

KIC 010724544

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})
010724544-01	OBS	No	1.490165	131.830381	85.5	2.323	9.6	13.0	0.78	5715	0.87	991.10
010724544-02	OBS	No	1.490188	132.563930	99.1	2.466	14.5	16.1	0.78	5715	0.95	991.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010724544-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
010724544-02	OBS	FP	0.00	1	0	0	1	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS—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.

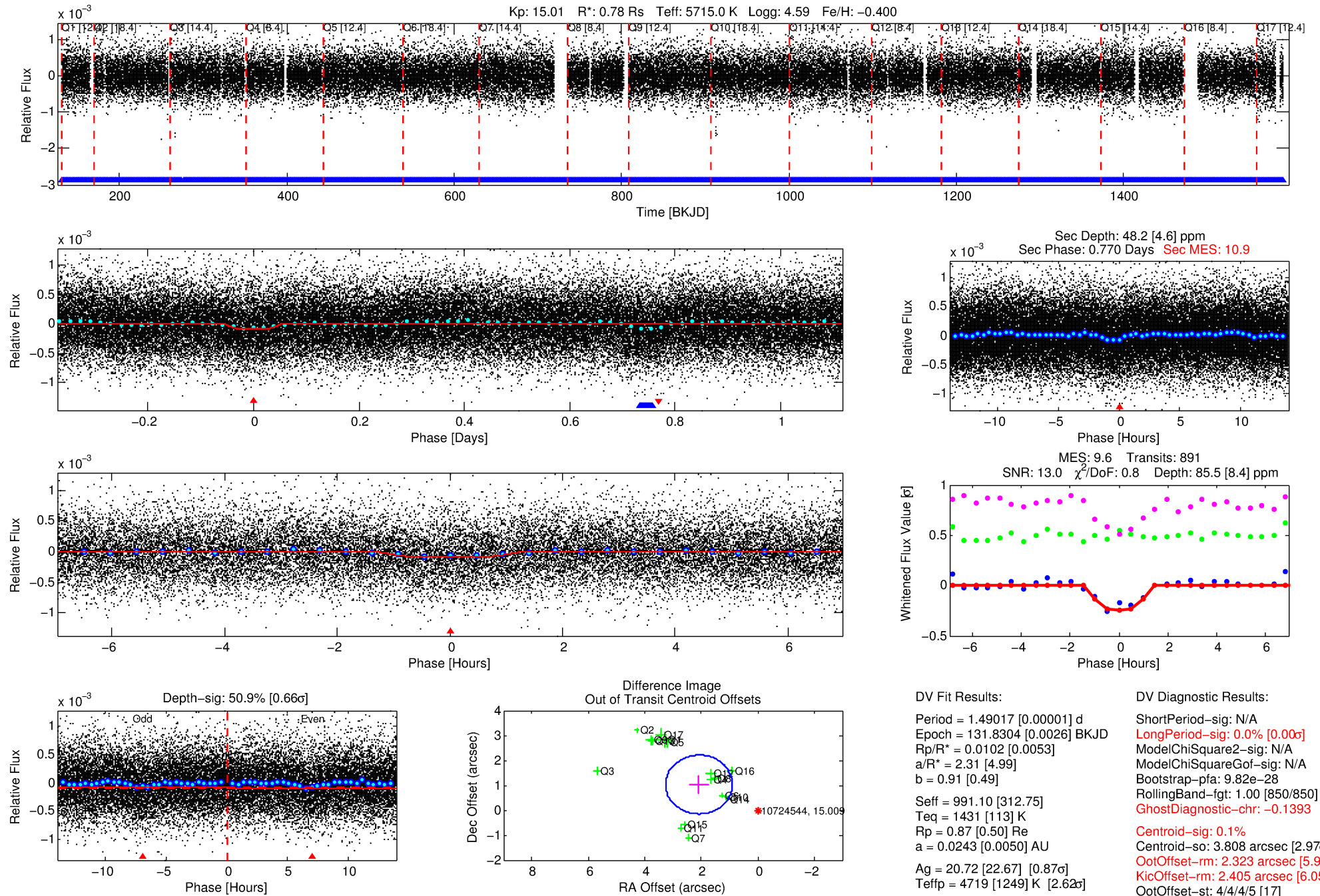
Ephemeris Match Information For 010724544-01

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
010724544-01	10724544	010724533-pri	10724533	2:1	88.7	20	11	9.04	15.01	1476.70	Direct-PRF	0	2.56	0.61

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: 10724544 Candidate: 1 of 2 Period: 1.490 d



DV Fit Results:

Period = 1.49017 [0.00001] d
Epoch = 131.8304 [0.0026] BKJD
Rp/R* = 0.0102 [0.0053]
a/R* = 2.31 [4.99]
b = 0.91 [0.49]
Seff = 991.10 [312.75]
Teff = 1431 [113] K
Rp = 0.87 [0.50] Re
a = 0.0243 [0.0050] AU
Ag = 20.72 [22.67] [0.87 σ]
Teffp = 4719 [1249] K [2.62 σ]

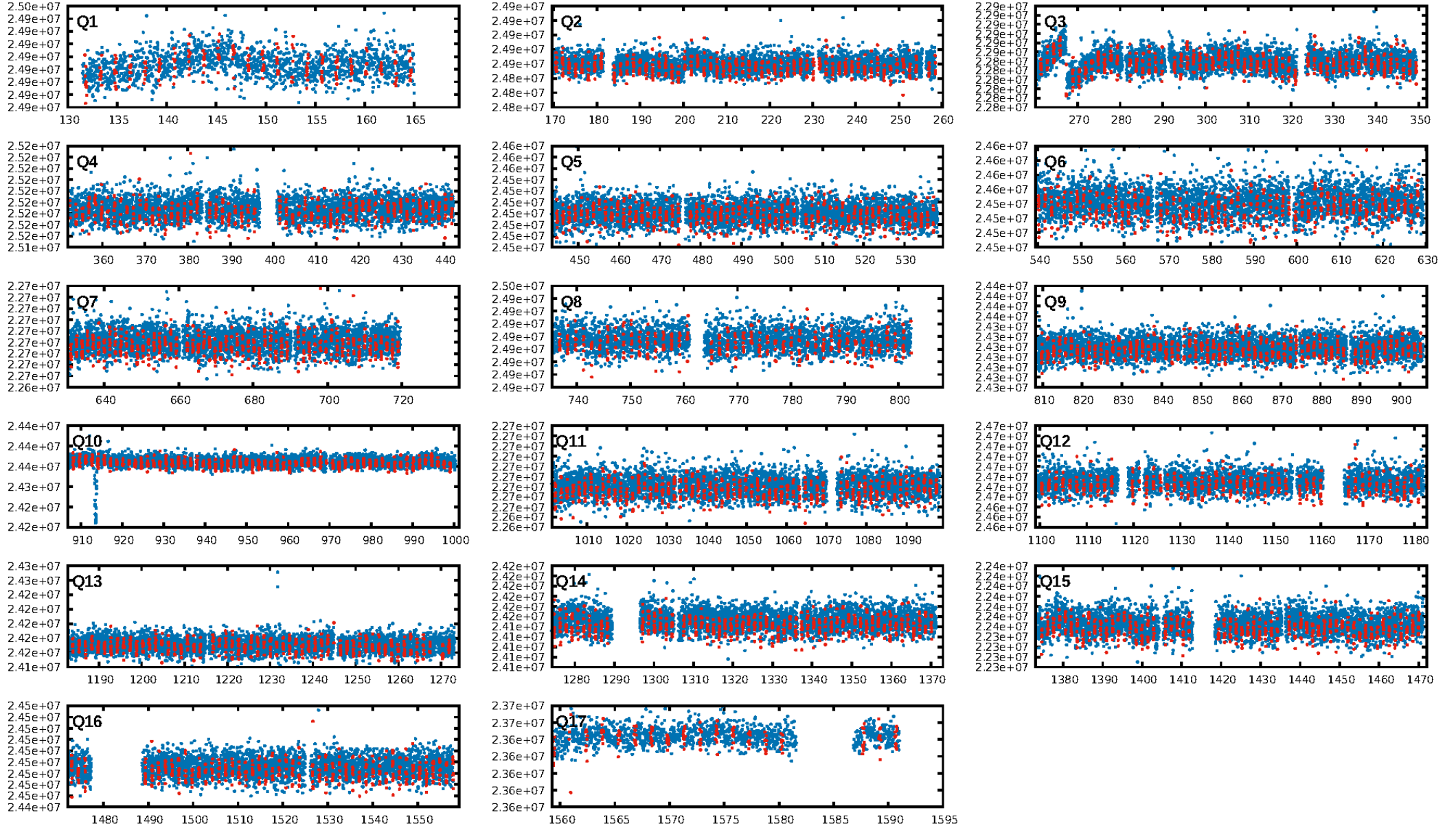
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.82e-28
RollingBand-fgt: 1.00 [850/850]
GhostDiagnostic-chr: -0.1393
Centroid-sig: 0.1%
Centroid-so: 3.808 arcsec [2.97 σ]
OotOffset-rm: 2.323 arcsec [5.91 σ]
KicOffset-rm: 2.405 arcsec [6.05 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

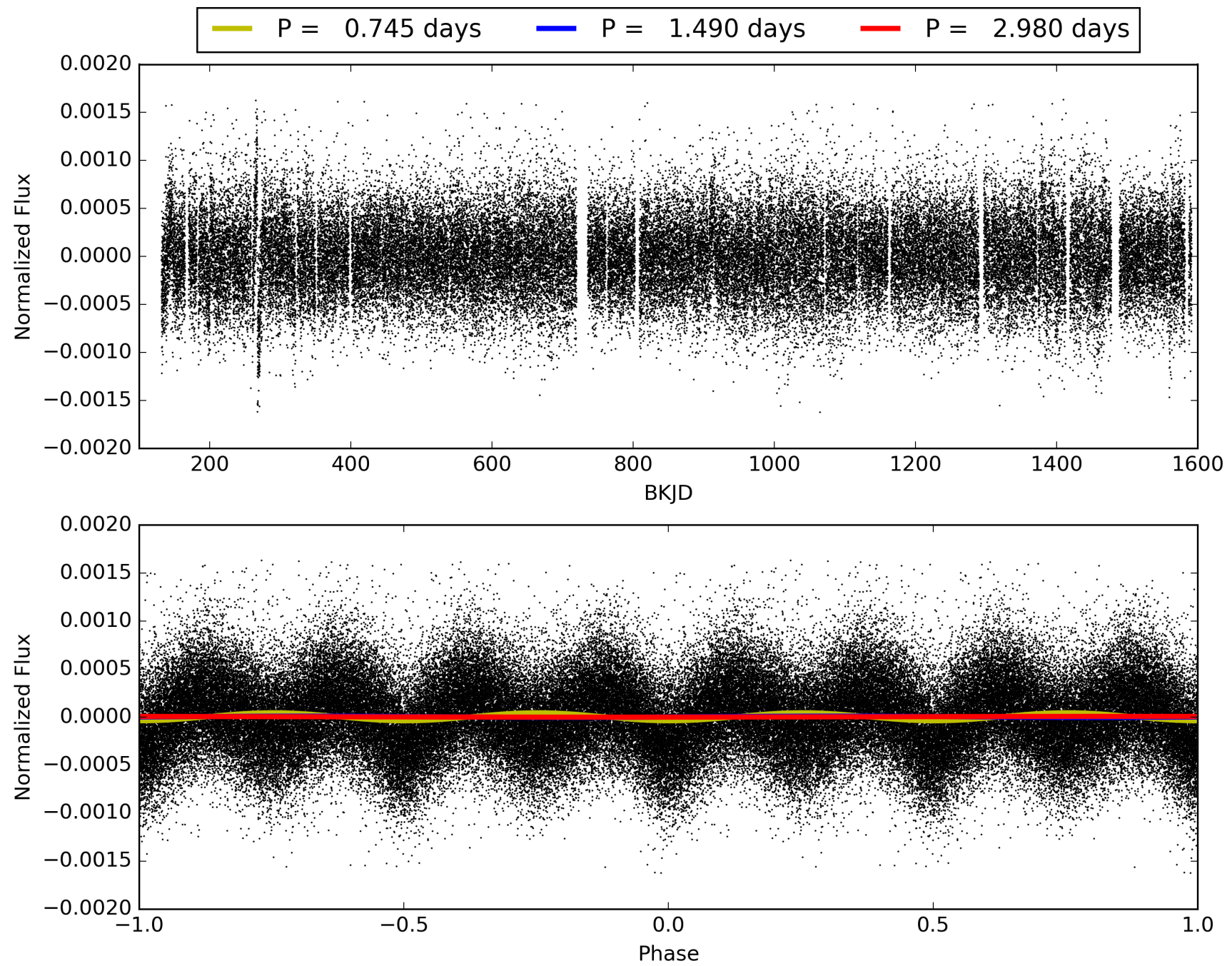
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:55:53 Z

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

TCE 010724544-01, PDC Light Curves

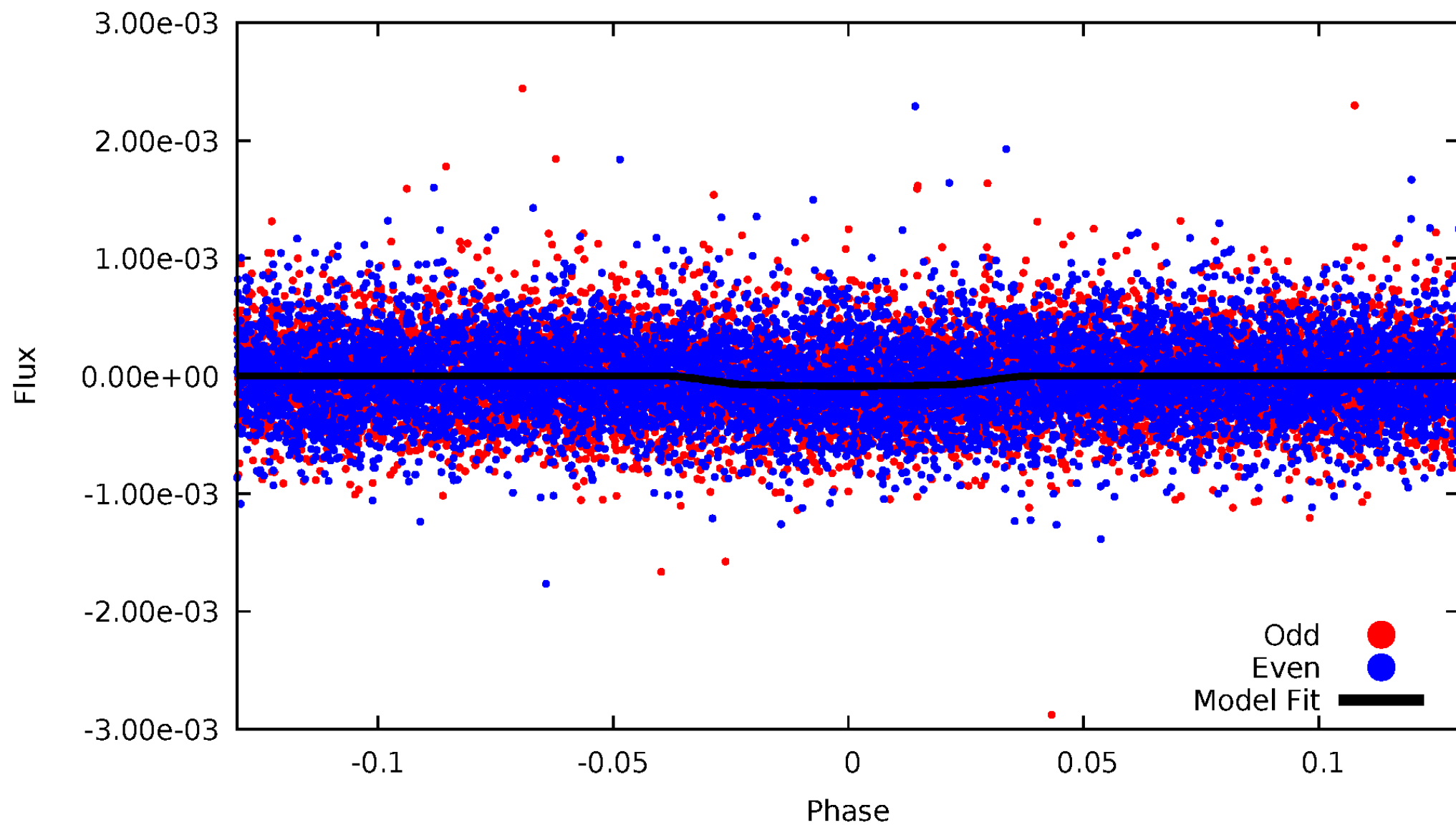


TCE 010724544-01



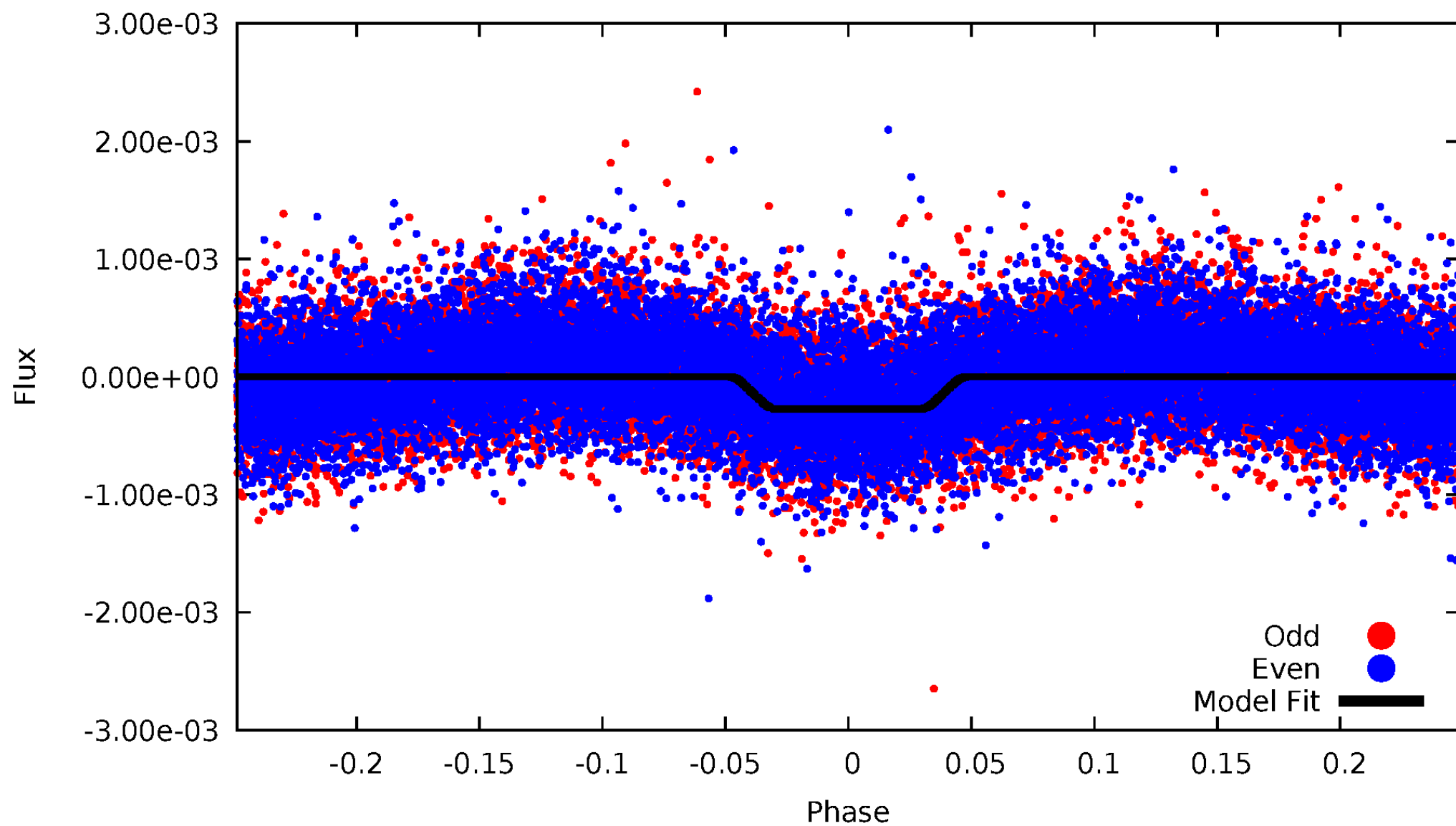
DV Odd/Even

TCE 010724544-01

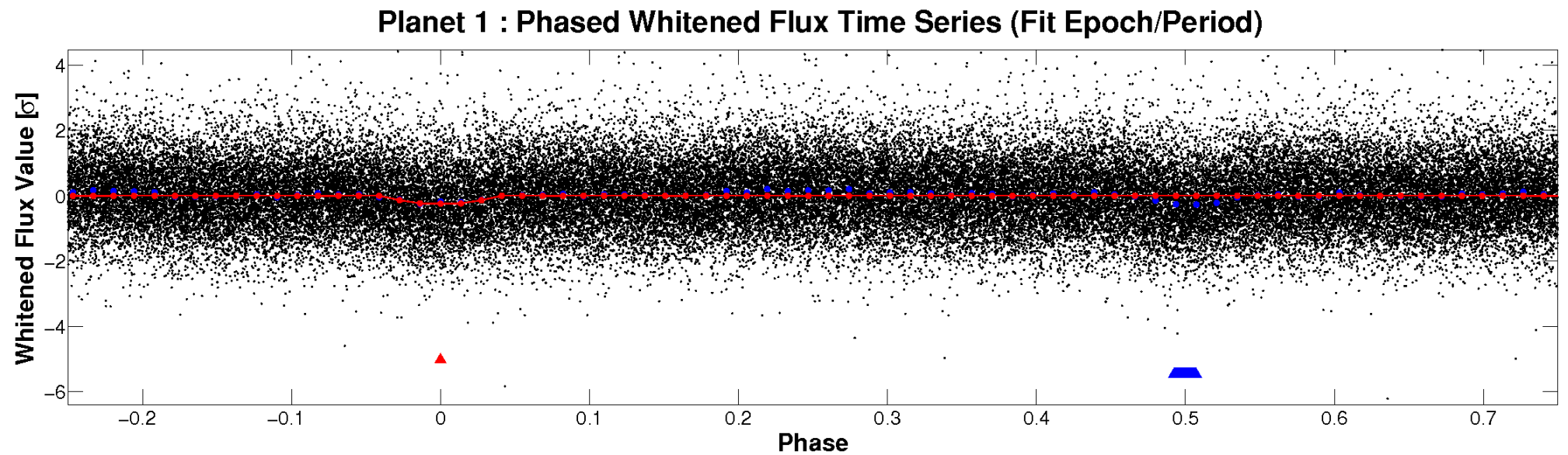
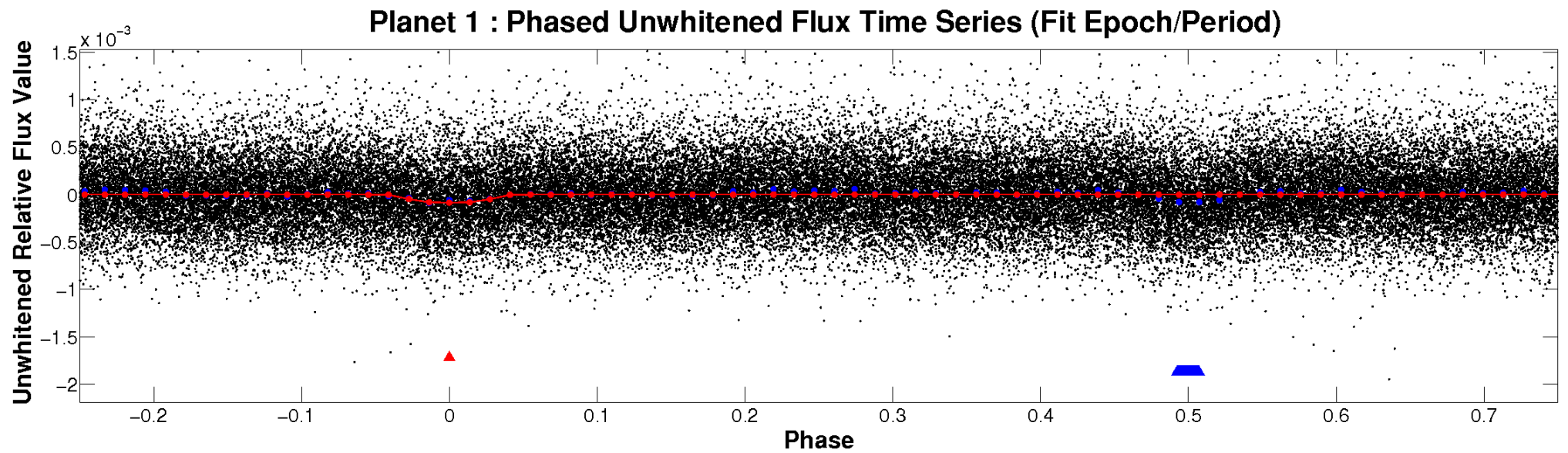


ALT Odd/Even

TCE 010724544-01

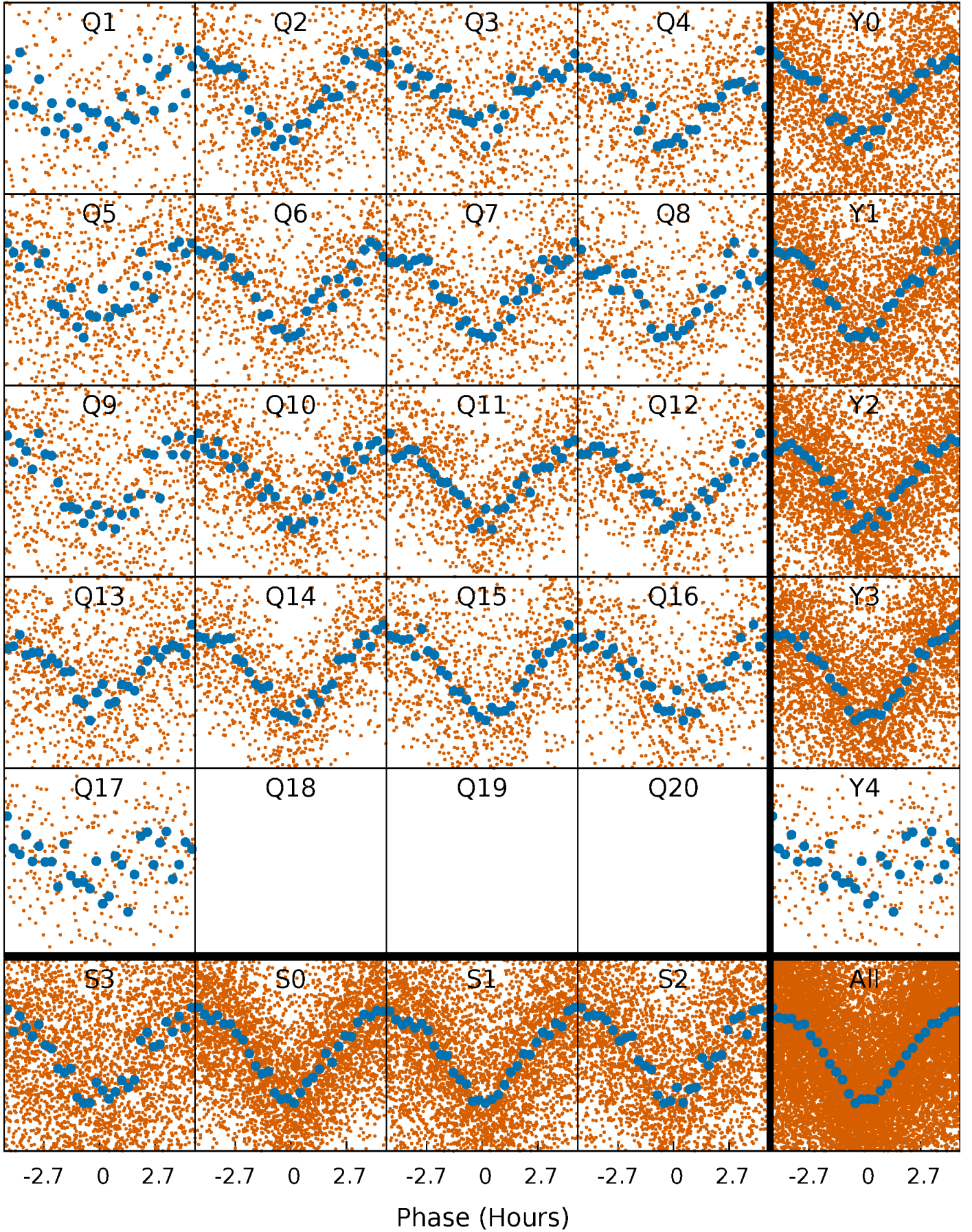


Non-Whitened Vs. Whitened Light Curve



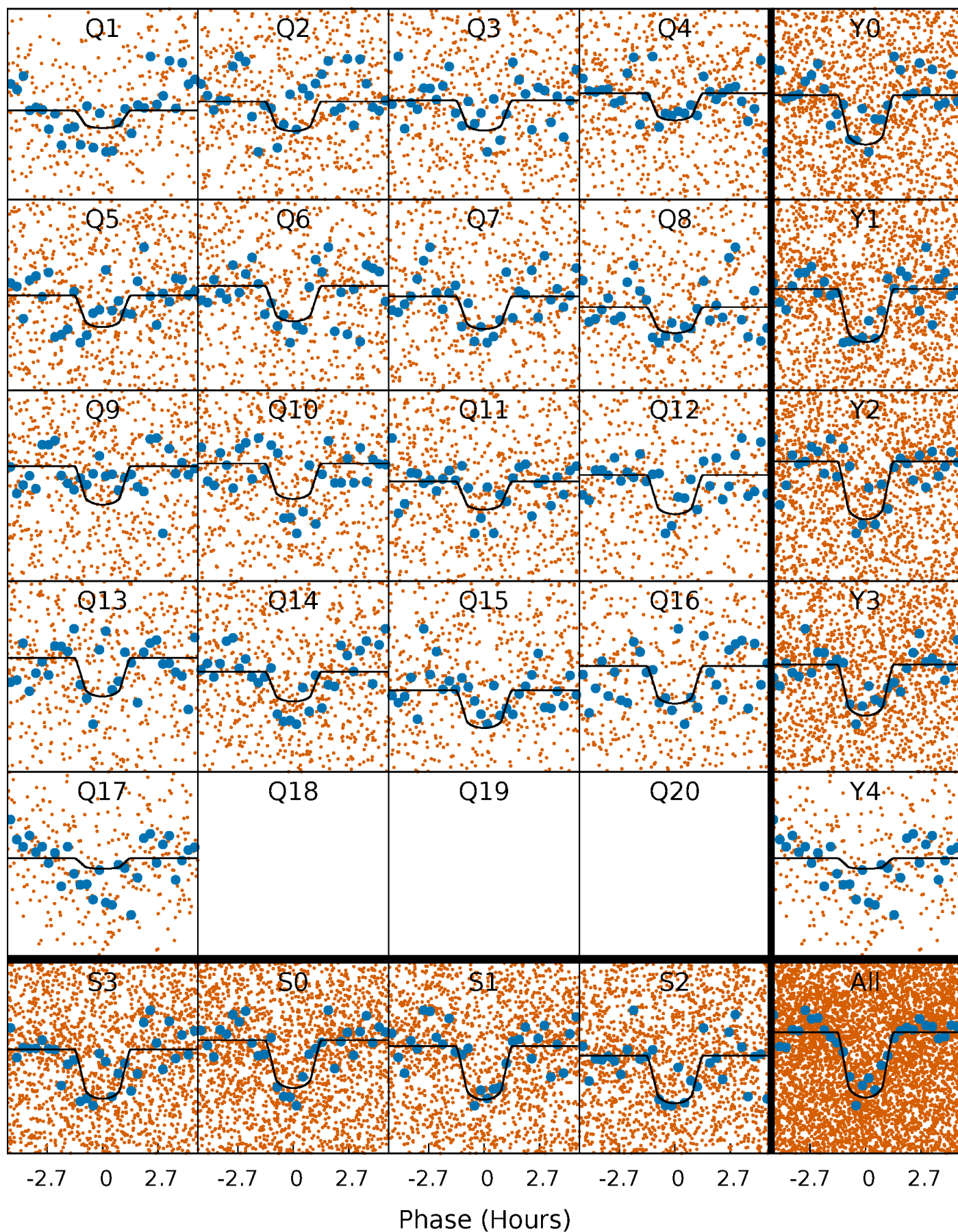
PDC Quarter-Phased Transit Curves

TCE 010724544-01 P= 1.490165 Days $T_0=131.830381$ (BKJD)



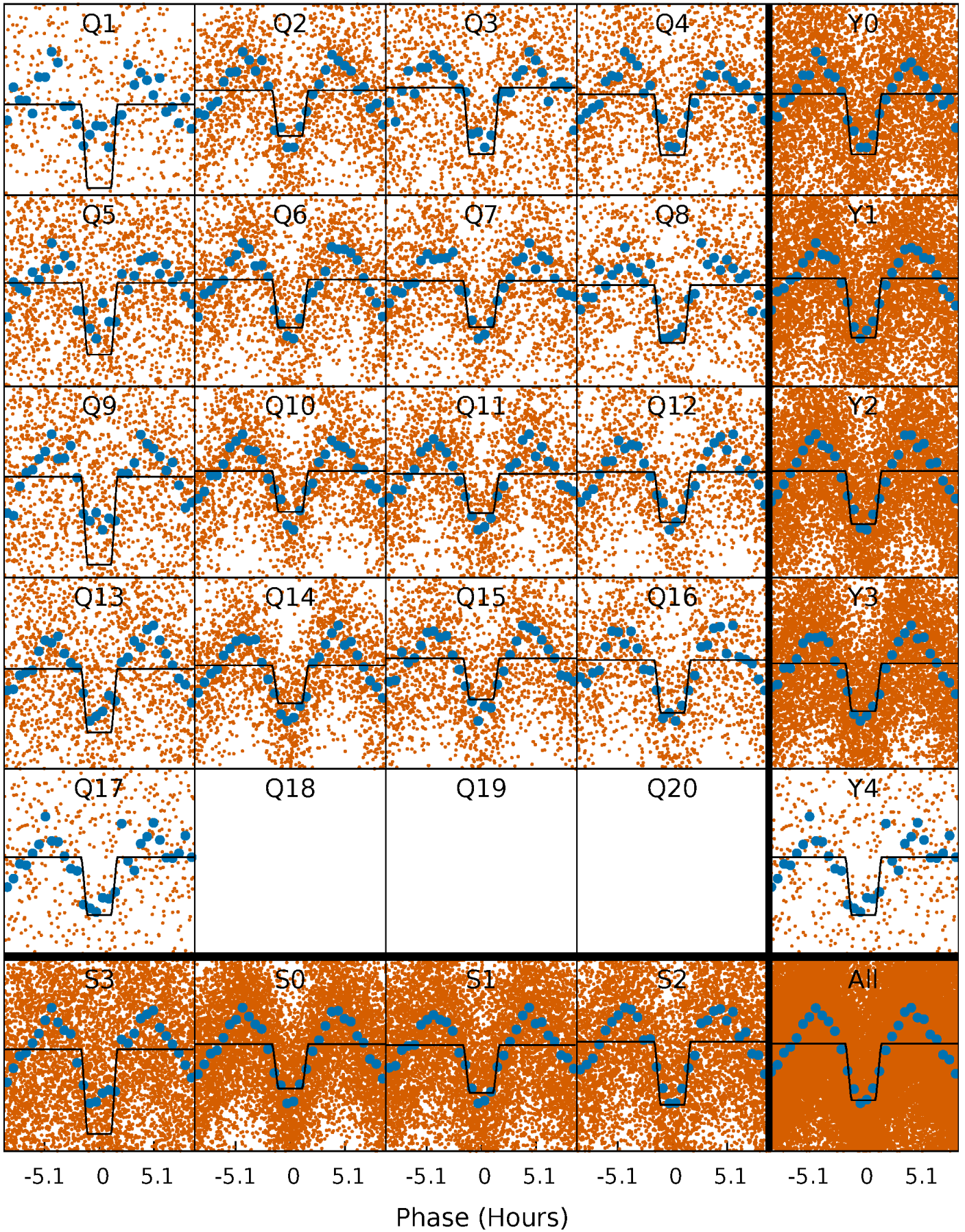
DV Quarter-Phased Transit Curves

TCE 010724544-01 P= 1.490165 Days $T_0=131.830381$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

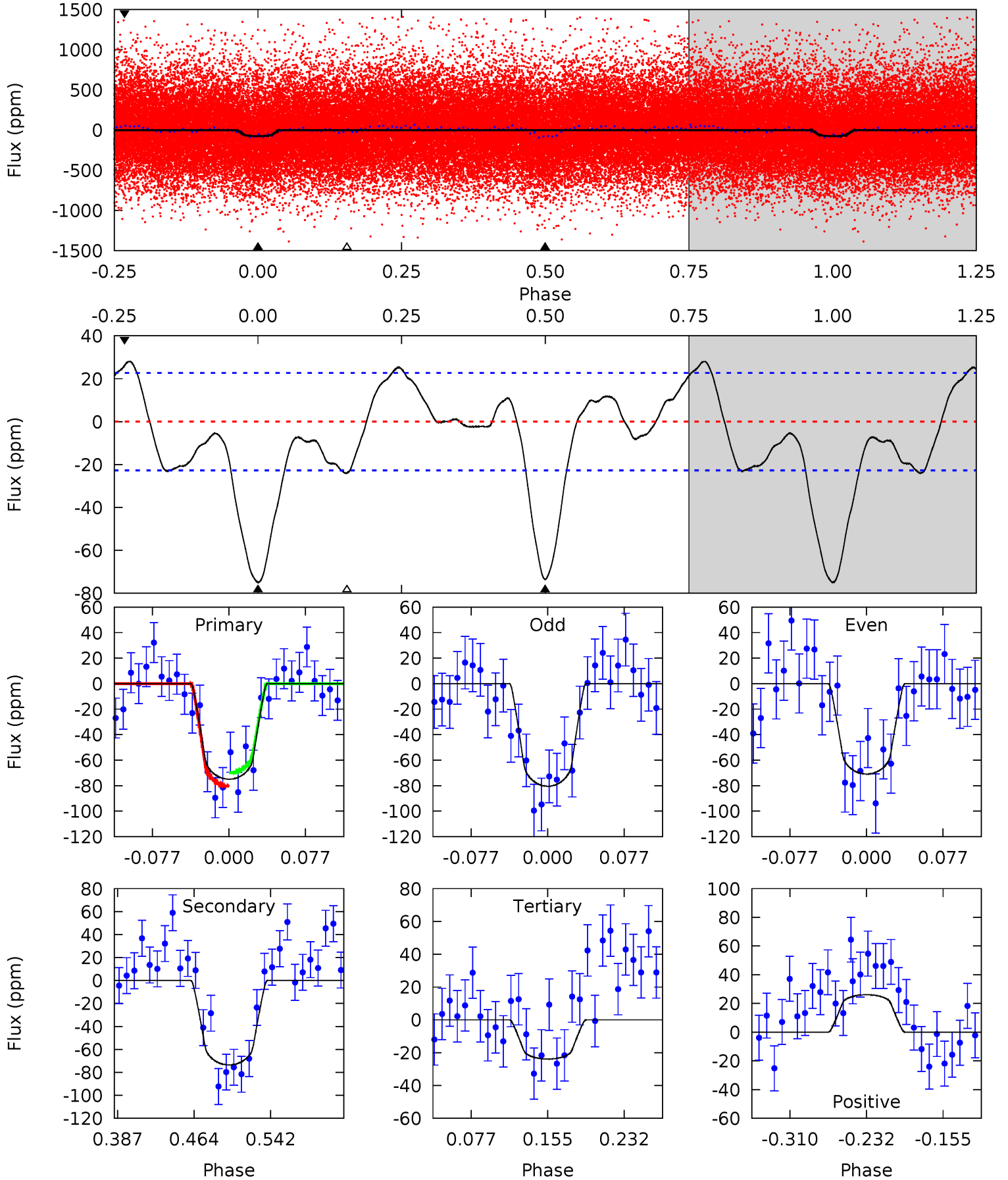
TCE 010724544-01 P= 1.490192 Days $T_0=131.817245$ (BKJD)



DV Model-Shift Uniqueness Test

010724544-01, P = 1.490165 Days, E = 130.340216 Days

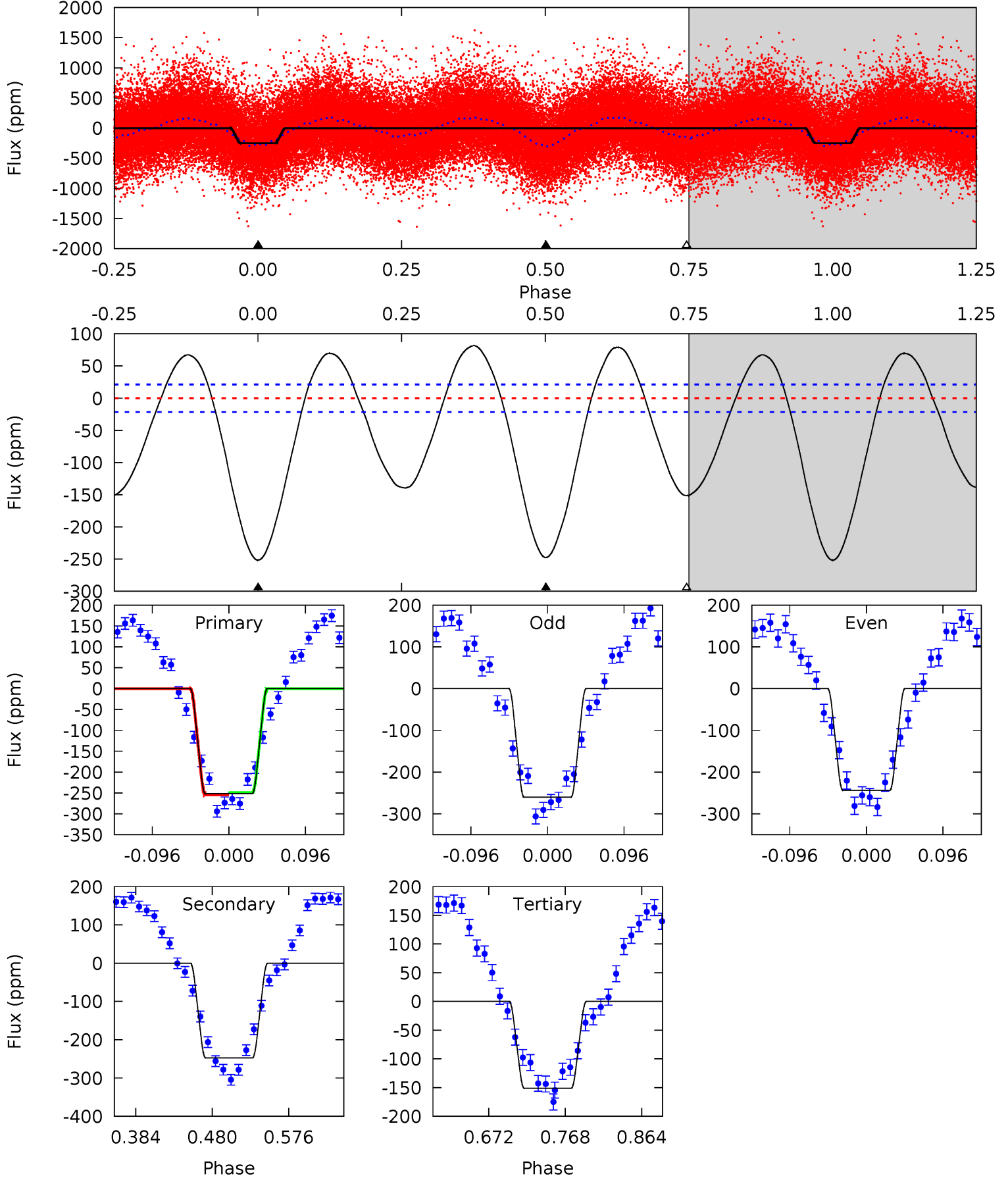
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	15.0	4.87	5.31	4.62	1.77	2.91	10.4	9.94	10.1	9.65	0.97	0.93	0.27	1.08



Alt Model-Shift Uniqueness Test

010724544-01, P = 1.490192 Days, E = 130.327053 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.9	53.1	32.4	0	4.57	1.66	17.2	21.5	53.9	20.6	53.1	1.76	1.00	0.24	0.54



Stellar Parameters For KIC 010724544

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5715^{+154}_{-154}	$4.586^{+0.040}_{-0.160}$	$-0.400^{+0.300}_{-0.300}$	$0.782^{+0.195}_{-0.065}$	$0.872^{+0.088}_{-0.098}$	$2.571^{+0.424}_{-1.177}$
	+3%/-3%	+1%/-3%	+75%/-75%	+25%/-8%	+10%/-11%	+16%/-46%
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 010724544-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-74 ± 5	$0.96^{+0.47}_{-0.51}$	2045^{+110}_{-90}	5146^{+2426}_{-771}	26^{+91}_{-14}
Alt.	-248 ± 5	$1.48^{+0.47}_{-0.48}$	2040^{+111}_{-86}	5563^{+1252}_{-634}	37^{+44}_{-15}

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

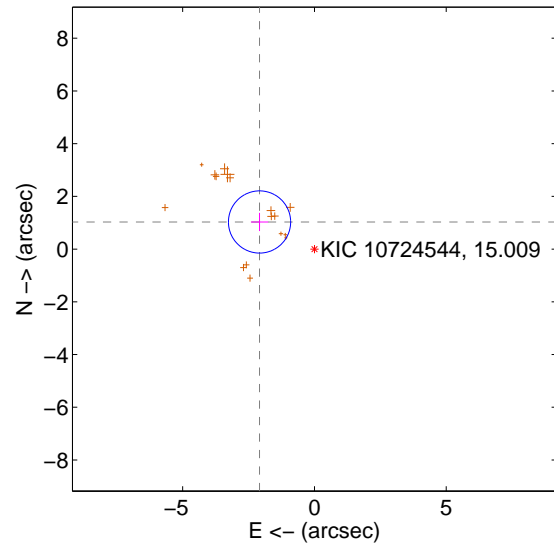
Supplemental centroid analysis for 010724544-01. Kepler magnitude: 15.01. Transit SNR 13.01

There are 0 quarters with good PRF difference image offsets

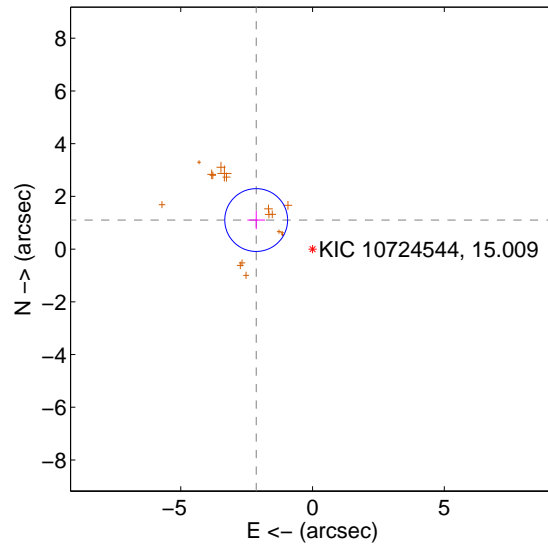
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.323 ± 0.393	5.91	2.082 ± 0.327	1.029 ± 0.344
PRF-fit source offset from KIC position	2.405 ± 0.397	6.05	2.137 ± 0.334	1.102 ± 0.344
photometric centroid source offset	3.81 ± 1.28	2.97	3.74 ± 1.29	0.71 ± 1.14

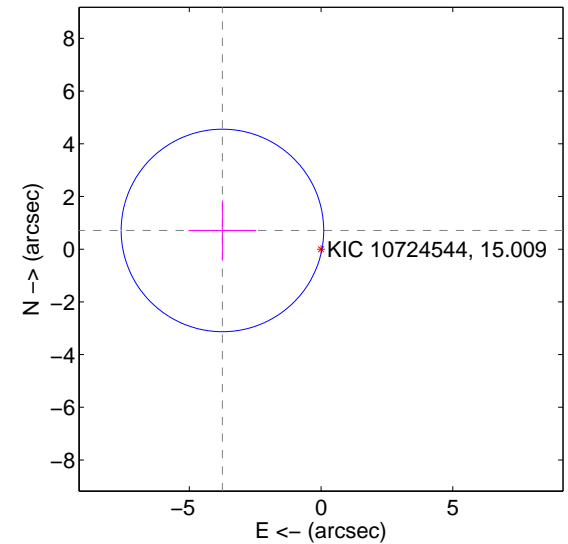
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

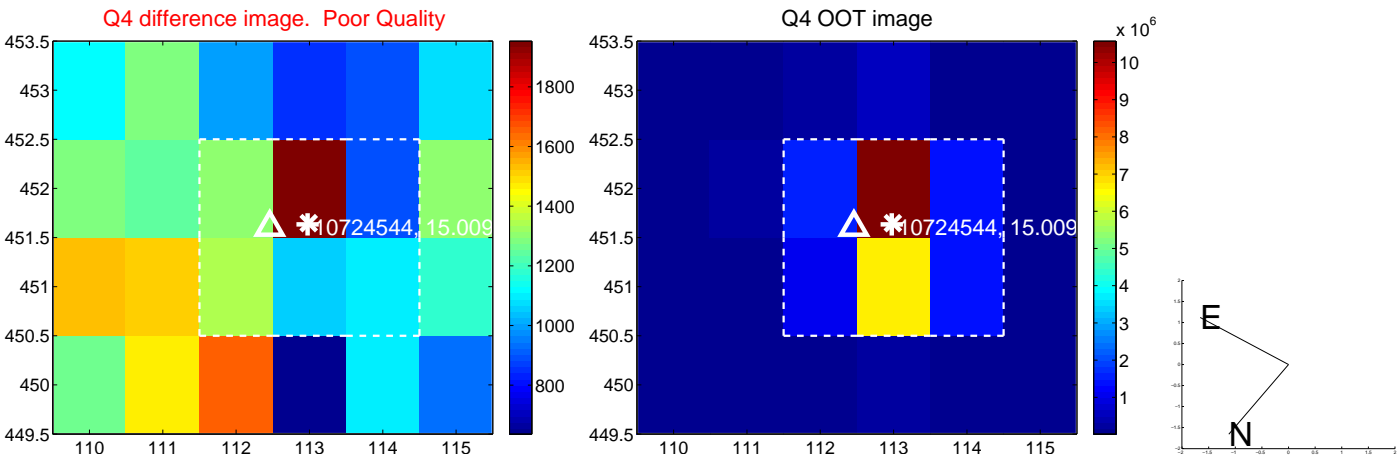
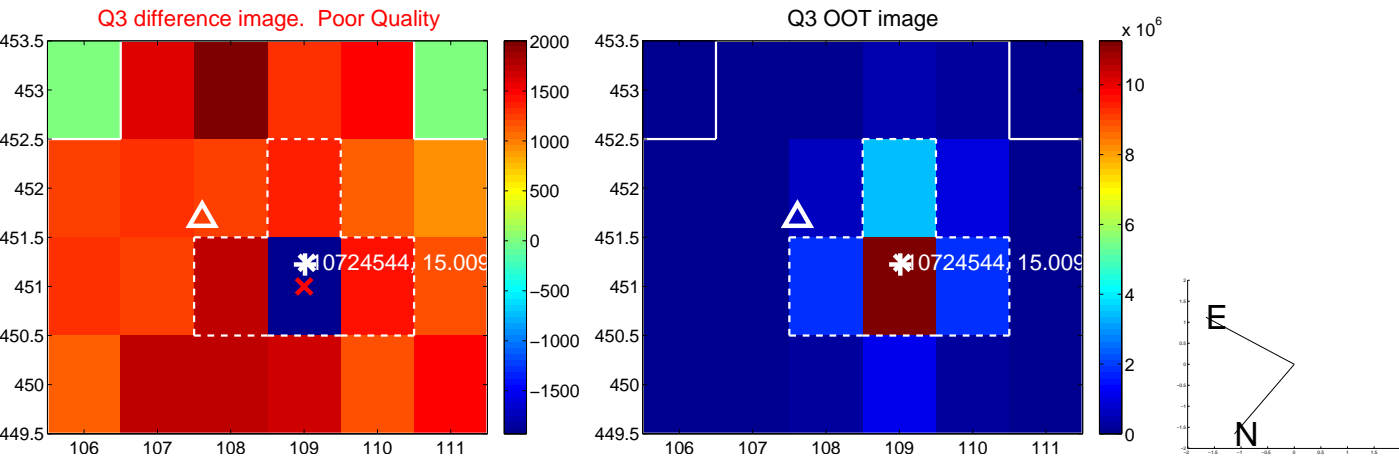
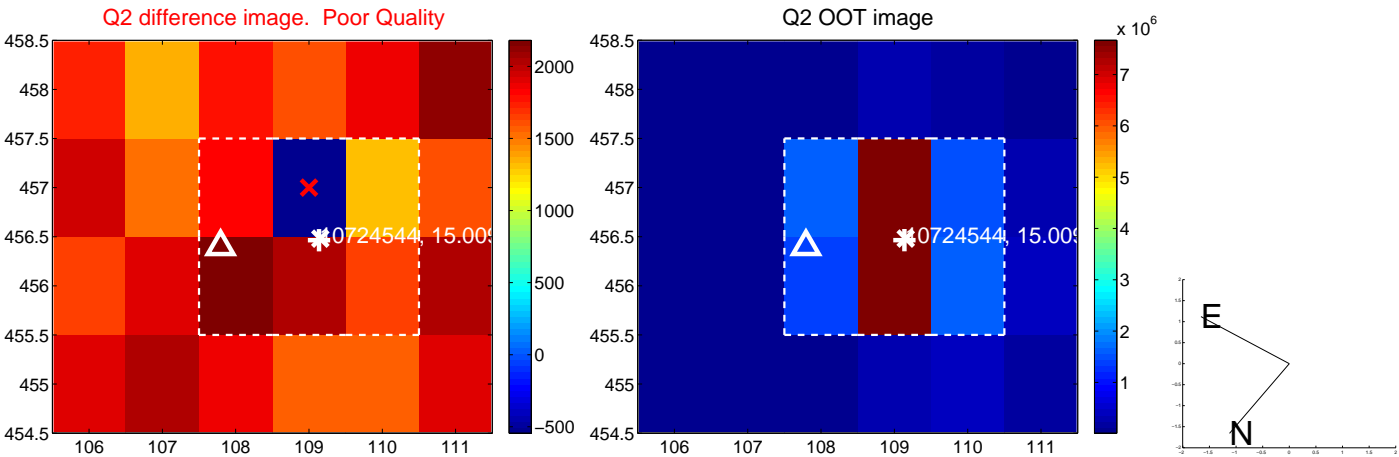
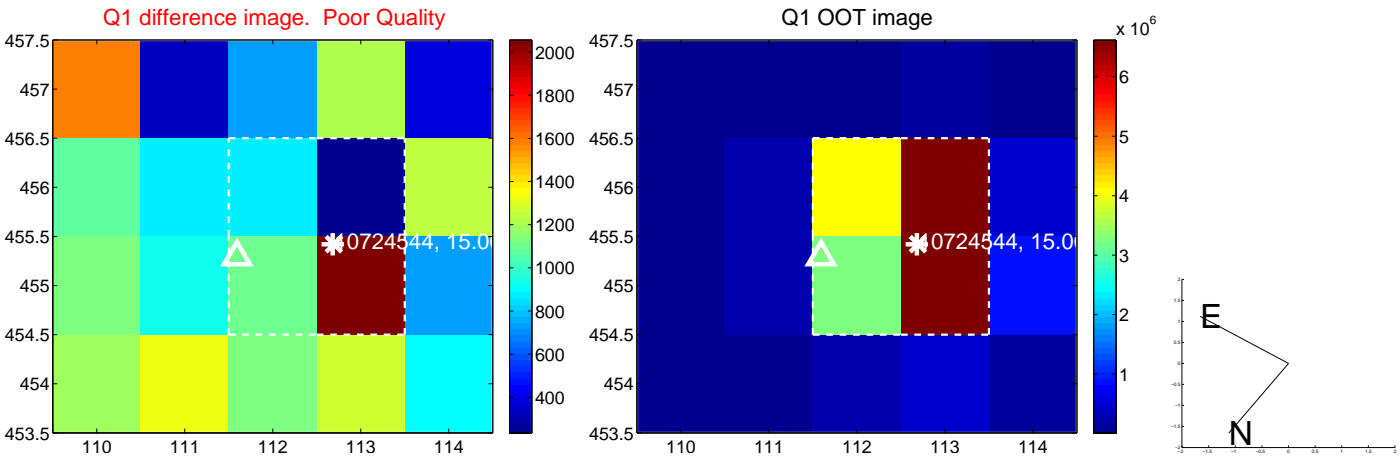


offset from photometric centroids

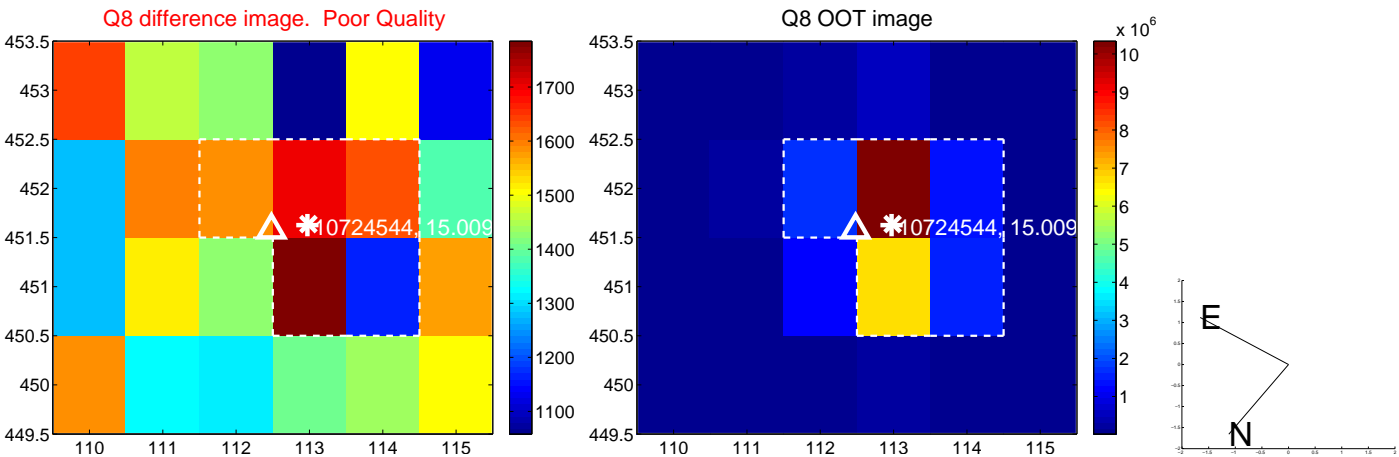
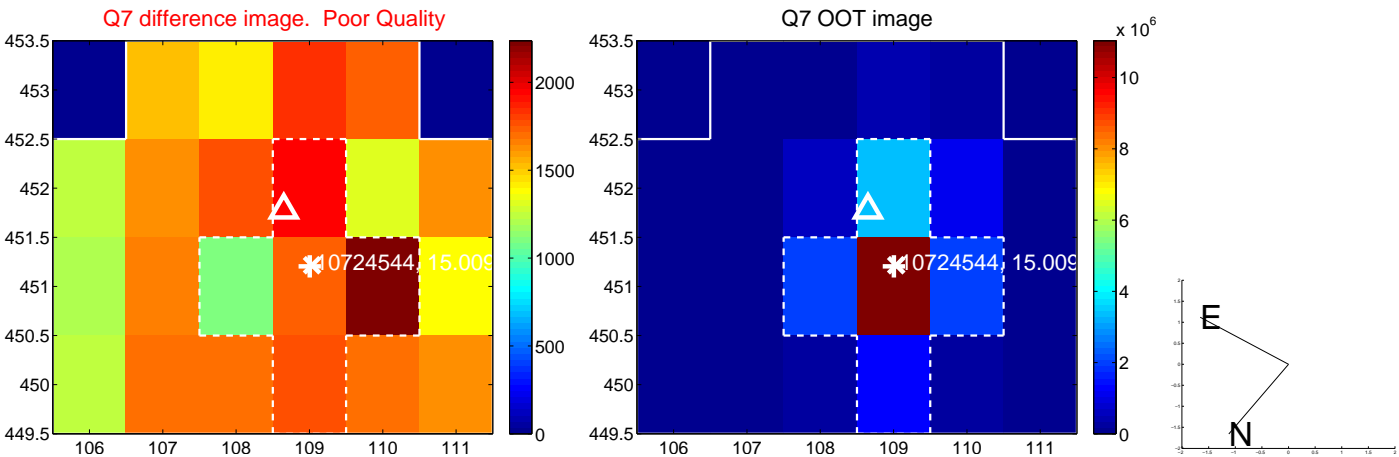
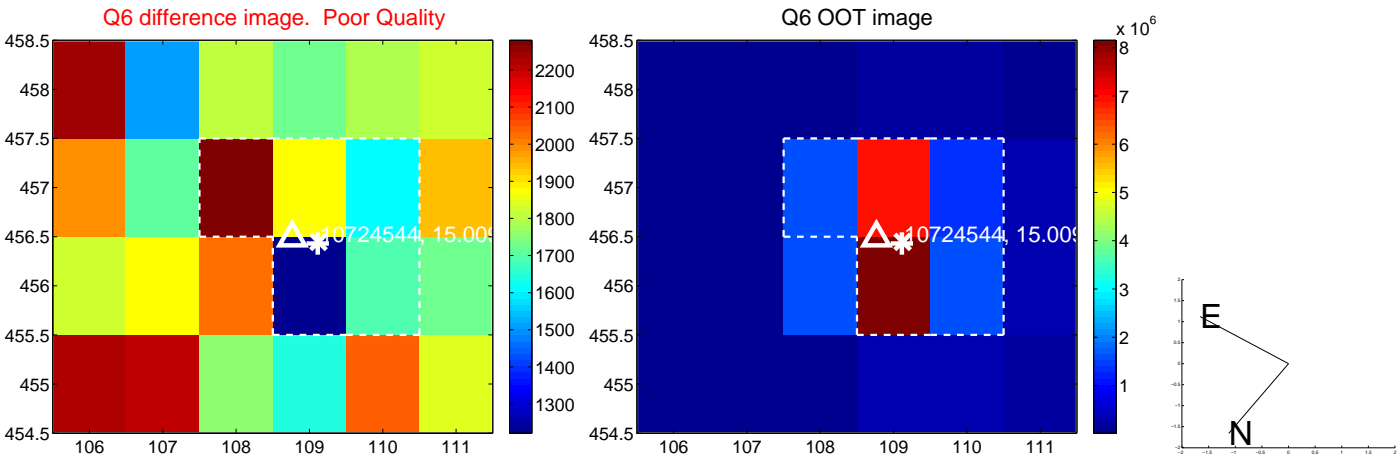
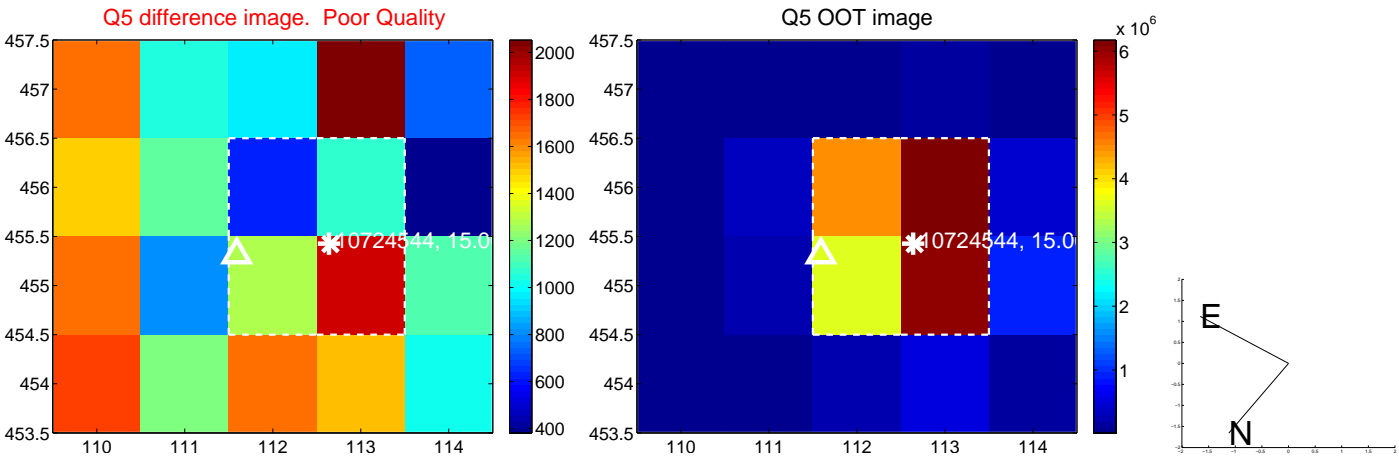


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

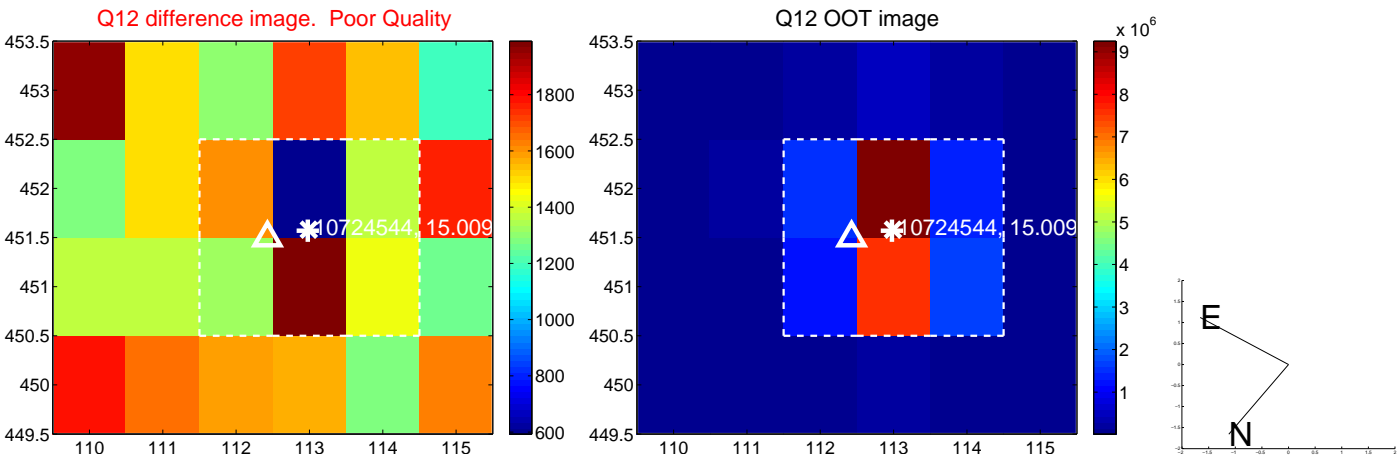
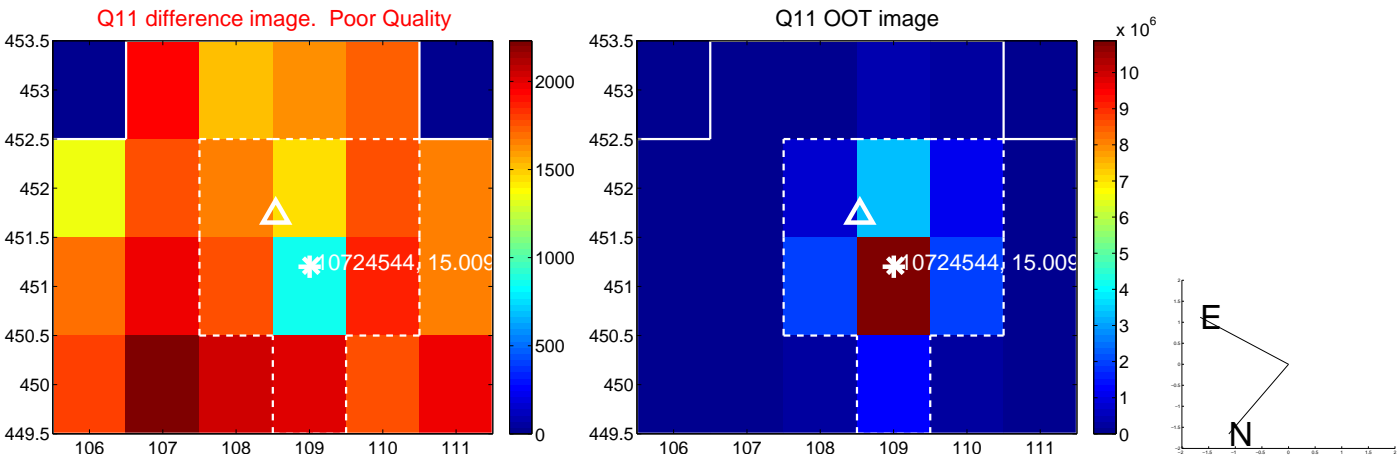
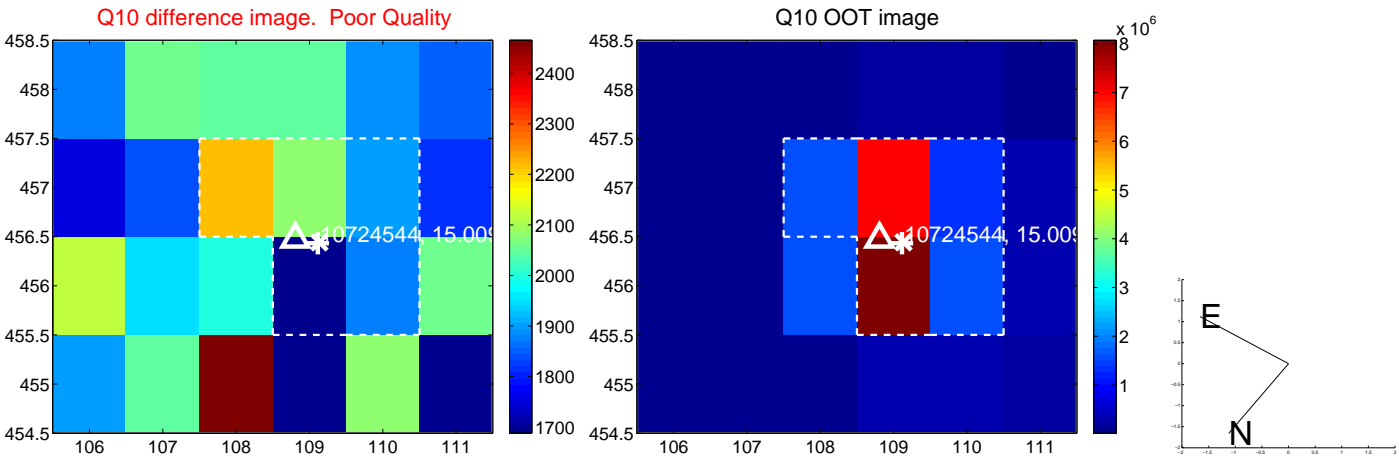
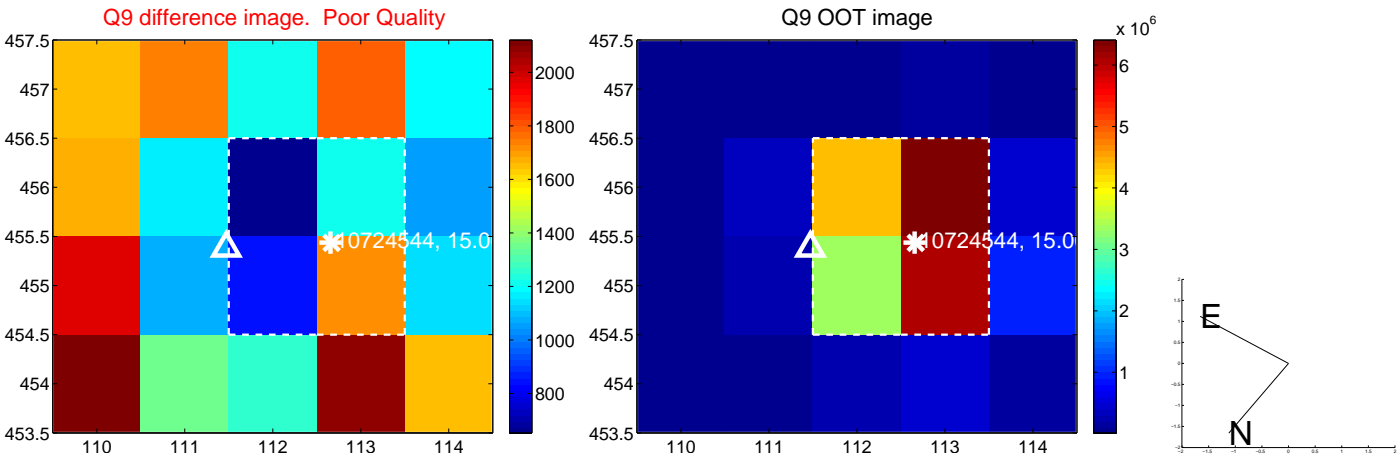
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



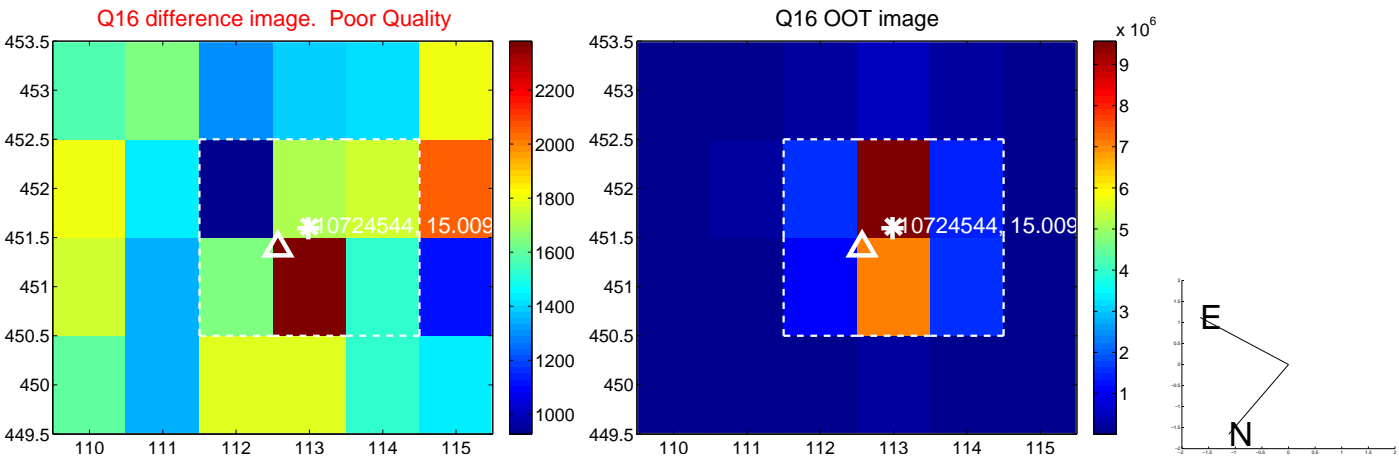
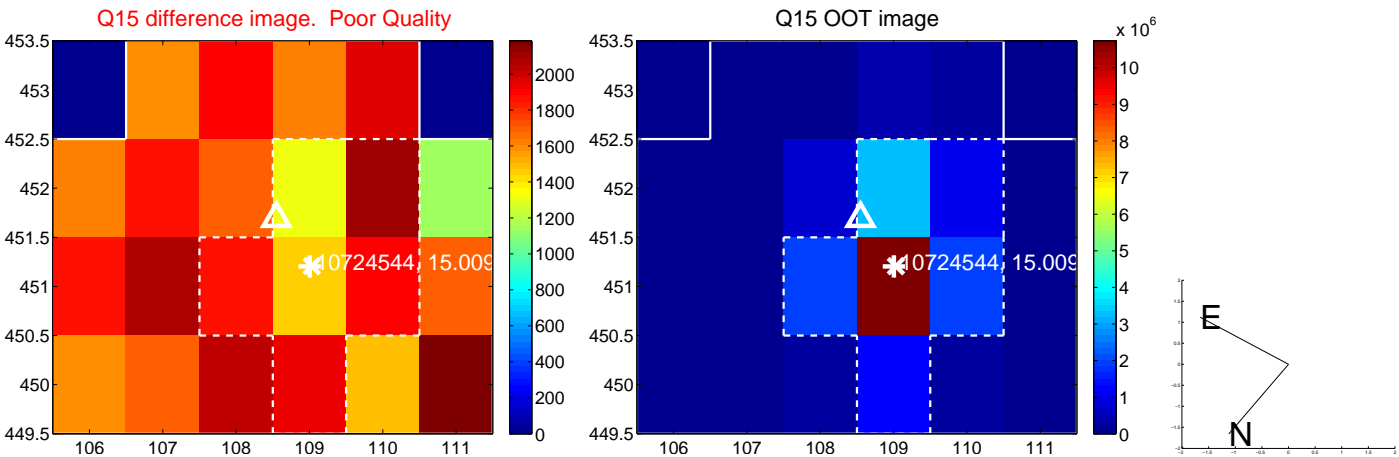
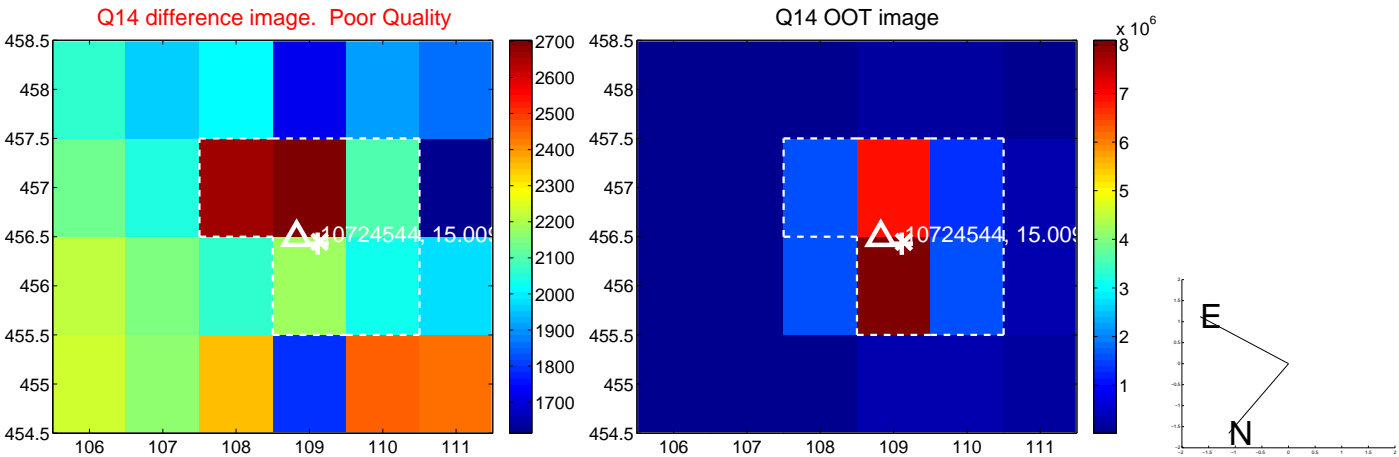
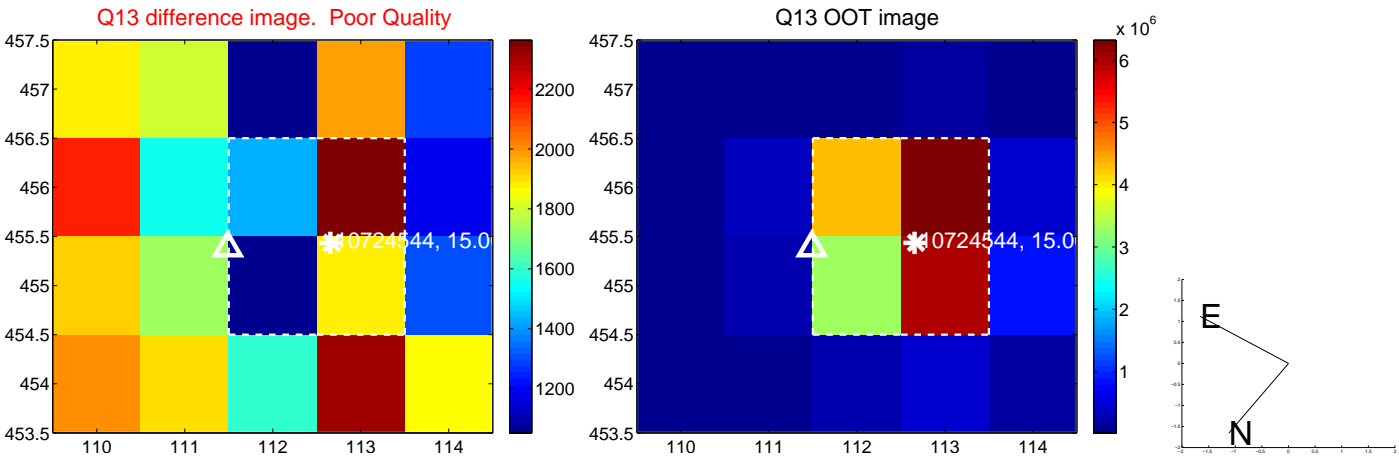
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



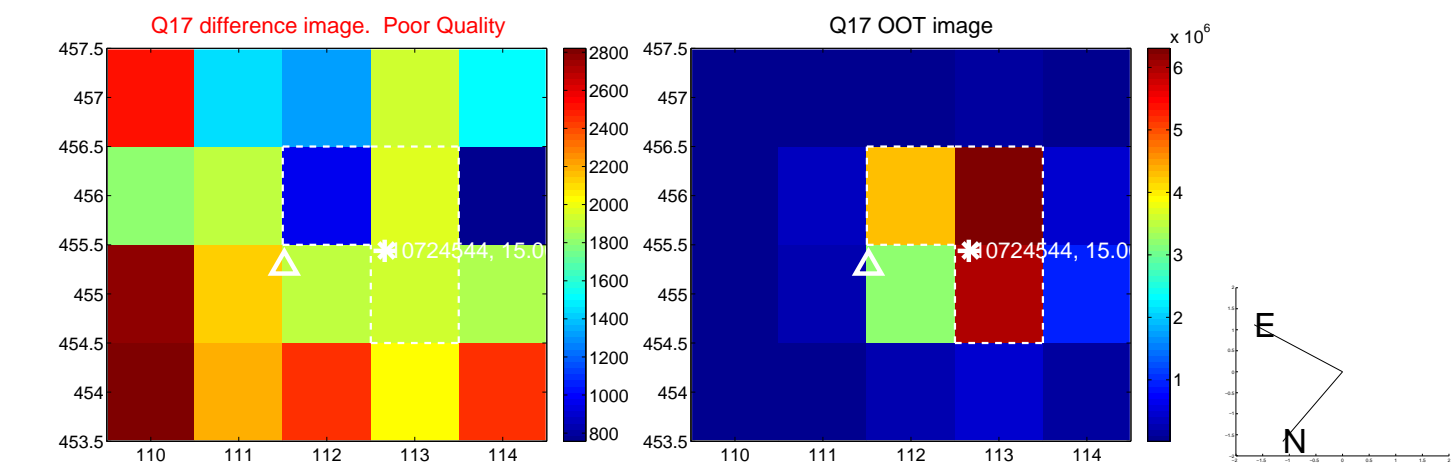
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



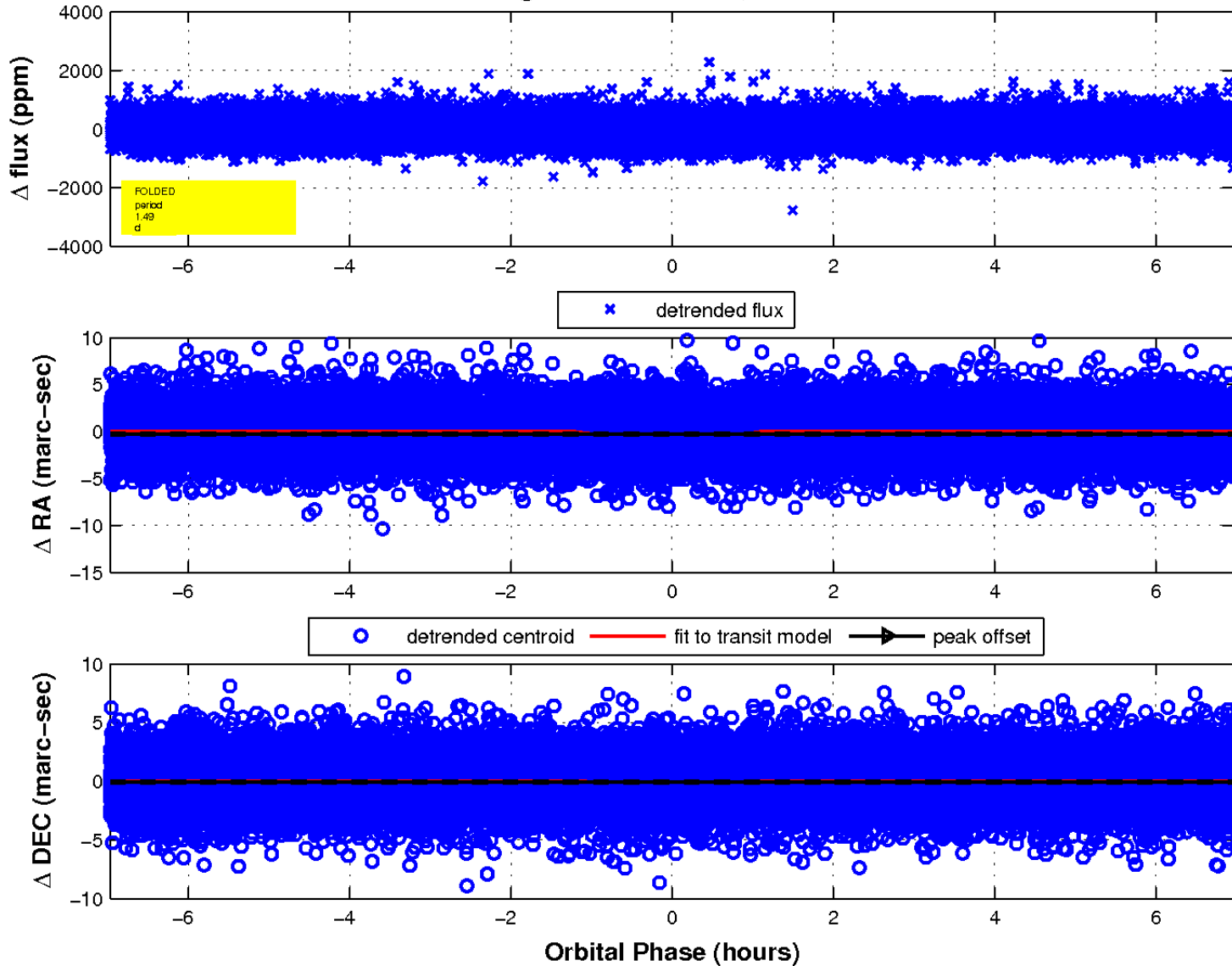
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

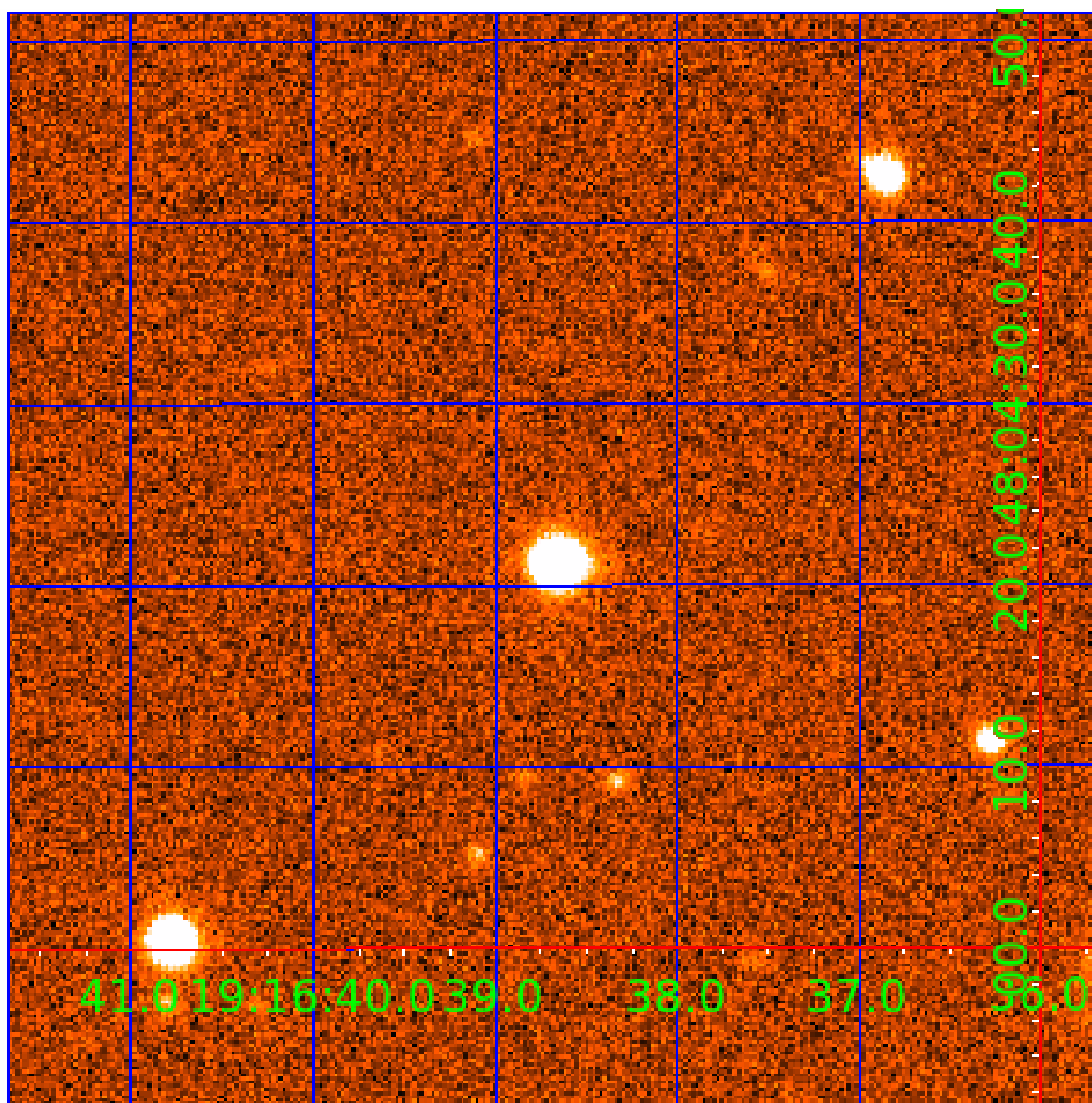


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010724544

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})
010724544-01	OBS	No	1.490165	131.830381	85.5	2.323	9.6	13.0	0.78	5715	0.87	991.10
010724544-02	OBS	No	1.490188	132.563930	99.1	2.466	14.5	16.1	0.78	5715	0.95	991.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010724544-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
010724544-02	OBS	FP	0.00	1	0	0	1	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS—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.

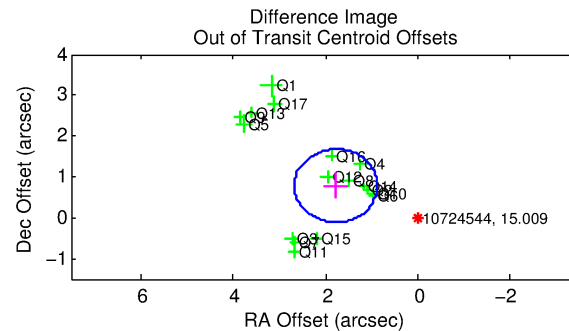
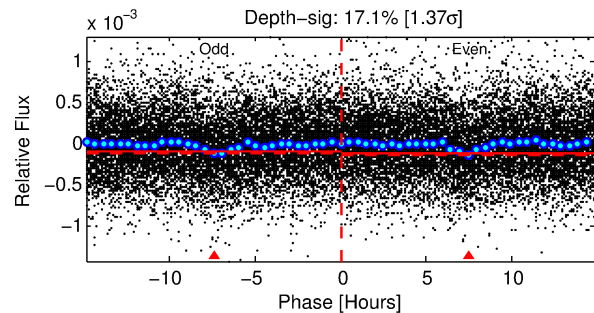
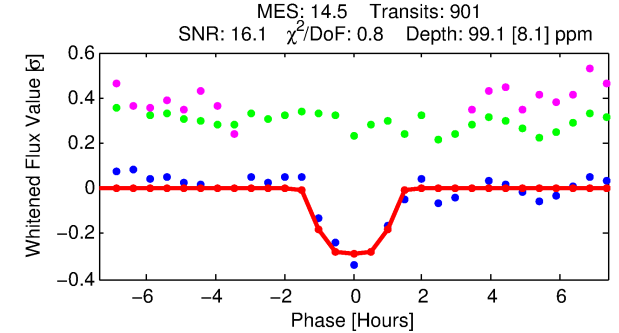
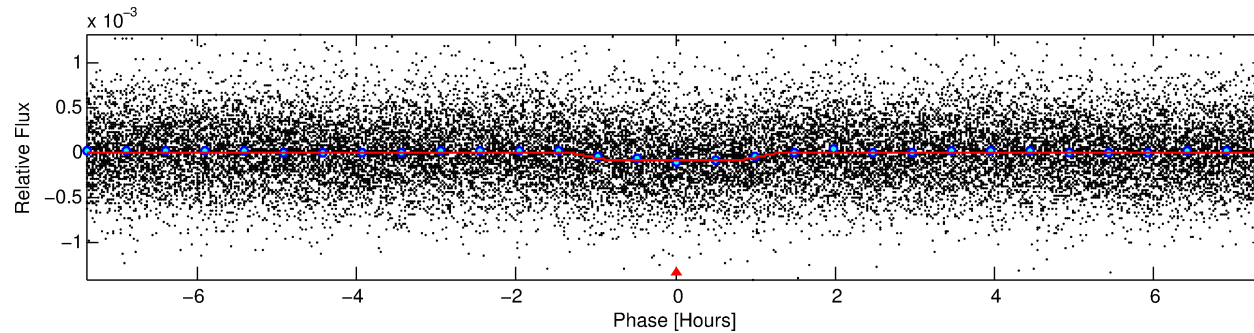
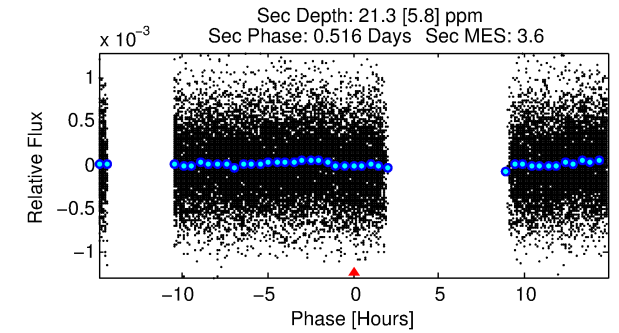
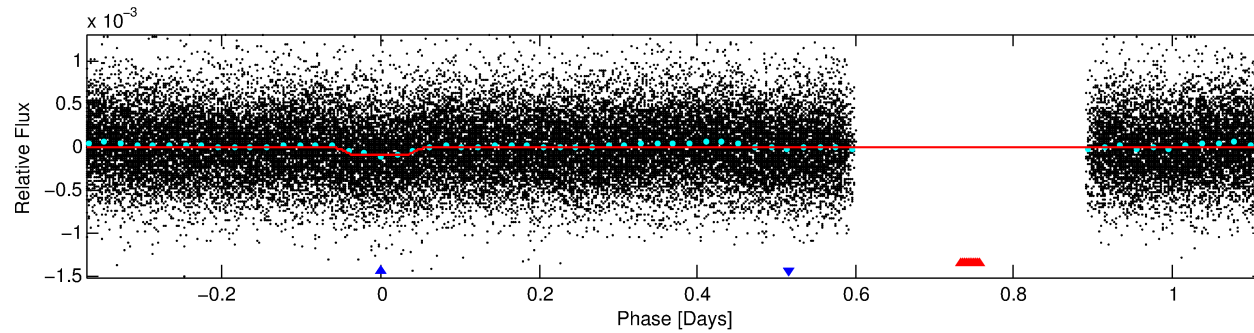
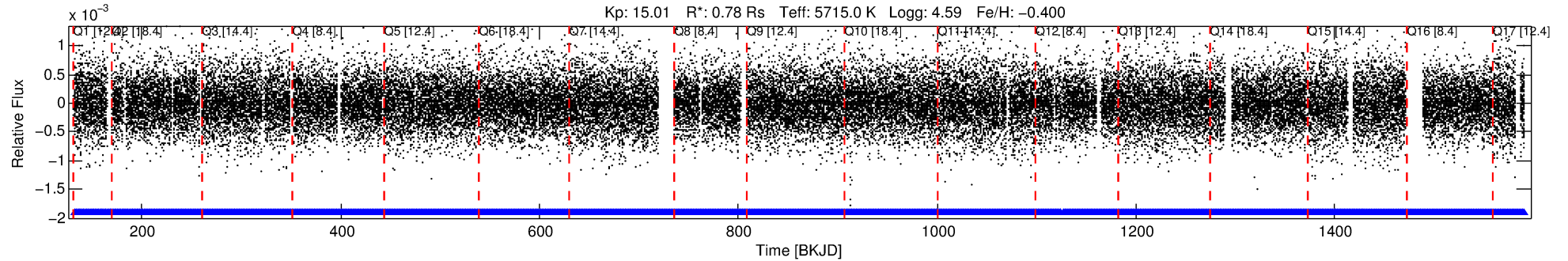
Ephemeris Match Information For 010724544-02

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
010724544-02	10724544	010724533-pri	10724533	2:1	88.7	20	11	9.04	15.01	1282.80	Direct-PRF	0	0.61	0.32

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol 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: 10724544 Candidate: 2 of 2 Period: 1.490 d



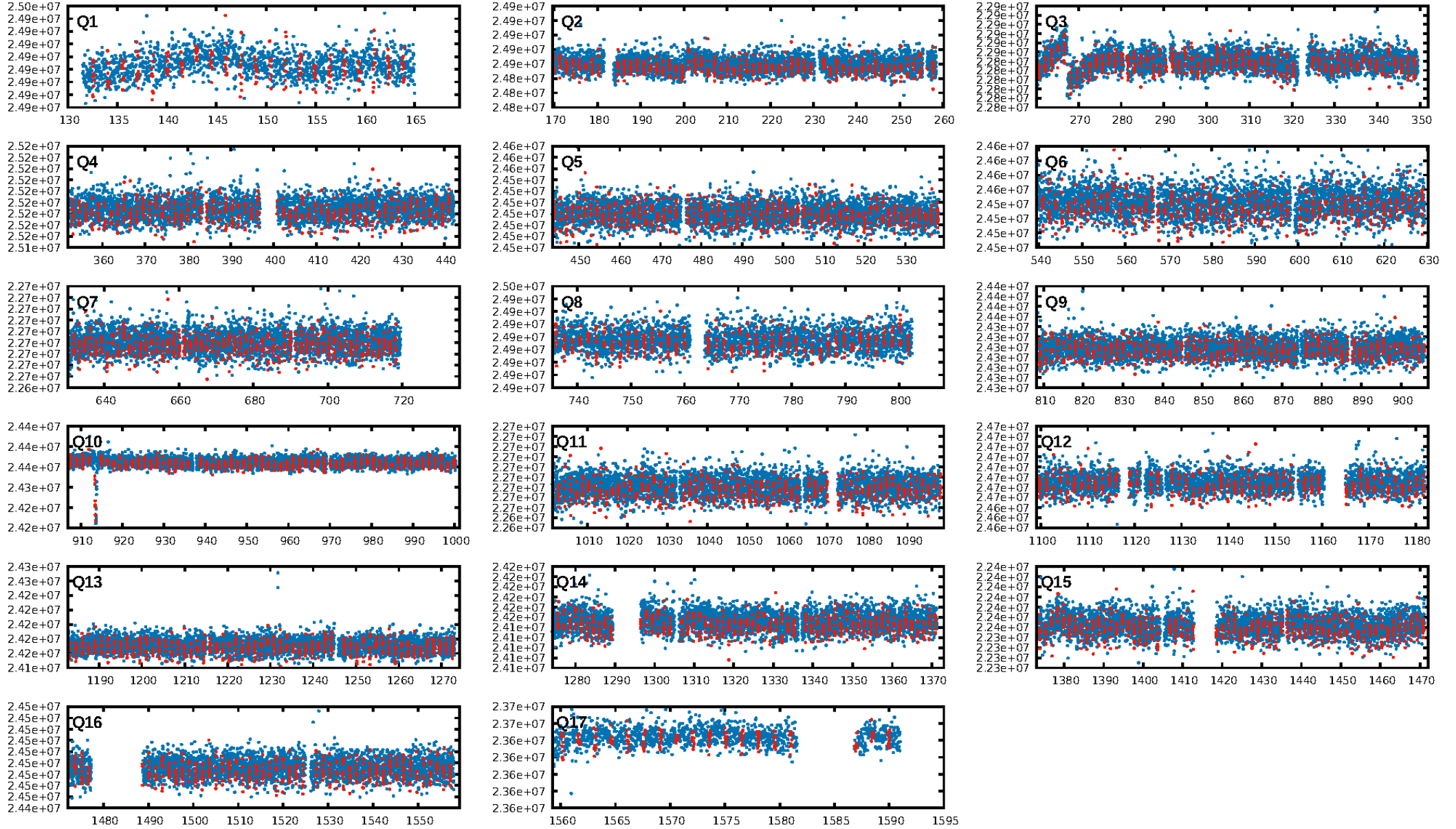
DV Fit Results:

Period = 1.49019 [0.00001] d
Epoch = 132.5639 [0.0023] BKJD
Rp/R* = 0.0111 [0.0041]
a/R* = 2.09 [3.05]
b = 0.93 [0.29]
Seff = 991.08 [312.74]
Teff = 1431 [113] K
Rp = 0.95 [0.42] Re
a = 0.0243 [0.0050] AU
Ag = 7.65 [6.45] [1.03 σ]
Teffp = 3679 [732] K [3.04 σ]

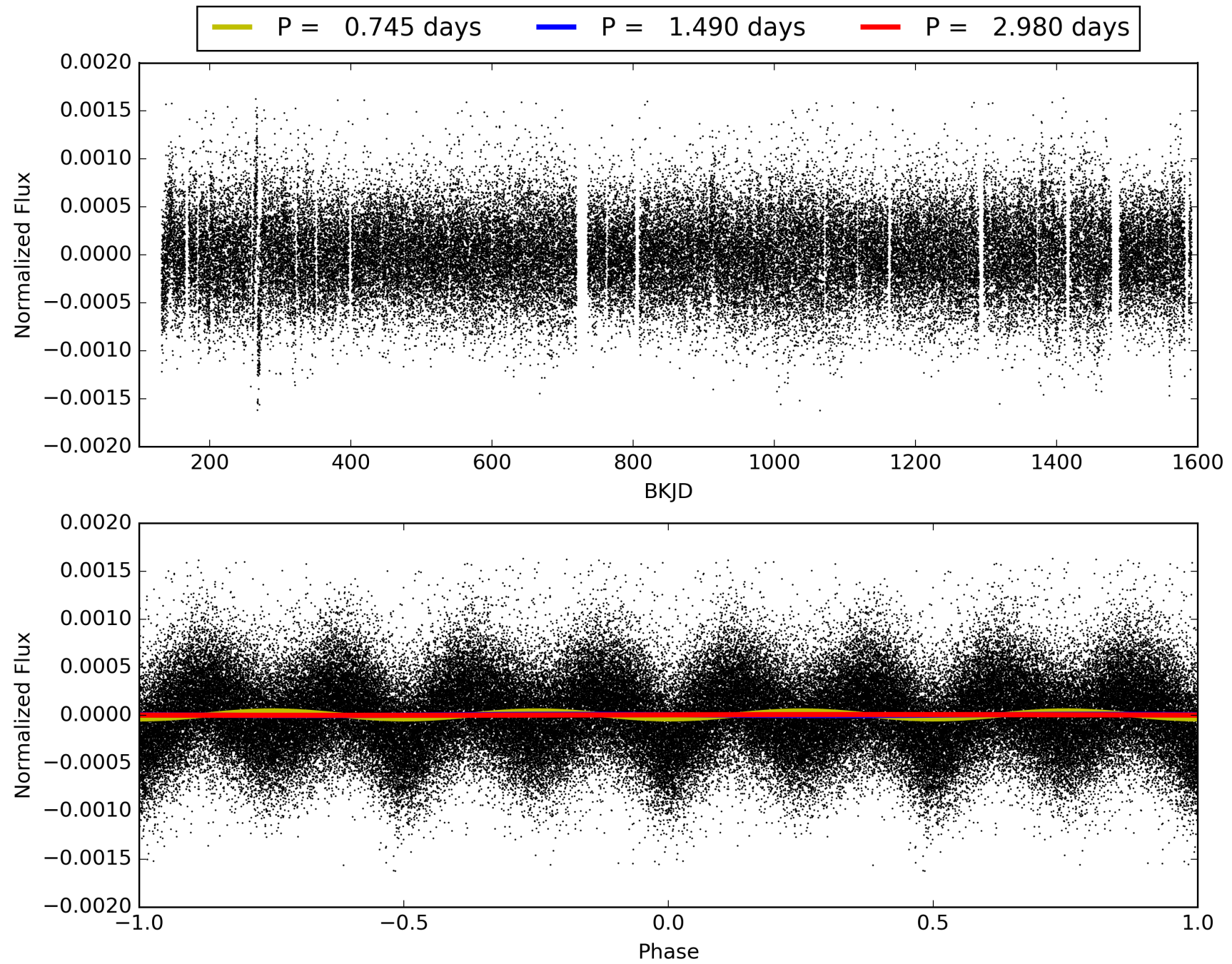
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.05e-50
RollingBand-fgt: 1.00 [861/861]
GhostDiagnostic-chr: 0.3058
Centroid-sig: 0.0%
Centroid-so: 5.219 arcsec [4.86 σ]
OotOffset-rm: 1.940 arcsec [6.49 σ]
KicOffset-rm: 2.011 arcsec [6.44 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 010724544-02, PDC Light Curves

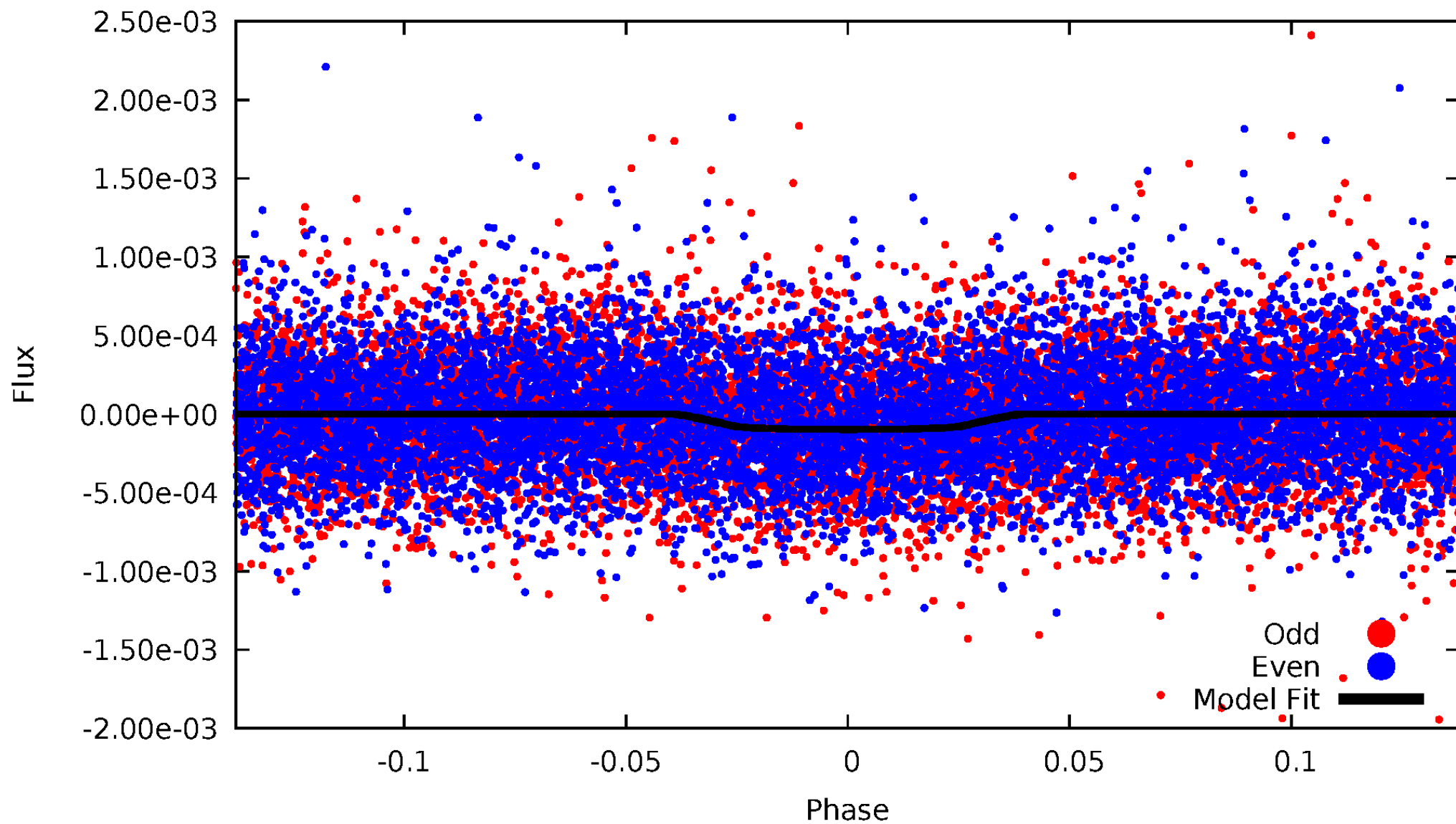


TCE 010724544-02



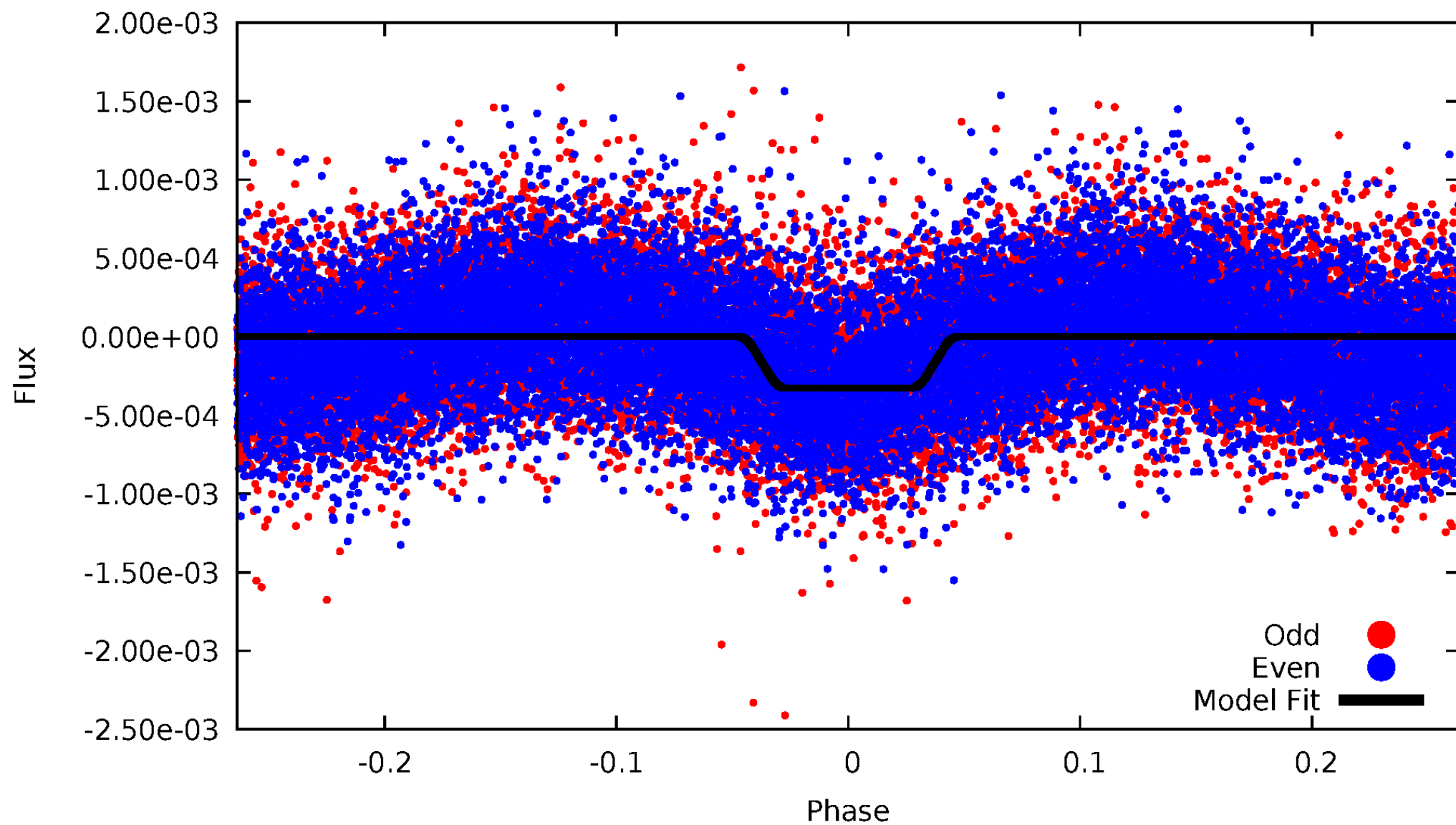
DV Odd/Even

TCE 010724544-02



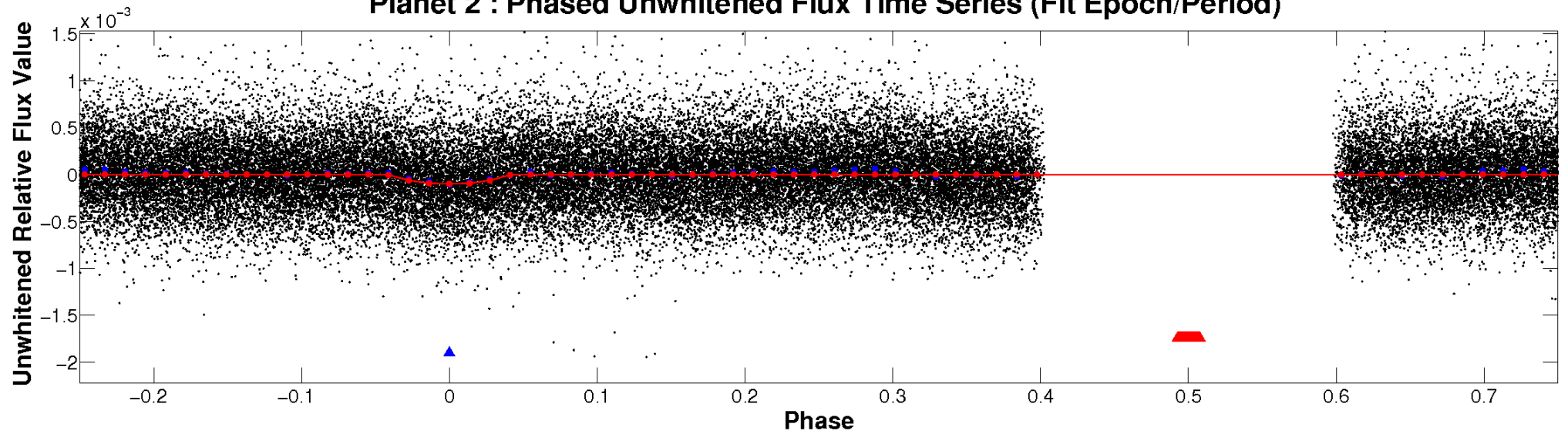
ALT Odd/Even

TCE 010724544-02

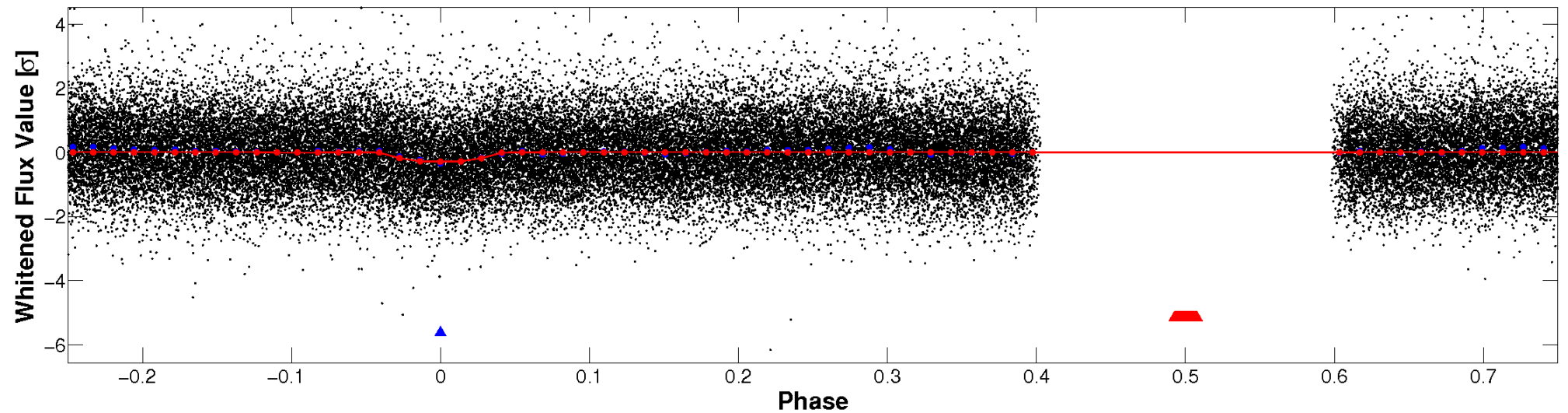


Non-Whitened Vs. Whitened Light Curve

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

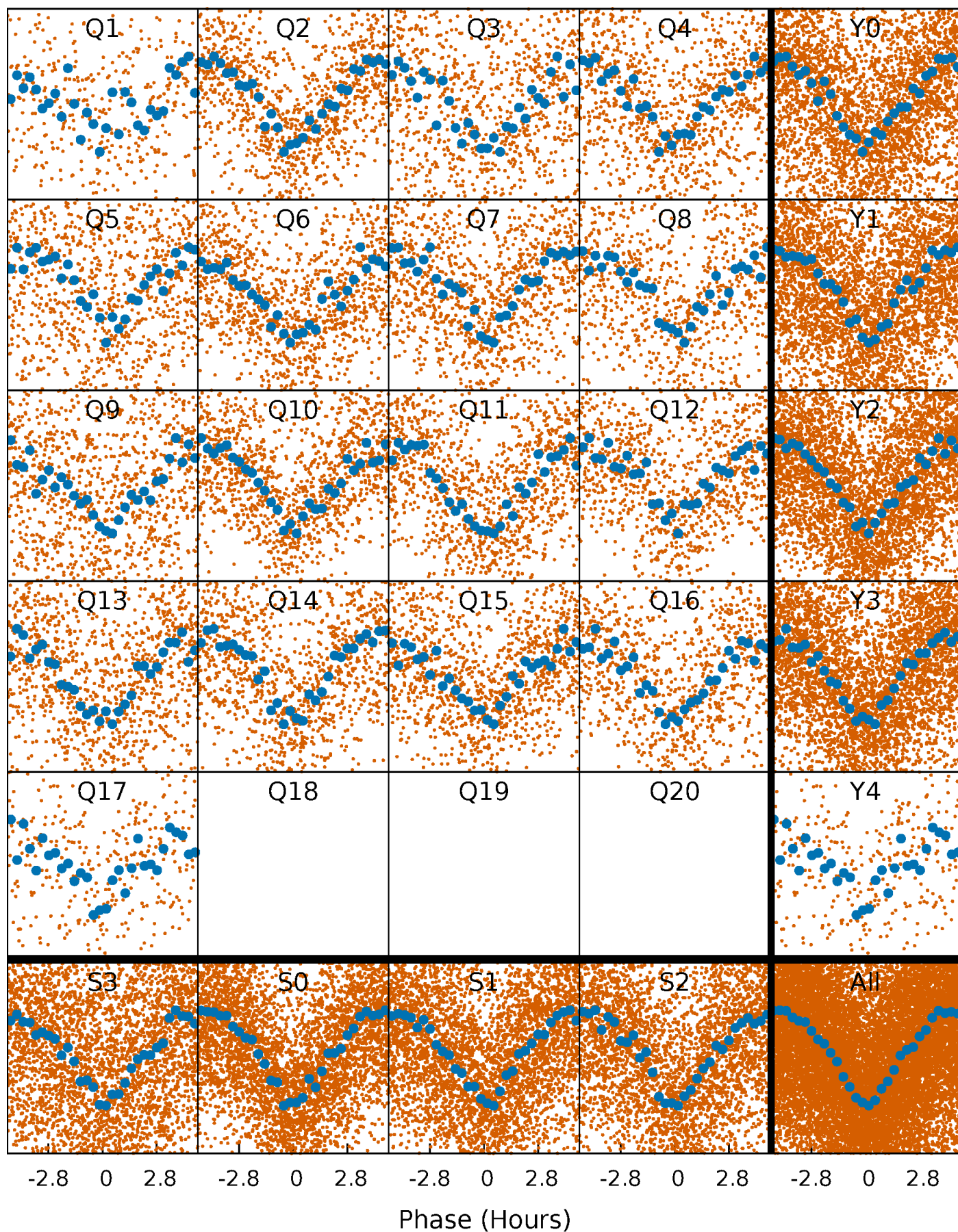


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



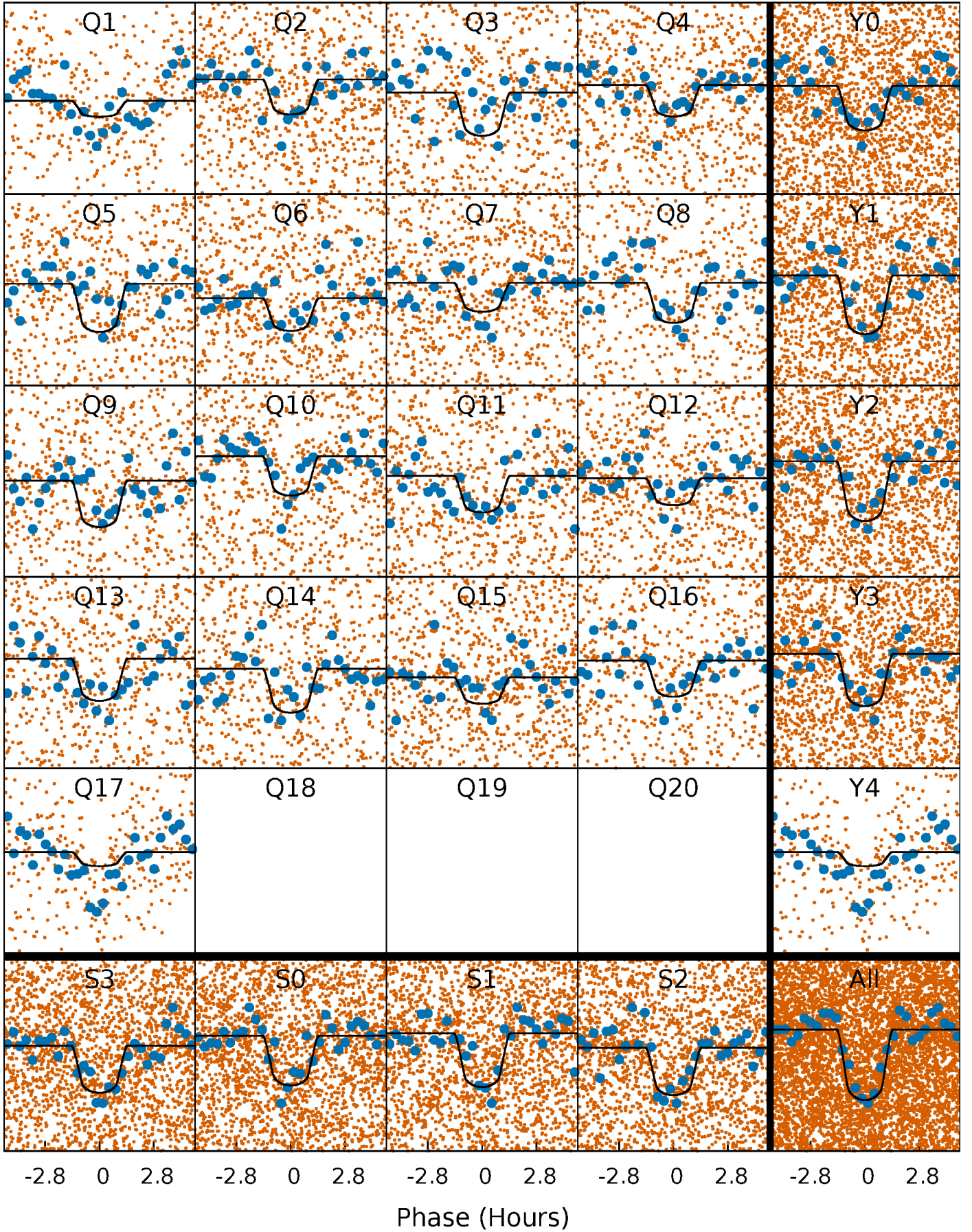
PDC Quarter-Phased Transit Curves

TCE 010724544-02 P= 1.490188 Days $T_0=132.563930$ (BKJD)



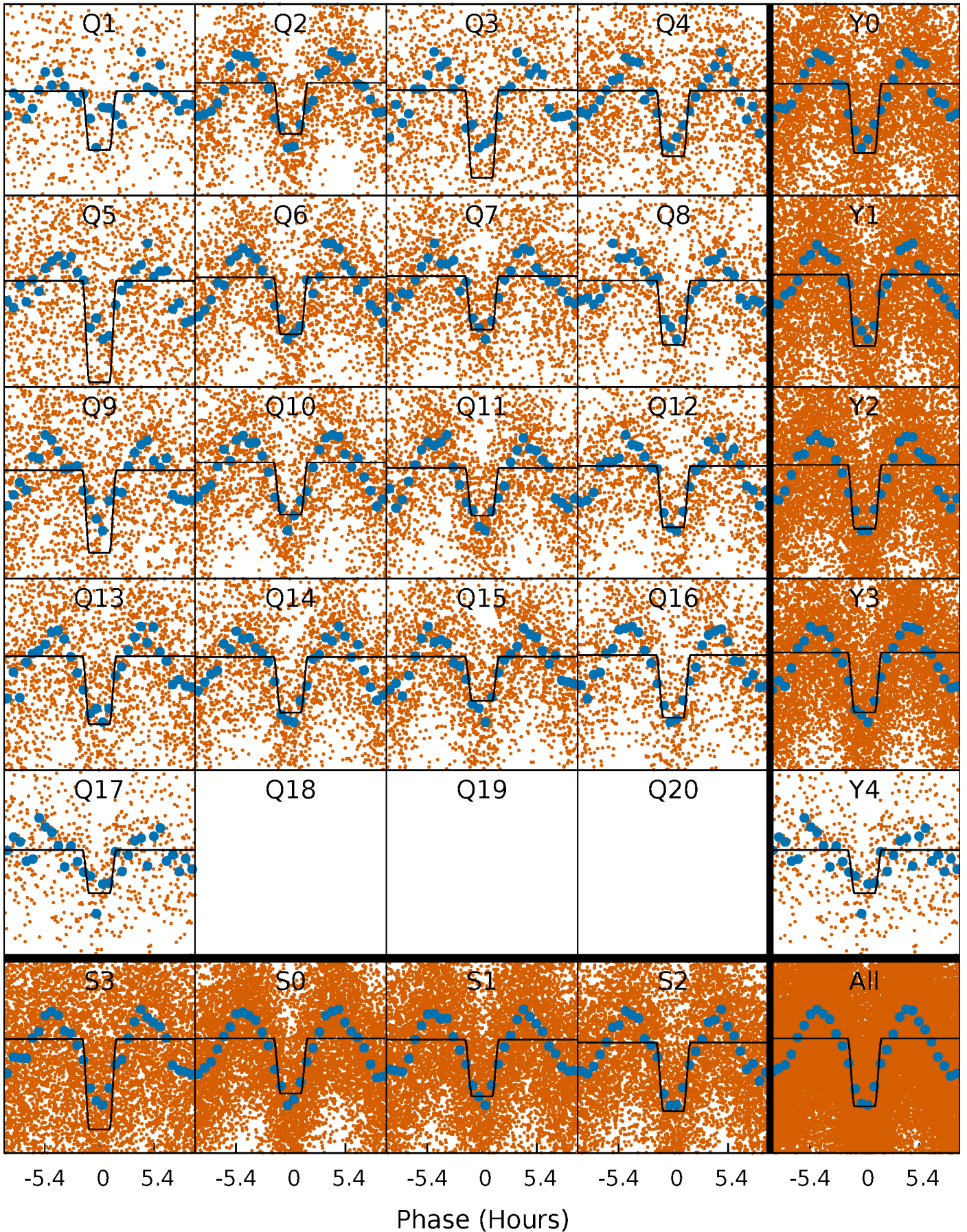
DV Quarter-Phased Transit Curves

TCE 010724544-02 P= 1.490188 Days $T_0=132.563930$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

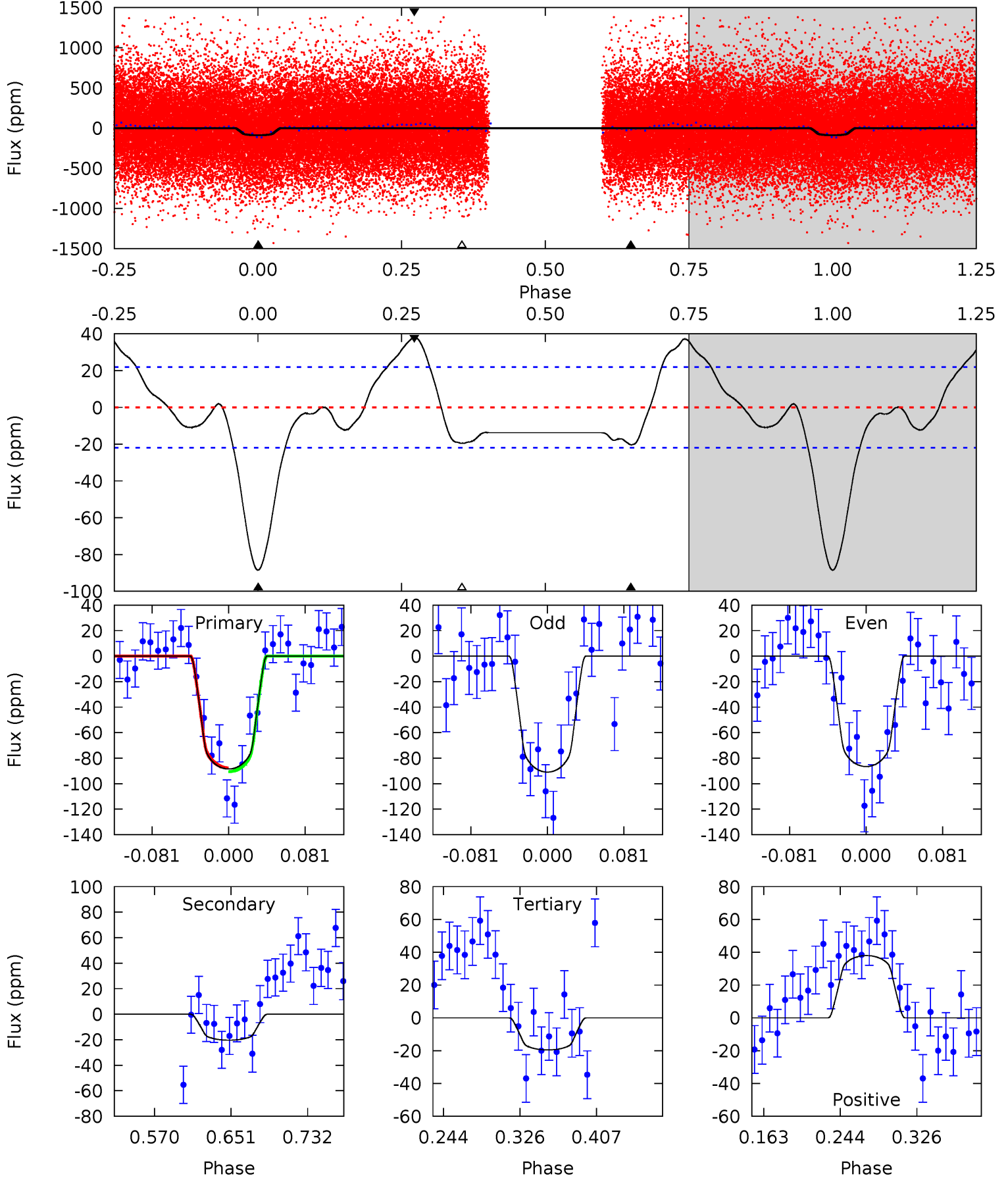
TCE 010724544-02 $P = 1.490186$ Days $T_0 = 132.567841$ (BKJD)



DV Model-Shift Uniqueness Test

010724544-02, P = 1.490188 Days, E = 131.073742 Days

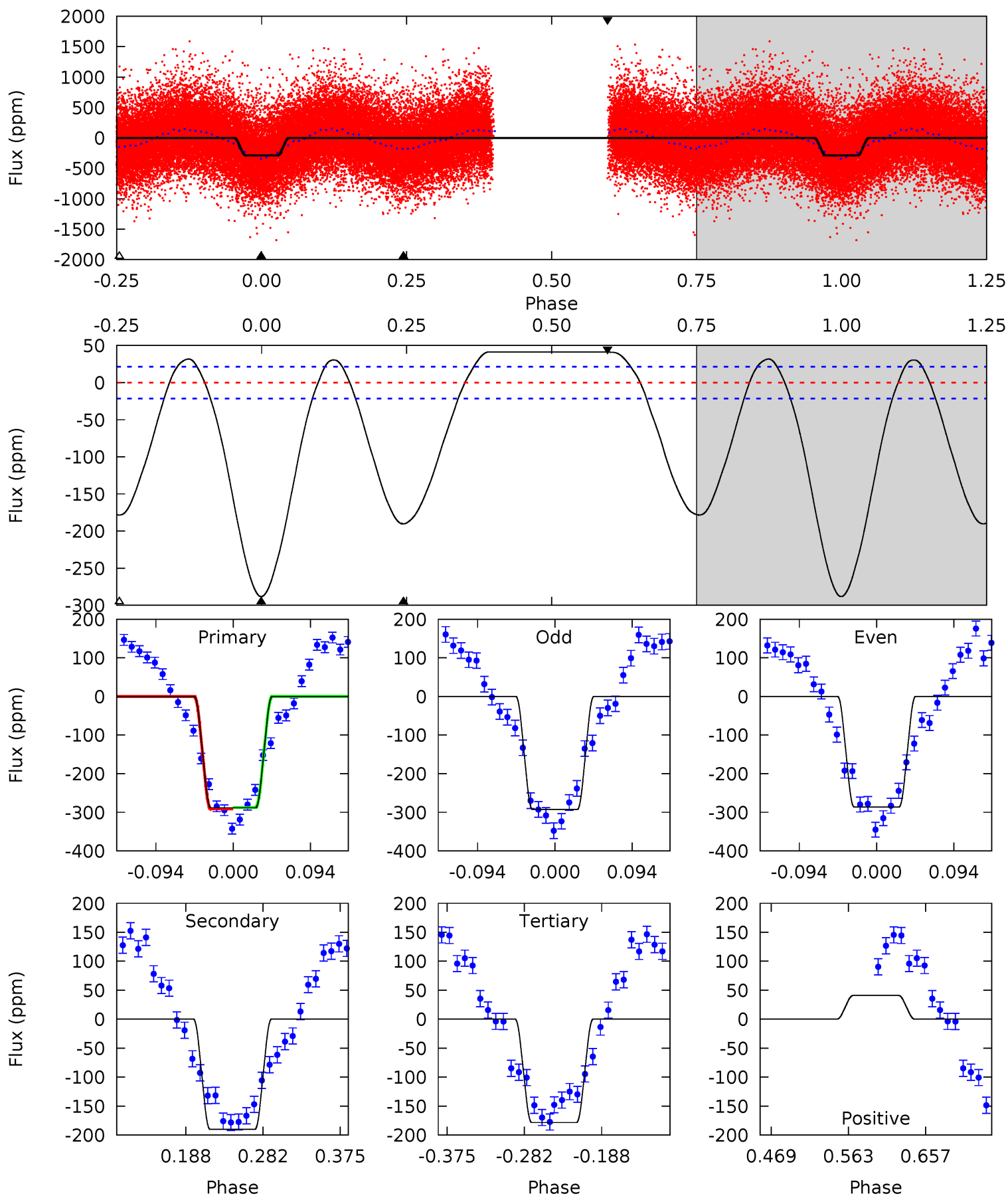
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.6	4.27	4.10	7.97	4.61	1.74	3.78	14.5	10.6	0.17	-3.70	0.46	0.96	0.30	0.30



Alt Model-Shift Uniqueness Test

010724544-02, P = 1.490186 Days, E = 131.077655 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
61.5	40.6	38.1	8.78	4.58	1.68	15.9	23.5	52.8	2.52	31.8	0.71	1.02	0.13	0.45



Stellar Parameters For KIC 010724544

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5715^{+154}_{-154}	$4.586^{+0.040}_{-0.160}$	$-0.400^{+0.300}_{-0.300}$	$0.782^{+0.195}_{-0.065}$	$0.872^{+0.088}_{-0.098}$	$2.571^{+0.424}_{-1.177}$
	+3%/-3%	+1%/-3%	+75%/-75%	+25%/-8%	+10%/-11%	+16%/-46%
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 010724544-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-20 ± 5	$1.00^{+0.41}_{-0.39}$	2035^{+116}_{-82}	3895^{+806}_{-451}	$6.368^{+10.351}_{-3.257}$
Alt.	-190 ± 5	$1.64^{+0.37}_{-0.38}$	2039^{+124}_{-78}	5038^{+571}_{-407}	23^{+15}_{-8}

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 $A_{obs} \gg 1.0$

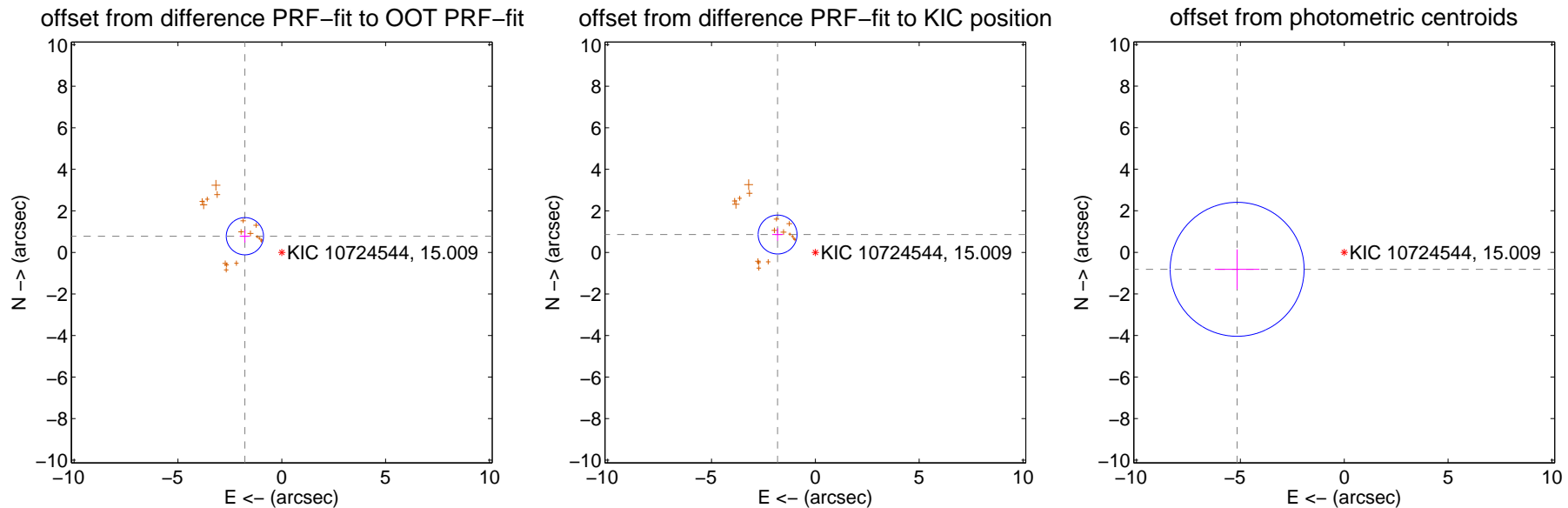
DV Centroid Data

Supplemental centroid analysis for 010724544-02. Kepler magnitude: 15.01. Transit SNR 16.10

There are 0 quarters with good PRF difference image offsets

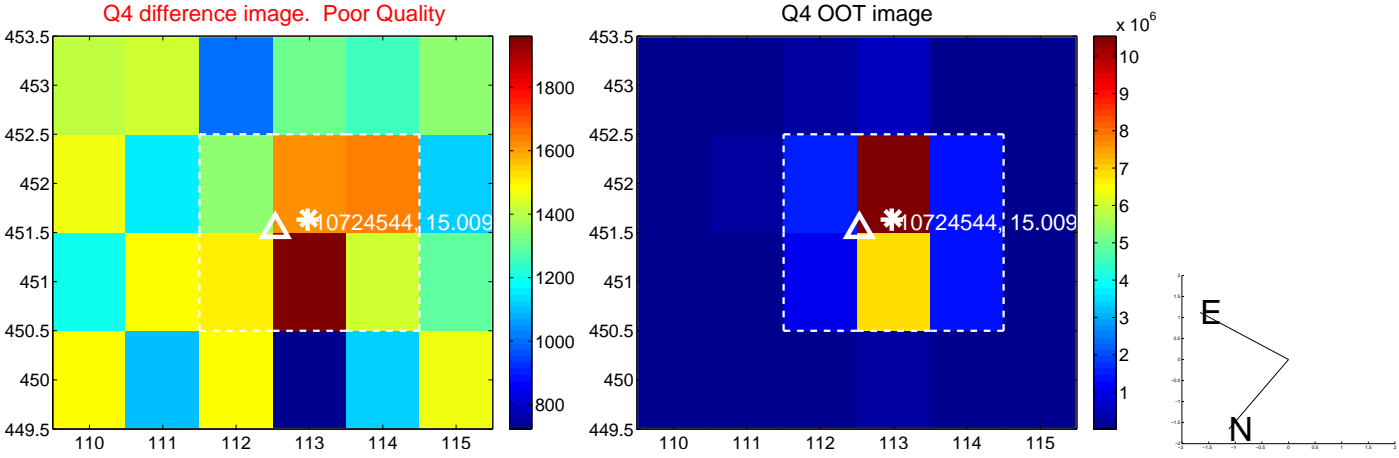
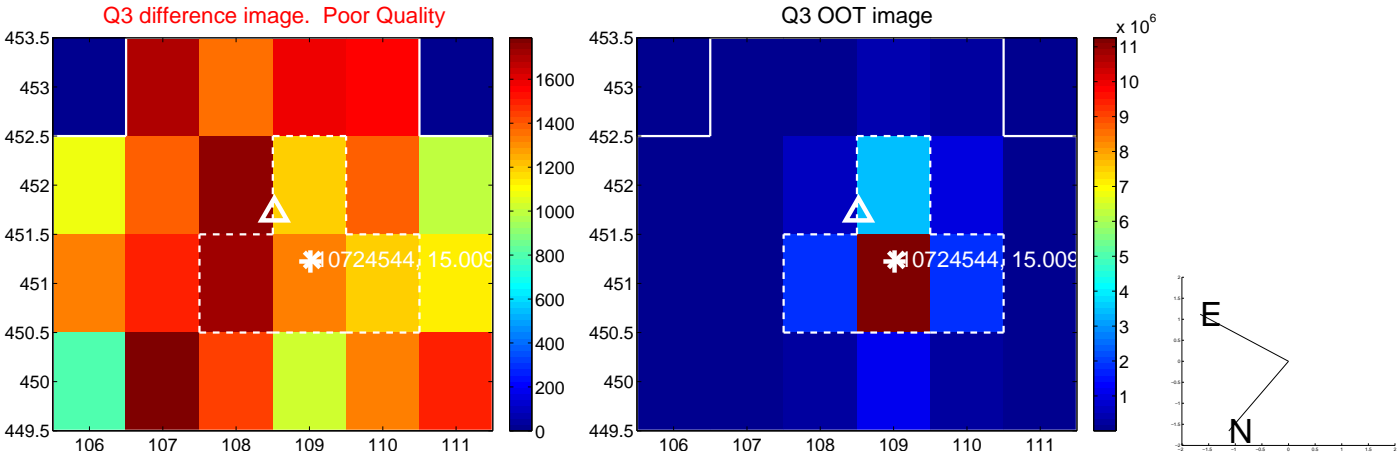
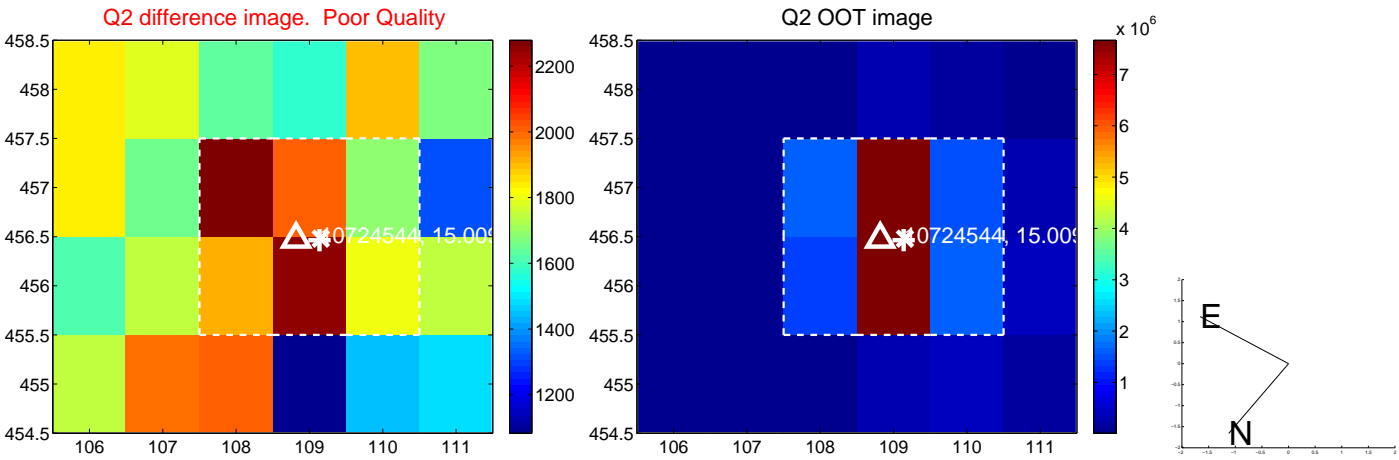
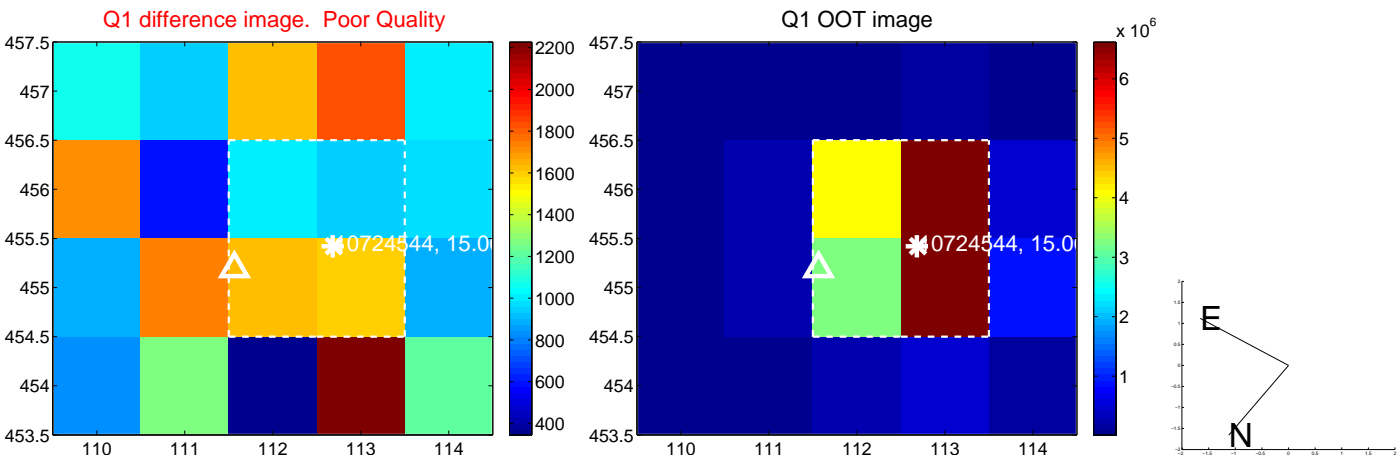
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.940 ± 0.299	6.49	1.776 ± 0.250	0.781 ± 0.306
PRF-fit source offset from KIC position	2.011 ± 0.312	6.44	1.818 ± 0.262	0.861 ± 0.304
photometric centroid source offset	5.22 ± 1.07	4.86	5.16 ± 1.08	-0.82 ± 0.96

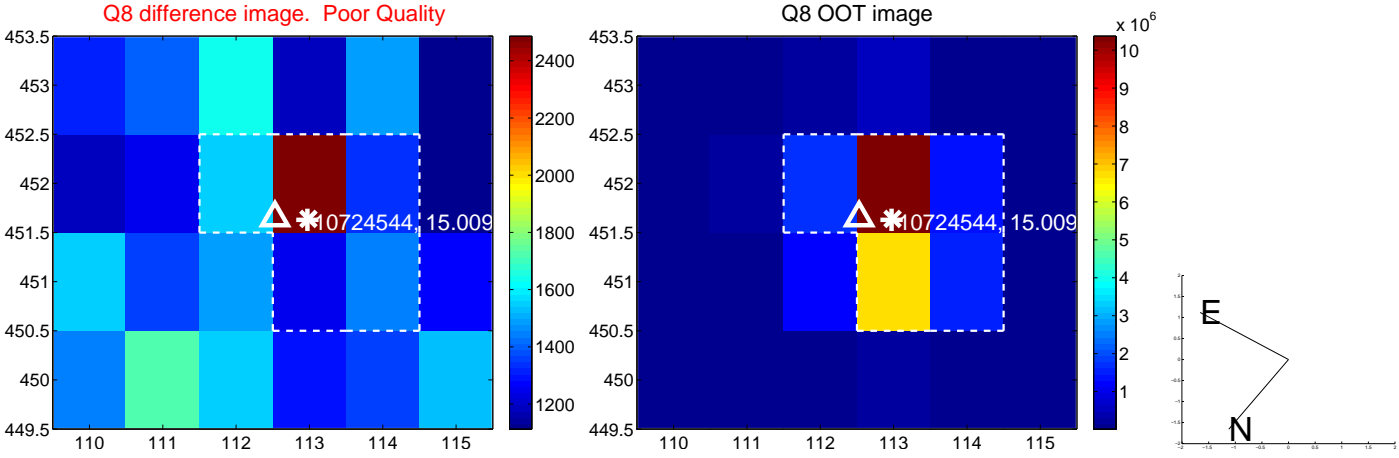
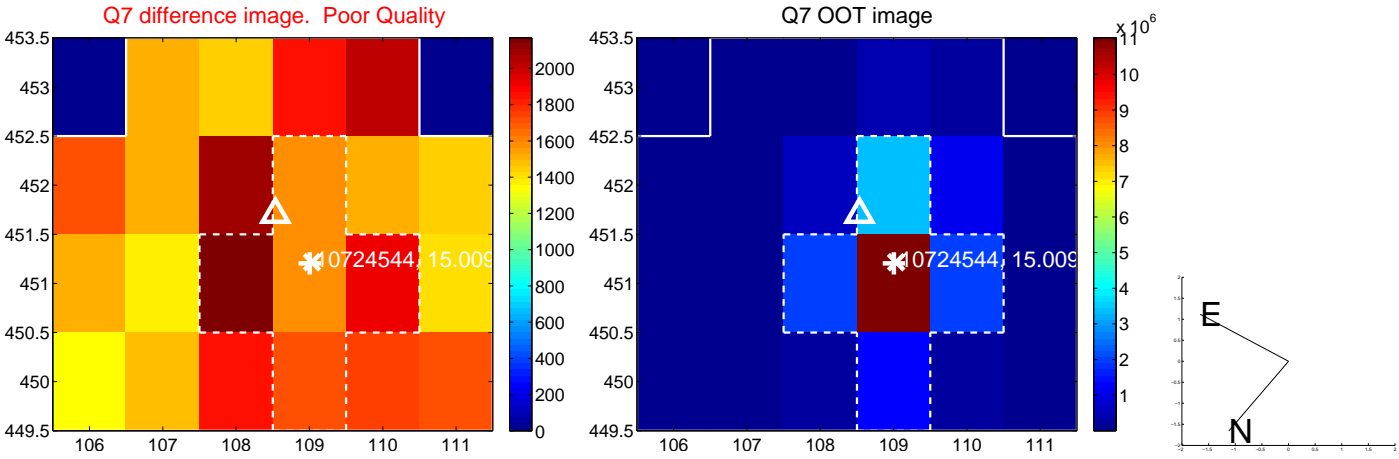
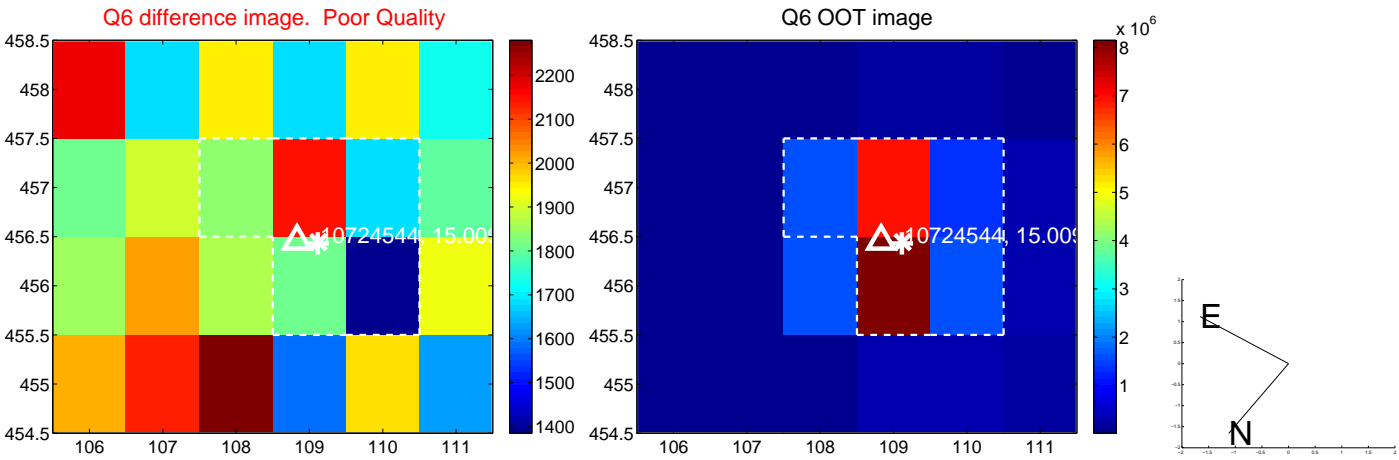
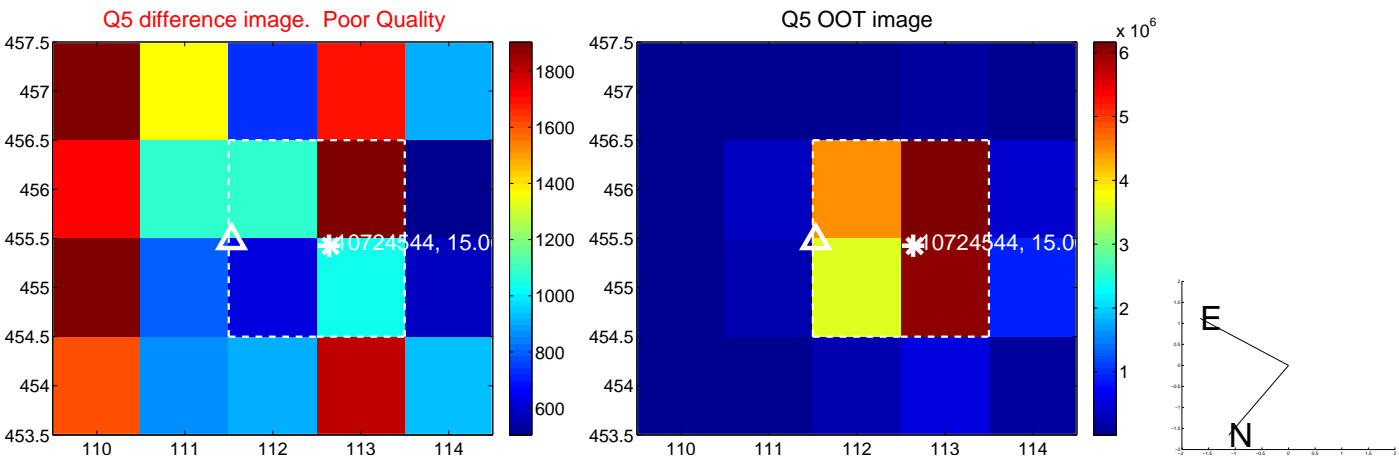


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

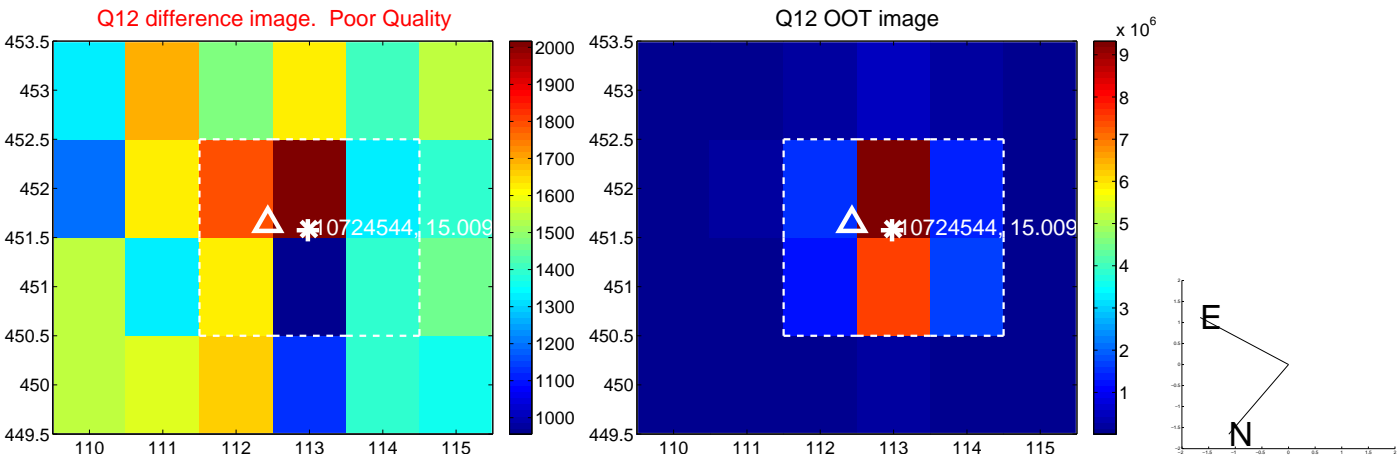
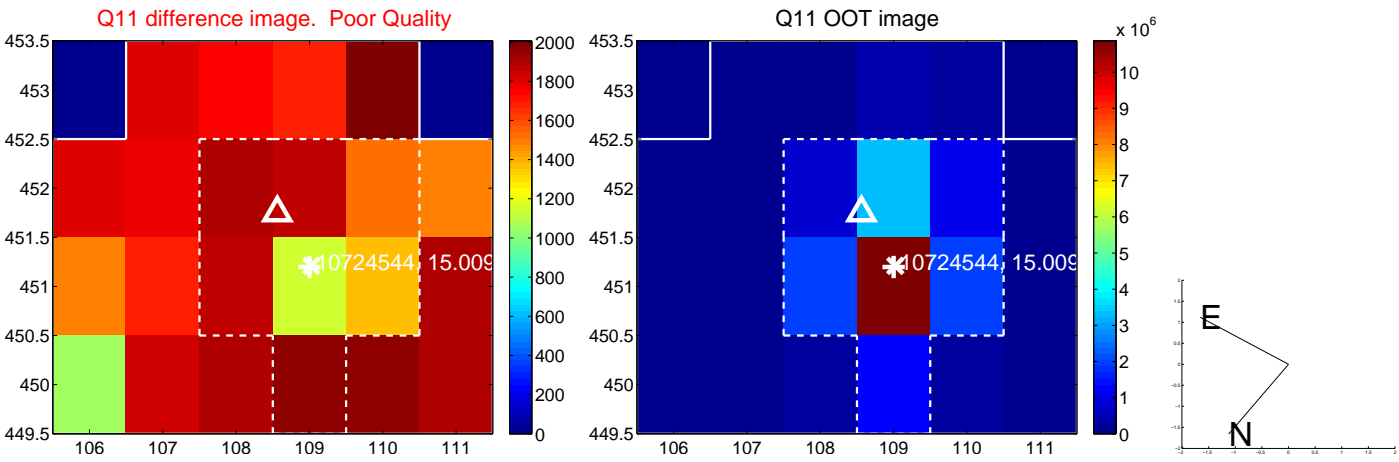
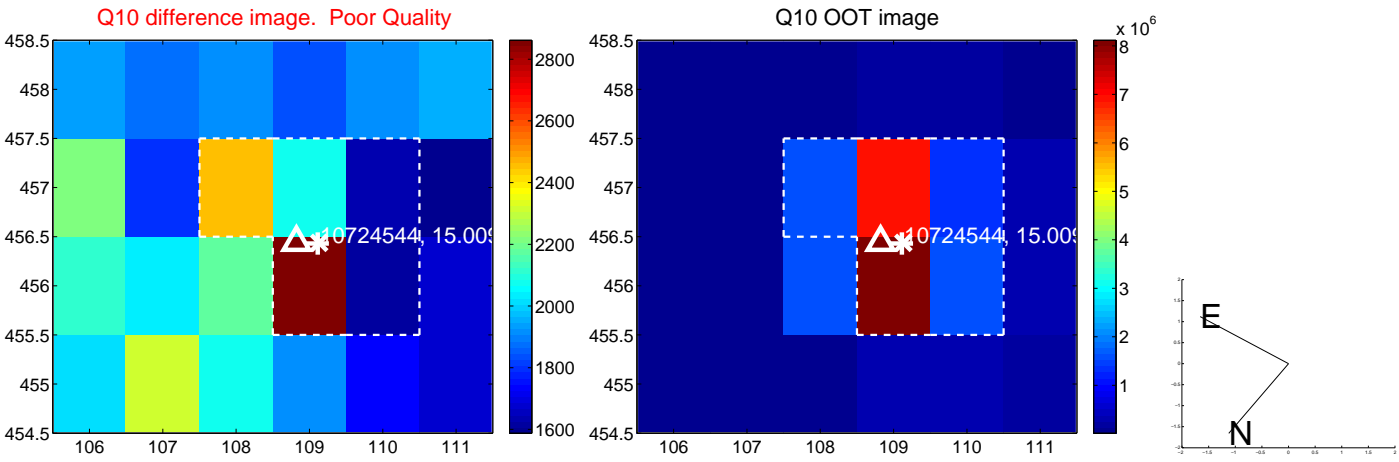
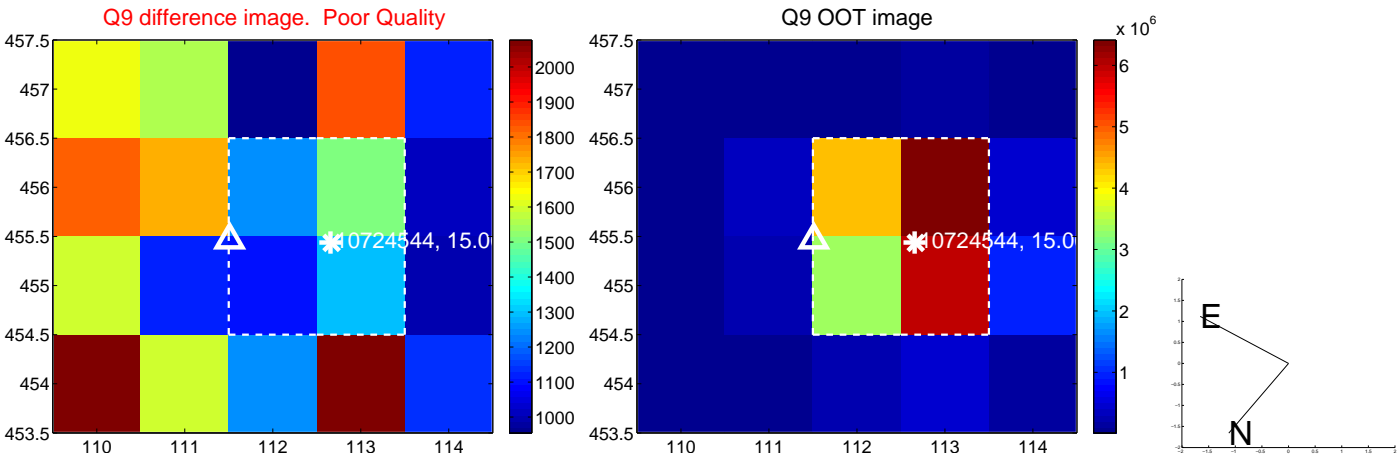
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



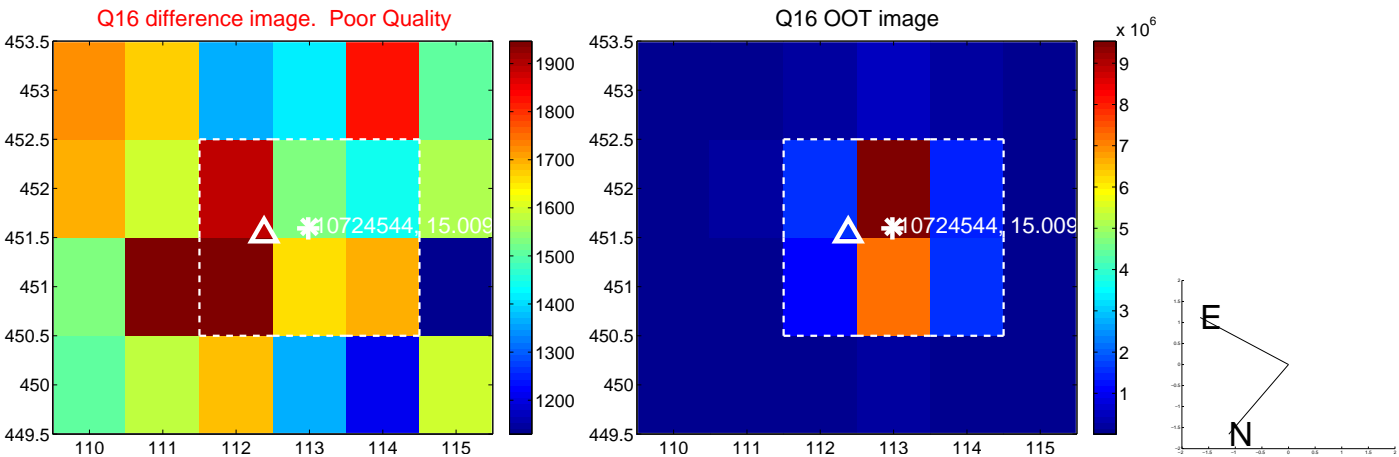
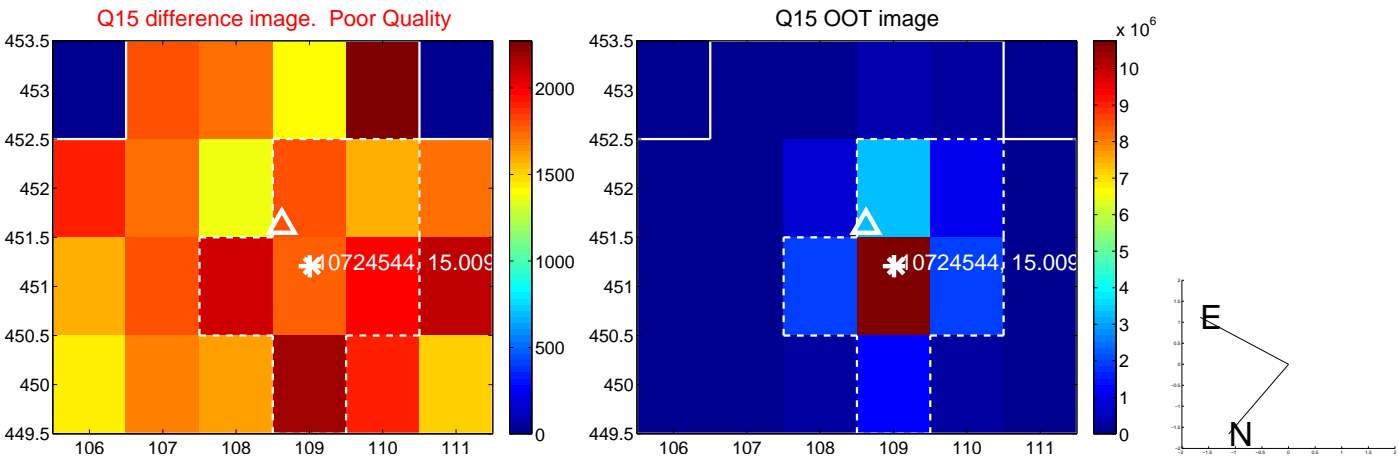
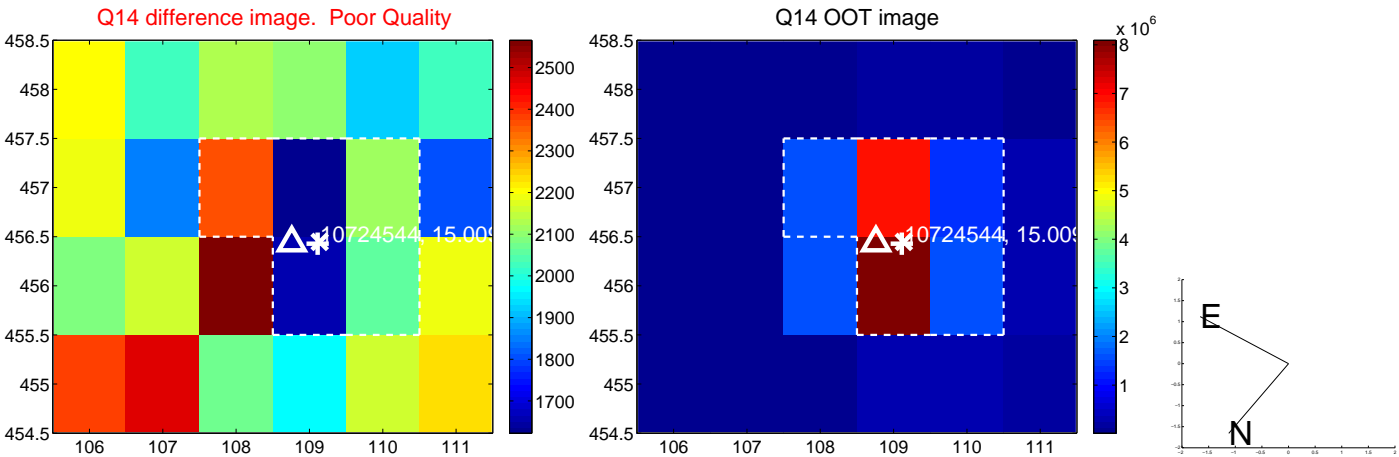
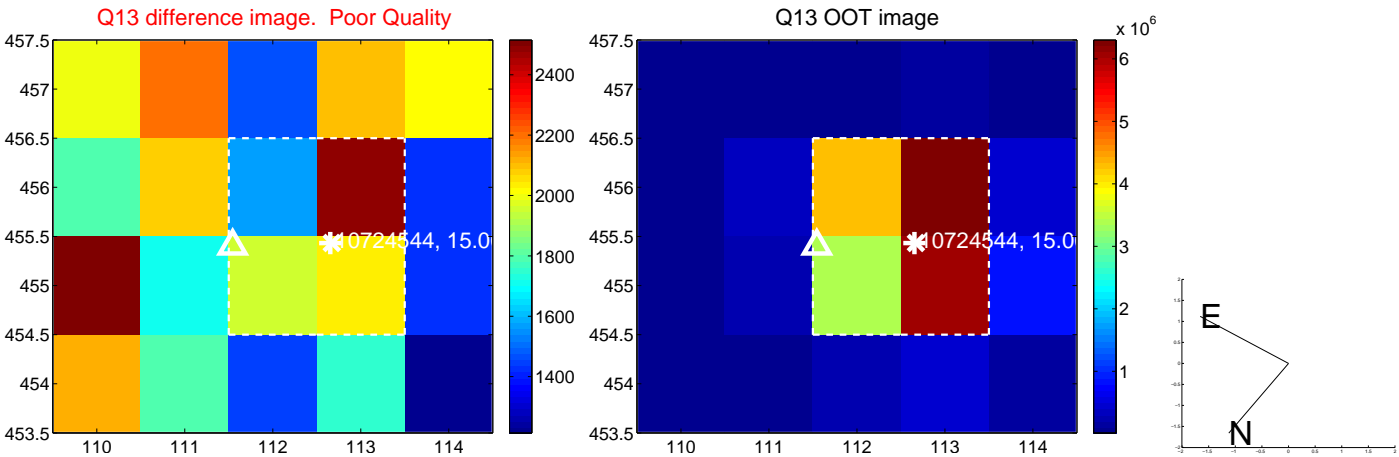
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



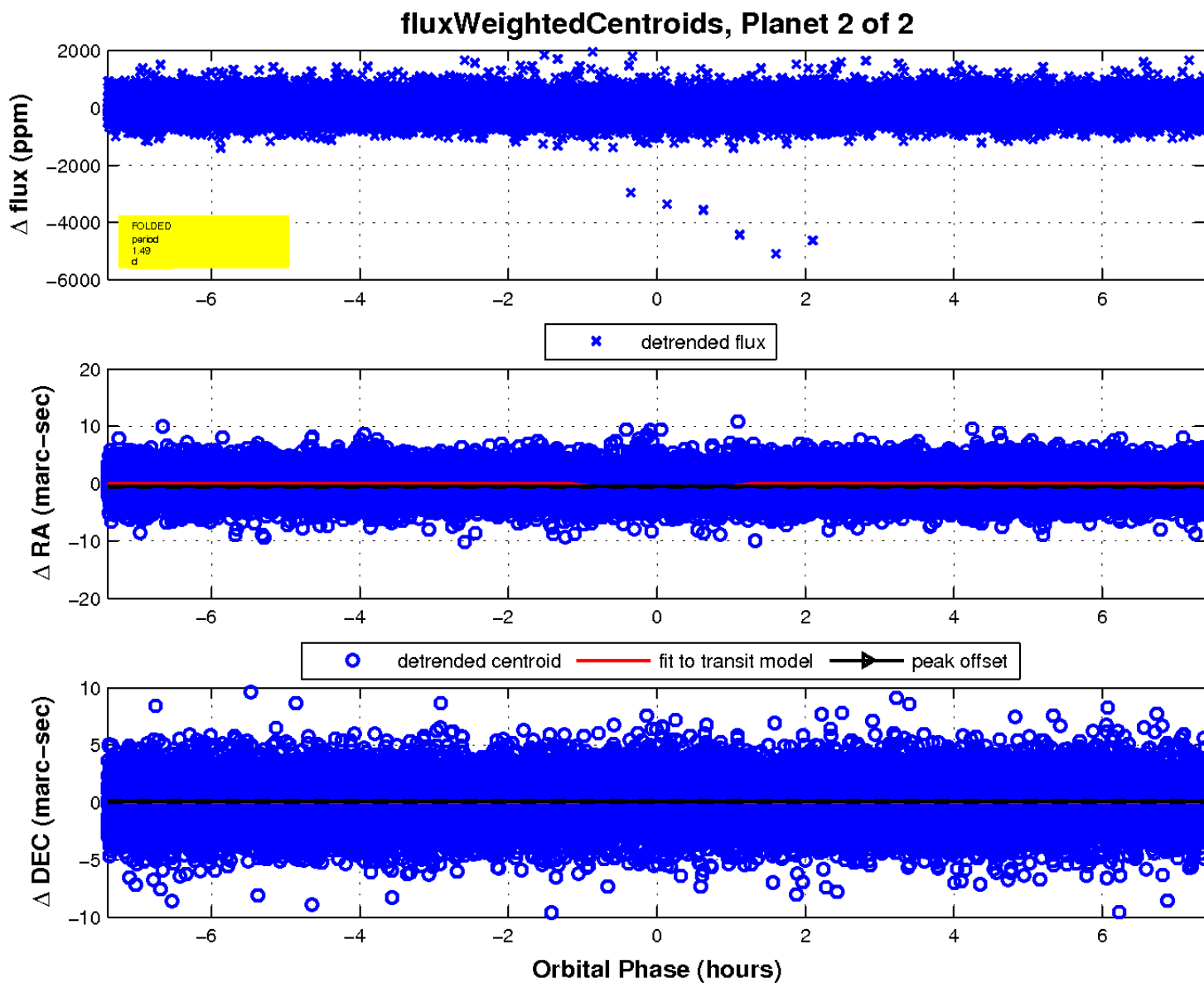
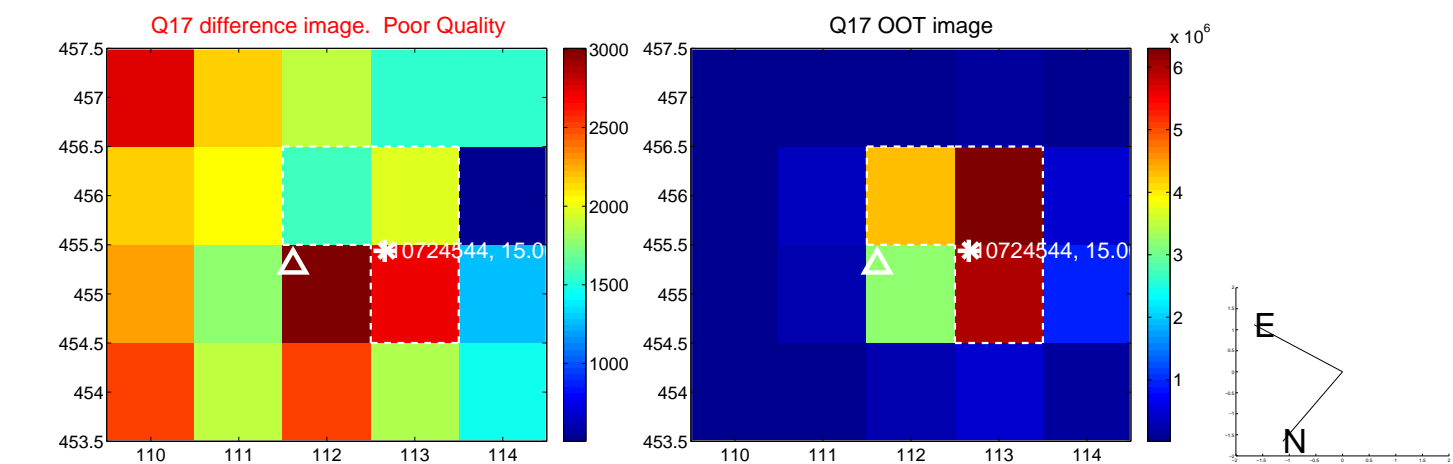
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

