

KIC 011098004

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})
011098004-01	OBS	No	444.566168	307.723061	474.7	5.659	14.4	8.4	1.21	6293	4.13	1.54
011098004-02	OBS	8041.01	7.507998	138.711241	50.2	4.246	8.9	8.9	1.21	6293	1.01	355.52

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011098004-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011098004-02	OBS	FP	0.00	0	0	0	1	CENT_KIC_POS—EPHEM_MATCH

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

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

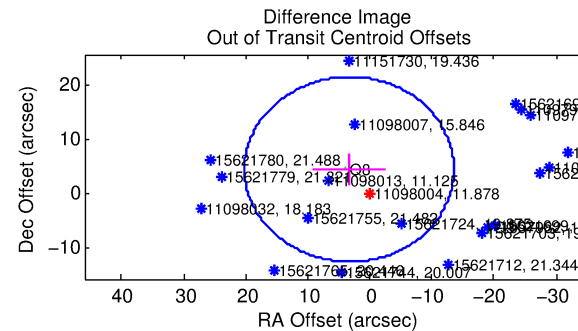
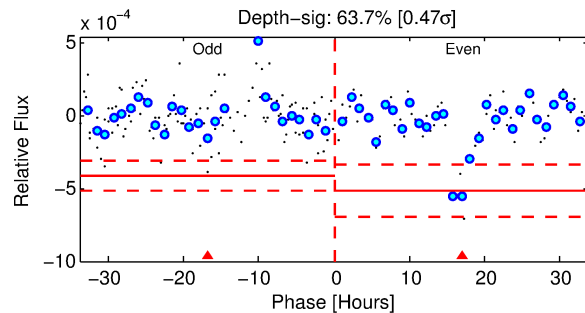
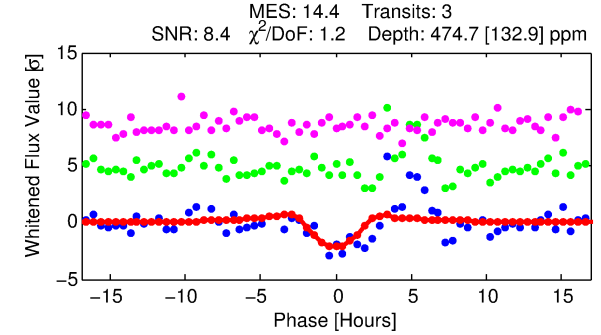
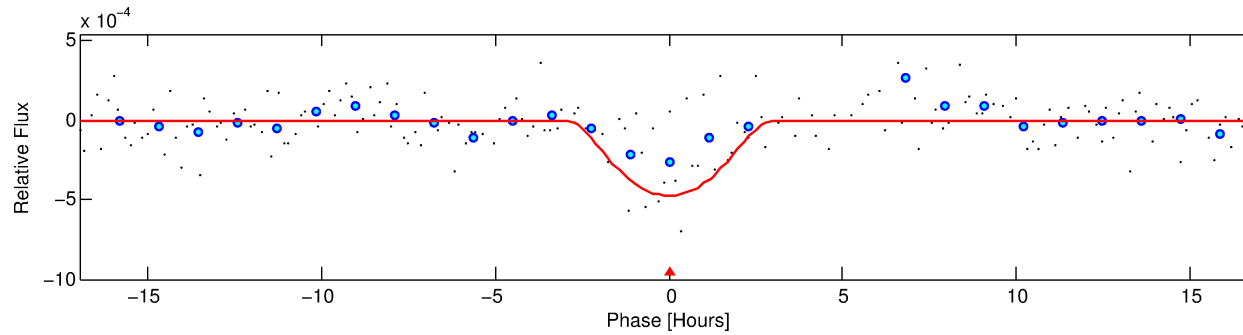
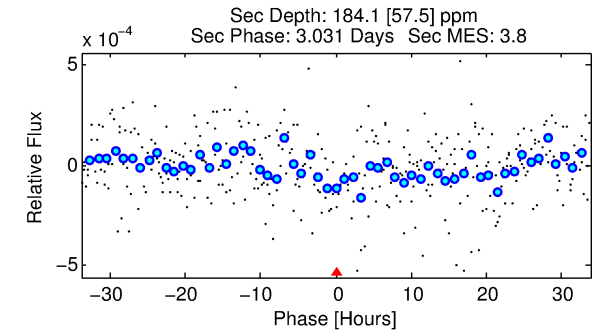
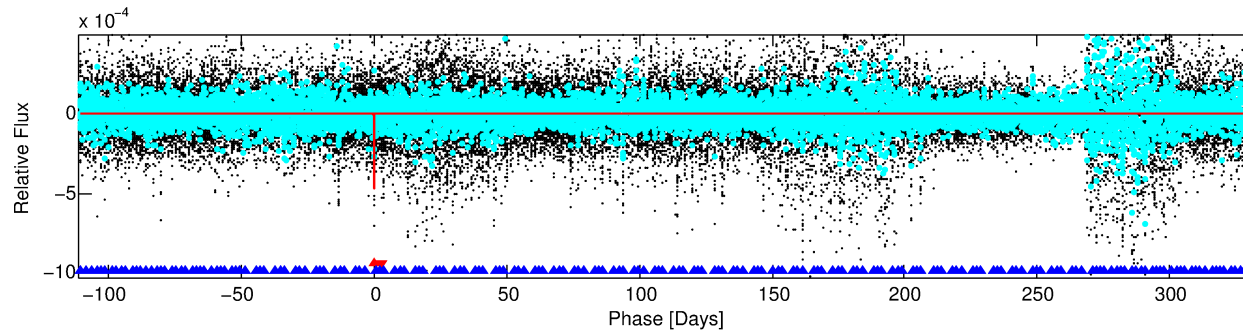
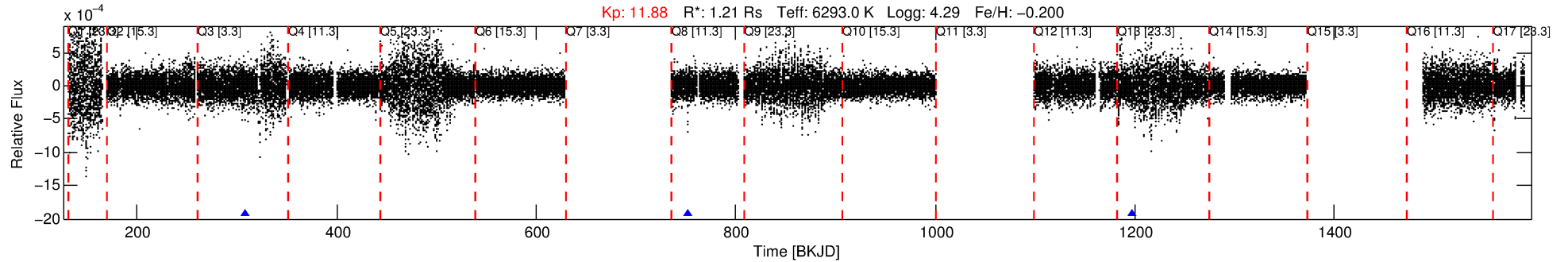
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011098004-01

No Significant Match Found

DV One-Page Summary

KIC: 11098004 Candidate: 1 of 2 Period: 444.566 d



DV Fit Results:

Period = 444.56617 [0.01127] d
Epoch = 307.7231 [0.0164] BKJD
Rp/R* = 0.0312 [0.0495]
a/R* = 178.61 [110.10]
b = 0.99 [0.09]
Seff = 1.54 [0.60]
Teq = 284 [27] K
Rp = 4.13 [6.68] Re
a = 1.1585 [0.2982] AU
Ag = 7952.46 [25508.84] [0.31σ]
Teffp = 4148 [3306] K [1.17σ]

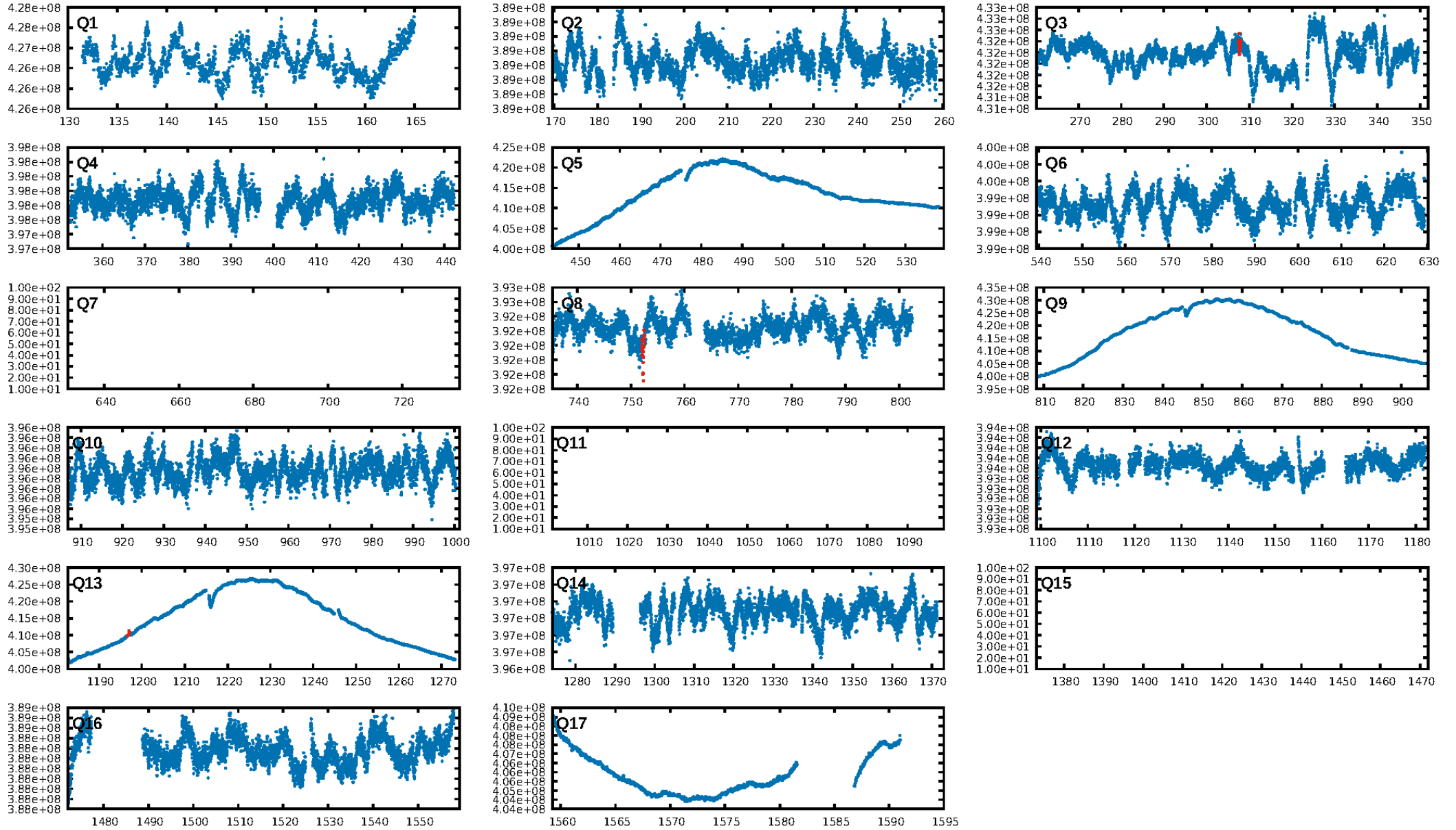
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1482.60σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 22.3%
ModelChiSquareGof-sig: 78.1%
Bootstrap-pfa: 4.25e-19
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.7874
Centroid-sig: 49.9%
Centroid-so: 2.502 arcsec [4.60σ]
OotOffset-rm: 5.605 arcsec [1.00σ]
KicOffset-rm: 6.787 arcsec [0.65σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

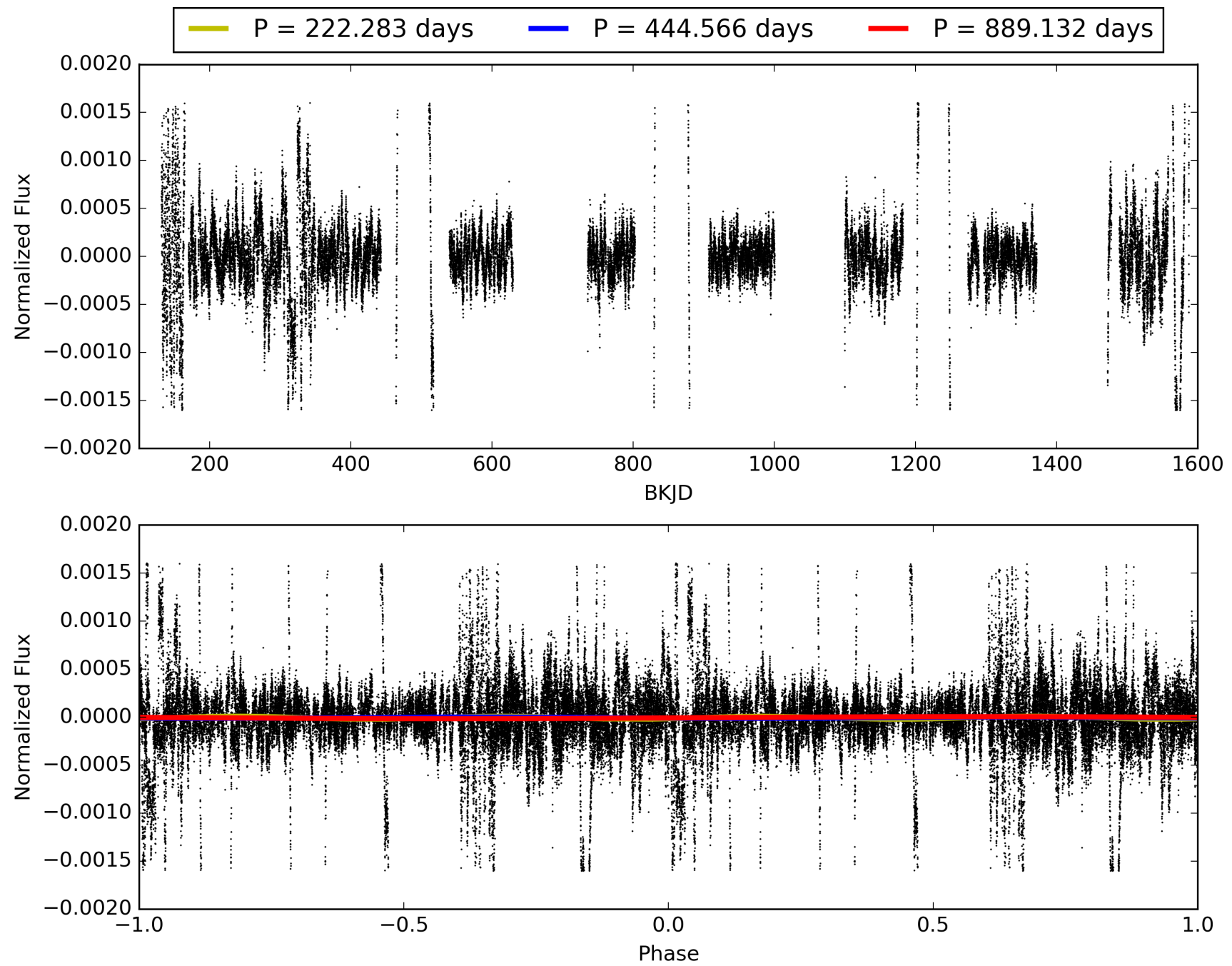
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:07:48 Z

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

TCE 011098004-01, PDC Light Curves

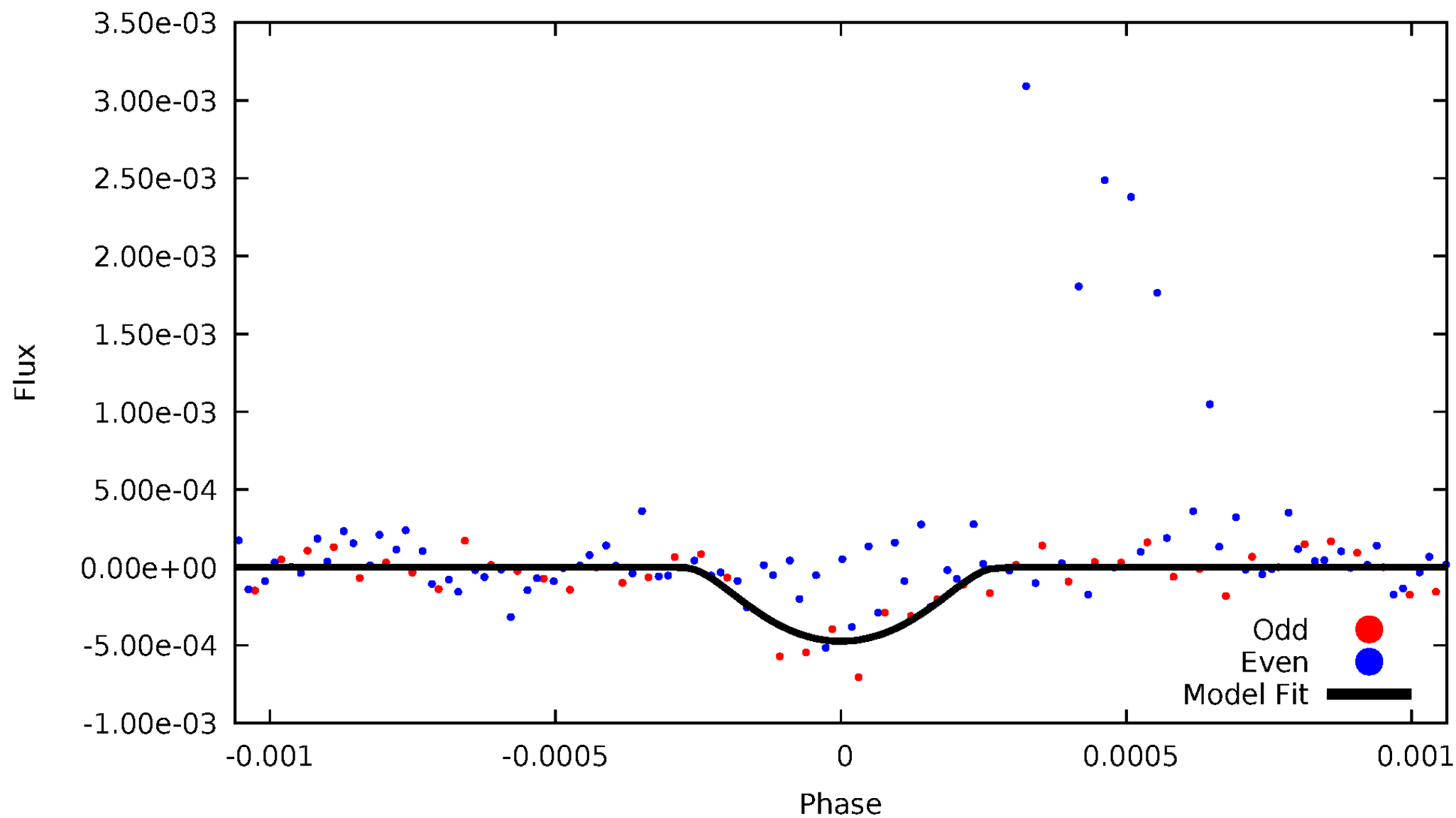


TCE 011098004-01



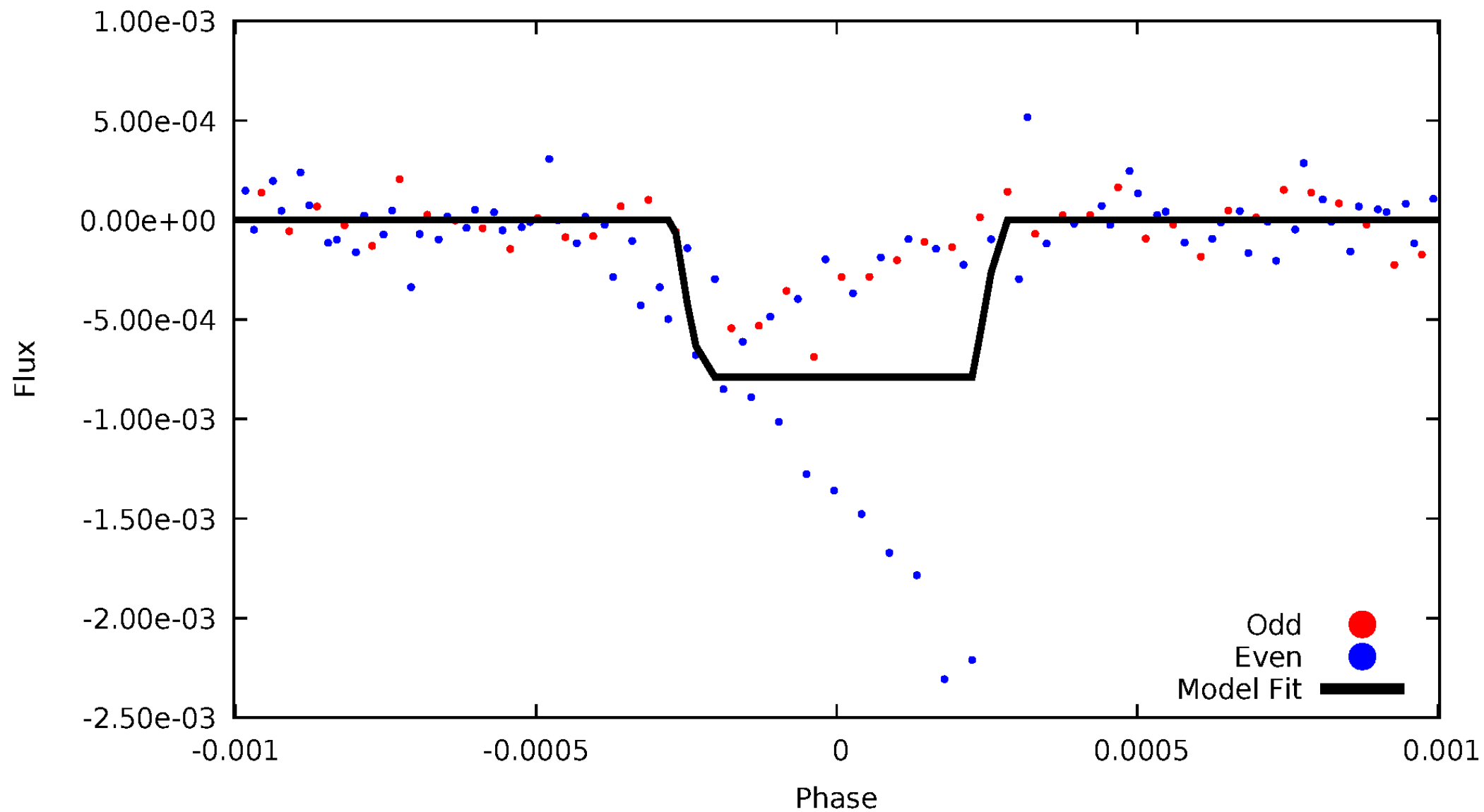
DV Odd/Even

TCE 011098004-01

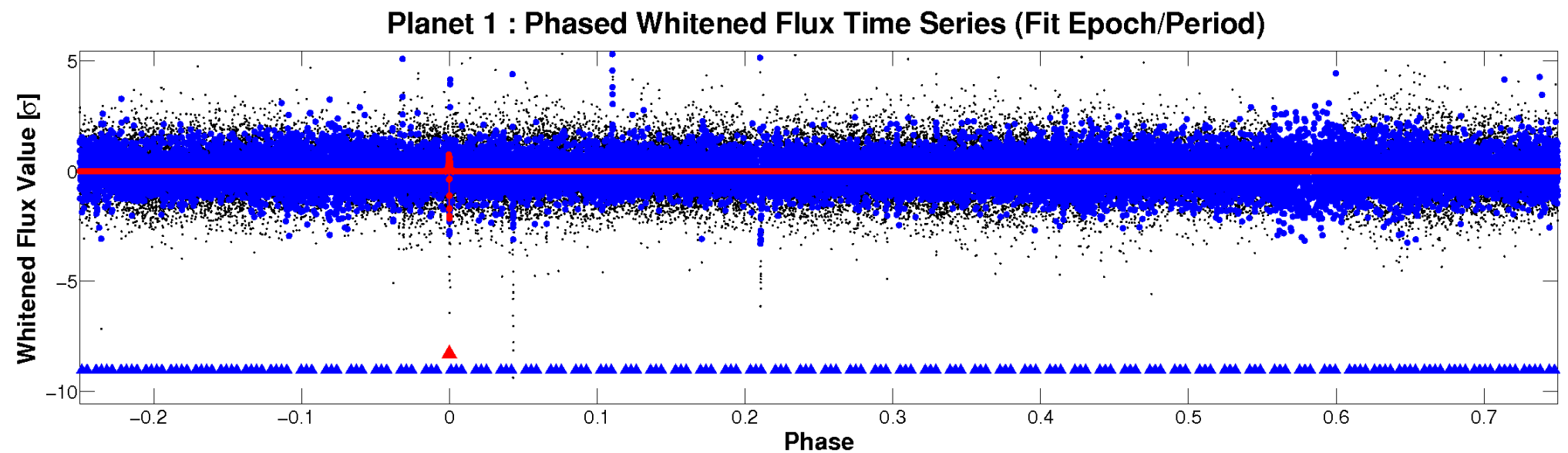
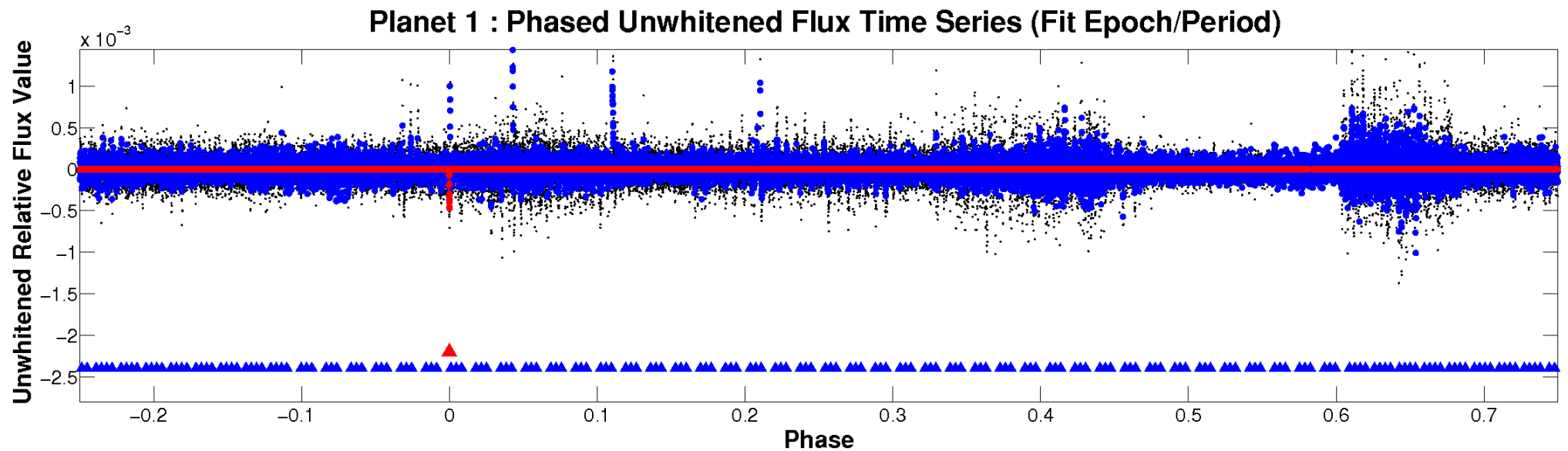


ALT Odd/Even

TCE 011098004-01

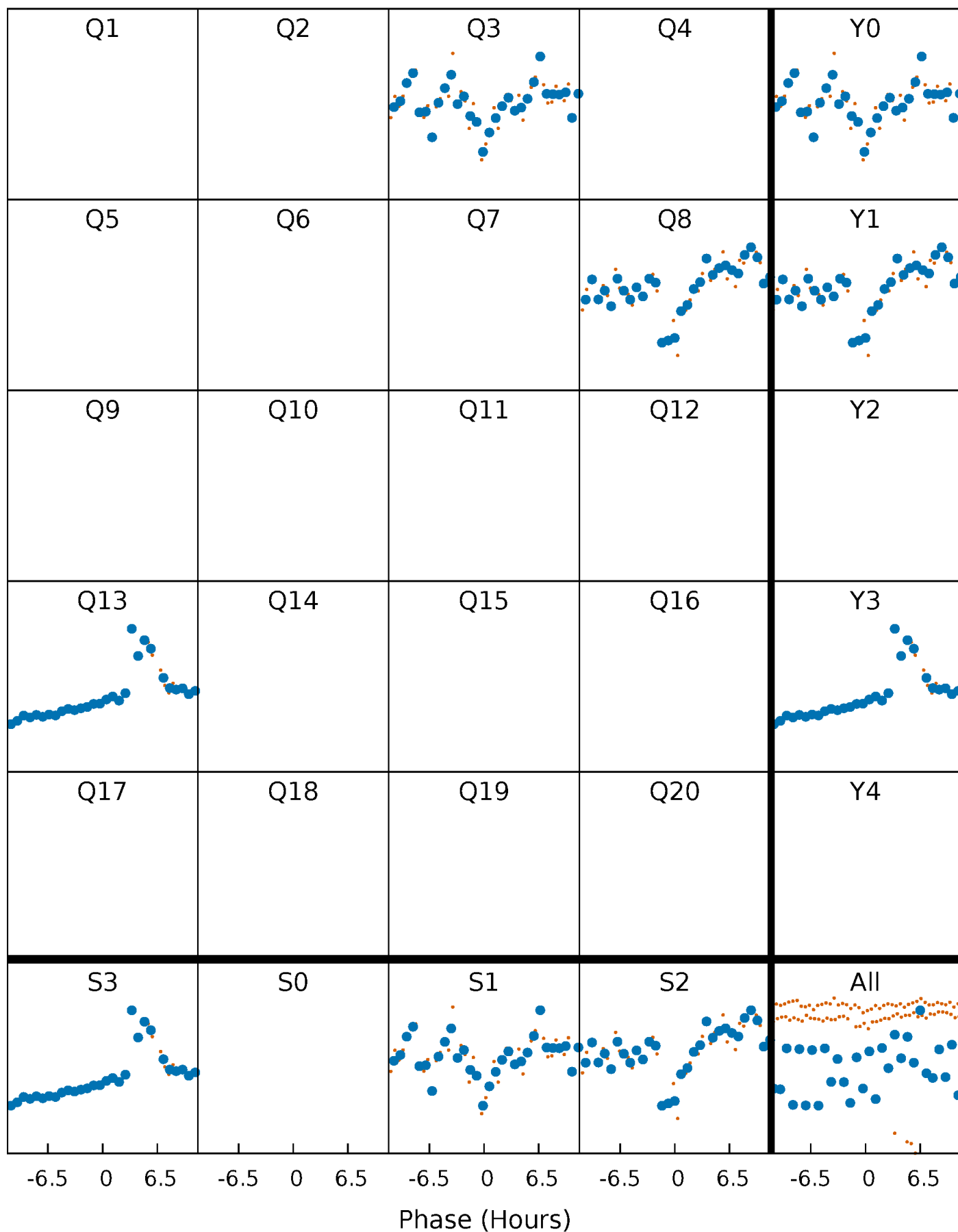


Non-Whitened Vs. Whitened Light Curve



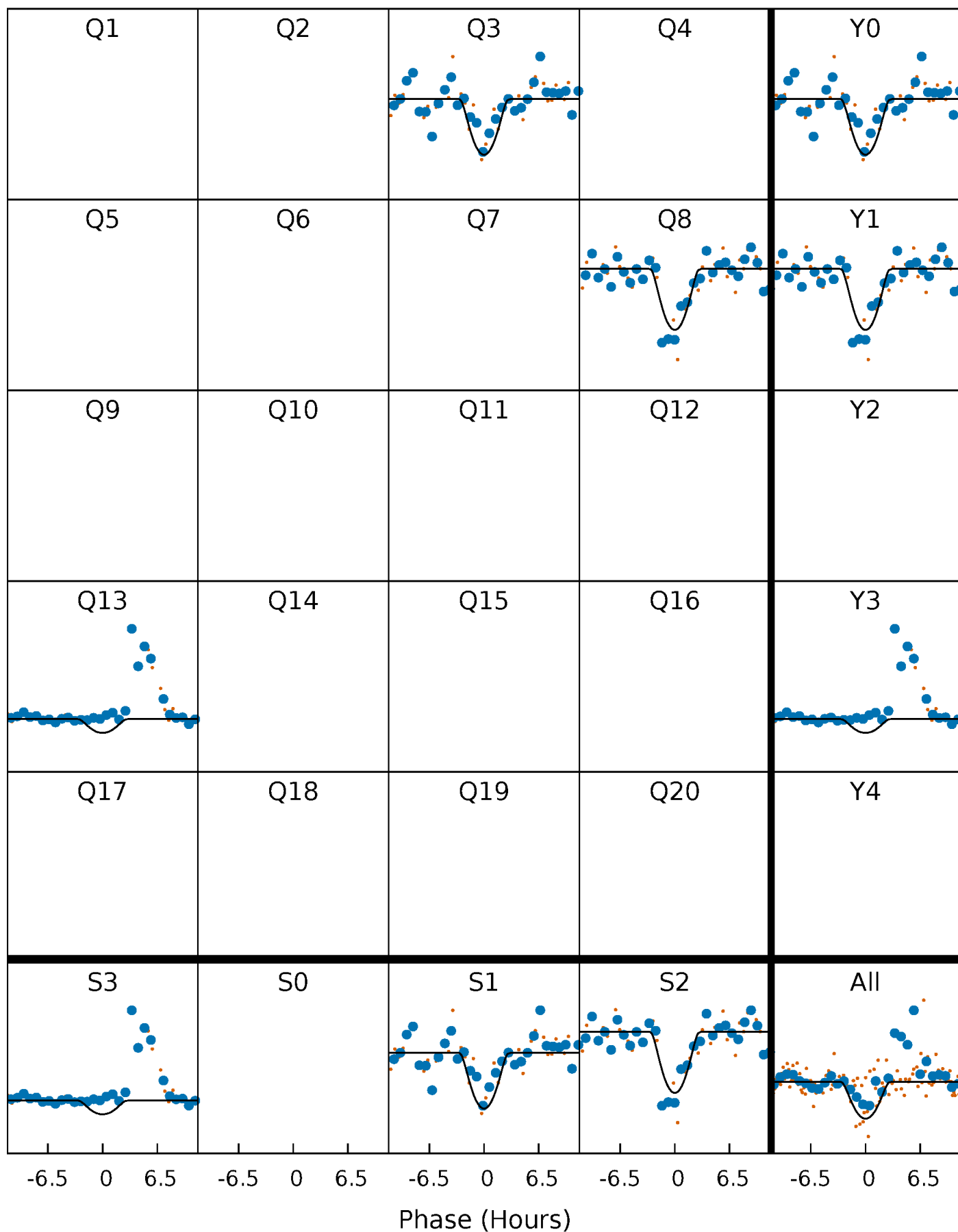
PDC Quarter-Phased Transit Curves

TCE 011098004-01 P=444.566168 Days $T_0=307.723061$ (BKJD)



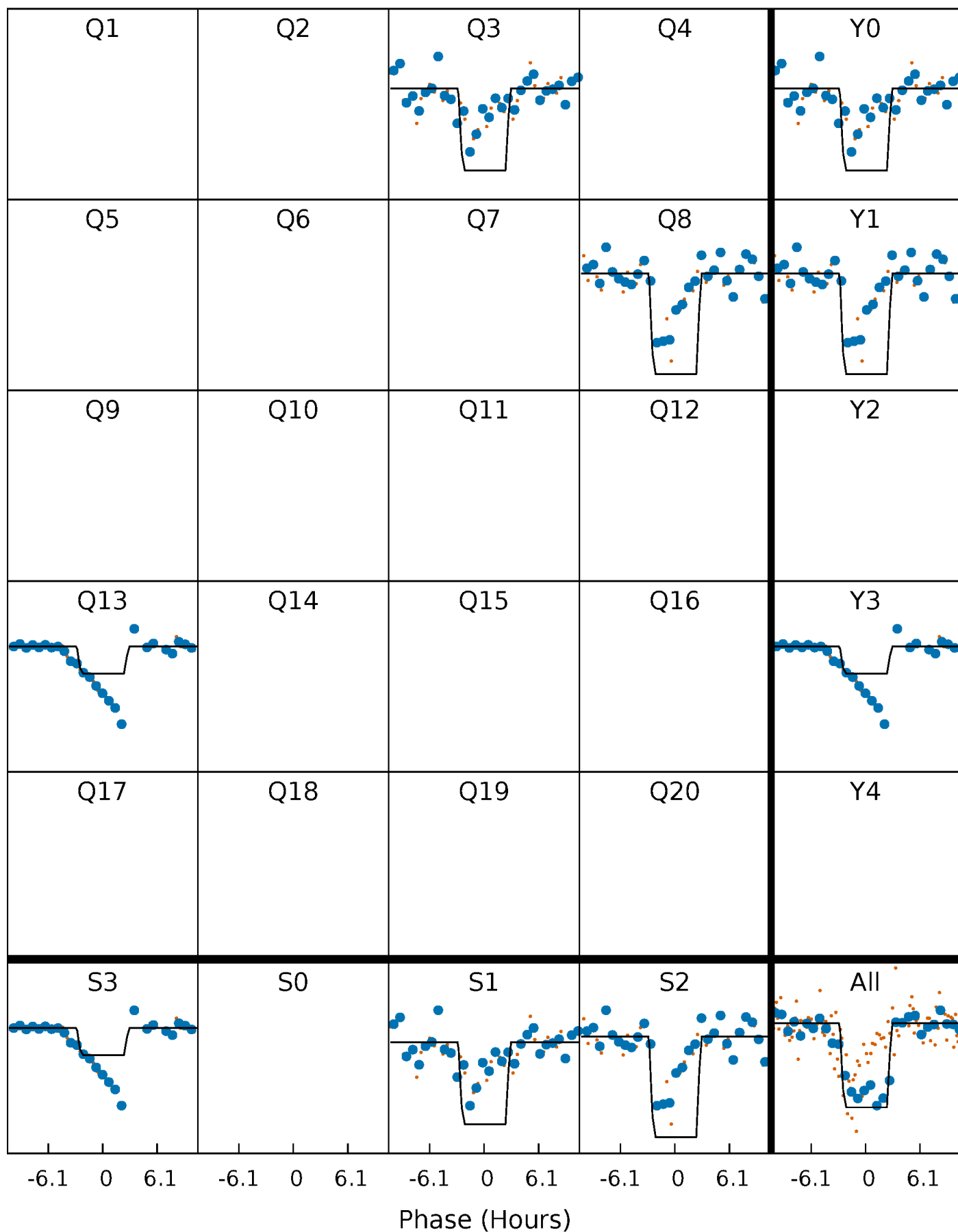
DV Quarter-Phased Transit Curves

TCE 011098004-01 P=444.566168 Days $T_0=307.723061$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

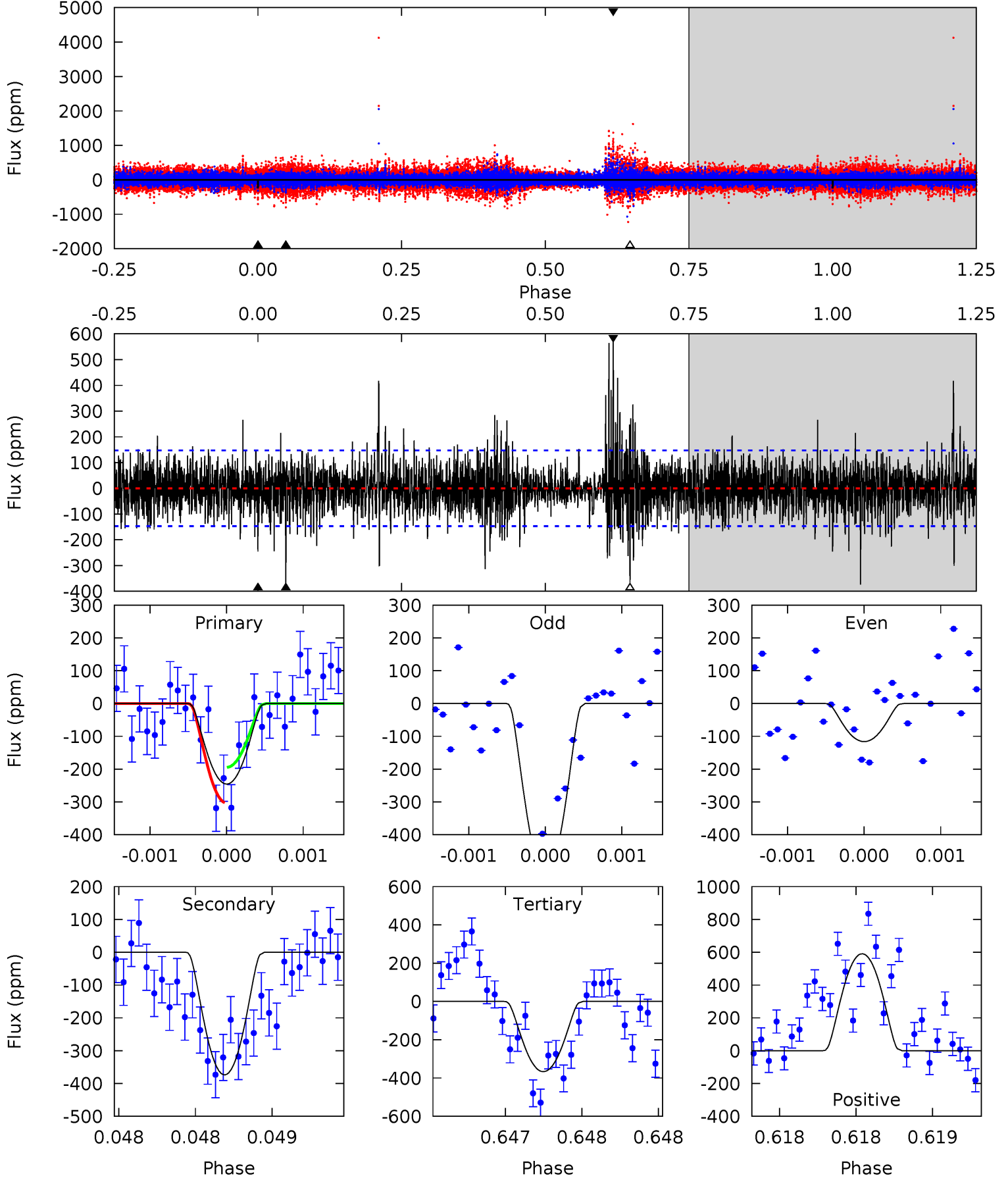
TCE 011098004-01 P=444.538909 Days $T_0=307.780736$ (BKJD)



DV Model-Shift Uniqueness Test

011098004-01, P = 444.566168 Days, E = 307.723061 Days

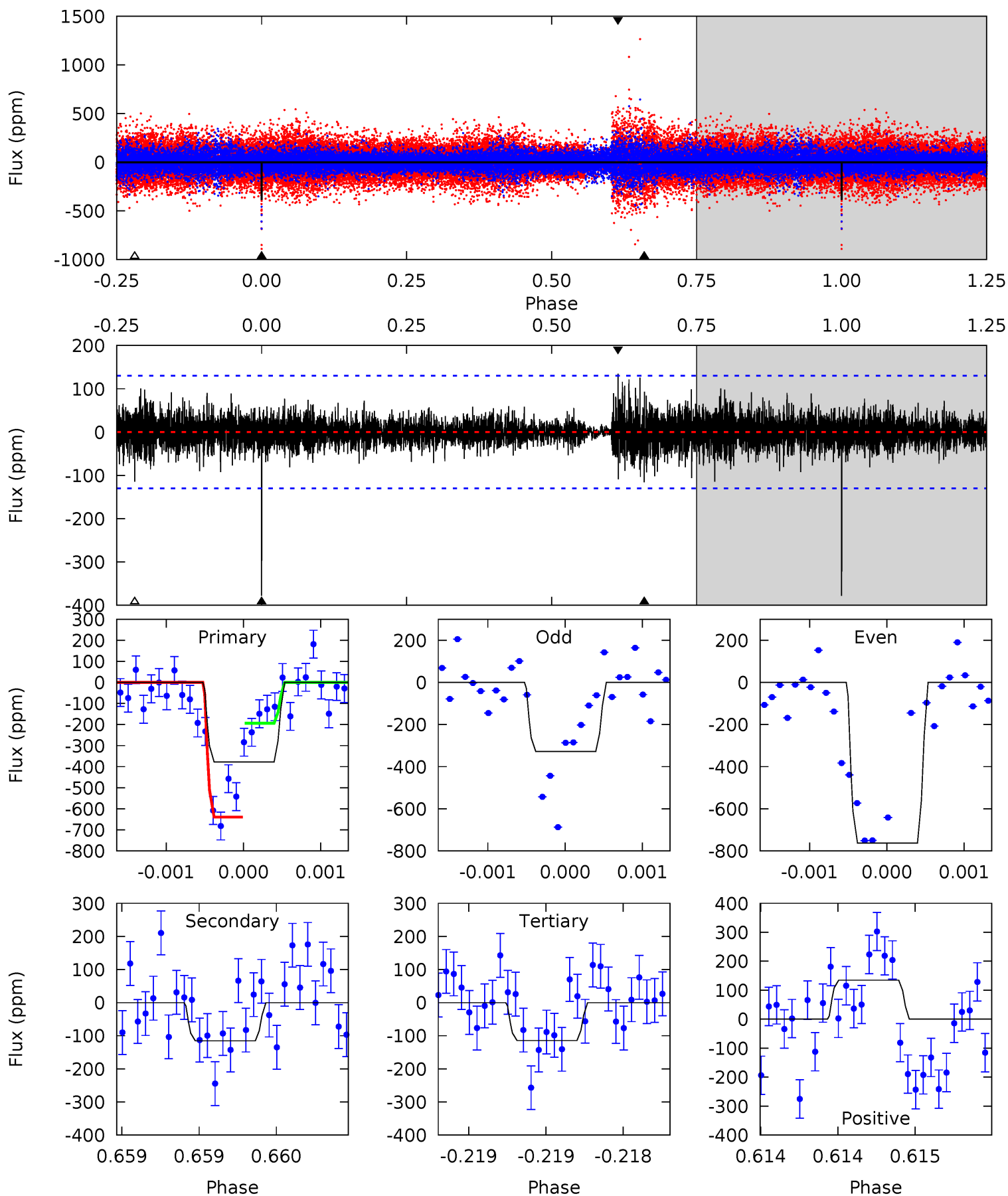
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.27	14.1	13.8	22.3	5.55	3.45	2.62	-4.56	-13.0	0.27	-8.19	6.12	0.79	0.61	2.05



Alt Model-Shift Uniqueness Test

011098004-01, P = 444.538909 Days, E = 307.780736 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	4.94	4.89	5.76	5.56	3.46	1.03	11.3	10.4	0.05	-0.82	10.2	2.11	0.26	9.46



Stellar Parameters For KIC 011098004

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6293^{+150}_{-188}	$4.291^{+0.132}_{-0.198}$	$-0.200^{+0.250}_{-0.300}$	$1.213^{+0.378}_{-0.204}$	$1.045^{+0.185}_{-0.108}$	$0.825^{+0.513}_{-0.424}$
	+2%/-3%	+3%/-5%	+125%/-150%	+31%/-17%	+18%/-10%	+62%/-51%
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 011098004-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-374 ± 26	$6.69^{+6.33}_{-4.44}$	399^{+29}_{-24}	4184^{+2929}_{-800}	6122^{+46595}_{-4465}
Alt.	-116 ± 23	$6.55^{+5.70}_{-4.46}$	401^{+29}_{-26}	3465^{+1895}_{-600}	1973^{+17877}_{-1440}

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 $A_{obs} \gg 1.0$

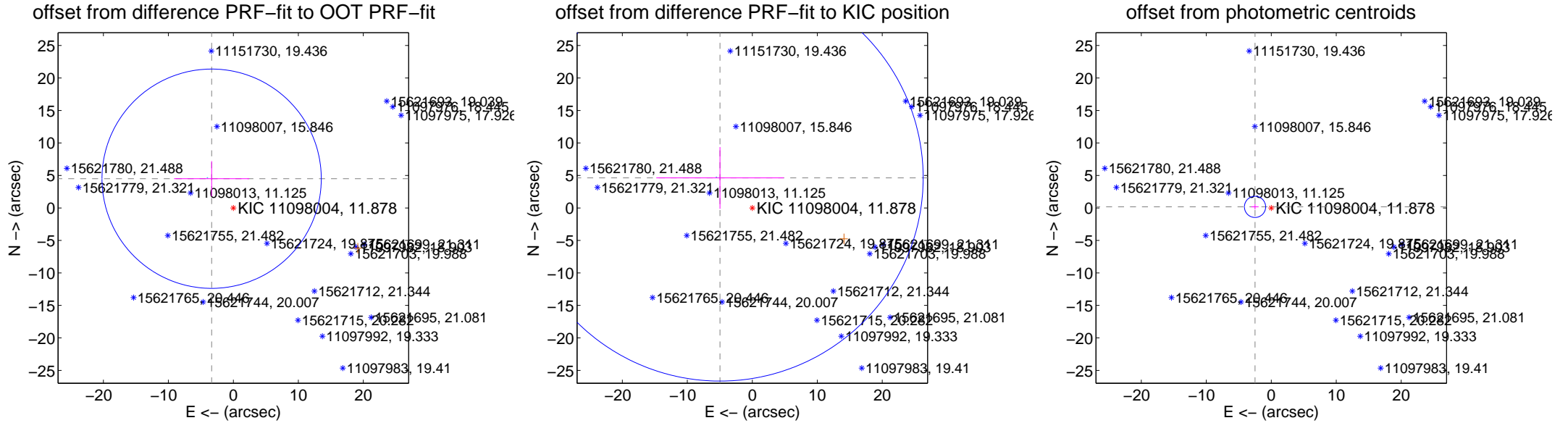
DV Centroid Data

Supplemental centroid analysis for 011098004-01. **Kepler magnitude: 11.88.** Transit SNR 8.38

There are 1 quarters with good PRF difference image offsets

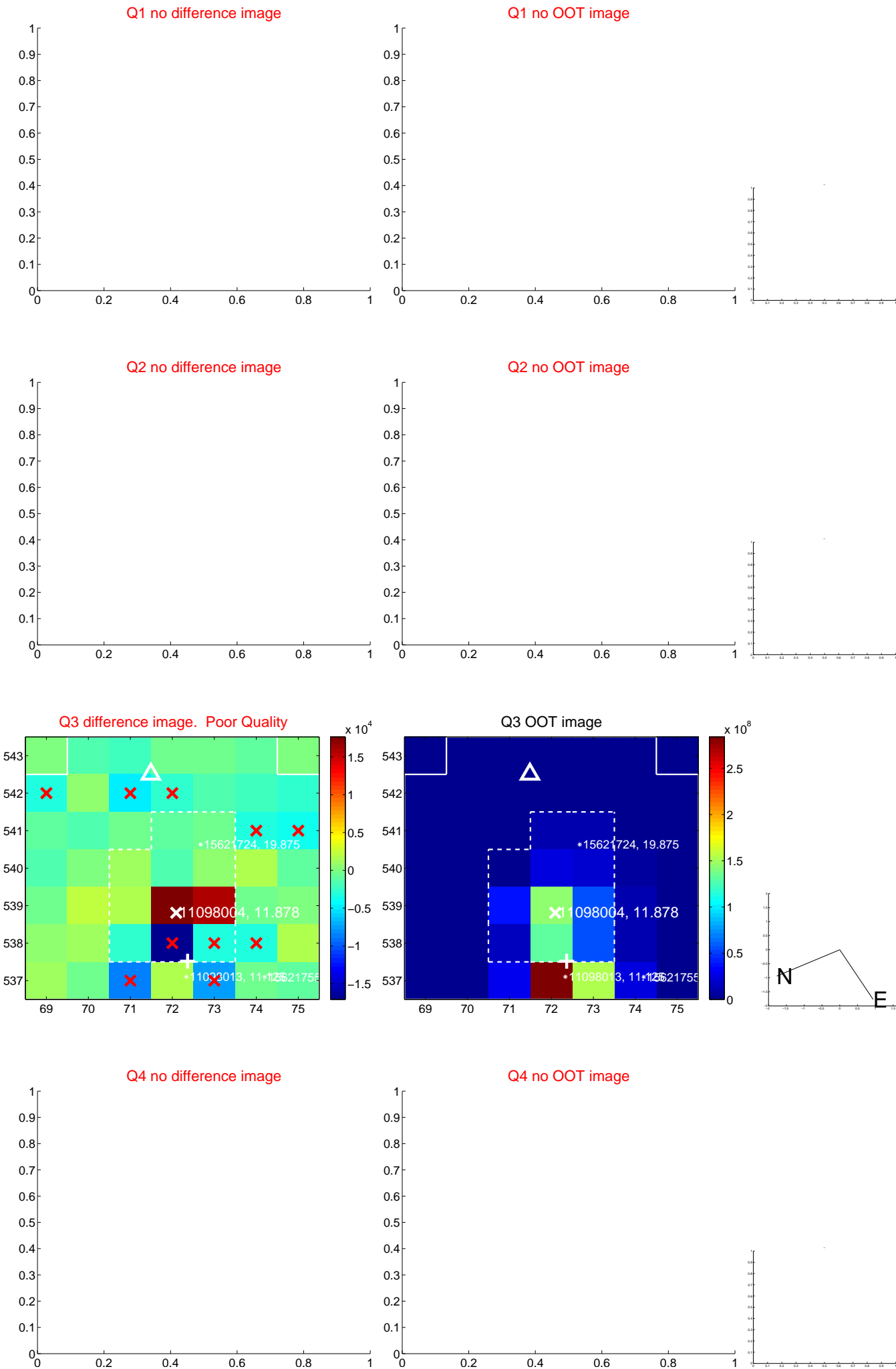
The direct PRF centroid is offset from the target star catalog position by about 1.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.605 ± 5.625	1.00	3.342 ± 5.787	4.500 ± 2.710
PRF-fit source offset from KIC position	6.787 ± 10.423	0.65	4.970 ± 9.815	4.623 ± 4.752
photometric centroid source offset	2.50 ± 0.54	4.60	2.50 ± 0.54	0.17 ± 0.41

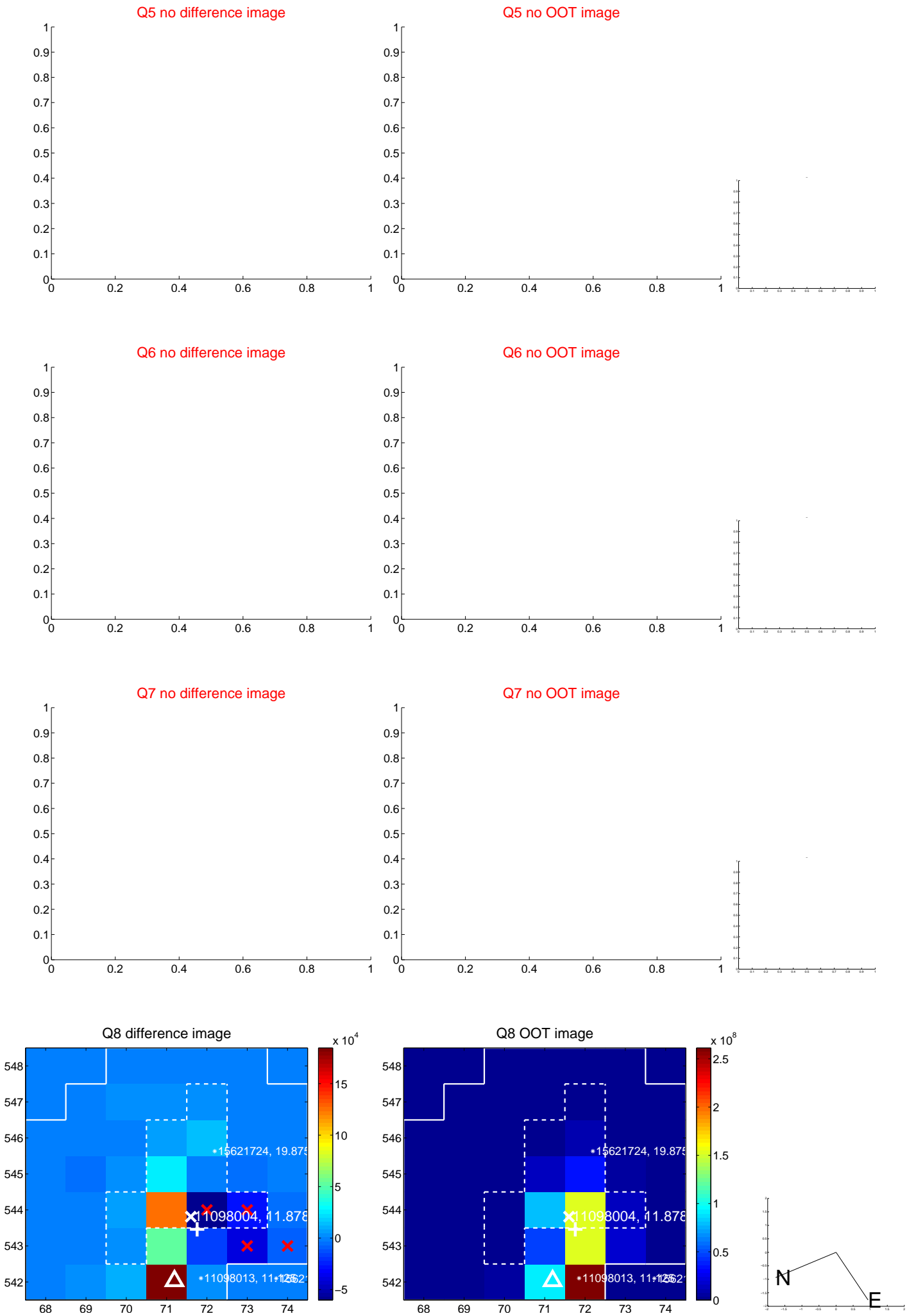


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



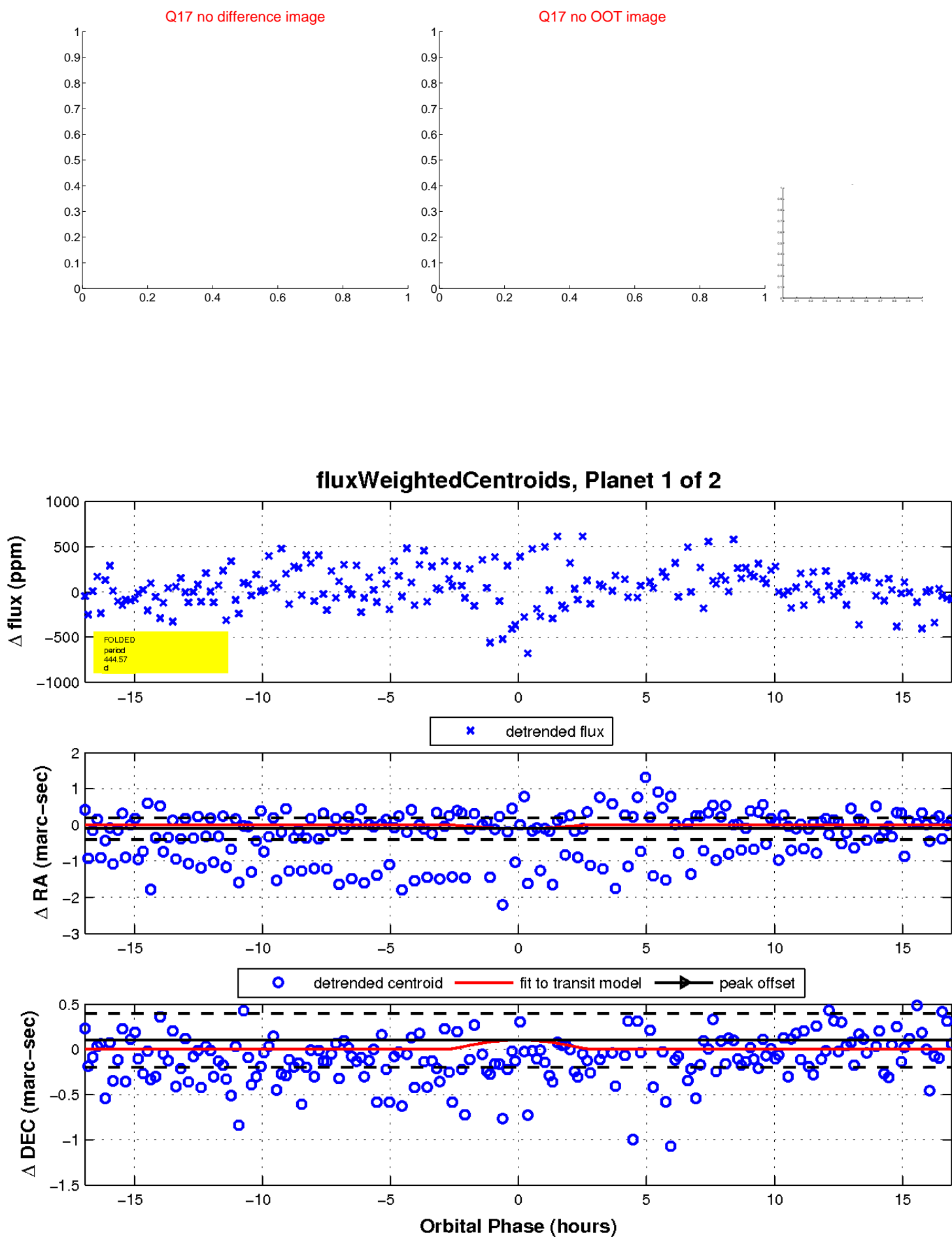
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

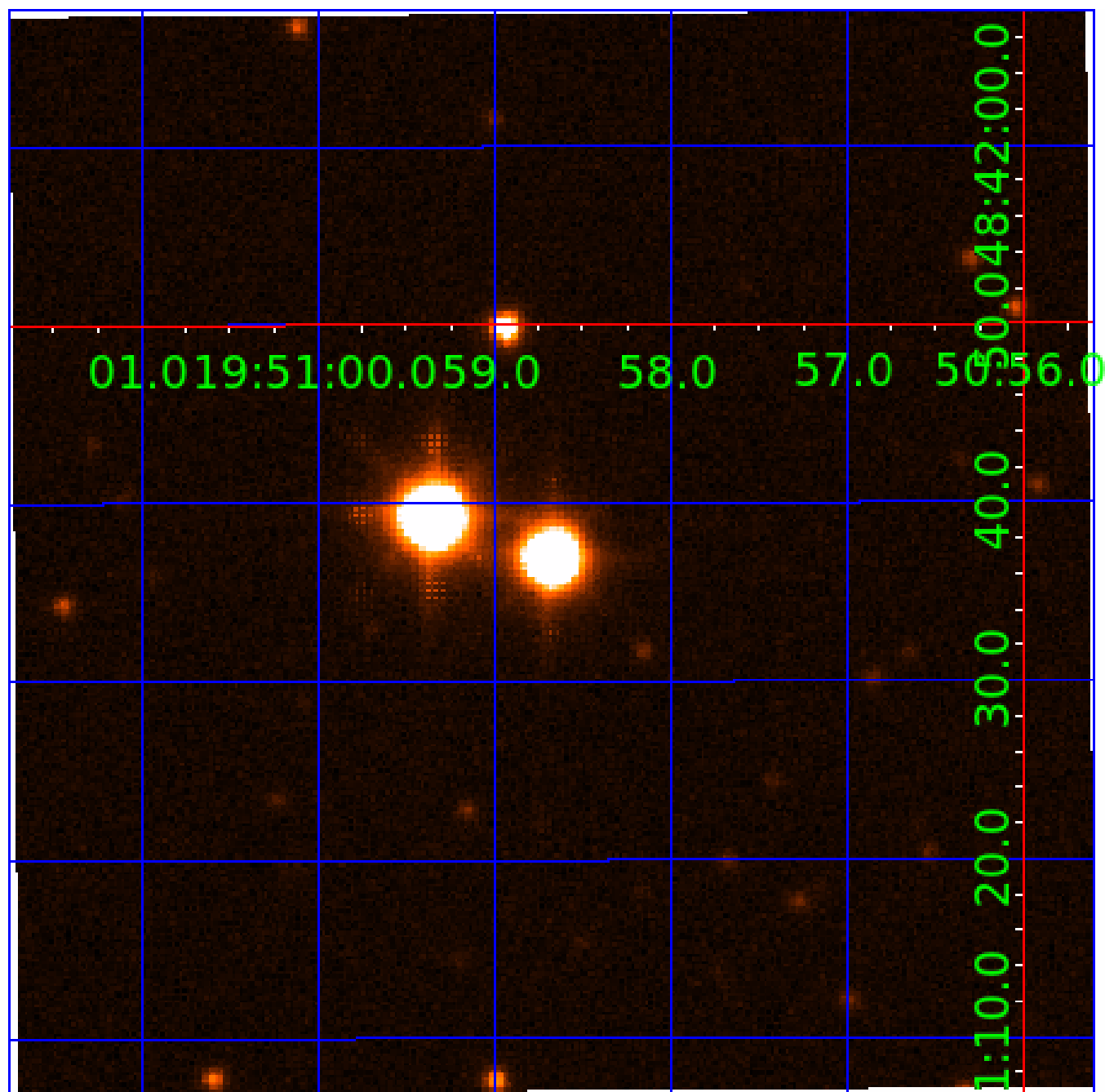


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011098004

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})
011098004-01	OBS	No	444.566168	307.723061	474.7	5.659	14.4	8.4	1.21	6293	4.13	1.54
011098004-02	OBS	8041.01	7.507998	138.711241	50.2	4.246	8.9	8.9	1.21	6293	1.01	355.52

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011098004-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011098004-02	OBS	FP	0.00	0	0	0	1	CENT_KIC_POS—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.

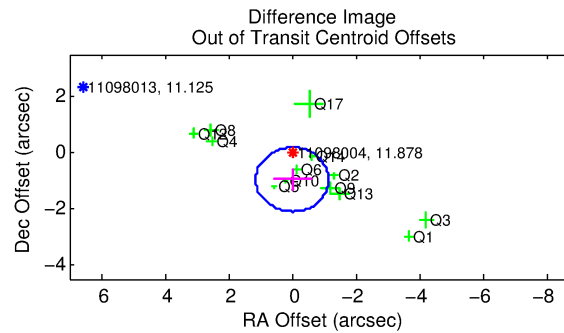
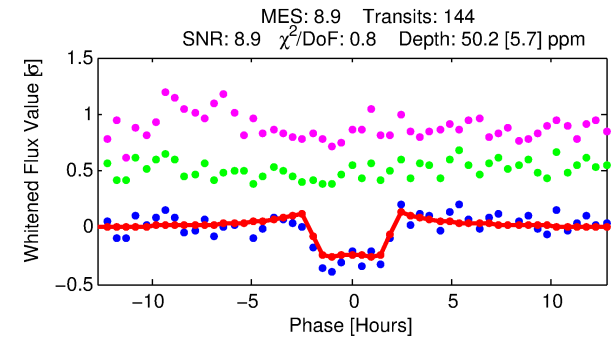
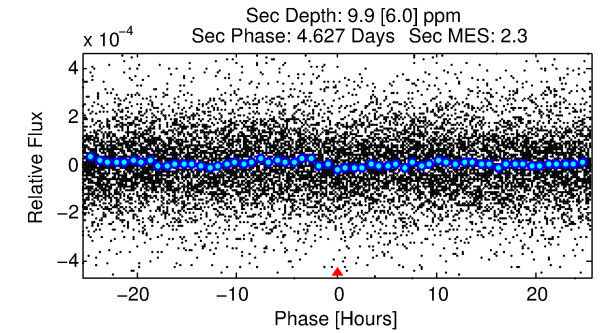
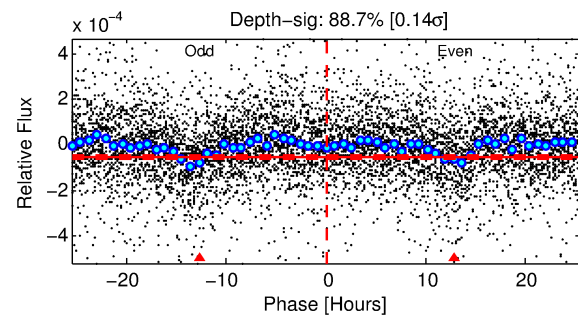
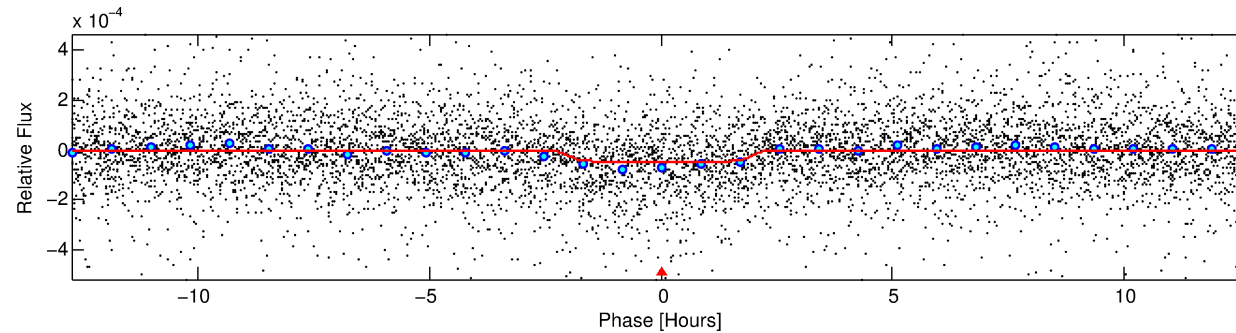
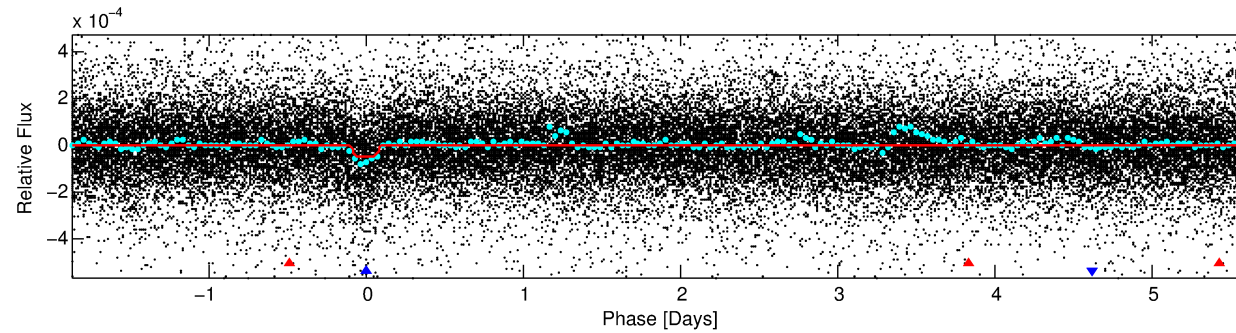
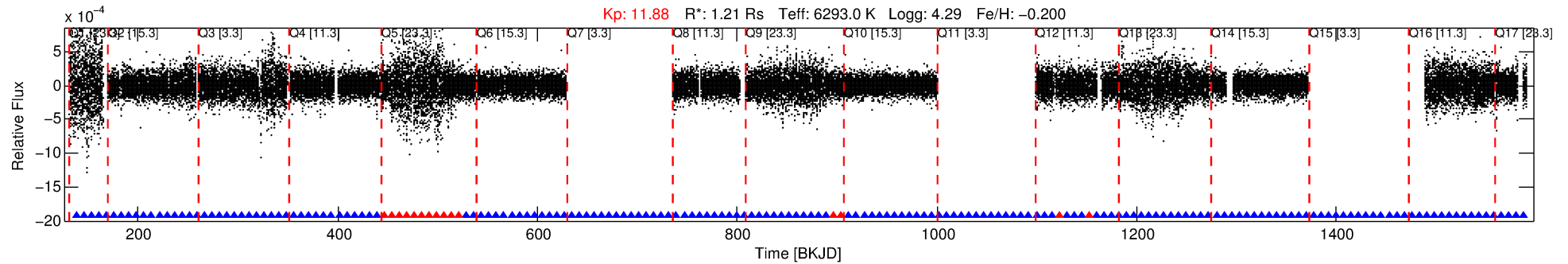
Ephemeris Match Information For 011098004-02

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
011098004-02	11098004	011098013-01	11098013	1:1	6.9	1	0	11.12	11.87	3.06	Direct-PRF	0	0.84	0.05

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: 11098004 Candidate: 2 of 2 Period: 7.508 d



DV Fit Results:

Period = 7.50800 [0.00006] d
Epoch = 138.7112 [0.0060] BKJD
 $R_p/R^* = 0.0077$ [0.0024]
 $a/R^* = 5.95$ [10.09]
 $b = 0.91$ [0.34]
 $S_{\text{eff}} = 355.52$ [137.61]
 $T_{\text{eq}} = 1107$ [107] K
 $R_p = 1.01$ [0.45] R_e
 $a = 0.0763$ [0.0196] AU
 $A_g = 30.88$ [29.33] [1.02 σ]
 $T_{\text{eff}} = 4035$ [892] K [3.26 σ]

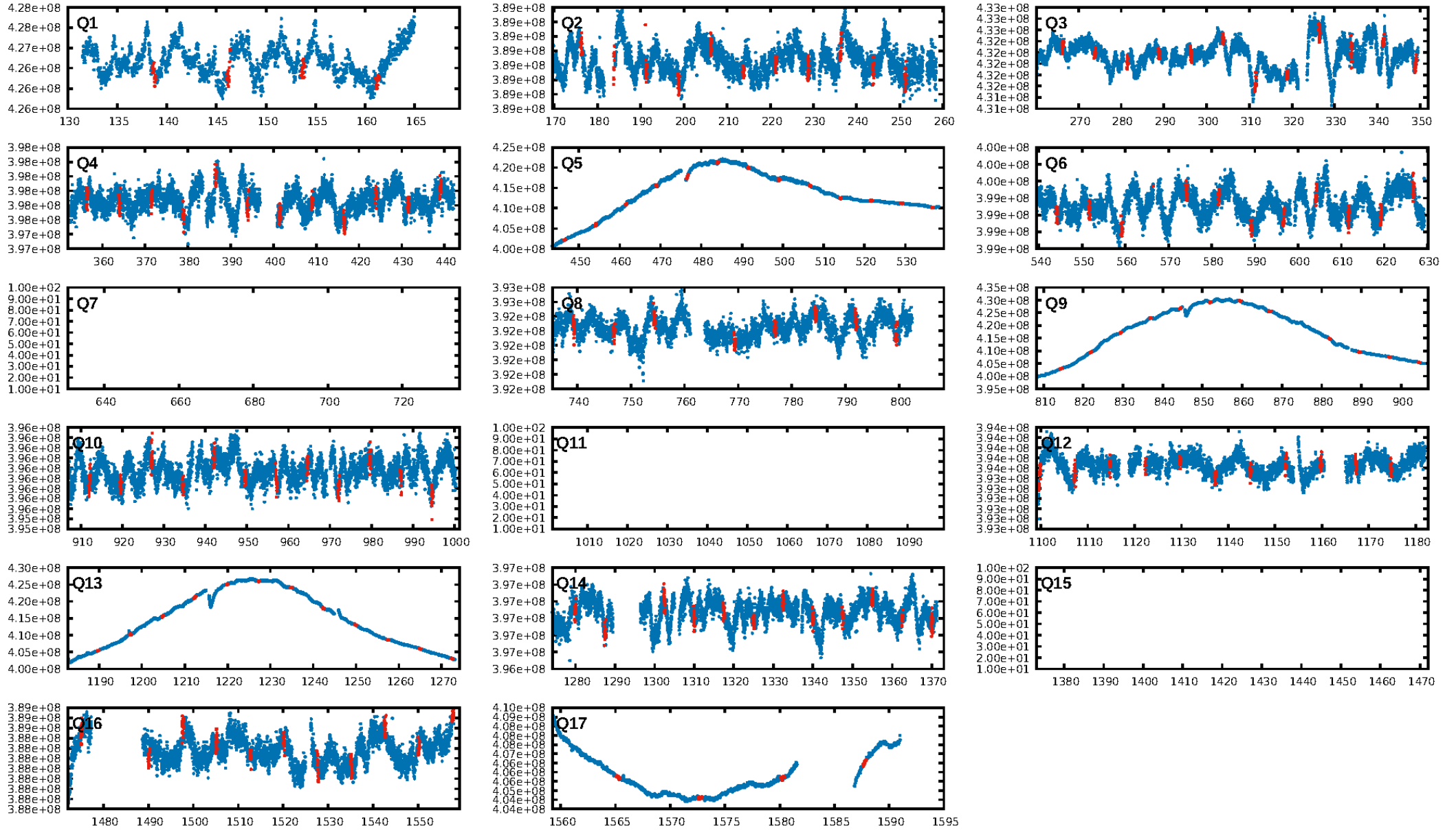
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1482.60 σ]
ModelChiSquare2-sig: 97.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.53e-18
RollingBand-fgt: 0.89 [121/136]
GhostDiagnostic-chr: -0.5487
Centroid-sig: 6.4%
Centroid-so: 3.163 arcsec [4.44 σ]
OotOffset-rm: 0.959 arcsec [2.52 σ]
KicOffset-rm: 5.148 arcsec [10.06 σ]
OotOffset-st: 4/1/3/5 [13]
KicOffset-st: 4/1/3/5 [13]
DiffImageQuality-fgm: 0.92 [12/13]
DiffImageOverlap-fno: 1.00 [14/14]

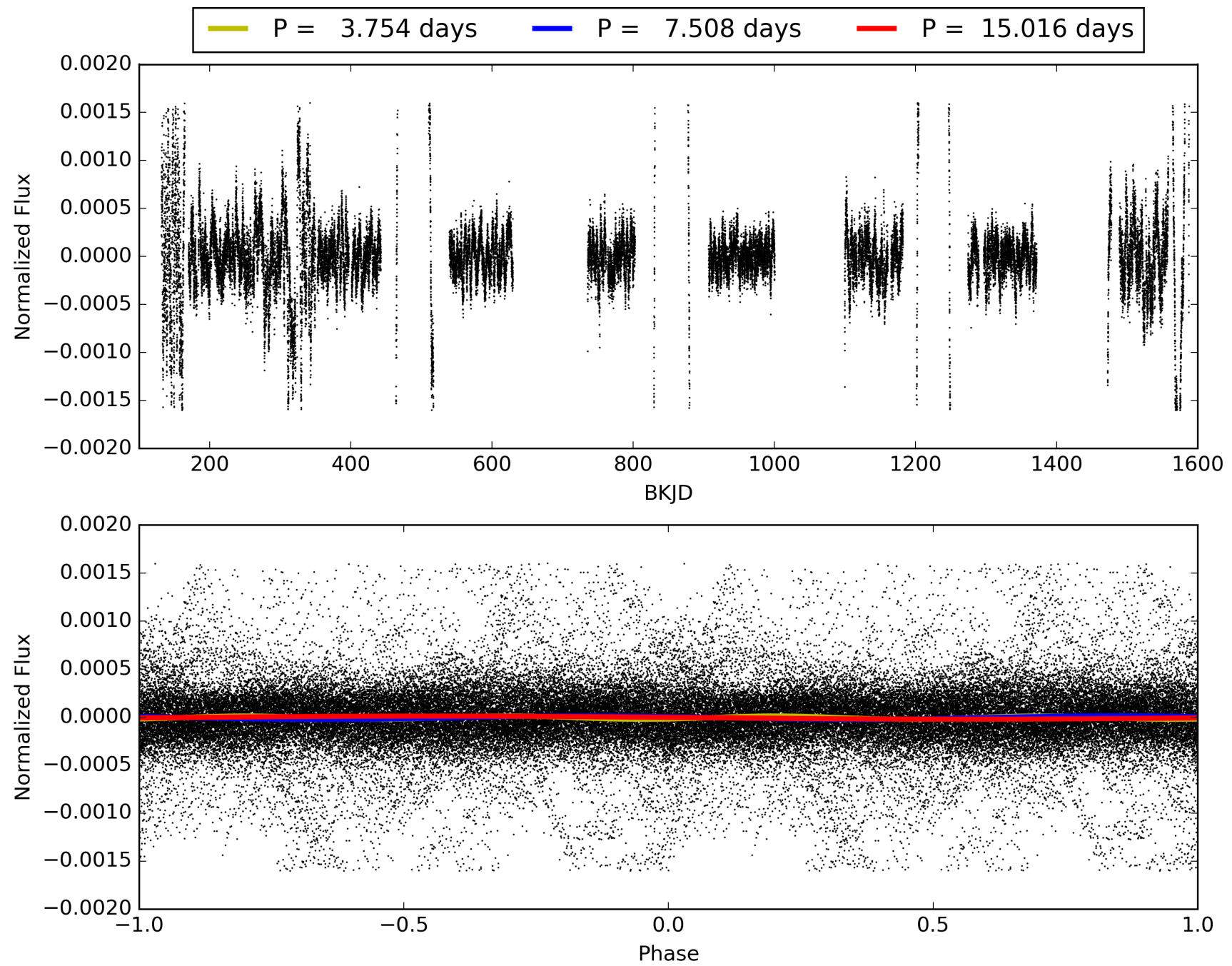
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:07:54 Z

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

TCE 011098004-02, PDC Light Curves

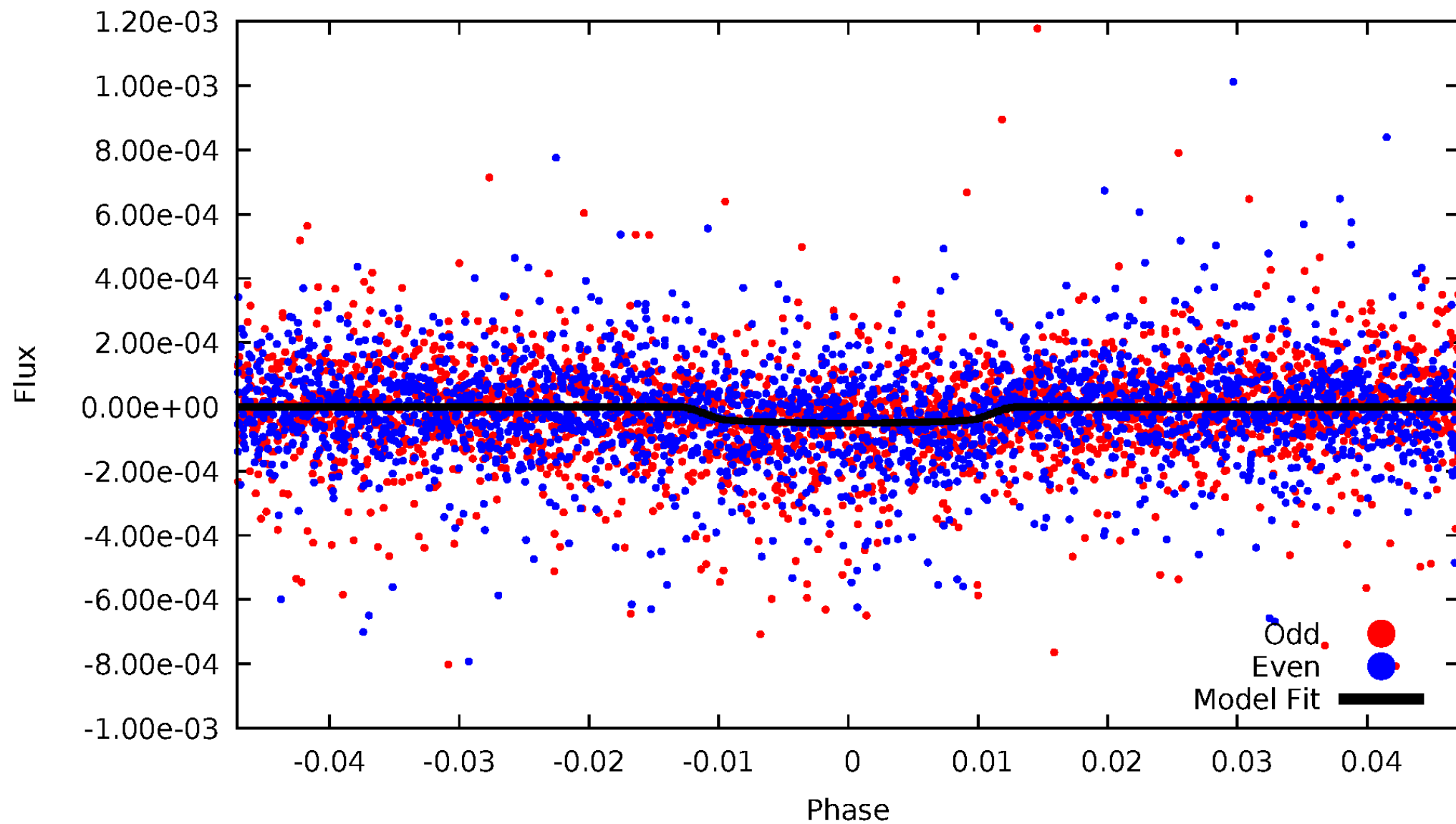


TCE 011098004-02



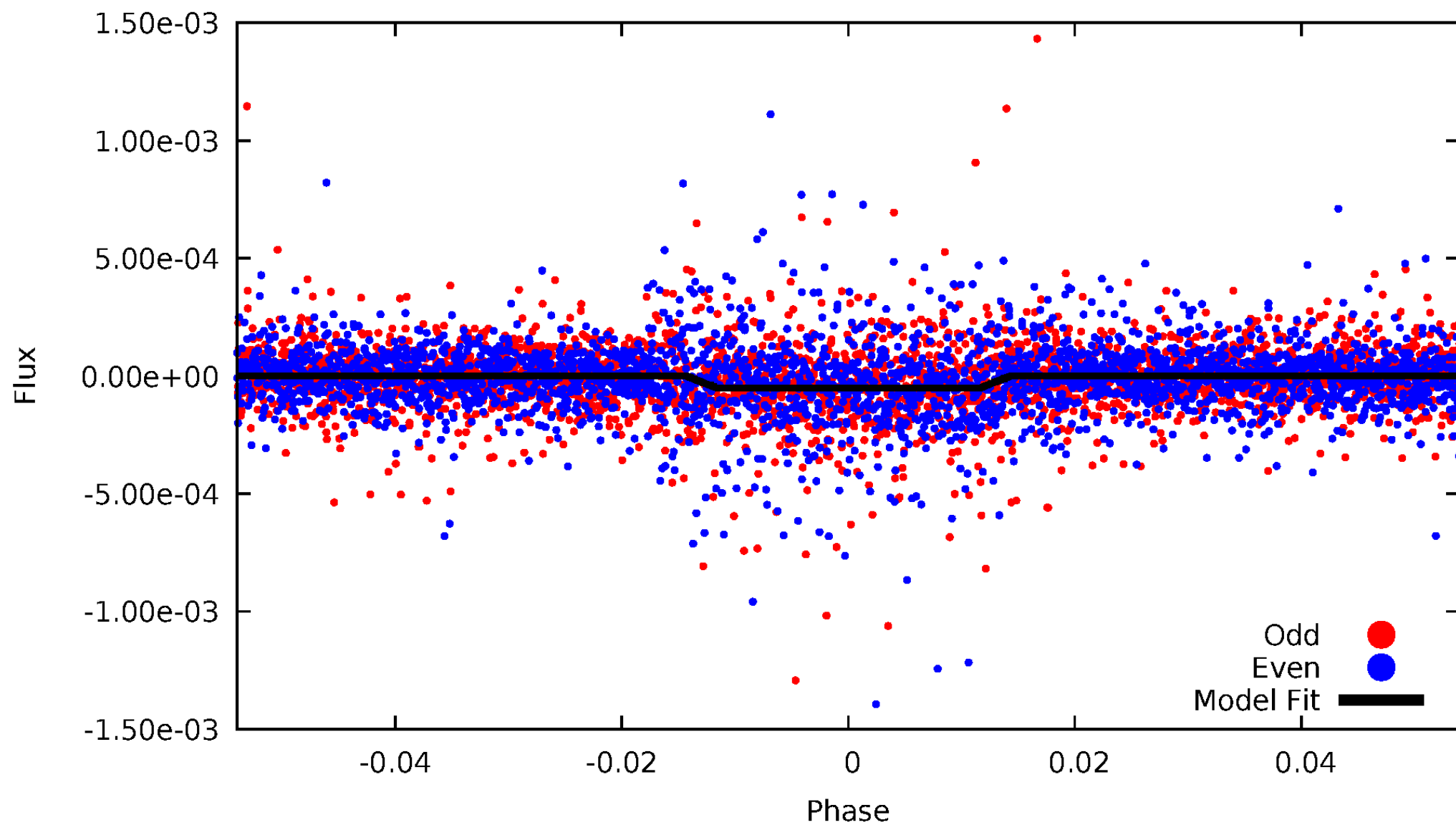
DV Odd/Even

TCE 011098004-02



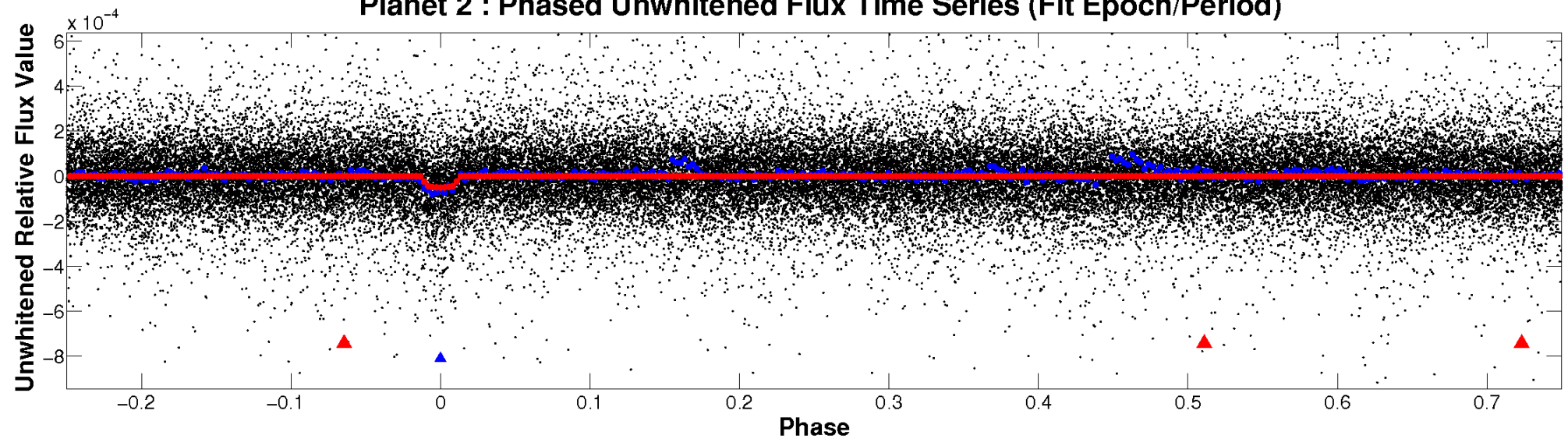
ALT Odd/Even

TCE 011098004-02

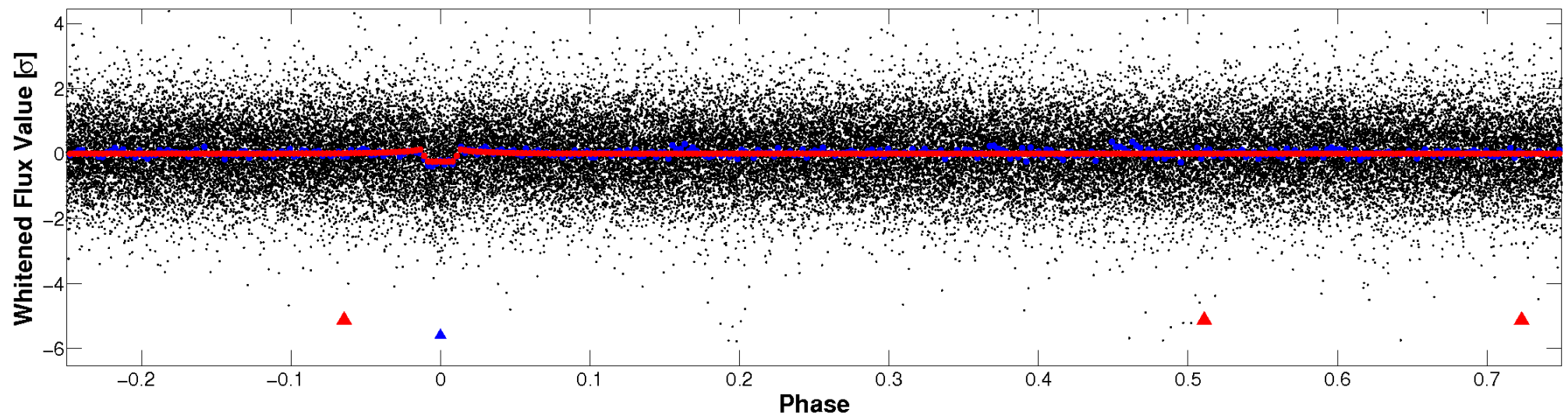


Non-Whitened Vs. Whitened Light Curve

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

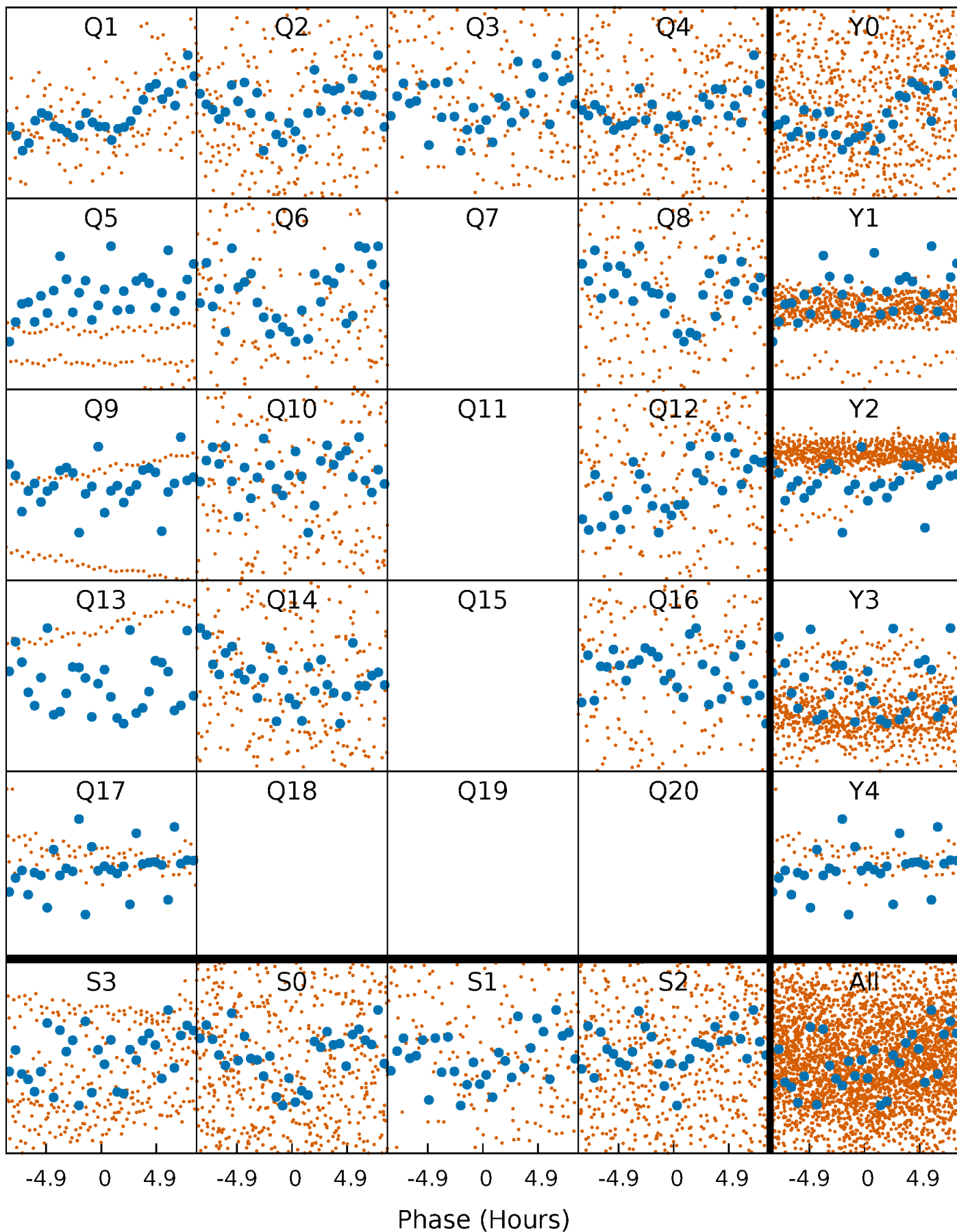


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



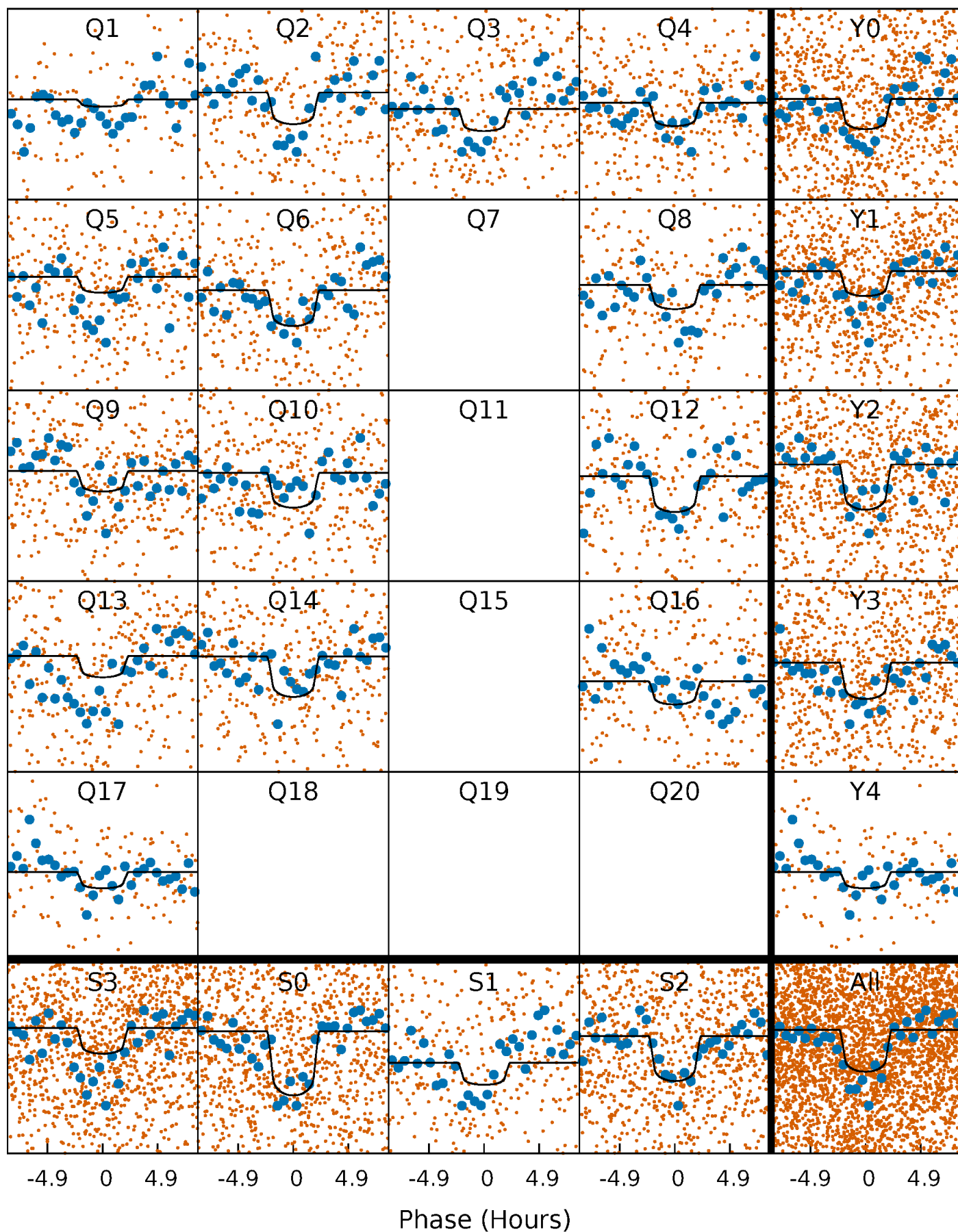
PDC Quarter-Phased Transit Curves

TCE 011098004-02 P= 7.507998 Days $T_0=138.711241$ (BKJD)



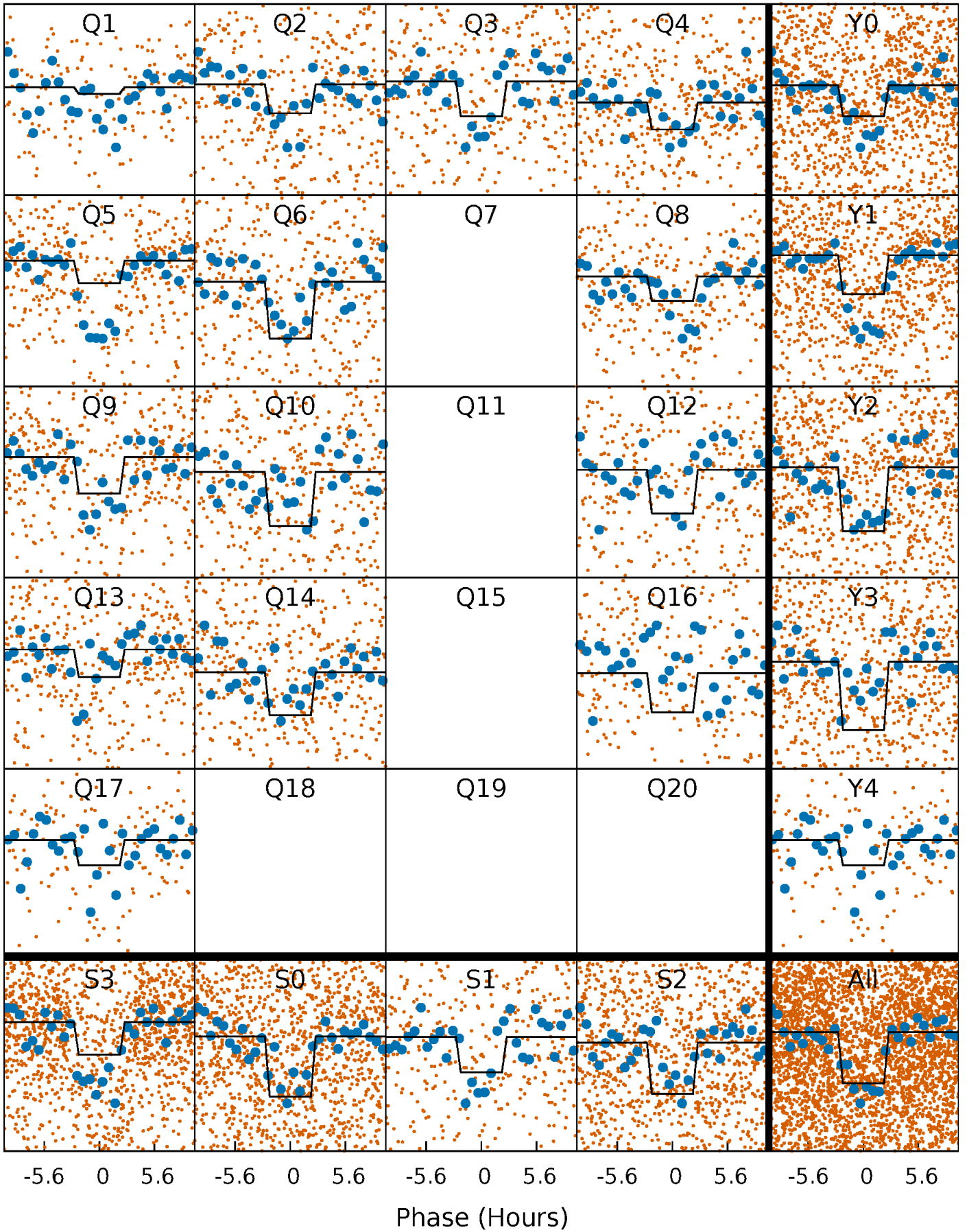
DV Quarter-Phased Transit Curves

TCE 011098004-02 P= 7.507998 Days $T_0=138.711241$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

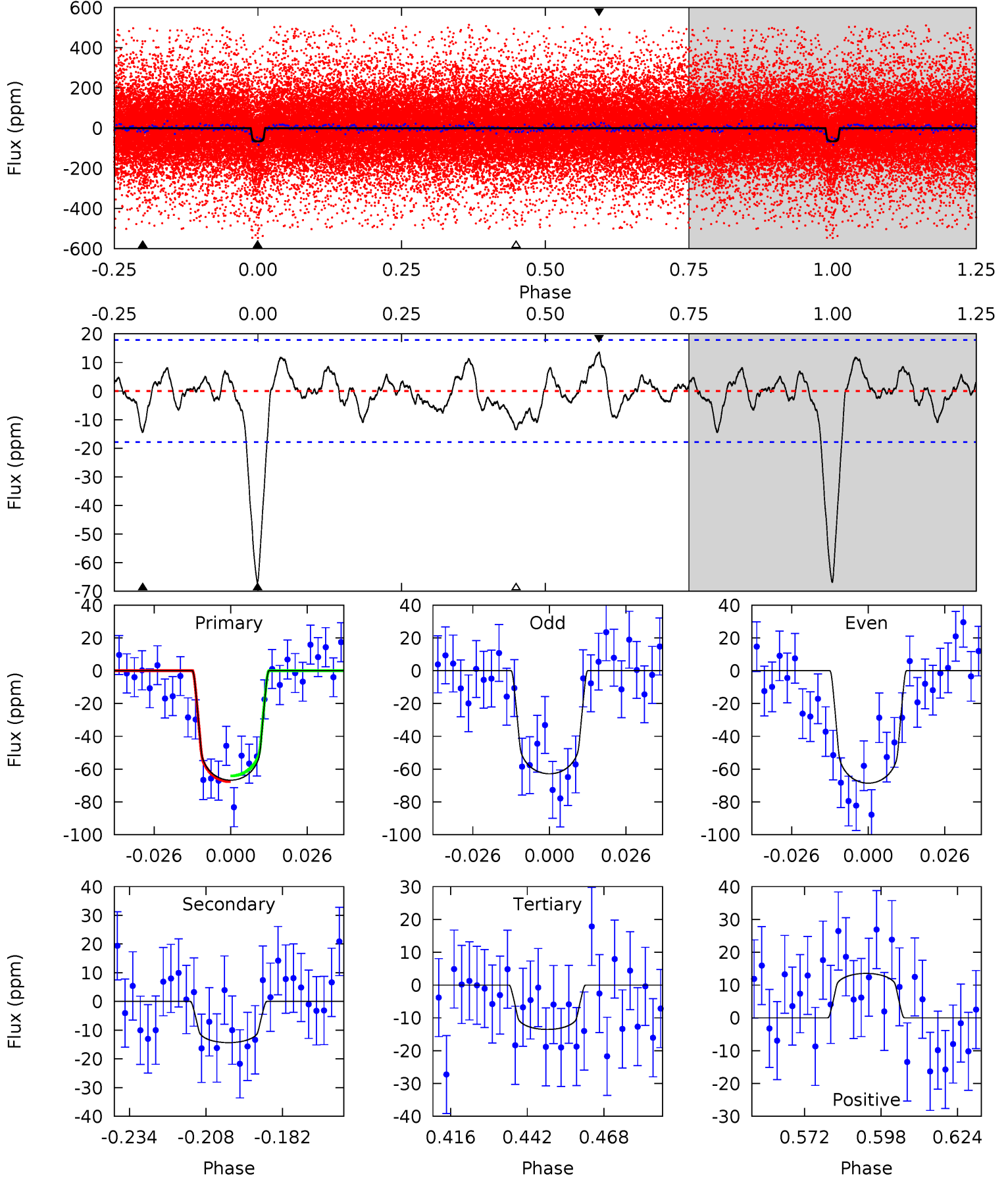
TCE 011098004-02 P= 7.507934 Days $T_0=138.698102$ (BKJD)



DV Model-Shift Uniqueness Test

011098004-02, P = 7.507998 Days, E = 131.203243 Days

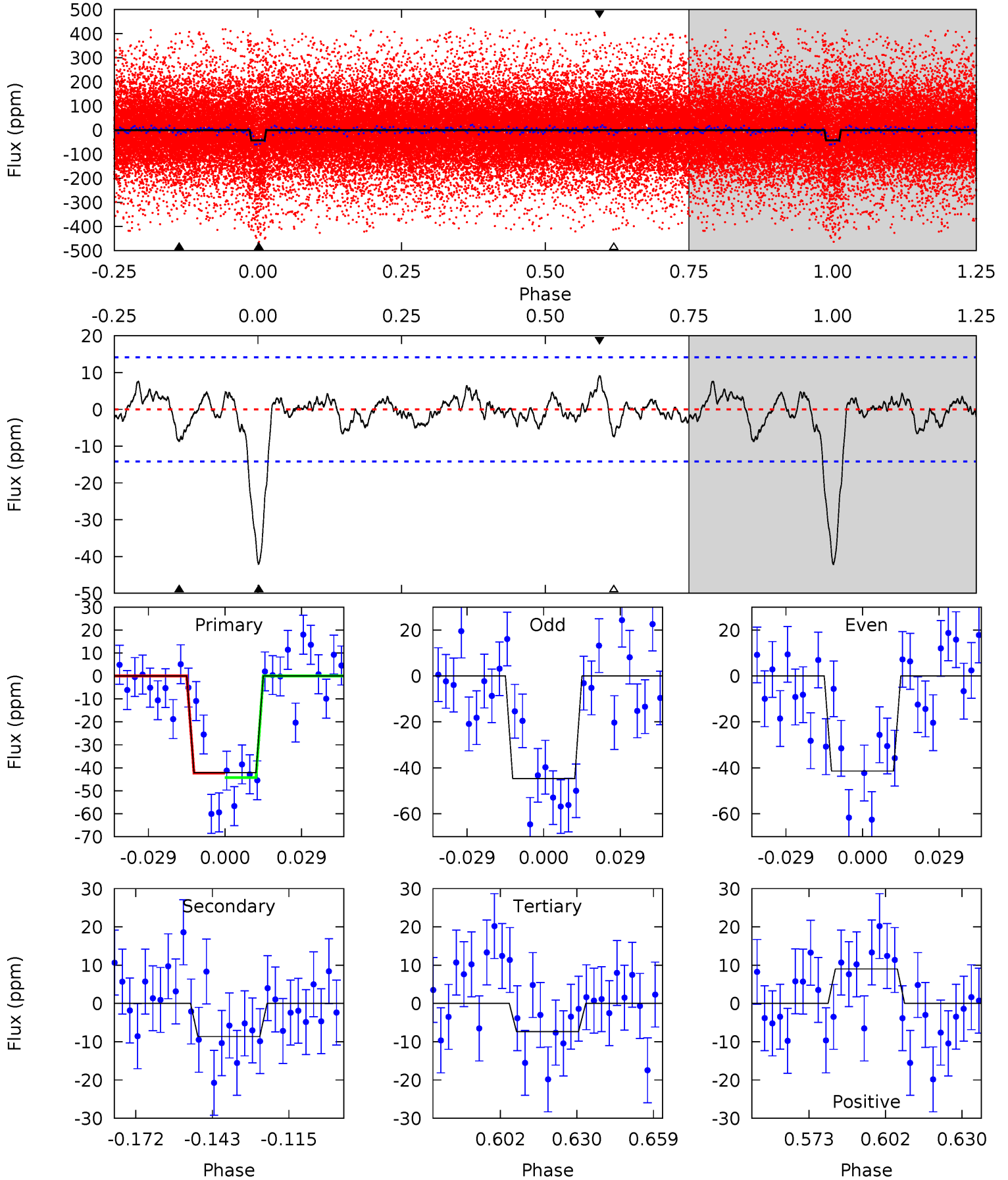
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	3.89	3.67	3.67	4.84	2.23	1.42	14.4	14.4	0.22	0.22	0.78	1.16	0.17	0.47



Alt Model-Shift Uniqueness Test

011098004-02, P = 7.507934 Days, E = 131.190168 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	2.94	2.50	3.06	4.82	2.19	0.97	11.8	11.3	0.44	-0.12	0.57	1.61	0.18	0.34



Stellar Parameters For KIC 011098004

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6293^{+150}_{-188}	$4.291^{+0.132}_{-0.198}$	$-0.200^{+0.250}_{-0.300}$	$1.213^{+0.378}_{-0.204}$	$1.045^{+0.185}_{-0.108}$	$0.825^{+0.513}_{-0.424}$
	+2%/-3%	+3%/-5%	+125%/-150%	+31%/-17%	+18%/-10%	+62%/-51%
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 011098004-02 / KOI 8041.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-14 ± 4	$1.02^{+0.38}_{-0.34}$	1553^{+107}_{-89}	4572^{+797}_{-523}	44^{+51}_{-22}
Alt.	-9 ± 3	$0.97^{+0.37}_{-0.32}$	1551^{+123}_{-89}	4212^{+755}_{-516}	27^{+42}_{-14}

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

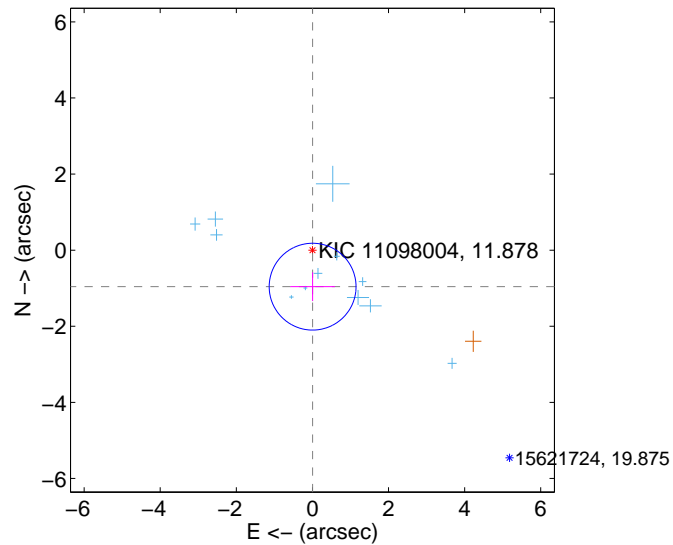
Supplemental centroid analysis for 011098004-02. **Kepler magnitude: 11.88.** Transit SNR 8.94

There are 12 quarters with good PRF difference image offsets

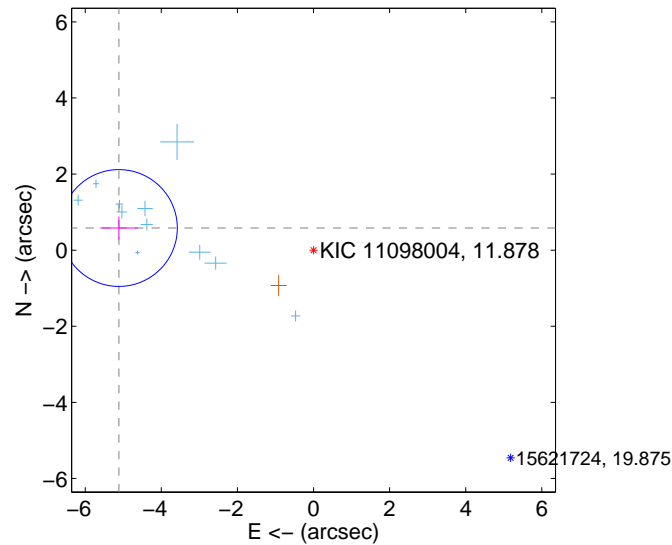
The OOT PRF centroid is offset from the target star catalog position by about 4.27 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.959 ± 0.380	2.52	-0.005 ± 0.585	-0.959 ± 0.378
PRF-fit source offset from KIC position	5.148 ± 0.512	10.06	5.115 ± 0.491	0.582 ± 0.303
photometric centroid source offset	3.16 ± 0.71	4.44	3.03 ± 0.72	0.90 ± 0.56

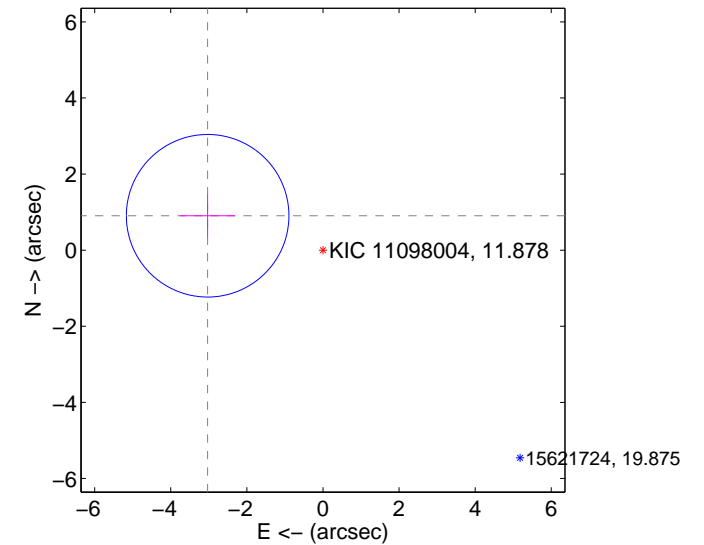
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

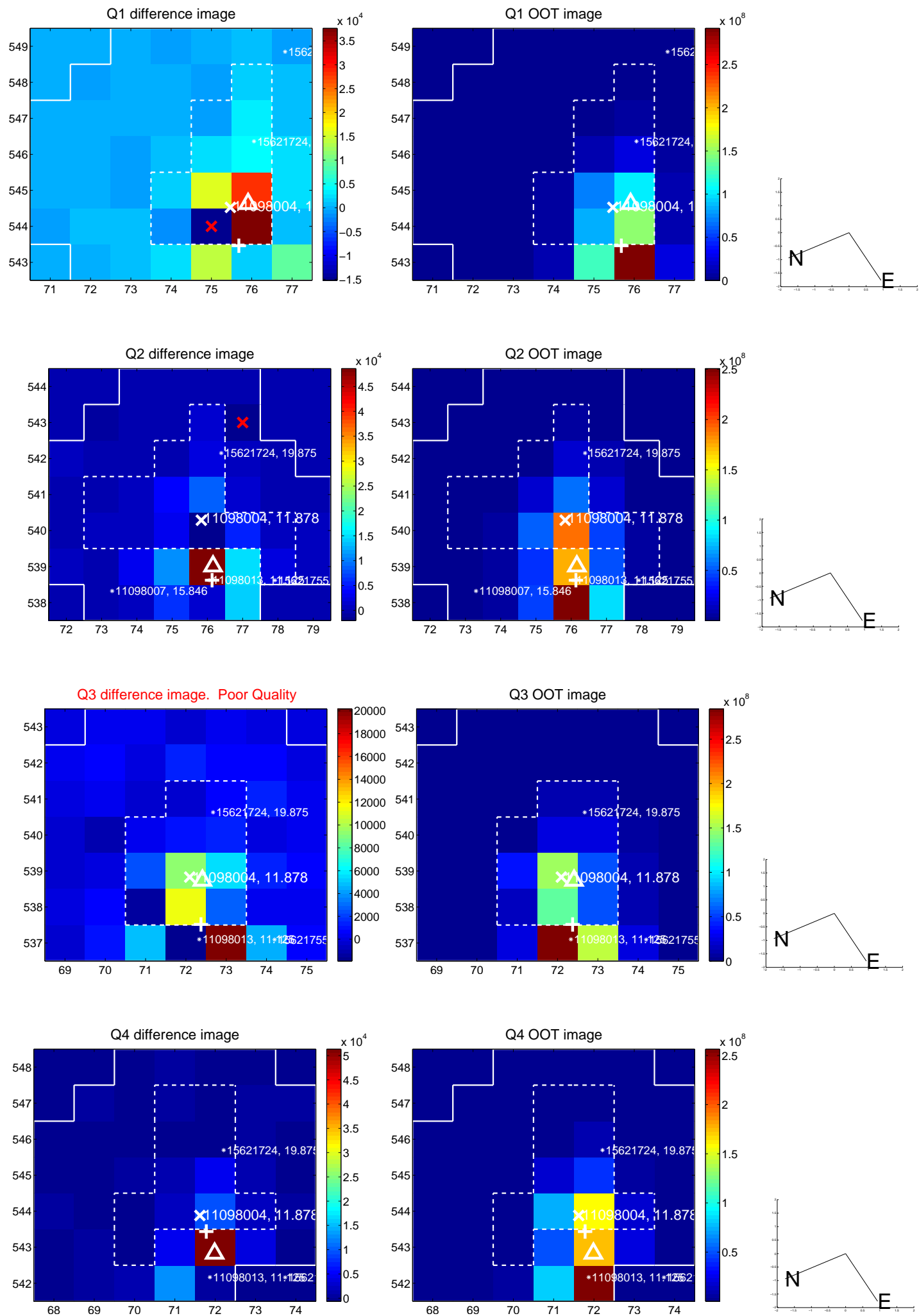


offset from photometric centroids

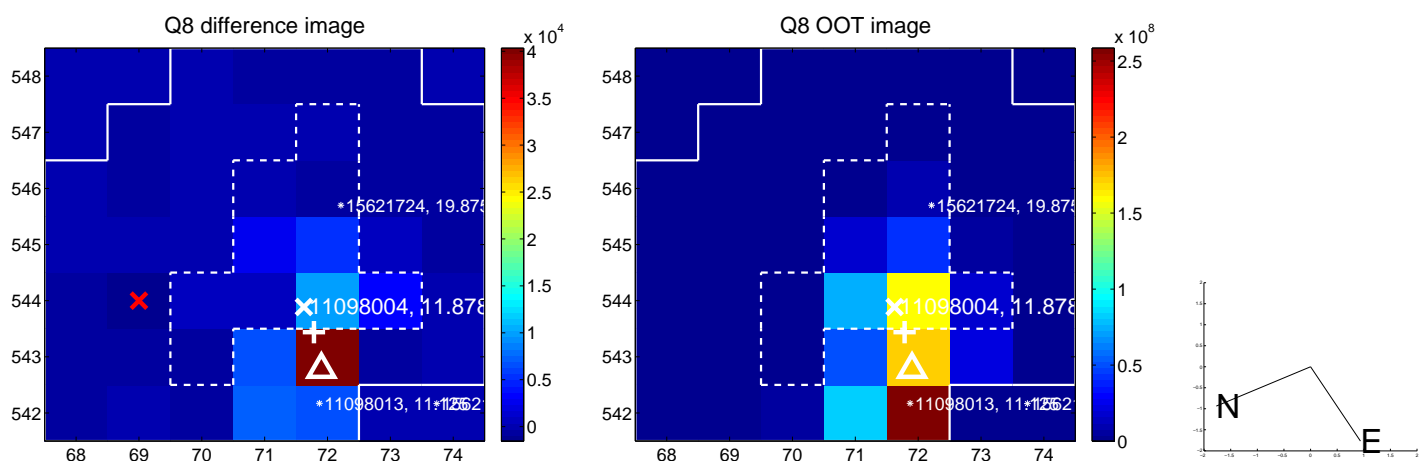
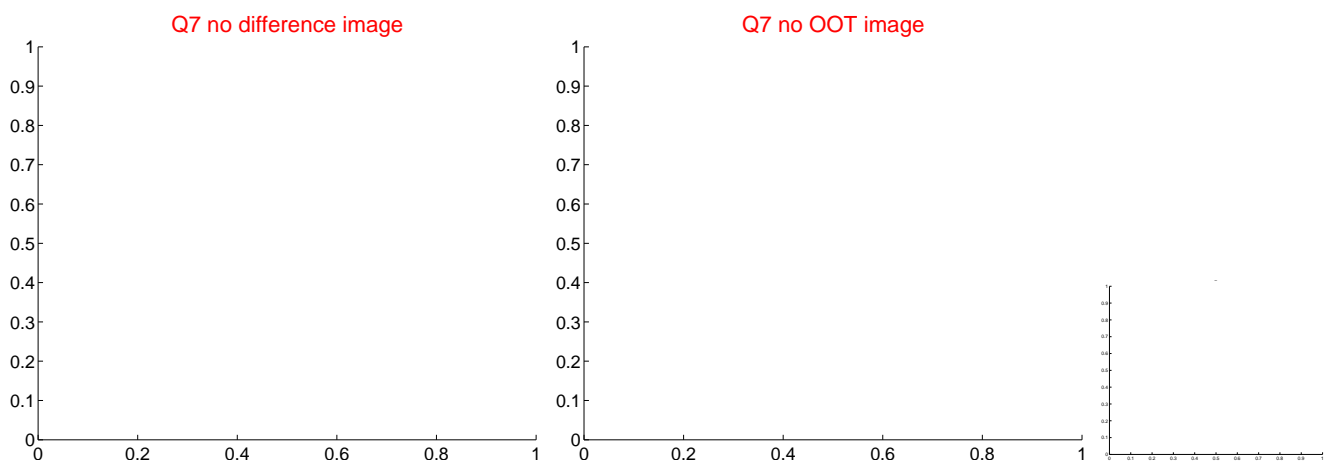
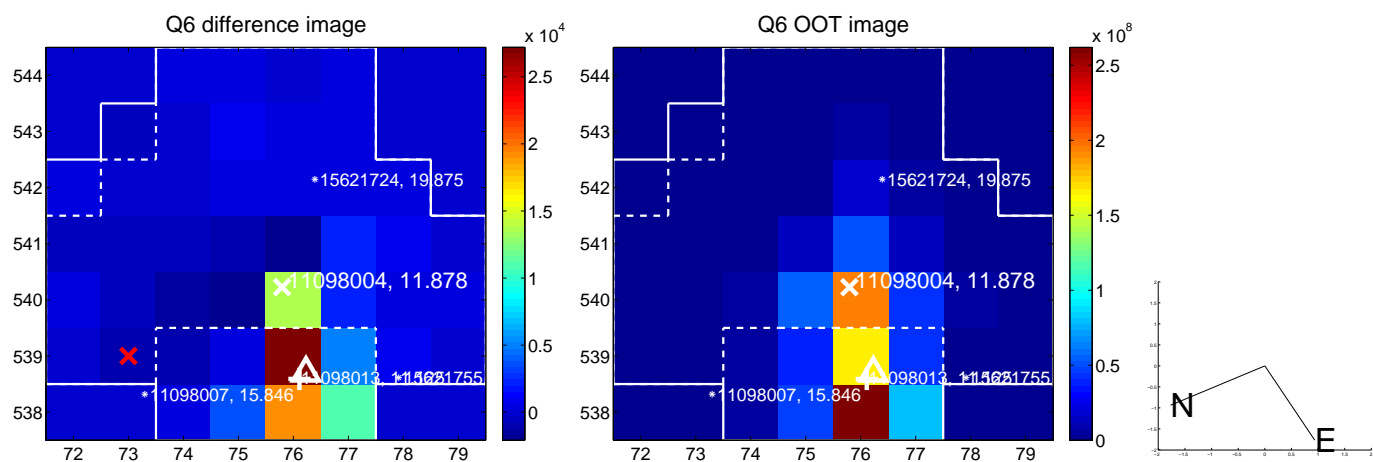
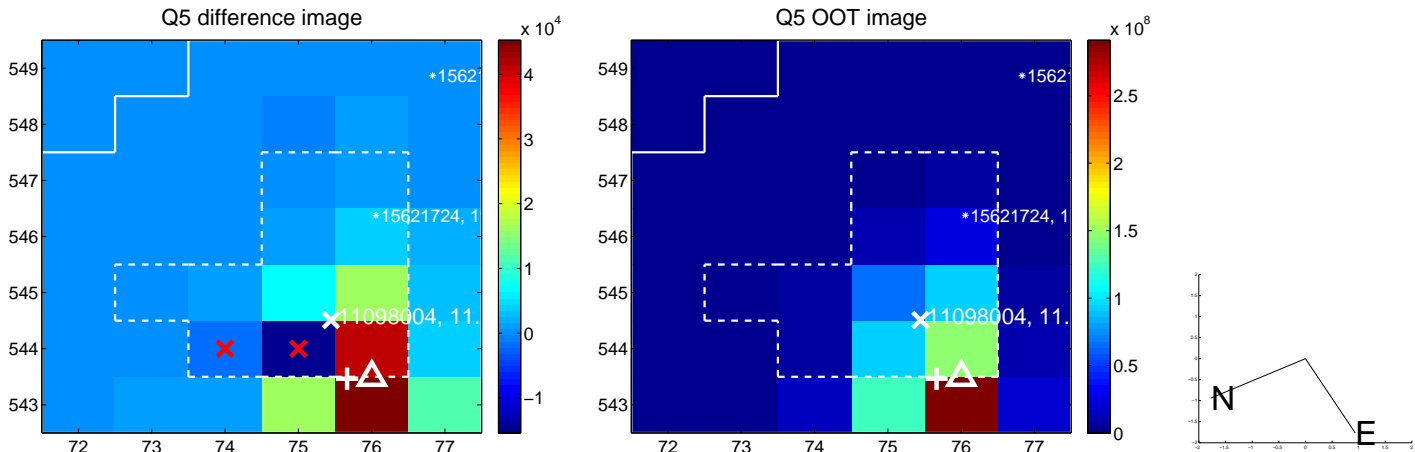


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

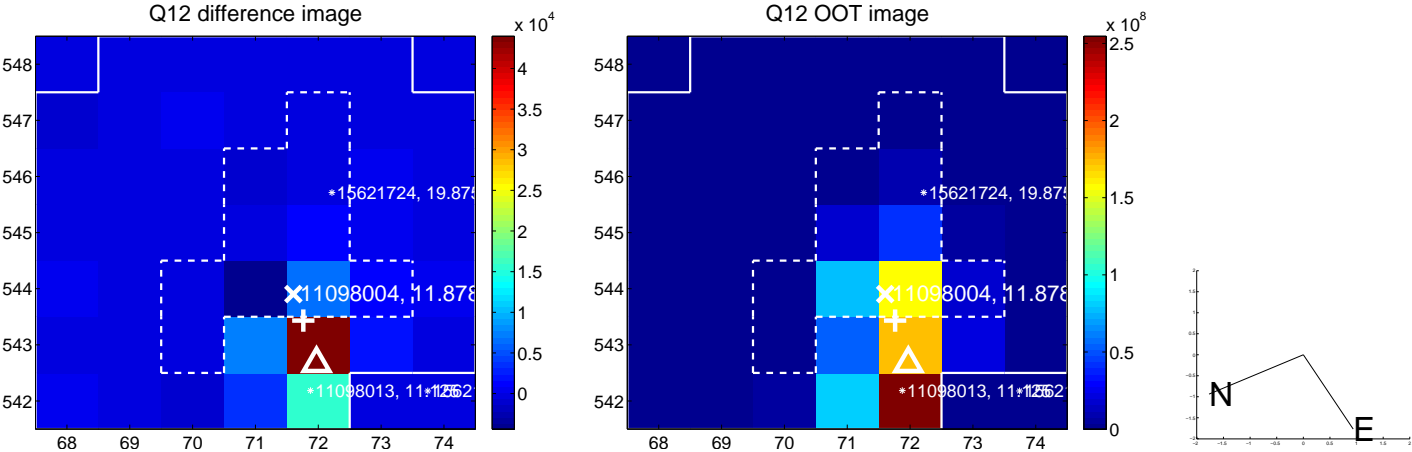
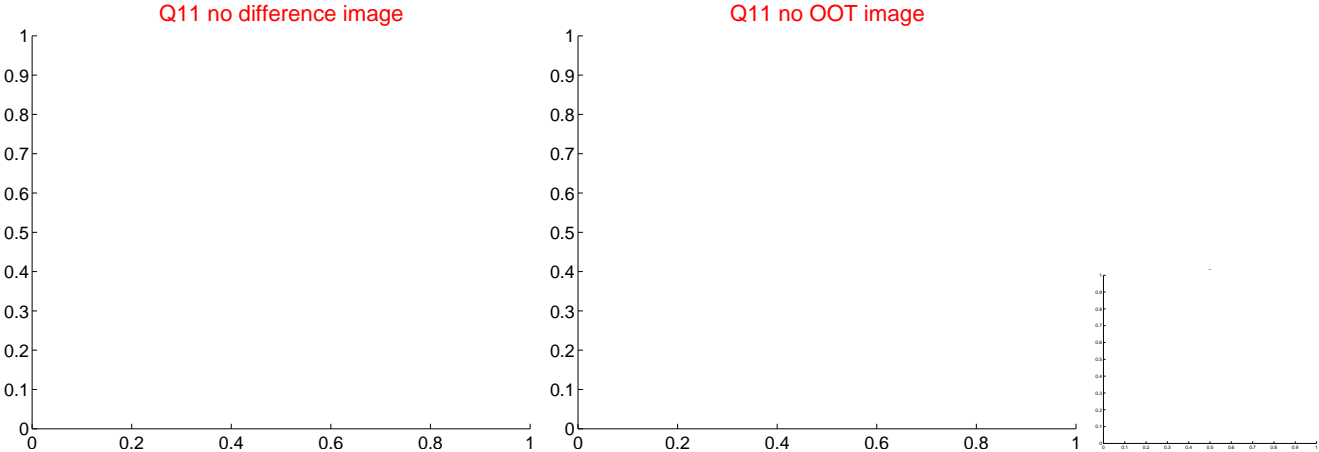
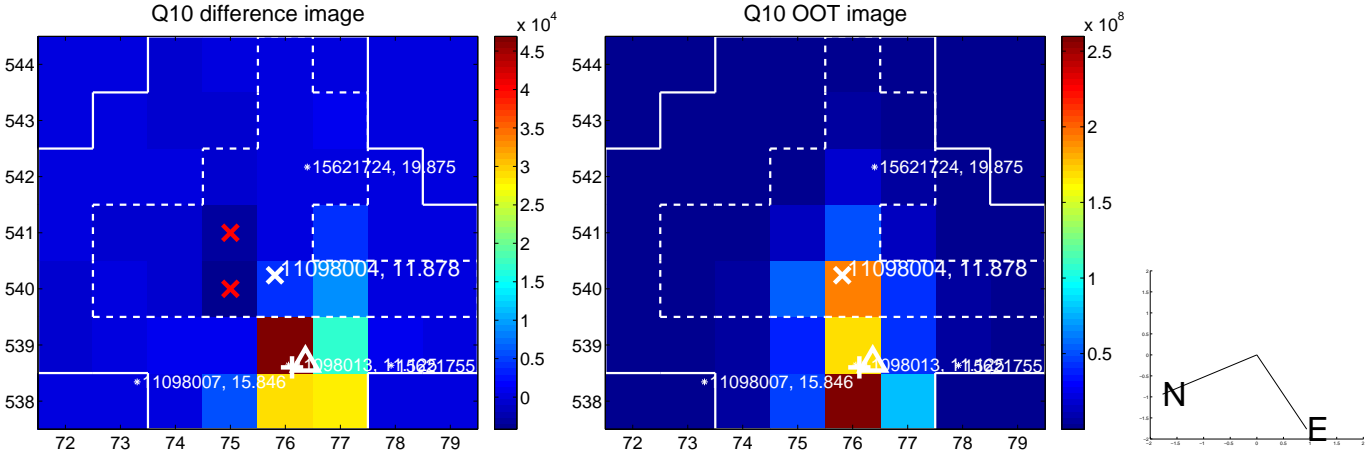
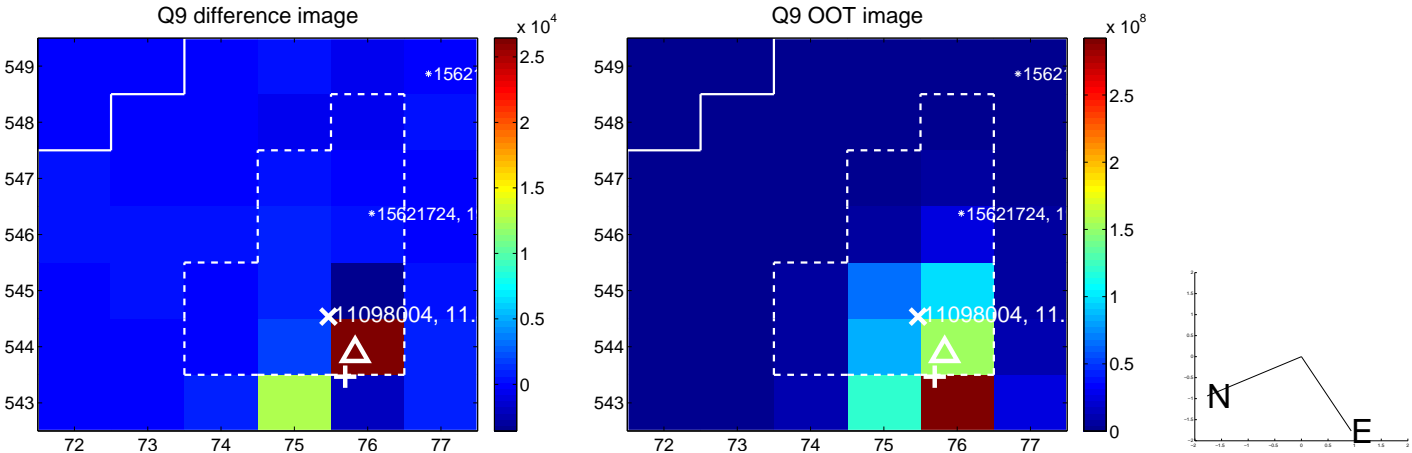
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



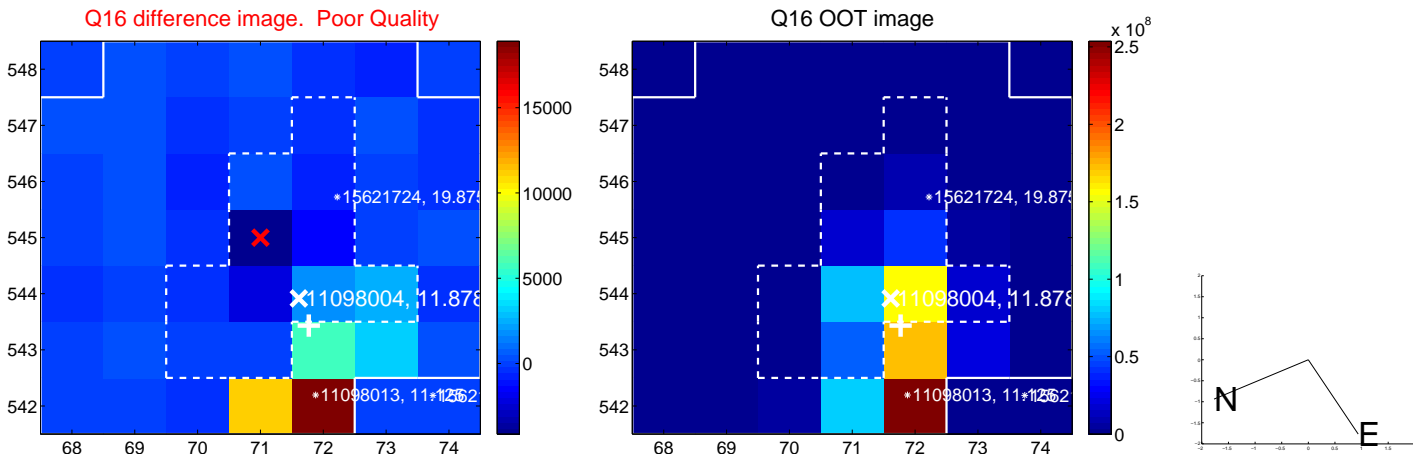
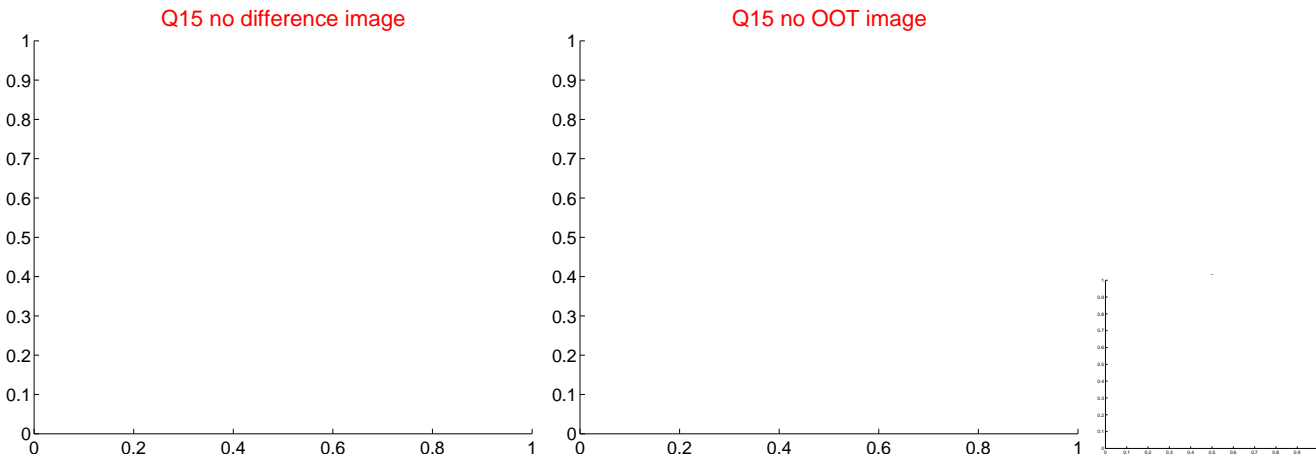
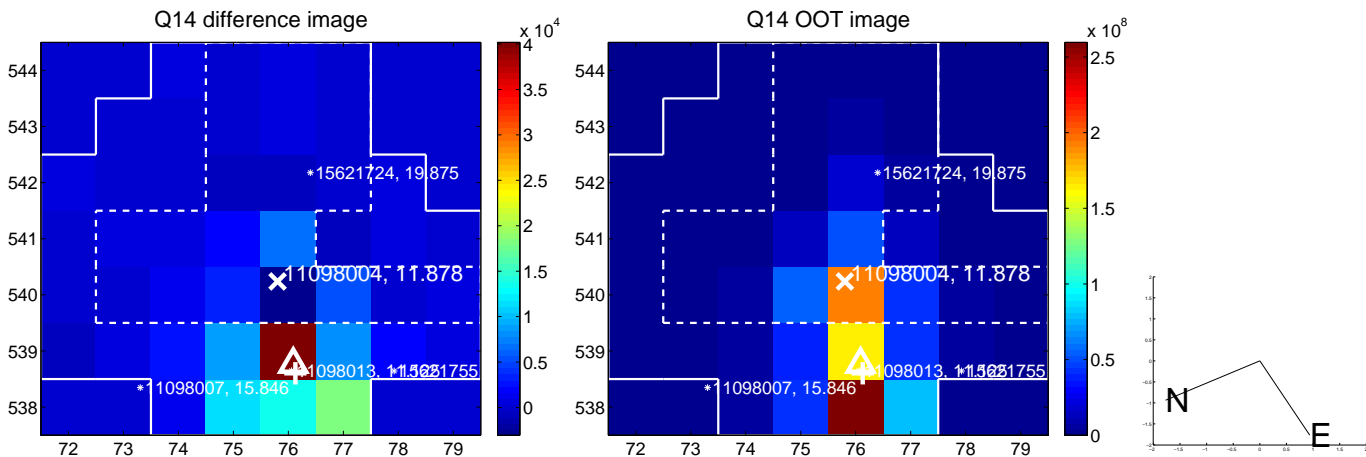
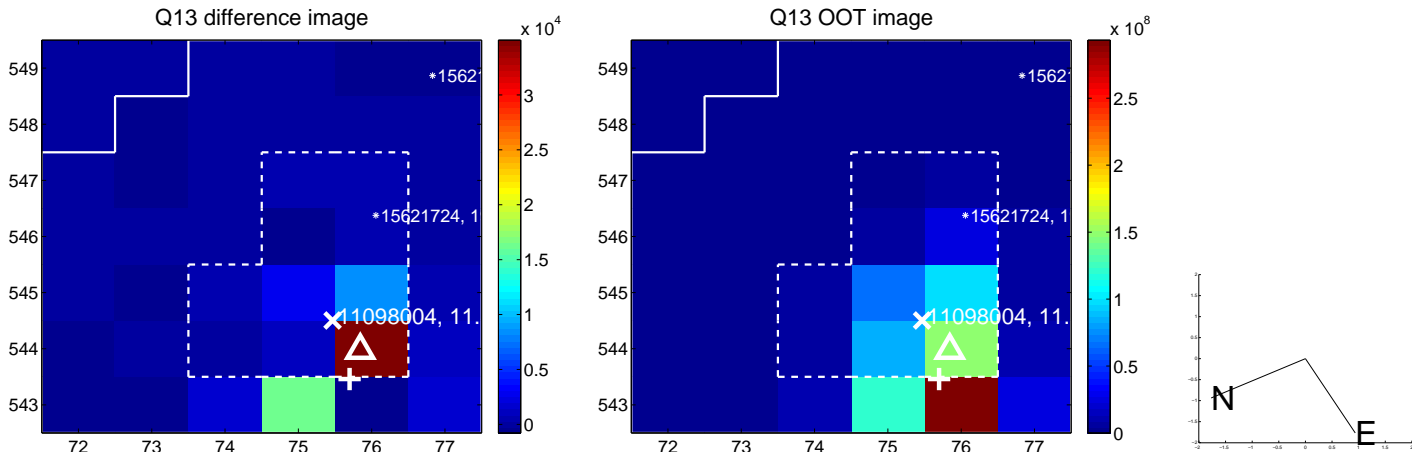
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



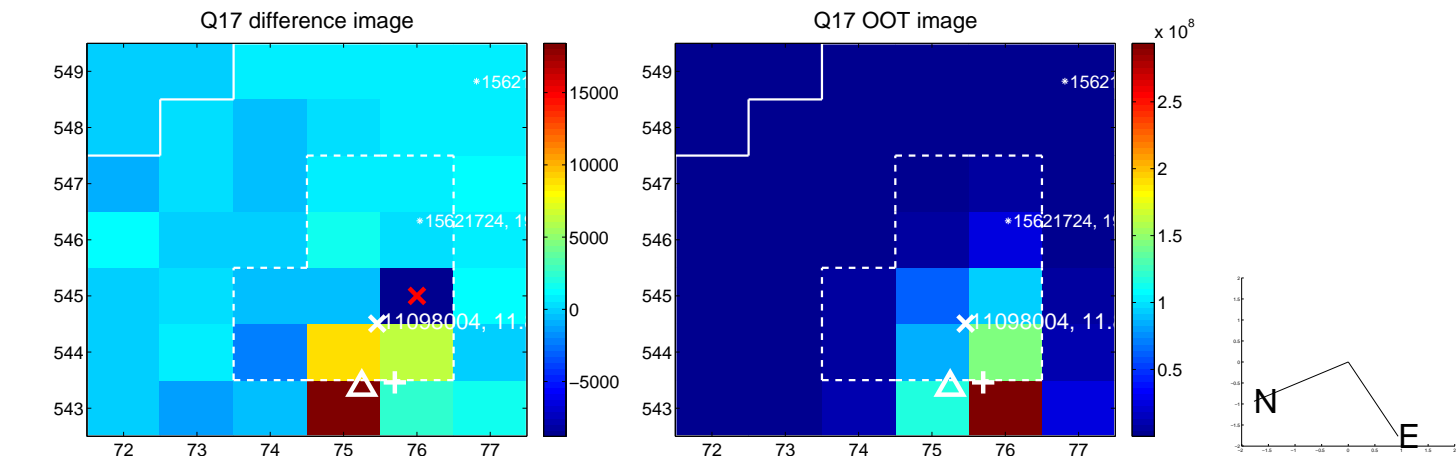
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



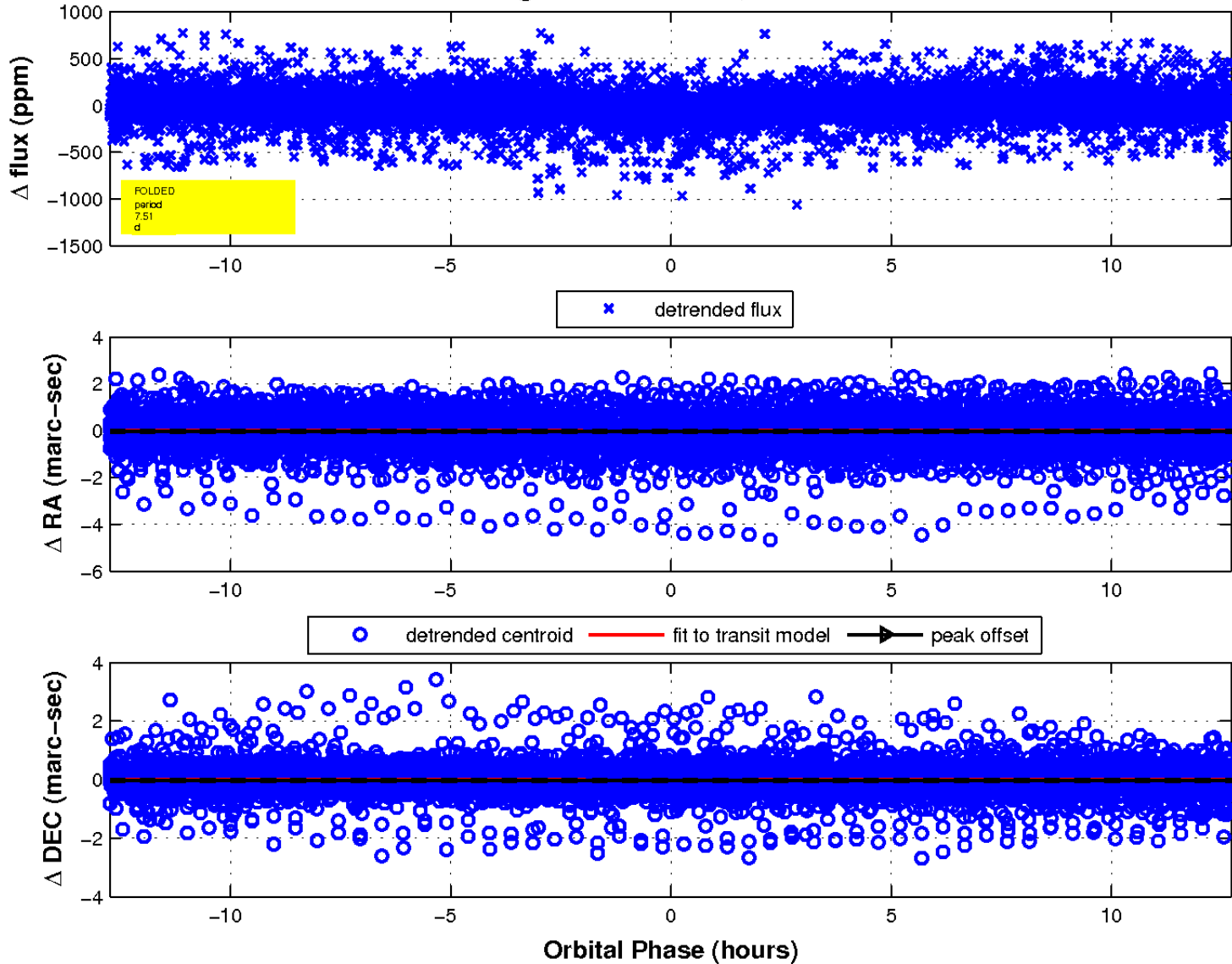
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

