

KIC 005305404

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})
005305404-01	OBS	3820.01	161.253175	189.101434	2868.7	23.492	82.2	69.4	0.81	5985	5.06	2.41
005305404-02	OBS	No	161.261324	216.371426	1395.2	47.219	26.7	48.8	0.81	5985	3.59	2.41

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005305404-01	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
005305404-02	OBS	FP	0.00	1	0	1	1	SAME_NTL_PERIOD—CENT_FEW_DIFFS—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 005305404-01

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
005305404-01	5305404	005217733-pri	5217733	1:1	49.4	12	-2	7.39	14.72	35.17	Direct-PRF	0	0.07	0.36

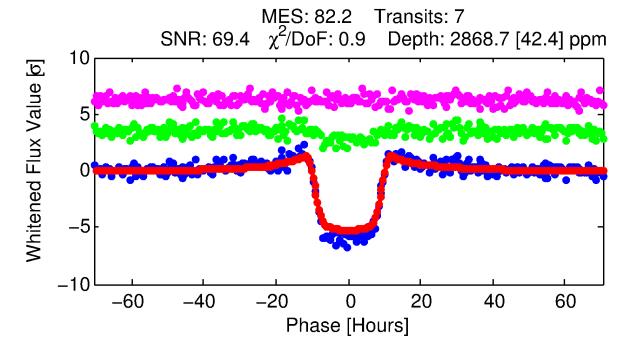
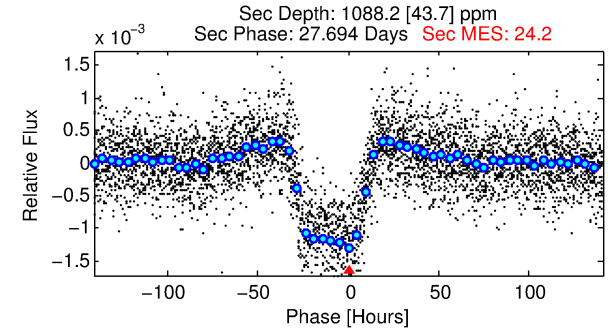
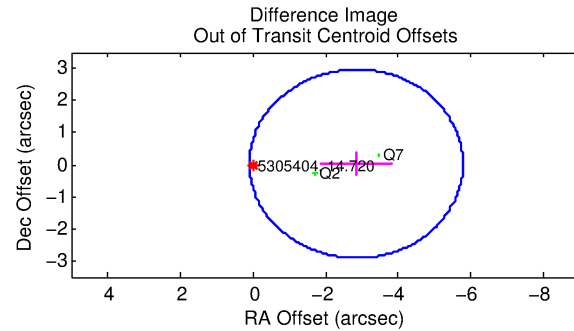
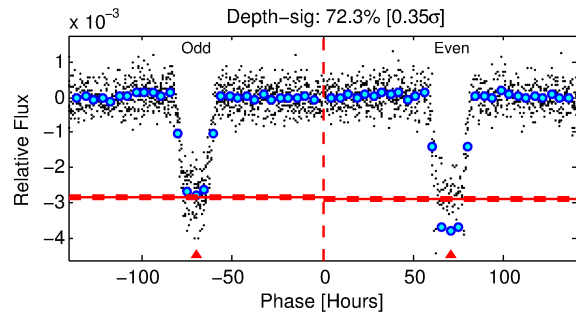
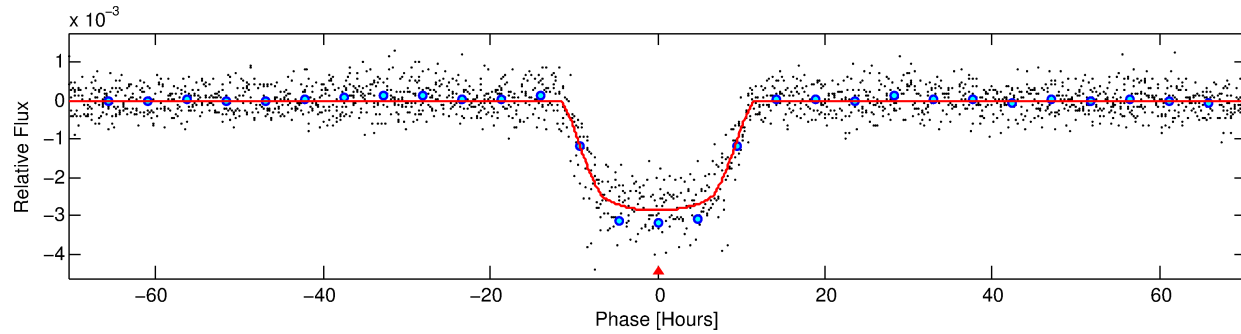
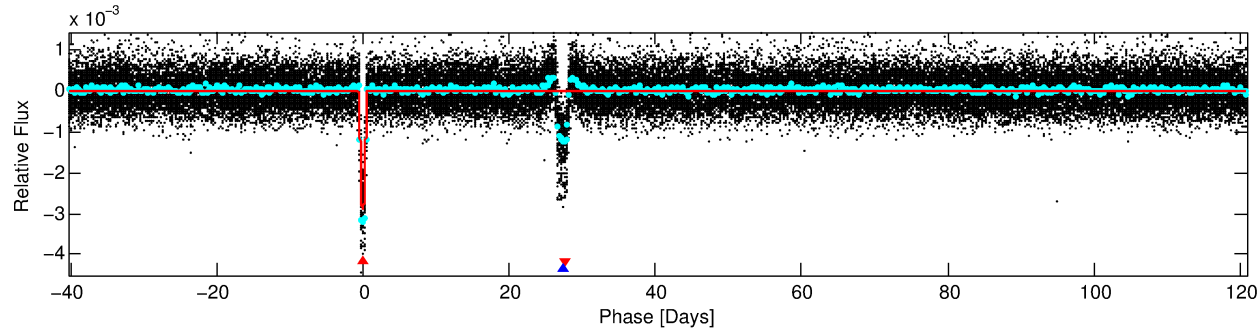
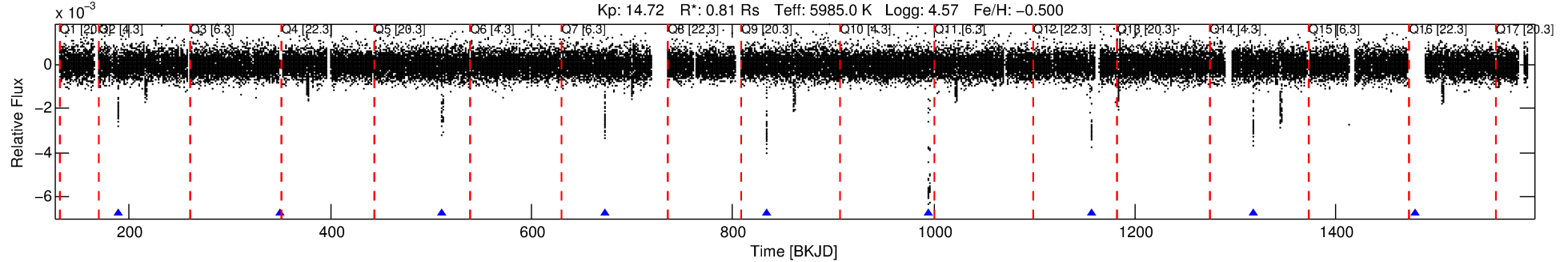
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 5305404 Candidate: 1 of 2 Period: 161.253 d

KOI: K03820.01 Corr: 0.985

Kp: 14.72 R*: 0.81 Rs Teff: 5985.0 K Logg: 4.57 Fe/H: -0.500



DV Fit Results:

Period = 161.25318 [0.00138] d
Epoch = 189.1014 [0.0061] BKJD
Rp/R* = 0.0571 [0.0006]
a/R* = 30.23 [0.99]
b = 0.89 [0.01]
Seff = 2.41 [0.87]
Teq = 318 [29] K
Rp = 5.06 [1.39] Re
a = 0.5598 [0.1300] AU
Ag = 7338.87 [2518.94] [2.91σ]
Teffp = 4548 [146] K [28.49σ]

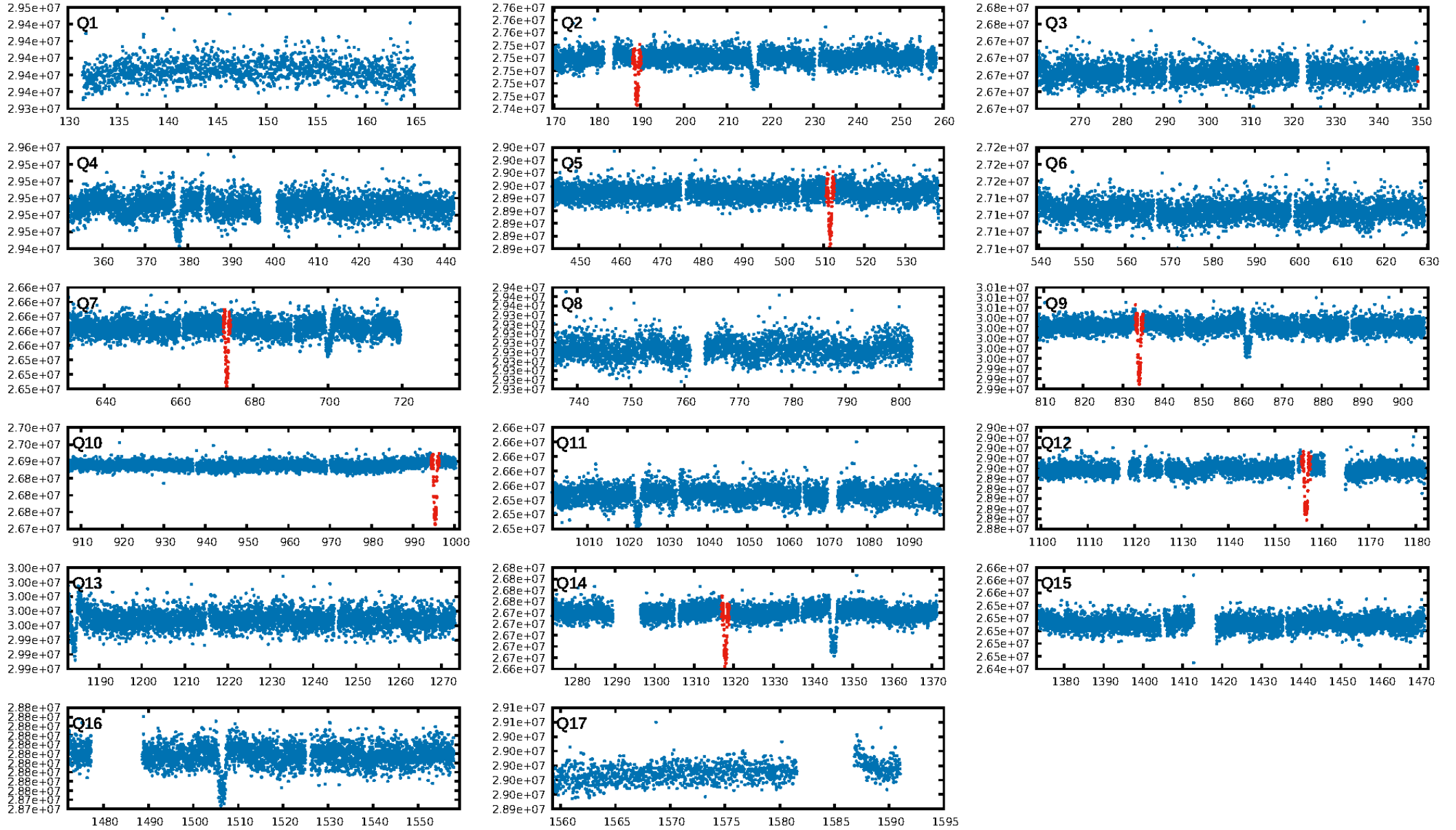
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.3% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: -0.1258
Centroid-sig: 0.0%
Centroid-so: 4.725 arcsec [16.20σ]
OotOffset-rm: 2.845 arcsec [2.91σ]
KicOffset-rm: 2.863 arcsec [2.87σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [6/6]

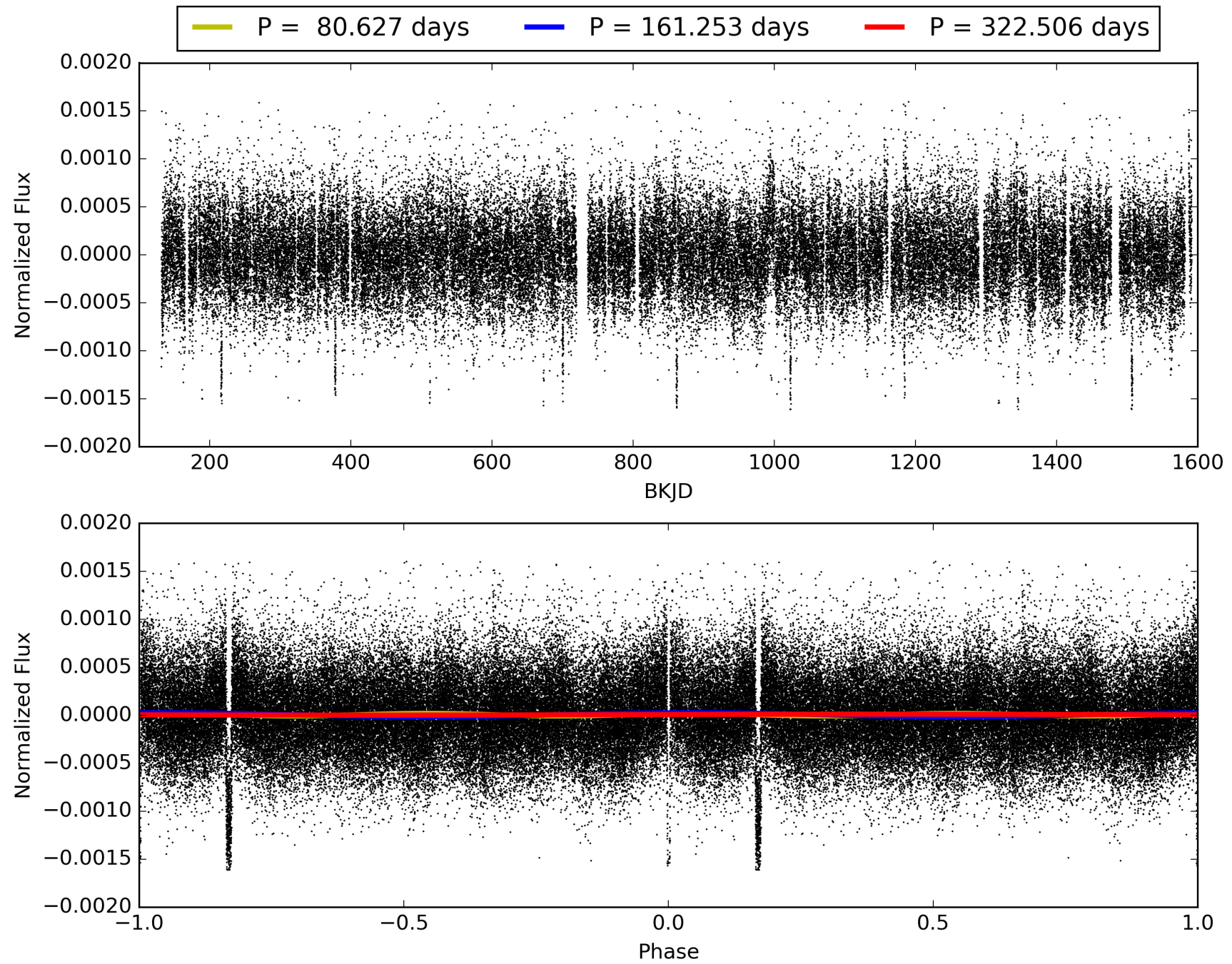
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005305404-01, PDC Light Curves

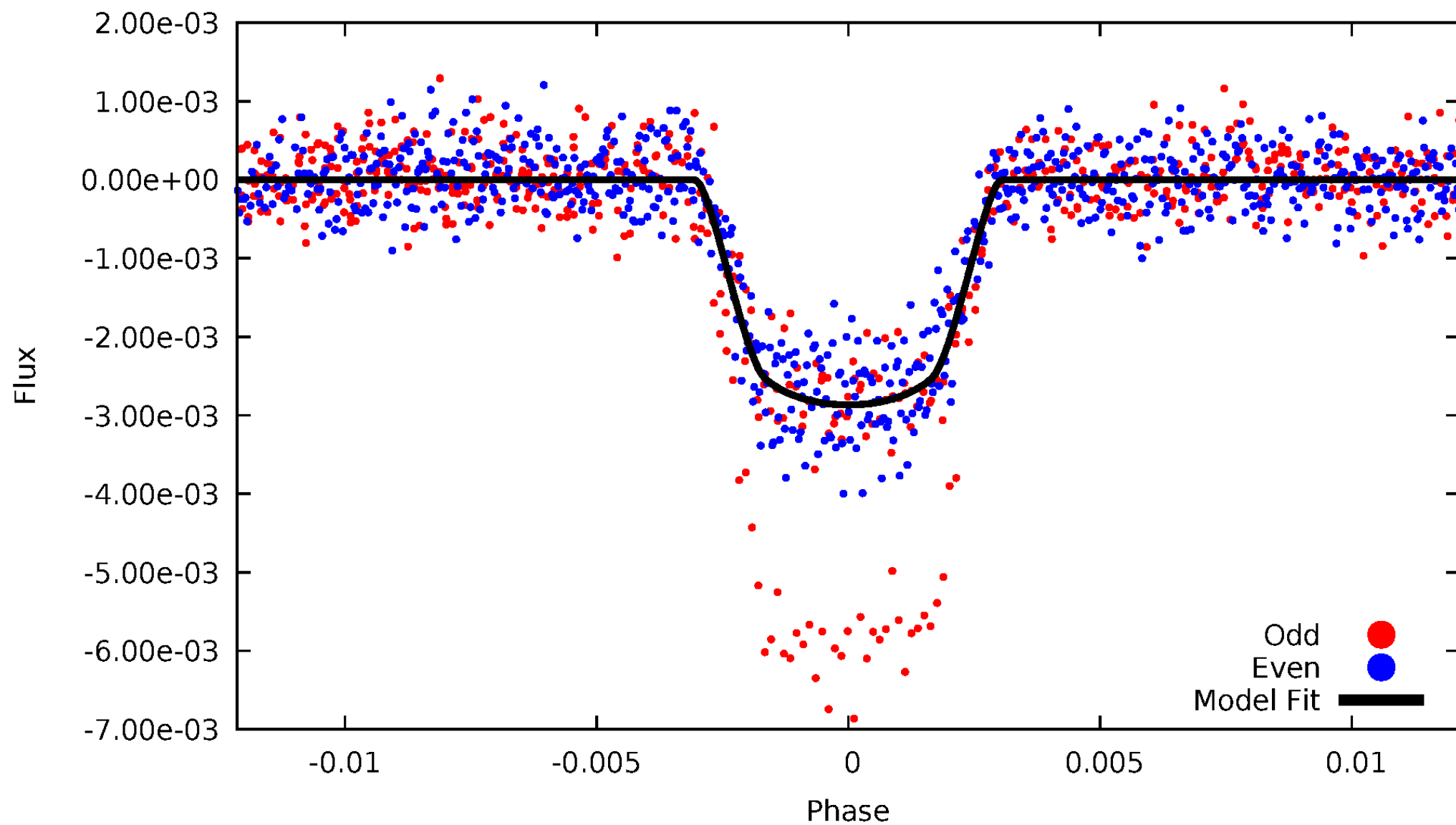


TCE 005305404-01



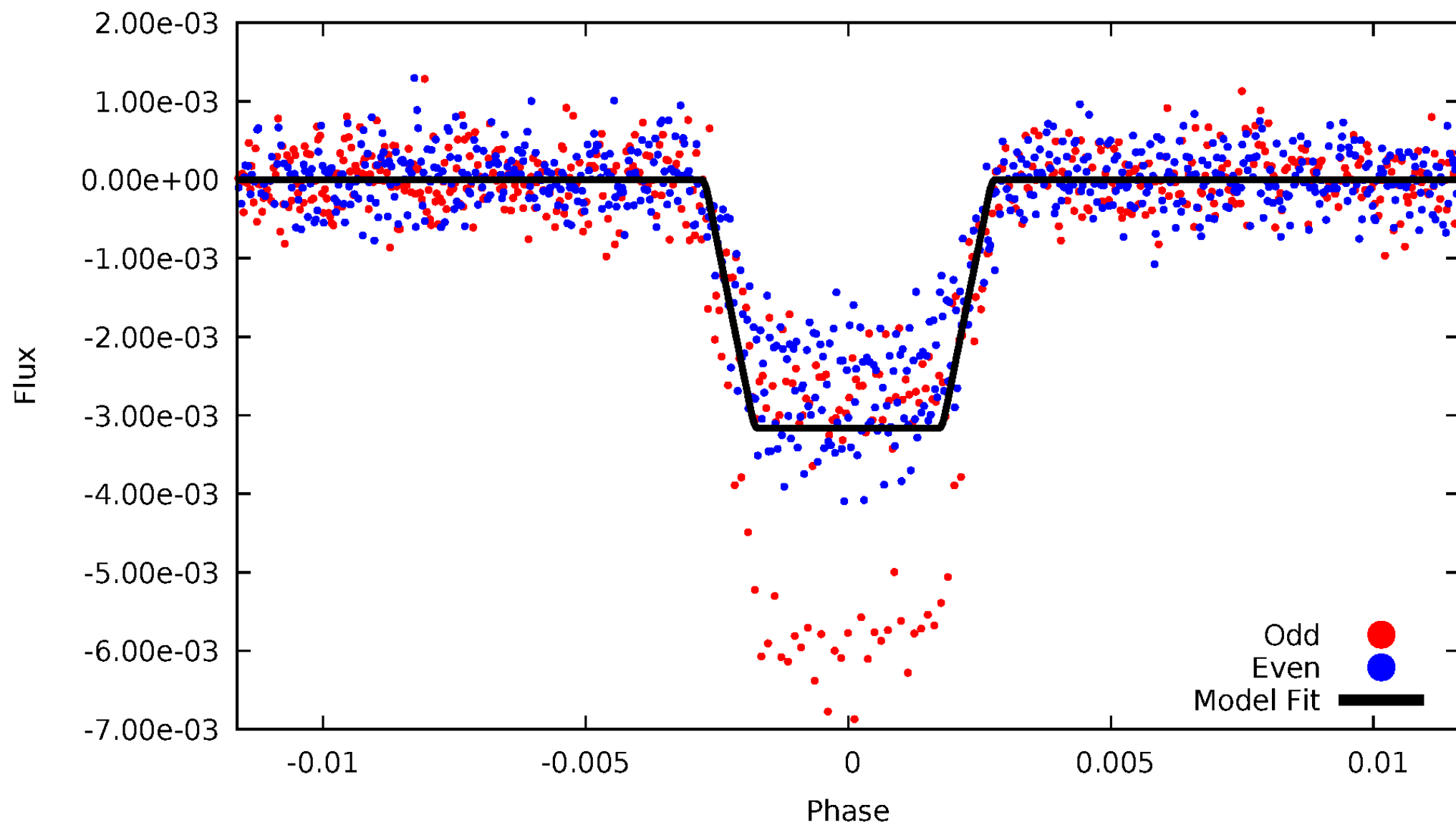
DV Odd/Even

TCE 005305404-01

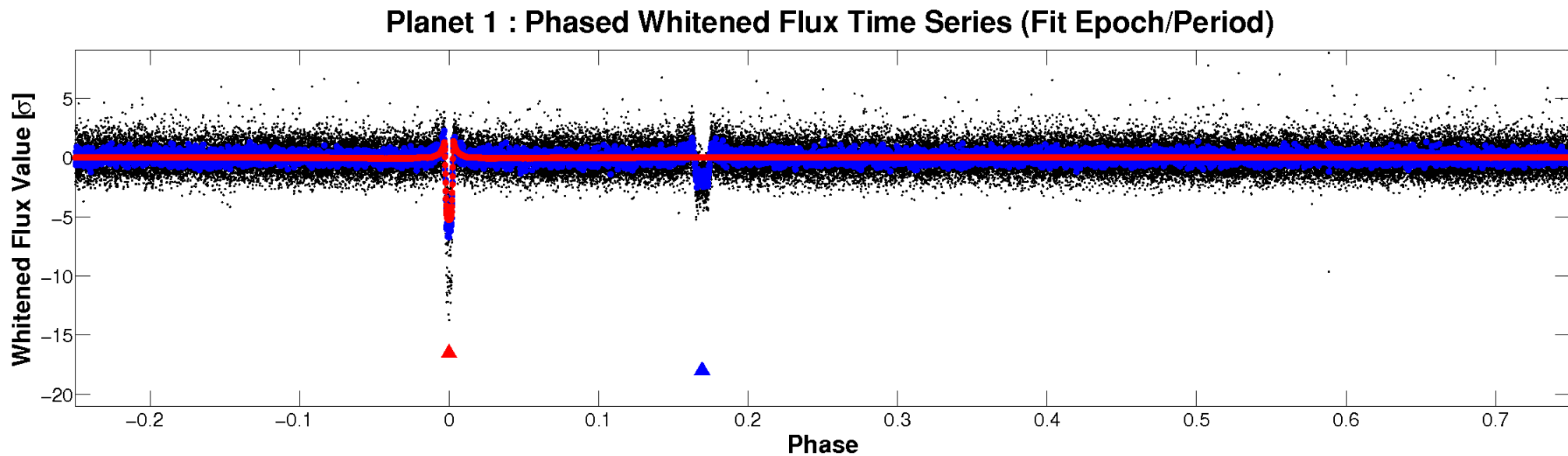
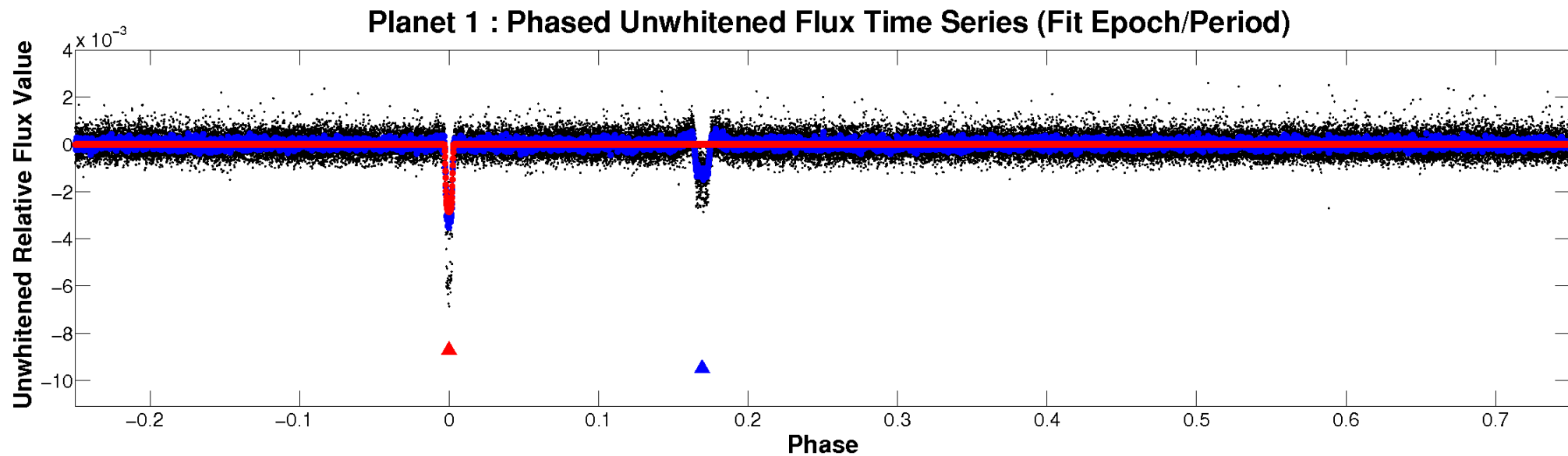


ALT Odd/Even

TCE 005305404-01

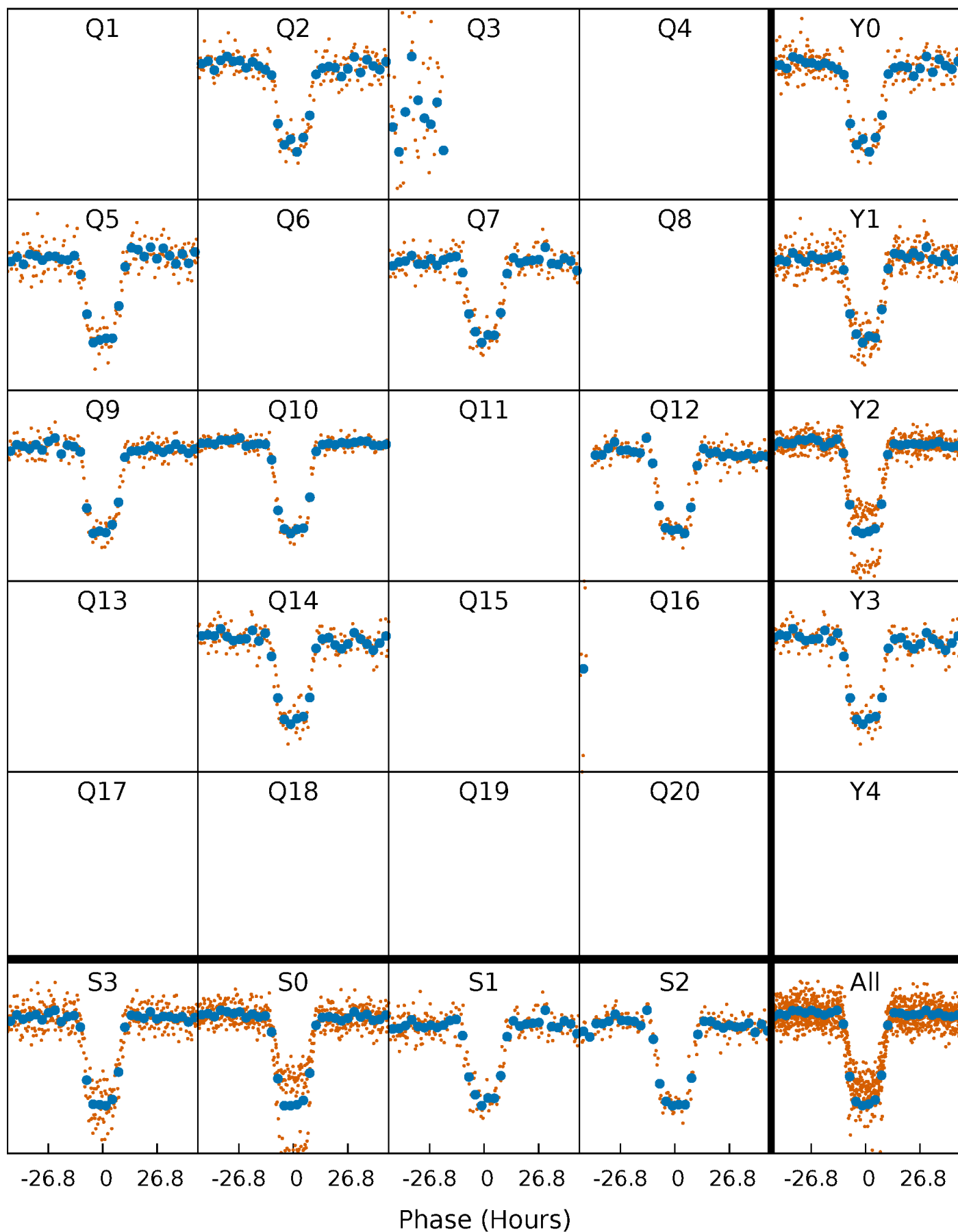


Non-Whitened Vs. Whitened Light Curve



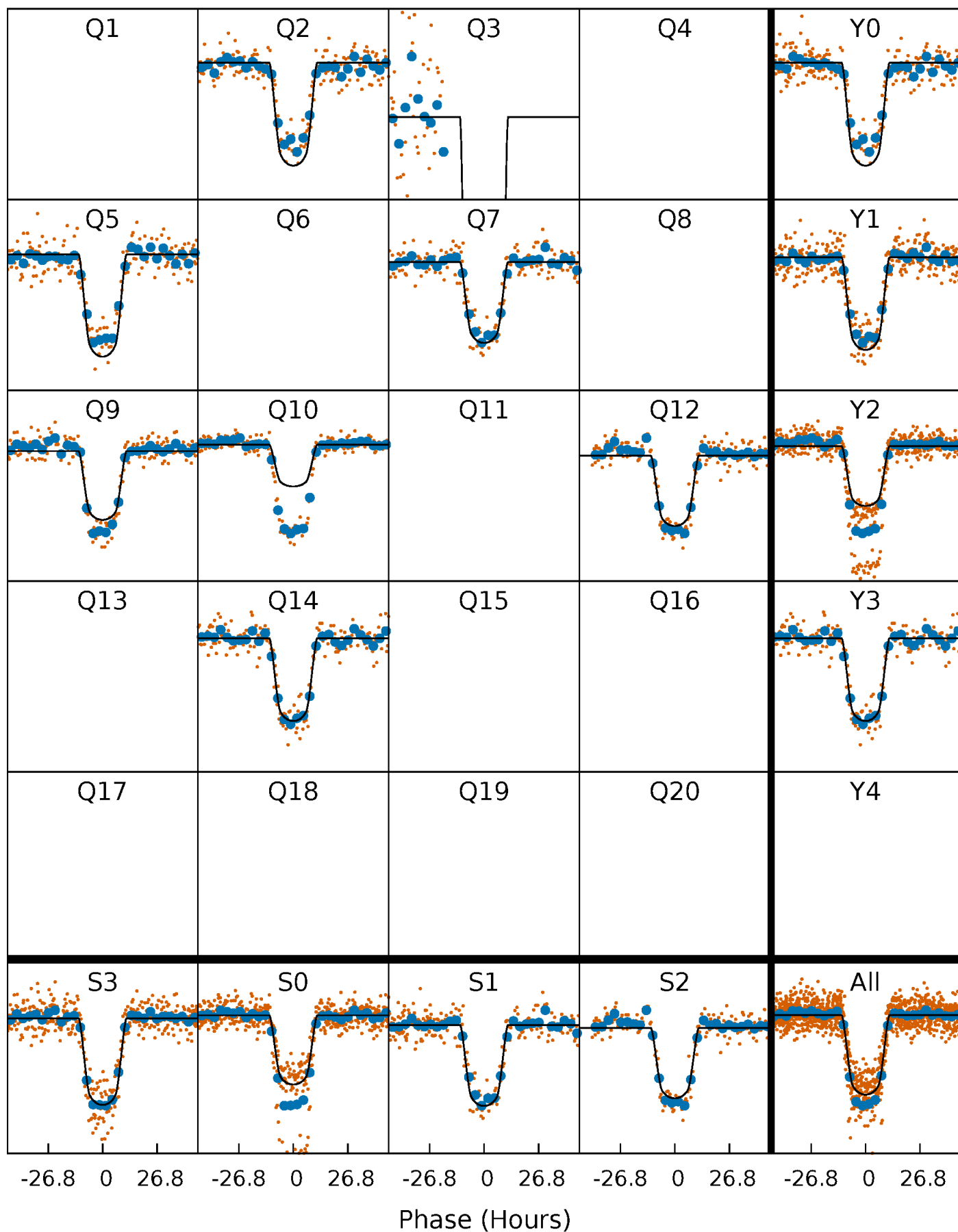
PDC Quarter-Phased Transit Curves

TCE 005305404-01 P=161.253175 Days $T_0=189.101434$ (BKJD)



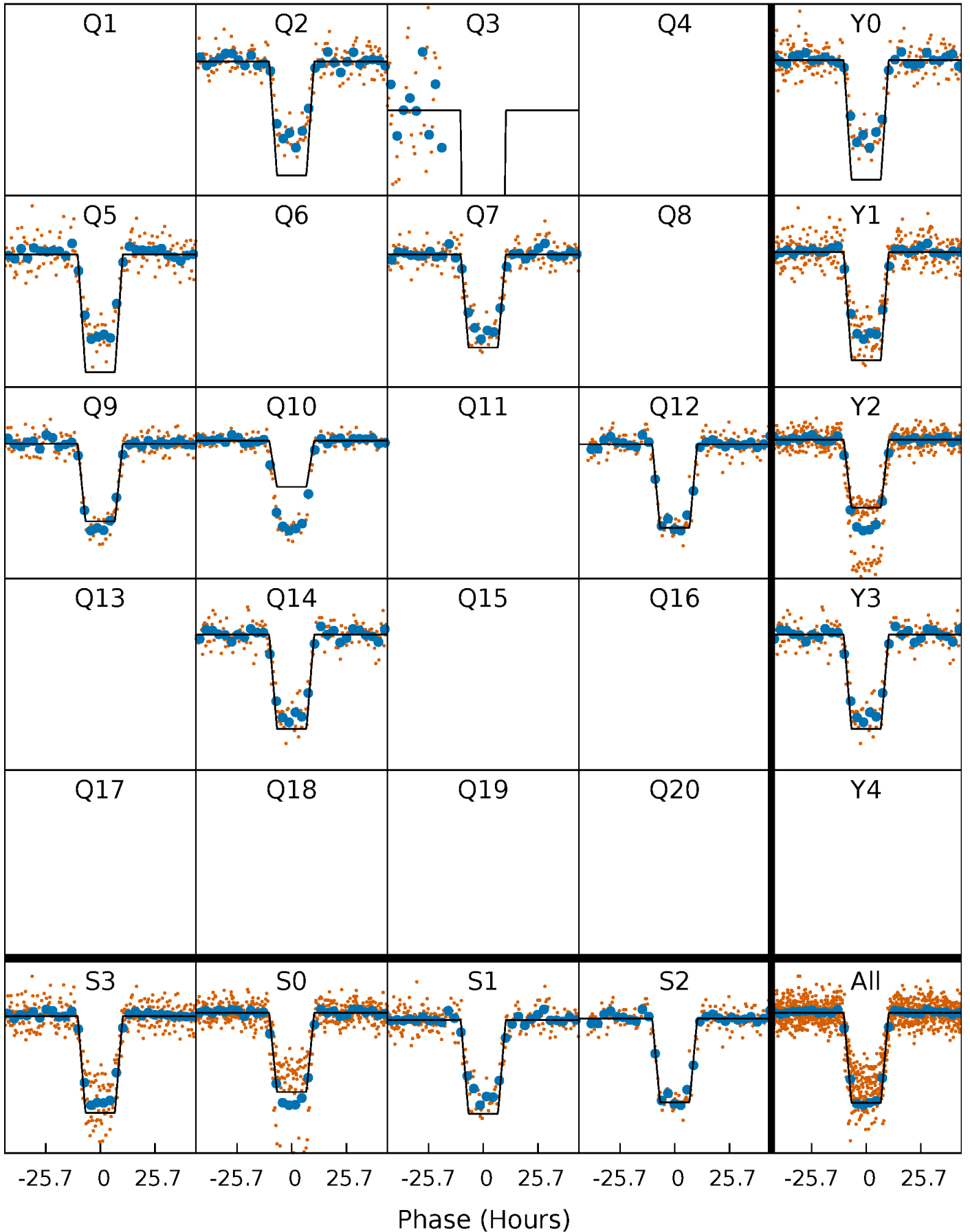
DV Quarter-Phased Transit Curves

TCE 005305404-01 P=161.253175 Days $T_0=189.101434$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

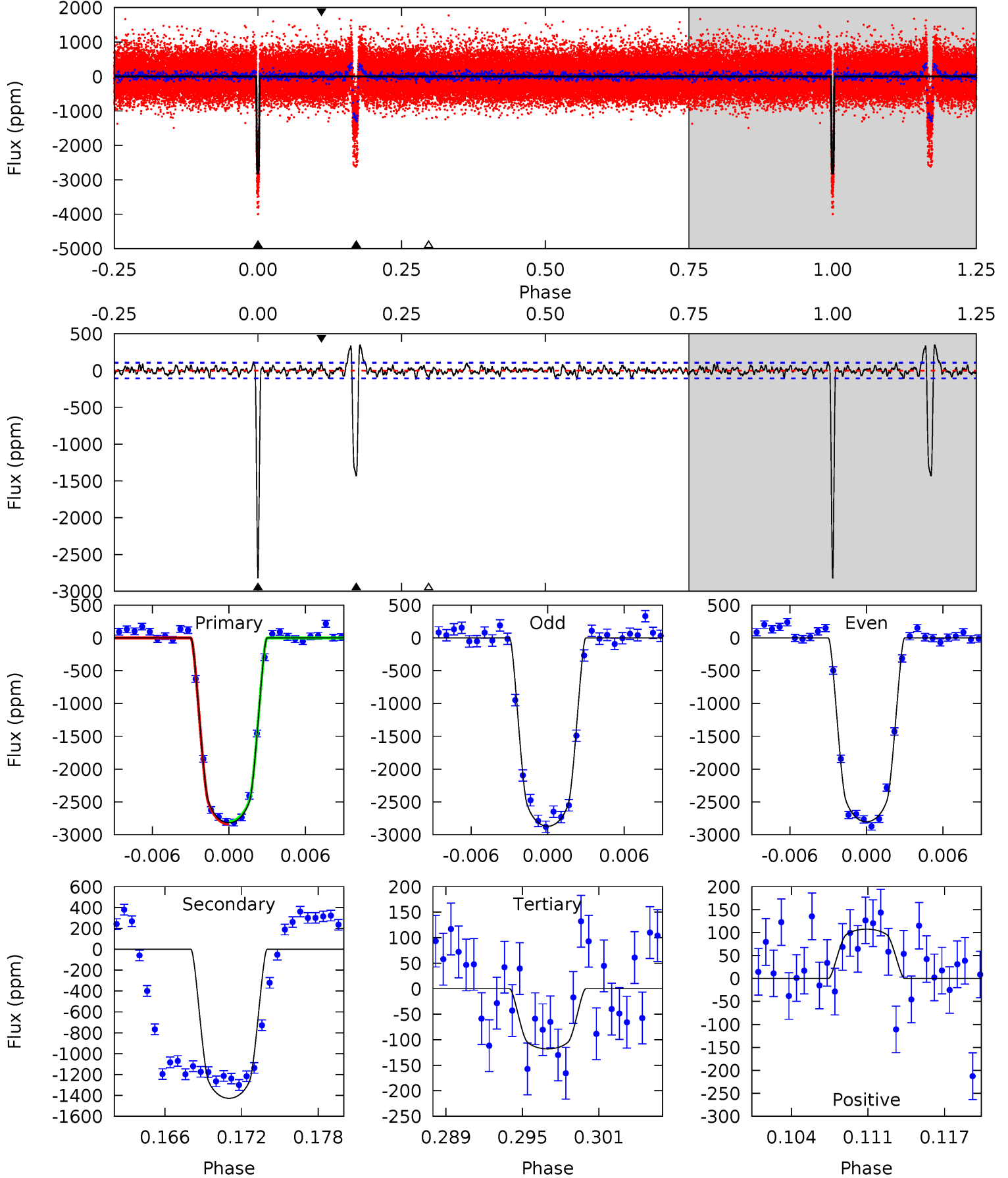
TCE 005305404-01 P=161.254844 Days $T_0=189.092435$ (BKJD)



DV Model-Shift Uniqueness Test

005305404-01, $P = 161.253175$ Days, $E = 27.848259$ Days

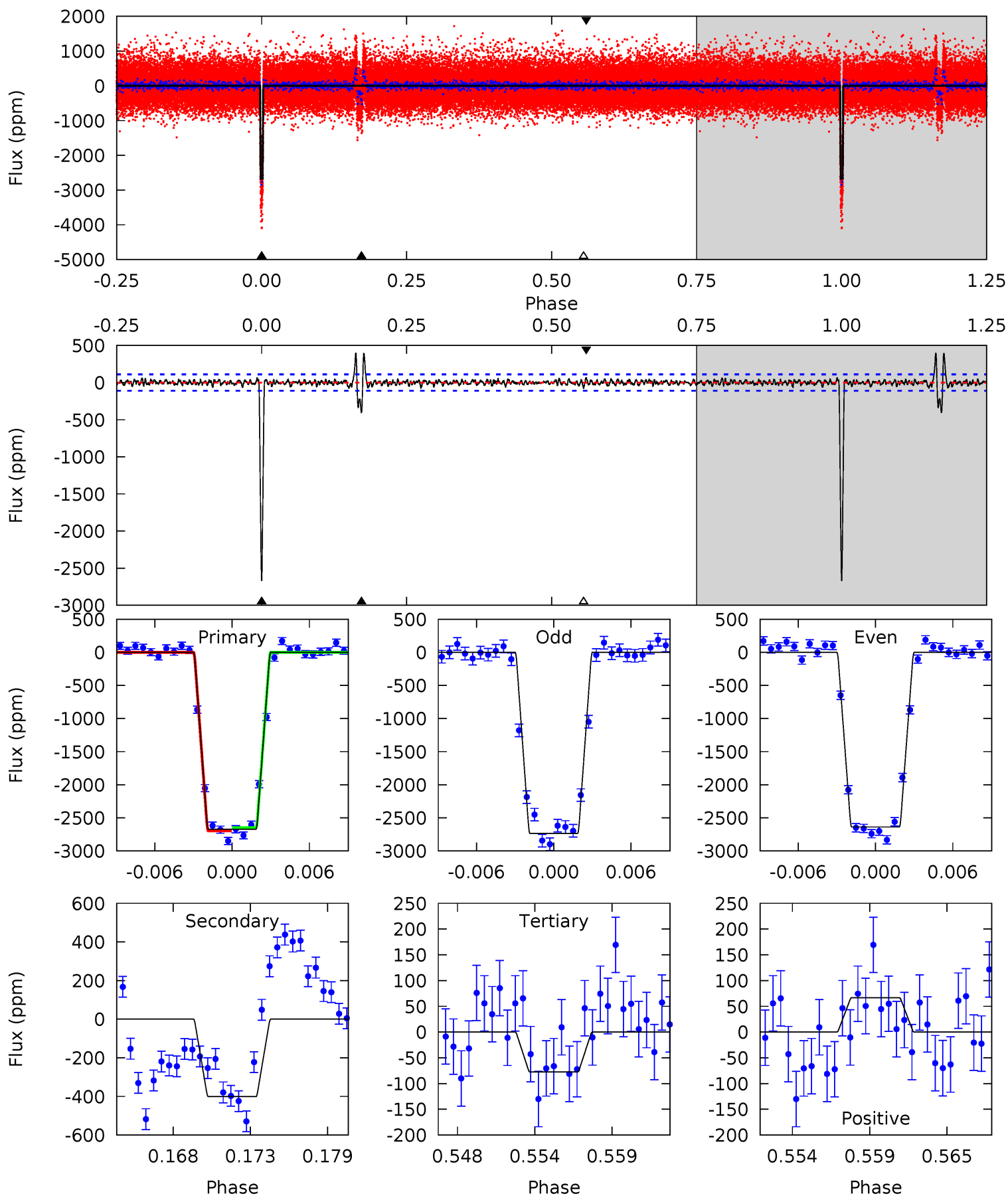
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
136.0	68.9	5.69	5.18	5.12	2.74	2.44	130.3	130.8	63.2	63.7	1.59	1.12	0.11	0.88



Alt Model-Shift Uniqueness Test

005305404-01, $P = 161.254844$ Days, $E = 27.837591$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
124.6	18.7	3.61	3.11	5.14	2.77	1.55	121.0	121.5	15.1	15.6	2.17	1.13	0.13	0



Stellar Parameters For KIC 005305404

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5985^{+161}_{-179}	$4.574^{+0.033}_{-0.187}$	$-0.500^{+0.300}_{-0.300}$	$0.811^{+0.222}_{-0.059}$	$0.910^{+0.089}_{-0.108}$	$2.398^{+0.448}_{-1.192}$
	+3%/-3%	+1%/-4%	+60%/-60%	+27%/-7%	+10%/-12%	+19%/-50%
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 005305404-01 / KOI 3820.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1428 ± 21	$5.22^{+0.72}_{-0.36}$	454^{+29}_{-19}	4966^{+117}_{-132}	8897^{+1142}_{-1751}
Alt.	-401 ± 21	$5.16^{+0.71}_{-0.36}$	455^{+27}_{-19}	3920^{+82}_{-89}	2557^{+361}_{-491}

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

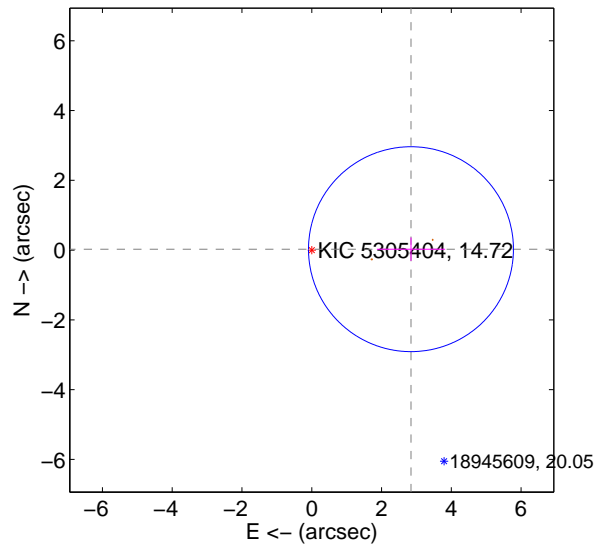
Supplemental centroid analysis for 005305404-01. Kepler magnitude: 14.72. Transit SNR 69.43

There are 0 quarters with good PRF difference image offsets

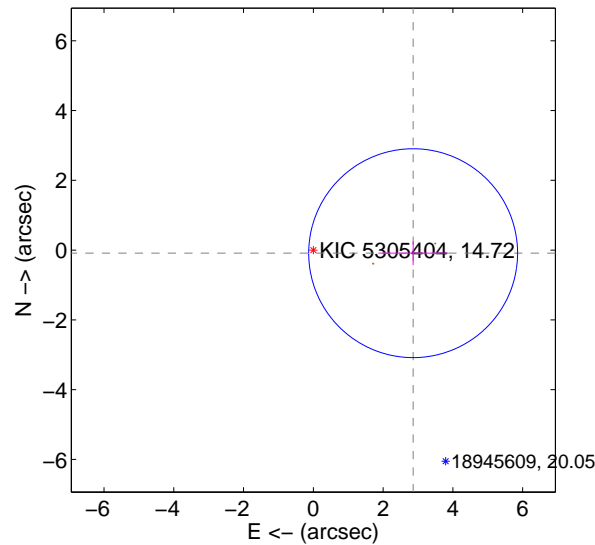
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.845 ± 0.979	2.91	-2.845 ± 0.979	0.026 ± 0.334
PRF-fit source offset from KIC position	2.863 ± 0.998	2.87	-2.862 ± 0.999	-0.089 ± 0.344
photometric centroid source offset	4.73 ± 0.29	16.20	-2.23 ± 0.28	-4.17 ± 0.29

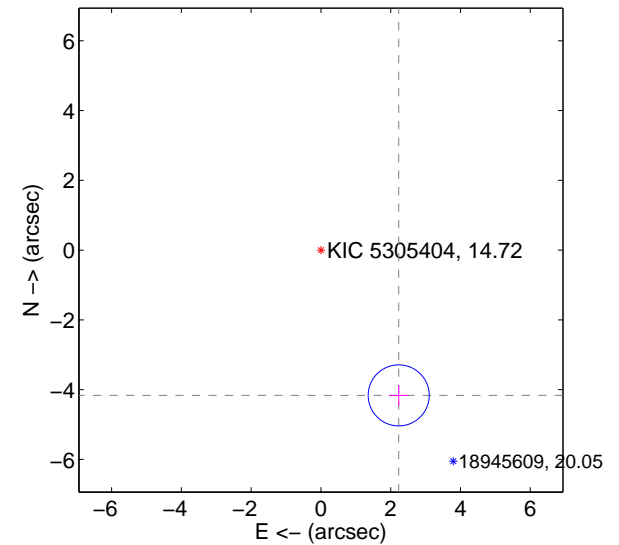
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

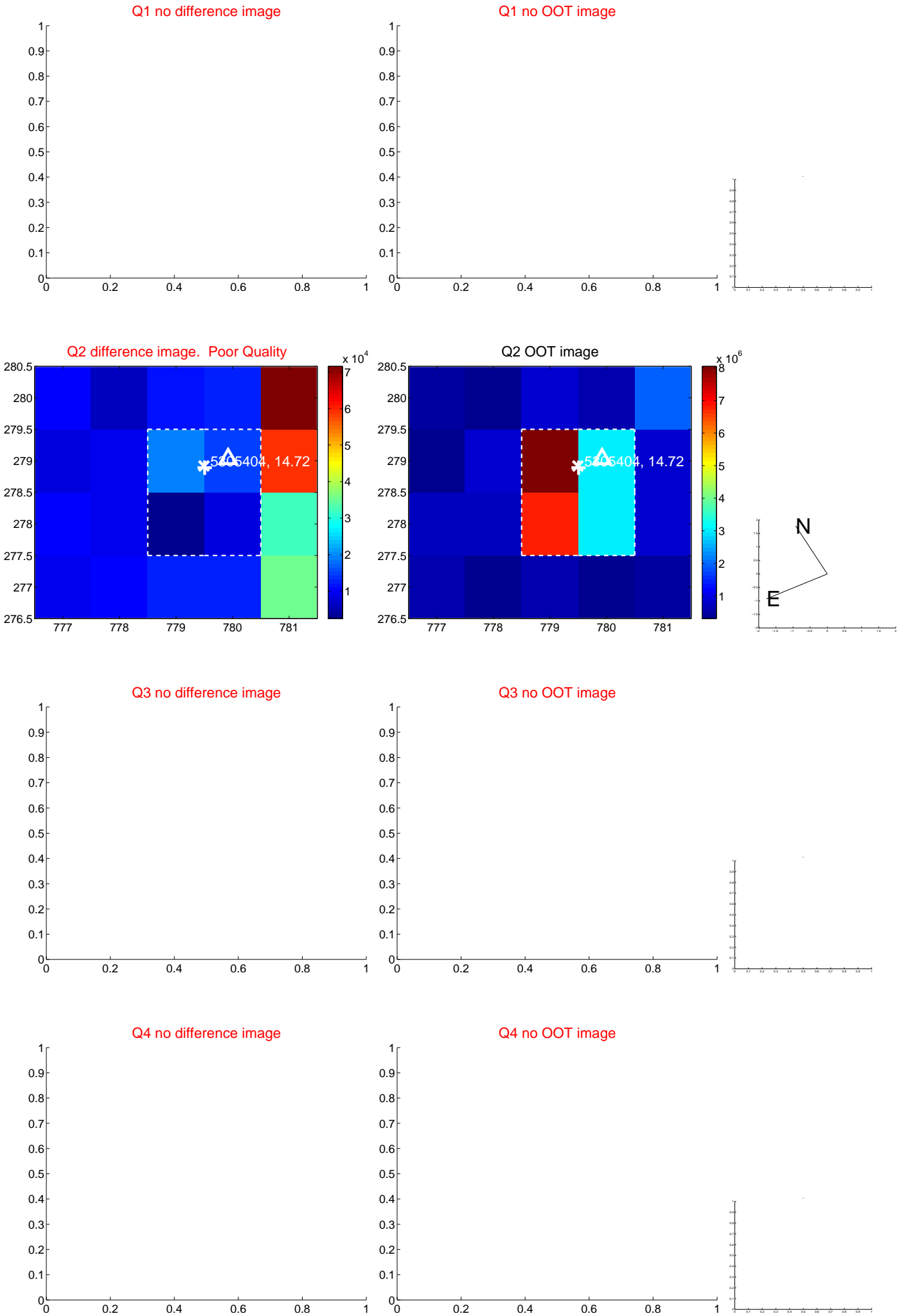


offset from photometric centroids

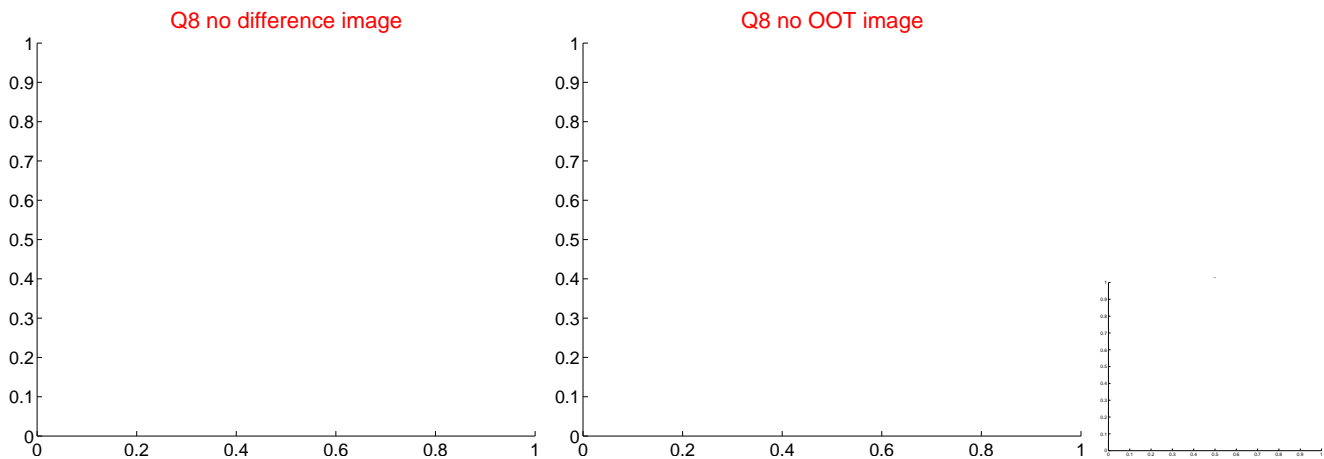
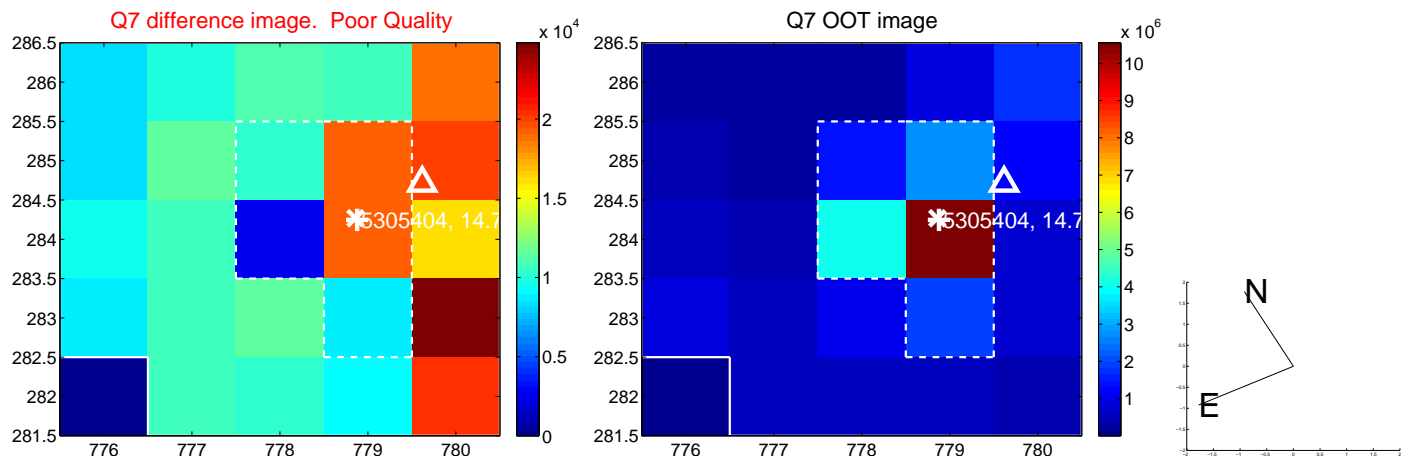
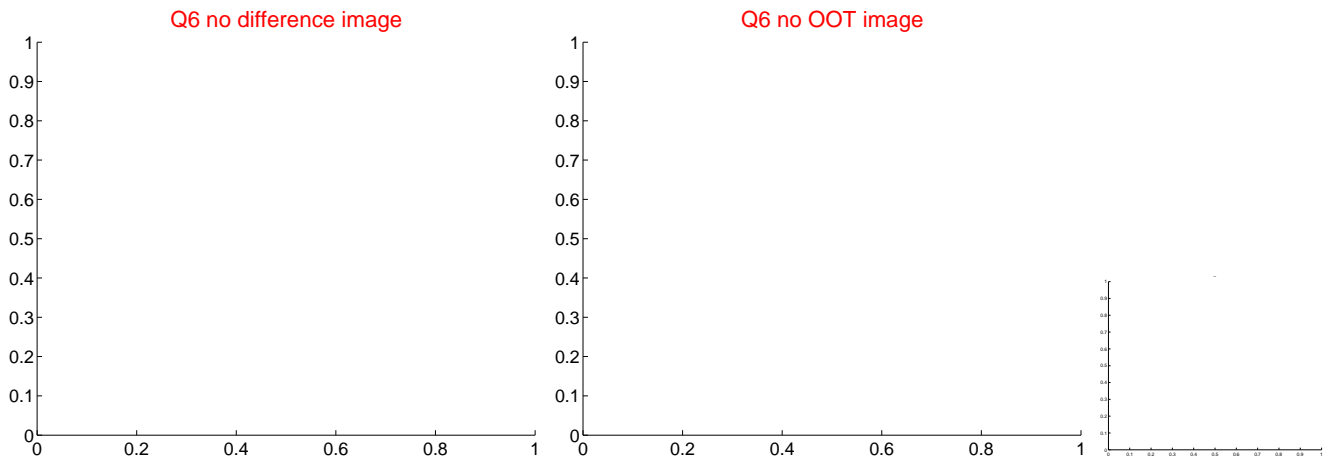
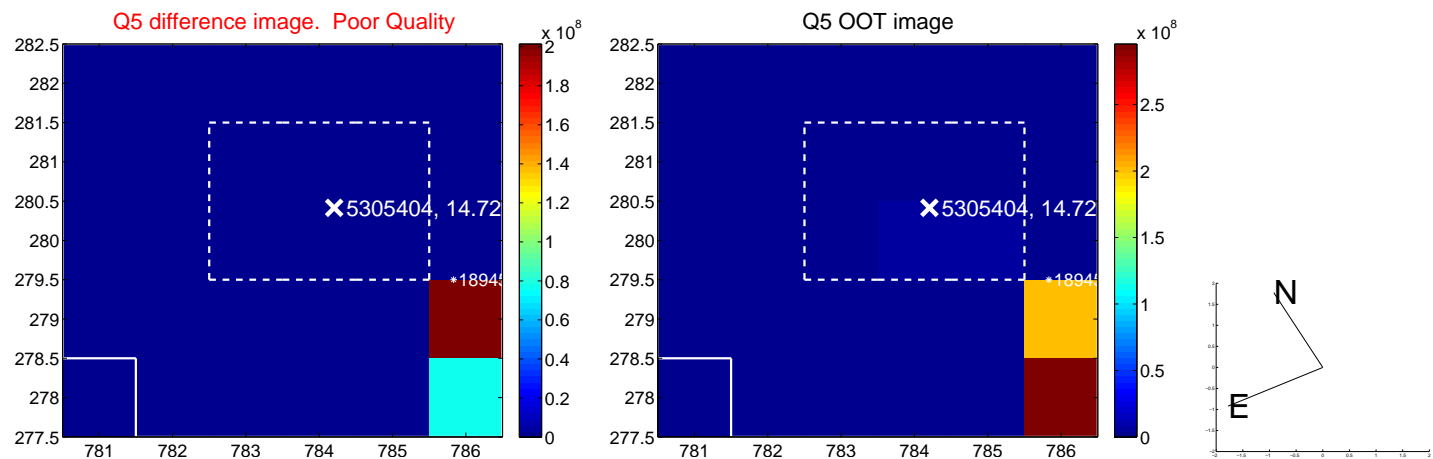


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

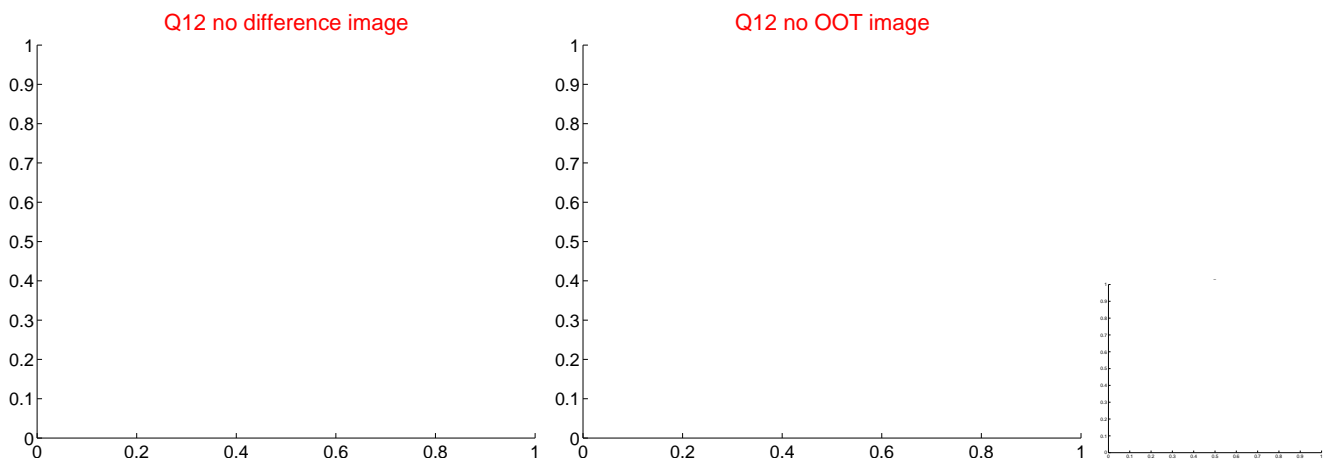
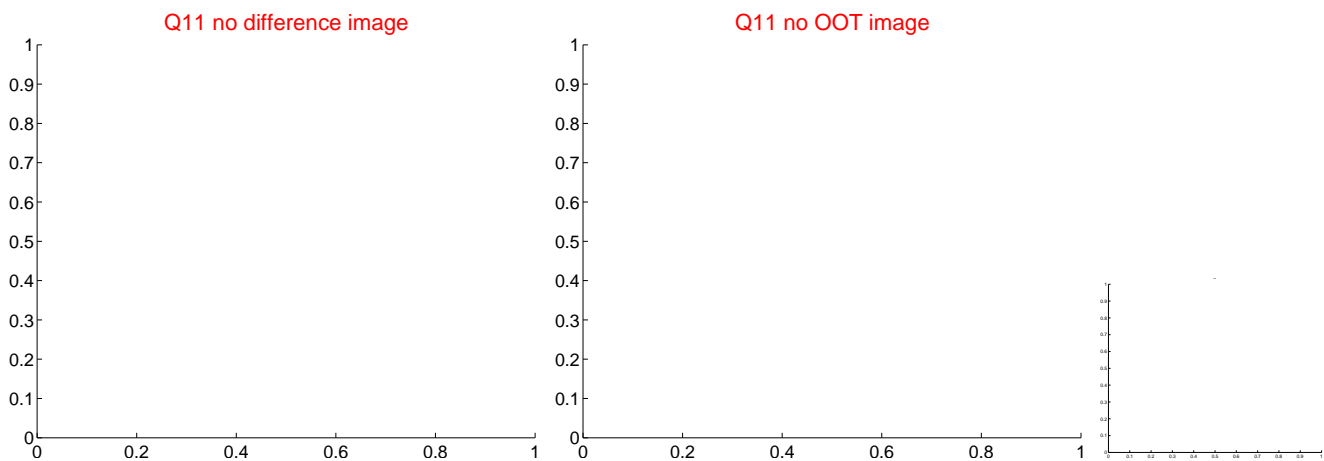
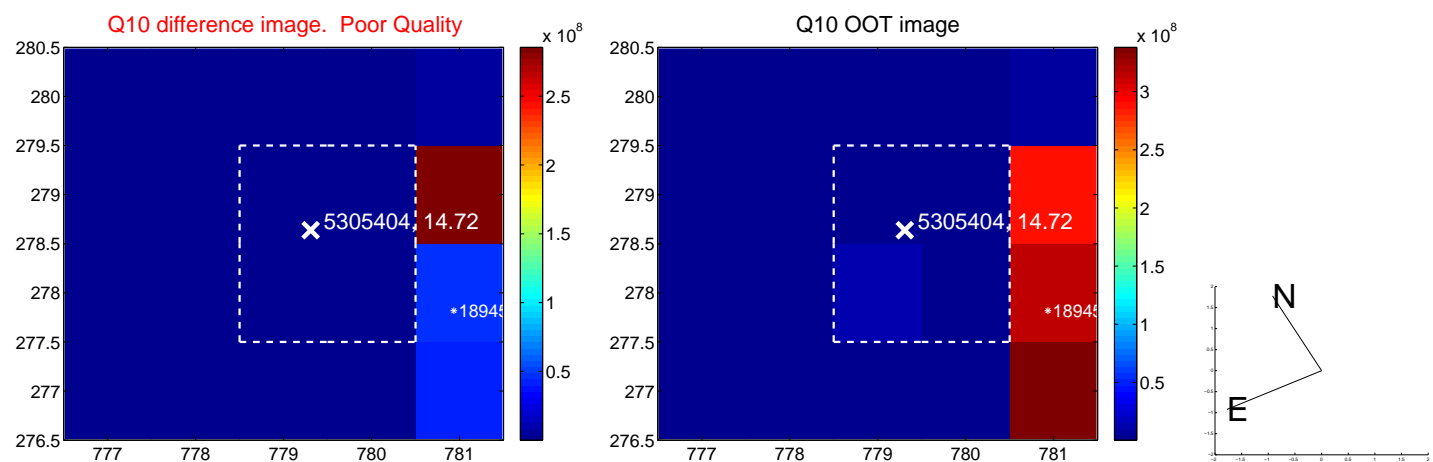
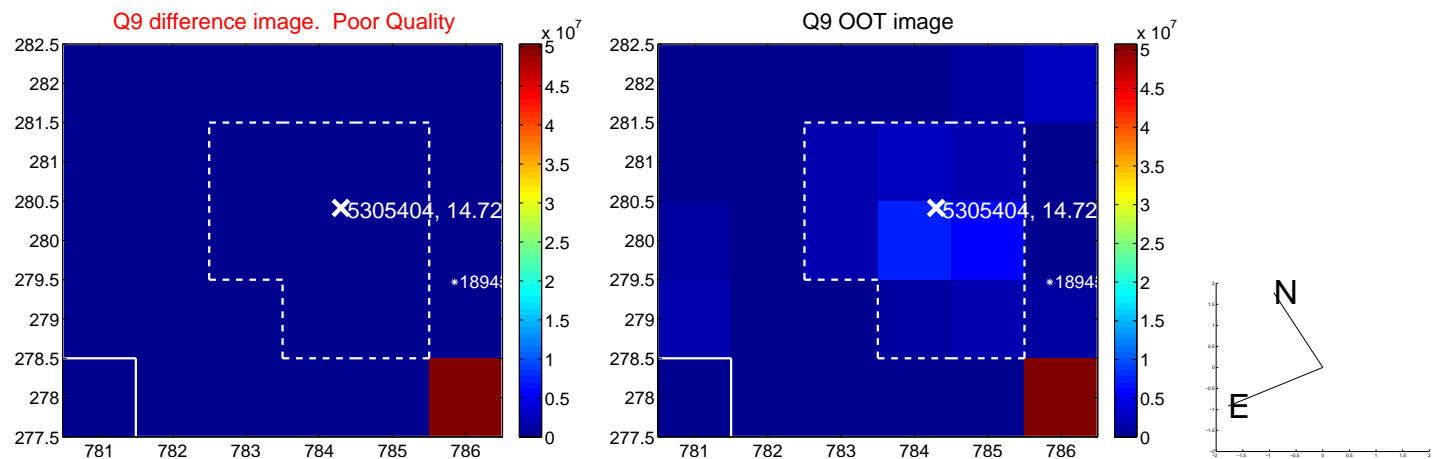
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



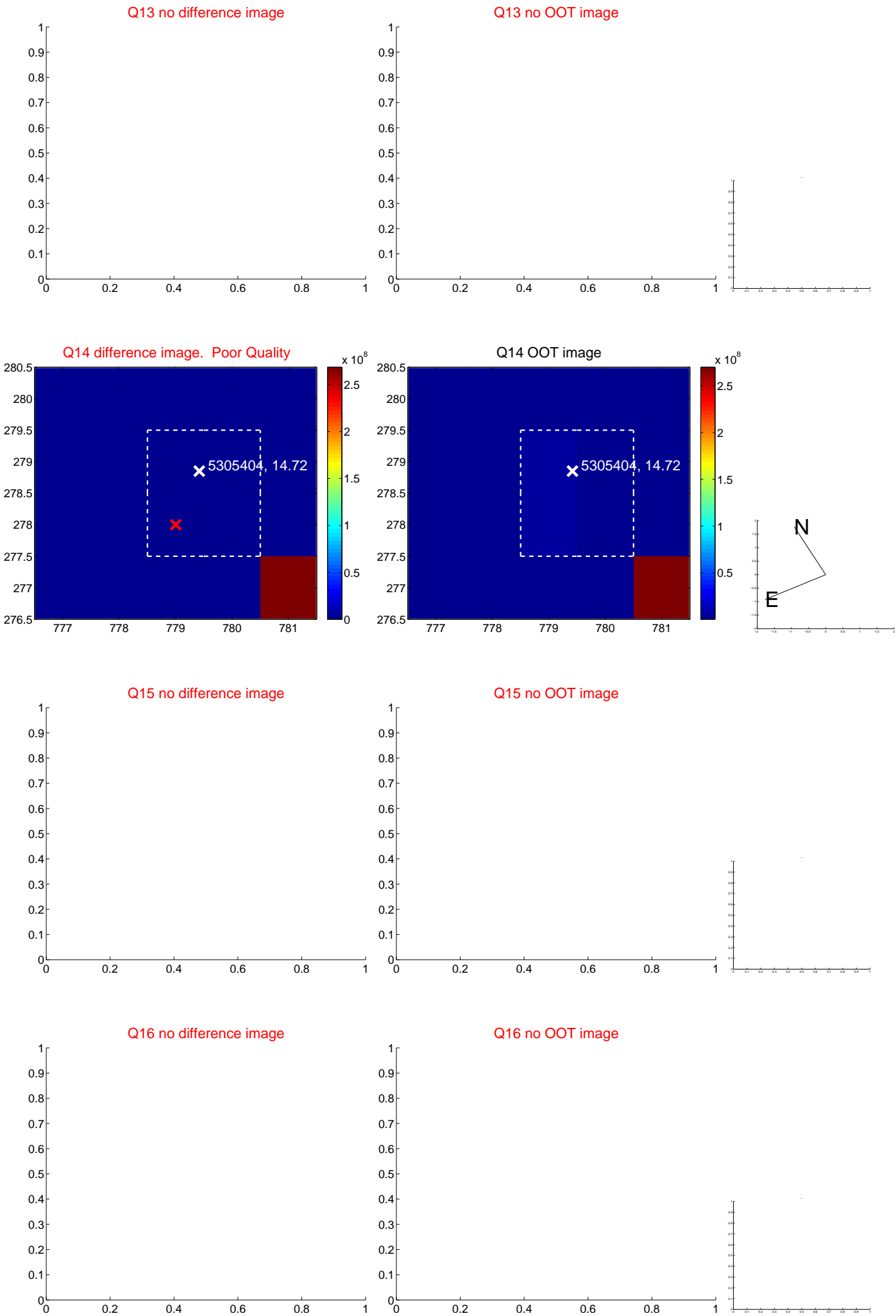
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



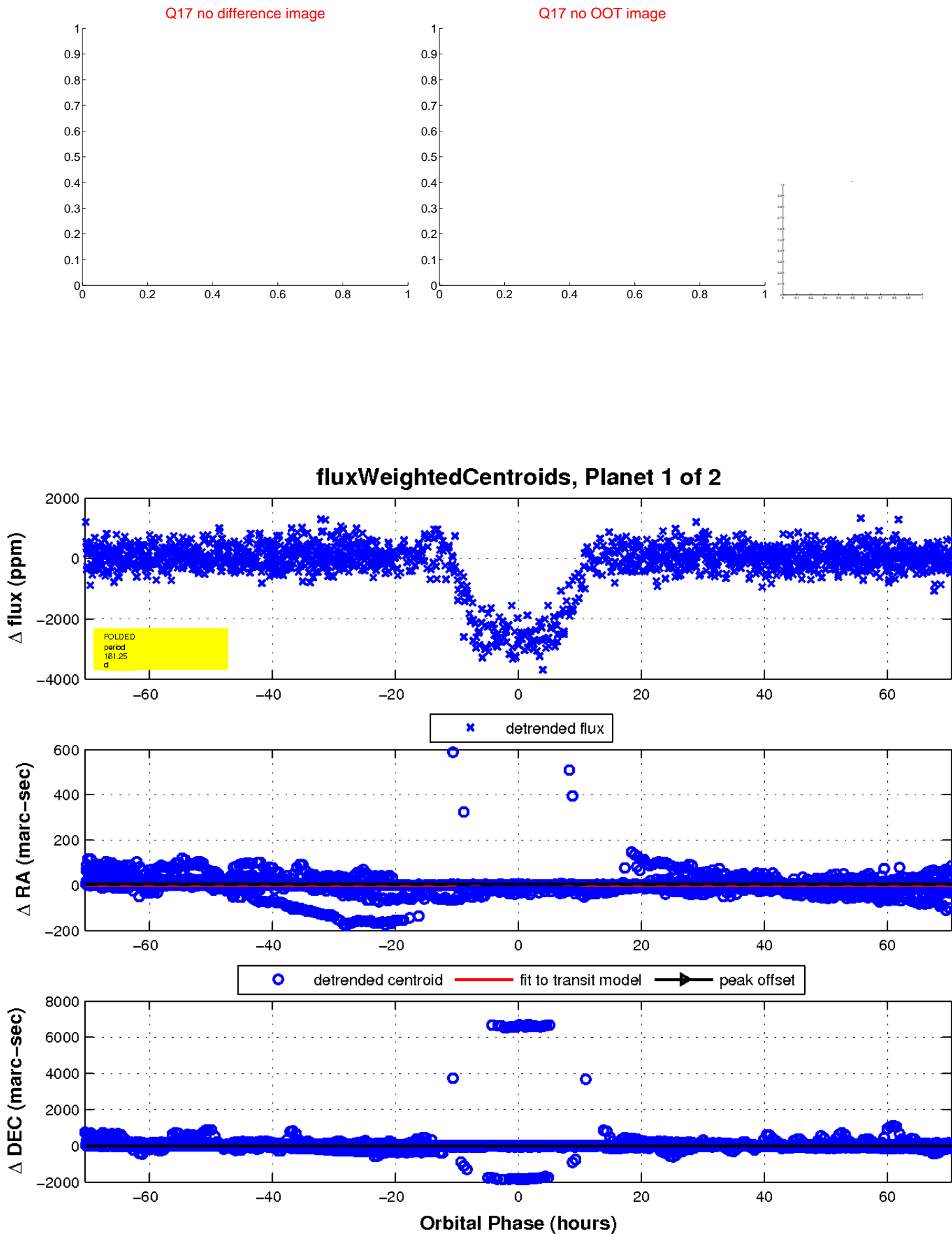
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

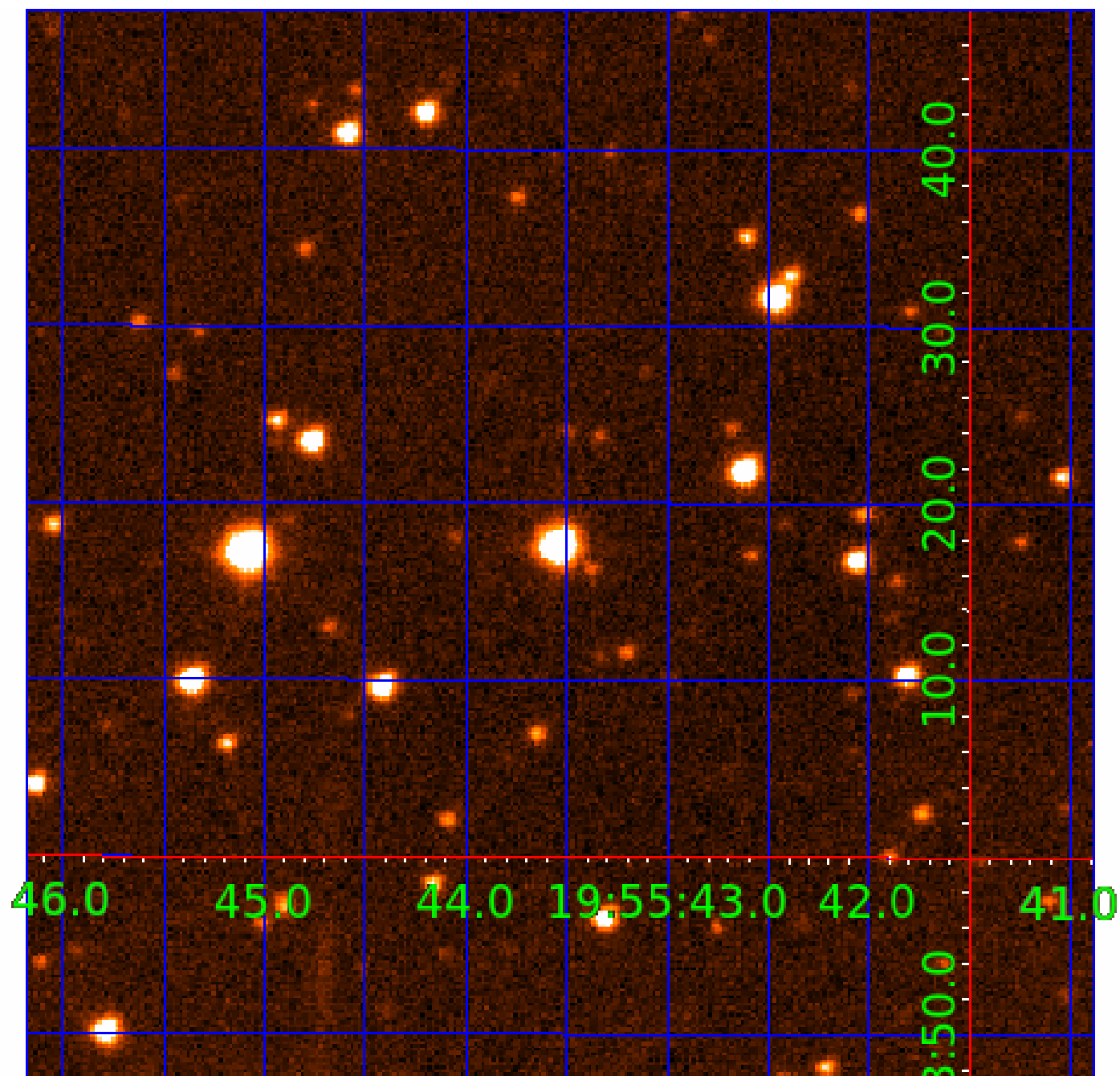


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005305404

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})
005305404-01	OBS	3820.01	161.253175	189.101434	2868.7	23.492	82.2	69.4	0.81	5985	5.06	2.41
005305404-02	OBS	No	161.261324	216.371426	1395.2	47.219	26.7	48.8	0.81	5985	3.59	2.41

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005305404-01	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
005305404-02	OBS	FP	0.00	1	0	1	1	SAME_NTL_PERIOD—CENT_FEW_DIFFS—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 005305404-02

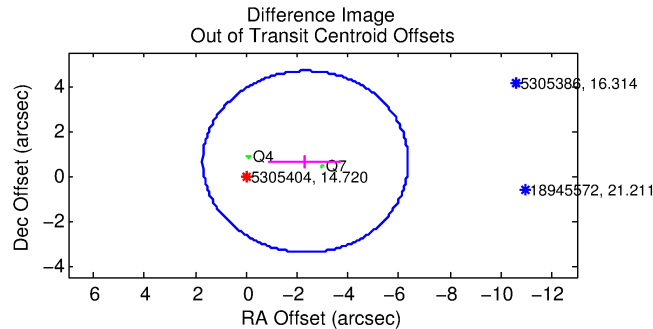
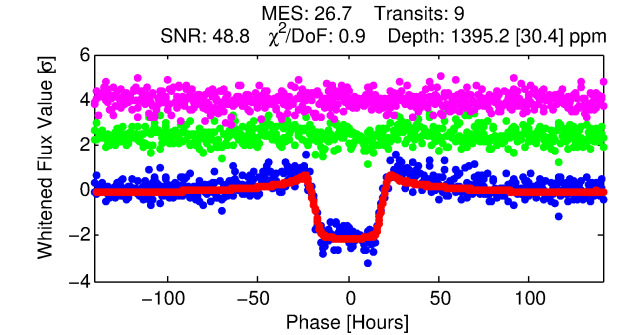
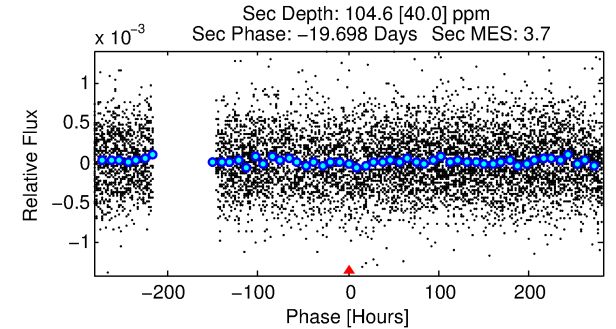
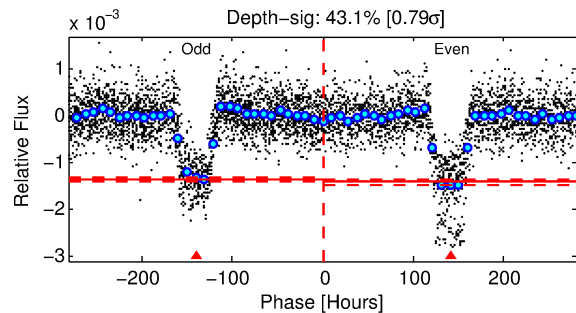
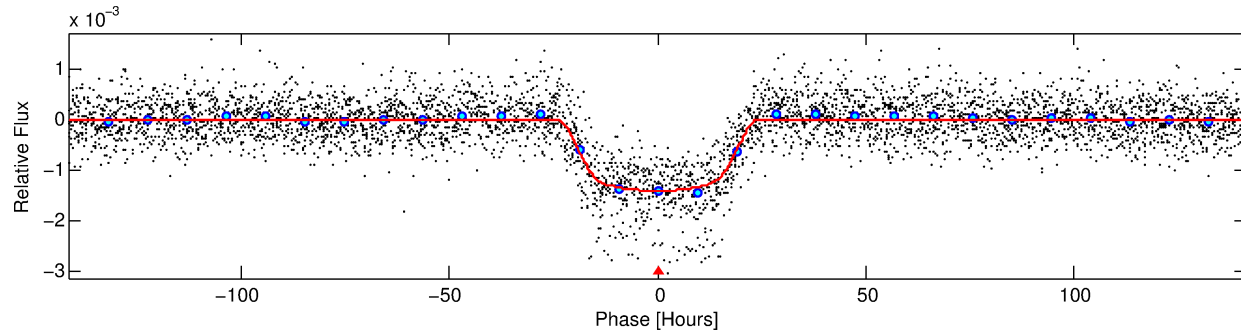
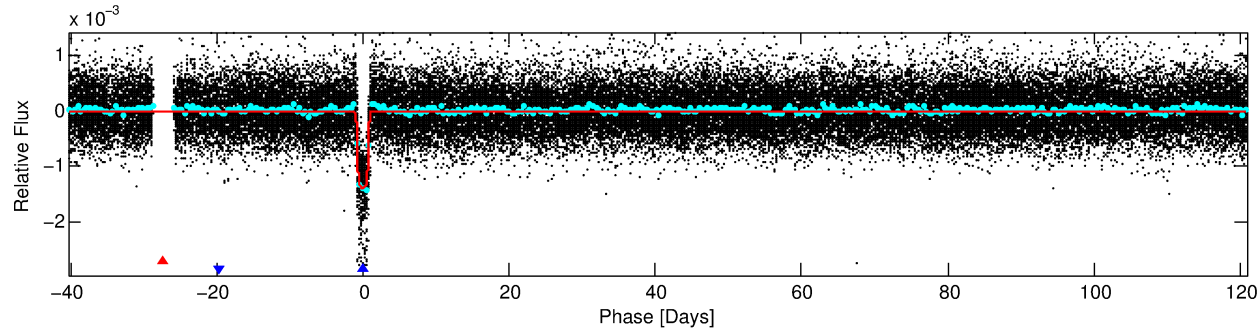
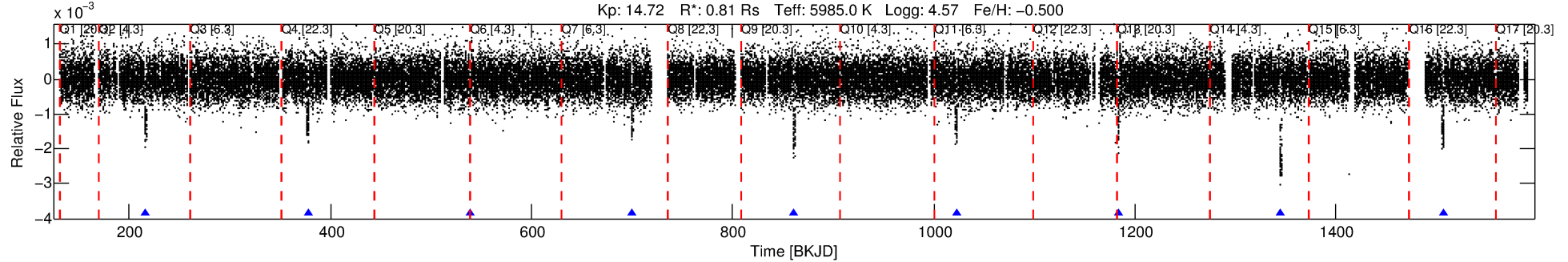
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
005305404-02	5305404	005217733-sec	5217733	1:1	49.4	12	-2	7.39	14.72	34.34	Direct-PRF	0	0.75	0.71

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: 5305404 Candidate: 2 of 2 Period: 161.261 d
KOI: K03820 Corr: No Ephemeris Match

Kp: 14.72 R*: 0.81 Rs Teff: 5985.0 K Logg: 4.57 Fe/H: -0.500



DV Fit Results:

Period = 161.26132 [0.00305] d
Epoch = 216.3714 [0.0147] BKJD
Rp/R* = 0.0406 [0.0006]
a/R* = 13.27 [0.59]
b = 0.91 [0.01]
Seff = 2.41 [0.87]
Teq = 318 [29] K
Rp = 3.59 [0.98] Re
a = 0.5598 [0.1300] AU
Ag = 1398.50 [717.14] [1.95σ]
Teffp = 3005 [302] K [8.86σ]

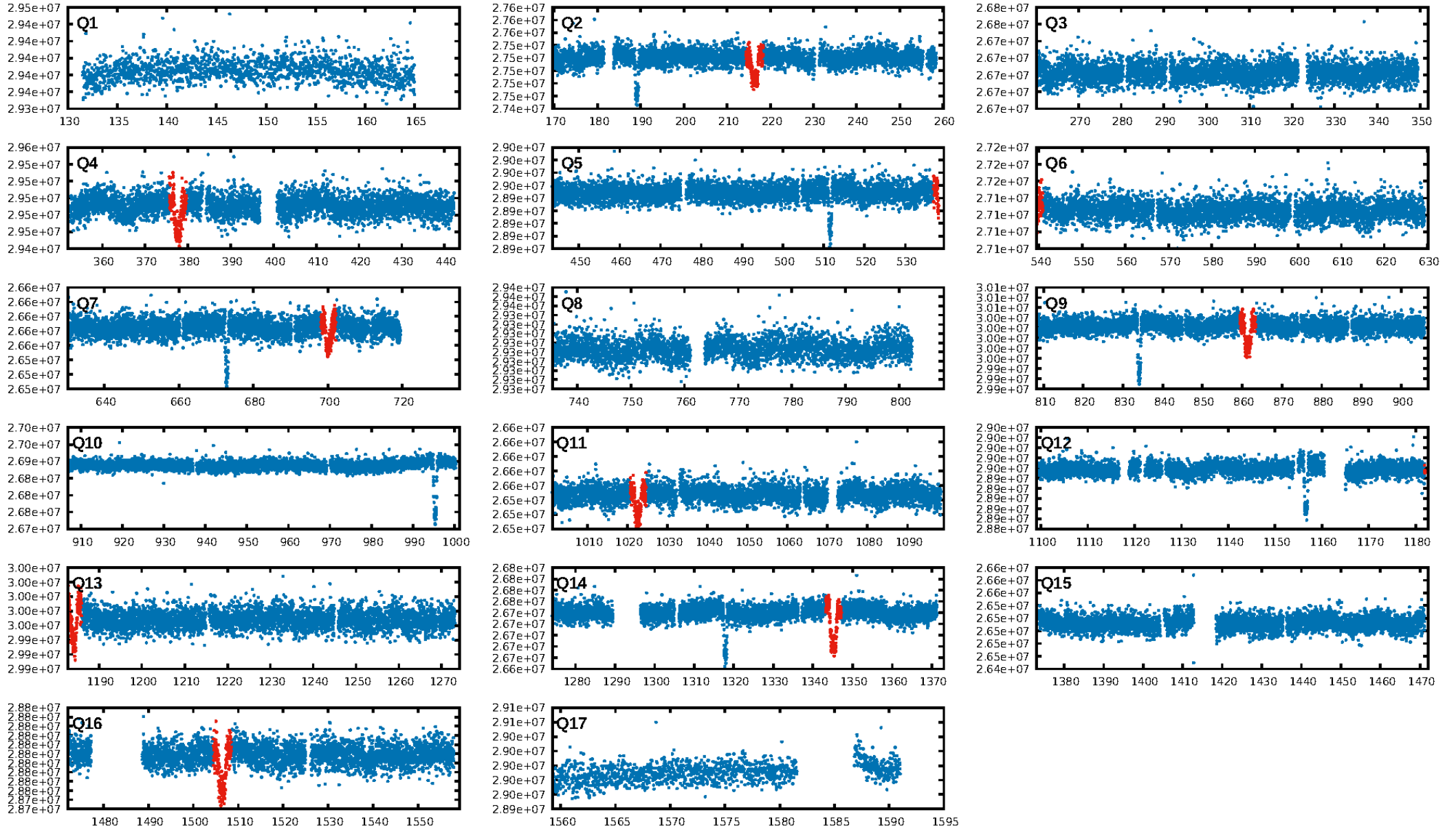
DV Diagnostic Results:

ShortPeriod-sig: 0.3% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.95e-162
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: -0.08857
Centroid-sig: 0.0%
Centroid-so: 4.068 arcsec [12.05σ]
OotOffset-rm: 2.417 arcsec [1.79σ]
KicOffset-rm: 2.481 arcsec [1.79σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [5/5]

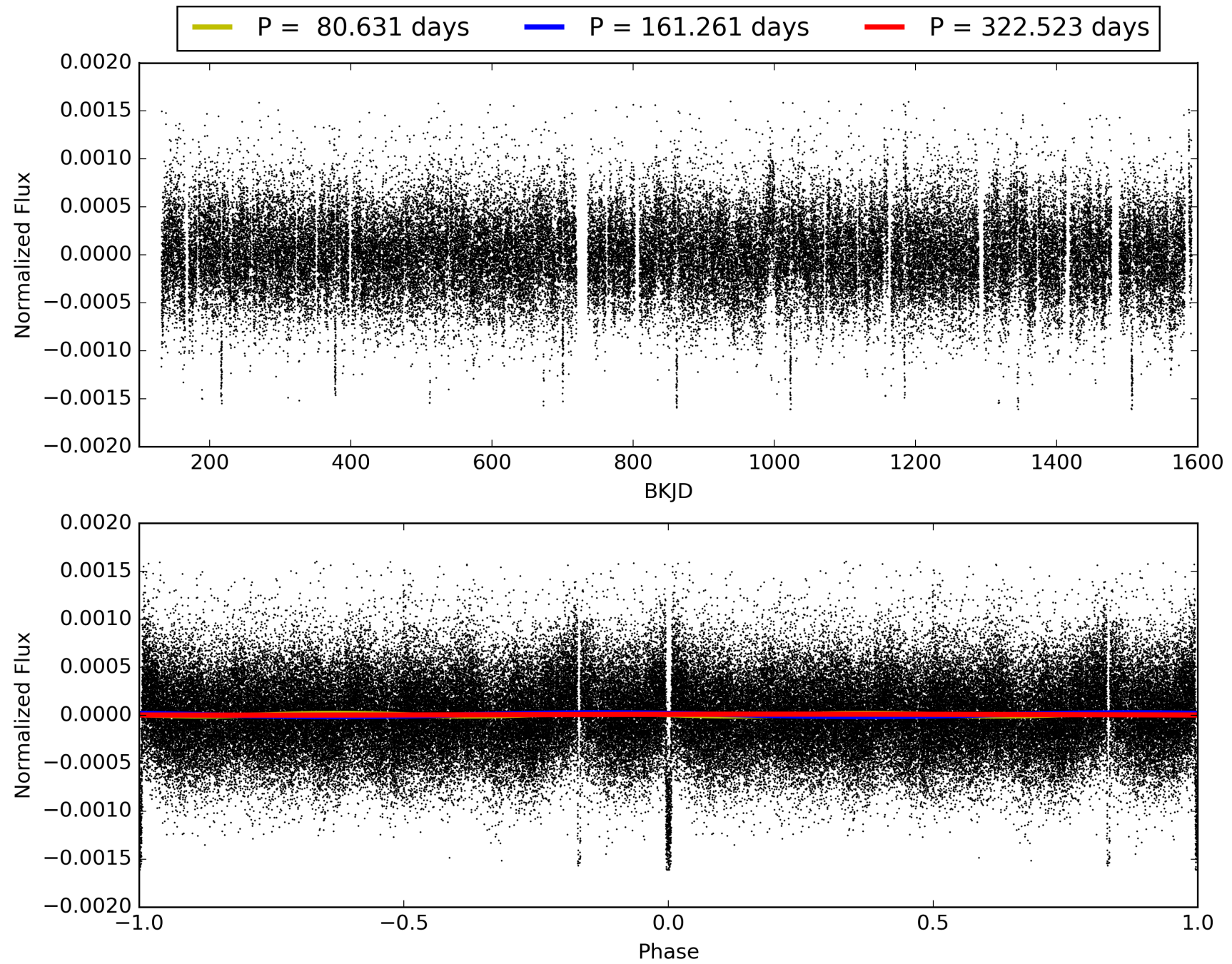
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:03:55 Z

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

TCE 005305404-02, PDC Light Curves

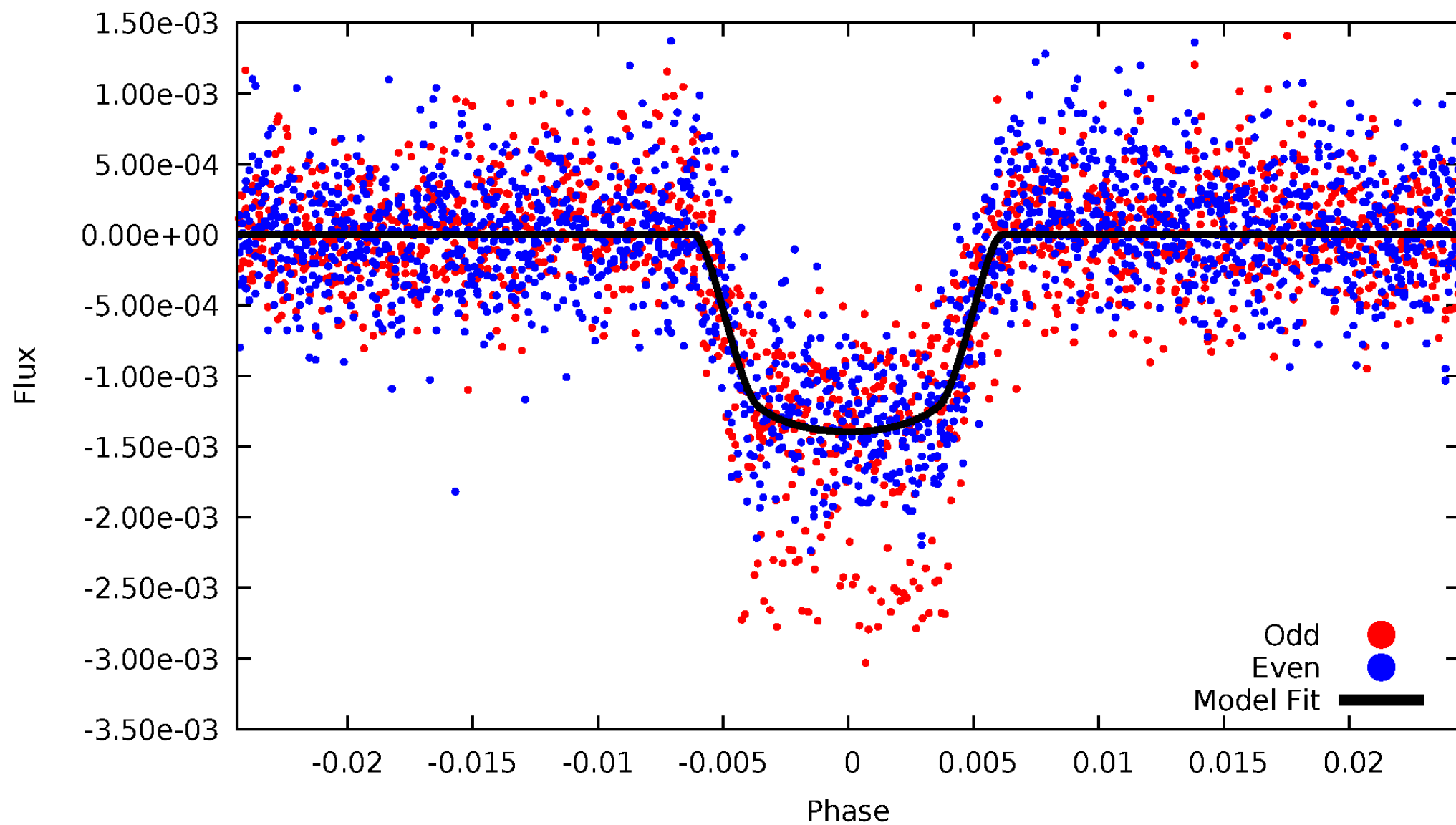


TCE 005305404-02



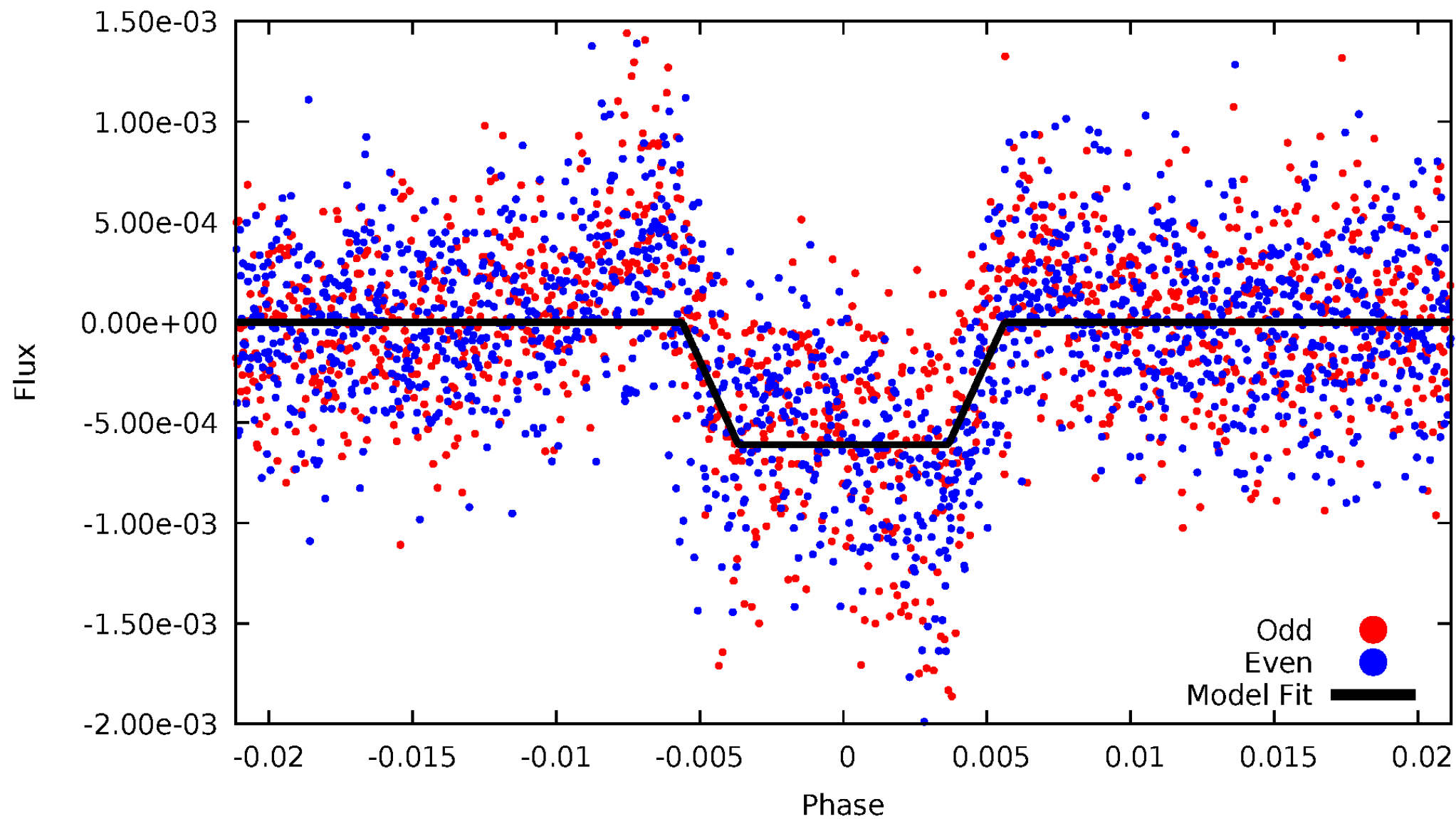
DV Odd/Even

TCE 005305404-02



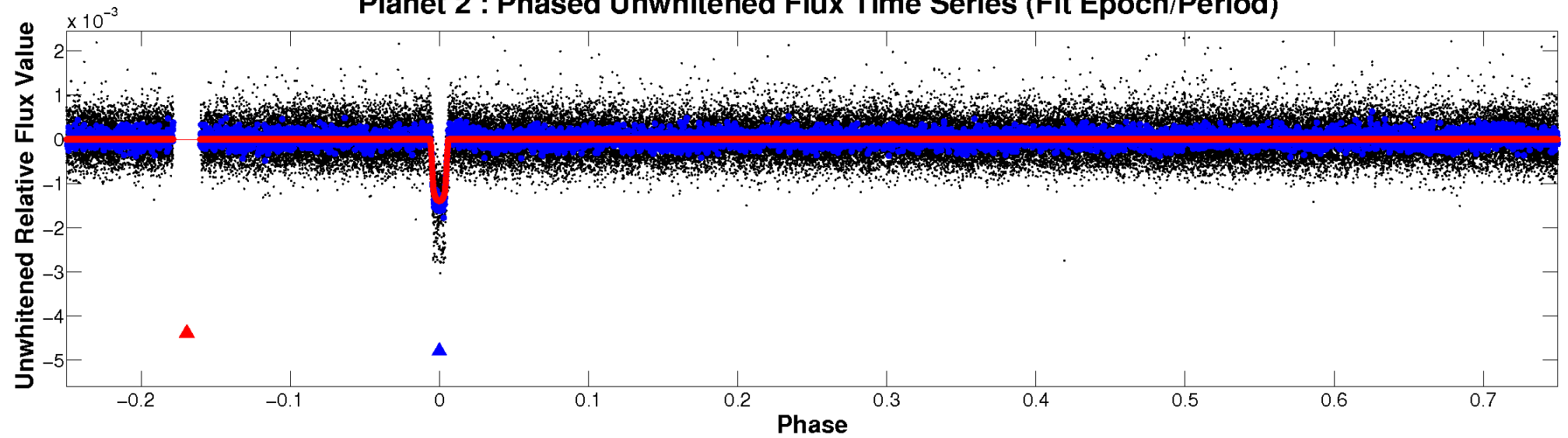
ALT Odd/Even

TCE 005305404-02

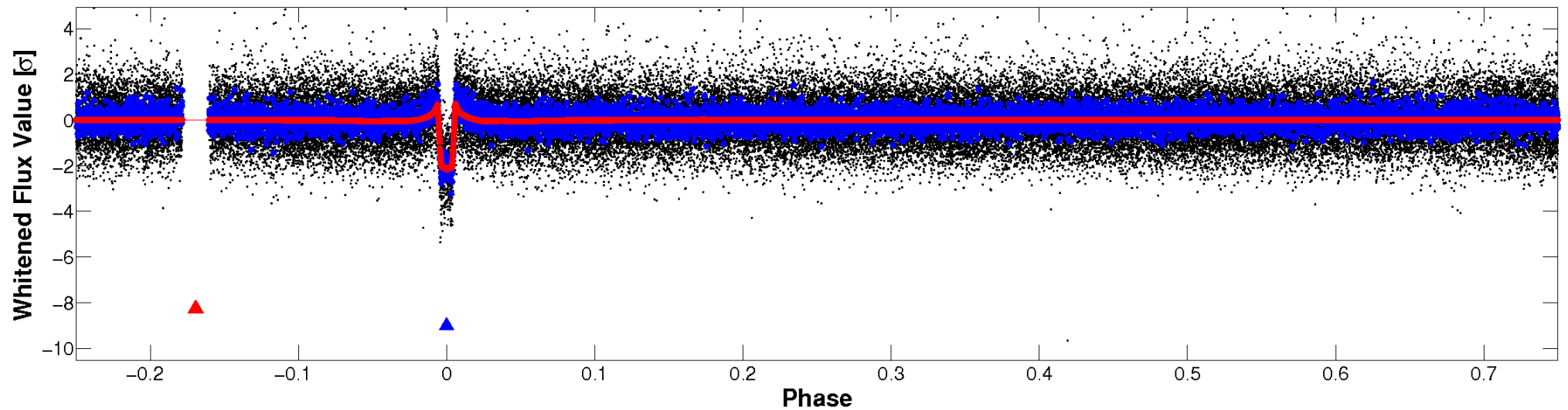


Non-Whitened Vs. Whitened Light Curve

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

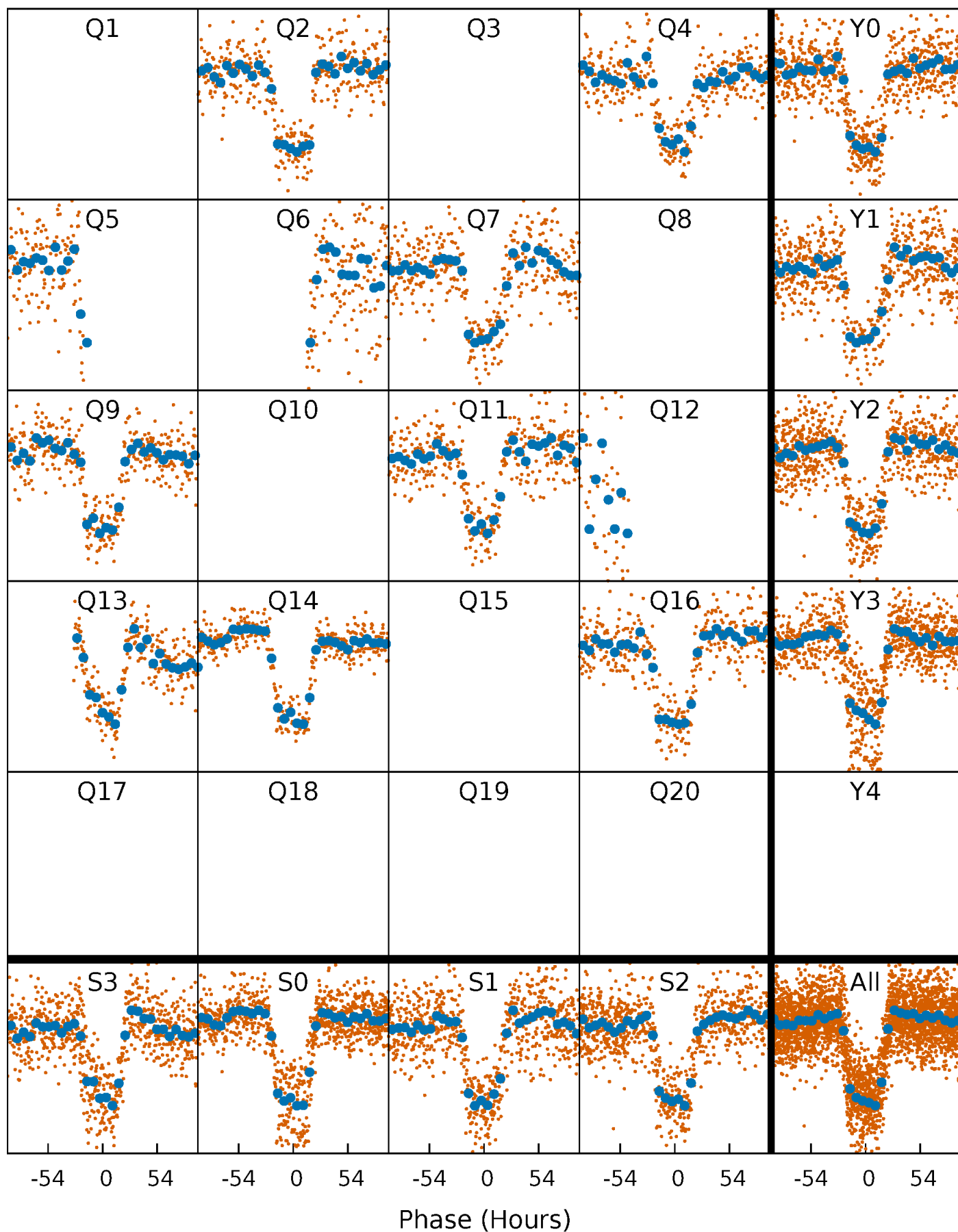


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



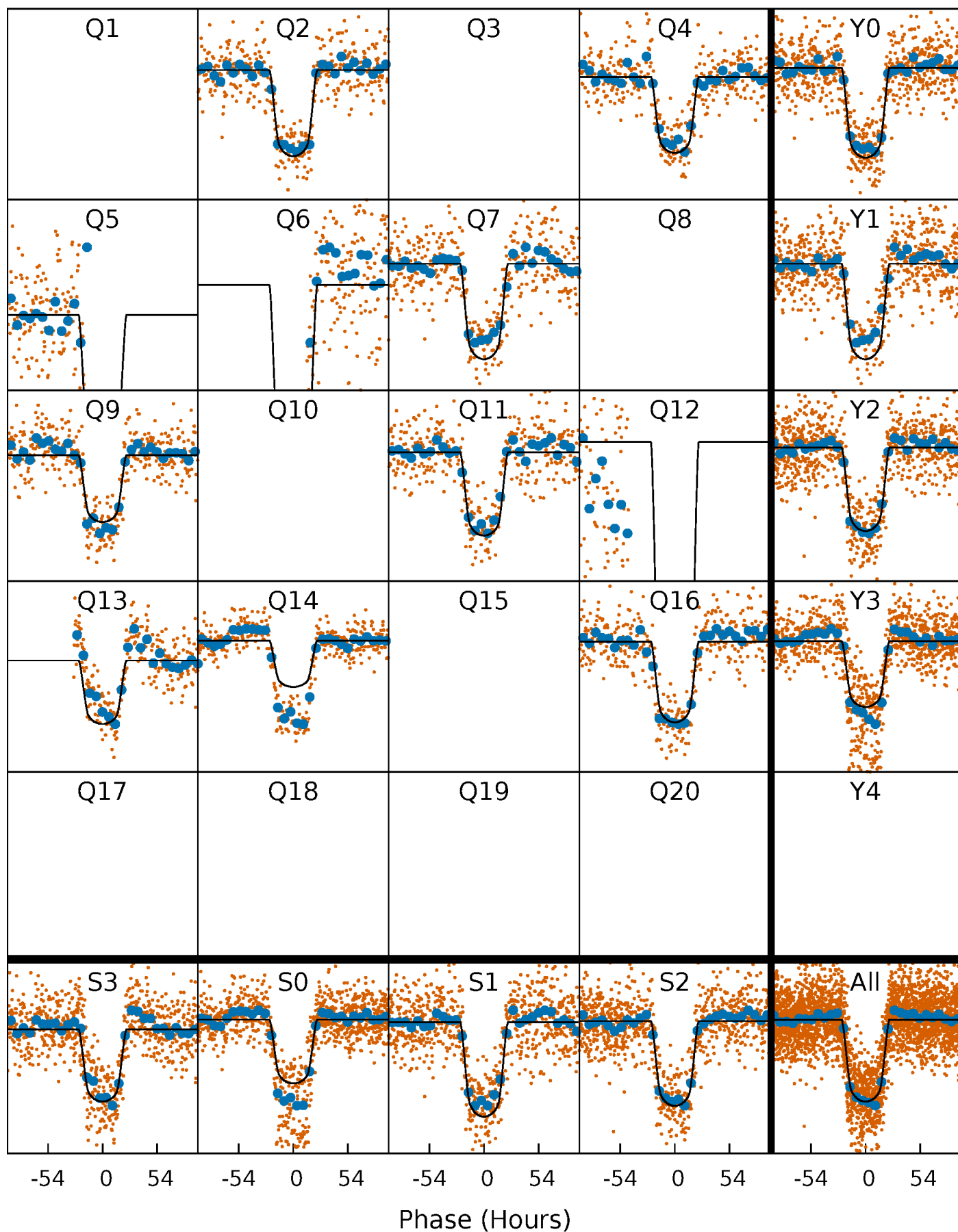
PDC Quarter-Phased Transit Curves

TCE 005305404-02 P=161.261324 Days $T_0=216.371425$ (BKJD)



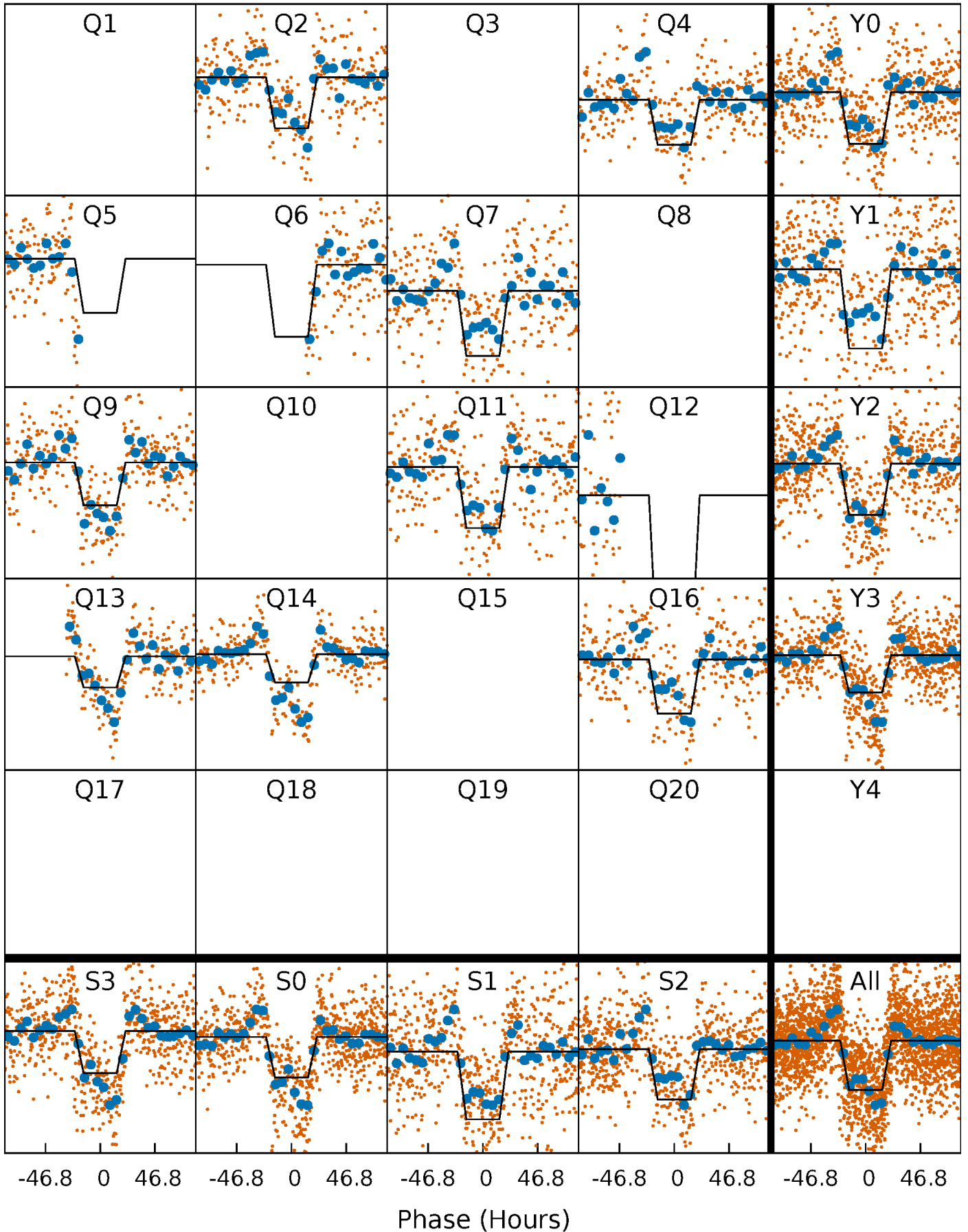
DV Quarter-Phased Transit Curves

TCE 005305404-02 P=161.261324 Days $T_0=216.371425$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

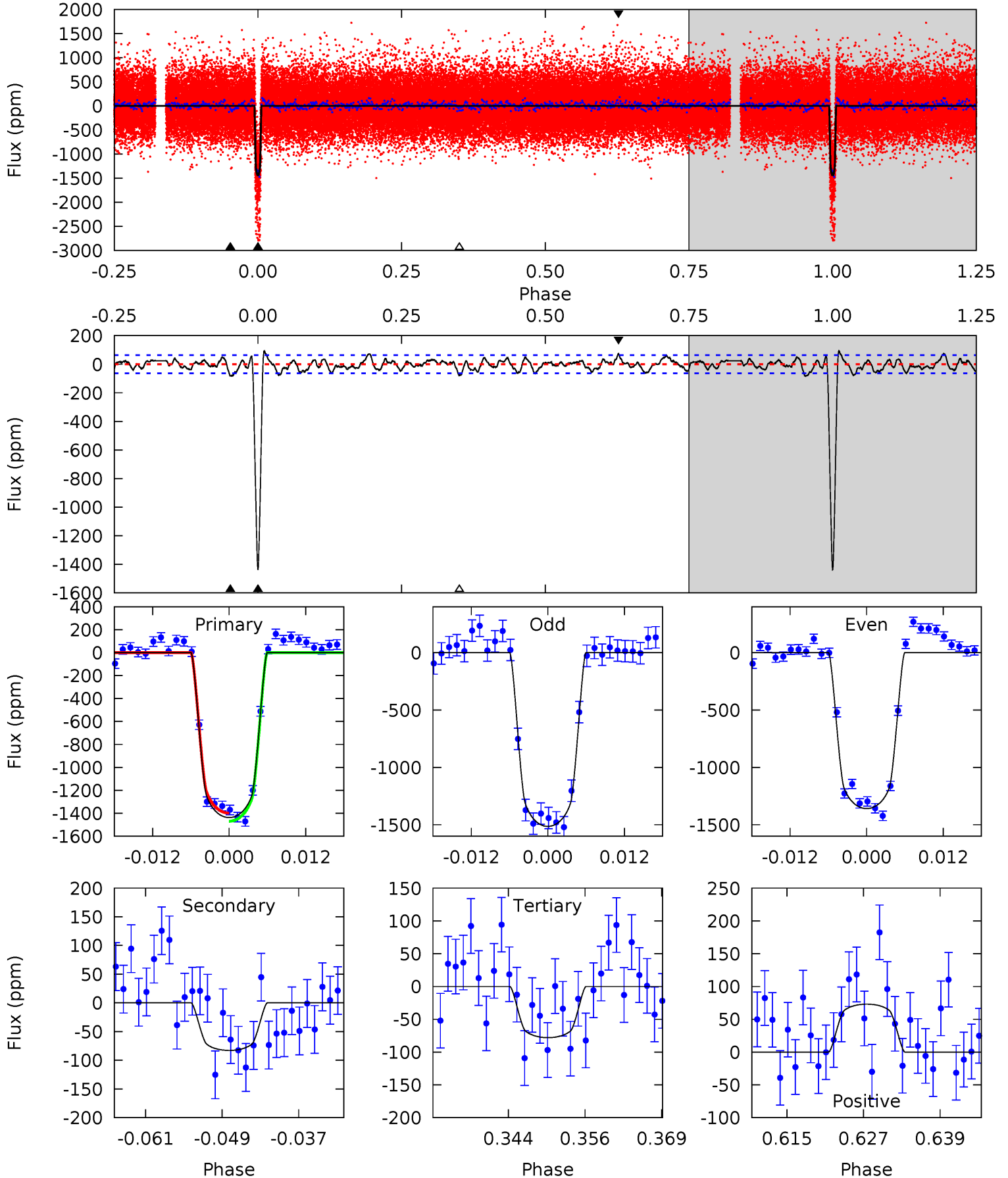
TCE 005305404-02 P=161.254844 Days $T_0=216.428626$ (BKJD)



DV Model-Shift Uniqueness Test

005305404-02, P = 161.261324 Days, E = 55.110101 Days

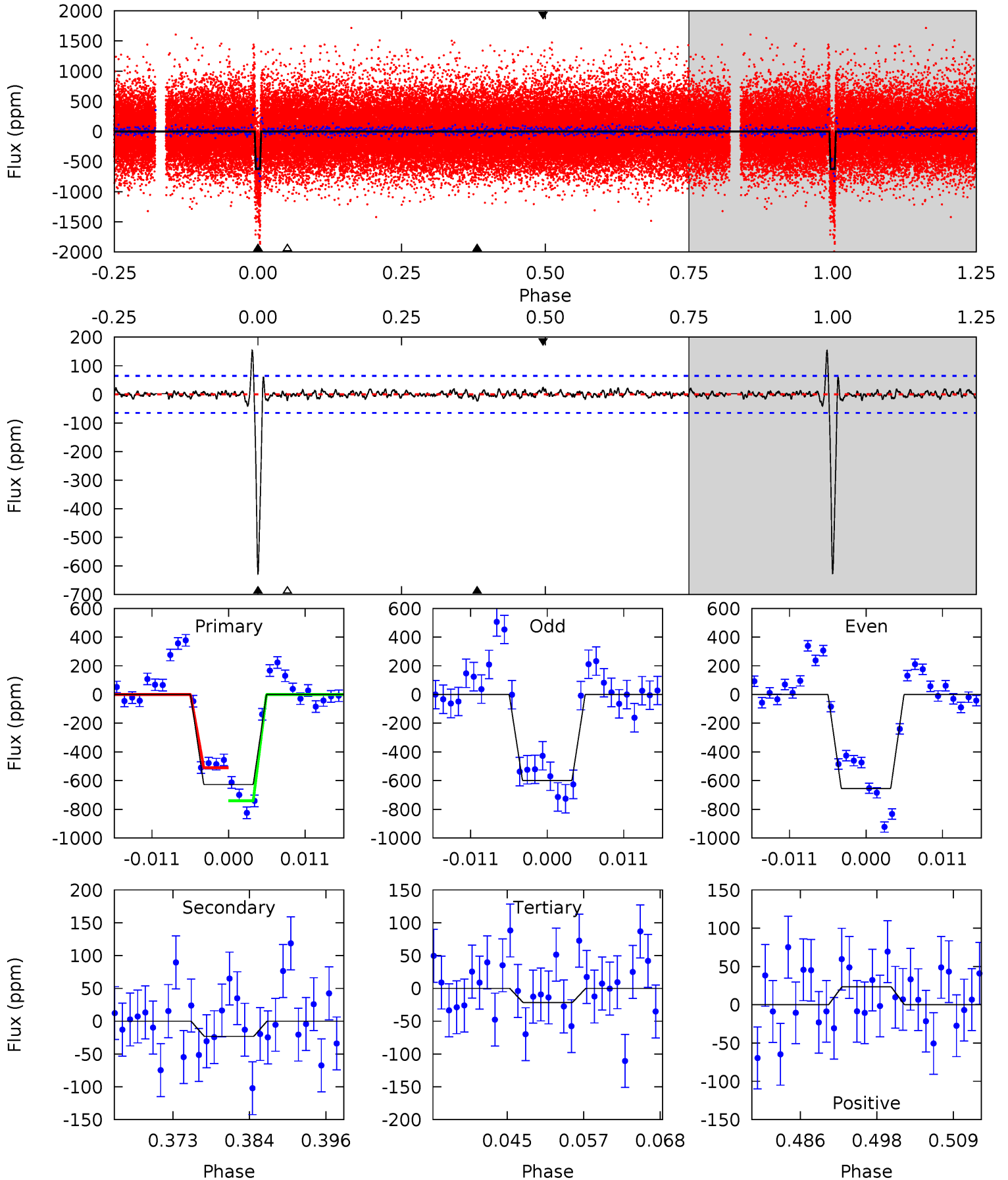
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
112.5	6.49	6.11	5.72	4.99	2.50	2.21	106.4	106.8	0.38	0.77	6.08	1.07	0.06	2.75



Alt Model-Shift Uniqueness Test

005305404-02, P = 161.254844 Days, E = 55.173782 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.5	1.79	1.66	1.80	5.00	2.53	0.67	46.9	46.7	0.13	-0.01	2.15	1.26	0.20	8.94



Stellar Parameters For KIC 005305404

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5985^{+161}_{-179}	$4.574^{+0.033}_{-0.187}$	$-0.500^{+0.300}_{-0.300}$	$0.811^{+0.222}_{-0.059}$	$0.910^{+0.089}_{-0.108}$	$2.398^{+0.448}_{-1.192}$
	+3%/-3%	+1%/-4%	+60%/-60%	+27%/-7%	+10%/-12%	+19%/-50%
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 005305404-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-83 ± 13	$3.69^{+0.50}_{-0.23}$	453^{+27}_{-19}	3365^{+99}_{-109}	1005^{+214}_{-241}
Alt.	-23 ± 13	$2.26^{+0.33}_{-0.17}$	455^{+30}_{-21}	3224^{+240}_{-360}	720^{+480}_{-391}

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

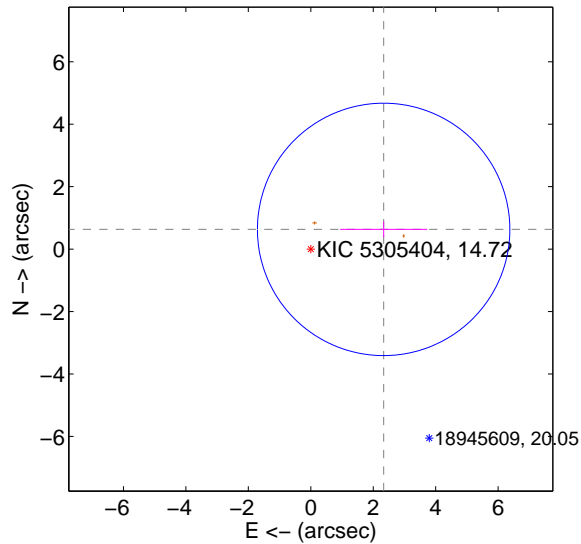
Supplemental centroid analysis for 005305404-02. Kepler magnitude: 14.72. Transit SNR 48.85

There are 0 quarters with good PRF difference image offsets

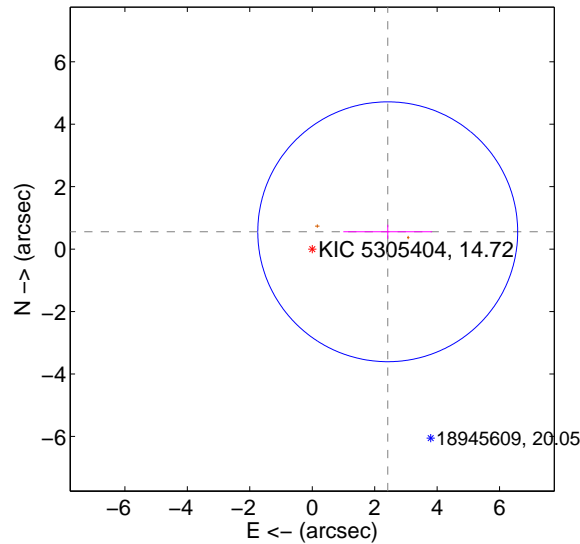
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.417 ± 1.347	1.79	-2.333 ± 1.394	0.631 ± 0.253
PRF-fit source offset from KIC position	2.481 ± 1.387	1.79	-2.418 ± 1.422	0.555 ± 0.225
photometric centroid source offset	4.07 ± 0.34	12.05	-0.25 ± 0.35	-4.06 ± 0.34

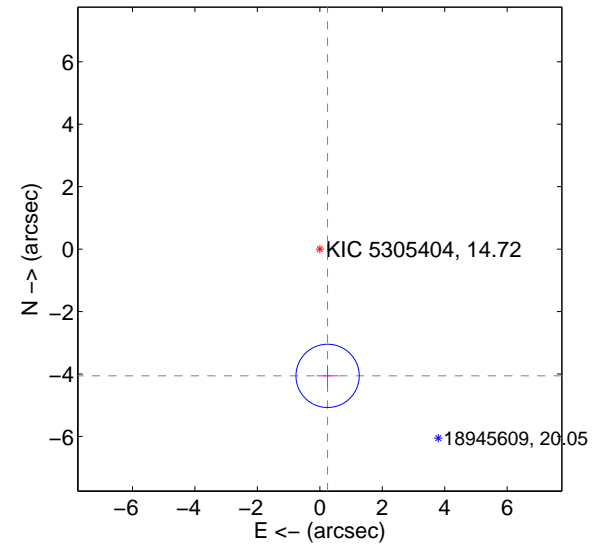
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

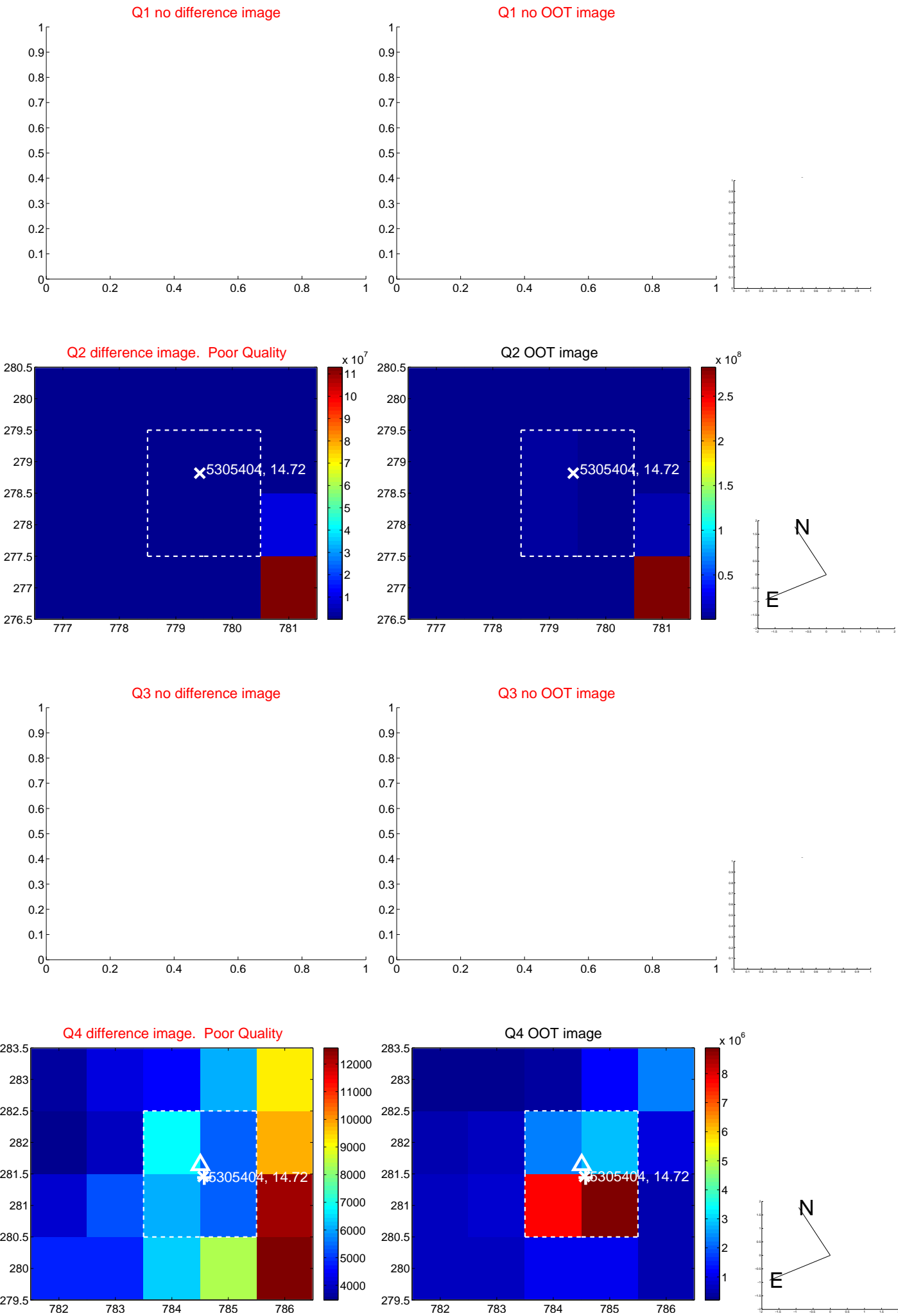


offset from photometric centroids

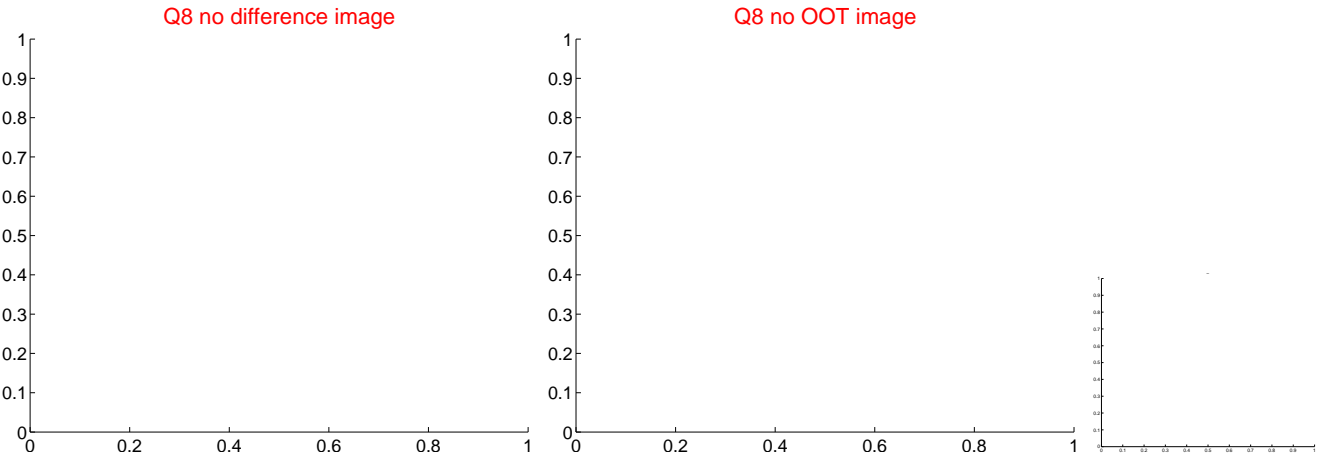
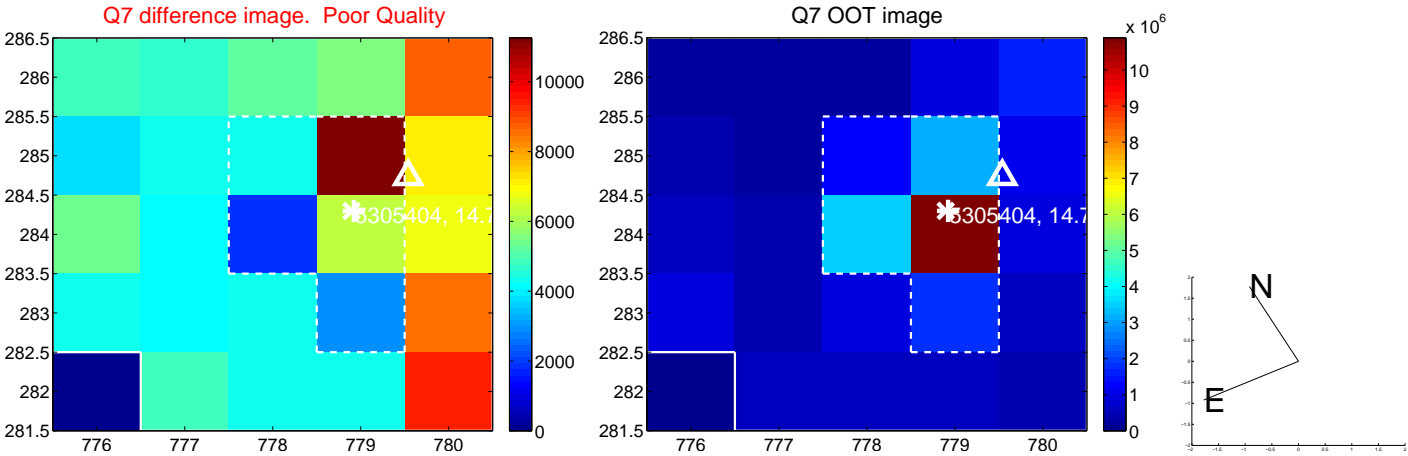


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

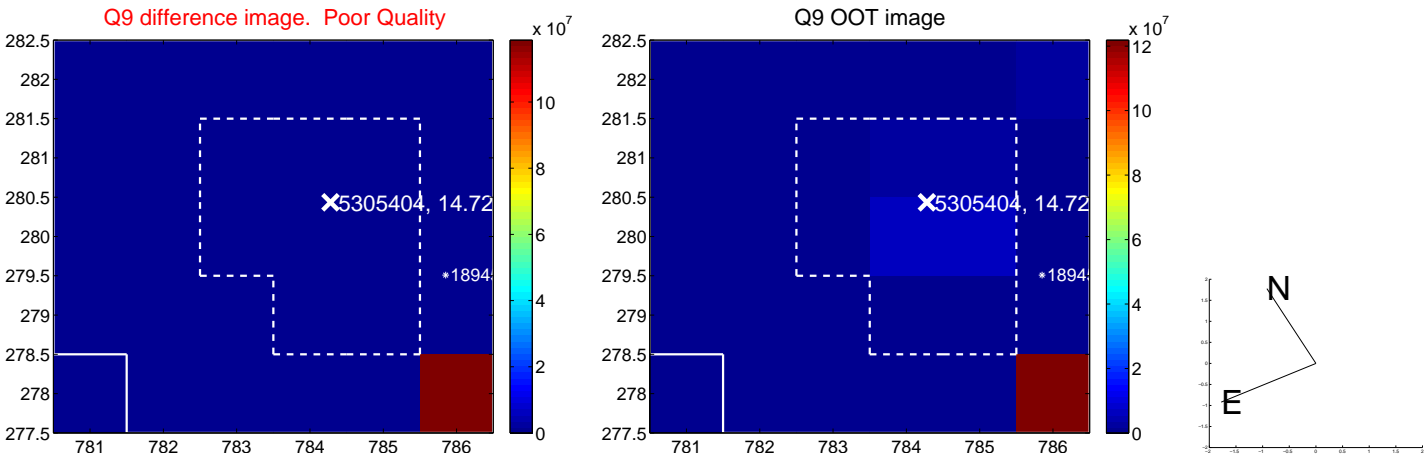
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



white ×: 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.

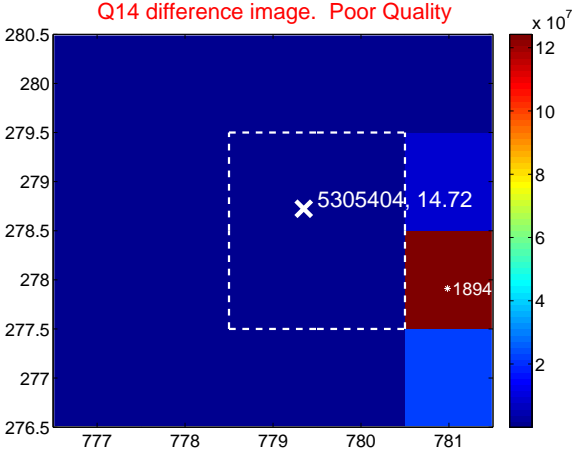
Q13 no difference image



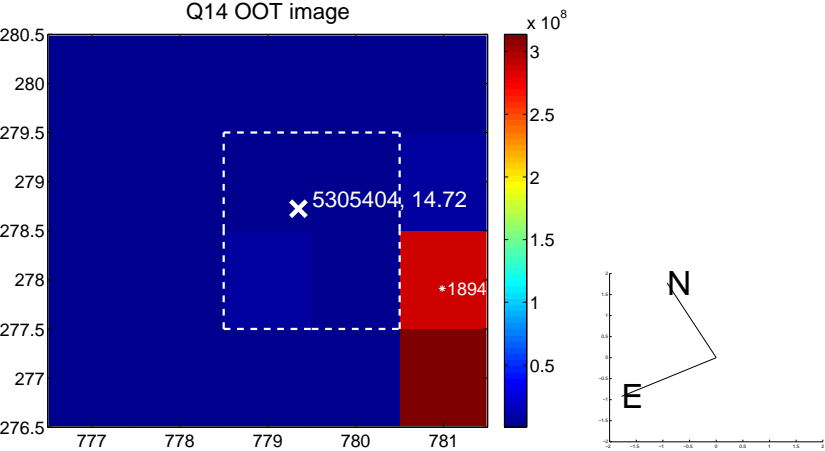
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



Q15 no difference image



Q15 no OOT image



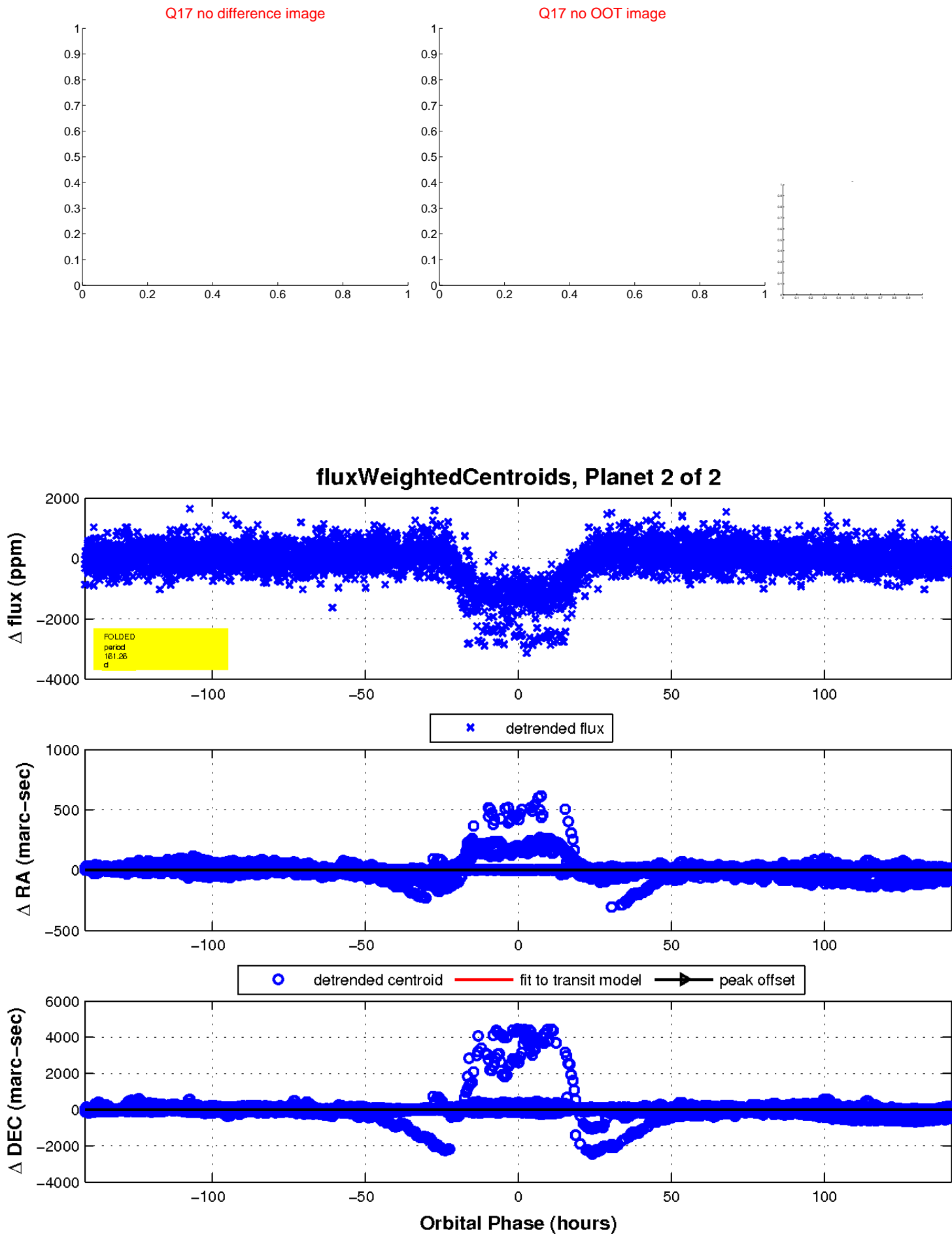
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

