

KIC 010059338

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})
010059338-01	OBS	No	387.423115	326.726872	39.7	15.891	11.6	11.2	26.61	4458	19.21	144.50
010059338-02	OBS	No	47.427960	171.993462	24.9	1.196	11.7	13.2	26.61	4458	15.91	2377.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010059338-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED—HALO_GHOST
010059338-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

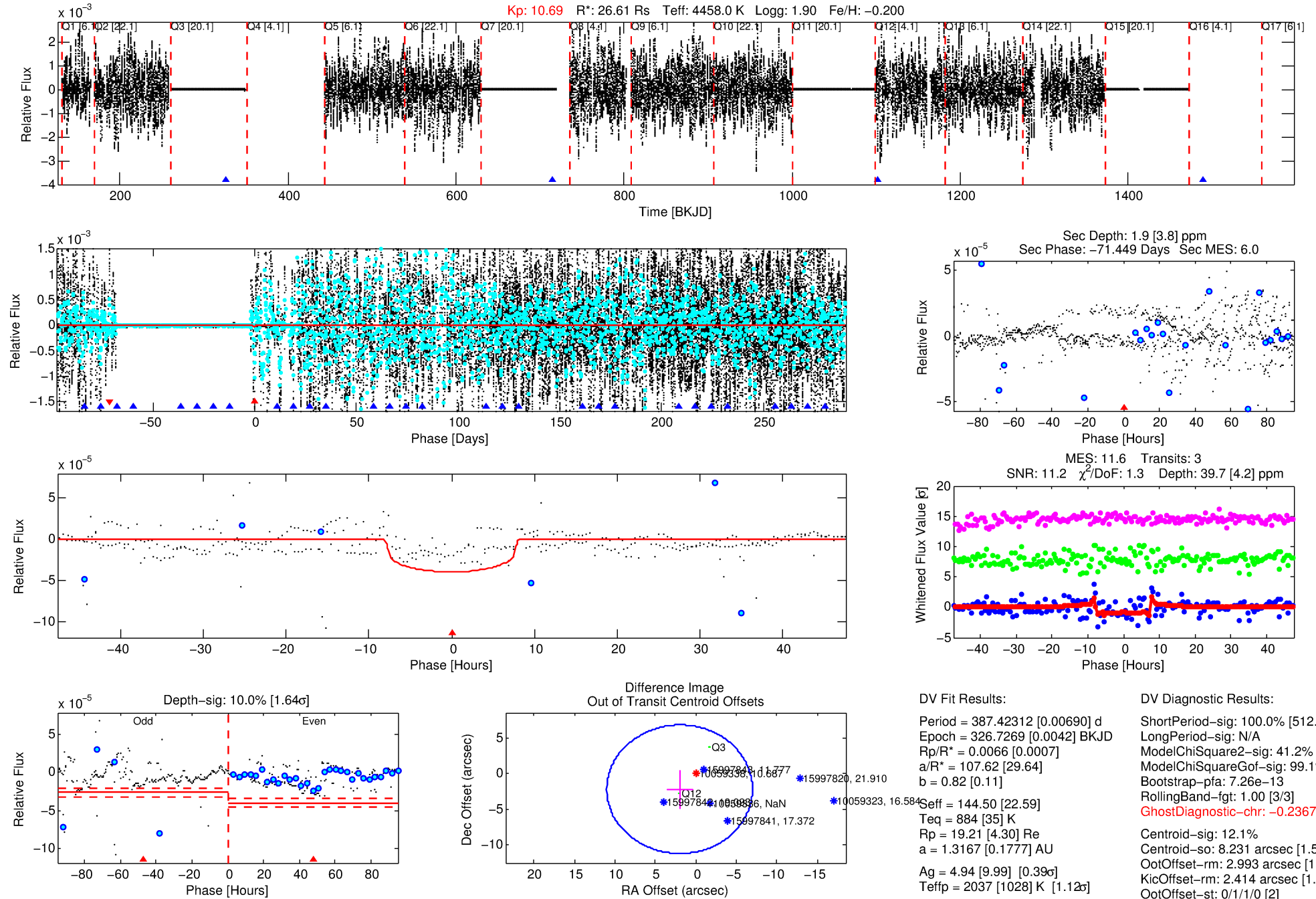
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010059338-01

No Significant Match Found

DV One-Page Summary

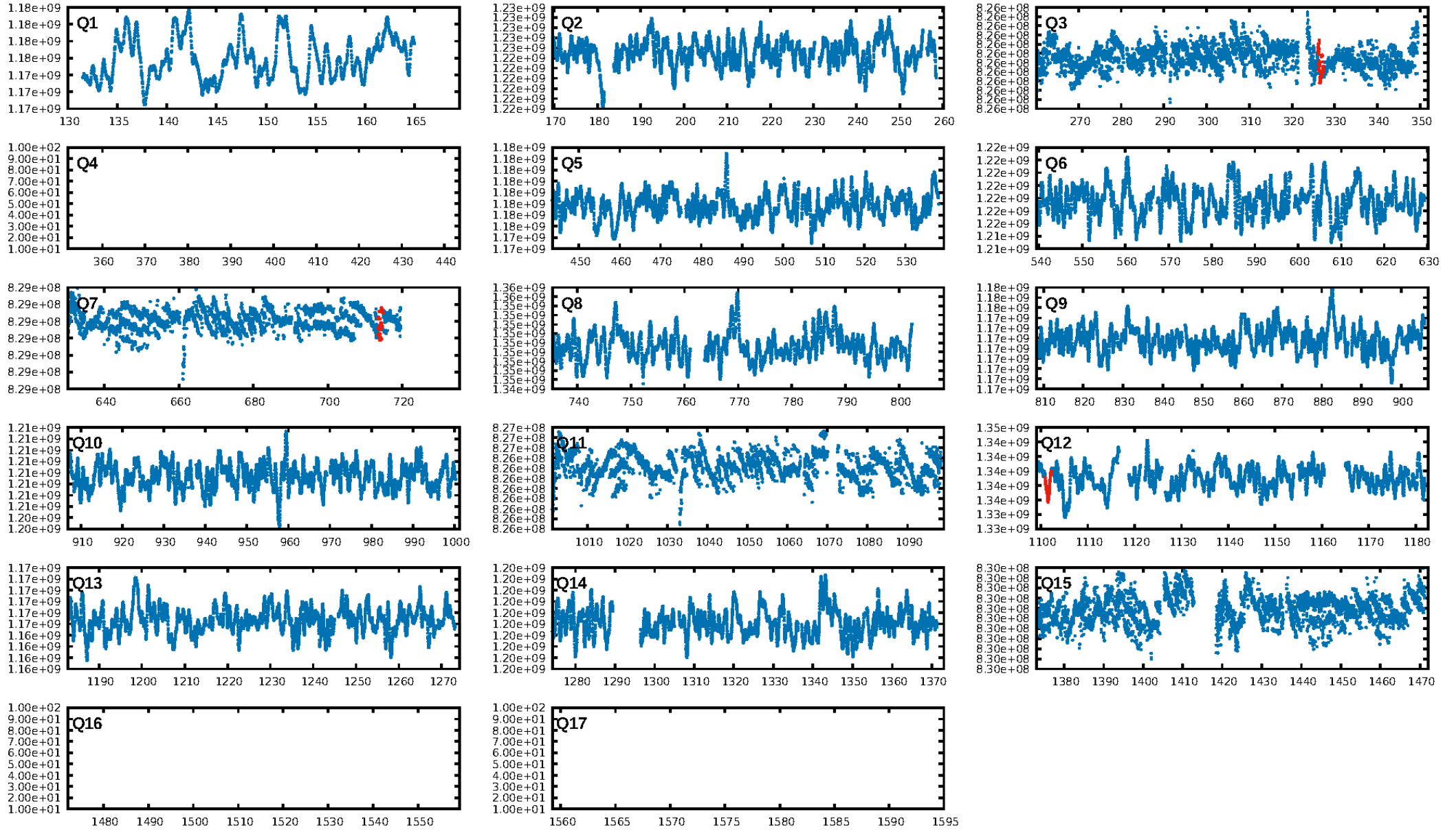
KIC: 10059338 Candidate: 1 of 2 Period: 387.423 d



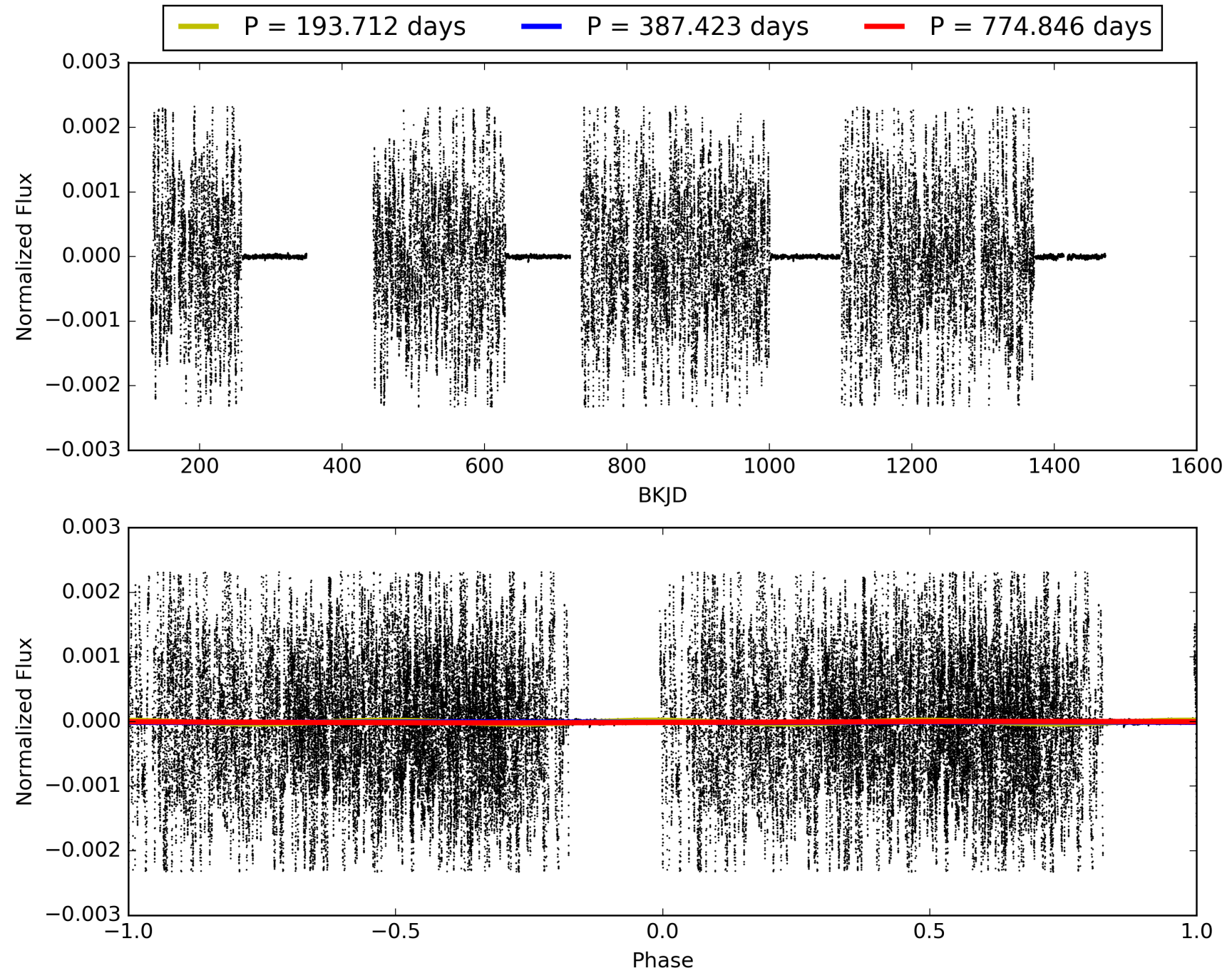
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:08:10 Z

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

TCE 010059338-01, PDC Light Curves

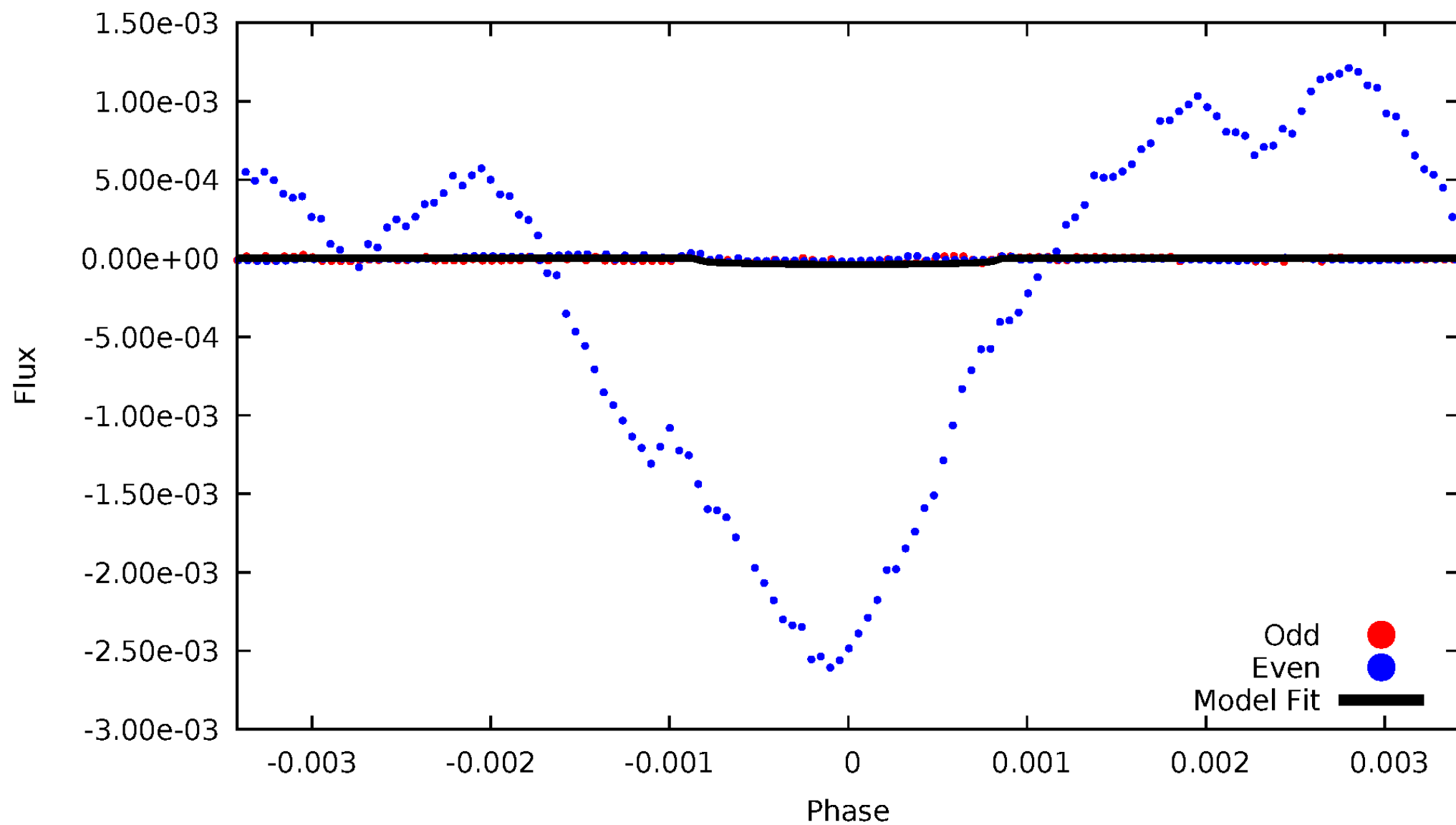


TCE 010059338-01



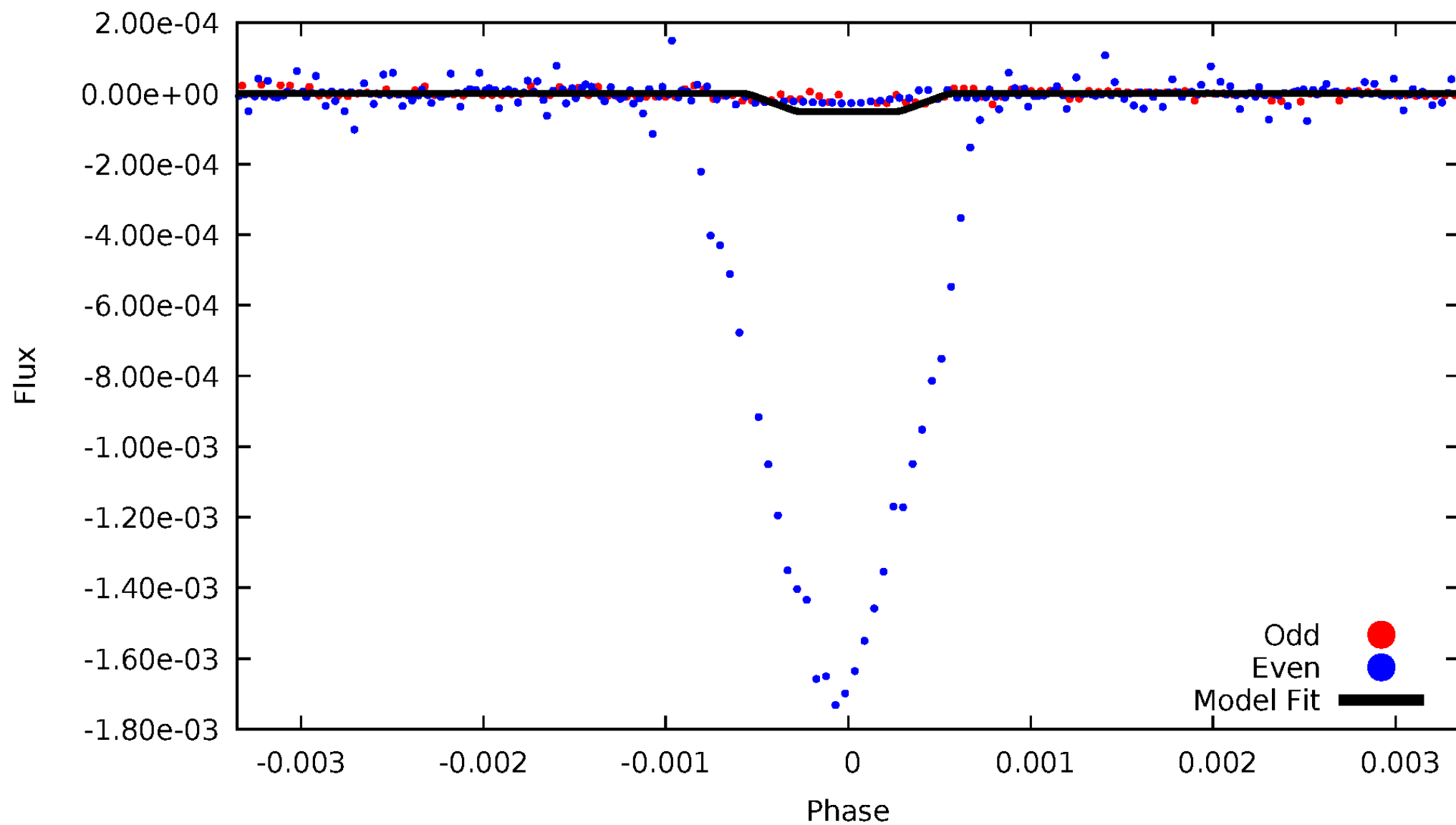
DV Odd/Even

TCE 010059338-01



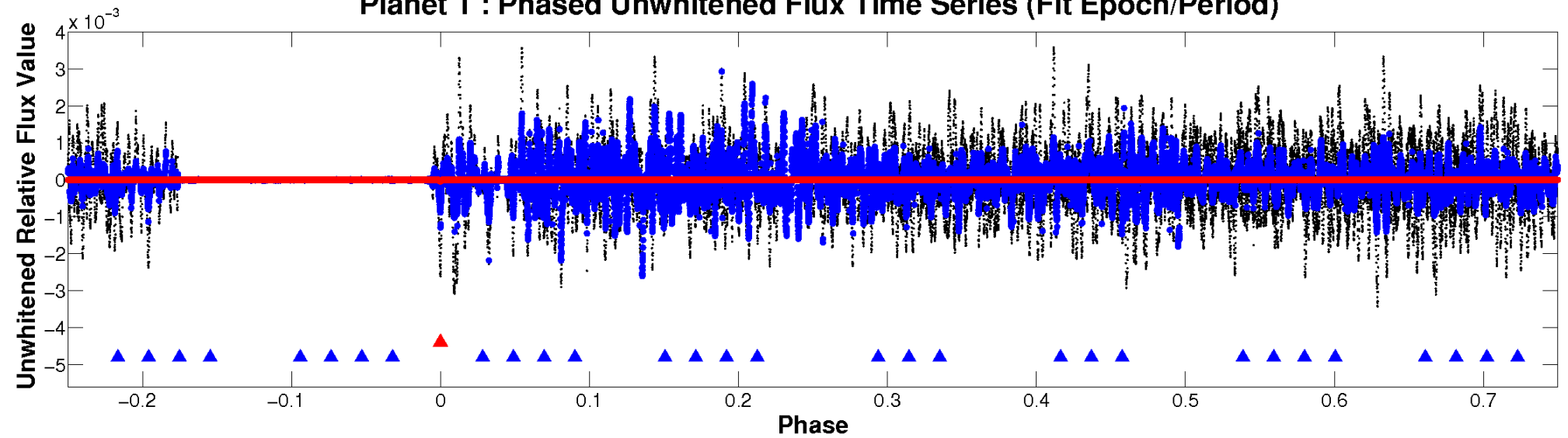
ALT Odd/Even

TCE 010059338-01

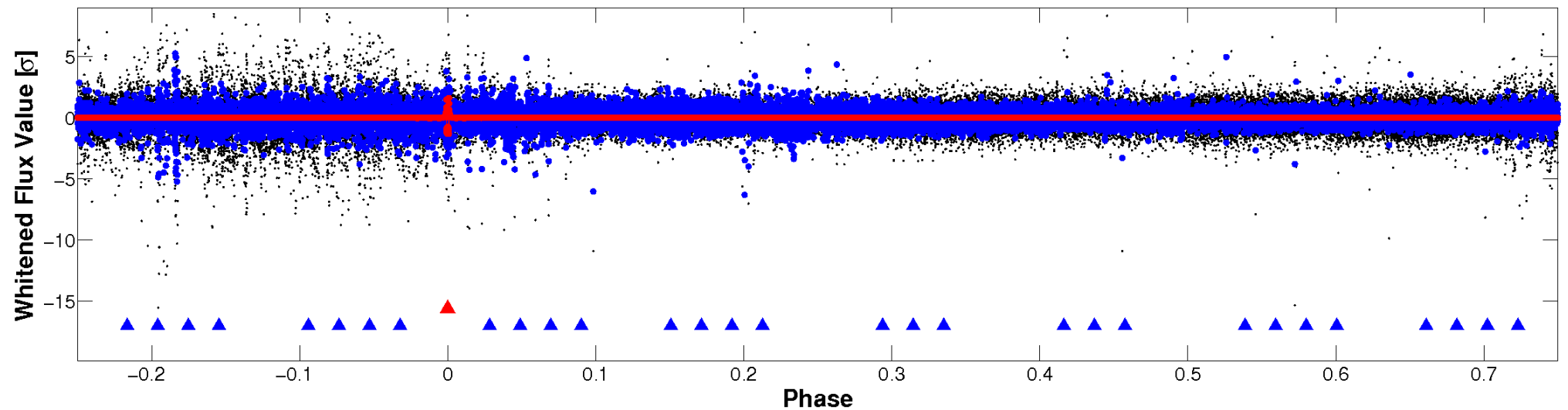


Non-Whitened Vs. Whitened Light Curve

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

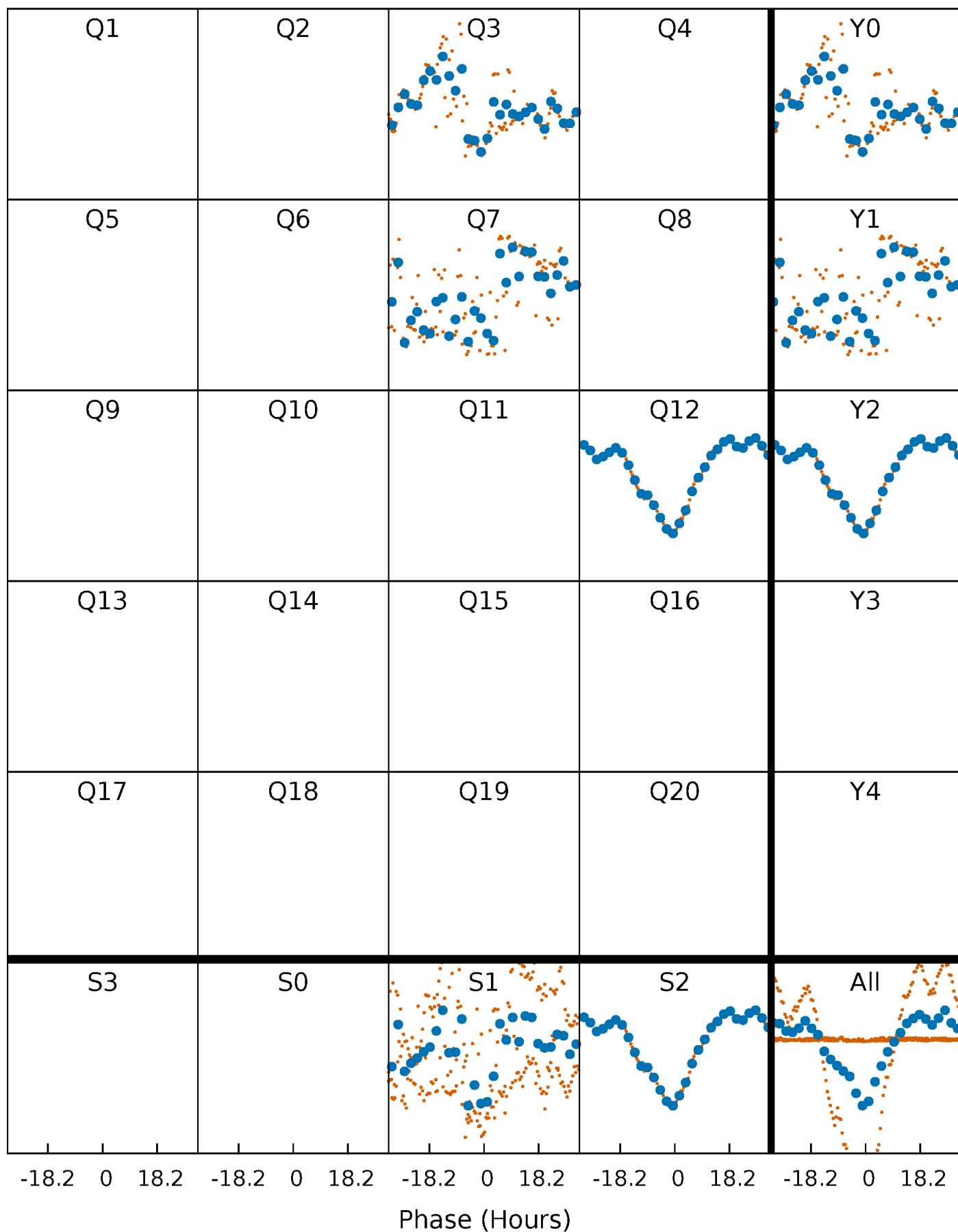


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



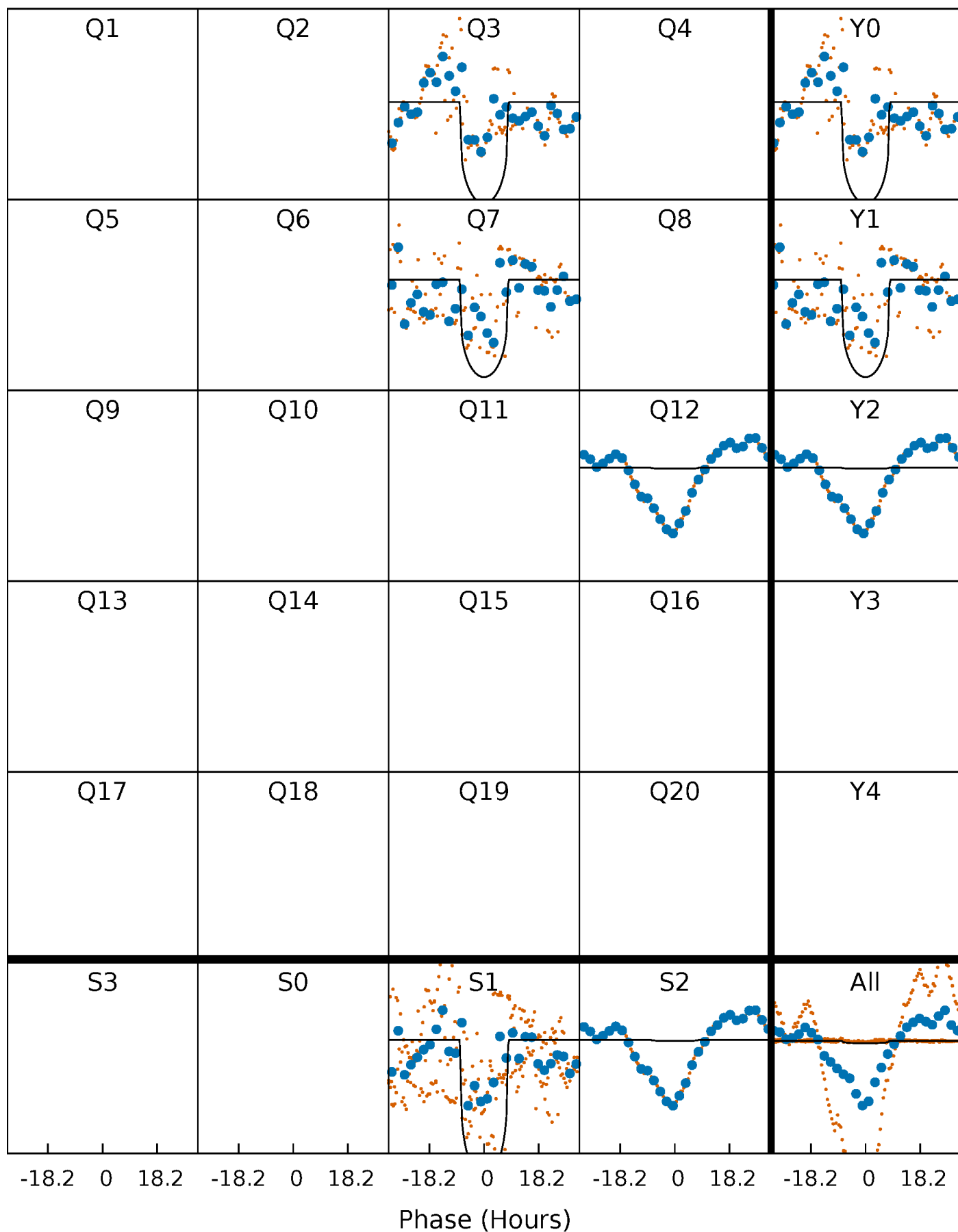
PDC Quarter-Phased Transit Curves

TCE 010059338-01 $P=387.423115$ Days $T_0=326.726872$ (BKJD)



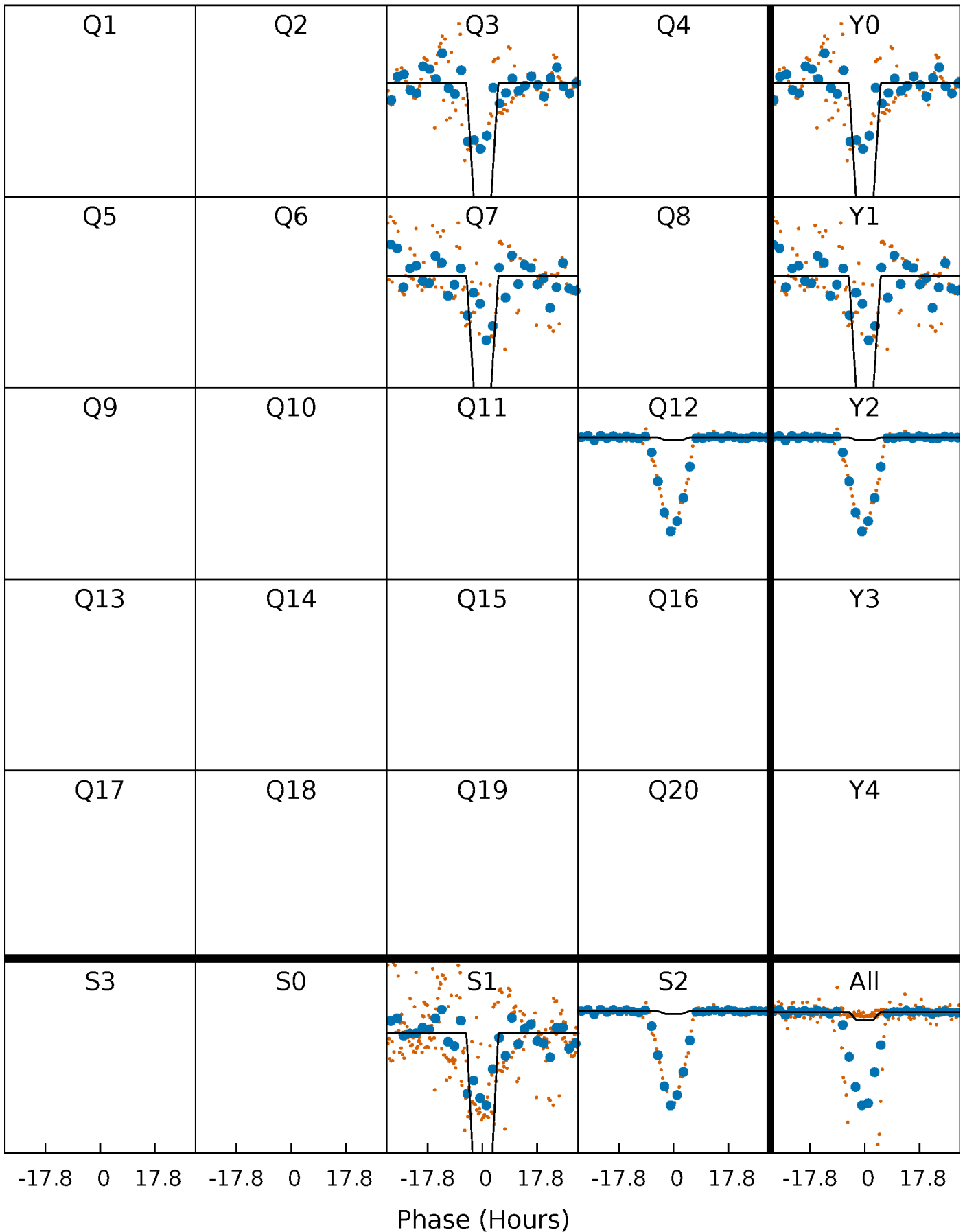
DV Quarter-Phased Transit Curves

TCE 010059338-01 P=387.423115 Days $T_0=326.726872$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

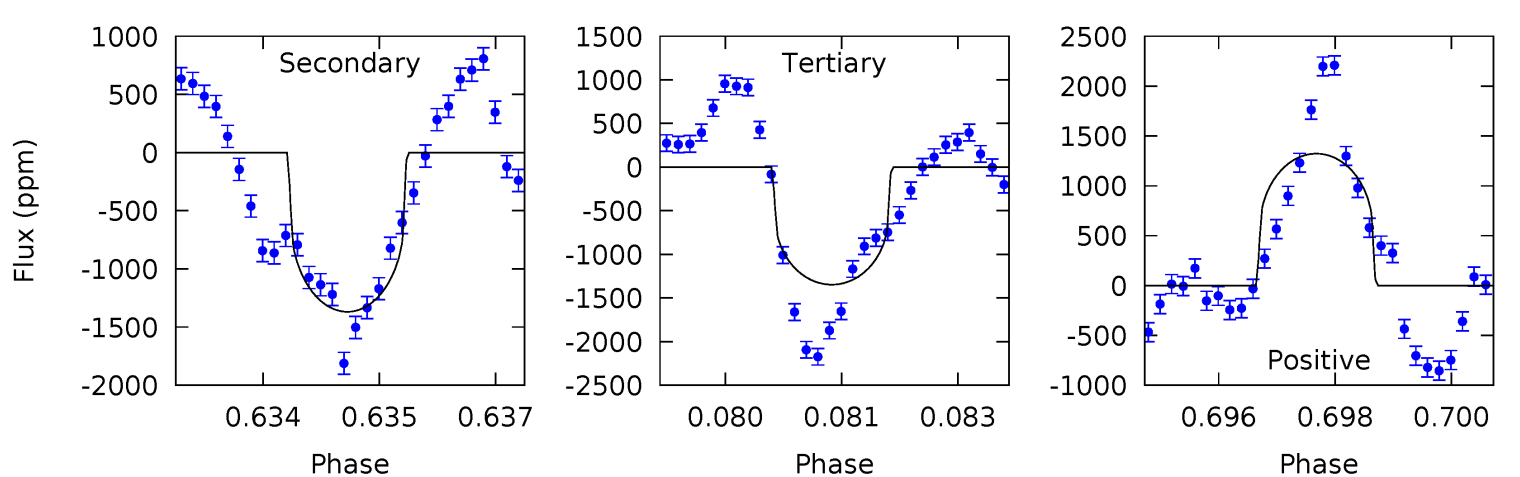
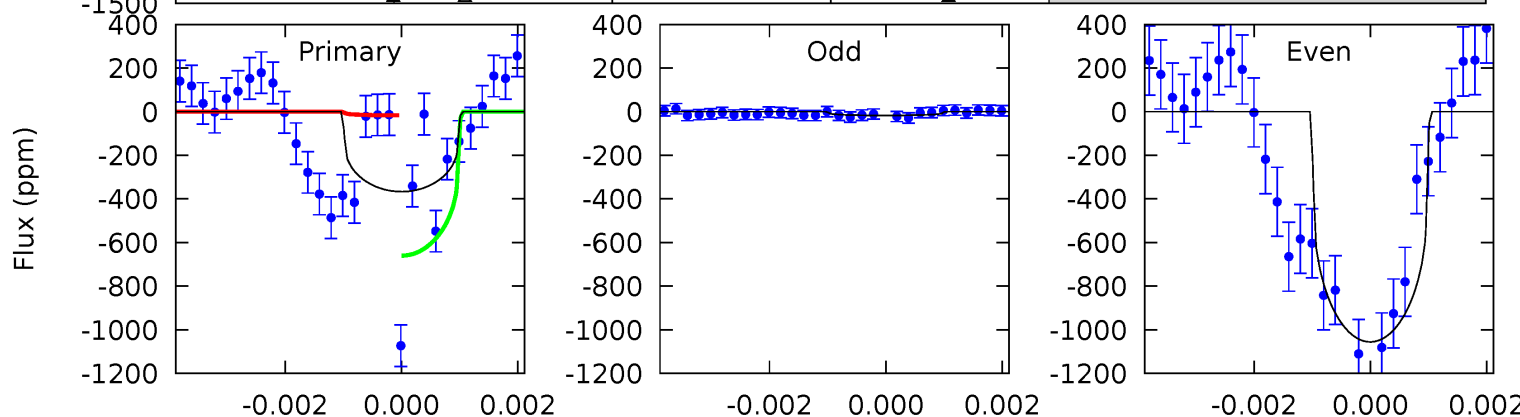
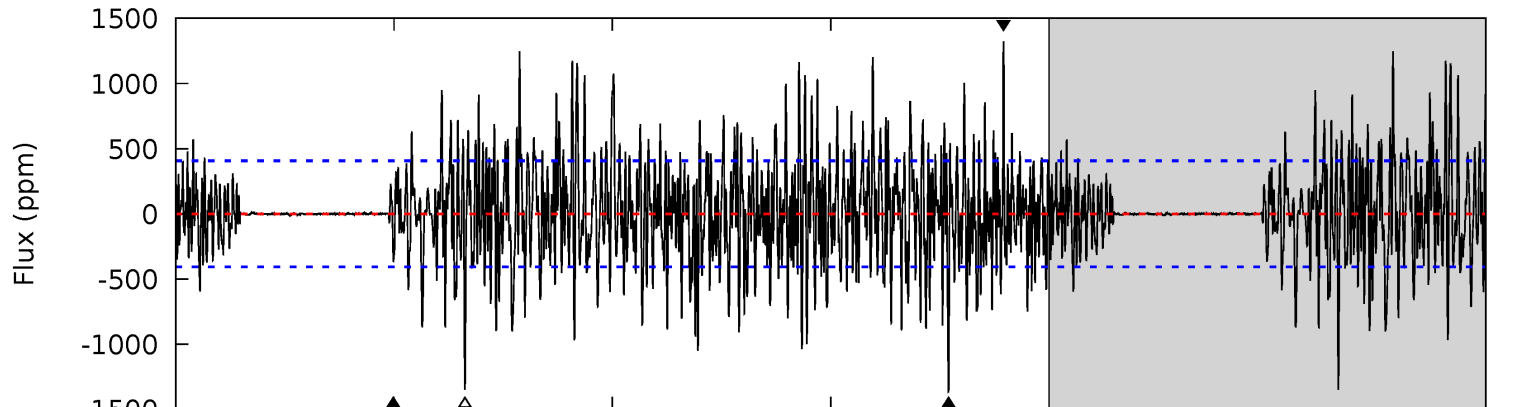
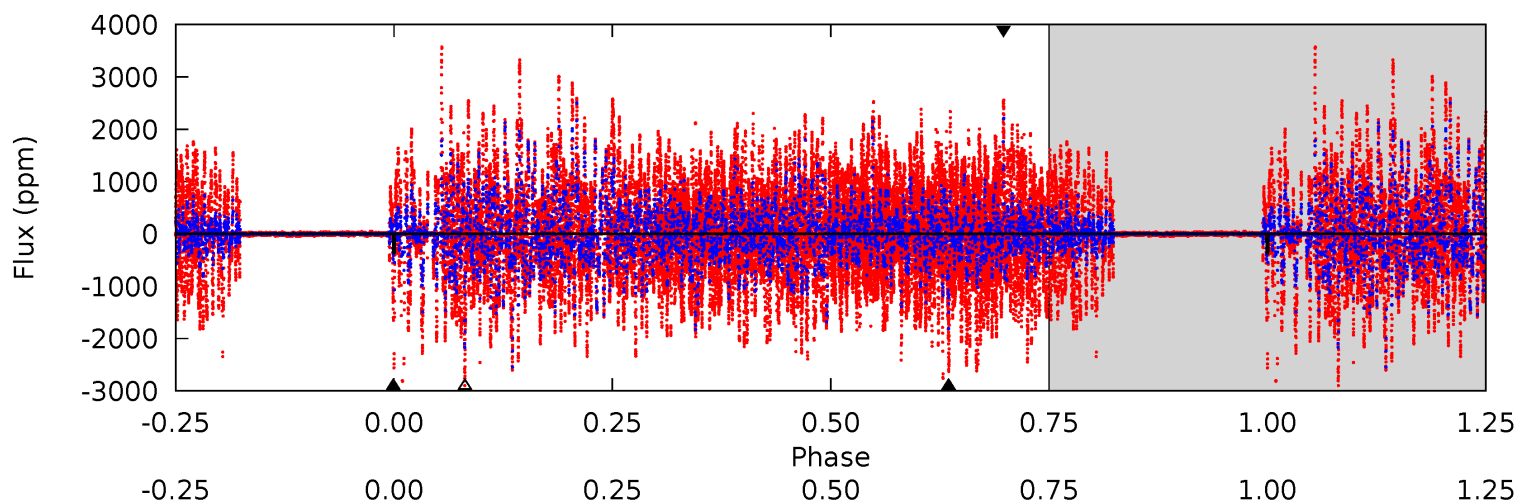
TCE 010059338-01 P=387.427109 Days $T_0=326.706543$ (BKJD)



DV Model-Shift Uniqueness Test

010059338-01, P = 387.423115 Days, E = 326.726872 Days

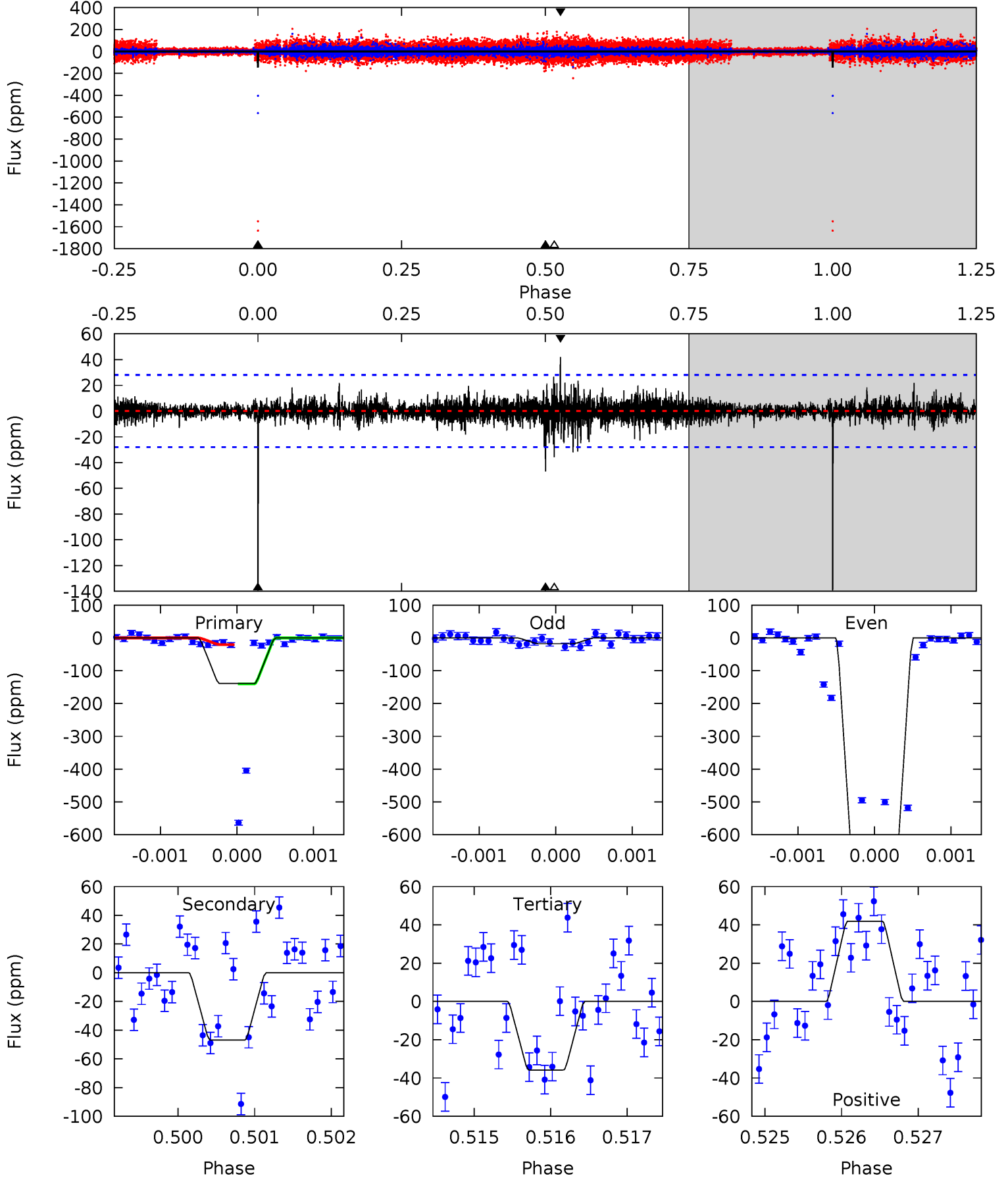
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.83	18.0	17.7	17.4	5.36	3.14	4.20	-12.9	-12.6	0.28	0.61	6.55	41.3	0.49	4.59



Alt Model-Shift Uniqueness Test

010059338-01, P = 387.427109 Days, E = 326.706543 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.9	9.07	6.94	8.12	5.43	3.25	1.02	20.0	18.8	2.14	0.96	64.4	23.2	0.23	0



Stellar Parameters For KIC 010059338

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4458^{+46}_{-73}	$1.895^{+0.027}_{-0.033}$	$-0.200^{+0.100}_{-0.150}$	$26.608^{+1.411}_{-5.291}$	$2.028^{+0.113}_{-0.738}$	$0.000^{+0.000}_{-0.000}$
	+1%/-2%	+1%/-2%	+50%/-75%	+5%/-20%	+6%/-36%	+30%/-8%
Source	SPE74	AST9	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 010059338-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1369 ± 76	$19.37^{+2.24}_{-2.39}$	1238^{+22}_{-25}	11444^{+1274}_{-945}	3500^{+957}_{-664}
Alt.	-47 ± 5	$21.13^{+2.19}_{-2.43}$	1237^{+23}_{-24}	4351^{+213}_{-175}	101^{+26}_{-19}

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

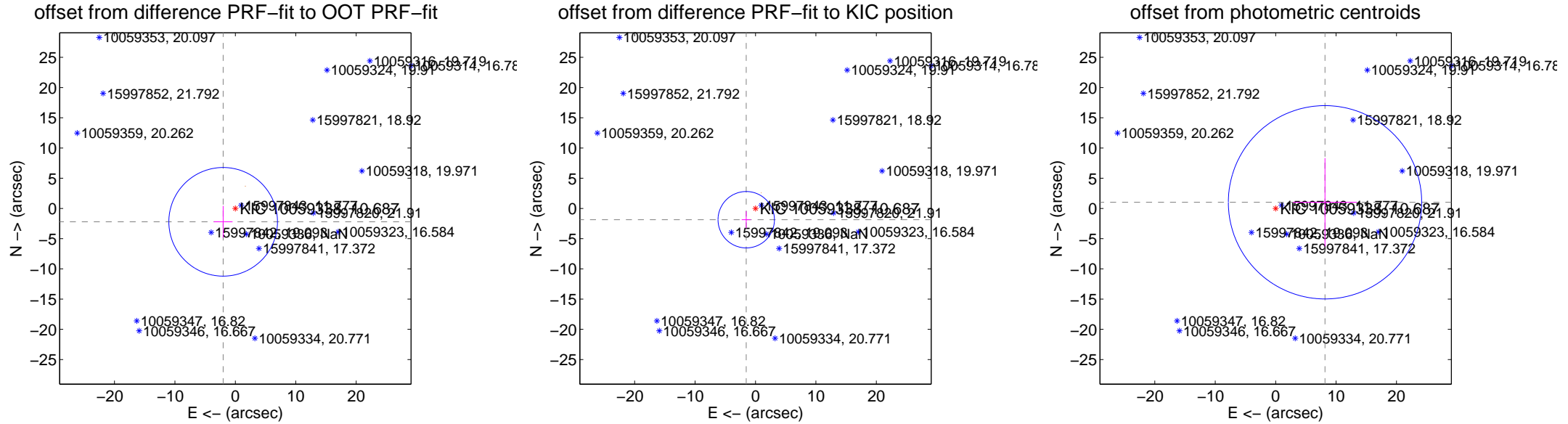
DV Centroid Data

Supplemental centroid analysis for 010059338-01. **Kepler magnitude: 10.69.** Transit SNR 11.19

There are 1 quarters with good PRF difference image offsets

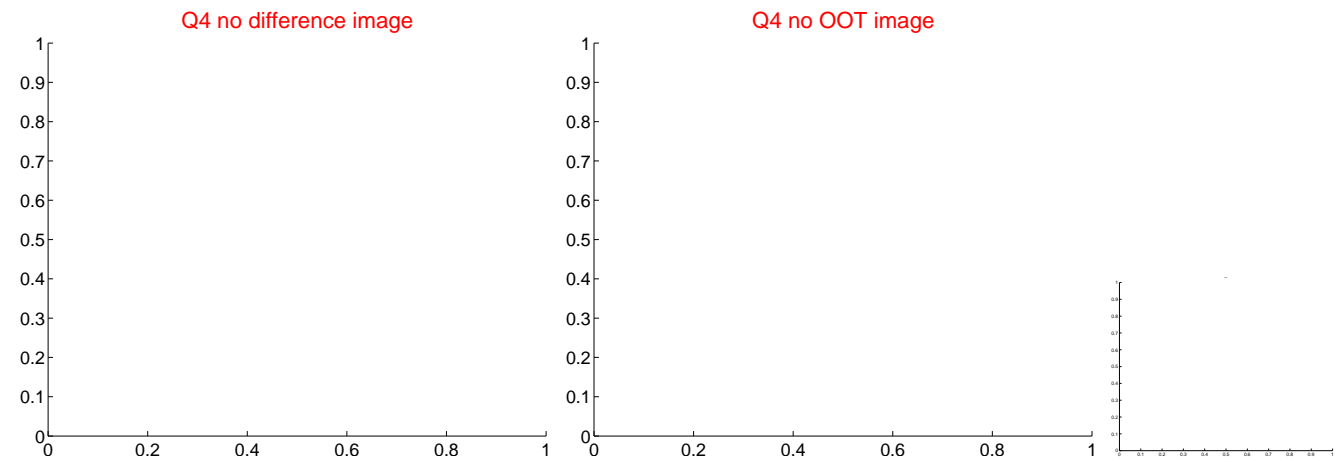
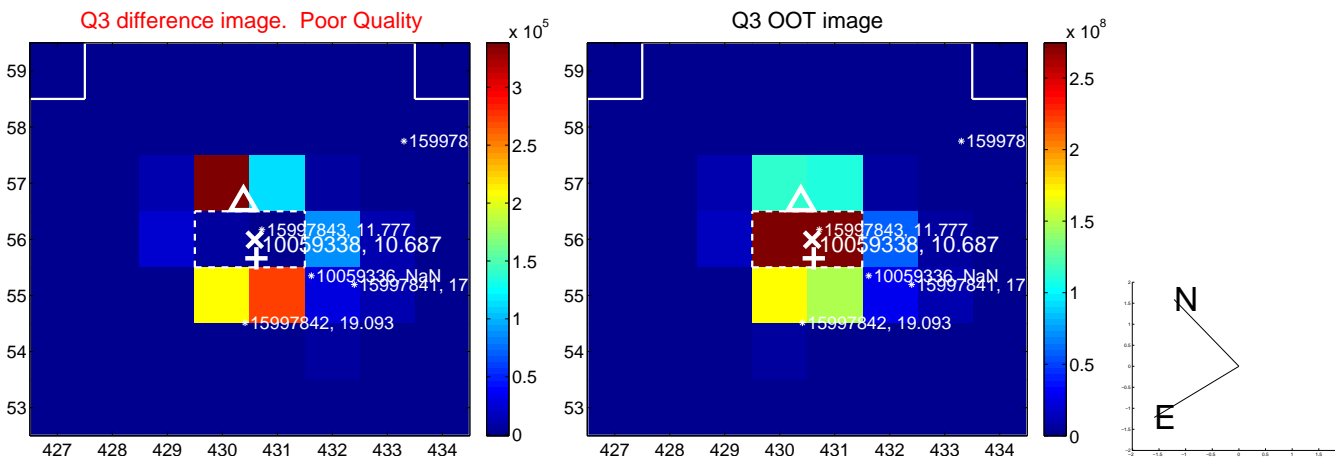
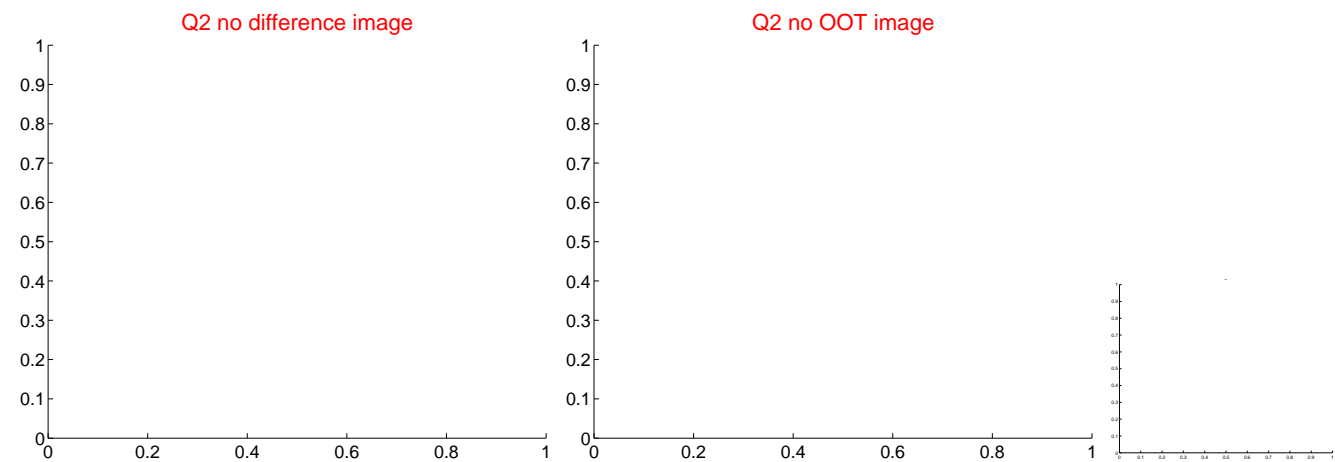
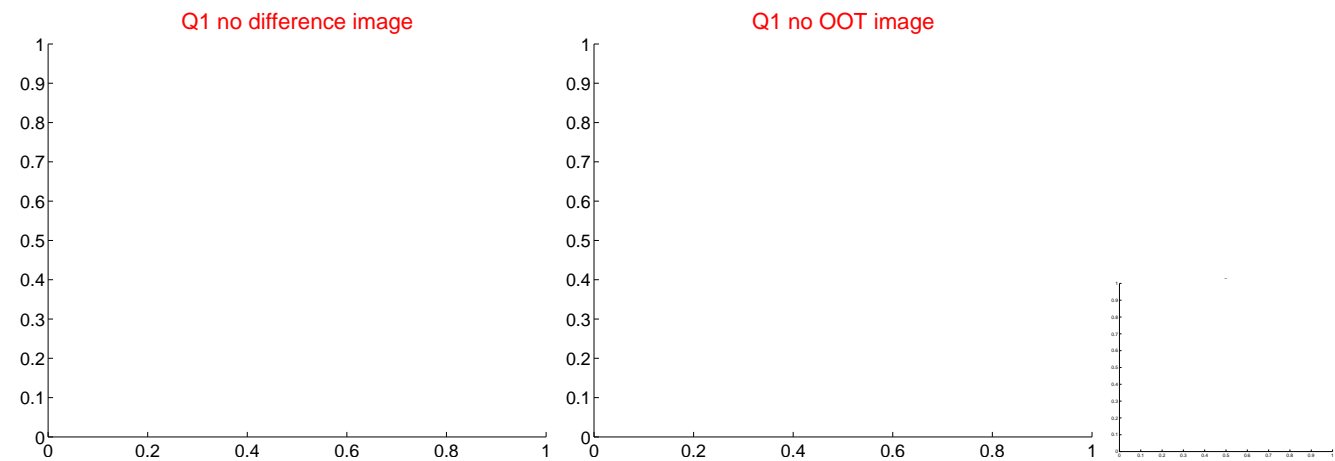
The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.993 ± 2.996	1.00	2.015 ± 1.560	-2.214 ± 2.632
PRF-fit source offset from KIC position	2.414 ± 1.555	1.55	1.531 ± 0.748	-1.867 ± 1.400
photometric centroid source offset	8.23 ± 5.33	1.54	-8.17 ± 5.29	1.02 ± 7.31



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.

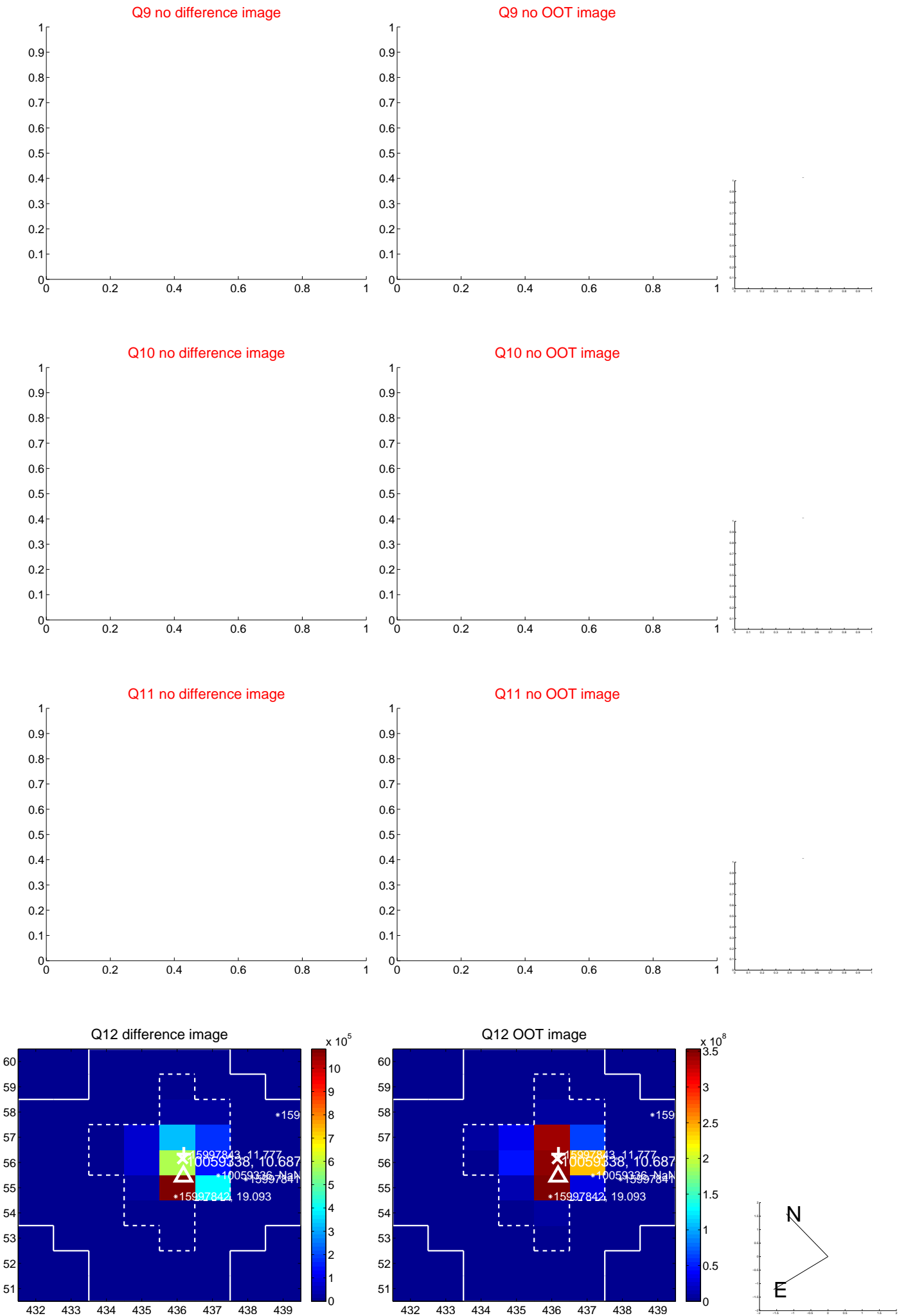
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



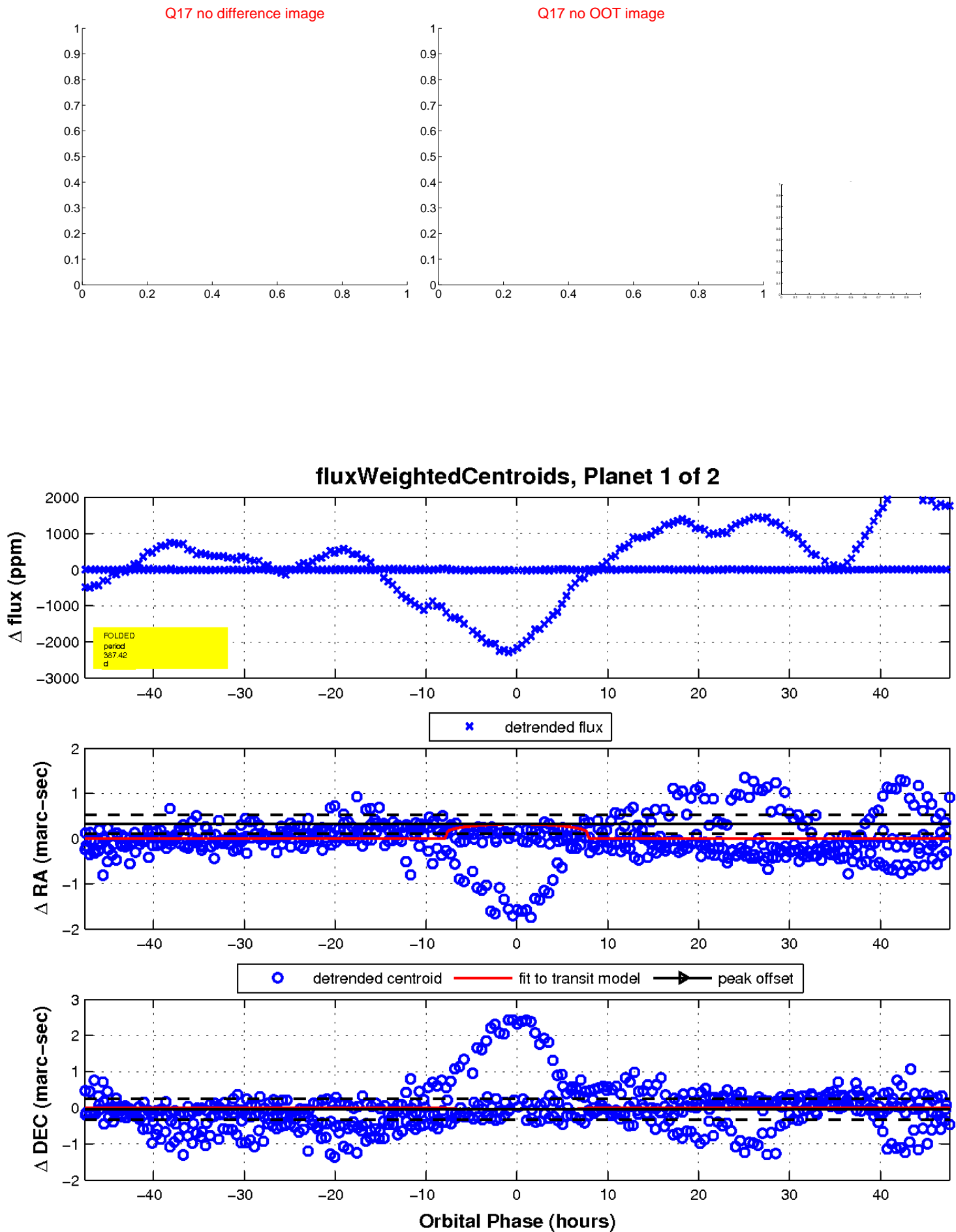
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

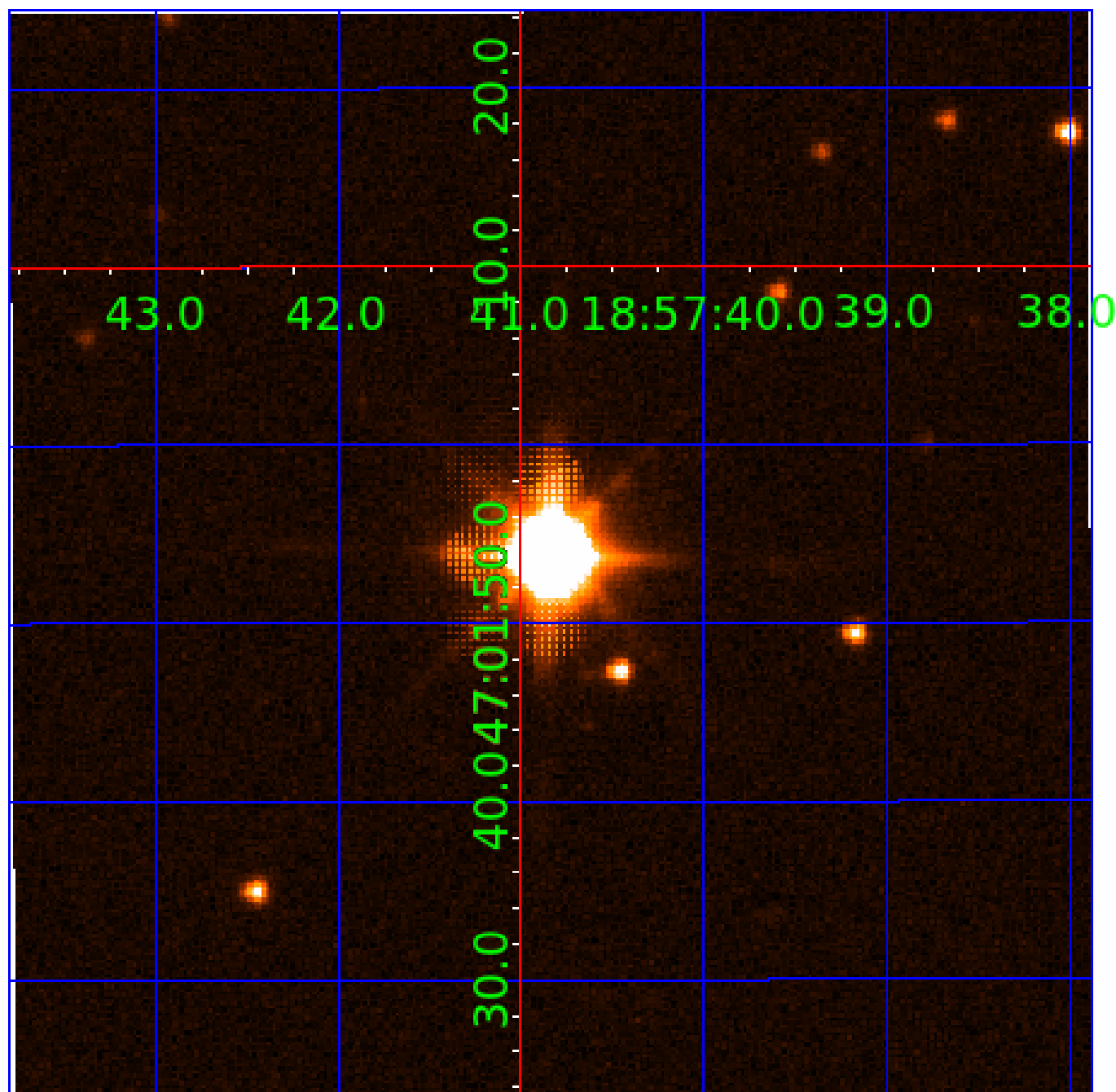


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010059338

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})
010059338-01	OBS	No	387.423115	326.726872	39.7	15.891	11.6	11.2	26.61	4458	19.21	144.50
010059338-02	OBS	No	47.427960	171.993462	24.9	1.196	11.7	13.2	26.61	4458	15.91	2377.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010059338-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED—HALO_GHOST
010059338-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

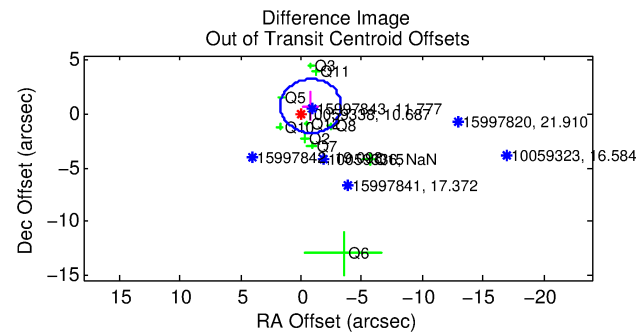
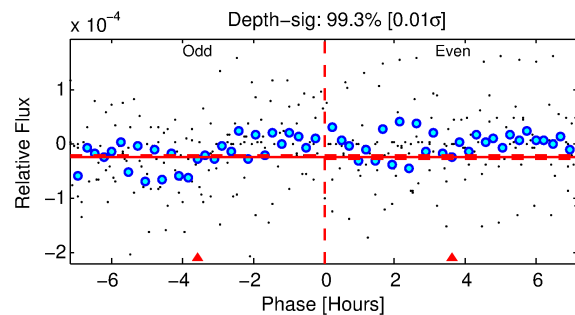
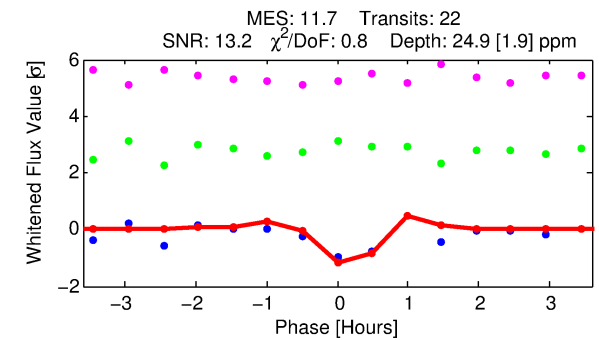
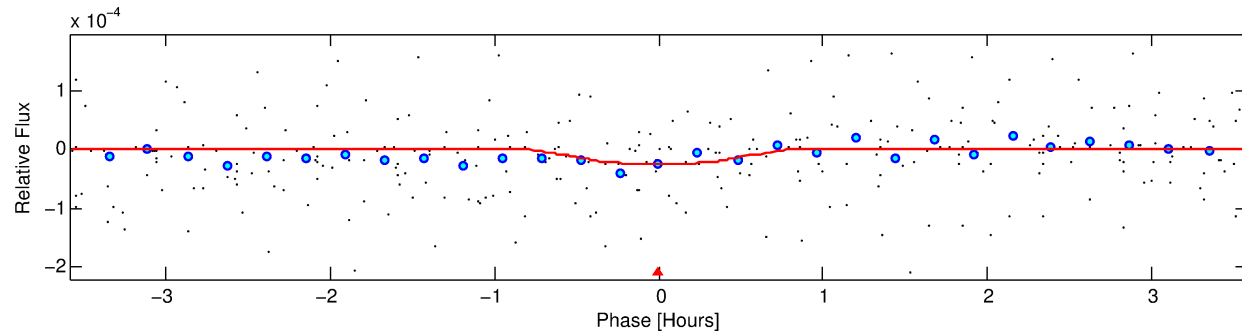
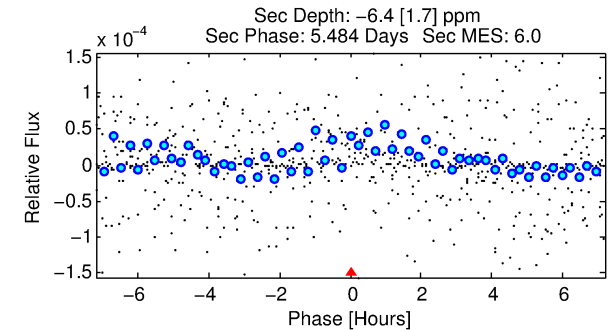
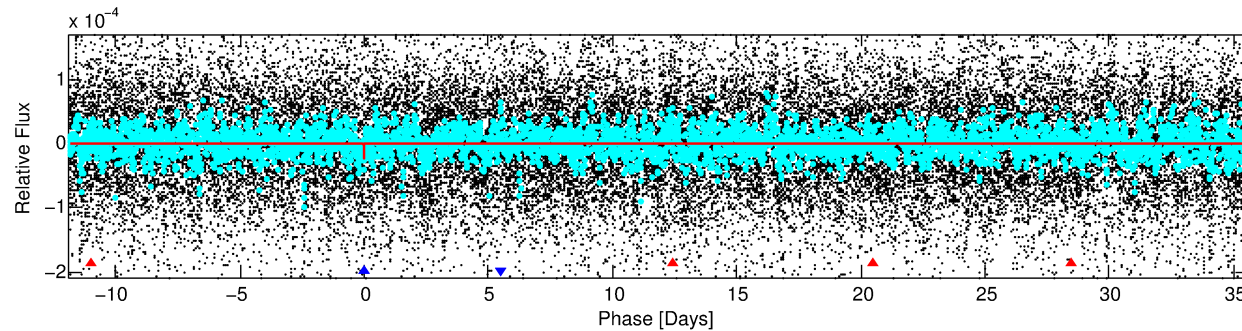
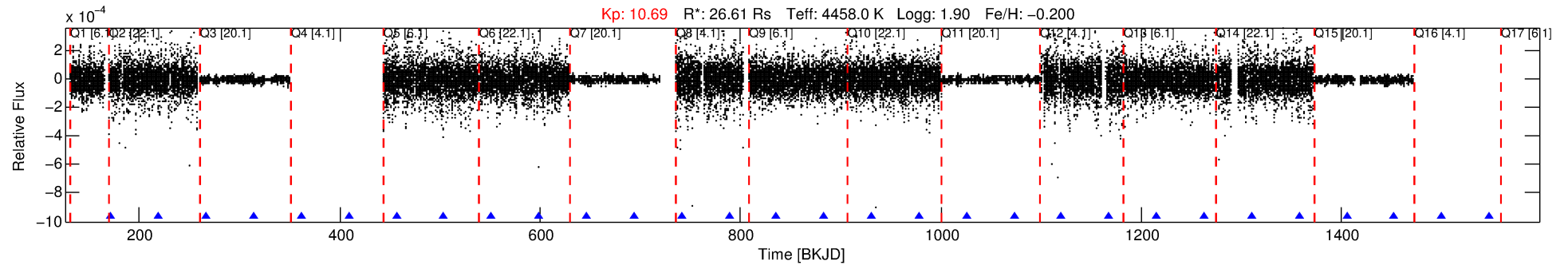
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010059338-02

No Significant Match Found

DV One-Page Summary

KIC: 10059338 Candidate: 2 of 2 Period: 47.428 d



DV Fit Results:

Period = 47.42796 [0.00021] d
Epoch = 171.9935 [0.0041] BKJD
Rp/R* = 0.0055 [0.0014]
a/R* = 155.20 [142.31]
b = 0.87 [0.27]
Seff = 2377.30 [371.58]
Teff = 1781 [70] K
Rp = 15.91 [5.22] Re
a = 0.3246 [0.0438] AU
Ag = N/A
Teffp = N/A

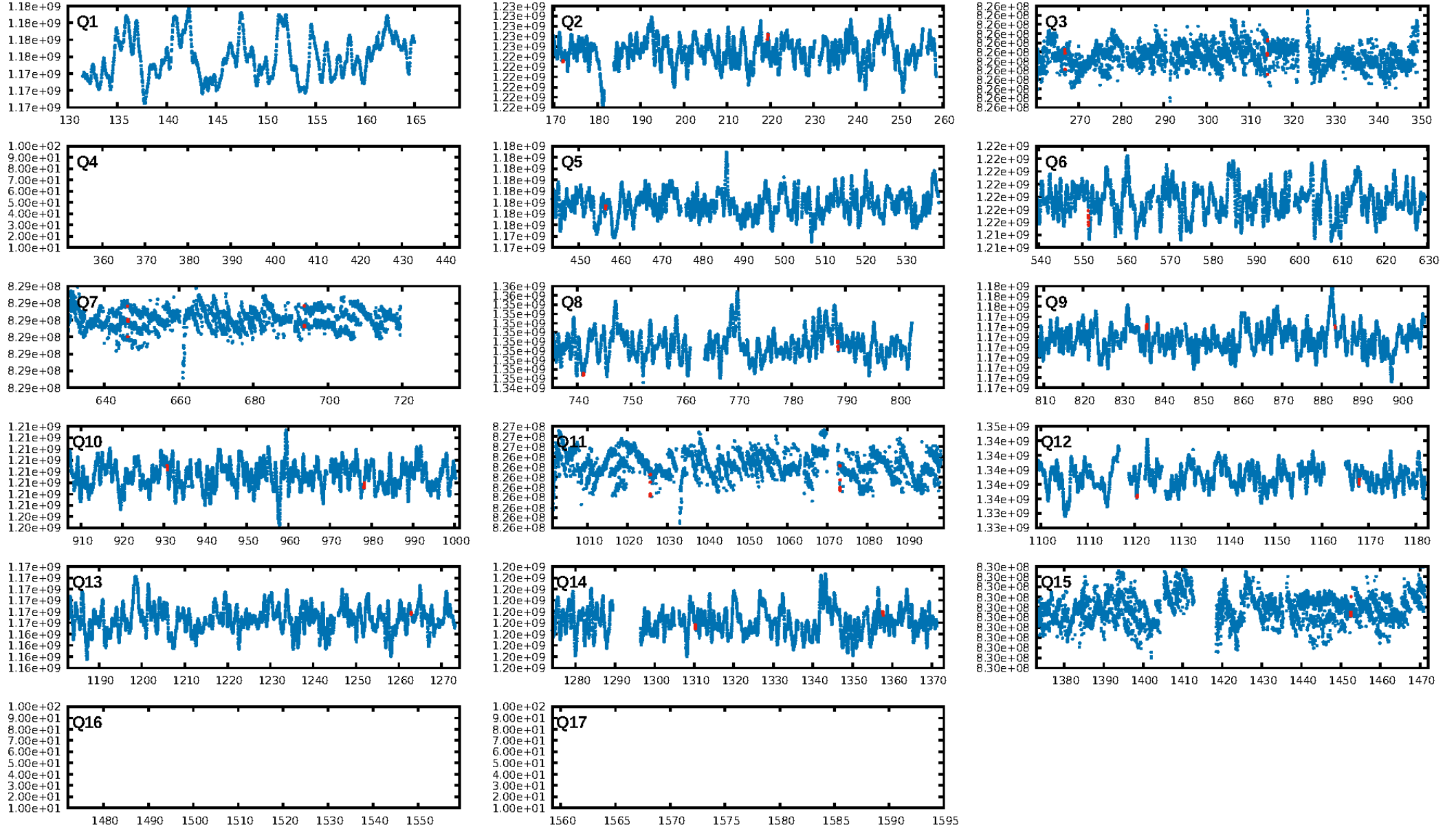
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [512.05σ]
ModelChiSquare2-sig: 98.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.12e-10
RollingBand-fgt: 1.00 [22/22]
GhostDiagnostic-chr: 3.764
Centroid-sig: 75.5%
Centroid-so: 1.594 arcsec [0.41σ]
OotOffset-rm: 1.093 arcsec [1.31σ]
OotOffset-st: 3/4/2/1 [10]
KicOffset-rm: 0.270 arcsec [0.33σ]
KicOffset-st: 3/4/2/1 [10]
DiffImageQuality-fgm: 0.30 [3/10]
DiffImageOverlap-fno: 1.00 [13/13]

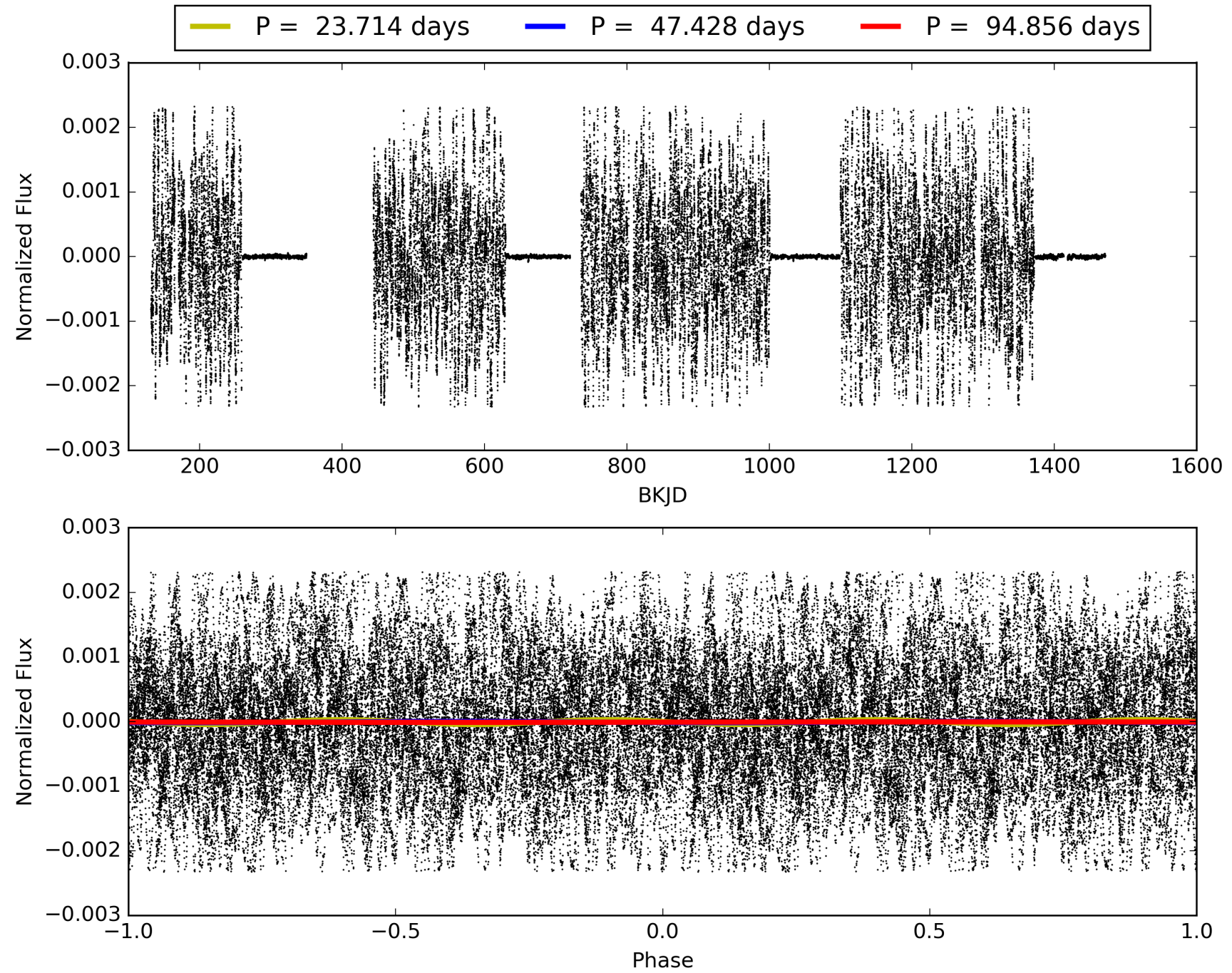
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:08:18 Z

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

TCE 010059338-02, PDC Light Curves

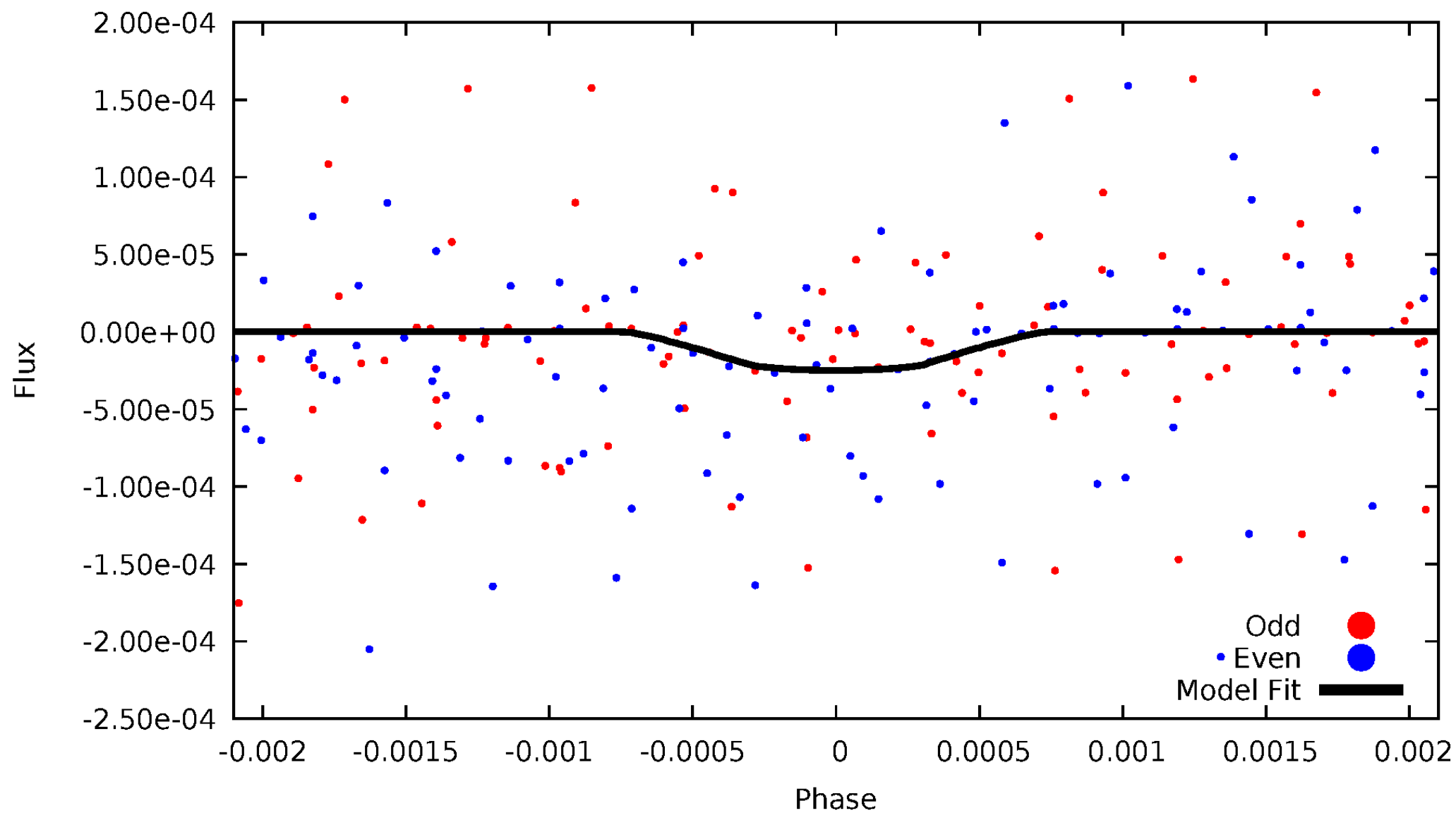


TCE 010059338-02



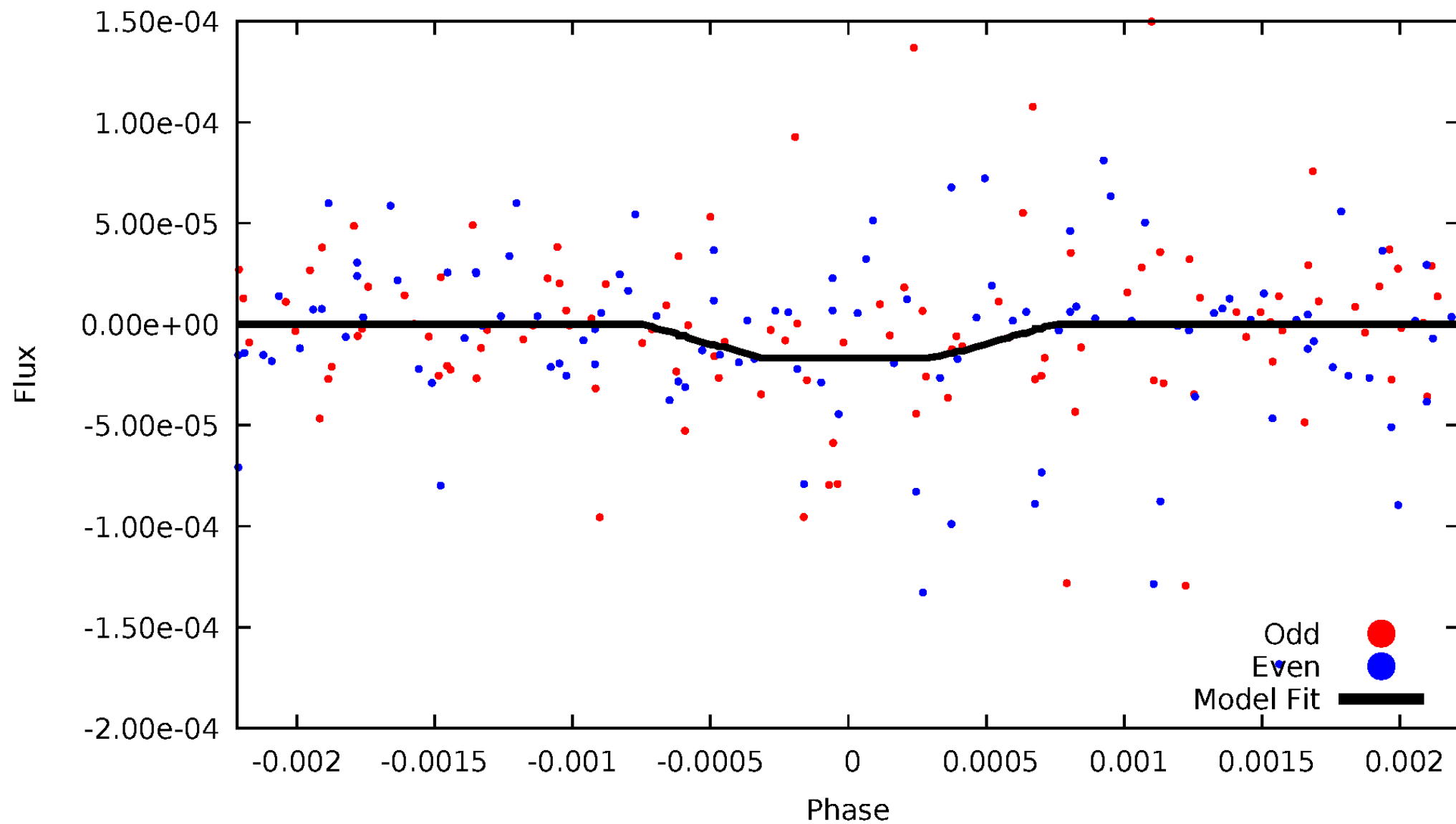
DV Odd/Even

TCE 010059338-02



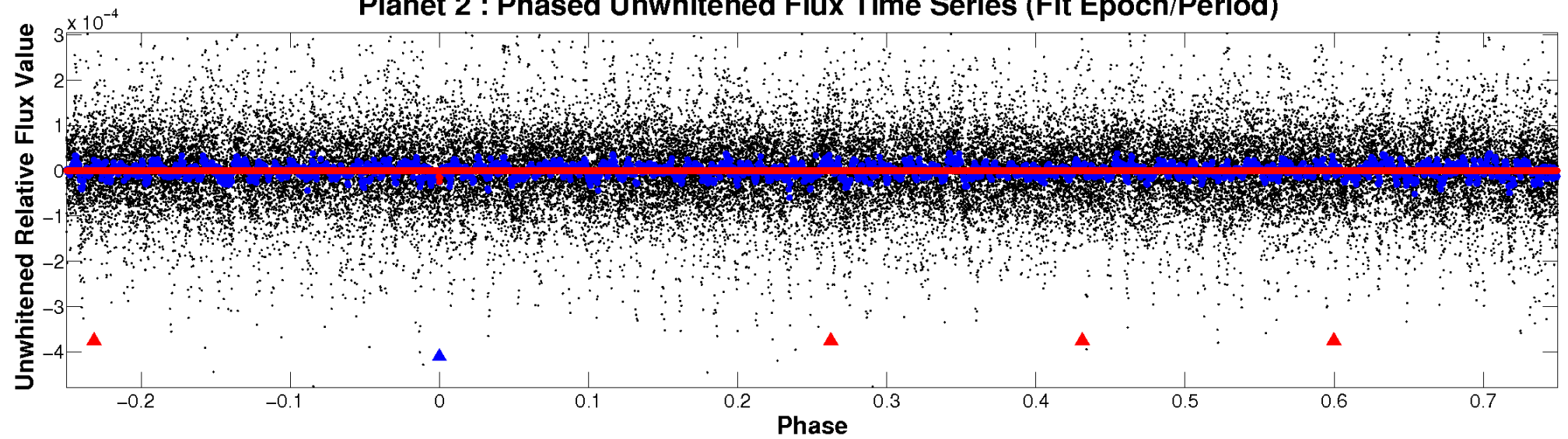
ALT Odd/Even

TCE 010059338-02

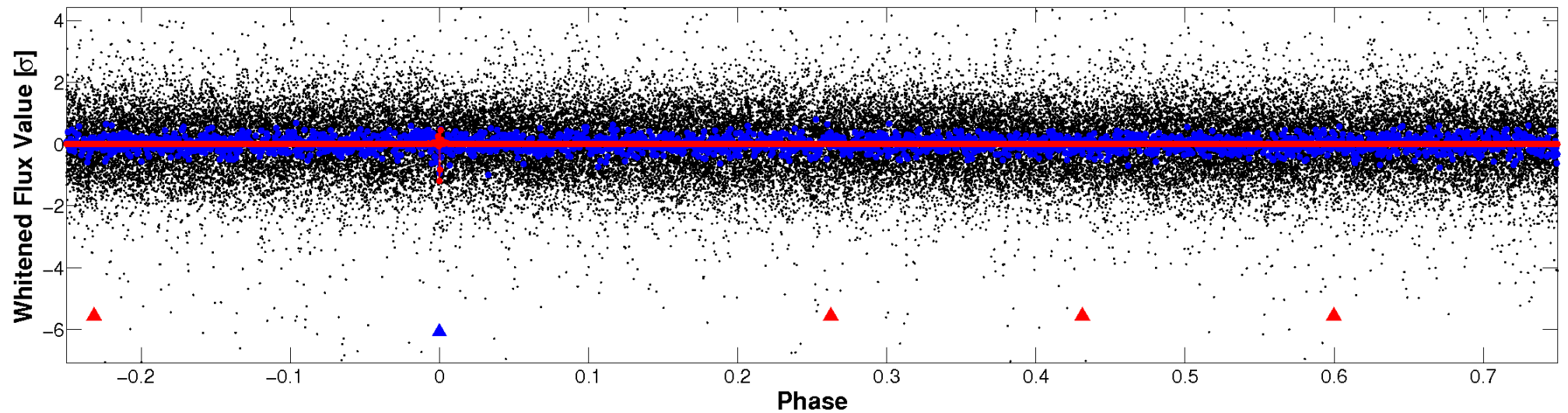


Non-Whitened Vs. Whitened Light Curve

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

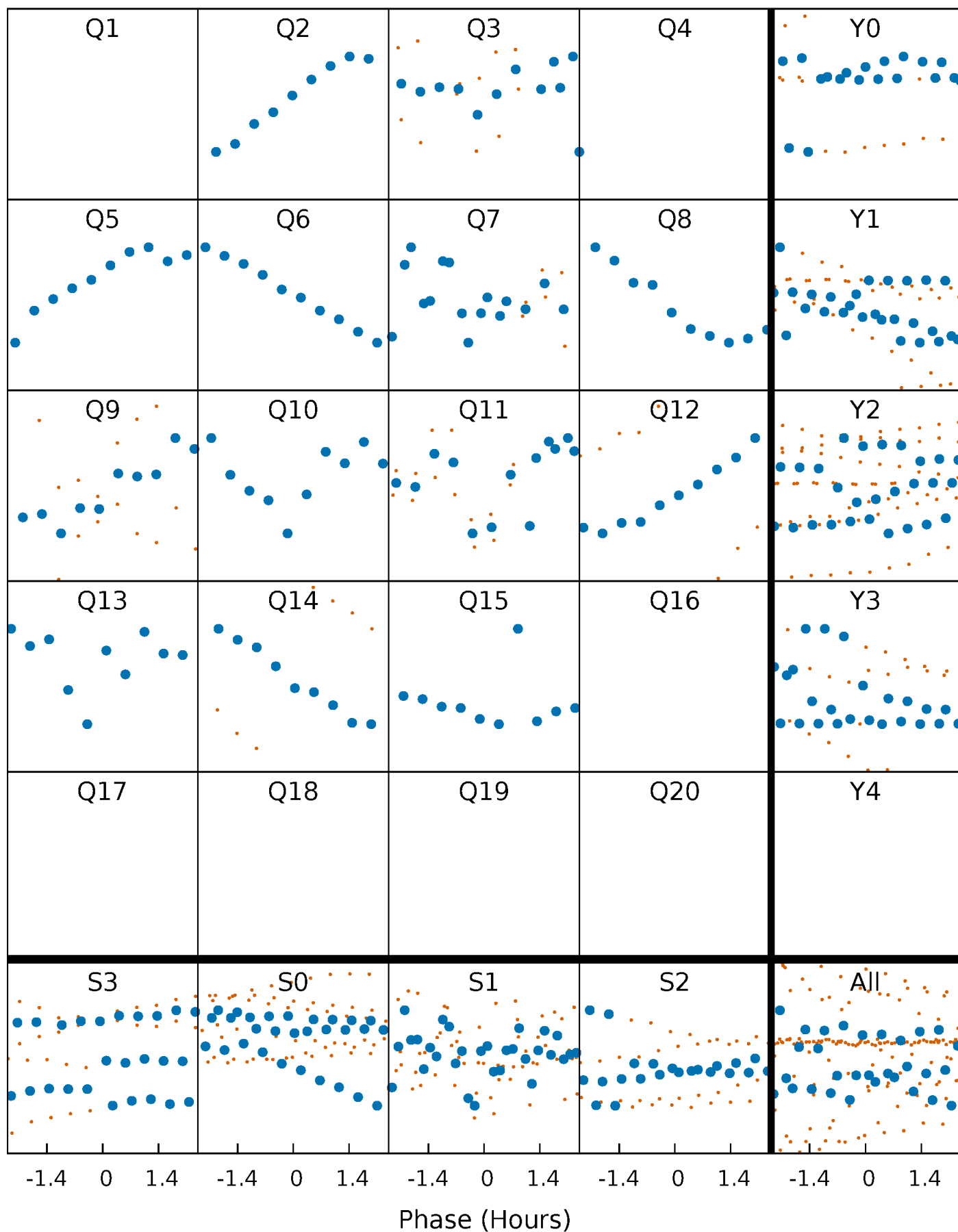


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



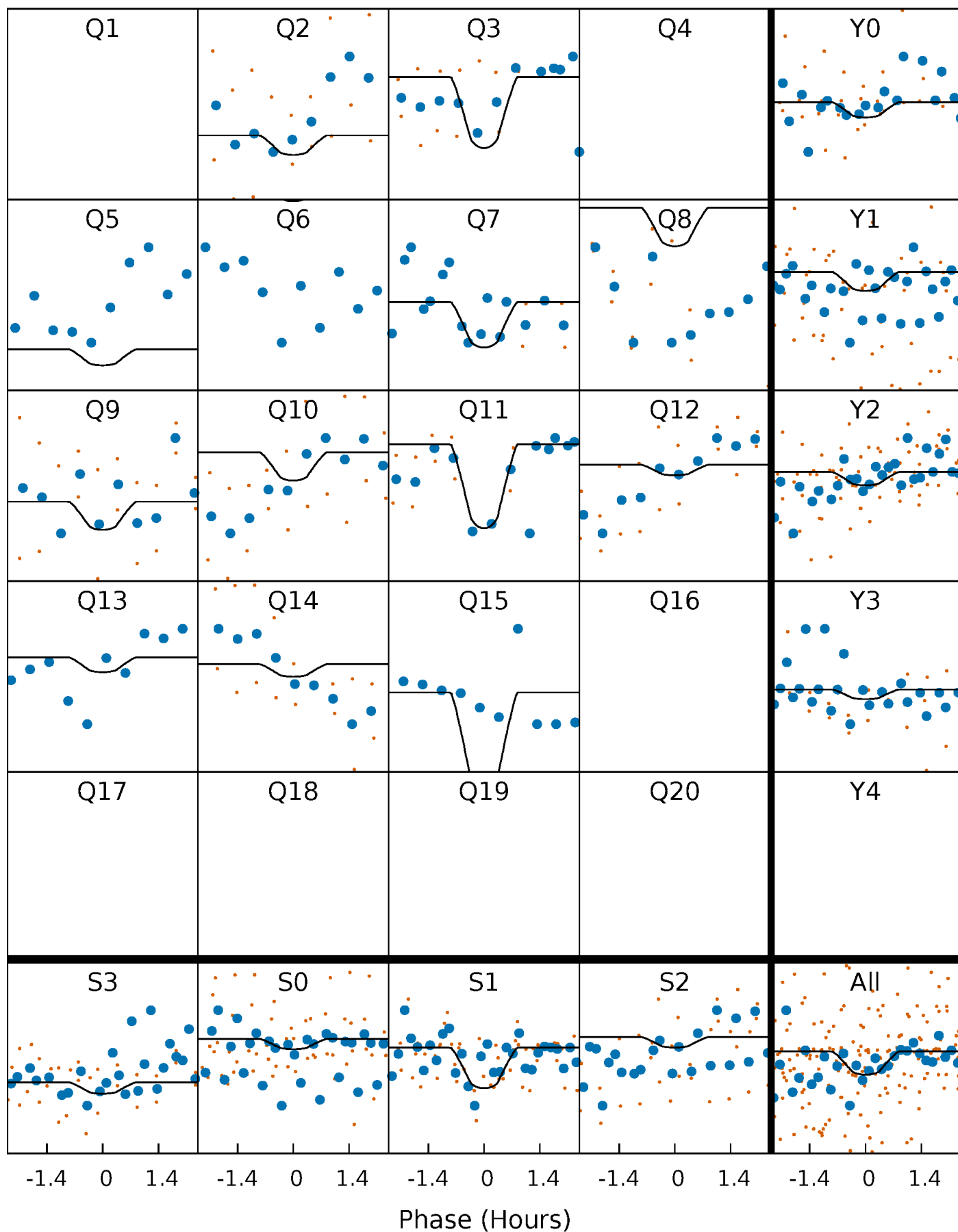
PDC Quarter-Phased Transit Curves

TCE 010059338-02 P= 47.427960 Days $T_0=171.993462$ (BKJD)



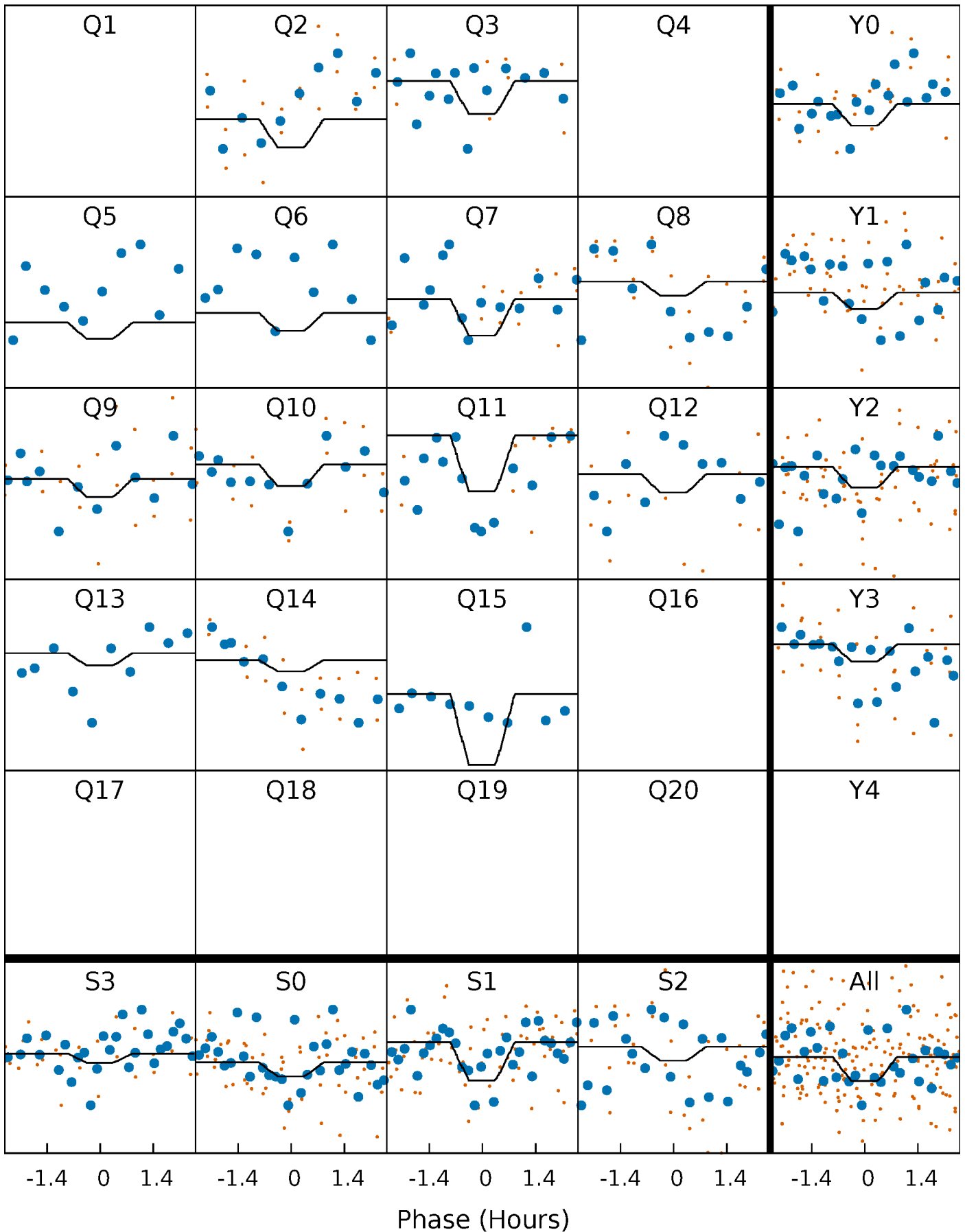
DV Quarter-Phased Transit Curves

TCE 010059338-02 P= 47.427960 Days $T_0=171.993462$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

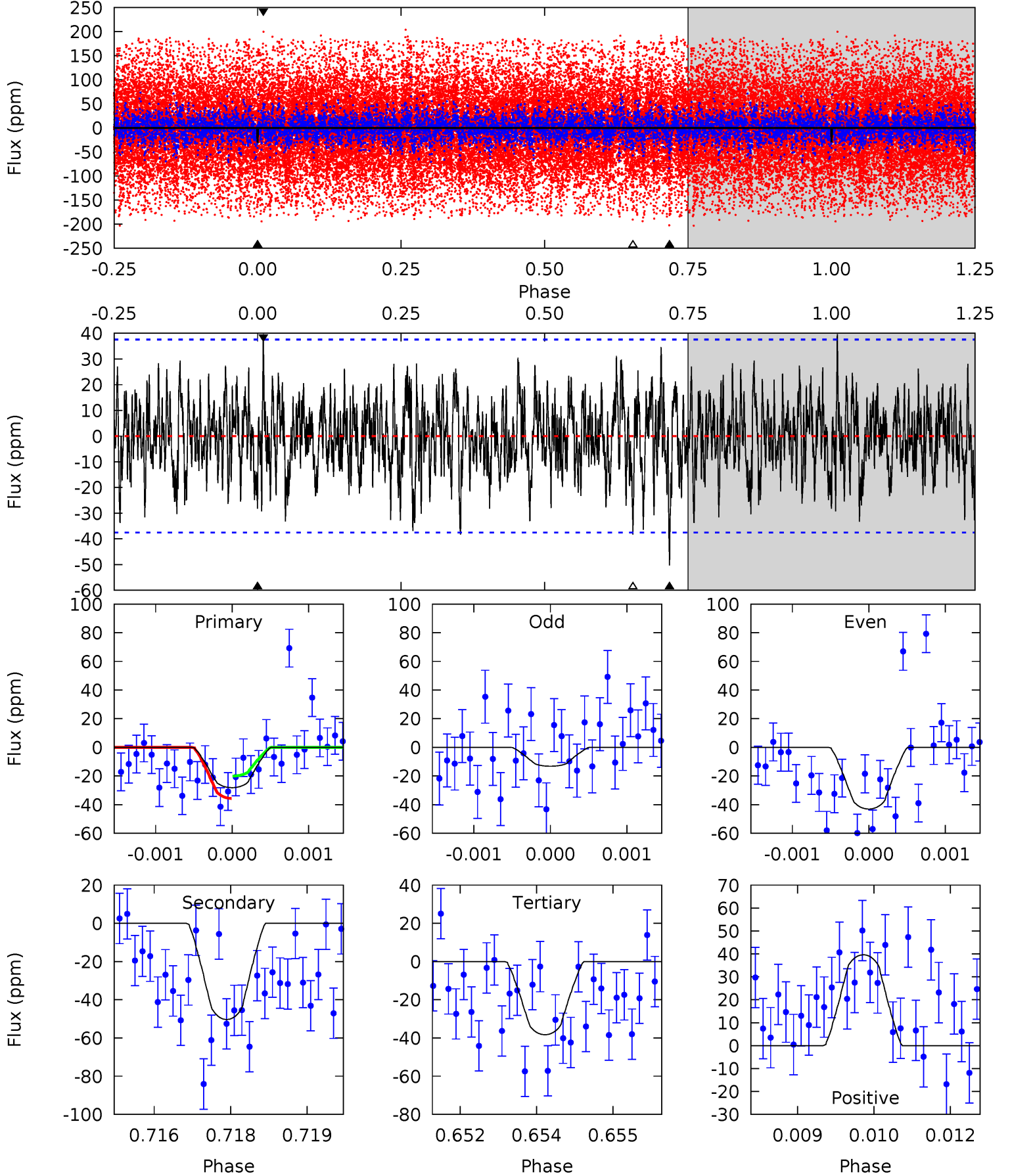
TCE 010059338-02 P= 47.427134 Days $T_0=172.002857$ (BKJD)



DV Model-Shift Uniqueness Test

010059338-02, $P = 47.427960$ Days, $E = 124.565502$ Days

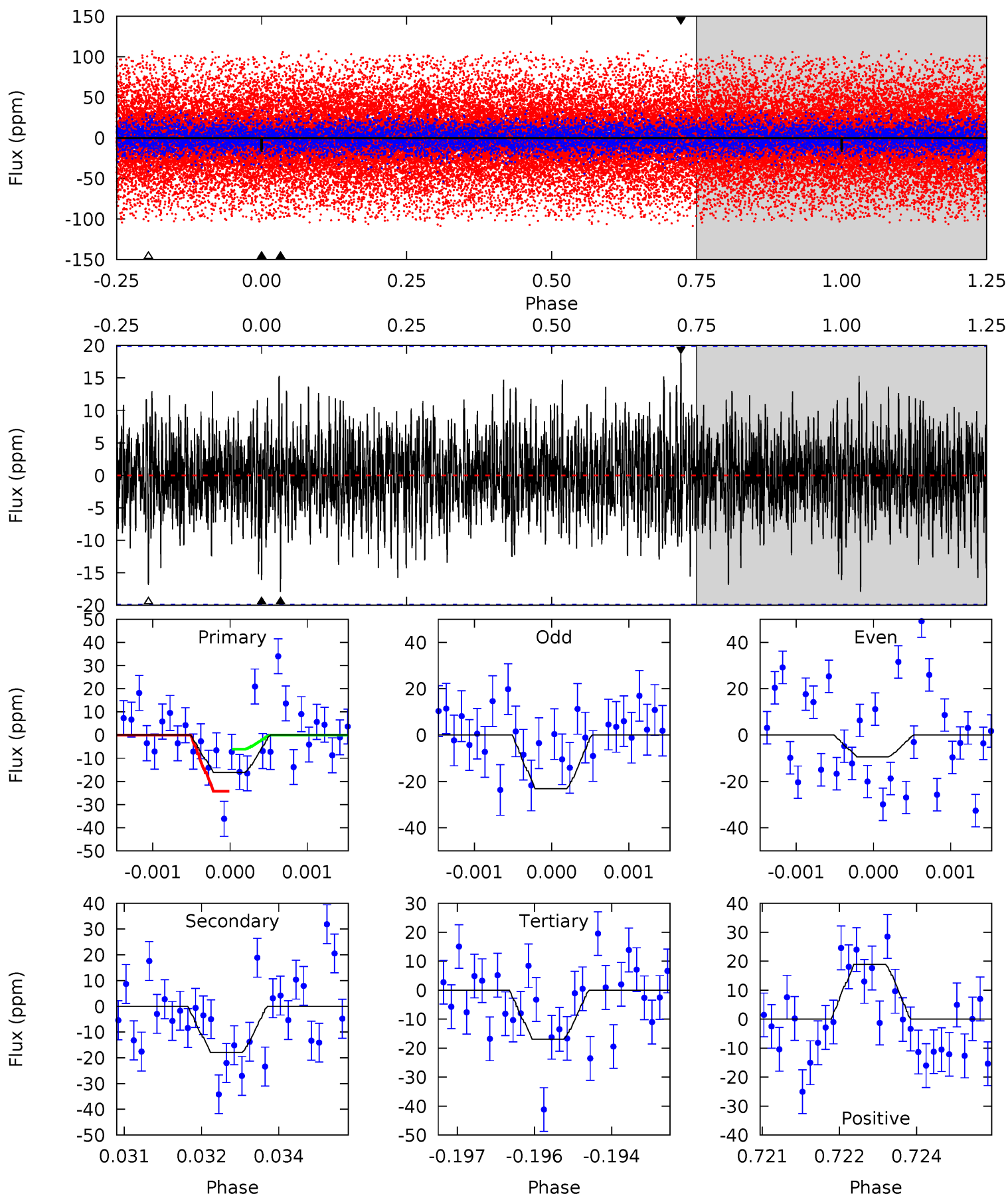
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.04	7.22	5.49	5.68	5.38	3.18	1.77	-1.45	-1.64	1.73	1.54	2.16	1.07	0.44	1.14



Alt Model-Shift Uniqueness Test

010059338-02, P = 47.427134 Days, E = 124.575723 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.35	4.84	4.56	5.12	5.38	3.18	1.35	-0.21	-0.77	0.28	-0.28	1.88	0.88	0.51	2.48



Stellar Parameters For KIC 010059338

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4458^{+46}_{-73}	$1.895^{+0.027}_{-0.033}$	$-0.200^{+0.100}_{-0.150}$	$26.608^{+1.411}_{-5.291}$	$2.028^{+0.113}_{-0.738}$	$0.000^{+0.000}_{-0.000}$
	+1%/-2%	+1%/-2%	+50%/-75%	+5%/-20%	+6%/-36%	+30%/-8%
Source	SPE74	AST9	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 010059338-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-50 ± 7	$15.84^{+4.41}_{-4.21}$	2491^{+42}_{-52}	4903^{+715}_{-463}	11^{+10}_{-4}
Alt.	-18 ± 4	$11.62^{+4.55}_{-3.92}$	2494^{+37}_{-53}	4486^{+821}_{-560}	$7.466^{+8.955}_{-3.628}$

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

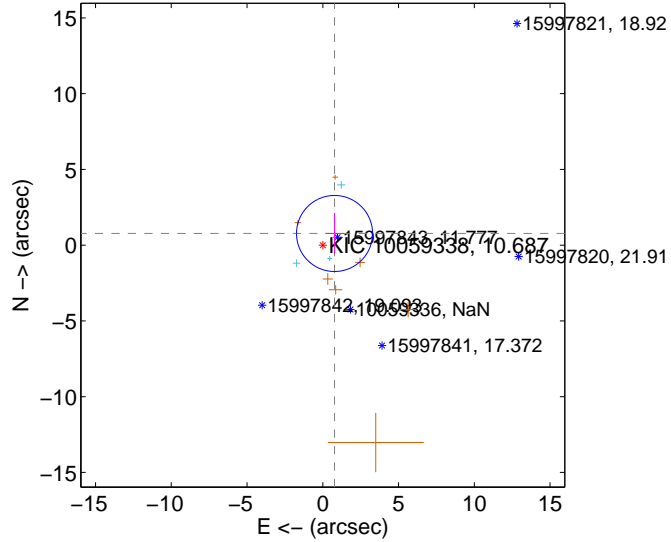
Supplemental centroid analysis for 010059338-02. **Kepler magnitude: 10.69.** Transit SNR 13.24

There are 3 quarters with good PRF difference image offsets

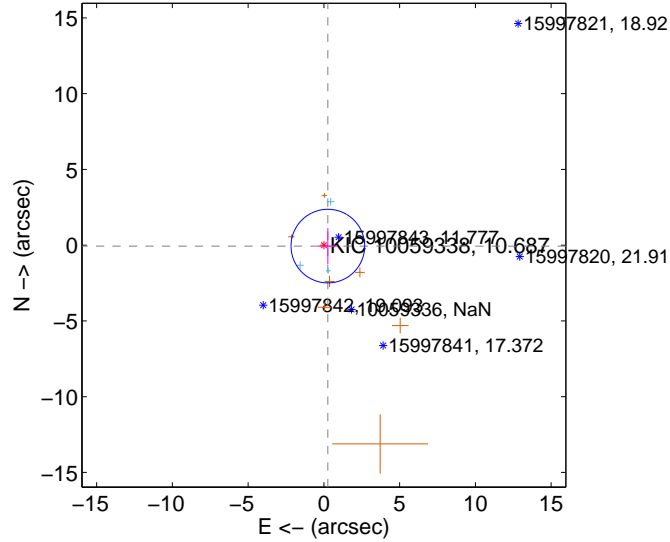
The direct PRF centroid is offset from the target star catalog position by about 1.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.093 ± 0.837	1.31	-0.775 ± 0.609	0.771 ± 1.354
PRF-fit source offset from KIC position	0.270 ± 0.810	0.33	-0.262 ± 0.650	-0.061 ± 1.186
photometric centroid source offset	1.59 ± 3.90	0.41	0.45 ± 3.91	-1.53 ± 3.90

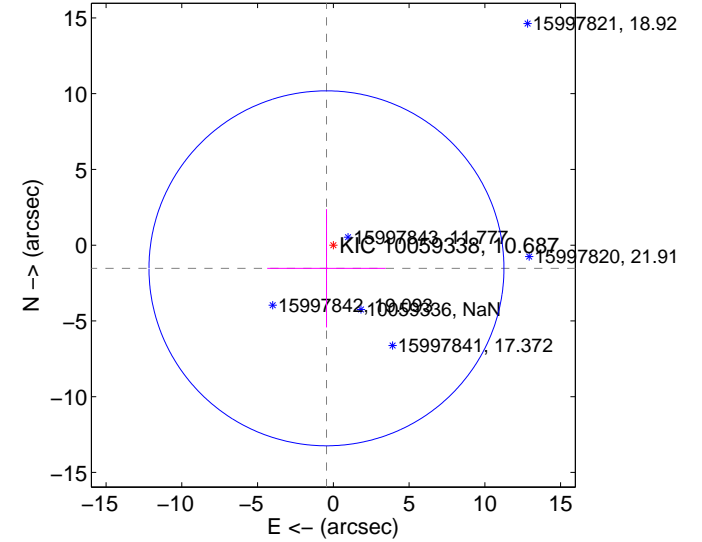
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

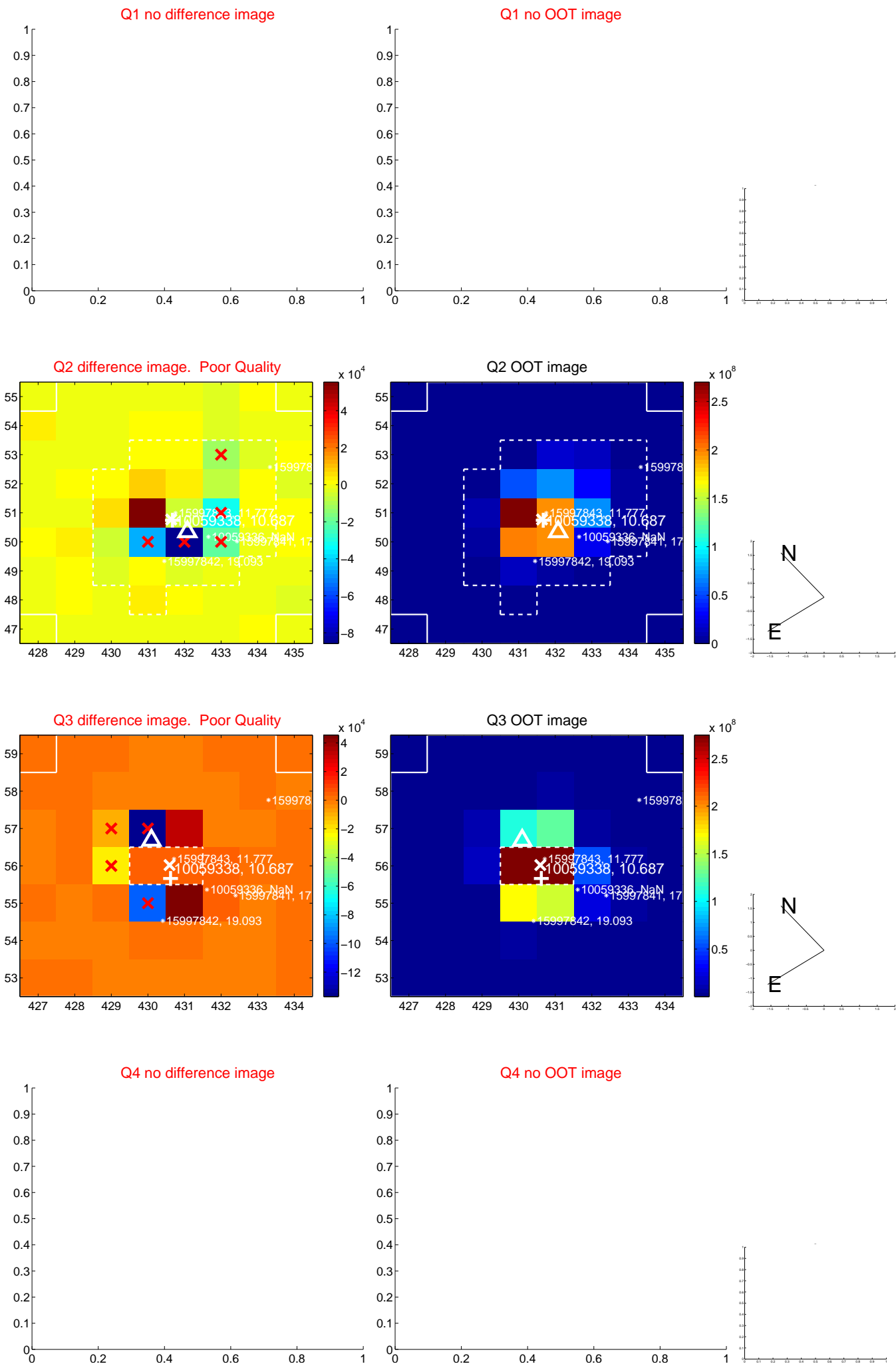


offset from photometric centroids

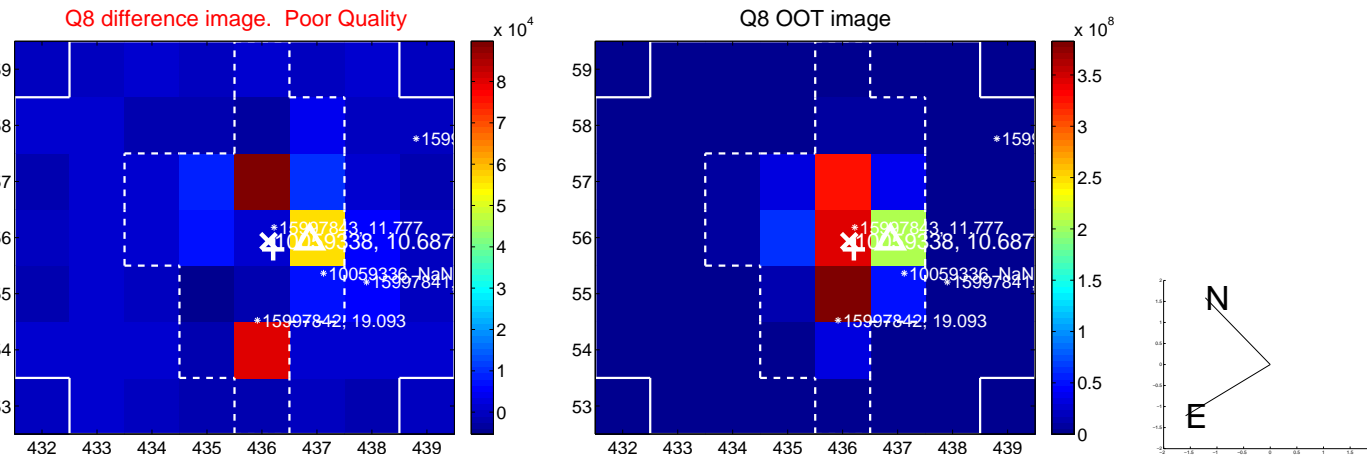
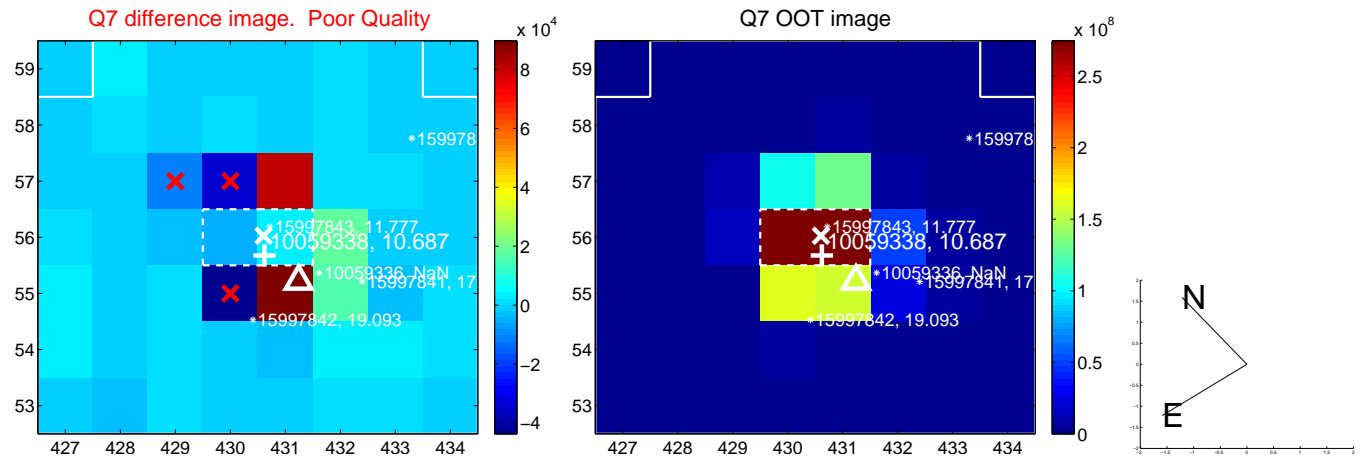
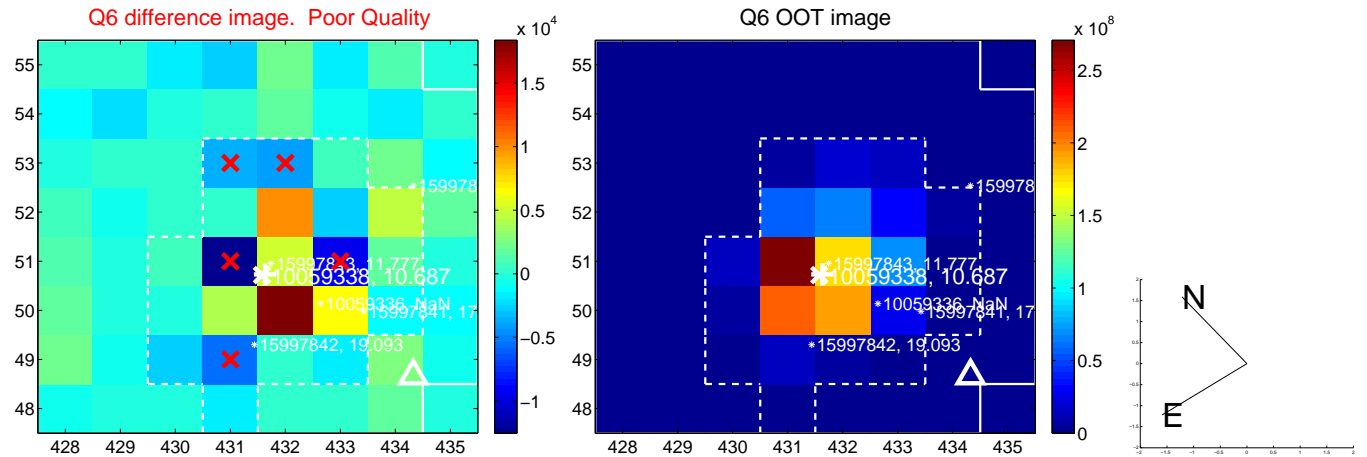
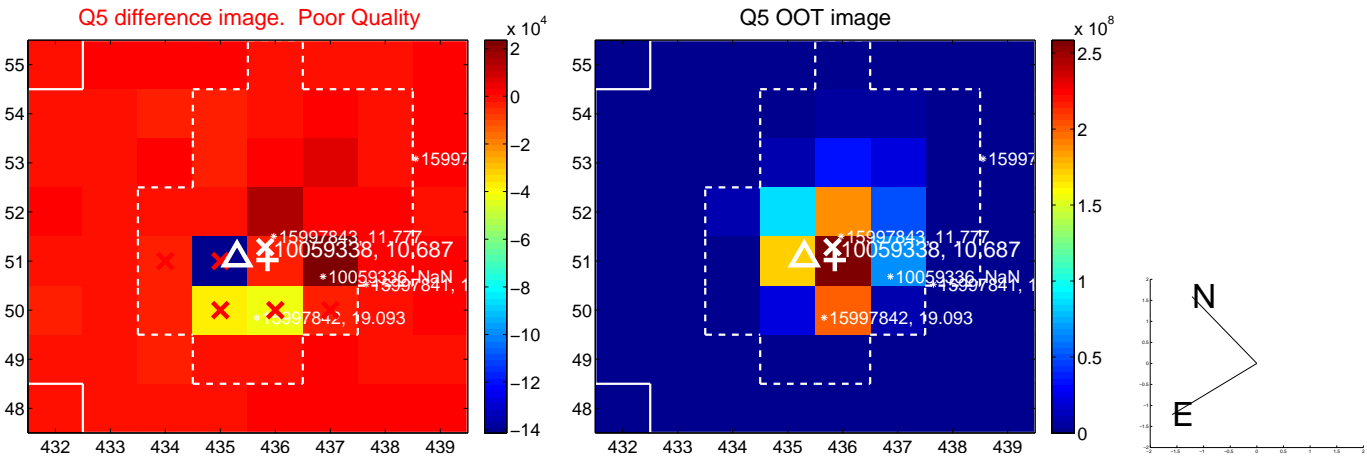


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

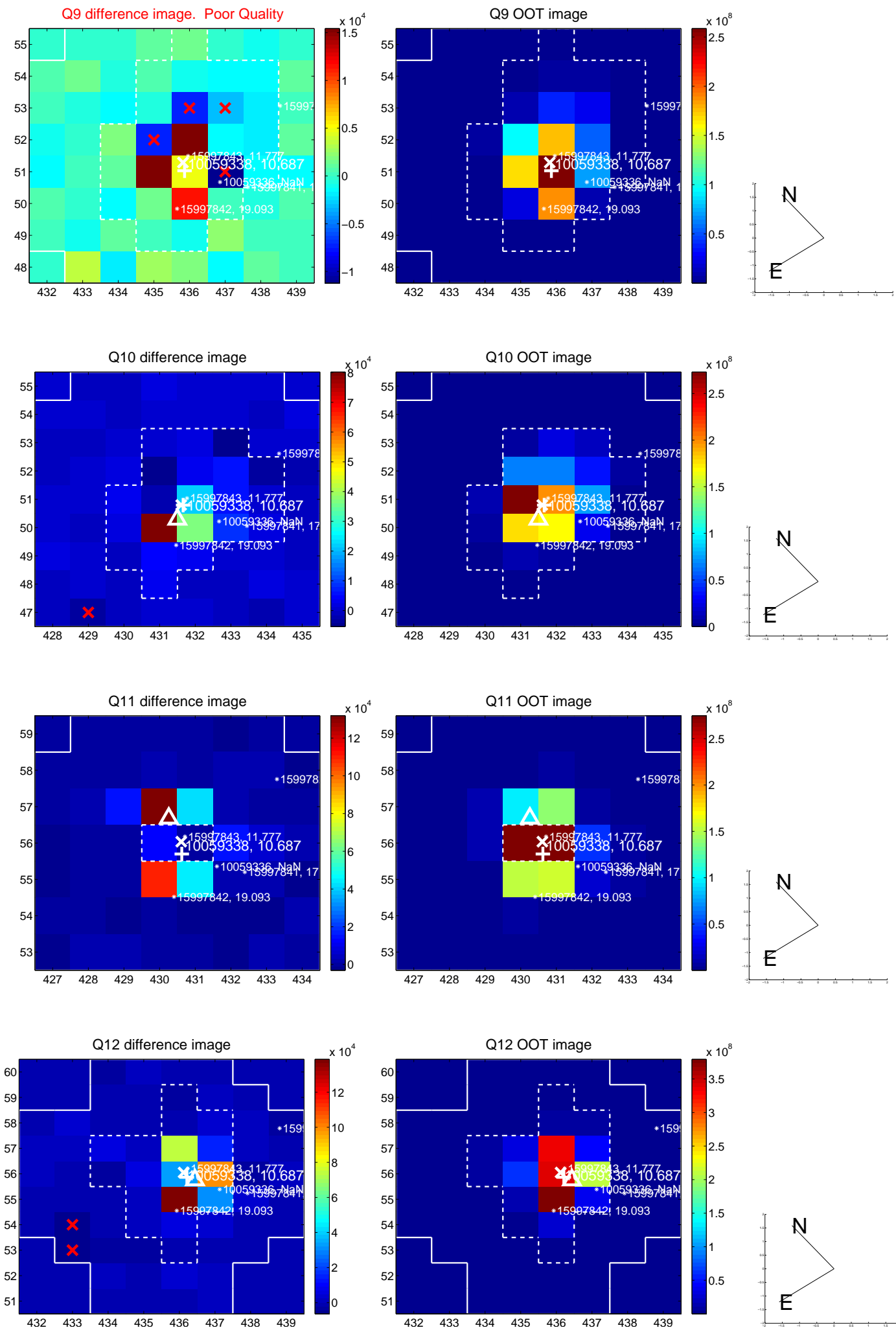
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



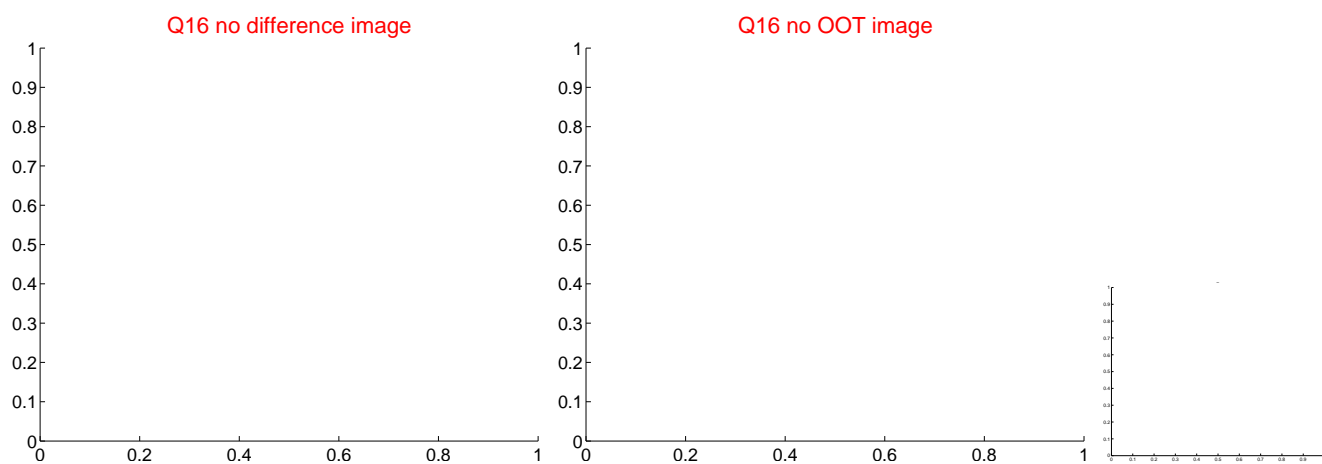
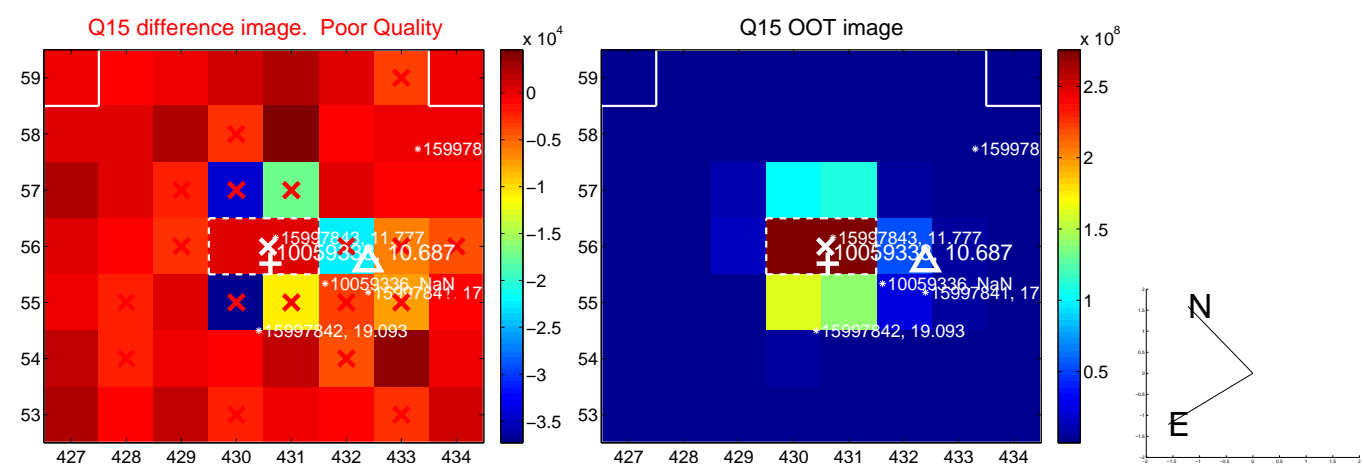
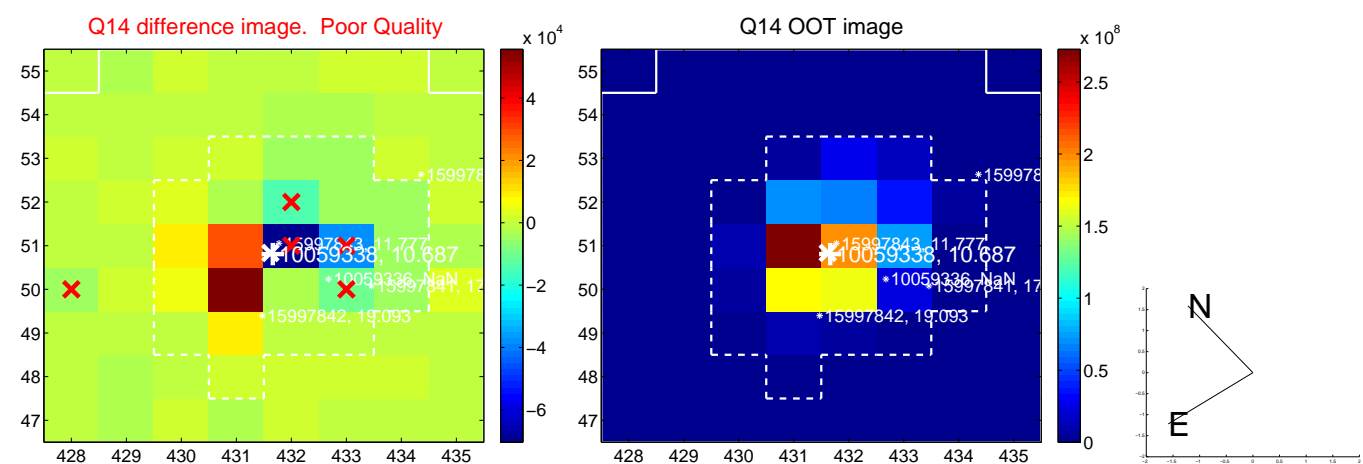
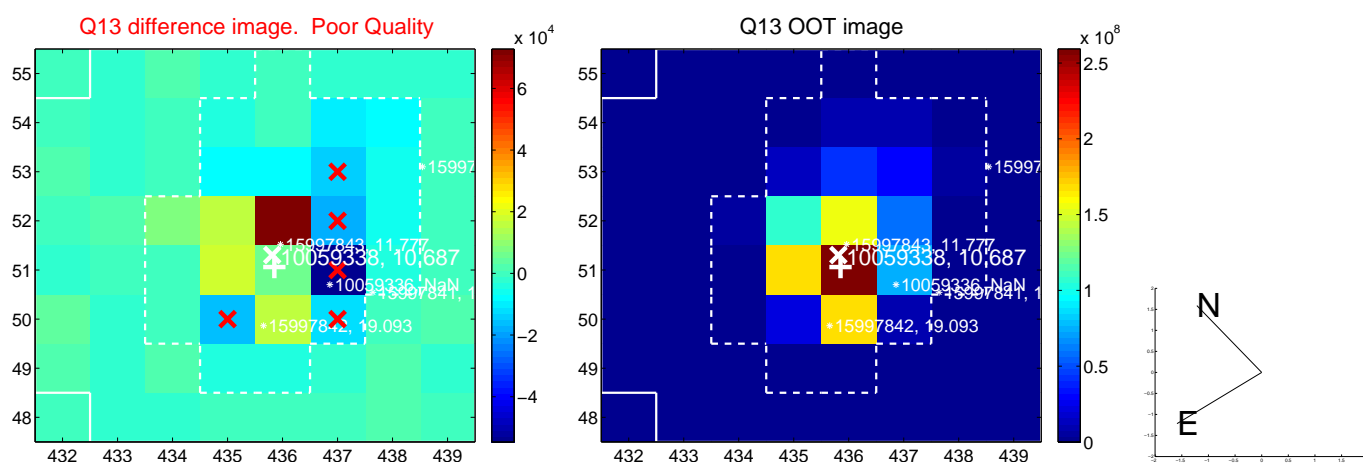
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



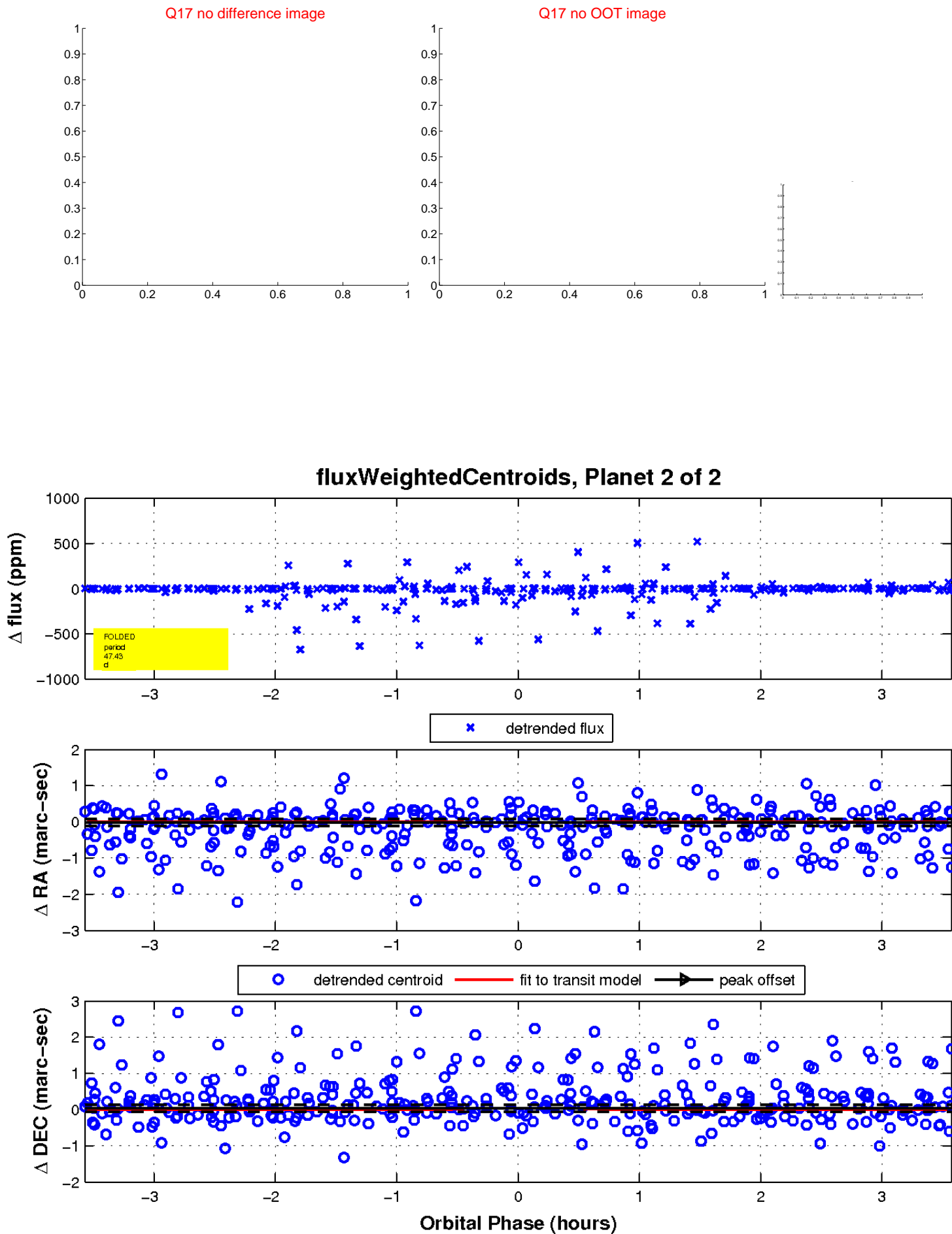
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

