

KIC 009640924

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R _★ (R _☉)	T _★ (K)	R _p (R _⊕)	S _p (S _⊕)
009640924-01	OBS	4239.01	1.089062	132.032624	71.1	2.248	13.6	13.1	1.10	6258	1.09	3539.71

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009640924-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—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.

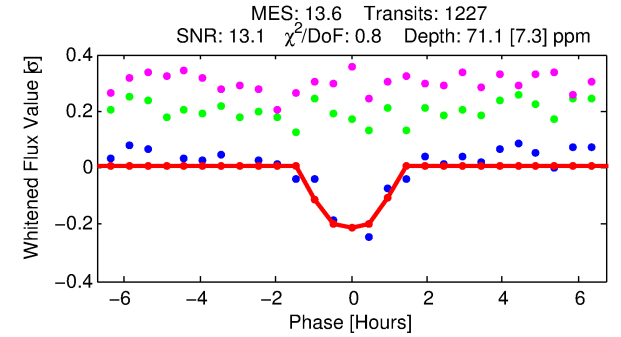
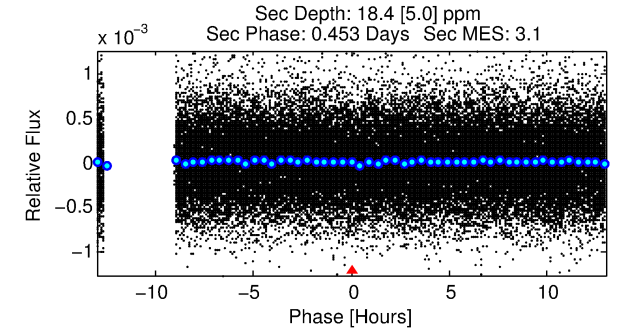
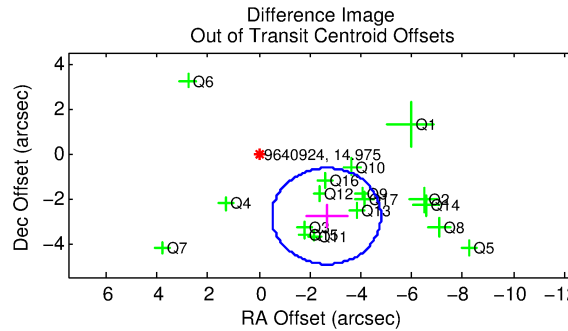
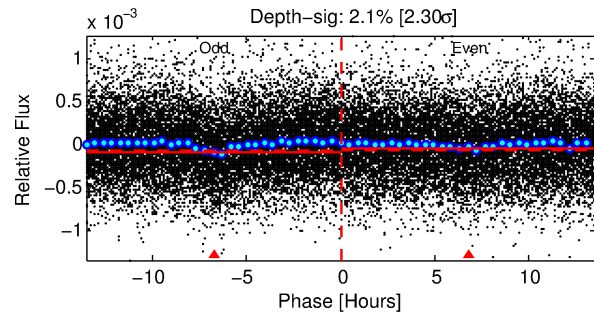
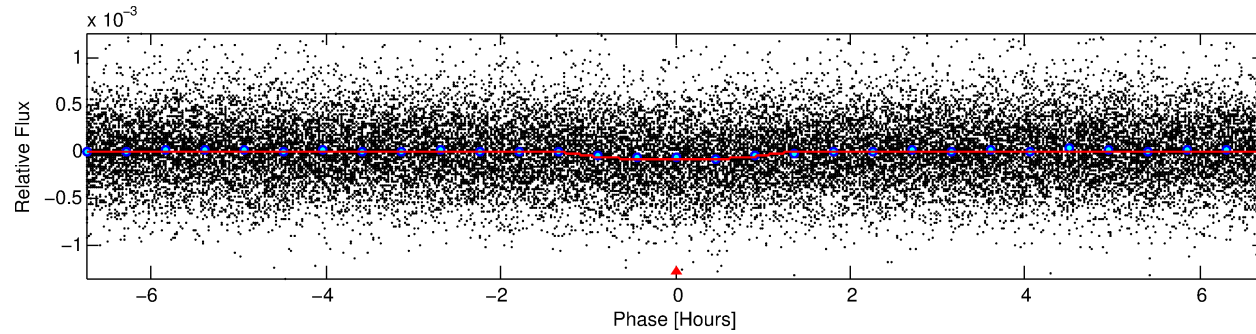
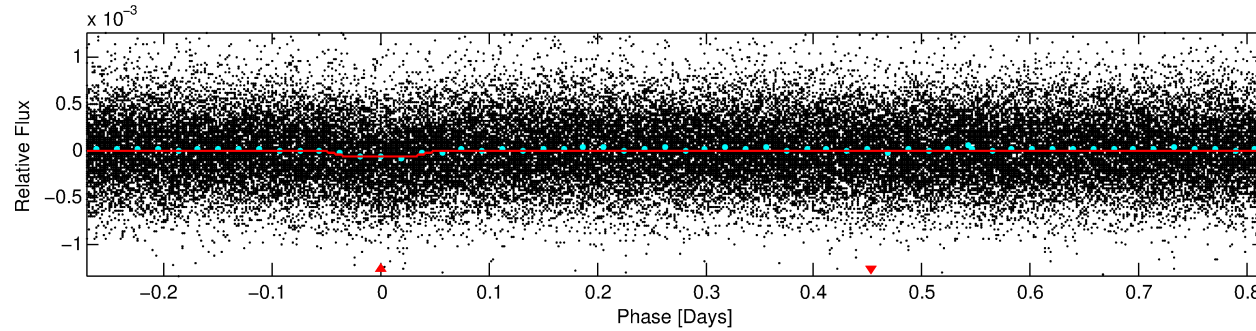
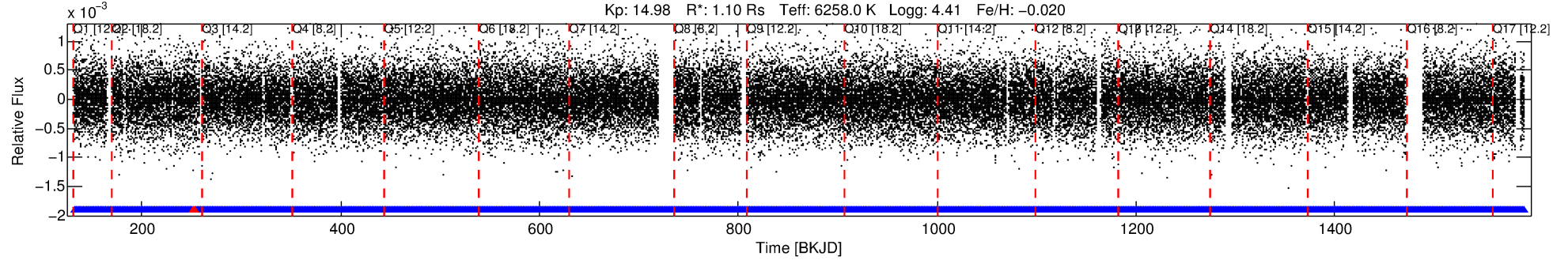
Ephemeris Match Information For 009640924-01

TCE (1)	KIC	Parent (2)	Parent KIC	P ₁ :P ₂	Dist (″)	ΔRow	ΔCol	m ₂	m ₁	D ₂ /D ₁	Mechanism	Flag	σ _P	σ _T
009640924-01	9640924	FL-Lyr-pri	9641031	1:2	143.3	30	-20	9.18	14.98	6127.60	Direct-PRF	0	2.38	0.75

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ 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 σ_P < 5.0 and σ_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: 9640924 Candidate: 1 of 1 Period: 1.089 d
KOI: K04239 Corr: No Ephemeris Match



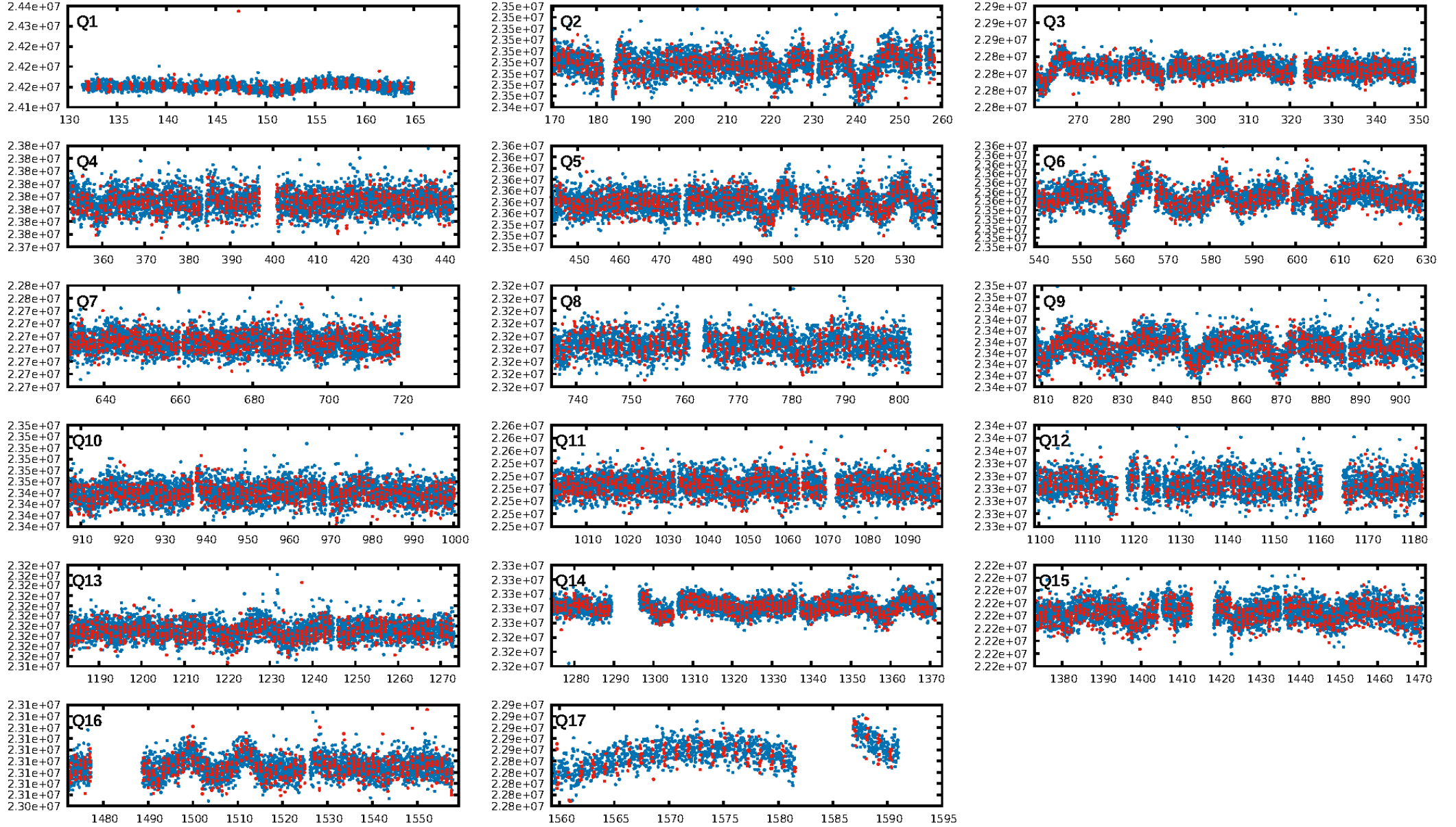
DV Fit Results:

Period = 1.08906 [0.00001] d
Epoch = 132.0326 [0.0024] BKJD
Rp/R* = 0.0091 [0.0050]
a/R* = 1.91 [4.11]
b = 0.90 [0.61]
Seff = 3539.71 [1521.52]
Teff = 1967 [211] K
Rp = 1.09 [0.70] Re
a = 0.0216 [0.0061] AU
Ag = 3.98 [4.75] [0.63σ]
Teffp = 4296 [1218] K [1.88σ]

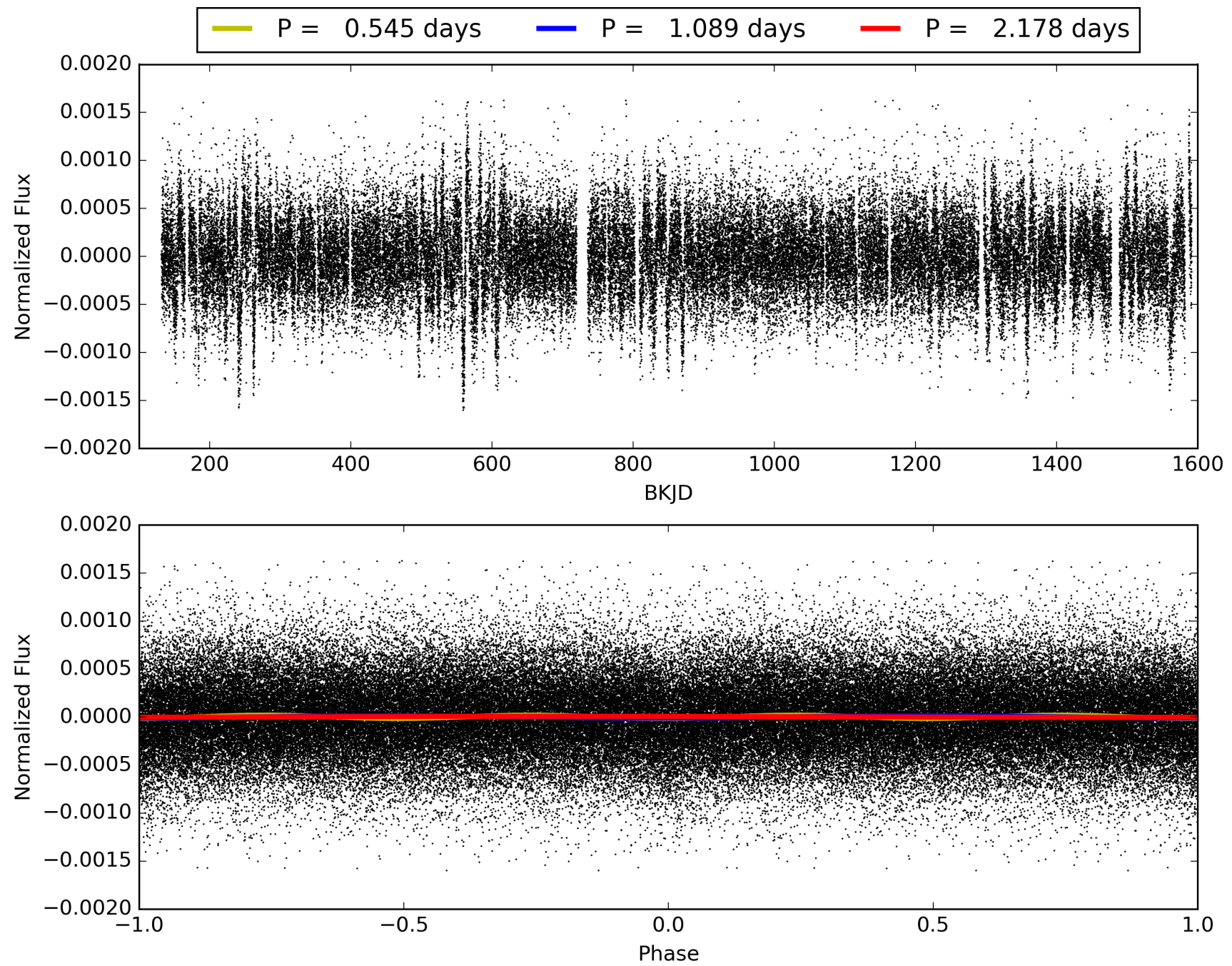
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.42e-41
RollingBand-fgt: 1.00 [1169/1171]
GhostDiagnostic-chr: -0.1095
Centroid-sig: 0.0%
Centroid-so: 3.238 arcsec [3.03σ]
OotOffset-rm: 3.854 arcsec [5.40σ]
KicOffset-rm: 3.764 arcsec [5.61σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.12 [2/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009640924-01, PDC Light Curves

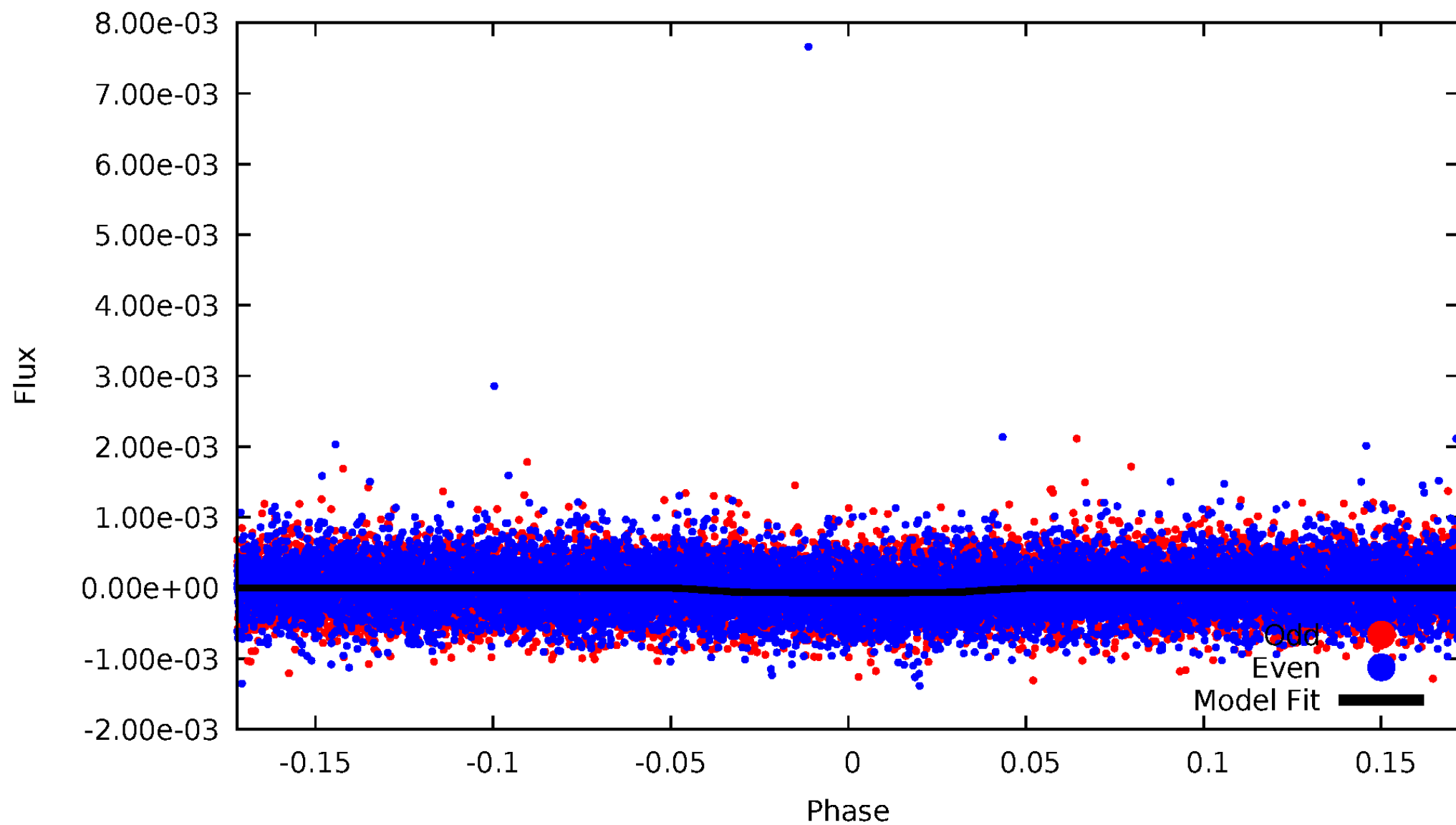


TCE 009640924-01



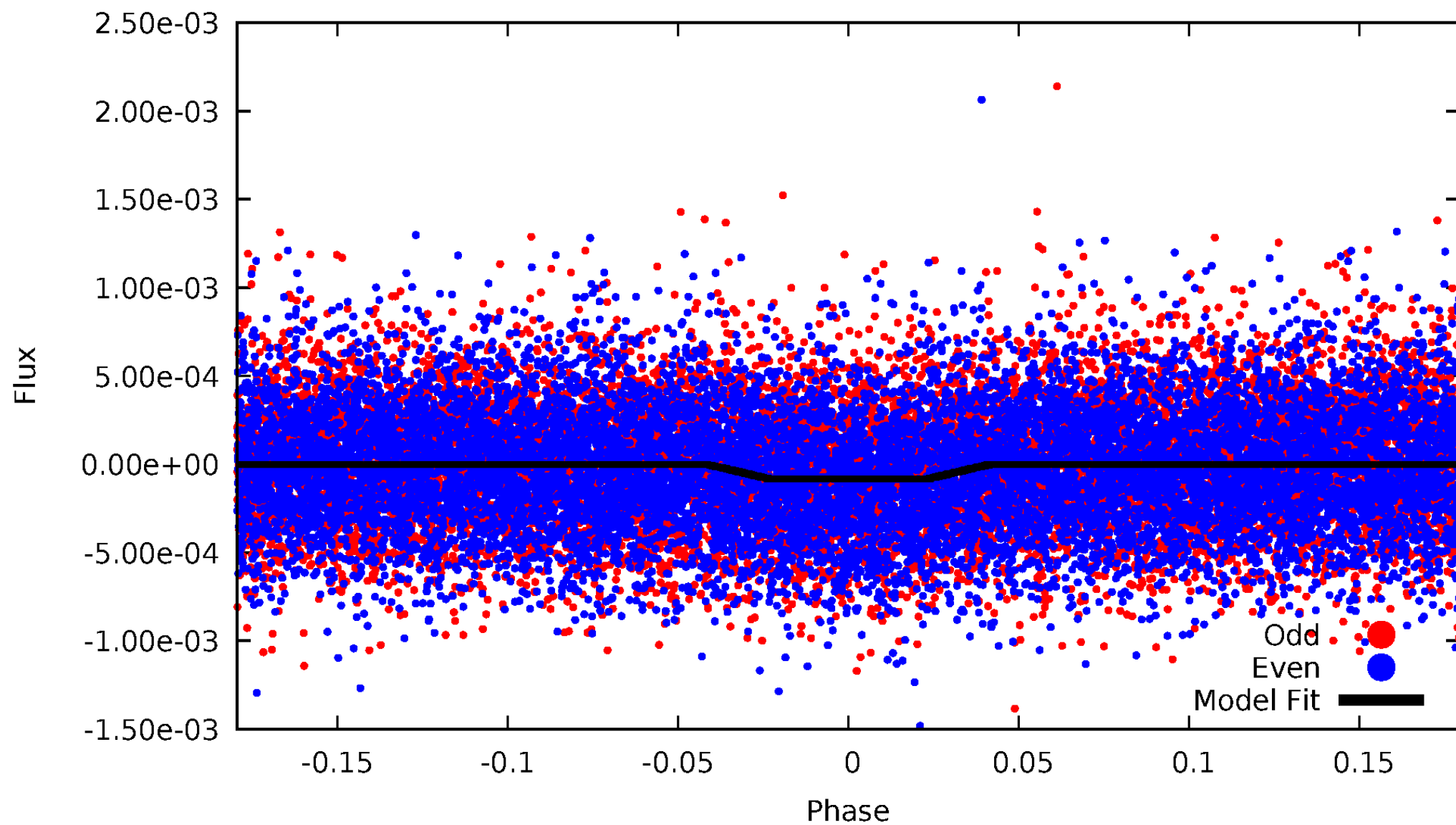
DV Odd/Even

TCE 009640924-01



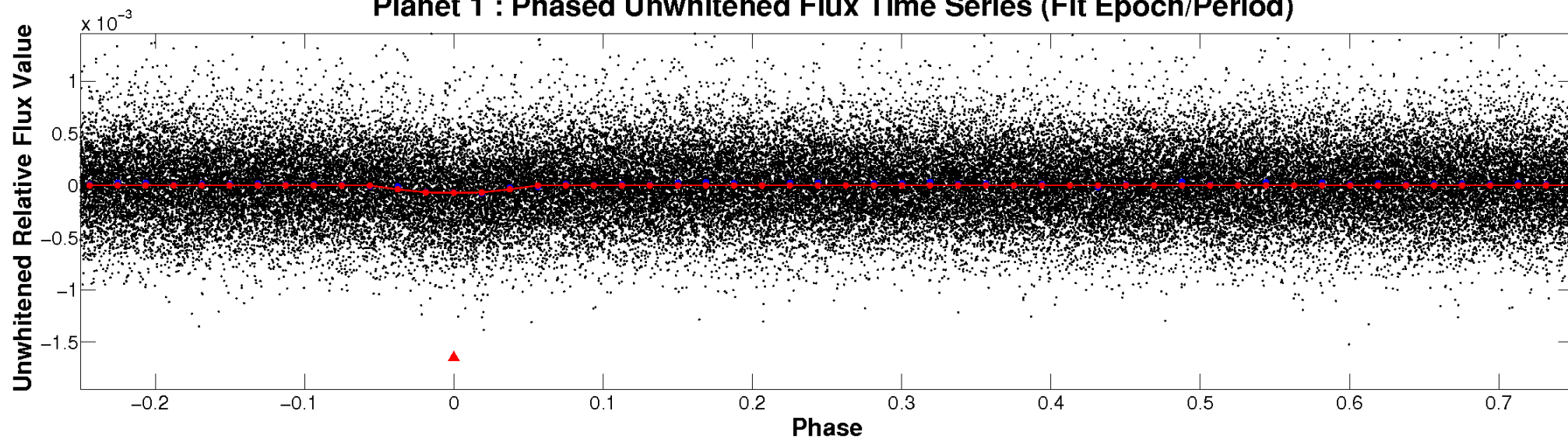
ALT Odd/Even

TCE 009640924-01

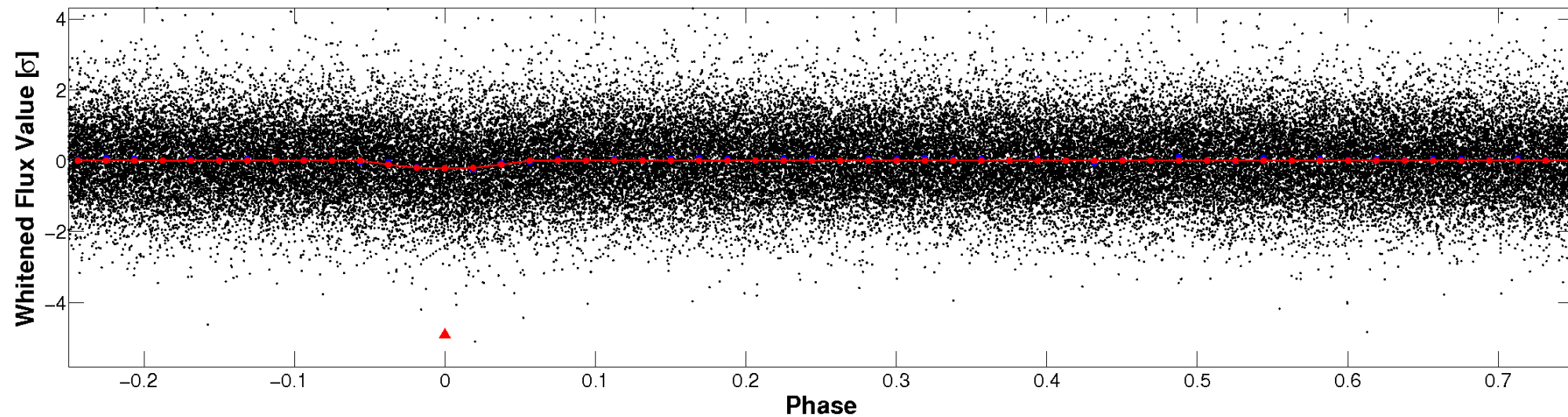


Non-Whitened Vs. Whitened Light Curve

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

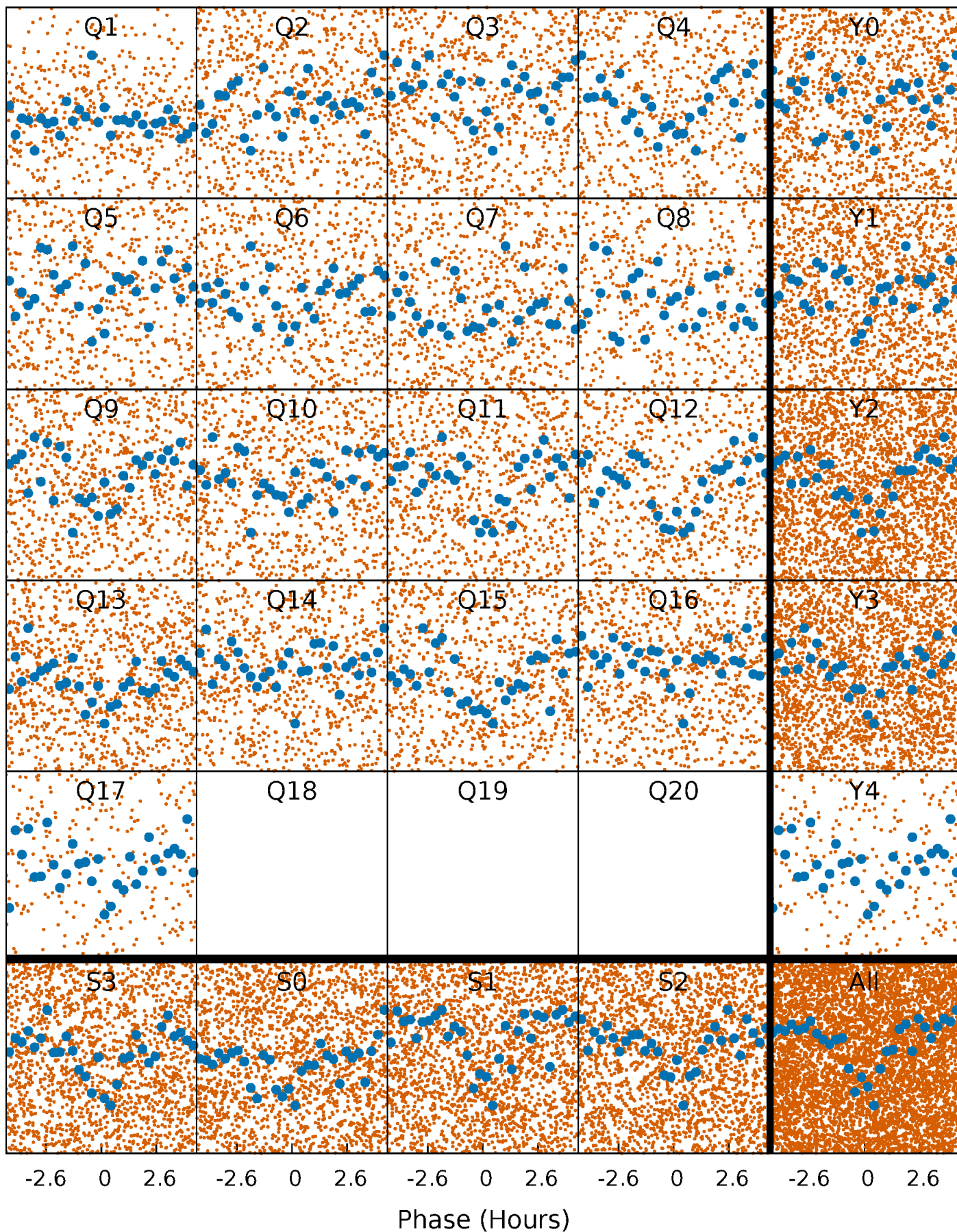


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



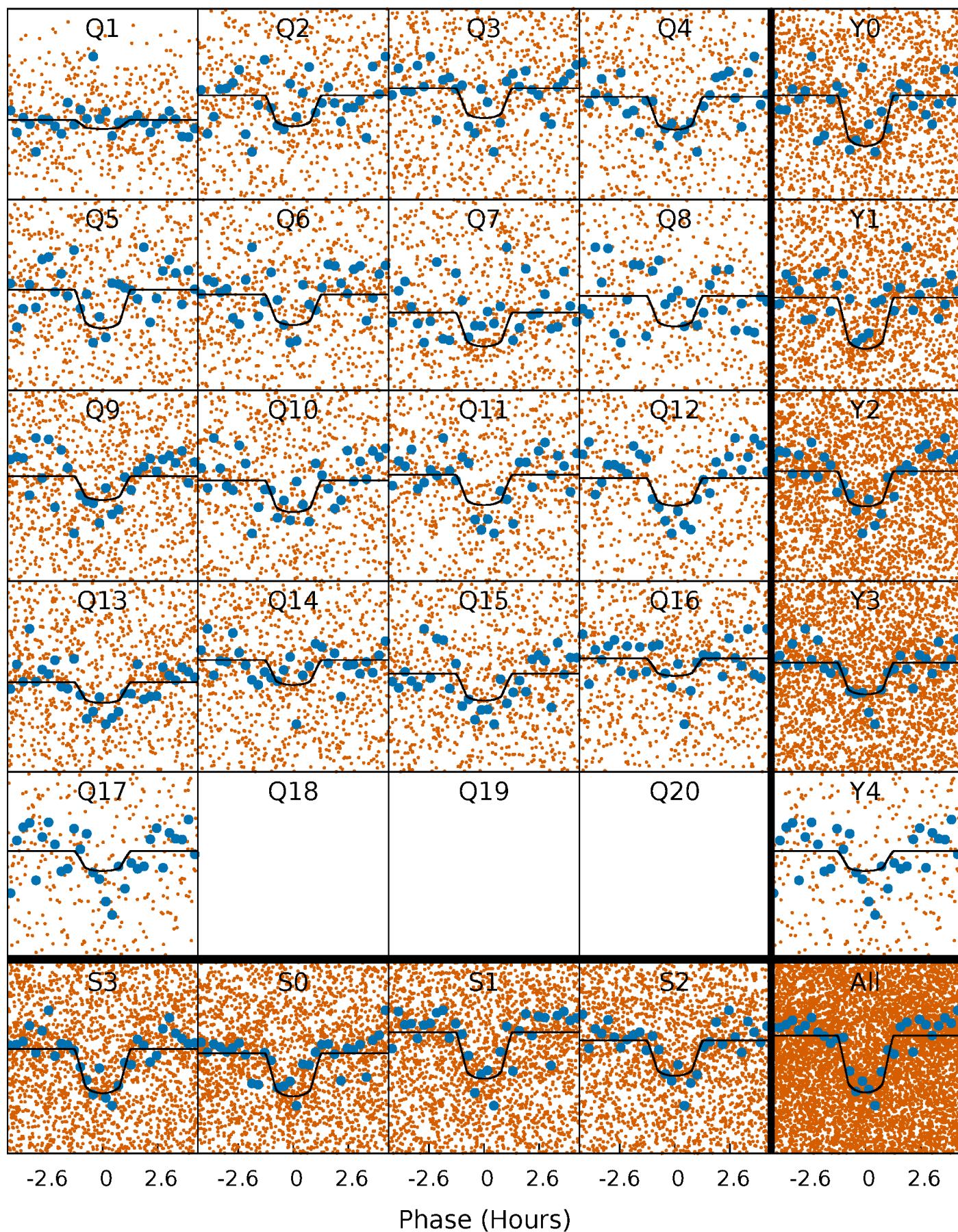
PDC Quarter-Phased Transit Curves

TCE 009640924-01 P= 1.089062 Days $T_0=132.032624$ (BKJD)



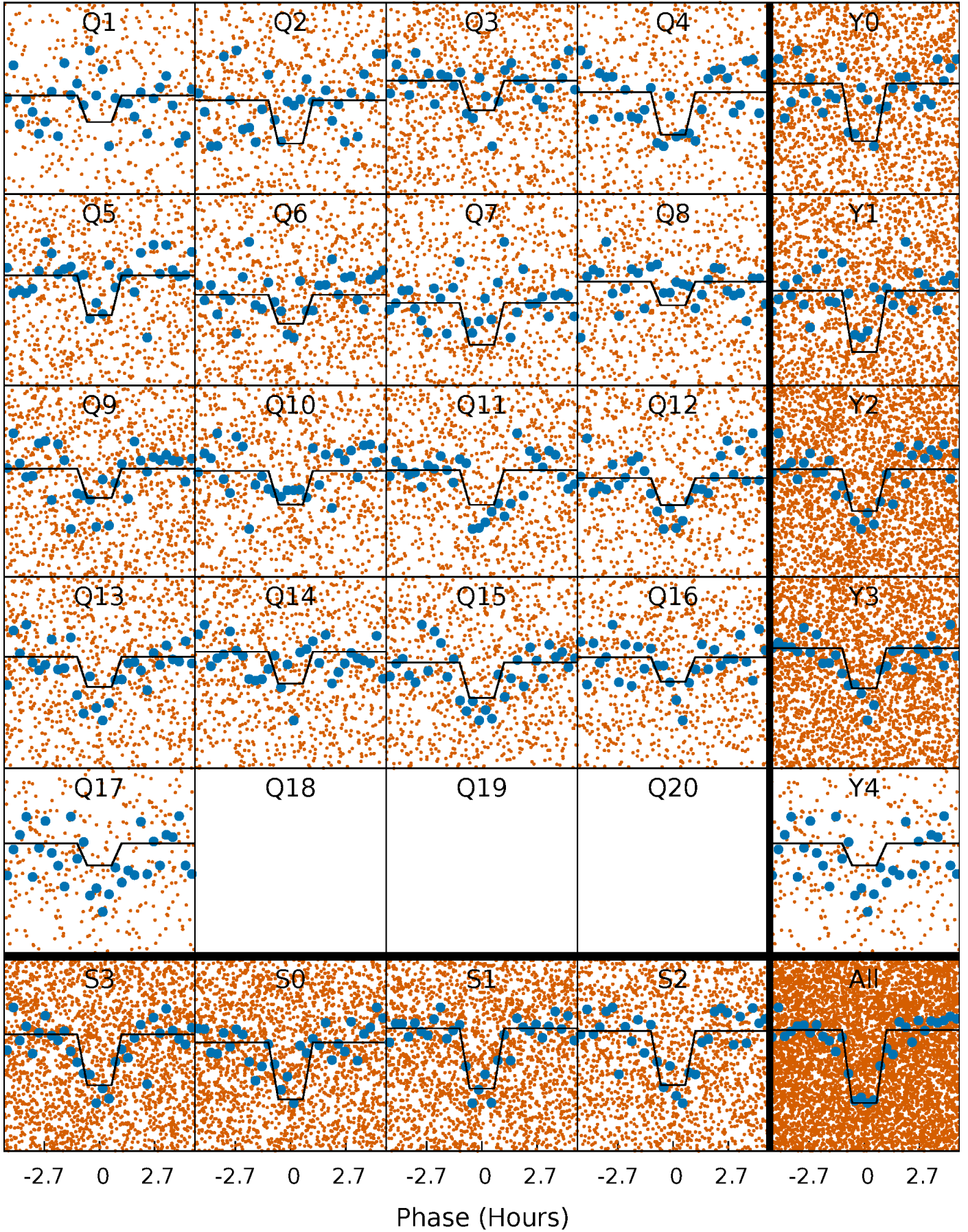
DV Quarter-Phased Transit Curves

TCE 009640924-01 P= 1.089062 Days $T_0=132.032624$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

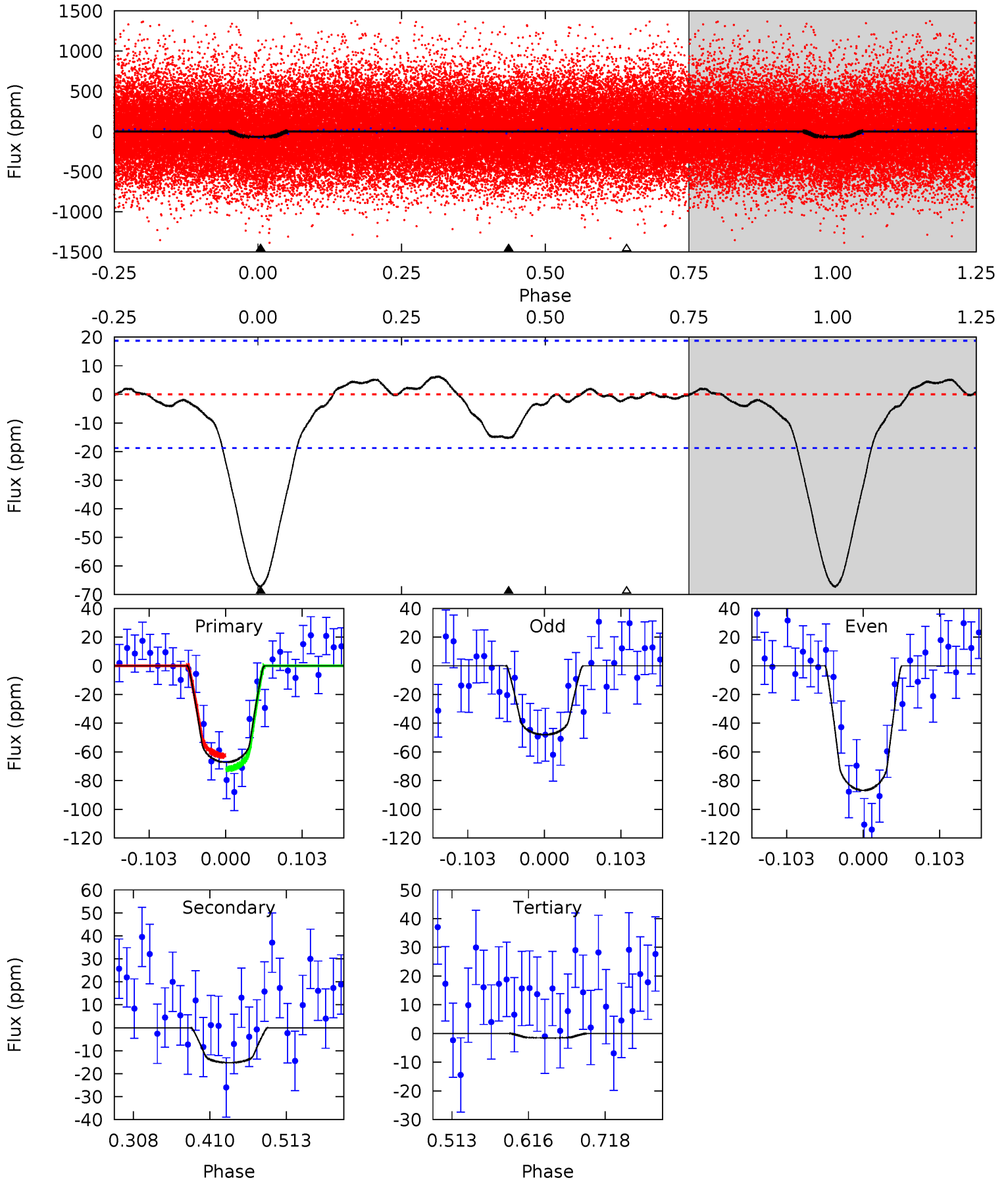
TCE 009640924-01 P= 1.089067 Days $T_0=132.030902$ (BKJD)



DV Model-Shift Uniqueness Test

009640924-01, P = 1.089062 Days, E = 130.943562 Days

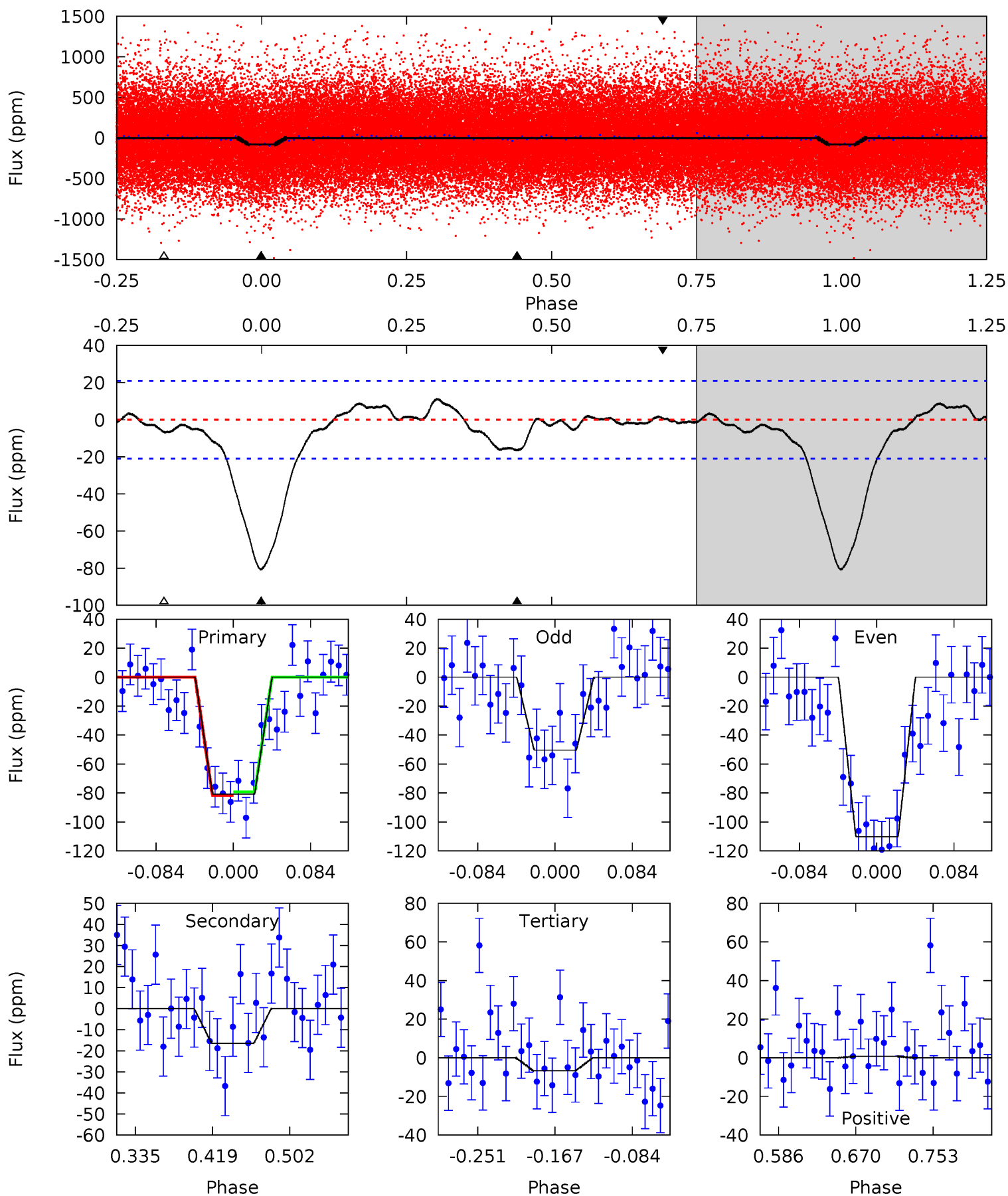
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	3.70	0.38	0	4.56	1.63	0.66	16.0	16.3	3.33	3.70	4.72	0.91	0.09	1.12



Alt Model-Shift Uniqueness Test

009640924-01, P = 1.089067 Days, E = 130.941835 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	3.61	1.47	0.16	4.60	1.73	0.98	16.2	17.6	2.14	3.45	6.56	0.94	0.12	0.27



Stellar Parameters For KIC 009640924

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6258^{+174}_{-239}	$4.413^{+0.072}_{-0.217}$	$-0.020^{+0.250}_{-0.300}$	$1.098^{+0.370}_{-0.123}$	$1.139^{+0.173}_{-0.157}$	$1.212^{+0.368}_{-0.666}$
	+3%/-4%	+2%/-5%	+1250%/-1500%	+34%/-11%	+15%/-14%	+30%/-55%
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 009640924-01 / KOI 4239.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-15 ± 4	$1.22^{+0.67}_{-0.61}$	2798^{+205}_{-150}	4082^{+1557}_{-702}	$2.487^{+8.134}_{-1.466}$
Alt.	-16 ± 5	$1.16^{+0.61}_{-0.59}$	2799^{+206}_{-152}	4267^{+1587}_{-726}	$3.042^{+10.054}_{-1.781}$

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 $A_{obs} \gg 1.0$

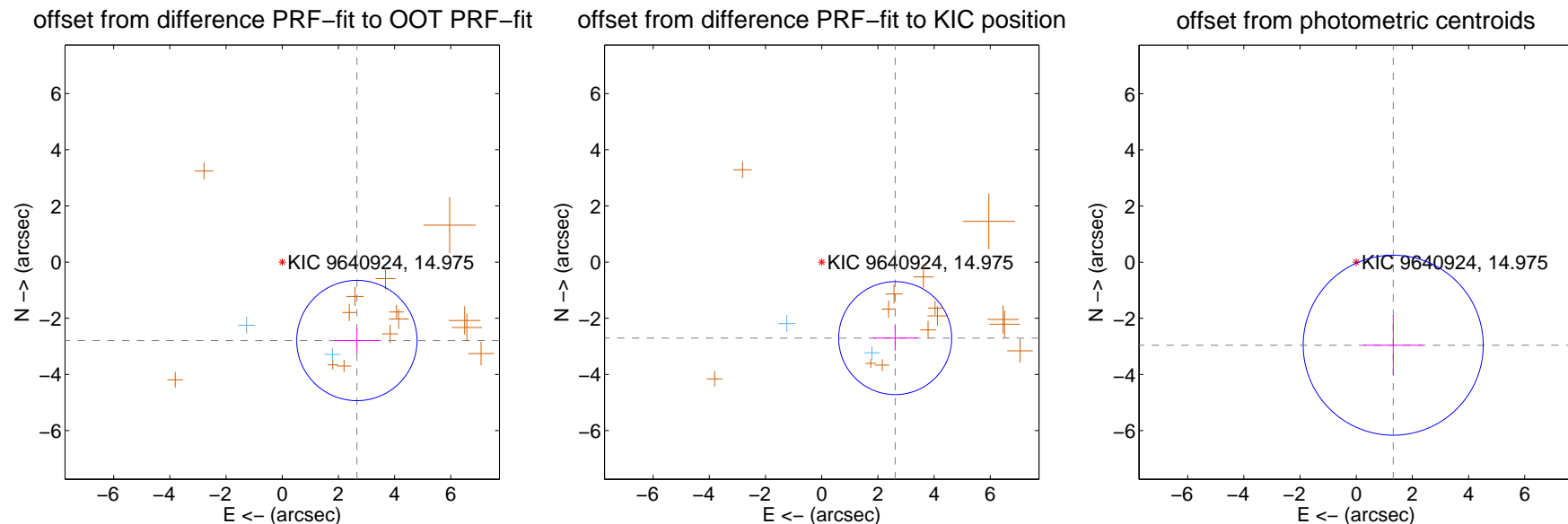
DV Centroid Data

Supplemental centroid analysis for 009640924-01. Kepler magnitude: 14.97. Transit SNR 13.07

There are 2 quarters with good PRF difference image offsets

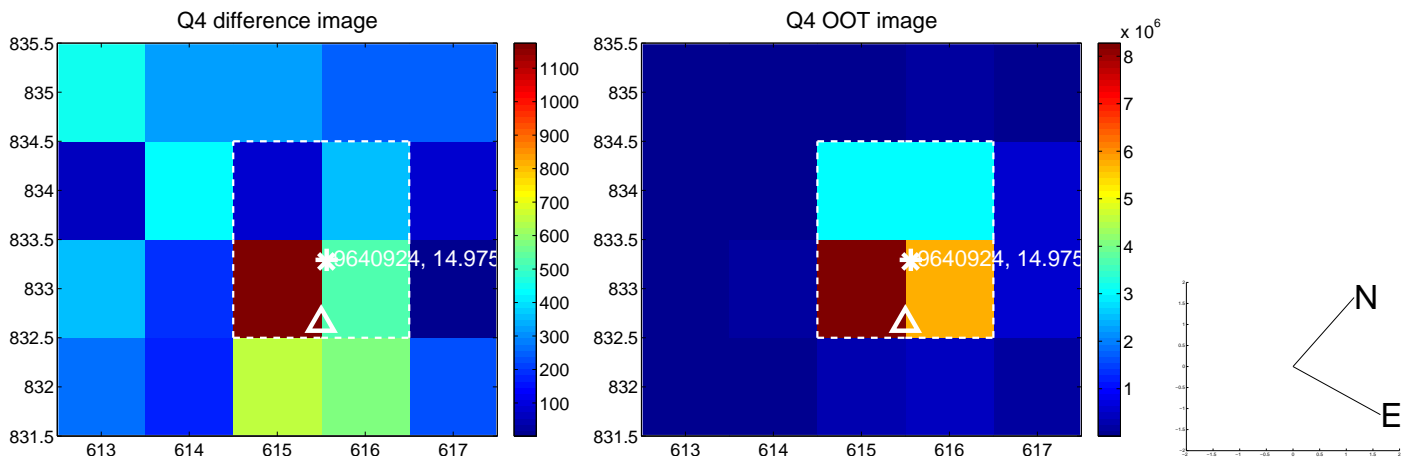
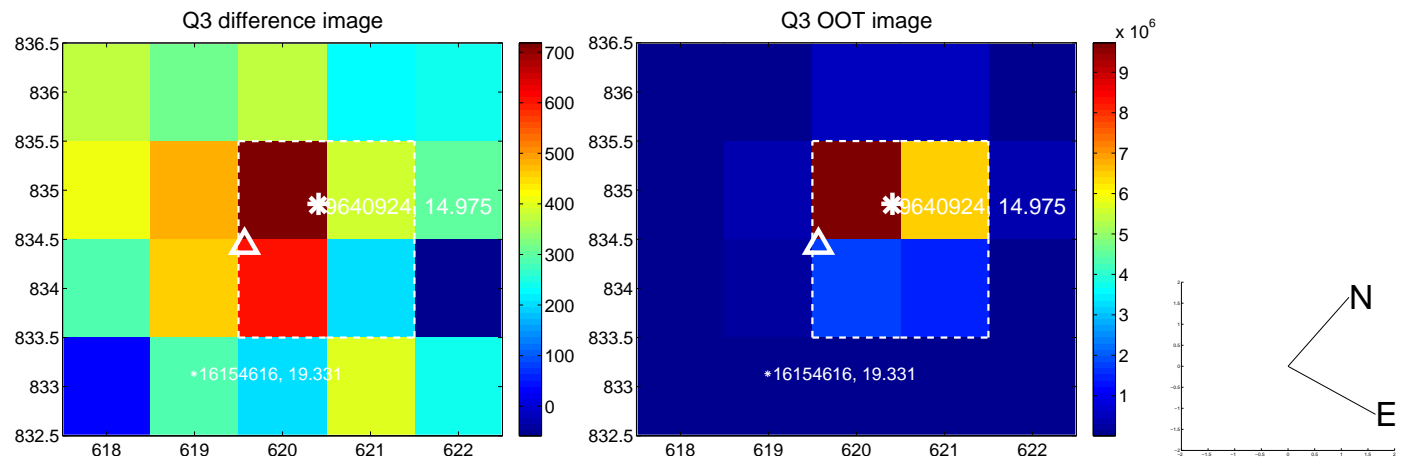
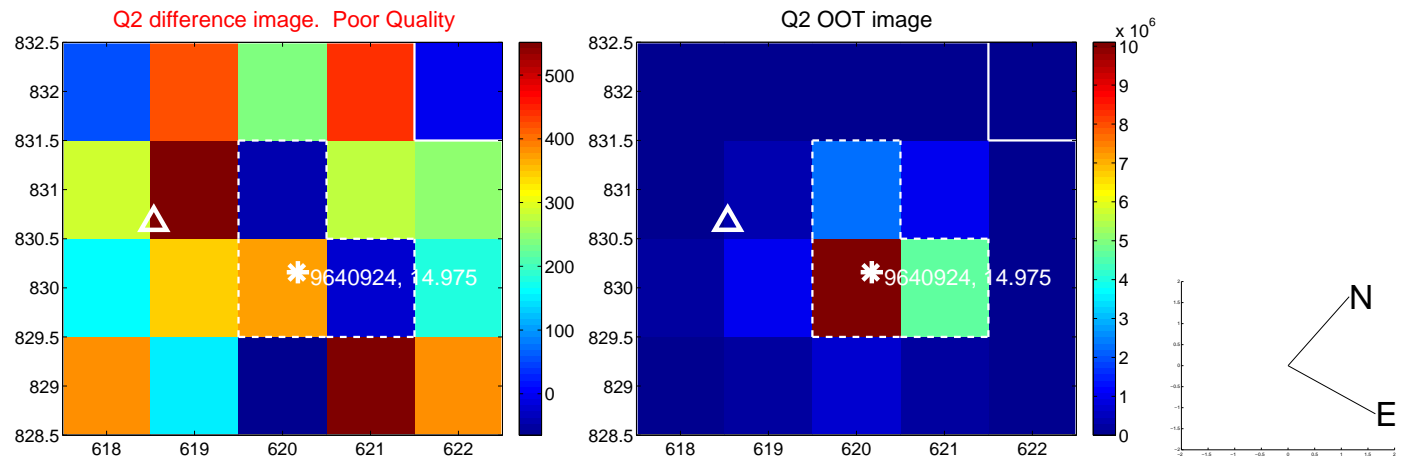
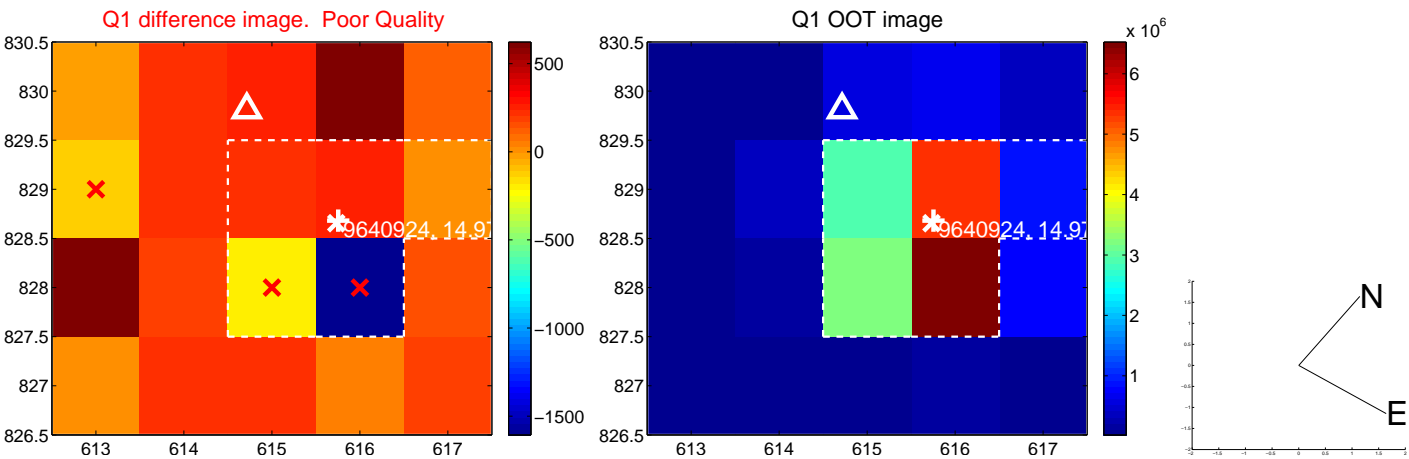
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.854 ± 0.714	5.40	-2.657 ± 0.818	-2.792 ± 0.468
PRF-fit source offset from KIC position	3.764 ± 0.670	5.61	-2.615 ± 0.789	-2.707 ± 0.449
photometric centroid source offset	3.24 ± 1.07	3.03	-1.32 ± 1.07	-2.96 ± 1.07

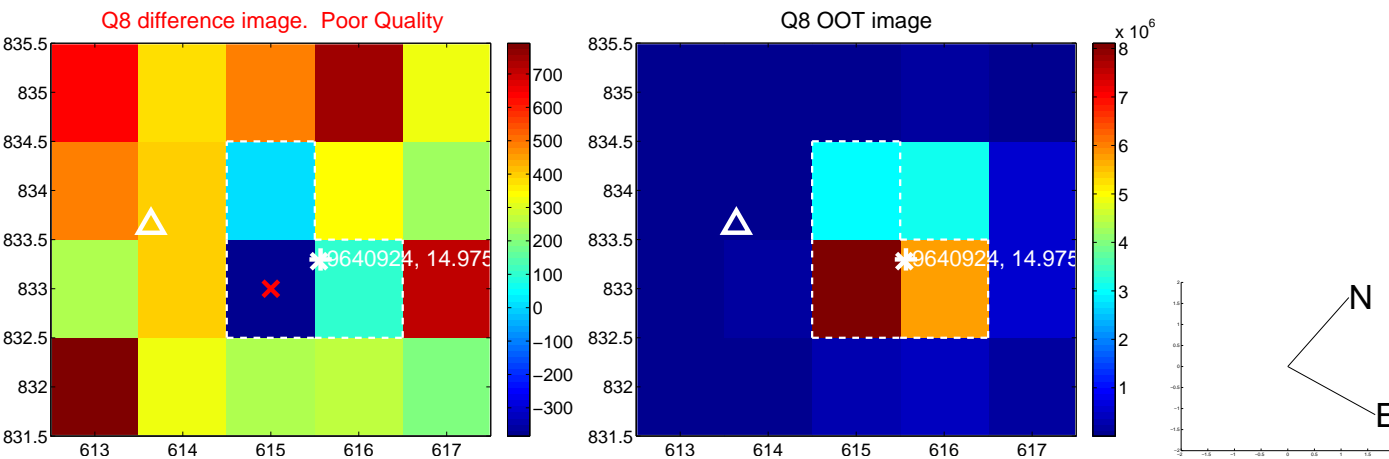
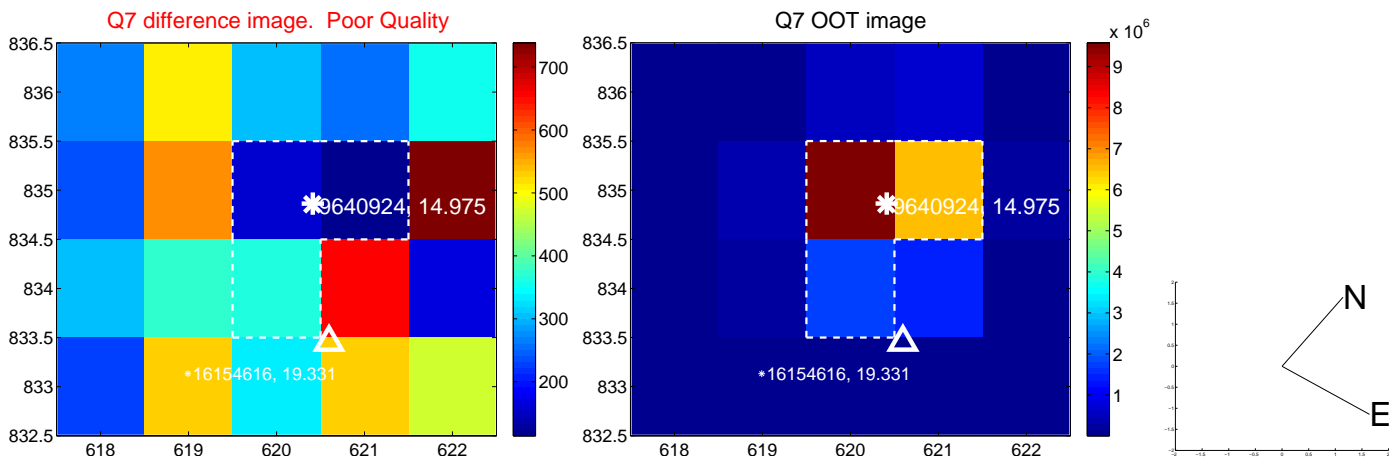
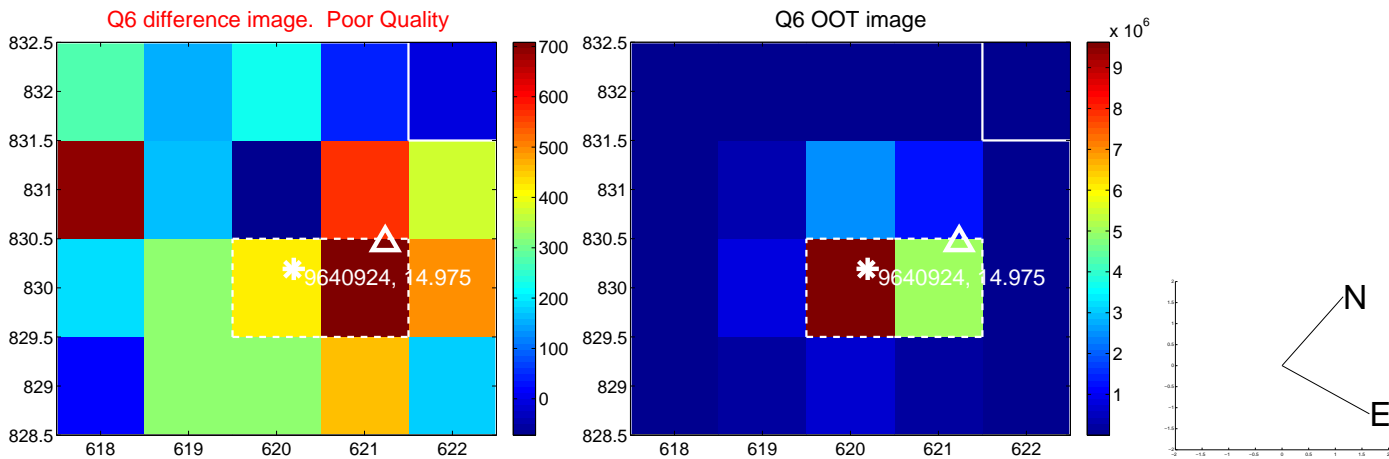
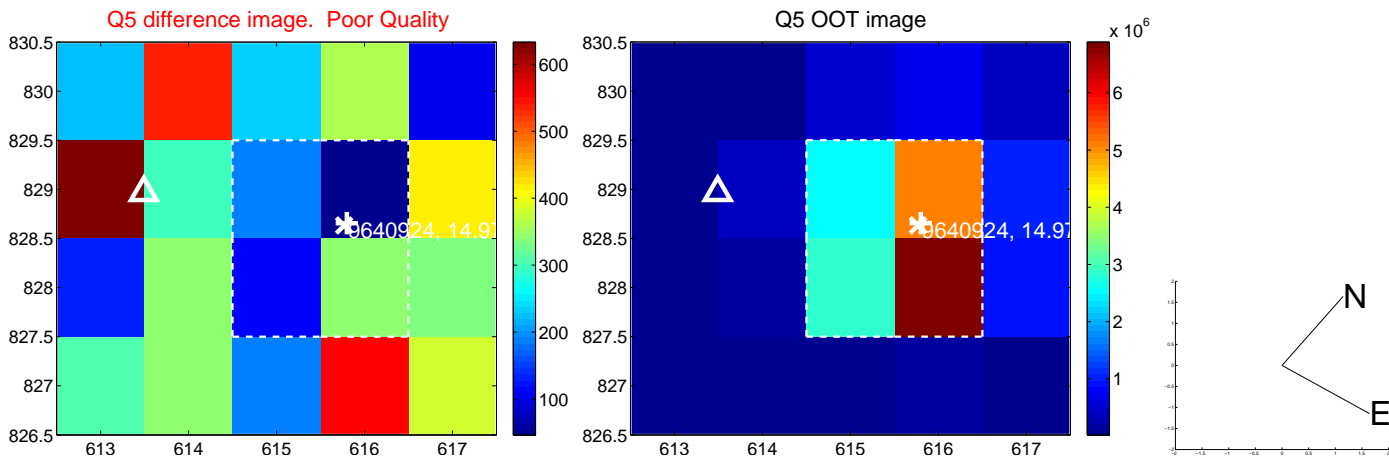


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

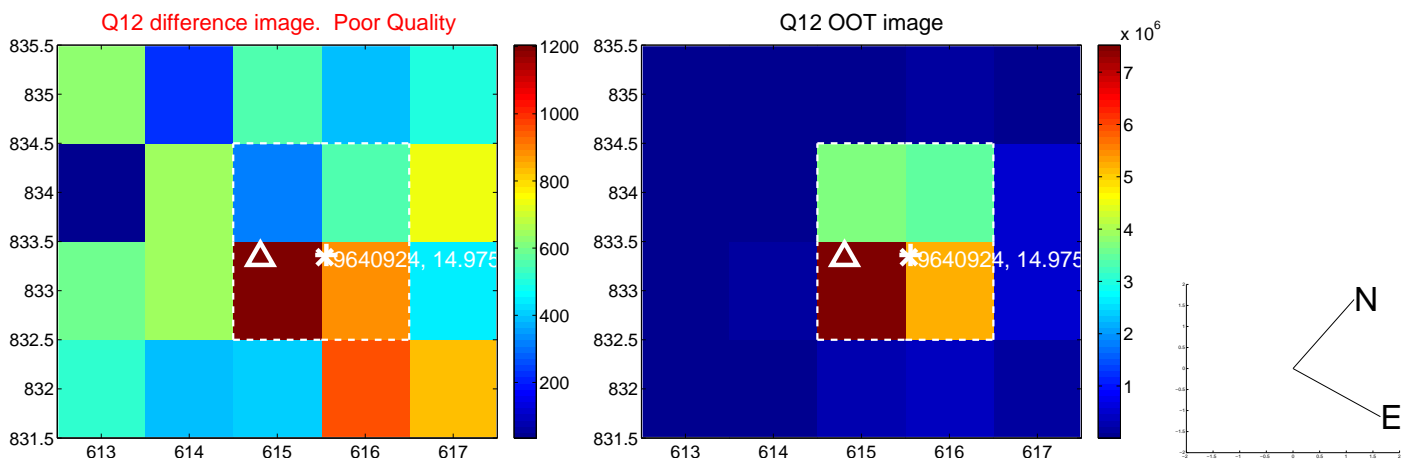
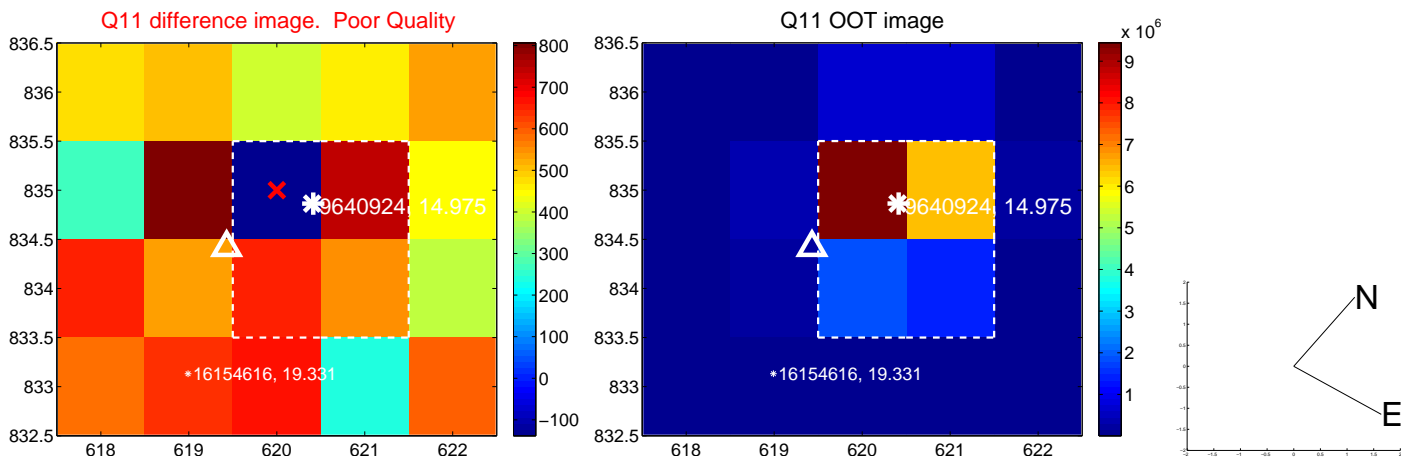
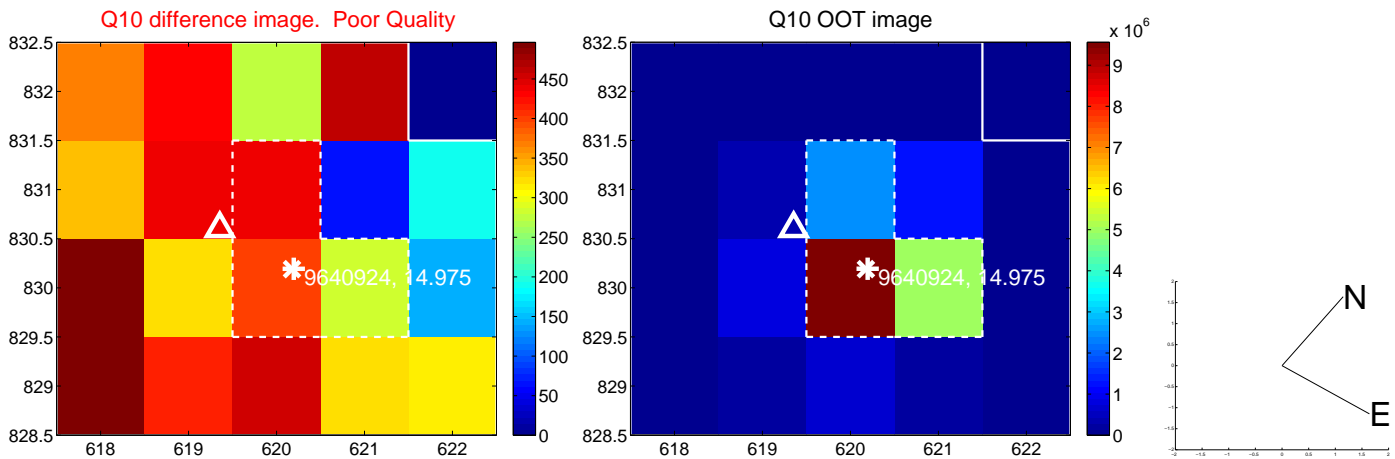
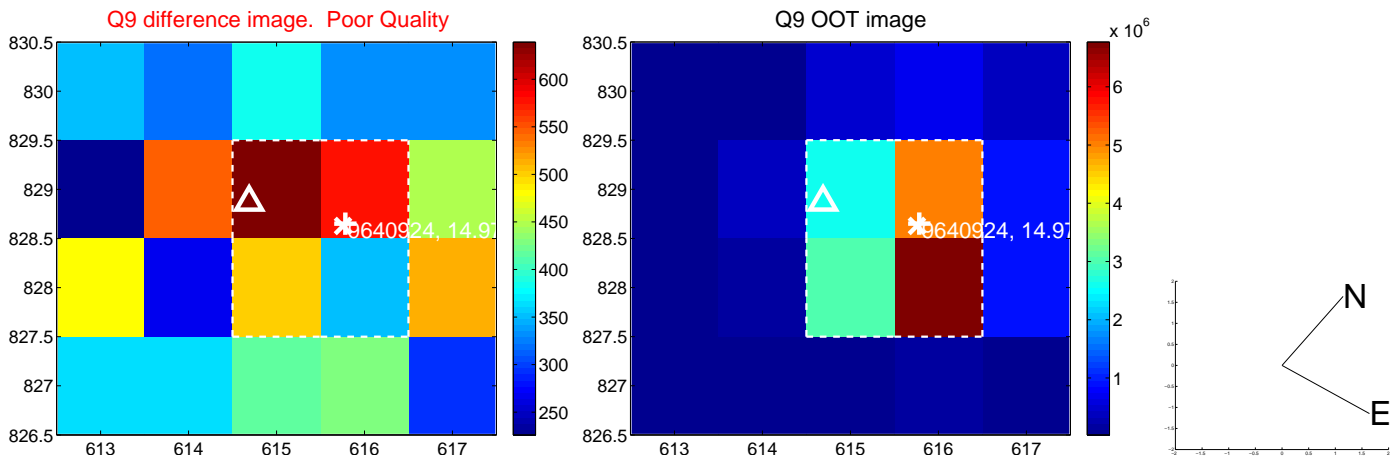
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



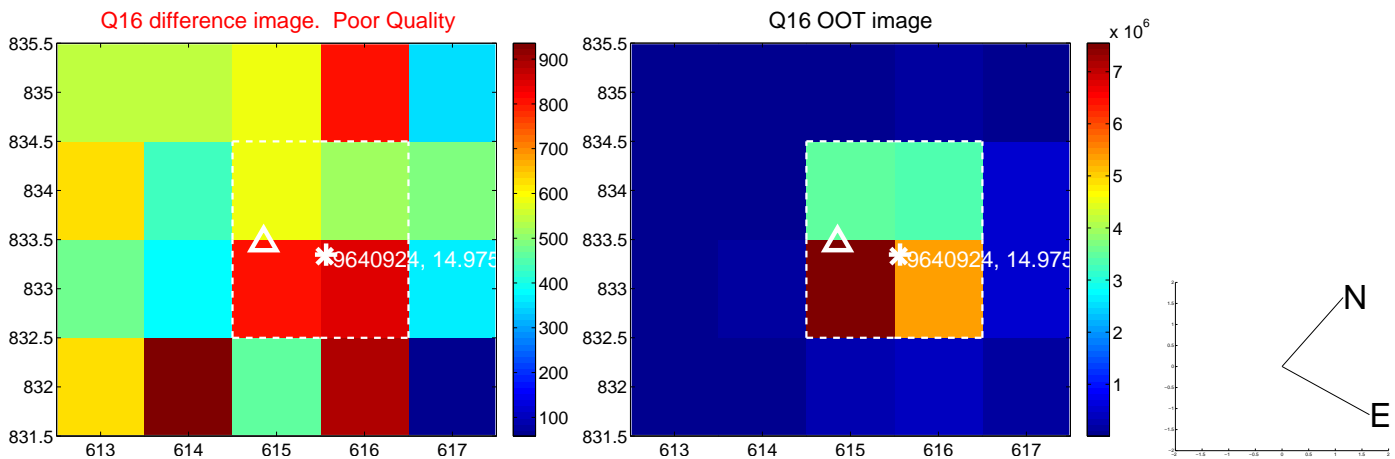
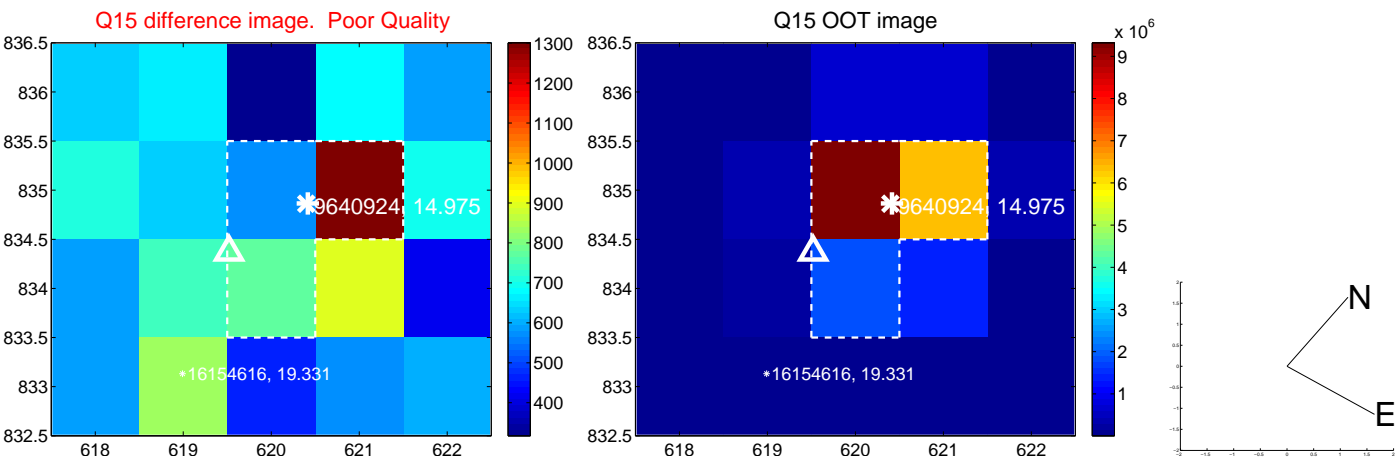
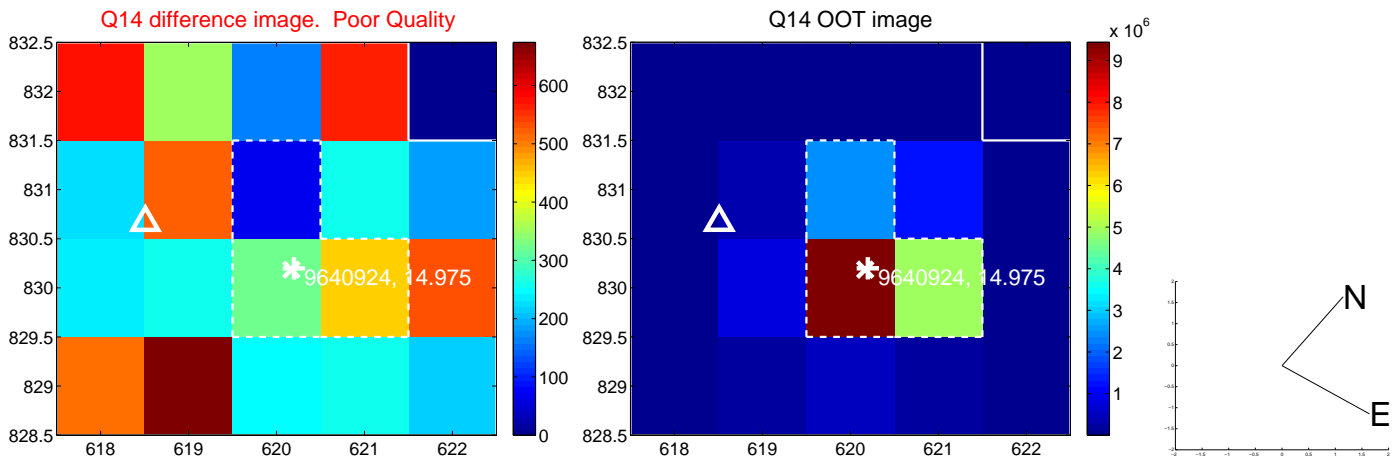
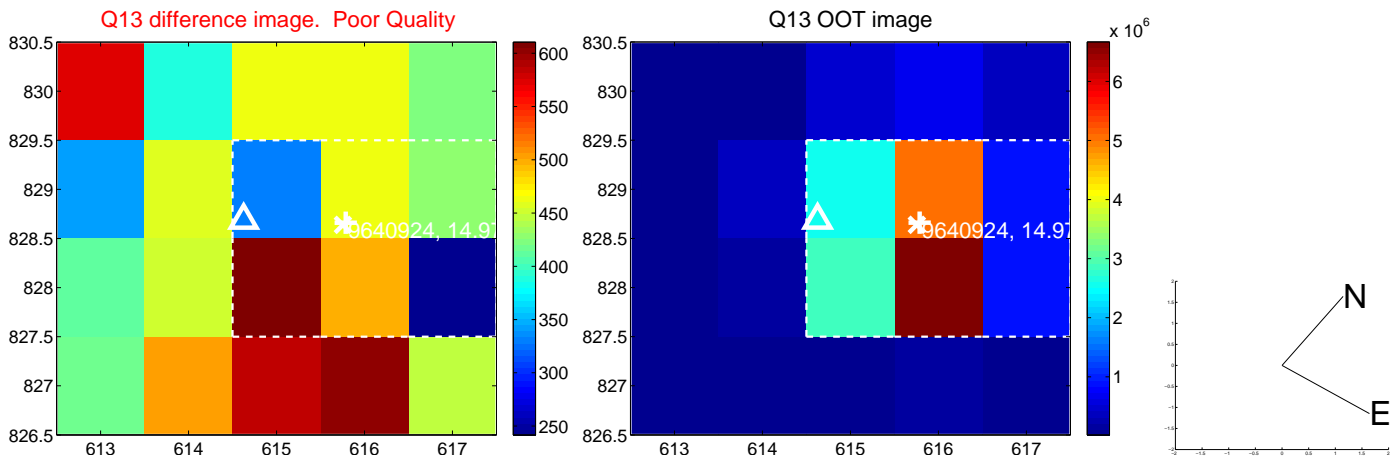
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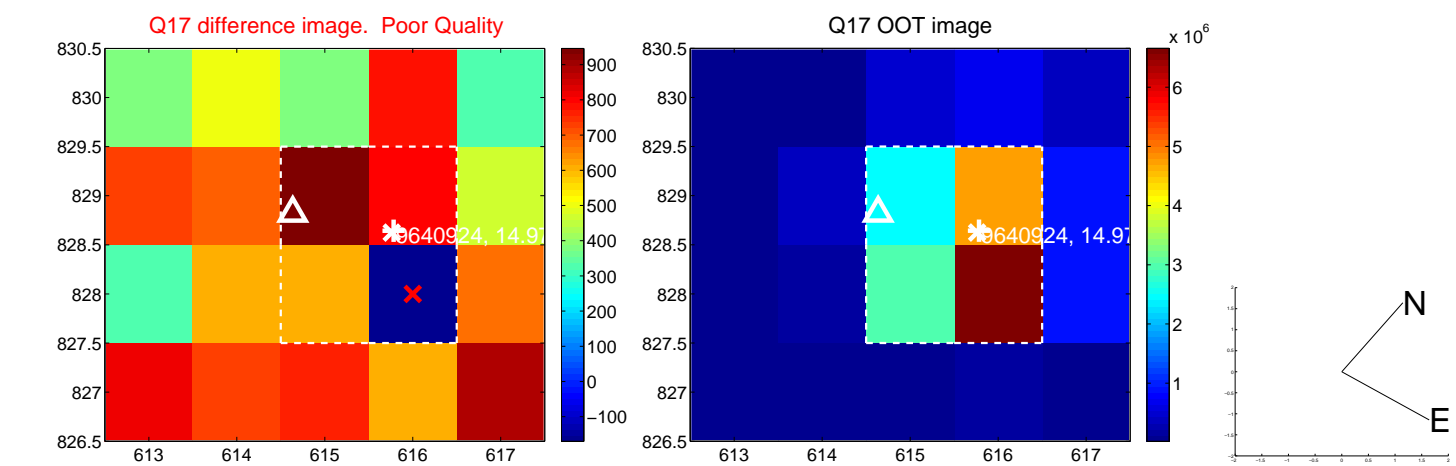
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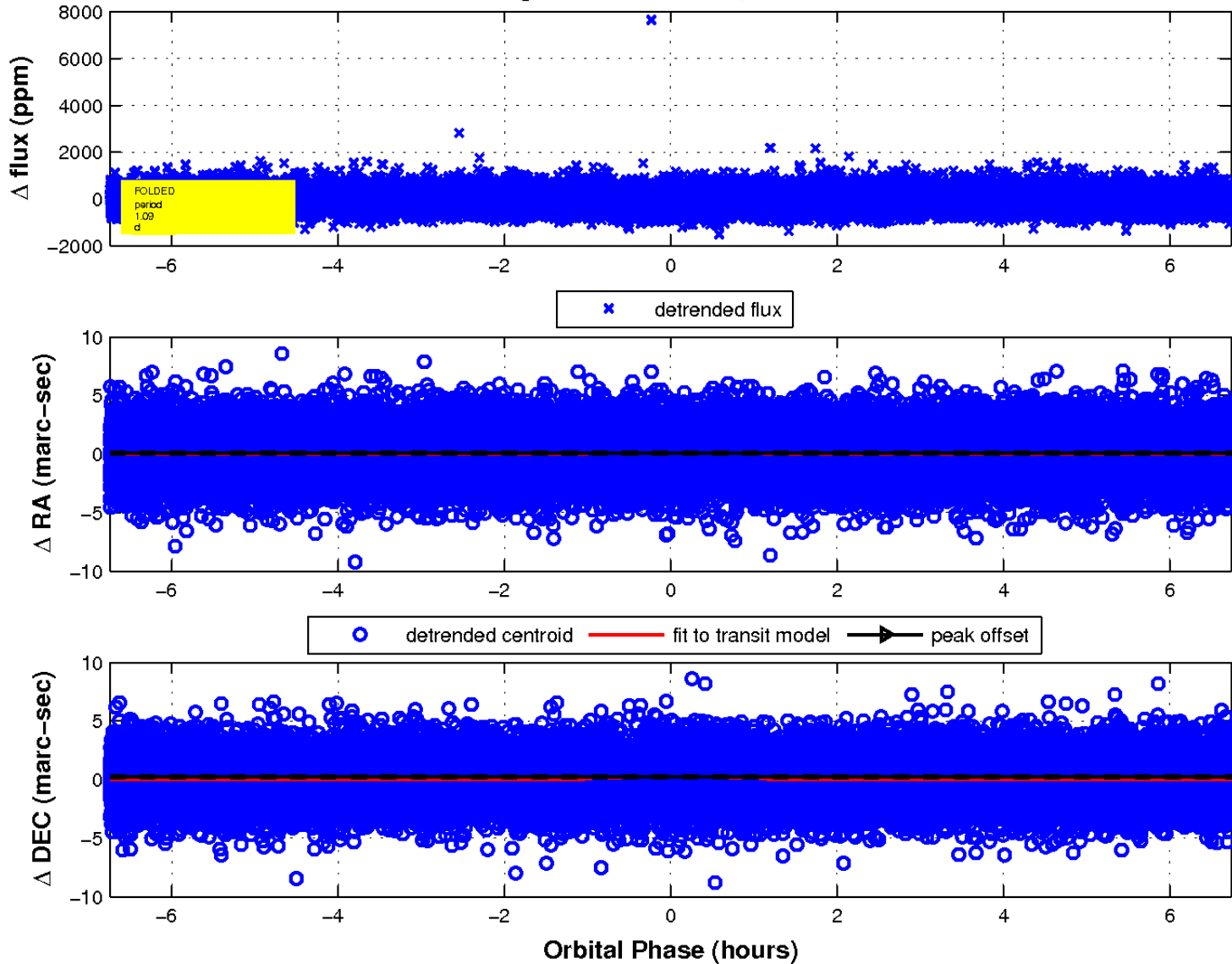
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fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

