

KIC 012256520

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})
012256520-01	OBS	2264.01	33.240314	143.473980	341.4	5.128	17.6	17.2	0.83	5382	1.73	13.19
012256520-02	OBS	2264.02	7.251046	138.201914	124.0	1.808	9.2	8.7	0.83	5382	1.15	100.42

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012256520-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012256520-02	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.

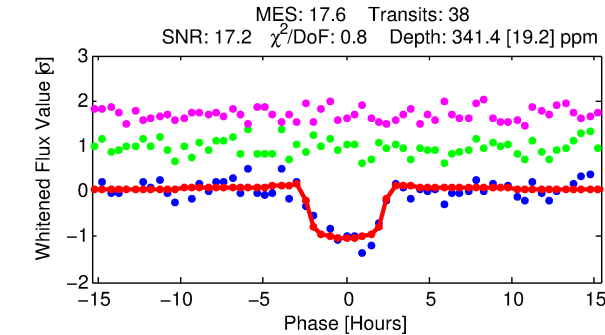
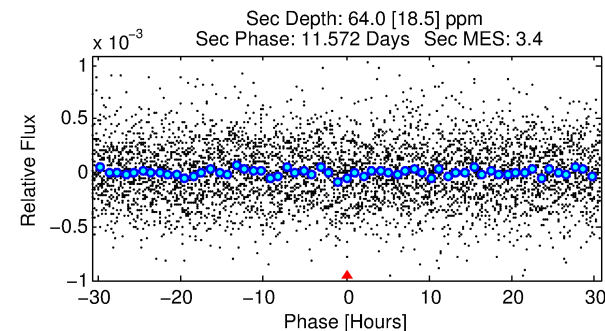
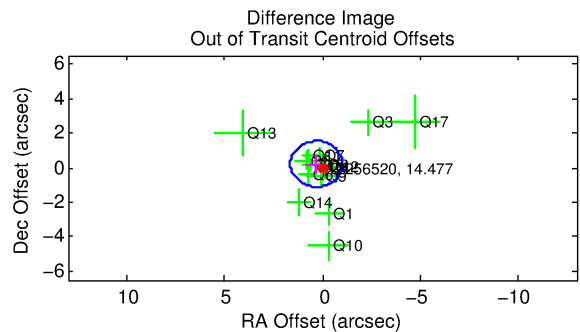
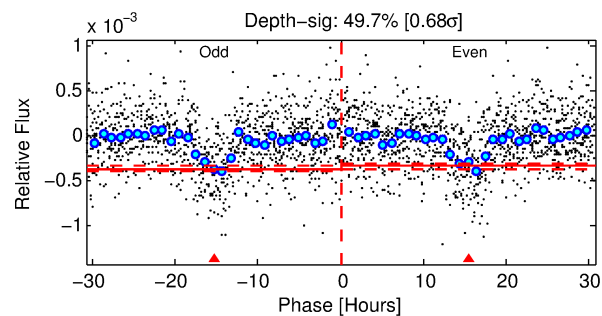
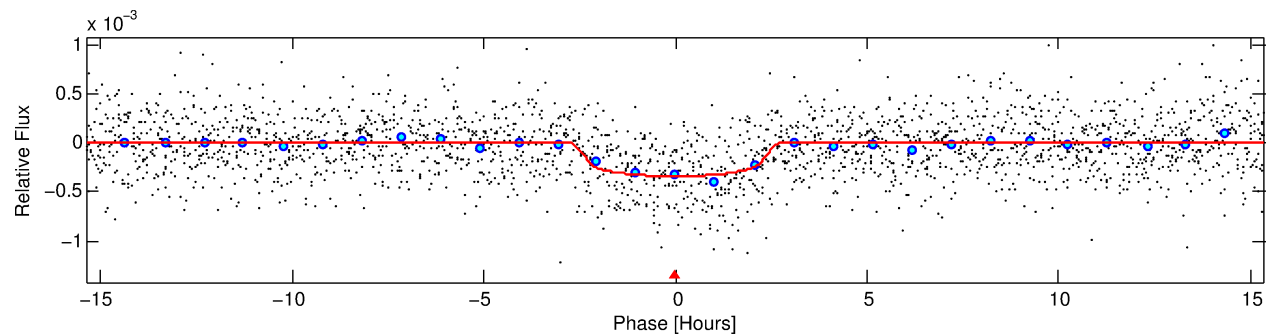
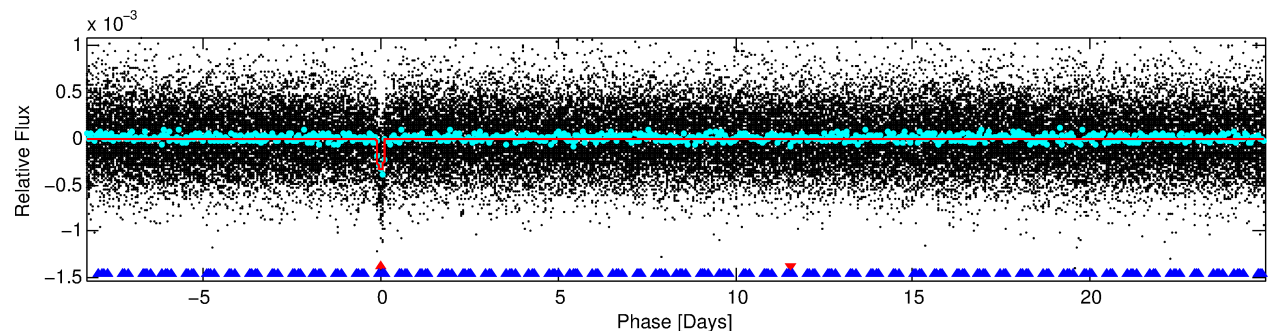
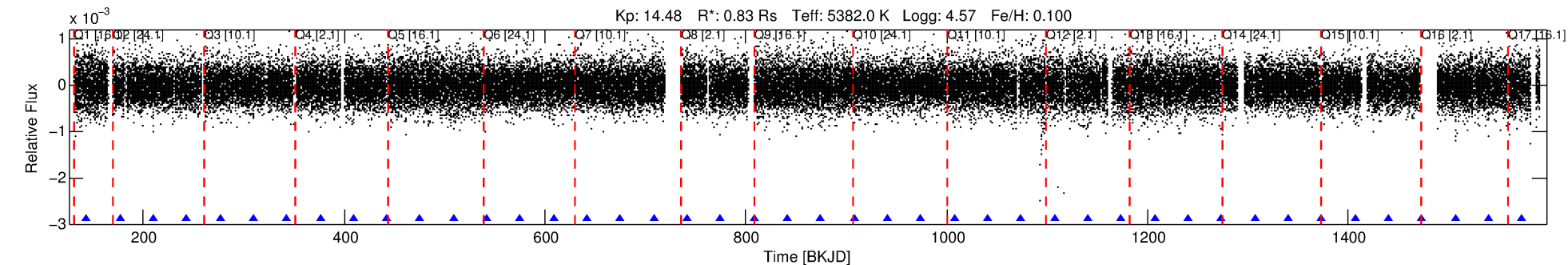
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012256520-01

No Significant Match Found

DV One-Page Summary

KIC: 12256520 Candidate: 1 of 2 Period: 33.240 d
KOI: K02264.01 Corr: 0.974



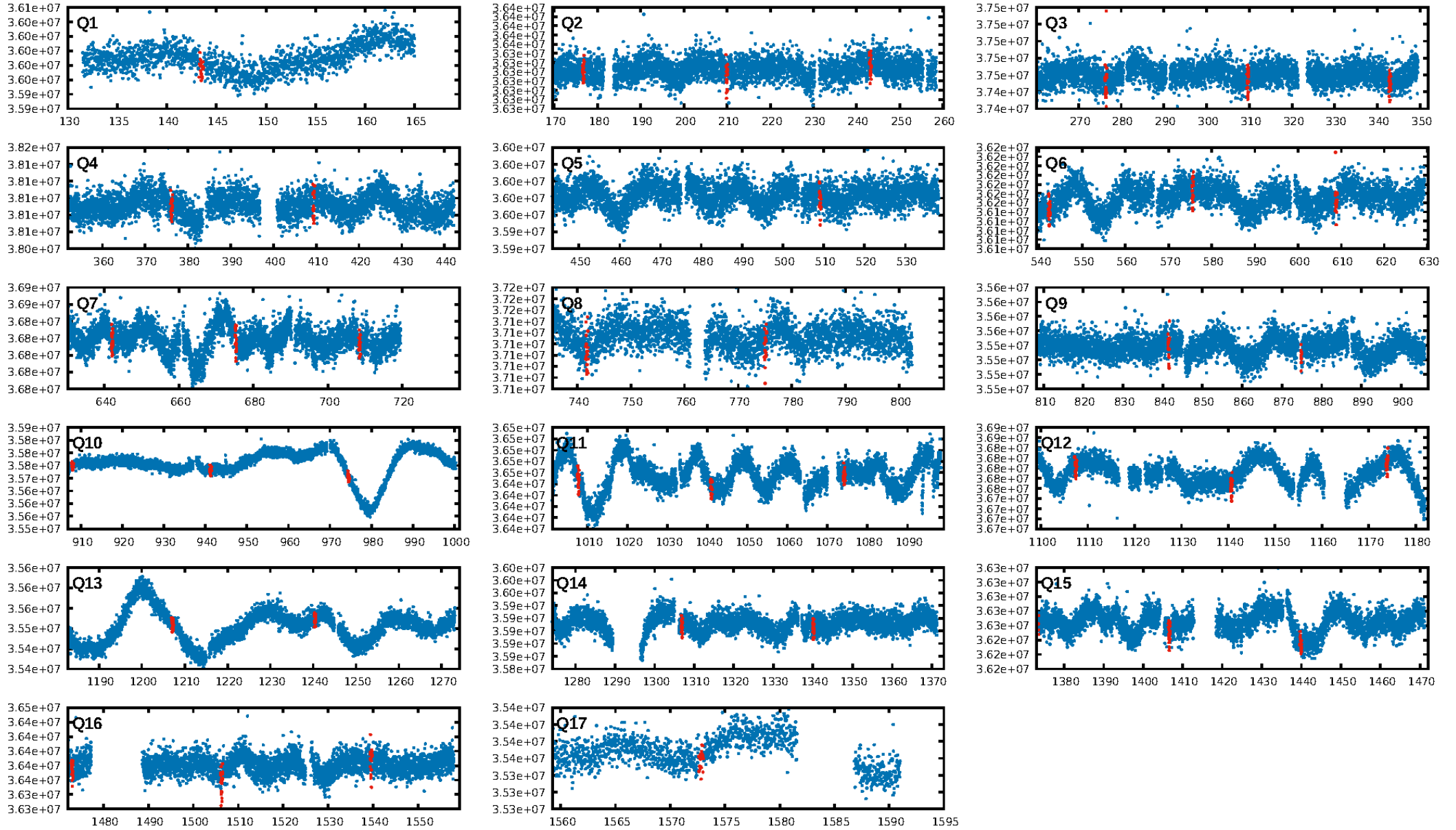
DV Fit Results:

Period = 33.24031 [0.00021] d
Epoch = 143.4740 [0.0052] BKJD
Rp/R* = 0.0191 [0.0063]
a/R* = 29.77 [39.20]
b = 0.82 [0.53]
Seff = 13.19 [2.29]
Teff = 486 [21] K
Rp = 1.73 [0.60] Re
a = 0.1975 [0.0204] AU
Ag = 460.11 [338.03] [1.36 σ]
Teffp = 3479 [625] K [4.79 σ]

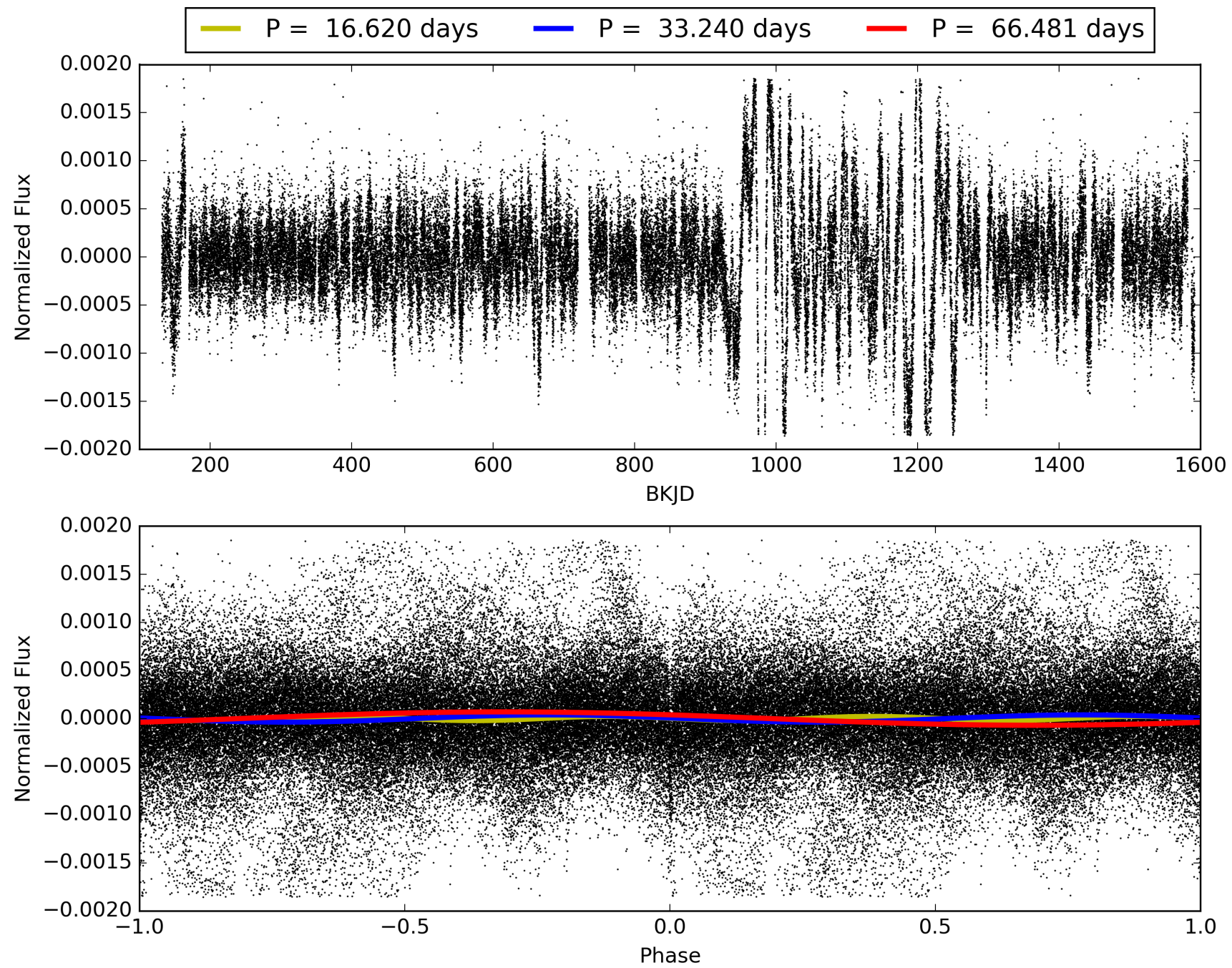
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [114.72 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 85.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.93e-68
RollingBand-fgt: 1.00 [36/36]
GhostDiagnostic-chr: -24.29
Centroid-sig: 2.4%
Centroid-so: 0.930 arcsec [1.29 σ]
OotOffset-rm: 0.386 arcsec [0.87 σ]
KicOffset-rm: 0.353 arcsec [0.87 σ]
OotOffset-st: 4/3/4/4 [15]
KicOffset-st: 4/3/4/4 [15]
DiffImageQuality-fgm: 0.67 [10/15]
DiffImageOverlap-fno: 0.94 [16/17]

TCE 012256520-01, PDC Light Curves

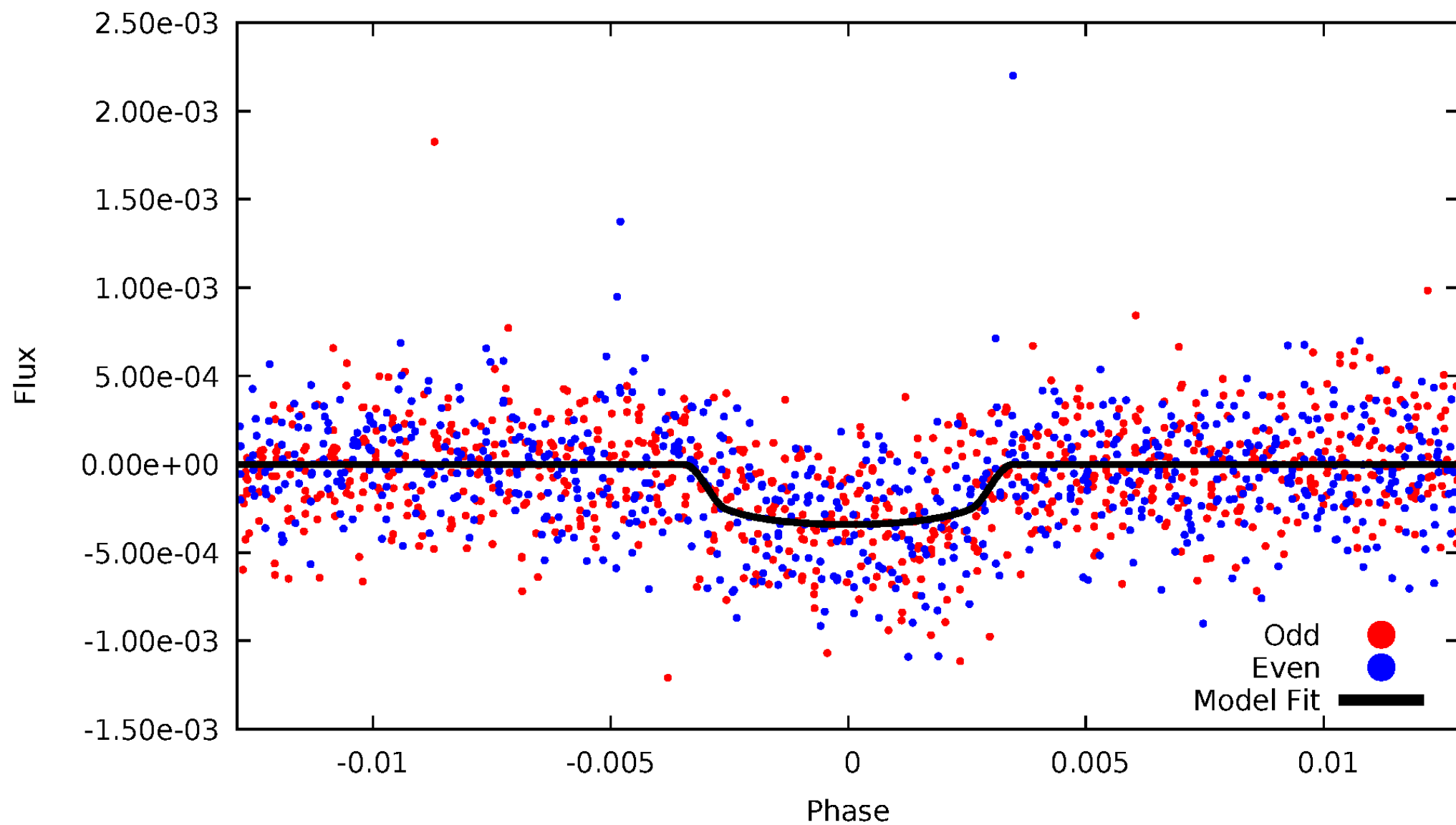


TCE 012256520-01



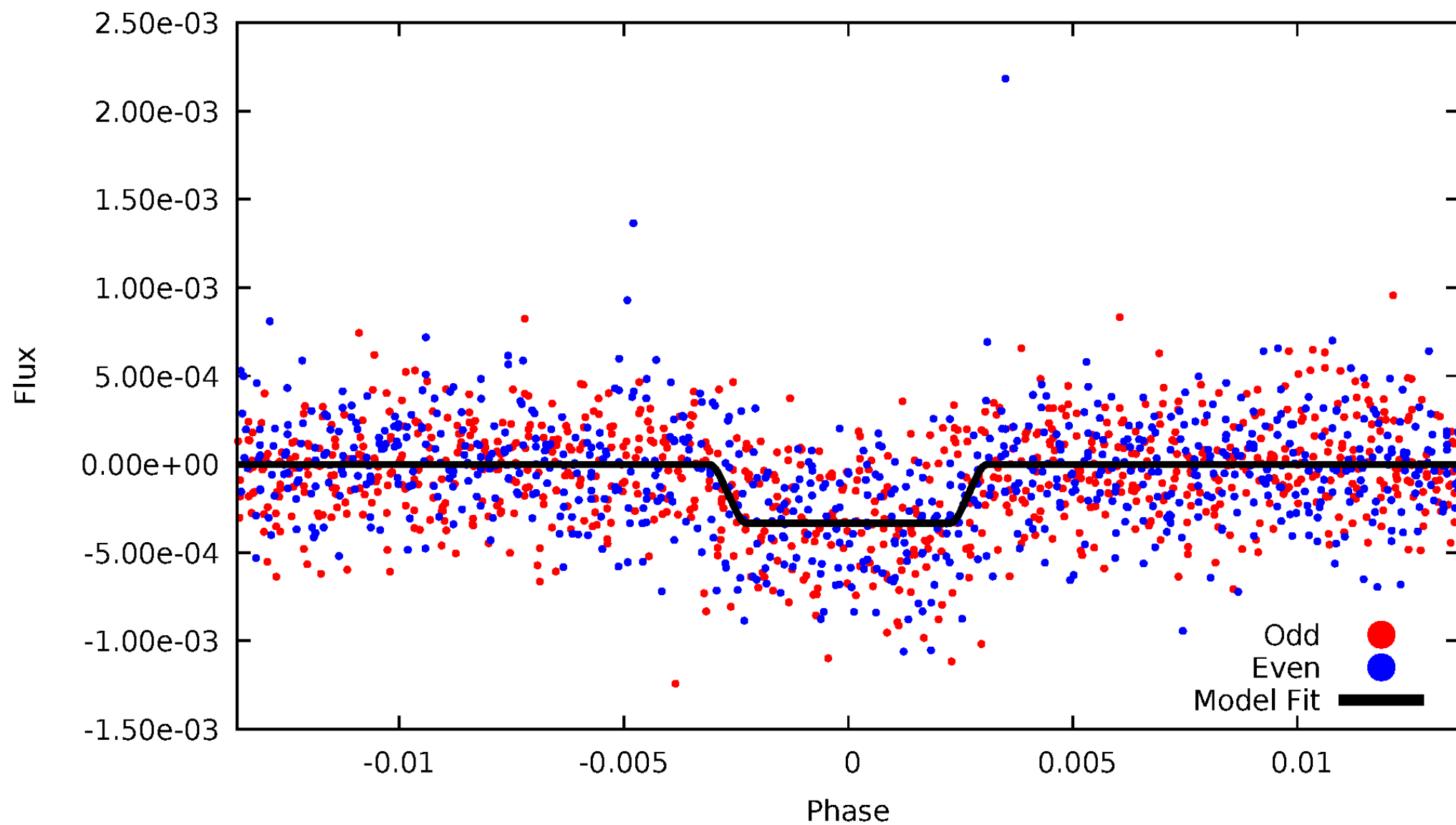
DV Odd/Even

TCE 012256520-01

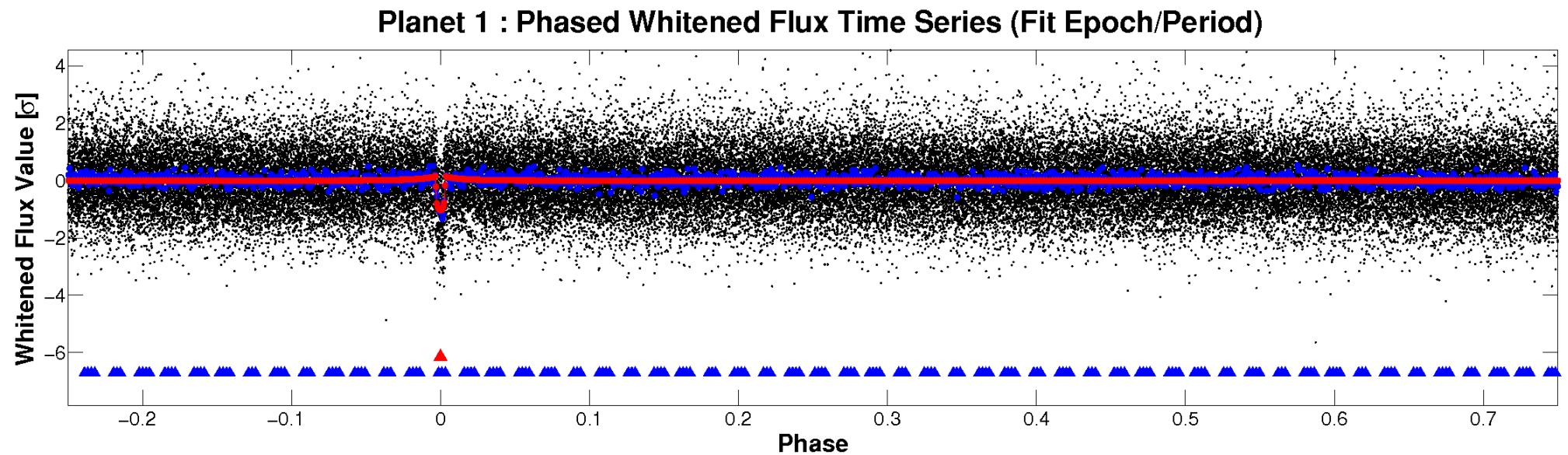
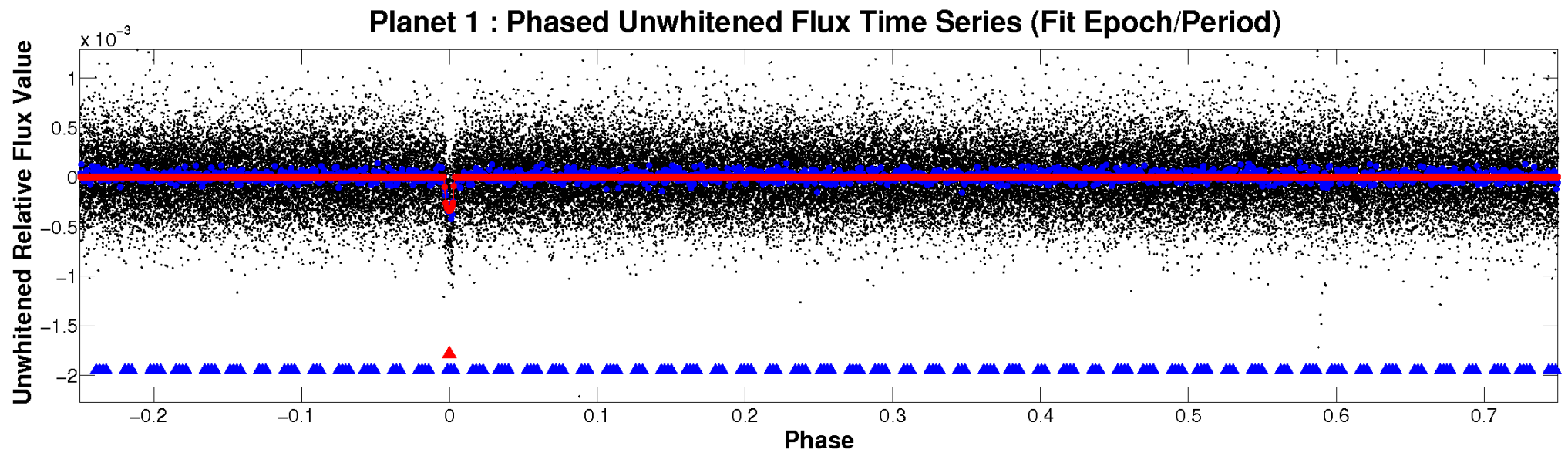


ALT Odd/Even

TCE 012256520-01

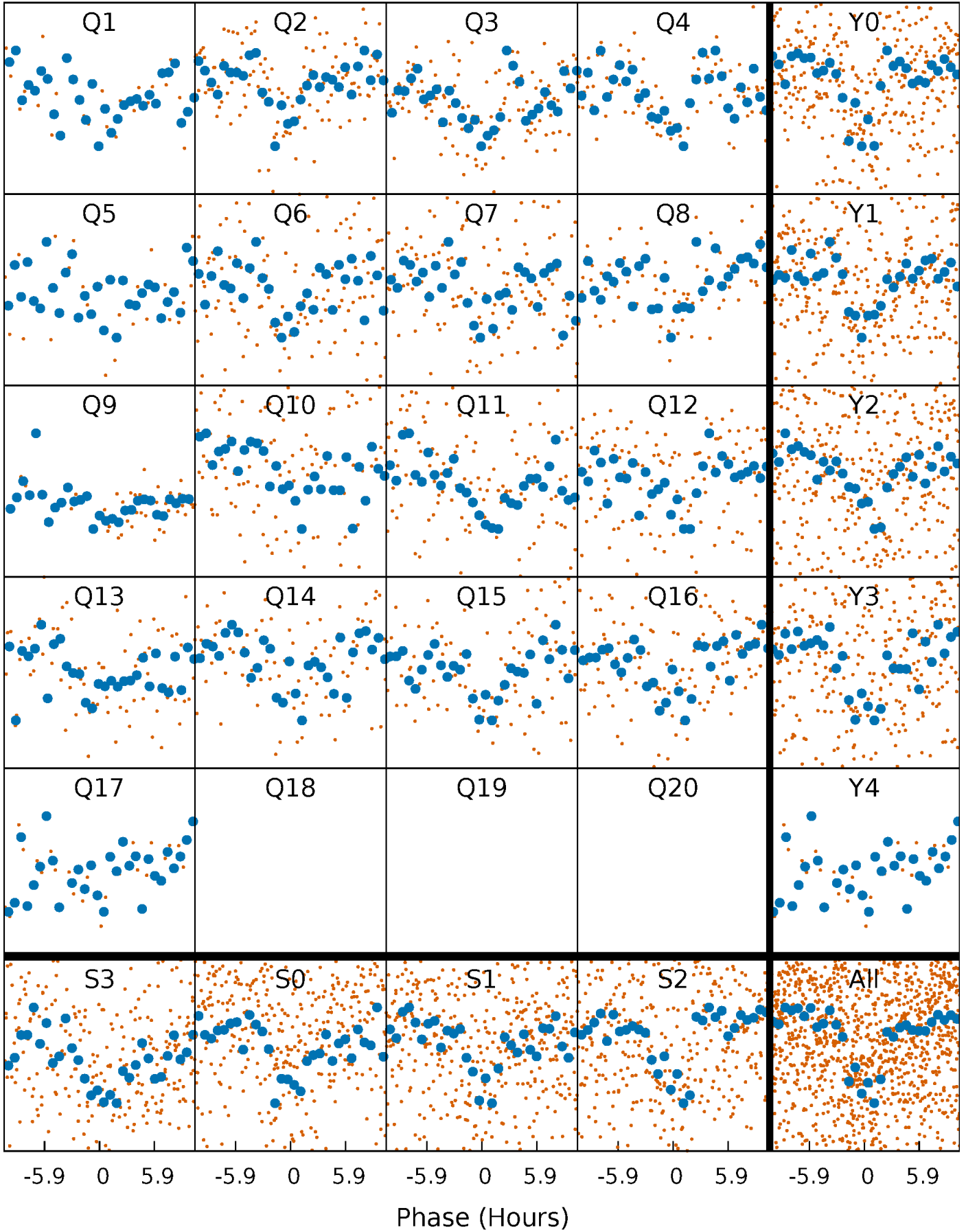


Non-Whitened Vs. Whitened Light Curve



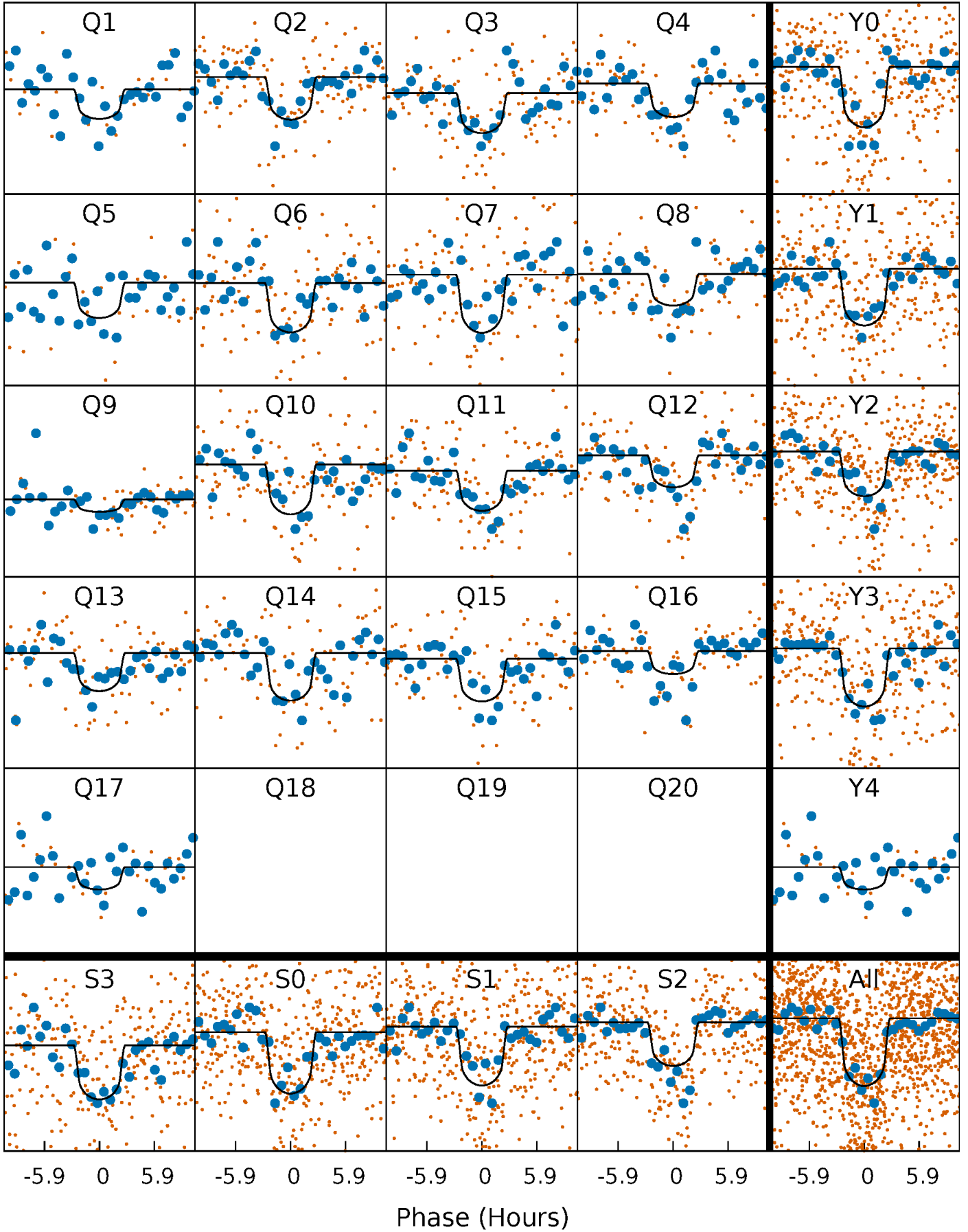
PDC Quarter-Phased Transit Curves

TCE 012256520-01 P= 33.240314 Days $T_0=143.473980$ (BKJD)



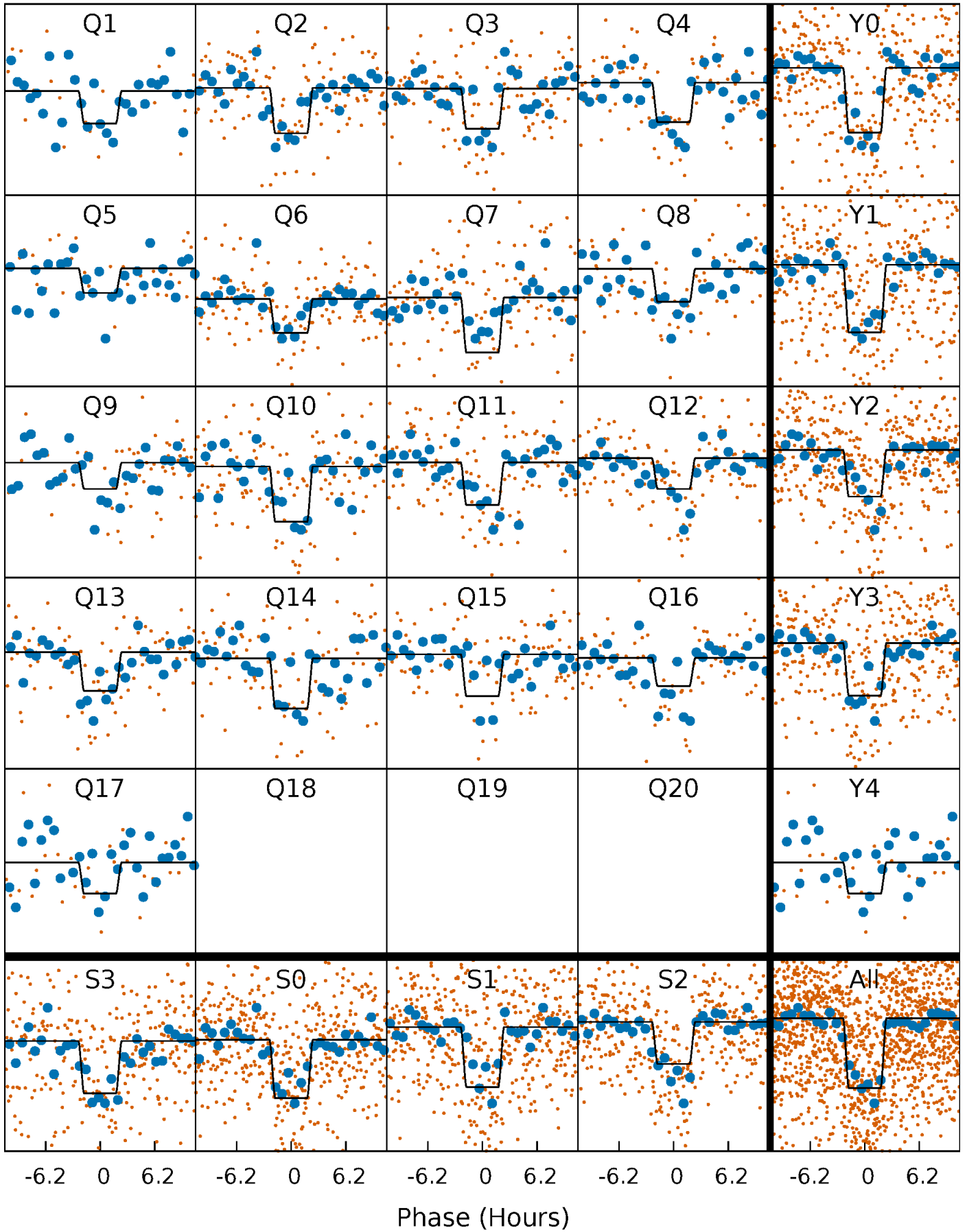
DV Quarter-Phased Transit Curves

TCE 012256520-01 P= 33.240314 Days $T_0=143.473980$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

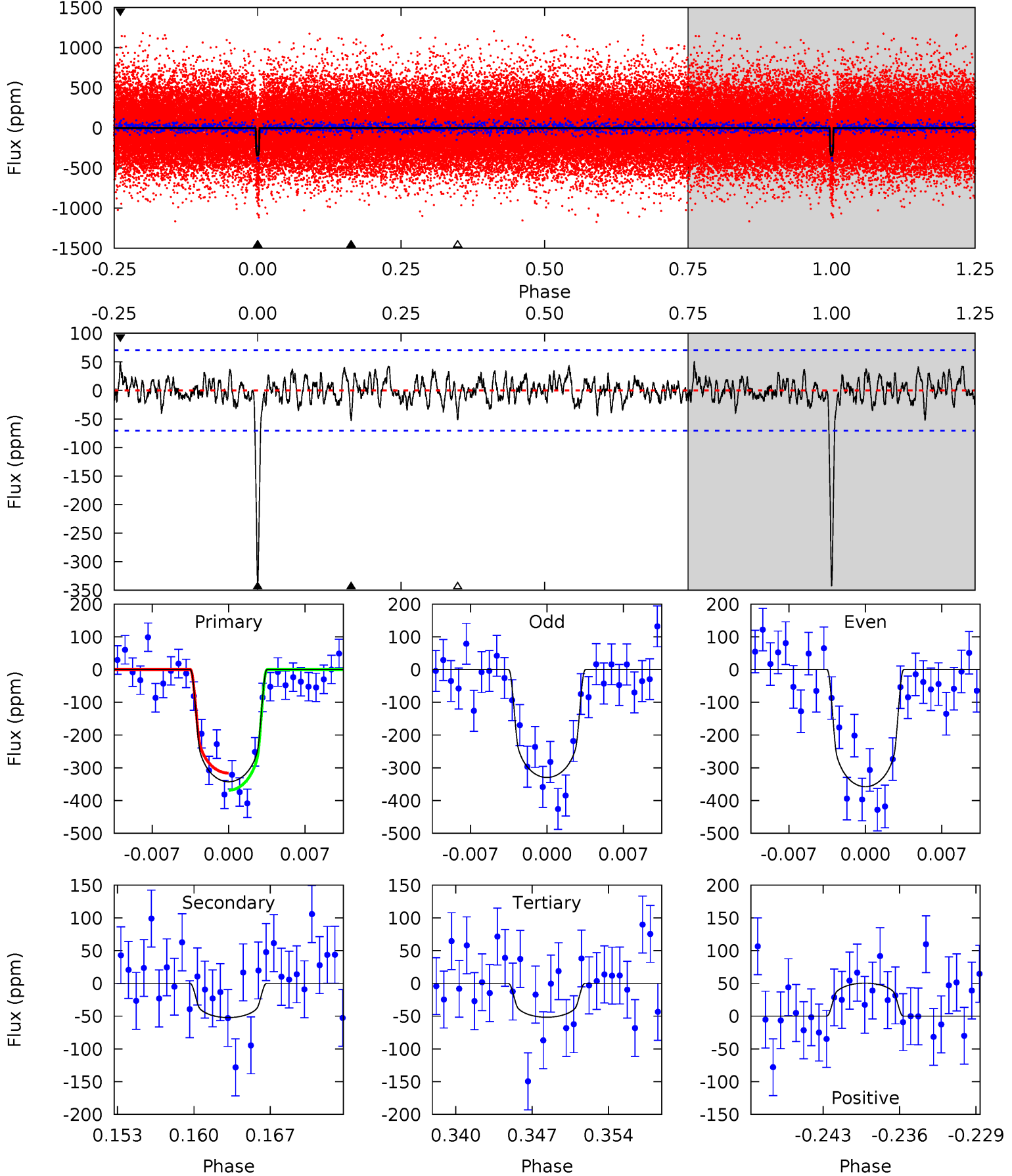
TCE 012256520-01 P= 33.240389 Days $T_0=143.472677$ (BKJD)



DV Model-Shift Uniqueness Test

012256520-01, P = 33.240314 Days, E = 110.233666 Days

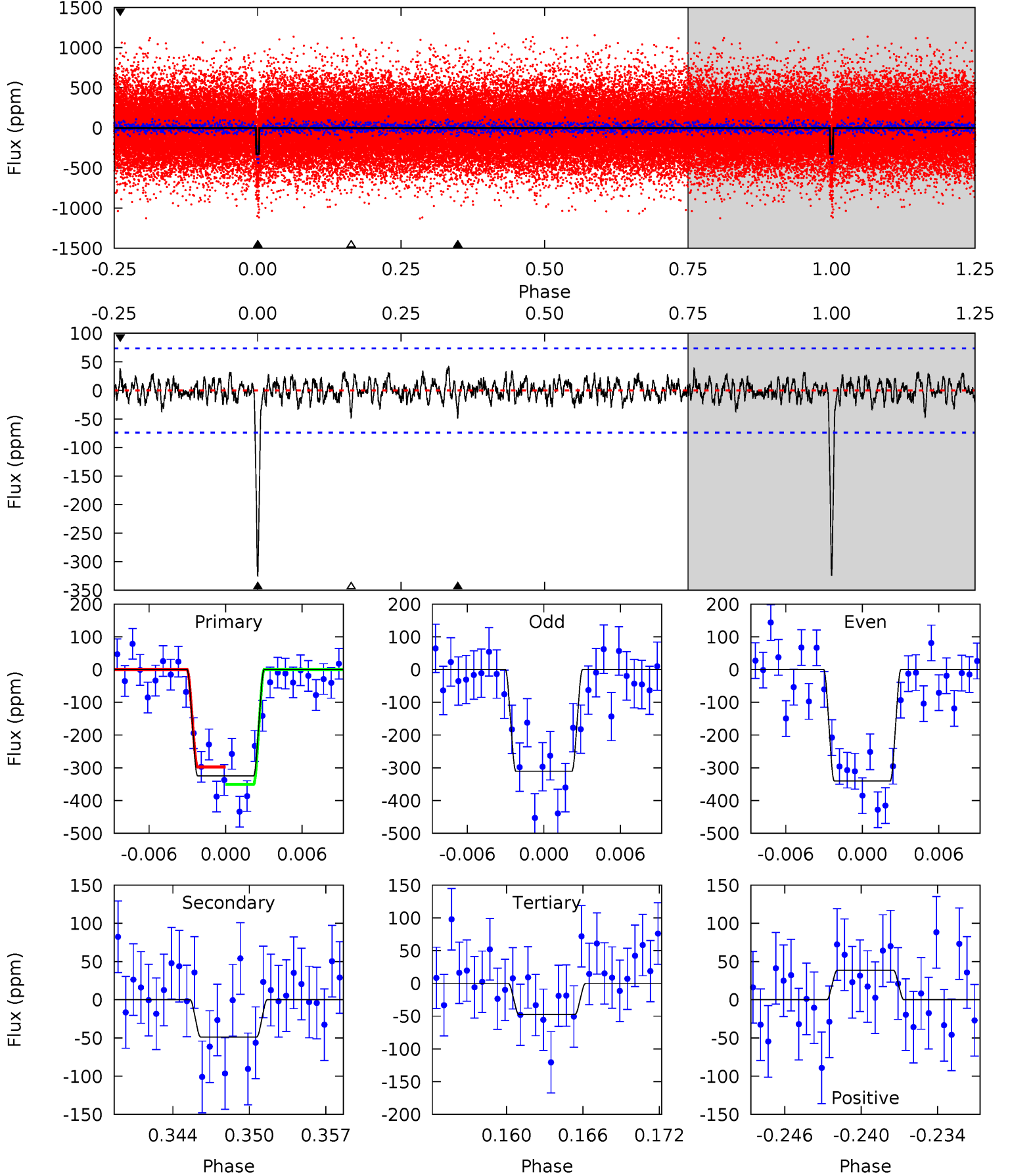
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.7	3.77	3.73	3.64	5.10	2.70	1.16	21.0	21.1	0.03	0.13	1.02	0.96	0.13	1.89



Alt Model-Shift Uniqueness Test

012256520-01, $P = 33.240389$ Days, $E = 110.232288$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.5	3.39	3.30	2.69	5.12	2.74	0.93	19.2	19.9	0.09	0.70	1.03	0.99	0.11	1.85



Stellar Parameters For KIC 012256520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5382^{+80}_{-80}	$4.571^{+0.015}_{-0.095}$	$0.100^{+0.150}_{-0.150}$	$0.827^{+0.091}_{-0.028}$	$0.928^{+0.033}_{-0.065}$	$2.310^{+0.187}_{-0.619}$
	+1%/-1%	+0%/-2%	+150%/-150%	+11%/-3%	+4%/-7%	+8%/-27%
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 012256520-01 / KOI 2264.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-52 ± 14	$1.74^{+0.62}_{-0.61}$	687^{+20}_{-16}	3719^{+597}_{-384}	367^{+492}_{-179}
Alt.	-49 ± 14	$1.63^{+0.61}_{-0.56}$	688^{+20}_{-16}	3742^{+629}_{-414}	372^{+526}_{-190}

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 $A_{obs} \gg 1.0$

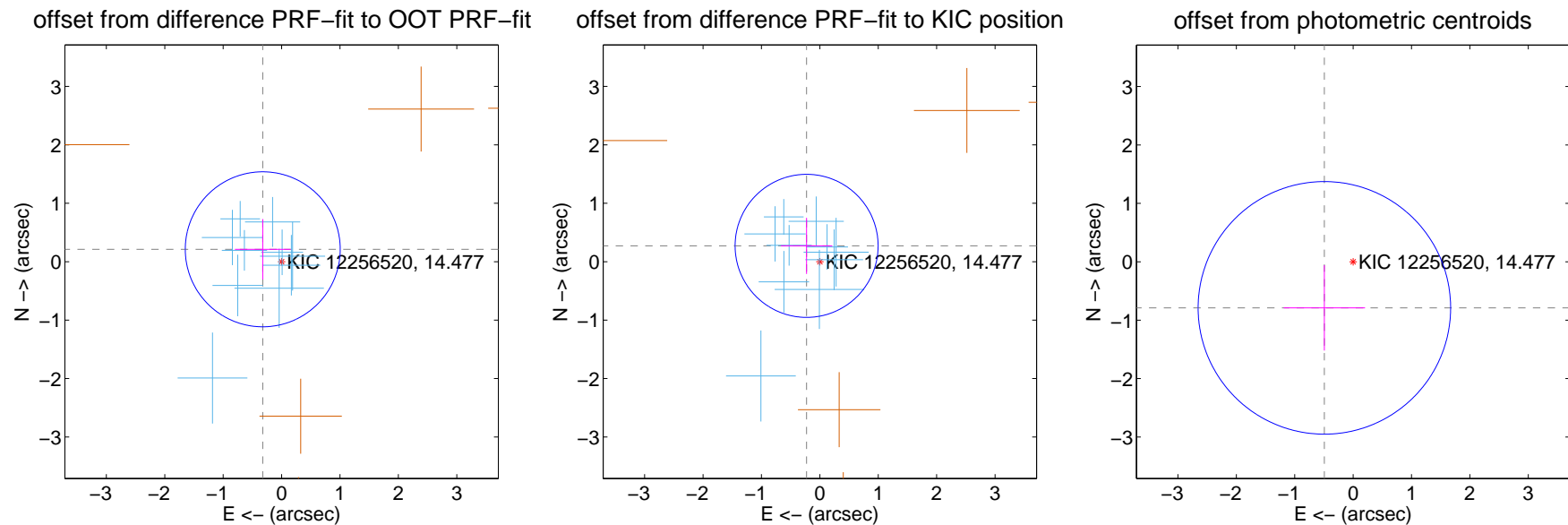
DV Centroid Data

Supplemental centroid analysis for 012256520-01. Kepler magnitude: 14.48. Transit SNR 17.21

There are 10 quarters with good PRF difference image offsets

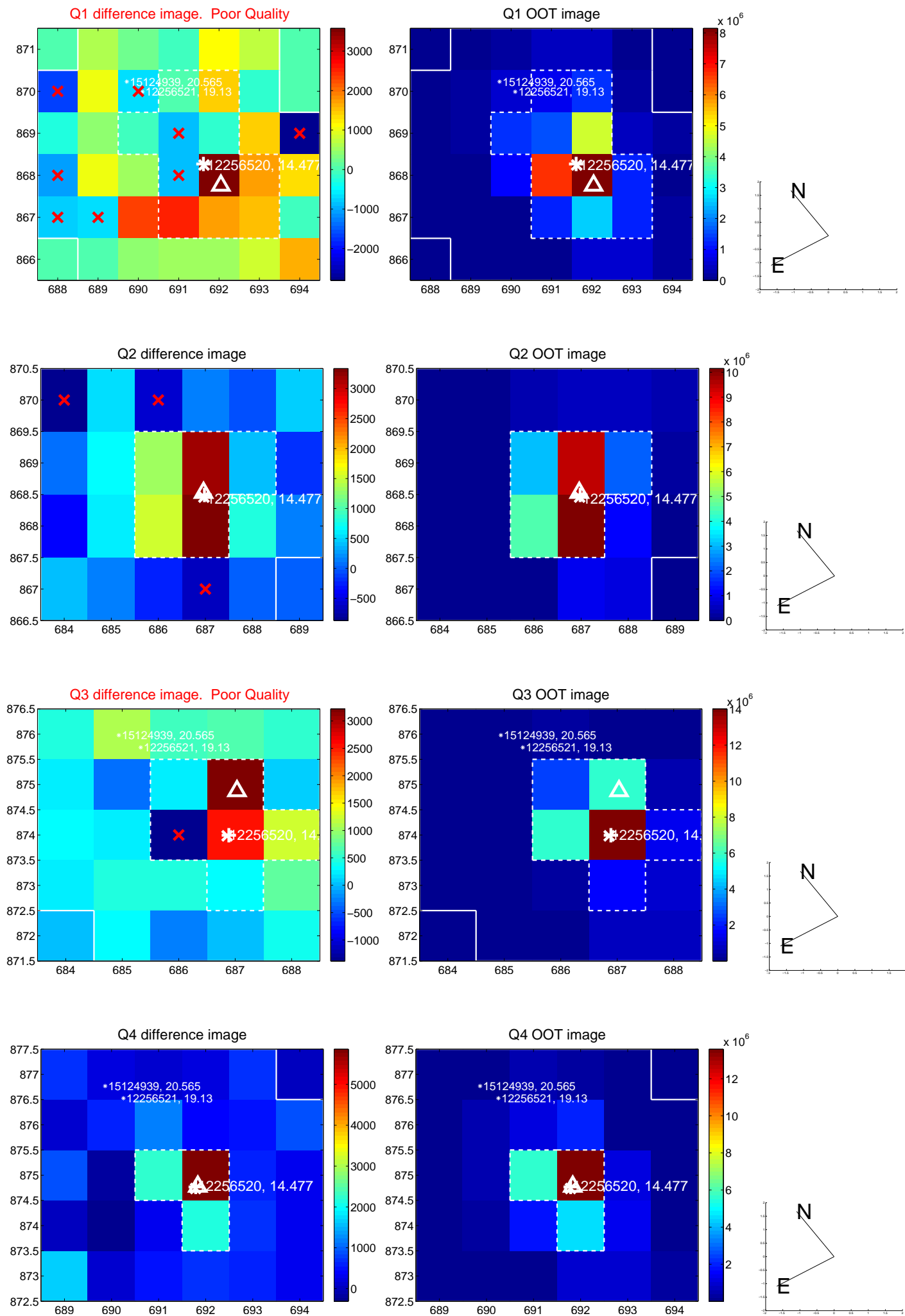
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.386 ± 0.442	0.87	0.322 ± 0.476	0.212 ± 0.517
PRF-fit source offset from KIC position	0.353 ± 0.408	0.87	0.227 ± 0.440	0.271 ± 0.480
photometric centroid source offset	0.93 ± 0.72	1.29	0.49 ± 0.70	-0.79 ± 0.73

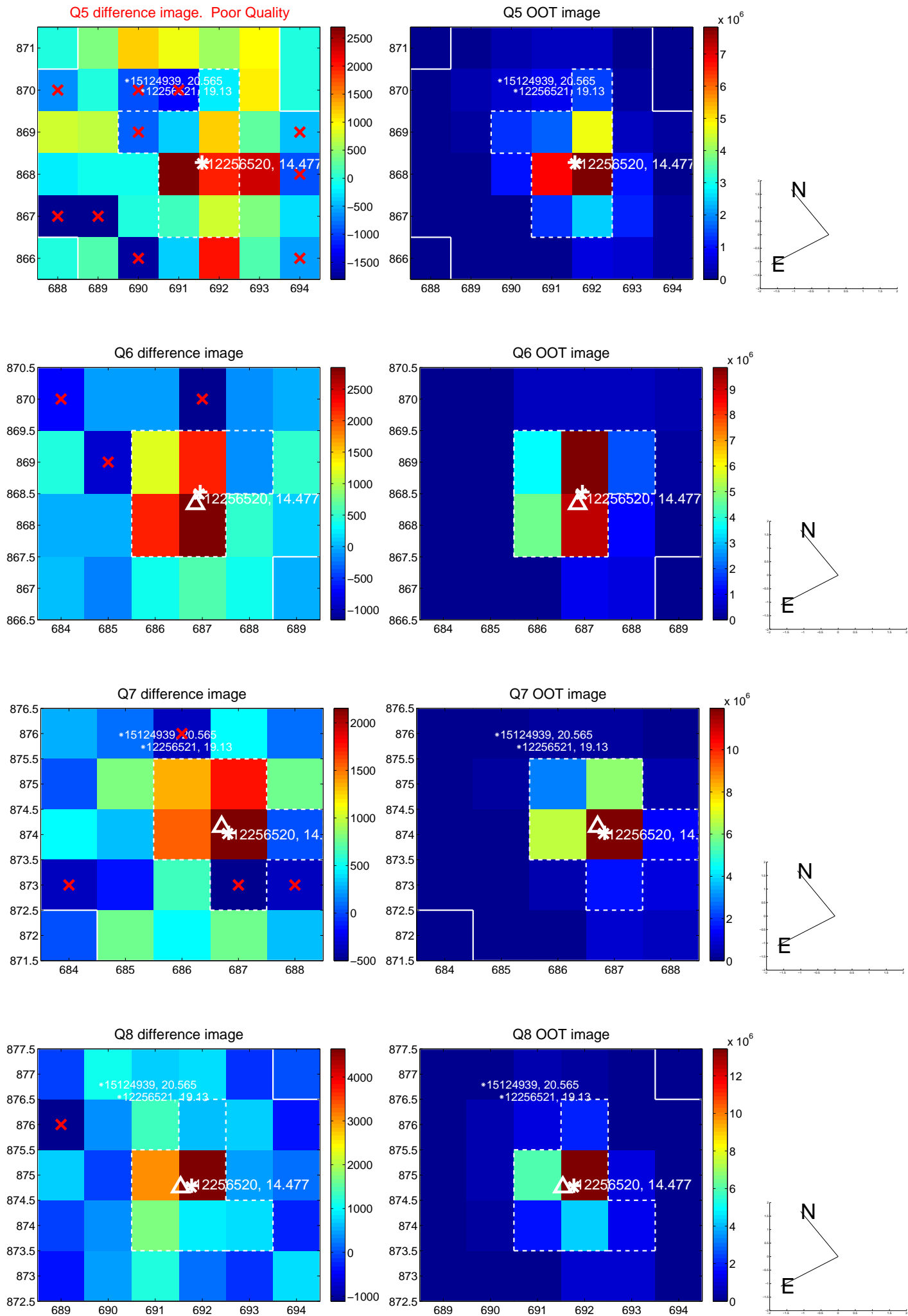


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

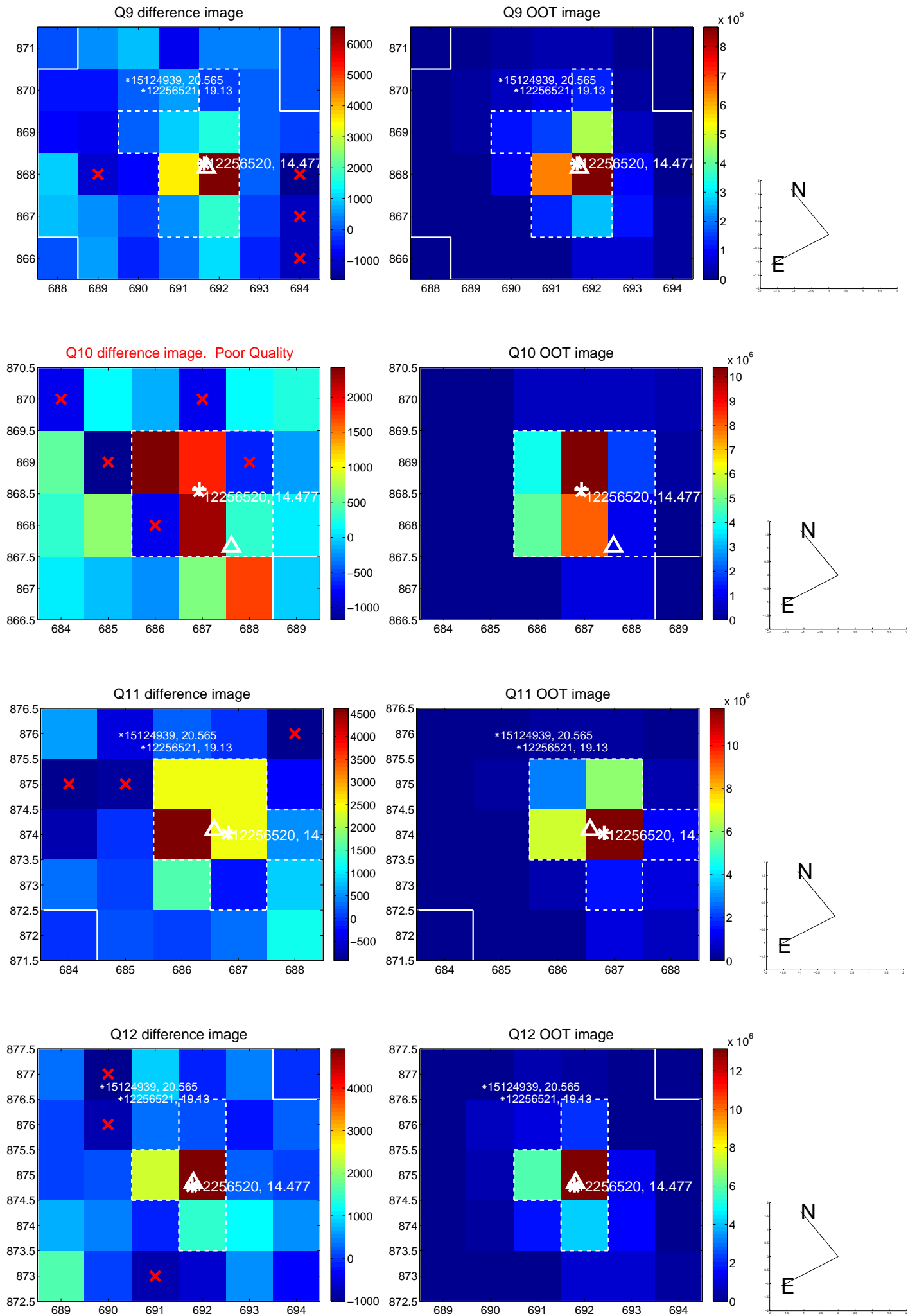
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



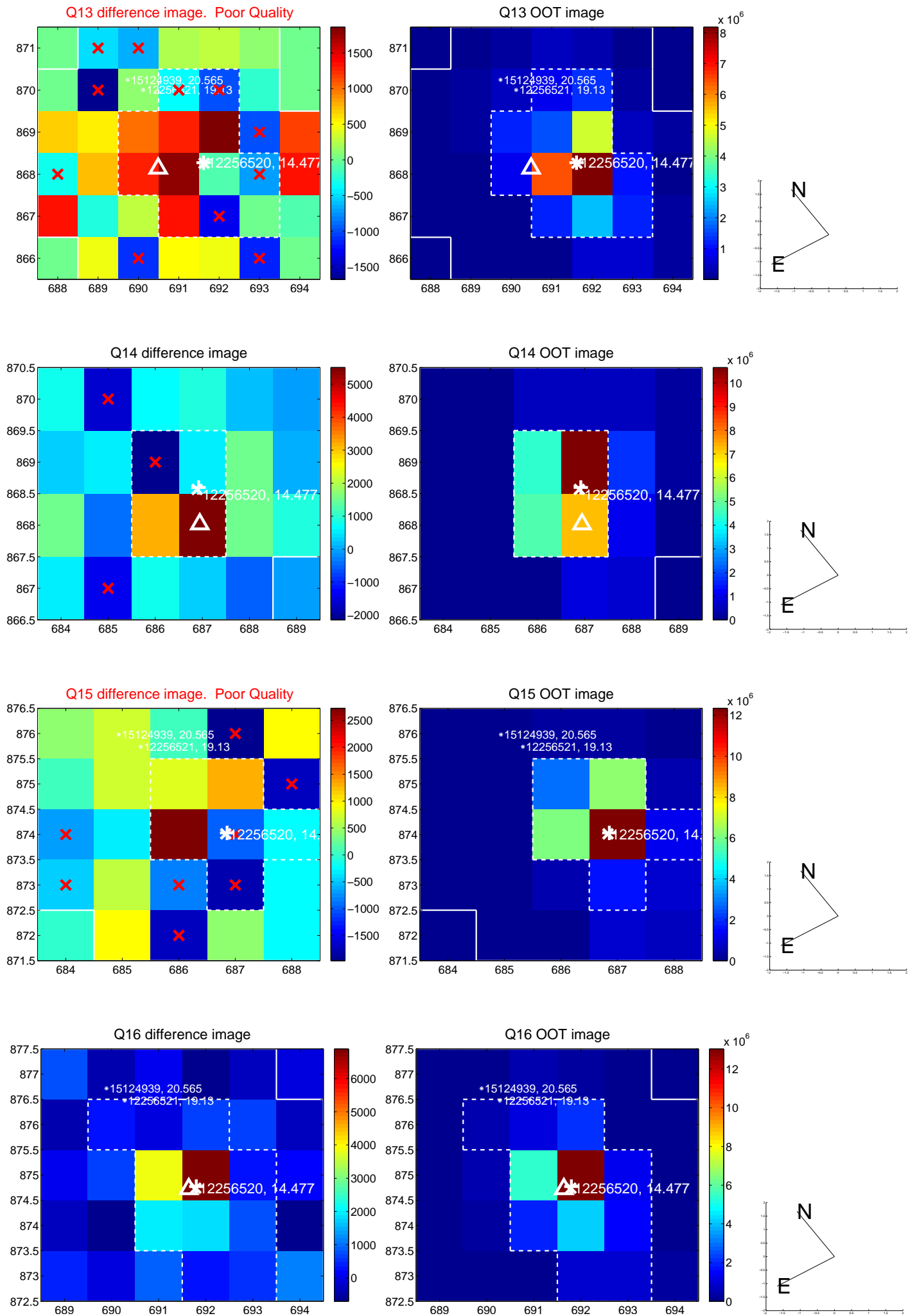
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



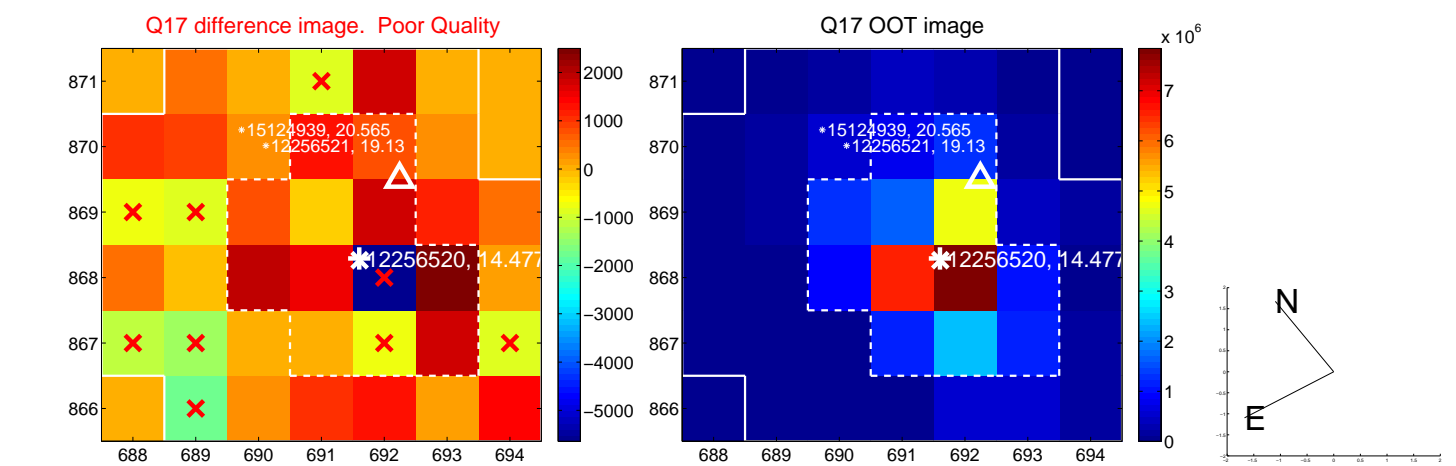
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



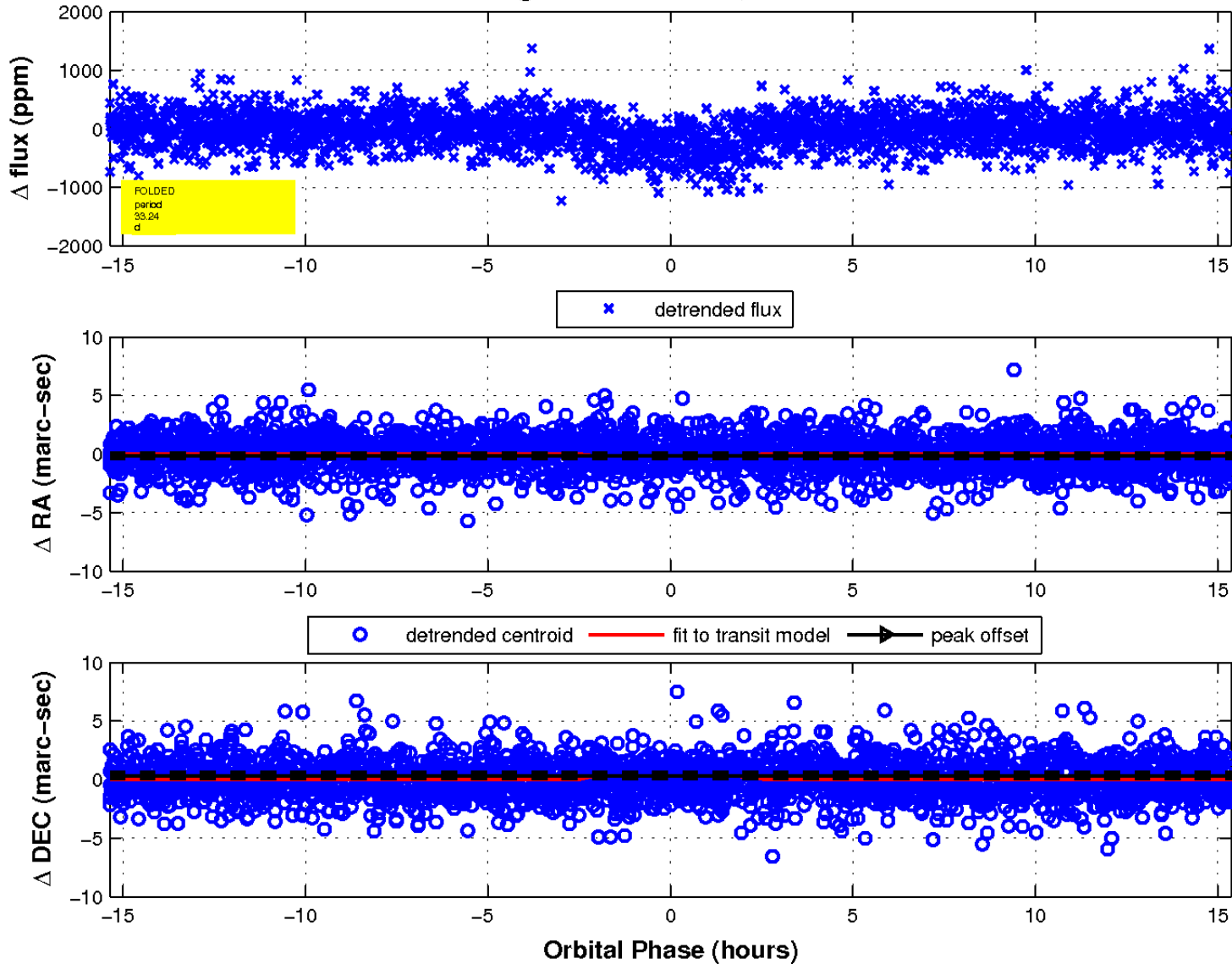
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

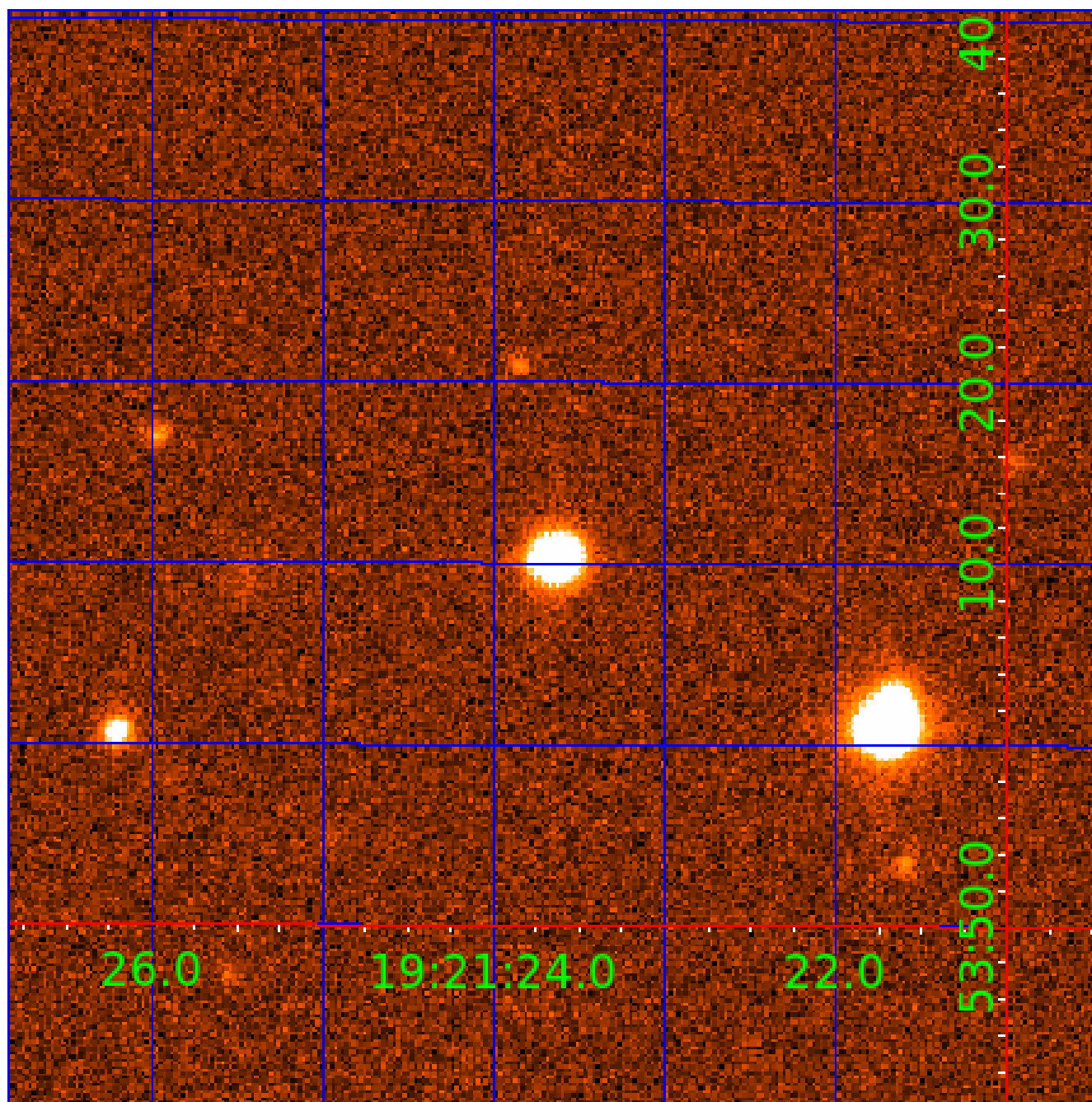


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 012256520

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})
012256520-01	OBS	2264.01	33.240314	143.473980	341.4	5.128	17.6	17.2	0.83	5382	1.73	13.19
012256520-02	OBS	2264.02	7.251046	138.201914	124.0	1.808	9.2	8.7	0.83	5382	1.15	100.42

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012256520-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012256520-02	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.

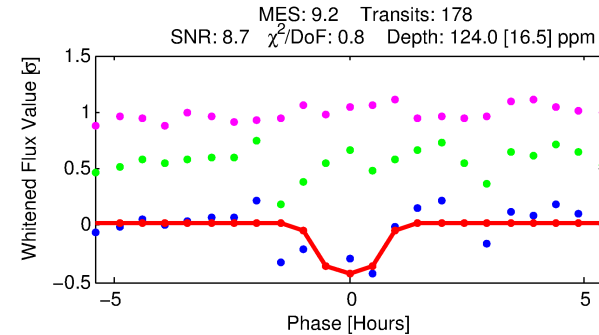
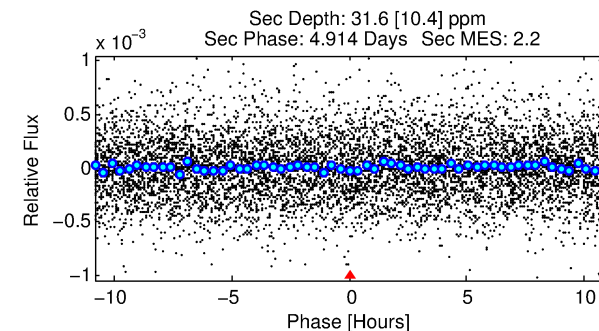
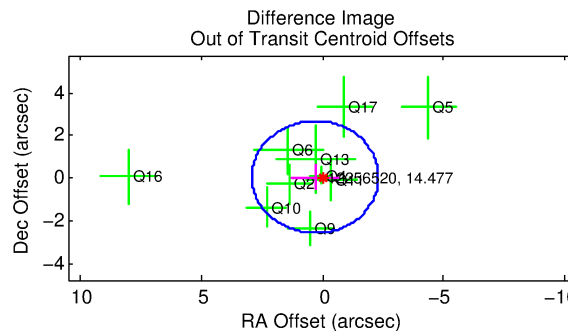
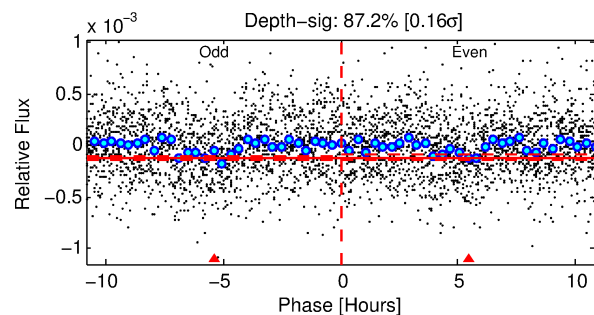
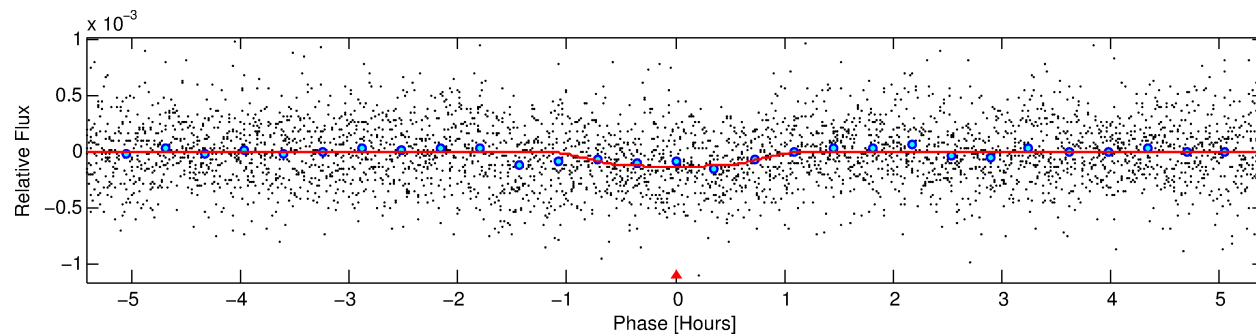
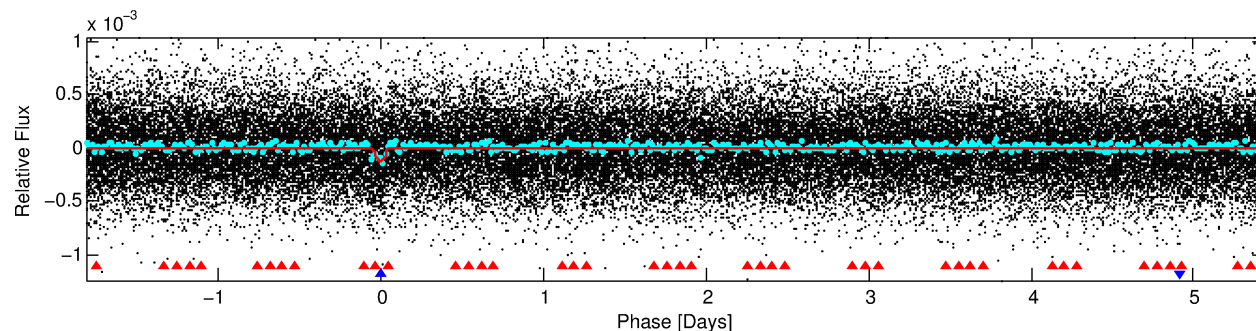
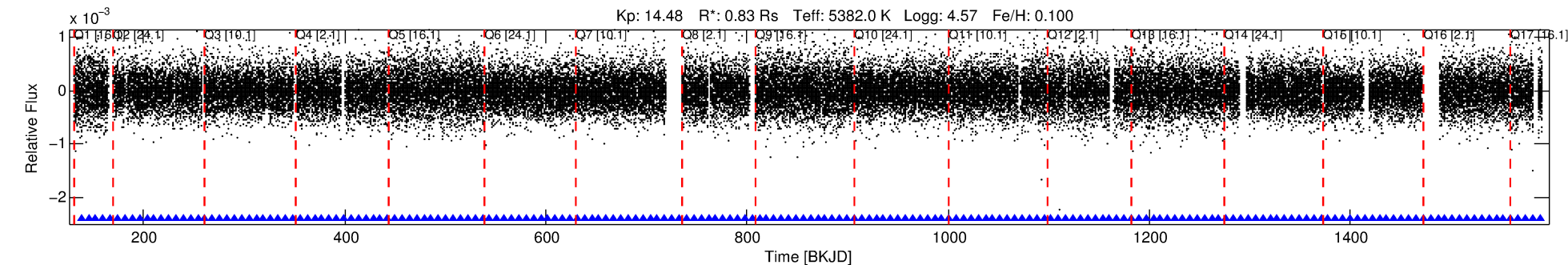
Ephemeris Match Information For 012256520-02

No Significant Match Found

DV One-Page Summary

KIC: 12256520 Candidate: 2 of 2 Period: 7.251 d
KOI: K02264 Corr: No Ephemeris Match

Kp: 14.48 R*: 0.83 Rs Teff: 5382.0 K Logg: 4.57 Fe/H: 0.100



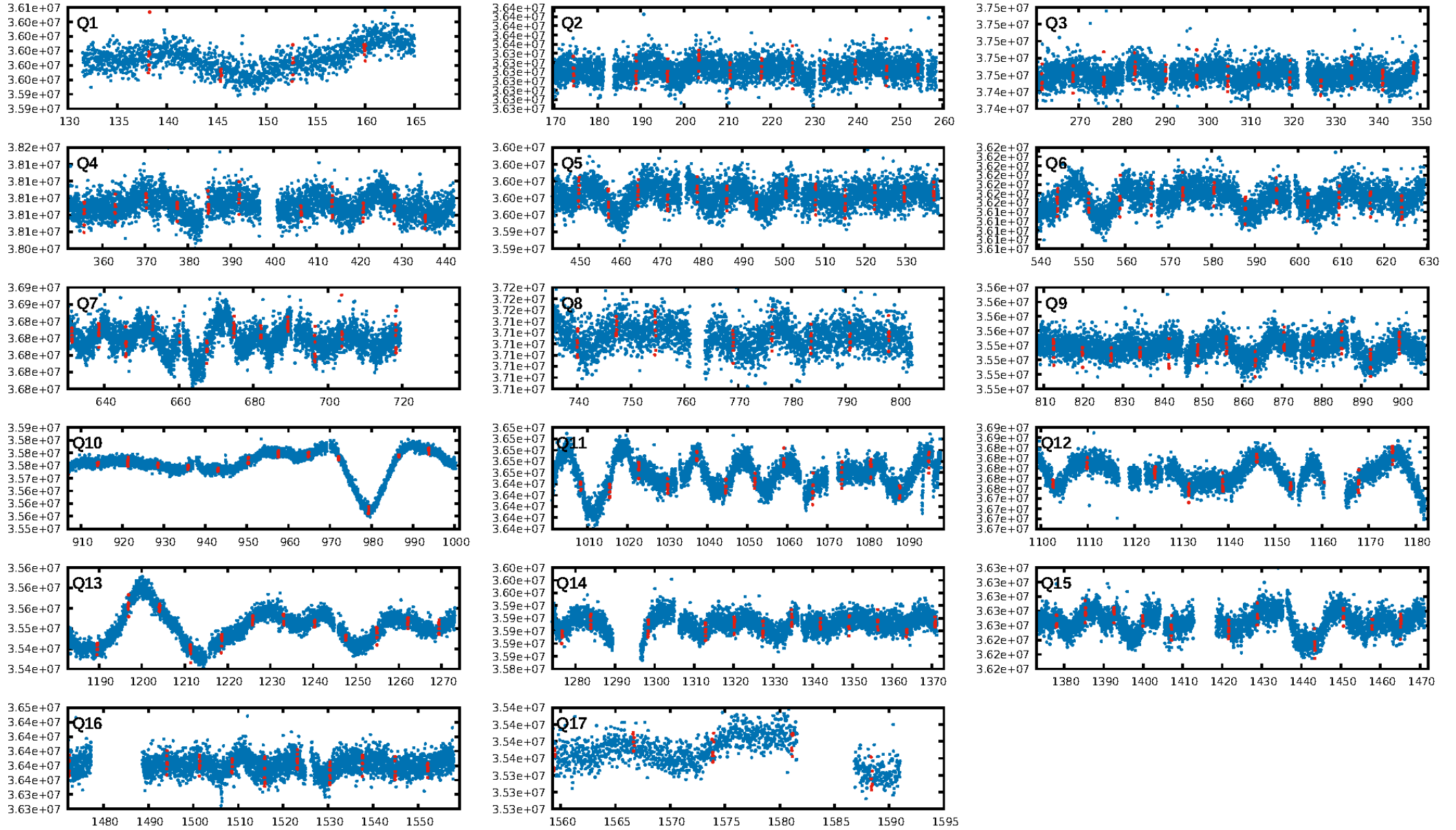
DV Fit Results:

Period = 7.25105 [0.00004] d
Epoch = 138.2019 [0.0046] BKJD
Rp/R* = 0.0127 [0.0109]
a/R* = 12.53 [48.09]
b = 0.93 [0.60]
Seff = 100.42 [17.45]
Teff = 807 [35] K
Rp = 1.15 [0.99] Re
a = 0.0716 [0.0074] AU
Ag = 67.29 [117.93] [0.56σ]
Teffp = 3574 [1560] K [1.77σ]

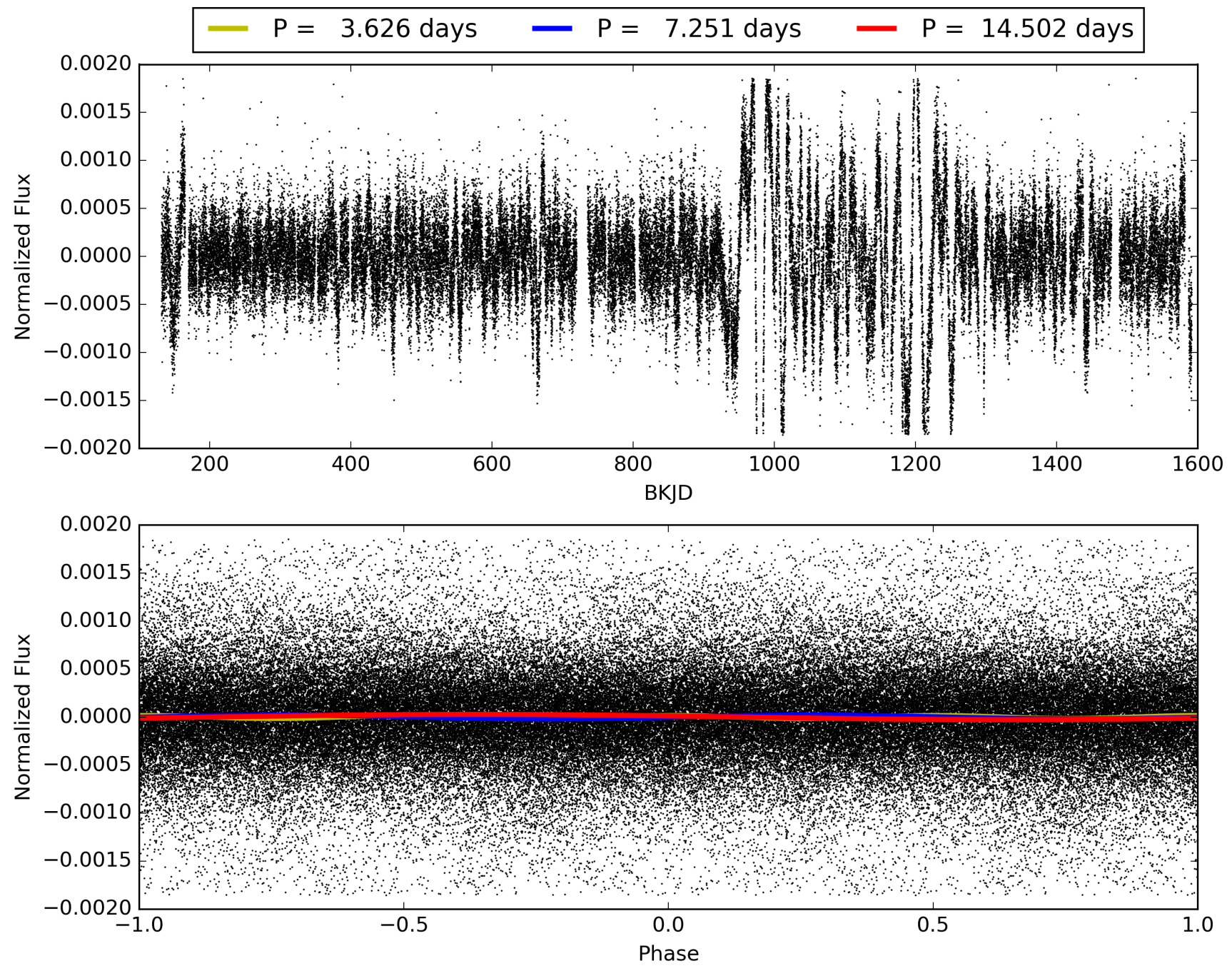
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [114.72σ]
ModelChiSquare2-sig: 99.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.87e-20
RollingBand-fgt: 1.00 [169/169]
GhostDiagnostic-chr: -16.76
Centroid-sig: 7.7%
Centroid-so: 2.109 arcsec [1.33σ]
OotOffset-rm: 0.310 arcsec [0.36σ]
KicOffset-rm: 0.272 arcsec [0.38σ]
OotOffset-st: 3/1/2/4 [10]
KicOffset-st: 3/1/2/4 [10]
DiffImageQuality-fgm: 0.20 [2/10]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 012256520-02, PDC Light Curves

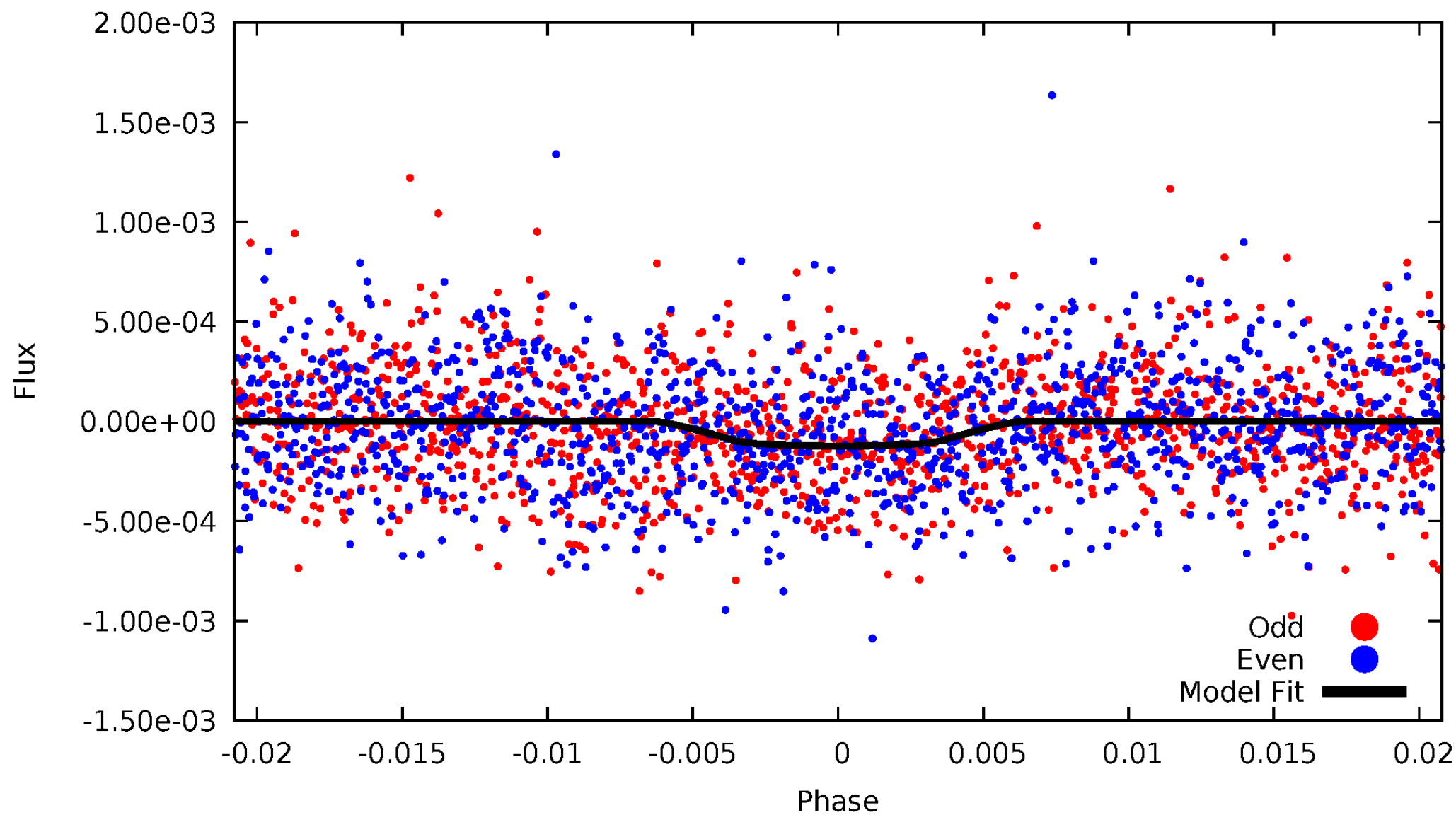


TCE 012256520-02



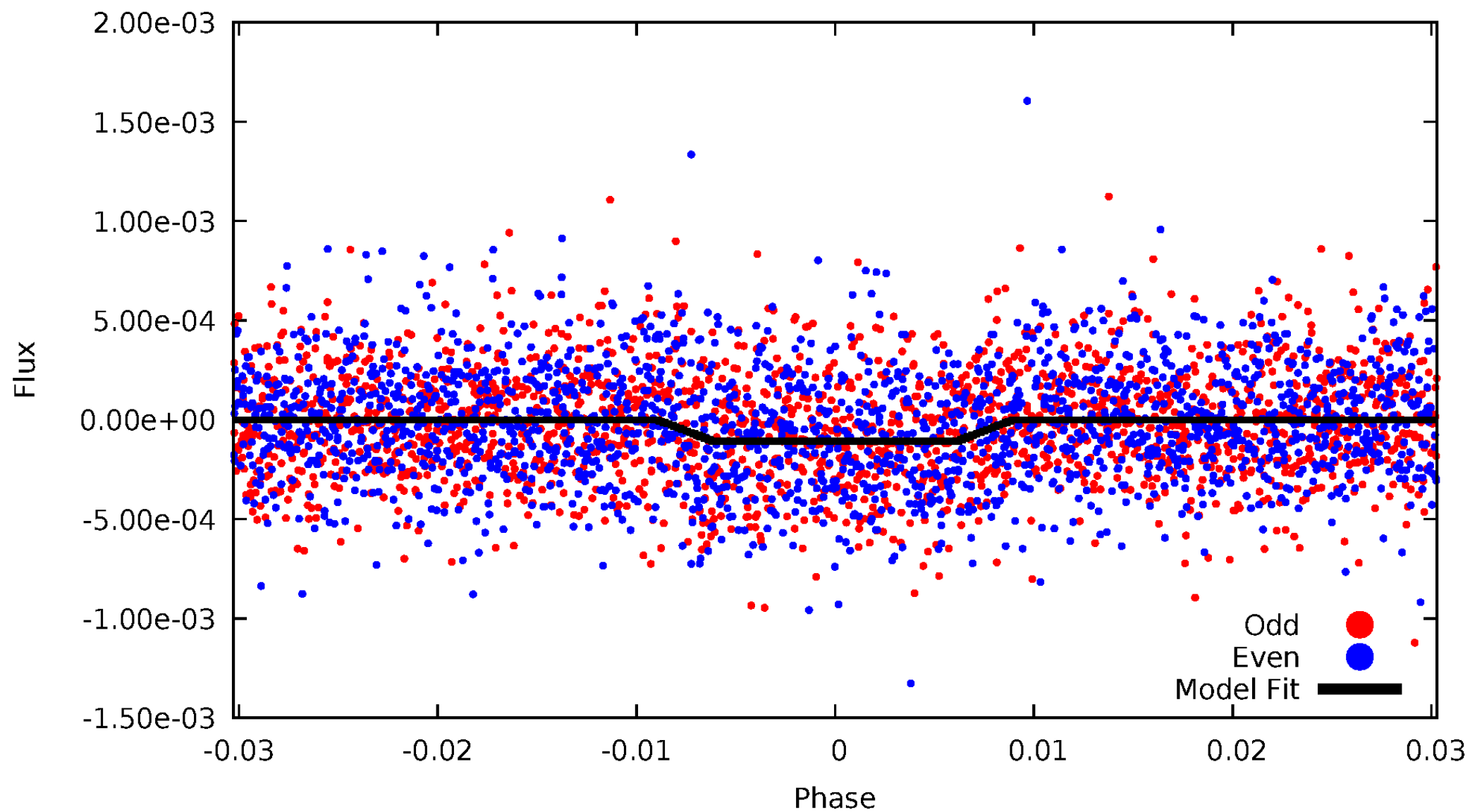
DV Odd/Even

TCE 012256520-02



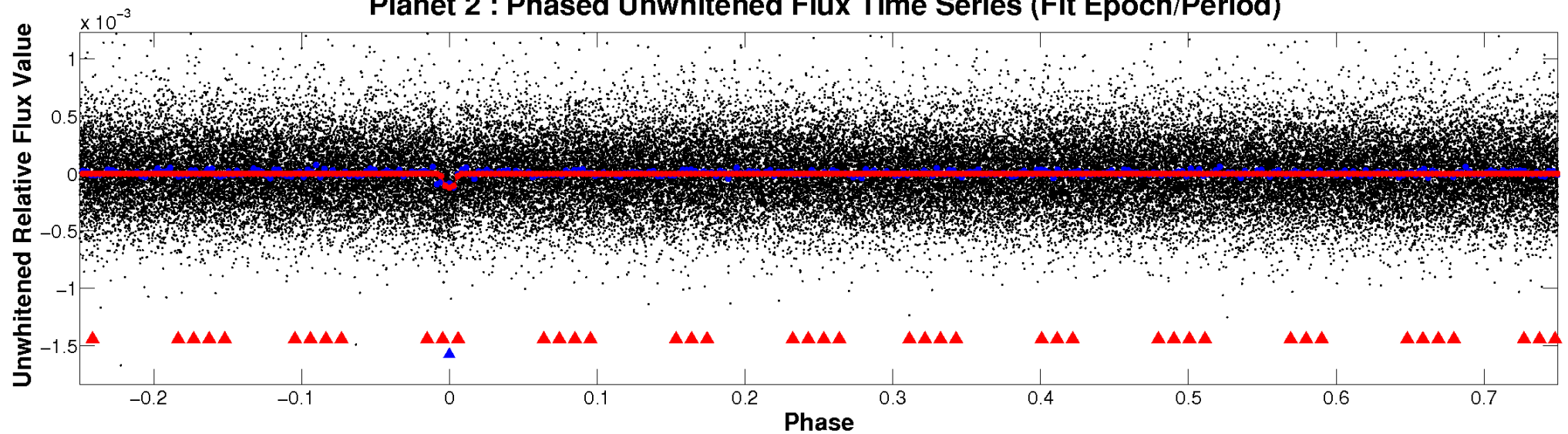
ALT Odd/Even

TCE 012256520-02

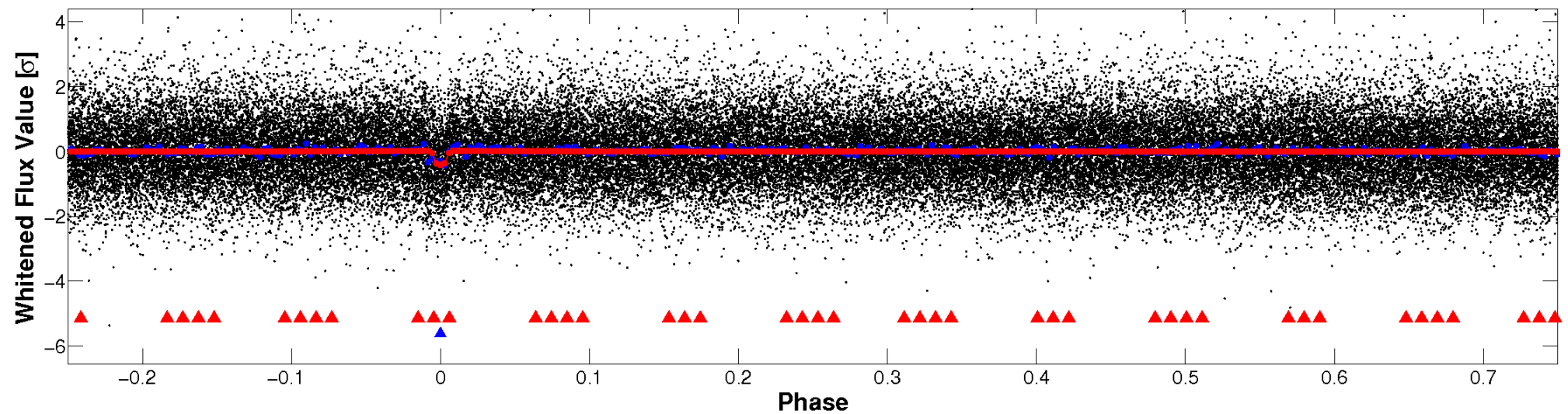


Non-Whitened Vs. Whitened Light Curve

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

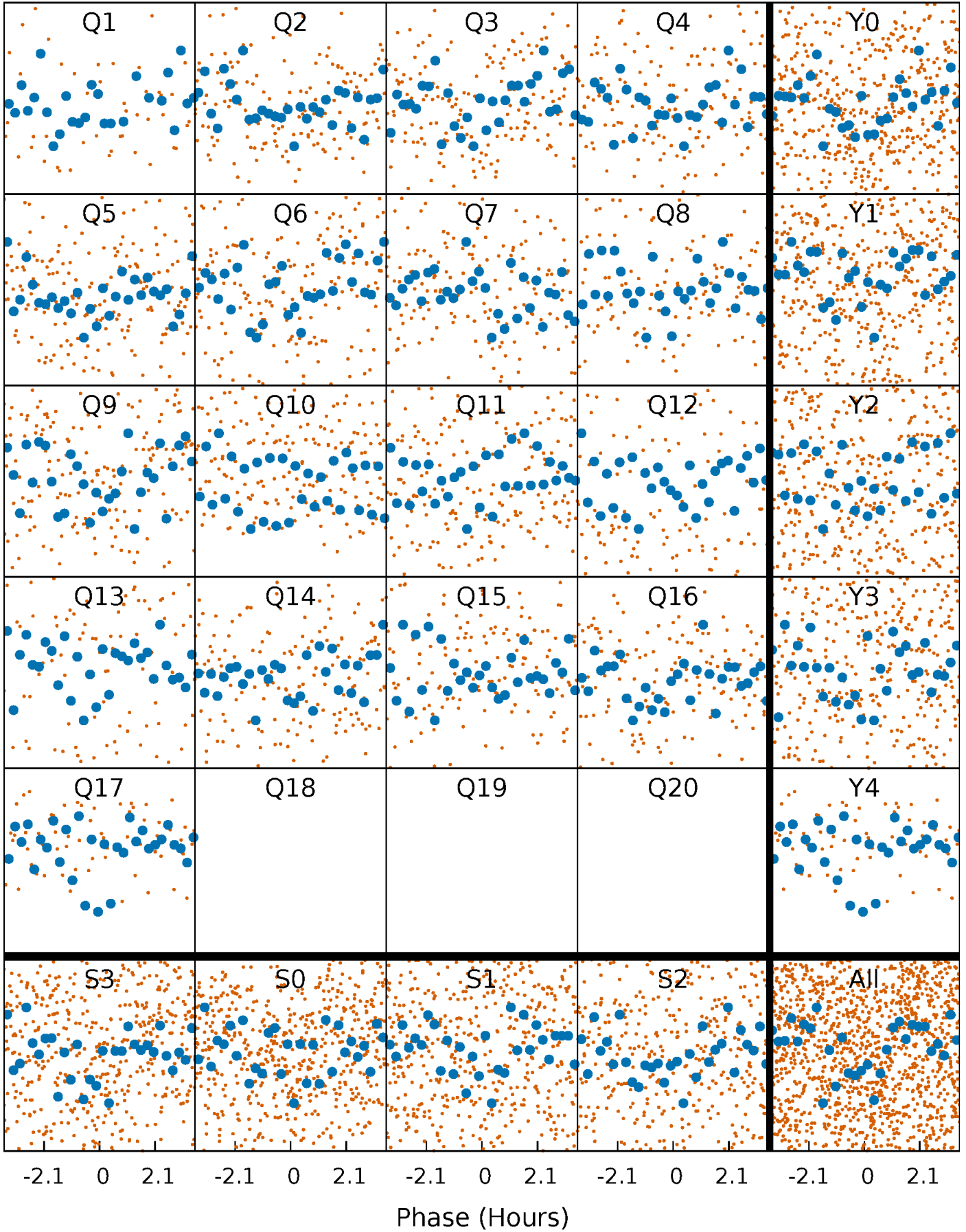


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



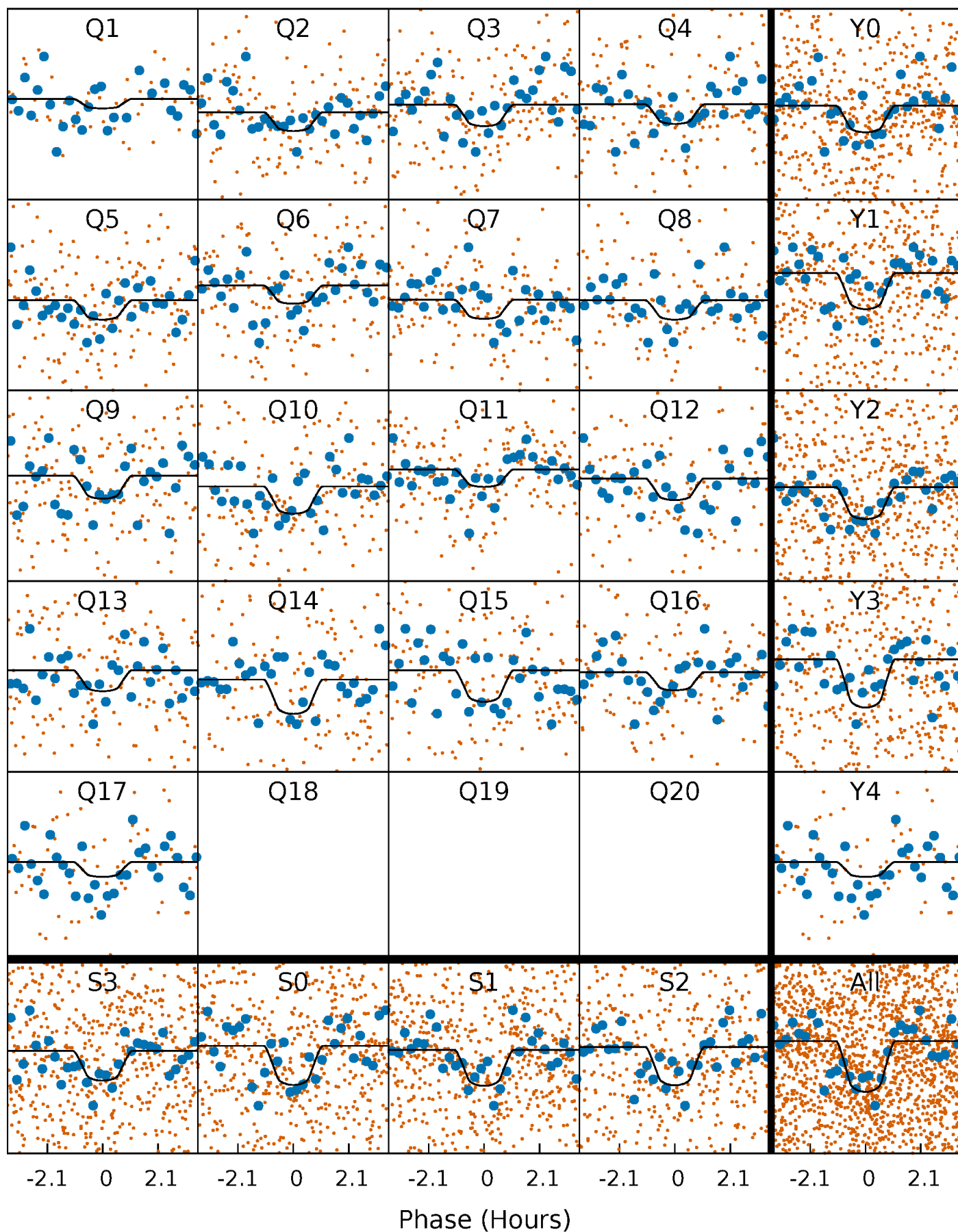
PDC Quarter-Phased Transit Curves

TCE 012256520-02 P= 7.251046 Days $T_0=138.201914$ (BKJD)



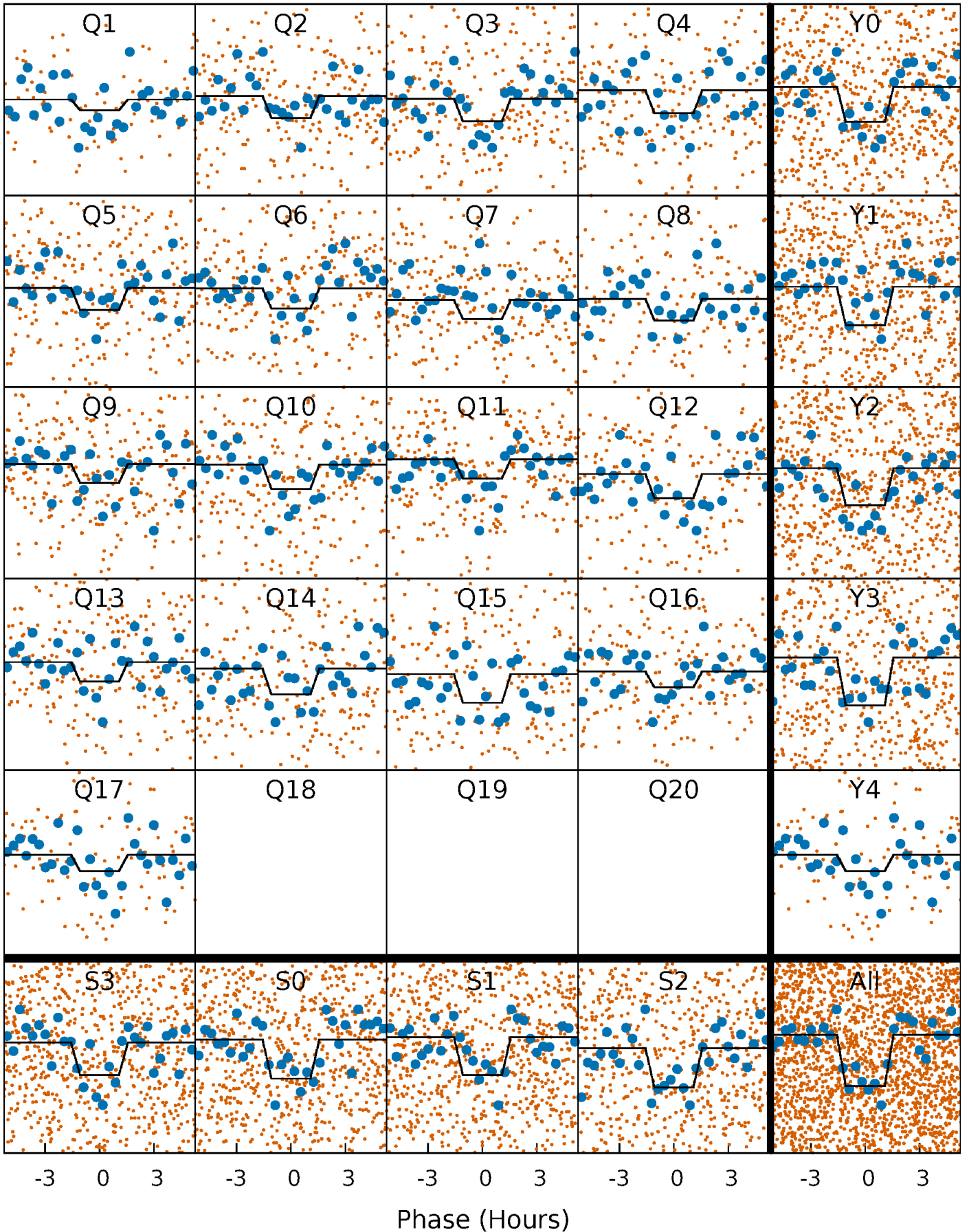
DV Quarter-Phased Transit Curves

TCE 012256520-02 P= 7.251046 Days $T_0=138.201914$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

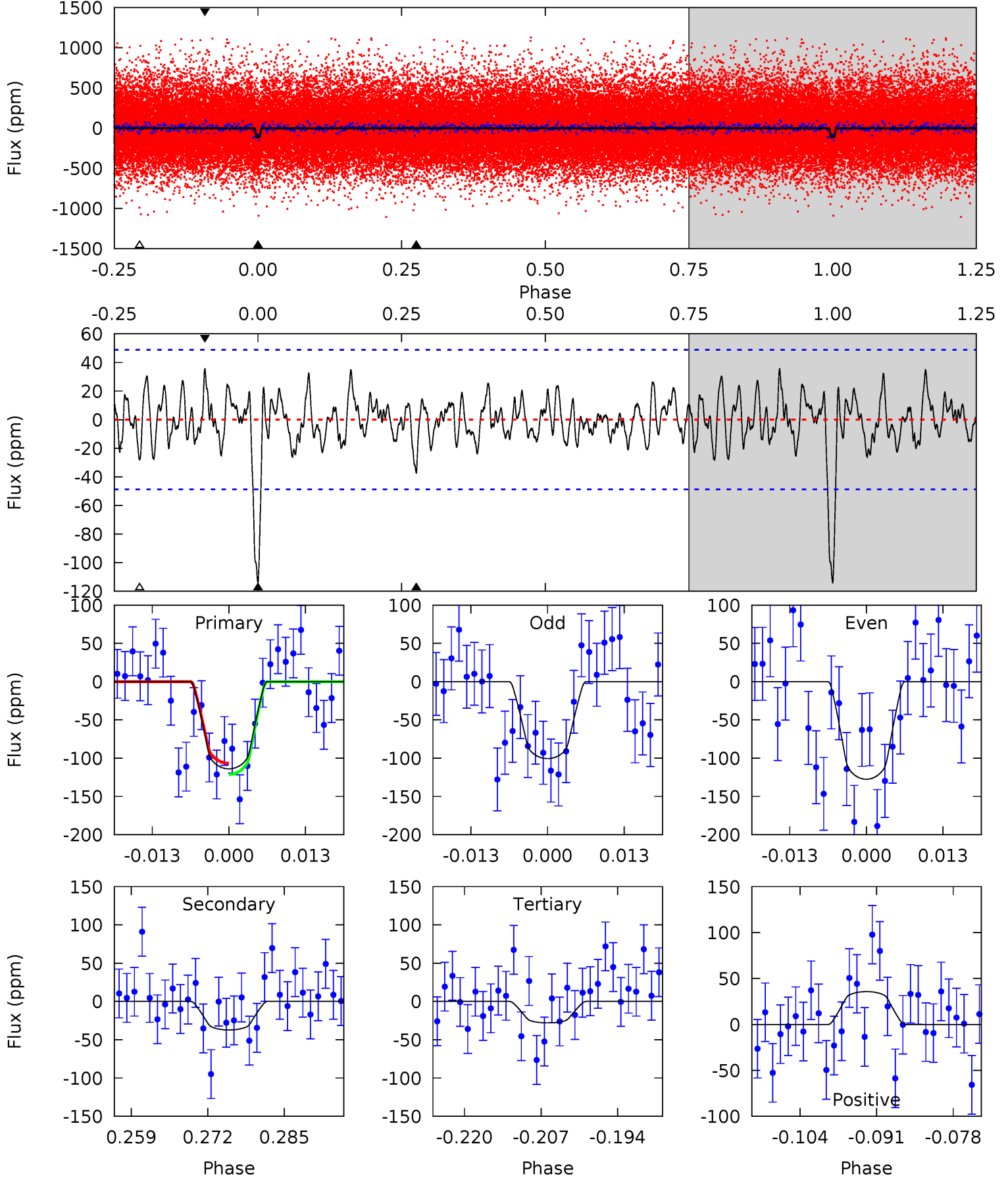
TCE 012256520-02 $P = 7.251031$ Days $T_0 = 138.185232$ (BKJD)



DV Model-Shift Uniqueness Test

012256520-02, P = 7.251046 Days, E = 130.950868 Days

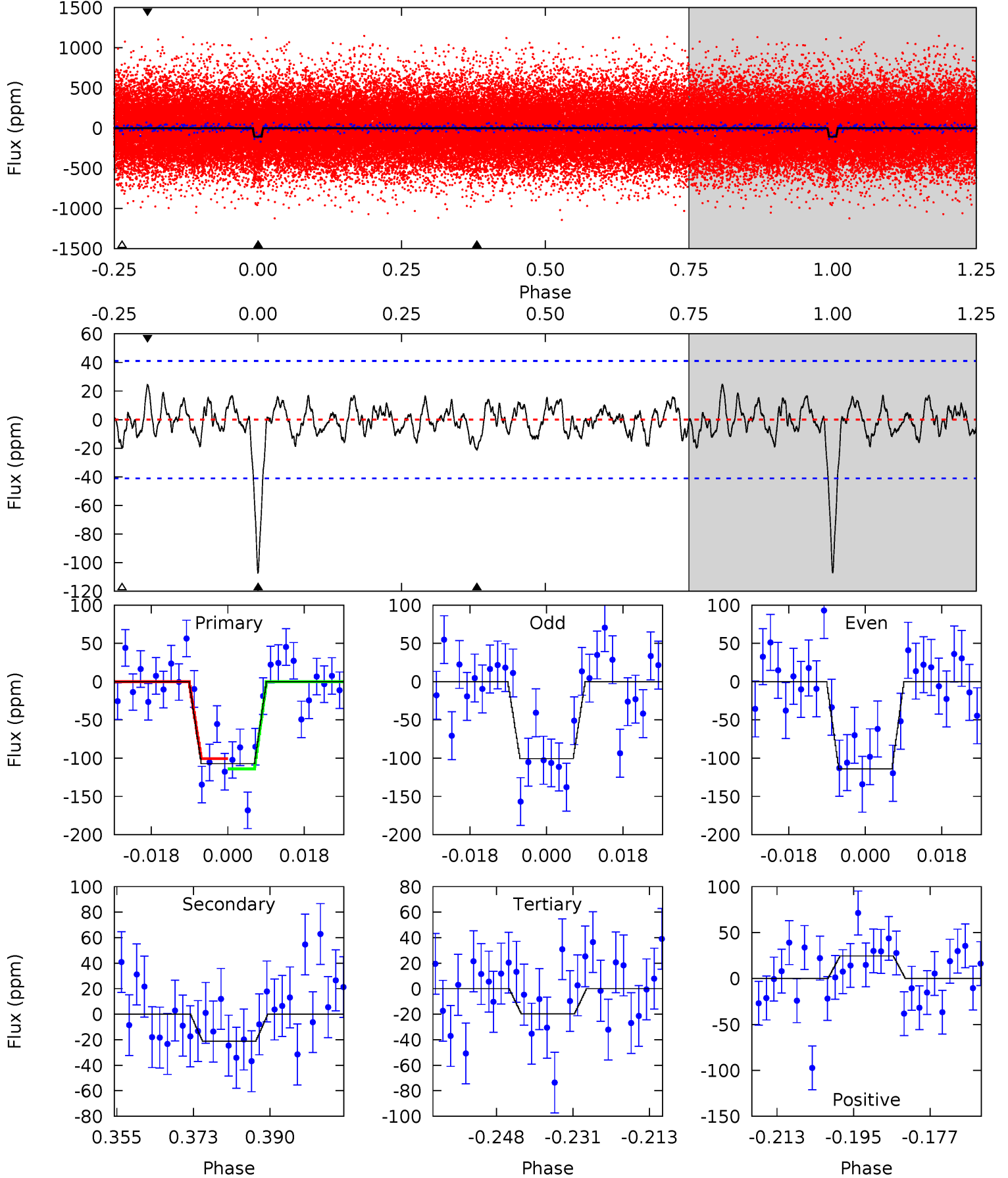
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	3.80	2.86	3.65	4.98	2.49	1.23	8.77	7.98	0.94	0.15	1.38	0.95	0.24	0.75



Alt Model-Shift Uniqueness Test

012256520-02, P = 7.251031 Days, E = 130.934201 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	2.53	2.36	2.94	4.92	2.37	0.98	10.5	9.91	0.17	-0.41	0.80	0.99	0.19	0.81



Stellar Parameters For KIC 012256520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5382^{+80}_{-80}	$4.571^{+0.015}_{-0.095}$	$0.100^{+0.150}_{-0.150}$	$0.827^{+0.091}_{-0.028}$	$0.928^{+0.033}_{-0.065}$	$2.310^{+0.187}_{-0.619}$
	+1%/-1%	+0%/-2%	+150%/-150%	+11%/-3%	+4%/-7%	+8%/-27%
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 012256520-02 / KOI 2264.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-37 ± 10	$1.31^{+0.95}_{-0.74}$	1142^{+33}_{-25}	3856^{+1459}_{-631}	58^{+261}_{-39}
Alt.	-21 ± 8	$1.13^{+0.95}_{-0.70}$	1141^{+36}_{-24}	3675^{+1647}_{-662}	46^{+261}_{-33}

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 $A_{obs} \gg 1.0$

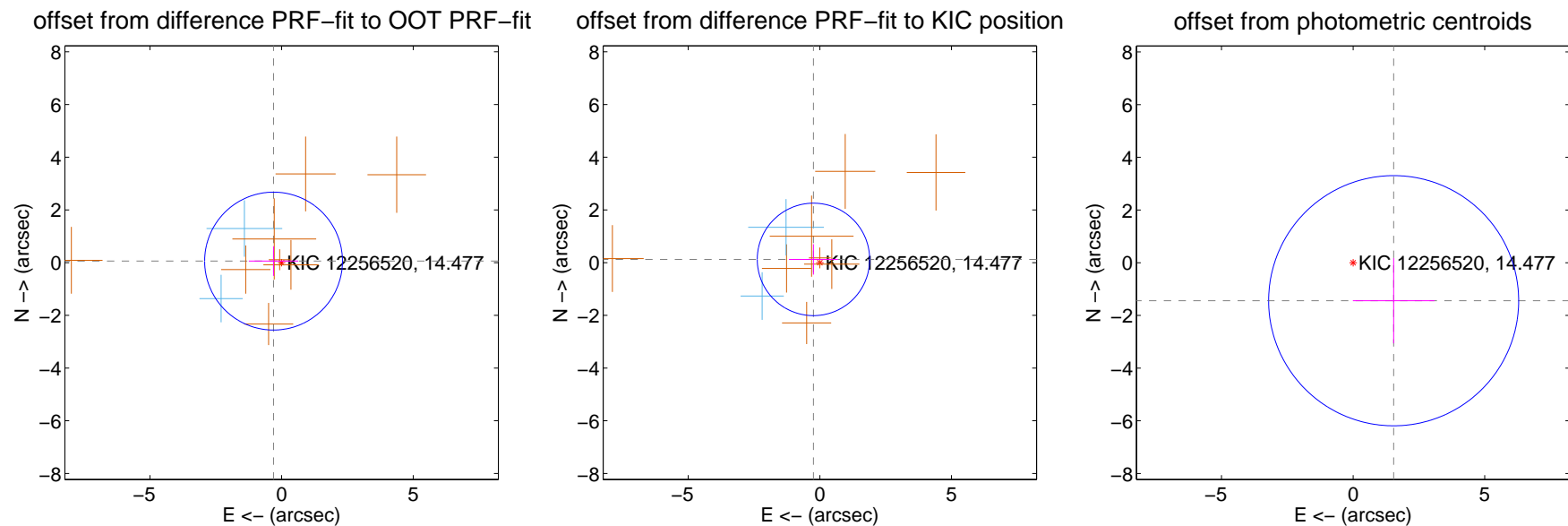
DV Centroid Data

Supplemental centroid analysis for 012256520-02. Kepler magnitude: 14.48. Transit SNR 8.74

There are 2 quarters with good PRF difference image offsets

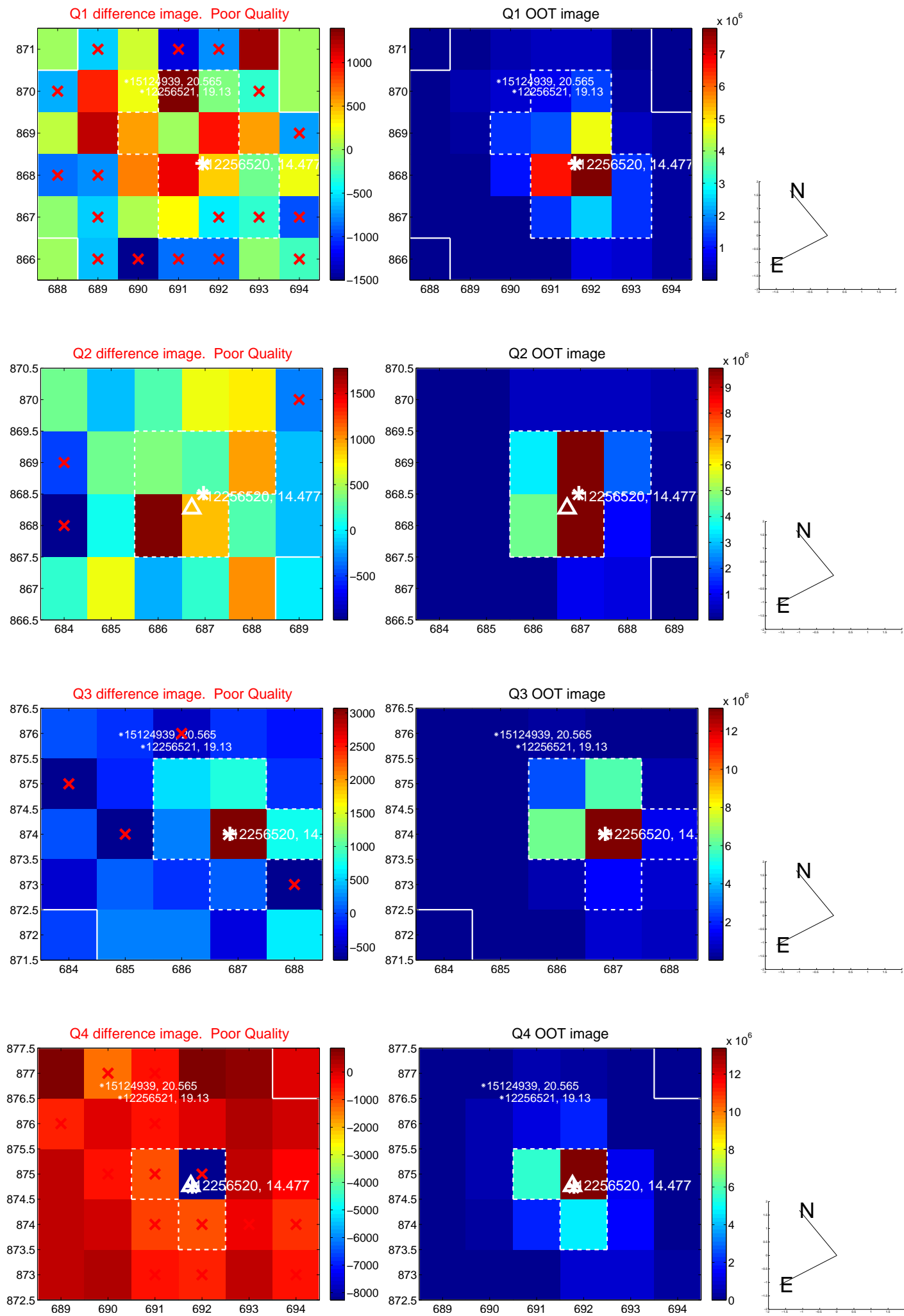
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.310 ± 0.872	0.36	0.305 ± 0.939	0.059 ± 0.563
PRF-fit source offset from KIC position	0.272 ± 0.711	0.38	0.242 ± 0.930	0.123 ± 0.576
photometric centroid source offset	2.11 ± 1.58	1.33	-1.54 ± 1.55	-1.44 ± 1.62

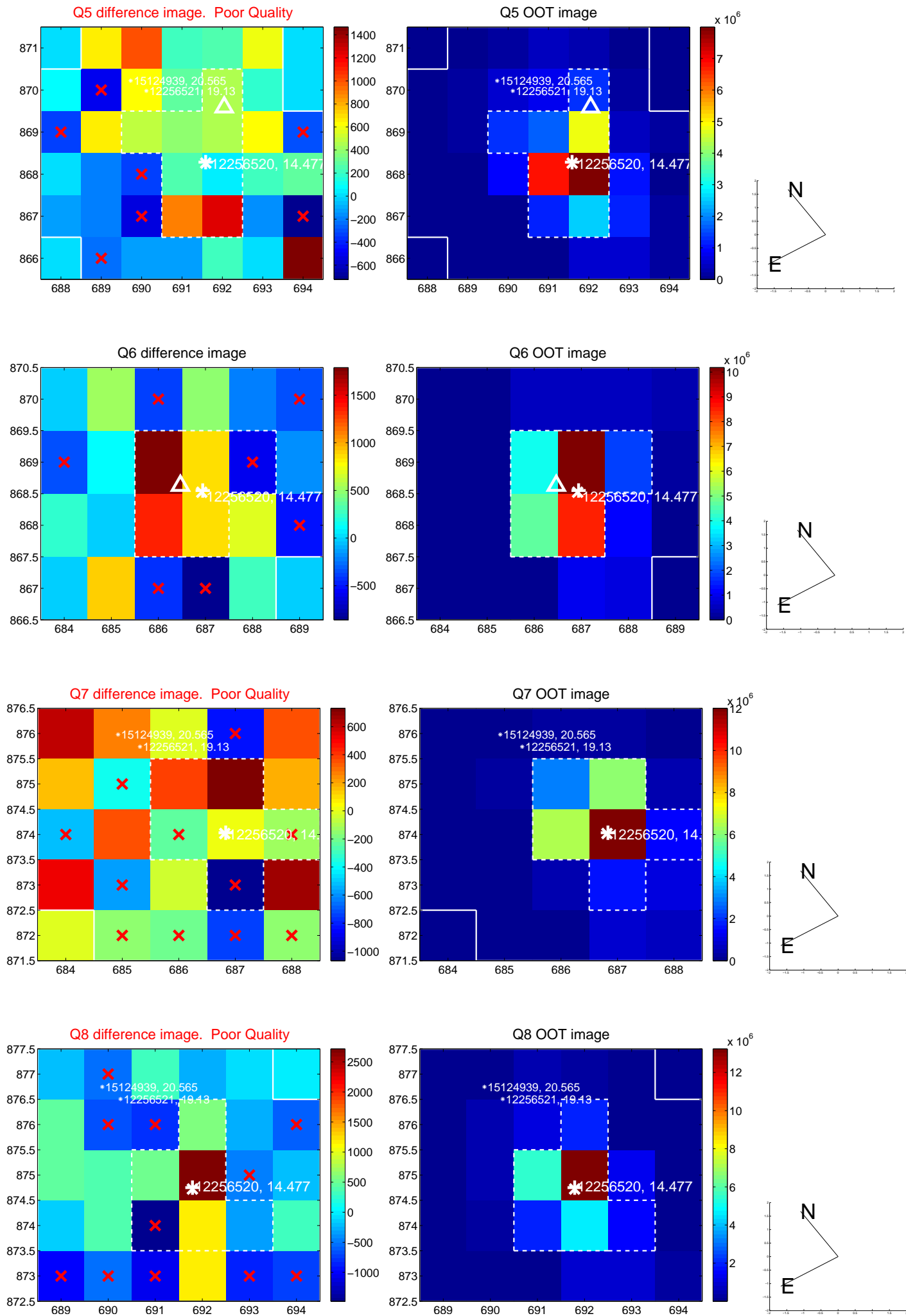


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

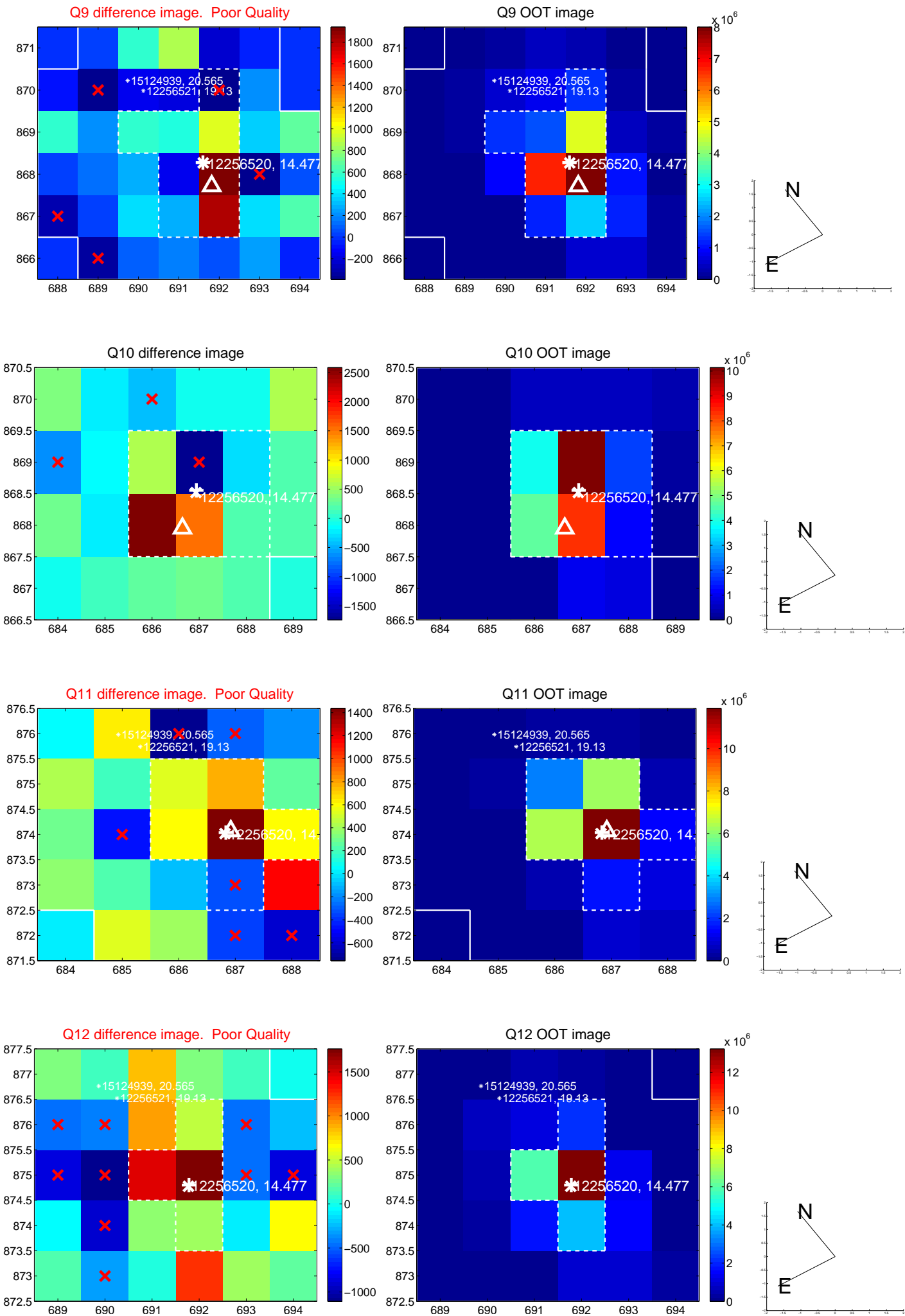
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



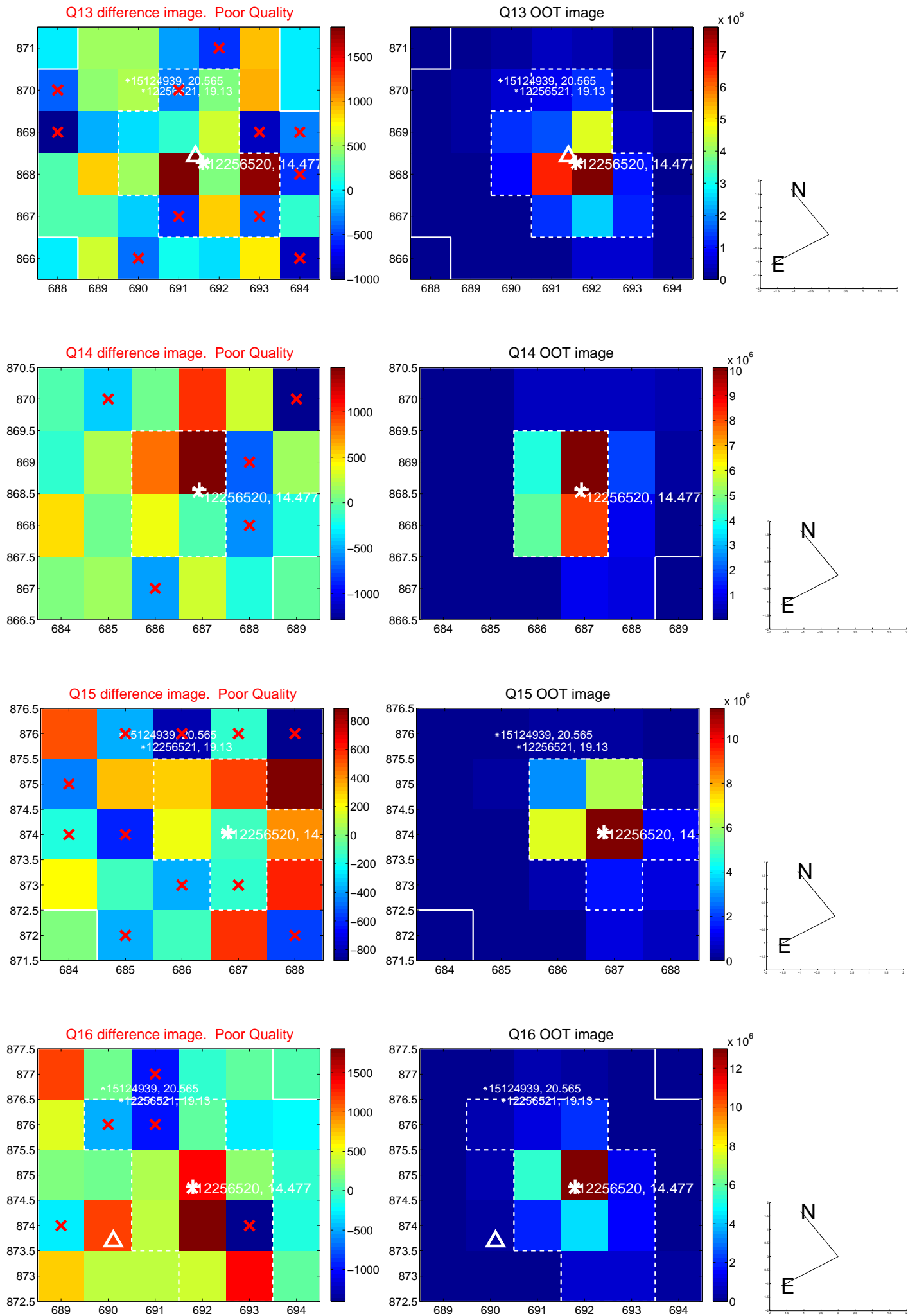
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



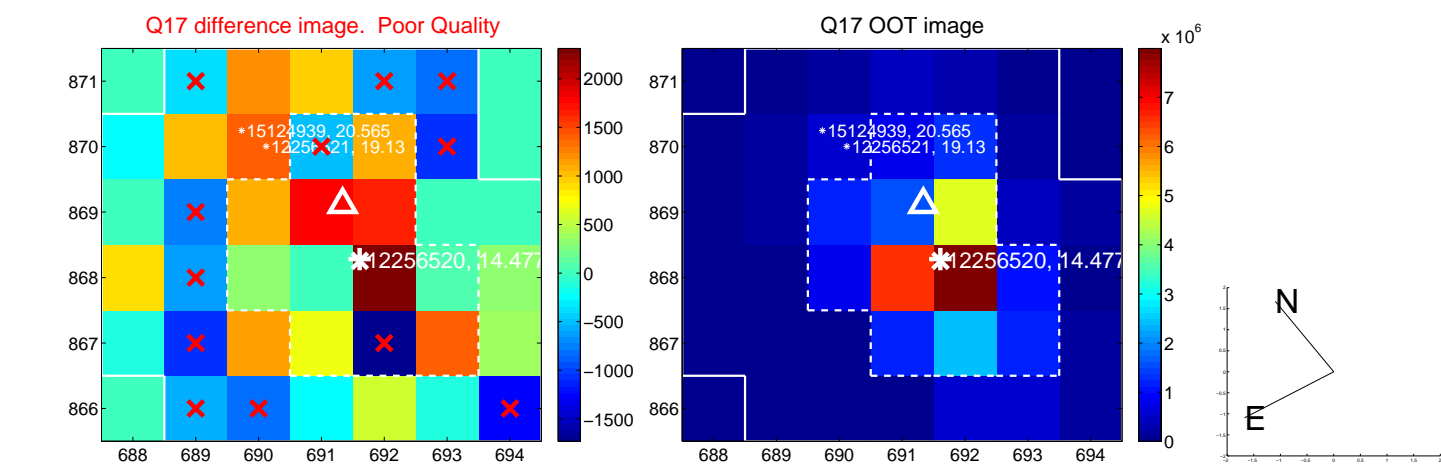
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



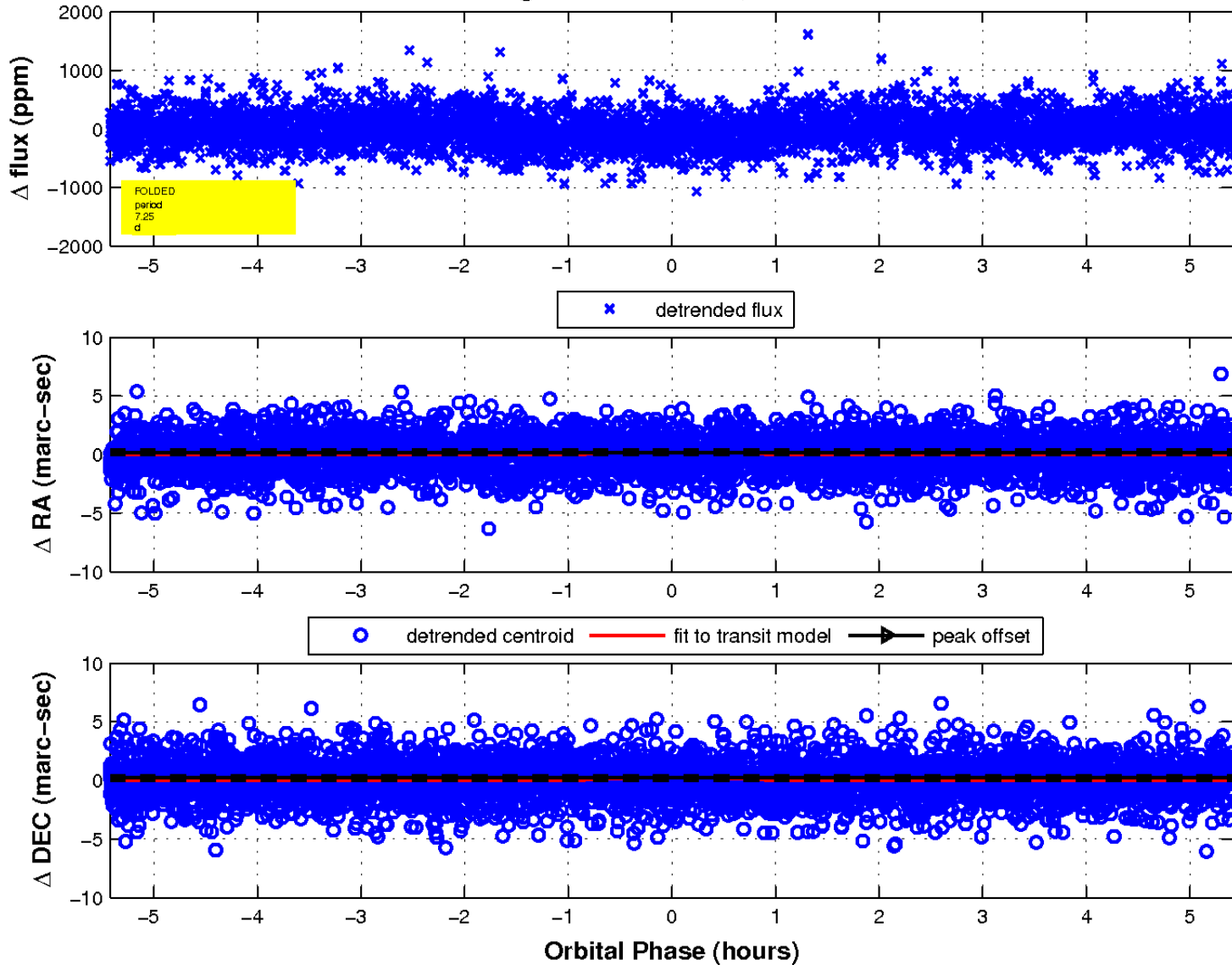
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

