

KIC 003858949

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})
003858949-01	OBS	0995.01	25.951947	154.883569	958.8	14.473	42.3	44.4	0.80	5372	4.91	17.40
003858949-02	OBS	No	25.951693	148.935020	789.6	19.911	41.8	45.1	0.80	5372	4.48	17.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003858949-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
003858949-02	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 003858949-01

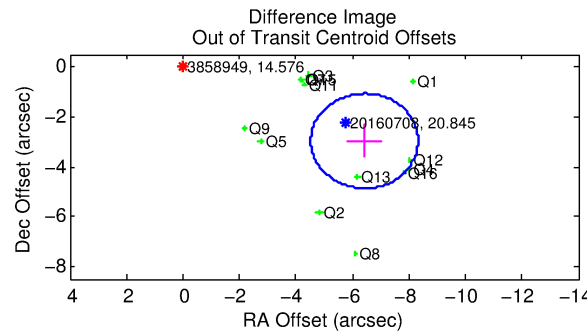
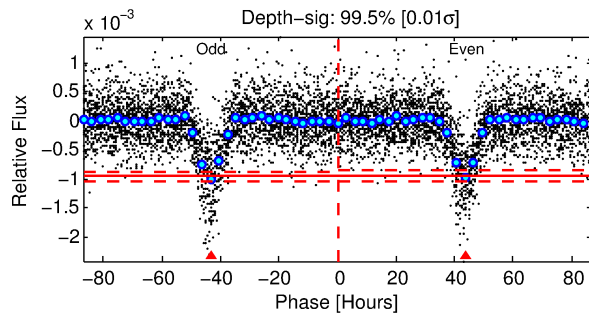
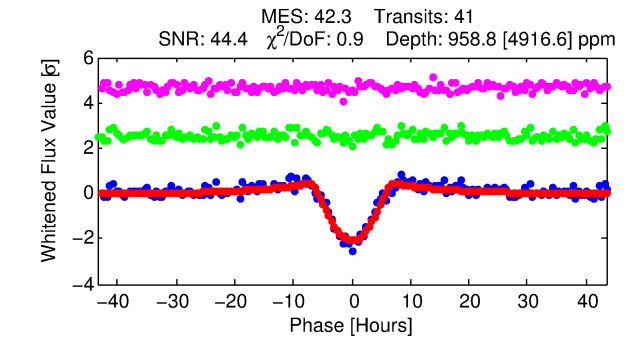
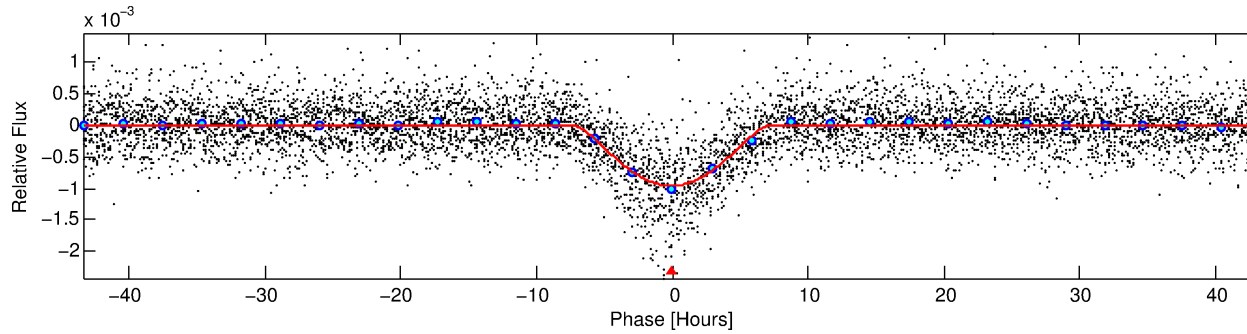
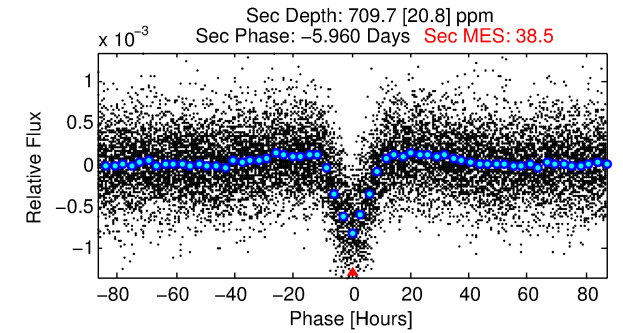
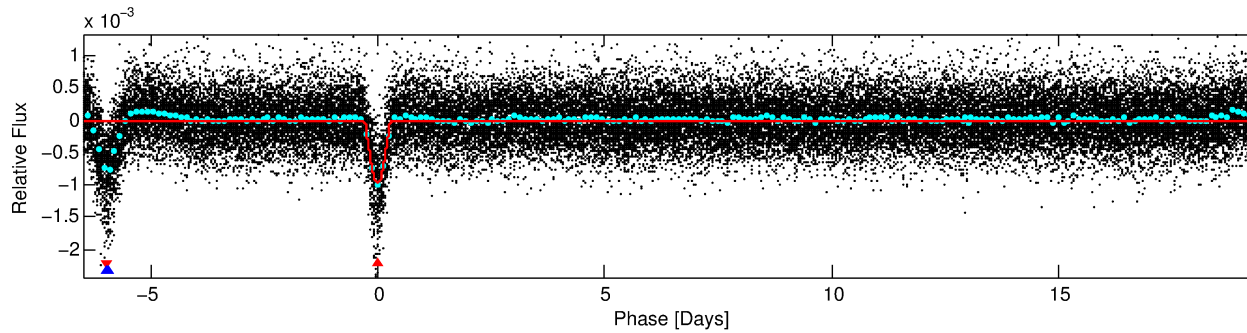
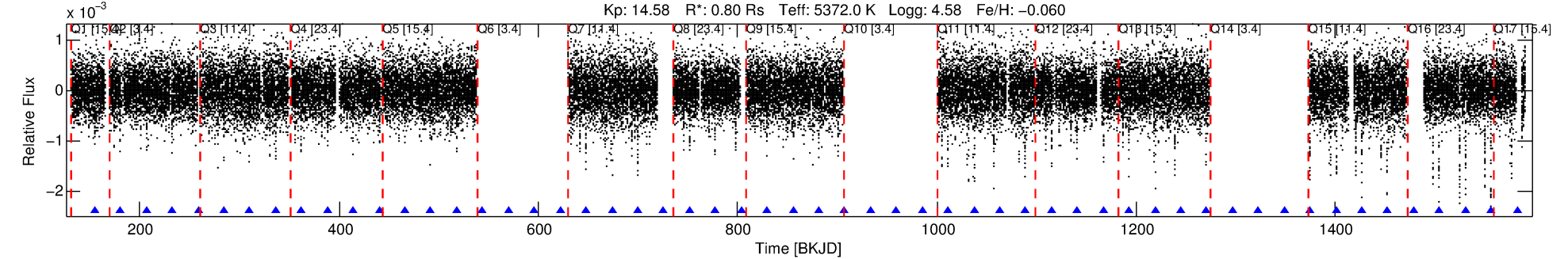
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (μ)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003858949-01	3858949	003858884-01	3858884	1:1	43.0	-5	10	9.28	14.58	415.60	Direct-PRF	0	0.37	0.15

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: 3858949 Candidate: 1 of 2 Period: 25.952 d
KOI: K00995.01 Corr: 0.984

Kp: 14.58 R*: 0.80 Rs Teff: 5372.0 K Logg: 4.58 Fe/H: -0.060



DV Fit Results:

Period = 25.95195 [0.00019] d
Epoch = 154.8836 [0.0060] BKJD
Rp/R* = 0.0566 [0.0403]
a/R* = 4.78 [0.75]
b = 1.00 [0.25]
Seff = 17.40 [4.27]
Teq = 521 [32] K
Rp = 4.91 [3.59] Re
a = 0.1648 [0.0238] AU
Ag = 439.43 [632.80] [0.69σ]
Teffp = 3686 [1317] K [2.40σ]

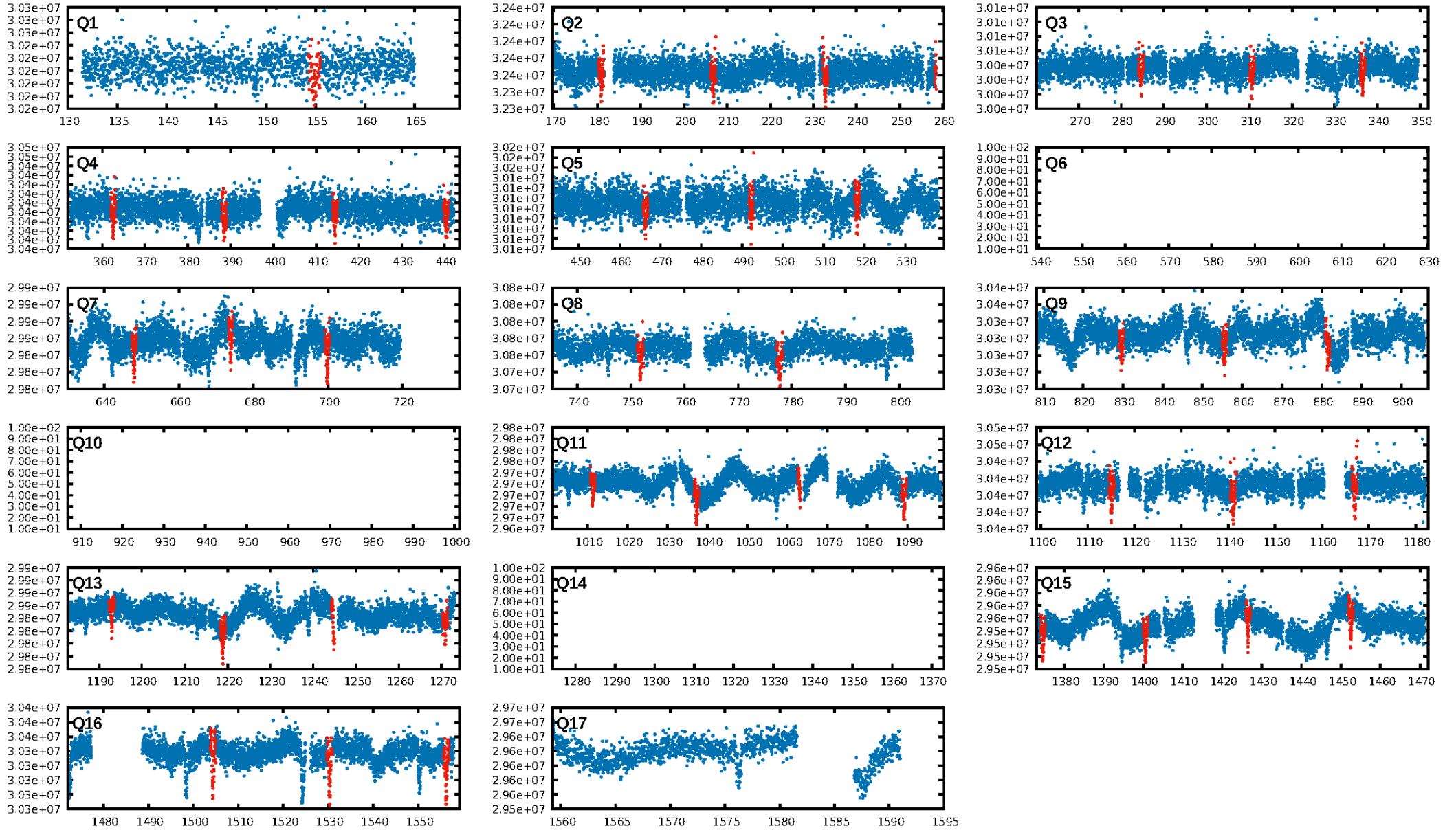
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [40/40]
GhostDiagnostic-chr: -0.169
Centroid-sig: N/A
Centroid-so: 4.990 arcsec [17.16σ]
OotOffset-rm: 7.077 arcsec [11.18σ]
KicOffset-rm: 7.060 arcsec [10.99σ]
OotOffset-st: 1/4/4/4 [13]
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DiffImageQuality-fgm: 0.00 [0/13]
DiffImageOverlap-fno: 1.00 [13/13]

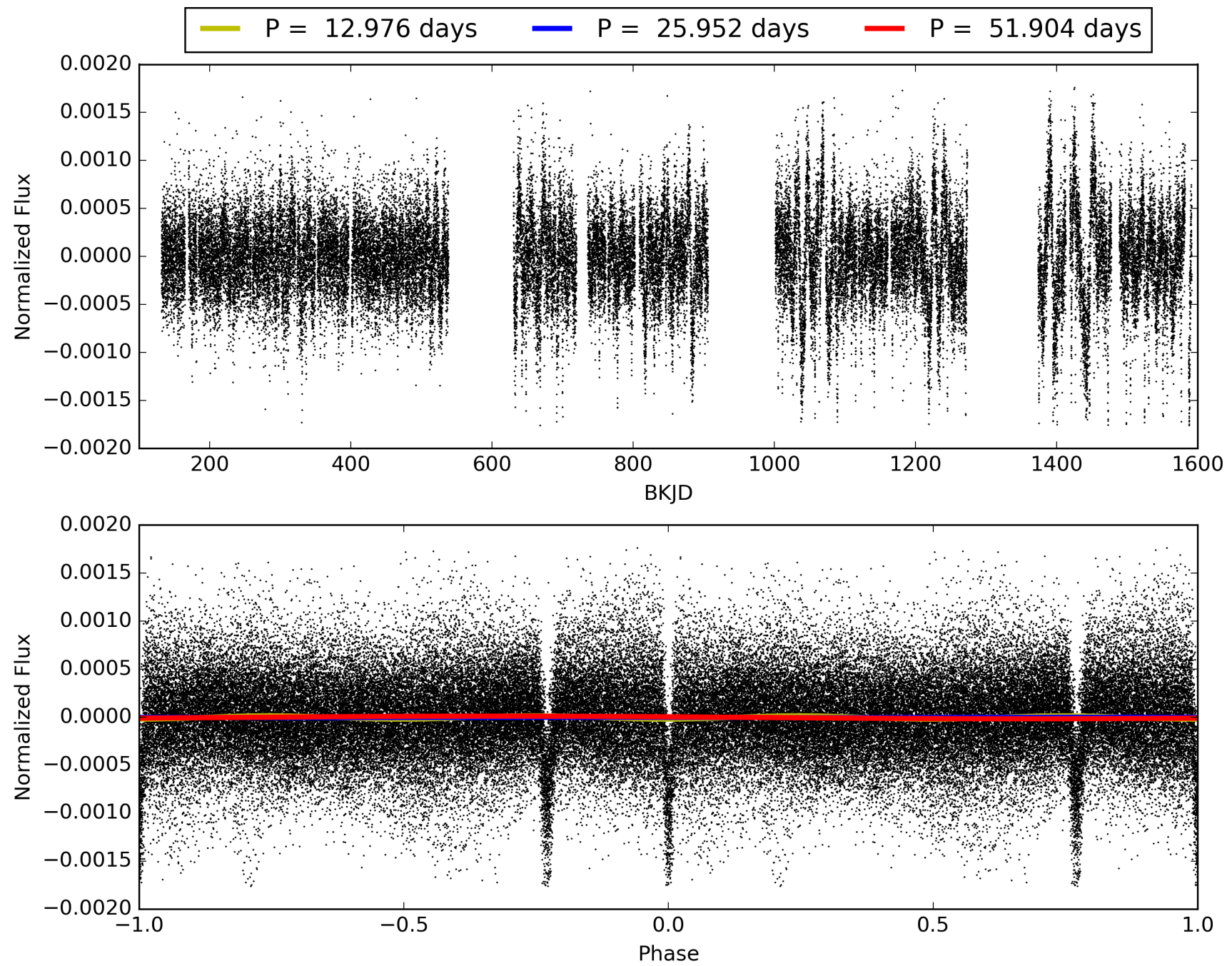
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:27:54 Z

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

TCE 003858949-01, PDC Light Curves

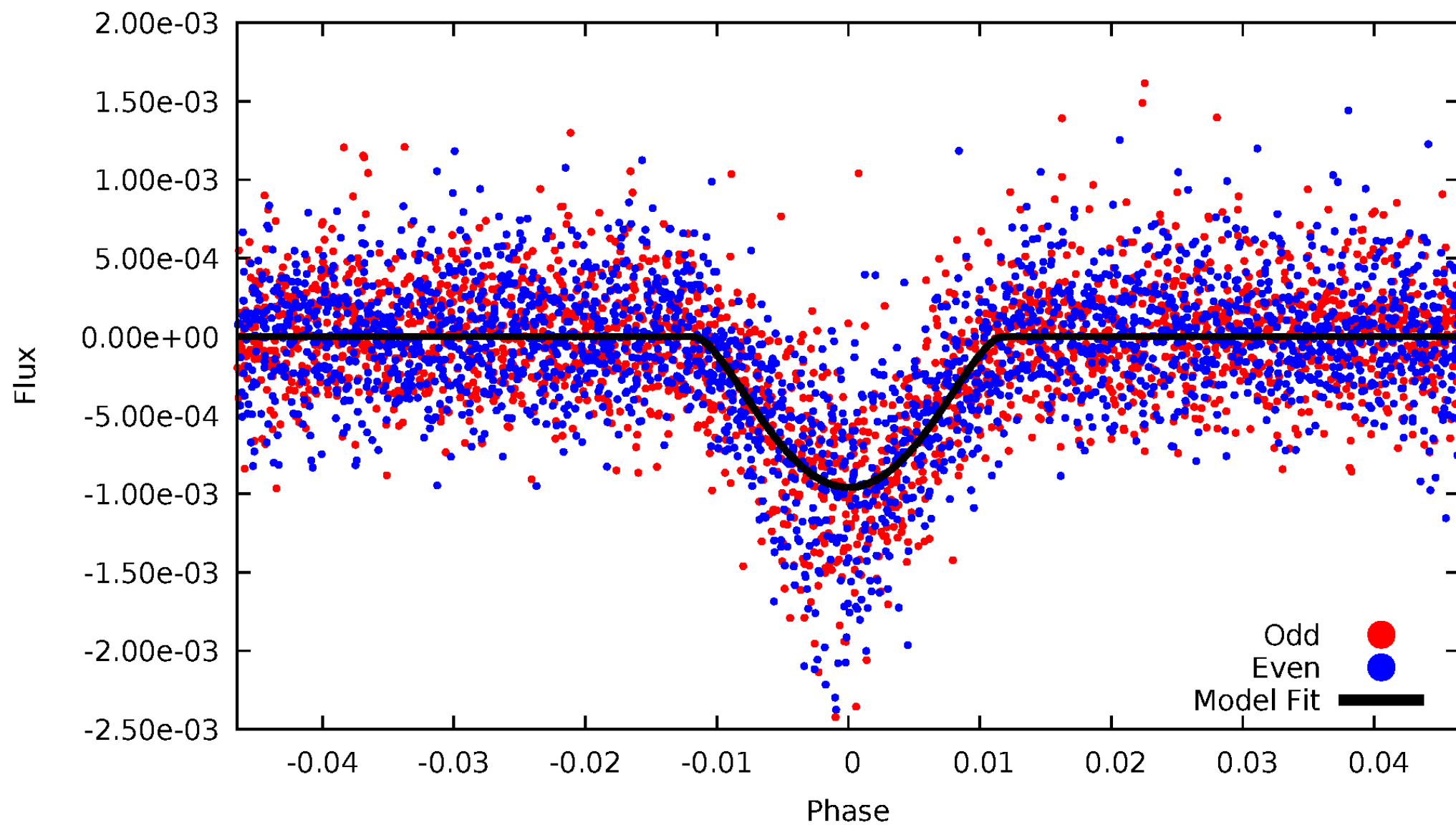


TCE 003858949-01



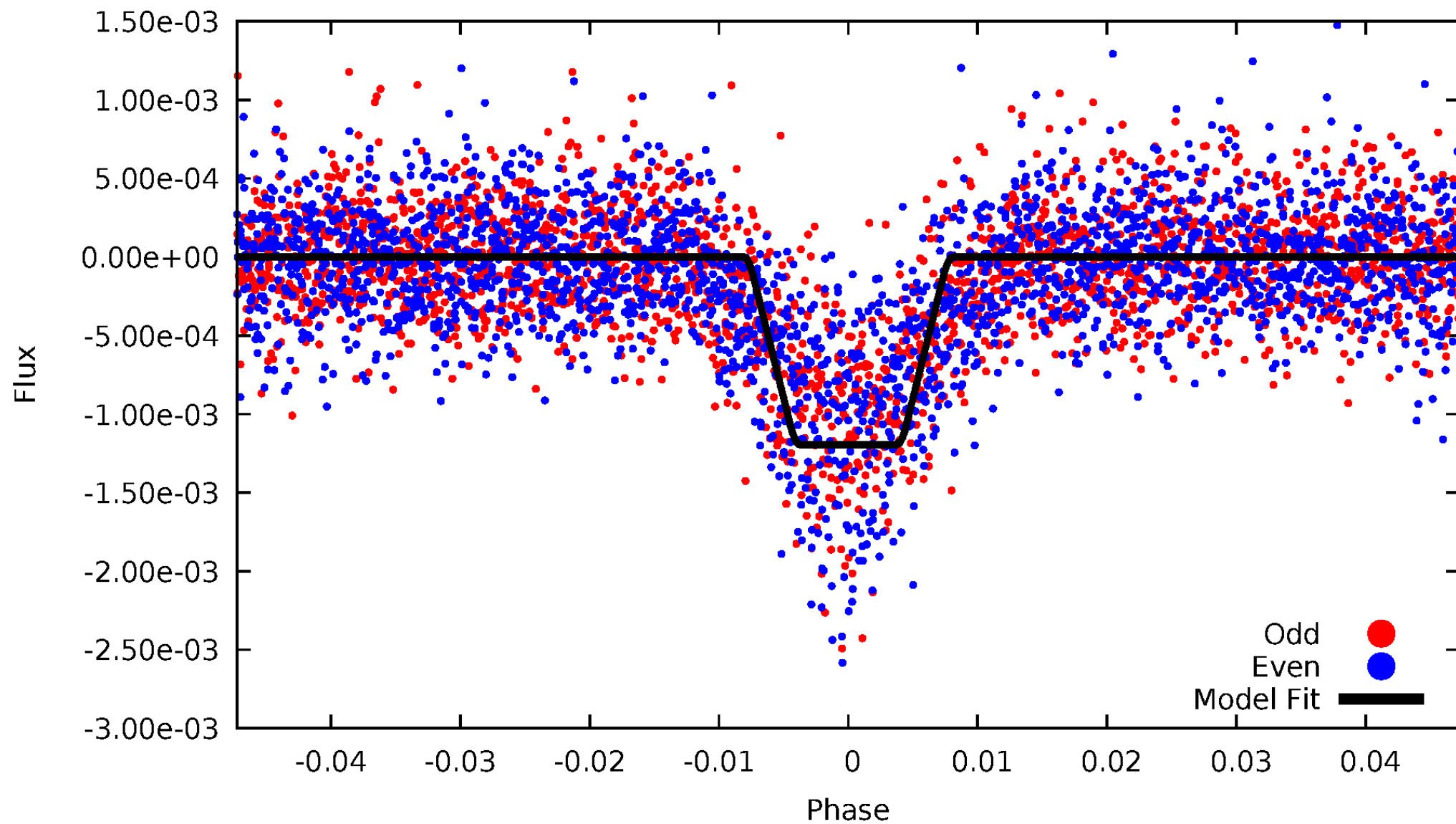
DV Odd/Even

TCE 003858949-01



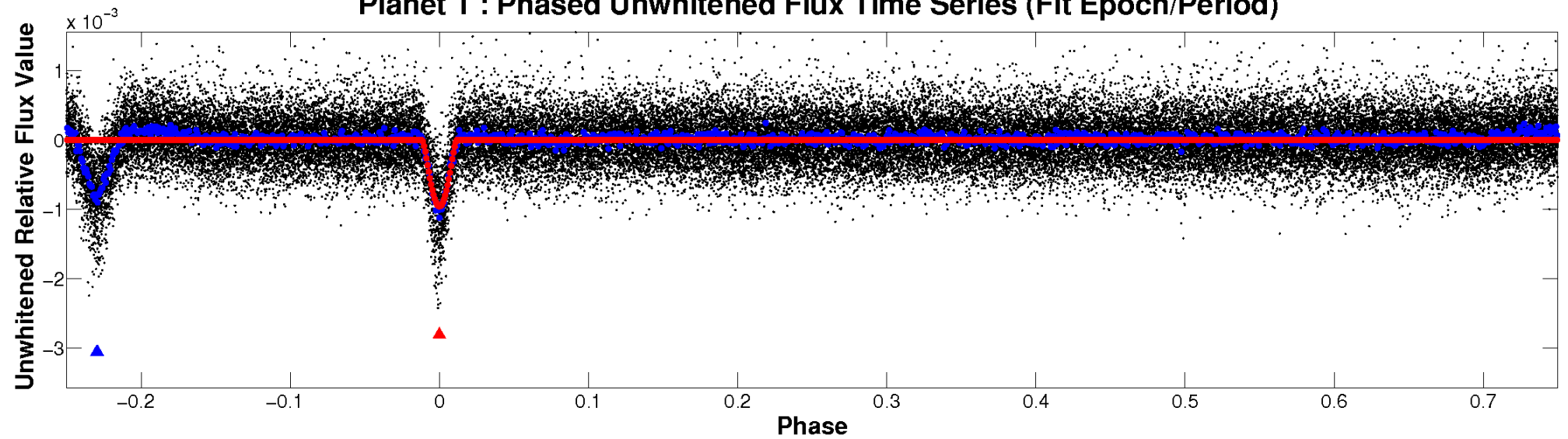
ALT Odd/Even

TCE 003858949-01

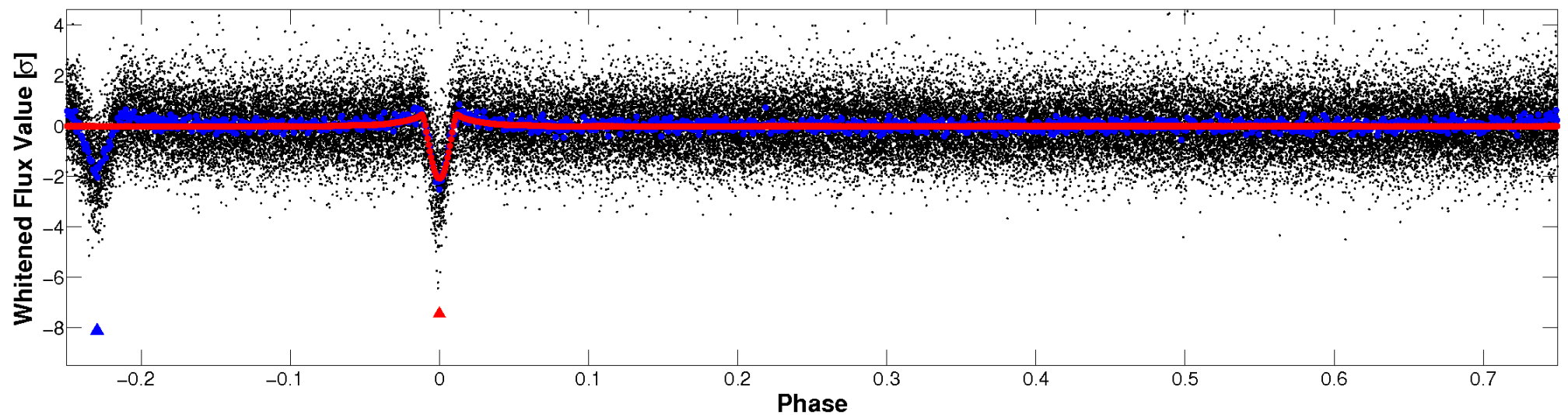


Non-Whitened Vs. Whitened Light Curve

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

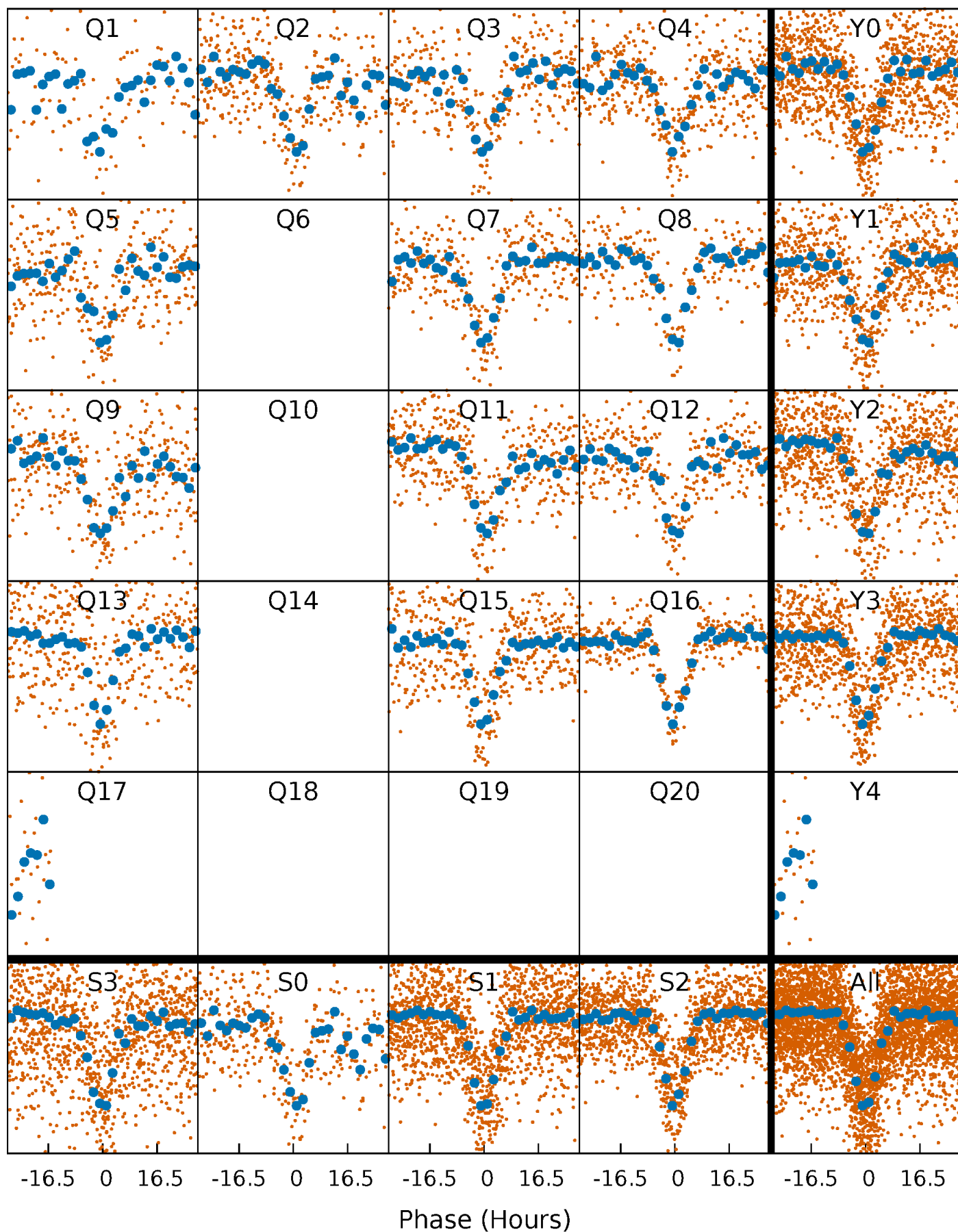


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



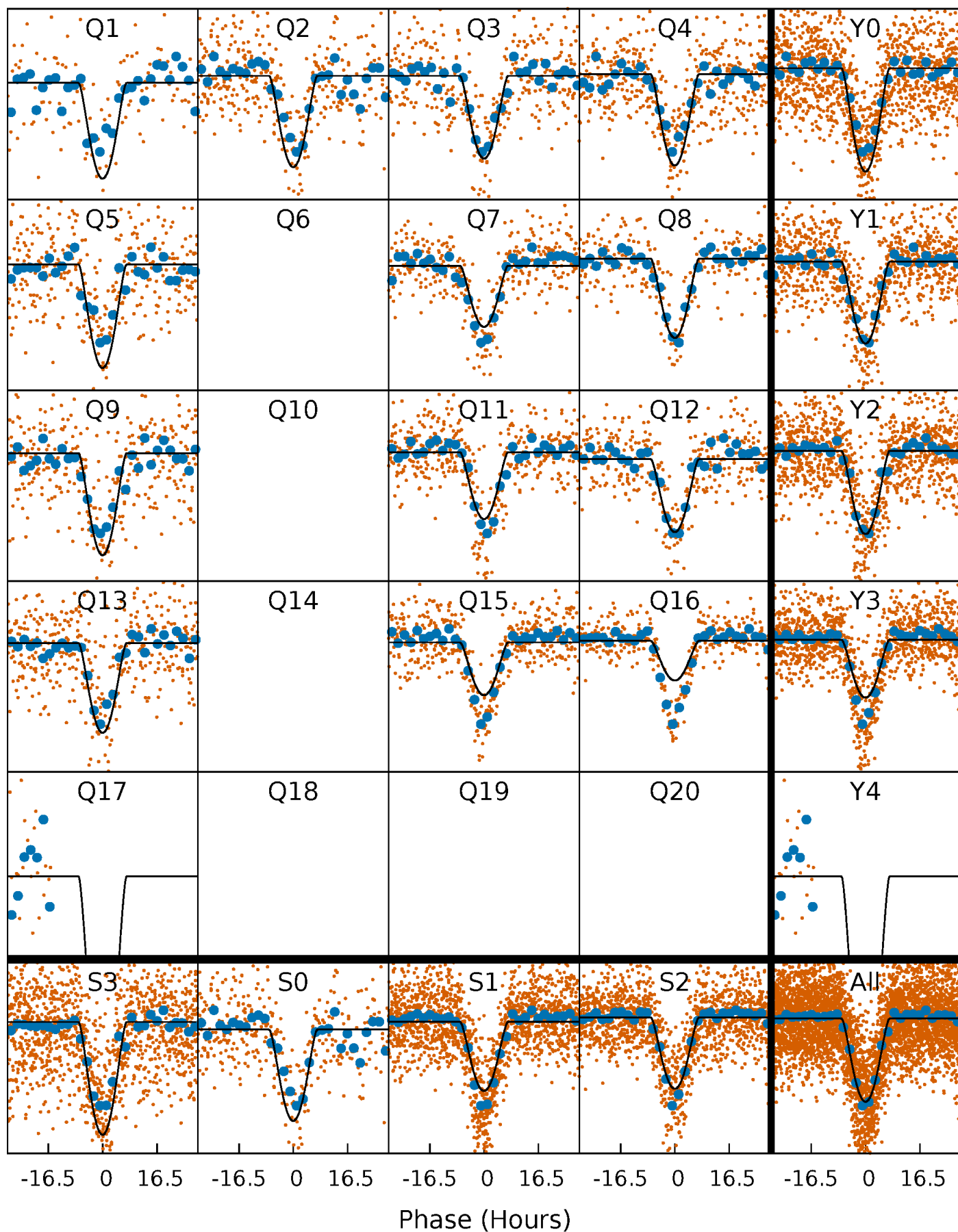
PDC Quarter-Phased Transit Curves

TCE 003858949-01 P= 25.951947 Days $T_0=154.883569$ (BKJD)



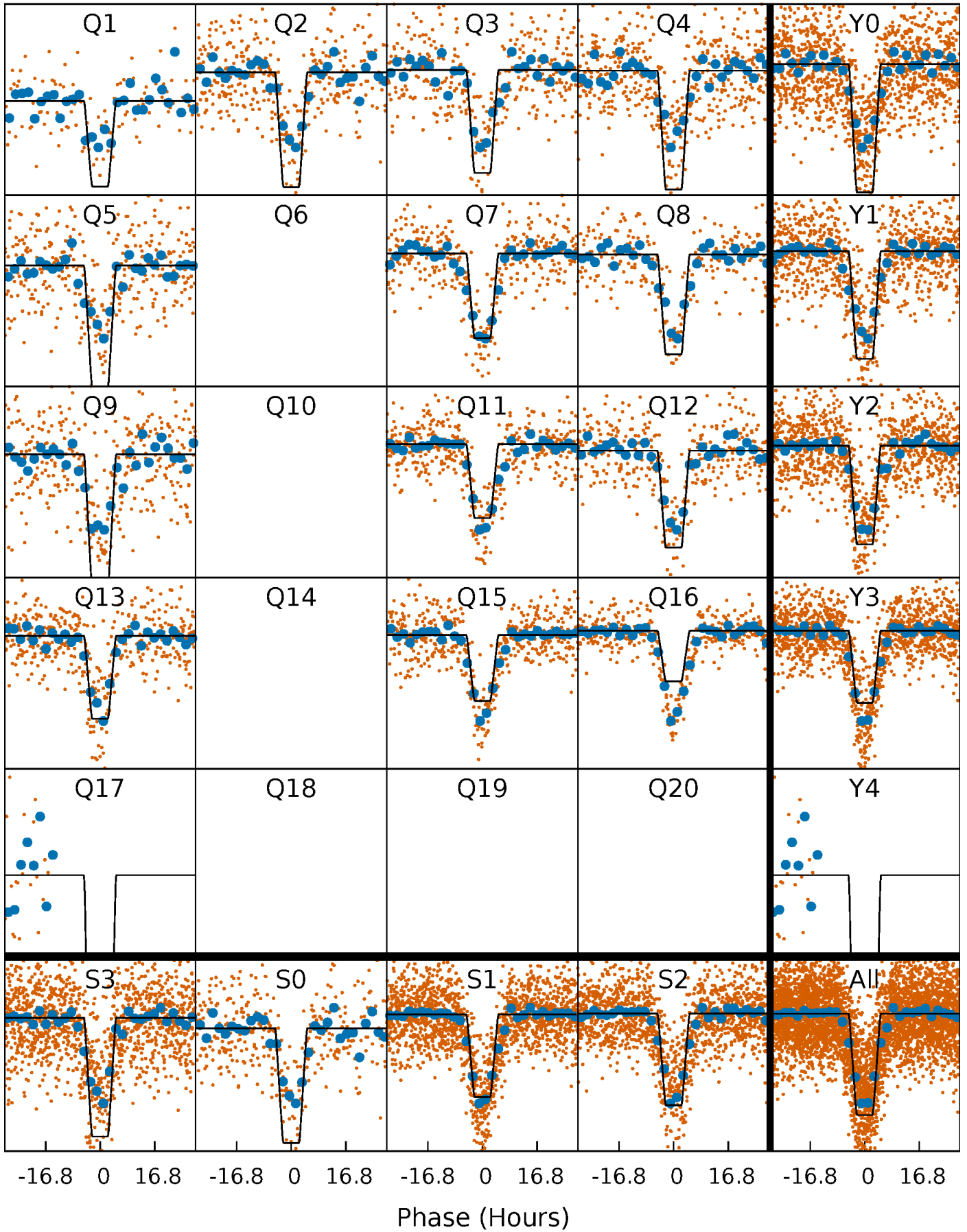
DV Quarter-Phased Transit Curves

TCE 003858949-01 P= 25.951947 Days $T_0=154.883569$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

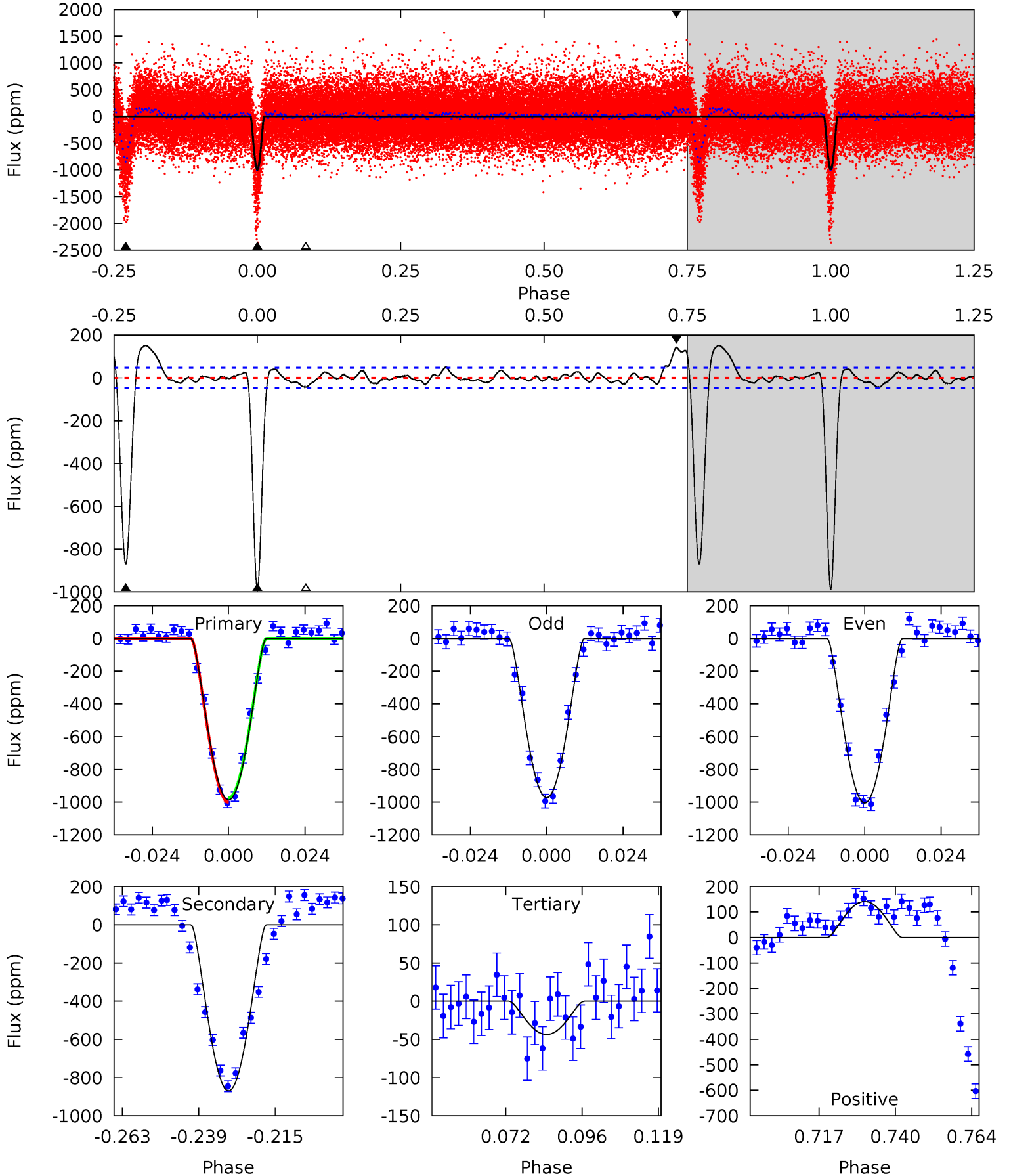
TCE 003858949-01 P= 25.951589 Days $T_0=154.889663$ (BKJD)



DV Model-Shift Uniqueness Test

003858949-01, P = 25.951947 Days, E = 128.931622 Days

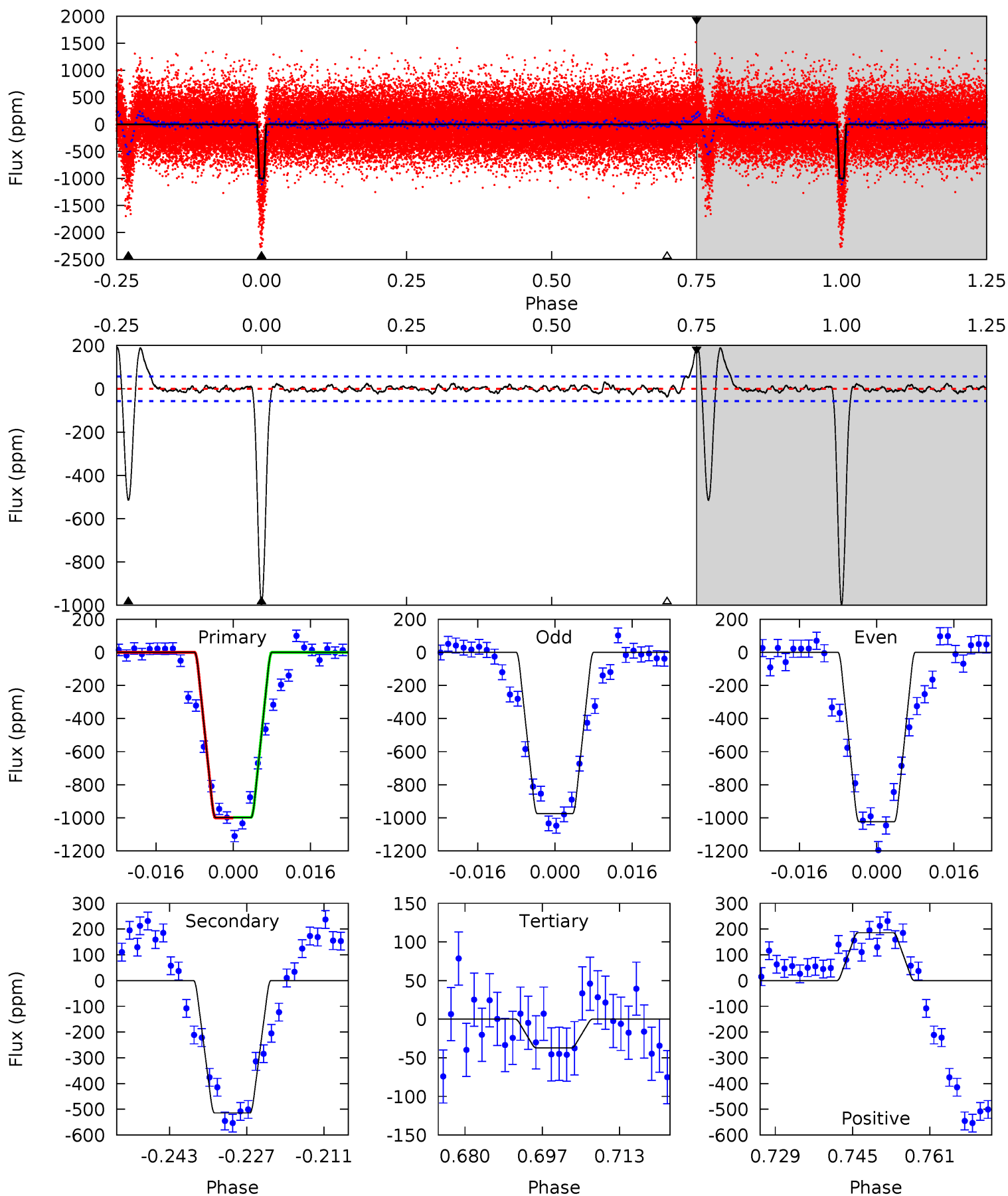
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
101.2	89.2	4.47	14.5	4.86	2.26	3.81	96.8	86.7	84.7	74.7	1.68	1.07	0.13	1.27



Alt Model-Shift Uniqueness Test

003858949-01, P = 25.951589 Days, E = 128.938074 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
86.3	44.4	3.20	16.0	4.93	2.40	2.67	83.1	70.2	41.2	28.4	2.11	1.14	0.16	0.12



Stellar Parameters For KIC 003858949

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5372^{+159}_{-143}	$4.584^{+0.030}_{-0.120}$	$-0.060^{+0.300}_{-0.300}$	$0.796^{+0.133}_{-0.071}$	$0.892^{+0.070}_{-0.104}$	$2.497^{+0.404}_{-0.857}$
	+3%/-3%	+1%/-3%	+500%/-500%	+17%/-9%	+8%/-12%	+16%/-34%
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 003858949-01 / KOI 0995.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-870 ± 10	$5.25^{+3.92}_{-2.72}$	742^{+32}_{-27}	4061^{+1442}_{-651}	463^{+1505}_{-309}
Alt.	-514 ± 12	$4.07^{+3.42}_{-2.59}$	743^{+33}_{-29}	4120^{+2042}_{-795}	467^{+2945}_{-333}

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

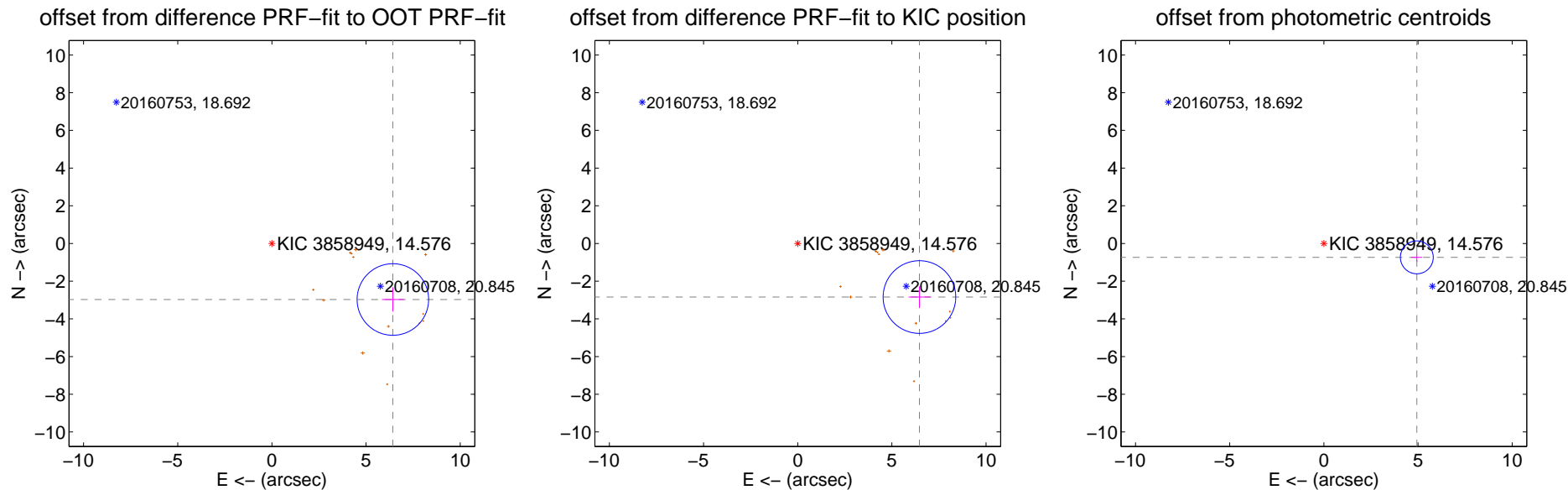
DV Centroid Data

Supplemental centroid analysis for 003858949-01. Kepler magnitude: 14.58. Transit SNR 44.42

There are 0 quarters with good PRF difference image offsets

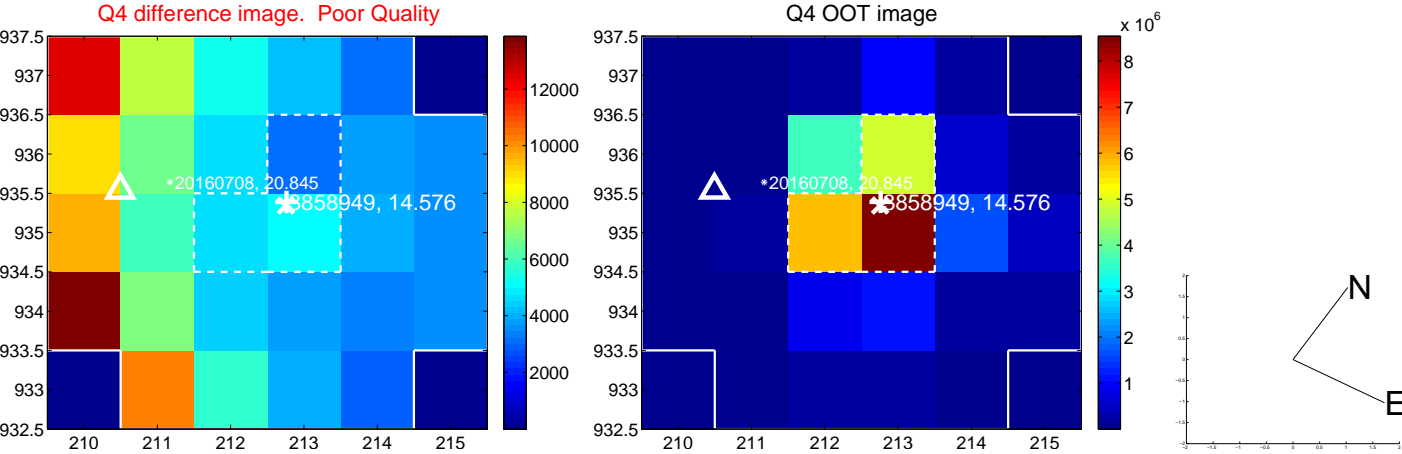
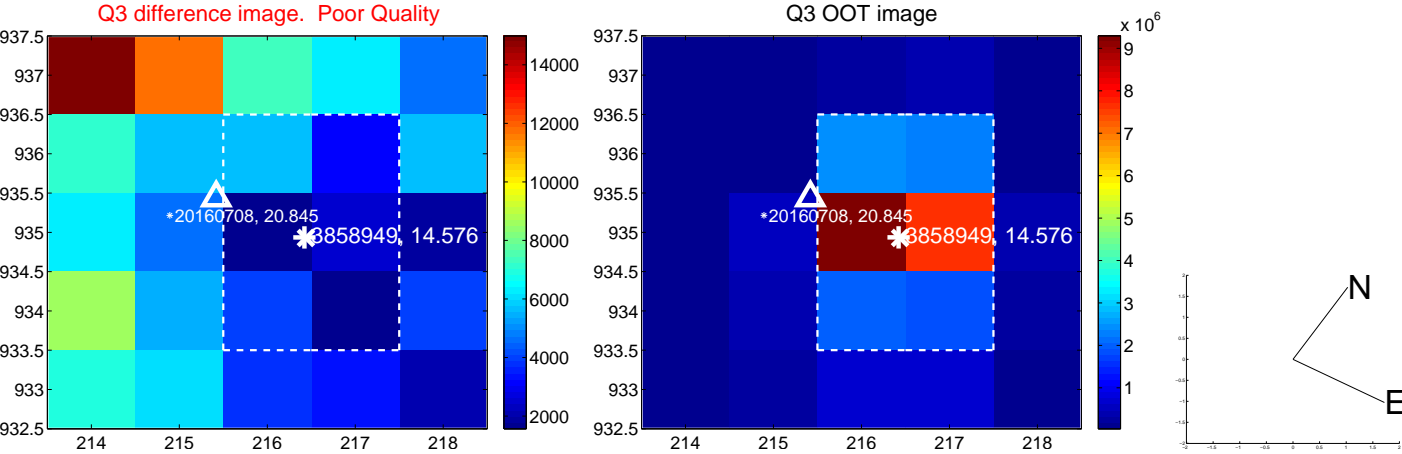
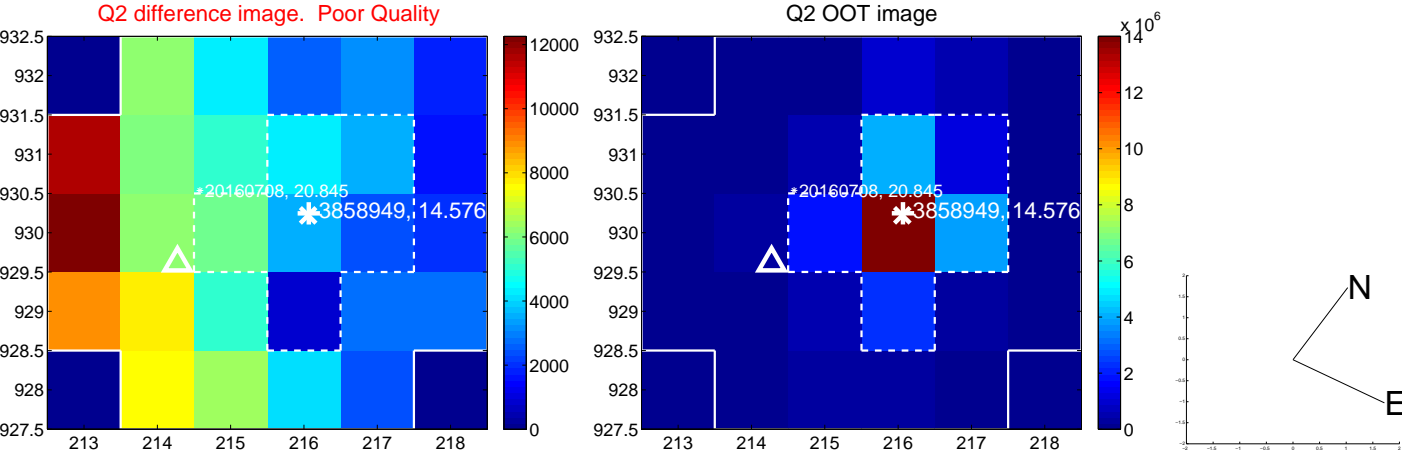
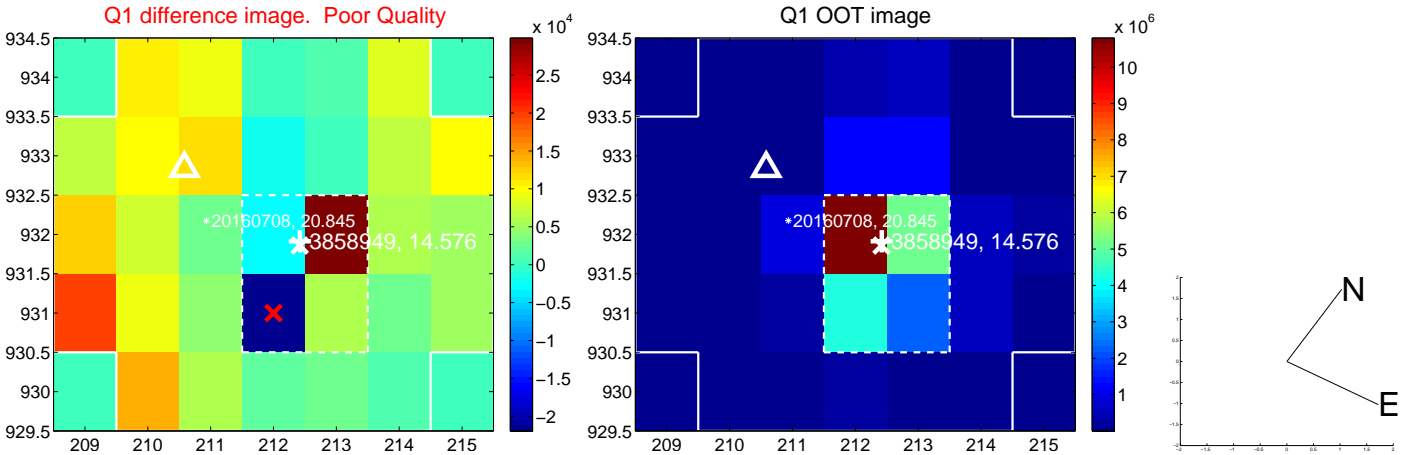
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.077 ± 0.633	11.18	-6.422 ± 0.577	-2.973 ± 0.634
PRF-fit source offset from KIC position	7.060 ± 0.643	10.99	-6.462 ± 0.575	-2.843 ± 0.564
photometric centroid source offset	4.99 ± 0.29	17.16	-4.93 ± 0.29	-0.74 ± 0.24

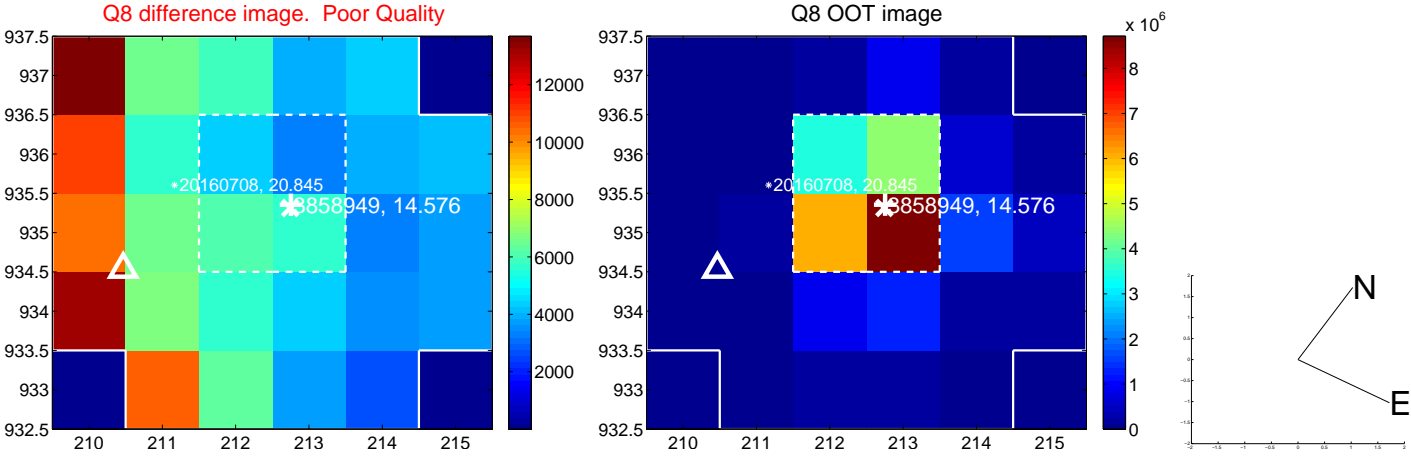
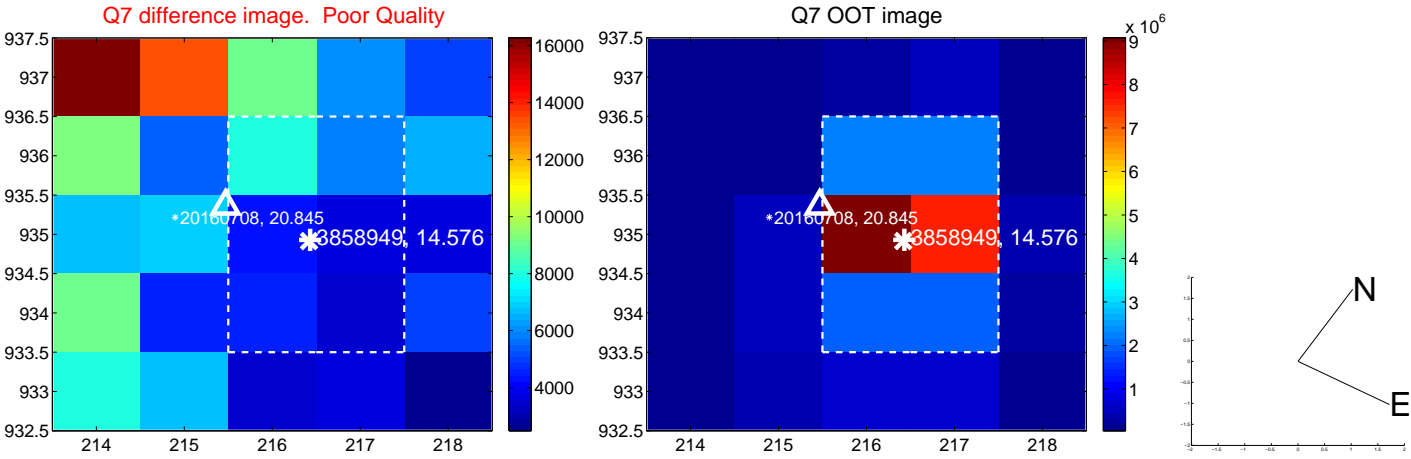
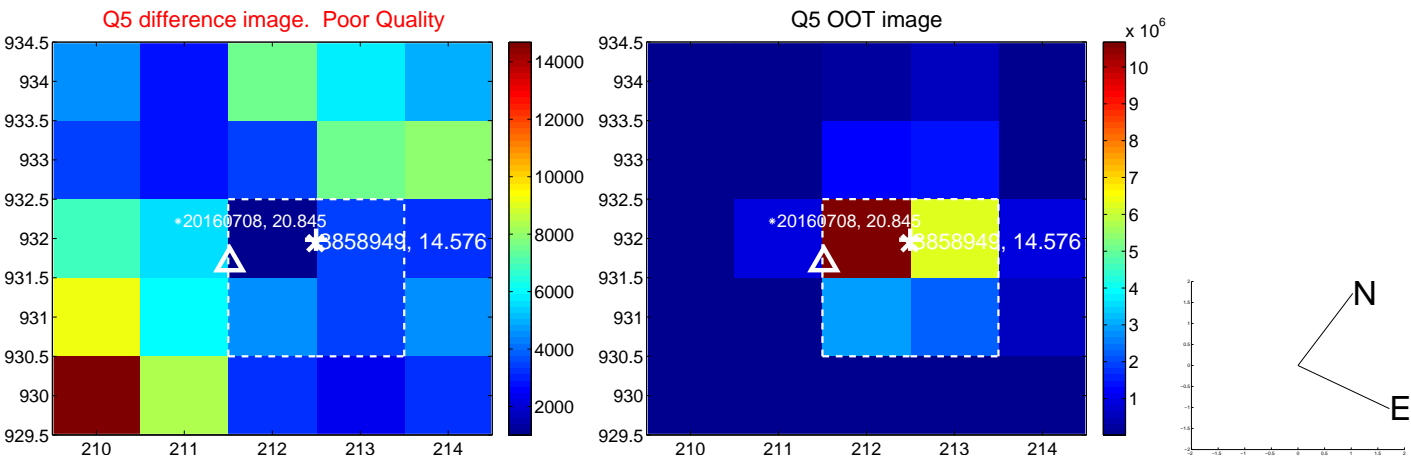


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

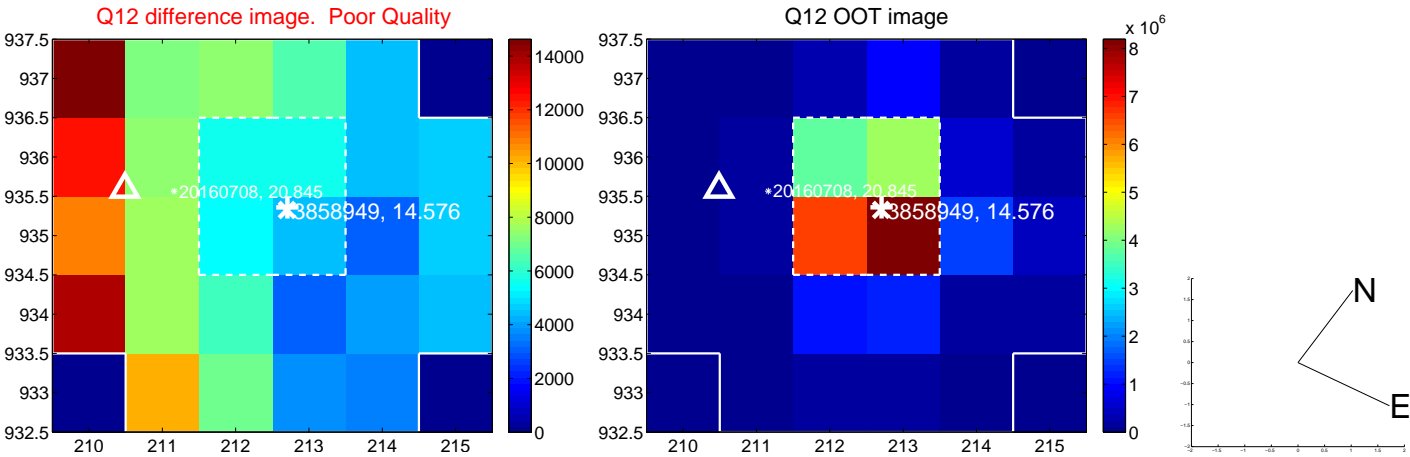
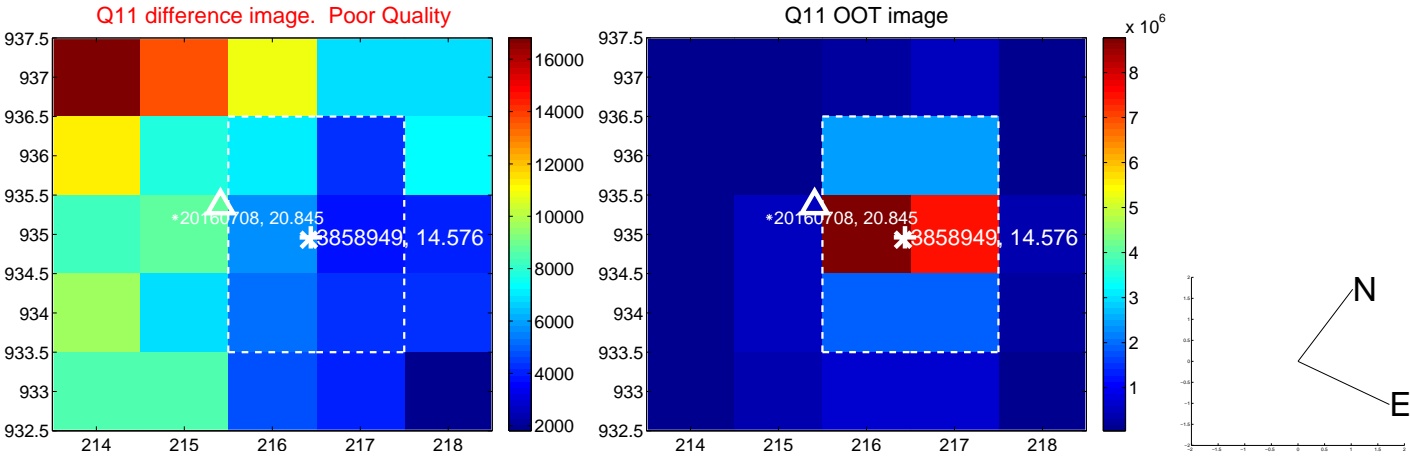
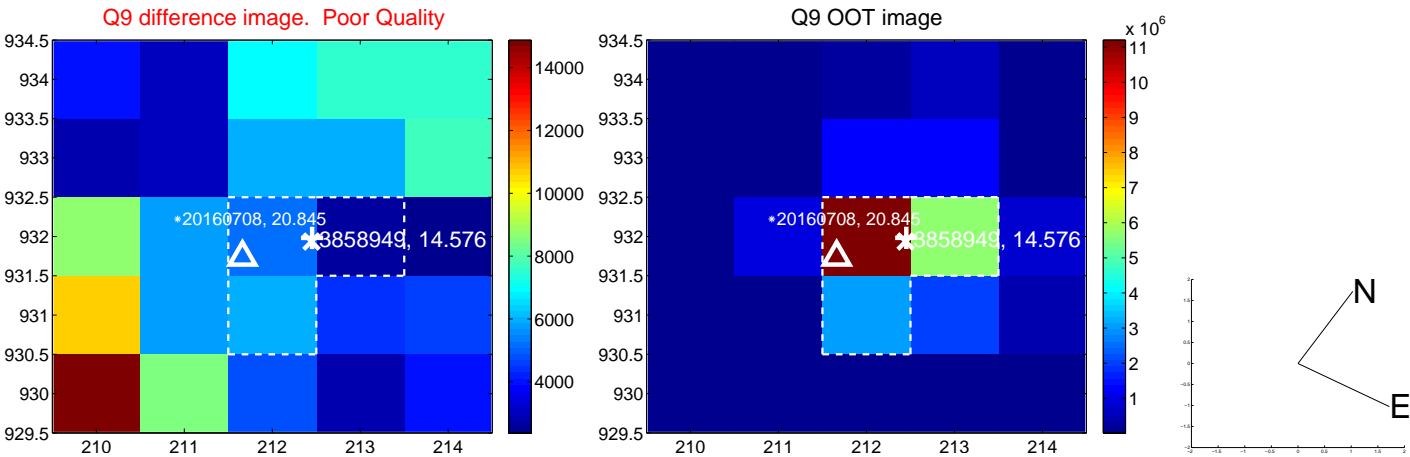
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



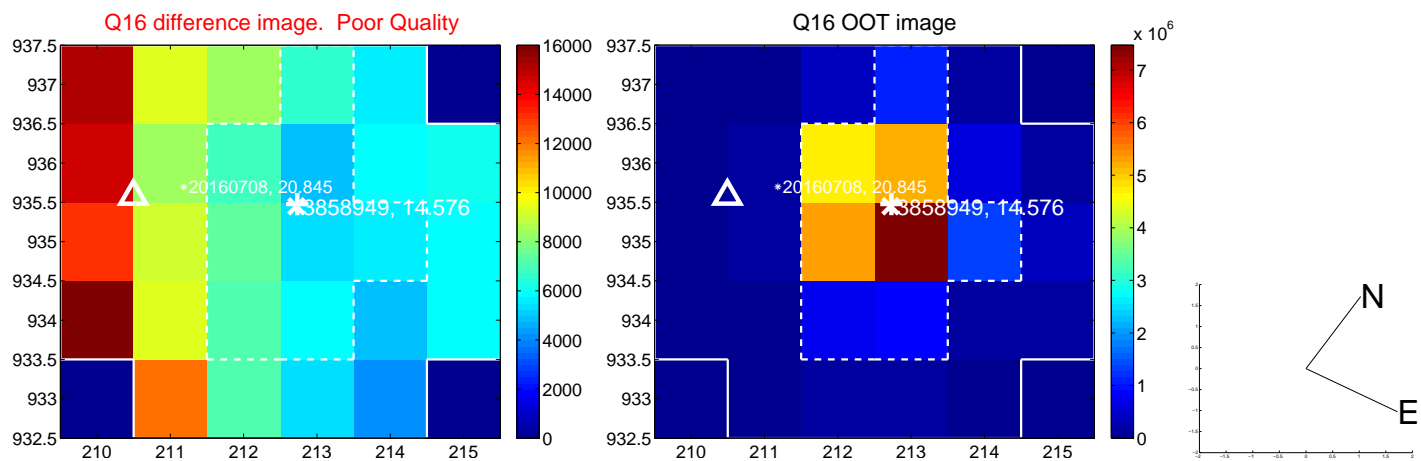
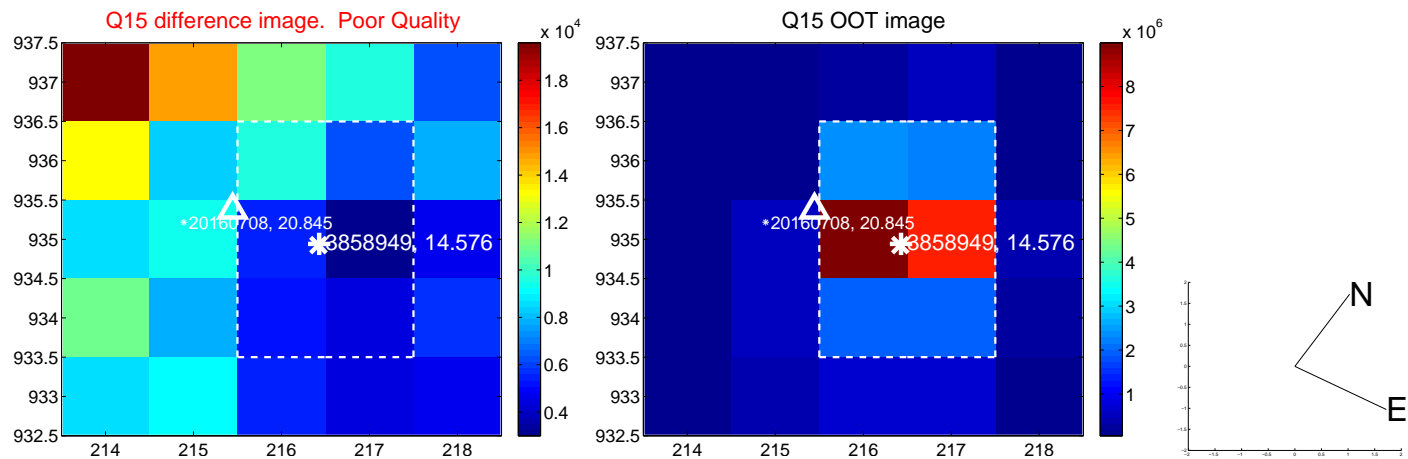
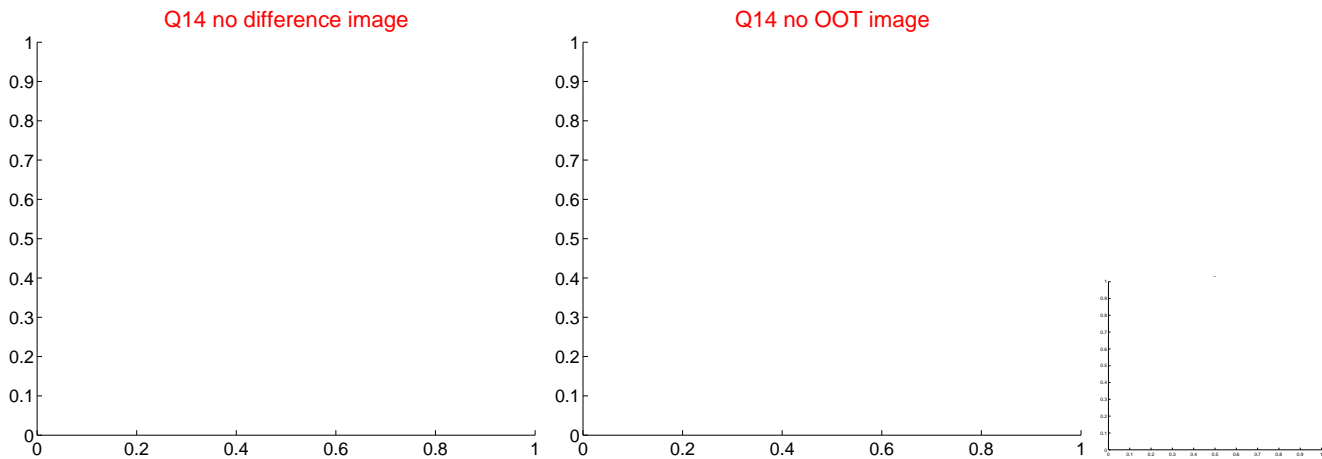
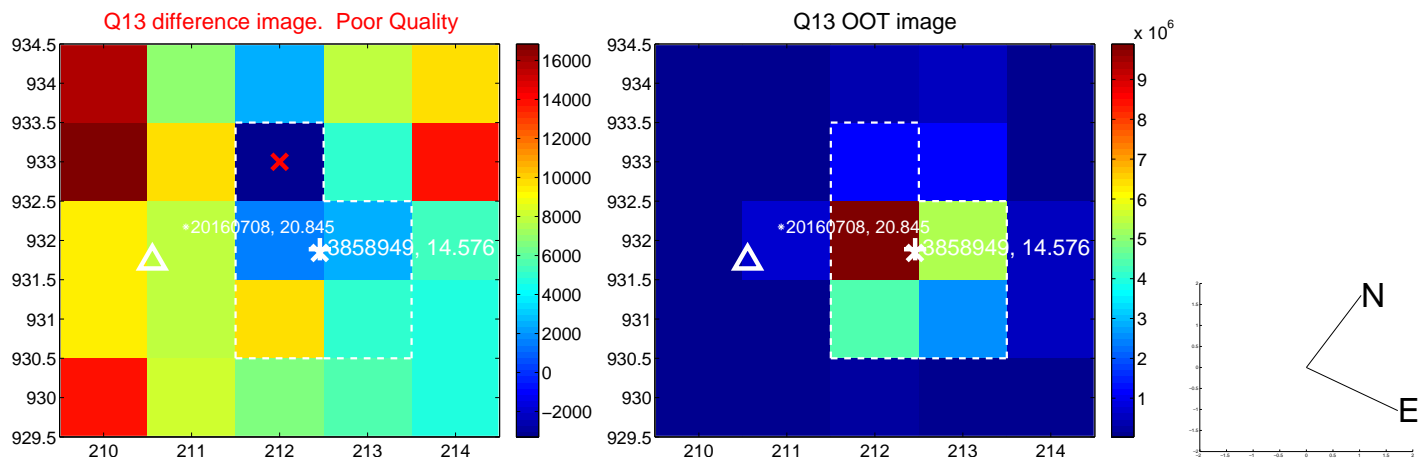
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



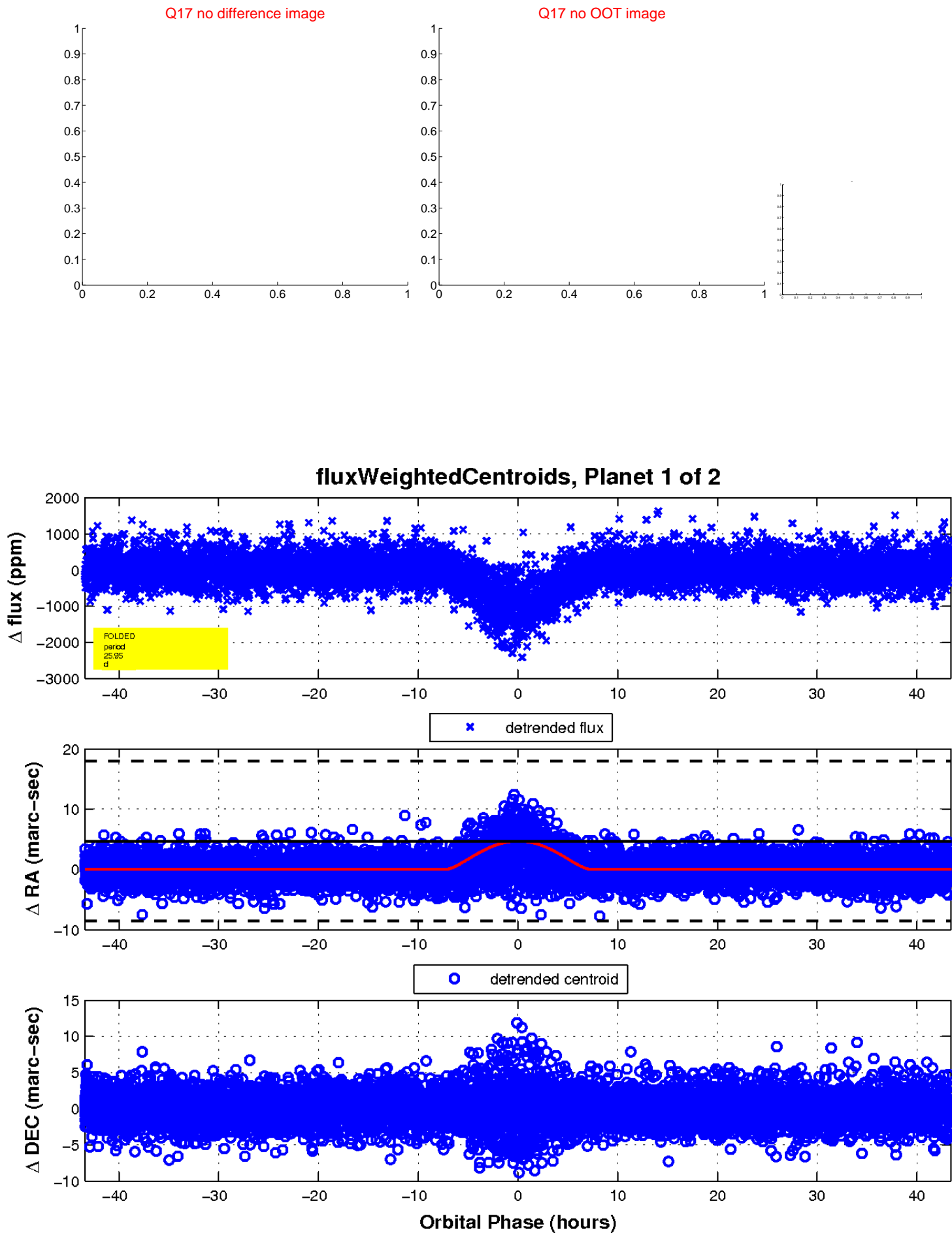
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

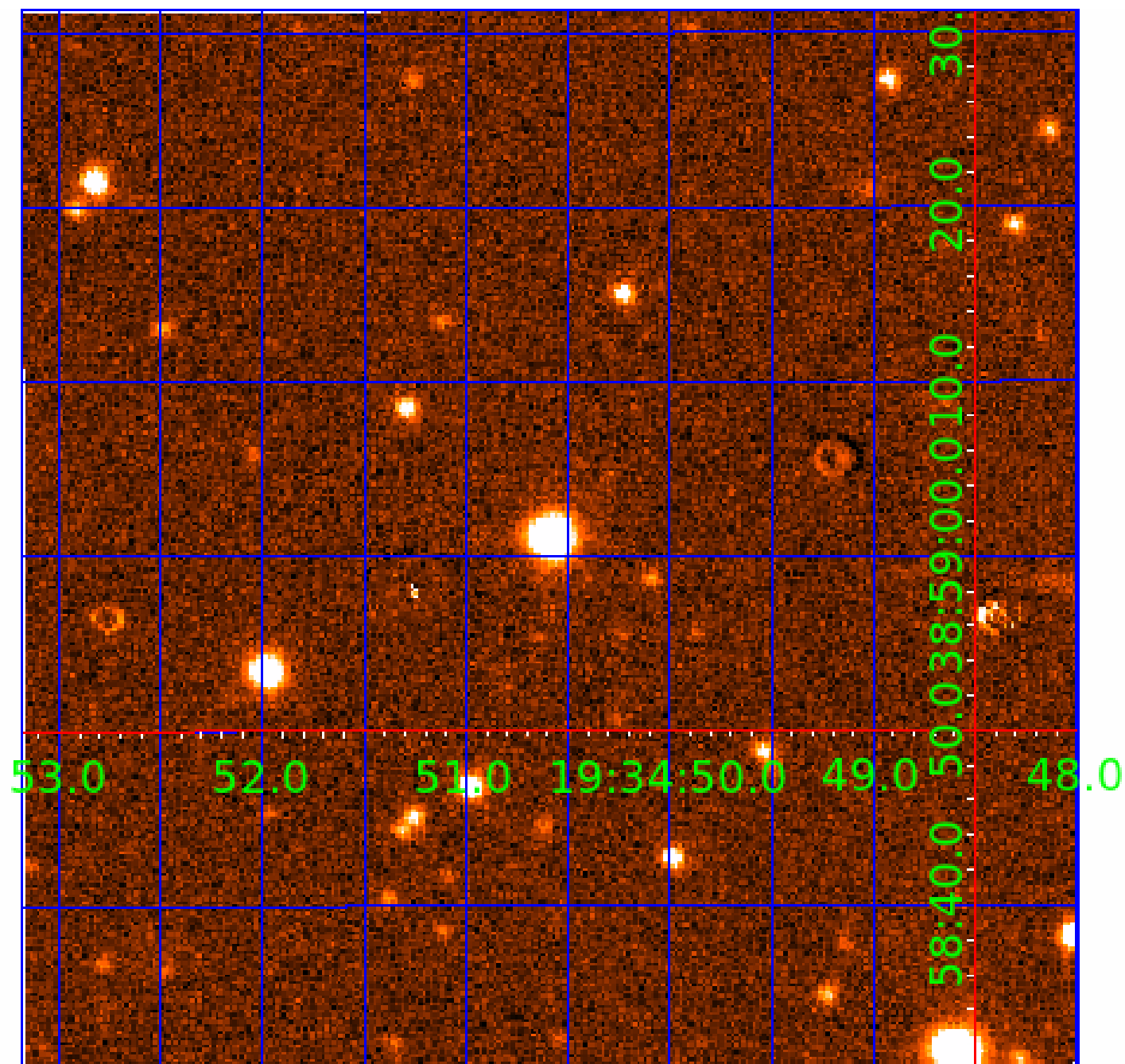


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003858949

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})
003858949-01	OBS	0995.01	25.951947	154.883569	958.8	14.473	42.3	44.4	0.80	5372	4.91	17.40
003858949-02	OBS	No	25.951693	148.935020	789.6	19.911	41.8	45.1	0.80	5372	4.48	17.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003858949-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
003858949-02	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 003858949-02

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (μ)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003858949-02	3858949	003858884-02	3858884	1:1	43.0	-5	10	9.28	14.58	426.75	Direct-PRF	0	0.03	0.10

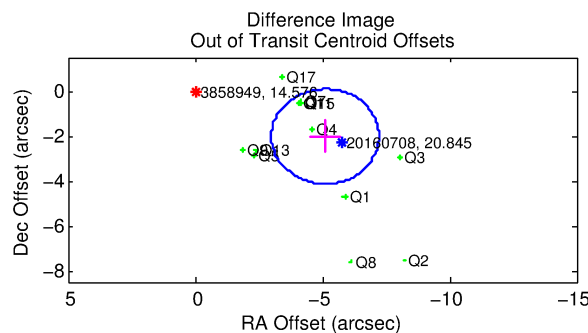
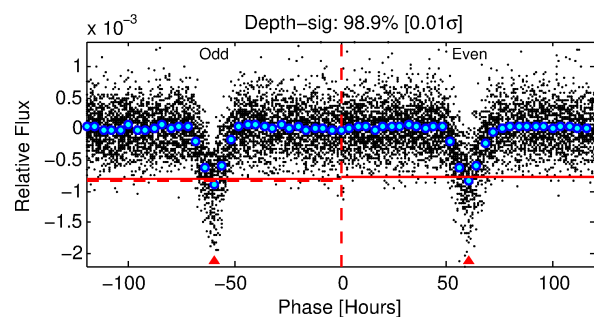
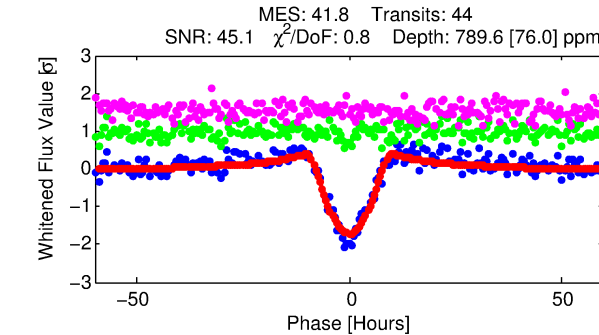
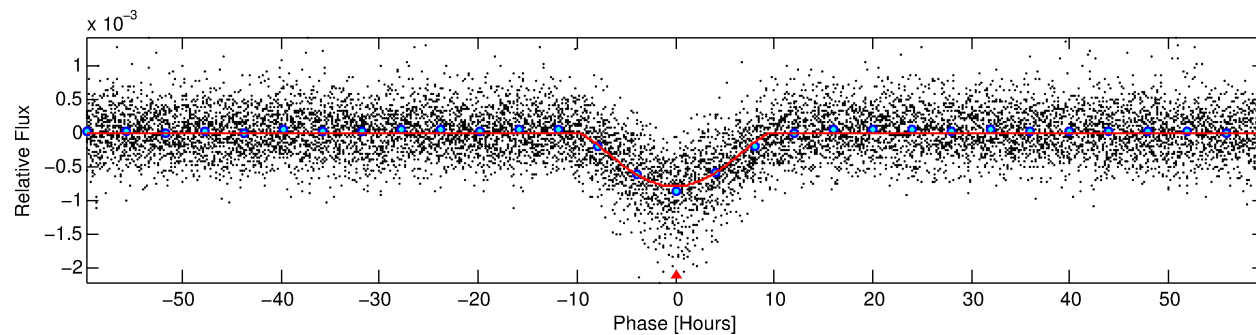
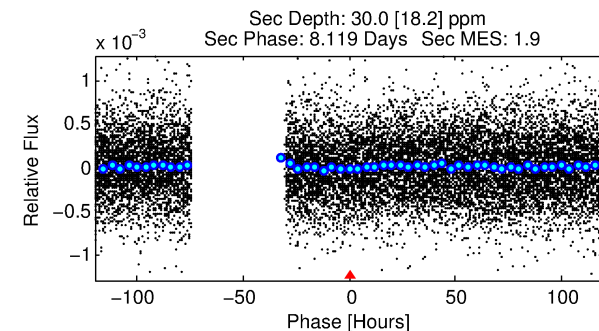
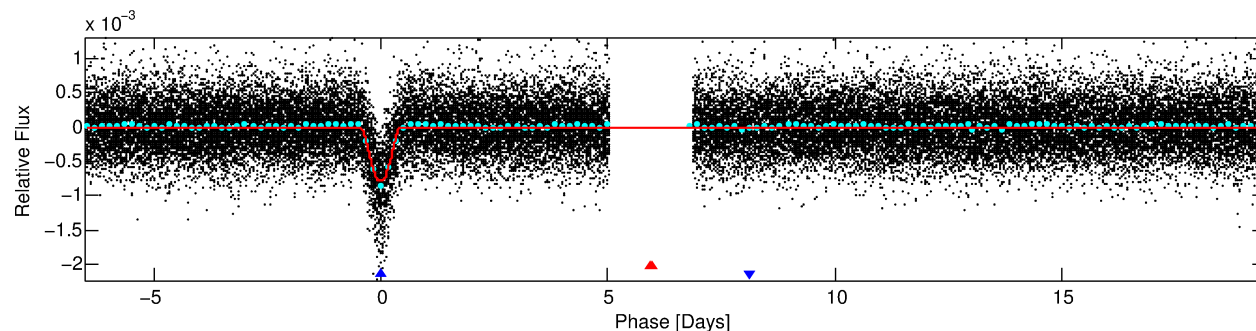
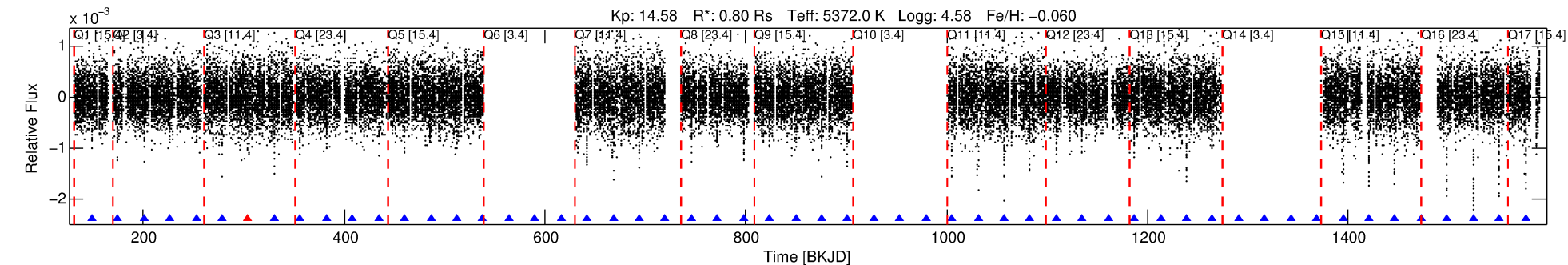
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 3858949 Candidate: 2 of 2 Period: 25.952 d

KOI: K00995 Corr: No Ephemeris Match

Kp: 14.58 R*: 0.80 Rs Teff: 5372.0 K Logg: 4.58 Fe/H: -0.060



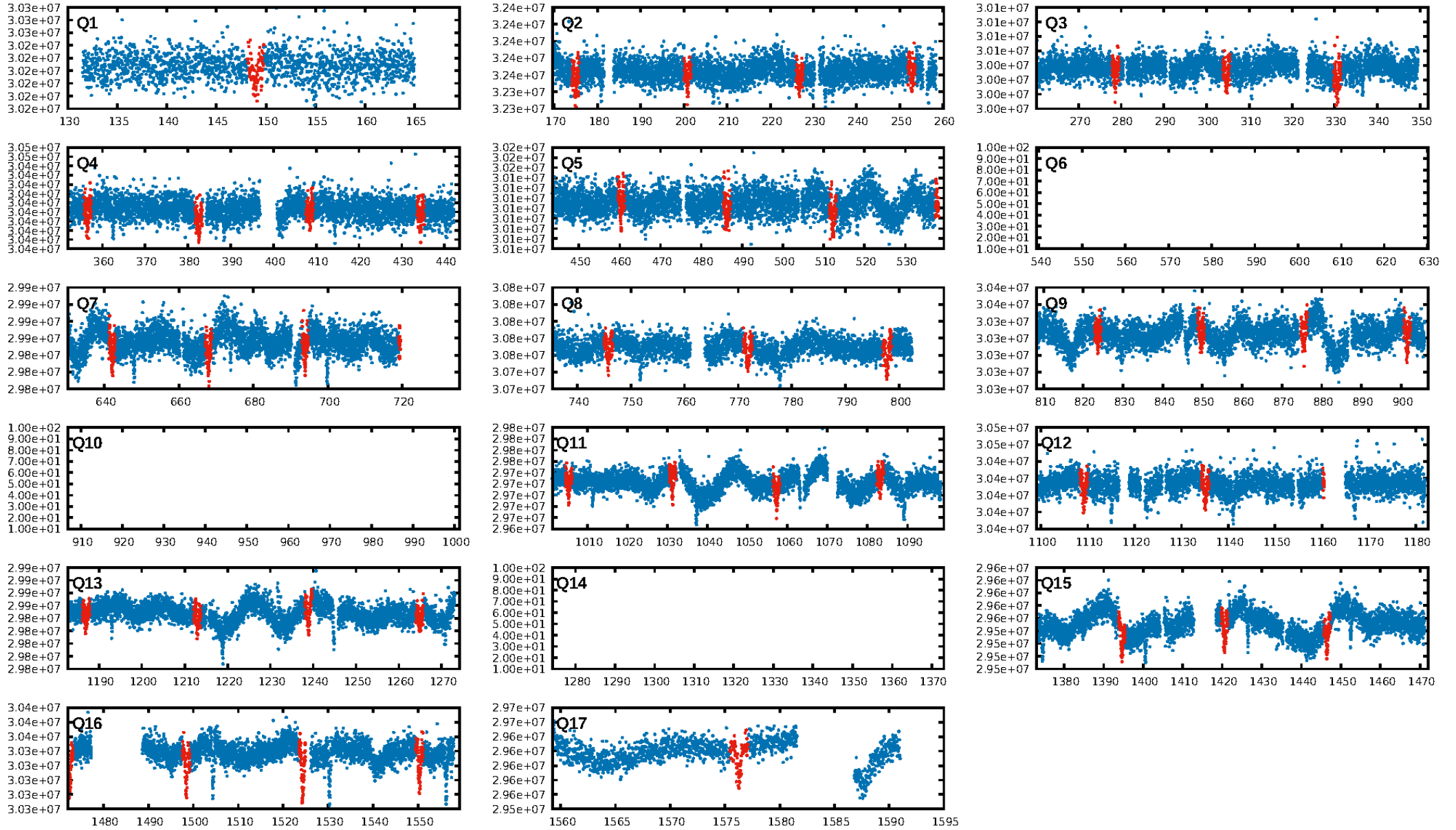
DV Fit Results:

Period = 25.95169 [0.00026] d
Epoch = 148.9350 [0.0078] BKJD
Rp/R* = 0.0516 [0.0346]
a/R* = 3.40 [0.48]
b = 1.00 [0.05]
Seff = 17.40 [4.27]
Teff = 521 [32] K
Rp = 4.48 [3.09] Re
a = 0.1648 [0.0238] AU
Ag = 22.32 [33.18] [0.64σ]
Teffp = 1750 [646] K [1.90σ]

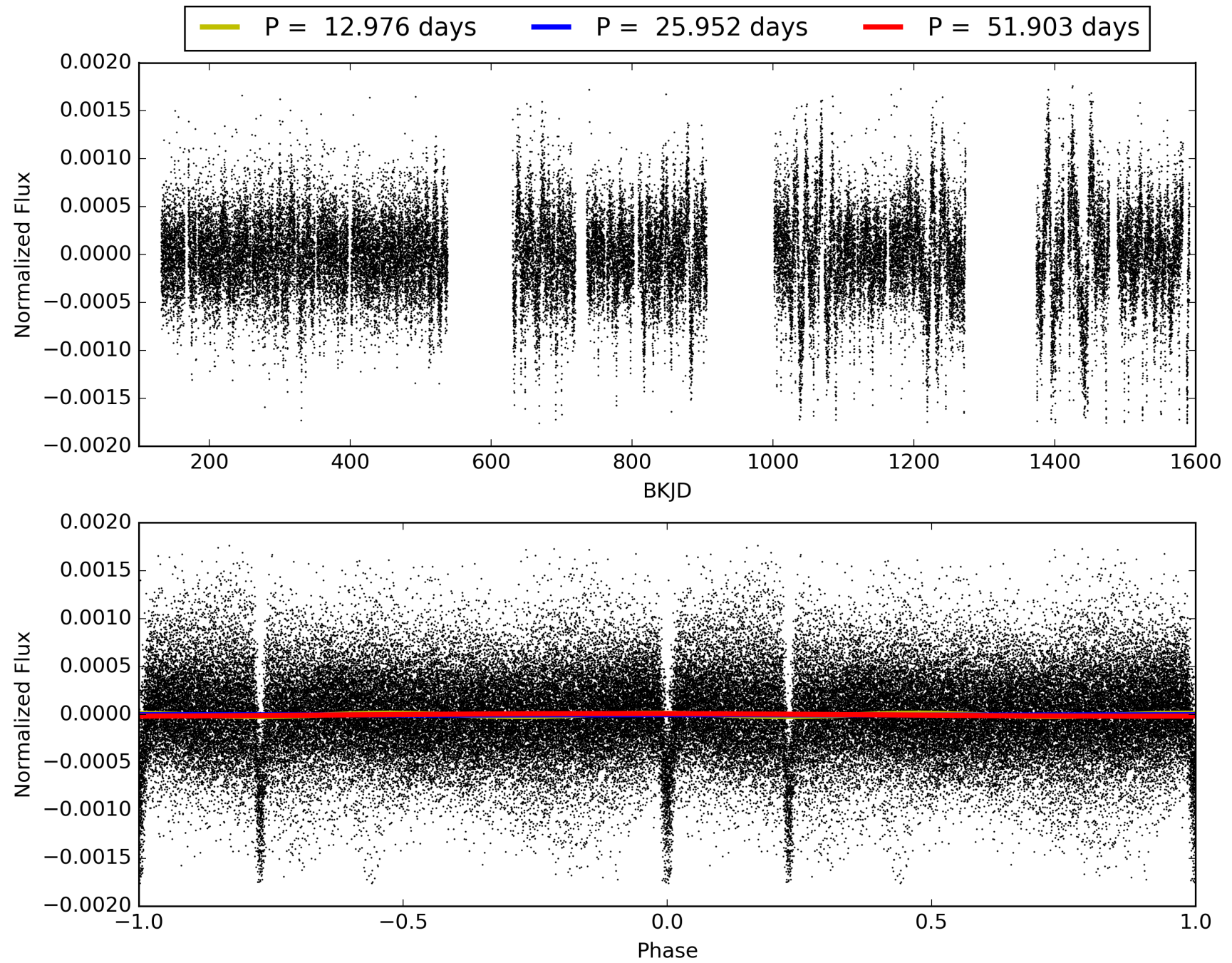
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.98 [41/42]
GhostDiagnostic-chr: -0.16
Centroid-sig: N/A
Centroid-so: 3.293 arcsec [10.84σ]
OotOffset-rm: 5.493 arcsec [7.80σ]
KicOffset-rm: 5.494 arcsec [7.25σ]
OotOffset-st: 1/4/2/5 [12]
KicOffset-st: 1/4/2/5 [12]
DiffImageQuality-fgm: 0.08 [1/12]
DiffImageOverlap-fno: 1.00 [12/12]

TCE 003858949-02, PDC Light Curves

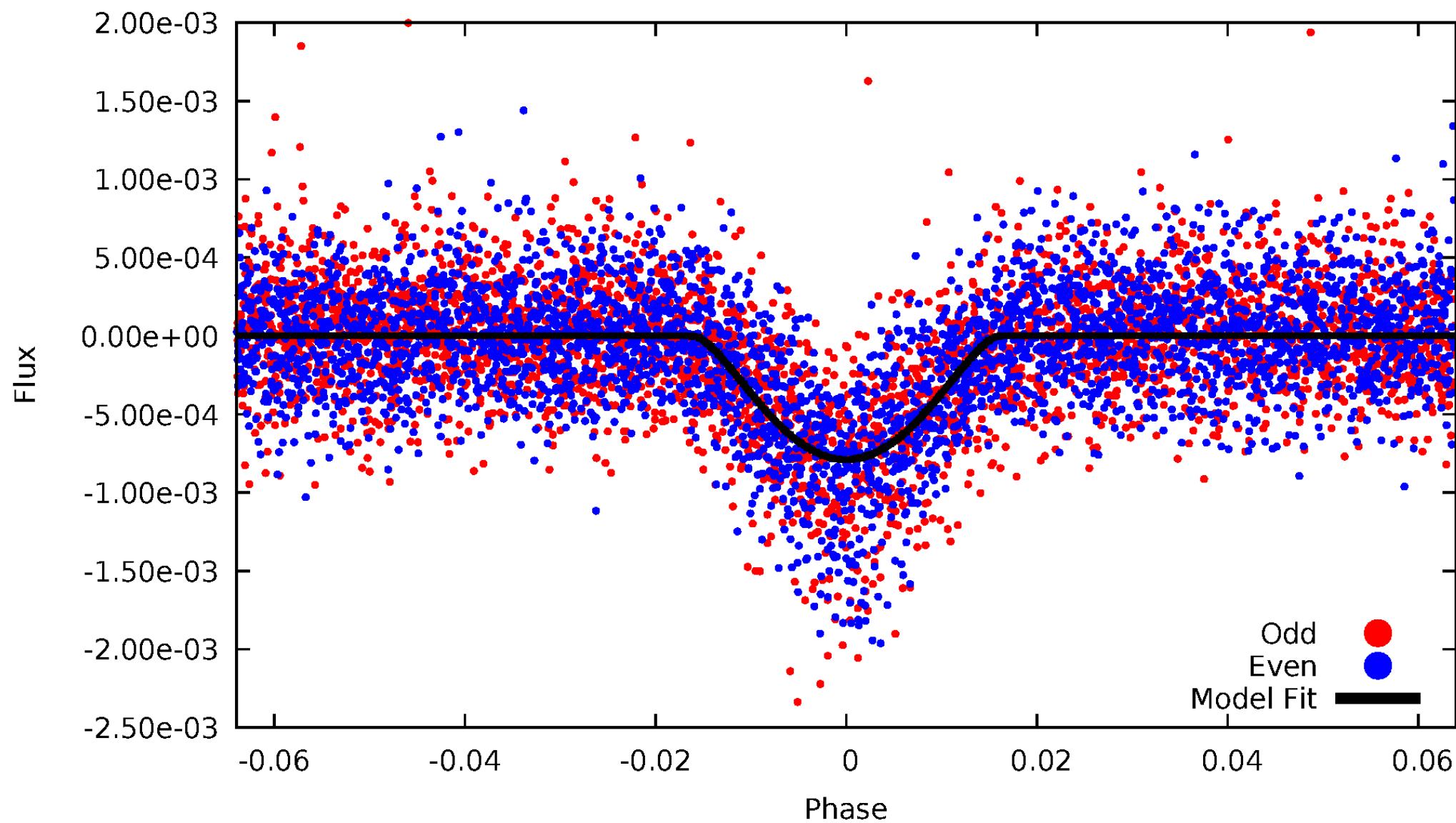


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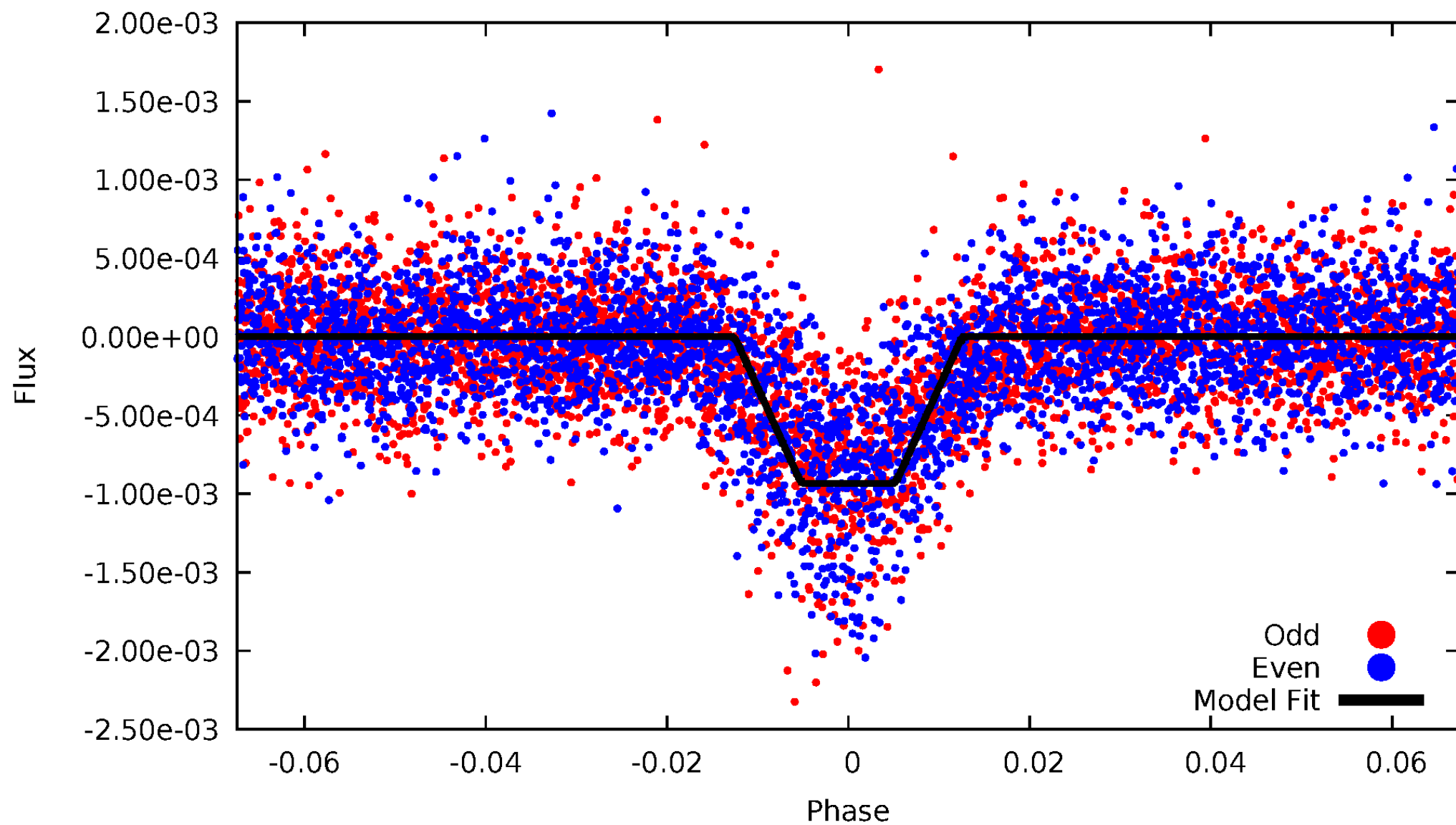
DV Odd/Even

TCE 003858949-02



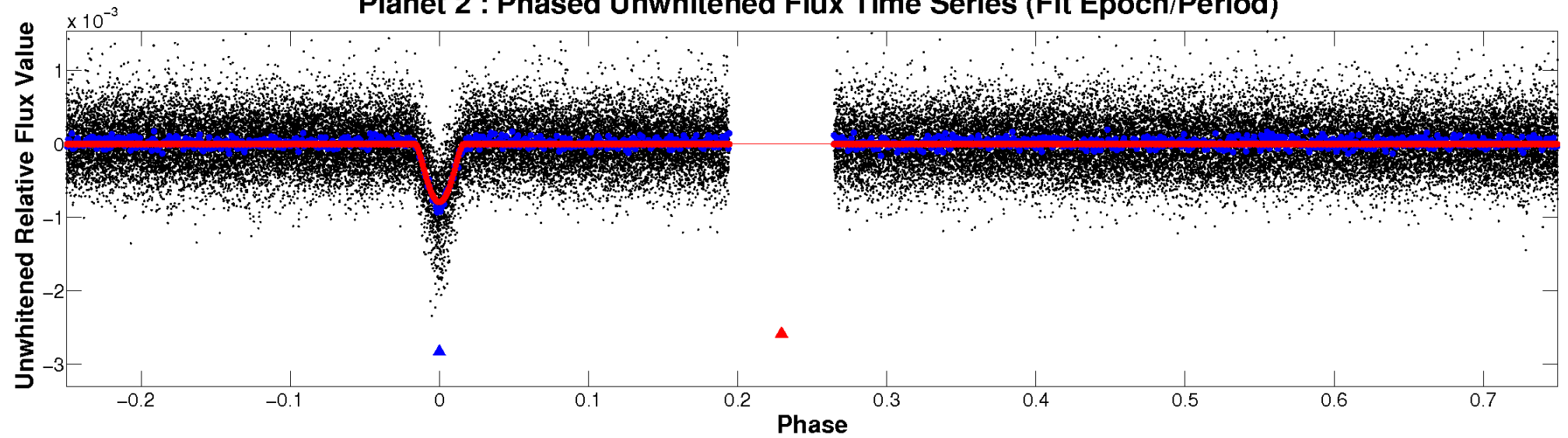
ALT Odd/Even

TCE 003858949-02

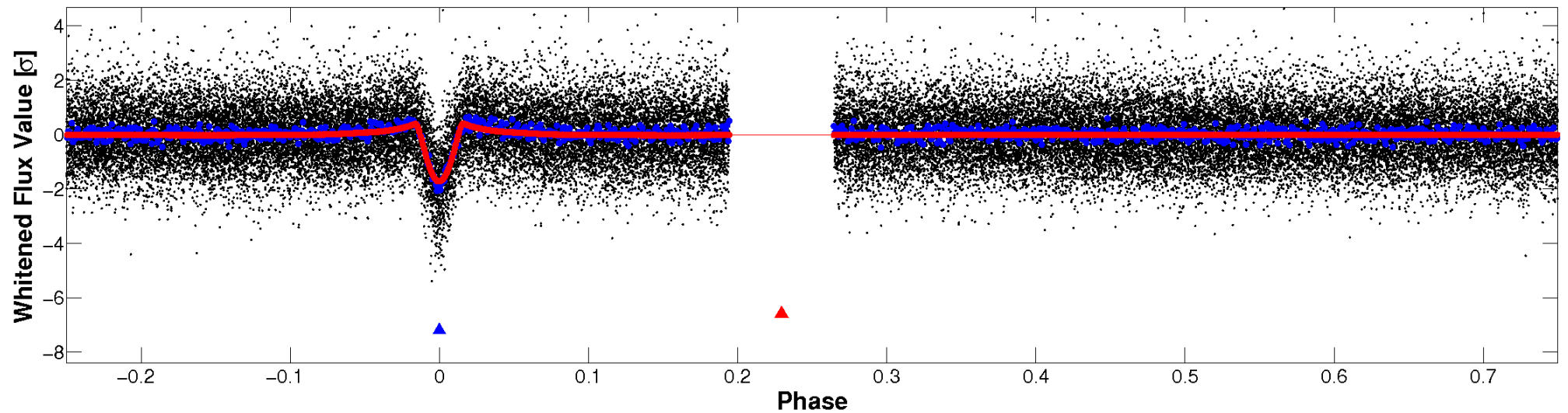


Non-Whitened Vs. Whitened Light Curve

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

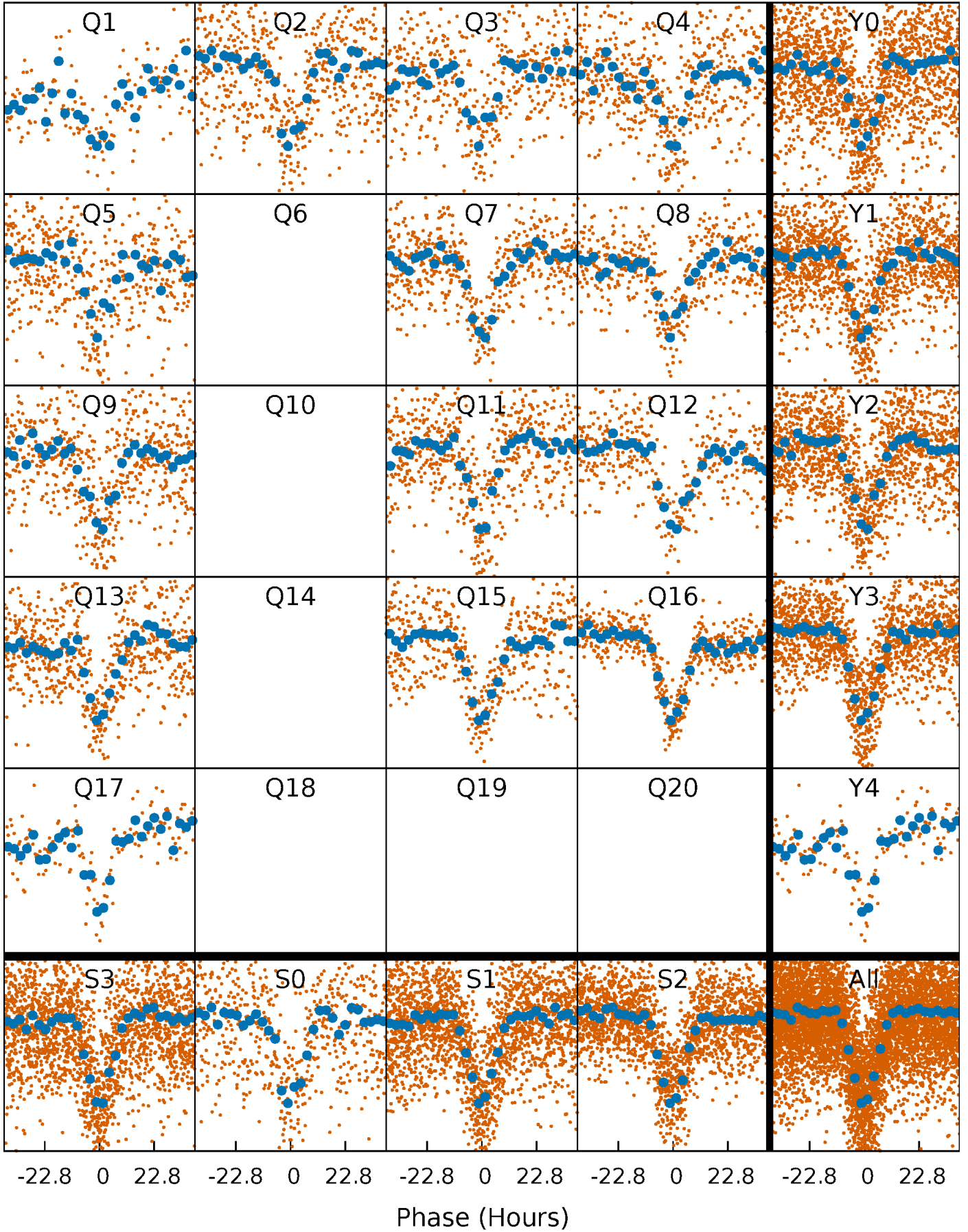


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



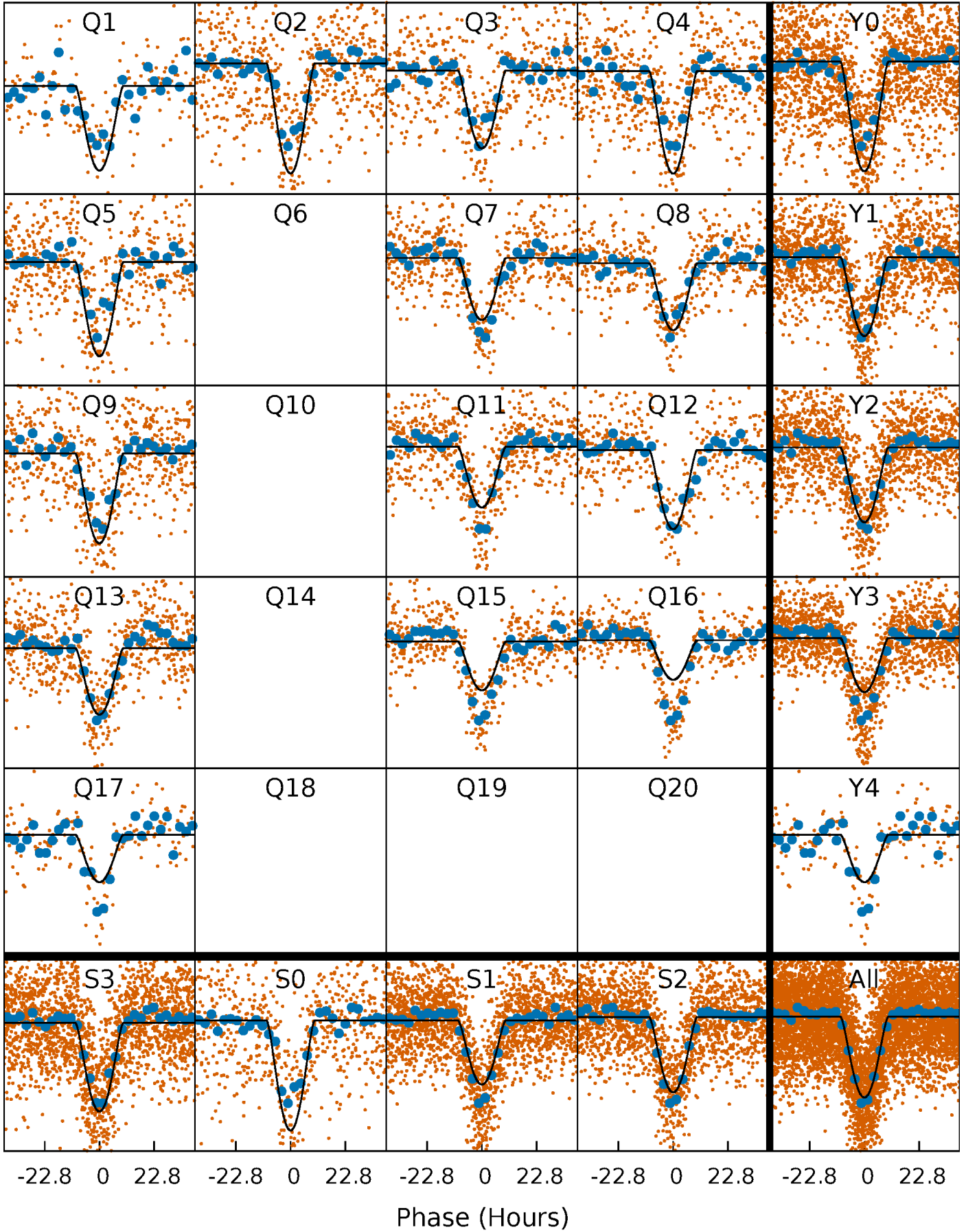
PDC Quarter-Phased Transit Curves

TCE 003858949-02 P= 25.951693 Days $T_0=148.935020$ (BKJD)



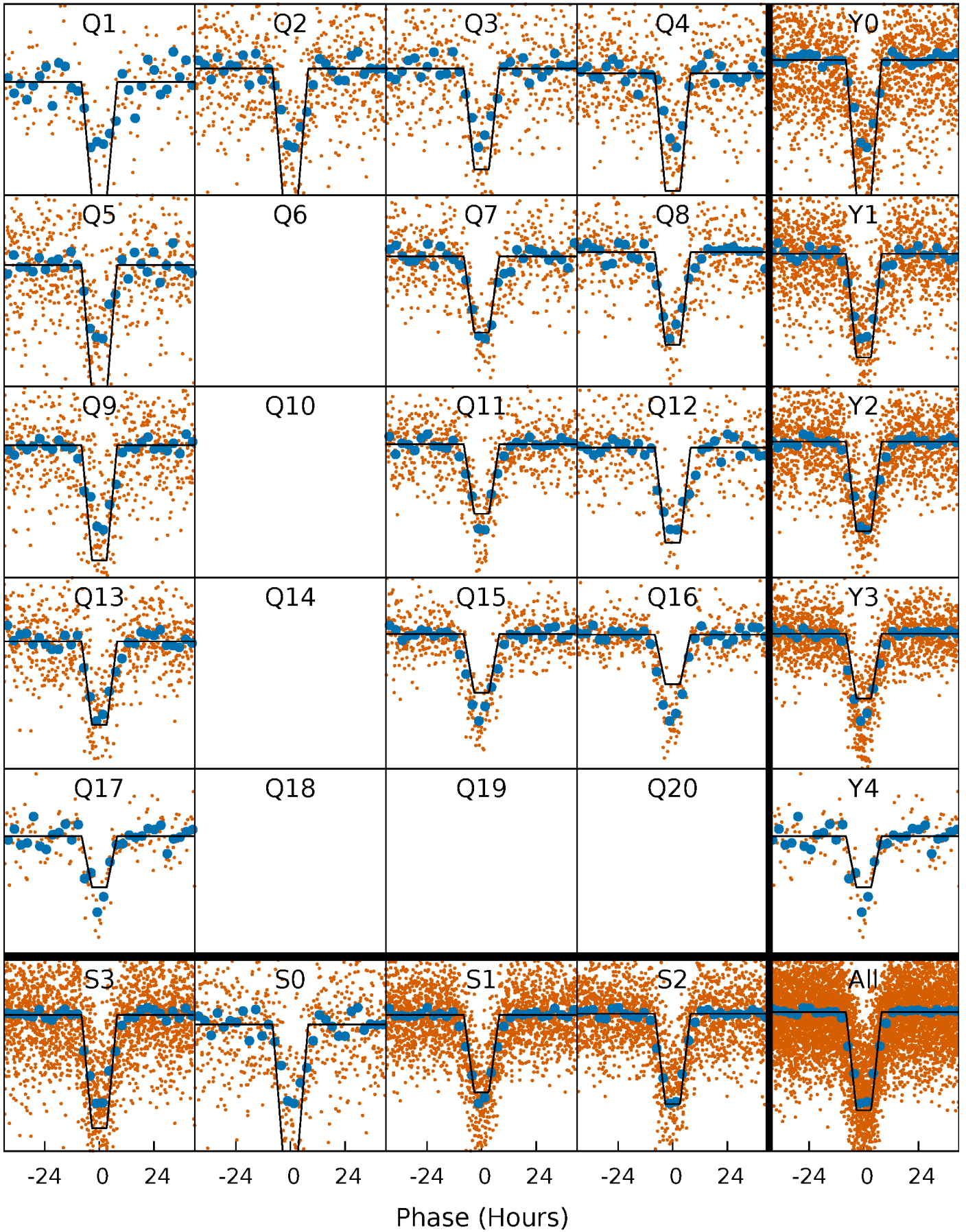
DV Quarter-Phased Transit Curves

TCE 003858949-02 P= 25.951693 Days $T_0=148.935020$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

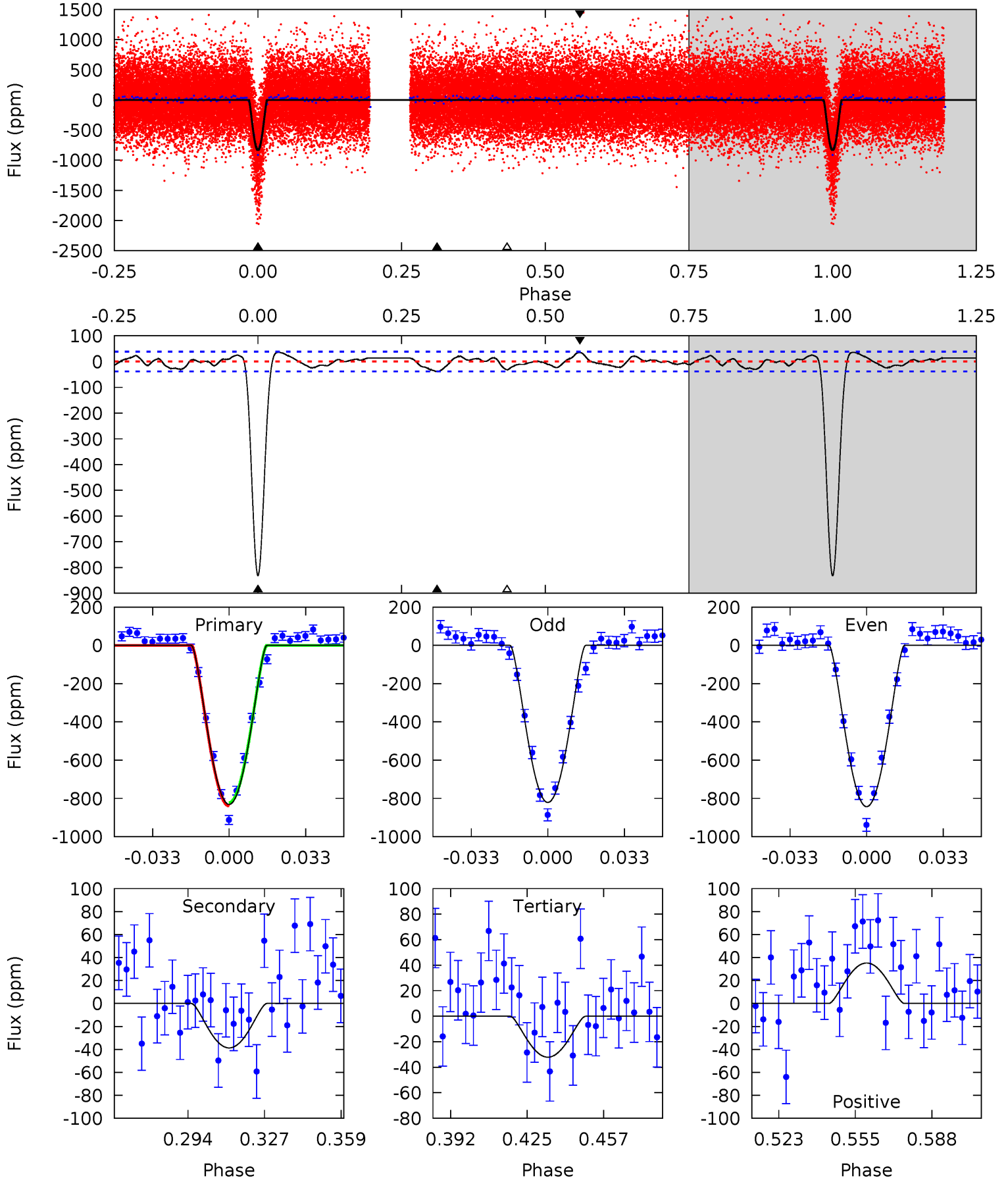
TCE 003858949-02 $P = 25.952751$ Days $T_0 = 148.900517$ (BKJD)



DV Model-Shift Uniqueness Test

003858949-02, P = 25.951693 Days, E = 122.983327 Days

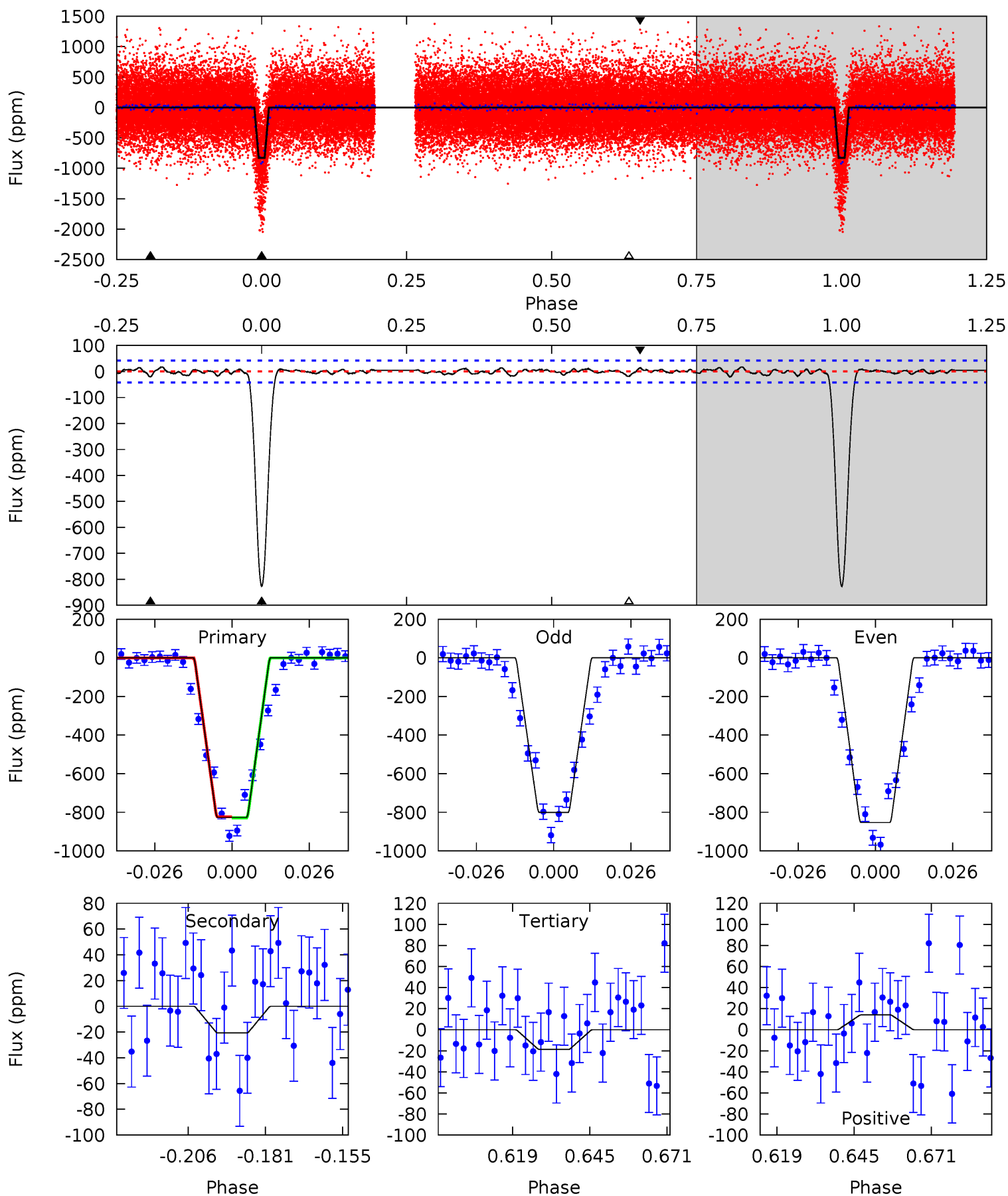
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
103.3	4.81	3.99	4.38	4.79	2.14	1.82	99.3	99.0	0.82	0.44	1.37	1.18	0.04	0.99



Alt Model-Shift Uniqueness Test

003858949-02, P = 25.952751 Days, E = 122.947766 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
94.7	2.37	2.15	1.61	4.84	2.23	0.74	92.6	93.1	0.23	0.76	3.00	1.12	0.02	0.31



Stellar Parameters For KIC 003858949

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5372^{+159}_{-143}	$4.584^{+0.030}_{-0.120}$	$-0.060^{+0.300}_{-0.300}$	$0.796^{+0.133}_{-0.071}$	$0.892^{+0.070}_{-0.104}$	$2.497^{+0.404}_{-0.857}$
	+3%/-3%	+1%/-3%	+500%/-500%	+17%/-9%	+8%/-12%	+16%/-34%
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 003858949-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-39 ± 8	$5.02^{+3.34}_{-2.68}$	742^{+34}_{-28}	2594^{+628}_{-297}	23^{+84}_{-14}
Alt.	-21 ± 9	$3.38^{+2.87}_{-2.13}$	742^{+32}_{-28}	2620^{+854}_{-388}	25^{+167}_{-18}

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

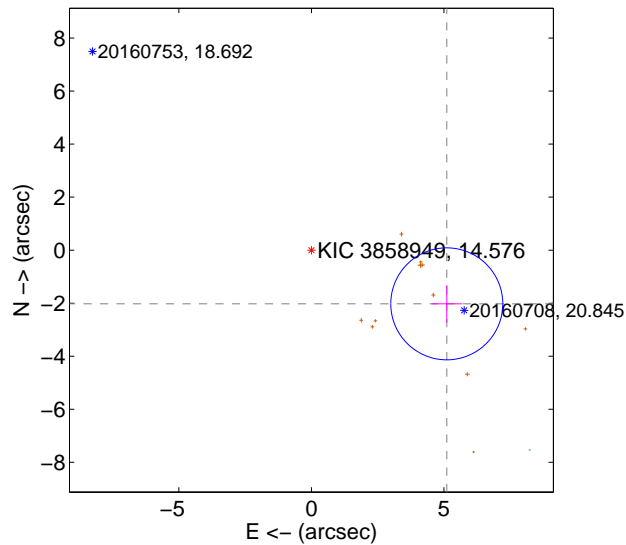
Supplemental centroid analysis for 003858949-02. Kepler magnitude: 14.58. Transit SNR 45.10

There are 1 quarters with good PRF difference image offsets

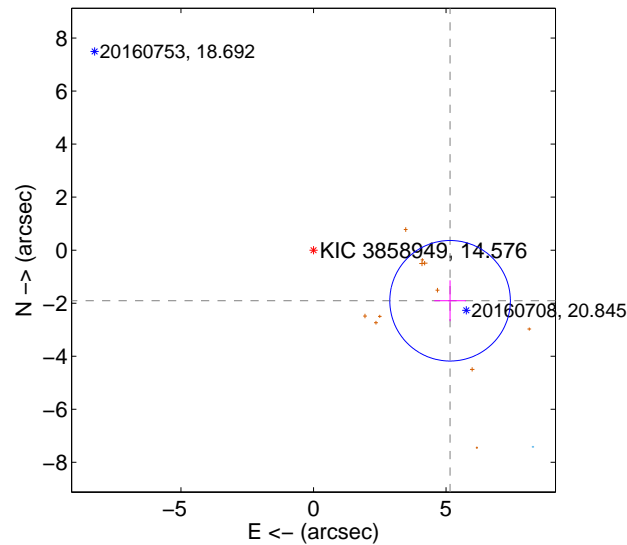
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.493 ± 0.704	7.80	-5.107 ± 0.571	-2.025 ± 0.704
PRF-fit source offset from KIC position	5.494 ± 0.758	7.25	-5.152 ± 0.599	-1.908 ± 0.771
photometric centroid source offset	3.29 ± 0.30	10.84	-3.29 ± 0.30	-0.03 ± 0.25

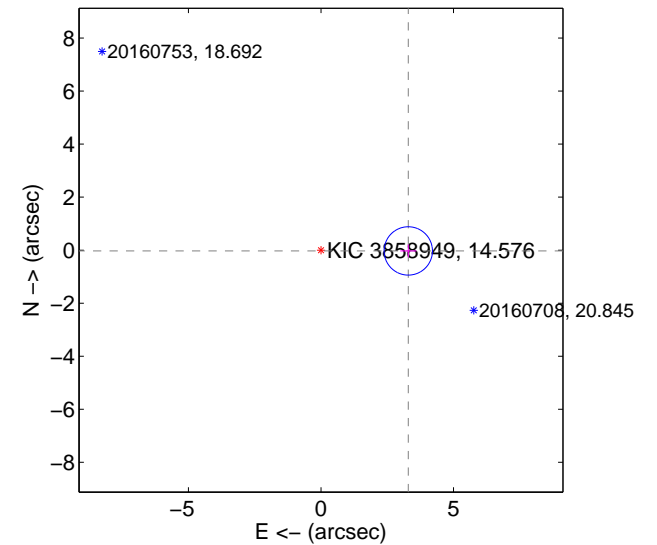
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

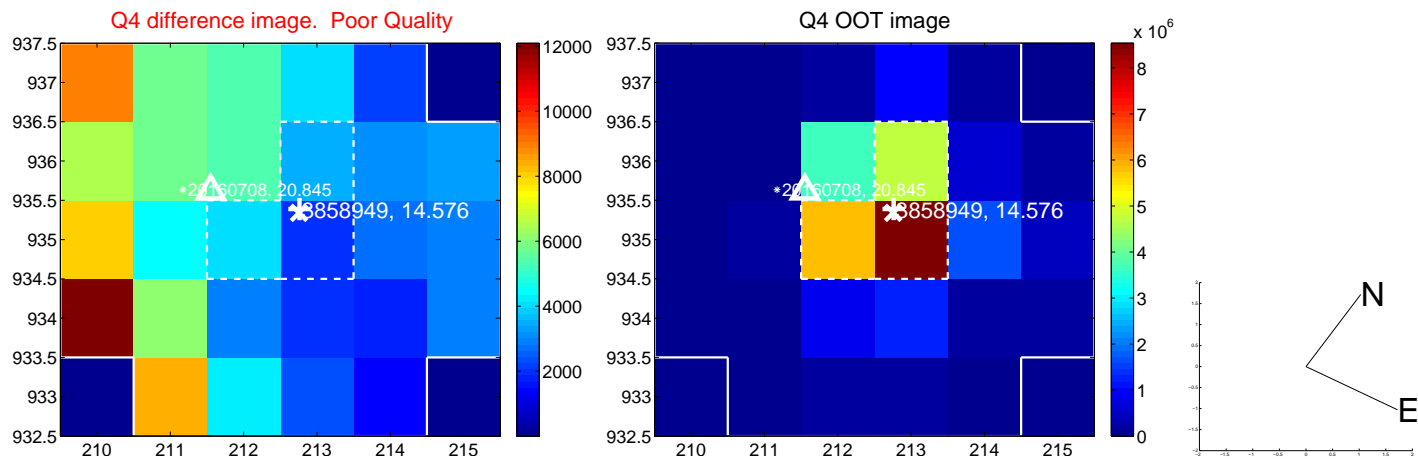
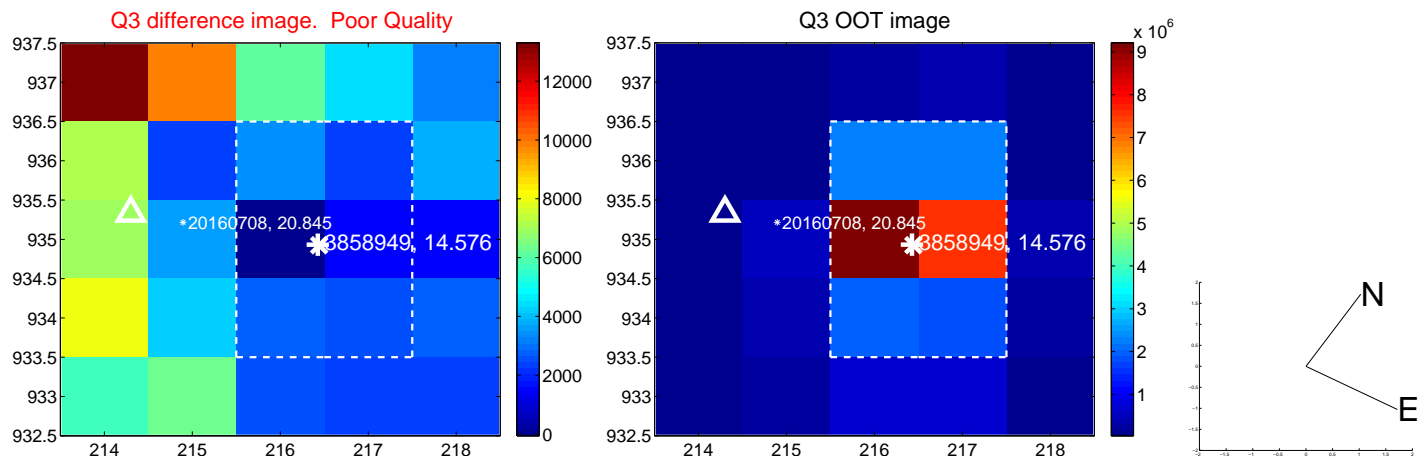
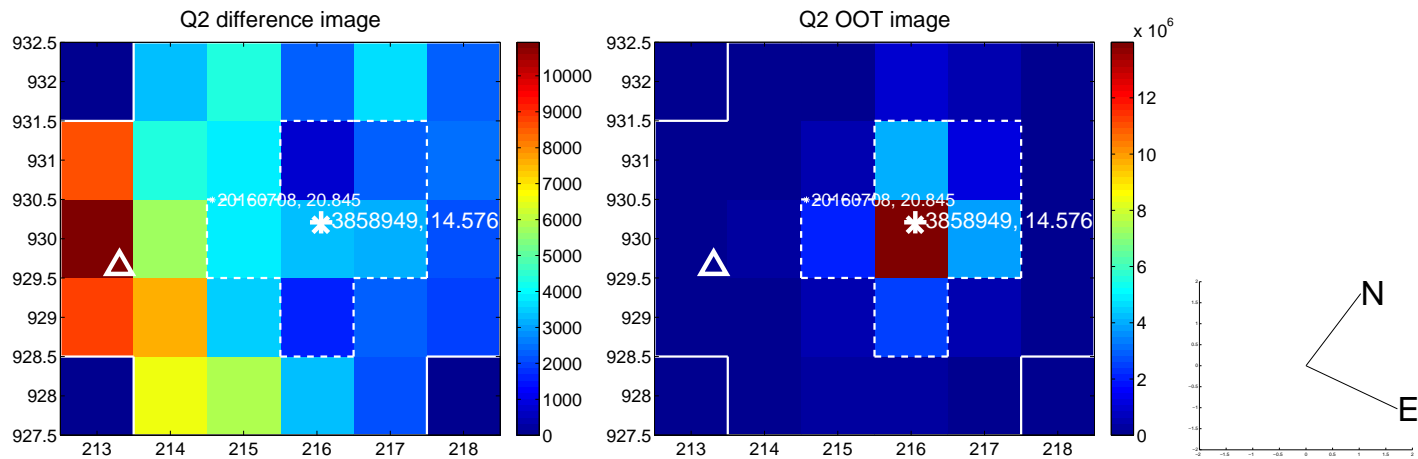
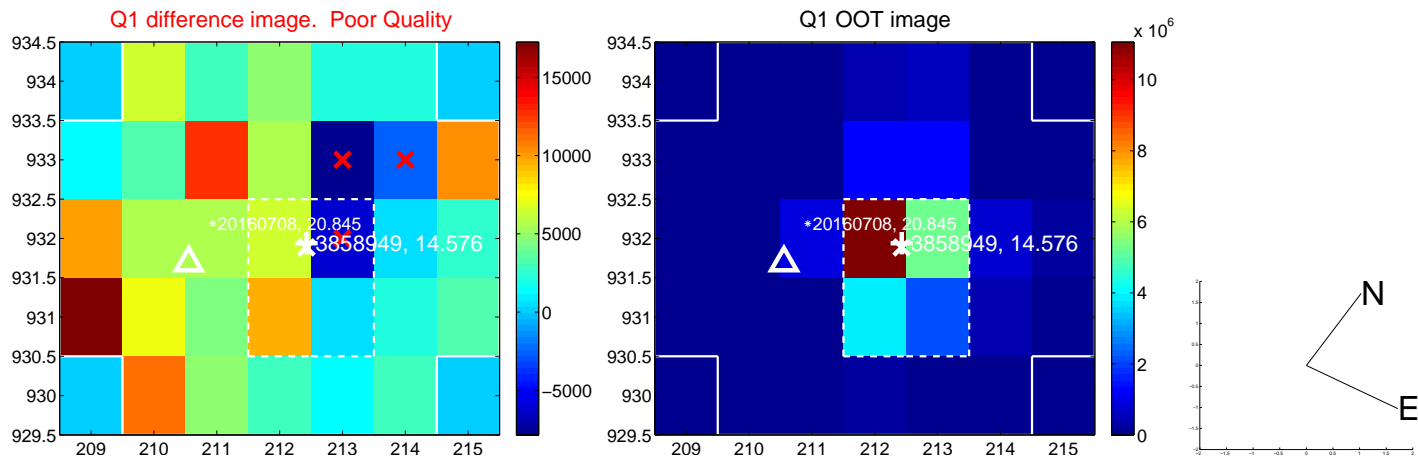


offset from photometric centroids

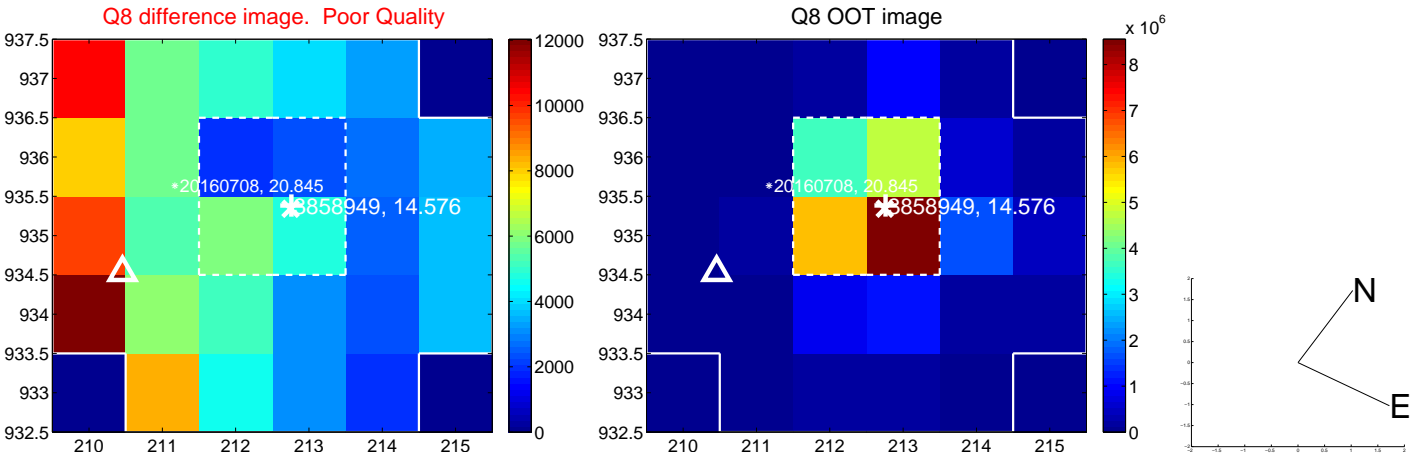
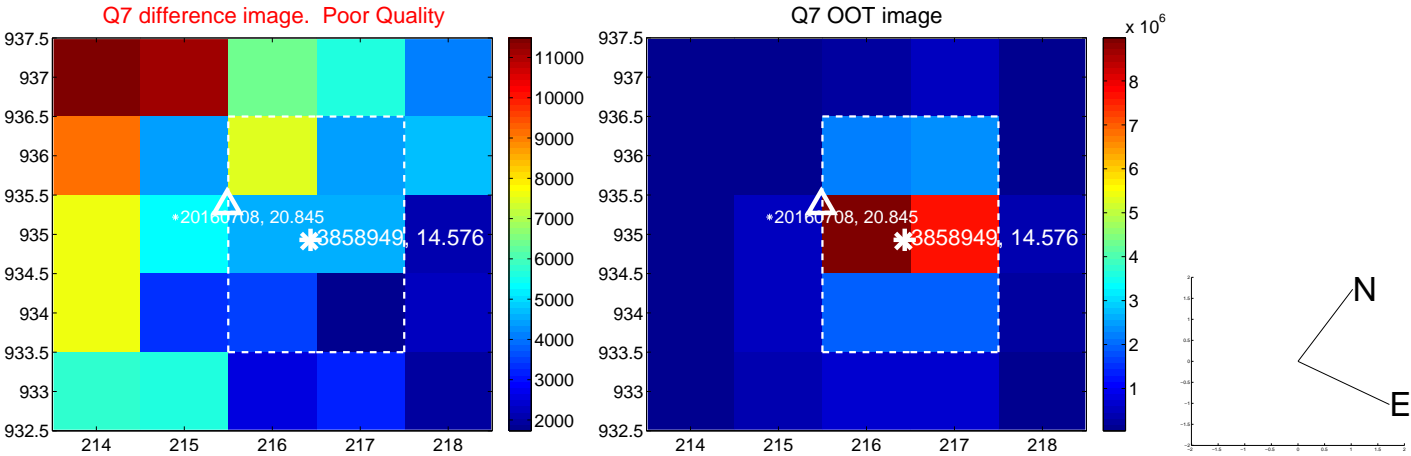
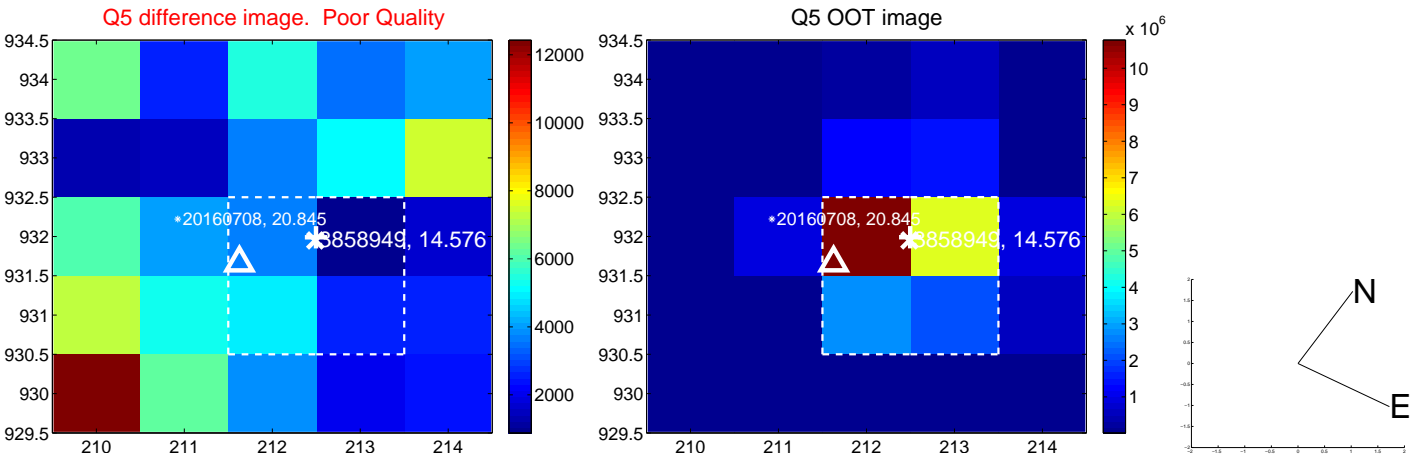


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

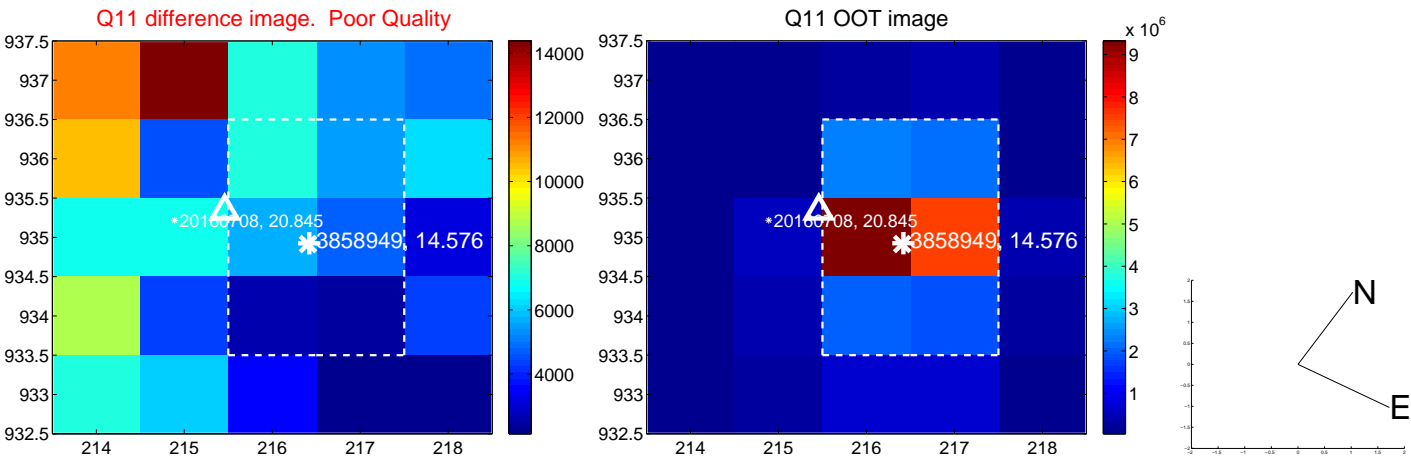
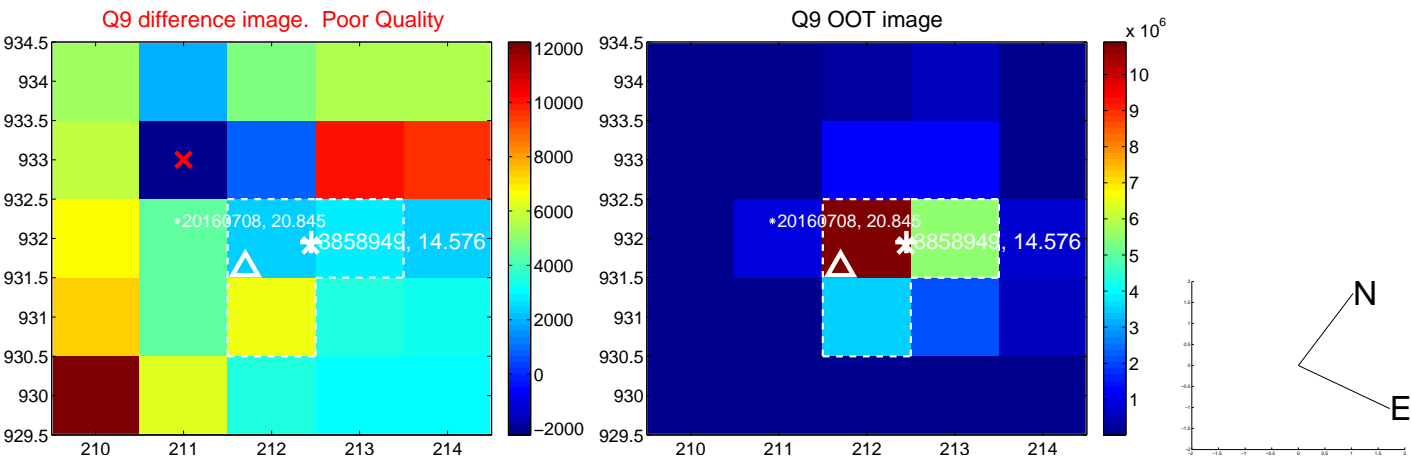
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



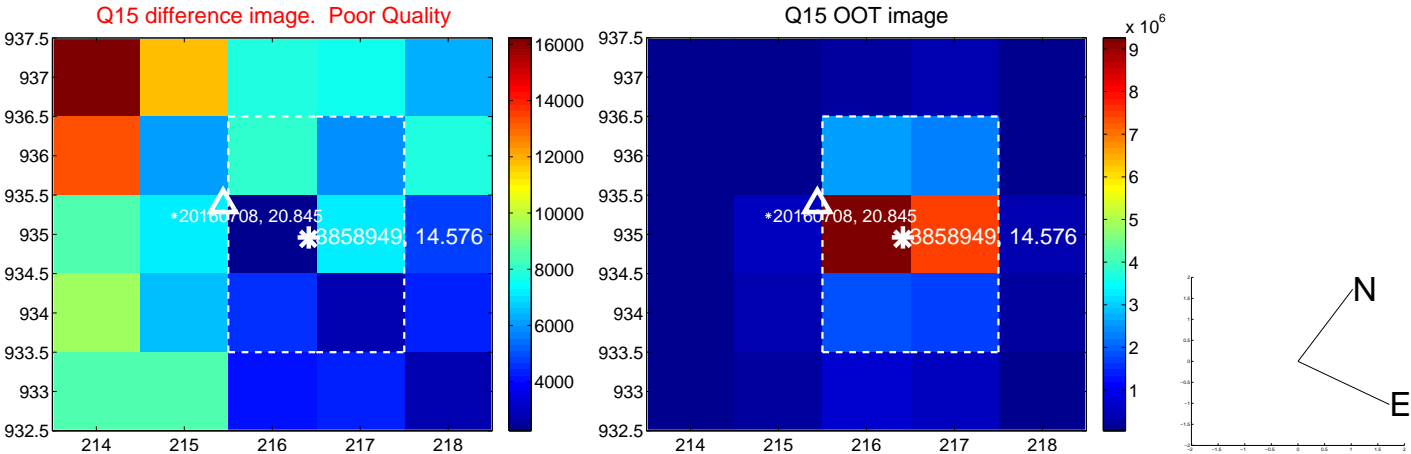
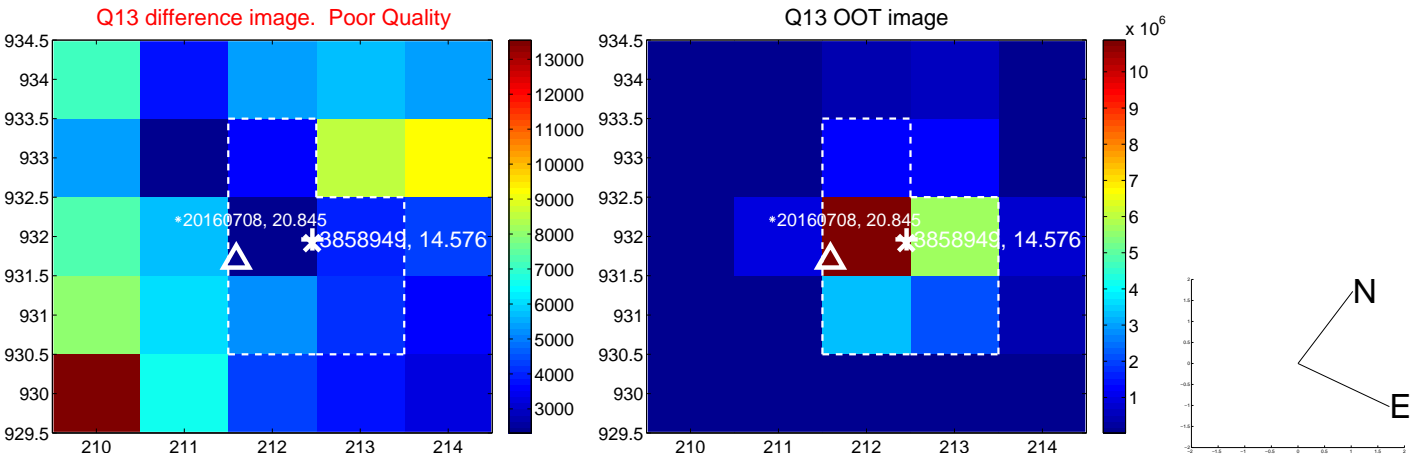
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



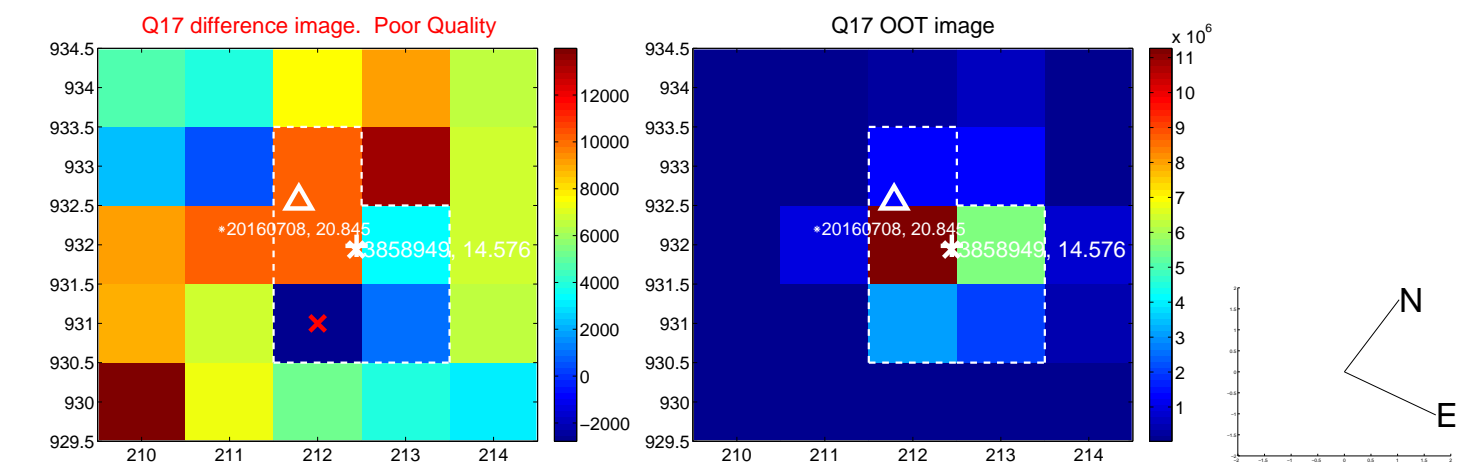
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



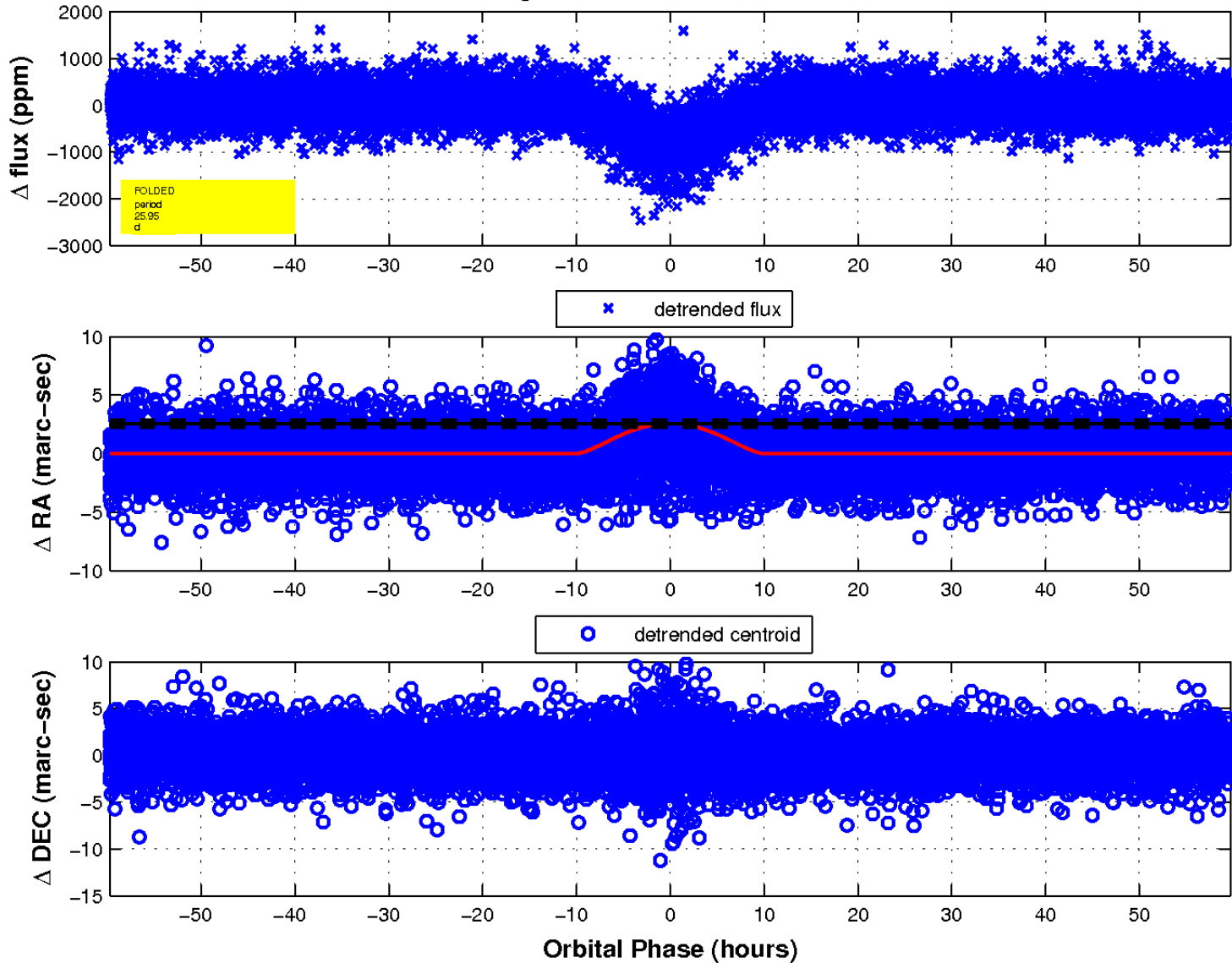
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

