

KIC 008394721

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})
008394721-01	OBS	0152.01	52.090733	158.745972	2893.6	8.846	143.4	146.0	1.32	6198	7.41	29.12
008394721-02	OBS	0152.03	13.484547	136.620831	657.6	5.454	58.8	62.1	1.32	6198	3.94	176.49
008394721-03	OBS	0152.02	27.402258	133.629566	741.8	7.383	49.8	54.6	1.32	6198	4.12	68.57
008394721-04	OBS	0152.04	81.062996	139.544011	395.8	3.301	12.8	14.0	1.32	6198	3.05	16.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008394721-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008394721-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-04	OBS	PC	0.98	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.

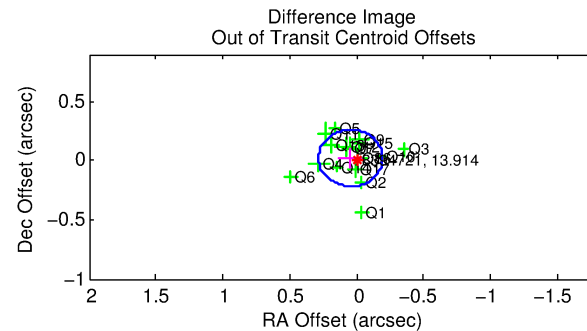
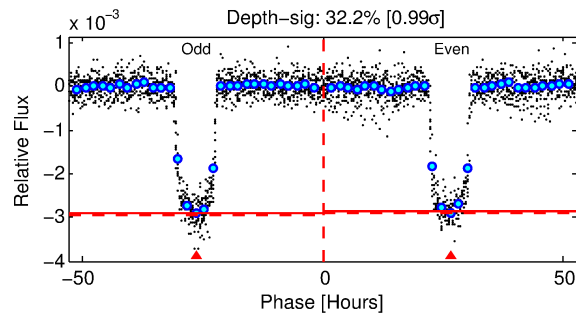
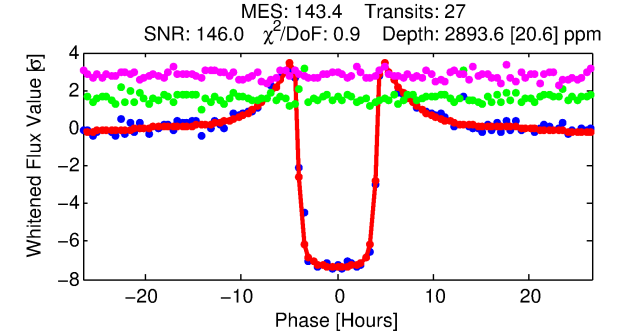
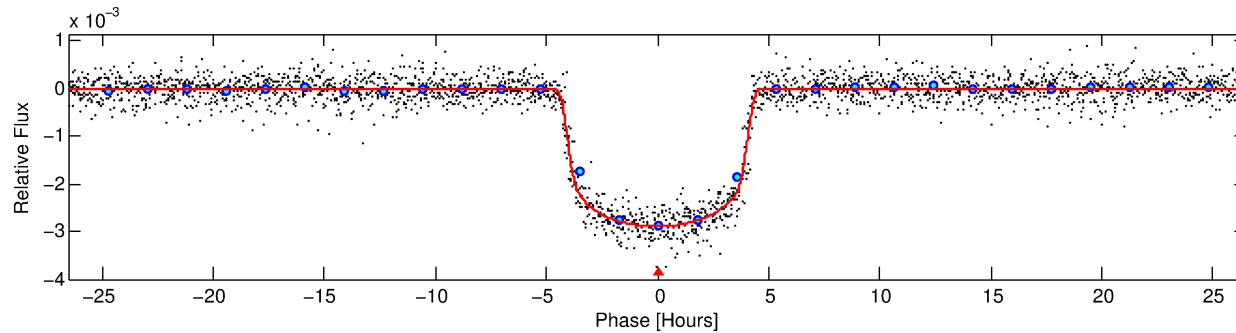
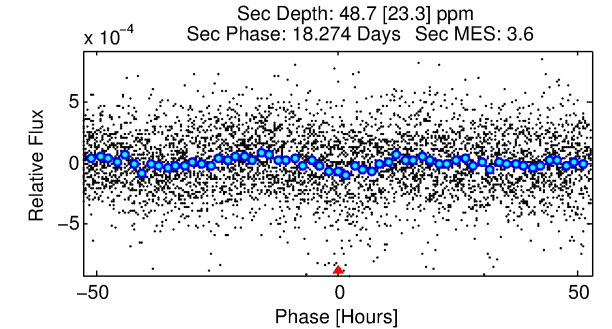
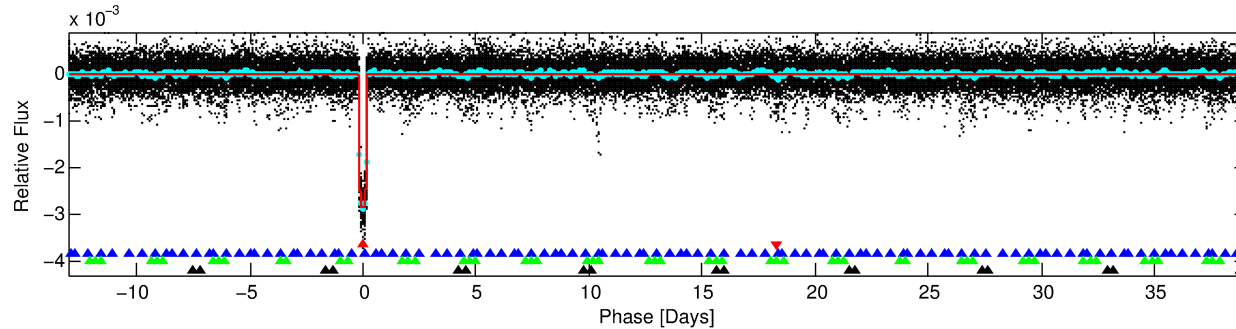
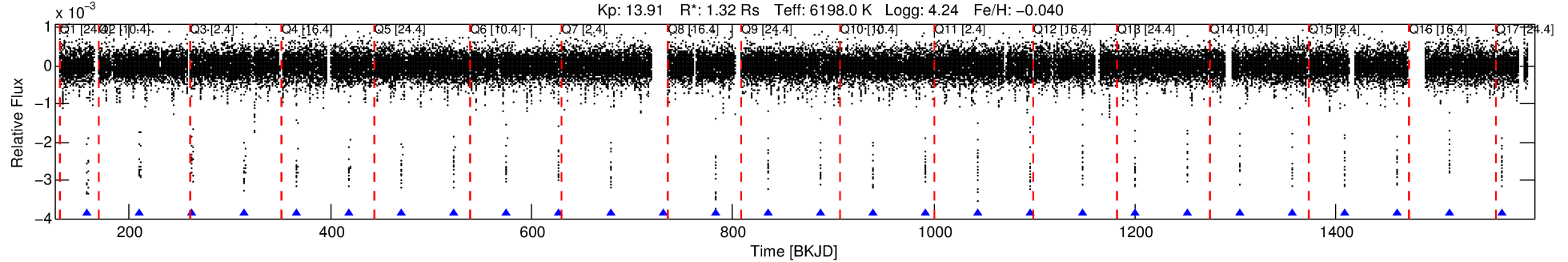
Ephemeris Match Information For 008394721-01

No Significant Match Found

DV One-Page Summary

KIC: 8394721 Candidate: 1 of 4 Period: 52.091 d
KOI: K00152.01 Name: Kepler-79d Corr: 0.988

Kp: 13.91 R*: 1.32 Rs Teff: 6198.0 K Logg: 4.24 Fe/H: -0.040



DV Fit Results:

Period = 52.09073 [0.00005] d
Epoch = 158.7460 [0.0008] BKJD
Rp/R* = 0.0513 [0.0006]
a/R* = 39.53 [2.19]
b = 0.58 [0.06]
Seff = 29.12 [7.31]
Teq = 592 [37] K
Rp = 7.41 [1.39] Re
a = 0.2821 [0.0450] AU
Ag = 38.83 [20.74] [1.82σ]
Teffp = 2286 [279] K [6.03σ]

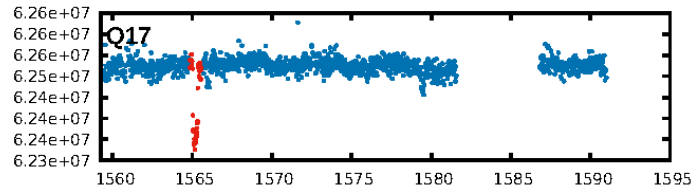
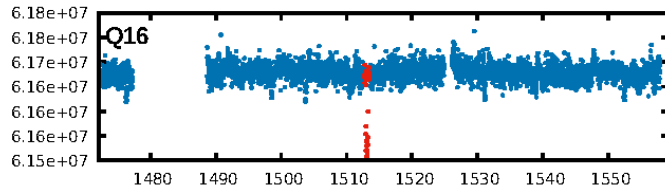
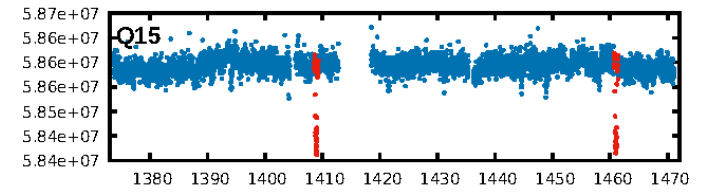
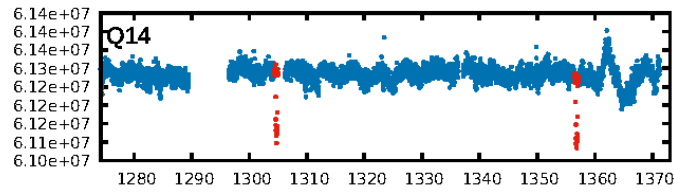
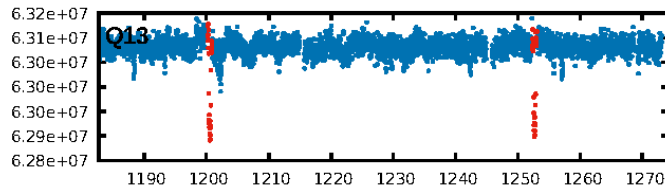
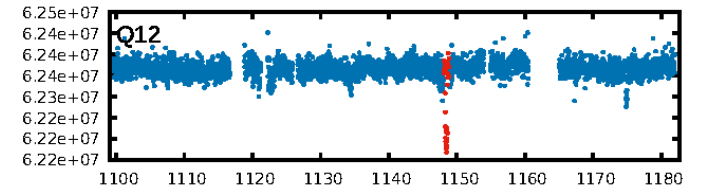
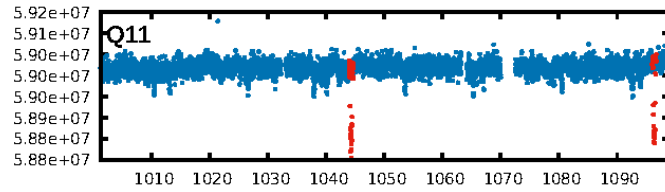
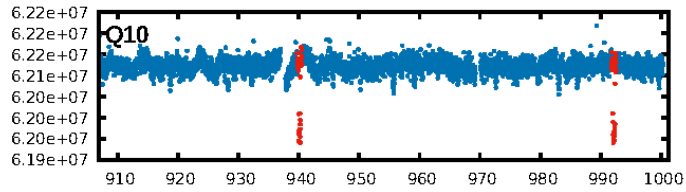
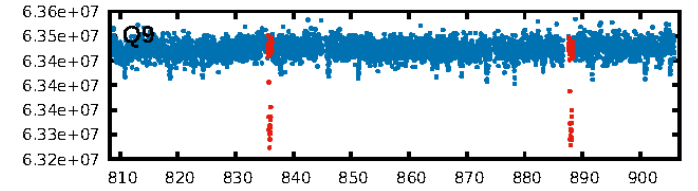
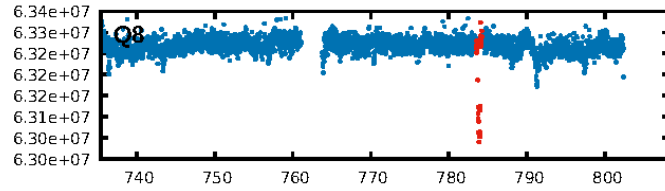
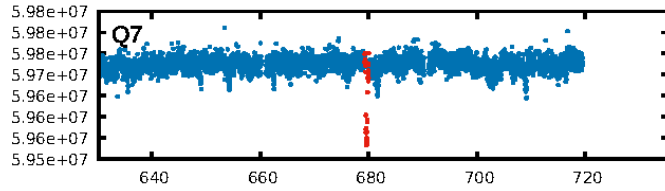
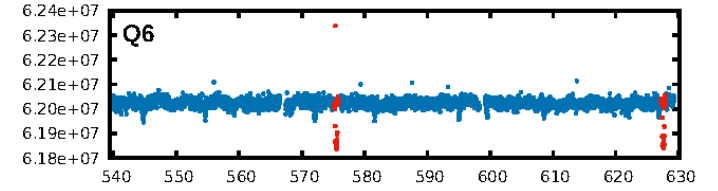
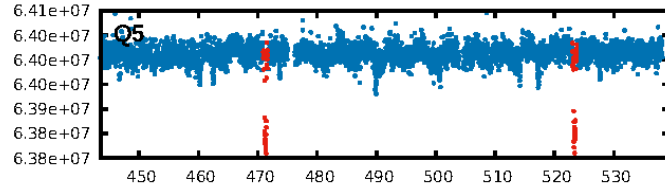
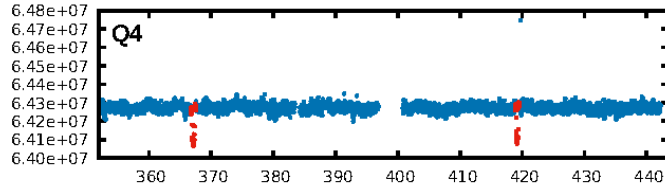
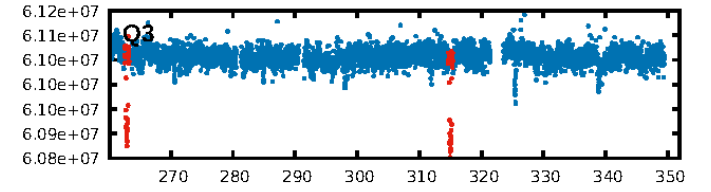
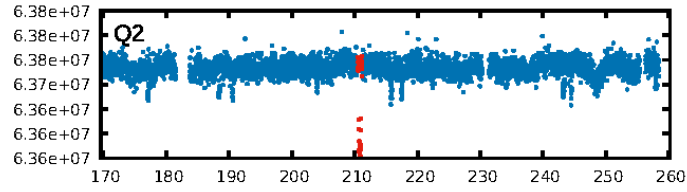
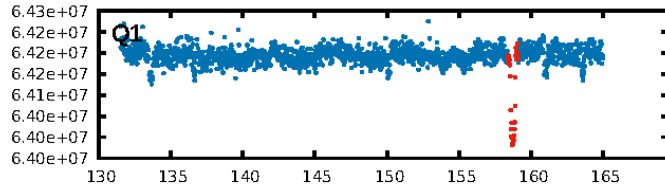
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [51.42σ]
LongPeriod-sig: 100.0% [73.64σ]
ModelChiSquare2-sig: 23.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [25/25]
GhostDiagnostic-chr: 3.397
Centroid-sig: 0.0%
Centroid-so: 0.656 arcsec [10.13σ]
OotOffset-rm: 0.053 arcsec [0.66σ]
KicOffset-rm: 0.105 arcsec [1.34σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.82 [14/17]

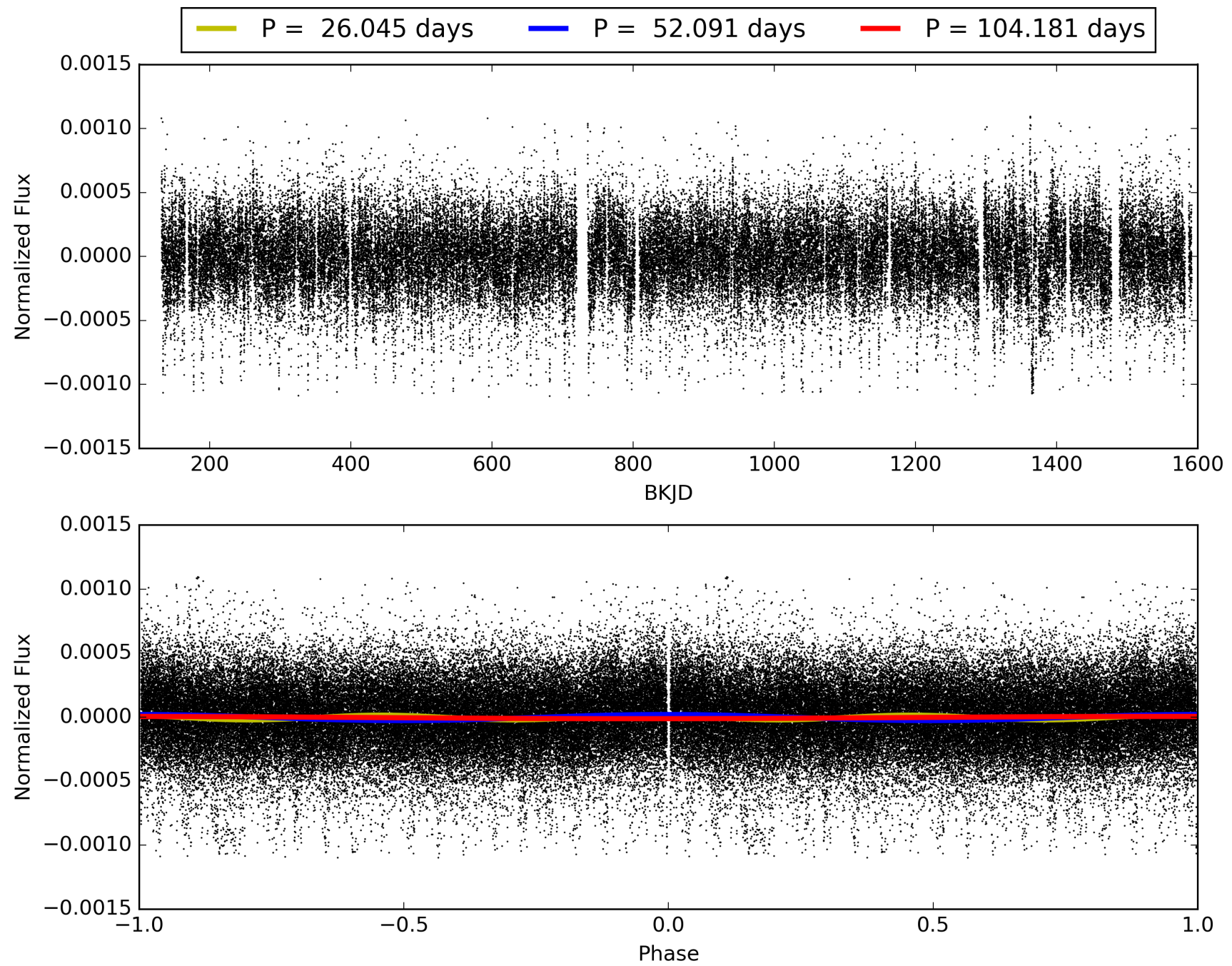
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:53:52 Z

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

TCE 008394721-01, PDC Light Curves

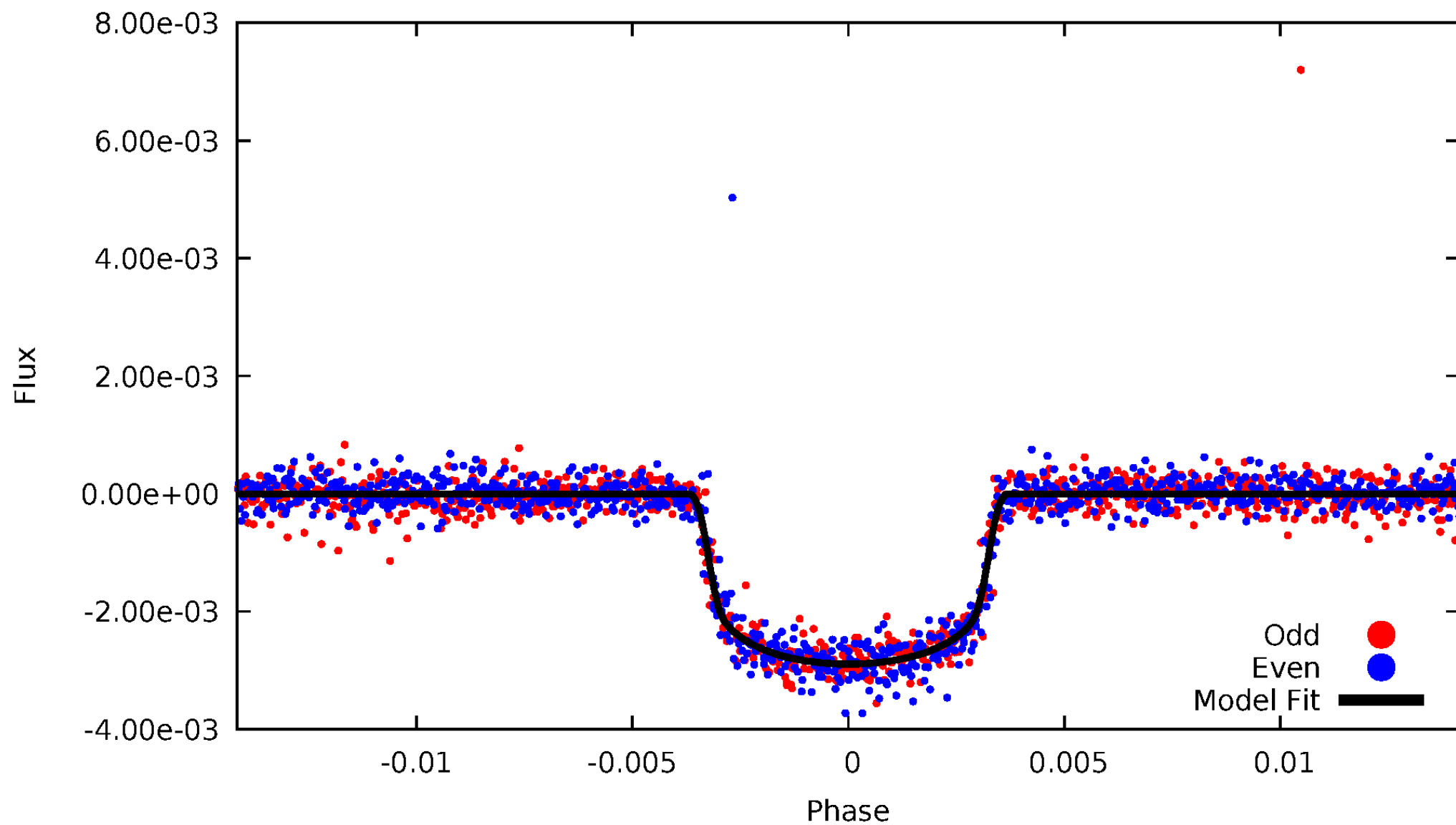


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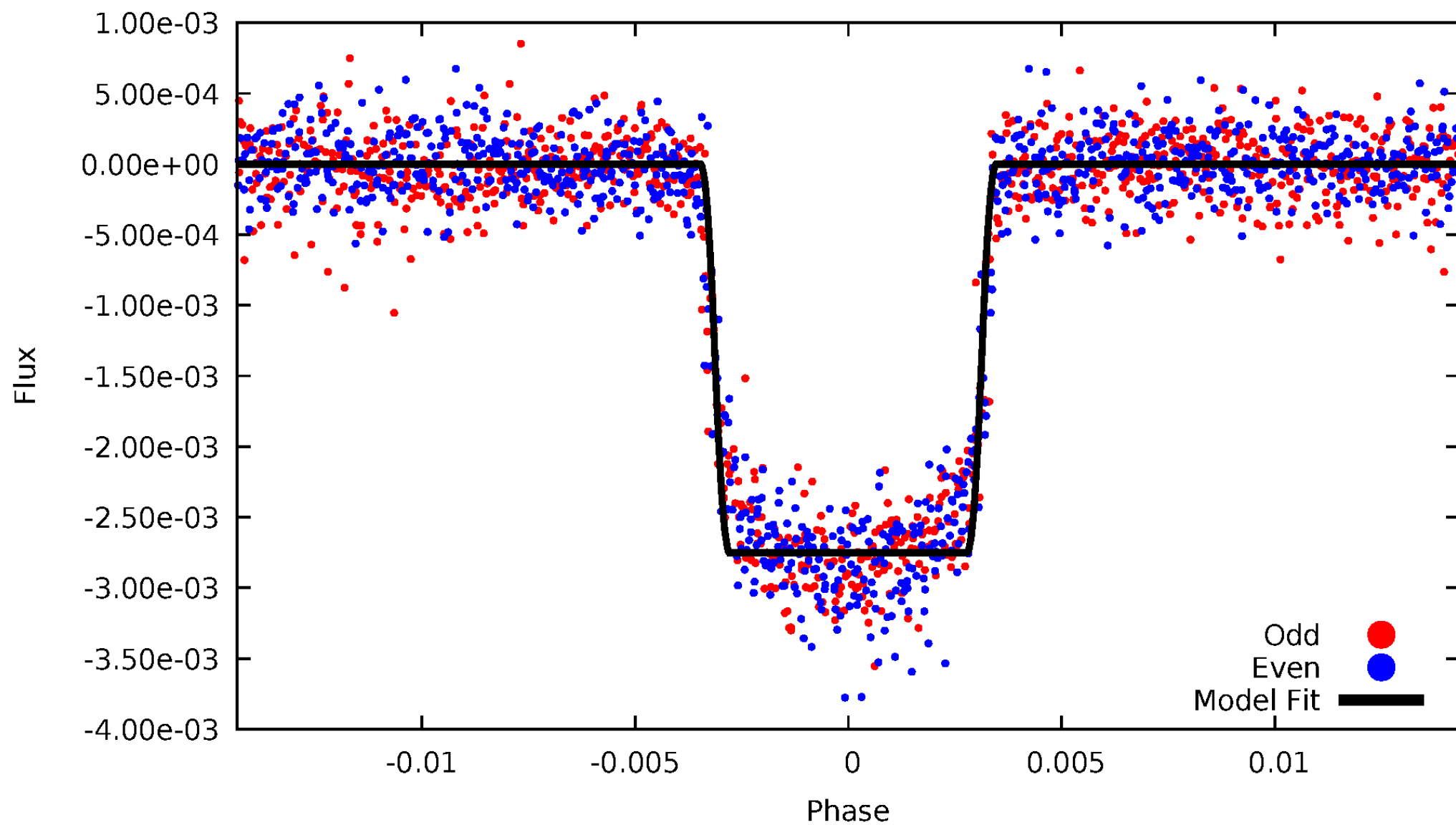
DV Odd/Even

TCE 008394721-01



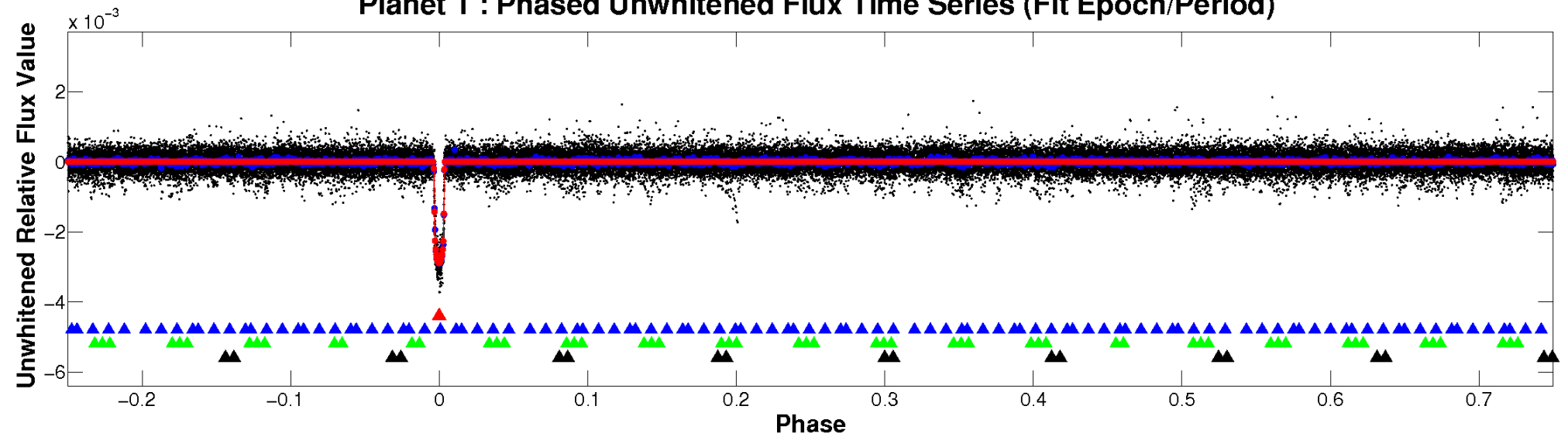
ALT Odd/Even

TCE 008394721-01

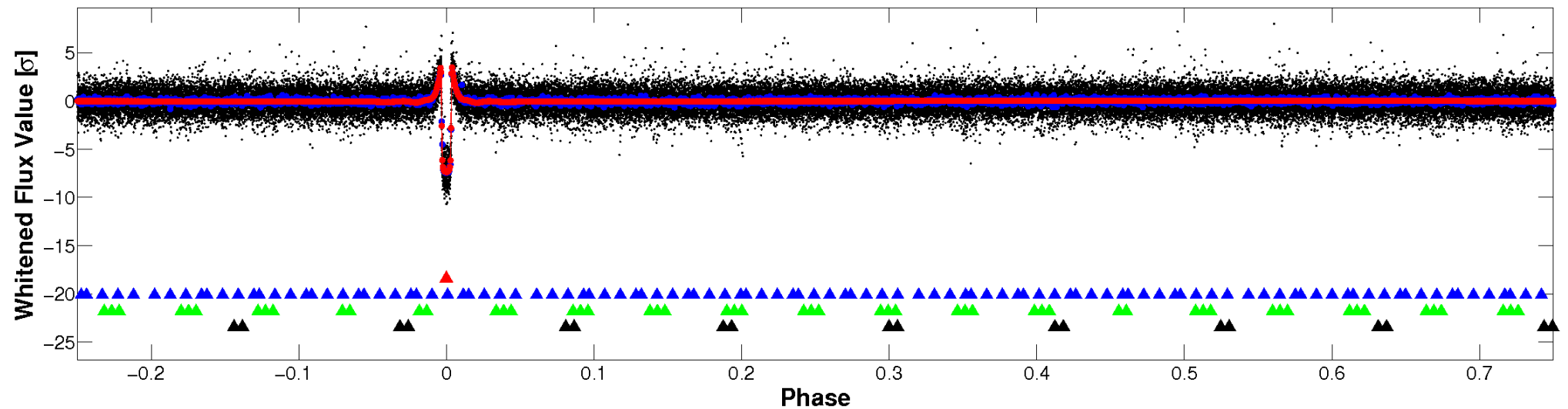


Non-Whitened Vs. Whitened Light Curve

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

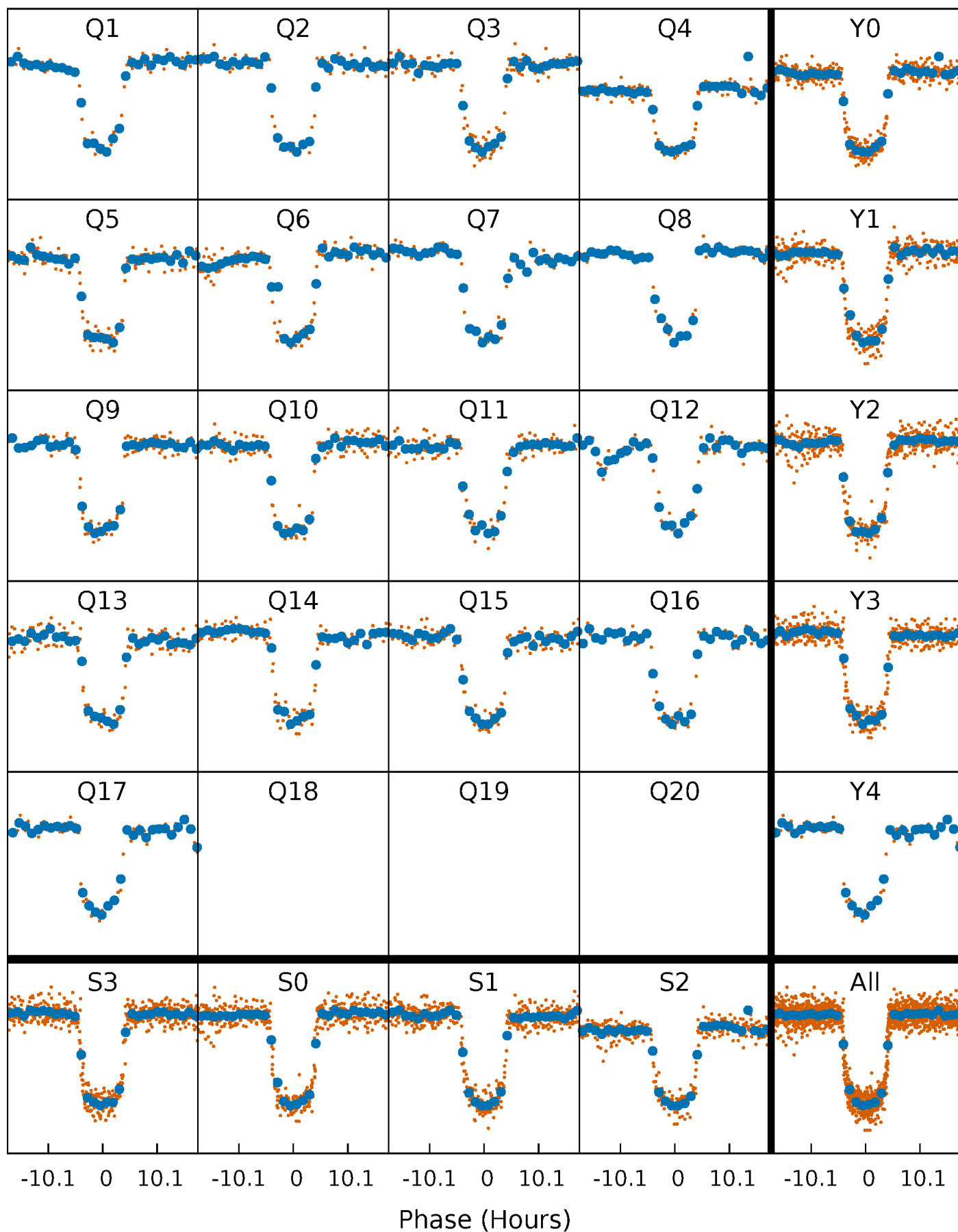


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



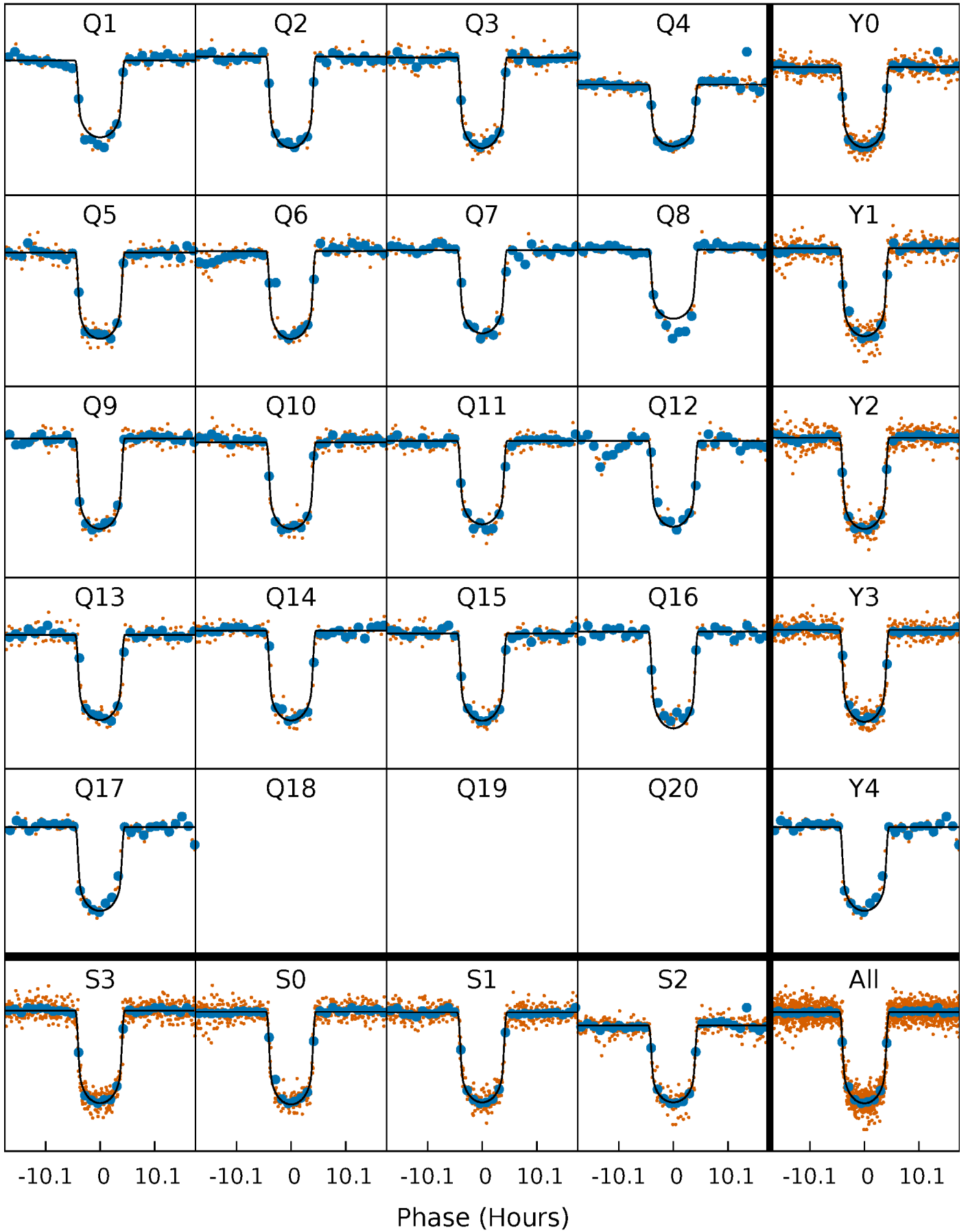
PDC Quarter-Phased Transit Curves

TCE 008394721-01 P= 52.090733 Days $T_0=158.745972$ (BKJD)



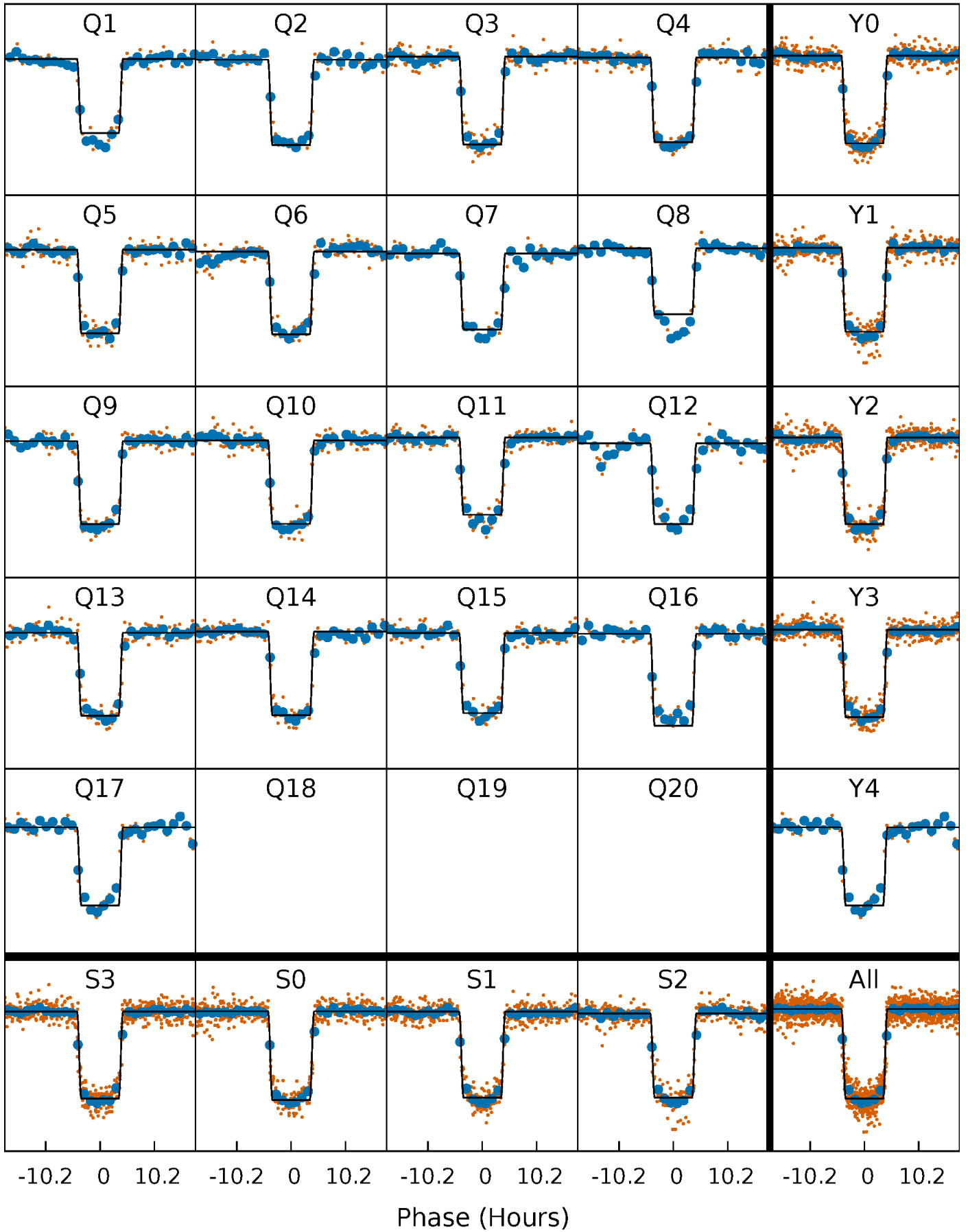
DV Quarter-Phased Transit Curves

TCE 008394721-01 P= 52.090733 Days $T_0=158.745972$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

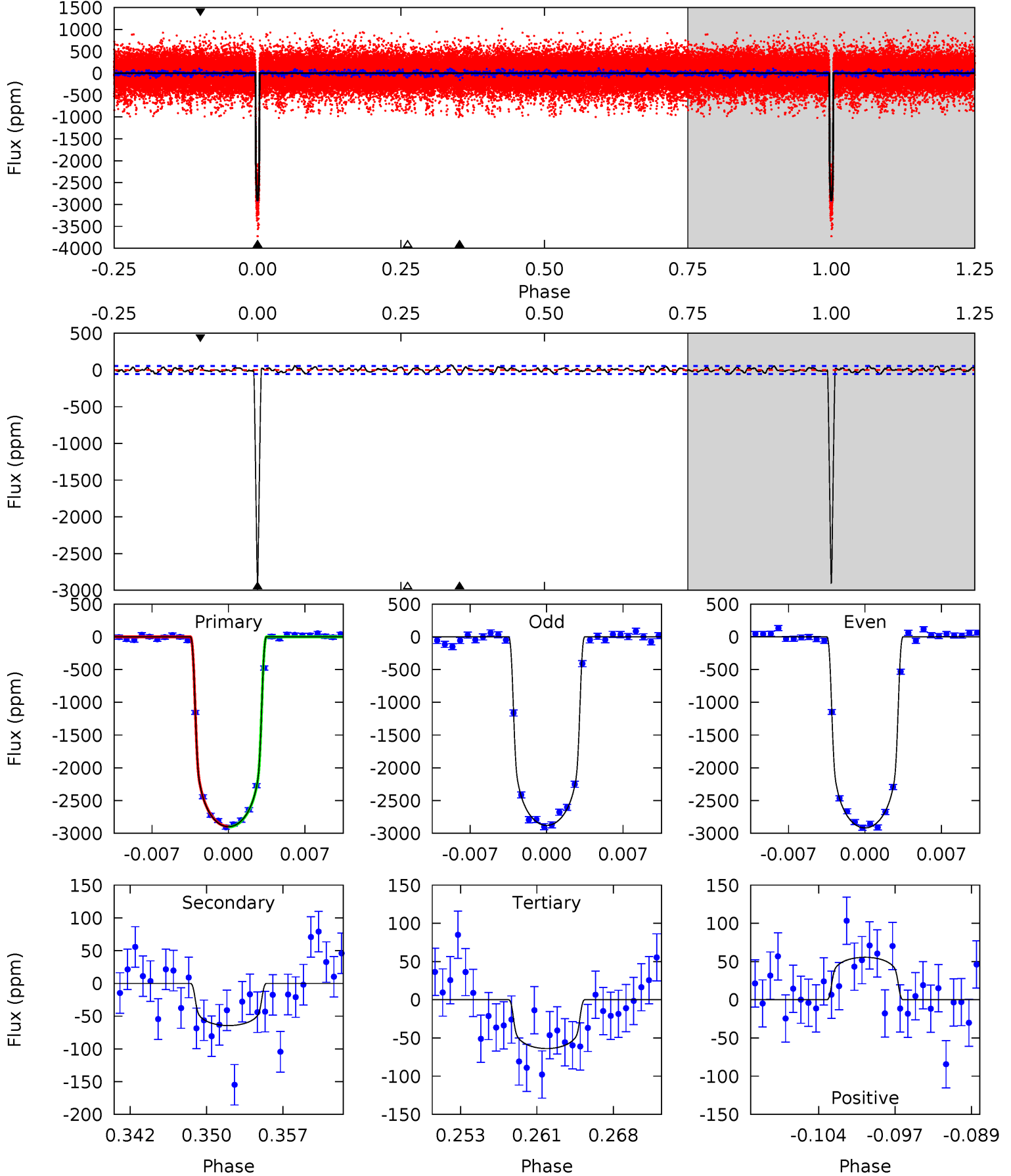
TCE 008394721-01 P= 52.090960 Days $T_0=158.743938$ (BKJD)



DV Model-Shift Uniqueness Test

008394721-01, P = 52.090733 Days, E = 106.655239 Days

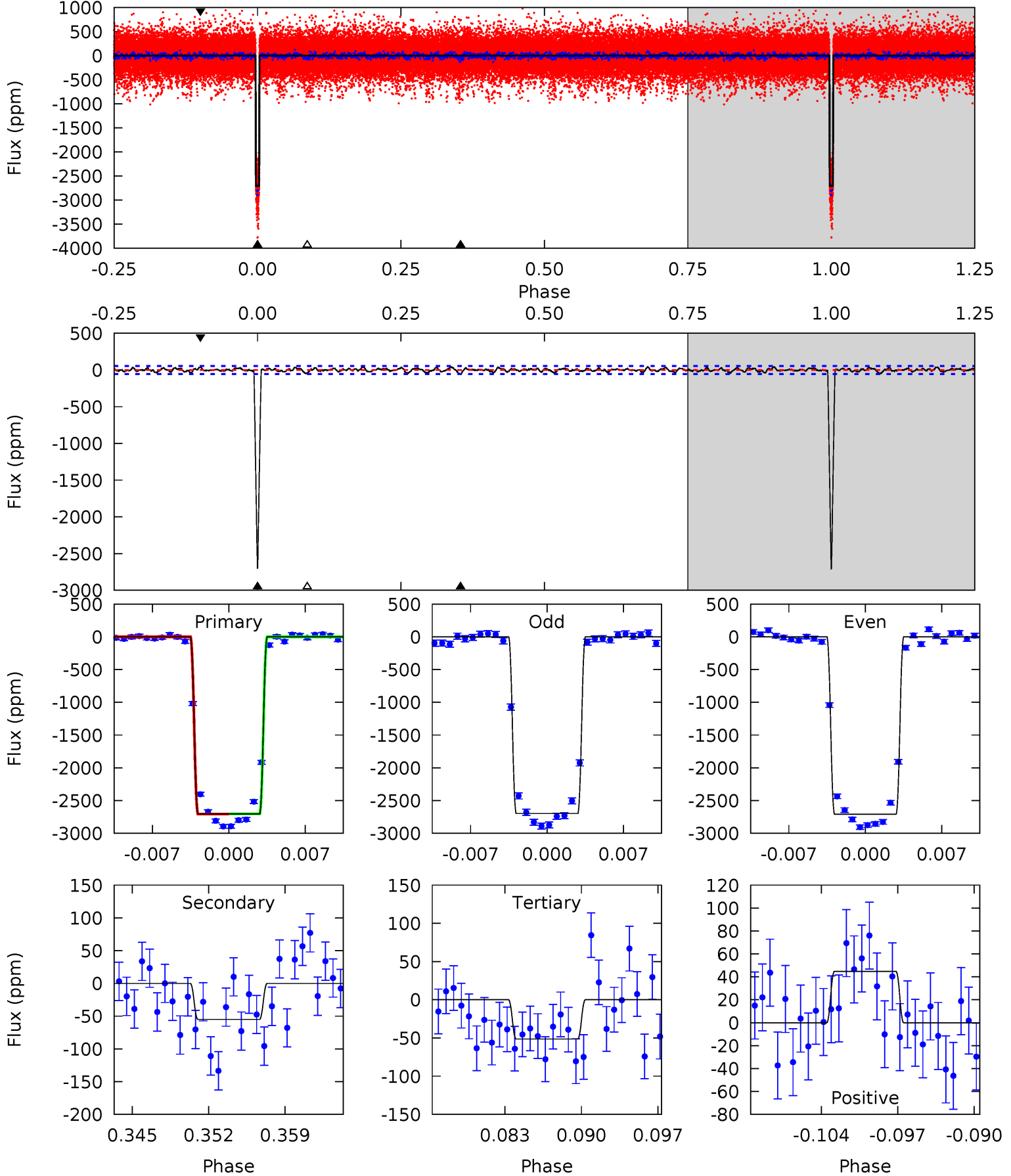
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
271.8	6.04	5.98	5.21	5.08	2.68	2.04	265.8	266.6	0.05	0.83	1.79	1.01	0.02	0.40



Alt Model-Shift Uniqueness Test

008394721-01, P = 52.090960 Days, E = 106.652978 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
250.8	5.10	4.76	4.15	5.10	2.70	1.55	246.0	246.7	0.34	0.96	0.48	1.00	0.02	0.28



Stellar Parameters For KIC 008394721

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6198^{+111}_{-136}	$4.237^{+0.130}_{-0.117}$	$-0.040^{+0.150}_{-0.150}$	$1.324^{+0.247}_{-0.202}$	$1.101^{+0.109}_{-0.081}$	$0.668^{+0.395}_{-0.249}$
	+2%/-2%	+3%/-3%	+375%/-375%	+19%/-15%	+10%/-7%	+59%/-37%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008394721-01 / KOI 0152.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-64 ± 11	$7.35^{+0.74}_{-0.61}$	824^{+40}_{-40}	3085^{+84}_{-82}	52^{+14}_{-12}
Alt.	-55 ± 11	$7.57^{+0.77}_{-0.64}$	826^{+42}_{-39}	3001^{+86}_{-98}	42^{+13}_{-10}

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 $A_{obs} \gg 1.0$

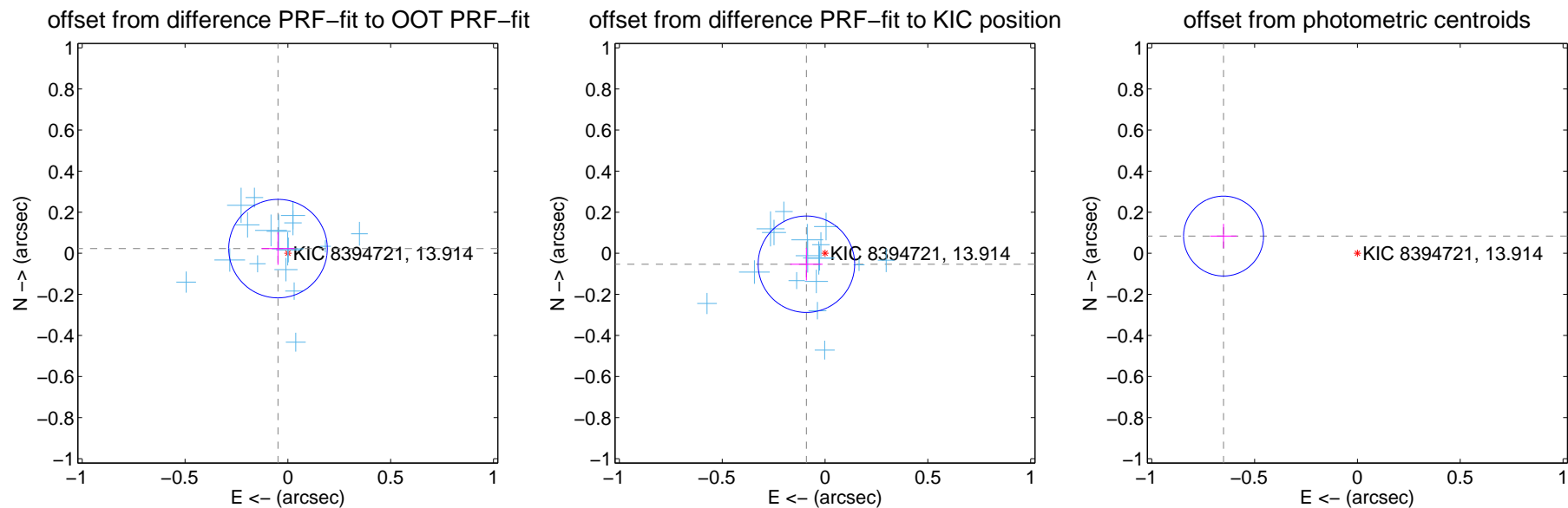
DV Centroid Data

Supplemental centroid analysis for 008394721-01. Kepler magnitude: 13.91. Transit SNR 145.98

There are 17 quarters with good PRF difference image offsets

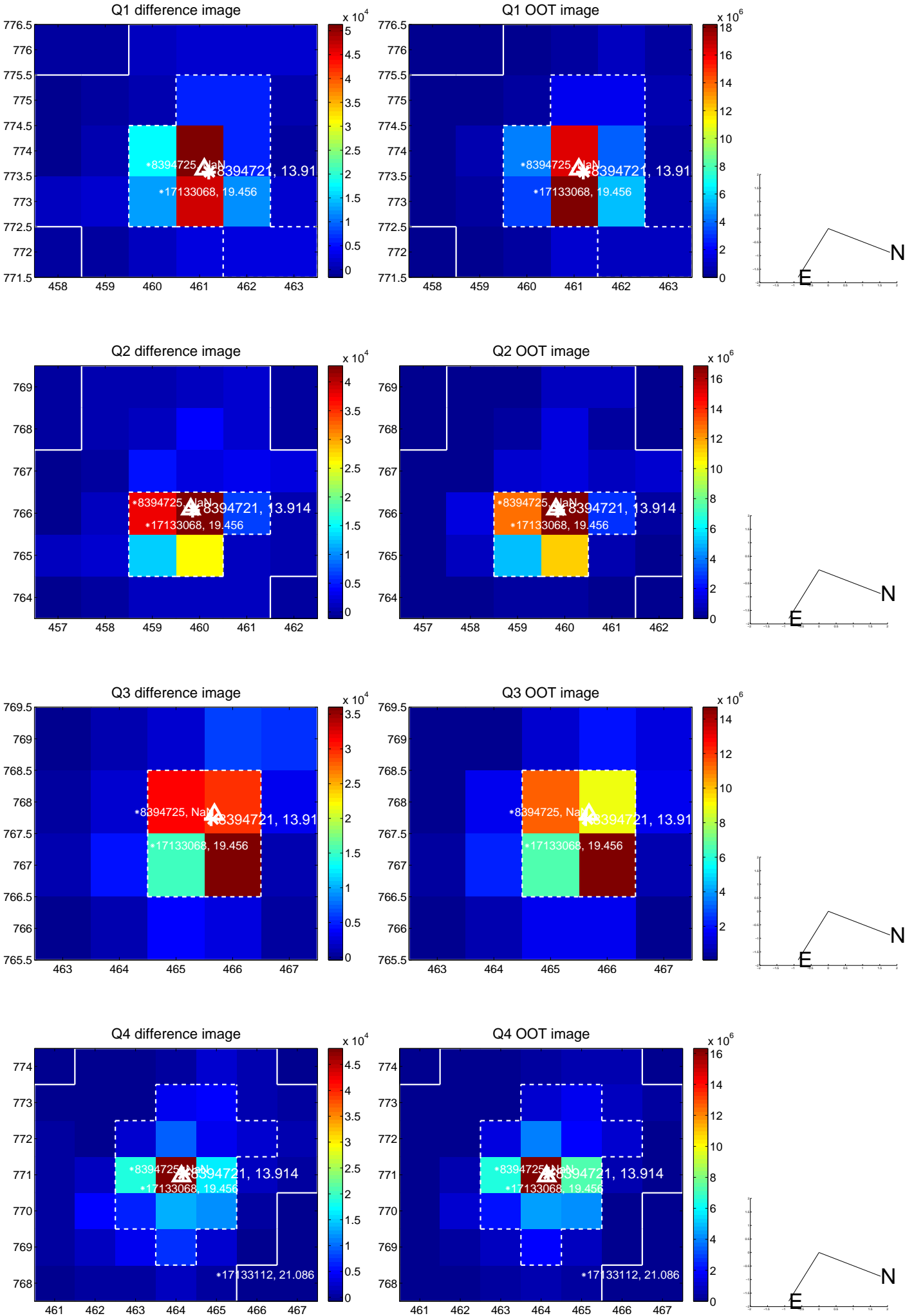
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.053 ± 0.080	0.66	0.048 ± 0.080	0.023 ± 0.079
PRF-fit source offset from KIC position	0.105 ± 0.078	1.34	0.091 ± 0.079	-0.053 ± 0.079
photometric centroid source offset	0.66 ± 0.06	10.13	0.65 ± 0.06	0.08 ± 0.06

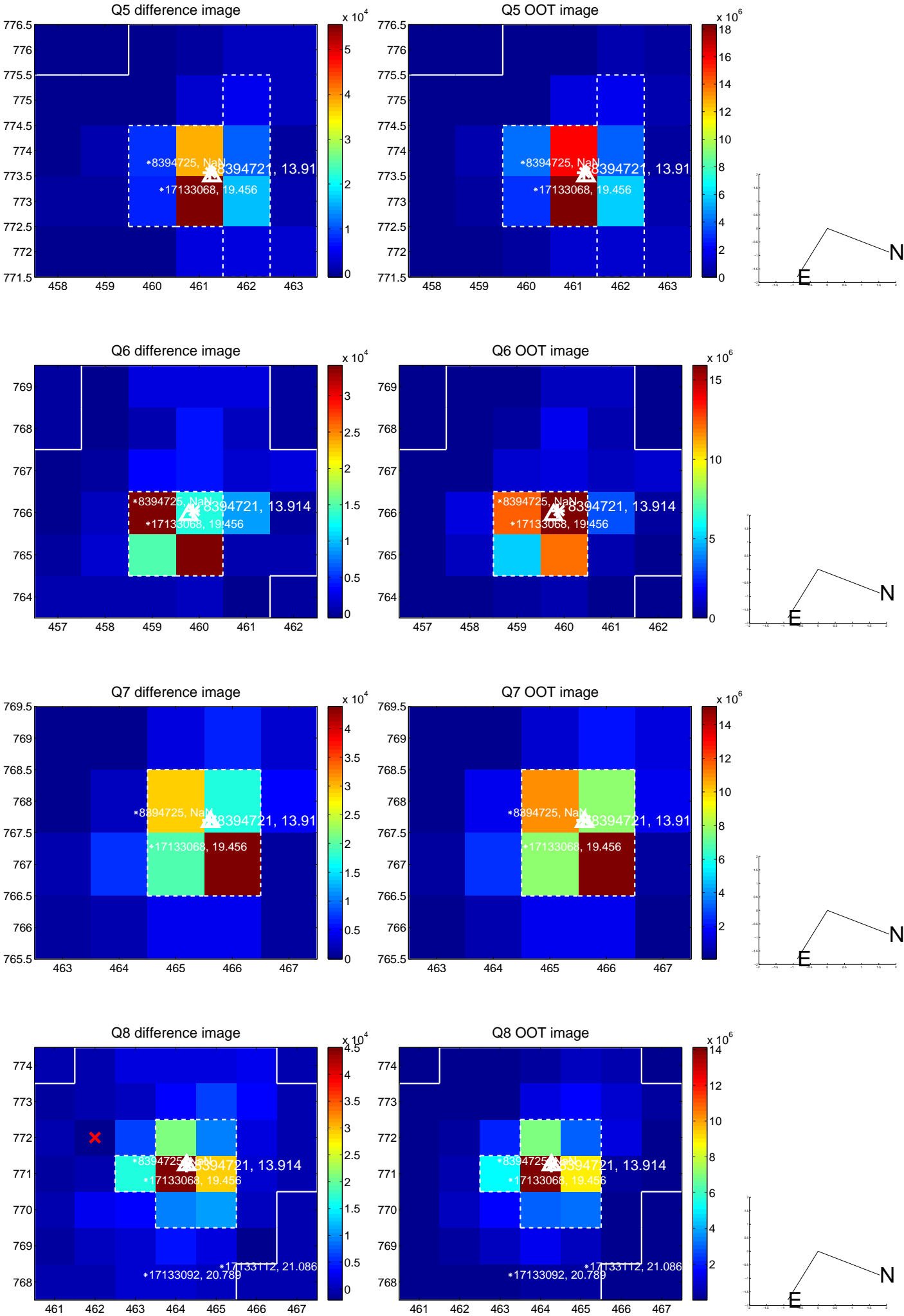


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

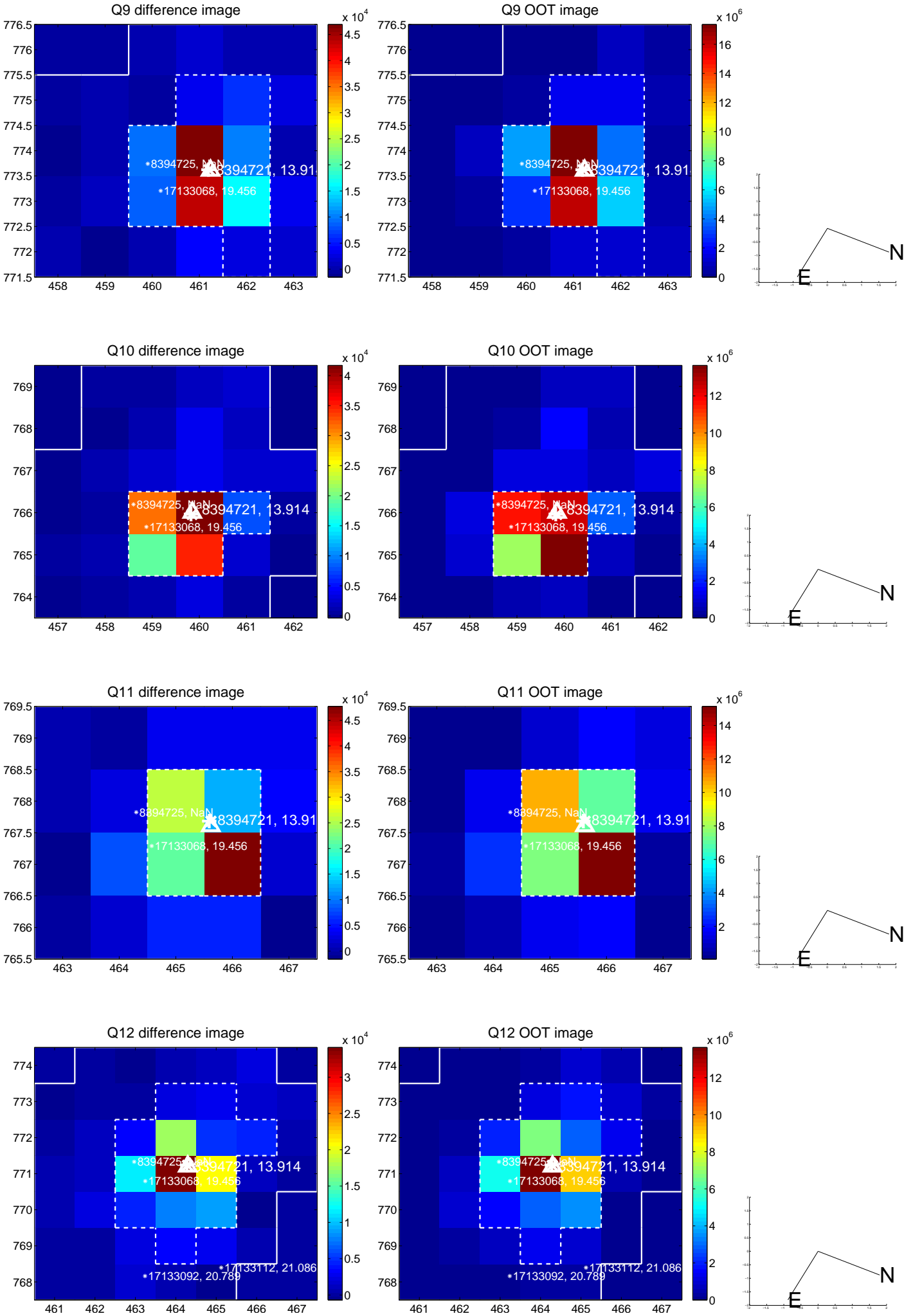
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



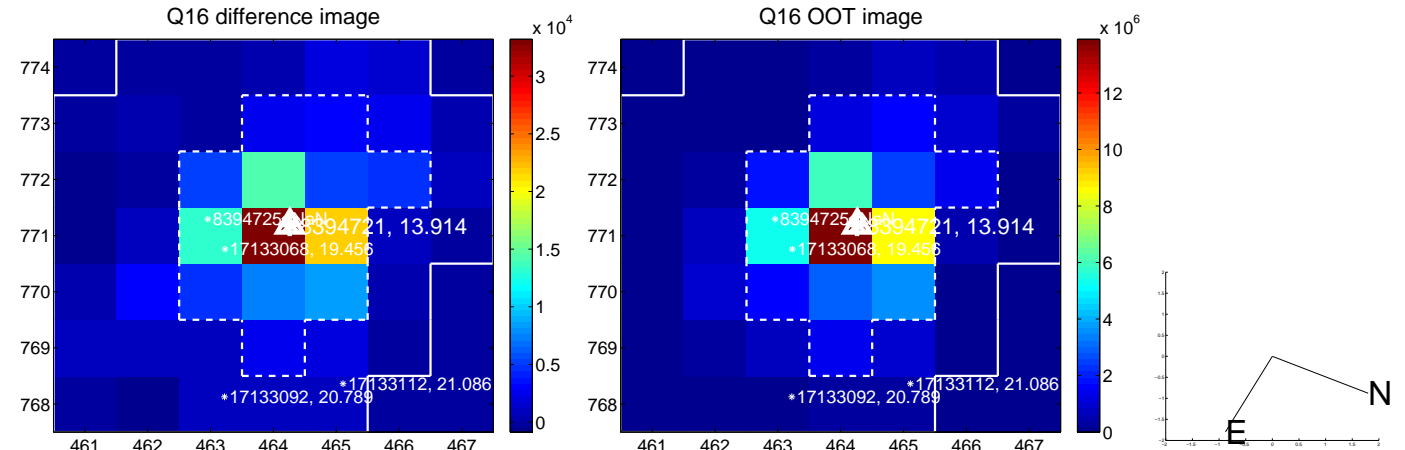
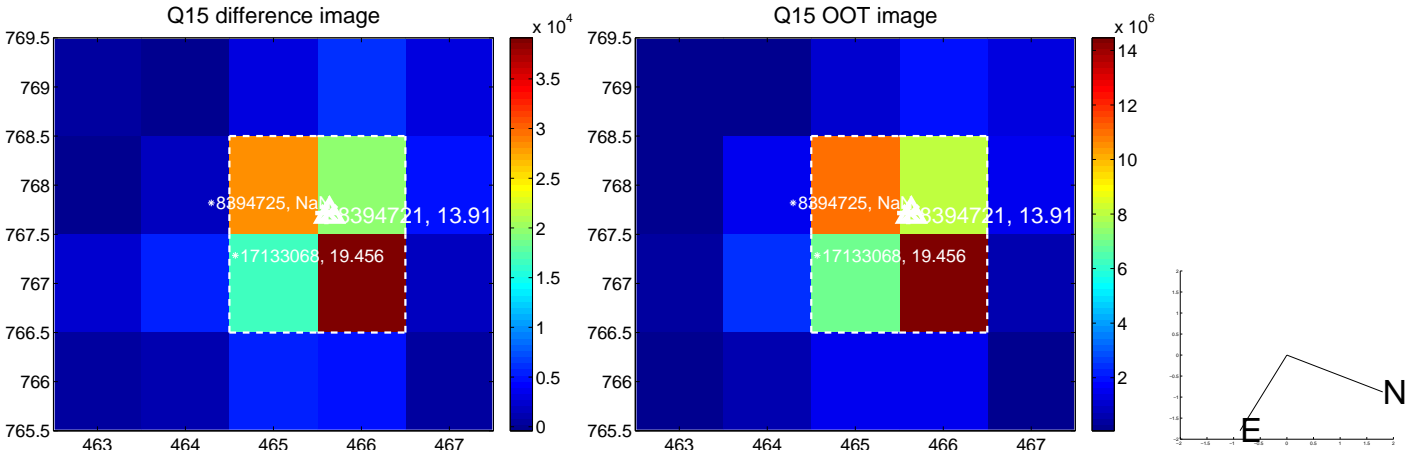
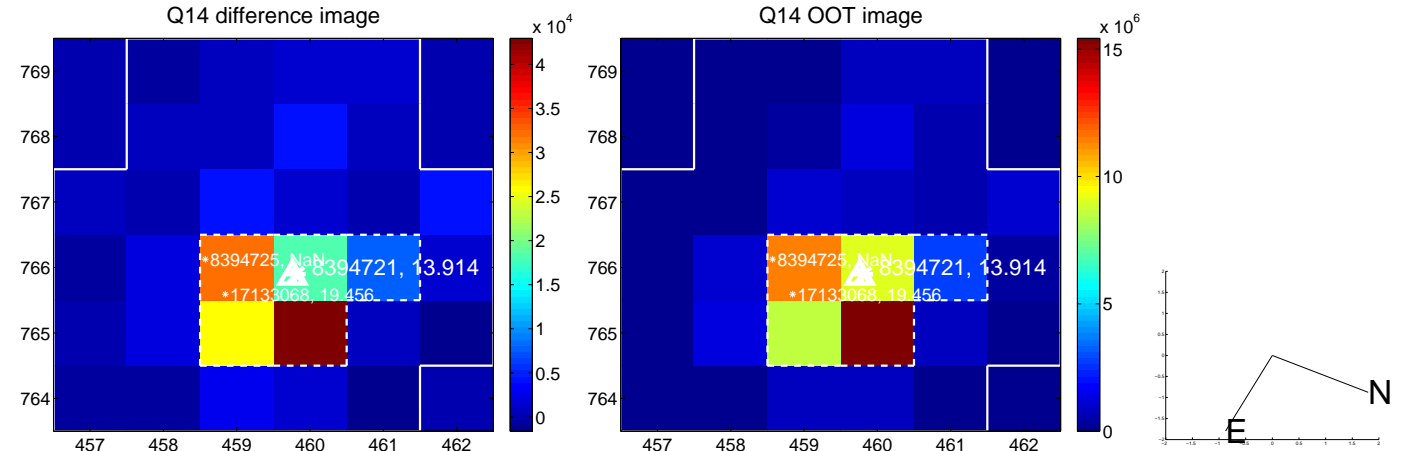
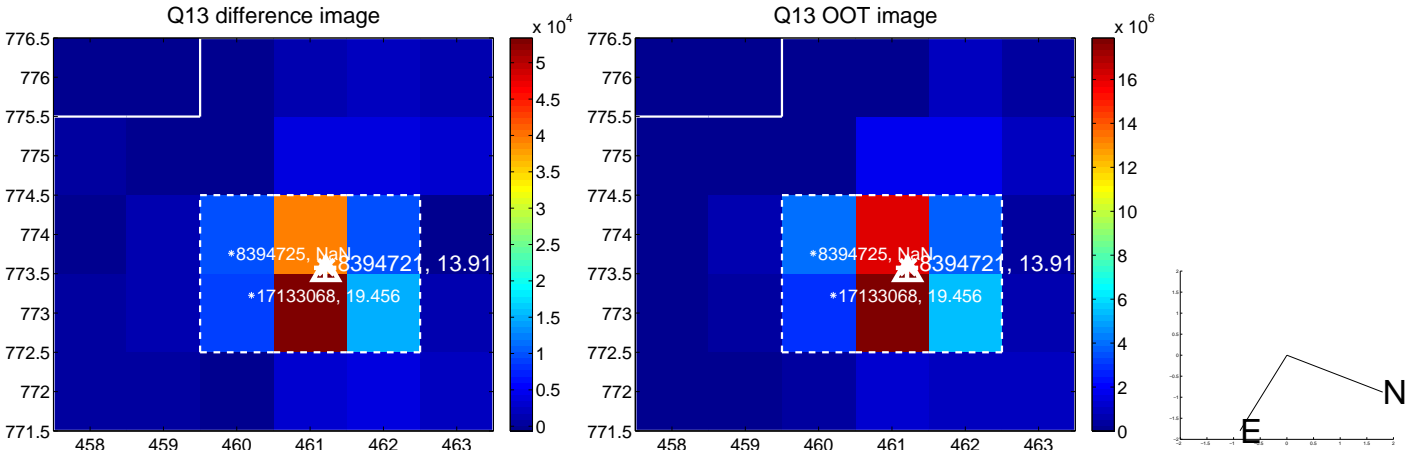
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



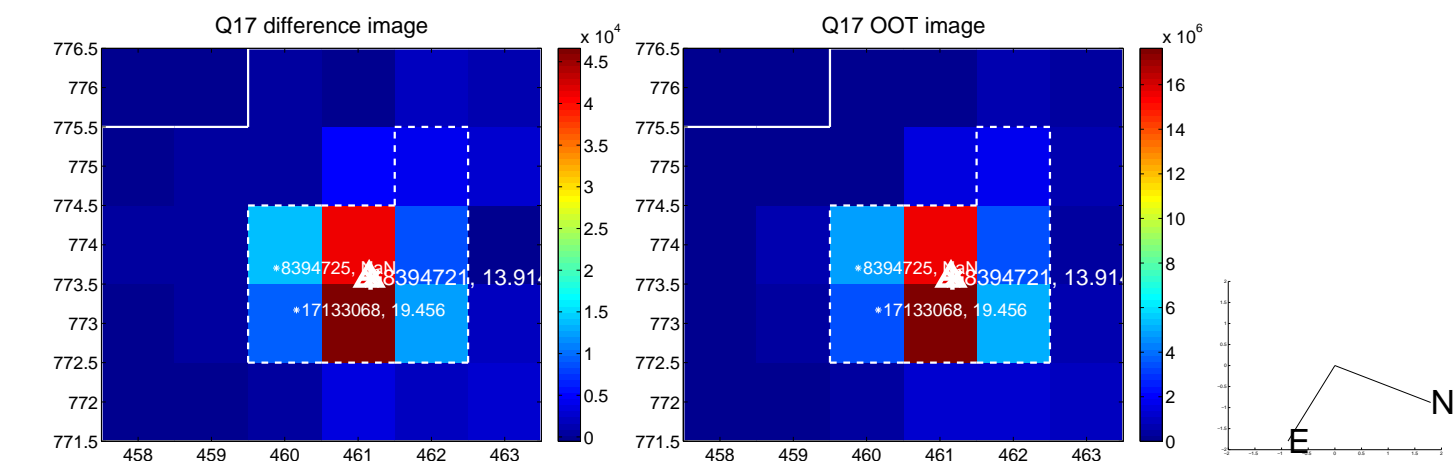
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



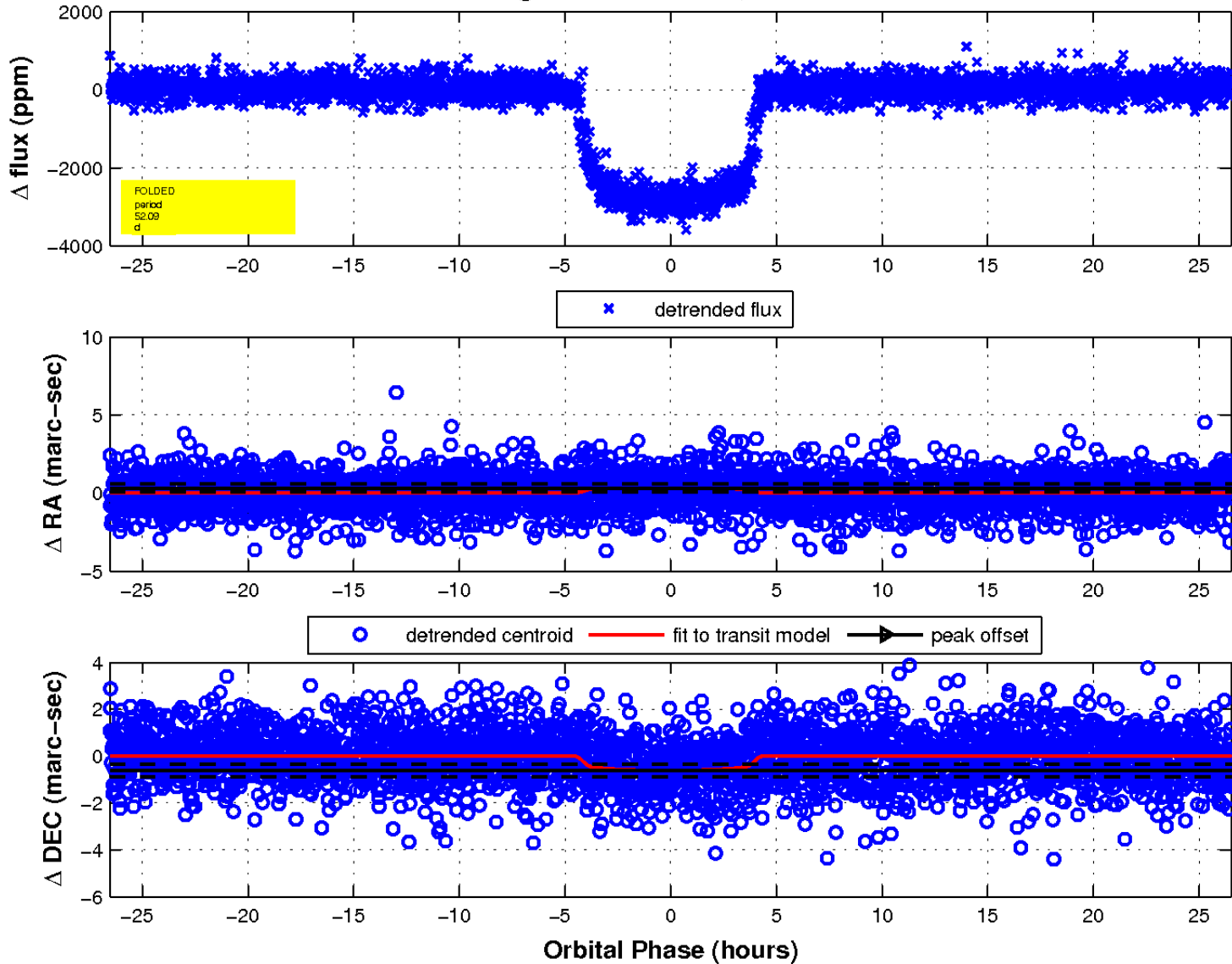
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

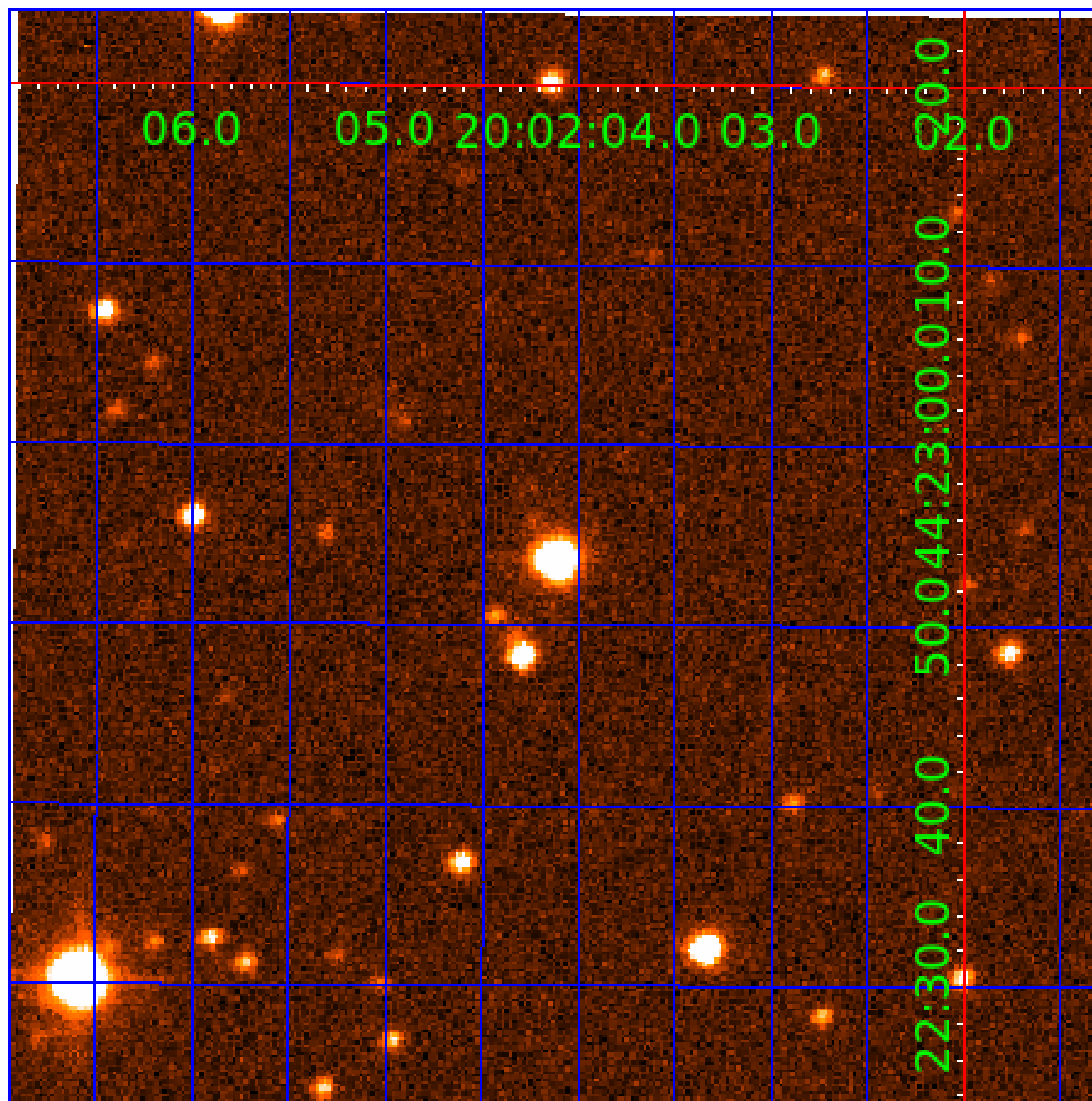


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 008394721

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})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008394721-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008394721-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-04	OBS	PC	0.98	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.

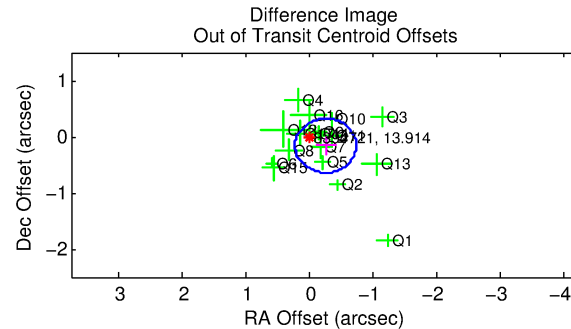
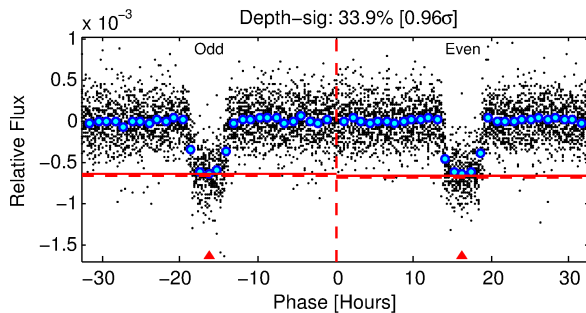
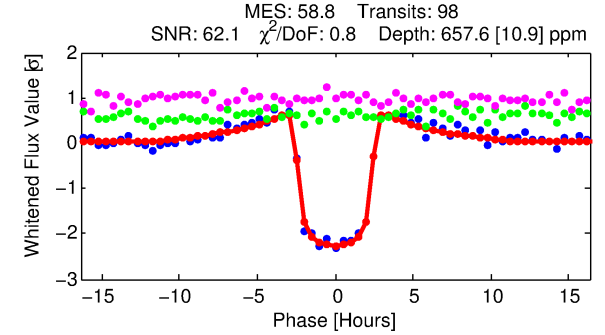
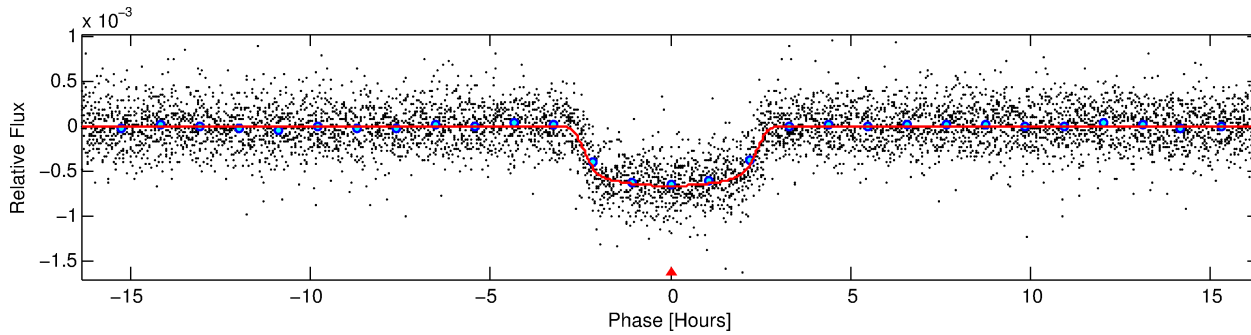
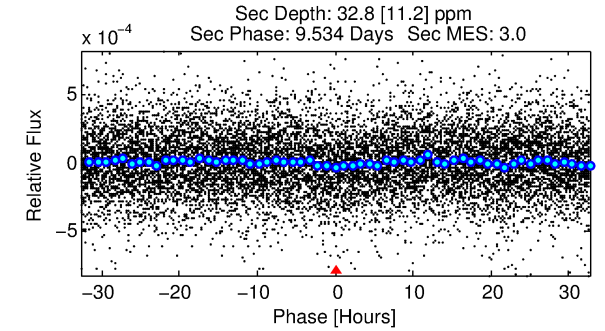
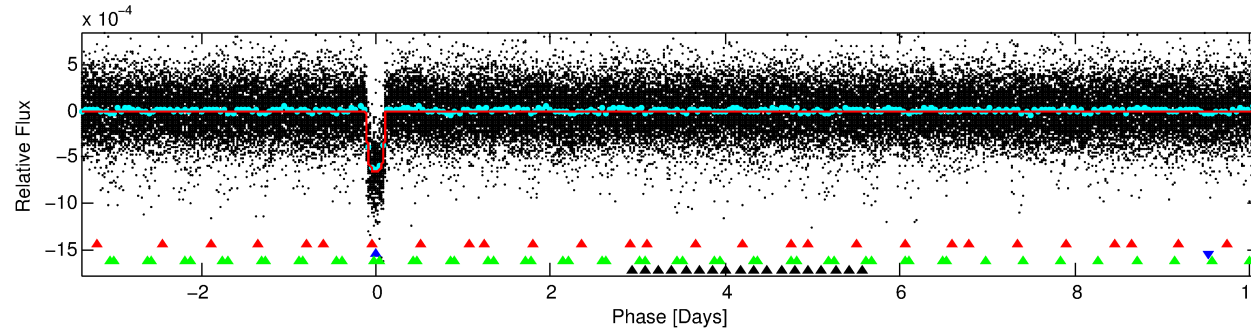
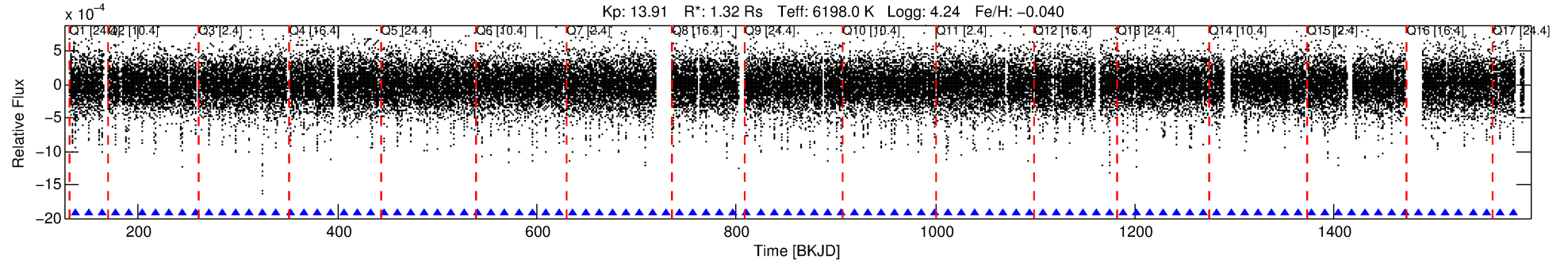
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008394721-02

No Significant Match Found

DV One-Page Summary

KIC: 8394721 Candidate: 2 of 4 Period: 13.485 d
KOI: K00152.03 Name: Kepler-79b Corr: 0.963



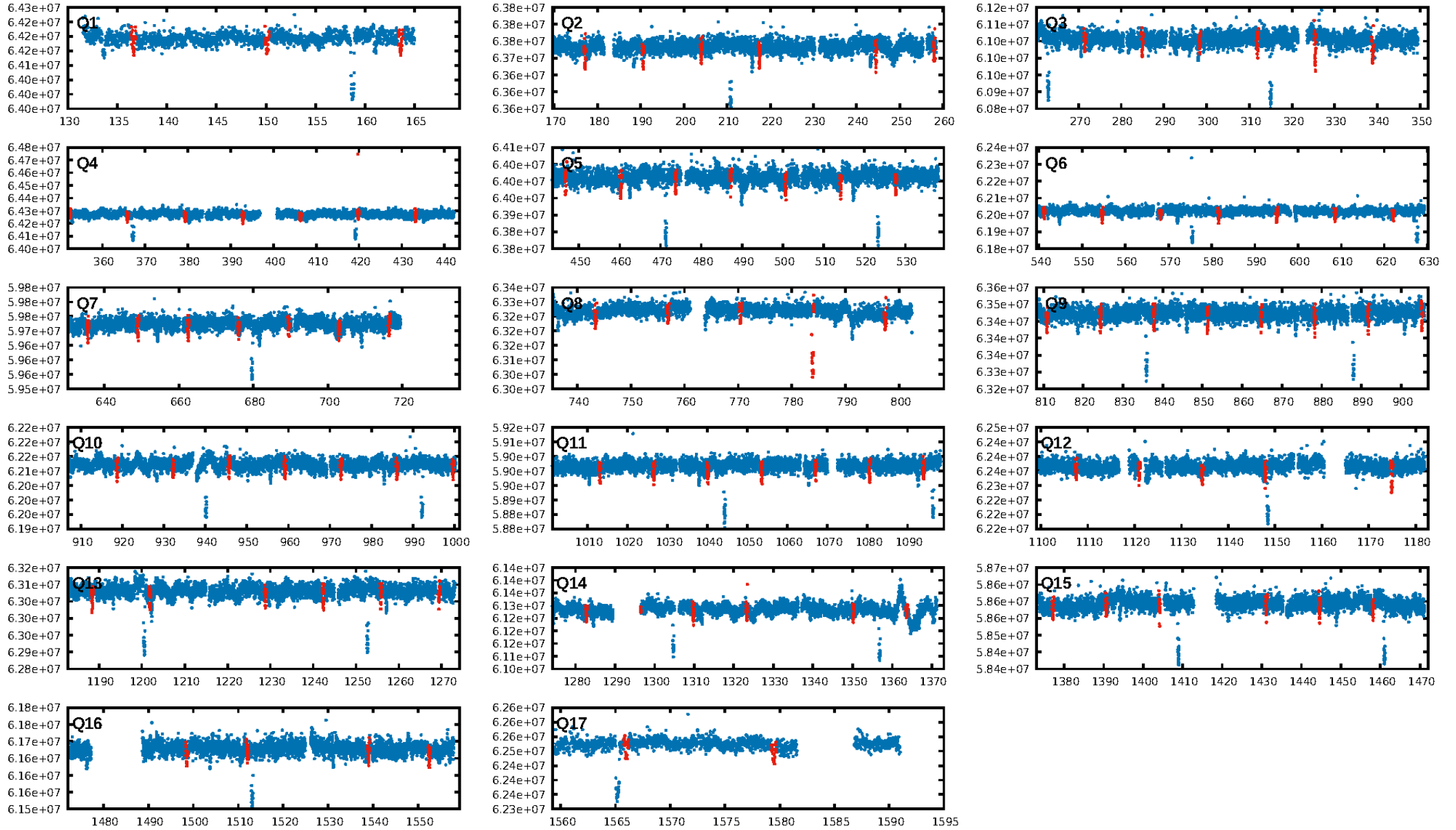
DV Fit Results:

Period = 13.48455 [0.00003] d
Epoch = 136.6208 [0.0015] BKJD
Rp/R* = 0.0273 [0.0007]
a/R* = 9.95 [1.09]
b = 0.88 [0.03]
Seff = 176.49 [44.30]
Teff = 929 [58] K
Rp = 3.94 [0.74] Re
a = 0.1146 [0.0183] AU
Ag = 15.25 [6.36] [2.24σ]
Teffp = 2840 [252] K [7.38σ]

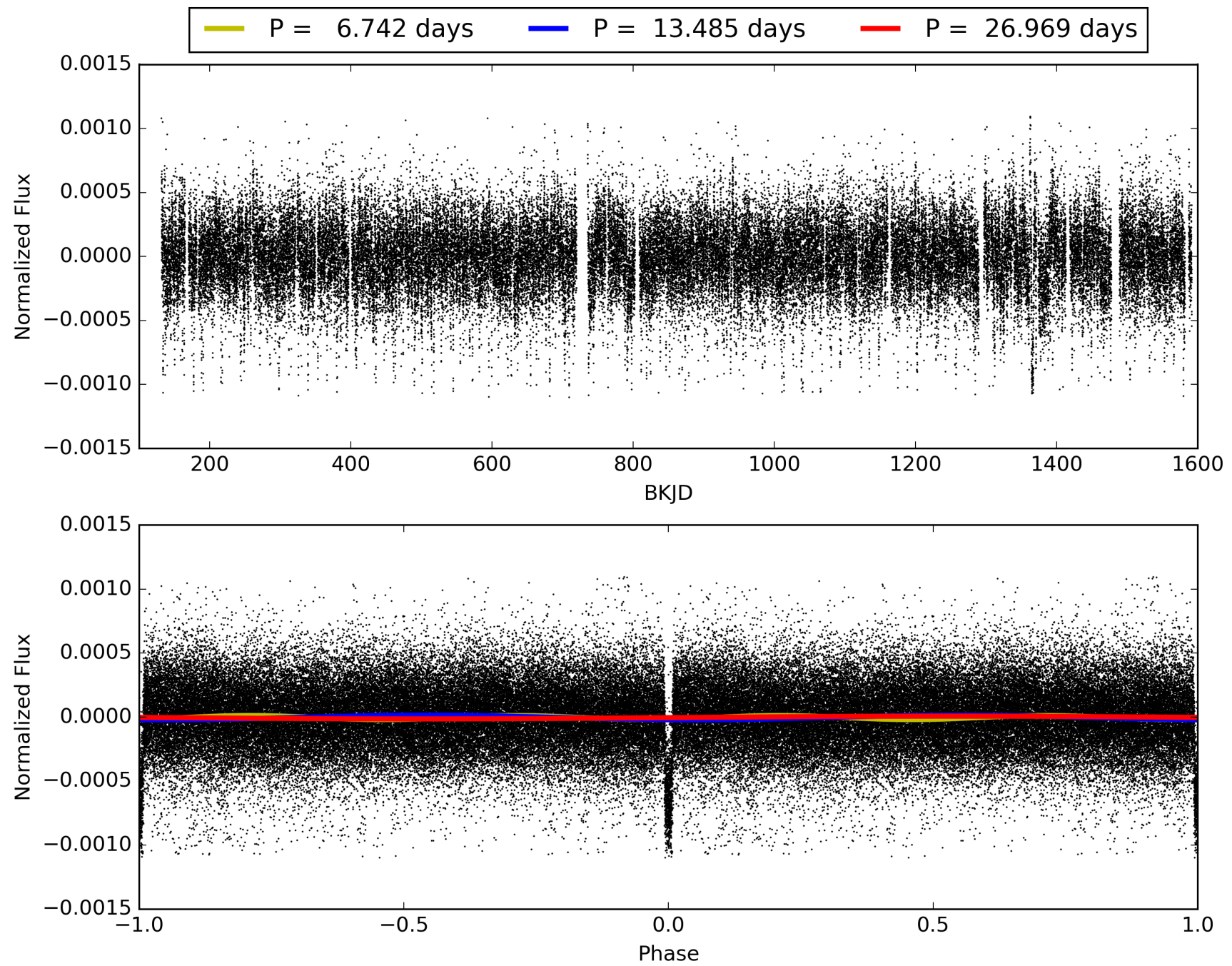
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [36.39σ]
ModelChiSquare2-sig: 73.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [93/93]
GhostDiagnostic-chr: 2.957
Centroid-sig: 20.9%
Centroid-so: 0.643 arcsec [3.48σ]
OotOffset-rm: 0.298 arcsec [1.86σ]
KicOffset-rm: 0.318 arcsec [1.97σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 008394721-02, PDC Light Curves

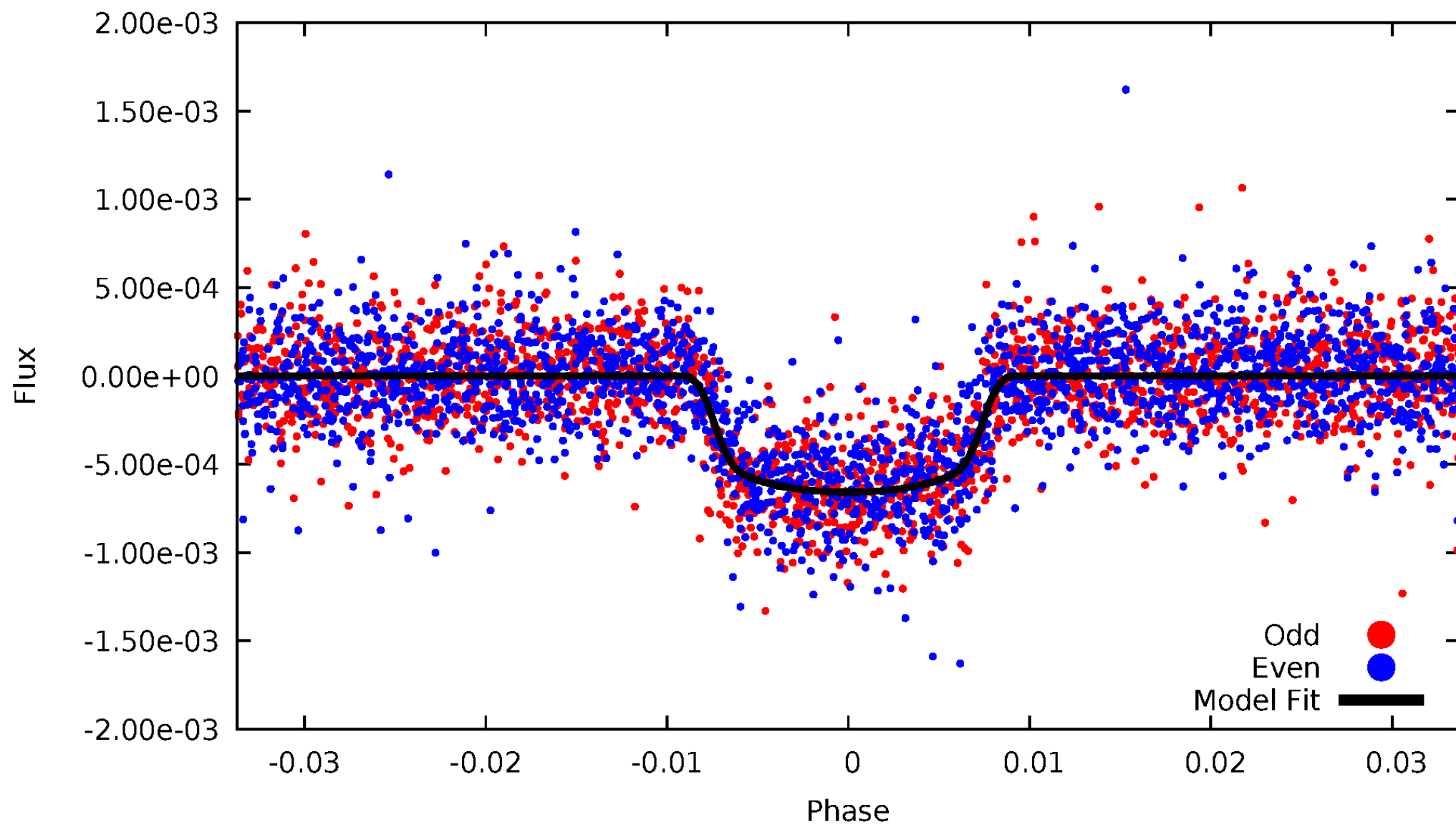


TCE 008394721-02



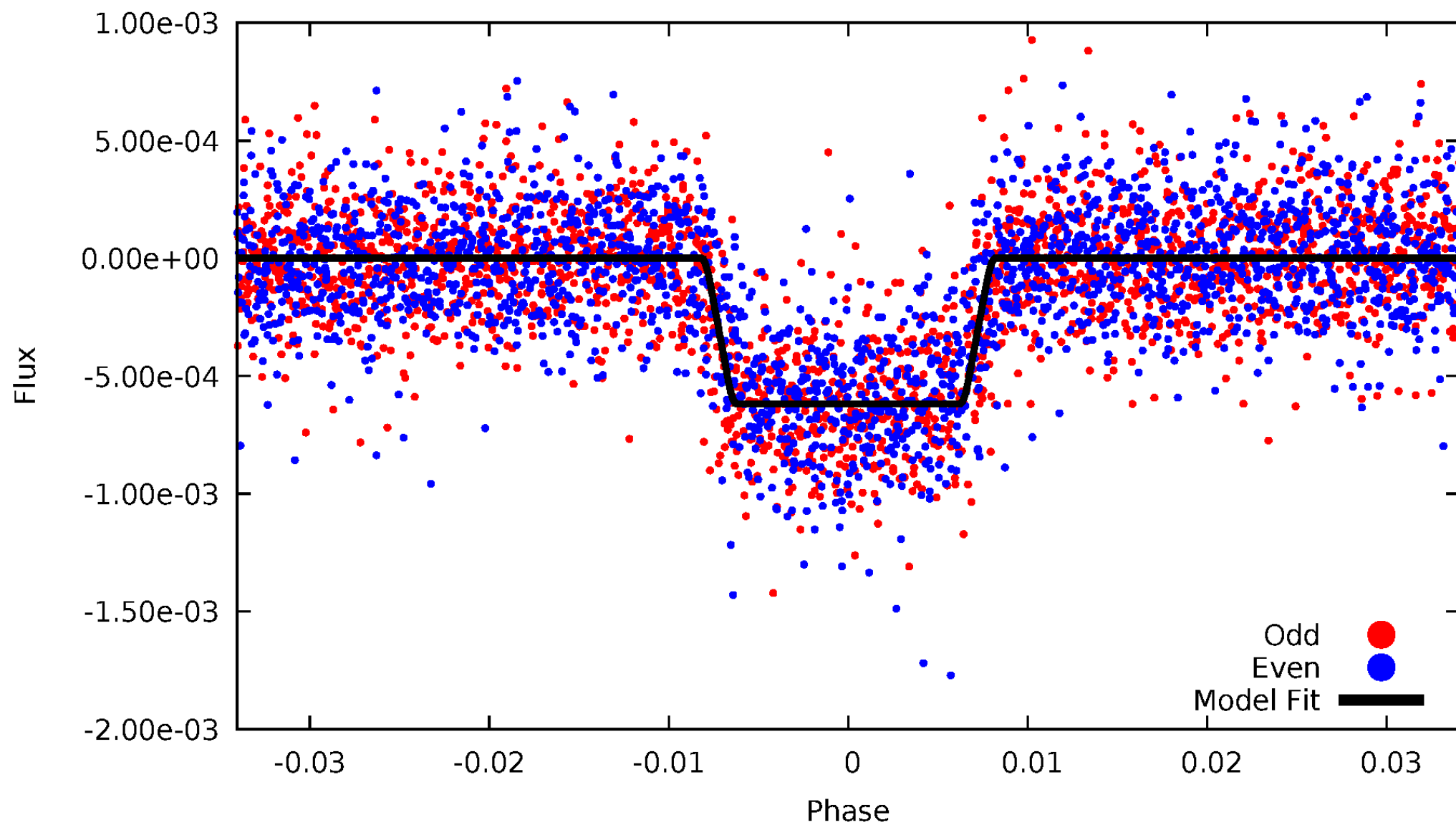
DV Odd/Even

TCE 008394721-02



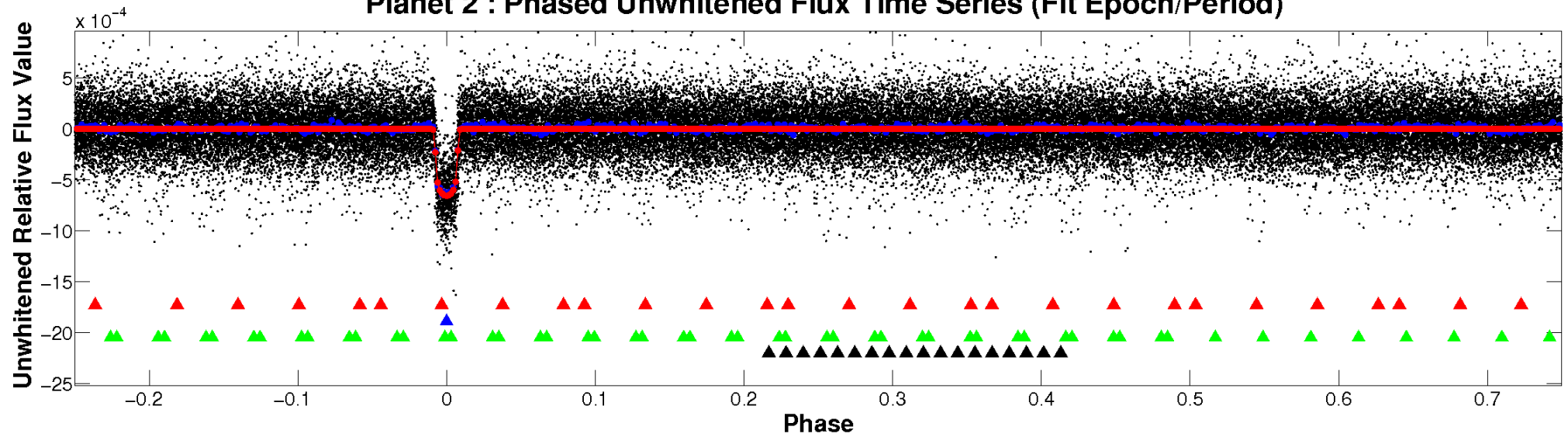
ALT Odd/Even

TCE 008394721-02

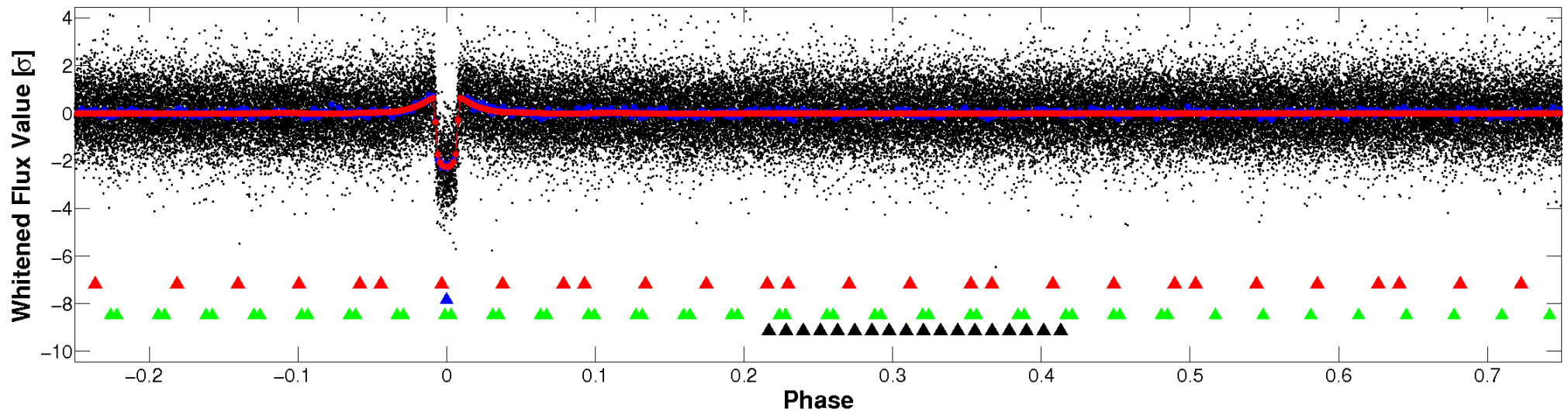


Non-Whitened Vs. Whitened Light Curve

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

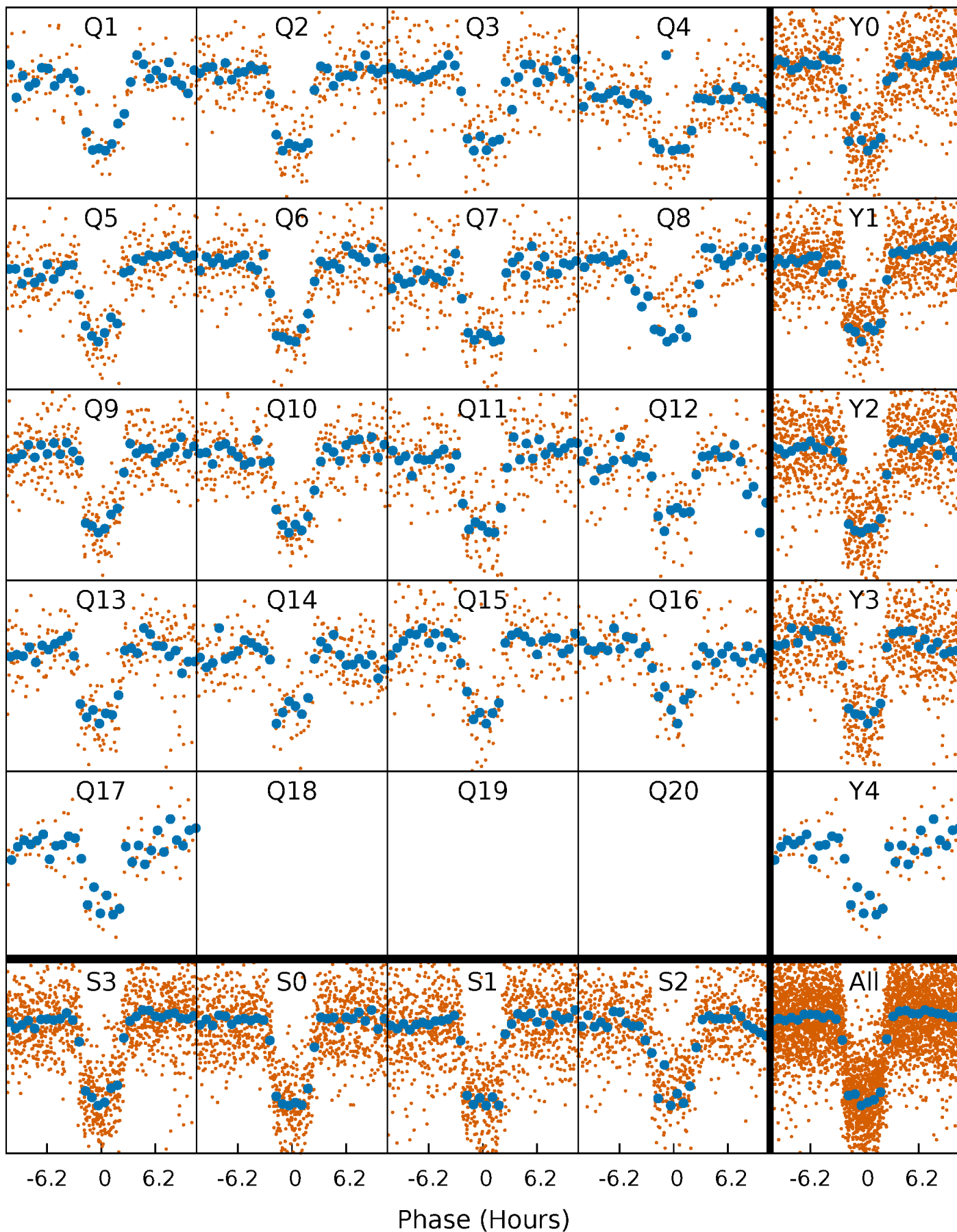


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



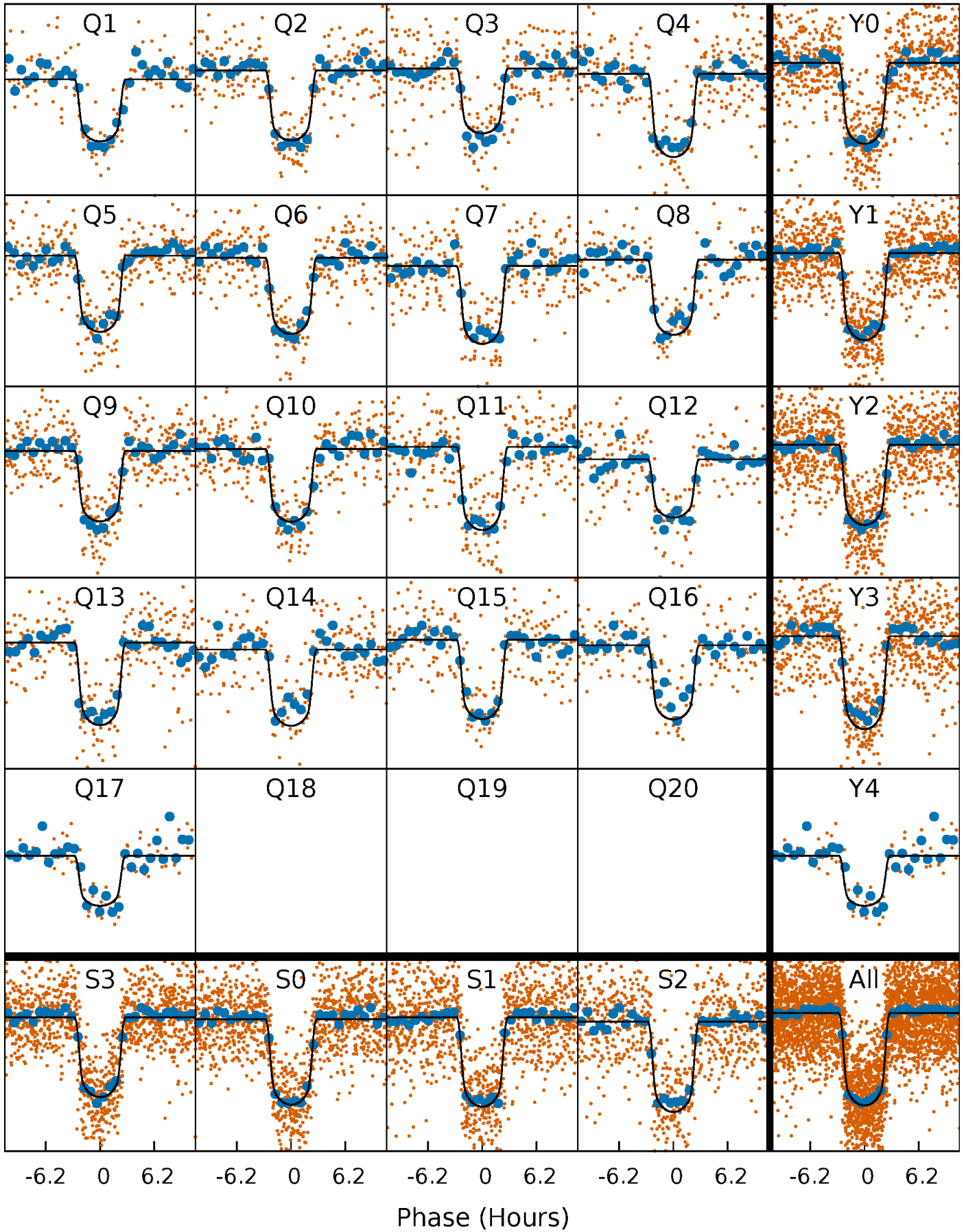
PDC Quarter-Phased Transit Curves

TCE 008394721-02 P= 13.484547 Days $T_0=136.620831$ (BKJD)



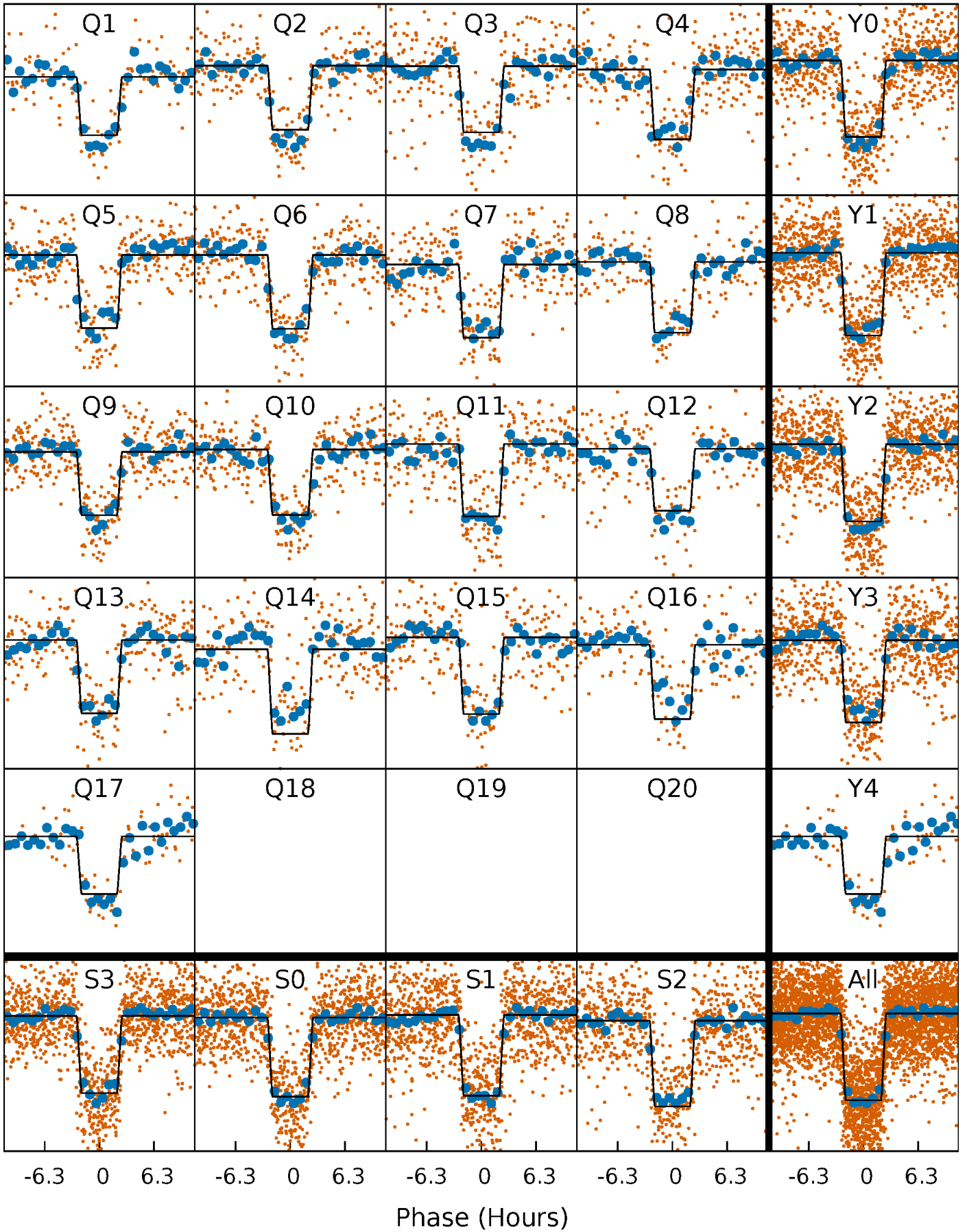
DV Quarter-Phased Transit Curves

TCE 008394721-02 P= 13.484547 Days $T_0=136.620831$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

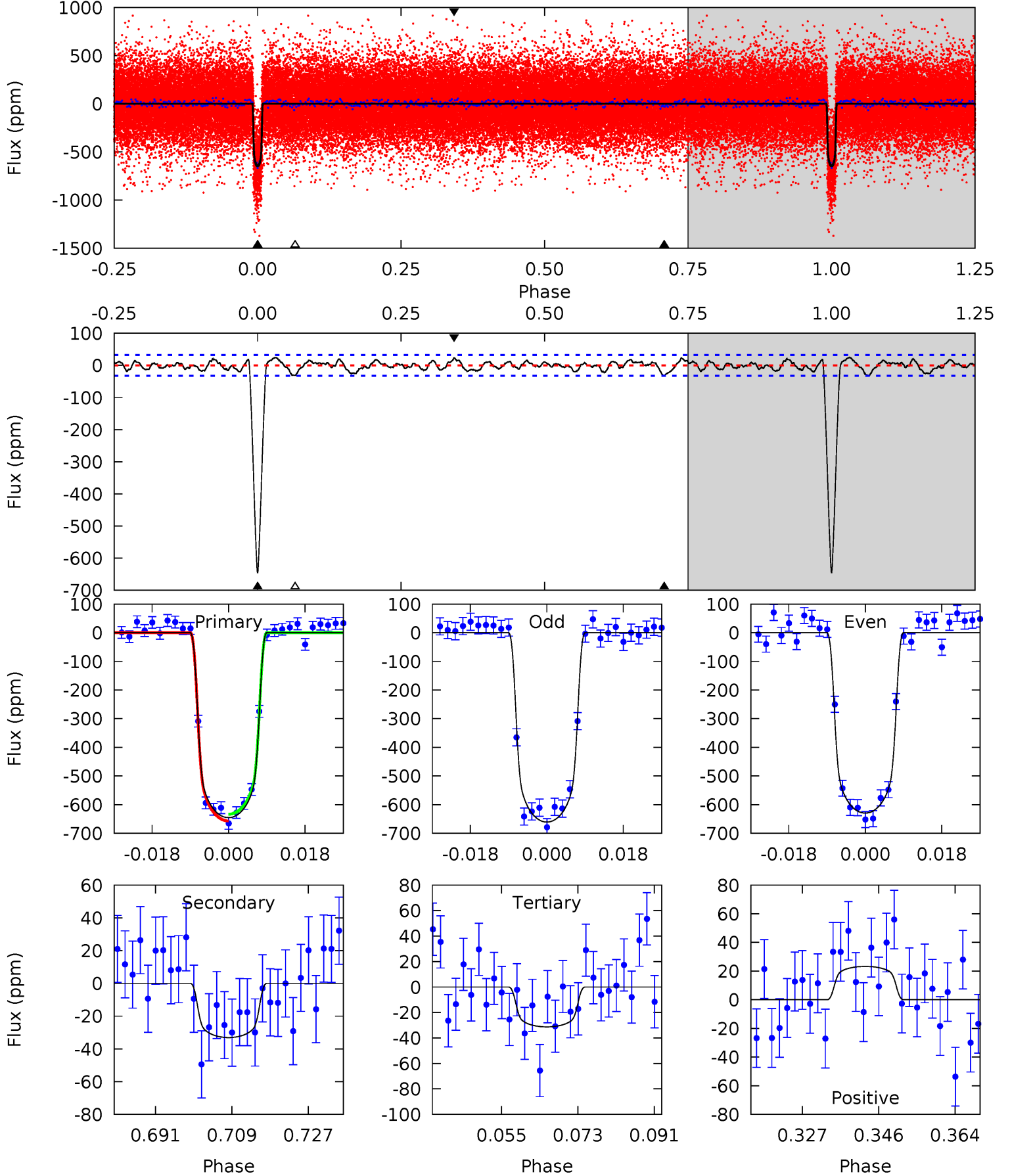
TCE 008394721-02 P= 13.484363 Days $T_0=136.629697$ (BKJD)



DV Model-Shift Uniqueness Test

008394721-02, $P = 13.484547$ Days, $E = 123.136284$ Days

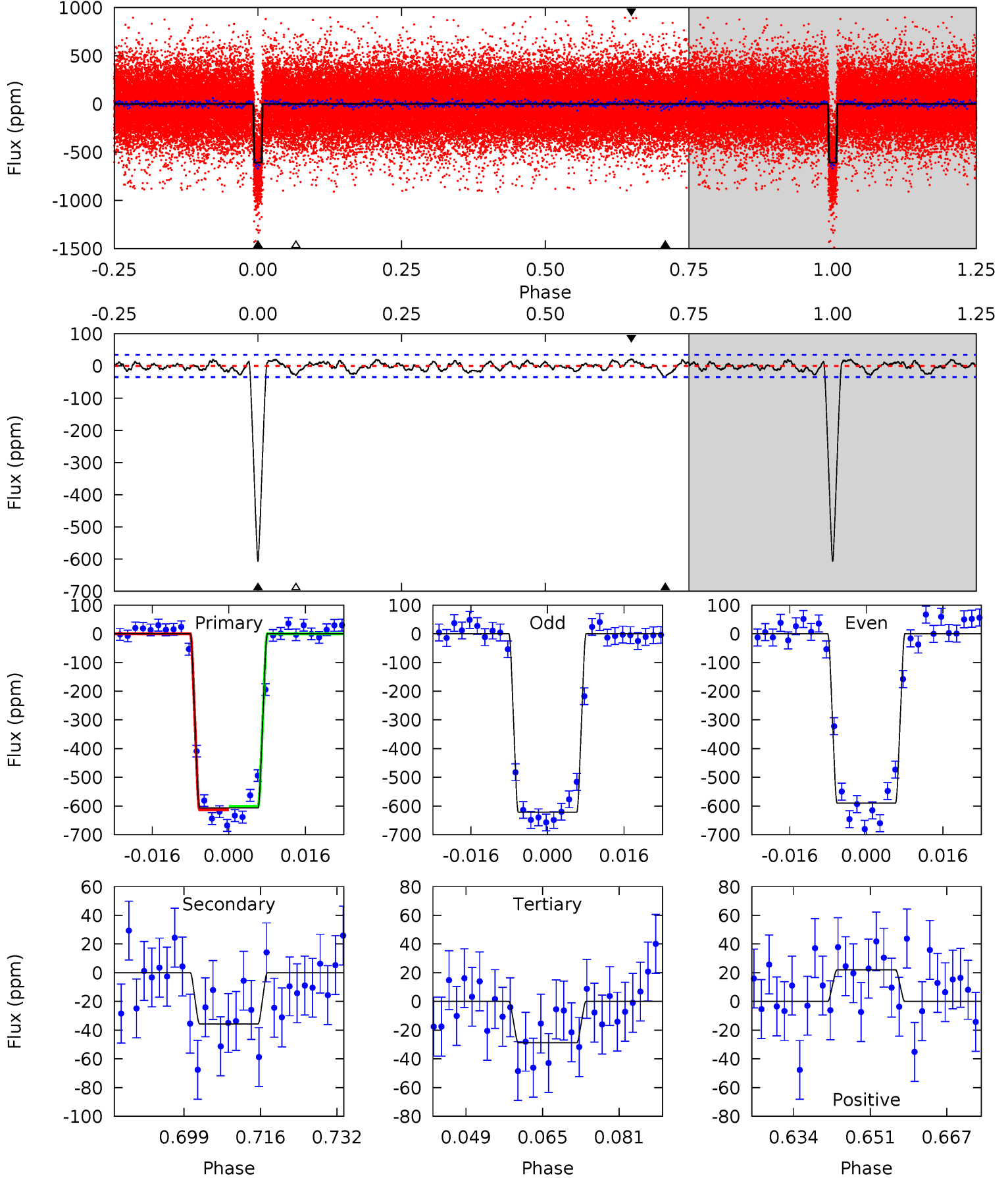
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
97.7	5.01	4.74	3.52	4.91	2.36	1.63	92.9	94.1	0.27	1.48	2.37	1.00	0.04	1.78



Alt Model-Shift Uniqueness Test

008394721-02, P = 13.484363 Days, E = 123.145334 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
86.9	5.10	4.13	3.15	4.93	2.40	1.48	82.7	83.7	0.97	1.95	2.29	1.00	0.03	0.88



Stellar Parameters For KIC 008394721

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6198^{+111}_{-136}	$4.237^{+0.130}_{-0.117}$	$-0.040^{+0.150}_{-0.150}$	$1.324^{+0.247}_{-0.202}$	$1.101^{+0.109}_{-0.081}$	$0.668^{+0.395}_{-0.249}$
	+2%/-2%	+3%/-3%	+375%/-375%	+19%/-15%	+10%/-7%	+59%/-37%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008394721-02 / KOI 0152.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-33 ± 7	$3.93^{+0.41}_{-0.37}$	1295^{+63}_{-61}	3356^{+116}_{-126}	15^{+5}_{-4}
Alt.	-36 ± 7	$3.60^{+0.40}_{-0.33}$	1299^{+66}_{-61}	3512^{+111}_{-131}	20^{+6}_{-5}

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

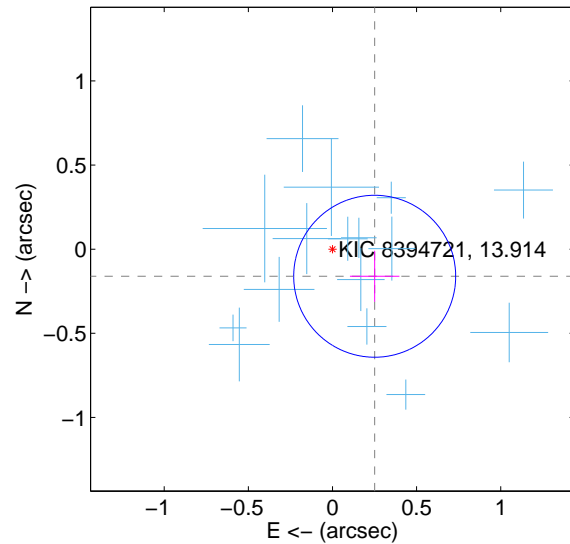
Supplemental centroid analysis for 008394721-02. Kepler magnitude: 13.91. Transit SNR 62.11

There are 17 quarters with good PRF difference image offsets

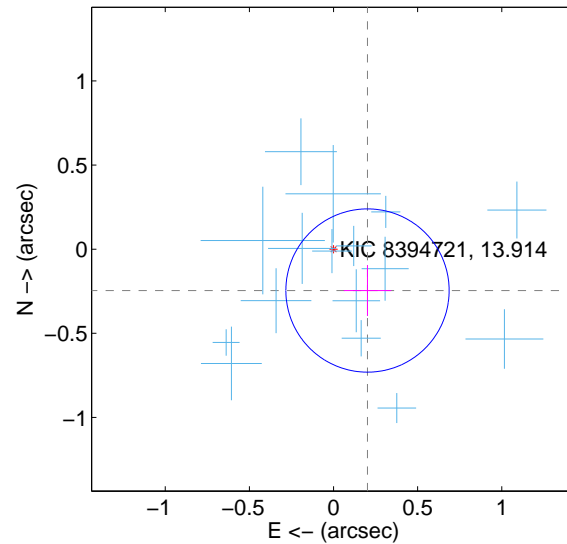
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.298 ± 0.160	1.86	-0.251 ± 0.147	-0.161 ± 0.152
PRF-fit source offset from KIC position	0.318 ± 0.162	1.97	-0.202 ± 0.141	-0.246 ± 0.151
photometric centroid source offset	0.64 ± 0.19	3.48	0.60 ± 0.19	-0.24 ± 0.17

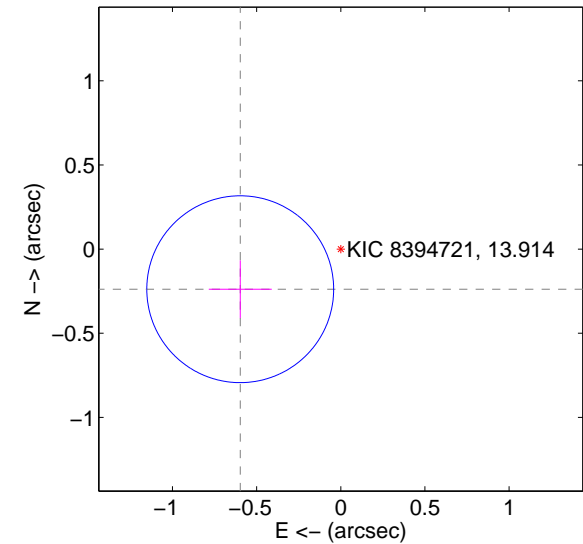
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

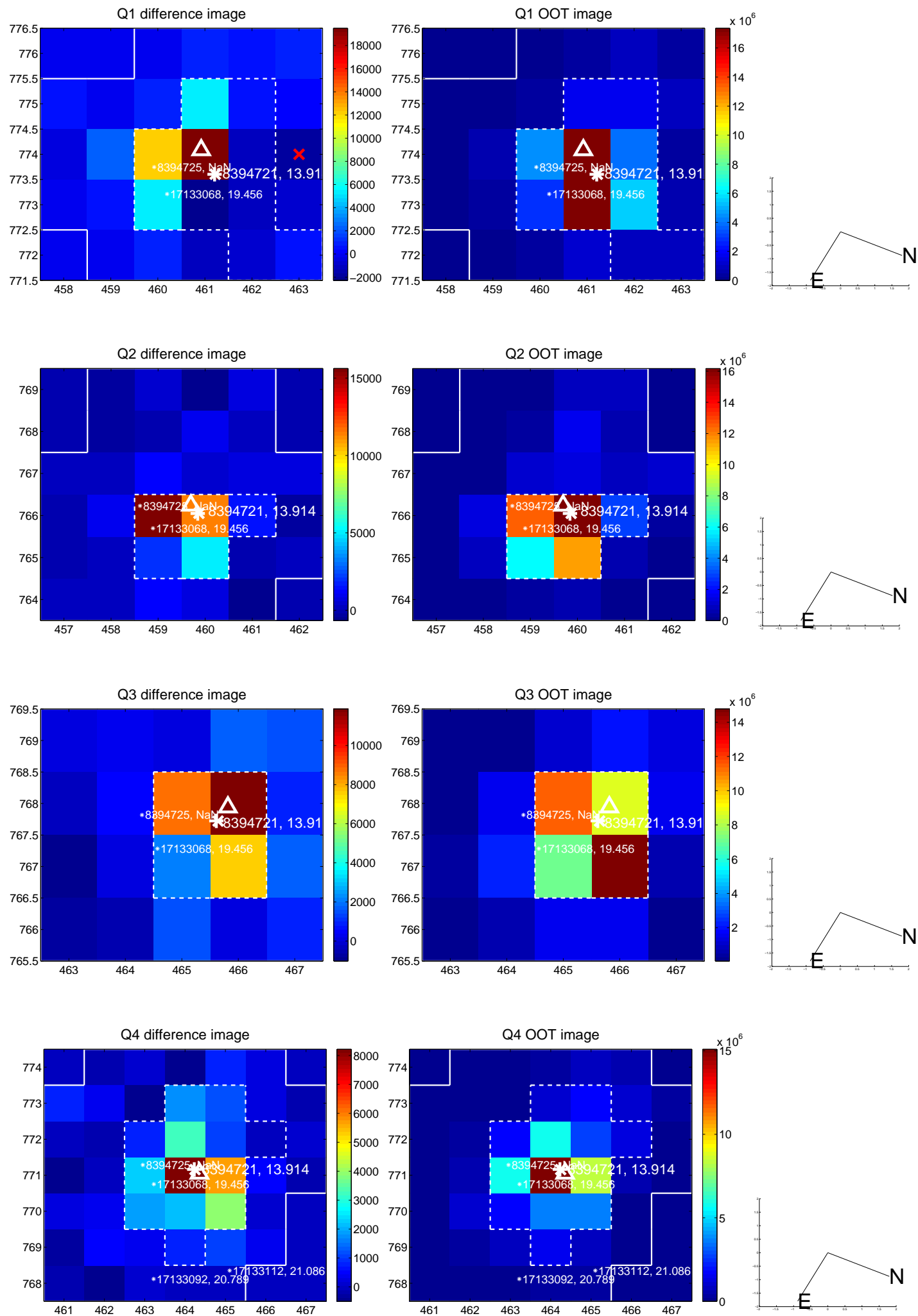


offset from photometric centroids

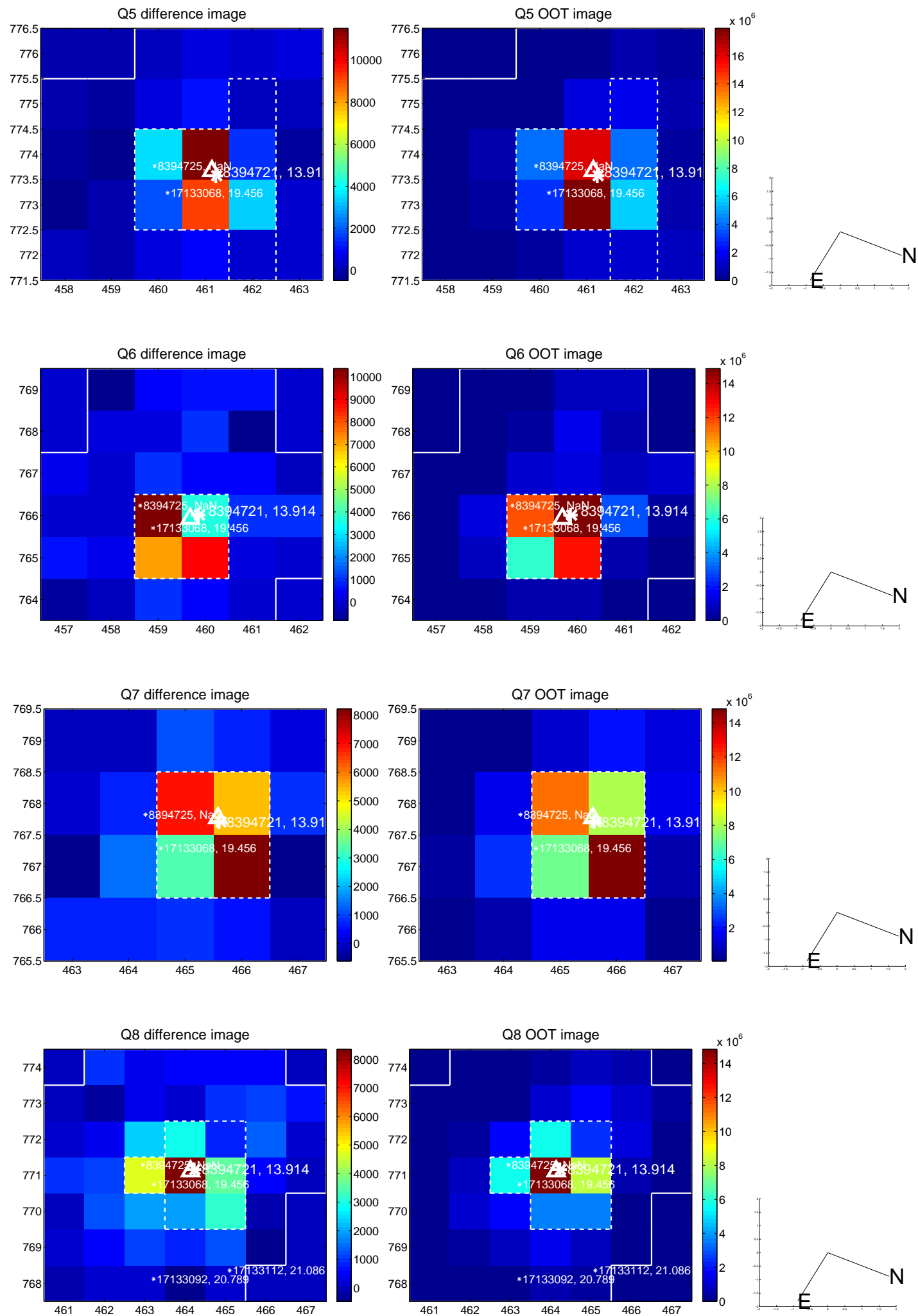


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

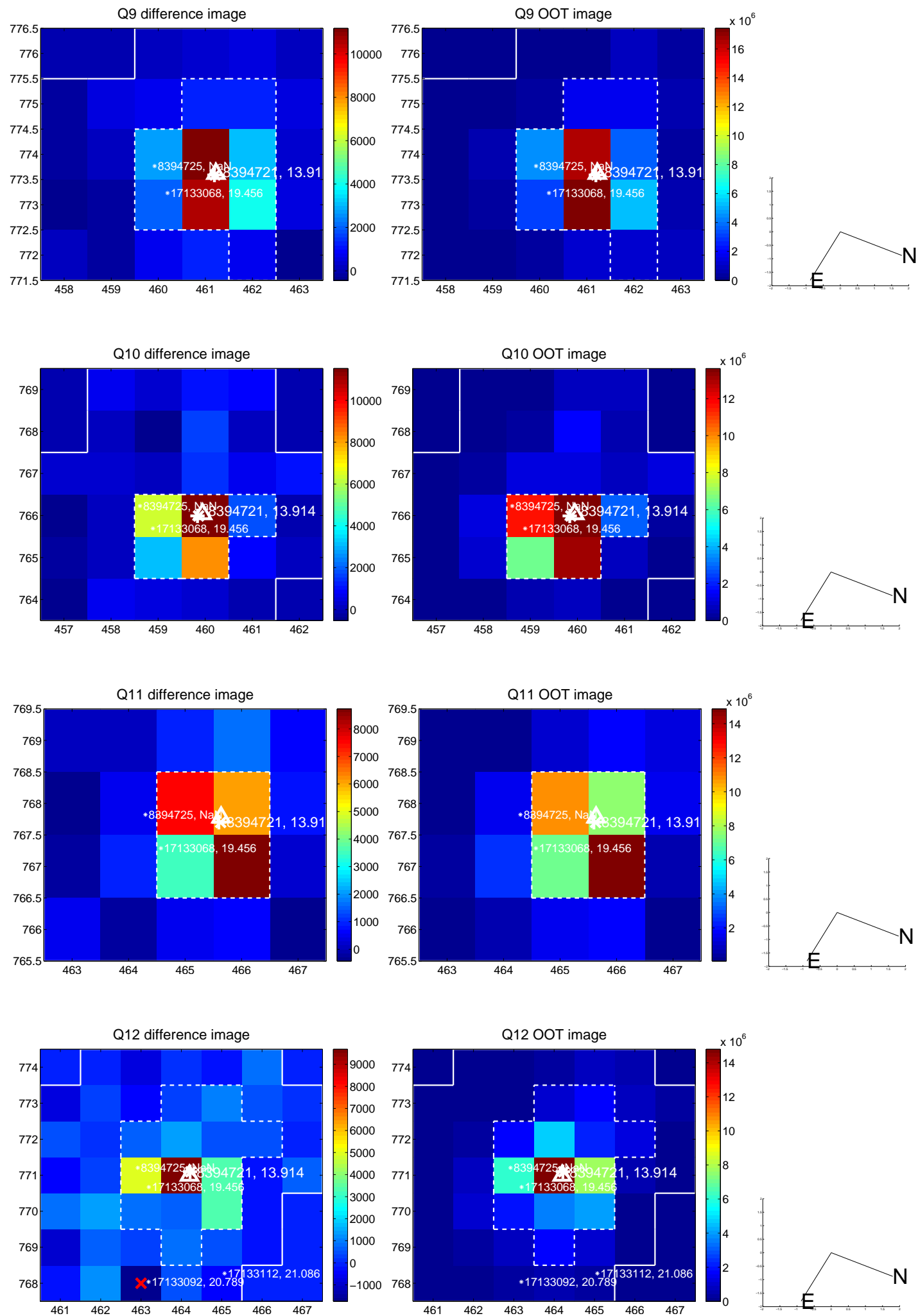
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



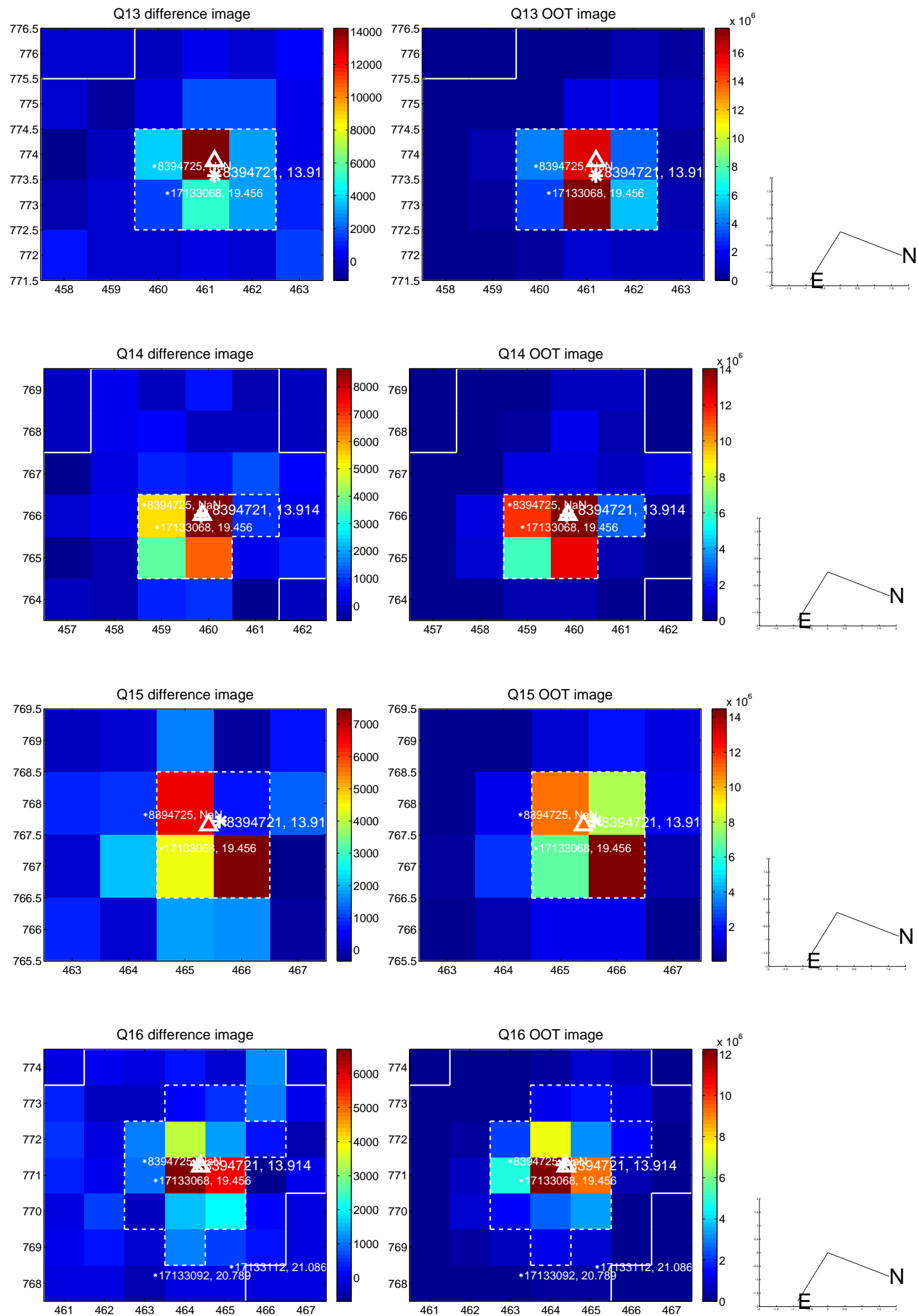
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



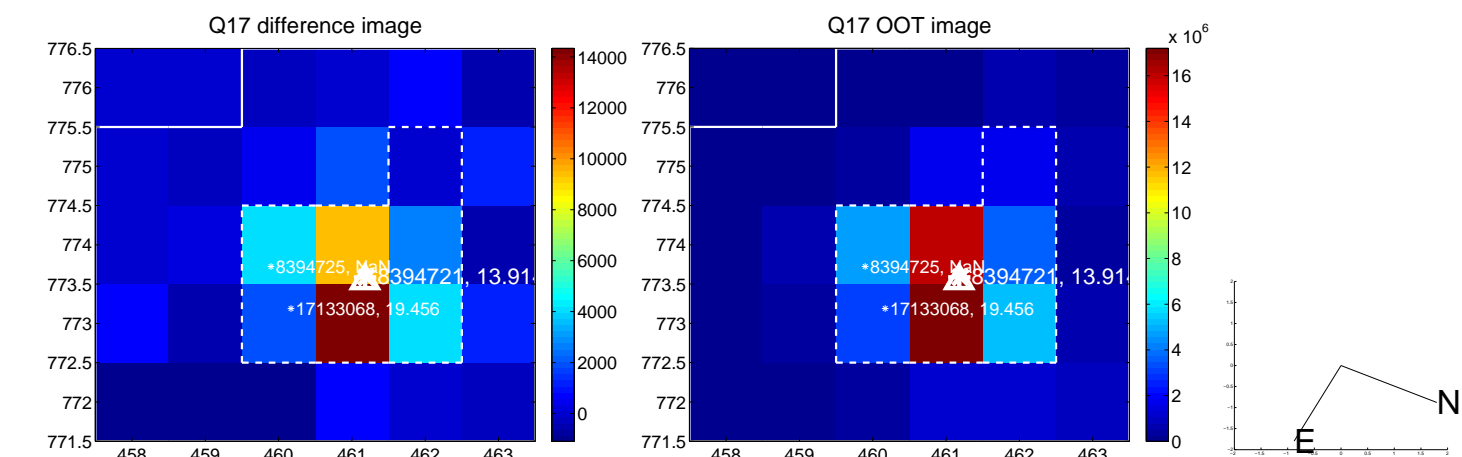
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



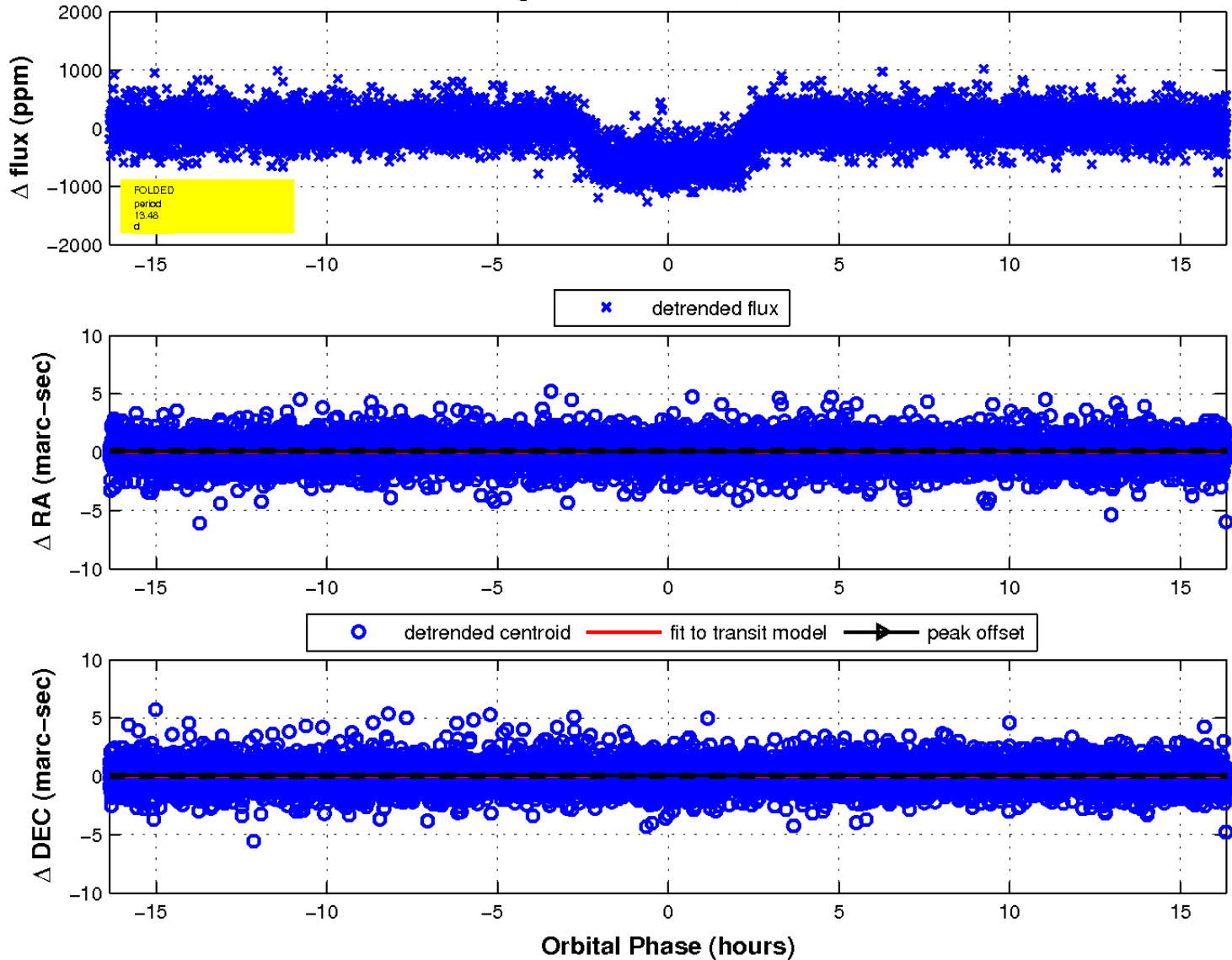
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

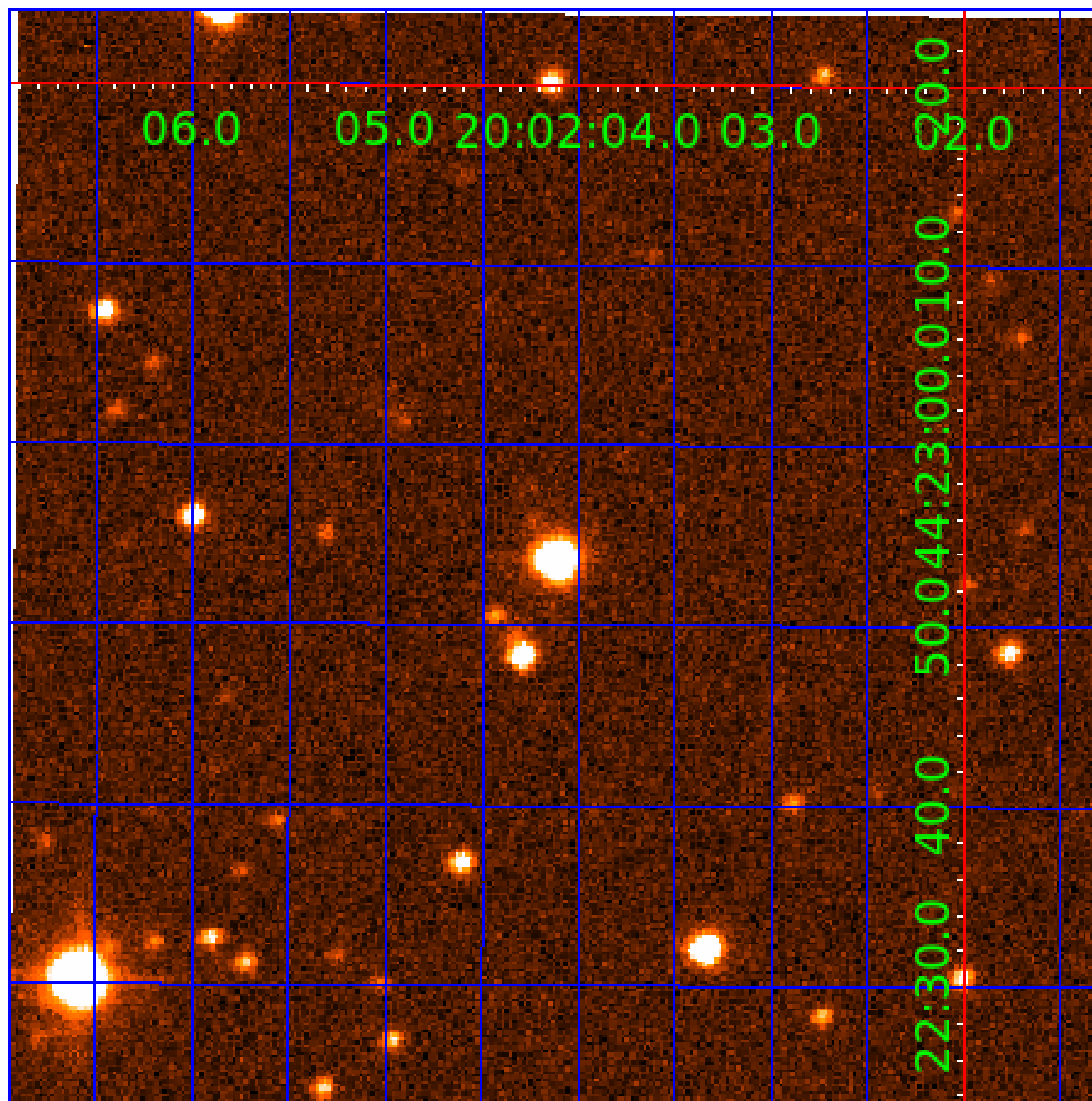


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 008394721

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})
008394721-01	OBS	0152.01	52.090733	158.745972	2893.6	8.846	143.4	146.0	1.32	6198	7.41	29.12
008394721-02	OBS	0152.03	13.484547	136.620831	657.6	5.454	58.8	62.1	1.32	6198	3.94	176.49
008394721-03	OBS	0152.02	27.402258	133.629566	741.8	7.383	49.8	54.6	1.32	6198	4.12	68.57
008394721-04	OBS	0152.04	81.062996	139.544011	395.8	3.301	12.8	14.0	1.32	6198	3.05	16.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008394721-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008394721-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-04	OBS	PC	0.98	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.

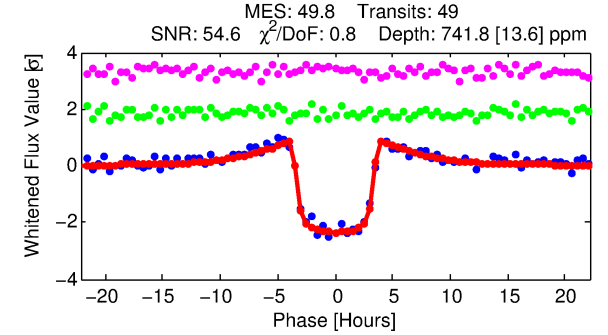
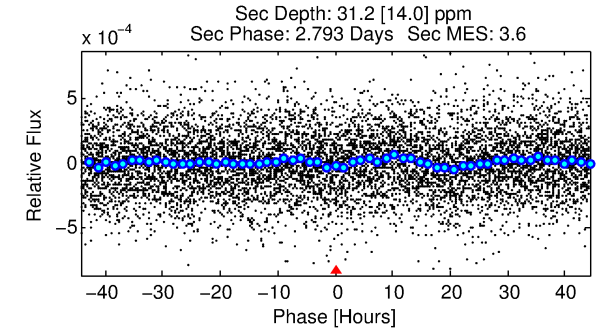
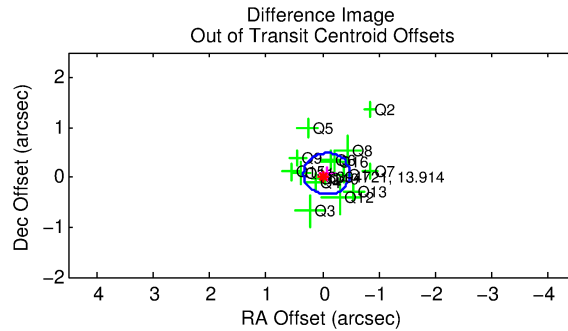
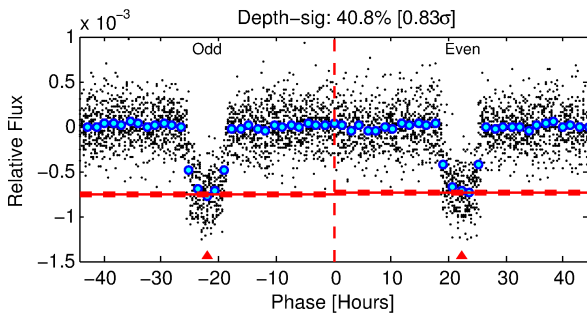
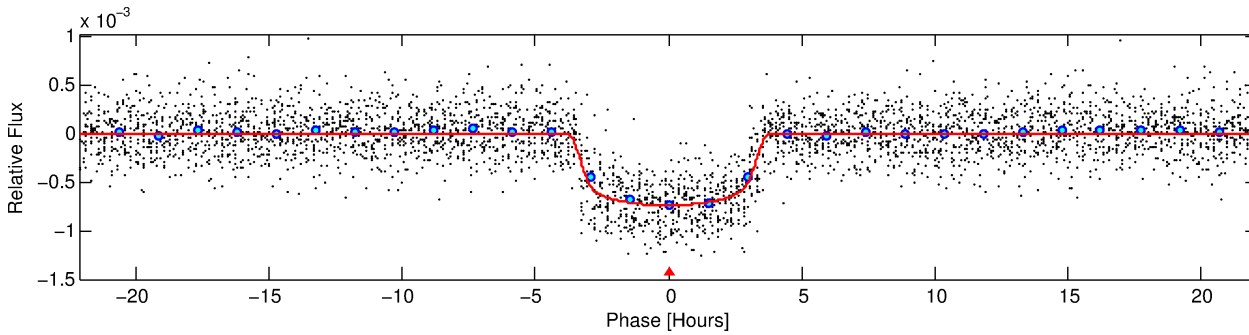
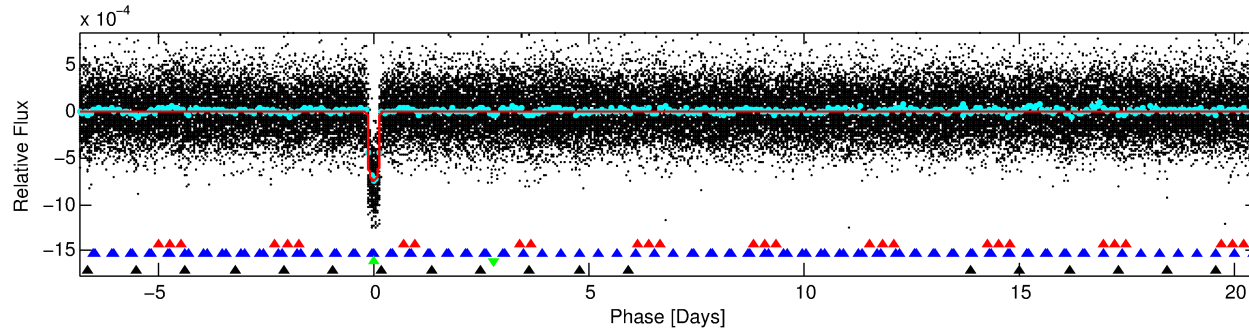
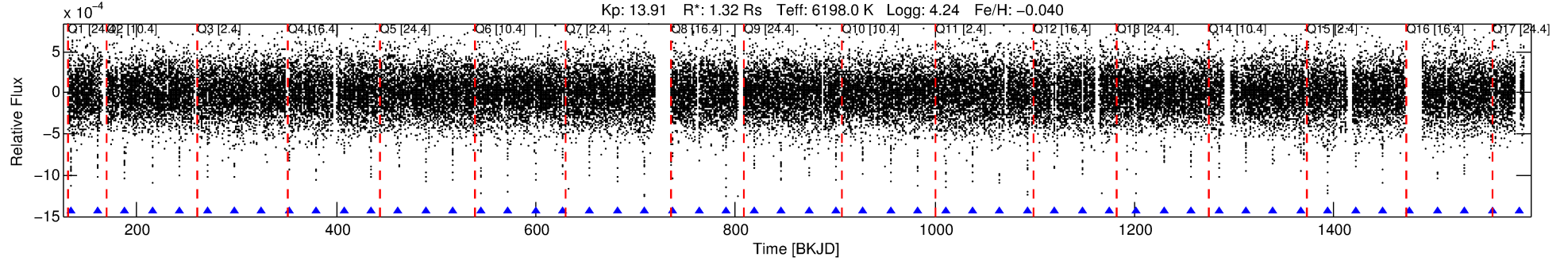
Ephemeris Match Information For 008394721-03

No Significant Match Found

DV One-Page Summary

KIC: 8394721 Candidate: 3 of 4 Period: 27.402 d
KOI: K00152.02 Name: Kepler-79c Corr: 0.962

Kp: 13.91 R*: 1.32 Rs Teff: 6198.0 K Logg: 4.24 Fe/H: -0.040



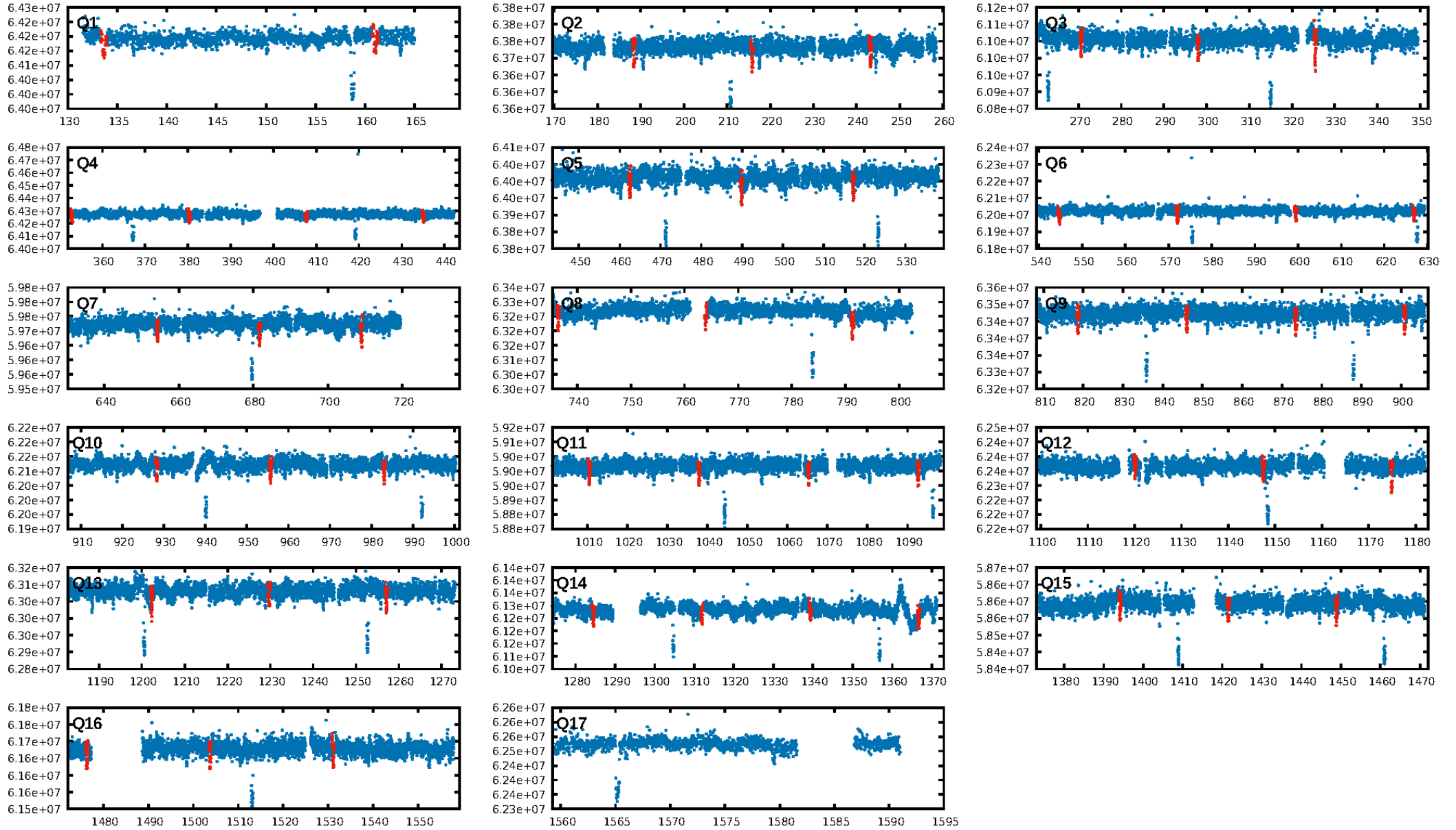
DV Fit Results:

Period = 27.40226 [0.00007] d
Epoch = 133.6296 [0.0021] BKJD
Rp/R* = 0.0285 [0.0007]
a/R* = 15.91 [1.74]
b = 0.86 [0.03]
Seff = 68.57 [17.21]
Teff = 734 [46] K
Rp = 4.12 [0.78] Re
a = 0.1839 [0.0293] AU
Ag = 34.11 [17.35] [1.91σ]
Teffp = 2742 [315] K [6.31σ]

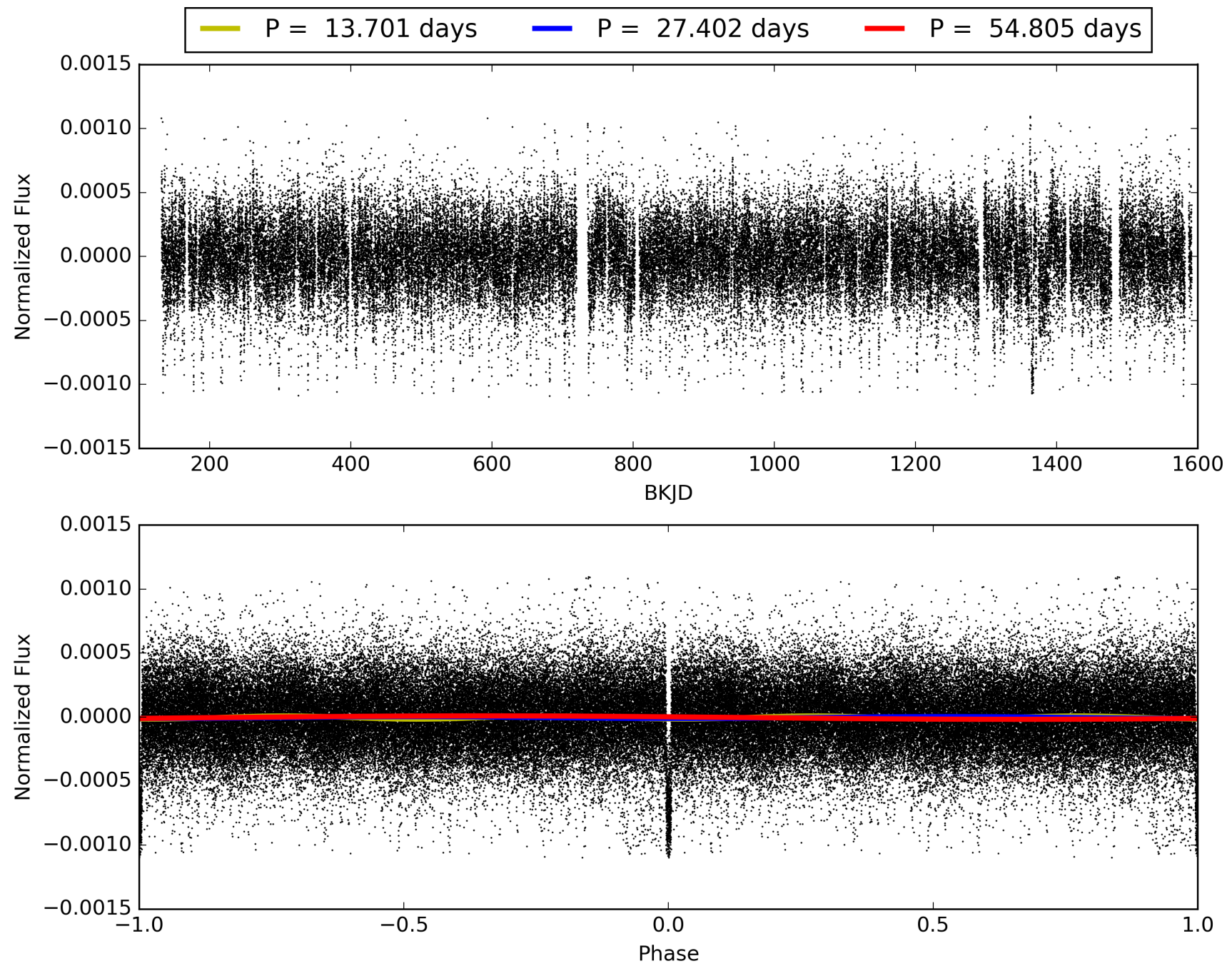
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [36.39σ]
LongPeriod-sig: 100.0% [51.42σ]
ModelChiSquare2-sig: 98.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [47/47]
GhostDiagnostic-chr: 2.668
Centroid-sig: 96.0%
Centroid-so: 0.808 arcsec [4.04σ]
OotOffset-rm: 0.102 arcsec [0.74σ]
KicOffset-rm: 0.031 arcsec [0.24σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 008394721-03, PDC Light Curves

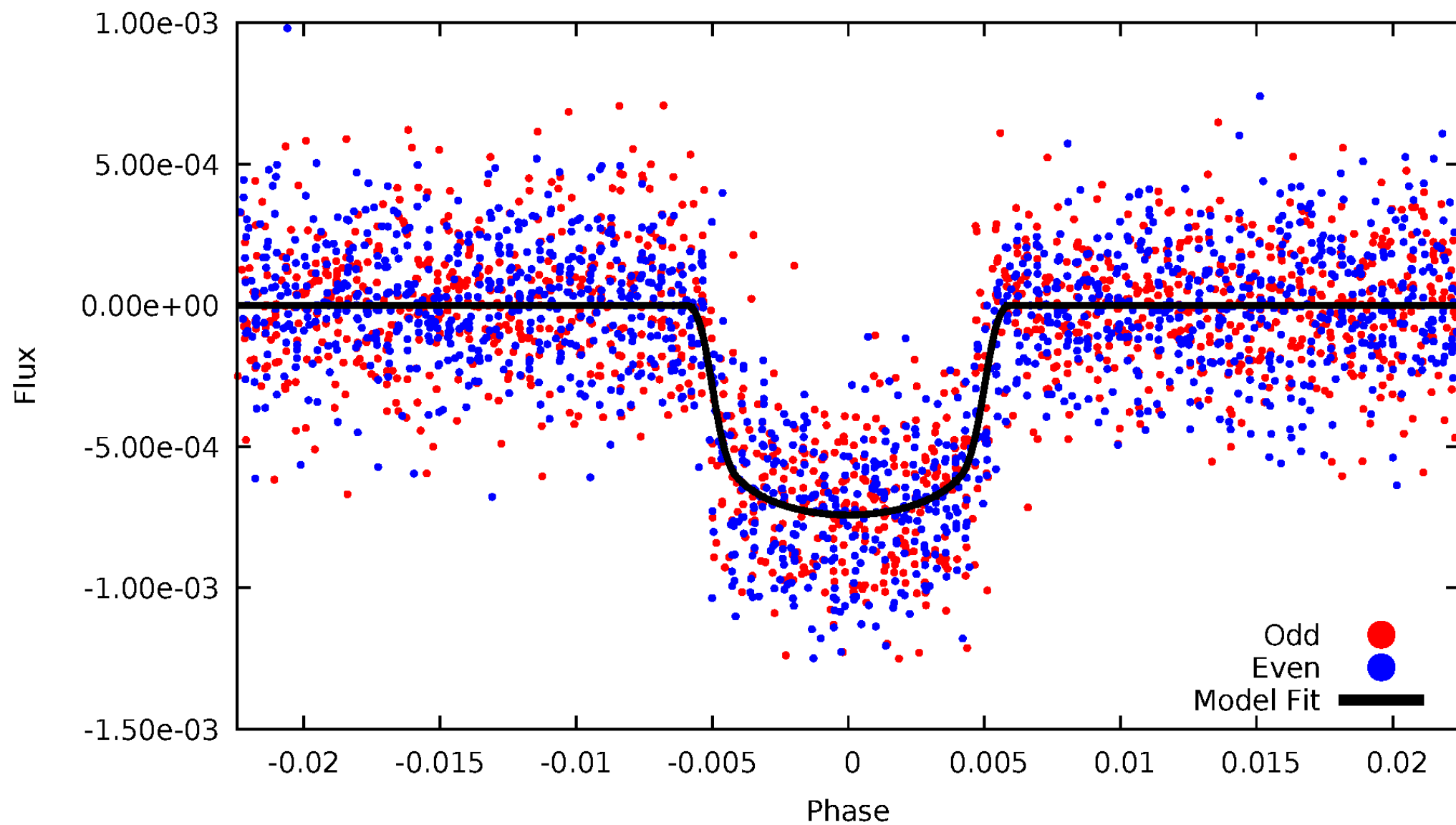


TCE 008394721-03



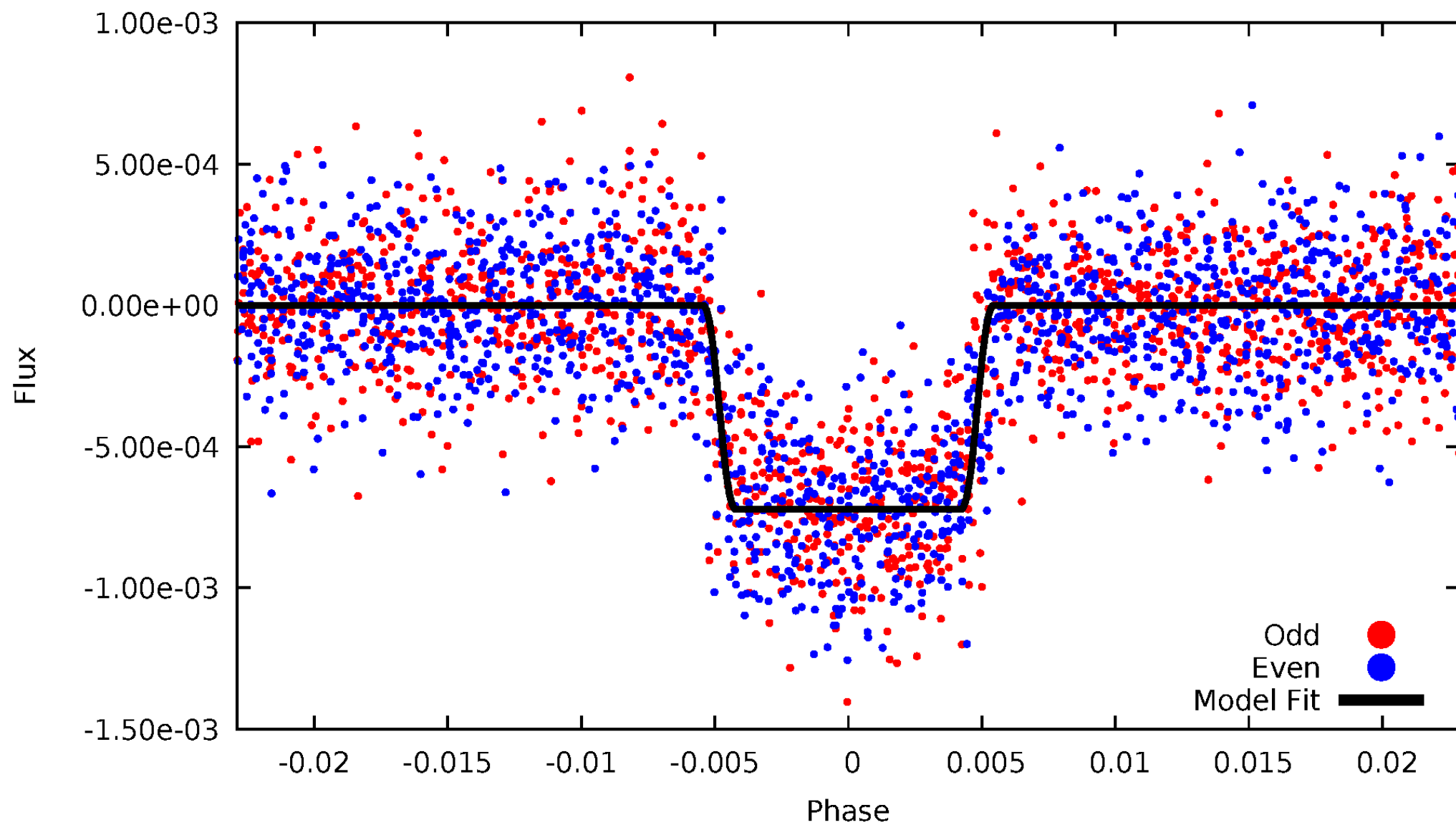
DV Odd/Even

TCE 008394721-03



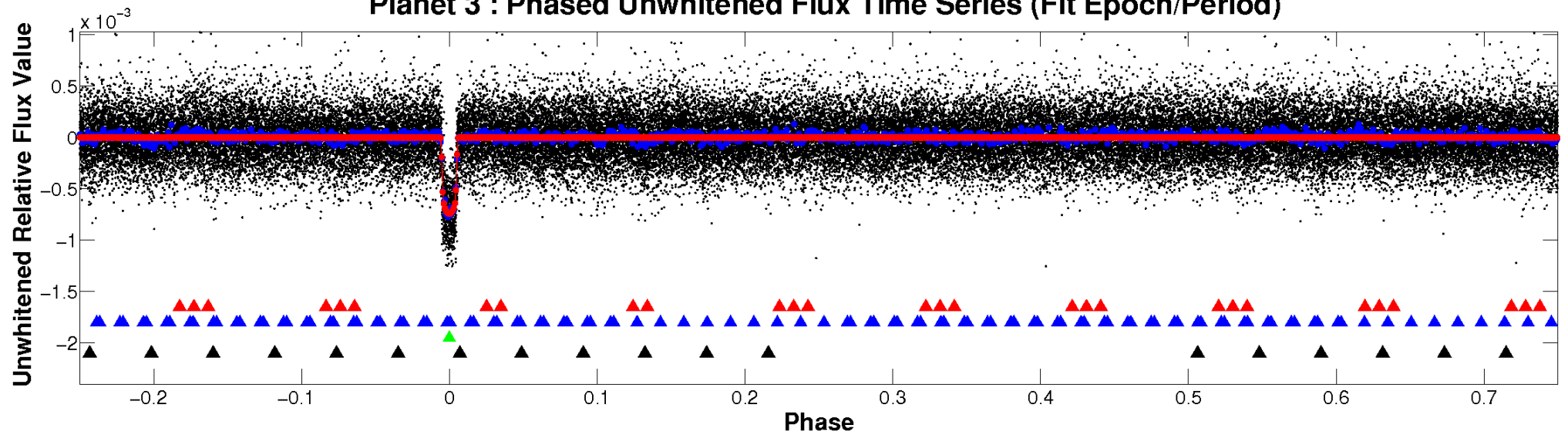
ALT Odd/Even

TCE 008394721-03

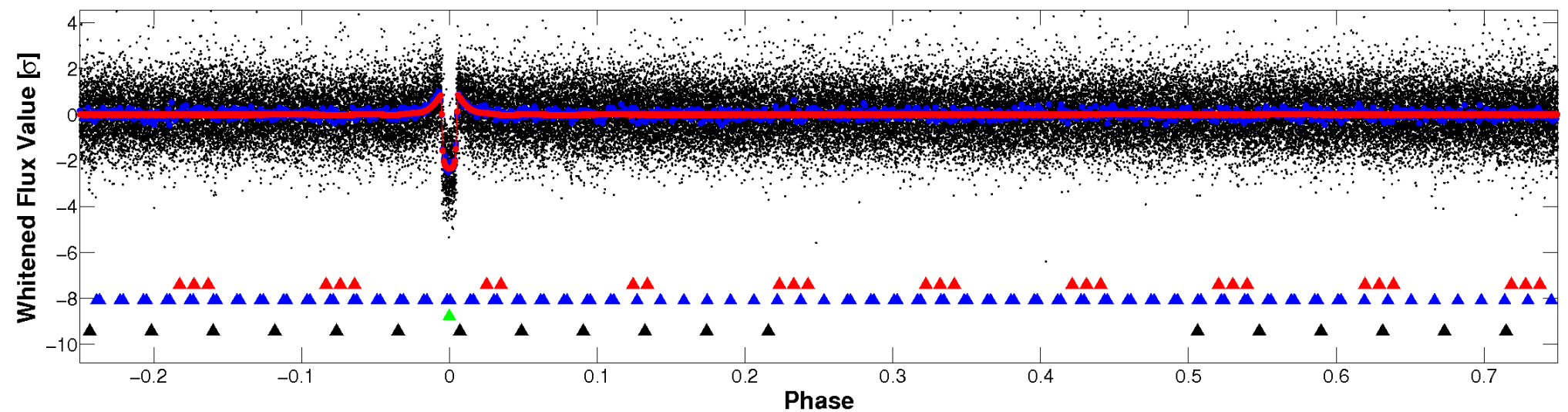


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

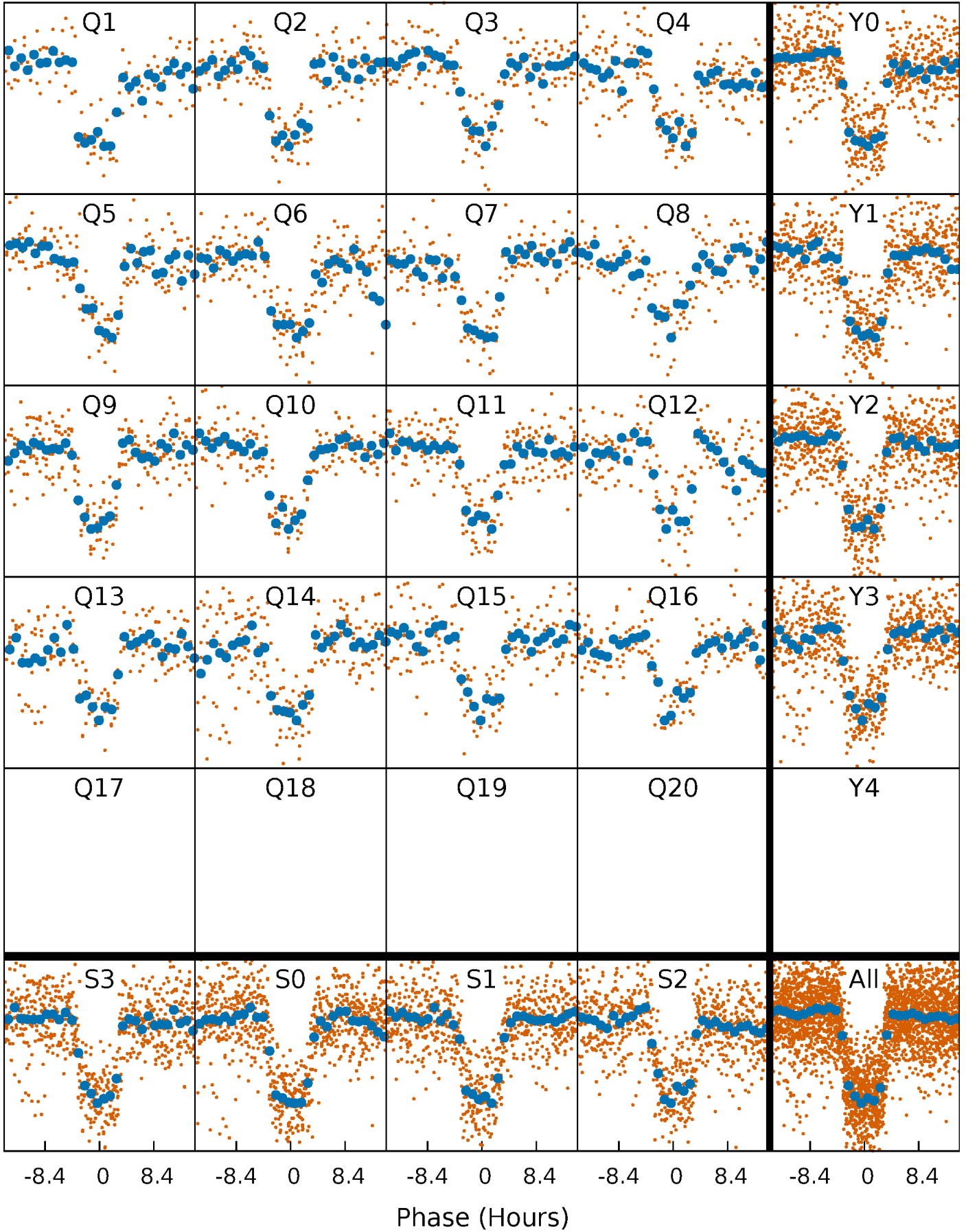


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



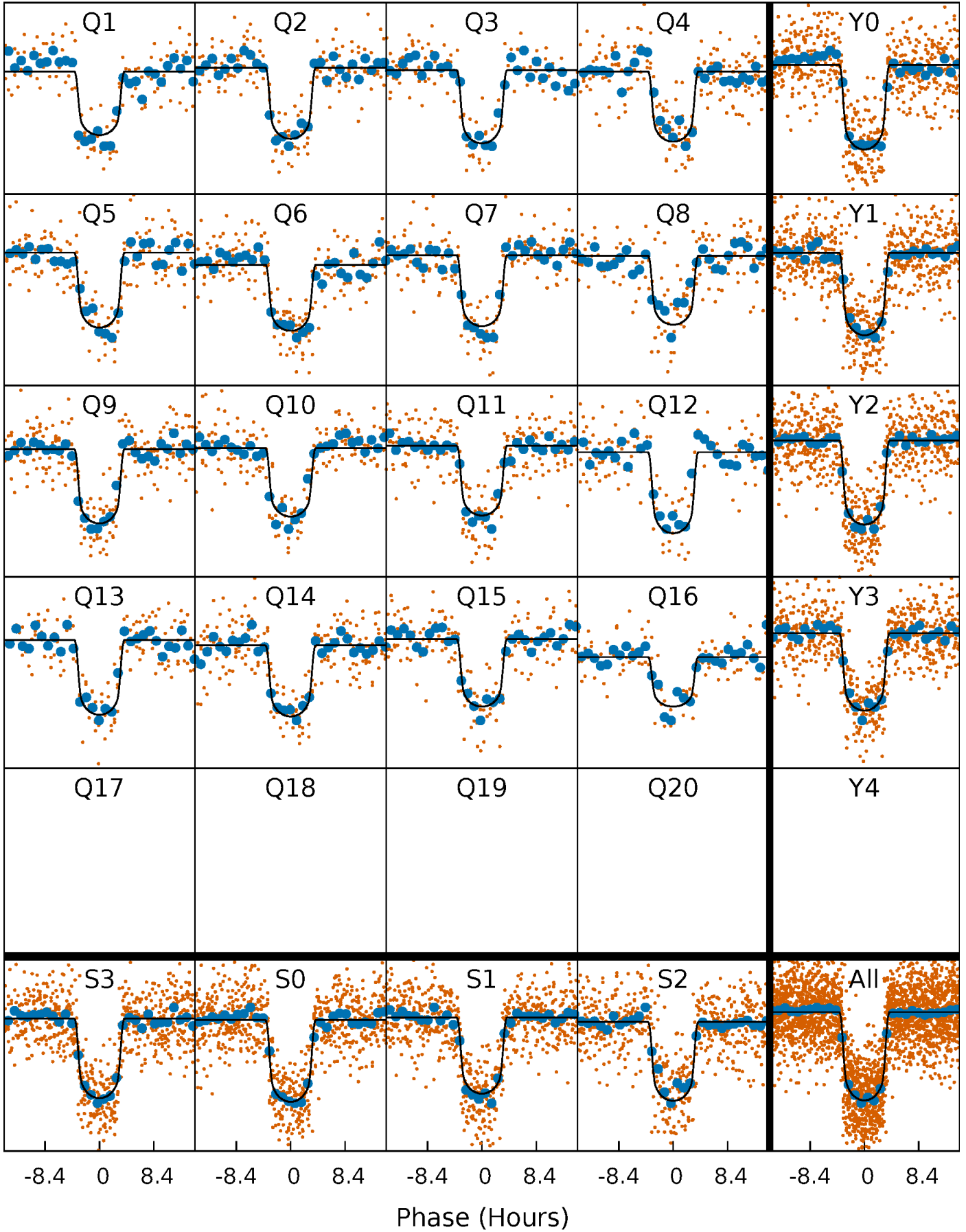
PDC Quarter-Phased Transit Curves

TCE 008394721-03 P= 27.402258 Days $T_0=133.629566$ (BKJD)



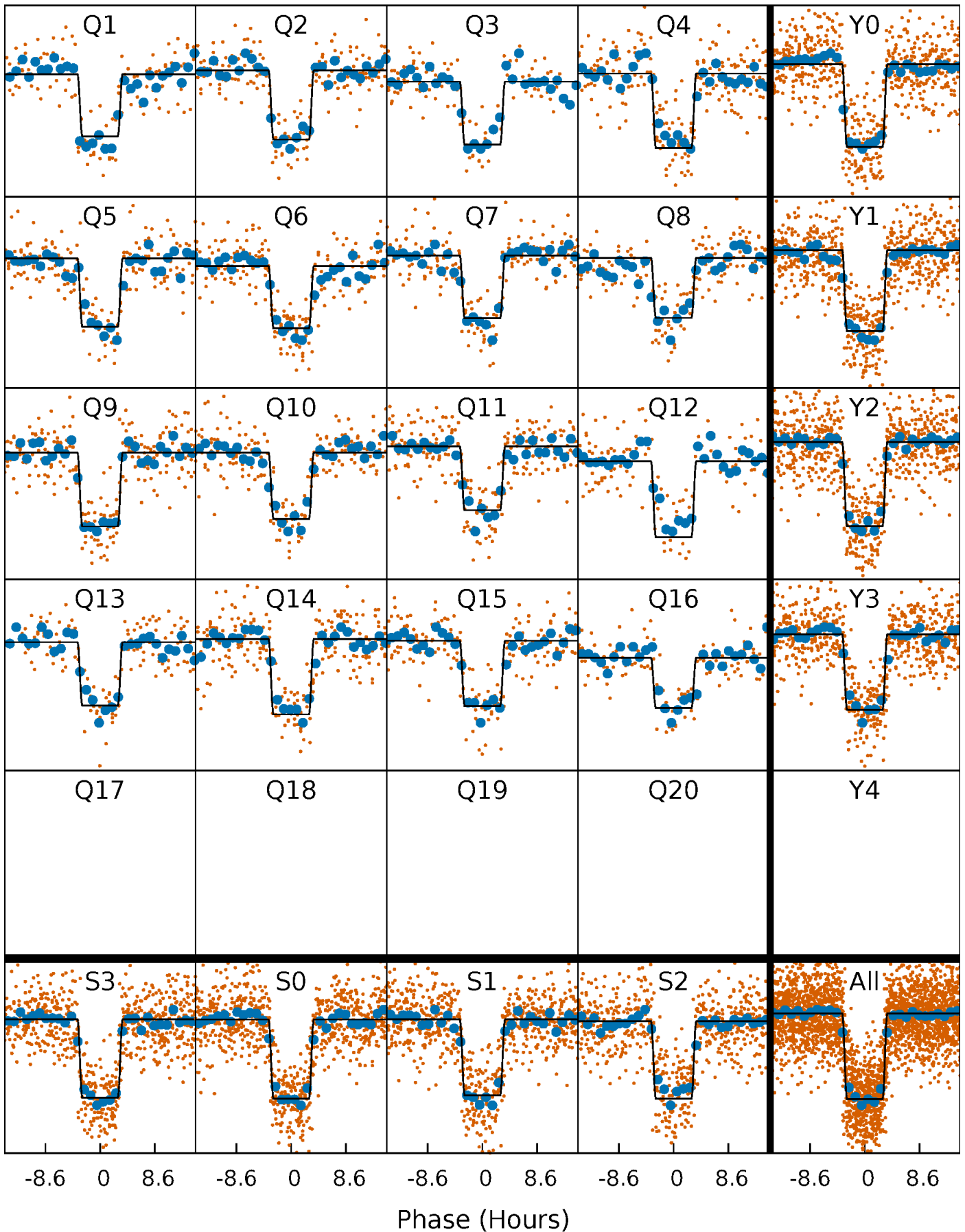
DV Quarter-Phased Transit Curves

TCE 008394721-03 P= 27.402258 Days $T_0=133.629566$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

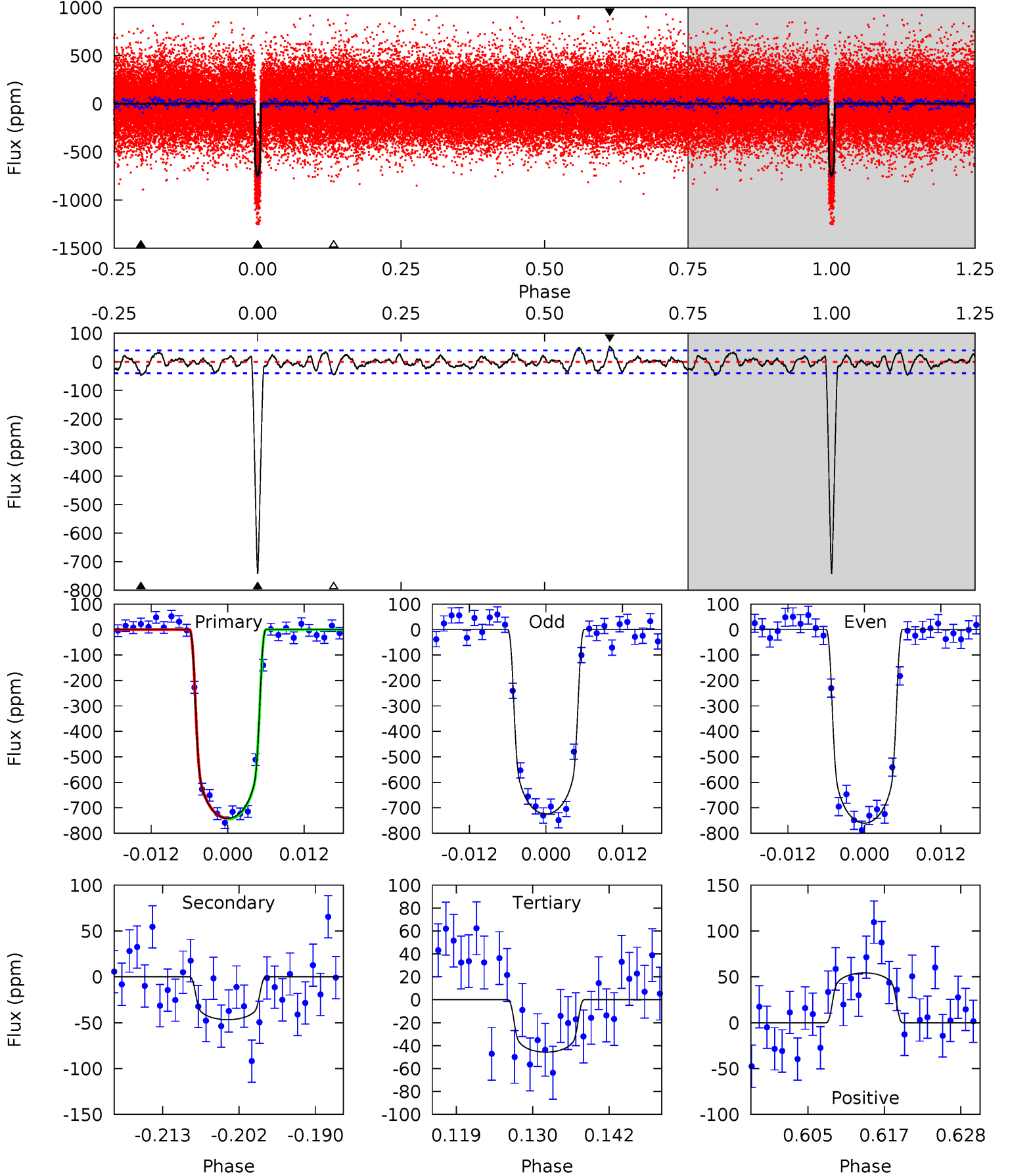
TCE 008394721-03 P= 27.401953 Days $T_0=133.637079$ (BKJD)



DV Model-Shift Uniqueness Test

008394721-03, P = 27.402258 Days, E = 106.227308 Days

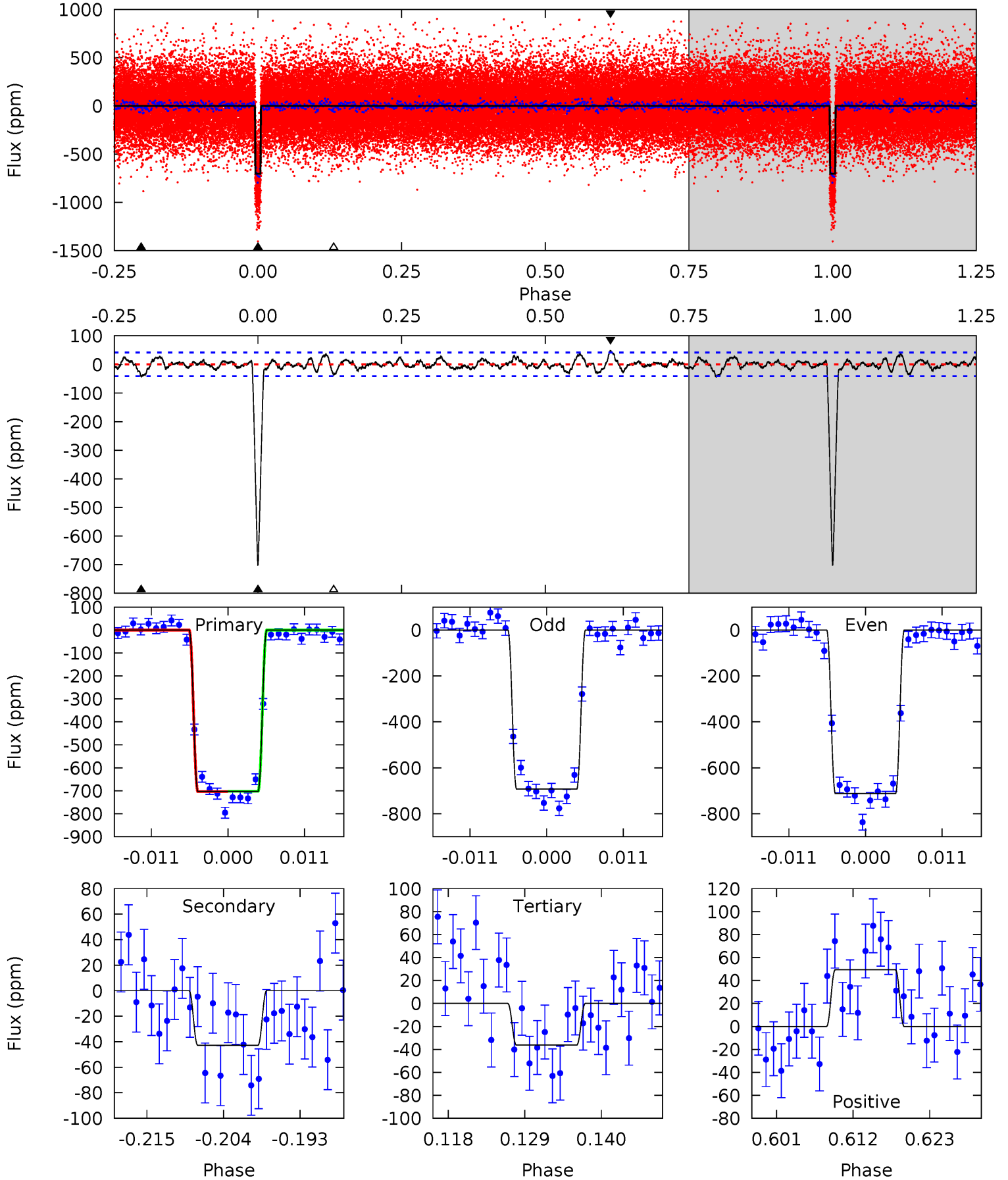
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
93.0	5.86	5.73	6.81	4.99	2.52	2.01	87.2	86.2	0.12	-0.95	2.24	0.99	0.07	0.26



Alt Model-Shift Uniqueness Test

008394721-03, P = 27.401953 Days, E = 106.235126 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
85.4	5.20	4.41	5.99	5.01	2.55	1.59	81.0	79.4	0.79	-0.79	1.19	0.99	0.07	0.04



Stellar Parameters For KIC 008394721

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6198^{+111}_{-136}	$4.237^{+0.130}_{-0.117}$	$-0.040^{+0.150}_{-0.150}$	$1.324^{+0.247}_{-0.202}$	$1.101^{+0.109}_{-0.081}$	$0.668^{+0.395}_{-0.249}$
	+2%/-2%	+3%/-3%	+375%/-375%	+19%/-15%	+10%/-7%	+59%/-37%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008394721-03 / KOI 0152.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-47 ± 8	$4.09^{+0.41}_{-0.35}$	1021^{+48}_{-50}	3508^{+108}_{-112}	52^{+14}_{-12}
Alt.	-43 ± 8	$3.86^{+0.45}_{-0.33}$	1023^{+48}_{-51}	3524^{+130}_{-135}	53^{+16}_{-13}

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 $A_{obs} \gg 1.0$

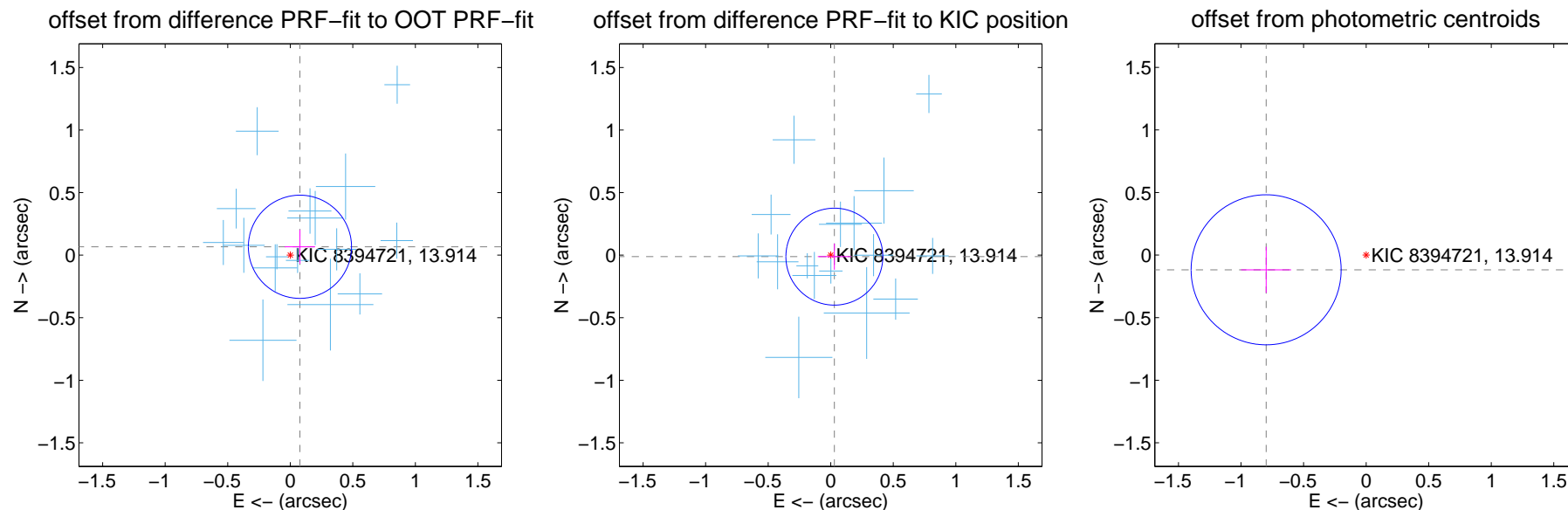
DV Centroid Data

Supplemental centroid analysis for 008394721-03. Kepler magnitude: 13.91. Transit SNR 54.62

There are 16 quarters with good PRF difference image offsets

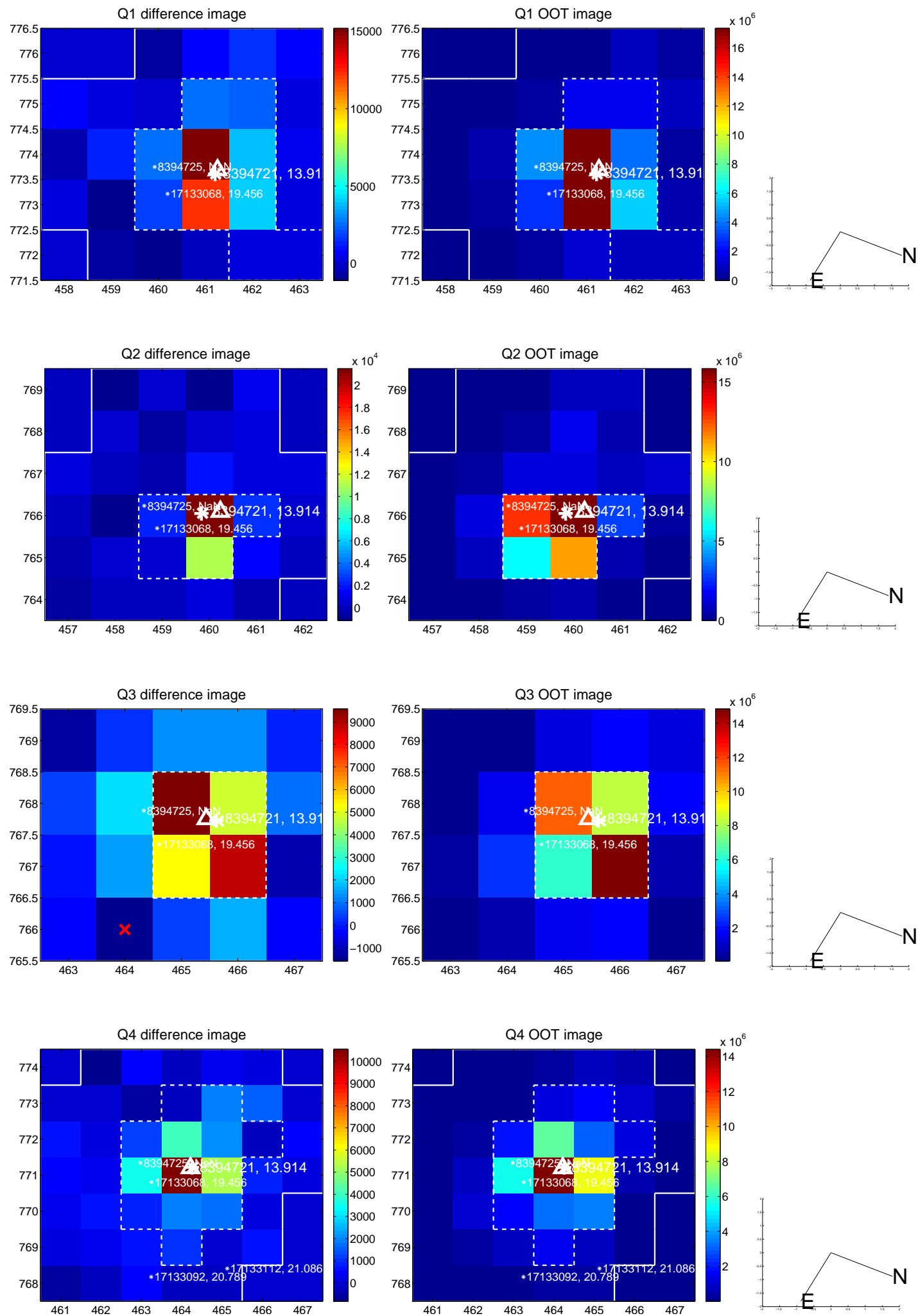
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.102 ± 0.137	0.74	-0.077 ± 0.122	0.067 ± 0.135
PRF-fit source offset from KIC position	0.031 ± 0.129	0.24	-0.029 ± 0.133	-0.012 ± 0.104
photometric centroid source offset	0.81 ± 0.20	4.04	0.80 ± 0.20	-0.12 ± 0.18

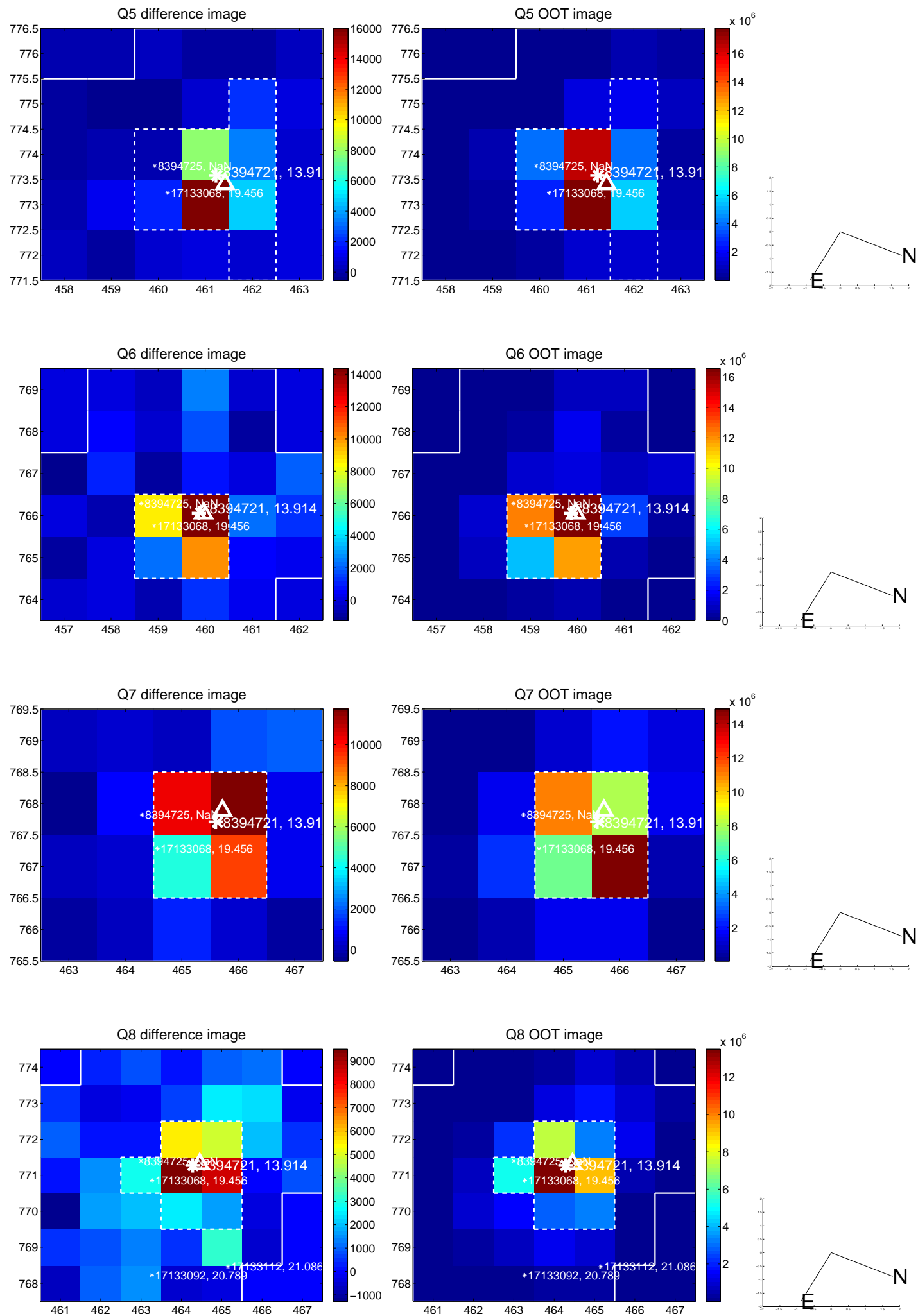


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

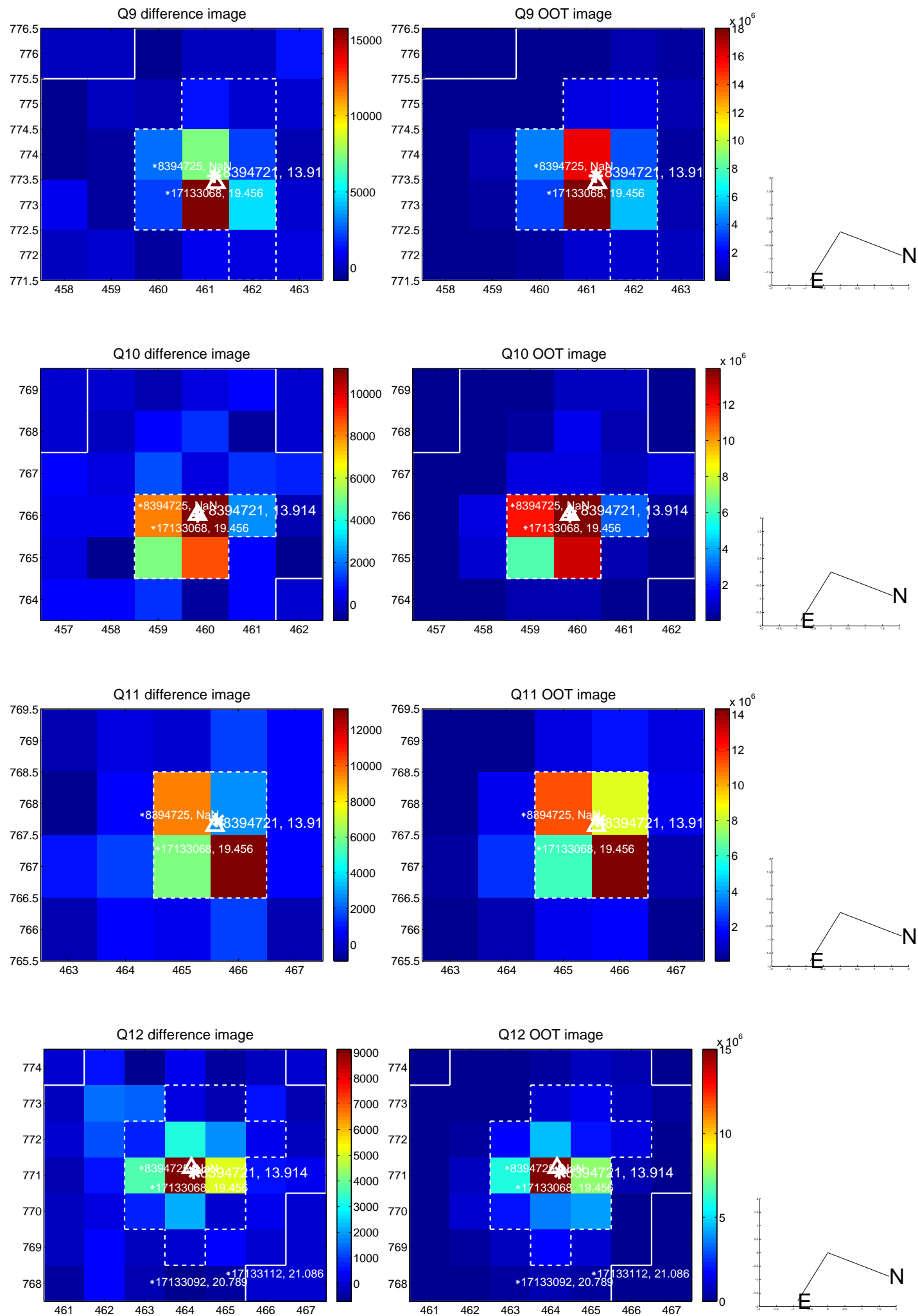
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



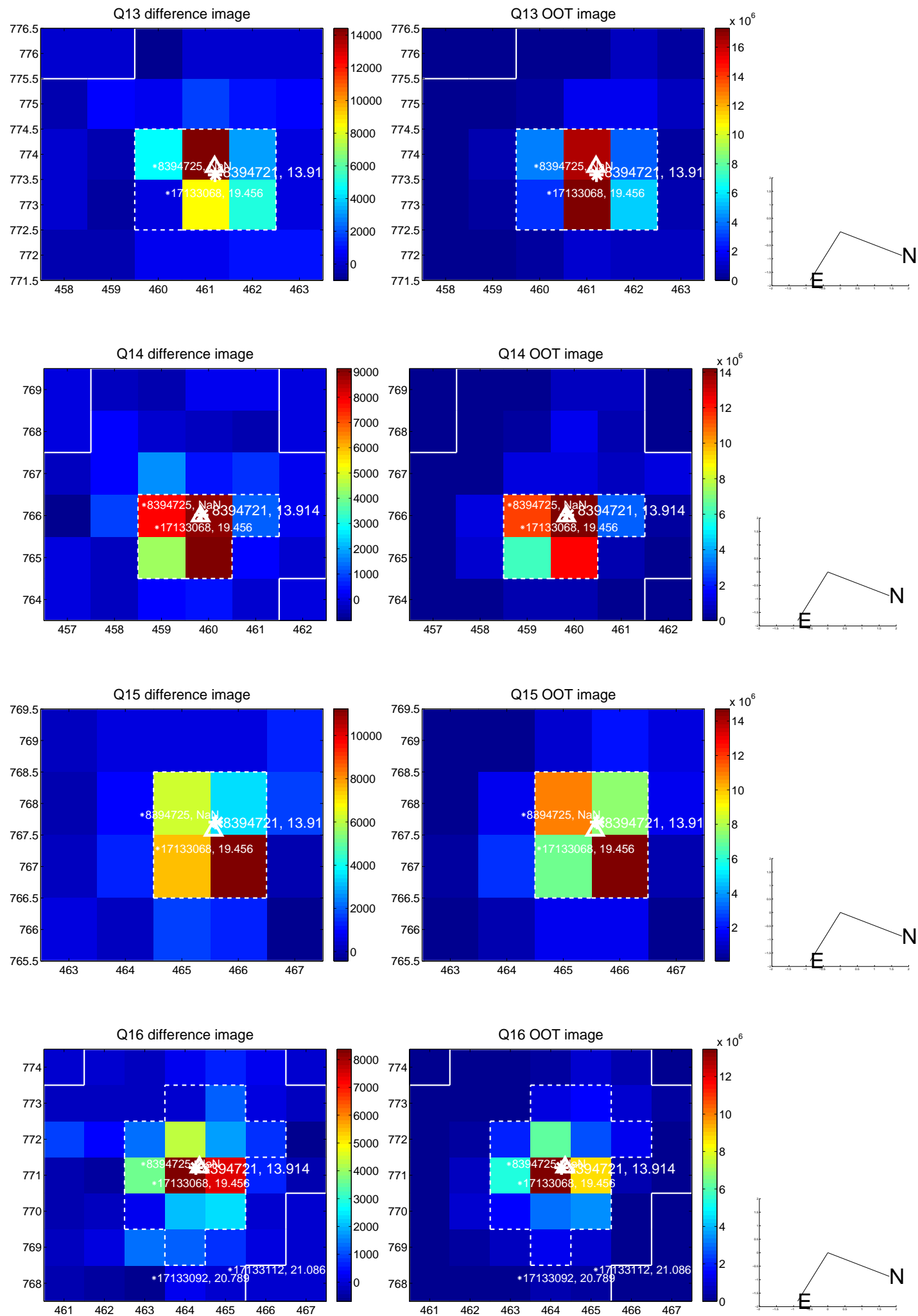
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



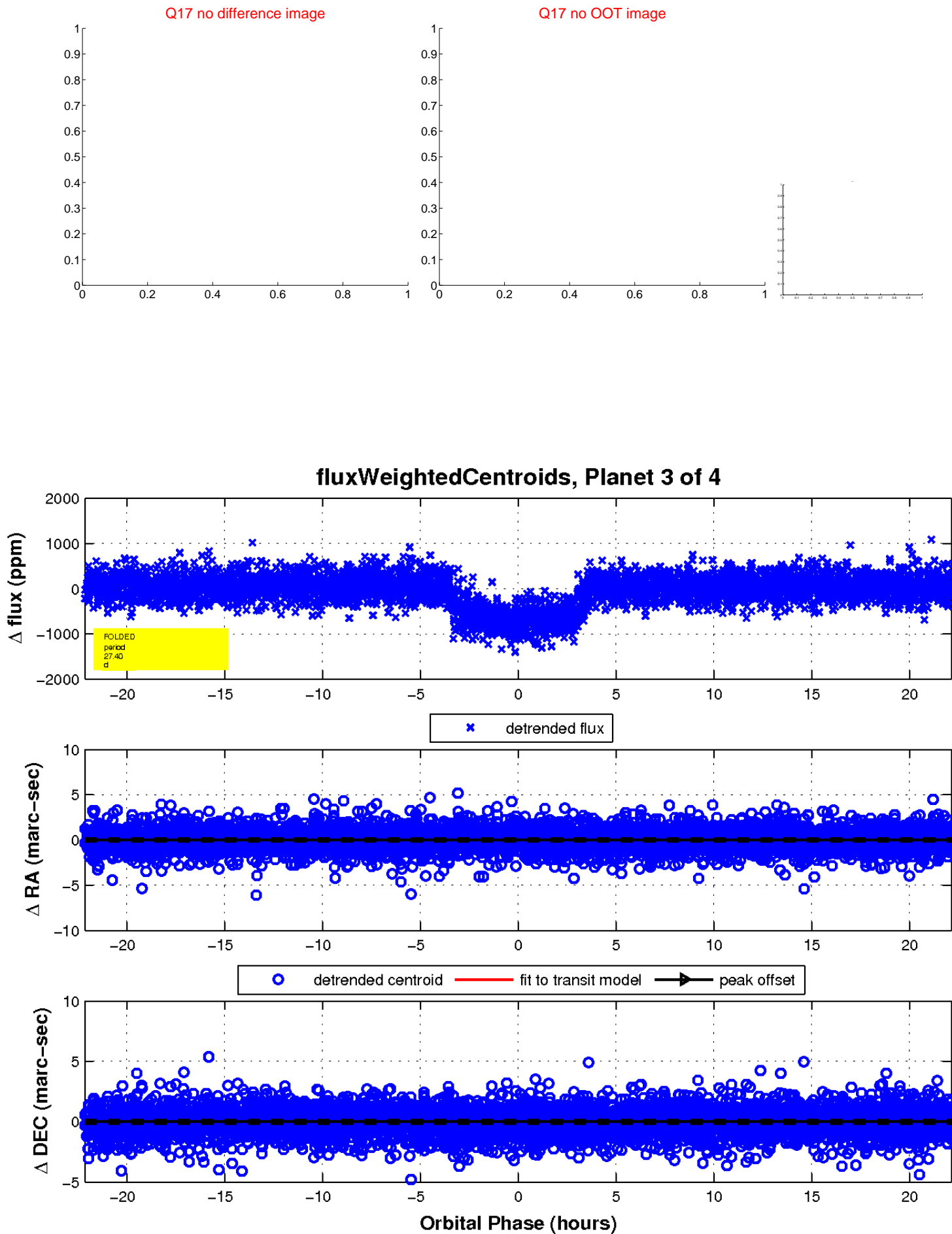
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

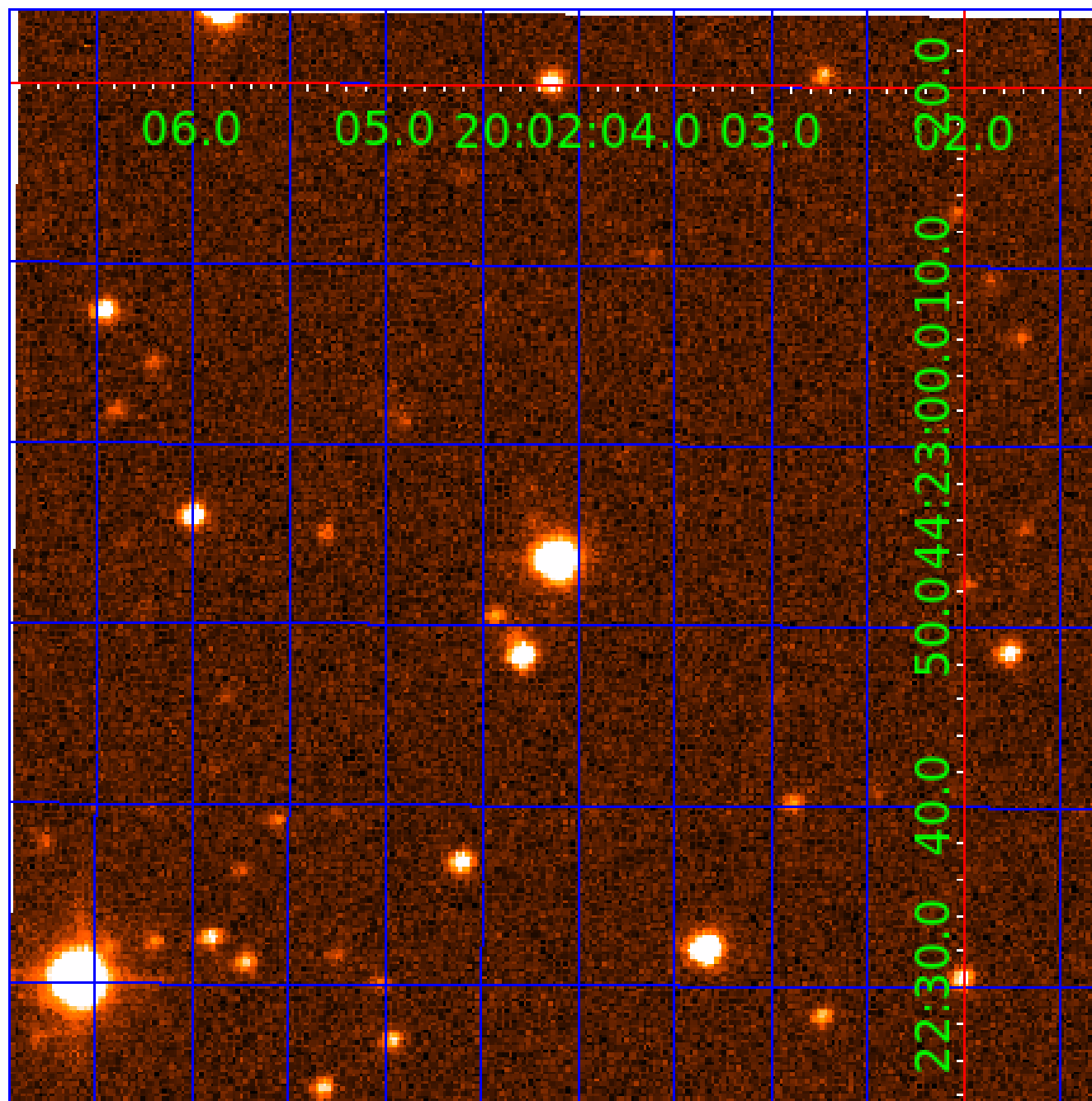


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008394721

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})
008394721-01	OBS	0152.01	52.090733	158.745972	2893.6	8.846	143.4	146.0	1.32	6198	7.41	29.12
008394721-02	OBS	0152.03	13.484547	136.620831	657.6	5.454	58.8	62.1	1.32	6198	3.94	176.49
008394721-03	OBS	0152.02	27.402258	133.629566	741.8	7.383	49.8	54.6	1.32	6198	4.12	68.57
008394721-04	OBS	0152.04	81.062996	139.544011	395.8	3.301	12.8	14.0	1.32	6198	3.05	16.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008394721-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008394721-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008394721-04	OBS	PC	0.98	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.

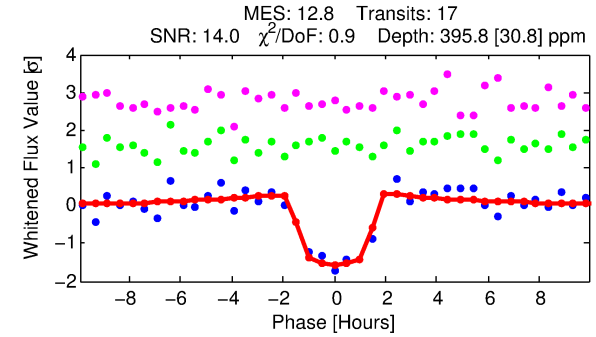
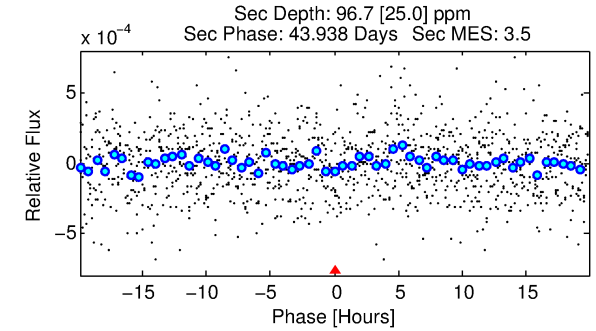
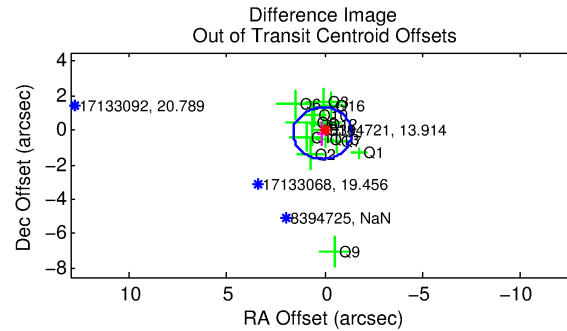
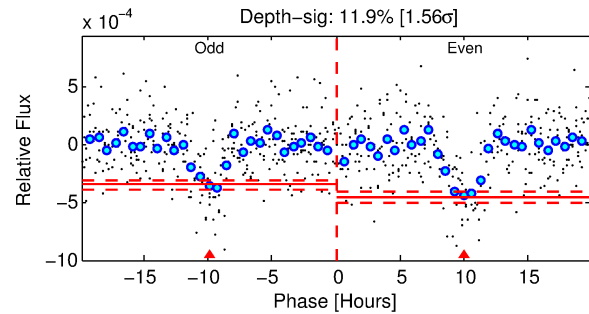
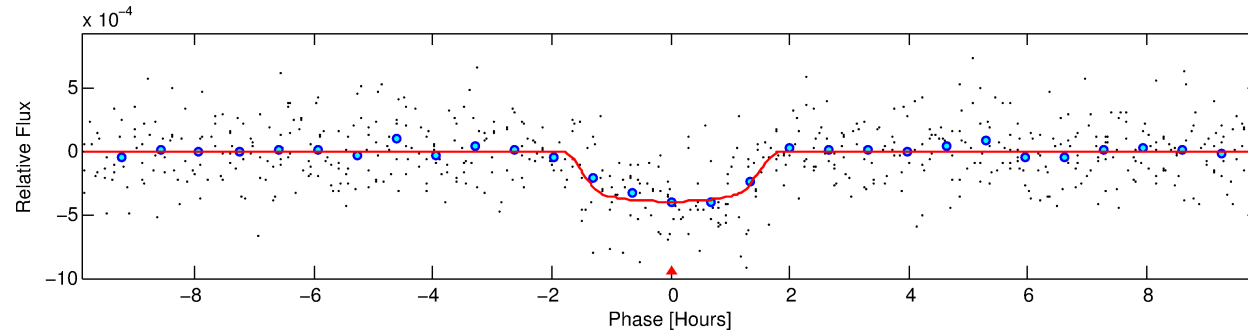
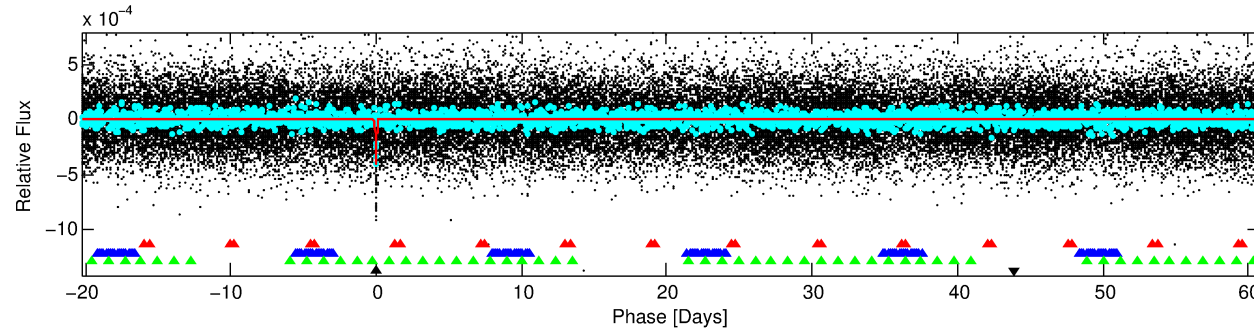
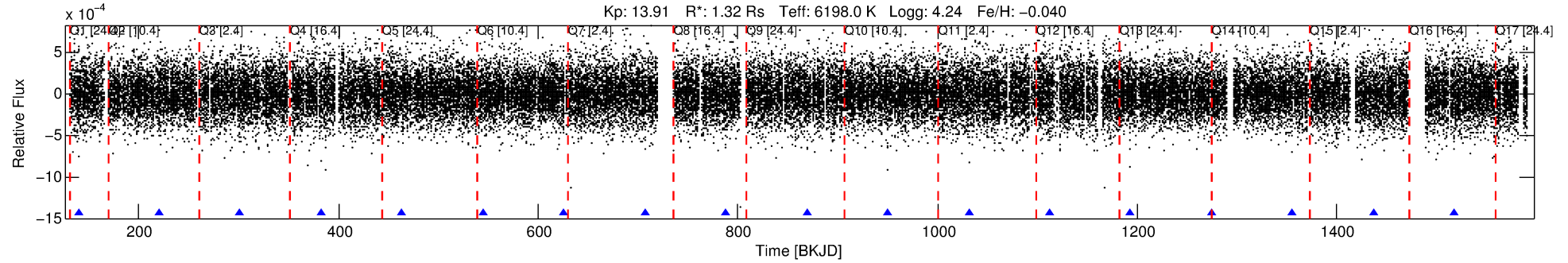
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008394721-04

No Significant Match Found

DV One-Page Summary

KIC: 8394721 Candidate: 4 of 4 Period: 81.063 d
KOI: K00152.04 Name: Kepler-79e Corr: 0.978



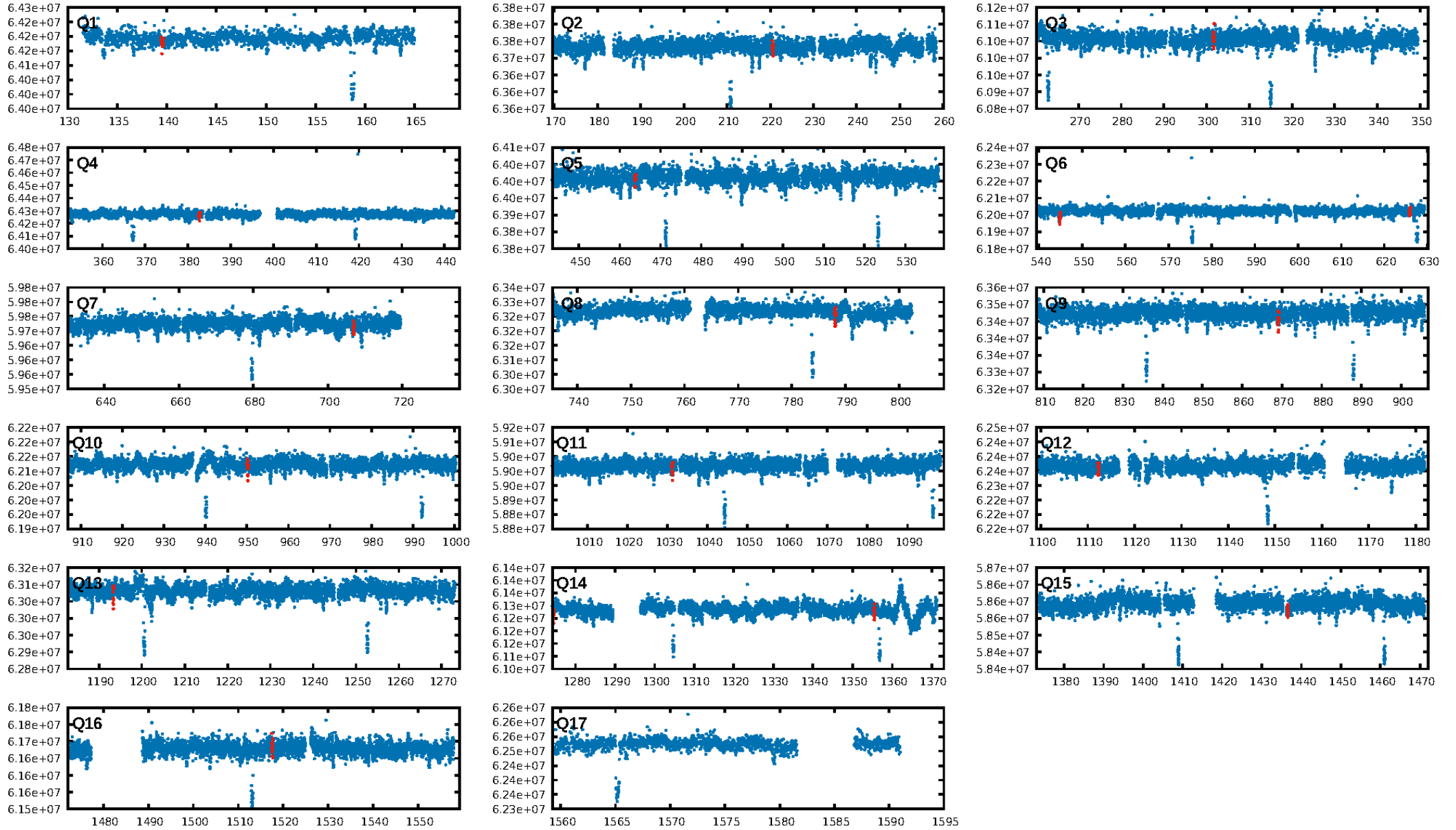
DV Fit Results:

Period = 81.06300 [0.00047] d
Epoch = 139.5440 [0.0049] BKJD
Rp/R* = 0.0211 [0.0064]
a/R* = 97.14 [150.61]
b = 0.88 [0.40]
Seff = 16.15 [4.05]
Teq = 511 [32] K
Rp = 3.05 [1.08] Re
a = 0.3789 [0.0604] AU
Ag = 821.20 [574.11] [1.43 σ]
Teffp = 4231 [702] K [5.29 σ]

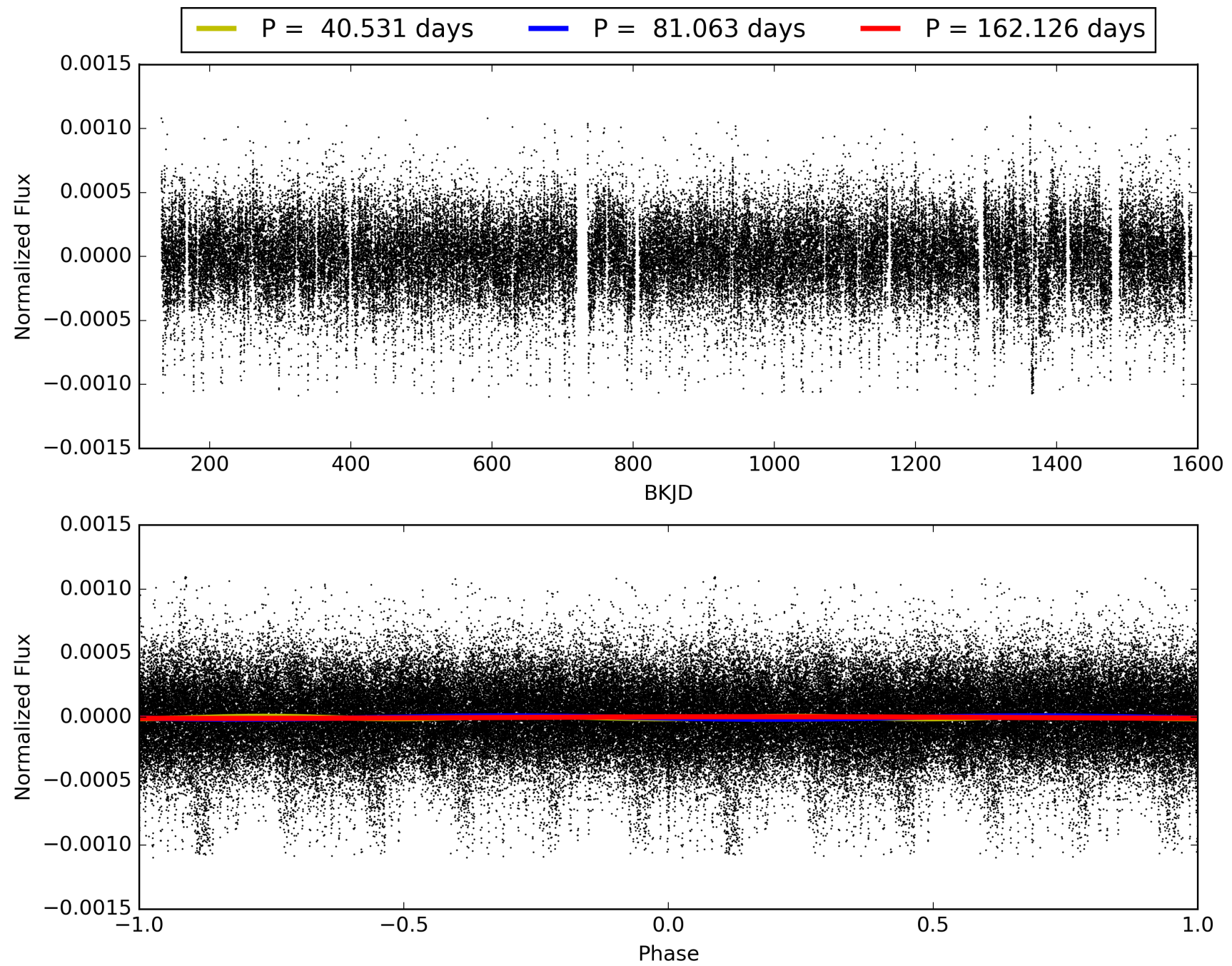
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [73.64 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 74.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.77e-38
RollingBand-fgt: 1.00 [16/16]
GhostDiagnostic-chr: 26.59
Centroid-sig: 48.9%
Centroid-so: 1.093 arcsec [1.25 σ]
OotOffset-rm: 0.218 arcsec [0.44 σ]
KicOffset-rm: 0.301 arcsec [0.61 σ]
OotOffset-st: 4/3/3/3 [13]
KicOffset-st: 4/3/3/3 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 1.00 [15/15]

TCE 008394721-04, PDC Light Curves

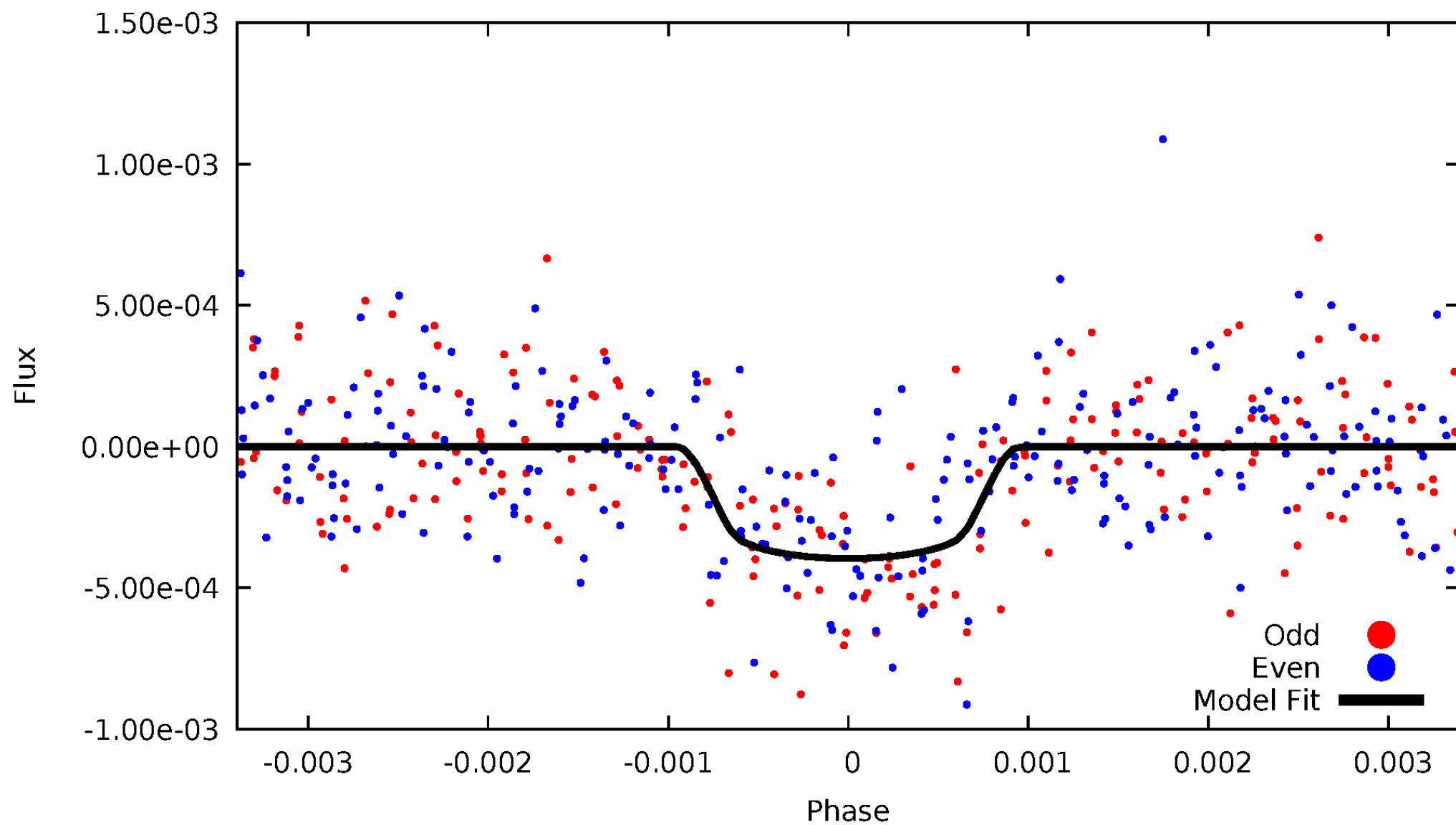


TCE 008394721-04



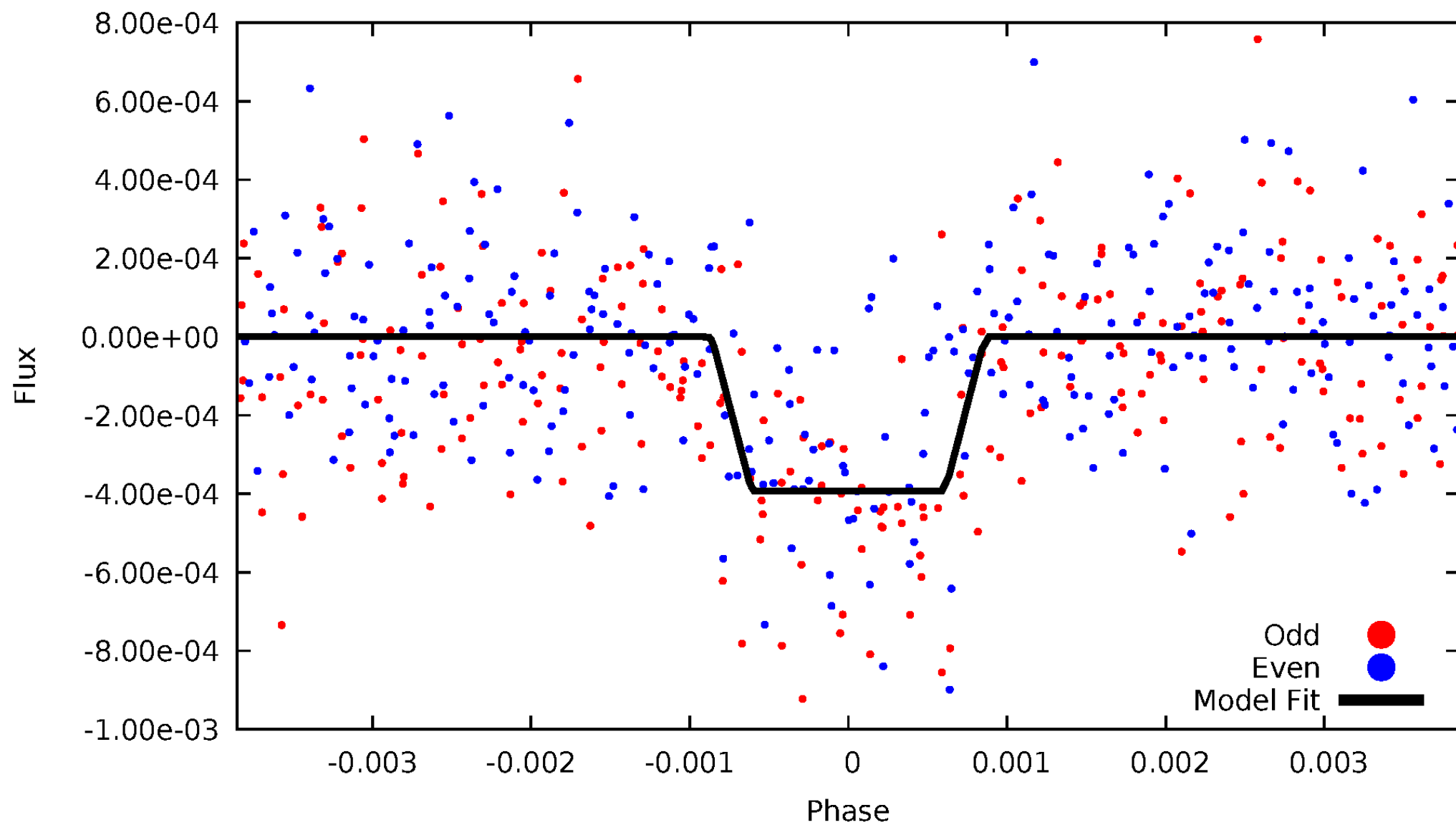
DV Odd/Even

TCE 008394721-04



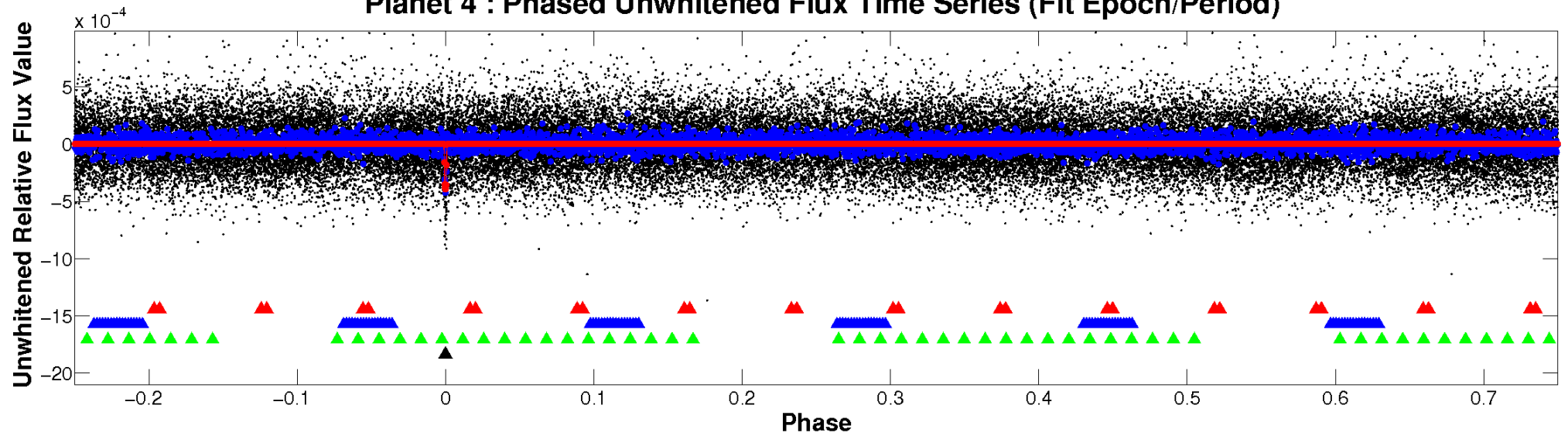
ALT Odd/Even

TCE 008394721-04

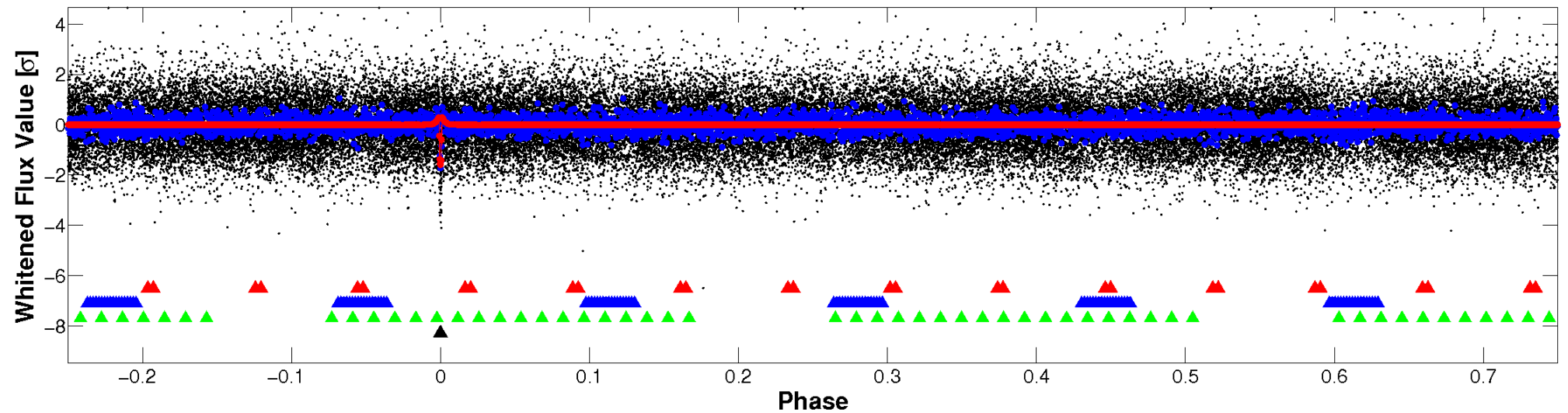


Non-Whitened Vs. Whitened Light Curve

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

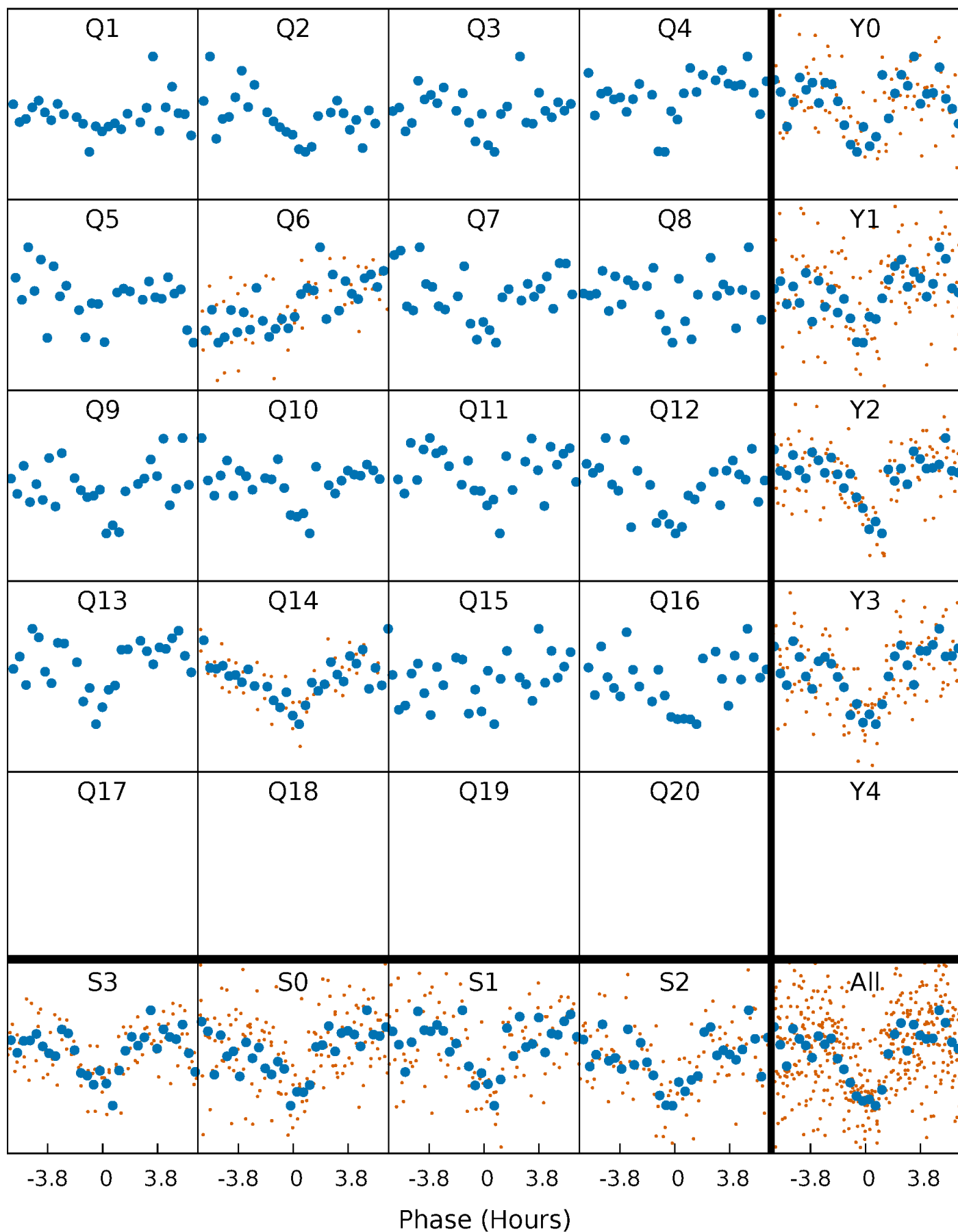


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



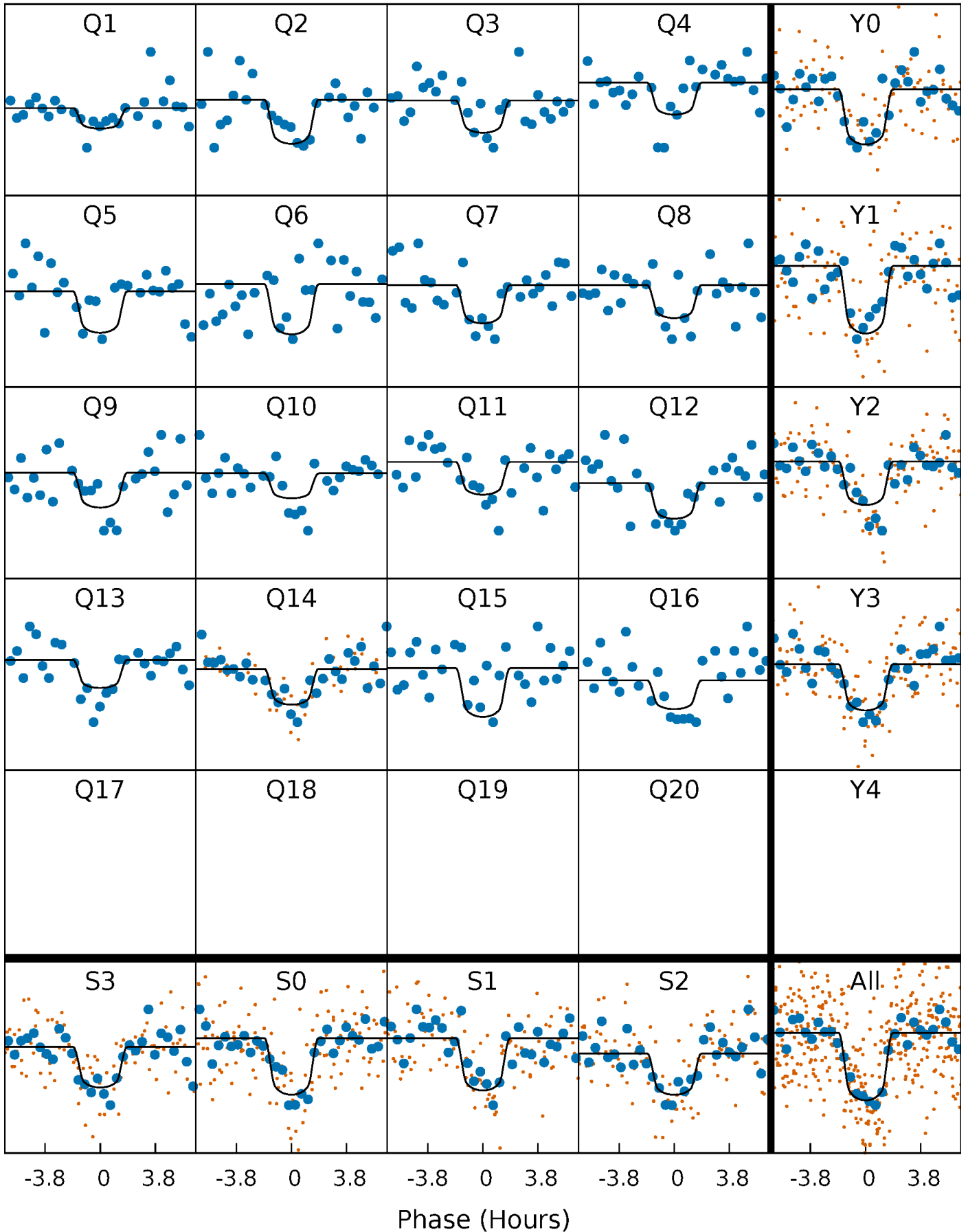
PDC Quarter-Phased Transit Curves

TCE 008394721-04 P= 81.062996 Days $T_0=139.544011$ (BKJD)



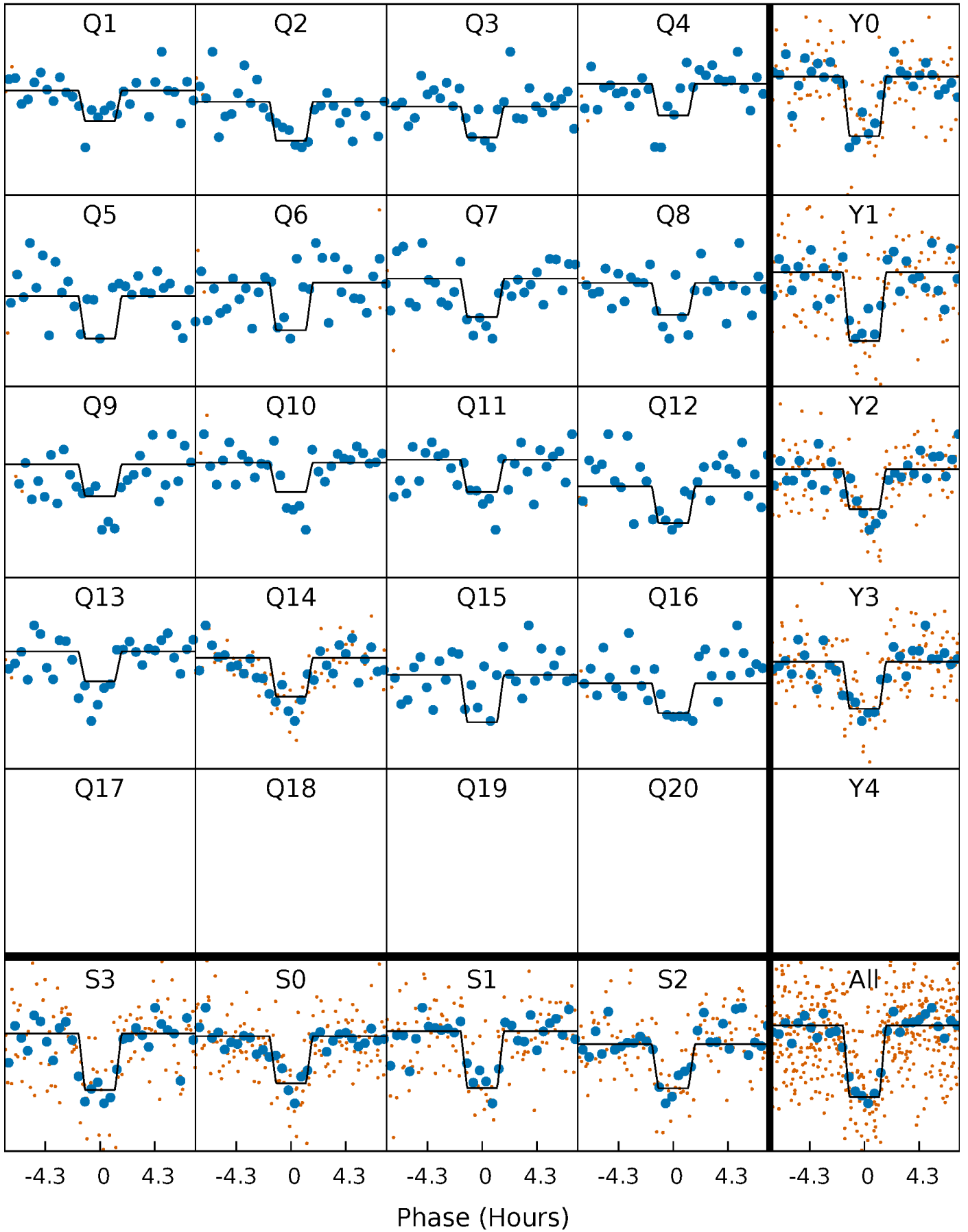
DV Quarter-Phased Transit Curves

TCE 008394721-04 $P = 81.062996$ Days $T_0 = 139.544011$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

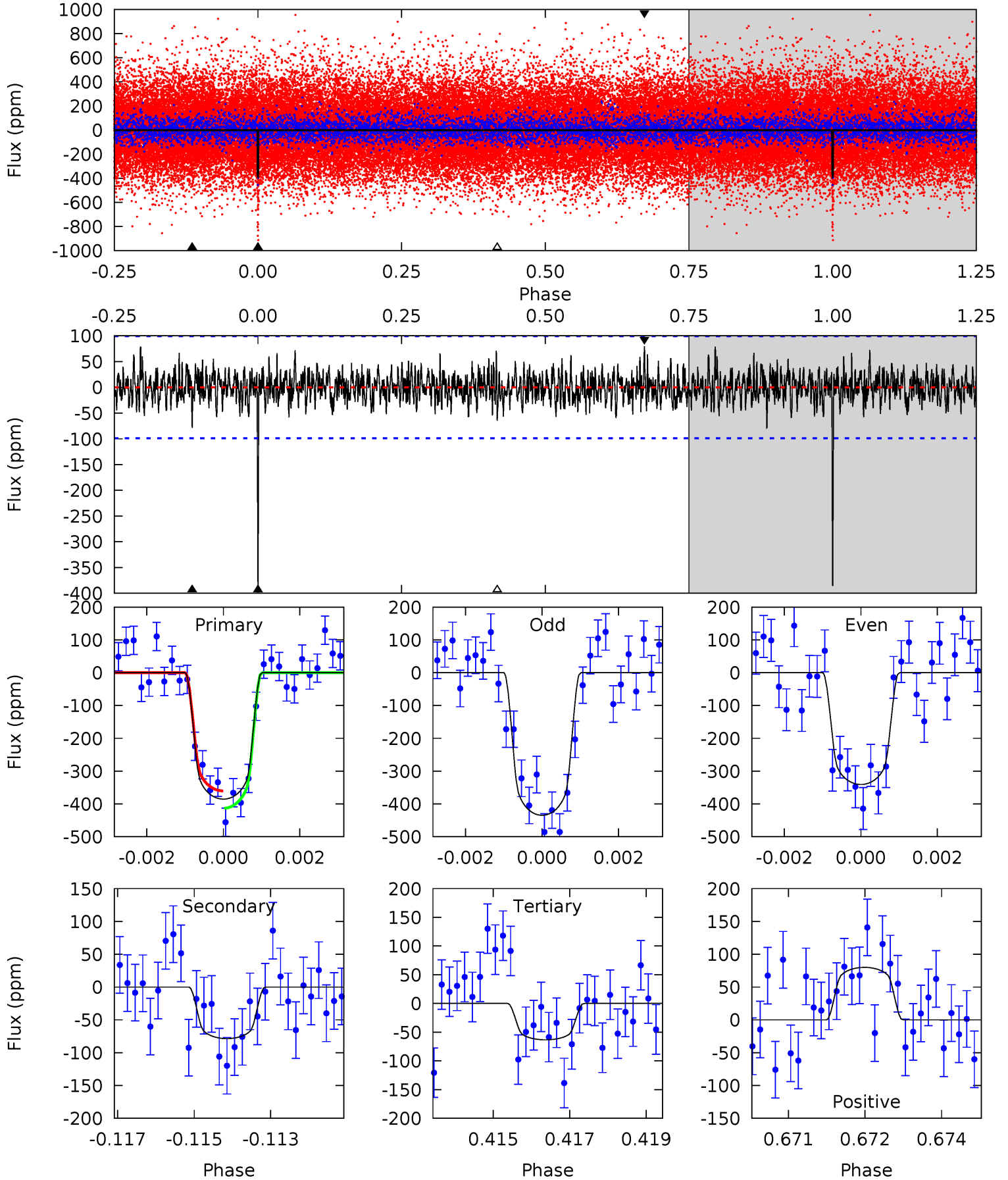
TCE 008394721-04 P= 81.063129 Days $T_0=139.544197$ (BKJD)



DV Model-Shift Uniqueness Test

008394721-04, P = 81.062996 Days, E = 58.481015 Days

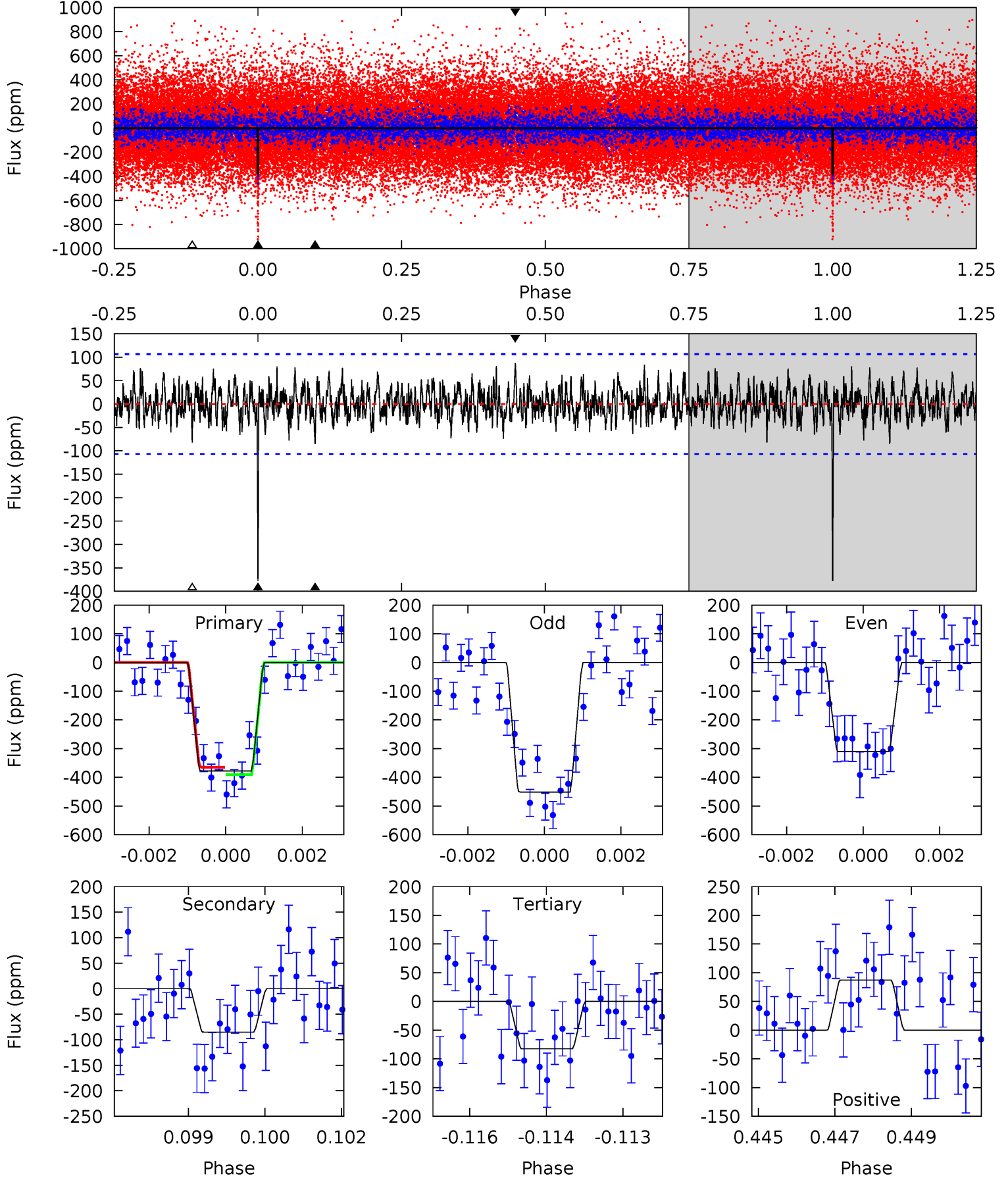
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.7	4.23	3.41	4.31	5.33	3.10	1.21	17.3	16.4	0.82	-0.08	2.53	0.92	0.17	1.42



Alt Model-Shift Uniqueness Test

008394721-04, P = 81.063129 Days, E = 58.481068 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	4.27	4.14	4.38	5.35	3.13	1.34	14.8	14.6	0.13	-0.12	3.53	1.01	0.19	0.66



Stellar Parameters For KIC 008394721

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6198^{+111}_{-136}	$4.237^{+0.130}_{-0.117}$	$-0.040^{+0.150}_{-0.150}$	$1.324^{+0.247}_{-0.202}$	$1.101^{+0.109}_{-0.081}$	$0.668^{+0.395}_{-0.249}$
	+2%/-2%	+3%/-3%	+375%/-375%	+19%/-15%	+10%/-7%	+59%/-37%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008394721-04 / KOI 0152.04

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-79 ± 19	$3.06^{+0.95}_{-1.02}$	712^{+37}_{-34}	4229^{+734}_{-387}	656^{+827}_{-294}
Alt.	-85 ± 20	$2.85^{+1.03}_{-0.95}$	712^{+34}_{-34}	4369^{+876}_{-449}	774^{+1095}_{-345}

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 $A_{obs} \gg 1.0$

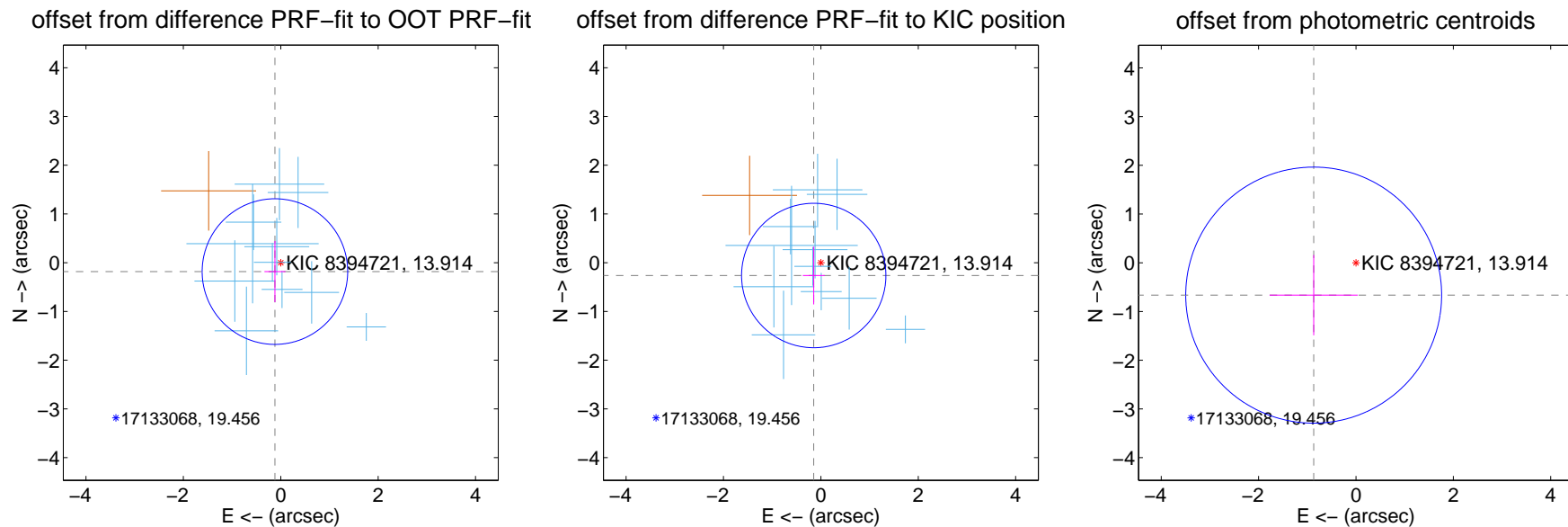
DV Centroid Data

Supplemental centroid analysis for 008394721-04. Kepler magnitude: 13.91. Transit SNR 14.04

There are 11 quarters with good PRF difference image offsets

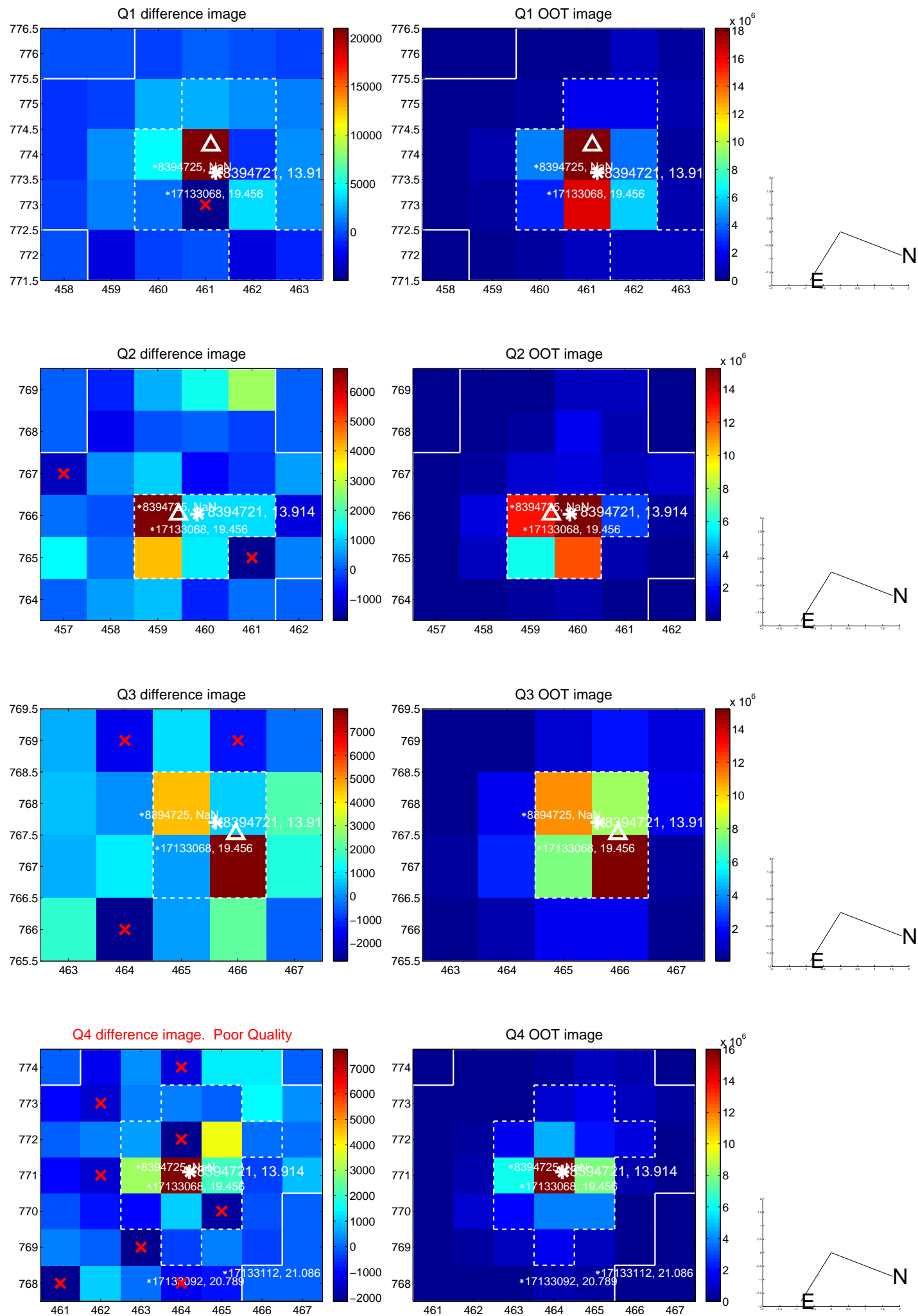
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.218 ± 0.498	0.44	0.120 ± 0.216	-0.182 ± 0.628
PRF-fit source offset from KIC position	0.301 ± 0.494	0.61	0.146 ± 0.224	-0.263 ± 0.594
photometric centroid source offset	1.09 ± 0.88	1.25	0.87 ± 0.90	-0.66 ± 0.82

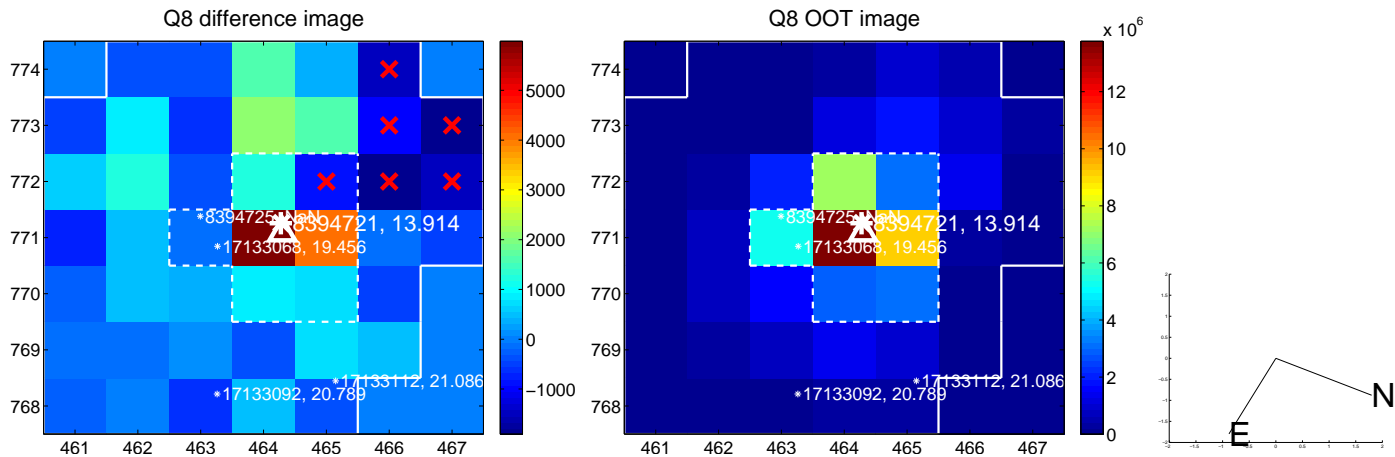
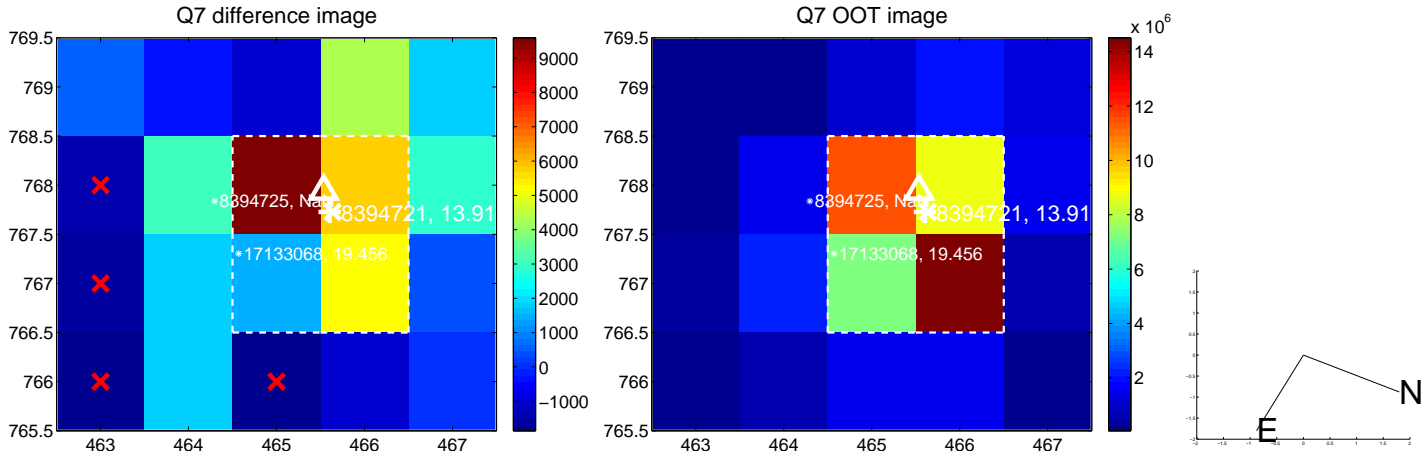
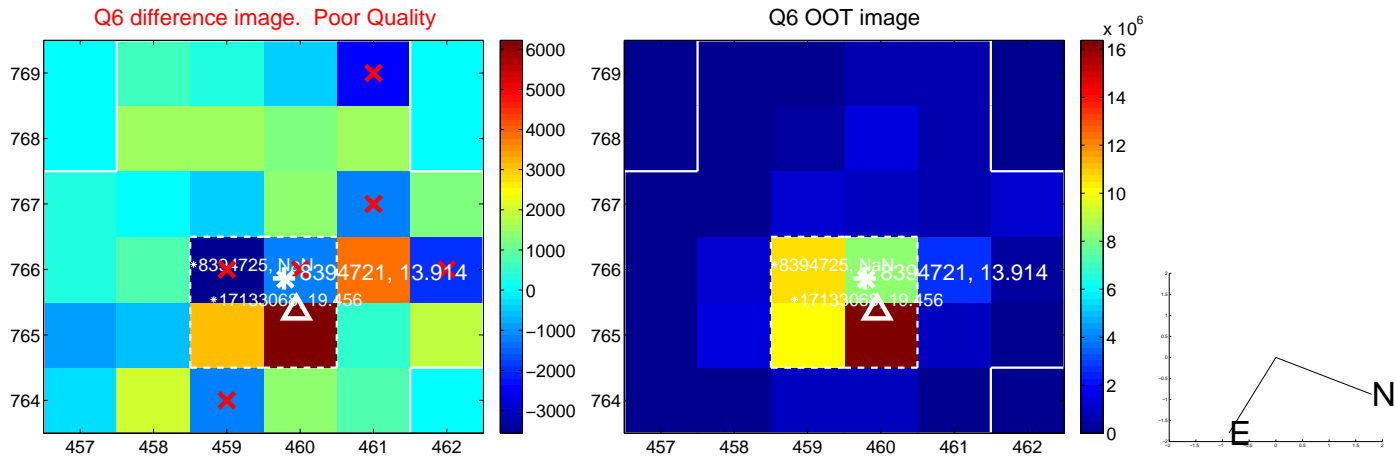
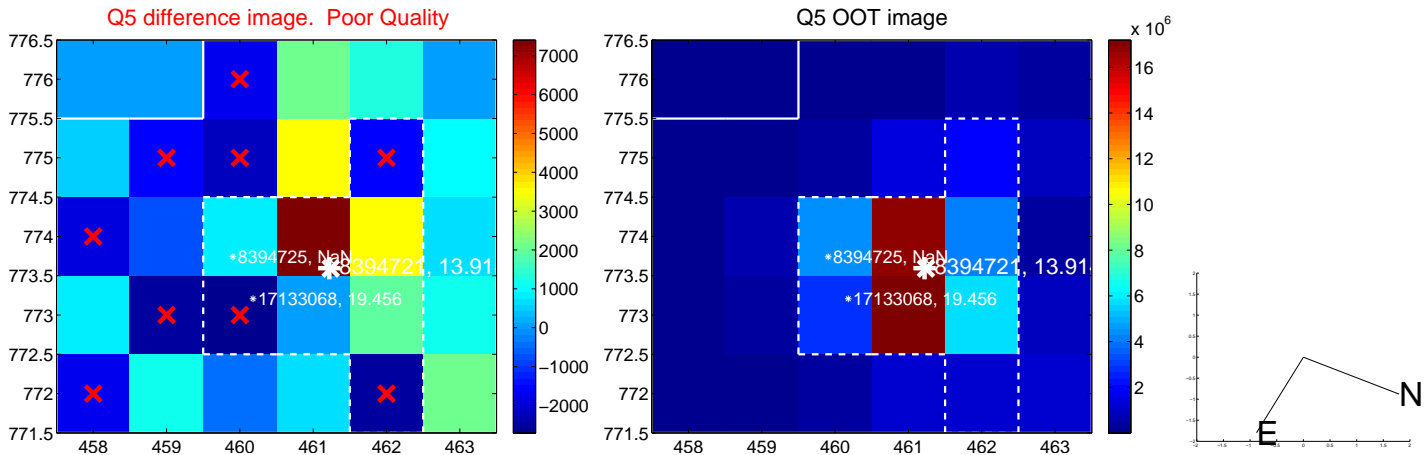


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

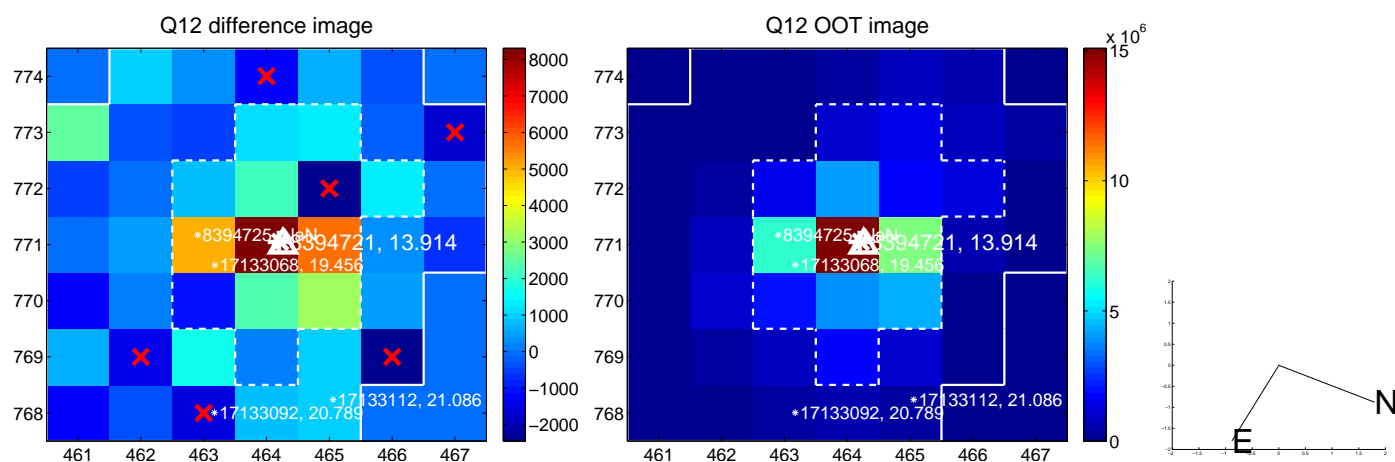
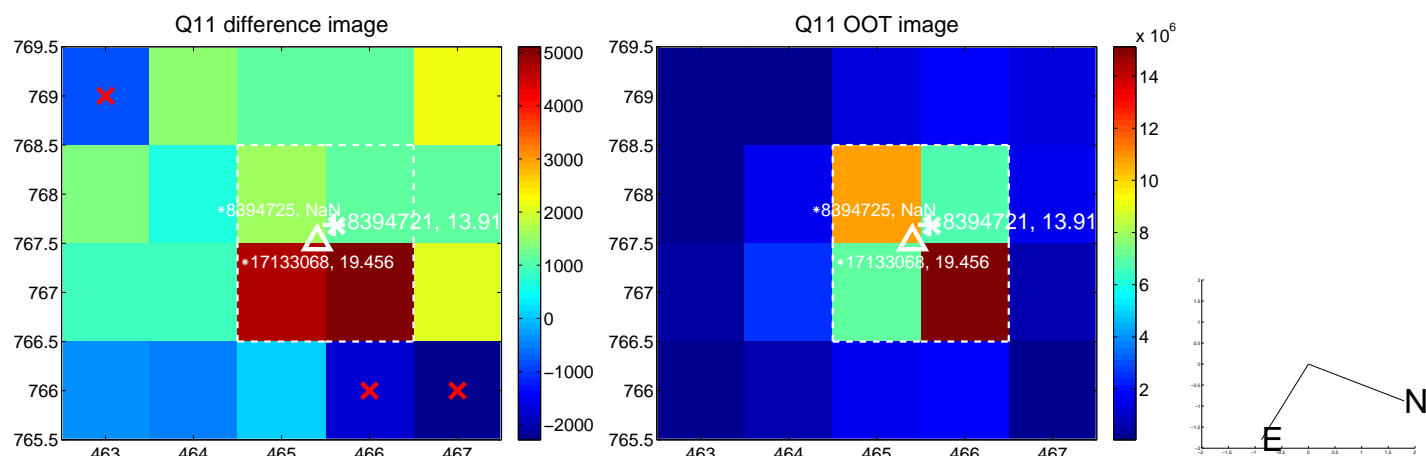
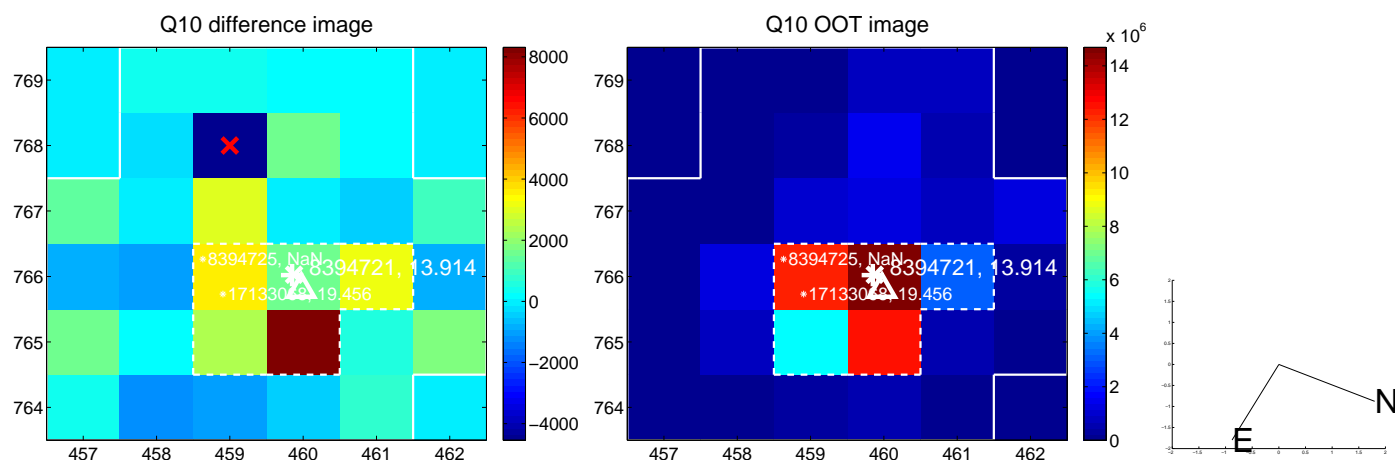
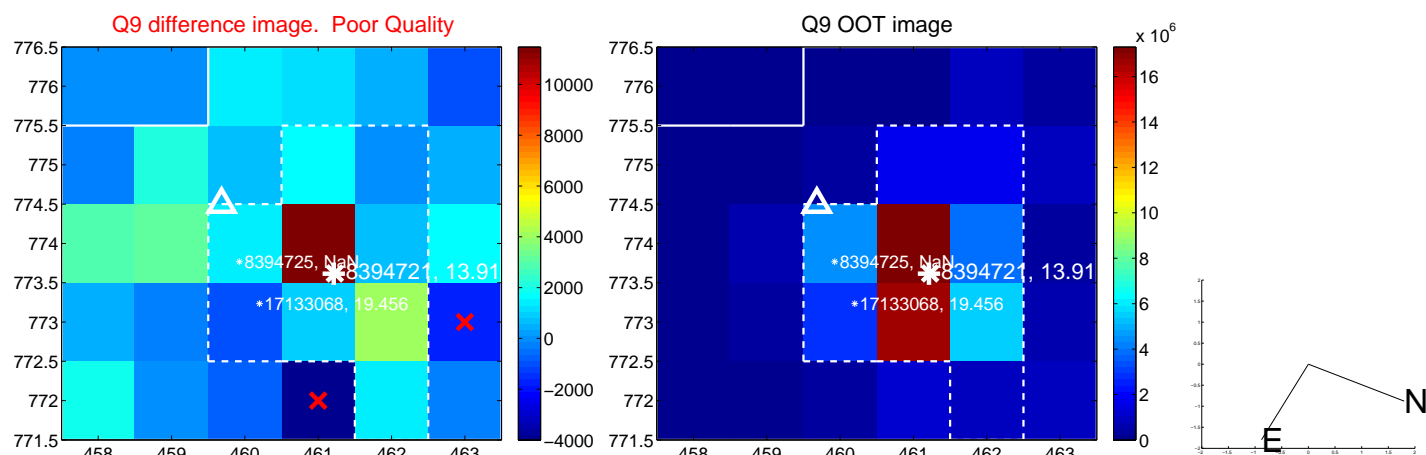
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



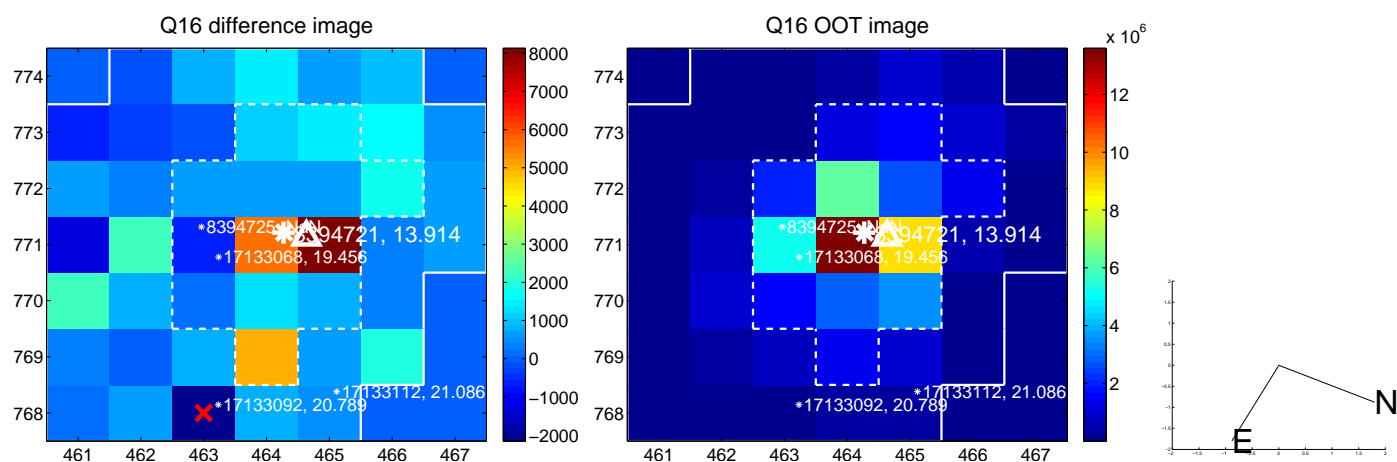
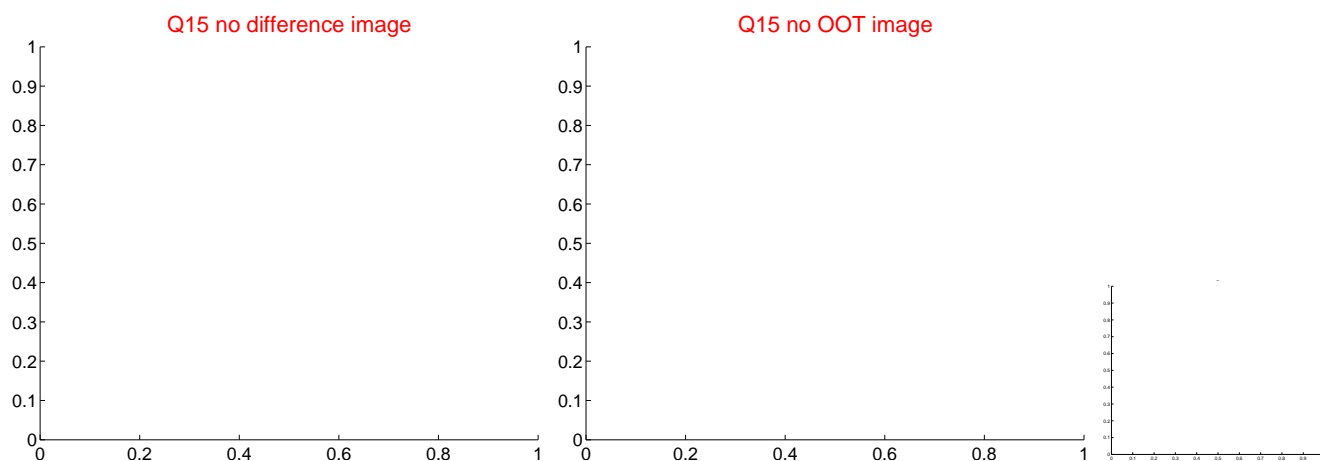
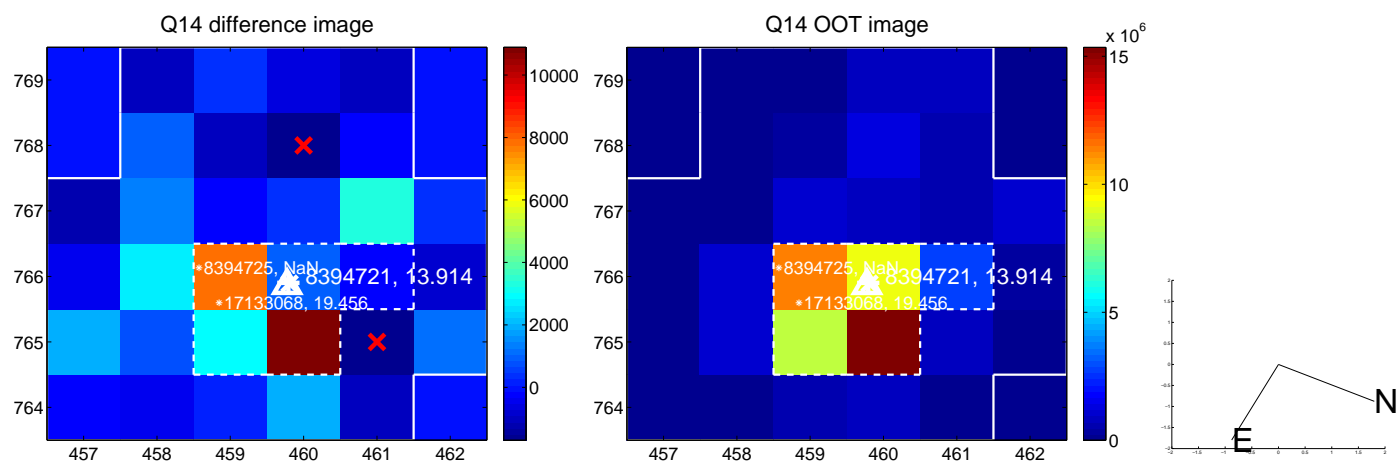
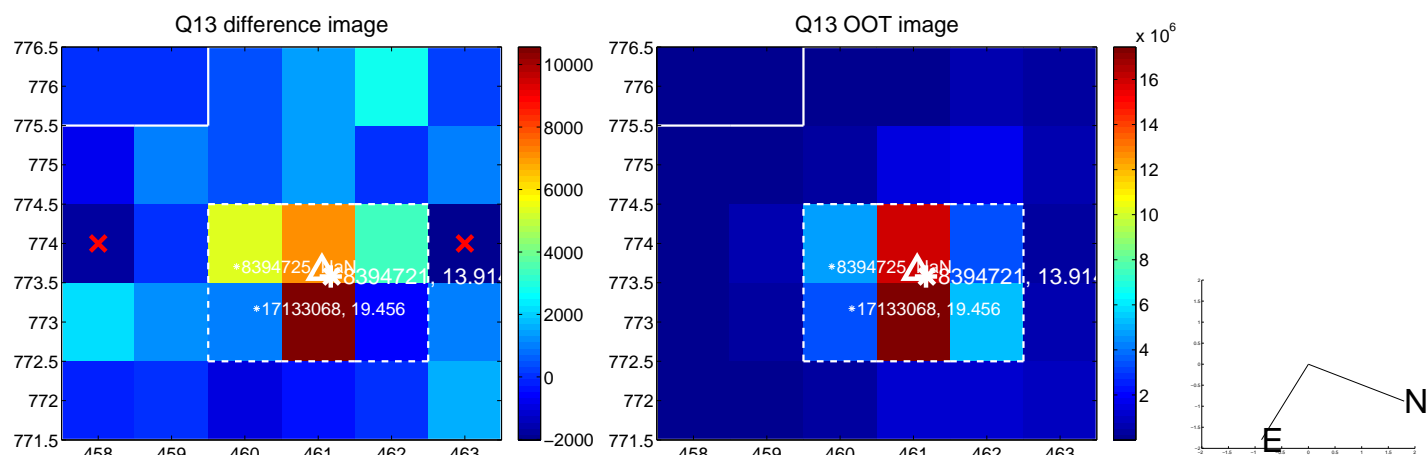
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



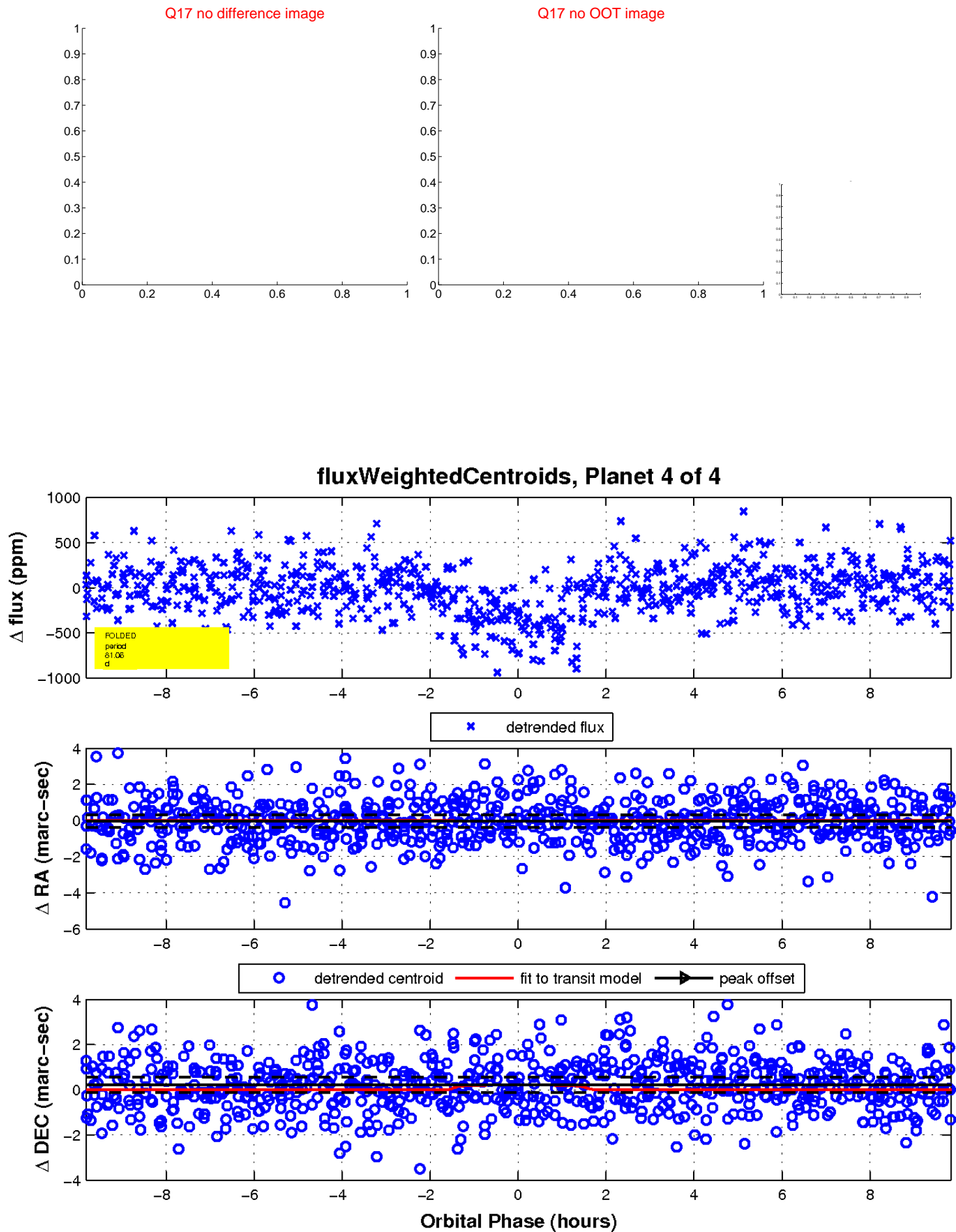
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

