

KIC 005872150

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})
005872150-01	OBS	0414.01	20.355097	134.633537	25066.8	5.364	1483.0	1373.3	1.08	6081	17.64	63.69
005872150-02	OBS	0414.02	5.922390	132.362879	389.9	3.591	35.5	38.7	1.08	6081	2.63	330.33
005872150-03	OBS	No	20.355090	144.378566	408.7	5.194	24.6	26.2	1.08	6081	2.44	63.69
005872150-04	OBS	No	403.387441	197.083678	441.7	10.352	33.9	6.0	1.08	6081	3.09	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005872150-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
005872150-02	OBS	FP	0.02	0	0	1	0	CENT_KIC_POS—HALO_GHOST
005872150-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
005872150-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

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.

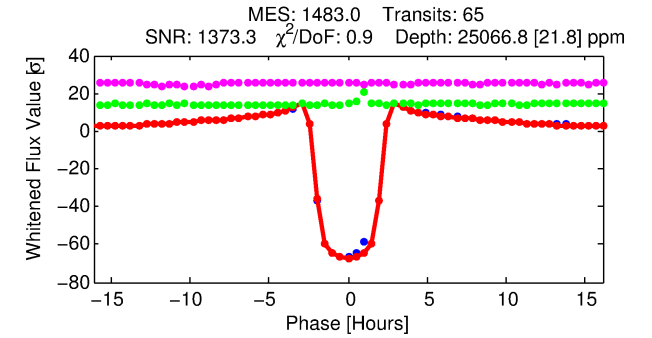
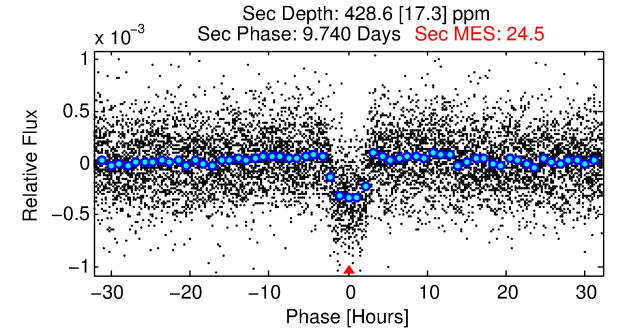
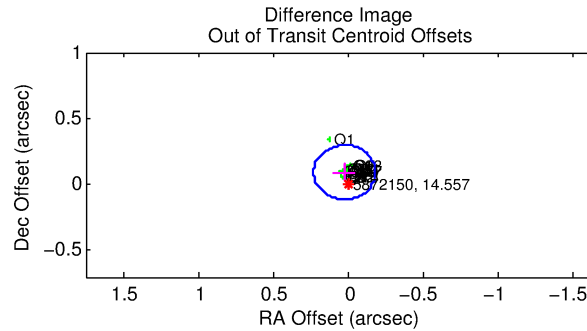
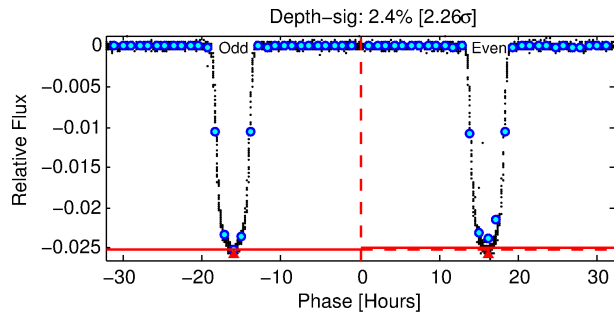
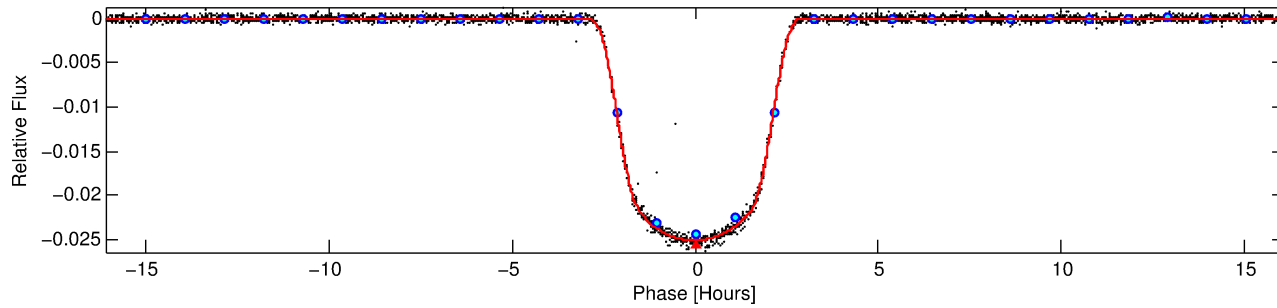
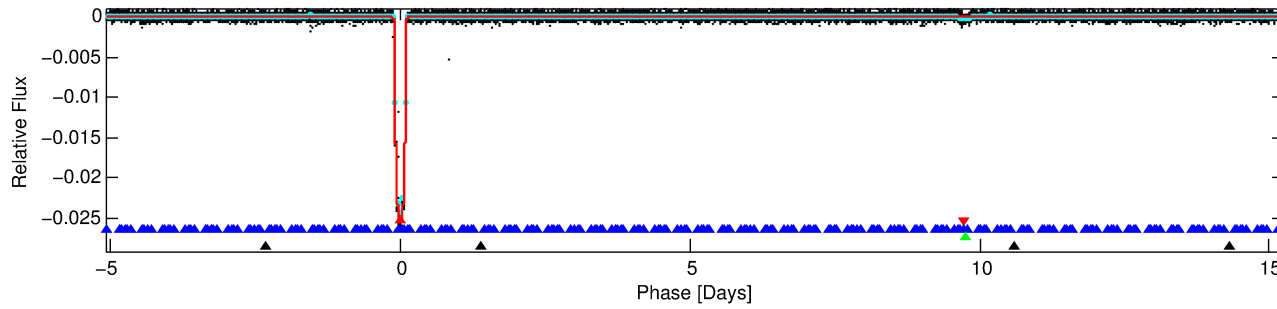
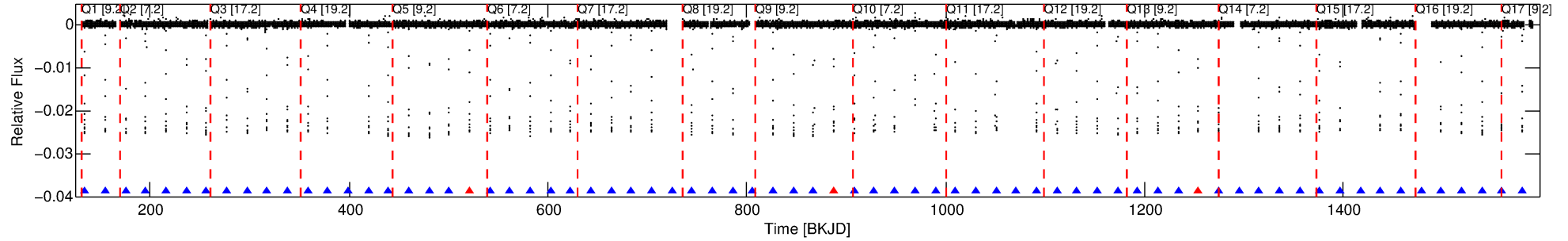
Ephemeris Match Information For 005872150-01

No Significant Match Found

DV One-Page Summary

KIC: 5872150 Candidate: 1 of 4 Period: 20.355 d
KOI: K00414.01 Corr: 0.999

Kp: 14.56 R*: 1.08 Rs Teff: 6081.0 K Logg: 4.40 Fe/H: 0.000



DV Fit Results:

Period = 20.35510 [0.00000] d
Epoch = 134.6335 [0.0001] BKJD
Rp/R* = 0.1501 [0.0001]
a/R* = 29.51 [0.09]
b = 0.54 [0.00]
Seff = 63.69 [26.61]
Teq = 720 [75] K
Rp = 17.64 [5.47] Re
a = 0.1494 [0.0397] AU
Ag = 16.91 [6.66] [2.39σ]
Teff = 2258 [85] K [13.56σ]

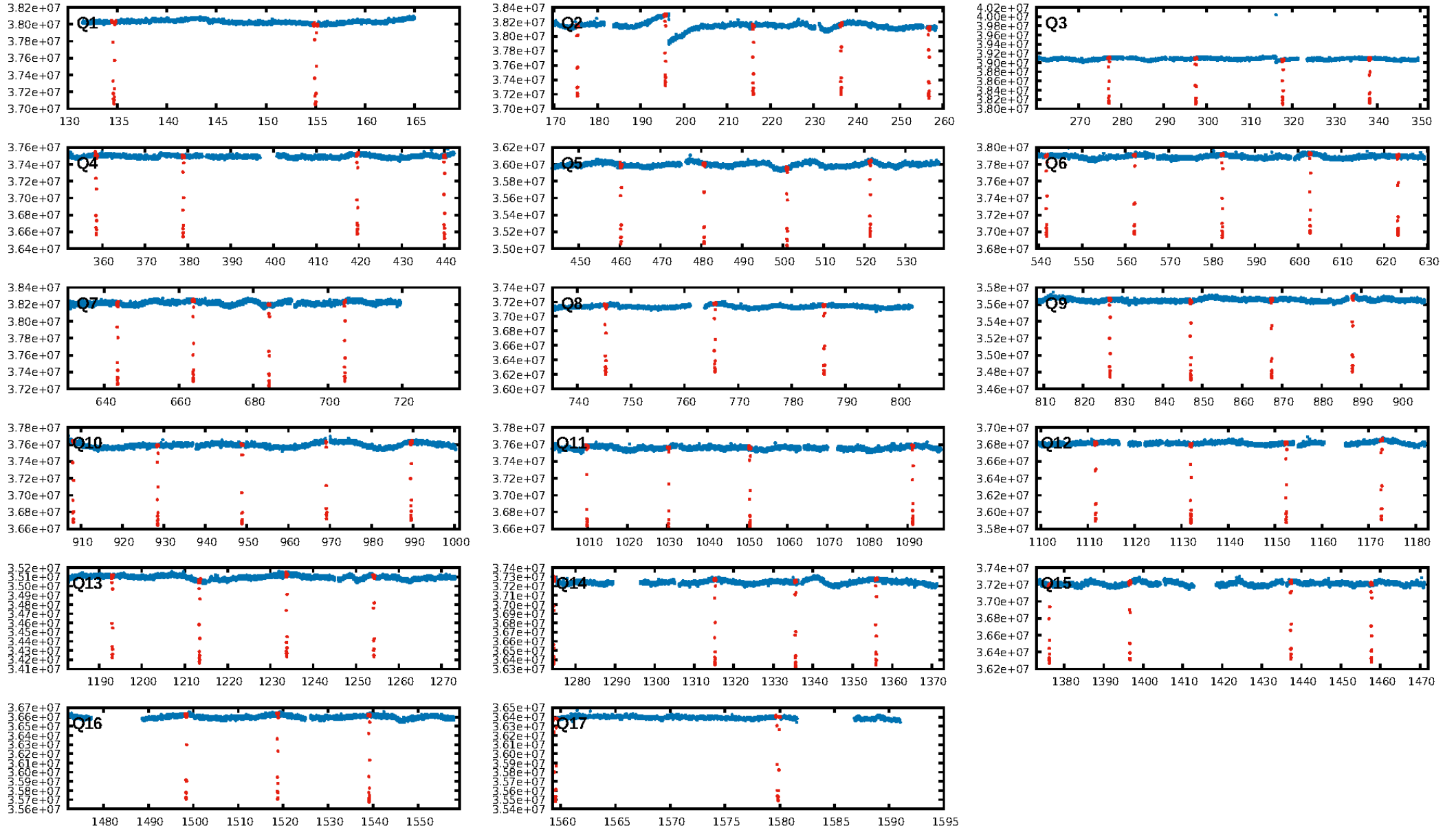
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [788.45σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 1.9%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.95 [58/61]
GhostDiagnostic-chr: 6.357
Centroid-sig: 0.0%
Centroid-so: 0.355 arcsec [43.11σ]
OotOffset-rm: 0.095 arcsec [1.38σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.310 arcsec [4.36σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

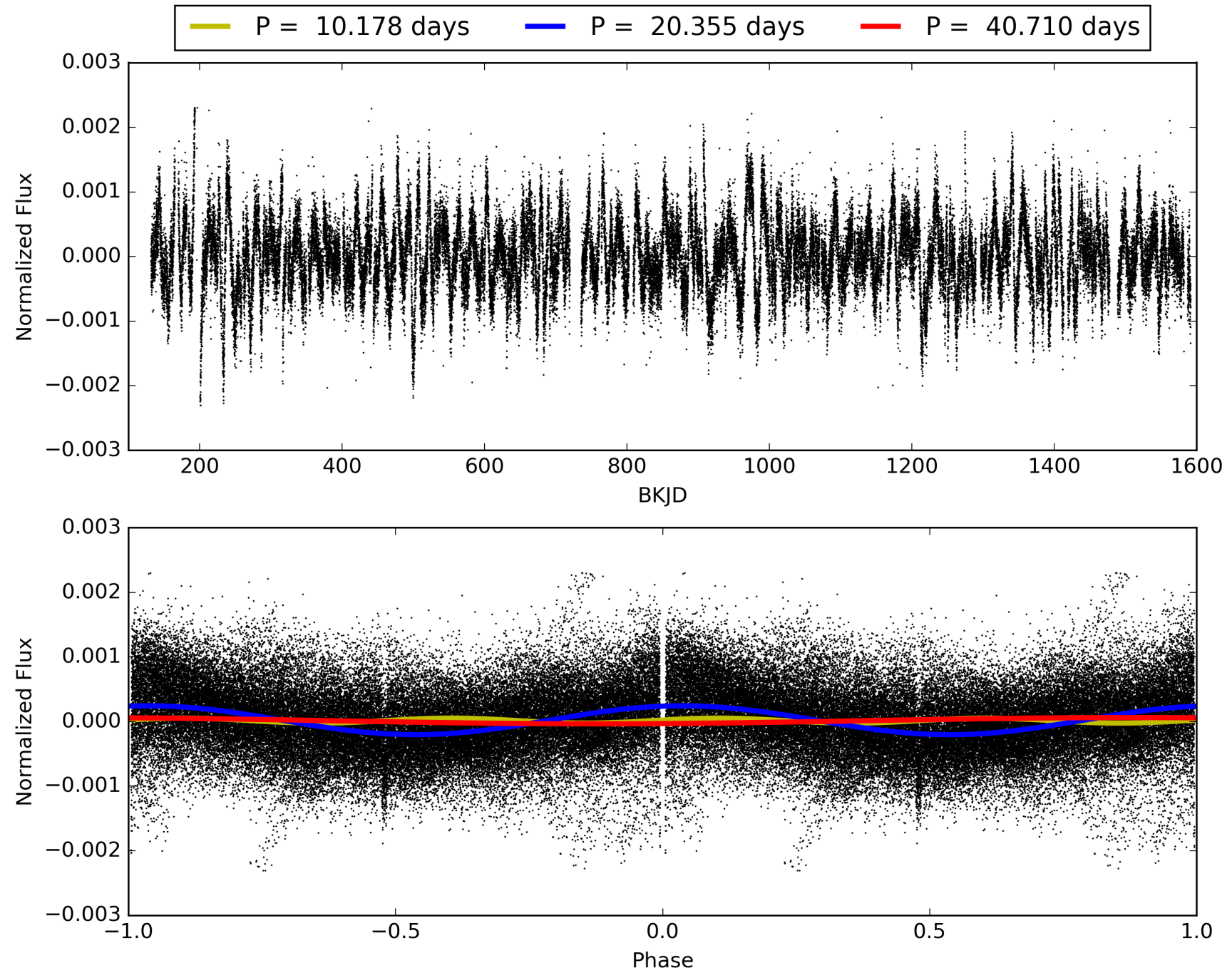
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:52:34 Z

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

TCE 005872150-01, PDC Light Curves

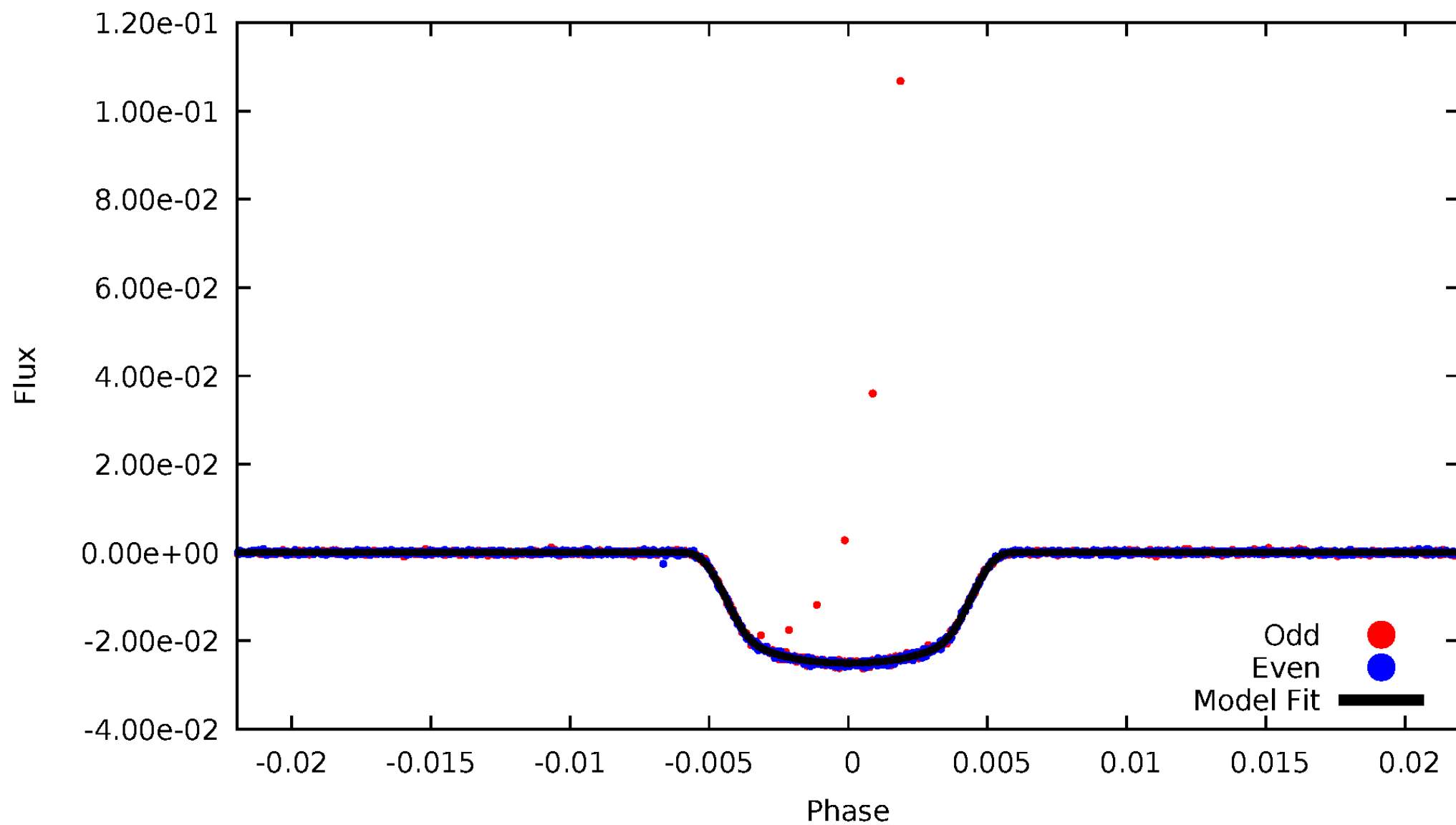


TCE 005872150-01



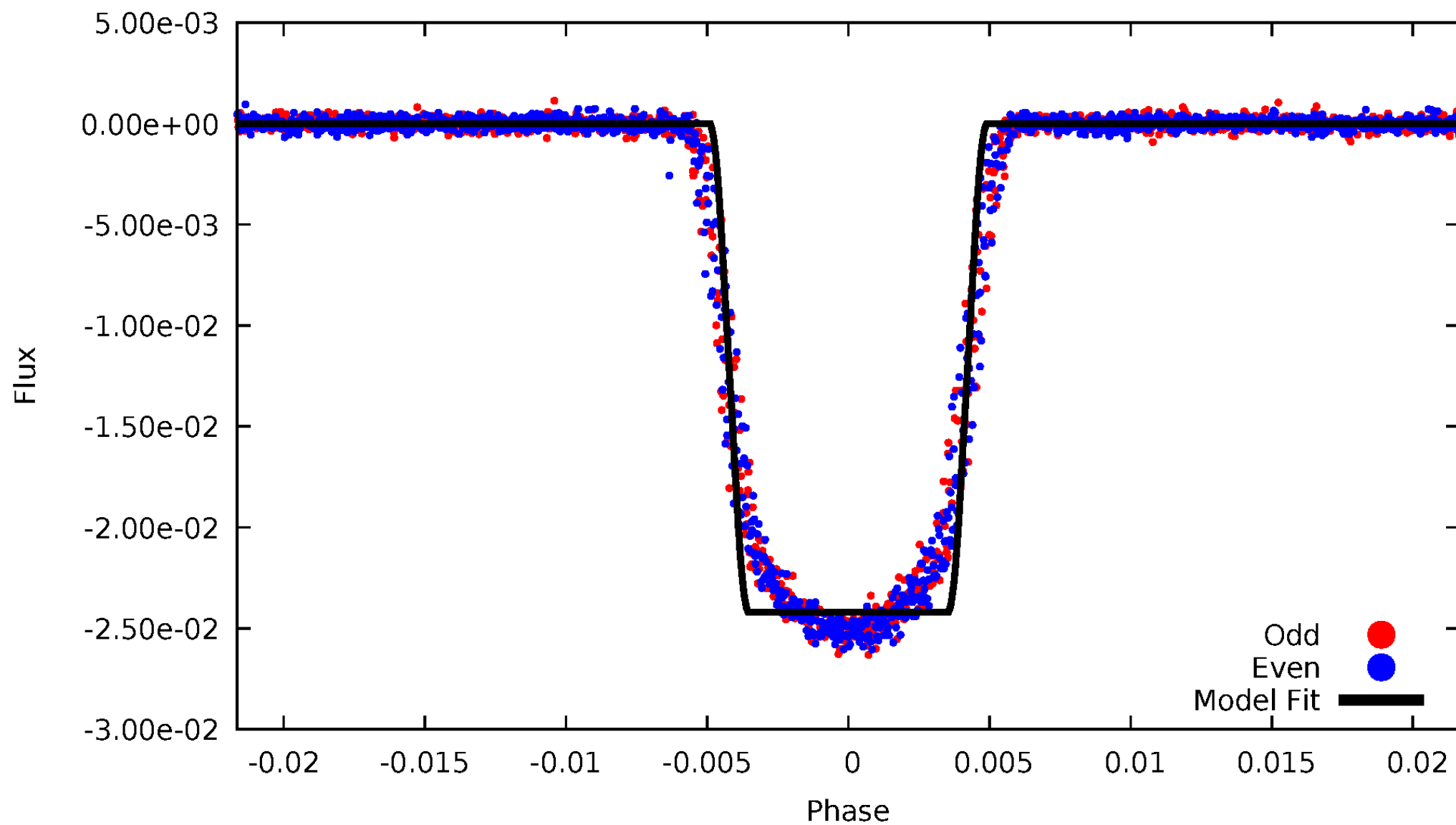
DV Odd/Even

TCE 005872150-01



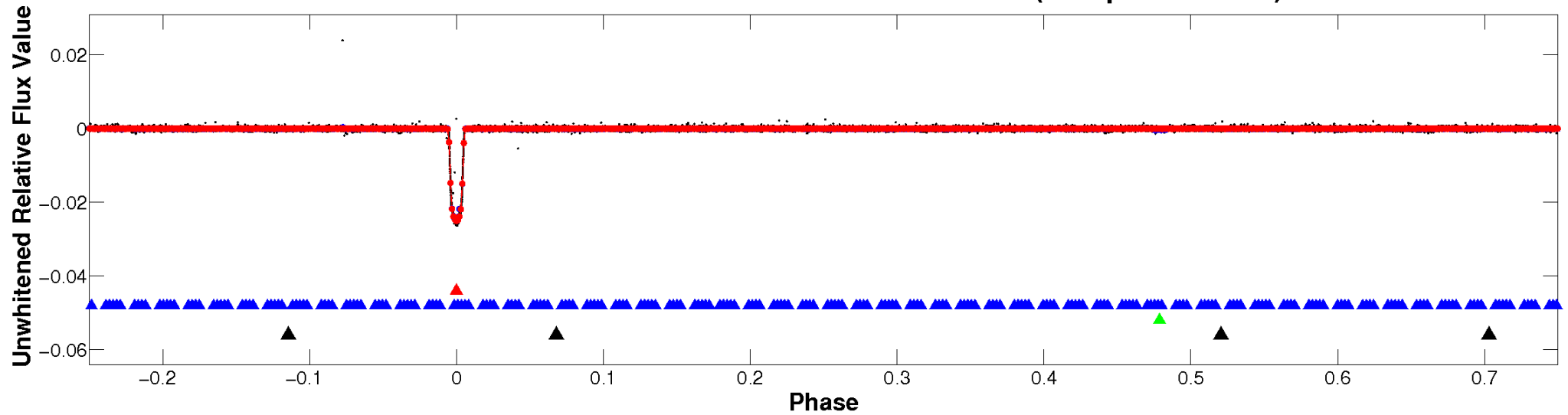
ALT Odd/Even

TCE 005872150-01

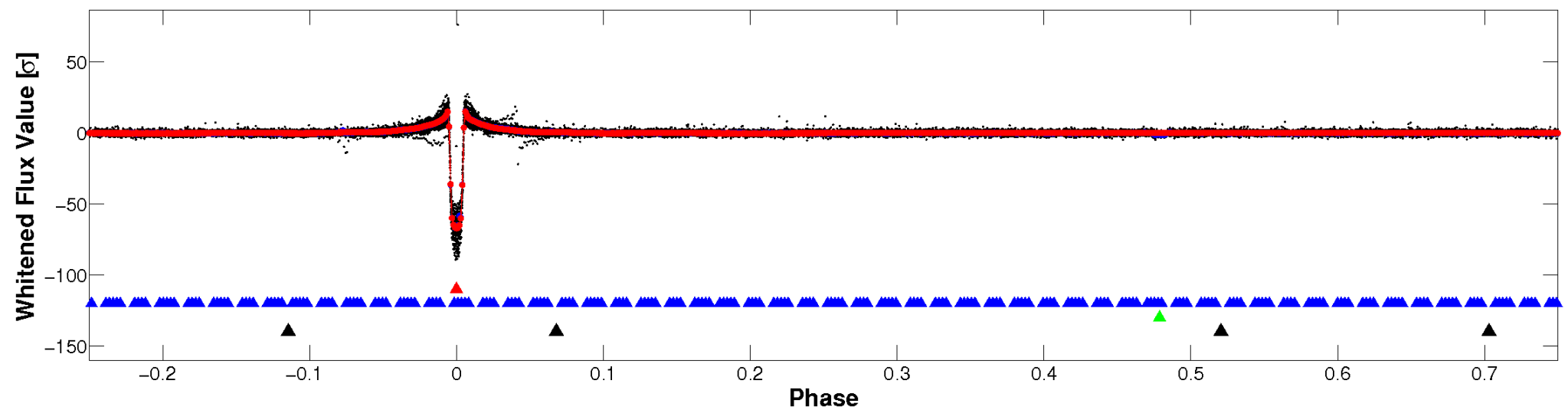


Non-Whitened Vs. Whitened Light Curve

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

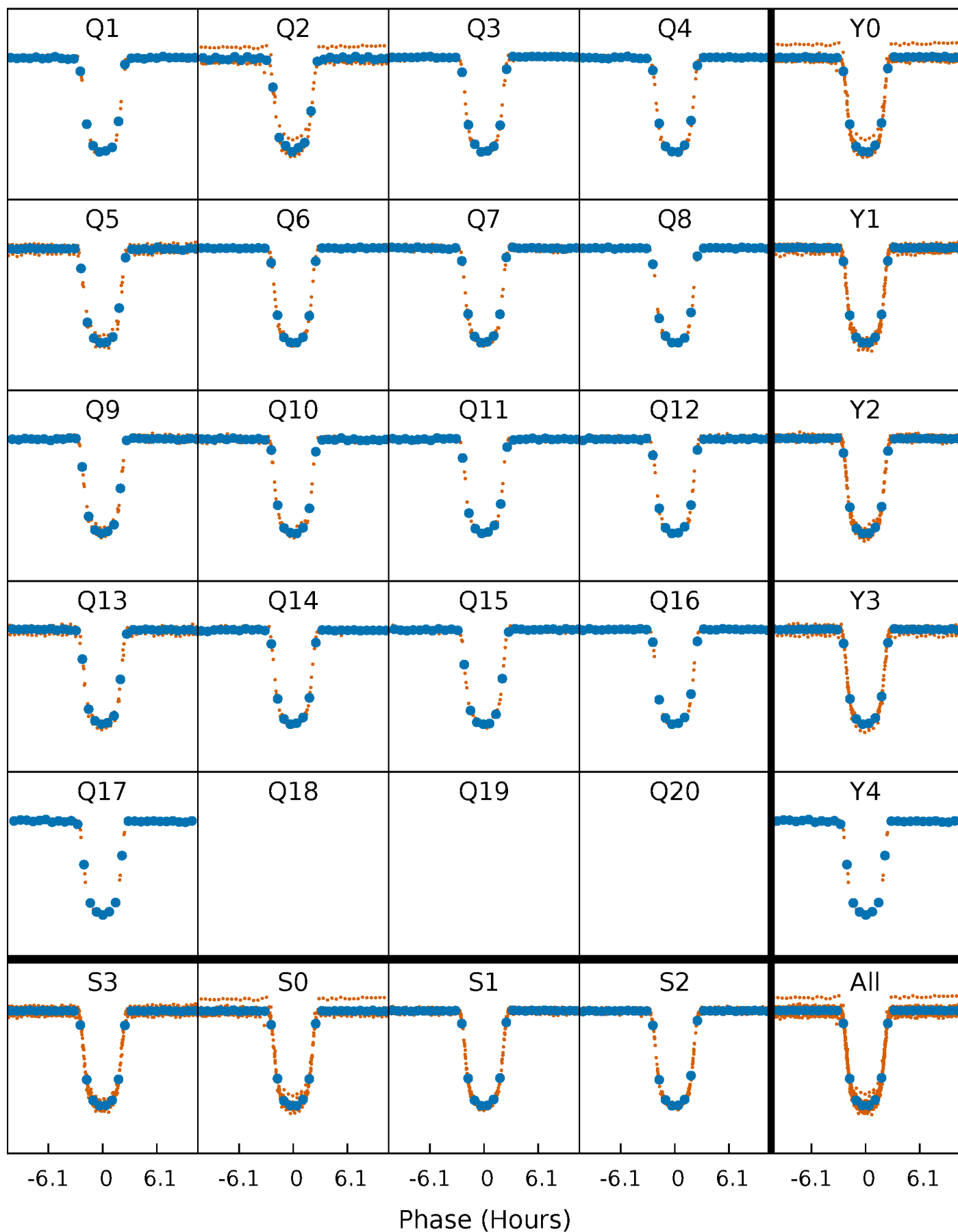


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



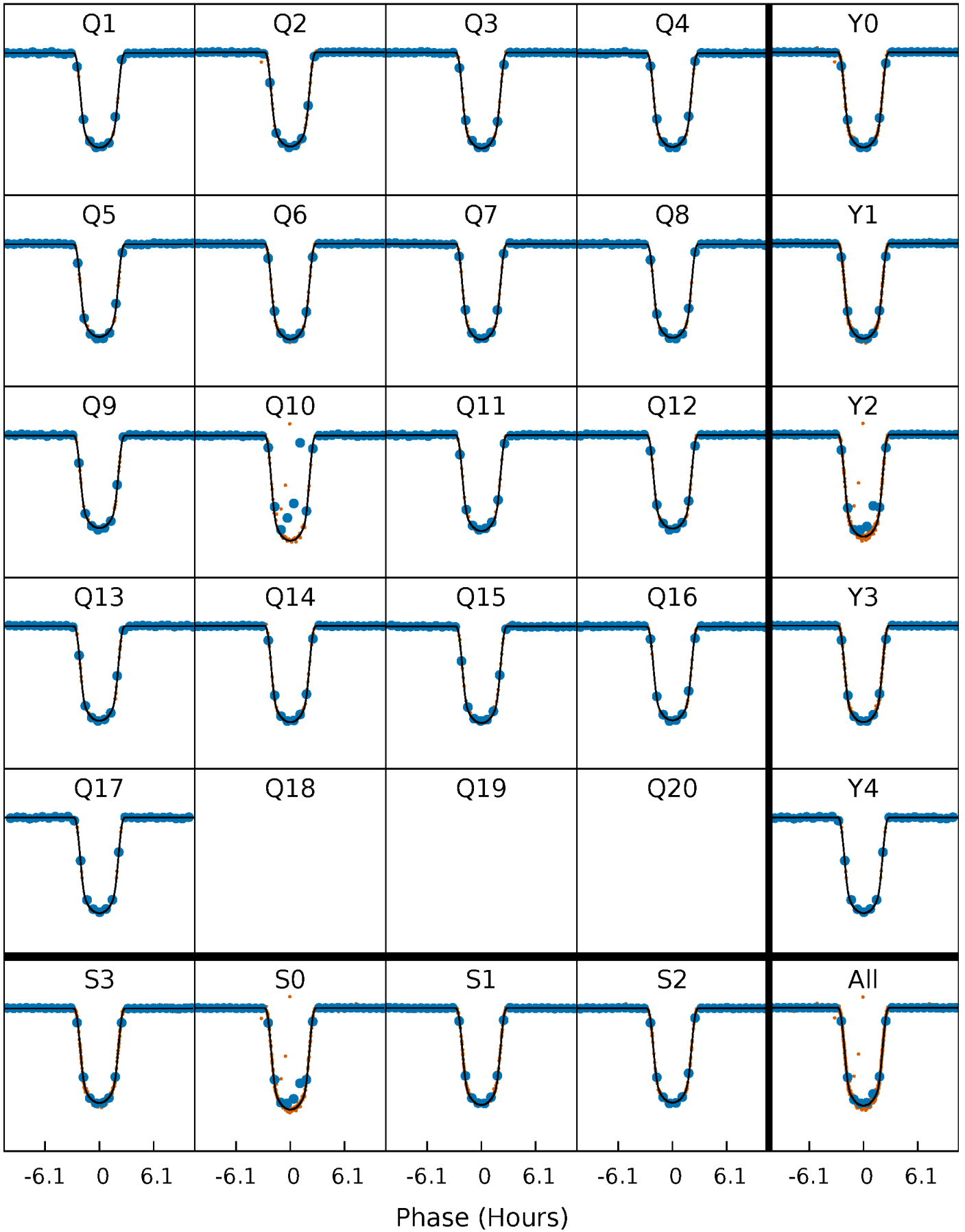
PDC Quarter-Phased Transit Curves

TCE 005872150-01 P= 20.355097 Days $T_0=134.633537$ (BKJD)



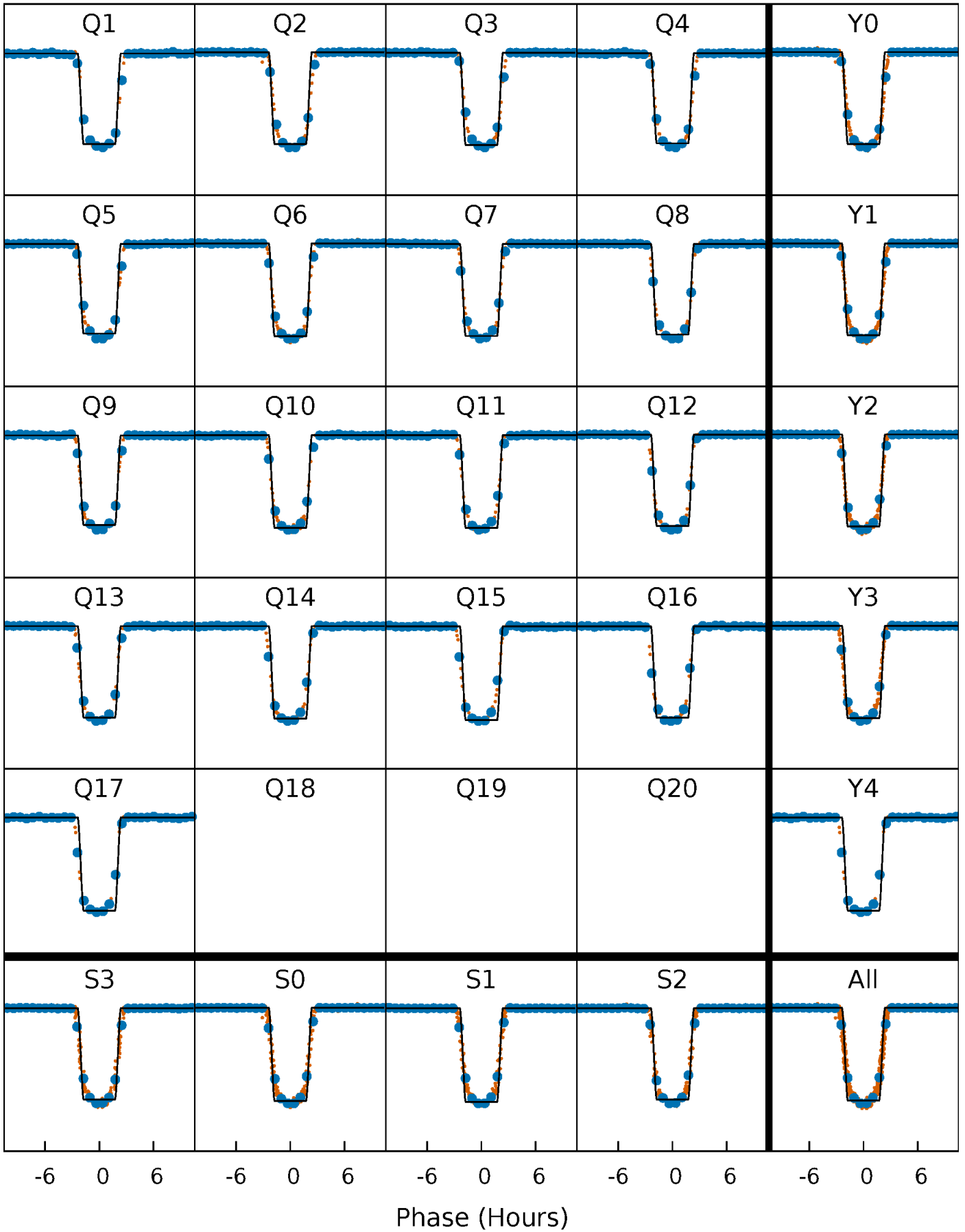
DV Quarter-Phased Transit Curves

TCE 005872150-01 P= 20.355097 Days $T_0=134.633537$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

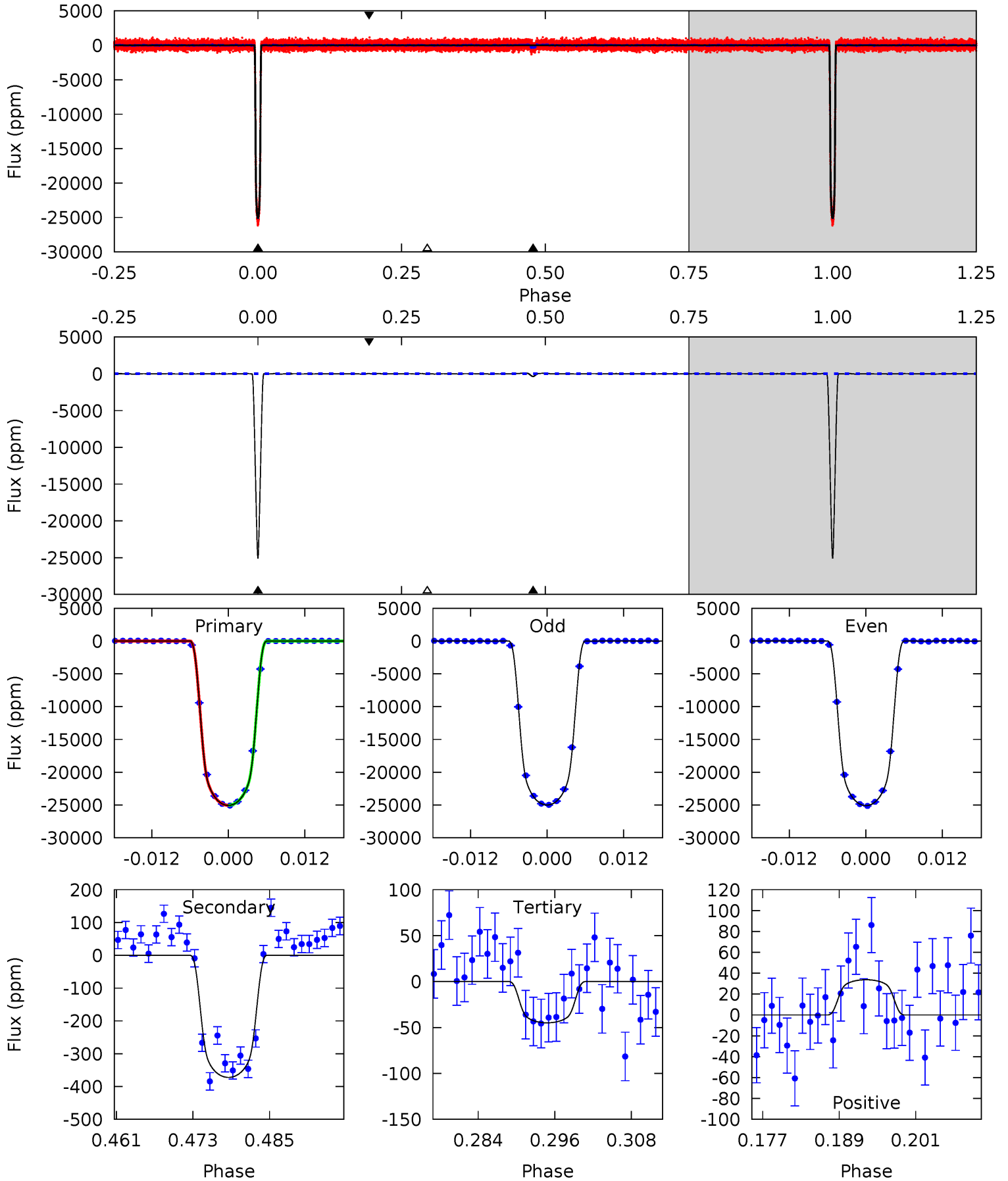
TCE 005872150-01 P= 20.355324 Days $T_0=134.625814$ (BKJD)



DV Model-Shift Uniqueness Test

005872150-01, P = 20.355097 Days, E = 114.278440 Days

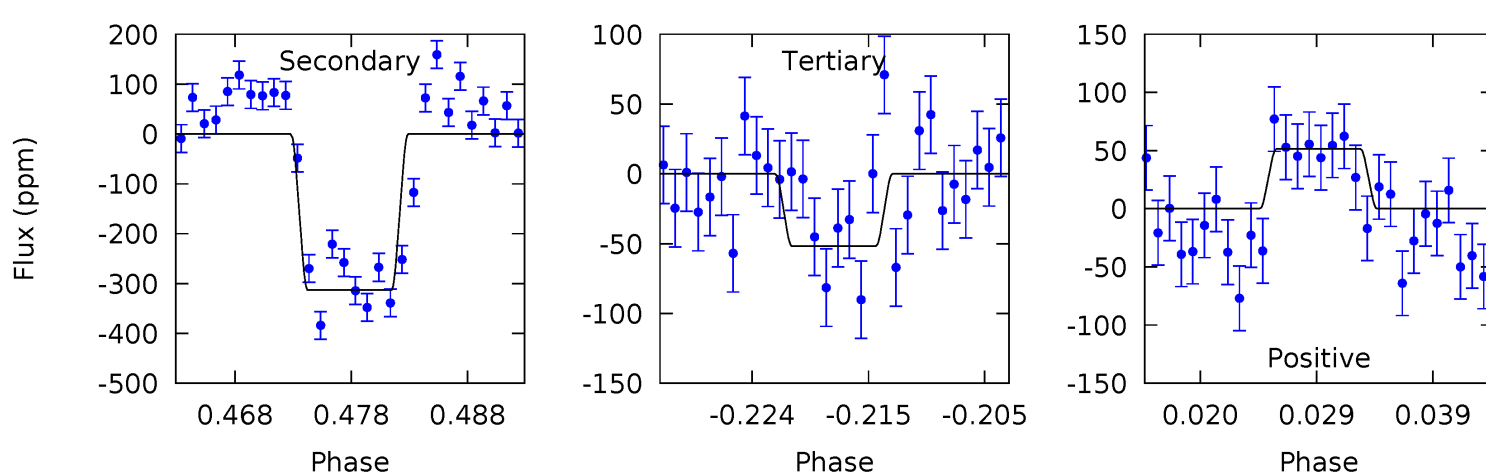
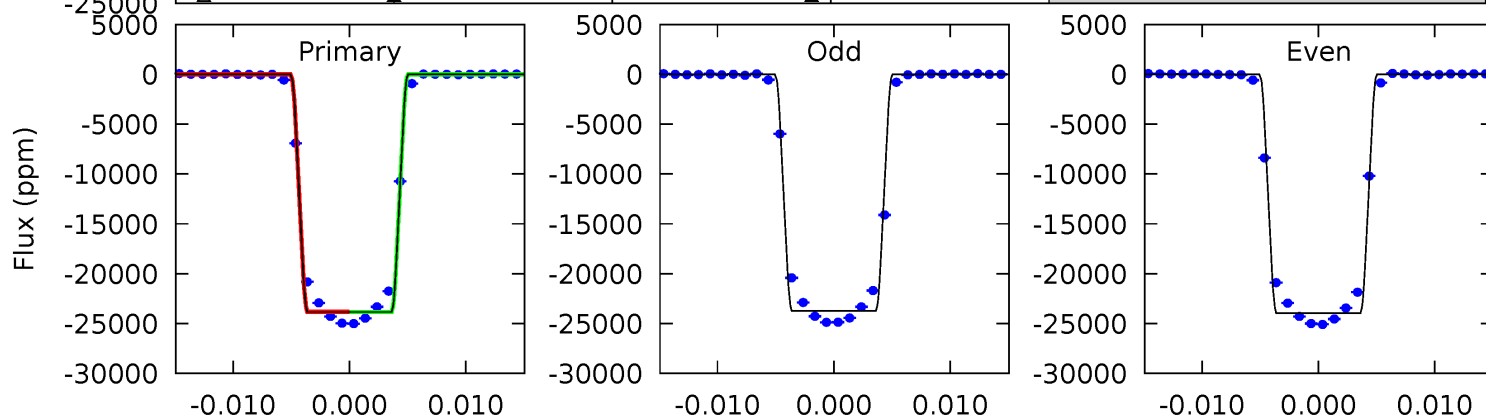
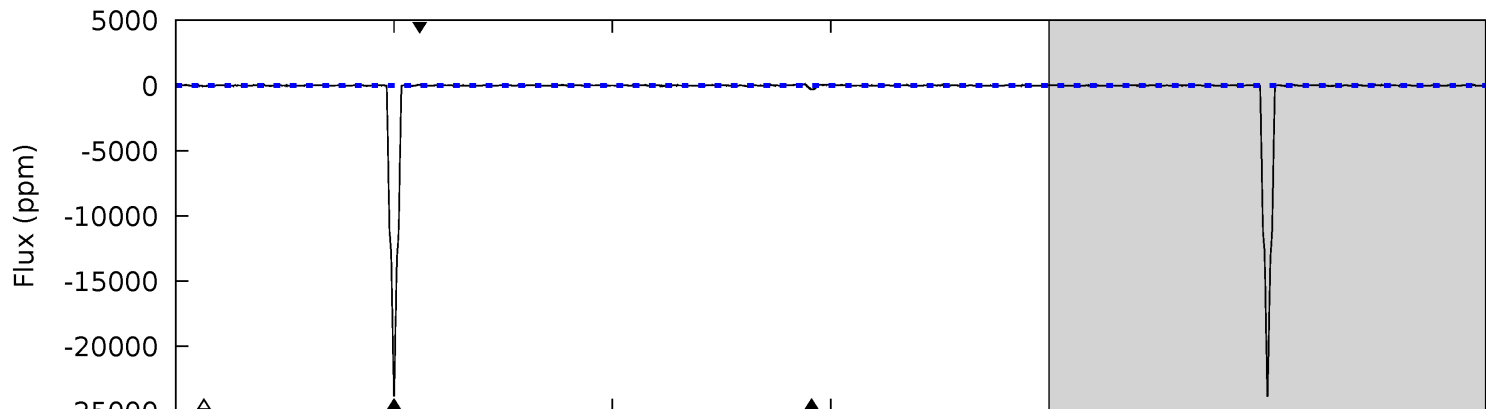
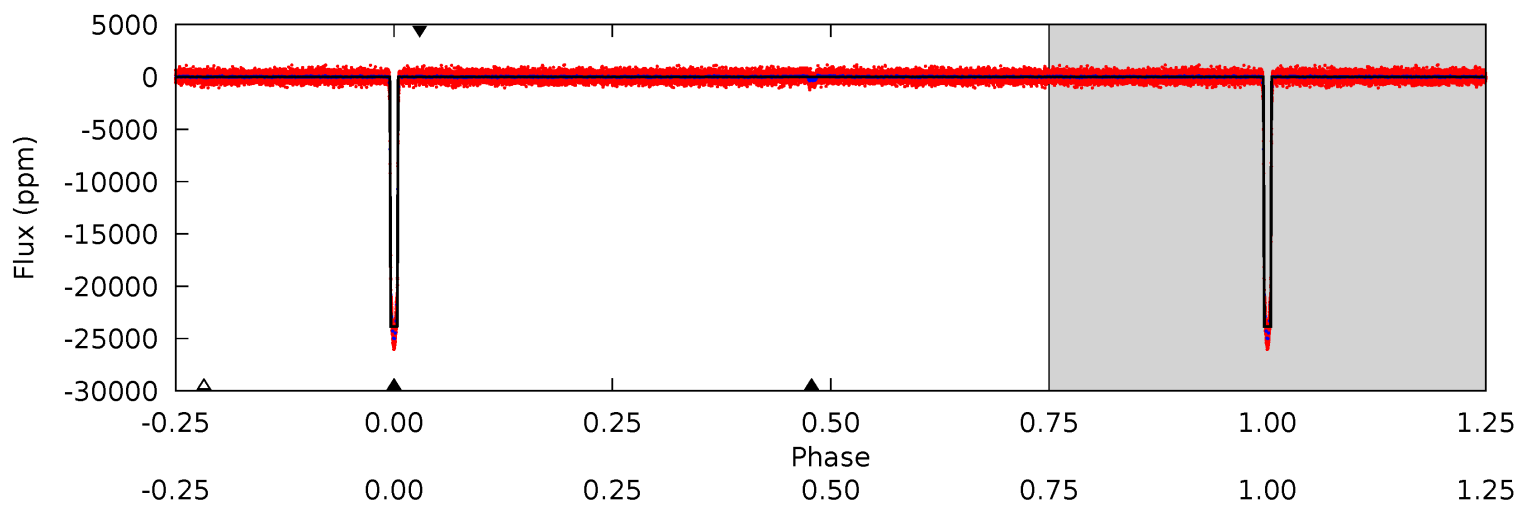
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2544	37.8	4.56	3.43	4.99	2.52	1.95	2539	2540	33.2	34.4	4.41	0.98	0.00	0.93



Alt Model-Shift Uniqueness Test

005872150-01, P = 20.355324 Days, E = 114.270490 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1901	24.9	4.13	4.09	5.03	2.58	1.41	1897	1897	20.8	20.8	9.29	1.00	0.00	1.05



Stellar Parameters For KIC 005872150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6081^{+184}_{-220}	$4.404^{+0.072}_{-0.217}$	$0.000^{+0.250}_{-0.300}$	$1.077^{+0.334}_{-0.143}$	$1.072^{+0.151}_{-0.135}$	$1.207^{+0.456}_{-0.631}$
	+3%/-4%	+2%/-5%	+inf%/-inf%	+31%/-13%	+14%/-13%	+38%/-52%
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 005872150-01 / KOI 0414.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-372 ± 10	$18.22^{+2.97}_{-1.59}$	1029^{+75}_{-57}	2884^{+56}_{-57}	14^{+2}_{-3}
Alt.	-313 ± 13	$18.85^{+3.03}_{-1.59}$	1023^{+78}_{-52}	2784^{+50}_{-56}	11^{+2}_{-3}

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 $A_{\text{obs}} \gg 1.0$

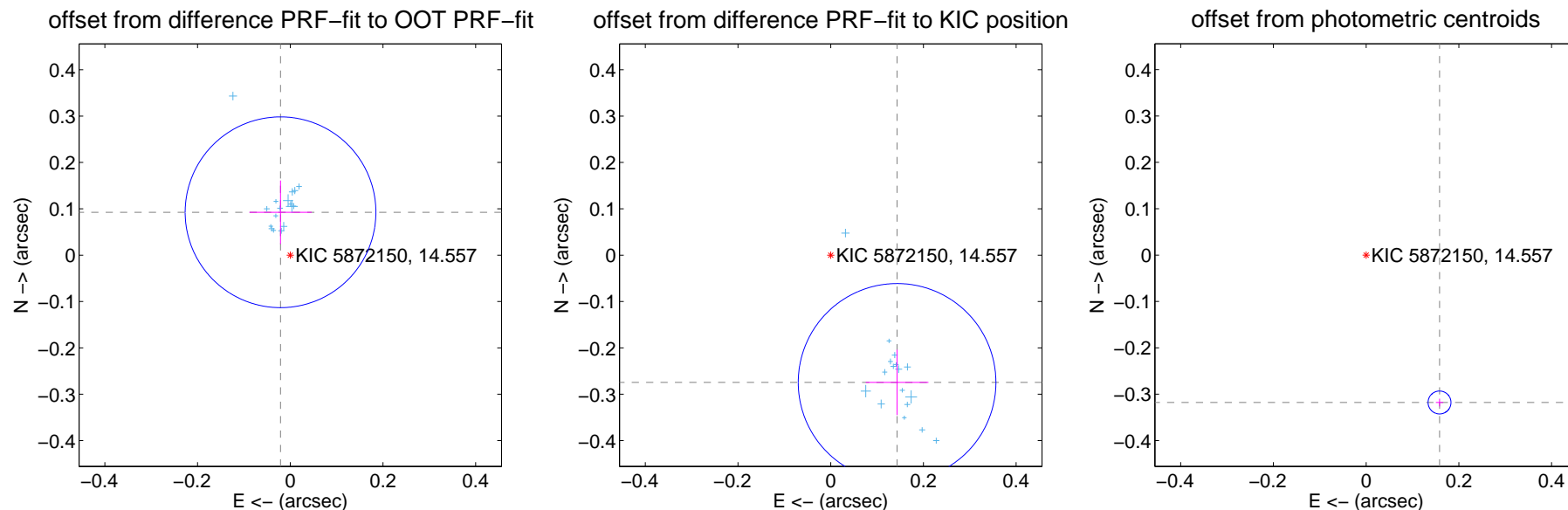
DV Centroid Data

Supplemental centroid analysis for 005872150-01. Kepler magnitude: 14.56. Transit SNR 1373.26

There are 17 quarters with good PRF difference image offsets

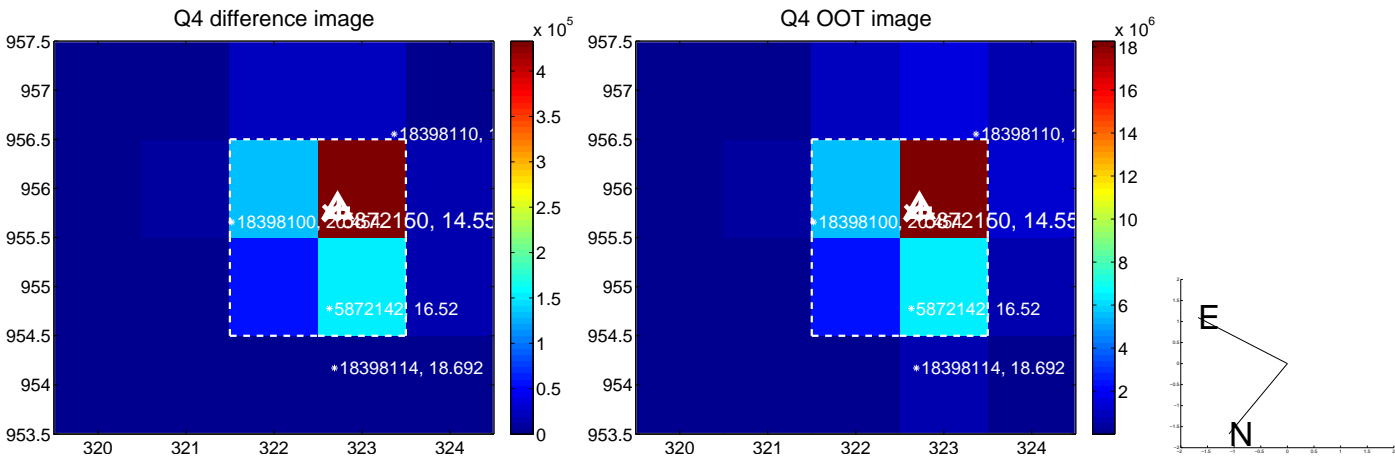
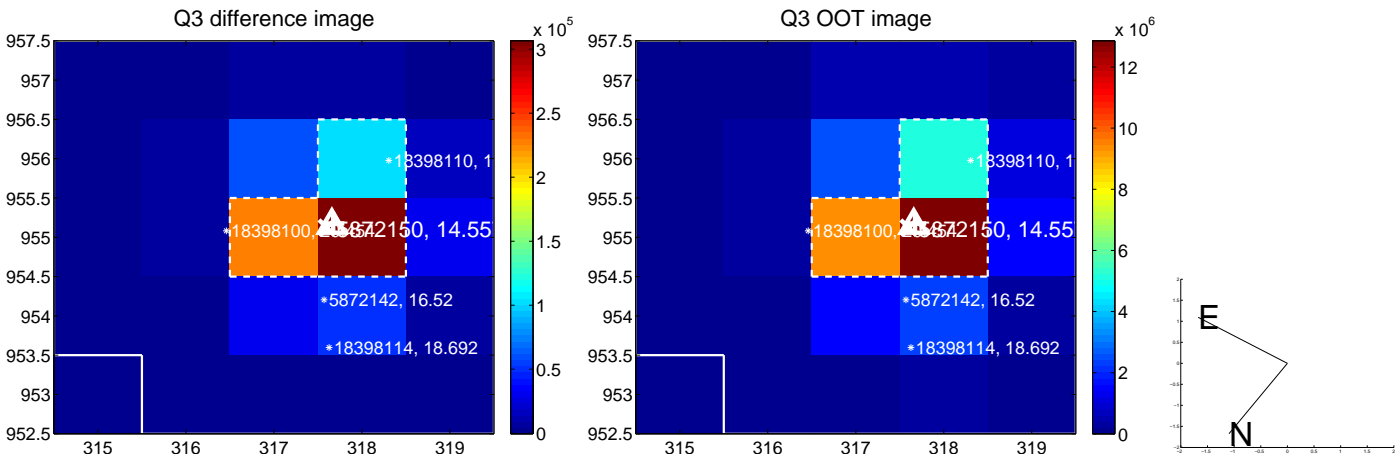
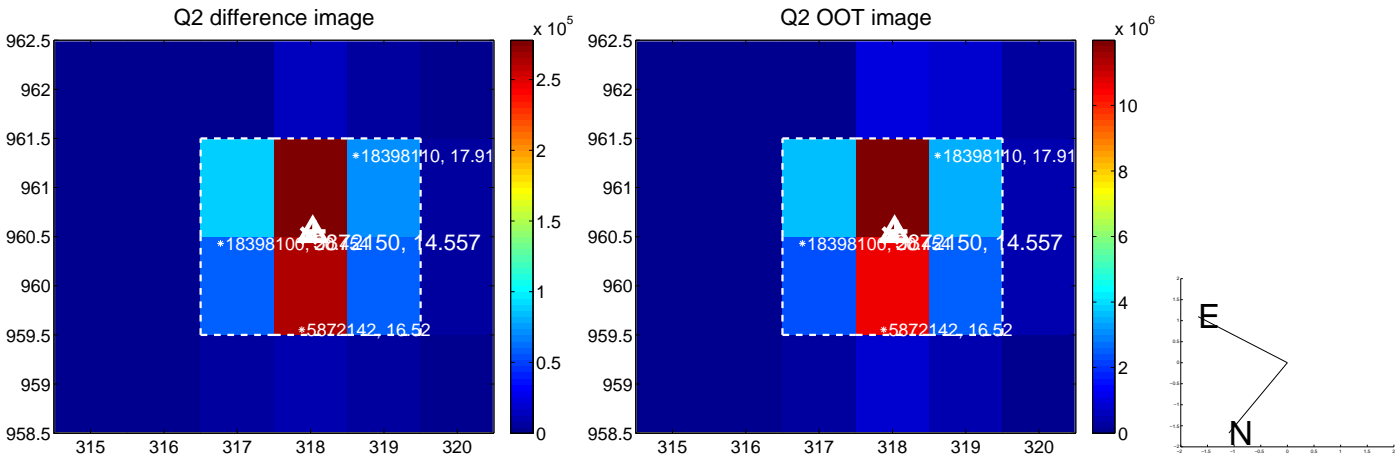
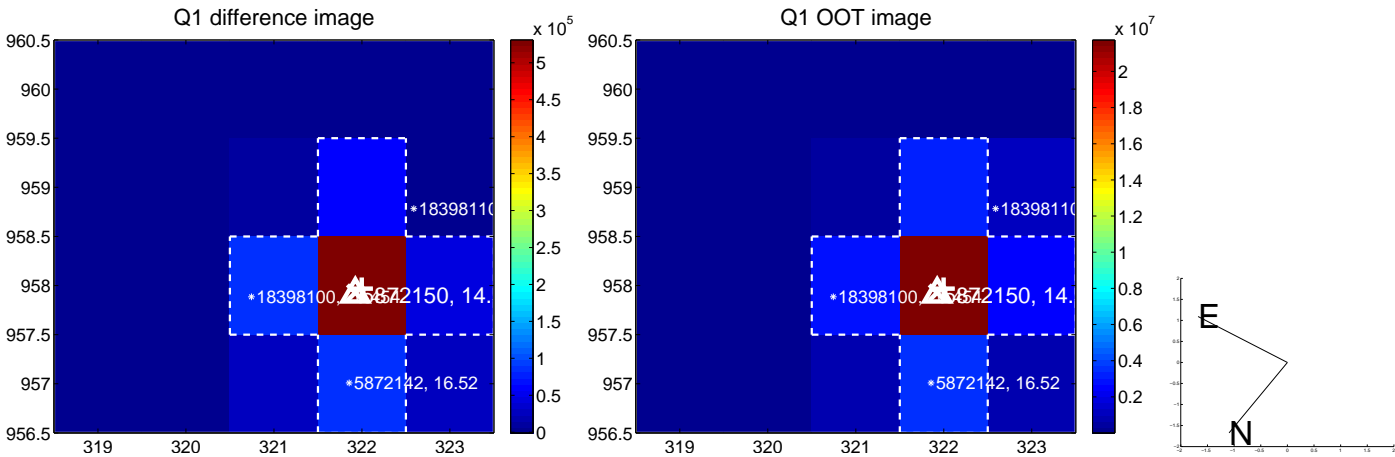
The direct PRF centroid is offset from the target star catalog position by about 0.44 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.095 ± 0.069	1.38	0.021 ± 0.067	0.093 ± 0.068
PRF-fit source offset from KIC position	0.310 ± 0.071	4.36	-0.143 ± 0.068	-0.275 ± 0.071
photometric centroid source offset	0.36 ± 0.01	43.11	-0.16 ± 0.01	-0.32 ± 0.01

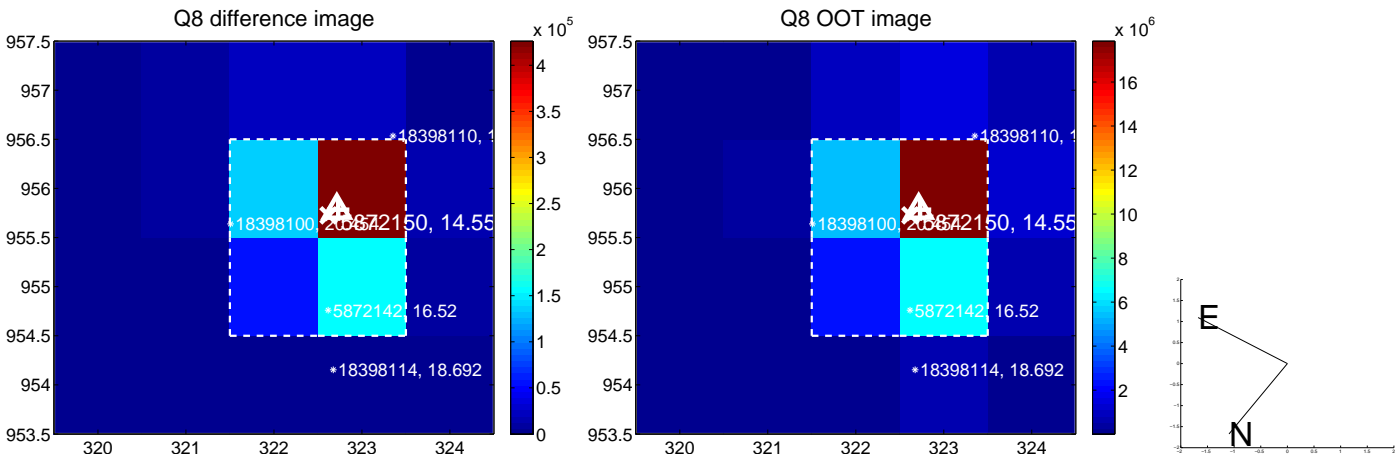
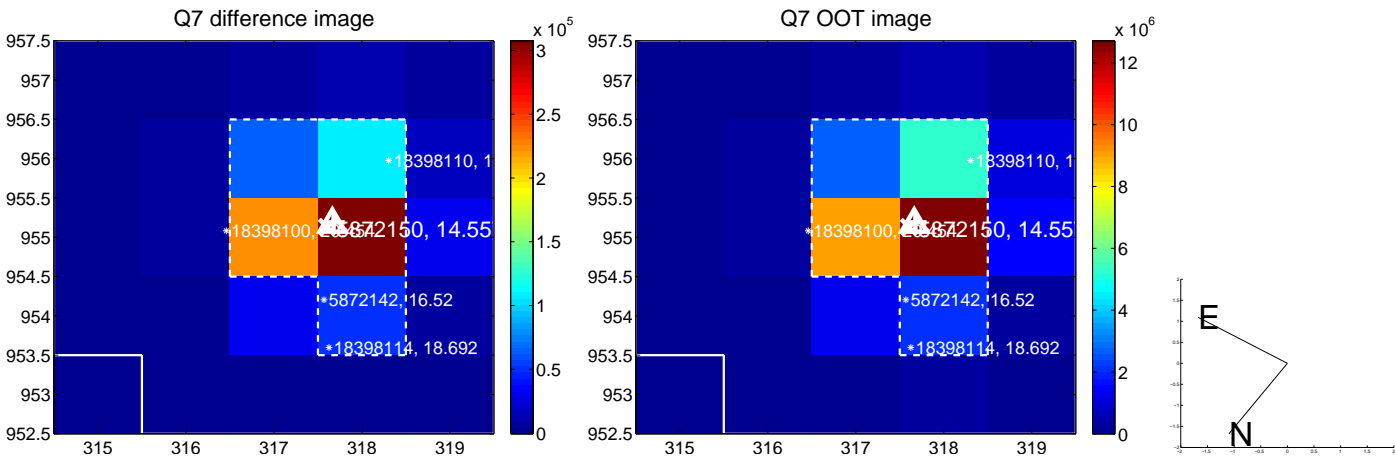
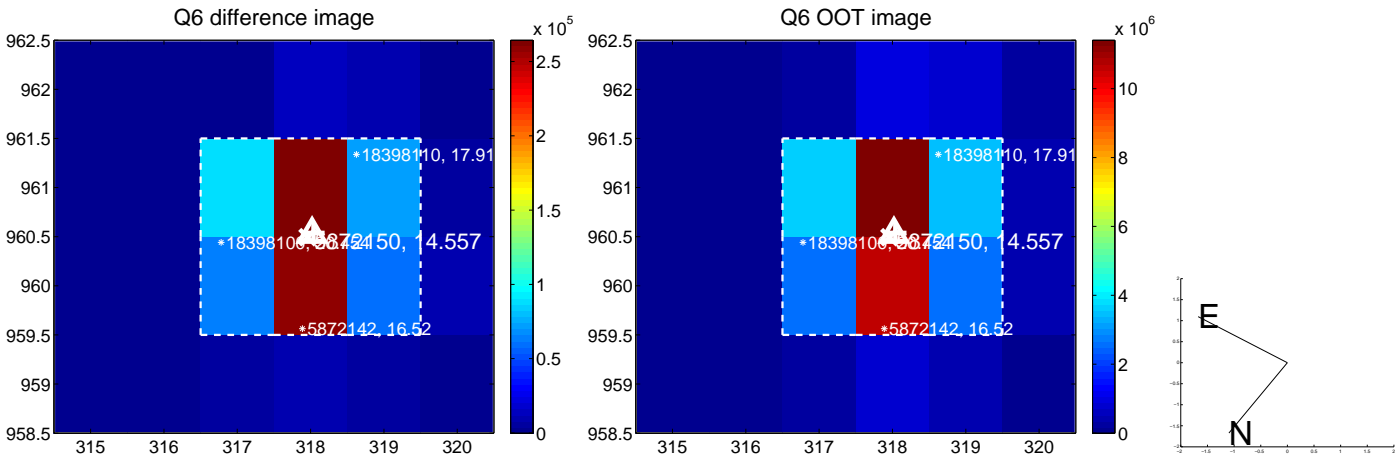
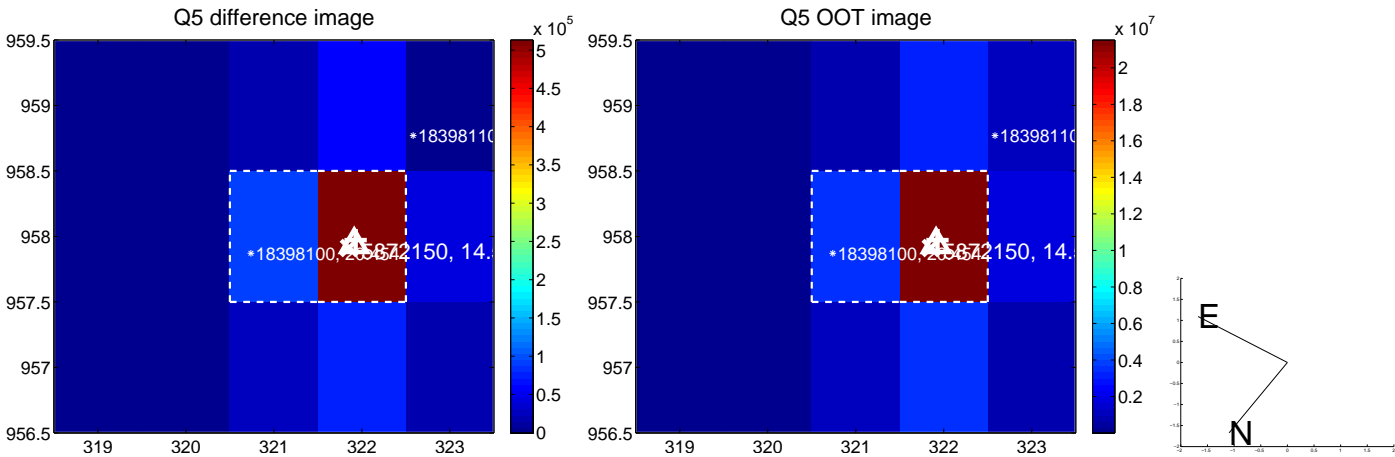


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

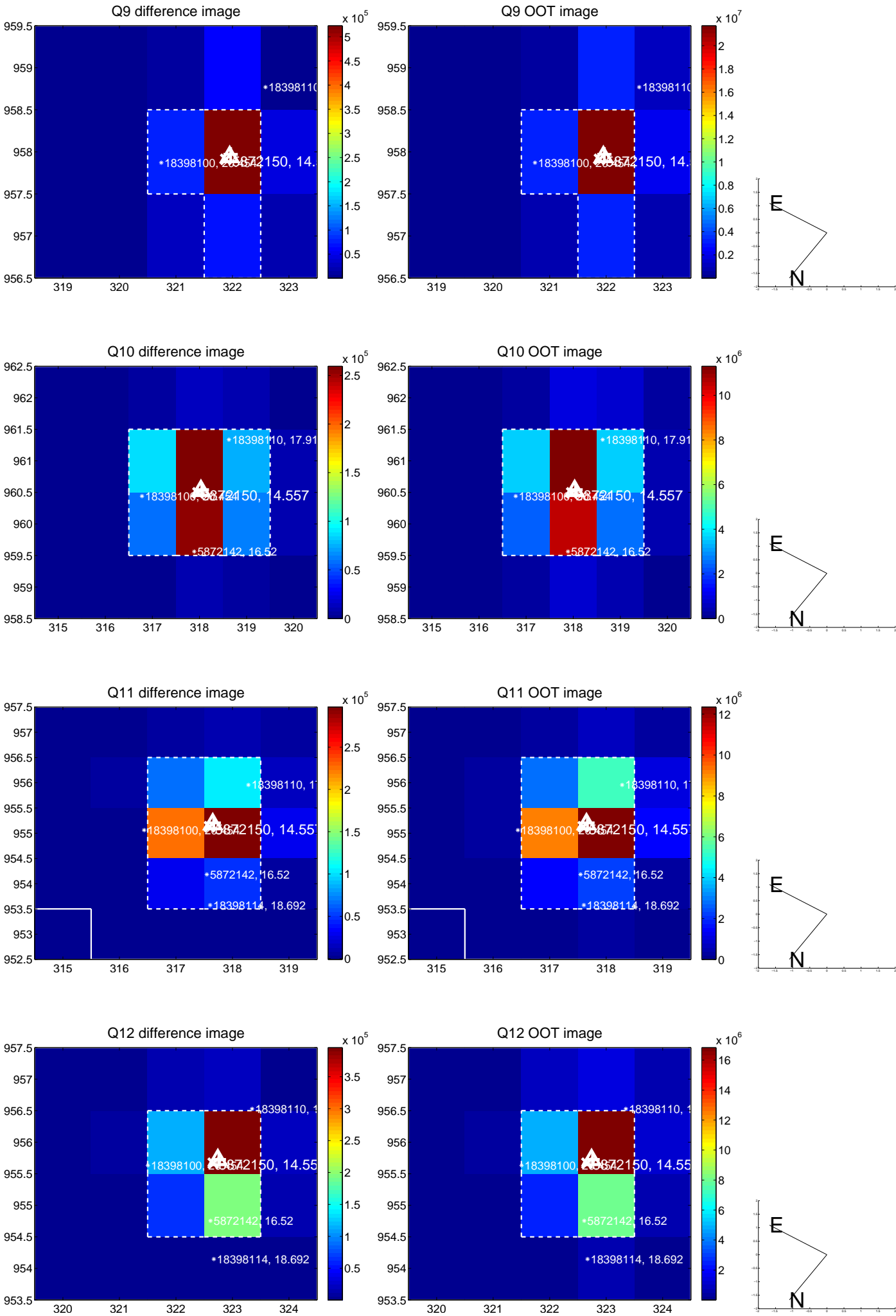
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



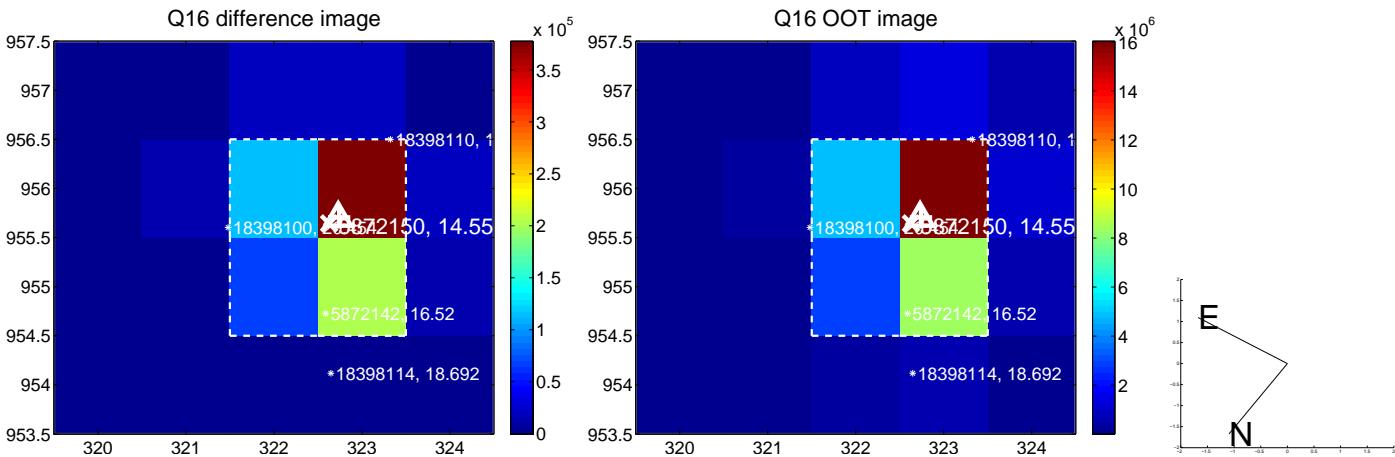
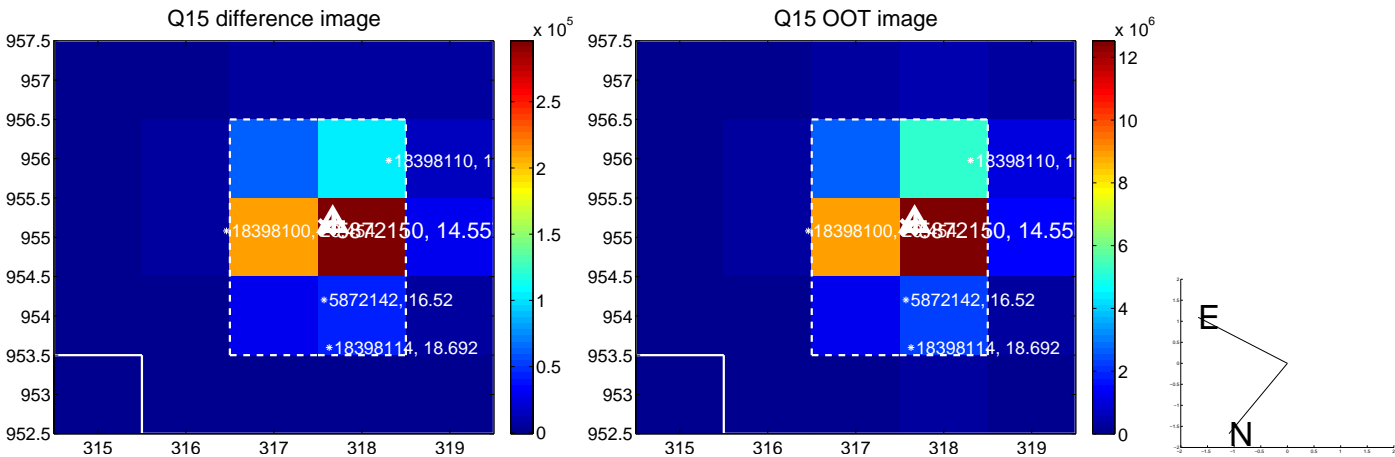
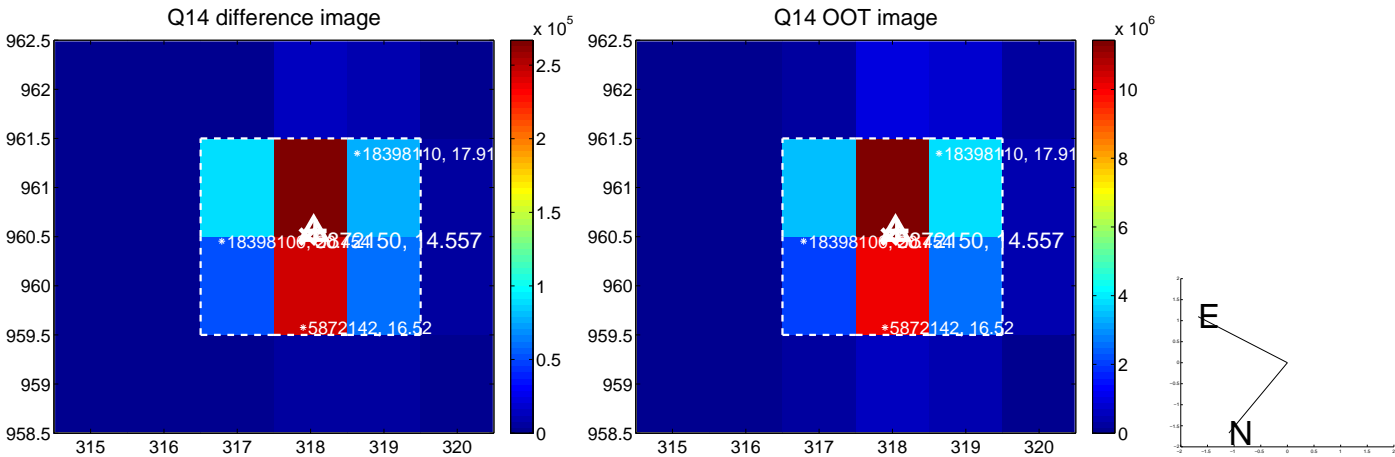
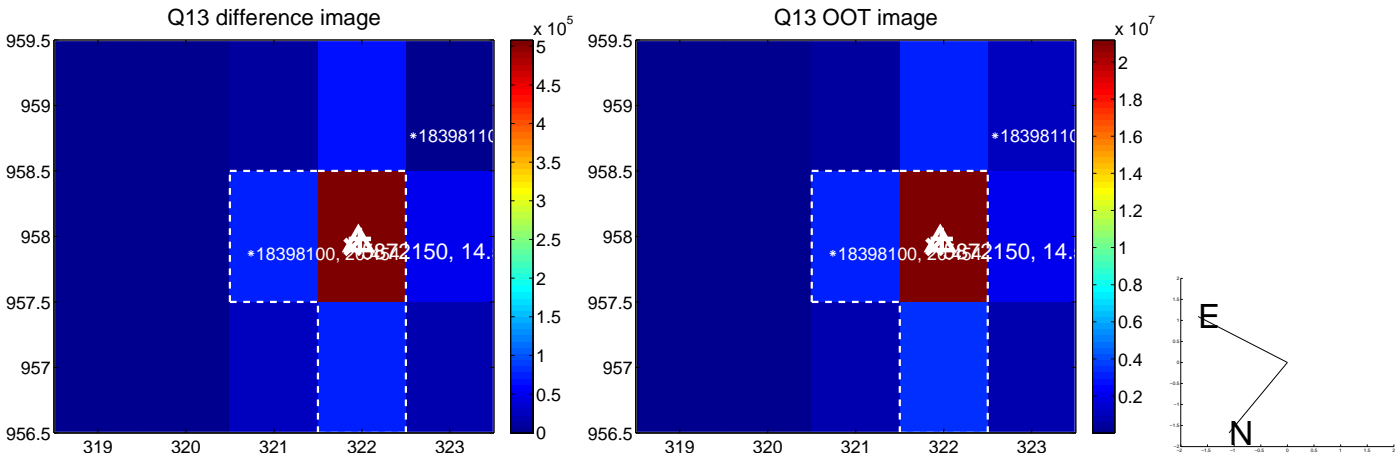
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



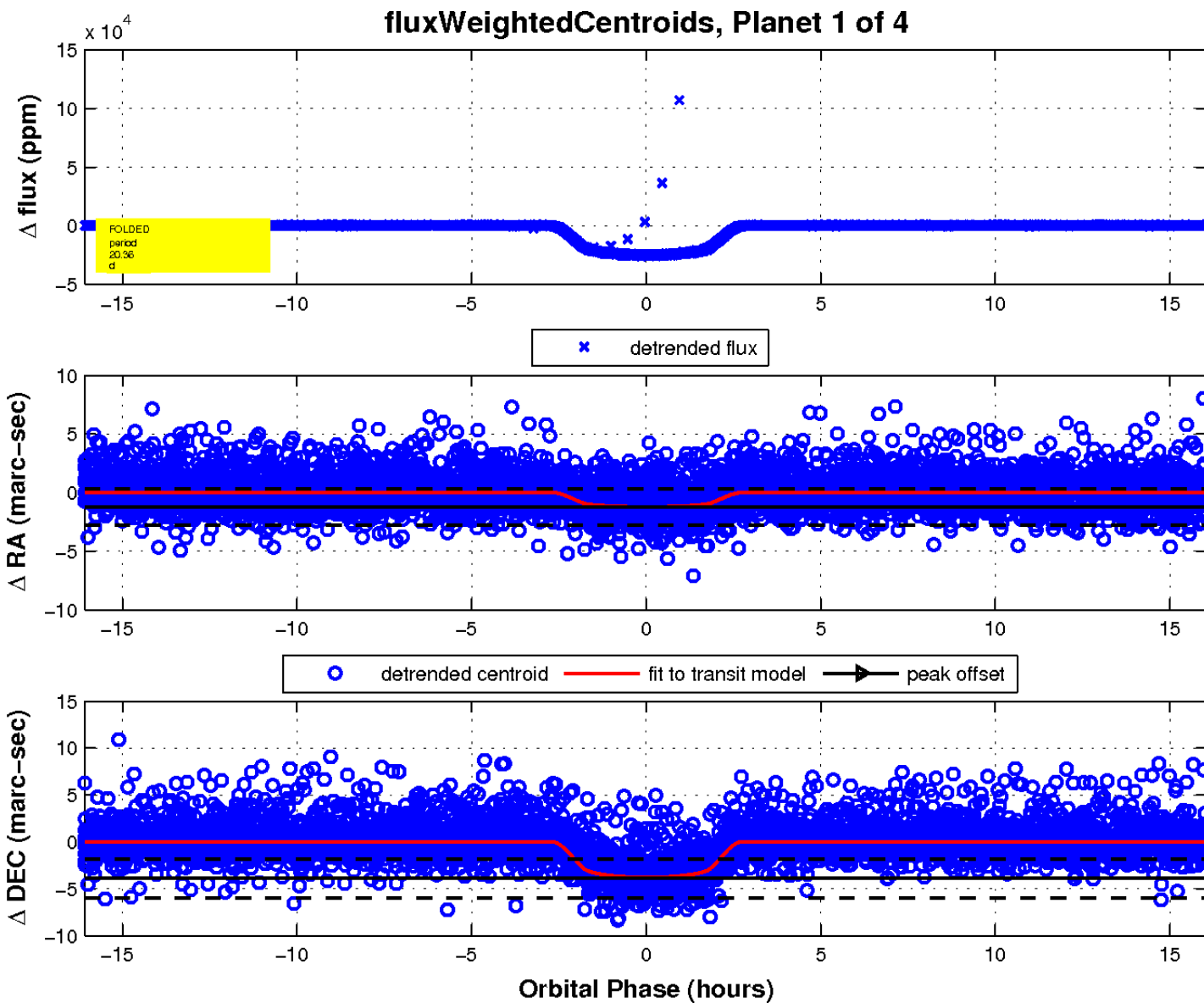
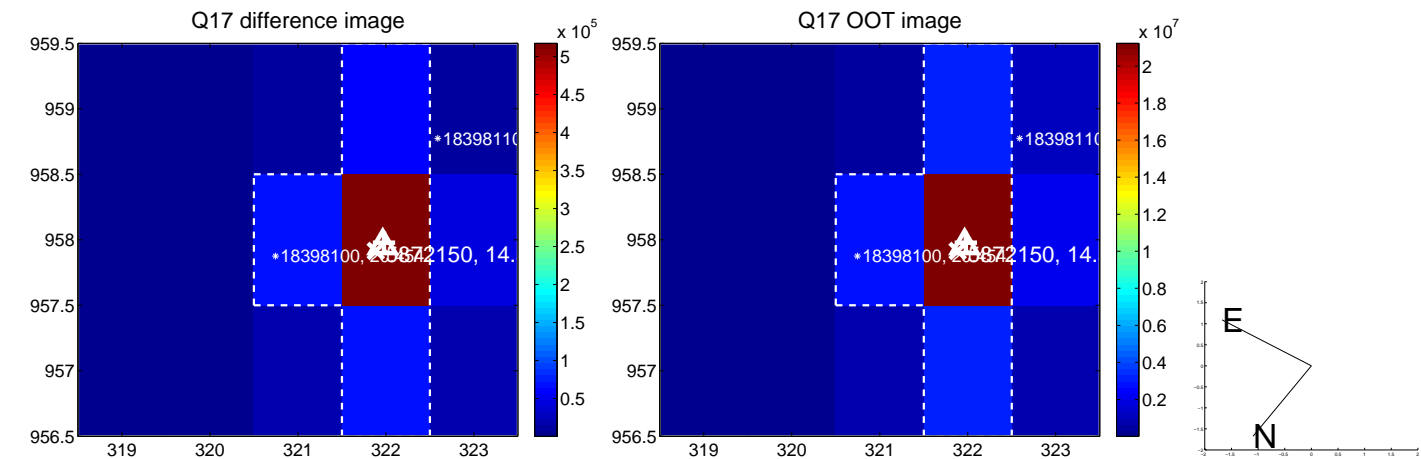
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

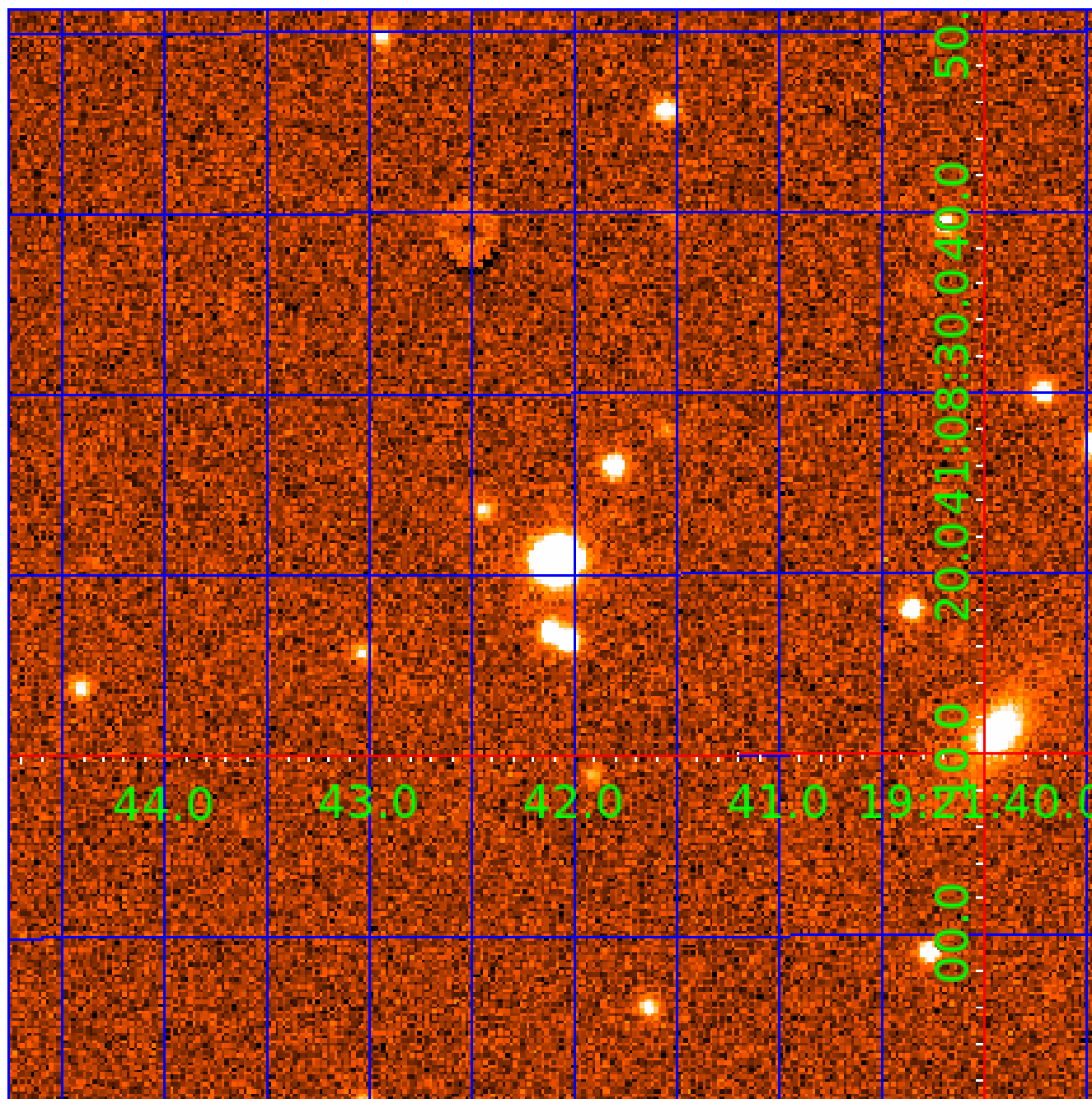


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005872150

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})
005872150-01	OBS	0414.01	20.355097	134.633537	25066.8	5.364	1483.0	1373.3	1.08	6081	17.64	63.69
005872150-02	OBS	0414.02	5.922390	132.362879	389.9	3.591	35.5	38.7	1.08	6081	2.63	330.33
005872150-03	OBS	No	20.355090	144.378566	408.7	5.194	24.6	26.2	1.08	6081	2.44	63.69
005872150-04	OBS	No	403.387441	197.083678	441.7	10.352	33.9	6.0	1.08	6081	3.09	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005872150-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
005872150-02	OBS	FP	0.02	0	0	1	0	CENT_KIC_POS—HALO_GHOST
005872150-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
005872150-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

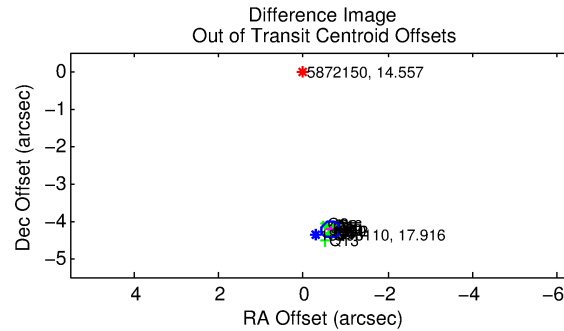
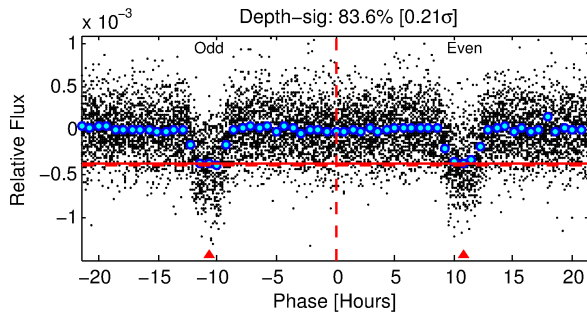
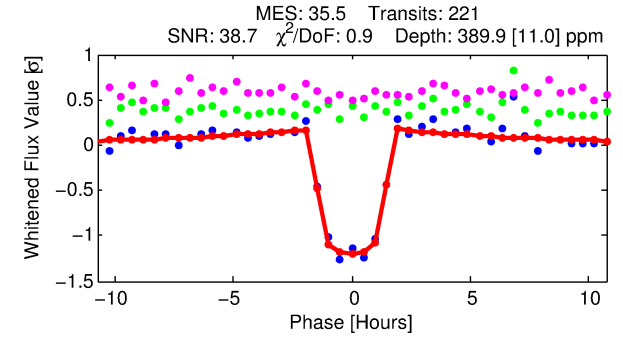
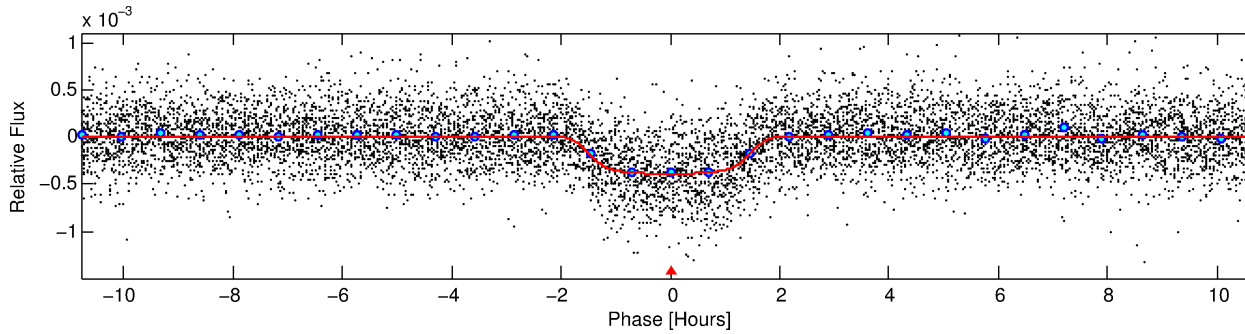
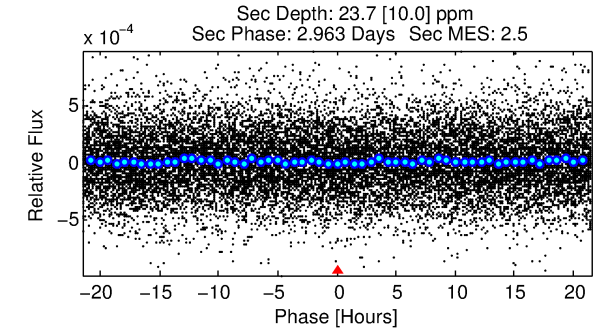
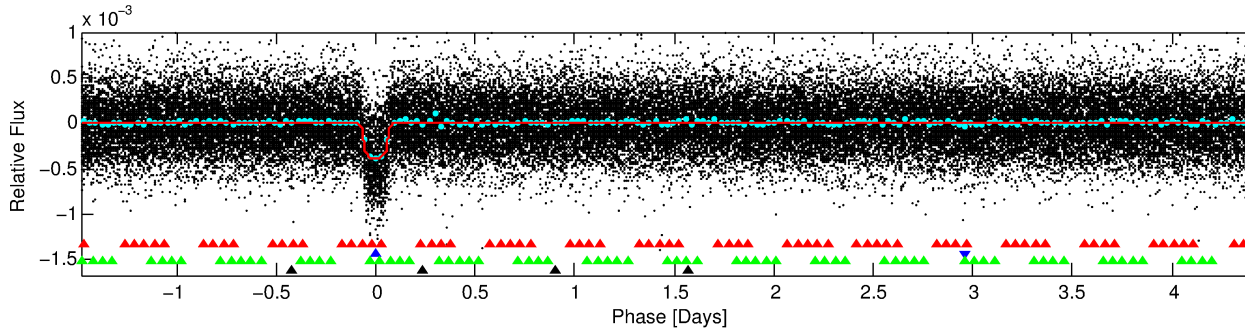
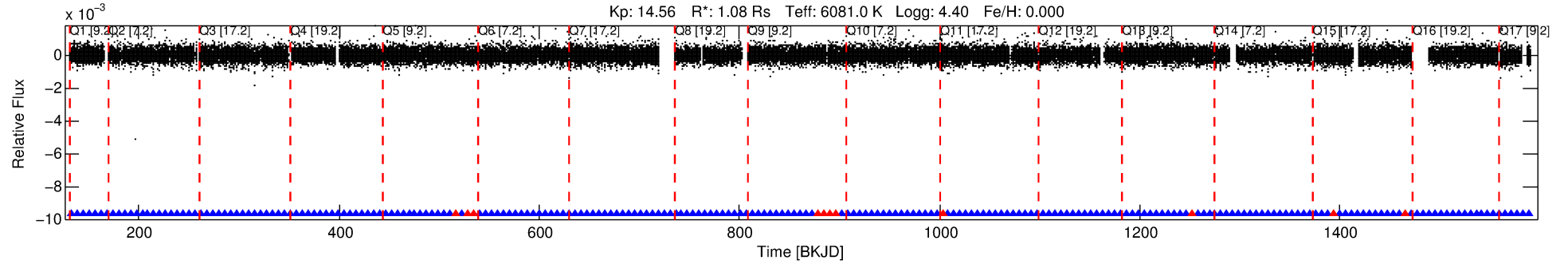
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005872150-02

No Significant Match Found

DV One-Page Summary

KIC: 5872150 Candidate: 2 of 4 Period: 5.922 d
KOI: K00414.02 Corr: 0.973



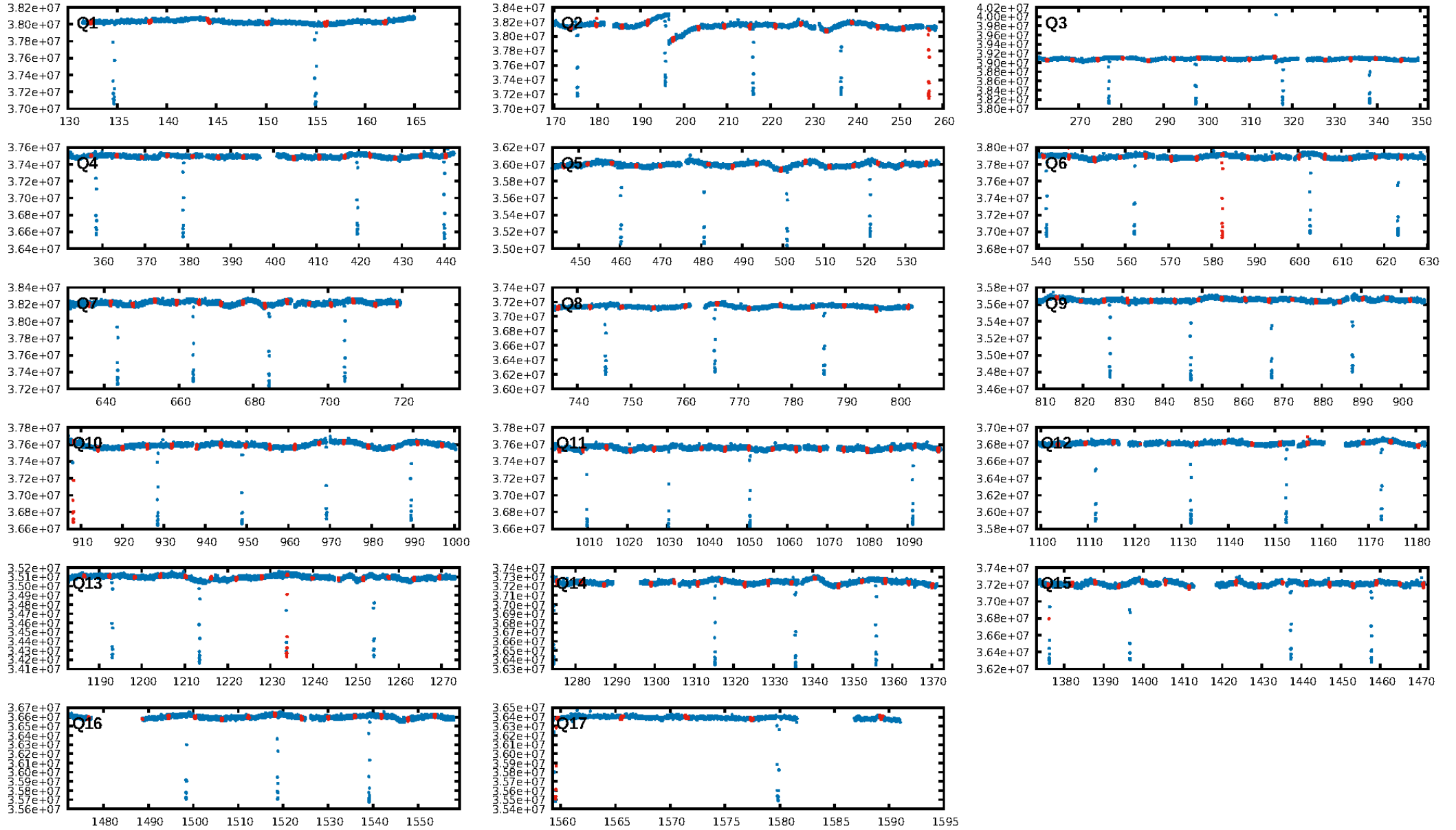
DV Fit Results:

Period = 5.92239 [0.00001] d
Epoch = 132.3629 [0.0016] BKJD
Rp/R* = 0.0223 [0.0008]
a/R* = 5.17 [0.76]
b = 0.94 [0.02]
Seff = 330.33 [138.05]
Teq = 1087 [114] K
Rp = 2.63 [0.82] Re
a = 0.0656 [0.0174] AU
Ag = 8.15 [4.72] [1.51σ]
Teffp = 2839 [320] K [5.16σ]

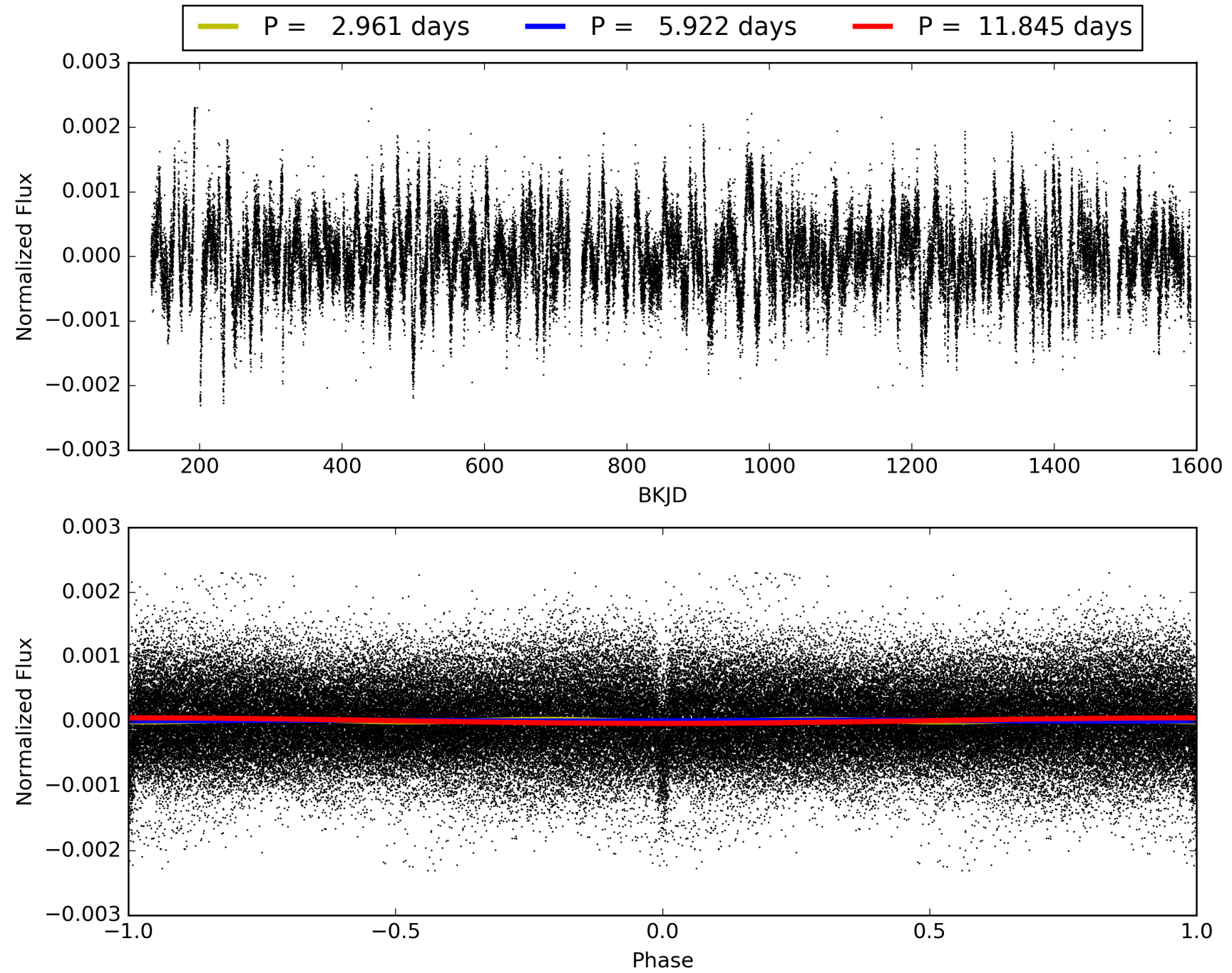
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [54.85σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.43e-252
RollingBand-fgt: 0.95 [200/211]
GhostDiagnostic-chr: 0.2355
Centroid-sig: 0.0%
Centroid-so: 8.845 arcsec [27.60σ]
OotOffset-rm: 4.283 arcsec [58.81σ]
KicOffset-rm: 4.696 arcsec [65.19σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 005872150-02, PDC Light Curves

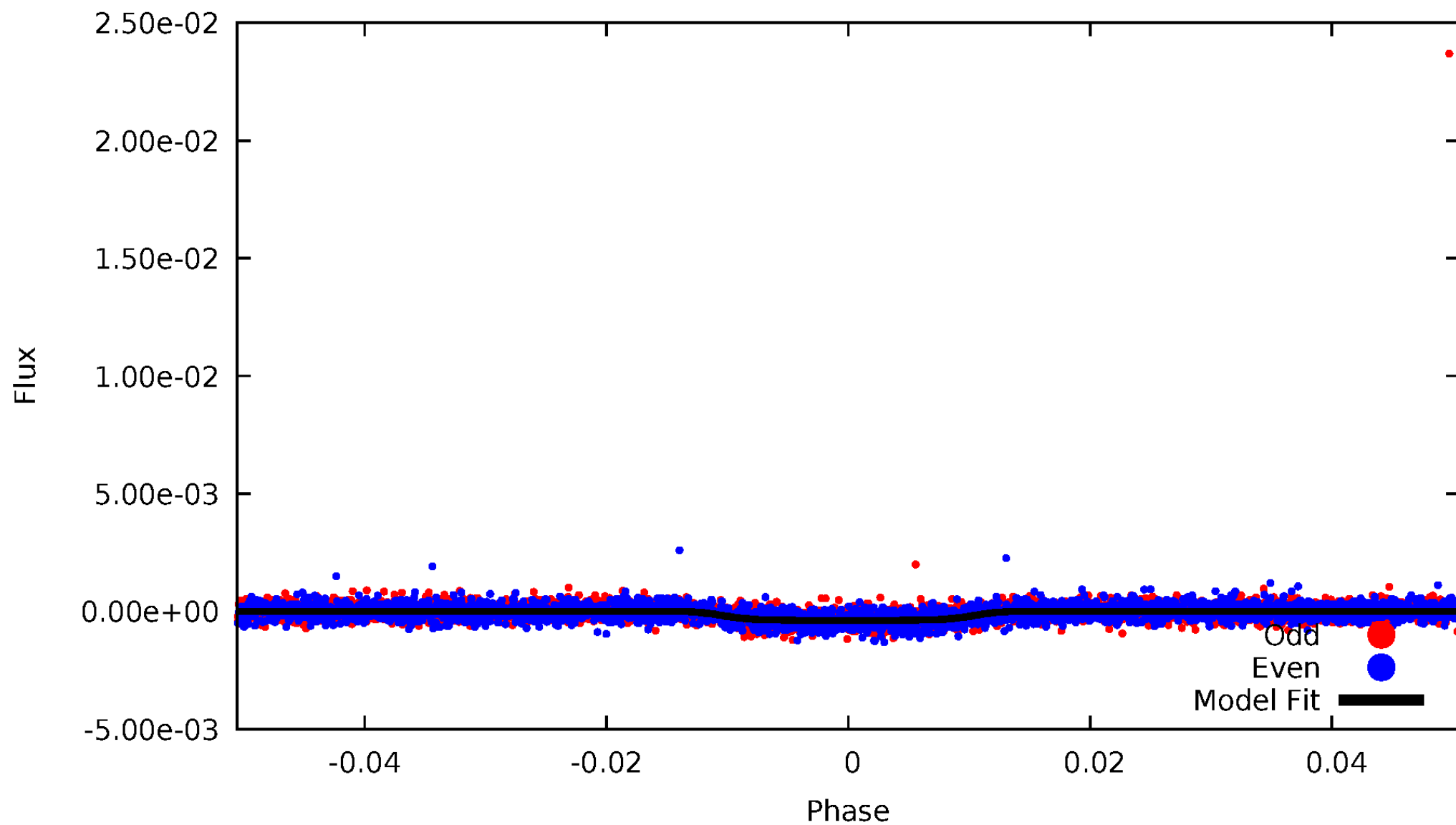


TCE 005872150-02



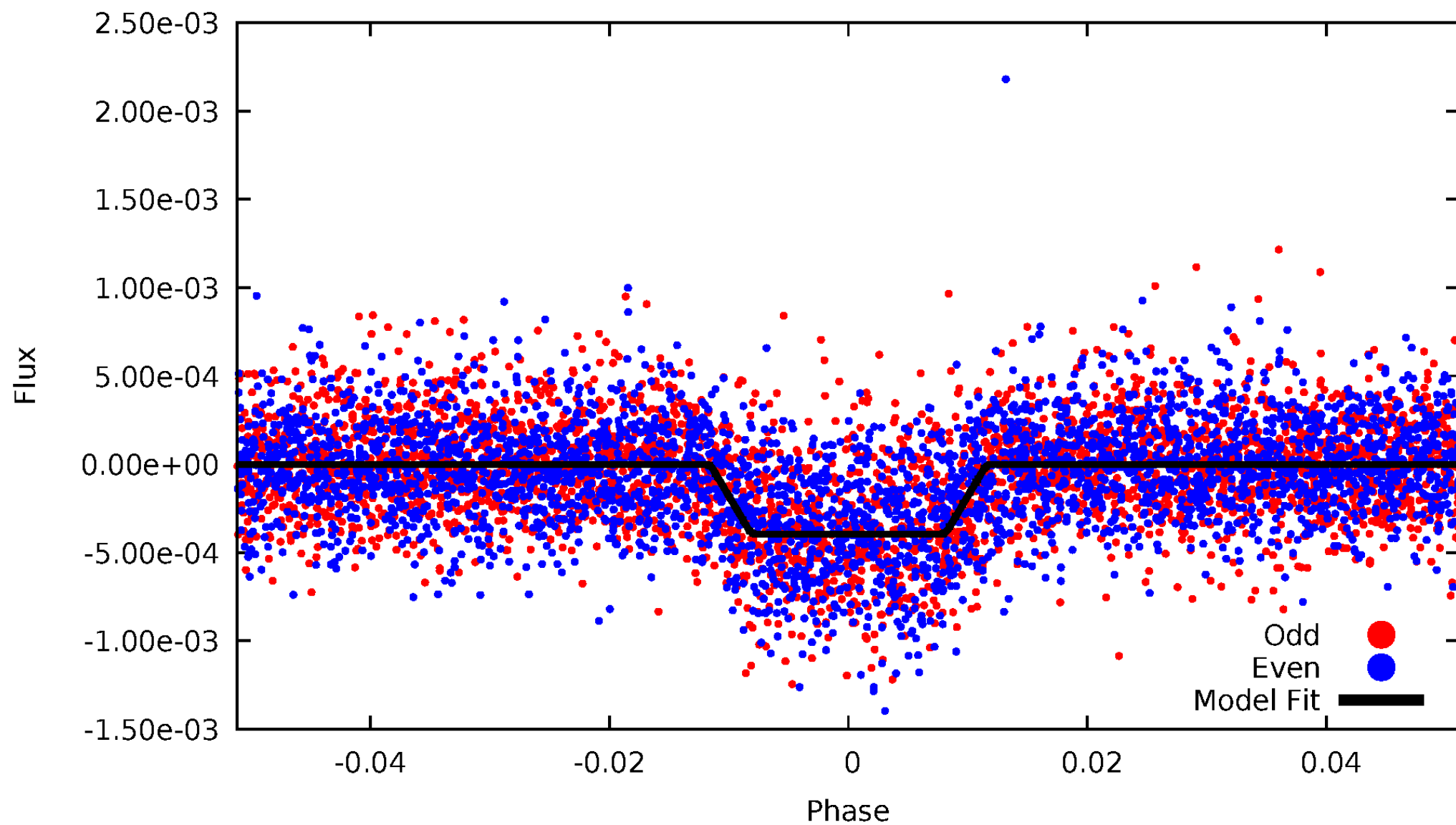
DV Odd/Even

TCE 005872150-02



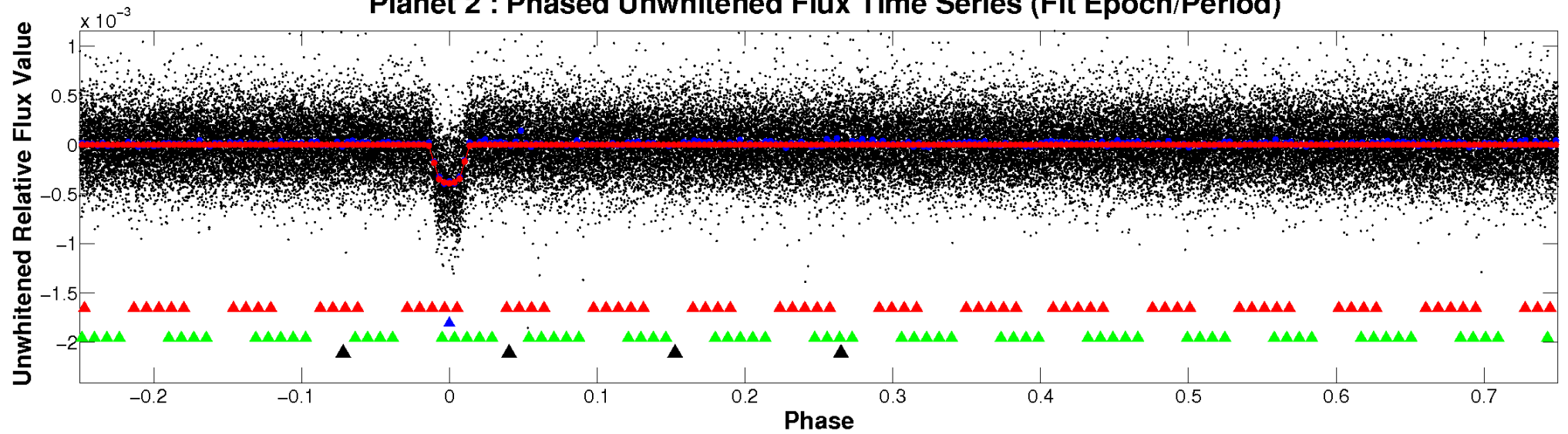
ALT Odd/Even

TCE 005872150-02

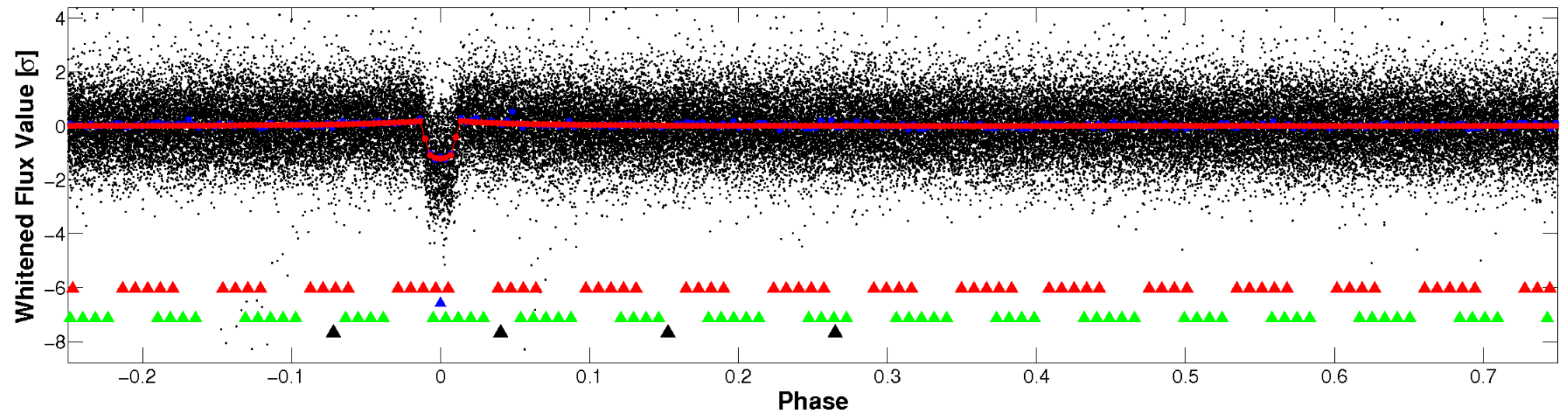


Non-Whitened Vs. Whitened Light Curve

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

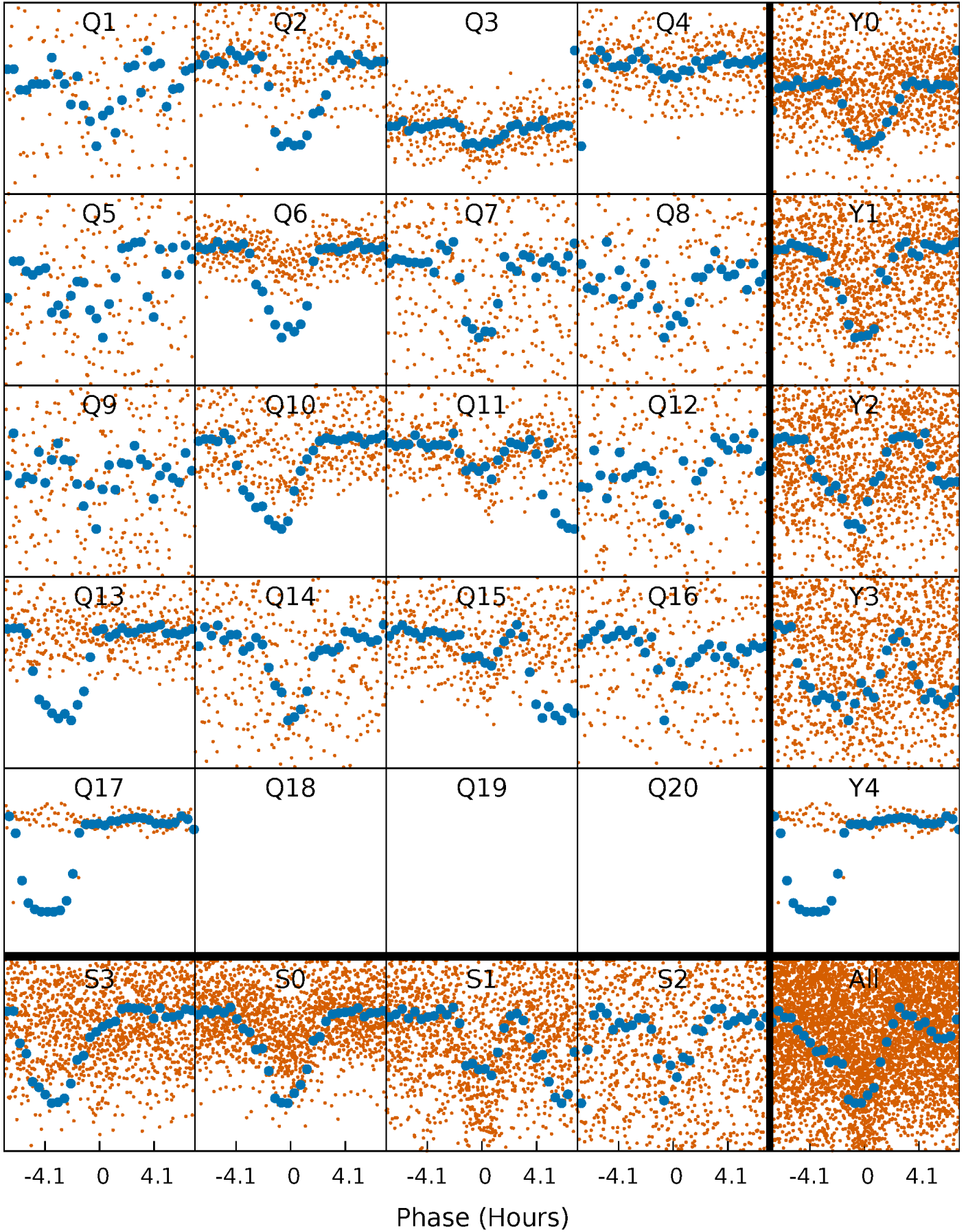


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



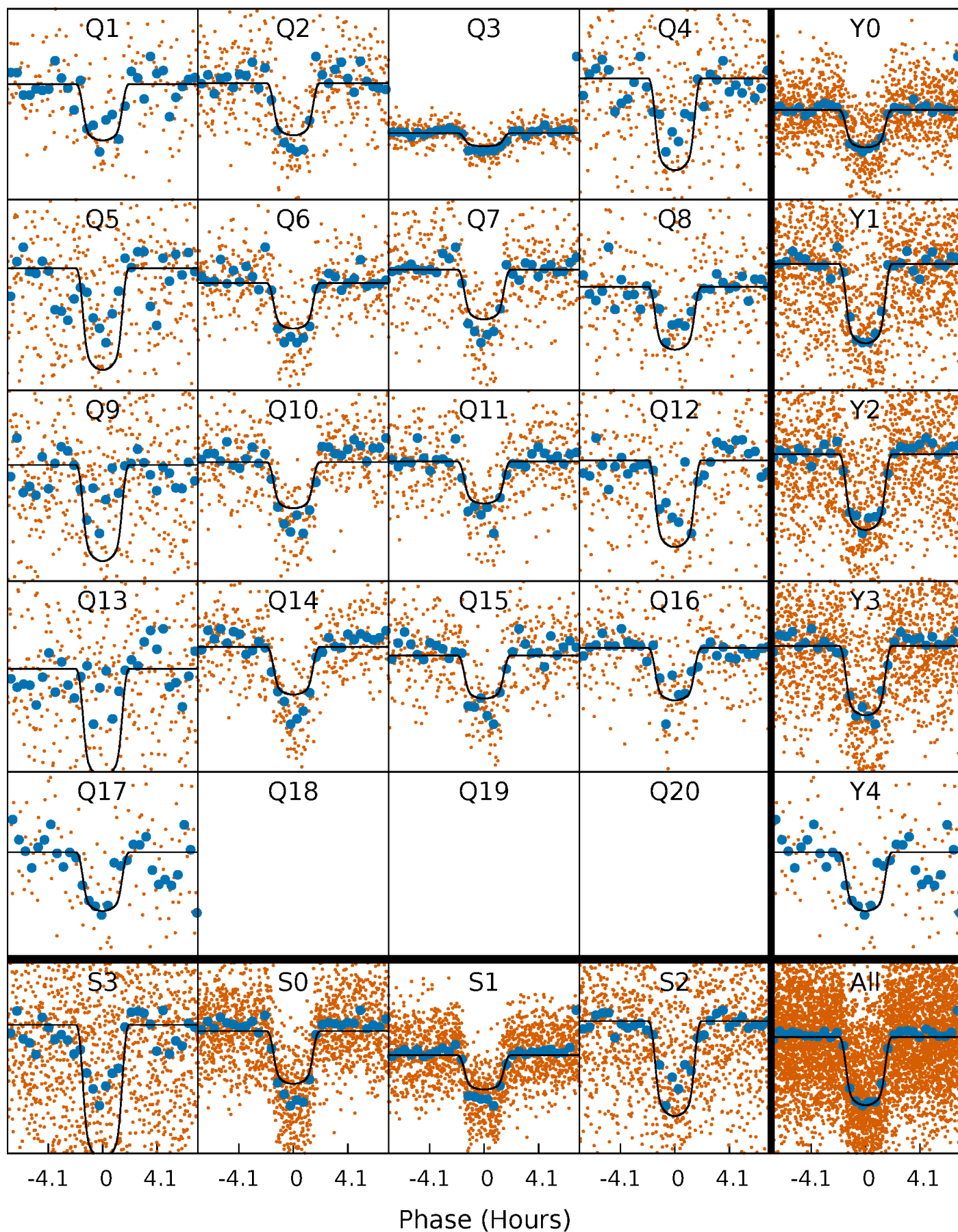
PDC Quarter-Phased Transit Curves

TCE 005872150-02 P= 5.922390 Days $T_0=132.362879$ (BKJD)



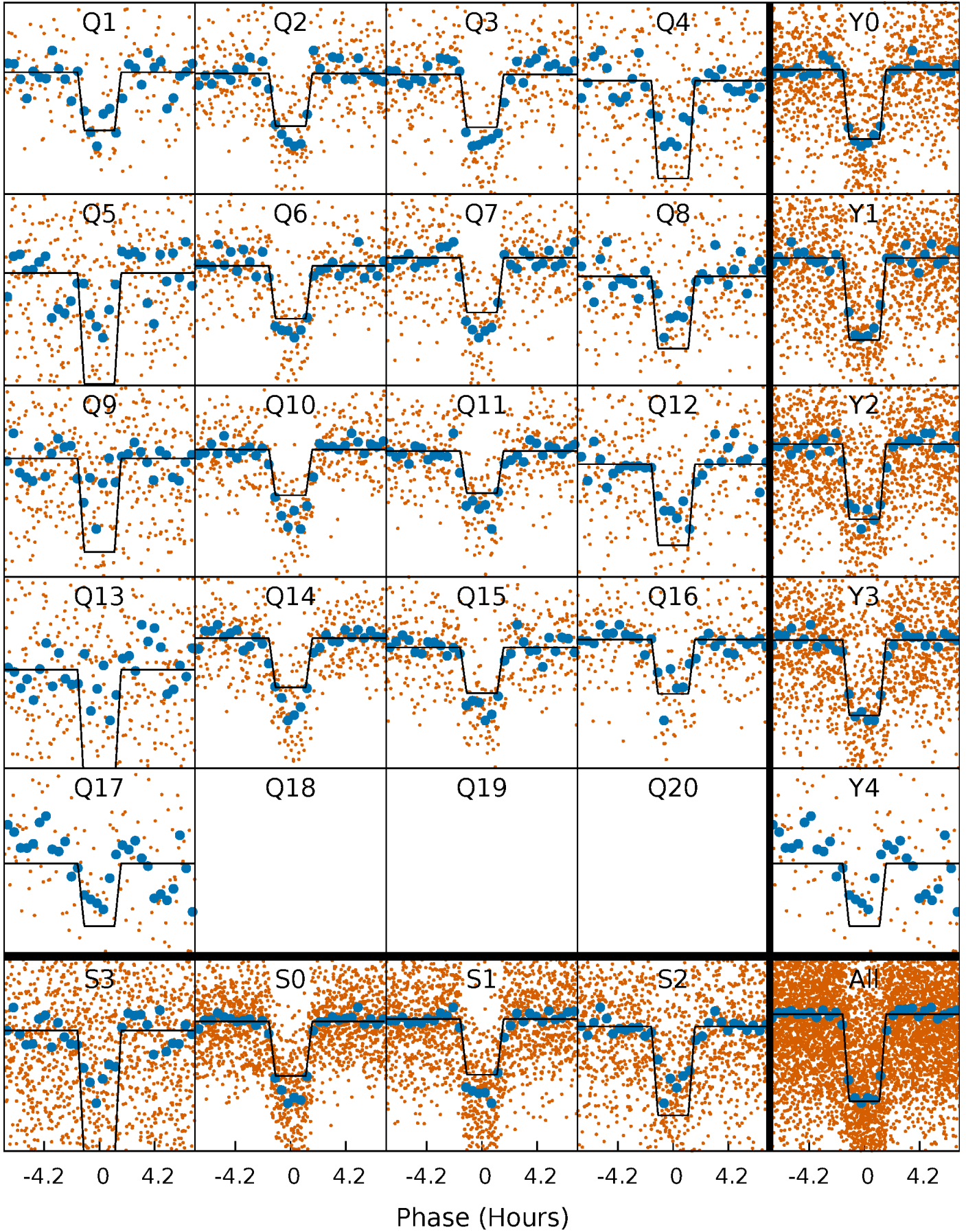
DV Quarter-Phased Transit Curves

TCE 005872150-02 P= 5.922390 Days $T_0=132.362879$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

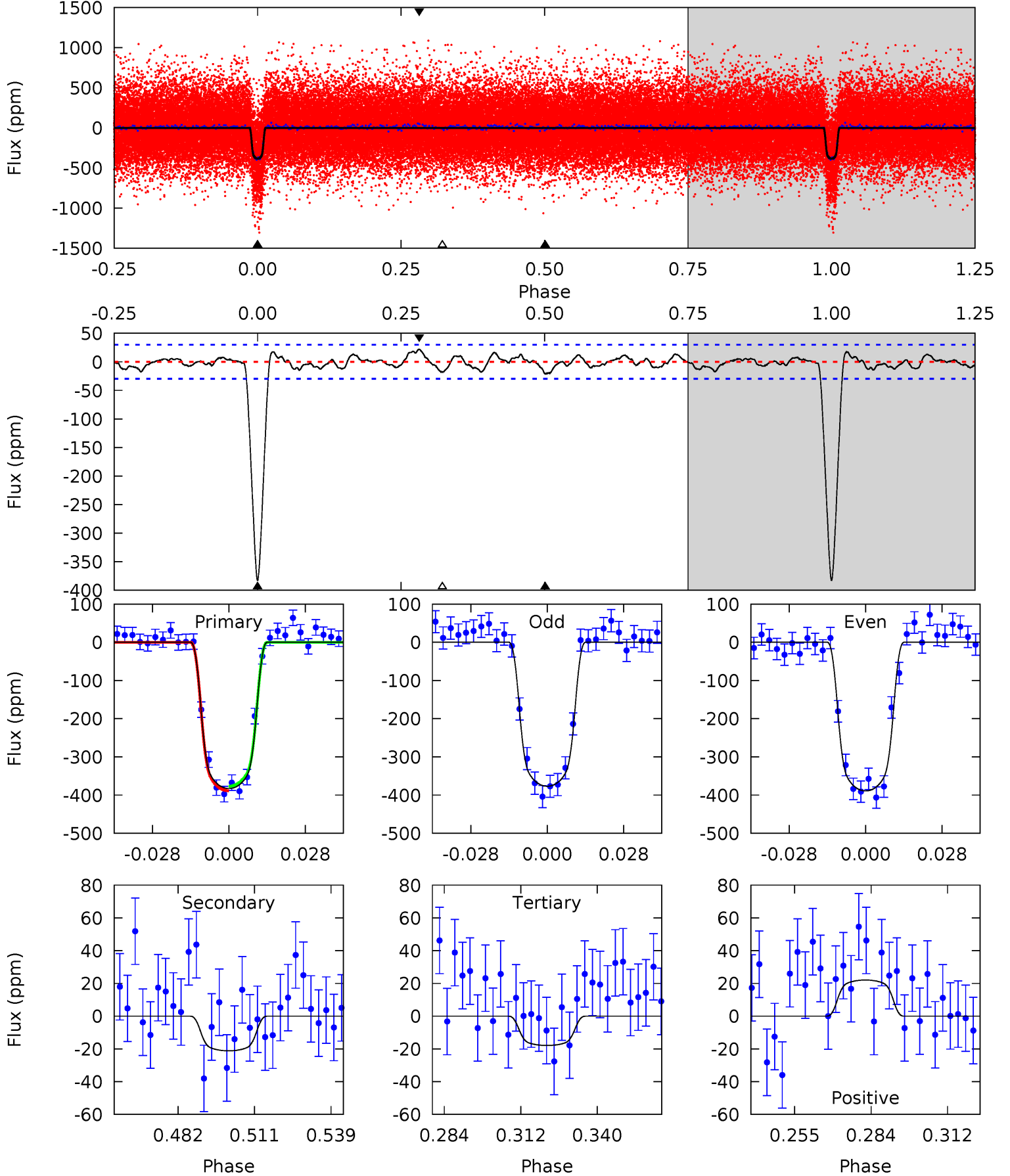
TCE 005872150-02 $P = 5.922396$ Days $T_0 = 132.362064$ (BKJD)



DV Model-Shift Uniqueness Test

005872150-02, P = 5.922390 Days, E = 126.440489 Days

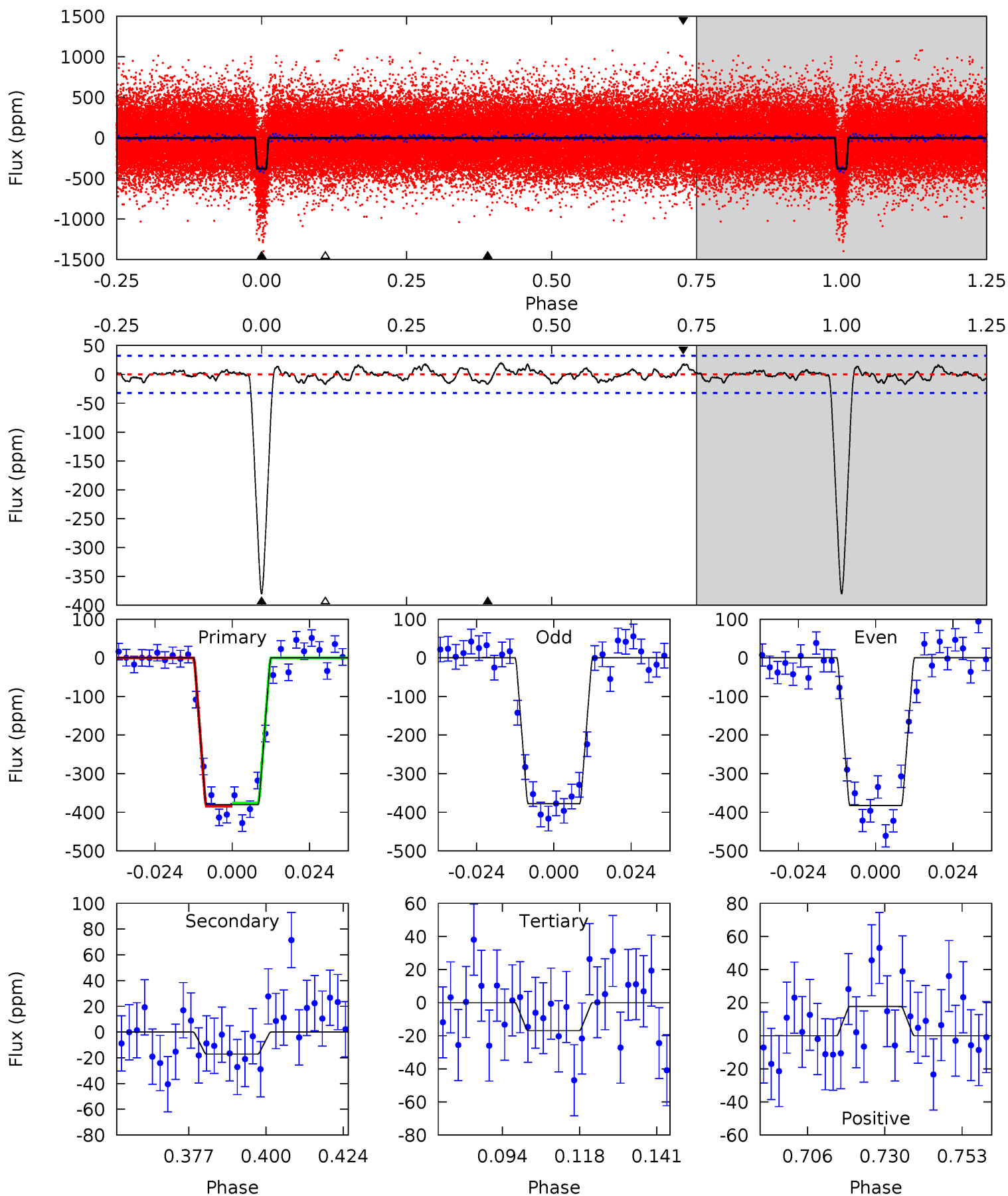
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.1	3.43	2.91	3.58	4.82	2.19	1.29	59.2	58.5	0.53	-0.14	1.00	0.92	0.05	0.95



Alt Model-Shift Uniqueness Test

005872150-02, P = 5.922396 Days, E = 126.439668 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.0	2.56	2.53	2.65	4.86	2.26	1.11	54.5	54.3	0.03	-0.09	0.34	0.95	0.05	0.61



Stellar Parameters For KIC 005872150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6081^{+184}_{-220}	$4.404^{+0.072}_{-0.217}$	$0.000^{+0.250}_{-0.300}$	$1.077^{+0.334}_{-0.143}$	$1.072^{+0.151}_{-0.135}$	$1.207^{+0.456}_{-0.631}$
	+3%/-4%	+2%/-5%	+inf%/-inf%	+31%/-13%	+14%/-13%	+38%/-52%
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 005872150-02 / KOI 0414.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-21 ± 6	$2.71^{+0.46}_{-0.26}$	1554^{+115}_{-90}	3272^{+171}_{-188}	$6.407^{+2.753}_{-2.358}$
Alt.	-17 ± 7	$2.42^{+0.41}_{-0.24}$	1551^{+108}_{-89}	3310^{+202}_{-250}	$6.782^{+3.136}_{-2.891}$

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

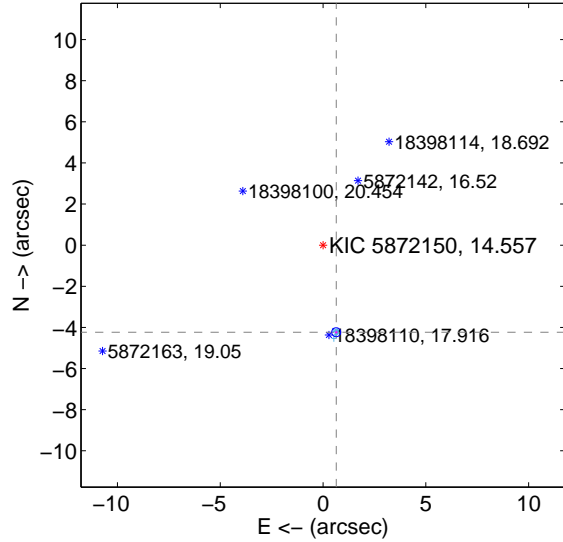
Supplemental centroid analysis for 005872150-02. Kepler magnitude: 14.56. Transit SNR 38.72

There are 15 quarters with good PRF difference image offsets

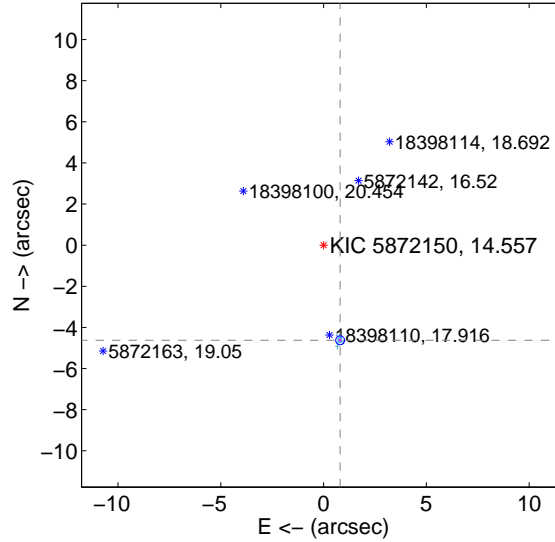
The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.283 ± 0.073	58.81	-0.641 ± 0.069	-4.235 ± 0.073
PRF-fit source offset from KIC position	4.696 ± 0.072	65.19	-0.805 ± 0.069	-4.627 ± 0.072
photometric centroid source offset	8.85 ± 0.32	27.60	-1.50 ± 0.31	-8.72 ± 0.32

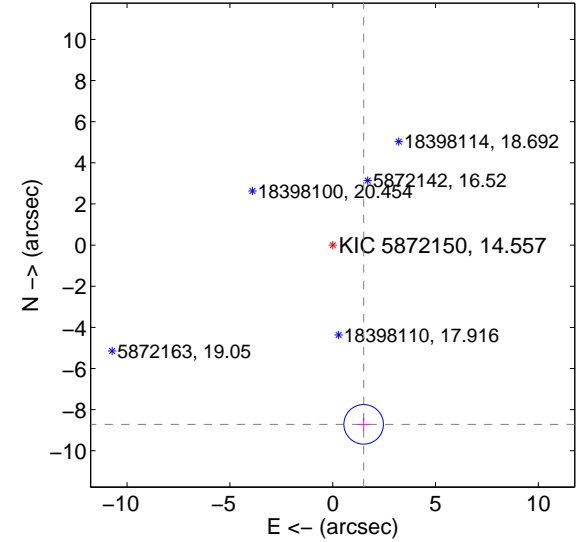
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

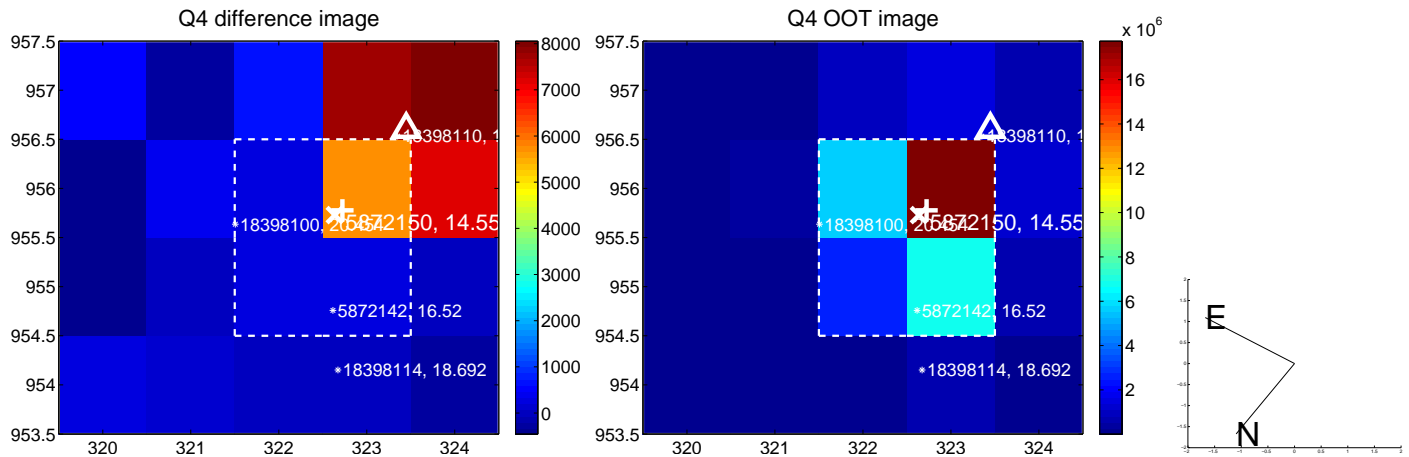
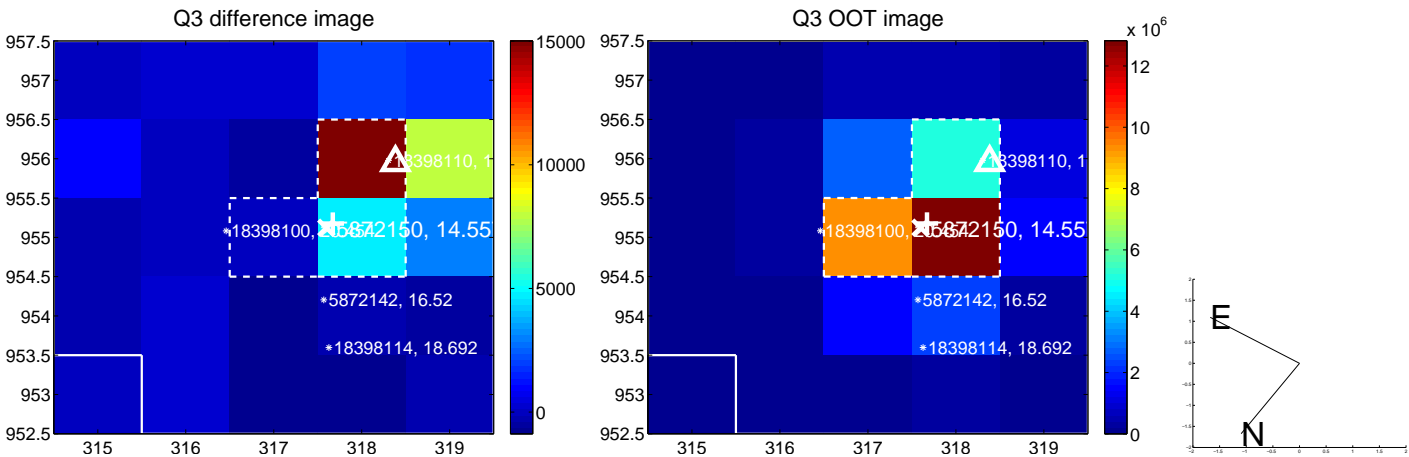
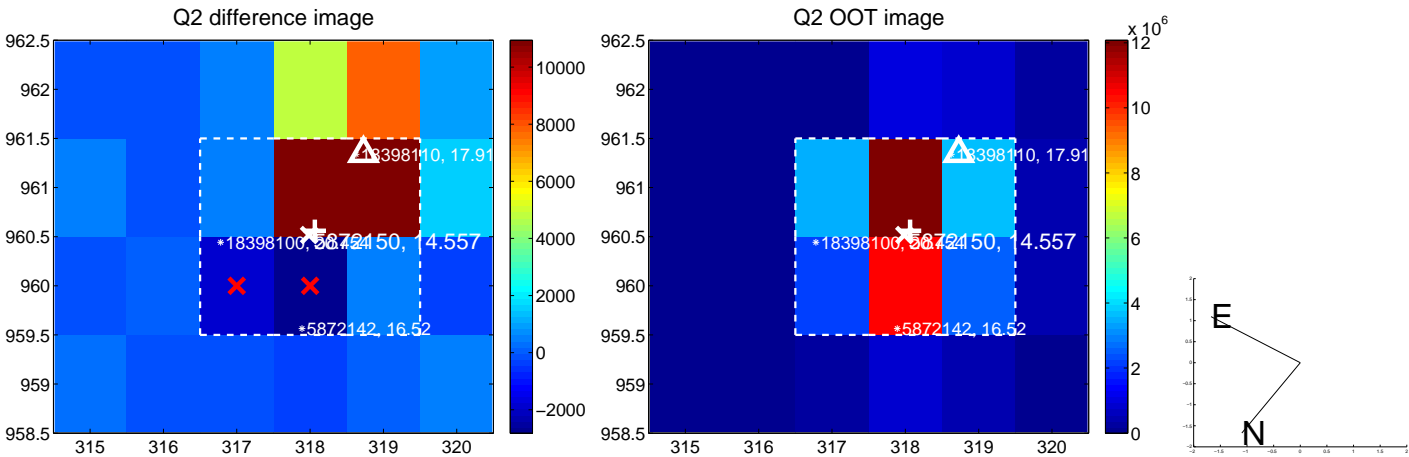
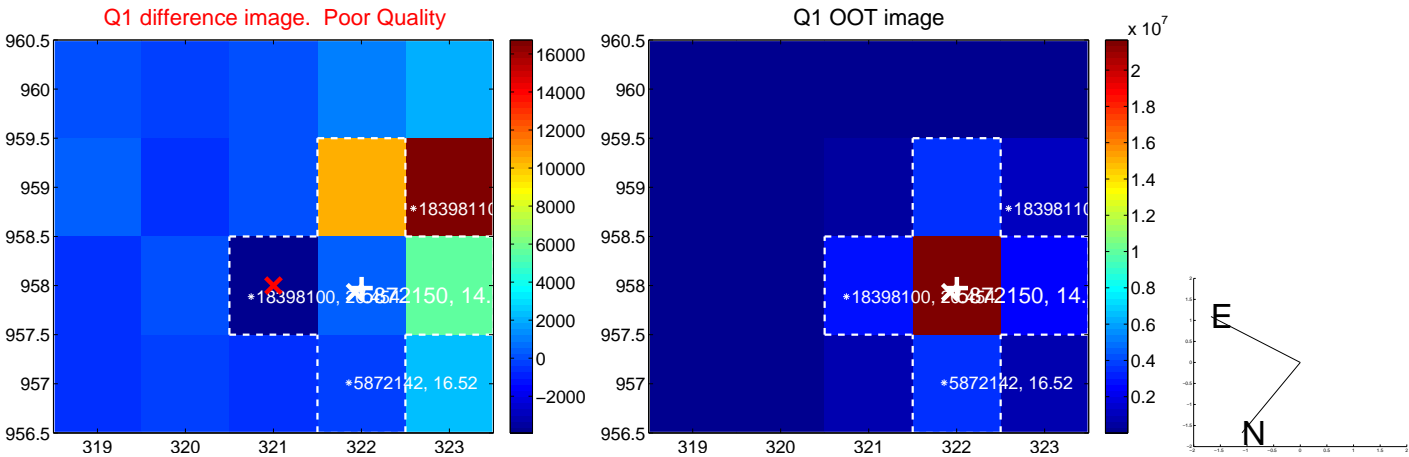


offset from photometric centroids

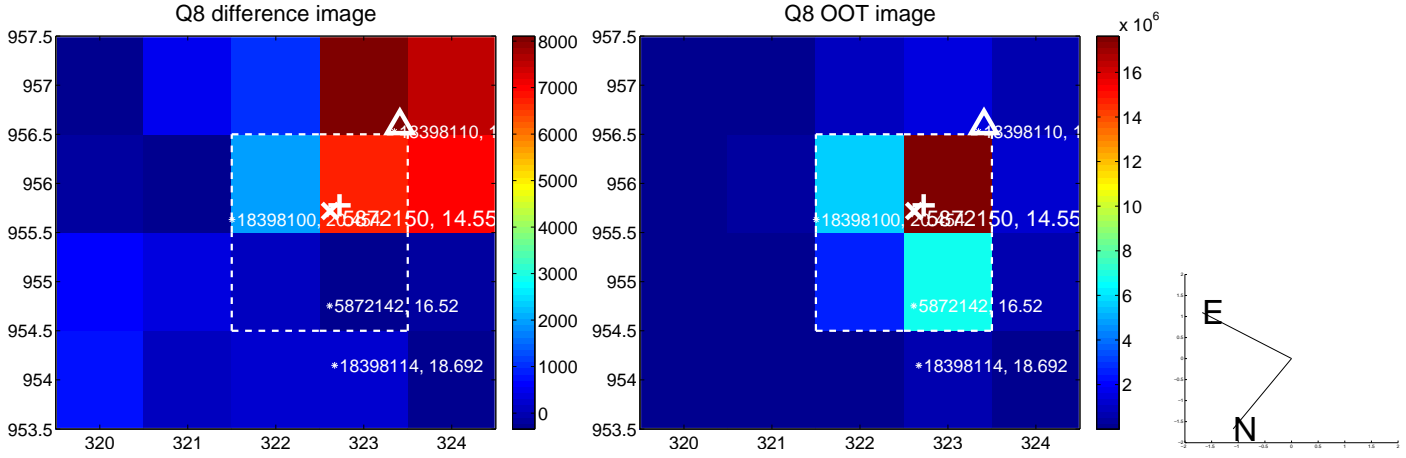
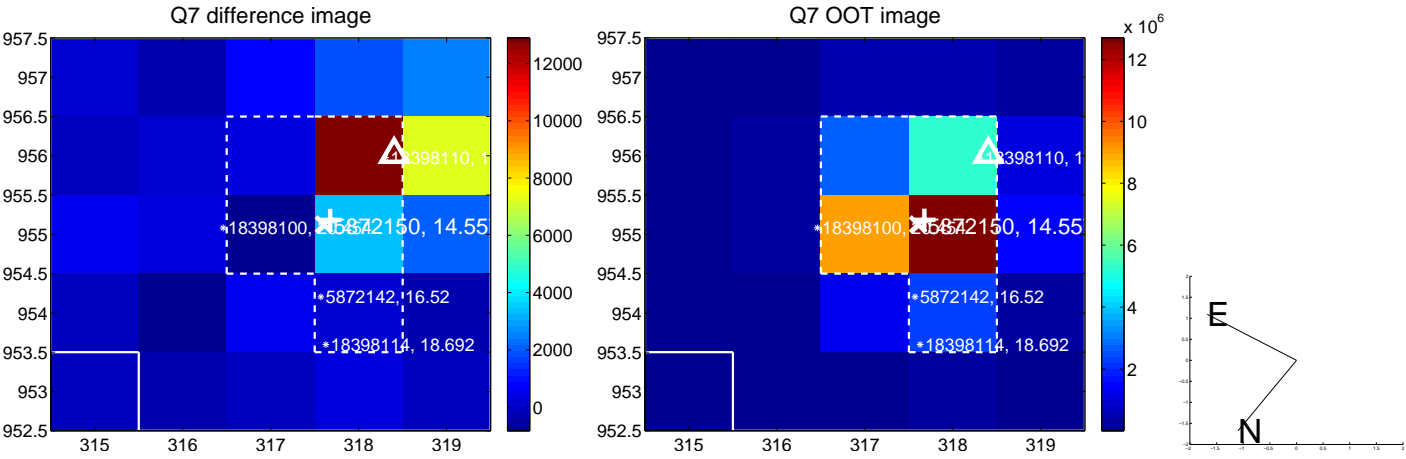
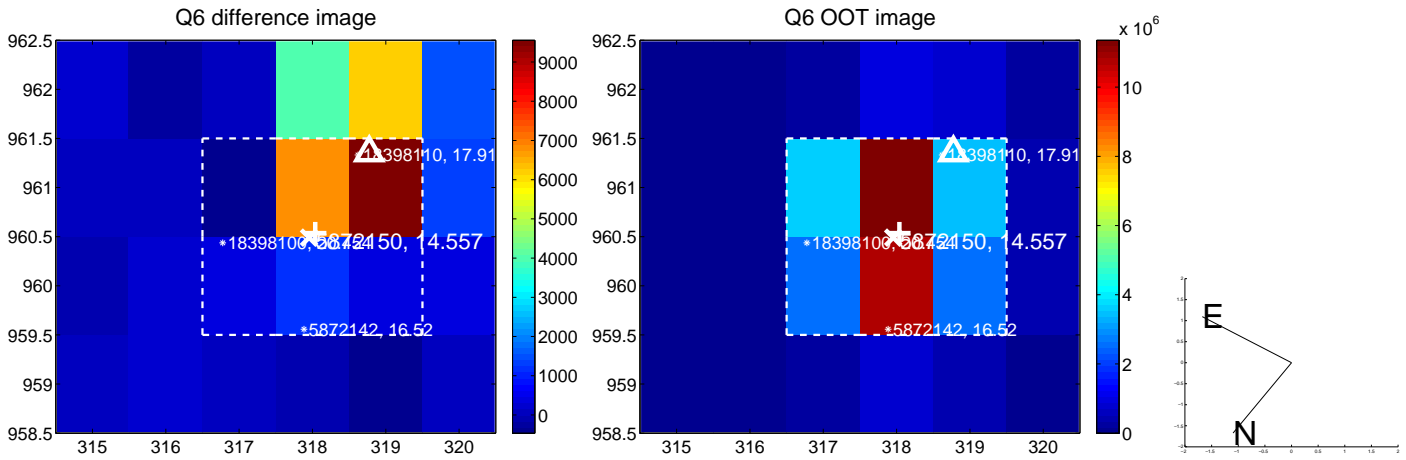
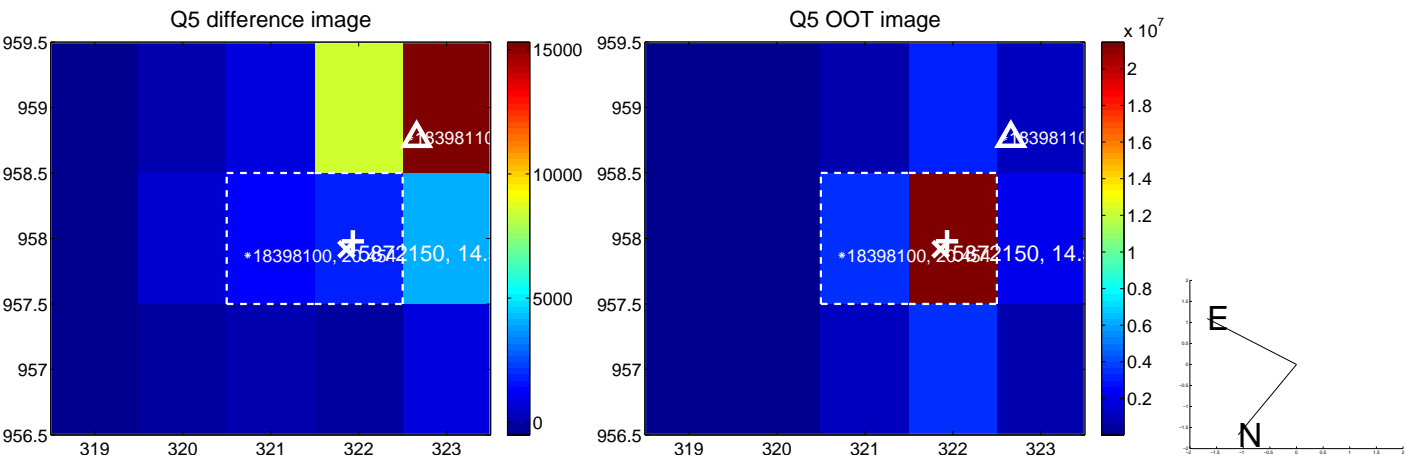


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

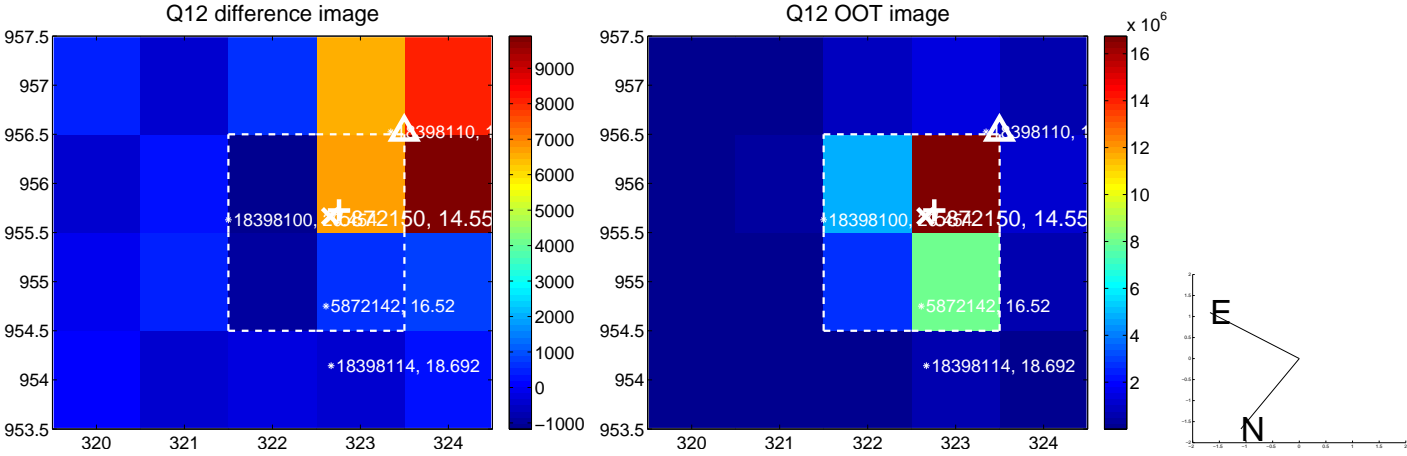
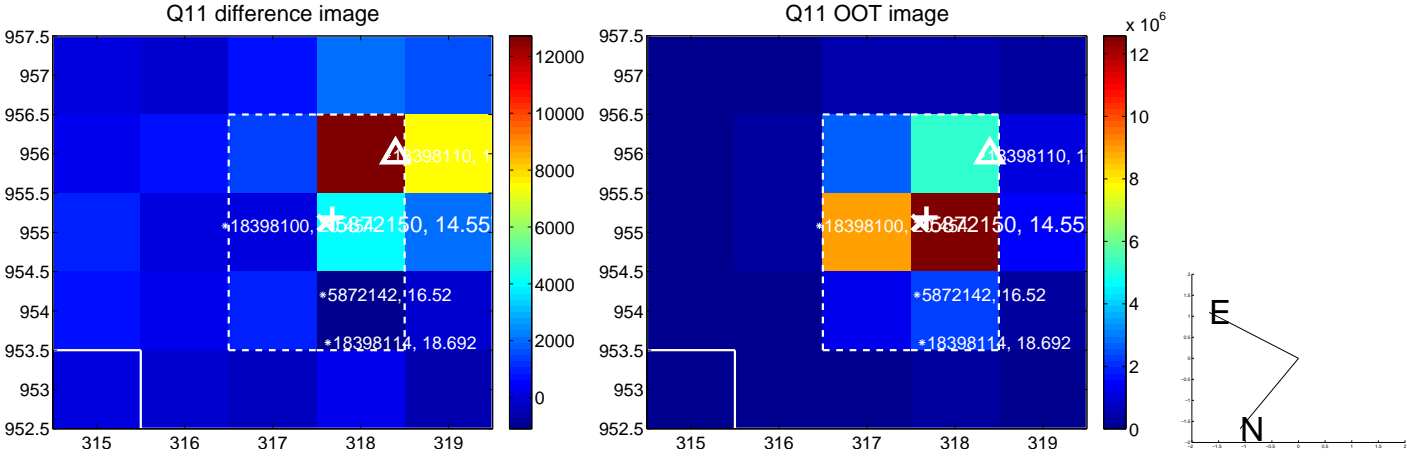
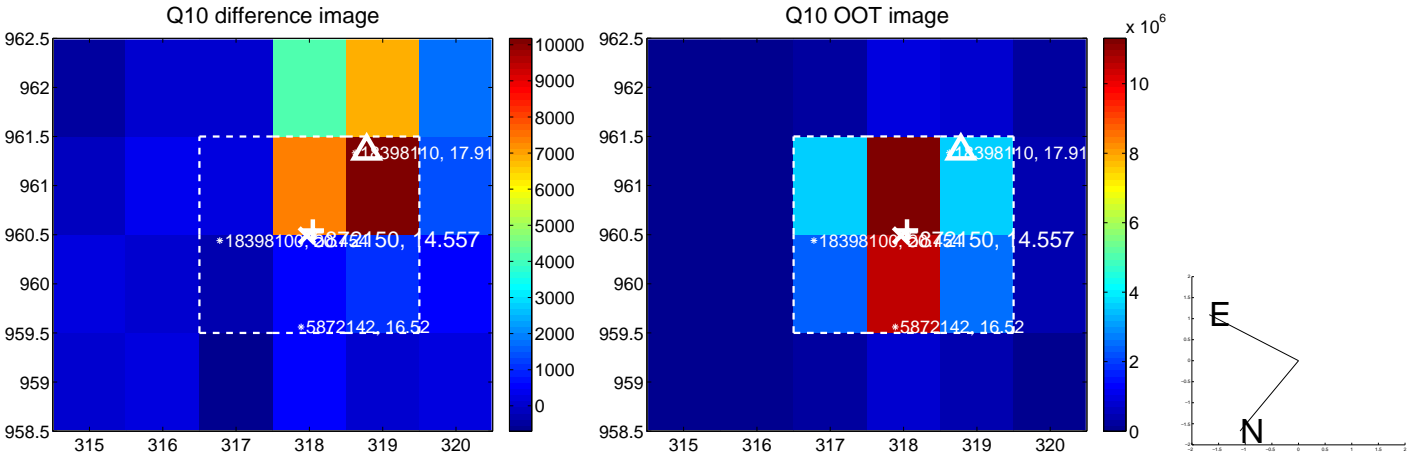
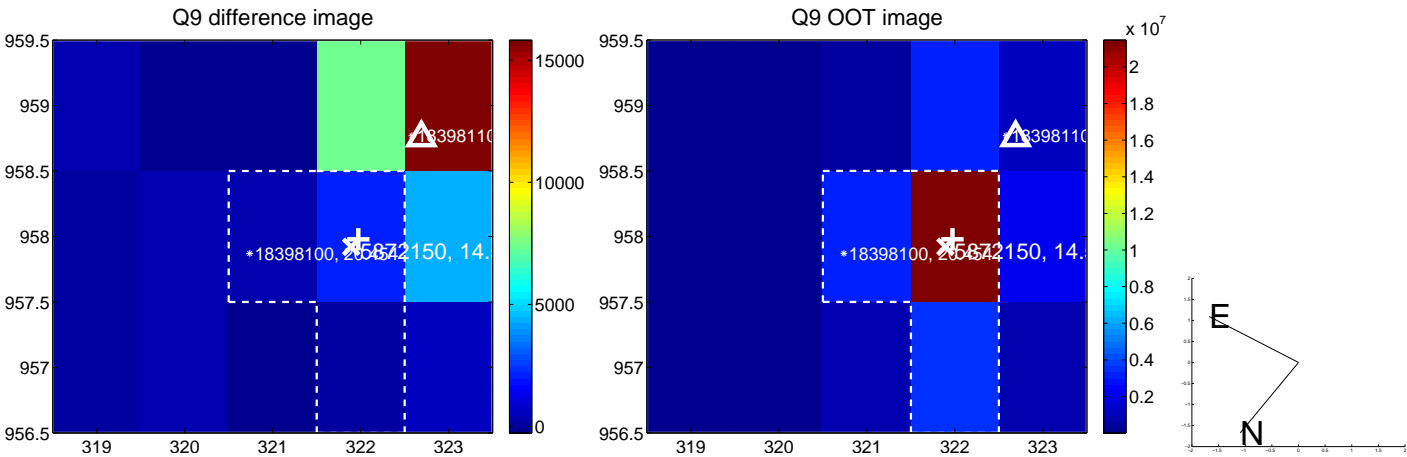
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



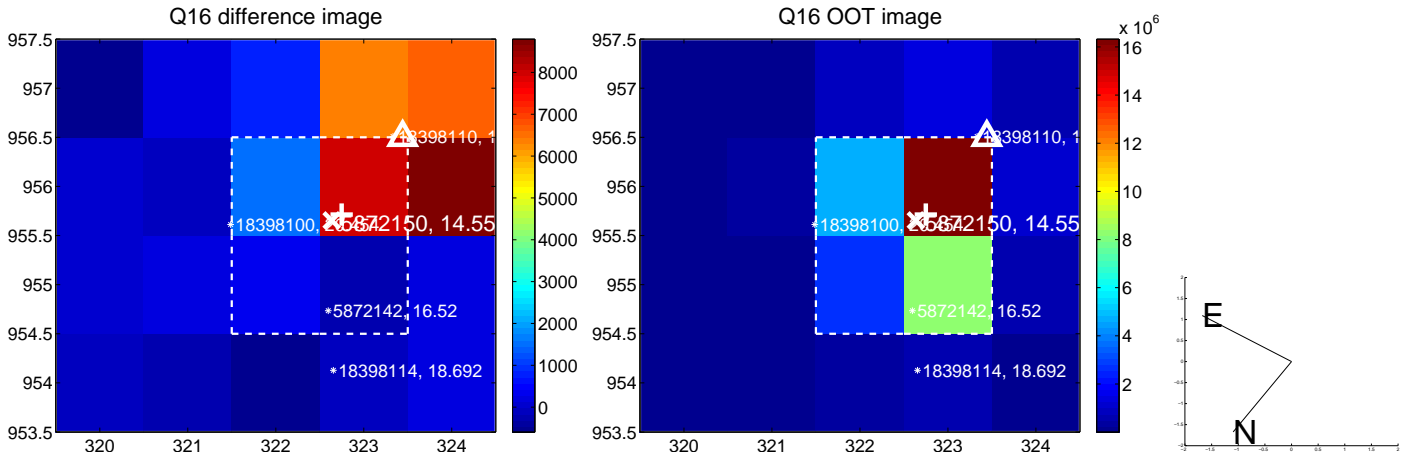
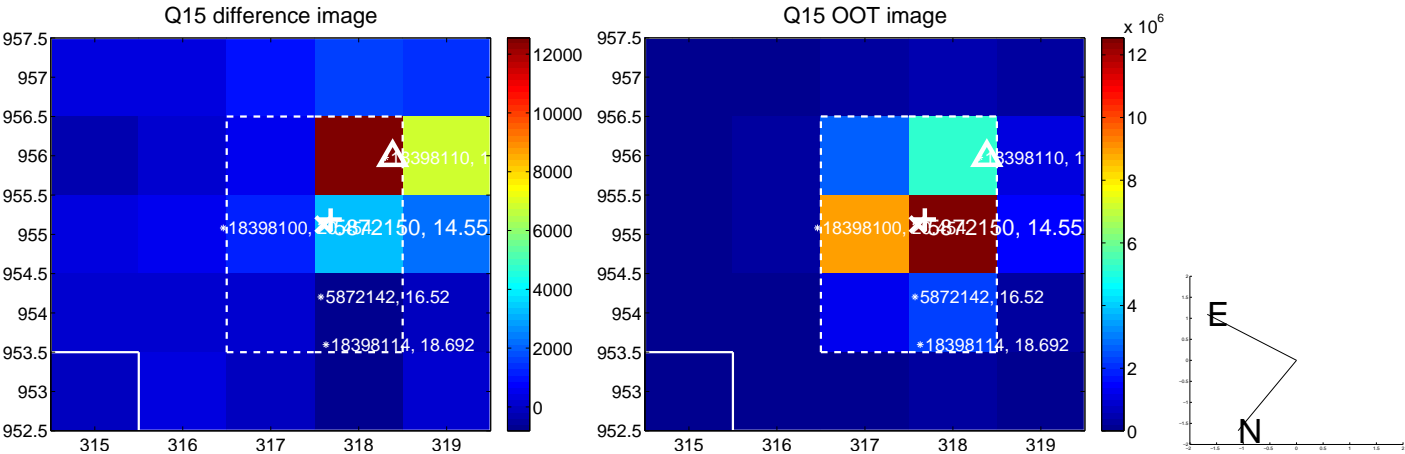
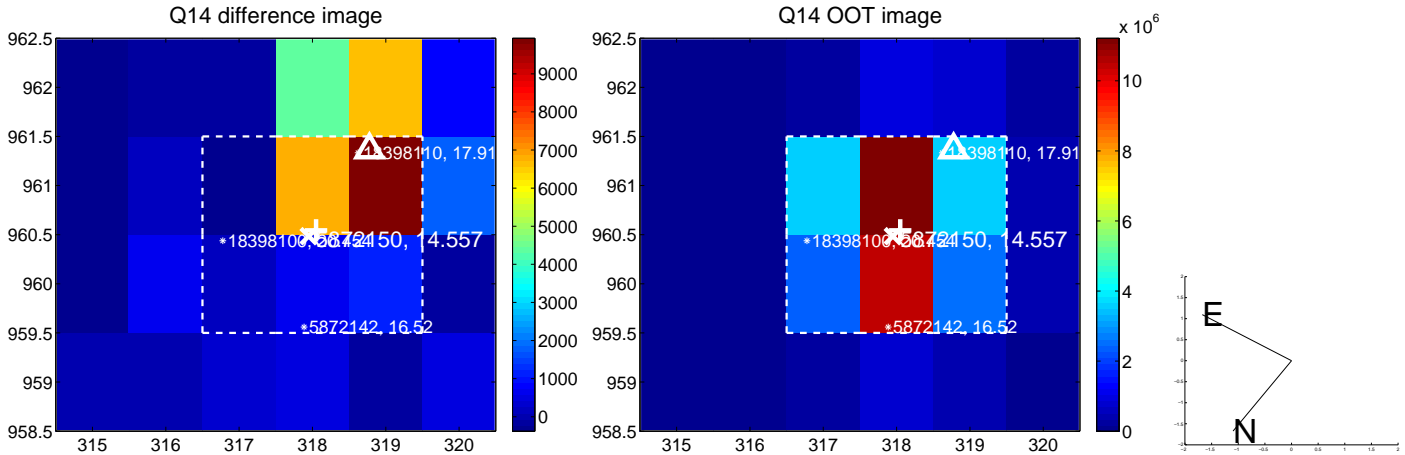
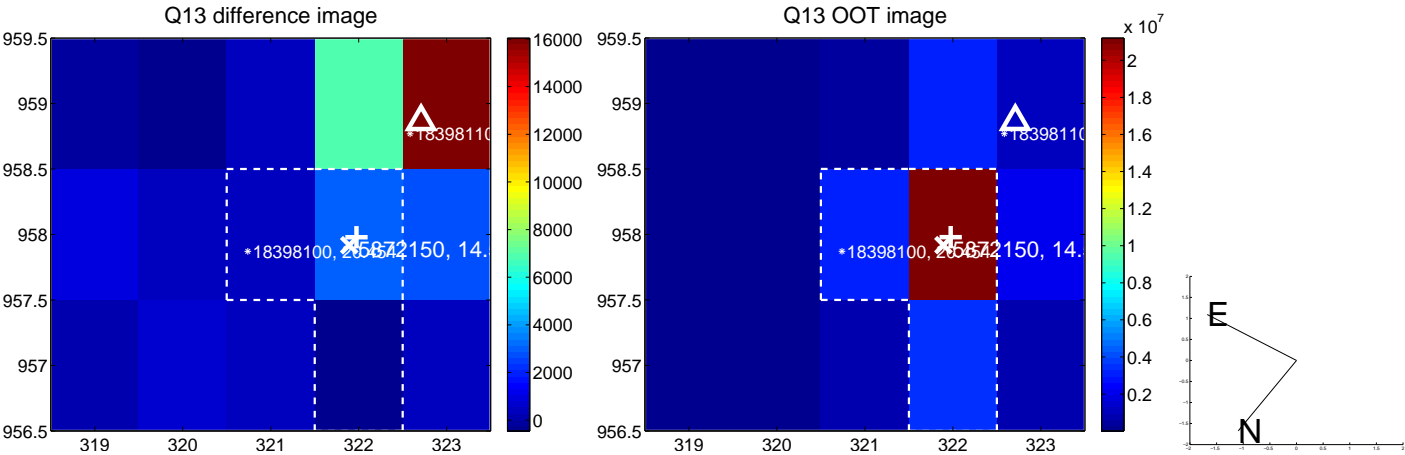
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



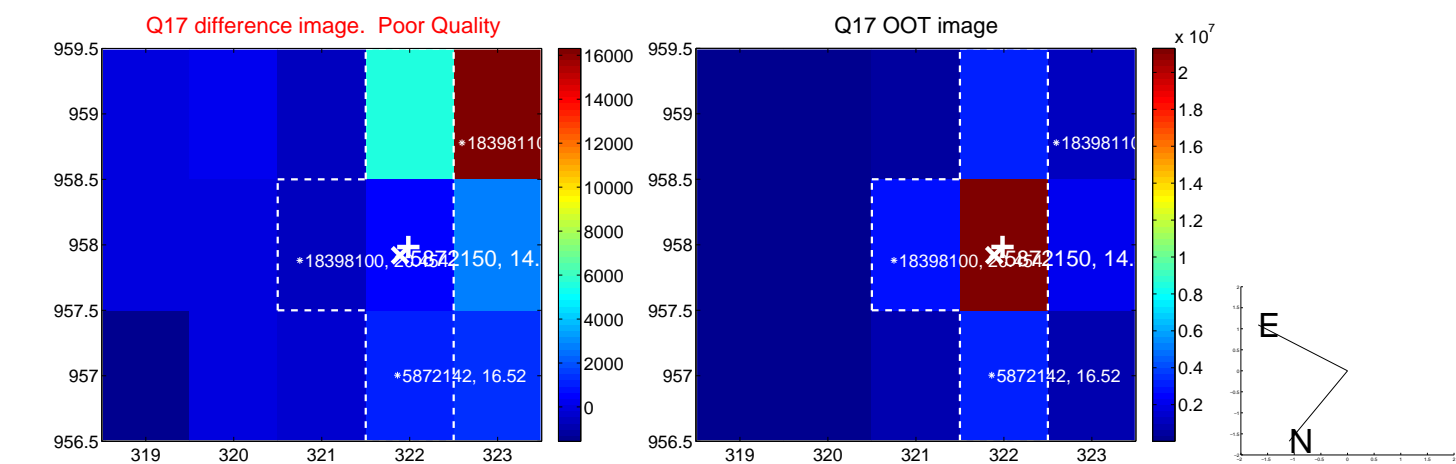
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



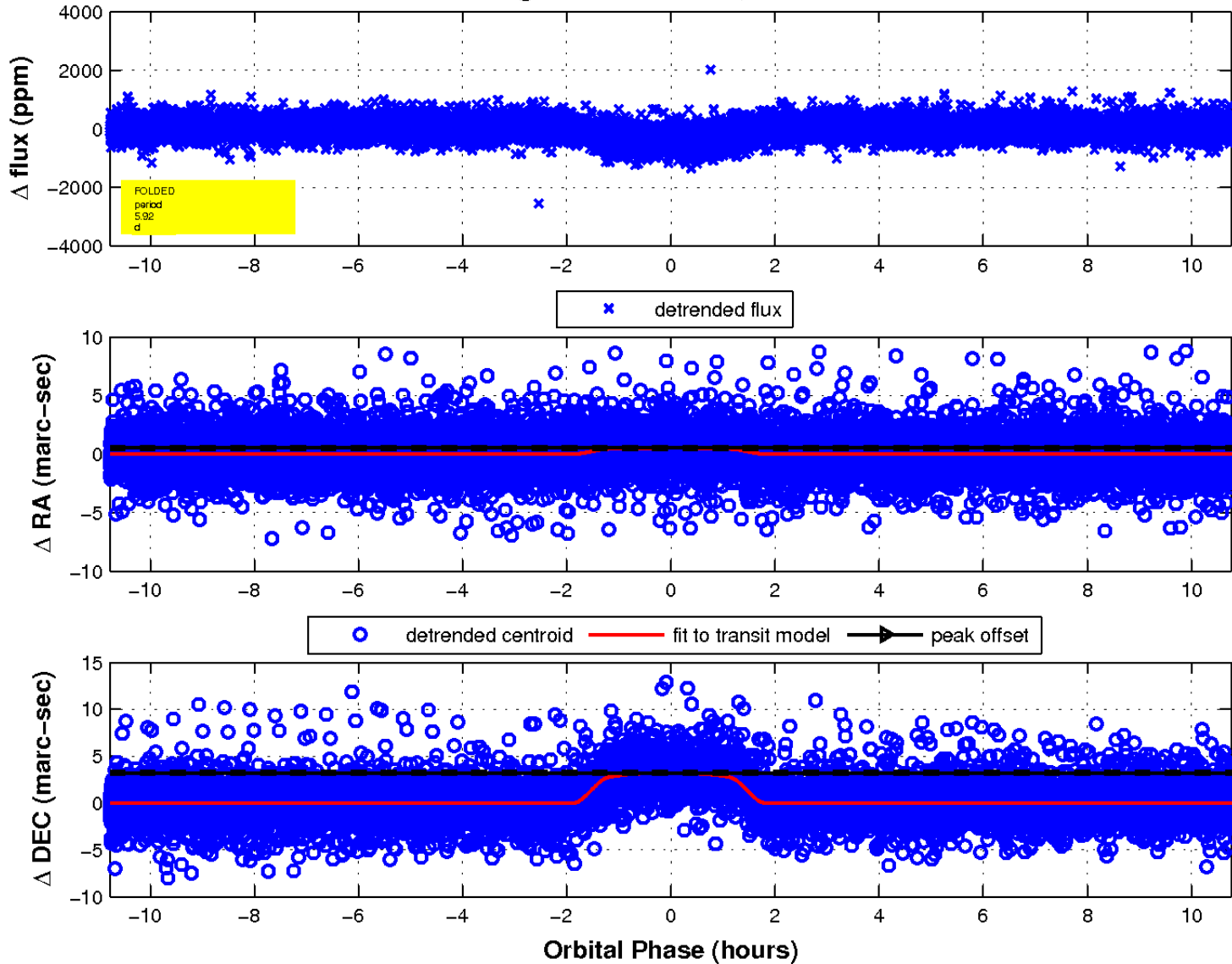
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

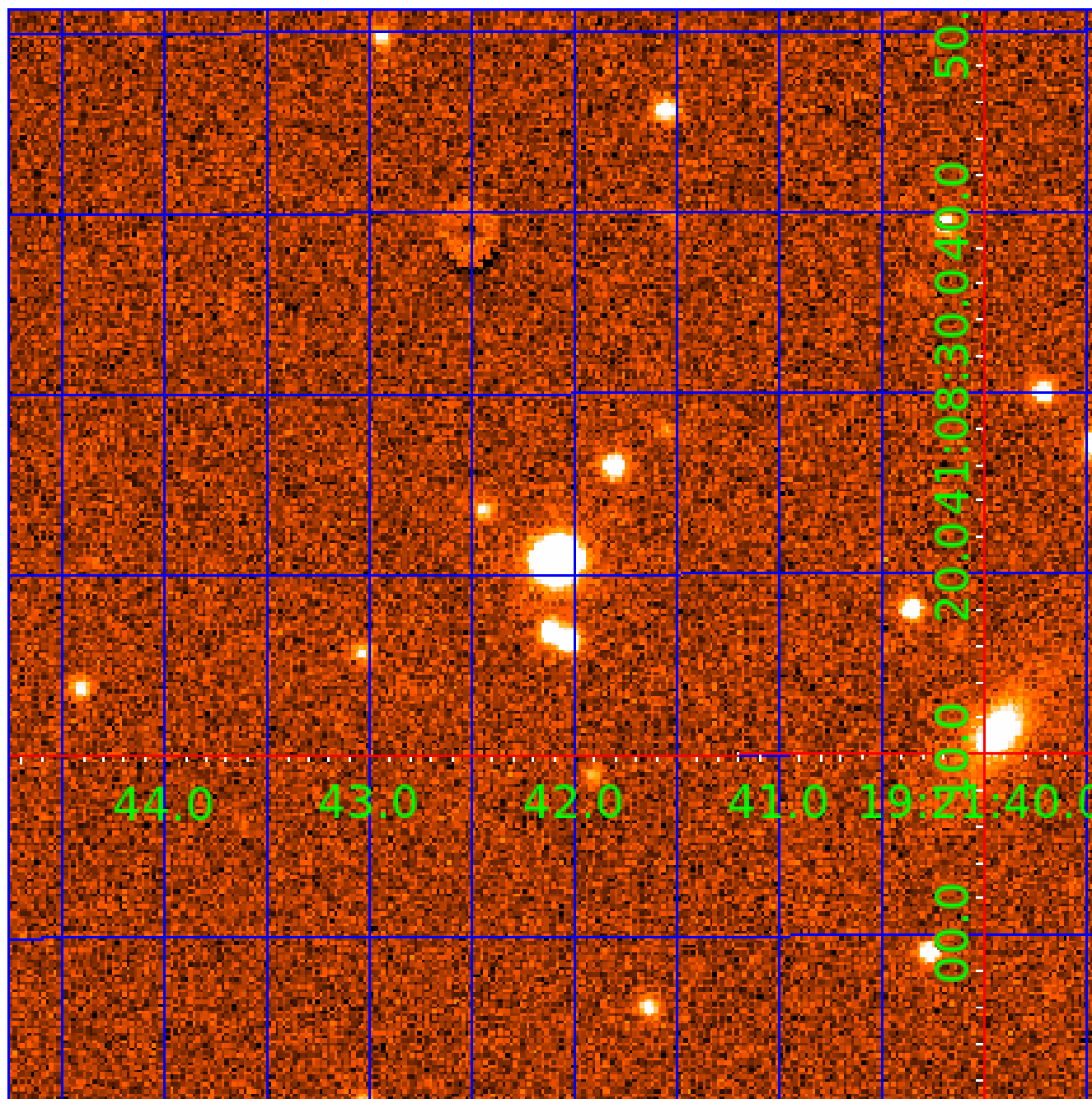


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 005872150

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})
005872150-01	OBS	0414.01	20.355097	134.633537	25066.8	5.364	1483.0	1373.3	1.08	6081	17.64	63.69
005872150-02	OBS	0414.02	5.922390	132.362879	389.9	3.591	35.5	38.7	1.08	6081	2.63	330.33
005872150-03	OBS	No	20.355090	144.378566	408.7	5.194	24.6	26.2	1.08	6081	2.44	63.69
005872150-04	OBS	No	403.387441	197.083678	441.7	10.352	33.9	6.0	1.08	6081	3.09	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005872150-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
005872150-02	OBS	FP	0.02	0	0	1	0	CENT_KIC_POS—HALO_GHOST
005872150-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
005872150-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

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.

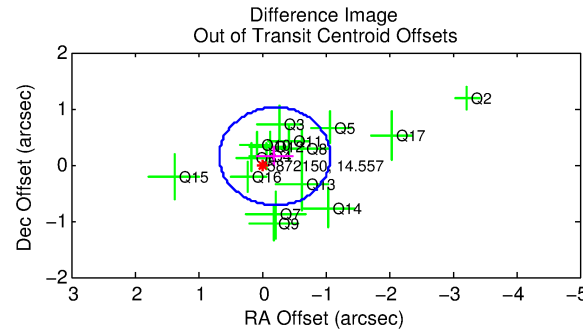
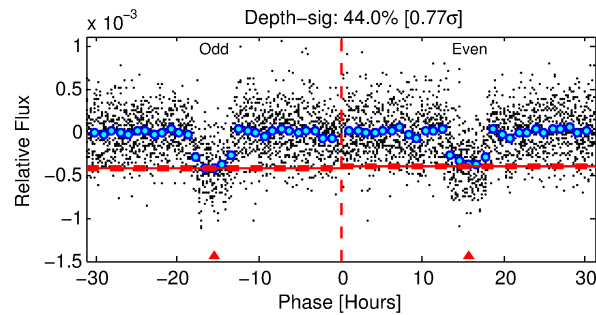
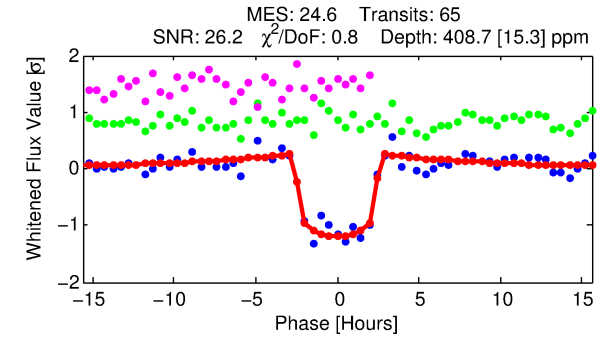
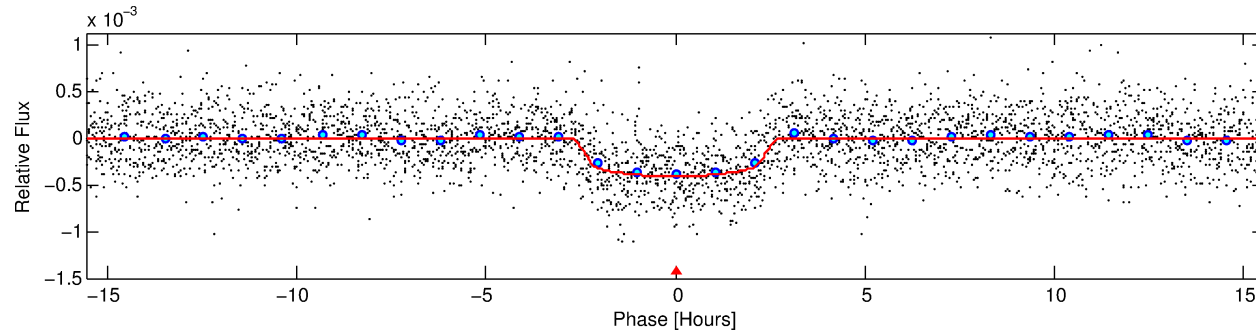
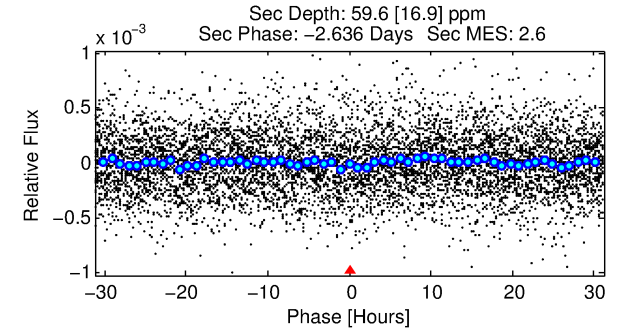
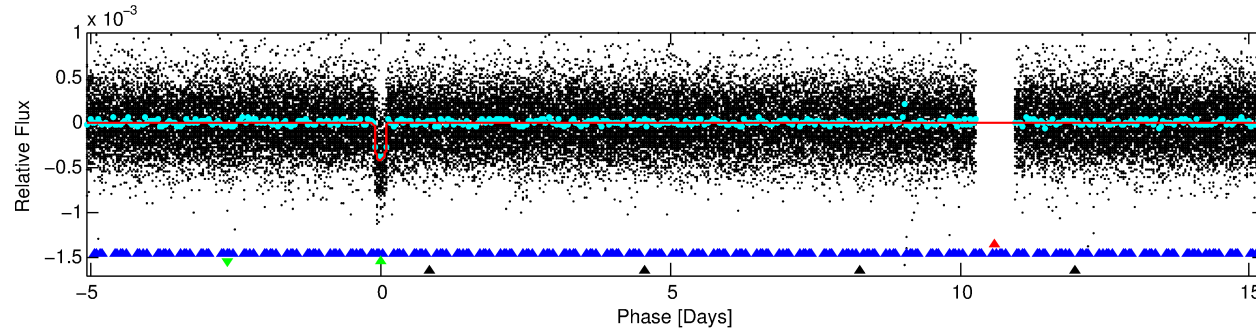
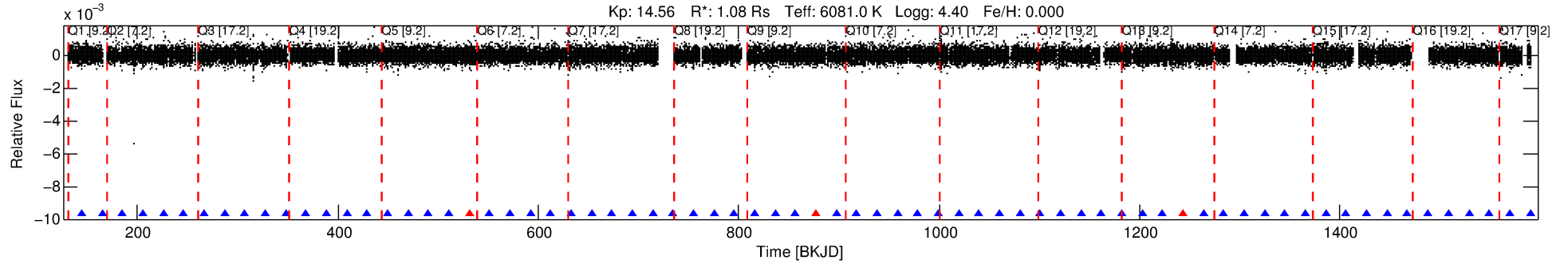
Ephemeris Match Information For 005872150-03

No Significant Match Found

DV One-Page Summary

KIC: 5872150 Candidate: 3 of 4 Period: 20.355 d

KOI: K00414 Corr: No Ephemeris Match



DV Fit Results:

Period = 20.35509 [0.00008] d
Epoch = 144.3786 [0.0033] BKJD
Rp/R* = 0.0208 [0.0029]
a/R* = 18.08 [12.33]
b = 0.82 [0.27]
Seff = 63.69 [26.61]
Teff = 720 [75] K
Rp = 2.44 [0.83] Re
a = 0.1494 [0.0397] AU
Ag = 122.96 [68.87] [1.77σ]
Teffp = 3709 [394] K [7.44σ]

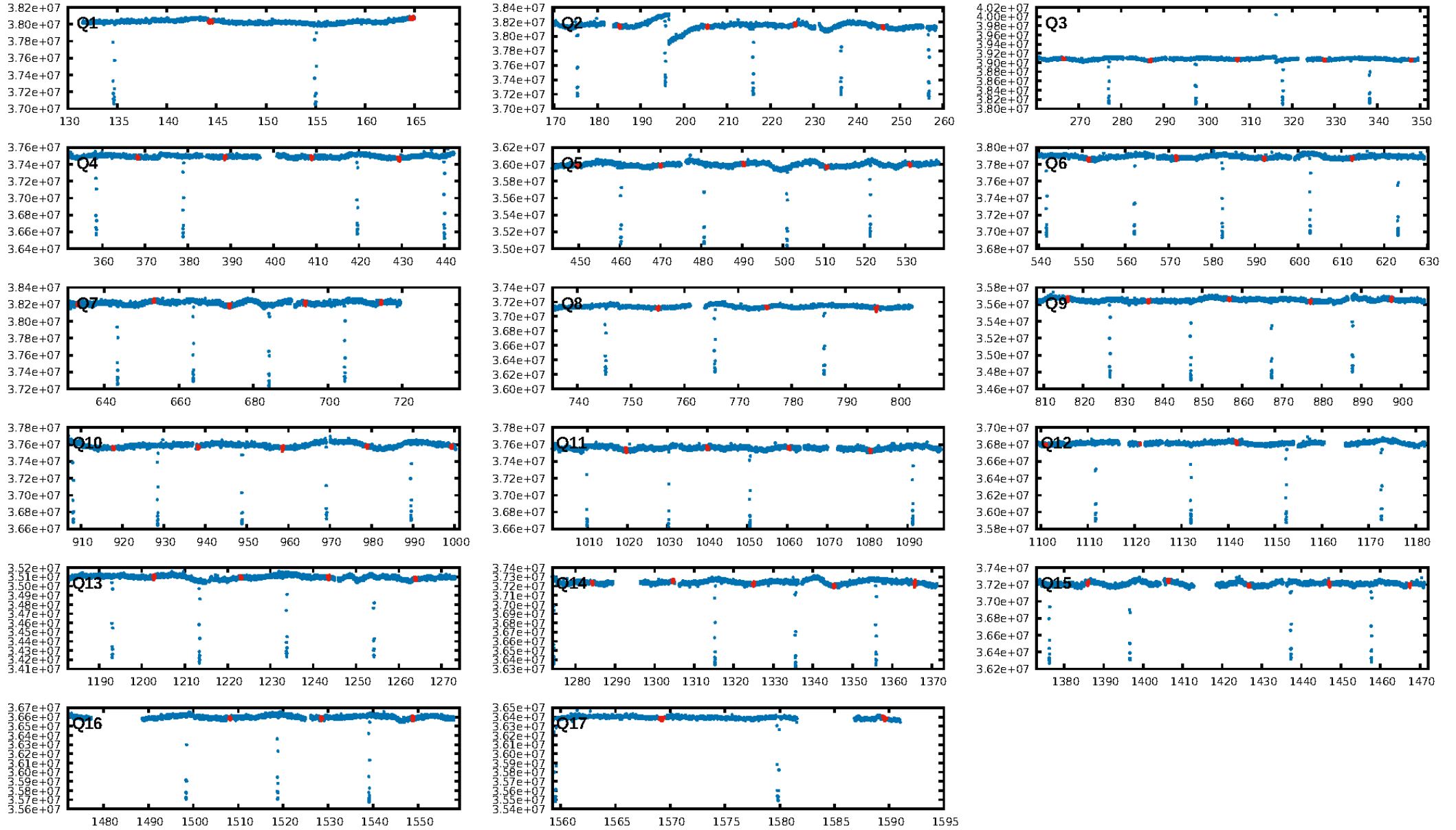
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.85σ]
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 61.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.92e-105
RollingBand-fgt: 0.95 [58/61]
GhostDiagnostic-chr: 4.716
Centroid-sig: 2.0%
Centroid-so: 1.212 arcsec [2.48σ]
OotOffset-rm: 0.252 arcsec [0.87σ]
KicOffset-rm: 0.441 arcsec [2.08σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.94 [16/17]

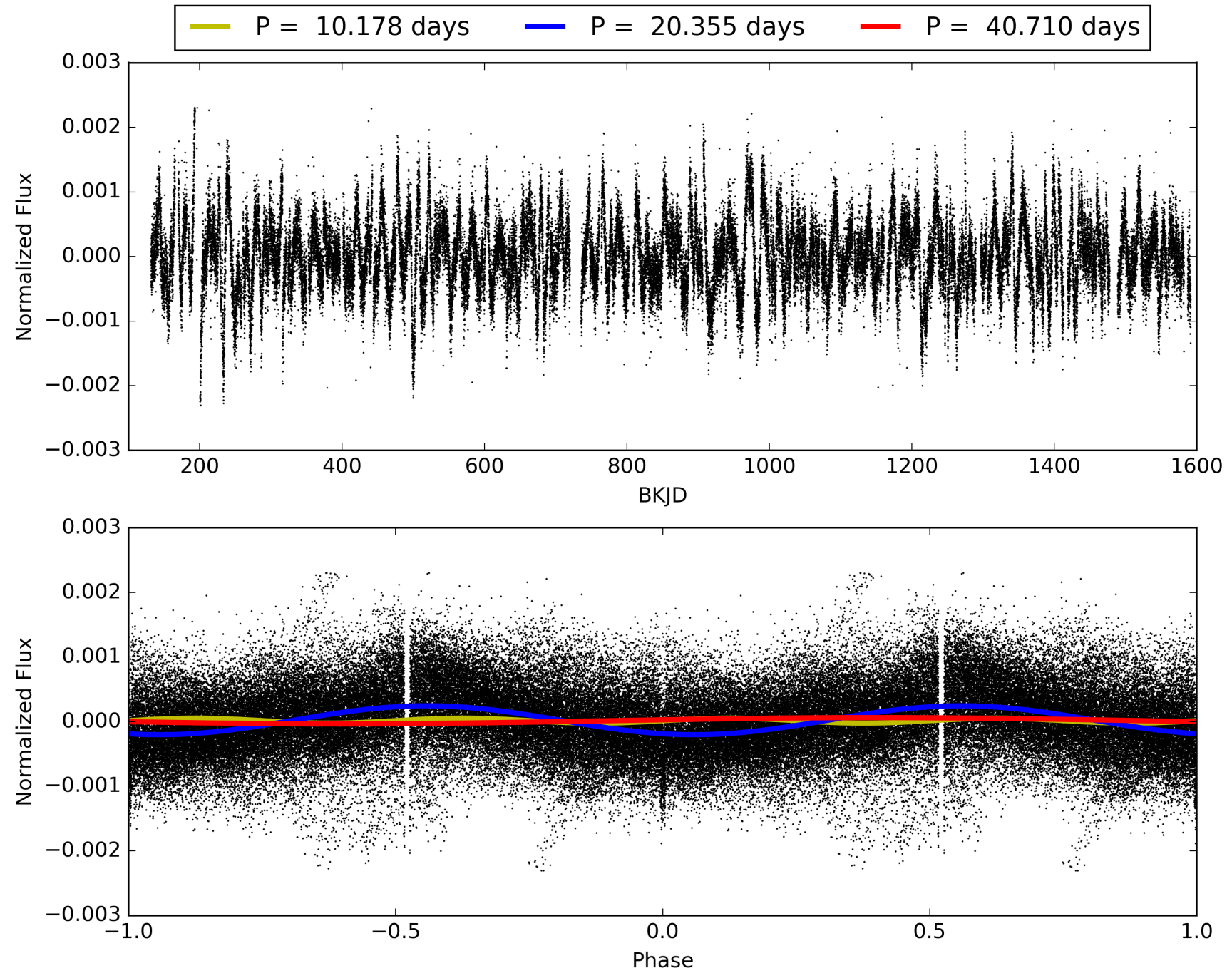
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:52:46 Z

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

TCE 005872150-03, PDC Light Curves

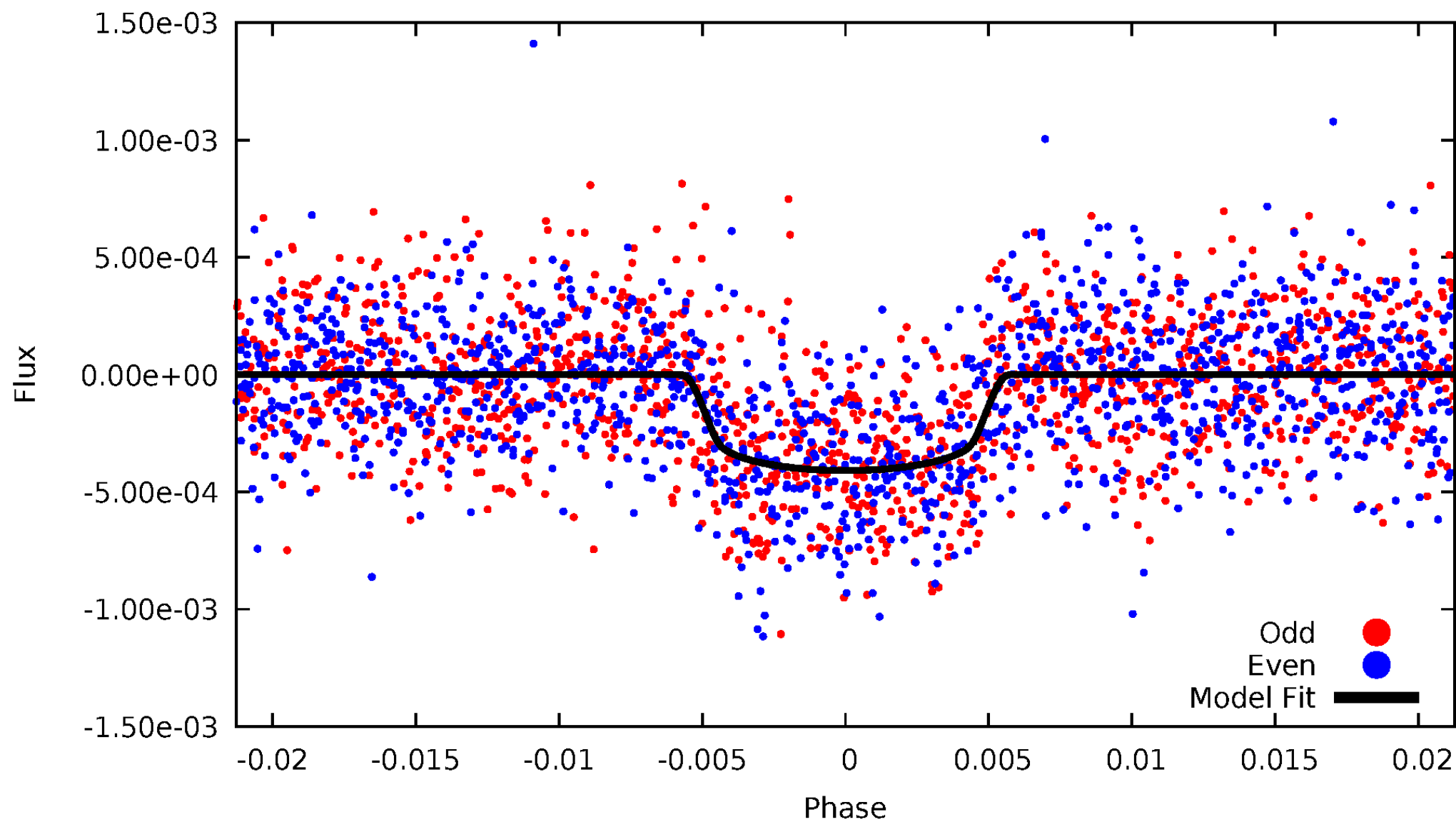


TCE 005872150-03



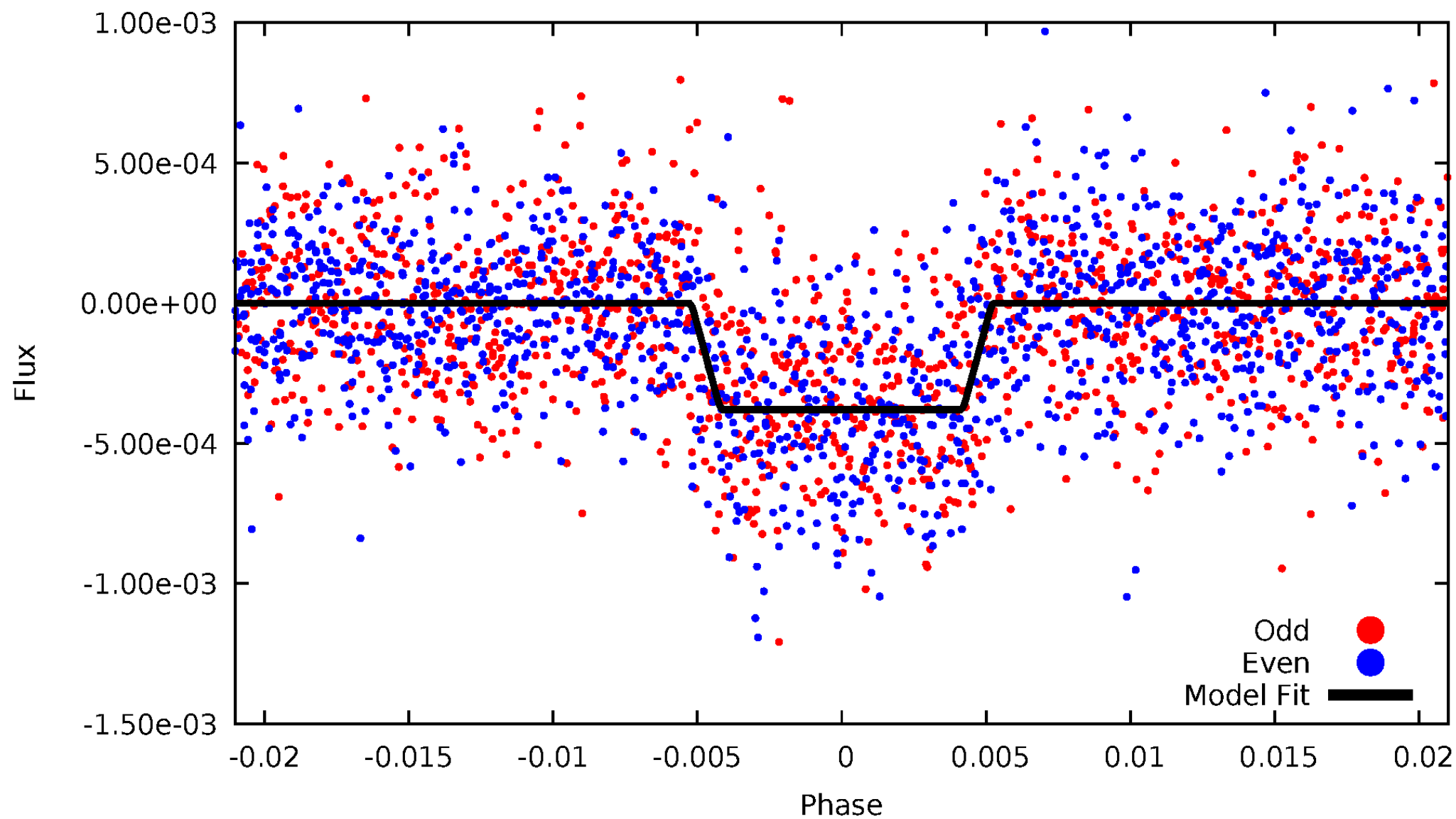
DV Odd/Even

TCE 005872150-03

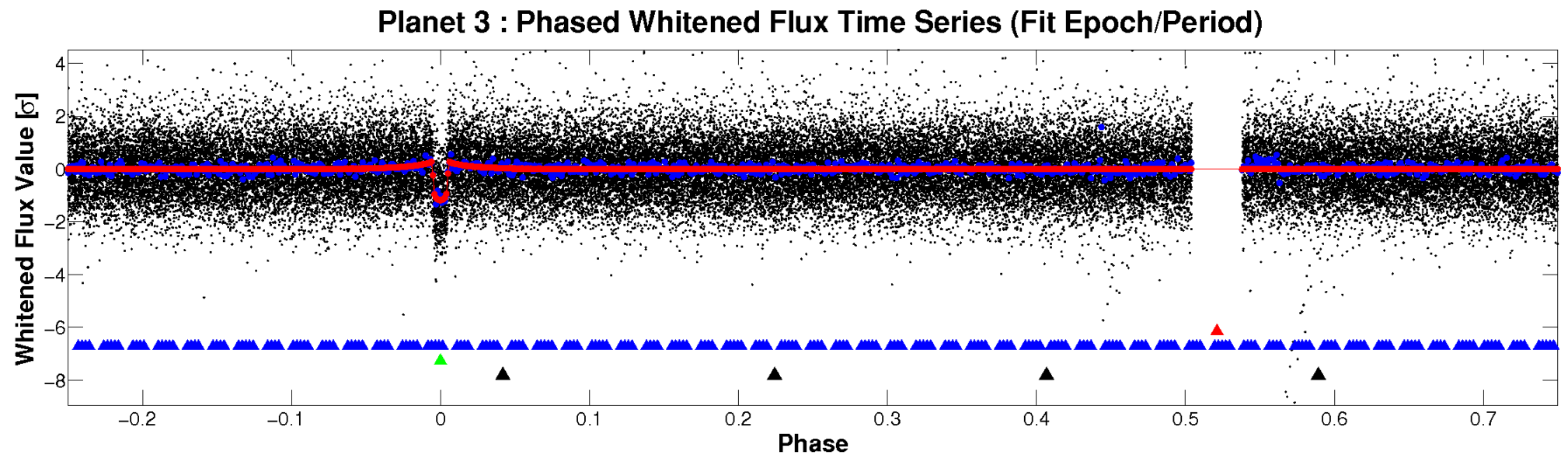
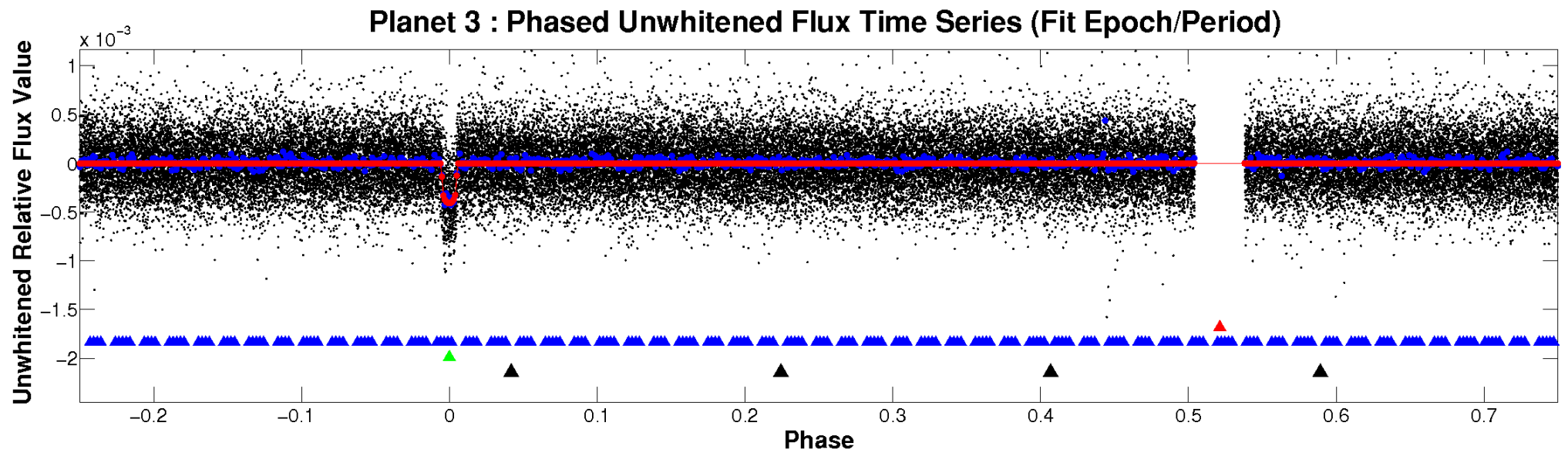


ALT Odd/Even

TCE 005872150-03

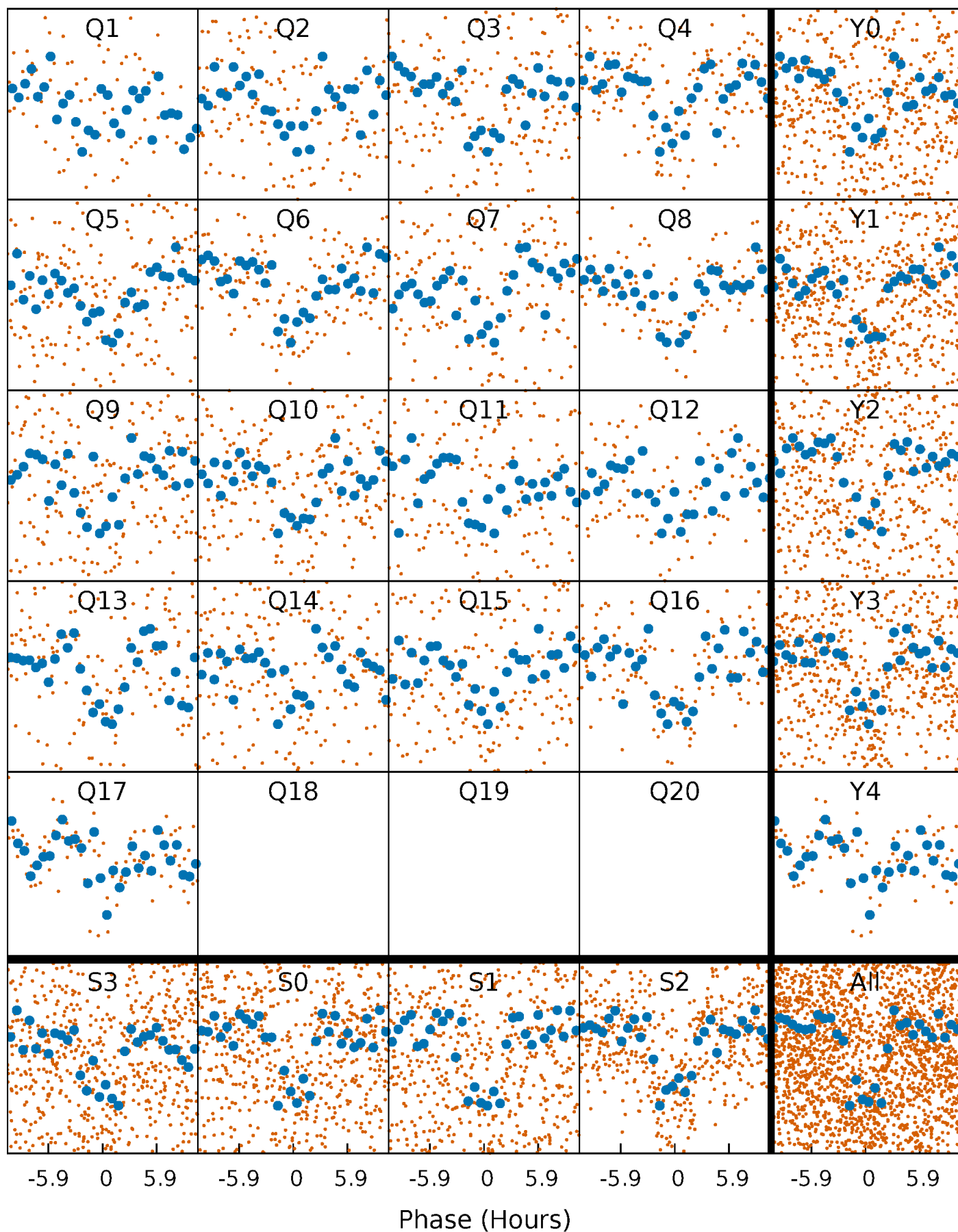


Non-Whitened Vs. Whitened Light Curve



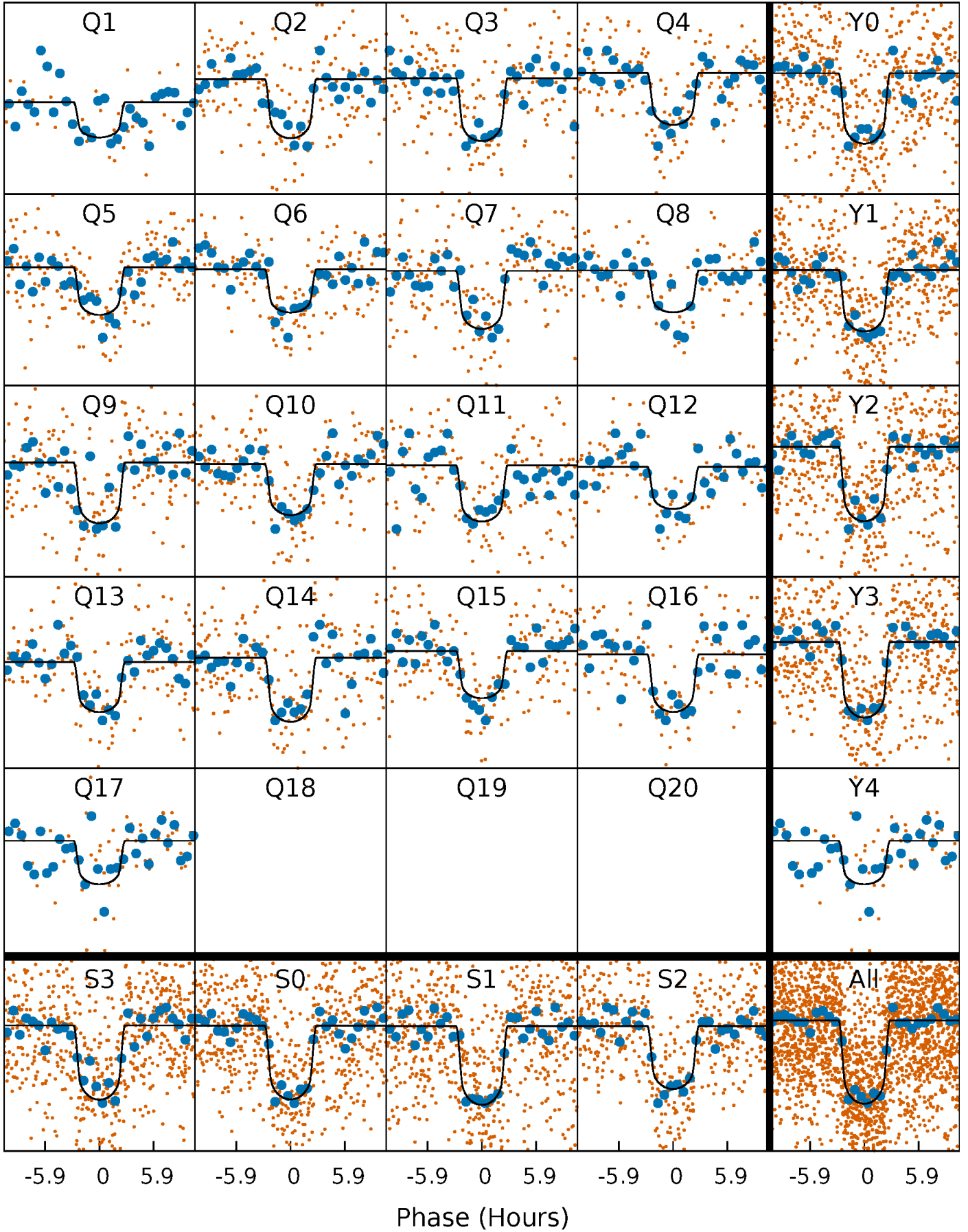
PDC Quarter-Phased Transit Curves

TCE 005872150-03 P= 20.355090 Days $T_0=144.378566$ (BKJD)



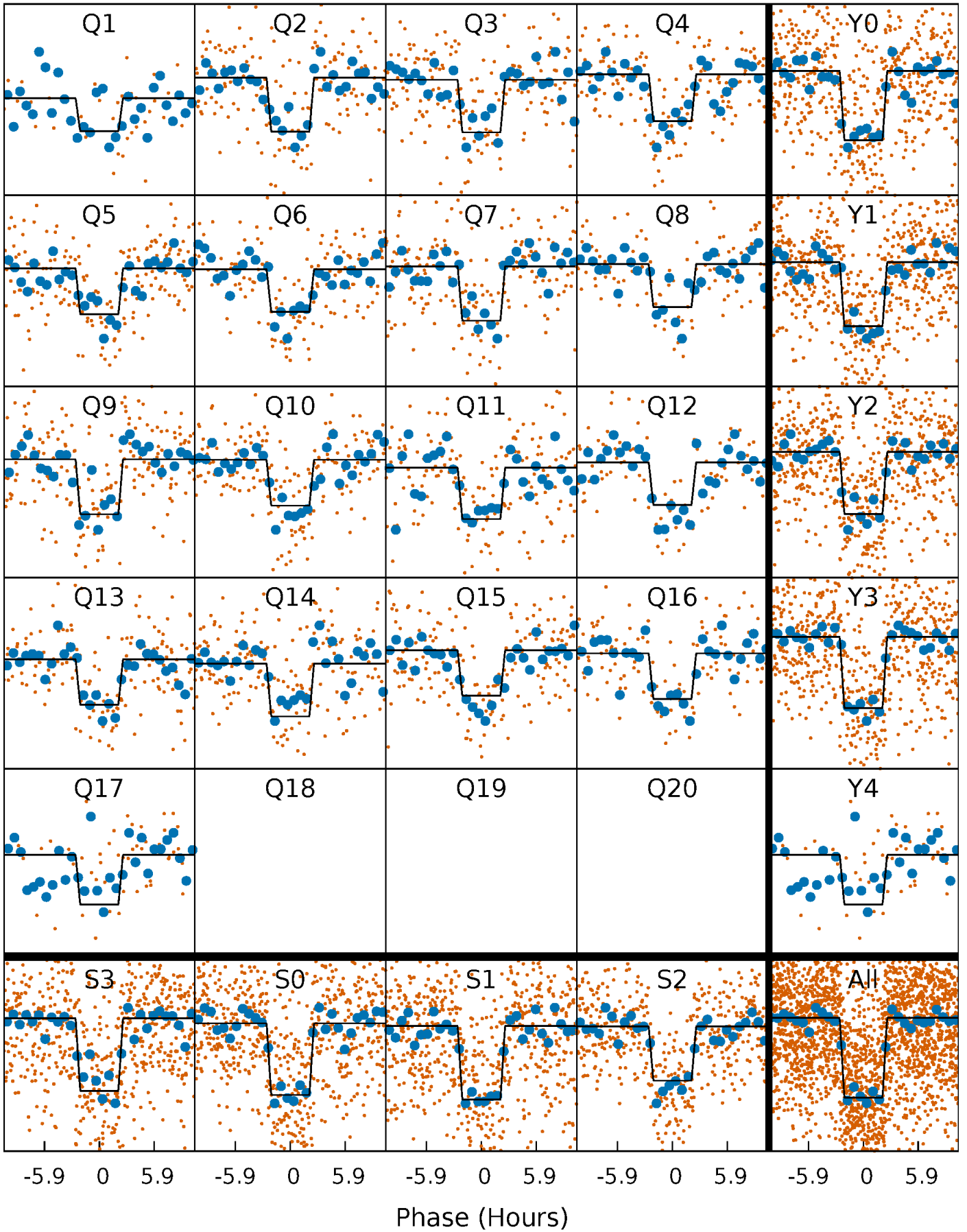
DV Quarter-Phased Transit Curves

TCE 005872150-03 P= 20.355090 Days $T_0=144.378566$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

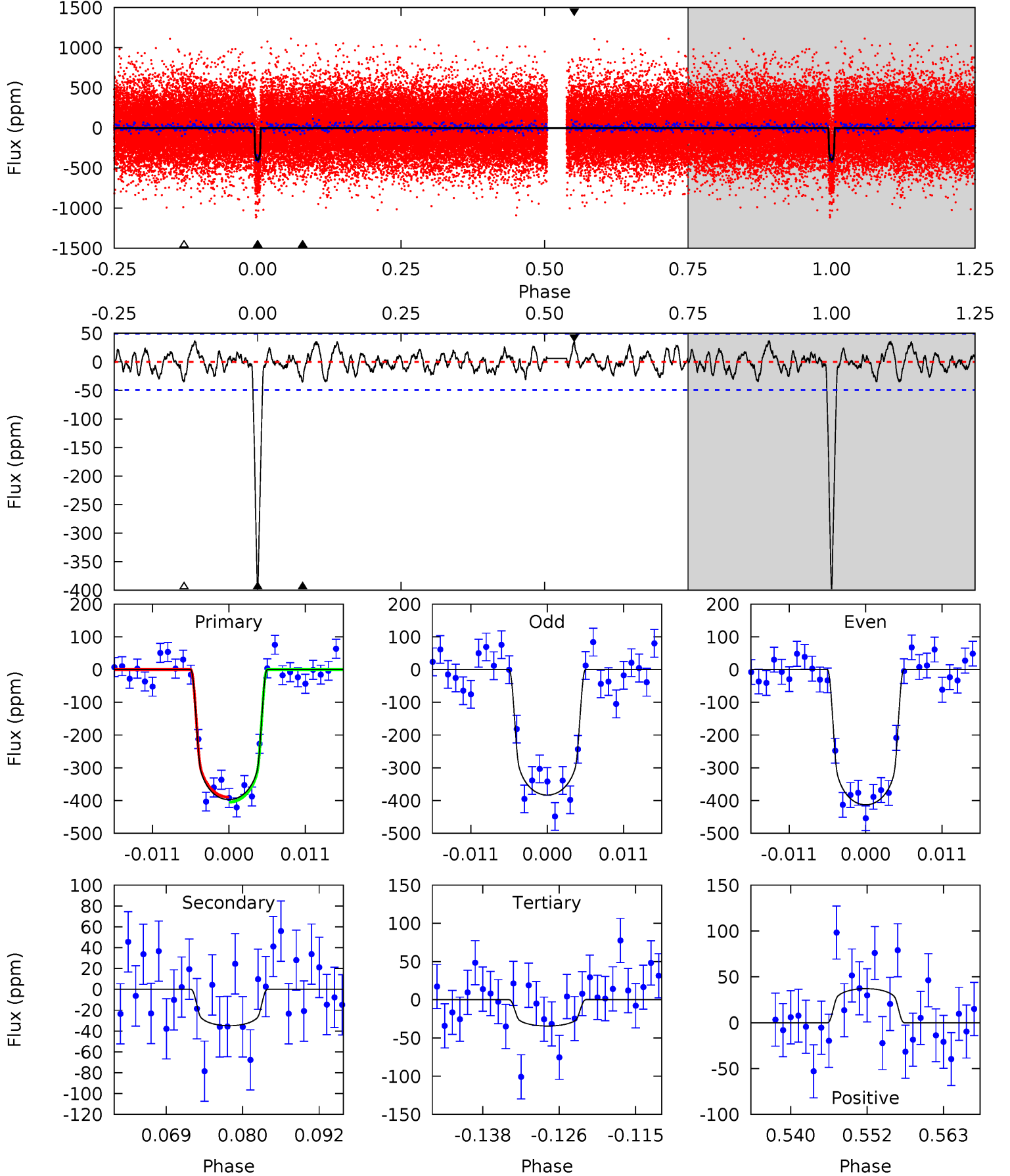
TCE 005872150-03 P= 20.354988 Days $T_0=144.383230$ (BKJD)



DV Model-Shift Uniqueness Test

005872150-03, P = 20.355090 Days, E = 124.023476 Days

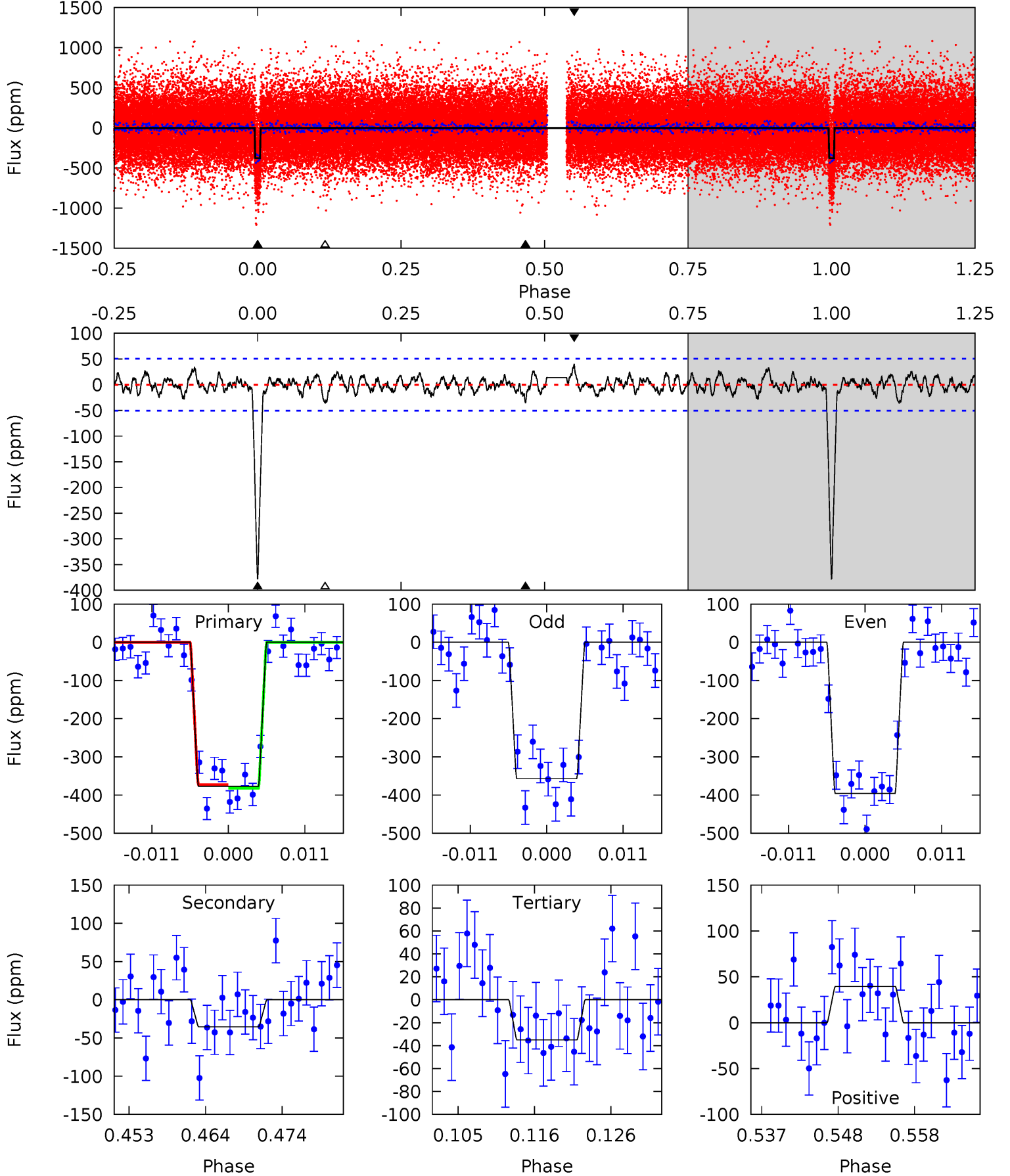
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.3	3.54	3.48	3.76	5.00	2.53	1.37	36.8	36.5	0.06	-0.22	1.51	0.98	0.09	0.78



Alt Model-Shift Uniqueness Test

005872150-03, $P = 20.354988$ Days, $E = 124.028242$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.4	3.51	3.47	3.92	5.02	2.56	1.16	33.9	33.5	0.04	-0.41	1.91	0.99	0.09	0.47



Stellar Parameters For KIC 005872150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6081^{+184}_{-220}	$4.404^{+0.072}_{-0.217}$	$0.000^{+0.250}_{-0.300}$	$1.077^{+0.334}_{-0.143}$	$1.072^{+0.151}_{-0.135}$	$1.207^{+0.456}_{-0.631}$
	+3%/-4%	+2%/-5%	+inf%/-inf%	+31%/-13%	+14%/-13%	+38%/-52%
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 005872150-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-35 ± 10	$2.54^{+0.57}_{-0.45}$	1027^{+74}_{-57}	3646^{+263}_{-250}	63^{+38}_{-24}
Alt.	-35 ± 10	$2.36^{+0.52}_{-0.40}$	1028^{+70}_{-57}	3745^{+291}_{-282}	73^{+47}_{-29}

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

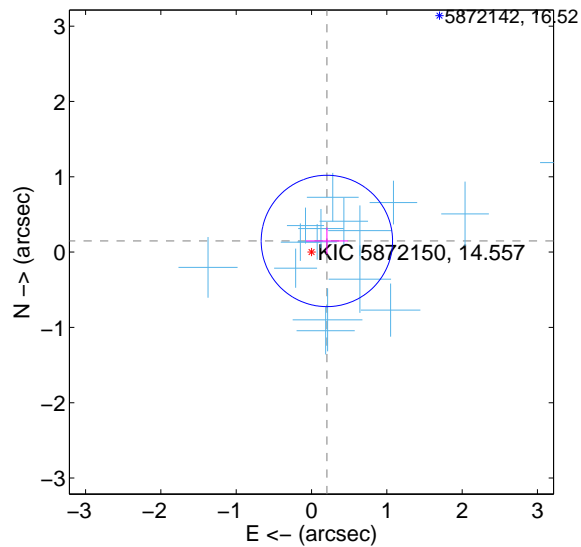
Supplemental centroid analysis for 005872150-03. Kepler magnitude: 14.56. Transit SNR 26.16

There are 16 quarters with good PRF difference image offsets

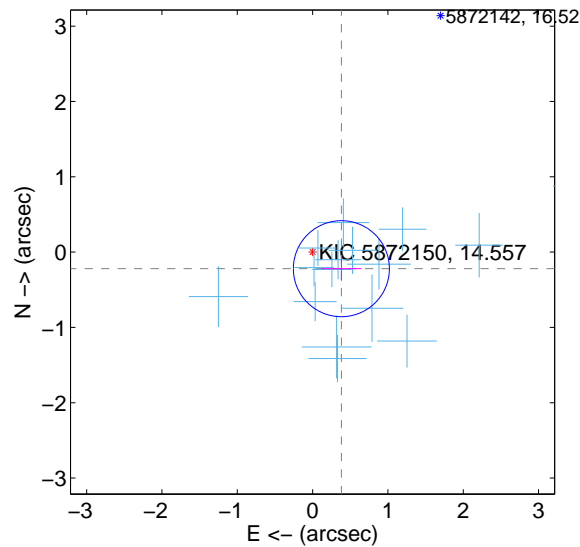
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.252 ± 0.291	0.87	-0.204 ± 0.279	0.148 ± 0.177
PRF-fit source offset from KIC position	0.441 ± 0.212	2.08	-0.382 ± 0.266	-0.220 ± 0.160
photometric centroid source offset	1.21 ± 0.49	2.48	-0.25 ± 0.46	-1.19 ± 0.49

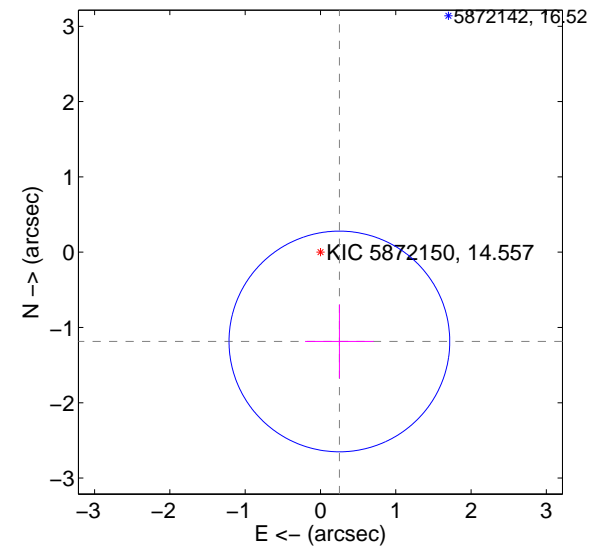
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

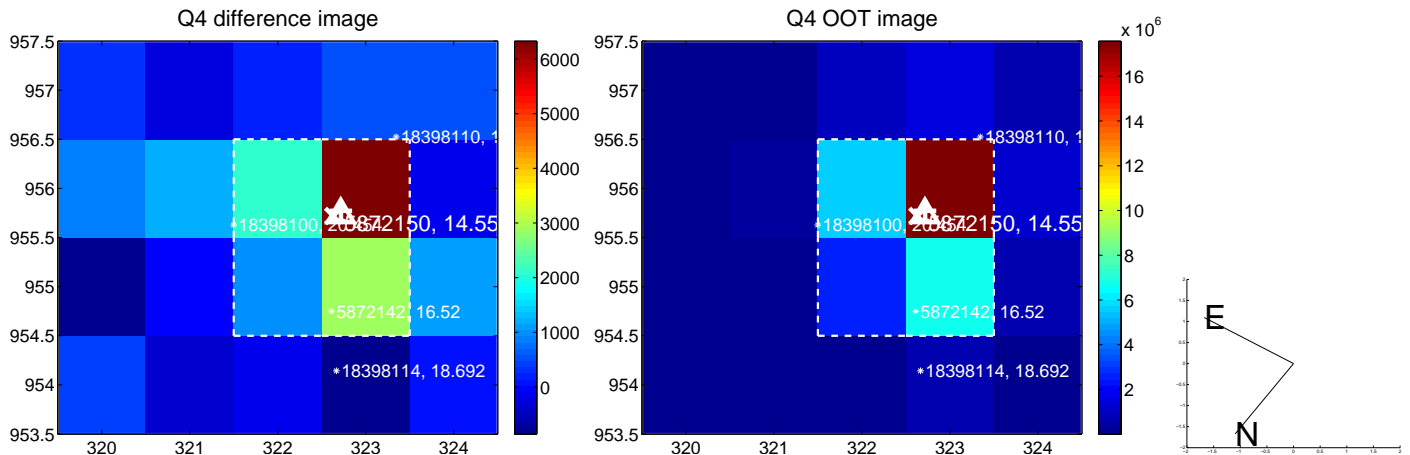
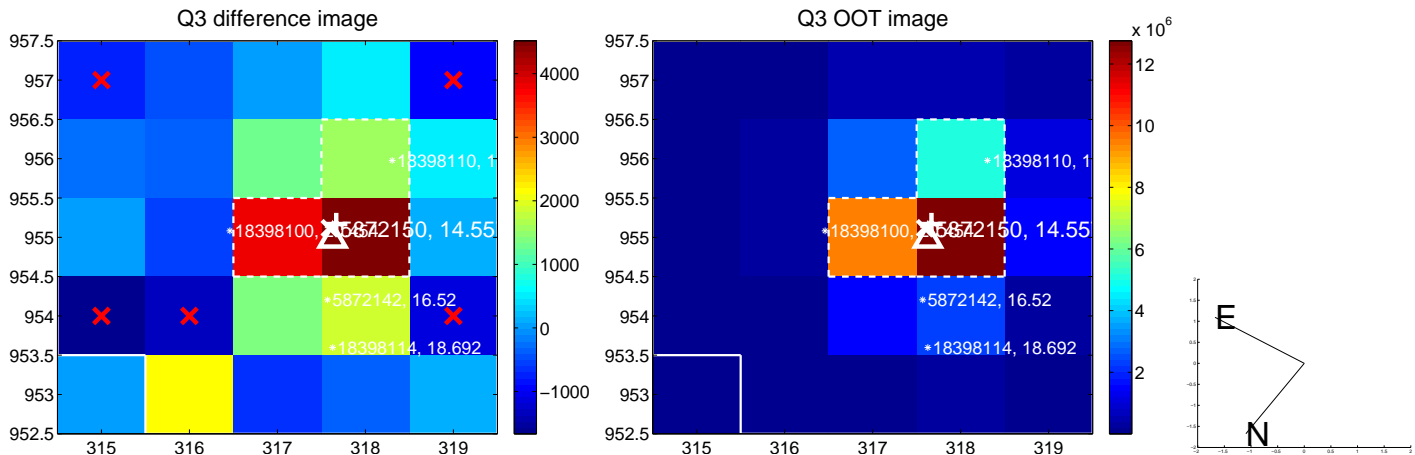
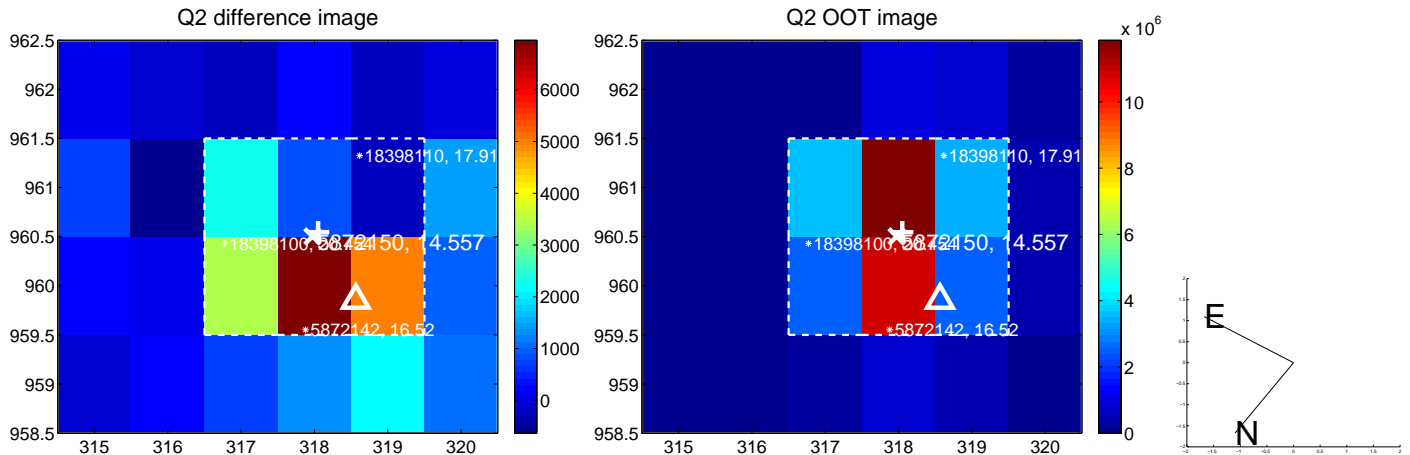
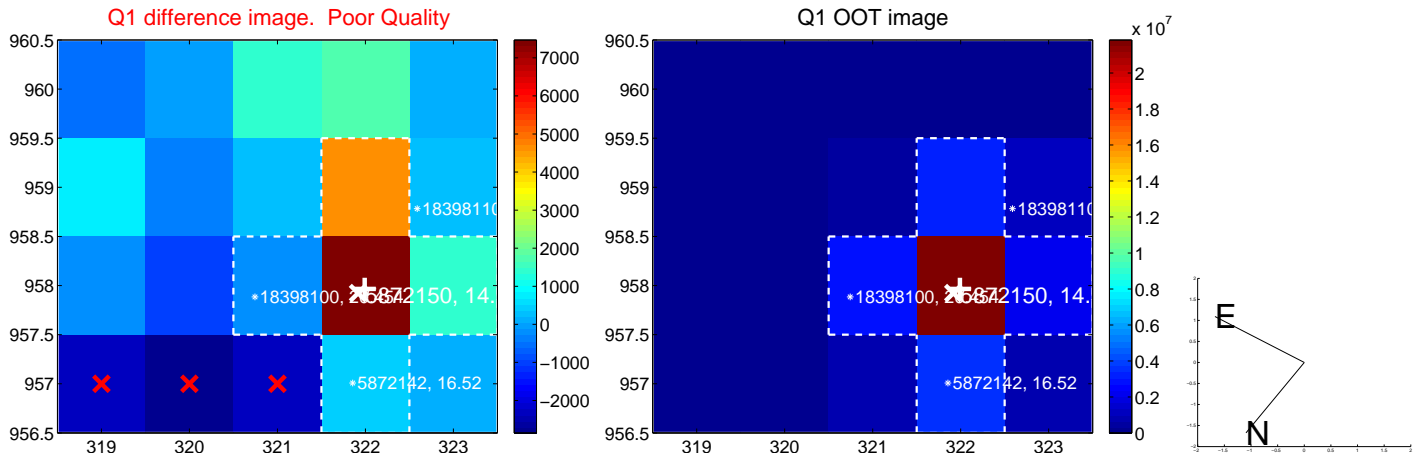


offset from photometric centroids

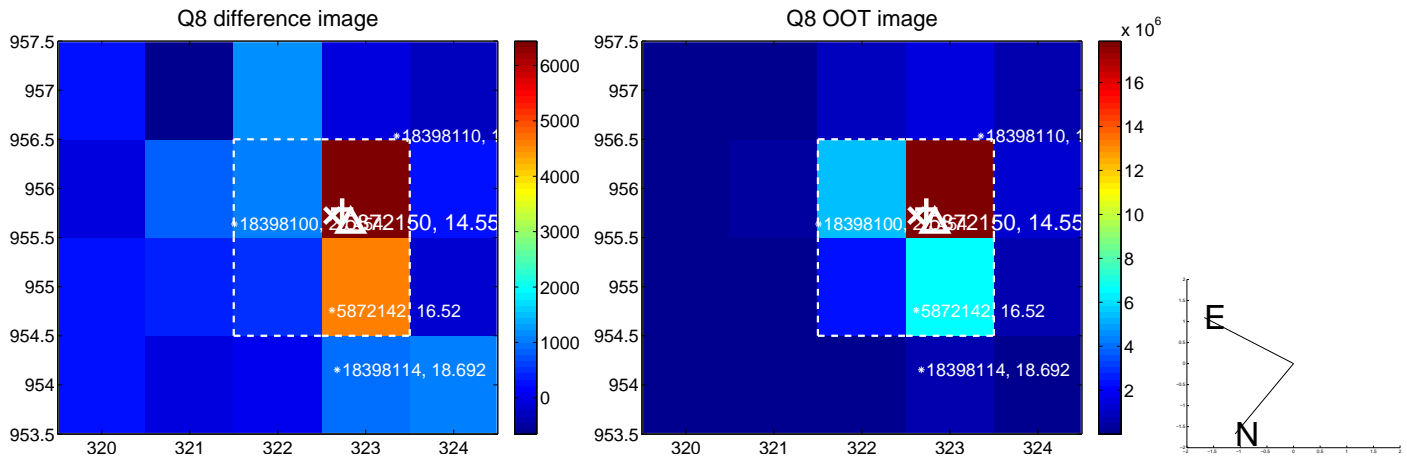
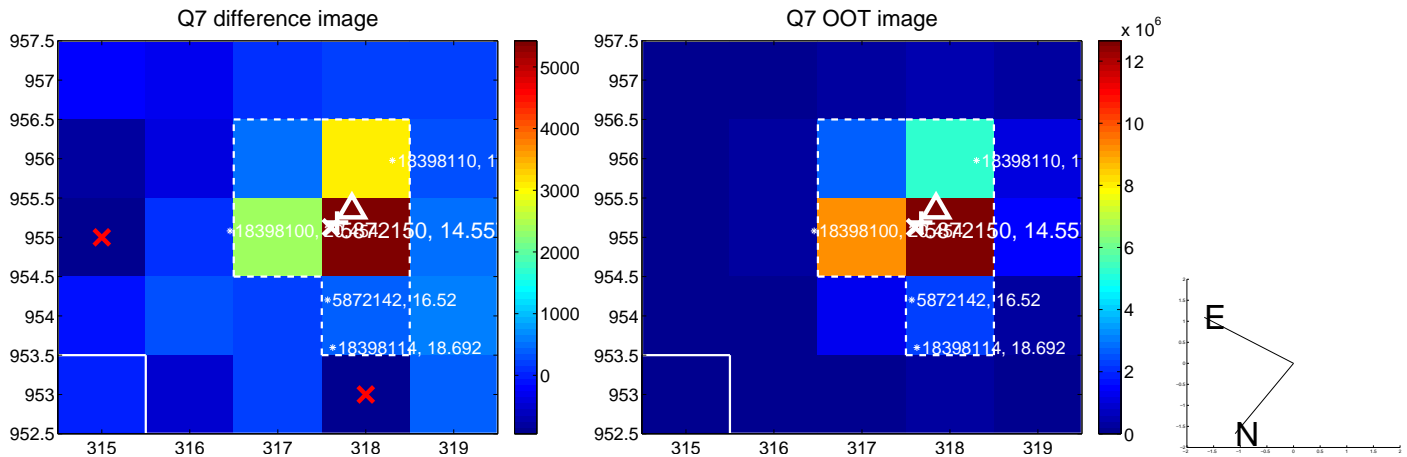
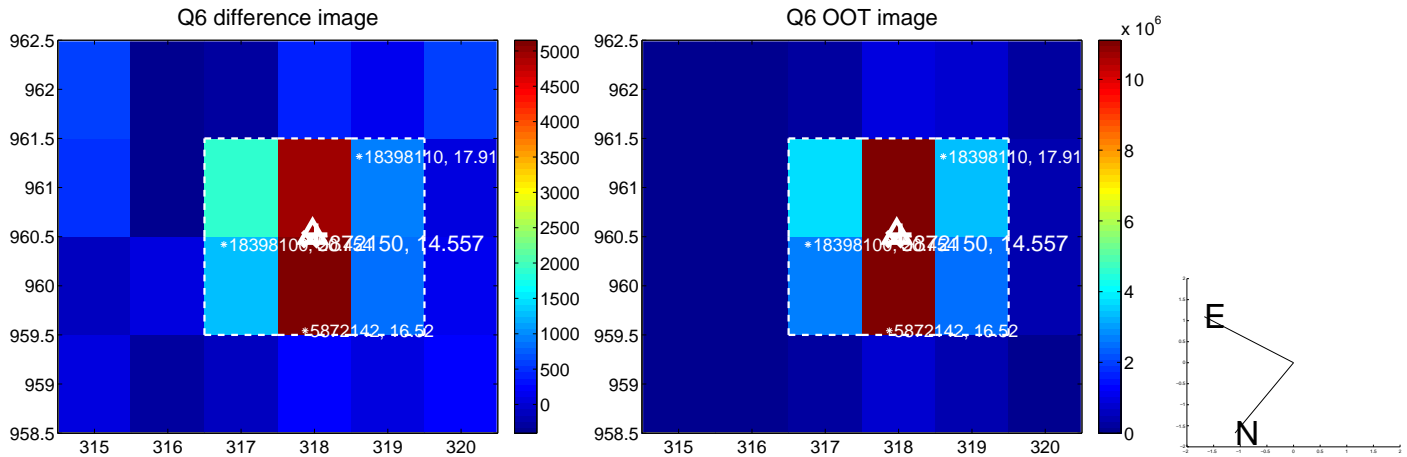
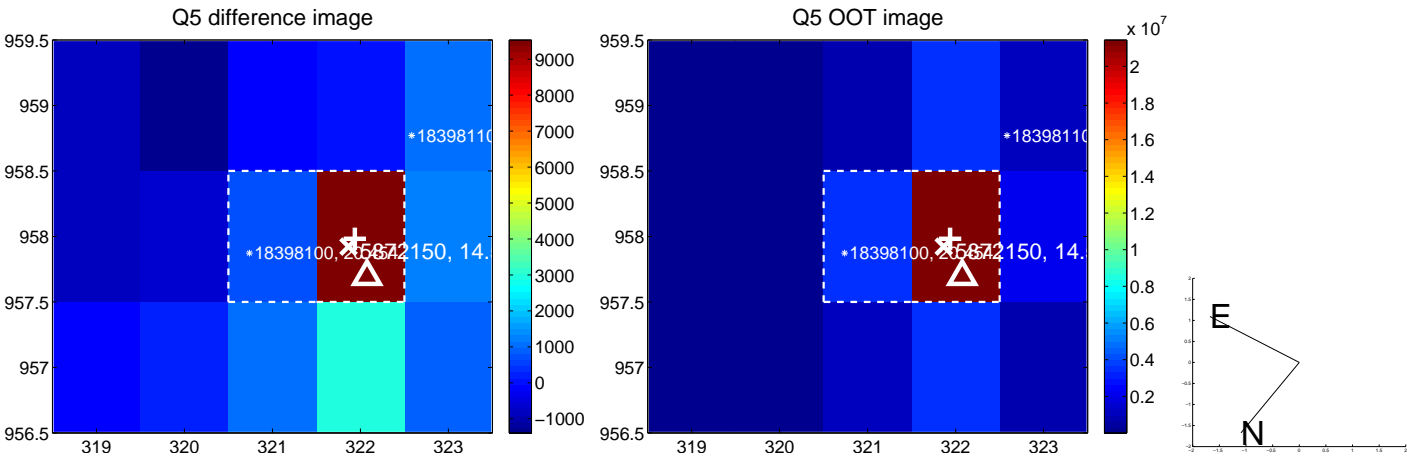


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

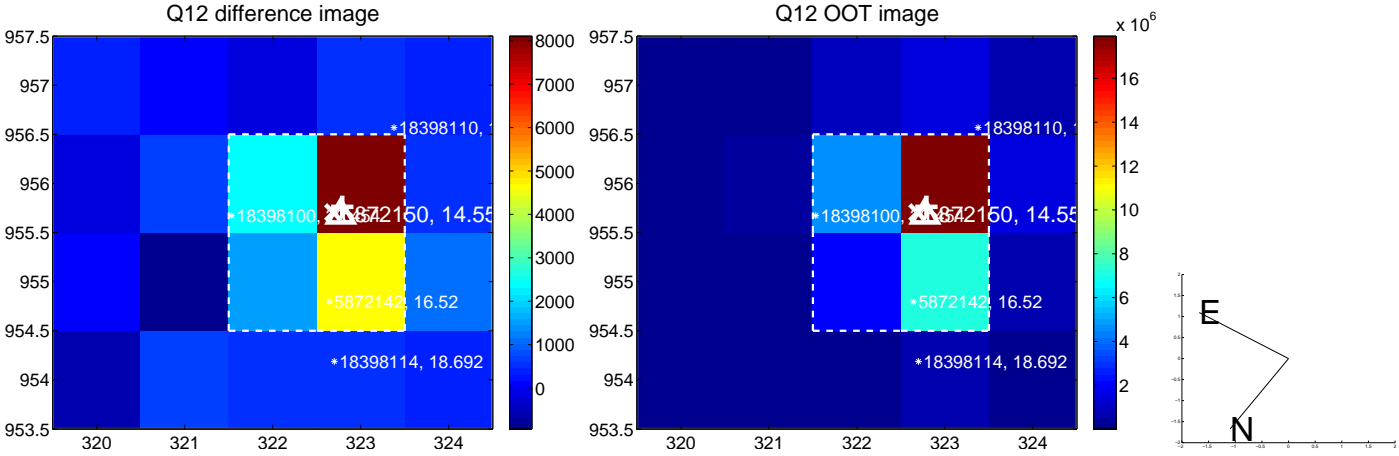
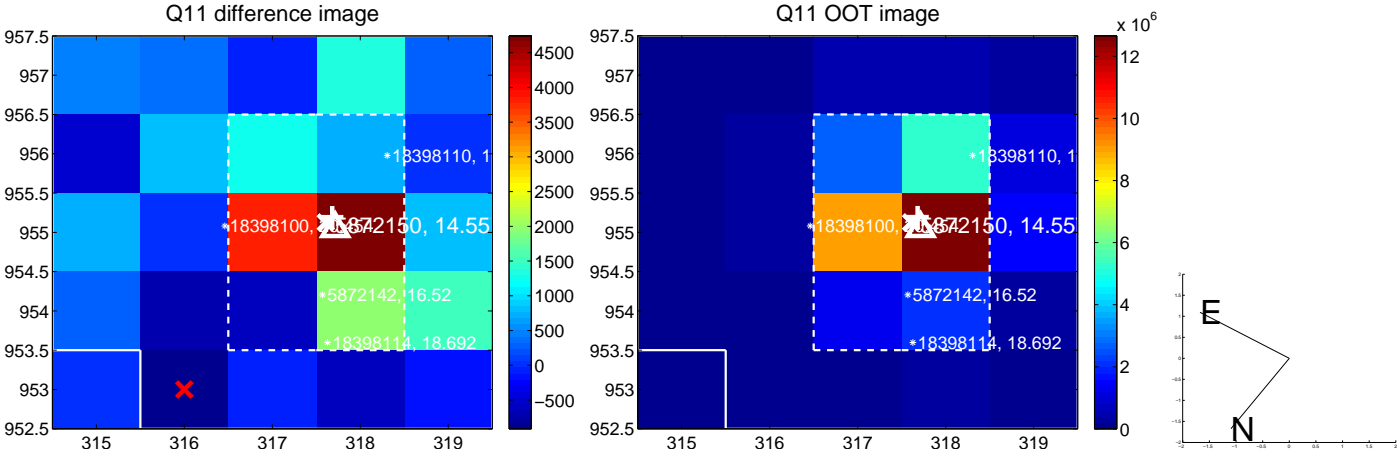
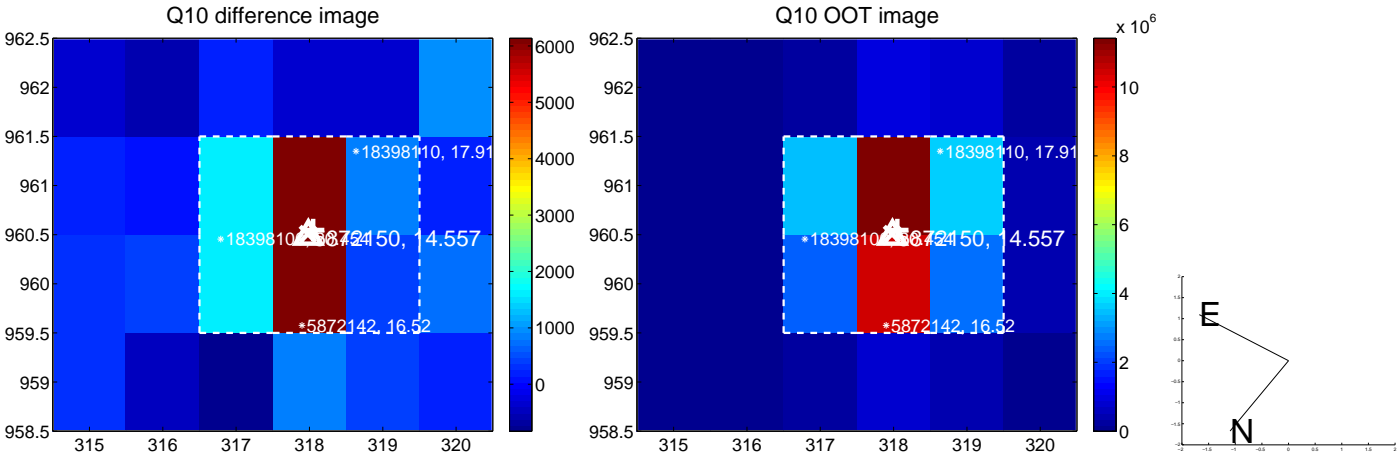
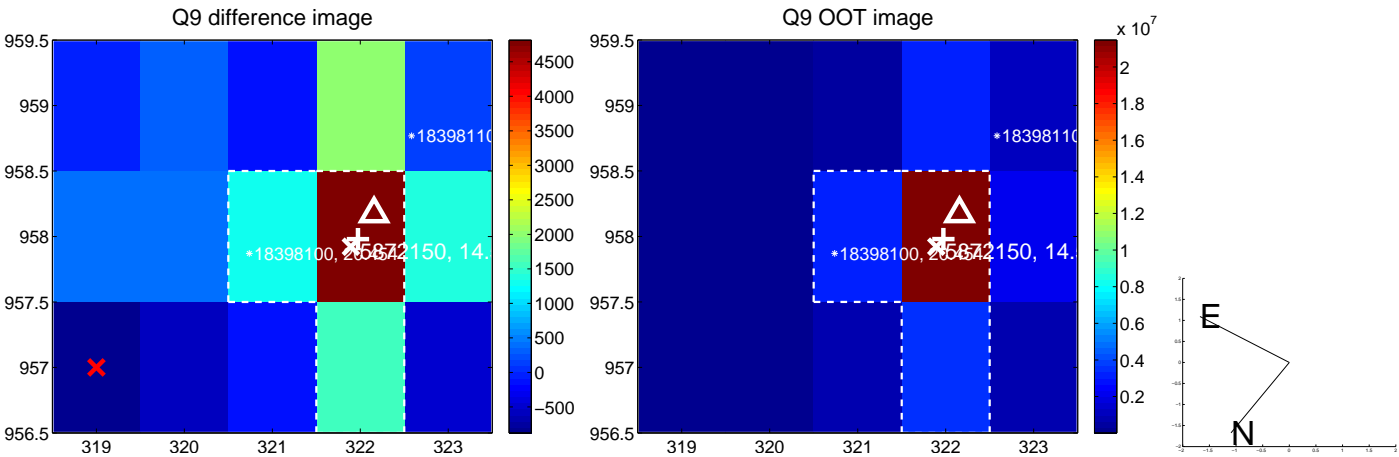
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



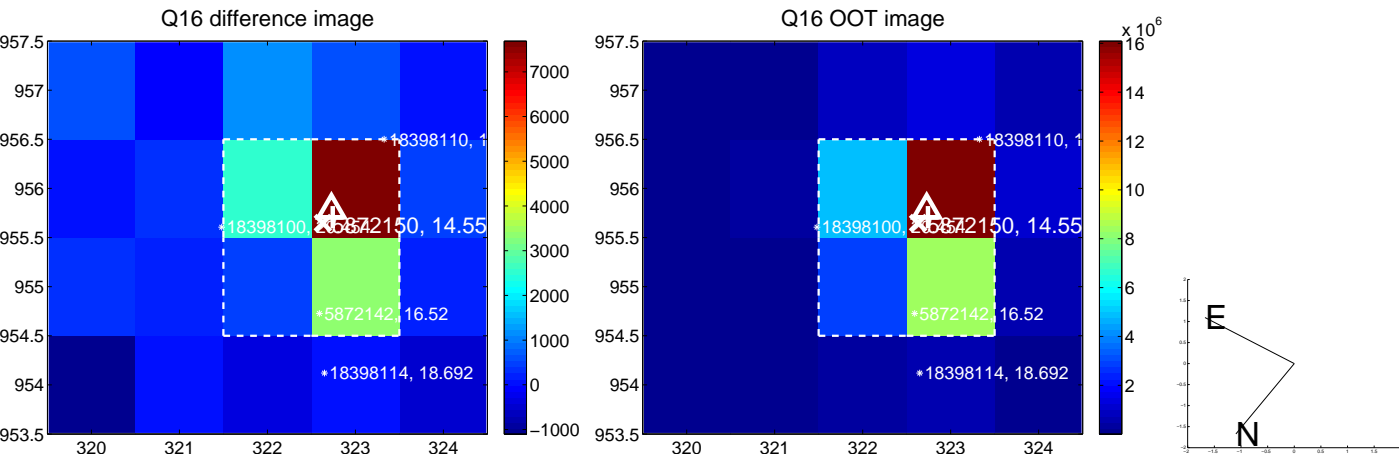
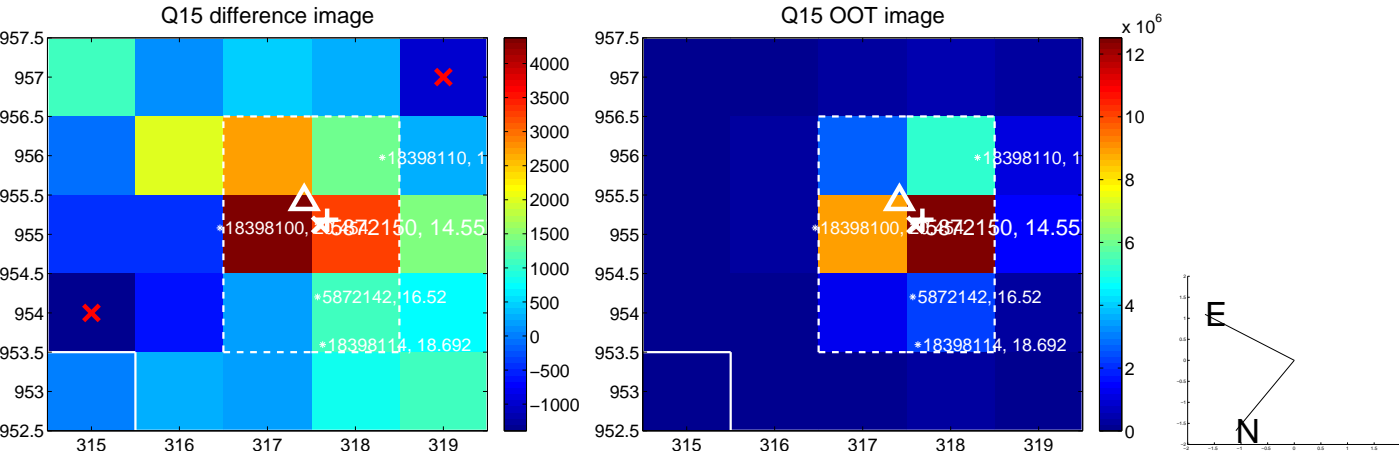
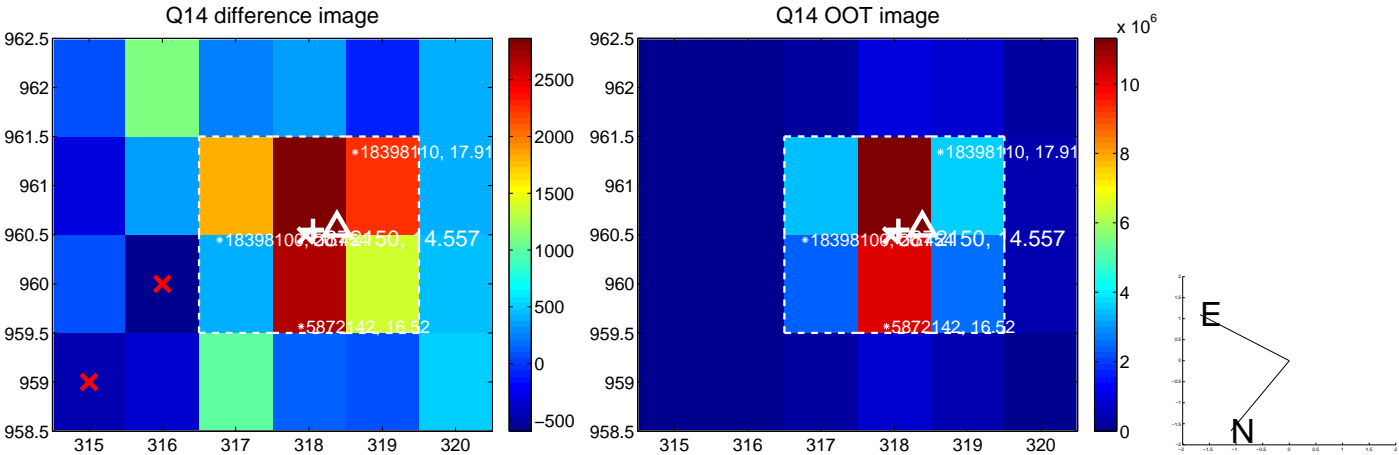
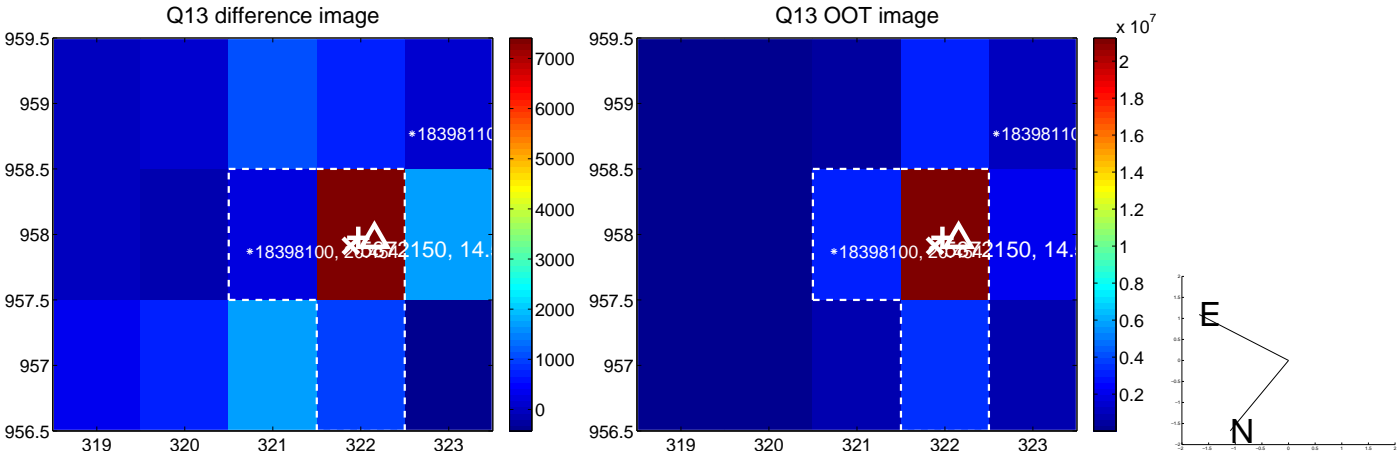
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



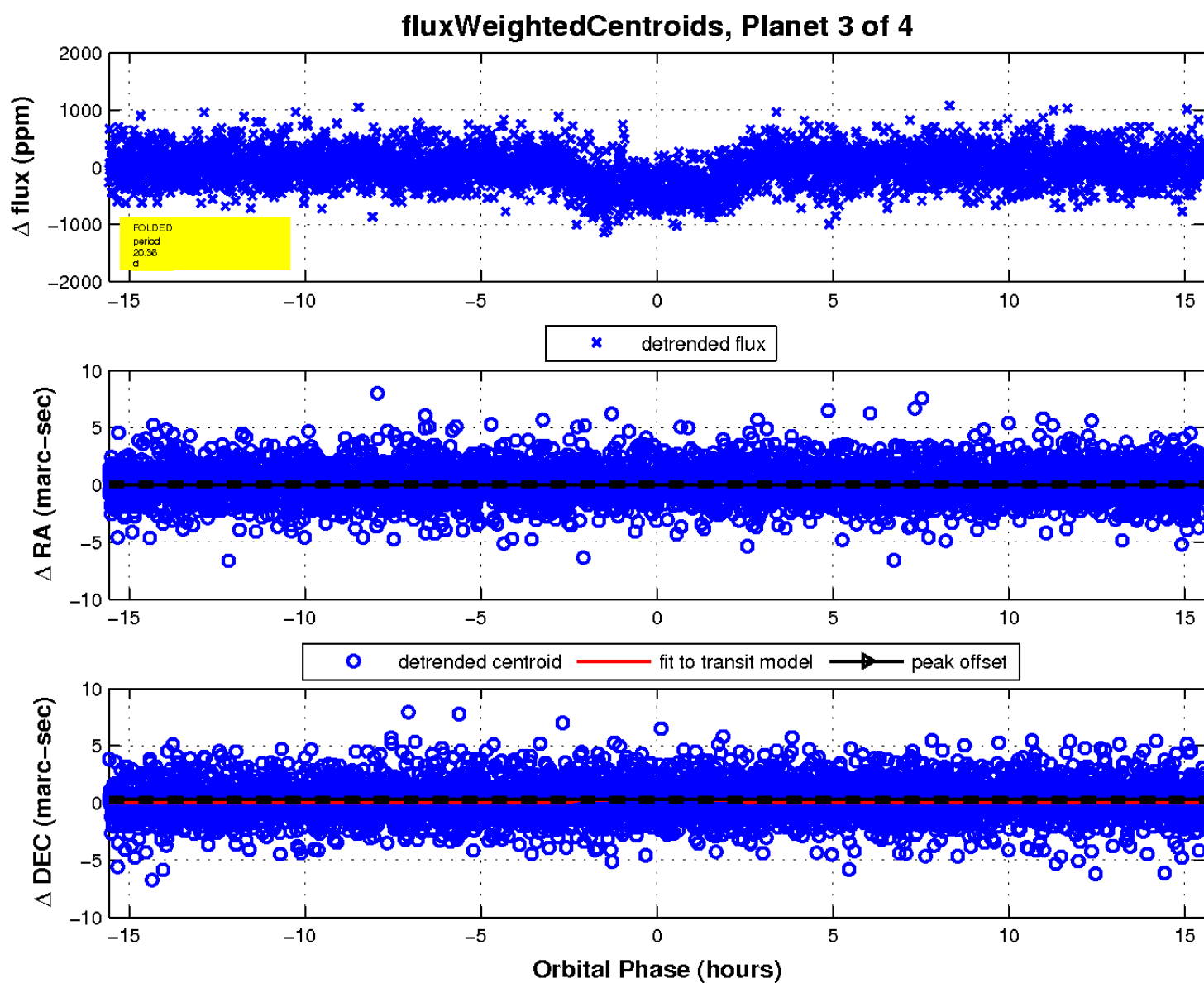
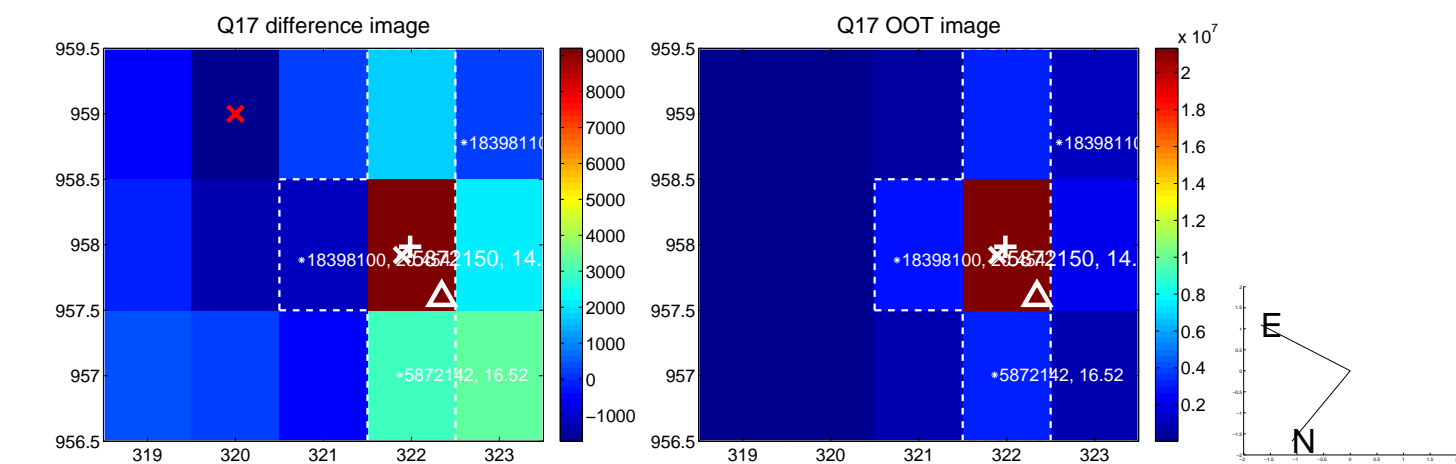
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

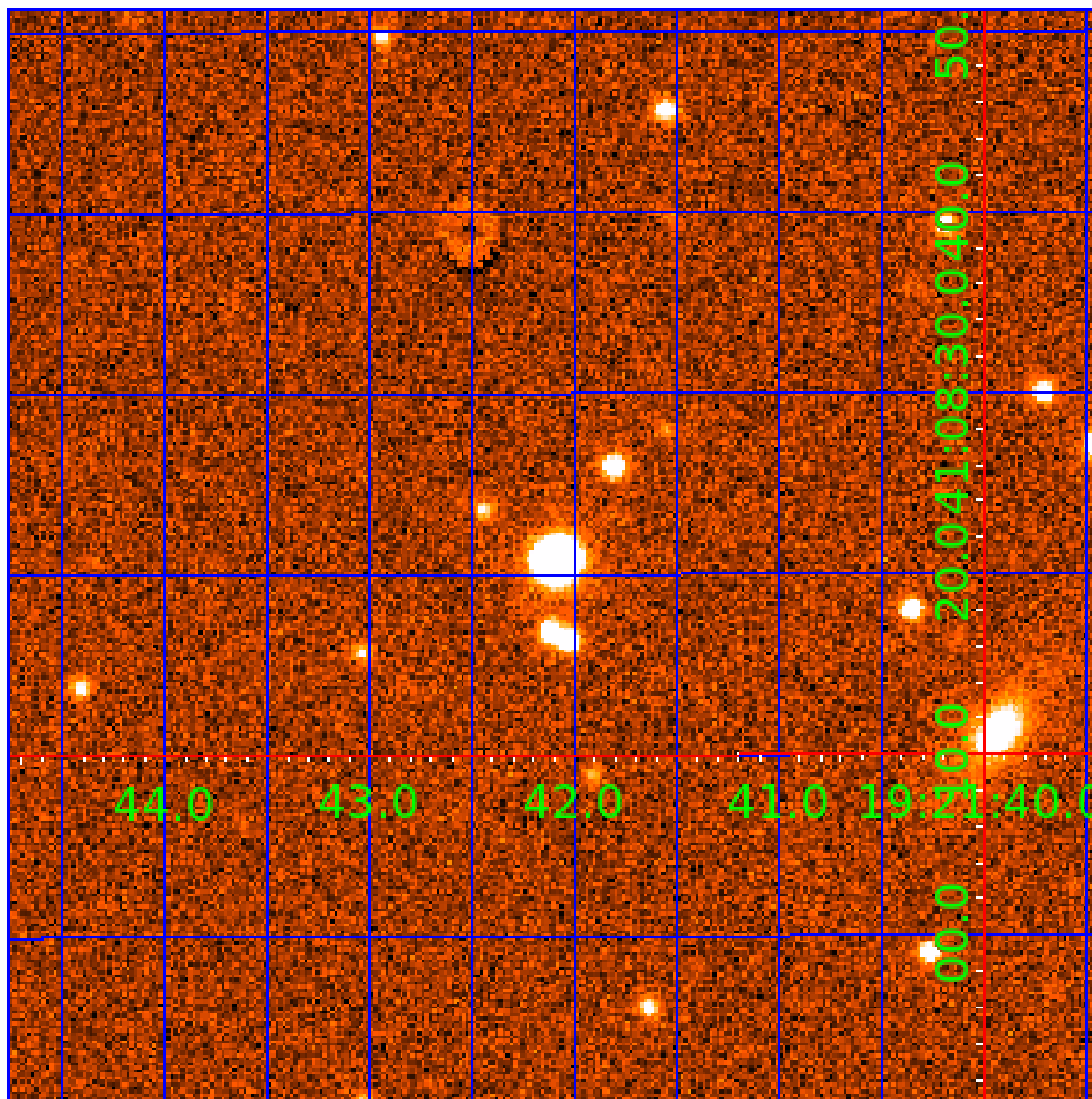


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005872150

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})
005872150-01	OBS	0414.01	20.355097	134.633537	25066.8	5.364	1483.0	1373.3	1.08	6081	17.64	63.69
005872150-02	OBS	0414.02	5.922390	132.362879	389.9	3.591	35.5	38.7	1.08	6081	2.63	330.33
005872150-03	OBS	No	20.355090	144.378566	408.7	5.194	24.6	26.2	1.08	6081	2.44	63.69
005872150-04	OBS	No	403.387441	197.083678	441.7	10.352	33.9	6.0	1.08	6081	3.09	1.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005872150-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
005872150-02	OBS	FP	0.02	0	0	1	0	CENT_KIC_POS—HALO_GHOST
005872150-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
005872150-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

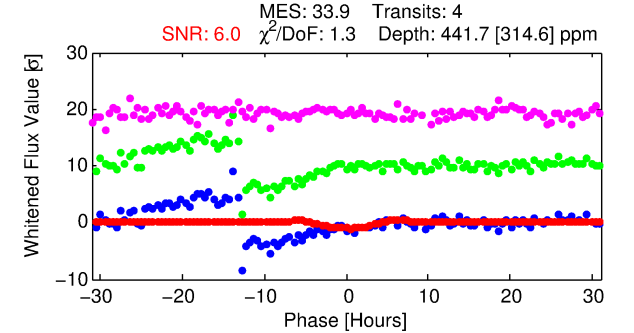
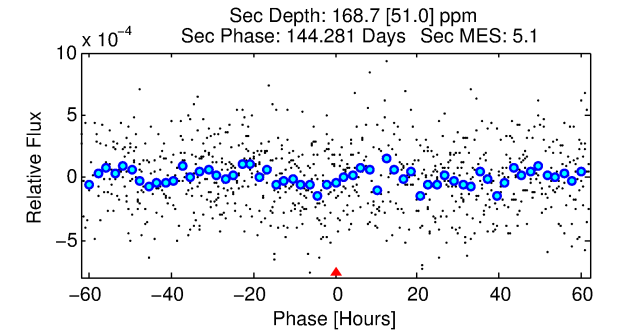
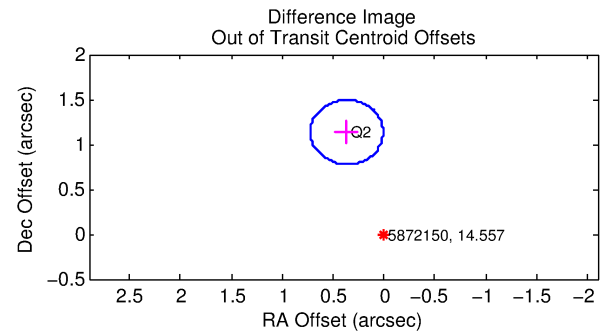
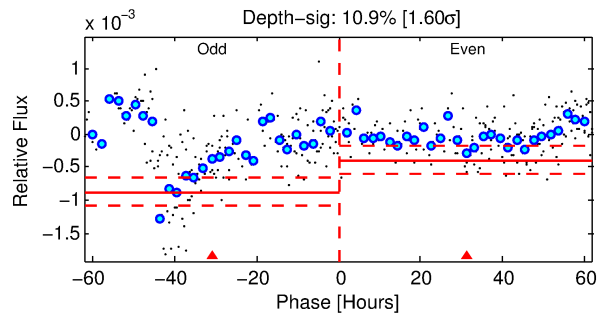
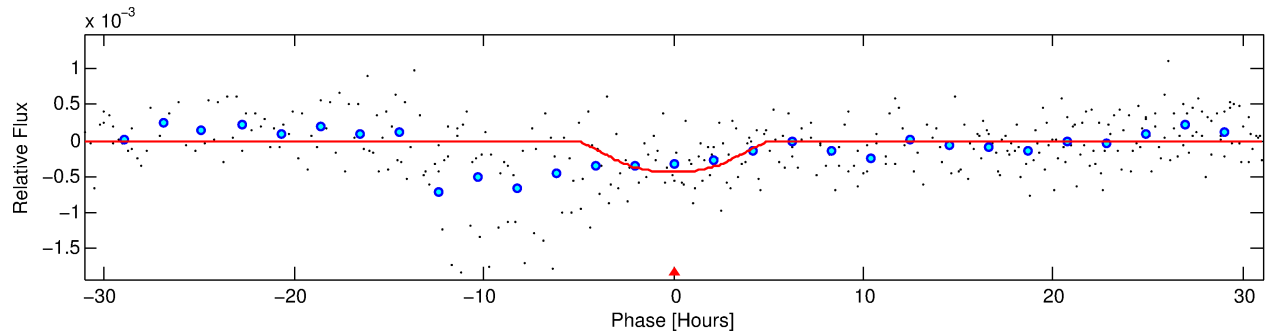
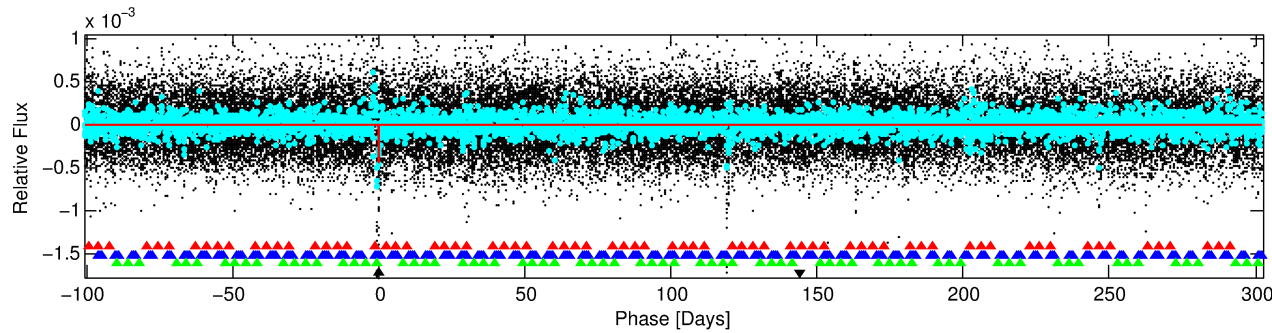
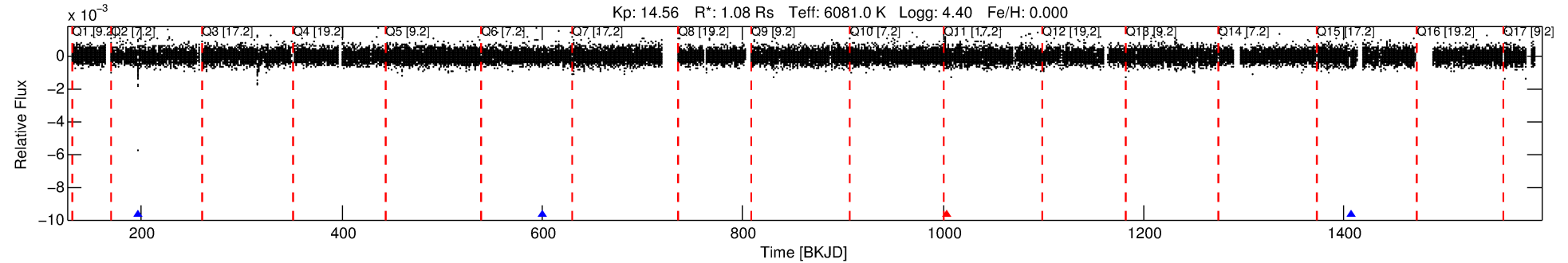
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005872150-04

No Significant Match Found

DV One-Page Summary

KIC: 5872150 Candidate: 4 of 4 Period: 403.387 d
KOI: K00414 Corr: No Ephemeris Match



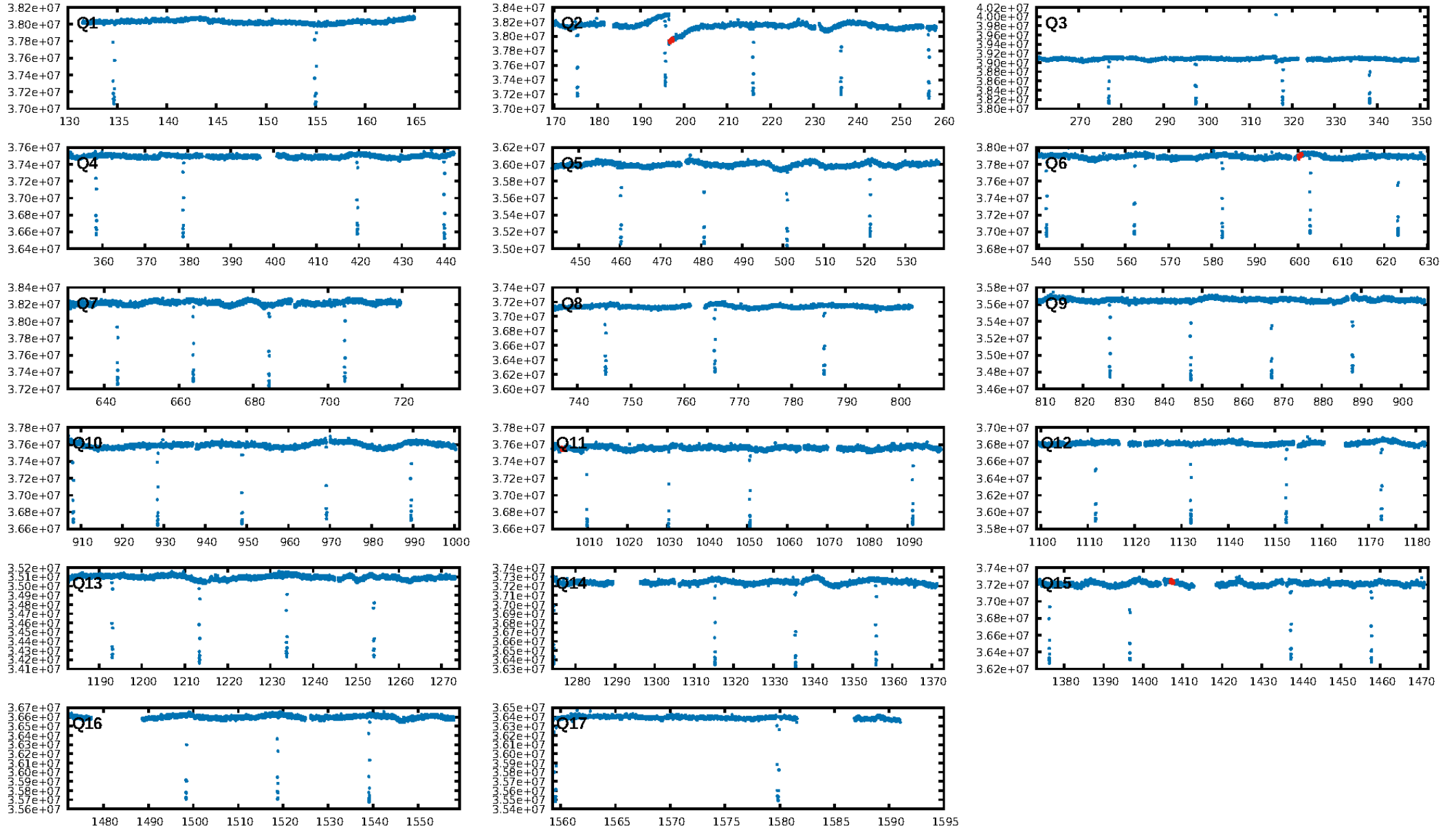
DV Fit Results:

Period = 403.38744 [0.02197] d
Epoch = 197.0837 [0.0424] BKJD
Rp/R* = 0.0263 [0.0185]
a/R* = 93.62 [55.86]
b = 0.98 [0.06]
Seff = 1.19 [0.50]
Teq = 266 [28] K
Rp = 3.09 [2.38] Re
a = 1.0939 [0.2904] AU
Ag = 11662.11 [17435.52] [0.67 σ]
Teffp = 4277 [1550] K [2.59 σ]

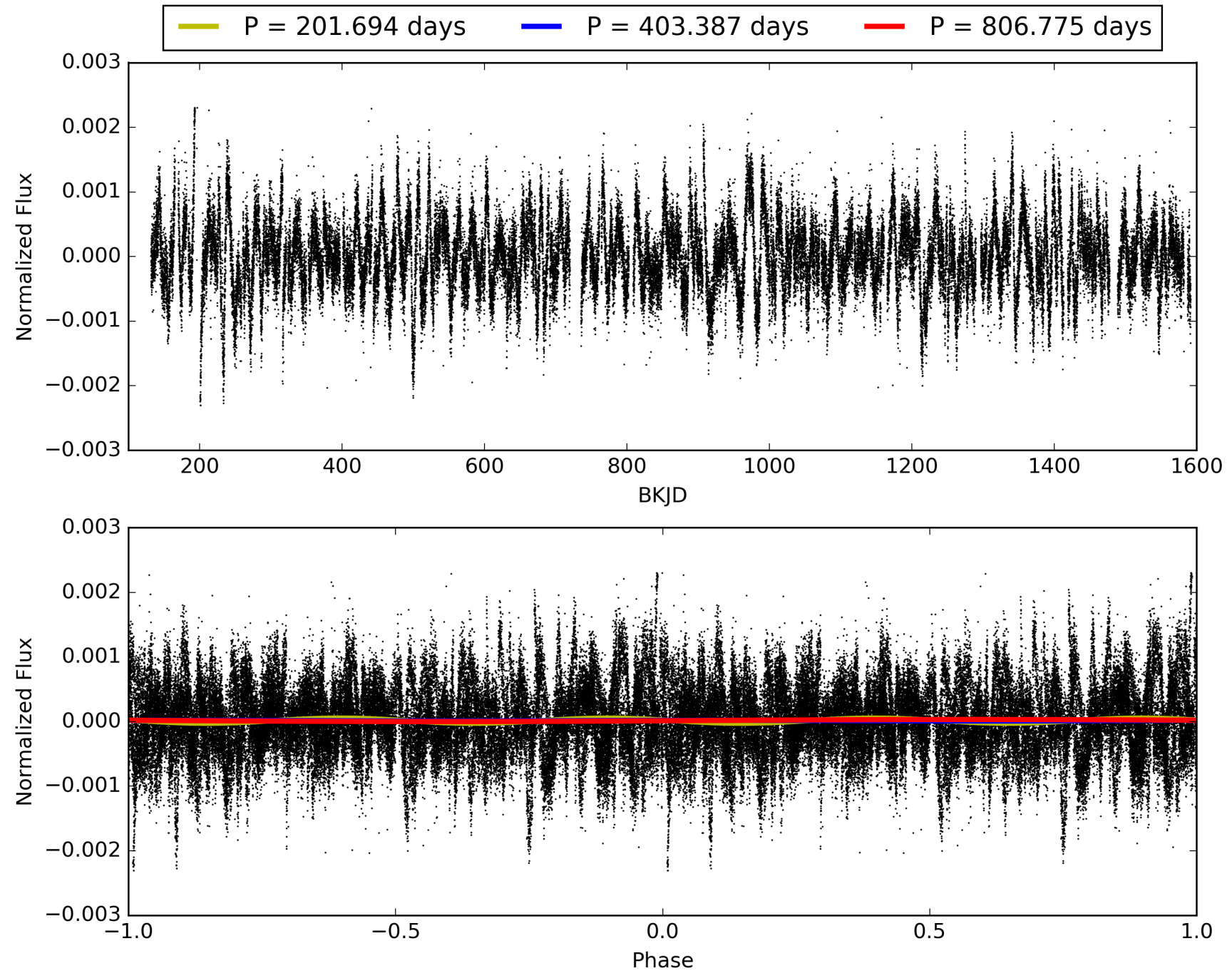
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [788.45 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 51.0%
Bootstrap-pfa: 5.52e-50
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: -0.9263
Centroid-sig: 8.8%
Centroid-so: 2.870 arcsec [1.48 σ]
OotOffset-rm: 1.191 arcsec [9.99 σ]
KicOffset-rm: 0.838 arcsec [7.00 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.00 [0/2]

TCE 005872150-04, PDC Light Curves

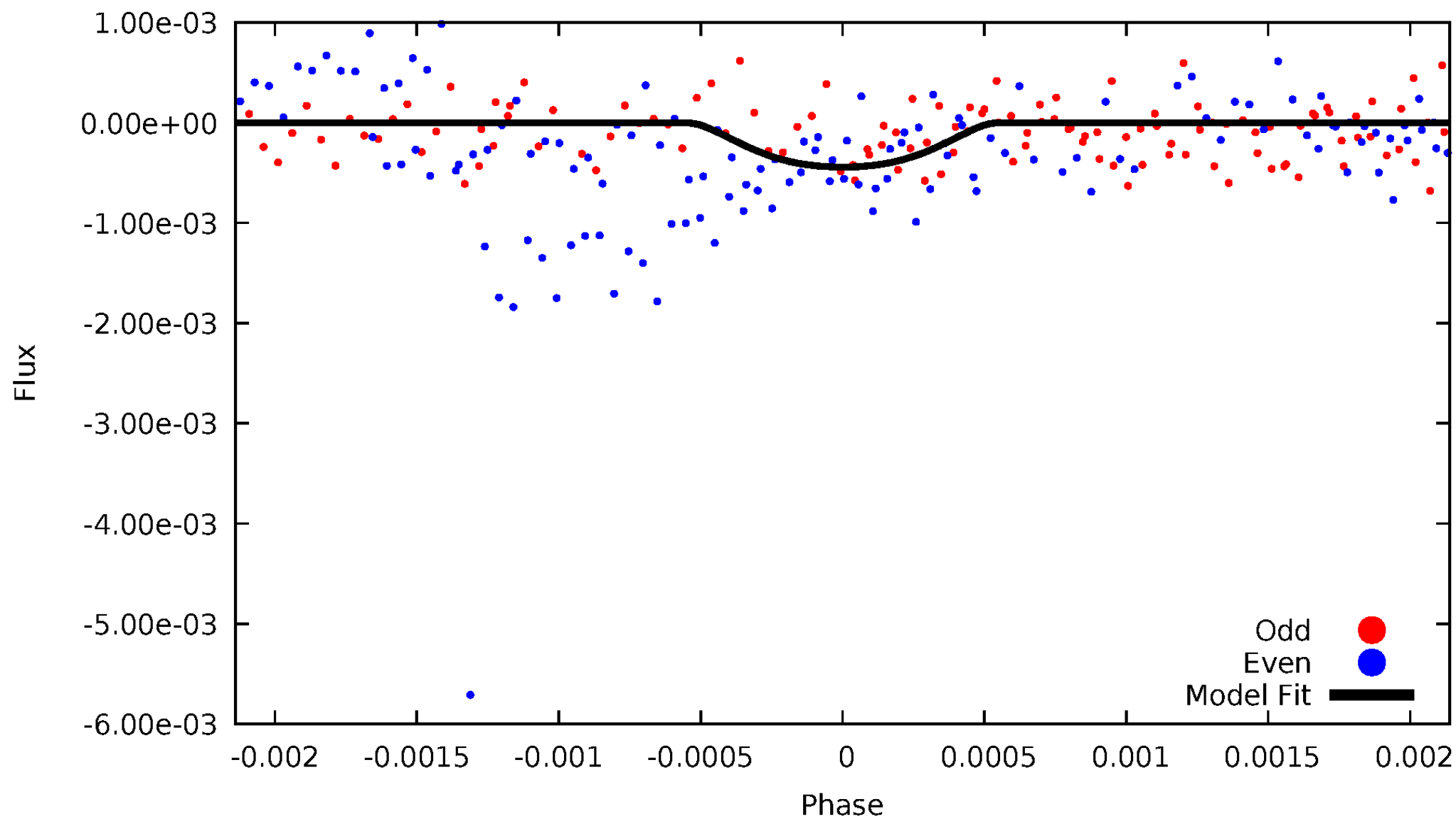


TCE 005872150-04



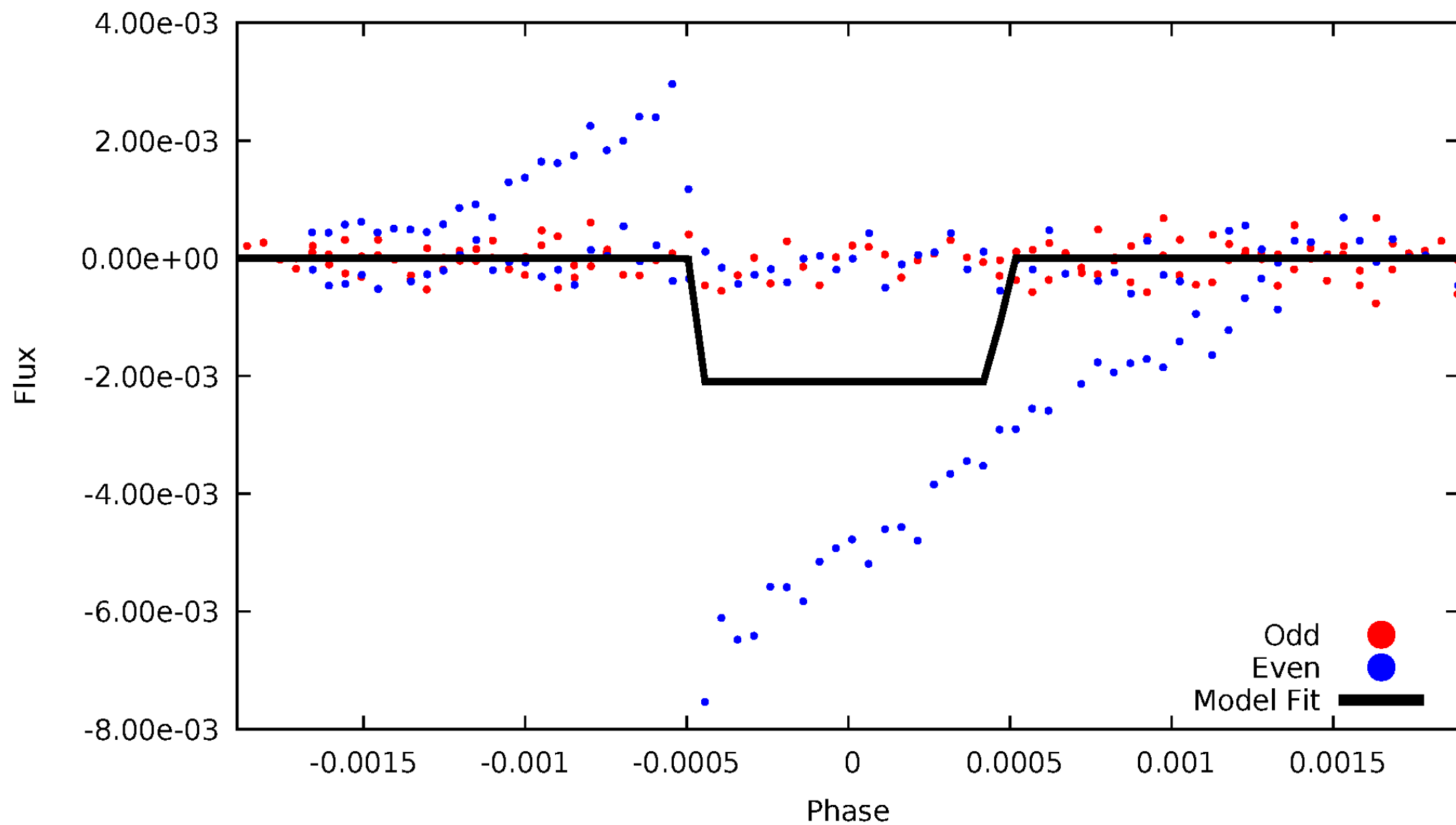
DV Odd/Even

TCE 005872150-04



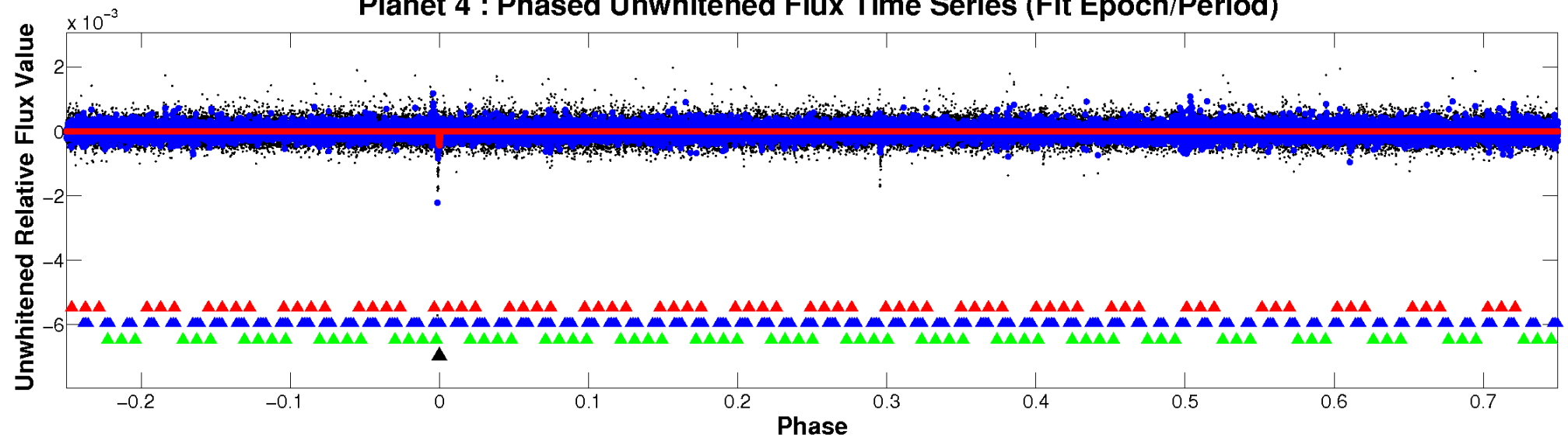
ALT Odd/Even

TCE 005872150-04

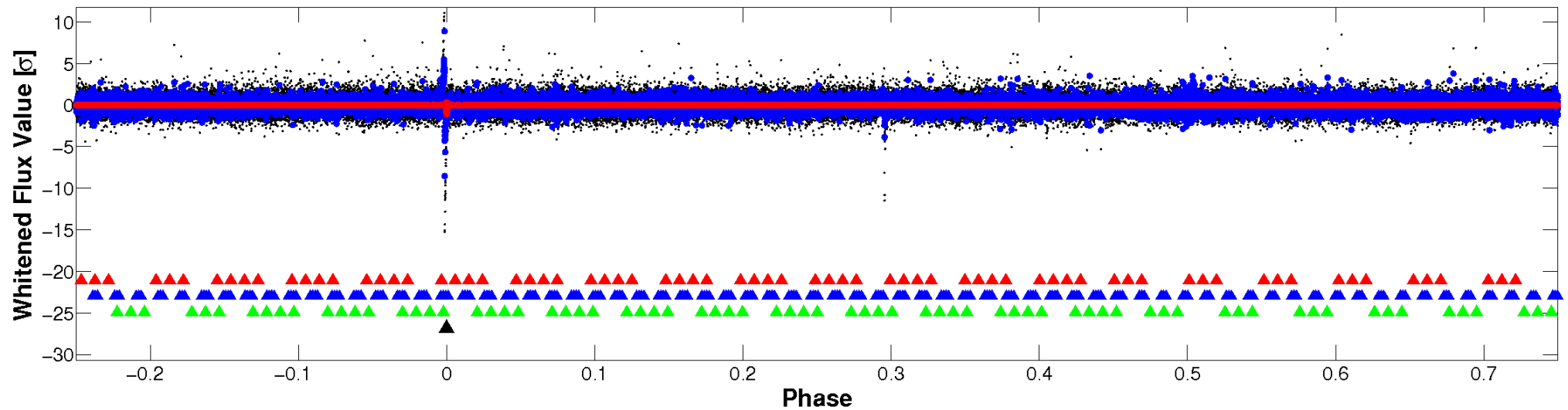


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

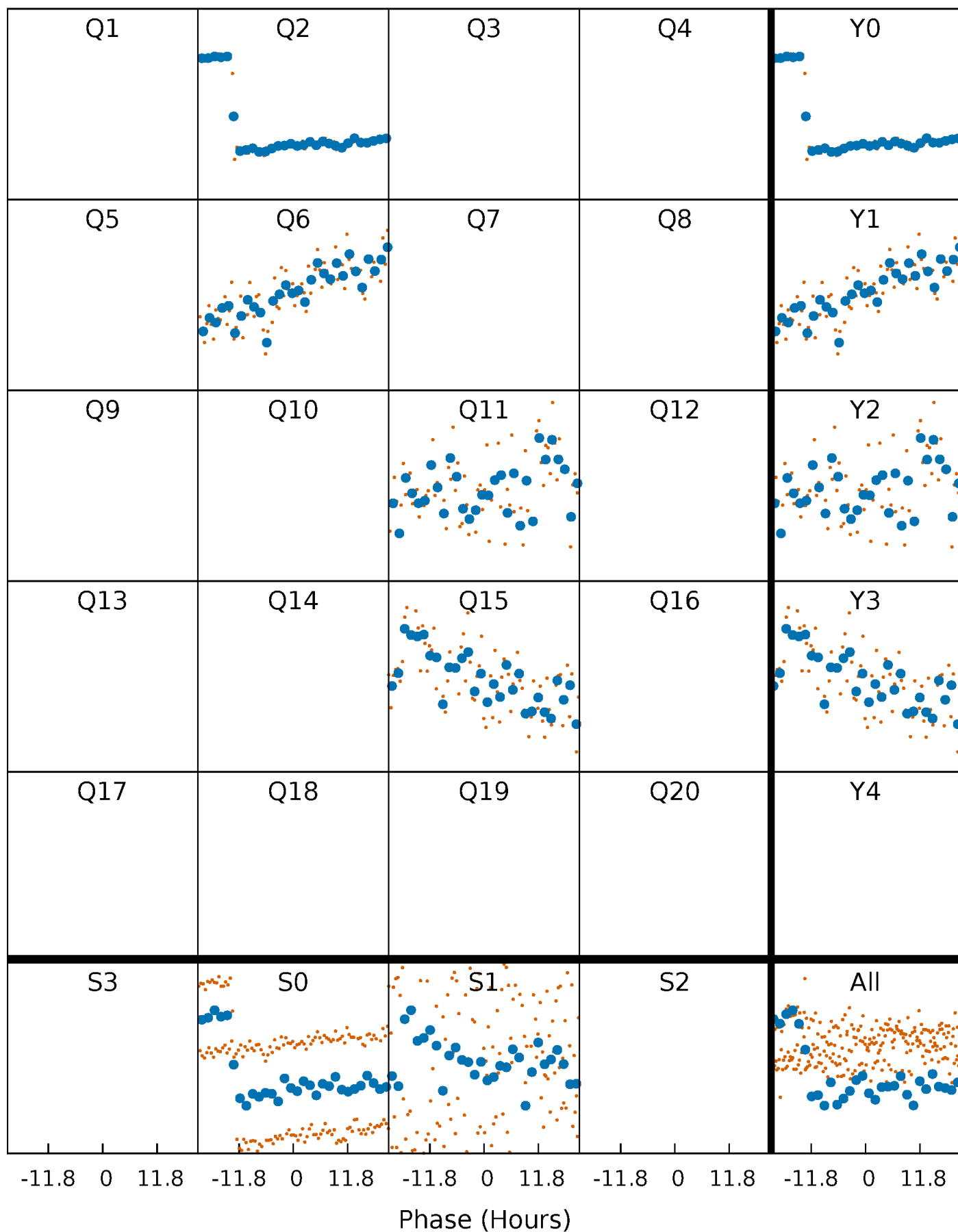


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



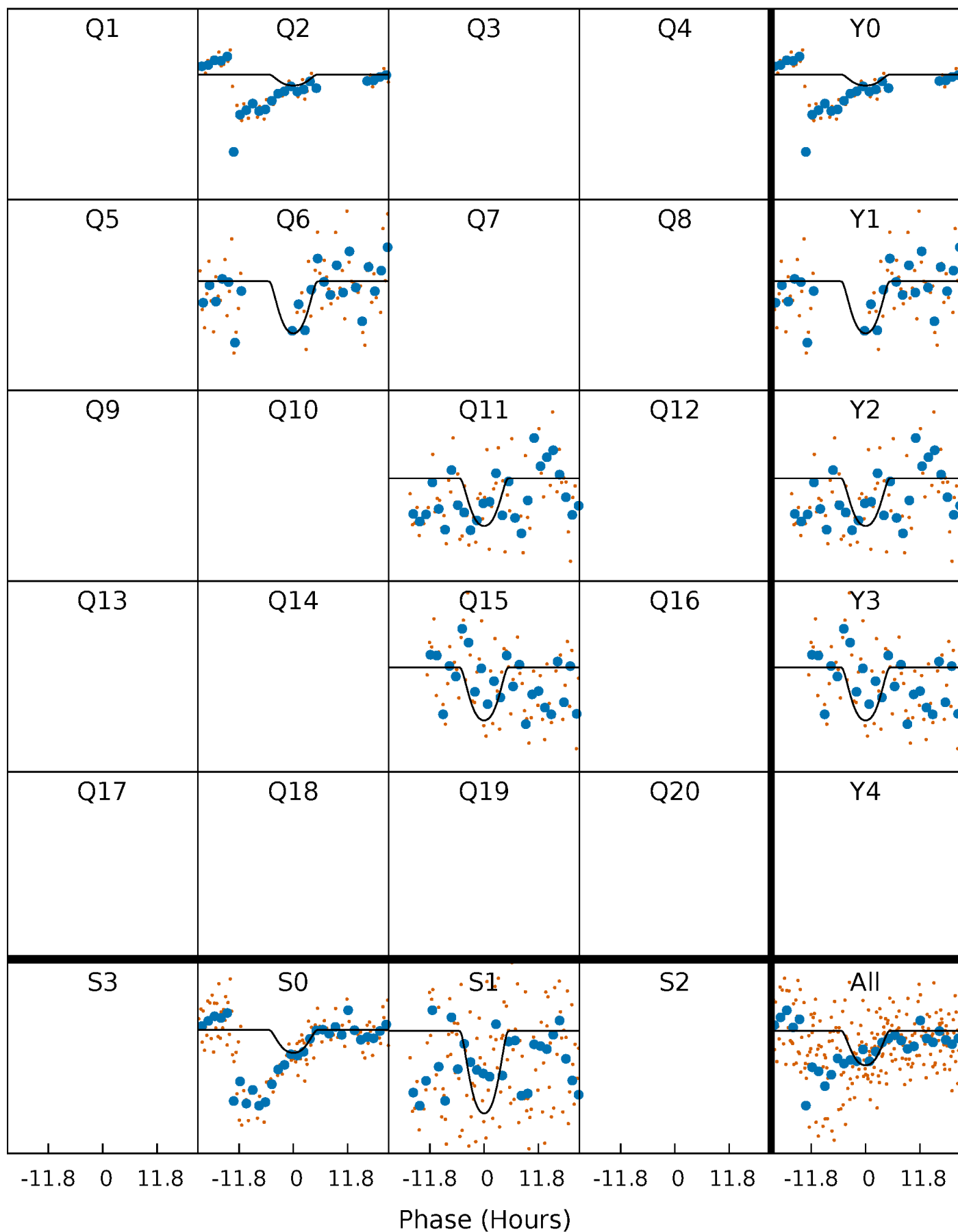
PDC Quarter-Phased Transit Curves

TCE 005872150-04 P=403.387441 Days $T_0=197.083678$ (BKJD)



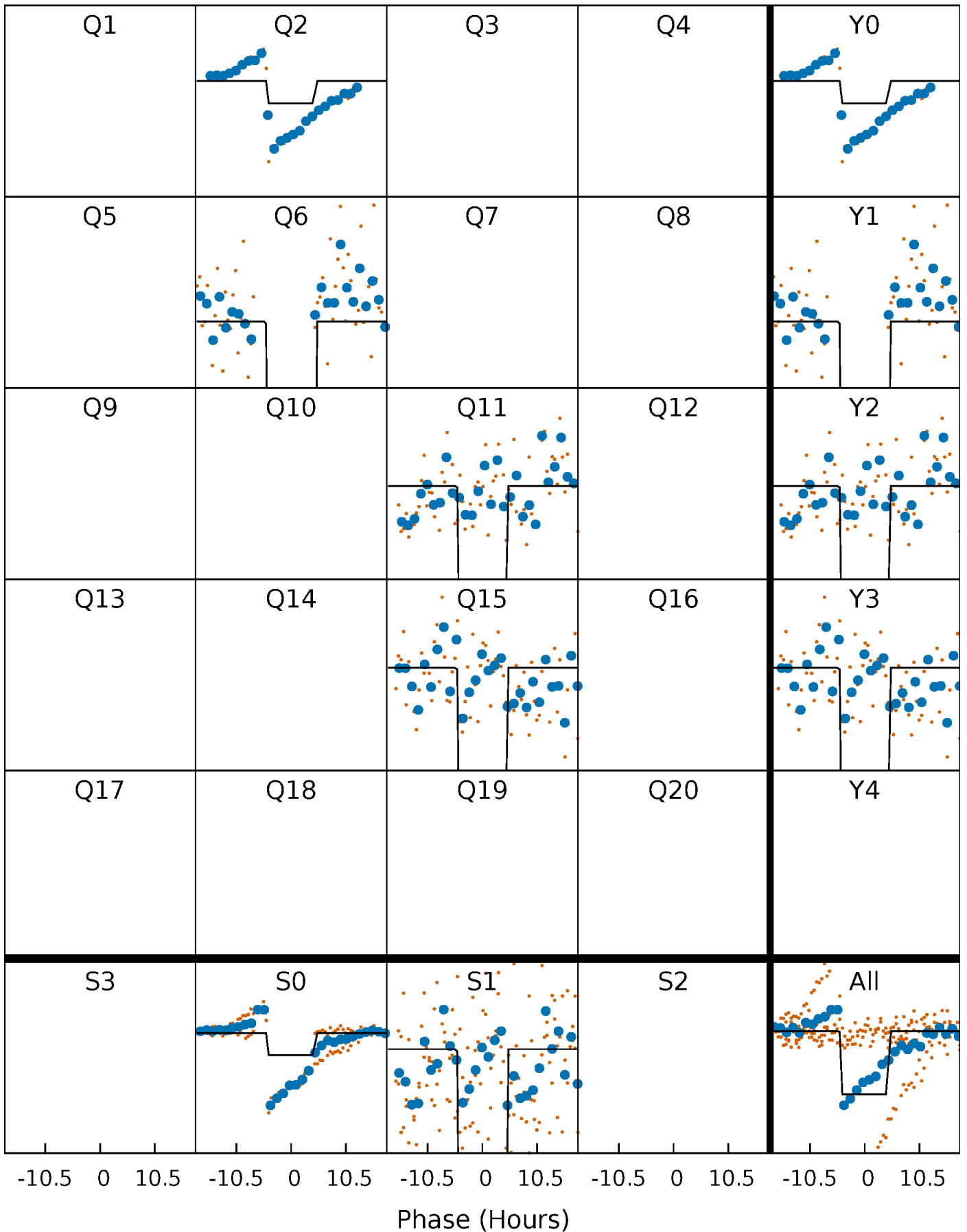
DV Quarter-Phased Transit Curves

TCE 005872150-04 $P=403.387441$ Days $T_0=197.083678$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

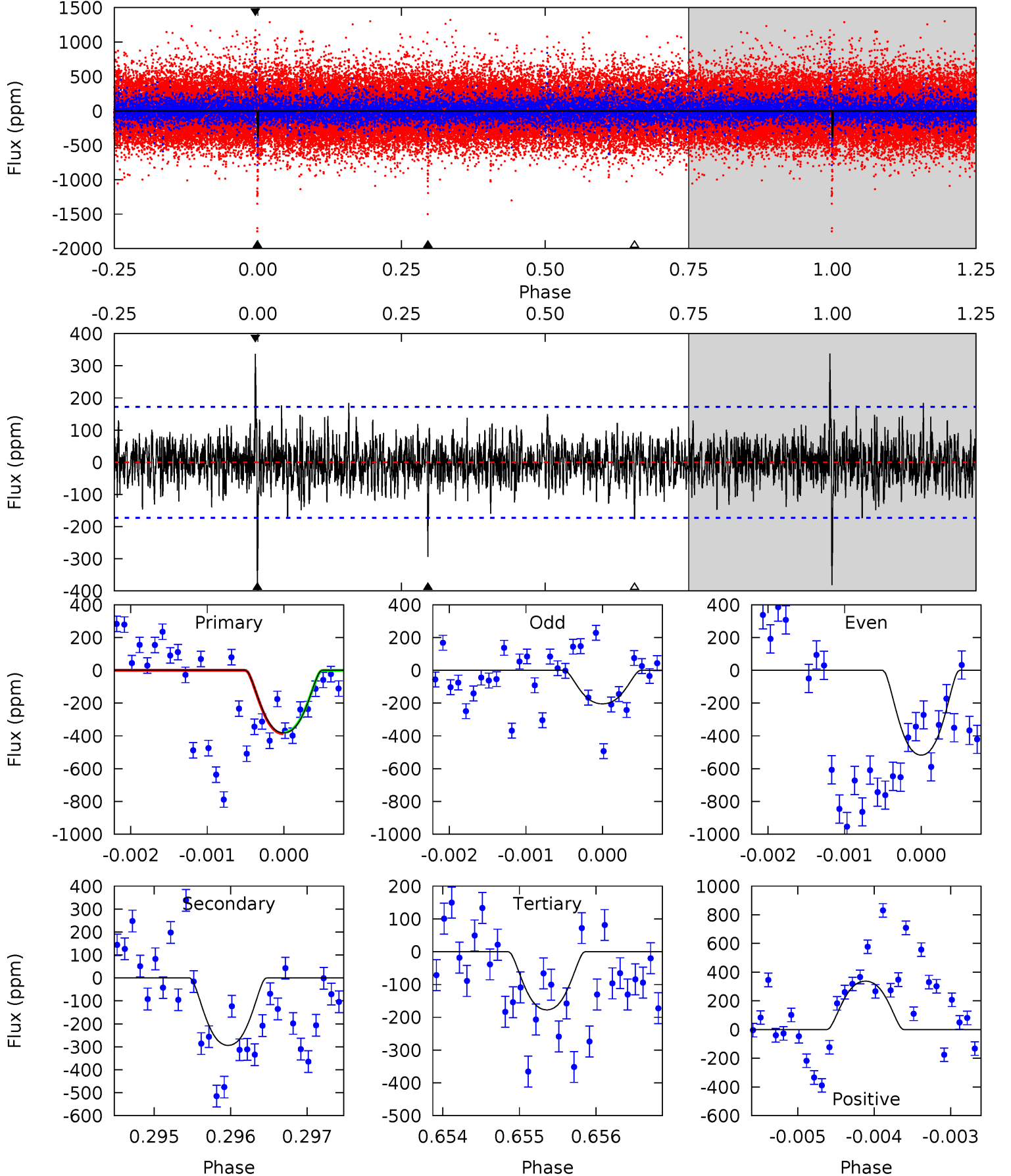
TCE 005872150-04 P=403.562810 Days $T_0=196.733741$ (BKJD)



DV Model-Shift Uniqueness Test

005872150-04, P = 403.387441 Days, E = 197.083678 Days

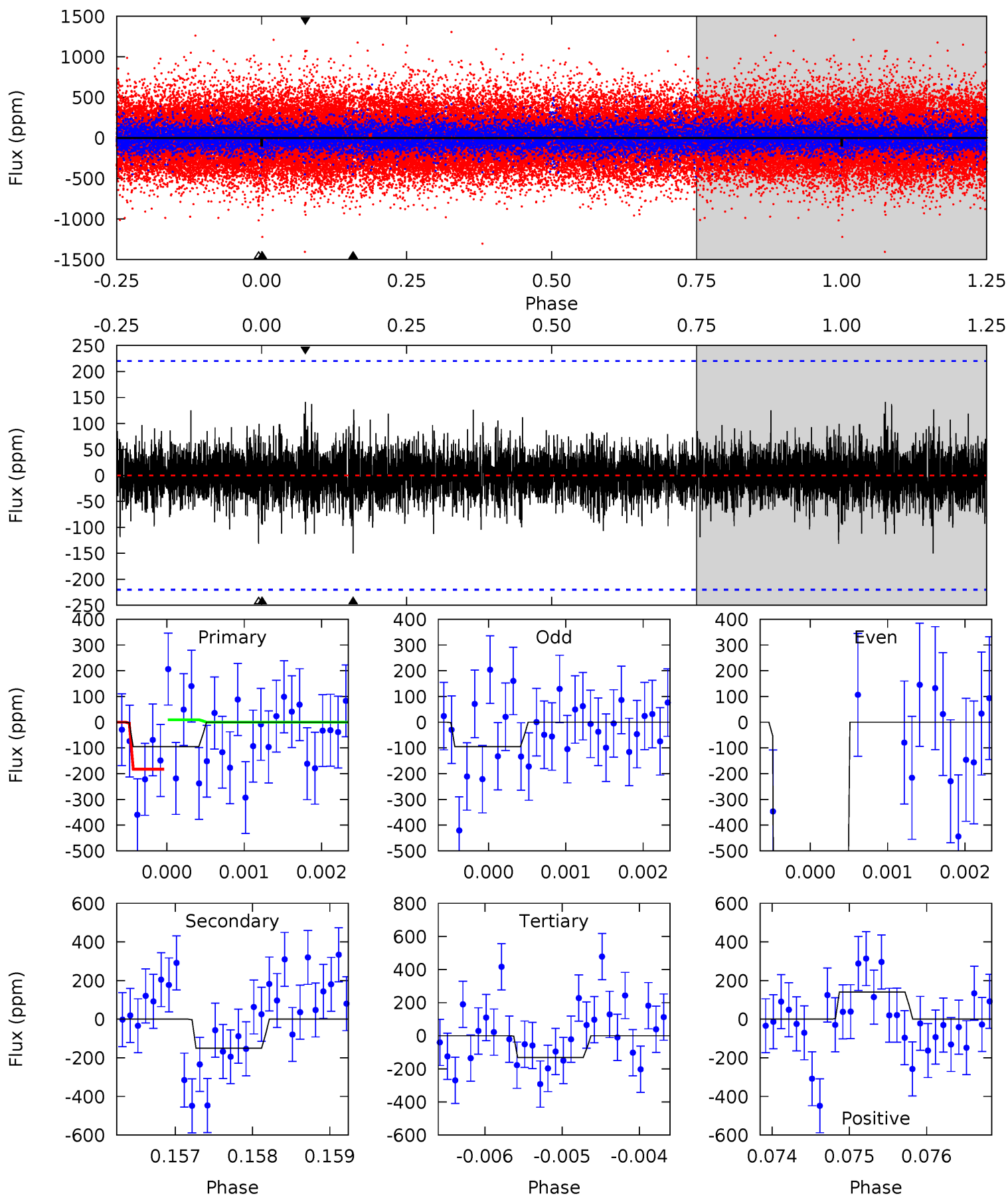
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	9.26	5.59	10.6	5.44	3.27	1.55	6.44	1.40	3.67	-1.37	4.92	1.22	0.47	0.15



Alt Model-Shift Uniqueness Test

005872150-04, P = 403.562810 Days, E = 196.733741 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.34	3.72	3.26	3.49	5.45	3.29	0.77	-0.91	-1.15	0.46	0.22	36.0	18.6	0.48	2.12



Stellar Parameters For KIC 005872150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6081^{+184}_{-220}	$4.404^{+0.072}_{-0.217}$	$0.000^{+0.250}_{-0.300}$	$1.077^{+0.334}_{-0.143}$	$1.072^{+0.151}_{-0.135}$	$1.207^{+0.456}_{-0.631}$
	+3%/-4%	+2%/-5%	+inf%/-inf%	+31%/-13%	+14%/-13%	+38%/-52%
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 005872150-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-294 ± 32	$3.59^{+2.28}_{-2.05}$	378^{+31}_{-20}	4797^{+2469}_{-813}	14764^{+69699}_{-9069}
Alt.	-150 ± 40	$5.57^{+2.38}_{-2.22}$	379^{+28}_{-19}	3599^{+696}_{-394}	3106^{+5221}_{-1698}

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 $A_{obs} \gg 1.0$

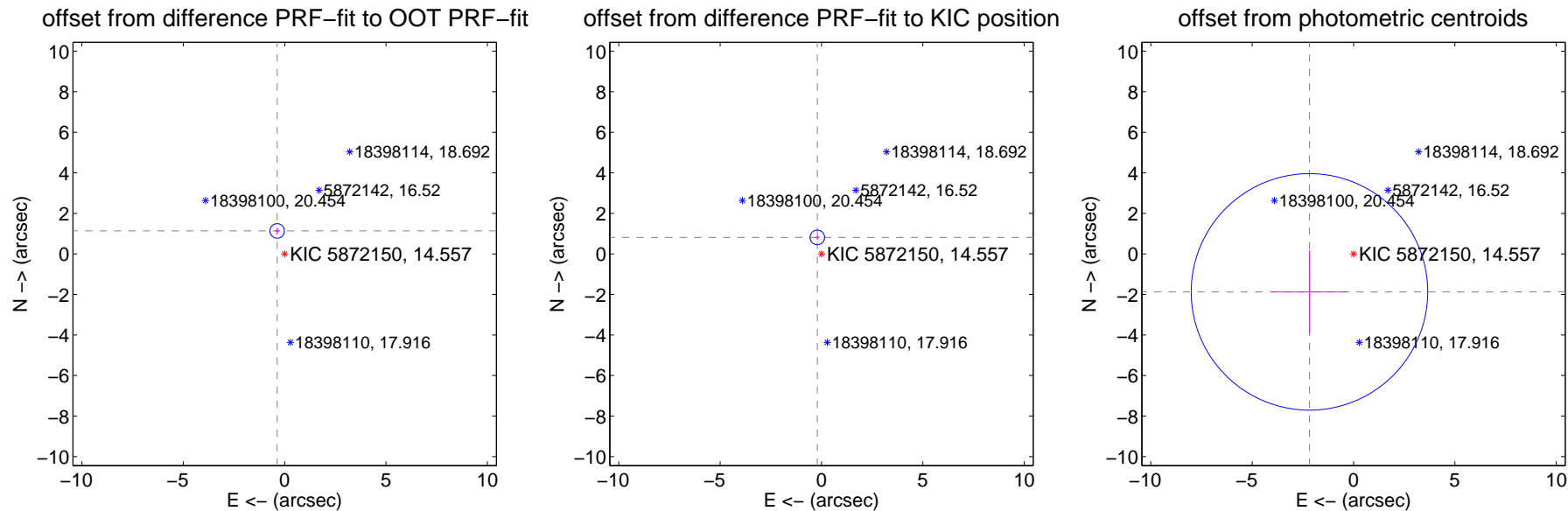
DV Centroid Data

Supplemental centroid analysis for 005872150-04. Kepler magnitude: 14.56. Transit SNR 6.01

There are 1 quarters with good PRF difference image offsets

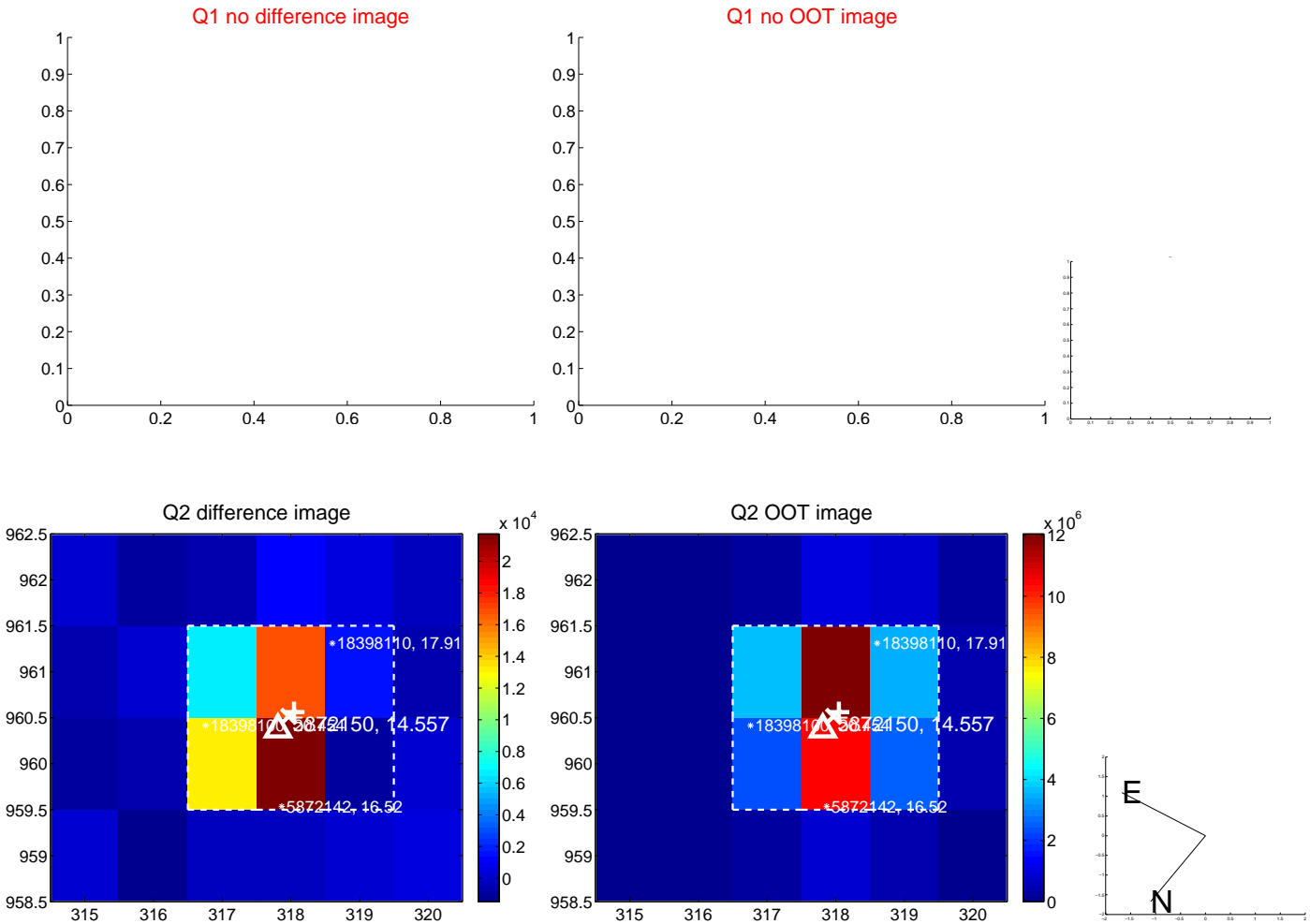
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.191 \pm 0.119	9.99	0.368 \pm 0.106	1.133 \pm 0.121
PRF-fit source offset from KIC position	0.838 \pm 0.120	7.00	0.205 \pm 0.106	0.813 \pm 0.121
photometric centroid source offset	2.87 \pm 1.94	1.48	2.17 \pm 1.87	-1.87 \pm 2.04



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.



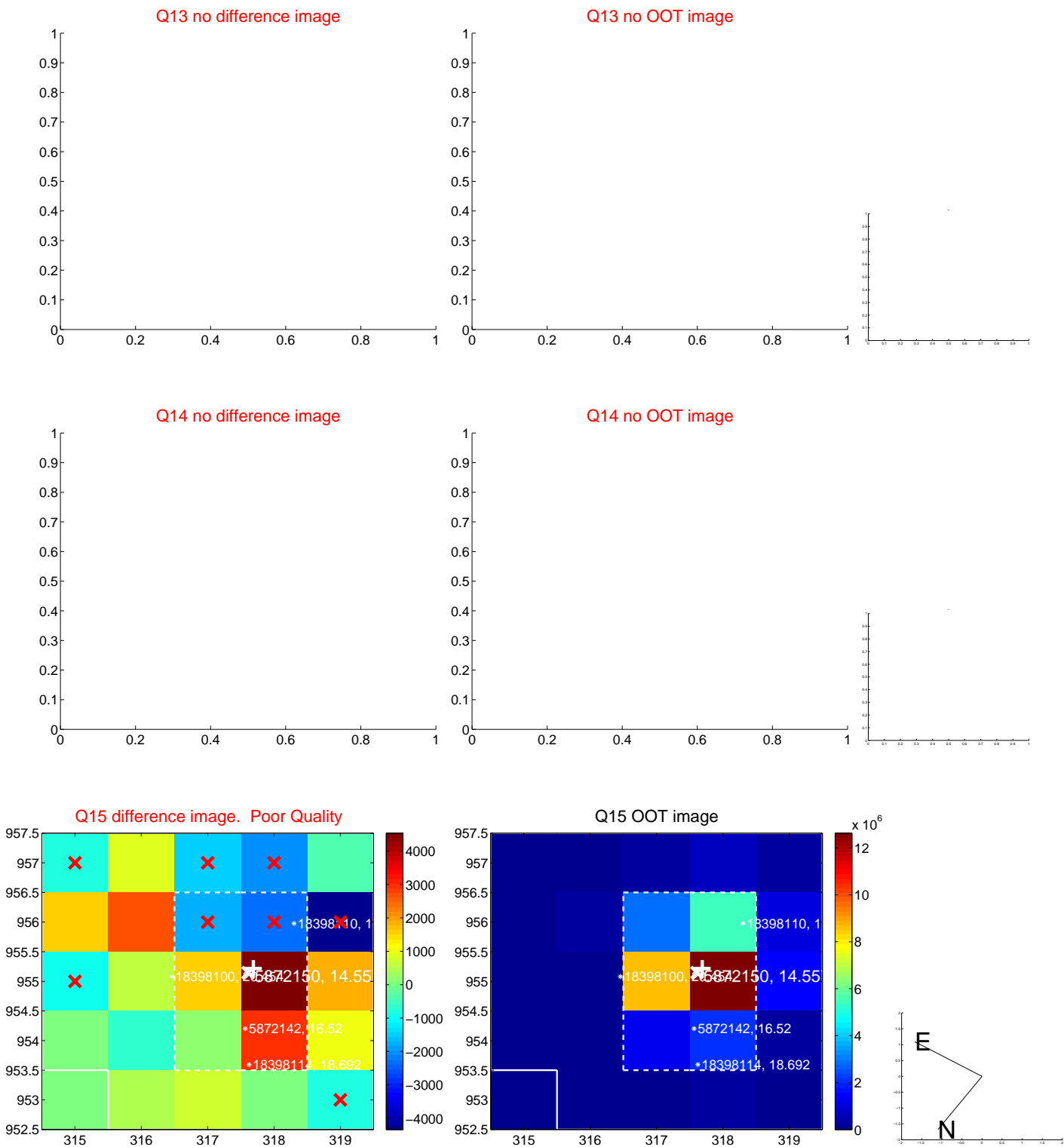
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



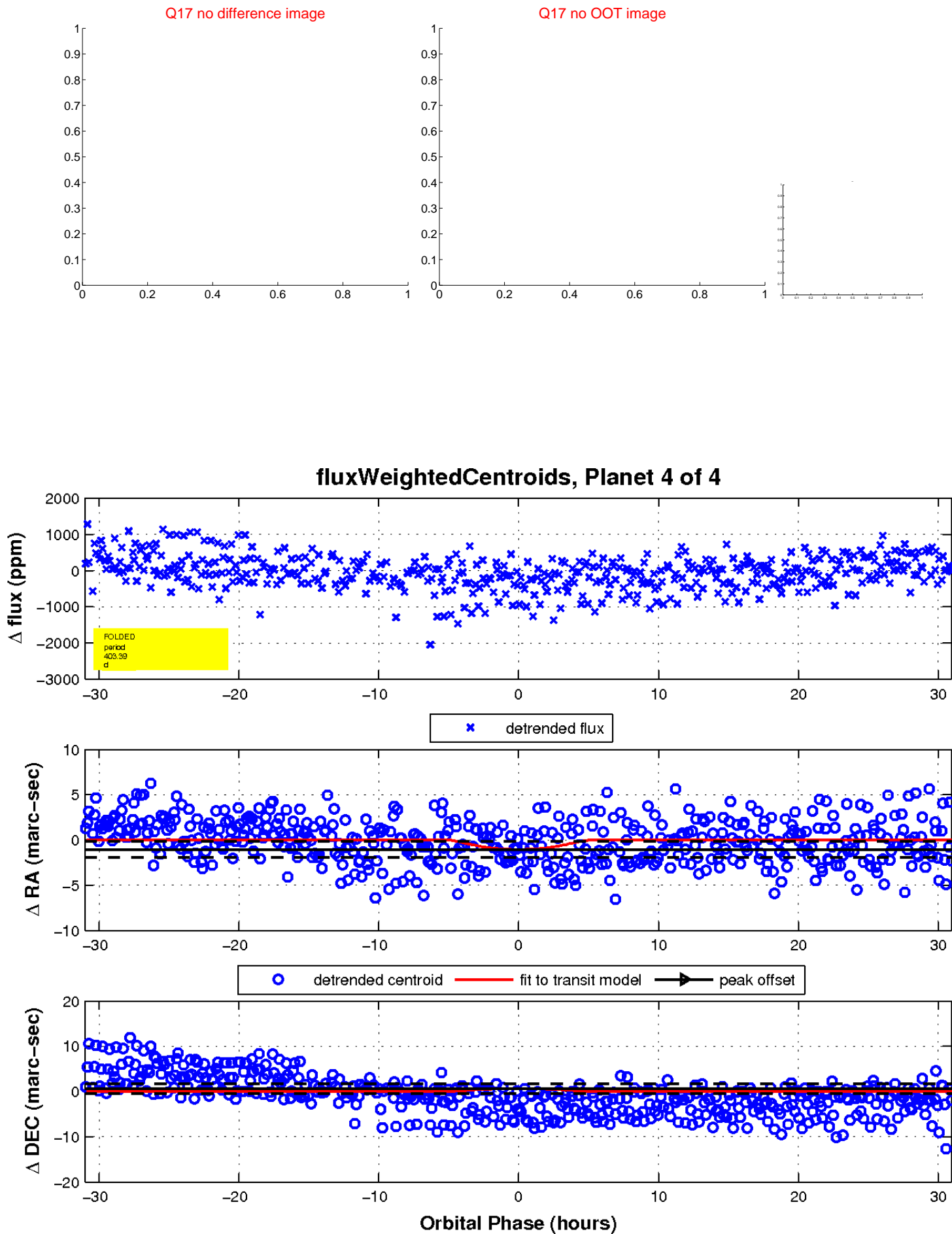
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

