

KIC 009897838

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})
009897838-01	OBS	No	39.229926	132.630375	32.3	1.592	11.1	12.7	2.34	5050	1.66	69.70
009897838-02	OBS	No	39.347268	133.112509	20.6	3.508	7.6	8.7	2.34	5050	1.28	69.43

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009897838-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009897838-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST

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

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

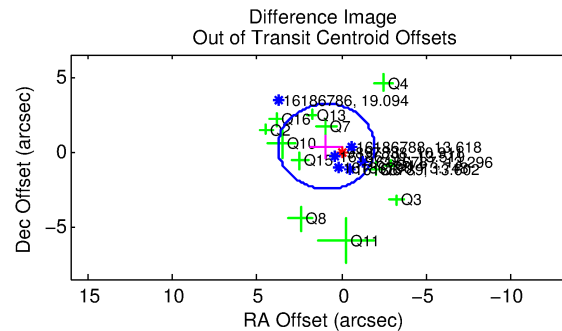
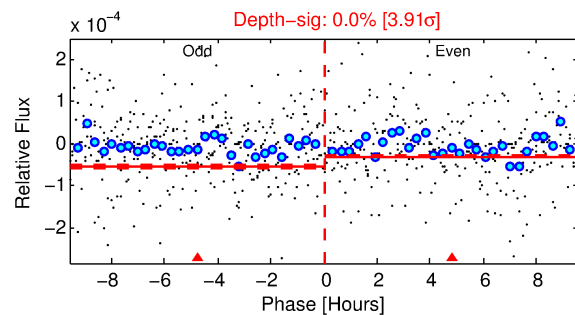
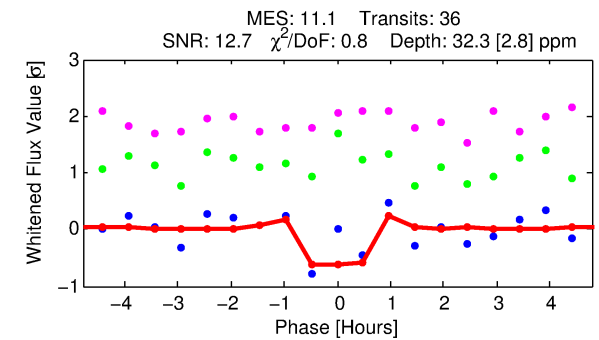
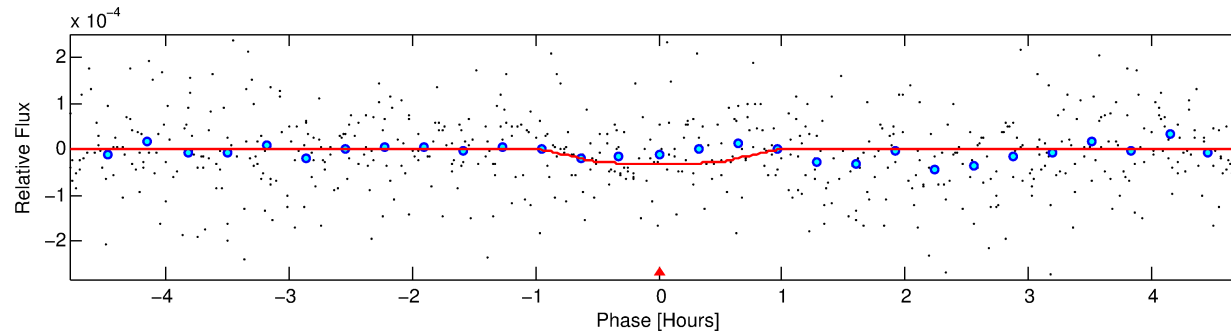
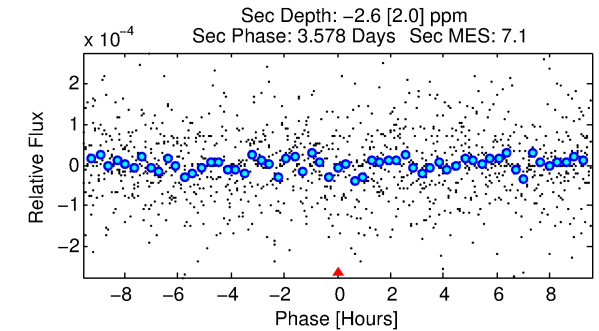
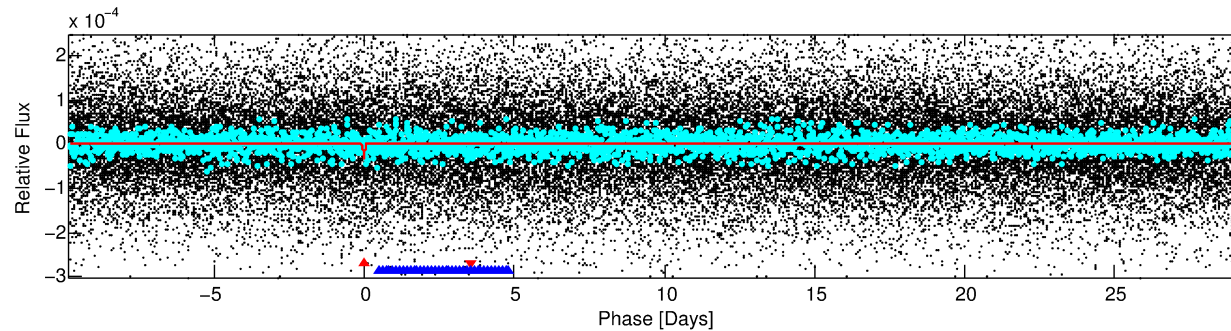
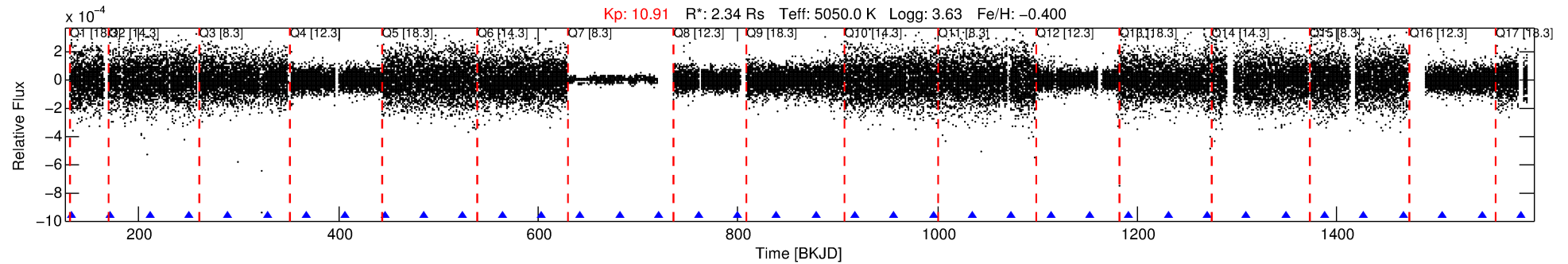
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009897838-01

No Significant Match Found

DV One-Page Summary

KIC: 9897838 Candidate: 1 of 2 Period: 39.230 d



DV Fit Results:

Period = 39.22993 [0.00023] d
Epoch = 132.6304 [0.0030] BKJD
Rp/R* = 0.0065 [0.0017]
a/R* = 74.57 [80.68]
b = 0.93 [0.17]
Seff = 69.70 [10.78]
Teq = 737 [28] K
Rp = 1.66 [0.49] Re
a = 0.2139 [0.0233] AU
Ag = N/A
Teffp = N/A

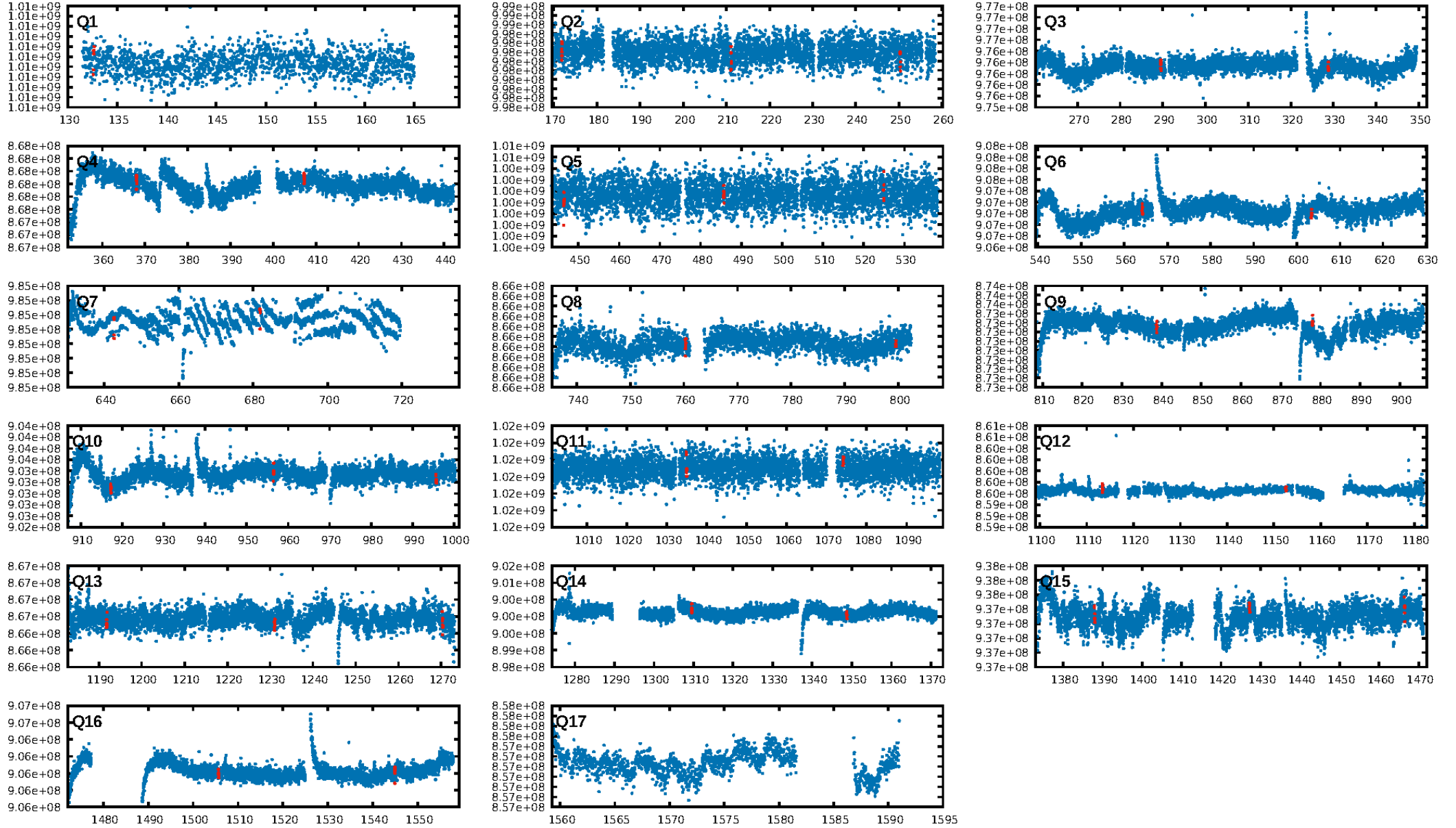
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 53.5% [0.73σ]
ModelChiSquare2-sig: 89.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.27e-19
RollingBand-fgt: 1.00 [35/35]
GhostDiagnostic-chr: -0.6057
Centroid-sig: N/A
Centroid-so: 1.134 arcsec [0.62σ]
OotOffset-rm: 0.965 arcsec [1.02σ]
KicOffset-rm: 0.584 arcsec [0.61σ]
OotOffset-st: 4/4/3/1 [12]
KicOffset-st: 4/4/3/1 [12]
DiffImageQuality-fgm: 0.17 [2/12]
DiffImageOverlap-fno: 1.00 [16/16]

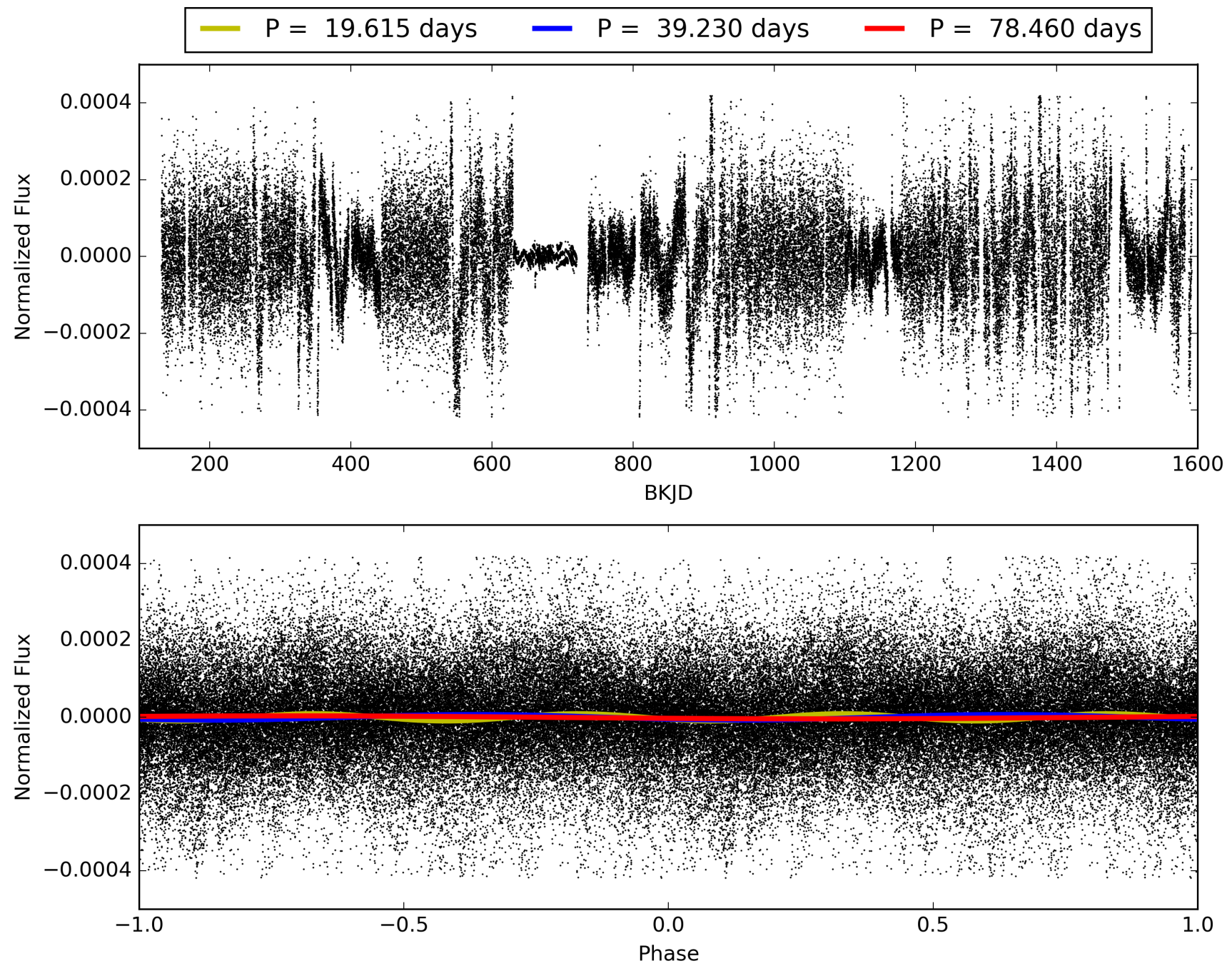
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:24:29 Z

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

TCE 009897838-01, PDC Light Curves

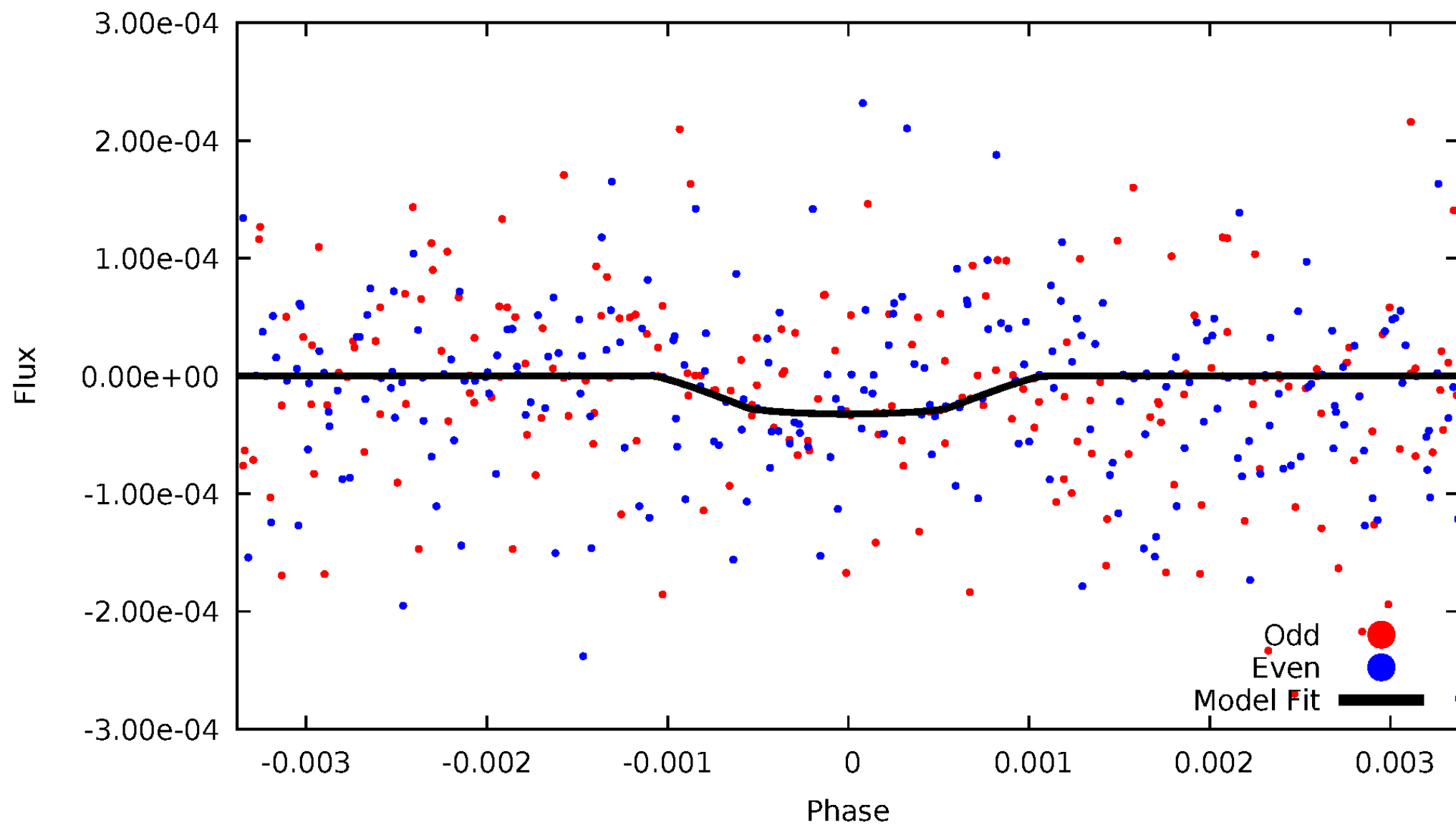


TCE 009897838-01



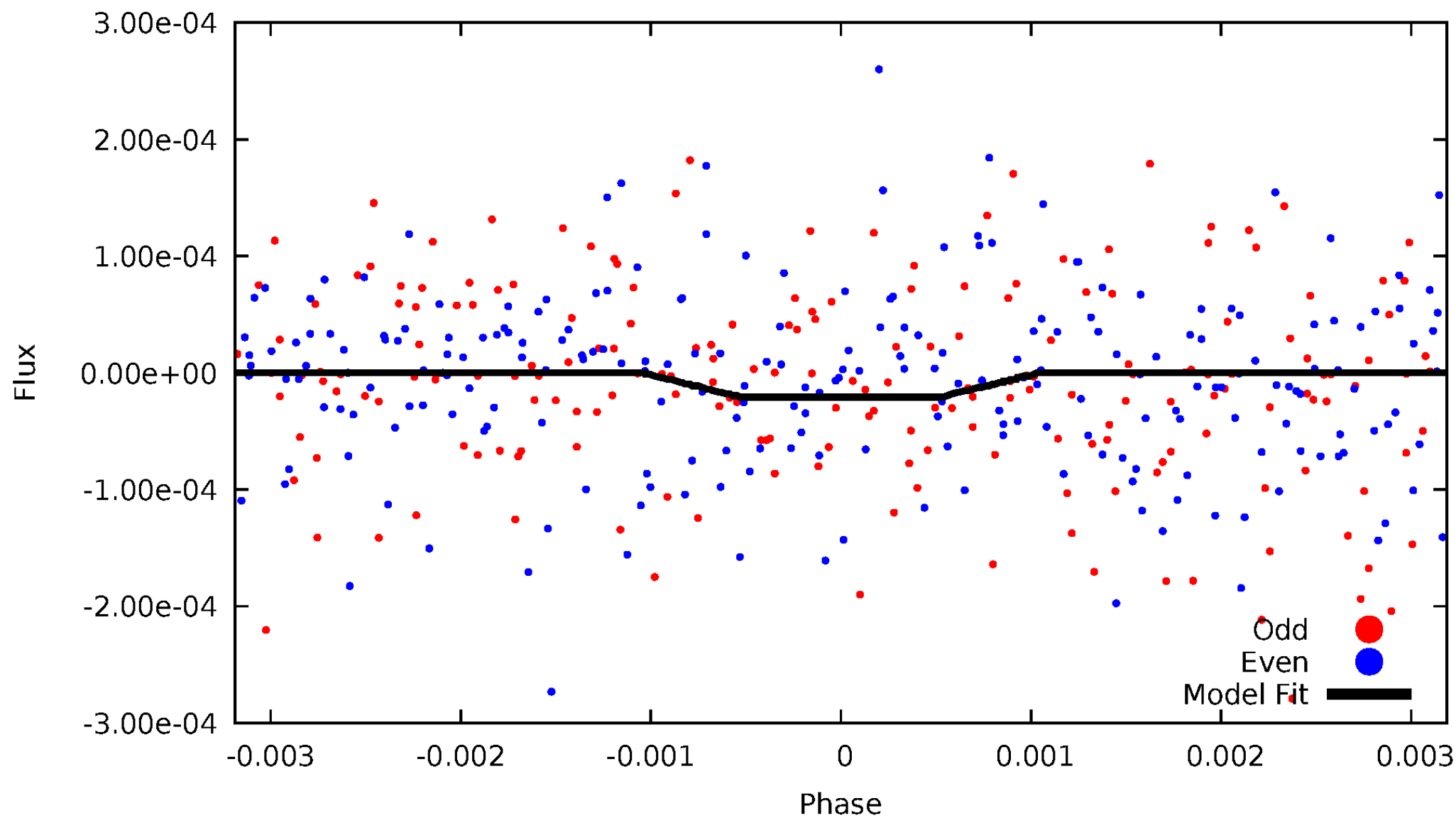
DV Odd/Even

TCE 009897838-01



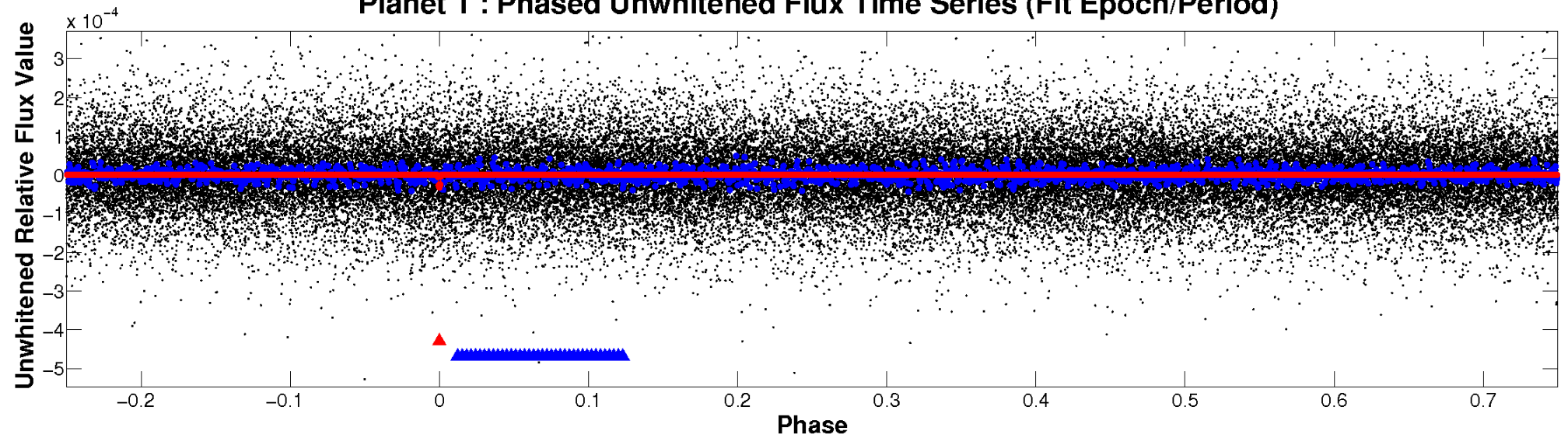
ALT Odd/Even

TCE 009897838-01

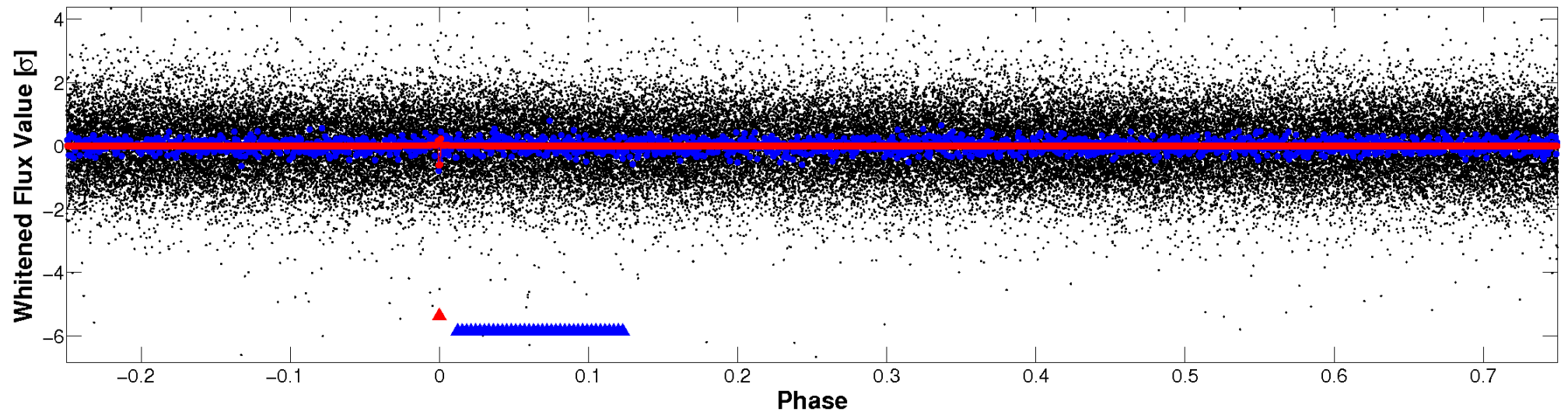


Non-Whitened Vs. Whitened Light Curve

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

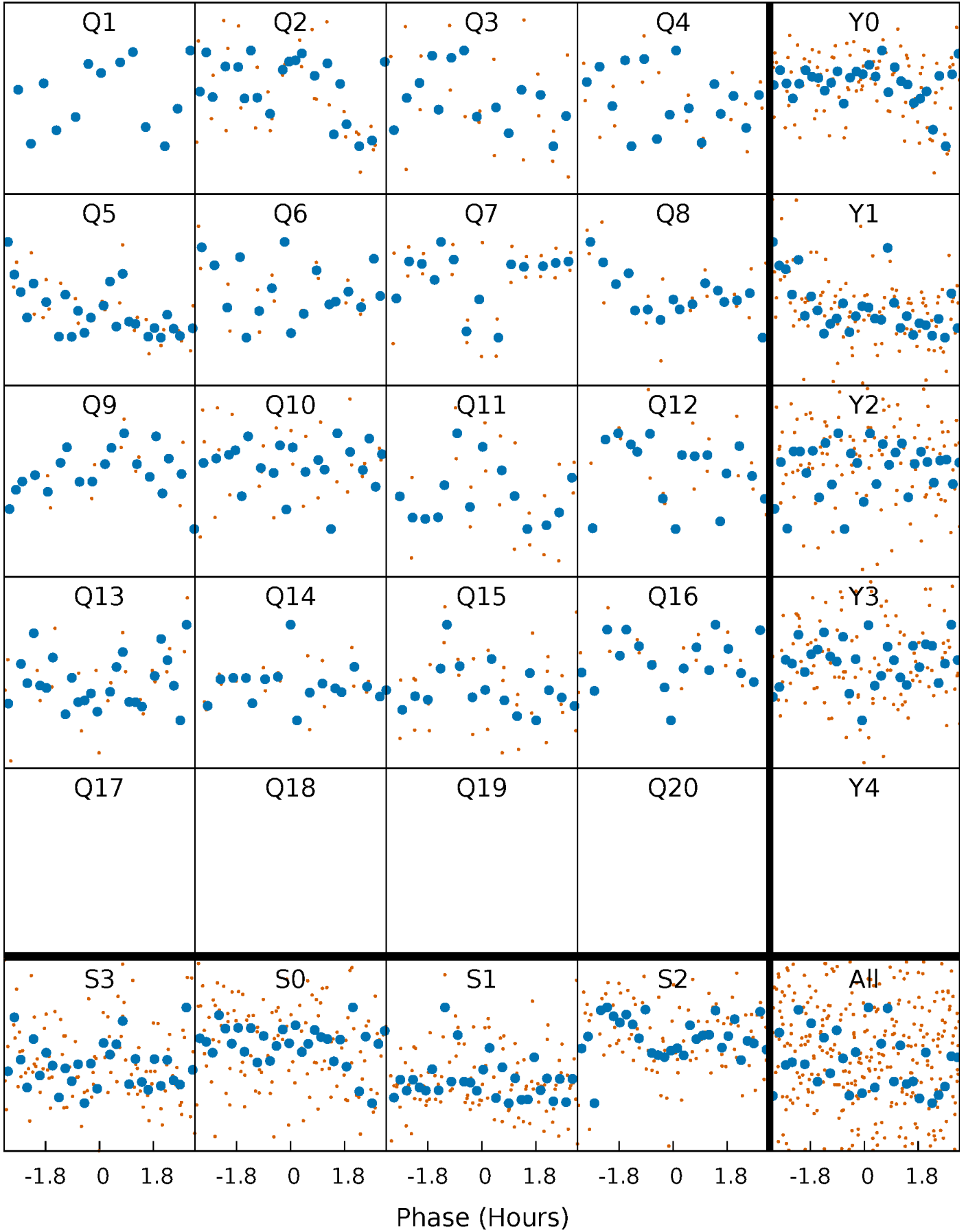


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



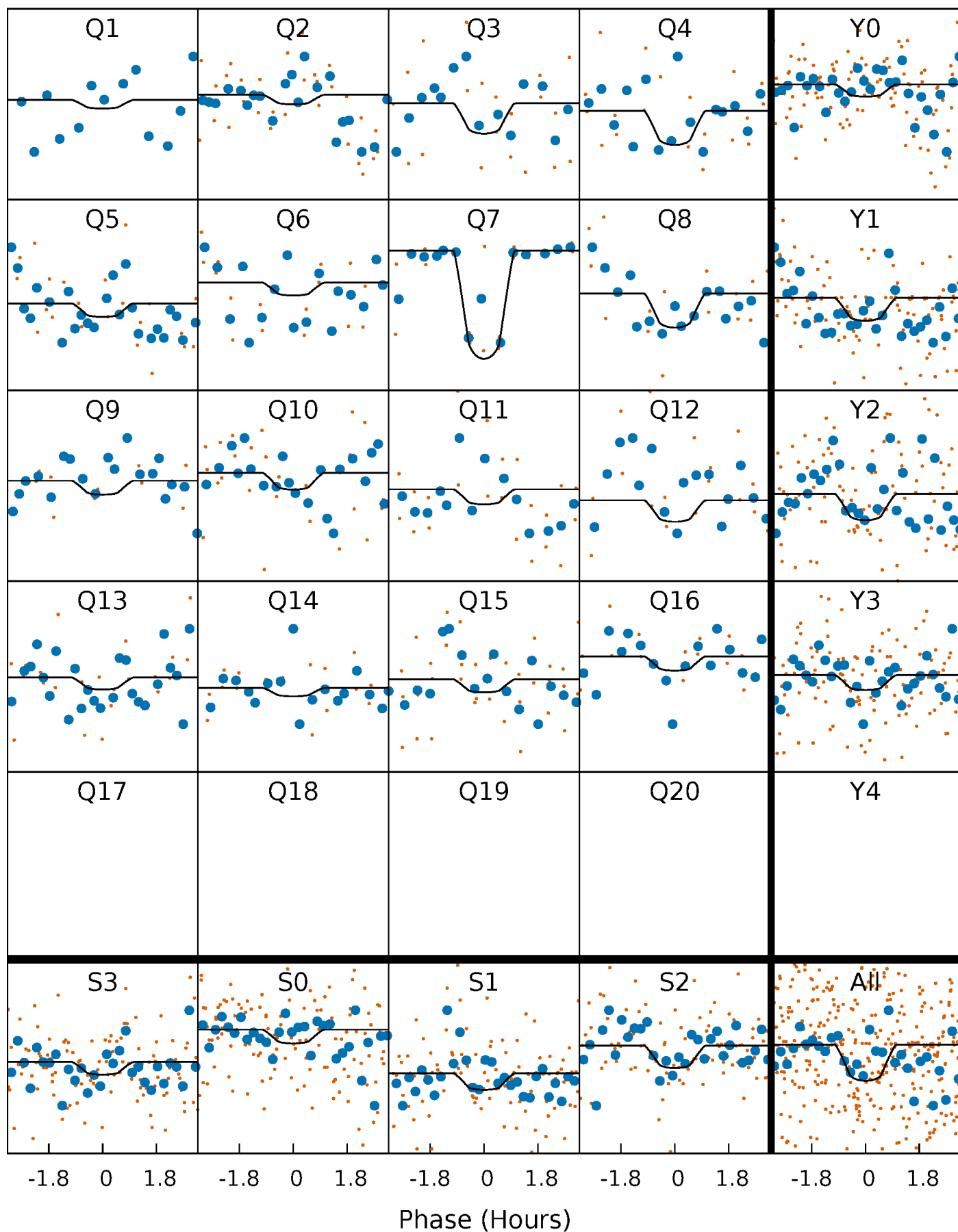
PDC Quarter-Phased Transit Curves

TCE 009897838-01 P= 39.229926 Days $T_0=132.630375$ (BKJD)



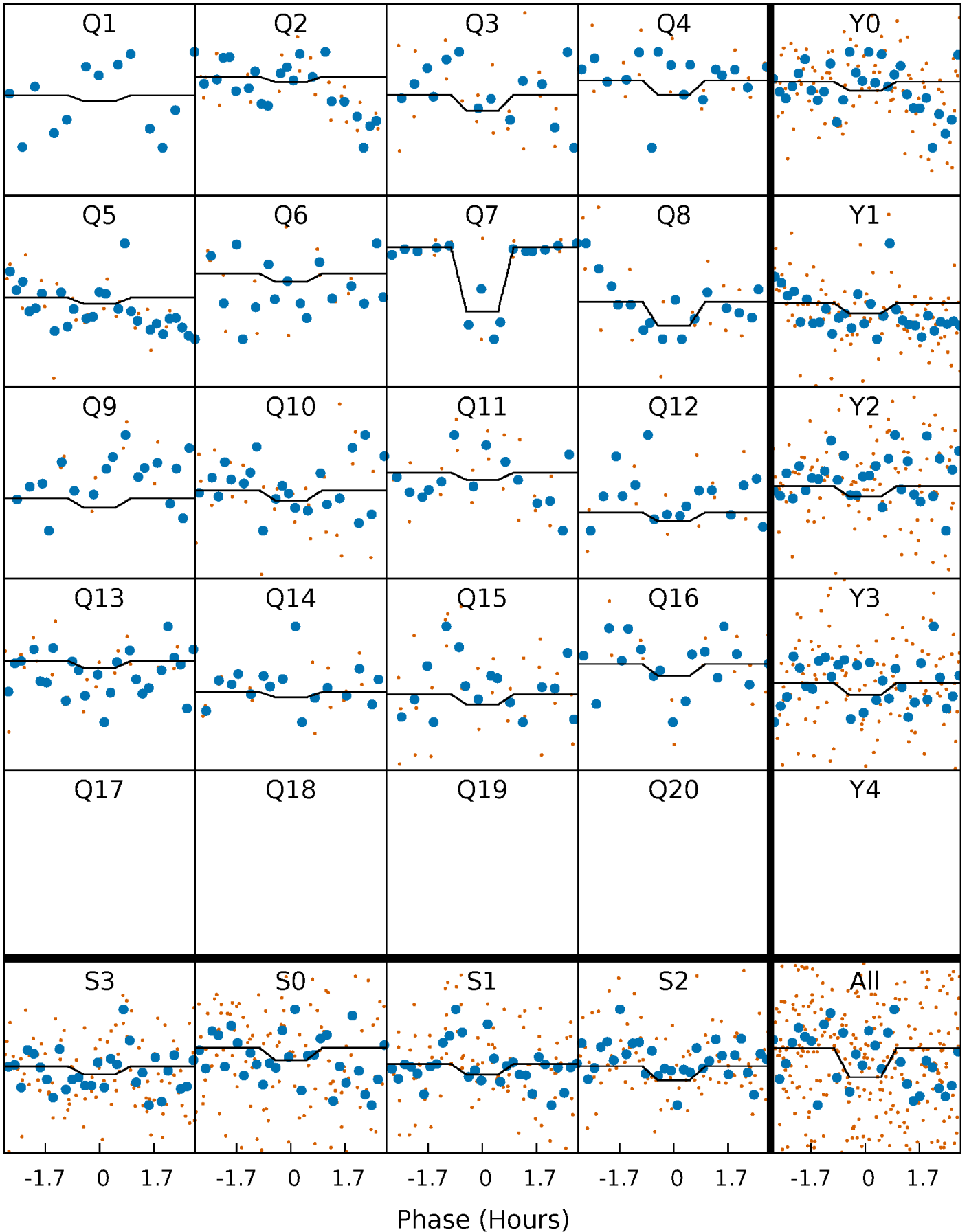
DV Quarter-Phased Transit Curves

TCE 009897838-01 P= 39.229926 Days $T_0=132.630375$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

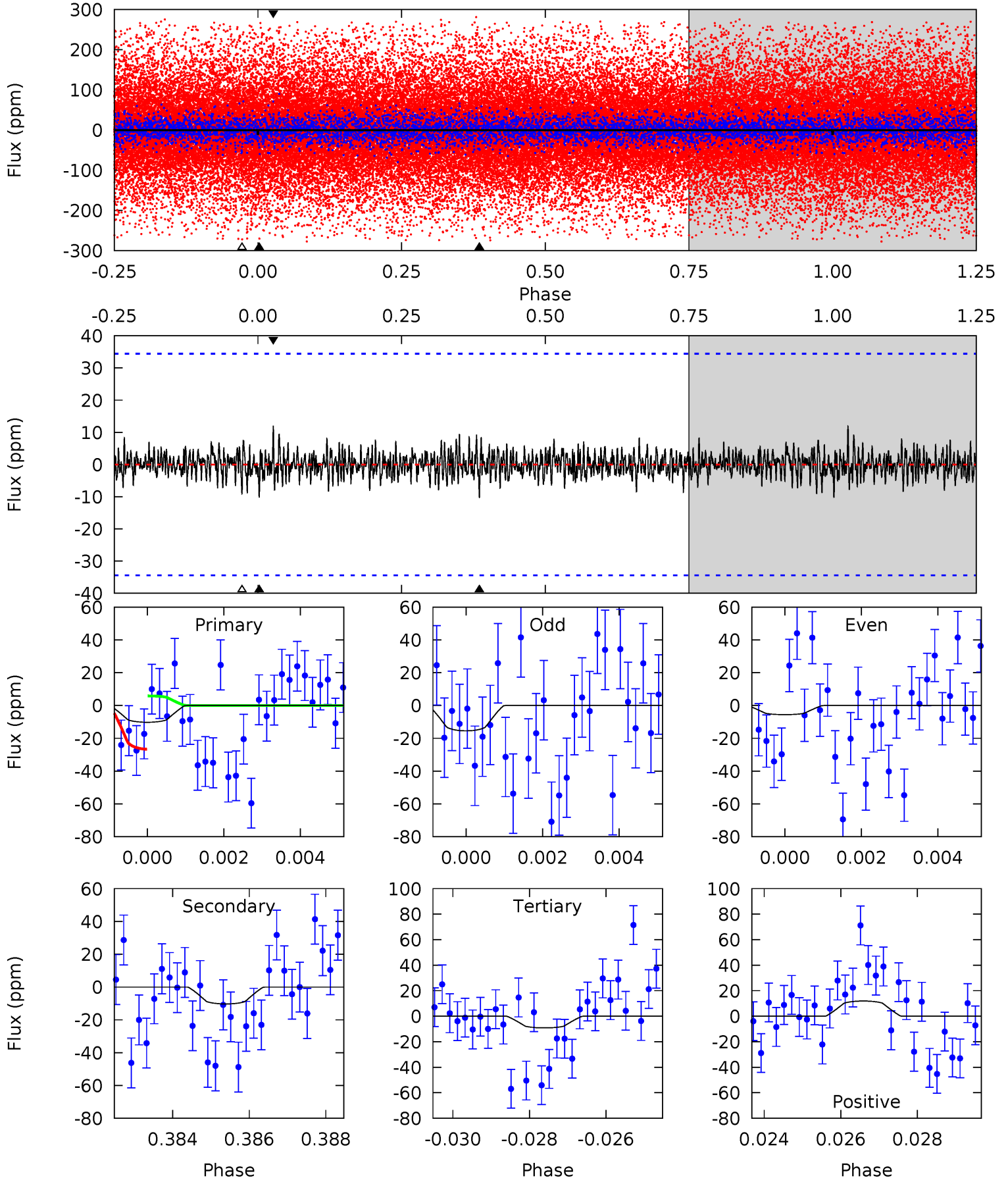
TCE 009897838-01 P= 39.229613 Days $T_0=132.635032$ (BKJD)



DV Model-Shift Uniqueness Test

009897838-01, P = 39.229926 Days, E = 93.400449 Days

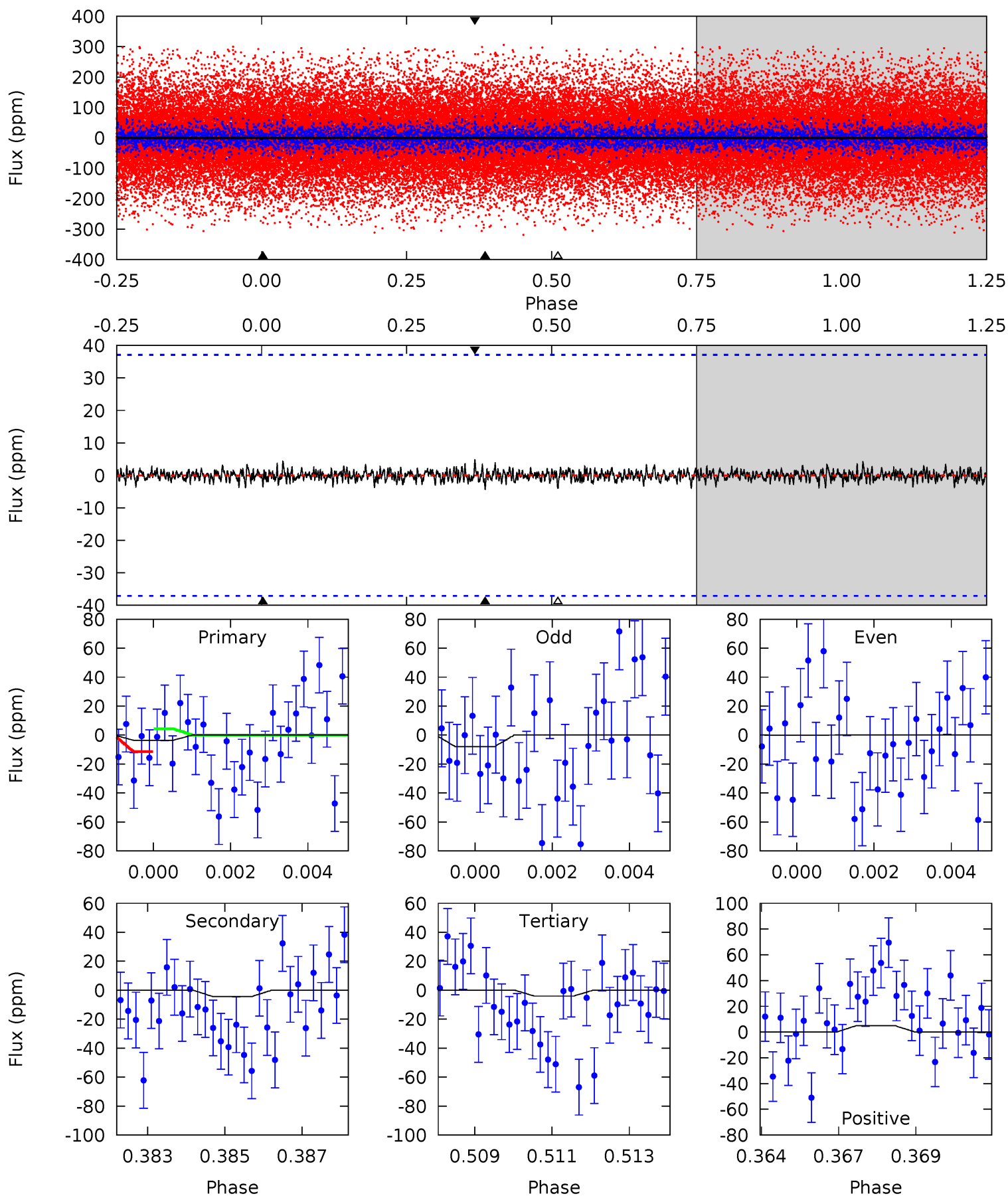
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.58	1.59	1.41	1.84	5.31	3.07	0.46	0.17	-0.26	0.18	-0.25	0.77	0.53	0.54	1.62



Alt Model-Shift Uniqueness Test

009897838-01, P = 39.229613 Days, E = 93.405419 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.52	0.62	0.58	0.70	5.32	3.08	0.18	-0.06	-0.18	0.04	-0.08	0.57	0.12	0.53	0.51



Stellar Parameters For KIC 009897838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5050^{+83}_{-53}	$3.628^{+0.049}_{-0.066}$	$-0.400^{+0.150}_{-0.100}$	$2.339^{+0.339}_{-0.127}$	$0.848^{+0.155}_{-0.009}$	$0.093^{+0.017}_{-0.022}$
	+2%/-1%	+1%/-2%	+37%/-25%	+14%/-5%	+18%/-1%	+18%/-24%
Source	SPE72	AST10	SPE72	DSEP		

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

Secondary Eclipse Parameters for KIC 009897838-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-10 ± 6	$1.69^{+0.46}_{-0.45}$	1033^{+31}_{-25}	3859^{+593}_{-559}	91^{+117}_{-56}
Alt.	-4 ± 7	$1.22^{+0.46}_{-0.46}$	1033^{+33}_{-24}	3655^{+1027}_{-7111}	70^{+191}_{-117}

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

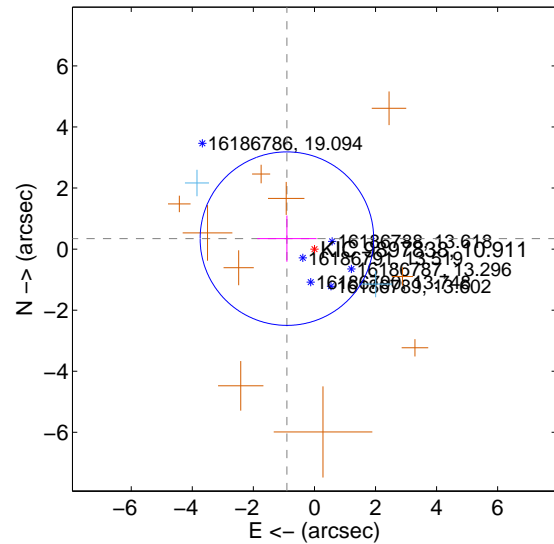
Supplemental centroid analysis for 009897838-01. **Kepler magnitude: 10.91.** Transit SNR 12.75

There are 2 quarters with good PRF difference image offsets

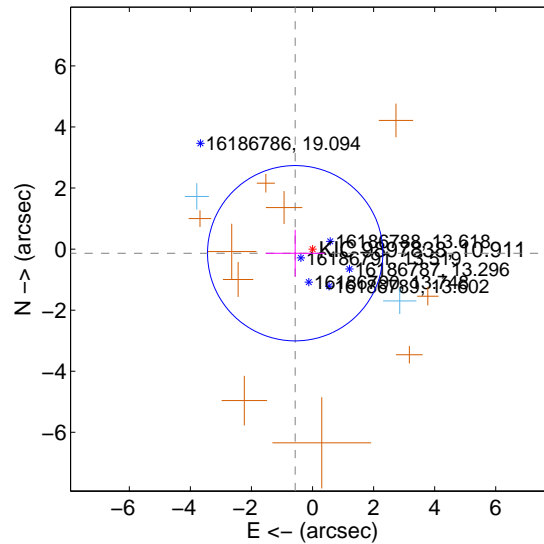
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.965 ± 0.947	1.02	0.902 ± 0.972	0.343 ± 0.756
PRF-fit source offset from KIC position	0.584 ± 0.957	0.61	0.568 ± 0.967	-0.135 ± 0.767
photometric centroid source offset	1.13 ± 1.82	0.62	0.16 ± 1.98	-1.12 ± 1.82

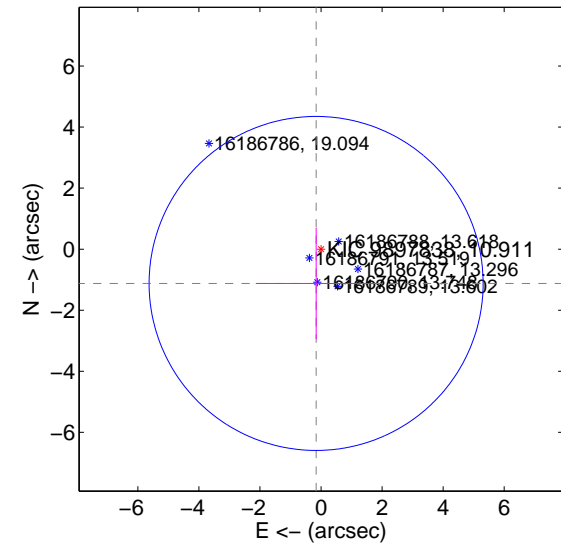
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

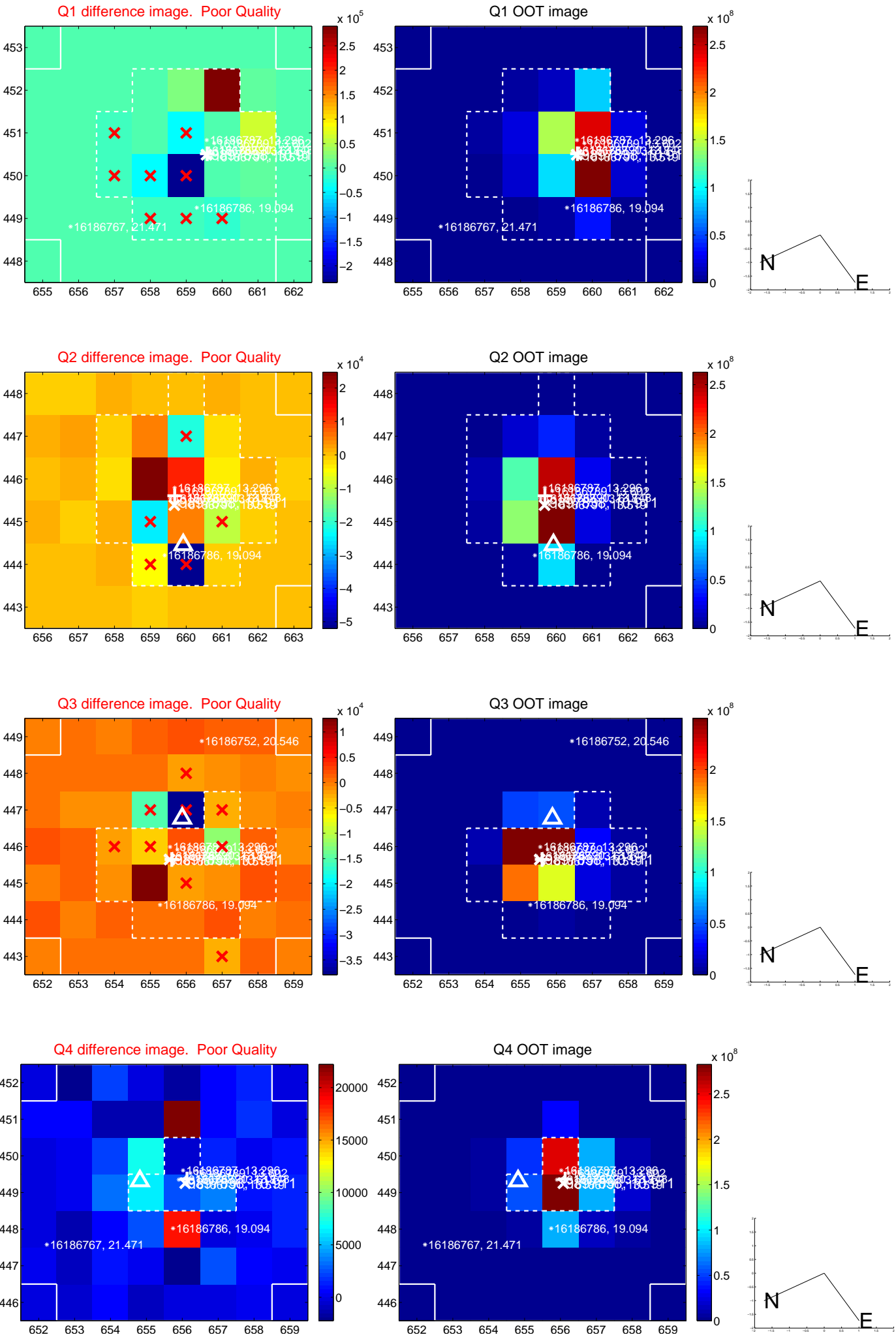


offset from photometric centroids

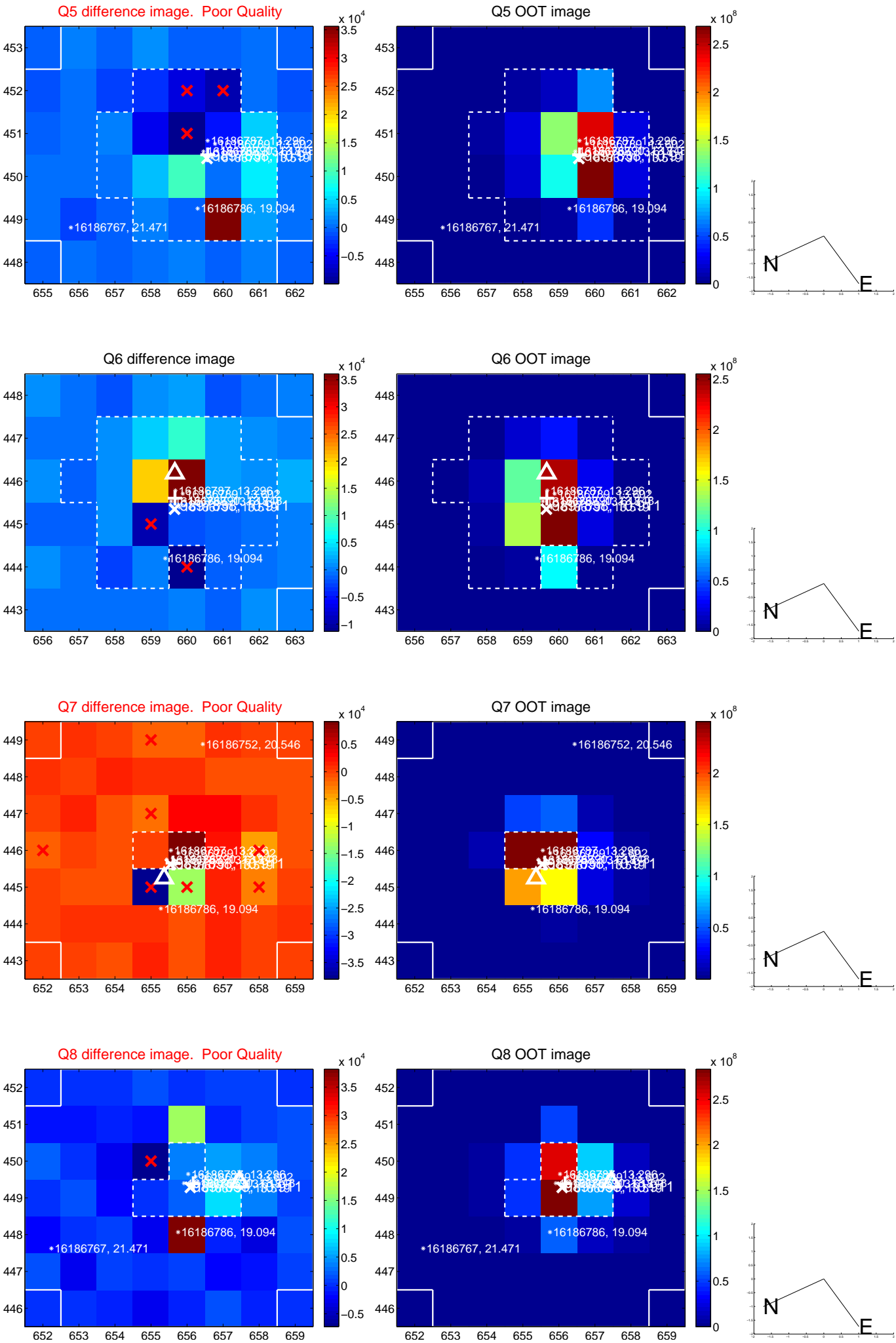


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

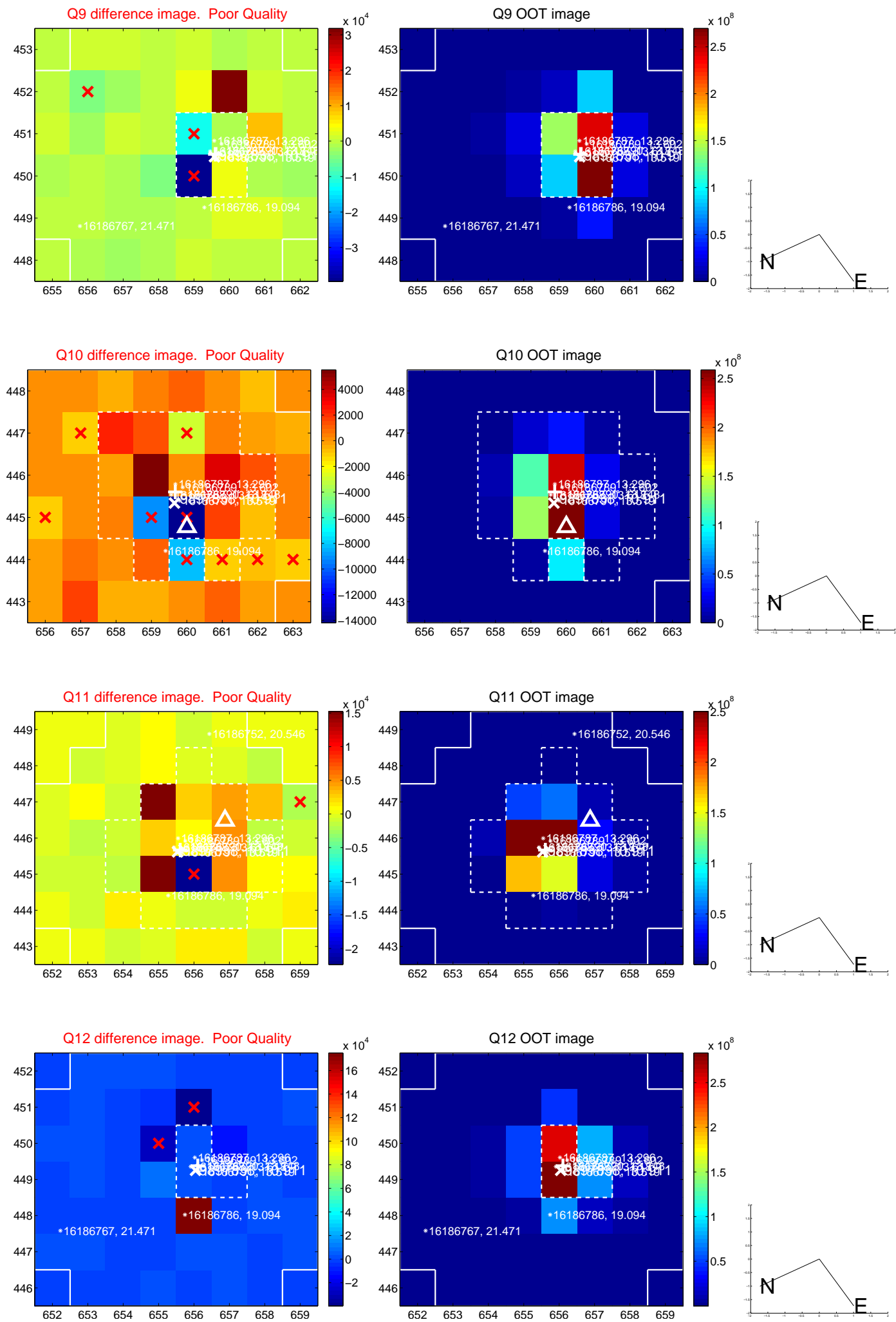
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



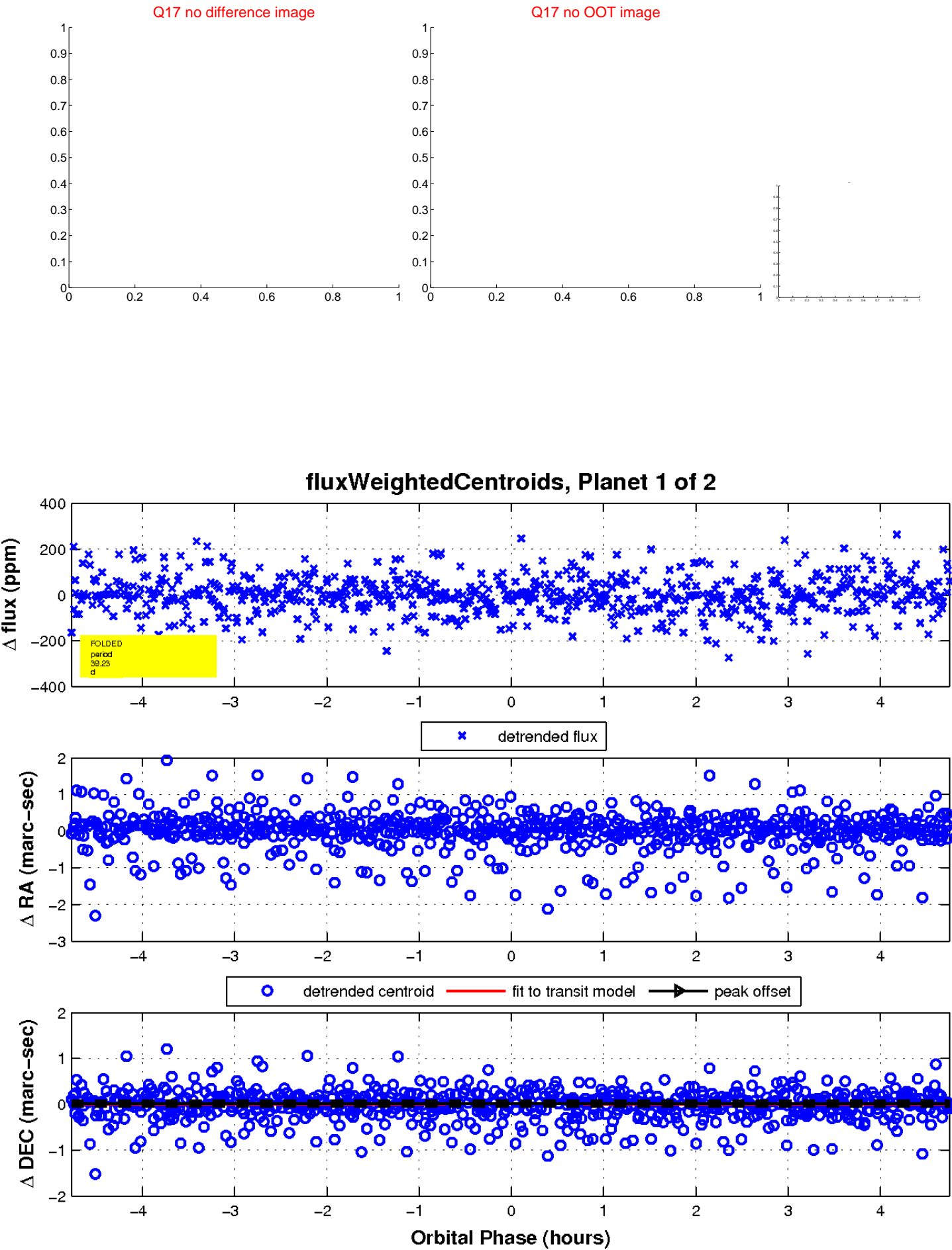
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

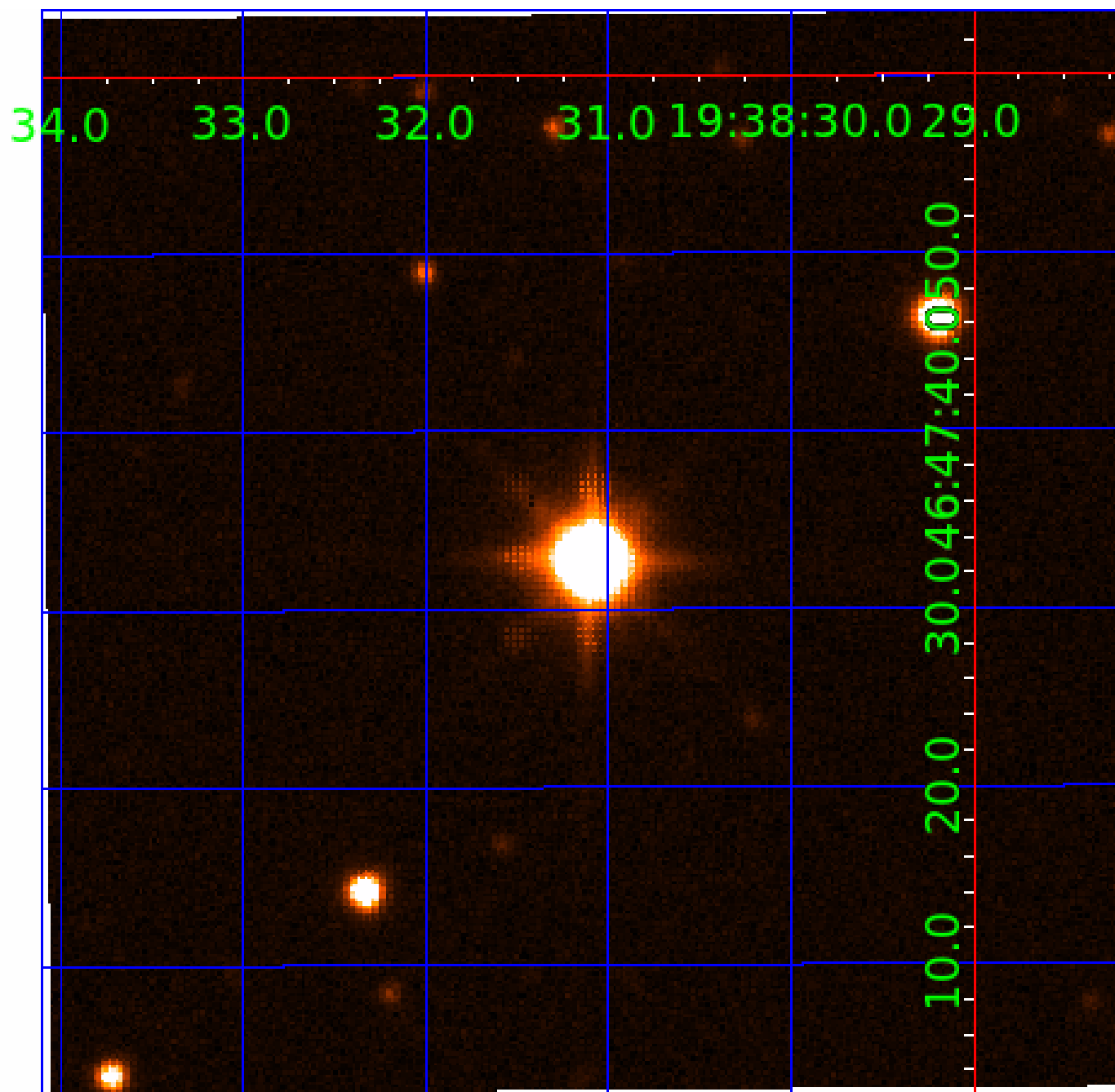


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009897838

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})
009897838-01	OBS	No	39.229926	132.630375	32.3	1.592	11.1	12.7	2.34	5050	1.66	69.70
009897838-02	OBS	No	39.347268	133.112509	20.6	3.508	7.6	8.7	2.34	5050	1.28	69.43

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009897838-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009897838-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST

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

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

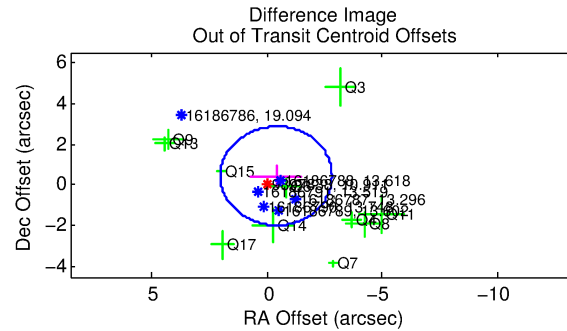
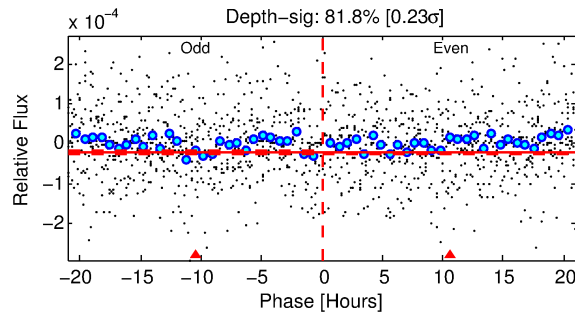
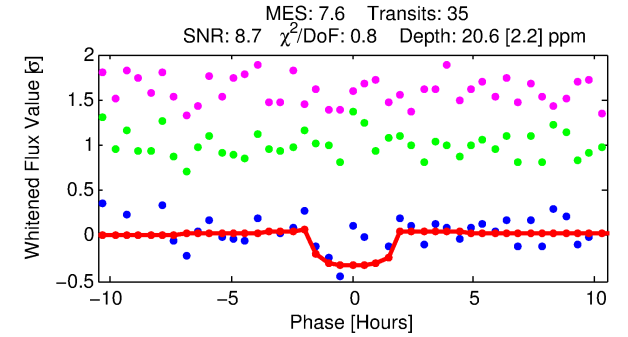
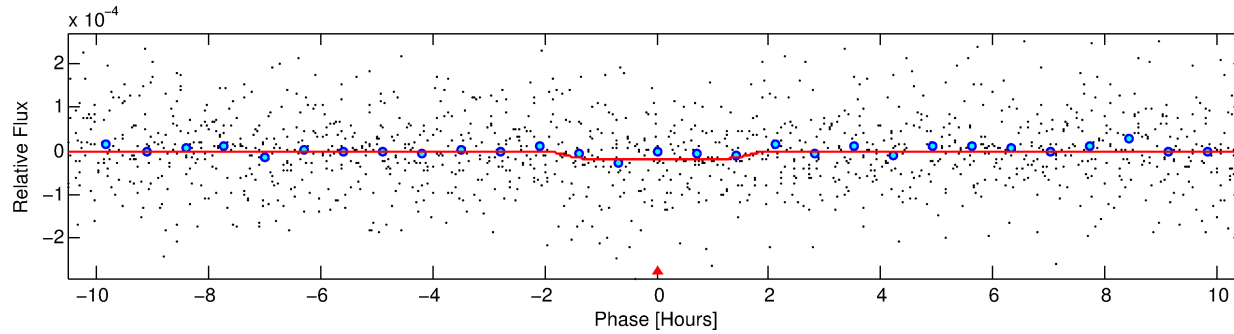
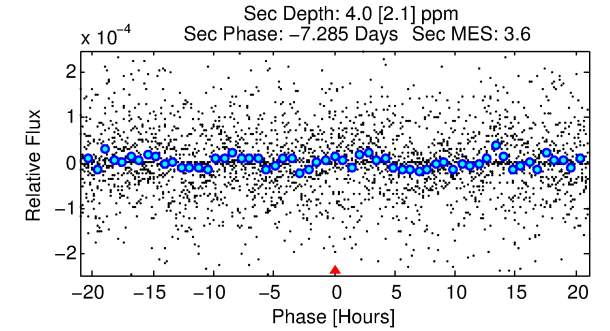
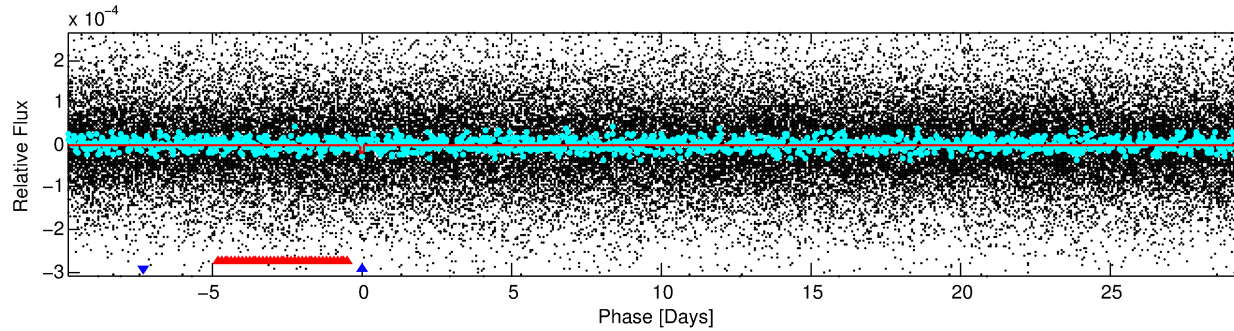
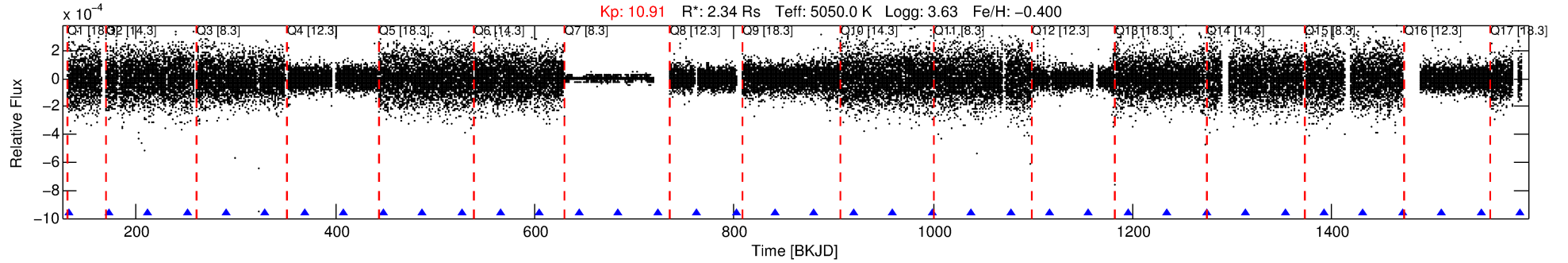
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009897838-02

No Significant Match Found

DV One-Page Summary

KIC: 9897838 Candidate: 2 of 2 Period: 39.347 d



DV Fit Results:

Period = 39.34727 [0.00079] d
Epoch = 133.1125 [0.0112] BKJD
Rp/R* = 0.0050 [0.0020]
a/R* = 39.03 [65.71]
b = 0.90 [0.38]
Seff = 69.43 [10.74]
Teq = 736 [28] K
Rp = 1.28 [0.54] Re
a = 0.2143 [0.0234] AU
Ag = 62.02 [59.75] [1.02σ]
Teffp = 3194 [763] K [3.22σ]

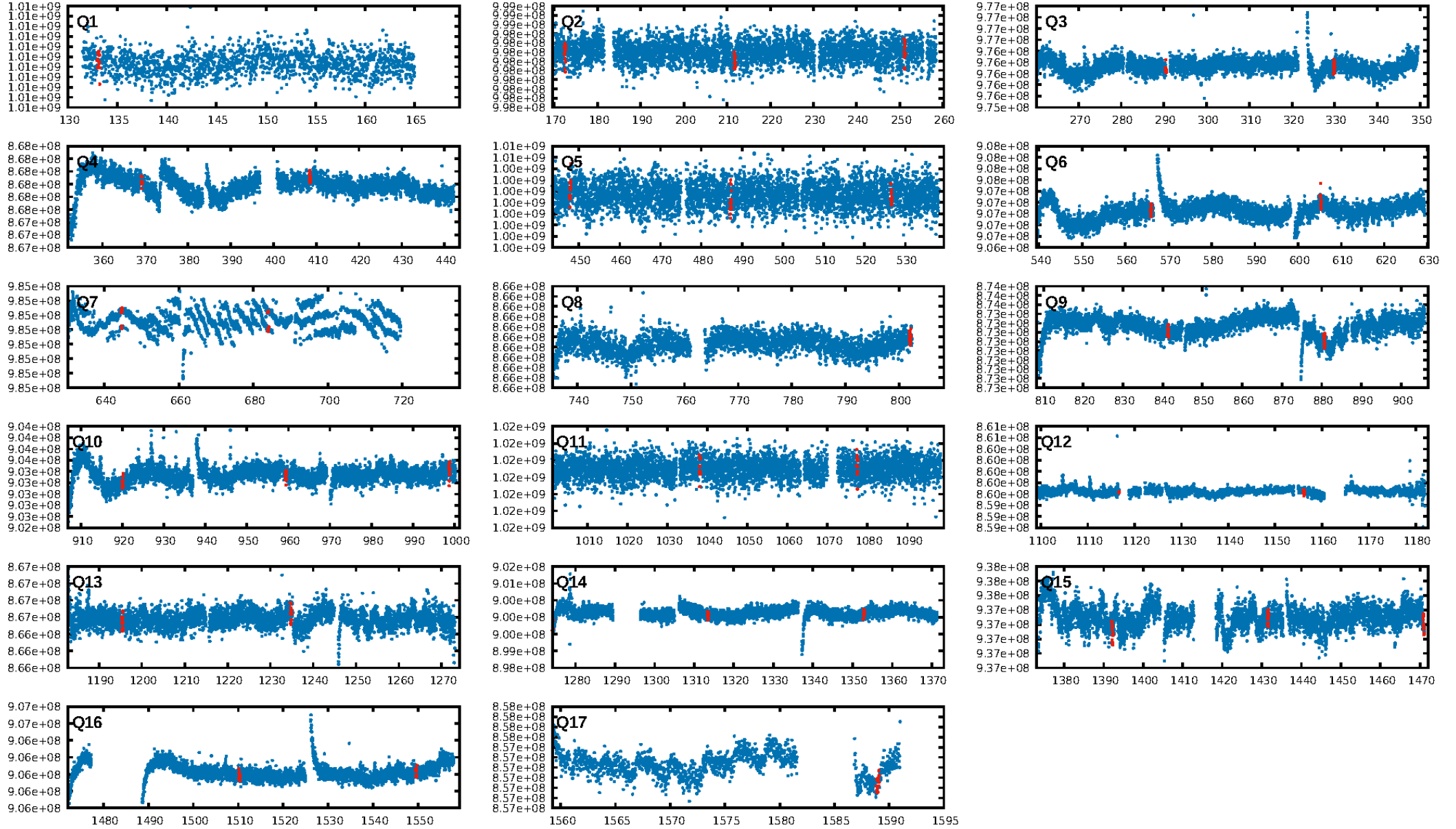
DV Diagnostic Results:

ShortPeriod-sig: 53.5% [0.73σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.32e-12
RollingBand-fgt: 1.00 [33/33]
GhostDiagnostic-chr: -0.1557
Centroid-sig: N/A
Centroid-so: 6.183 arcsec [2.74σ]
OotOffset-rm: 0.605 arcsec [0.75σ]
KicOffset-rm: 0.618 arcsec [0.58σ]
OotOffset-st: 2/4/2/3 [11]
KicOffset-st: 2/4/2/3 [11]
DiffImageQuality-fgm: 0.45 [5/11]
DiffImageOverlap-fno: 1.00 [15/15]

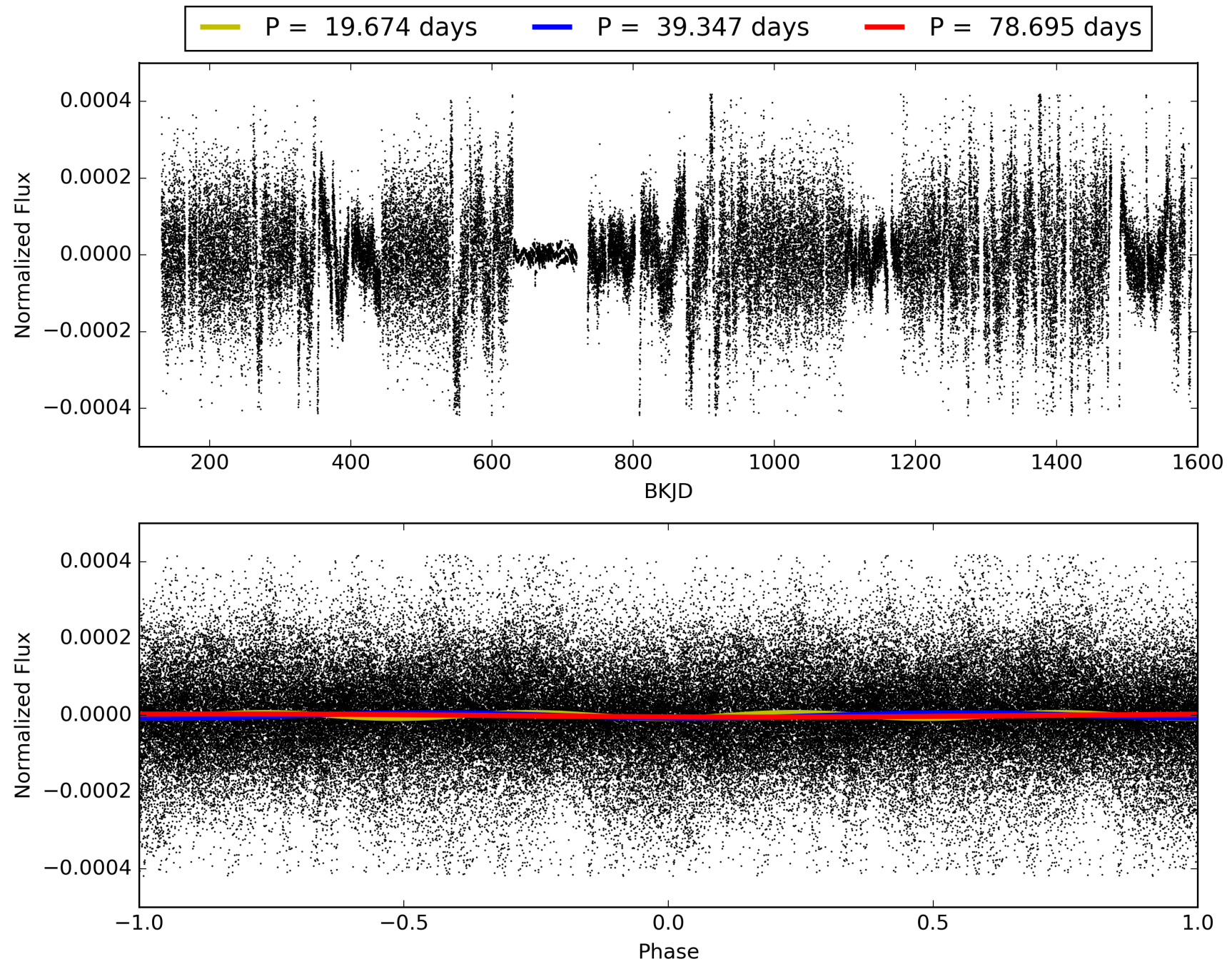
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:24:36 Z

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

TCE 009897838-02, PDC Light Curves

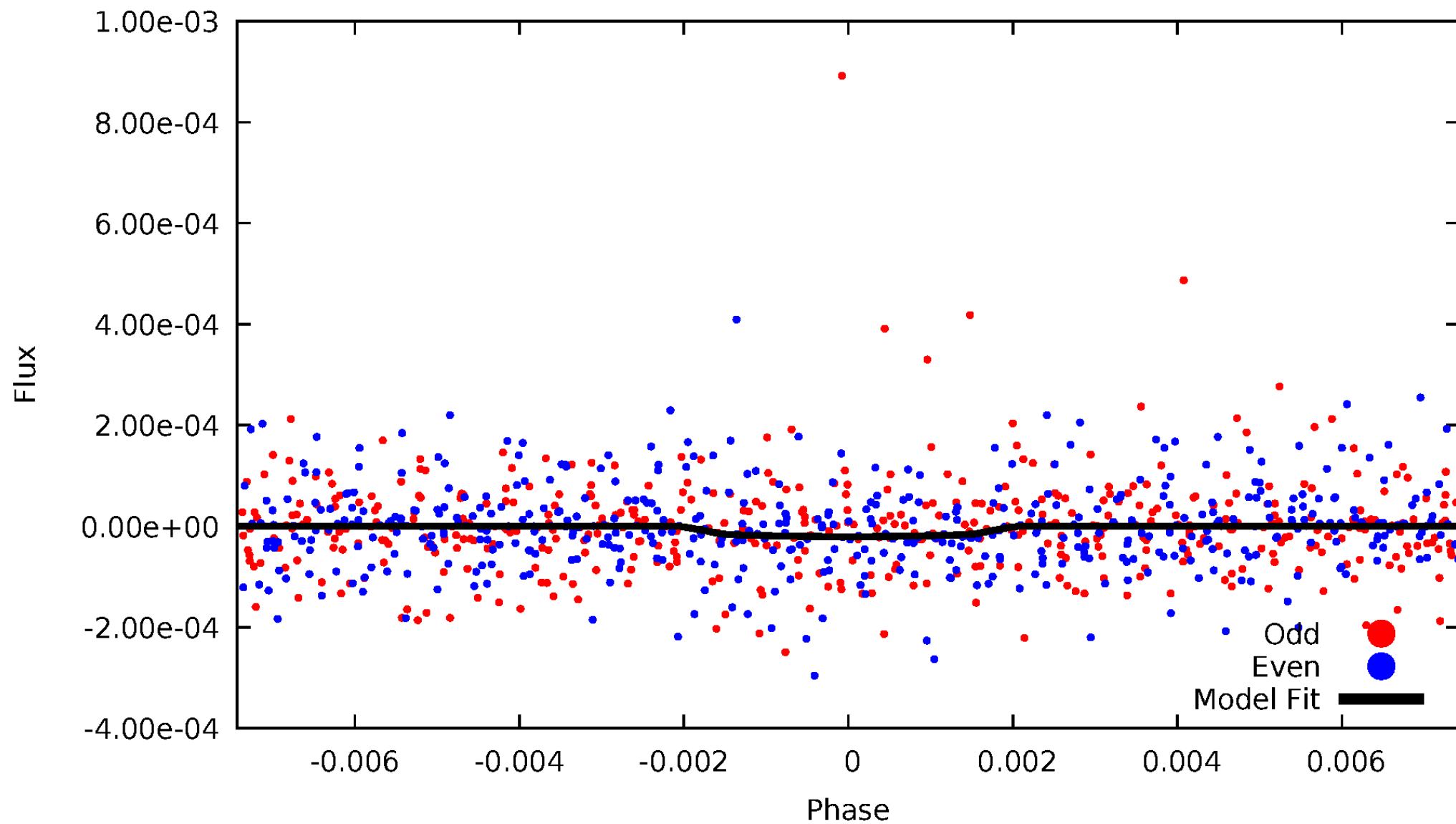


TCE 009897838-02



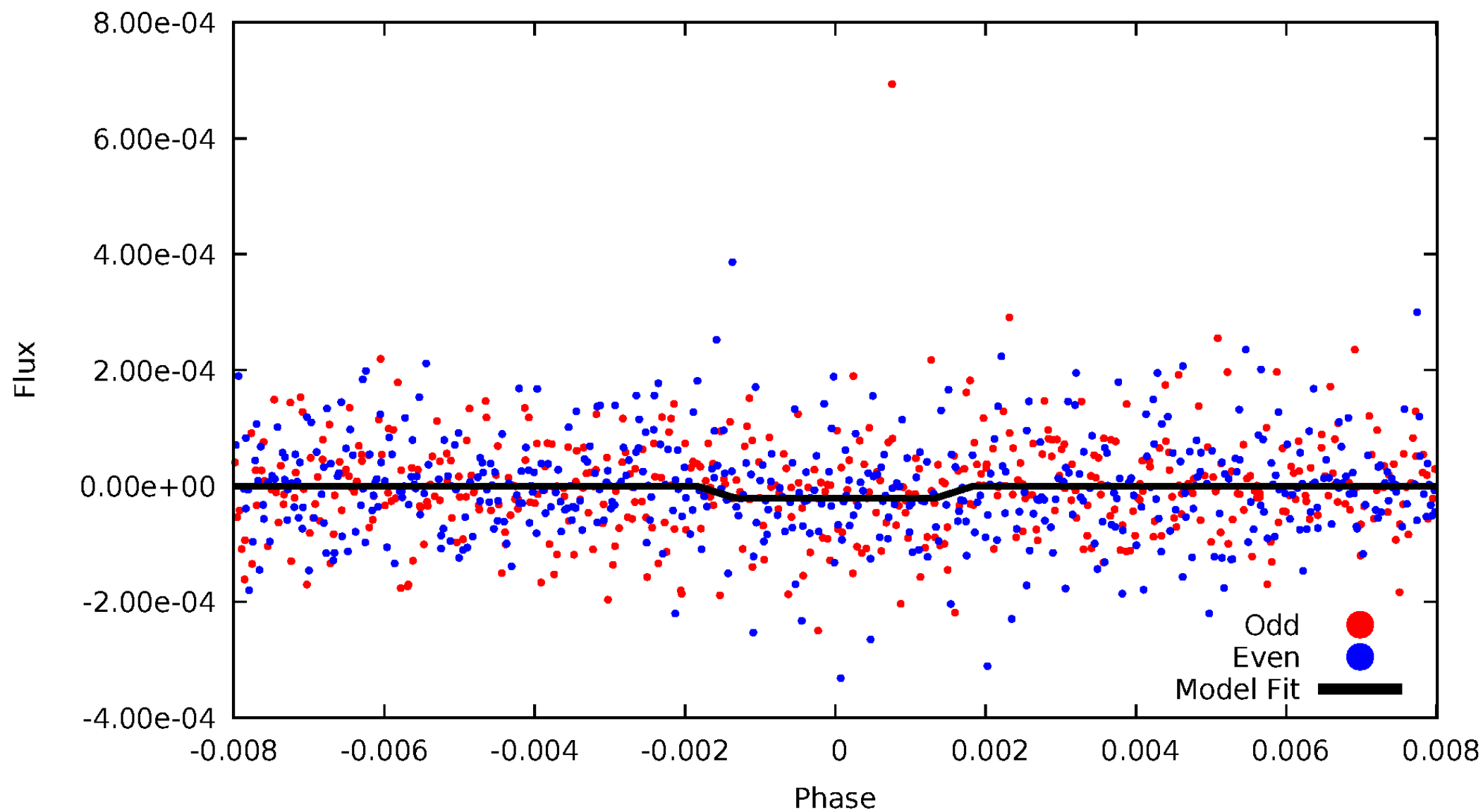
DV Odd/Even

TCE 009897838-02



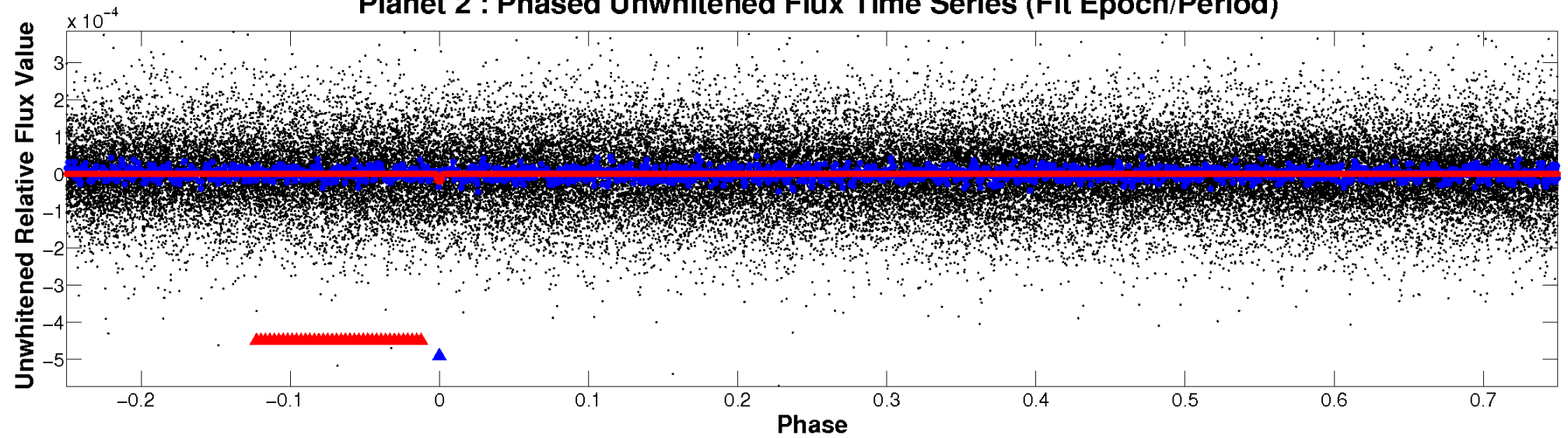
ALT Odd/Even

TCE 009897838-02

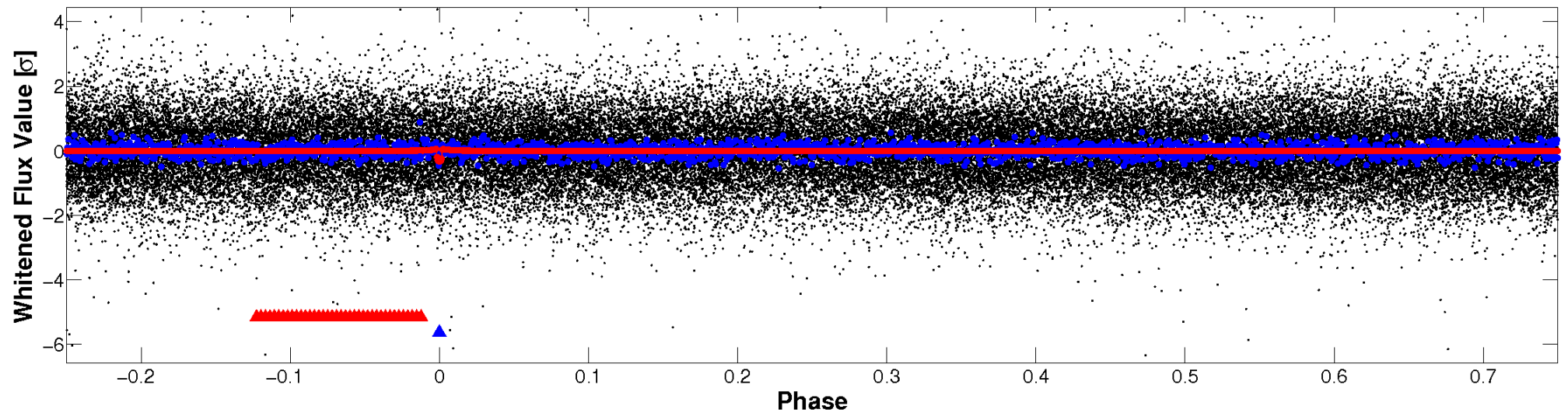


Non-Whitened Vs. Whitened Light Curve

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

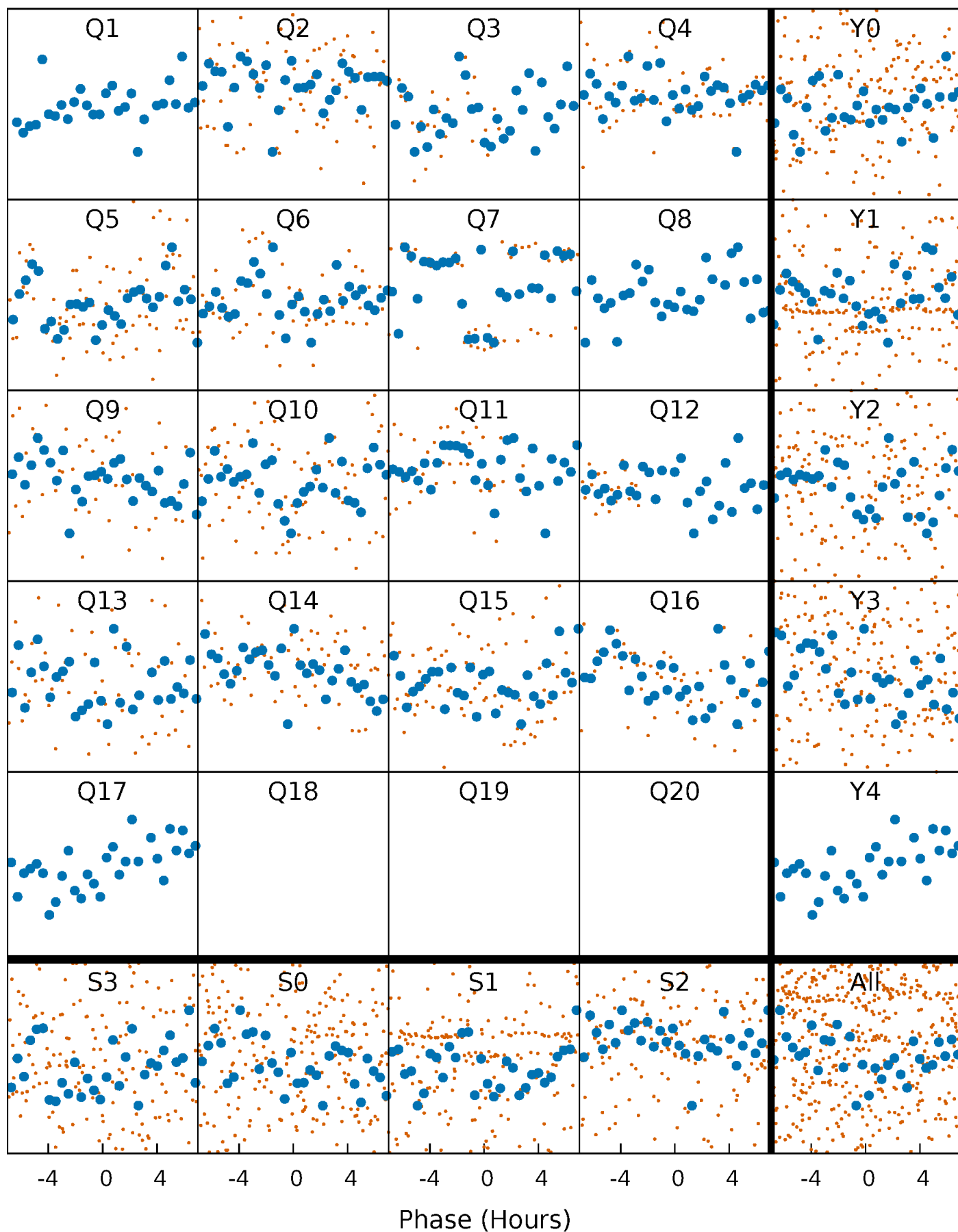


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



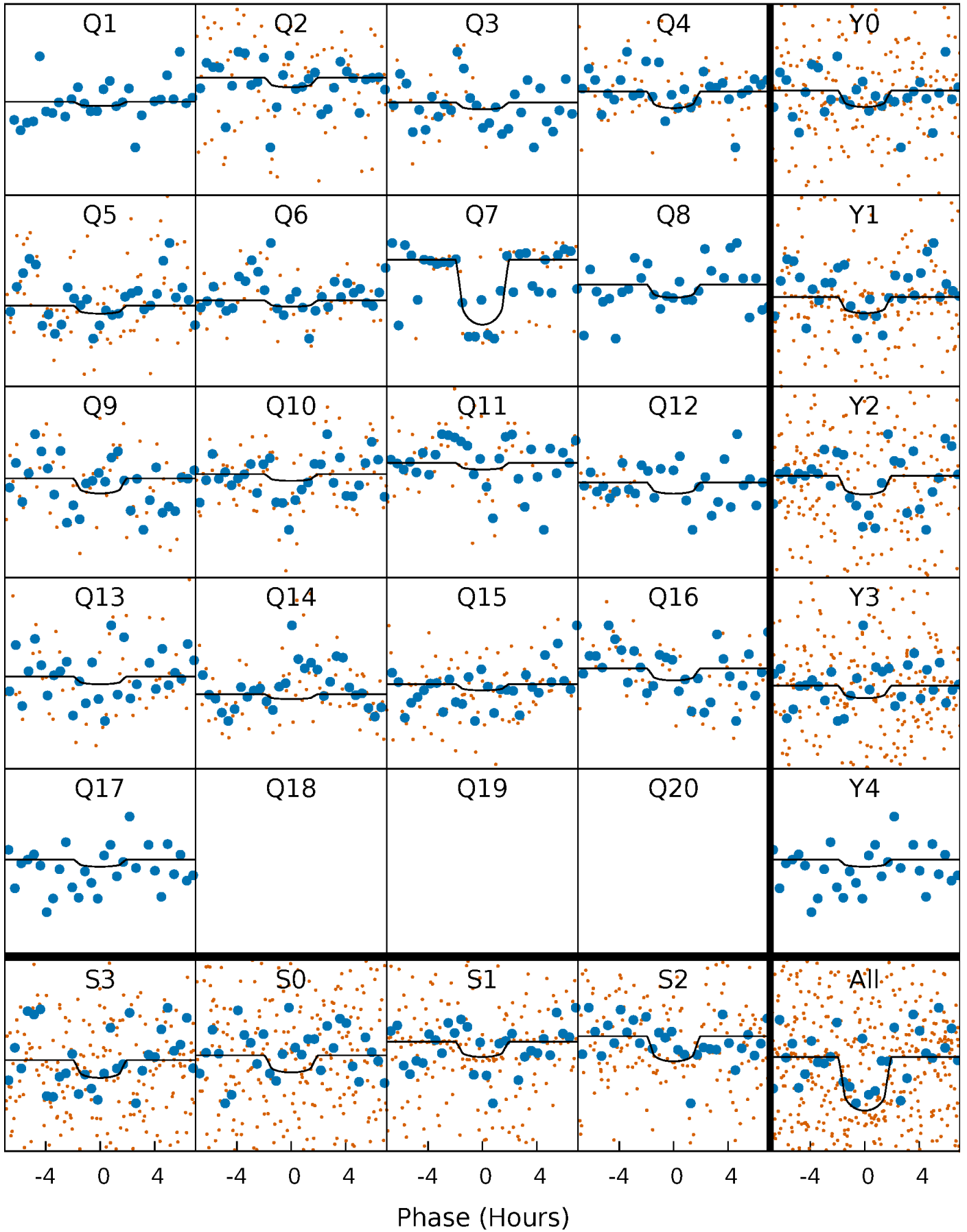
PDC Quarter-Phased Transit Curves

TCE 009897838-02 P= 39.347268 Days $T_0=133.112509$ (BKJD)



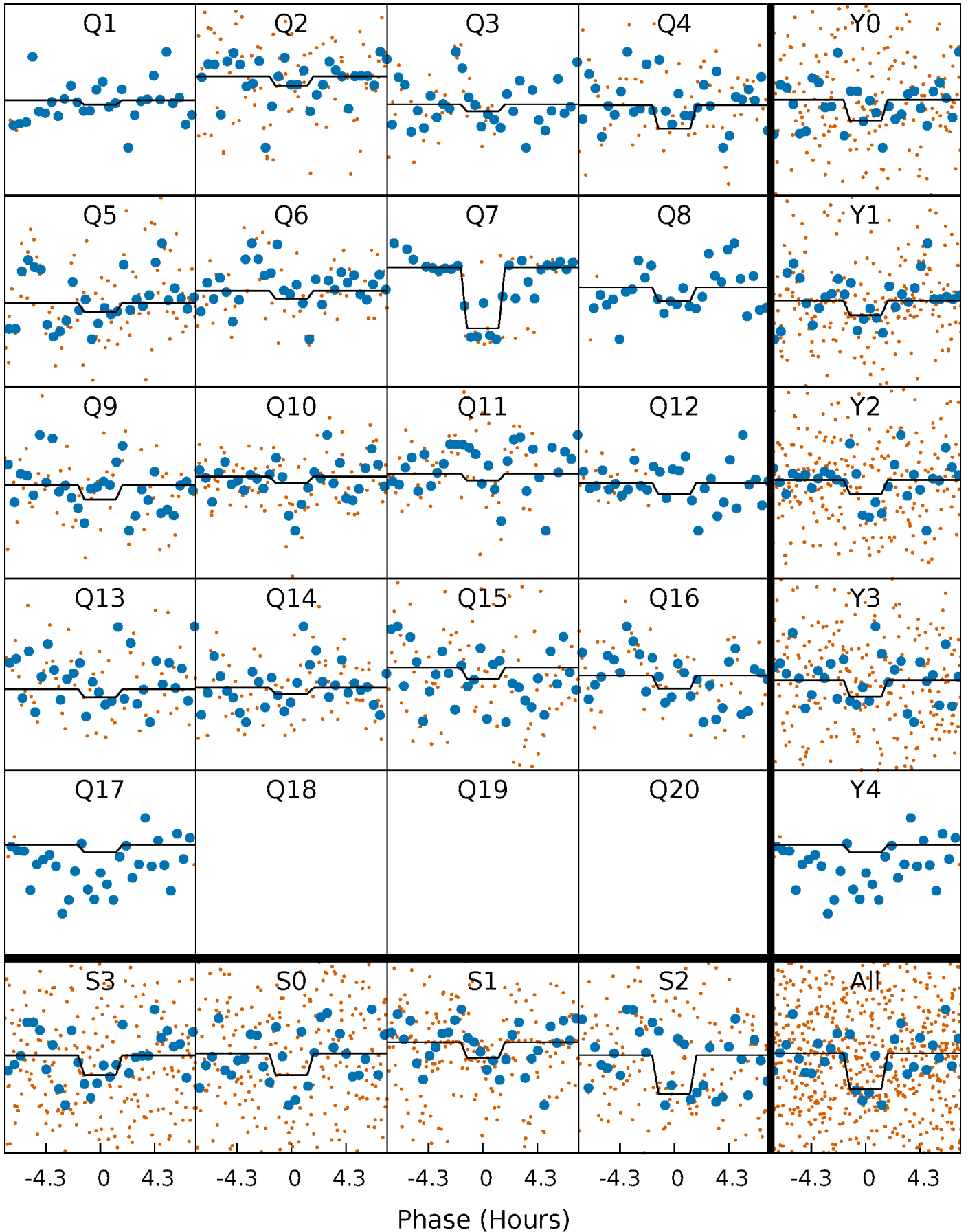
DV Quarter-Phased Transit Curves

TCE 009897838-02 P= 39.347268 Days $T_0=133.112509$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

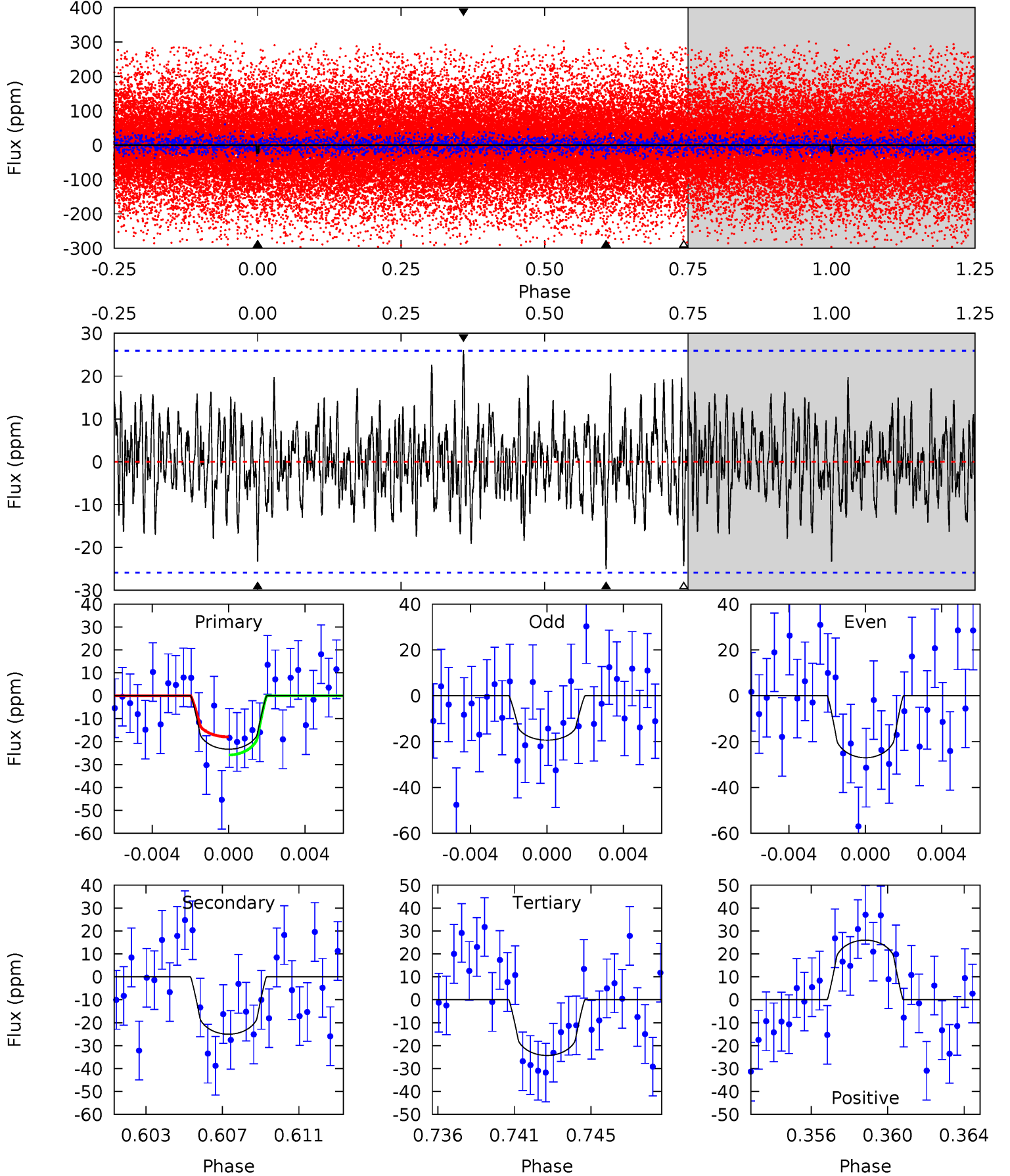
TCE 009897838-02 P= 39.345325 Days $T_0=133.136144$ (BKJD)



DV Model-Shift Uniqueness Test

009897838-02, P = 39.347268 Days, E = 93.765241 Days

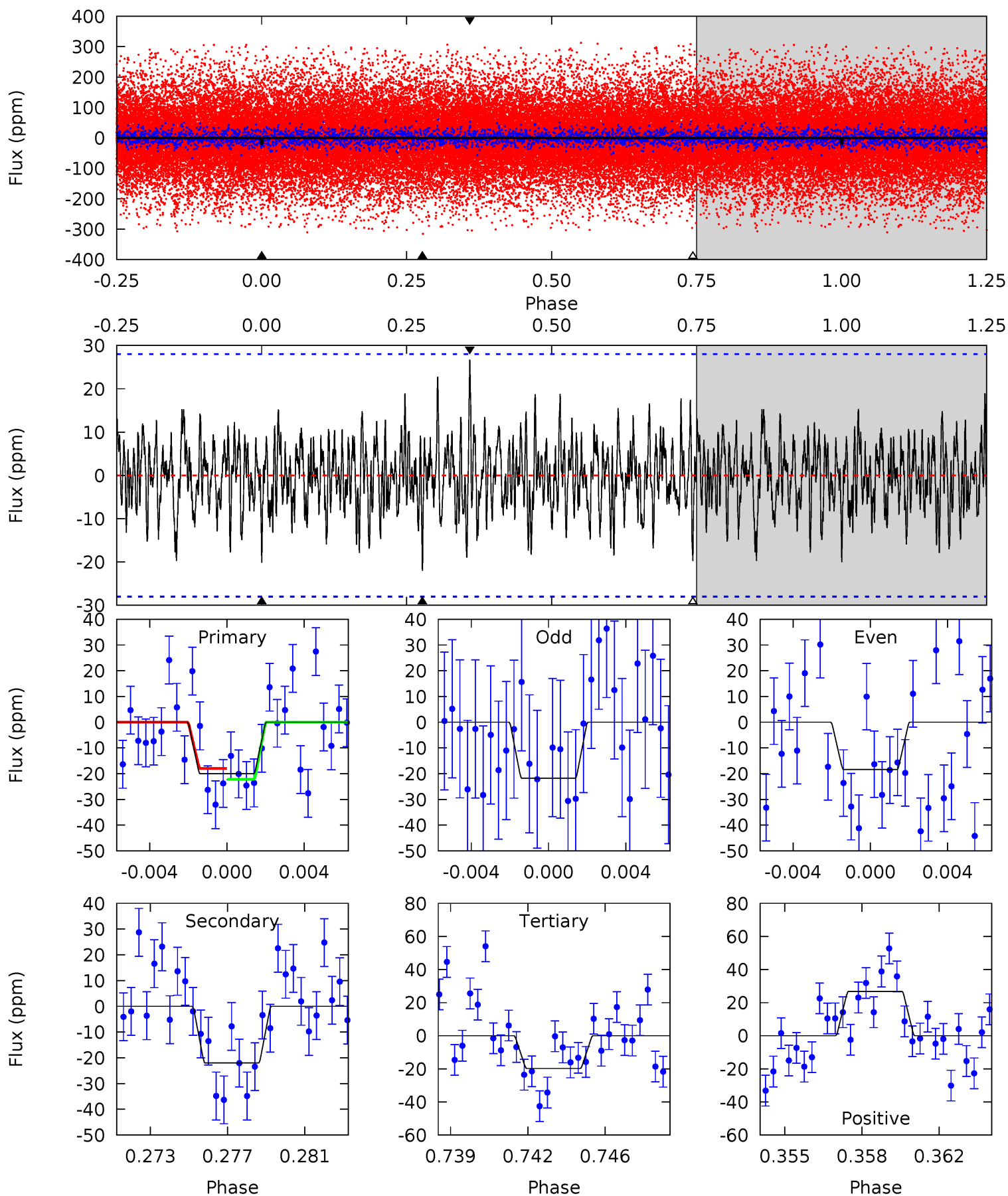
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.68	5.02	4.87	5.22	5.19	2.86	1.47	-0.20	-0.54	0.15	-0.20	0.77	0.40	0.51	0.80



Alt Model-Shift Uniqueness Test

009897838-02, P = 39.345325 Days, E = 93.790819 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.73	4.10	3.68	4.97	5.21	2.90	1.29	0.05	-1.25	0.42	-0.88	0.31	0.82	0.55	0.39



Stellar Parameters For KIC 009897838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5050^{+83}_{-53}	$3.628^{+0.049}_{-0.066}$	$-0.400^{+0.150}_{-0.100}$	$2.339^{+0.339}_{-0.127}$	$0.848^{+0.155}_{-0.009}$	$0.093^{+0.017}_{-0.022}$
	+2%/-1%	+1%/-2%	+37%/-25%	+14%/-5%	+18%/-1%	+18%/-24%
Source	SPE72	AST10	SPE72	DSEP		

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

Secondary Eclipse Parameters for KIC 009897838-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-25 ± 5	$1.30^{+0.50}_{-0.47}$	1031^{+30}_{-24}	5047^{+1211}_{-660}	382^{+595}_{-191}
Alt.	-22 ± 5	$1.22^{+0.49}_{-0.49}$	1032^{+30}_{-24}	5060^{+1423}_{-690}	388^{+718}_{-203}

T_{max} = Theoretical Maximum Planetary Temperature

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

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

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

DV Centroid Data

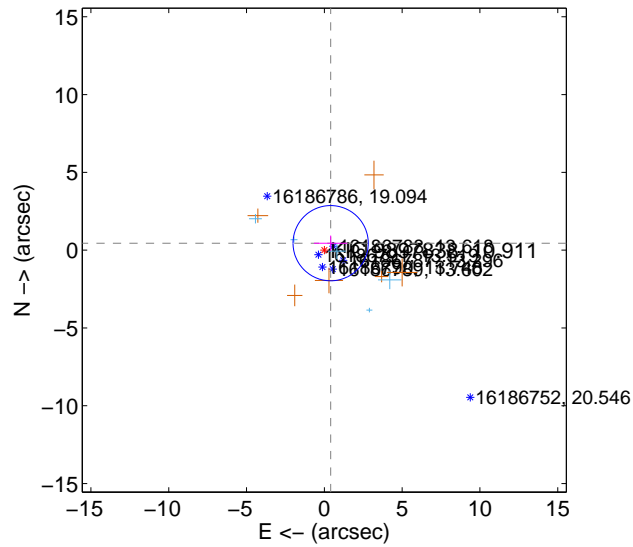
Supplemental centroid analysis for 009897838-02. **Kepler magnitude: 10.91.** Transit SNR 8.72

There are 5 quarters with good PRF difference image offsets

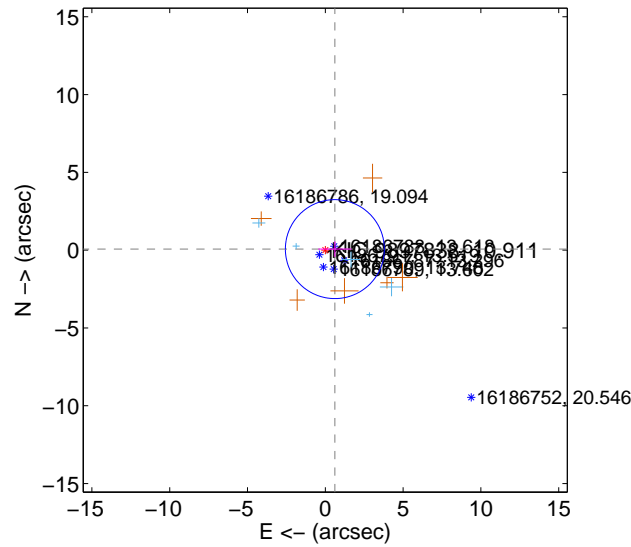
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.605 ± 0.806	0.75	-0.406 ± 1.073	0.449 ± 0.489
PRF-fit source offset from KIC position	0.618 ± 1.060	0.58	-0.614 ± 1.065	0.068 ± 0.500
photometric centroid source offset	6.18 ± 2.26	2.74	2.99 ± 2.42	-5.41 ± 2.21

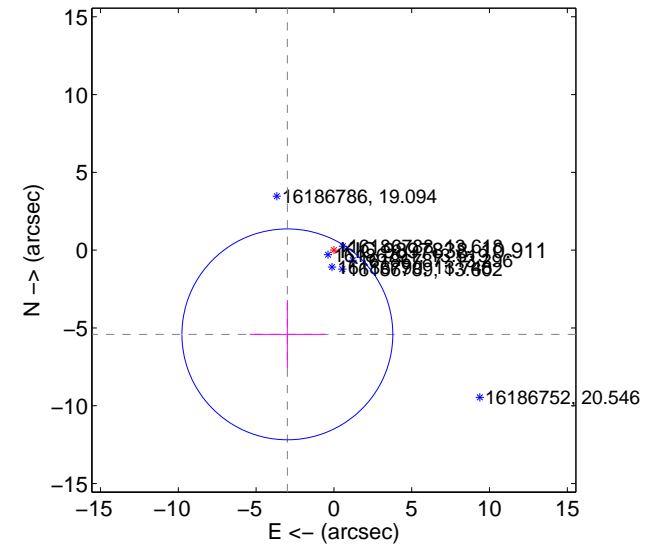
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

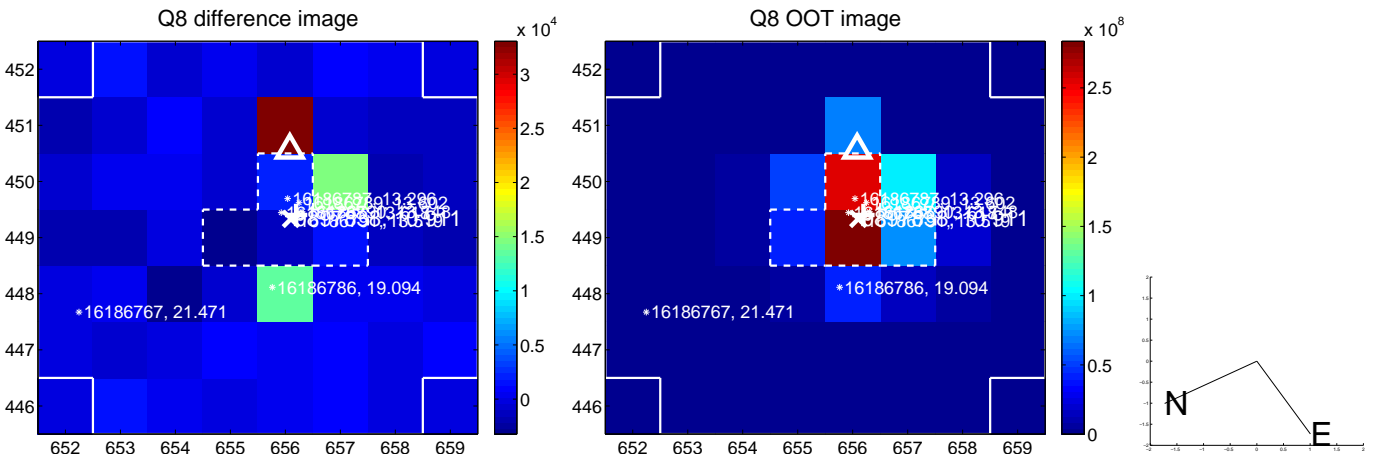
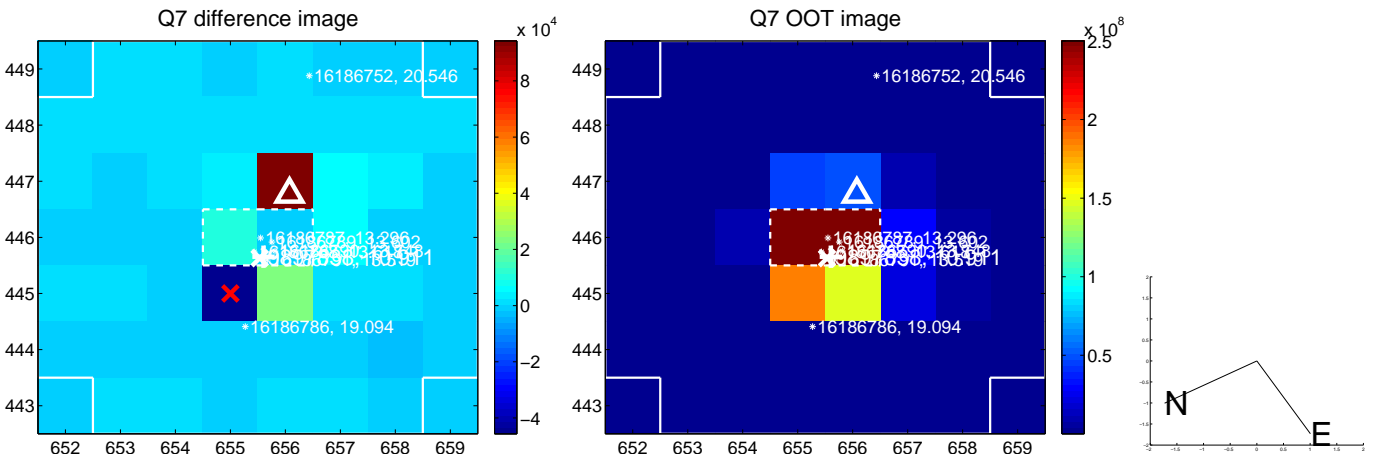
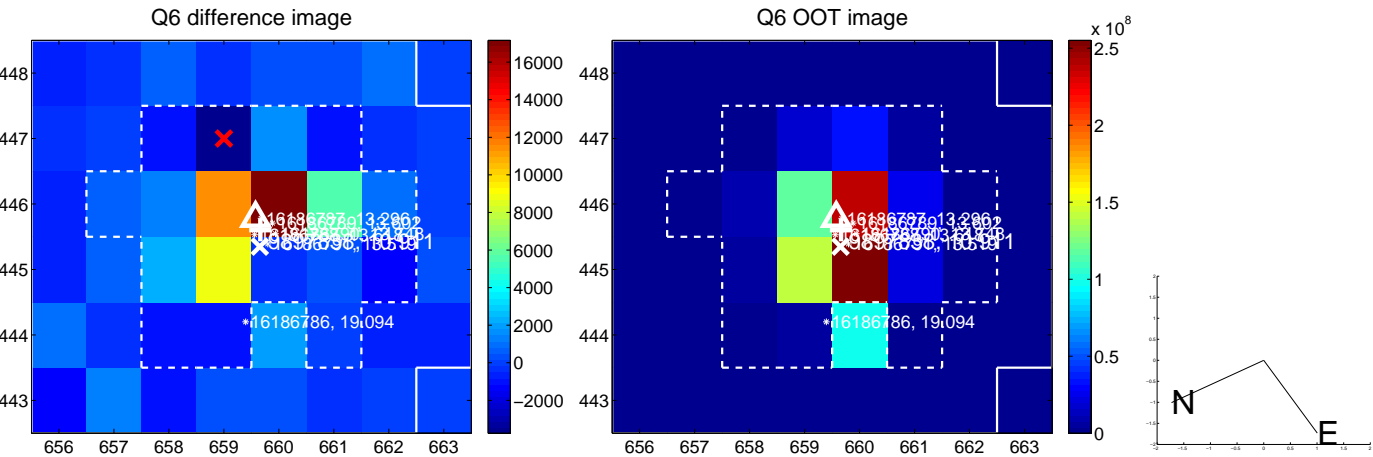
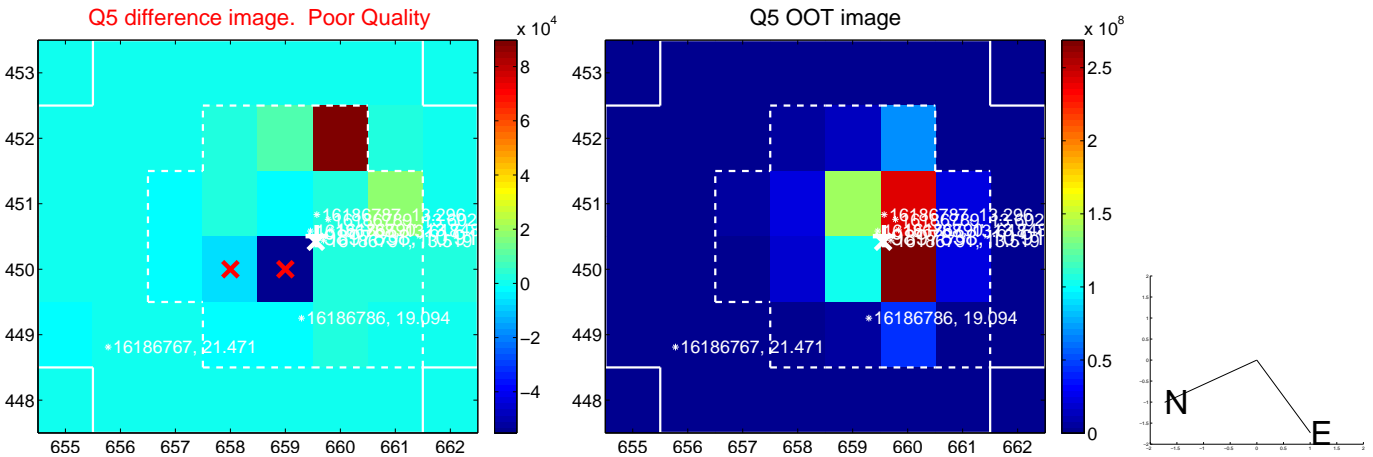


offset from photometric centroids

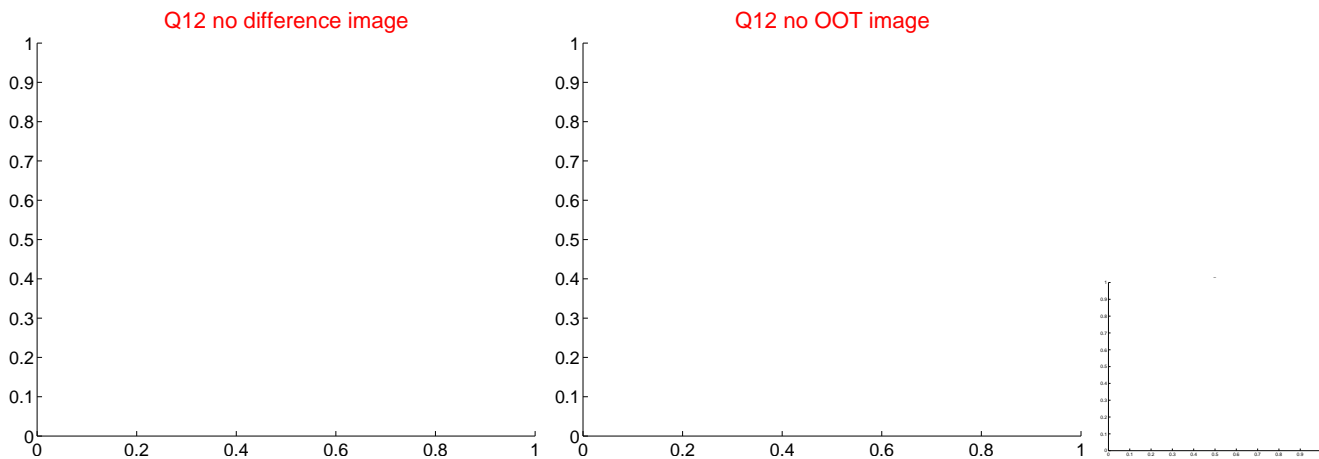
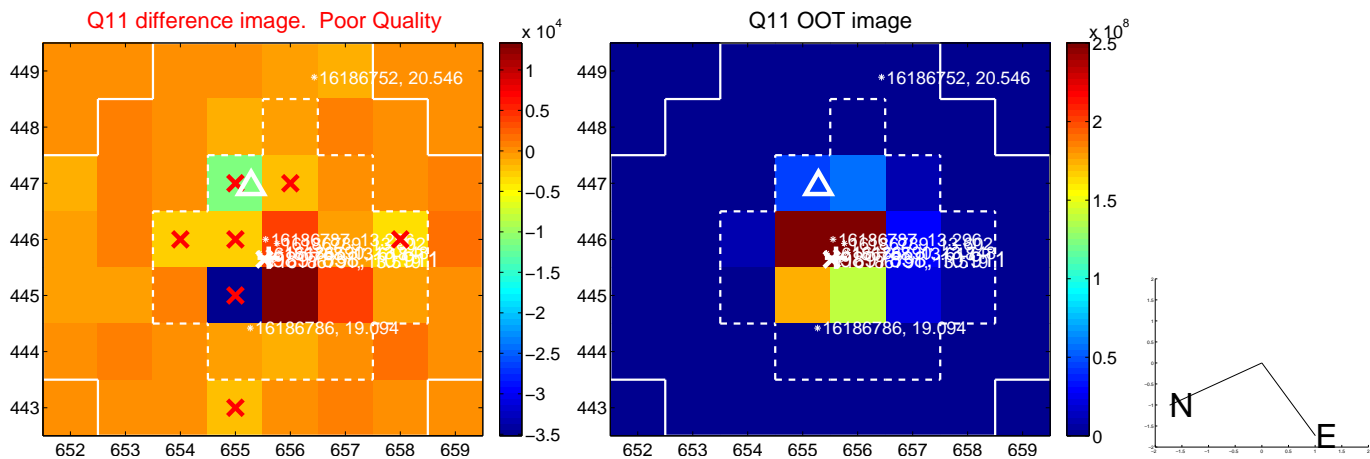
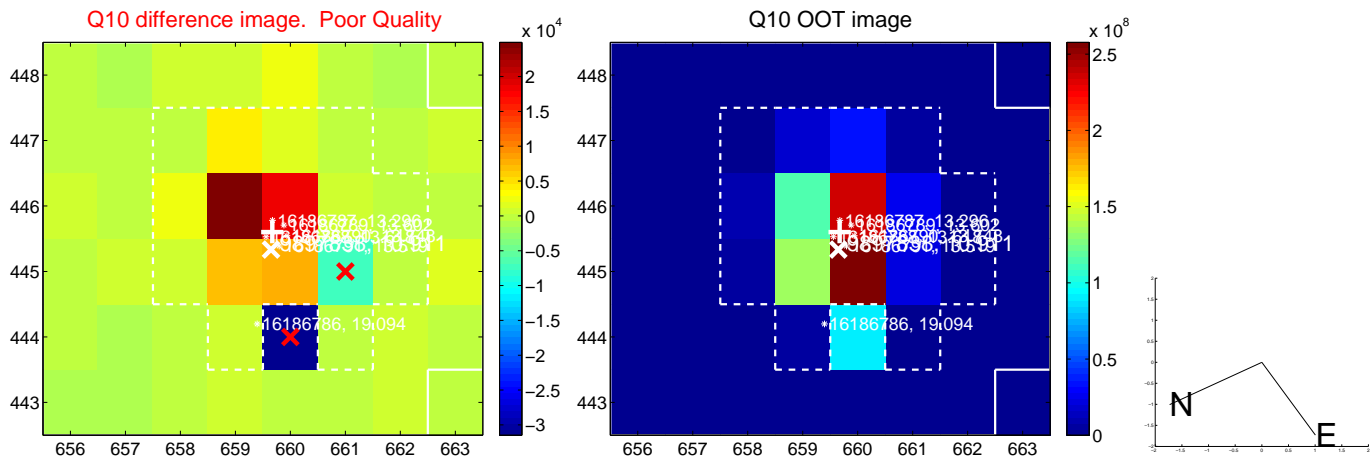
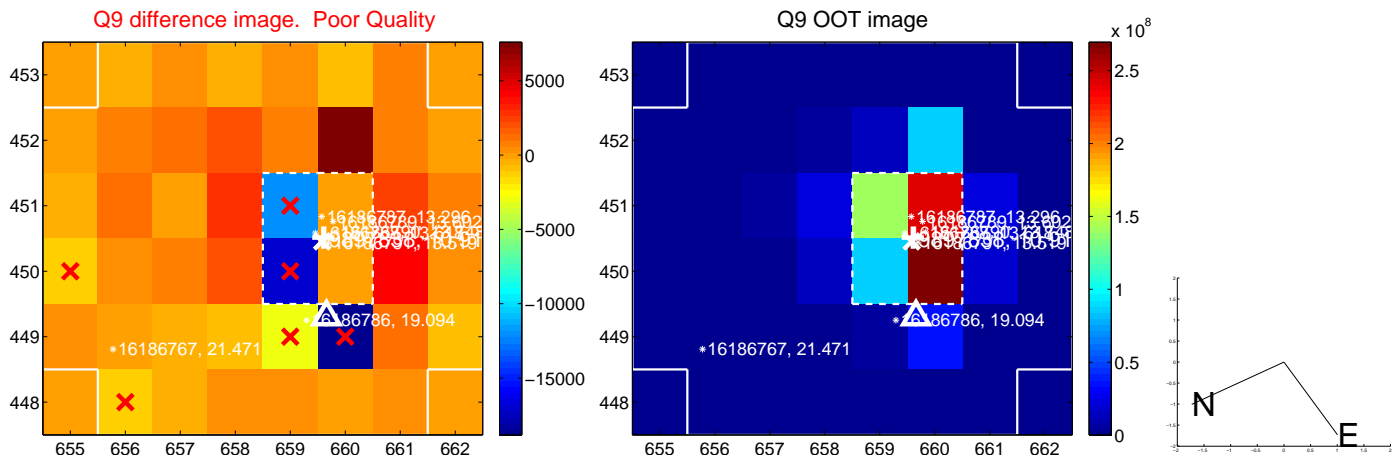


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

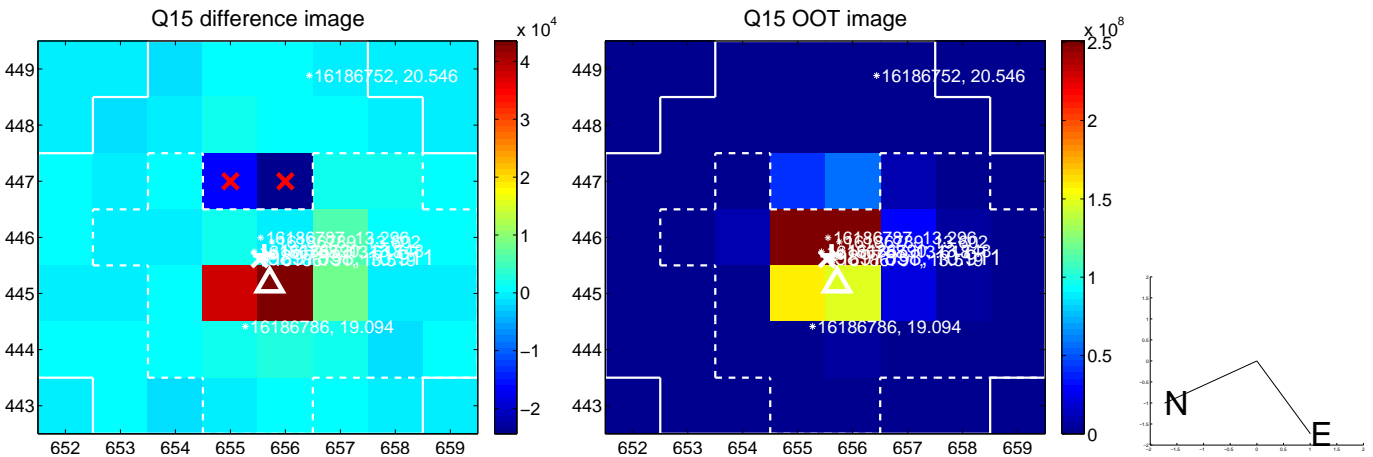
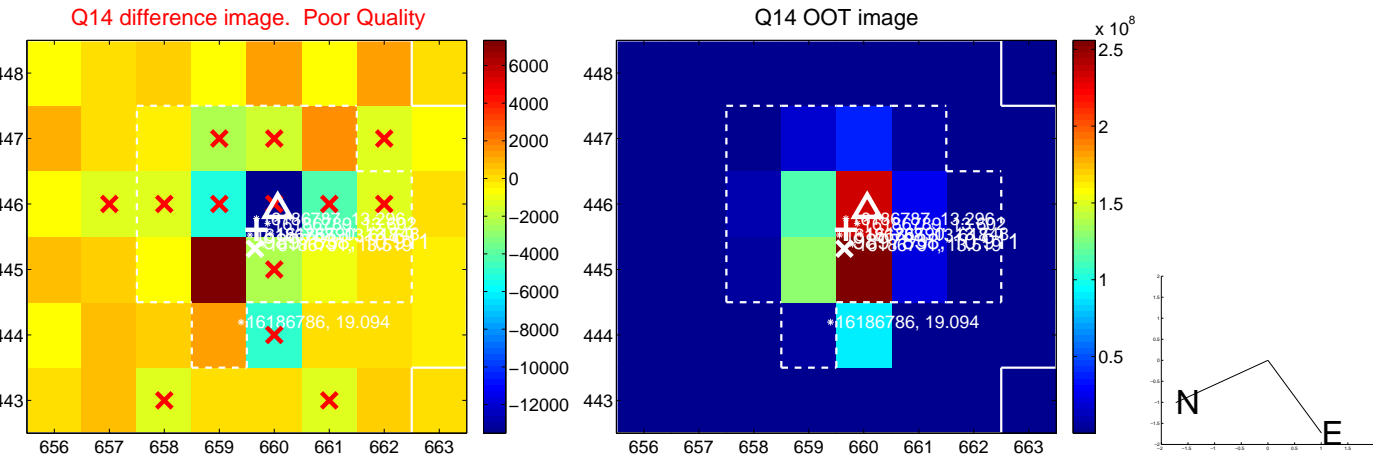
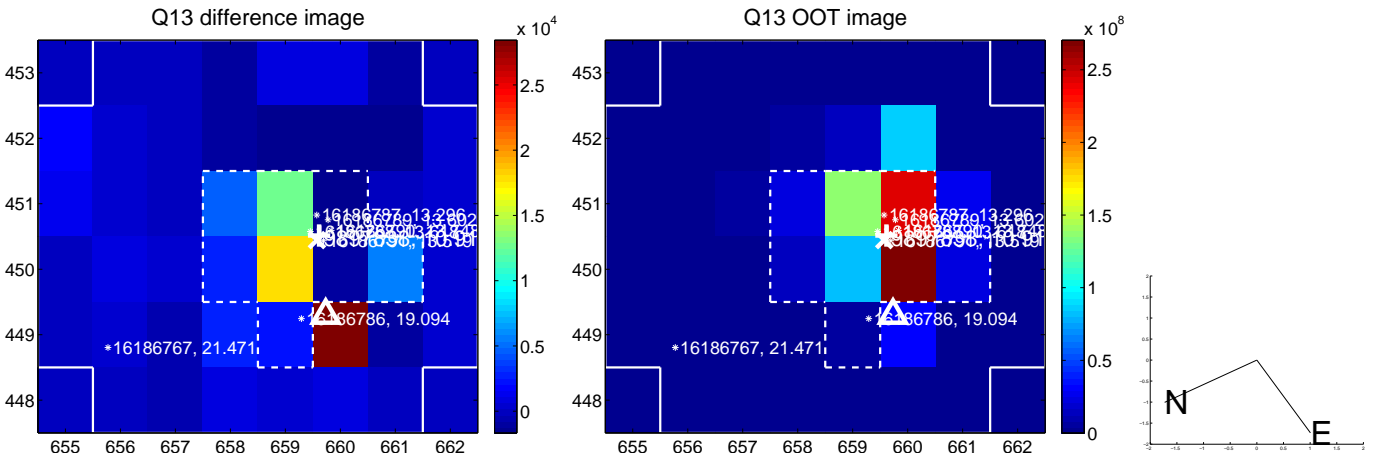
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



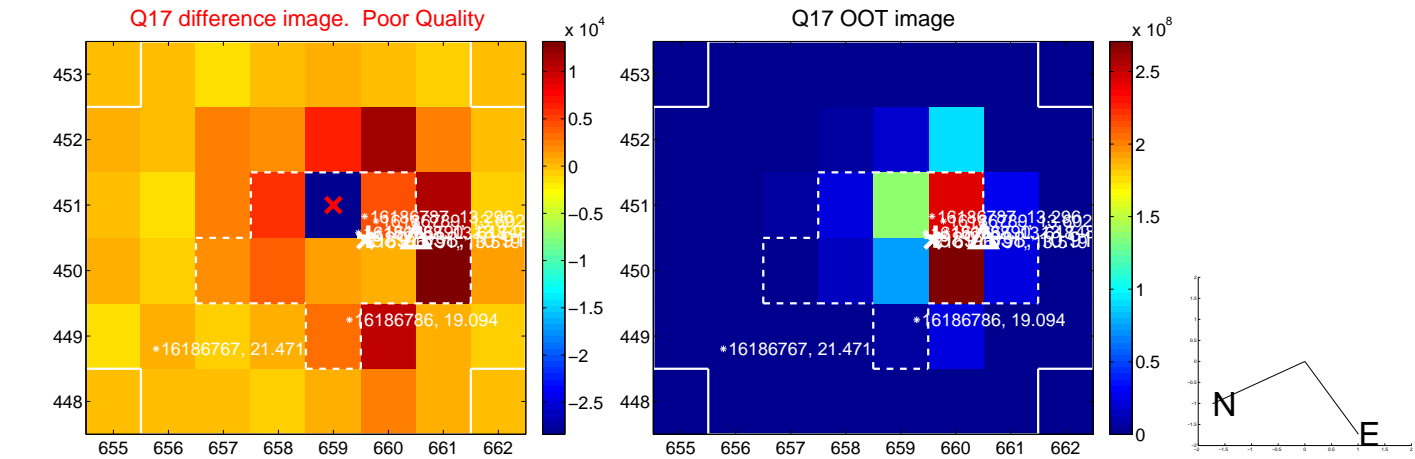
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



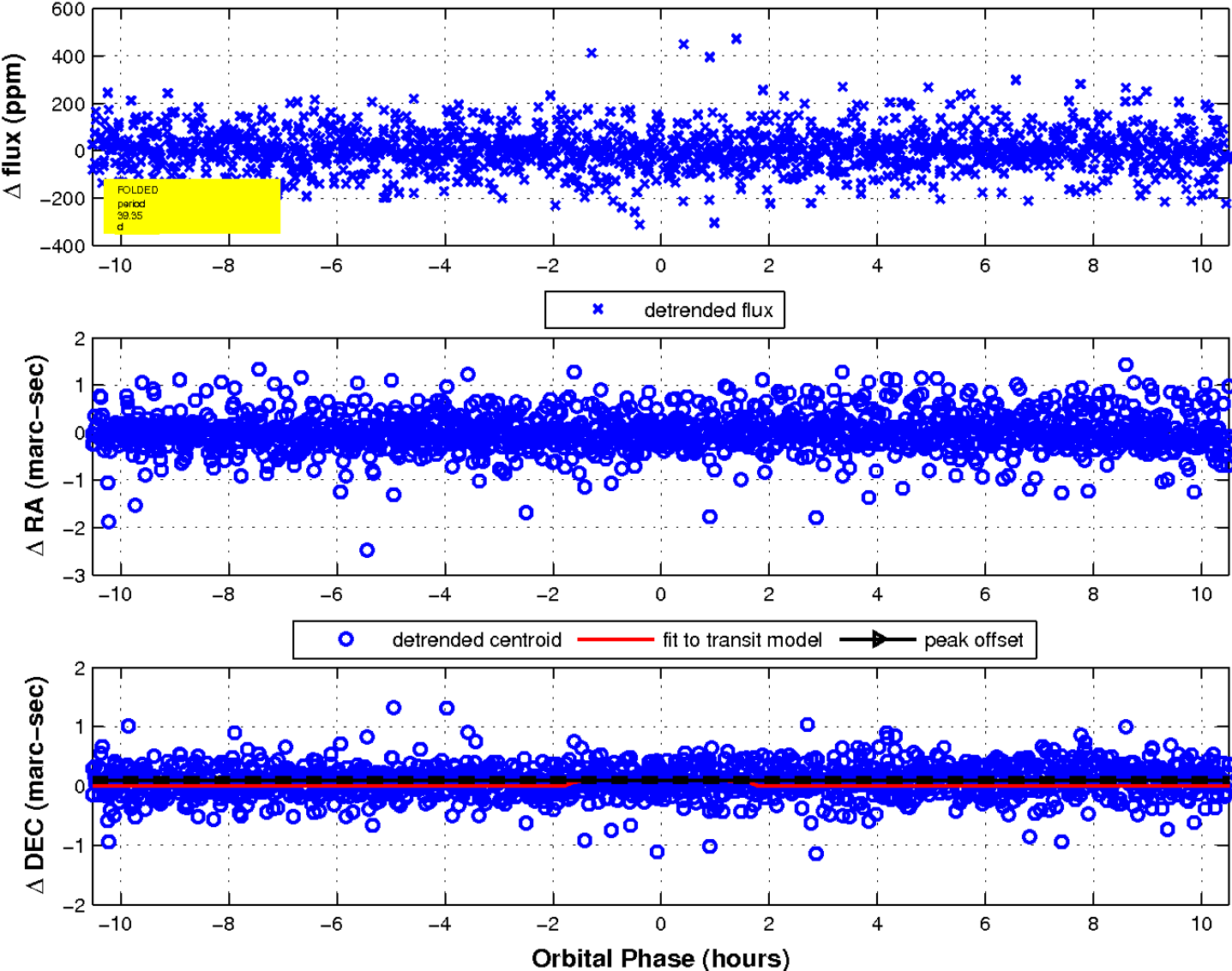
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

