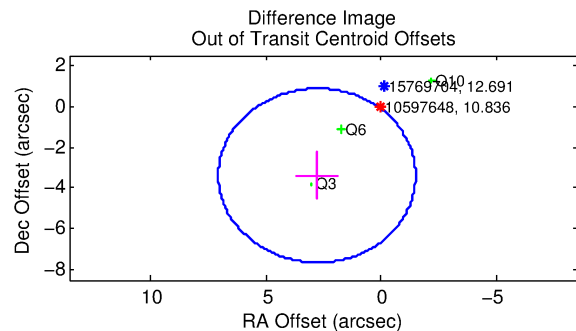
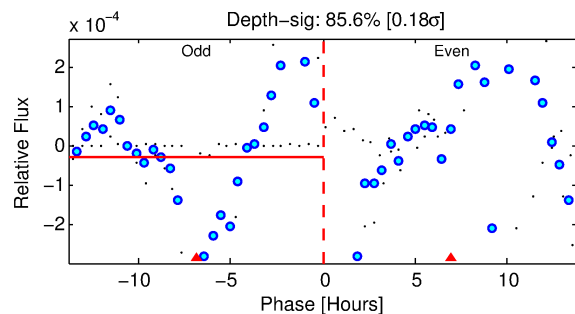
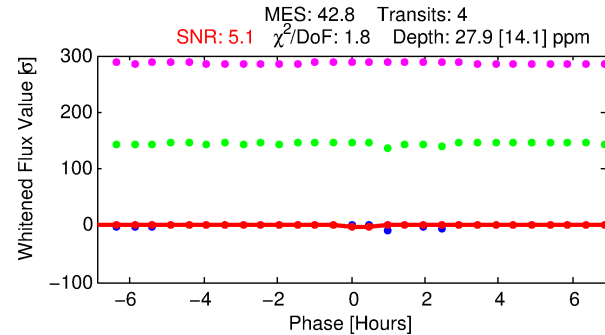
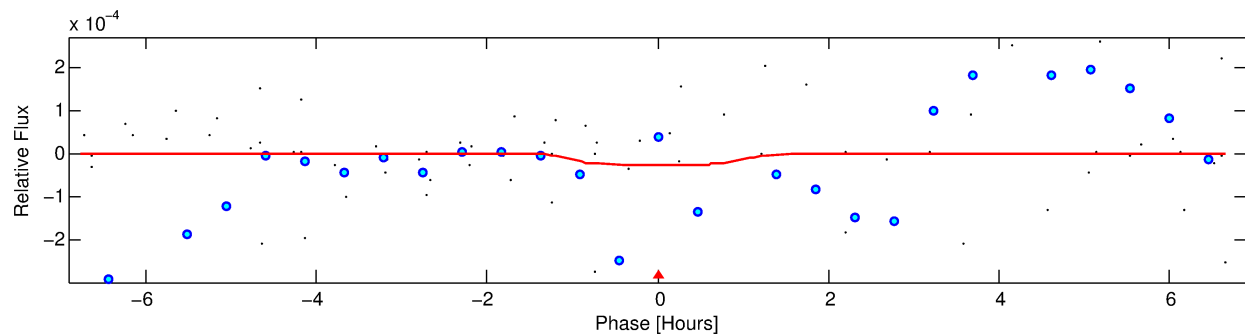
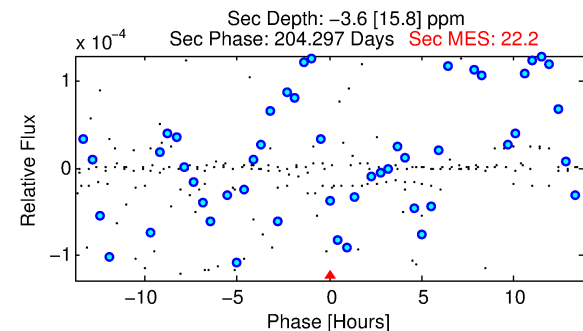
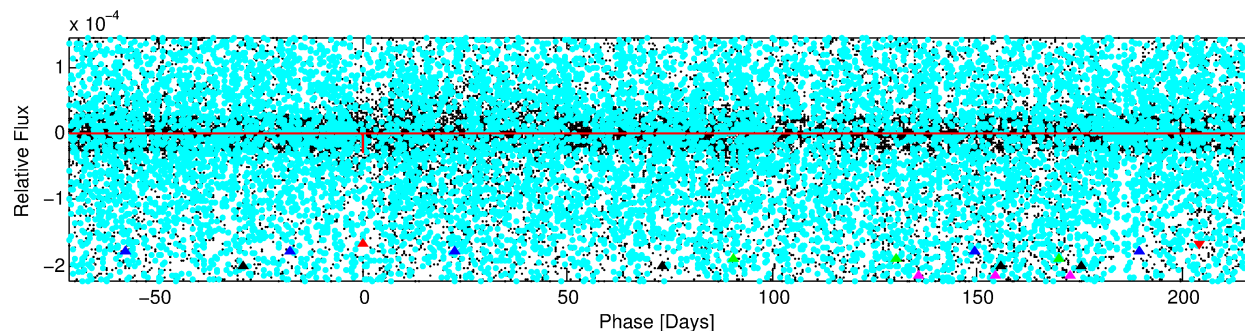
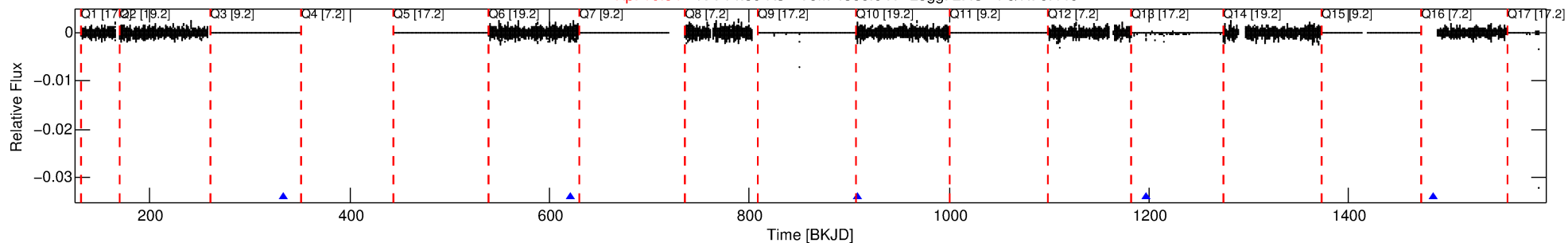
Ephemeris Match Information For 010597648-01

No Significant Match Found

DV One-Page Summary

KIC: 10597648 Candidate: 1 of 5 Period: 287.849 d

Kp: 10.84 R*: 14.89 Rs Teff: 4500.0 K Logg: 2.43 Fe/H: 0.440



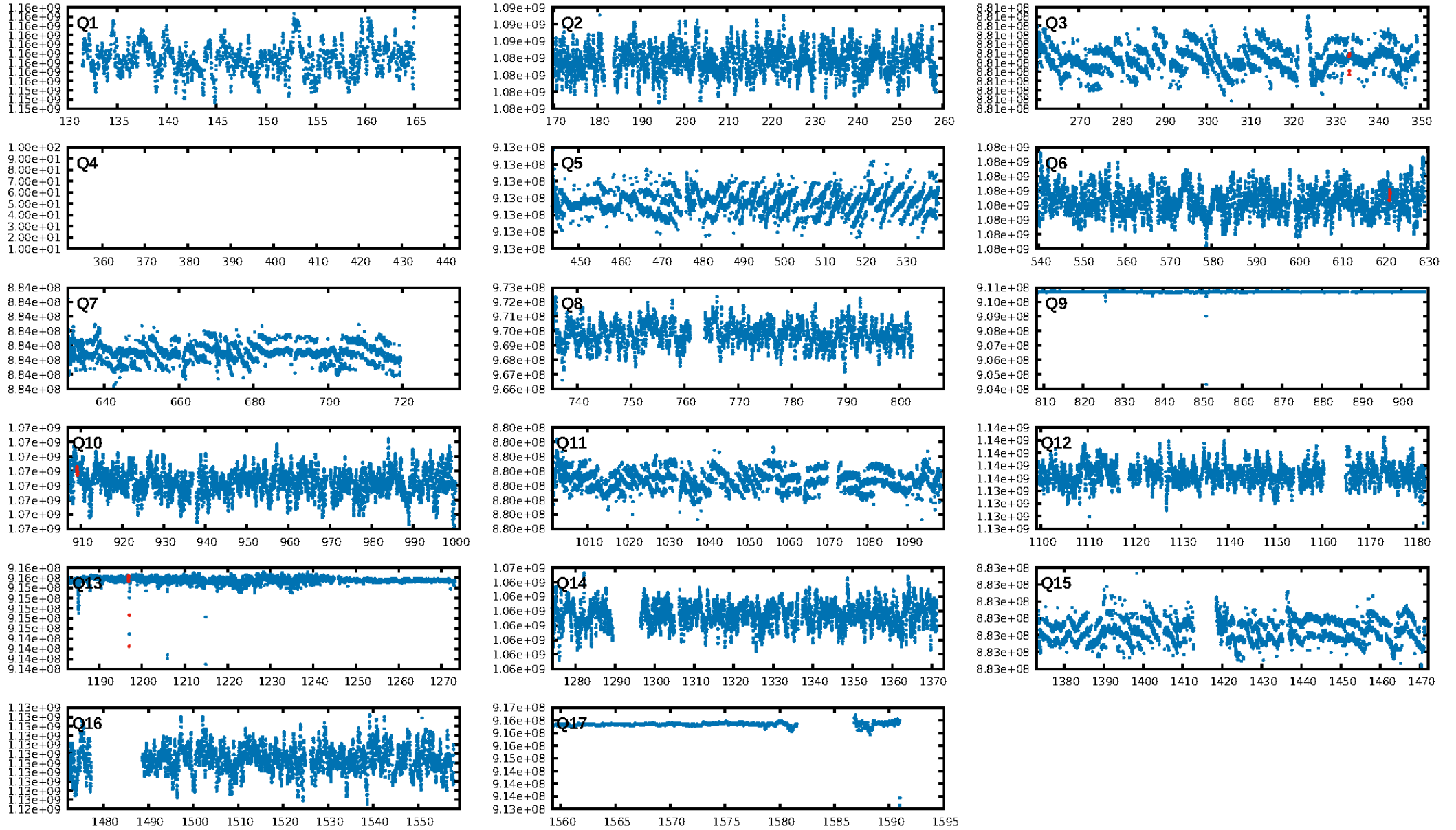
DV Fit Results:

Period = 287.84931 [0.01990] d
Epoch = 333.4052 [0.0096] BKJD
Rp/R* = 0.0048 [0.0137]
a/R* = 847.27 [7033.48]
b = 0.47 [13.74]
Seff = 66.51 [12.06]
Teq = 728 [33] K
Rp = 7.83 [22.25] Re
a = 1.1071 [0.1605] AU
Ag = N/A
Teffp = N/A

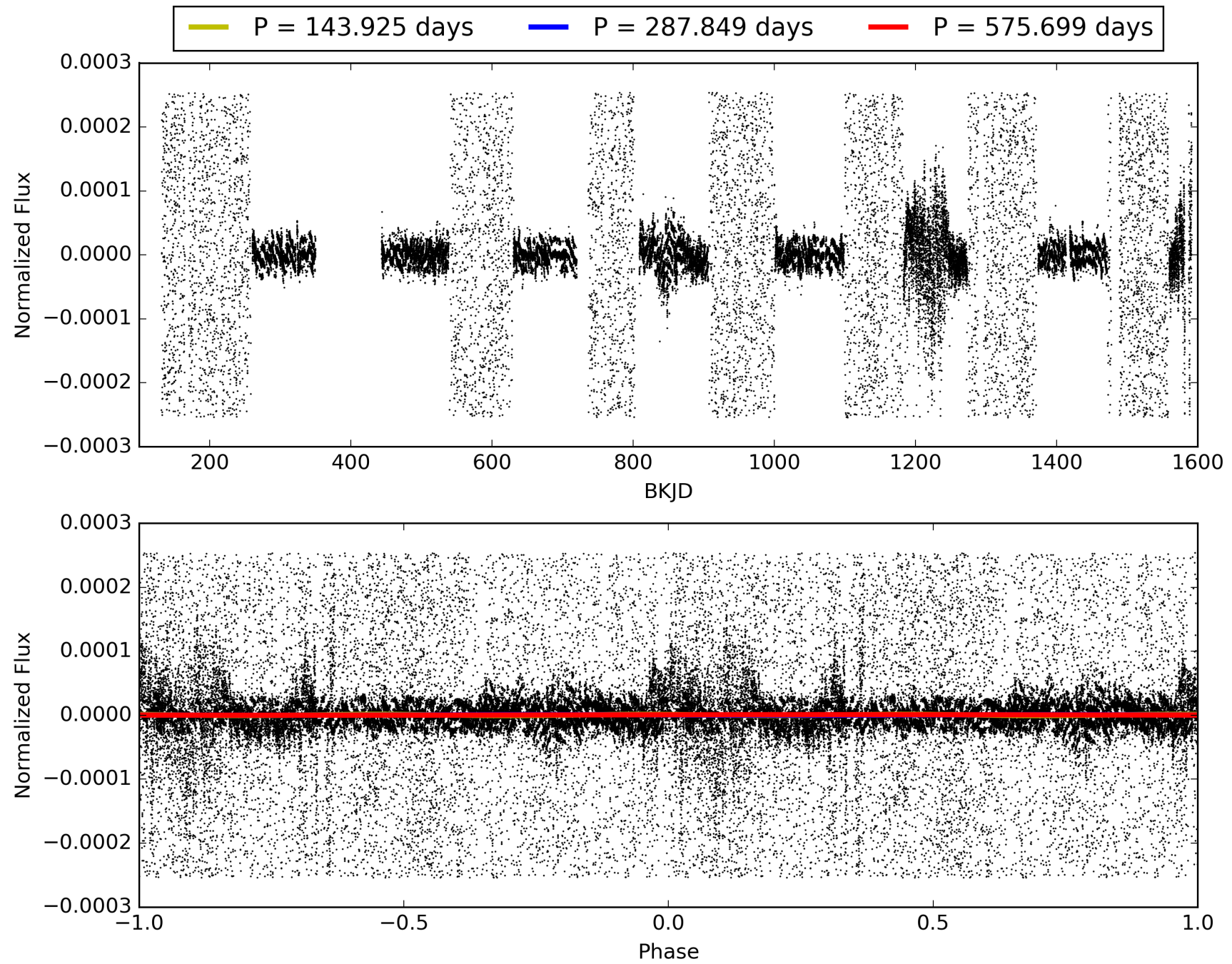
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [391.46σ]
LongPeriod-sig: 100.0% [378.63σ]
ModelChiSquare2-sig: 2.7%
ModelChiSquareGof-sig: 80.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -8.816
Centroid-sig: 22.8%
Centroid-so: 7.622 arcsec [1.18σ]
OotOffset-rm: 4.381 arcsec [3.08σ]
KicOffset-rm: 4.540 arcsec [3.08σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-st: 2/1/0/0 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010597648-01, PDC Light Curves

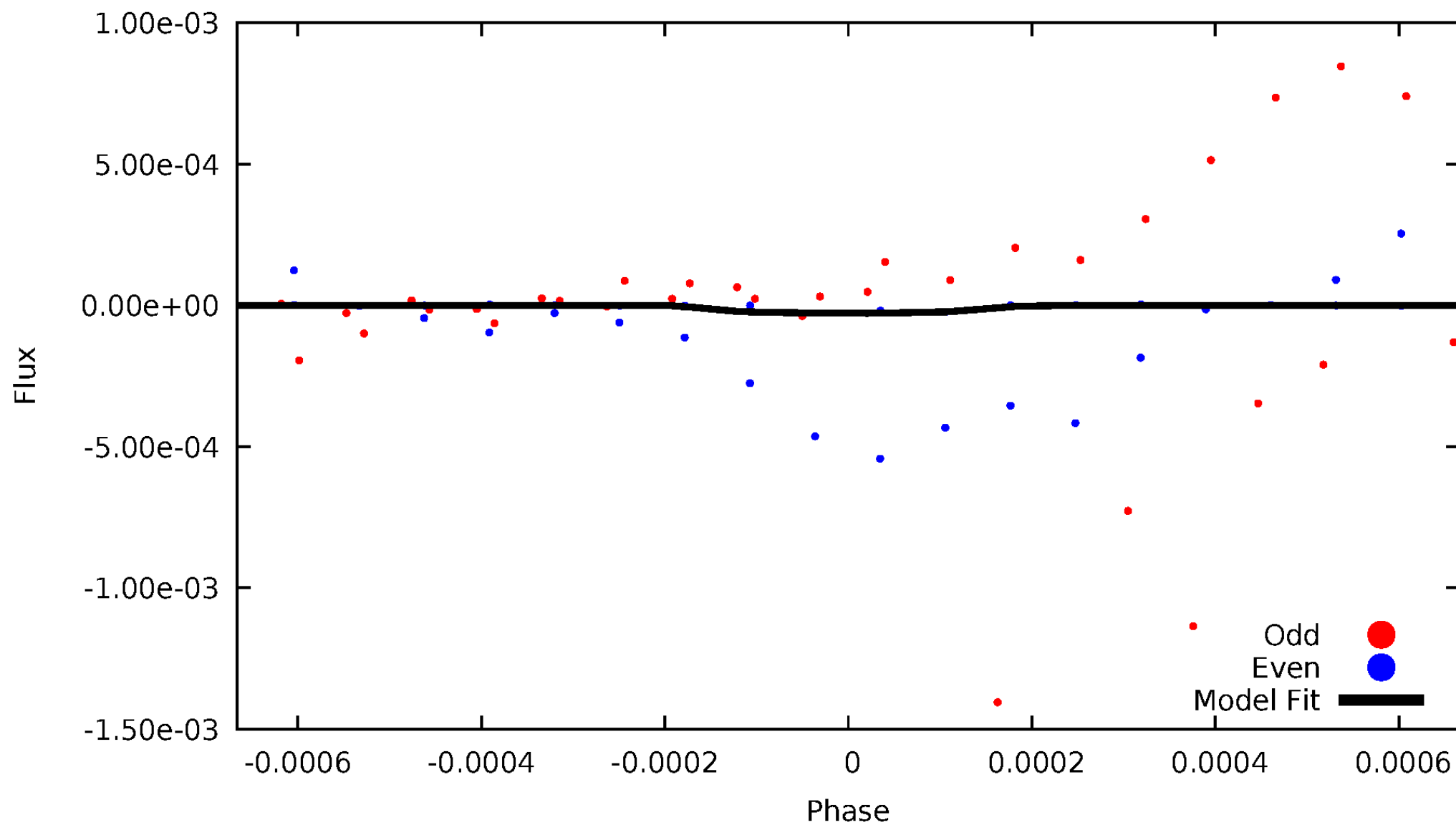


TCE 010597648-01



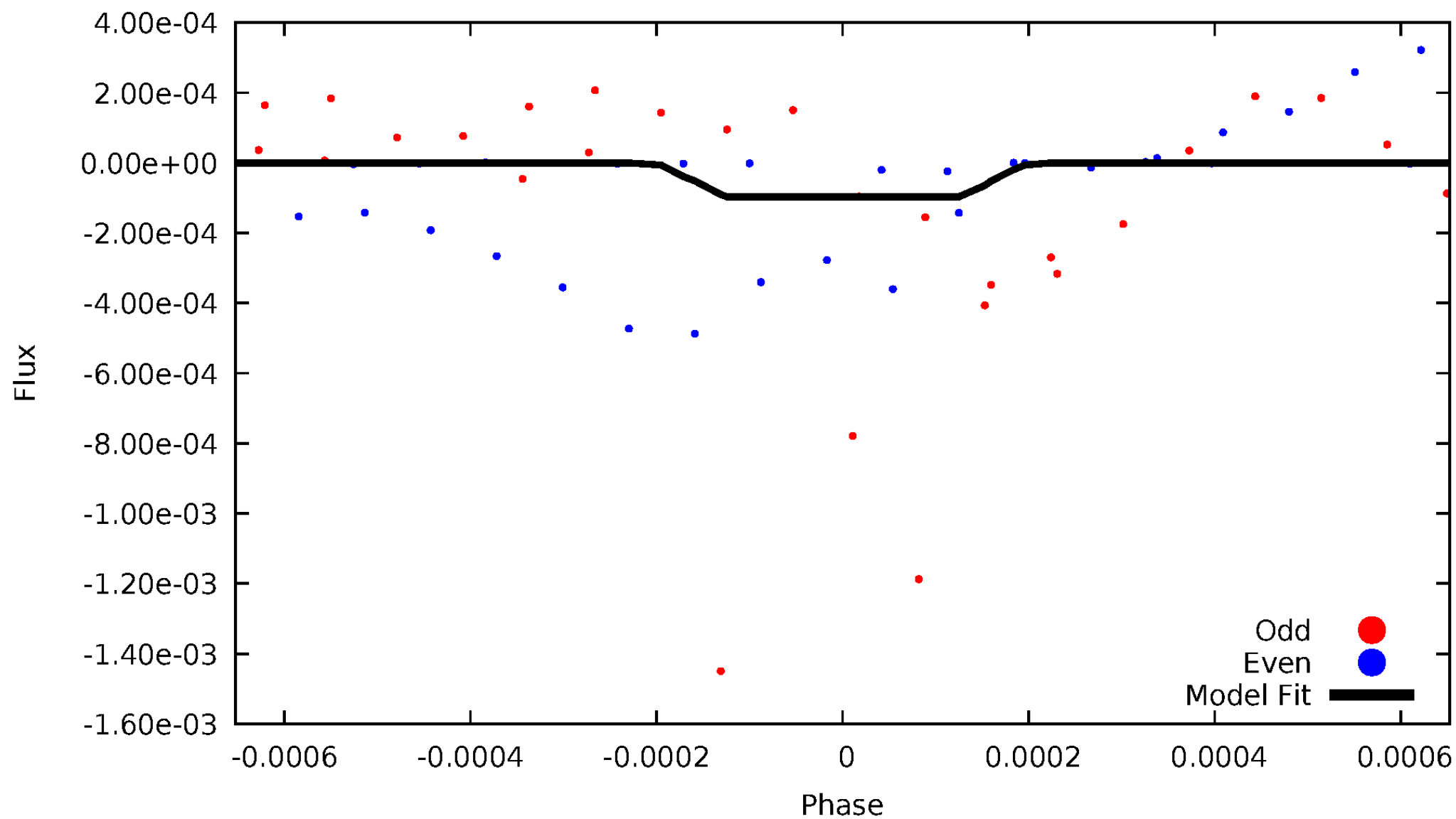
DV Odd/Even

TCE 010597648-01



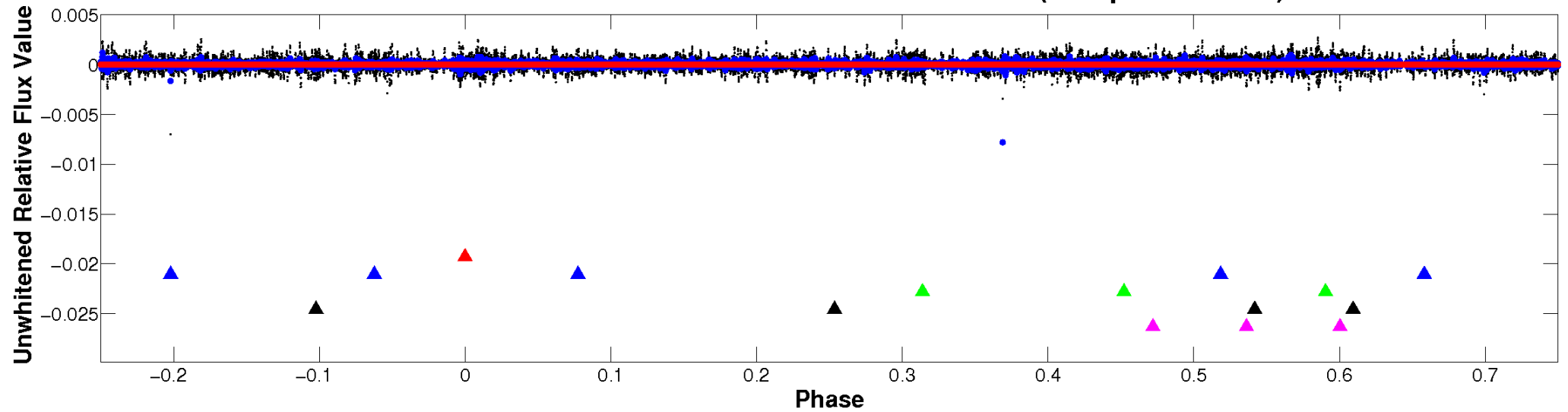
ALT Odd/Even

TCE 010597648-01

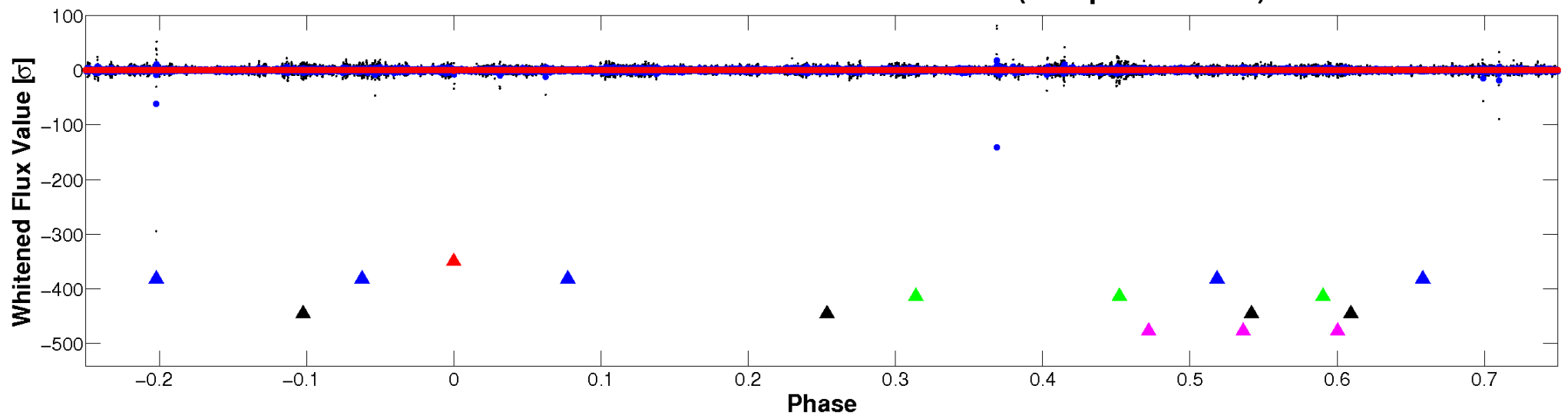


Non-Whitened Vs. Whitened Light Curve

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

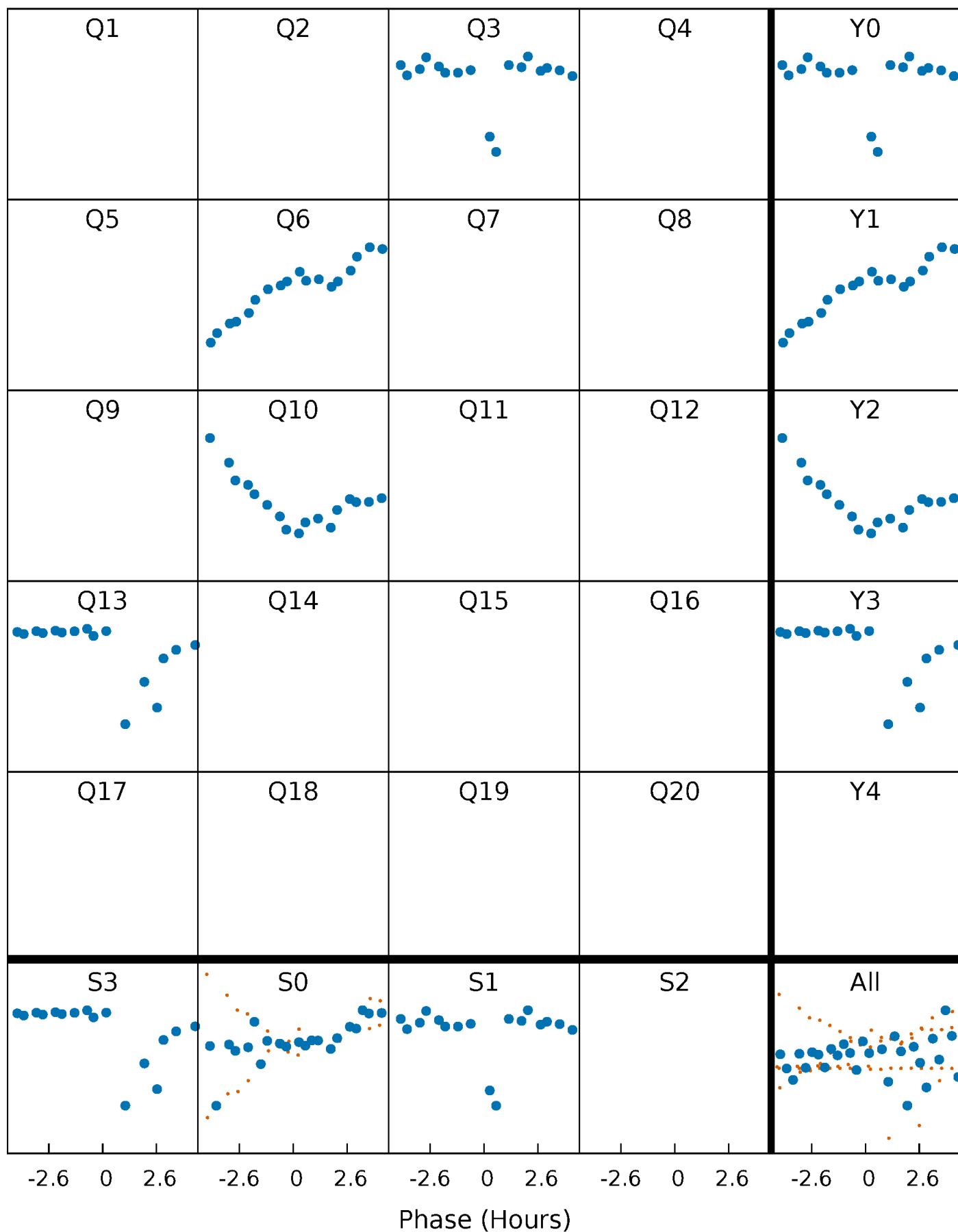


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



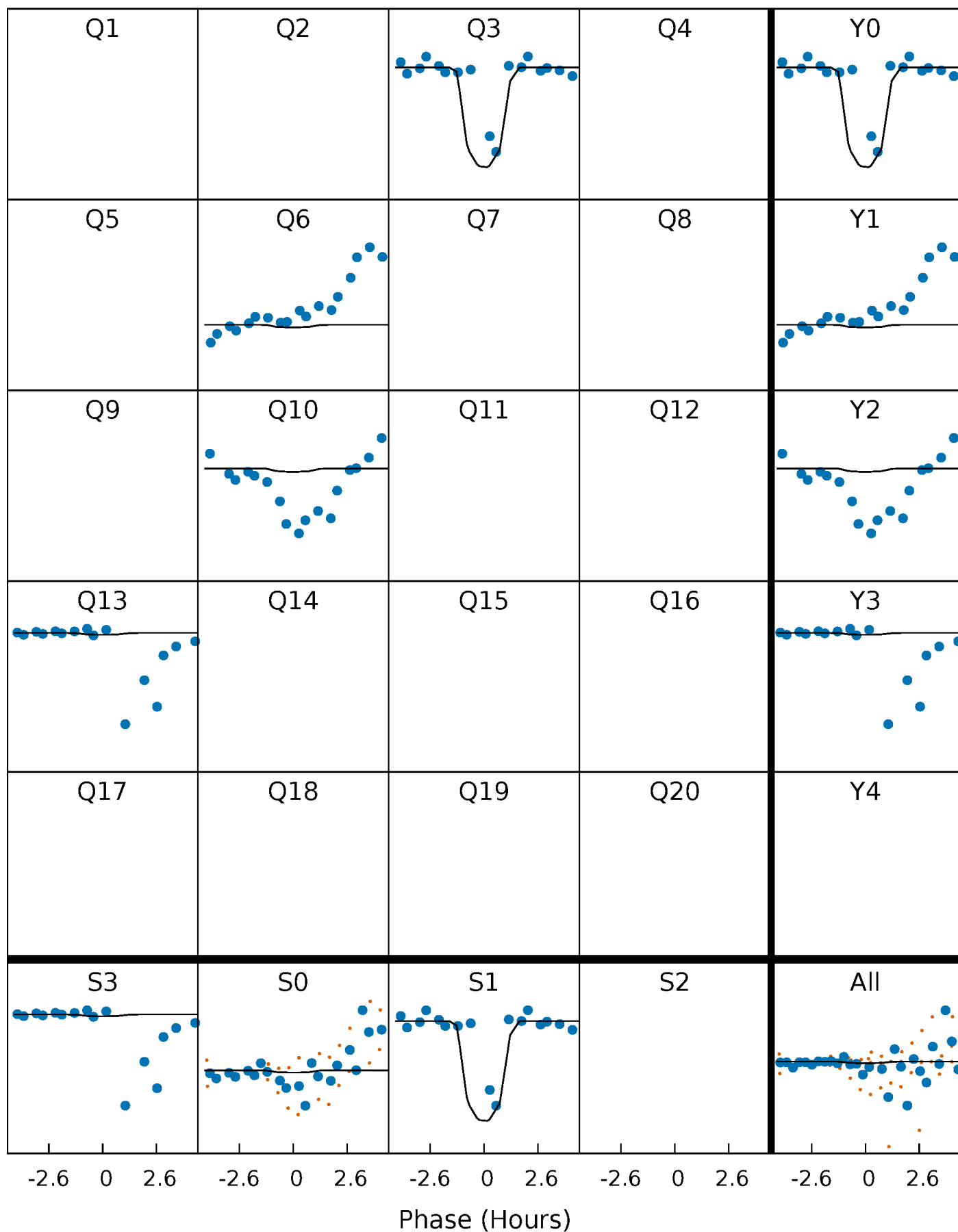
PDC Quarter-Phased Transit Curves

TCE 010597648-01 P=287.849313 Days $T_0=333.405215$ (BKJD)



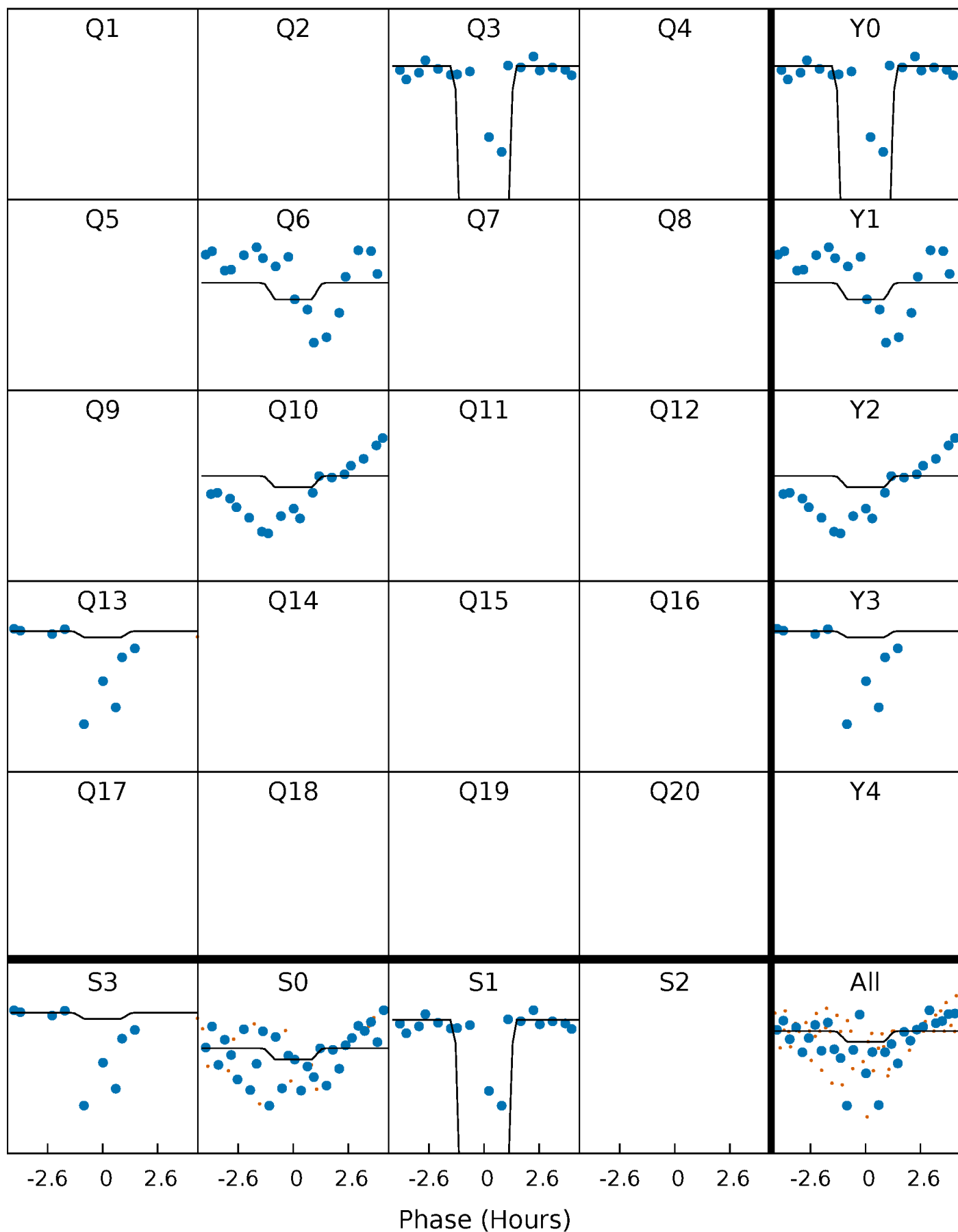
DV Quarter-Phased Transit Curves

TCE 010597648-01 P=287.849313 Days $T_0=333.405215$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

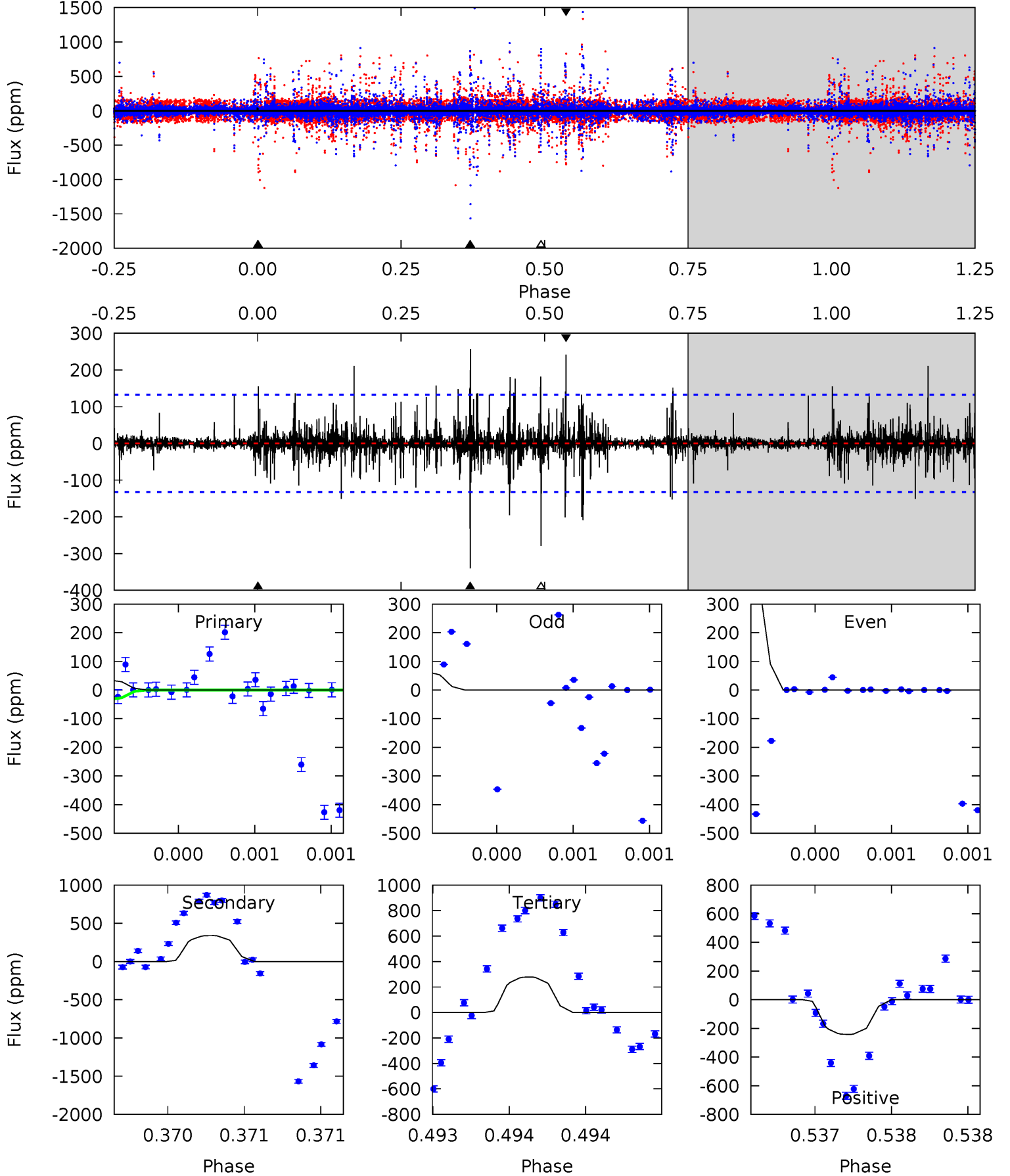
TCE 010597648-01 P=287.878168 Days $T_0=333.403207$ (BKJD)



DV Model-Shift Uniqueness Test

010597648-01, P = 287.849313 Days, E = 45.555902 Days

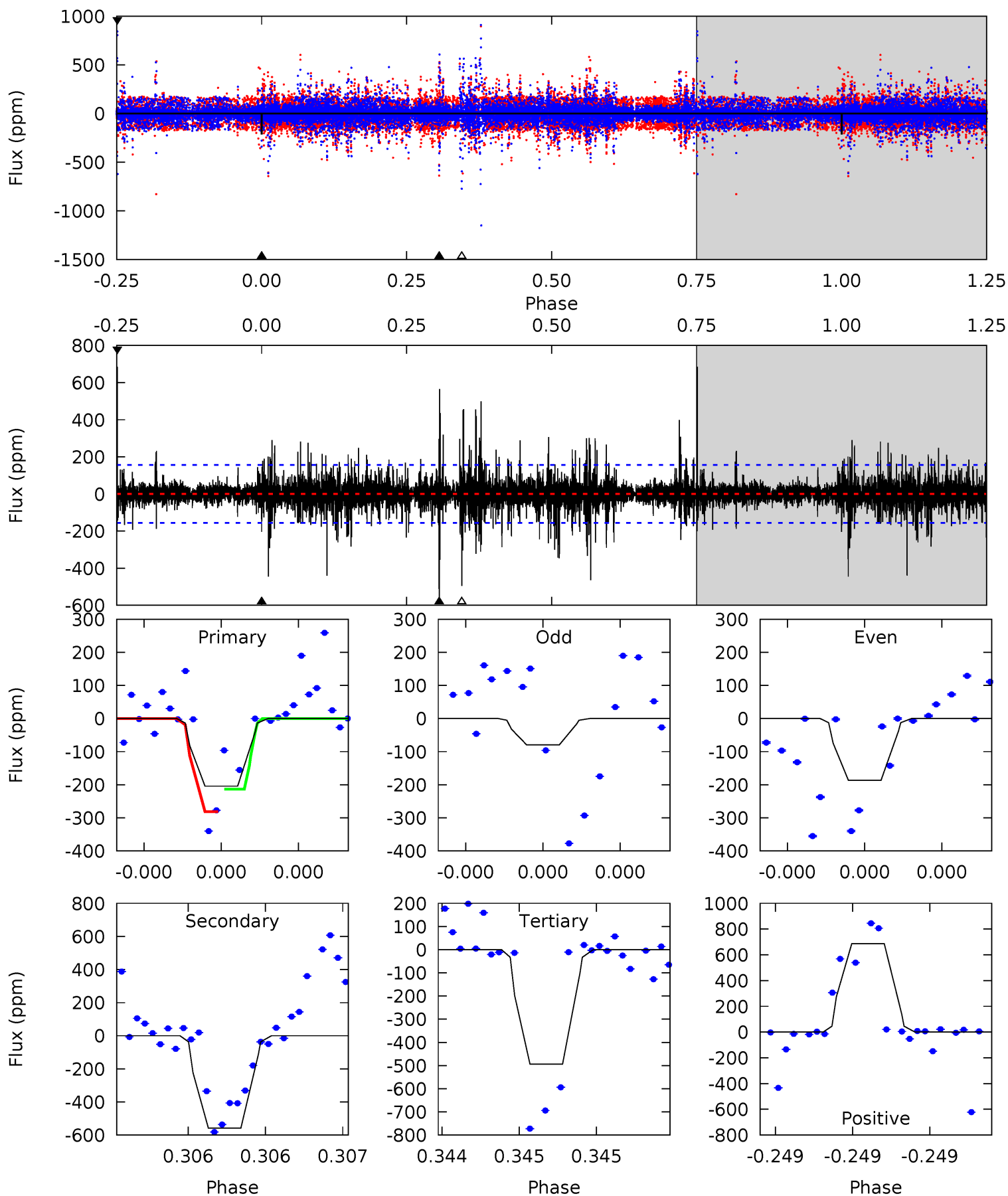
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.49	14.4	11.8	10.2	5.60	3.52	0.89	-10.3	-8.74	2.60	4.15	3.21	1.69	0.43	0.36



Alt Model-Shift Uniqueness Test

010597648-01, P = 287.878168 Days, E = 45.525039 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.34	20.0	17.8	24.6	5.60	3.53	1.78	-10.4	-17.3	2.26	-4.60	1.04	2.01	0.55	1.47



Stellar Parameters For KIC 010597648

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4500^{+114}_{-96}	$2.431^{+0.030}_{-0.030}$	$0.440^{+0.050}_{-0.200}$	$14.895^{+3.199}_{-2.909}$	$2.181^{+0.921}_{-0.753}$	$0.001^{+0.000}_{-0.000}$
	+3%/-2%	+1%/-1%	+11%/-45%	+21%/-20%	+42%/-35%	+30%/-20%
Source	PHO55	AST55	SPE55	DSEP		

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

Secondary Eclipse Parameters for KIC 010597648-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-340 ± 24	$17.77^{+19.59}_{-12.25}$	1021^{+35}_{-33}	5678^{+6246}_{-1463}	751^{+7262}_{-577}
Alt.	-557 ± 28	$23.09^{+19.63}_{-13.92}$	1022^{+36}_{-38}	5587^{+3729}_{-1215}	710^{+3672}_{-497}

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

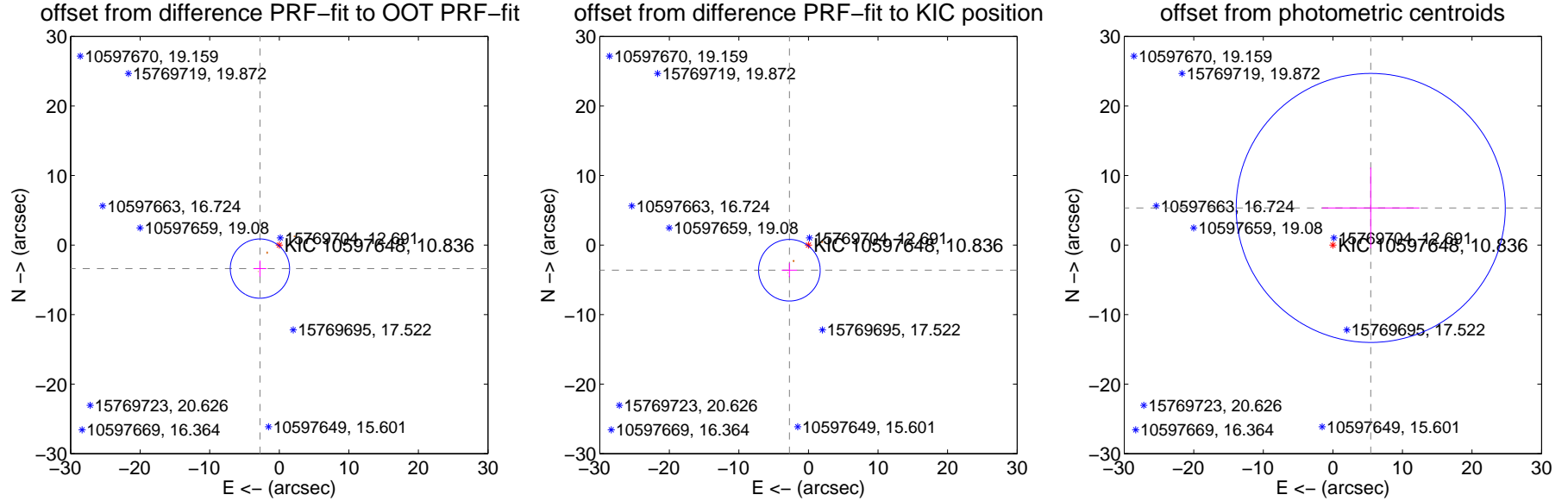
DV Centroid Data

Supplemental centroid analysis for 010597648-01. **Kepler magnitude: 10.84.** Transit SNR 5.14

There are 0 quarters with good PRF difference image offsets

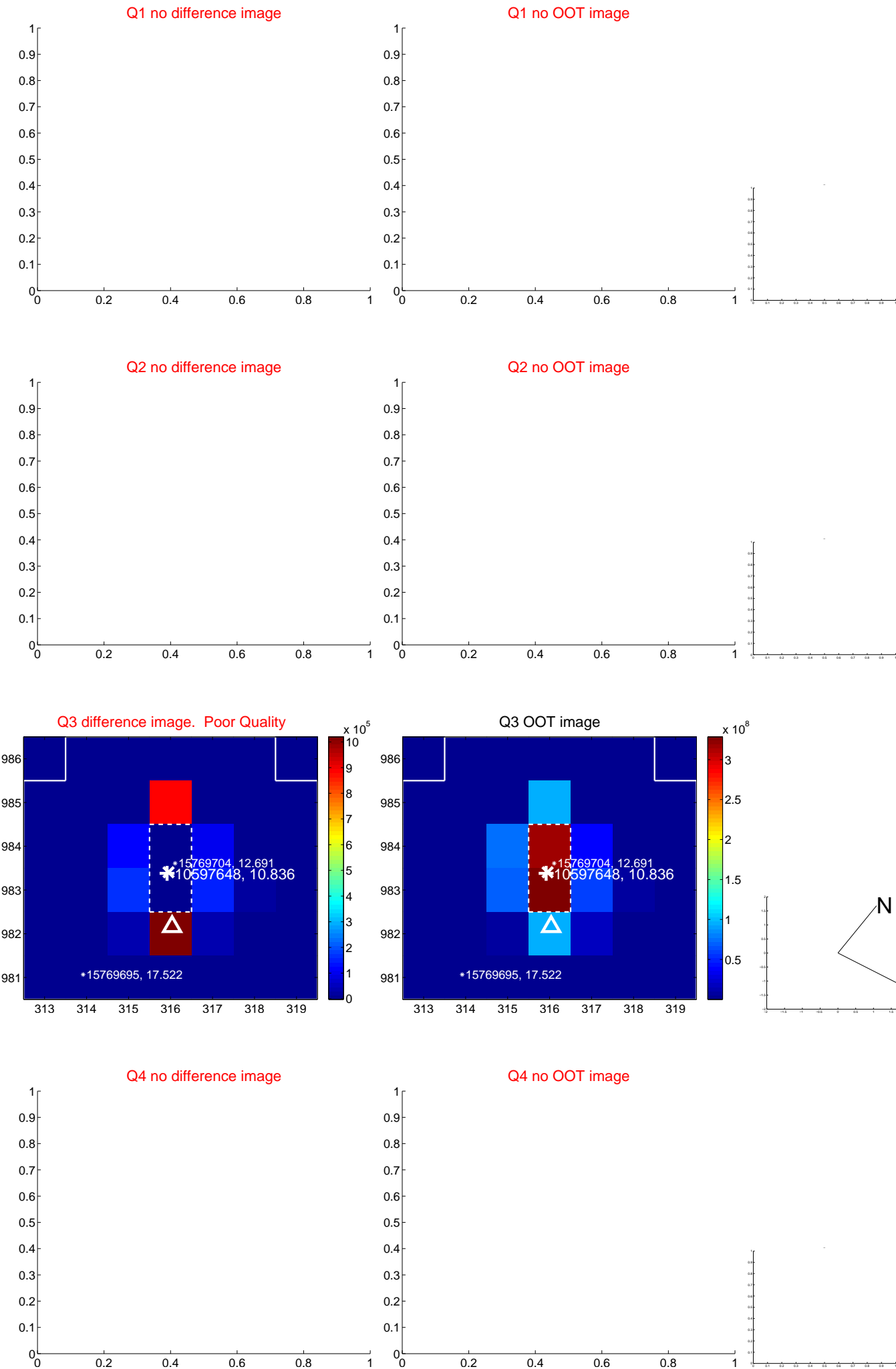
The direct PRF centroid is offset from the target star catalog position by about 0.84 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.381 \pm 1.421	3.08	2.781 \pm 0.908	-3.386 \pm 1.147
PRF-fit source offset from KIC position	4.540 \pm 1.476	3.08	2.740 \pm 1.106	-3.620 \pm 1.022
photometric centroid source offset	7.62 \pm 6.45	1.18	-5.44 \pm 7.00	5.34 \pm 5.82

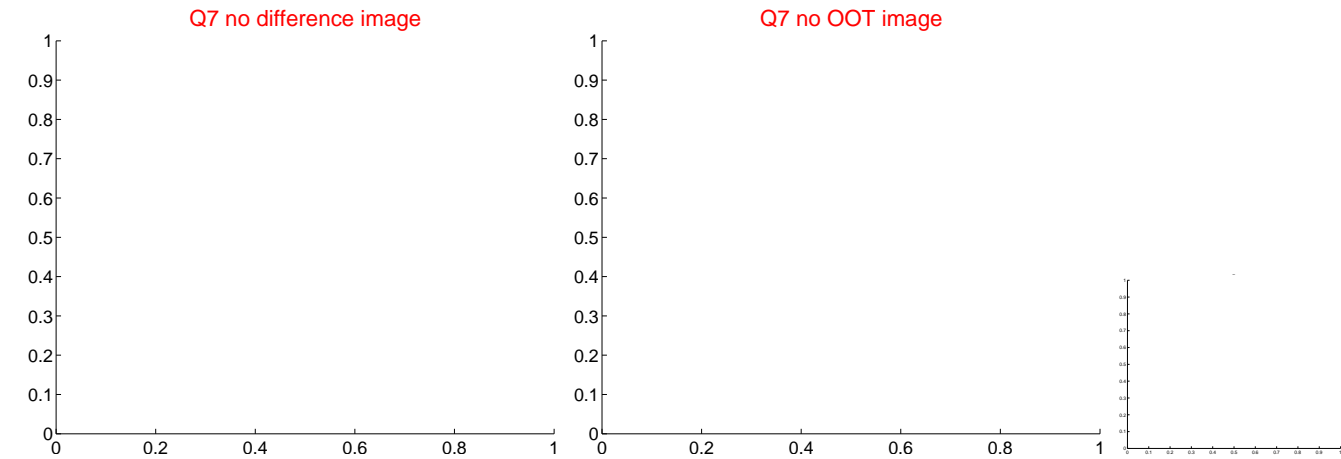
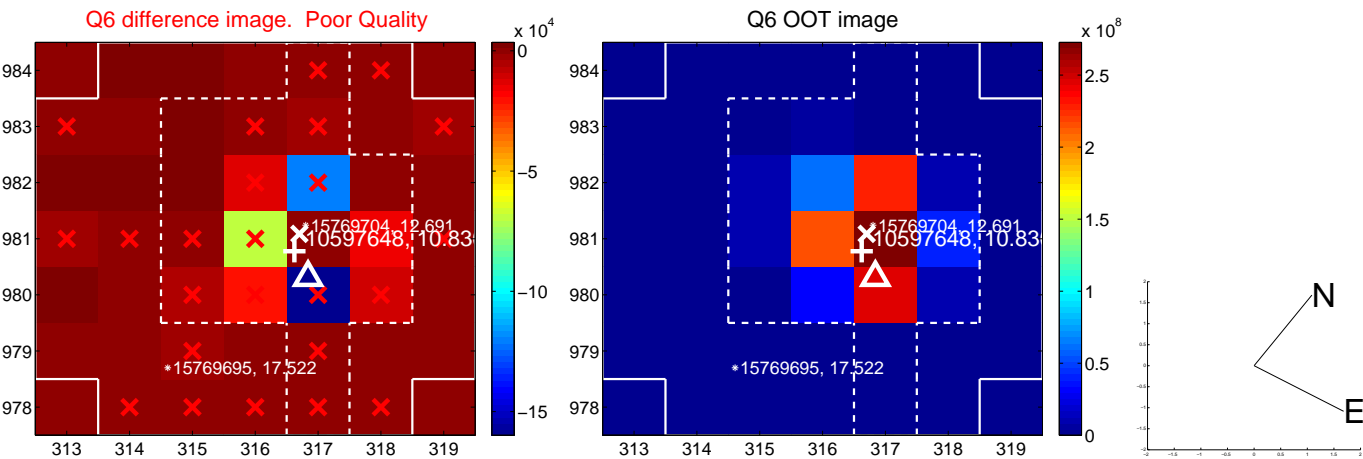


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

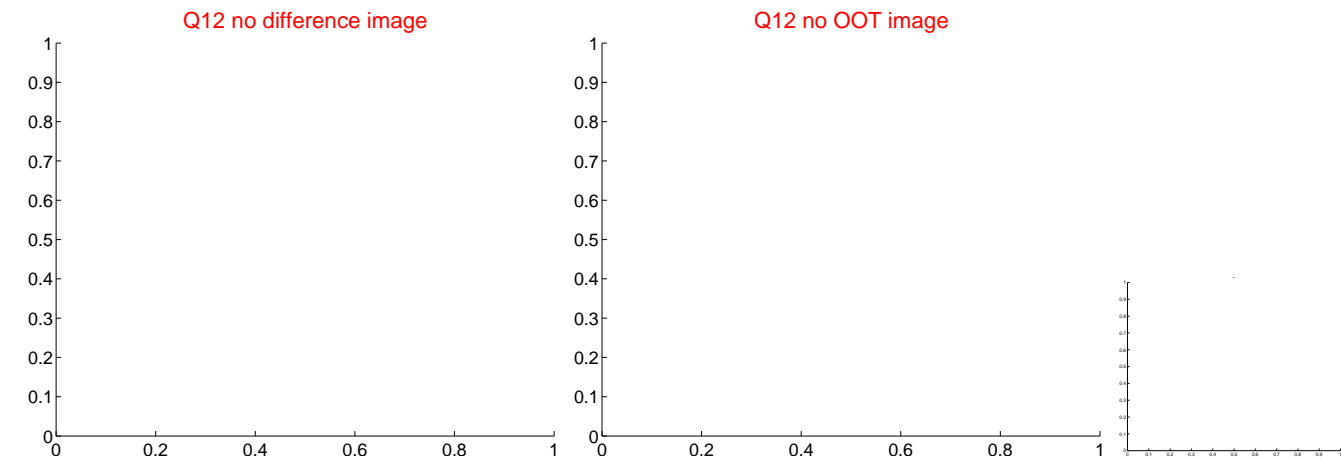
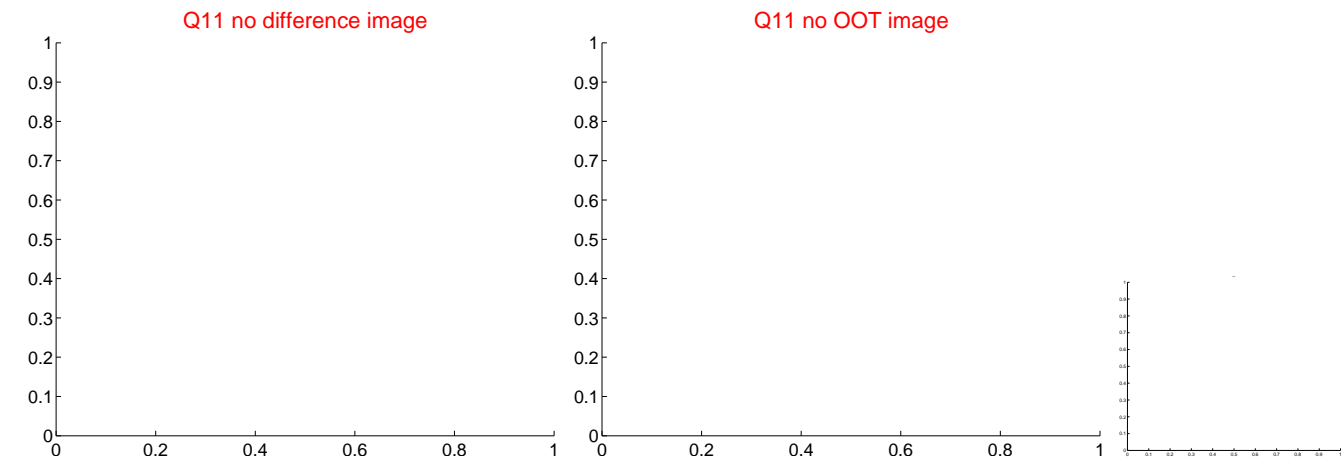
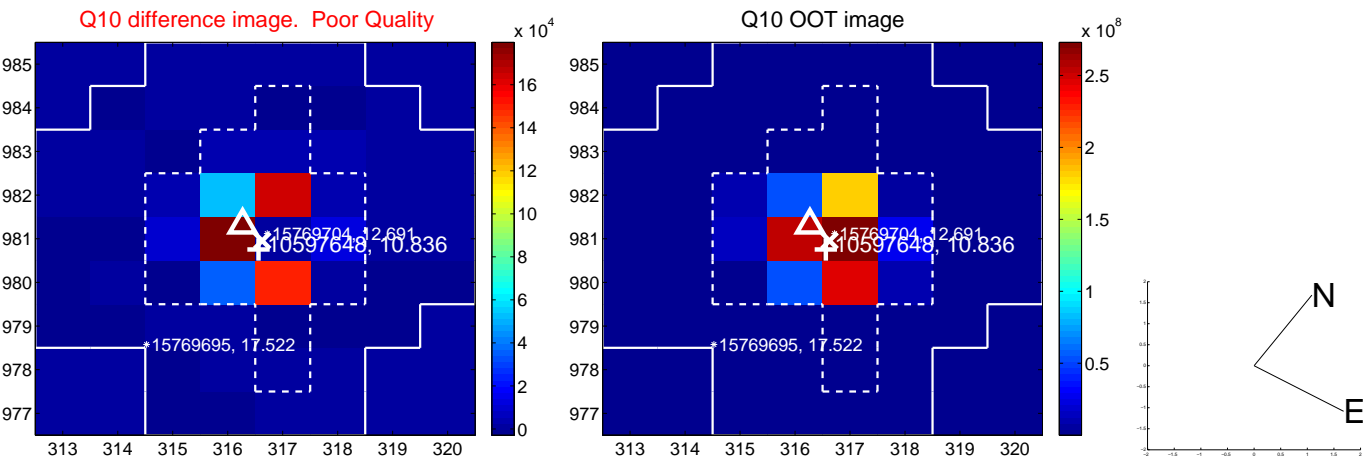
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



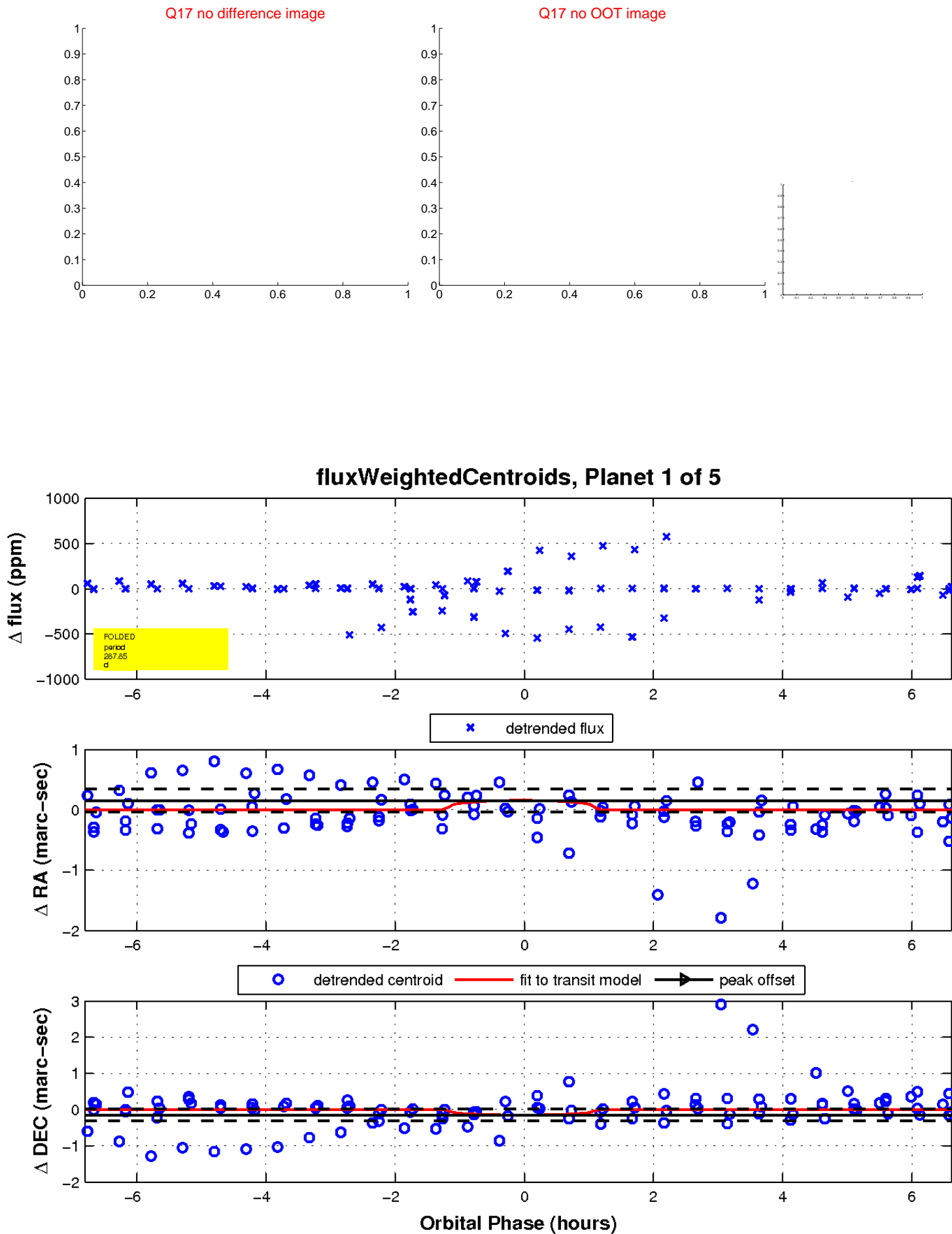
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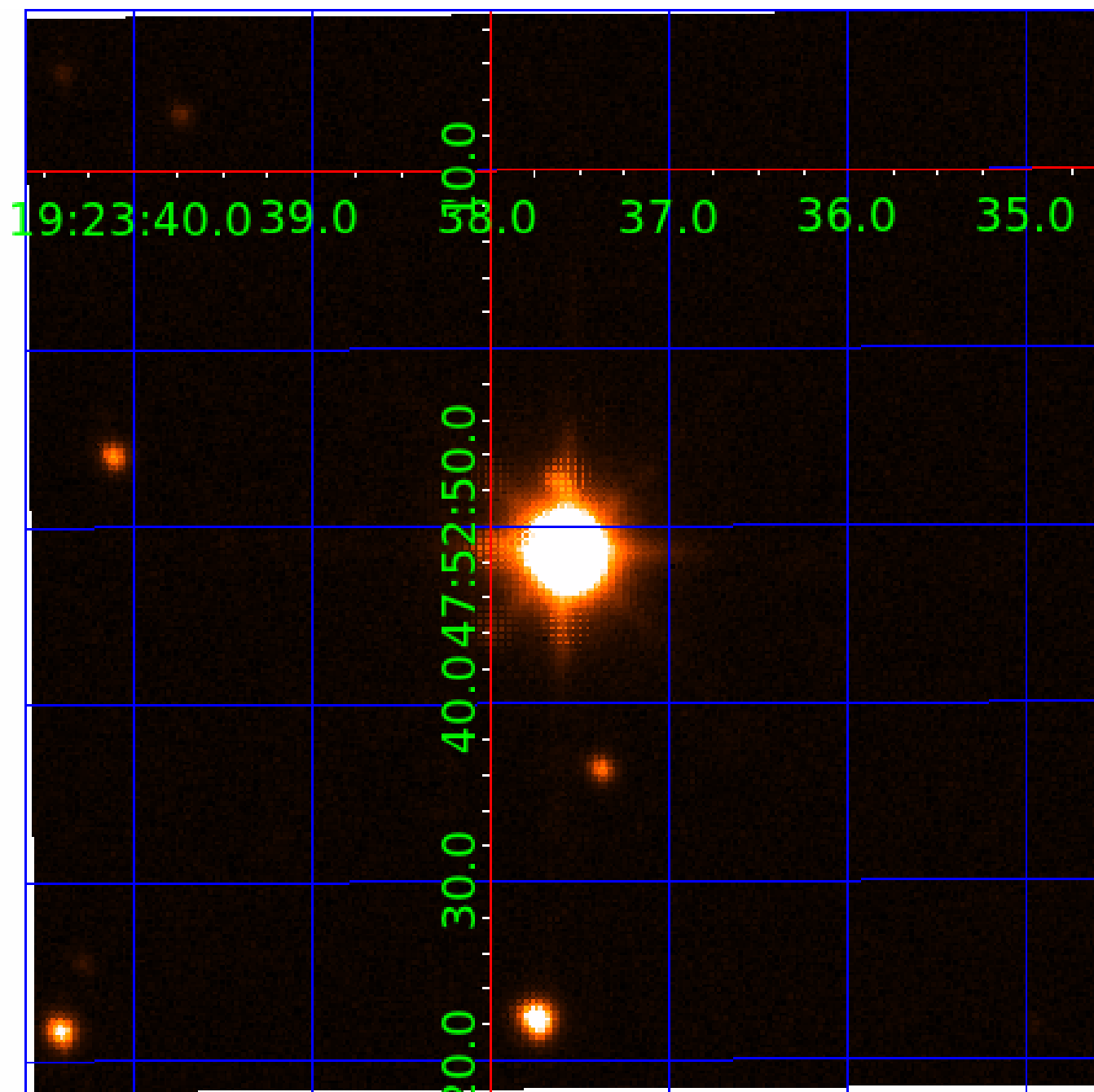


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010597648

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})
010597648-01	OBS	No	287.849313	333.405215	27.9	2.301	42.8	5.1	14.89	4500	7.83	66.51
010597648-02	OBS	No	247.620140	355.712970	6349.1	0.889	96.1	82.4	14.89	4500	127.91	81.29
010597648-03	OBS	No	535.898821	215.510914	2093.0	6.674	61.3	31.2	14.89	4500	139.39	29.04
010597648-04	OBS	No	390.278231	201.531959	2113.0	6.071	59.6	49.1	14.89	4500	139.93	44.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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010597648-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010597648-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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.

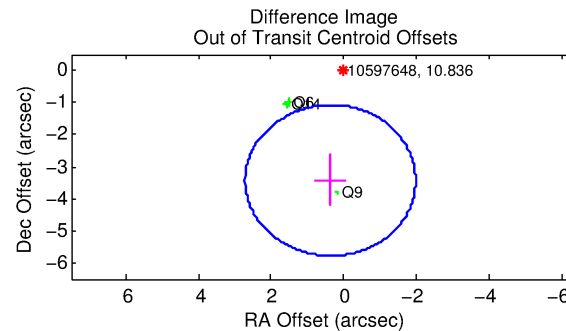
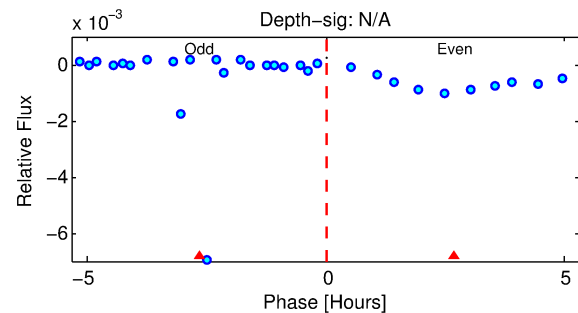
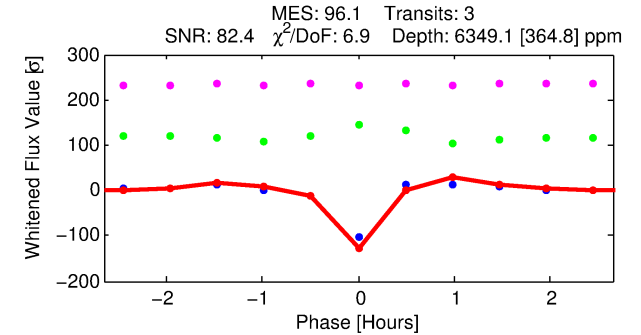
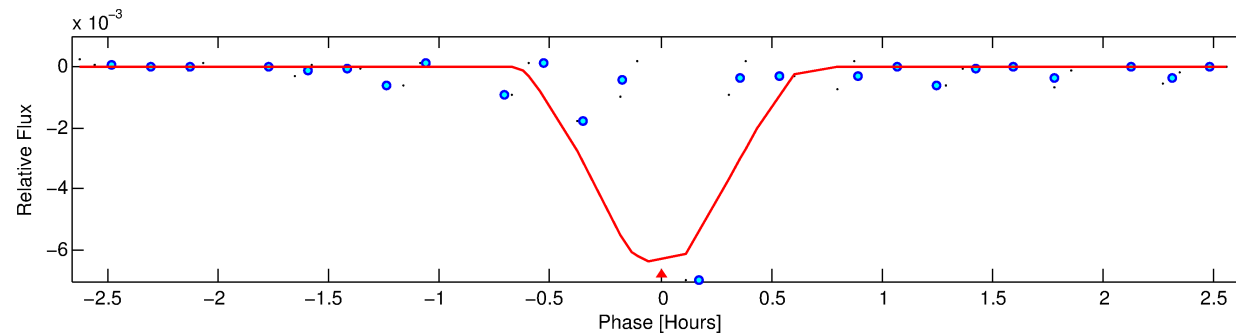
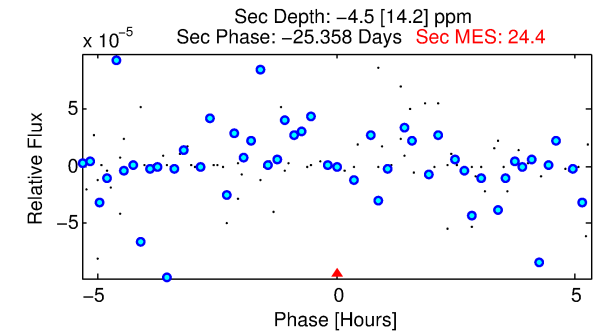
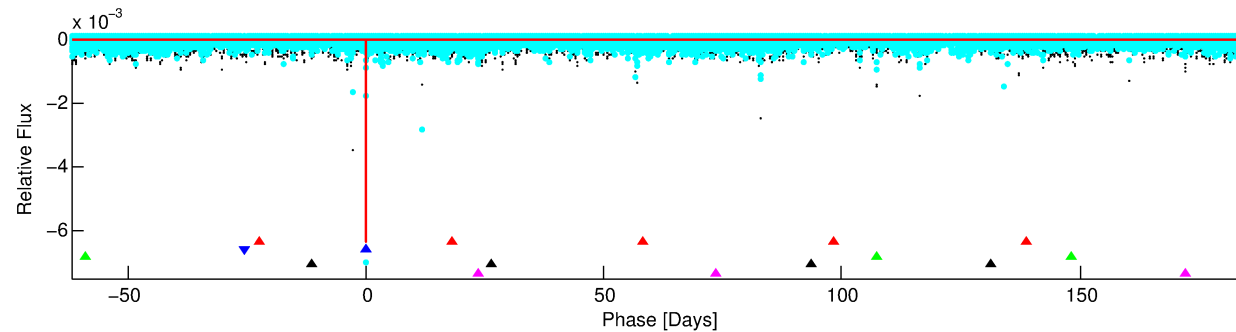
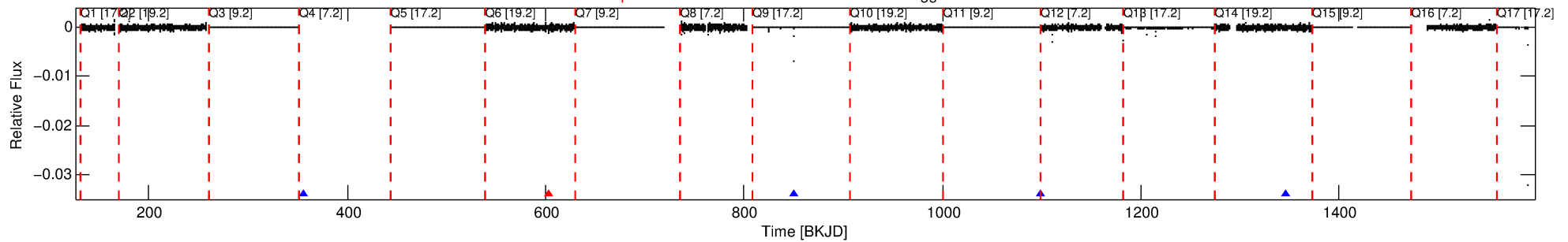
Ephemeris Match Information For 010597648-02

No Significant Match Found

DV One-Page Summary

KIC: 10597648 Candidate: 2 of 5 Period: 247.620 d

Kp: 10.84 R*: 14.89 Rs Teff: 4500.0 K Logg: 2.43 Fe/H: 0.440



DV Fit Results:

Period = 247.62014 [0.00069] d
Epoch = 355.7130 [0.0014] BKJD
Rp/R* = 0.0787 [0.0617]
a/R* = 1824.46 [3772.51]
b = 0.65 [1.94]
Seff = 81.29 [14.74]
Teq = 766 [35] K
Rp = 127.91 [103.97] Re
a = 1.0013 [0.1452] AU
Ag = N/A
Teffp = N/A

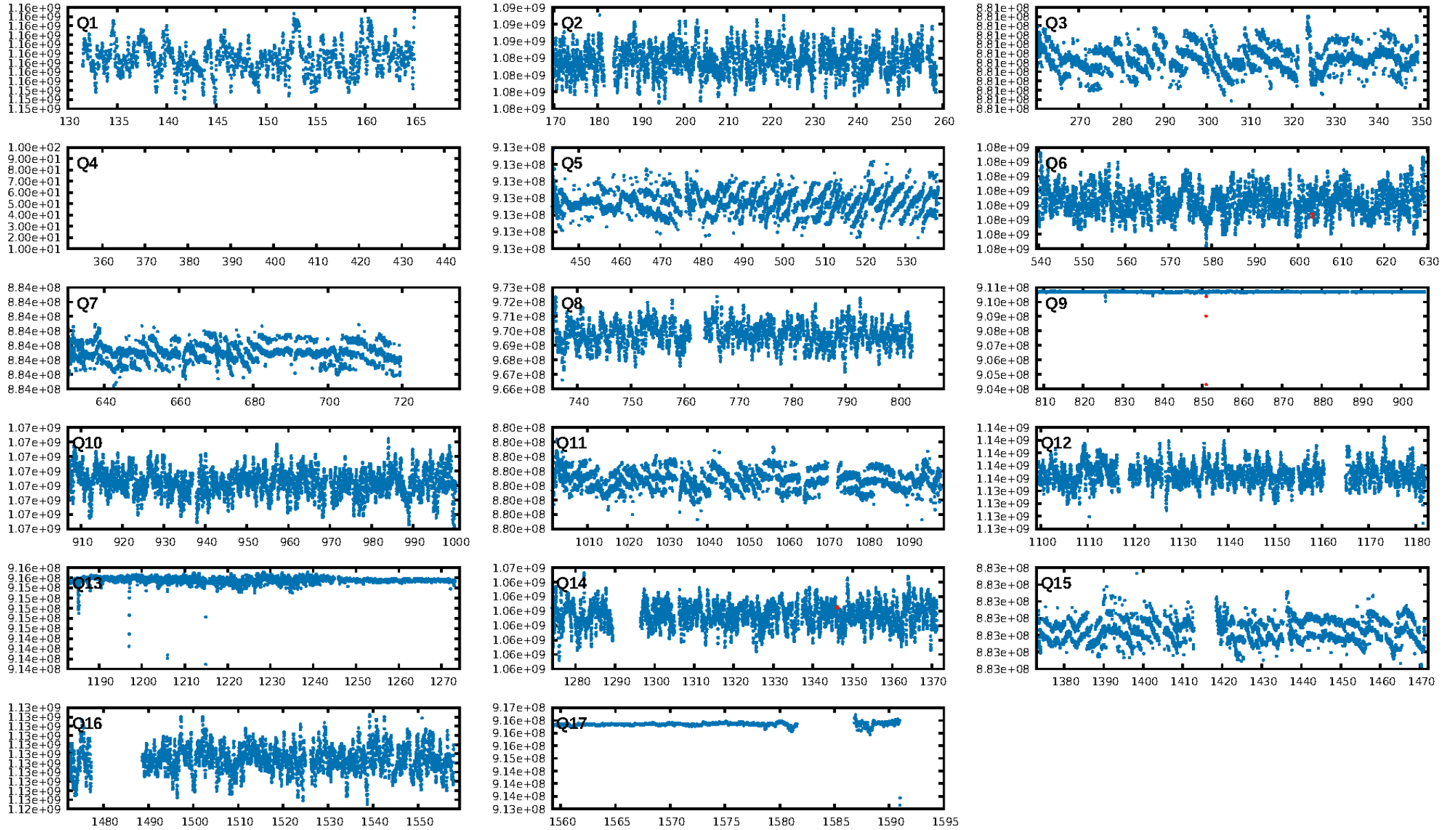
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [391.46σ]
ModelChiSquare2-sig: 63.2%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: -1.892
Centroid-sig: 38.5%
Centroid-so: 0.237 arcsec [5.63σ]
OotOffset-rm: 3.450 arcsec [4.41σ]
KicOffset-rm: 3.510 arcsec [8.32σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

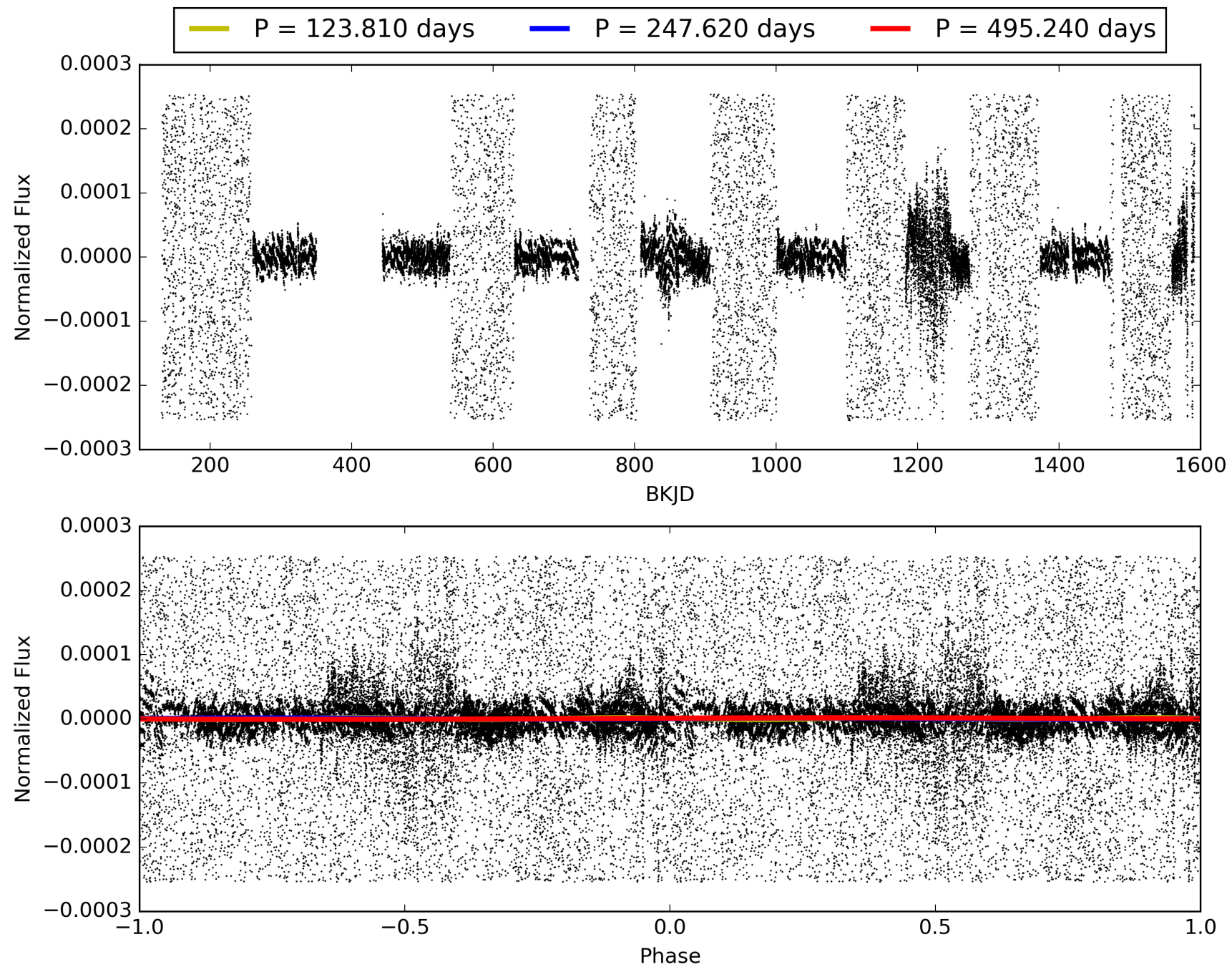
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010597648-02, PDC Light Curves

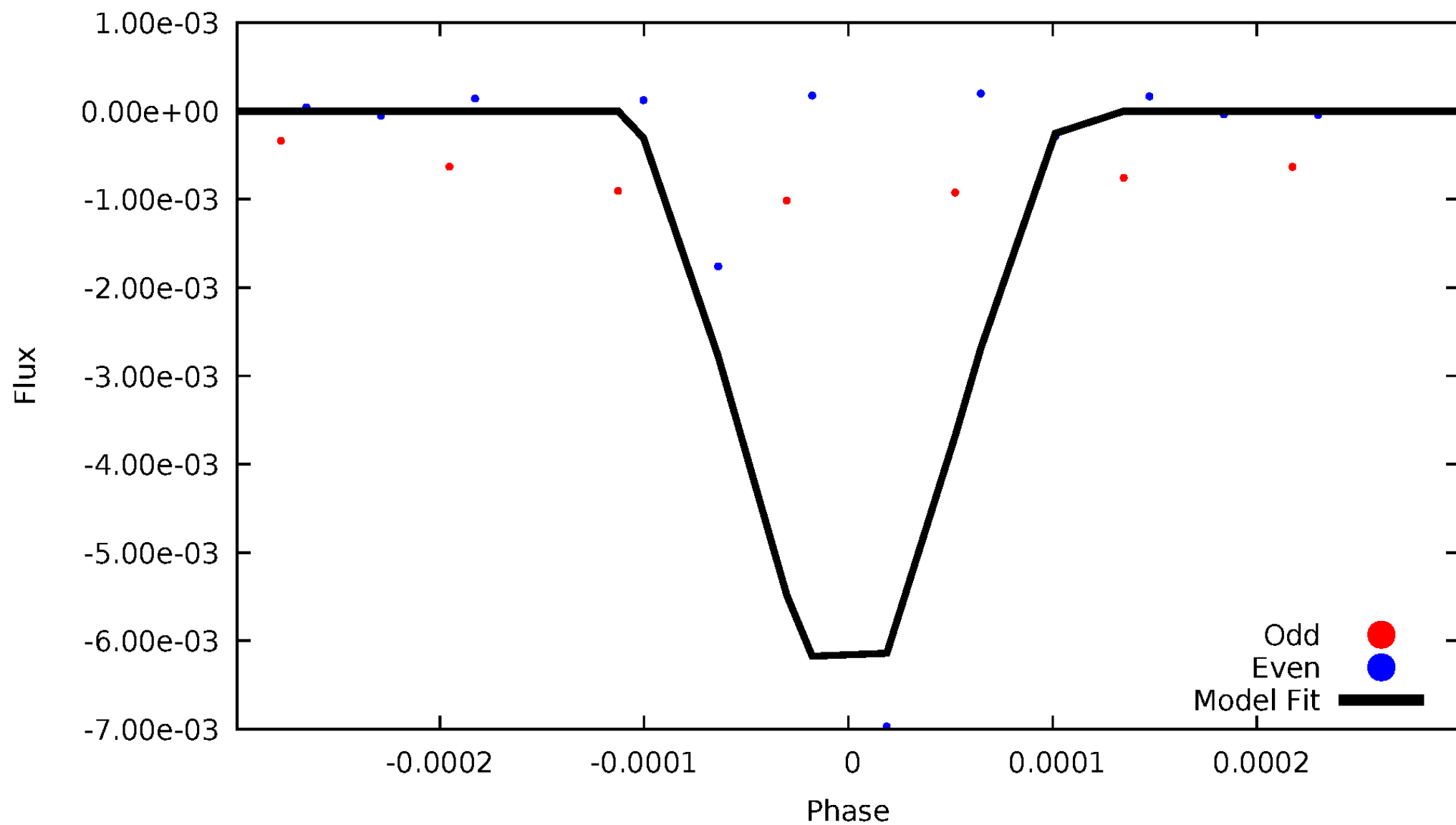


TCE 010597648-02



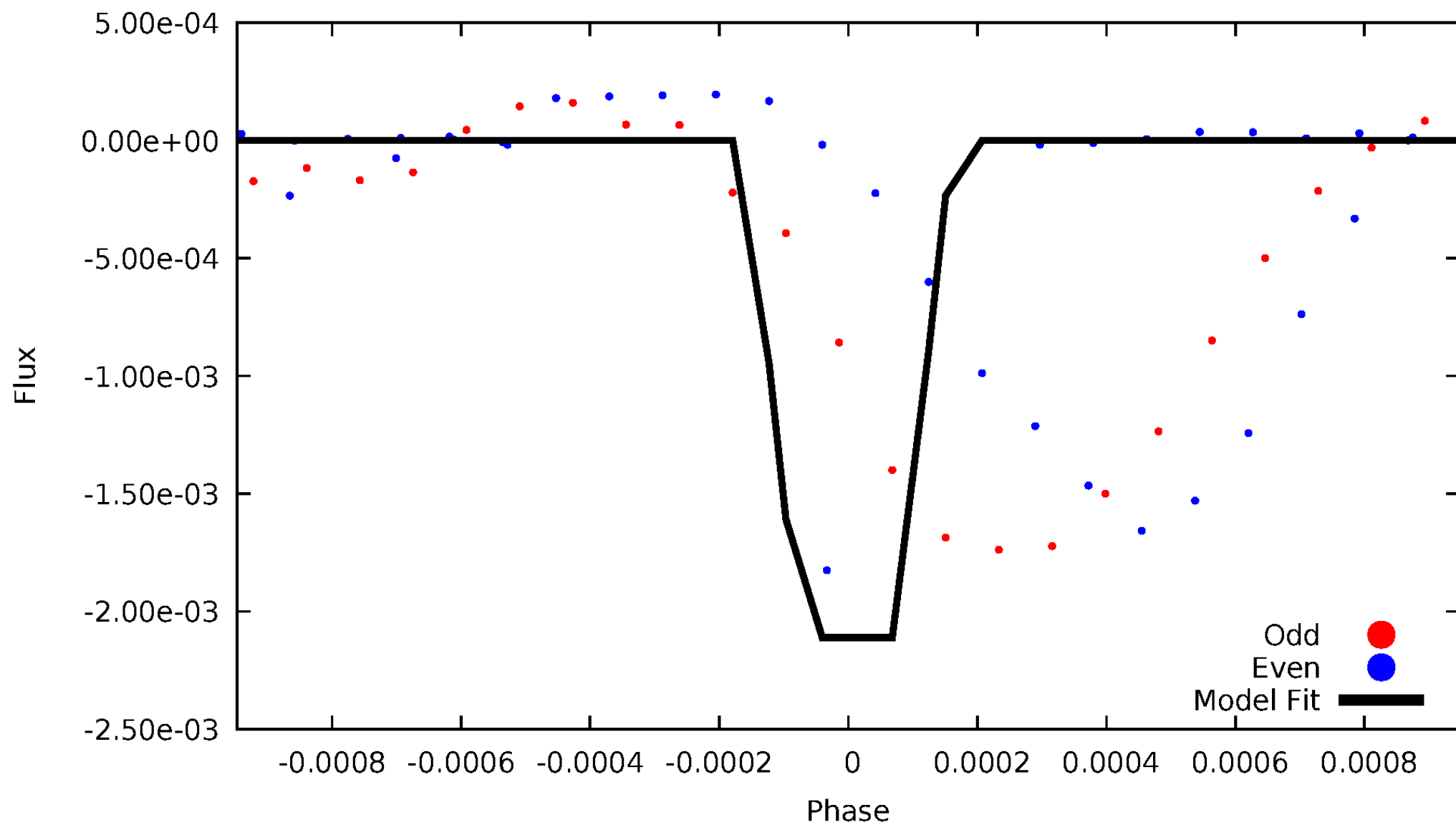
DV Odd/Even

TCE 010597648-02



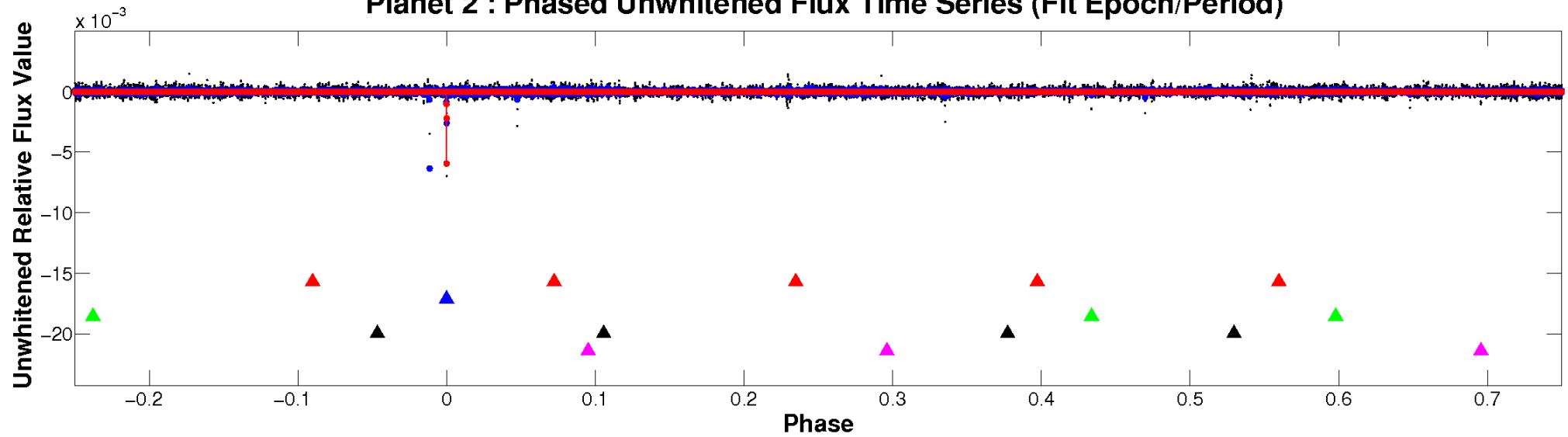
ALT Odd/Even

TCE 010597648-02

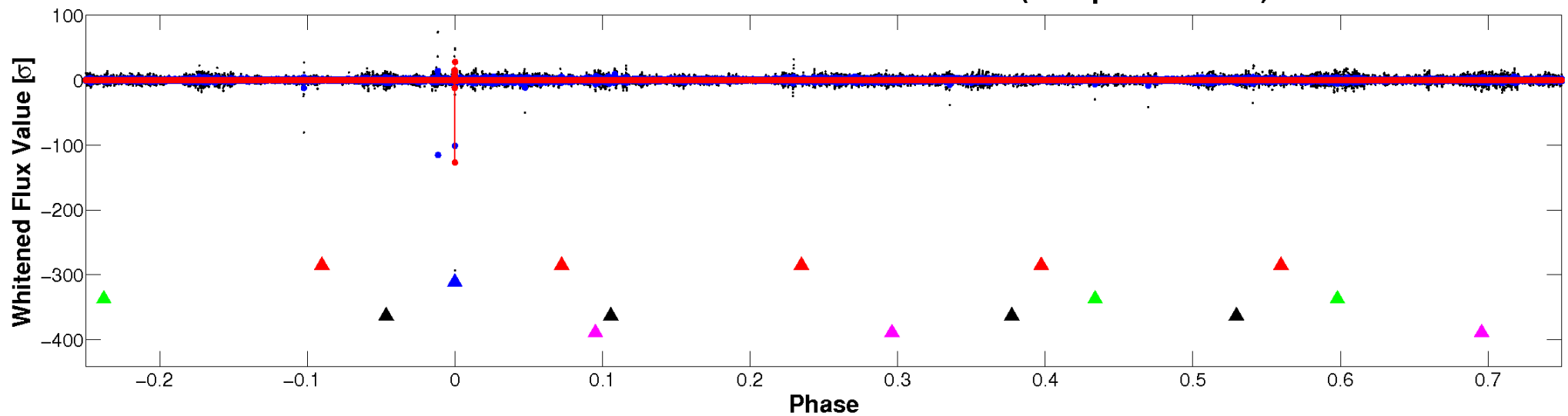


Non-Whitened Vs. Whitened Light Curve

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

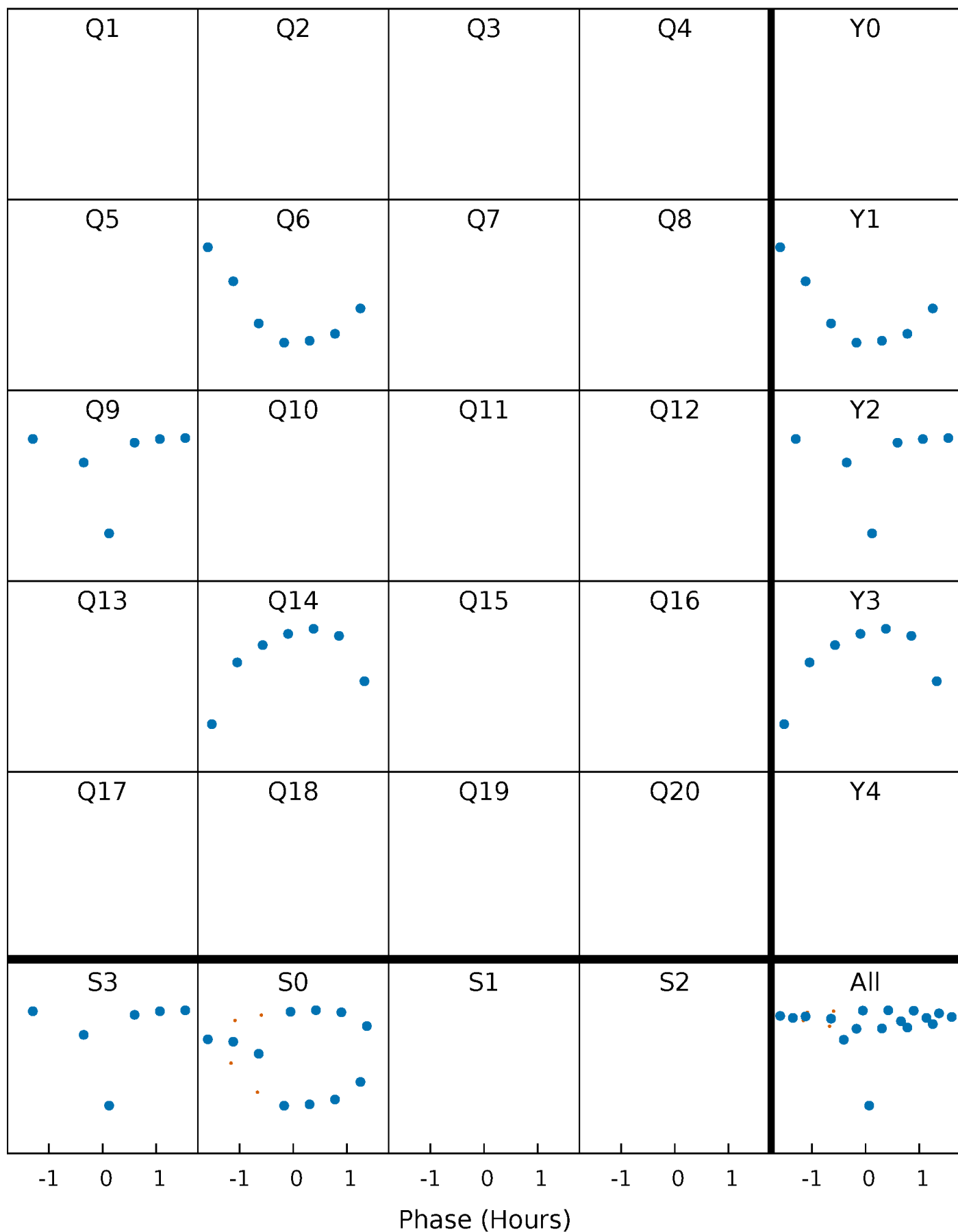


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



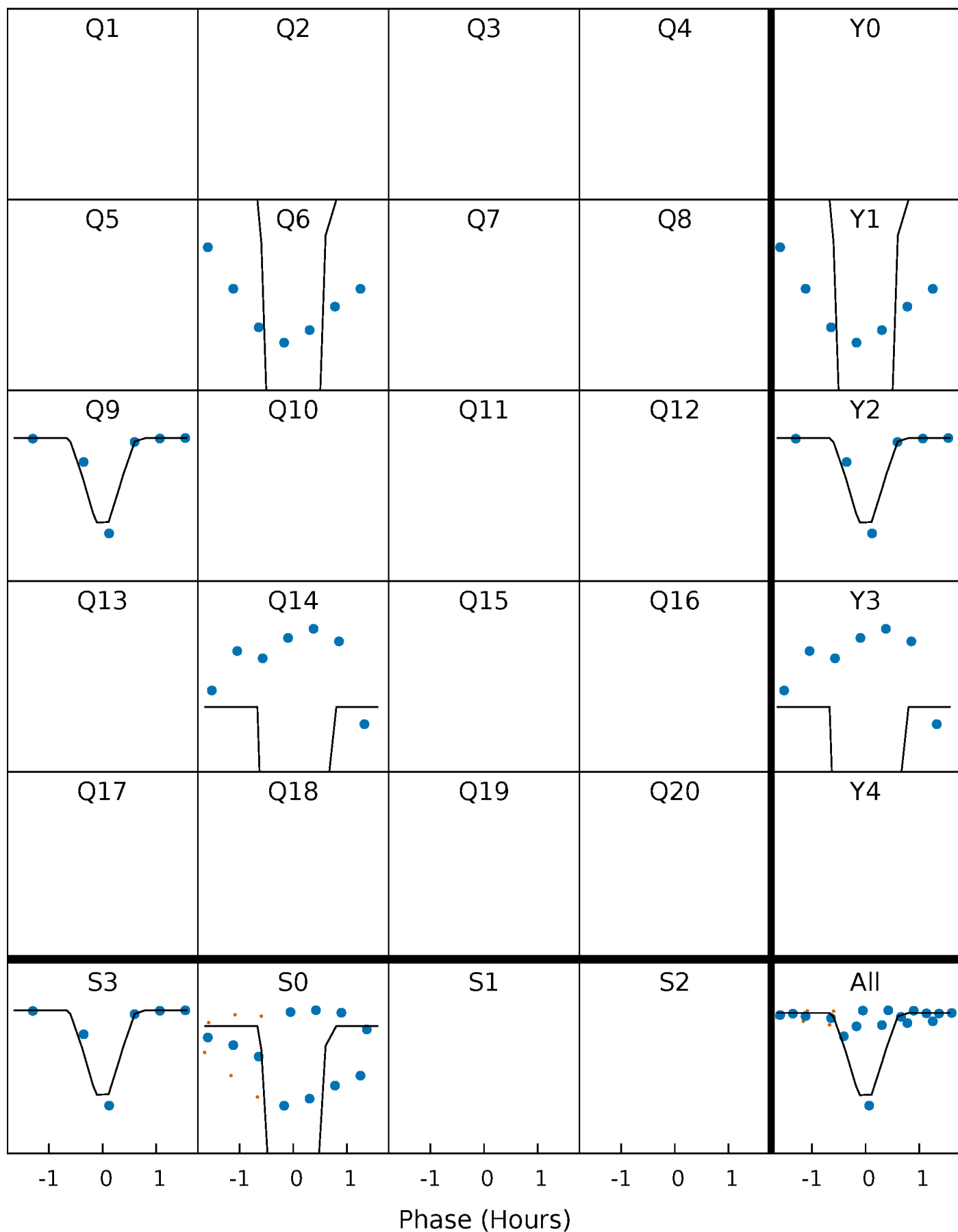
PDC Quarter-Phased Transit Curves

TCE 010597648-02 $P=247.620140$ Days $T_0=355.712970$ (BKJD)



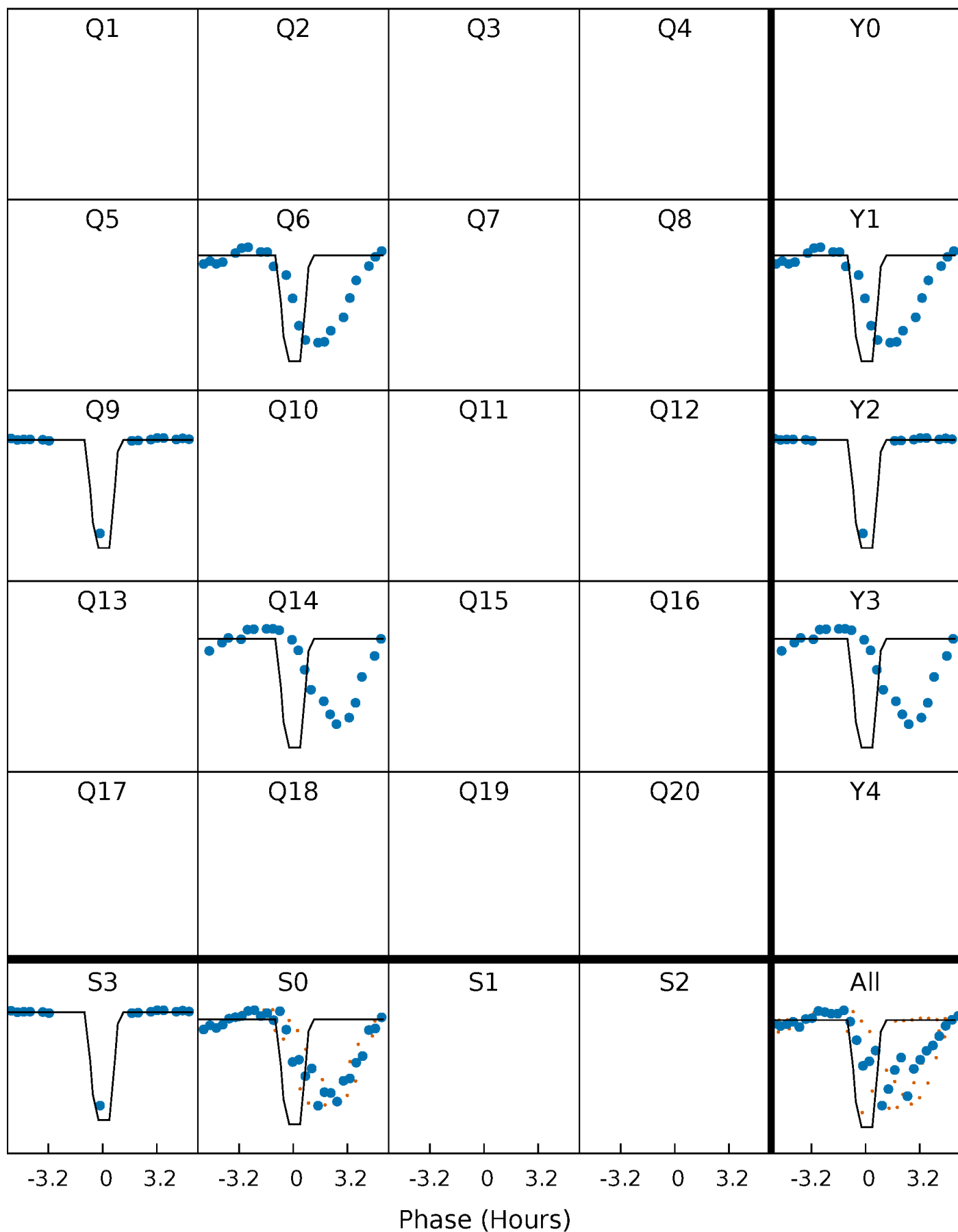
DV Quarter-Phased Transit Curves

TCE 010597648-02 P=247.620140 Days $T_0=355.712970$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

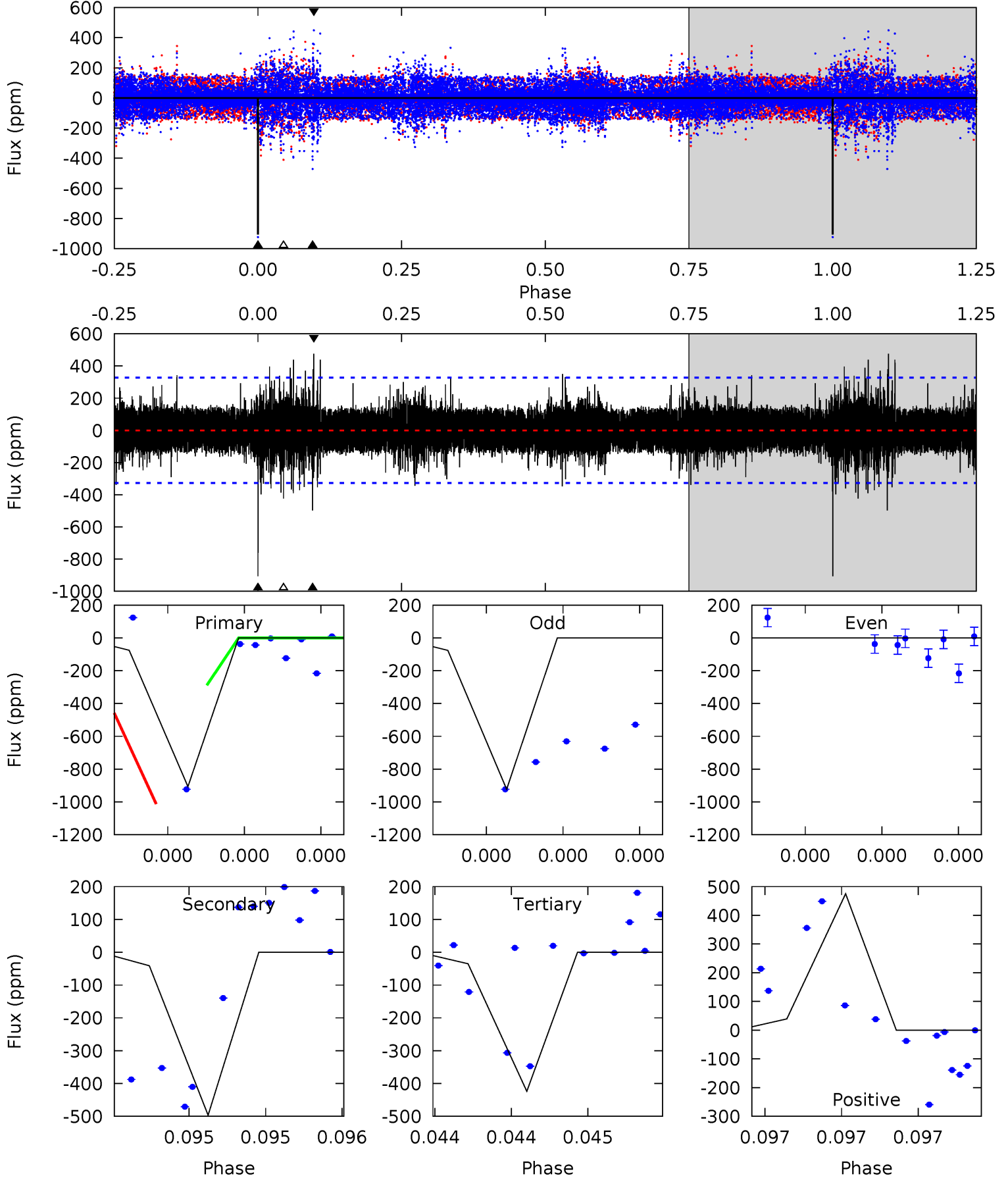
TCE 010597648-02 P=247.657386 Days $T_0=355.630916$ (BKJD)



DV Model-Shift Uniqueness Test

010597648-02, P = 247.620140 Days, E = 108.092830 Days

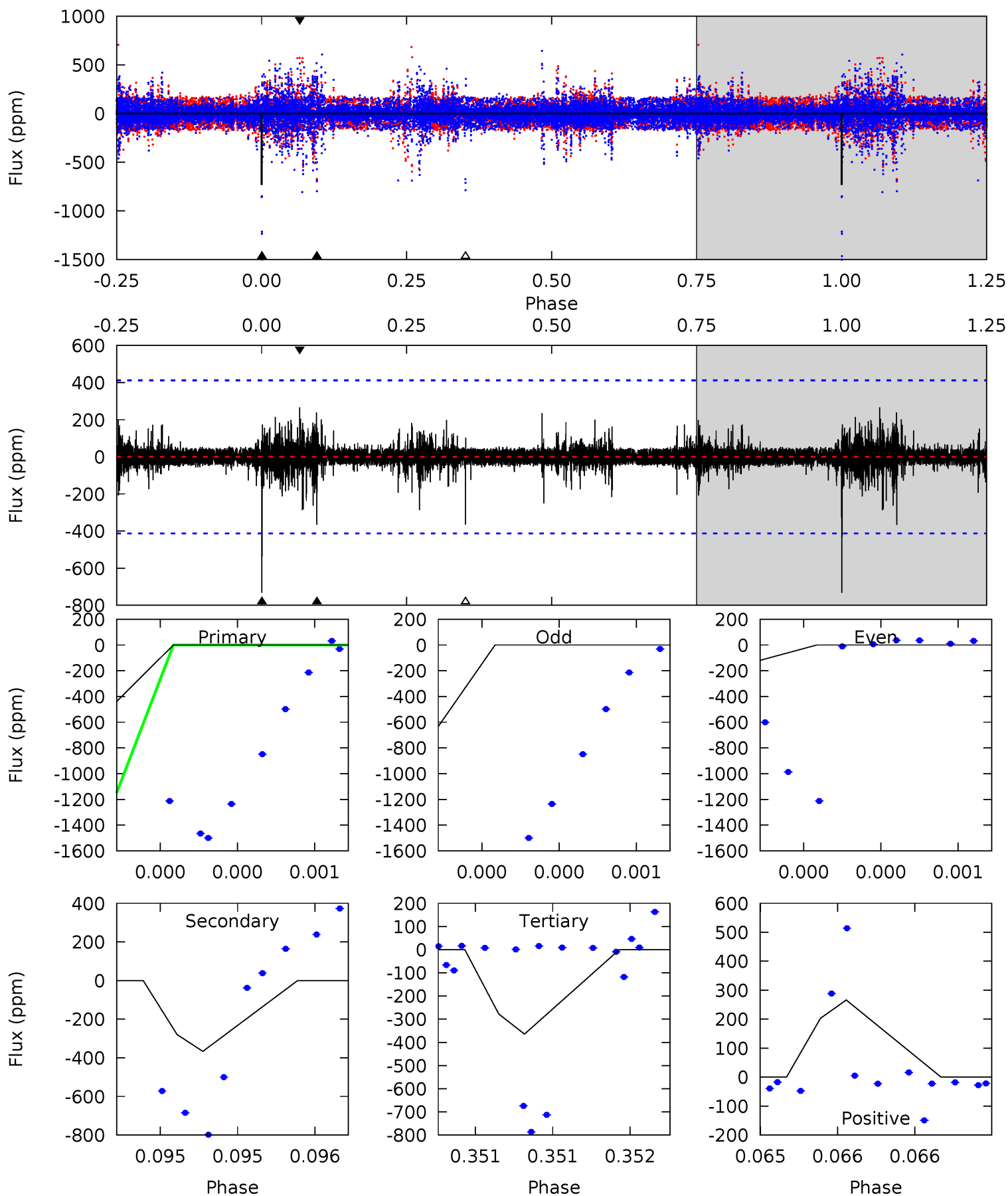
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	8.69	7.42	8.31	5.73	3.72	1.01	8.44	7.55	1.27	0.37	0	1.98	0.34	0



Alt Model-Shift Uniqueness Test

010597648-02, P = 247.657386 Days, E = 107.973530 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	5.07	5.03	3.68	5.69	3.66	0.39	5.09	6.44	0.04	1.39	5.62	1.00	0.27	6.47



Stellar Parameters For KIC 010597648

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4500^{+114}_{-96}	$2.431^{+0.030}_{-0.030}$	$0.440^{+0.050}_{-0.200}$	$14.895^{+3.199}_{-2.909}$	$2.181^{+0.921}_{-0.753}$	$0.001^{+0.000}_{-0.000}$
	+3%/-2%	+1%/-1%	+11%/-45%	+21%/-20%	+42%/-35%	+30%/-20%
Source	PHO55	AST55	SPE55	DSEP		

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

Secondary Eclipse Parameters for KIC 010597648-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-497 ± 57	$141.24^{+102.45}_{-82.77}$	1075^{+37}_{-37}	2905^{+892}_{-396}	14^{+66}_{-9}
Alt.	-367 ± 72	$107.19^{+89.35}_{-71.46}$	1073^{+37}_{-36}	2984^{+1322}_{-457}	17^{+145}_{-12}

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

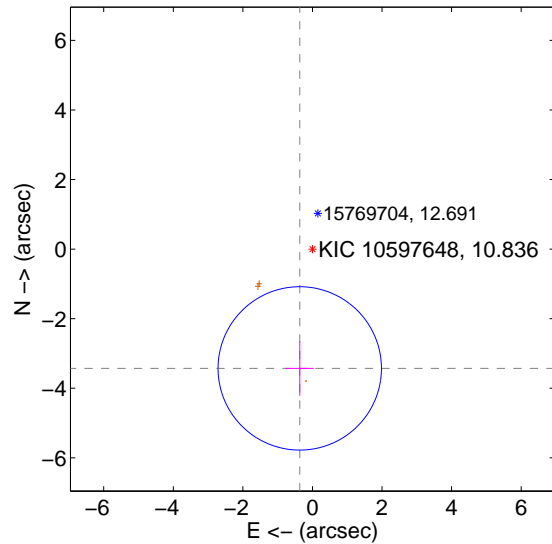
Supplemental centroid analysis for 010597648-02. **Kepler magnitude: 10.84.** Transit SNR 82.42

There are 0 quarters with good PRF difference image offsets

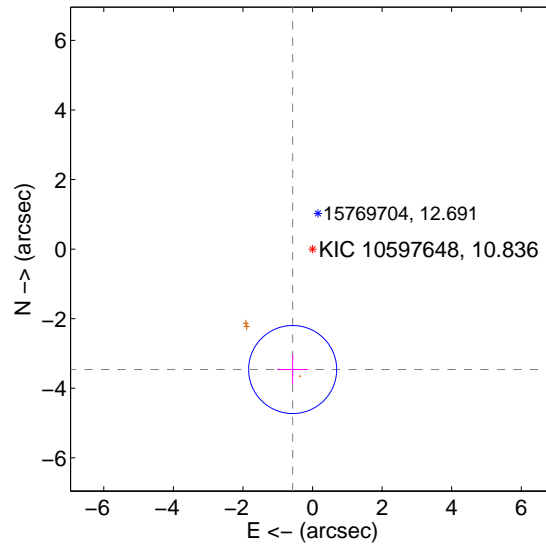
The direct PRF centroid is offset from the target star catalog position by about 1.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.450 ± 0.783	4.41	0.365 ± 0.402	-3.430 ± 0.786
PRF-fit source offset from KIC position	3.510 ± 0.422	8.32	0.571 ± 0.447	-3.463 ± 0.421
photometric centroid source offset	0.24 ± 0.04	5.63	0.15 ± 0.05	-0.19 ± 0.04

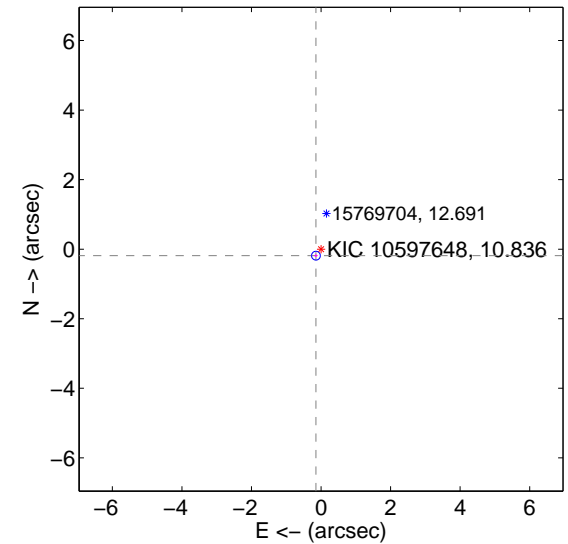
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

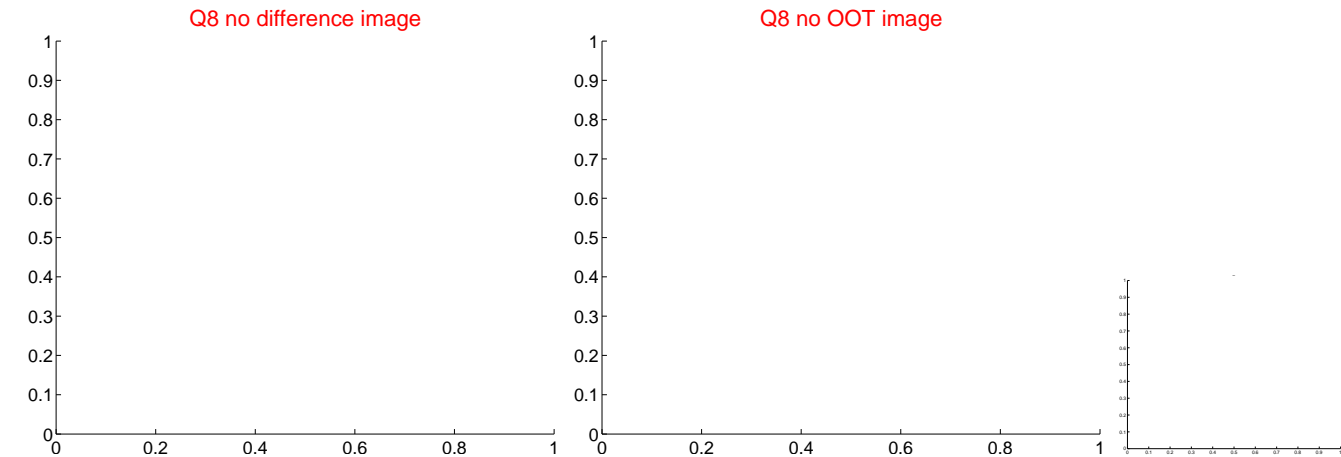
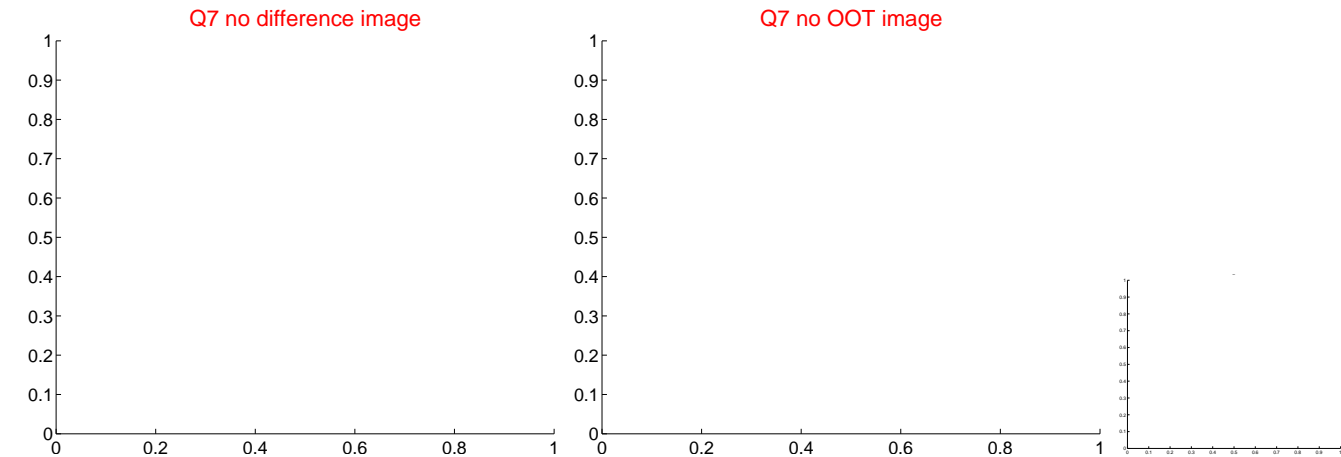
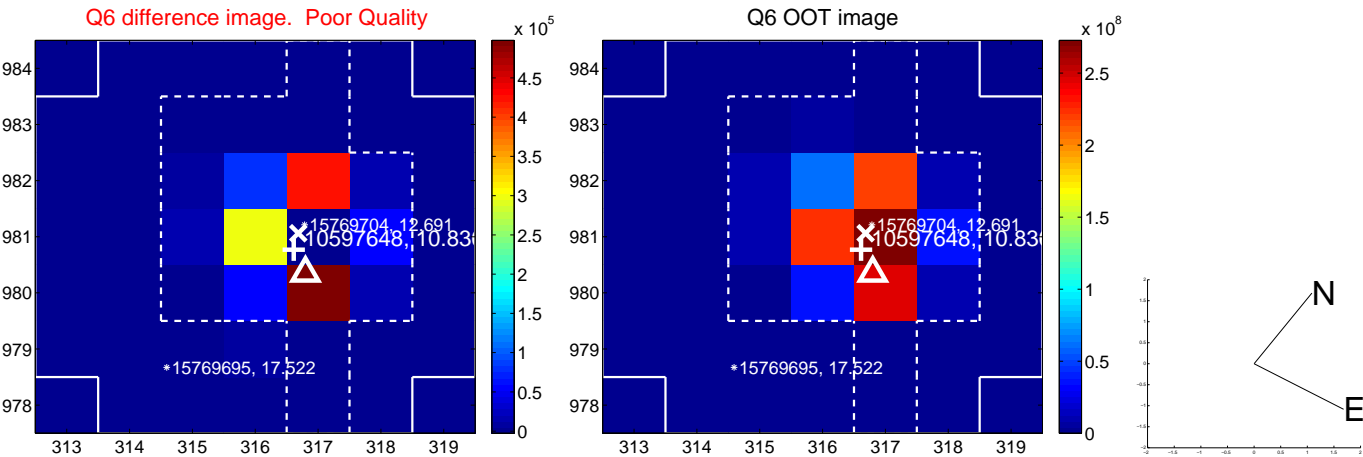


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

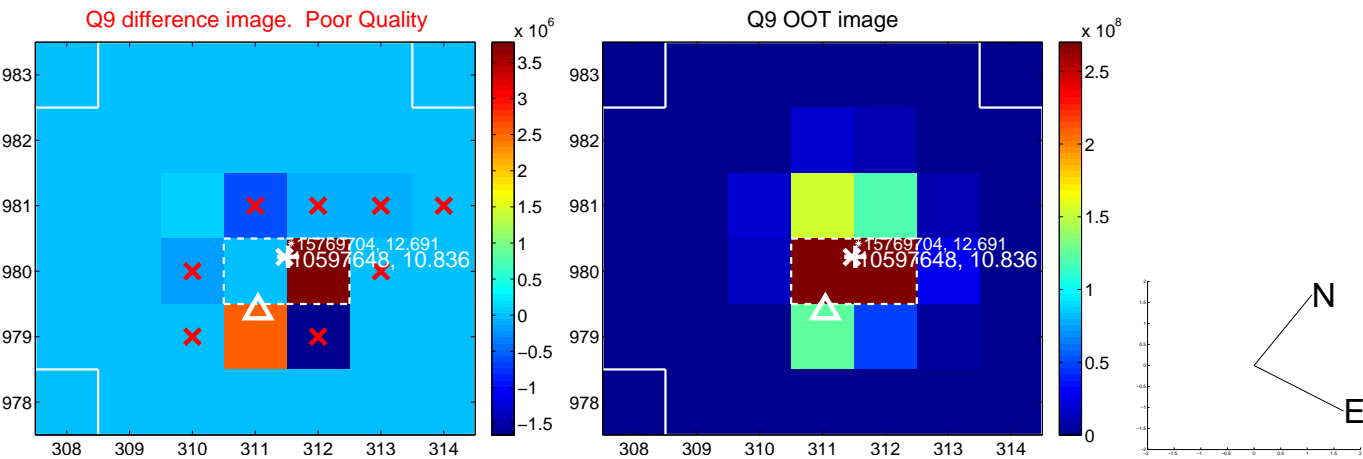
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



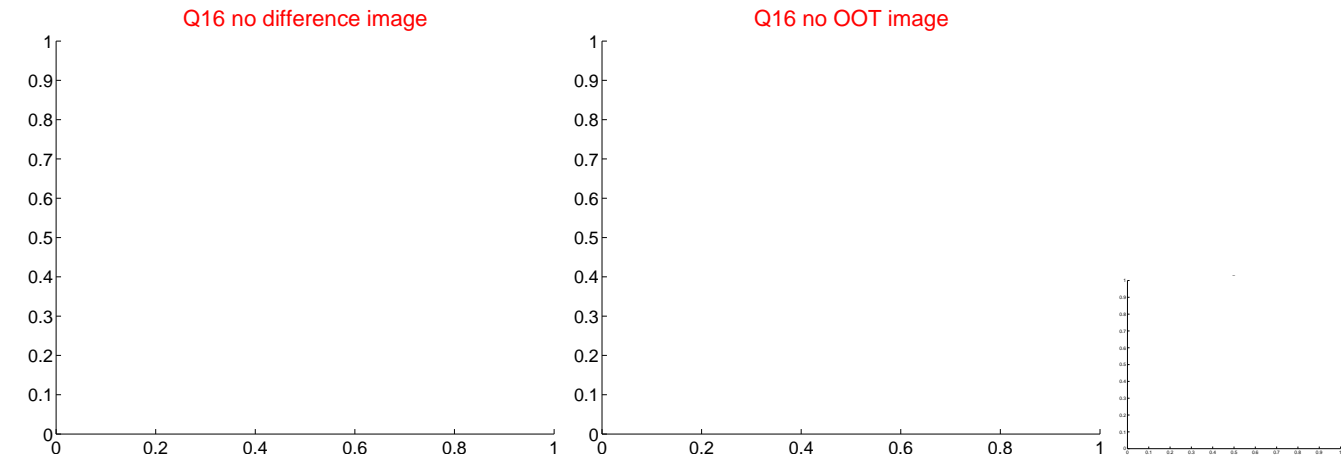
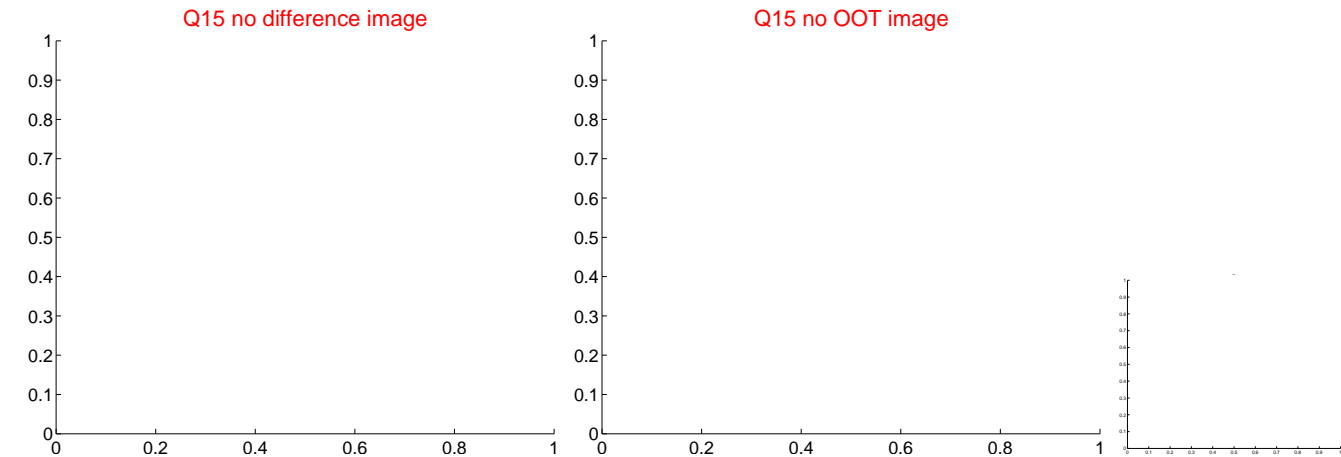
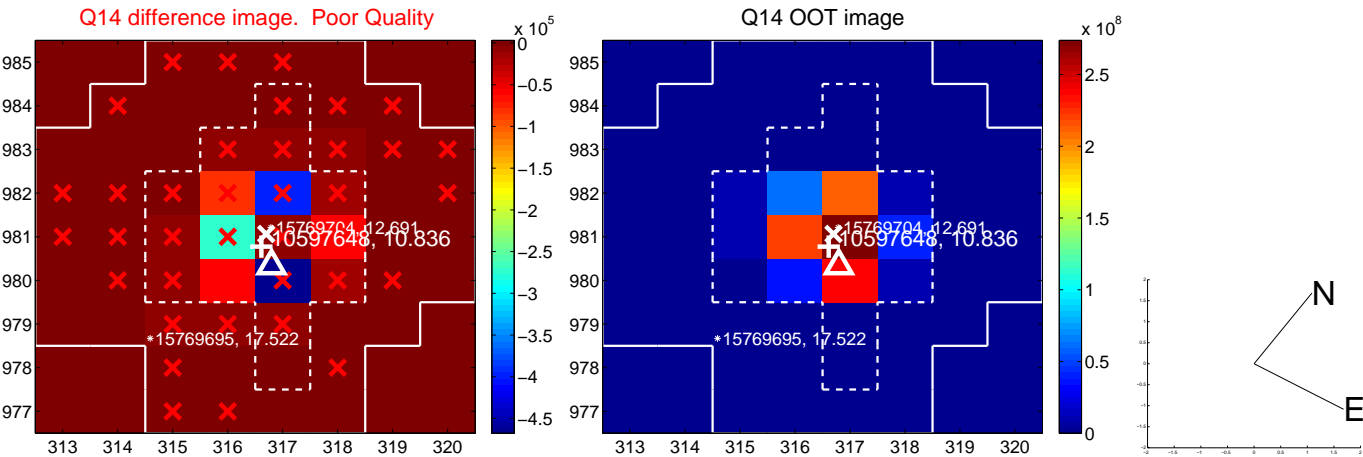
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



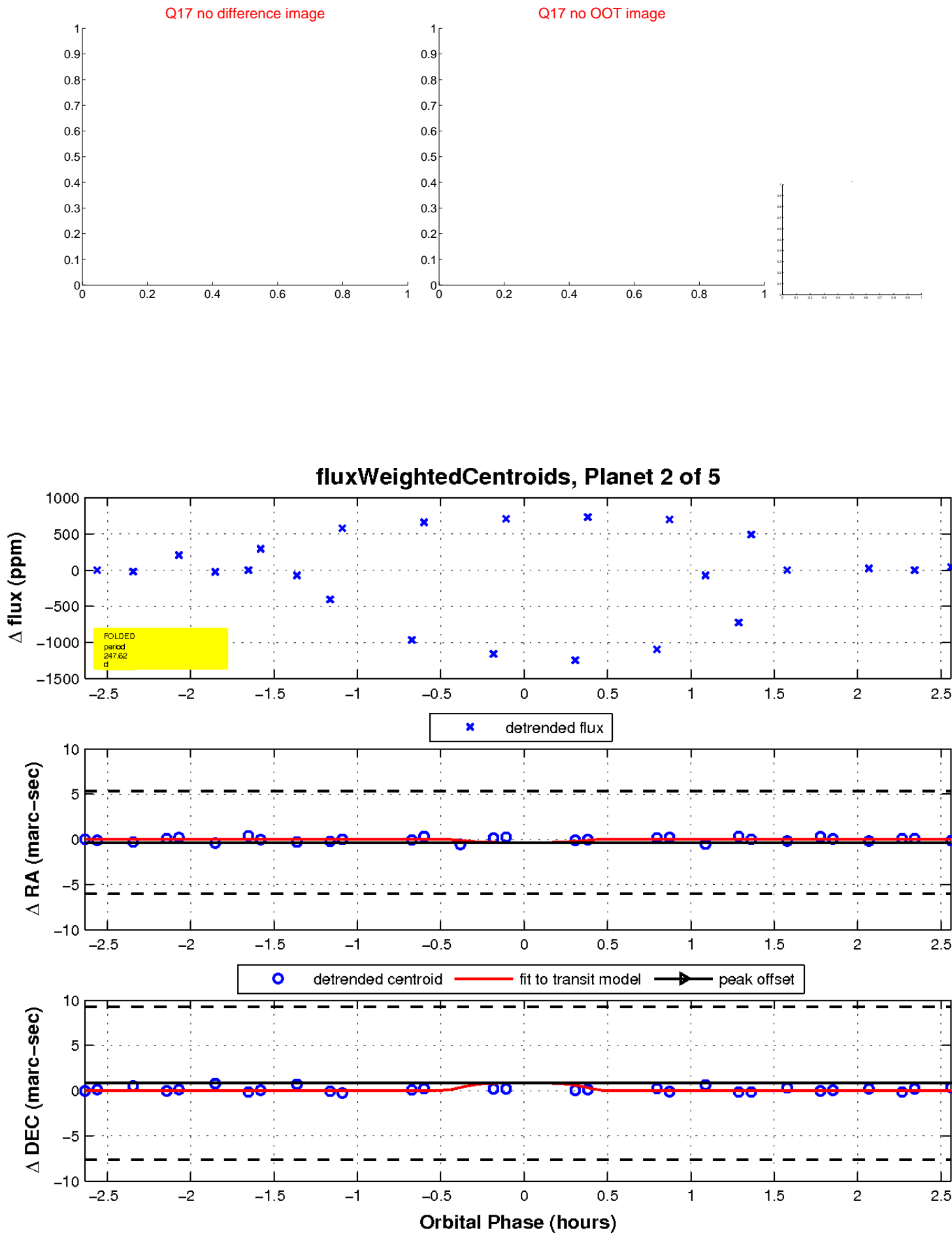
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

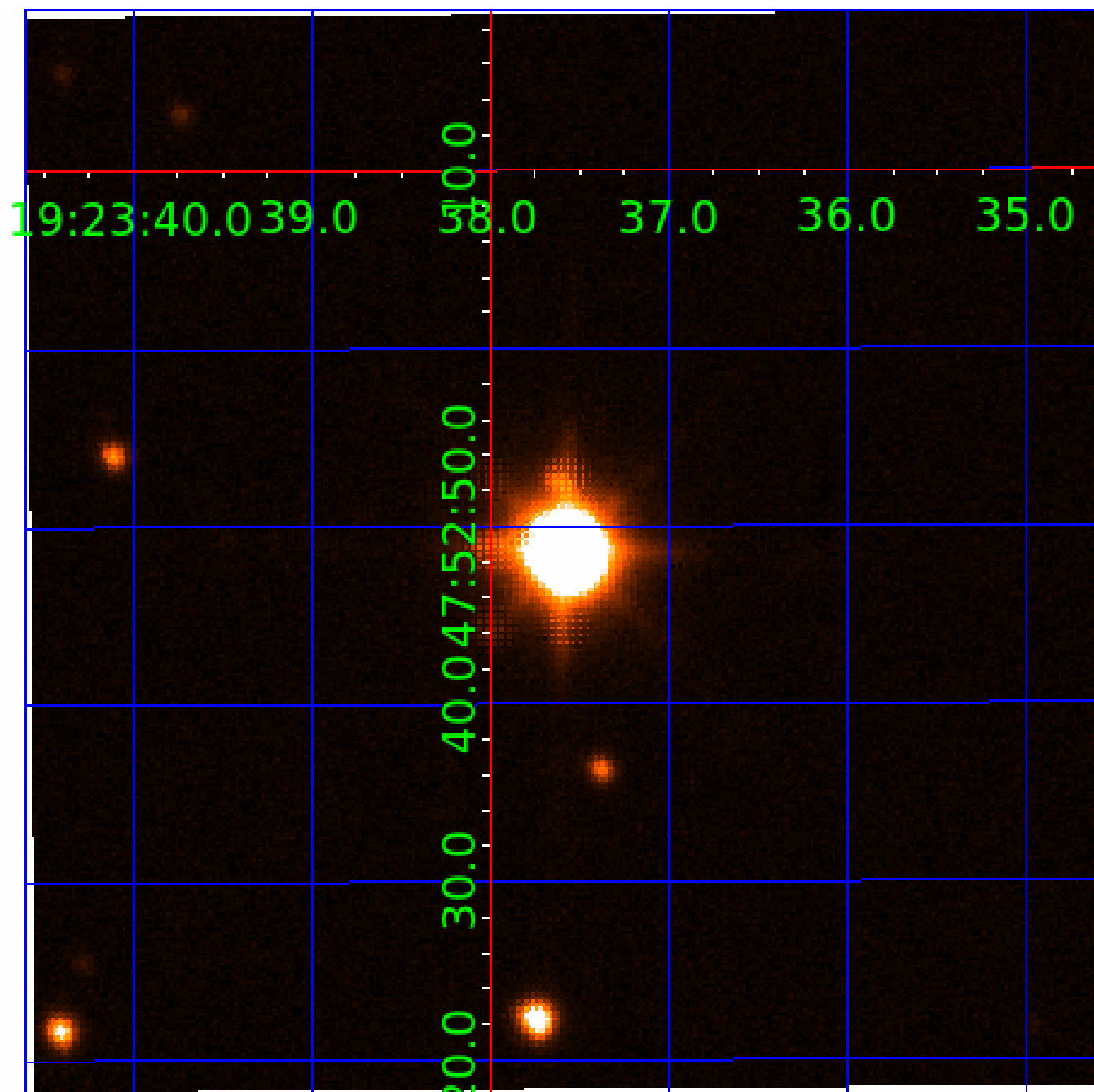


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010597648

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})
010597648-01	OBS	No	287.849313	333.405215	27.9	2.301	42.8	5.1	14.89	4500	7.83	66.51
010597648-02	OBS	No	247.620140	355.712970	6349.1	0.889	96.1	82.4	14.89	4500	127.91	81.29
010597648-03	OBS	No	535.898821	215.510914	2093.0	6.674	61.3	31.2	14.89	4500	139.39	29.04
010597648-04	OBS	No	390.278231	201.531959	2113.0	6.071	59.6	49.1	14.89	4500	139.93	44.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010597648-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010597648-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

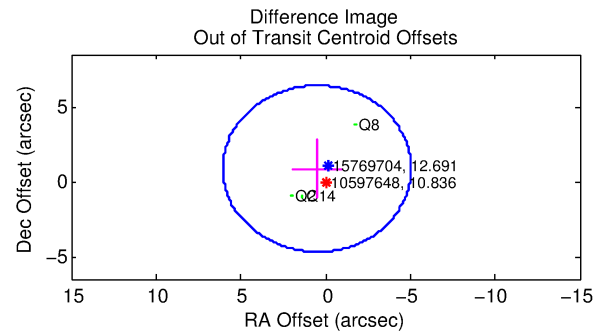
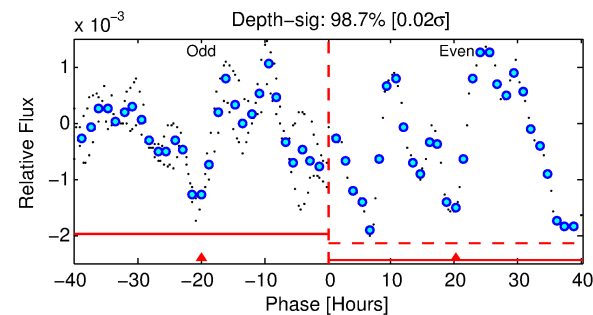
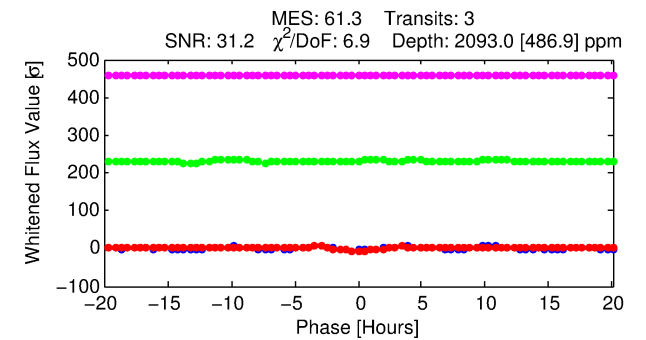
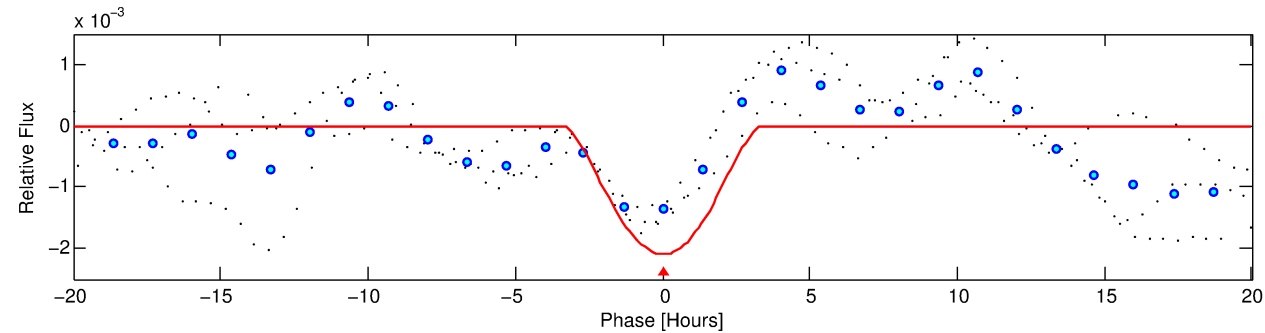
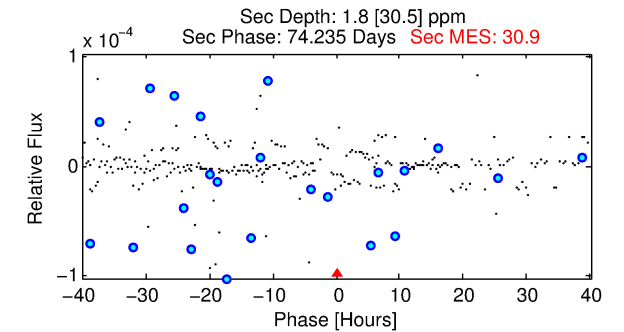
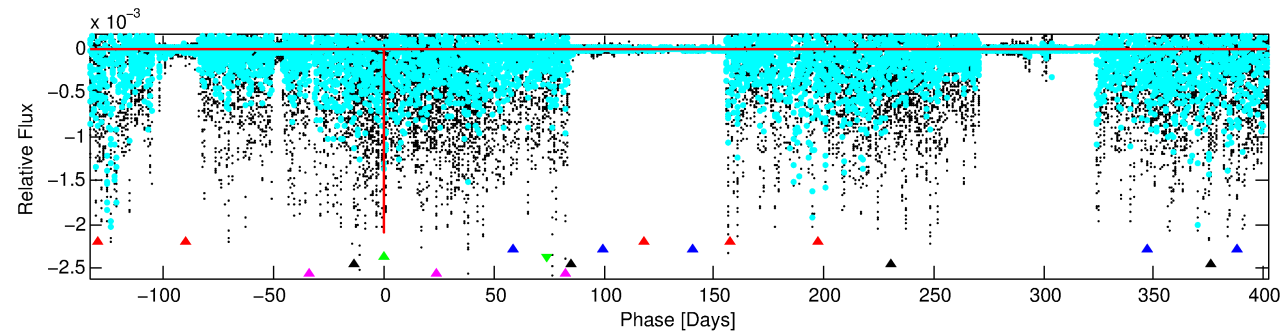
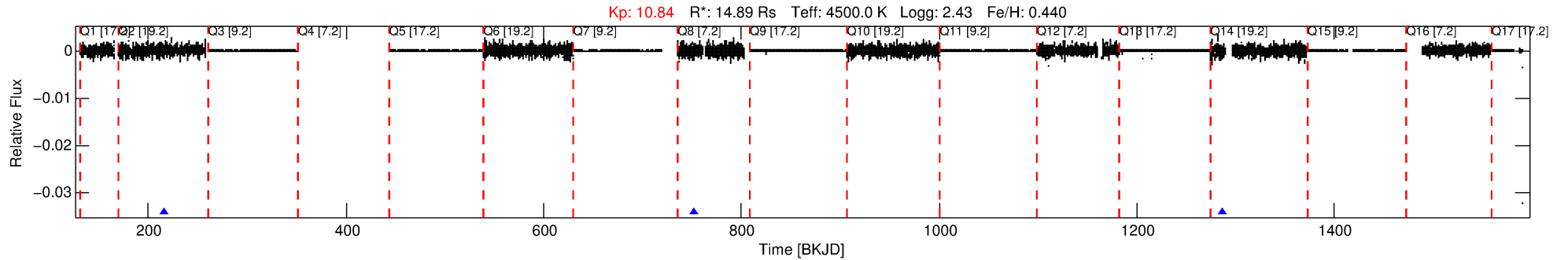
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010597648-03

No Significant Match Found

DV One-Page Summary

KIC: 10597648 Candidate: 3 of 5 Period: 535.899 d



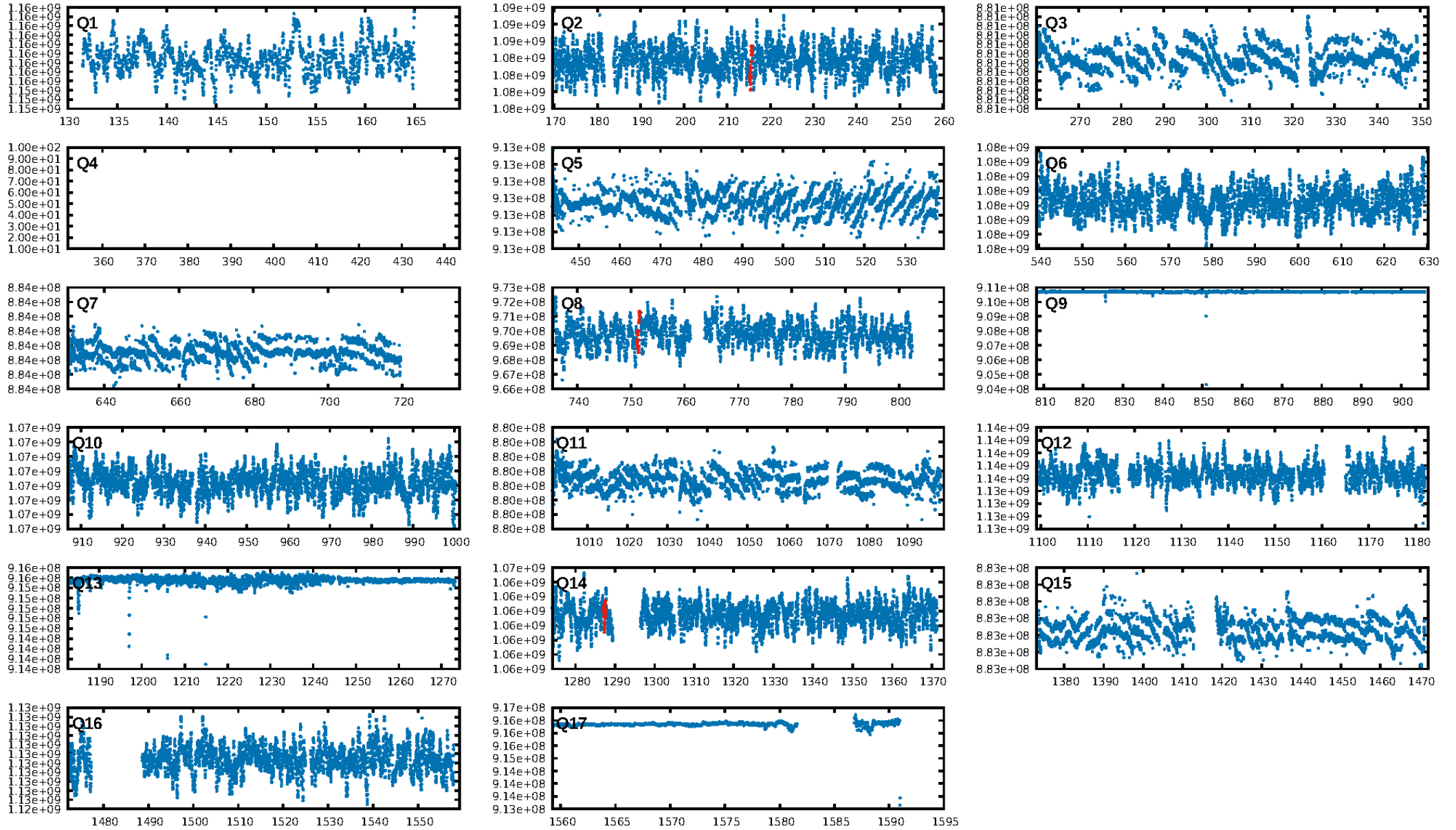
DV Fit Results:

Period = 535.89882 [0.00504] d
Epoch = 215.5109 [0.0065] BKJD
Rp/R* = 0.0858 [0.0965]
a/R* = 259.49 [56.68]
b = 1.00 [0.12]
Seff = 29.04 [5.27]
Teq = 592 [27] K
Rp = 139.39 [159.64] Re
a = 1.6754 [0.2430] AU
Ag = 0.14 [2.44] [-0.35 σ]
Teffp = 562 [2414] K [-0.01 σ]

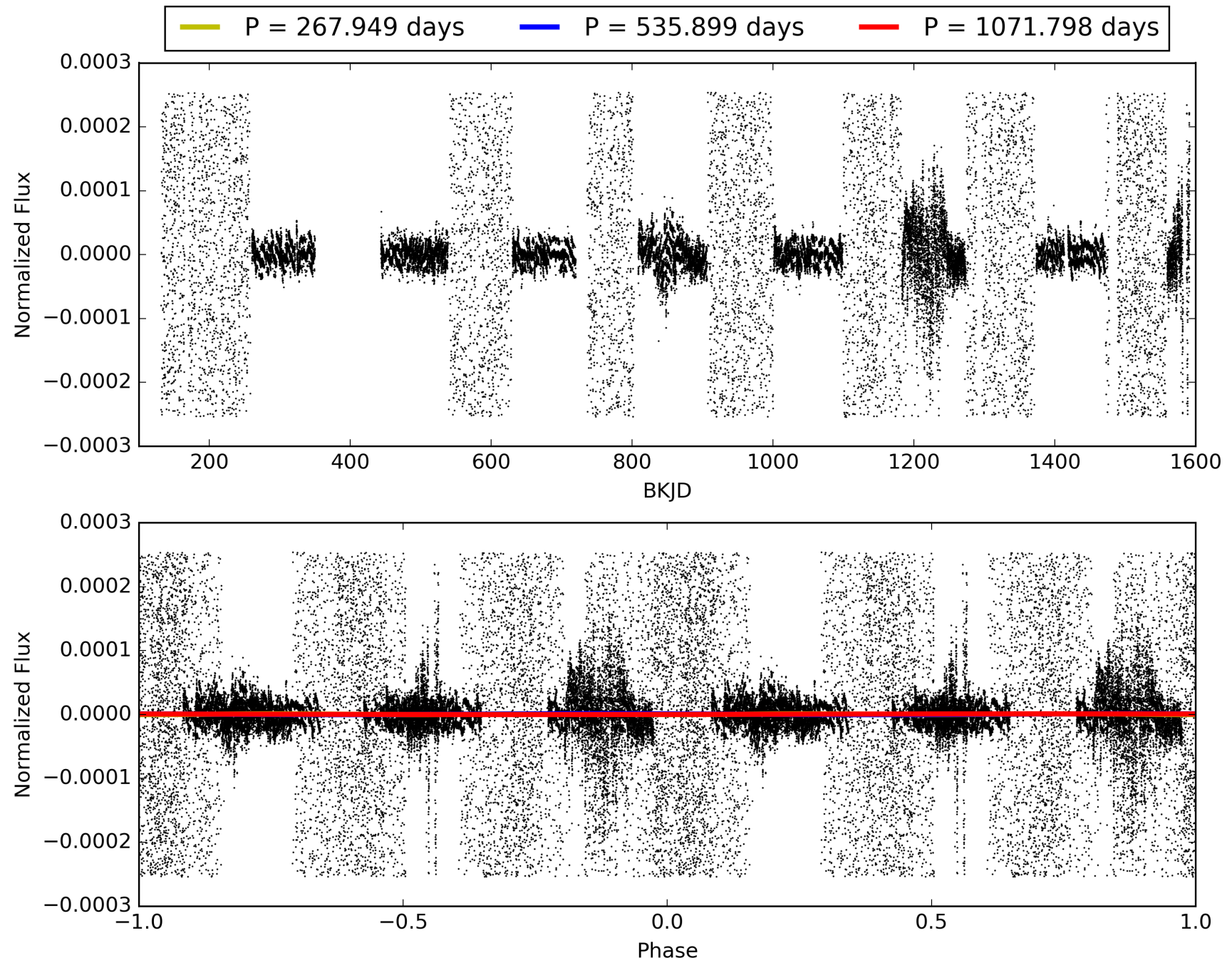
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [387.37 σ]
LongPeriod-sig: 100.0% [185.59 σ]
ModelChiSquare2-sig: 1.6%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -9.063
Centroid-sig: 0.1%
Centroid-so: 0.201 arcsec [2.36 σ]
OotOffset-rm: 1.000 arcsec [0.54 σ]
KicOffset-rm: 0.767 arcsec [0.53 σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010597648-03, PDC Light Curves

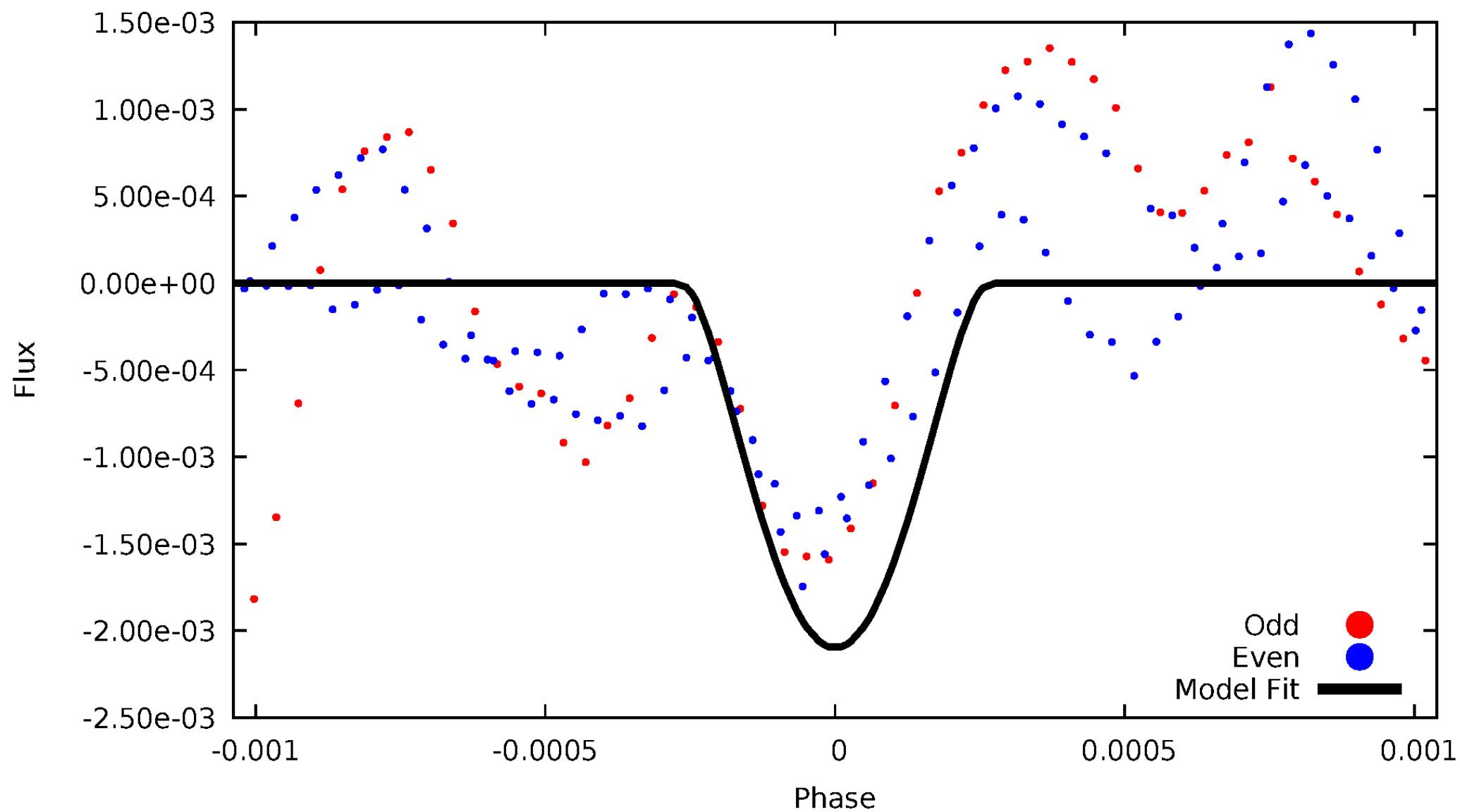


TCE 010597648-03



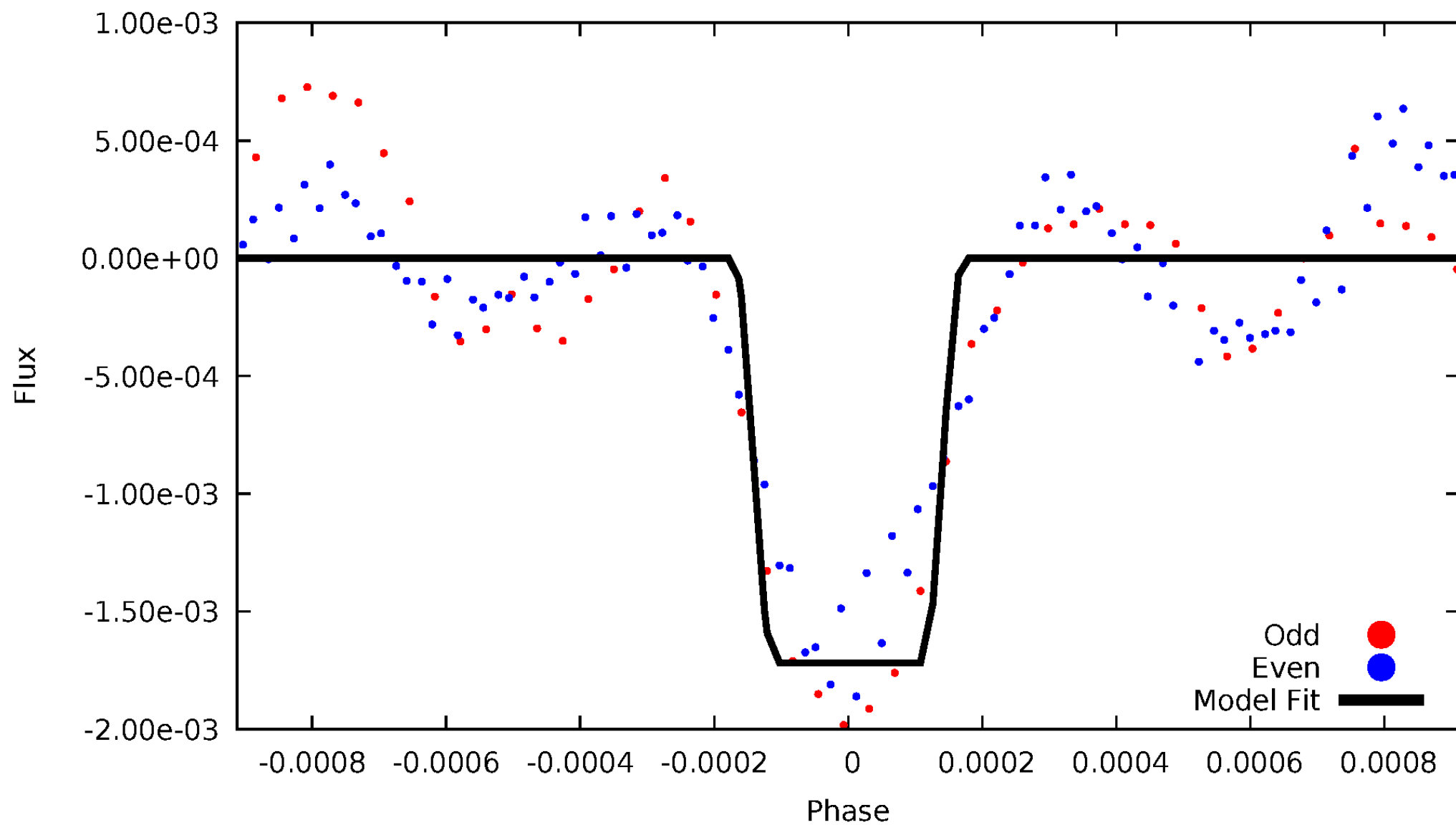
DV Odd/Even

TCE 010597648-03



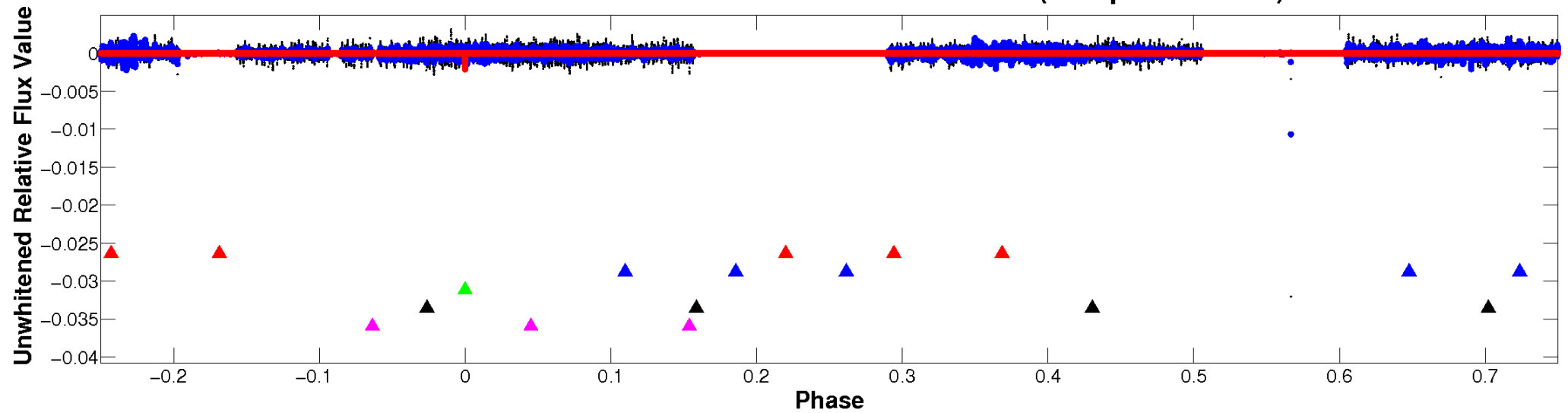
ALT Odd/Even

TCE 010597648-03

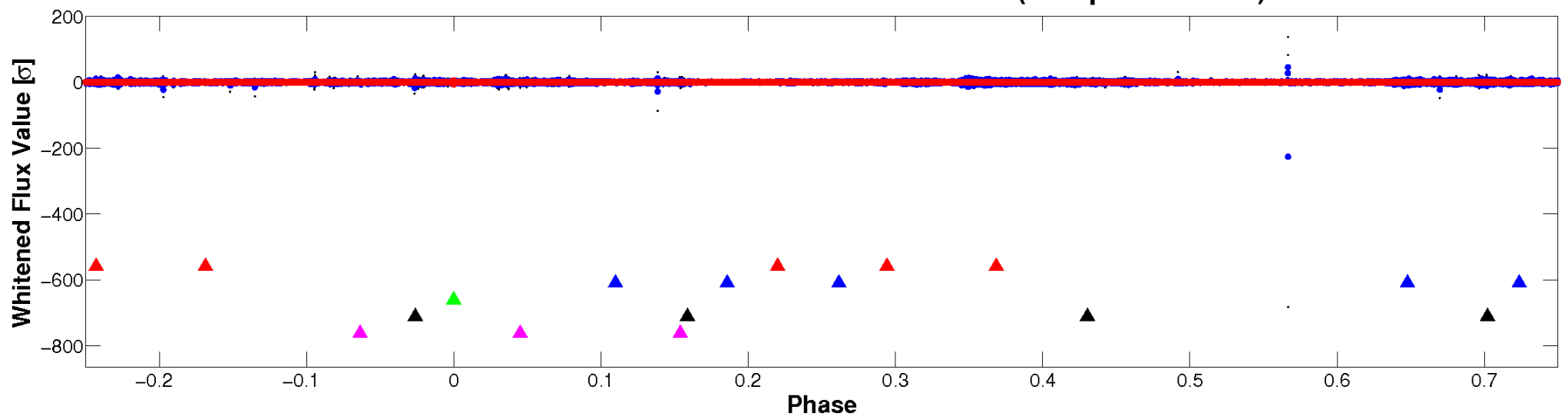


Non-Whitened Vs. Whitened Light Curve

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

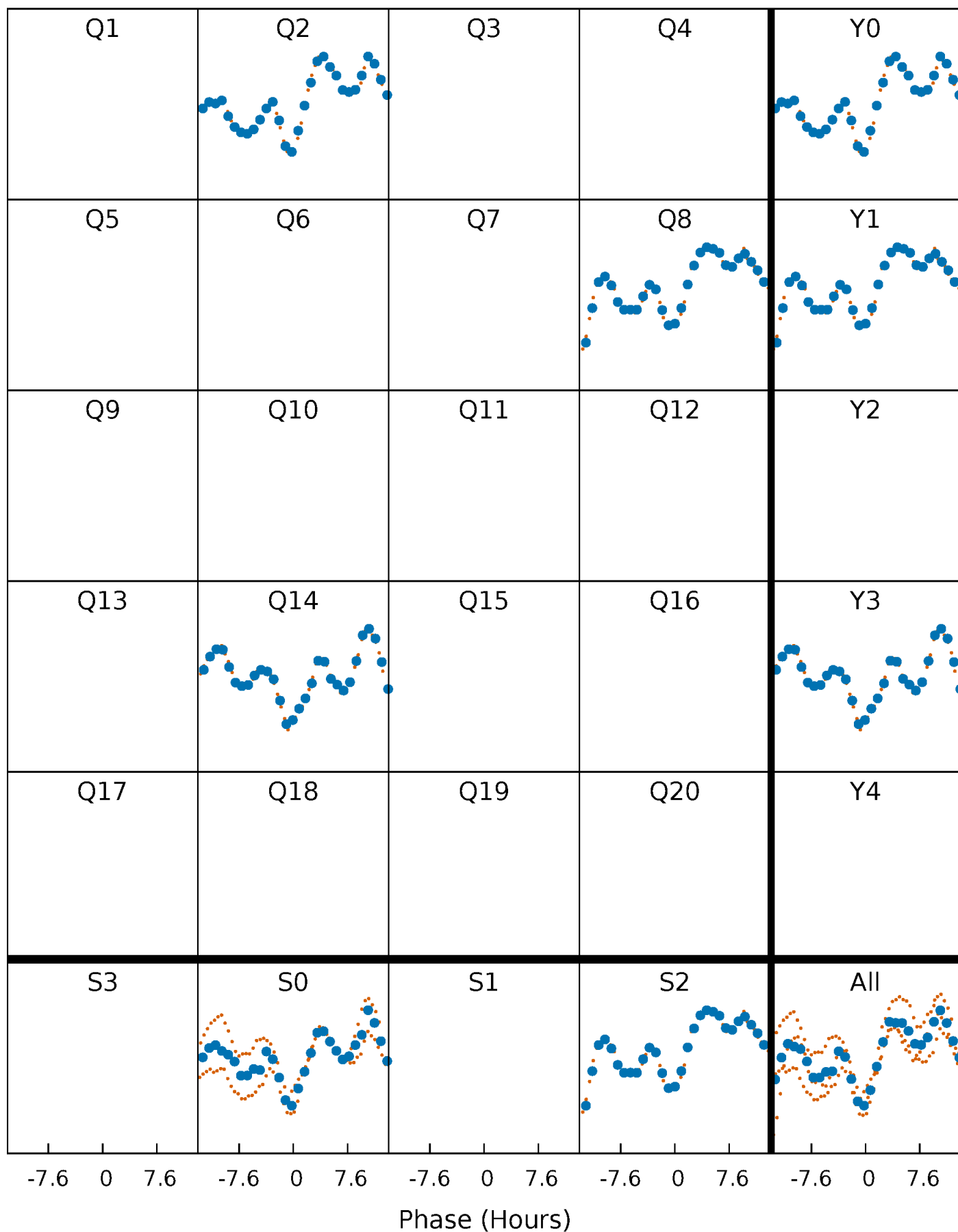


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



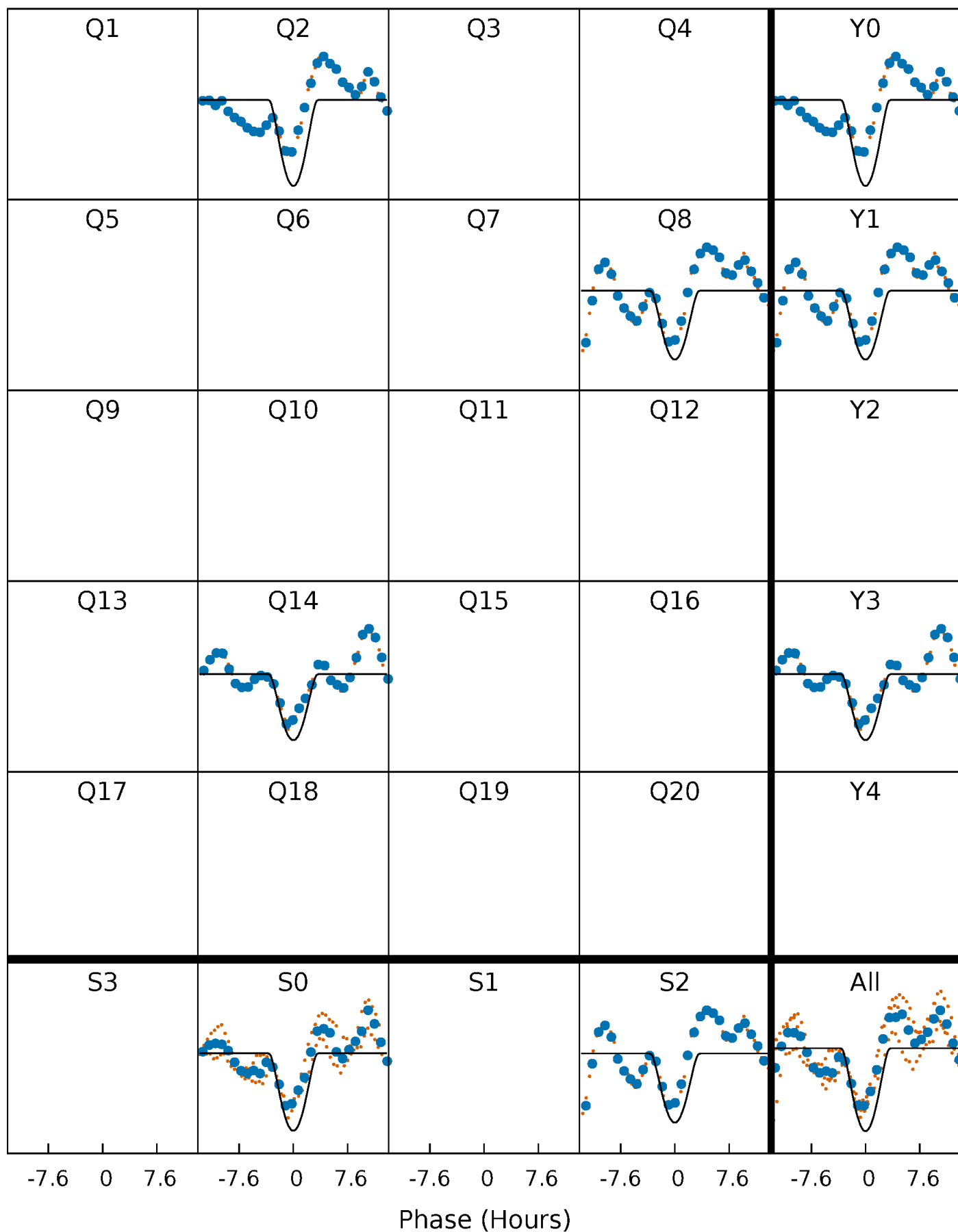
PDC Quarter-Phased Transit Curves

TCE 010597648-03 $P=535.898821$ Days $T_0=215.510915$ (BKJD)



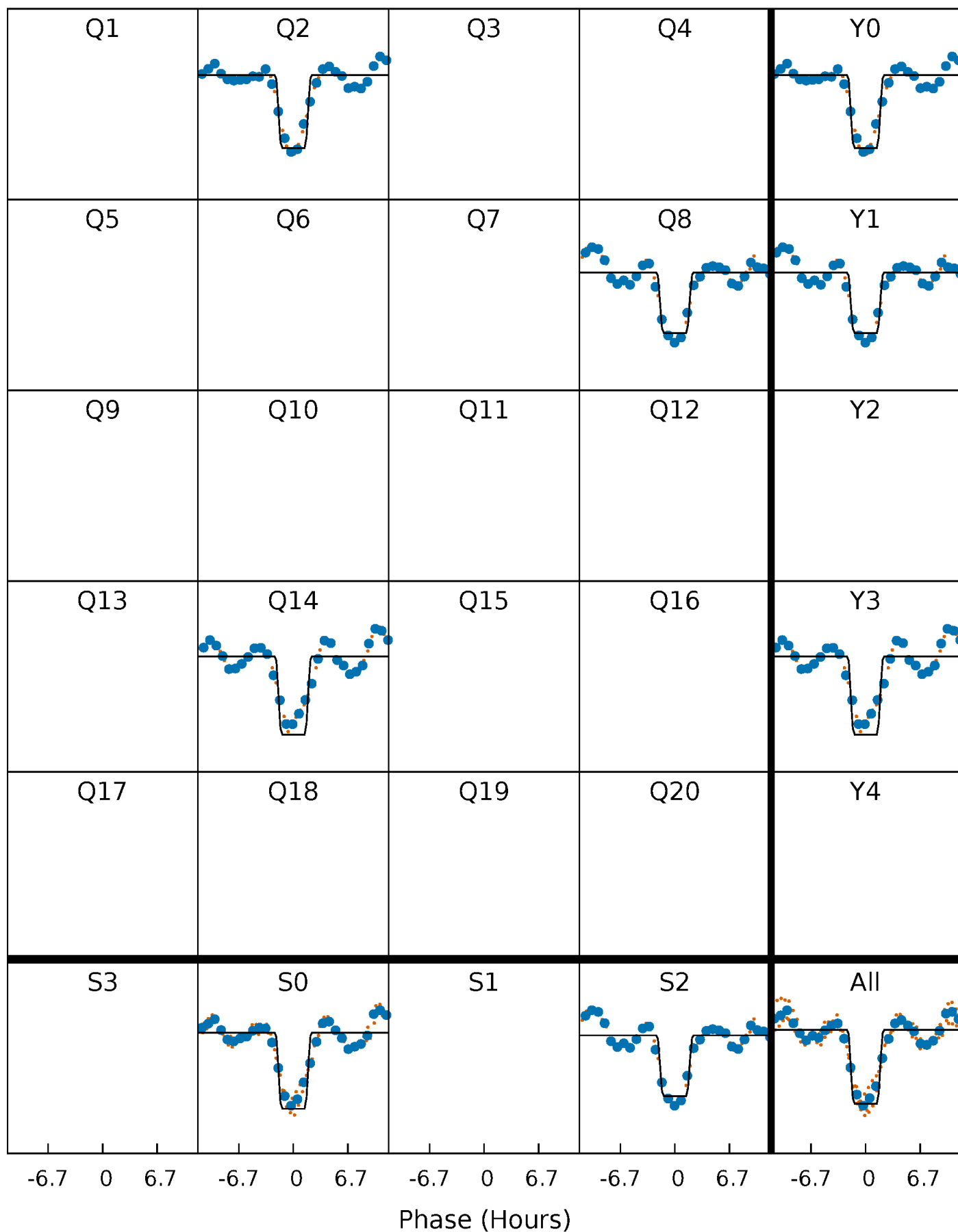
DV Quarter-Phased Transit Curves

TCE 010597648-03 $P=535.898821$ Days $T_0=215.510915$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

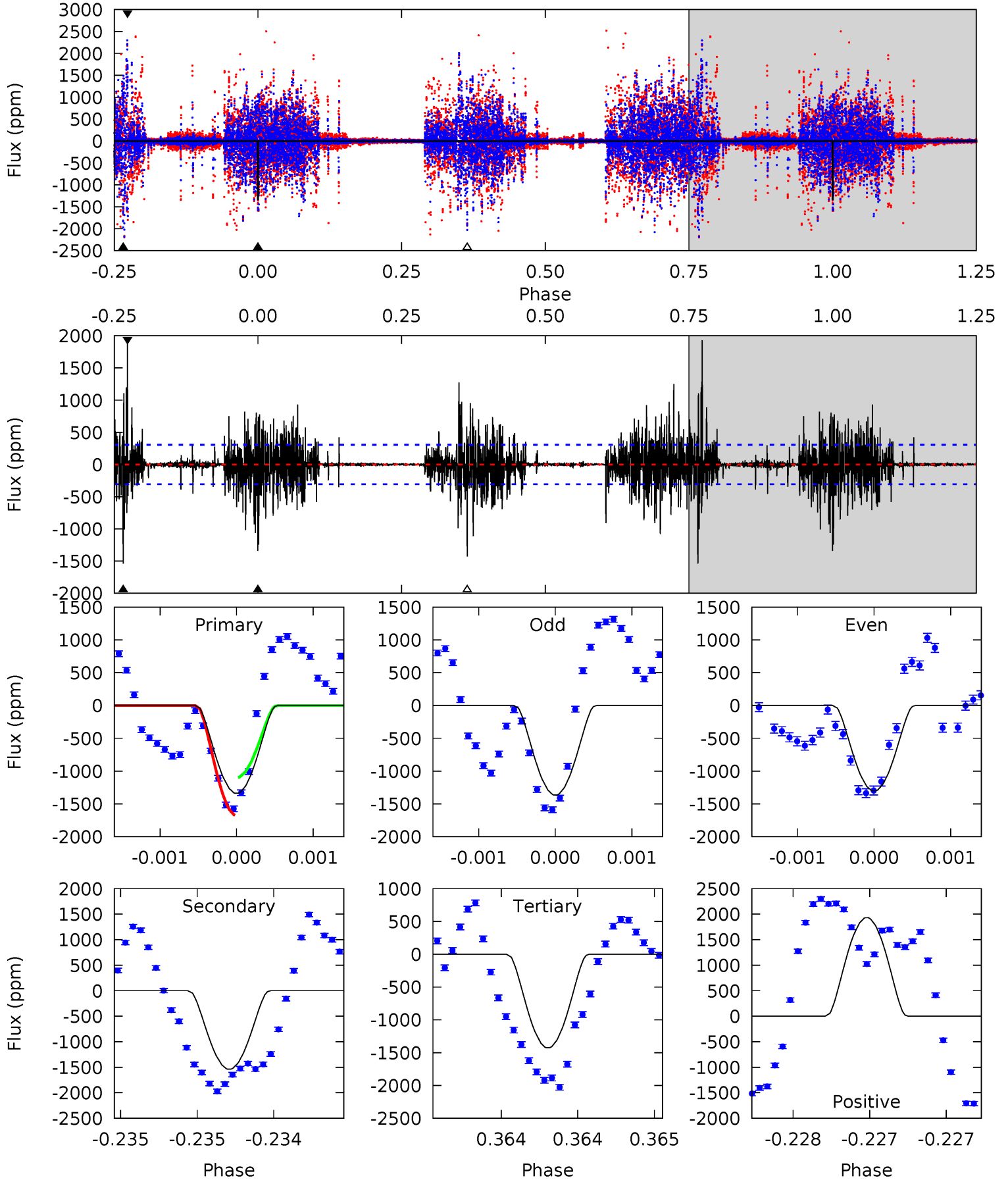
TCE 010597648-03 $P=535.897356$ Days $T_0=215.510129$ (BKJD)



DV Model-Shift Uniqueness Test

010597648-03, P = 535.898821 Days, E = 215.510915 Days

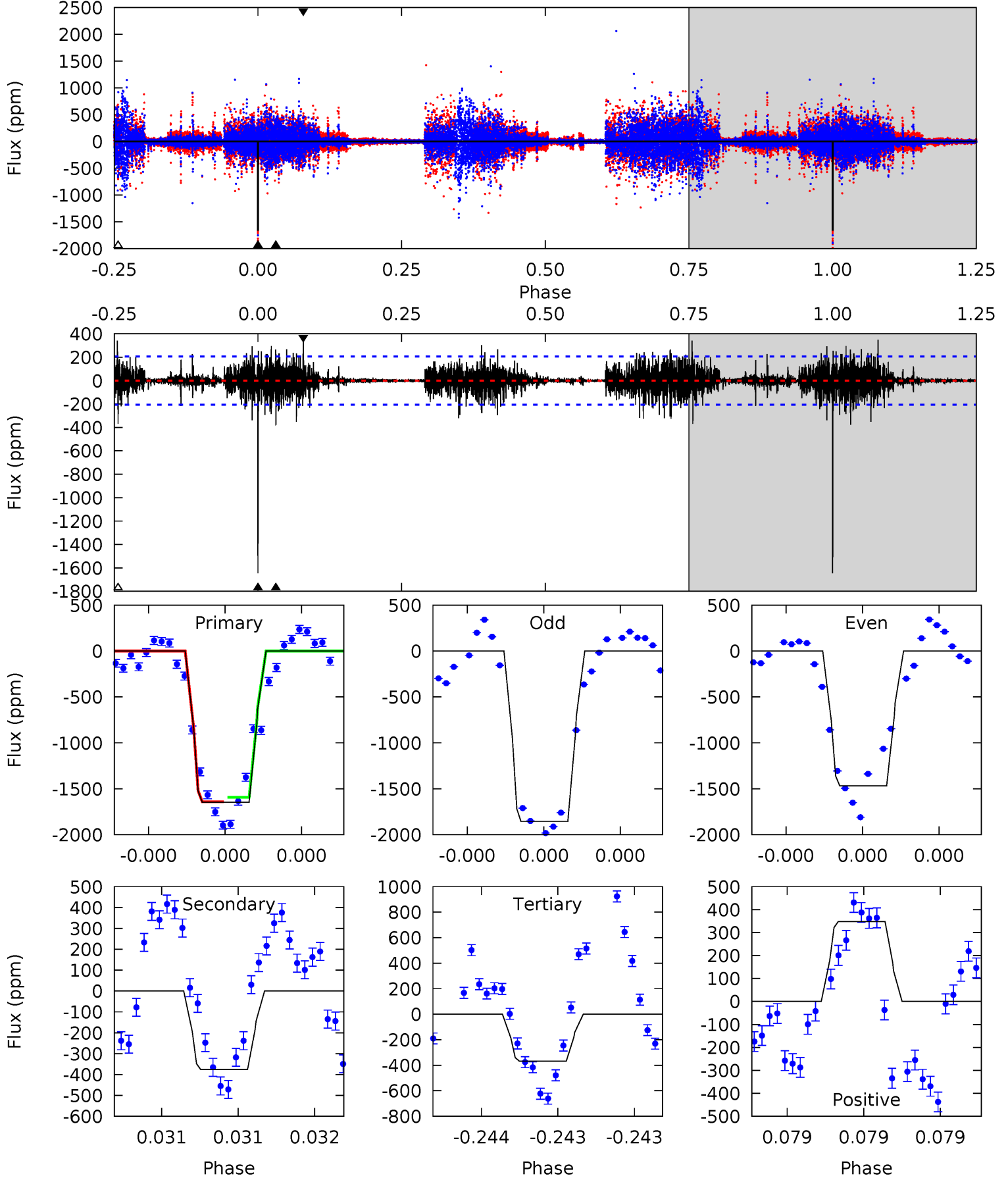
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.4	28.1	26.0	35.2	5.57	3.47	3.48	-1.60	-10.8	2.05	-7.14	0.40	0.97	0.56	4.93



Alt Model-Shift Uniqueness Test

010597648-03, P = 535.897356 Days, E = 215.510129 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.0	10.3	10.1	9.52	5.64	3.58	1.49	35.0	35.5	0.22	0.78	3.26	0.99	0.17	0.63



Stellar Parameters For KIC 010597648

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4500^{+114}_{-96}	$2.431^{+0.030}_{-0.030}$	$0.440^{+0.050}_{-0.200}$	$14.895^{+3.199}_{-2.909}$	$2.181^{+0.921}_{-0.753}$	$0.001^{+0.000}_{-0.000}$
	+3%/-2%	+1%/-1%	+11%/-45%	+21%/-20%	+42%/-35%	+30%/-20%
Source	PHO55	AST55	SPE55	DSEP		

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

Secondary Eclipse Parameters for KIC 010597648-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1538 ± 55	$177.26^{+151.11}_{-114.61}$	831^{+30}_{-28}	3187^{+1347}_{-467}	75^{+539}_{-52}
Alt.	-376 ± 37	$130.24^{+134.04}_{-88.59}$	831^{+29}_{-27}	2839^{+1194}_{-438}	33^{+273}_{-24}

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

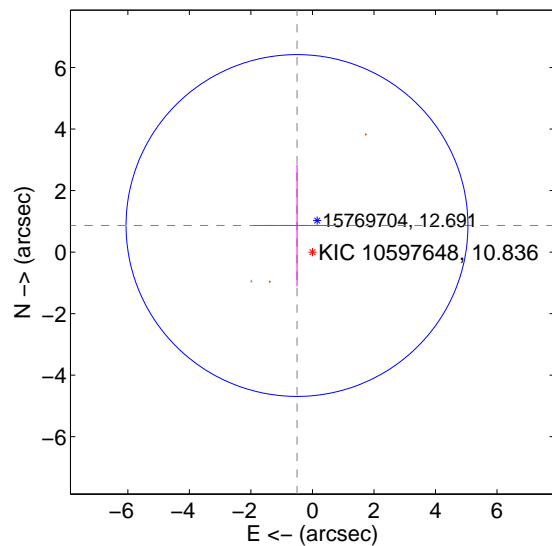
Supplemental centroid analysis for 010597648-03. **Kepler magnitude: 10.84.** Transit SNR 31.19

There are 1 quarters with good PRF difference image offsets

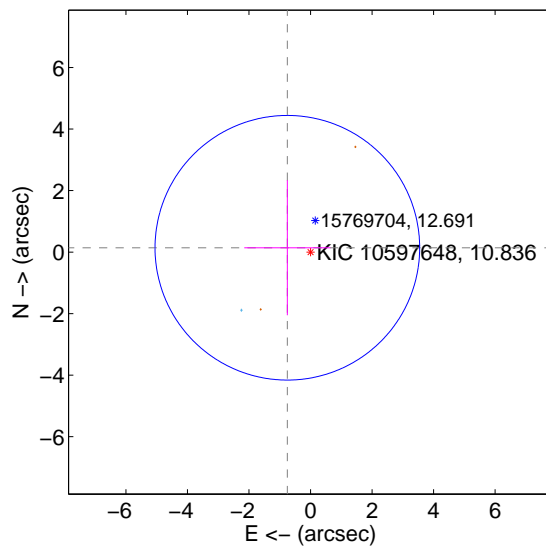
The direct PRF centroid is offset from the target star catalog position by about 0.93 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.000 ± 1.852	0.54	0.502 ± 1.419	0.865 ± 1.977
PRF-fit source offset from KIC position	0.767 ± 1.434	0.53	0.754 ± 1.400	0.141 ± 2.196
photometric centroid source offset	0.20 ± 0.09	2.36	-0.11 ± 0.09	-0.17 ± 0.08

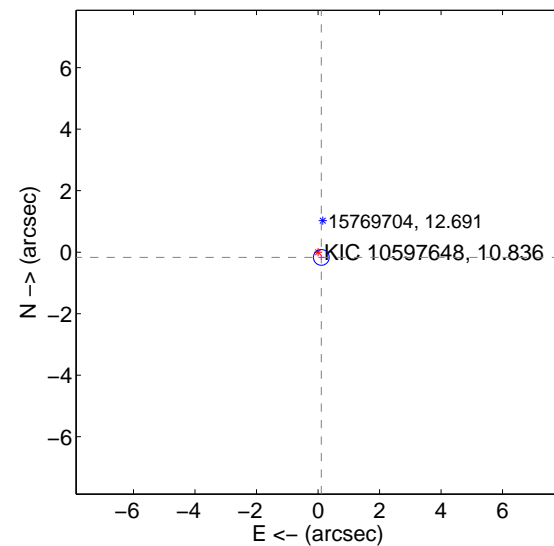
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

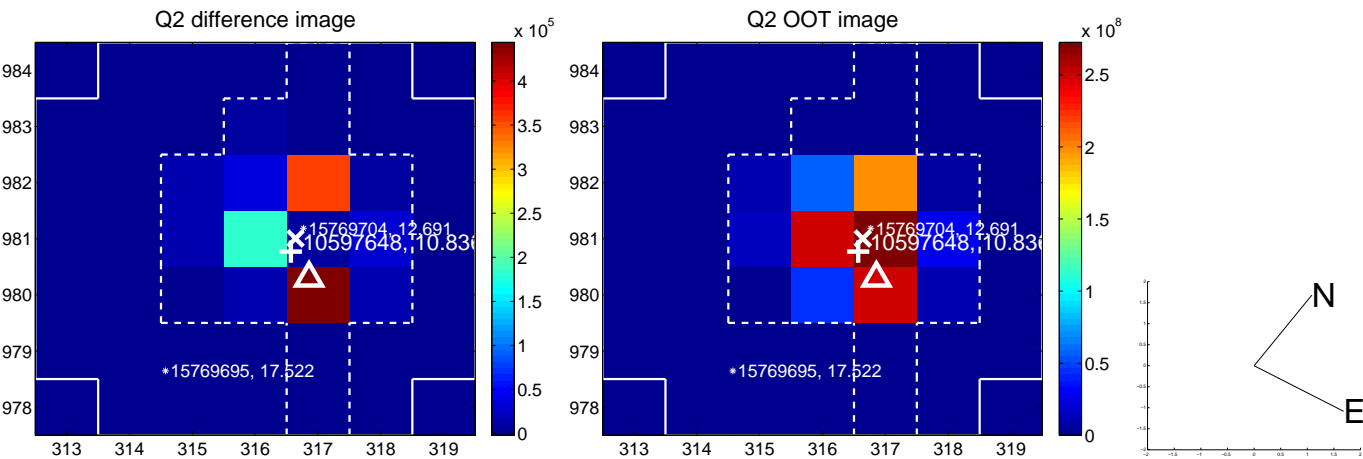


offset from photometric centroids

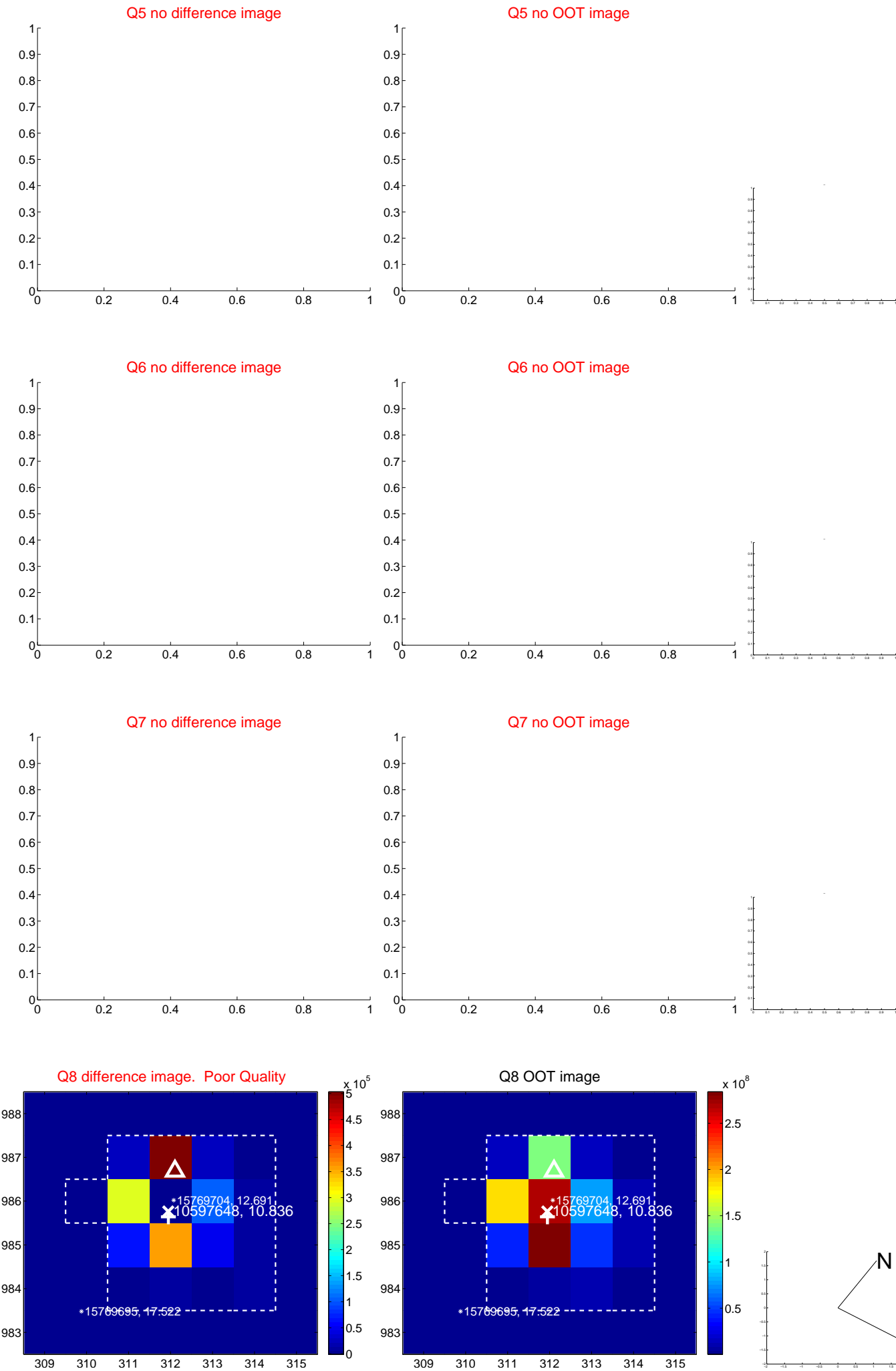


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



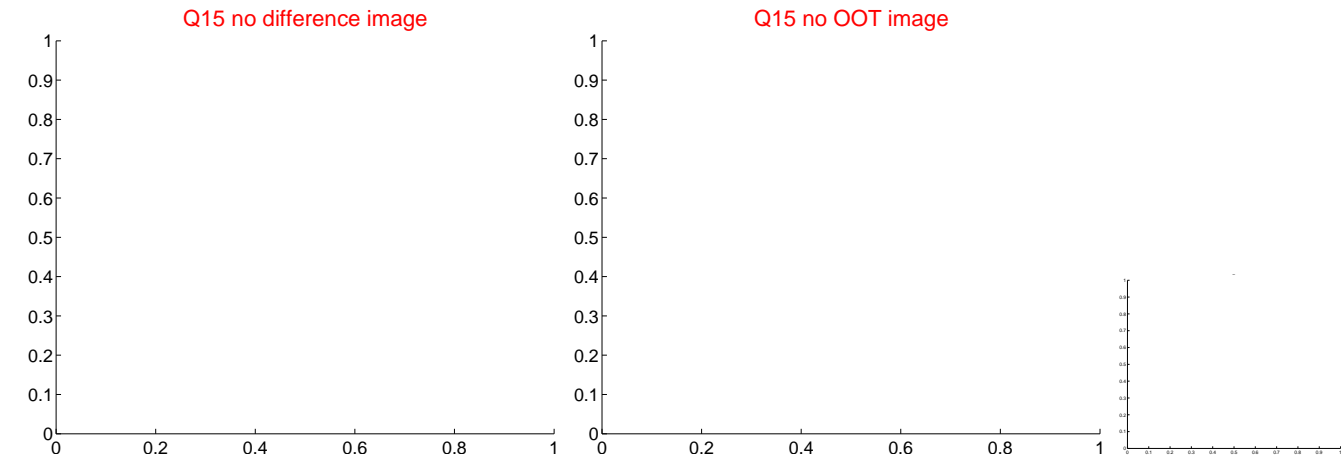
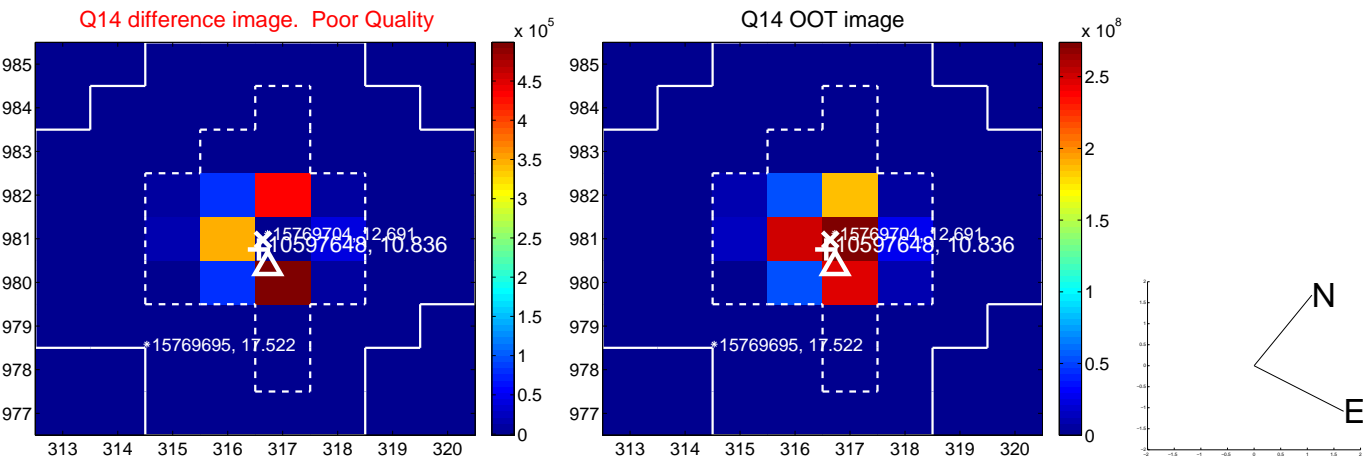
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



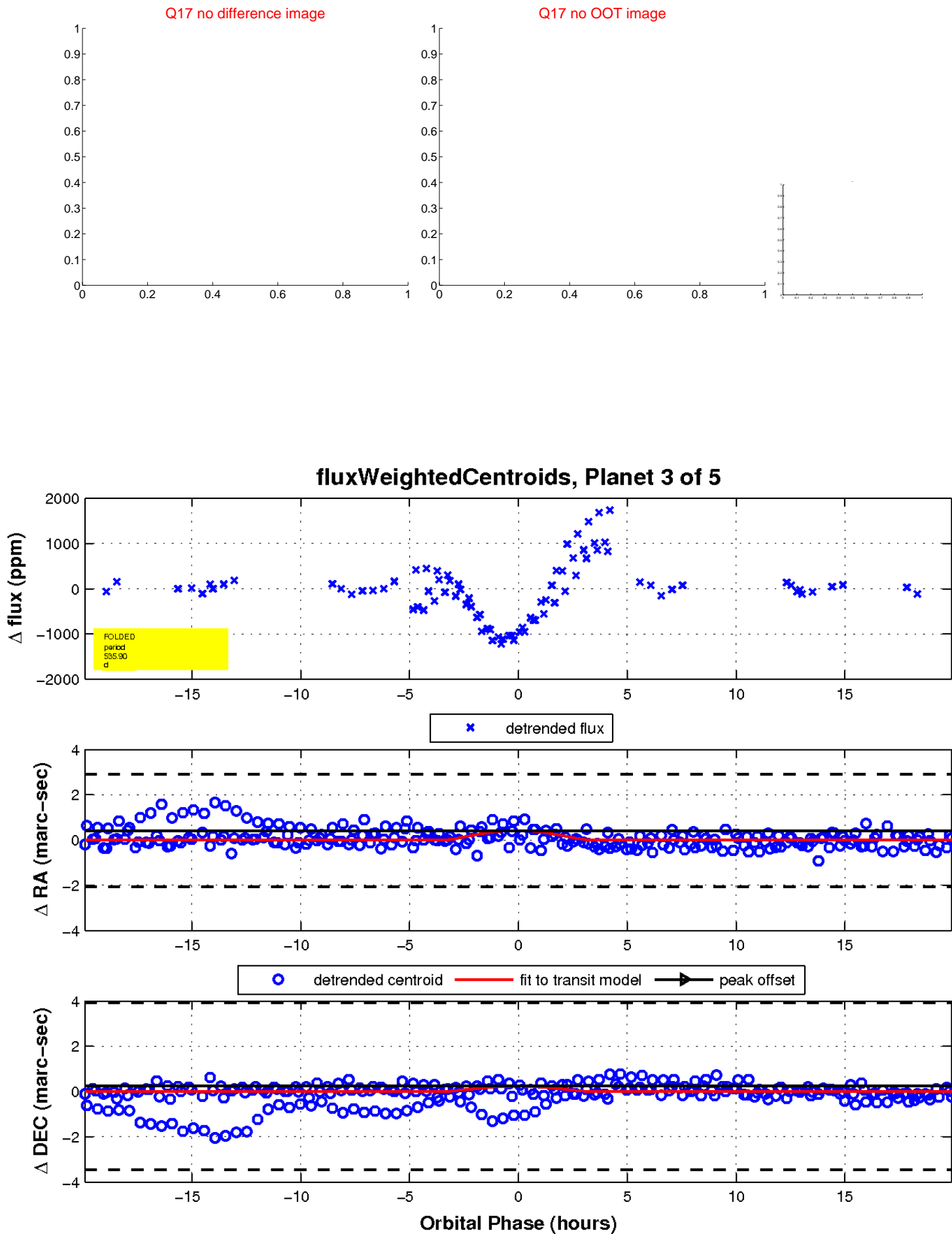
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

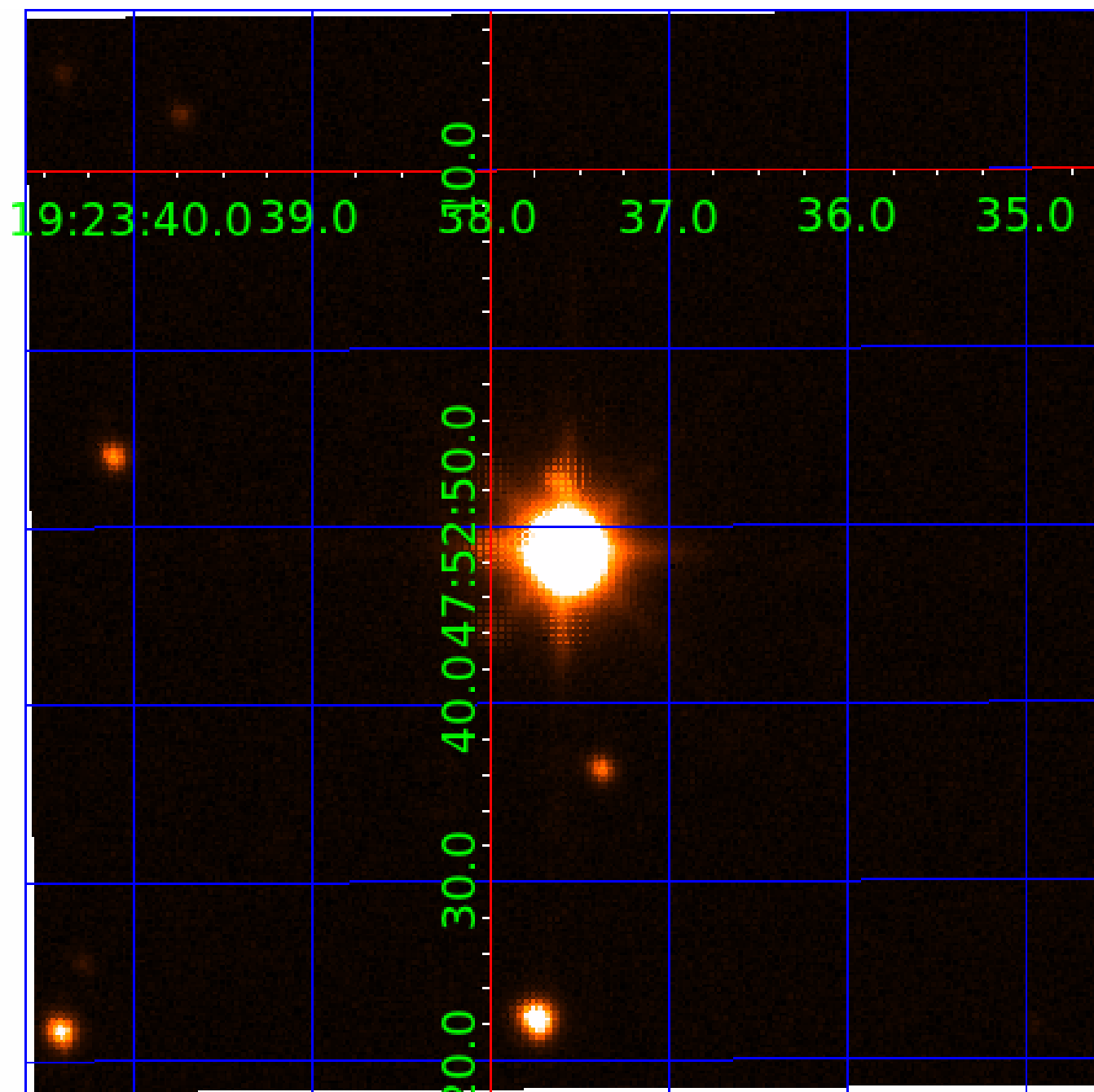


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010597648

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})
010597648-01	OBS	No	287.849313	333.405215	27.9	2.301	42.8	5.1	14.89	4500	7.83	66.51
010597648-02	OBS	No	247.620140	355.712970	6349.1	0.889	96.1	82.4	14.89	4500	127.91	81.29
010597648-03	OBS	No	535.898821	215.510914	2093.0	6.674	61.3	31.2	14.89	4500	139.39	29.04
010597648-04	OBS	No	390.278231	201.531959	2113.0	6.071	59.6	49.1	14.89	4500	139.93	44.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010597648-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010597648-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010597648-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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.

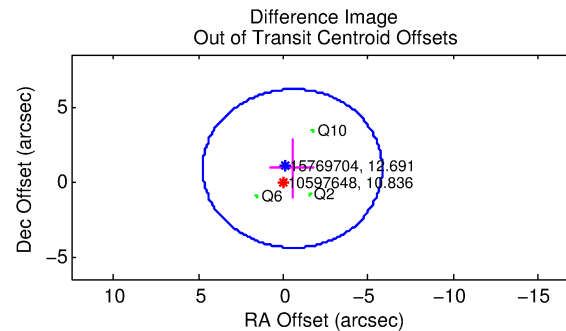
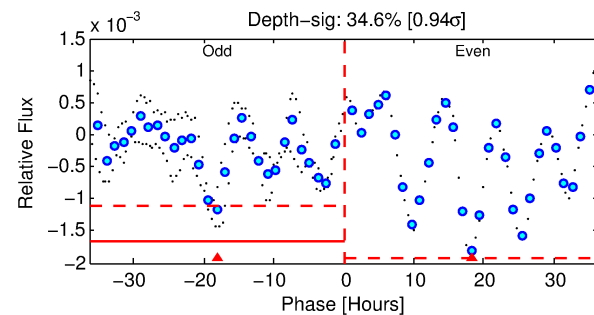
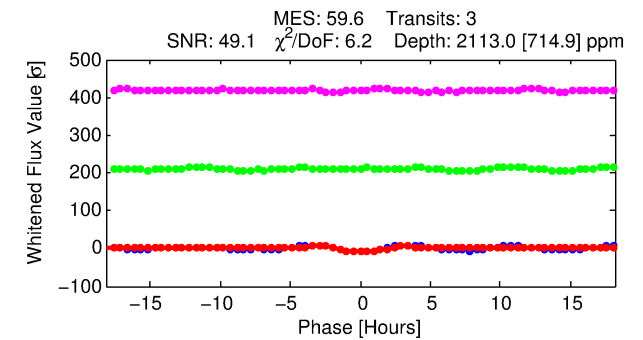
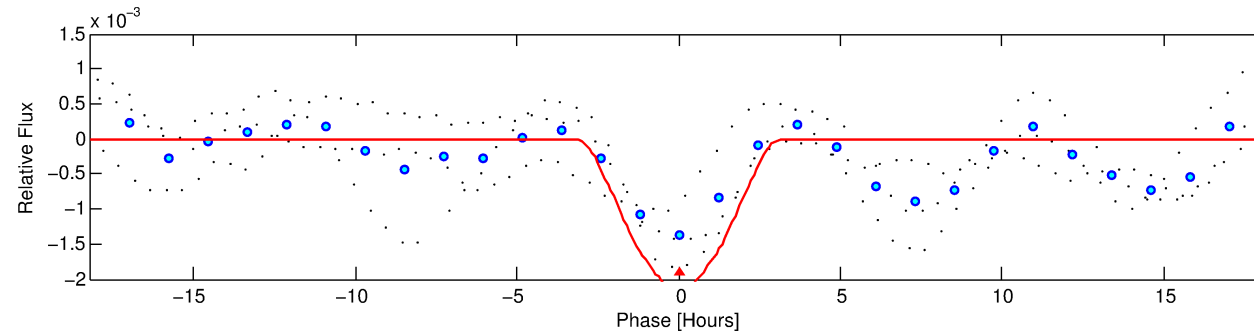
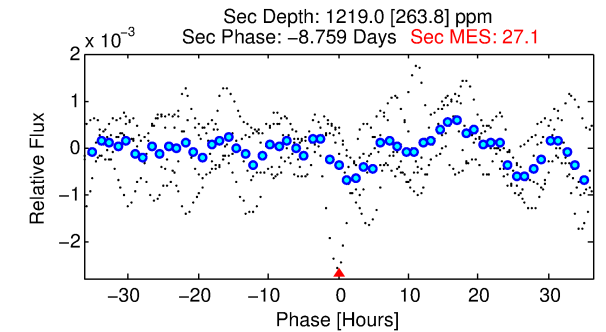
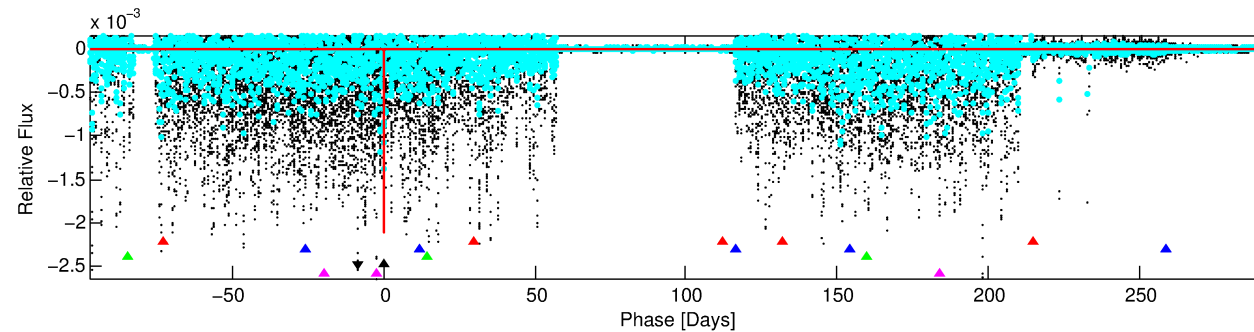
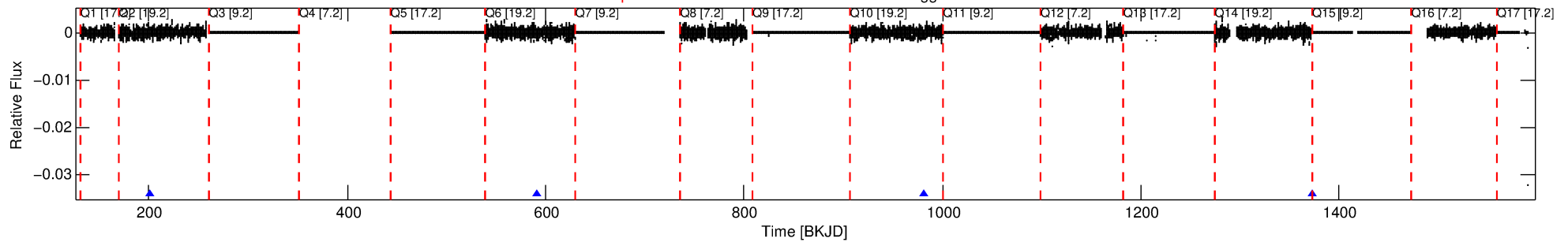
Ephemeris Match Information For 010597648-04

No Significant Match Found

DV One-Page Summary

KIC: 10597648 Candidate: 4 of 5 Period: 390.278 d

Kp: 10.84 R*: 14.89 Rs Teff: 4500.0 K Logg: 2.43 Fe/H: 0.440



DV Fit Results:

Period = 390.27823 [0.00519] d
Epoch = 201.5320 [0.0066] BKJD
Rp/R* = 0.0861 [0.1036]
a/R* = 208.13 [48.83]
b = 1.00 [0.13]
Seff = 44.32 [8.04]
Teq = 658 [30] K
Rp = 139.93 [170.99] Re
a = 1.3561 [0.1967] AU
Ag = 62.99 [152.44] [0.41σ]
Teffp = 2866 [1732] K [1.27σ]

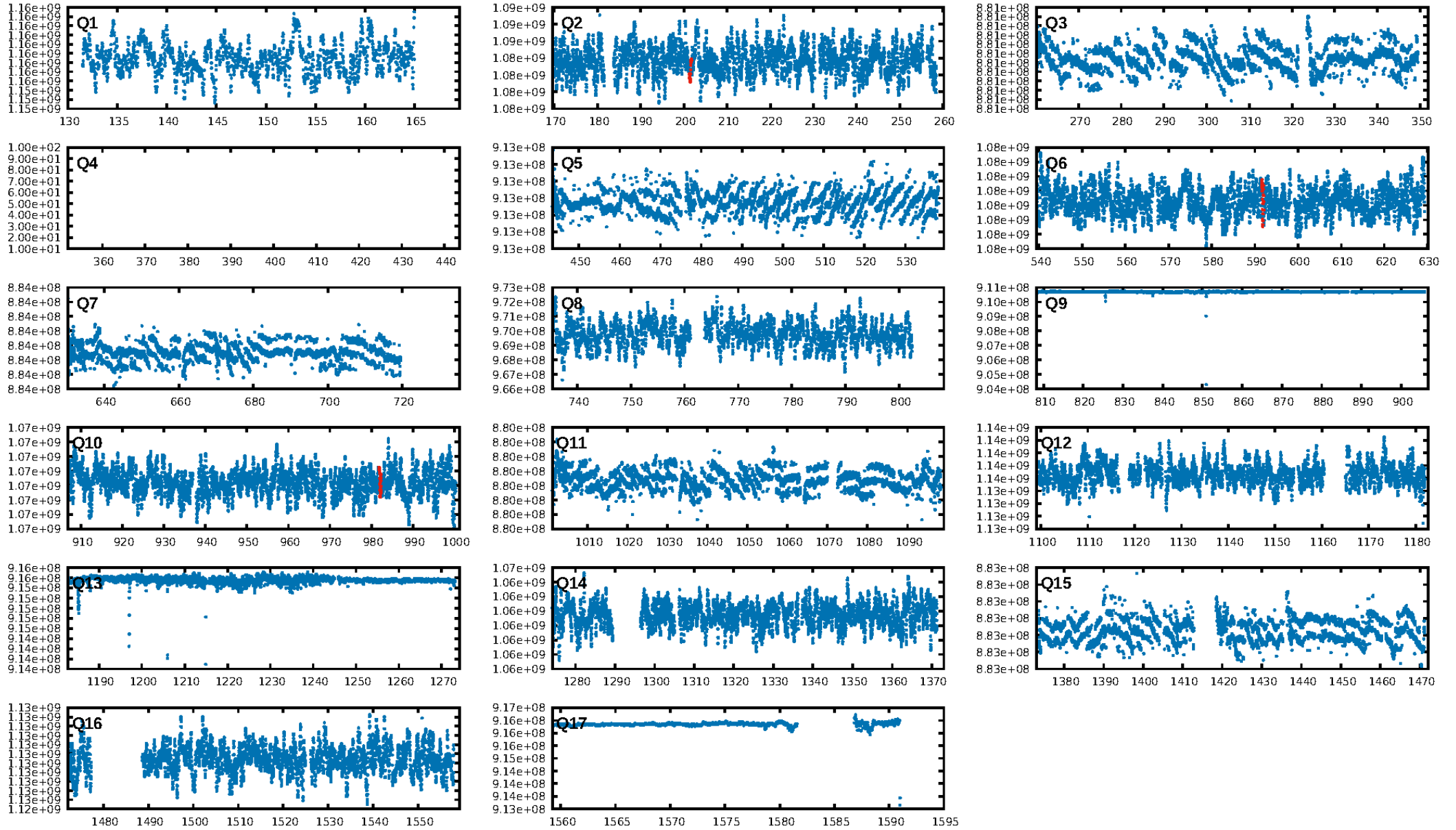
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [378.63σ]
LongPeriod-sig: 100.0% [387.37σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 15.97
Centroid-sig: 58.8%
Centroid-so: 0.067 arcsec [0.94σ]
OotOffset-rm: 1.038 arcsec [0.59σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-rm: 0.274 arcsec [0.18σ]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

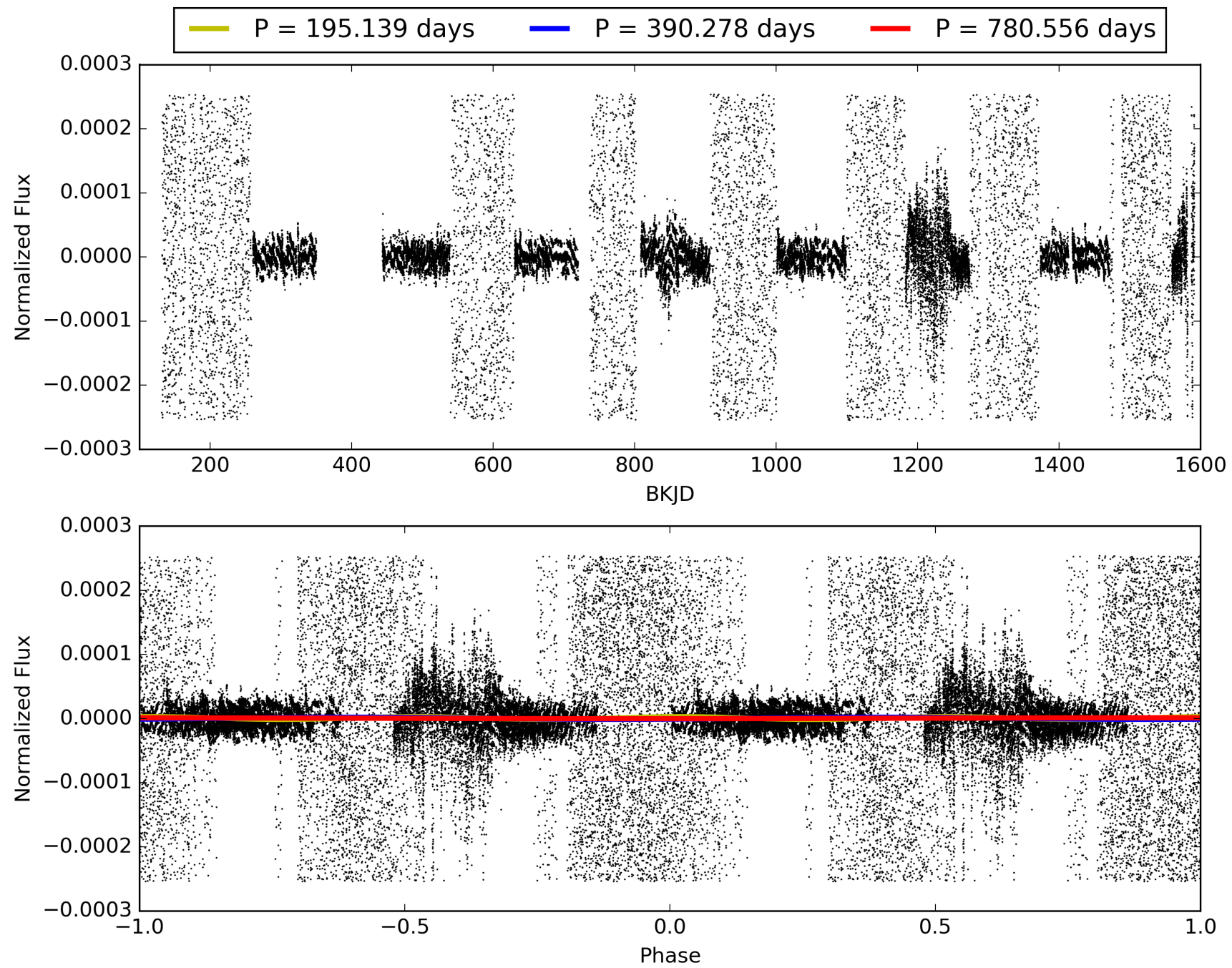
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:12:38 Z

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

TCE 010597648-04, PDC Light Curves

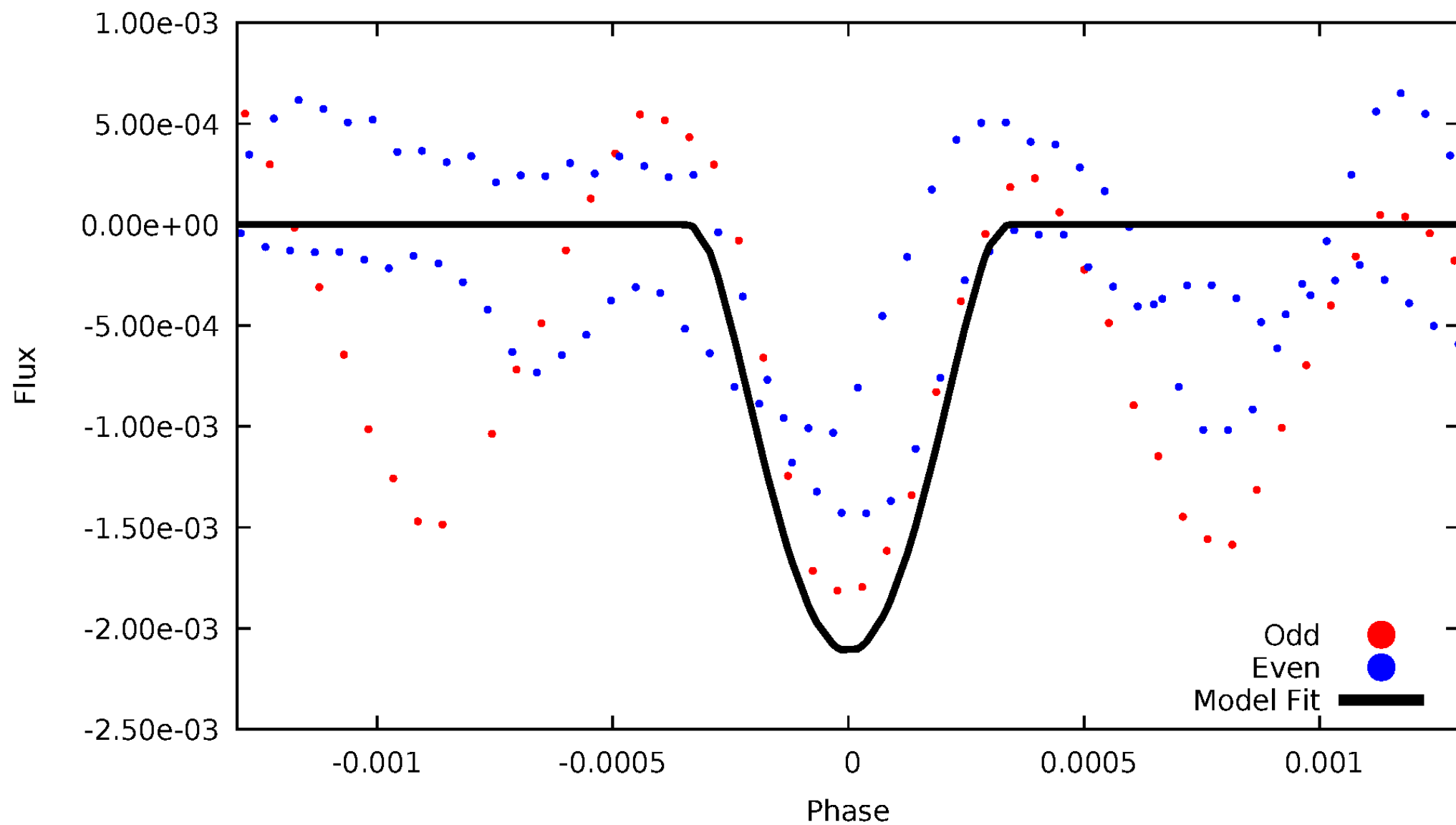


TCE 010597648-04



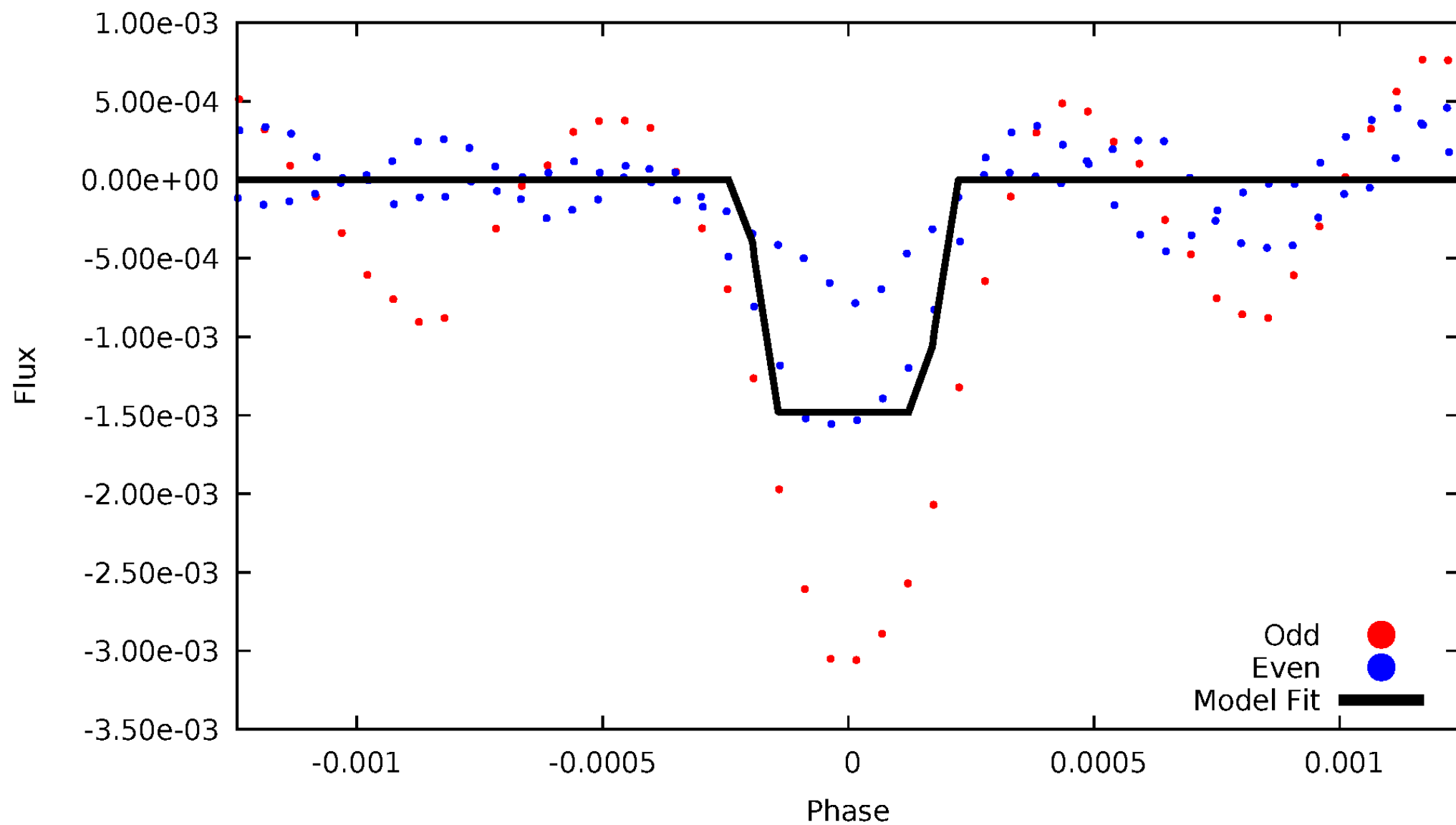
DV Odd/Even

TCE 010597648-04



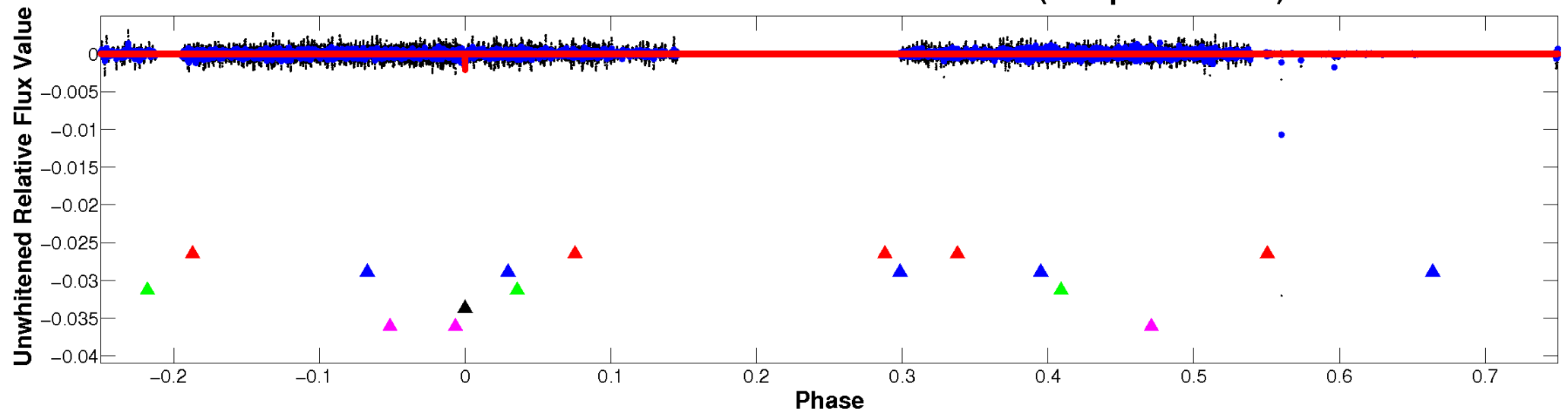
ALT Odd/Even

TCE 010597648-04

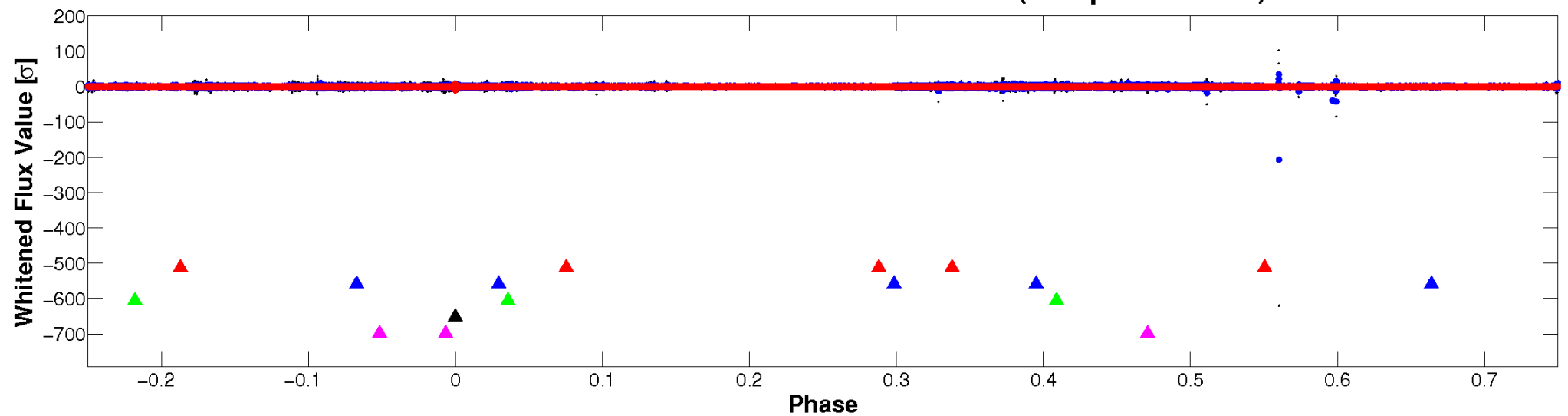


Non-Whitened Vs. Whitened Light Curve

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



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



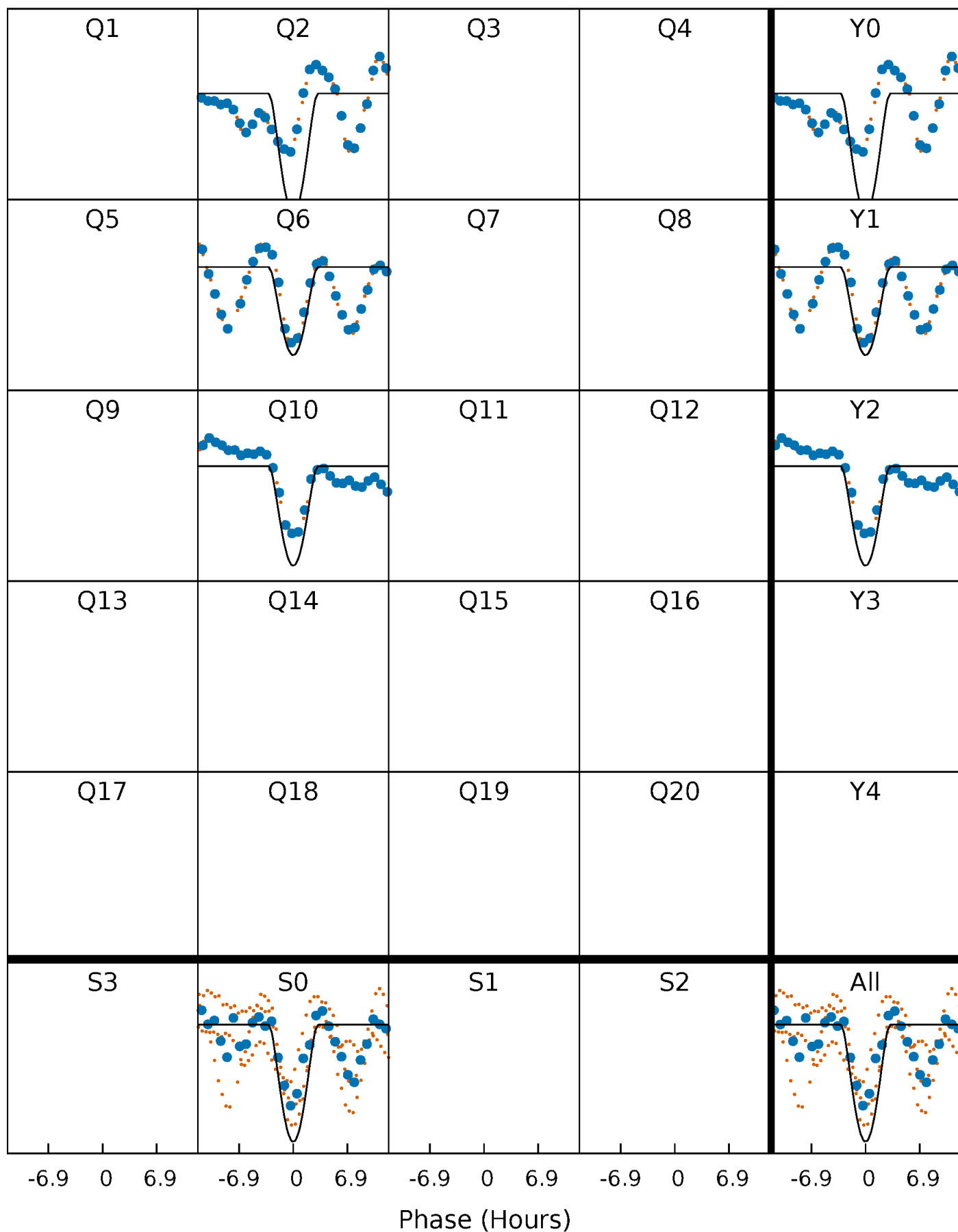
PDC Quarter-Phased Transit Curves

TCE 010597648-04 $P=390.278231$ Days $T_0=201.531959$ (BKJD)



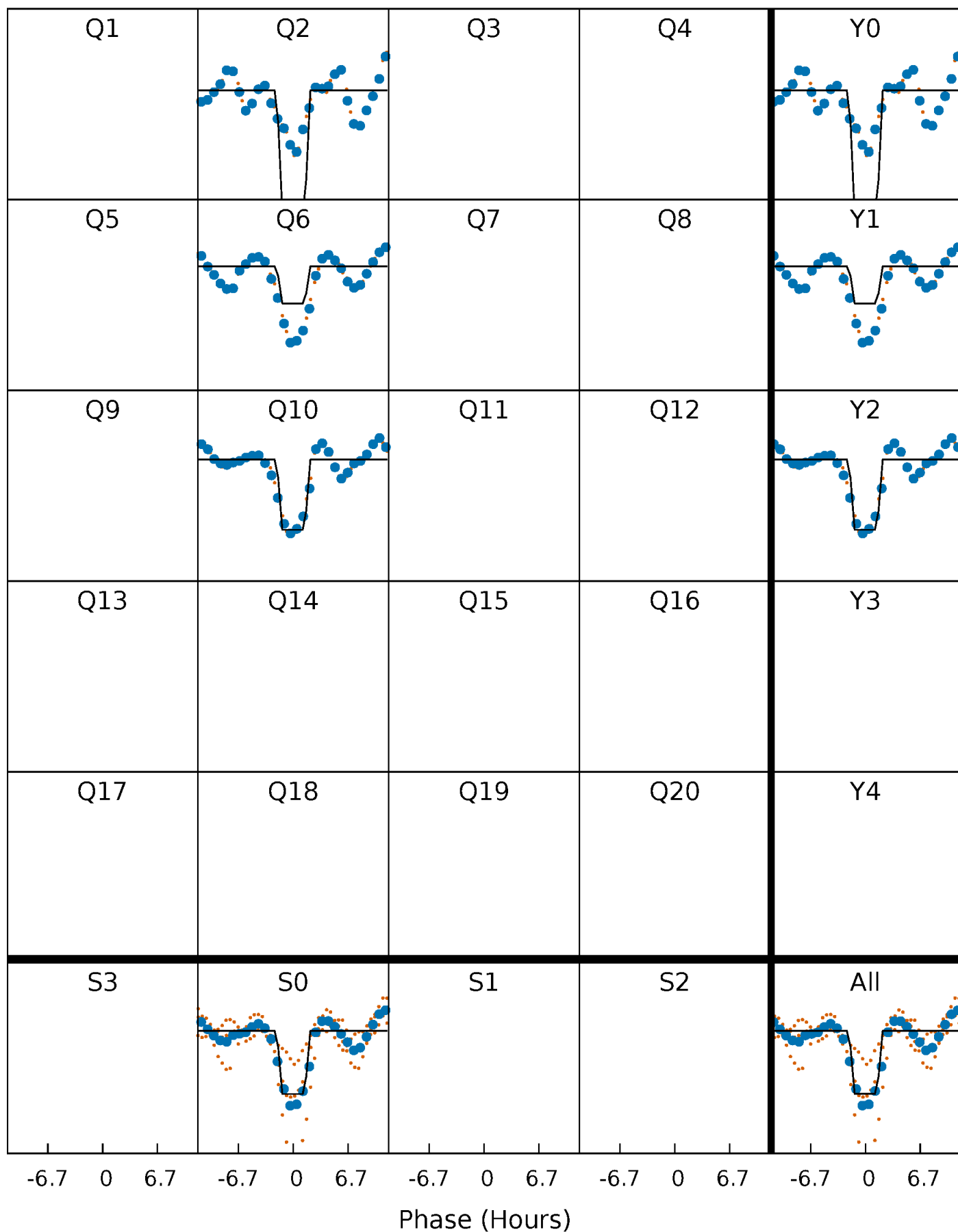
DV Quarter-Phased Transit Curves

TCE 010597648-04 $P=390.278231$ Days $T_0=201.531959$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

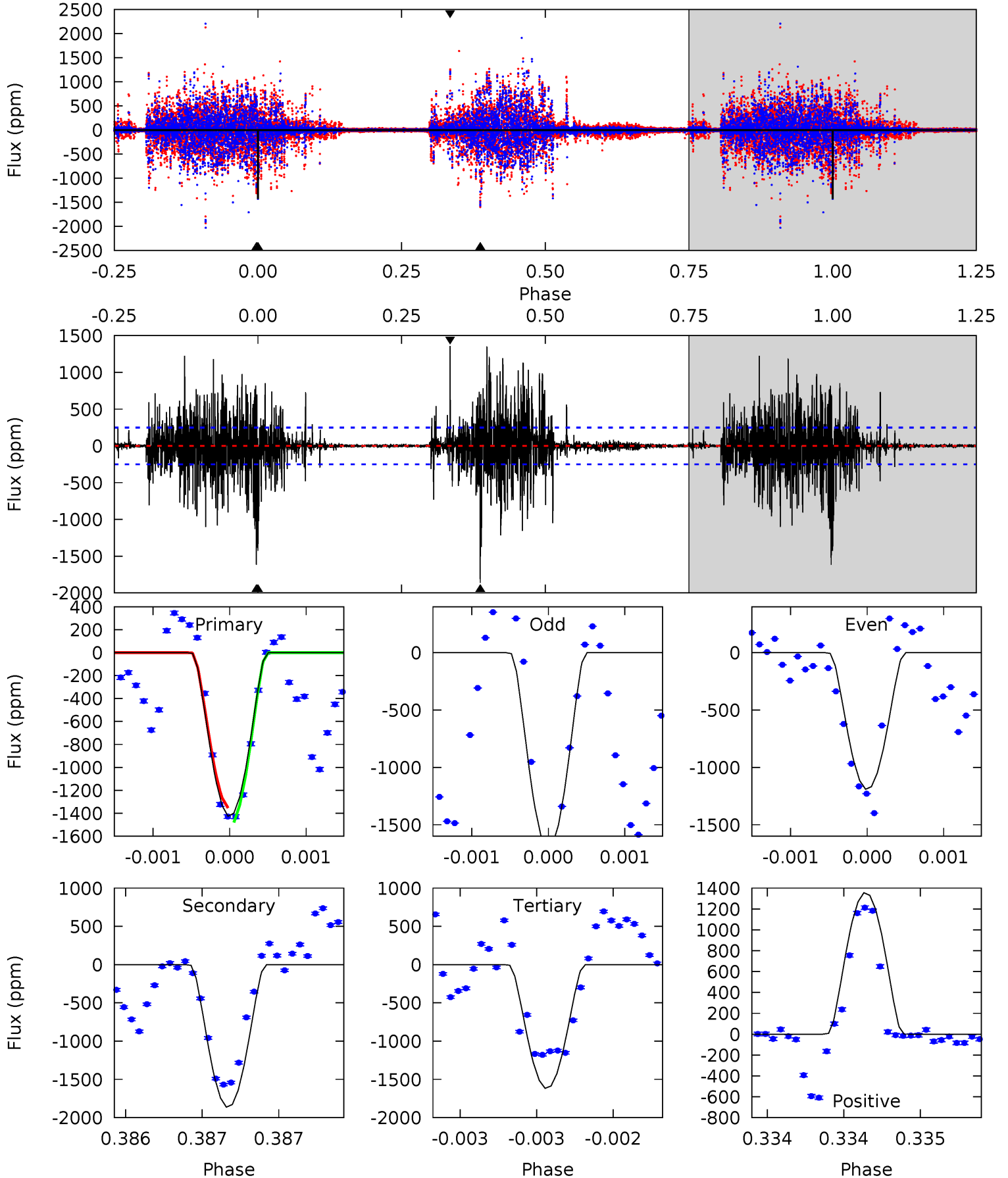
TCE 010597648-04 $P=390.280996$ Days $T_0=201.513819$ (BKJD)



DV Model-Shift Uniqueness Test

010597648-04, P = 390.278231 Days, E = 201.531959 Days

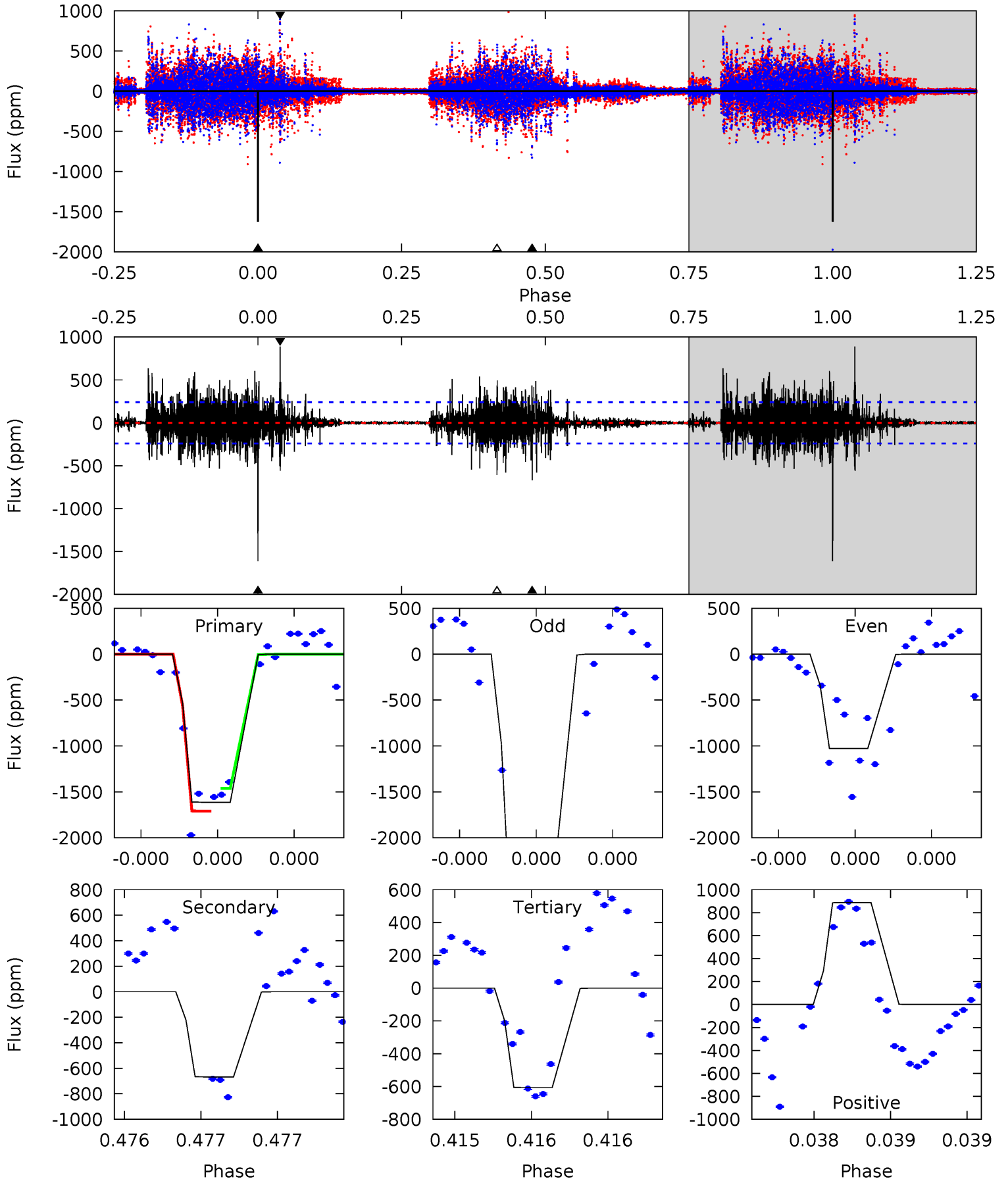
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.5	41.2	35.7	30.0	5.52	3.40	4.07	-4.21	1.54	5.45	11.2	4.14	0.91	0.42	1.39



Alt Model-Shift Uniqueness Test

010597648-04, P = 390.280996 Days, E = 201.513819 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.6	15.6	14.2	20.7	5.60	3.53	2.10	23.5	16.9	1.42	-5.14	22.2	1.12	0.35	2.72



Stellar Parameters For KIC 010597648

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4500^{+114}_{-96}	$2.431^{+0.030}_{-0.030}$	$0.440^{+0.050}_{-0.200}$	$14.895^{+3.199}_{-2.909}$	$2.181^{+0.921}_{-0.753}$	$0.001^{+0.000}_{-0.000}$
	+3%/-2%	+1%/-1%	+11%/-45%	+21%/-20%	+42%/-35%	+30%/-20%
Source	PHO55	AST55	SPE55	DSEP		

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

Secondary Eclipse Parameters for KIC 010597648-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1863 ± 45	$180.29^{+161.35}_{-119.89}$	923^{+32}_{-32}	3264^{+1462}_{-516}	58^{+444}_{-41}
Alt.	-667 ± 43	$132.73^{+135.74}_{-91.08}$	923^{+32}_{-30}	3080^{+1482}_{-524}	39^{+354}_{-30}

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

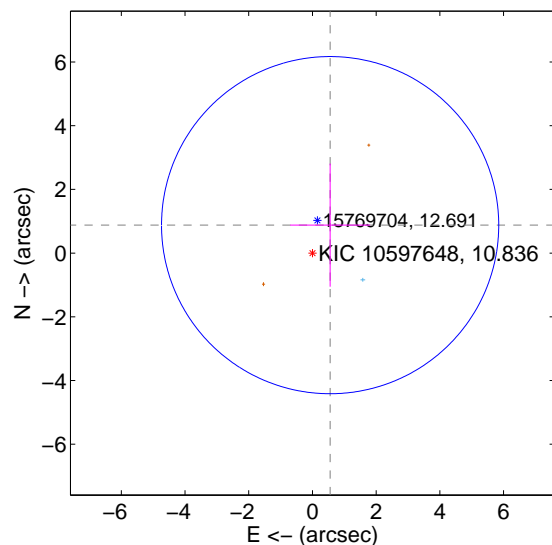
Supplemental centroid analysis for 010597648-04. **Kepler magnitude: 10.84.** Transit SNR 49.08

There are 1 quarters with good PRF difference image offsets

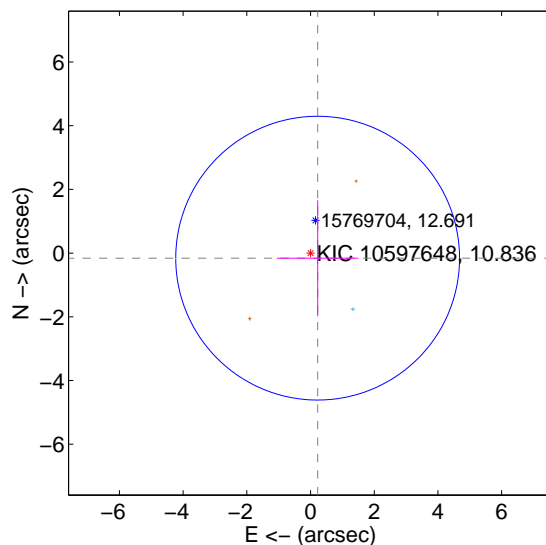
The direct PRF centroid is offset from the target star catalog position by about 1.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.038 ± 1.764	0.59	-0.555 ± 1.254	0.877 ± 1.931
PRF-fit source offset from KIC position	0.274 ± 1.485	0.18	-0.224 ± 1.281	-0.159 ± 1.823
photometric centroid source offset	0.07 ± 0.07	0.94	0.04 ± 0.08	-0.05 ± 0.07

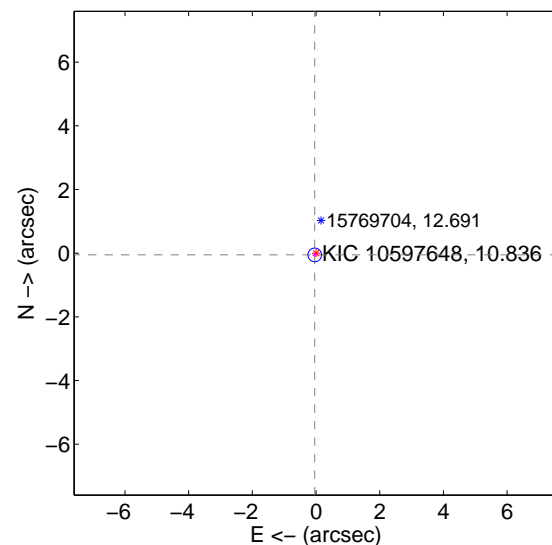
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

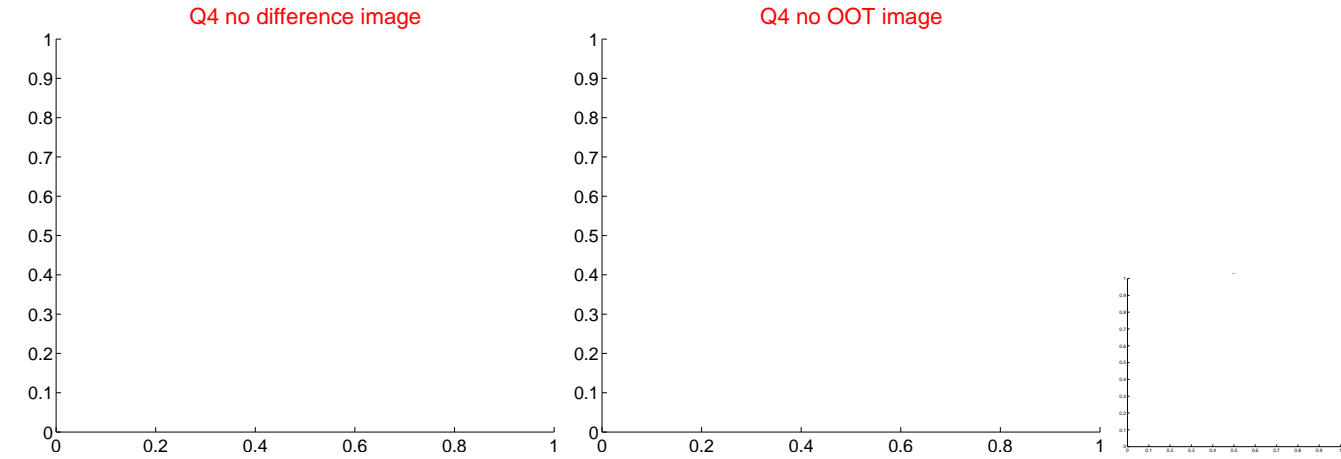
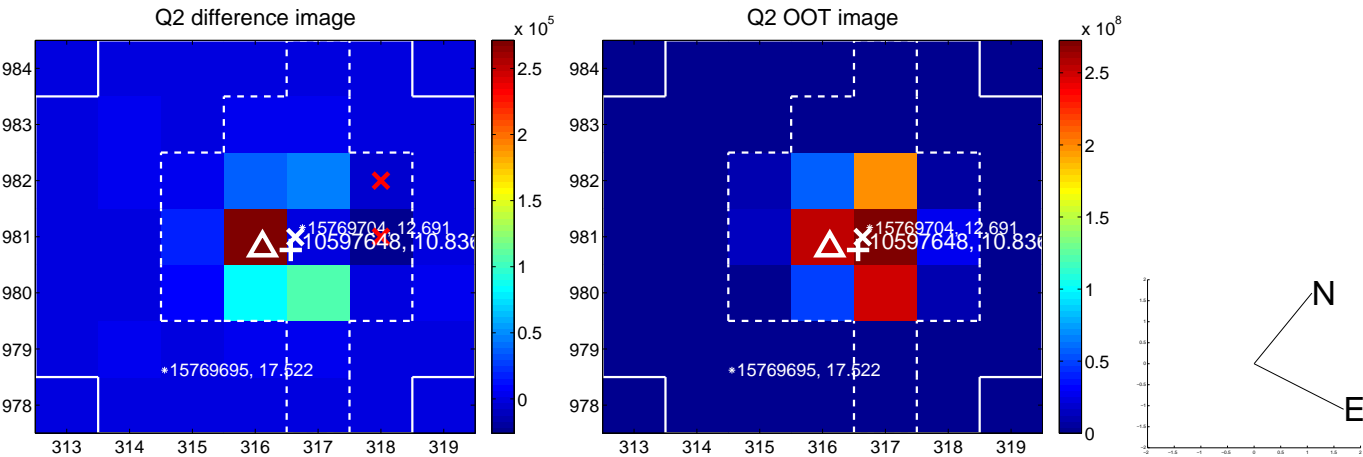


offset from photometric centroids

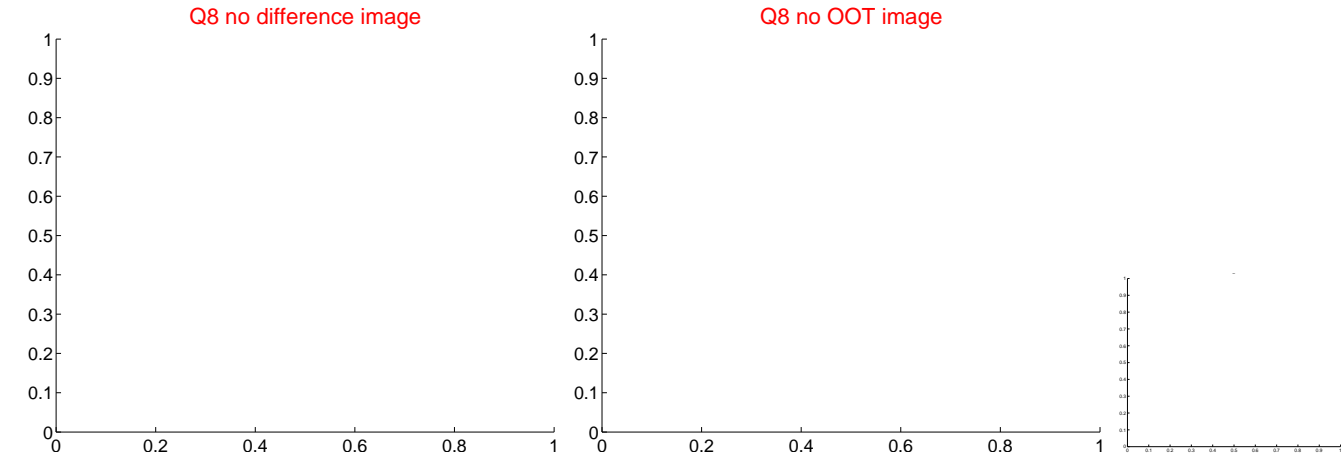
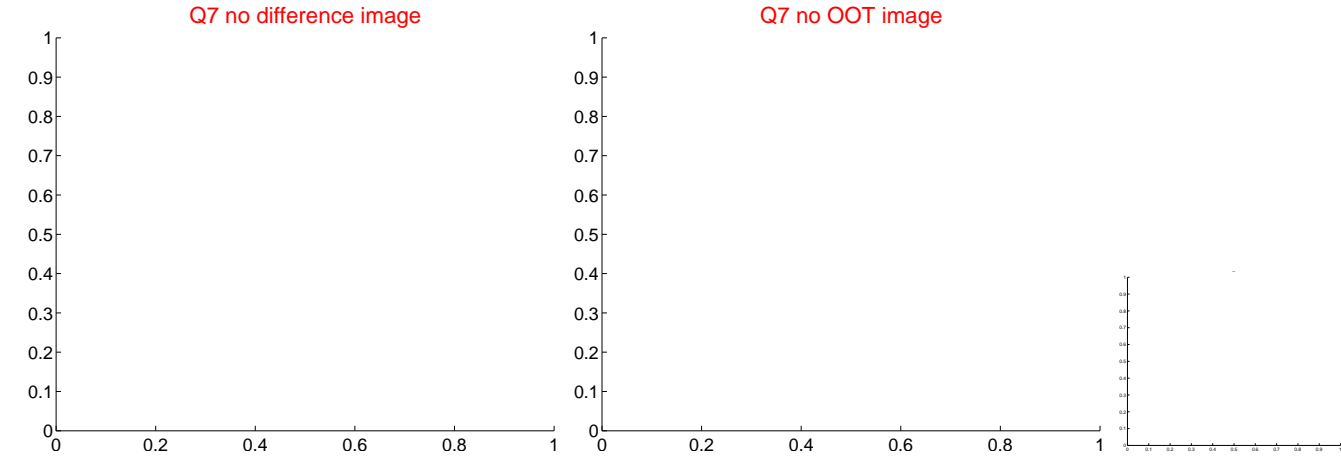
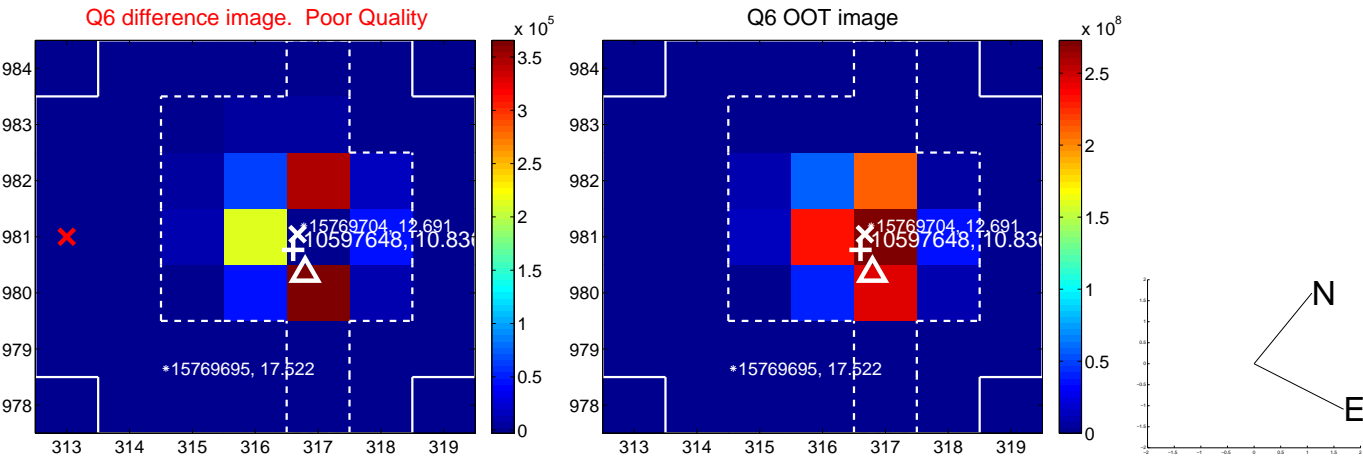
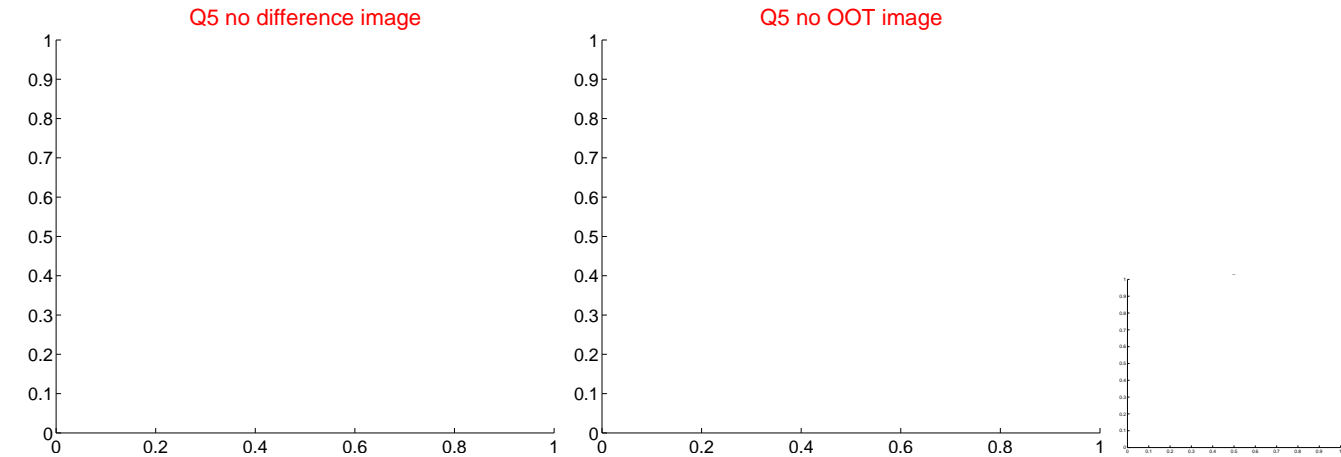


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

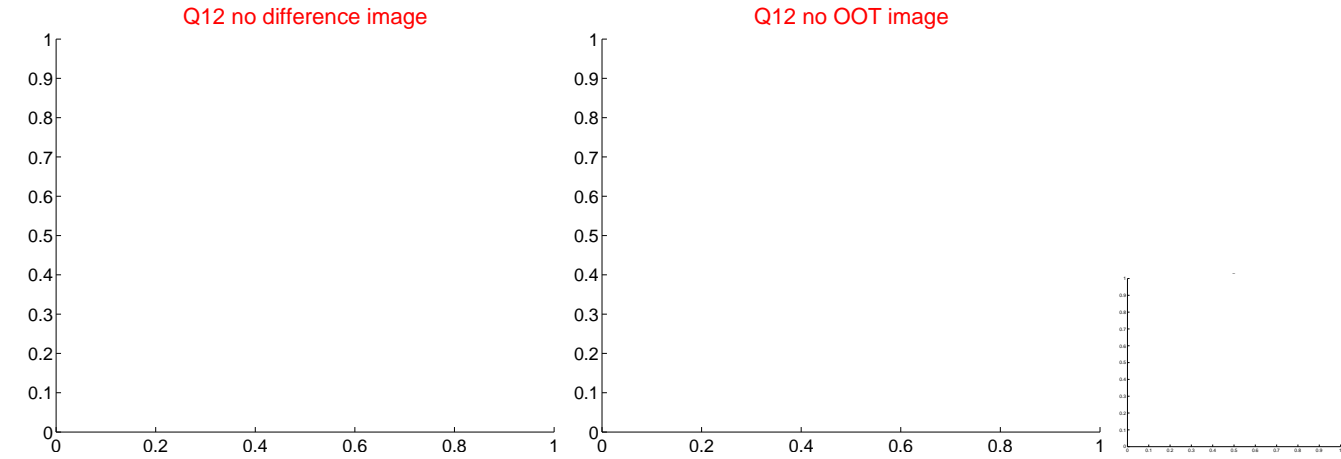
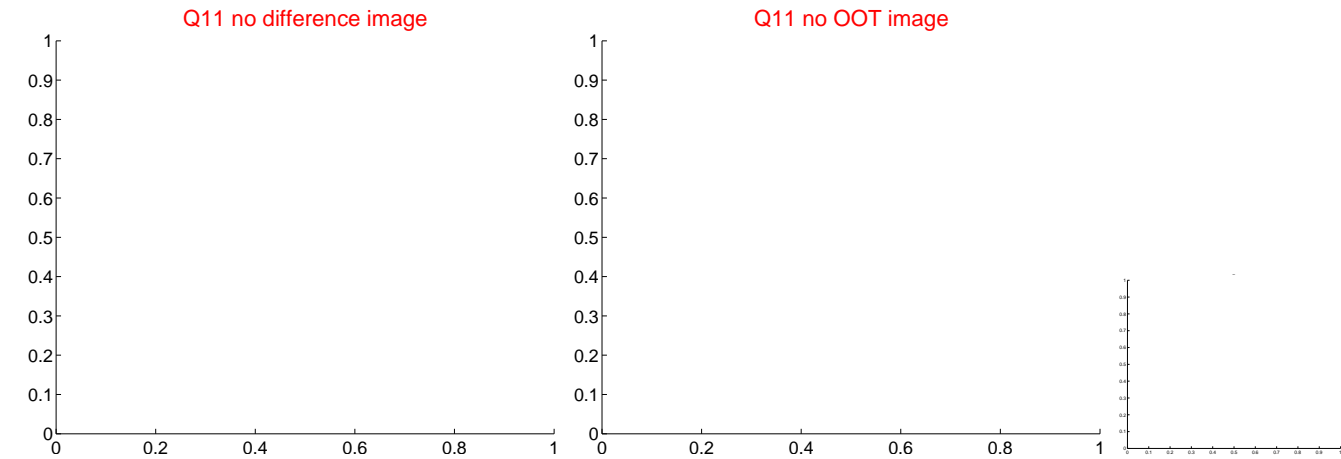
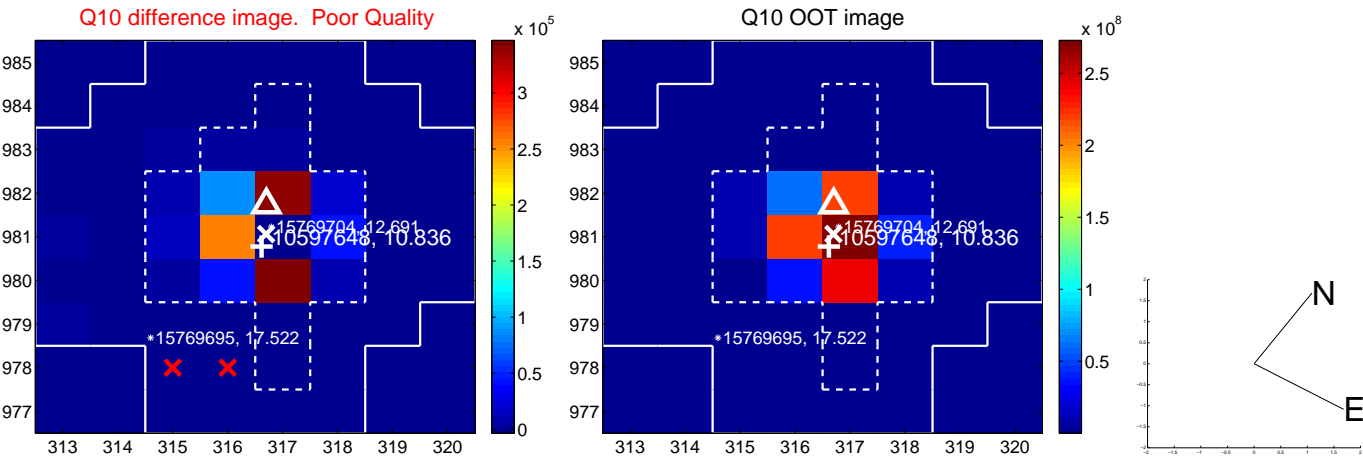
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



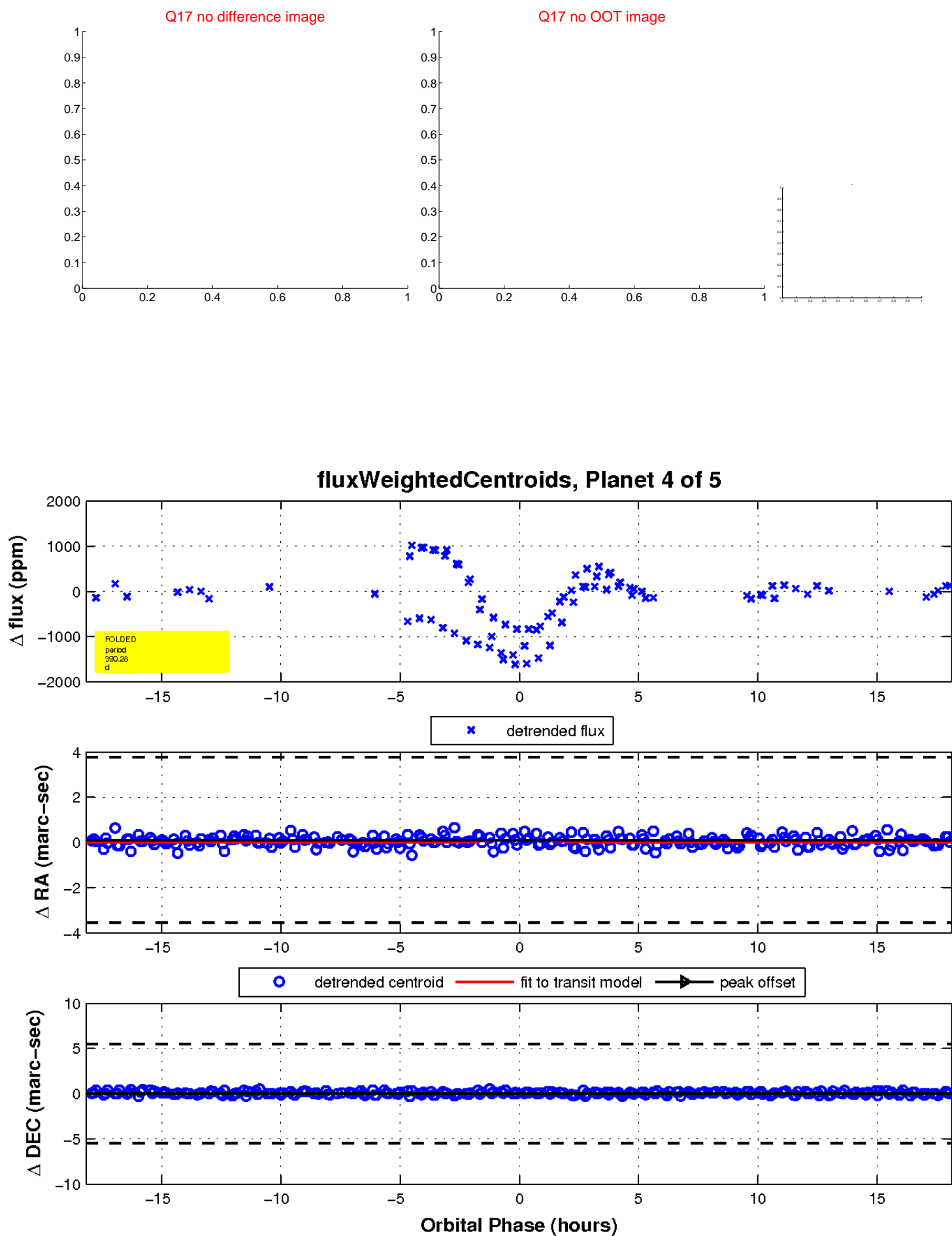
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

