

KIC 008355239

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})
008355239-01	OBS	0574.01	20.134918	151.231937	1035.7	3.740	53.6	57.8	0.83	4963	2.96	20.70
008355239-02	OBS	0574.02	10.399882	141.511675	262.3	3.437	18.4	19.8	0.83	4963	1.54	49.94

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008355239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008355239-02	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.

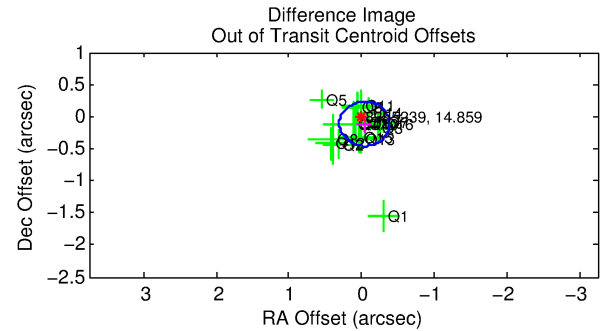
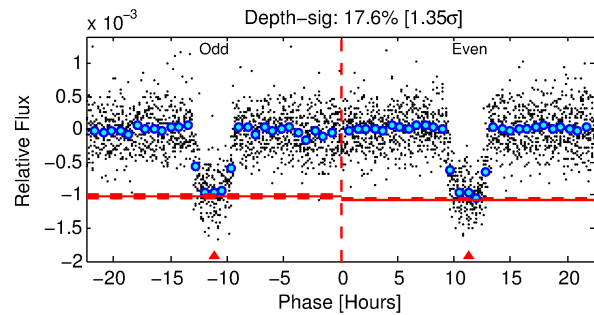
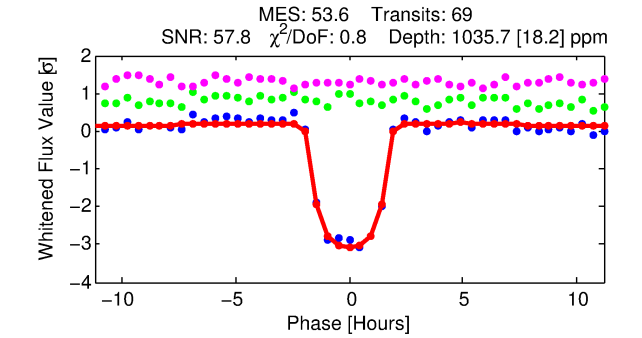
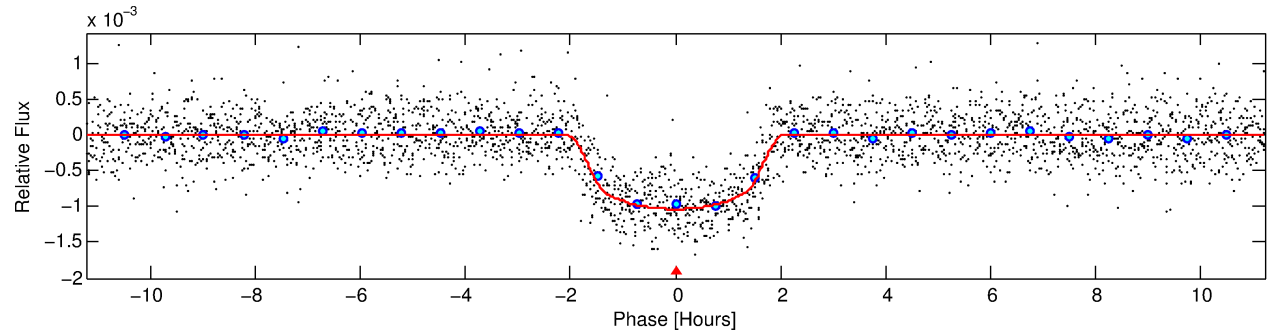
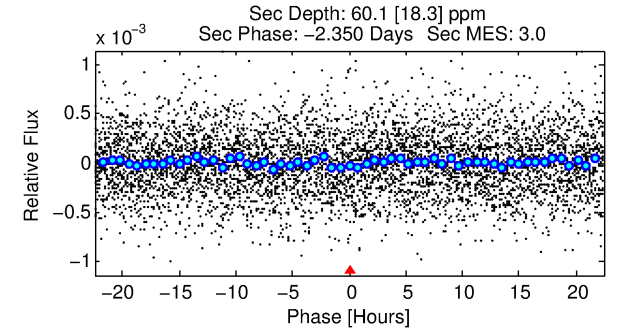
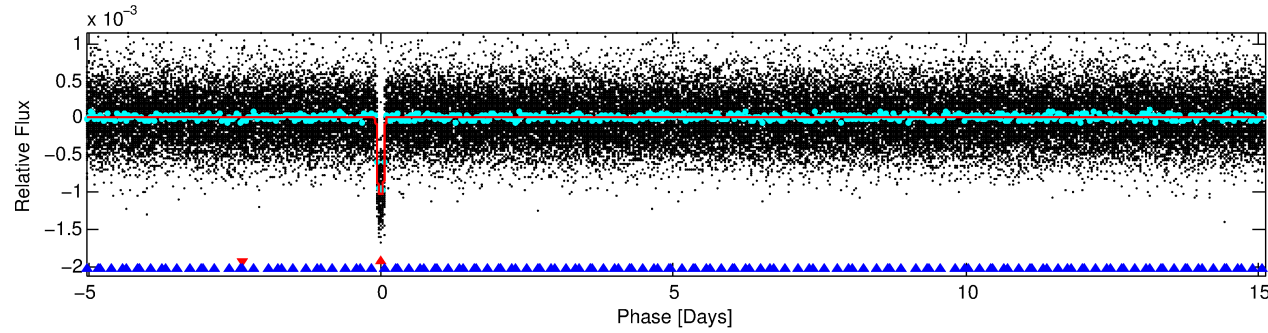
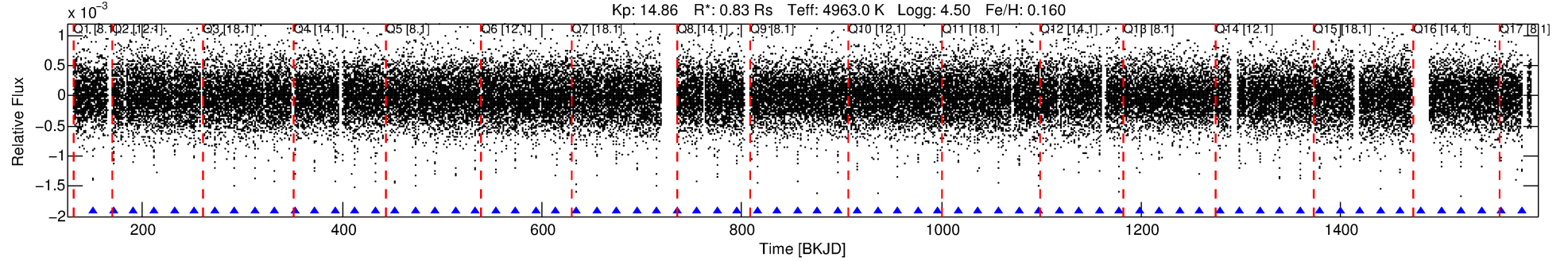
Ephemeris Match Information For 008355239-01

No Significant Match Found

DV One-Page Summary

KIC: 8355239 Candidate: 1 of 2 Period: 20.135 d
KOI: K00574.01 Name: Kepler-189c Corr: 0.990

Kp: 14.86 R*: 0.83 Rs Teff: 4963.0 K Logg: 4.50 Fe/H: 0.160



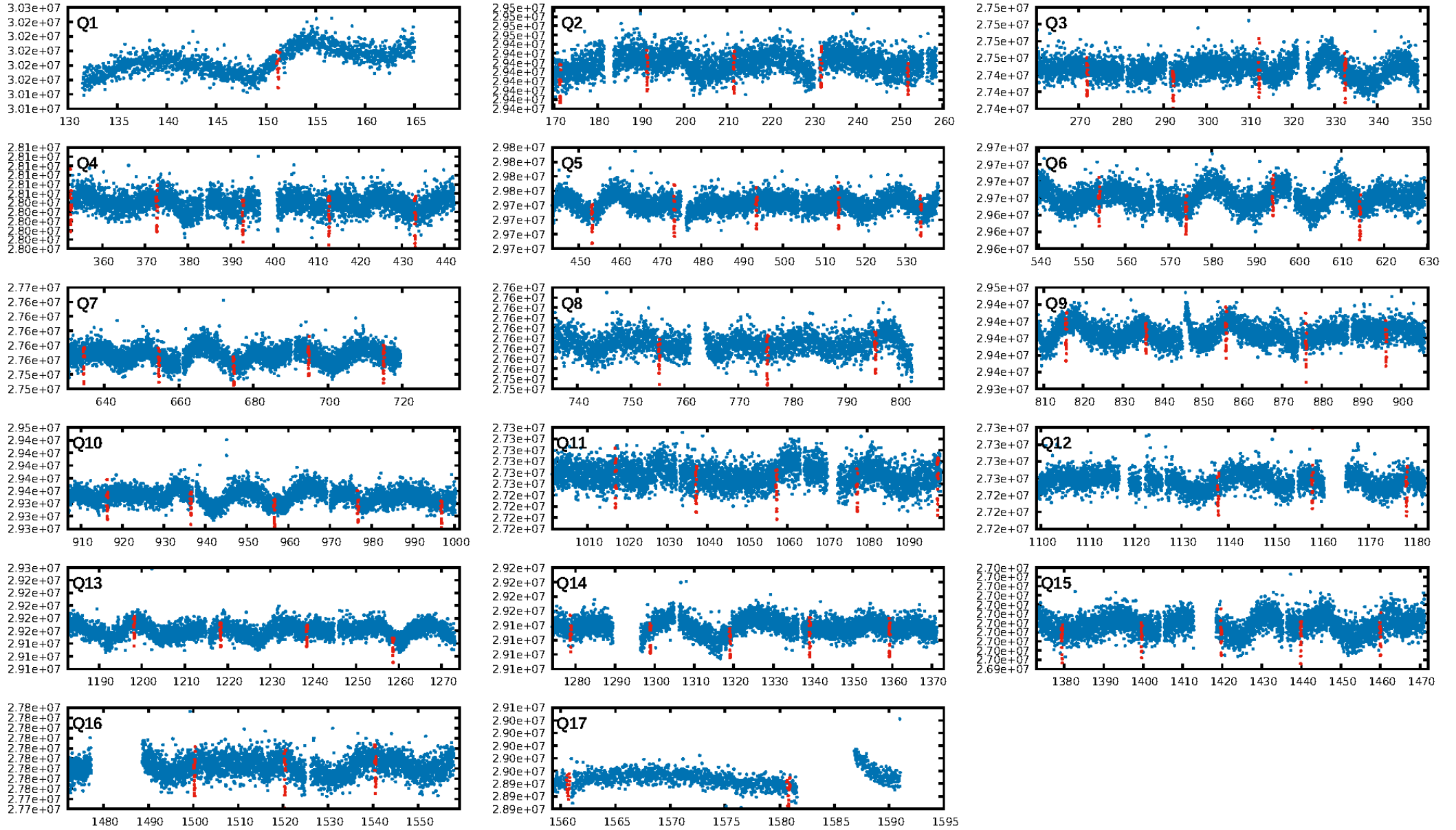
DV Fit Results:

Period = 20.13492 [0.00004] d
Epoch = 151.2319 [0.0014] BKJD
Rp/R* = 0.0328 [0.0040]
a/R* = 27.62 [11.73]
b = 0.78 [0.21]
Seff = 20.70 [2.90]
Teq = 544 [19] K
Rp = 2.96 [0.42] Re
a = 0.1339 [0.0101] AU
Ag = 67.86 [27.87] [2.40σ]
Teffp = 2414 [239] K [7.79σ]

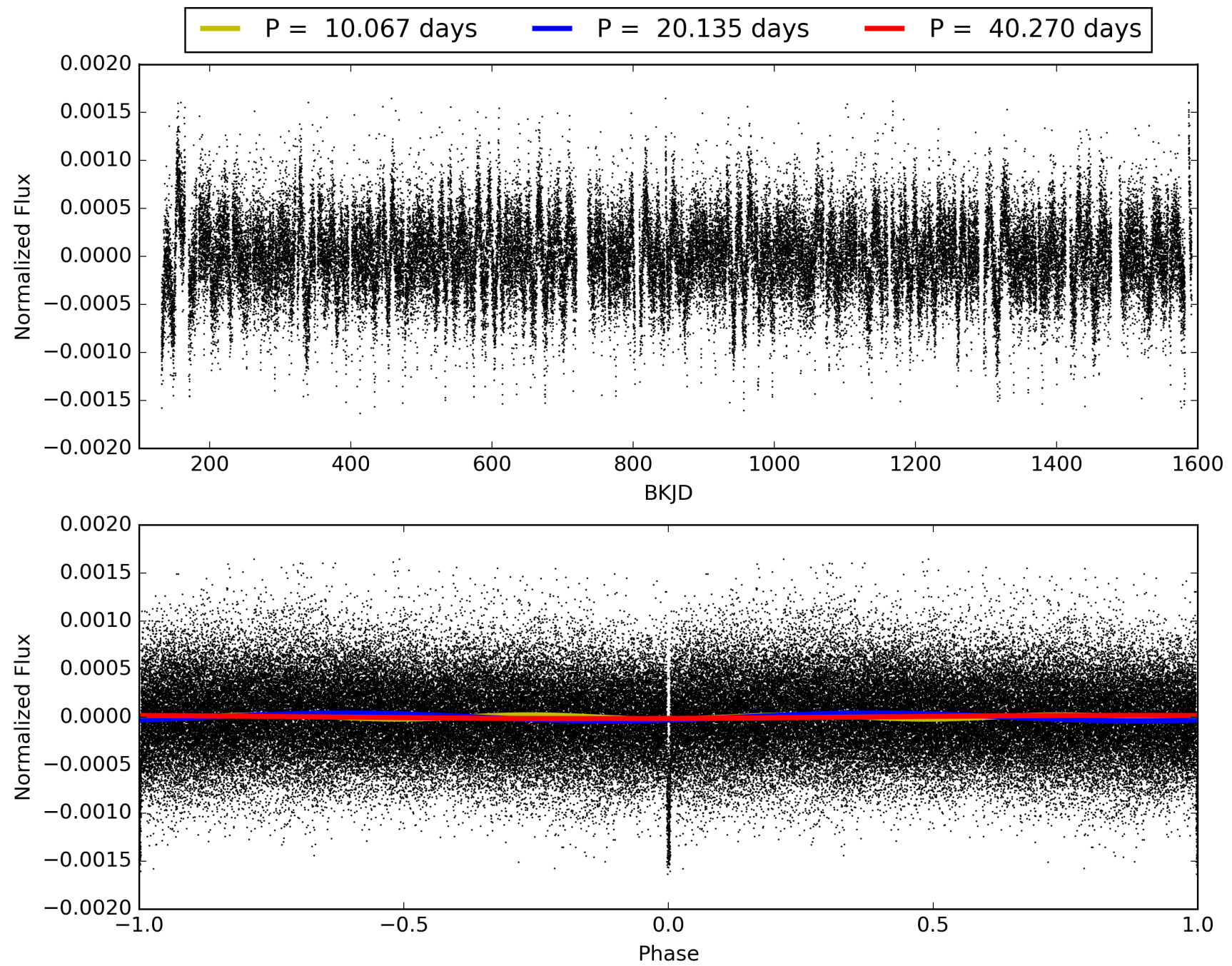
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [46.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [66/66]
GhostDiagnostic-chr: 3.491
Centroid-sig: 66.4%
Centroid-so: 0.153 arcsec [0.71σ]
OotOffset-rm: 0.121 arcsec [1.05σ]
KicOffset-rm: 0.271 arcsec [2.92σ]
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 008355239-01, PDC Light Curves

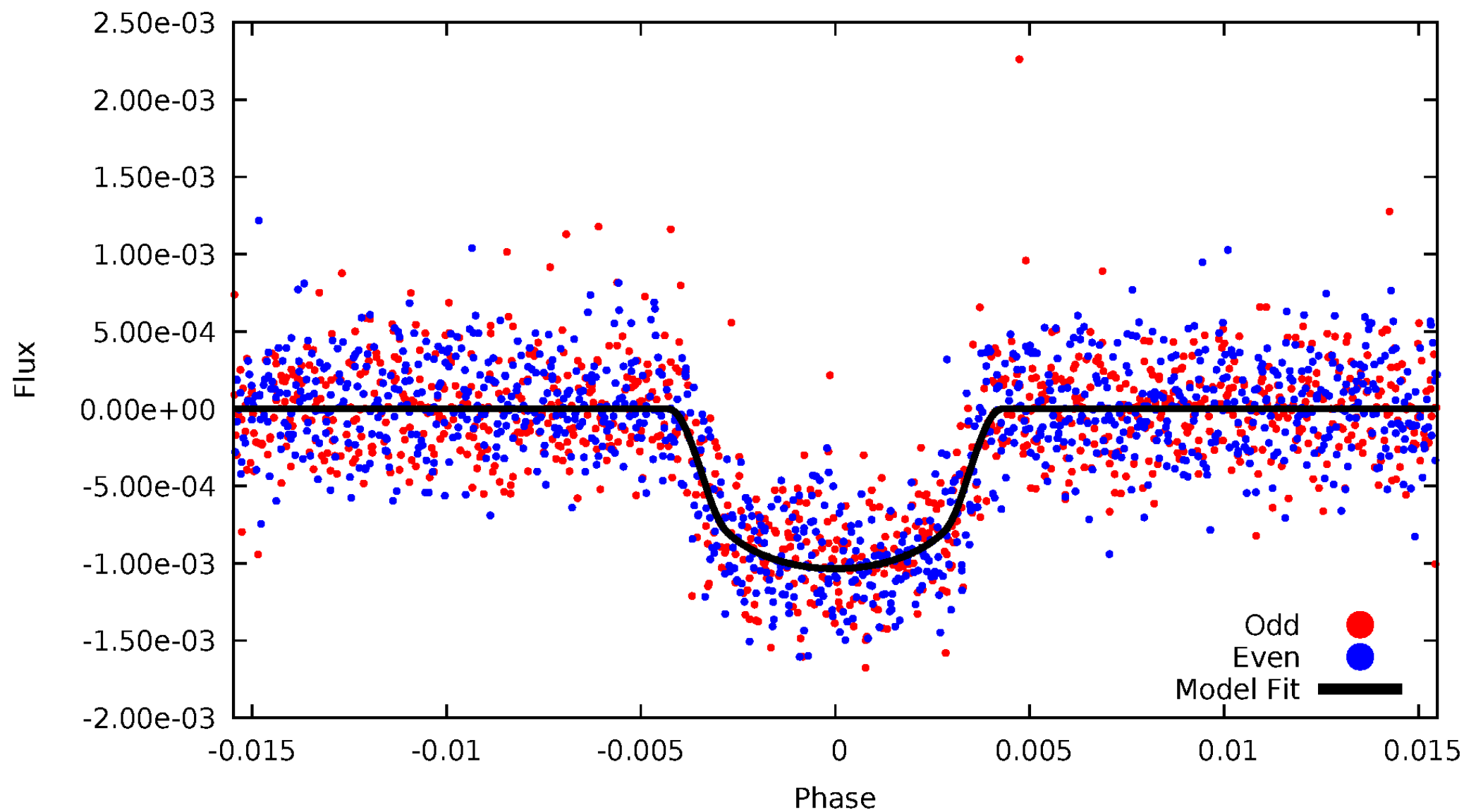


TCE 008355239-01



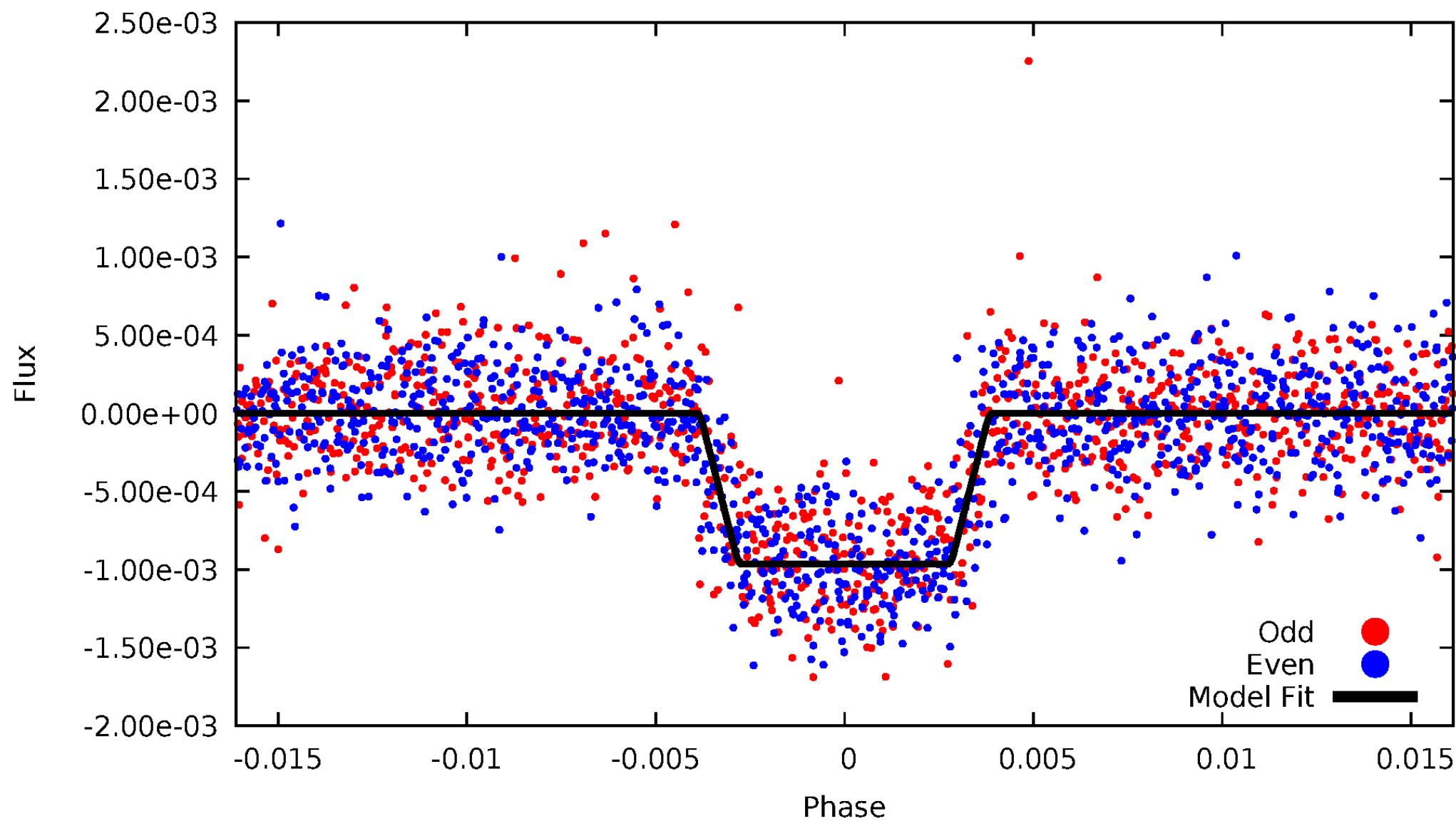
DV Odd/Even

TCE 008355239-01



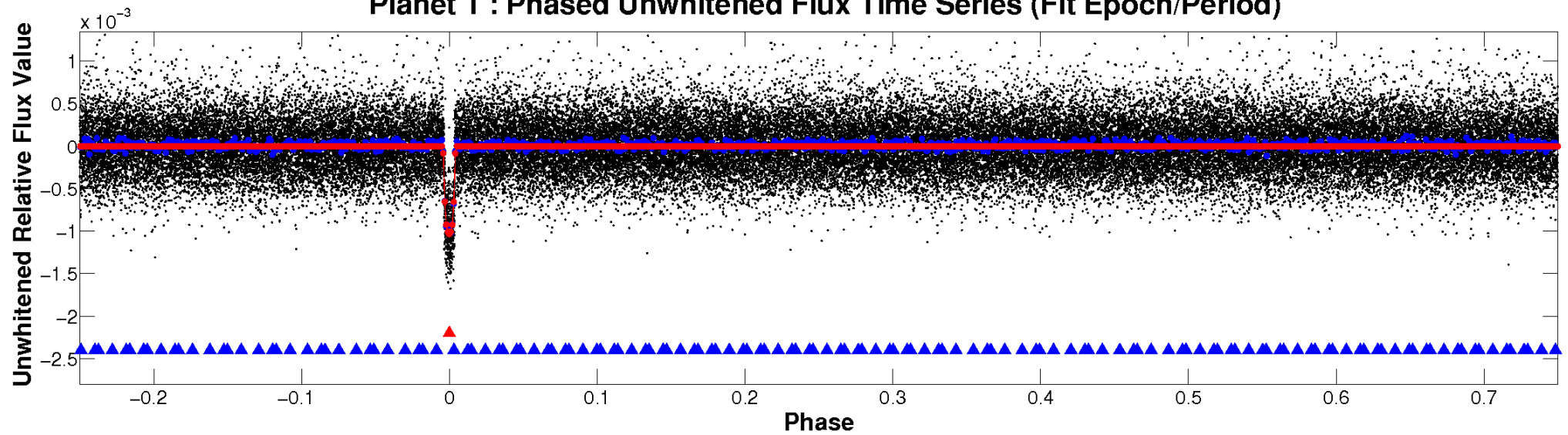
ALT Odd/Even

TCE 008355239-01

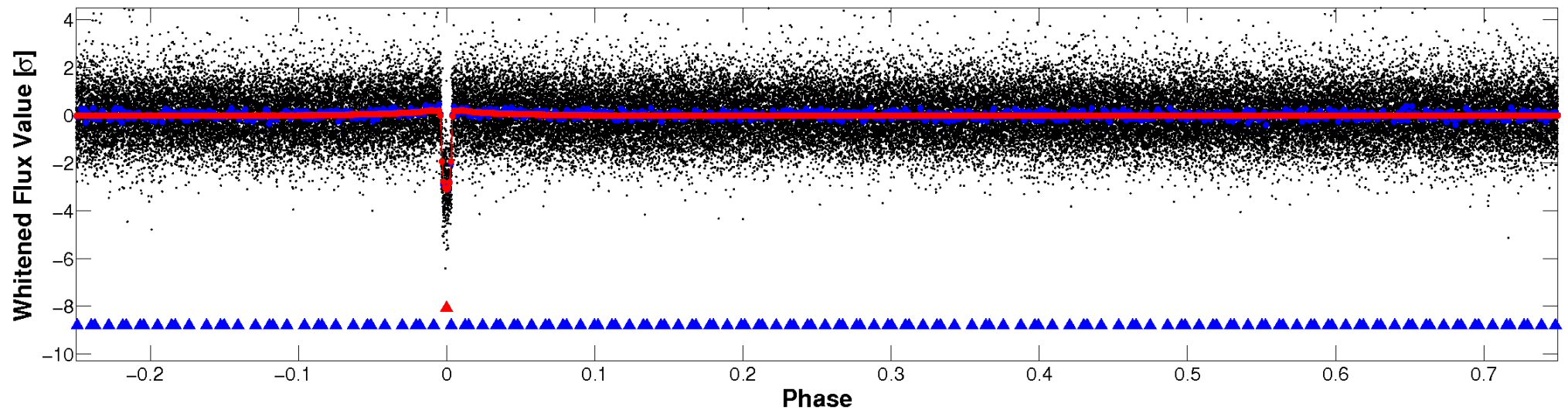


Non-Whitened Vs. Whitened Light Curve

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

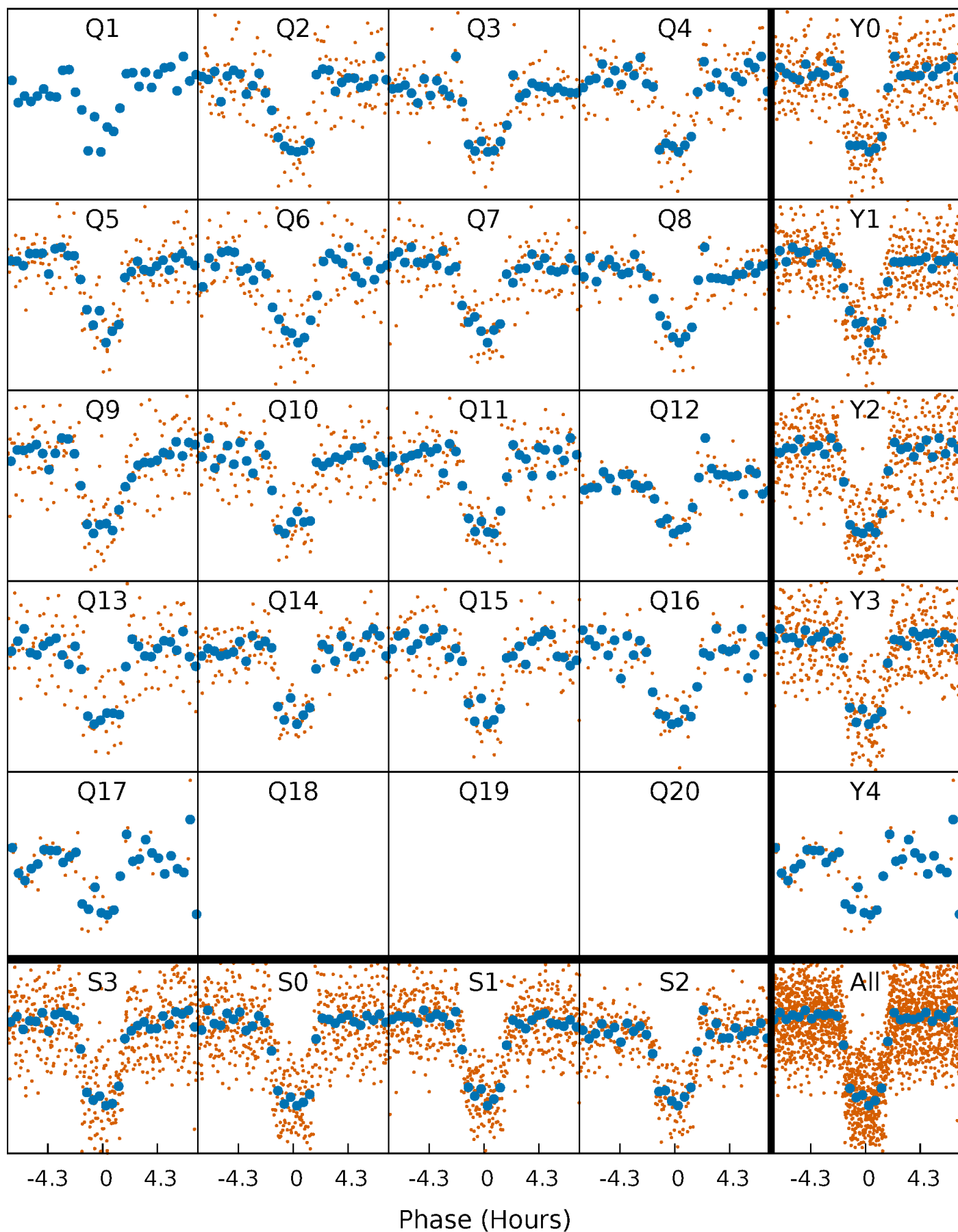


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



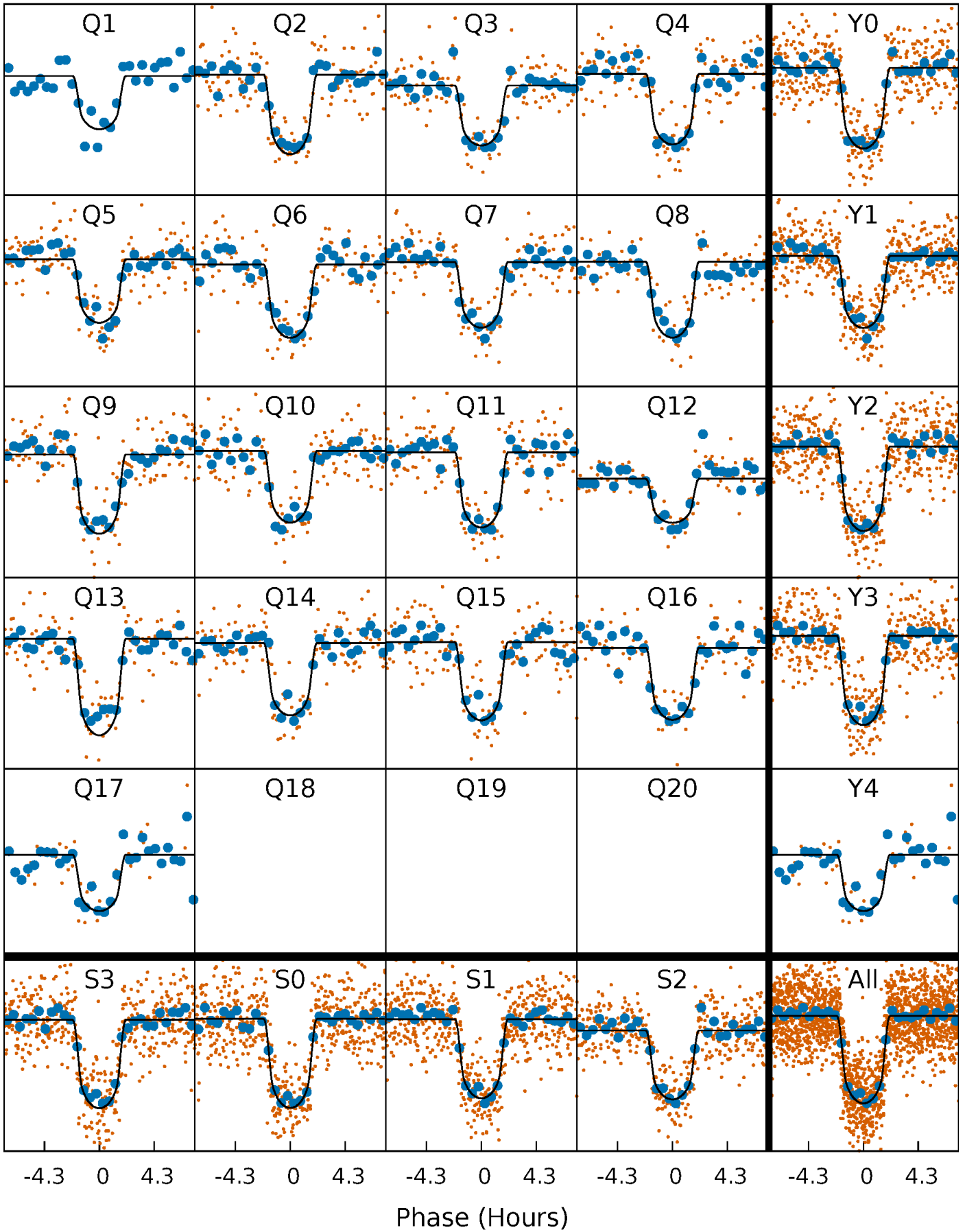
PDC Quarter-Phased Transit Curves

TCE 008355239-01 P= 20.134918 Days $T_0=151.231937$ (BKJD)



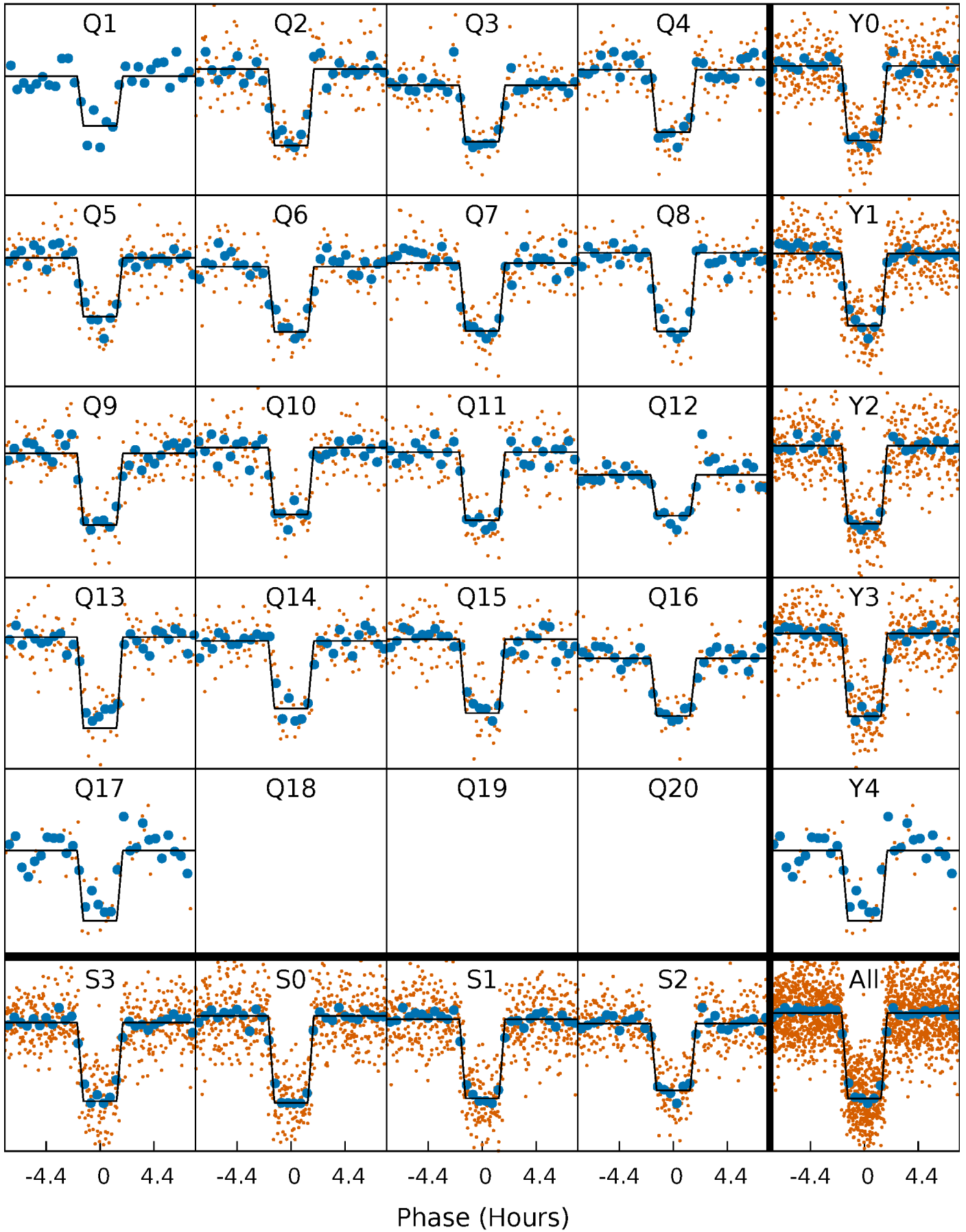
DV Quarter-Phased Transit Curves

TCE 008355239-01 P= 20.134918 Days $T_0=151.231937$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

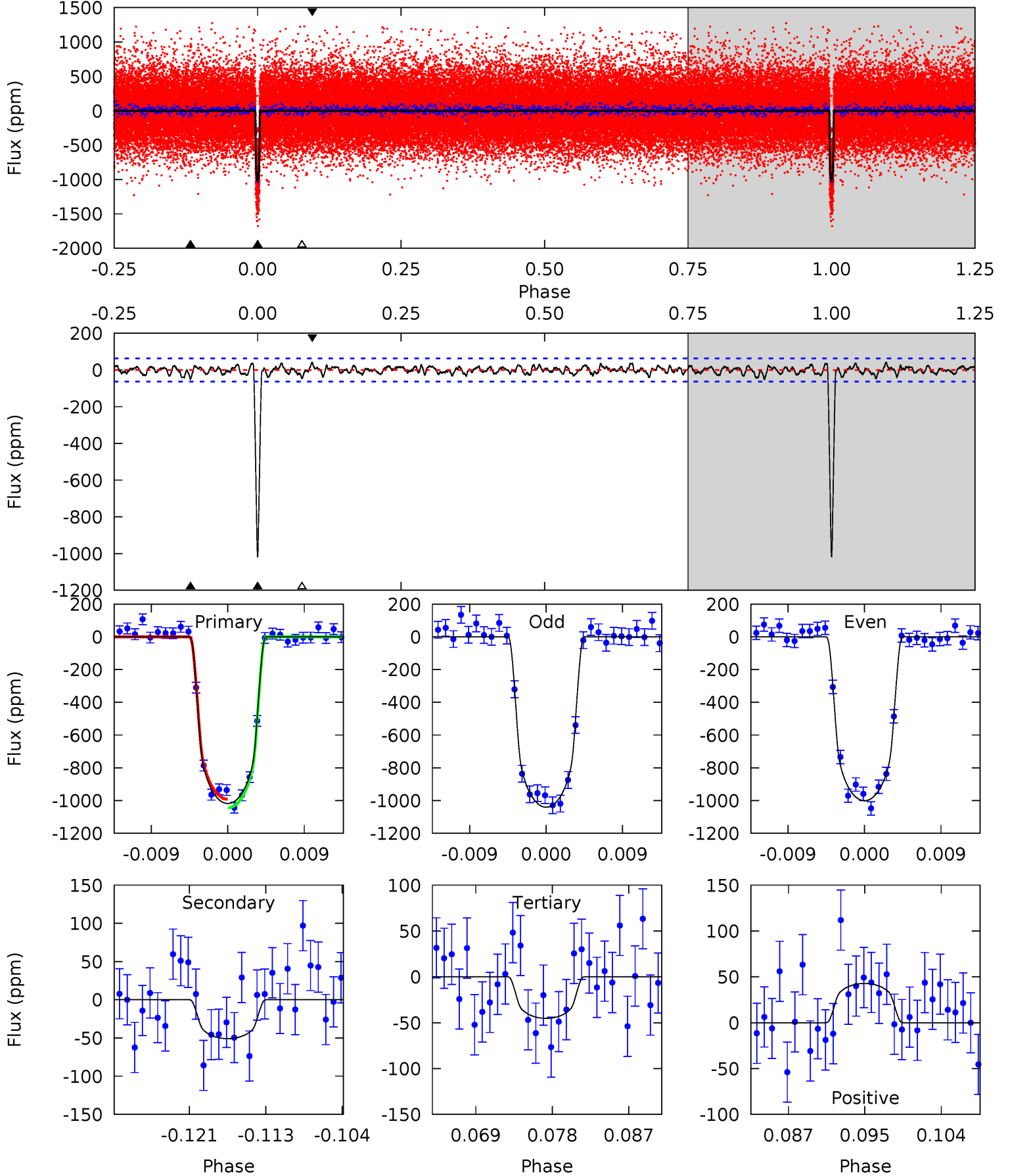
TCE 008355239-01 P= 20.134728 Days $T_0=151.238629$ (BKJD)



DV Model-Shift Uniqueness Test

008355239-01, P = 20.134918 Days, E = 131.097019 Days

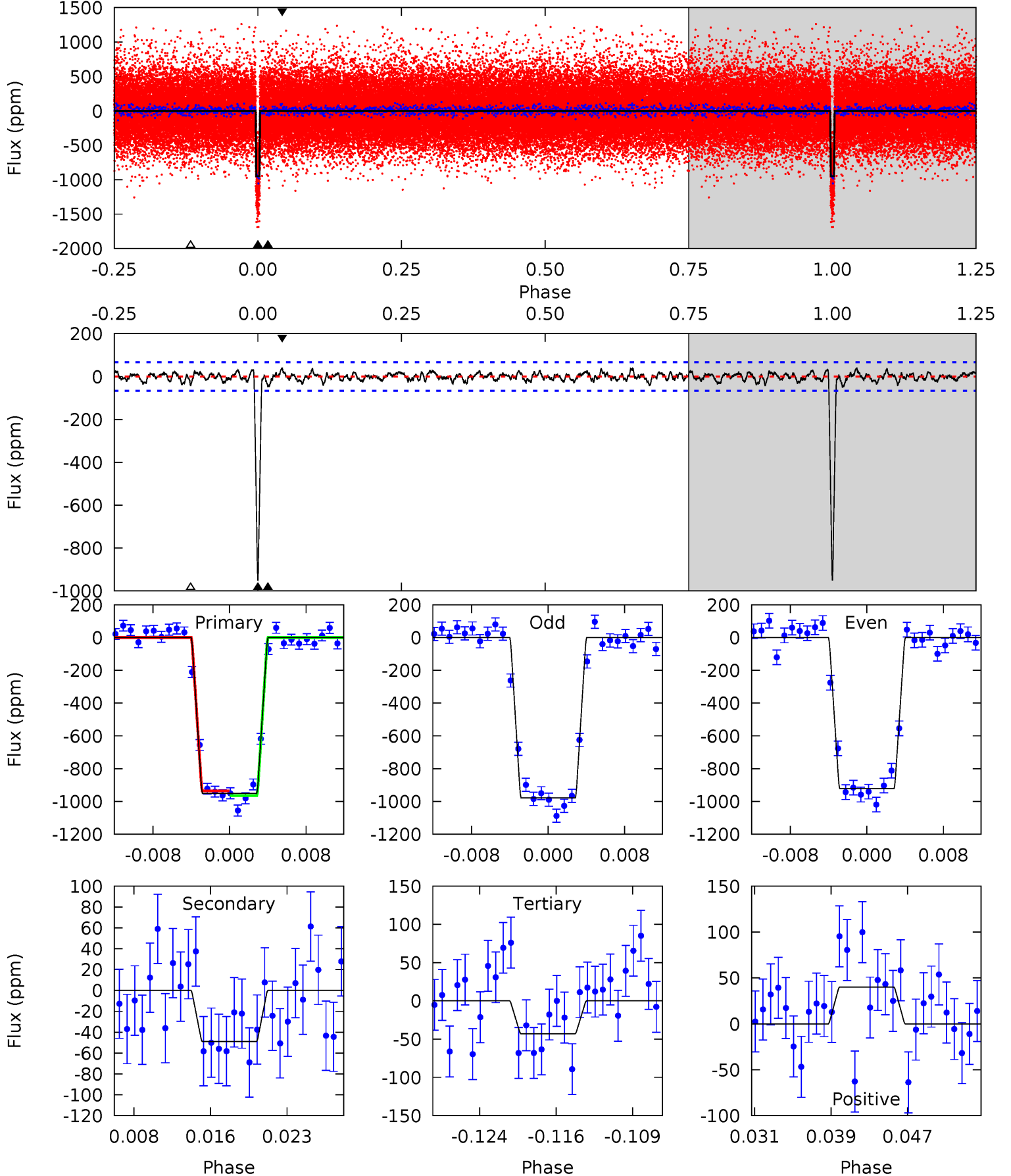
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
81.8	4.09	3.64	3.44	5.05	2.63	1.25	78.2	78.4	0.45	0.65	1.59	0.97	0.04	2.13



Alt Model-Shift Uniqueness Test

008355239-01, P = 20.134728 Days, E = 131.103901 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
72.4	3.72	3.26	3.05	5.07	2.66	1.09	69.1	69.3	0.46	0.68	2.13	0.98	0.04	1.09



Stellar Parameters For KIC 008355239

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4963^{+79}_{-79}	$4.501^{+0.075}_{-0.025}$	$0.160^{+0.150}_{-0.150}$	$0.826^{+0.032}_{-0.060}$	$0.789^{+0.050}_{-0.029}$	$1.973^{+0.537}_{-0.181}$
	+2%/-2%	+2%/-1%	+94%/-94%	+4%/-7%	+6%/-4%	+27%/-9%
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 008355239-01 / KOI 0574.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-51 ± 12	$2.92^{+0.41}_{-0.38}$	755^{+16}_{-18}	2963^{+151}_{-157}	60^{+25}_{-19}
Alt.	-49 ± 13	$2.74^{+0.41}_{-0.35}$	755^{+17}_{-18}	2988^{+172}_{-172}	64^{+29}_{-23}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

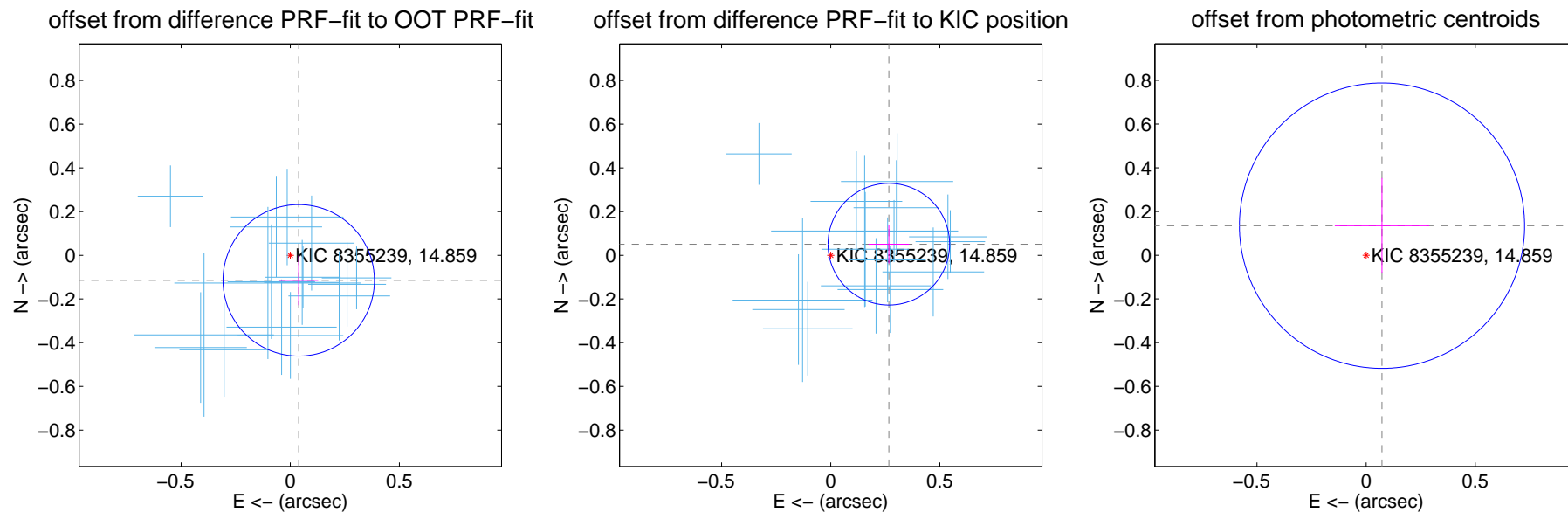
DV Centroid Data

Supplemental centroid analysis for 008355239-01. Kepler magnitude: 14.86. Transit SNR 57.85

There are 17 quarters with good PRF difference image offsets

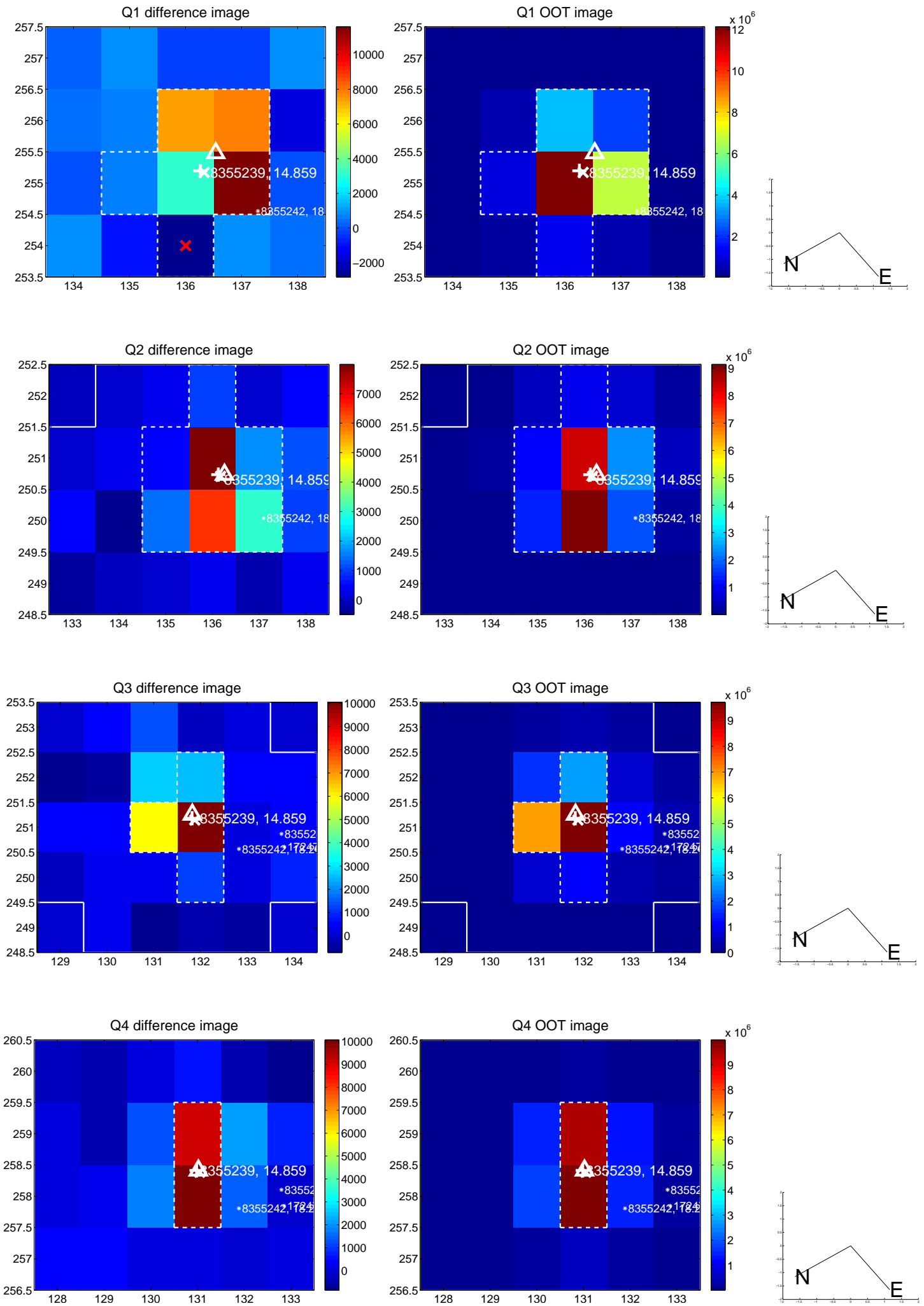
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.121 ± 0.116	1.05	-0.039 ± 0.090	-0.115 ± 0.114
PRF-fit source offset from KIC position	0.271 ± 0.093	2.92	-0.266 ± 0.093	0.051 ± 0.088
photometric centroid source offset	0.15 ± 0.22	0.71	-0.07 ± 0.22	0.14 ± 0.22

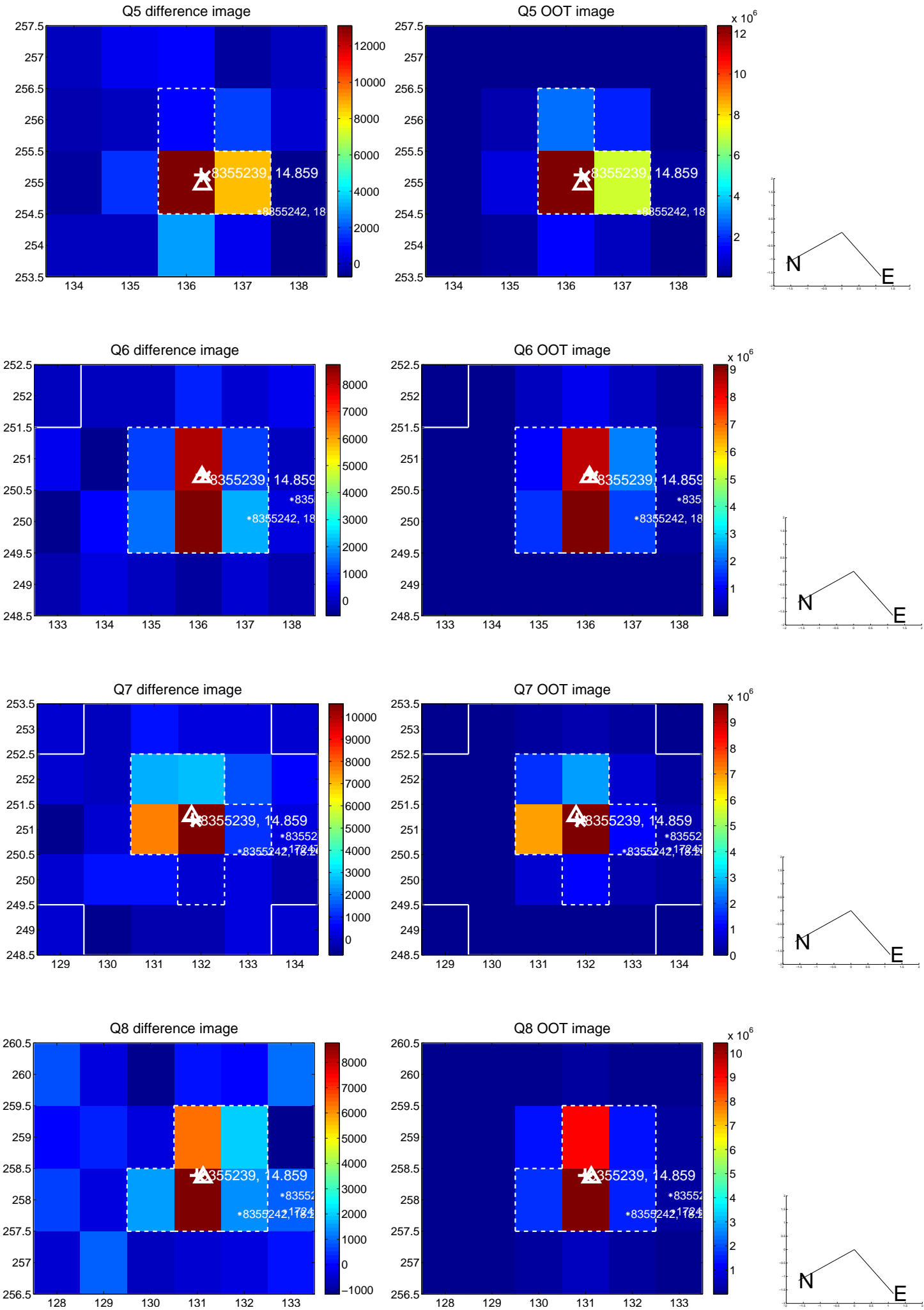


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

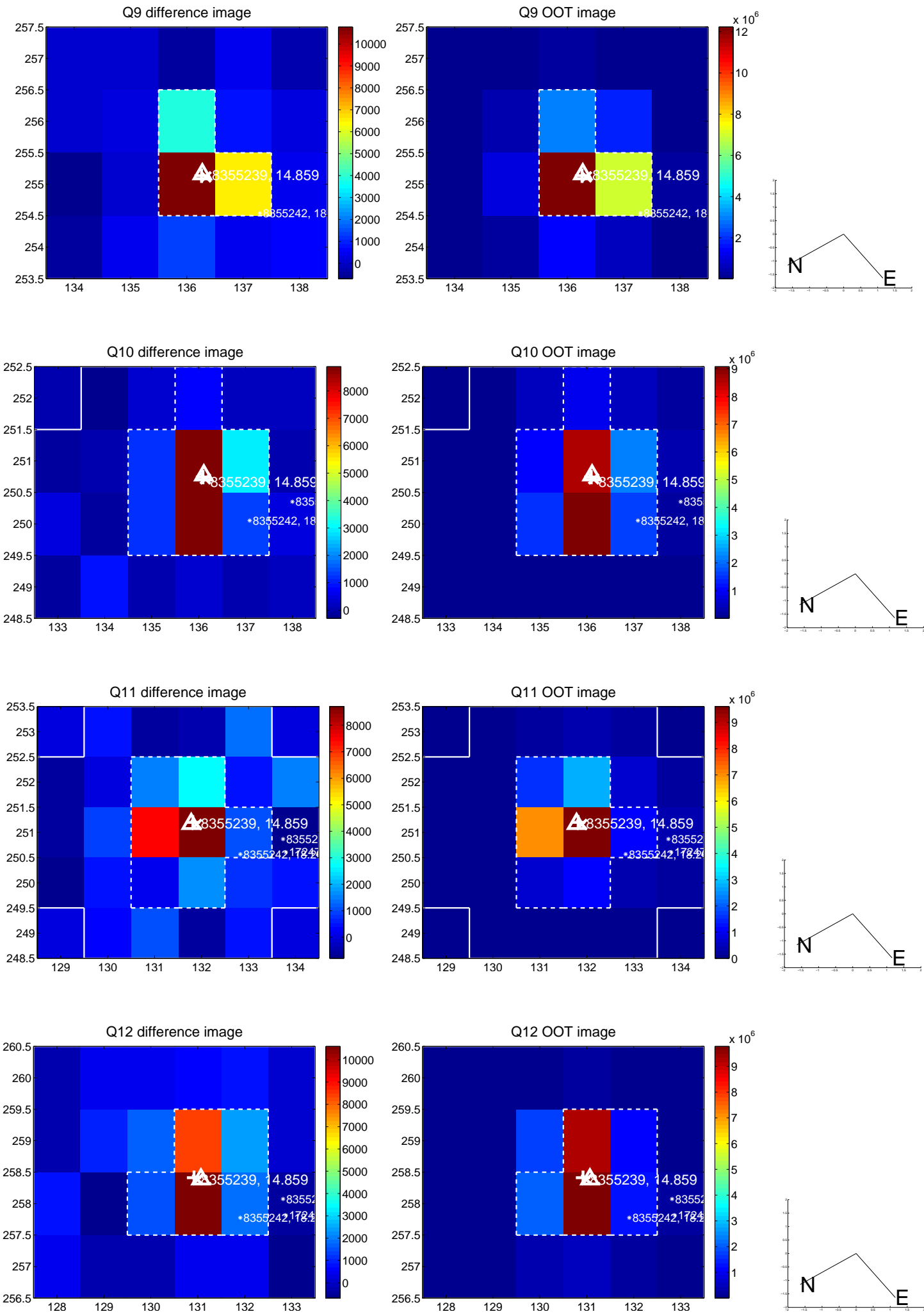
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



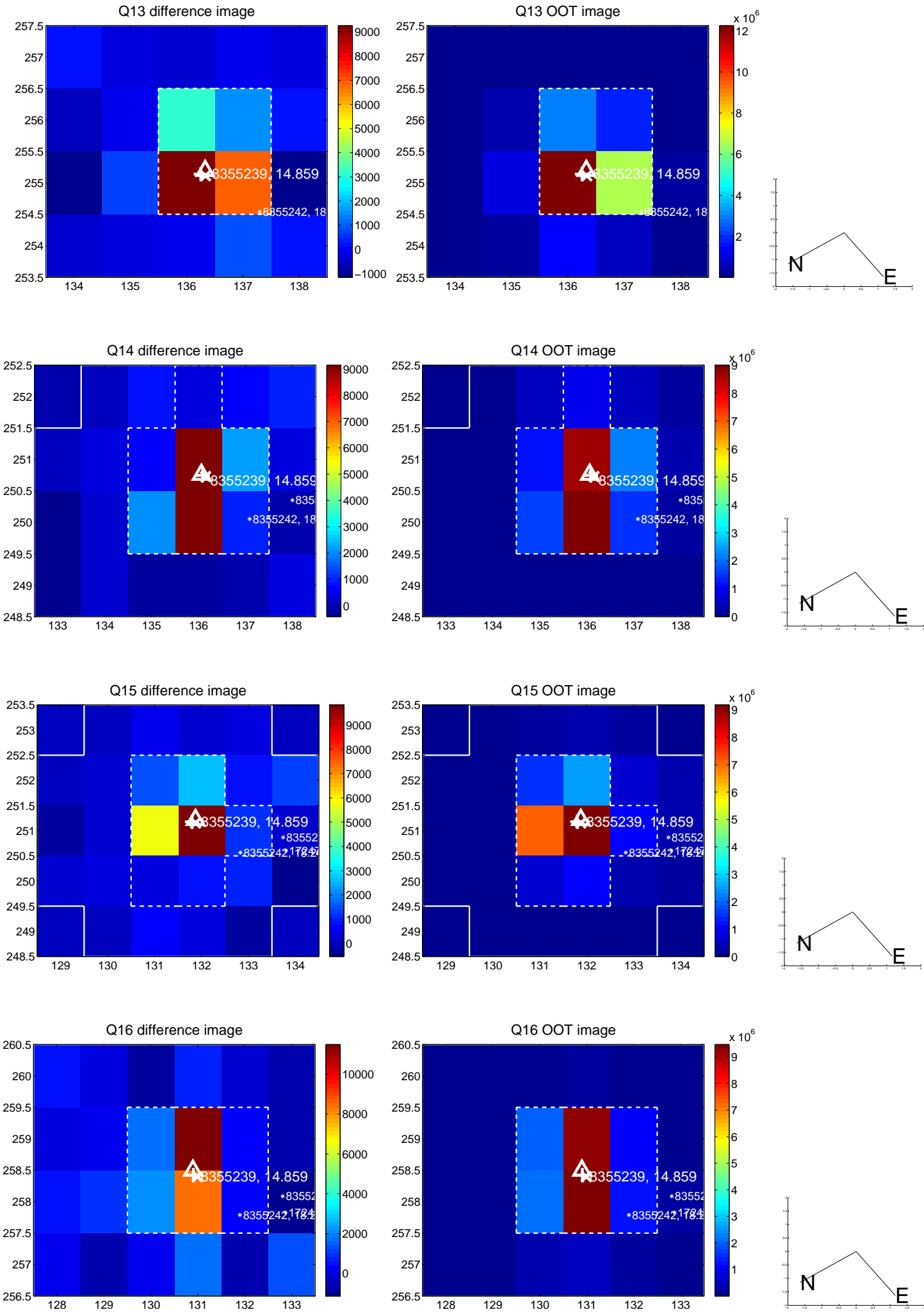
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



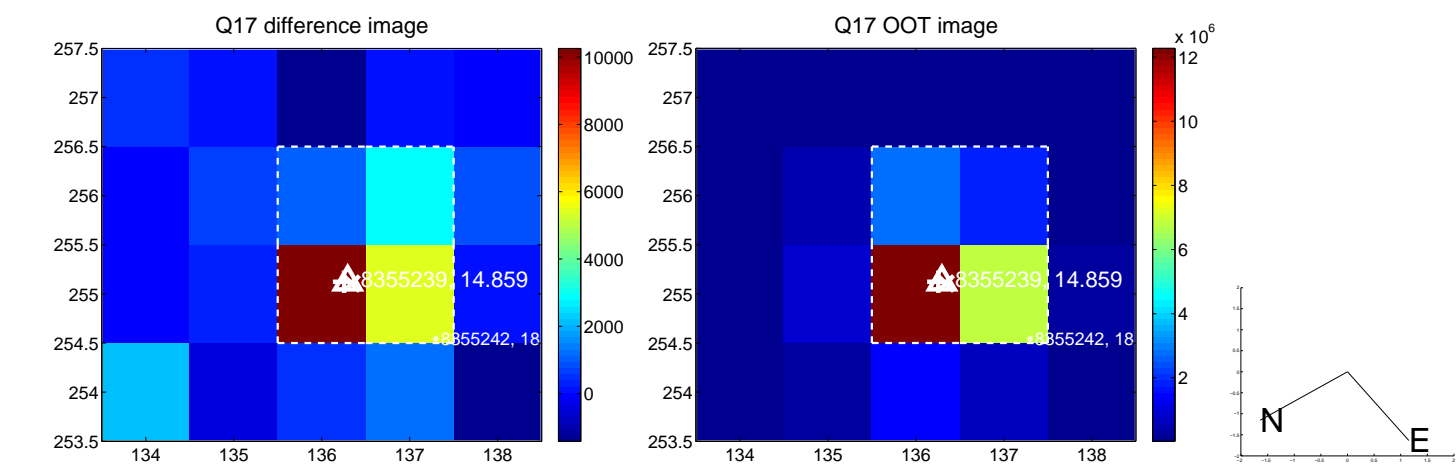
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



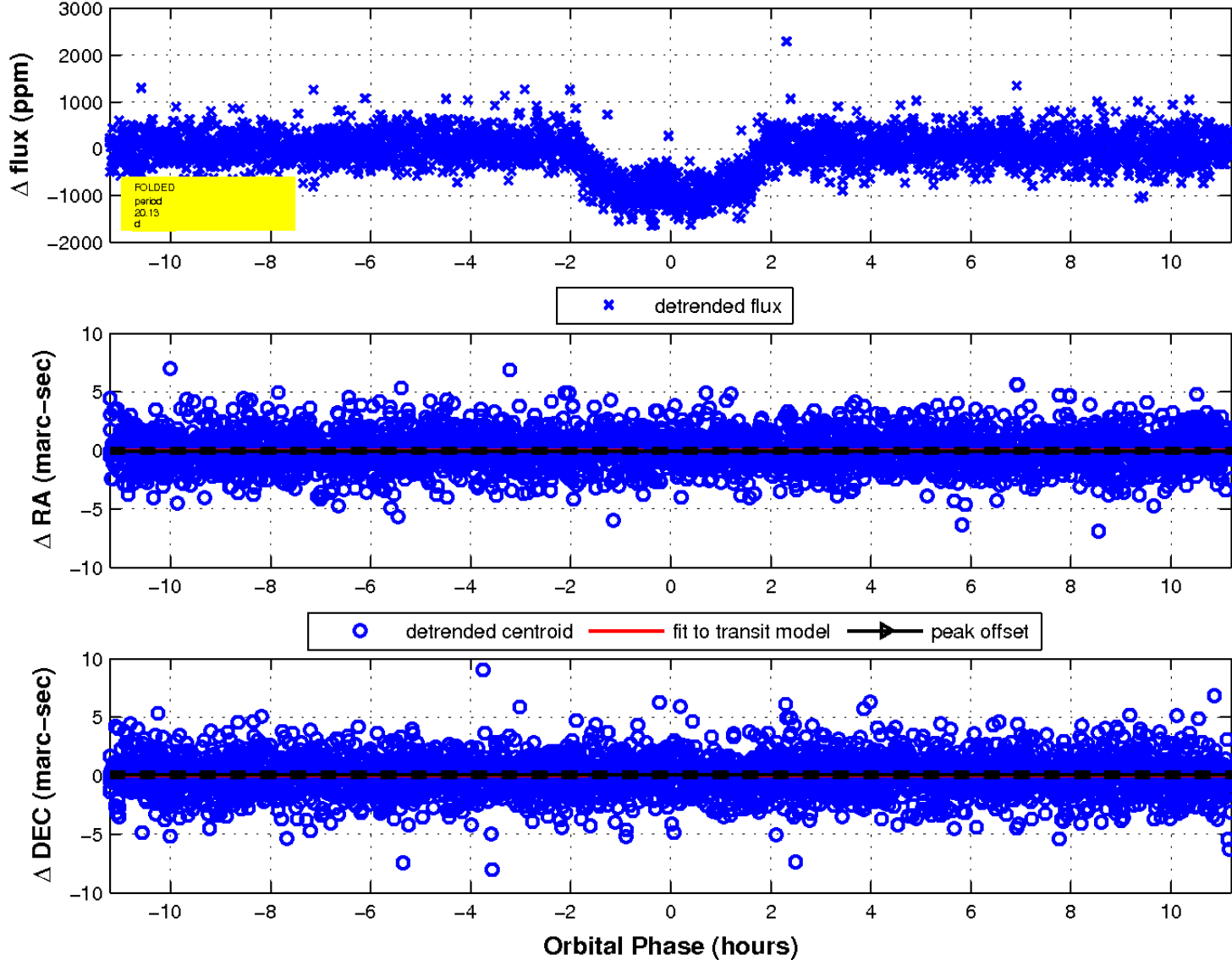
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

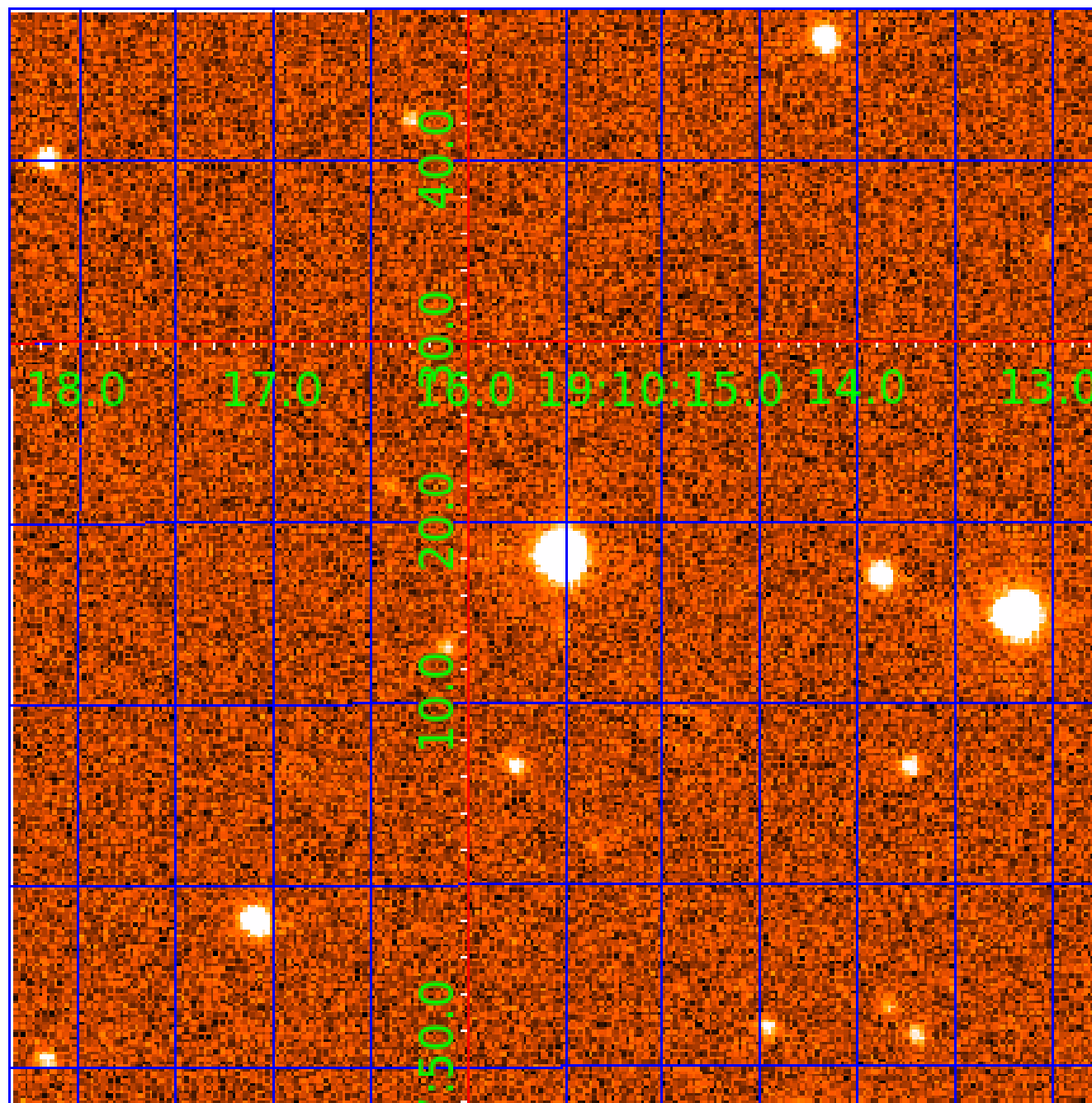


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008355239

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})
008355239-01	OBS	0574.01	20.134918	151.231937	1035.7	3.740	53.6	57.8	0.83	4963	2.96	20.70
008355239-02	OBS	0574.02	10.399882	141.511675	262.3	3.437	18.4	19.8	0.83	4963	1.54	49.94

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008355239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008355239-02	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.

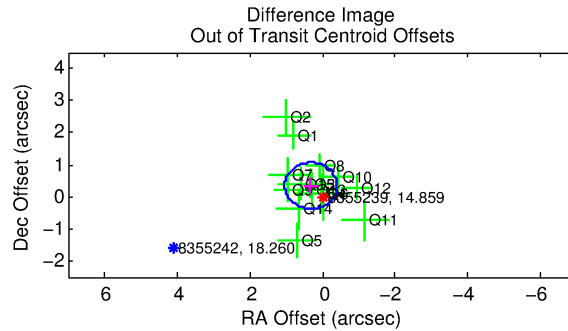
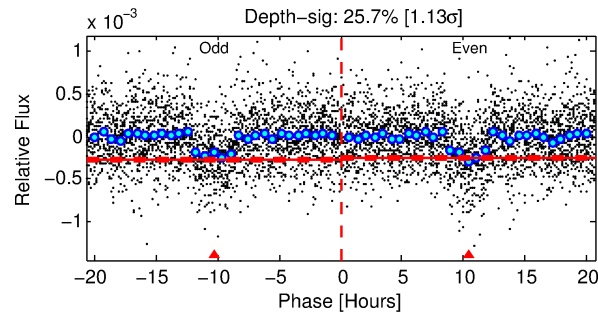
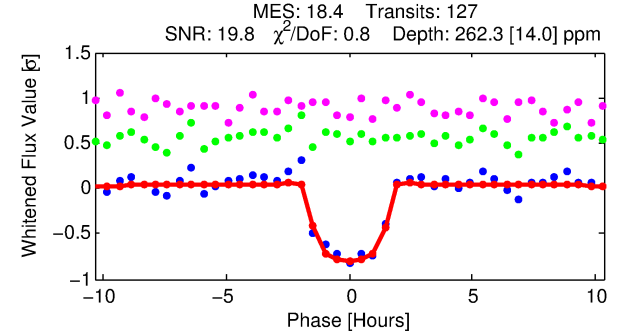
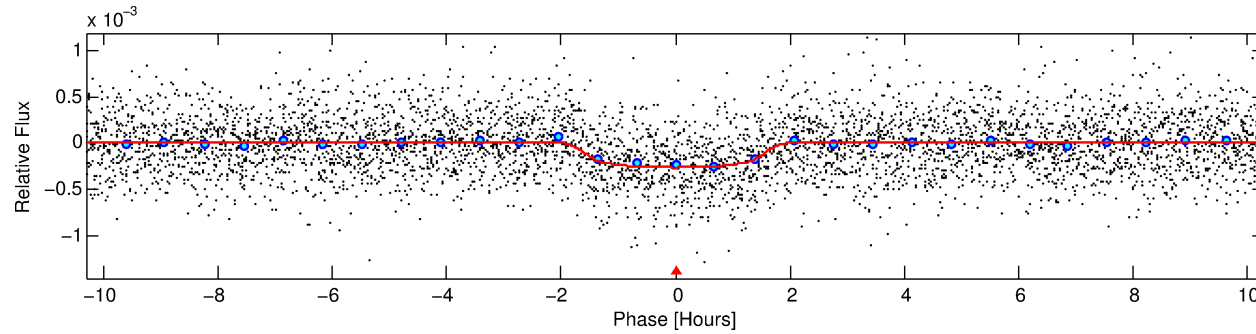
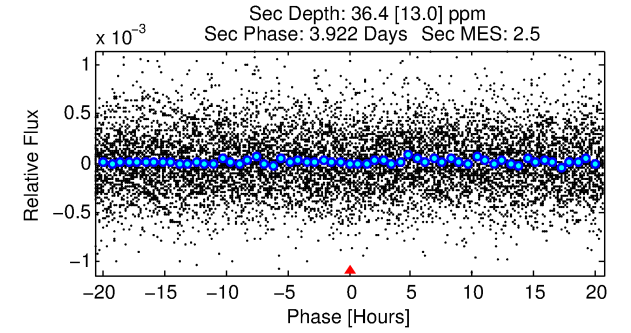
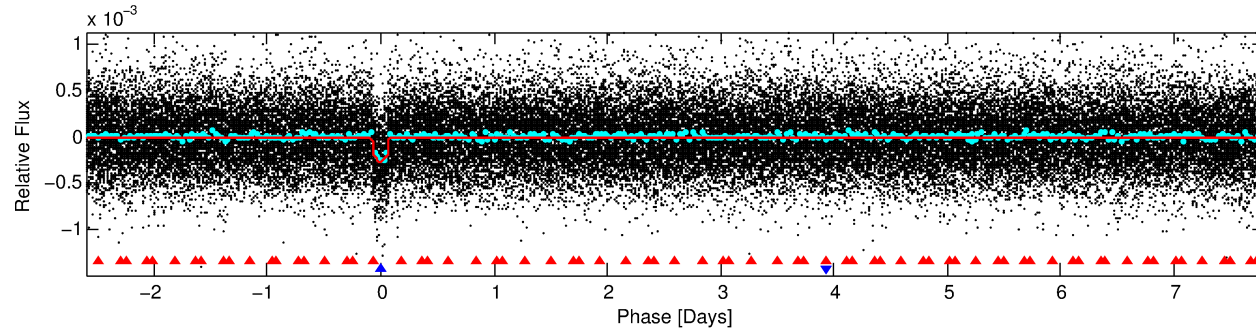
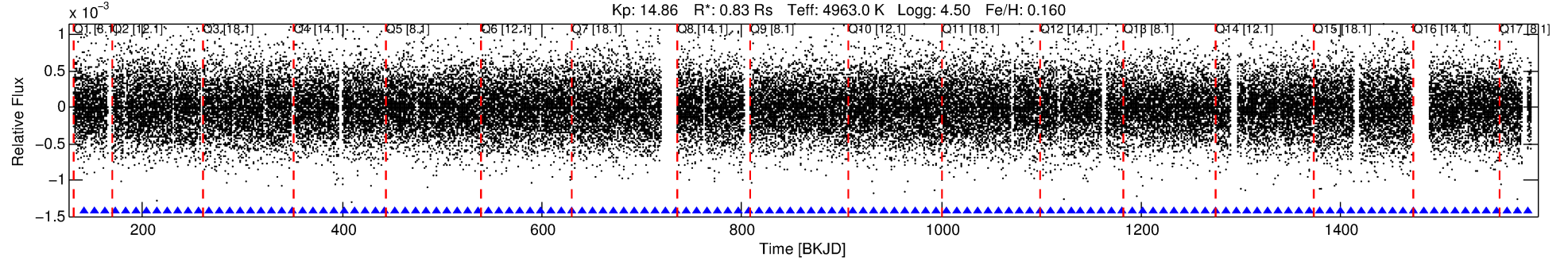
Ephemeris Match Information For 008355239-02

No Significant Match Found

DV One-Page Summary

KIC: 8355239 Candidate: 2 of 2 Period: 10.400 d
KOI: K00574.02 Name: Kepler-189b Corr: 0.988

Kp: 14.86 R*: 0.83 Rs Teff: 4963.0 K Logg: 4.50 Fe/H: 0.160



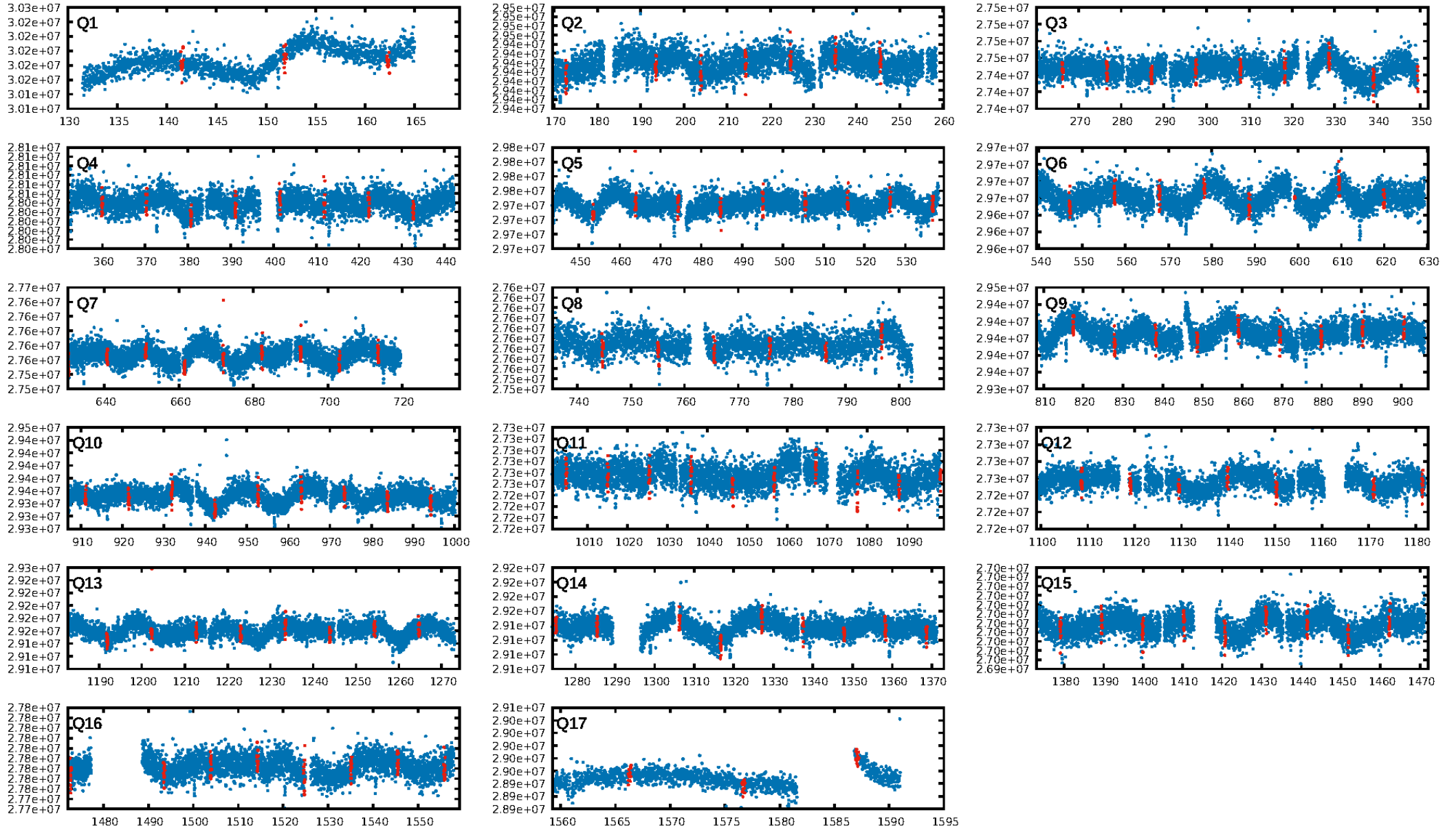
DV Fit Results:

Period = 10.39988 [0.00005] d
Epoch = 141.5117 [0.0037] BKJD
Rp/R* = 0.0171 [0.0081]
a/R* = 13.43 [23.20]
b = 0.84 [0.64]
Seff = 49.94 [7.00]
Teff = 678 [24] K
Rp = 1.54 [0.74] Re
a = 0.0862 [0.0065] AU
Ag = 62.78 [64.17] [0.96σ]
Teffp = 2950 [750] K [3.03σ]

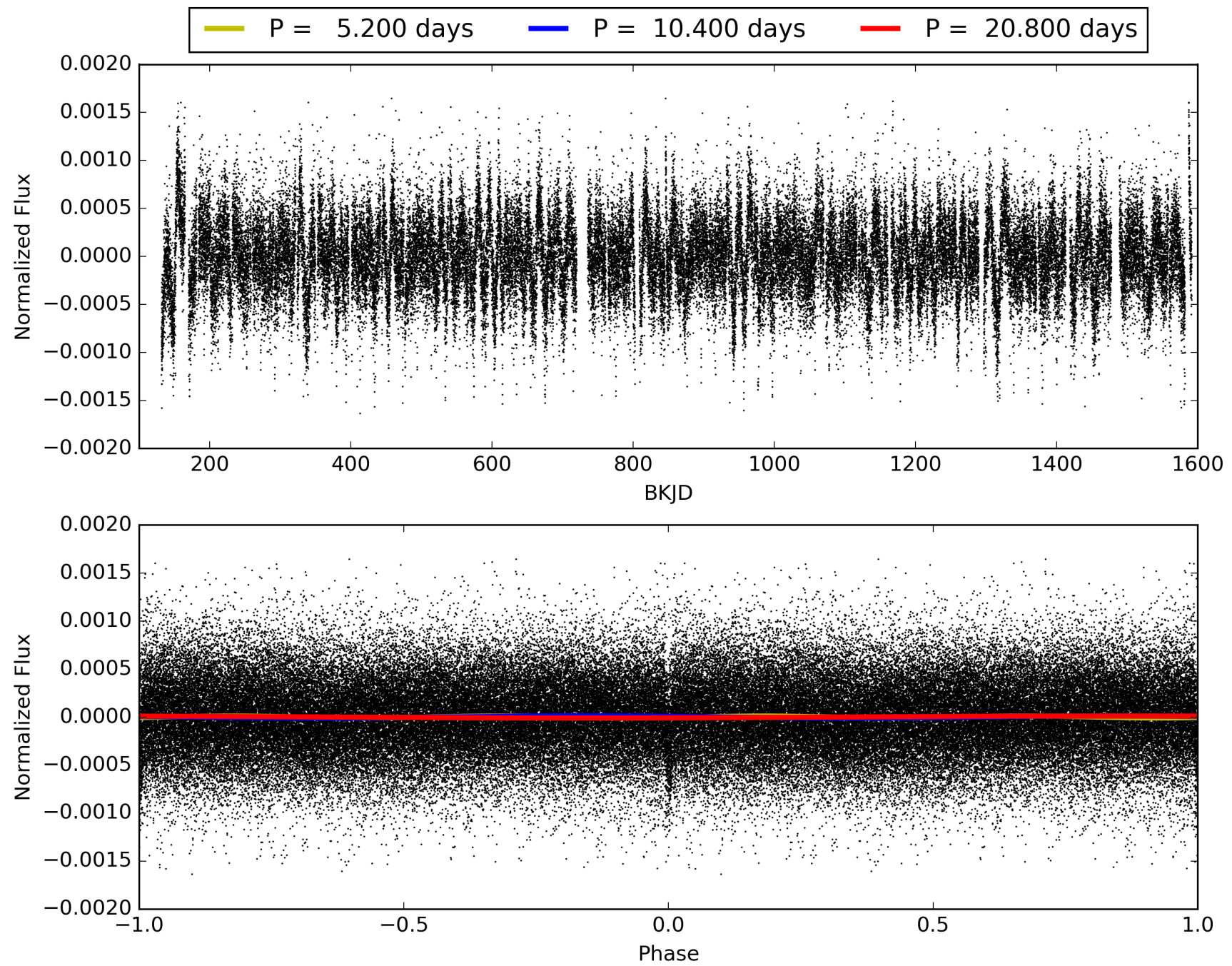
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [46.00σ]
ModelChiSquare2-sig: 98.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.89e-73
RollingBand-fgt: 1.00 [121/121]
GhostDiagnostic-chr: 1.465
Centroid-sig: 12.1%
Centroid-so: 0.486 arcsec [0.74σ]
OotOffset-rm: 0.472 arcsec [1.97σ]
KicOffset-rm: 0.500 arcsec [2.01σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.93 [14/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 008355239-02, PDC Light Curves

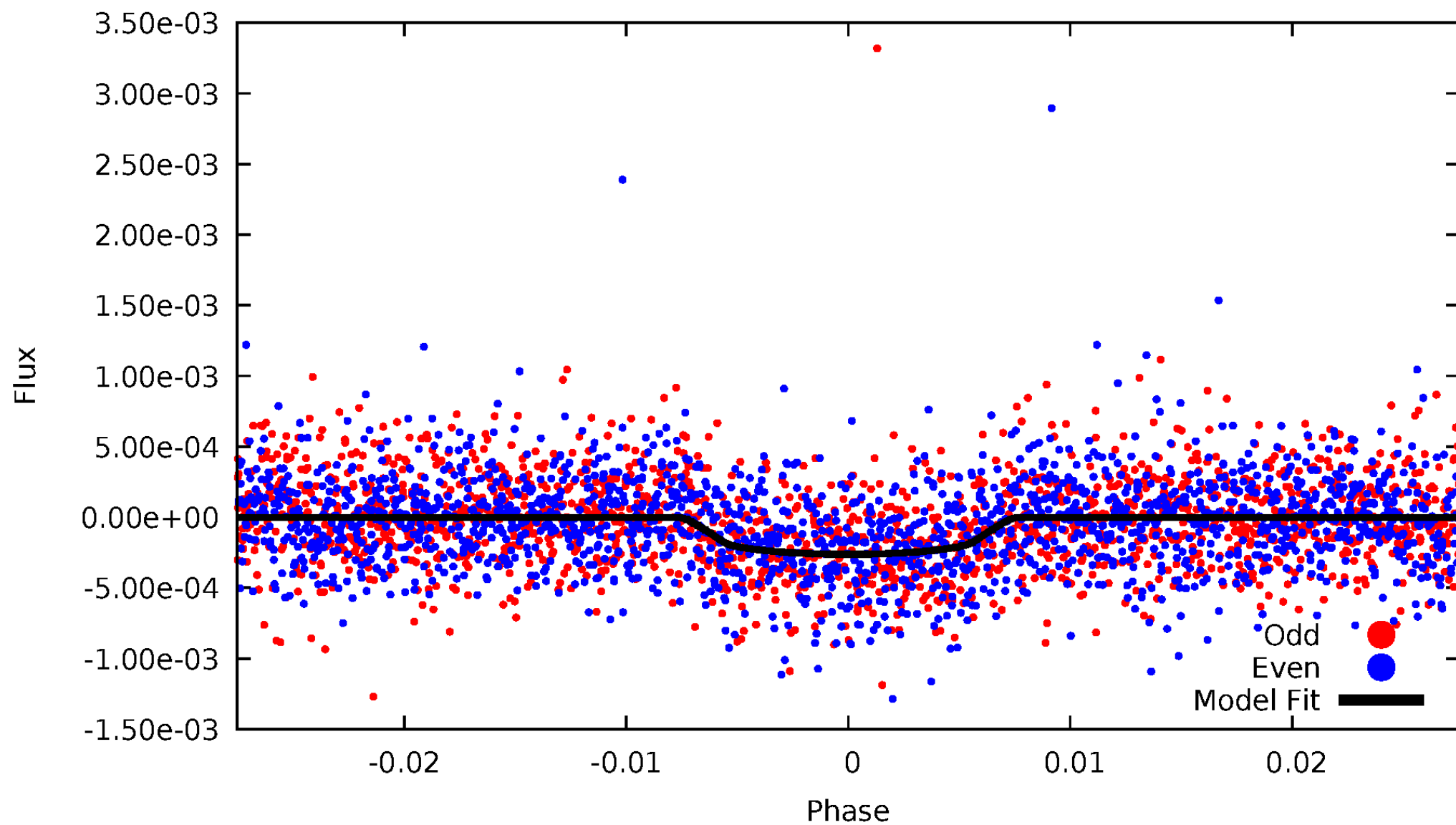


TCE 008355239-02



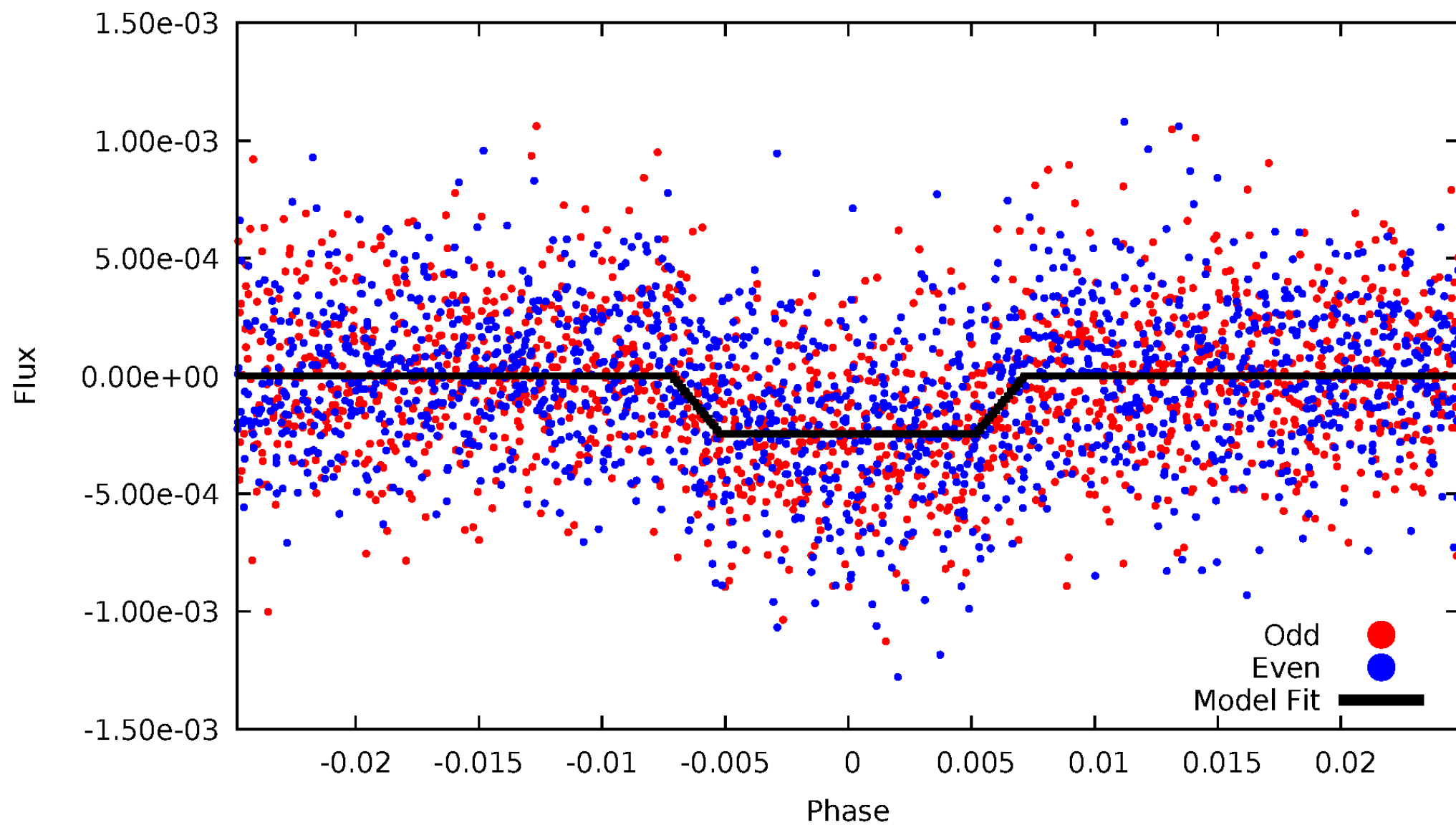
DV Odd/Even

TCE 008355239-02



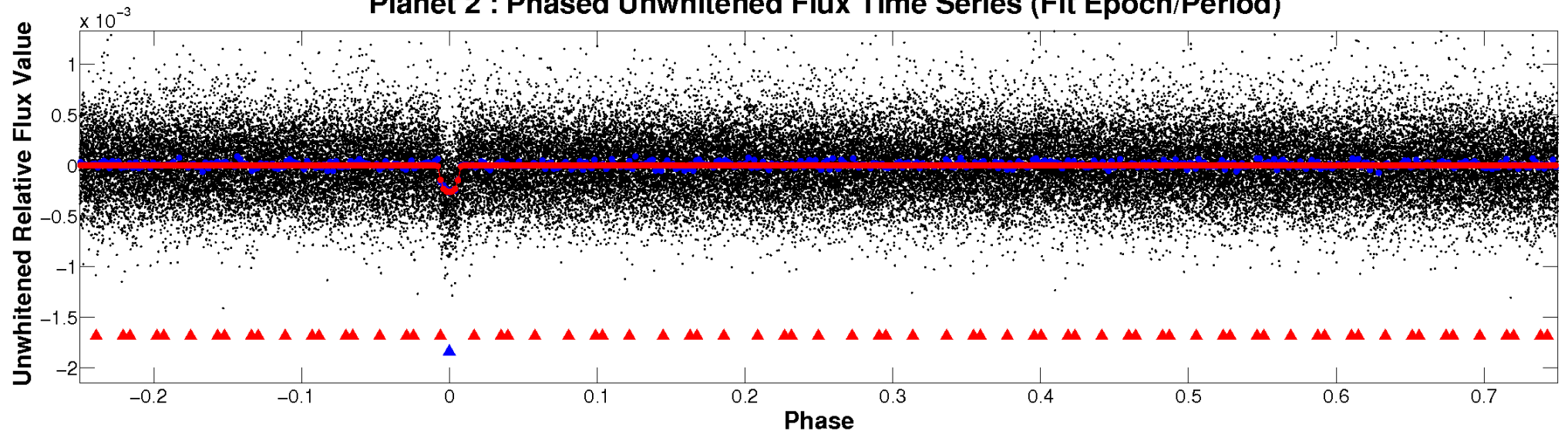
ALT Odd/Even

TCE 008355239-02

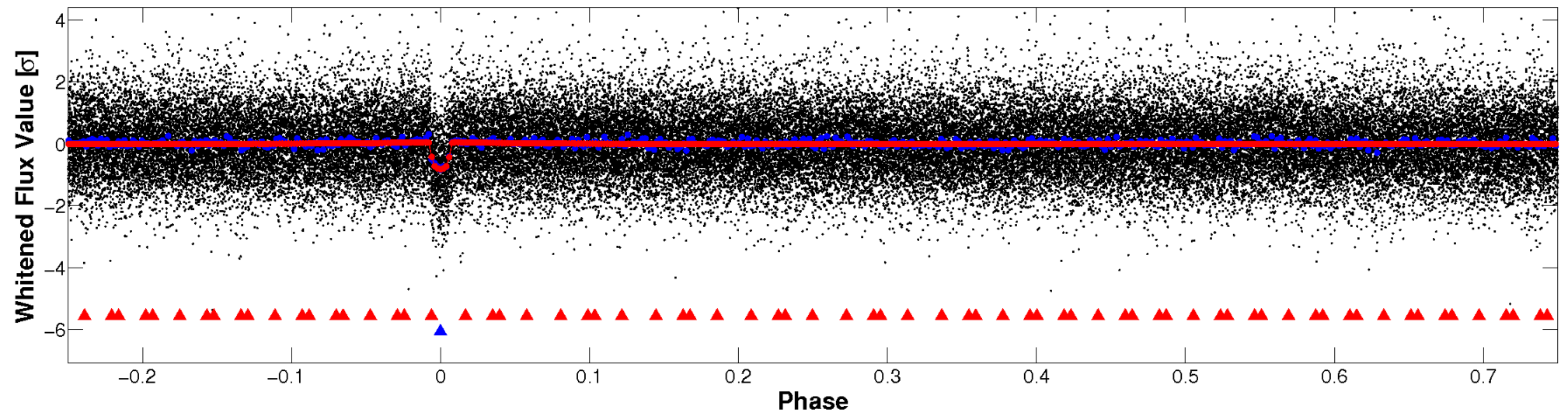


Non-Whitened Vs. Whitened Light Curve

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

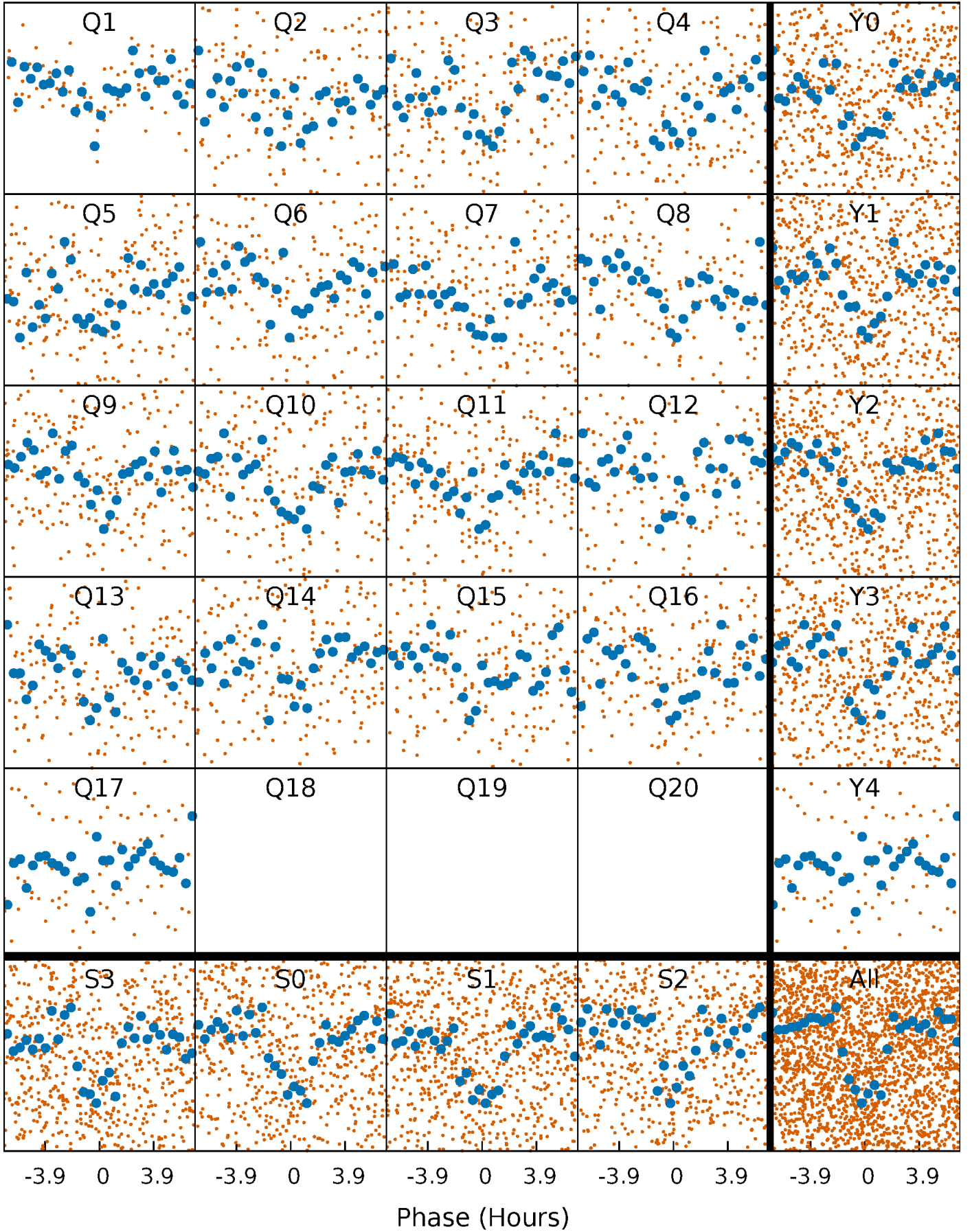


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



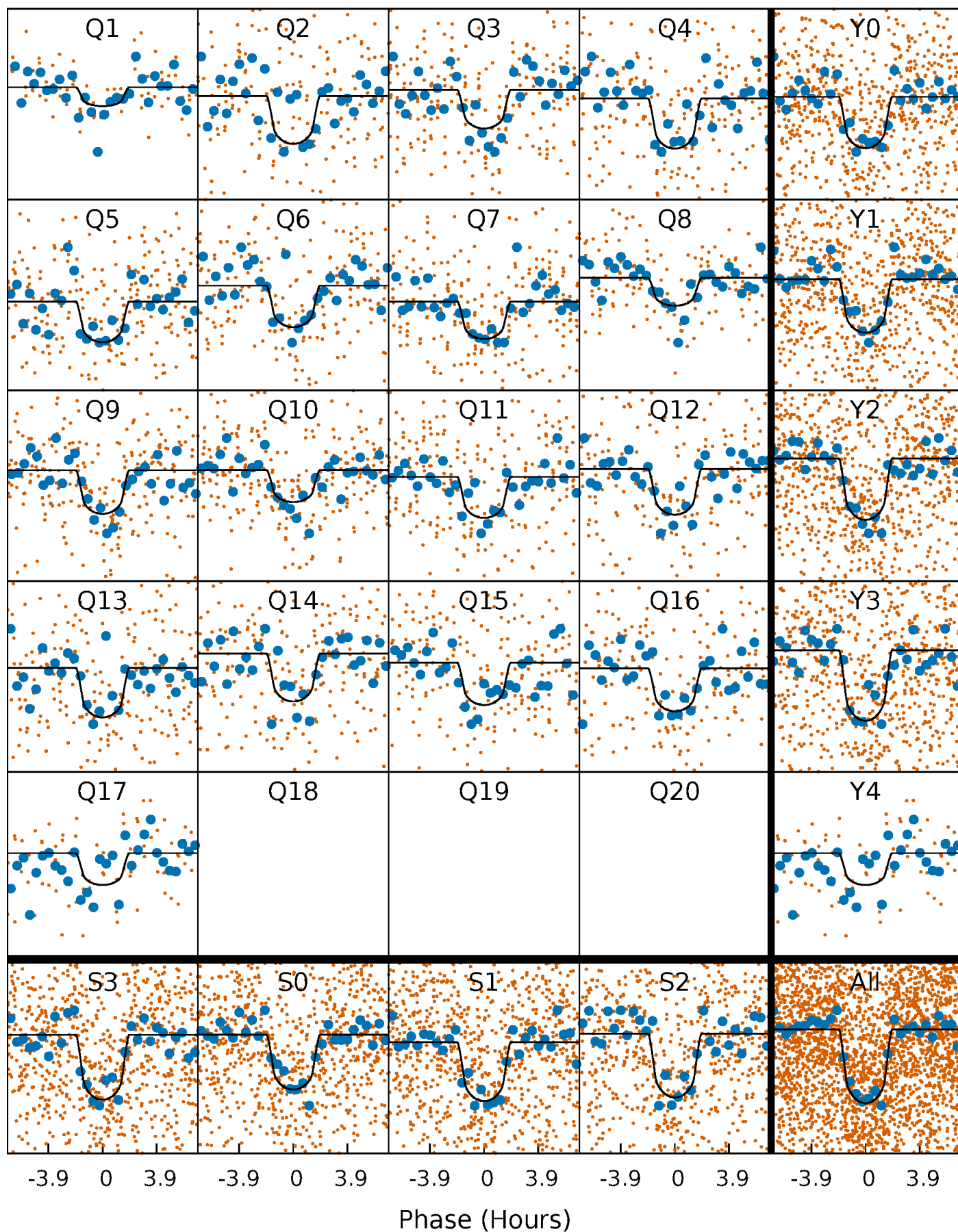
PDC Quarter-Phased Transit Curves

TCE 008355239-02 P= 10.399882 Days $T_0=141.511675$ (BKJD)



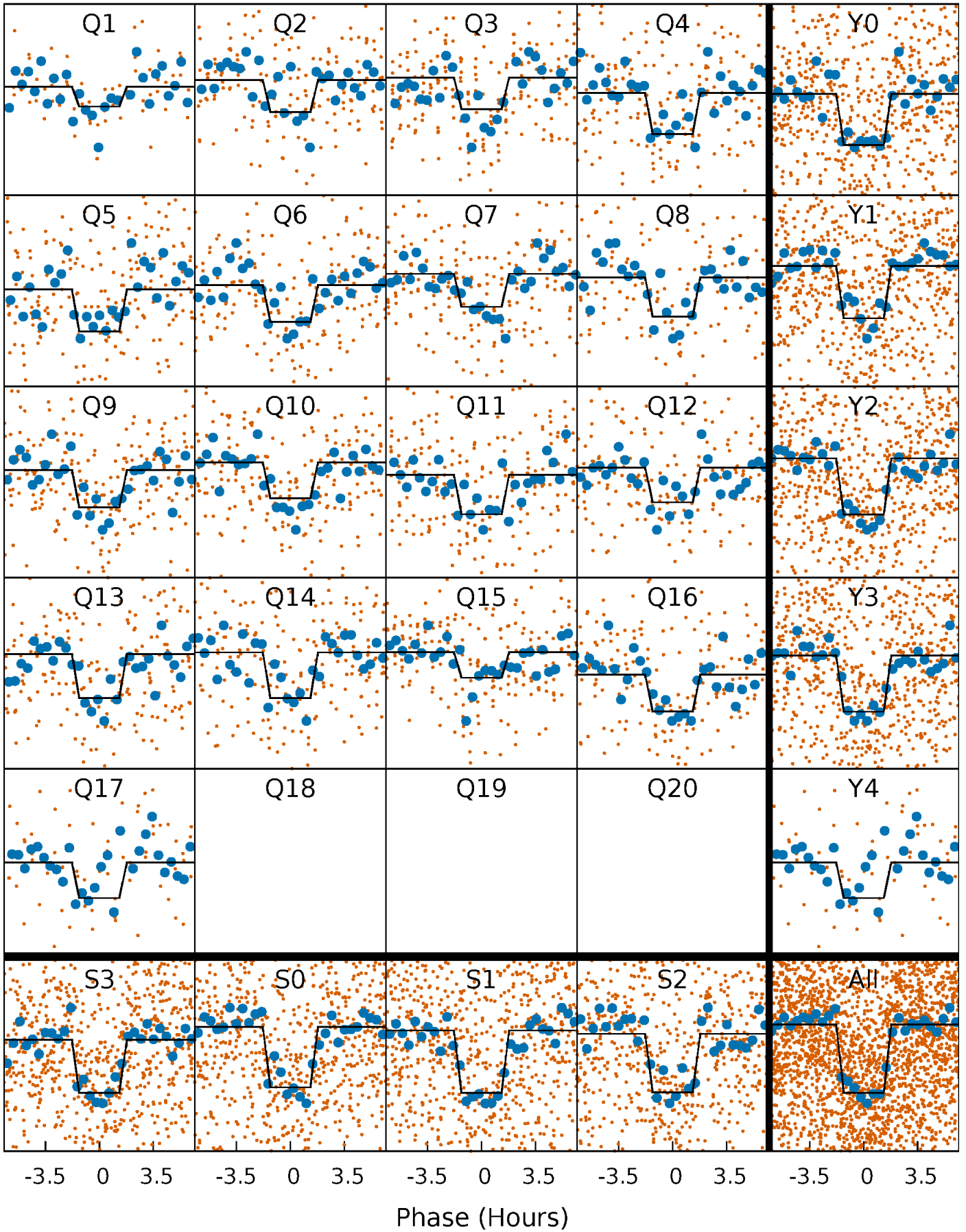
DV Quarter-Phased Transit Curves

TCE 008355239-02 P= 10.399882 Days $T_0=141.511675$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

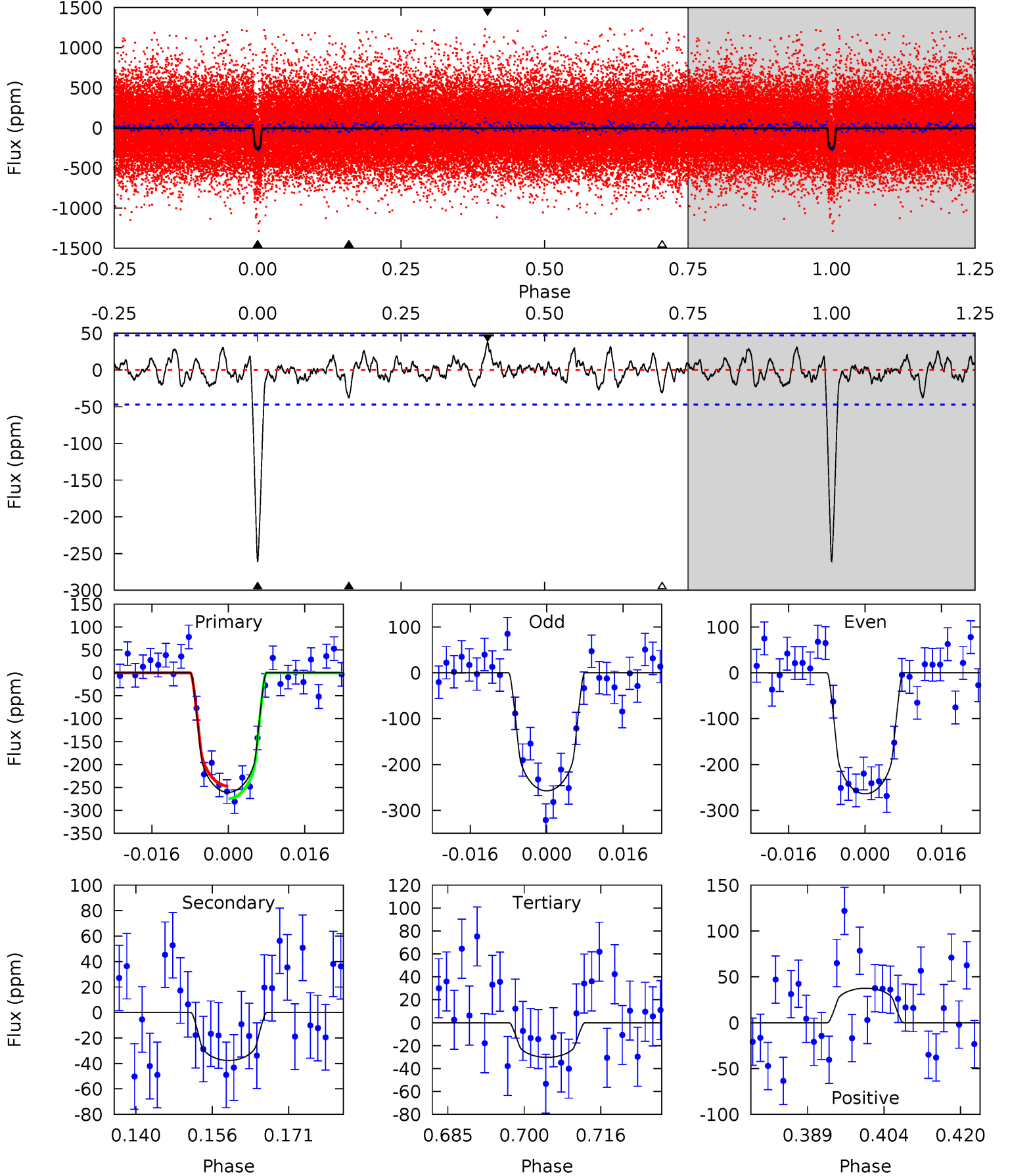
TCE 008355239-02 P= 10.399885 Days $T_0=141.511443$ (BKJD)



DV Model-Shift Uniqueness Test

008355239-02, $P = 10.399882$ Days, $E = 131.111793$ Days

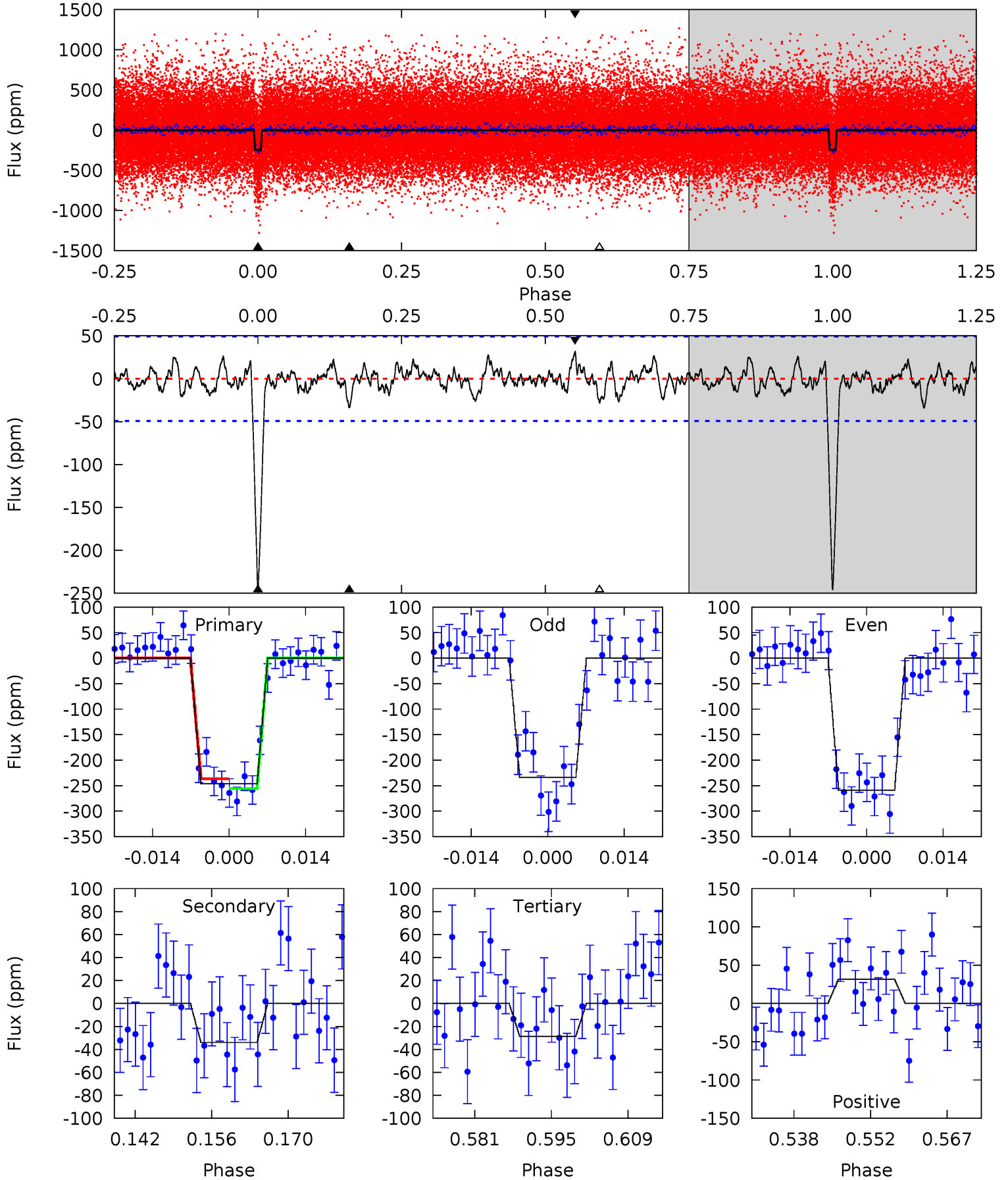
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.3	3.95	3.17	3.94	4.94	2.42	1.19	24.2	23.4	0.78	0.01	0.34	1.02	0.13	1.44



Alt Model-Shift Uniqueness Test

008355239-02, $P = 10.399885$ Days, $E = 131.111558$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.8	3.42	2.87	3.19	4.96	2.45	1.04	21.9	21.6	0.55	0.23	1.26	0.94	0.11	0.98



Stellar Parameters For KIC 008355239

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4963^{+79}_{-79}	$4.501^{+0.075}_{-0.025}$	$0.160^{+0.150}_{-0.150}$	$0.826^{+0.032}_{-0.060}$	$0.789^{+0.050}_{-0.029}$	$1.973^{+0.537}_{-0.181}$
	+2%/-2%	+2%/-1%	+94%/-94%	+4%/-7%	+6%/-4%	+27%/-9%
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 008355239-02 / KOI 0574.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-38 ± 10	$1.50^{+0.74}_{-0.66}$	942^{+20}_{-24}	3431^{+782}_{-405}	68^{+162}_{-38}
Alt.	-34 ± 10	$1.39^{+0.74}_{-0.64}$	941^{+21}_{-25}	3451^{+836}_{-437}	69^{+182}_{-41}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

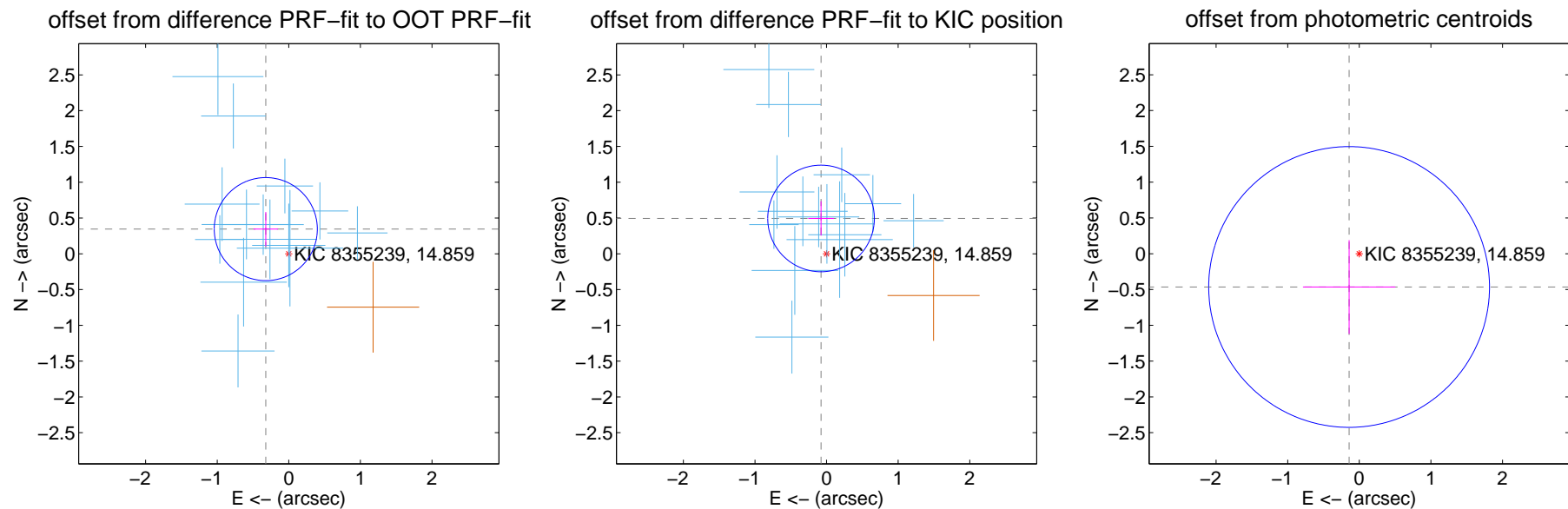
DV Centroid Data

Supplemental centroid analysis for 008355239-02. Kepler magnitude: 14.86. Transit SNR 19.79

There are 14 quarters with good PRF difference image offsets

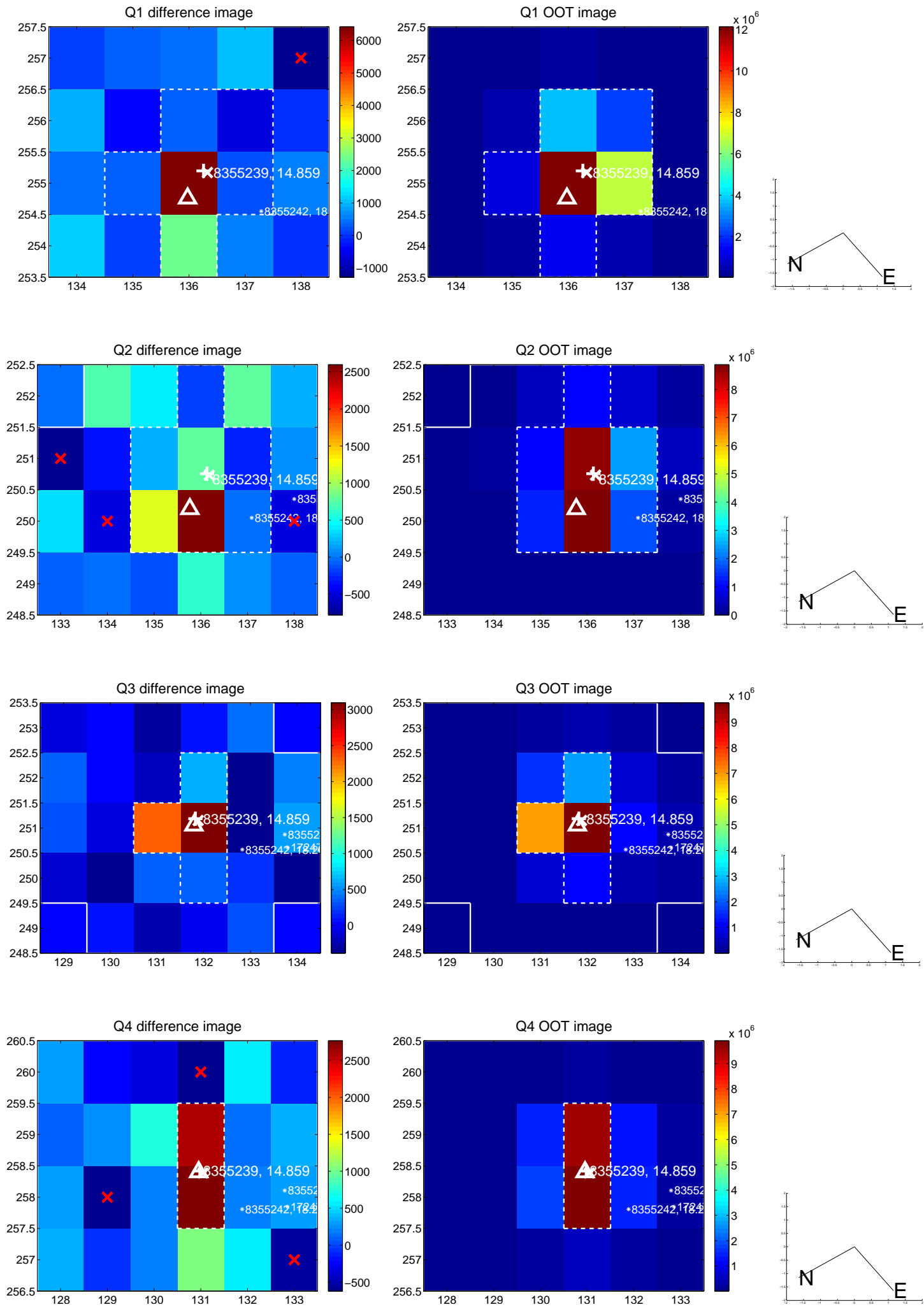
The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.472 ± 0.240	1.97	0.322 ± 0.171	0.345 ± 0.240
PRF-fit source offset from KIC position	0.500 ± 0.248	2.01	0.077 ± 0.180	0.494 ± 0.241
photometric centroid source offset	0.49 ± 0.65	0.74	0.14 ± 0.64	-0.46 ± 0.65

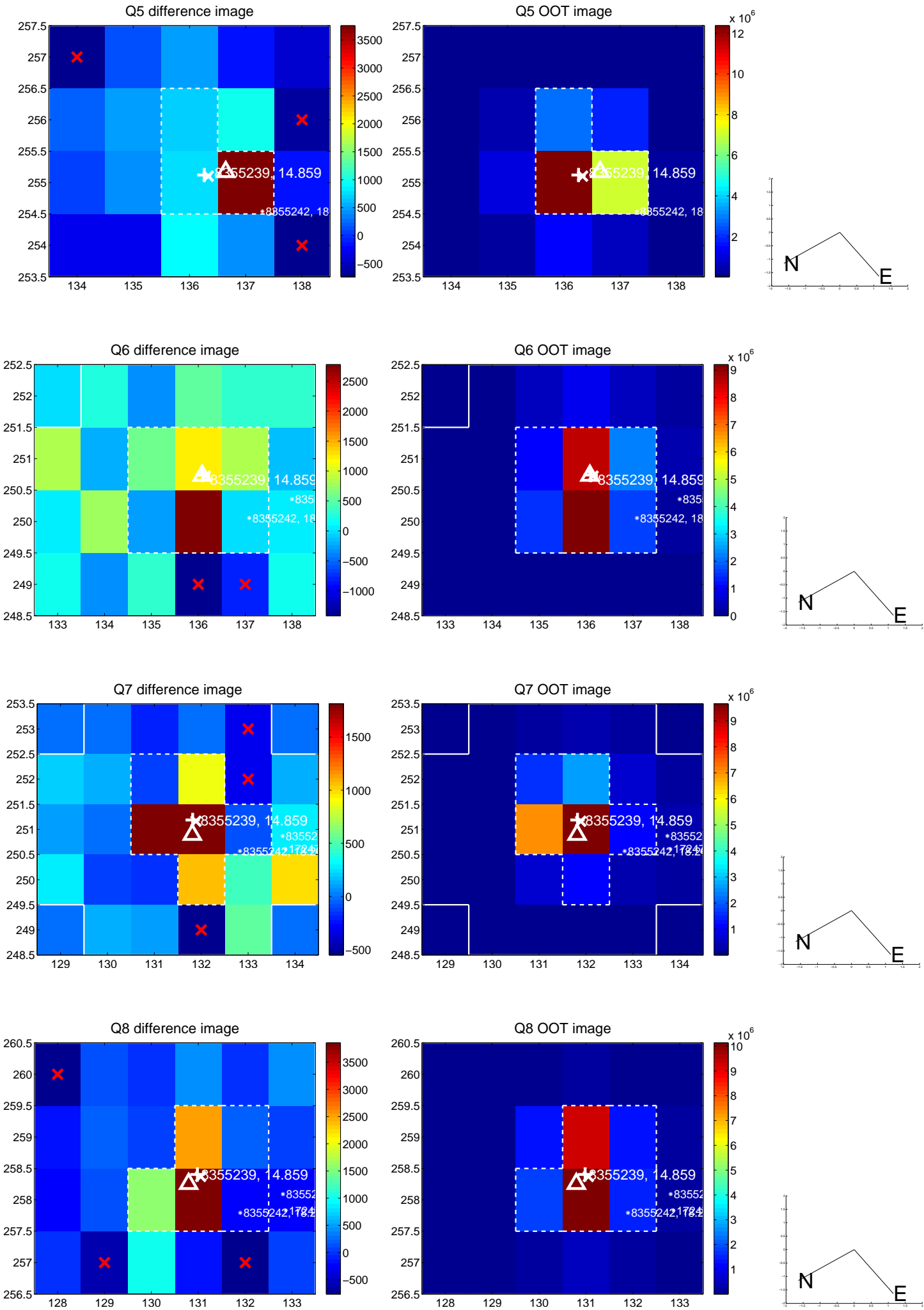


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

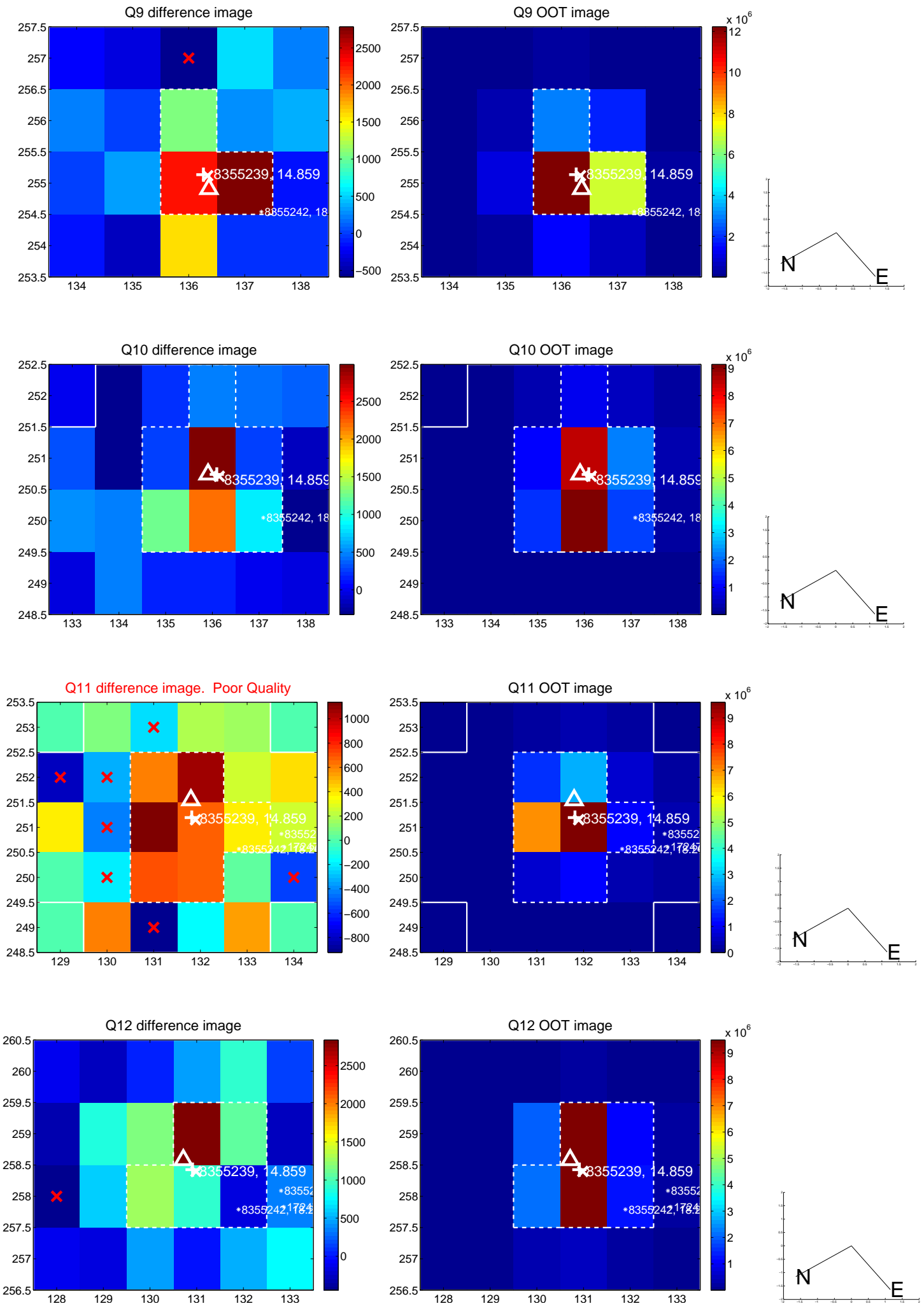
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



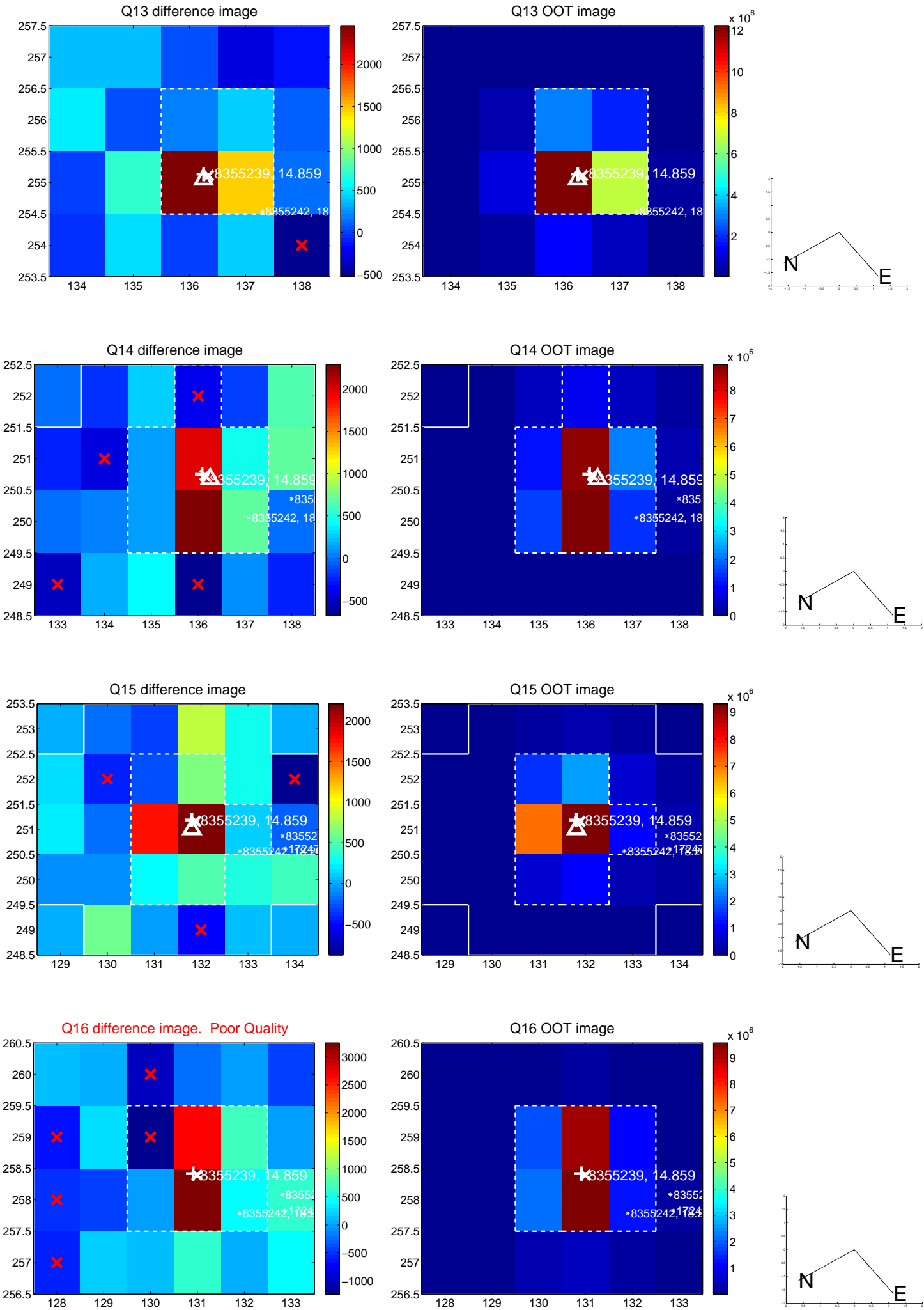
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



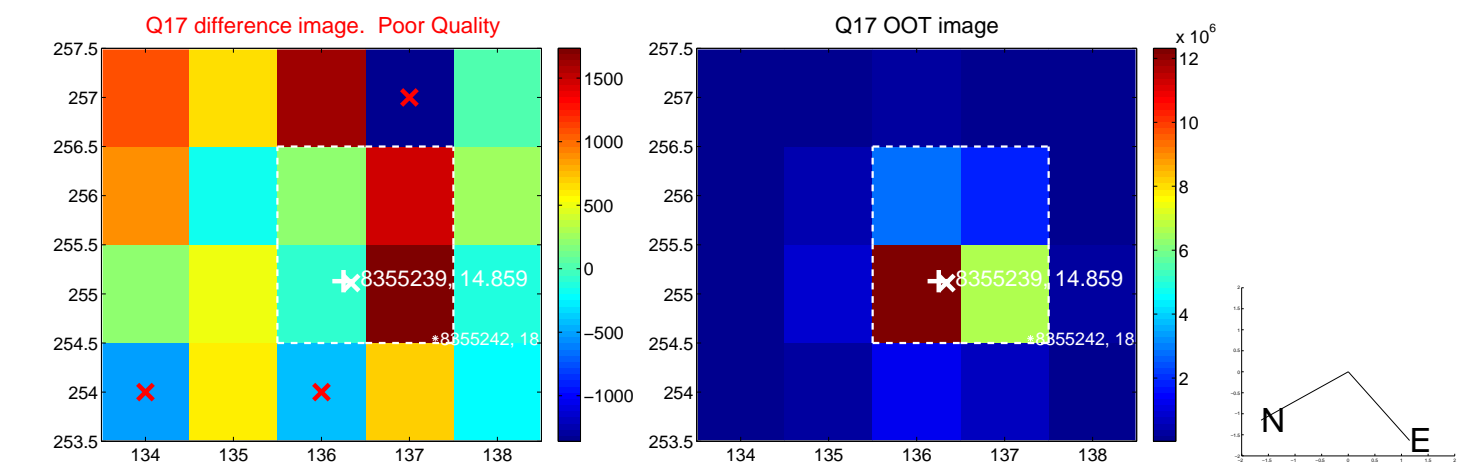
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



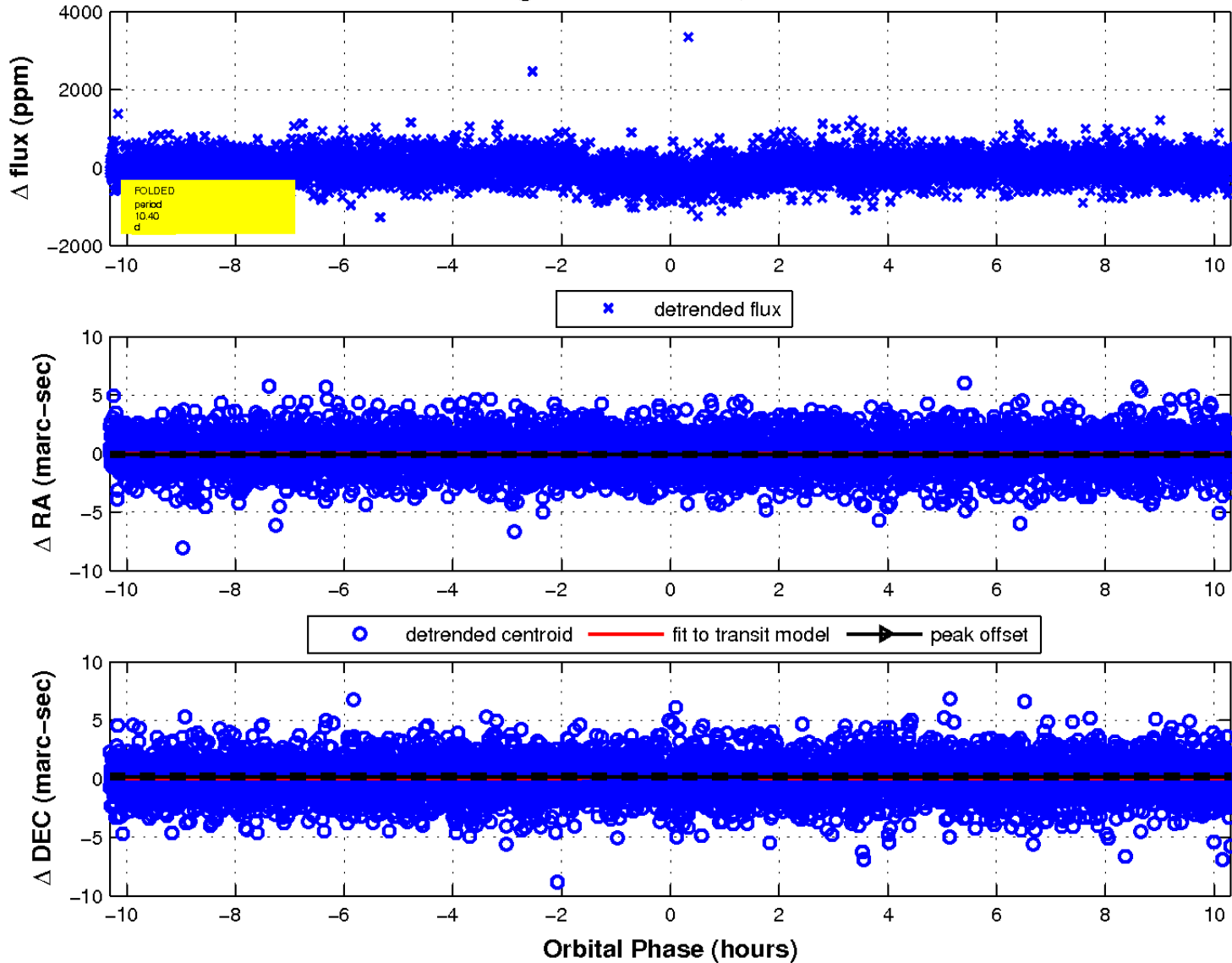
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

