

KIC 004769931

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})
004769931-01	OBS	4058.01	1.878836	133.088337	124.2	3.704	17.7	19.4	0.73	5448	0.98	552.66
004769931-02	OBS	No	228.067995	300.027463	504.6	2.339	7.9	6.6	0.73	5448	1.75	0.92

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004769931-01	OBS	FP	0.00	0	0	0	1	EPHEM_MATCH
004769931-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST

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

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

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

Ephemeris Match Information For 004769931-01

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
004769931-01	4769931	004678875-01	4678875	1:1	448.1	112	1	13.24	13.90	6463.80	Col-Anomaly	0	1.19	0.62

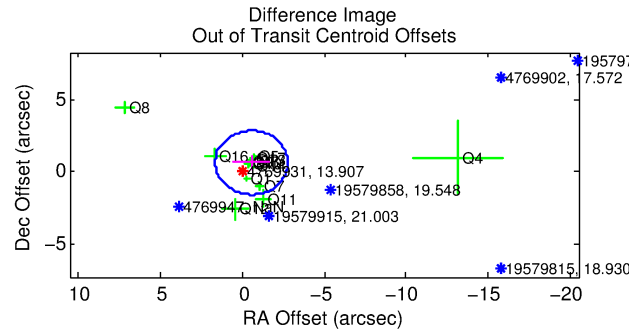
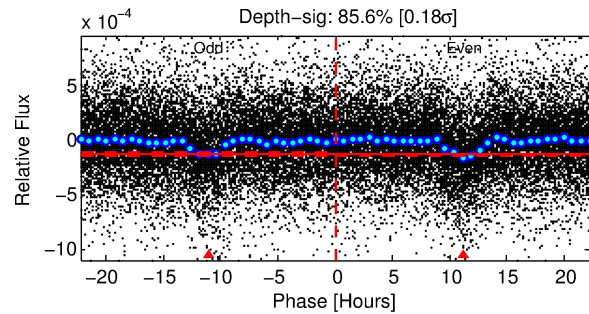
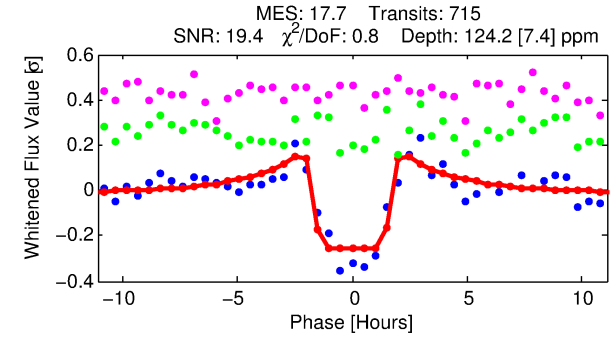
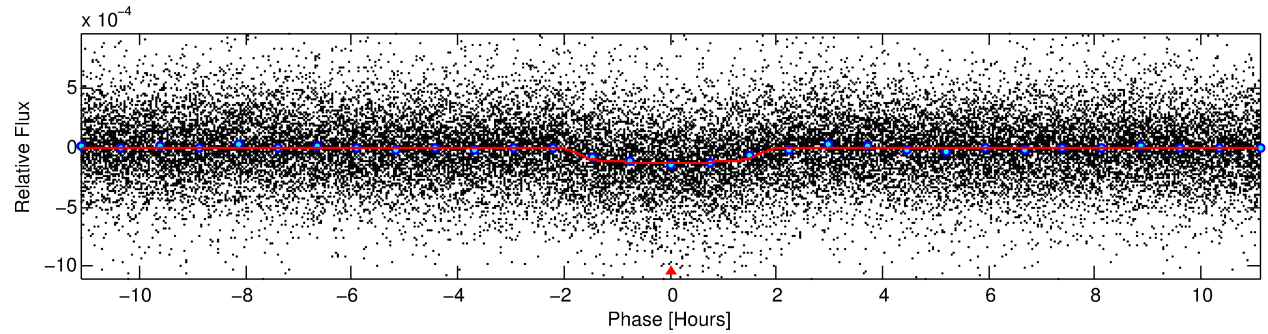
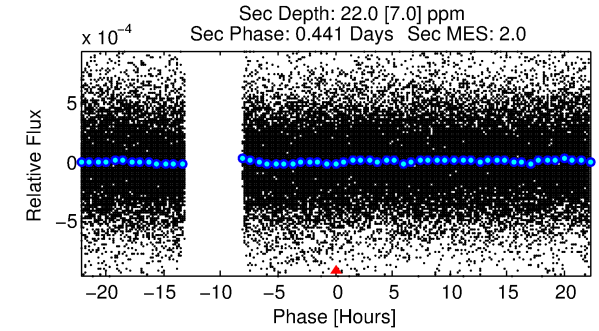
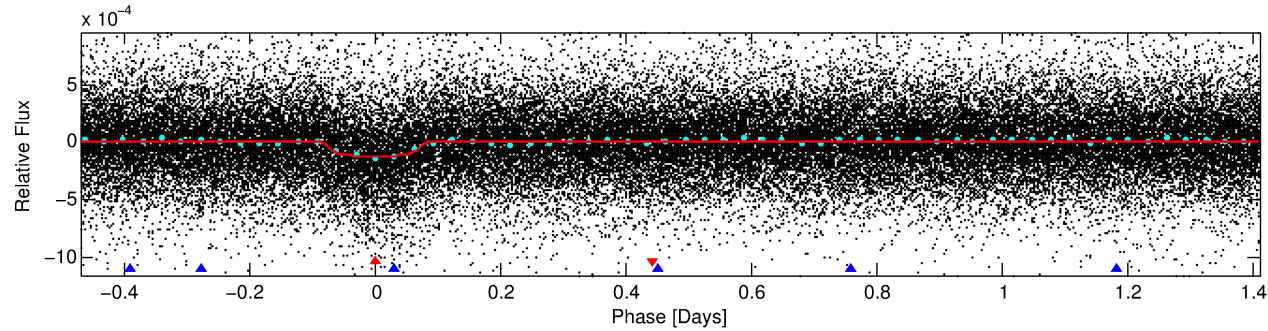
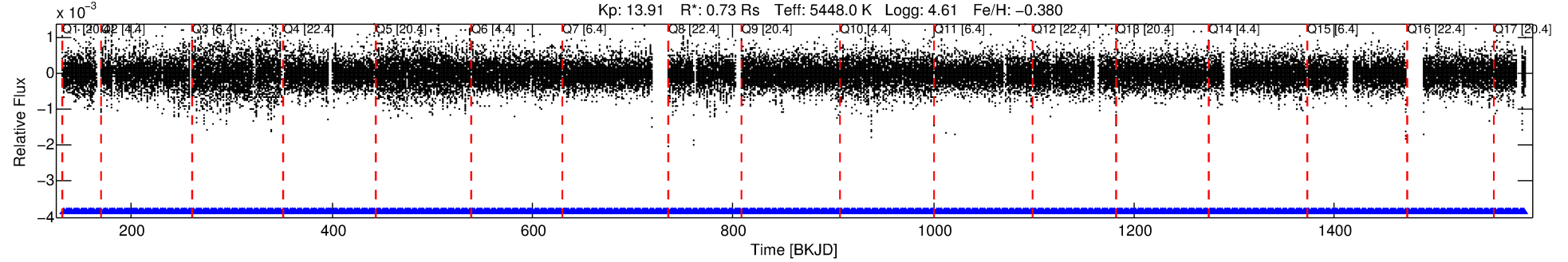
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 4769931 Candidate: 1 of 2 Period: 1.879 d

KOI: K04058.01 Corr: 0.951

Kp: 13.91 R*: 0.73 Rs Teff: 5448.0 K Logg: 4.61 Fe/H: -0.380



DV Fit Results:

Period = 1.87884 [0.00001] d
Epoch = 133.0883 [0.0016] BKJD
Rp/R* = 0.0122 [0.0022]
a/R* = 2.01 [1.24]
b = 0.90 [0.17]
Seff = 552.66 [132.94]
Teq = 1236 [74] K
Rp = 0.98 [0.25] Re
a = 0.0277 [0.0041] AU
Ag = 9.70 [5.09] [1.71σ]
Teffp = 3374 [418] K [5.04σ]

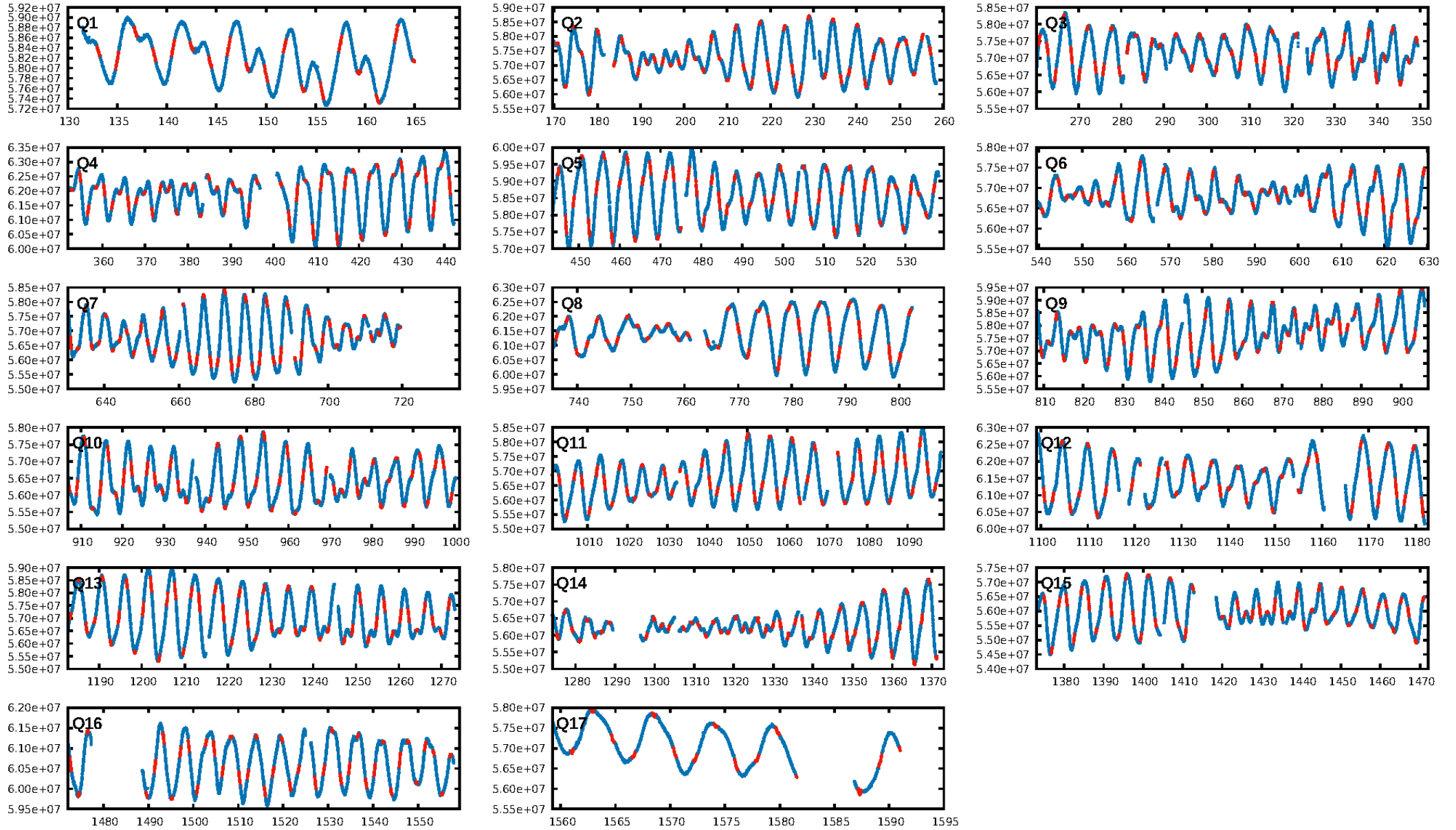
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1239.14σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.90e-60
RollingBand-fgt: 1.00 [683/683]
GhostDiagnostic-chr: 2.185
Centroid-sig: 40.1%
Centroid-so: 0.734 arcsec [1.19σ]
OotOffset-rm: 0.850 arcsec [1.16σ]
OotOffset-st: 3/2/4/5 [14]
KicOffset-rm: 0.784 arcsec [1.30σ]
KicOffset-st: 3/2/4/5 [14]
DiffImageQuality-fgm: 0.79 [11/14]
DiffImageOverlap-fno: 1.00 [17/17]

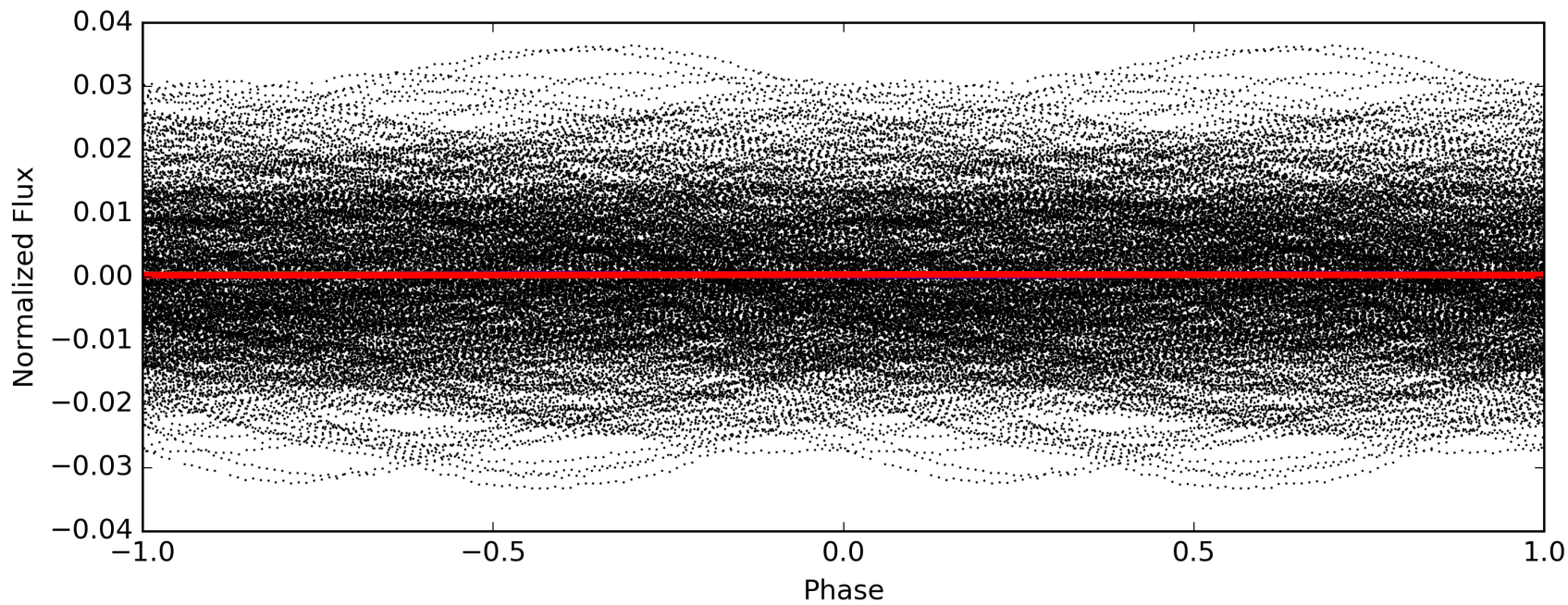
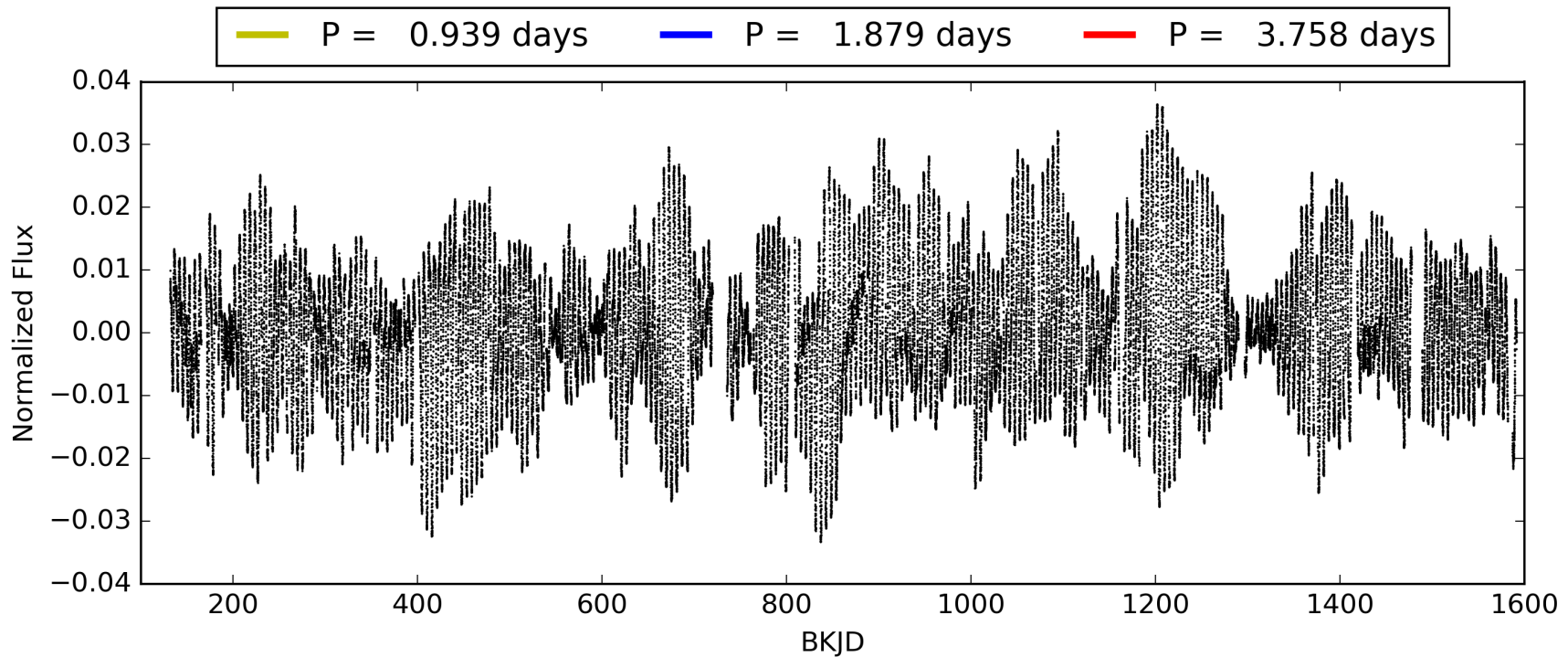
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:40:23 Z

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

TCE 004769931-01, PDC Light Curves

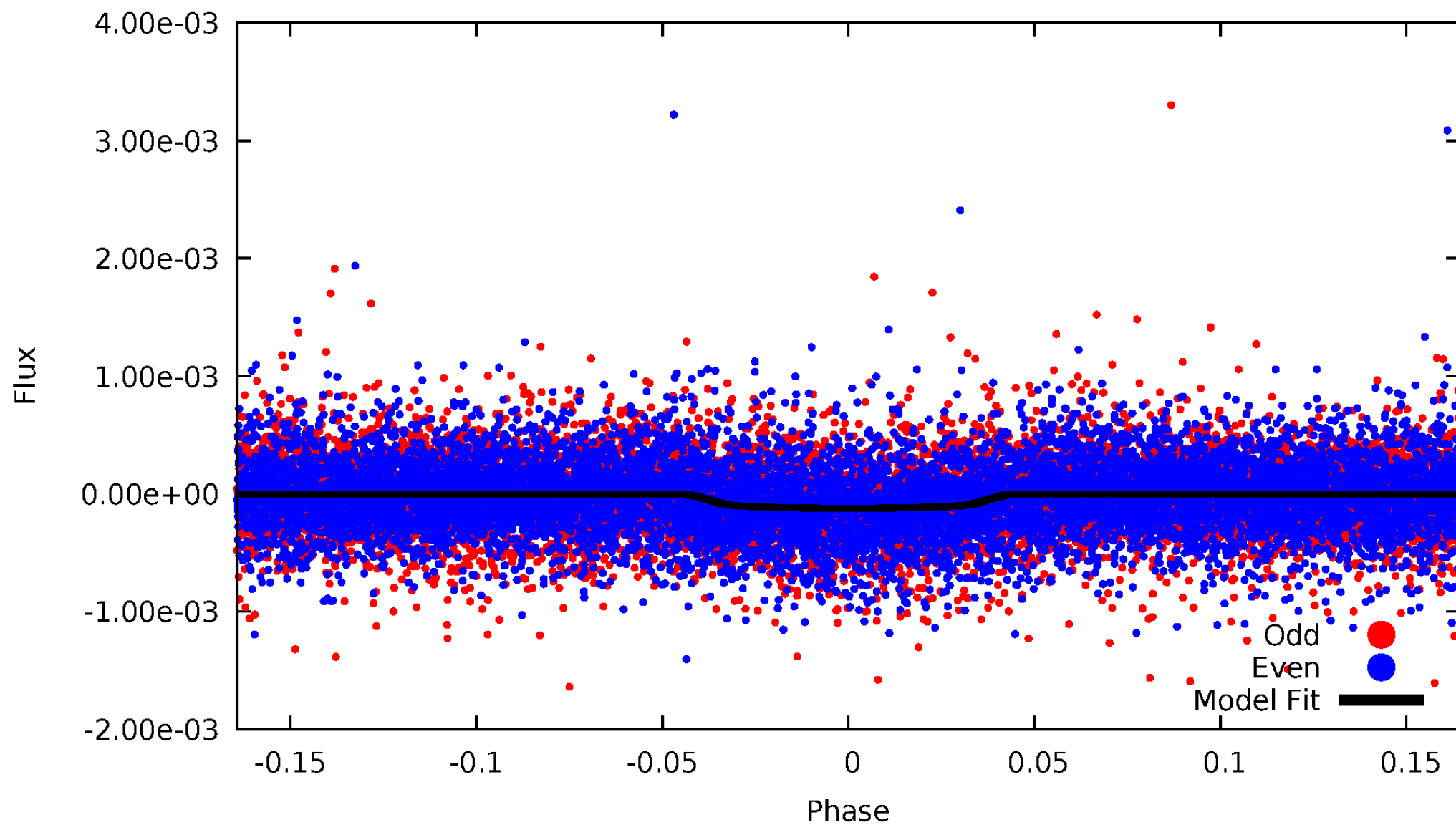


TCE 004769931-01



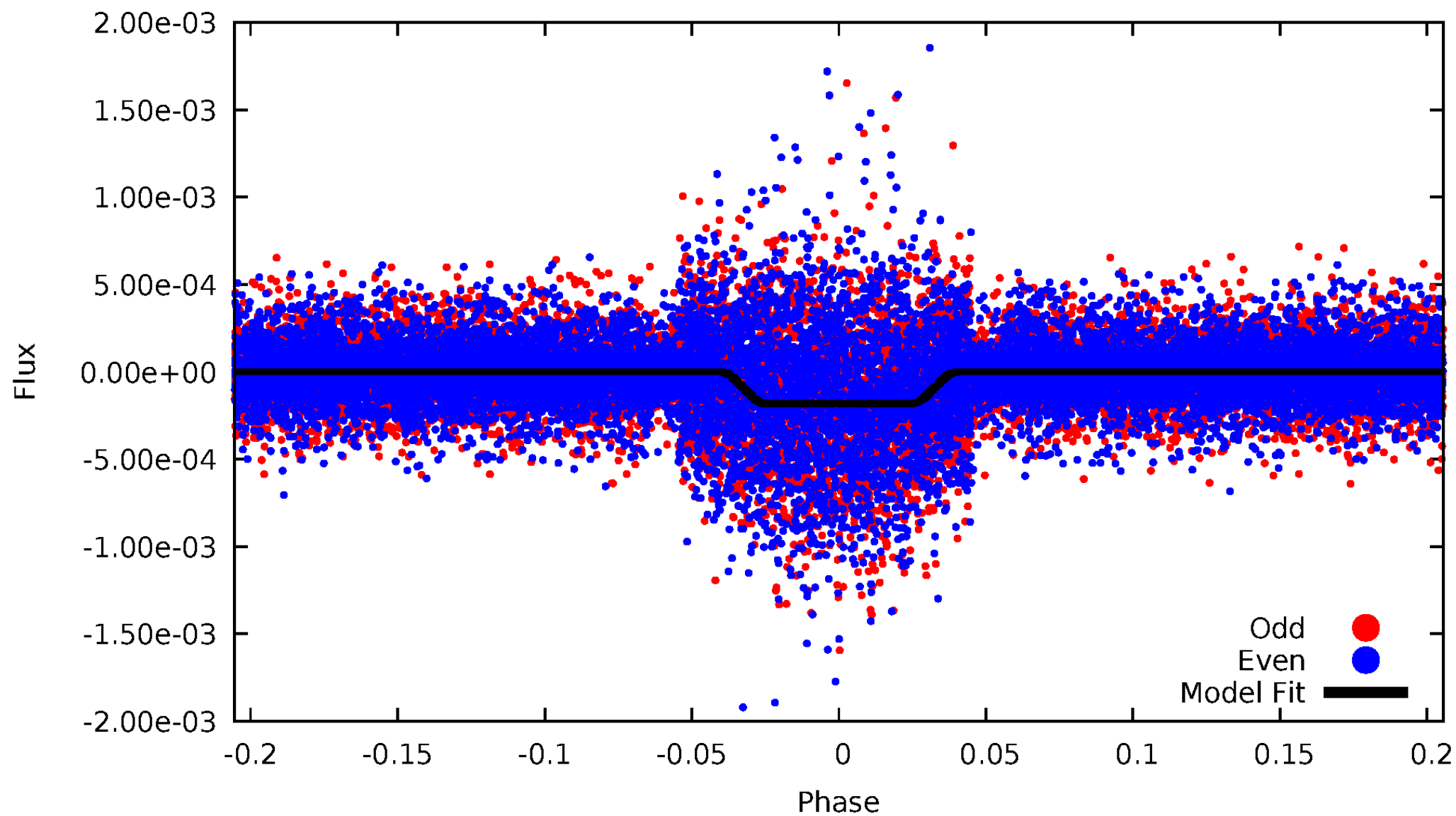
DV Odd/Even

TCE 004769931-01

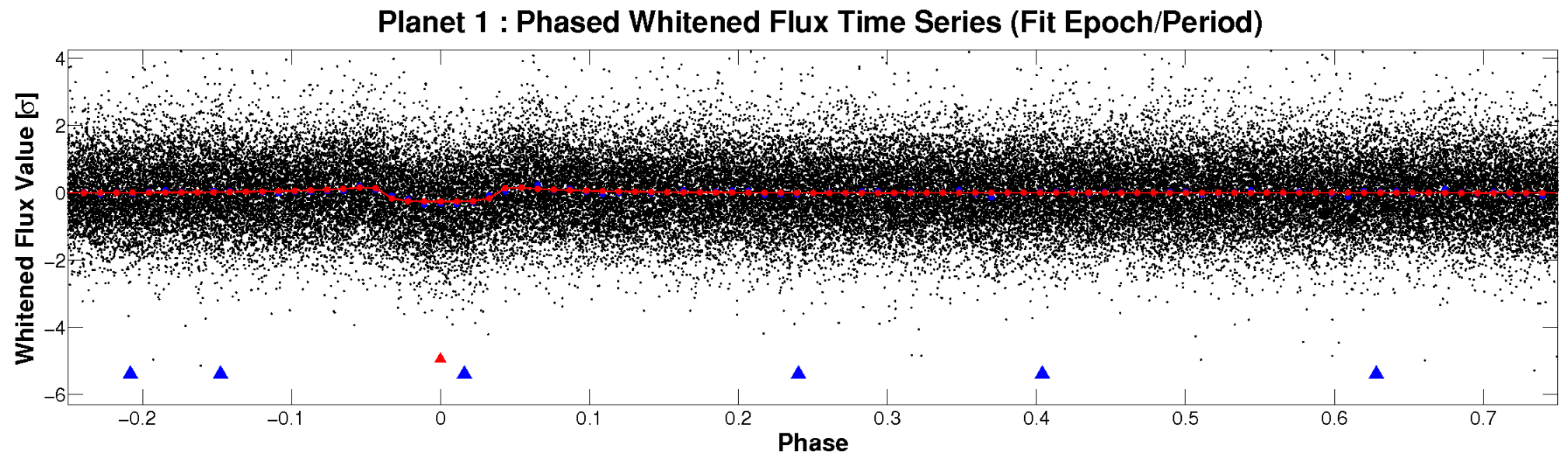
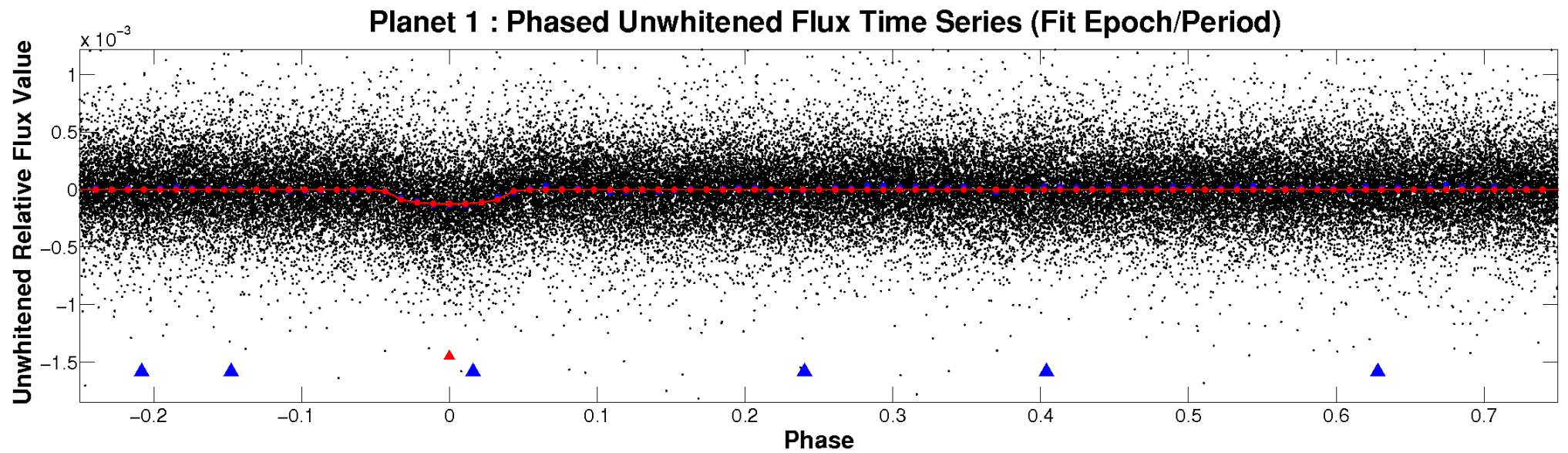


ALT Odd/Even

TCE 004769931-01

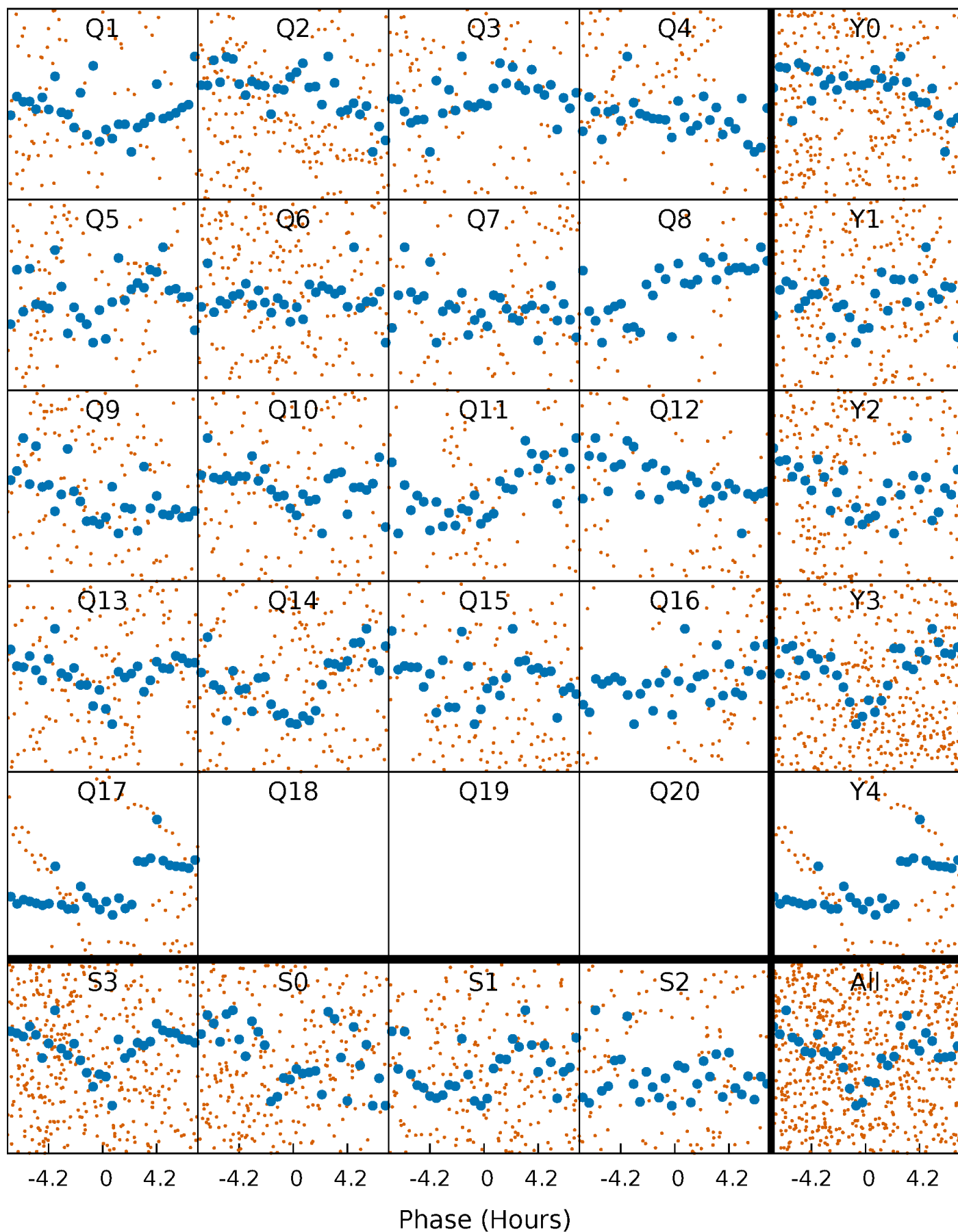


Non-Whitened Vs. Whitened Light Curve



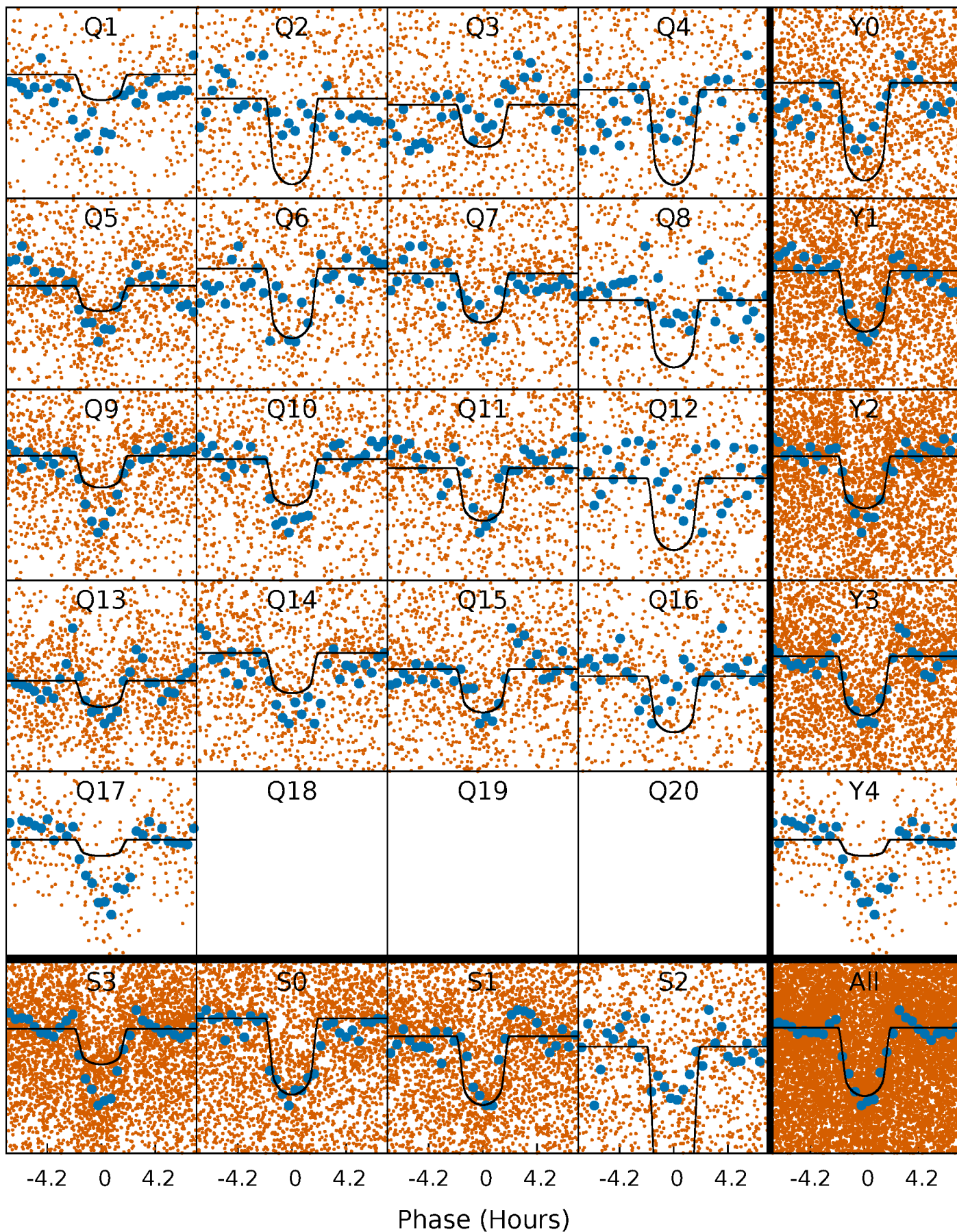
PDC Quarter-Phased Transit Curves

TCE 004769931-01 P= 1.878836 Days $T_0=133.088337$ (BKJD)



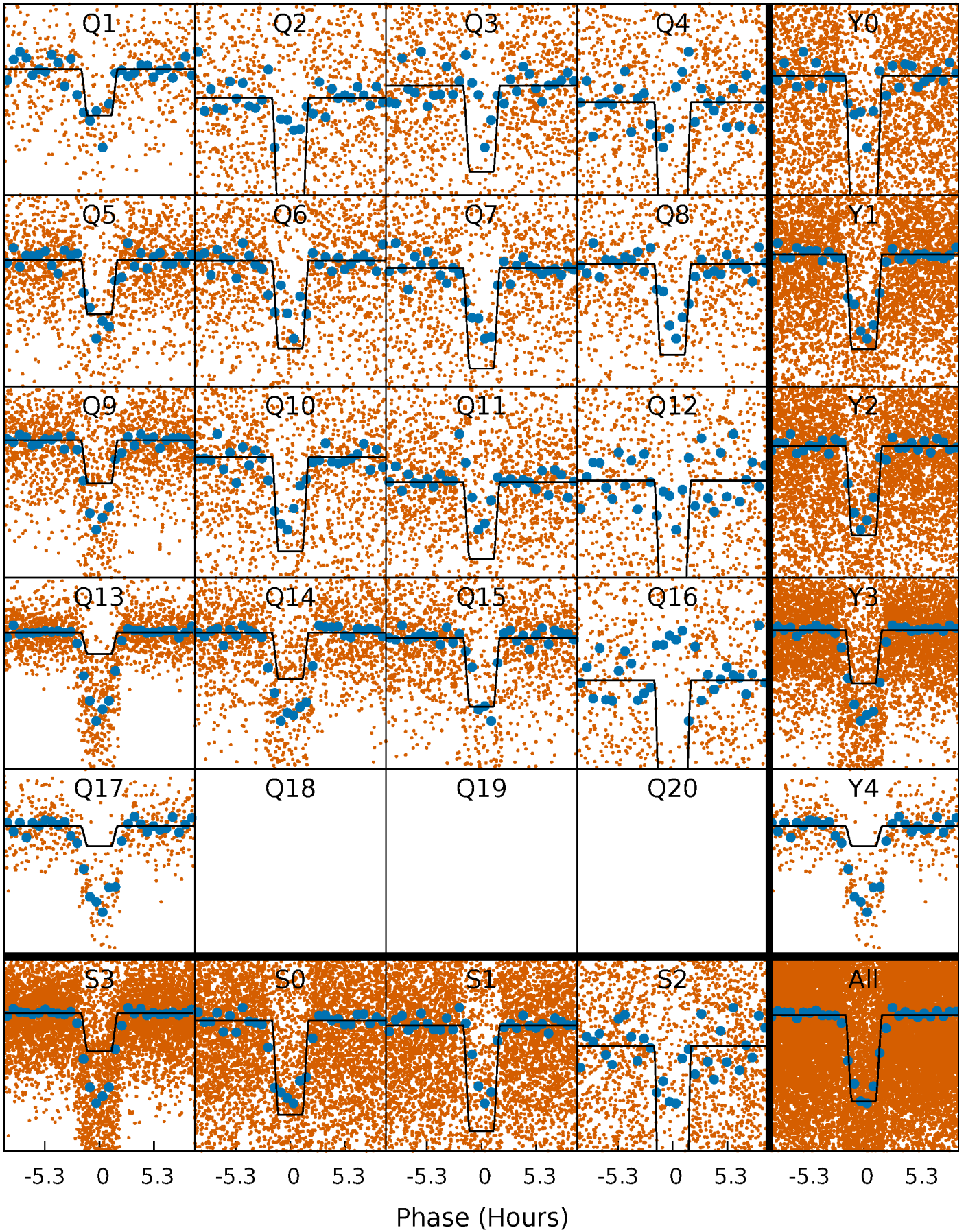
DV Quarter-Phased Transit Curves

TCE 004769931-01 P= 1.878836 Days $T_0=133.088337$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

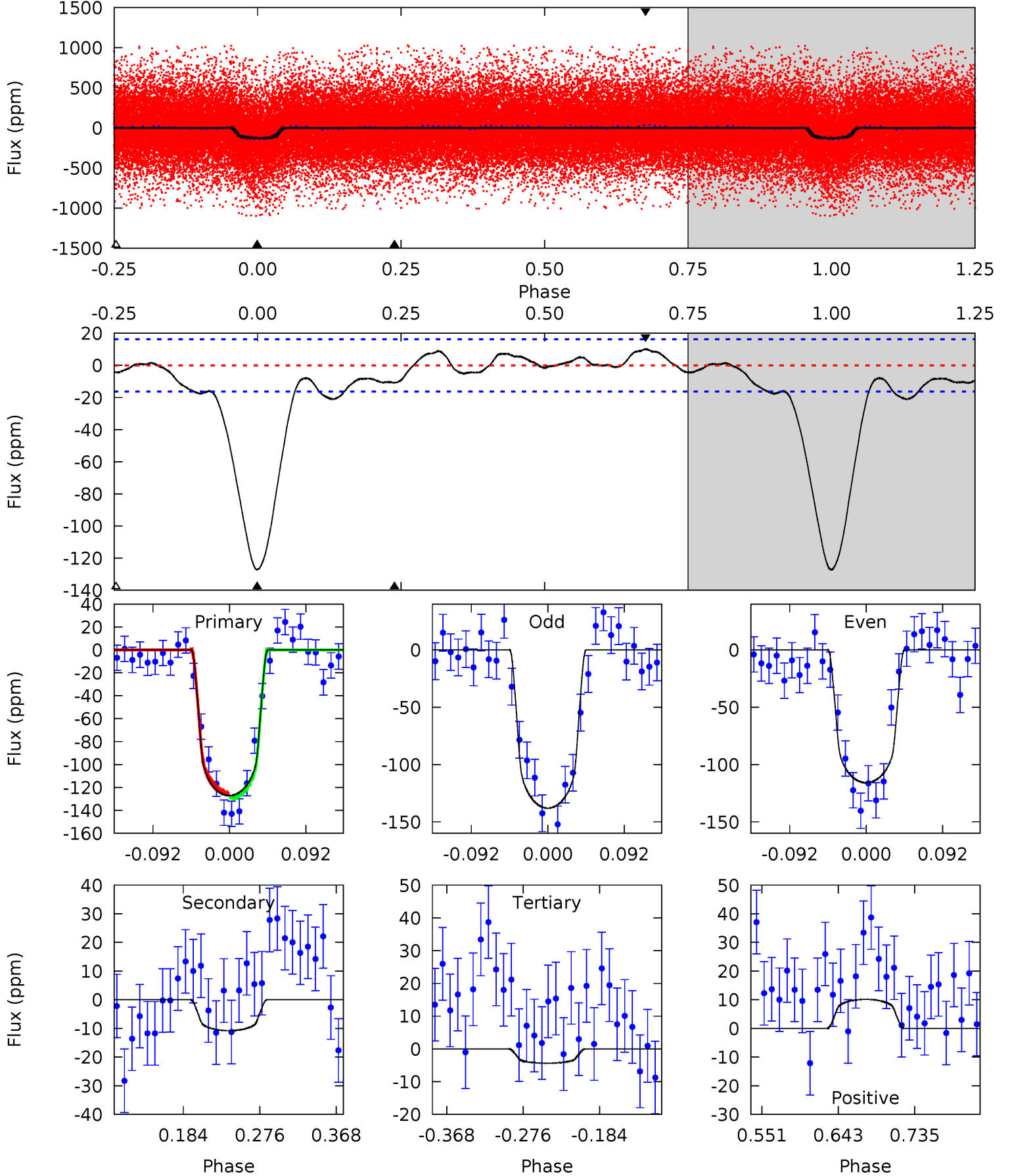
TCE 004769931-01 P= 1.878873 Days $T_0=133.074228$ (BKJD)



DV Model-Shift Uniqueness Test

004769931-01, P = 1.878836 Days, E = 131.209501 Days

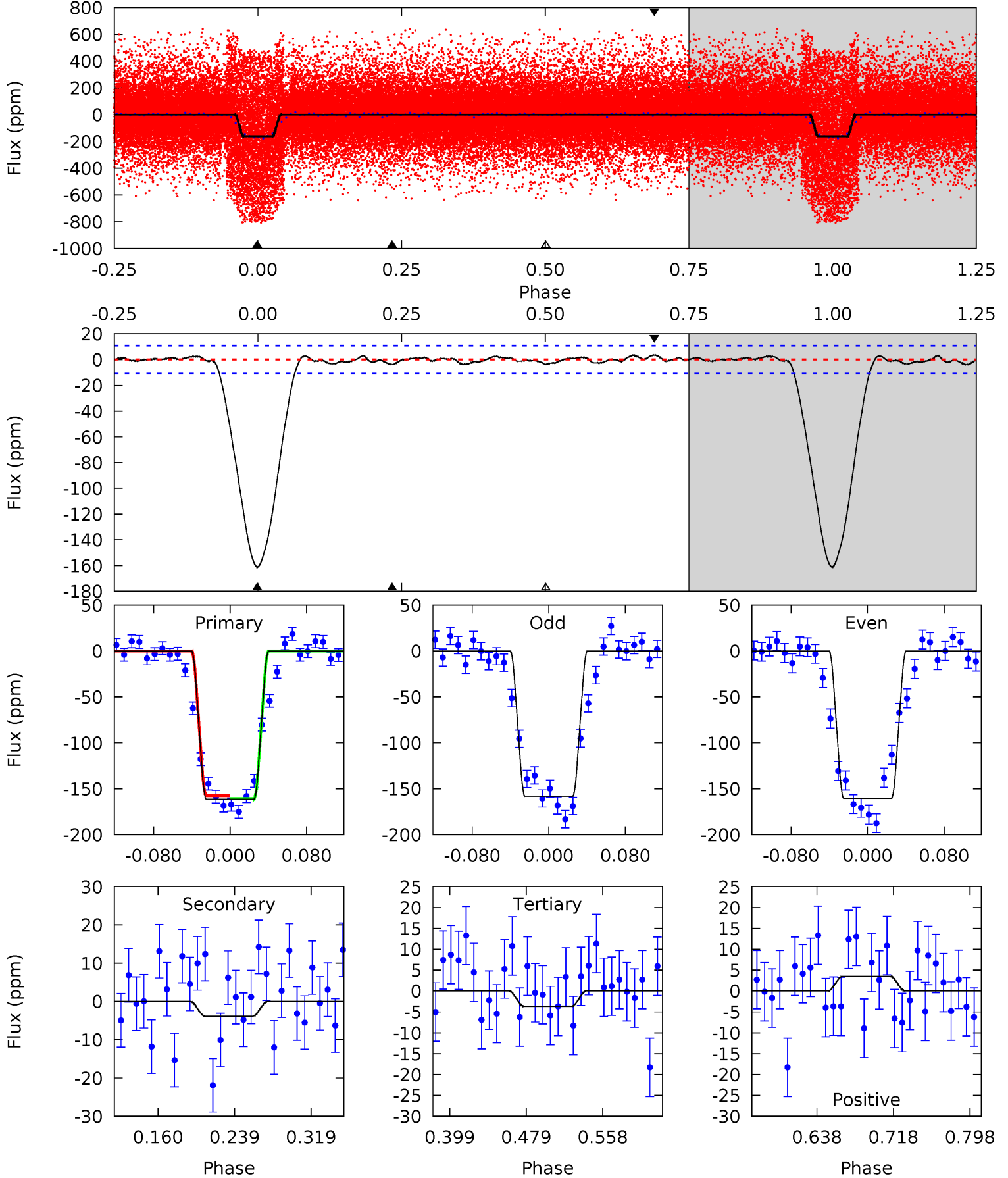
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.8	3.04	1.23	2.85	4.58	1.69	2.13	34.5	32.9	1.81	0.19	3.13	1.00	0.07	0.59



Alt Model-Shift Uniqueness Test

004769931-01, P = 1.878873 Days, E = 131.195355 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.3	1.63	1.56	1.49	4.61	1.75	0.70	66.8	66.8	0.07	0.14	0.46	1.22	0.02	0.68



Stellar Parameters For KIC 004769931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5448^{+162}_{-146}	$4.613^{+0.037}_{-0.112}$	$-0.380^{+0.300}_{-0.300}$	$0.734^{+0.131}_{-0.056}$	$0.815^{+0.083}_{-0.083}$	$2.901^{+0.449}_{-1.017}$
	+3%/-3%	+1%/-2%	+79%/-79%	+18%/-8%	+10%/-10%	+15%/-35%
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 004769931-01 / KOI 4058.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-11 ± 4	$1.01^{+0.20}_{-0.21}$	1750^{+77}_{-66}	3297^{+327}_{-259}	$4.341^{+3.190}_{-1.793}$
Alt.	-4 ± 2	$1.11^{+0.20}_{-0.20}$	1750^{+78}_{-62}	2716^{+286}_{-492}	$1.287^{+1.174}_{-0.811}$

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

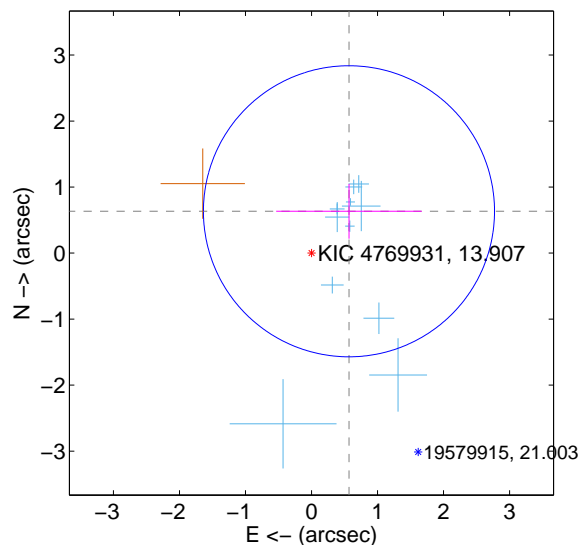
Supplemental centroid analysis for 004769931-01. Kepler magnitude: 13.91. Transit SNR 19.38

There are 11 quarters with good PRF difference image offsets

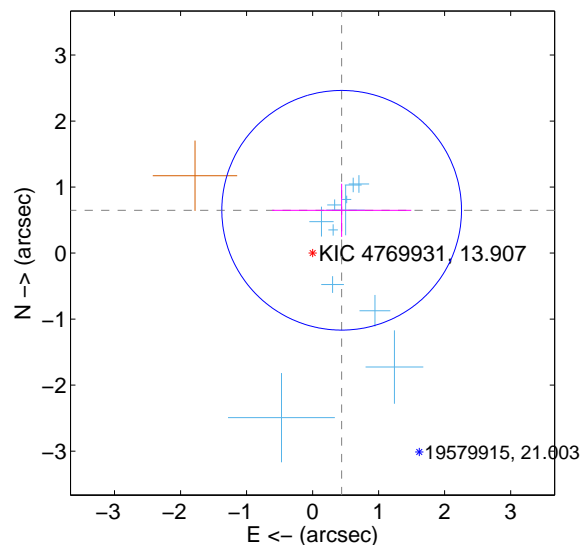
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.850 ± 0.735	1.16	-0.567 ± 1.102	0.633 ± 0.415
PRF-fit source offset from KIC position	0.784 ± 0.605	1.30	-0.440 ± 1.055	0.649 ± 0.403
photometric centroid source offset	0.73 ± 0.61	1.19	-0.06 ± 0.48	-0.73 ± 0.62

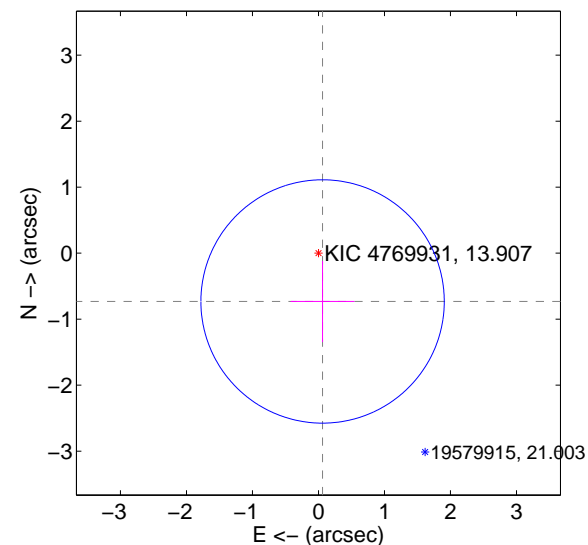
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

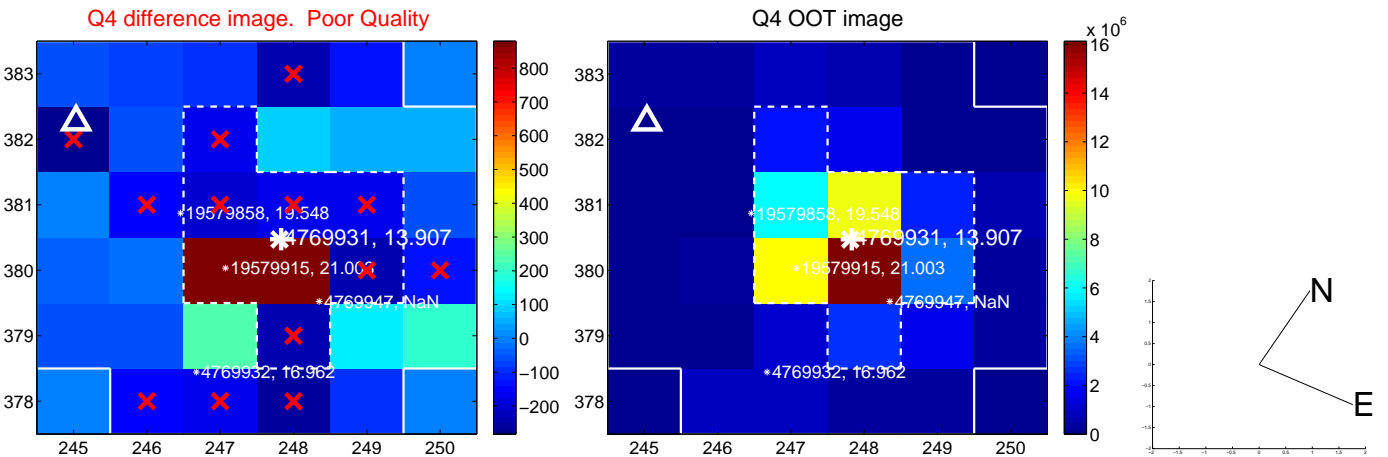
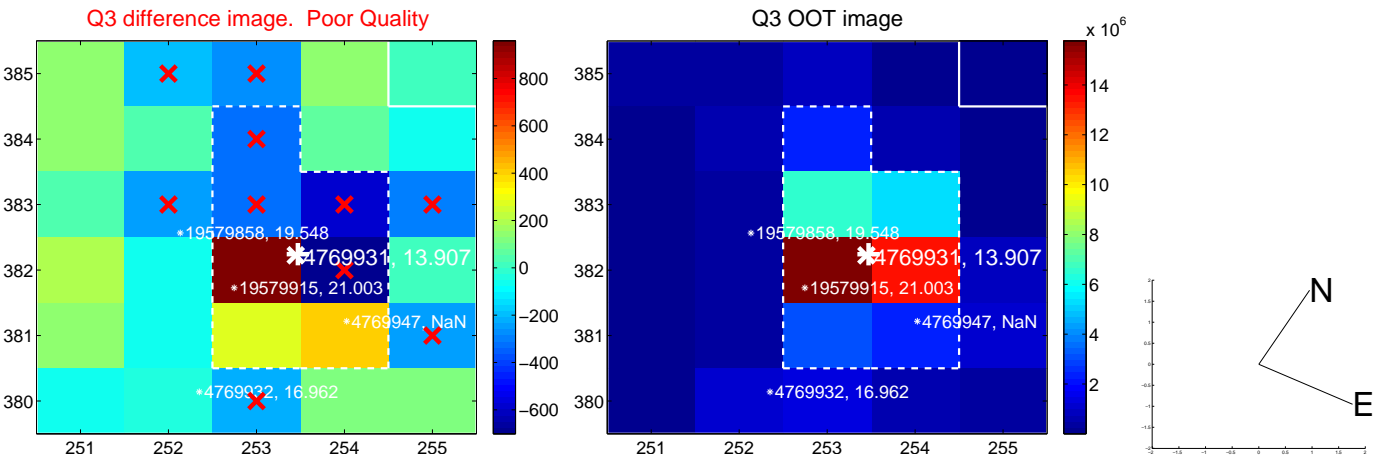
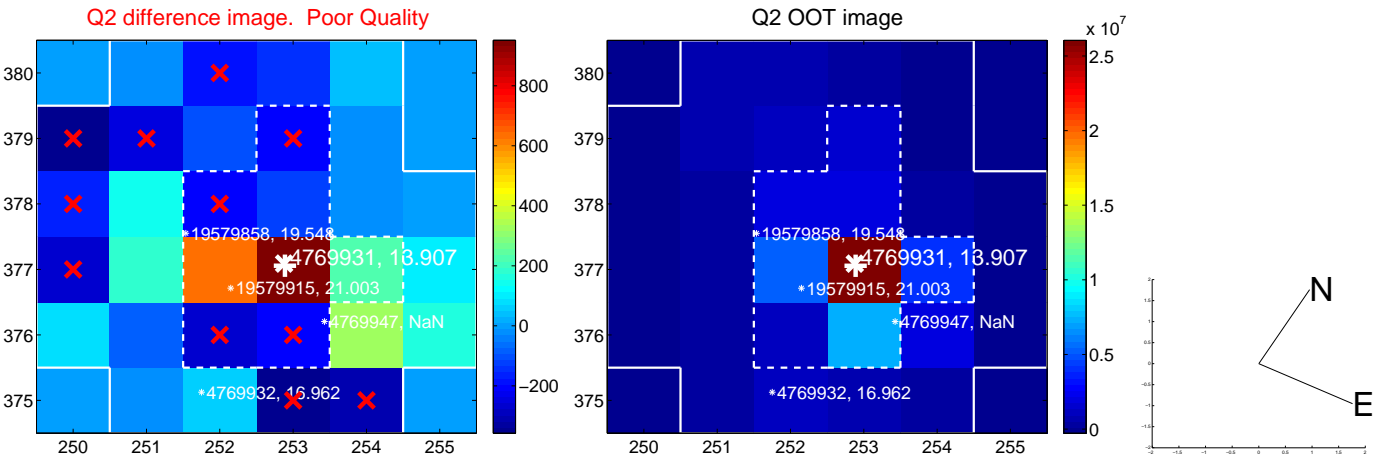
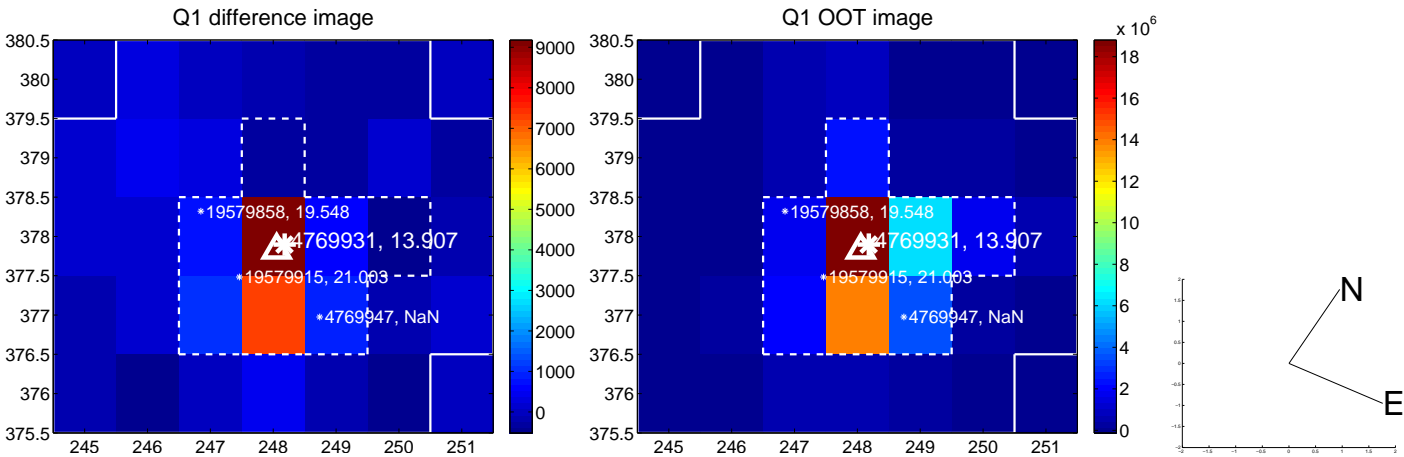


offset from photometric centroids

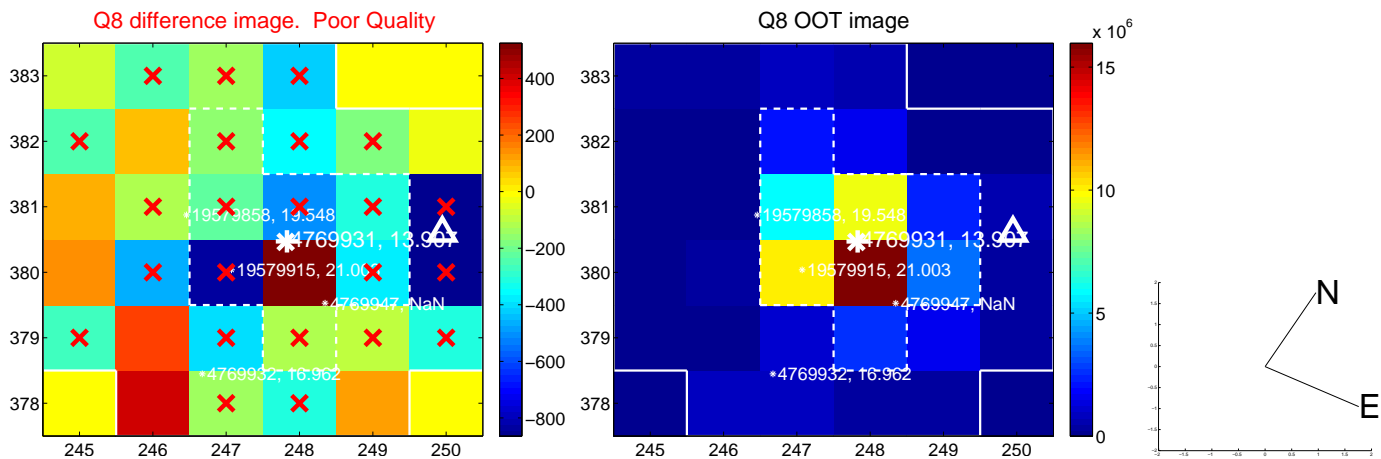
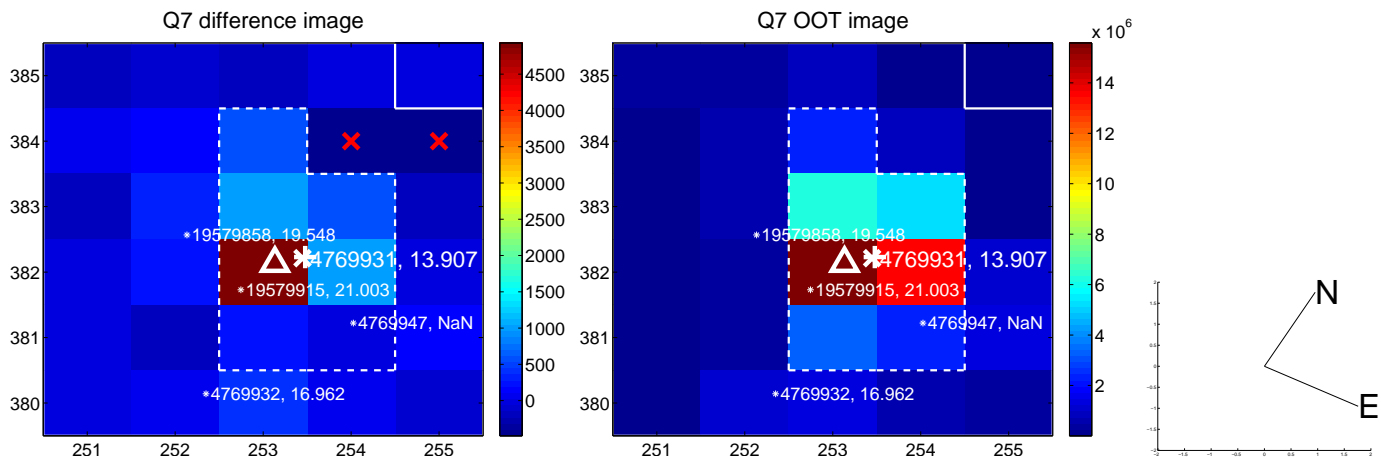
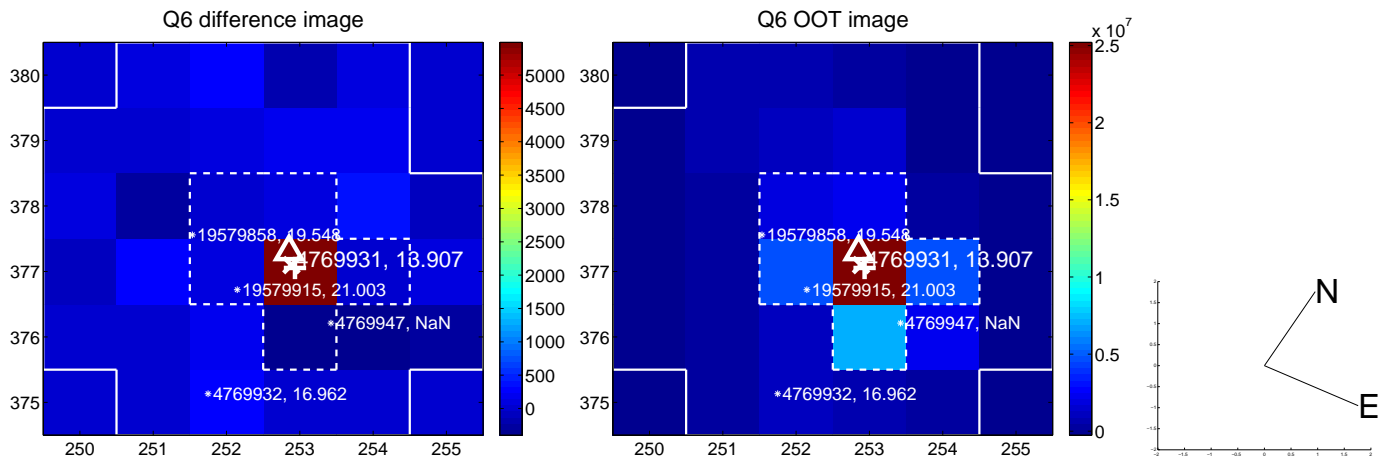
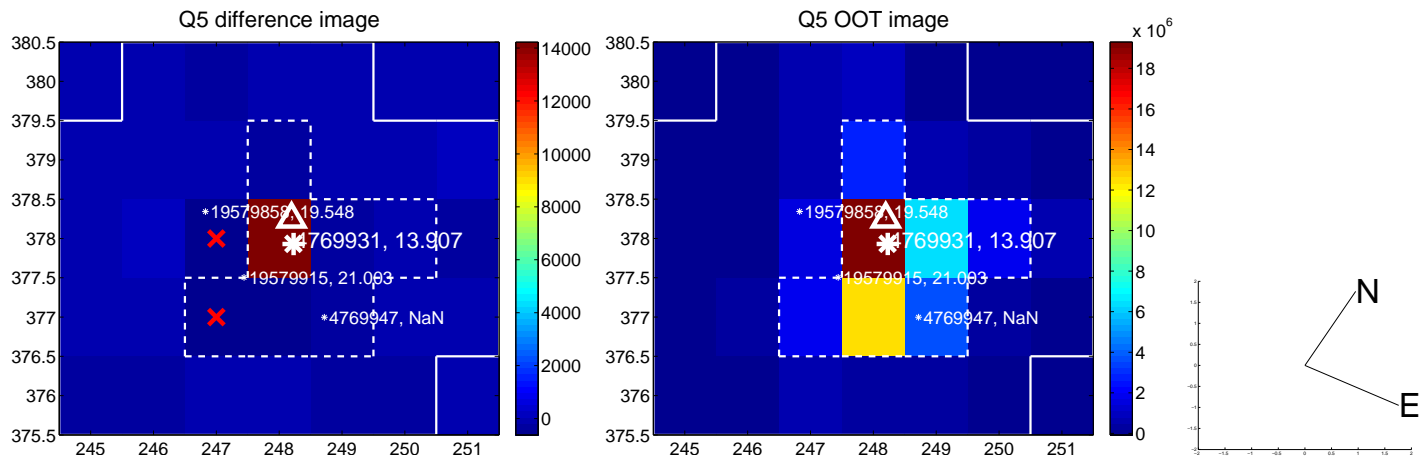


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

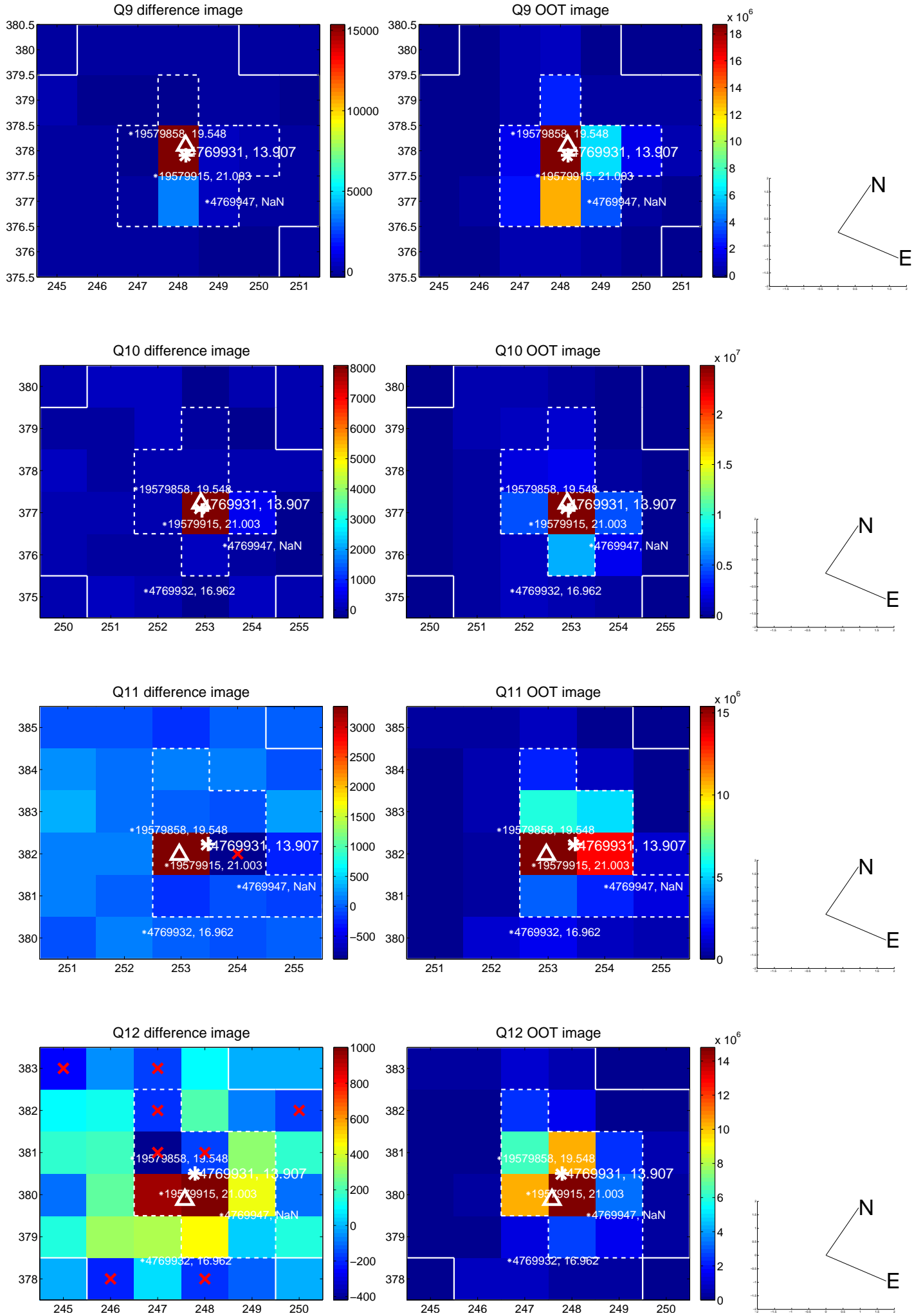
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



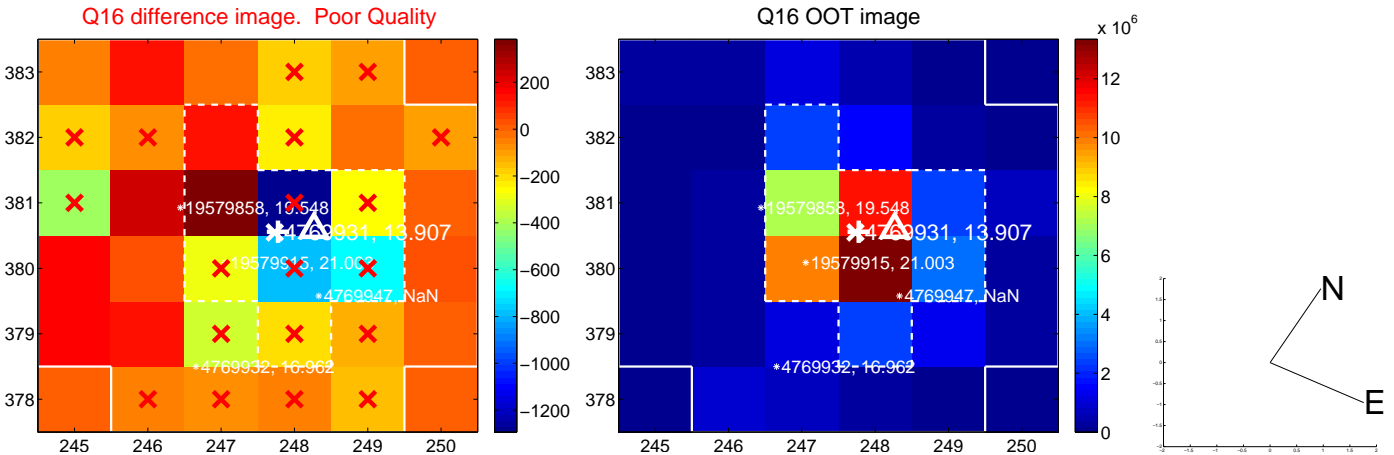
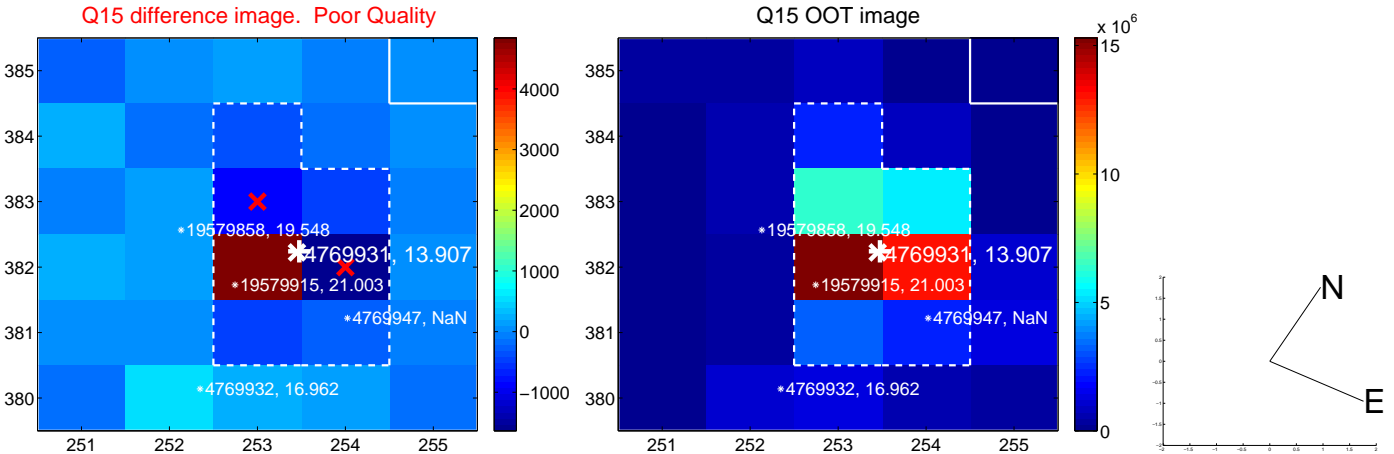
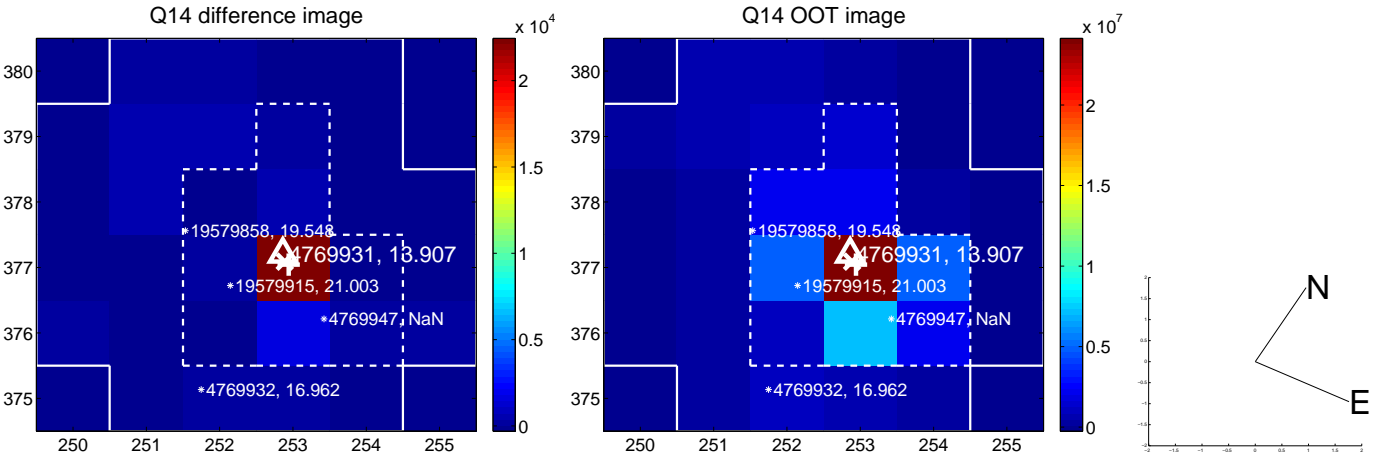
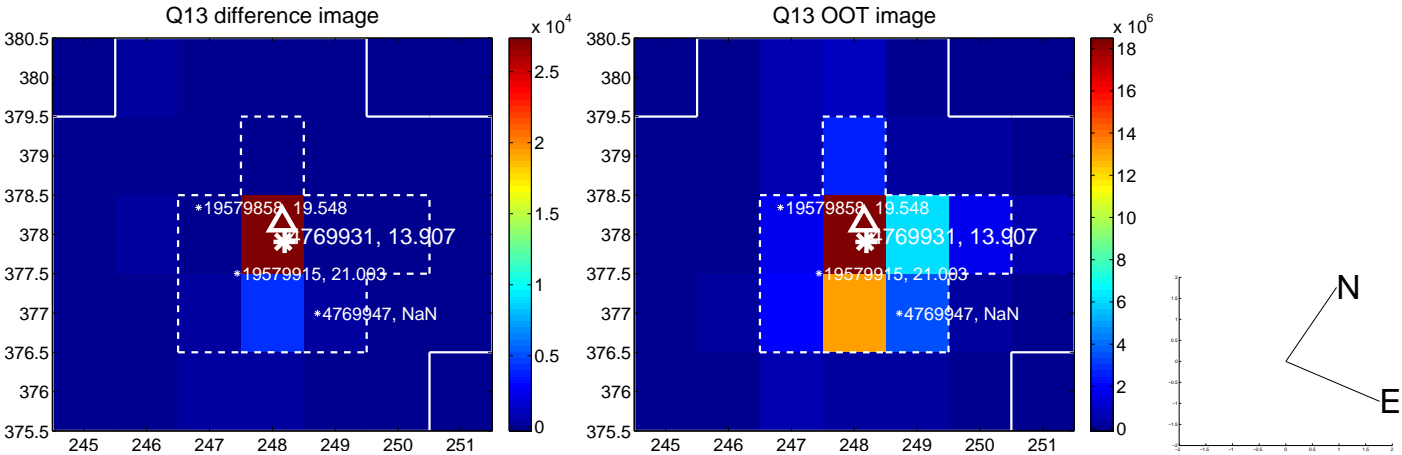
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



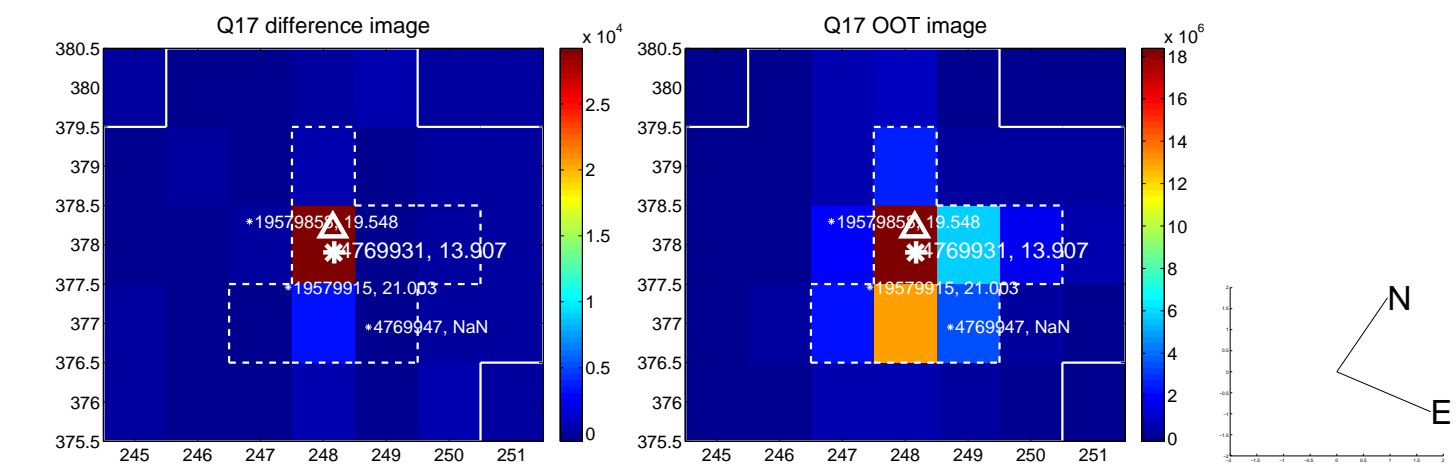
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



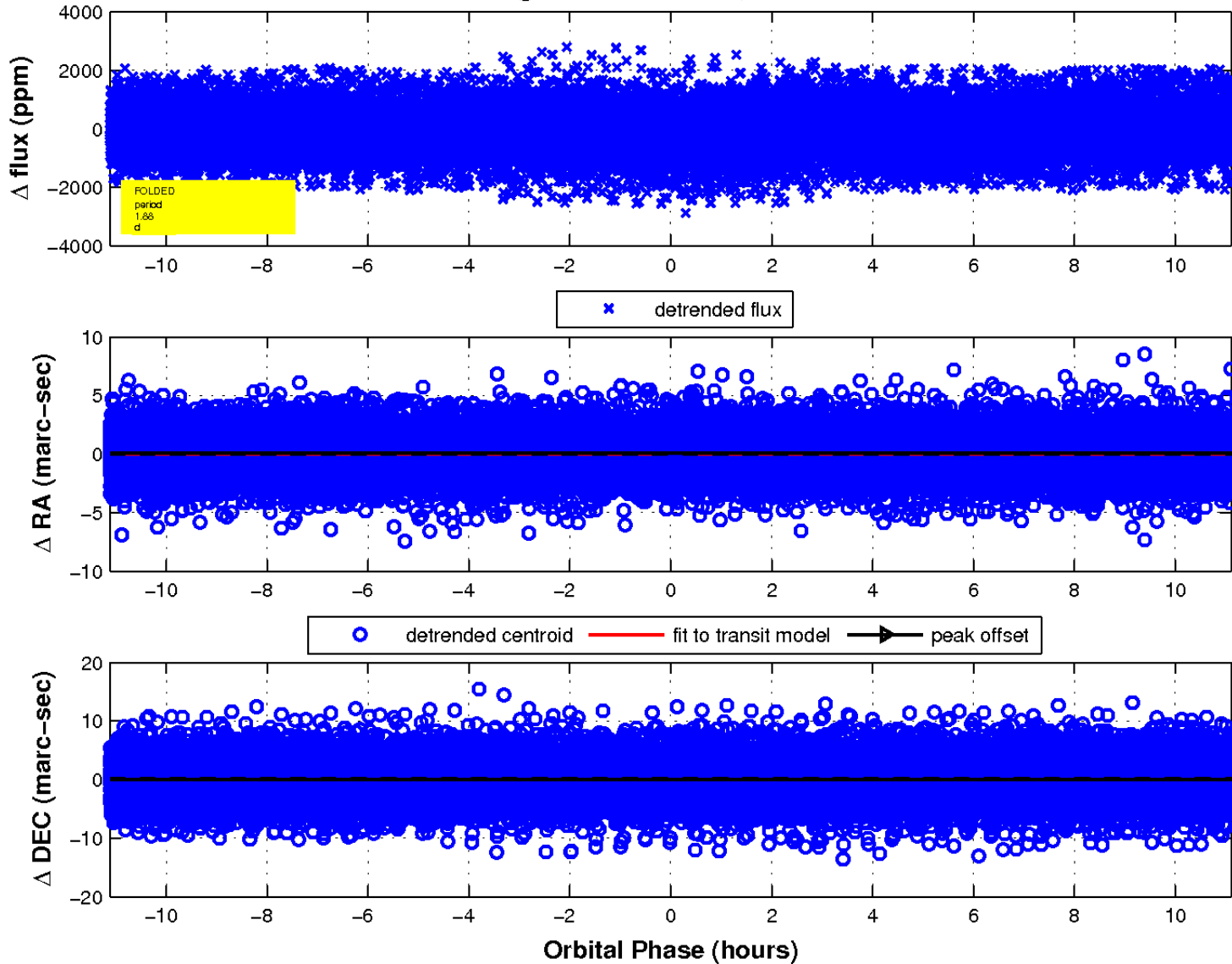
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

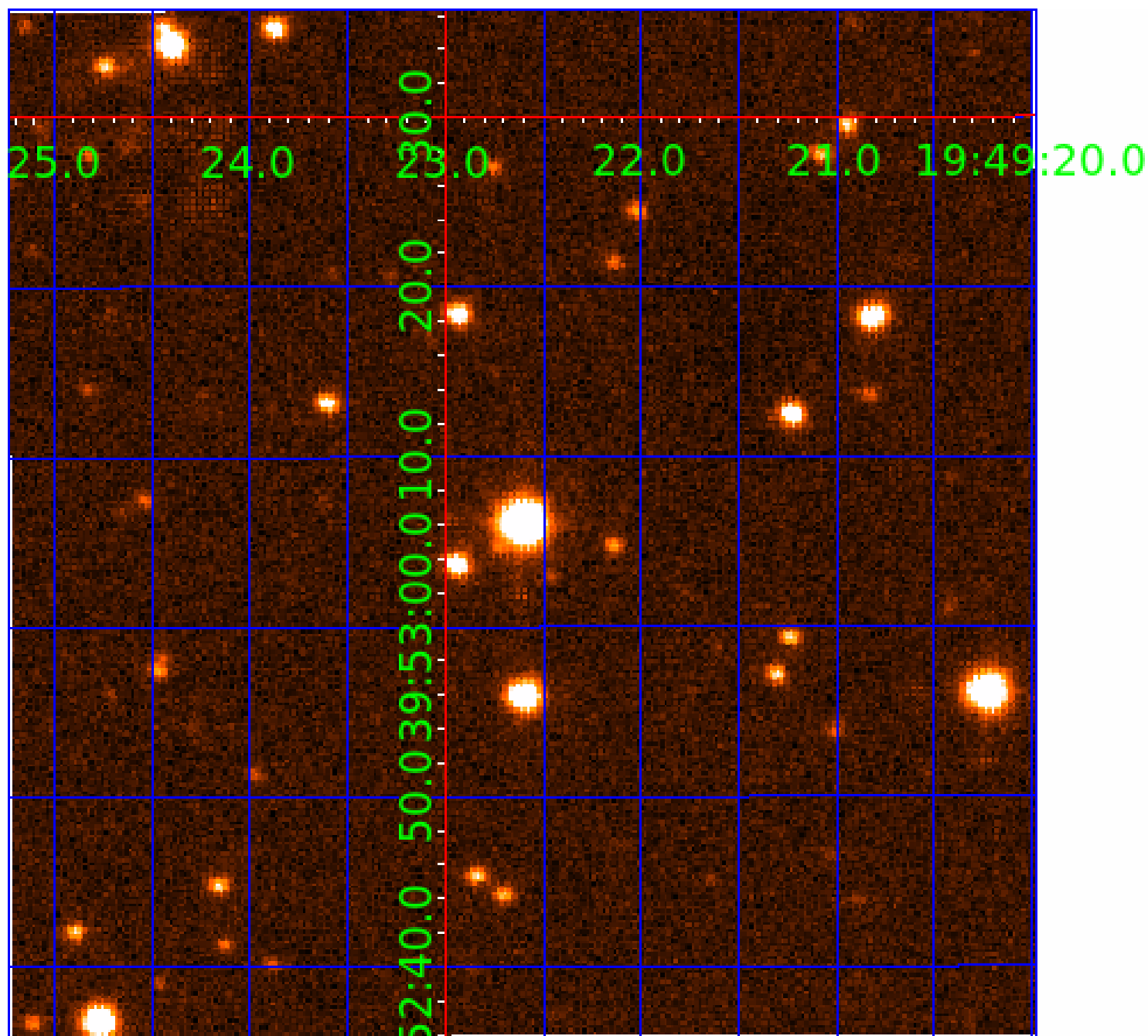


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 004769931

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})
004769931-01	OBS	4058.01	1.878836	133.088337	124.2	3.704	17.7	19.4	0.73	5448	0.98	552.66
004769931-02	OBS	No	228.067995	300.027463	504.6	2.339	7.9	6.6	0.73	5448	1.75	0.92

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004769931-01	OBS	FP	0.00	0	0	0	1	EPHEM_MATCH
004769931-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST

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

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

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

Ephemeris Match Information For 004769931-02

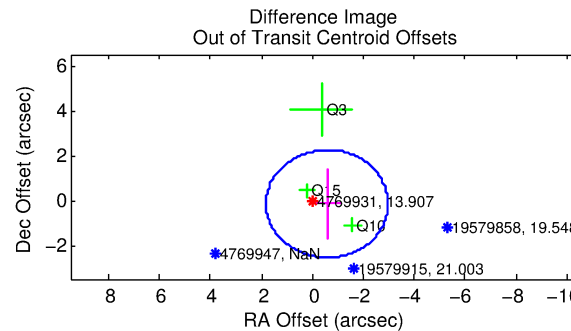
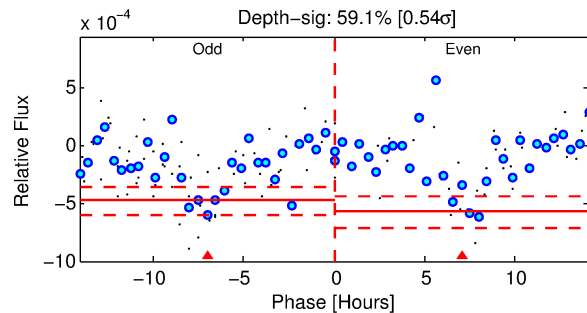
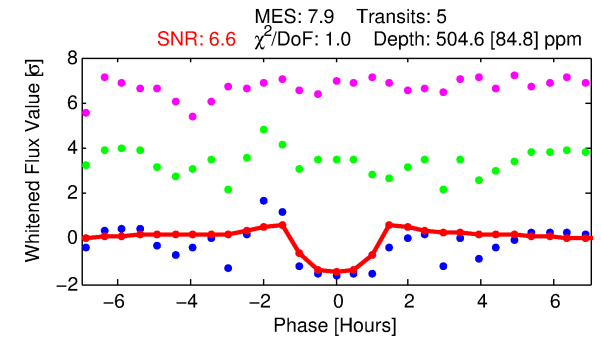
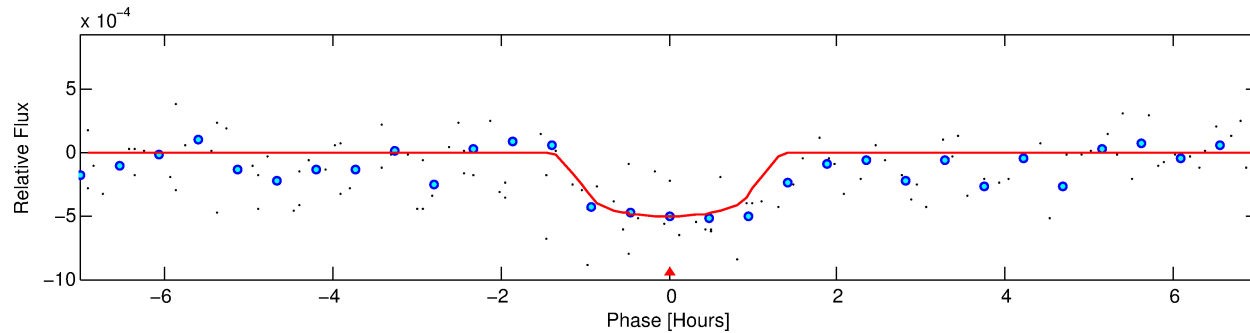
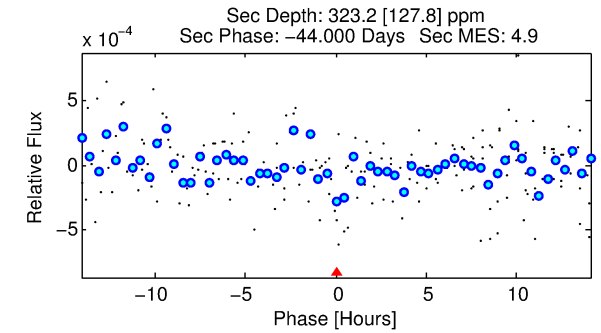
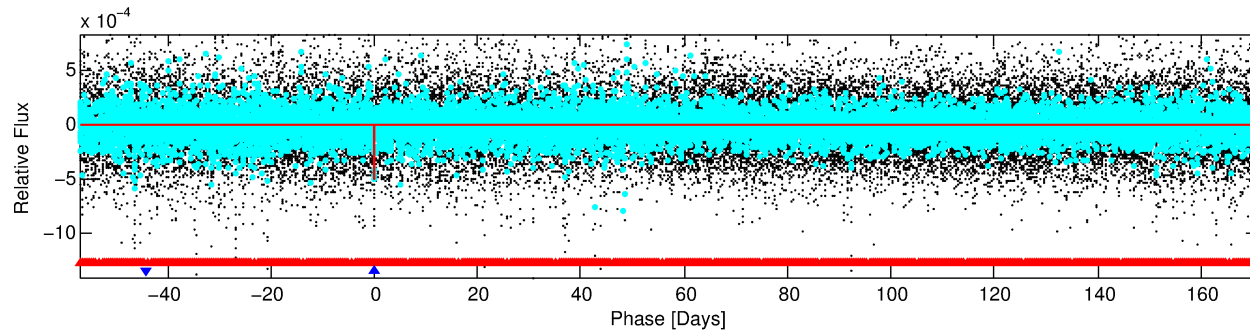
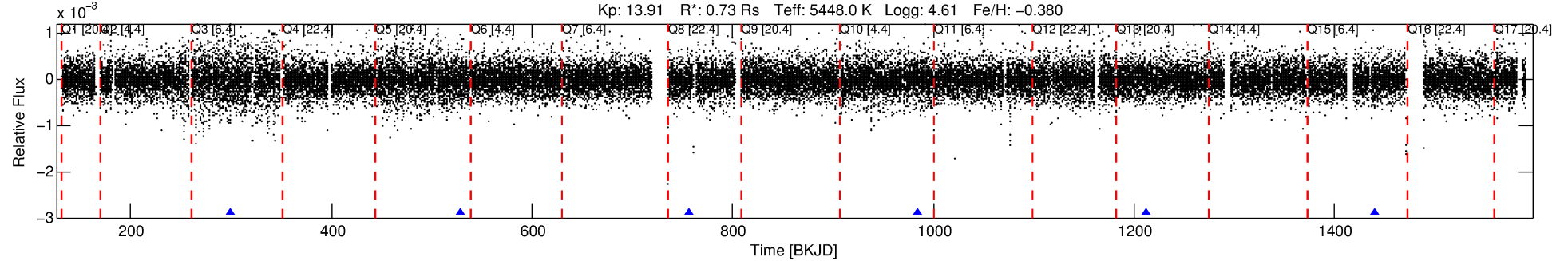
No Significant Match Found

DV One-Page Summary

KIC: 4769931 Candidate: 2 of 2 Period: 228.068 d

KOI: K04058 Corr: No Ephemeris Match

Kp: 13.91 R*: 0.73 Rs Teff: 5448.0 K Logg: 4.61 Fe/H: -0.380



DV Fit Results:

Period = 228.06800 [0.00213] d
Epoch = 300.0275 [0.0075] BKJD
Rp/R* = 0.0218 [0.0421]
a/R* = 571.27 [4573.38]
b = 0.68 [6.56]
Seff = 0.92 [0.22]
Teq = 250 [15] K
Rp = 1.75 [3.39] Re
a = 0.6800 [0.0998] AU
Ag = 26886.27 [104460.29] [0.26σ]
Teffp = 4944 [4797] K [0.98σ]

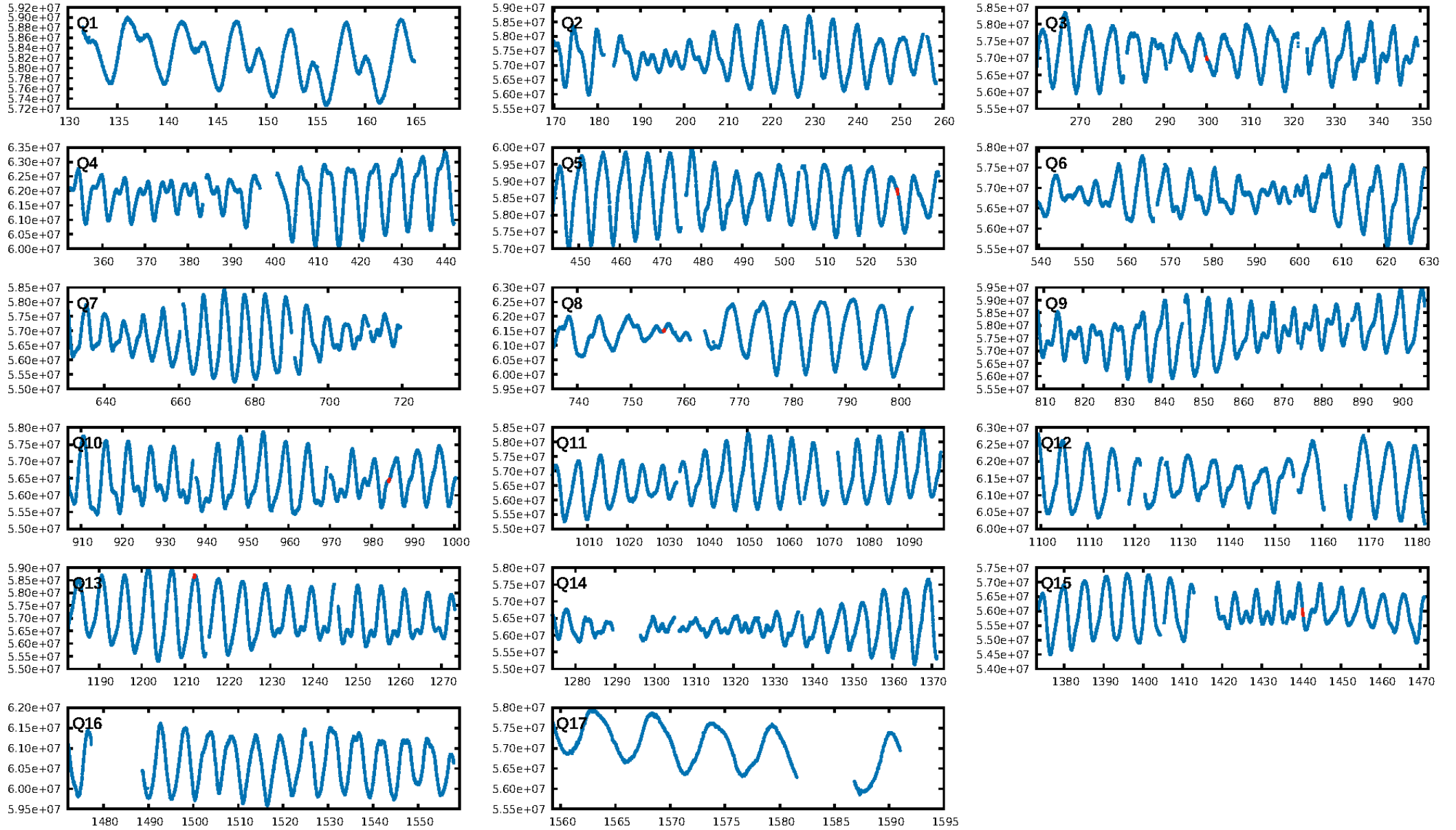
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1239.14σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 63.3%
ModelChiSquareGof-sig: 93.4%
Bootstrap-pfa: 8.83e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.2224
Centroid-sig: 25.0%
Centroid-so: 2.009 arcsec [1.14σ]
OotOffset-rm: 0.603 arcsec [0.75σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-rm: 0.493 arcsec [0.81σ]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.67 [4/6]

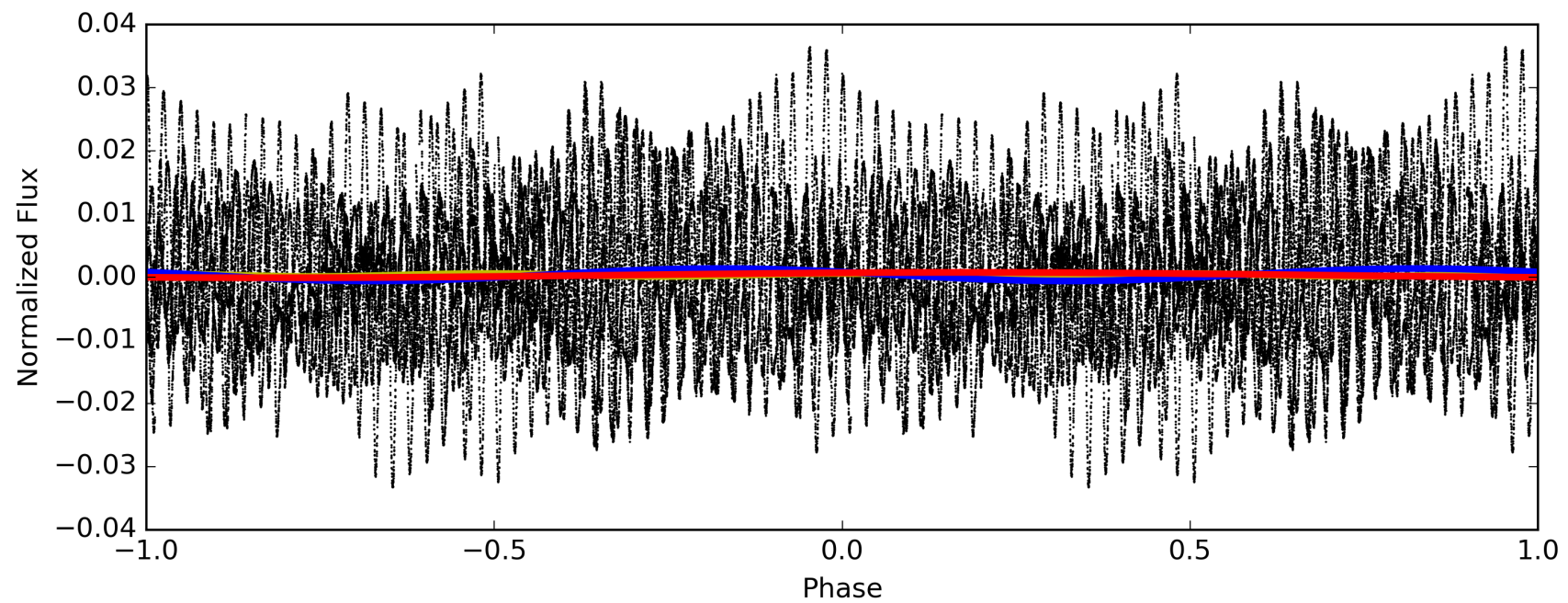
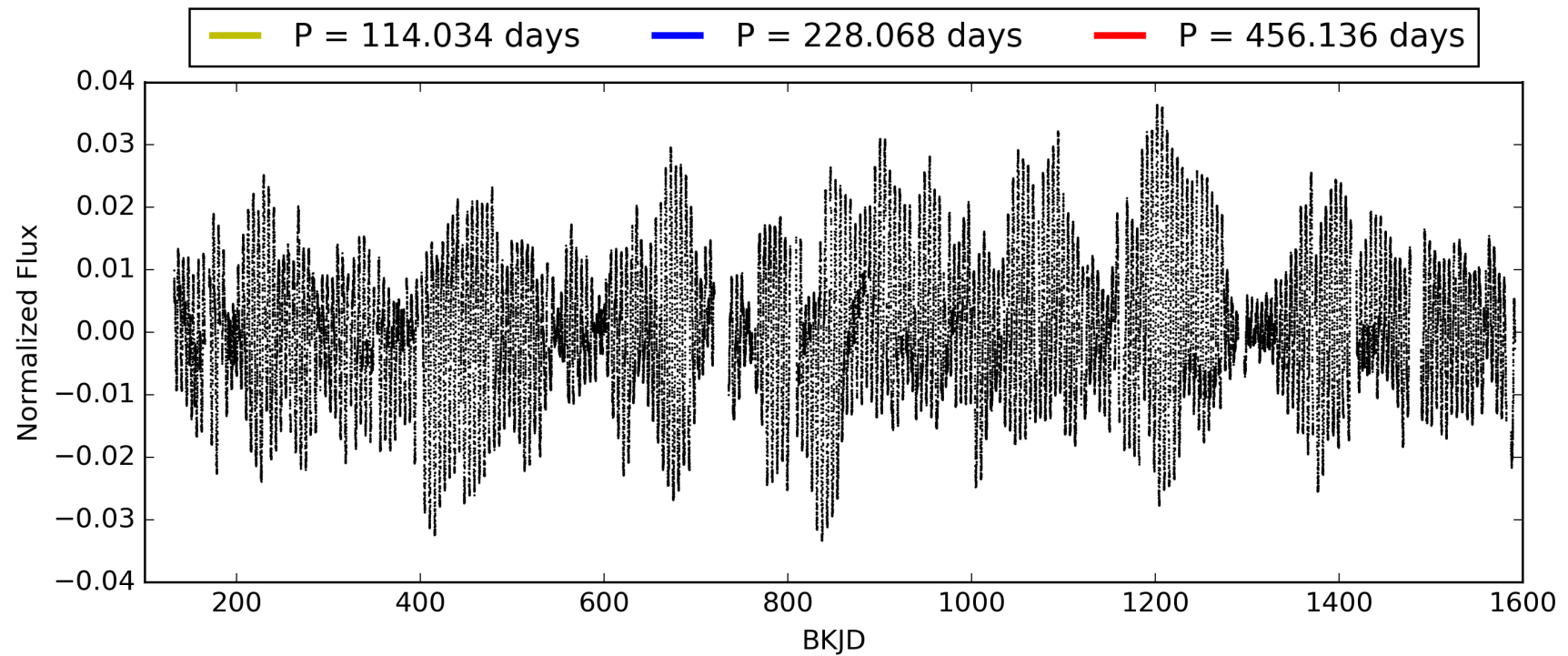
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:40:39 Z

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

TCE 004769931-02, PDC Light Curves

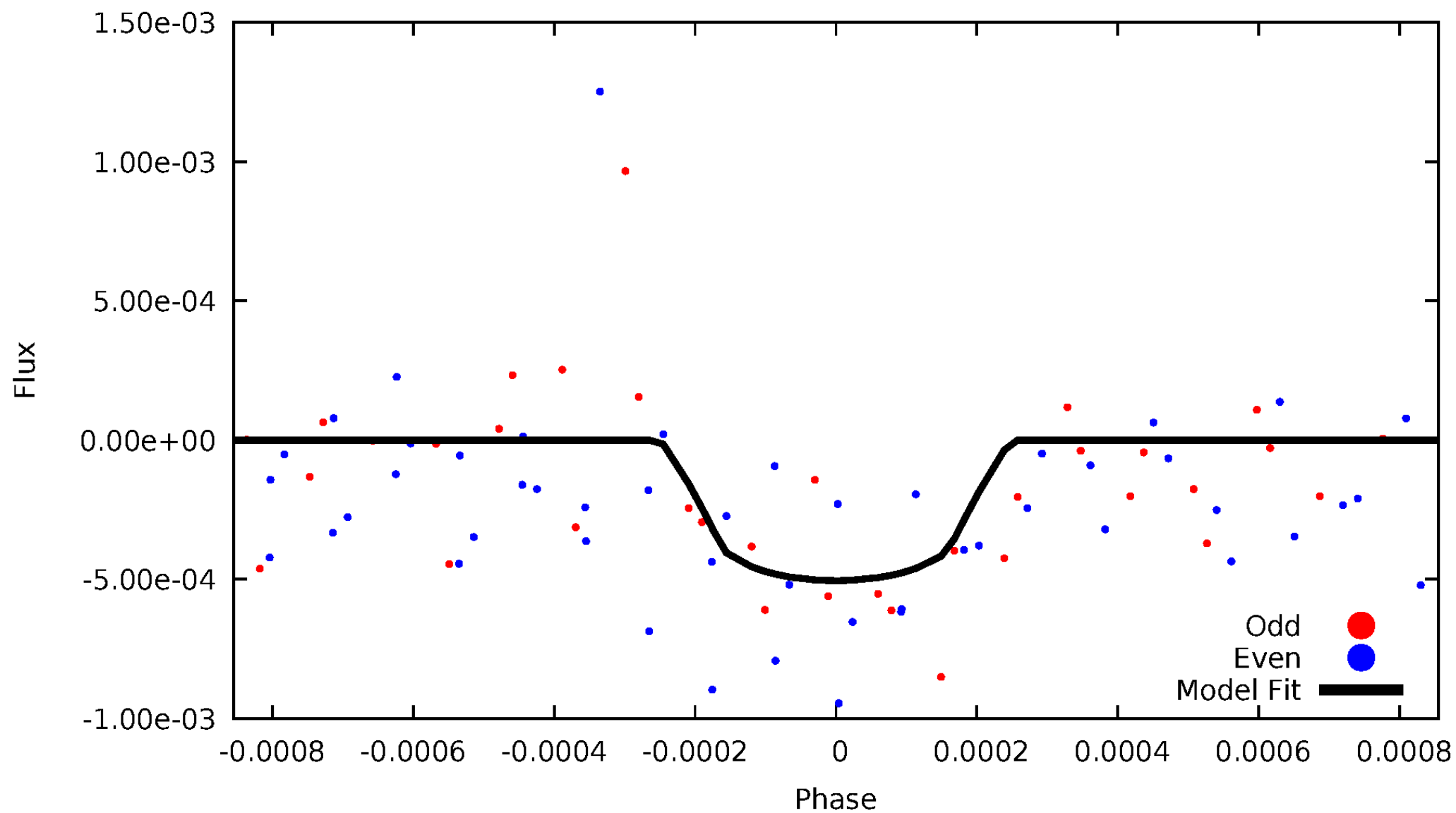


TCE 004769931-02



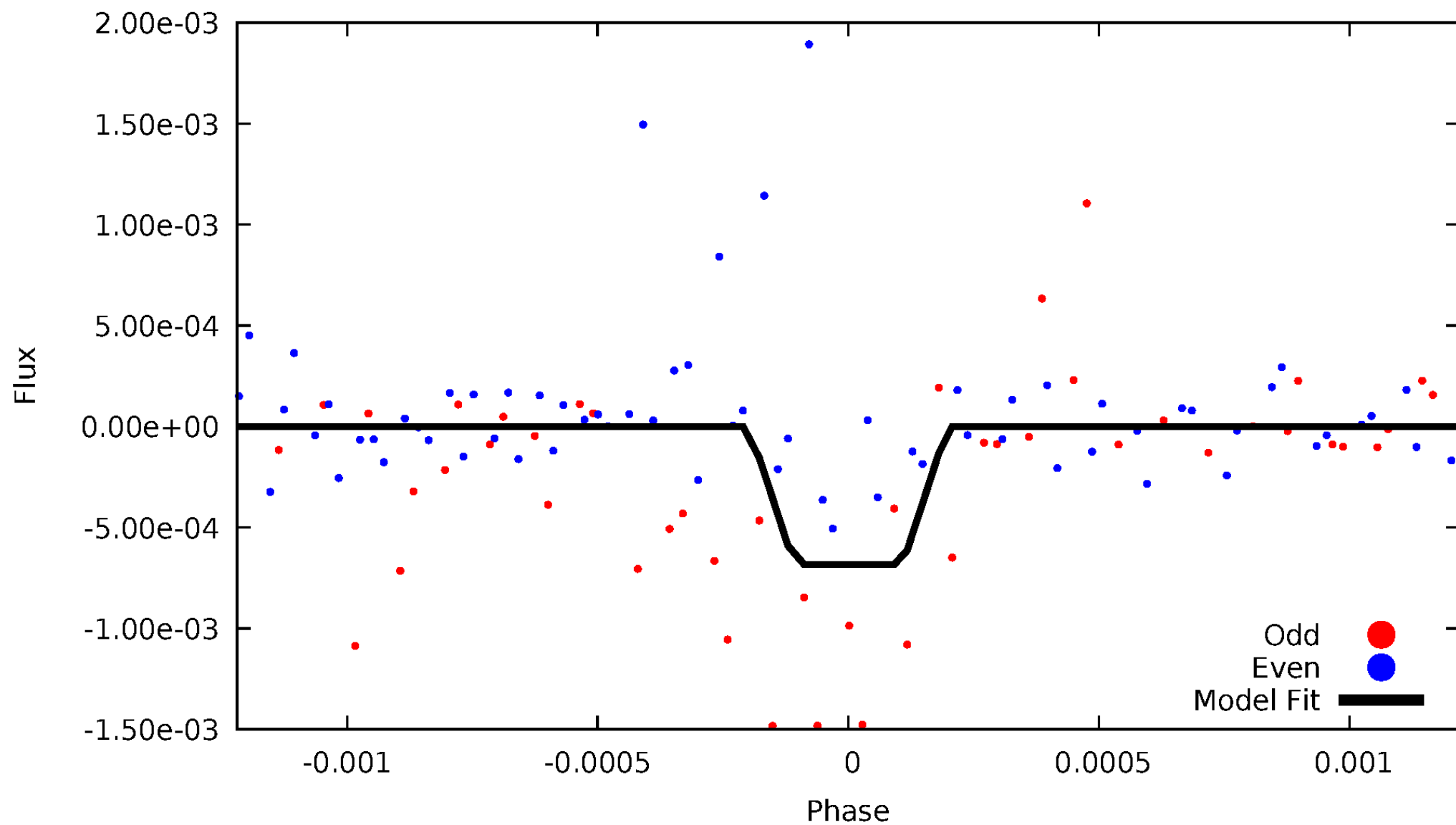
DV Odd/Even

TCE 004769931-02



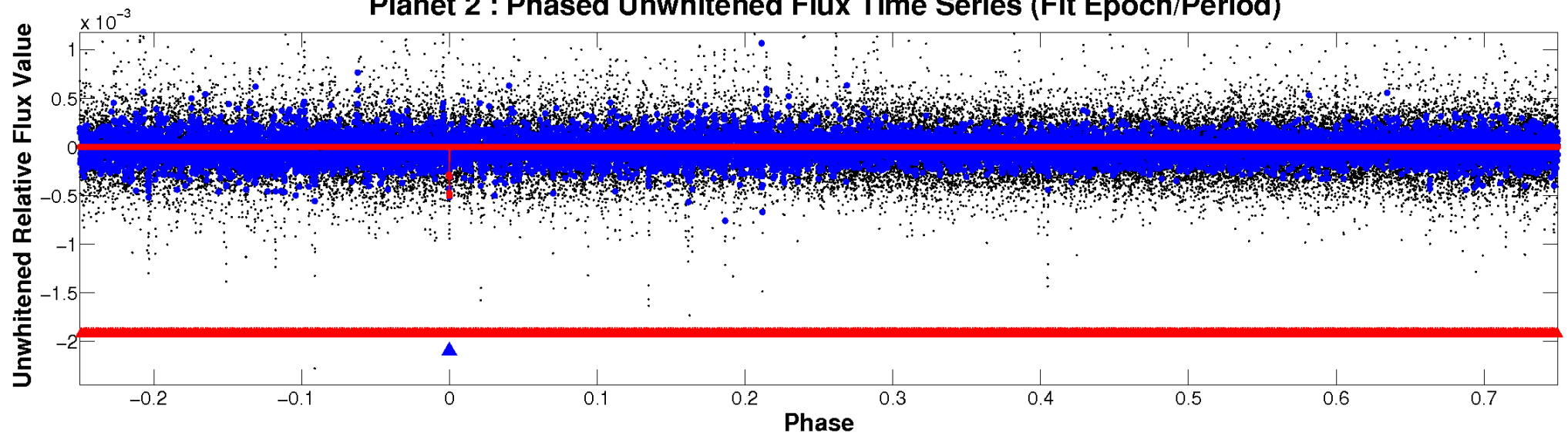
ALT Odd/Even

TCE 004769931-02

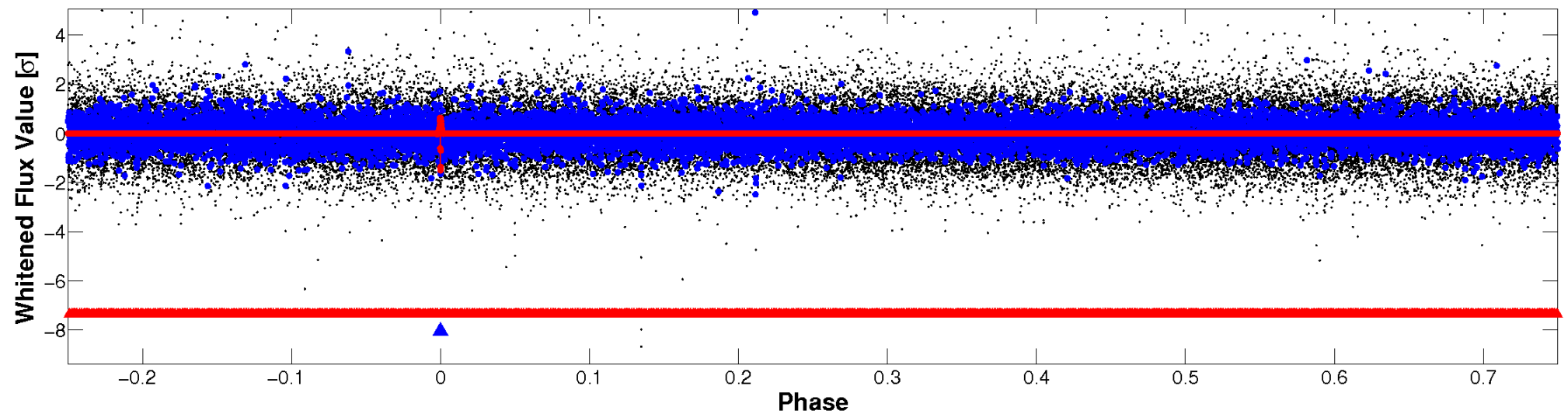


Non-Whitened Vs. Whitened Light Curve

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

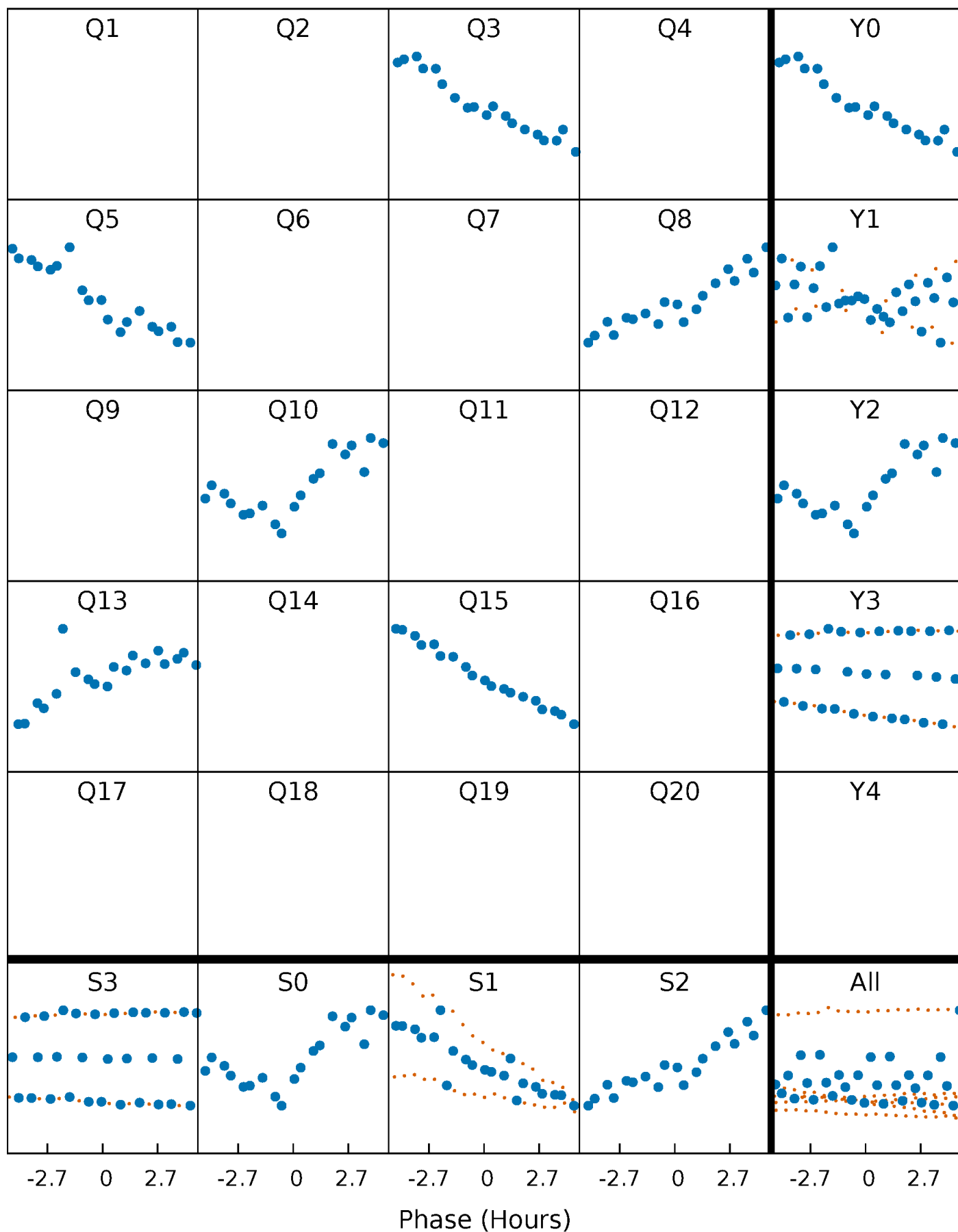


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



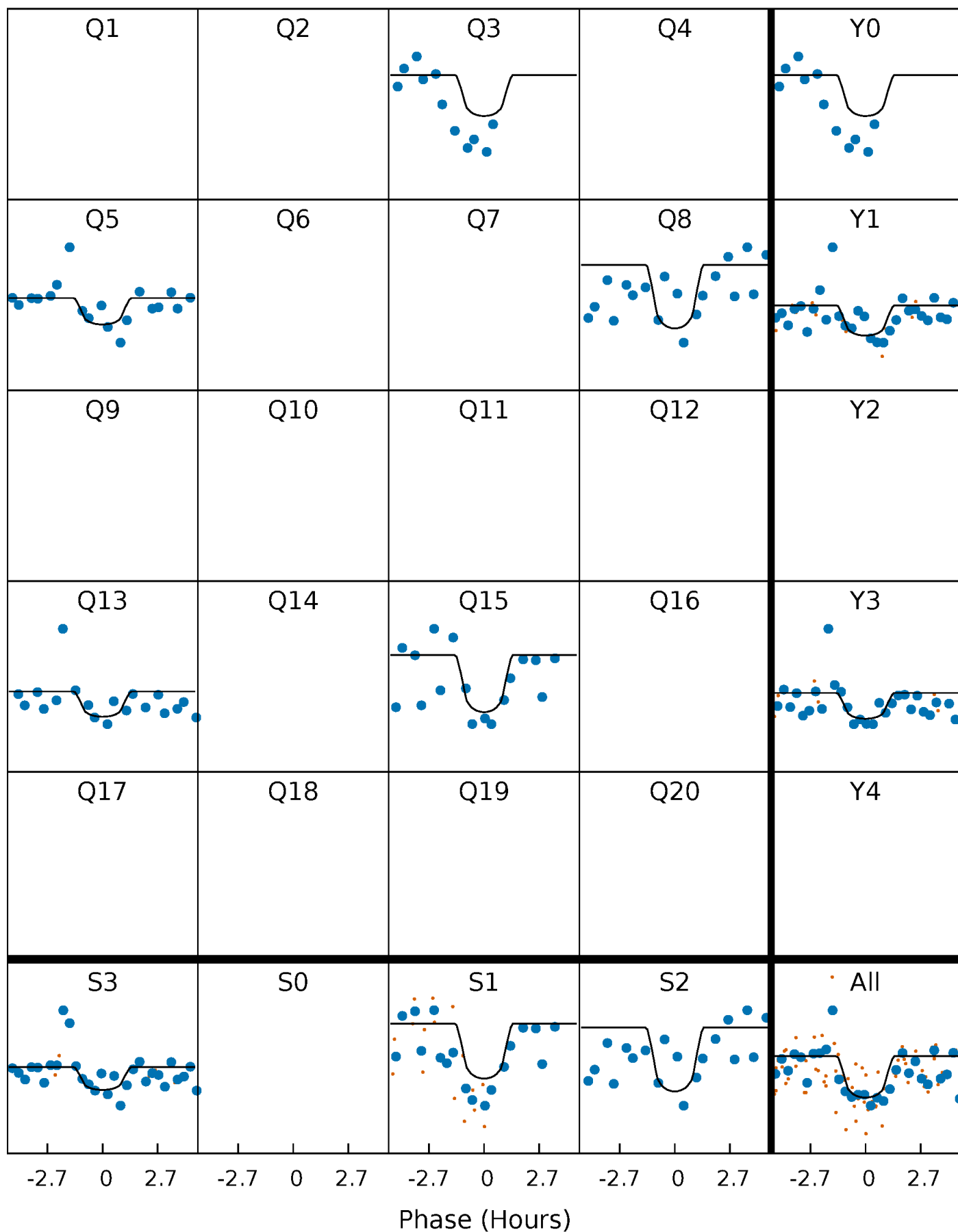
PDC Quarter-Phased Transit Curves

TCE 004769931-02 $P=228.067995$ Days $T_0=300.027463$ (BKJD)



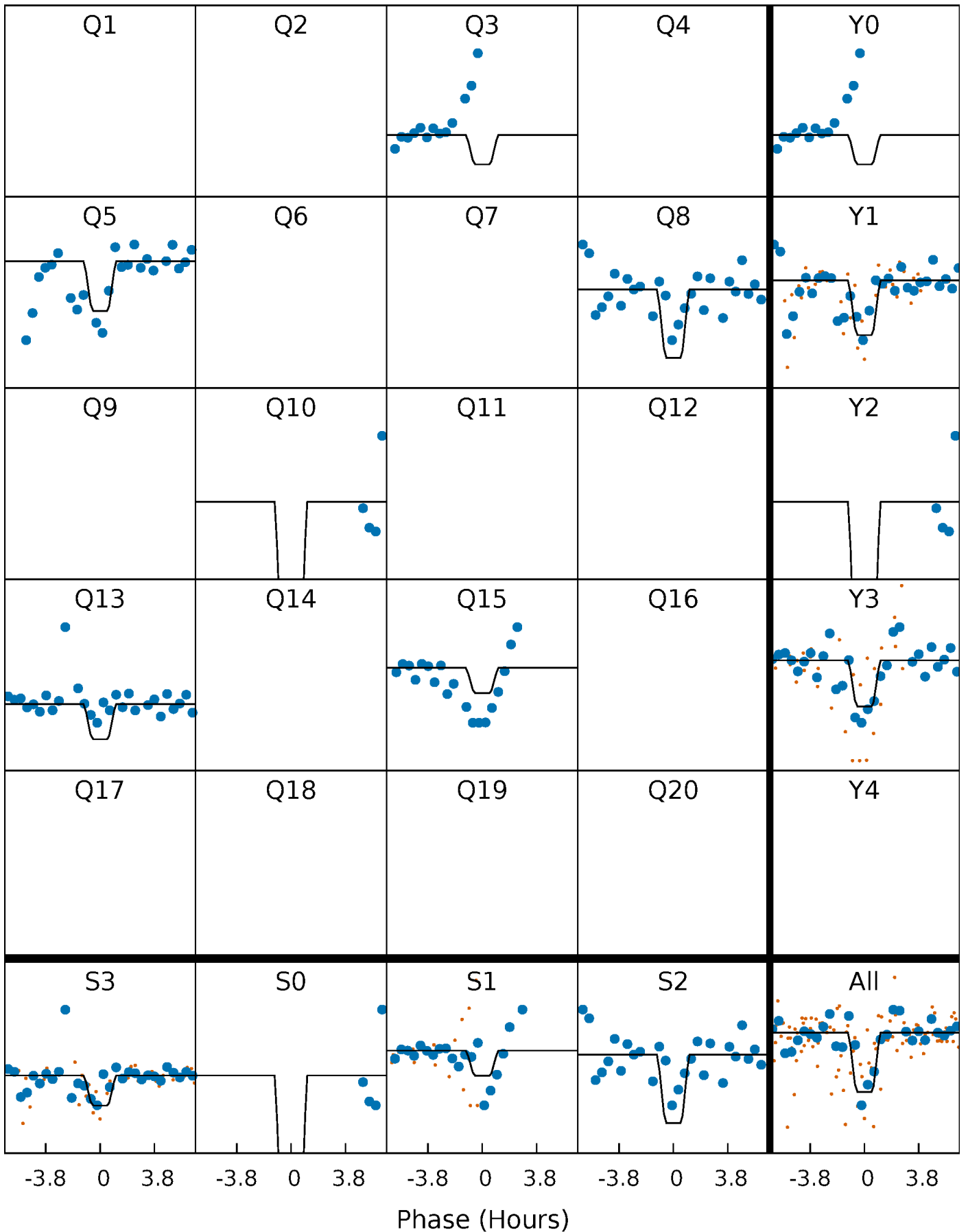
DV Quarter-Phased Transit Curves

TCE 004769931-02 P=228.067995 Days $T_0=300.027463$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

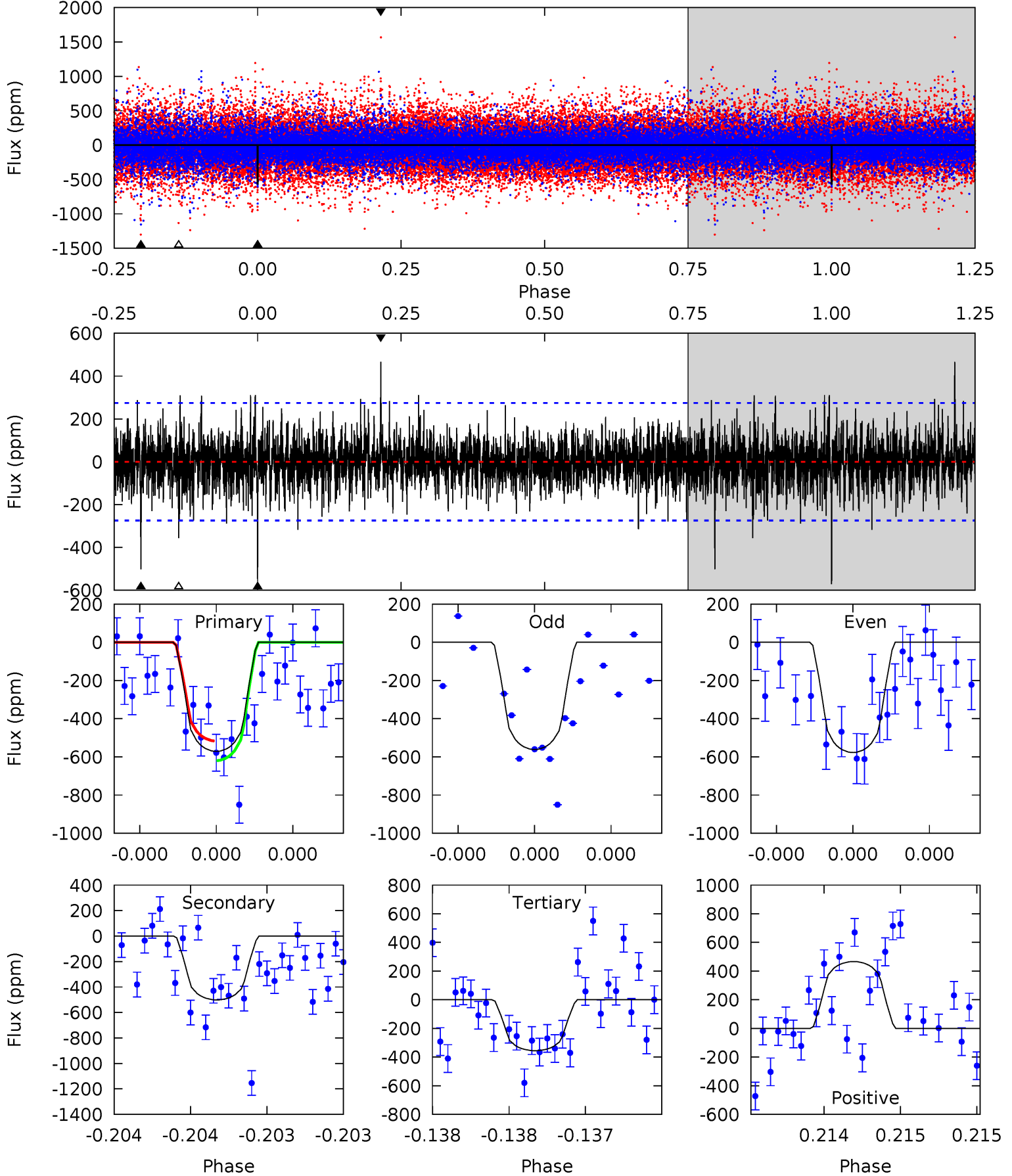
TCE 004769931-02 P=228.062459 Days $T_0=300.066642$ (BKJD)



DV Model-Shift Uniqueness Test

004769931-02, $P = 228.067995$ Days, $E = 71.959468$ Days

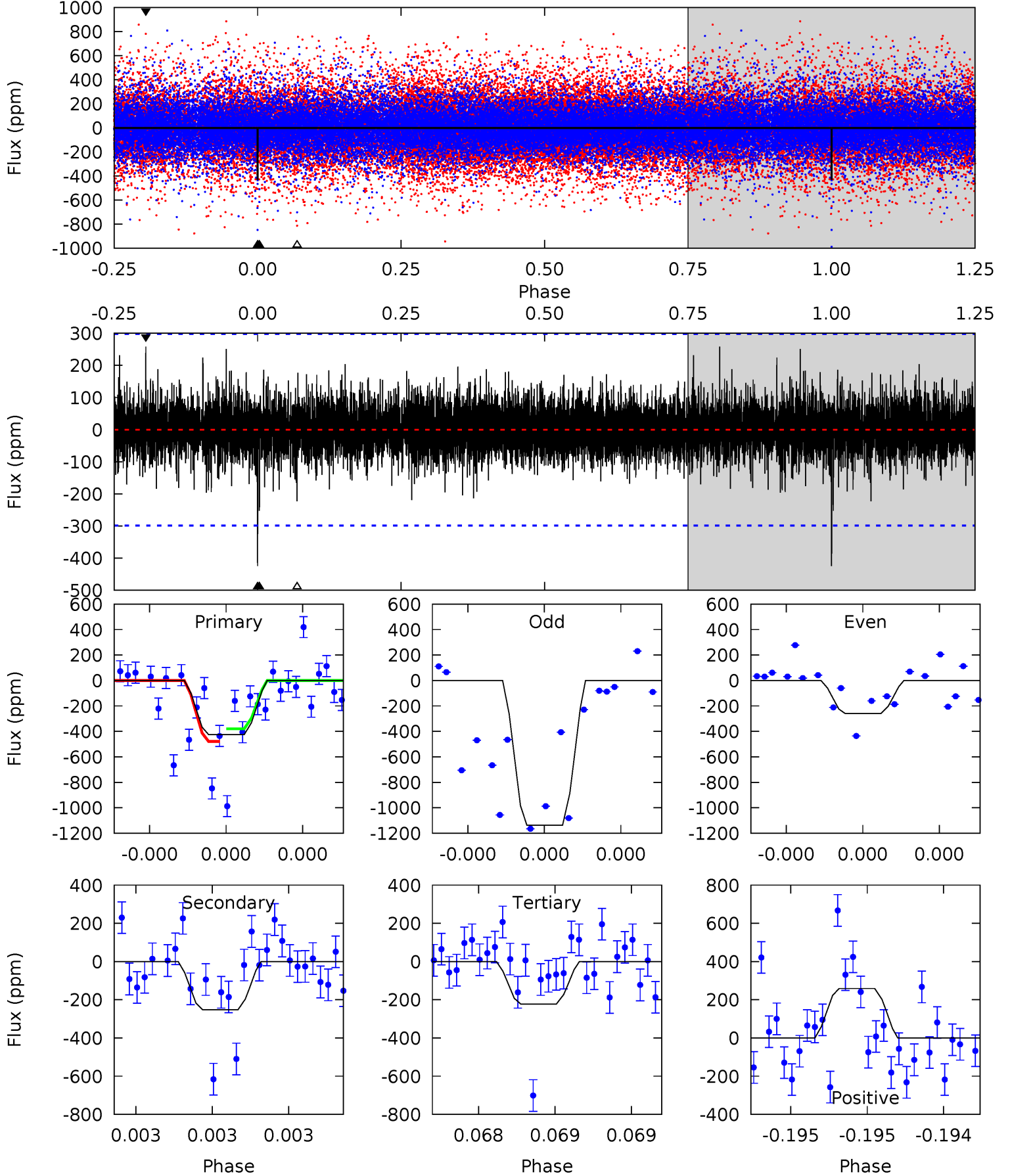
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	10.2	7.24	9.50	5.59	3.50	1.60	4.39	2.13	2.97	0.70	0.16	1.11	0.45	1.04



Alt Model-Shift Uniqueness Test

004769931-02, $P = 228.062459$ Days, $E = 72.004183$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.00	4.75	4.19	4.87	5.62	3.55	0.97	3.81	3.12	0.56	-0.13	9.26	0.45	0.38	0.93



Stellar Parameters For KIC 004769931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5448^{+162}_{-146}	$4.613^{+0.037}_{-0.112}$	$-0.380^{+0.300}_{-0.300}$	$0.734^{+0.131}_{-0.056}$	$0.815^{+0.083}_{-0.083}$	$2.901^{+0.449}_{-1.017}$
	+3%/-3%	+1%/-2%	+79%/-79%	+18%/-8%	+10%/-10%	+15%/-35%
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 004769931-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-501 ± 49	$3.02^{+3.23}_{-2.09}$	354^{+17}_{-14}	4447^{+3230}_{-966}	$13469^{+128246}_{-10217}$
Alt.	-252 ± 53	$3.18^{+2.83}_{-2.00}$	353^{+17}_{-13}	3851^{+1807}_{-728}	6440^{+36511}_{-4720}

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 $A_{obs} \gg 1.0$

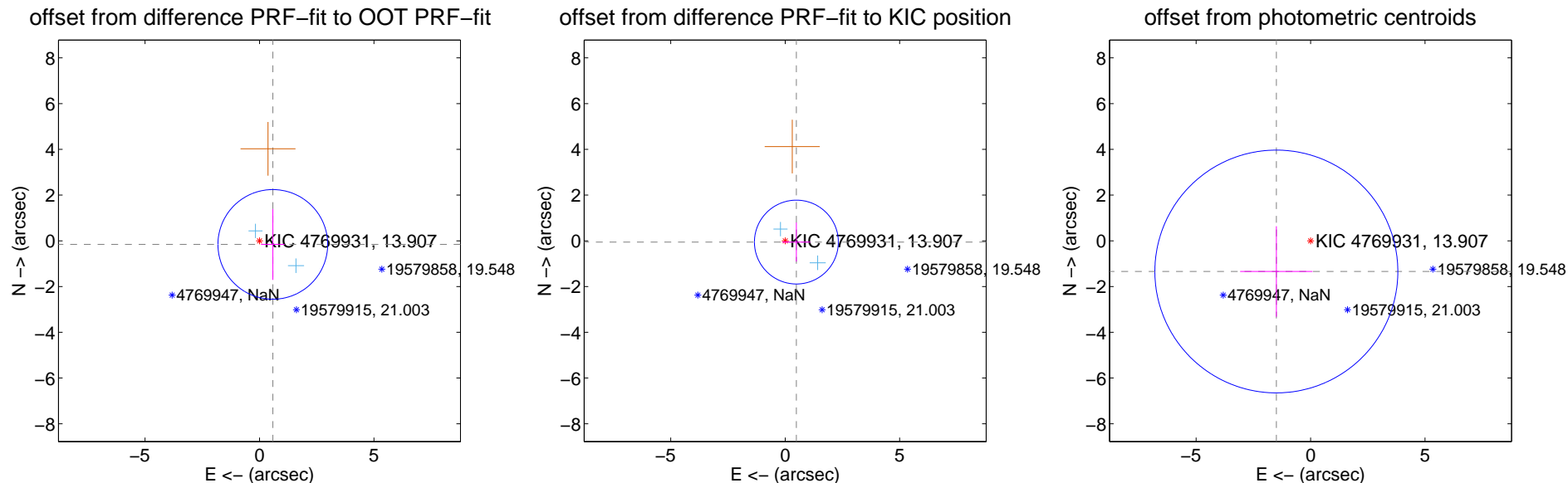
DV Centroid Data

Supplemental centroid analysis for 004769931-02. Kepler magnitude: 13.91. Transit SNR 6.64

There are 2 quarters with good PRF difference image offsets

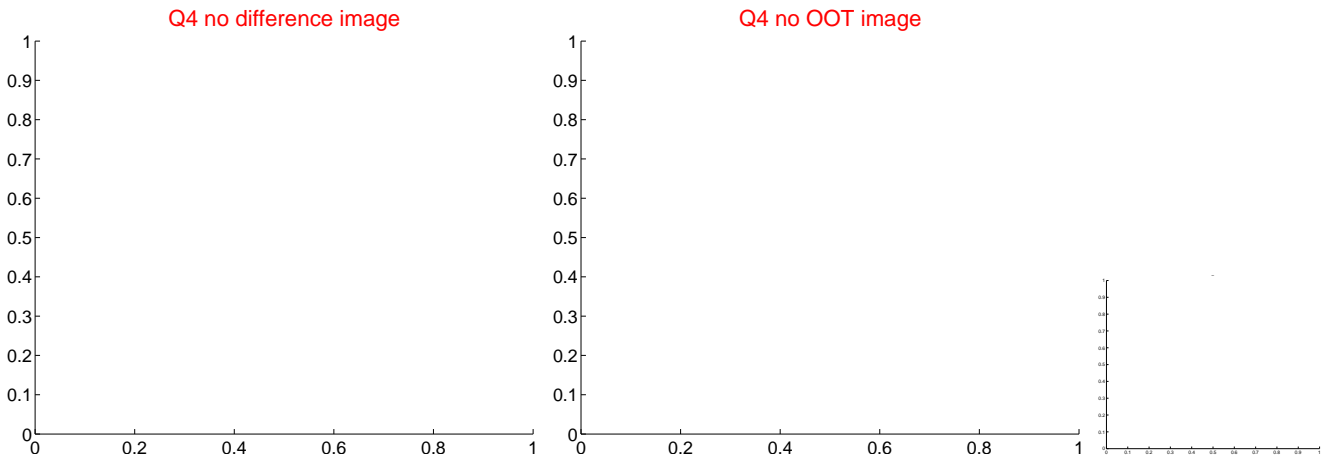
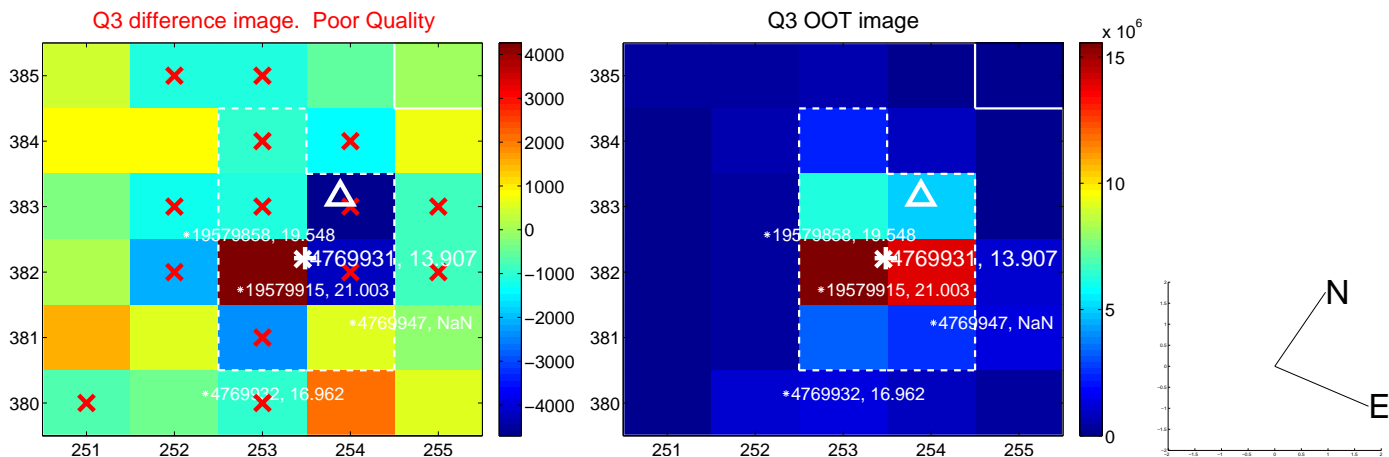
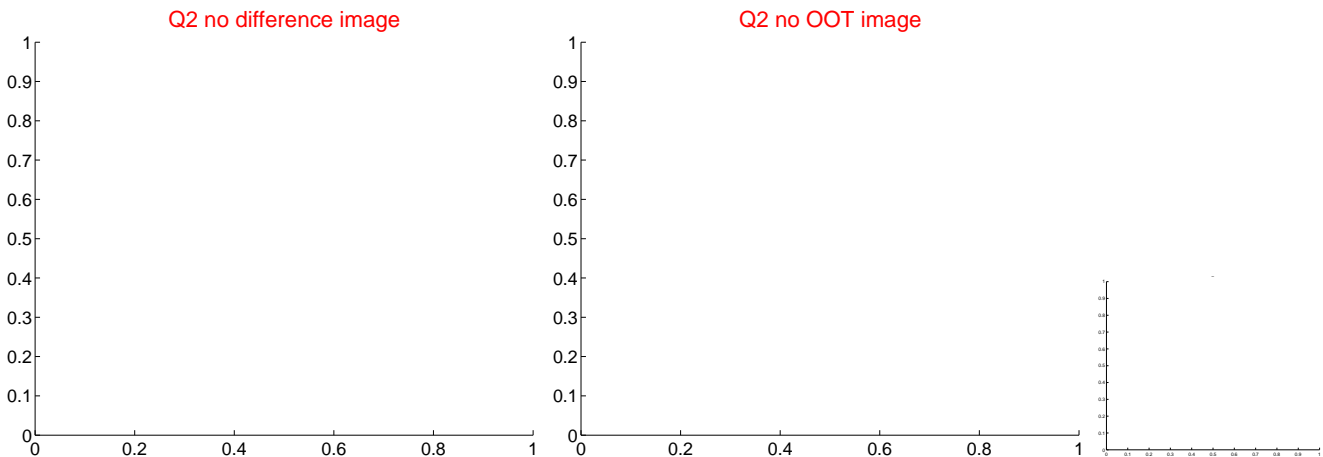
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.603 ± 0.799	0.75	-0.582 ± 0.519	-0.157 ± 1.552
PRF-fit source offset from KIC position	0.493 ± 0.611	0.81	-0.490 ± 0.607	-0.055 ± 0.854
photometric centroid source offset	2.01 ± 1.77	1.14	1.50 ± 1.58	-1.34 ± 1.98

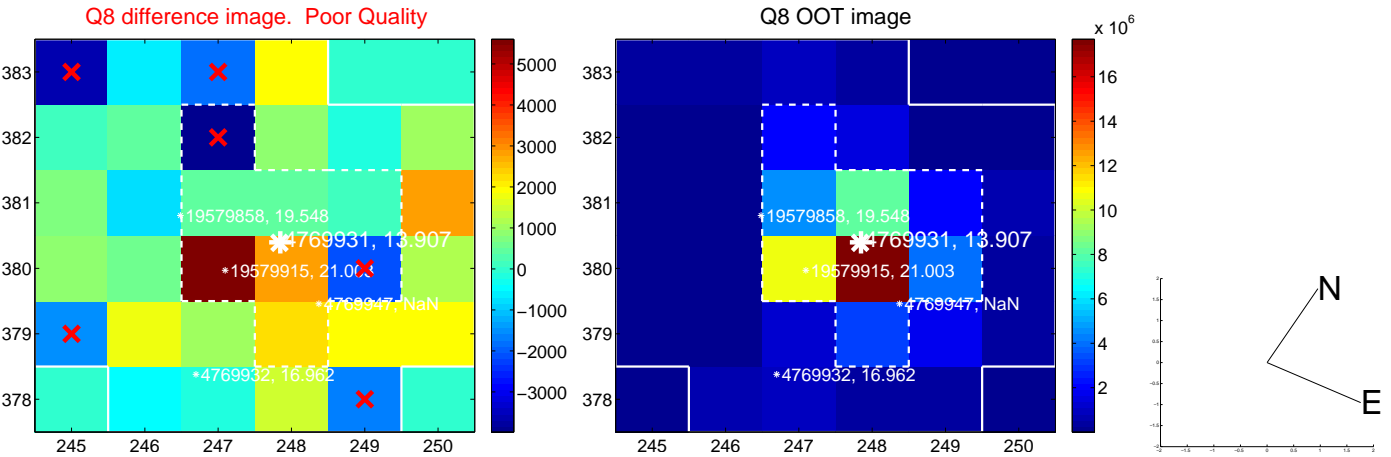
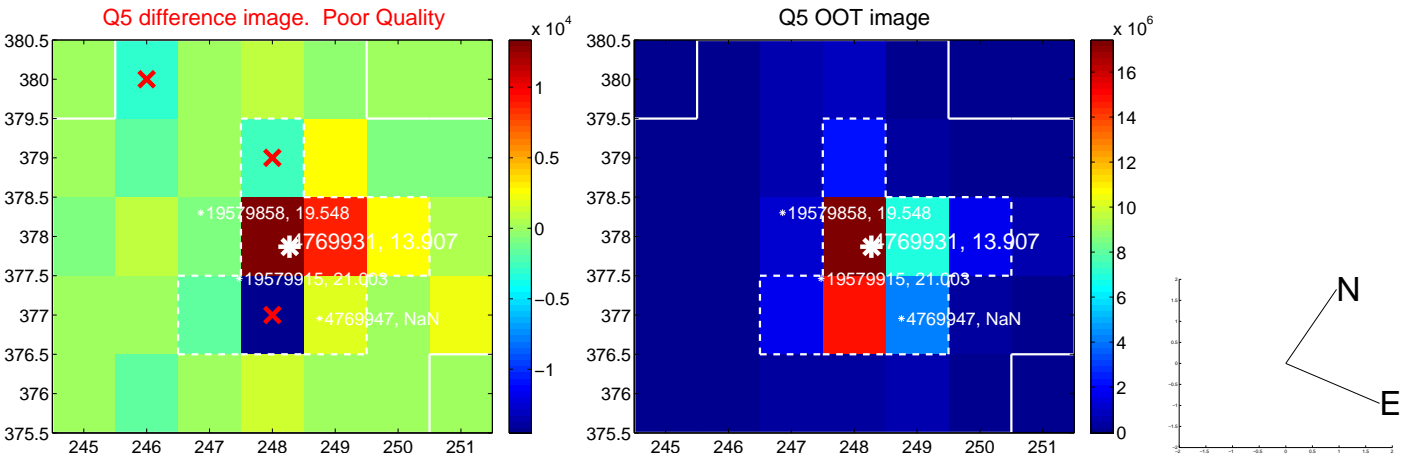


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

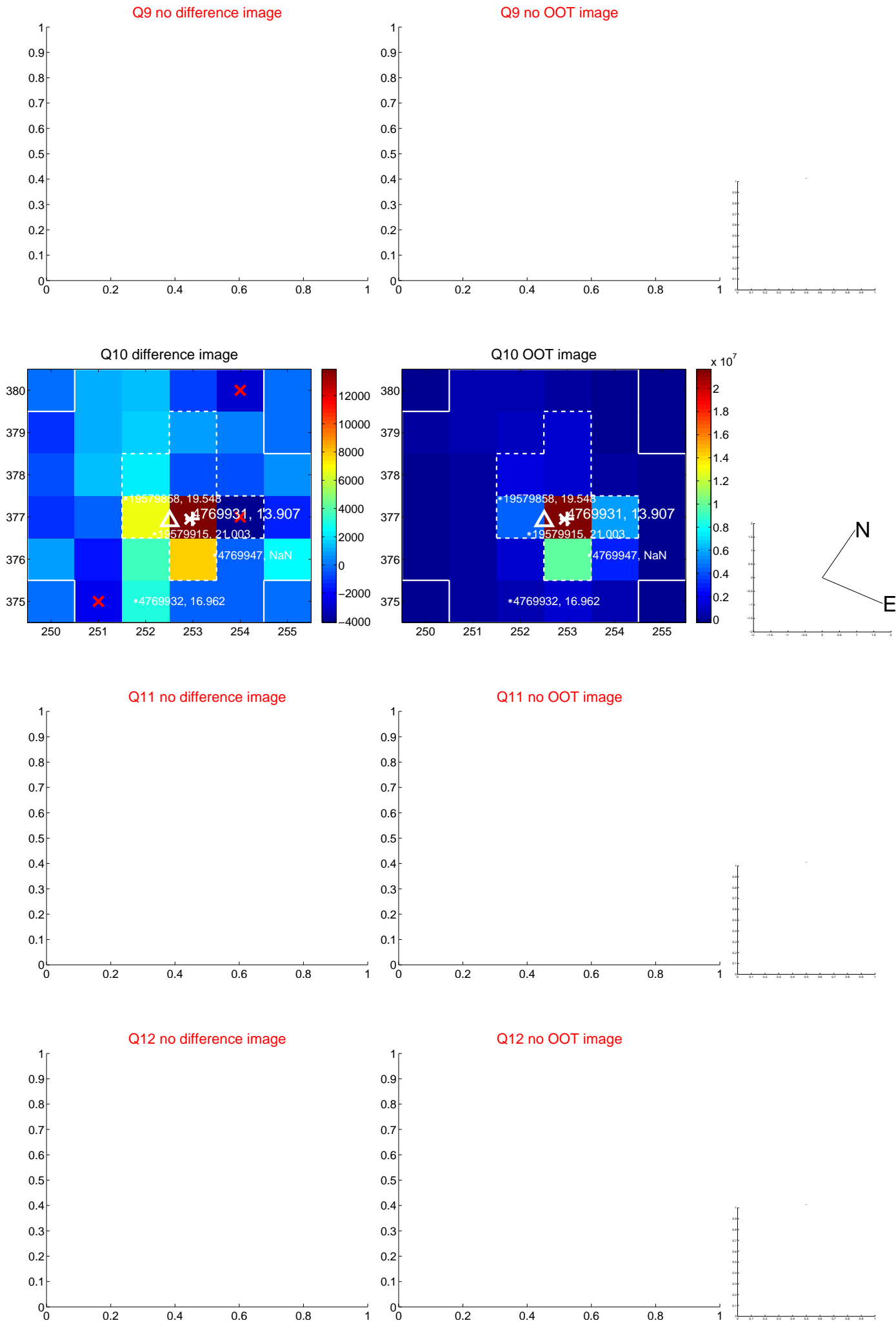
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



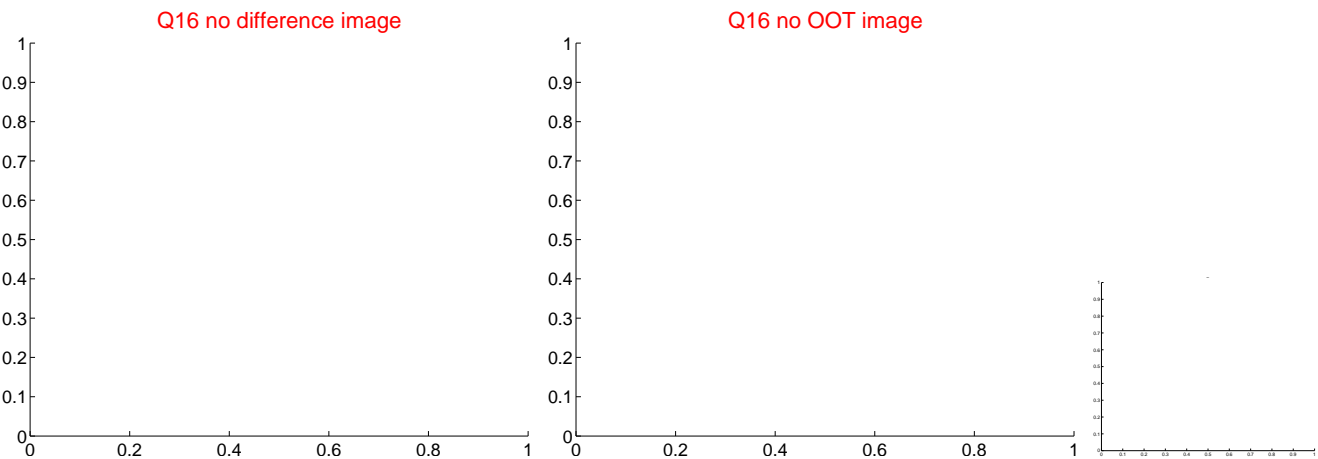
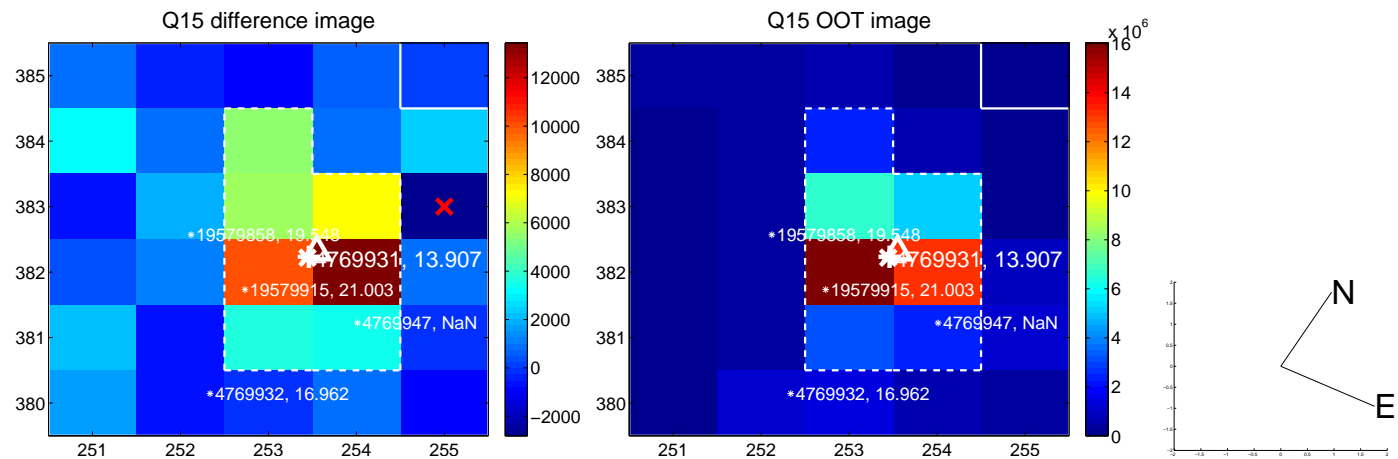
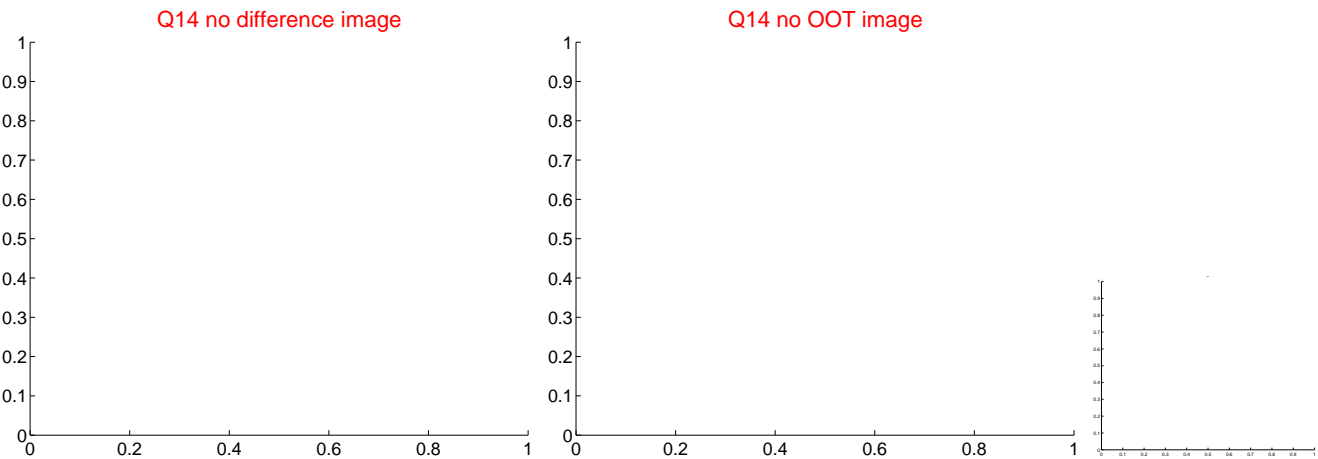
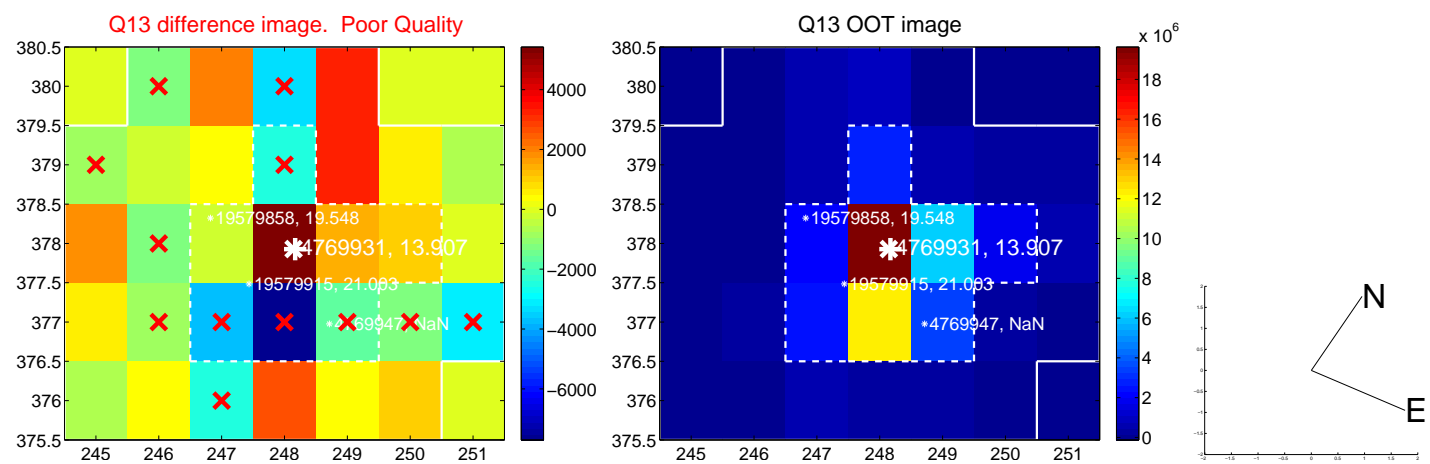
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



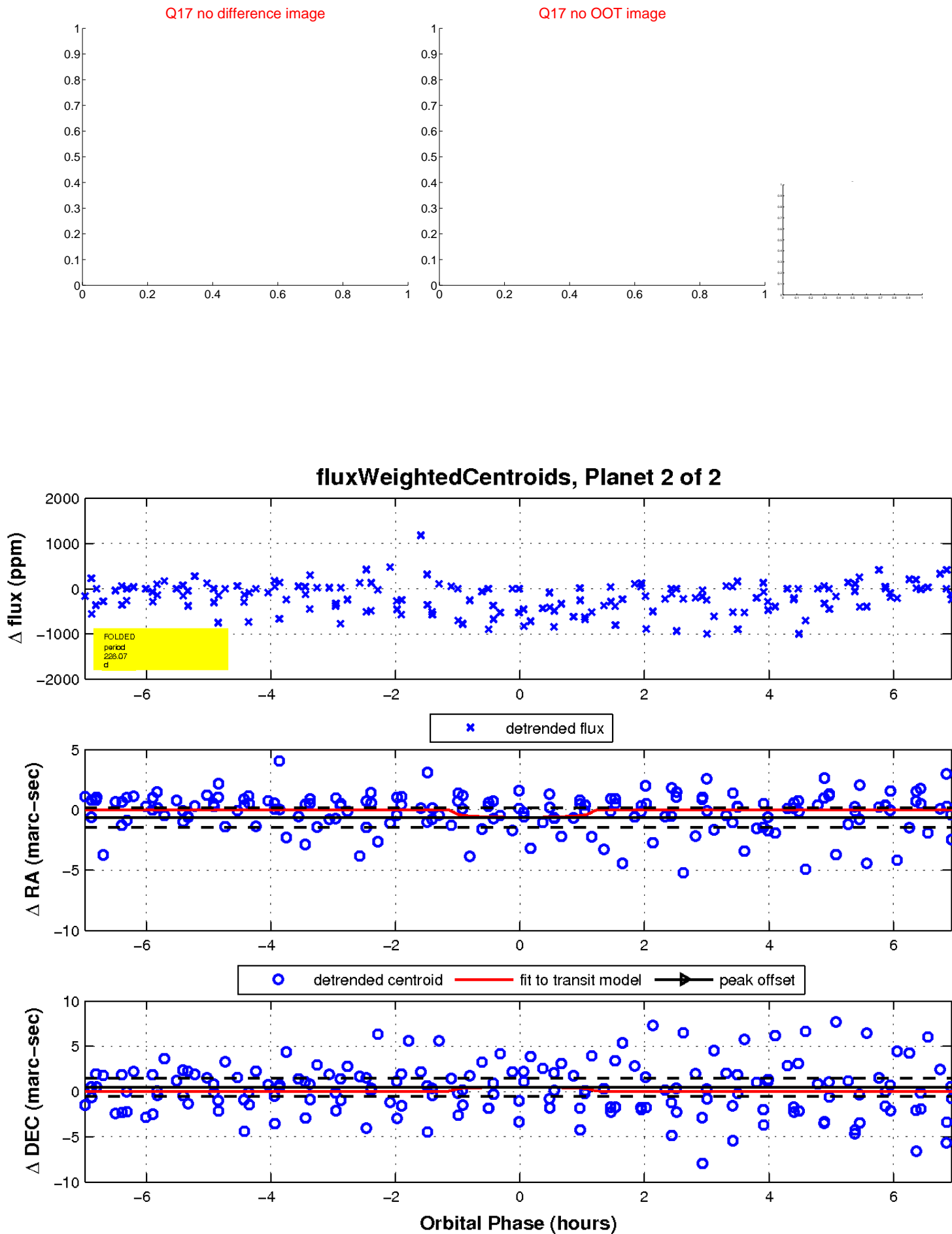
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

