

KIC 003559860

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})
003559860-01	OBS	3440.01	33.025764	161.016175	507.2	7.145	11.1	11.2	0.99	5819	2.85	24.00
003559860-02	OBS	3440.02	58.940659	159.623804	547.9	4.655	7.4	8.0	0.99	5819	2.44	11.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003559860-01	OBS	FP	0.18	0	1	0	0	DEPTH_ODDEVEN_ALT
003559860-02	OBS	FP	0.09	1	0	0	0	INDIV_TRANS_SKYE

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.

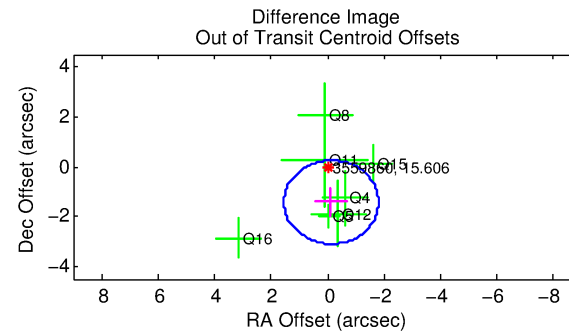
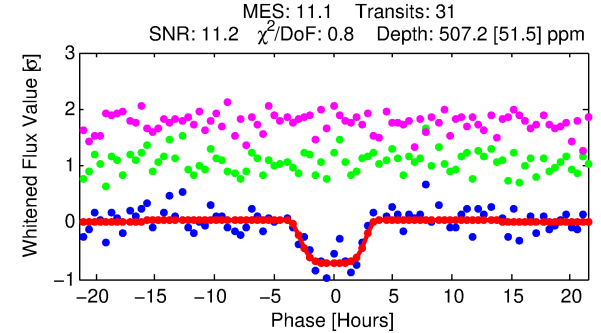
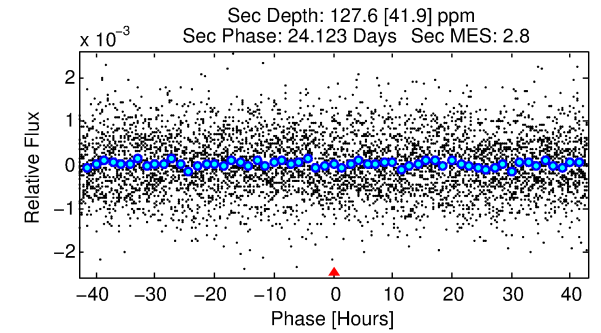
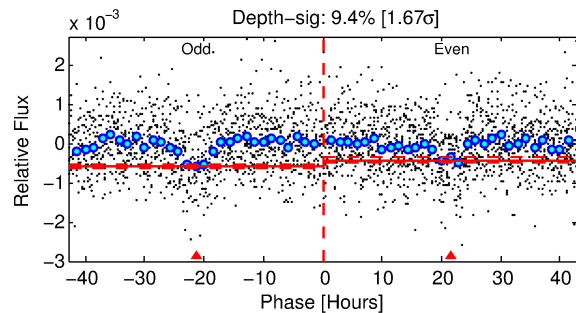
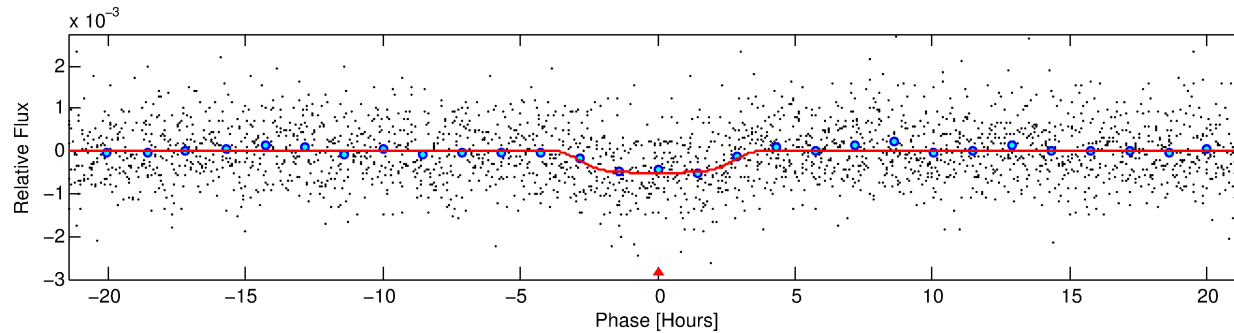
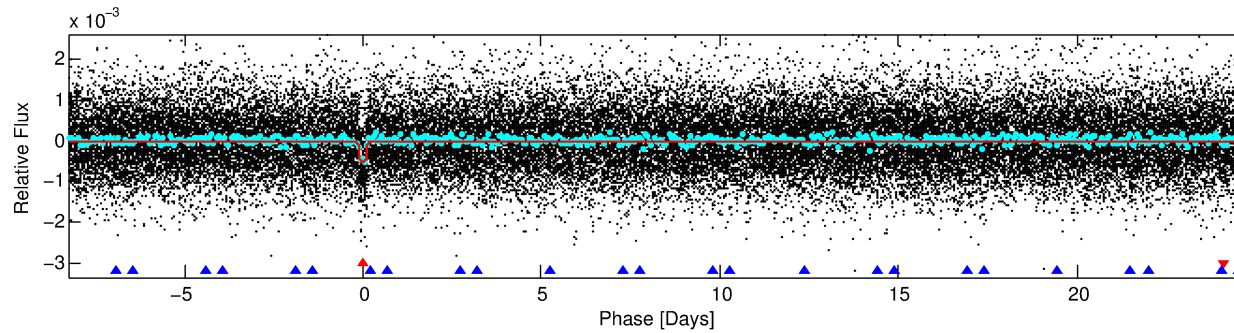
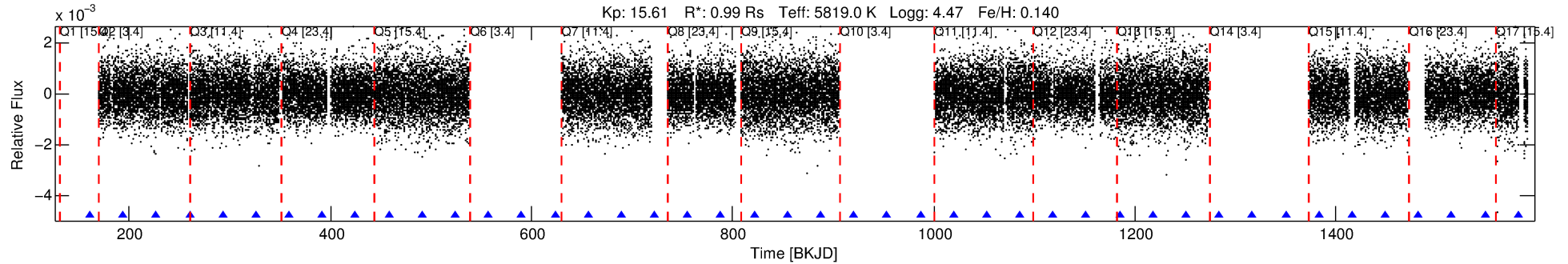
Ephemeris Match Information For 003559860-01

No Significant Match Found

DV One-Page Summary

KIC: 3559860 Candidate: 1 of 2 Period: 33.026 d

KOI: K03440.01 Corr: 0.912



DV Fit Results:

Period = 33.02576 [0.00056] d
Epoch = 161.0162 [0.0138] BKJD
Rp/R* = 0.0263 [0.0024]
a/R* = 13.64 [4.07]
b = 0.95 [0.03]
Seff = 24.00 [5.59]
Teq = 564 [33] K
Rp = 2.84 [0.53] Re
a = 0.2048 [0.0302] AU
Ag = 363.76 [159.19] [2.28 σ]
Teffp = 3811 [362] K [8.93 σ]

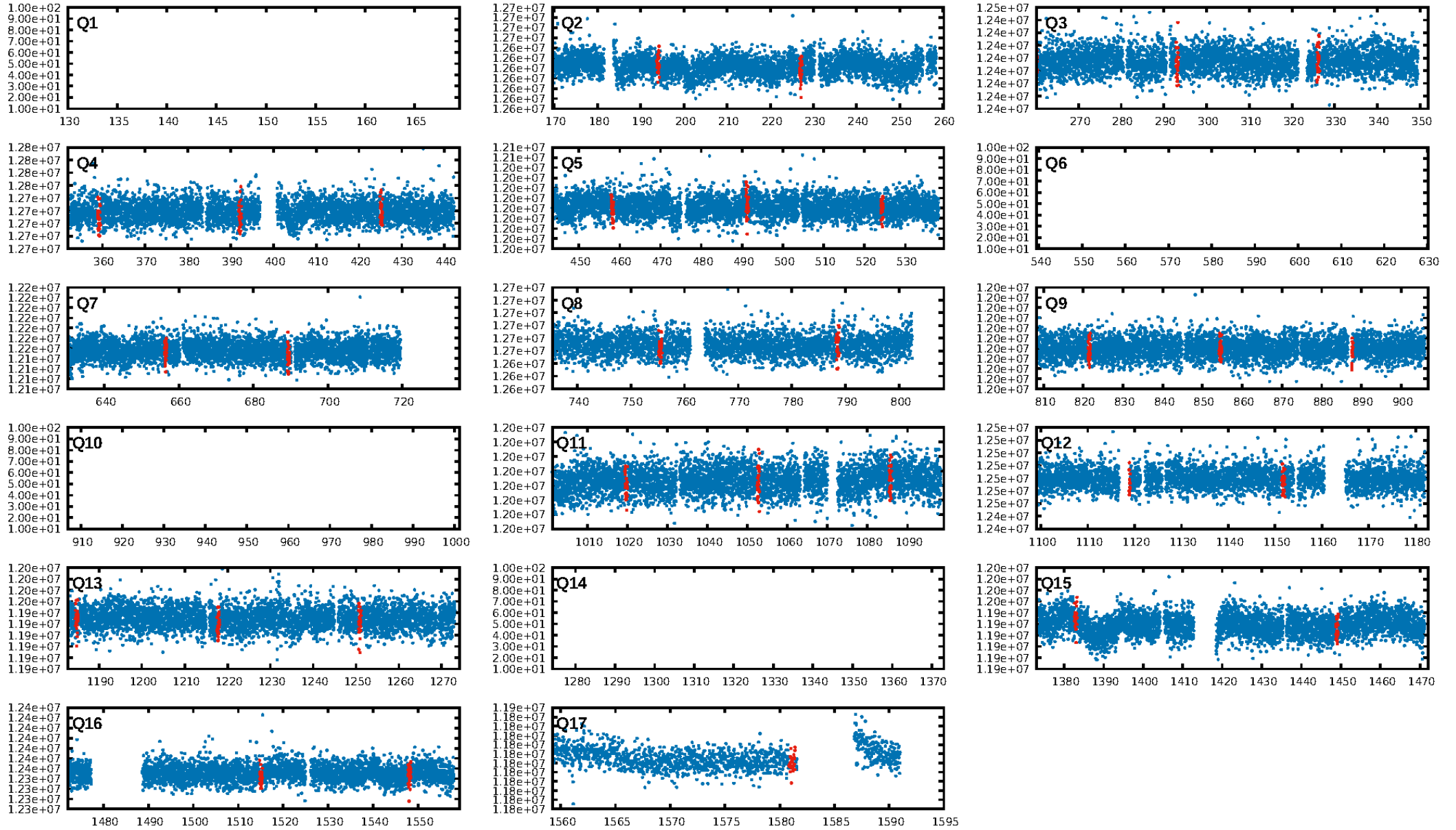
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [72.94 σ]
ModelChiSquare2-sig: 68.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.39e-28
RollingBand-fgt: 1.00 [30/30]
GhostDiagnostic-chr: 6.897
Centroid-sig: N/A
Centroid-so: 1.245 arcsec [1.00 σ]
OotOffset-rm: 1.430 arcsec [2.57 σ]
KicOffset-rm: 1.519 arcsec [2.71 σ]
OotOffset-st: 0/2/4/1 [7]
KicOffset-st: 0/2/4/1 [7]
DiffImageQuality-fgm: 0.57 [4/7]
DiffImageOverlap-fno: 1.00 [12/12]

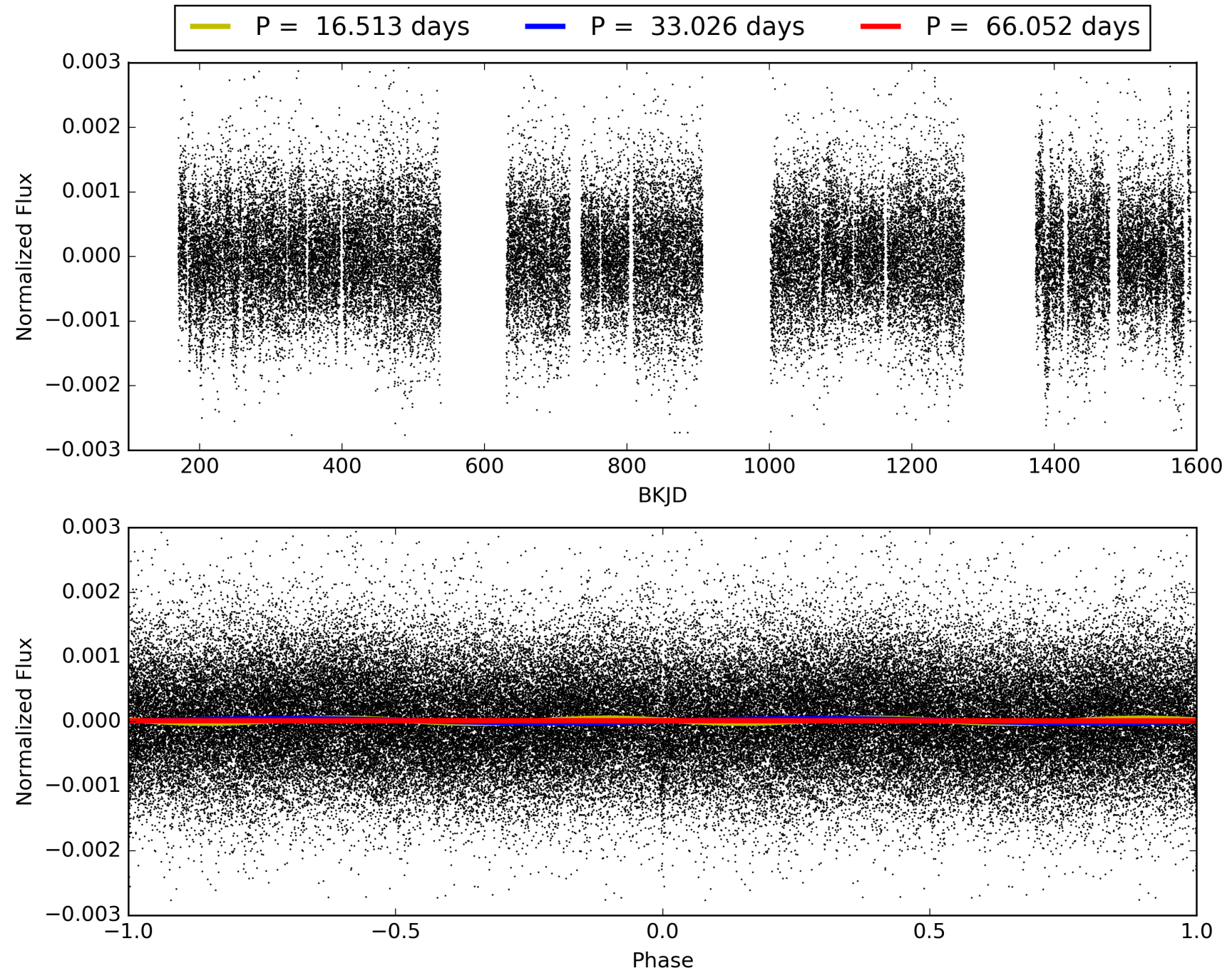
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:02:00 Z

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

TCE 003559860-01, PDC Light Curves

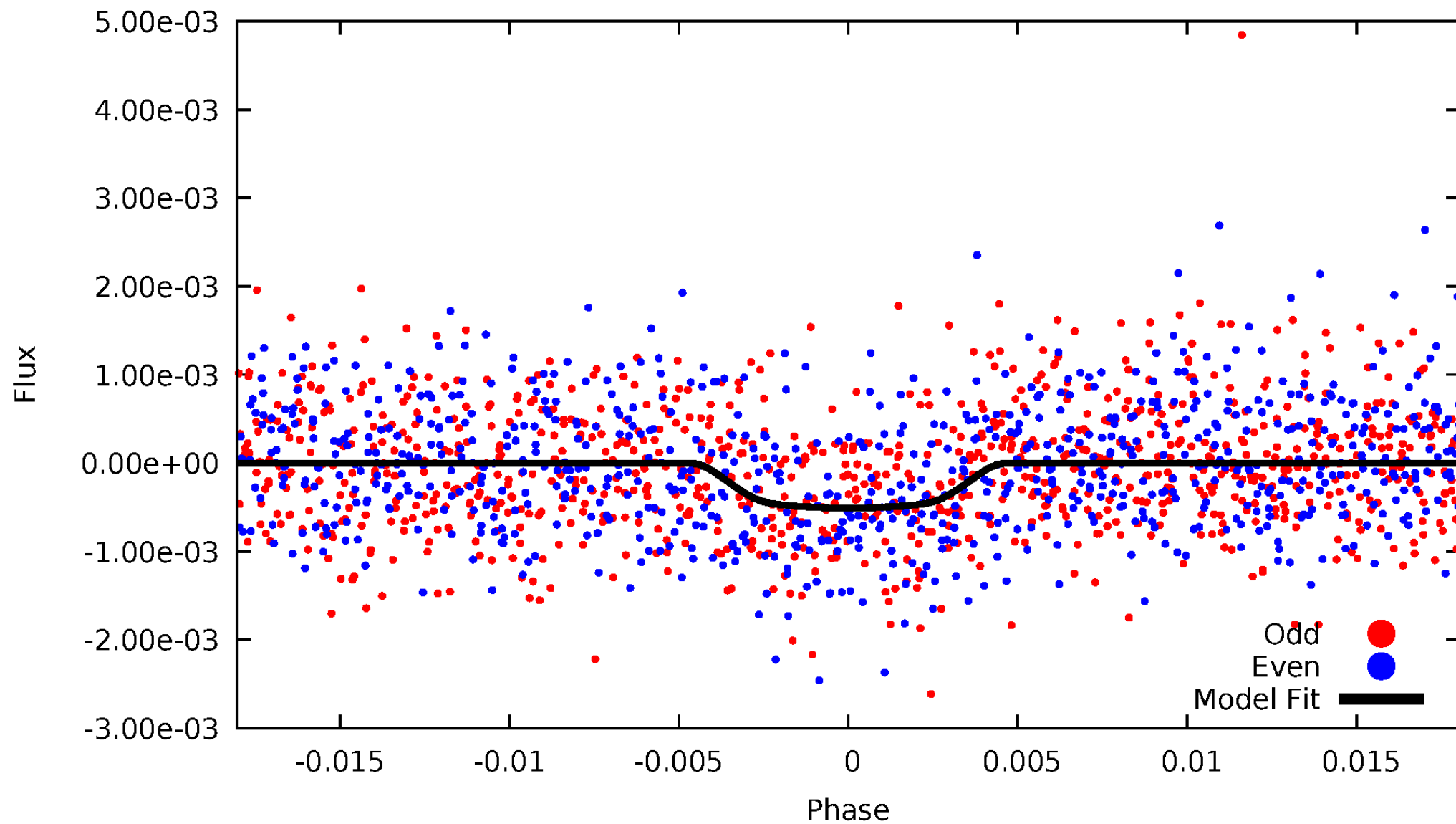


TCE 003559860-01



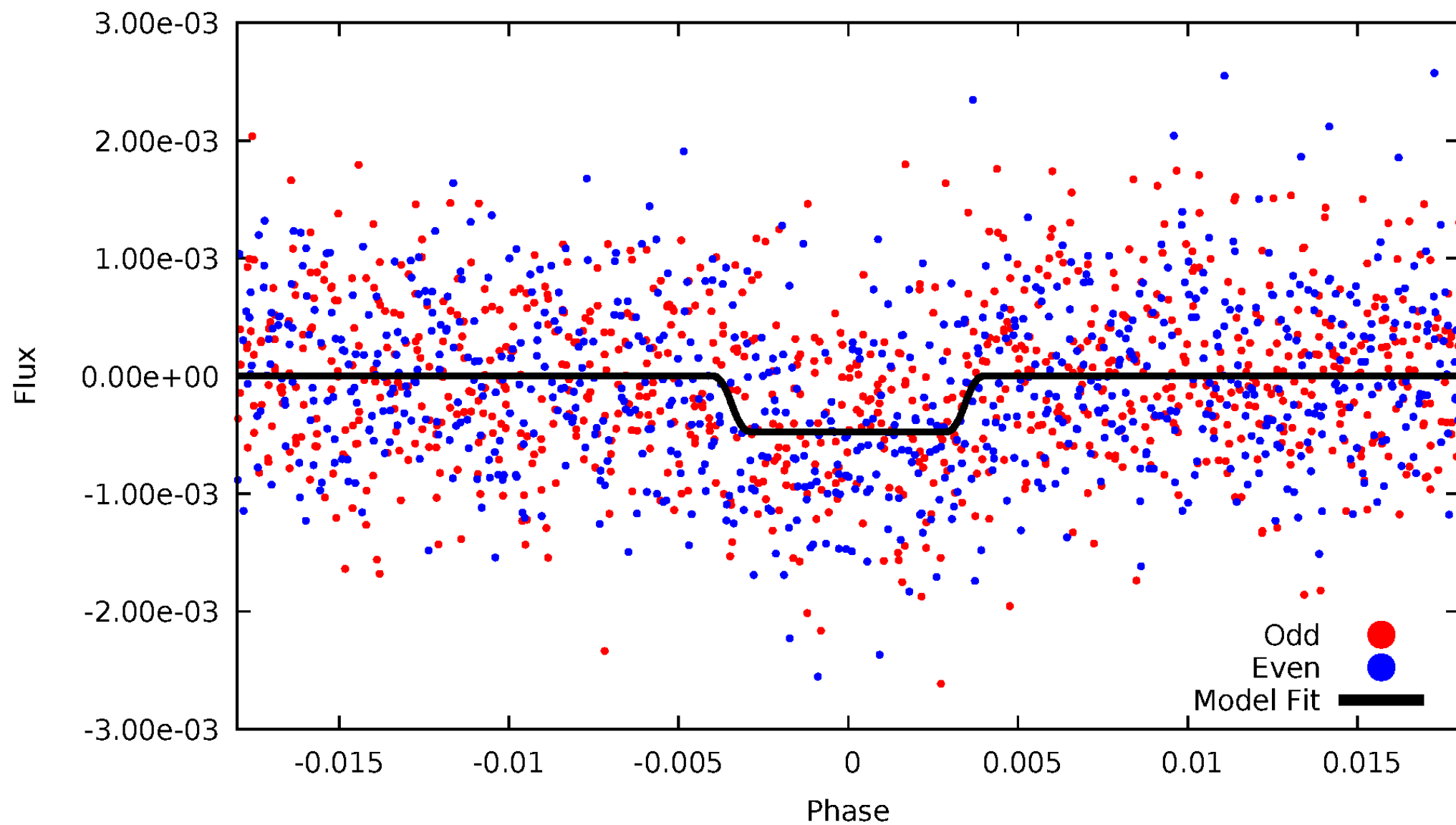
DV Odd/Even

TCE 003559860-01



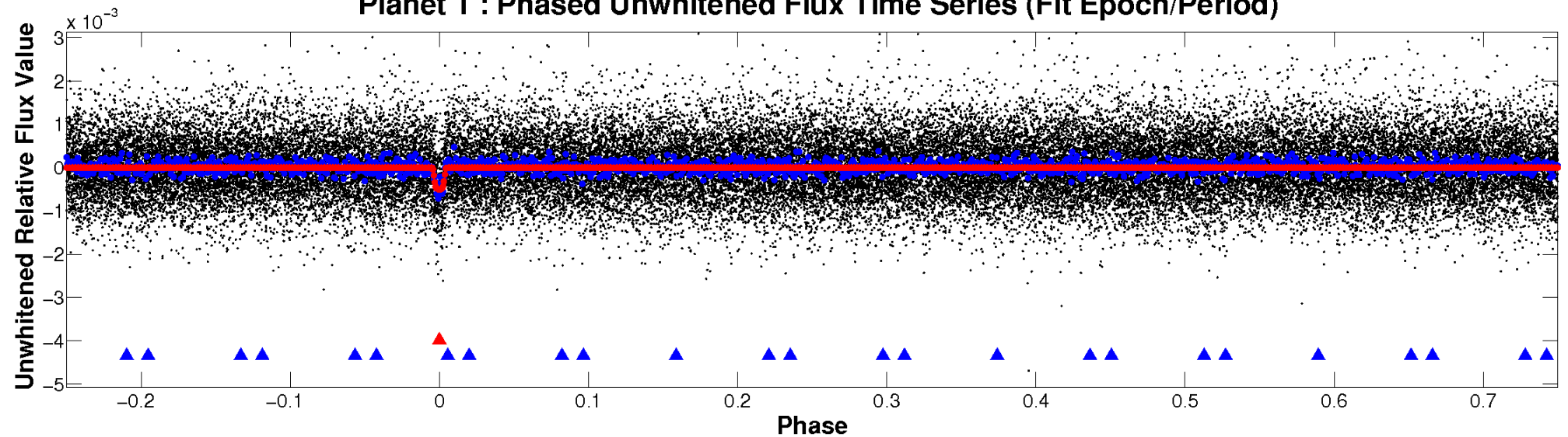
ALT Odd/Even

TCE 003559860-01

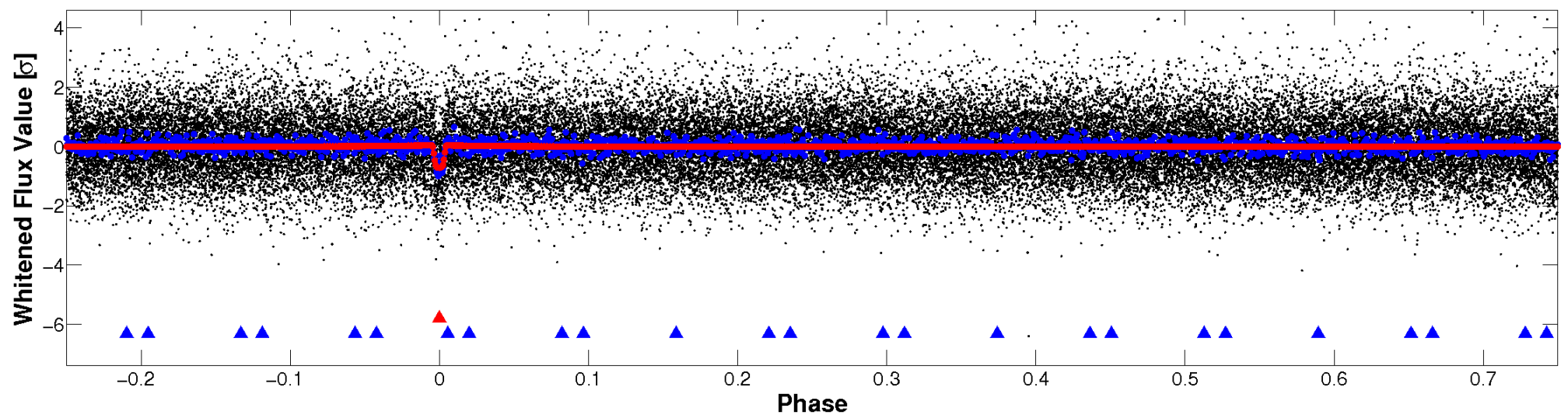


Non-Whitened Vs. Whitened Light Curve

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

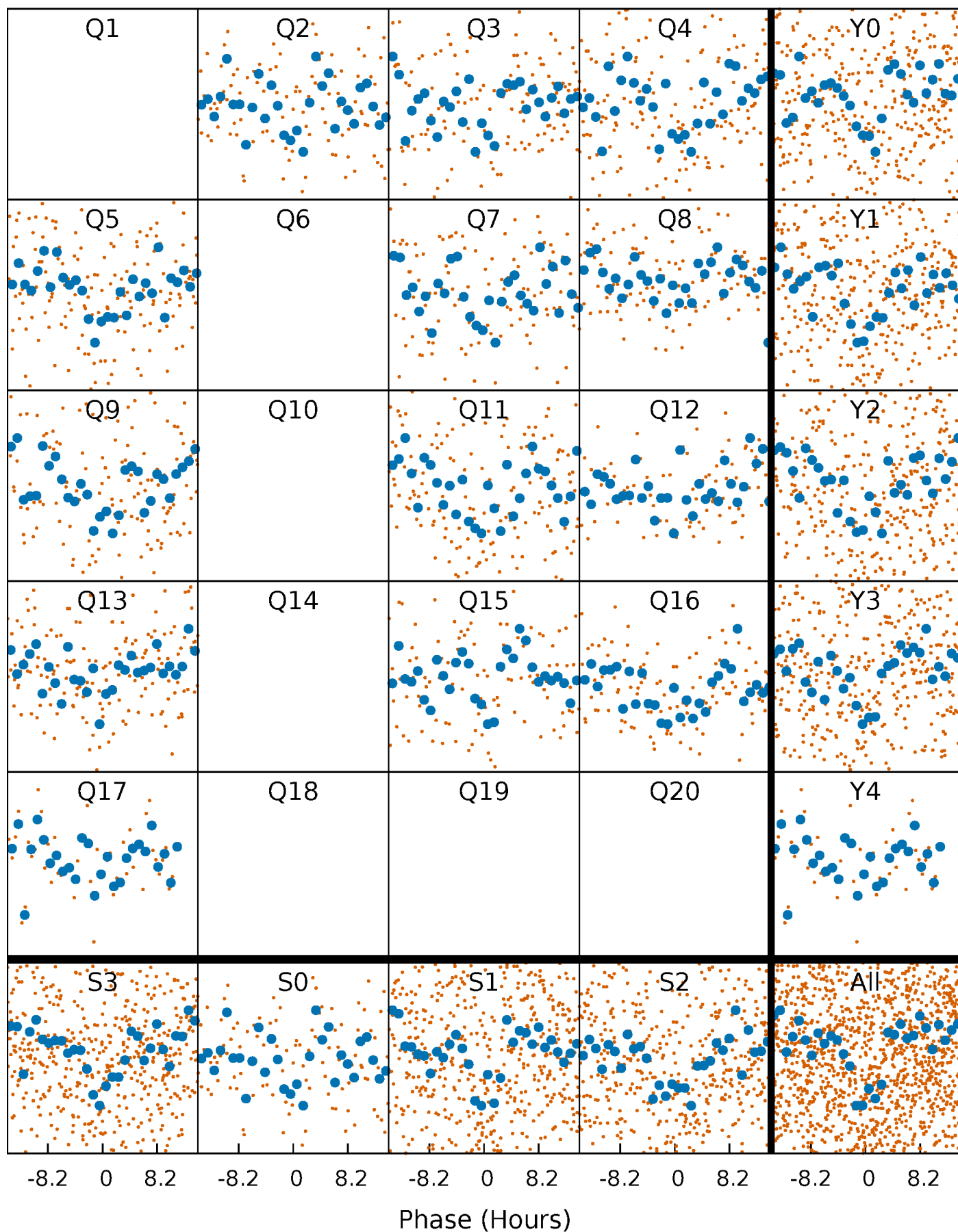


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



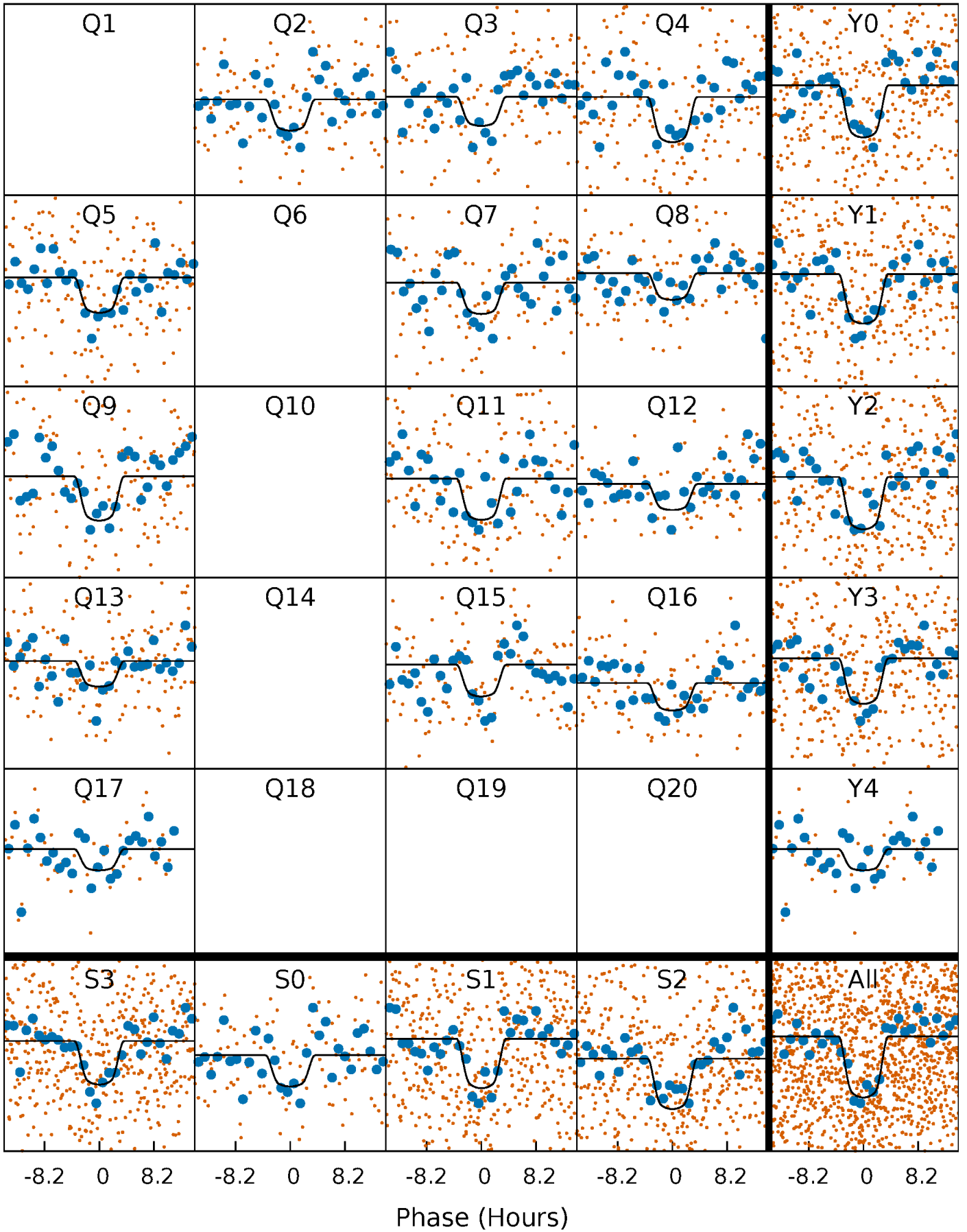
PDC Quarter-Phased Transit Curves

TCE 003559860-01 P= 33.025764 Days $T_0=161.016175$ (BKJD)



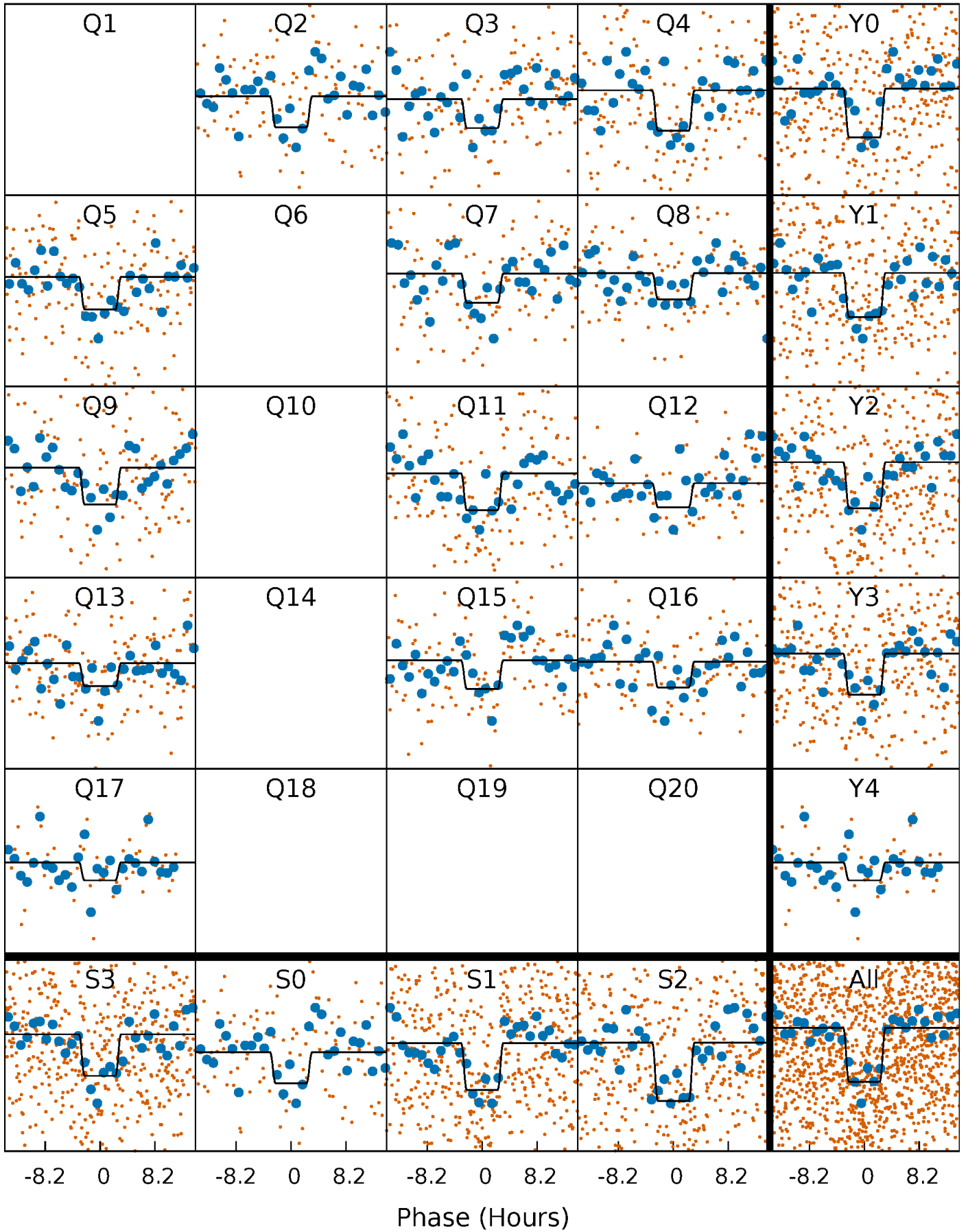
DV Quarter-Phased Transit Curves

TCE 003559860-01 P= 33.025764 Days $T_0=161.016175$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

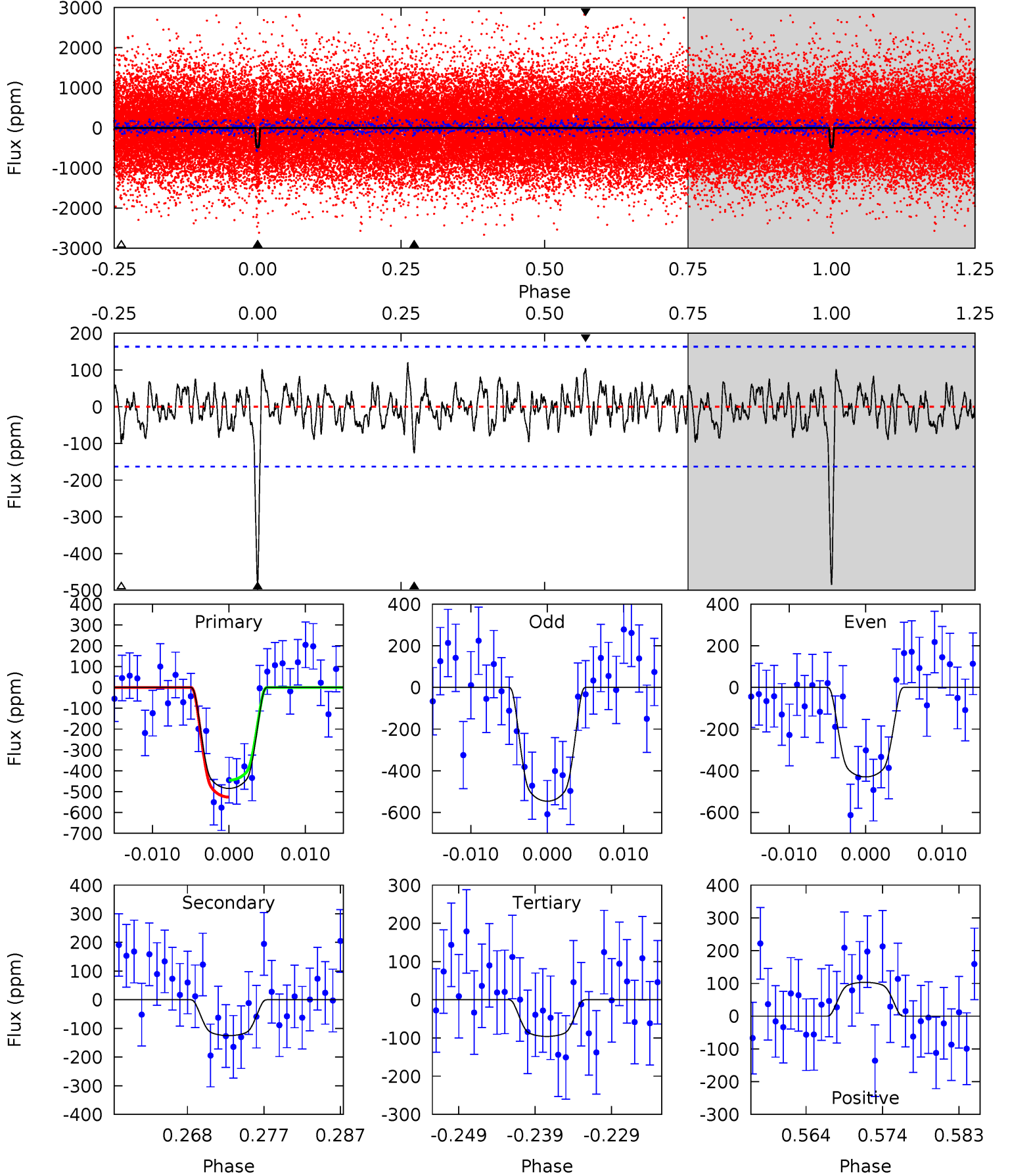
TCE 003559860-01 P= 33.025297 Days $T_0=161.022063$ (BKJD)



DV Model-Shift Uniqueness Test

003559860-01, P = 33.025764 Days, E = 161.016175 Days

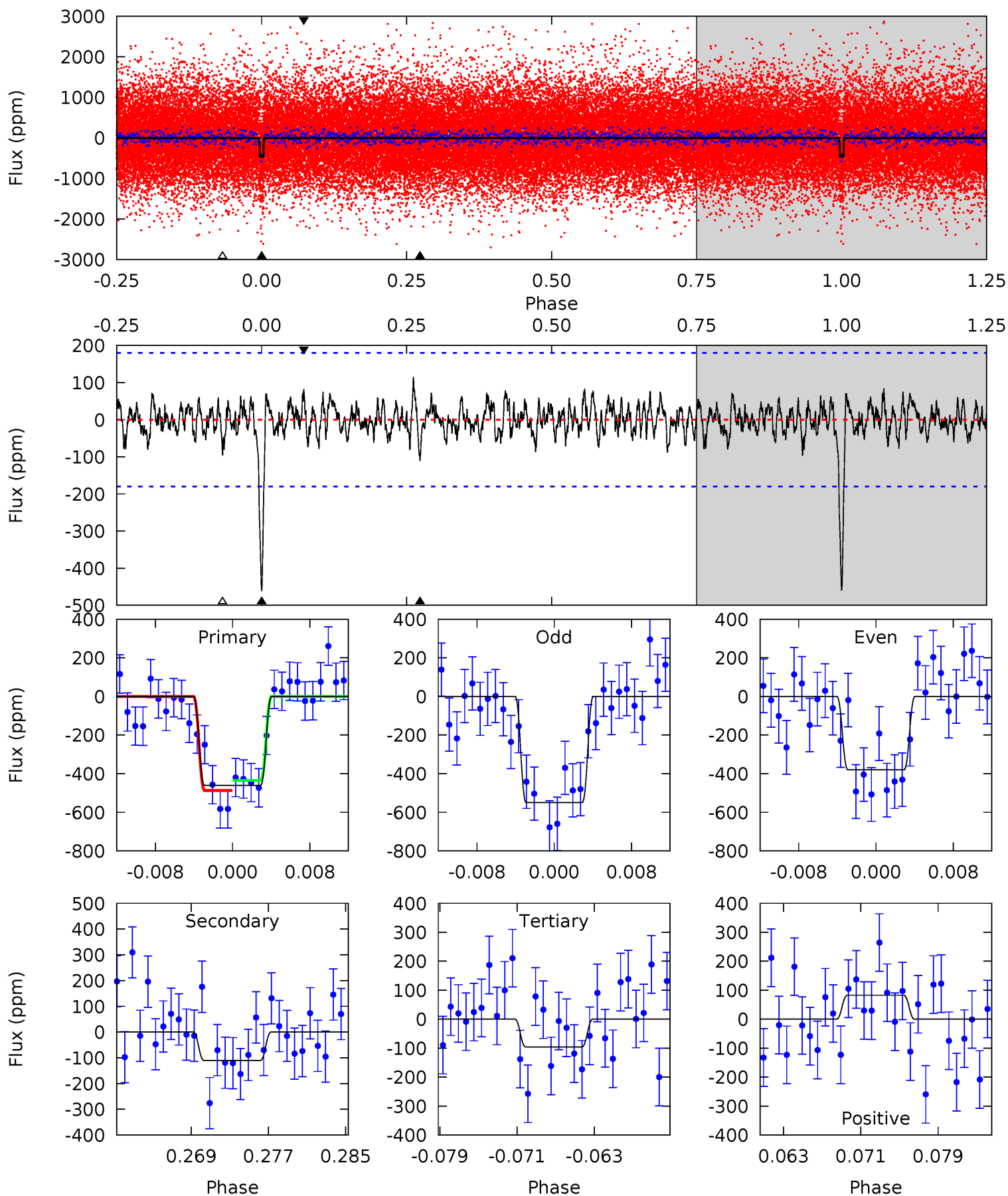
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	3.86	2.96	3.18	5.03	2.59	1.15	12.0	11.8	0.90	0.68	1.80	1.00	0.20	1.25



Alt Model-Shift Uniqueness Test

003559860-01, $P = 33.025297$ Days, $E = 161.022063$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	3.12	2.70	2.34	5.07	2.66	0.92	10.3	10.6	0.42	0.78	2.38	1.05	0.20	0.74



Stellar Parameters For KIC 003559860

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5819^{+69}_{-87}	$4.468^{+0.032}_{-0.128}$	$0.140^{+0.150}_{-0.150}$	$0.990^{+0.163}_{-0.054}$	$1.049^{+0.059}_{-0.073}$	$1.523^{+0.187}_{-0.539}$
	+1%/-1%	+1%/-3%	+107%/-107%	+16%/-5%	+6%/-7%	+12%/-35%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003559860-01 / KOI 3440.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-125 ± 32	$2.89^{+0.35}_{-0.28}$	795^{+31}_{-20}	4078^{+238}_{-246}	338^{+125}_{-111}
Alt.	-111 ± 36	$2.39^{+0.34}_{-0.29}$	796^{+34}_{-20}	4294^{+304}_{-337}	437^{+200}_{-162}

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 $A_{obs} \gg 1.0$

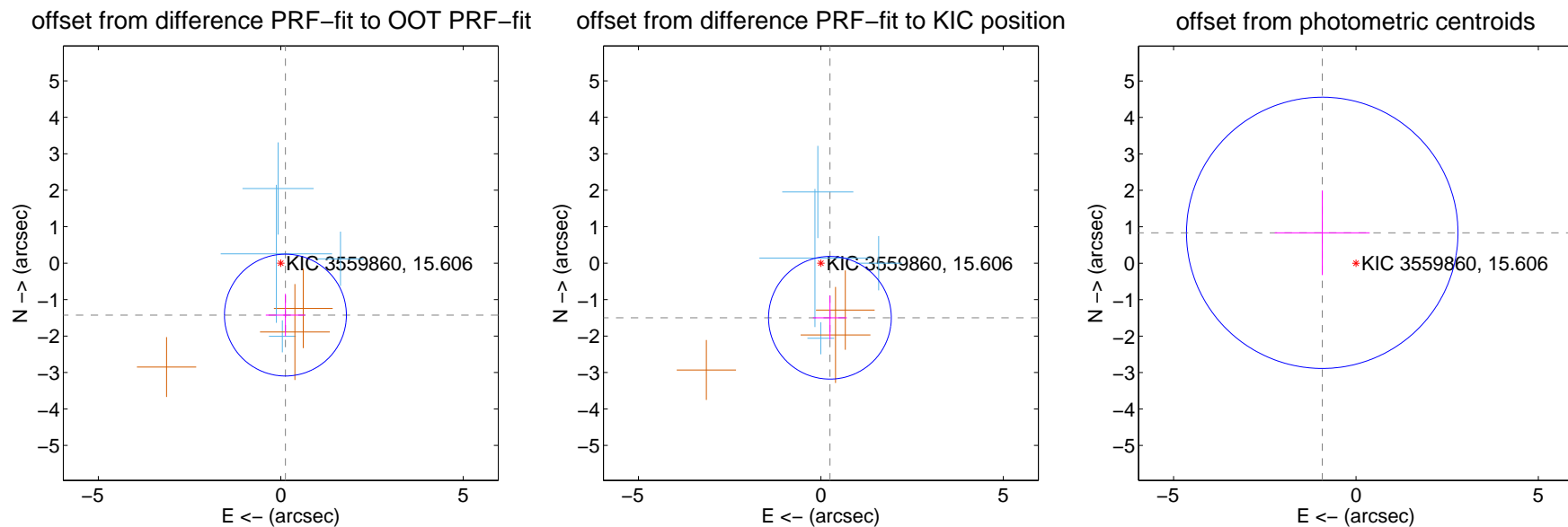
DV Centroid Data

Supplemental centroid analysis for 003559860-01. Kepler magnitude: 15.61. Transit SNR 11.20

There are 4 quarters with good PRF difference image offsets

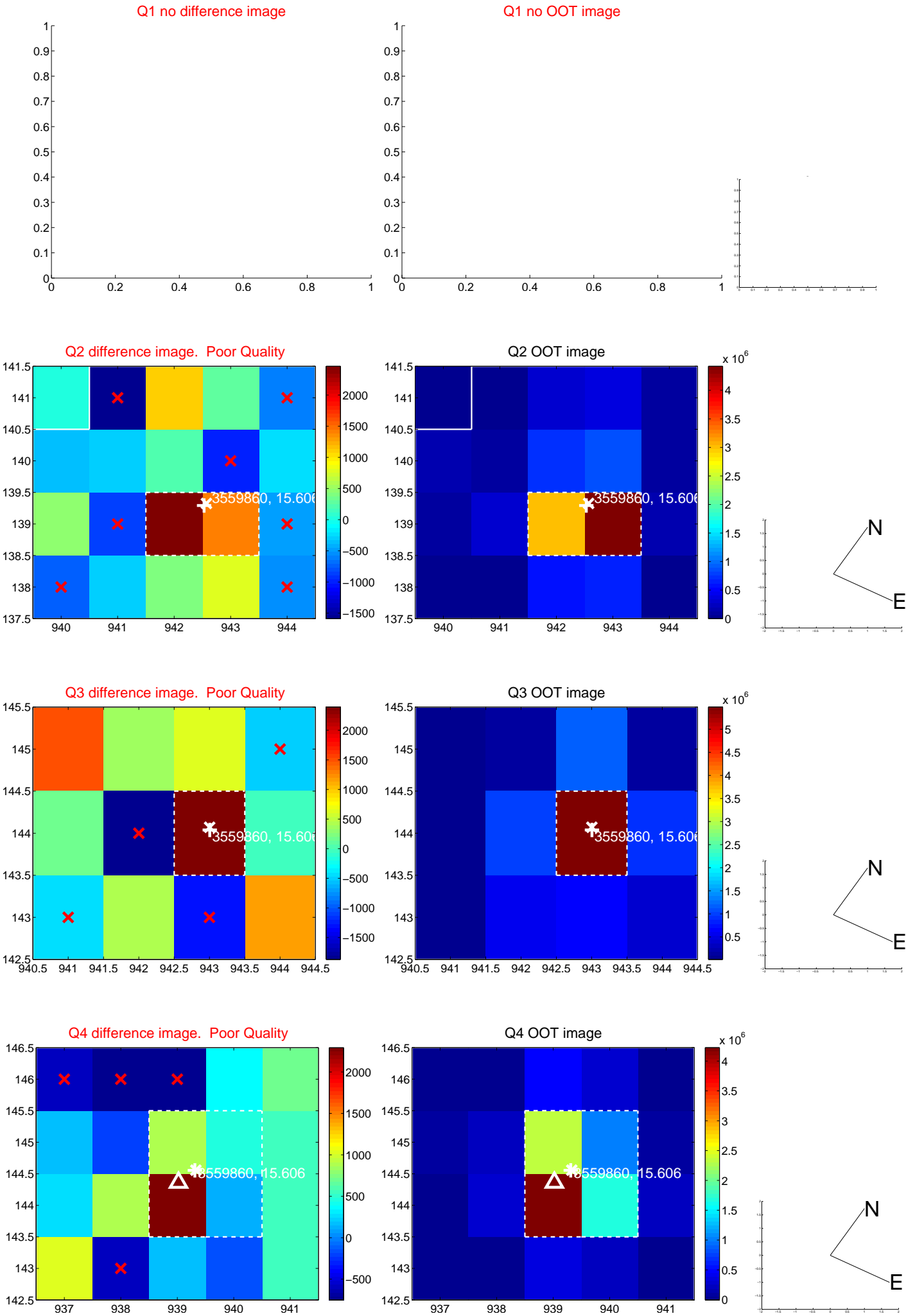
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.430 ± 0.557	2.57	-0.128 ± 0.540	-1.425 ± 0.582
PRF-fit source offset from KIC position	1.519 ± 0.561	2.71	-0.248 ± 0.463	-1.498 ± 0.603
photometric centroid source offset	1.25 ± 1.24	1.00	0.92 ± 1.30	0.83 ± 1.16

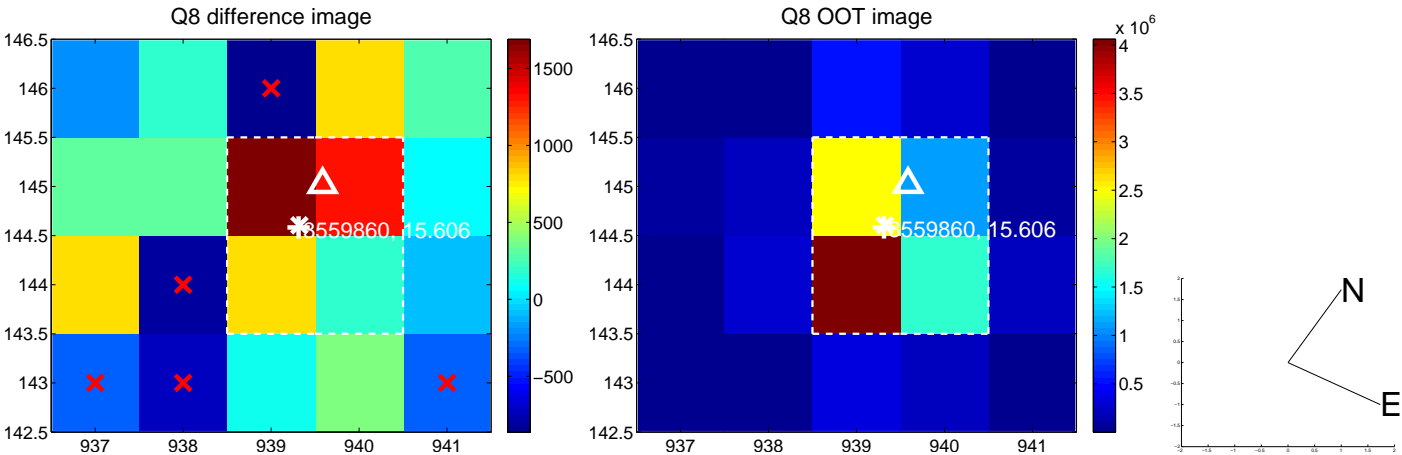
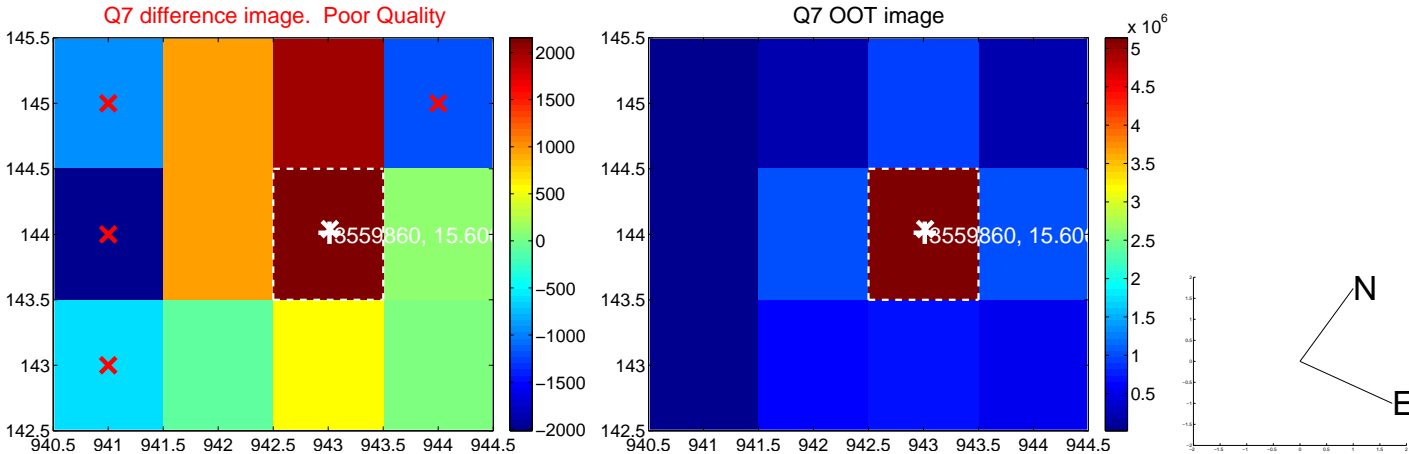
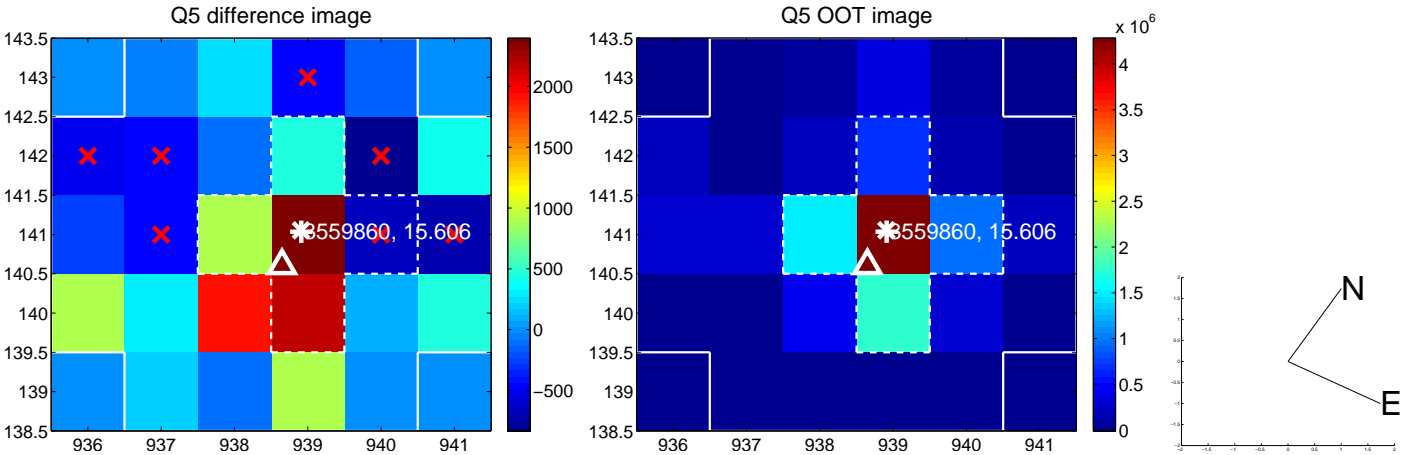


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

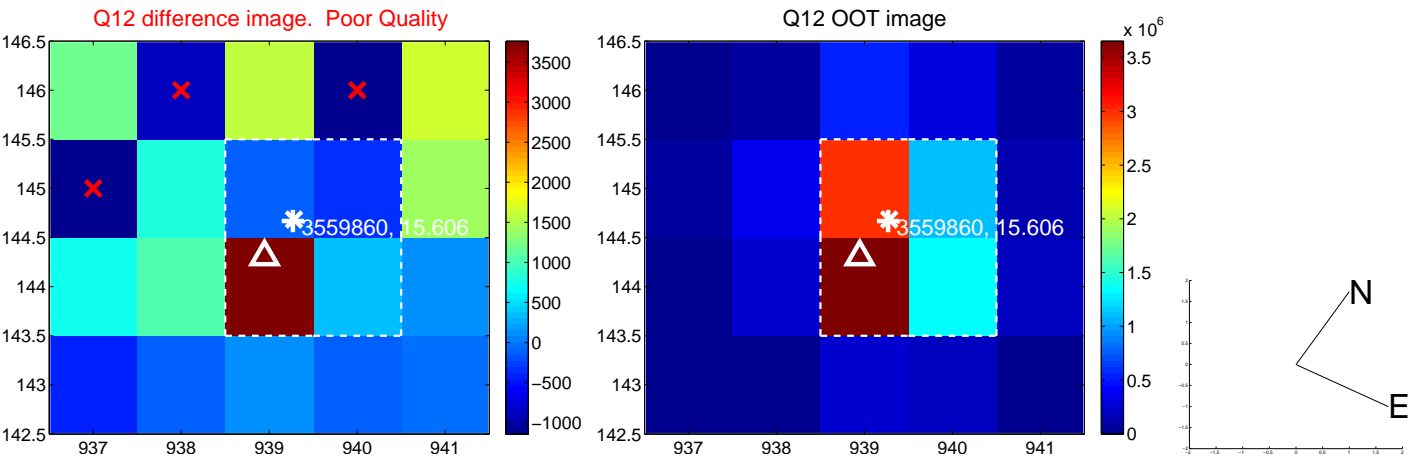
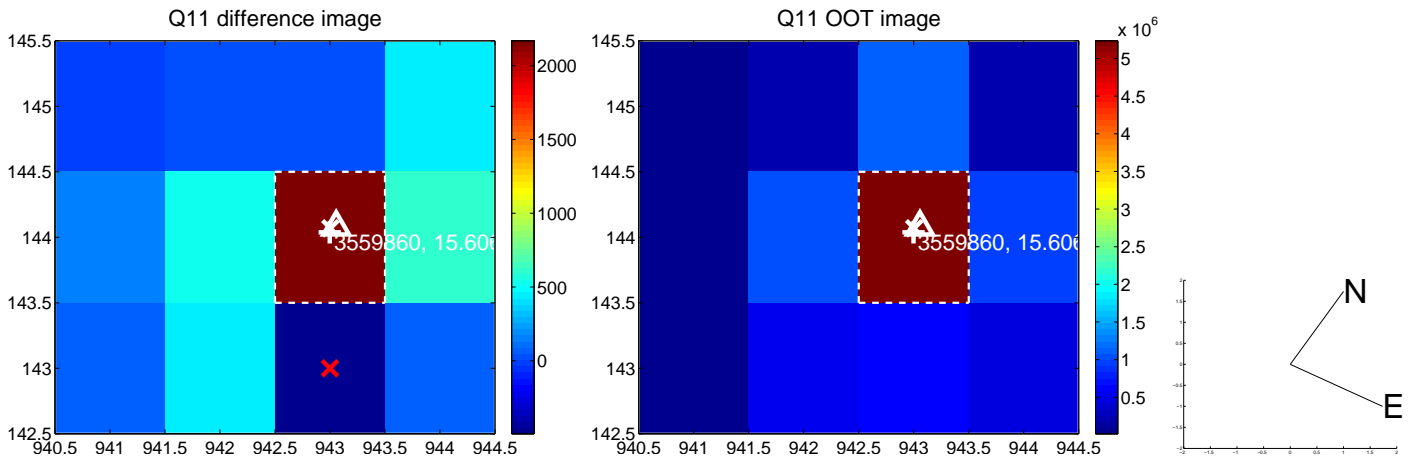
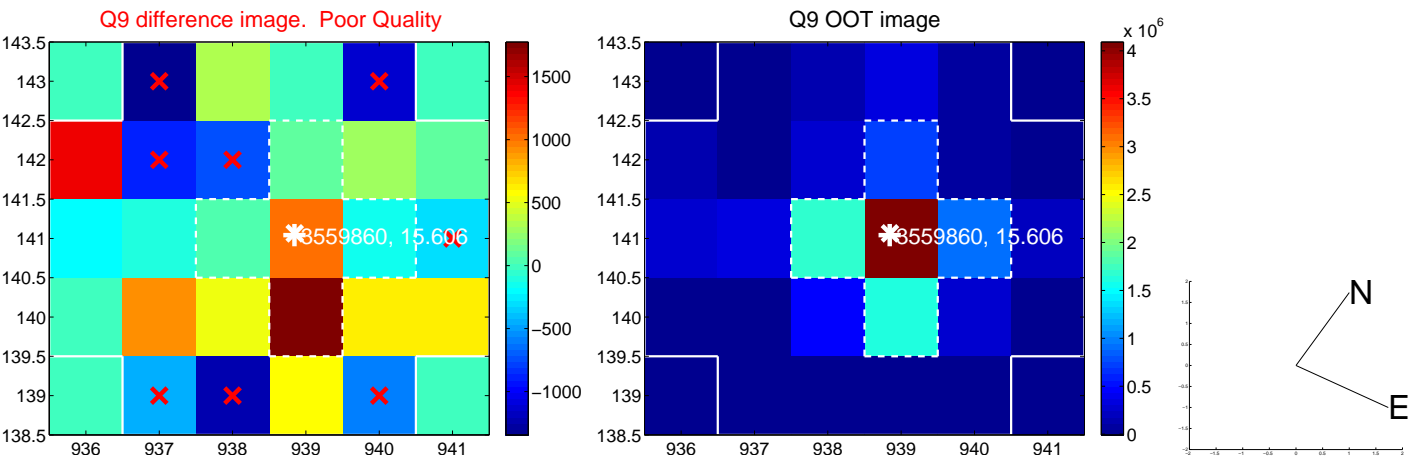
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



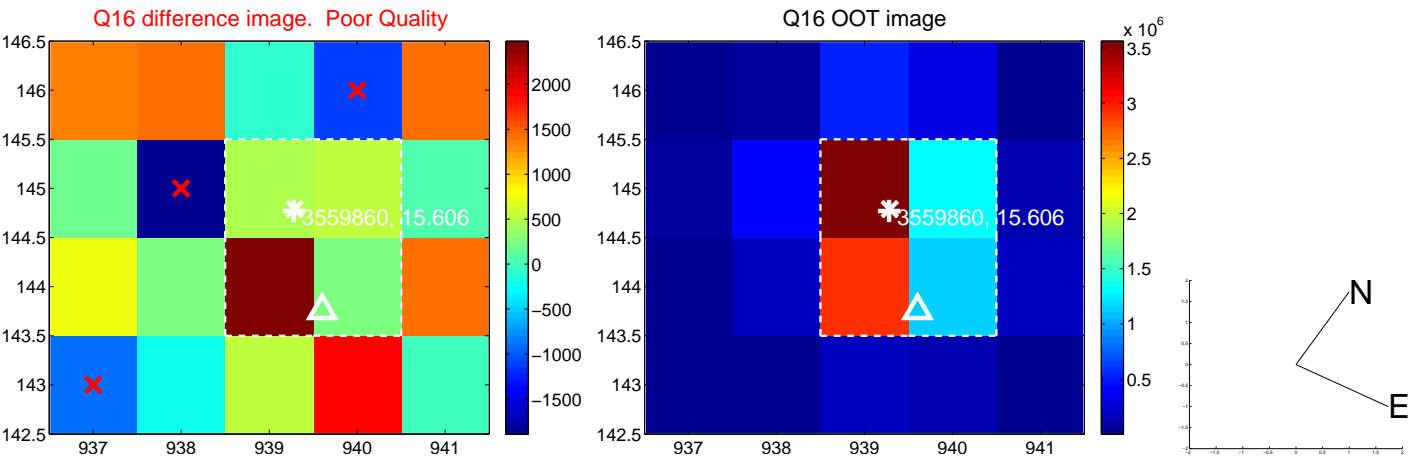
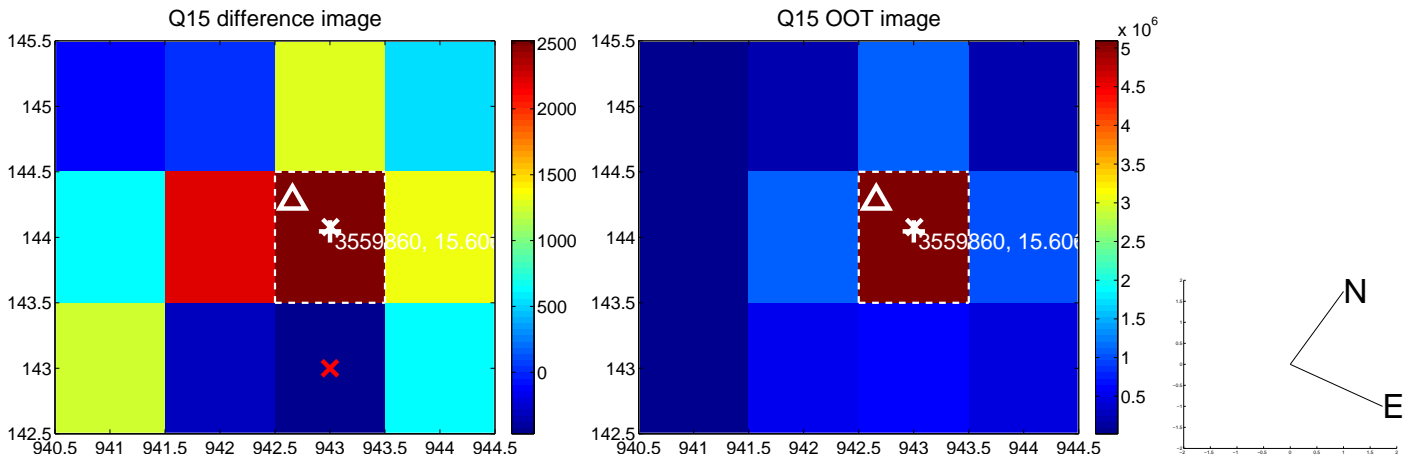
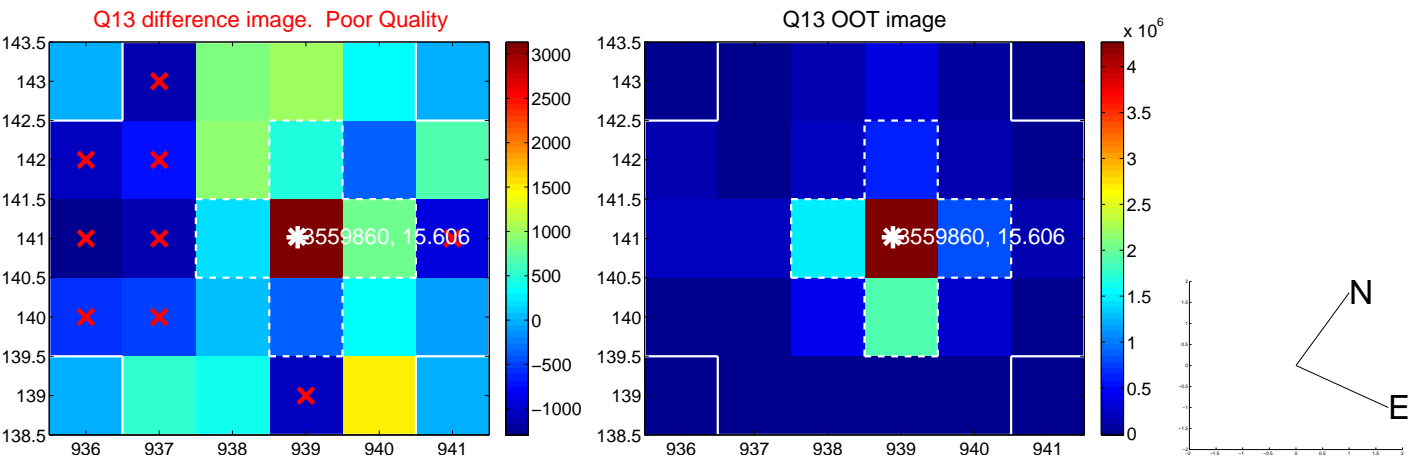
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



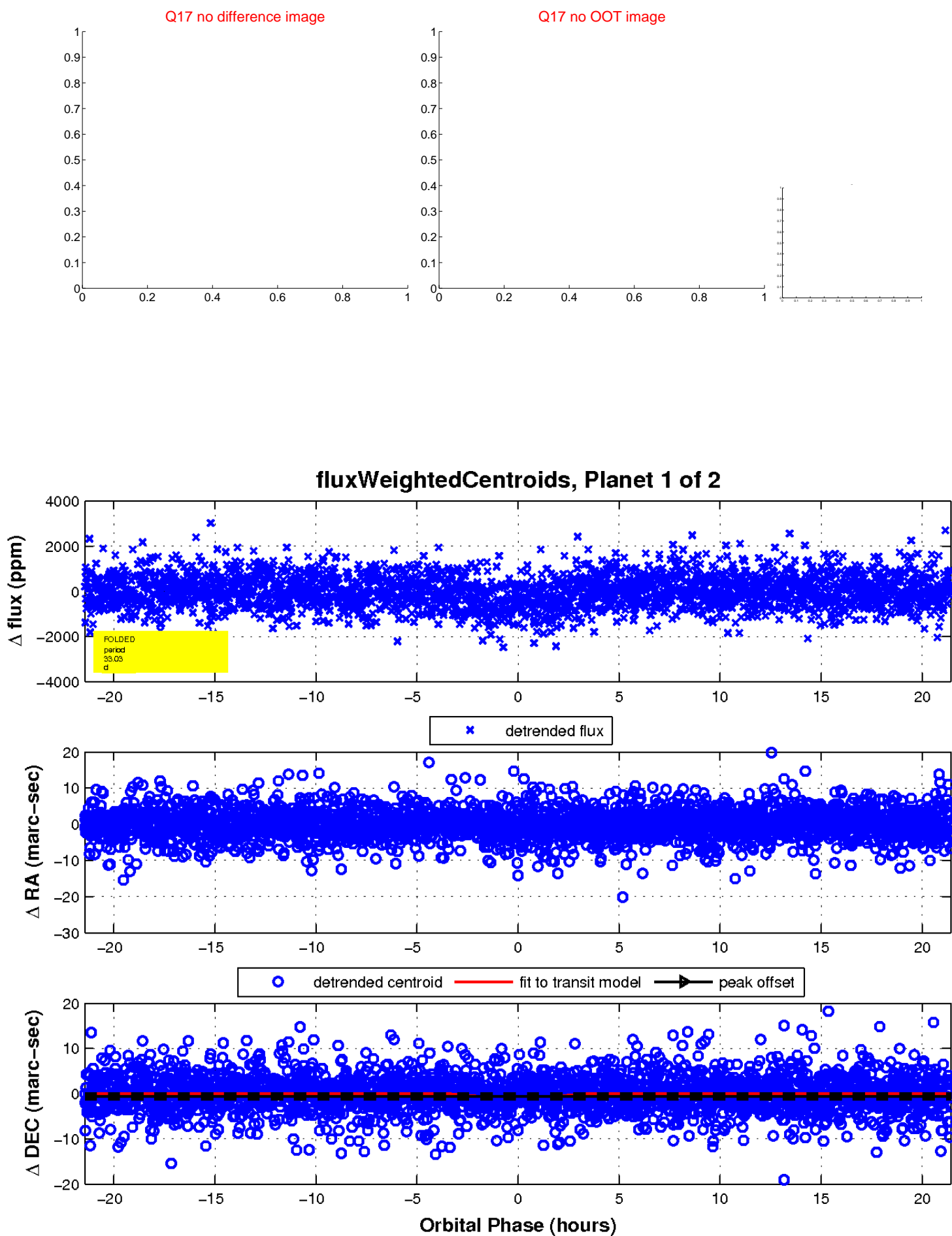
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



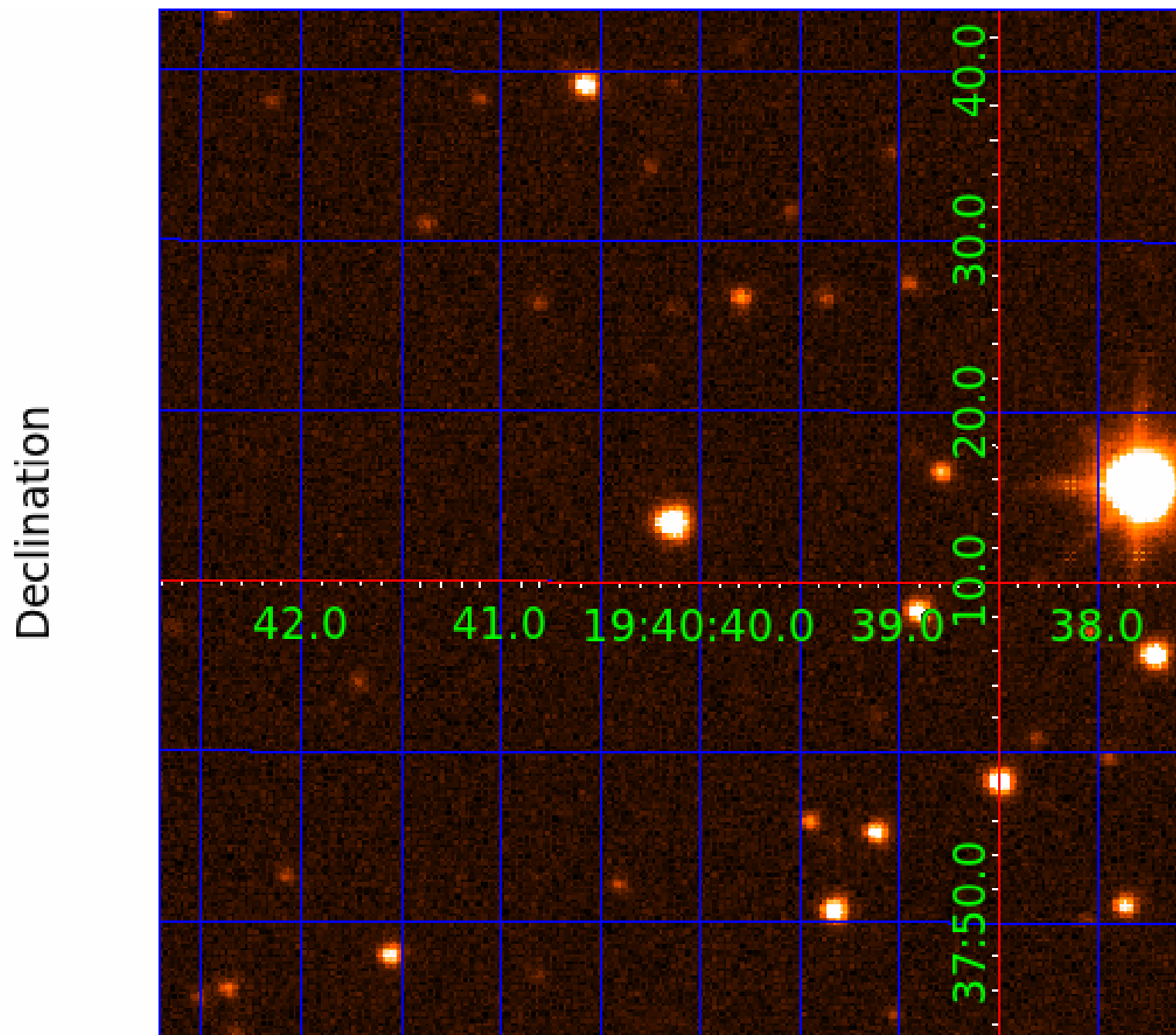
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 003559860

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})
003559860-01	OBS	3440.01	33.025764	161.016175	507.2	7.145	11.1	11.2	0.99	5819	2.85	24.00
003559860-02	OBS	3440.02	58.940659	159.623804	547.9	4.655	7.4	8.0	0.99	5819	2.44	11.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003559860-01	OBS	FP	0.18	0	1	0	0	DEPTH_ODDEVEN_ALT
003559860-02	OBS	FP	0.09	1	0	0	0	INDIV_TRANS_SKYE

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 003559860-02

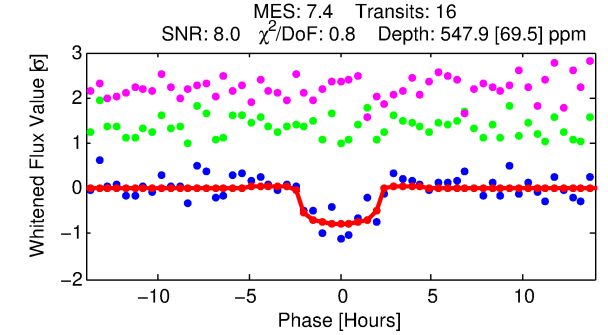
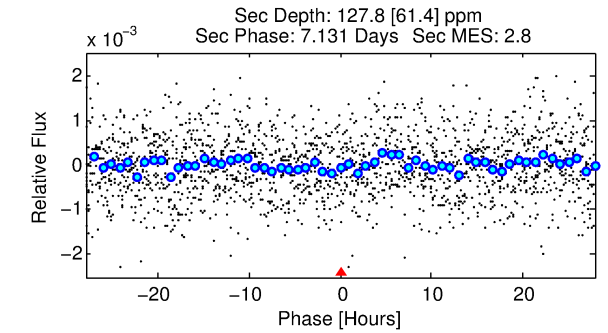
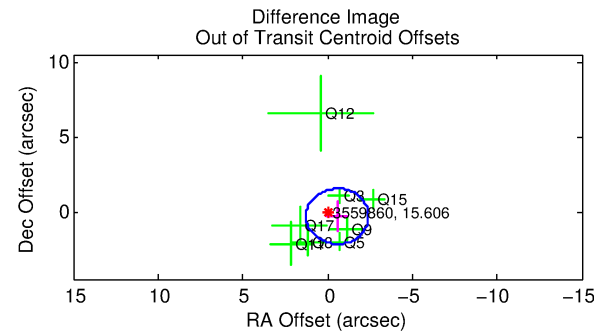
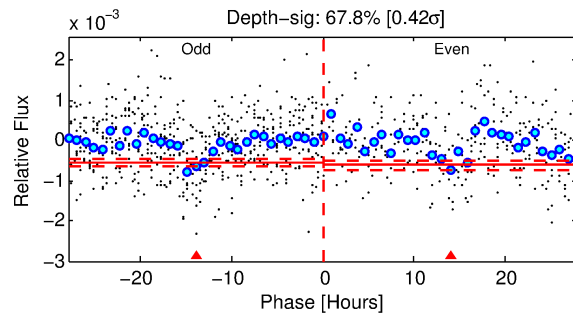
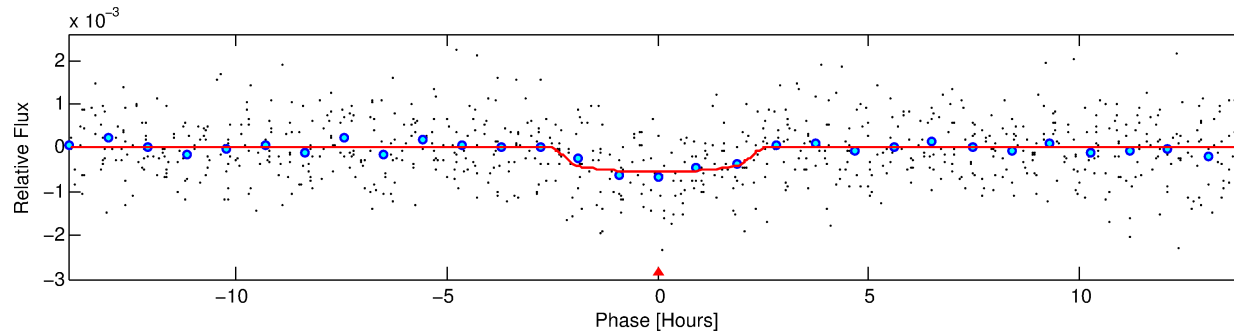
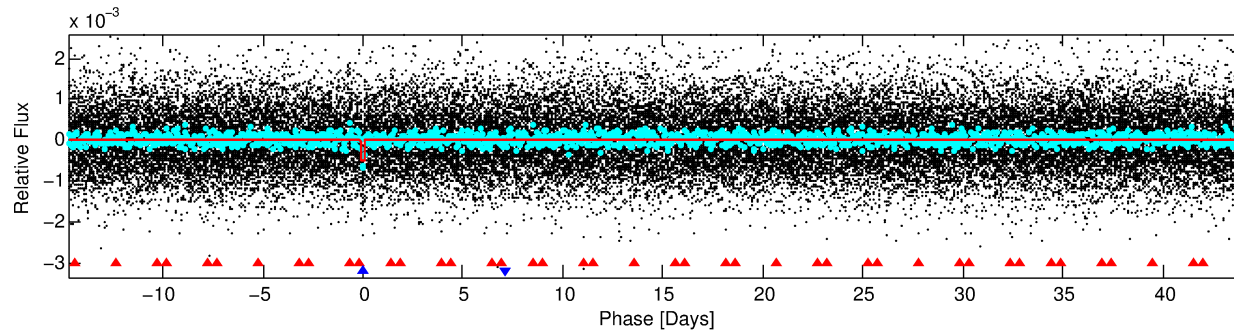
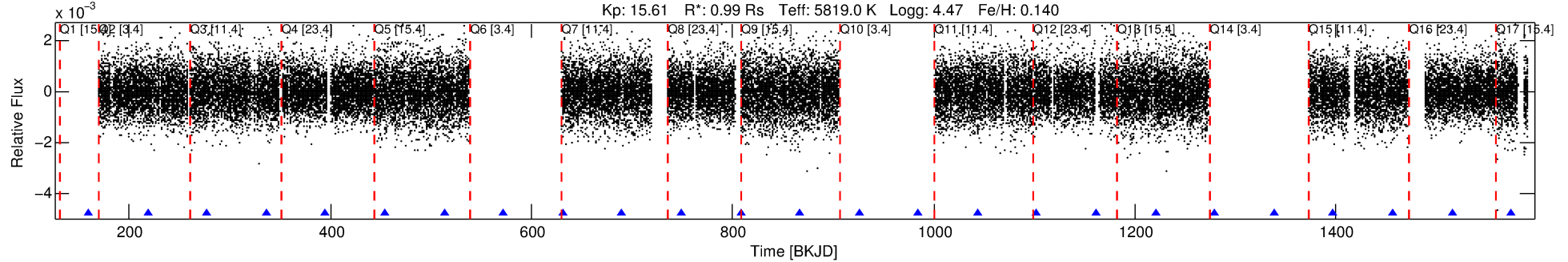
No Significant Match Found

DV One-Page Summary

KIC: 3559860 Candidate: 2 of 2 Period: 58.941 d

KOI: K03440.02 Corr: 0.894

Kp: 15.61 R*: 0.99 Rs Teff: 5819.0 K Logg: 4.47 Fe/H: 0.140



DV Fit Results:

Period = 58.94066 [0.00086] d
Epoch = 159.6238 [0.0109] BKJD
Rp/R* = 0.0226 [0.0348]
a/R* = 76.50 [513.84]
b = 0.65 [6.07]
Seff = 11.09 [2.58]
Teq = 465 [27] K
Rp = 2.44 [3.78] Re
a = 0.3013 [0.0444] AU
Ag = 1073.39 [3354.73] [0.32σ]
Teffp = 4118 [3210] K [1.14σ]

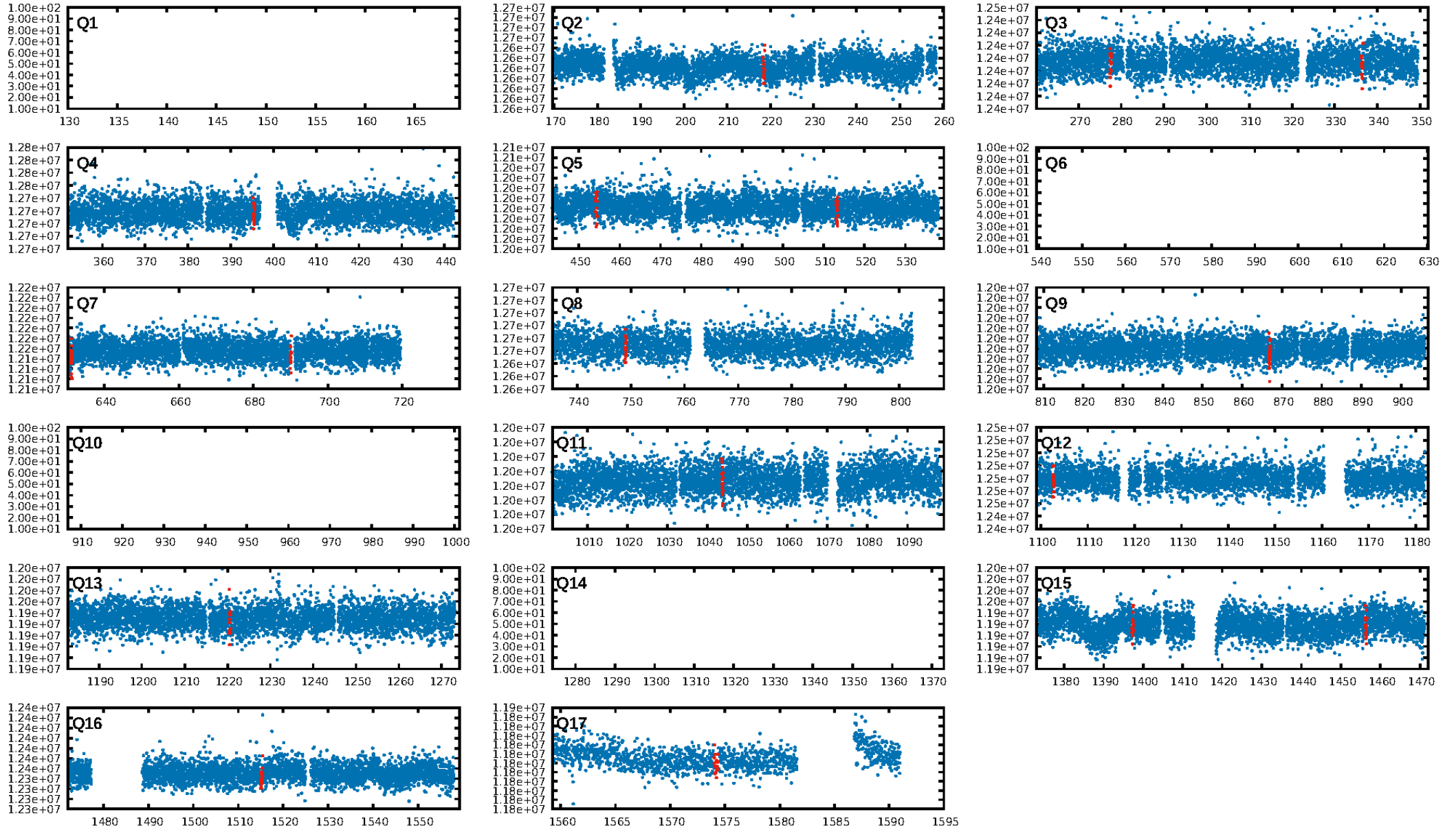
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [72.94σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.33e-13
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: 5.186
Centroid-sig: N/A
Centroid-so: 2.562 arcsec [1.67σ]
OotOffset-rm: 0.652 arcsec [1.06σ]
KicOffset-rm: 0.666 arcsec [1.11σ]
OotOffset-st: 0/3/2/3 [8]
KicOffset-st: 0/3/2/3 [8]
DiffImageQuality-fgm: 0.12 [1/8]
DiffImageOverlap-fno: 0.91 [10/11]

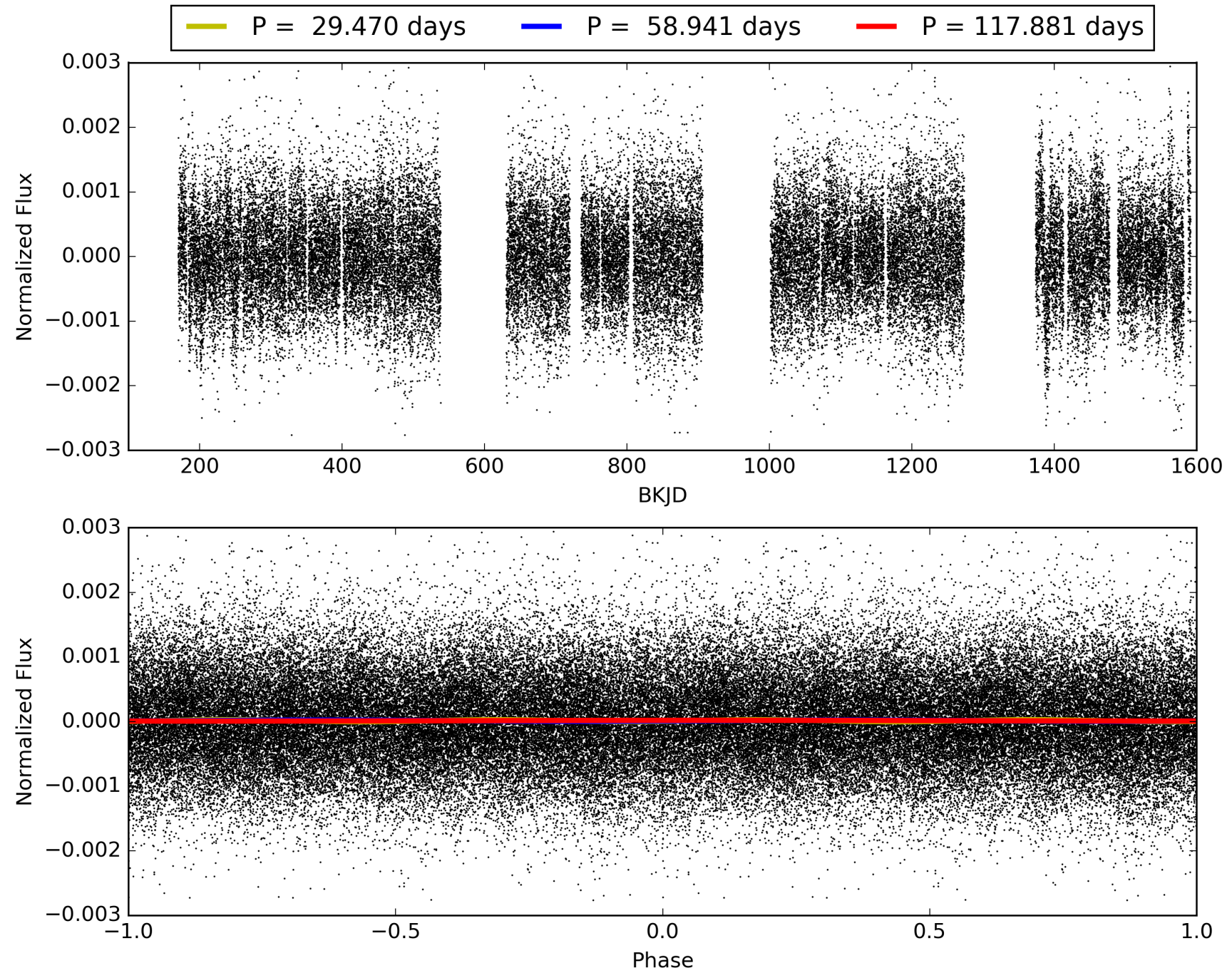
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:02:09 Z

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

TCE 003559860-02, PDC Light Curves

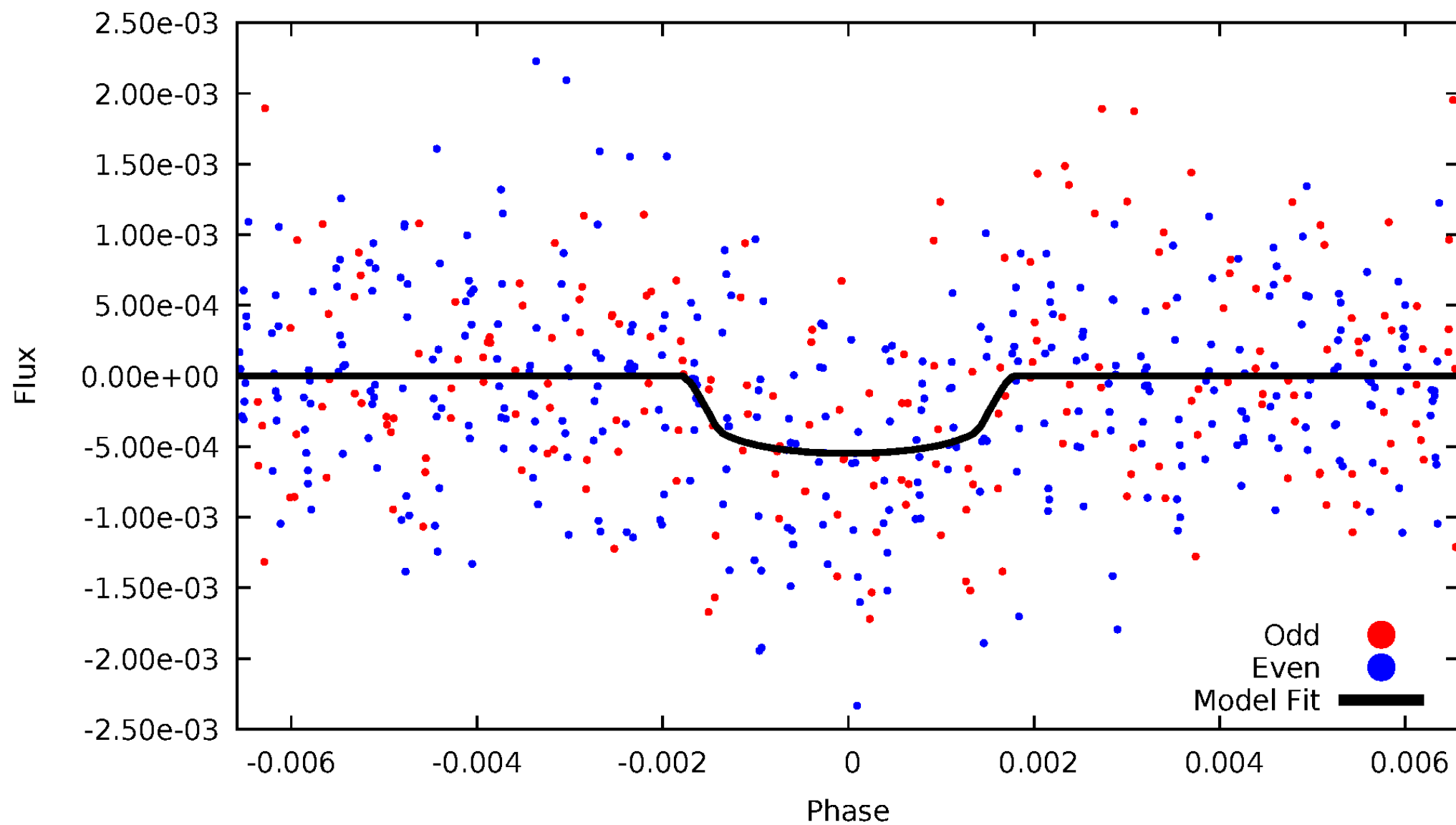


TCE 003559860-02



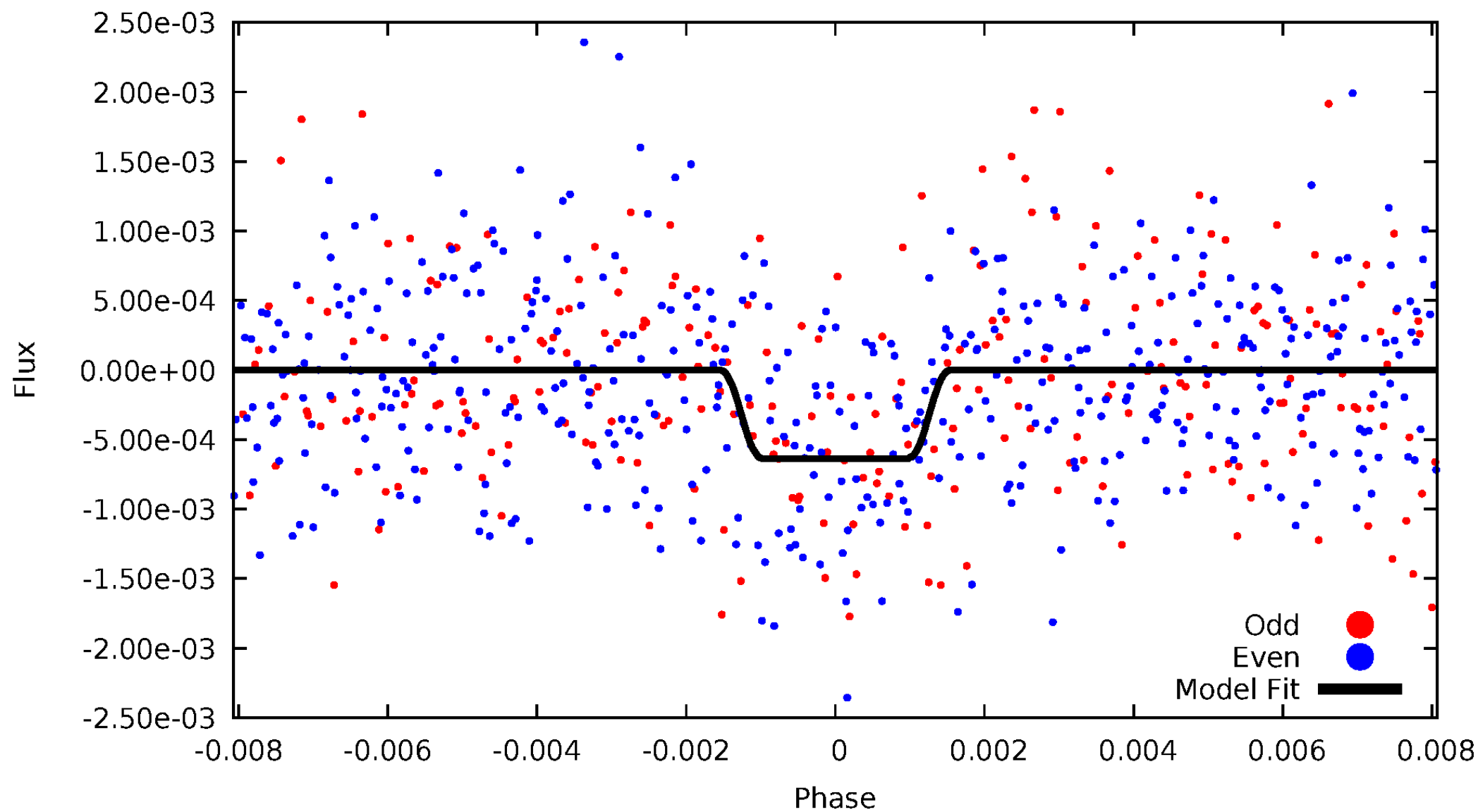
DV Odd/Even

TCE 003559860-02



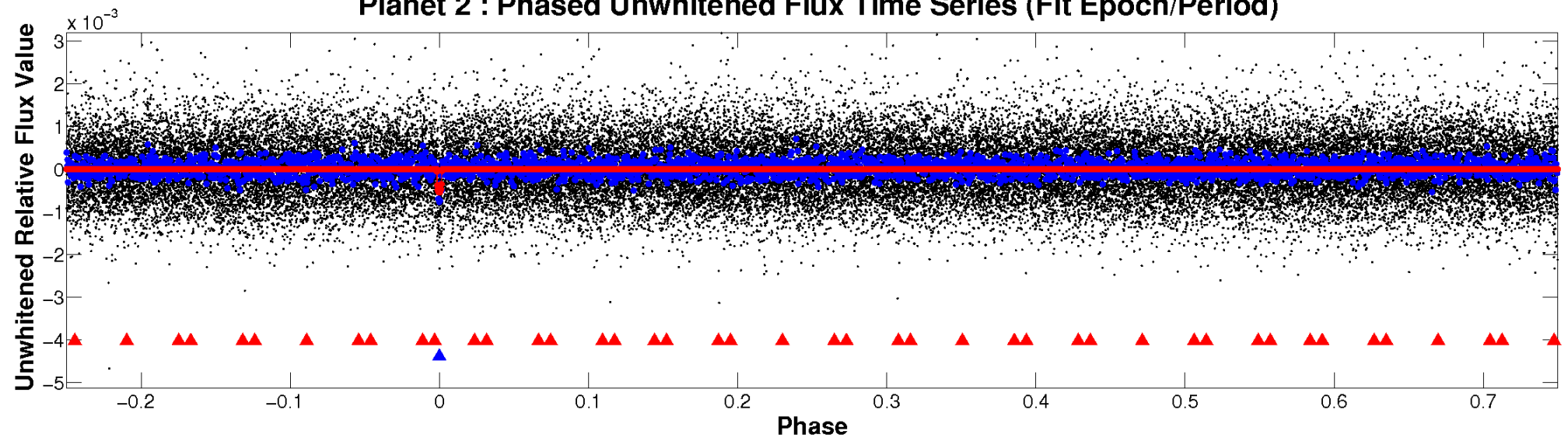
ALT Odd/Even

TCE 003559860-02

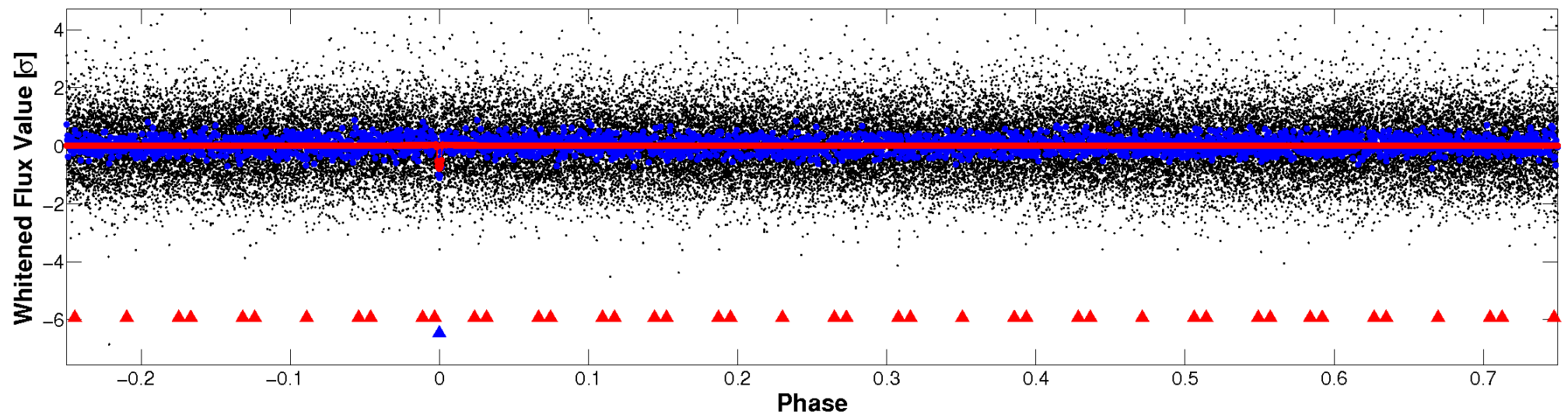


Non-Whitened Vs. Whitened Light Curve

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

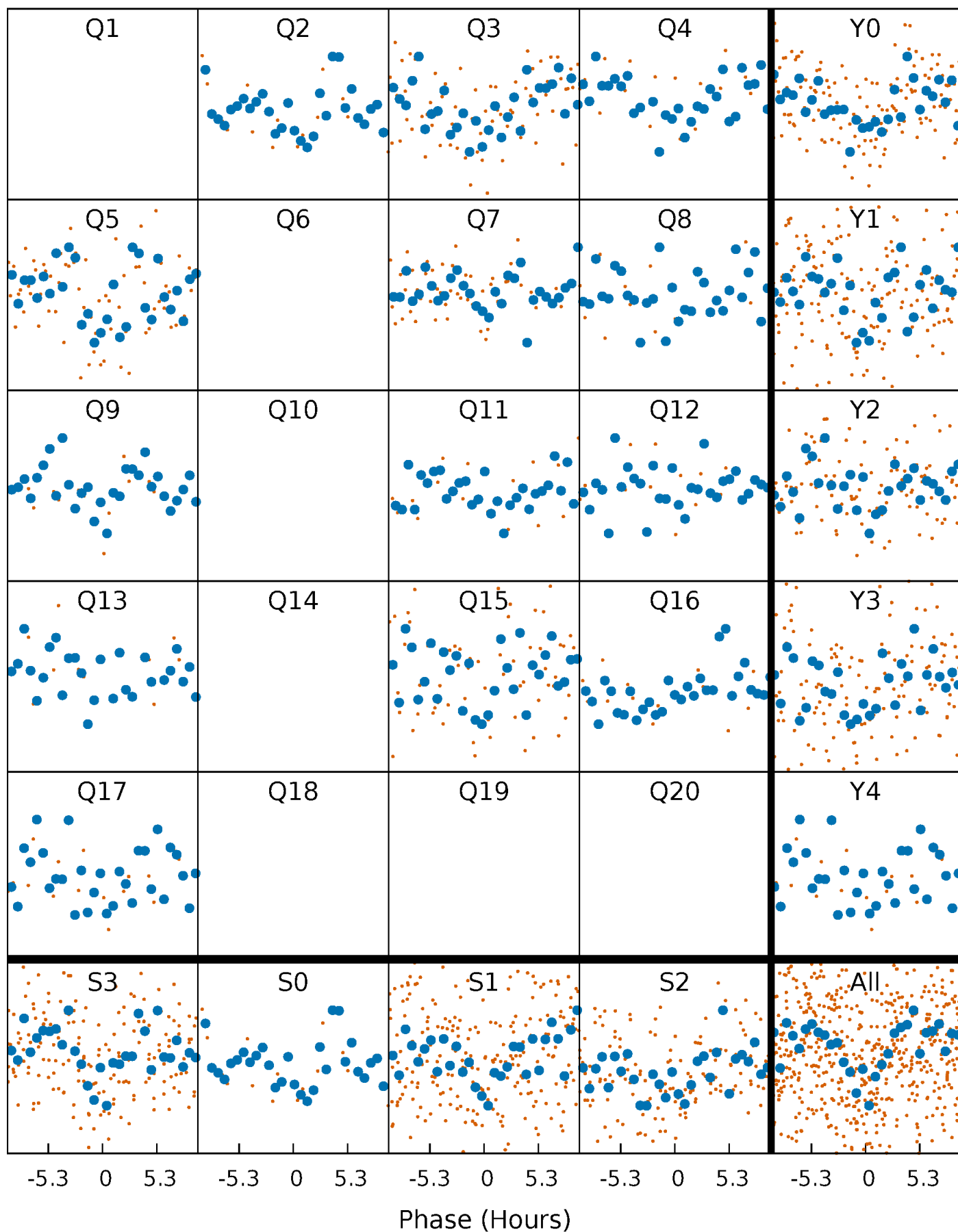


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



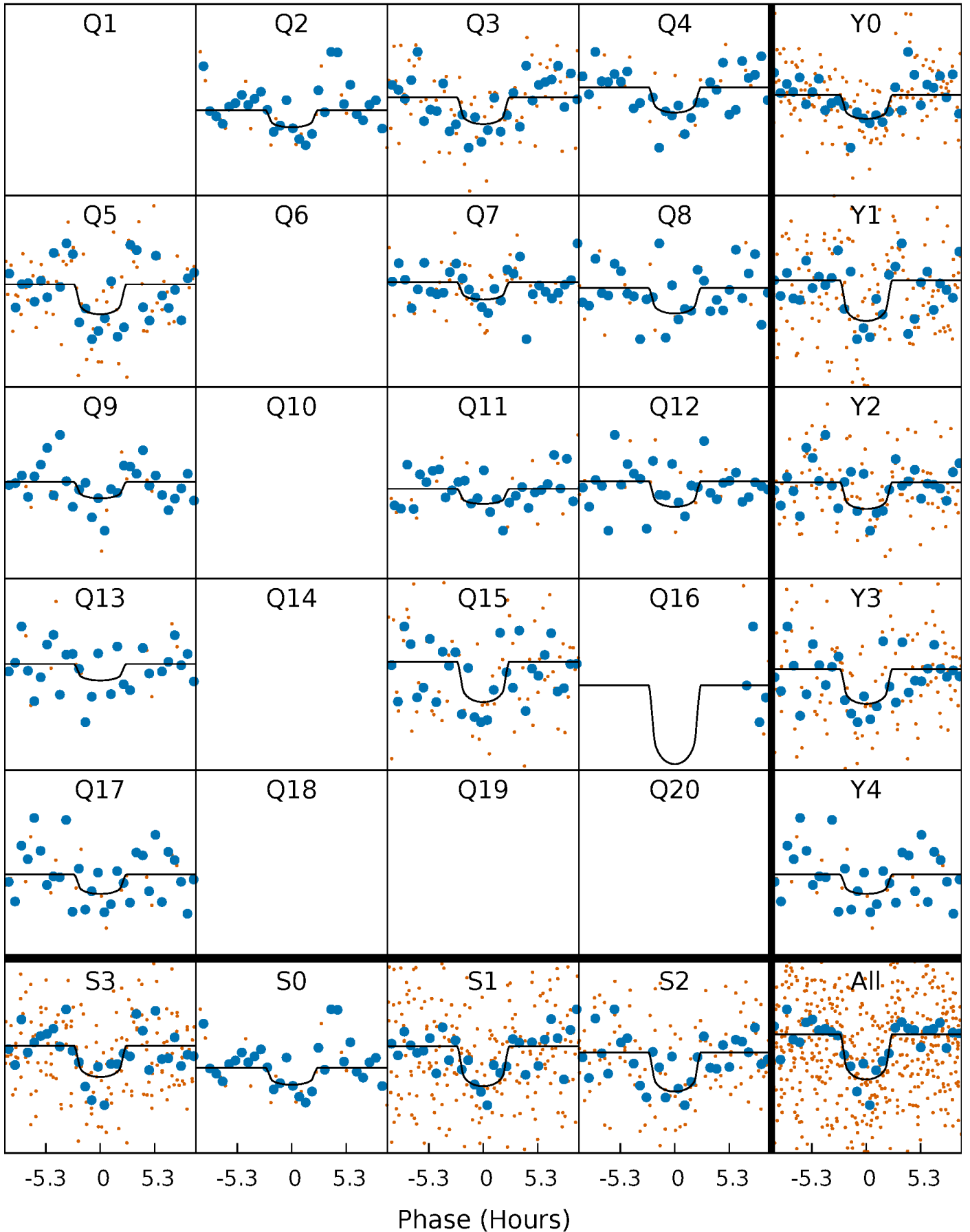
PDC Quarter-Phased Transit Curves

TCE 003559860-02 $P = 58.940659$ Days $T_0 = 159.623804$ (BKJD)



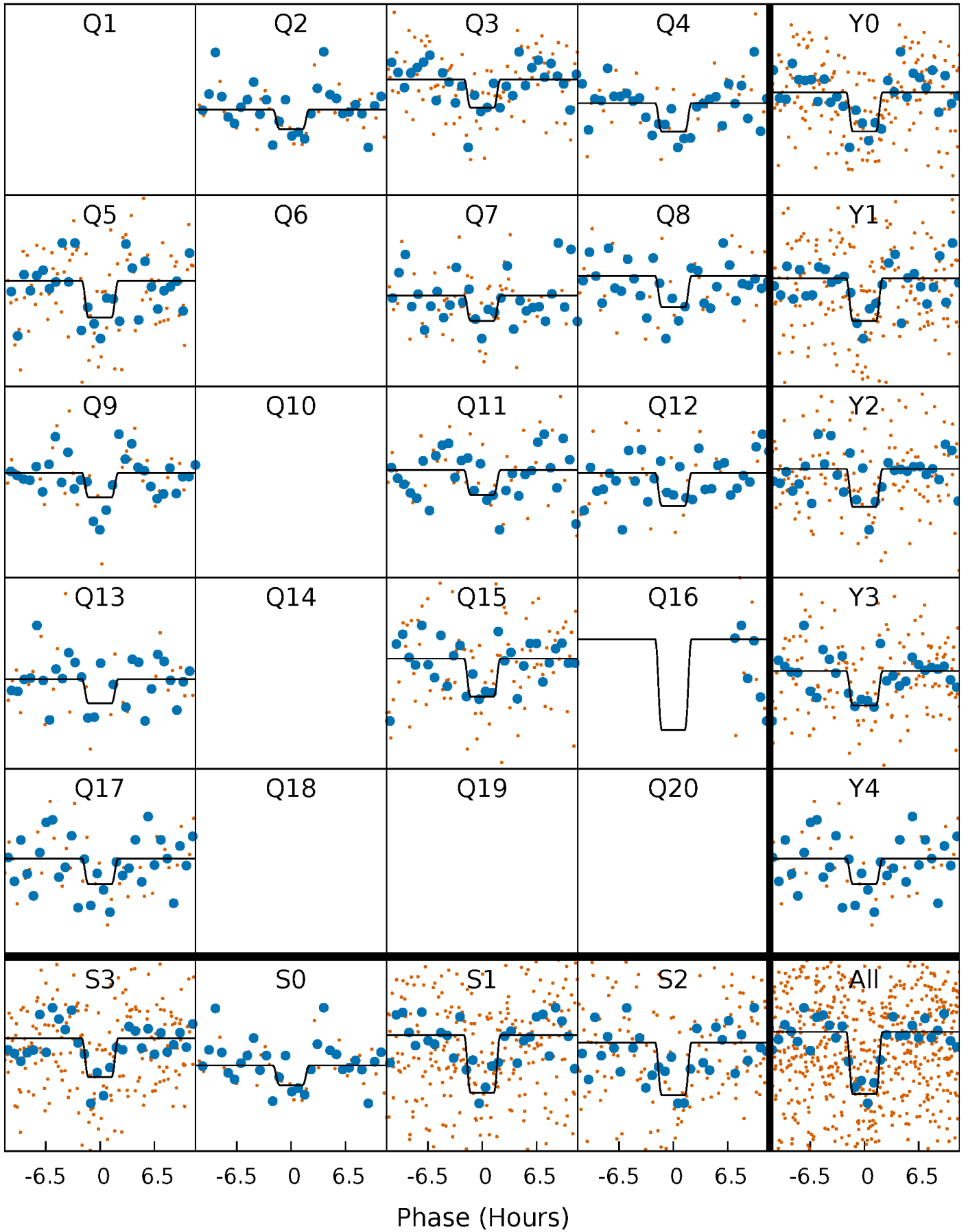
DV Quarter-Phased Transit Curves

TCE 003559860-02 P= 58.940659 Days $T_0=159.623804$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

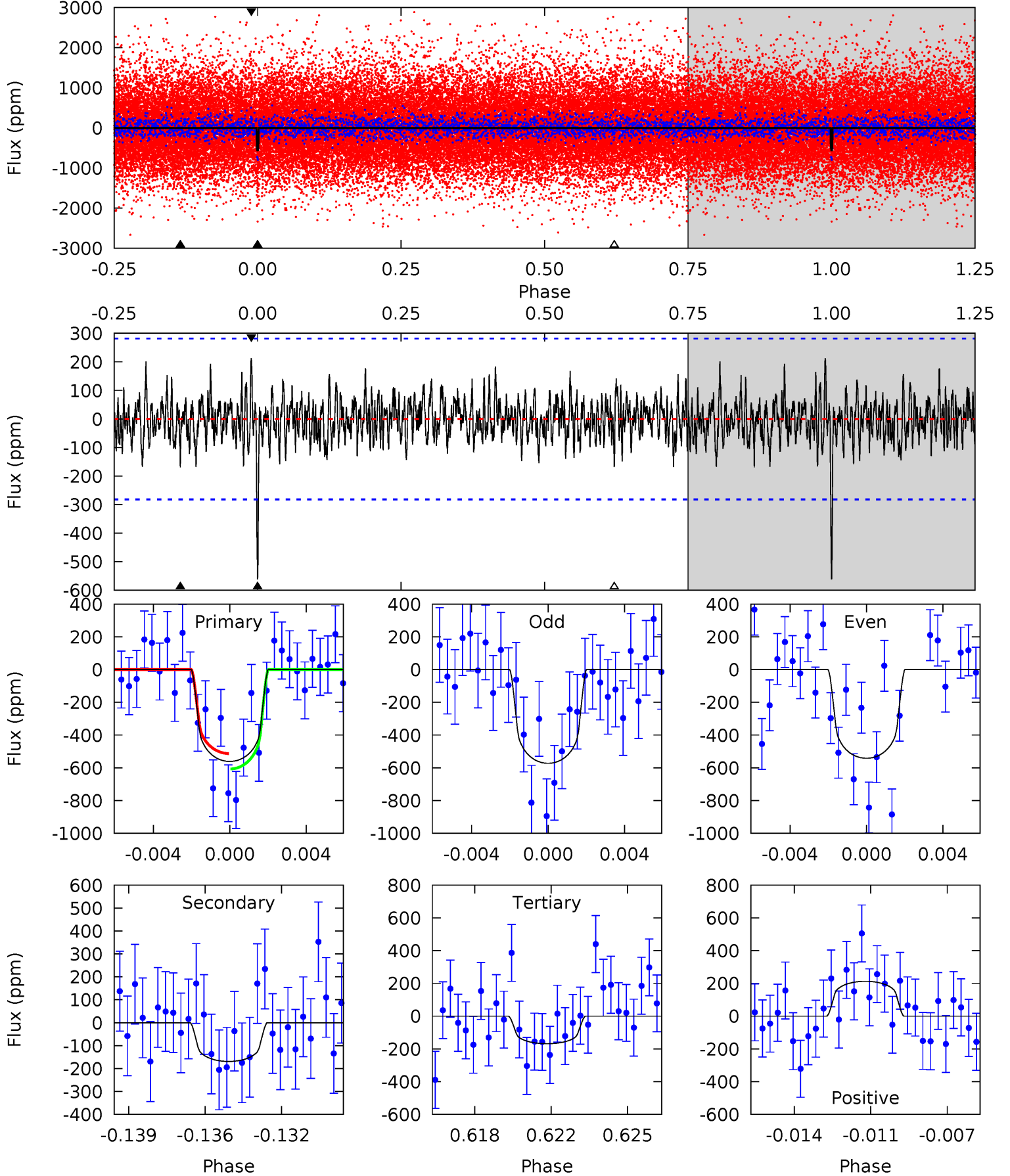
TCE 003559860-02 P= 58.939968 Days $T_0=159.628125$ (BKJD)



DV Model-Shift Uniqueness Test

003559860-02, P = 58.940659 Days, E = 159.623804 Days

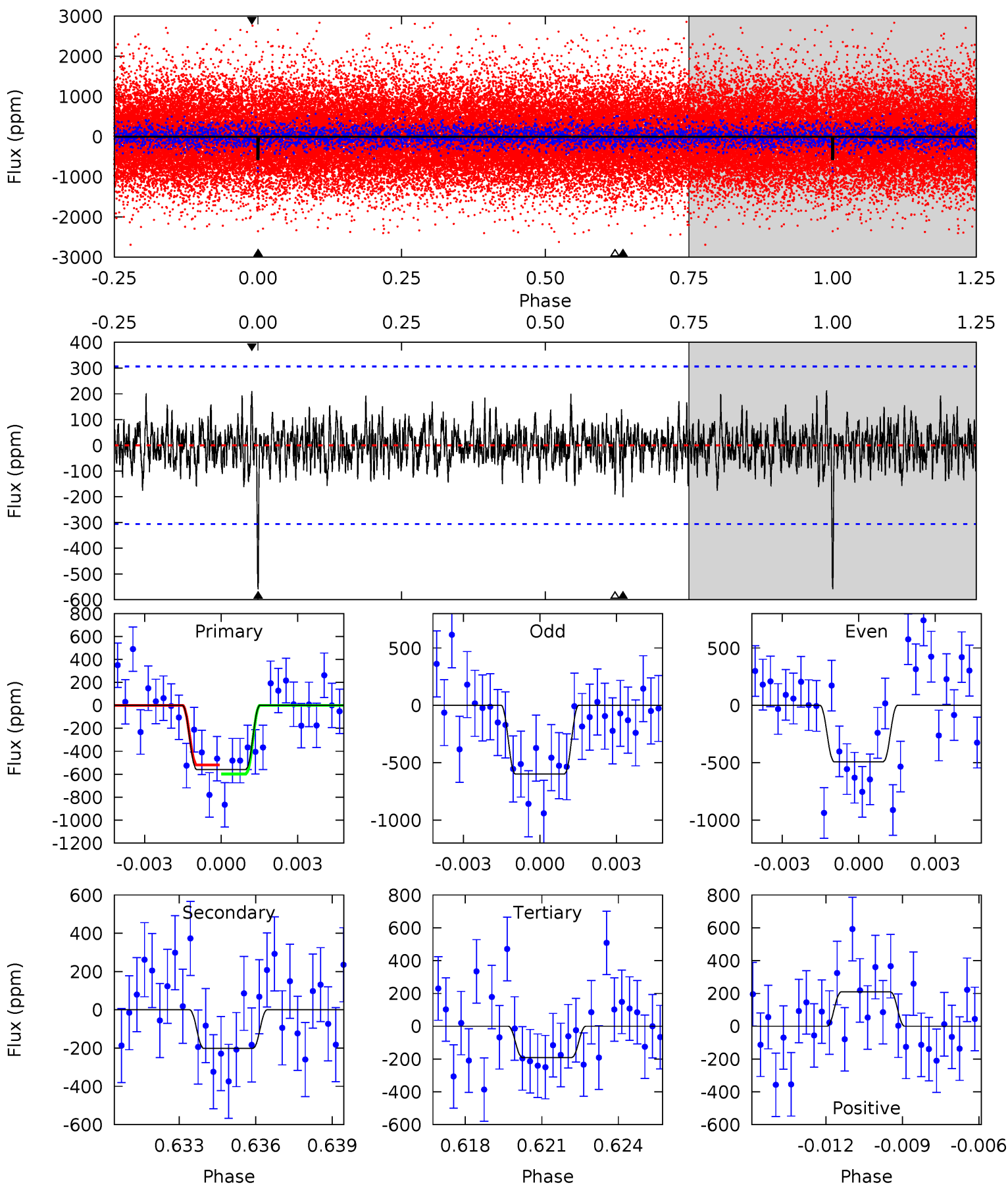
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	3.13	3.12	3.94	5.22	2.91	1.11	7.28	6.46	0.01	-0.81	0.28	0.93	0.27	0.87



Alt Model-Shift Uniqueness Test

003559860-02, P = 58.939968 Days, E = 159.628125 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.58	3.46	3.28	3.60	5.25	2.96	1.02	6.30	5.98	0.18	-0.14	0.89	0.94	0.27	0.67



Stellar Parameters For KIC 003559860

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5819^{+69}_{-87}	$4.468^{+0.032}_{-0.128}$	$0.140^{+0.150}_{-0.150}$	$0.990^{+0.163}_{-0.054}$	$1.049^{+0.059}_{-0.073}$	$1.523^{+0.187}_{-0.539}$
	+1%/-1%	+1%/-3%	+107%/-107%	+16%/-5%	+6%/-7%	+12%/-35%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003559860-02 / KOI 3440.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-169 ± 54	$3.86^{+3.52}_{-2.61}$	657^{+28}_{-16}	3890^{+2358}_{-746}	546^{+4555}_{-398}
Alt.	-202 ± 58	$4.09^{+3.66}_{-2.69}$	656^{+26}_{-16}	3923^{+2168}_{-750}	591^{+4264}_{-437}

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

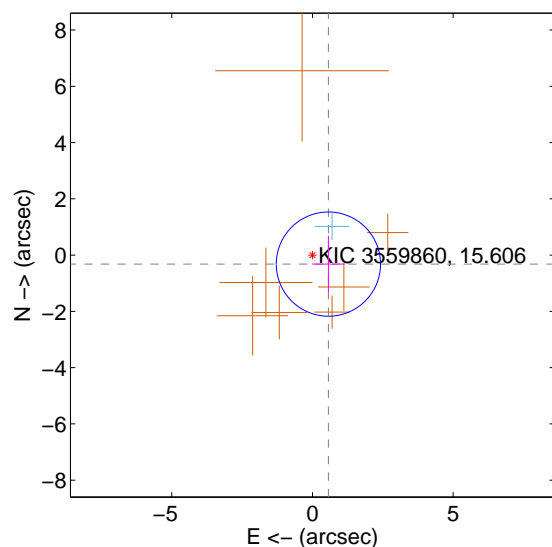
Supplemental centroid analysis for 003559860-02. Kepler magnitude: 15.61. Transit SNR 7.99

There are 1 quarters with good PRF difference image offsets

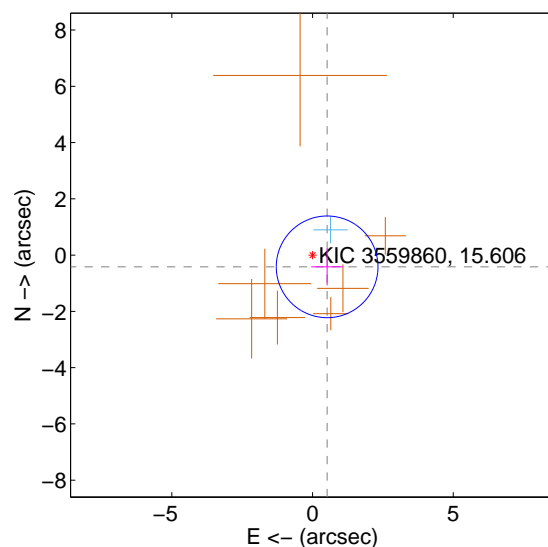
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.652 ± 0.617	1.06	-0.568 ± 0.581	-0.320 ± 1.003
PRF-fit source offset from KIC position	0.666 ± 0.602	1.11	-0.519 ± 0.564	-0.417 ± 0.657
photometric centroid source offset	2.56 ± 1.54	1.67	0.65 ± 1.68	2.48 ± 1.52

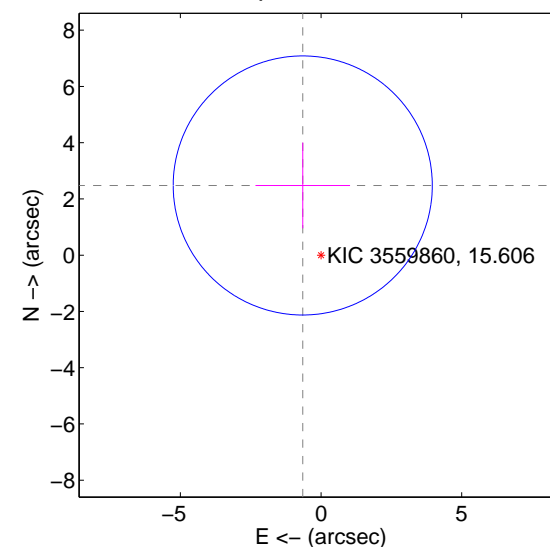
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

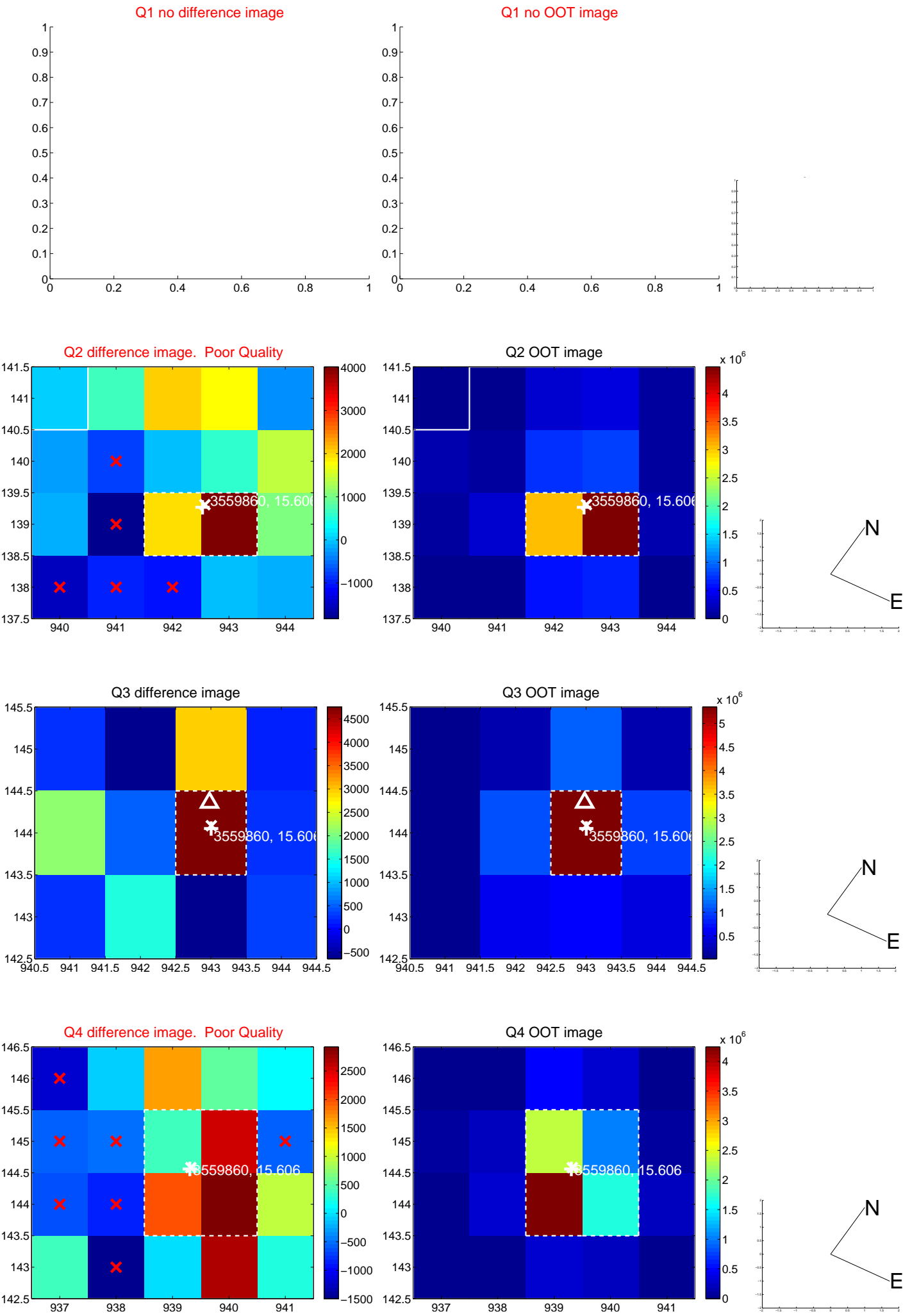


offset from photometric centroids

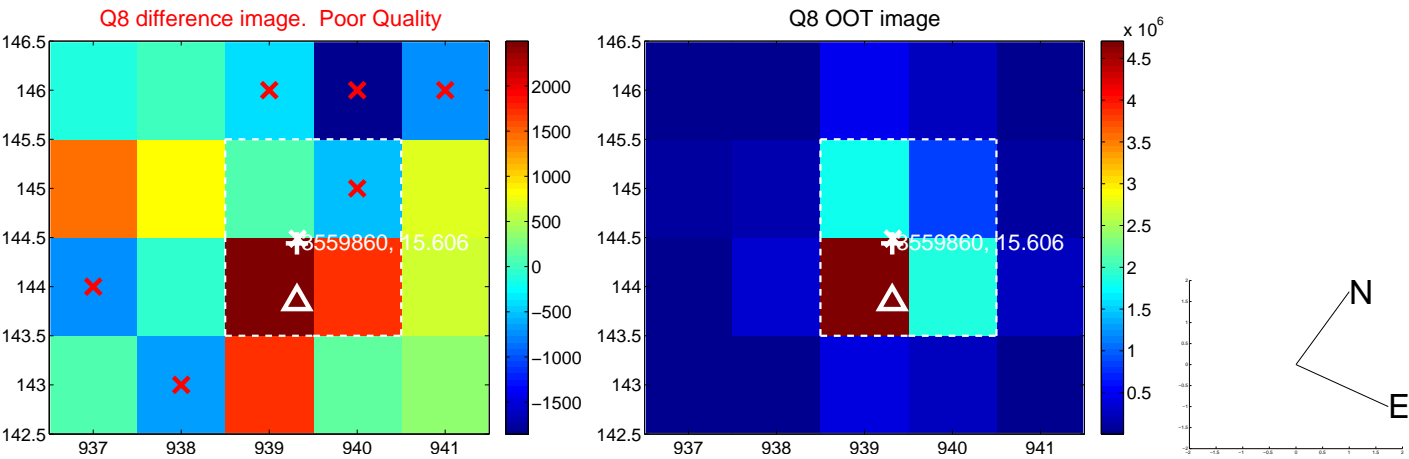
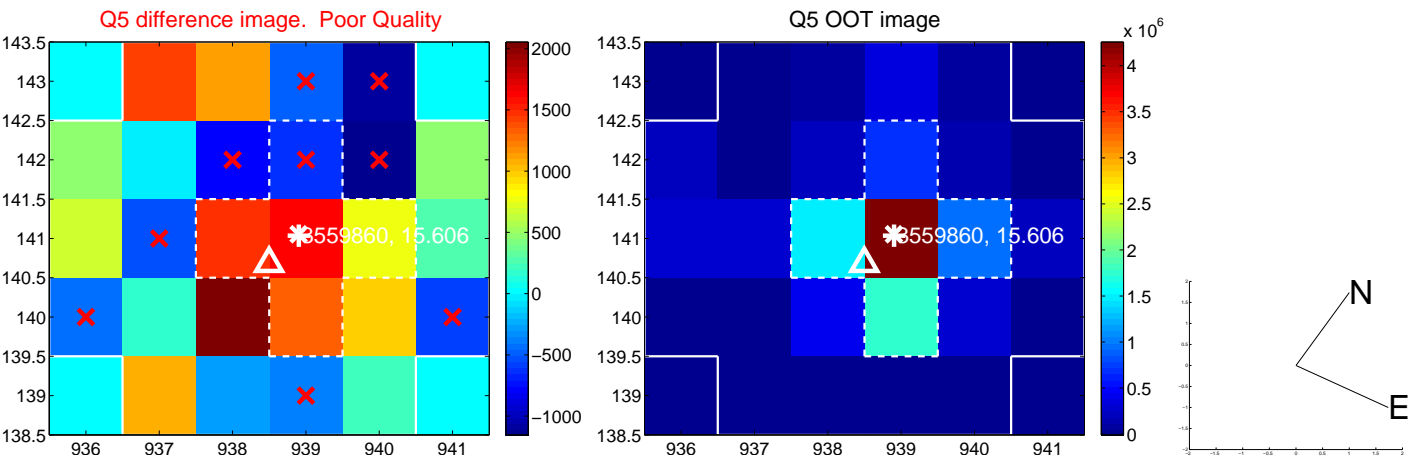


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

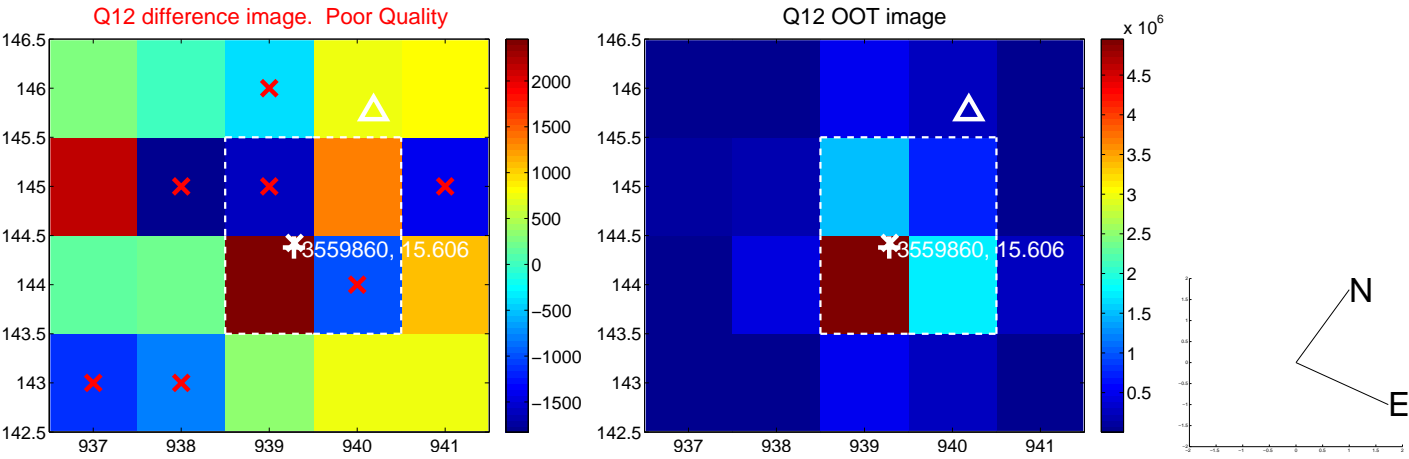
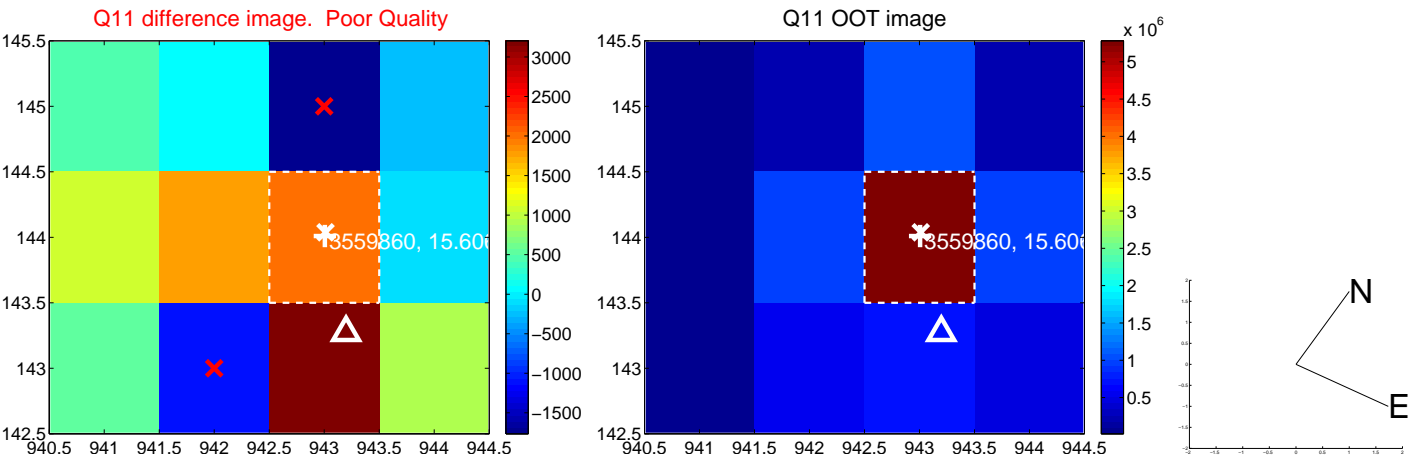
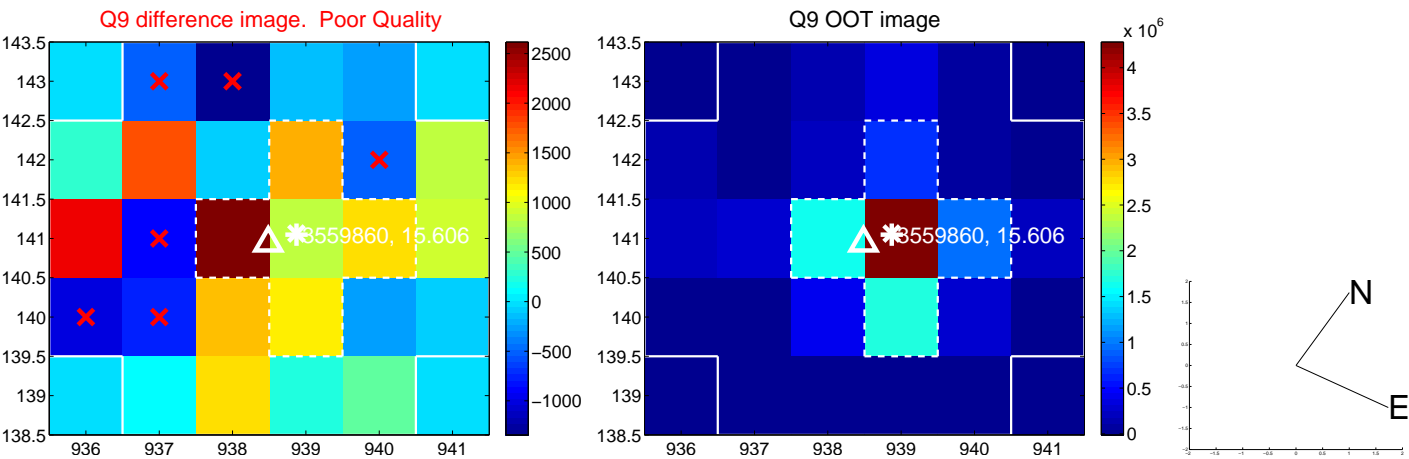
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



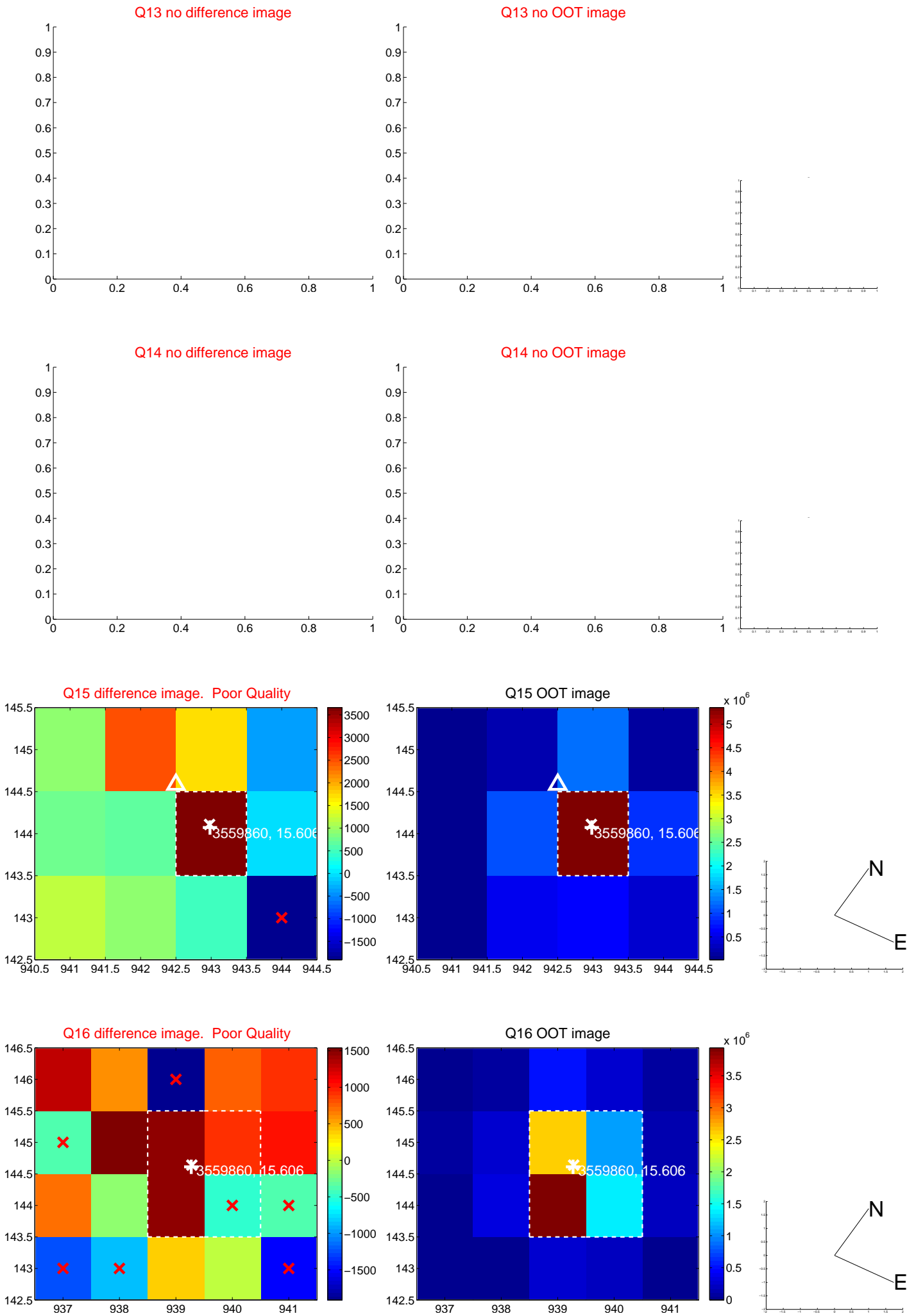
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



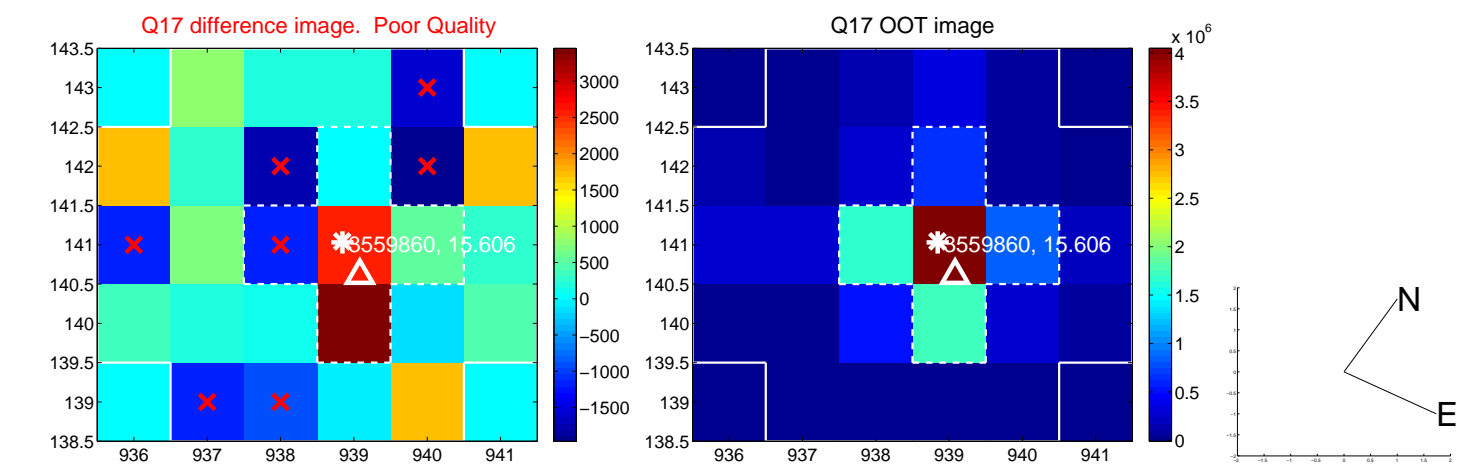
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



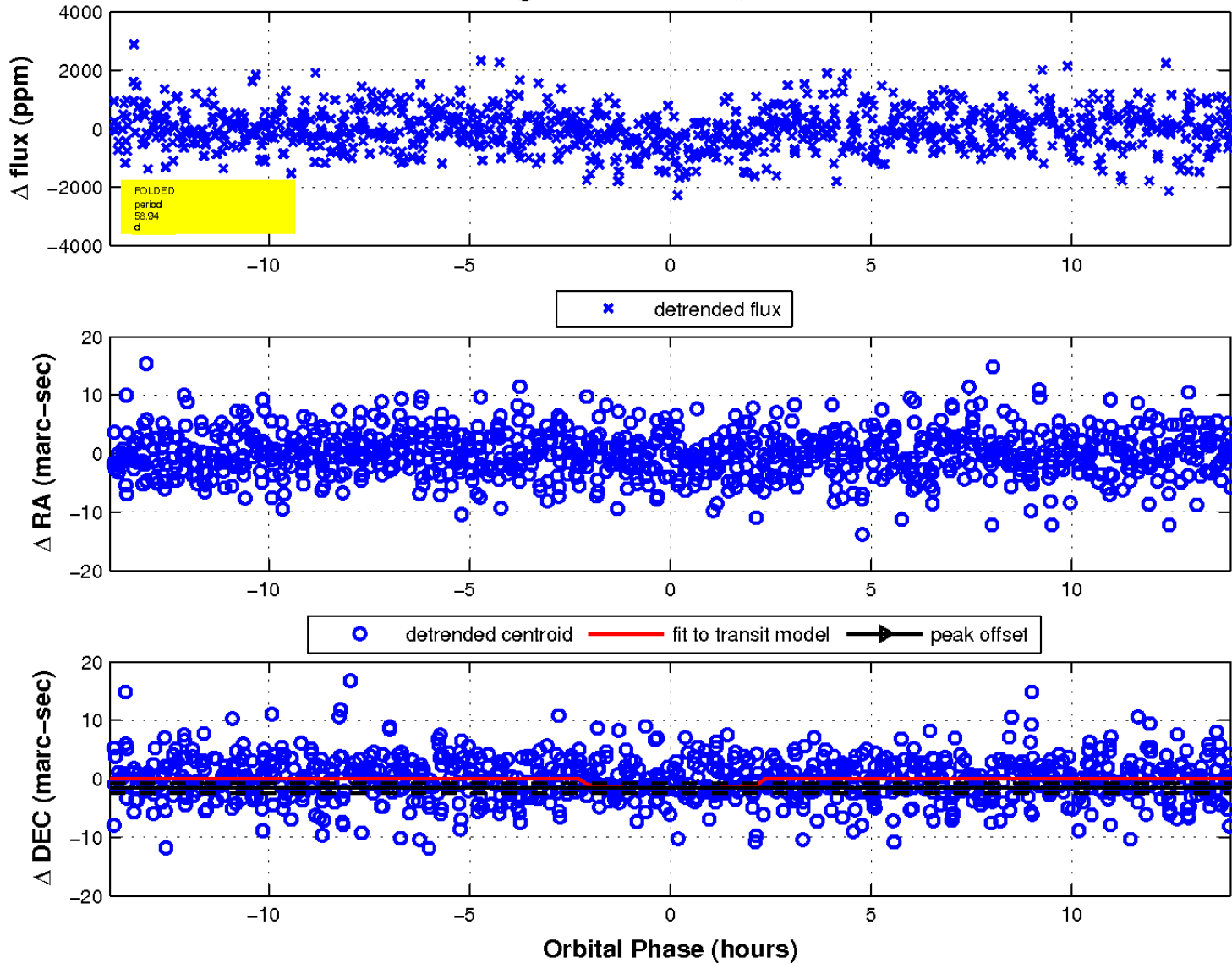
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

