

KIC 009402709

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})
009402709-01	OBS	No	0.536518	132.033355	24.8	4.093	14.6	12.0	3.81	5048	2.31	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009402709-01	OBS	FP	0.00	1	0	0	1	LPP_DV—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.

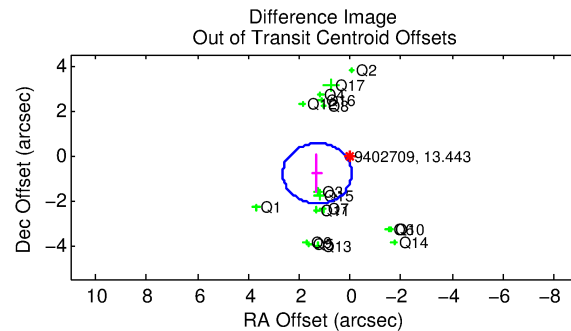
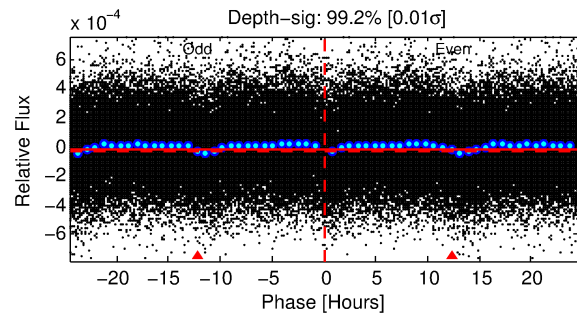
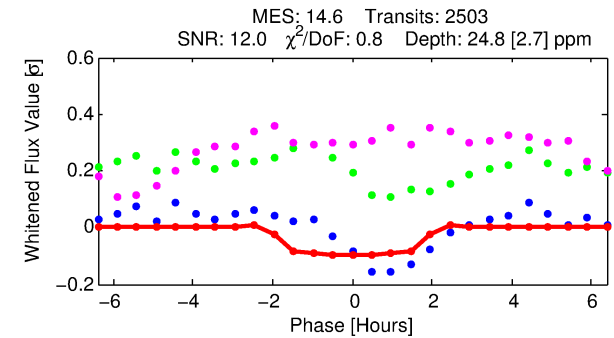
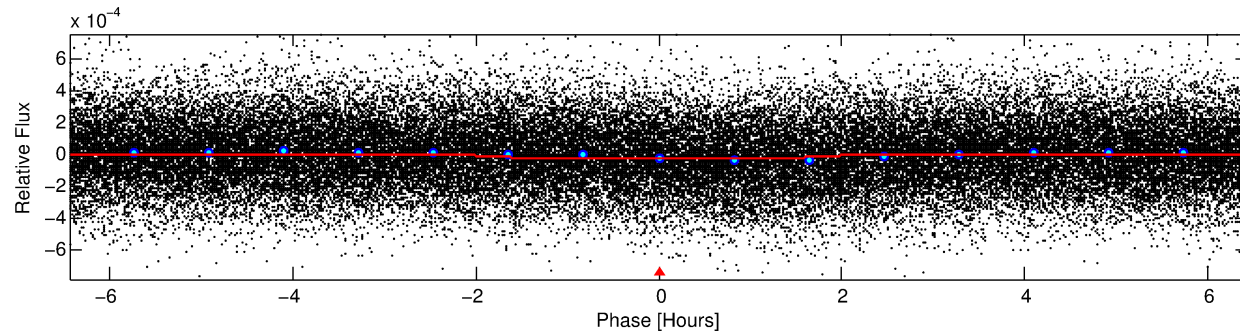
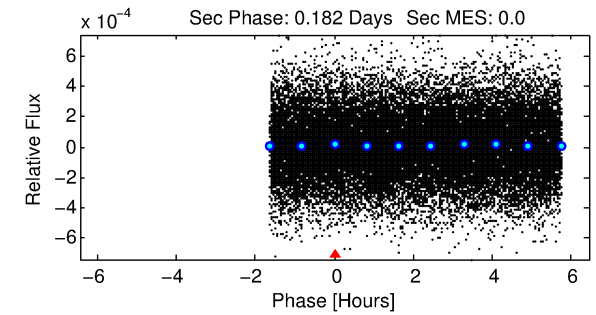
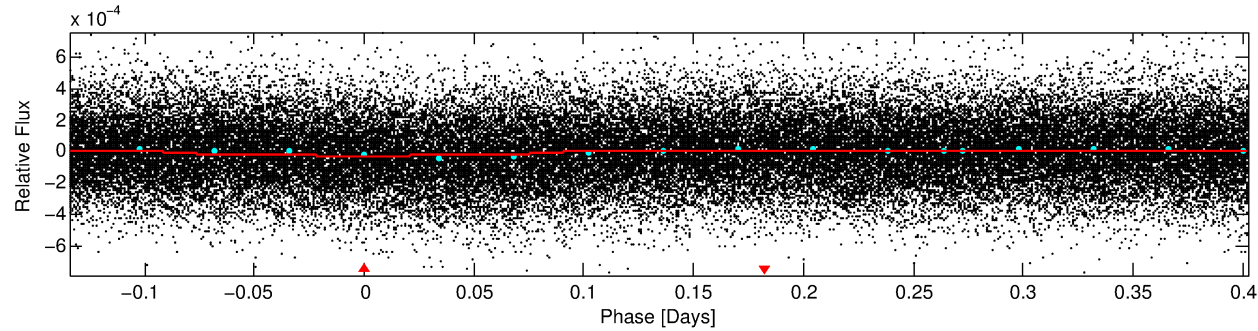
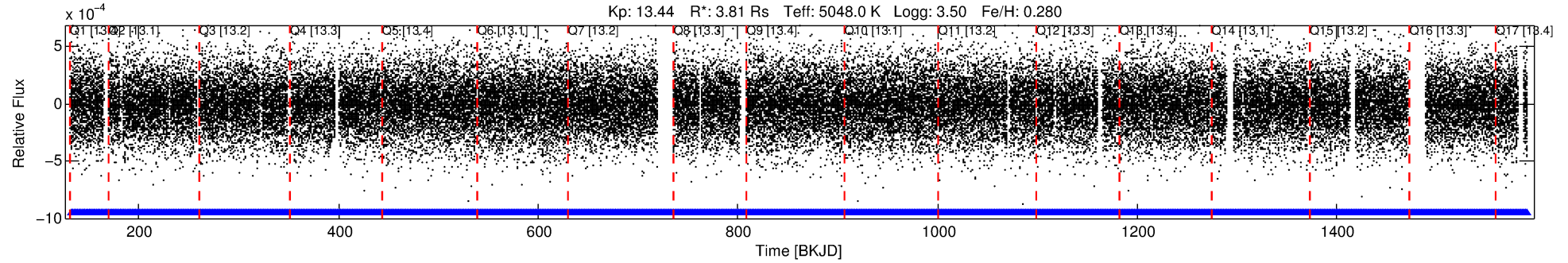
Ephemeris Match Information For 009402709-01

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
009402709-01	9402709	009402670-01	9402670	1:1	52.9	-5	12	15.67	13.45	2.76	Direct-PRF	1	2.40	0.28

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: 9402709 Candidate: 1 of 1 Period: 0.537 d



DV Fit Results:

Period = 0.53652 [0.00001] d
Epoch = 132.0334 [0.0034] BKJD
Rp/R* = 0.0056 [0.0027]
a/R* = 1.05 [0.18]
b = 0.90 [0.43]
Seff = N/A
Teq = N/A
Rp = 2.31 [1.72] Re
a = N/A
Ag = N/A
Teffp = N/A

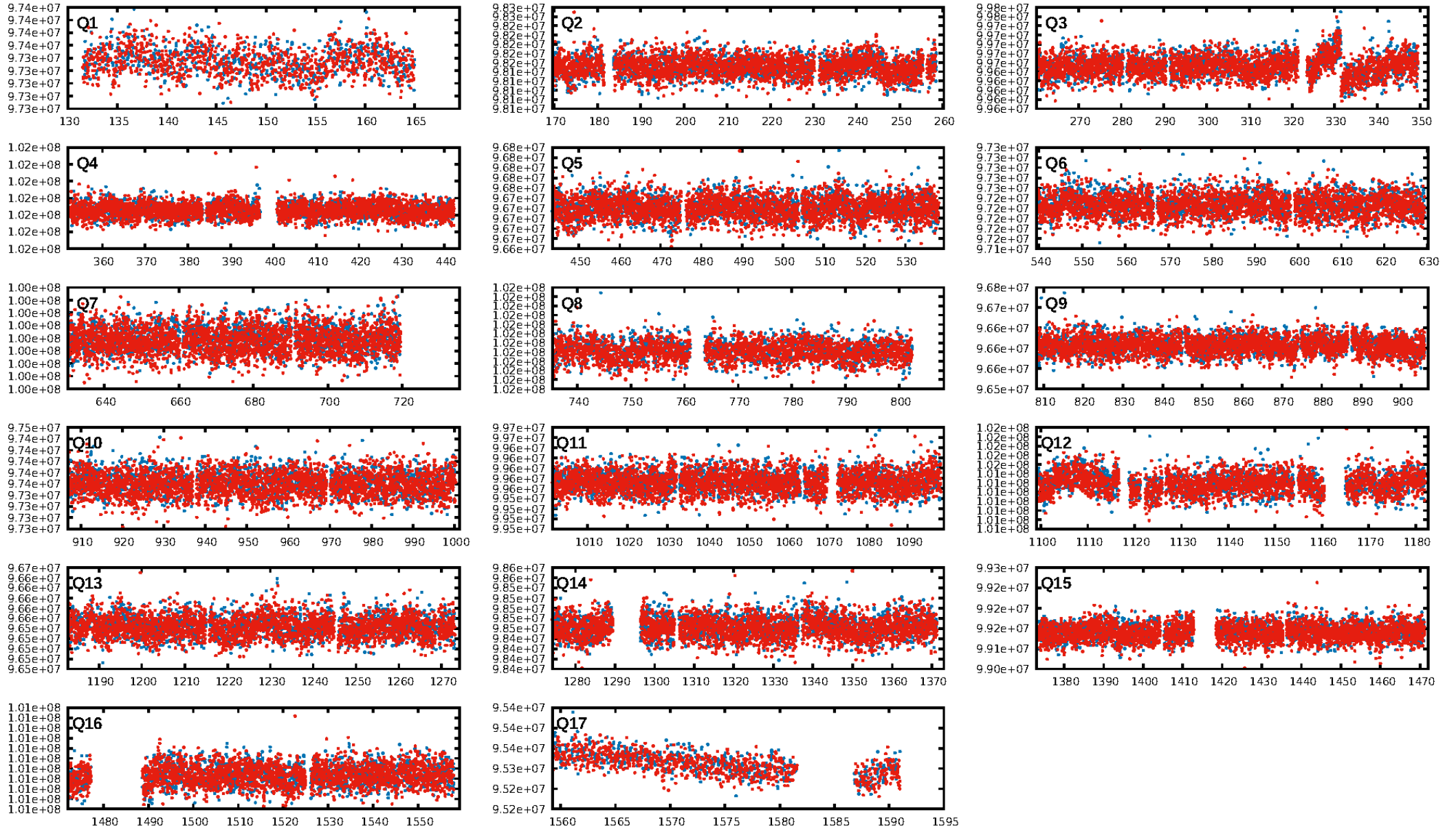
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.47e-80
RollingBand-fgt: 1.00 [2390/2390]
GhostDiagnostic-chr: -98.7
Centroid-sig: 0.0%
Centroid-so: 4.880 arcsec [7.35σ]
OotOffset-rm: 1.523 arcsec [3.38σ]
KicOffset-rm: 1.430 arcsec [3.17σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.47 [8/17]
DiffImageOverlap-fno: 1.00 [17/17]

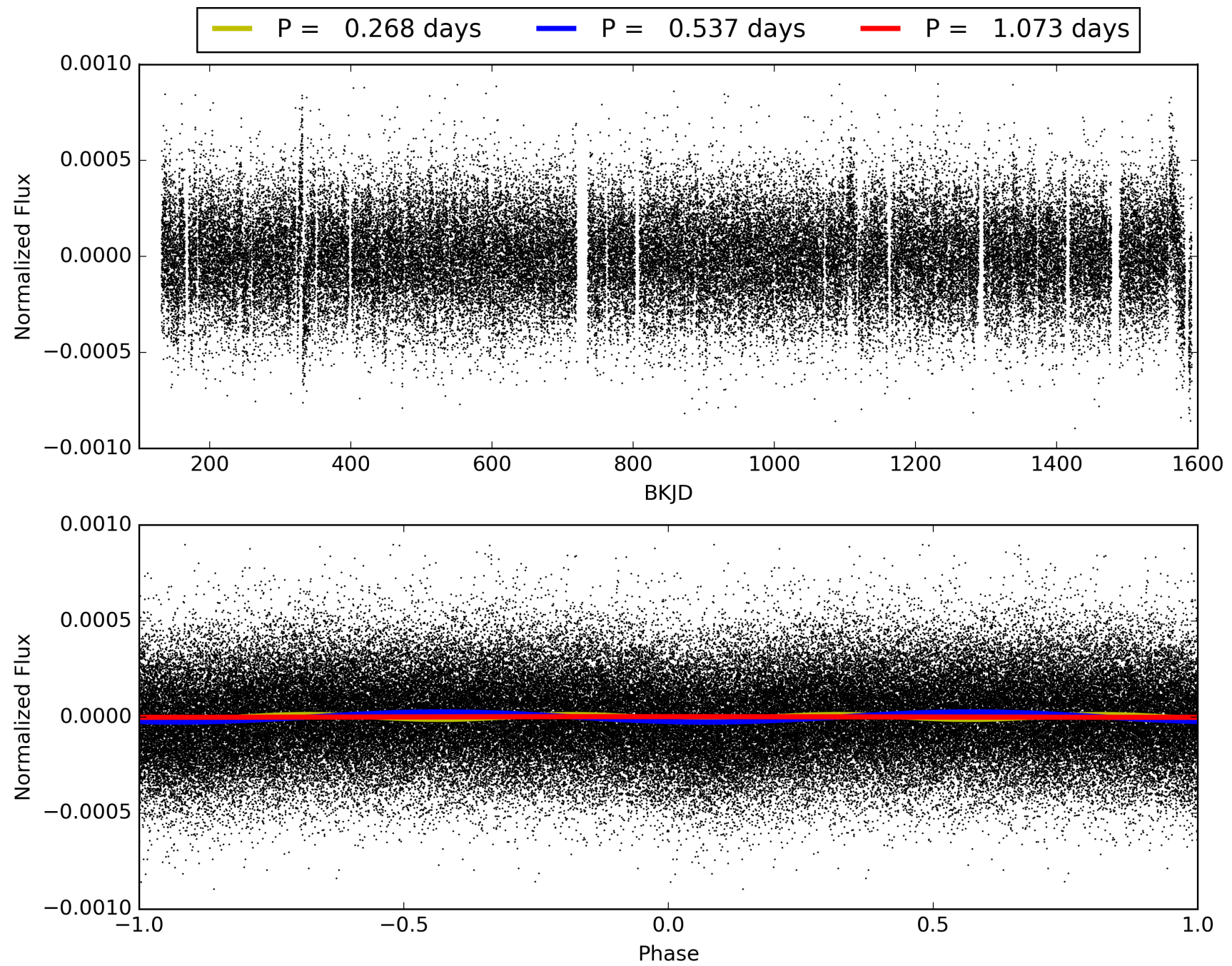
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:50:57 Z

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

TCE 009402709-01, PDC Light Curves

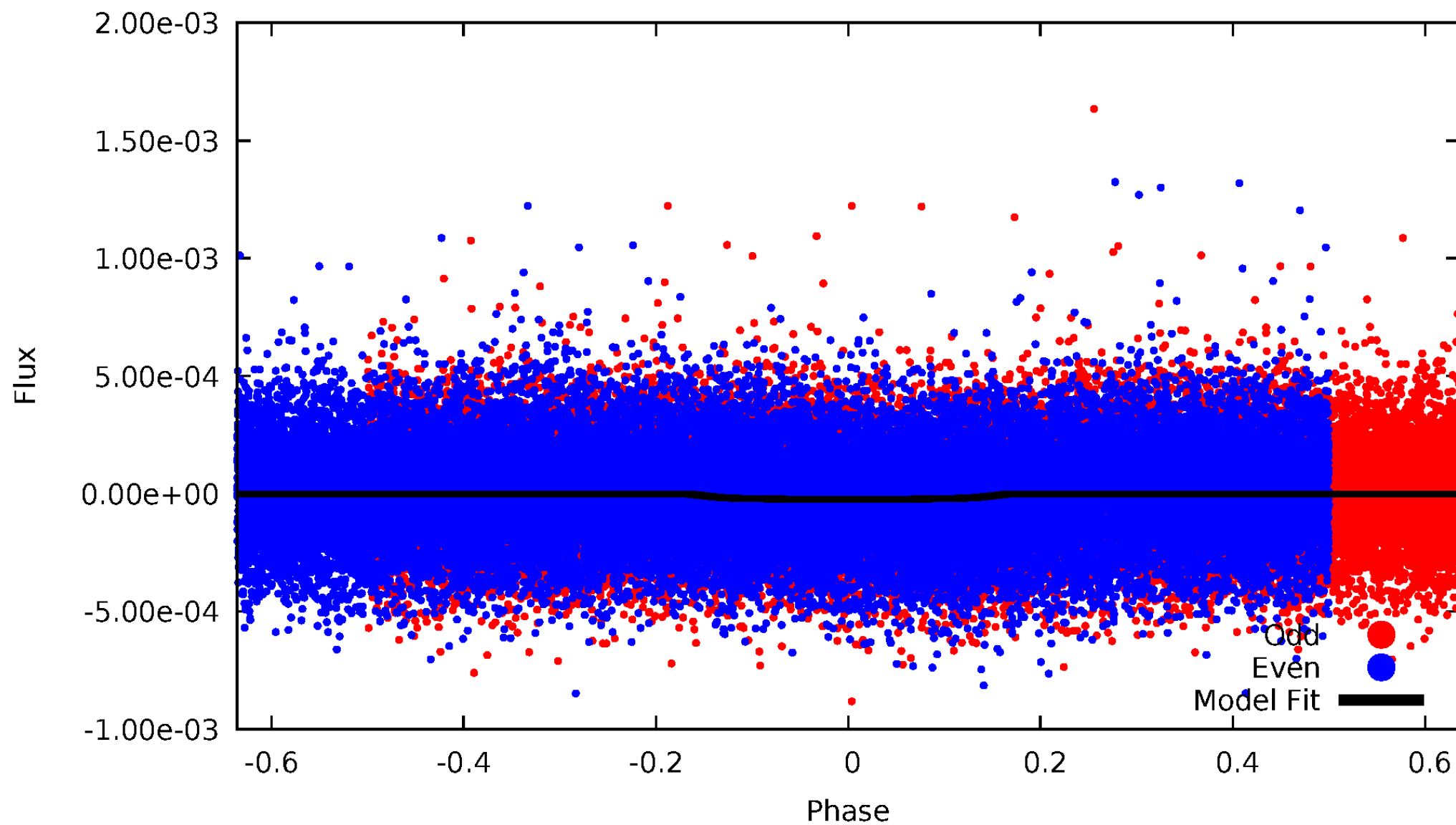


TCE 009402709-01



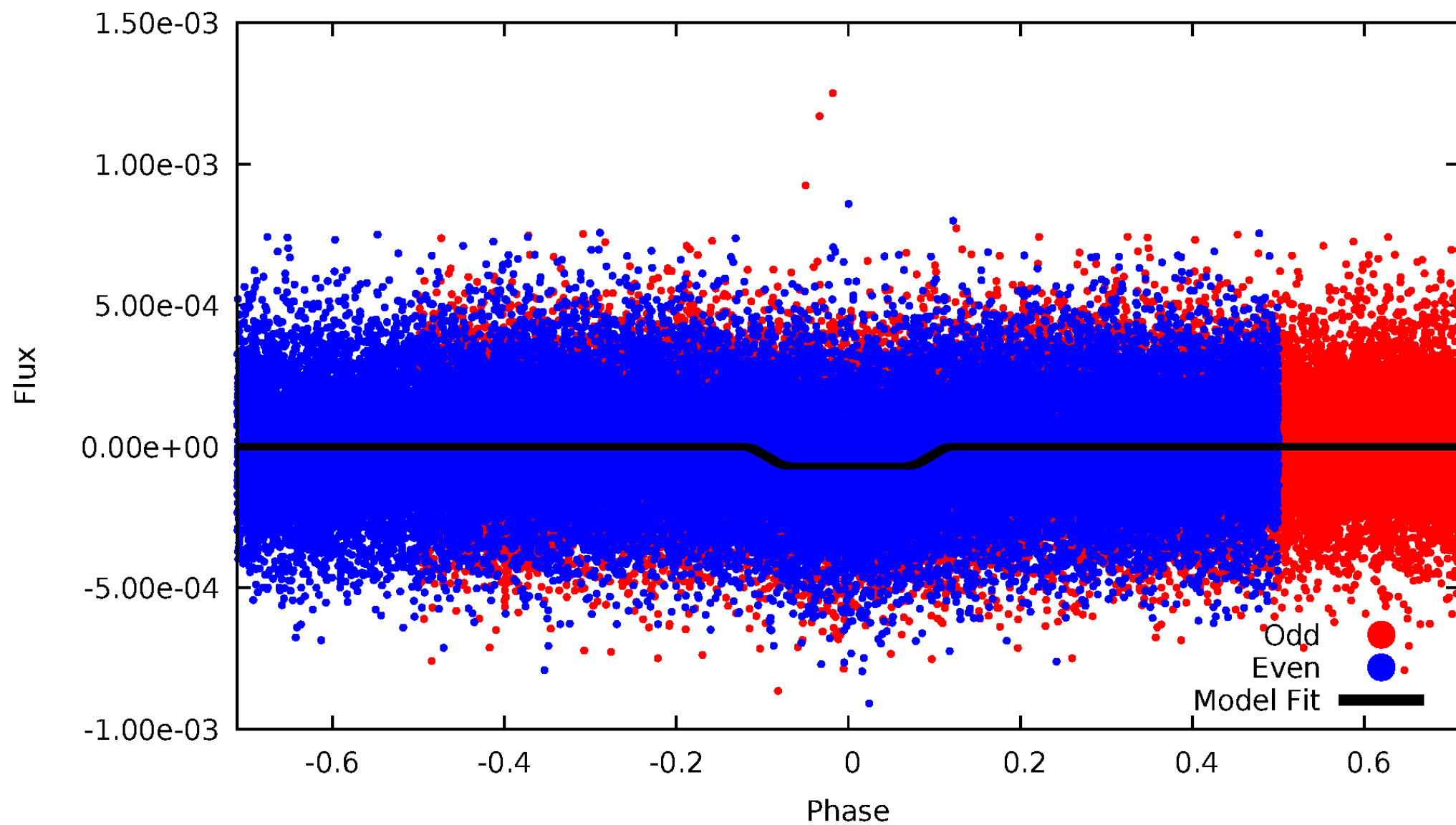
DV Odd/Even

TCE 009402709-01



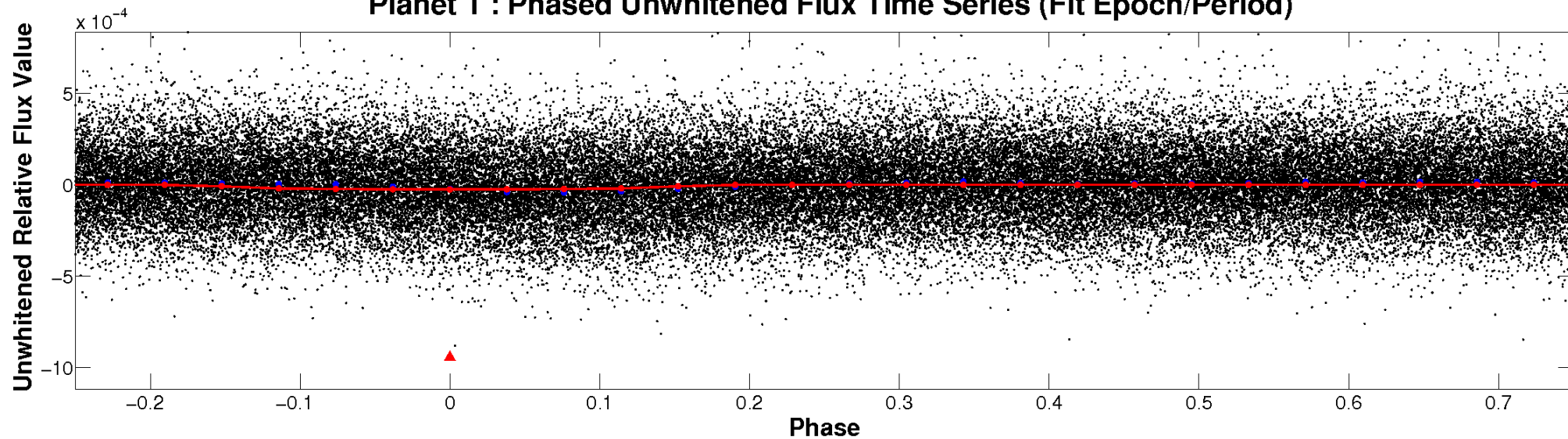
ALT Odd/Even

TCE 009402709-01

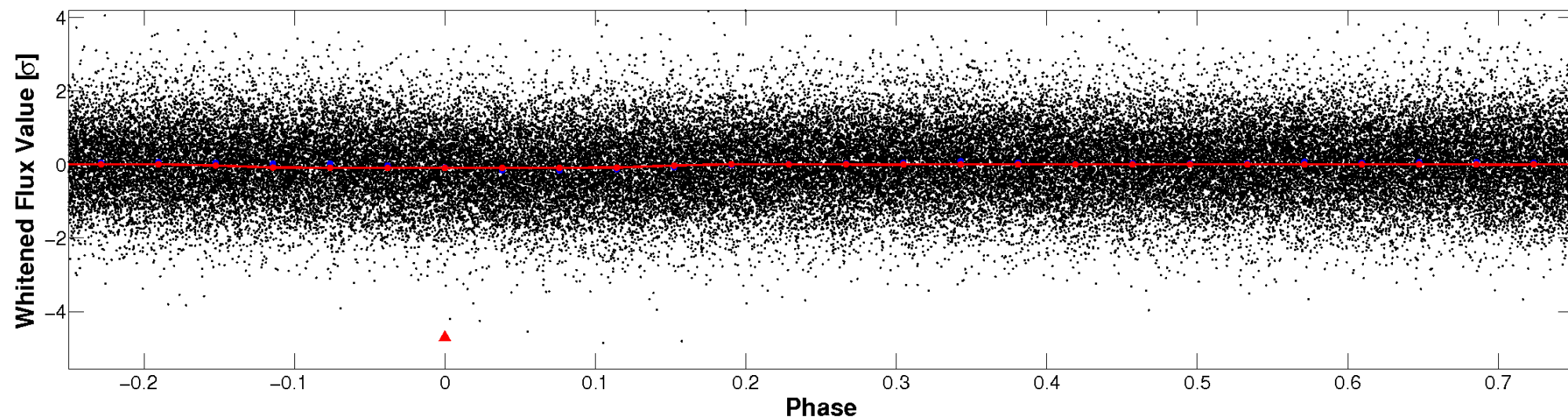


Non-Whitened Vs. Whitened Light Curve

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

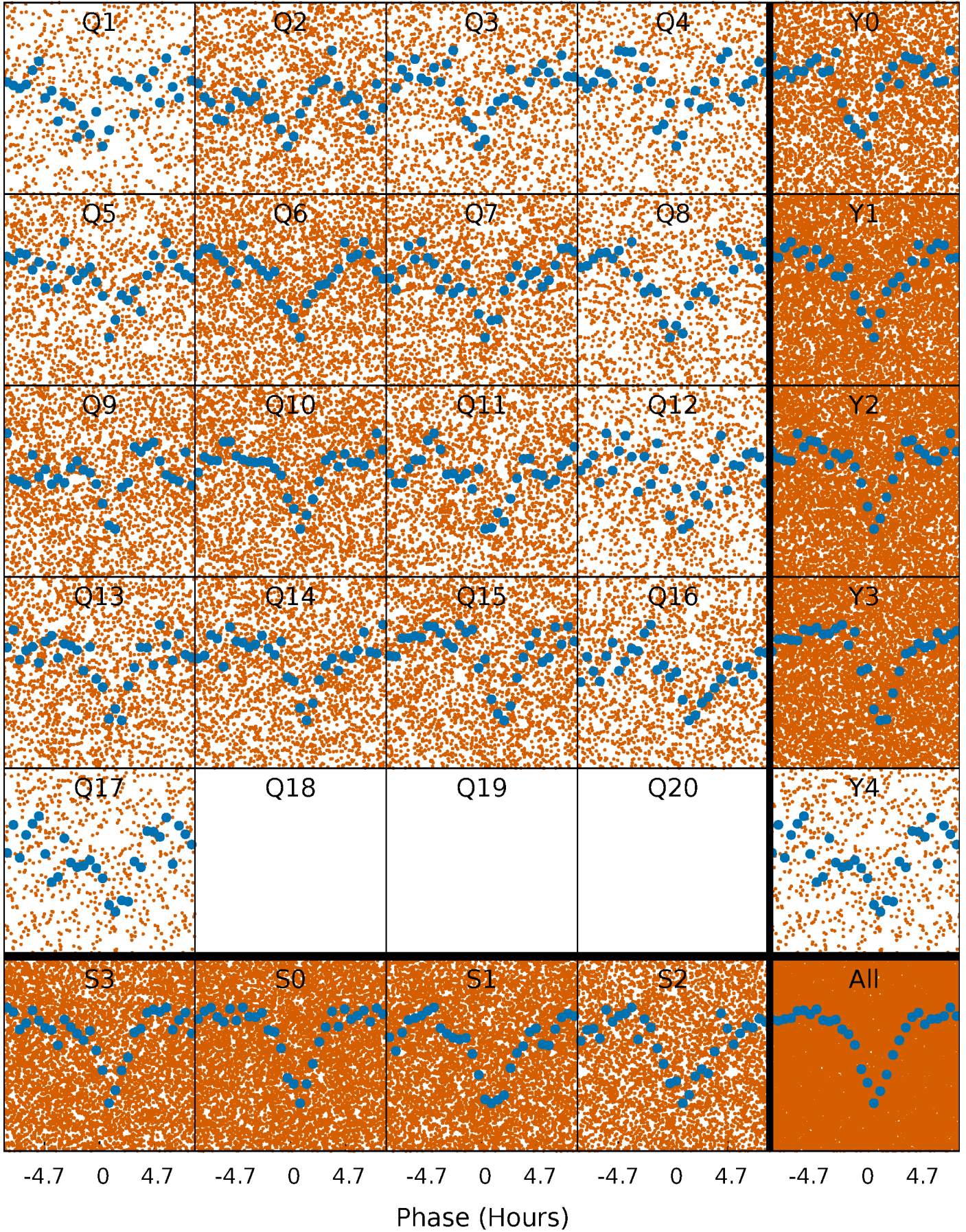


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



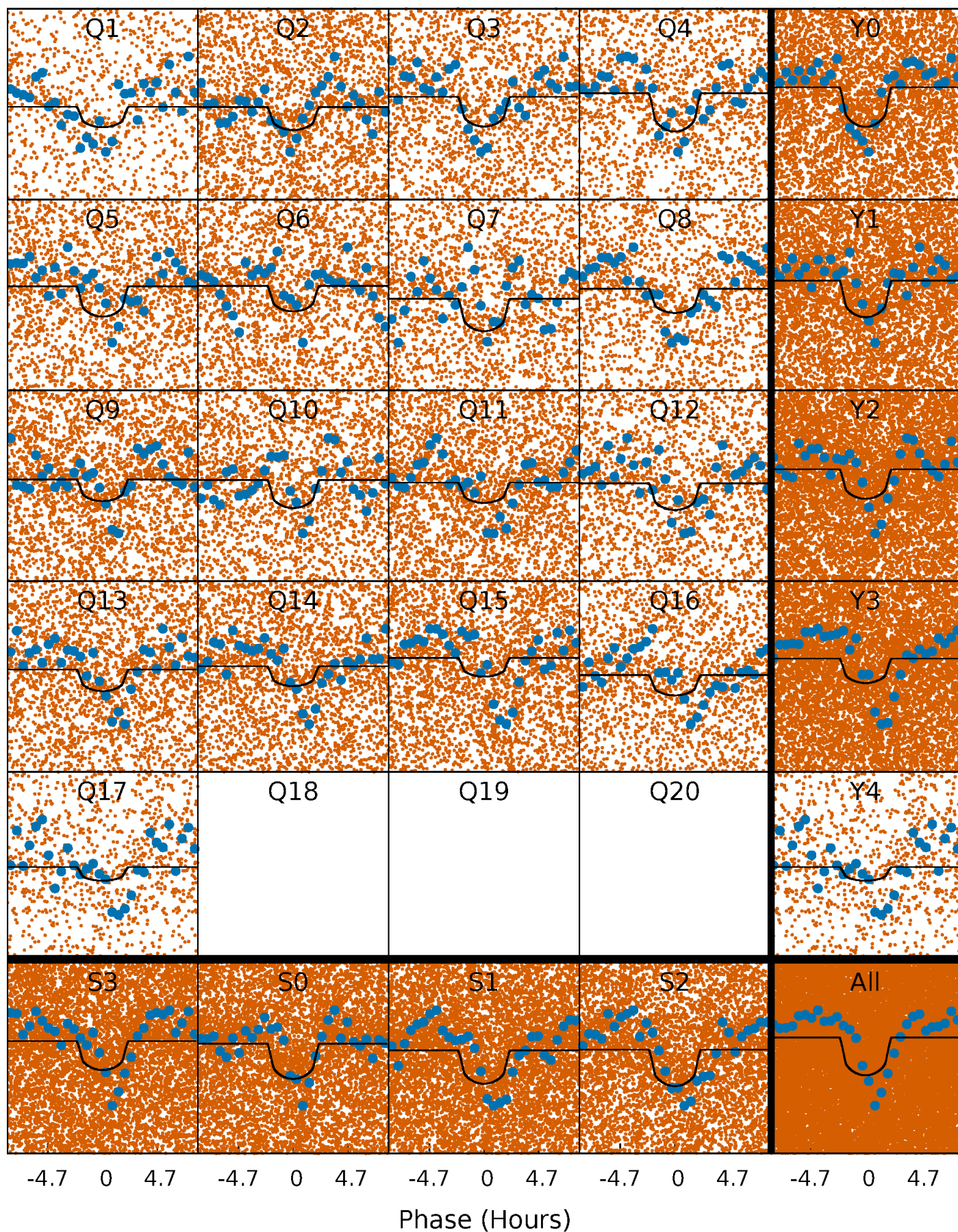
PDC Quarter-Phased Transit Curves

TCE 009402709-01 P= 0.536518 Days $T_0=132.033355$ (BKJD)



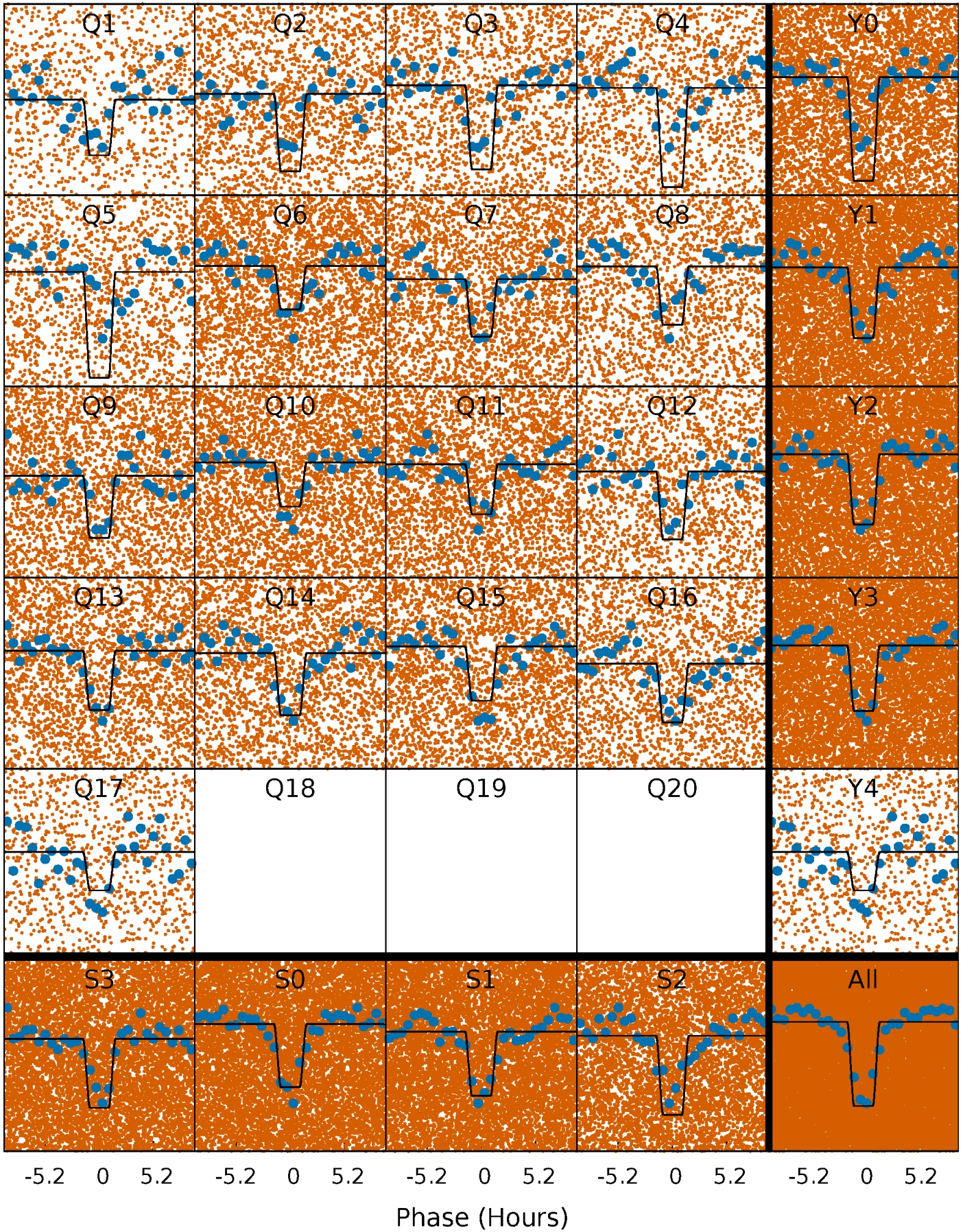
DV Quarter-Phased Transit Curves

TCE 009402709-01 P= 0.536518 Days $T_0=132.033355$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

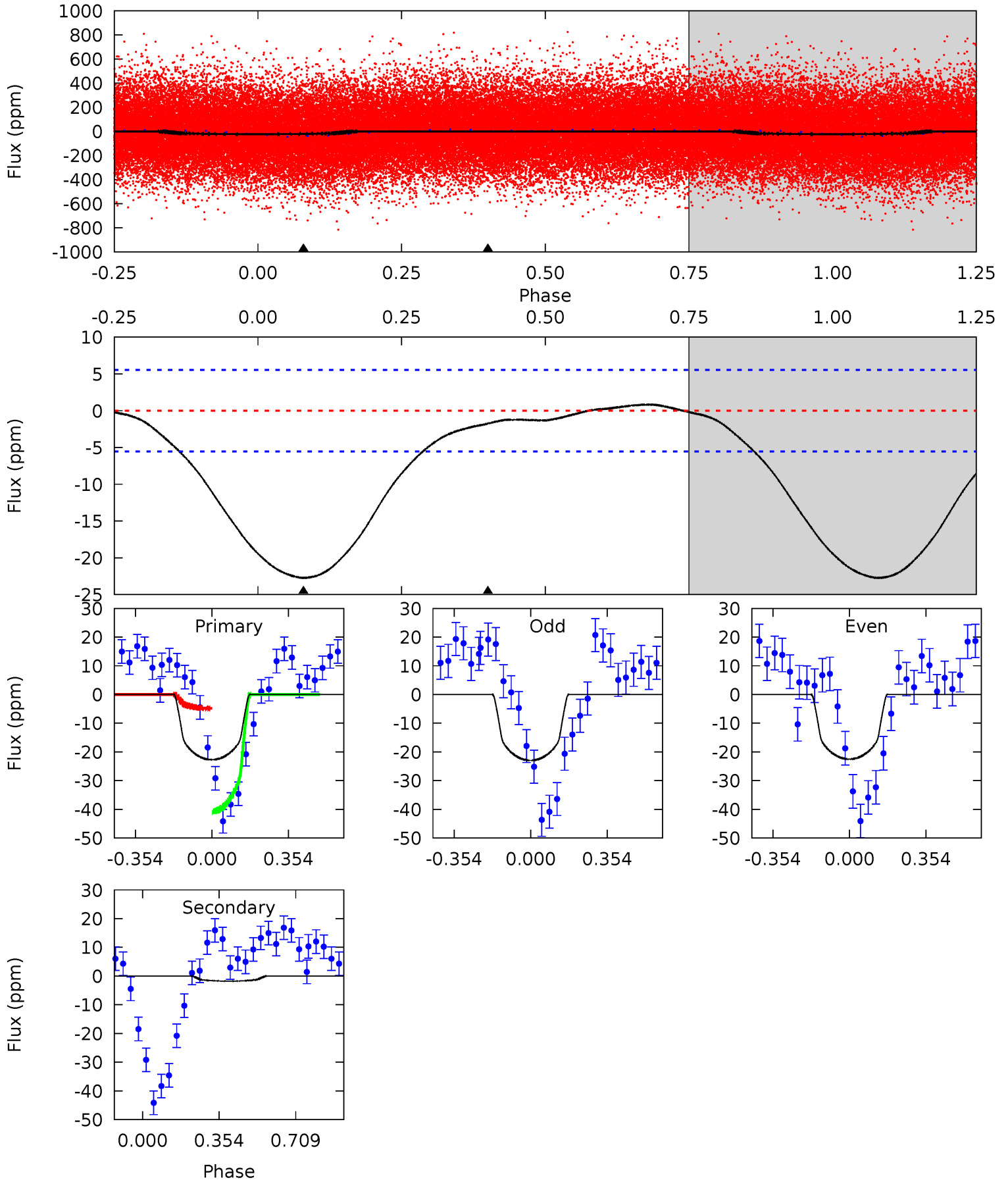
TCE 009402709-01 P= 0.536544 Days $T_0=132.031855$ (BKJD)



DV Model-Shift Uniqueness Test

009402709-01, P = 0.536518 Days, E = 131.496837 Days

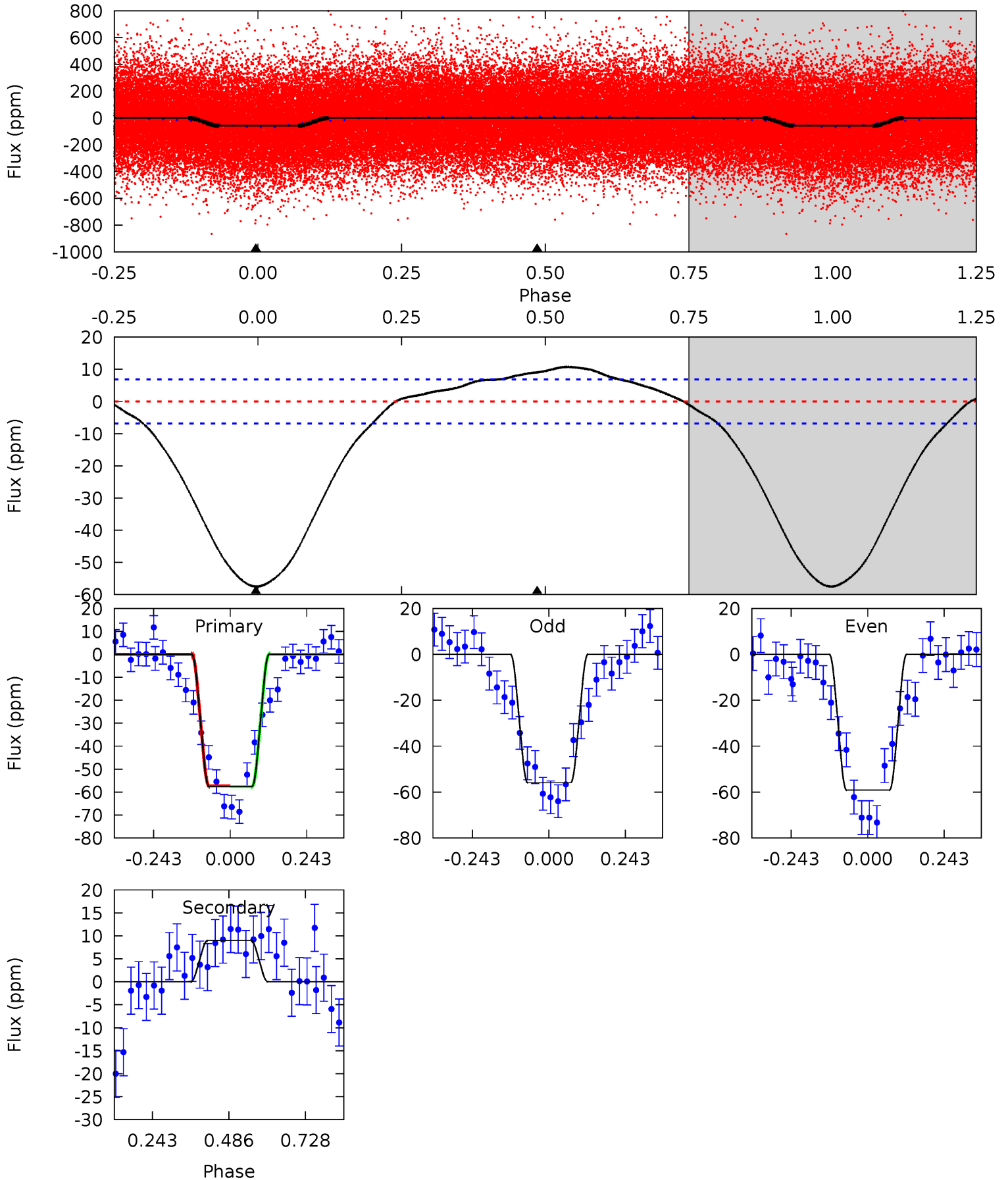
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	1.36	0	0	4.29	0.93	0.41	17.6	17.6	1.36	1.36	0.18	0.97	0.04	13.8



Alt Model-Shift Uniqueness Test

009402709-01, P = 0.536544 Days, E = 131.495311 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.8	-5.76	0	0	4.38	1.17	0.99	36.8	36.8	-5.76	-5.76	1.01	1.02	0.16	0.09



Stellar Parameters For KIC 009402709

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5048^{+158}_{-176}	$3.496^{+0.840}_{-0.210}$	$0.280^{+0.150}_{-0.300}$	$3.808^{+1.169}_{-2.171}$	$1.657^{+0.233}_{-0.699}$	$0.042^{+0.519}_{-0.025}$
	+3%/-3%	+24%/-6%	+54%/-107%	+31%/-57%	+14%/-42%	+1228%/-58%
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 009402709-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2 ± 1	$1.92^{+1.41}_{-1.04}$	4765^{+532}_{-909}	-3913^{+1166}_{-455}	$0.047^{+0.195}_{-0.039}$
Alt.	9 ± 2	$2.88^{+1.59}_{-1.15}$	4740^{+526}_{-814}	-4405^{+401}_{-417}	$-0.134^{+0.078}_{-0.222}$

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

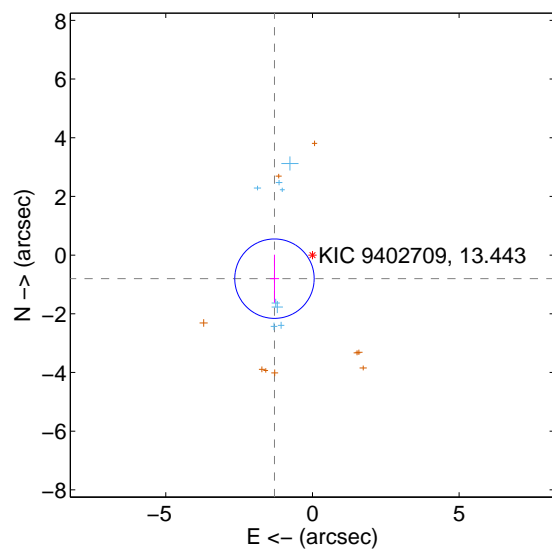
Supplemental centroid analysis for 009402709-01. Kepler magnitude: 13.44. Transit SNR 11.98

There are 8 quarters with good PRF difference image offsets

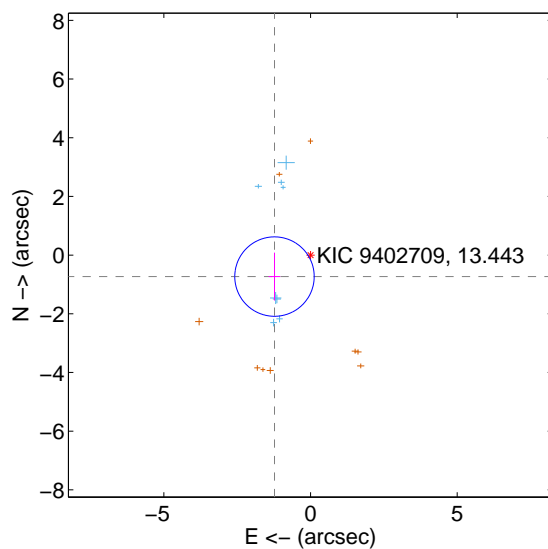
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.523 ± 0.451	3.38	1.294 ± 0.156	-0.803 ± 0.818
PRF-fit source offset from KIC position	1.430 ± 0.451	3.17	1.228 ± 0.197	-0.732 ± 0.816
photometric centroid source offset	4.88 ± 0.66	7.35	-3.44 ± 0.66	-3.46 ± 0.66

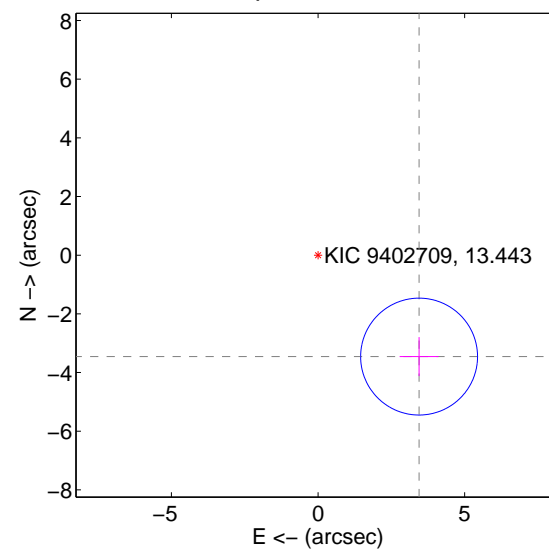
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

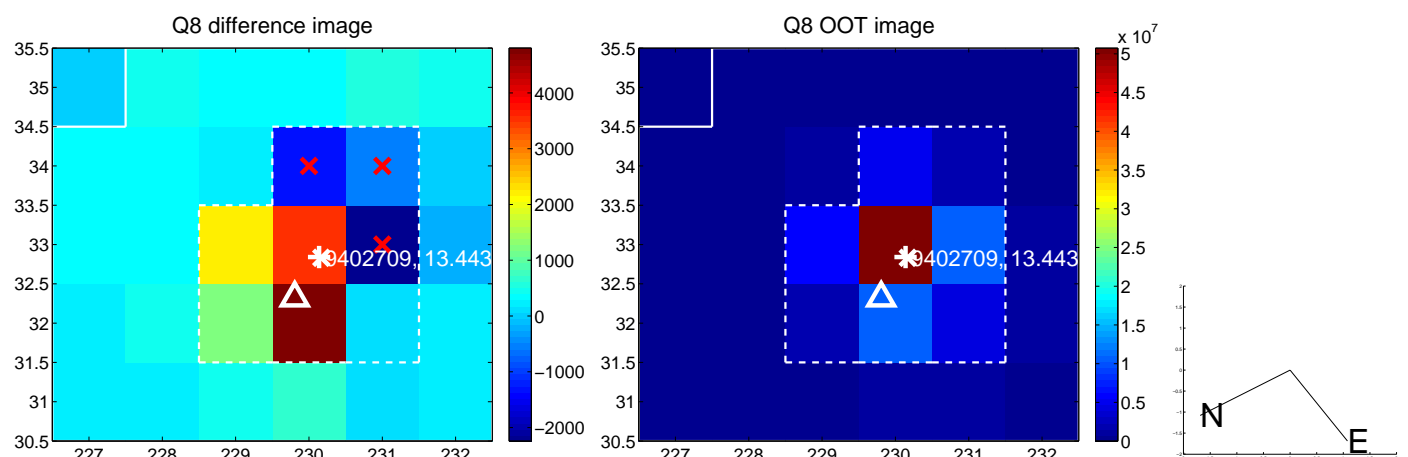
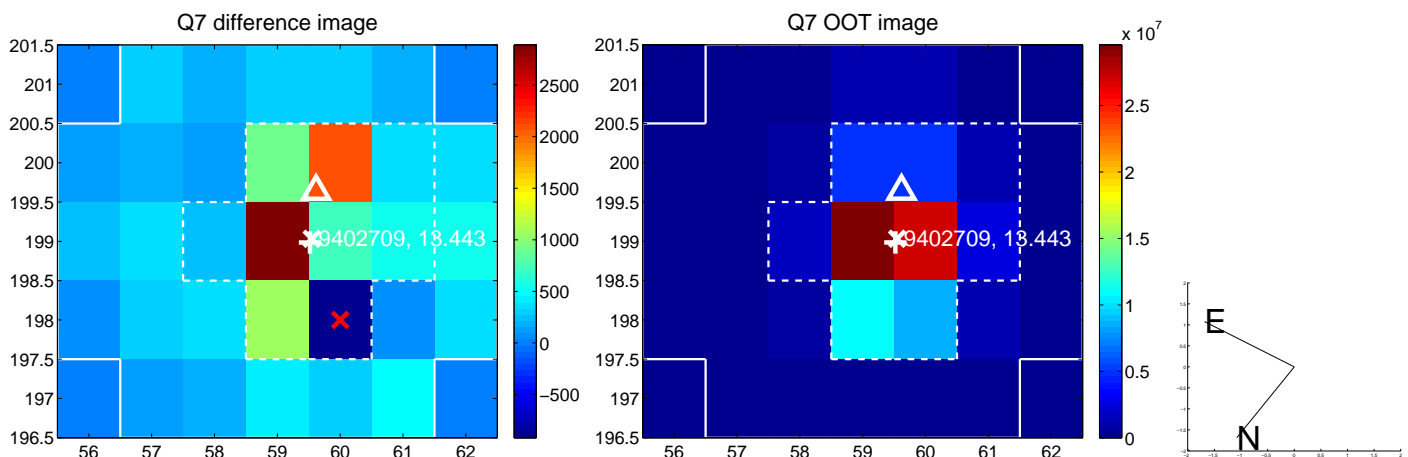
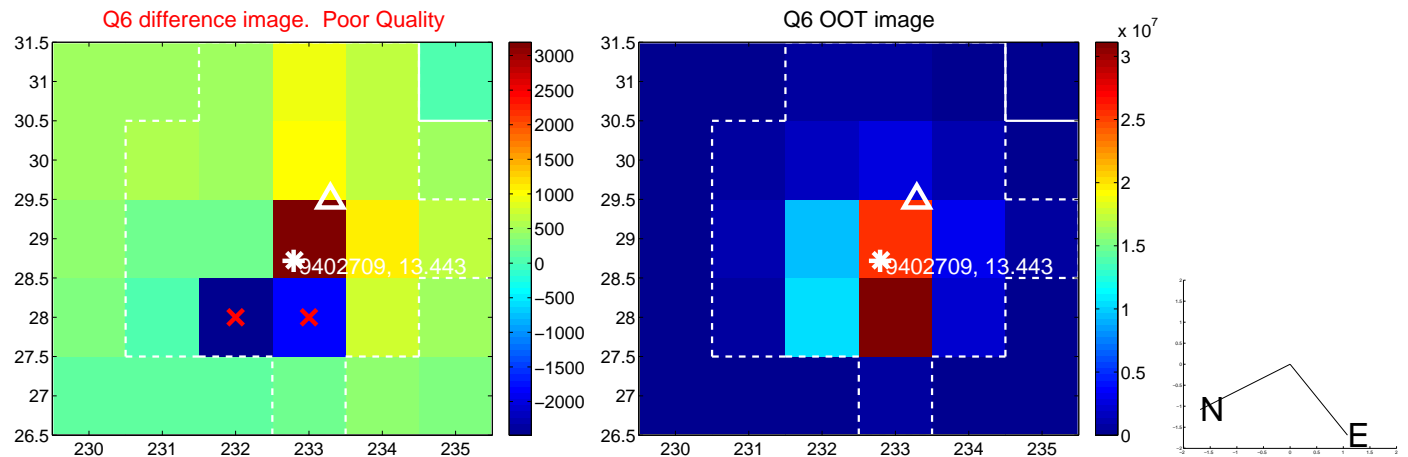
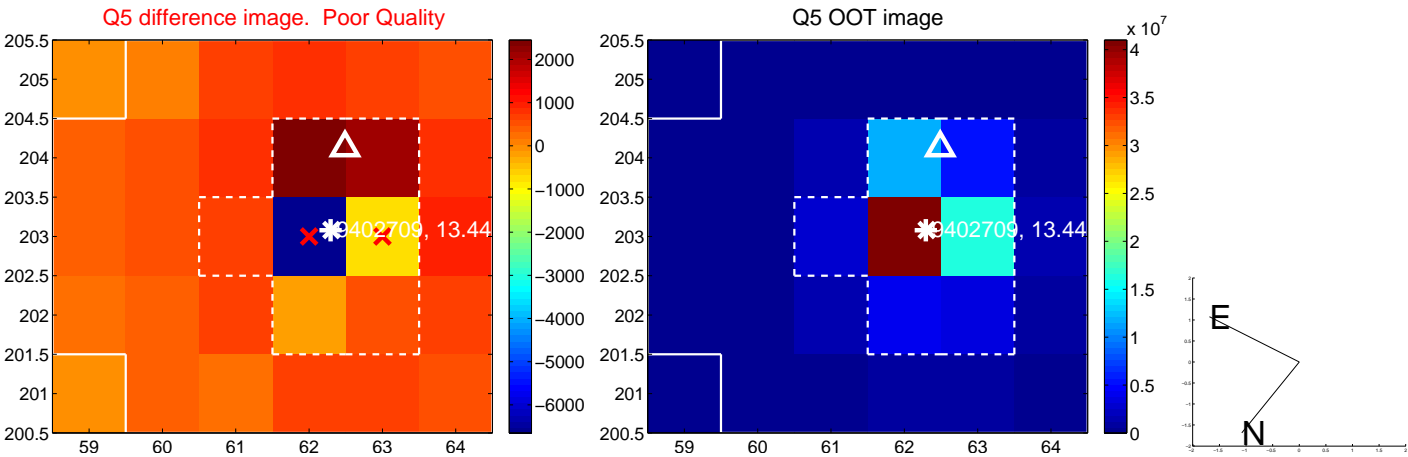


offset from photometric centroids

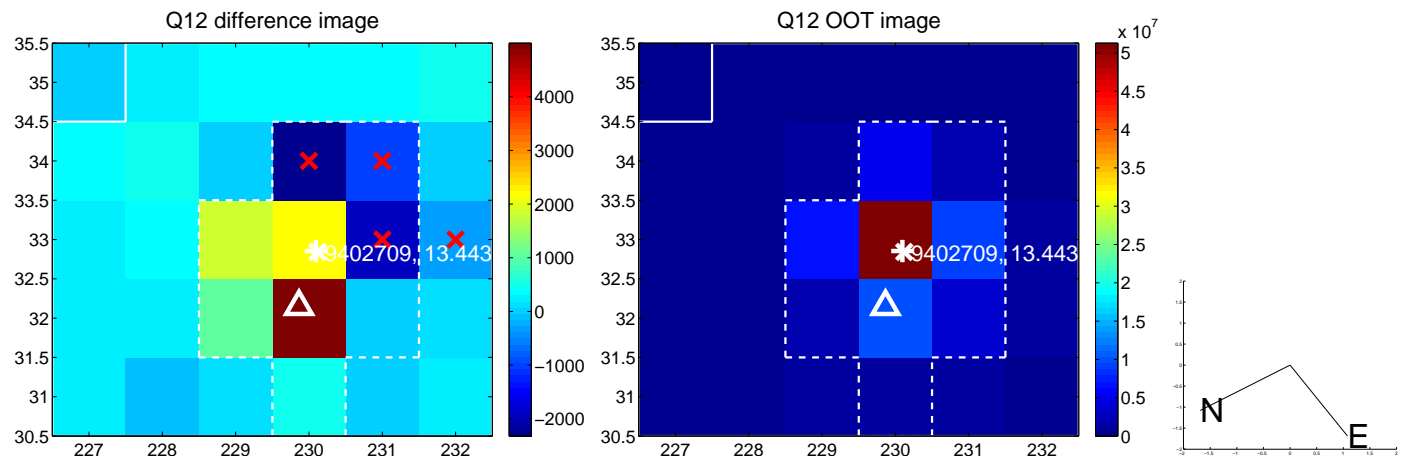
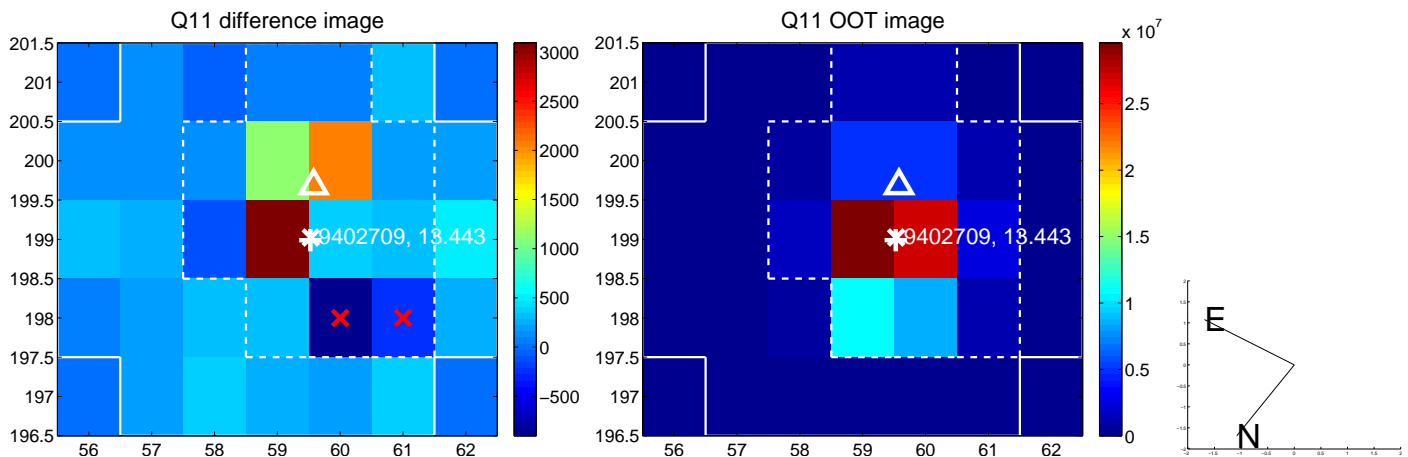
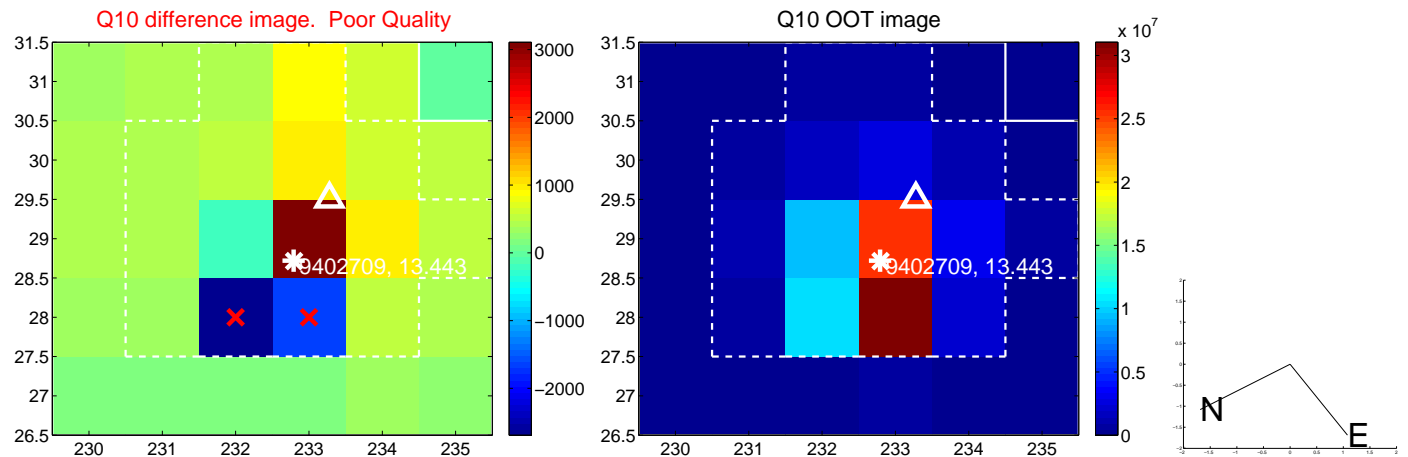
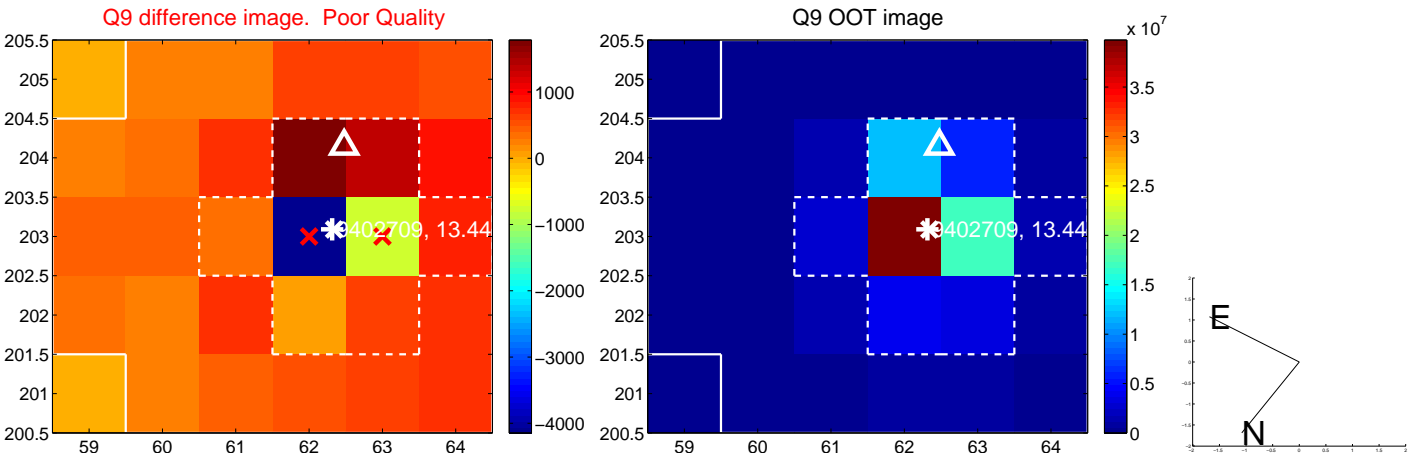


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

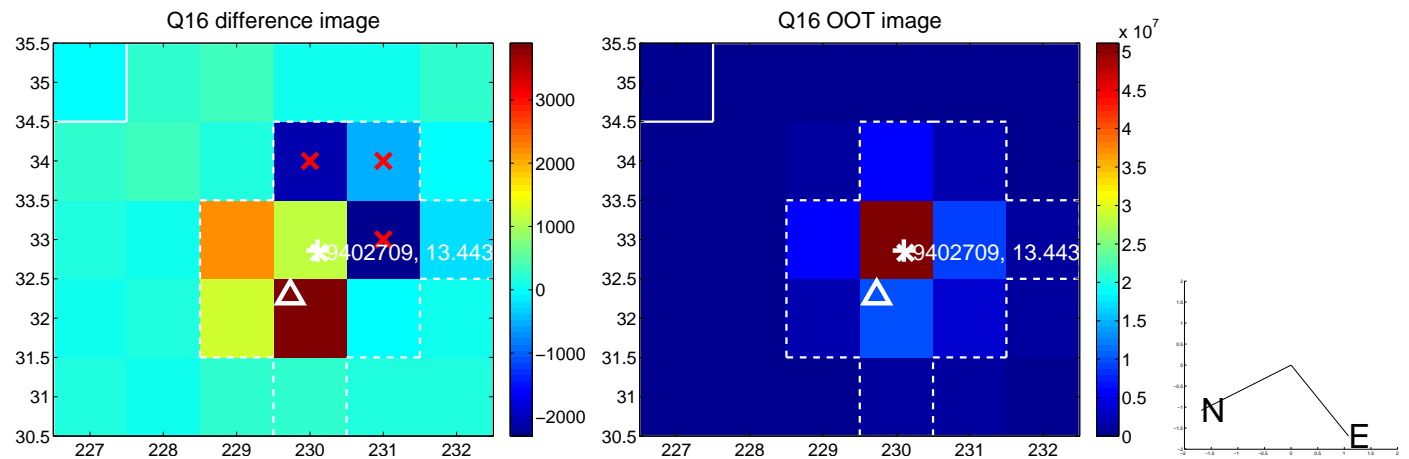
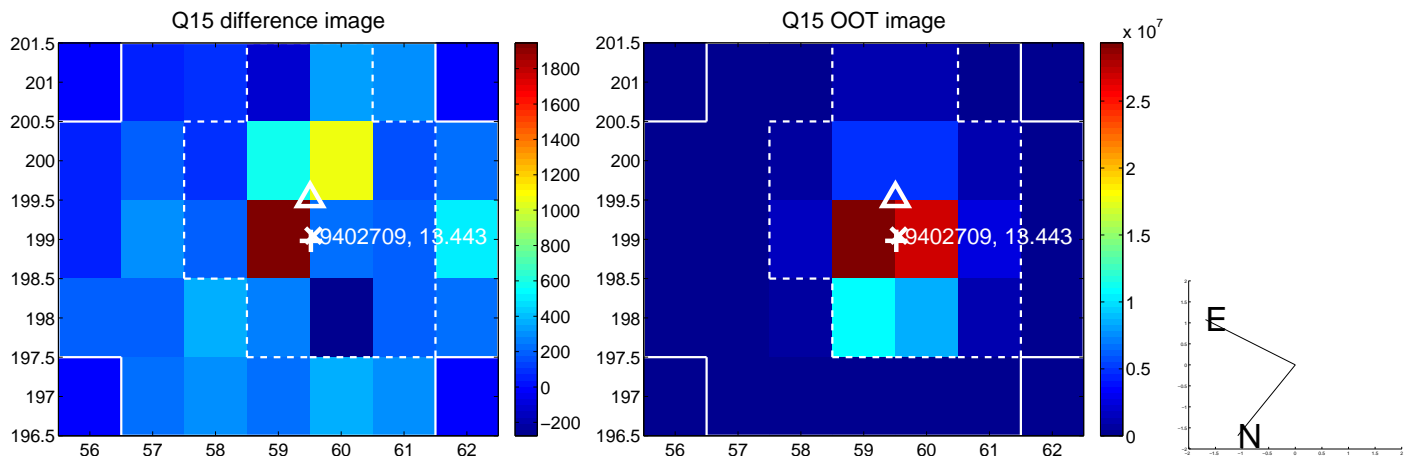
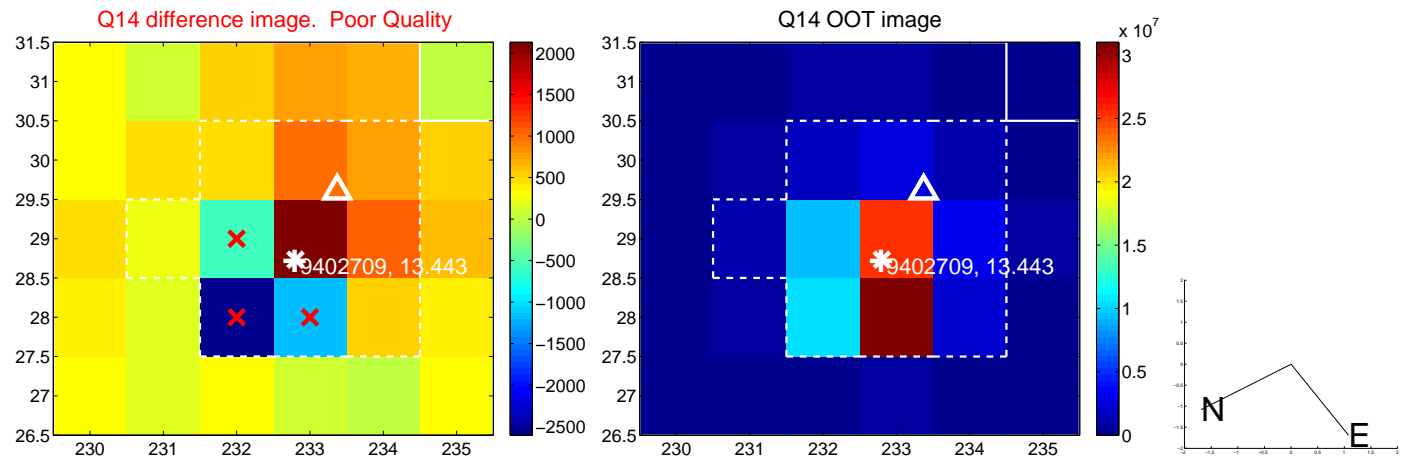
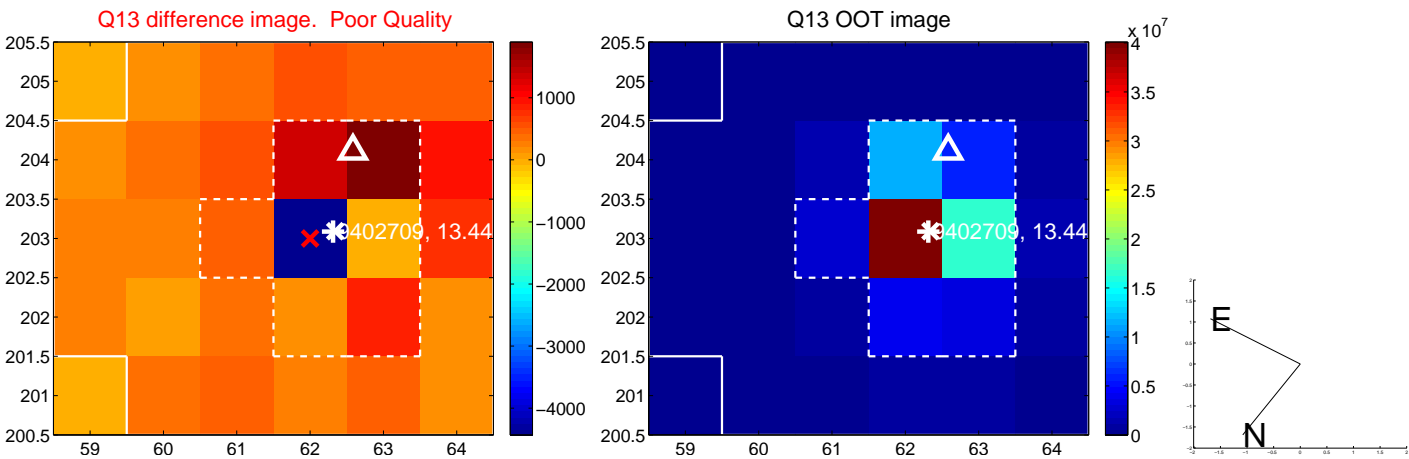
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



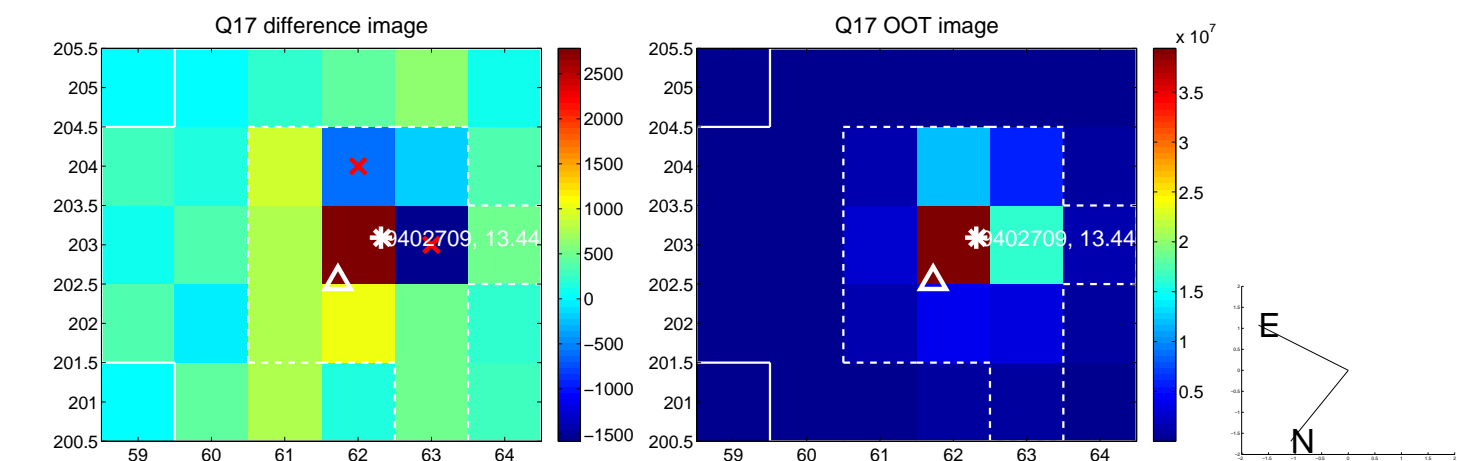
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



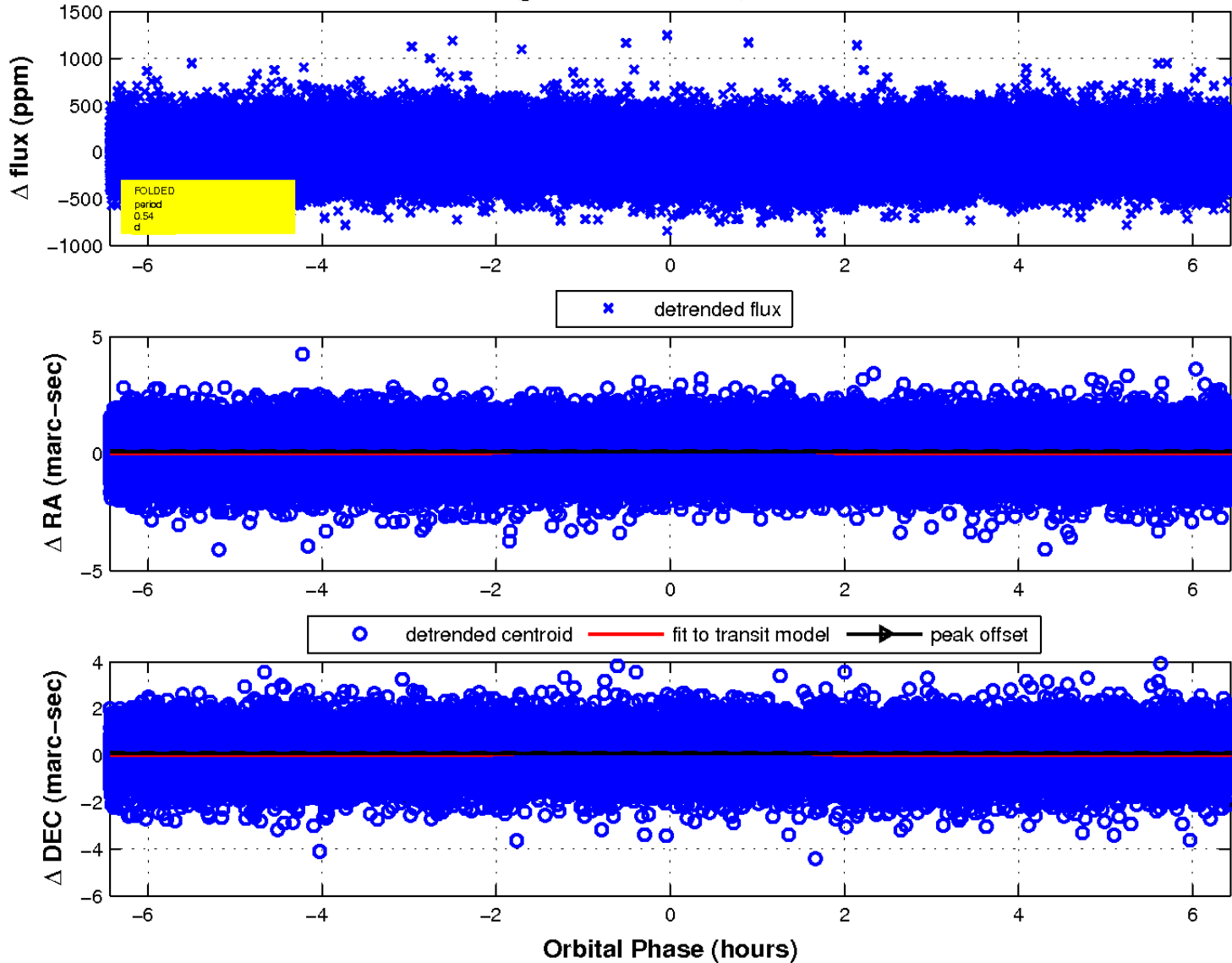
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

