

KIC 008559644

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})
008559644-01	OBS	0139.01	224.782718	142.092071	3480.4	11.037	153.2	147.0	1.24	5873	7.67	2.93
008559644-02	OBS	0139.02	3.341809	134.669846	156.4	3.073	35.9	39.3	1.24	5873	1.84	800.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008559644-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008559644-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

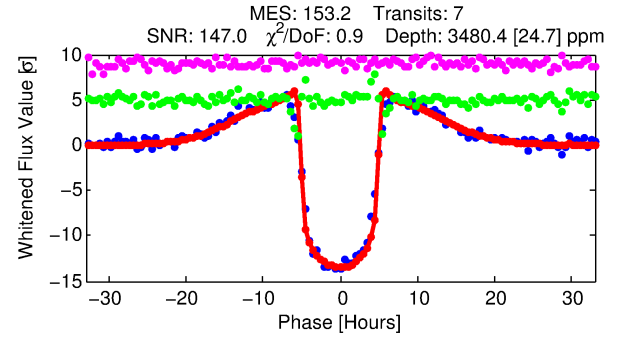
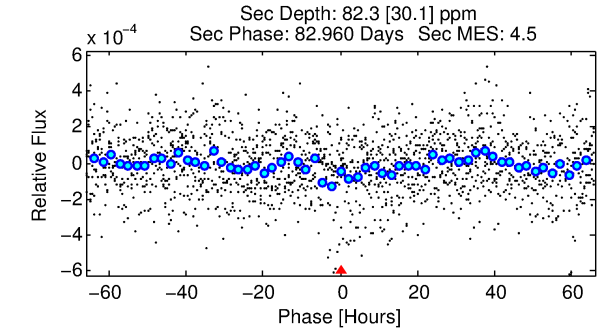
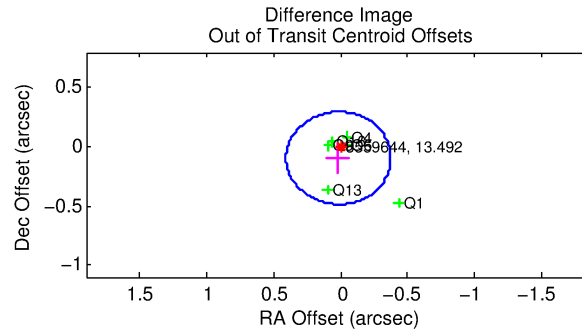
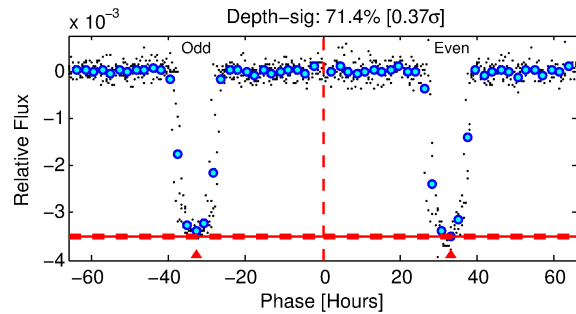
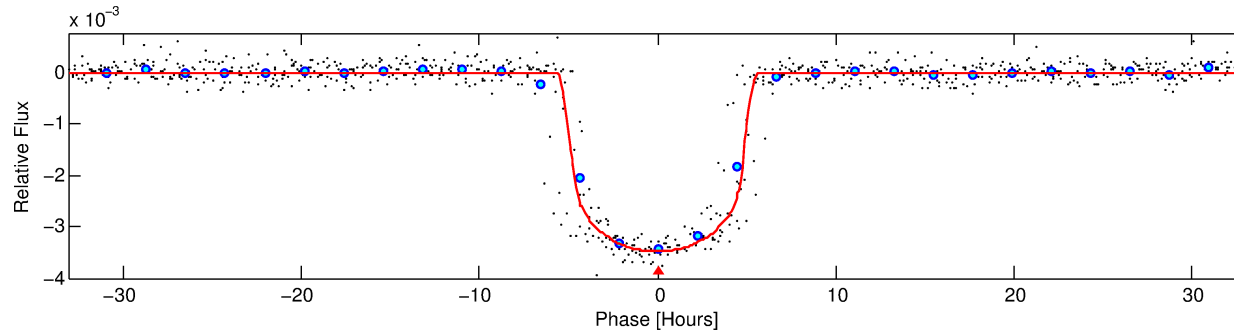
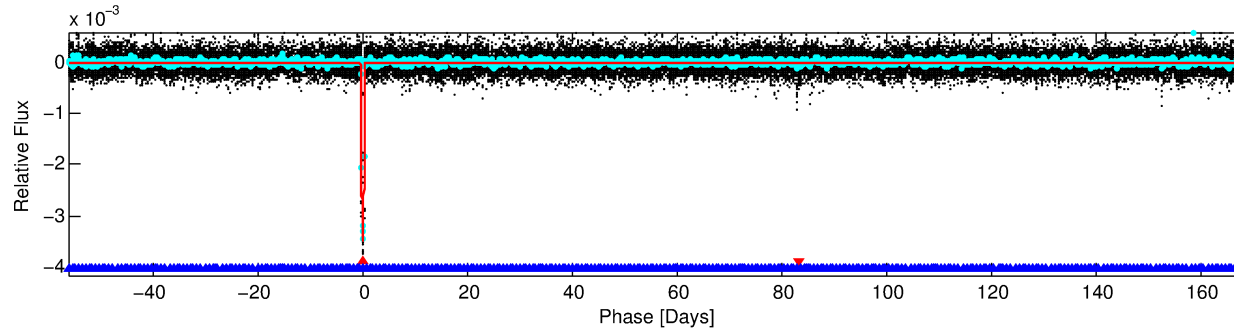
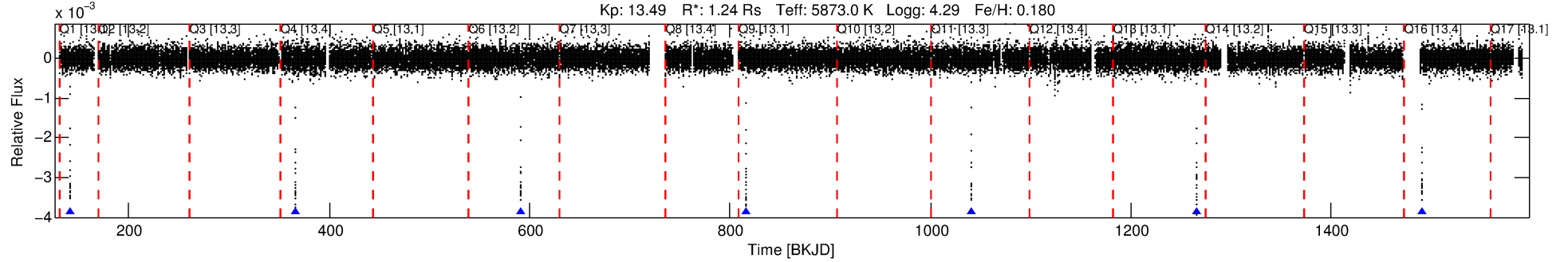
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008559644-01

No Significant Match Found

DV One-Page Summary

KIC: 8559644 Candidate: 1 of 2 Period: 224.783 d
KOI: K00139.01 Name: Kepler-111c Corr: 0.969



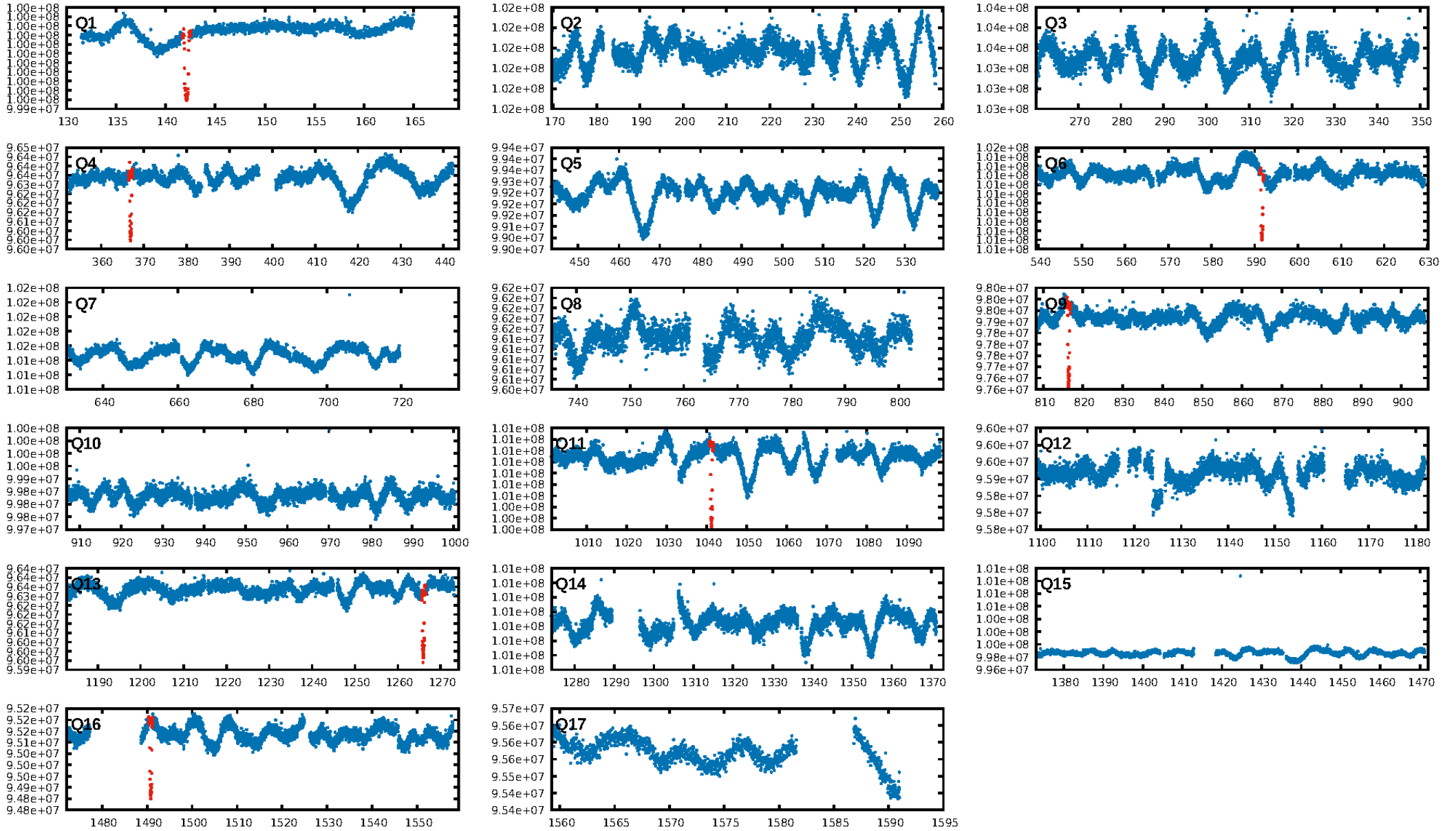
DV Fit Results:

Period = 224.78272 [0.00028] d
Epoch = 142.0921 [0.0010] BKJD
Rp/R* = 0.0569 [0.0006]
a/R* = 129.68 [5.00]
b = 0.65 [0.03]
Seff = 2.93 [0.69]
Teq = 334 [20] K
Rp = 7.67 [1.33] Re
a = 0.7453 [0.1098] AU
Ag = 427.21 [181.82] [2.34 σ]
Teffp = 2344 [221] K [9.08 σ]

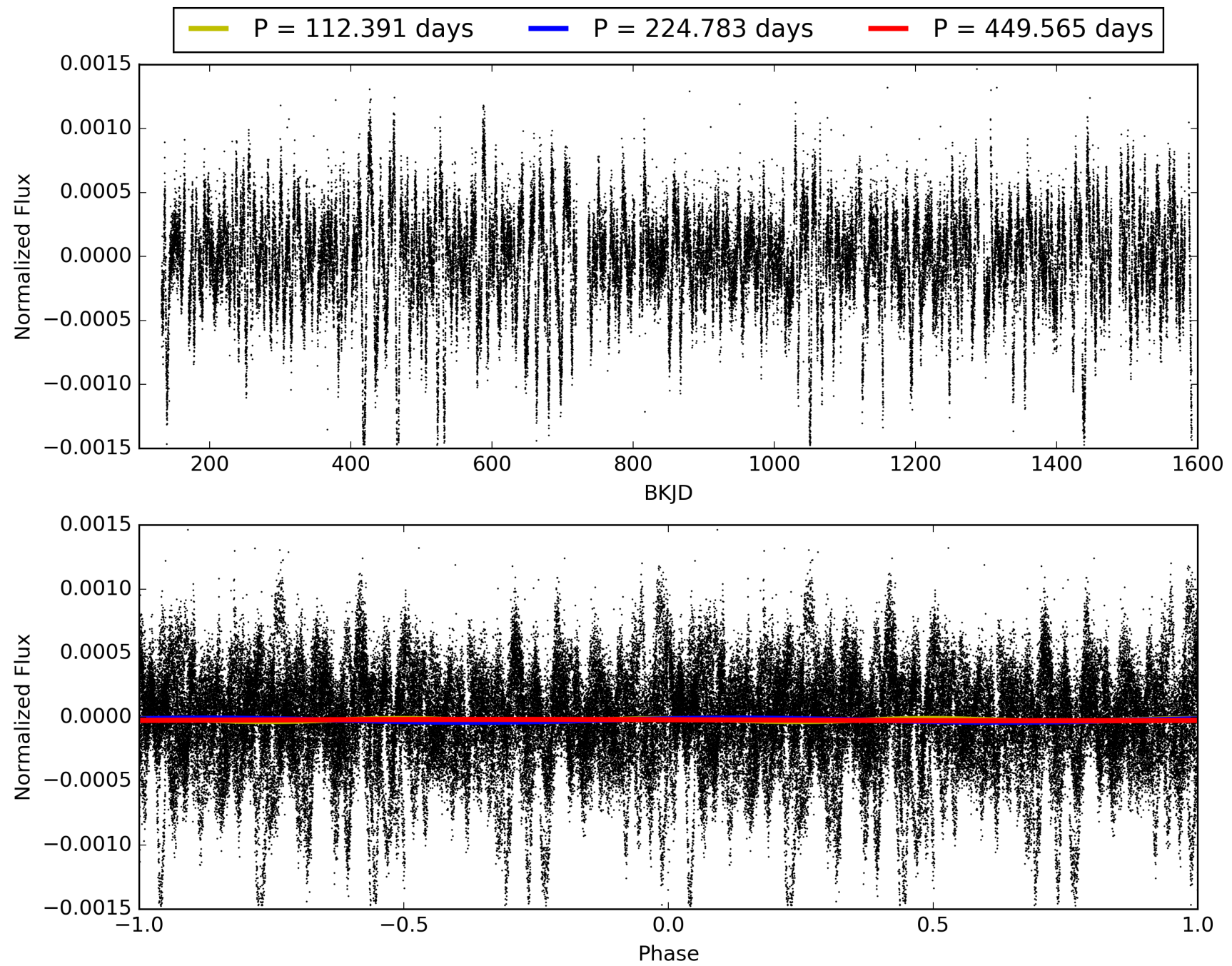
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [463.89 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 88.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 6.526
Centroid-sig: 34.4%
Centroid-so: 0.006 arcsec [0.10 σ]
OotOffset-rm: 0.096 arcsec [0.73 σ]
OotOffset-st: 1/0/2/3 [6]
KicOffset-rm: 0.135 arcsec [0.97 σ]
KicOffset-st: 1/0/2/3 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 0.33 [2/6]

TCE 008559644-01, PDC Light Curves

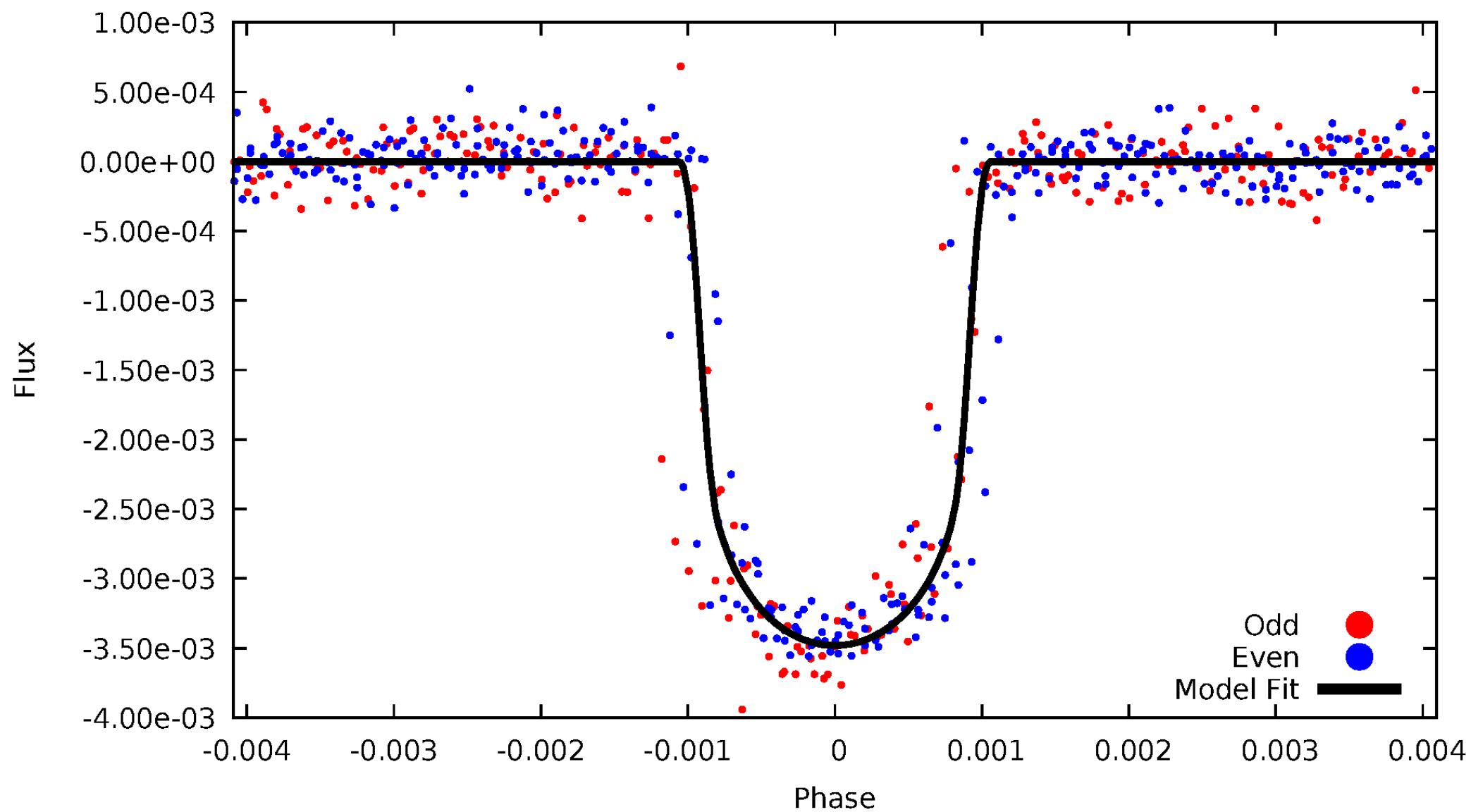


TCE 008559644-01



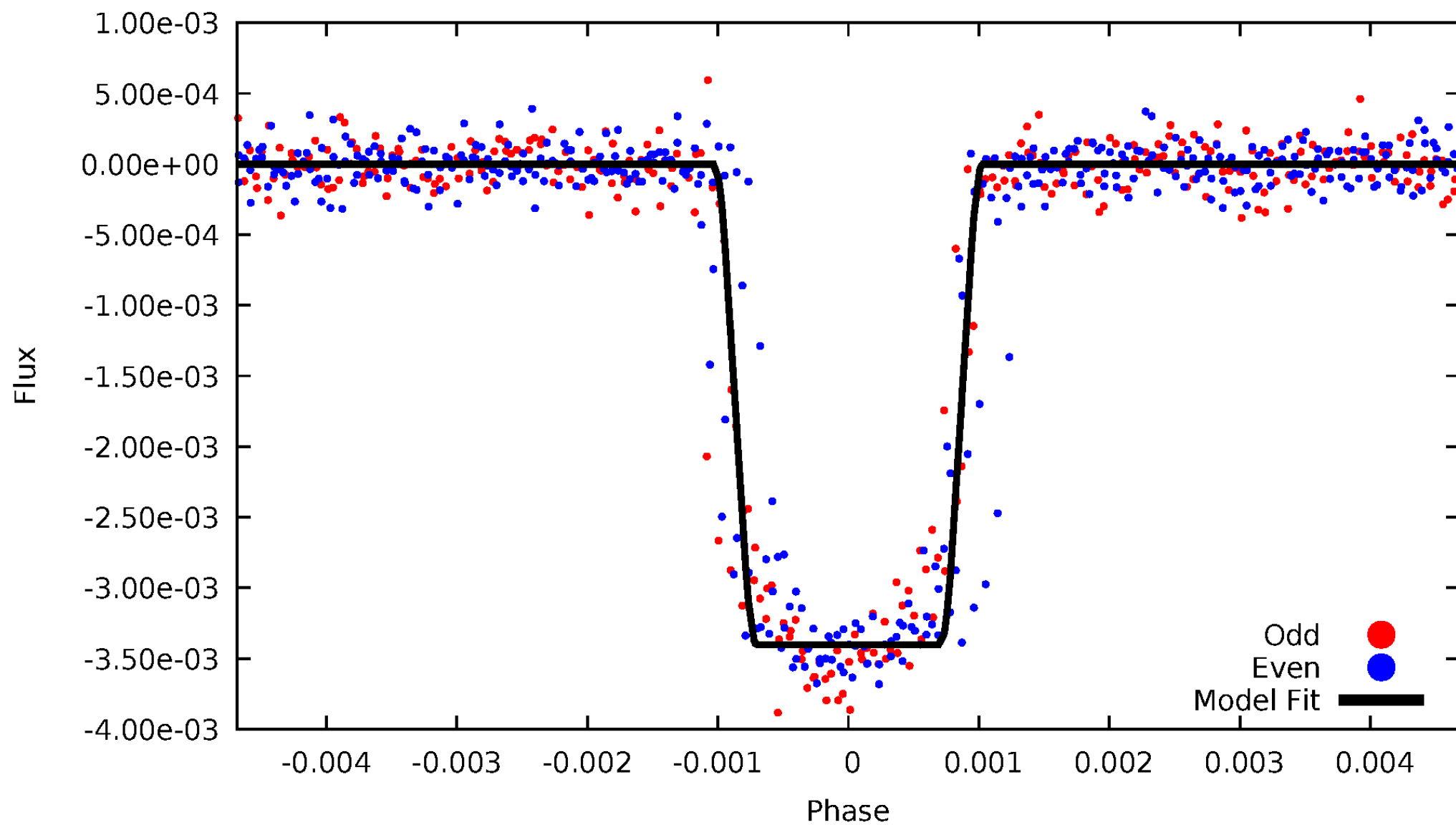
DV Odd/Even

TCE 008559644-01



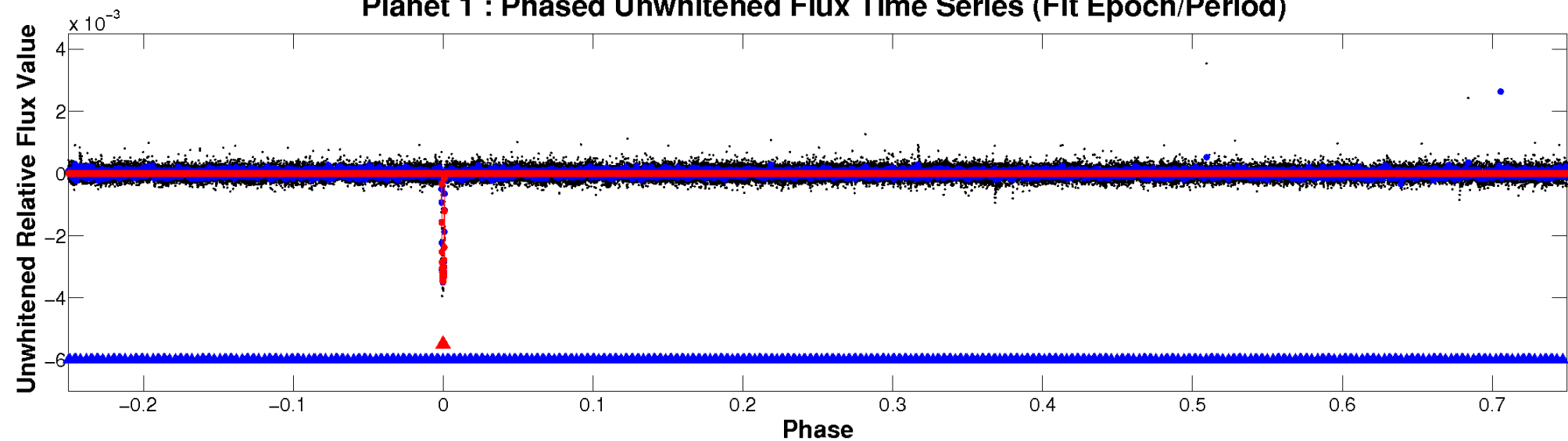
ALT Odd/Even

TCE 008559644-01

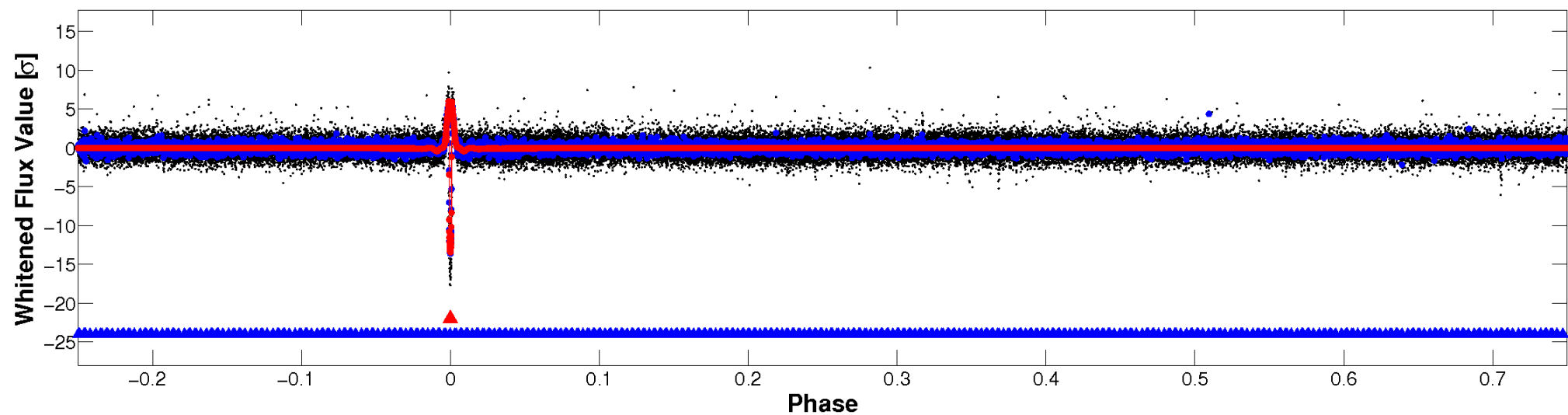


Non-Whitened Vs. Whitened Light Curve

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

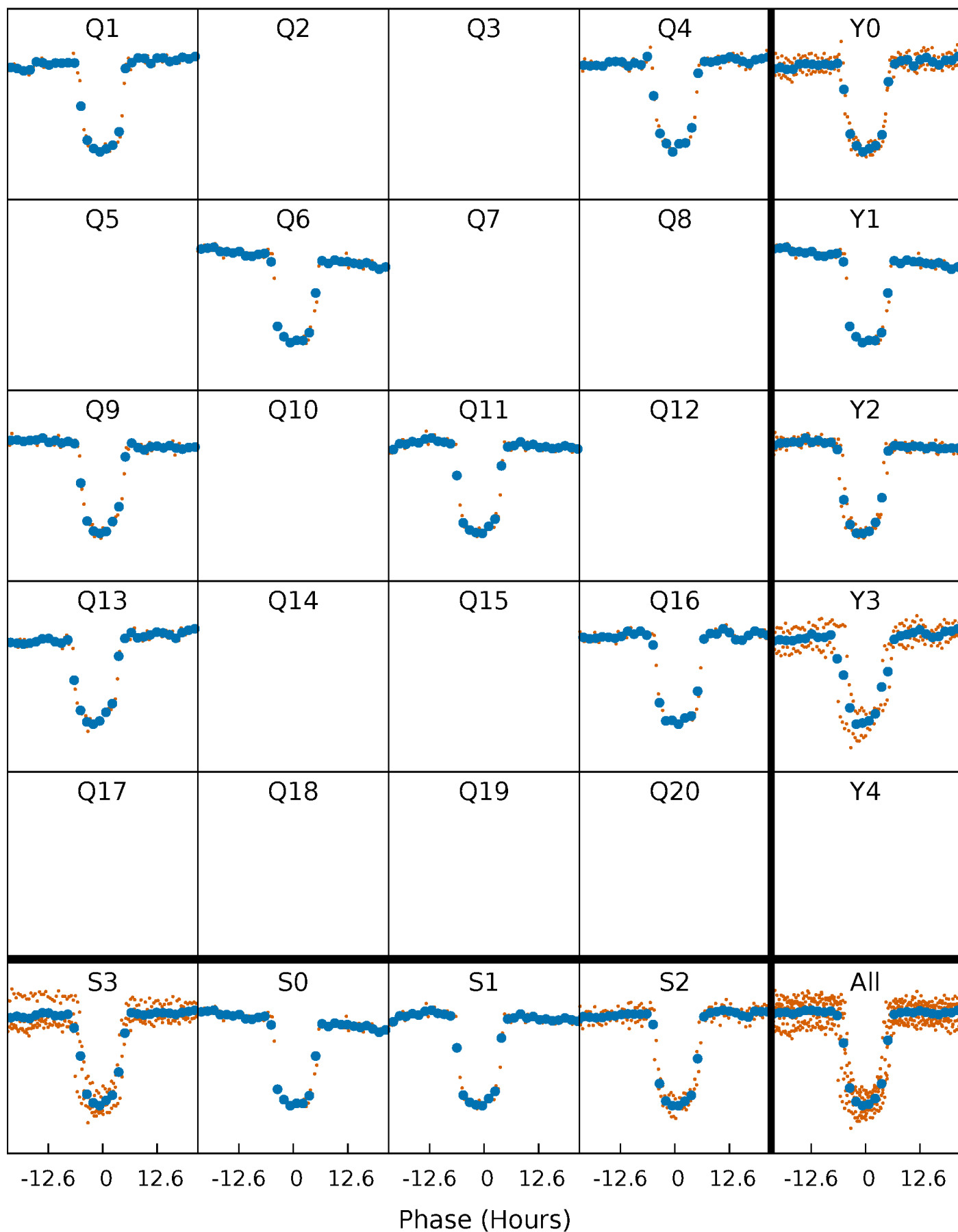


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



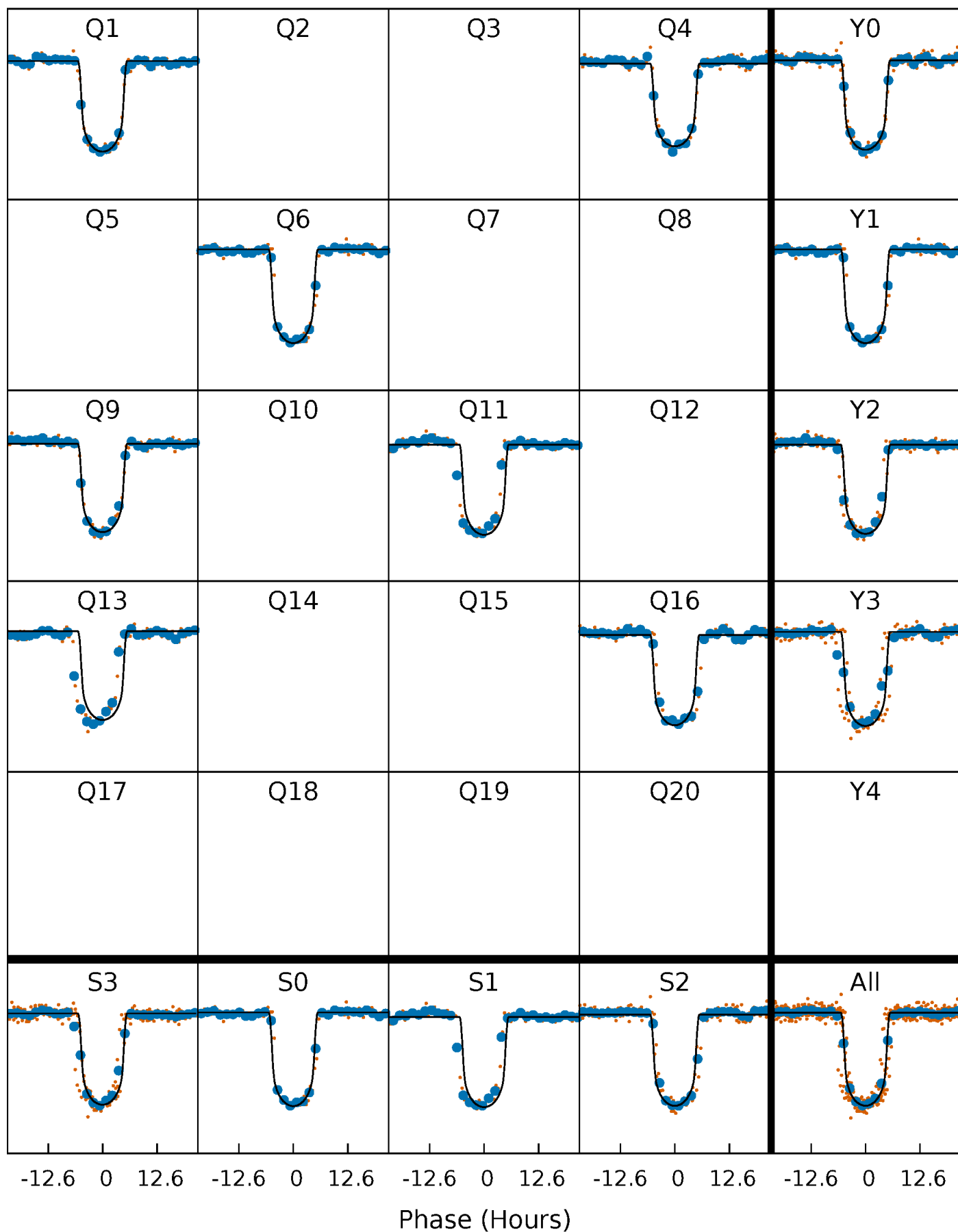
PDC Quarter-Phased Transit Curves

TCE 008559644-01 P=224.782718 Days $T_0=142.092071$ (BKJD)



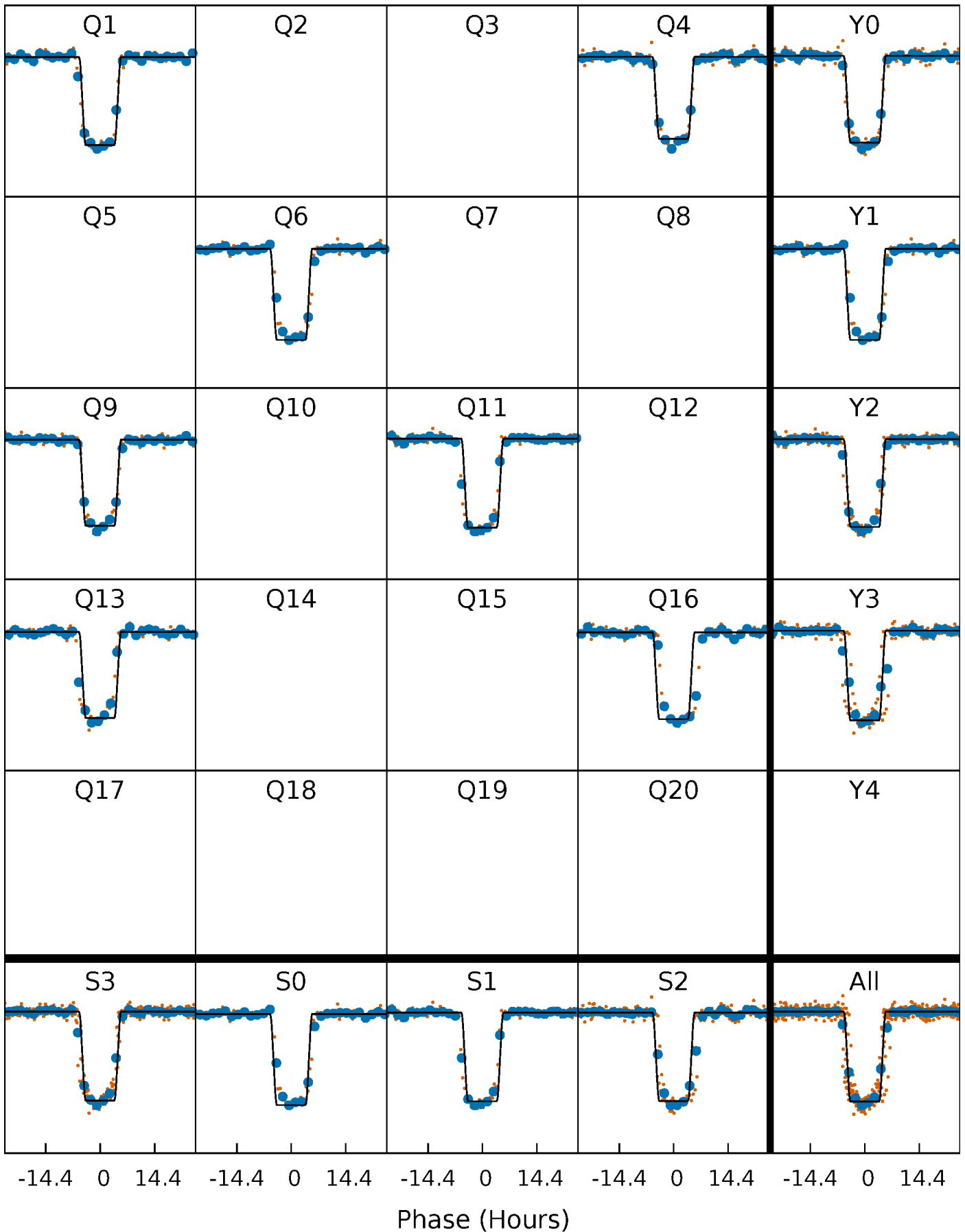
DV Quarter-Phased Transit Curves

TCE 008559644-01 P=224.782718 Days $T_0=142.092071$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

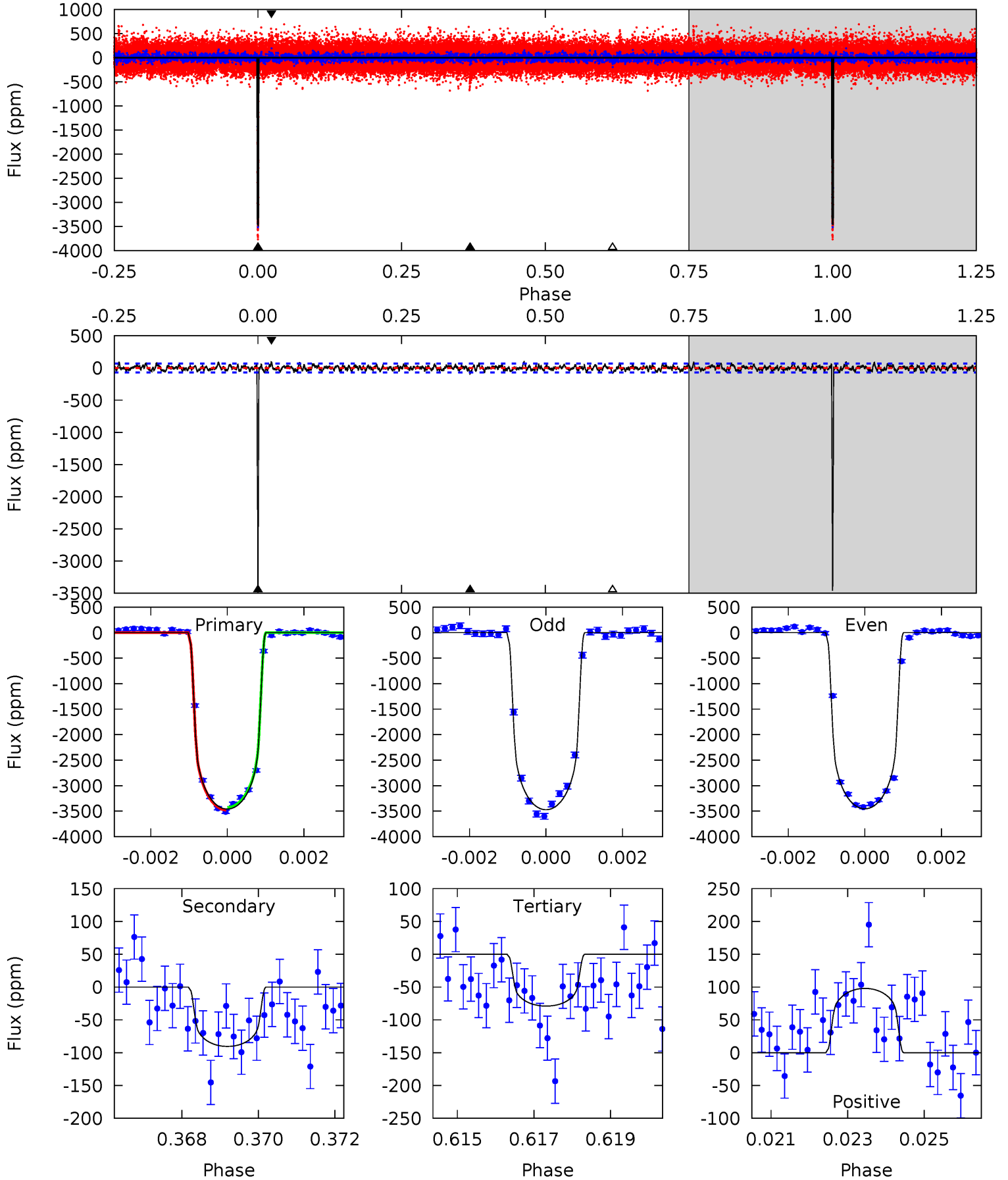
TCE 008559644-01 P=224.775971 Days $T_0=142.105217$ (BKJD)



DV Model-Shift Uniqueness Test

008559644-01, P = 224.782718 Days, E = 142.092071 Days

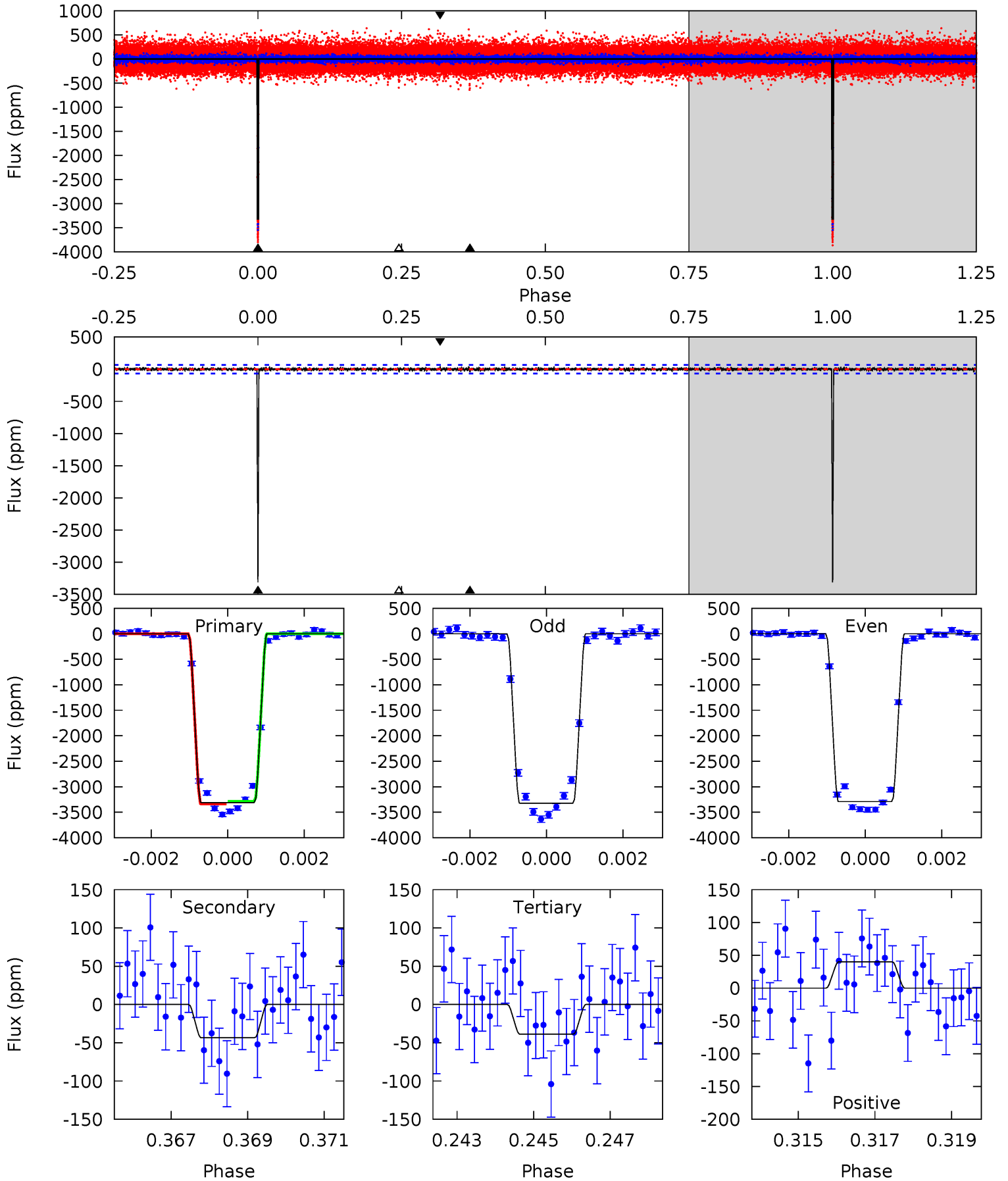
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
261.8	6.85	5.98	7.41	5.32	3.08	2.07	255.8	254.4	0.86	-0.56	0.72	1.01	0.03	1.98



Alt Model-Shift Uniqueness Test

008559644-01, P = 224.775971 Days, E = 142.105217 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
261.8	3.43	3.07	3.16	5.33	3.09	0.74	258.7	258.7	0.36	0.27	1.34	0.99	0.01	2.19



Stellar Parameters For KIC 008559644

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5873^{+93}_{-129}	$4.293^{+0.120}_{-0.120}$	$0.180^{+0.150}_{-0.150}$	$1.235^{+0.213}_{-0.194}$	$1.092^{+0.080}_{-0.089}$	$0.816^{+0.432}_{-0.282}$
	+2%/-2%	+3%/-3%	+83%/-83%	+17%/-16%	+7%/-8%	+53%/-35%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008559644-01 / KOI 0139.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-90 ± 13	$7.67^{+0.74}_{-0.66}$	465^{+22}_{-20}	3047^{+72}_{-84}	470^{+116}_{-104}
Alt.	-43 ± 13	$7.85^{+0.73}_{-0.68}$	465^{+20}_{-22}	2744^{+94}_{-117}	218^{+74}_{-71}

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 $A_{obs} \gg 1.0$

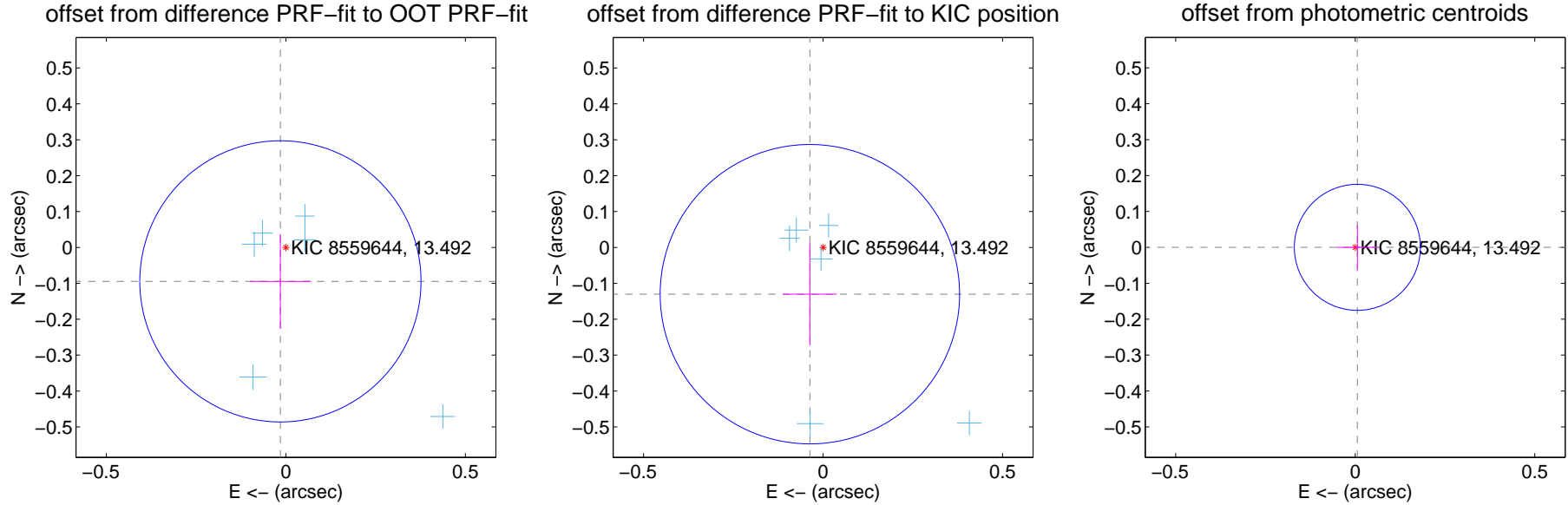
DV Centroid Data

Supplemental centroid analysis for 008559644-01. Kepler magnitude: 13.49. Transit SNR 146.98

There are 6 quarters with good PRF difference image offsets

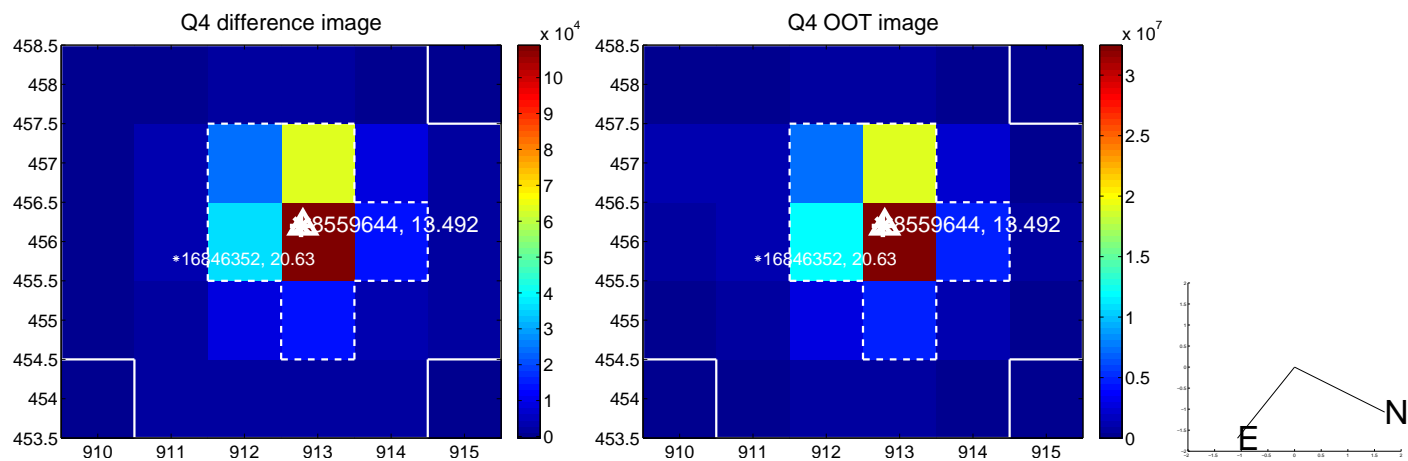
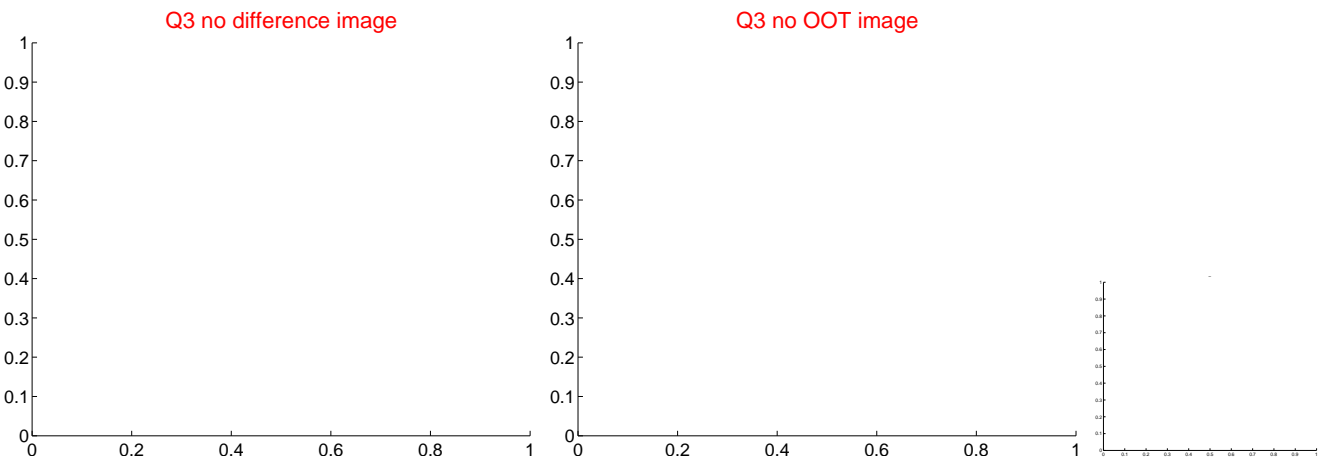
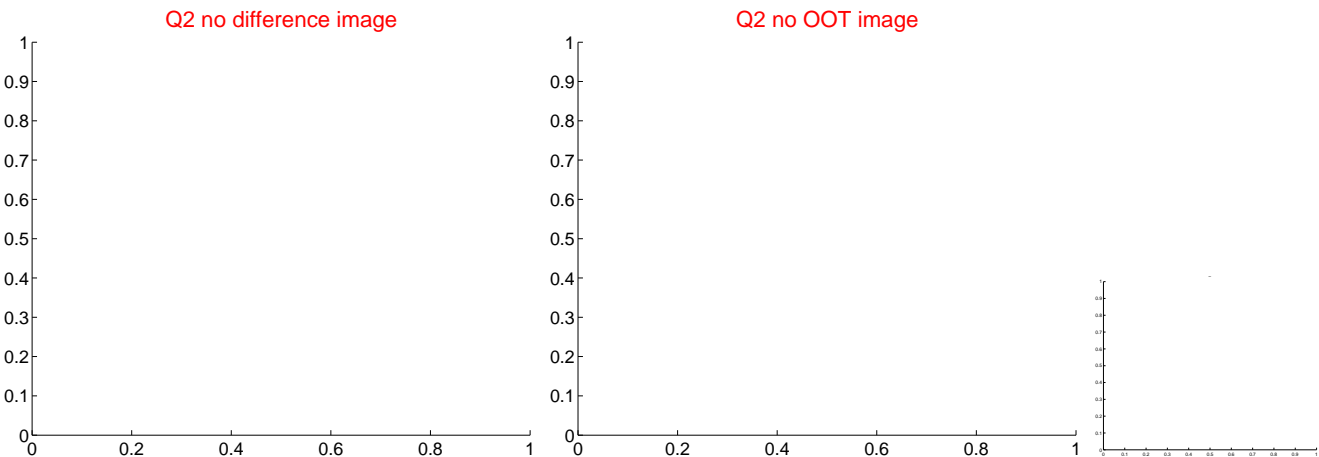
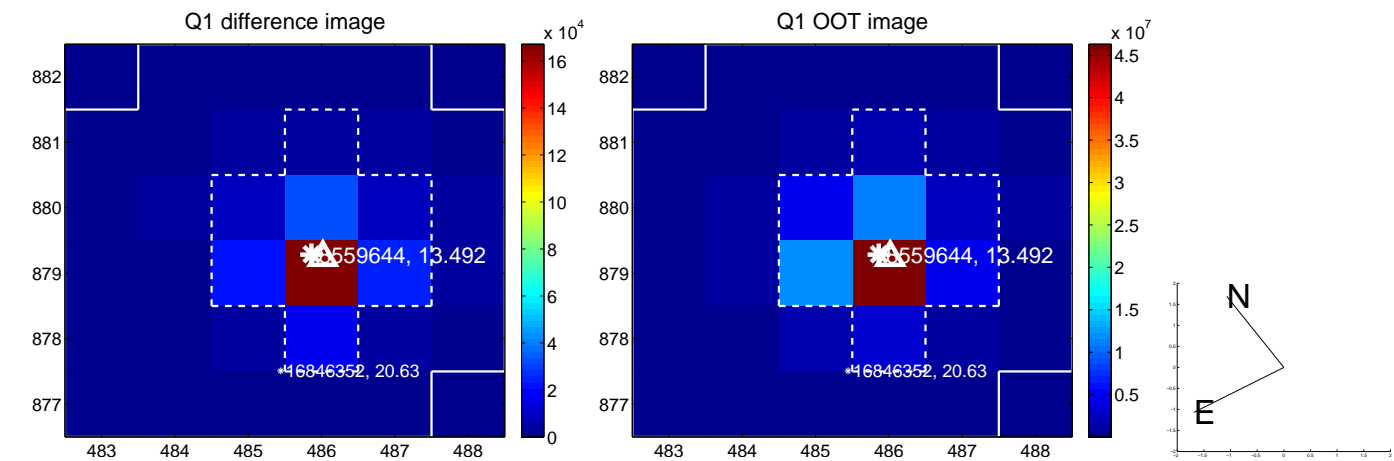
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.096 ± 0.131	0.73	0.015 ± 0.085	-0.094 ± 0.132
PRF-fit source offset from KIC position	0.135 ± 0.139	0.97	0.037 ± 0.075	-0.130 ± 0.143
photometric centroid source offset	0.01 ± 0.06	0.10	-0.01 ± 0.06	0.00 ± 0.06

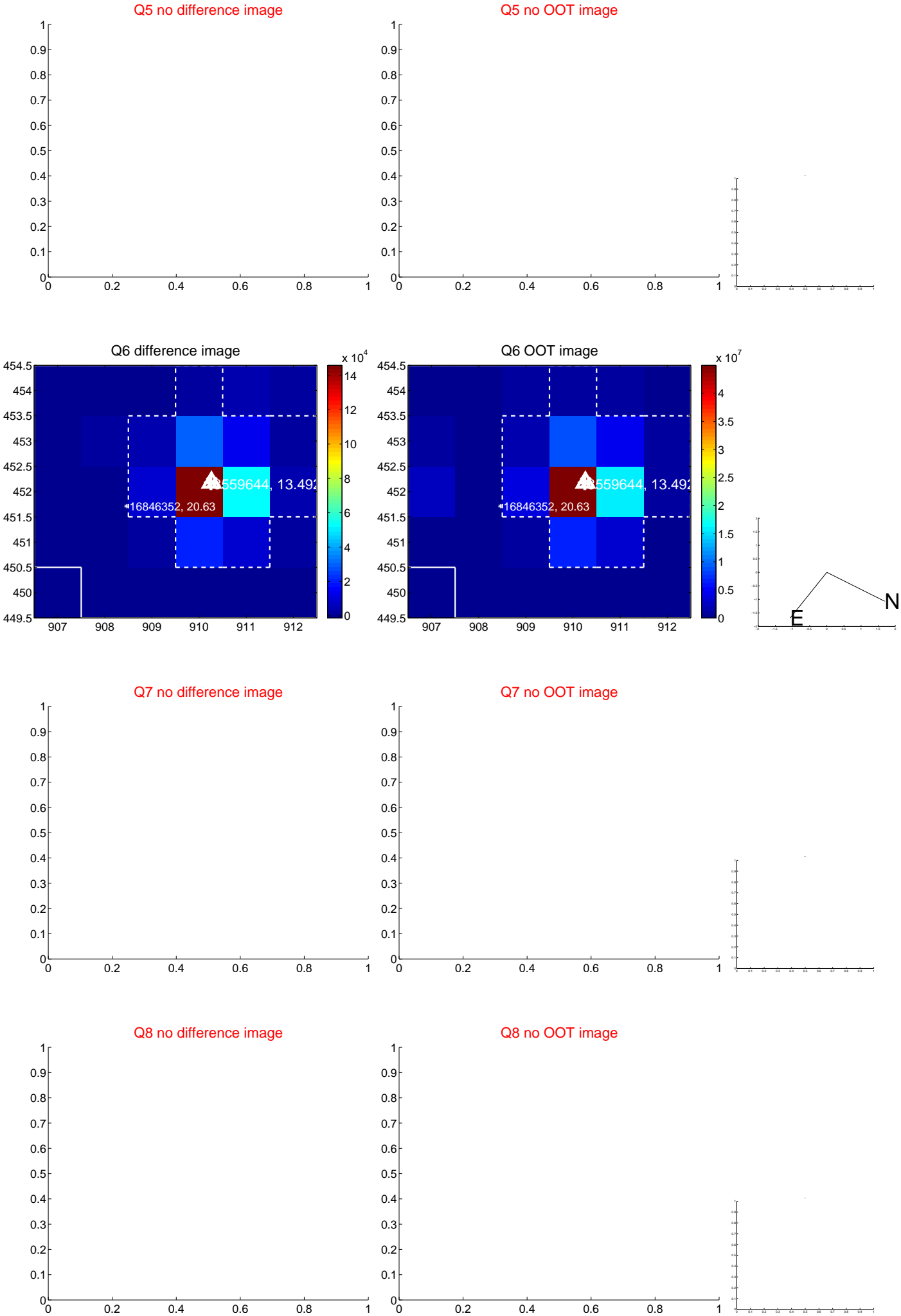


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

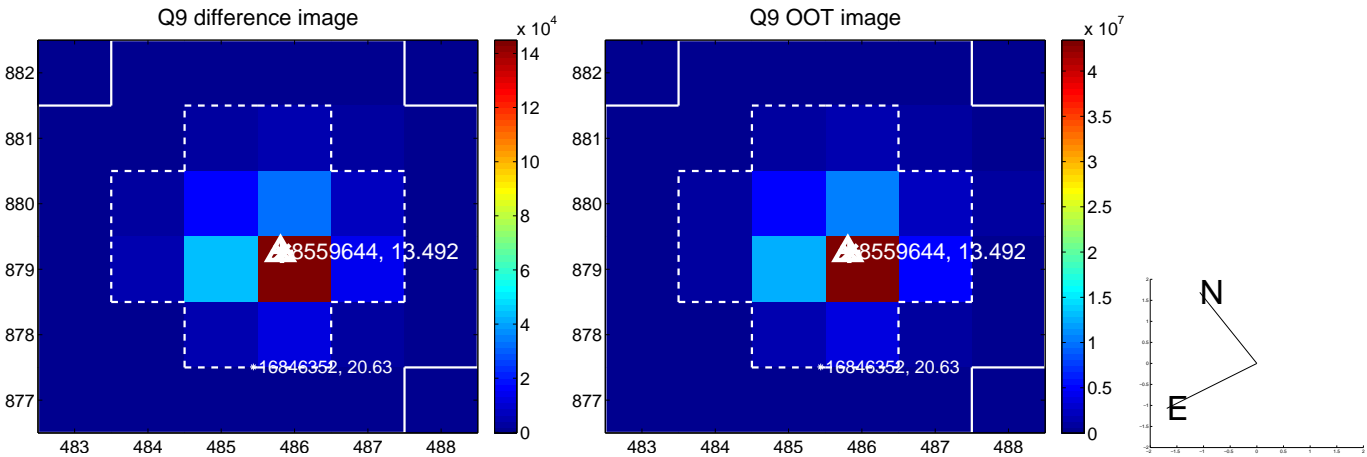
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



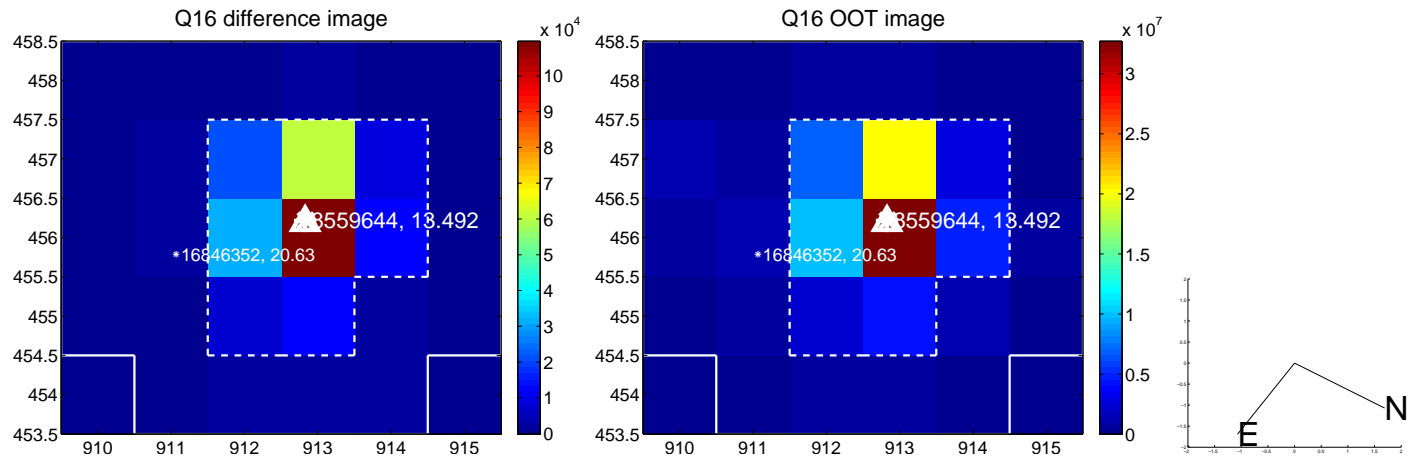
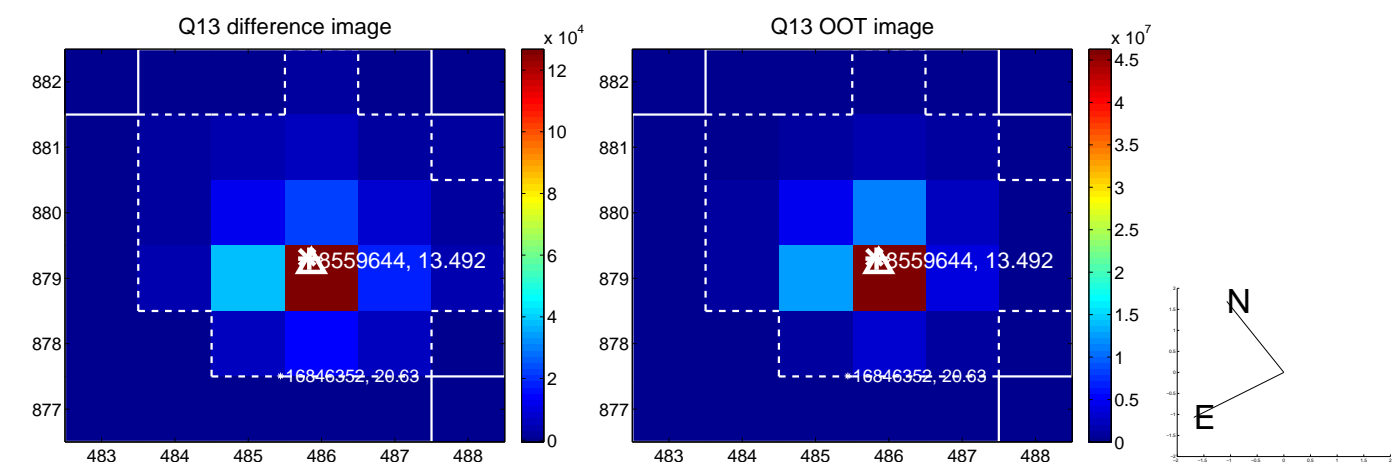
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



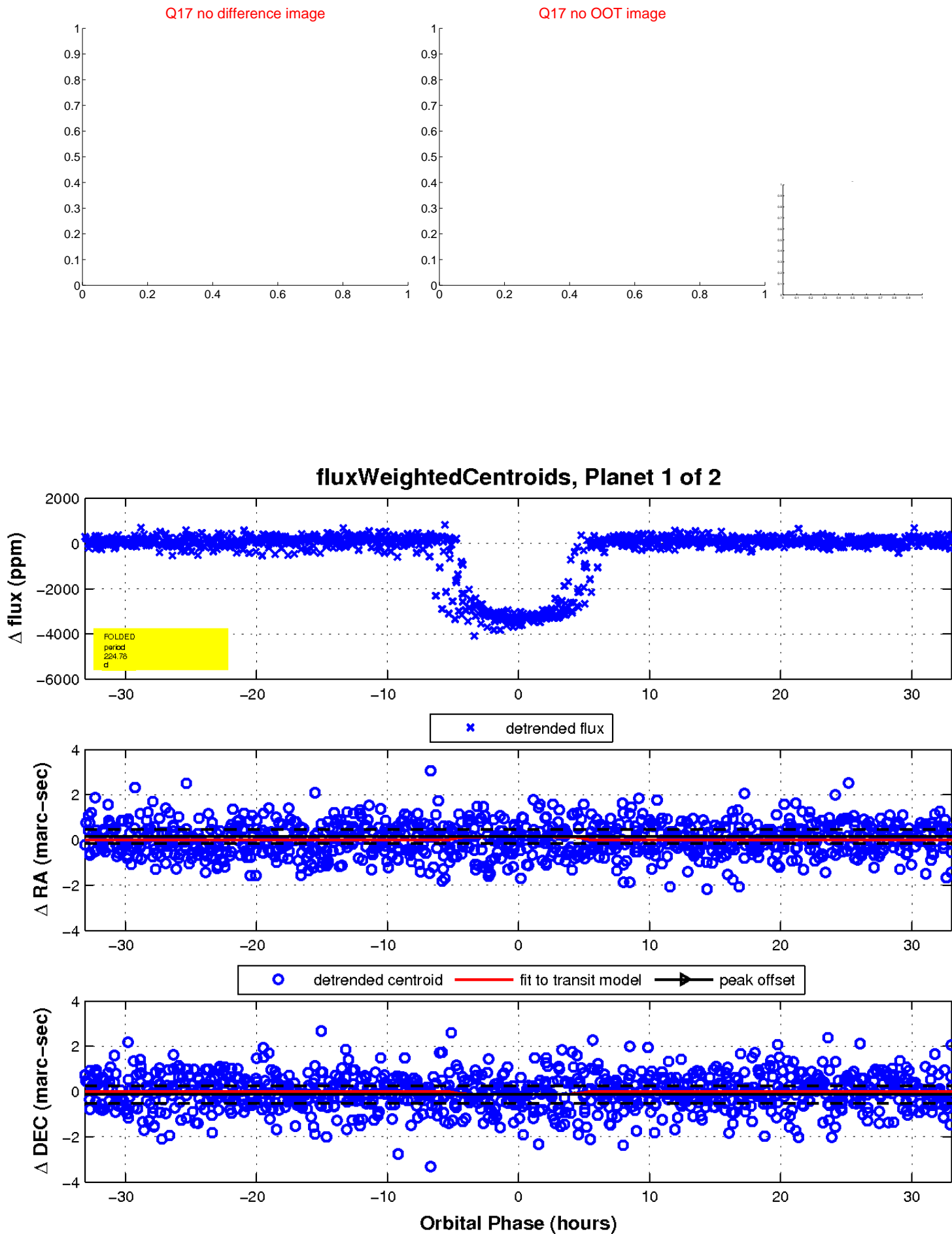
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



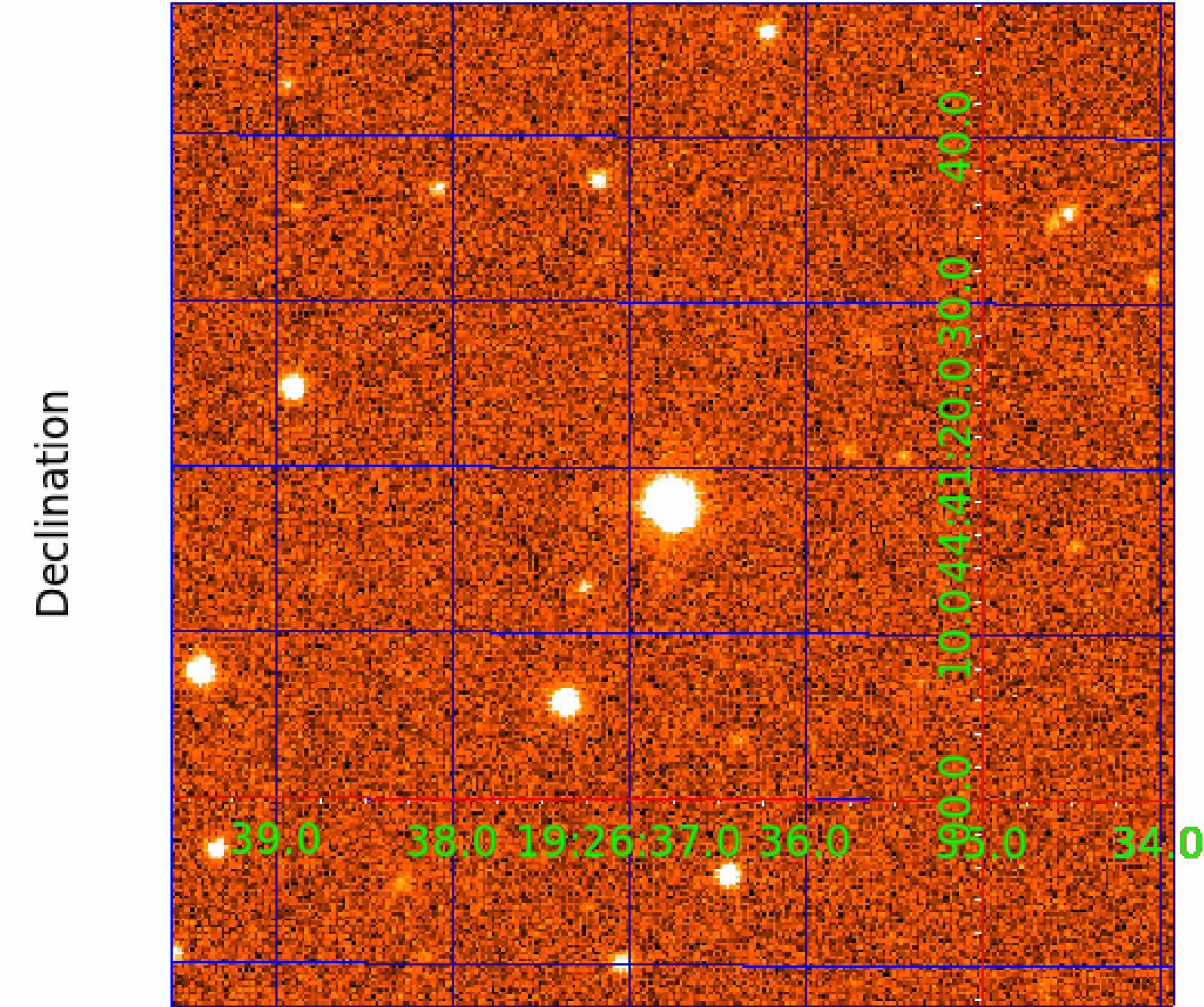
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008559644

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})
008559644-01	OBS	0139.01	224.782718	142.092071	3480.4	11.037	153.2	147.0	1.24	5873	7.67	2.93
008559644-02	OBS	0139.02	3.341809	134.669846	156.4	3.073	35.9	39.3	1.24	5873	1.84	800.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008559644-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008559644-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

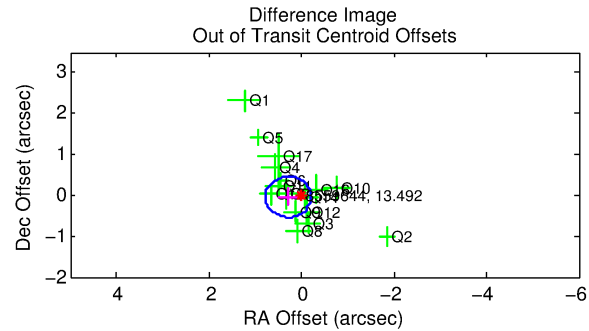
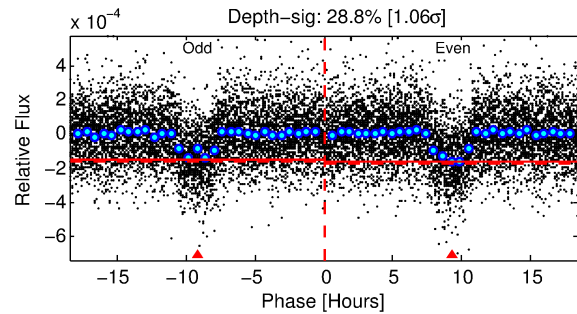
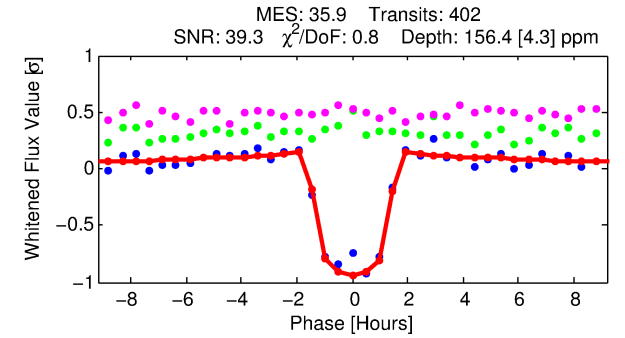
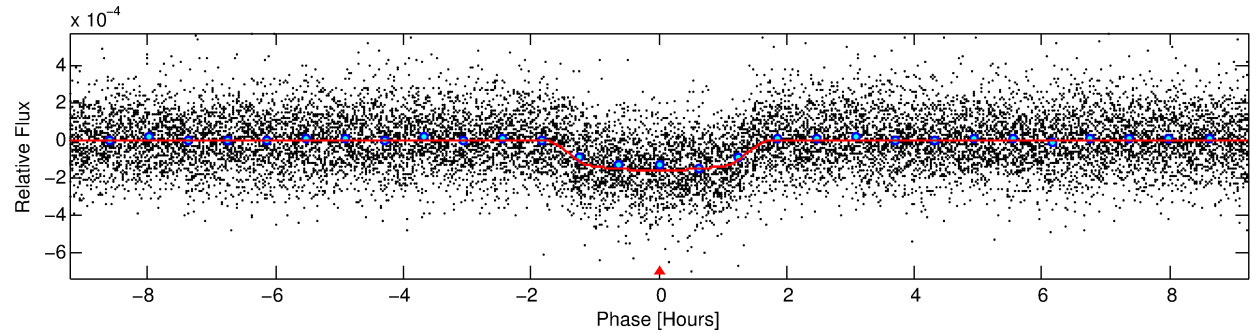
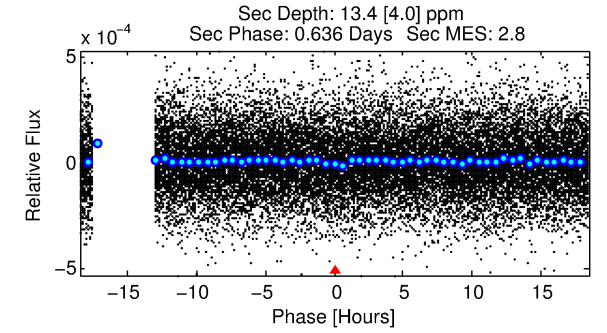
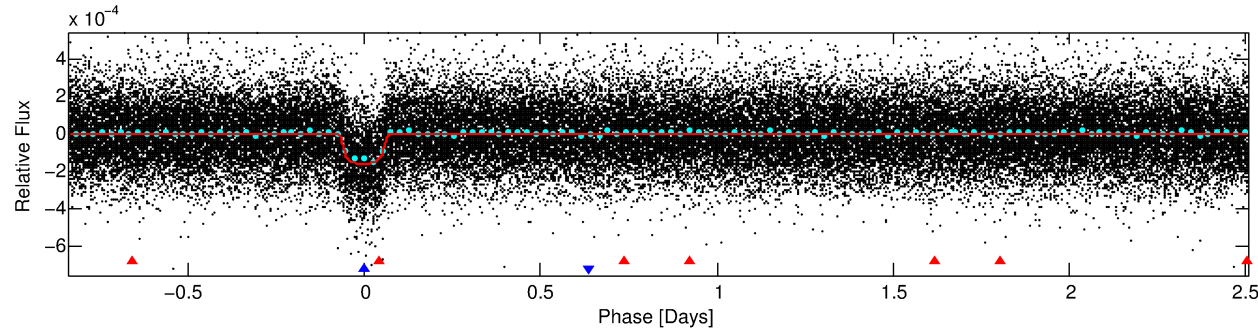
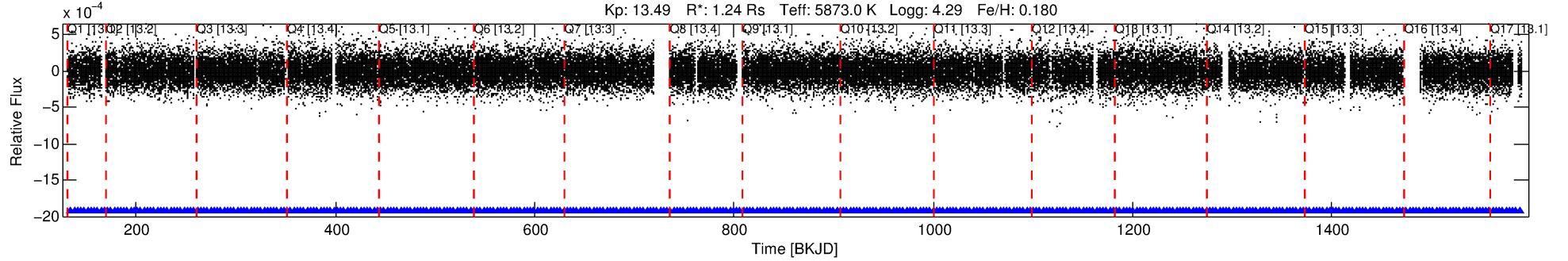
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008559644-02

No Significant Match Found

DV One-Page Summary

KIC: 8559644 Candidate: 2 of 2 Period: 3.342 d
KOI: K00139.02 Name: Kepler-111b Corr: 0.991



DV Fit Results:

Period = 3.34181 [0.00001] d
Epoch = 134.6698 [0.0011] BKJD
Rp/R* = 0.0137 [0.0018]
a/R* = 3.92 [2.32]
b = 0.90 [0.13]
Seff = 800.70 [187.56]
Teq = 1356 [79] K
Rp = 1.84 [0.40] Re
a = 0.0451 [0.0066] AU
Ag = 4.39 [1.99] [1.70σ]
Teffp = 3036 [310] K [5.25σ]

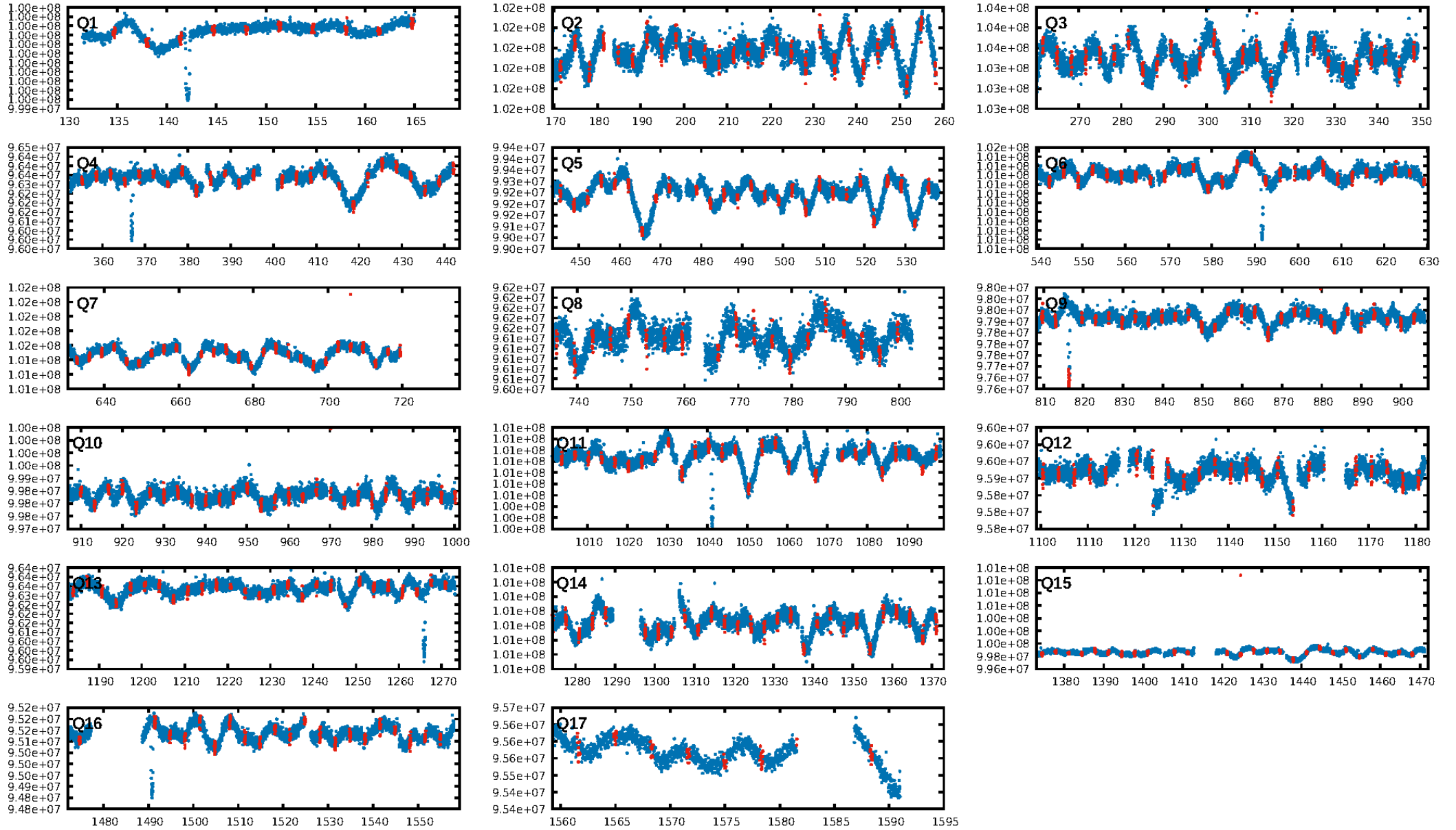
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [463.89σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.79e-271
RollingBand-fgt: 1.00 [385/385]
GhostDiagnostic-chr: 11.23
Centroid-sig: 0.7%
Centroid-so: 0.543 arcsec [1.81σ]
OotOffset-rm: 0.292 arcsec [1.77σ]
OotOffset-st: 4/3/4/5 [16]
KicOffset-rm: 0.325 arcsec [2.09σ]
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DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [17/17]

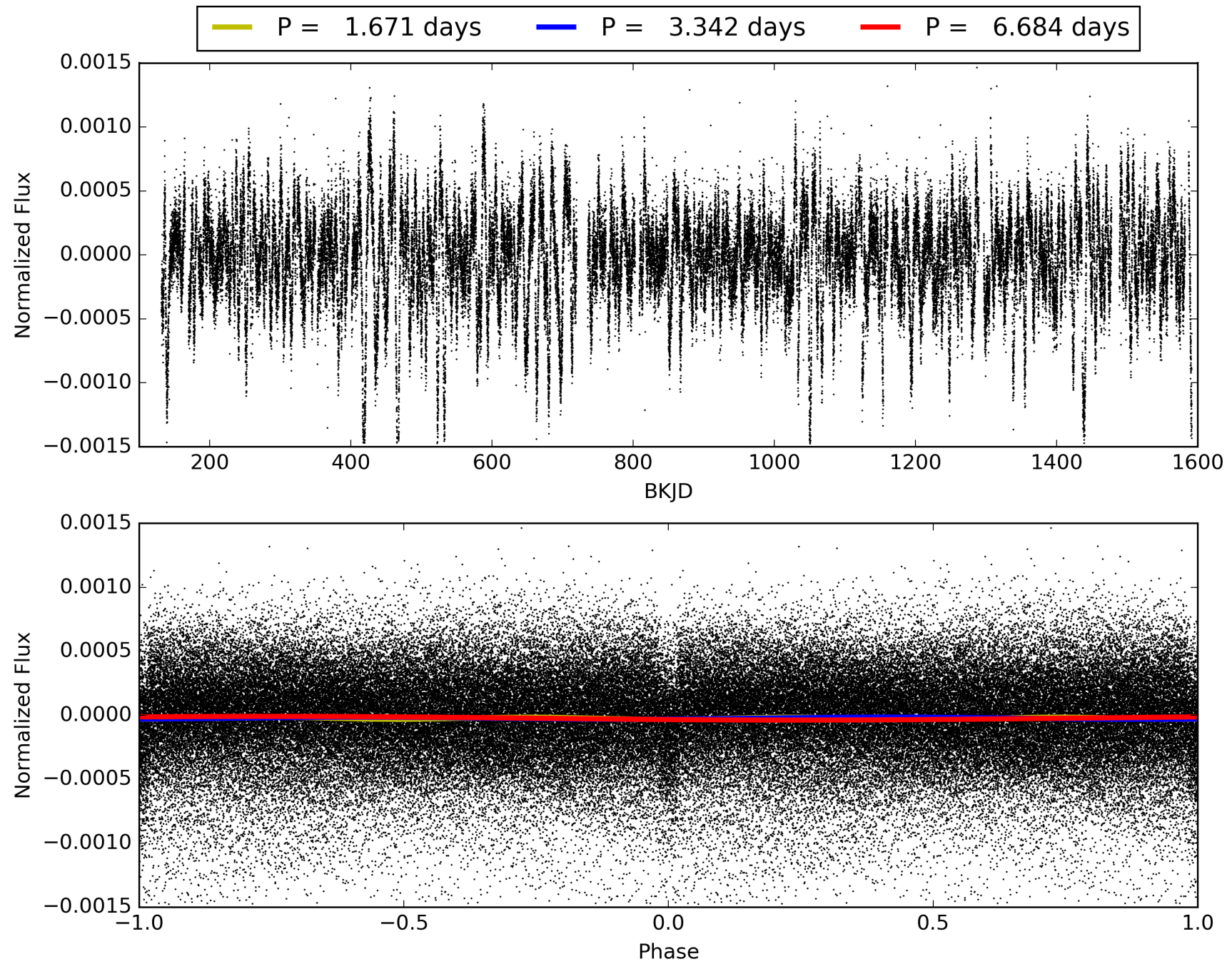
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:39:36 Z

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

TCE 008559644-02, PDC Light Curves

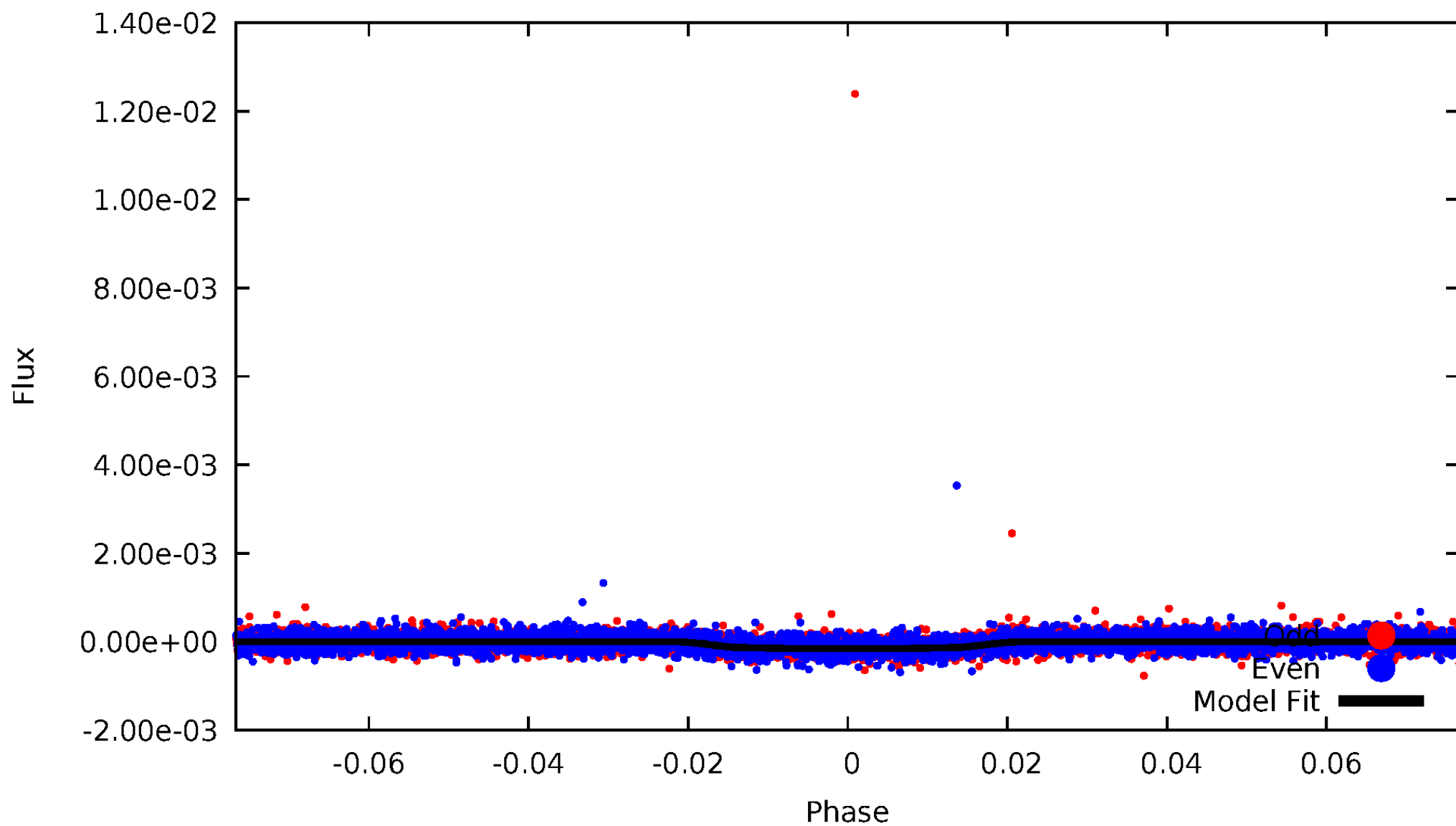


TCE 008559644-02



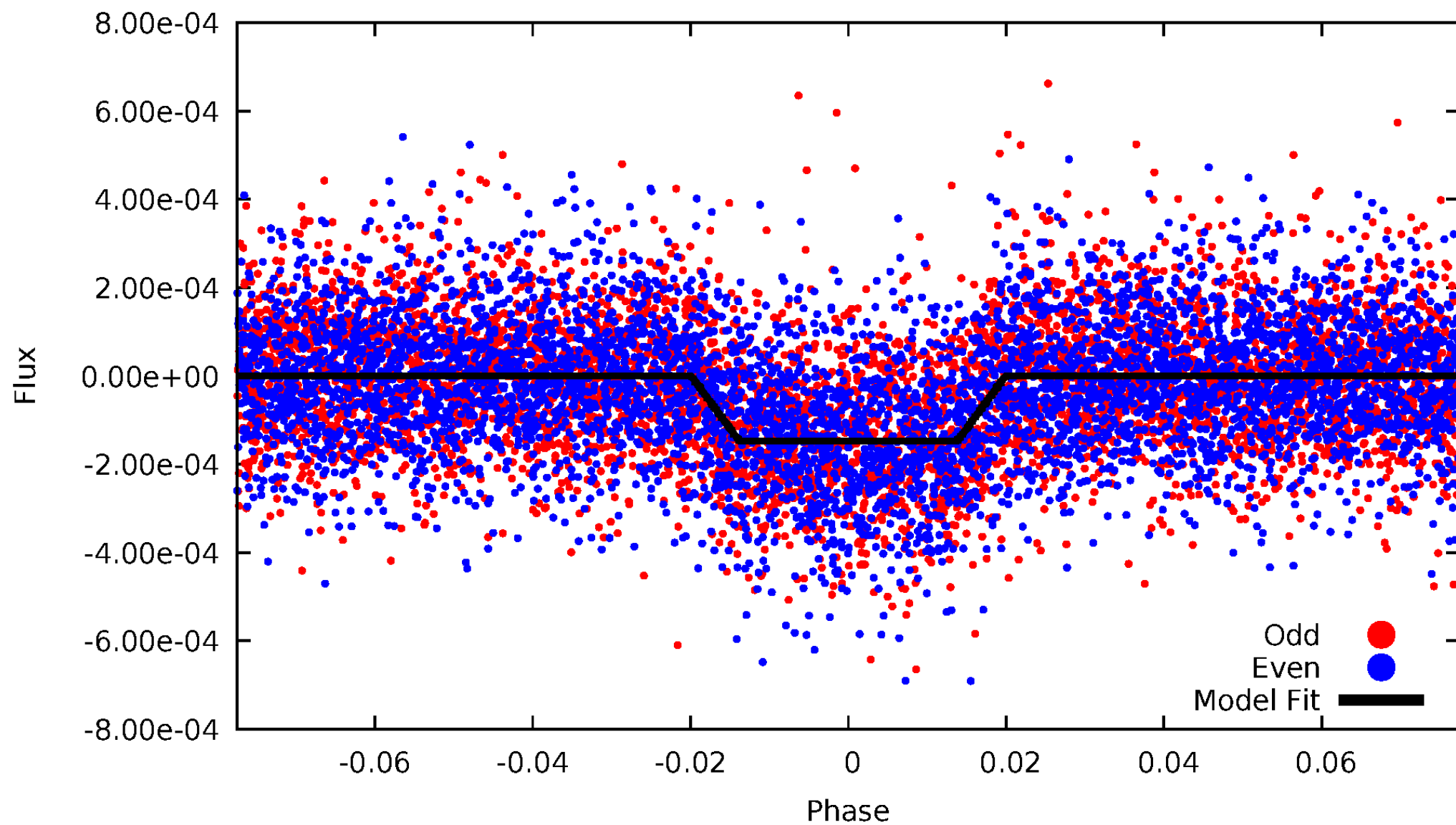
DV Odd/Even

TCE 008559644-02



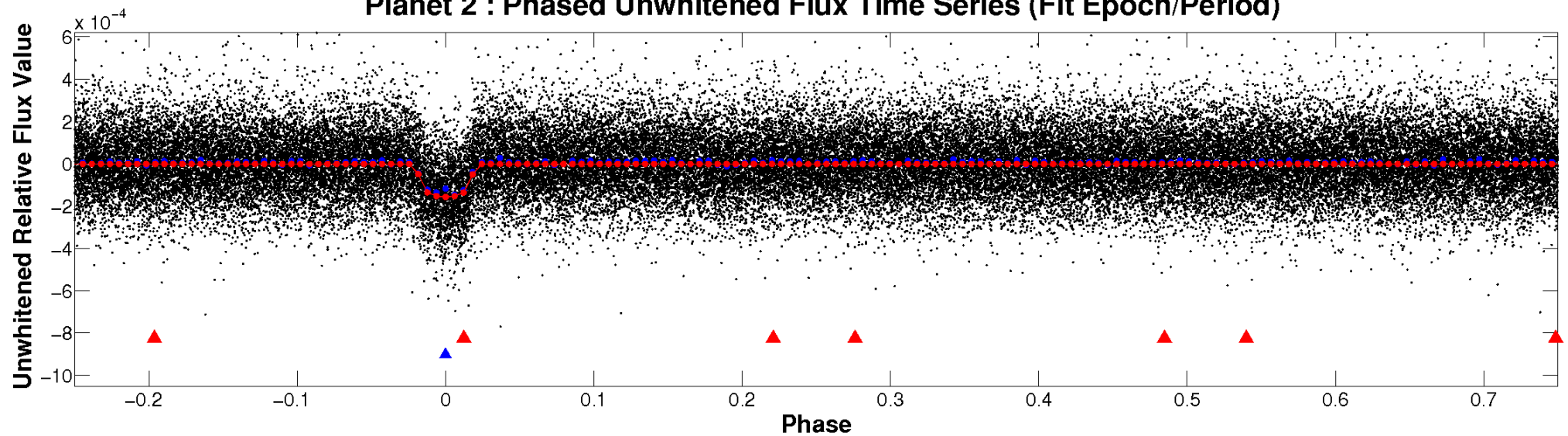
ALT Odd/Even

TCE 008559644-02

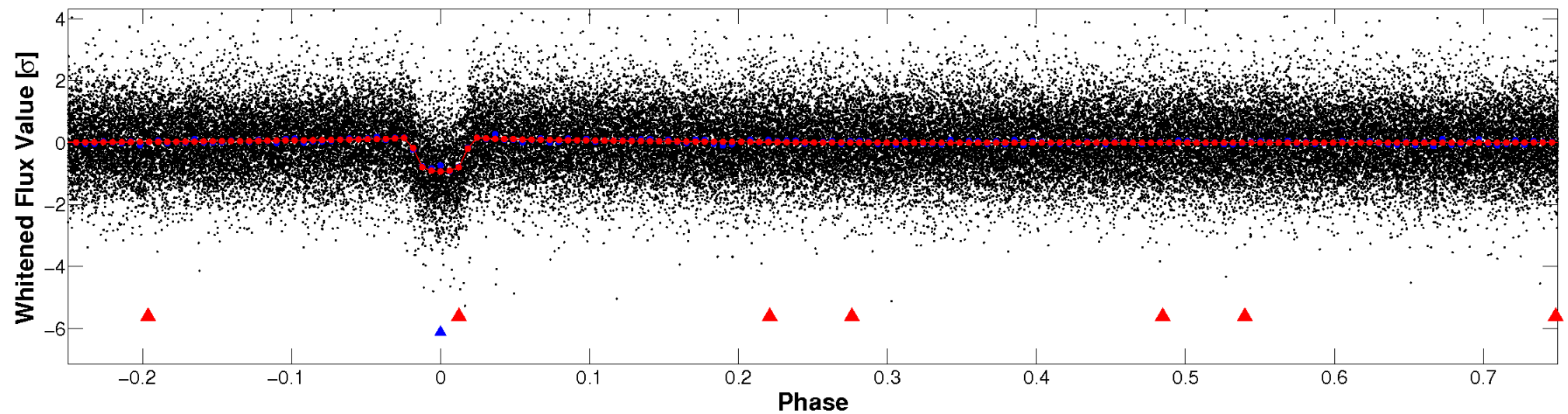


Non-Whitened Vs. Whitened Light Curve

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

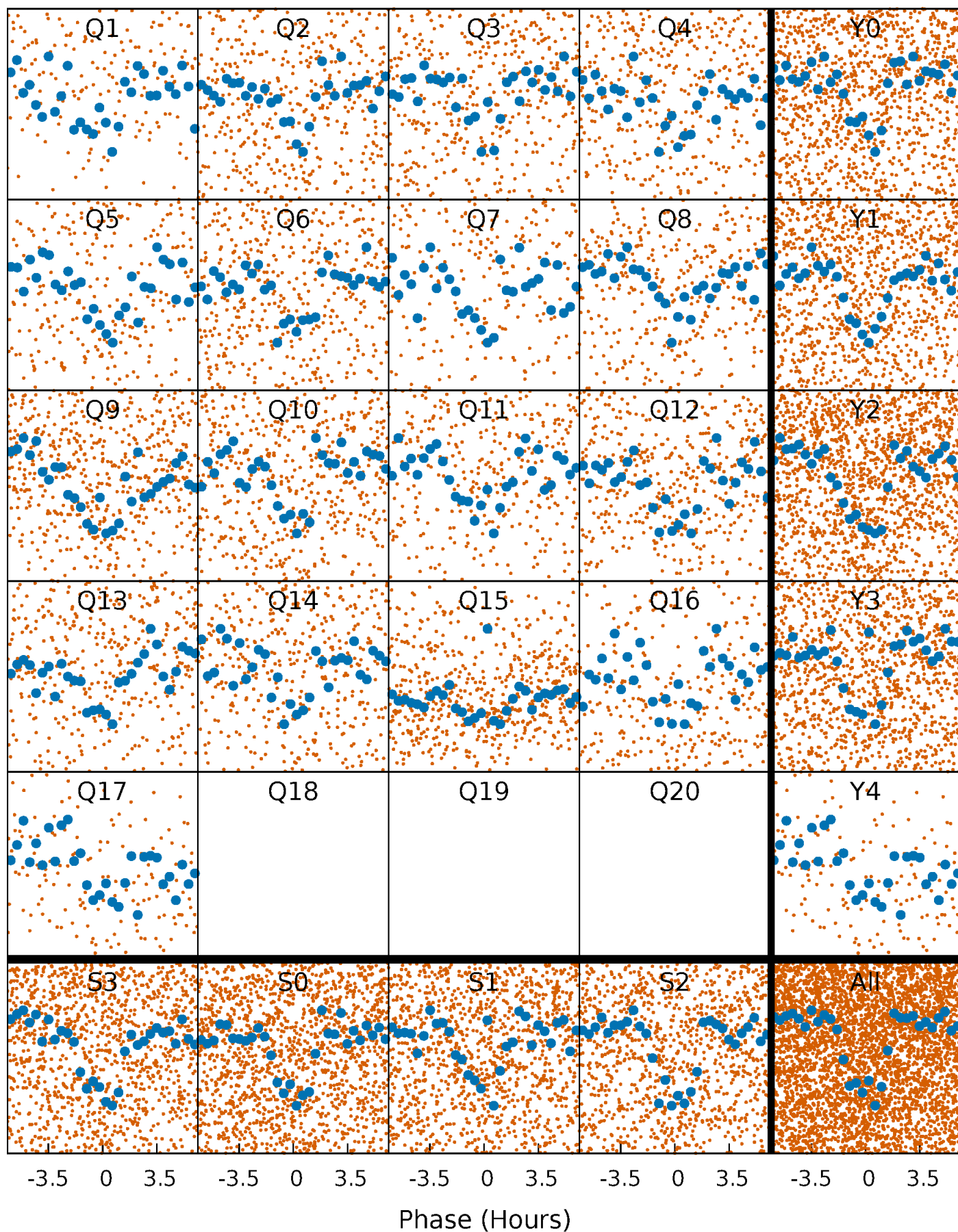


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



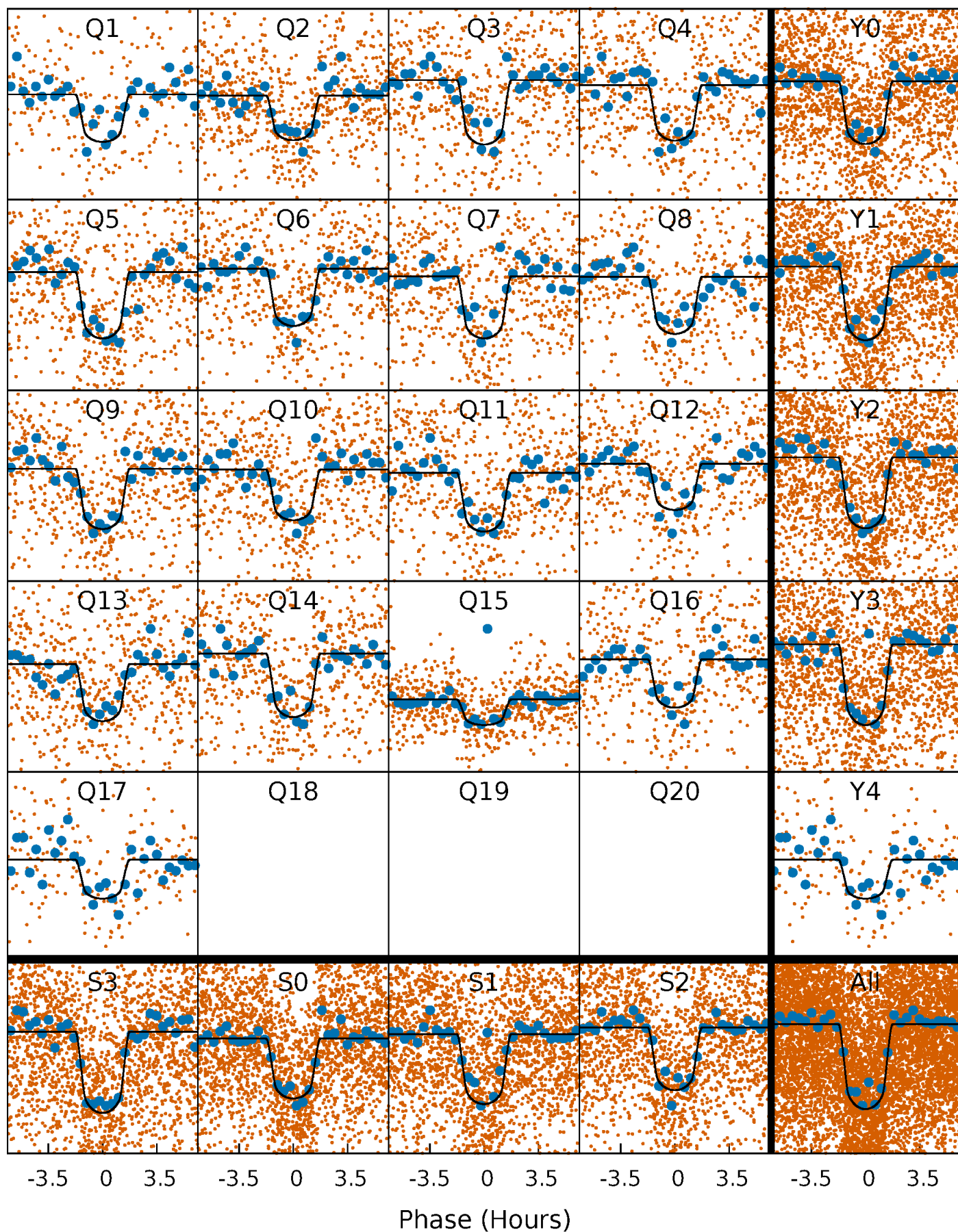
PDC Quarter-Phased Transit Curves

TCE 008559644-02 P= 3.341809 Days $T_0=134.669846$ (BKJD)



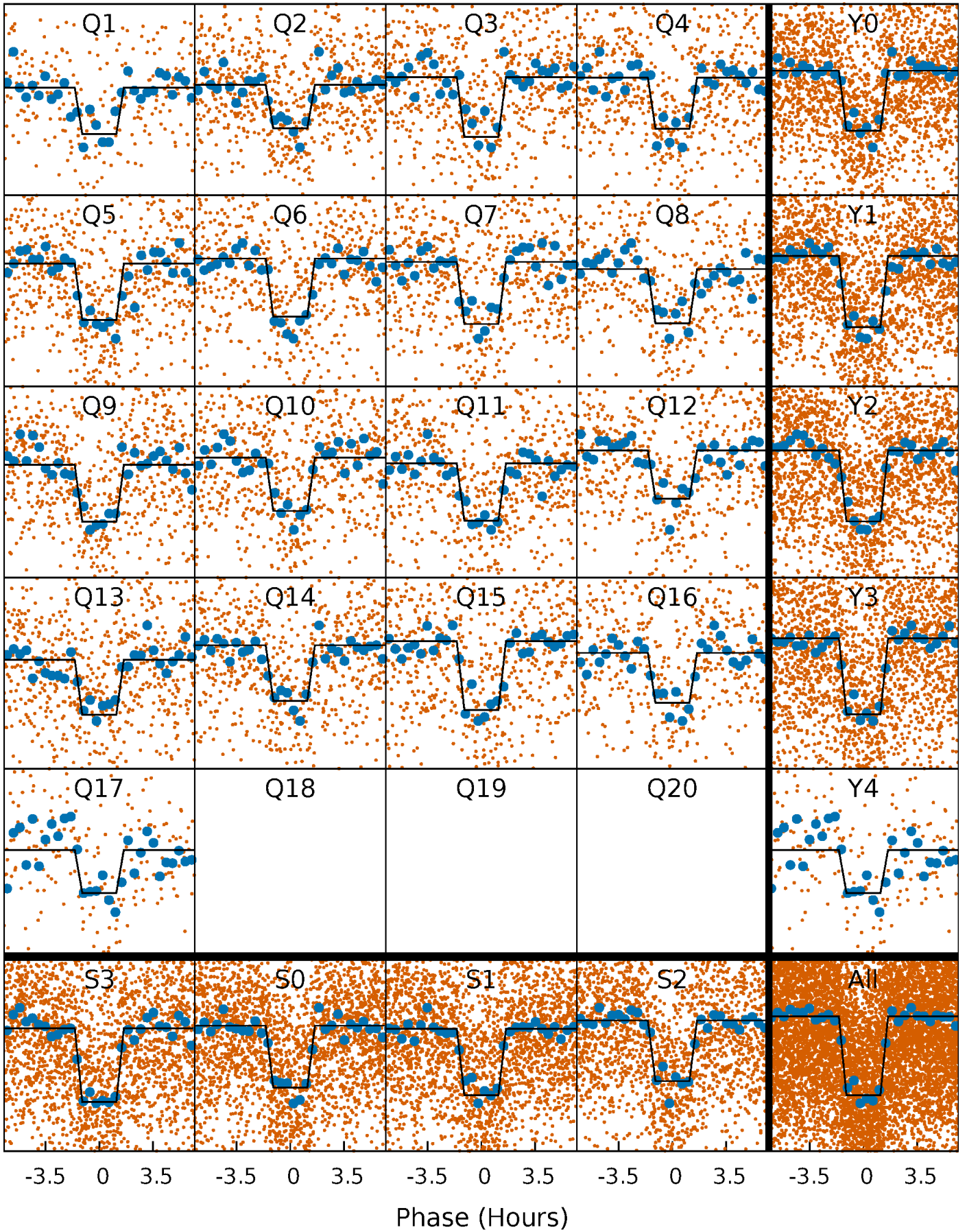
DV Quarter-Phased Transit Curves

TCE 008559644-02 P= 3.341809 Days $T_0=134.669846$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

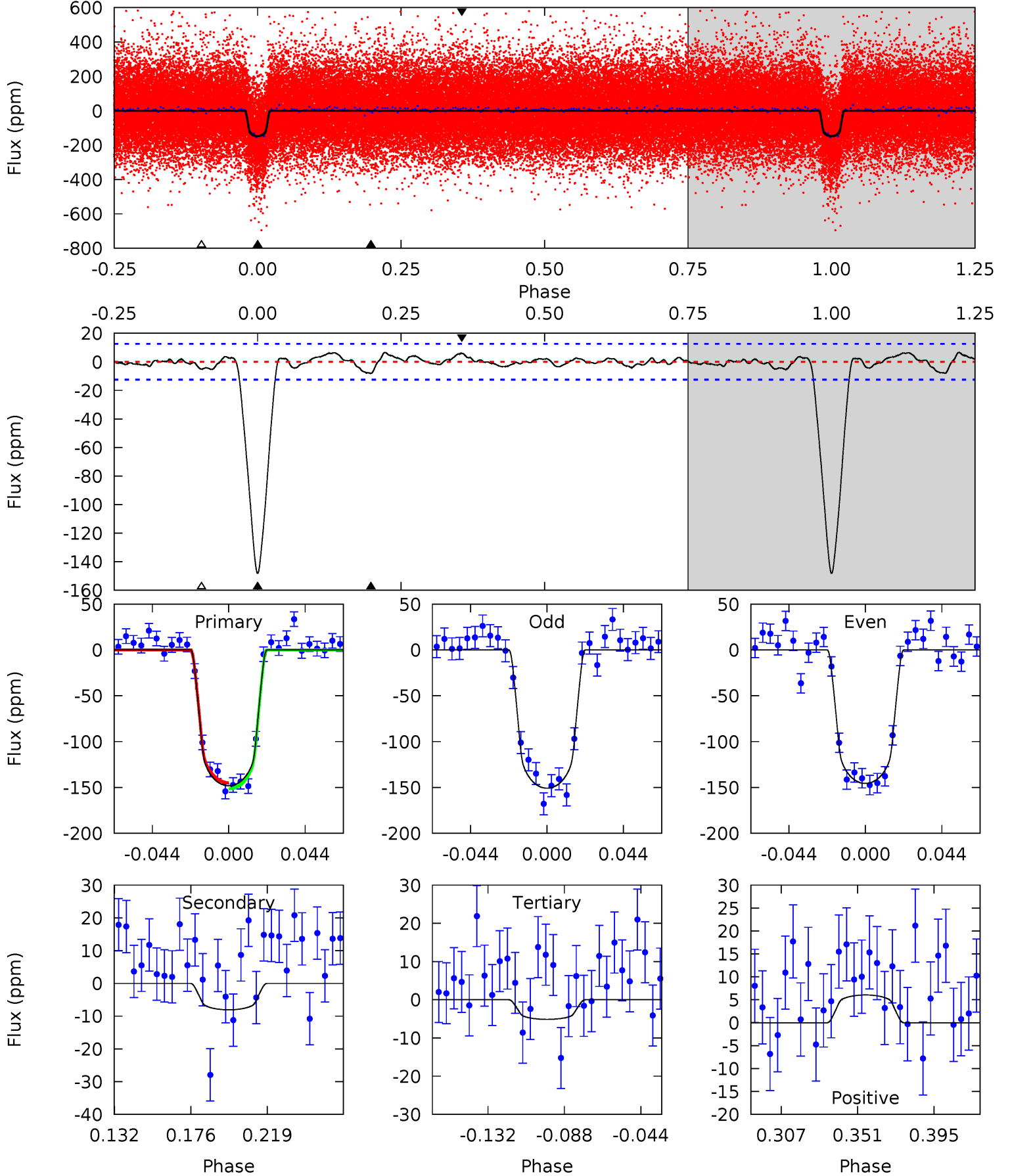
TCE 008559644-02 P= 3.341795 Days $T_0=134.672656$ (BKJD)



DV Model-Shift Uniqueness Test

008559644-02, P = 3.341809 Days, E = 131.328037 Days

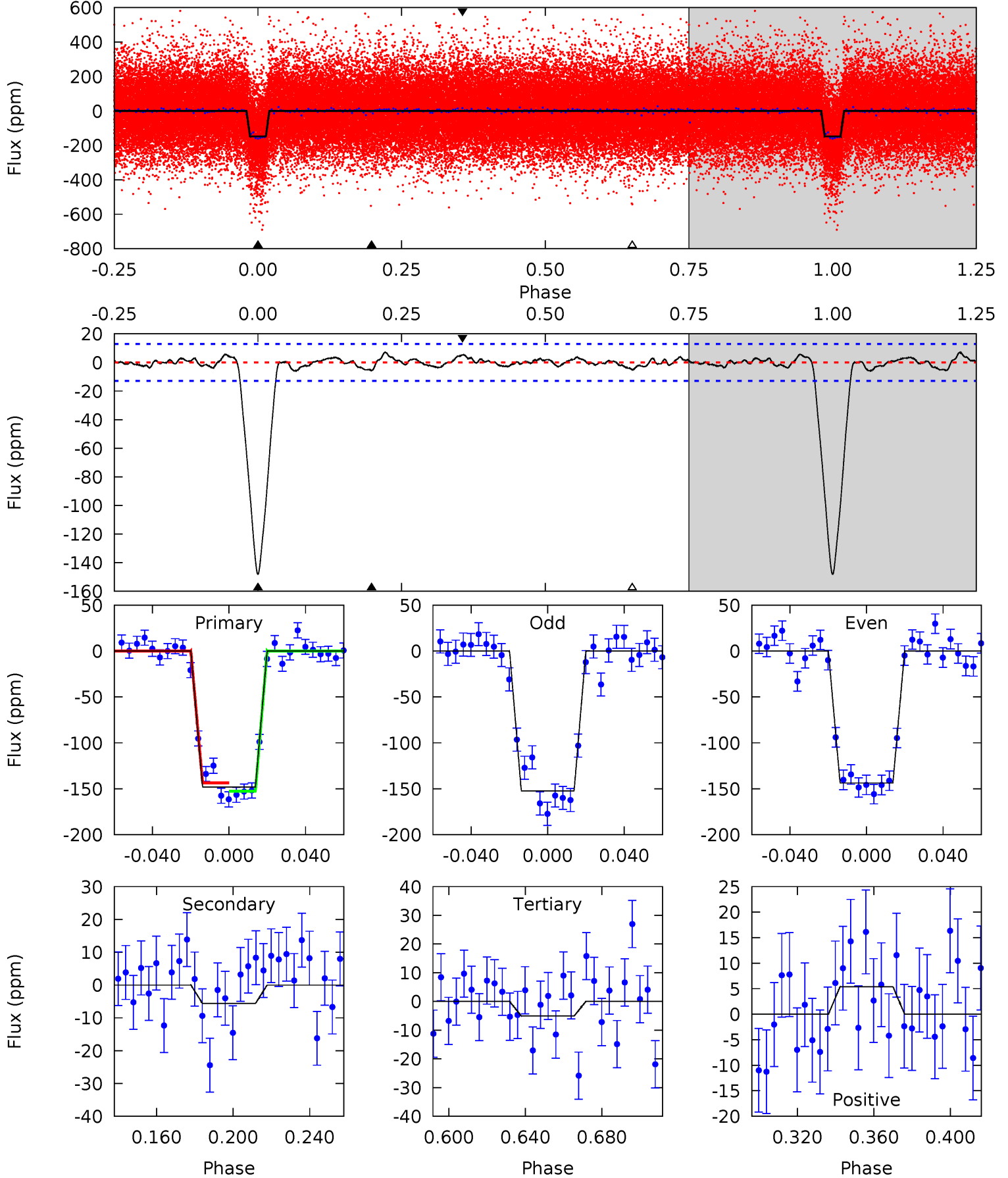
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.8	3.04	1.93	2.28	4.73	2.02	0.91	53.9	53.6	1.11	0.76	0.98	0.96	0.04	1.25



Alt Model-Shift Uniqueness Test

008559644-02, P = 3.341795 Days, E = 131.330861 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
54.5	2.07	1.87	1.99	4.75	2.05	0.81	52.6	52.5	0.21	0.09	1.57	1.01	0.04	1.67



Stellar Parameters For KIC 008559644

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5873^{+93}_{-129}	$4.293^{+0.120}_{-0.120}$	$0.180^{+0.150}_{-0.150}$	$1.235^{+0.213}_{-0.194}$	$1.092^{+0.080}_{-0.089}$	$0.816^{+0.432}_{-0.282}$
	+2%/-2%	+3%/-3%	+83%/-83%	+17%/-16%	+7%/-8%	+53%/-35%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008559644-02 / KOI 0139.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-8 ± 3	$1.84^{+0.31}_{-0.28}$	1893^{+89}_{-85}	3182^{+219}_{-248}	$2.616^{+1.354}_{-1.017}$
Alt.	-6 ± 3	$1.64^{+0.28}_{-0.28}$	1892^{+93}_{-89}	3098^{+284}_{-371}	$2.213^{+1.670}_{-1.177}$

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 $A_{obs} \gg 1.0$

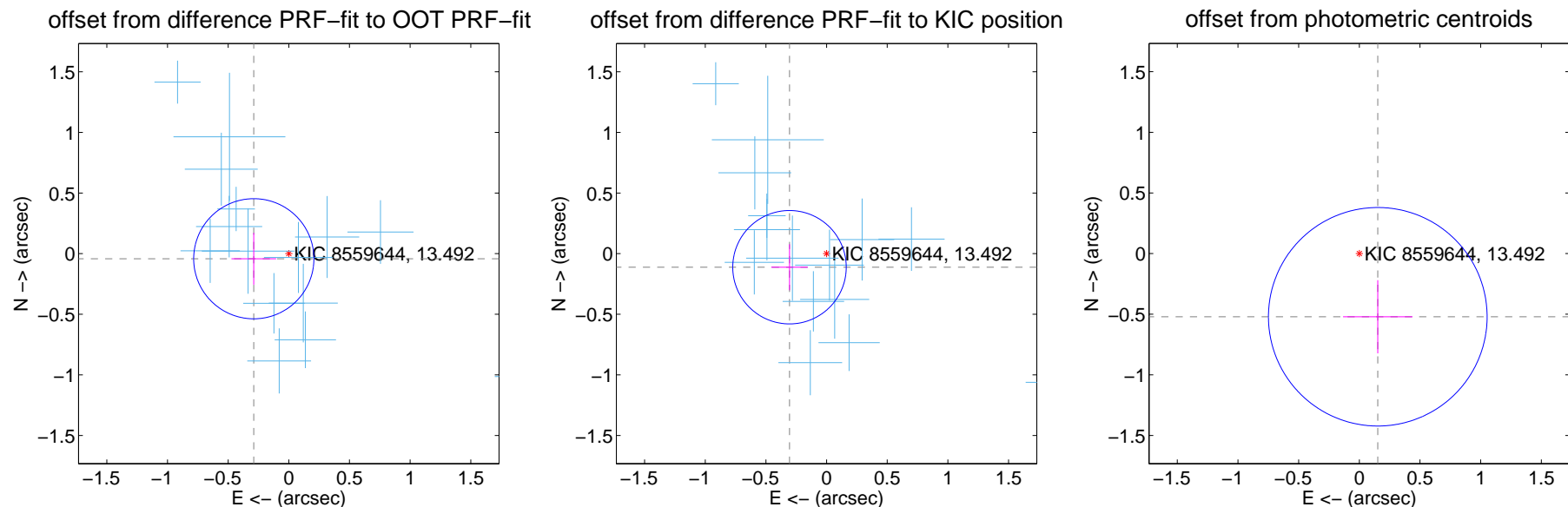
DV Centroid Data

Supplemental centroid analysis for 008559644-02. Kepler magnitude: 13.49. Transit SNR 39.28

There are 16 quarters with good PRF difference image offsets

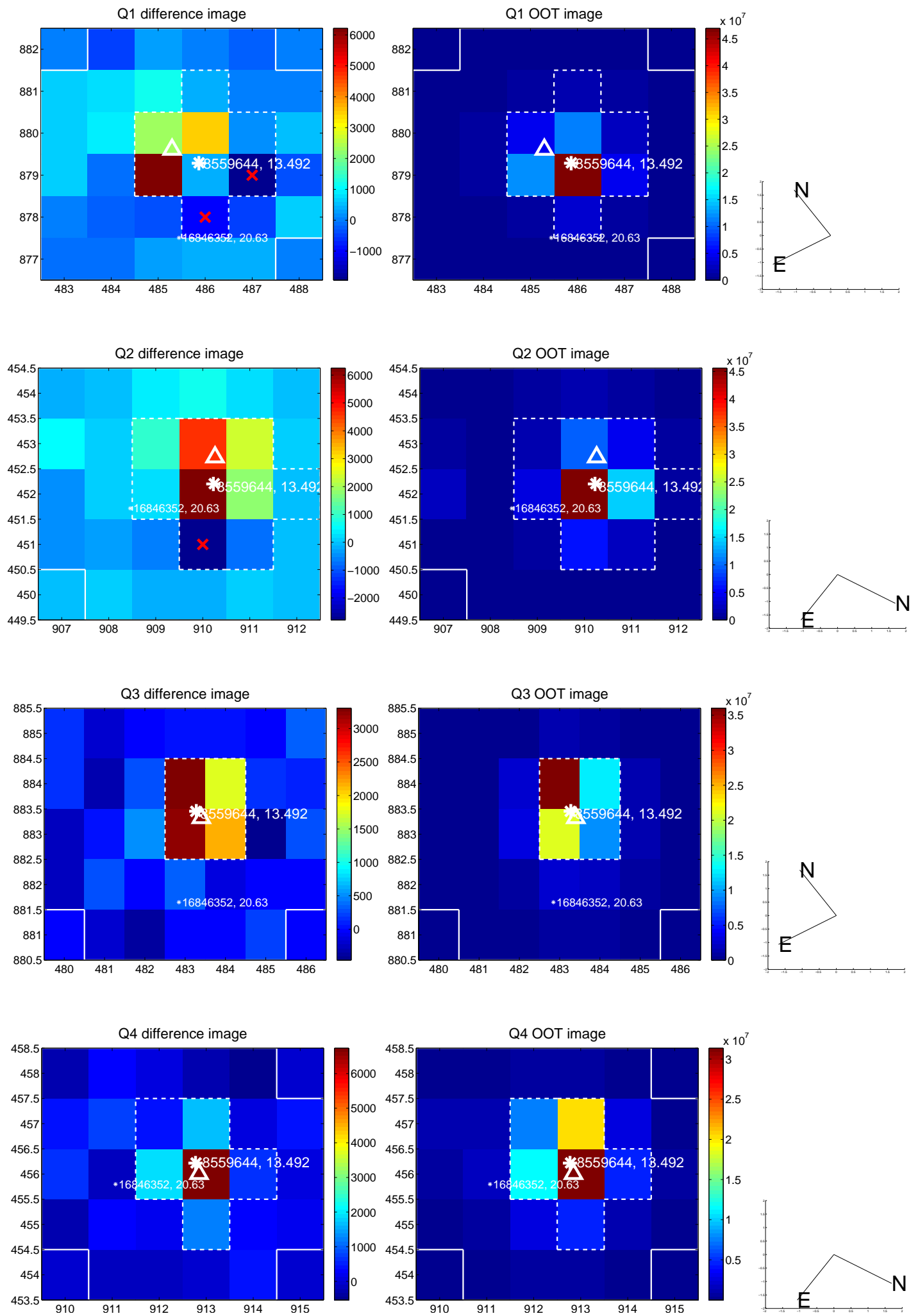
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.292 ± 0.165	1.77	0.289 ± 0.184	-0.042 ± 0.214
PRF-fit source offset from KIC position	0.325 ± 0.156	2.09	0.306 ± 0.151	-0.112 ± 0.190
photometric centroid source offset	0.54 ± 0.30	1.81	-0.15 ± 0.29	-0.52 ± 0.30

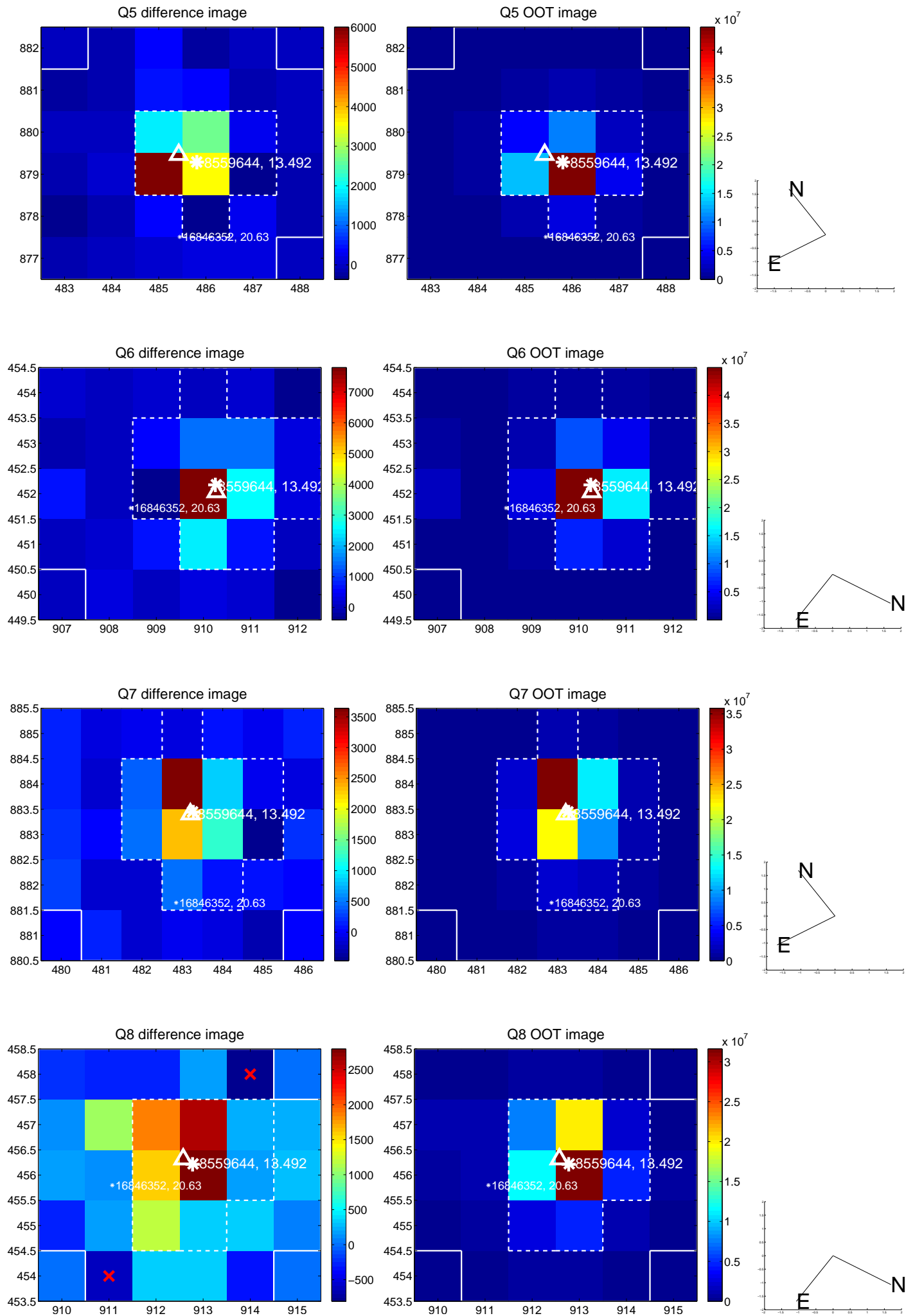


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

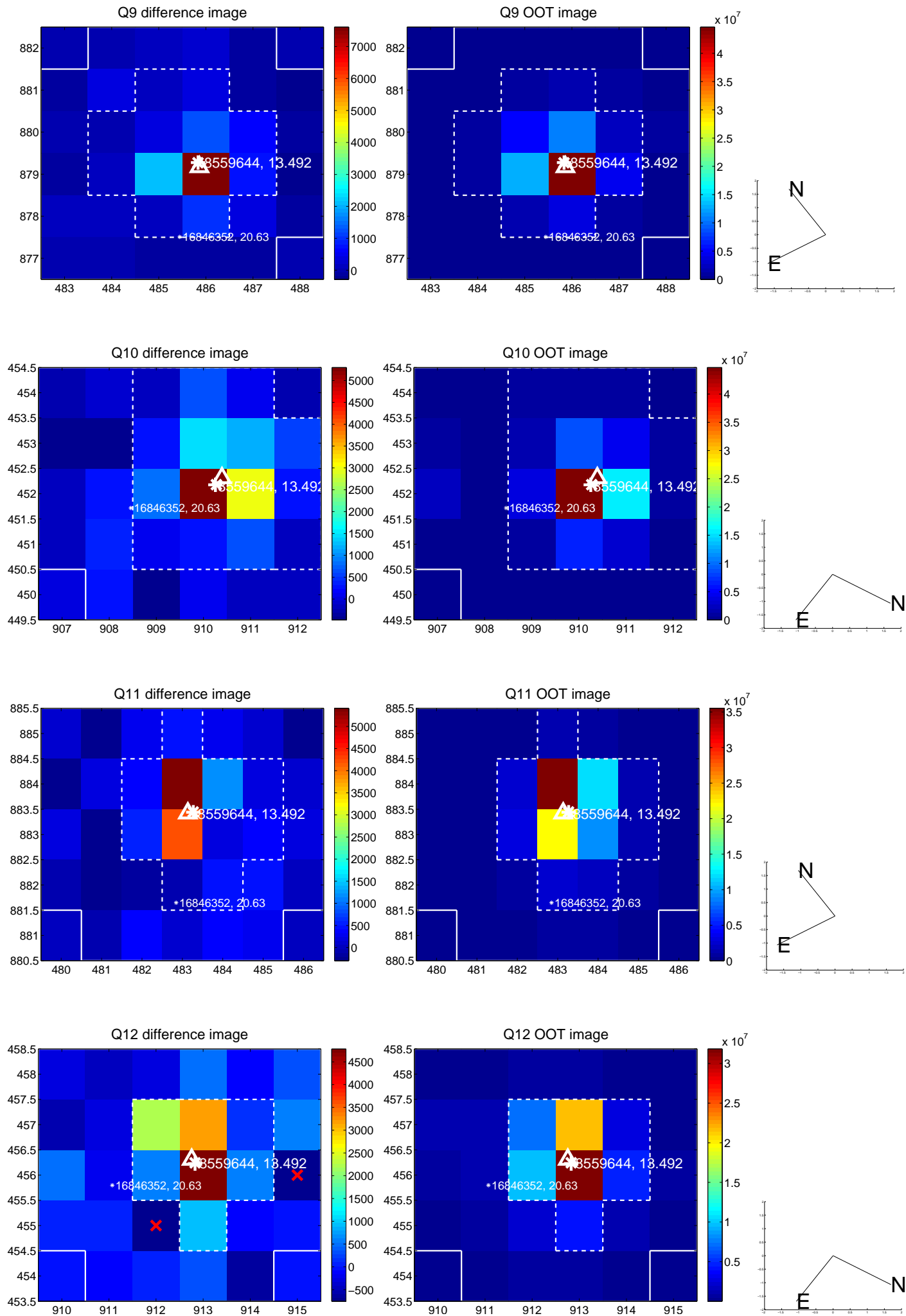
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



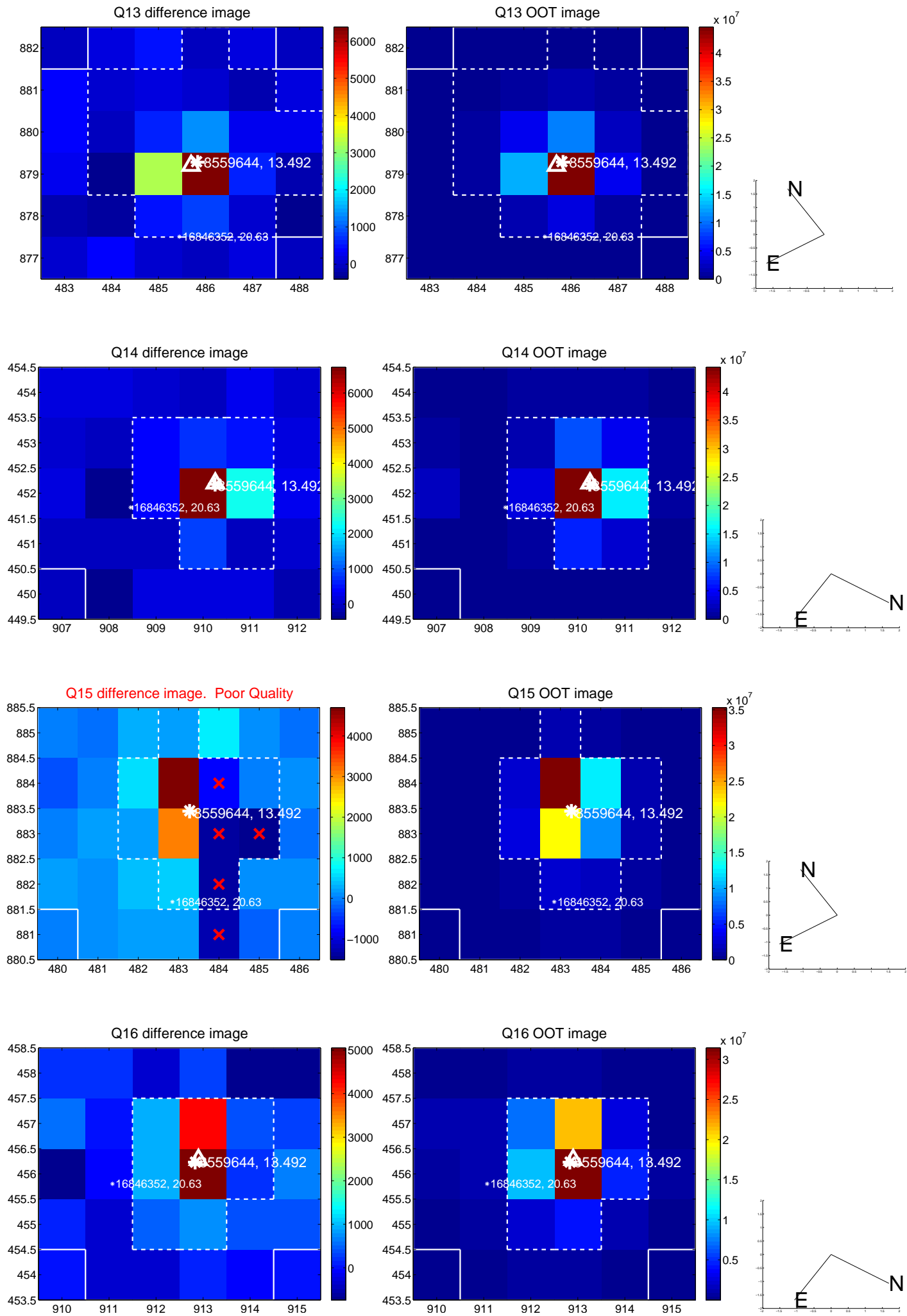
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



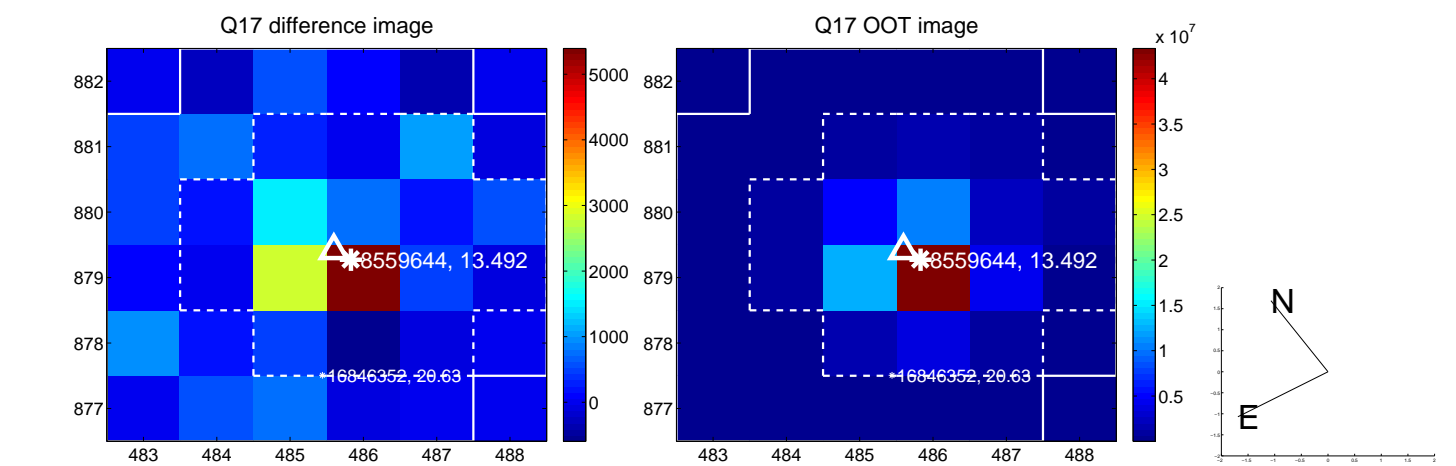
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



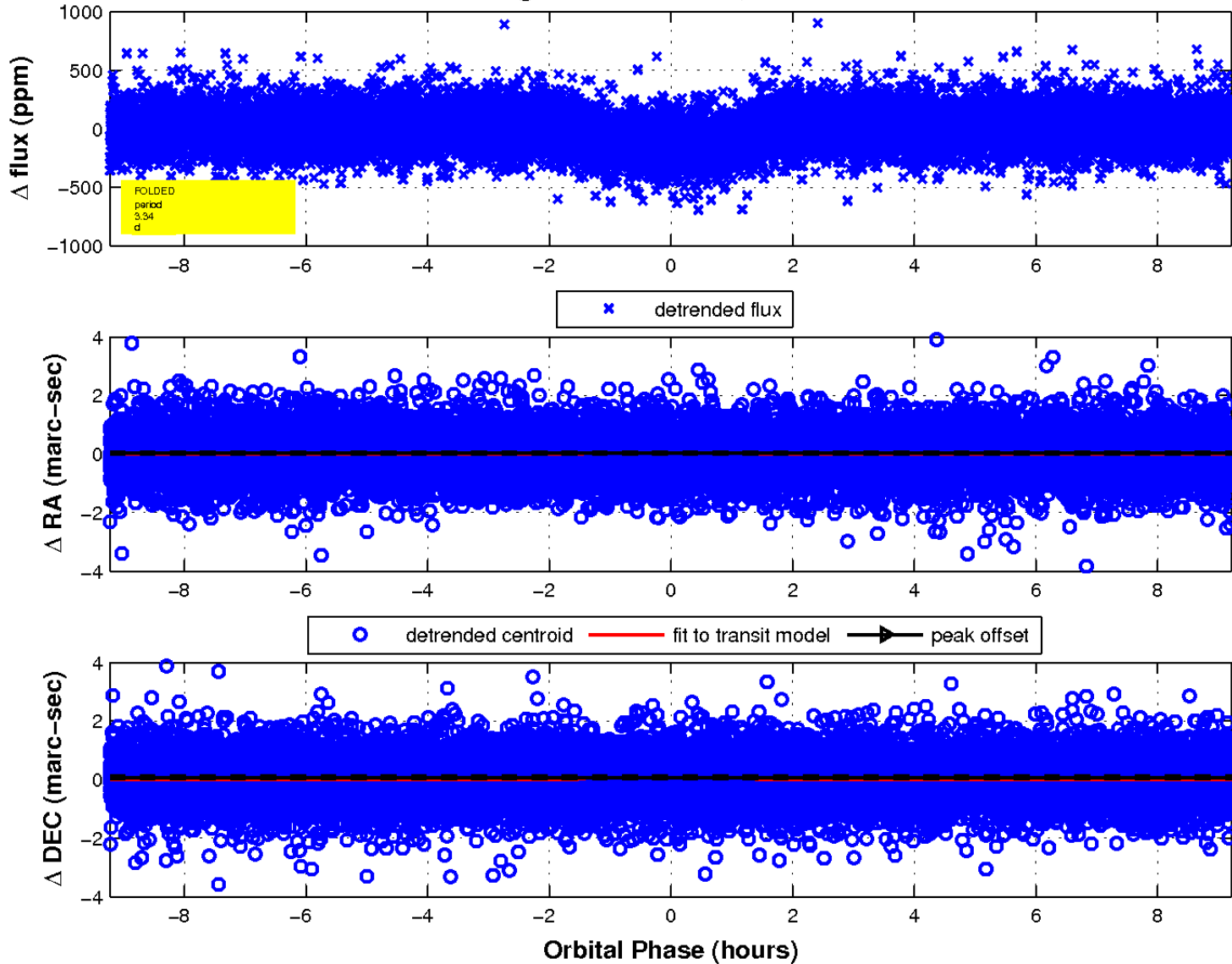
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

