

KIC 009674564

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})
009674564-01	OBS	4096.01	6.873706	132.460421	183.3	4.597	13.0	13.7	0.91	5668	2.56	159.84
009674564-02	OBS	No	6.873662	136.136088	171.4	5.734	12.8	13.5	0.91	5668	1.69	159.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009674564-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
009674564-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

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.

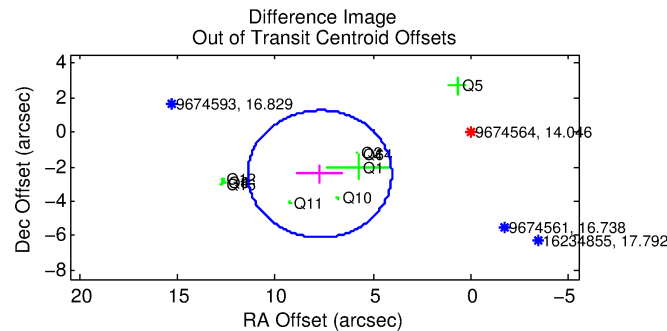
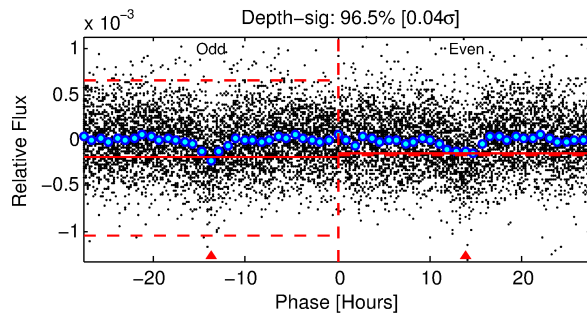
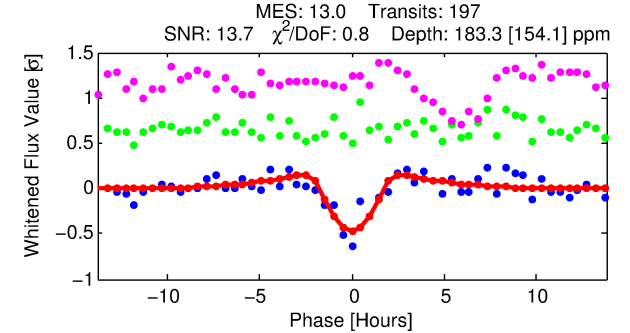
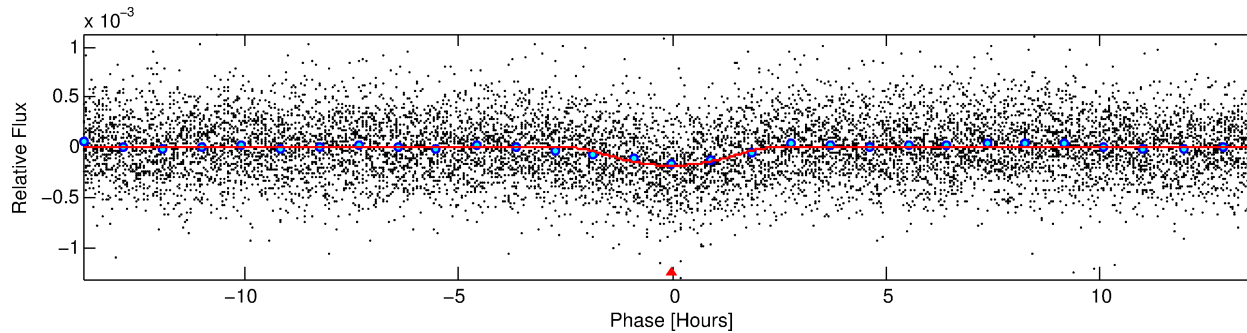
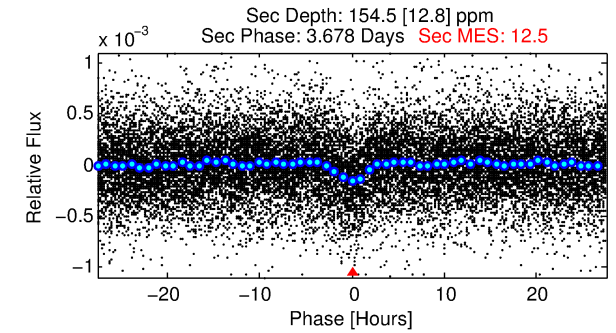
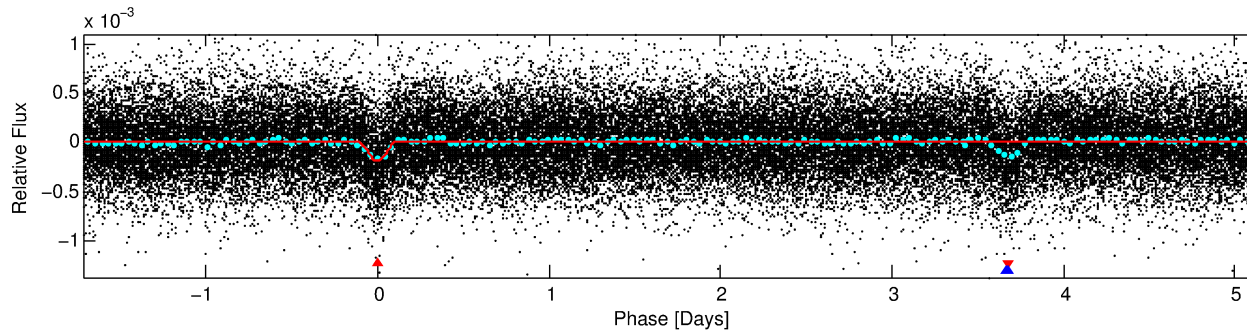
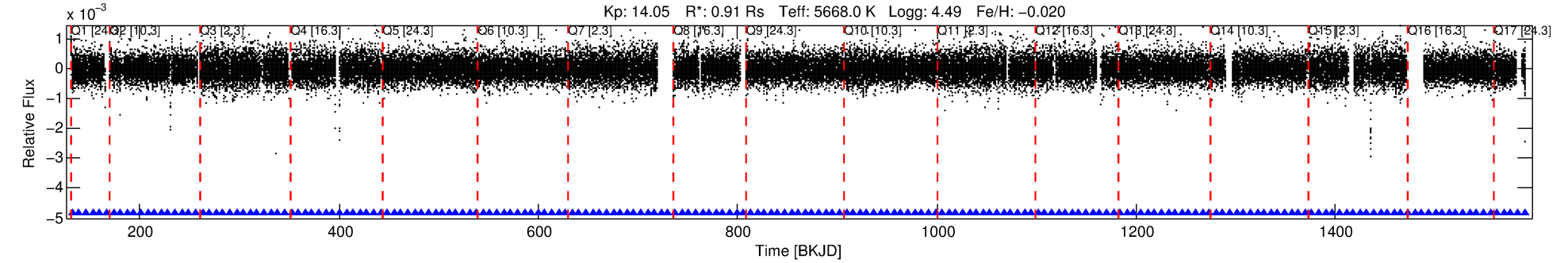
Ephemeris Match Information For 009674564-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009674564-01	9674564	009674592-01	9674592	1:1	16.5	4	0	15.93	14.04	48.88	Direct-PRF	0	0.16	0.14

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9674564 Candidate: 1 of 2 Period: 6.874 d
KOI: K04096.01 Corr: 0.864



DV Fit Results:

Period = 6.87371 [0.00005] d
Epoch = 132.4604 [0.0064] BKJD
Rp/R* = 0.0258 [0.0569]
a/R* = 2.80 [1.42]
b = 1.00 [0.07]
Seff = 159.84 [57.47]
Teq = 907 [81] K
Rp = 2.56 [5.71] Re
a = 0.0694 [0.0163] AU
Ag = 62.19 [275.44] [0.22σ]
Teffp = 3937 [4347] K [0.70σ]

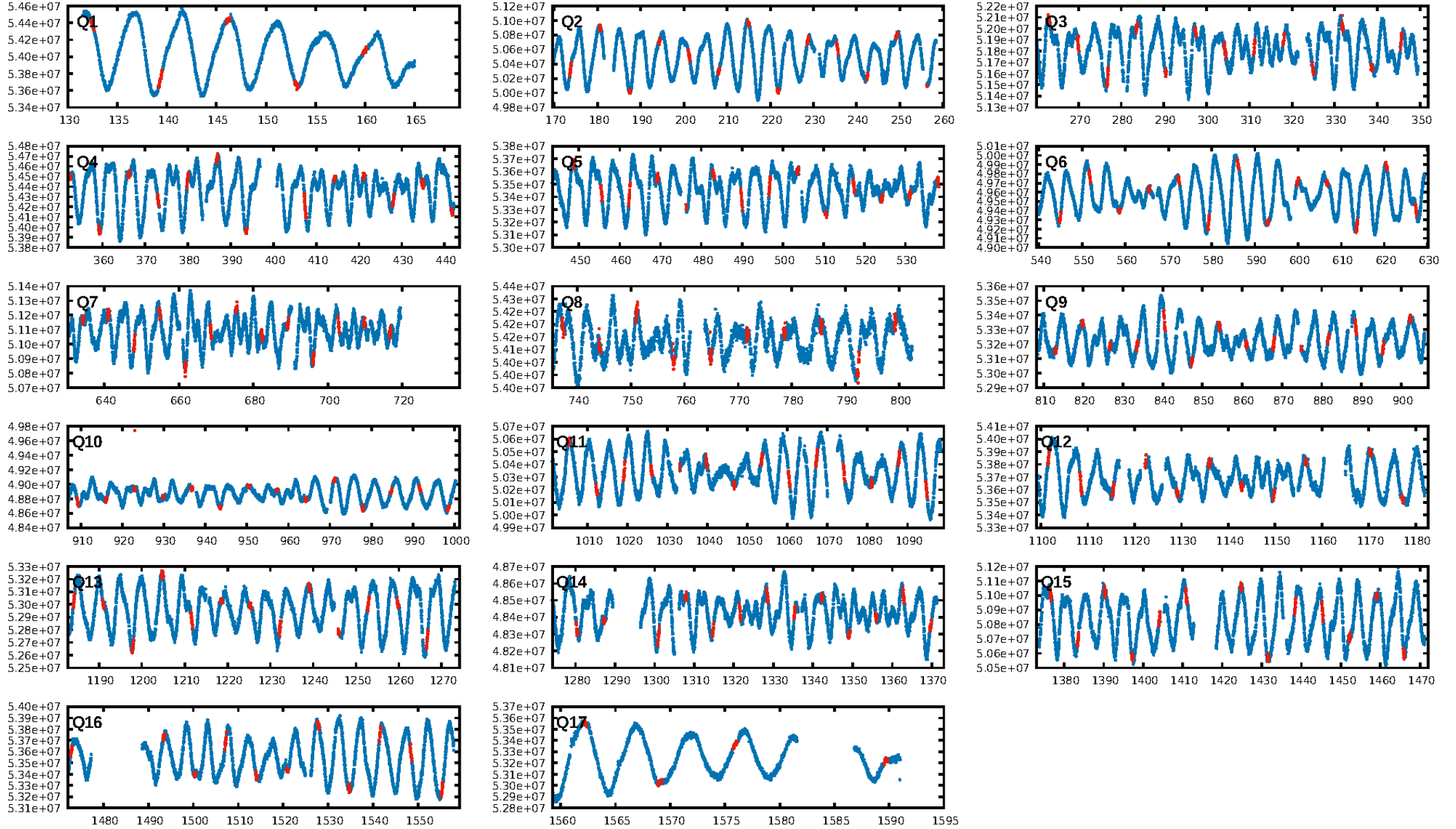
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 82.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.27e-37
RollingBand-fgt: 1.00 [188/188]
GhostDiagnostic-chr: -0.252
Centroid-sig: N/A
Centroid-so: 38.060 arcsec [49.59σ]
OotOffset-rm: 8.098 arcsec [6.59σ]
KicOffset-rm: 8.052 arcsec [5.83σ]
OotOffset-st: 4/1/4/2 [11]
KicOffset-st: 4/1/4/2 [11]
DiffImageQuality-fgm: 0.82 [9/11]
DiffImageOverlap-fno: 1.00 [17/17]

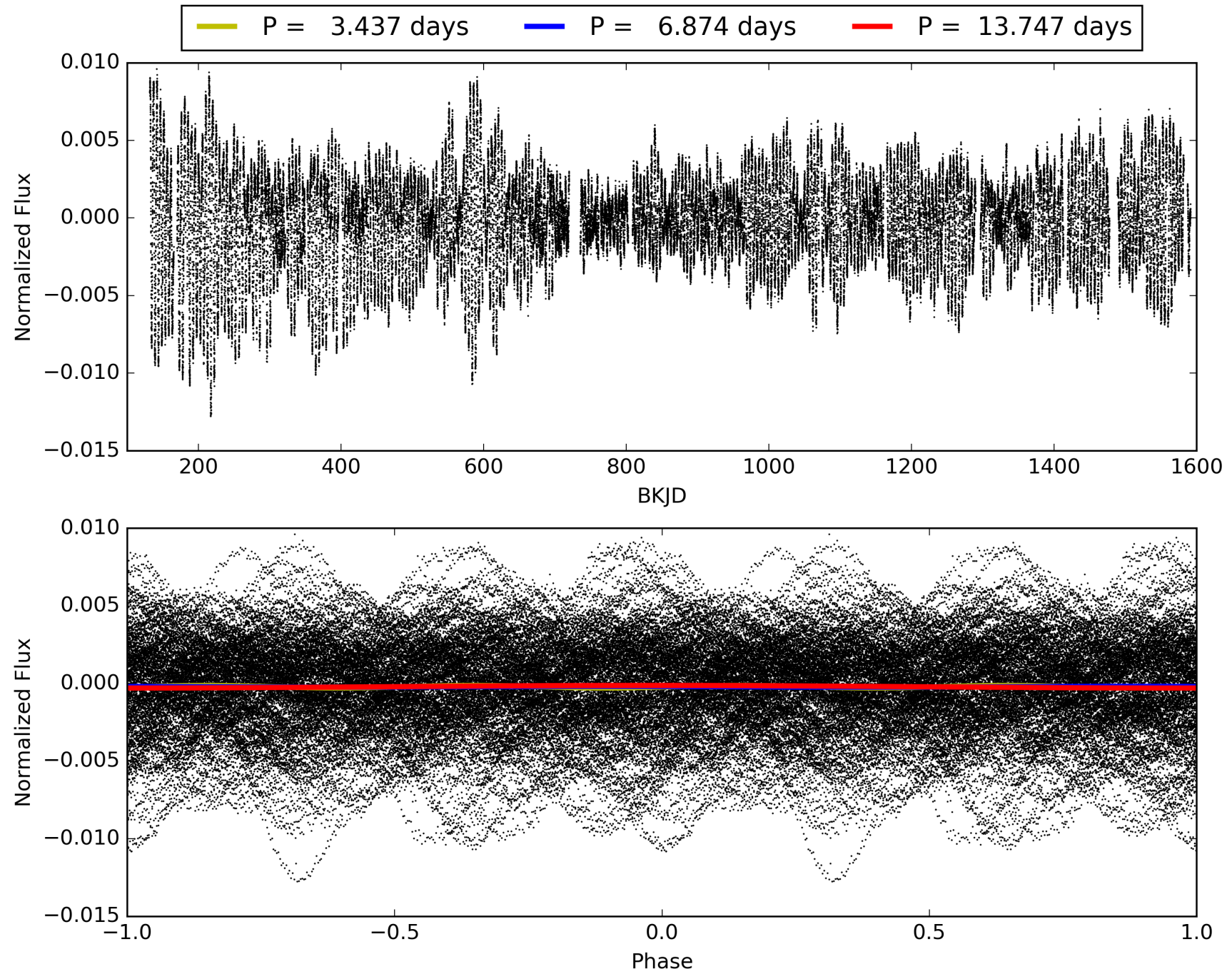
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:58:11 Z

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

TCE 009674564-01, PDC Light Curves

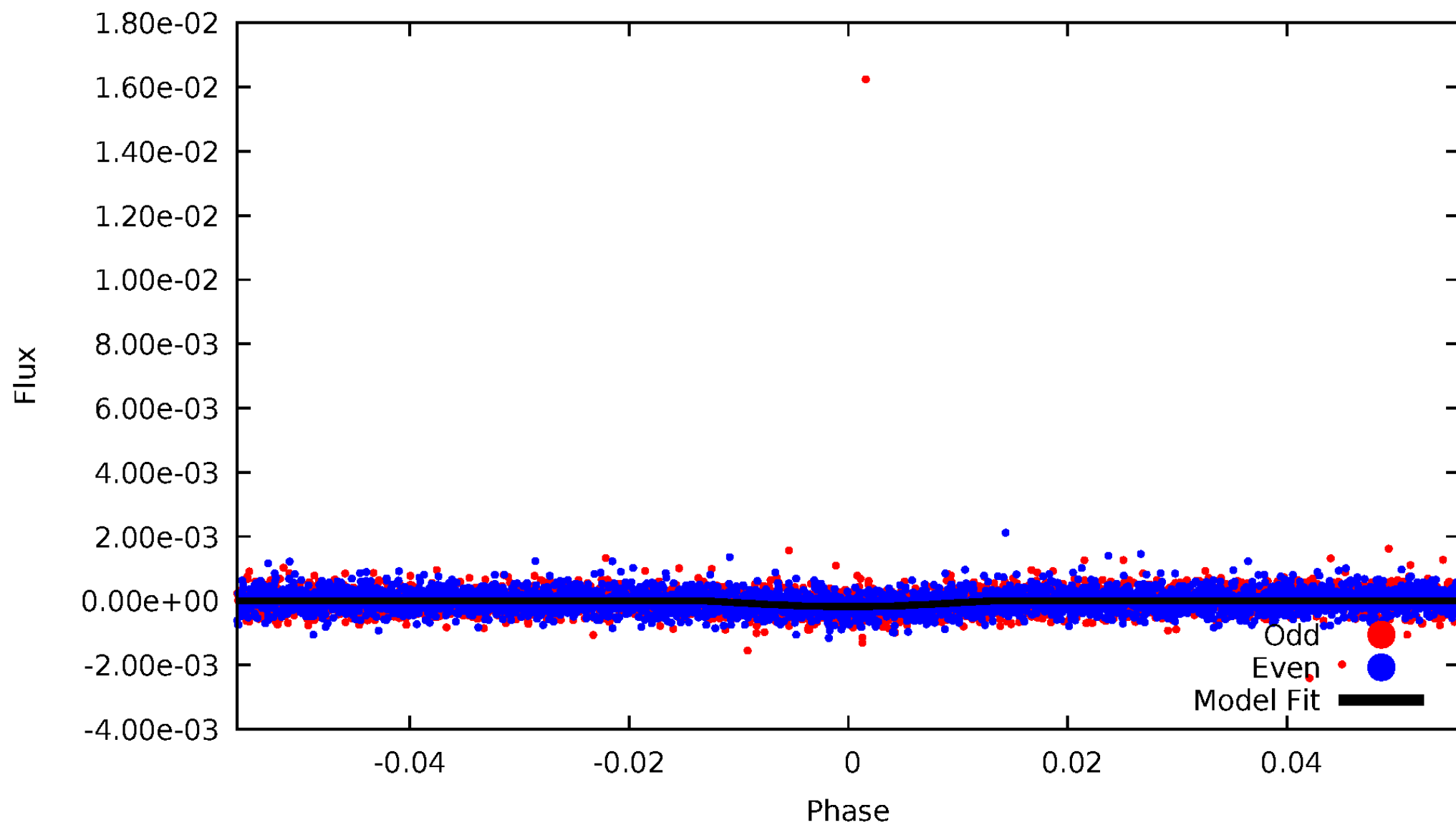


TCE 009674564-01



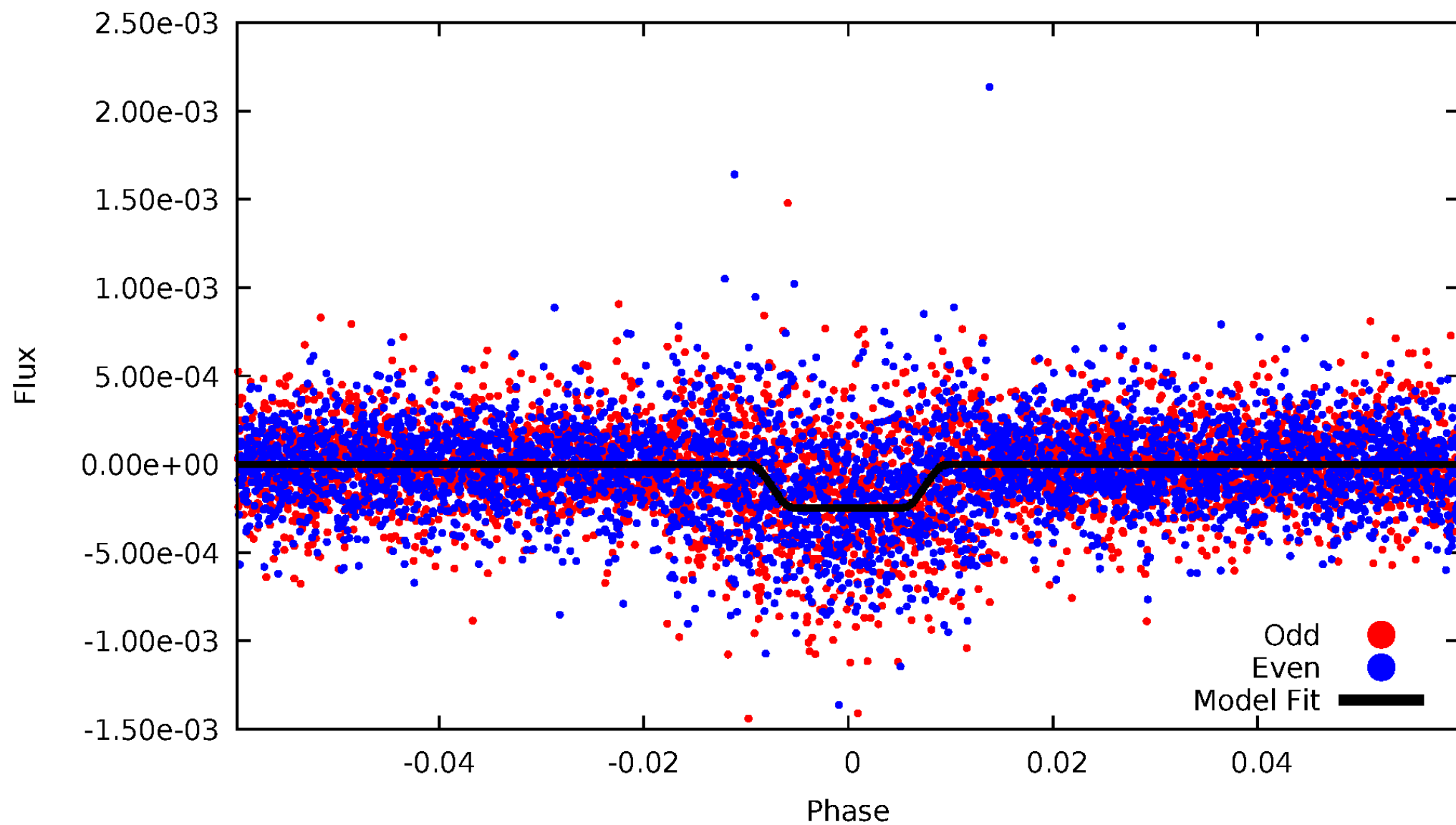
DV Odd/Even

TCE 009674564-01



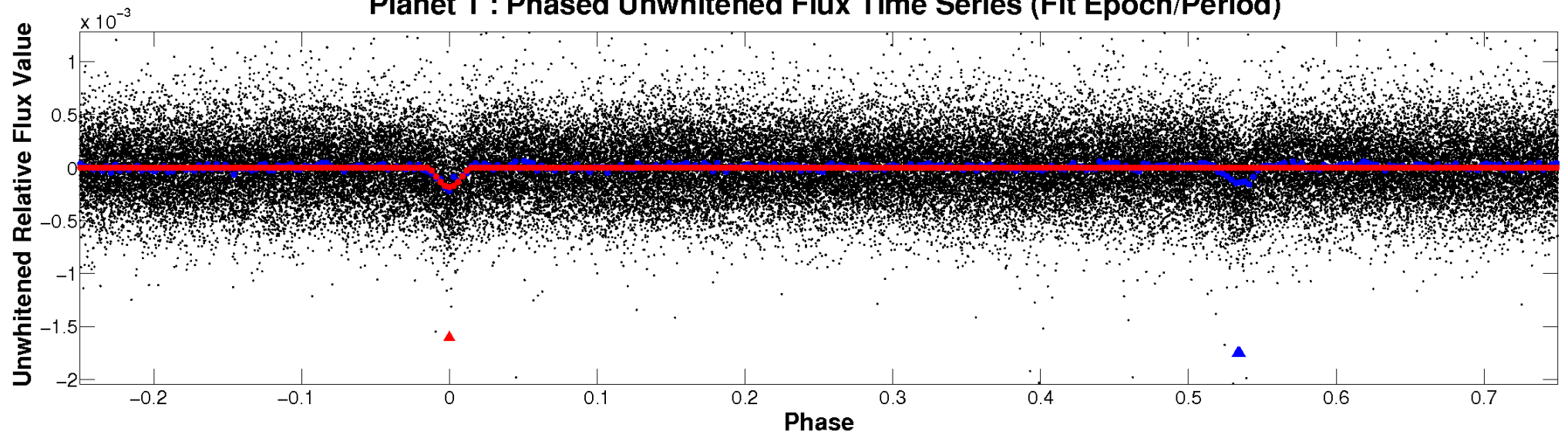
ALT Odd/Even

TCE 009674564-01

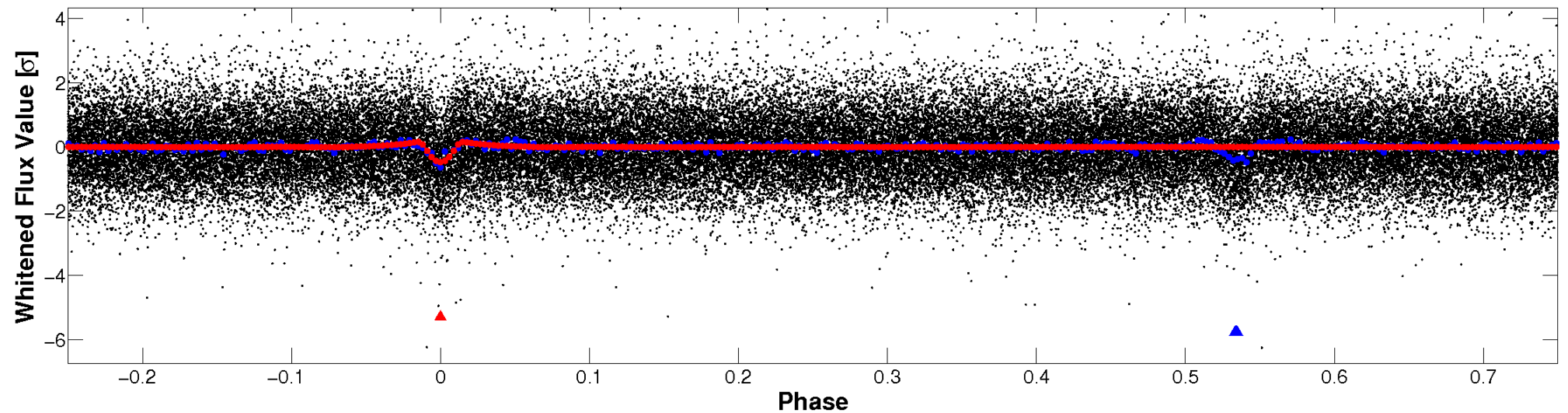


Non-Whitened Vs. Whitened Light Curve

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

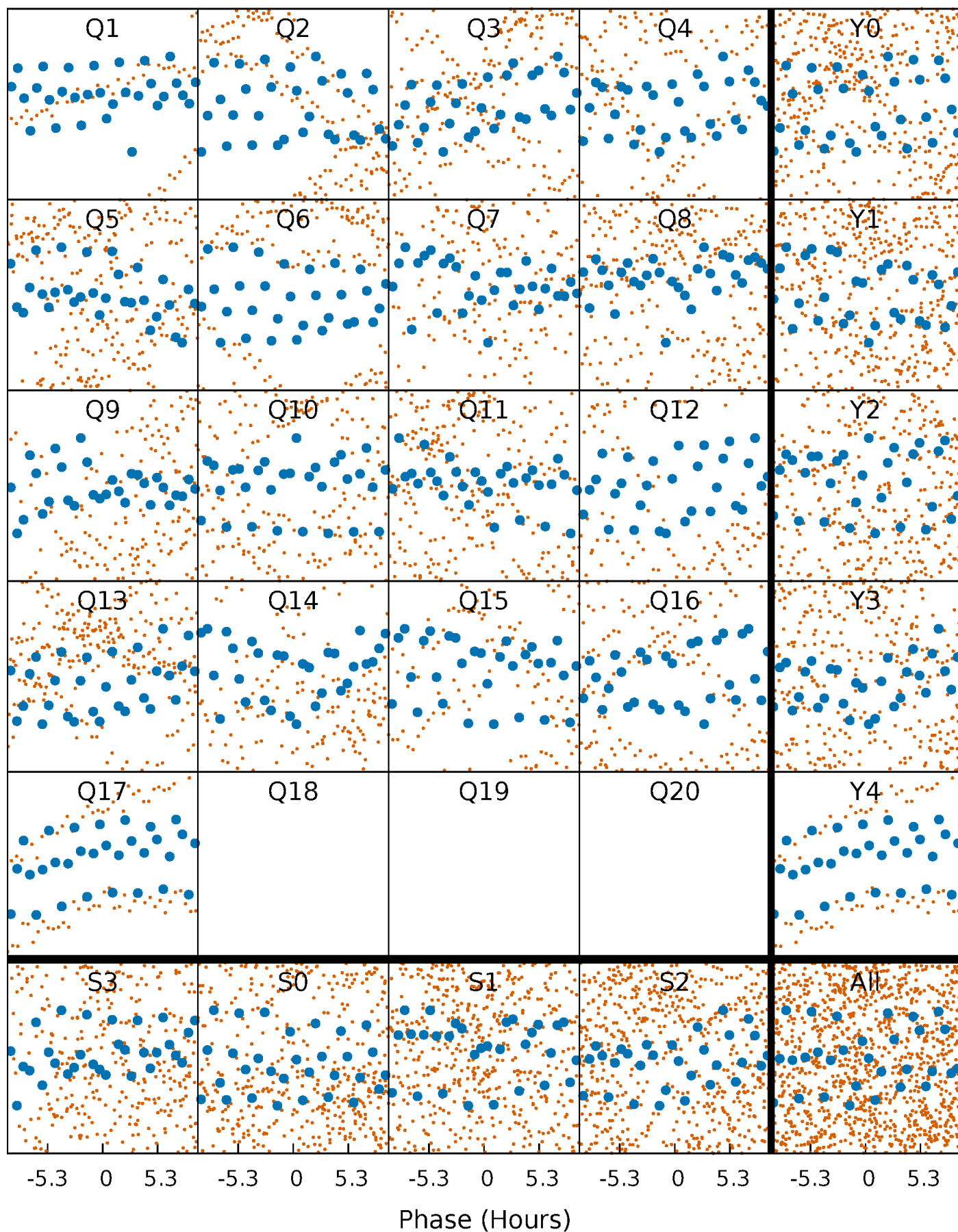


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



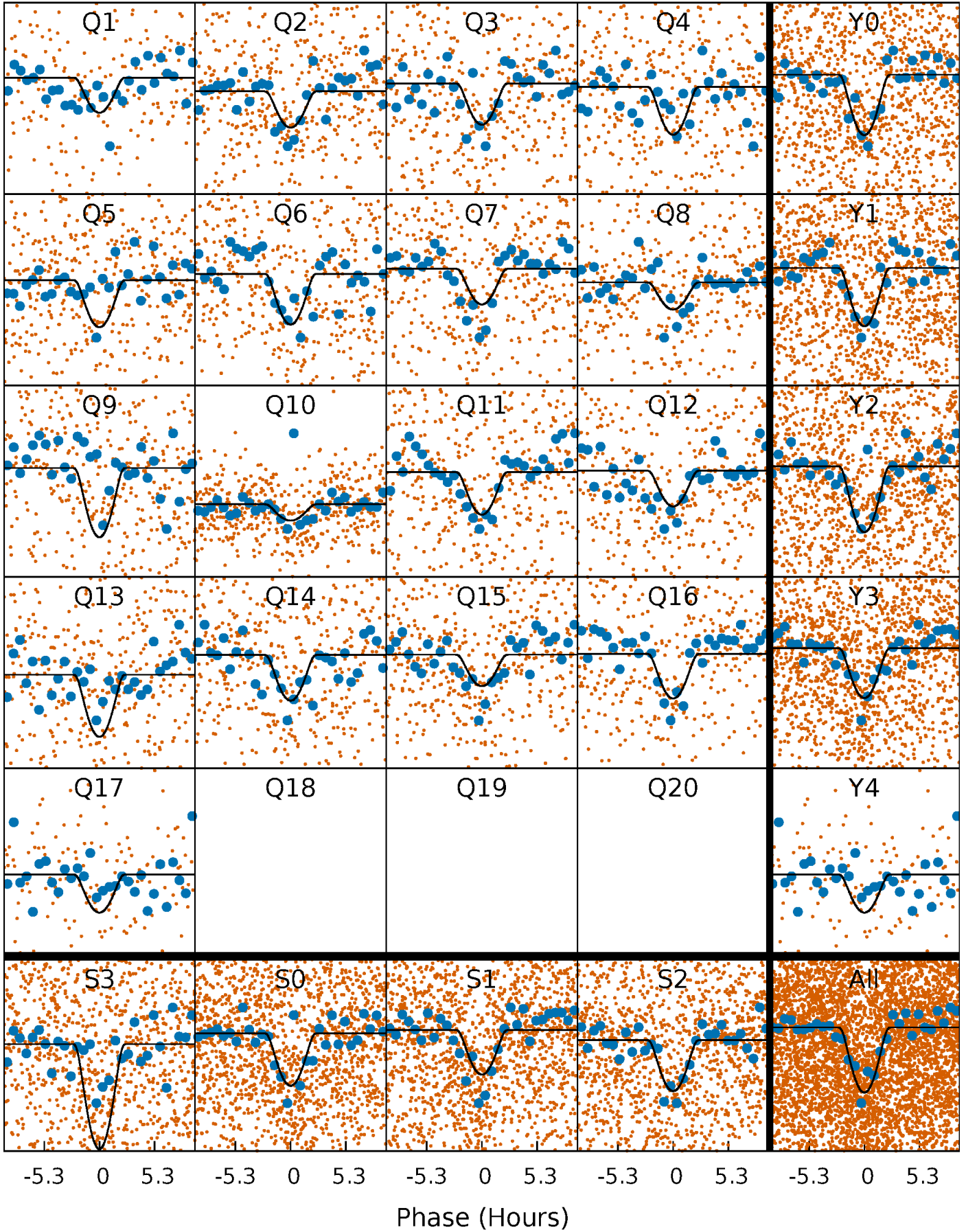
PDC Quarter-Phased Transit Curves

TCE 009674564-01 P= 6.873706 Days $T_0=132.460421$ (BKJD)



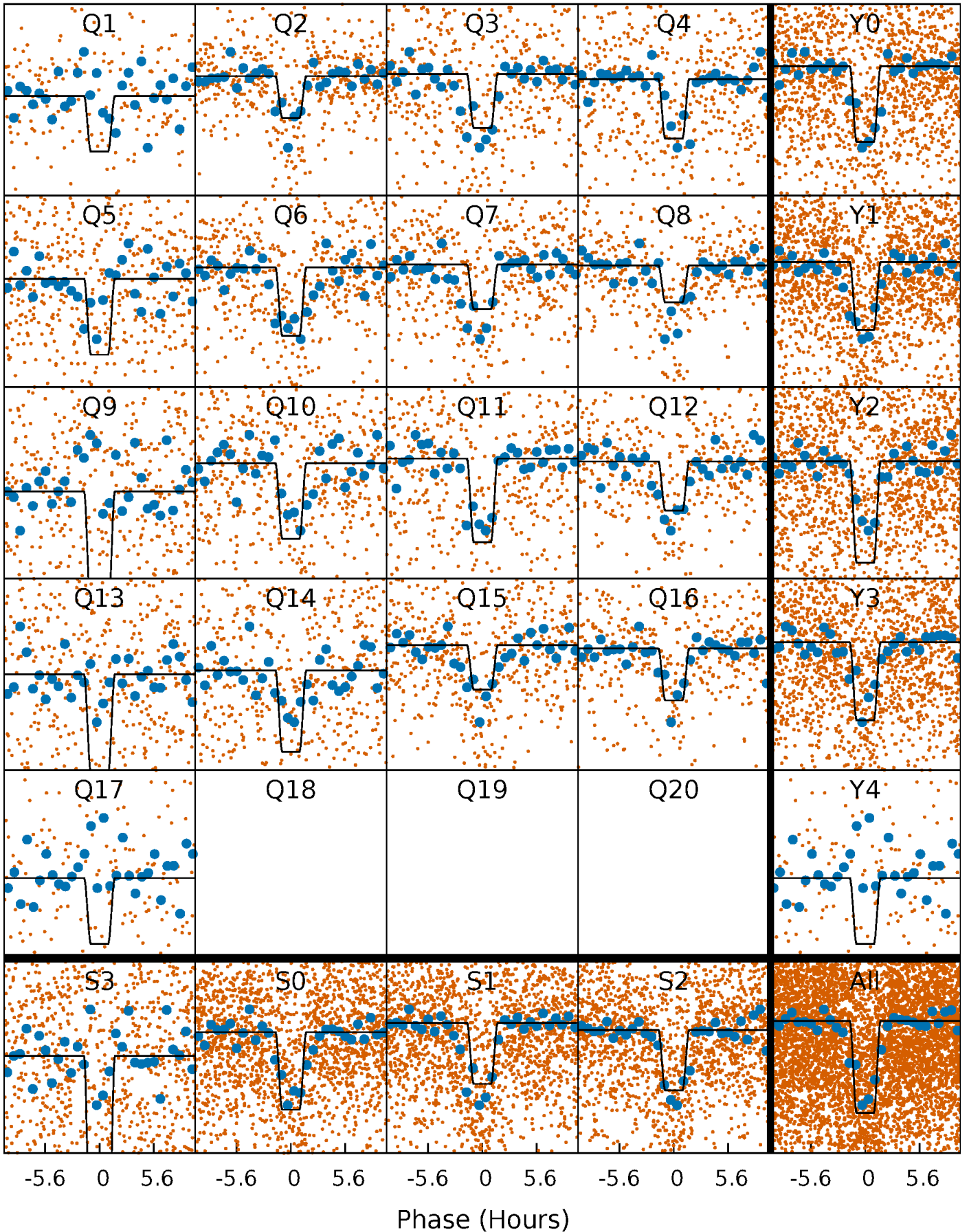
DV Quarter-Phased Transit Curves

TCE 009674564-01 P= 6.873706 Days $T_0=132.460421$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

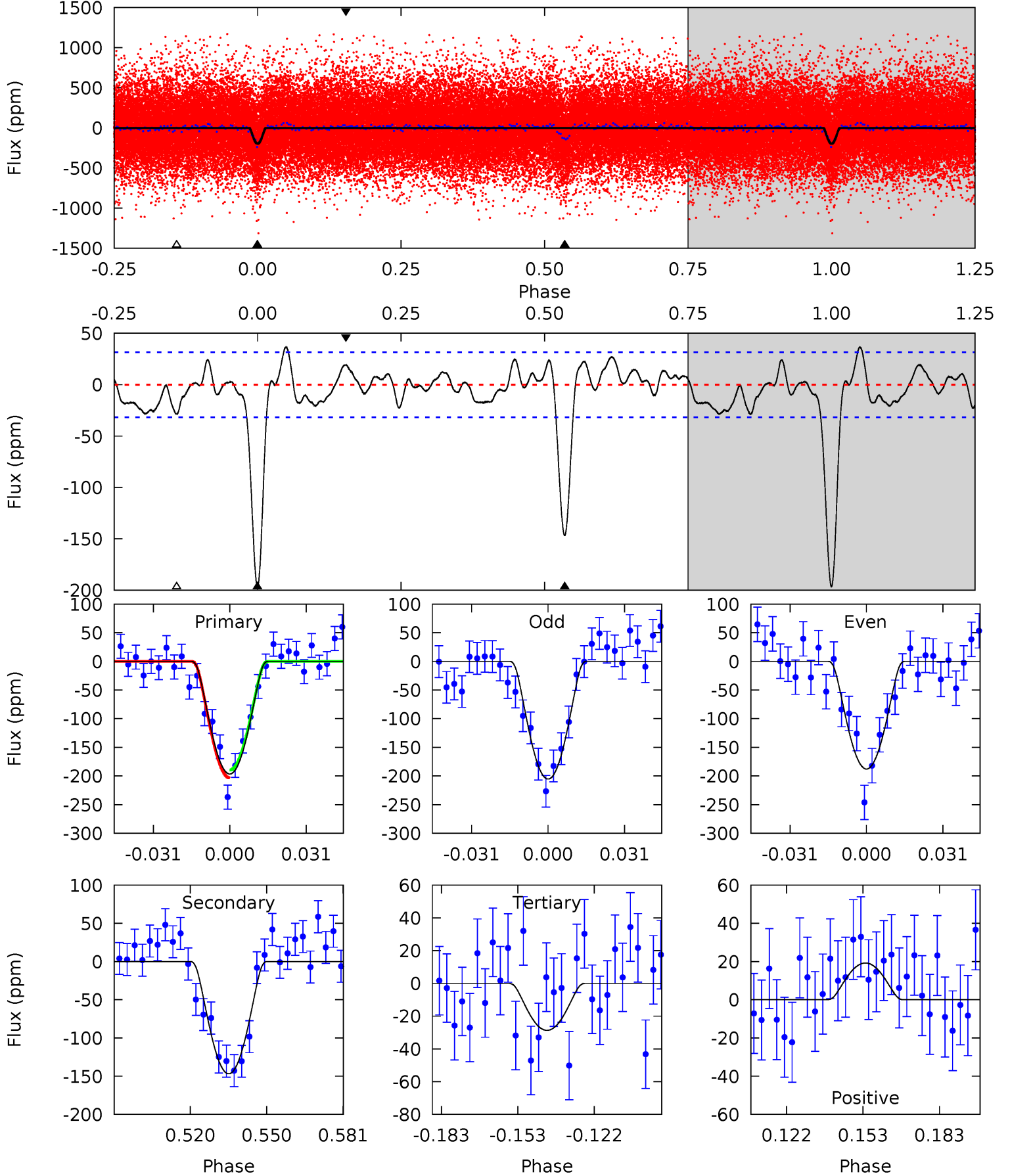
TCE 009674564-01 P= 6.873685 Days $T_0=132.464482$ (BKJD)



DV Model-Shift Uniqueness Test

009674564-01, P = 6.873706 Days, E = 125.586715 Days

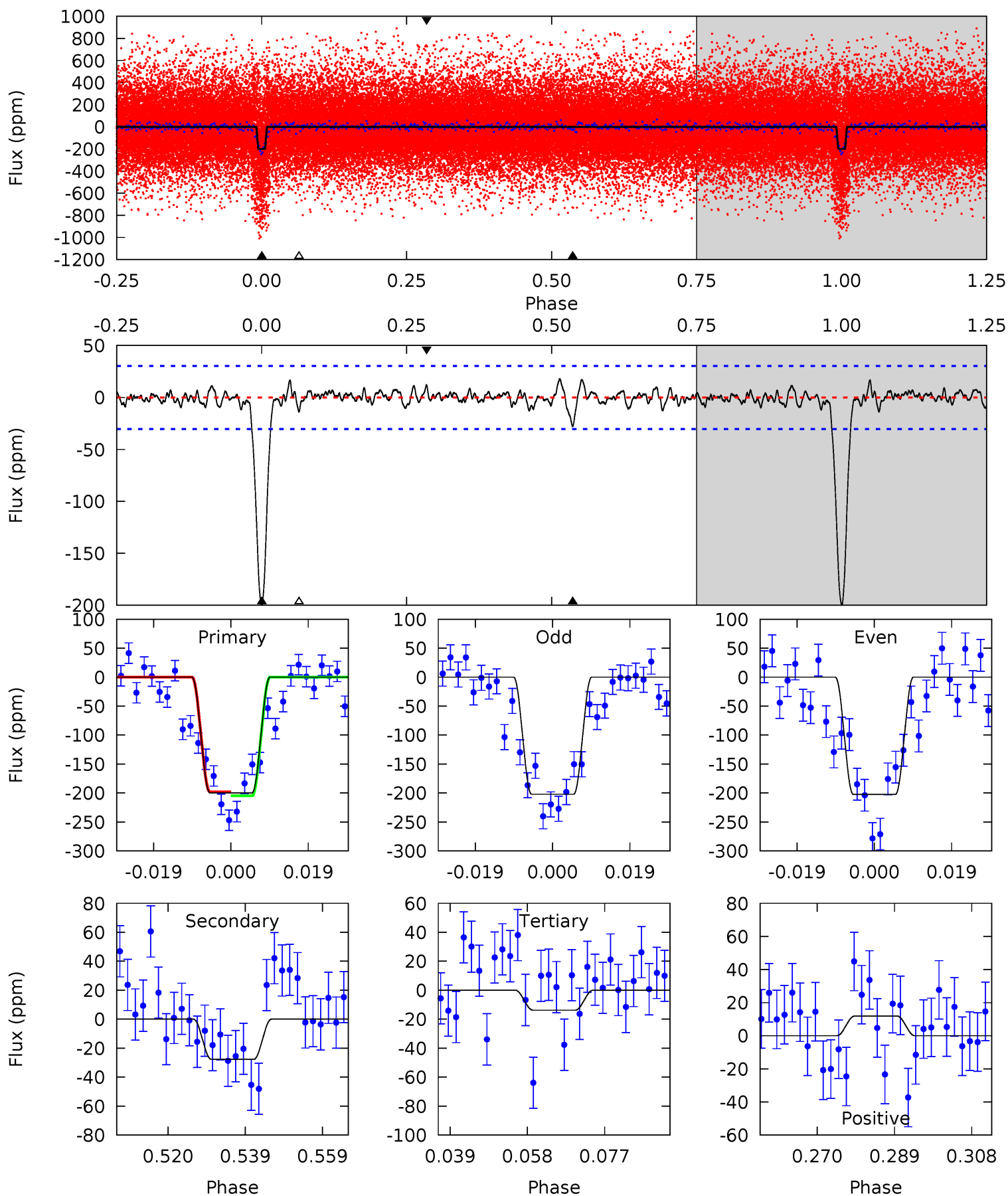
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.9	22.3	4.36	2.93	4.81	2.16	1.99	25.5	27.0	18.0	19.4	1.33	0.95	0.16	1.04



Alt Model-Shift Uniqueness Test

009674564-01, P = 6.873685 Days, E = 125.590797 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.3	4.48	2.23	1.92	4.90	2.34	0.78	30.0	30.3	2.26	2.56	0.02	0.98	0.08	0.56



Stellar Parameters For KIC 009674564

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5668^{+152}_{-152}	$4.492^{+0.062}_{-0.188}$	$-0.020^{+0.250}_{-0.300}$	$0.912^{+0.254}_{-0.091}$	$0.943^{+0.104}_{-0.094}$	$1.748^{+0.453}_{-0.873}$
	+3%/-3%	+1%/-4%	+1250%/-1500%	+28%/-10%	+11%/-10%	+26%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009674564-01 / KOI 4096.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-147 ± 7	$5.37^{+4.89}_{-3.51}$	1288^{+94}_{-61}	3298^{+1506}_{-585}	14^{+92}_{-10}
Alt.	-28 ± 6	$4.79^{+4.92}_{-3.18}$	1285^{+78}_{-55}	2646^{+1090}_{-515}	$3.166^{+25.502}_{-2.455}$

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

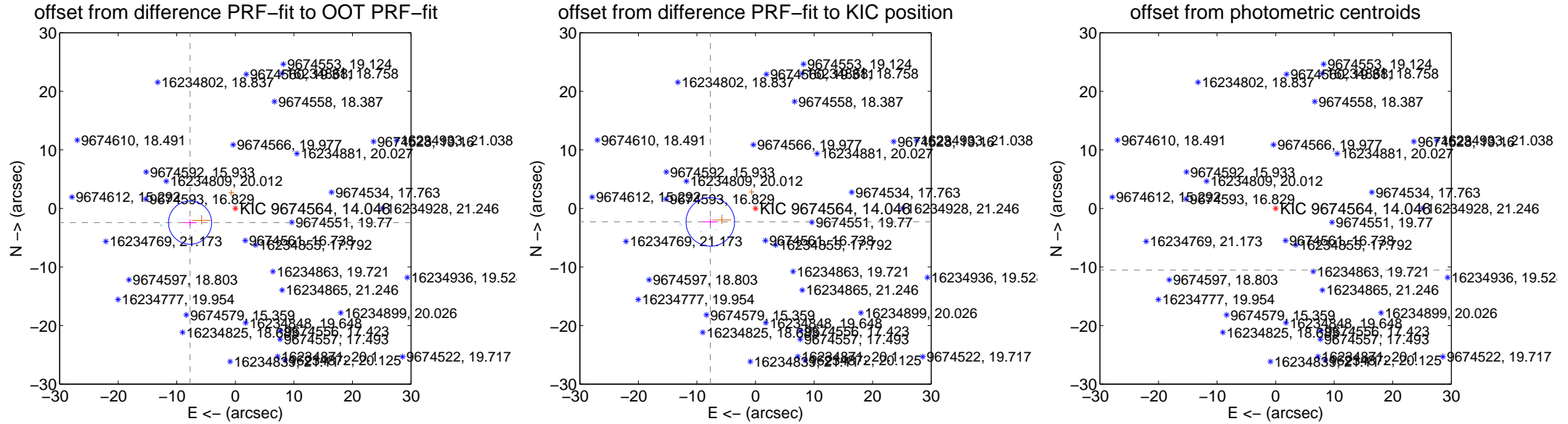
DV Centroid Data

Supplemental centroid analysis for 009674564-01. Kepler magnitude: 14.05. Transit SNR 13.75

There are 9 quarters with good PRF difference image offsets

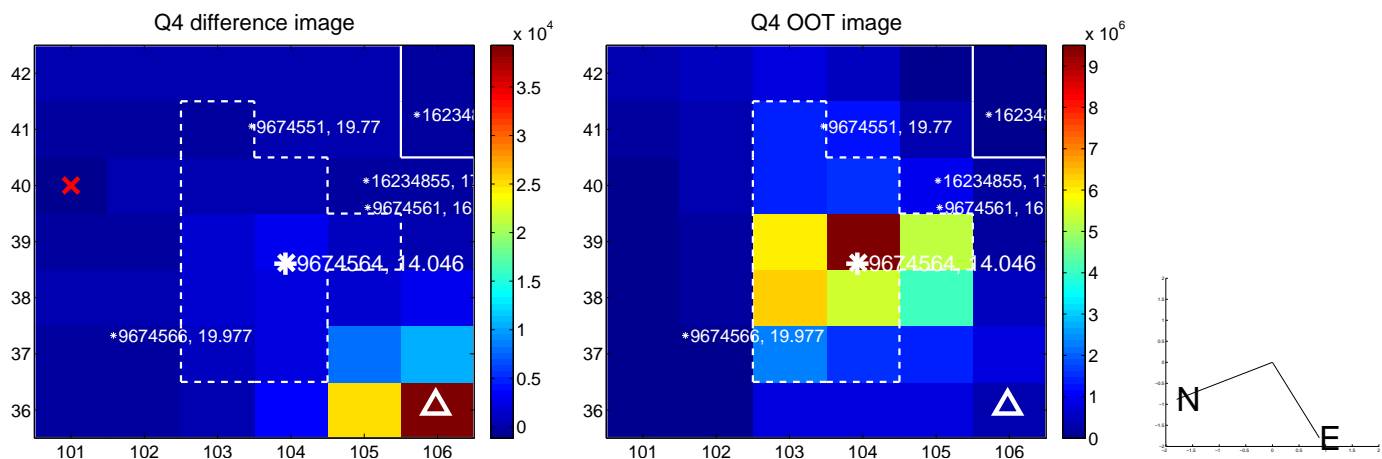
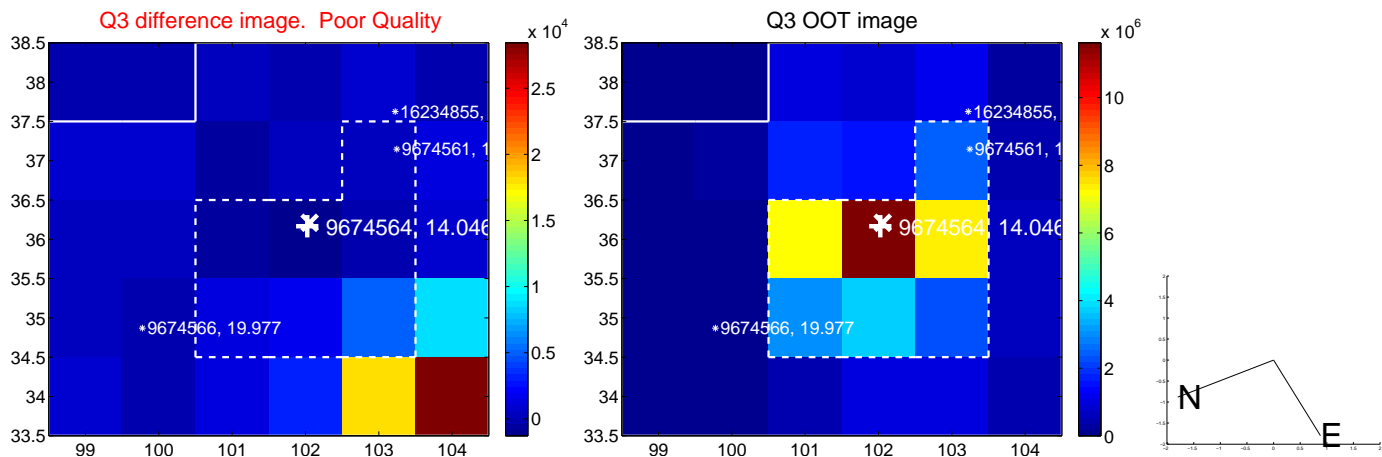
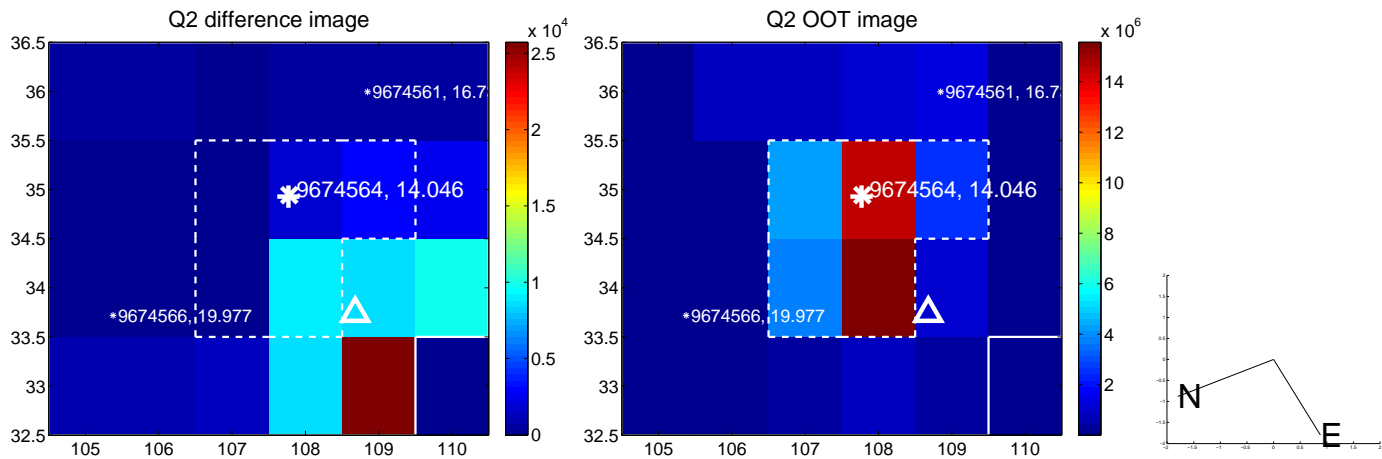
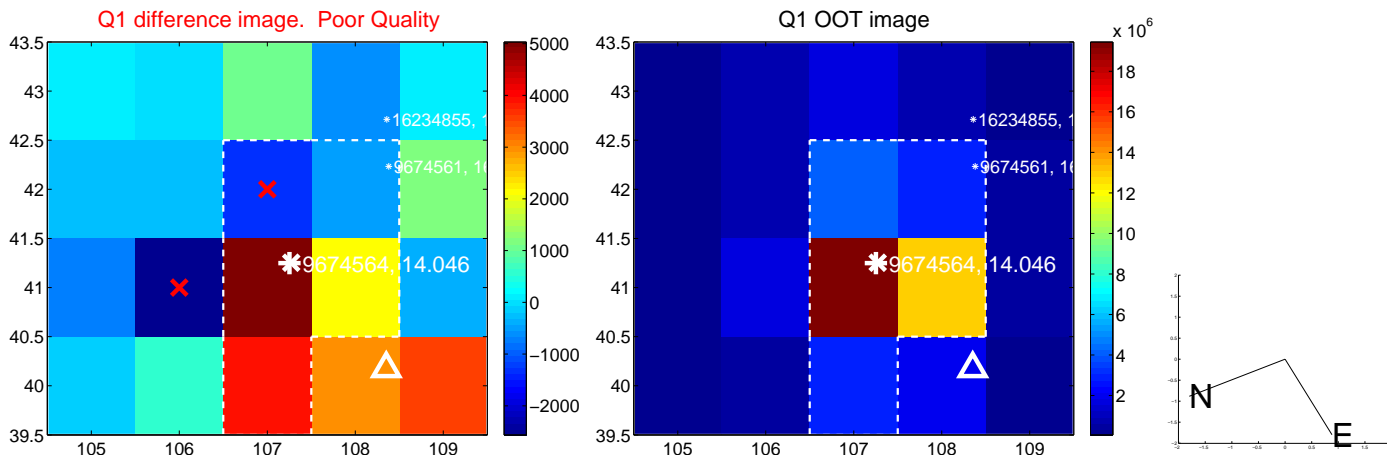
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.098 ± 1.228	6.59	7.726 ± 1.165	-2.426 ± 0.512
PRF-fit source offset from KIC position	8.052 ± 1.382	5.83	7.717 ± 1.298	-2.300 ± 0.607
photometric centroid source offset	38.06 ± 0.77	49.59	36.58 ± 0.77	-10.53 ± 0.74

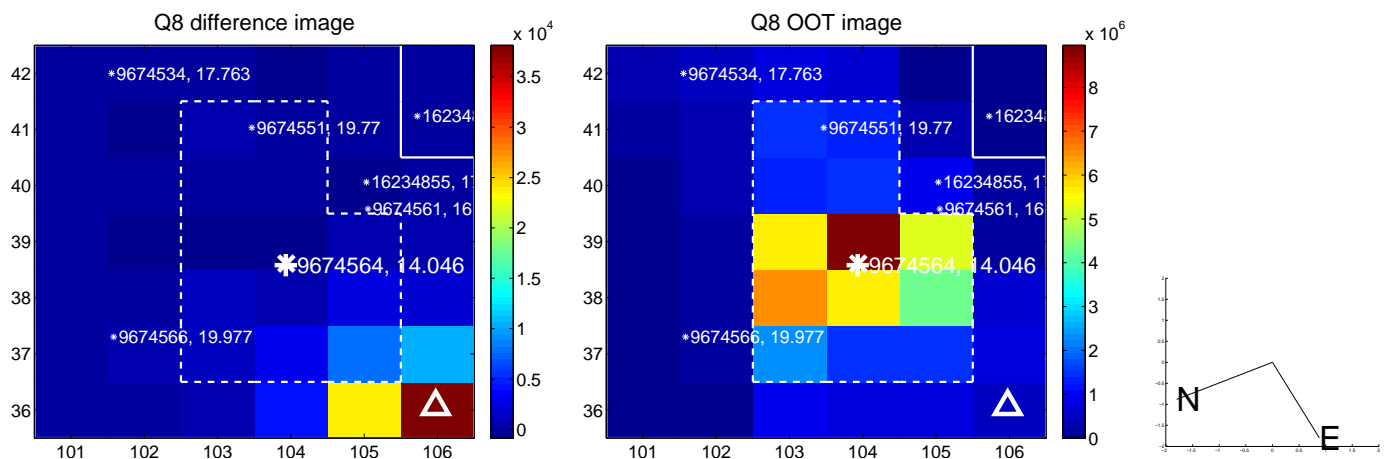
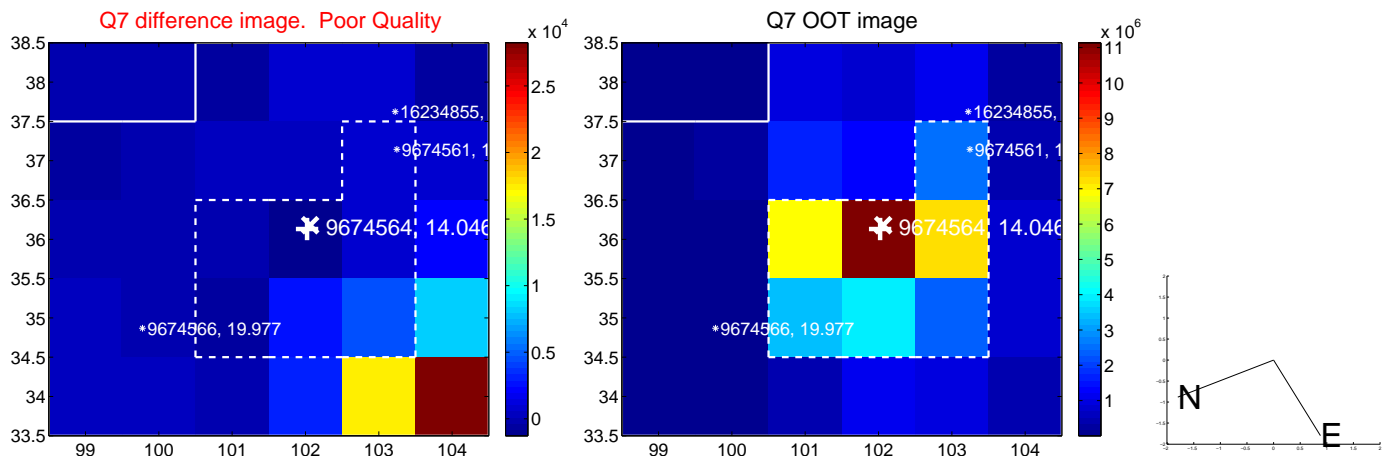
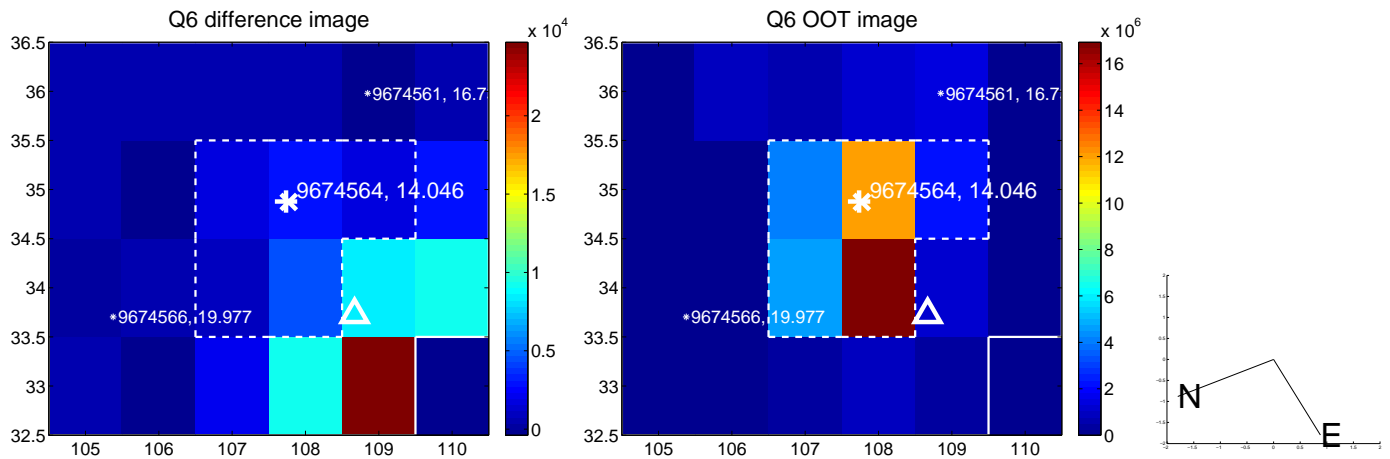
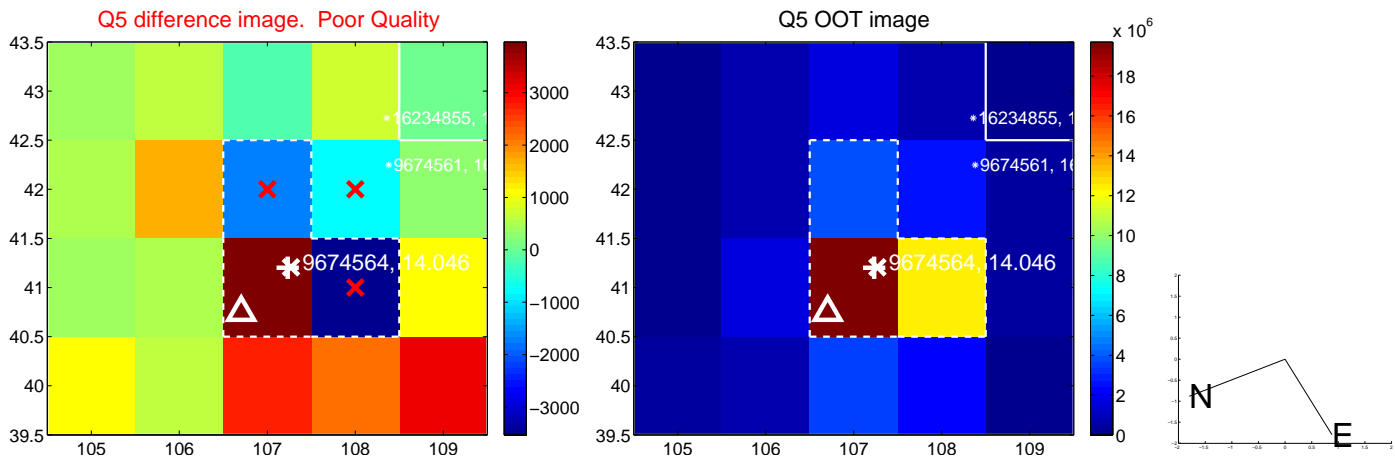


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

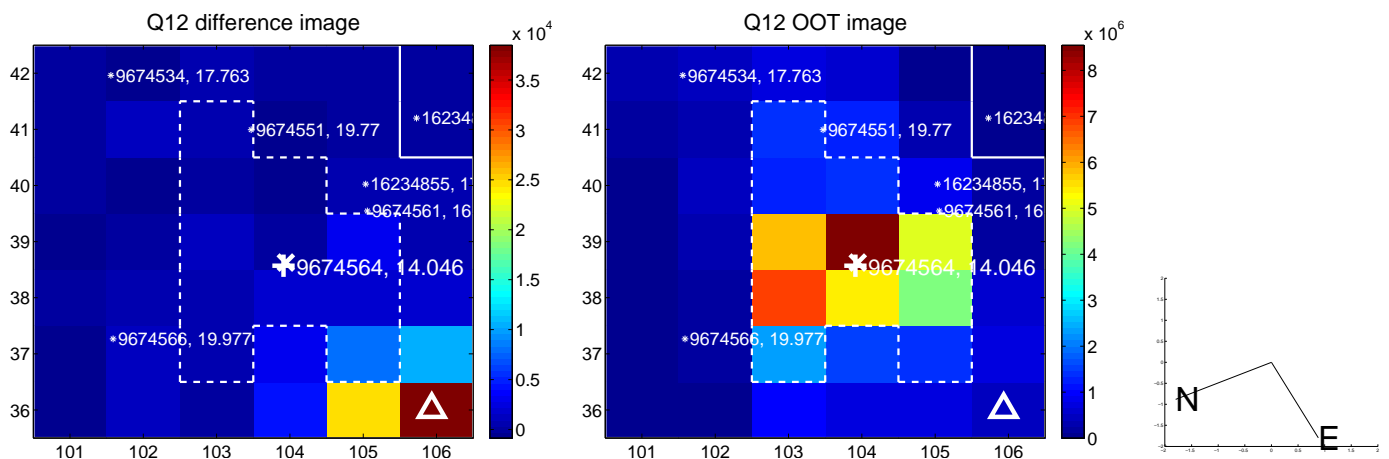
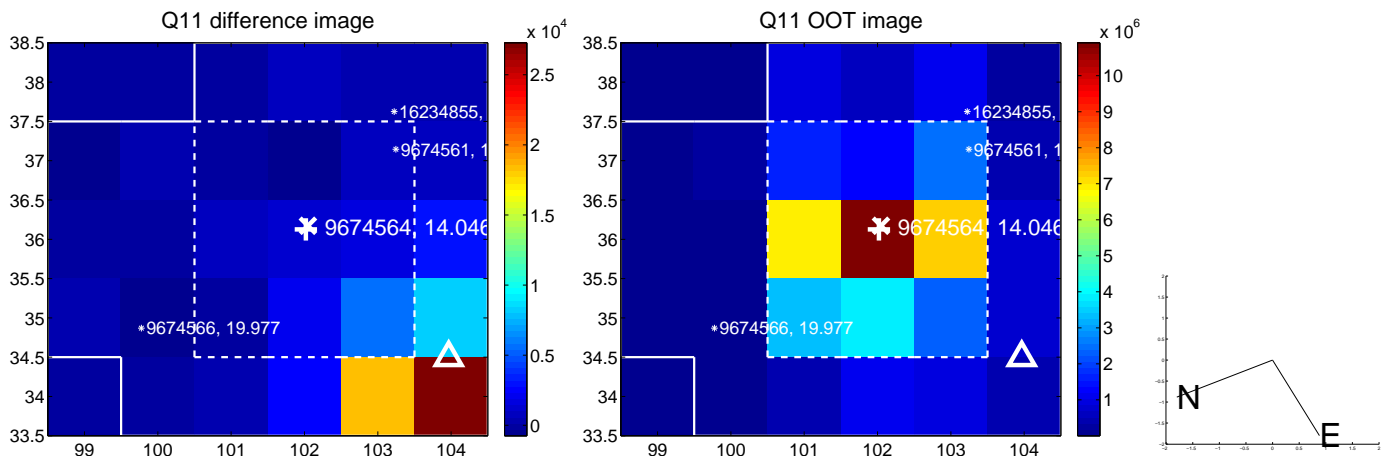
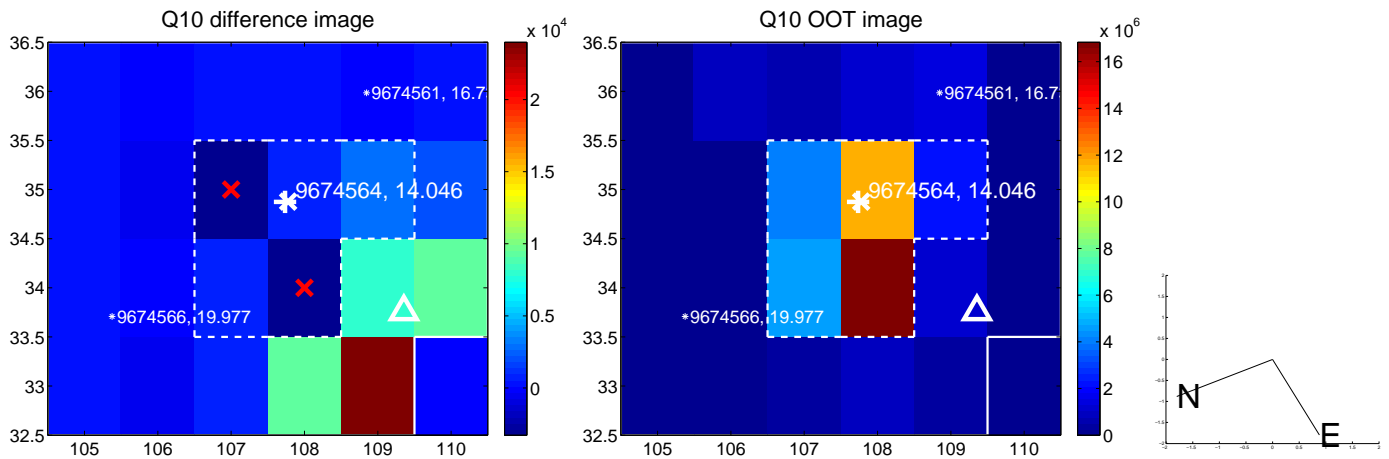
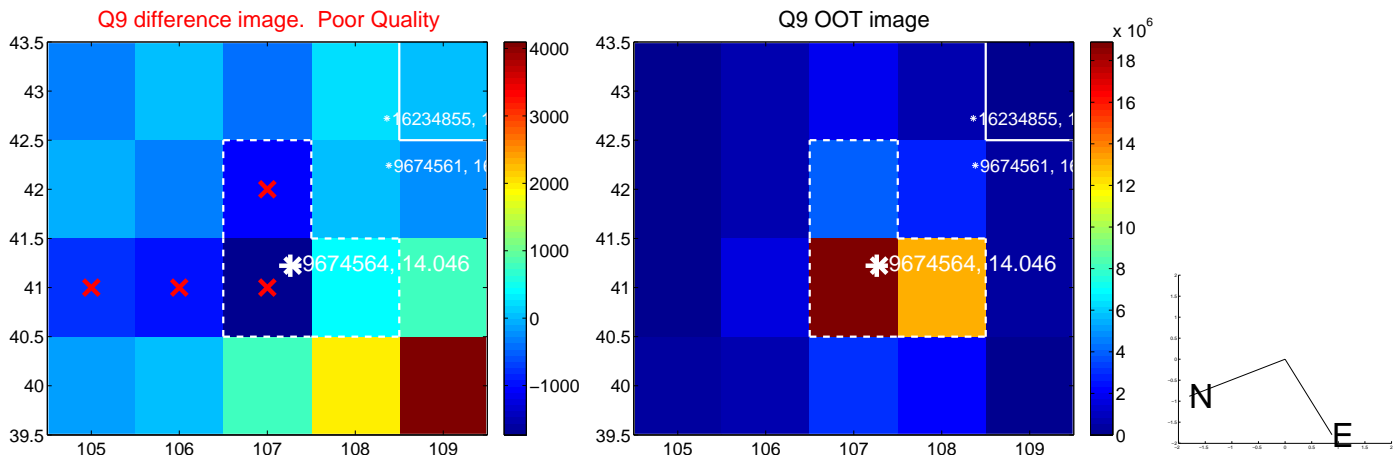
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



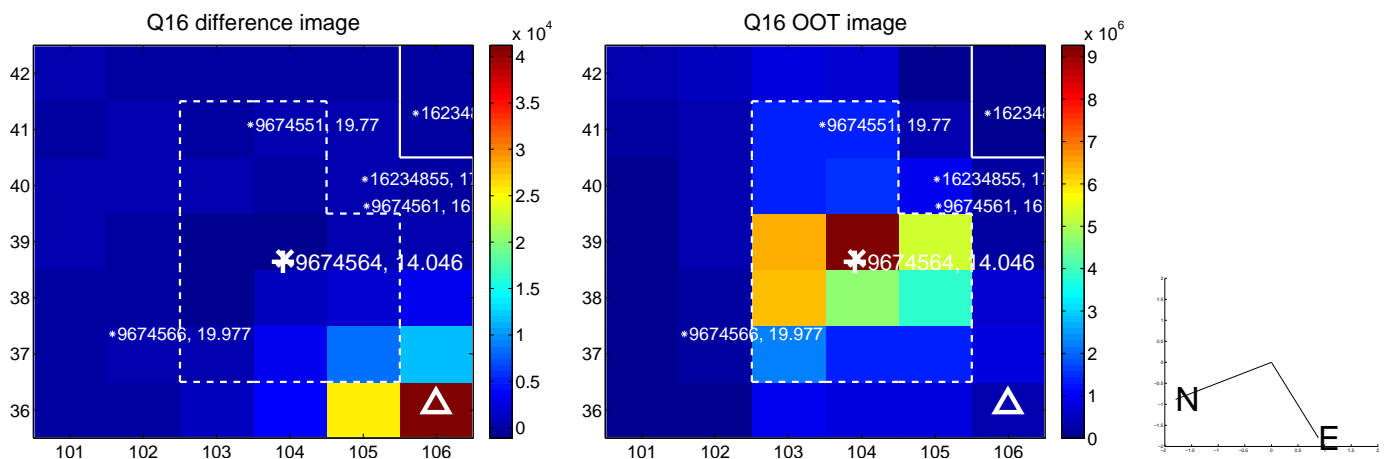
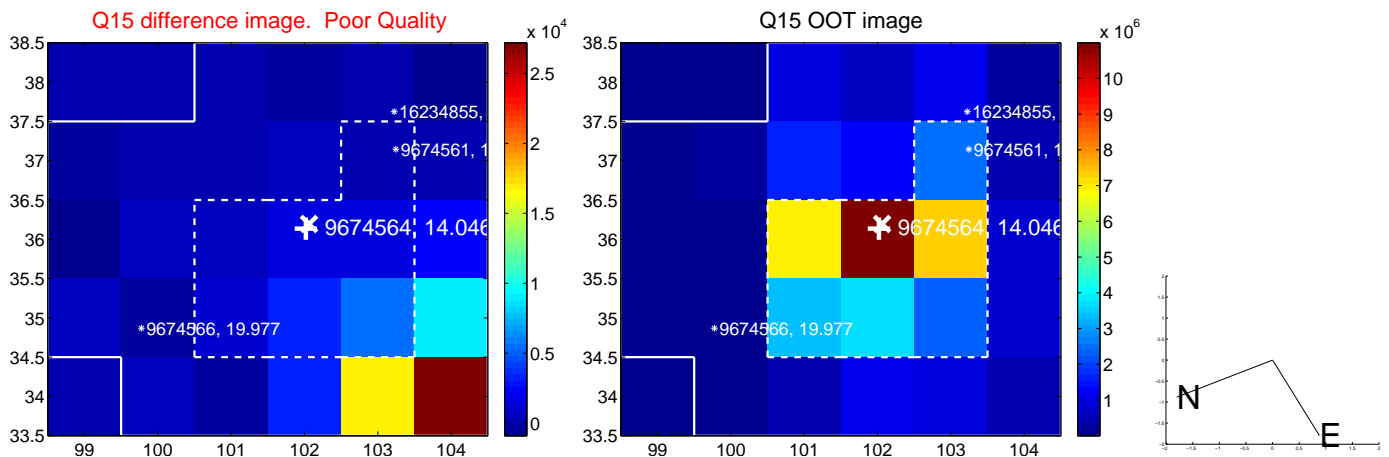
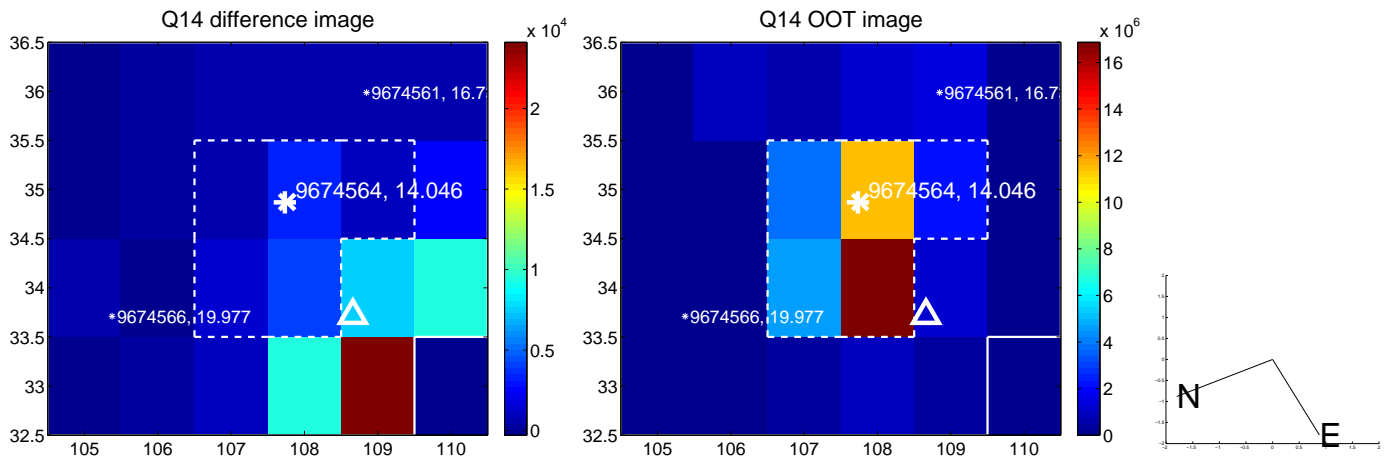
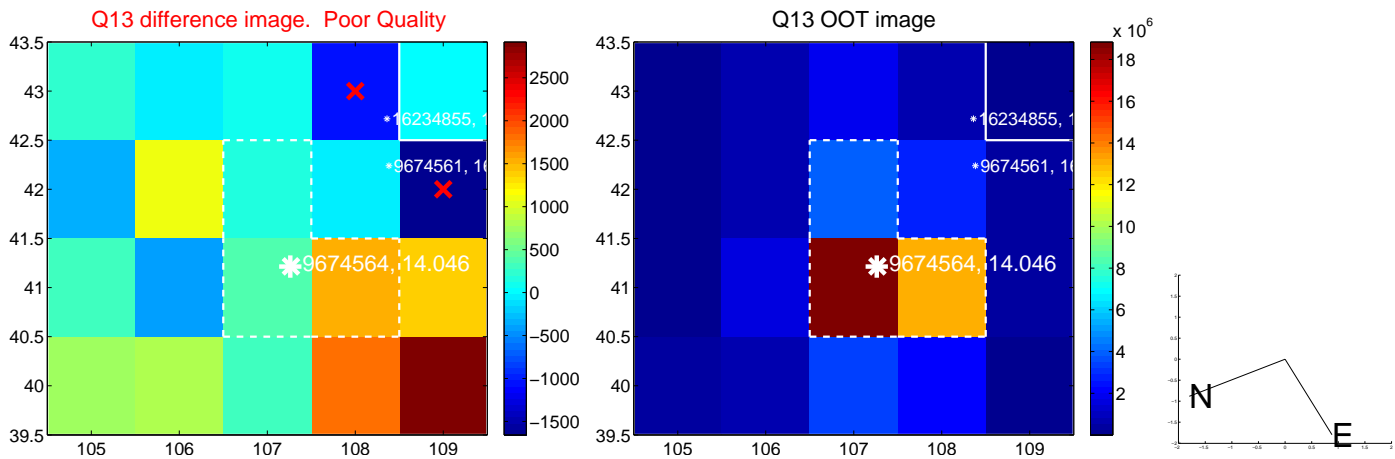
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



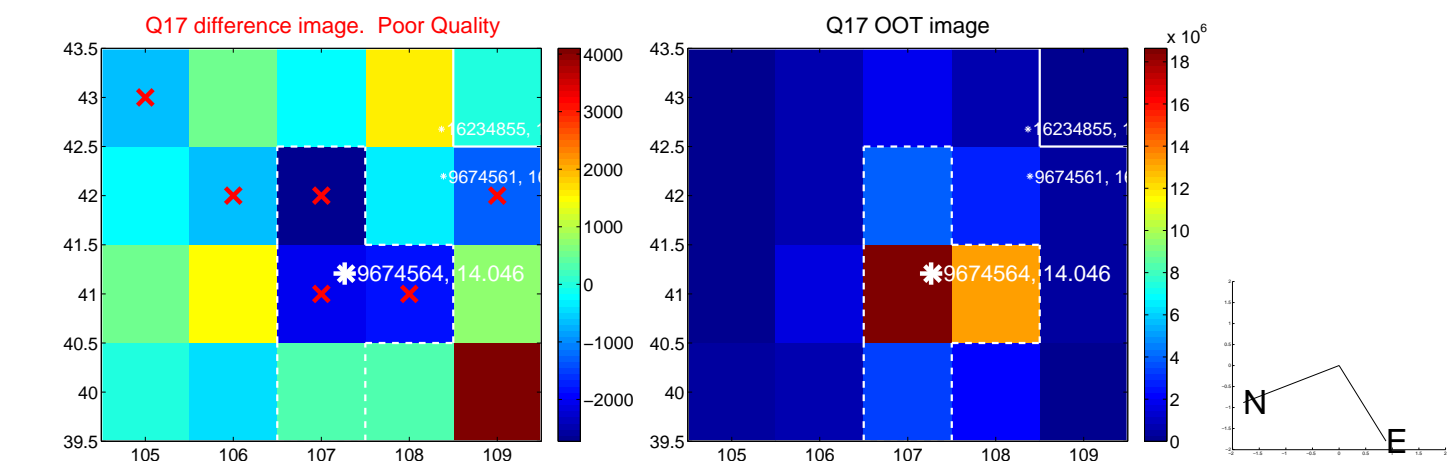
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



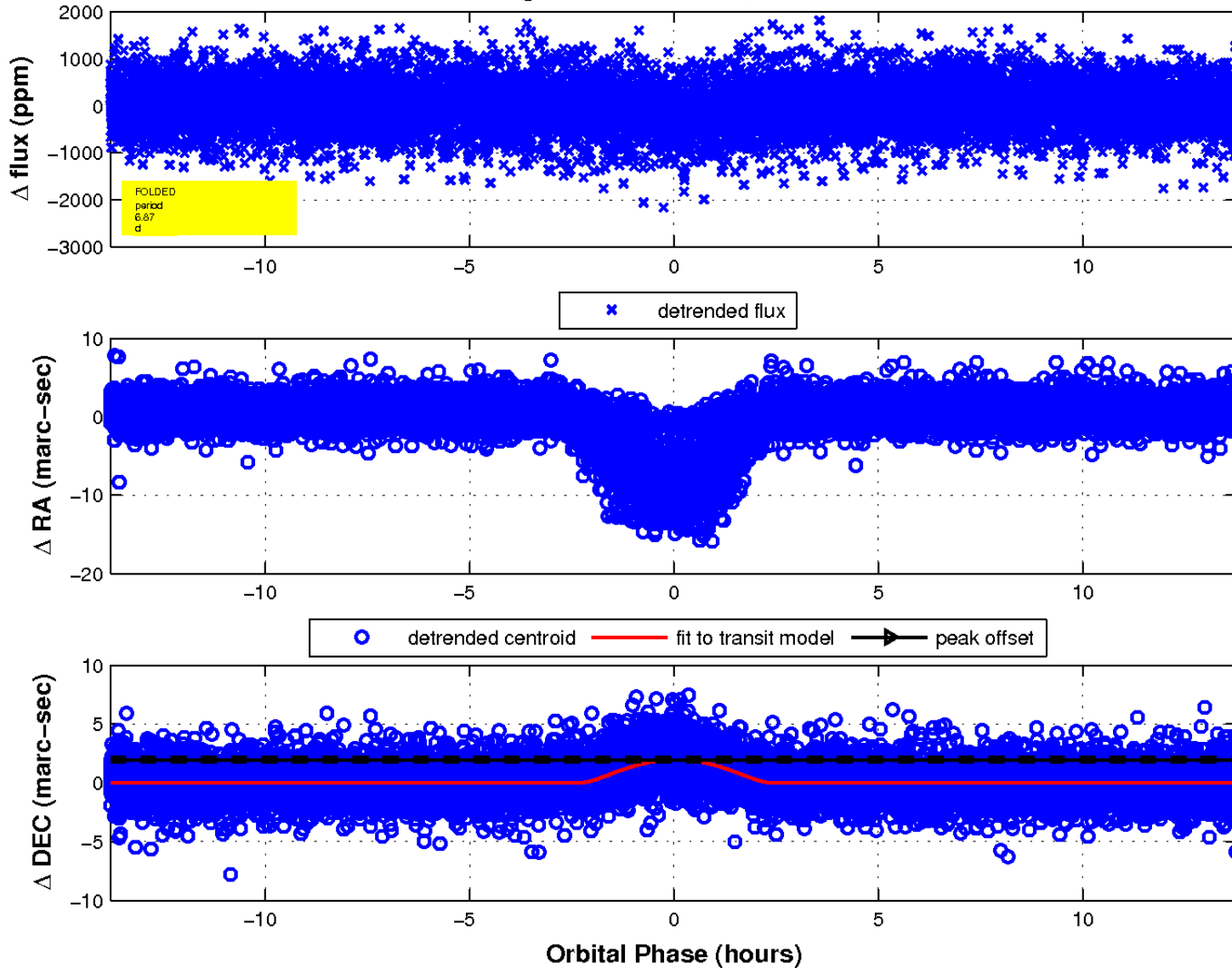
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



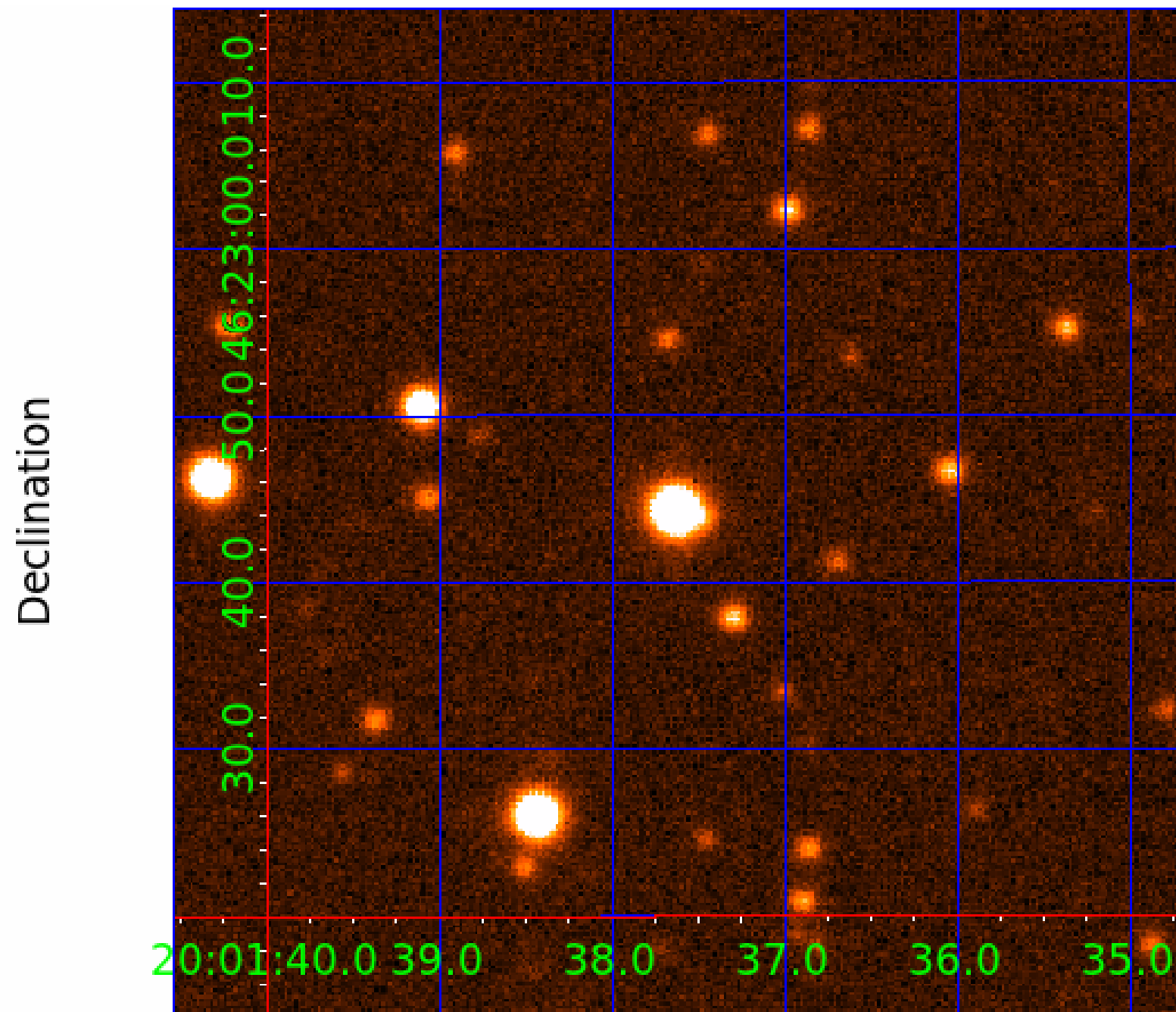
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 009674564

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})
009674564-01	OBS	4096.01	6.873706	132.460421	183.3	4.597	13.0	13.7	0.91	5668	2.56	159.84
009674564-02	OBS	No	6.873662	136.136088	171.4	5.734	12.8	13.5	0.91	5668	1.69	159.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009674564-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
009674564-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

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 009674564-02

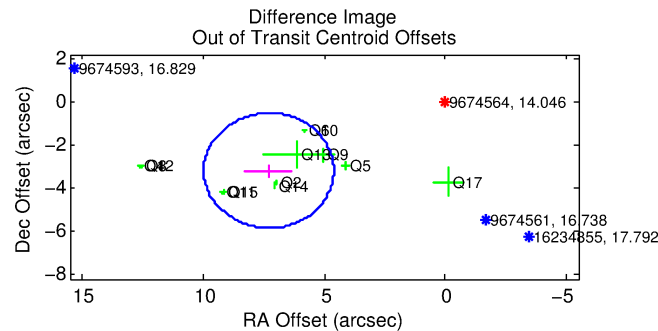
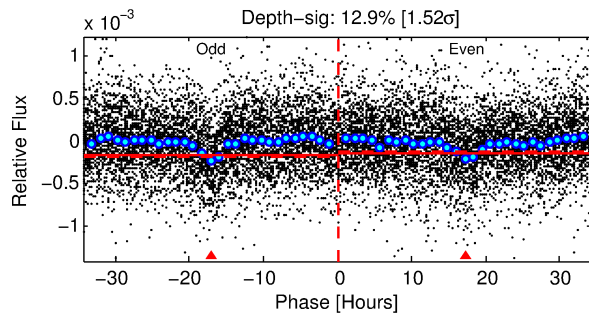
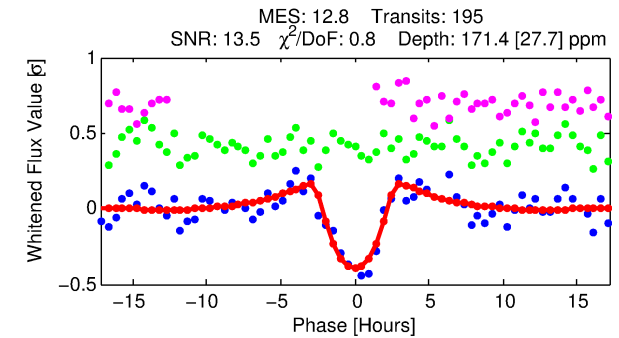
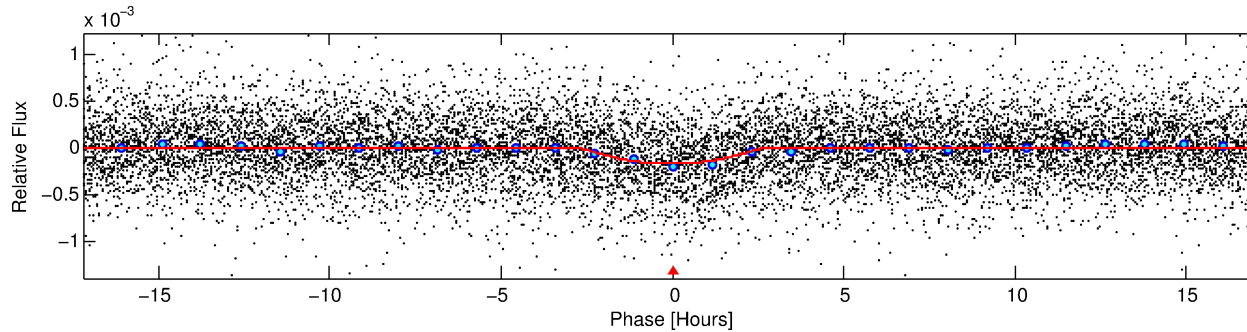
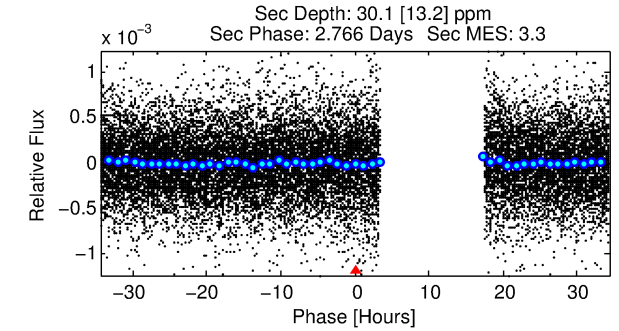
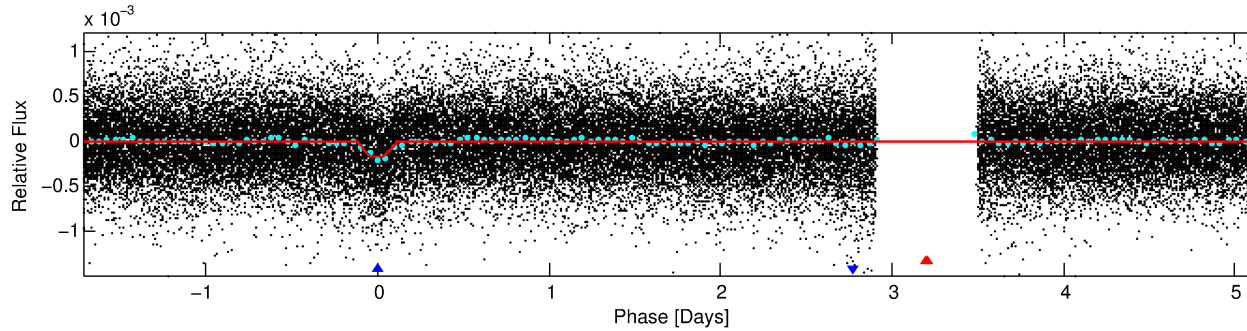
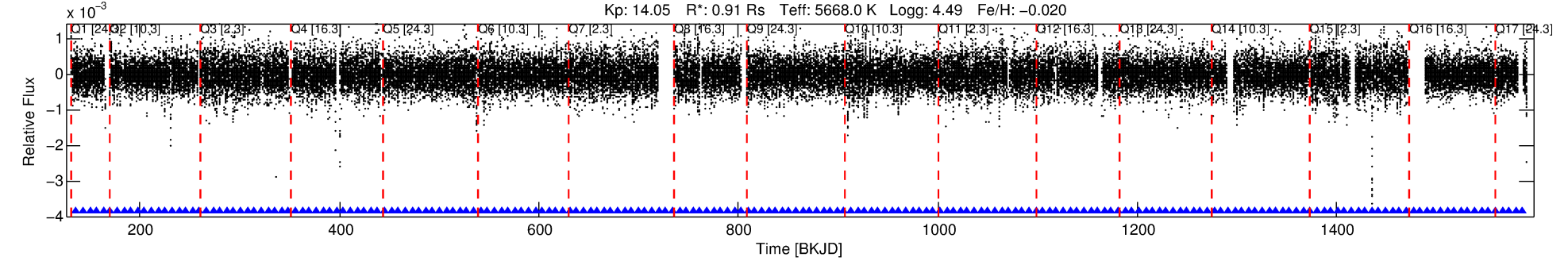
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009674564-02	9674564	3729.01	9674592	1:1	16.5	4	0	15.93	14.04	57.76	Direct-PRF	0	0.01	0.14

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9674564 Candidate: 2 of 2 Period: 6.874 d
KOI: K04096 Corr: No Ephemeris Match

Kp: 14.05 R*: 0.91 Rs Teff: 5668.0 K Logg: 4.49 Fe/H: -0.020



DV Fit Results:

Period = 6.87366 [0.00006] d
Epoch = 136.1361 [0.0075] BKJD
Rp/R* = 0.0170 [0.0022]
a/R* = 2.57 [0.30]
b = 0.98 [0.01]
Seff = 159.84 [57.47]
Teq = 907 [81] K
Rp = 1.69 [0.52] Re
a = 0.0694 [0.0163] AU
Ag = 27.87 [17.03] [1.58σ]
Teffp = 3221 [416] K [5.46σ]

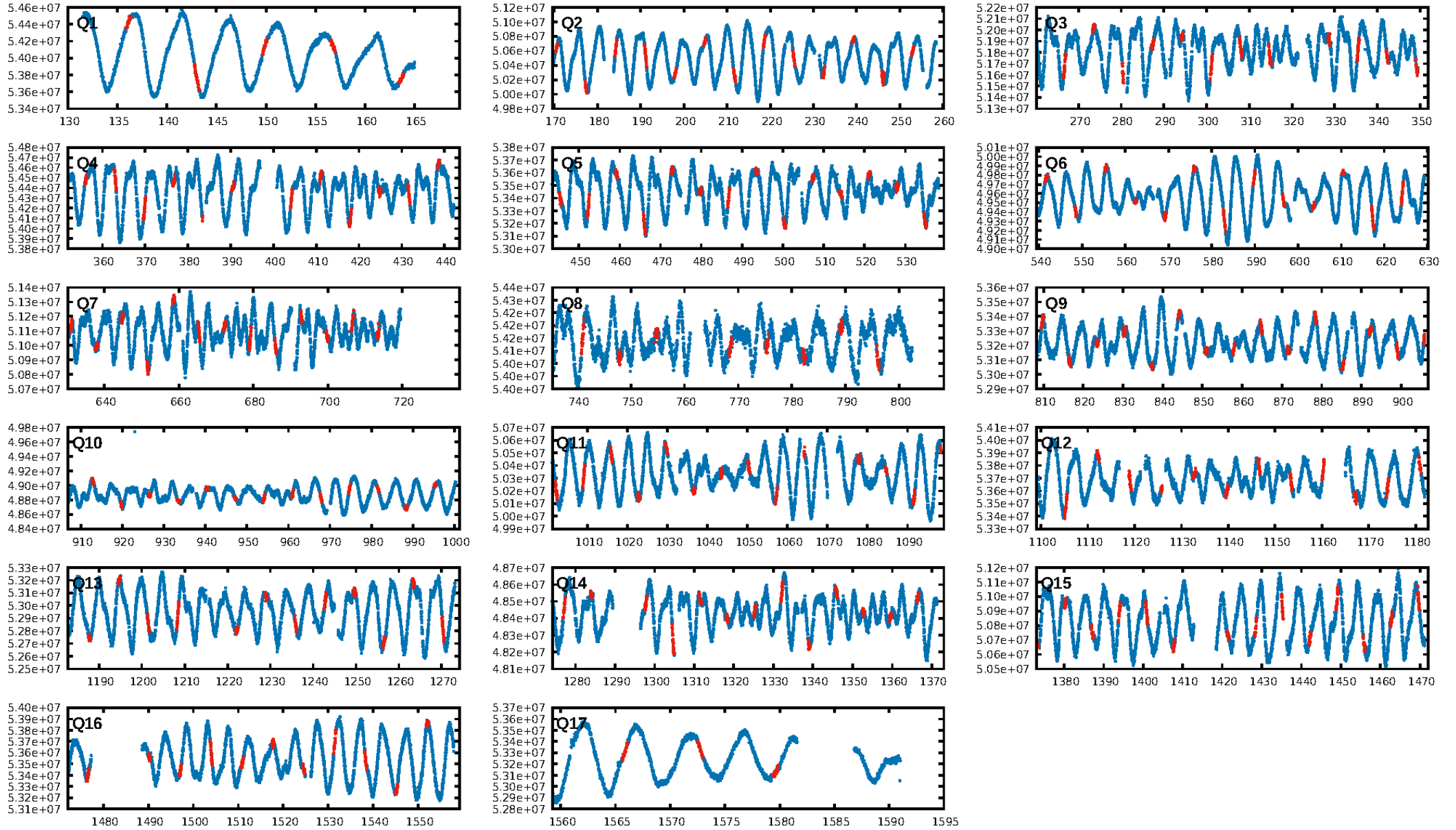
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 99.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.02e-35
RollingBand-fgt: 1.00 [187/187]
GhostDiagnostic-chr: -0.1824
Centroid-sig: N/A
Centroid-so: 43.211 arcsec [59.17σ]
OotOffset-rm: 7.951 arcsec [8.88σ]
KicOffset-rm: 7.896 arcsec [8.68σ]
OotOffset-st: 4/2/3/4 [13]
KicOffset-st: 4/2/3/4 [13]
DiffImageQuality-fgm: 0.92 [12/13]
DiffImageOverlap-fno: 1.00 [17/17]

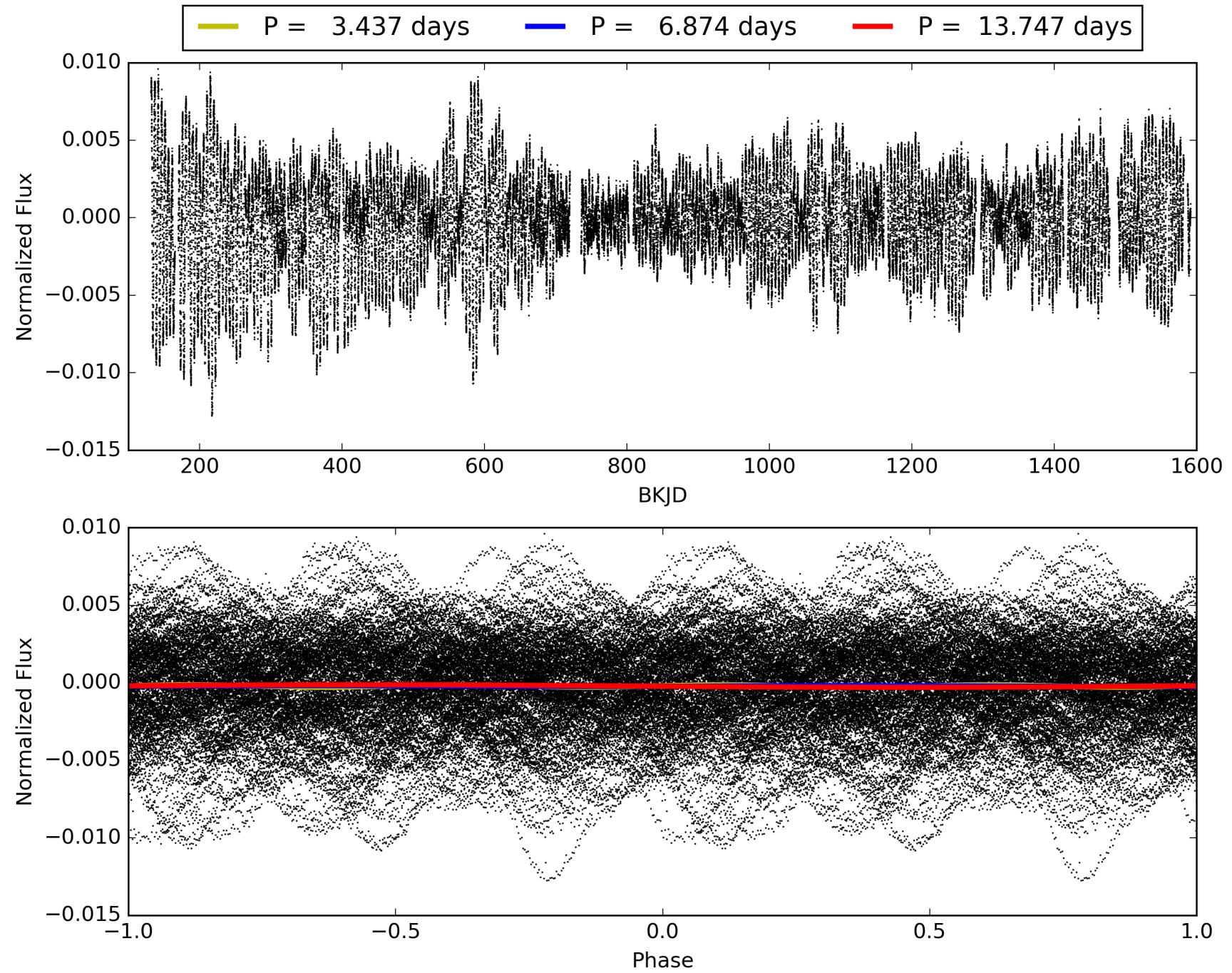
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:58:19 Z

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

TCE 009674564-02, PDC Light Curves

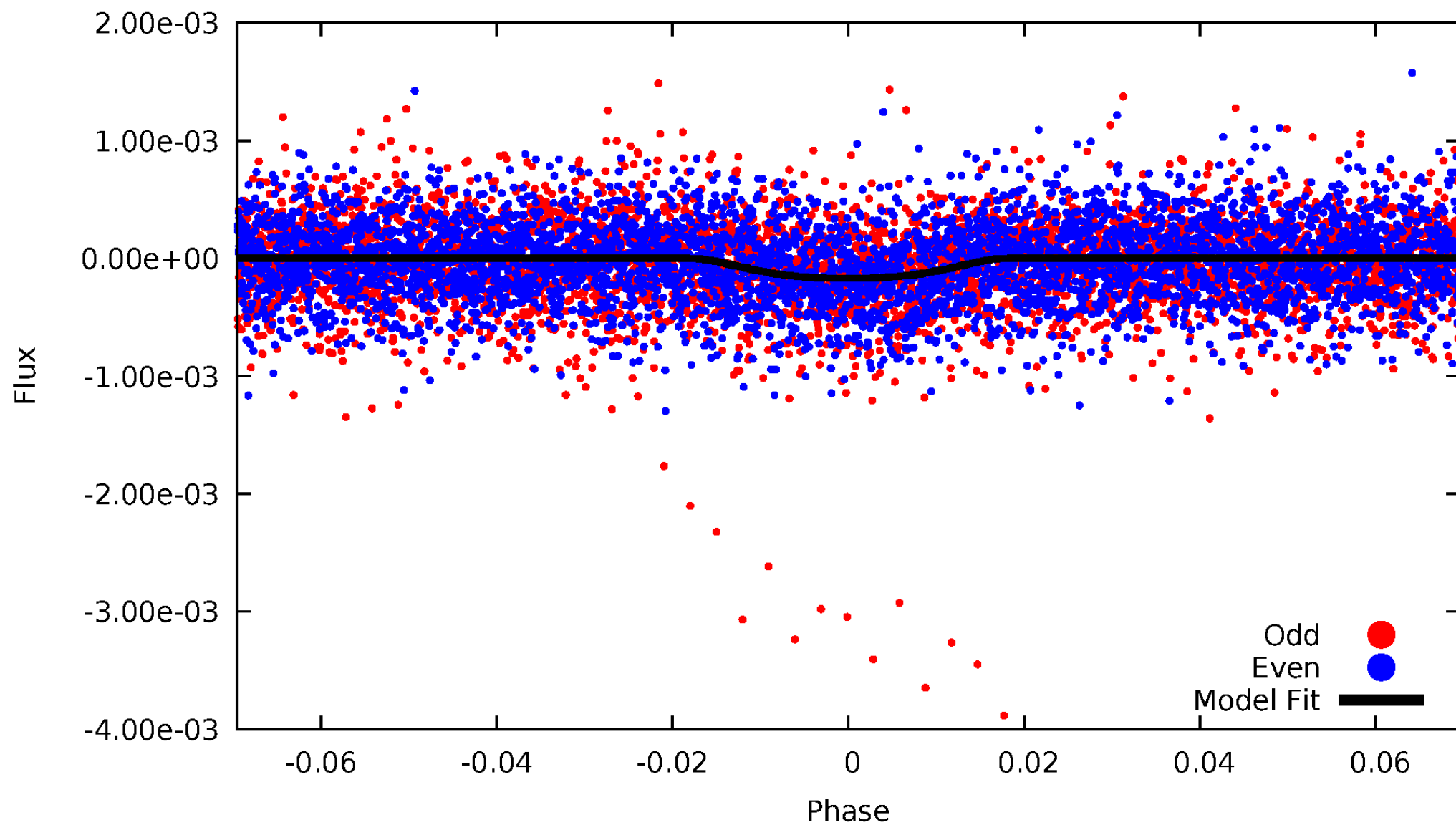


TCE 009674564-02



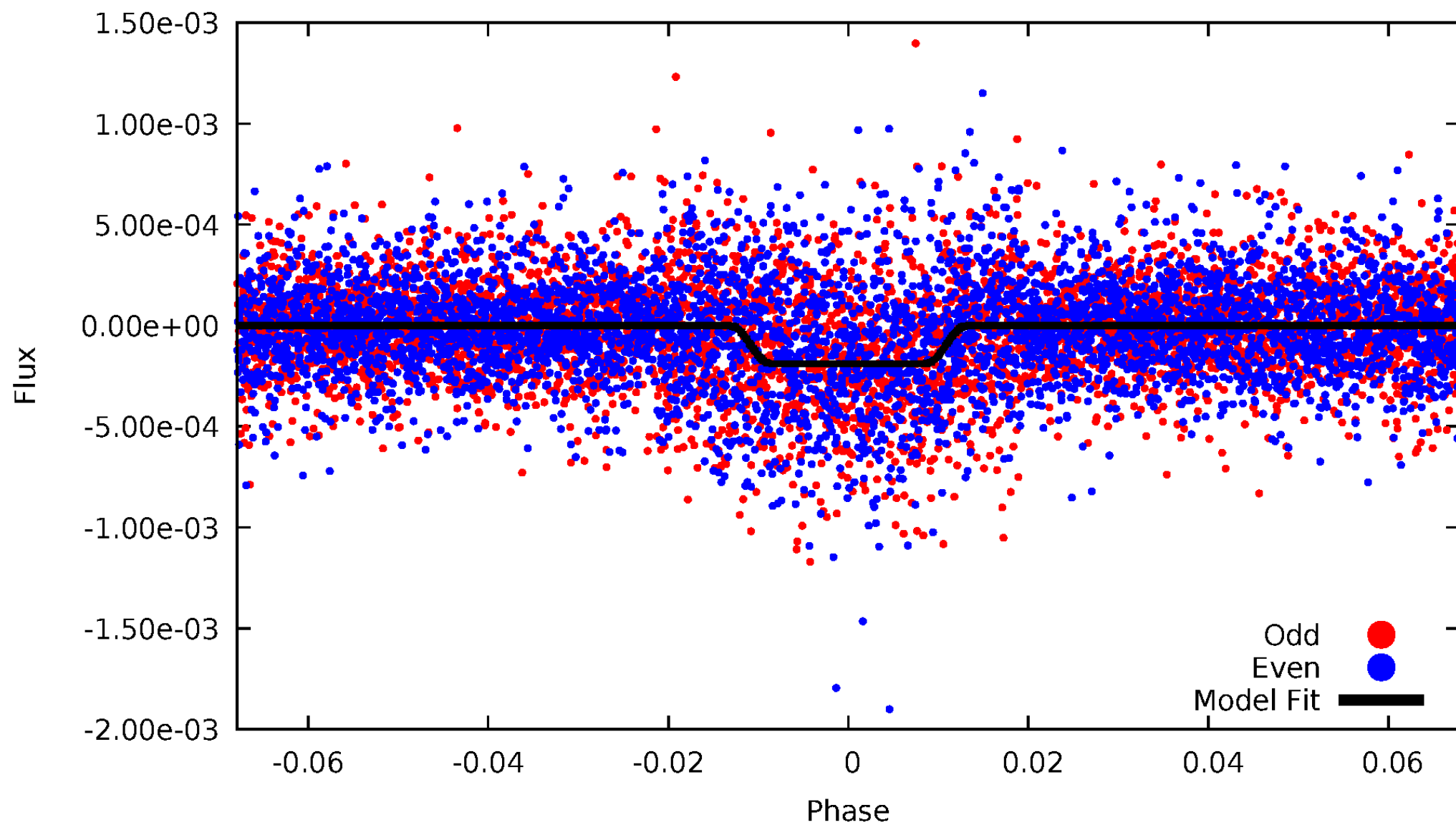
DV Odd/Even

TCE 009674564-02



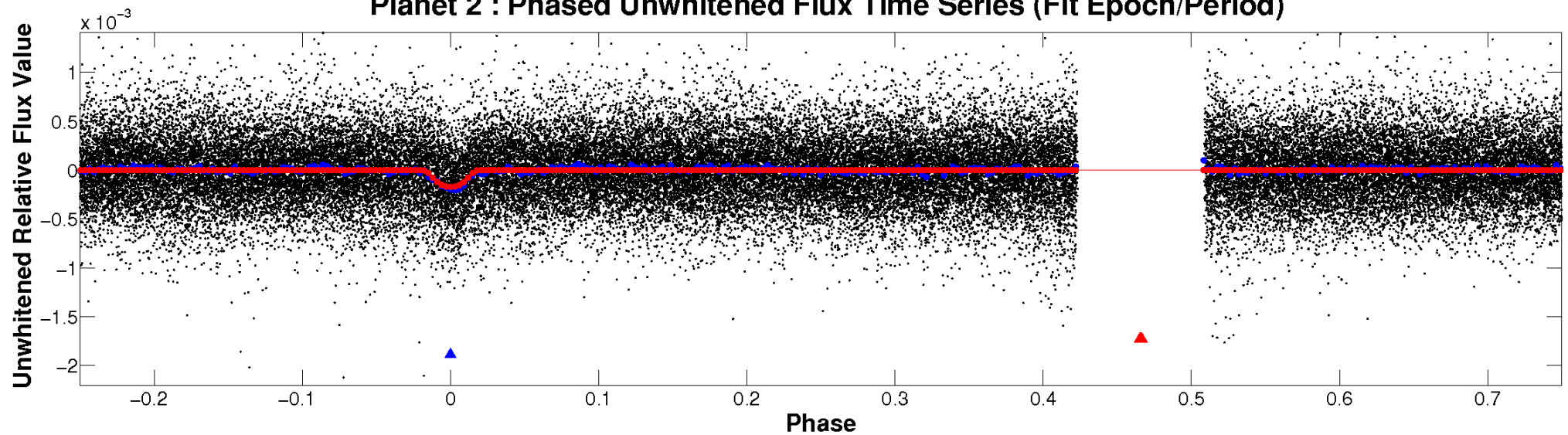
ALT Odd/Even

TCE 009674564-02

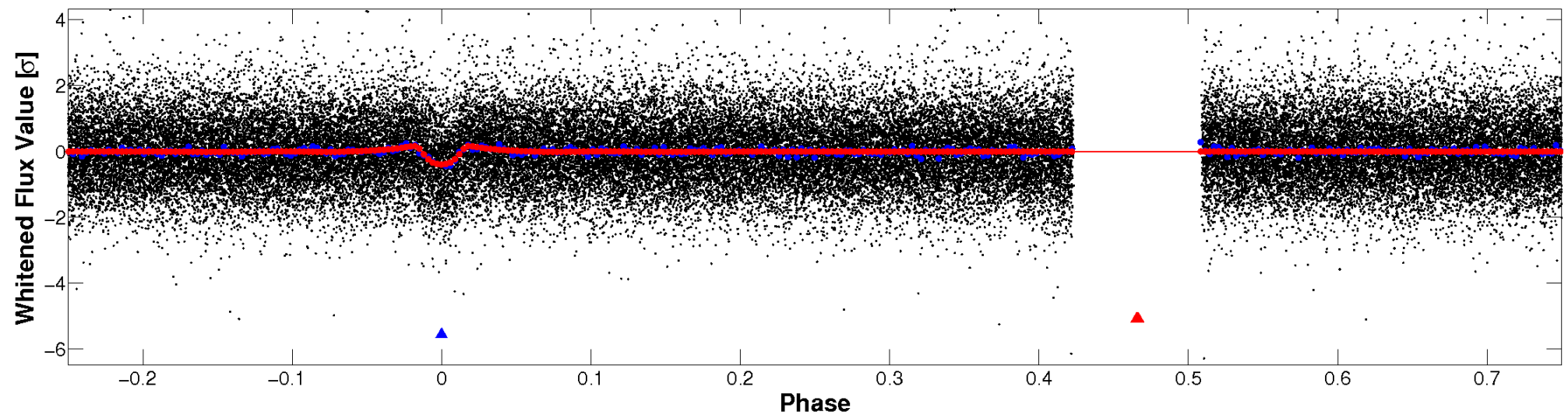


Non-Whitened Vs. Whitened Light Curve

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

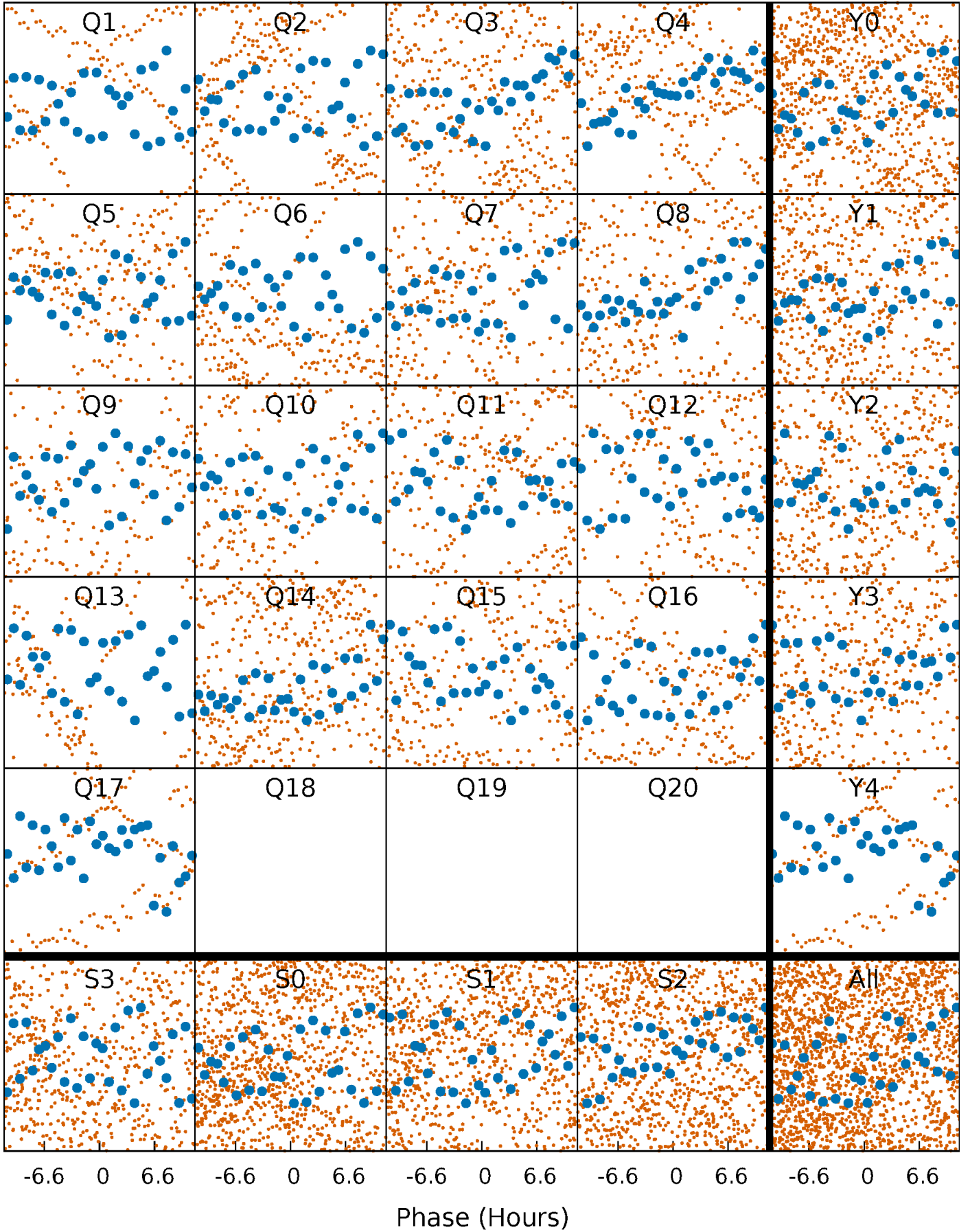


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



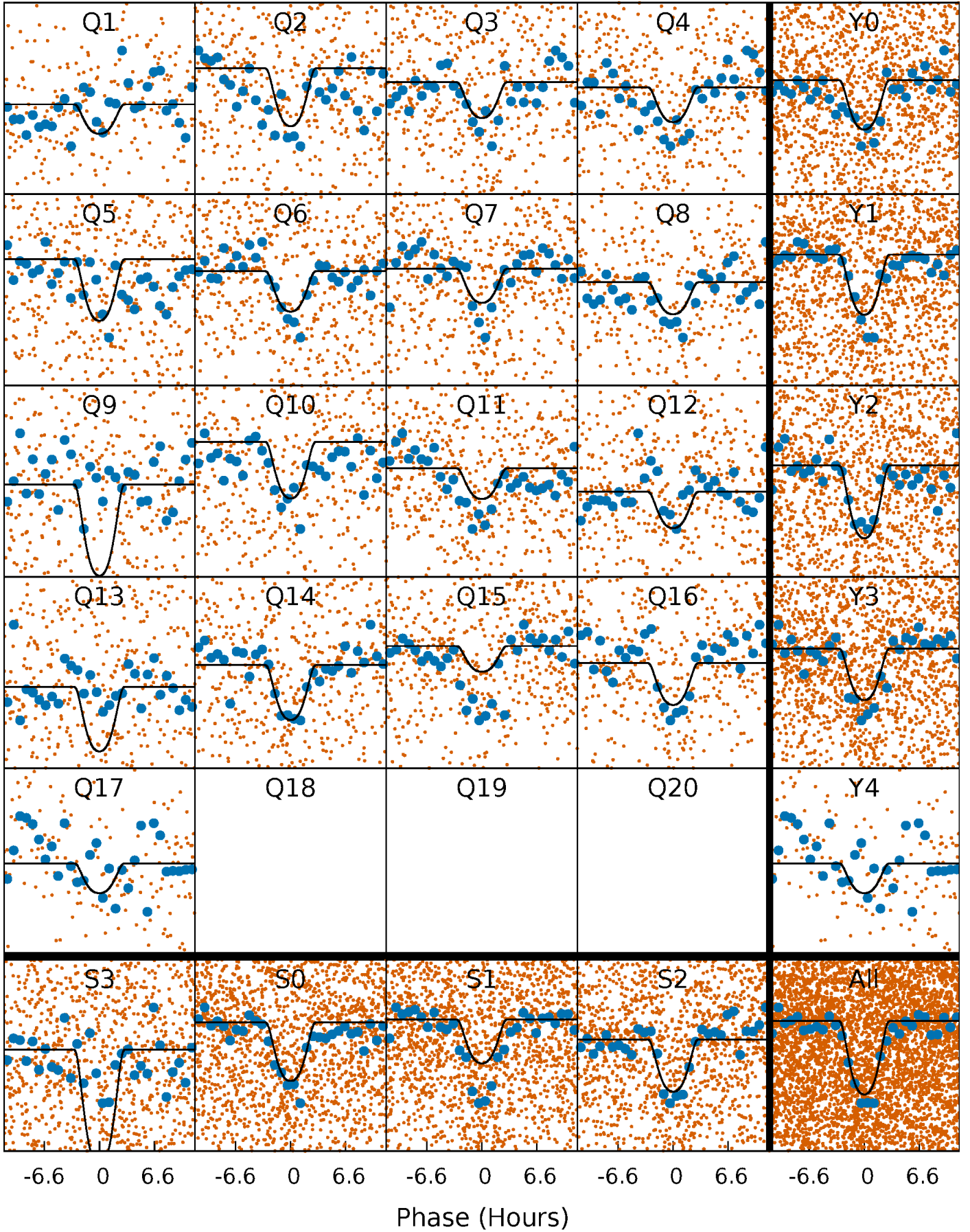
PDC Quarter-Phased Transit Curves

TCE 009674564-02 P= 6.873662 Days $T_0=136.136088$ (BKJD)



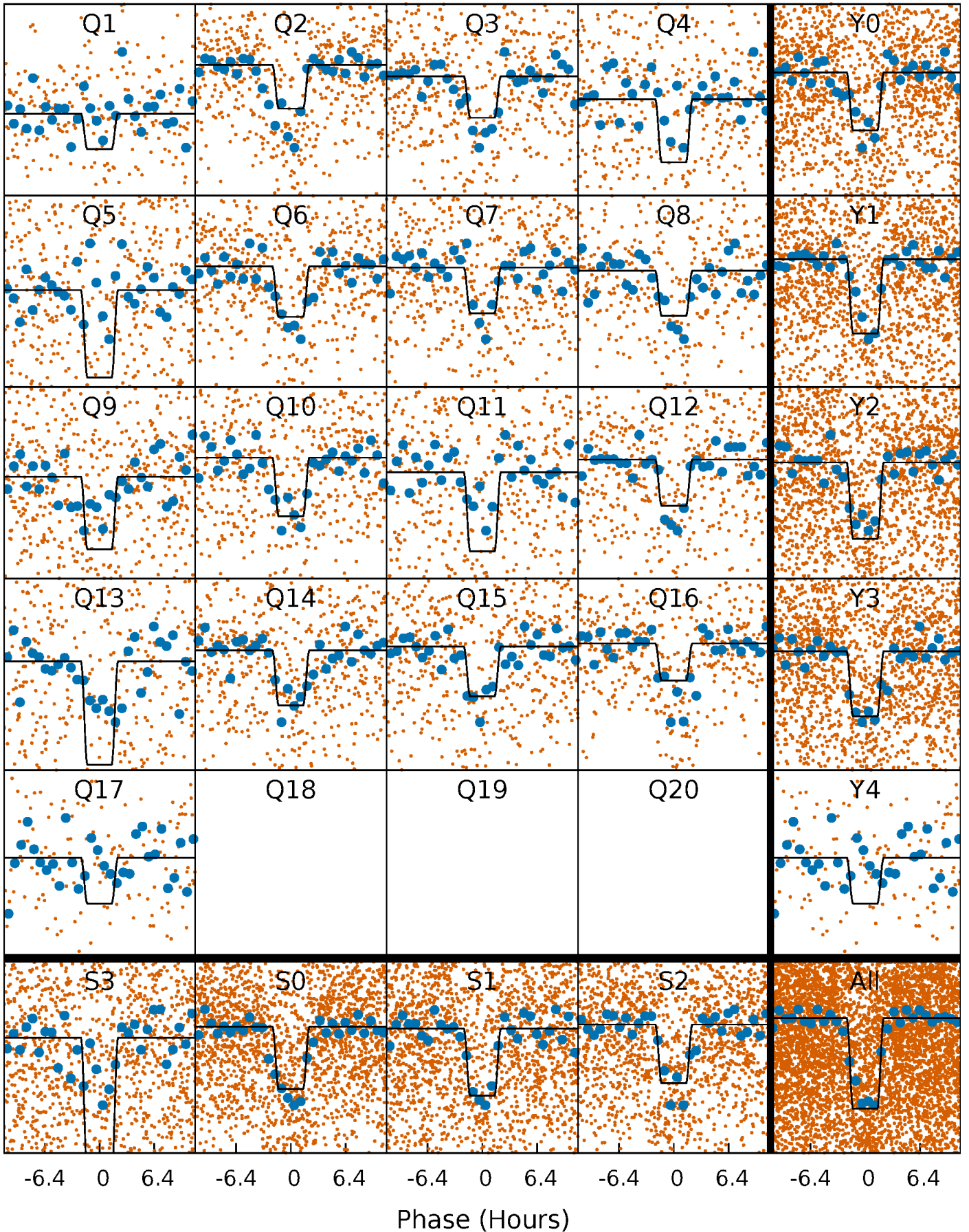
DV Quarter-Phased Transit Curves

TCE 009674564-02 P= 6.873662 Days $T_0=136.136088$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

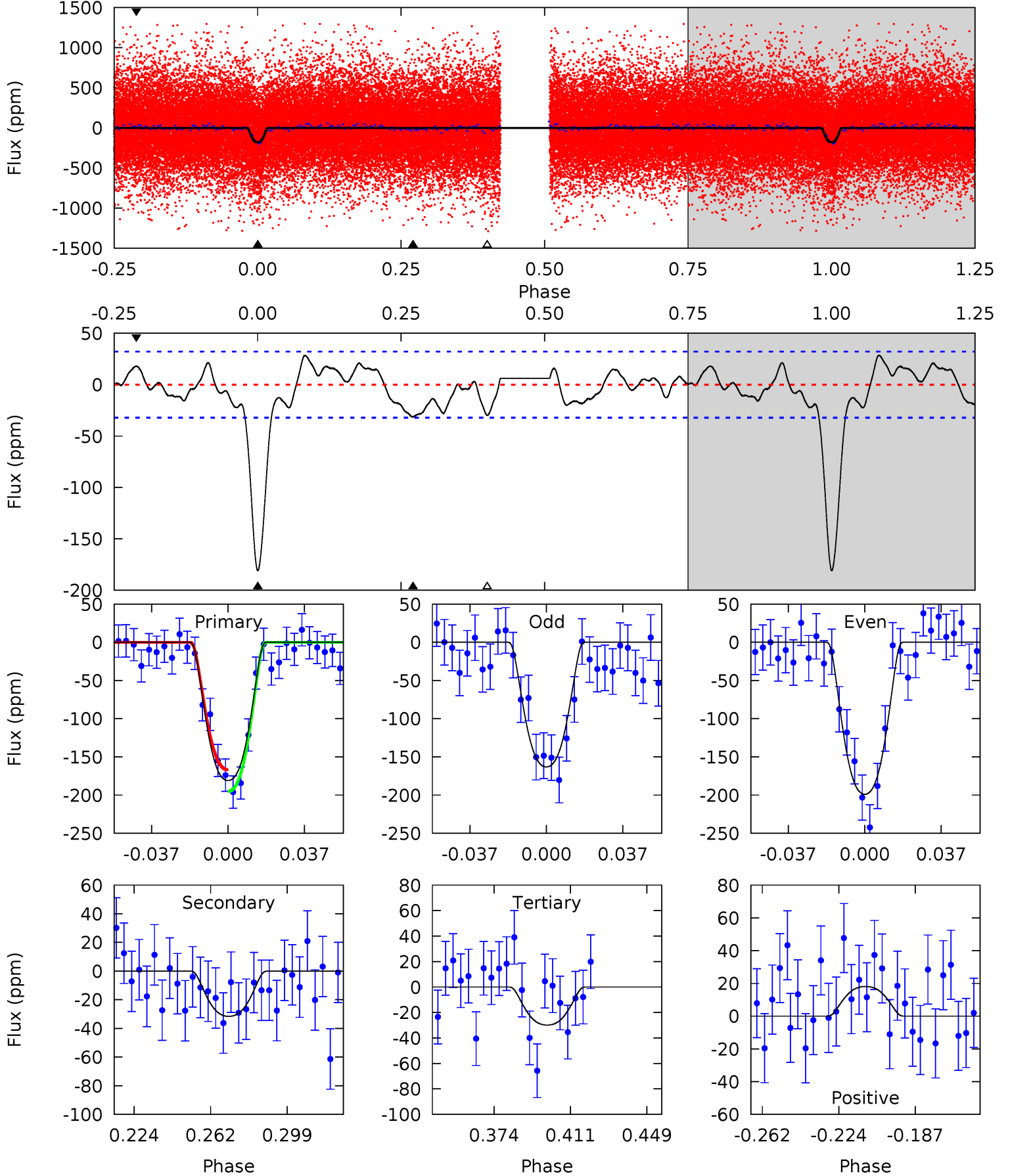
TCE 009674564-02 P= 6.873611 Days $T_0=136.137362$ (BKJD)



DV Model-Shift Uniqueness Test

009674564-02, P = 6.873662 Days, E = 129.262426 Days

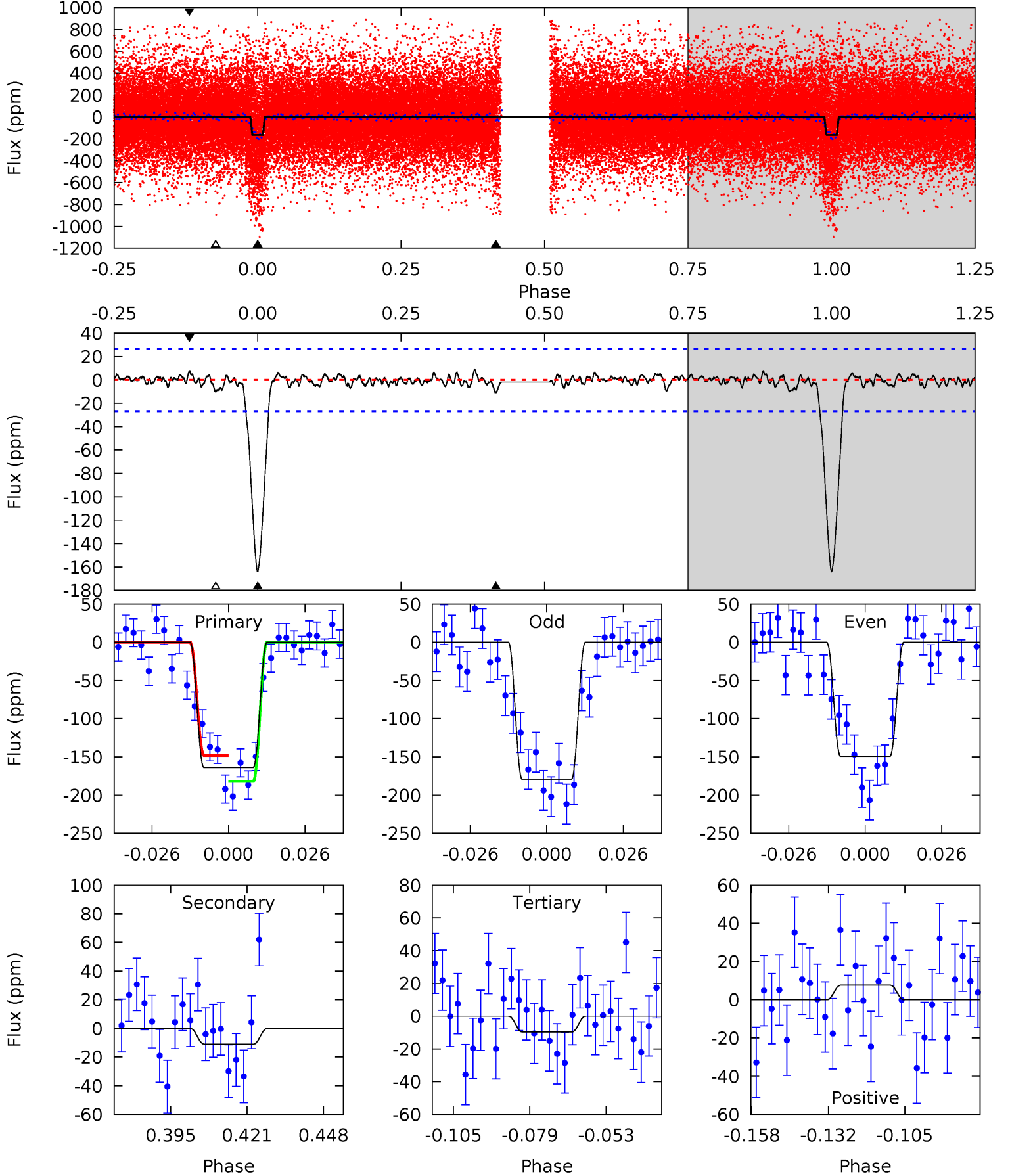
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.8	4.67	4.42	2.68	4.77	2.08	1.89	22.4	24.1	0.25	1.99	2.66	1.22	0.14	2.12



Alt Model-Shift Uniqueness Test

009674564-02, P = 6.873611 Days, E = 129.263751 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.8	1.99	1.77	1.39	4.84	2.22	0.57	28.0	28.4	0.23	0.60	2.71	0.99	0.05	3.11



Stellar Parameters For KIC 009674564

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5668^{+152}_{-152}	$4.492^{+0.062}_{-0.188}$	$-0.020^{+0.250}_{-0.300}$	$0.912^{+0.254}_{-0.091}$	$0.943^{+0.104}_{-0.094}$	$1.748^{+0.453}_{-0.873}$
	+3%/-3%	+1%/-4%	+1250%/-1500%	+28%/-10%	+11%/-10%	+26%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009674564-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-32 ± 7	$1.75^{+0.34}_{-0.25}$	1288^{+85}_{-61}	3652^{+238}_{-200}	26^{+13}_{-8}
Alt.	-11 ± 6	$1.43^{+0.31}_{-0.26}$	1288^{+85}_{-61}	3294^{+292}_{-367}	13^{+10}_{-8}

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

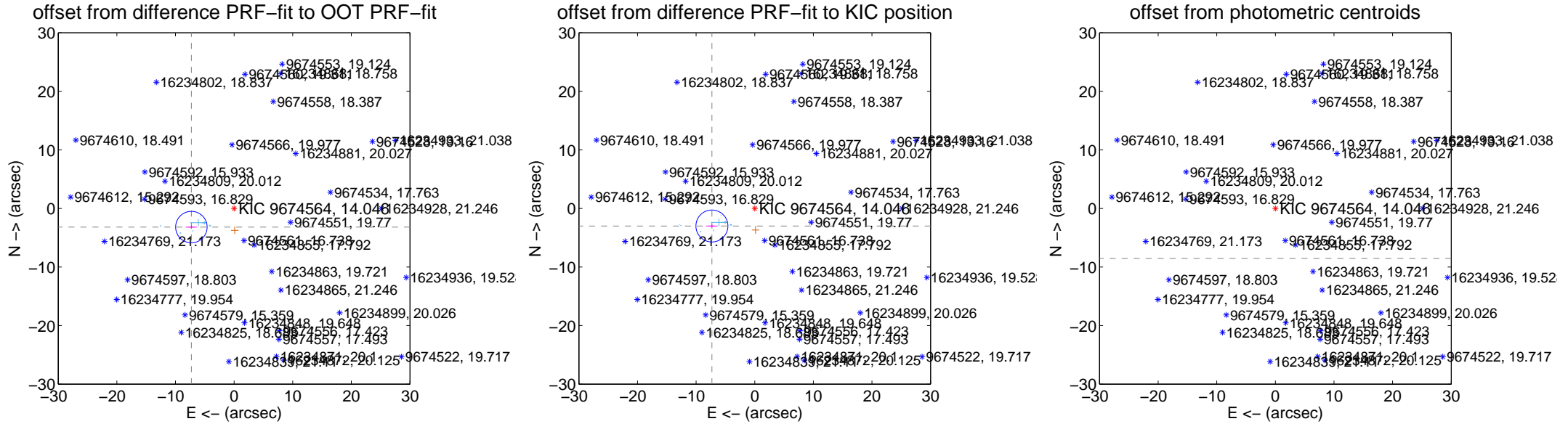
DV Centroid Data

Supplemental centroid analysis for 009674564-02. Kepler magnitude: 14.05. Transit SNR 13.51

There are 12 quarters with good PRF difference image offsets

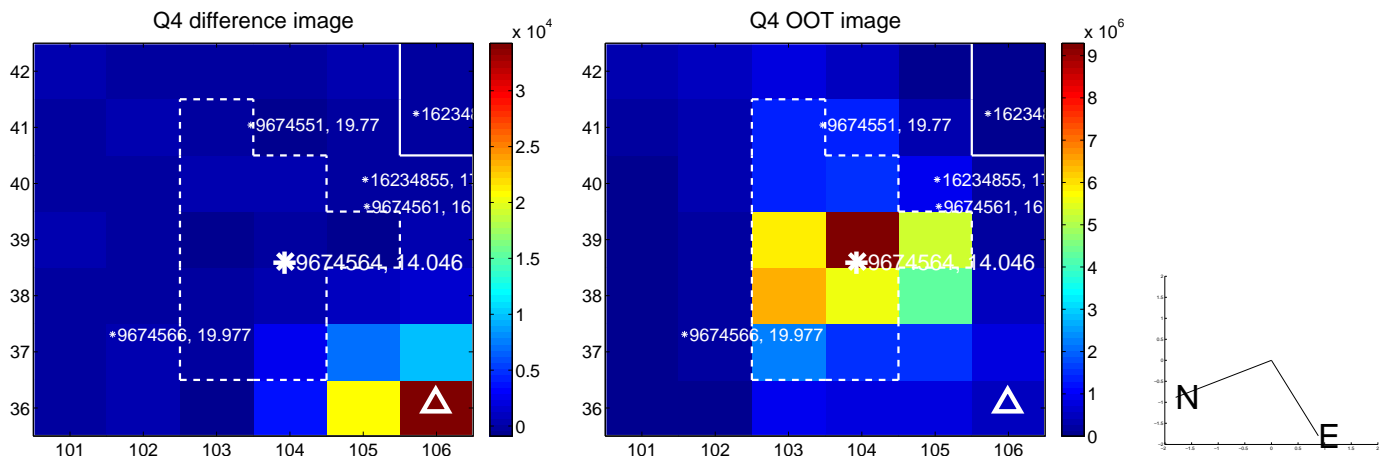
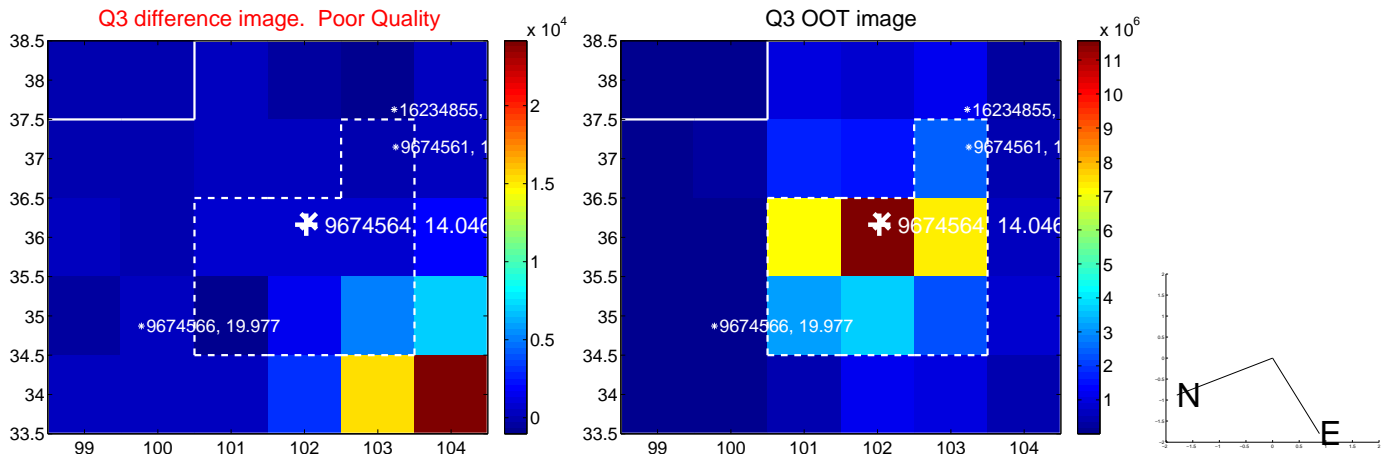
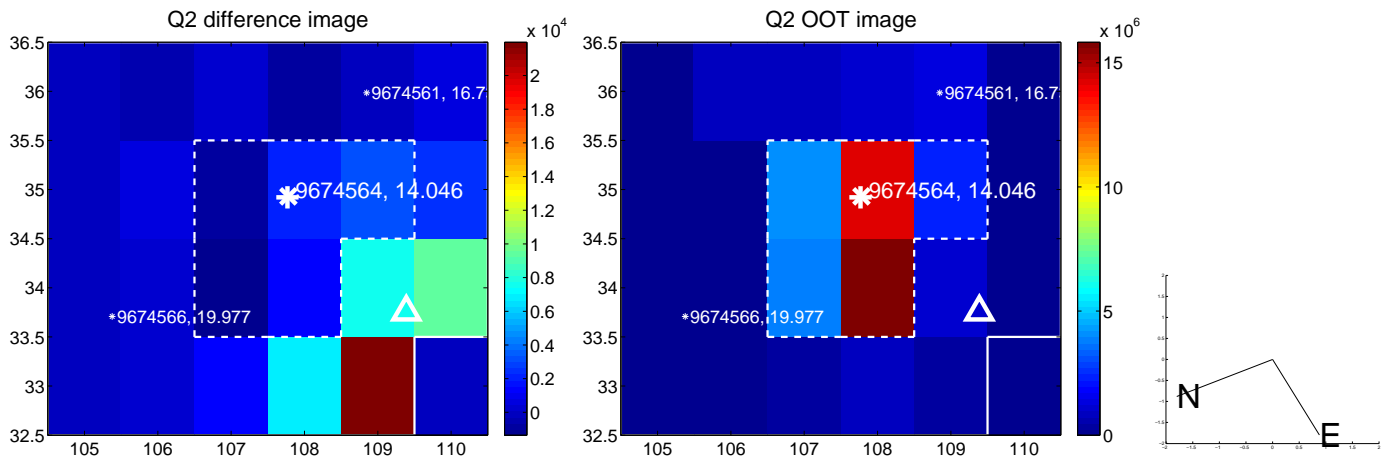
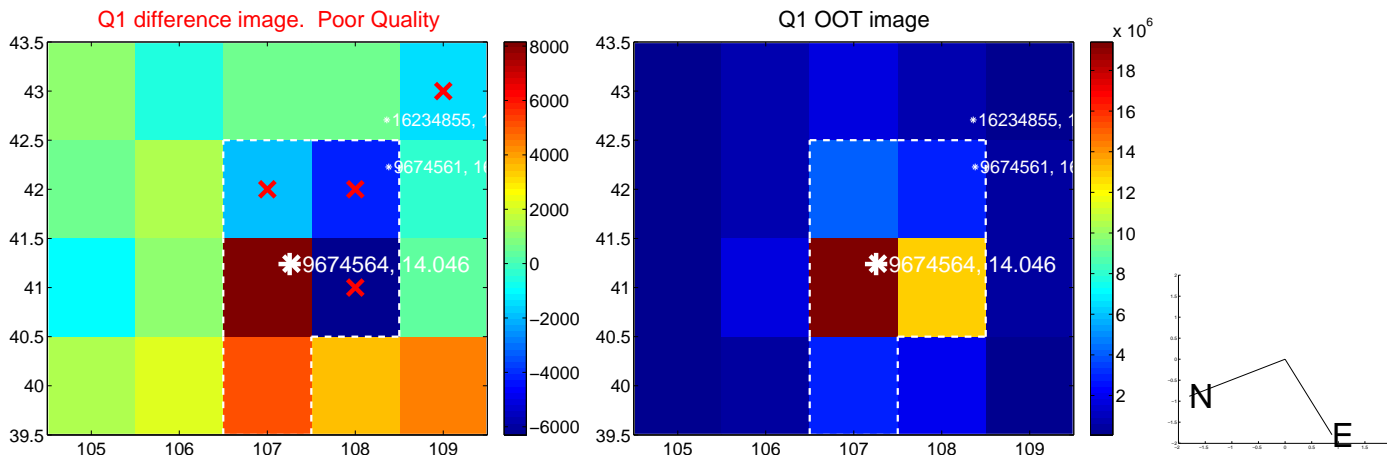
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.951 \pm 0.895	8.88	7.287 \pm 0.964	-3.181 \pm 0.261
PRF-fit source offset from KIC position	7.896 \pm 0.910	8.68	7.305 \pm 0.973	-2.997 \pm 0.252
photometric centroid source offset	43.21 \pm 0.73	59.17	42.36 \pm 0.73	-8.54 \pm 0.69

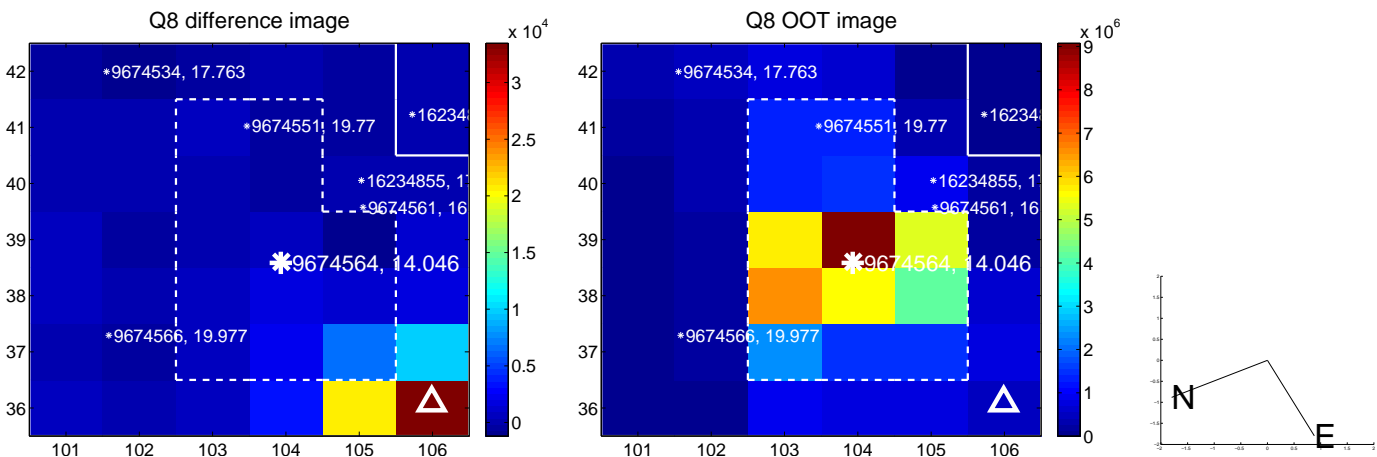
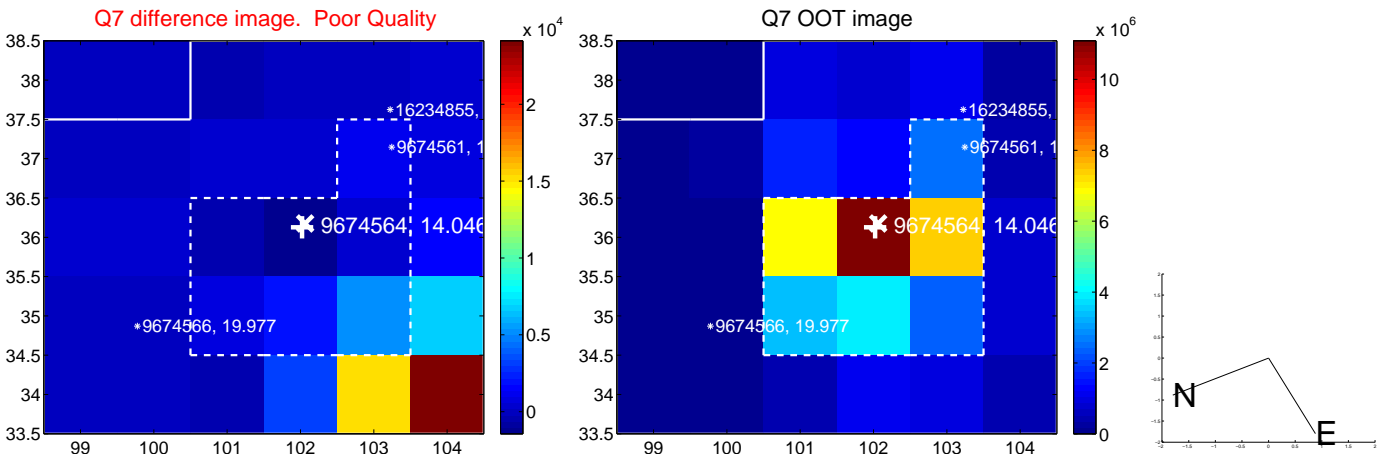
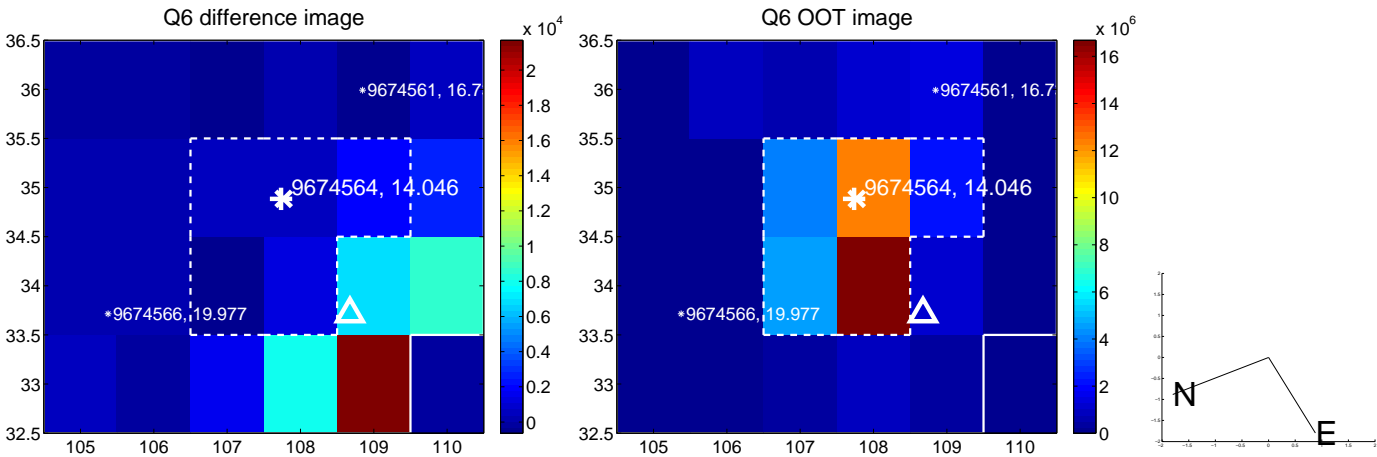
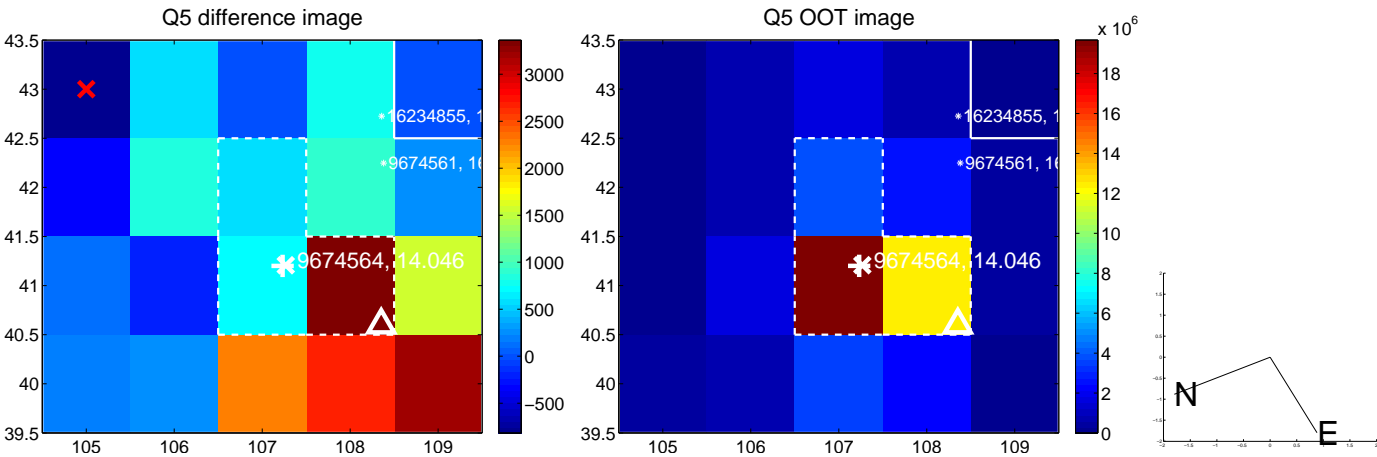


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

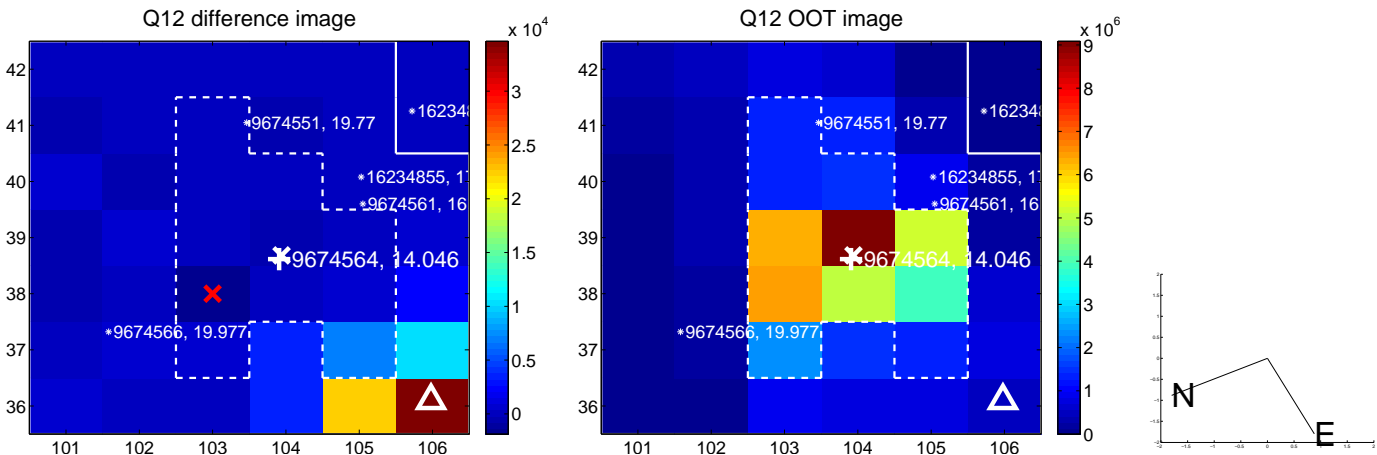
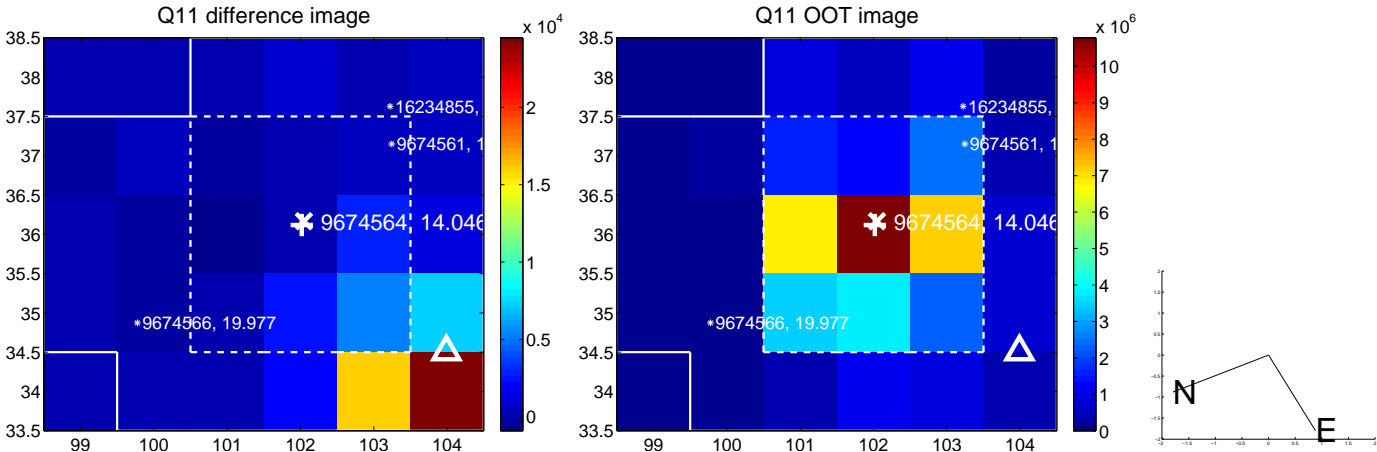
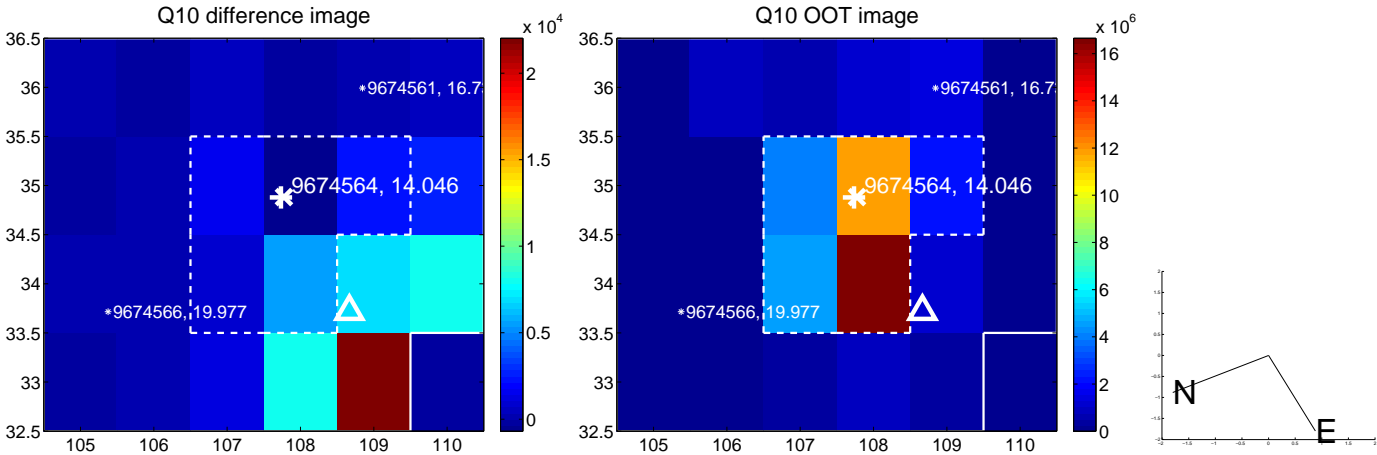
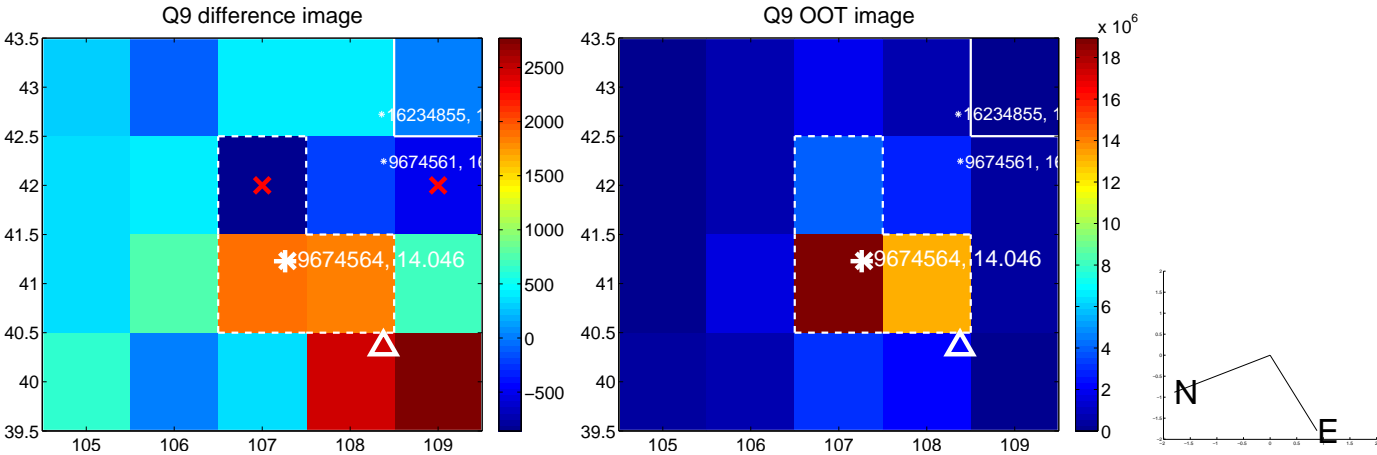
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



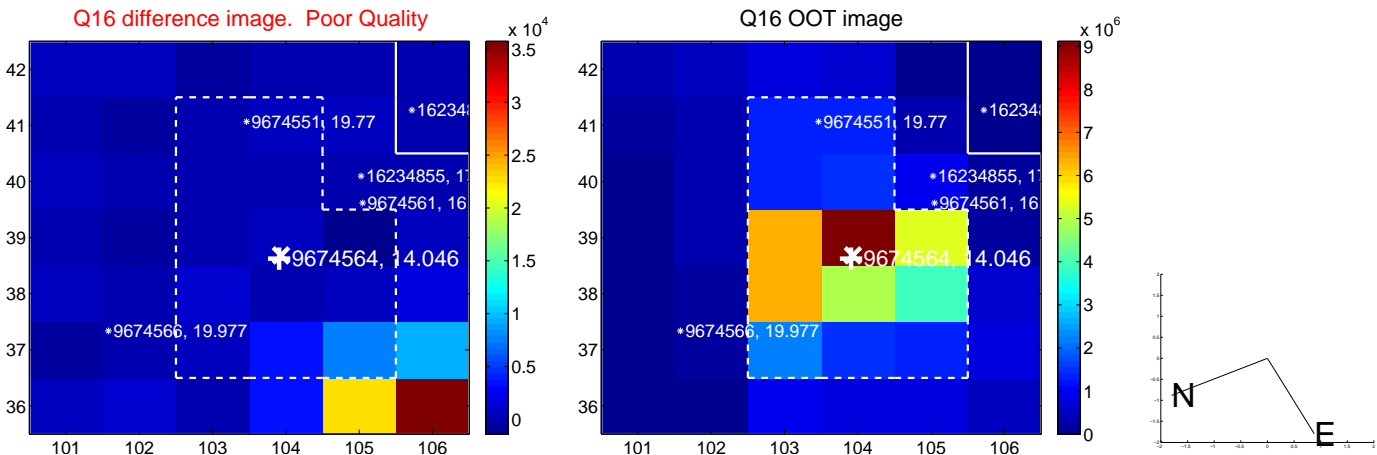
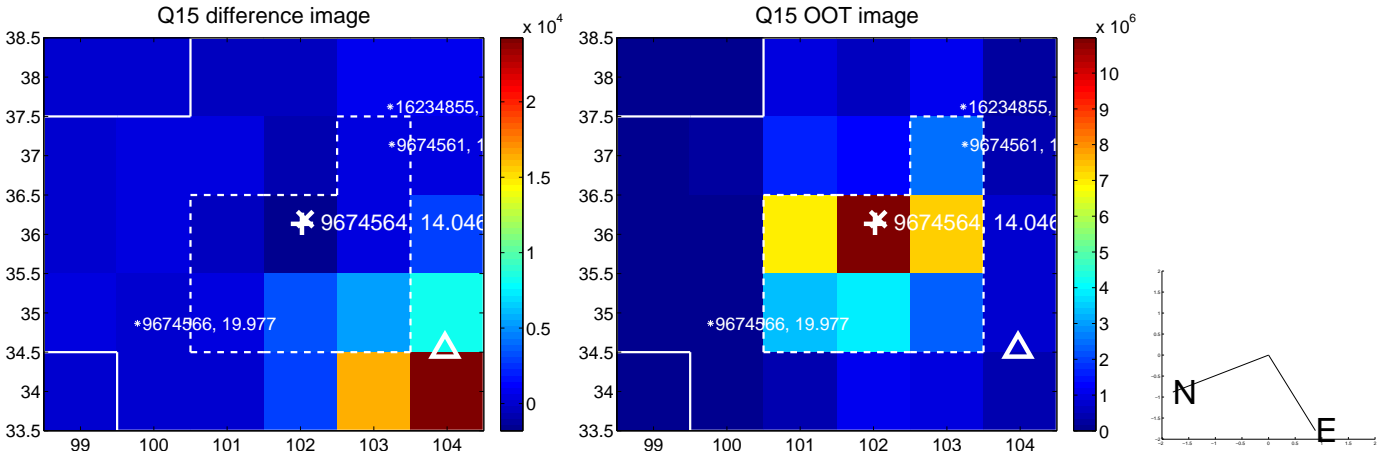
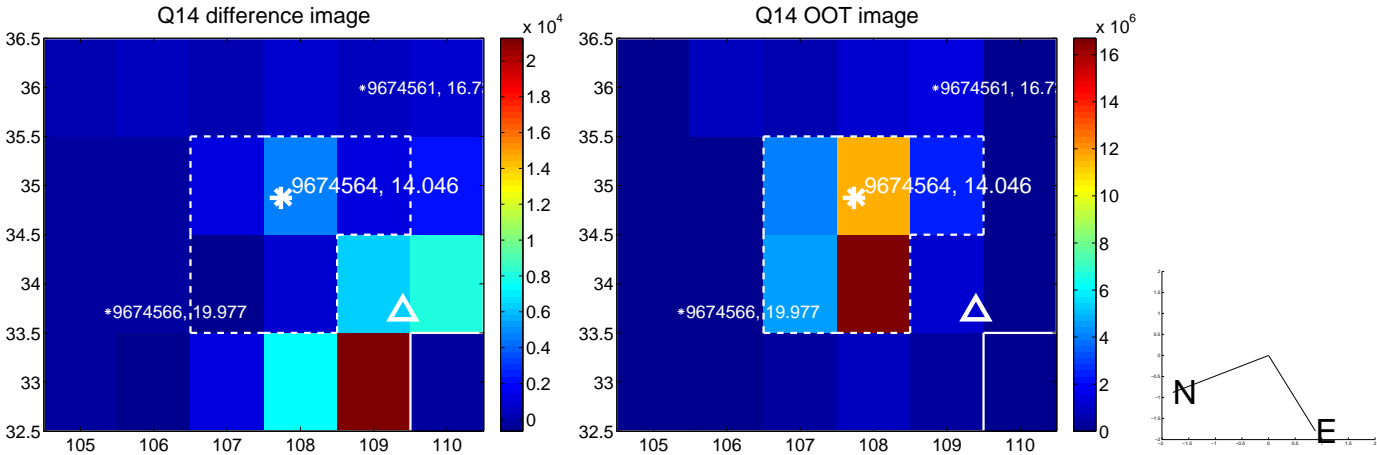
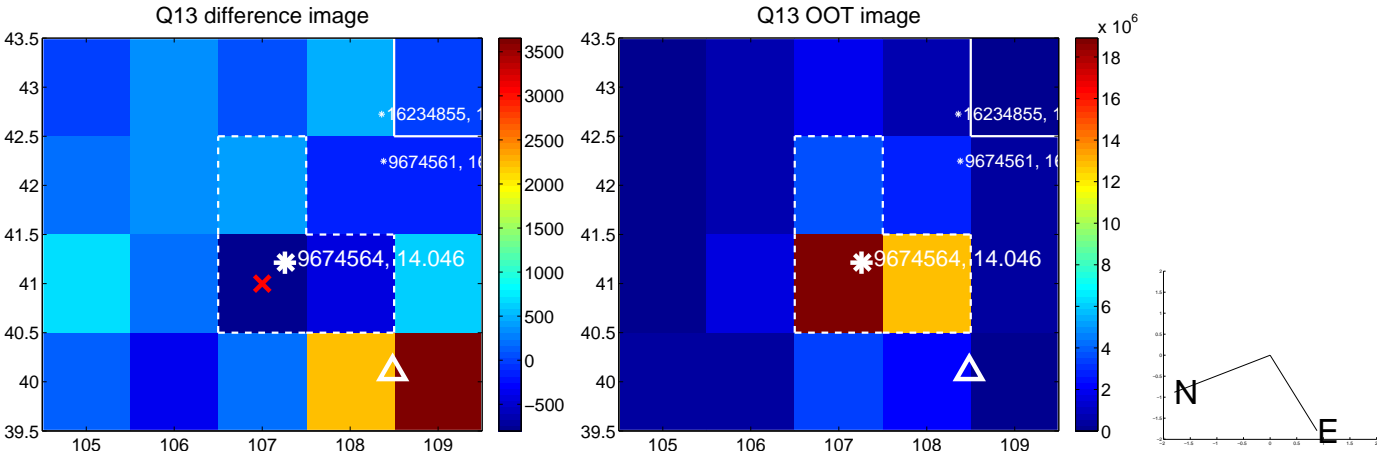
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



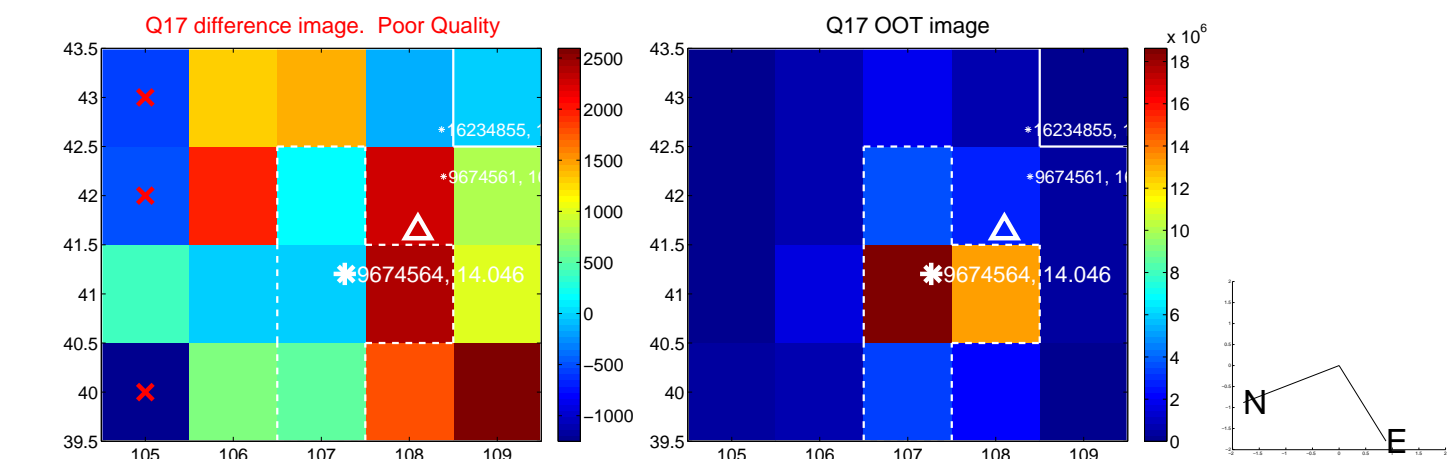
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



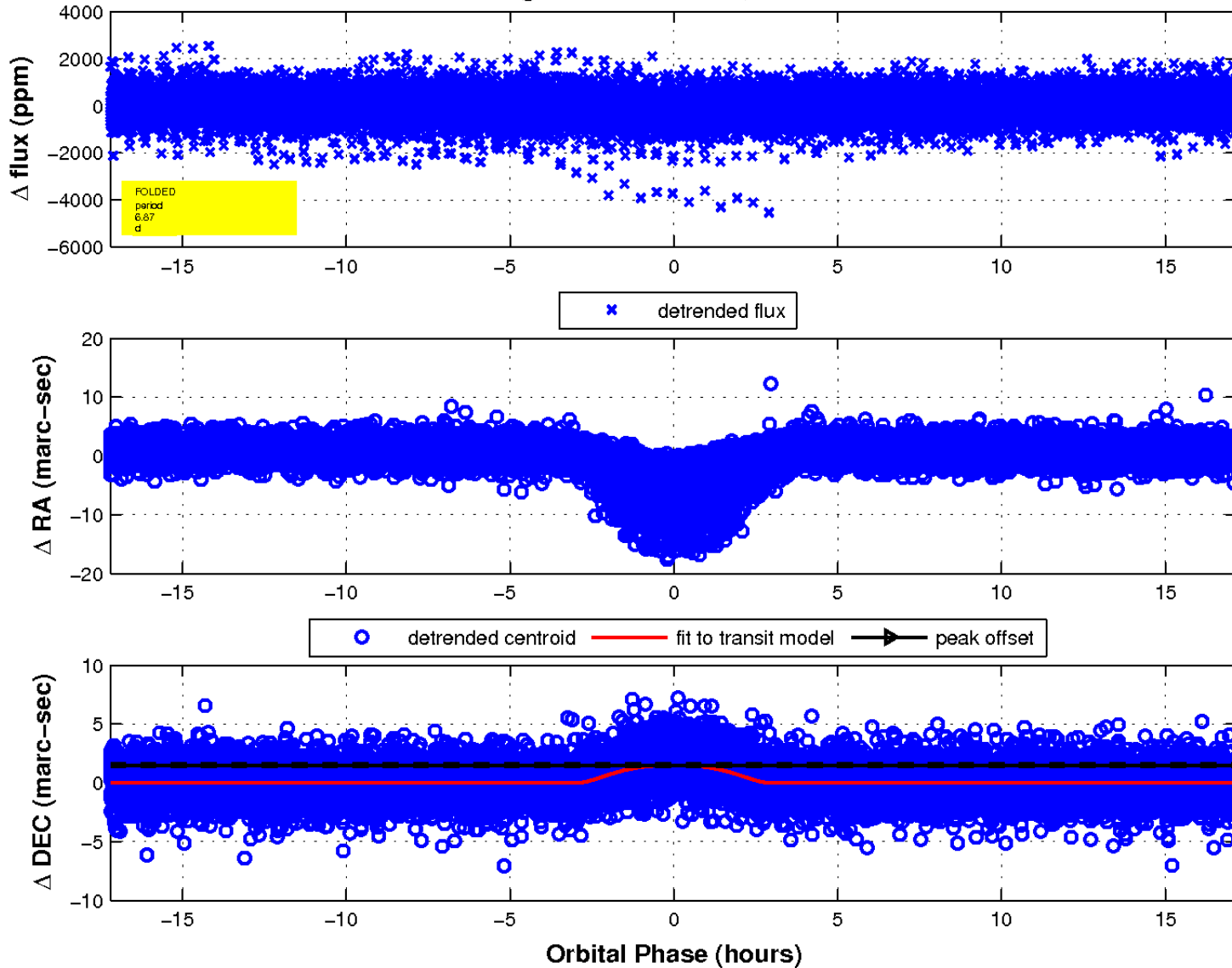
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

