

KIC 009220612

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})
009220612-01	OBS	4059.01	0.979142	132.231345	117.9	2.430	14.9	16.1	0.78	5390	1.03	1359.94

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009220612-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—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 009220612-01

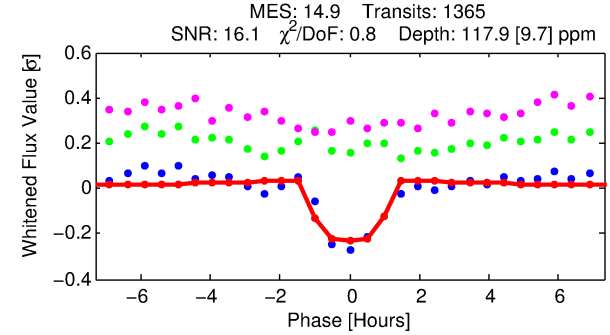
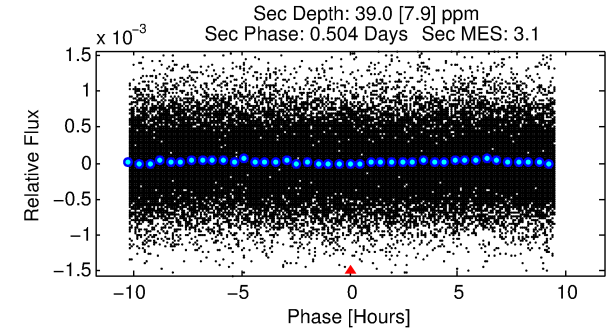
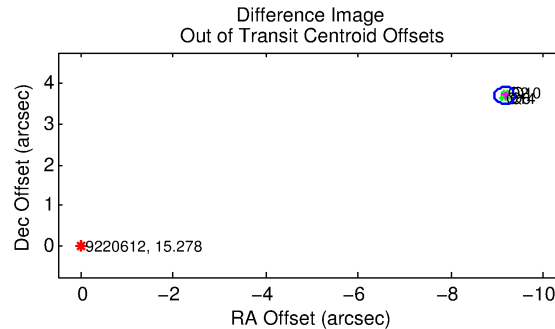
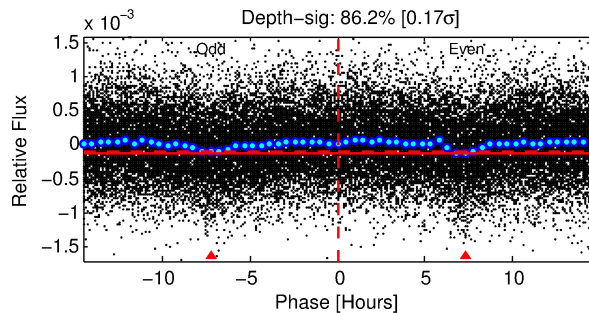
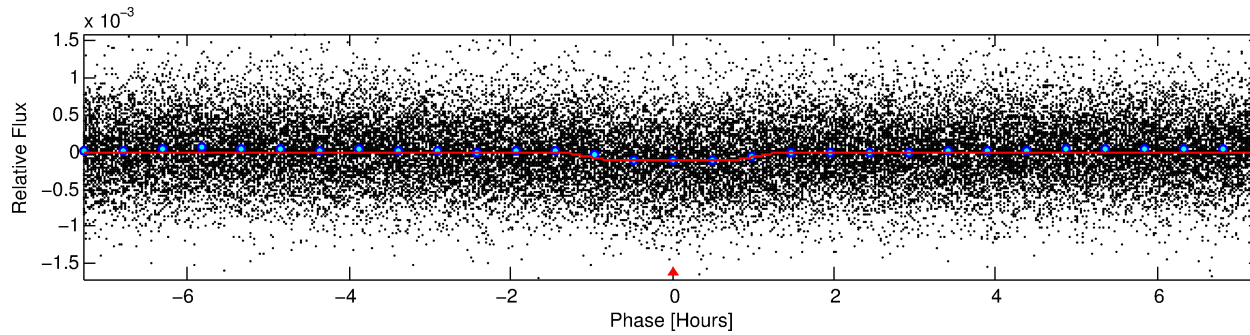
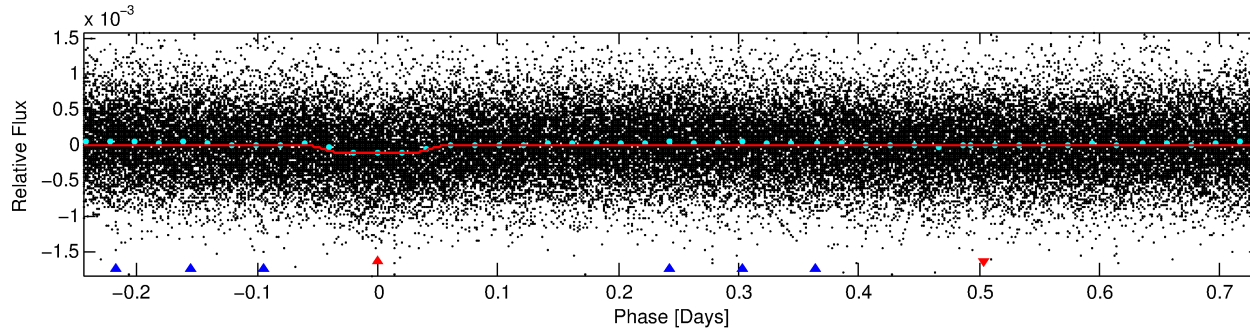
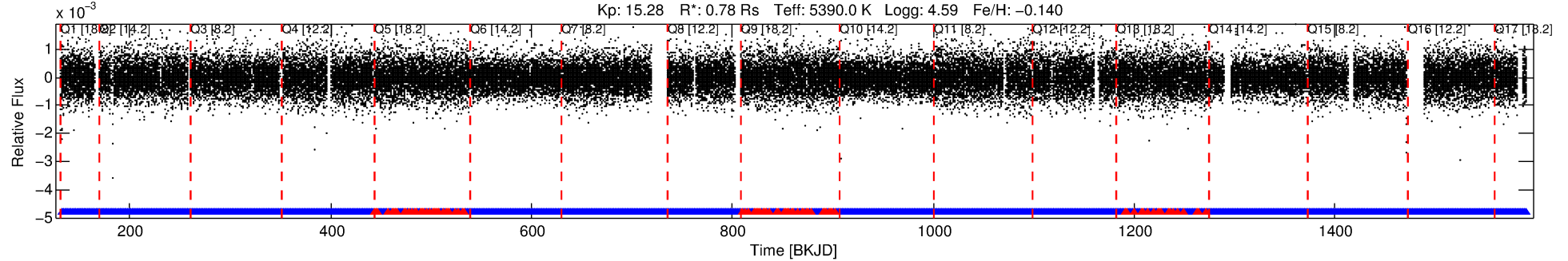
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009220612-01	9220612	009220600-pri	9220600	1:1	21.2	4	4	12.26	15.27	550.00	Direct-PRF	0	1.98	0.98

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: 9220612 Candidate: 1 of 2 Period: 0.979 d
KOI: K04059.01 Corr: 0.920

Kp: 15.28 R*: 0.78 Rs Teff: 5390.0 K Logg: 4.59 Fe/H: -0.140



DV Fit Results:

Period = 0.97914 [0.00001] d
Epoch = 132.2313 [0.0018] BKJD
Rp/R* = 0.0121 [0.0051]
a/R* = 1.65 [1.98]
b = 0.91 [0.36]
Seff = 1359.94 [340.78]
Teff = 1548 [97] K
Rp = 1.03 [0.47] Re
a = 0.0184 [0.0028] AU
Ag = 6.82 [6.11] [0.95σ]
Teffp = 3869 [847] K [2.72σ]

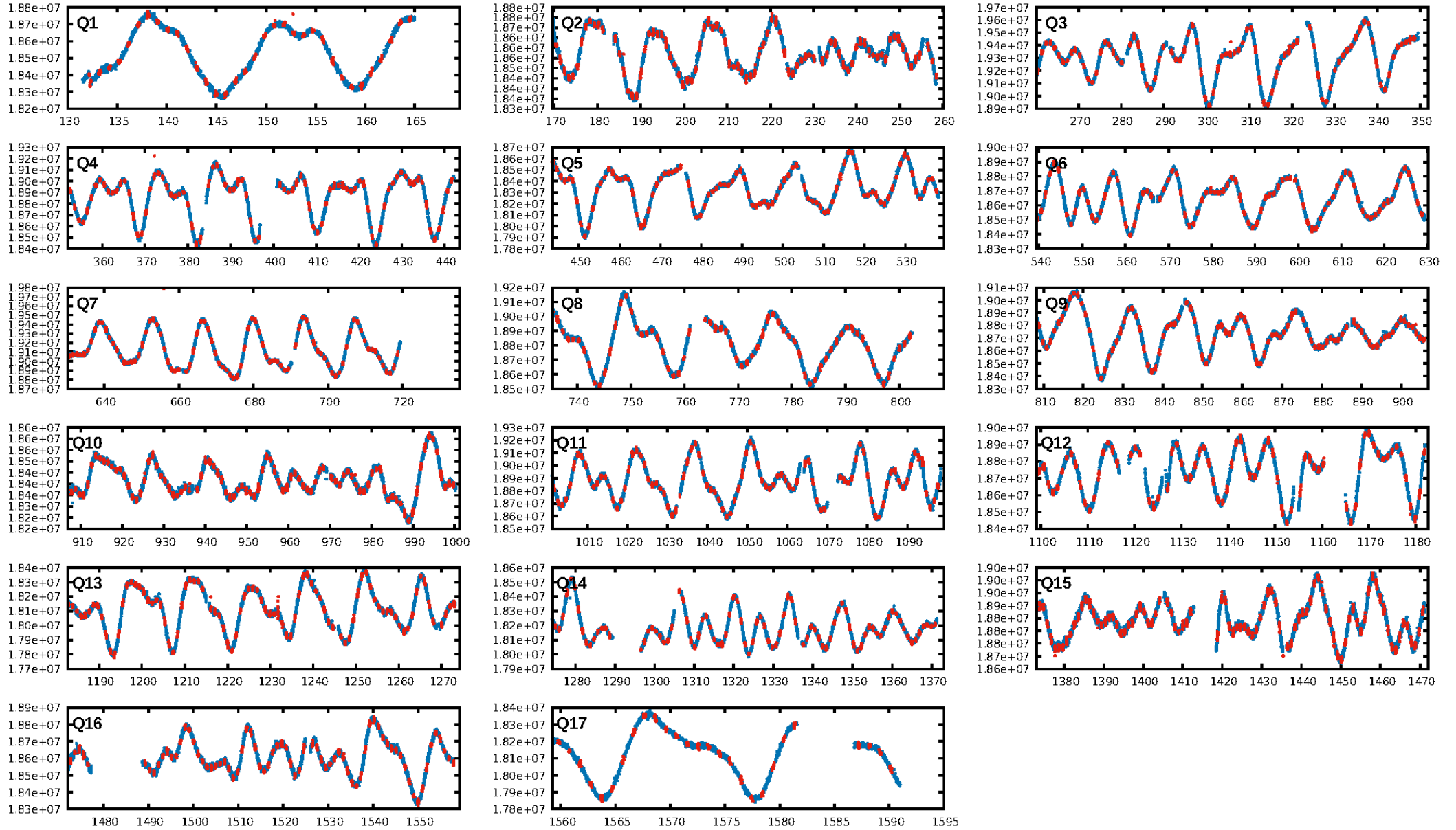
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [539.98σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.07e-48
RollingBand-fgt: 0.93 [1212/1304]
GhostDiagnostic-chr: -0.6443
Centroid-sig: 0.0%
Centroid-so: 8.197 arcsec [11.04σ]
OotOffset-rm: 9.887 arcsec [136.98σ]
KicOffset-rm: 9.850 arcsec [130.65σ]
OotOffset-st: 4/0/0/0 [4]
KicOffset-st: 4/0/0/0 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [17/17]

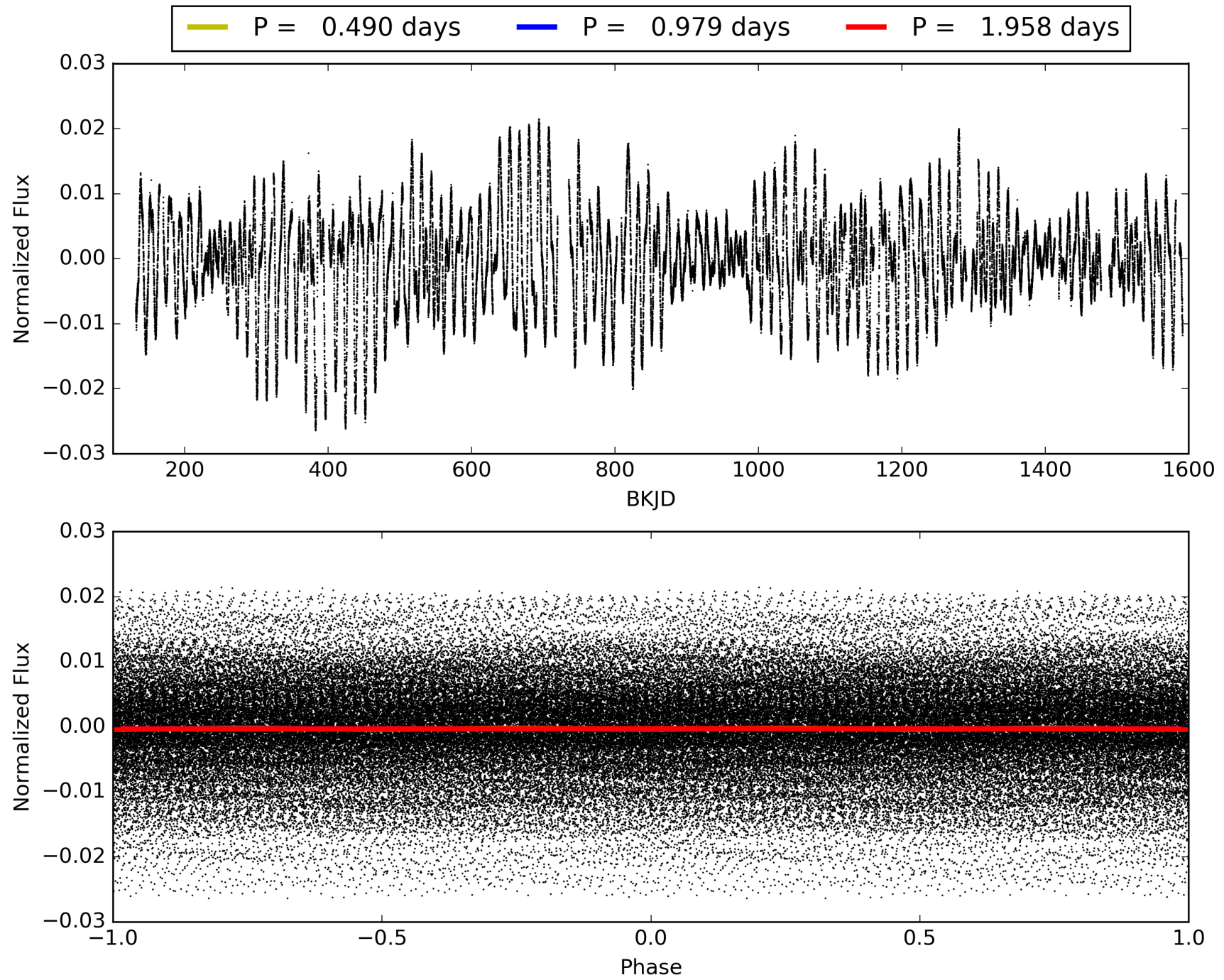
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:17:40 Z

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

TCE 009220612-01, PDC Light Curves

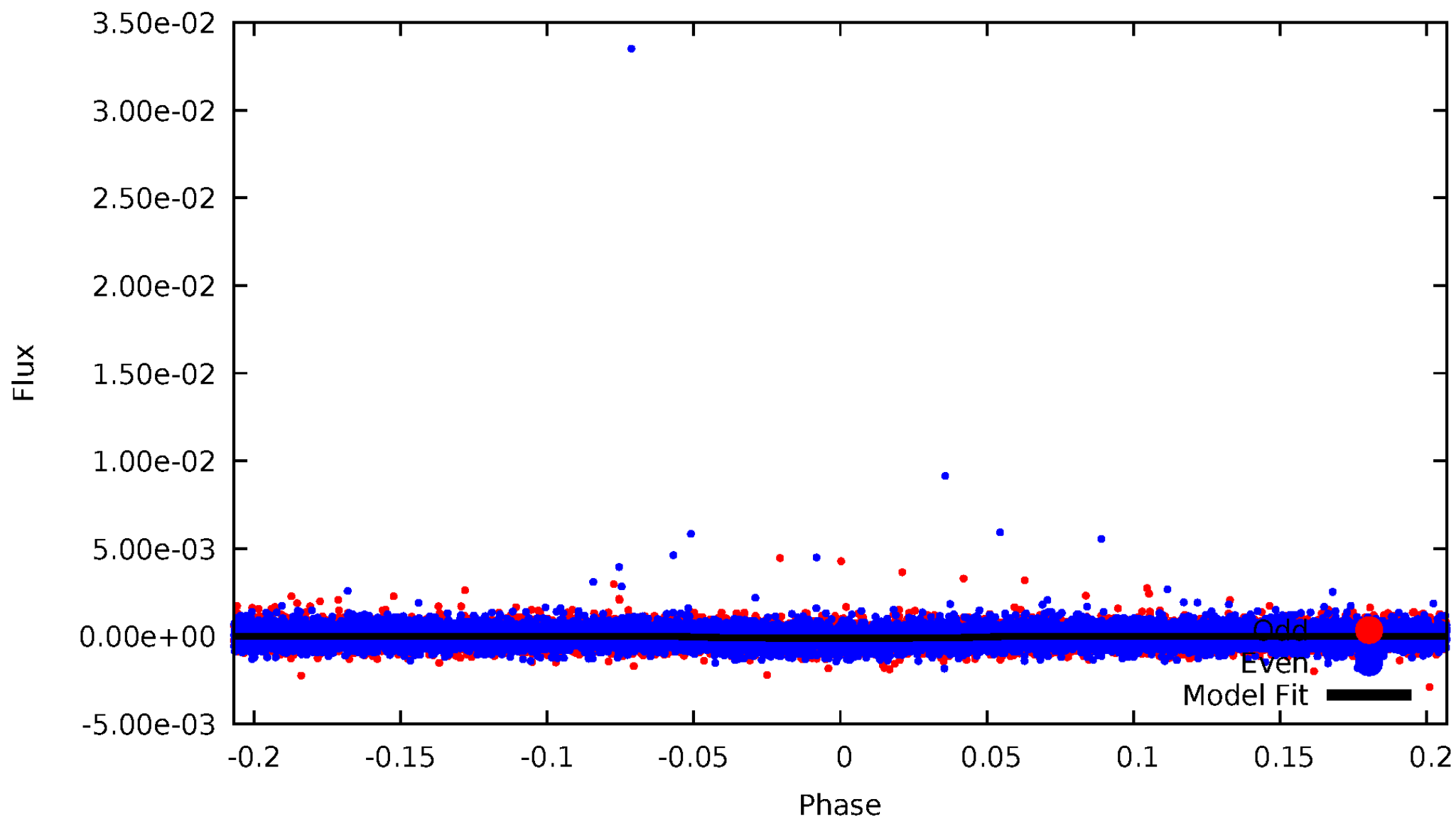


TCE 009220612-01



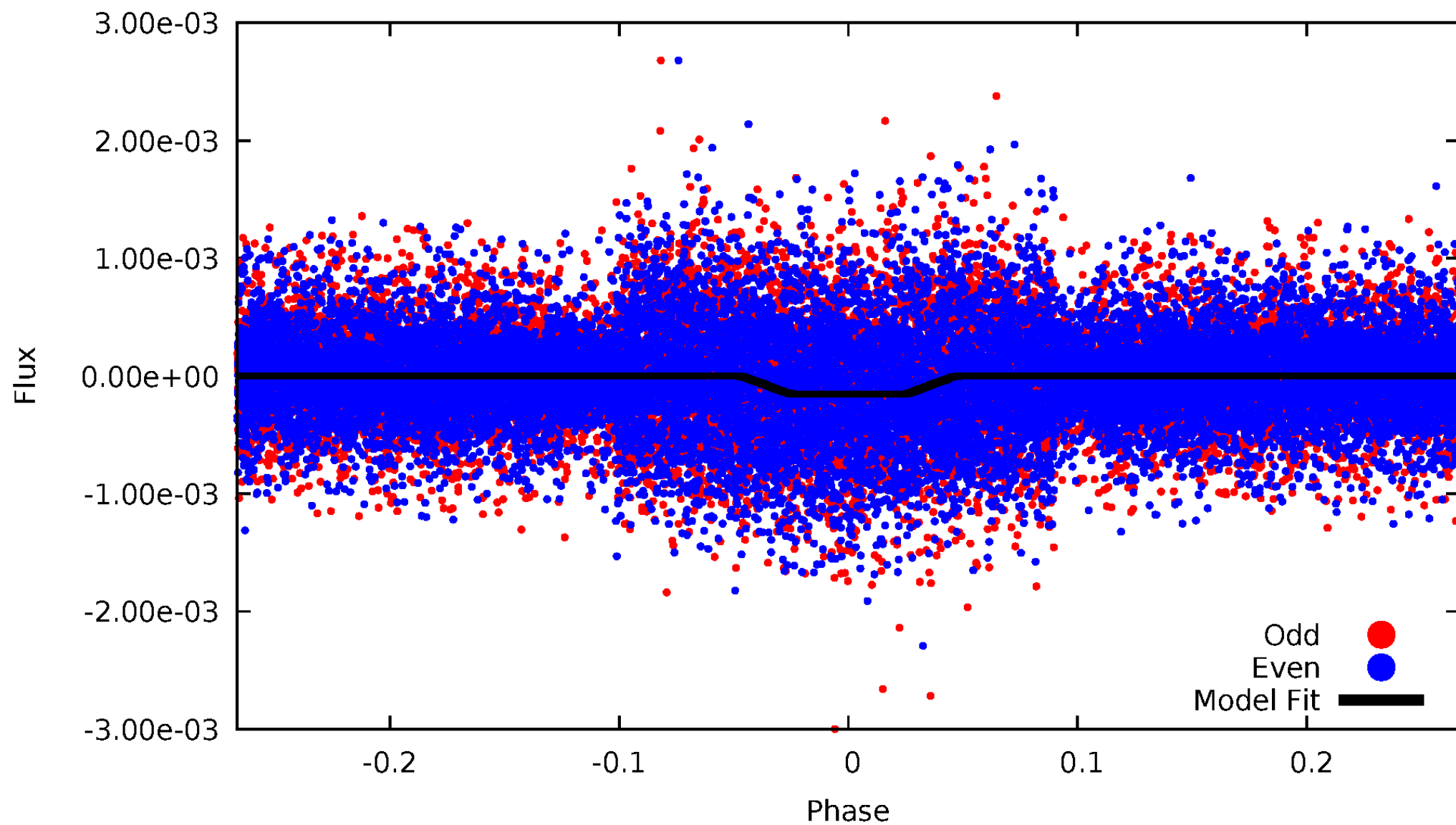
DV Odd/Even

TCE 009220612-01



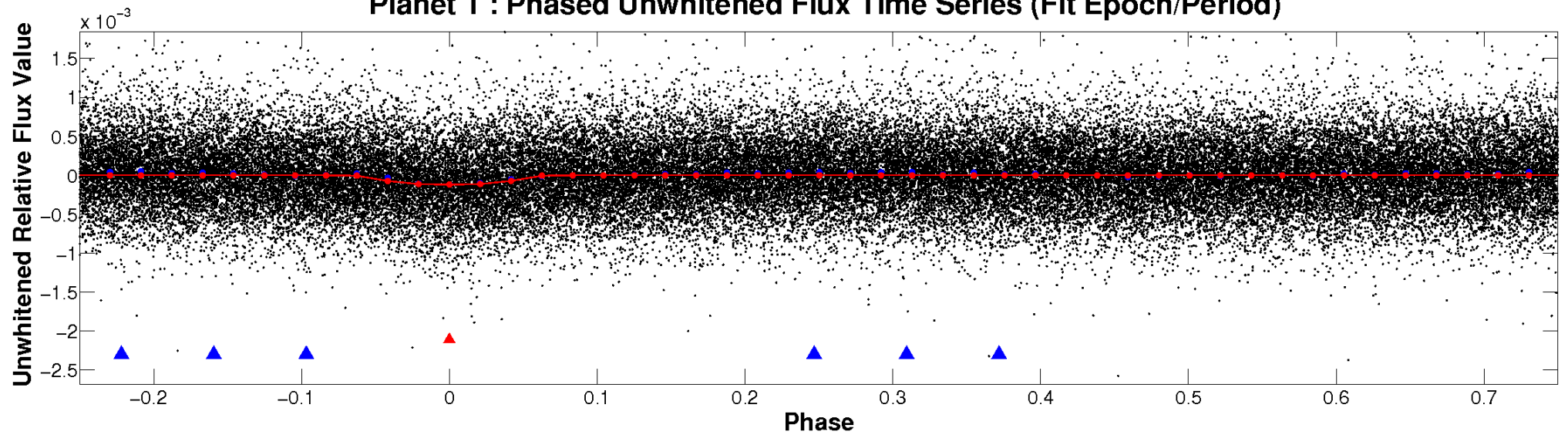
ALT Odd/Even

TCE 009220612-01

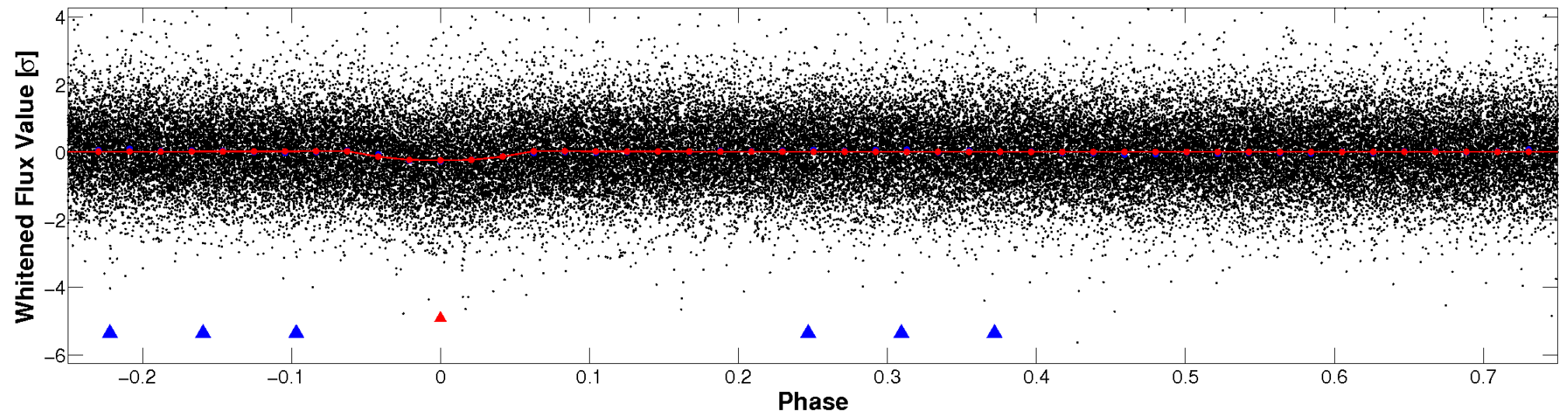


Non-Whitened Vs. Whitened Light Curve

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

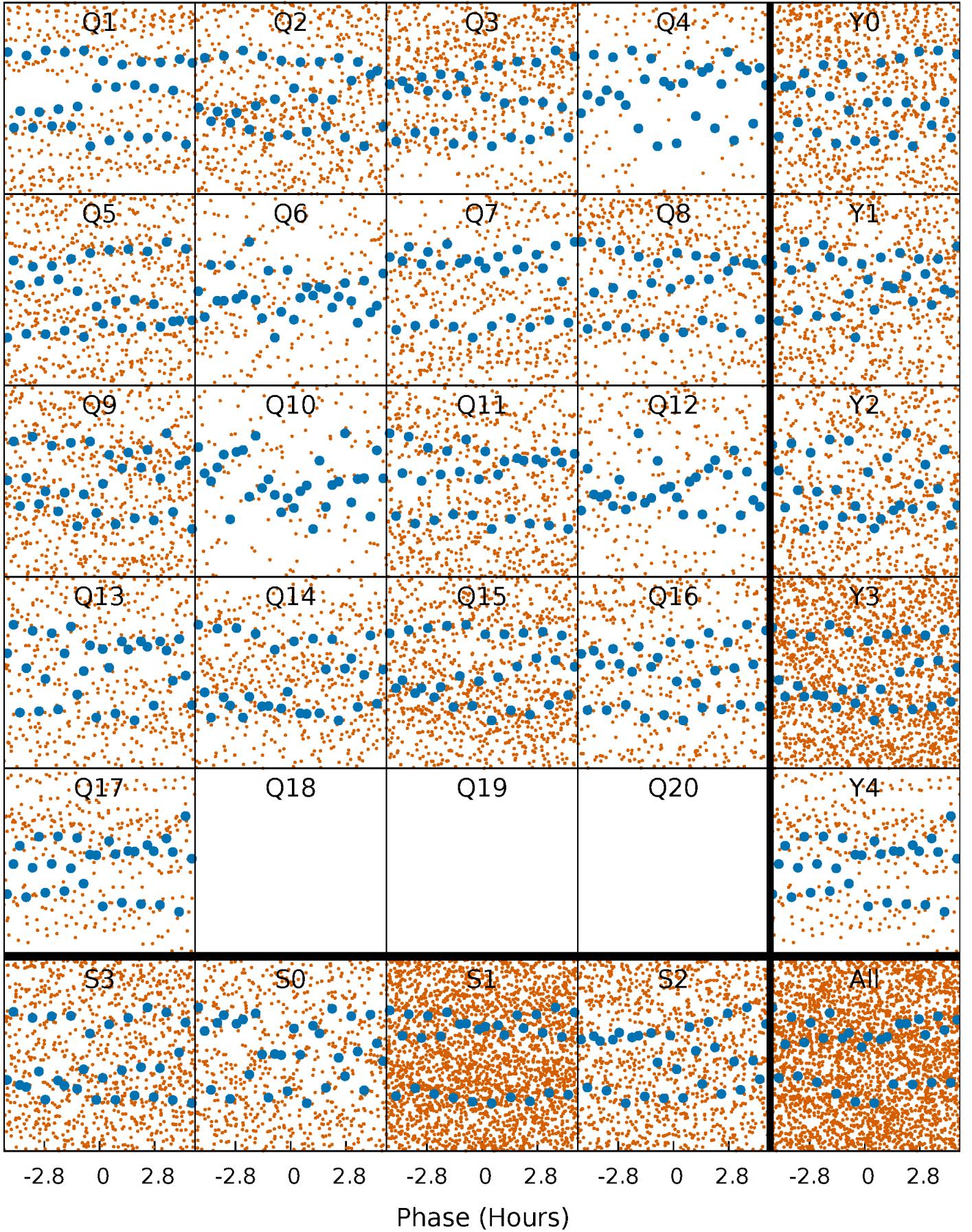


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



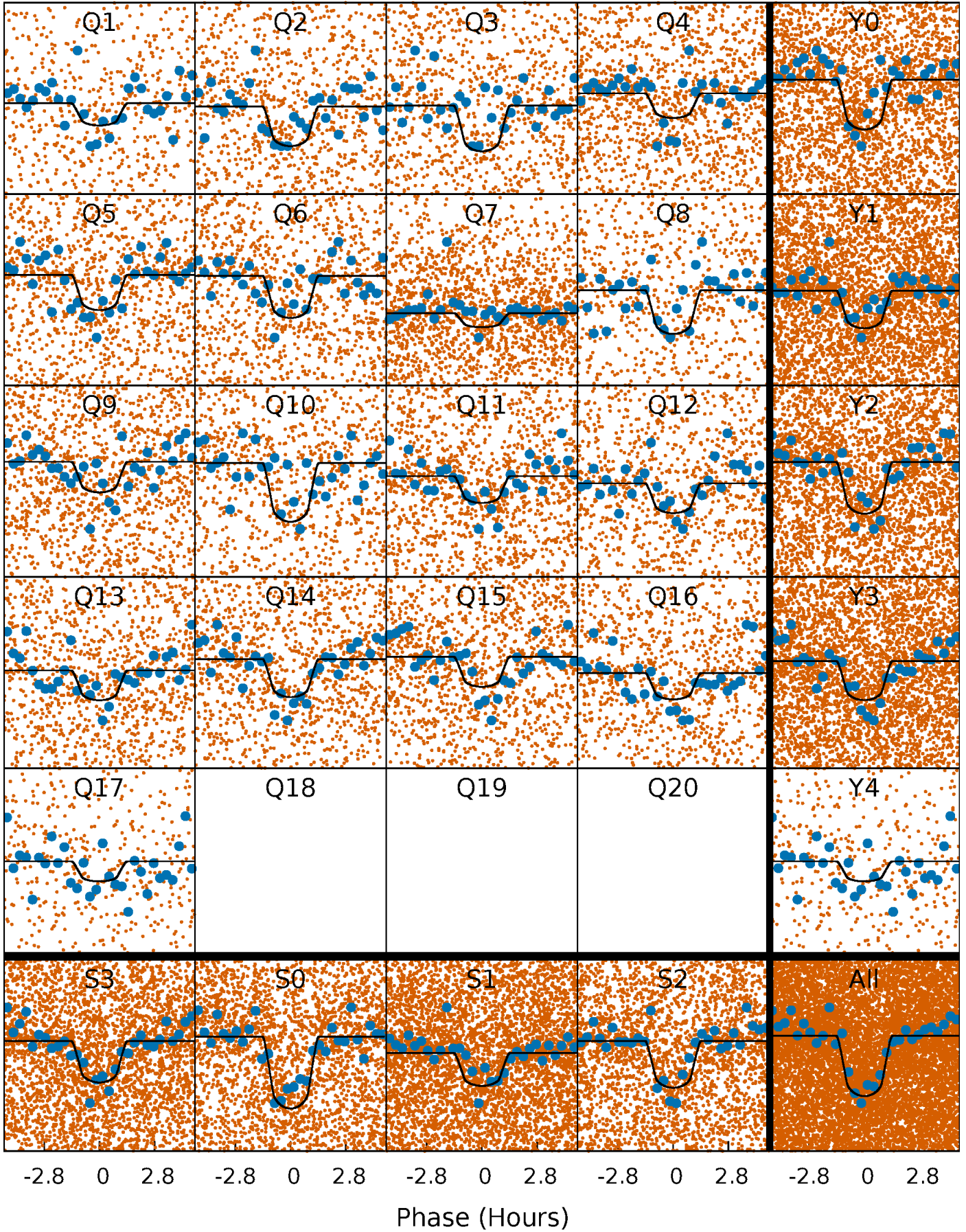
PDC Quarter-Phased Transit Curves

TCE 009220612-01 P= 0.979142 Days $T_0=132.231345$ (BKJD)



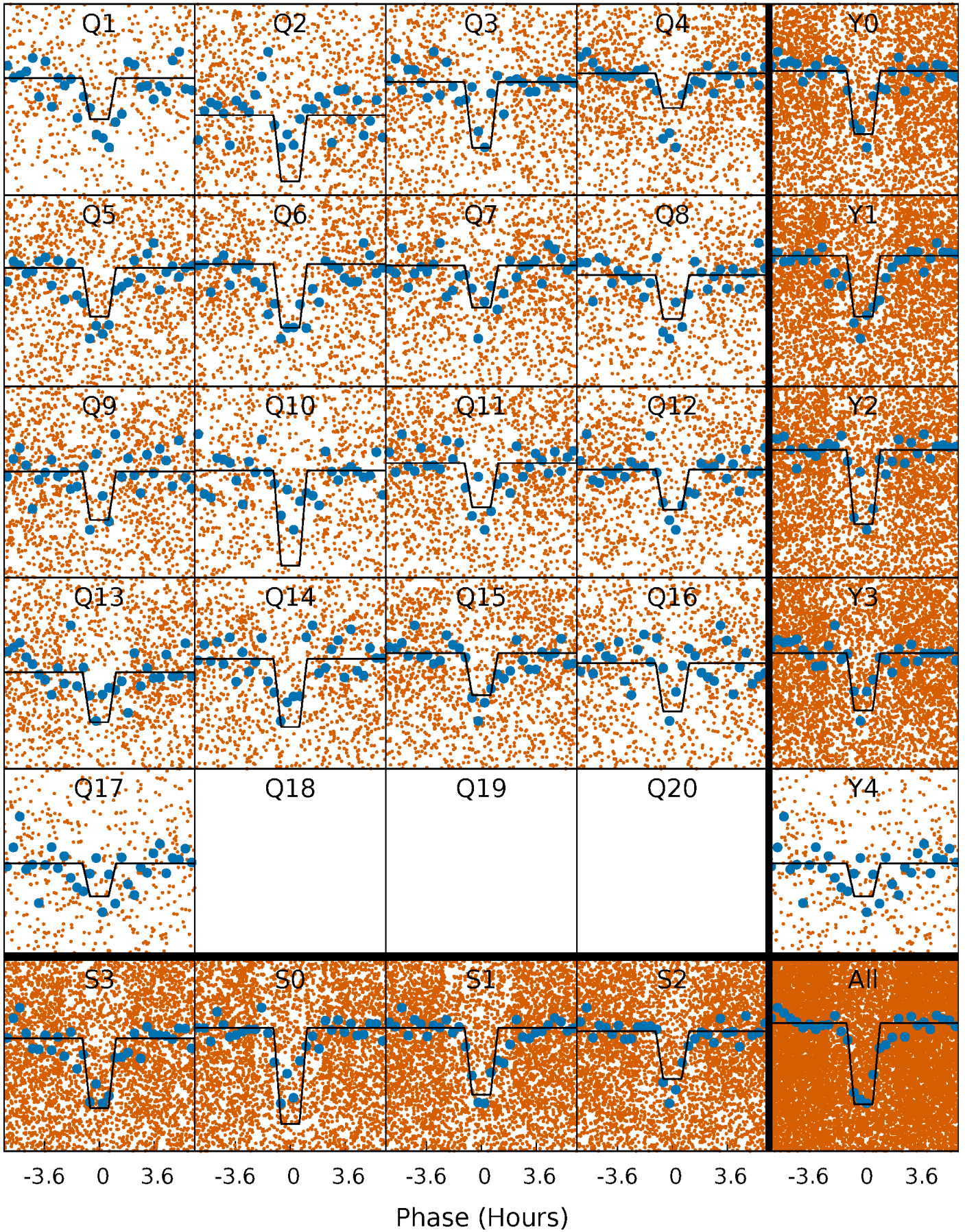
DV Quarter-Phased Transit Curves

TCE 009220612-01 P= 0.979142 Days $T_0=132.231345$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

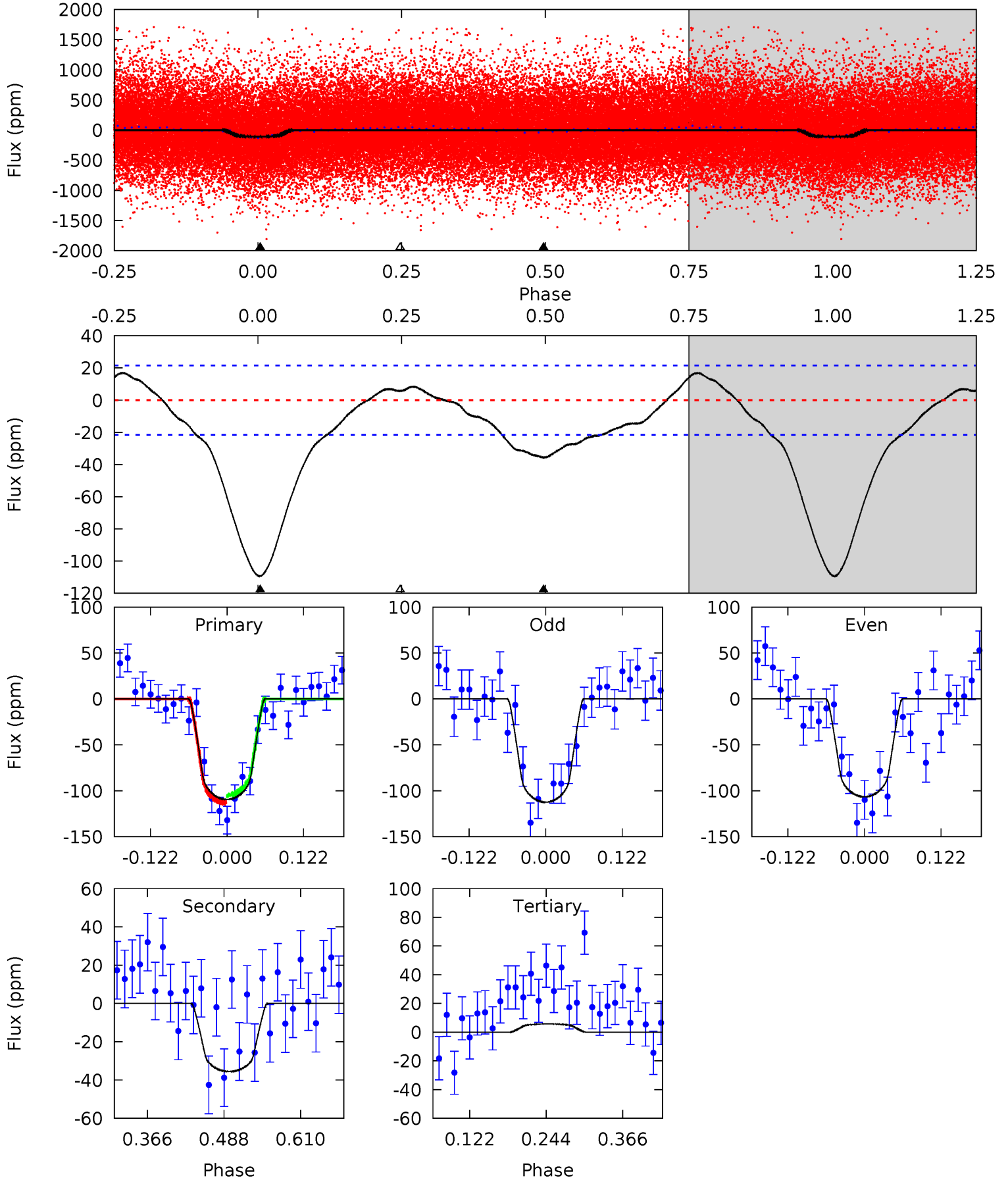
TCE 009220612-01 P= 0.979171 Days $T_0=132.212640$ (BKJD)



DV Model-Shift Uniqueness Test

009220612-01, P = 0.979142 Days, E = 131.252203 Days

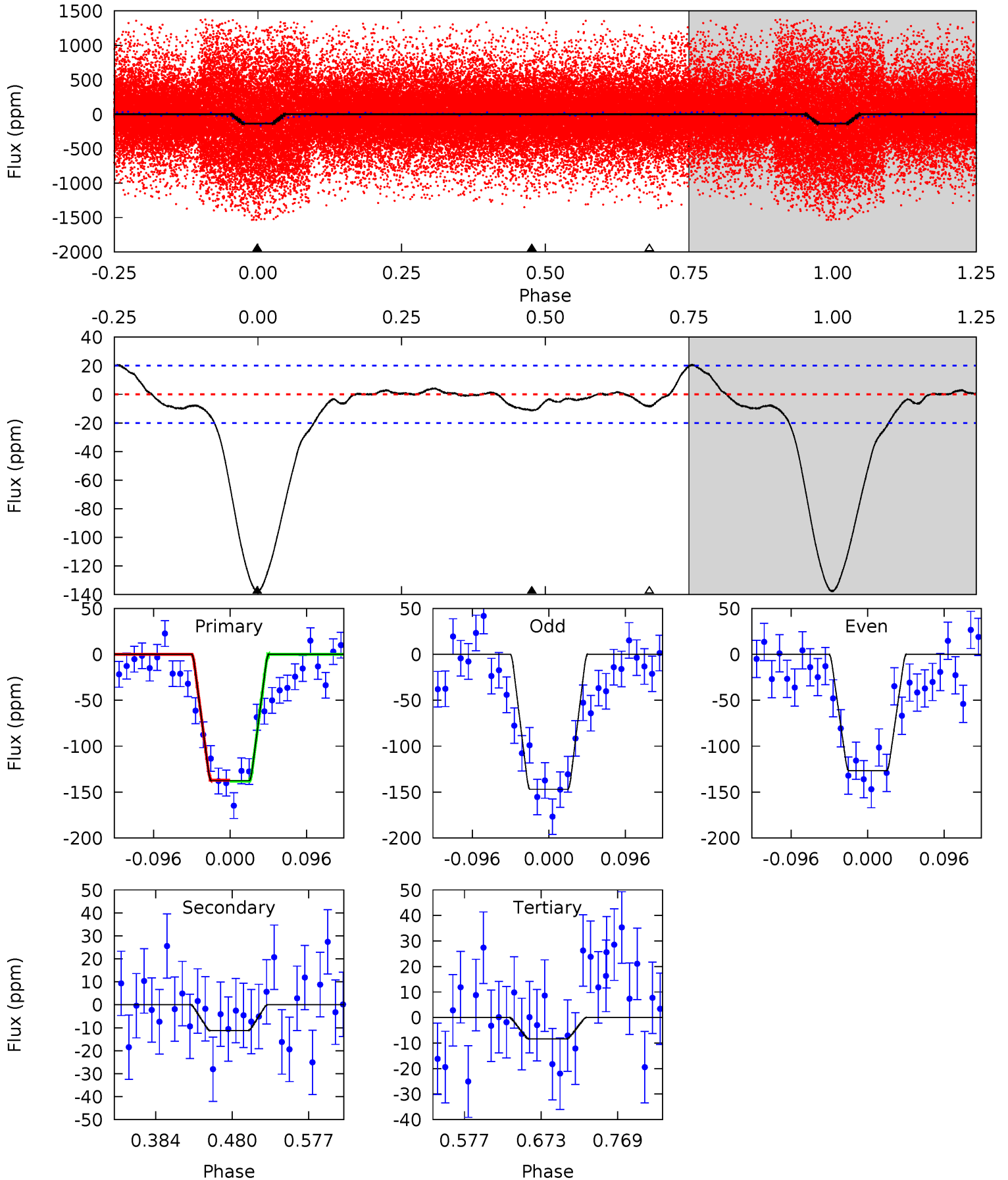
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.0	7.46	-1.20	0	4.52	1.55	2.02	24.2	23.0	8.67	7.46	0.62	0.95	0.13	0.85



Alt Model-Shift Uniqueness Test

009220612-01, P = 0.979171 Days, E = 131.233469 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.3	2.55	1.90	0	4.57	1.66	1.65	29.4	31.3	0.65	2.55	2.31	0.91	0.13	0.14



Stellar Parameters For KIC 009220612

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5390^{+159}_{-159}	$4.591^{+0.030}_{-0.120}$	$-0.140^{+0.300}_{-0.300}$	$0.780^{+0.143}_{-0.061}$	$0.875^{+0.070}_{-0.104}$	$2.593^{+0.416}_{-0.932}$
	+3%/-3%	+1%/-3%	+214%/-214%	+18%/-8%	+8%/-12%	+16%/-36%
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 009220612-01 / KOI 4059.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-36 ± 5	$1.07^{+0.44}_{-0.45}$	2202^{+102}_{-90}	4015^{+1001}_{-483}	$5.688^{+12.057}_{-2.917}$
Alt.	-11 ± 4	$1.09^{+0.46}_{-0.44}$	2196^{+98}_{-84}	3198^{+747}_{-538}	$1.649^{+3.608}_{-0.985}$

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

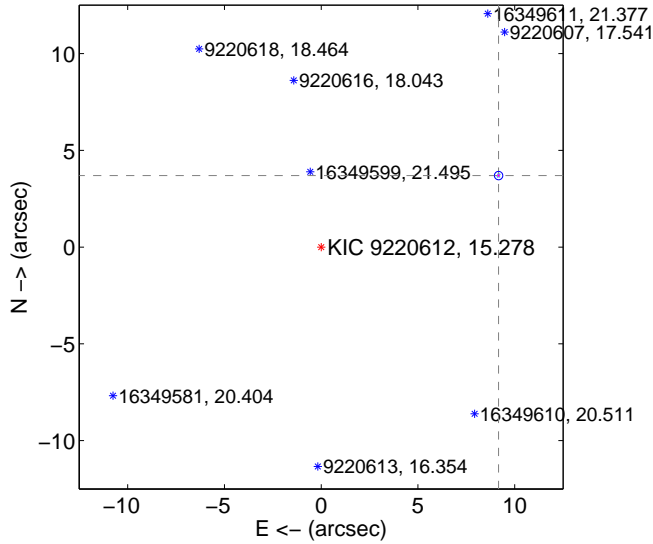
Supplemental centroid analysis for 009220612-01. Kepler magnitude: 15.28. Transit SNR 16.07

There are 4 quarters with good PRF difference image offsets

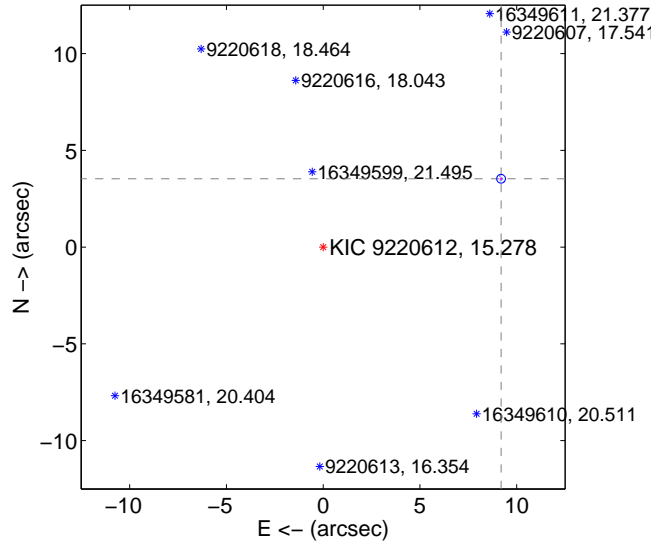
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.887 ± 0.072	136.98	-9.170 ± 0.072	3.696 ± 0.075
PRF-fit source offset from KIC position	9.850 ± 0.075	130.65	-9.194 ± 0.074	3.534 ± 0.085
photometric centroid source offset	8.20 ± 0.74	11.04	-6.53 ± 0.75	4.96 ± 0.72

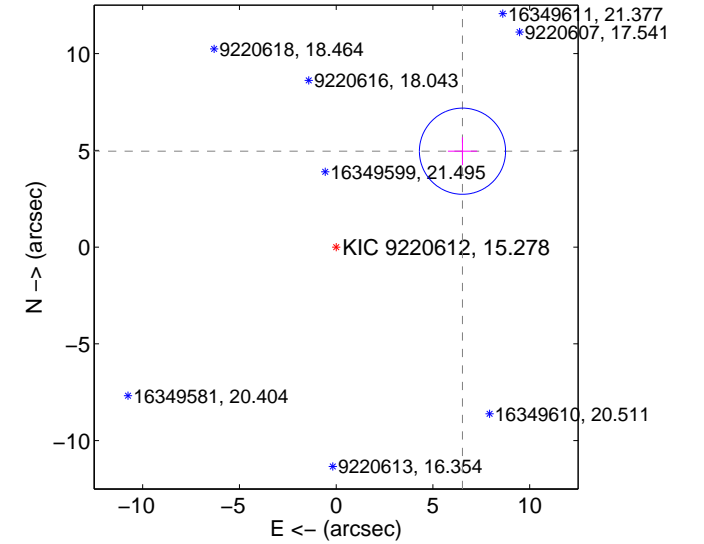
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

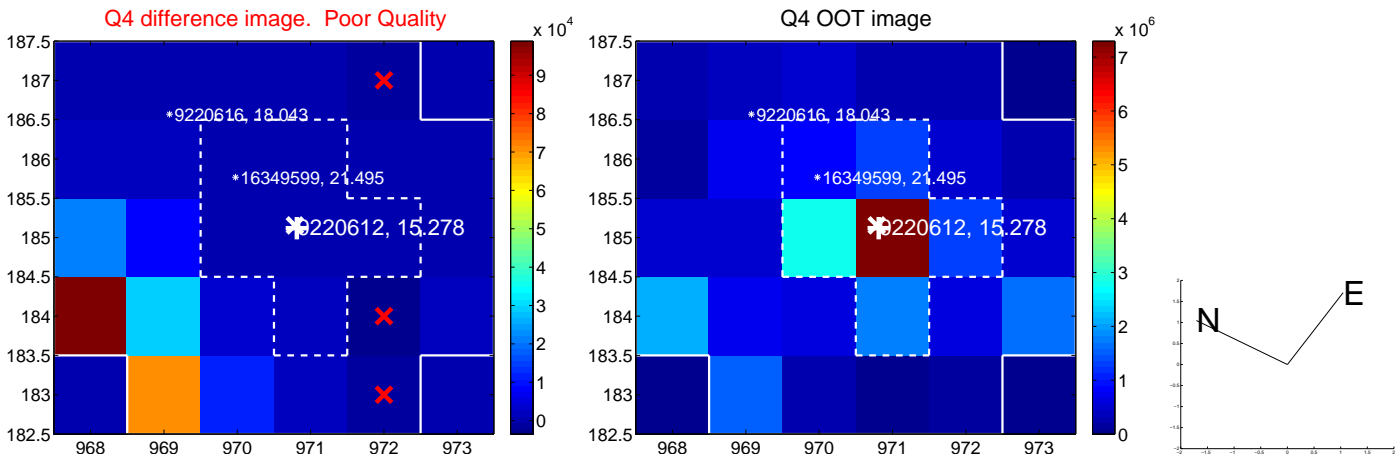
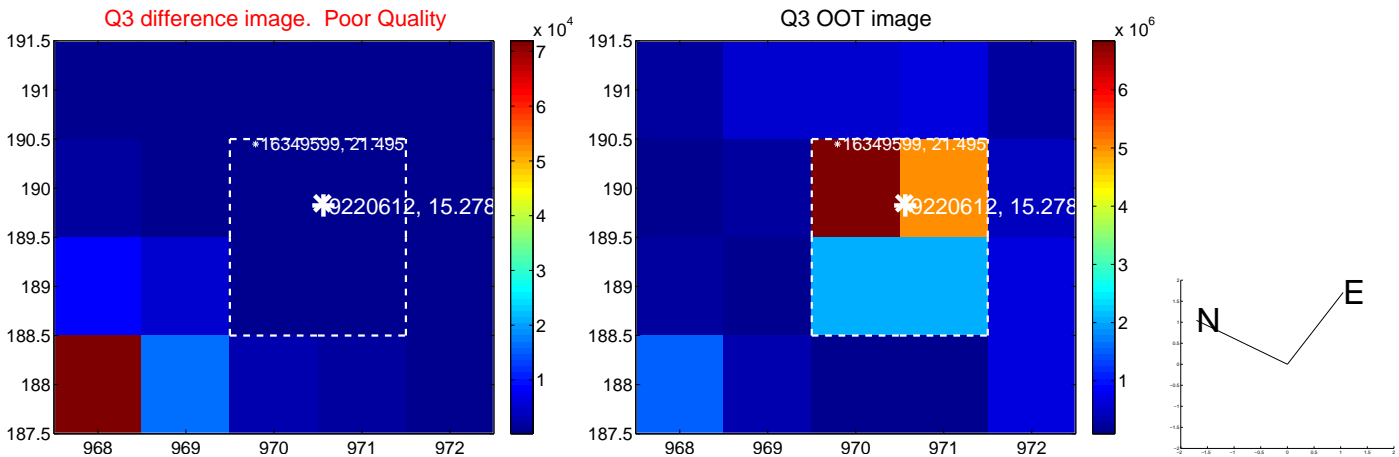
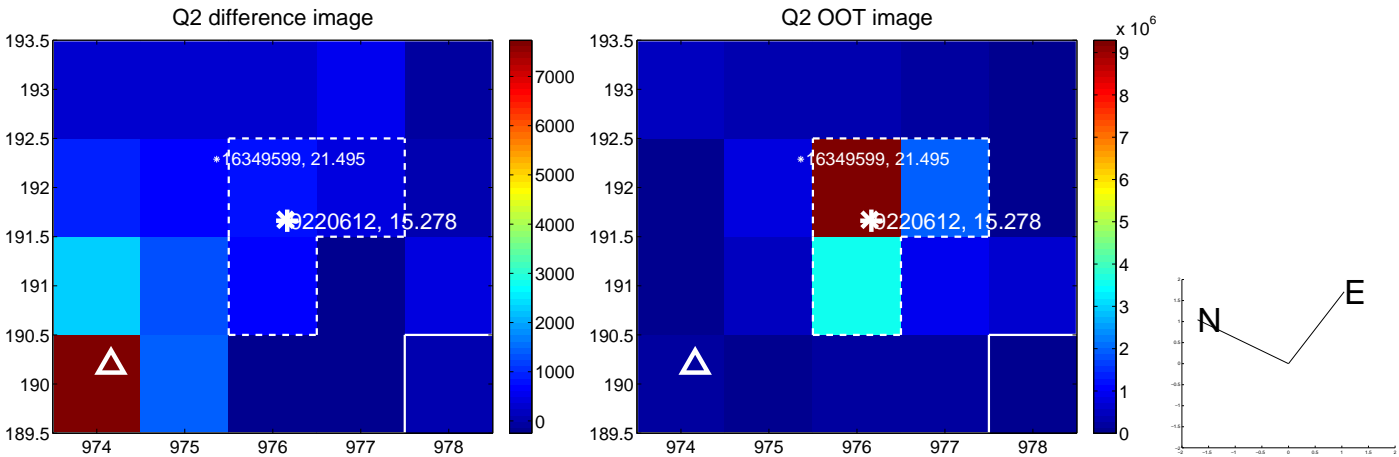
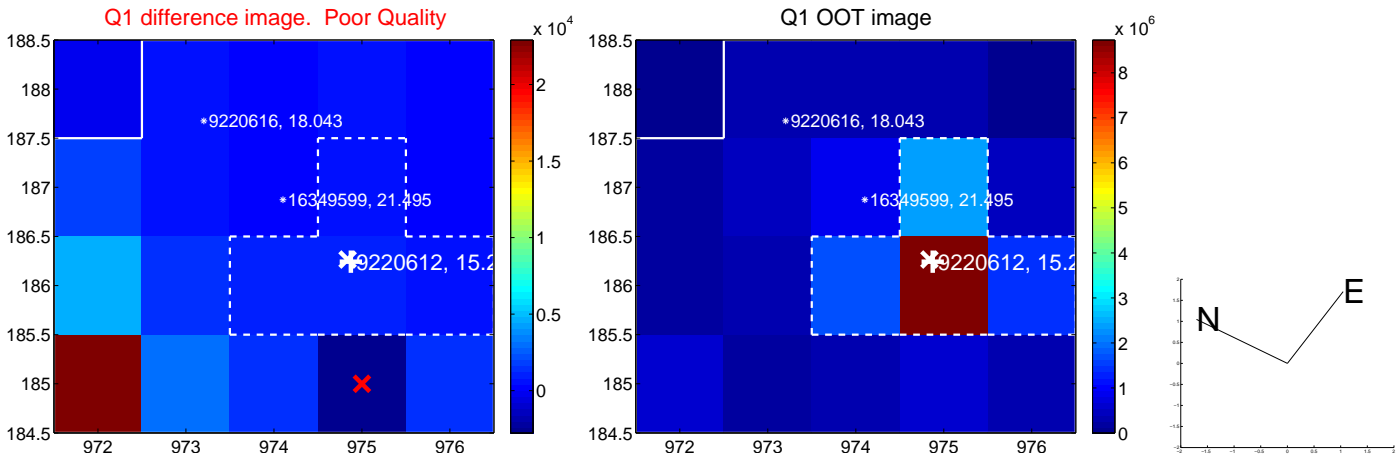


offset from photometric centroids

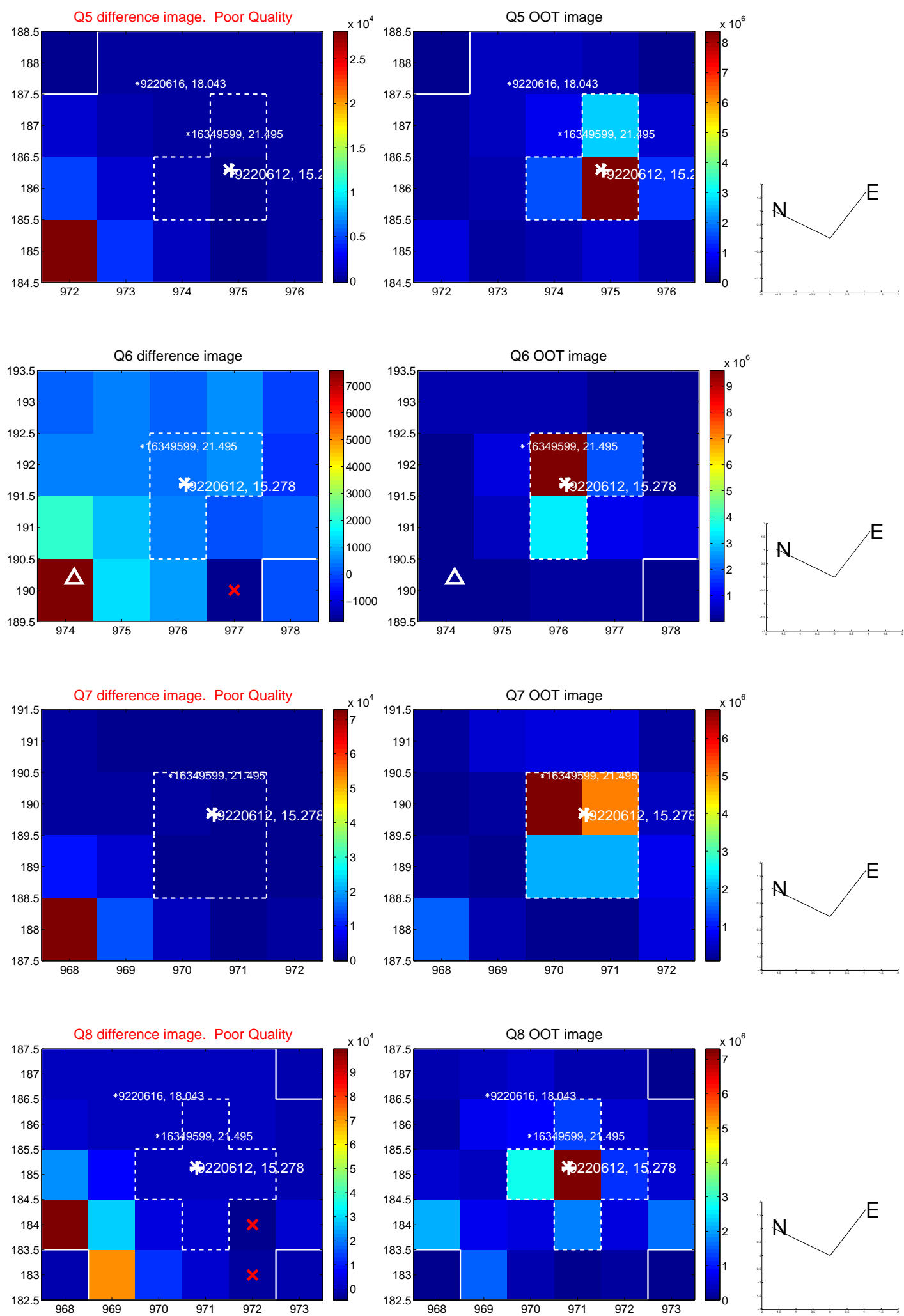


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

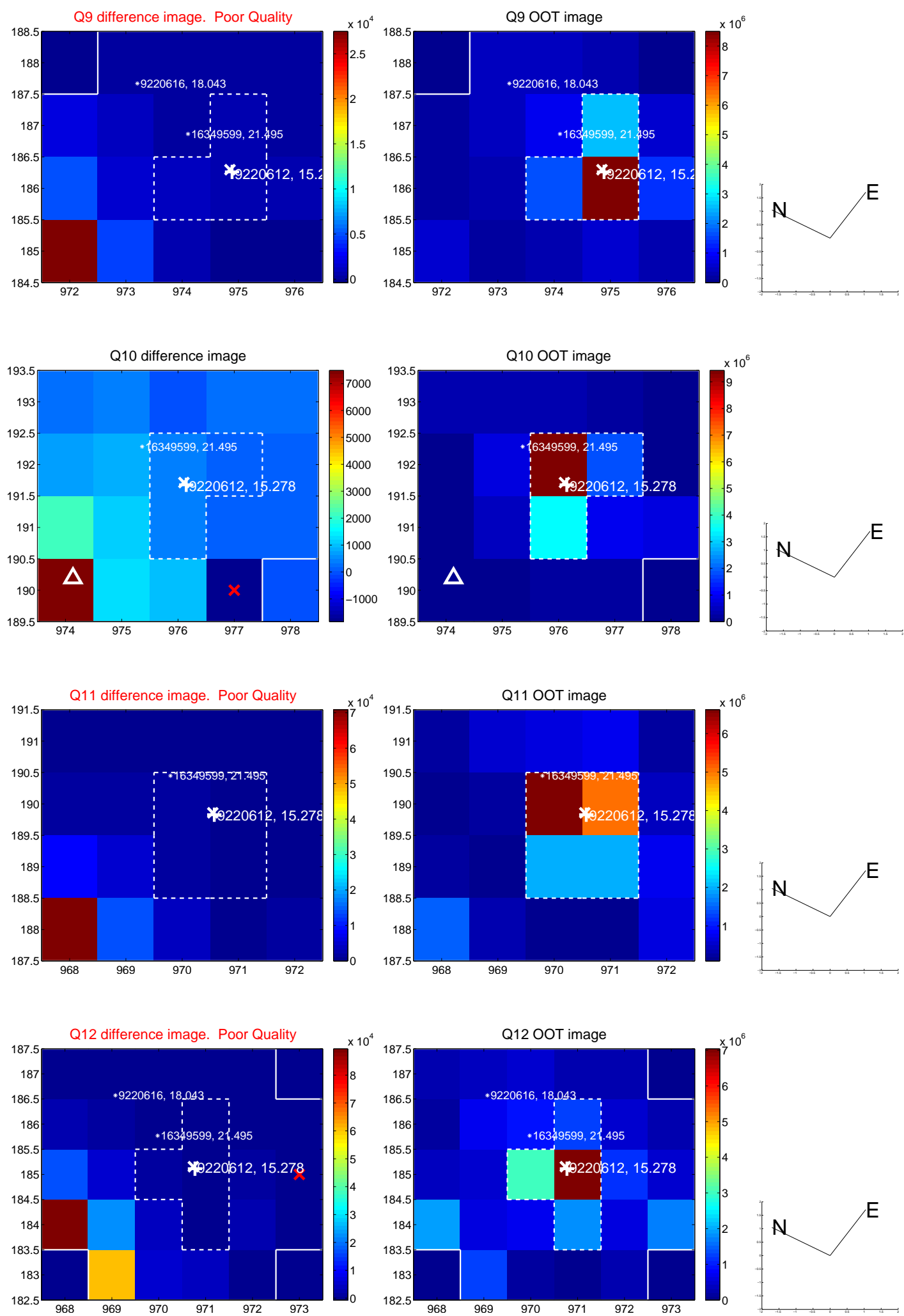
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



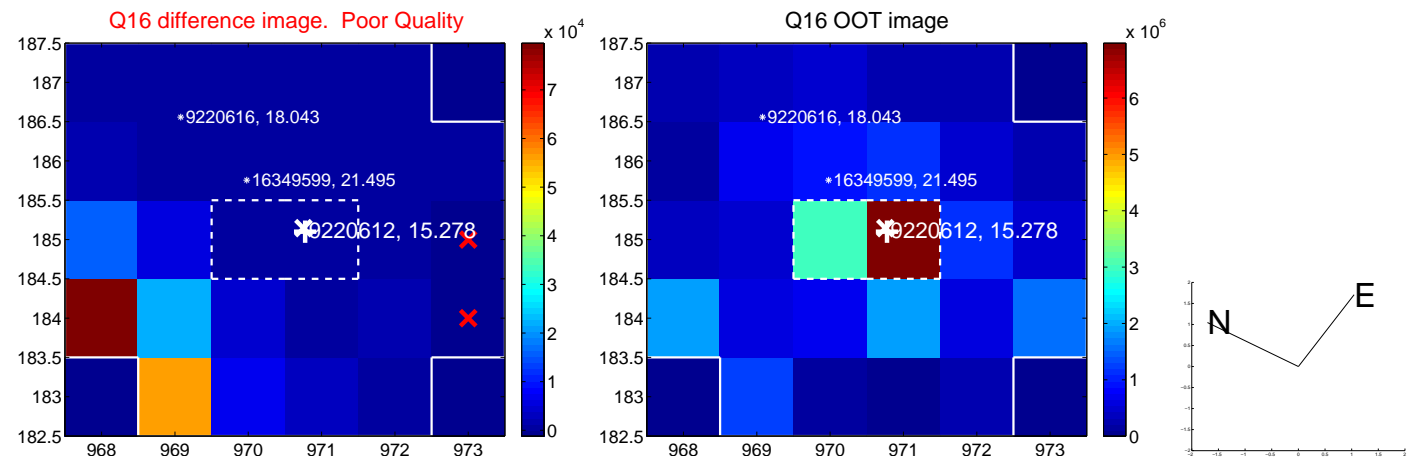
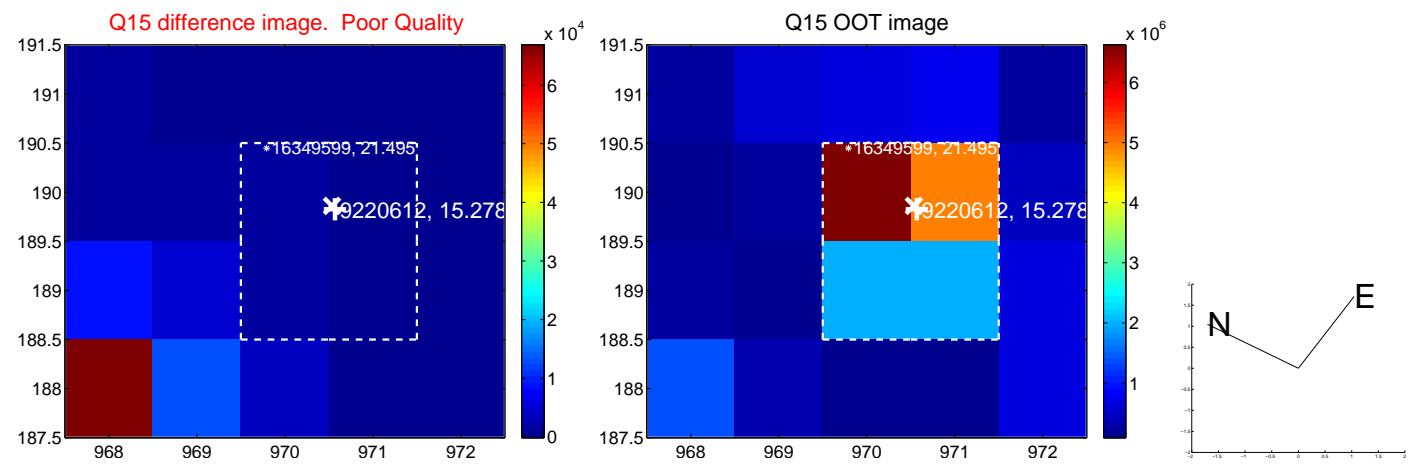
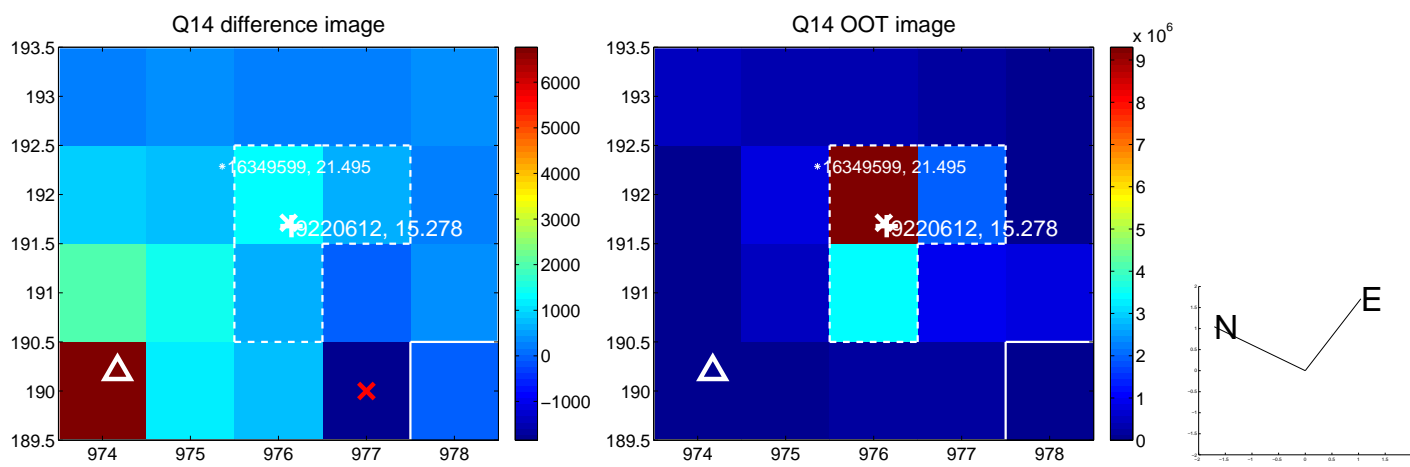
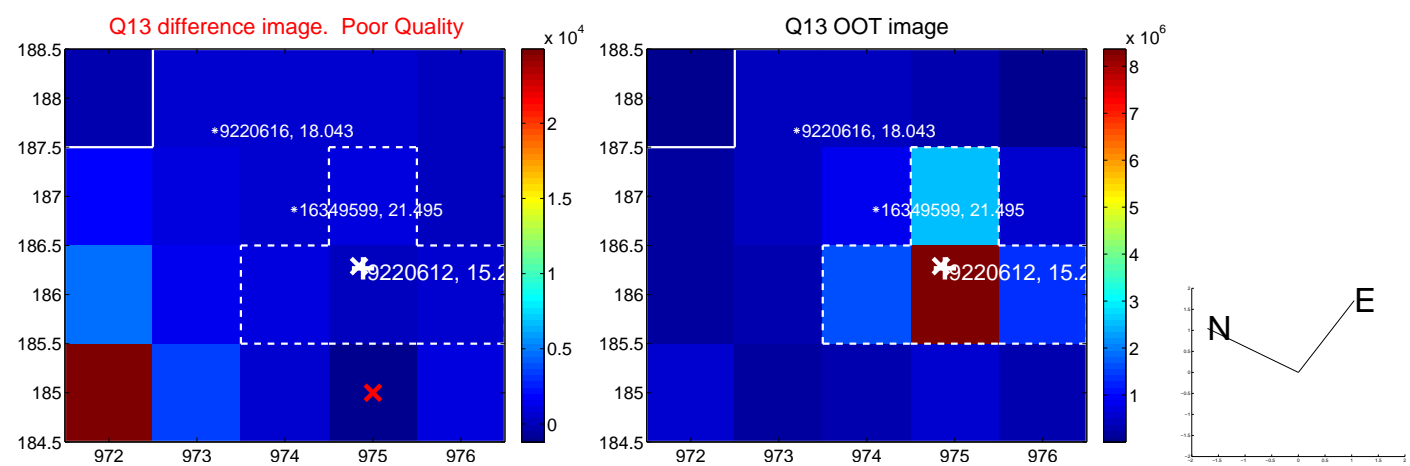
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



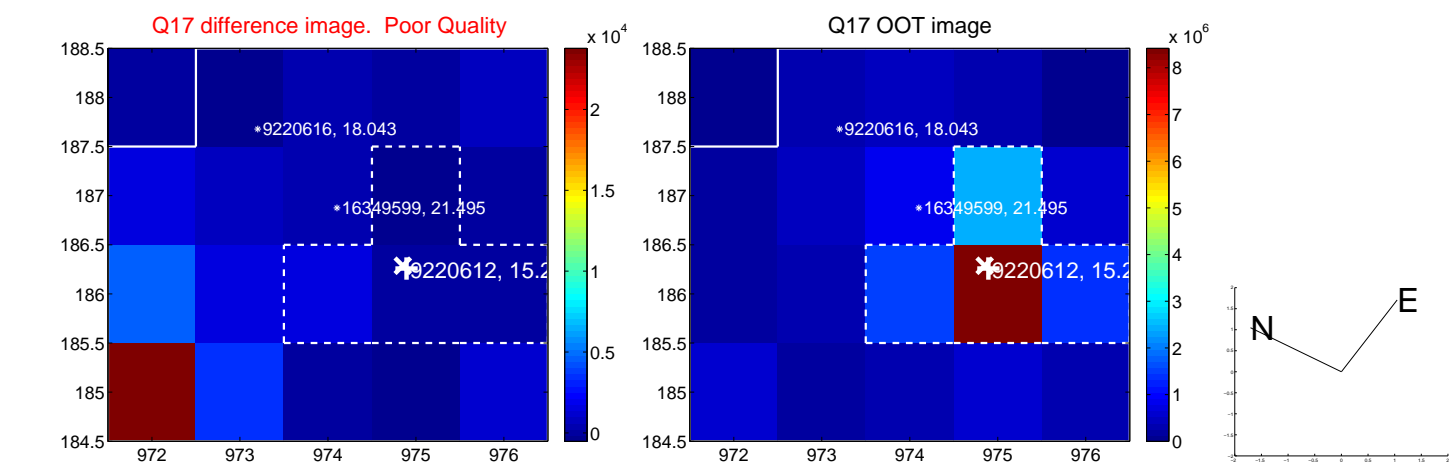
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



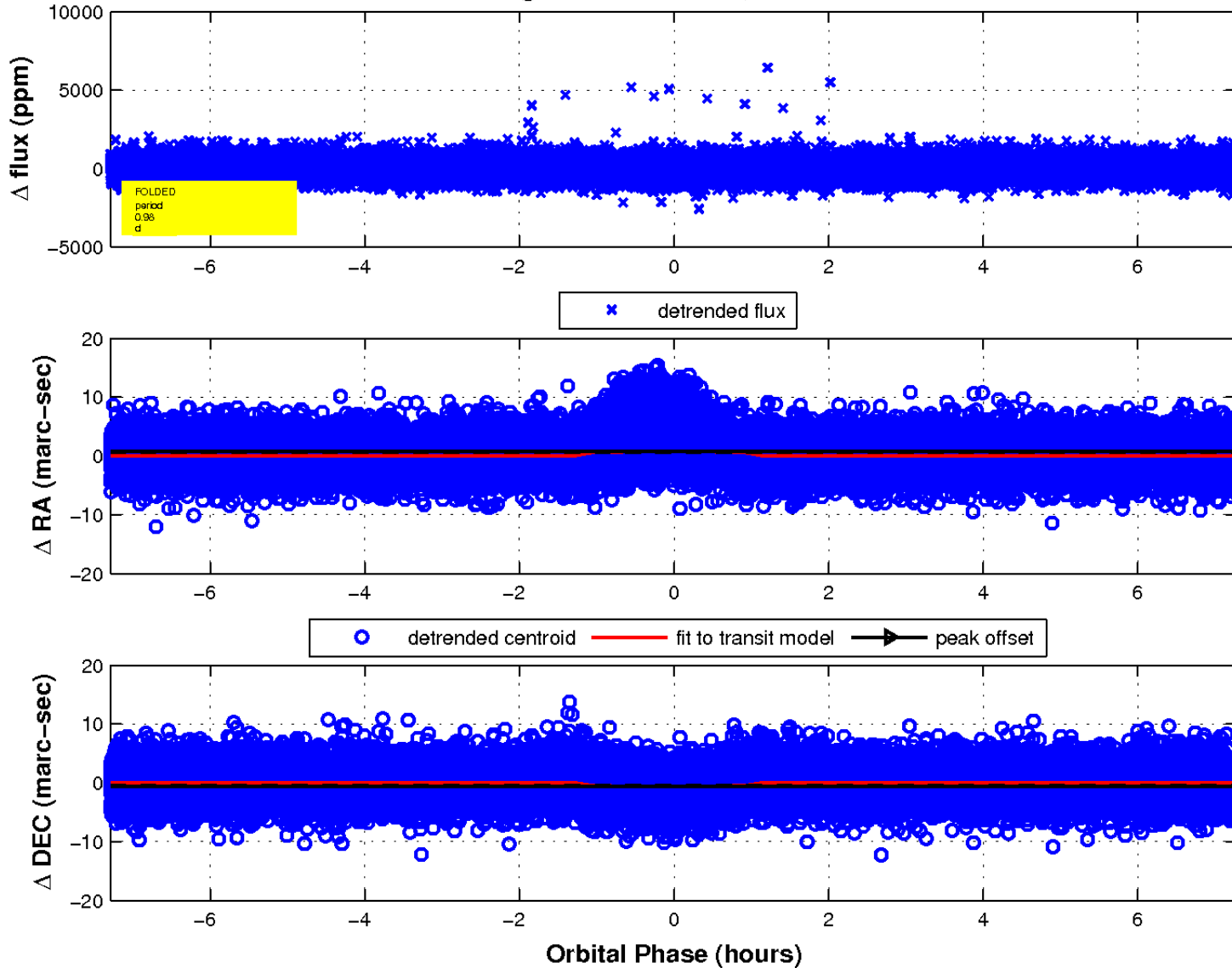
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination

