

KIC 003836453

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})
003836453-01	OBS	1903.01	1.540386	131.998606	132.6	1.829	53.2	57.0	0.73	4955	1.04	509.43
003836453-02	OBS	No	0.770217	131.979595	19.4	1.613	7.6	8.3	0.73	4955	0.40	1283.64

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003836453-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
003836453-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_CROWDED—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 003836453-01

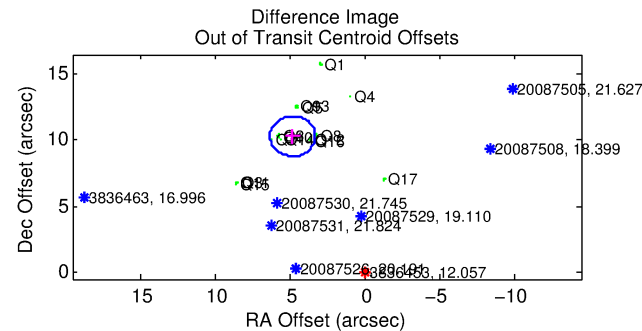
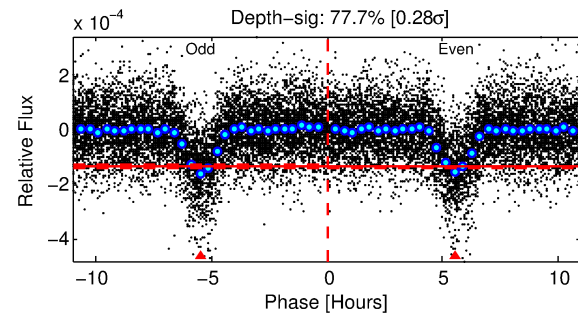
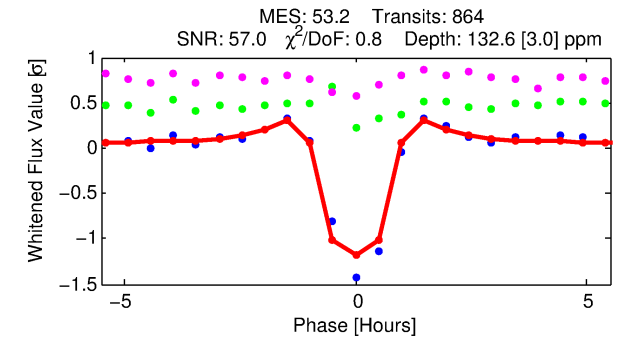
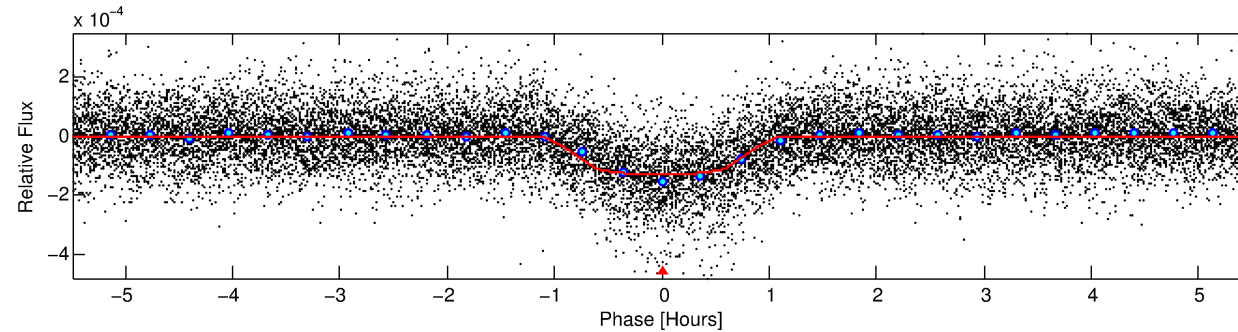
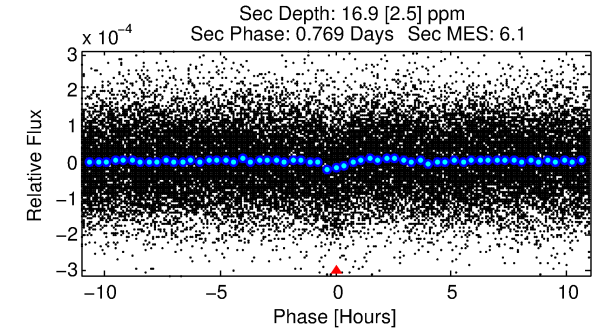
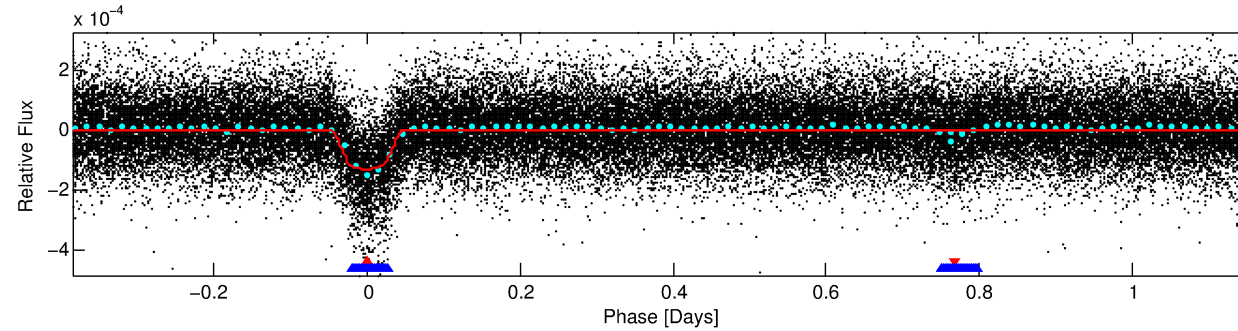
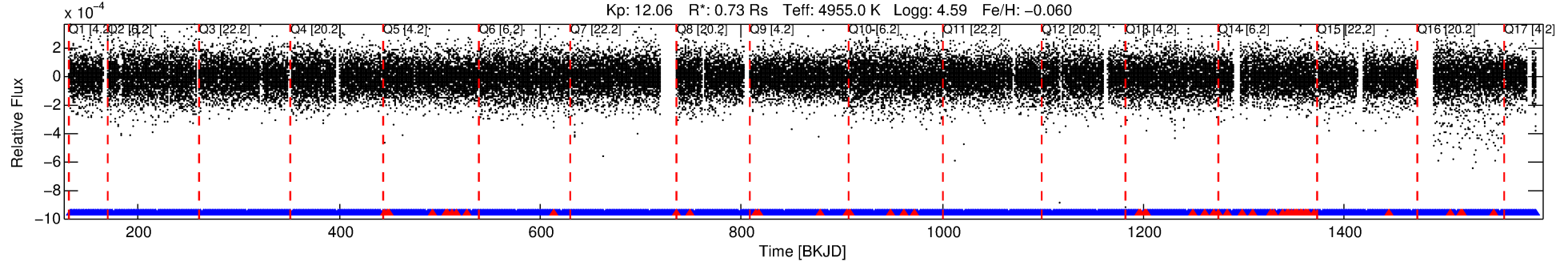
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003836453-01	3836453	6363.01	3836413	1:1	38.9	-4	-9	13.76	12.06	557.58	Direct-PRF	0	0.48	0.15

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: 3836453 Candidate: 1 of 2 Period: 1.540 d
KOI: K01903.01 Corr: 0.963

Kp: 12.06 R*: 0.73 Rs Teff: 4955.0 K Logg: 4.59 Fe/H: -0.060



DV Fit Results:

Period = 1.54039 [0.00000] d
Epoch = 131.9986 [0.0004] BKJD
Rp/R* = 0.0129 [0.0018]
a/R* = 3.12 [1.52]
b = 0.90 [0.12]
Seff = 509.43 [56.12]
Teq = 1211 [33] K
Rp = 1.04 [0.15] Re
a = 0.0239 [0.0012] AU
Ag = 4.95 [1.59] [2.49σ]
Teff = 2794 [224] K [6.97σ]

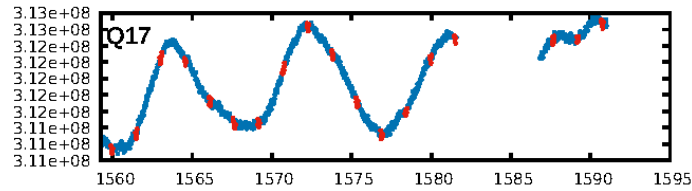
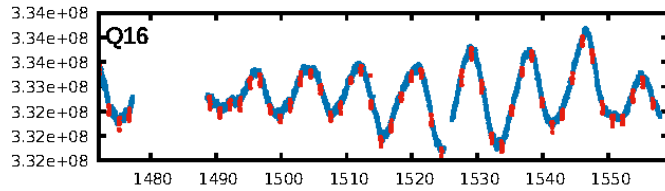
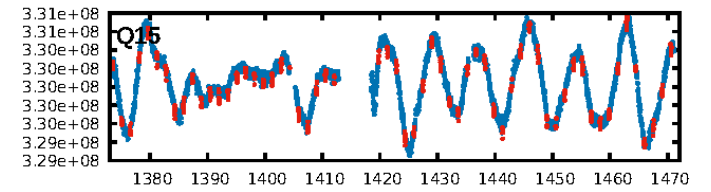
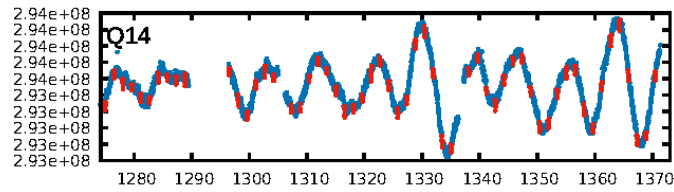
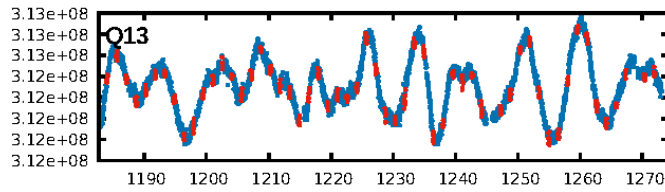
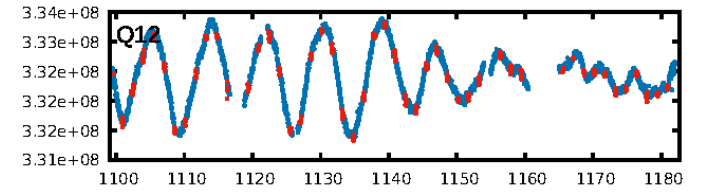
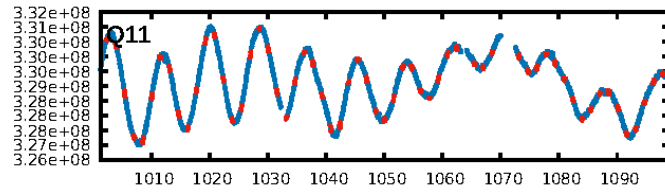
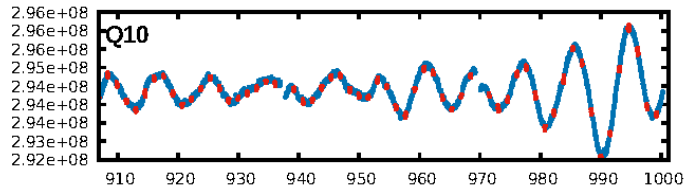
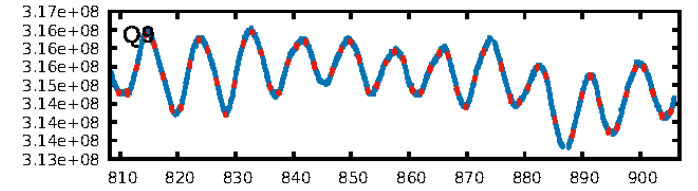
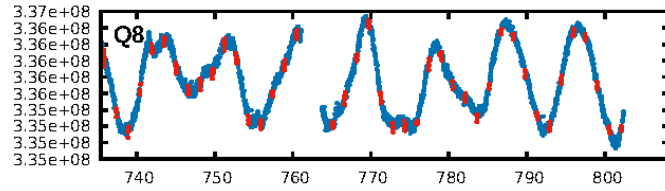
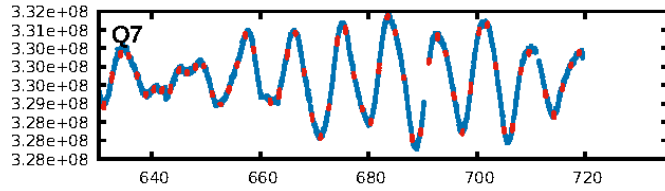
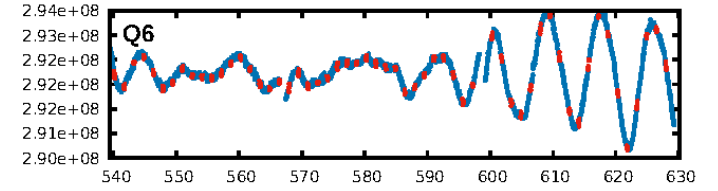
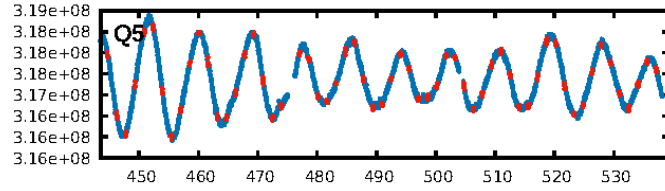
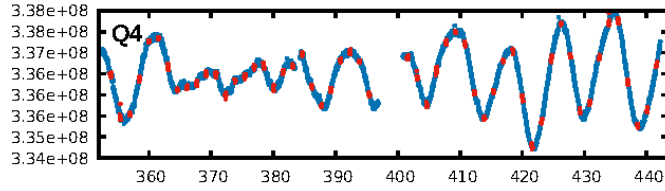
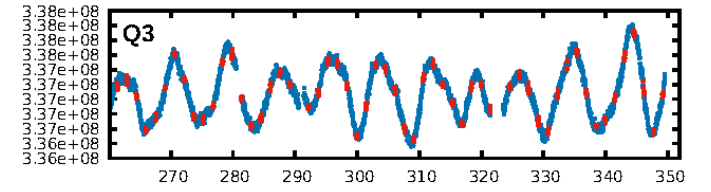
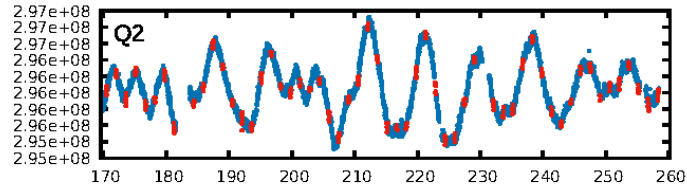
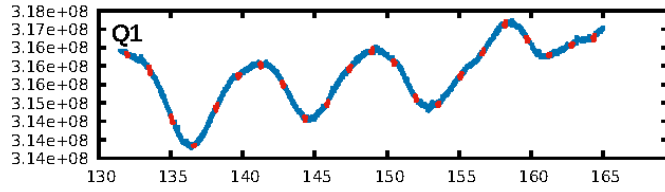
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.58σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.94 [773/824]
GhostDiagnostic-chr: -0.09701
Centroid-sig: 0.0%
Centroid-so: 18.062 arcsec [77.22σ]
OotOffset-rm: 11.362 arcsec [22.52σ]
KicOffset-rm: 11.416 arcsec [22.62σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.12 [2/17]
DiffImageOverlap-fno: 0.00 [0/17]

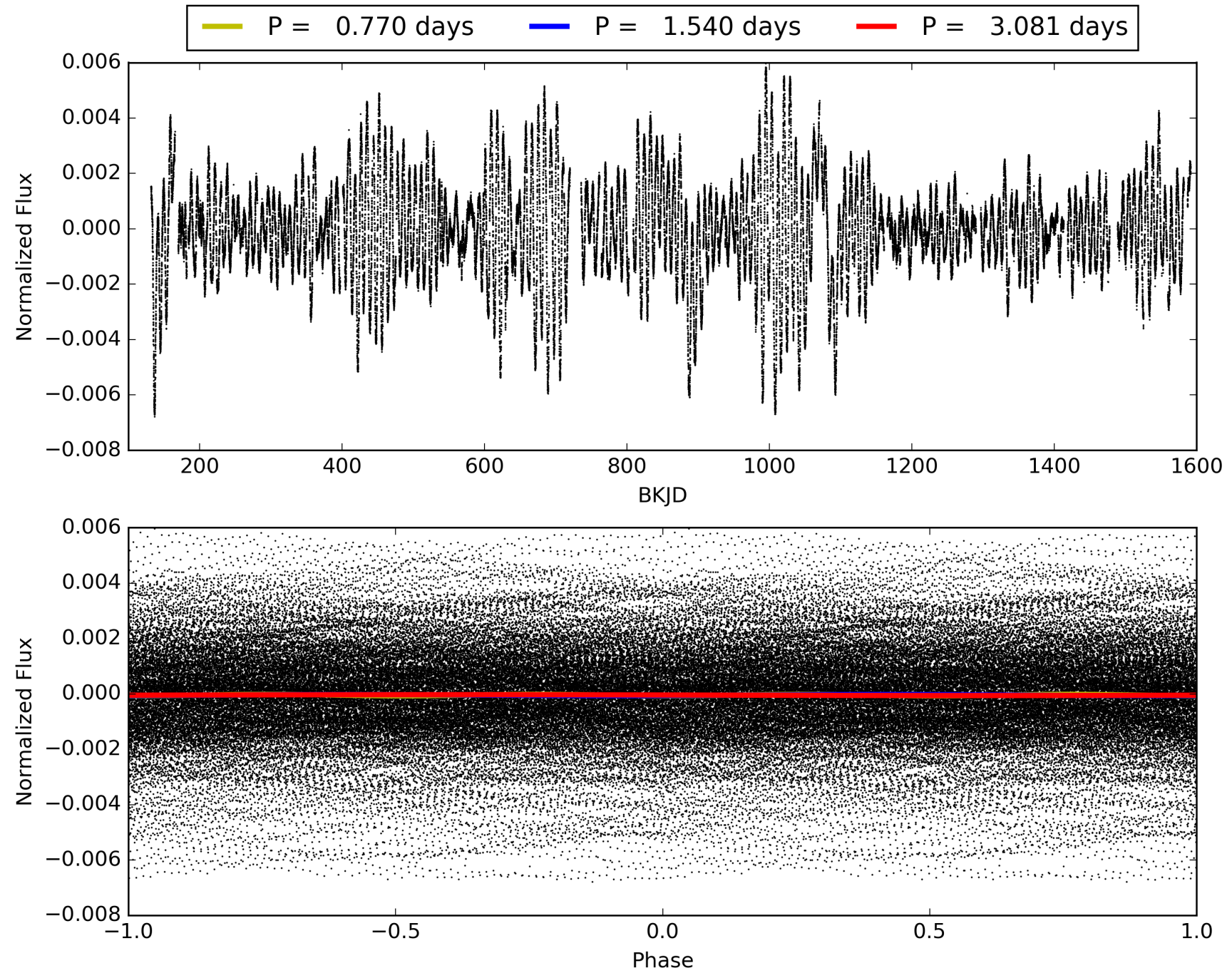
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003836453-01, PDC Light Curves

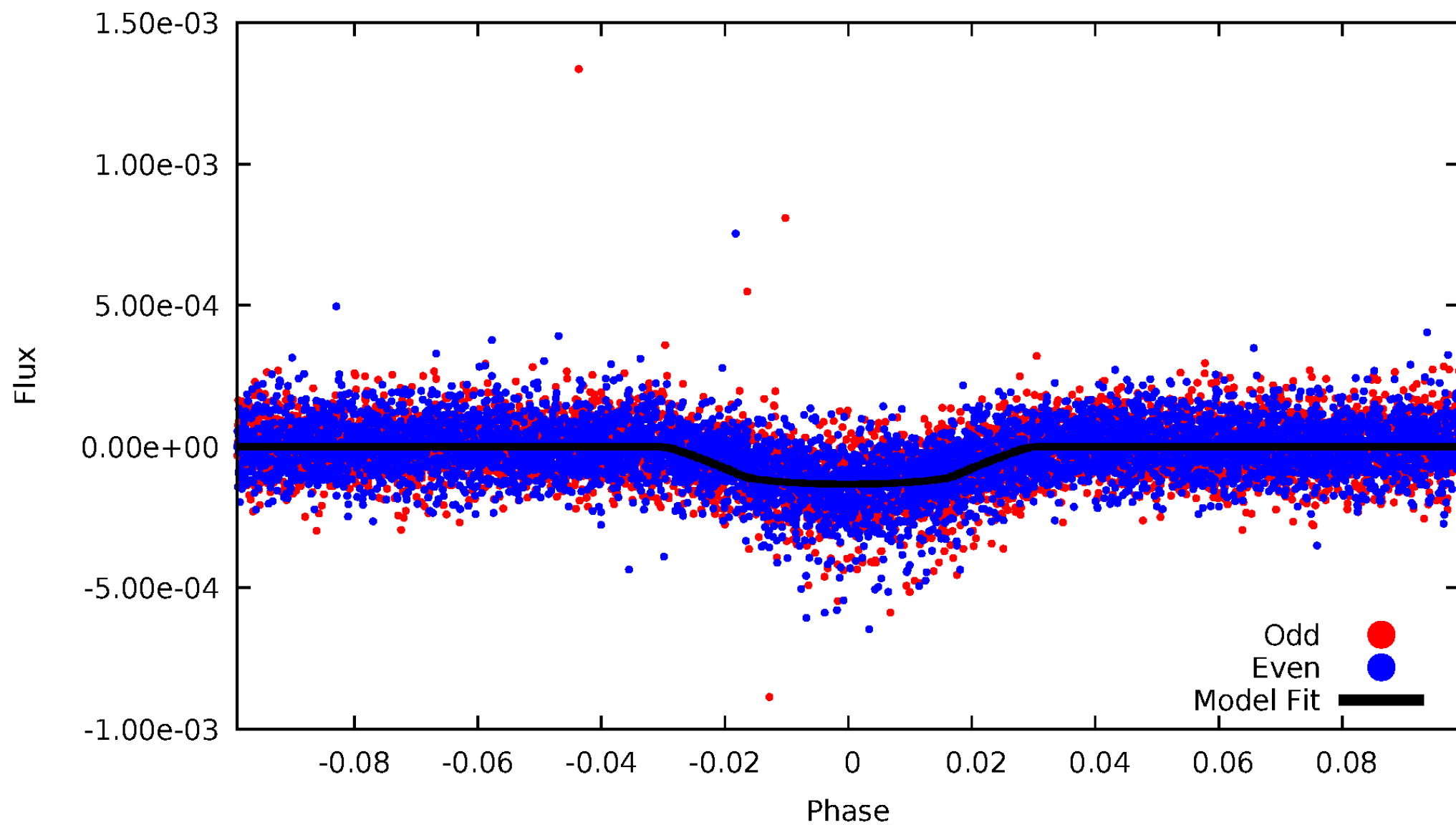


TCE 003836453-01



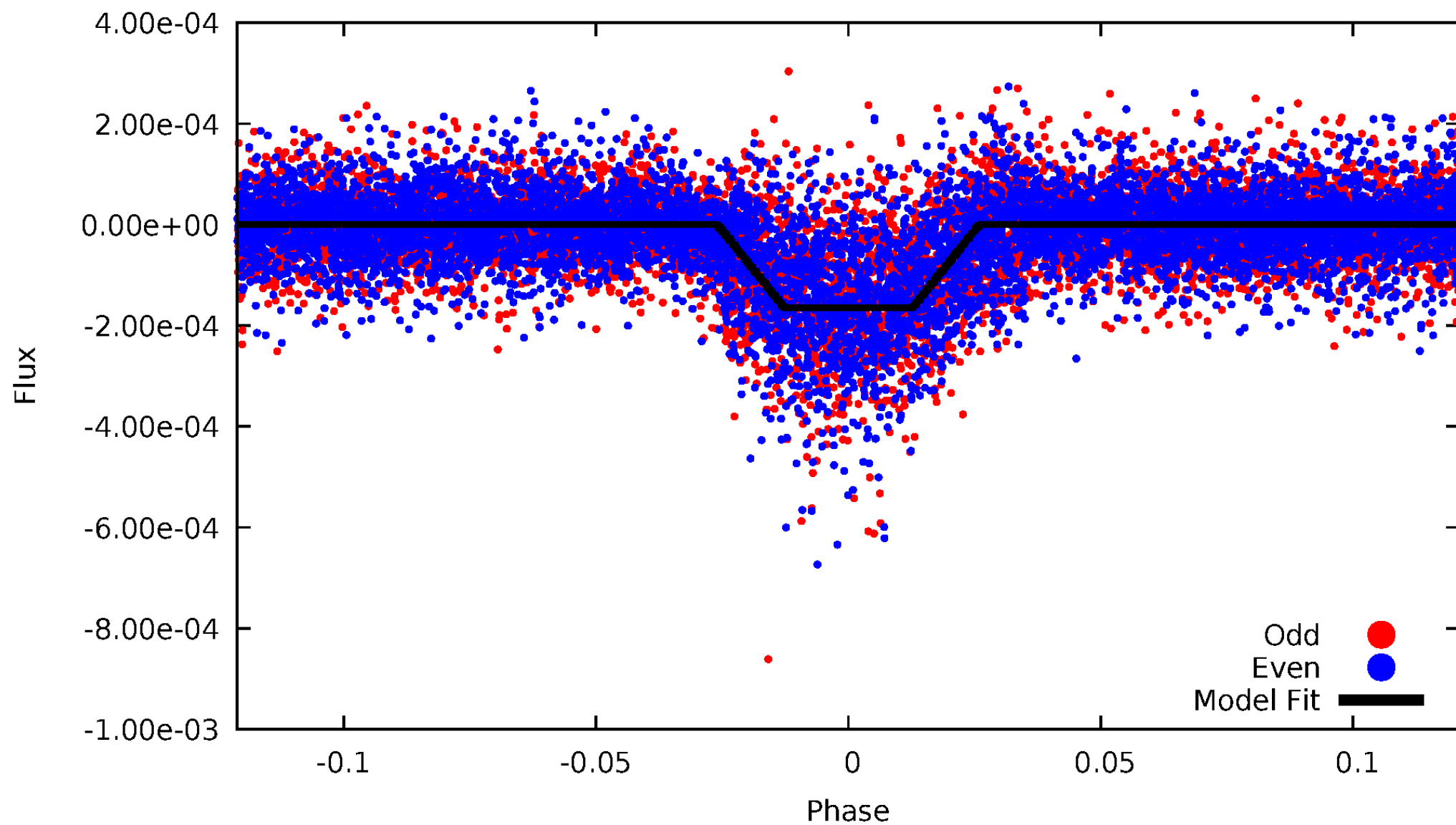
DV Odd/Even

TCE 003836453-01



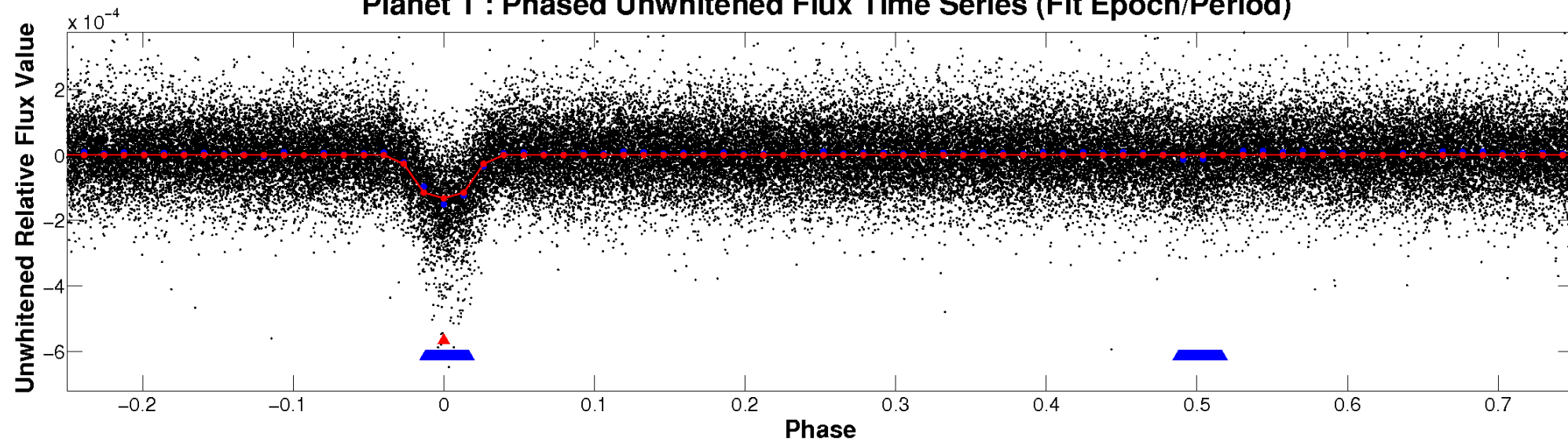
ALT Odd/Even

TCE 003836453-01

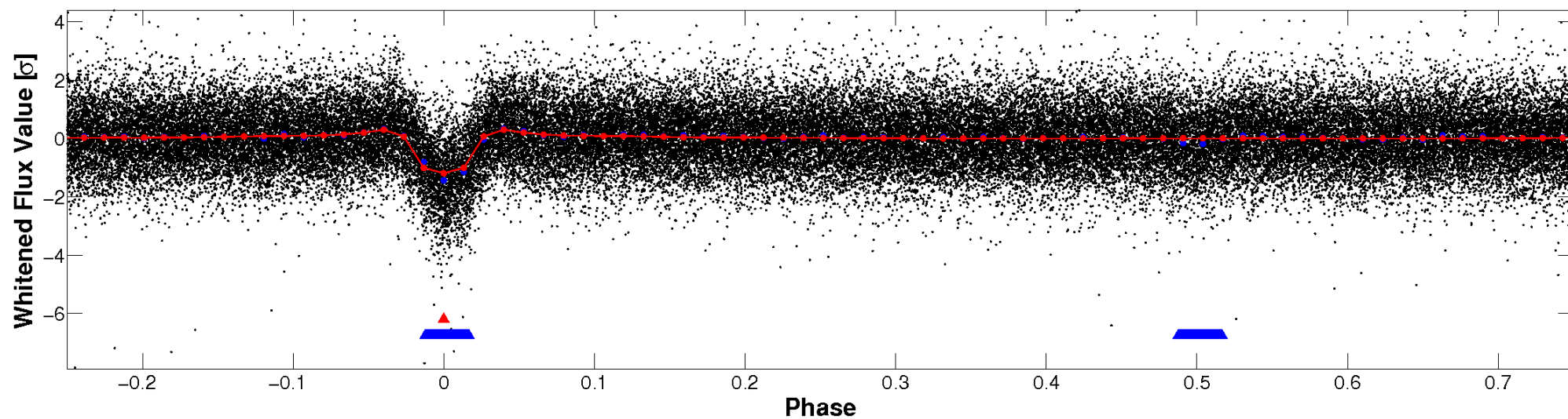


Non-Whitened Vs. Whitened Light Curve

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

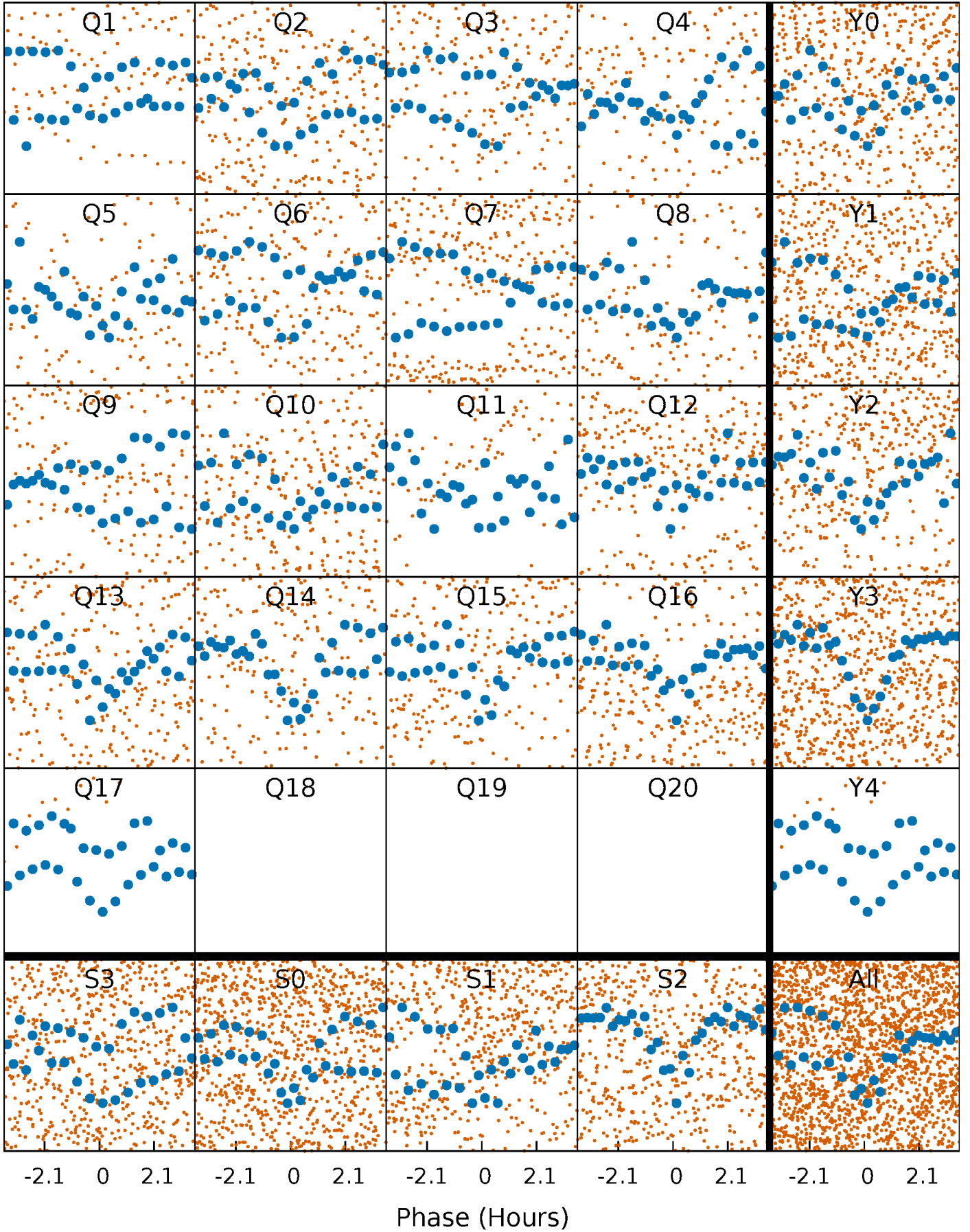


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



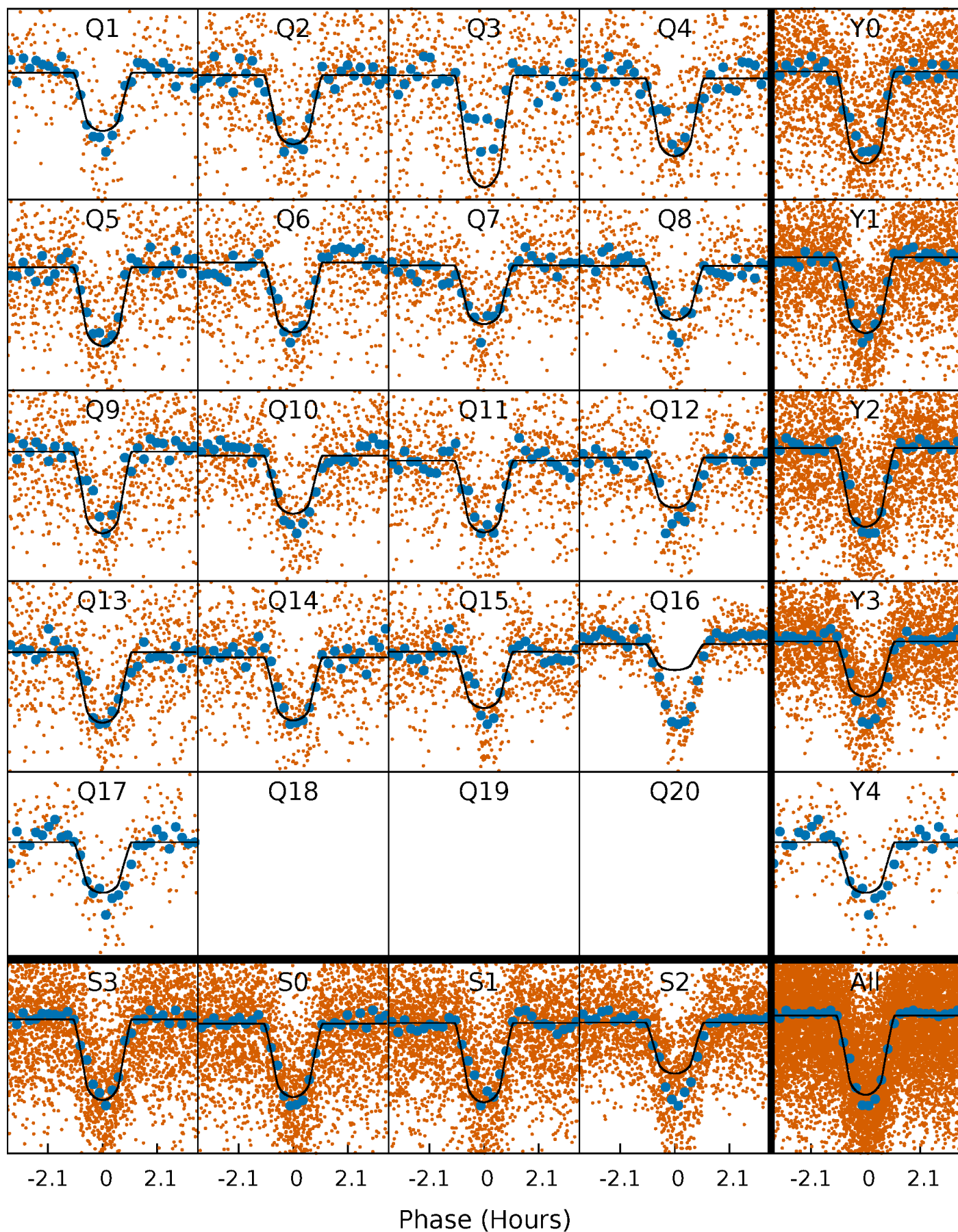
PDC Quarter-Phased Transit Curves

TCE 003836453-01 P= 1.540386 Days $T_0=131.998606$ (BKJD)



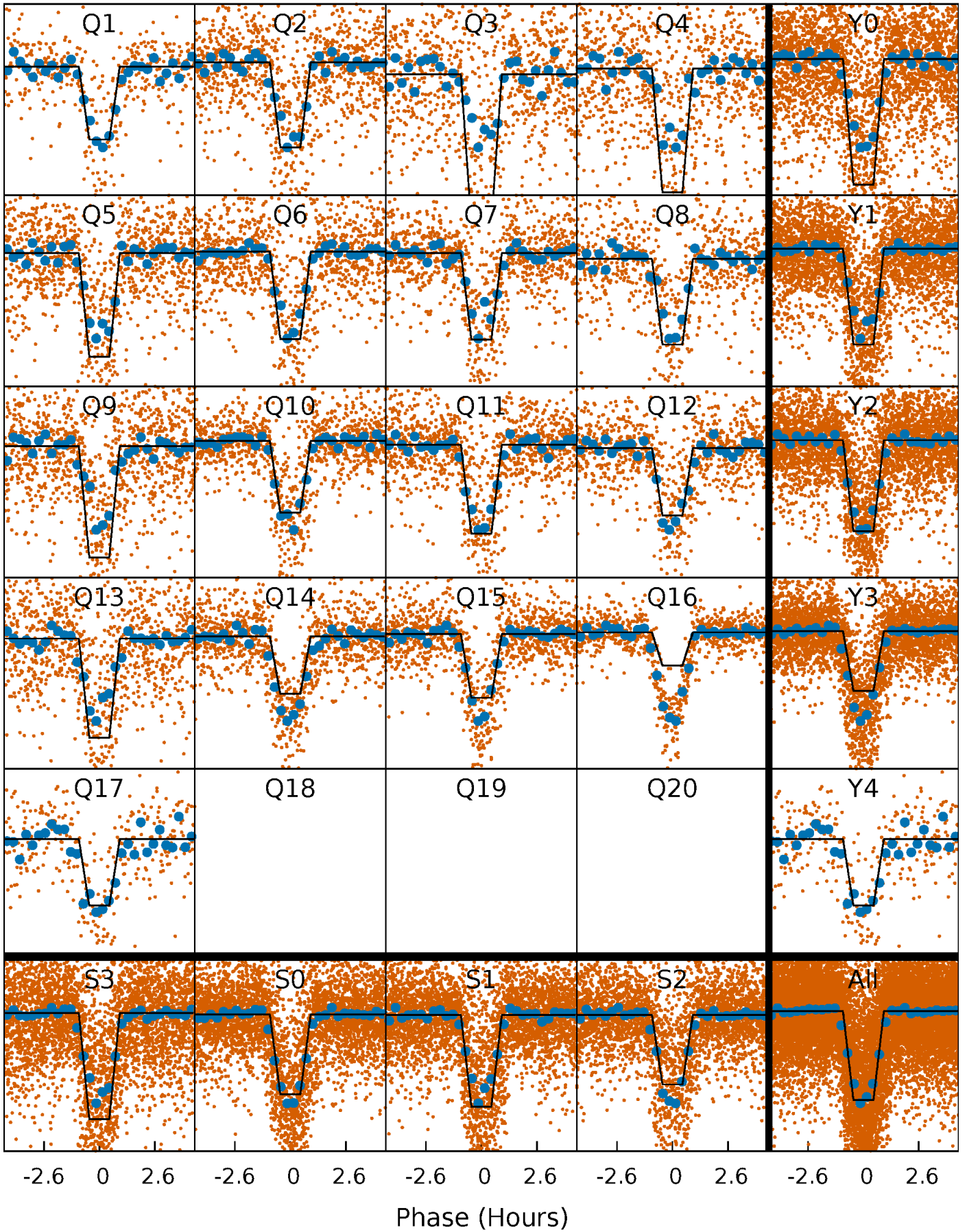
DV Quarter-Phased Transit Curves

TCE 003836453-01 P= 1.540386 Days $T_0=131.998606$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

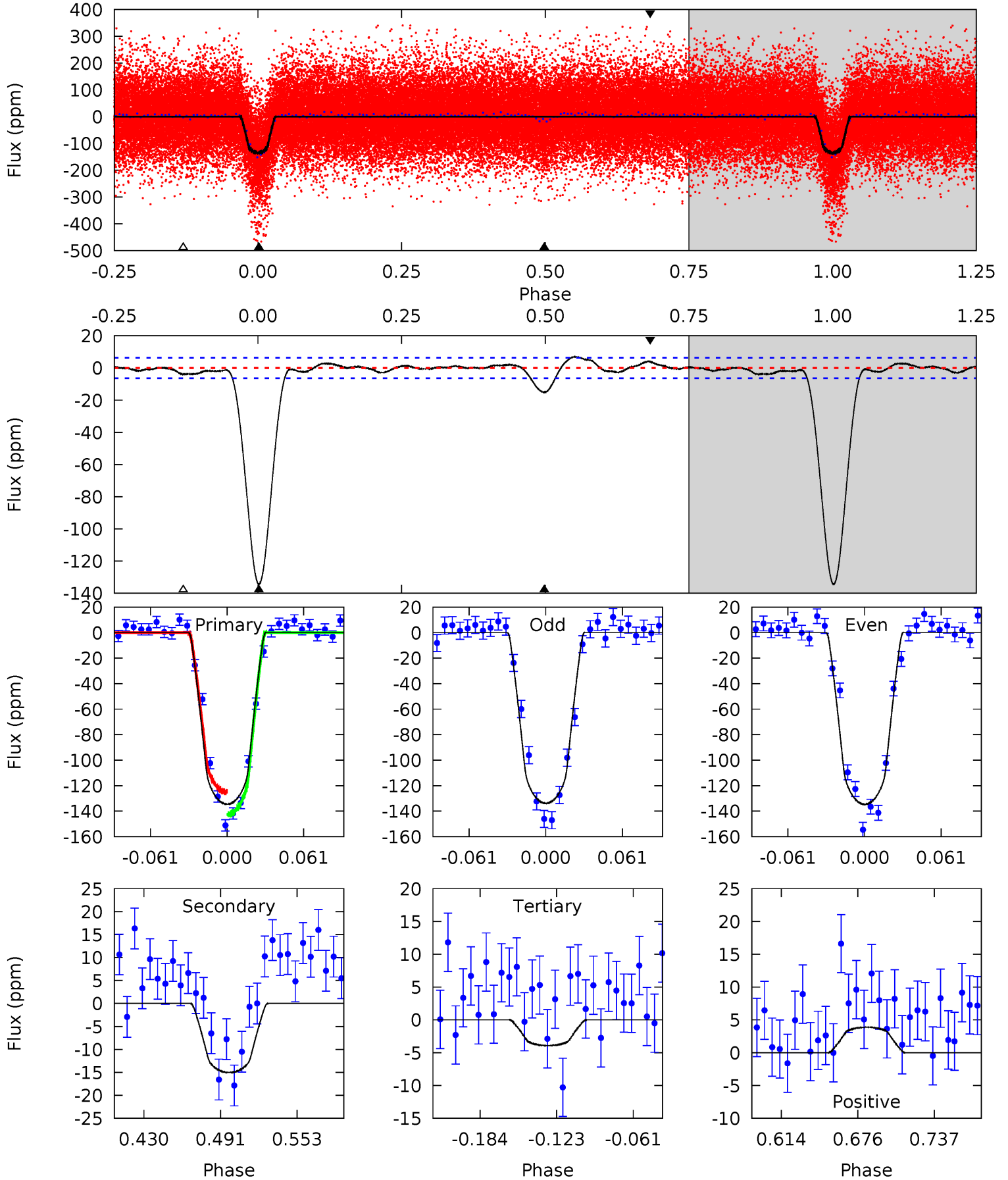
TCE 003836453-01 P= 1.540401 Days $T_0=131.994343$ (BKJD)



DV Model-Shift Uniqueness Test

003836453-01, P = 1.540386 Days, E = 130.458220 Days

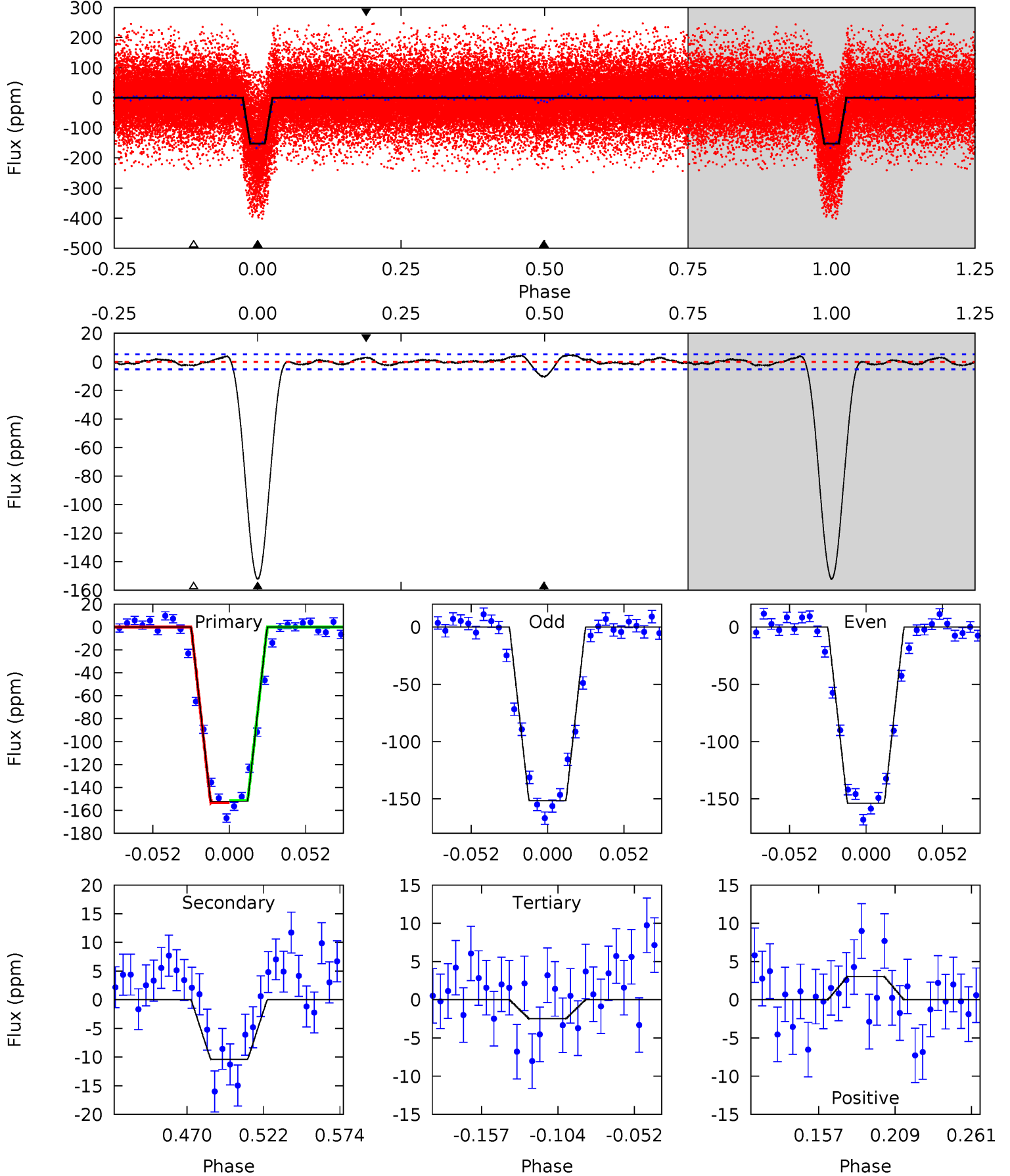
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
99.0	11.1	2.89	2.86	4.67	1.87	1.40	96.1	96.1	8.17	8.21	0.29	1.06	0.05	6.44



Alt Model-Shift Uniqueness Test

003836453-01, P = 1.540401 Days, E = 130.453942 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
136.3	9.32	2.22	2.71	4.70	1.94	1.33	134.1	133.6	7.10	6.61	0.97	1.04	0.03	0.95



Stellar Parameters For KIC 003836453

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4955^{+99}_{-1}	$4.592^{+0.024}_{-0.042}$	$-0.060^{+0.150}_{-0.150}$	$0.735^{+0.044}_{-0.033}$	$0.771^{+0.041}_{-0.041}$	$2.730^{+0.330}_{-0.385}$
	+2%/-0%	+1%/-1%	+250%/-250%	+6%/-4%	+5%/-5%	+12%/-14%
Source	SPE18	SPE18	SPE18	DSEP		

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

Secondary Eclipse Parameters for KIC 003836453-01 / KOI 1903.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-15 ± 1	$1.04^{+0.15}_{-0.15}$	1690^{+47}_{-67}	3188^{+163}_{-156}	$4.326^{+1.509}_{-1.014}$
Alt.	-10 ± 1	$1.05^{+0.14}_{-0.16}$	1694^{+48}_{-66}	3020^{+166}_{-142}	$3.035^{+1.164}_{-0.715}$

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

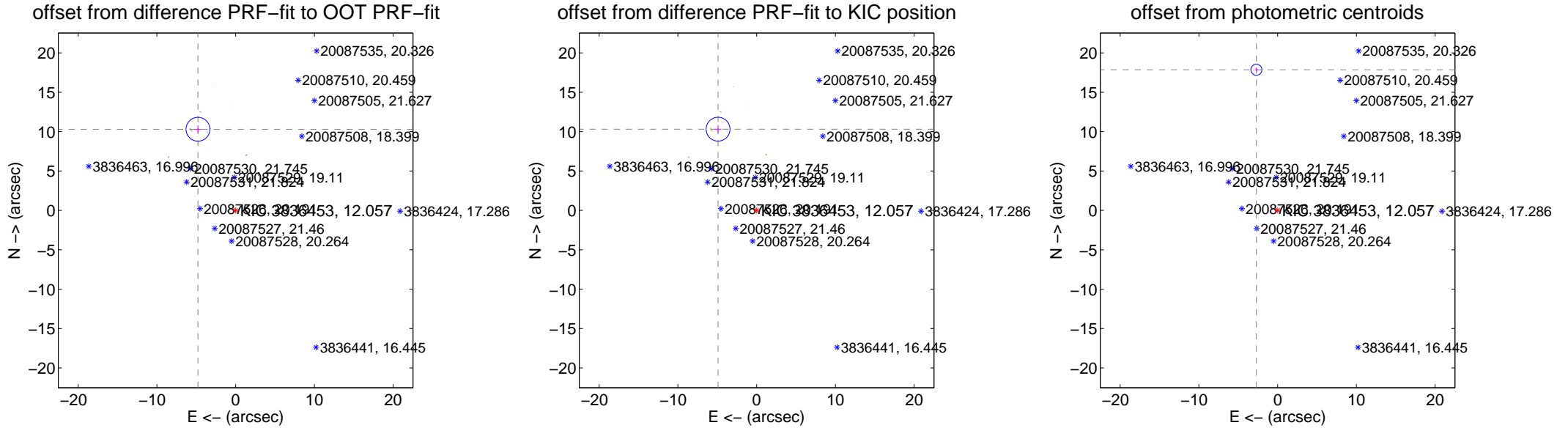
DV Centroid Data

Supplemental centroid analysis for 003836453-01. Kepler magnitude: 12.06. Transit SNR 56.98

There are 2 quarters with good PRF difference image offsets

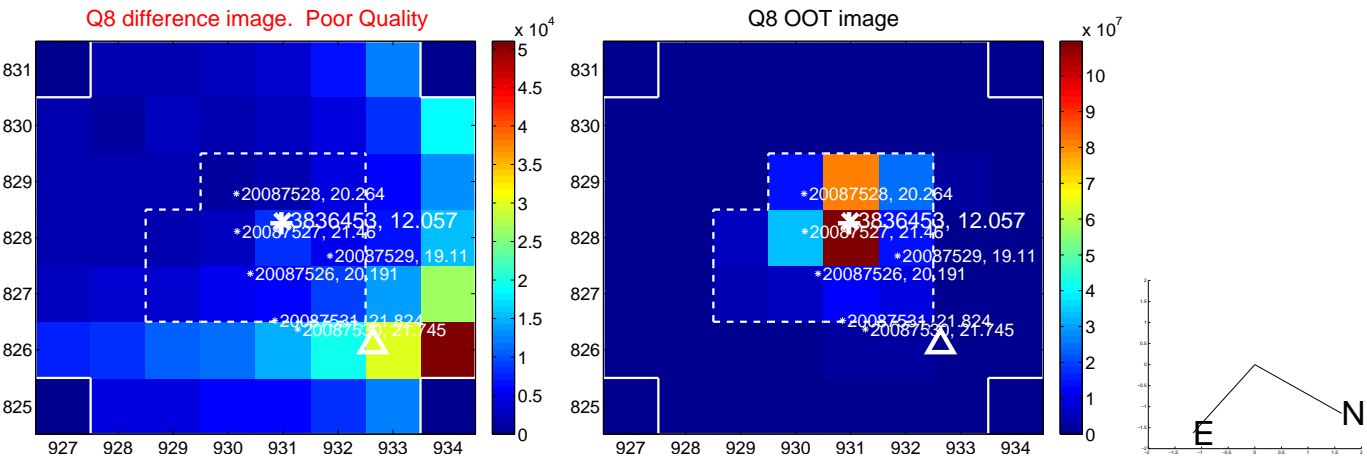
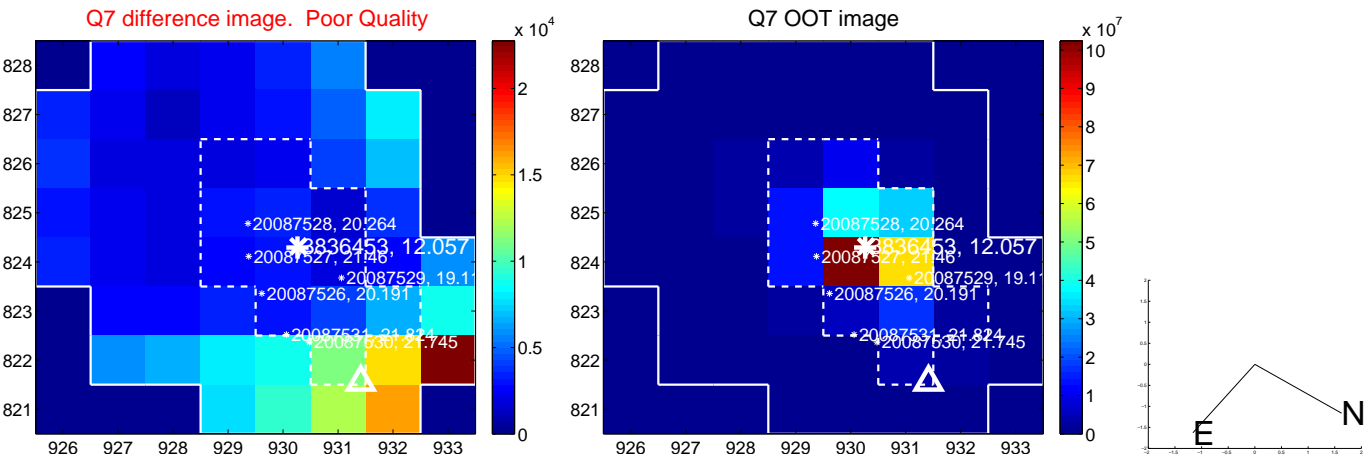
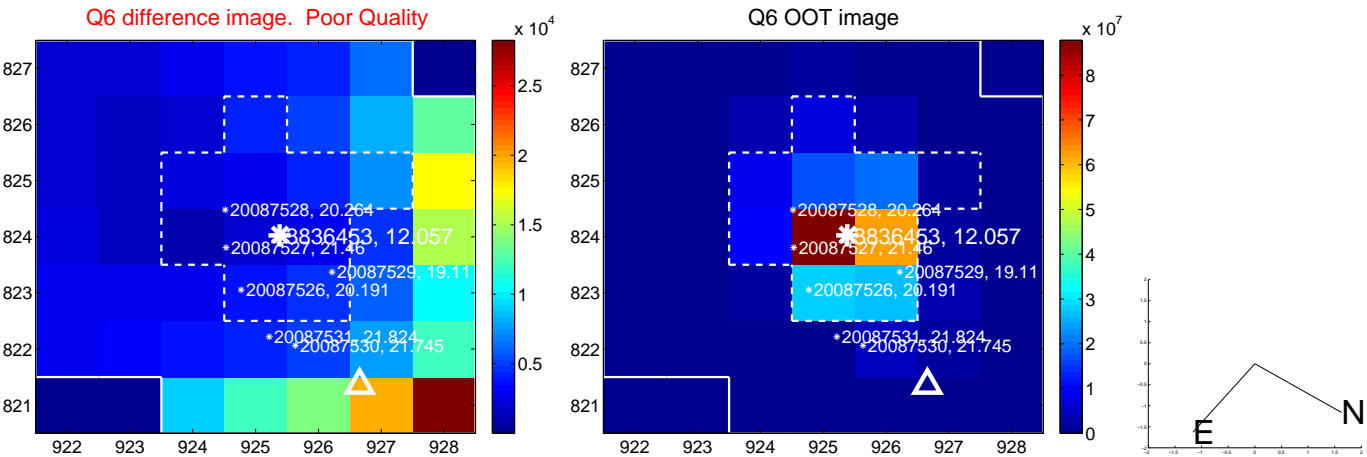
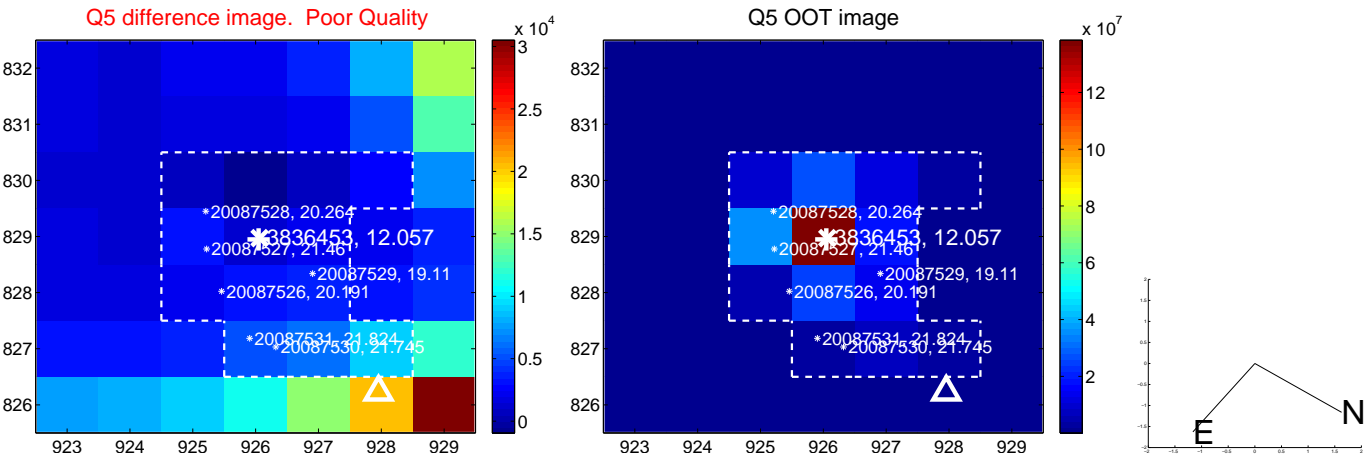
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	11.362 \pm 0.505	22.52	4.788 \pm 0.428	10.303 \pm 0.520
PRF-fit source offset from KIC position	11.416 \pm 0.505	22.62	4.898 \pm 0.424	10.311 \pm 0.521
photometric centroid source offset	18.06 \pm 0.23	77.22	2.70 \pm 0.20	17.86 \pm 0.23

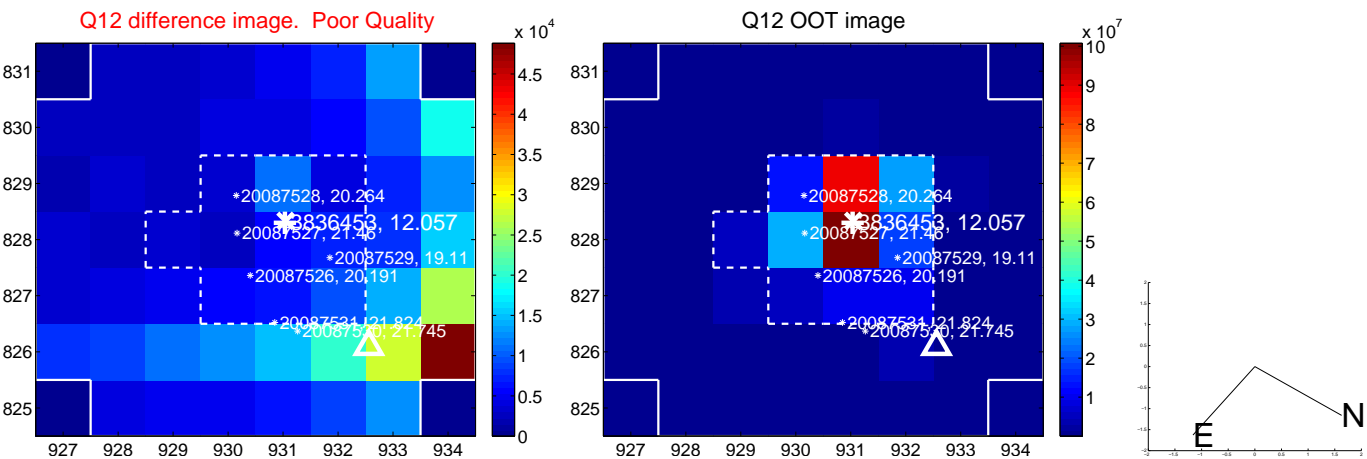
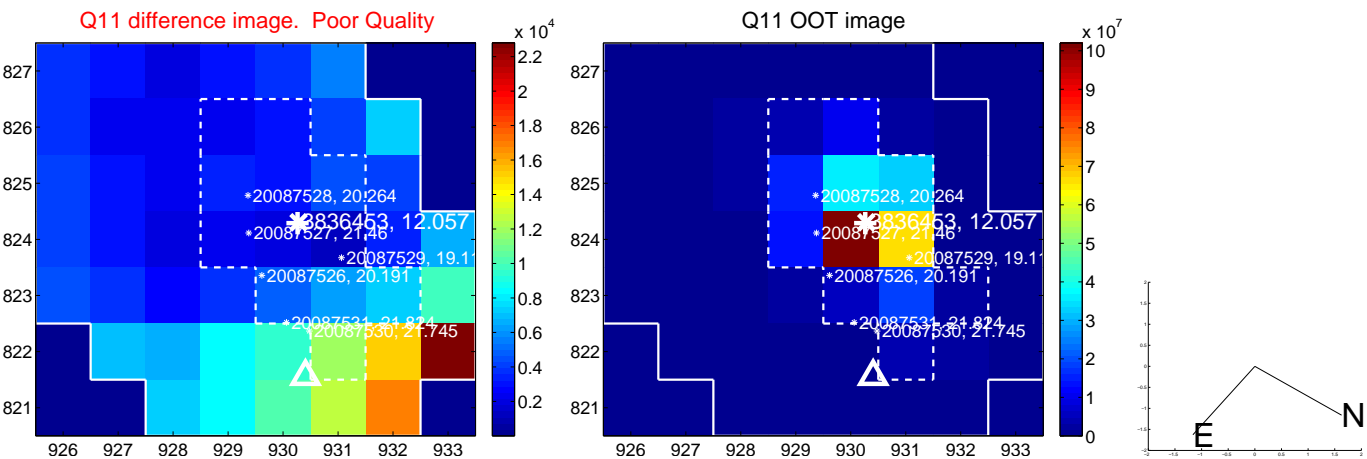
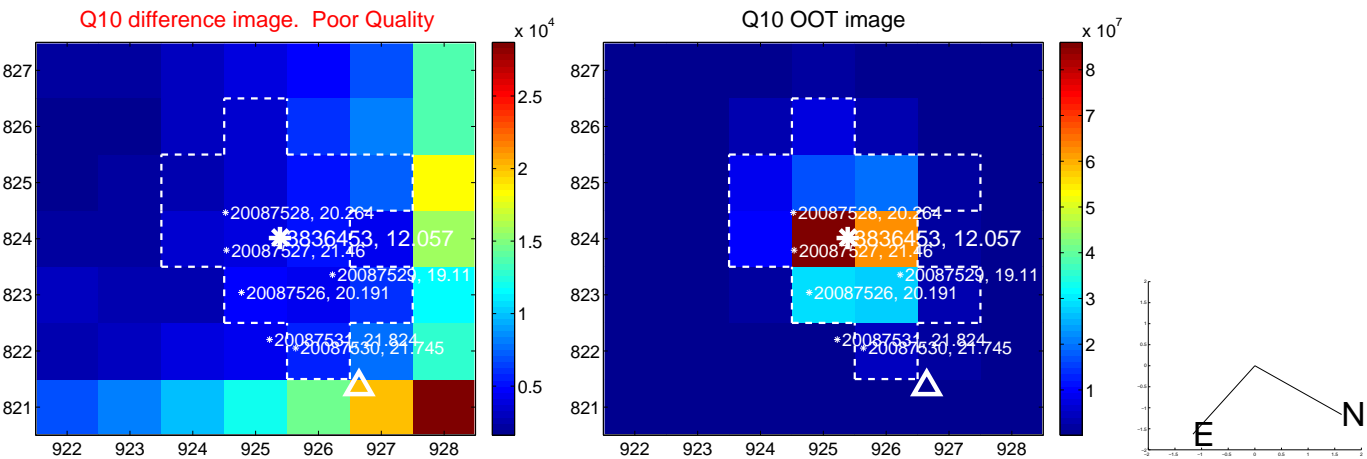
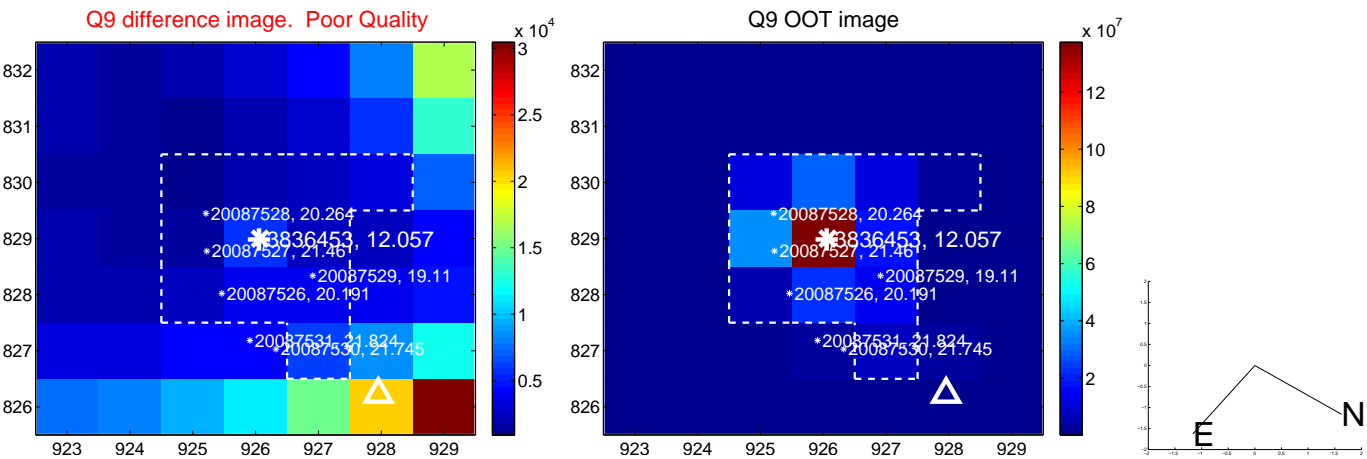


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

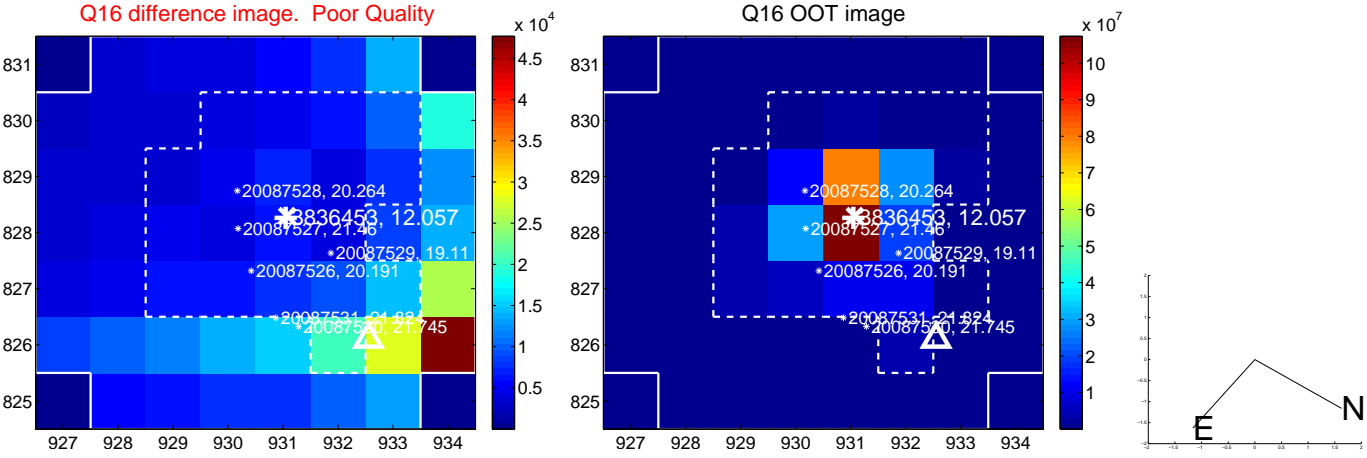
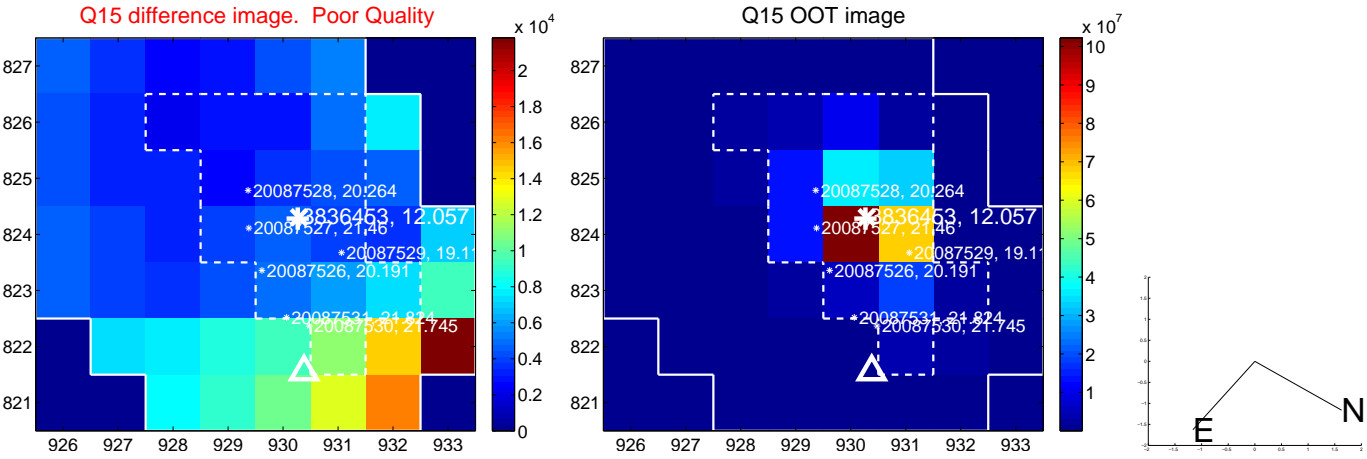
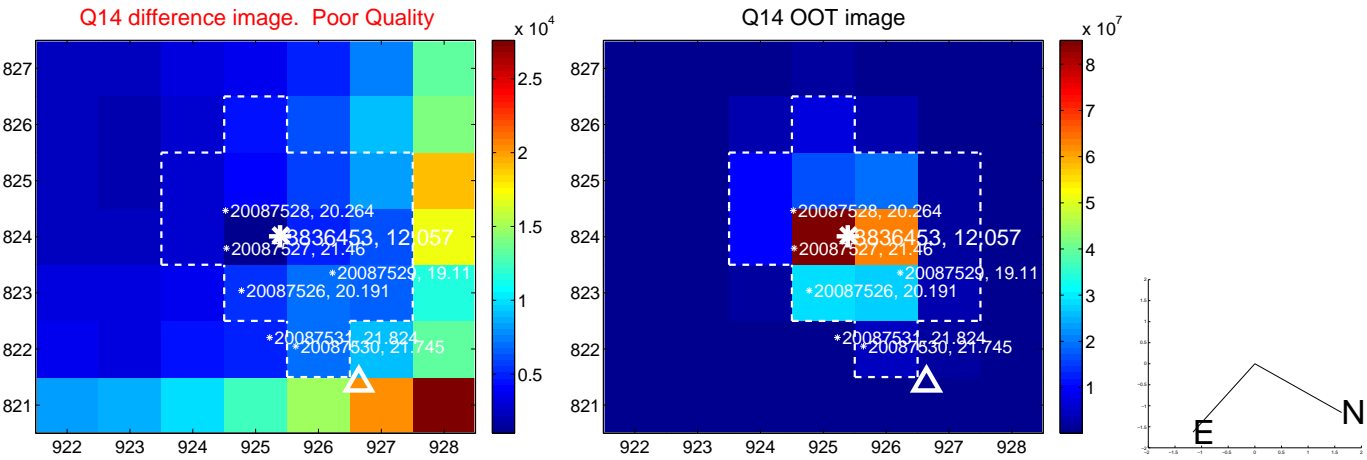
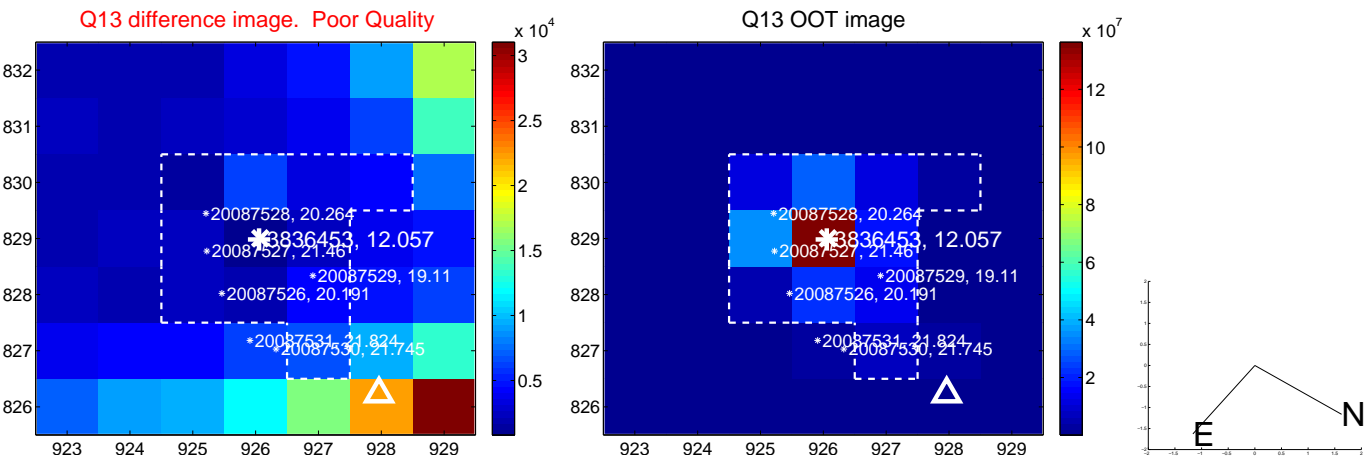
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



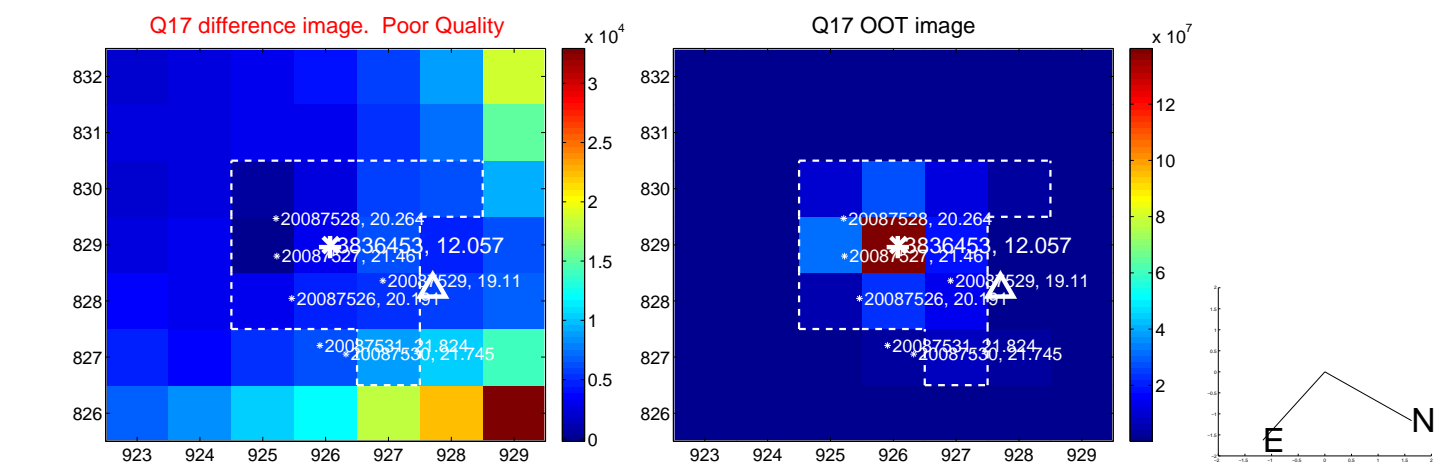
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



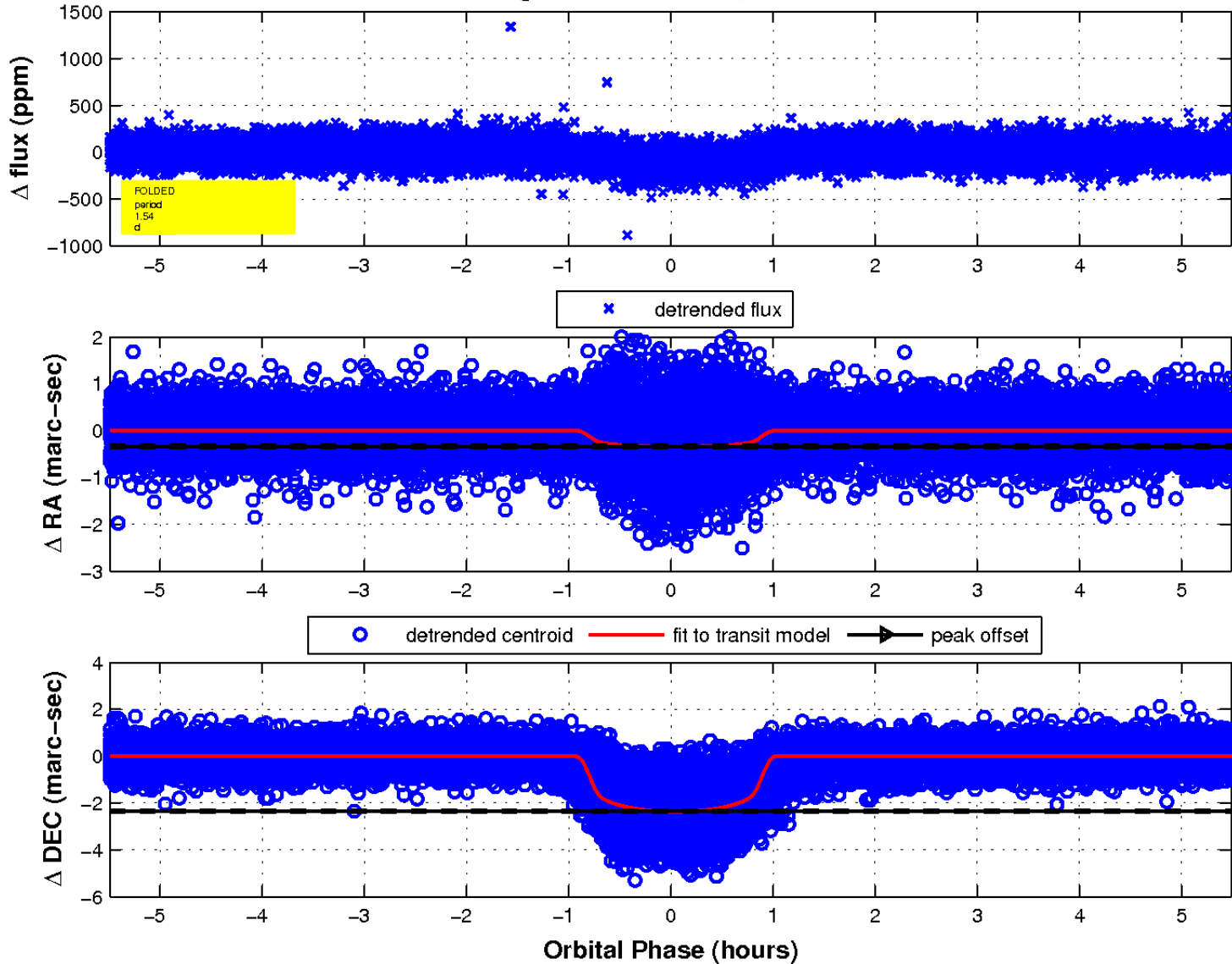
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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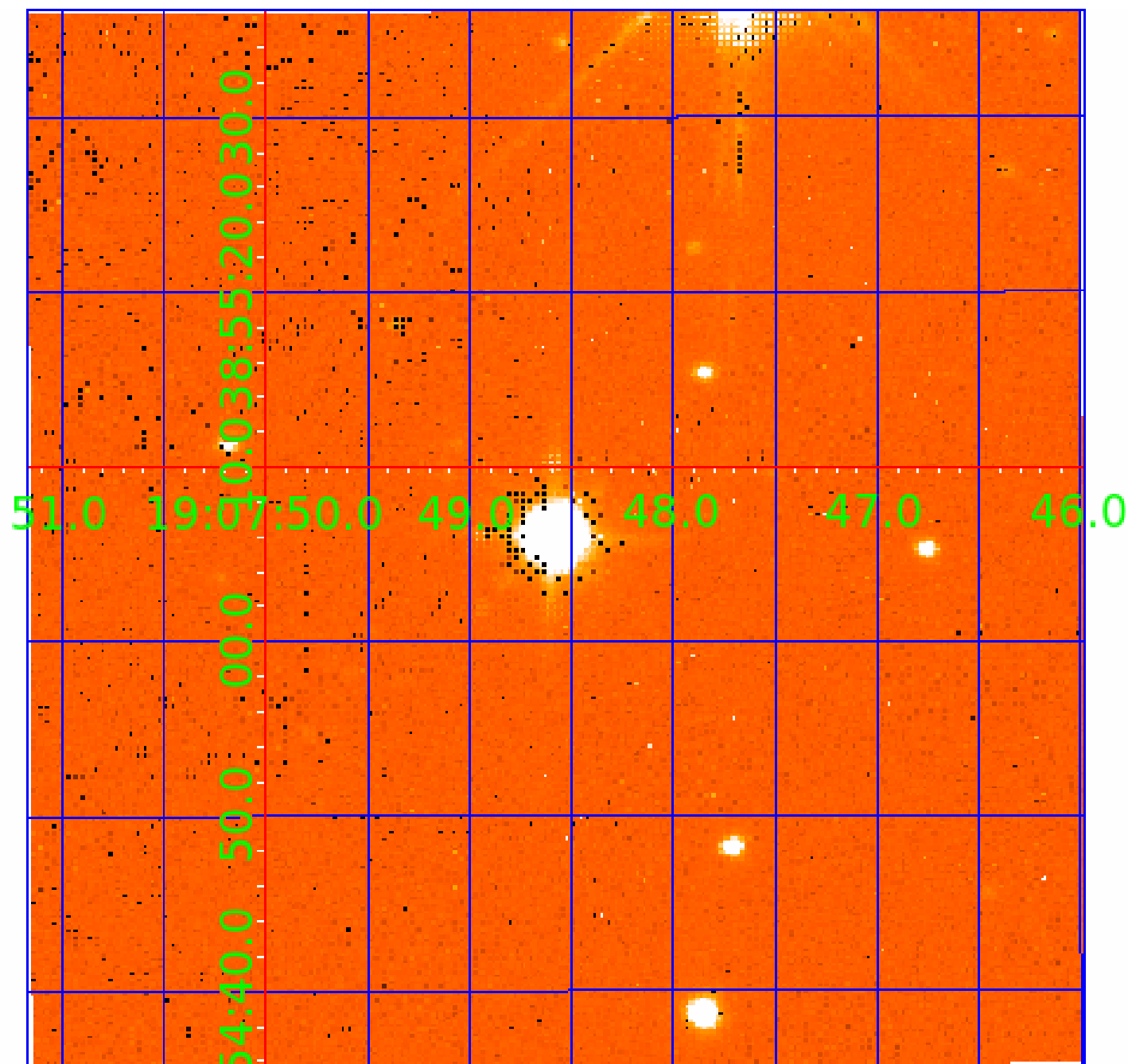


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 003836453

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})
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003836453-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_CROWDED—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 003836453-02

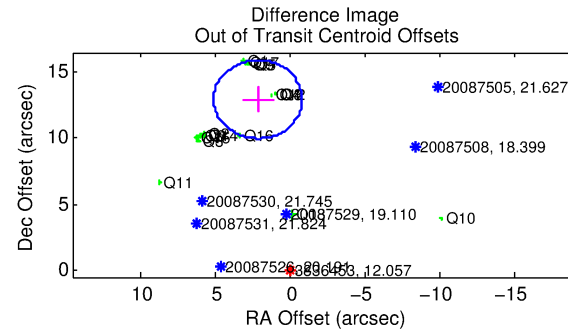
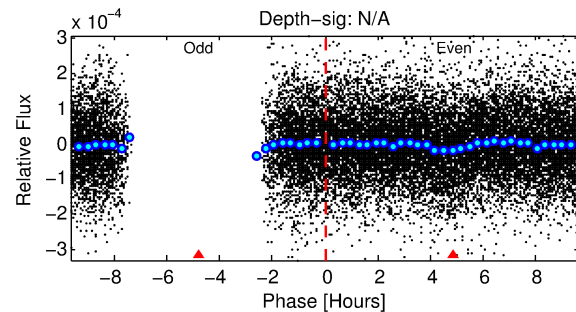
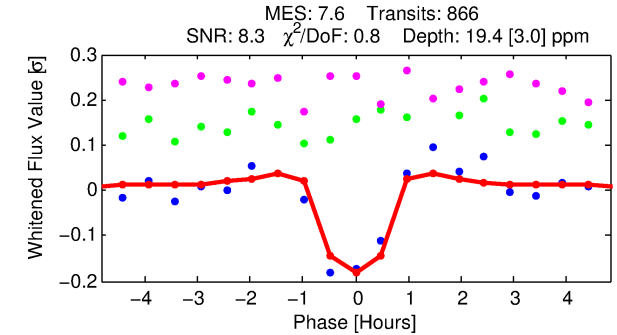
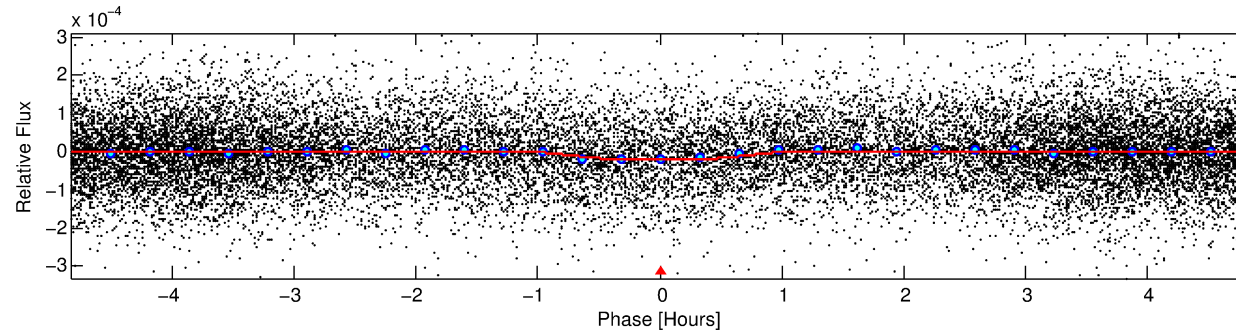
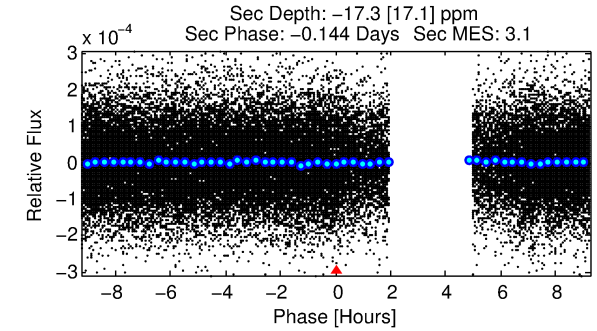
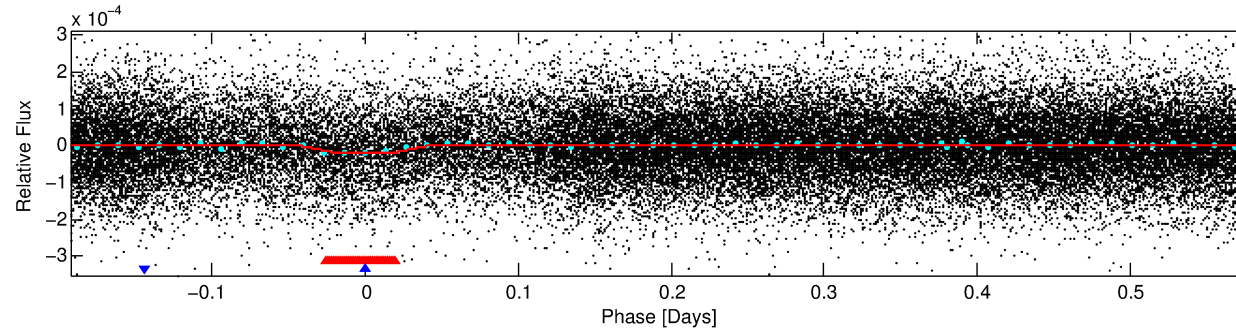
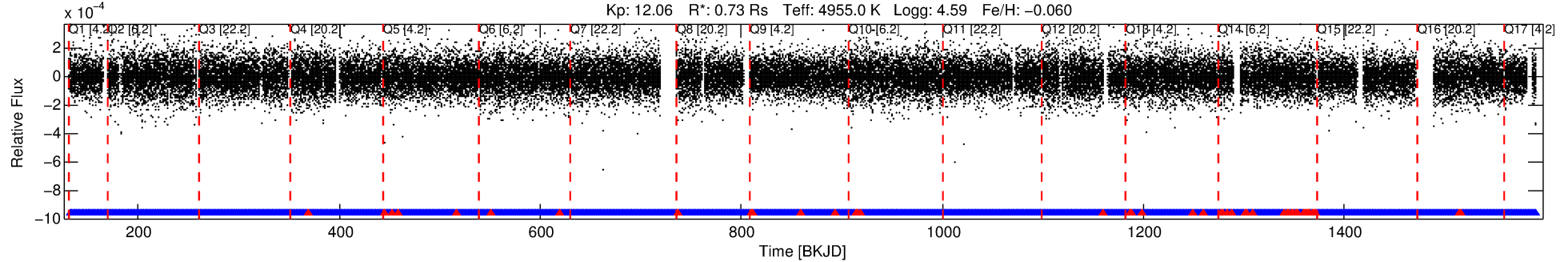
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003836453-02	3836453	6363.01	3836413	1:2	38.9	-4	-9	13.76	12.06	3903.10	Direct-PRF	0	5.00	1.33

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: 3836453 Candidate: 2 of 2 Period: 0.770 d
KOI: K01903 Corr: No Ephemeris Match

Kp: 12.06 R*: 0.73 Rs Teff: 4955.0 K Logg: 4.59 Fe/H: -0.060



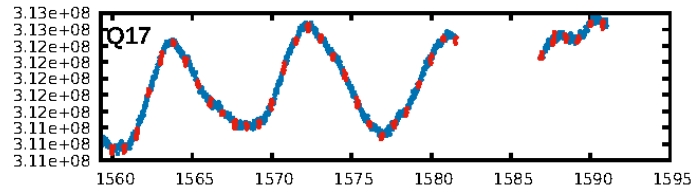
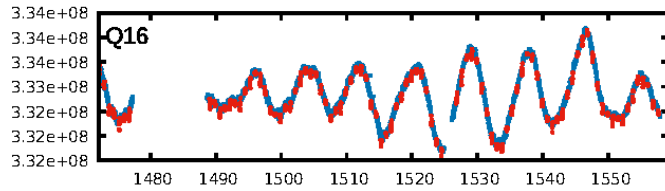
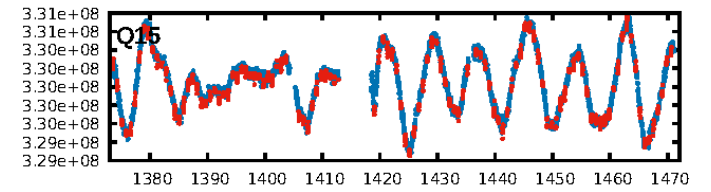
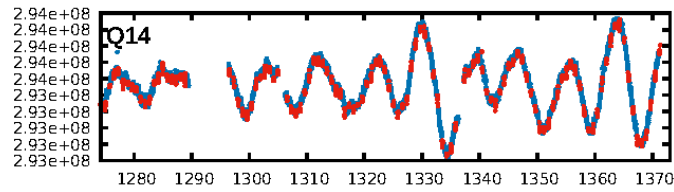
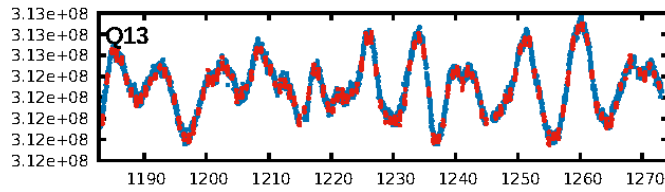
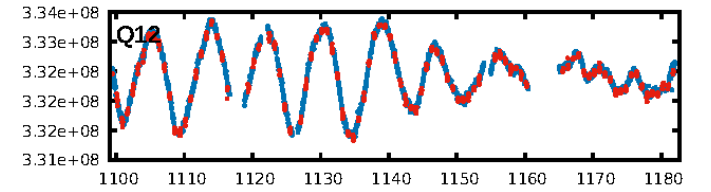
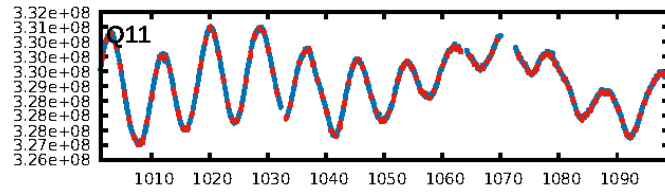
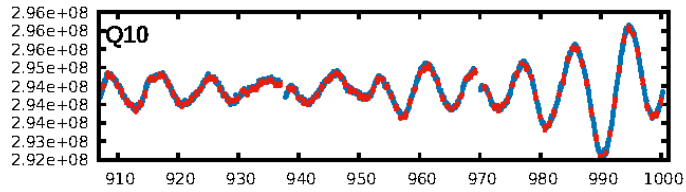
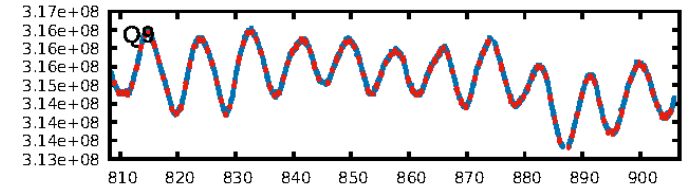
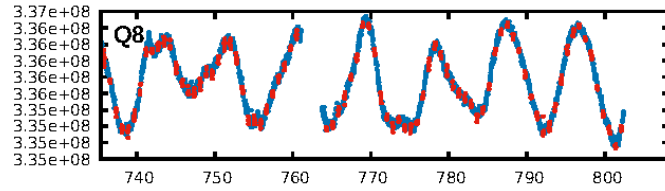
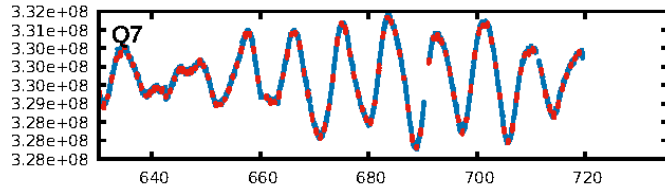
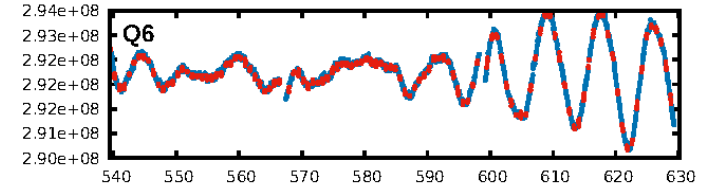
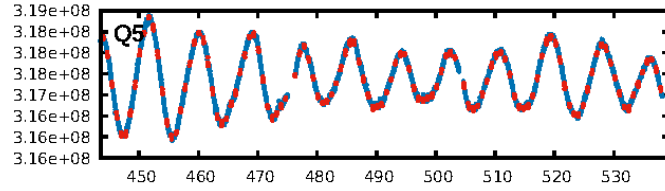
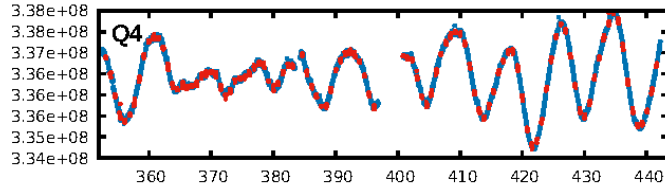
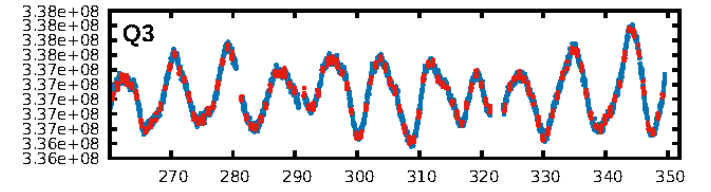
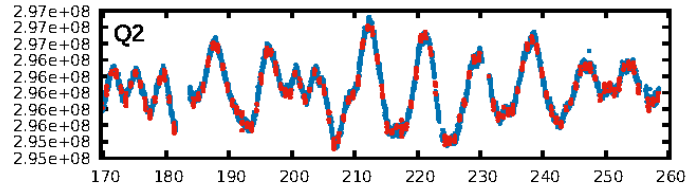
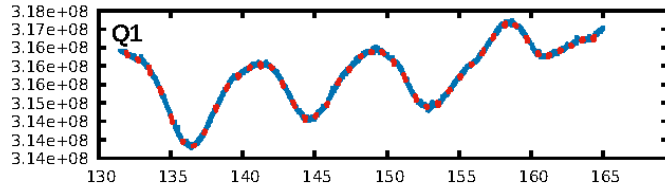
DV Fit Results:

Period = 0.77022 [0.00001] d
Epoch = 131.9796 [0.0023] BKJD
Rp/R* = 0.0050 [0.0021]
a/R* = 1.83 [2.13]
b = 0.91 [0.33]
Seff = 1283.64 [141.41]
Teq = 1526 [42] K
Rp = 0.40 [0.17] Re
a = 0.0151 [0.0008] AU
Ag = N/A
Teff = N/A

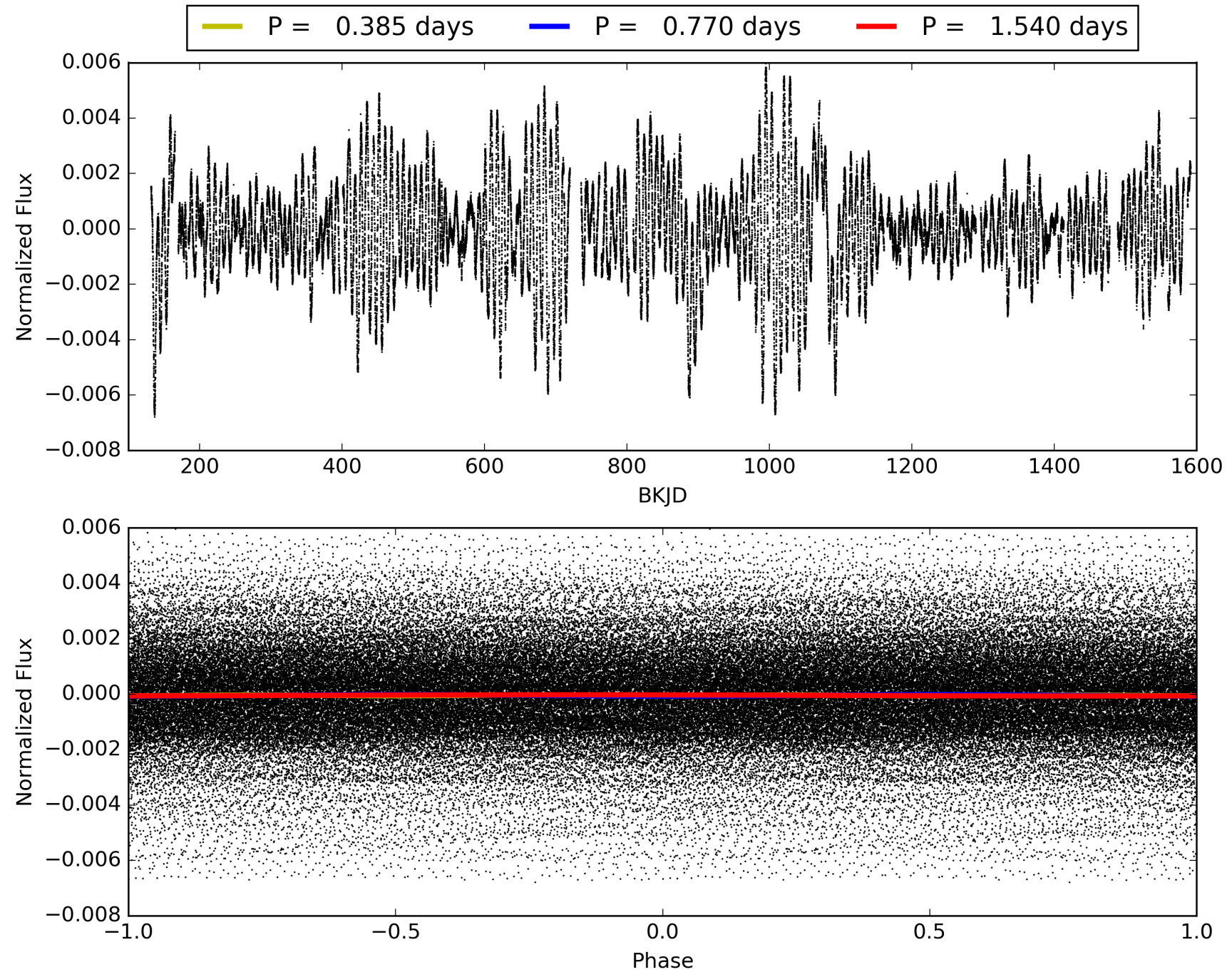
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [7.58σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.88e-13
RollingBand-fgt: 0.95 [783/828]
GhostDiagnostic-chr: -0.196
Centroid-sig: 0.0%
Centroid-so: 17.124 arcsec [14.66σ]
OotOffset-rm: 13.105 arcsec [13.29σ]
KicOffset-rm: 13.132 arcsec [13.43σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.29 [5/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 003836453-02, PDC Light Curves

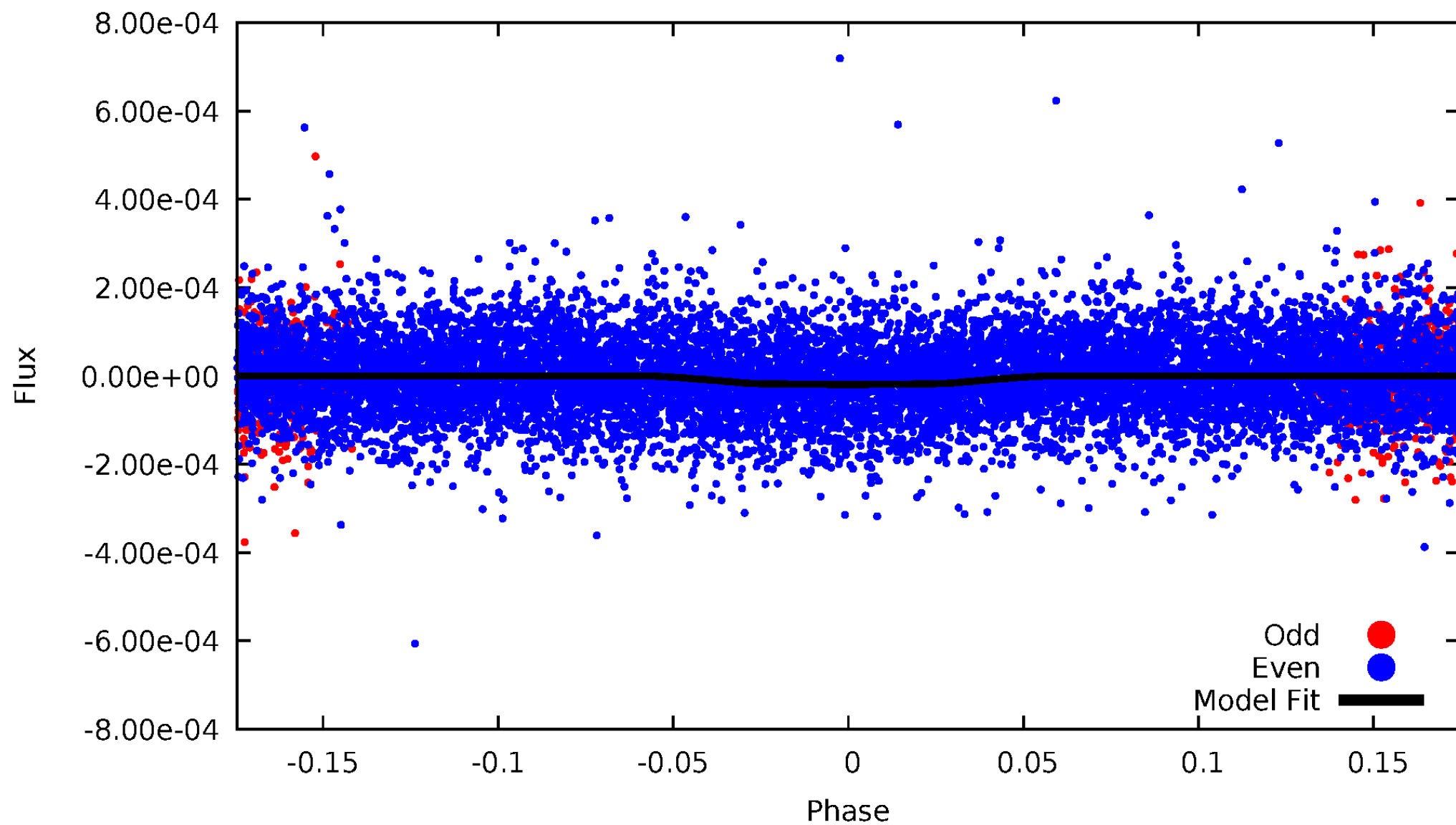


TCE 003836453-02



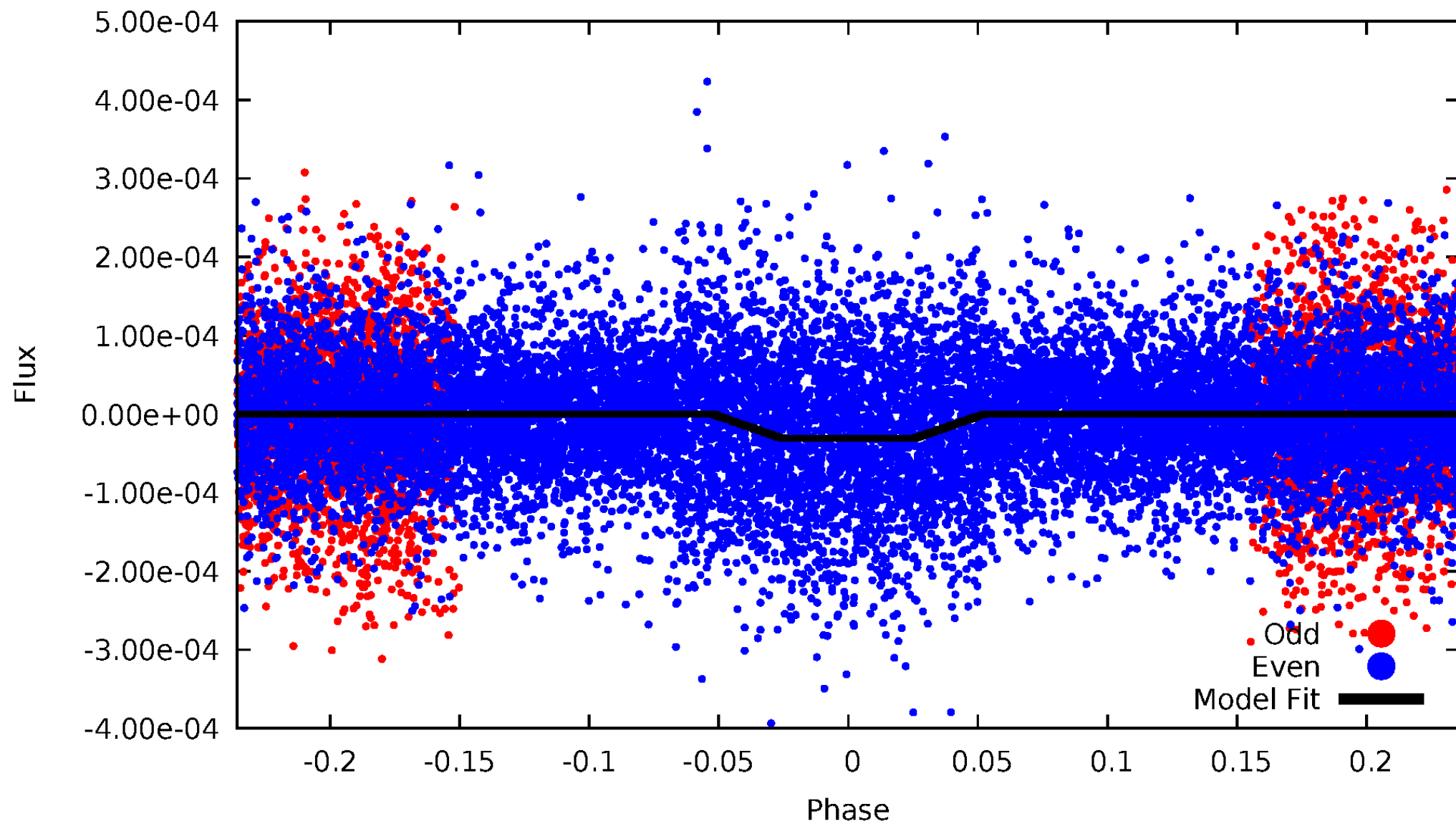
DV Odd/Even

TCE 003836453-02



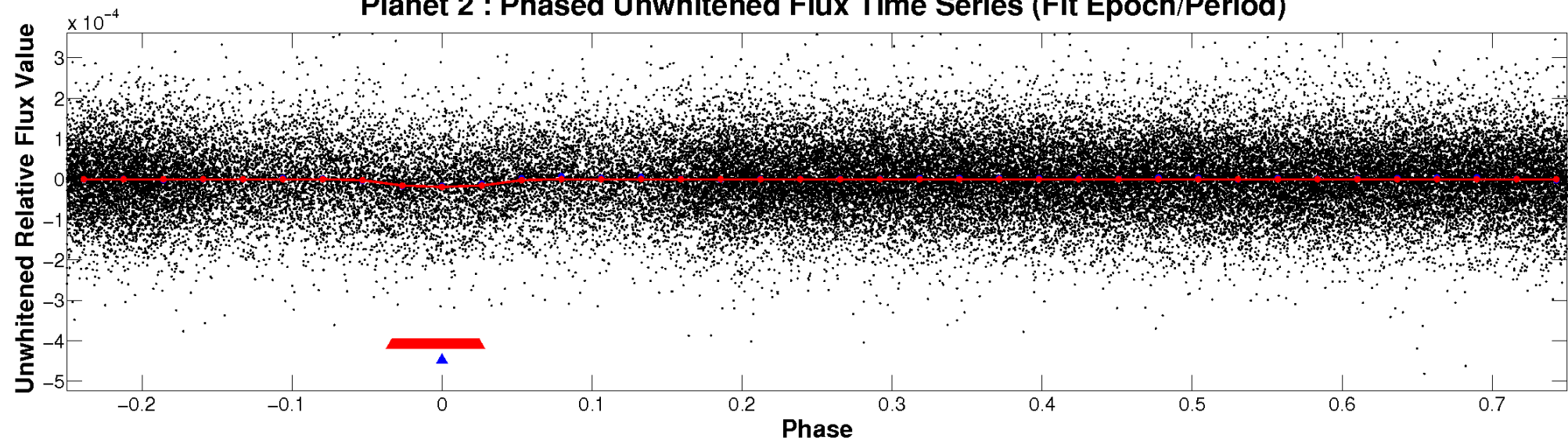
ALT Odd/Even

TCE 003836453-02

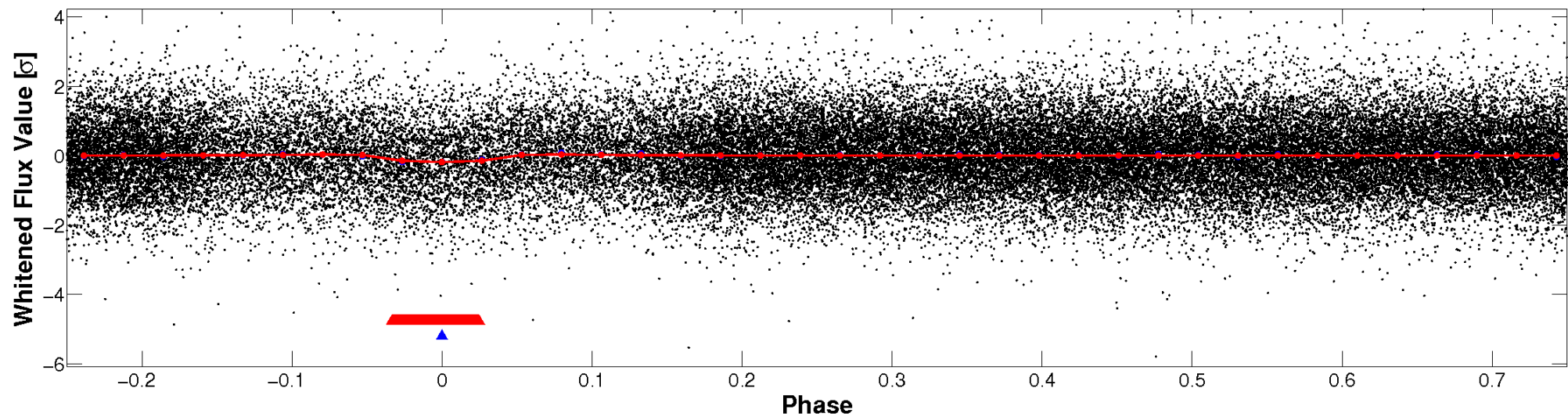


Non-Whitened Vs. Whitened Light Curve

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

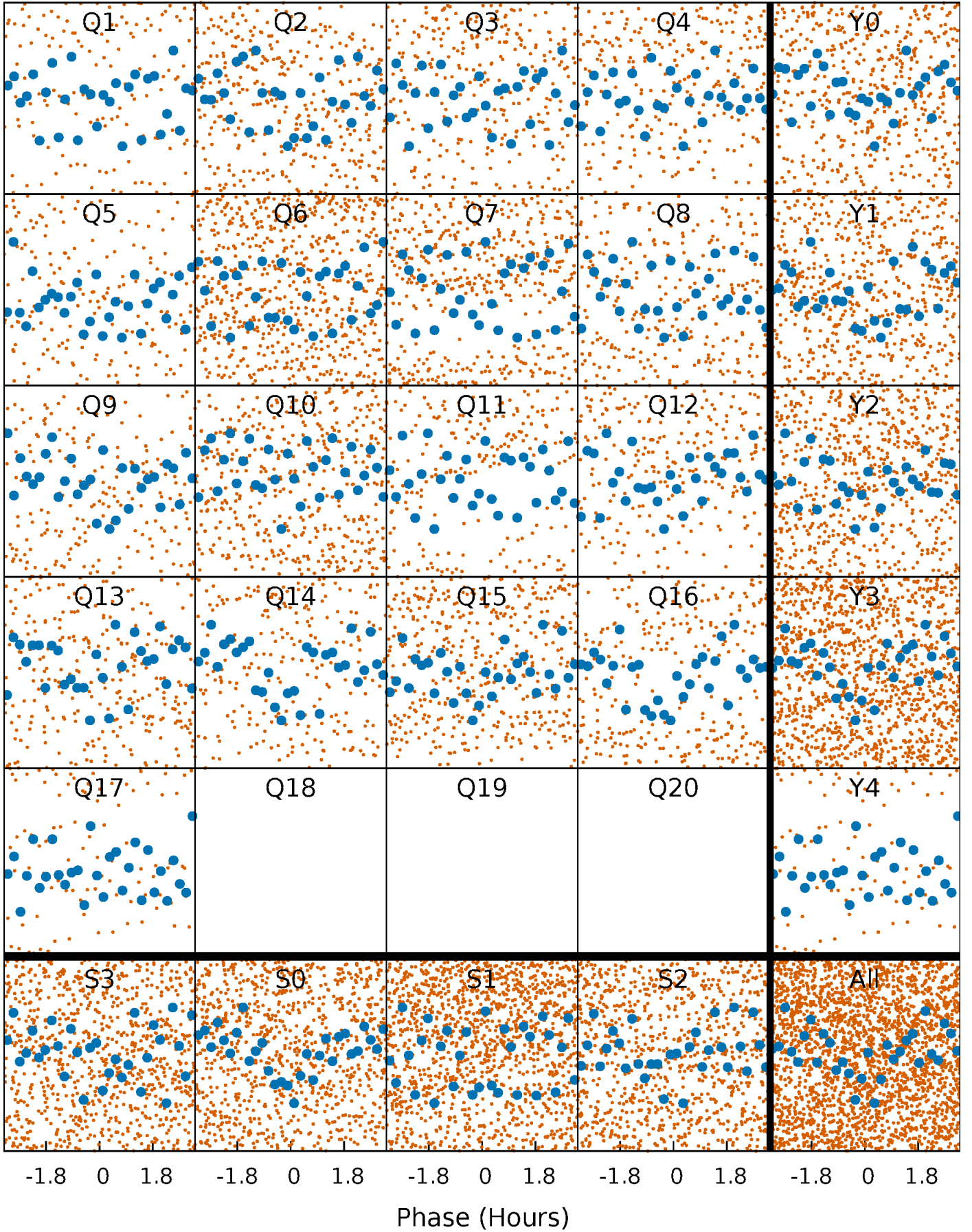


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



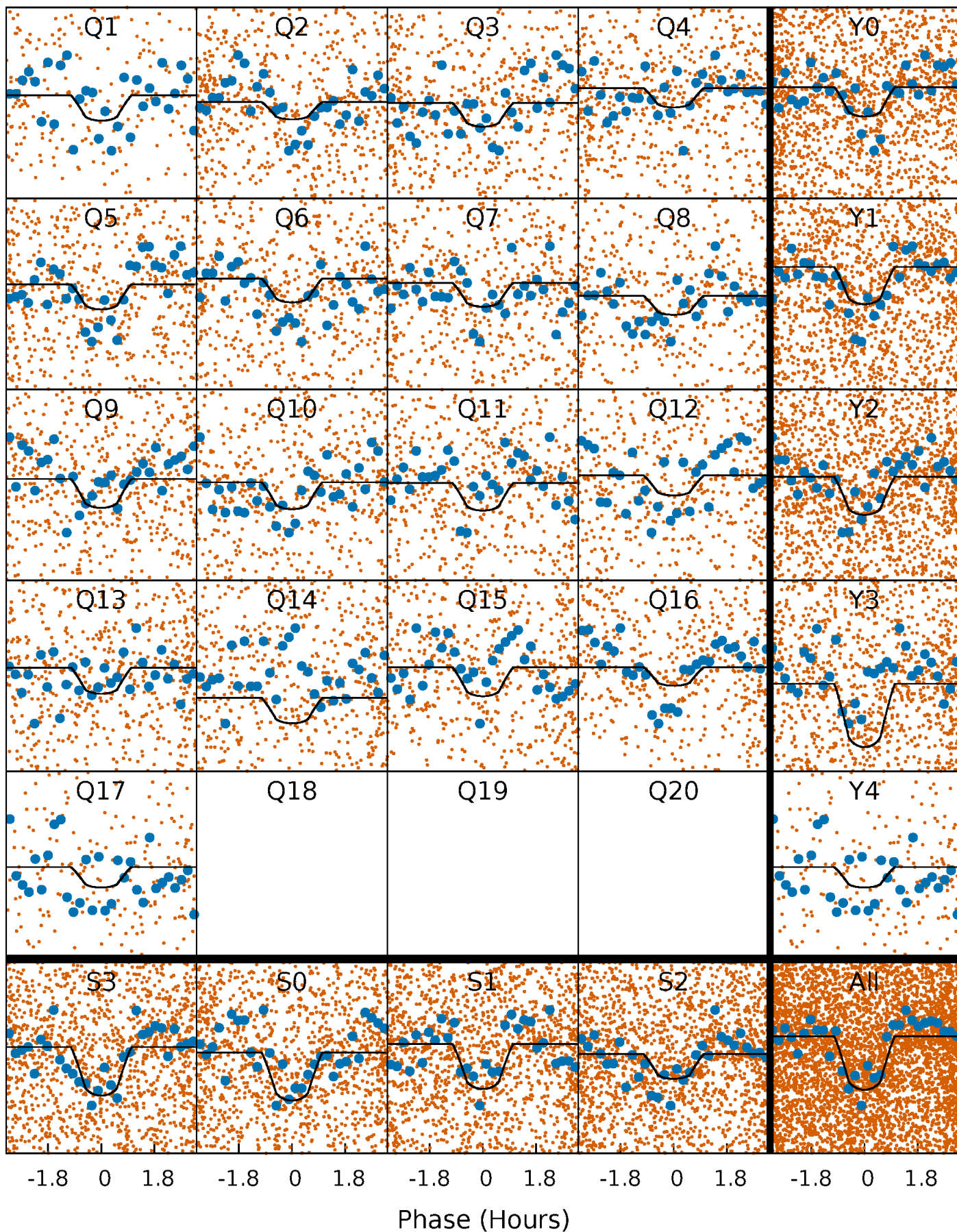
PDC Quarter-Phased Transit Curves

TCE 003836453-02 $P = 0.770217$ Days $T_0 = 131.979595$ (BKJD)



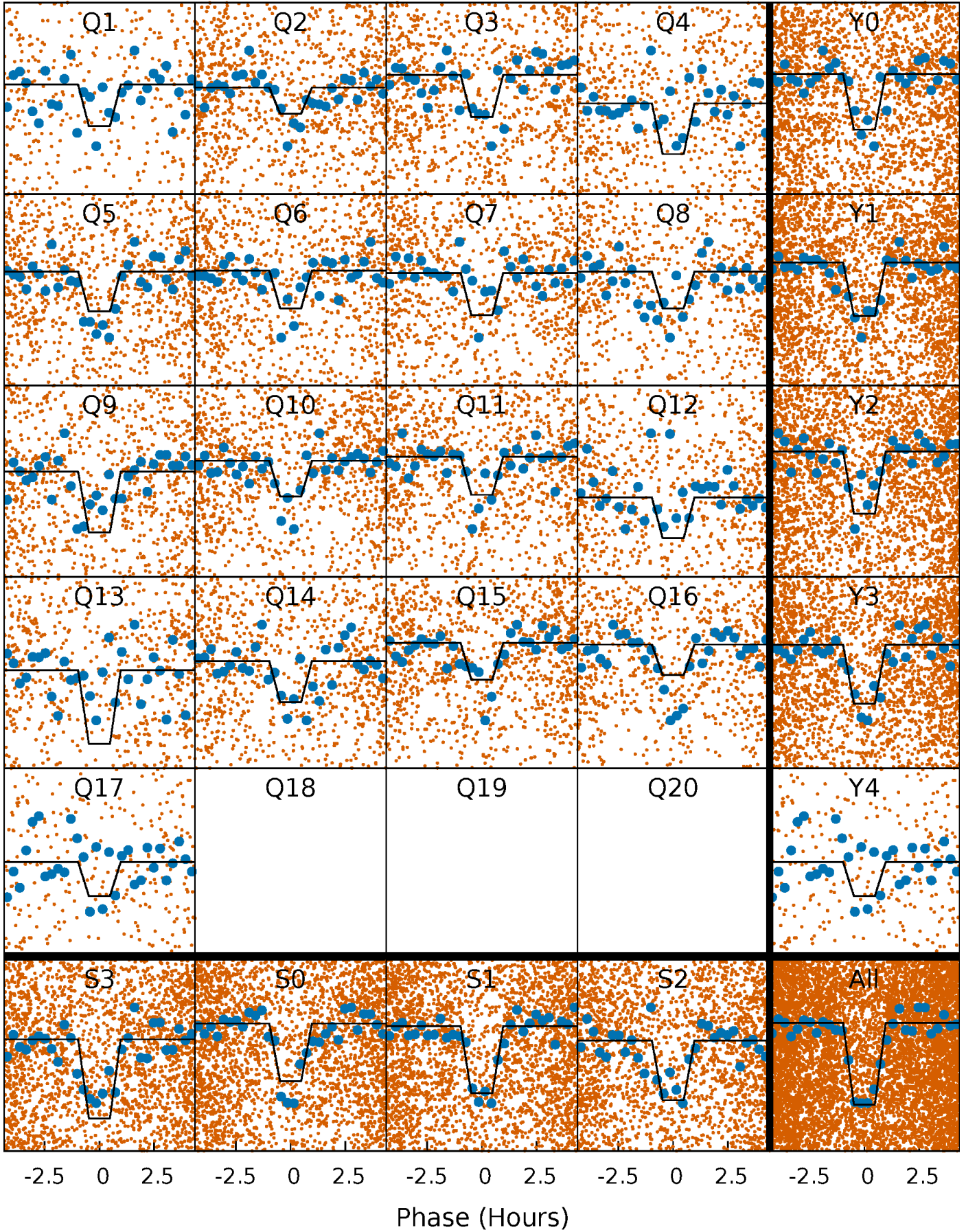
DV Quarter-Phased Transit Curves

TCE 003836453-02 P= 0.770217 Days $T_0=131.979595$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

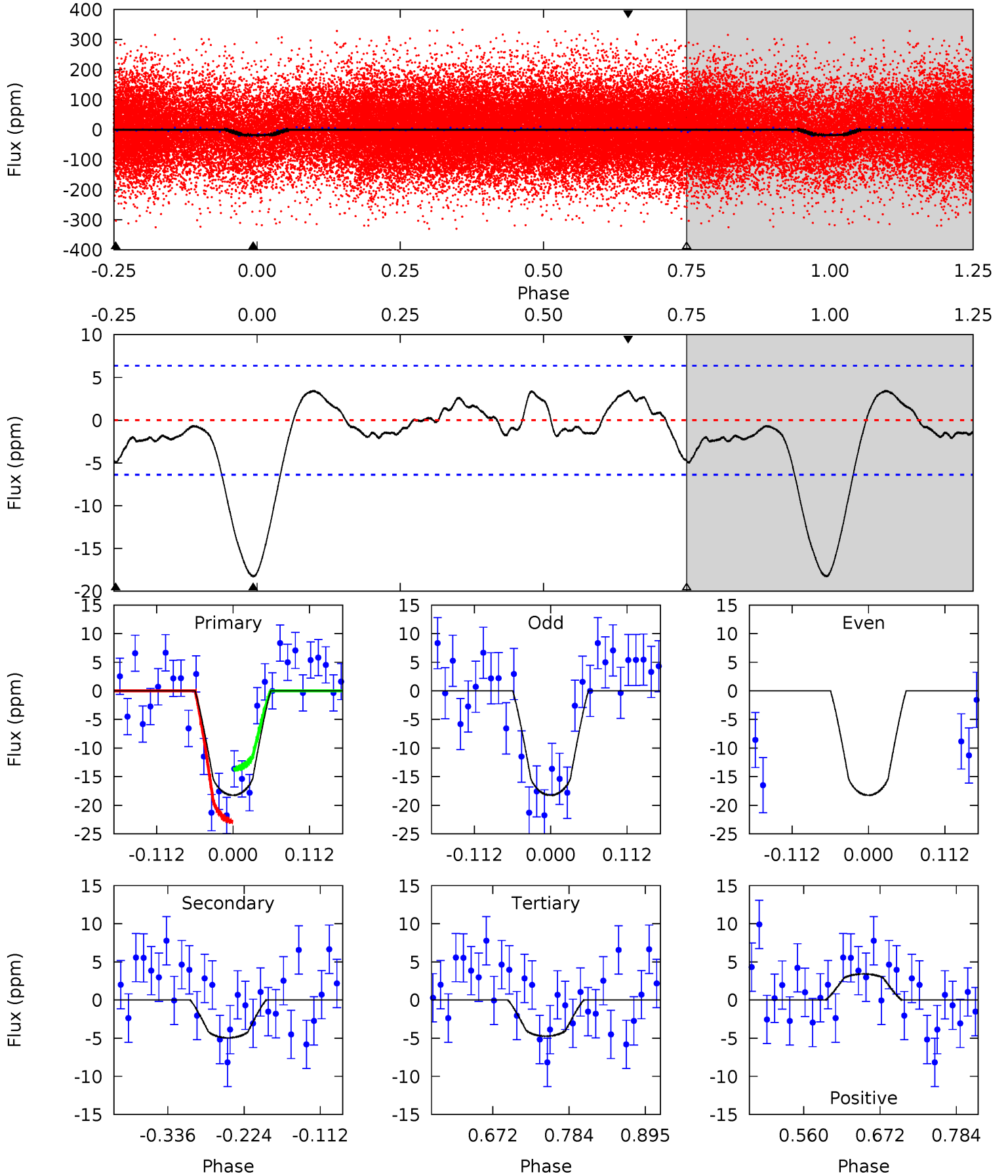
TCE 003836453-02 P= 0.770203 Days $T_0=131.987309$ (BKJD)



DV Model-Shift Uniqueness Test

003836453-02, P = 0.770217 Days, E = 131.209378 Days

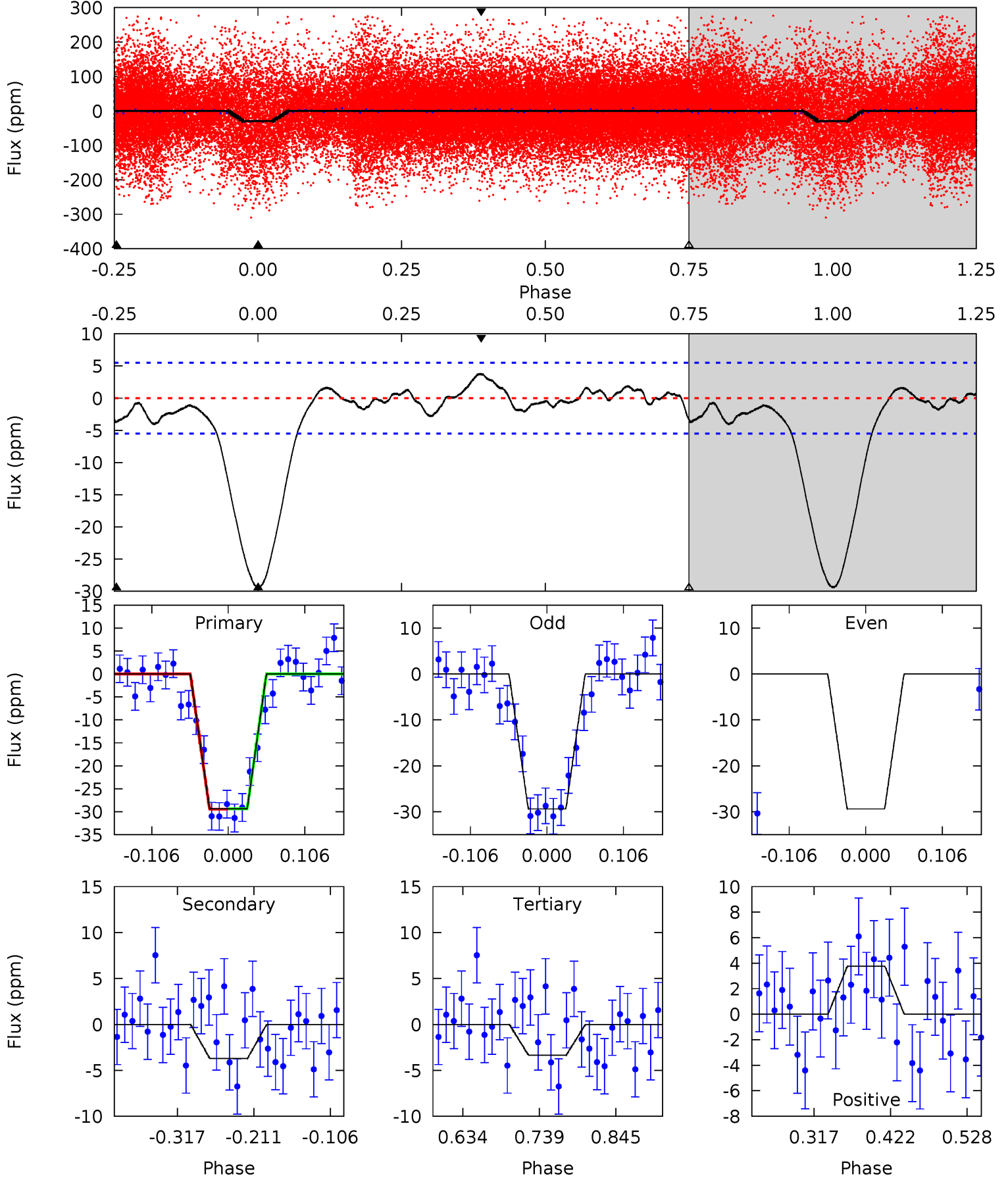
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	3.52	3.38	2.43	4.54	1.59	1.23	9.62	10.6	0.15	1.09	0	0.94	0.16	3.27



Alt Model-Shift Uniqueness Test

003836453-02, P = 0.770203 Days, E = 131.217106 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.3	3.07	2.77	3.10	4.55	1.62	1.15	21.5	21.2	0.30	-0.04	0	0.94	0.11	0.04



Stellar Parameters For KIC 003836453

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4955^{+99}_{-1}	$4.592^{+0.024}_{-0.042}$	$-0.060^{+0.150}_{-0.150}$	$0.735^{+0.044}_{-0.033}$	$0.771^{+0.041}_{-0.041}$	$2.730^{+0.330}_{-0.385}$
	+2%/-0%	+1%/-1%	+250%/-250%	+6%/-4%	+5%/-5%	+12%/-14%
Source	SPE18	SPE18	SPE18	DSEP		

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

Secondary Eclipse Parameters for KIC 003836453-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5 ± 1	$0.40^{+0.16}_{-0.15}$	2132^{+58}_{-84}	3585^{+737}_{-450}	$3.790^{+6.357}_{-2.051}$
Alt.	-4 ± 1	$0.45^{+0.16}_{-0.17}$	2131^{+57}_{-70}	3282^{+597}_{-398}	$2.259^{+3.240}_{-1.178}$

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

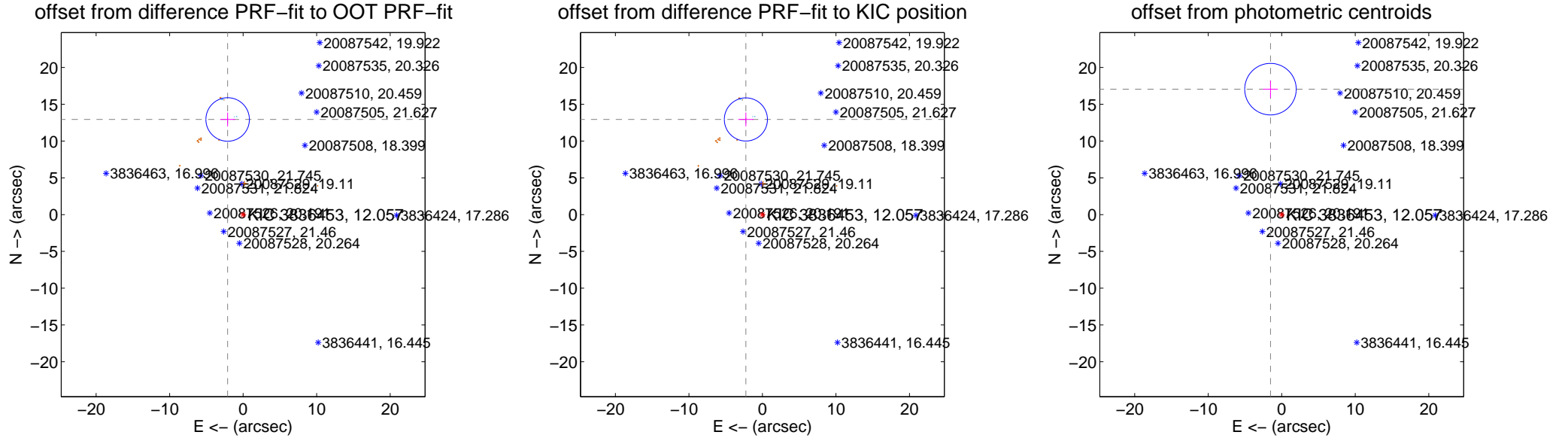
DV Centroid Data

Supplemental centroid analysis for 003836453-02. Kepler magnitude: 12.06. Transit SNR 8.34

There are 5 quarters with good PRF difference image offsets

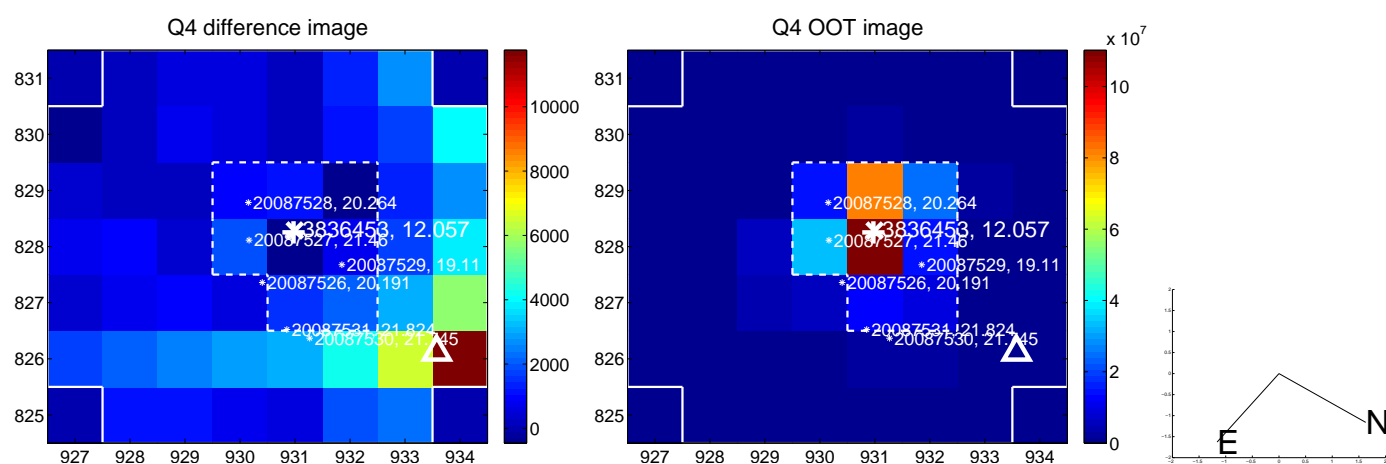
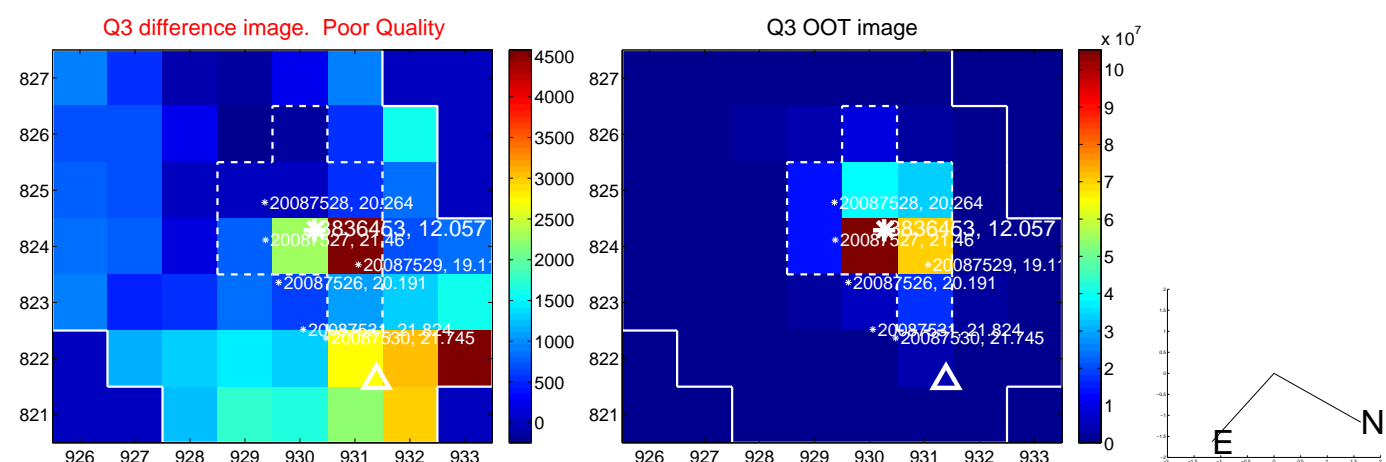
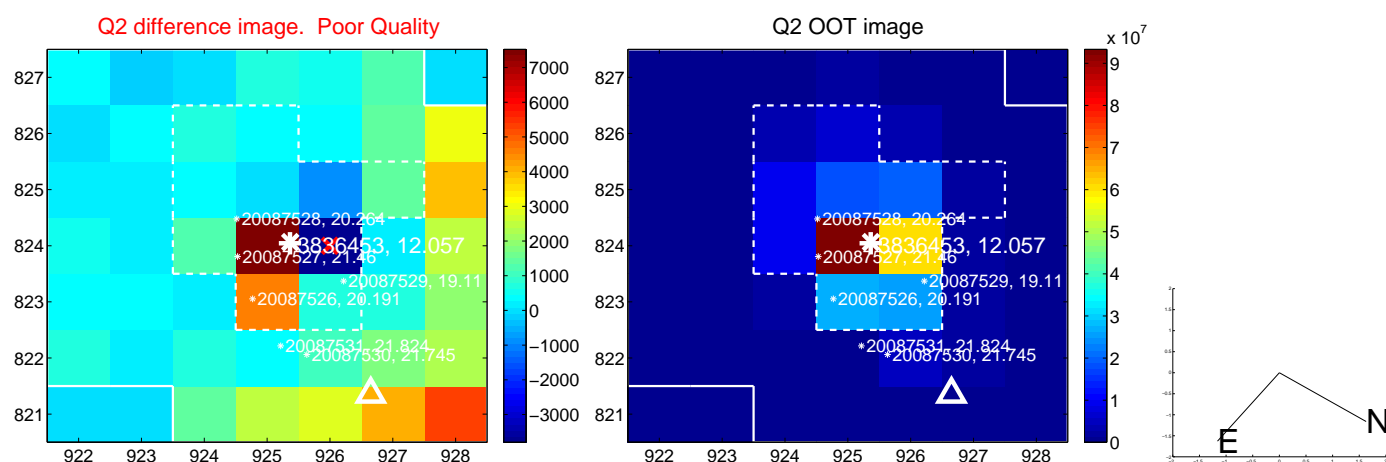
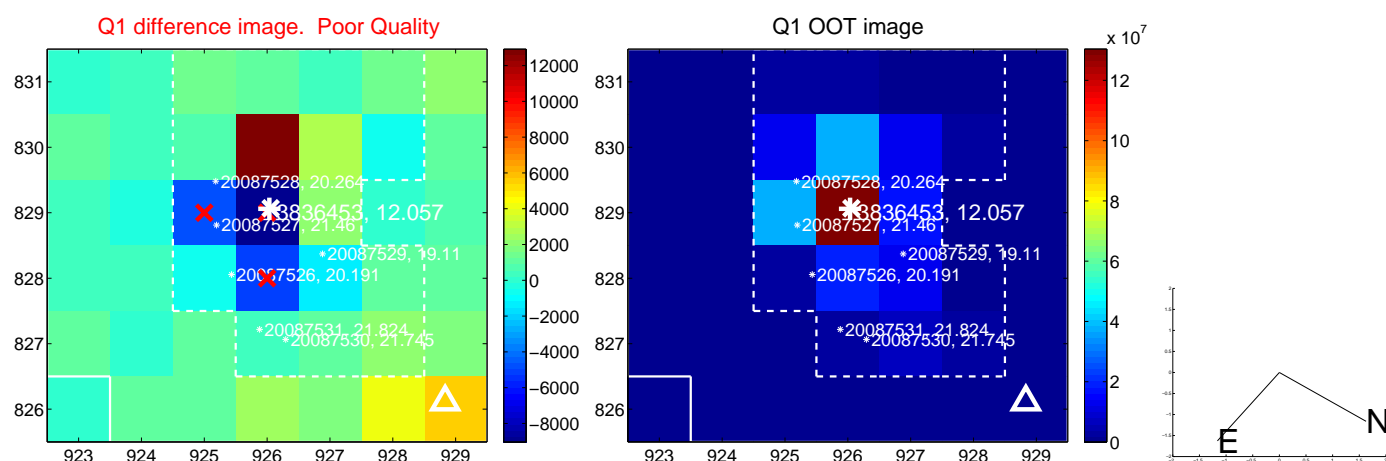
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	13.105 \pm 0.986	13.29	2.111 \pm 1.007	12.934 \pm 0.942
PRF-fit source offset from KIC position	13.132 \pm 0.978	13.43	2.255 \pm 1.043	12.937 \pm 0.934
photometric centroid source offset	17.12 \pm 1.17	14.66	1.53 \pm 1.00	17.05 \pm 1.17

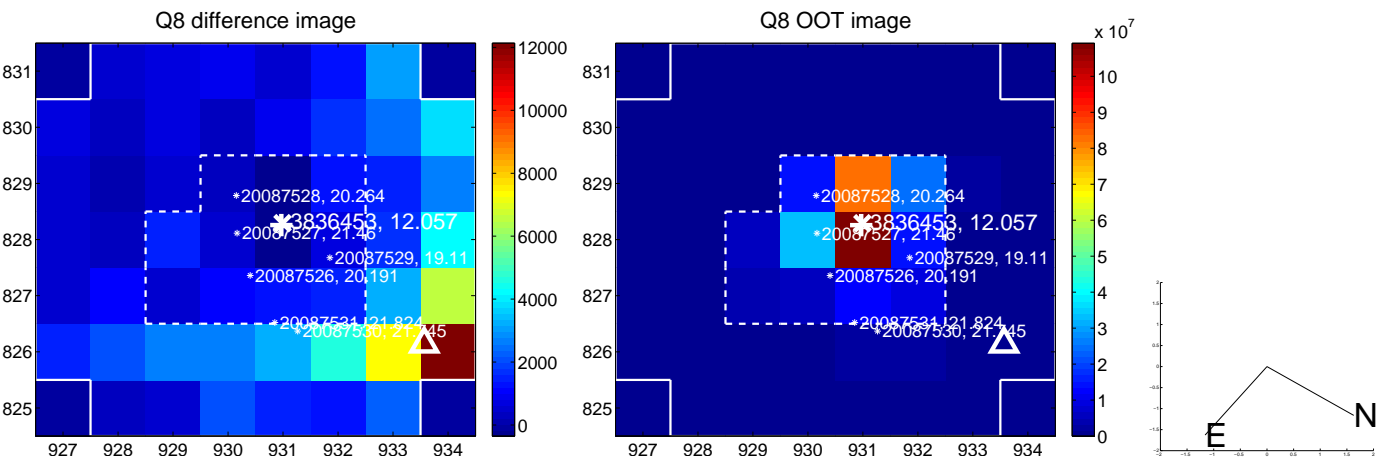
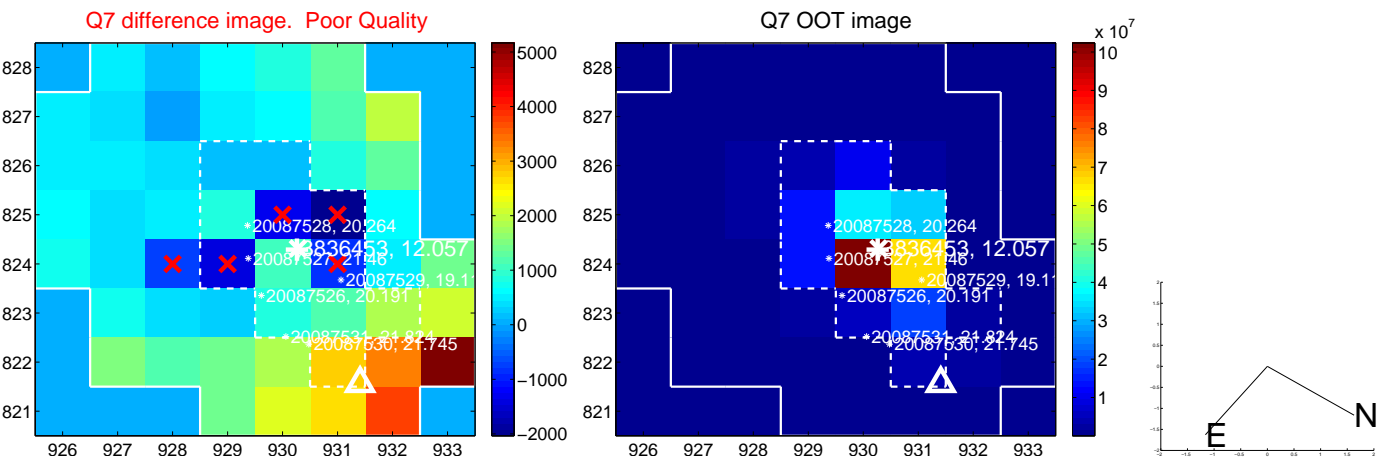
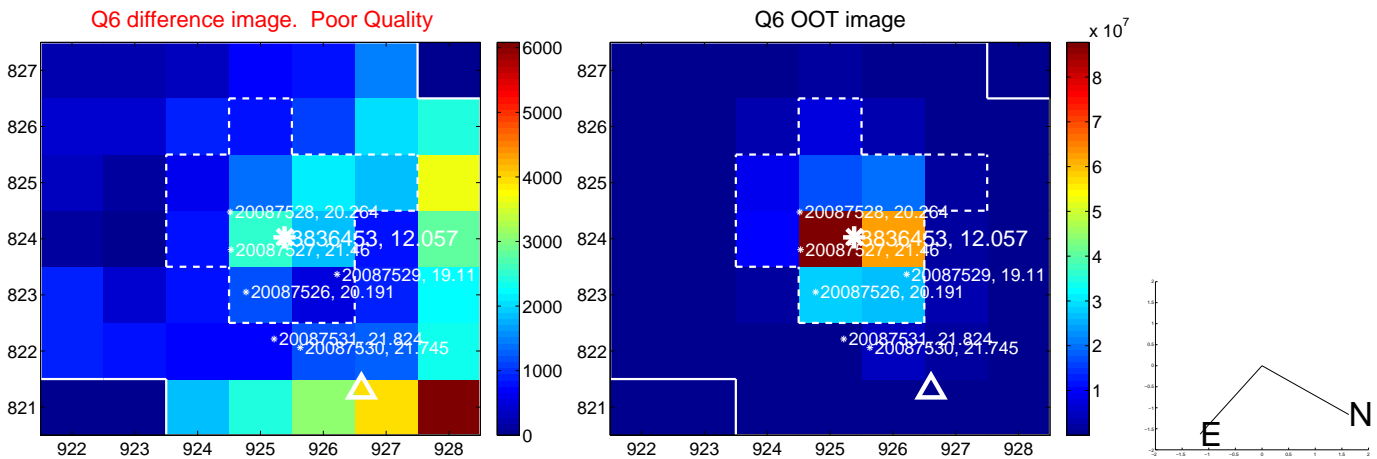
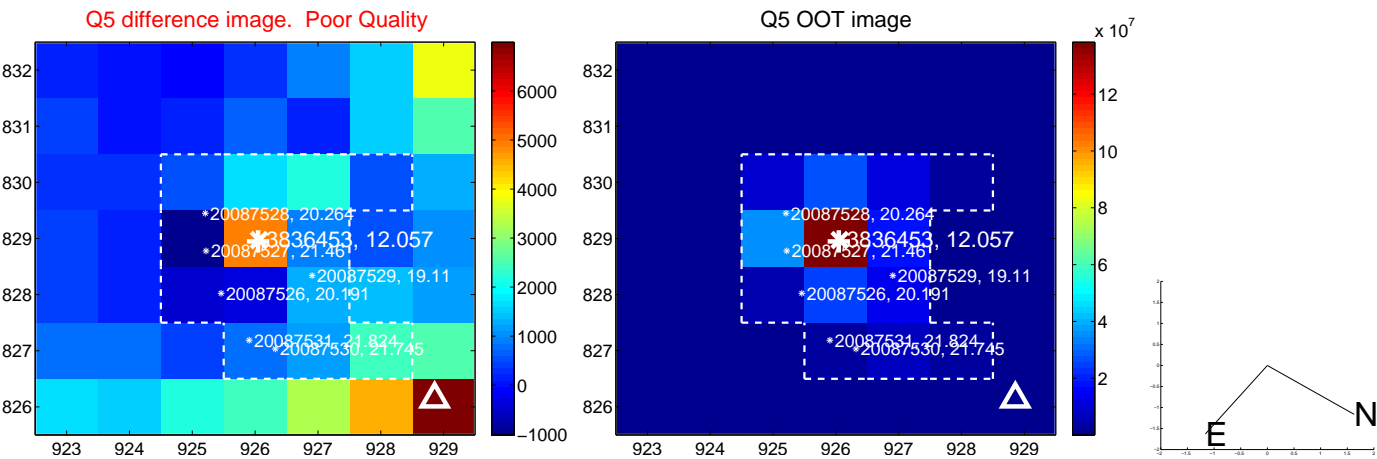


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

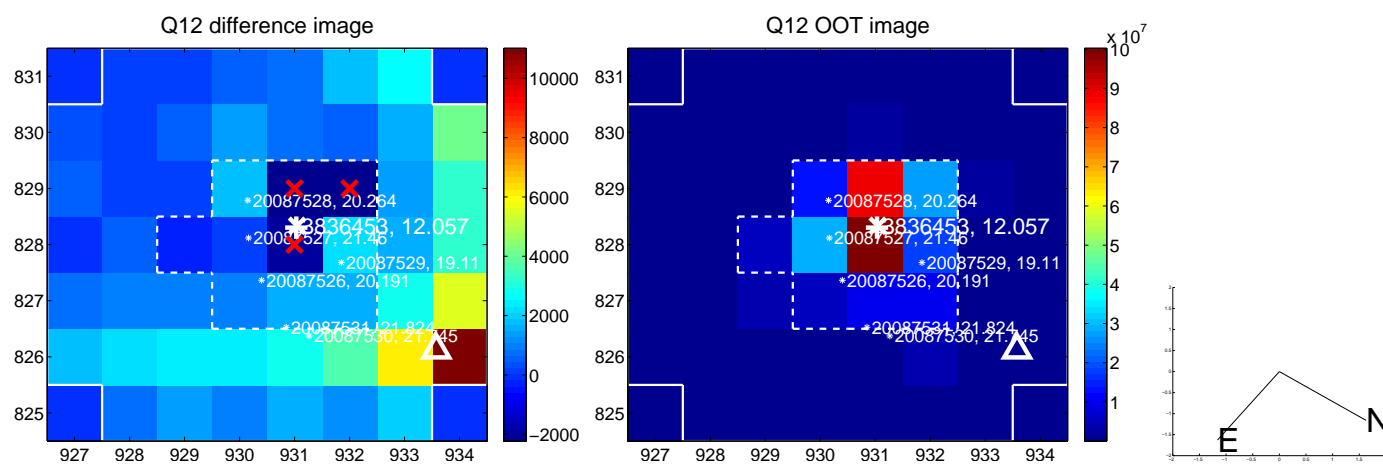
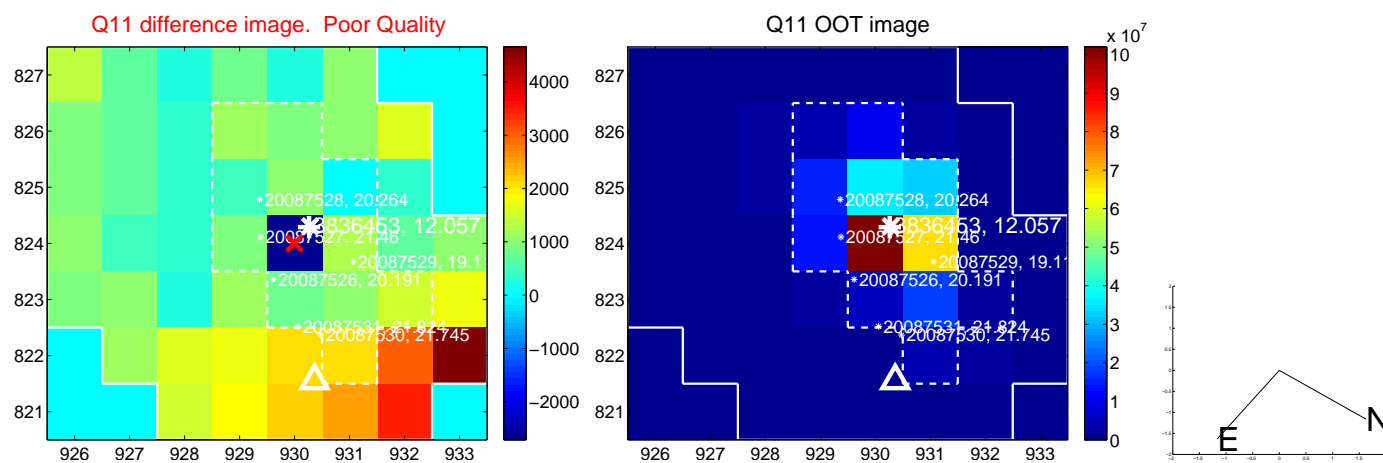
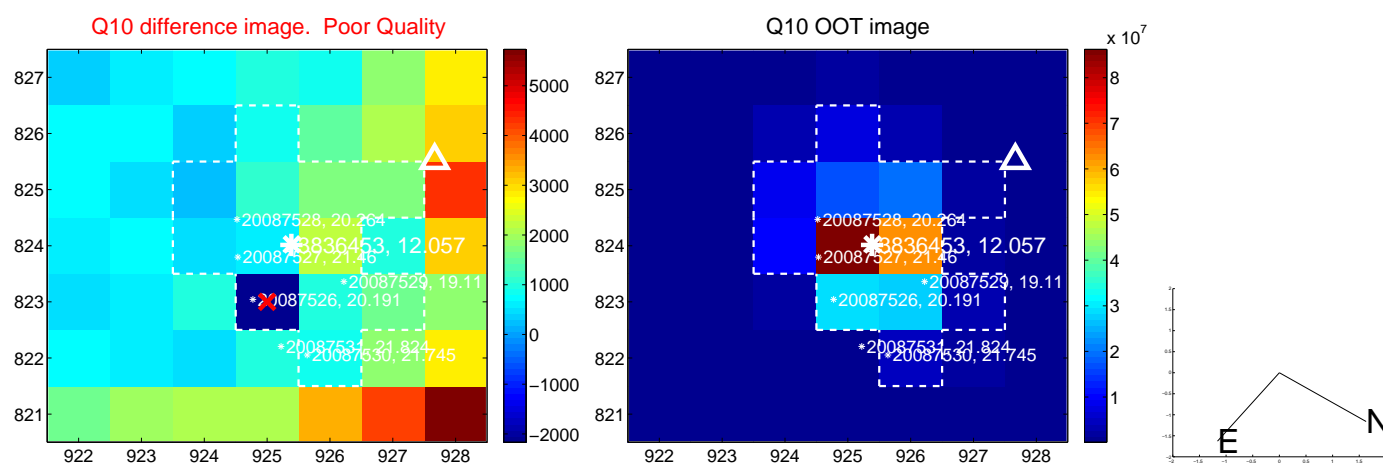
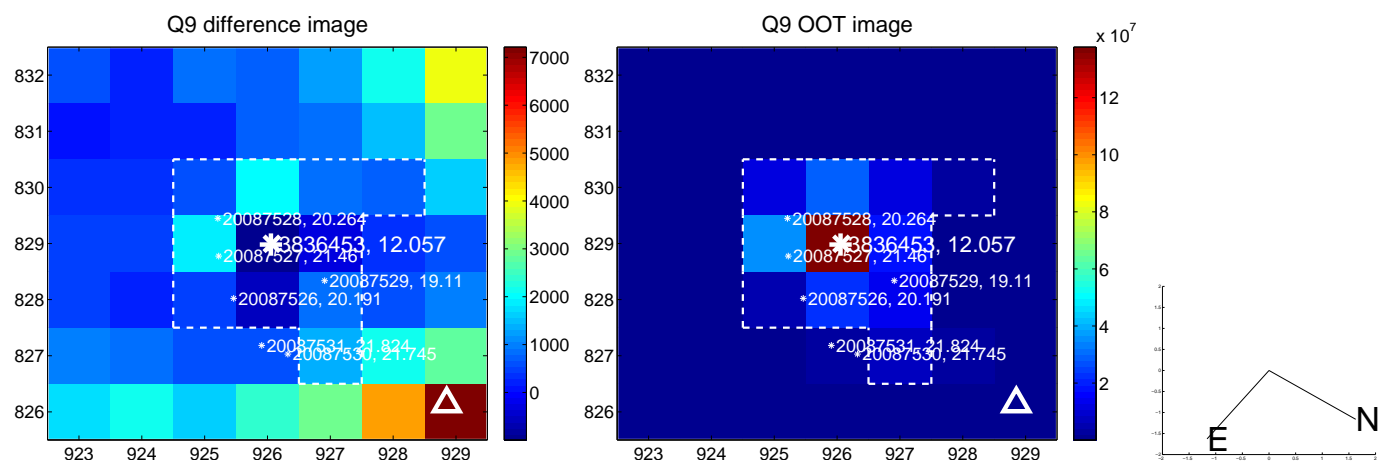
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



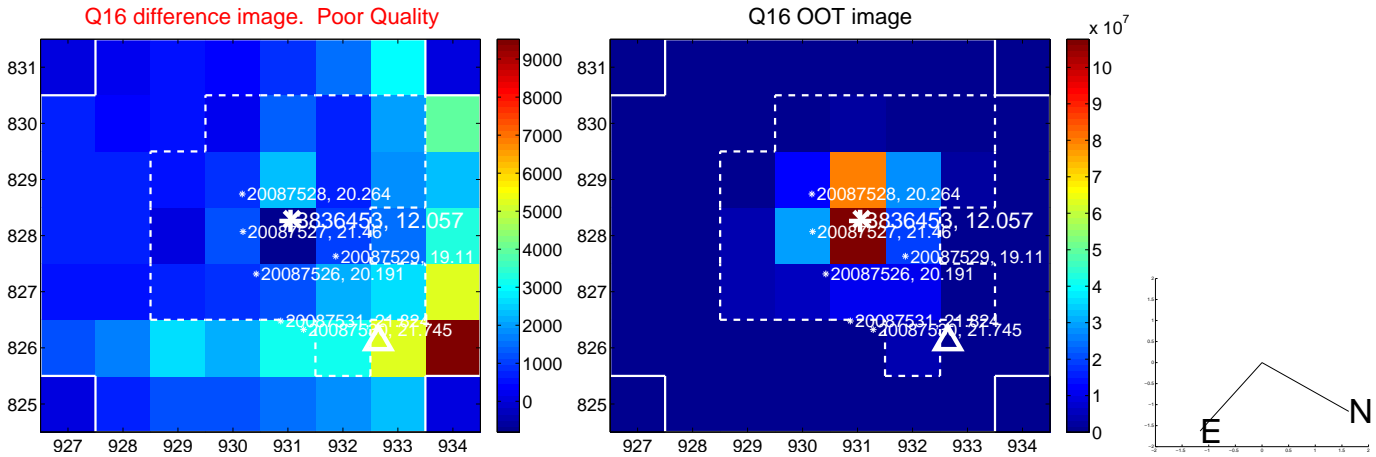
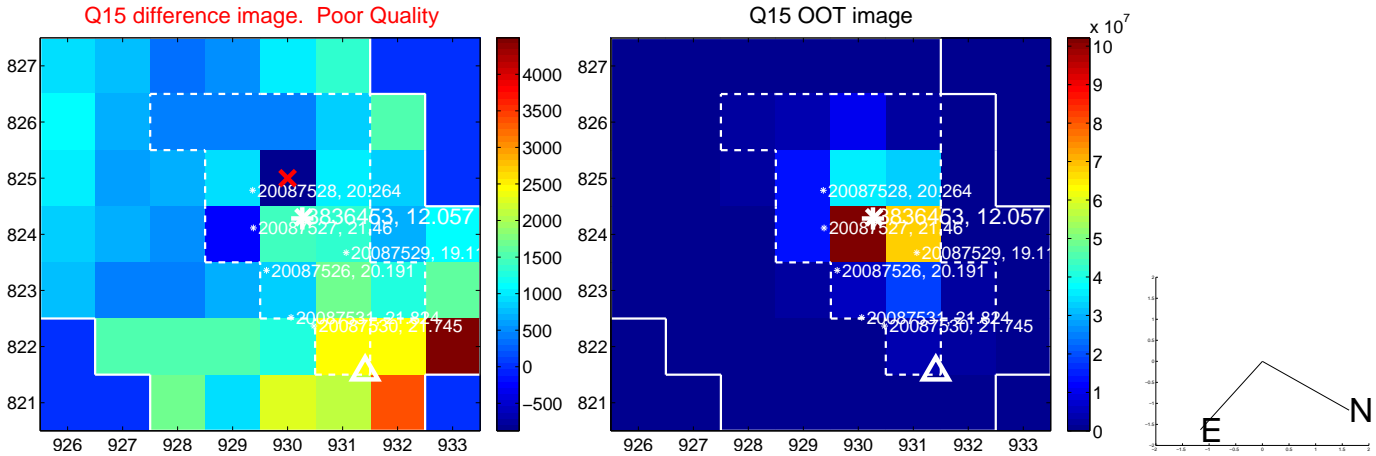
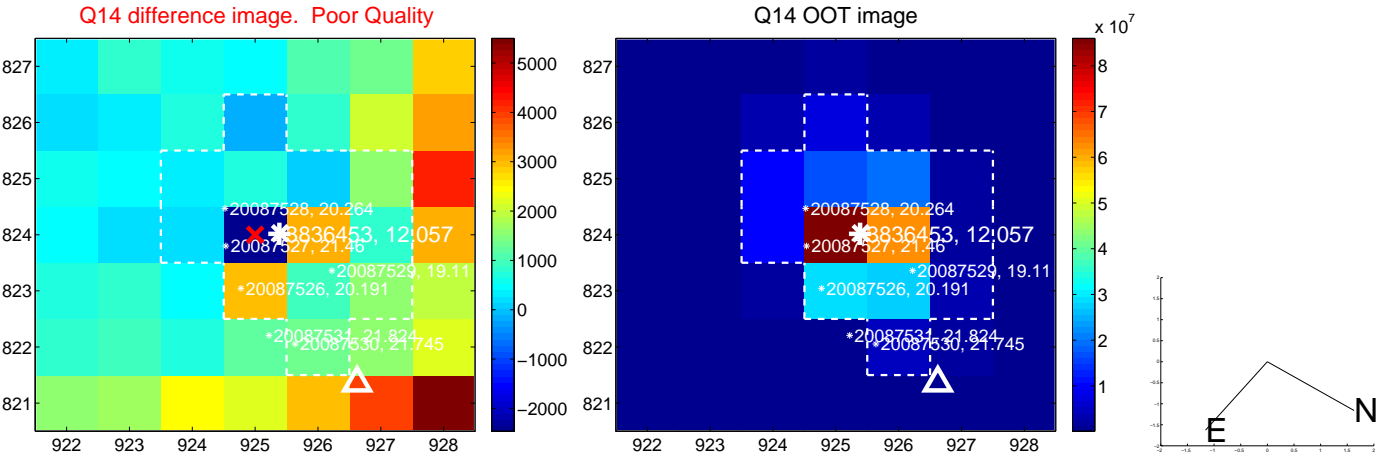
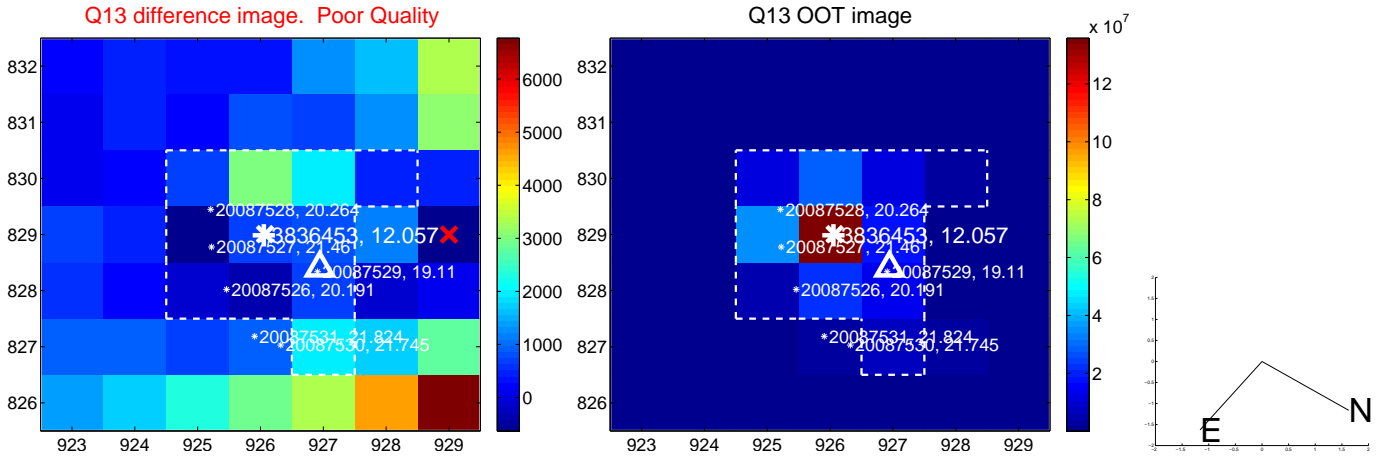
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



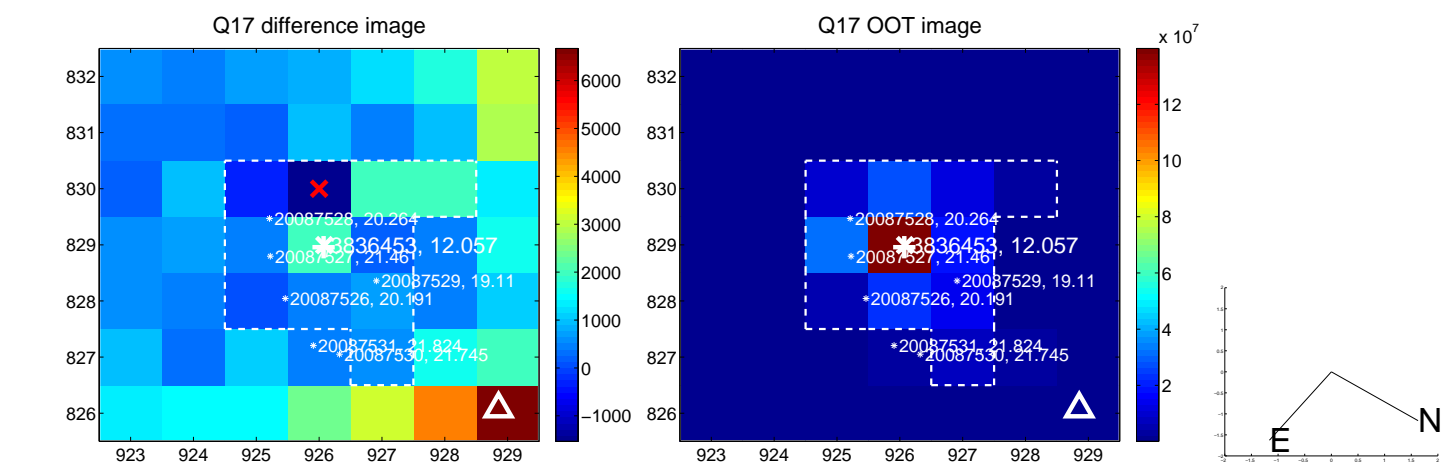
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



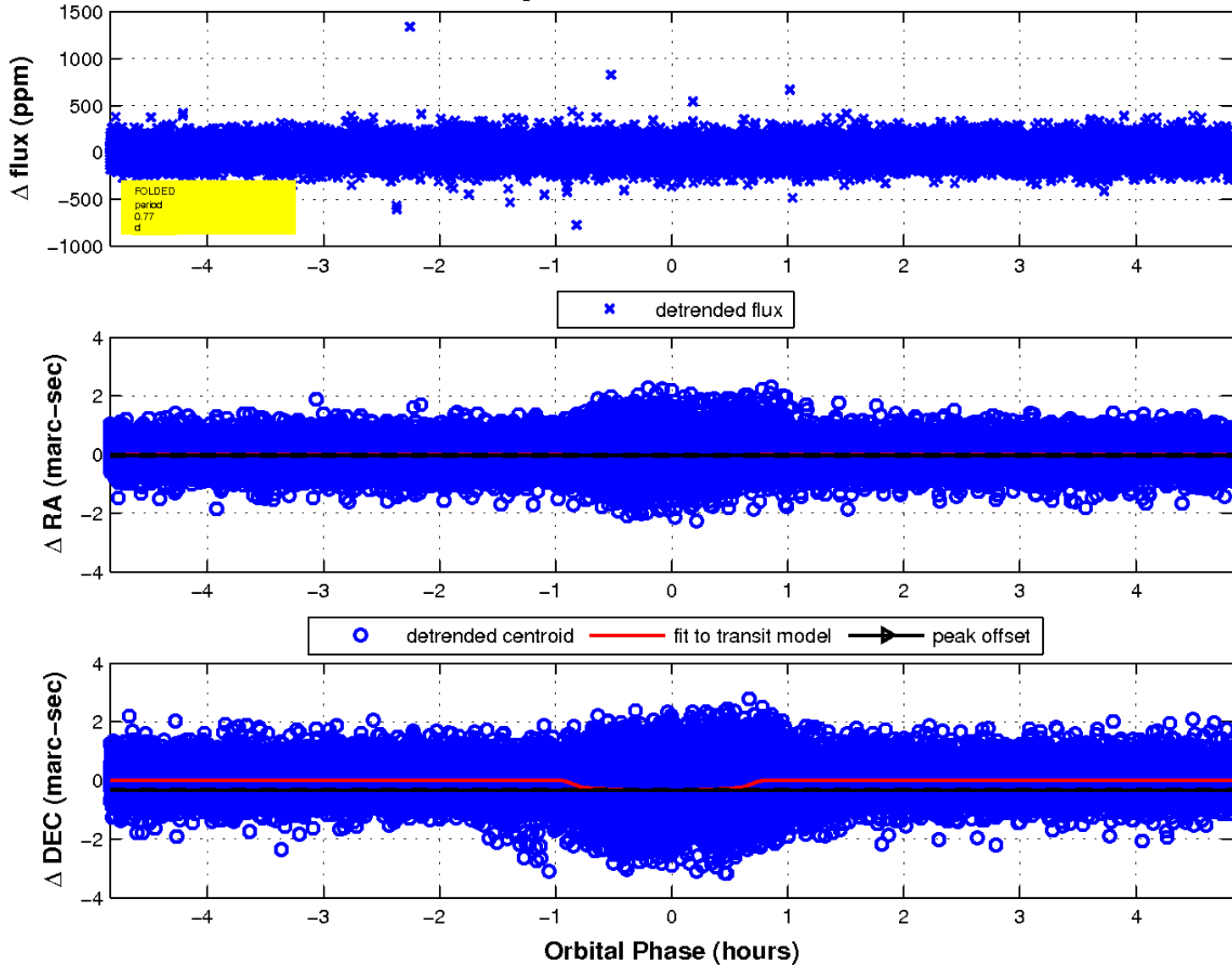
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

