

KIC 007138446

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})
007138446-01	OBS	No	0.901022	132.406470	31.3	2.936	8.5	5.2	1.66	7096	1.09	15235.27
007138446-02	OBS	No	86.562623	188.174863	419.4	14.156	7.7	4.5	1.66	7096	3.51	34.62
007138446-03	OBS	No	3.949040	134.001209	146.9	4.514	8.5	7.9	1.66	7096	2.33	2124.10
007138446-04	OBS	No	0.901038	131.947828	53.0	3.487	10.4	7.5	1.66	7096	1.22	15234.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007138446-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007138446-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_KIC_POS

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

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

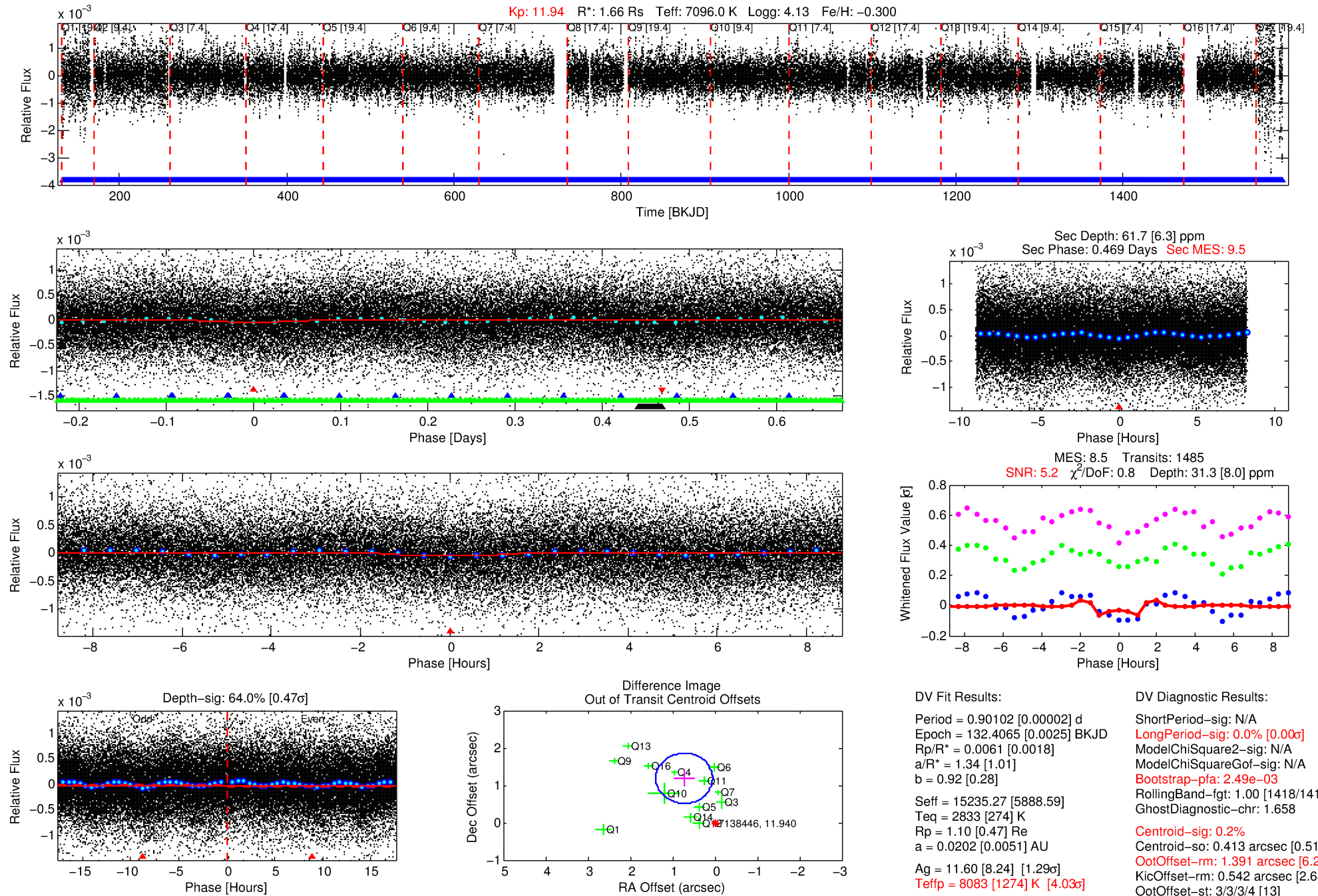
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007138446-01

No Significant Match Found

DV One-Page Summary

KIC: 7138446 Candidate: 1 of 4 Period: 0.901 d



DV Fit Results:

Period = 0.90102 [0.00002] d
Epoch = 132.4065 [0.0025] BKJD
Rp/R* = 0.0061 [0.0018]
a/R* = 1.34 [1.01]
b = 0.92 [0.28]
Seff = 15235.27 [5888.59]
Teq = 2833 [274] K
Rp = 1.10 [0.47] Re
a = 0.0202 [0.0051] AU
Ag = 11.60 [8.24] [1.29σ]
Teffp = 8083 [1274] K [4.03σ]

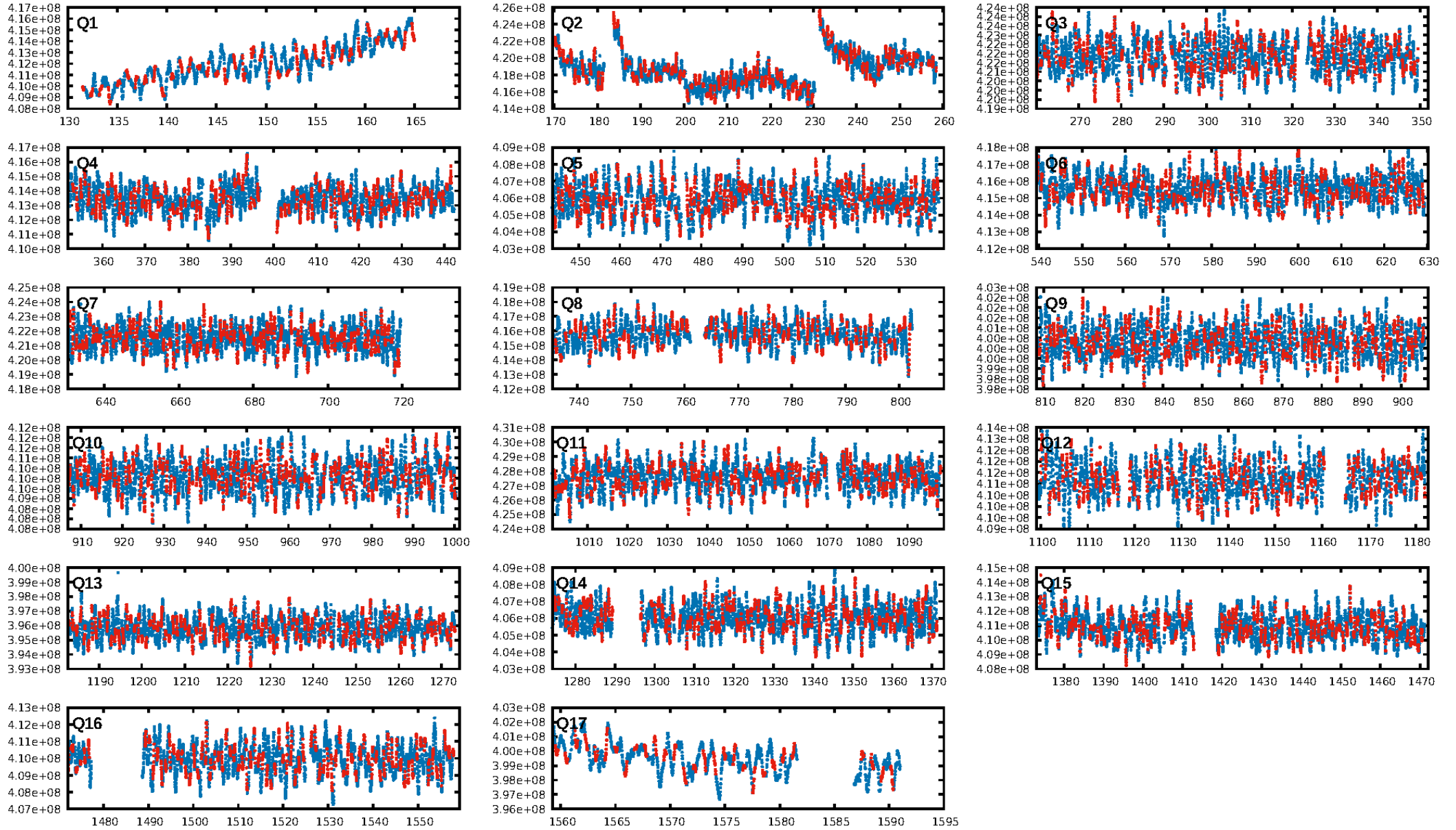
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.49e-03
RollingBand-fgt: 1.00 [1418/1418]
GhostDiagnostic-chr: 1.658
Centroid-sig: 0.2%
Centroid-so: 0.413 arcsec [0.51σ]
OotOffset-rm: 1.391 arcsec [6.21σ]
OotOffset-st: 3/3/3/4 [13]
KicOffset-rm: 0.542 arcsec [2.63σ]
KicOffset-st: 3/3/3/4 [13]
DiffImageQuality-fgm: 0.69 [9/13]
DiffImageOverlap-fno: 1.00 [17/17]

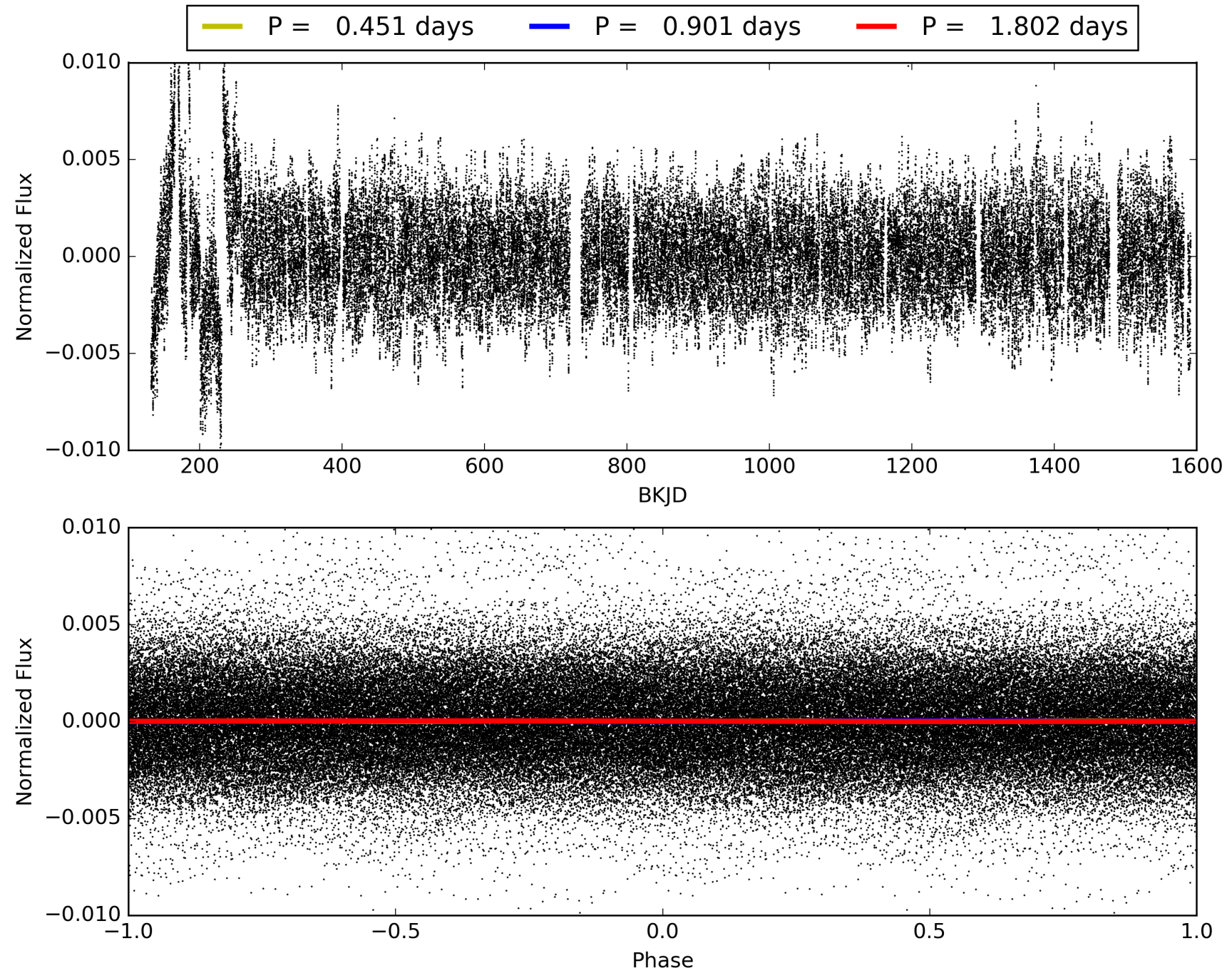
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:33:11 Z

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

TCE 007138446-01, PDC Light Curves

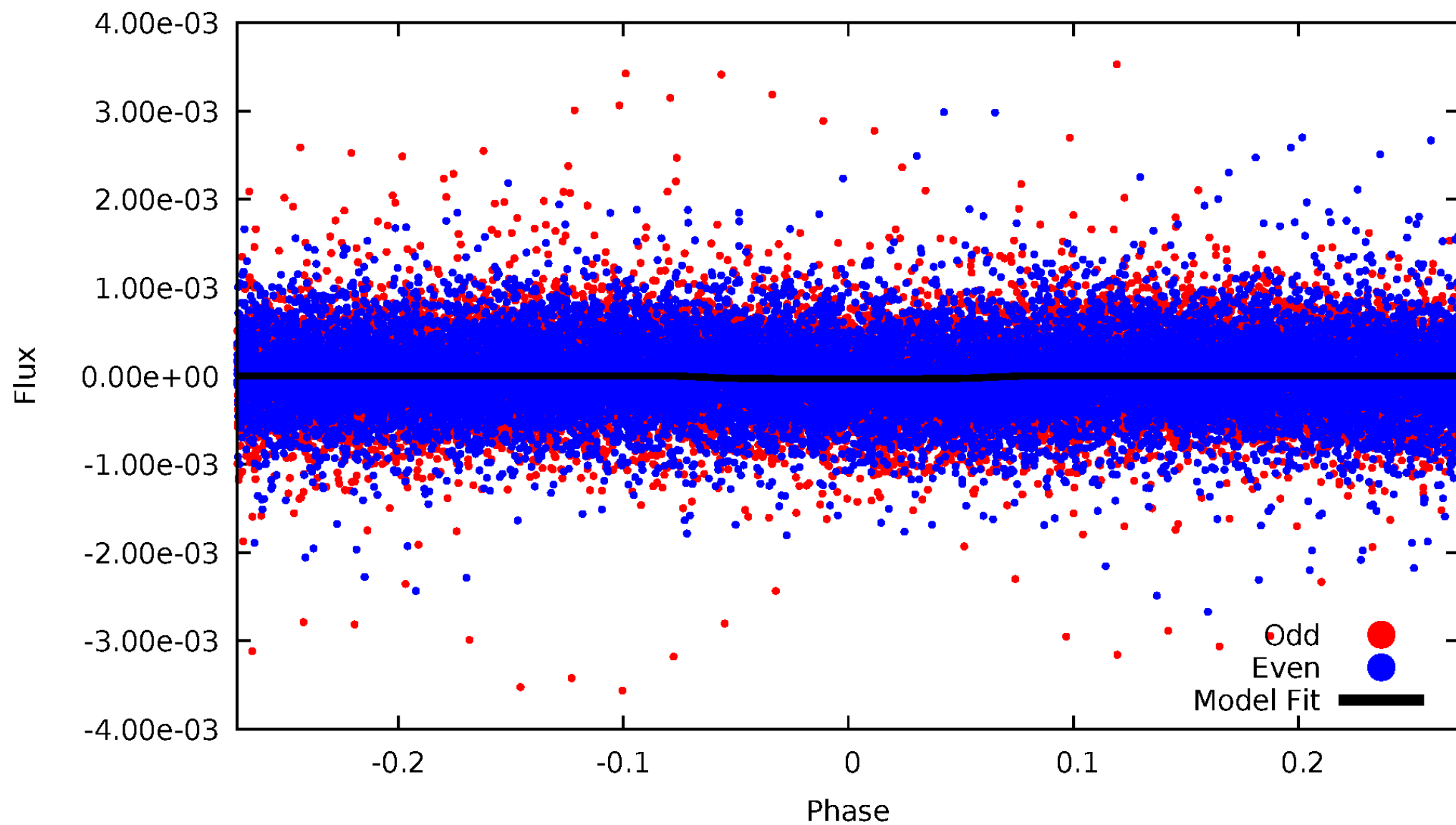


TCE 007138446-01



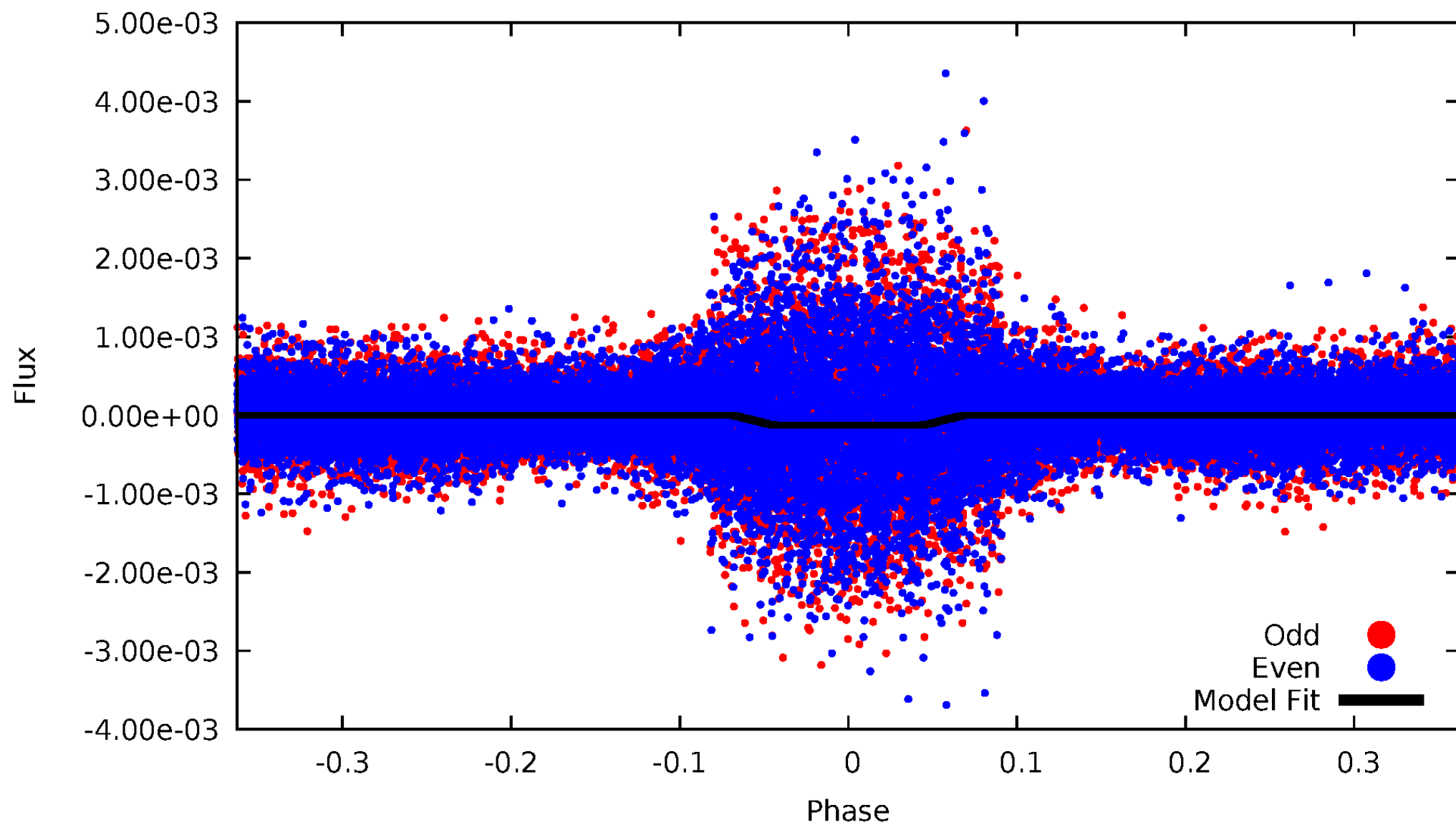
DV Odd/Even

TCE 007138446-01



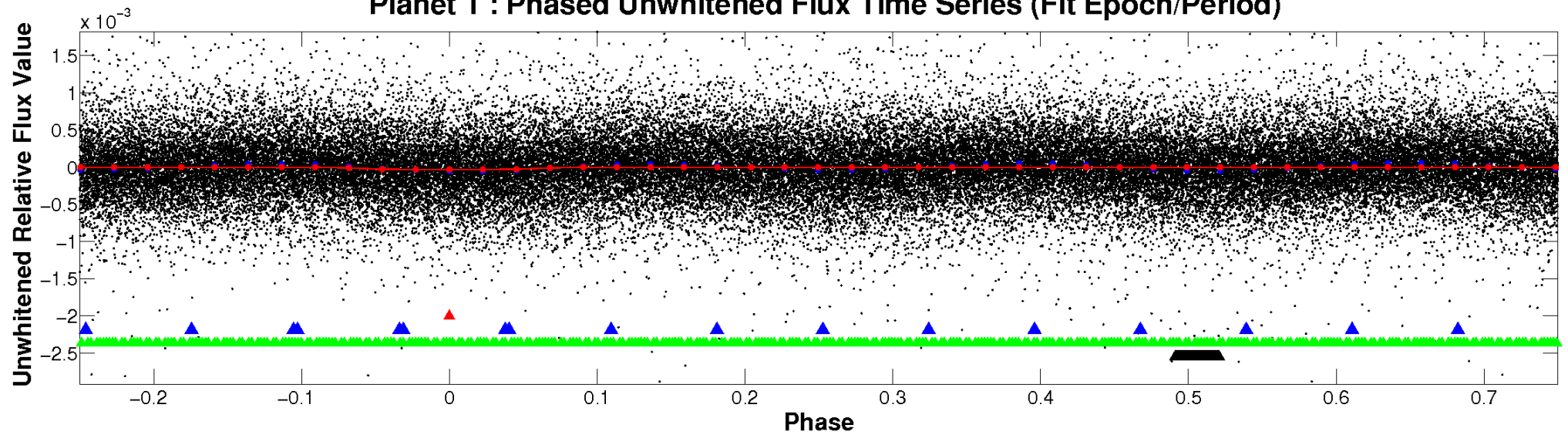
ALT Odd/Even

TCE 007138446-01

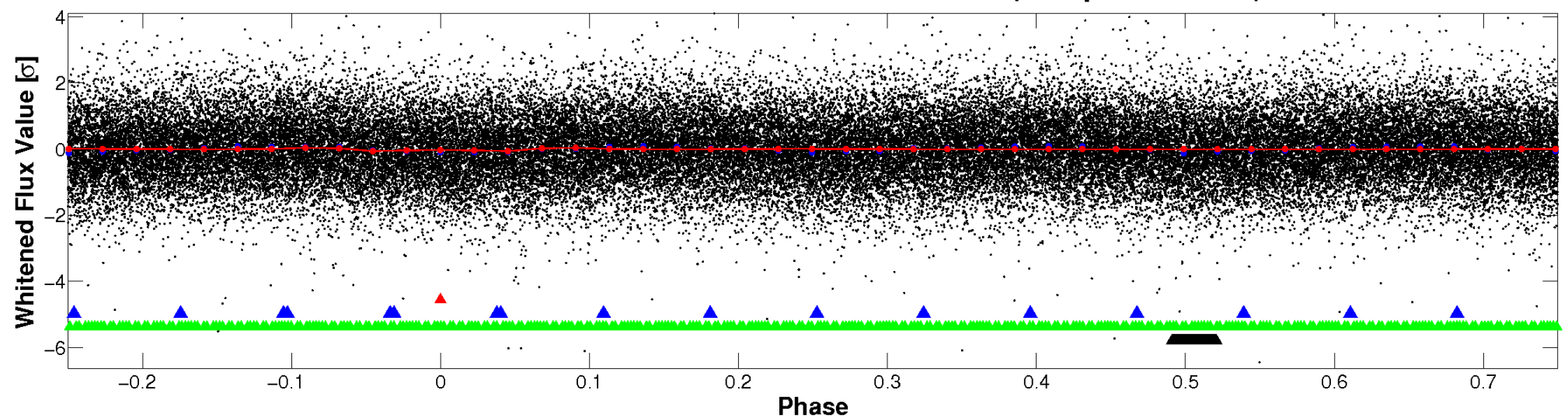


Non-Whitened Vs. Whitened Light Curve

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

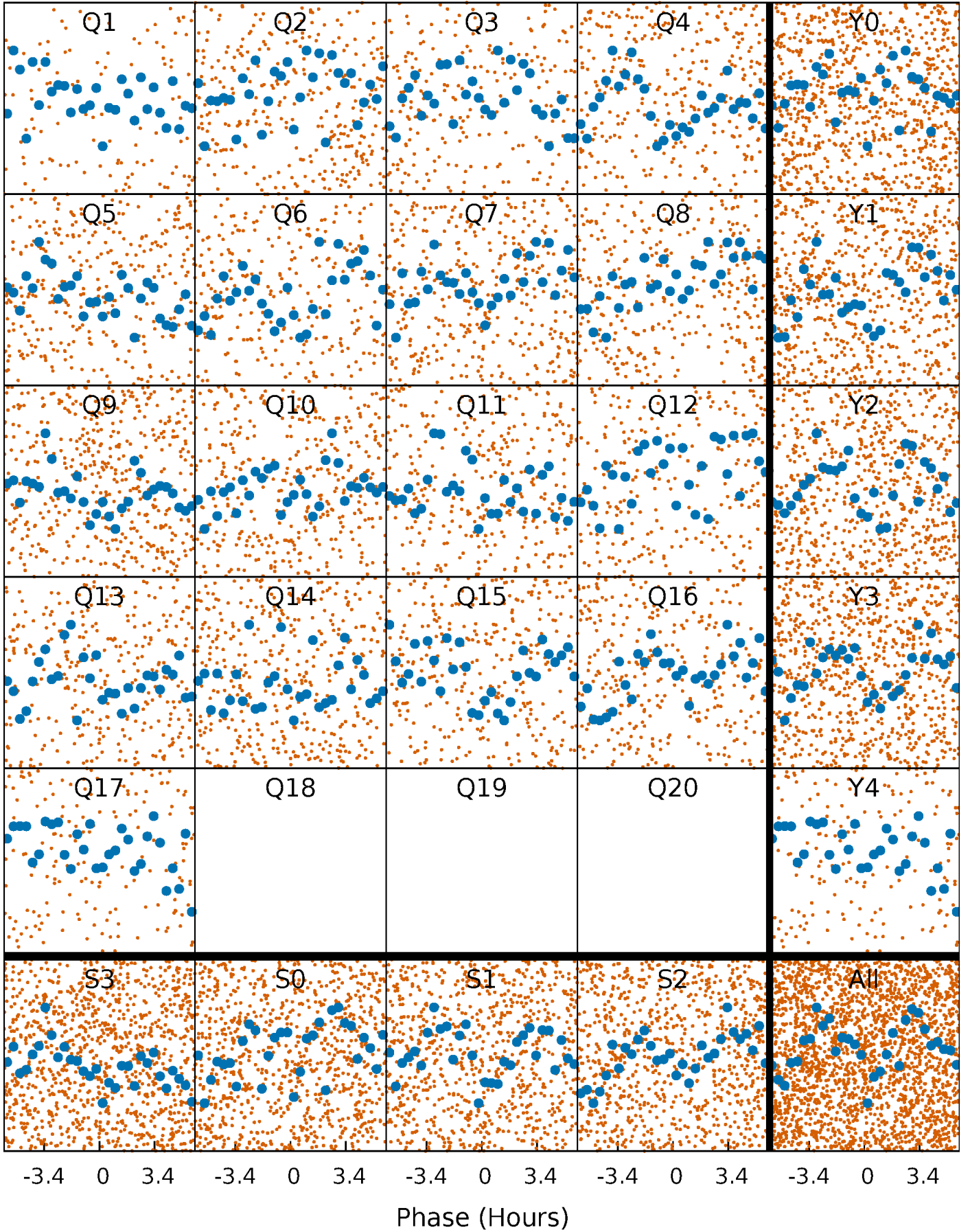


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



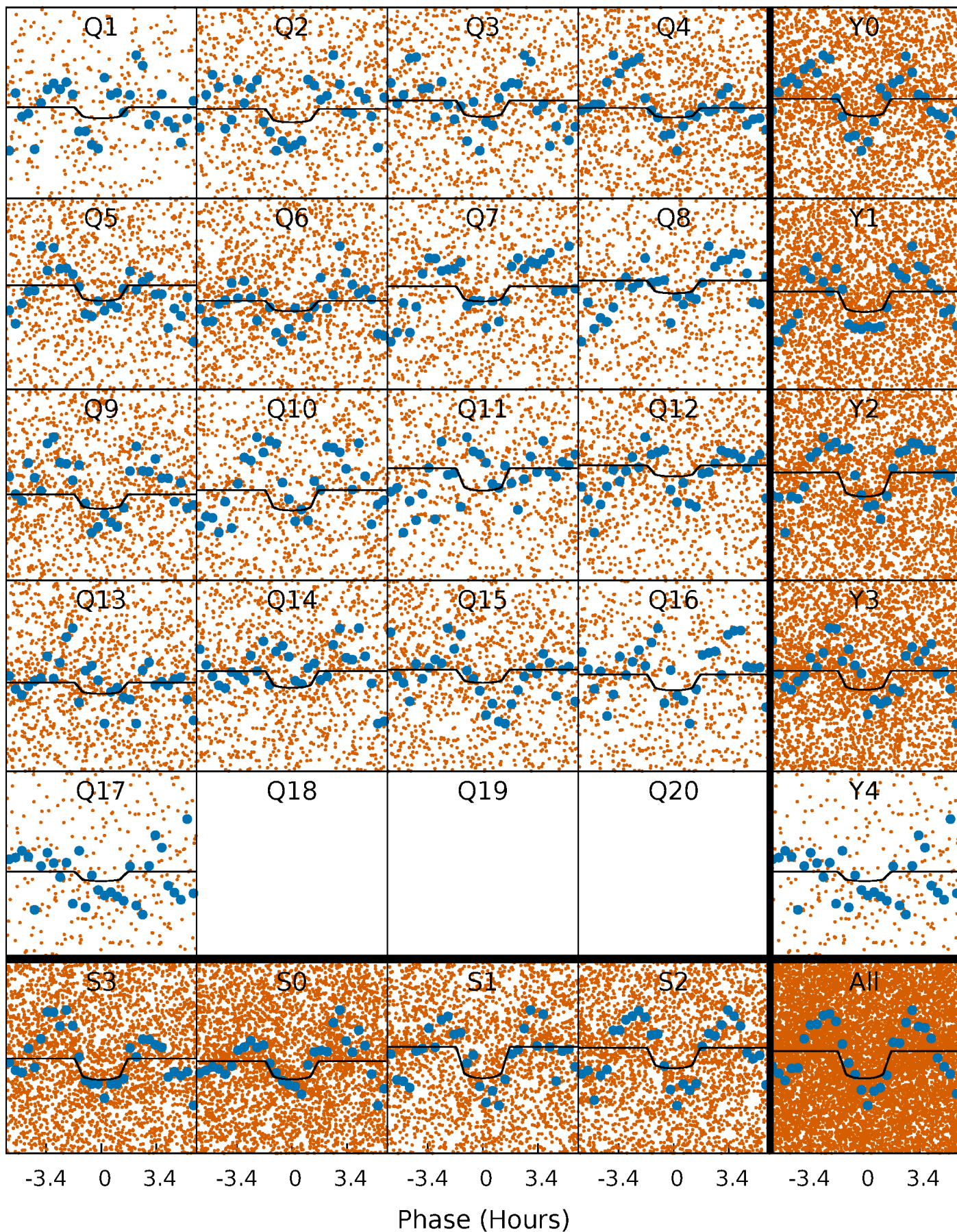
PDC Quarter-Phased Transit Curves

TCE 007138446-01 P= 0.901022 Days $T_0=132.406470$ (BKJD)



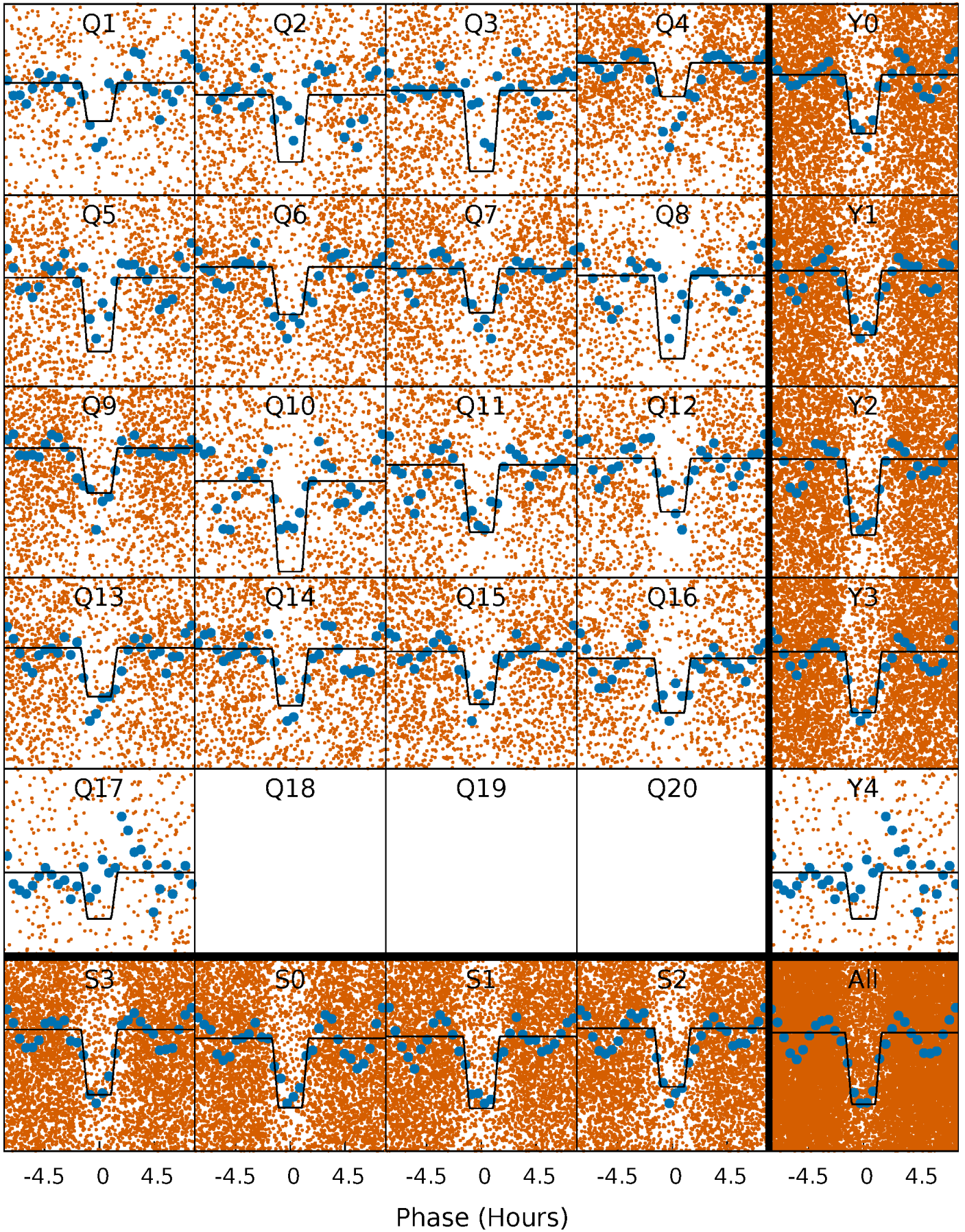
DV Quarter-Phased Transit Curves

TCE 007138446-01 P= 0.901022 Days $T_0=132.406470$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

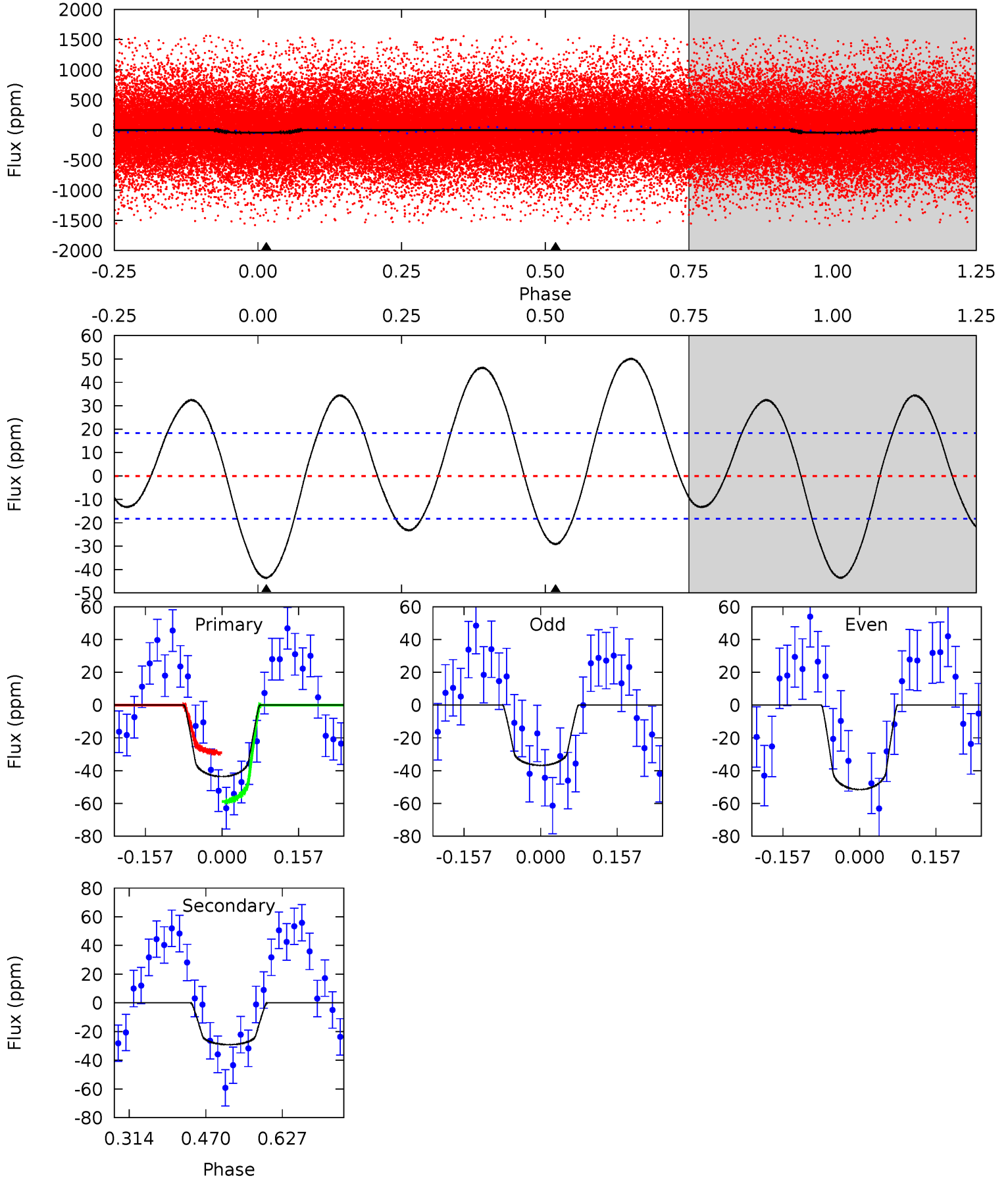
TCE 007138446-01 P= 0.901068 Days $T_0=132.386746$ (BKJD)



DV Model-Shift Uniqueness Test

007138446-01, P = 0.901022 Days, E = 131.505448 Days

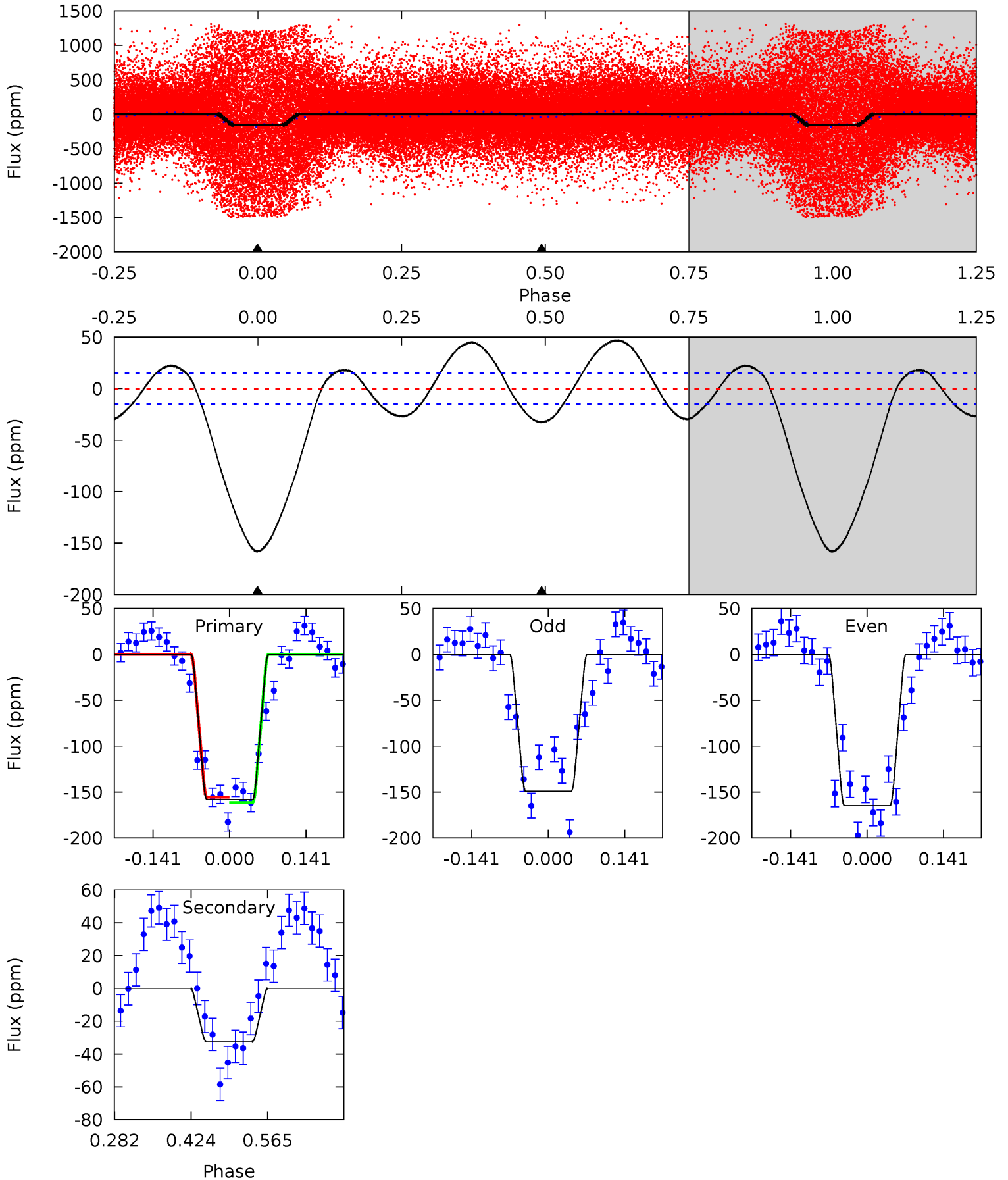
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	7.11	0	0	4.47	1.42	4.32	10.6	10.6	7.11	7.11	1.81	1.18	0.53	3.64



Alt Model-Shift Uniqueness Test

007138446-01, P = 0.901068 Days, E = 131.485678 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.6	9.79	0	0	4.49	1.47	6.46	47.6	47.6	9.79	9.79	2.28	0.91	0.23	0.86



Stellar Parameters For KIC 007138446

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7096^{+171}_{-256}	$4.133^{+0.175}_{-0.193}$	$-0.300^{+0.300}_{-0.350}$	$1.657^{+0.502}_{-0.411}$	$1.363^{+0.214}_{-0.235}$	$0.422^{+0.416}_{-0.211}$
	+2%/-4%	+4%/-5%	+100%/-117%	+30%/-25%	+16%/-17%	+99%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007138446-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-29 ± 4	$1.09^{+0.40}_{-0.36}$	3980^{+308}_{-284}	6591^{+1647}_{-957}	$5.547^{+6.965}_{-2.657}$
Alt.	-33 ± 3	$2.04^{+0.44}_{-0.39}$	3971^{+313}_{-259}	4882^{+488}_{-386}	$1.756^{+0.933}_{-0.584}$

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 $A_{obs} \gg 1.0$

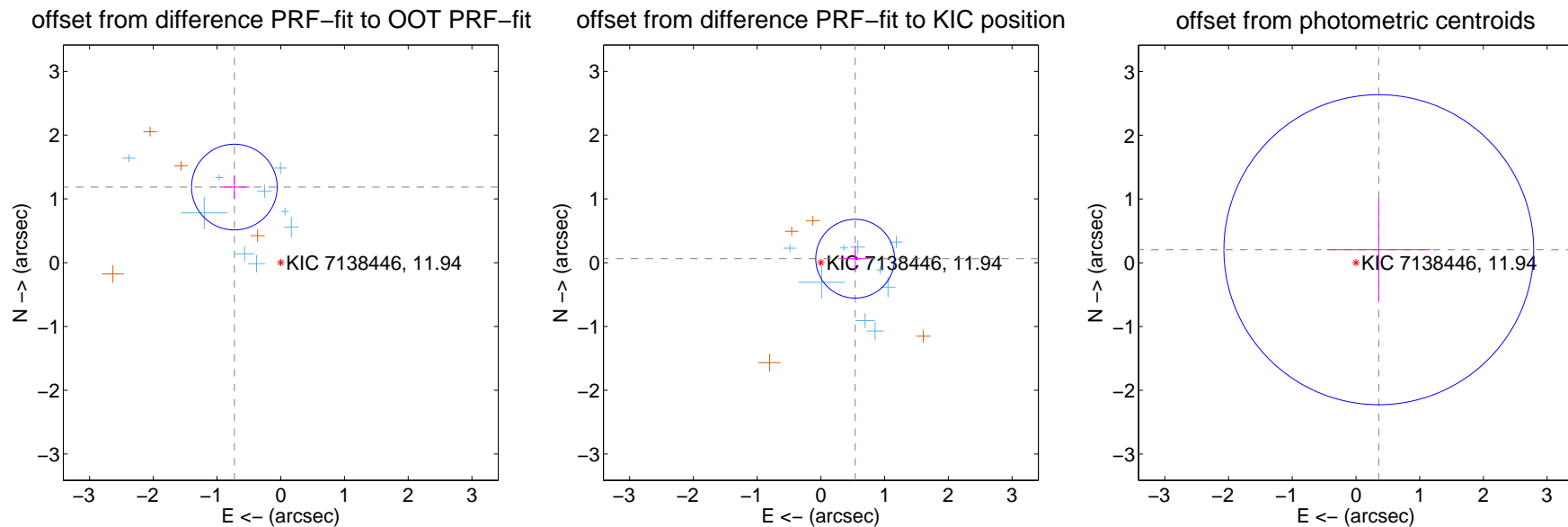
DV Centroid Data

Supplemental centroid analysis for 007138446-01. **Kepler magnitude: 11.94.** Transit SNR 5.21

There are 9 quarters with good PRF difference image offsets

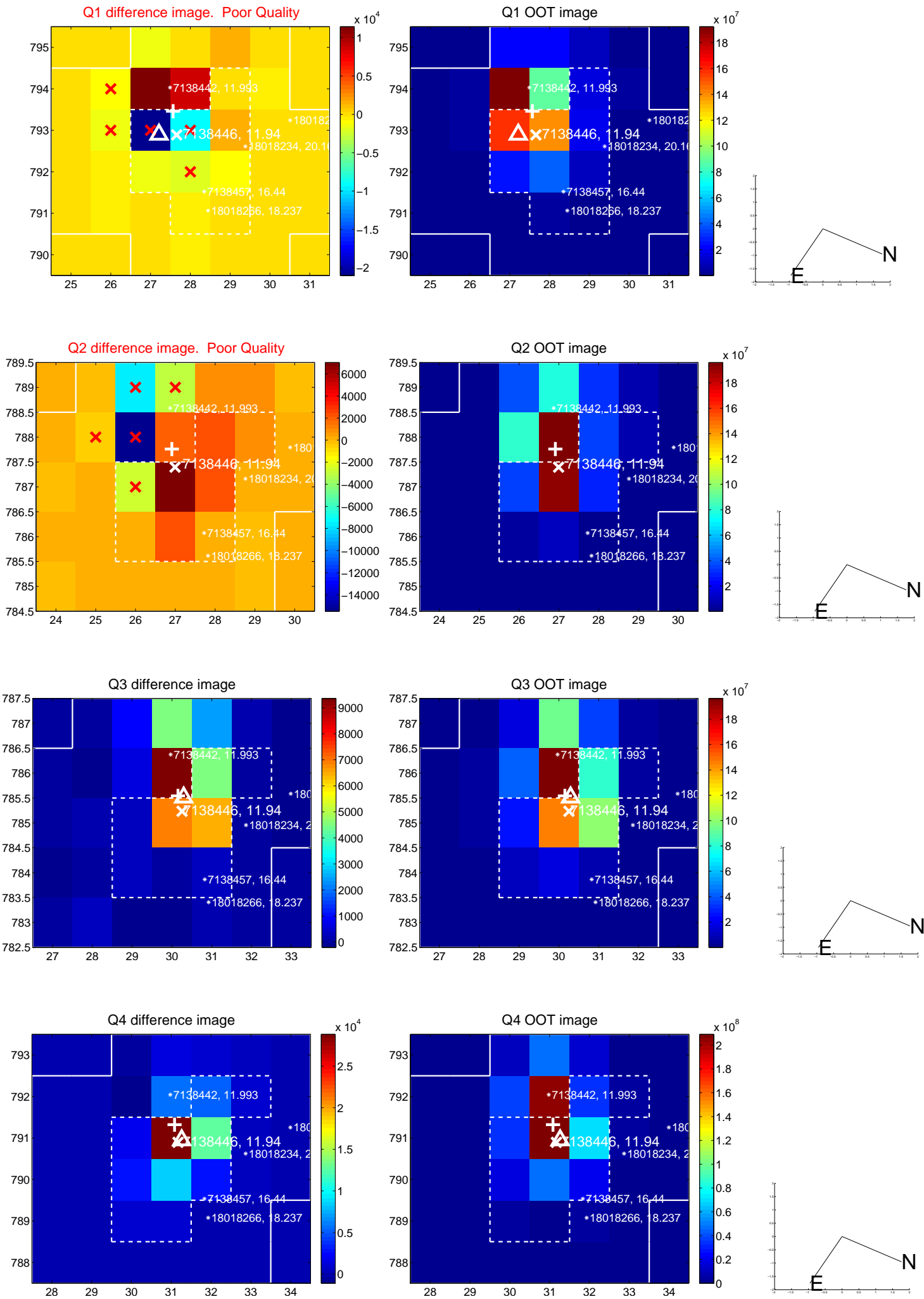
The direct PRF centroid is offset from the target star catalog position by about 1.51 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.391 ± 0.224	6.21	0.728 ± 0.234	1.186 ± 0.190
PRF-fit source offset from KIC position	0.542 ± 0.206	2.63	-0.538 ± 0.209	0.063 ± 0.201
photometric centroid source offset	0.41 ± 0.81	0.51	-0.36 ± 0.81	0.20 ± 0.80

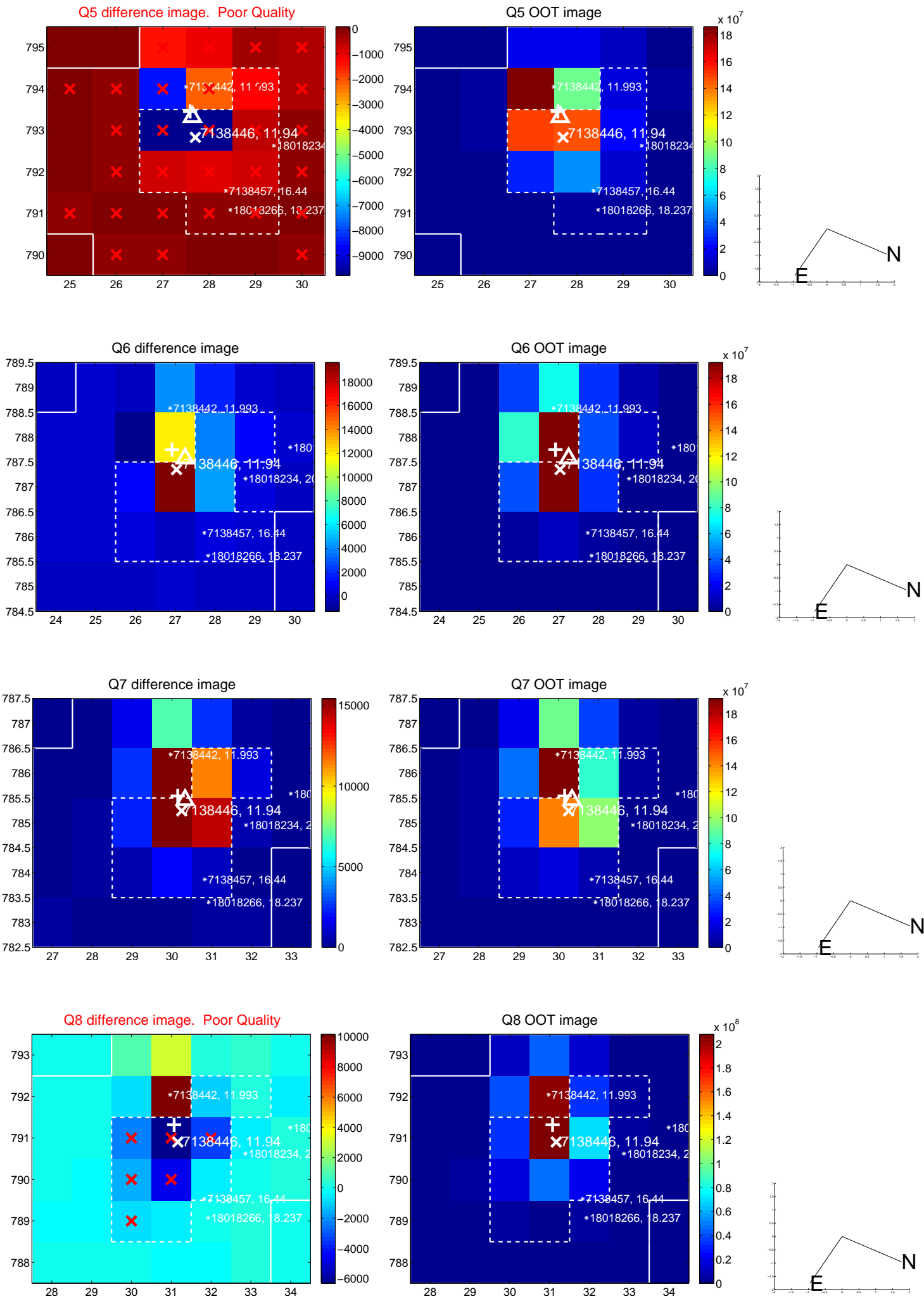


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

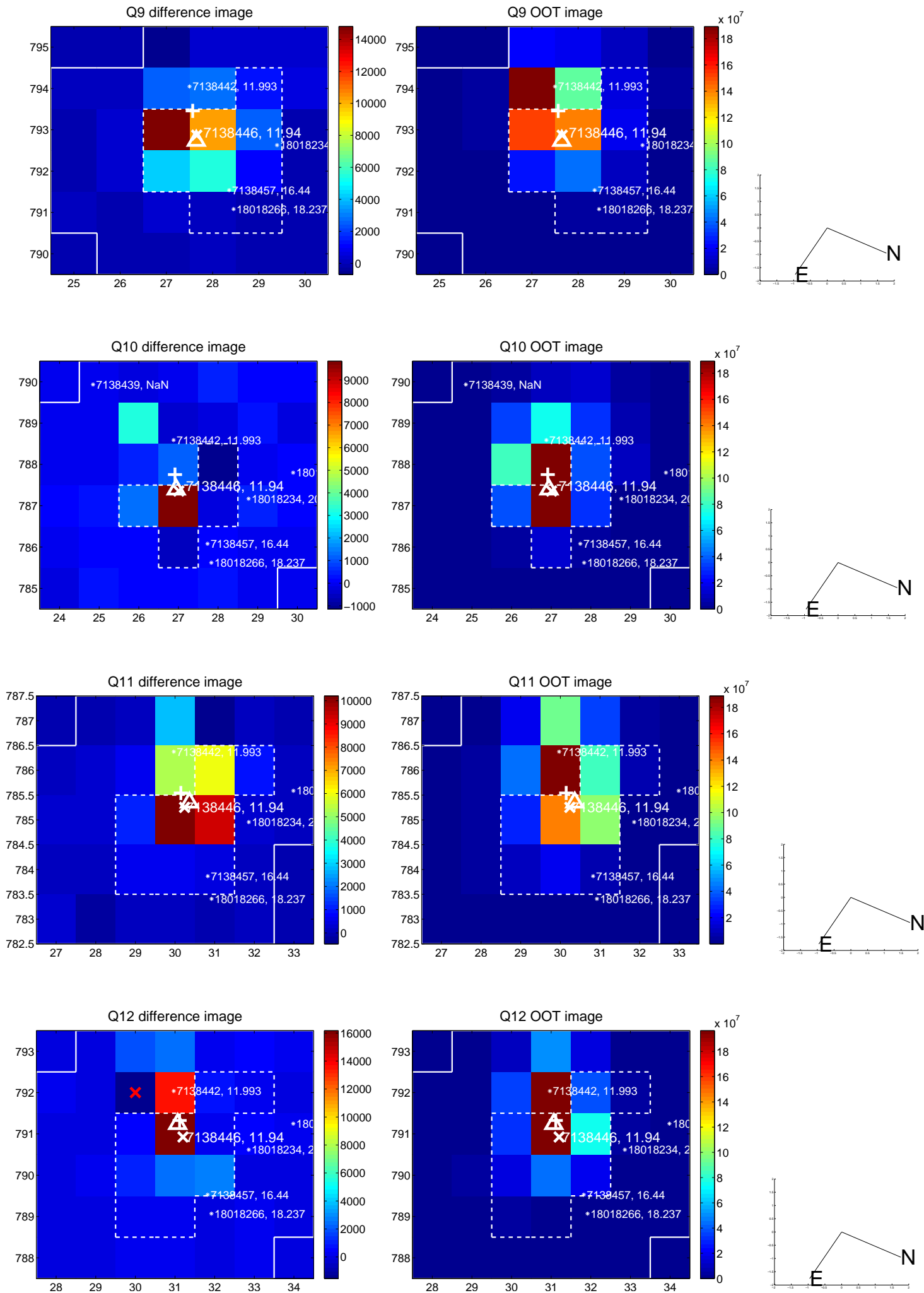
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



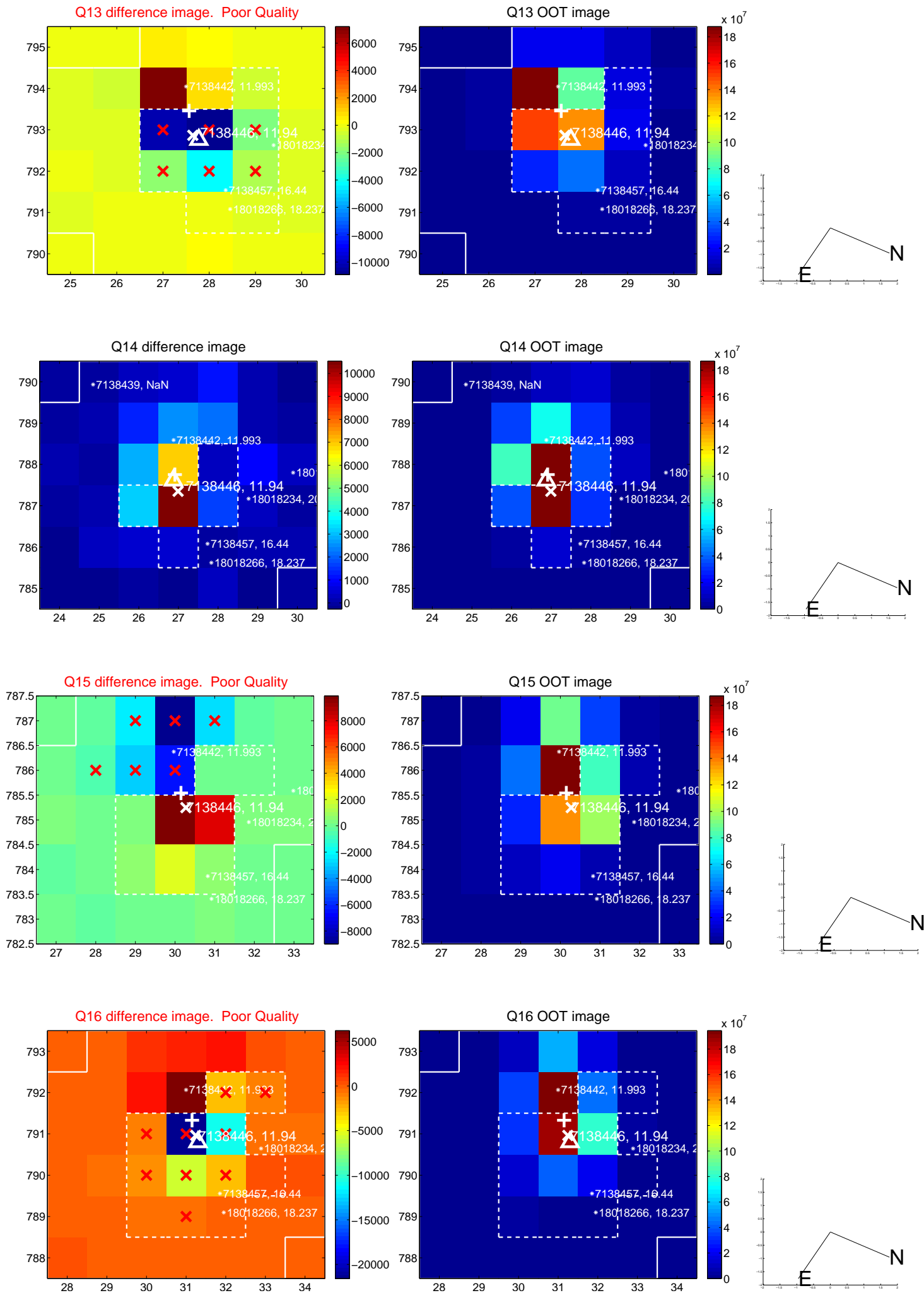
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



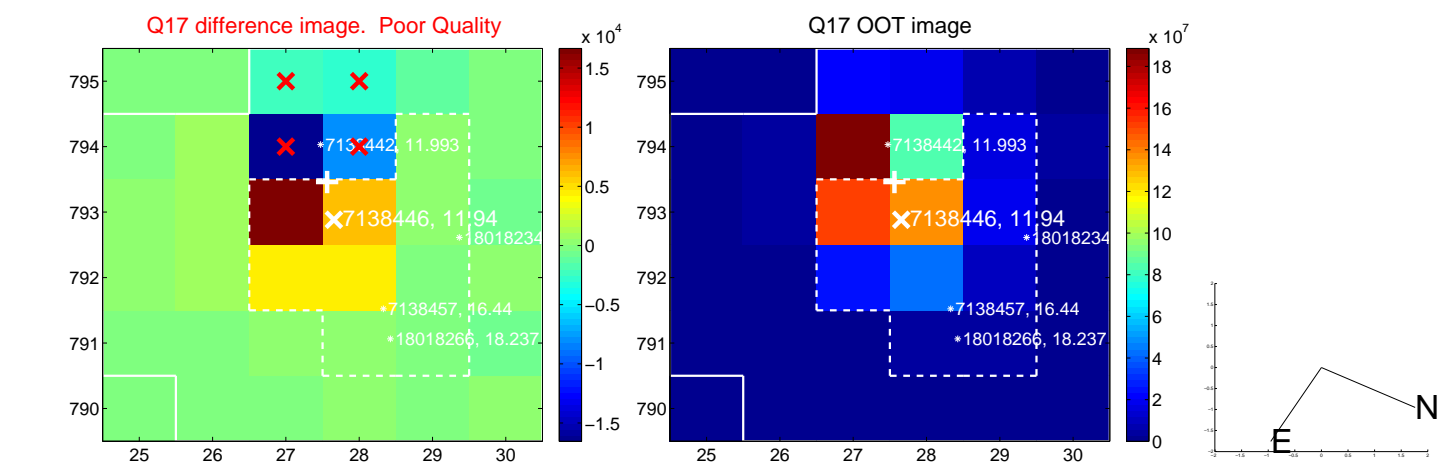
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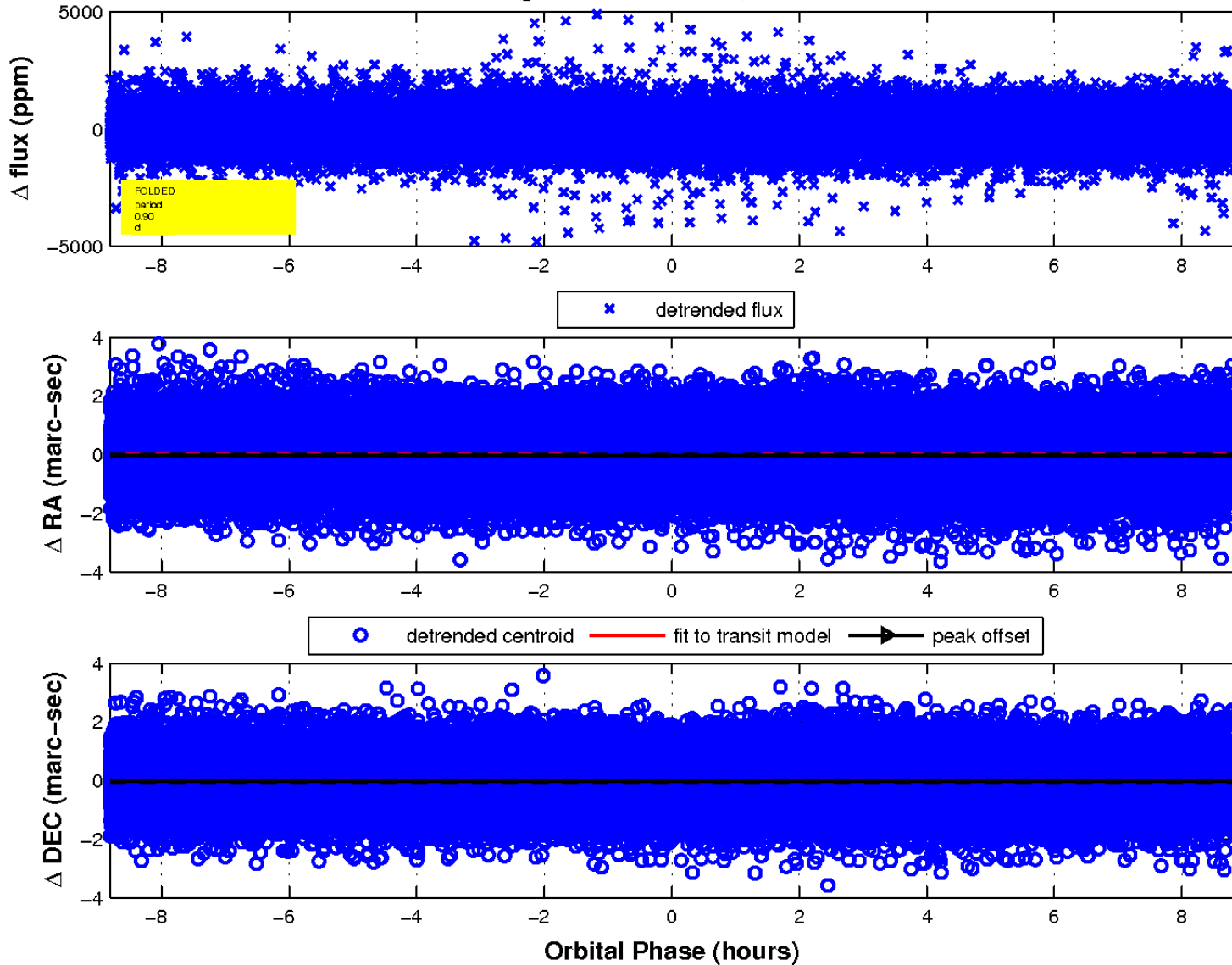
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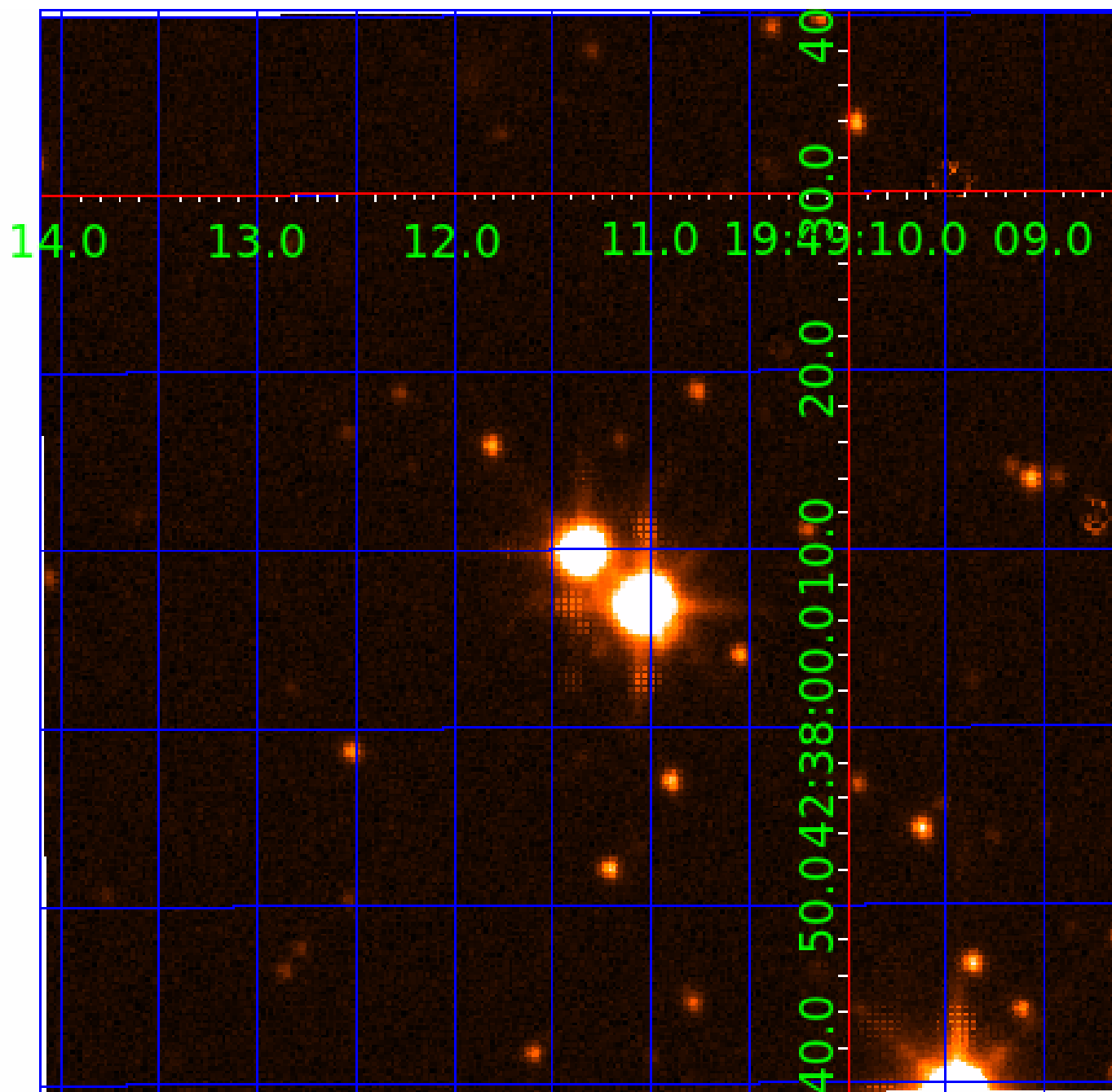


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 007138446

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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007138446-04	OBS	No	0.901038	131.947828	53.0	3.487	10.4	7.5	1.66	7096	1.22	15234.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007138446-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007138446-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_KIC_POS

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

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

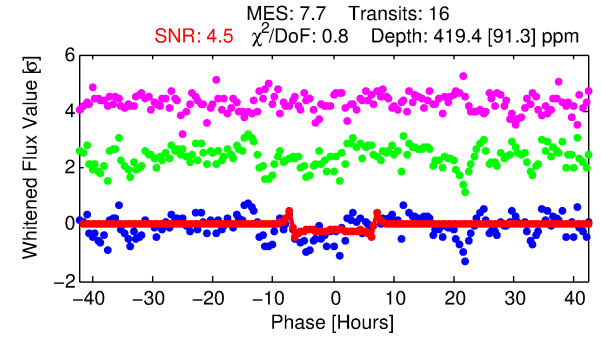
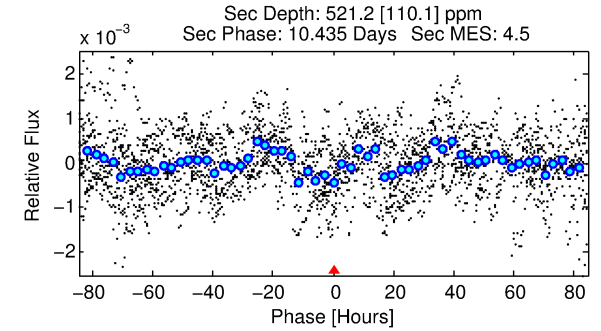
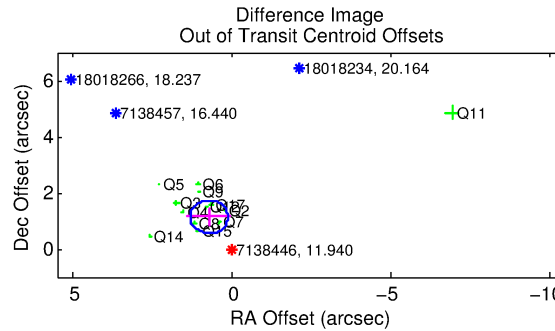
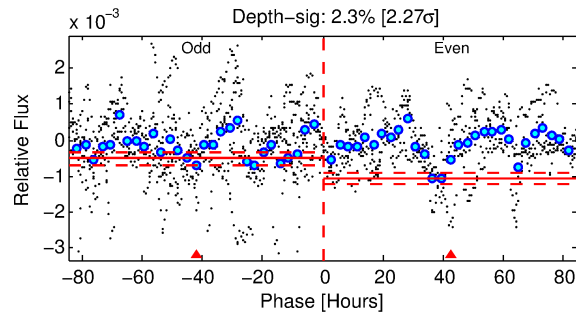
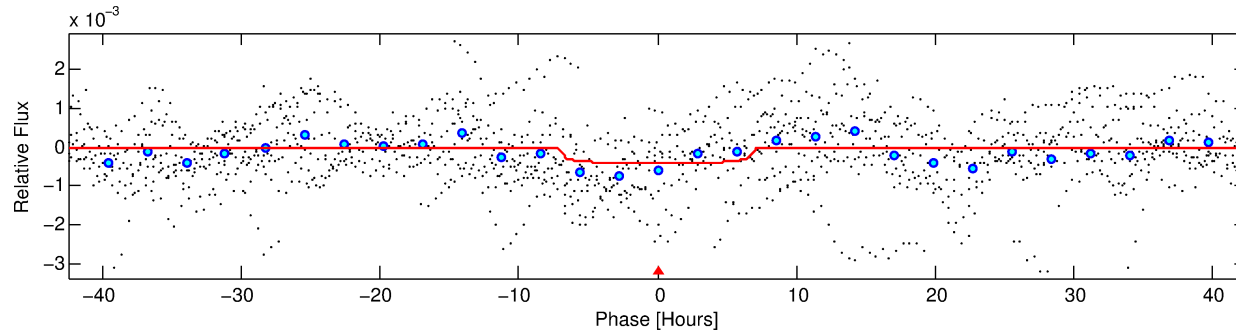
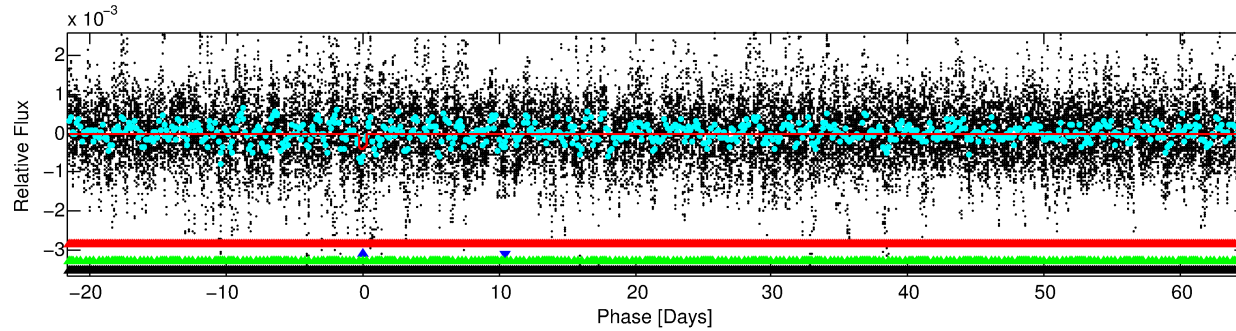
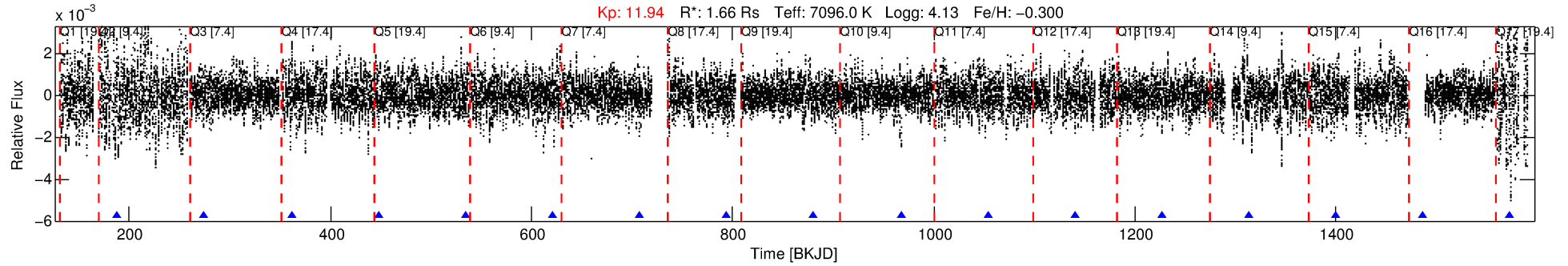
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007138446-02

No Significant Match Found

DV One-Page Summary

KIC: 7138446 Candidate: 2 of 4 Period: 86.563 d



DV Fit Results:

Period = 86.56262 [0.00094] d
Epoch = 188.1749 [0.0079] BKJD
 $R_p/R^* = 0.0194$ [0.0051]
 $a/R^* = 42.18$ [54.32]
 $b = 0.47$ [2.10]
 $\text{Seff} = 34.63$ [13.38]
 $T_{\text{eq}} = 619$ [60] K
 $R_p = 3.51$ [1.41] R_e
 $a = 0.4244$ [0.1063] AU
 $\text{Ag} = 4194.13$ [2819.78] [1.49 σ]
 $T_{\text{eff}} = 7696$ [1129] K [6.26 σ]

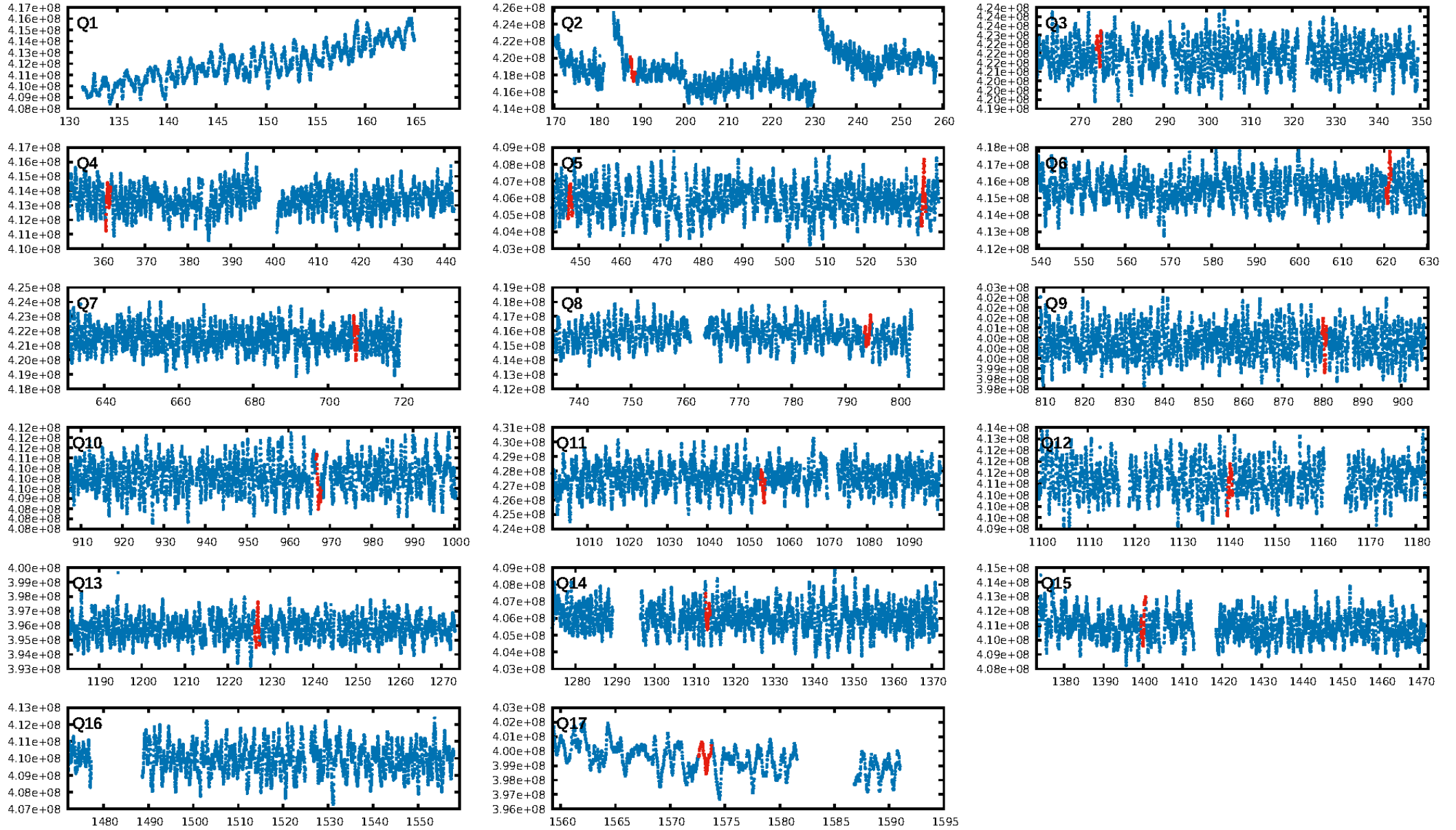
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [133.44 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 30.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.80e-13
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: 3.05
Centroid-sig: 6.5%
Centroid-so: 0.994 arcsec [1.74 σ]
OOTOffset-rm: 1.348 arcsec [6.84 σ]
KicOffset-rm: 0.337 arcsec [0.53 σ]
OOTOffset-st: 3/4/3/3 [13]
KicOffset-st: 3/4/3/3 [13]
DiffImageQuality-fgm: 0.54 [7/13]
DiffImageOverlap-fno: 0.00 [0/13]

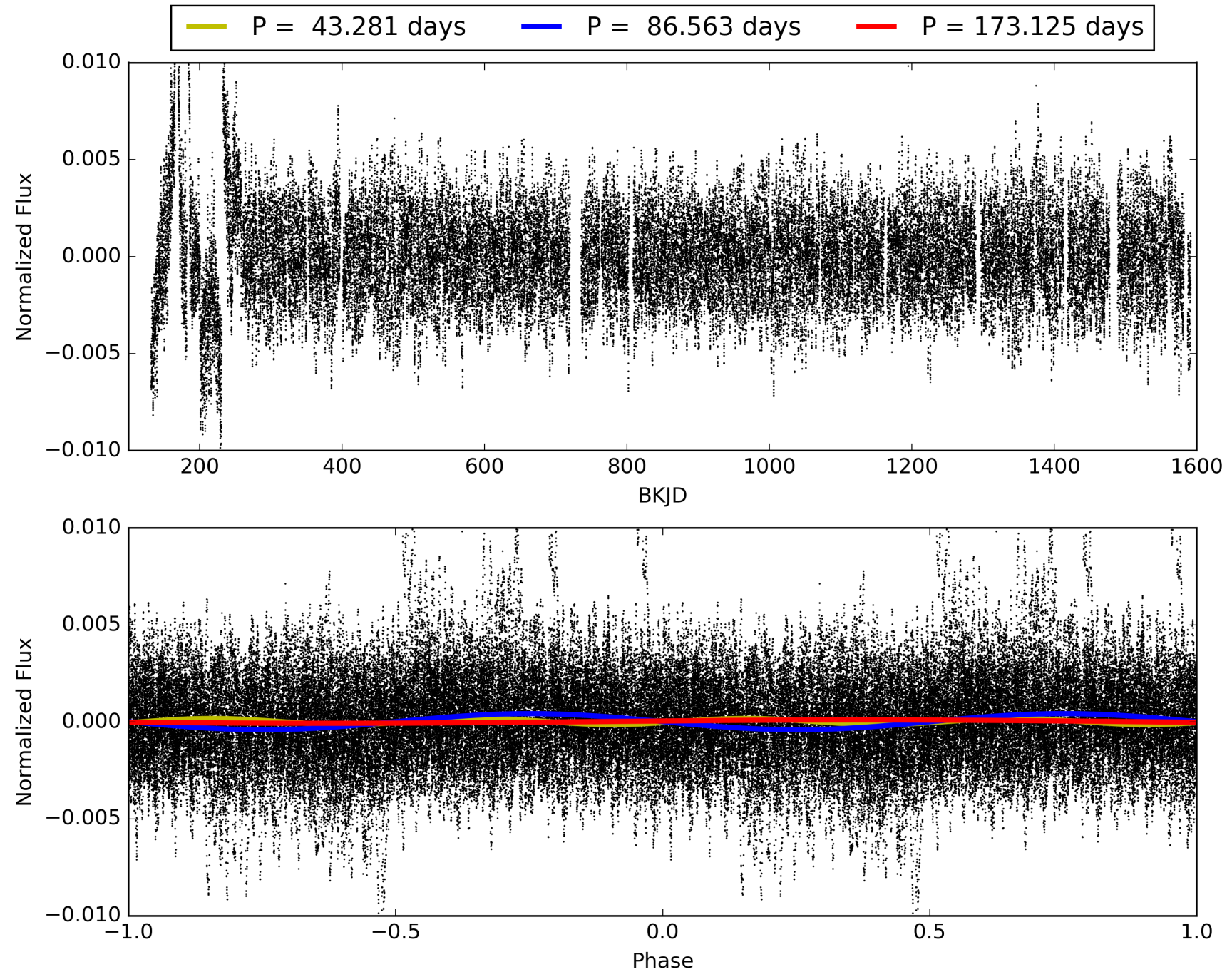
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:33:21 Z

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

TCE 007138446-02, PDC Light Curves

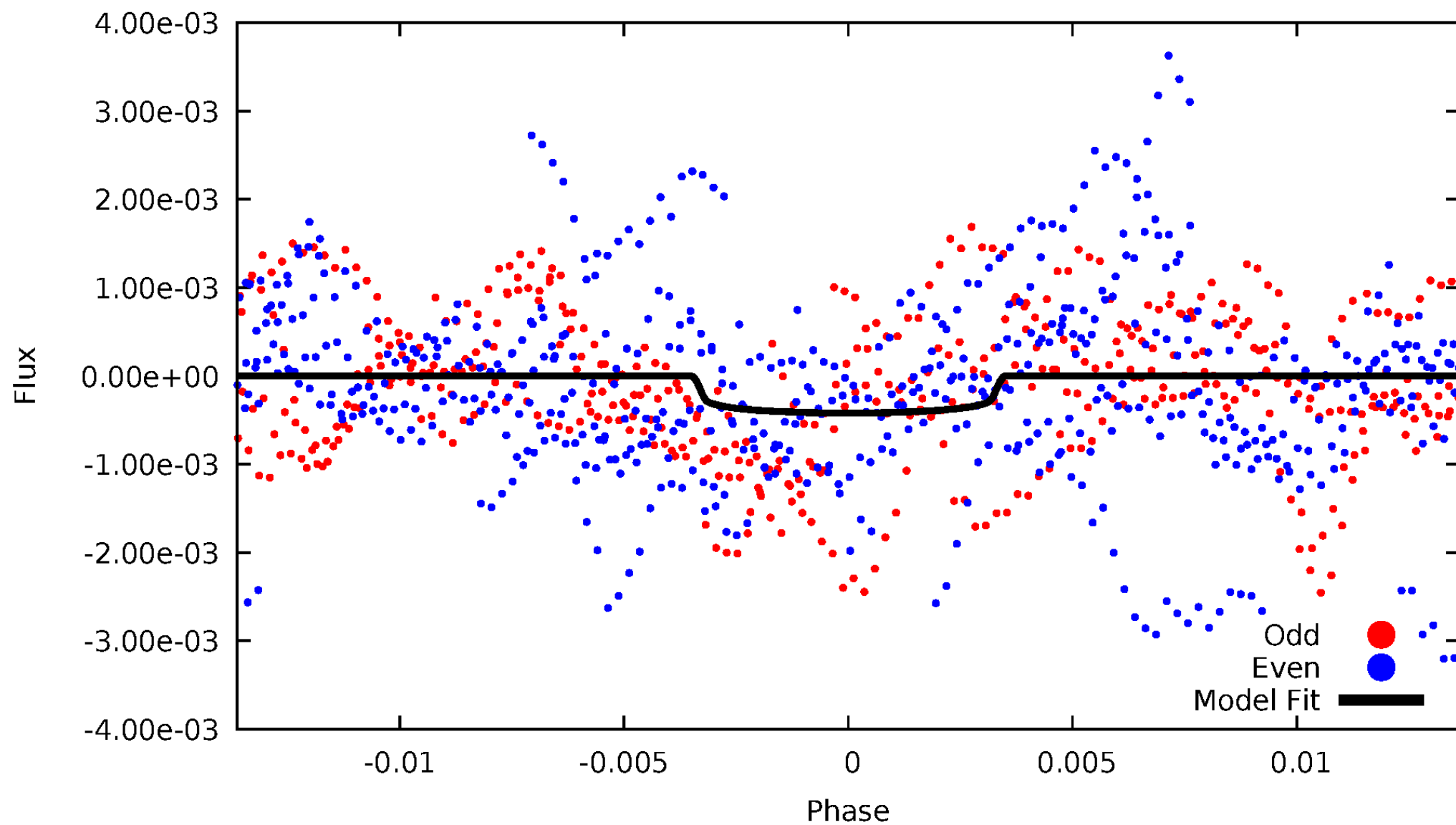


TCE 007138446-02



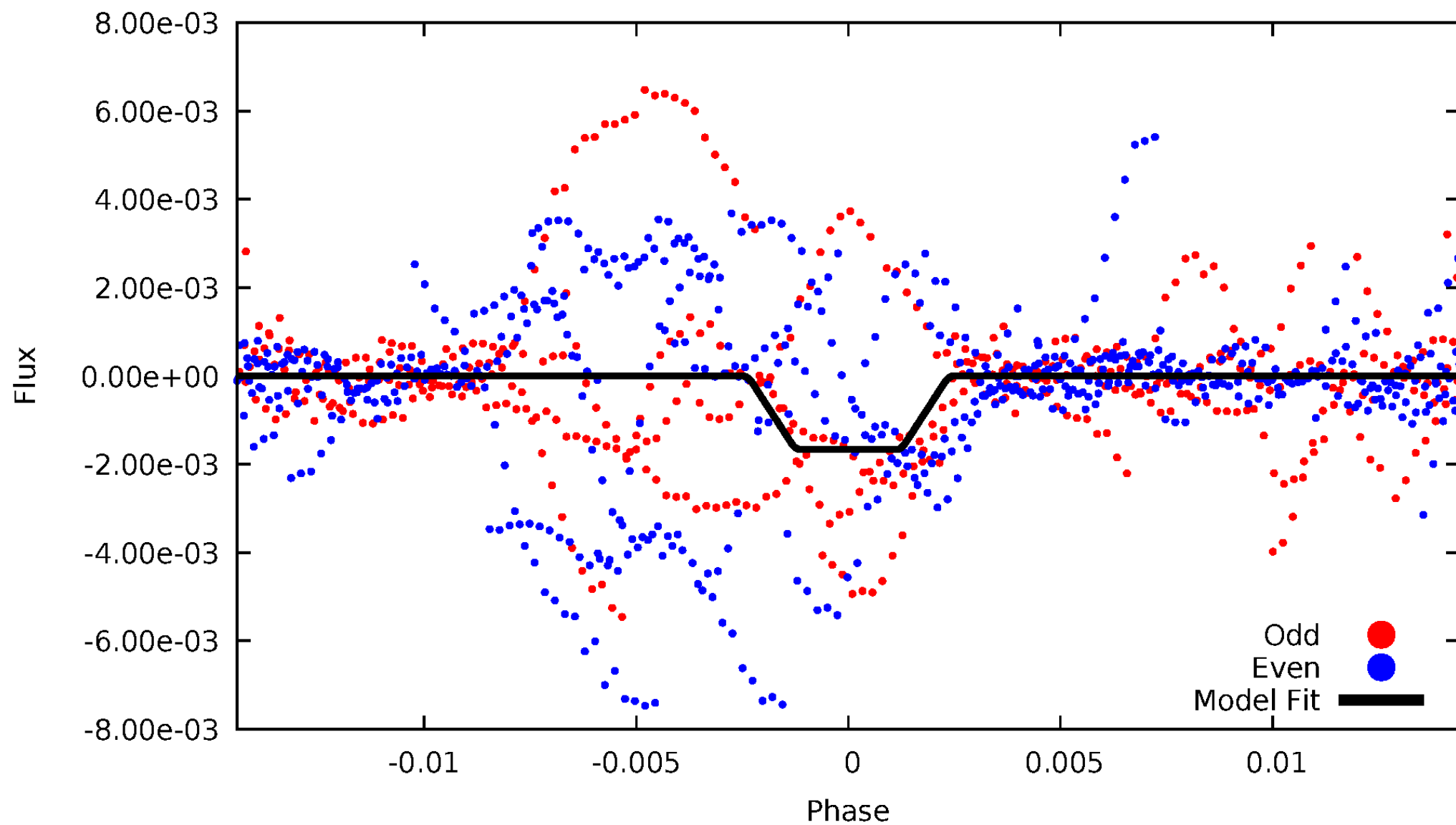
DV Odd/Even

TCE 007138446-02



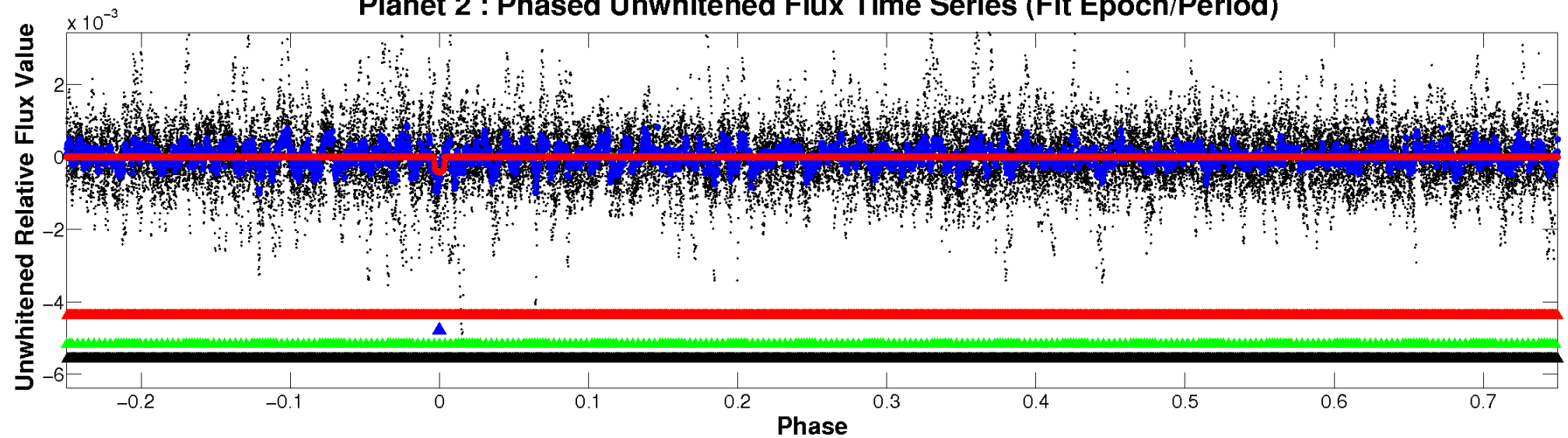
ALT Odd/Even

TCE 007138446-02

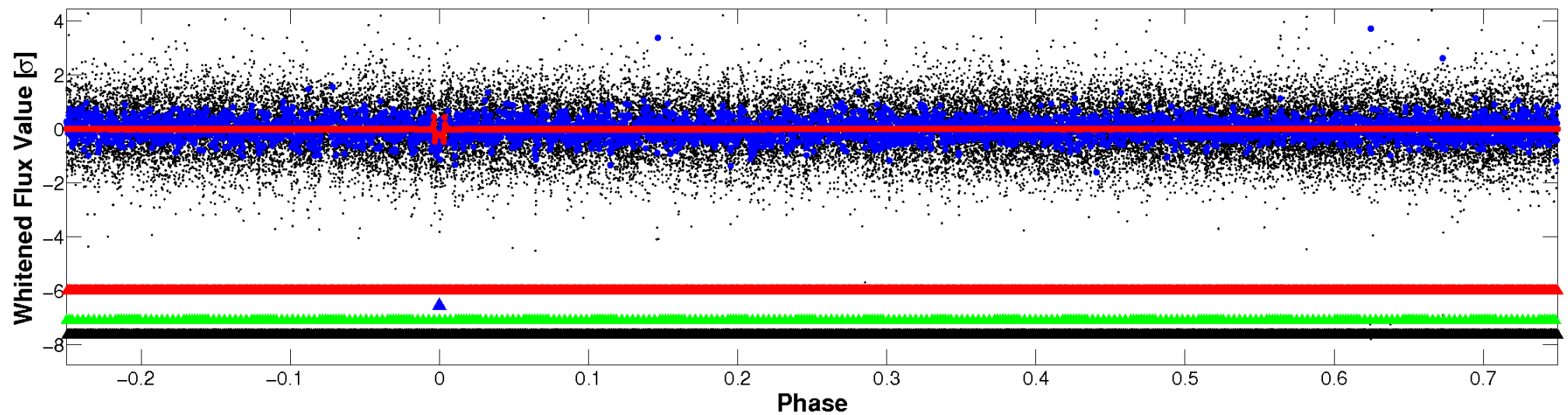


Non-Whitened Vs. Whitened Light Curve

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

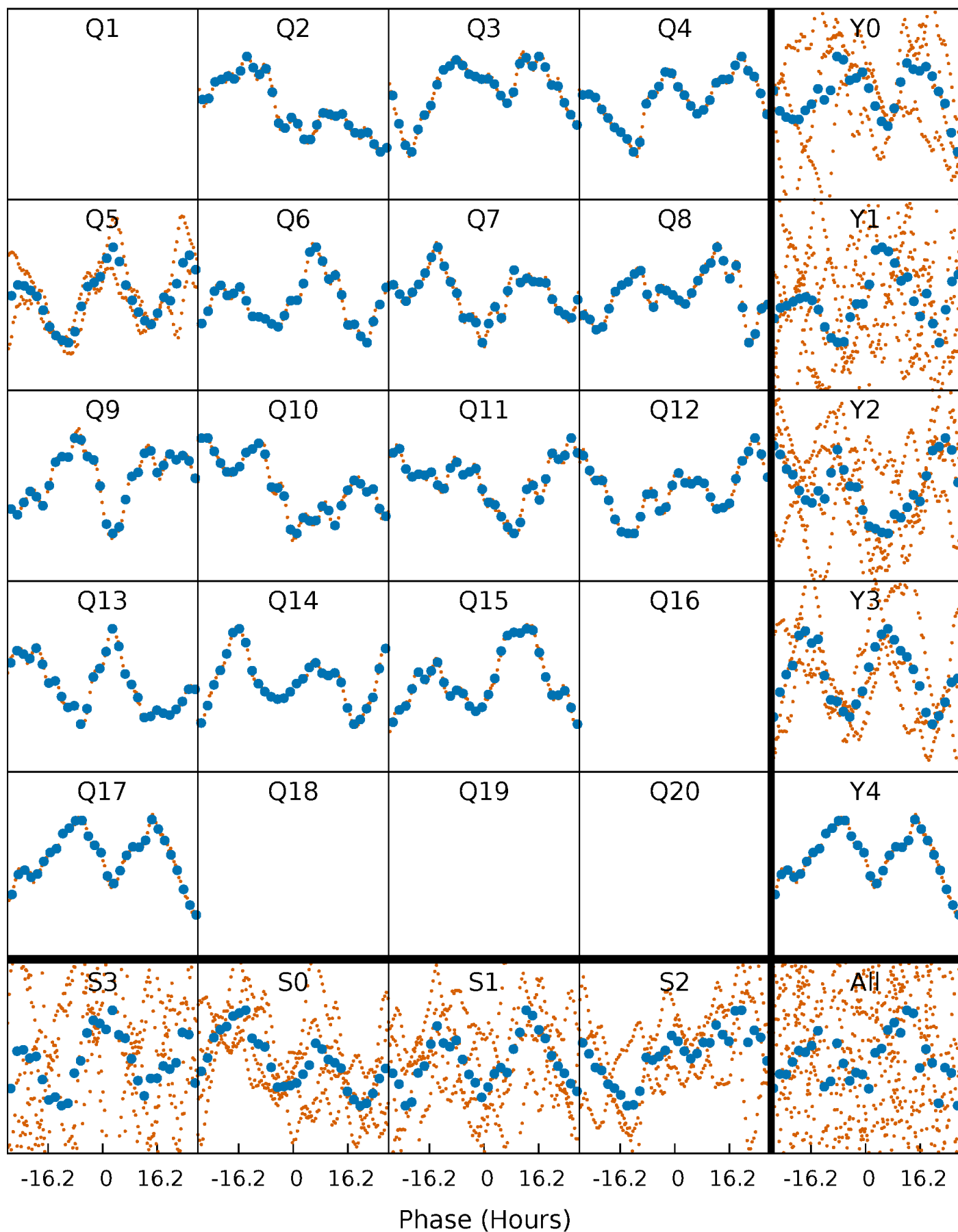


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



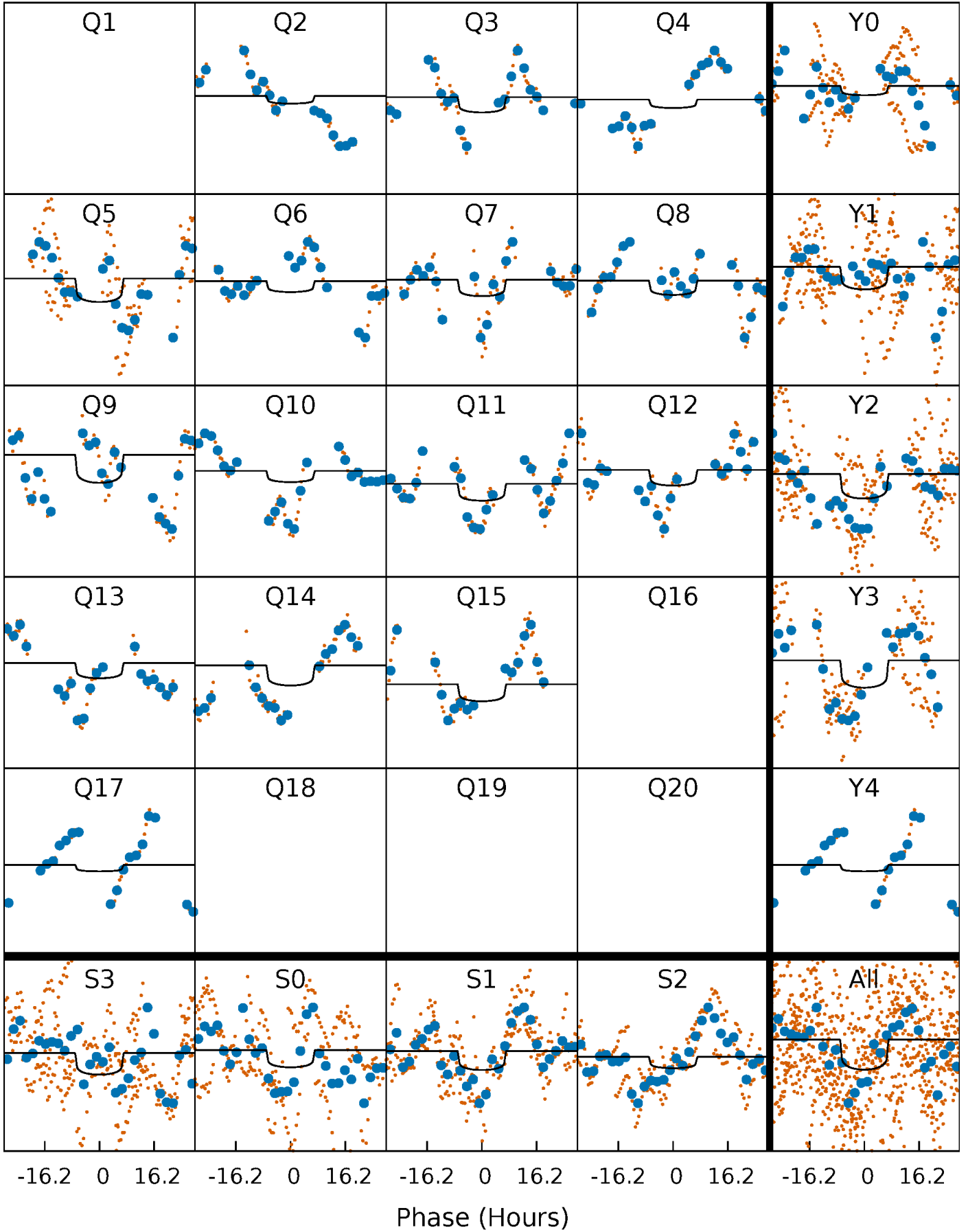
PDC Quarter-Phased Transit Curves

TCE 007138446-02 P= 86.562623 Days $T_0=188.174863$ (BKJD)



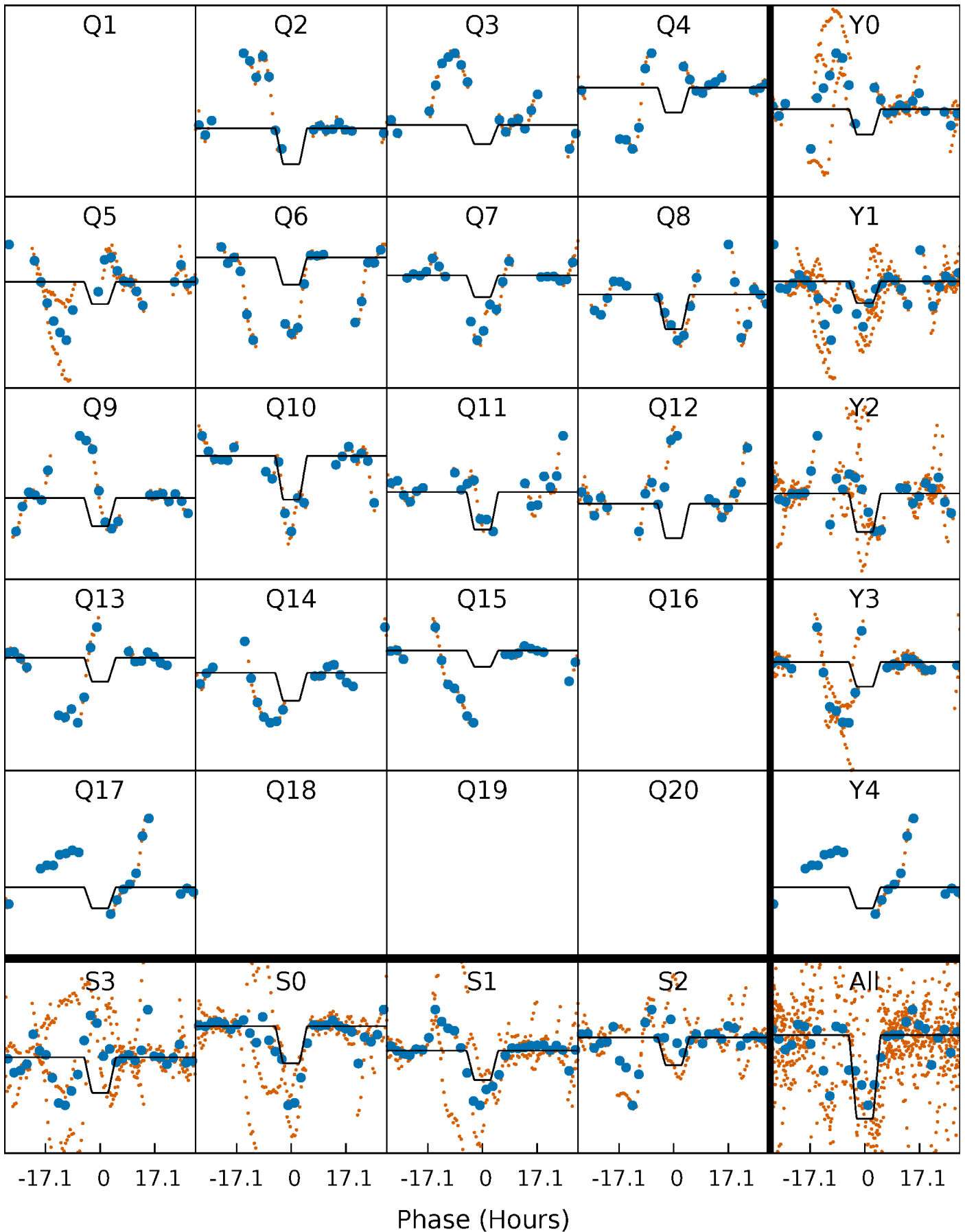
DV Quarter-Phased Transit Curves

TCE 007138446-02 P= 86.562623 Days $T_0=188.174863$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

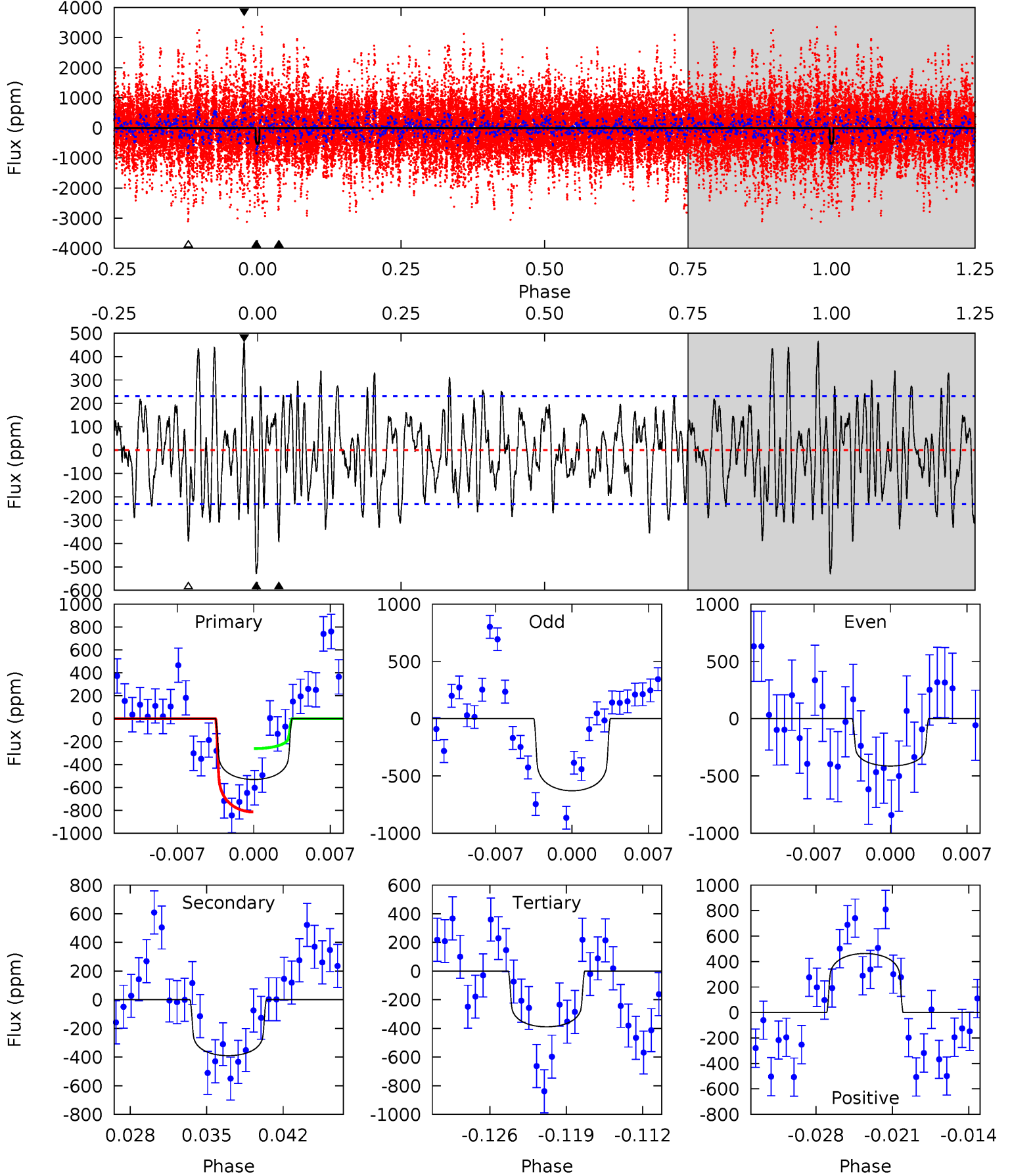
TCE 007138446-02 P= 86.563371 Days $T_0=188.196370$ (BKJD)



DV Model-Shift Uniqueness Test

007138446-02, P = 86.562623 Days, E = 101.612240 Days

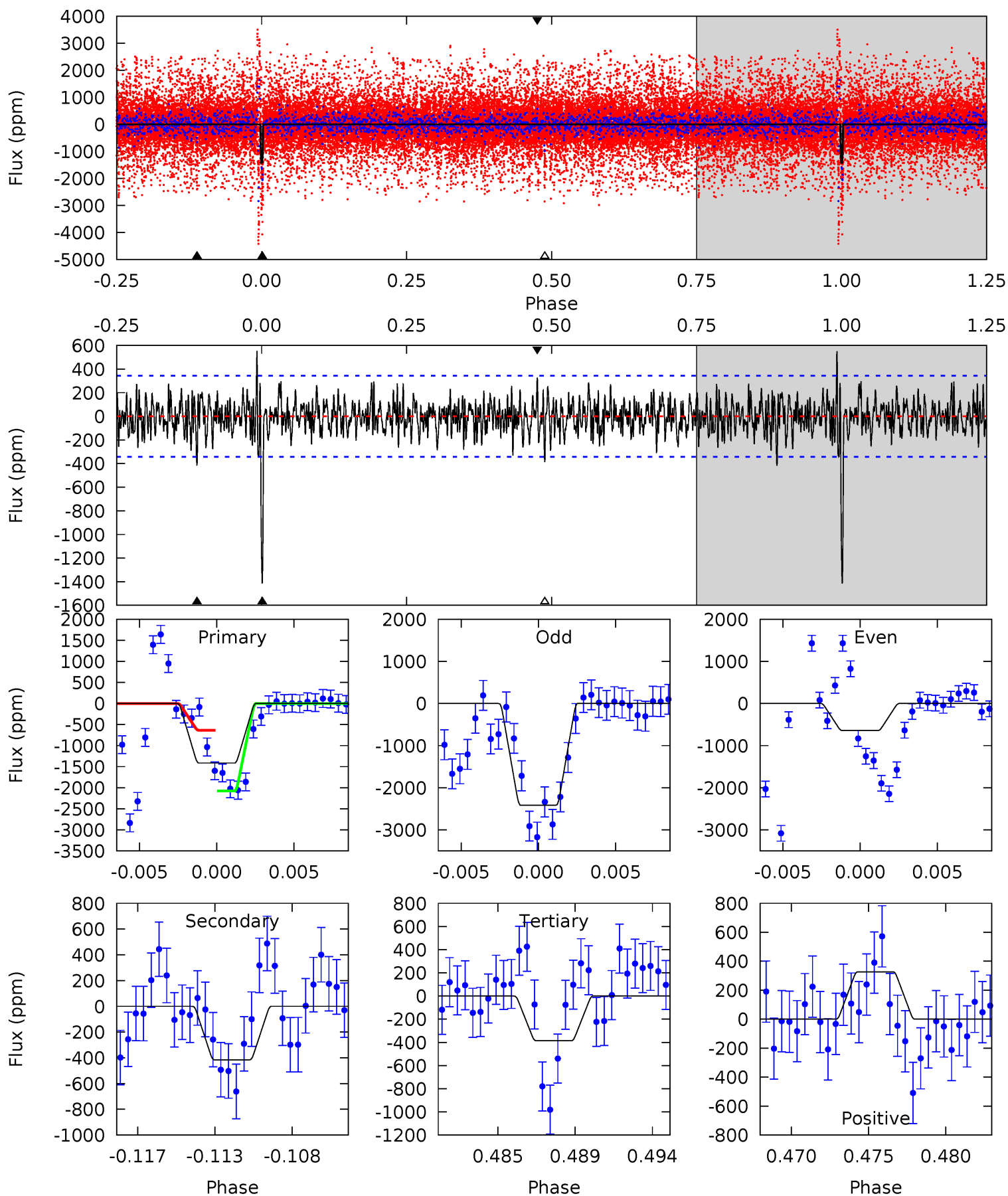
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	8.60	8.57	10.2	5.09	2.70	3.11	3.13	1.49	0.03	-1.61	2.40	0.75	0.47	6.14



Alt Model-Shift Uniqueness Test

007138446-02, P = 86.563371 Days, E = 101.632999 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.3	6.25	5.80	4.91	5.16	2.81	1.69	15.5	16.4	0.45	1.34	13.6	0.02	0.28	0



Stellar Parameters For KIC 007138446

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7096^{+171}_{-256}	$4.133^{+0.175}_{-0.193}$	$-0.300^{+0.300}_{-0.350}$	$1.657^{+0.502}_{-0.411}$	$1.363^{+0.214}_{-0.235}$	$0.422^{+0.416}_{-0.211}$
	+2%/-4%	+4%/-5%	+100%/-117%	+30%/-25%	+16%/-17%	+99%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007138446-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-390 ± 45	$3.53^{+1.17}_{-0.96}$	868^{+67}_{-63}	7140^{+1526}_{-869}	3029^{+3106}_{-1297}
Alt.	-416 ± 66	$7.39^{+1.68}_{-1.31}$	866^{+66}_{-61}	5033^{+383}_{-317}	745^{+371}_{-269}

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

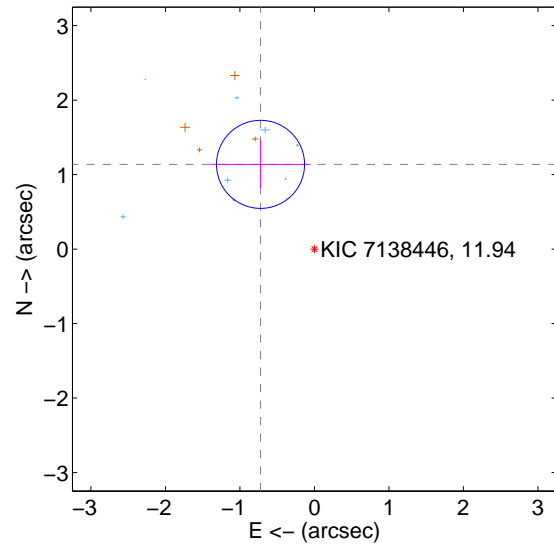
Supplemental centroid analysis for 007138446-02. **Kepler magnitude: 11.94.** Transit SNR 4.52

There are 7 quarters with good PRF difference image offsets

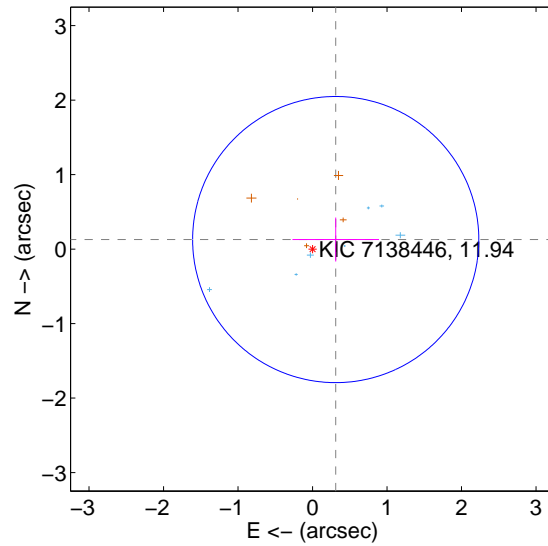
The OOT PRF centroid is offset from the target star catalog position by about 2.32 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.348 ± 0.197	6.84	0.724 ± 0.672	1.137 ± 0.321
PRF-fit source offset from KIC position	0.337 ± 0.640	0.53	-0.311 ± 0.581	0.128 ± 0.295
photometric centroid source offset	0.99 ± 0.57	1.74	-0.86 ± 0.58	-0.50 ± 0.56

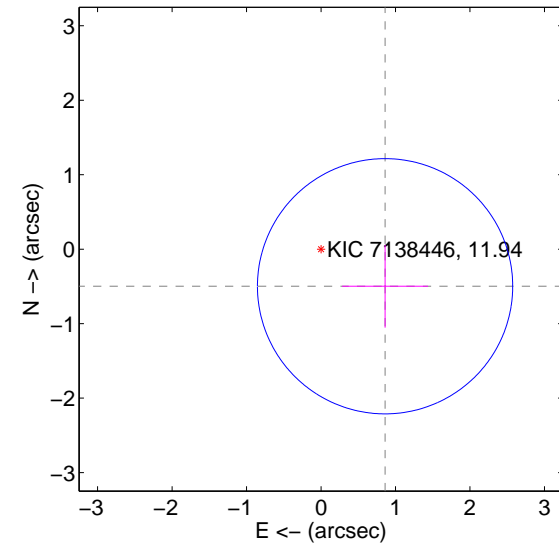
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

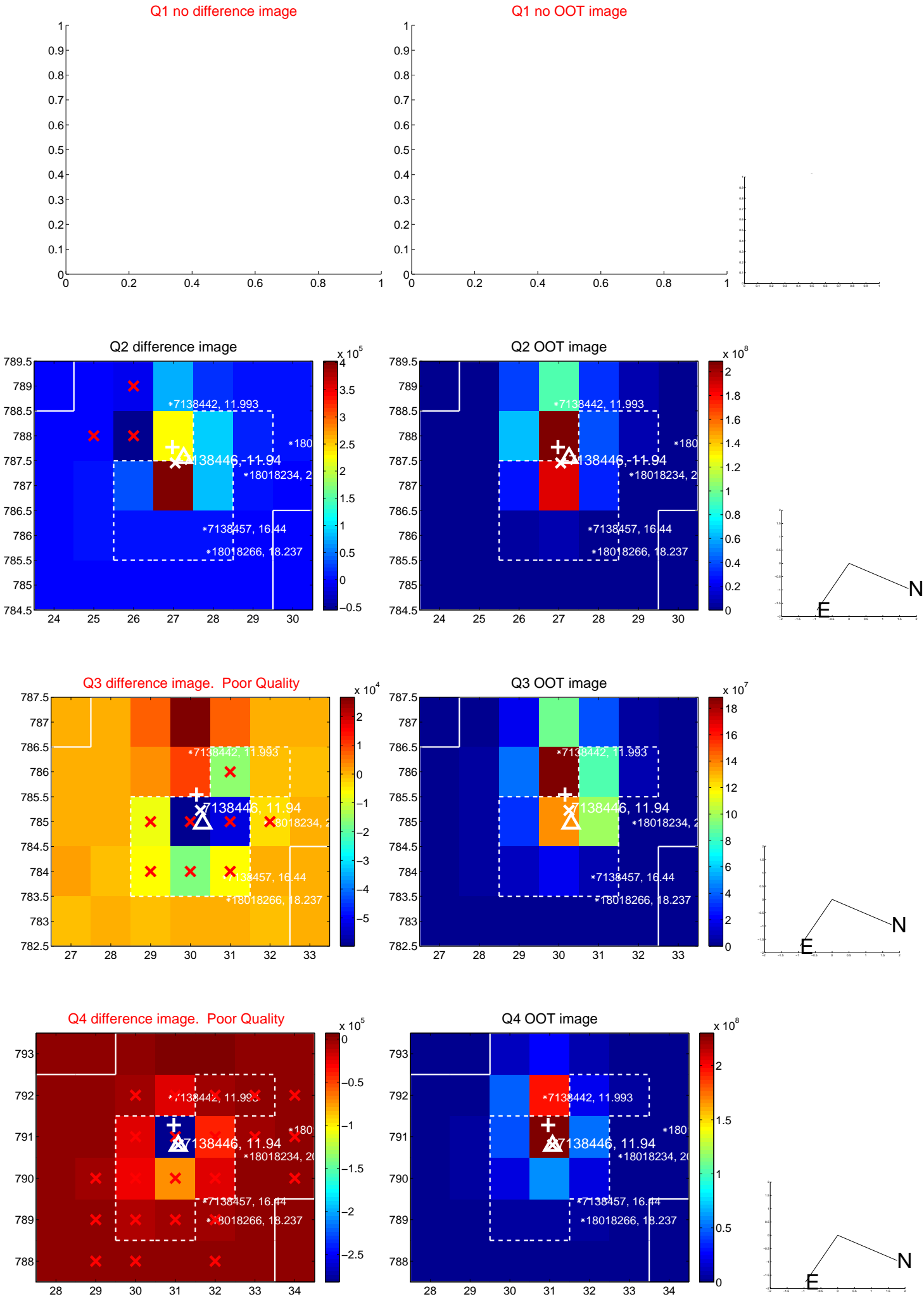


offset from photometric centroids

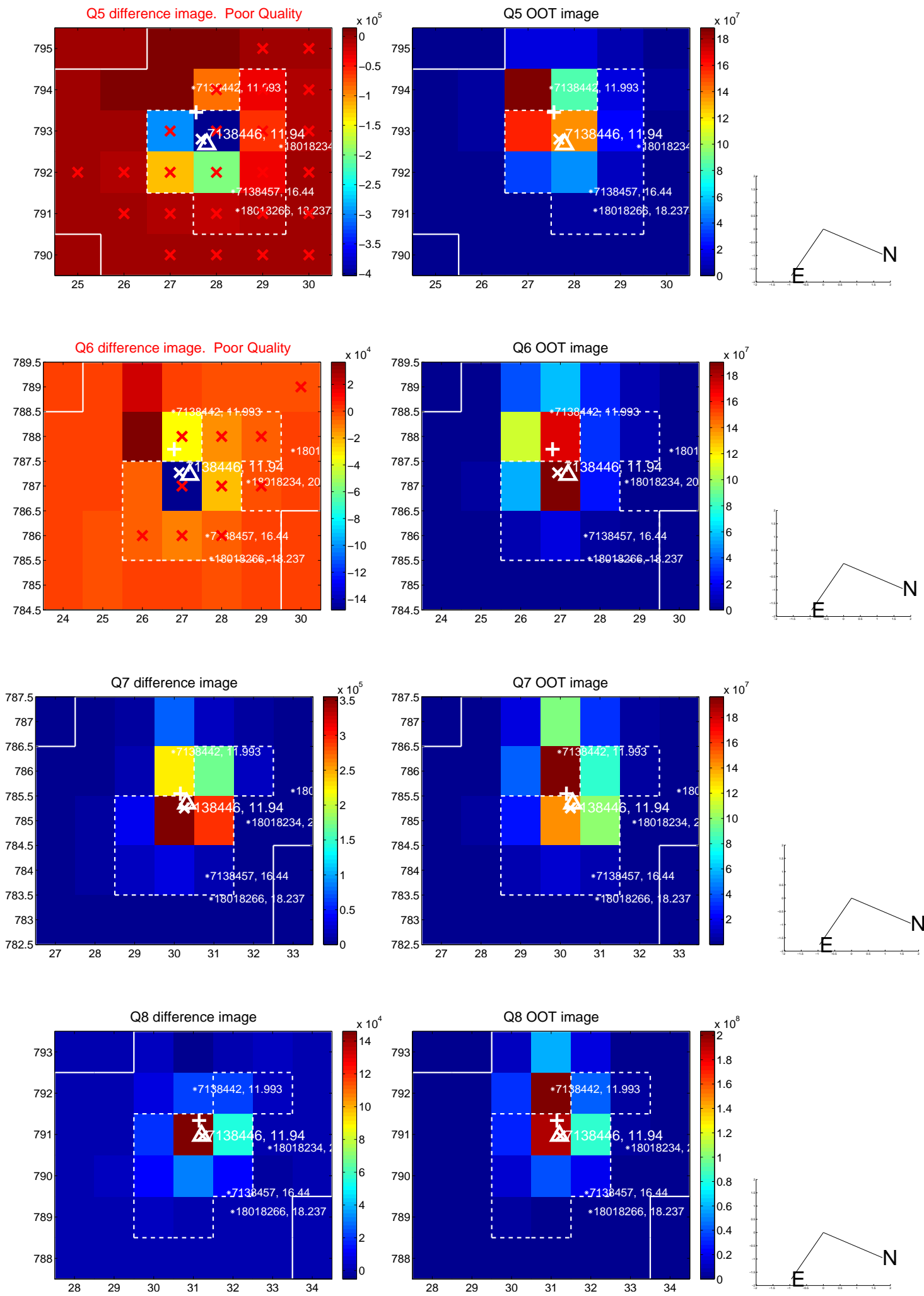


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

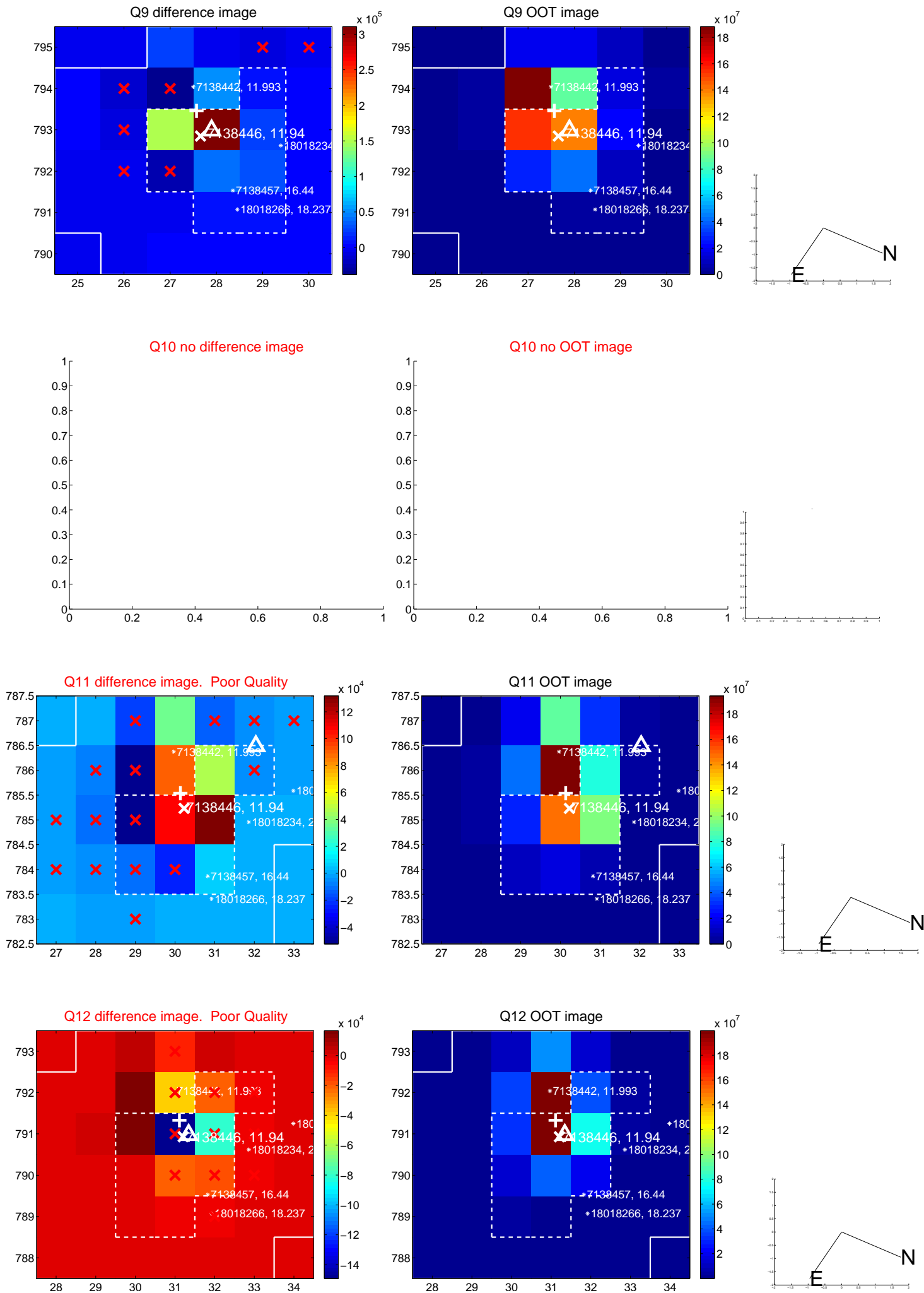
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

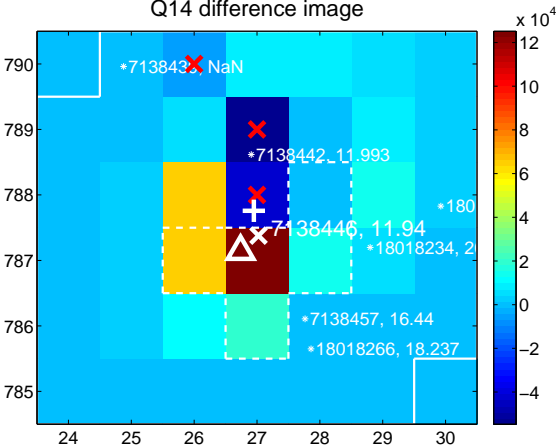
Q13 no difference image



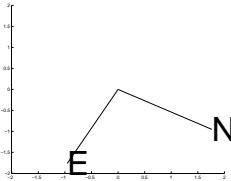
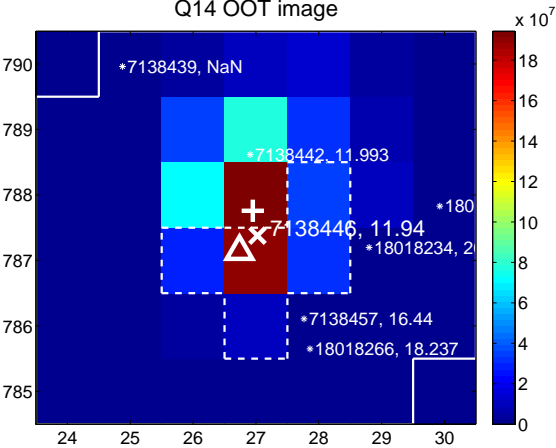
Q13 no OOT image



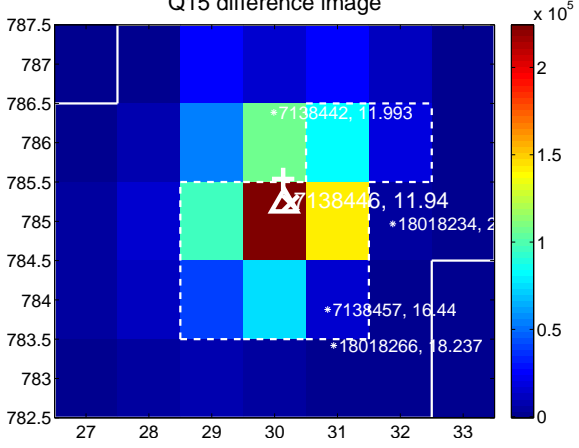
Q14 difference image



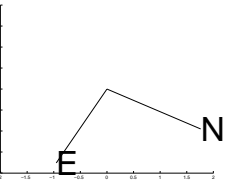
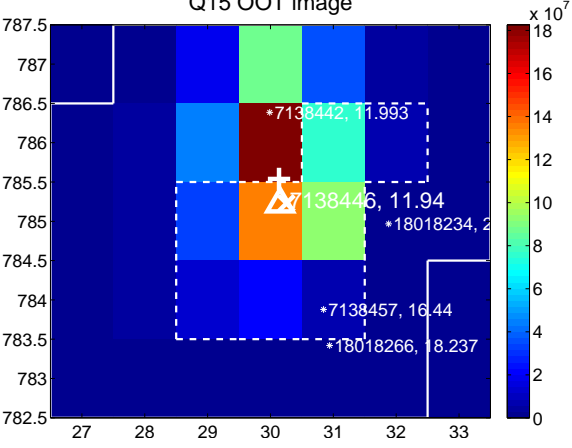
Q14 OOT image



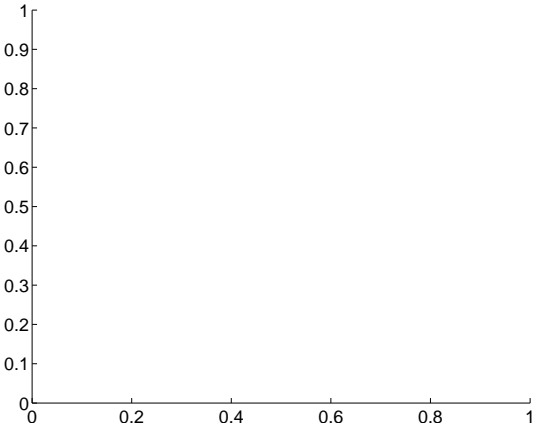
Q15 difference image



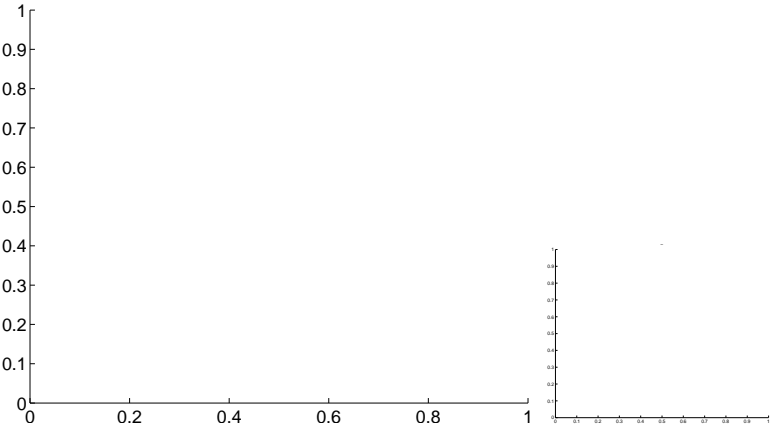
Q15 OOT image



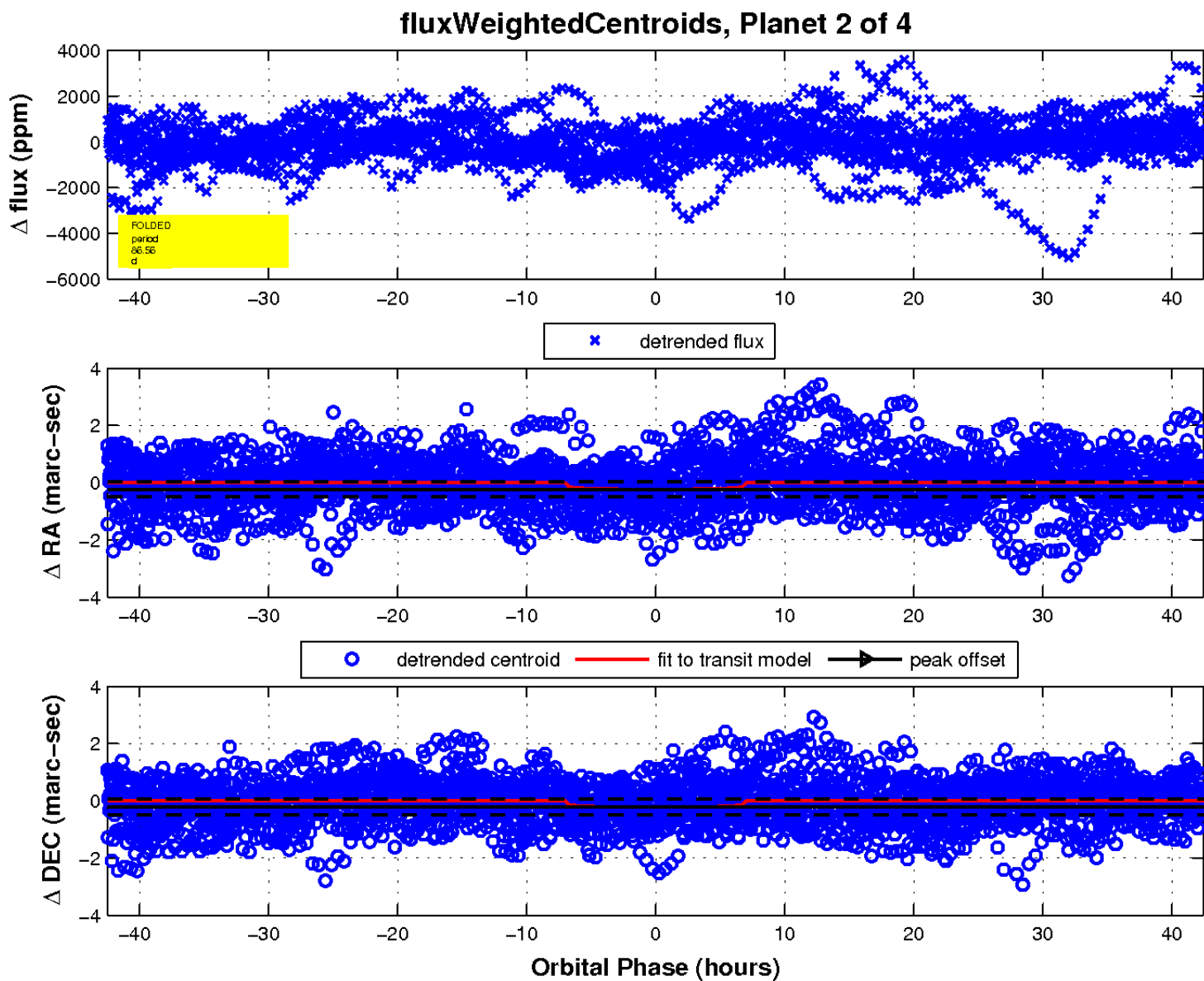
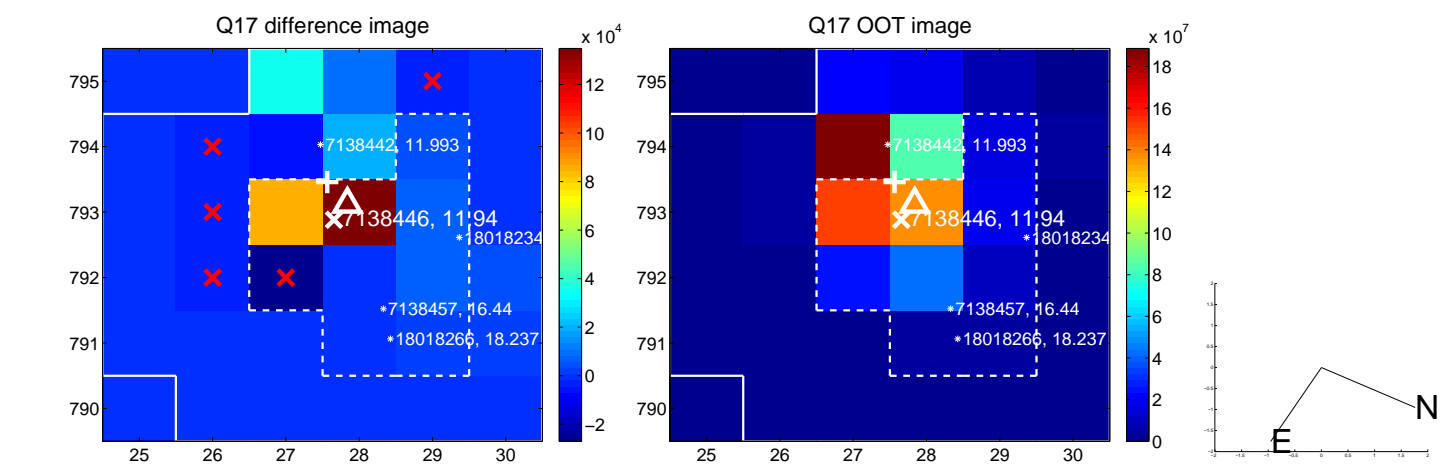
Q16 no difference image



Q16 no OOT image

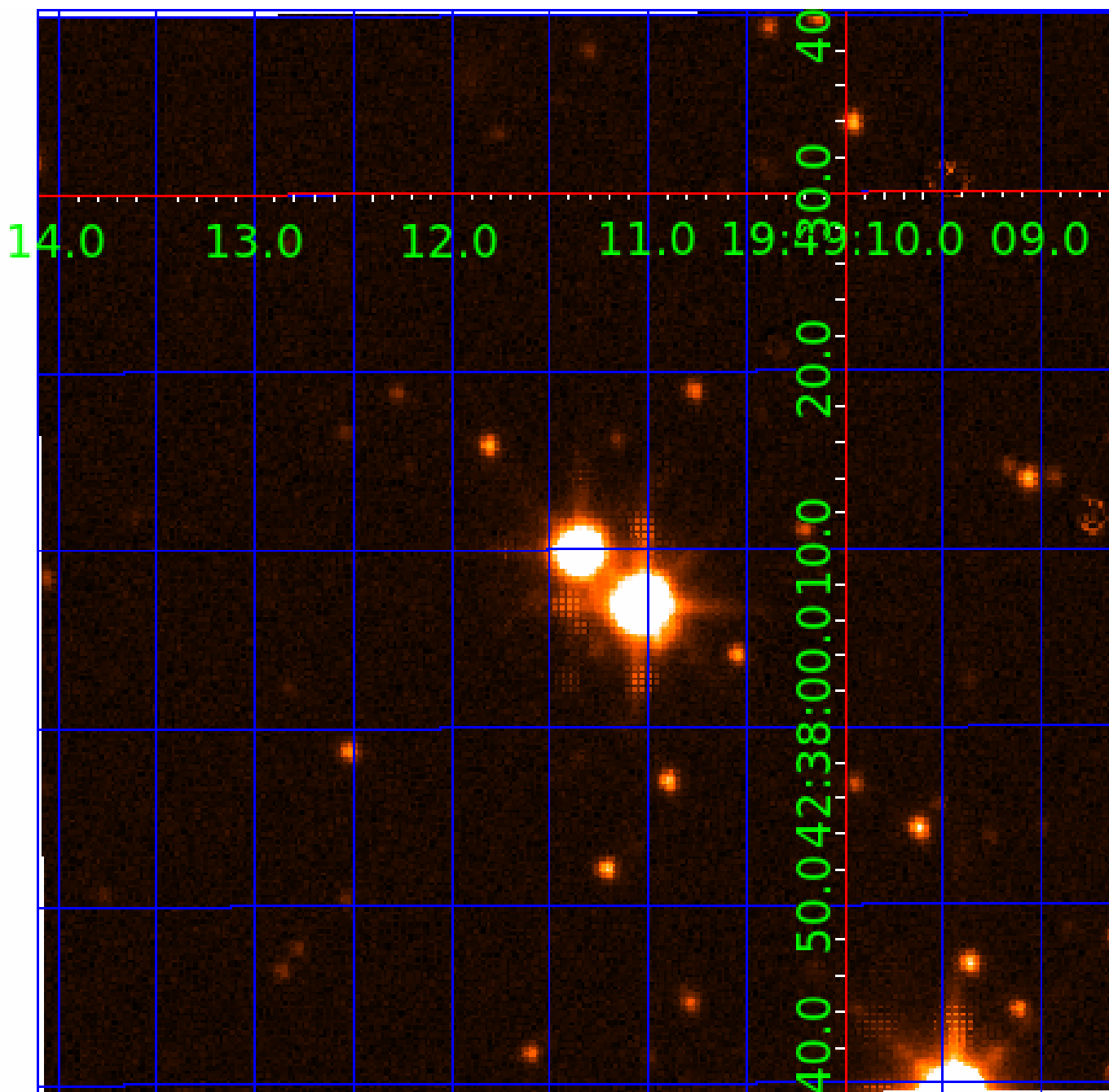


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007138446

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})
007138446-01	OBS	No	0.901022	132.406470	31.3	2.936	8.5	5.2	1.66	7096	1.09	15235.27
007138446-02	OBS	No	86.562623	188.174863	419.4	14.156	7.7	4.5	1.66	7096	3.51	34.62
007138446-03	OBS	No	3.949040	134.001209	146.9	4.514	8.5	7.9	1.66	7096	2.33	2124.10
007138446-04	OBS	No	0.901038	131.947828	53.0	3.487	10.4	7.5	1.66	7096	1.22	15234.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007138446-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007138446-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_KIC_POS

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

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

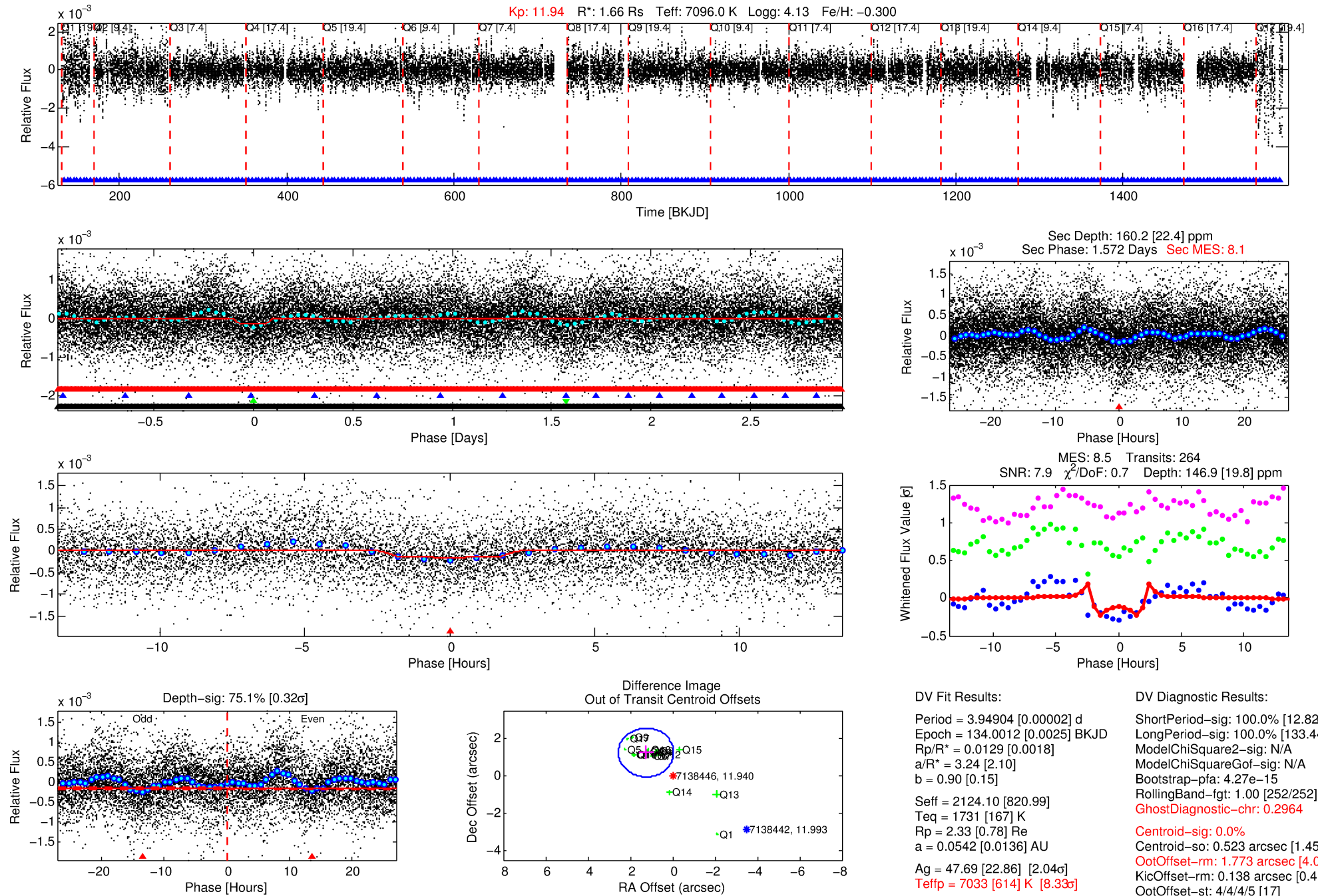
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007138446-03

No Significant Match Found

DV One-Page Summary

KIC: 7138446 Candidate: 3 of 4 Period: 3.949 d



DV Fit Results:

Period = 3.94904 [0.00002] d
Epoch = 134.0012 [0.0025] BKJD
Rp/R* = 0.0129 [0.0018]
a/R* = 3.24 [2.10]
b = 0.90 [0.15]
Seff = 2124.10 [820.99]
Teq = 1731 [167] K
Rp = 2.33 [0.78] Re
a = 0.0542 [0.0136] AU
Ag = 47.69 [22.86] [2.04 σ]
Teffp = 7033 [614] K [8.33 σ]

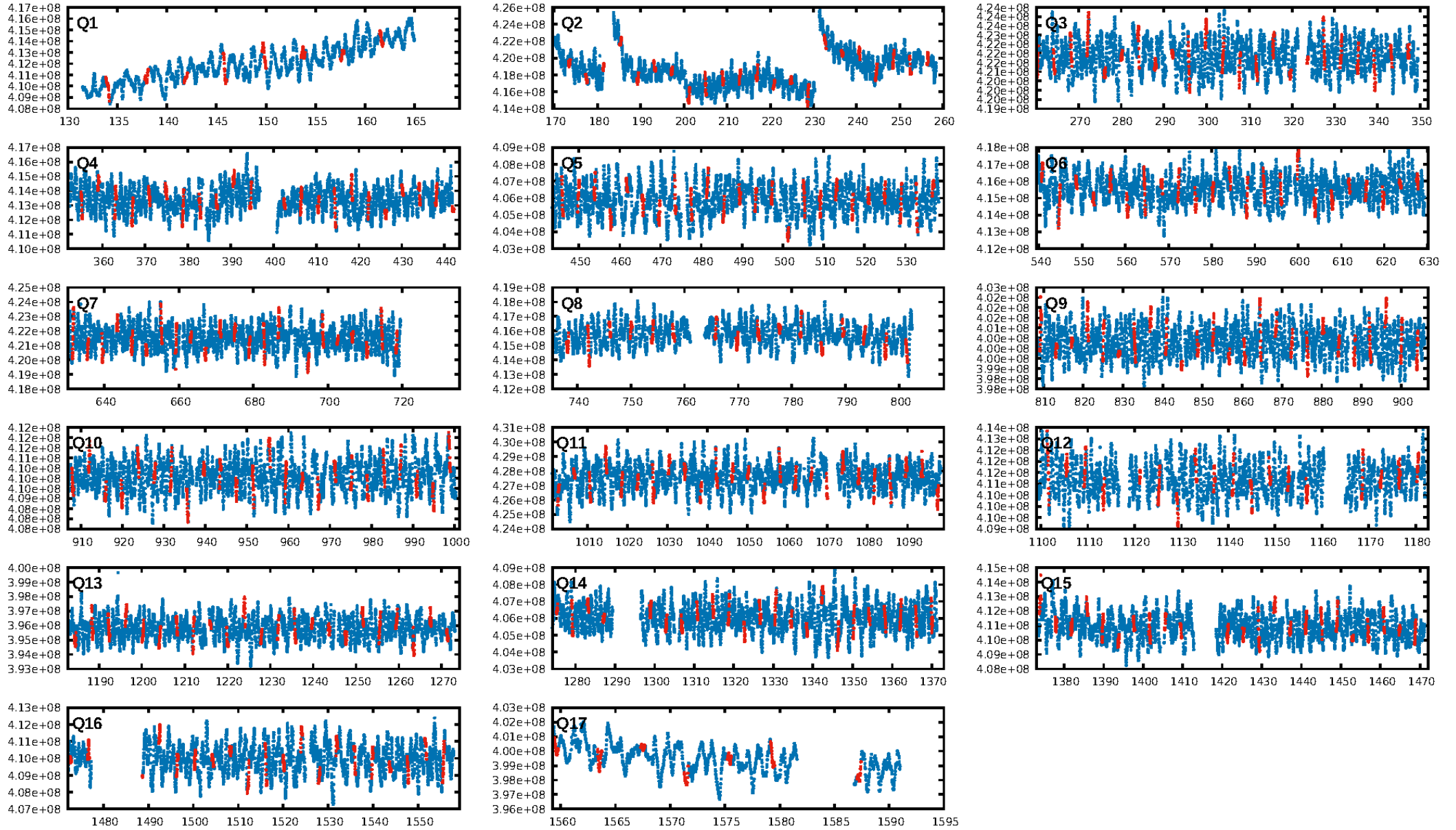
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.82 σ]
LongPeriod-sig: 100.0% [133.44 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.27e-15
RollingBand-fgt: 1.00 [252/252]
GhostDiagnostic-chr: 0.2964
Centroid-sig: 0.0%
Centroid-so: 0.523 arcsec [1.45 σ]
OotOffset-rm: 1.773 arcsec [4.07 σ]
KicOffset-rm: 0.138 arcsec [0.41 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.76 [13/17]
DiffImageOverlap-fno: 0.00 [0/17]

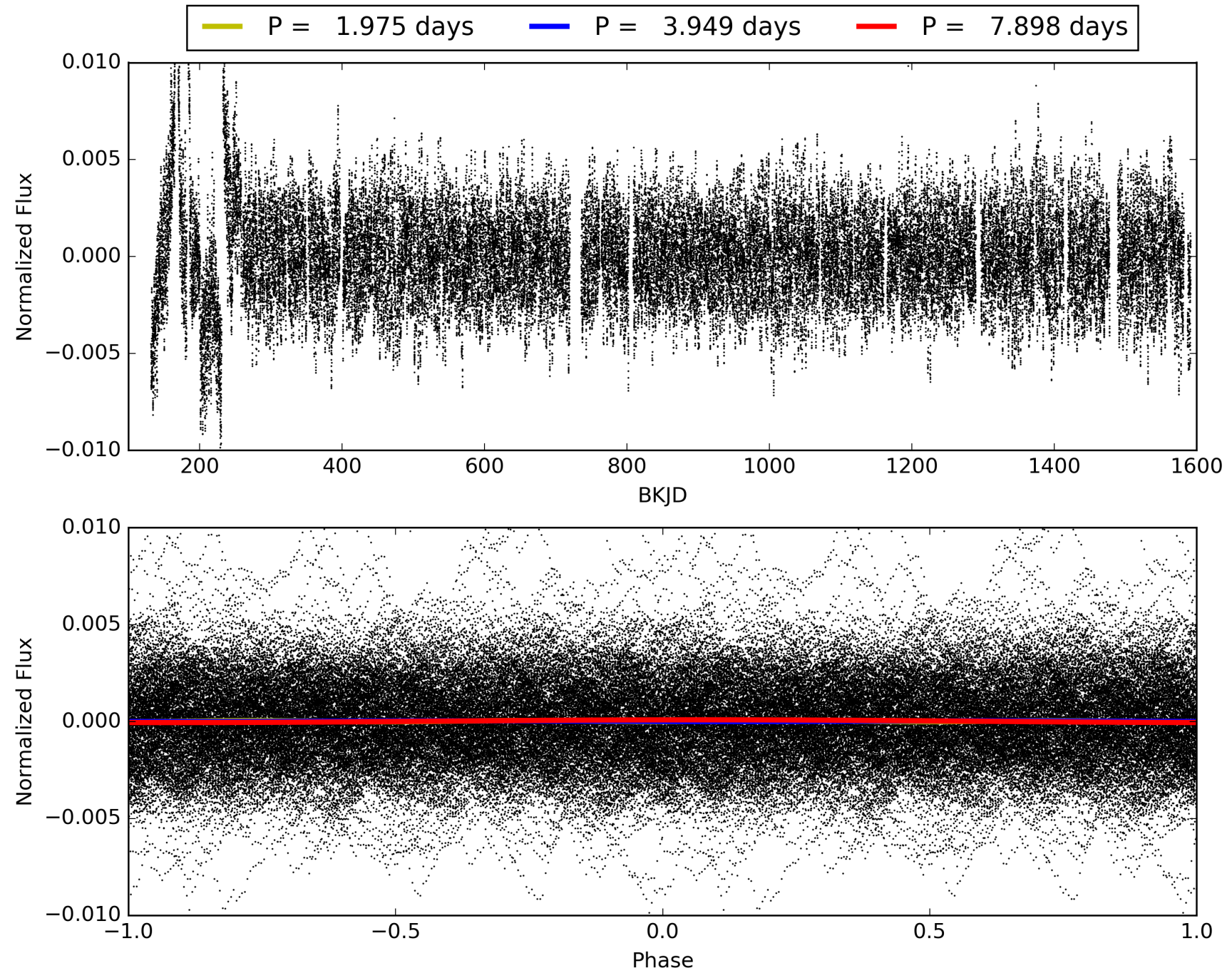
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:33:27 Z

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

TCE 007138446-03, PDC Light Curves

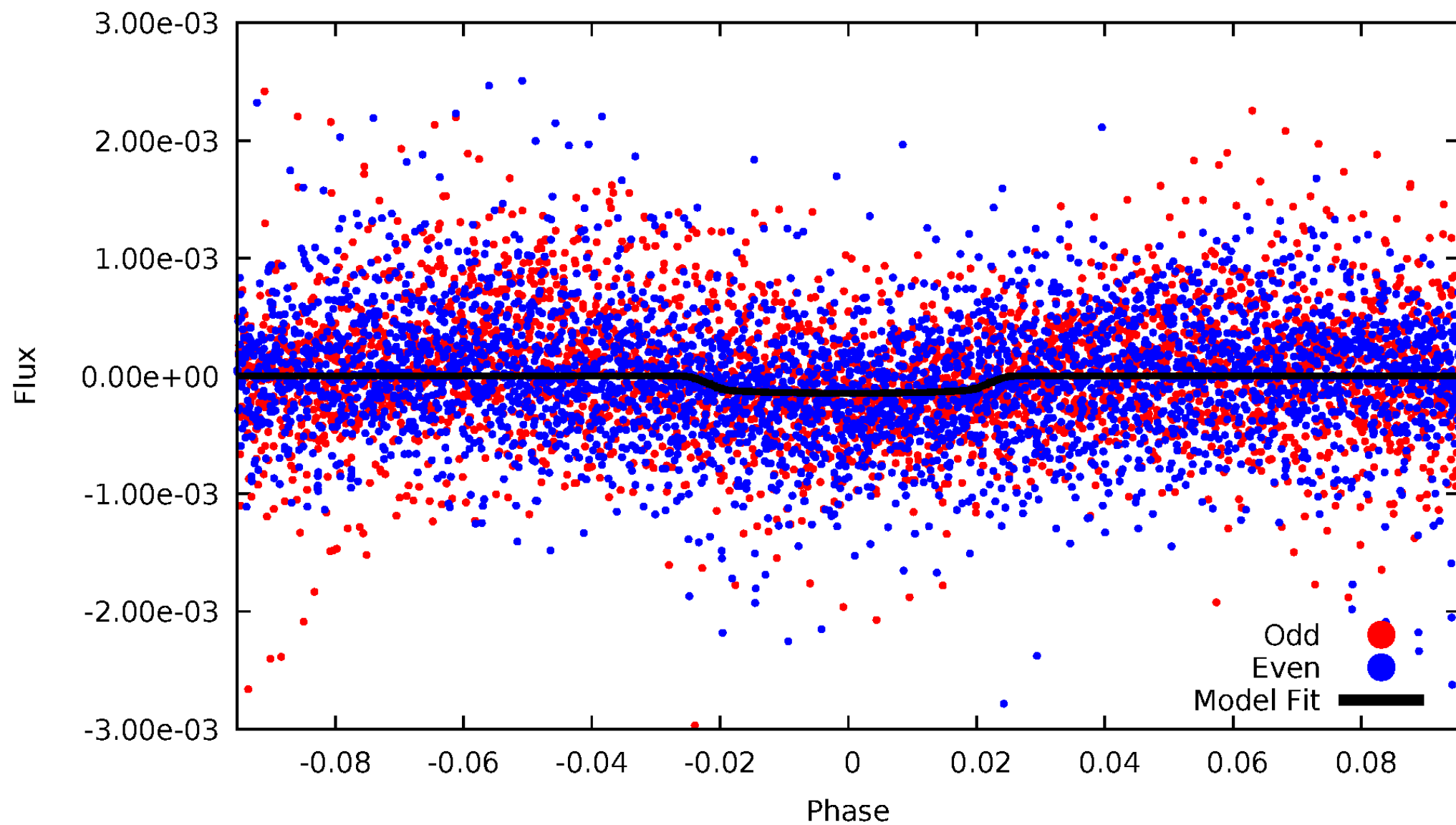


TCE 007138446-03



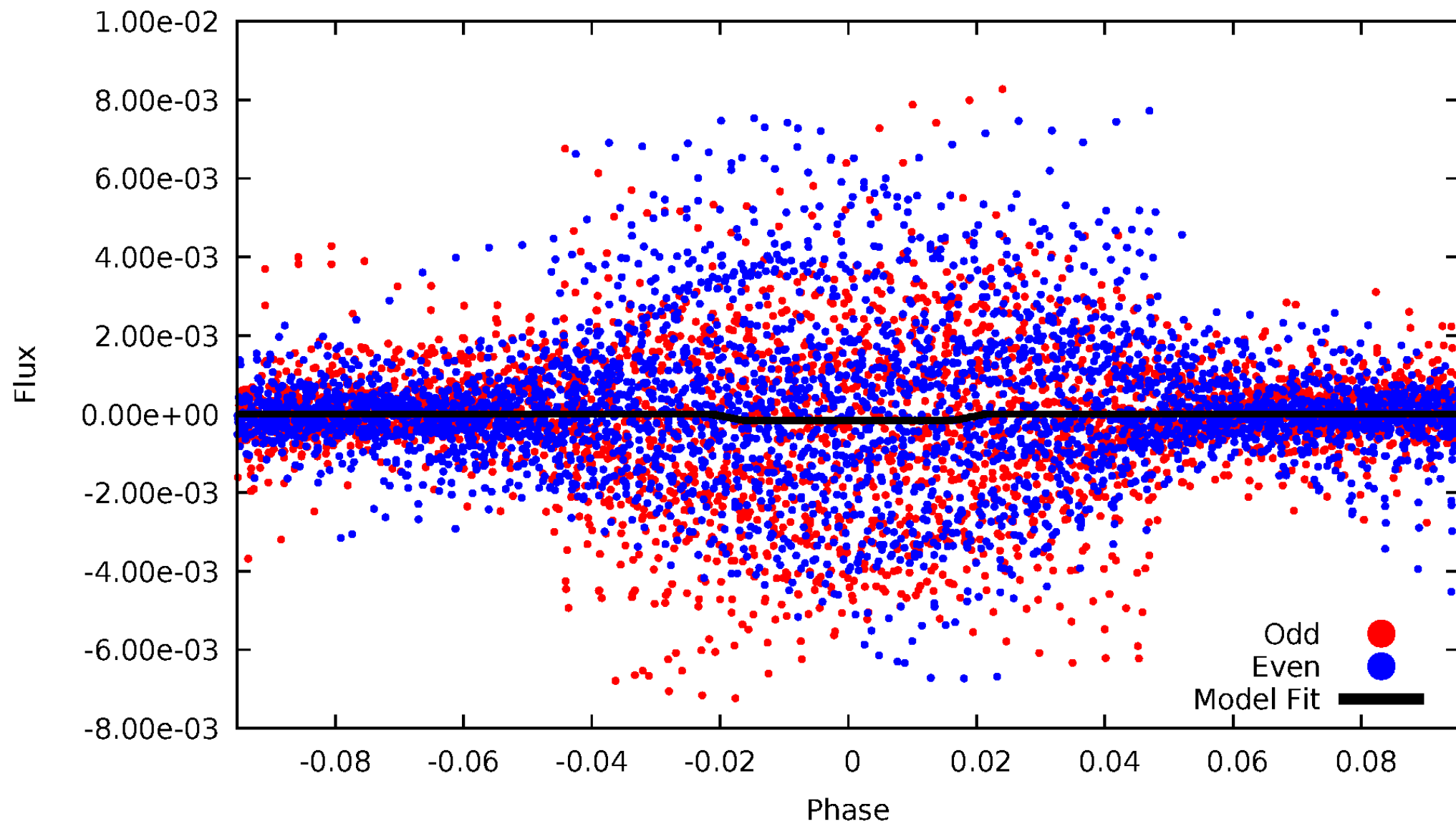
DV Odd/Even

TCE 007138446-03



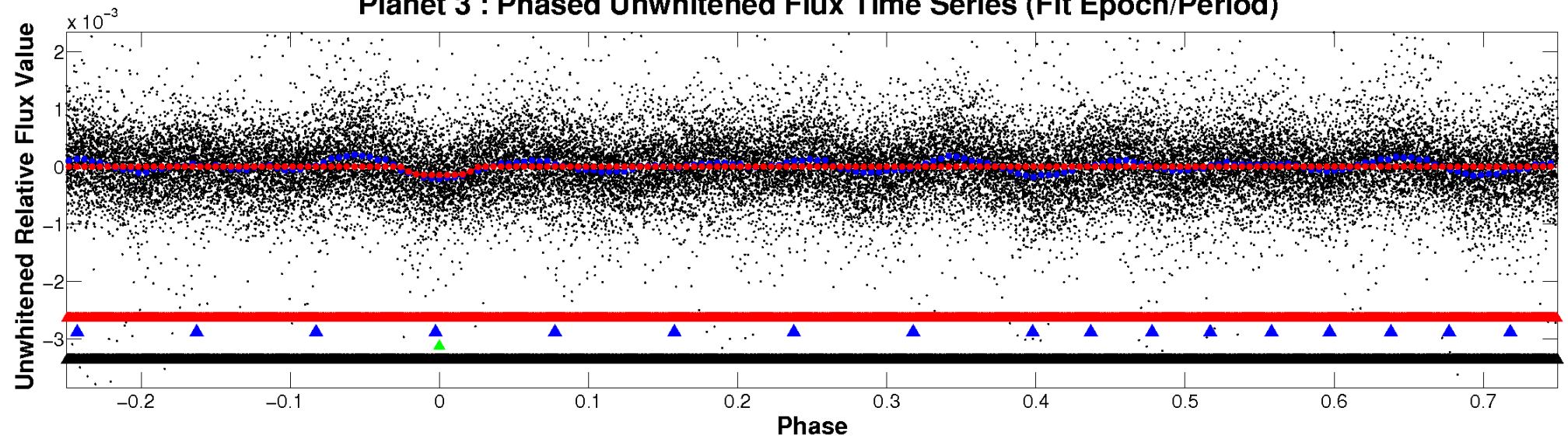
ALT Odd/Even

TCE 007138446-03

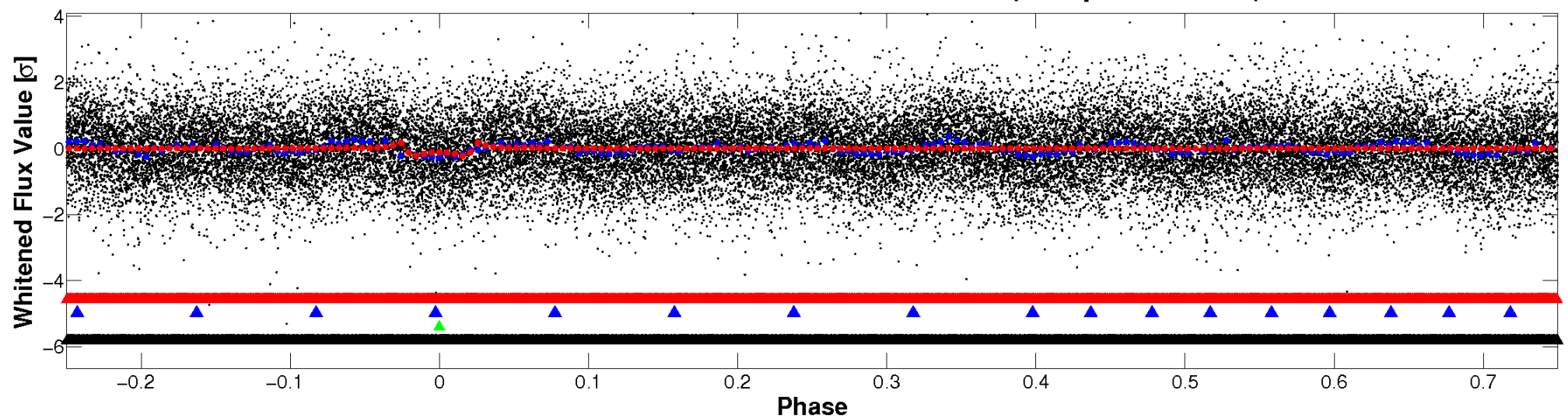


Non-Whitened Vs. Whitened Light Curve

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

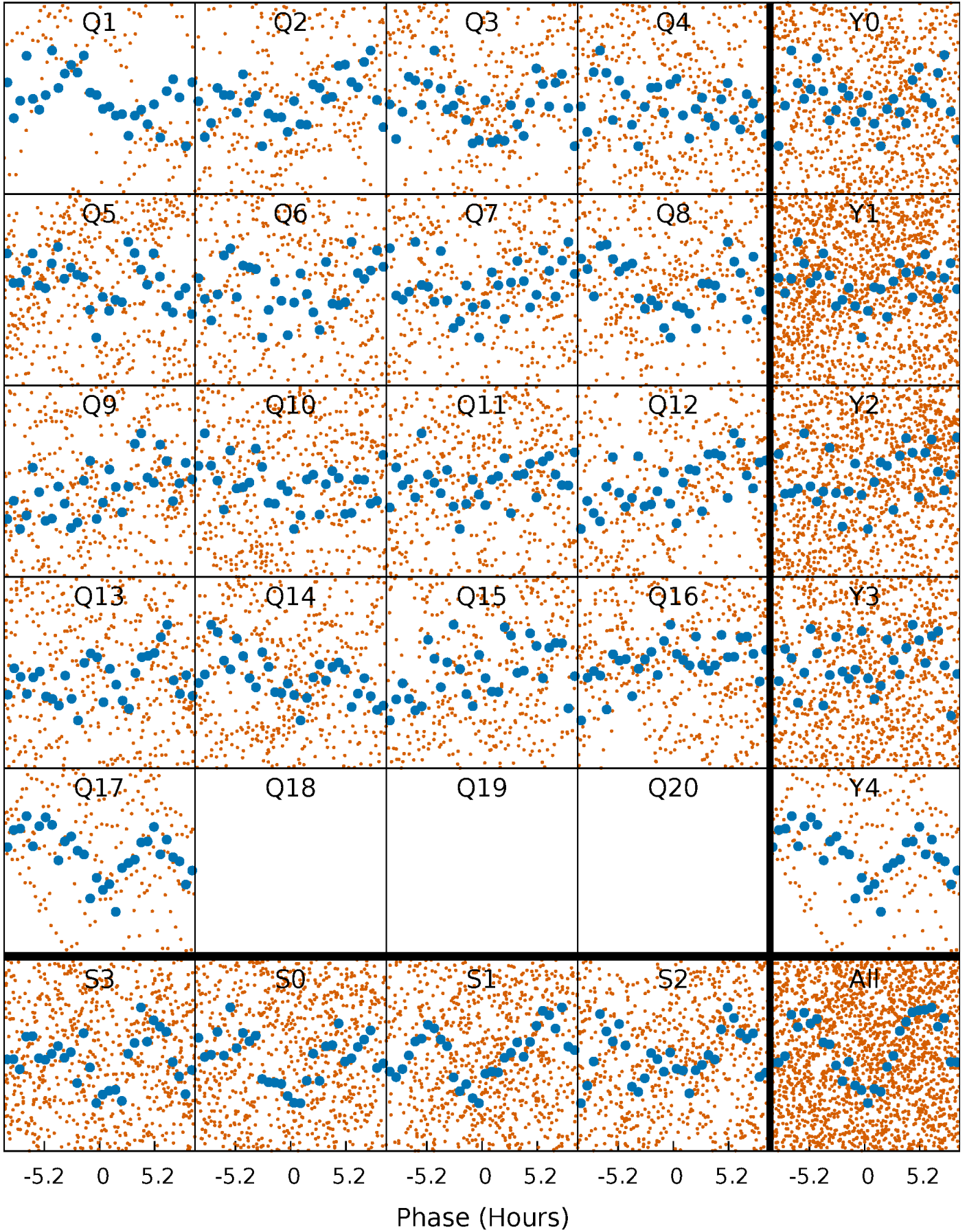


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



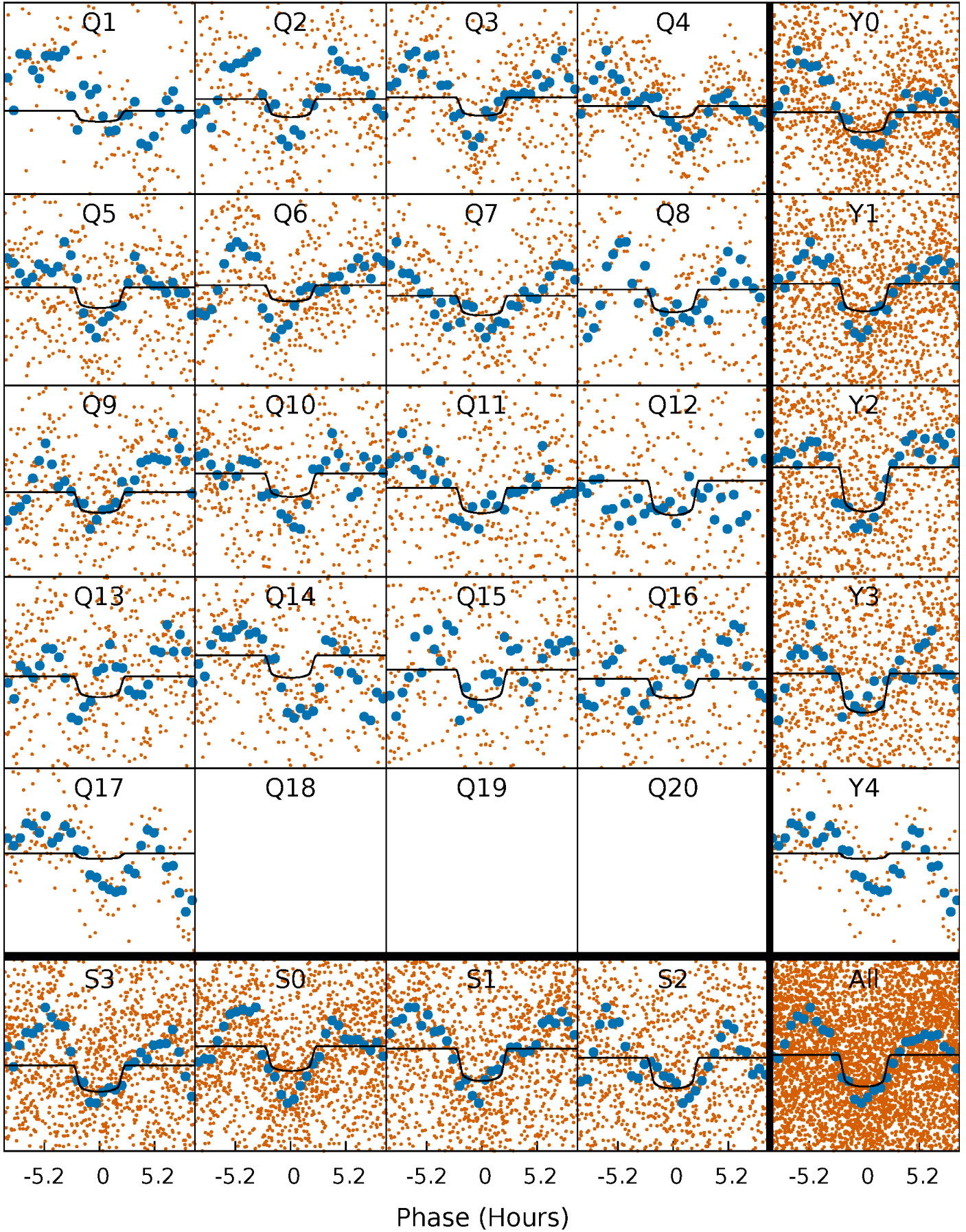
PDC Quarter-Phased Transit Curves

TCE 007138446-03 P= 3.949040 Days $T_0=134.001209$ (BKJD)



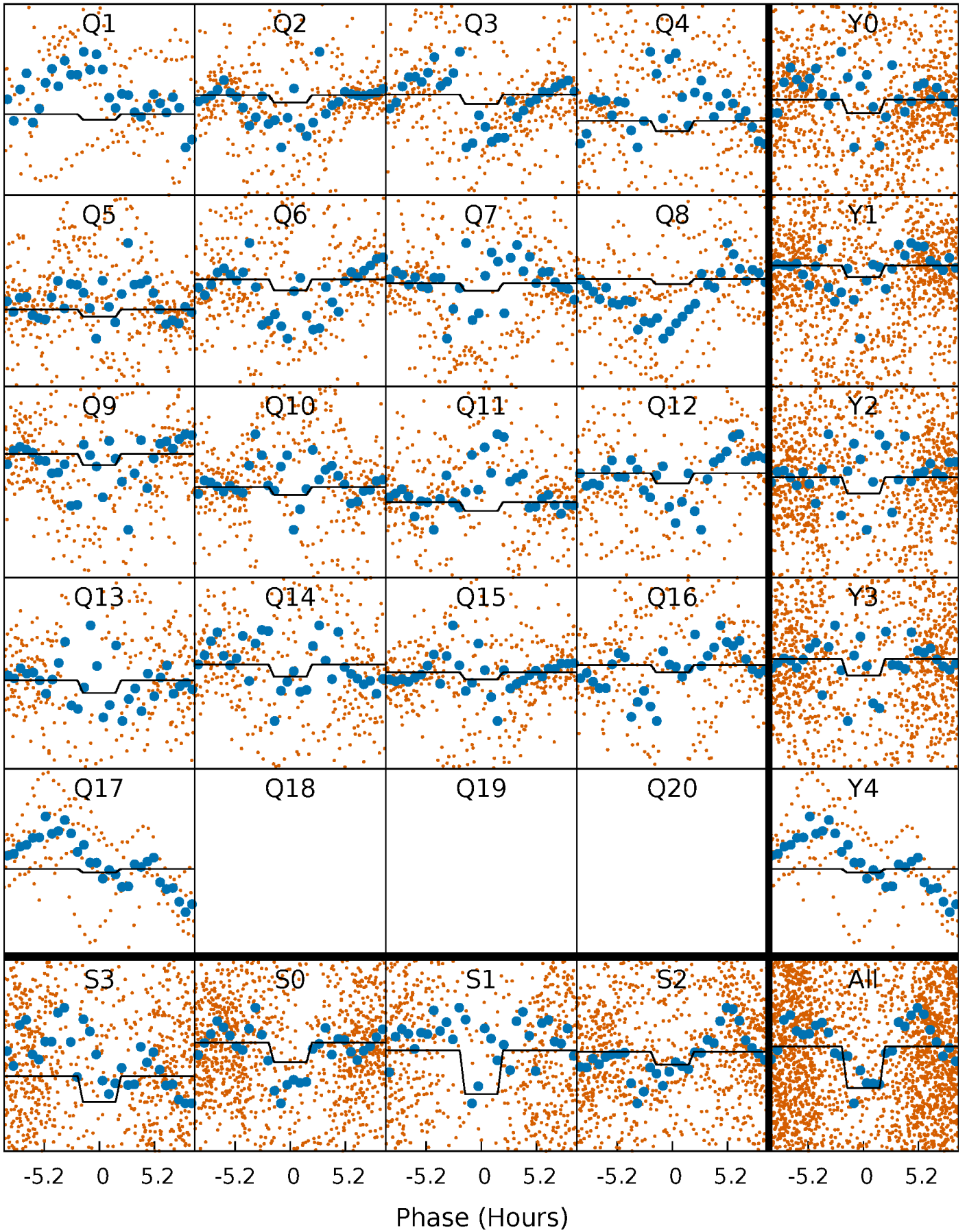
DV Quarter-Phased Transit Curves

TCE 007138446-03 P= 3.949040 Days $T_0=134.001209$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

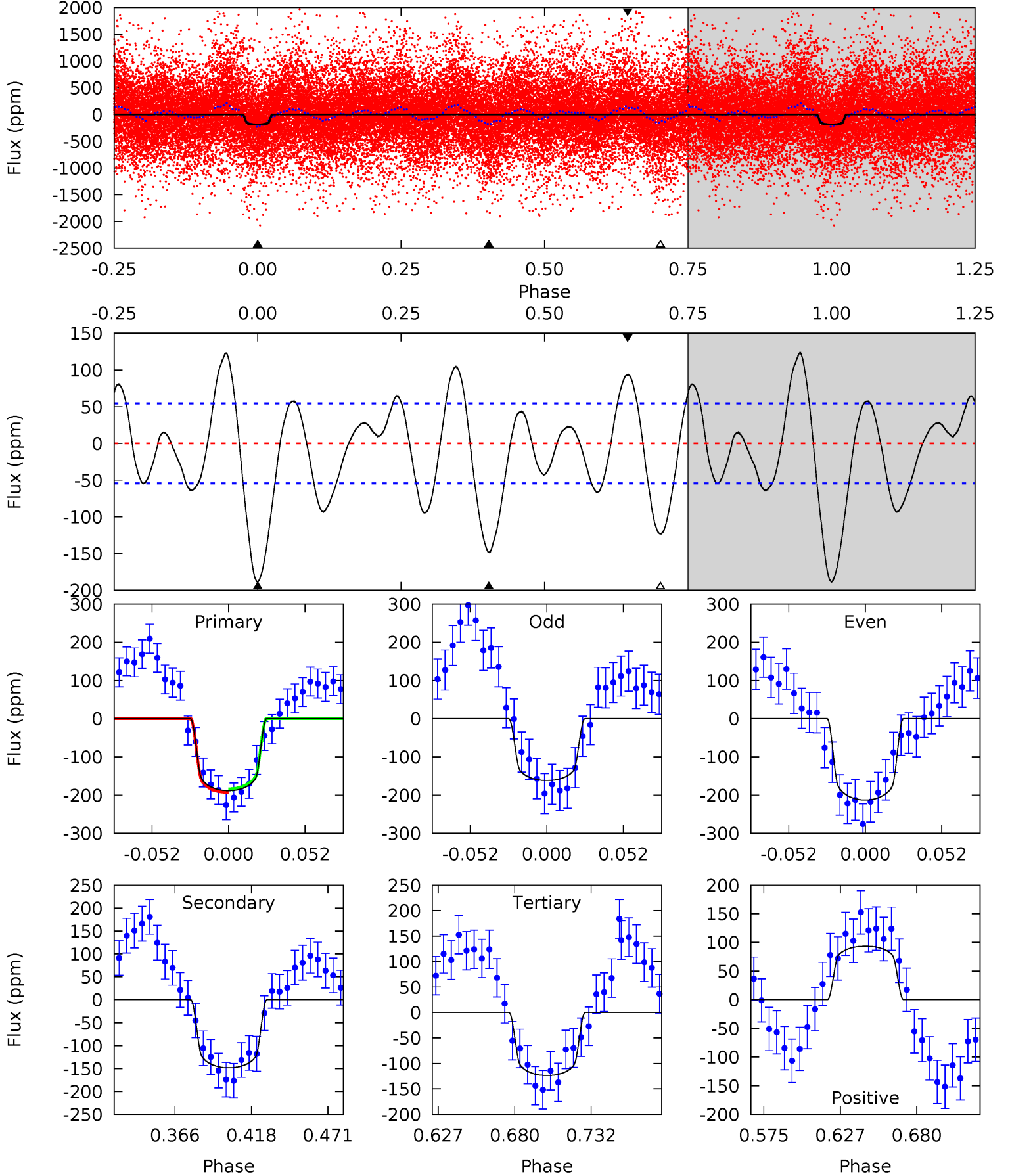
TCE 007138446-03 P= 3.949040 Days $T_0=134.001209$ (BKJD)



DV Model-Shift Uniqueness Test

007138446-03, P = 3.949040 Days, E = 130.052169 Days

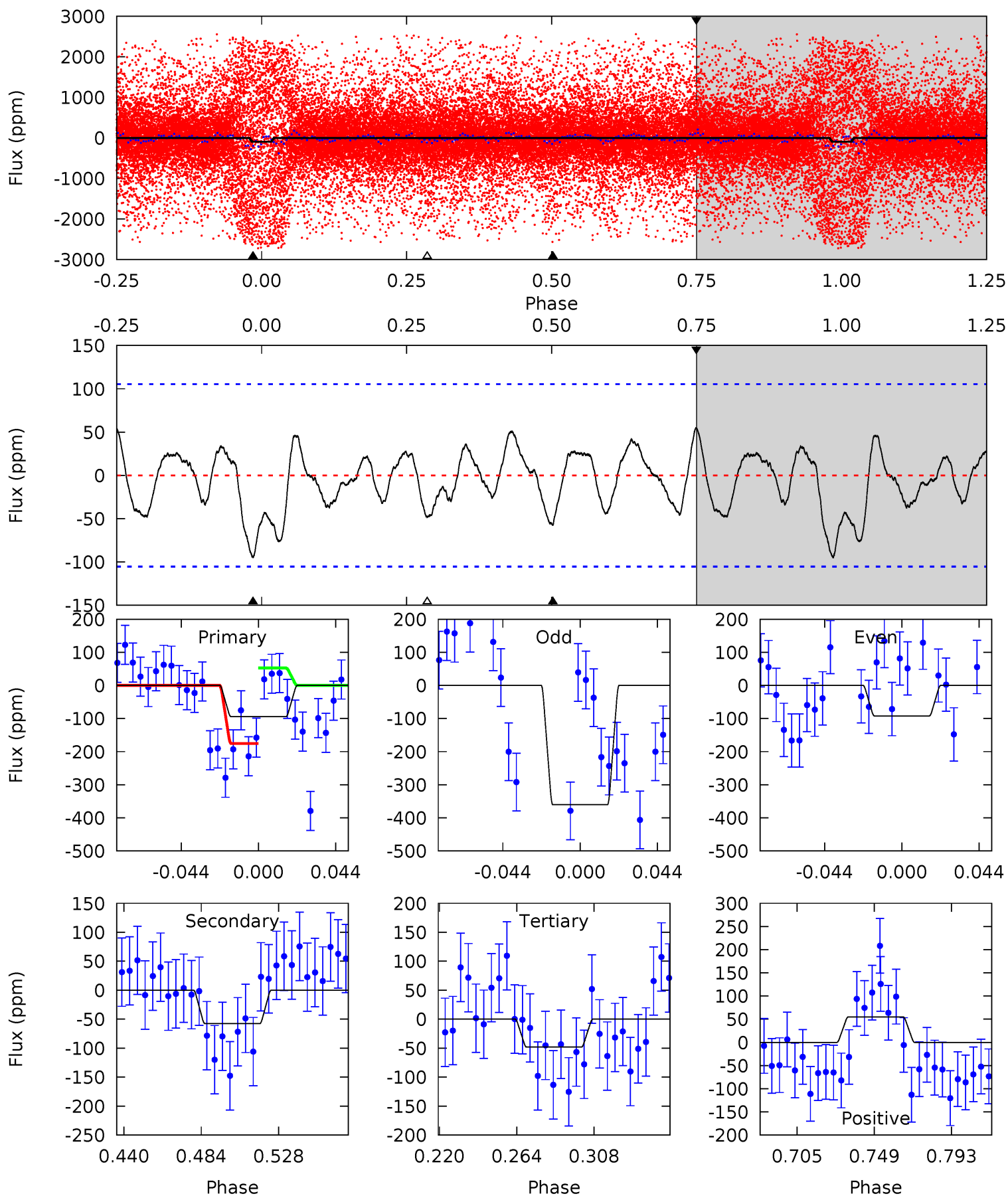
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	12.8	10.7	8.07	4.70	1.94	4.77	5.60	8.20	2.14	4.74	2.21	1.04	0.39	0.42



Alt Model-Shift Uniqueness Test

007138446-03, P = 3.949040 Days, E = 130.052169 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.25	2.59	2.16	2.47	4.73	2.01	1.20	2.08	1.78	0.42	0.12	5.89	1.01	0.37	0



Stellar Parameters For KIC 007138446

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7096^{+171}_{-256}	$4.133^{+0.175}_{-0.193}$	$-0.300^{+0.300}_{-0.350}$	$1.657^{+0.502}_{-0.411}$	$1.363^{+0.214}_{-0.235}$	$0.422^{+0.416}_{-0.211}$
	+2%/-4%	+4%/-5%	+100%/-117%	+30%/-25%	+16%/-17%	+99%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007138446-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-148 ± 12	$2.37^{+0.56}_{-0.46}$	2431^{+195}_{-183}	6786^{+706}_{-465}	42^{+22}_{-14}
Alt.	-58 ± 22	$2.36^{+0.51}_{-0.47}$	2425^{+183}_{-168}	5386^{+576}_{-659}	16^{+12}_{-8}

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 $A_{\text{obs}} \gg 1.0$

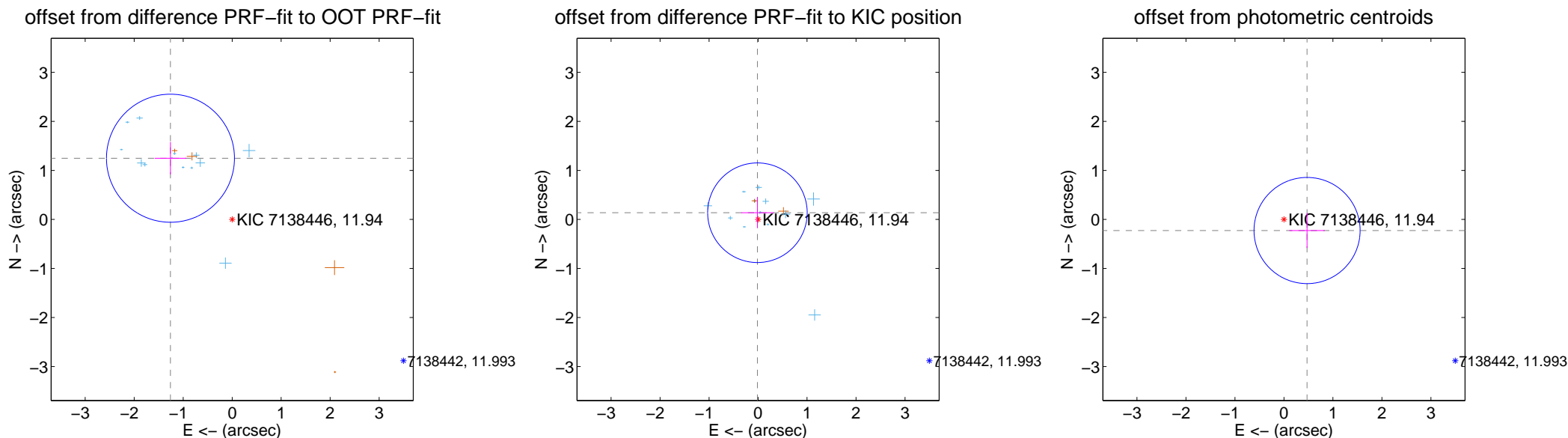
DV Centroid Data

Supplemental centroid analysis for 007138446-03. **Kepler magnitude: 11.94.** Transit SNR 7.87

There are 13 quarters with good PRF difference image offsets

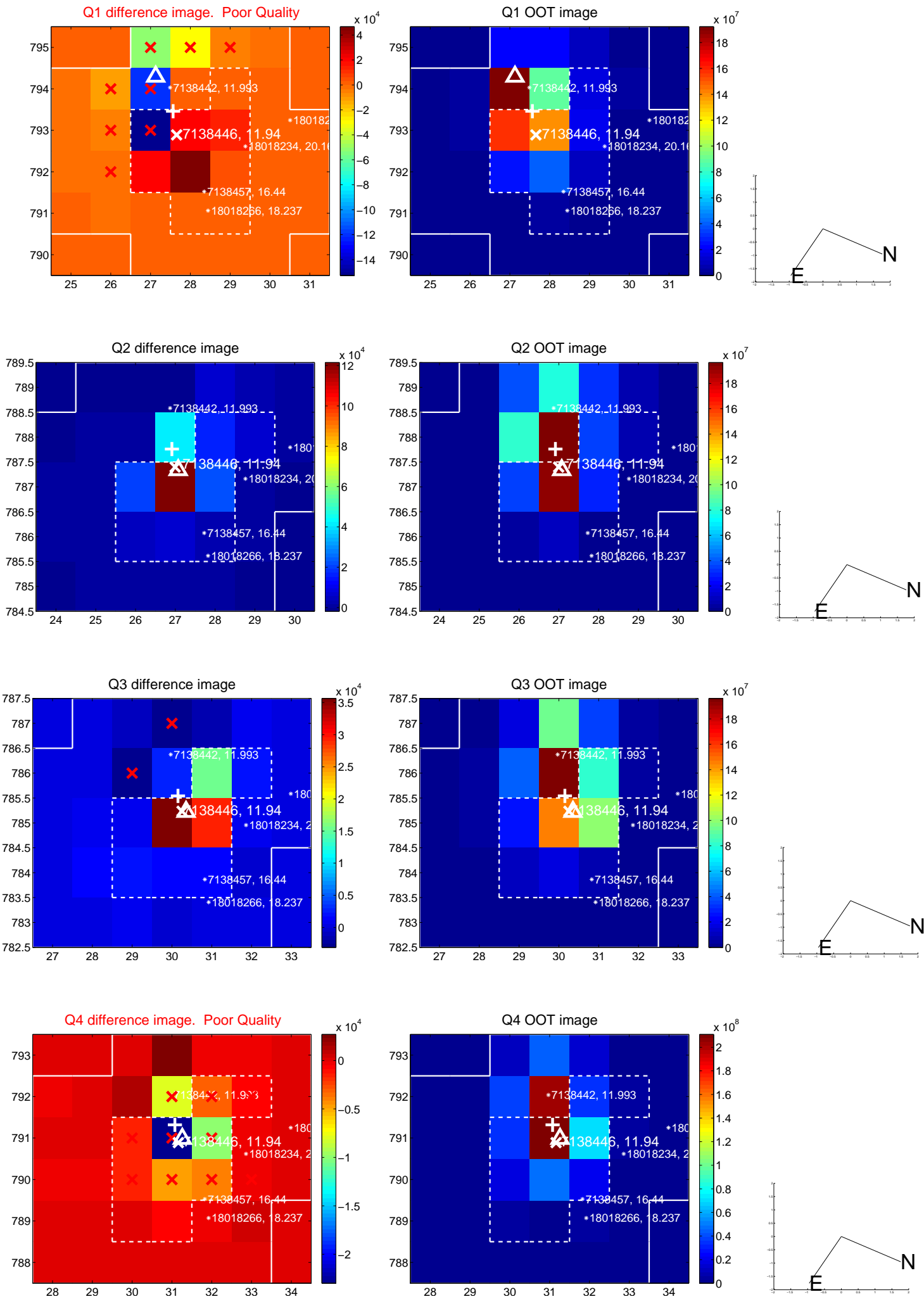
The OOT PRF centroid is offset from the target star catalog position by about 2.33 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.773 ± 0.435	4.07	1.259 ± 0.323	1.248 ± 0.329
PRF-fit source offset from KIC position	0.138 ± 0.339	0.41	0.013 ± 0.332	0.137 ± 0.314
photometric centroid source offset	0.52 ± 0.36	1.45	-0.47 ± 0.36	-0.23 ± 0.36

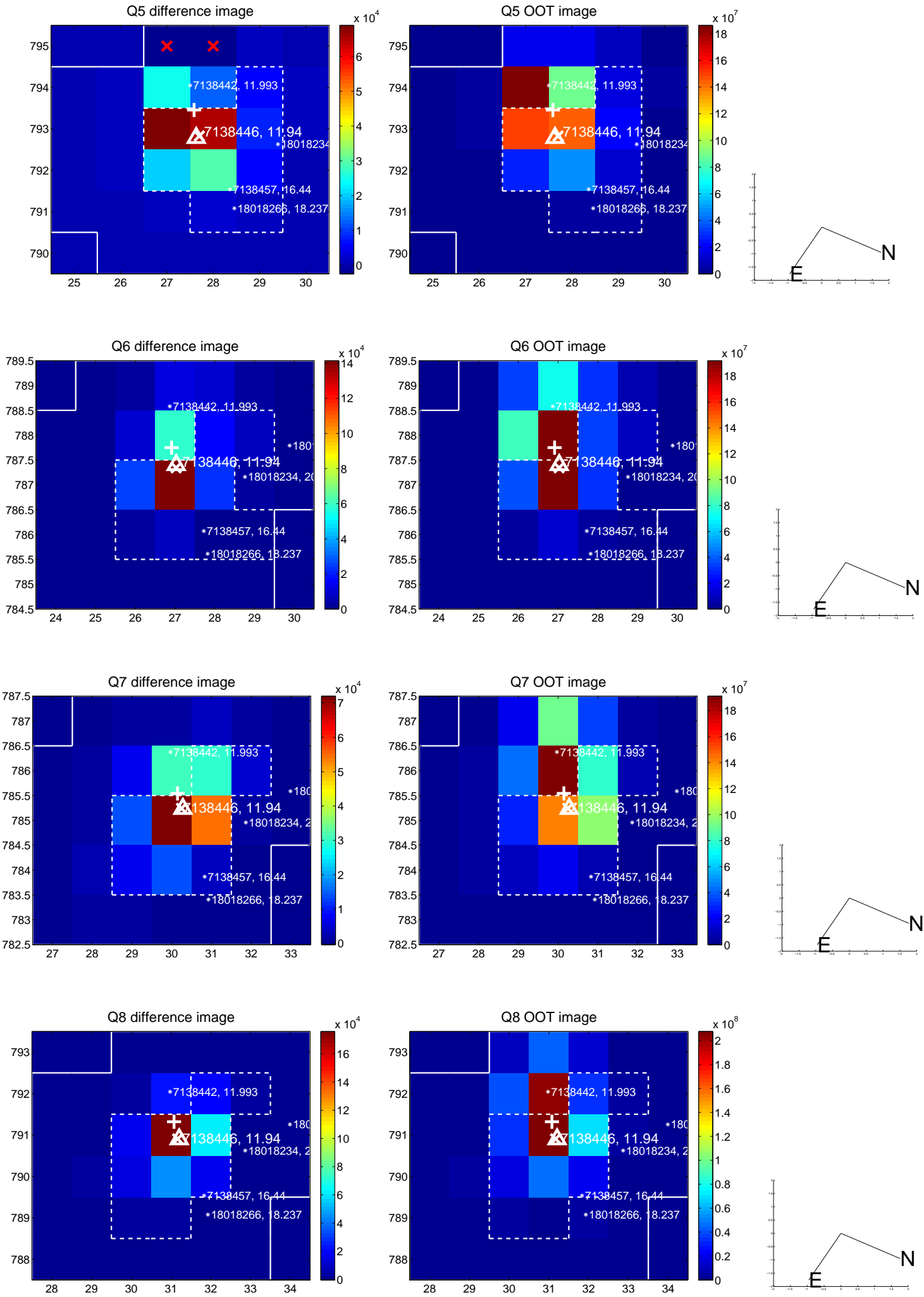


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

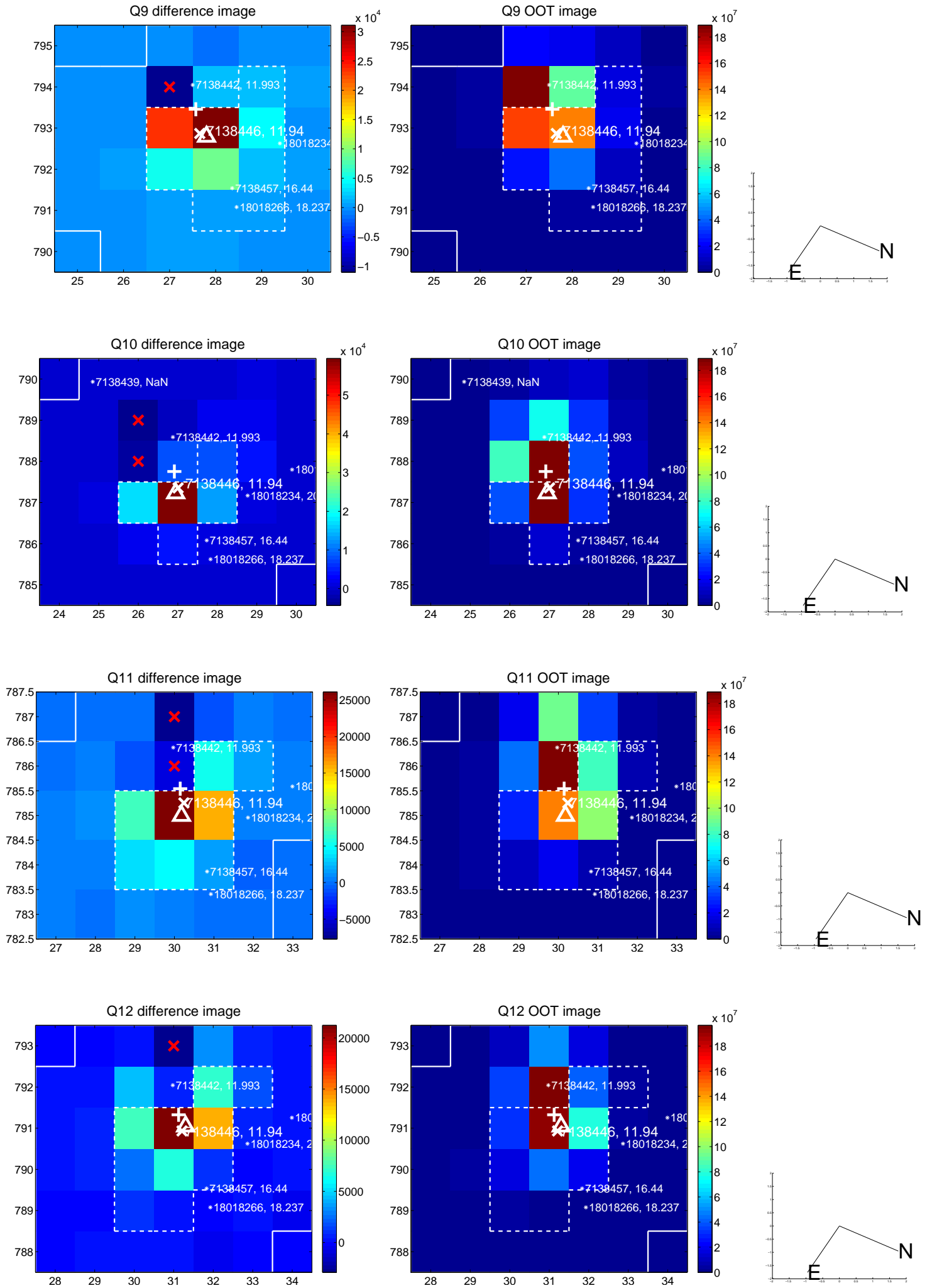
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



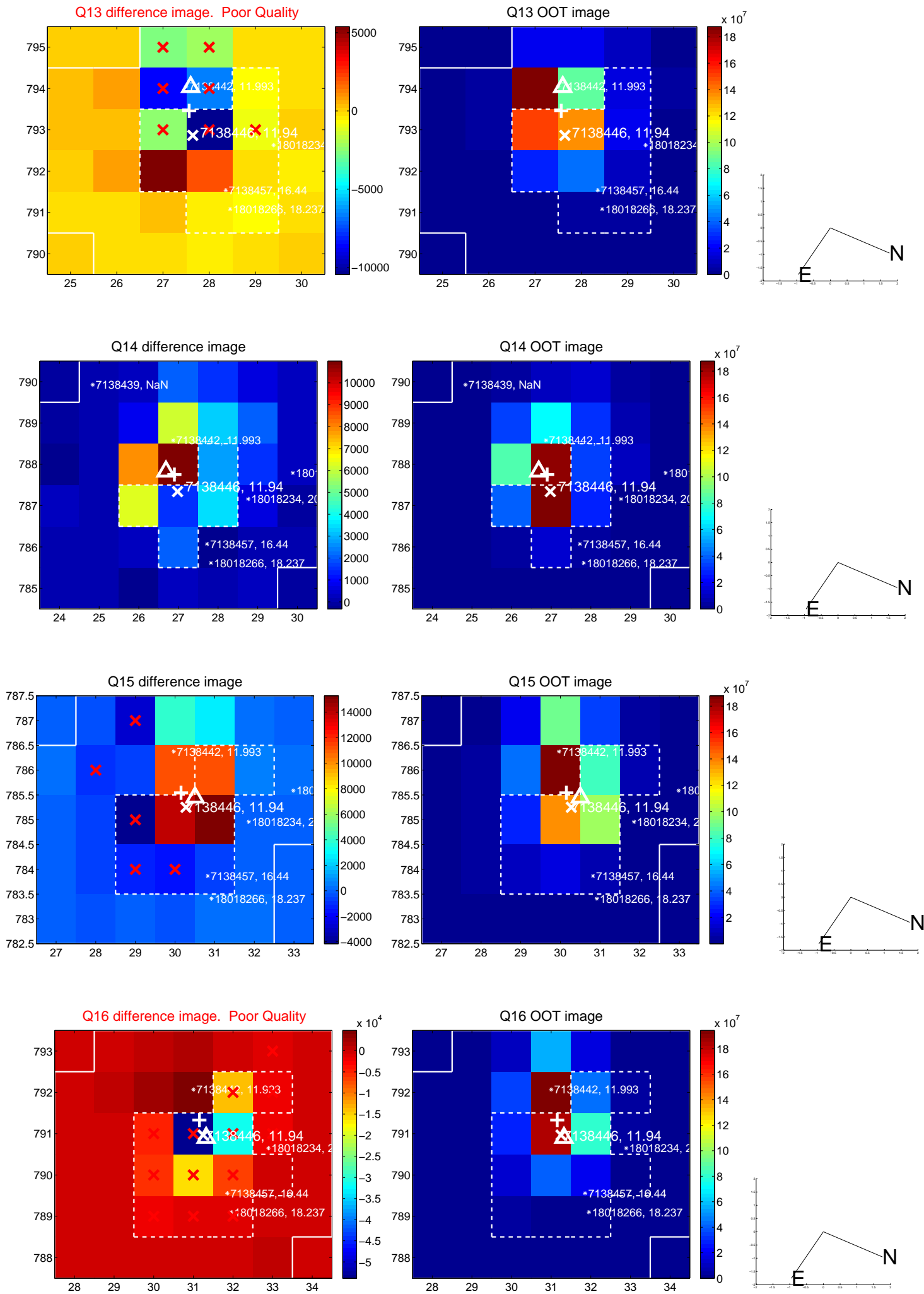
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



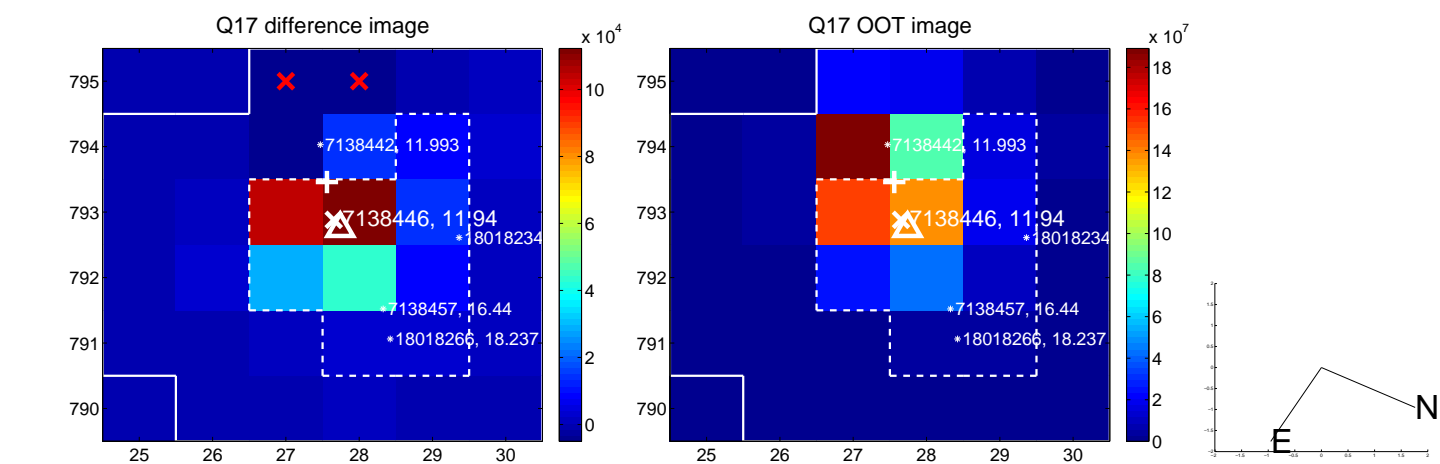
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



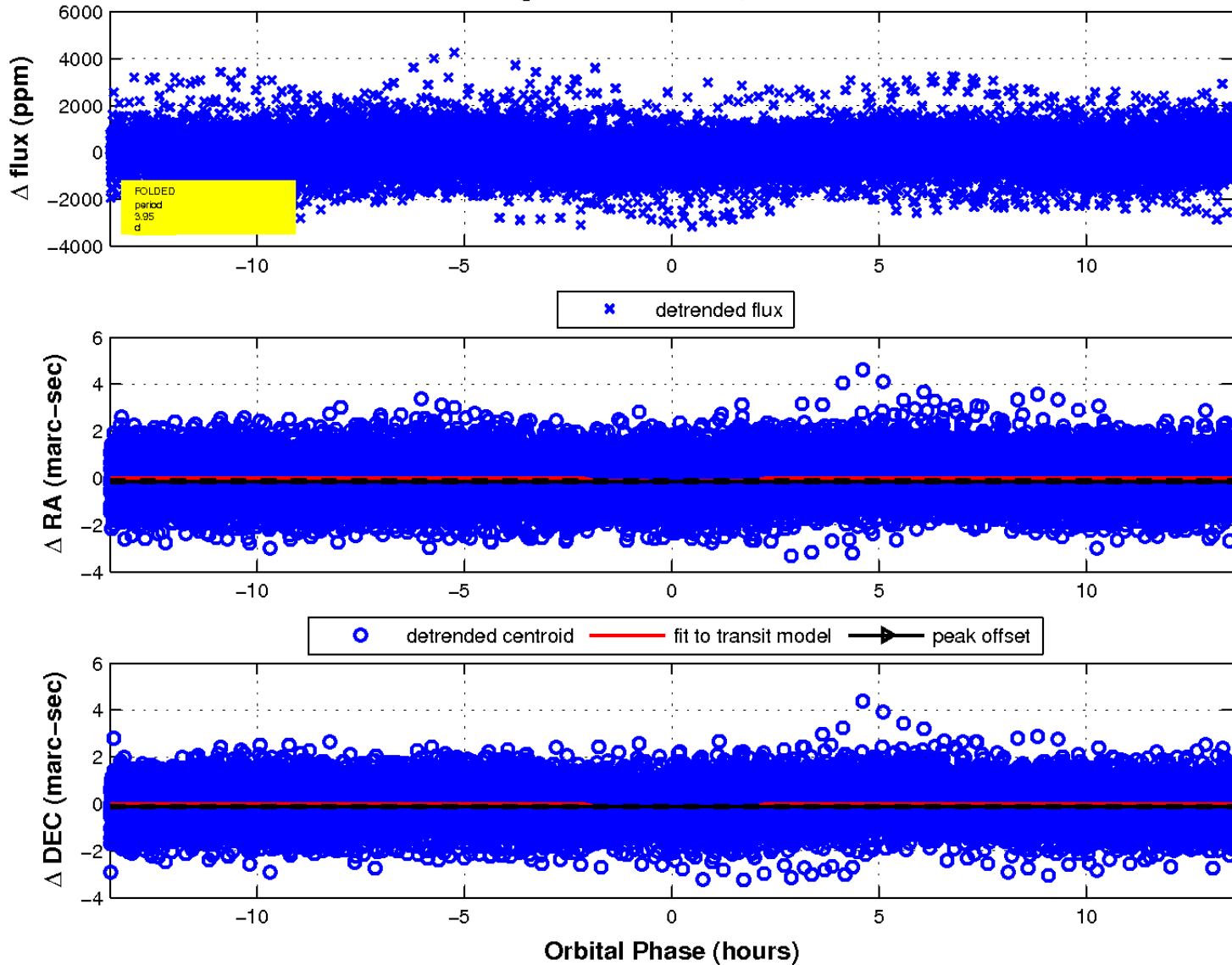
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

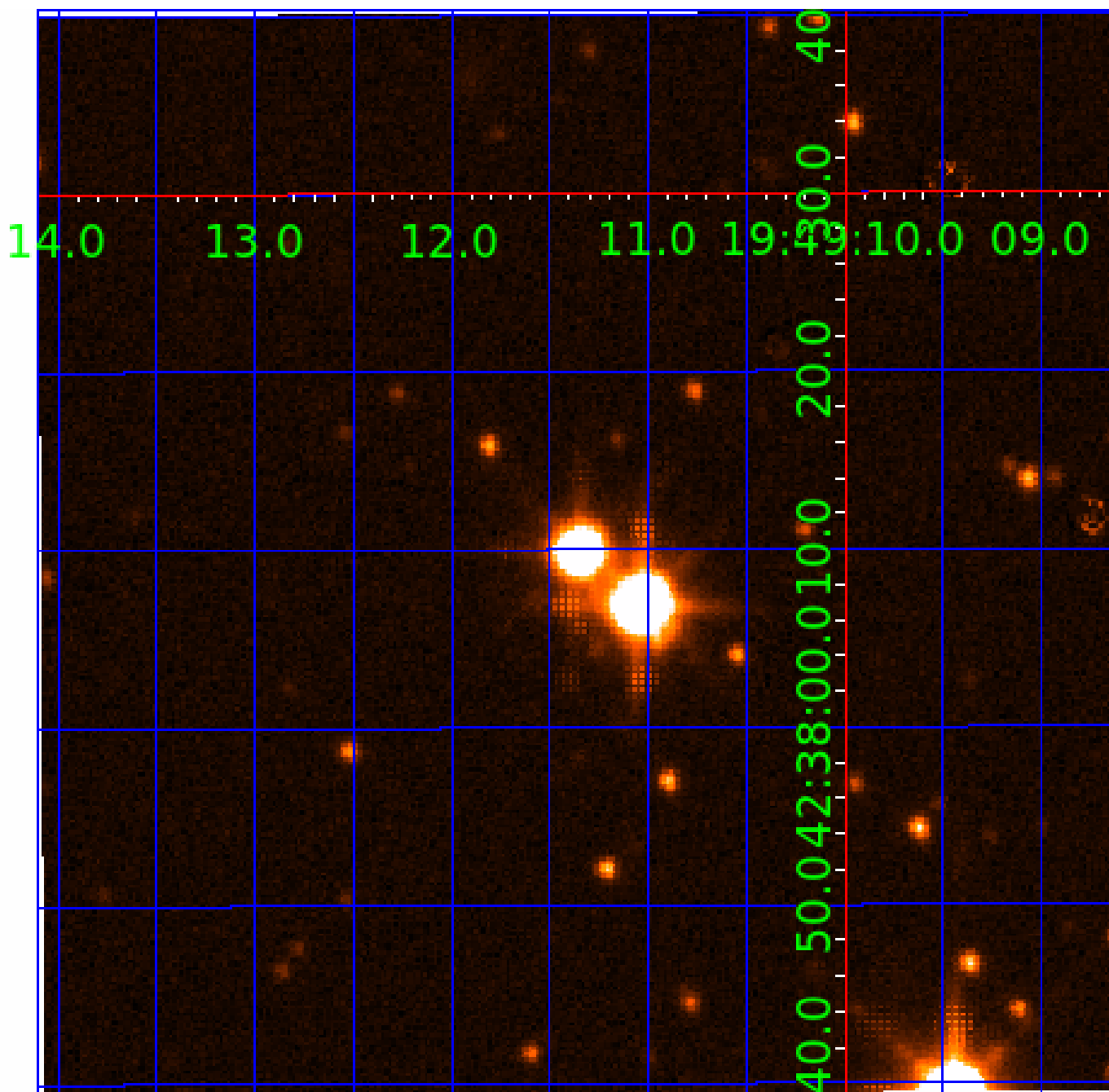


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 007138446

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})
007138446-01	OBS	No	0.901022	132.406470	31.3	2.936	8.5	5.2	1.66	7096	1.09	15235.27
007138446-02	OBS	No	86.562623	188.174863	419.4	14.156	7.7	4.5	1.66	7096	3.51	34.62
007138446-03	OBS	No	3.949040	134.001209	146.9	4.514	8.5	7.9	1.66	7096	2.33	2124.10
007138446-04	OBS	No	0.901038	131.947828	53.0	3.487	10.4	7.5	1.66	7096	1.22	15234.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007138446-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007138446-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007138446-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_KIC_POS

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

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

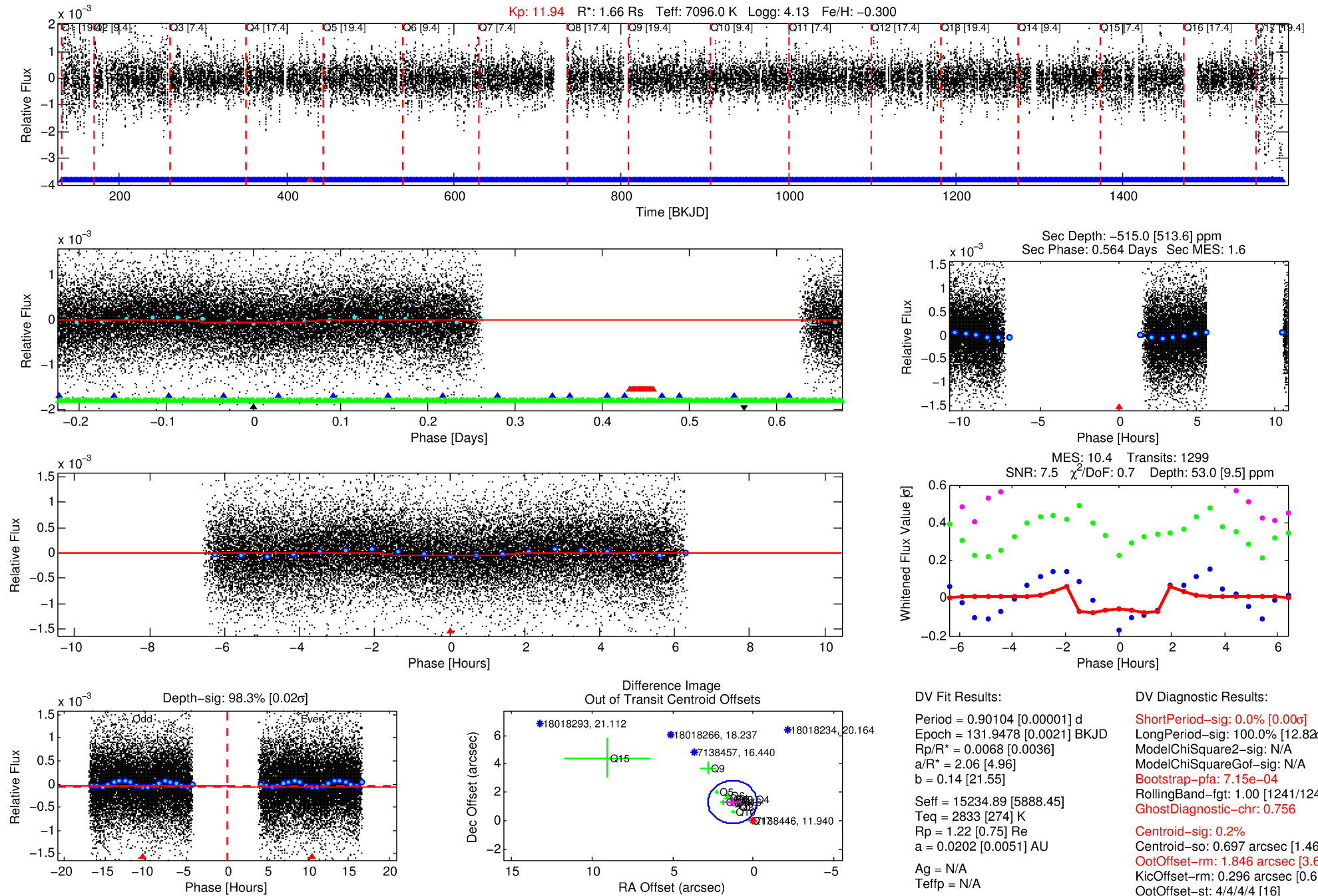
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007138446-04

No Significant Match Found

DV One-Page Summary

KIC: 7138446 Candidate: 4 of 4 Period: 0.901 d



DV Fit Results:

Period = 0.90104 [0.00001] d
Epoch = 131.9478 [0.0021] BKJD
Rp/R* = 0.0068 [0.0036]
a/R* = 2.06 [4.96]
b = 0.14 [21.55]
Seff = 15234.89 [5888.45]
Teq = 2833 [274] K
Rp = 1.22 [0.75] Re
a = 0.0202 [0.0051] AU
Ag = N/A
Teffp = N/A

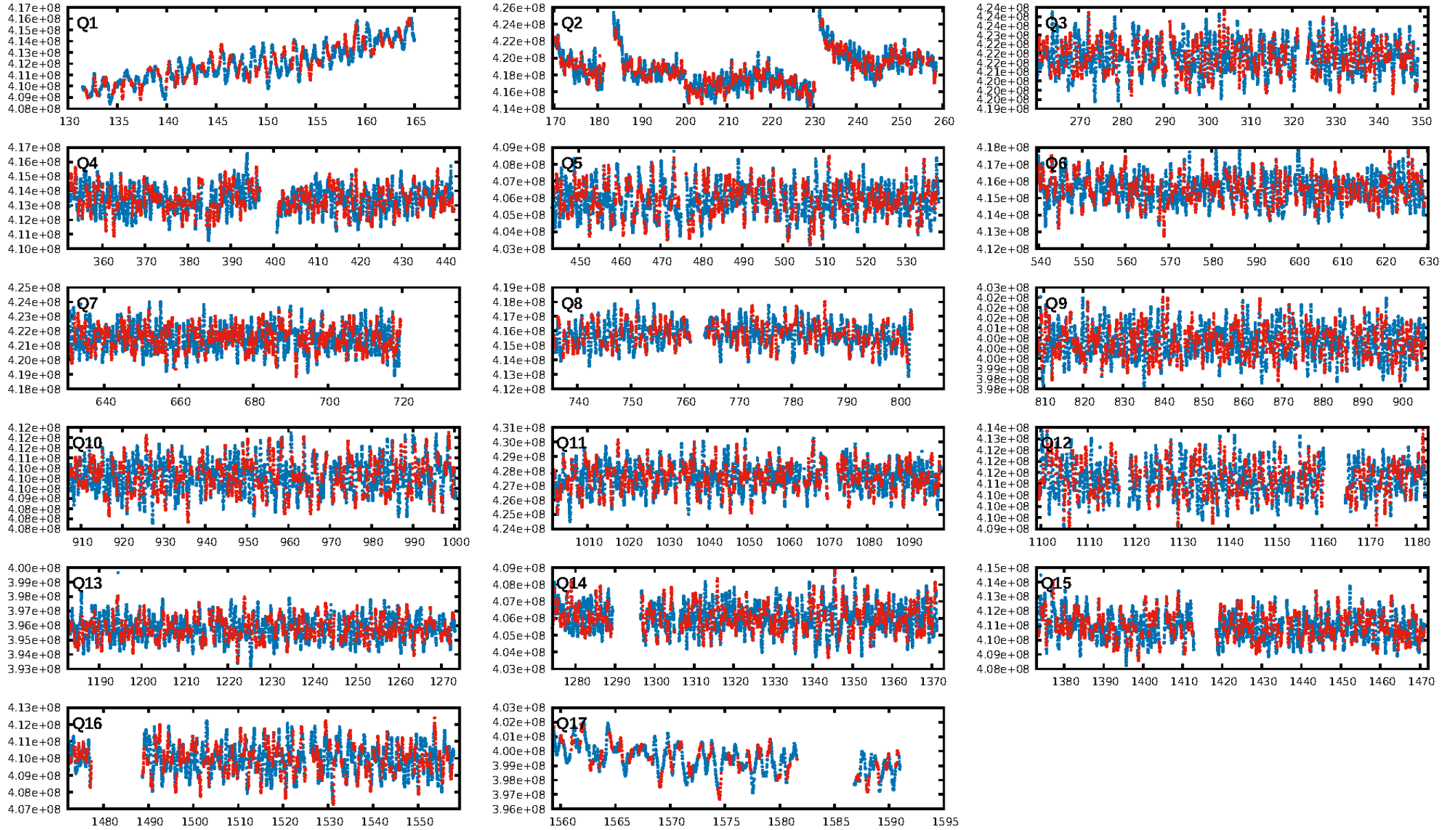
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: 100.0% [12.82 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.15e-04
RollingBand-fgt: 1.00 [1241/1242]
GhostDiagnostic-chr: 0.756
Centroid-sig: 0.2%
Centroid-so: 0.697 arcsec [1.46 σ]
OotOffset-rm: 1.846 arcsec [3.67 σ]
KicOffset-rm: 0.296 arcsec [0.67 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.50 [8/16]
DiffImageOverlap-fno: 1.00 [17/17]

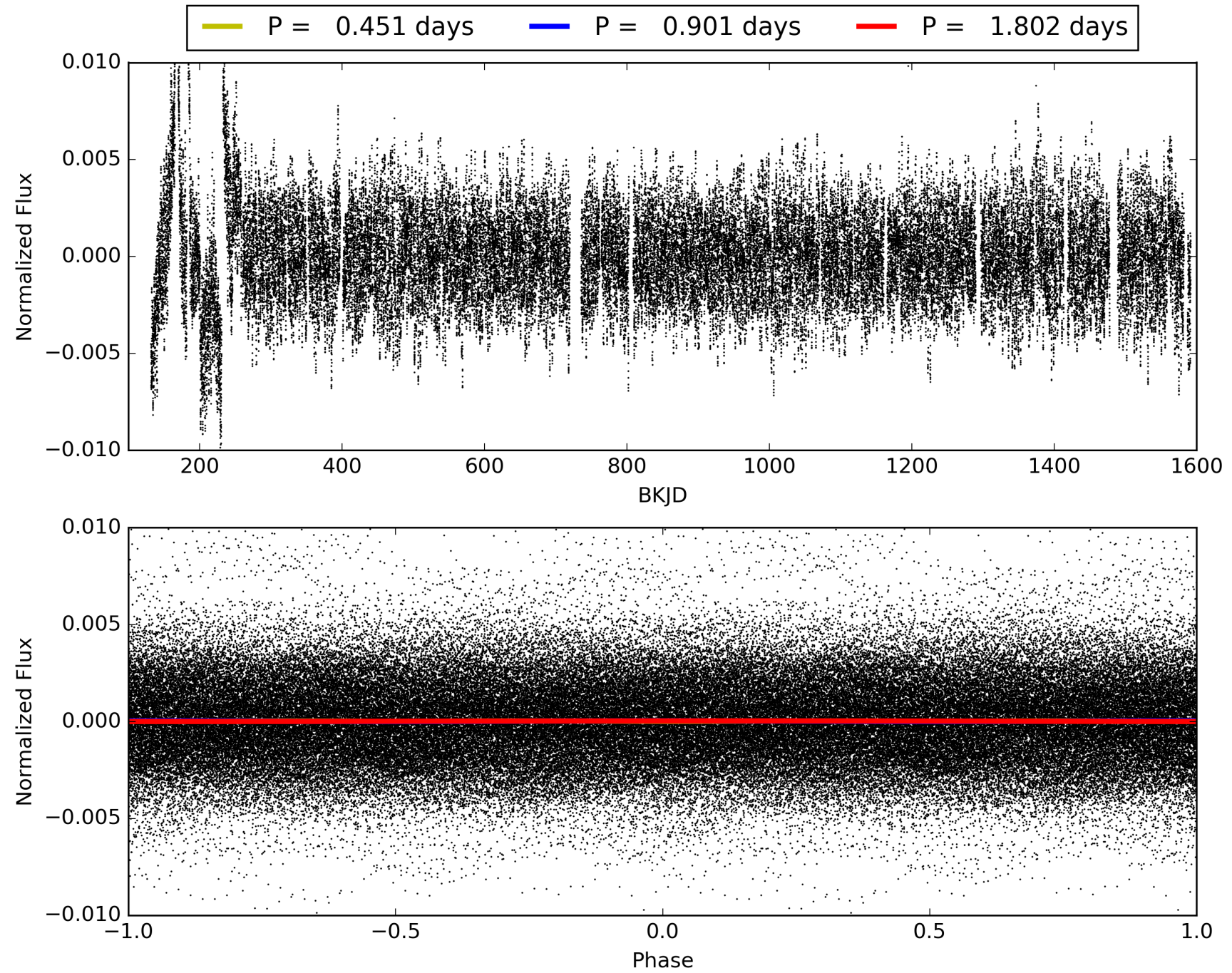
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:33:35 Z

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

TCE 007138446-04, PDC Light Curves

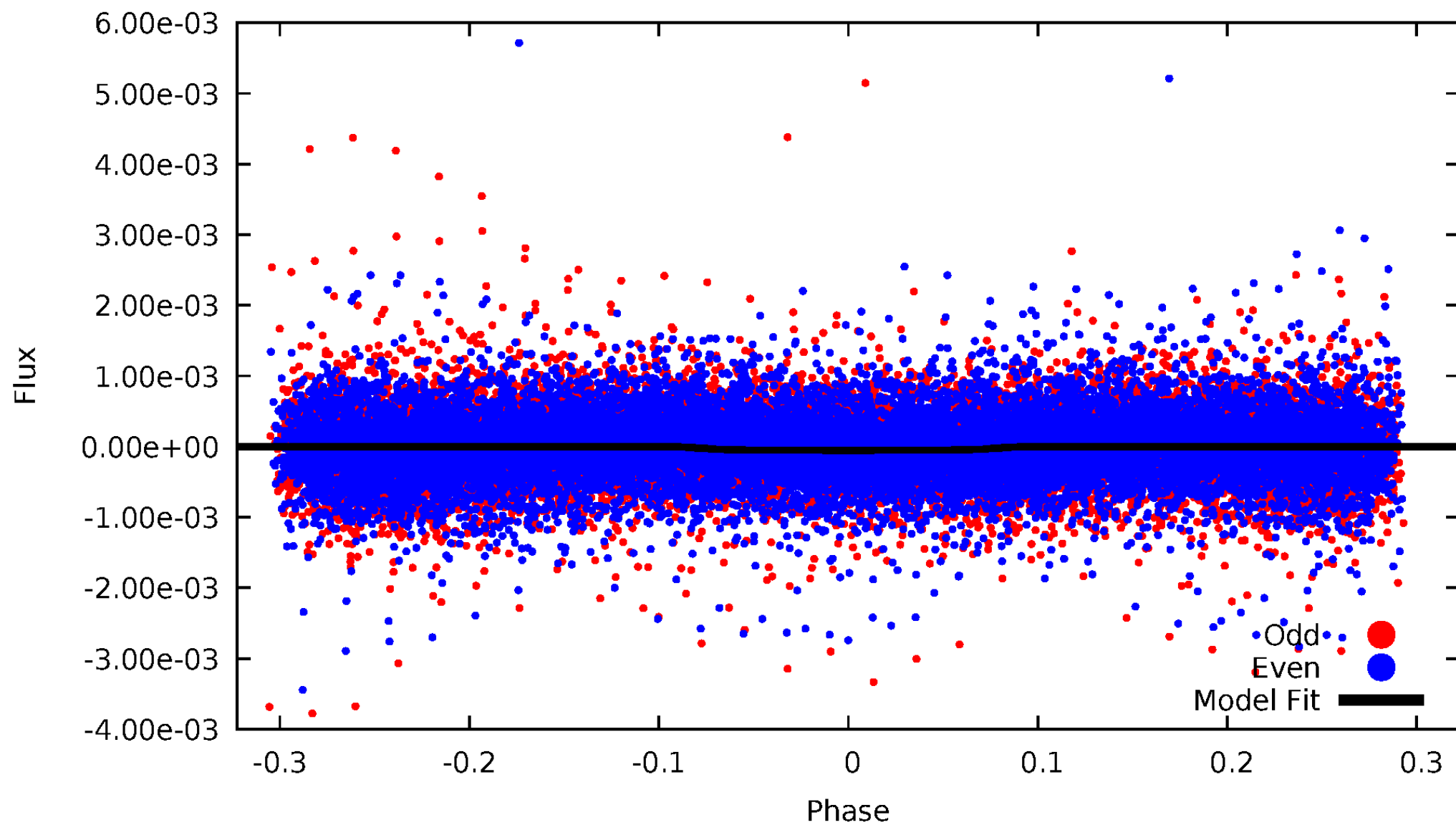


TCE 007138446-04



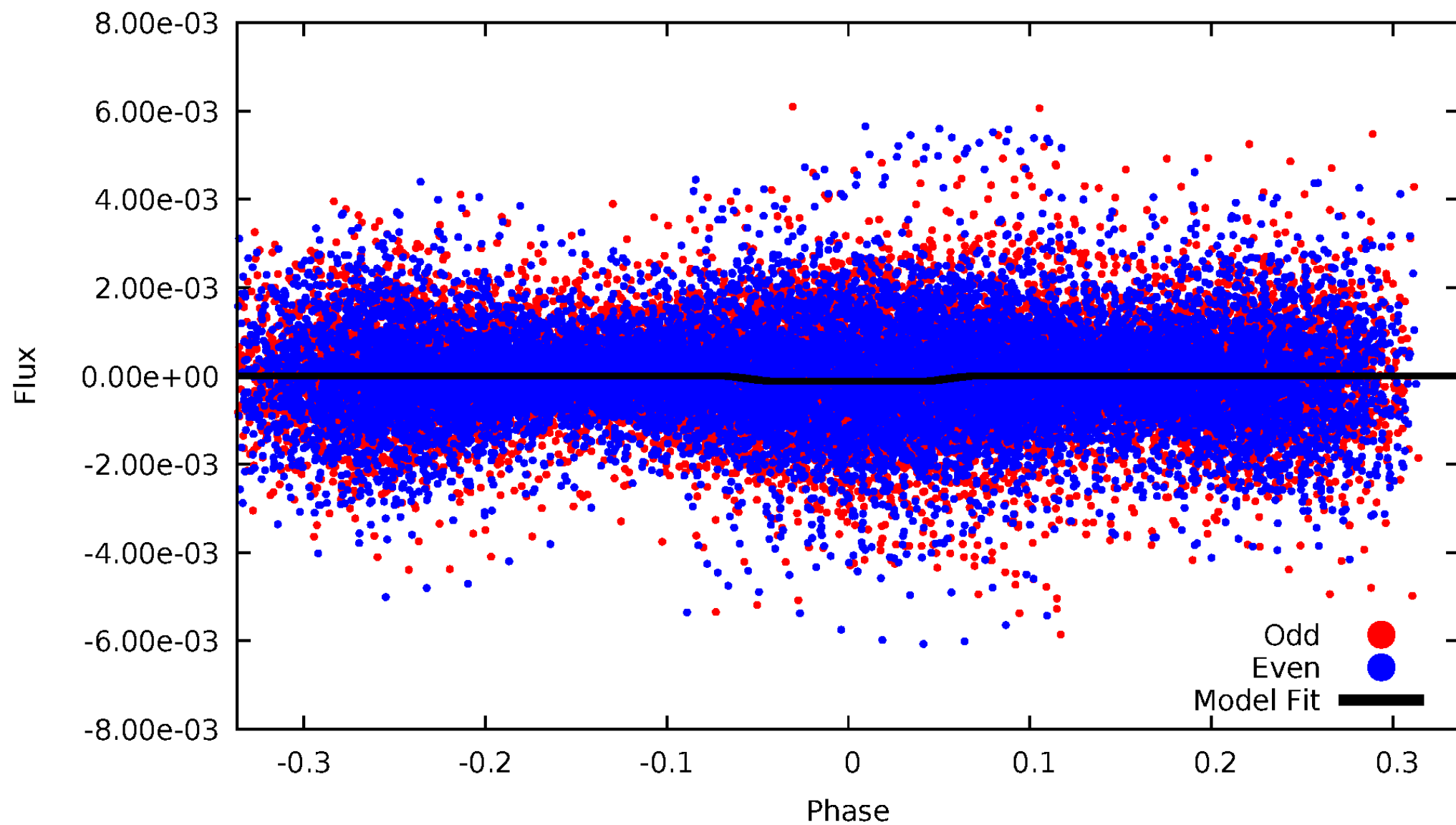
DV Odd/Even

TCE 007138446-04



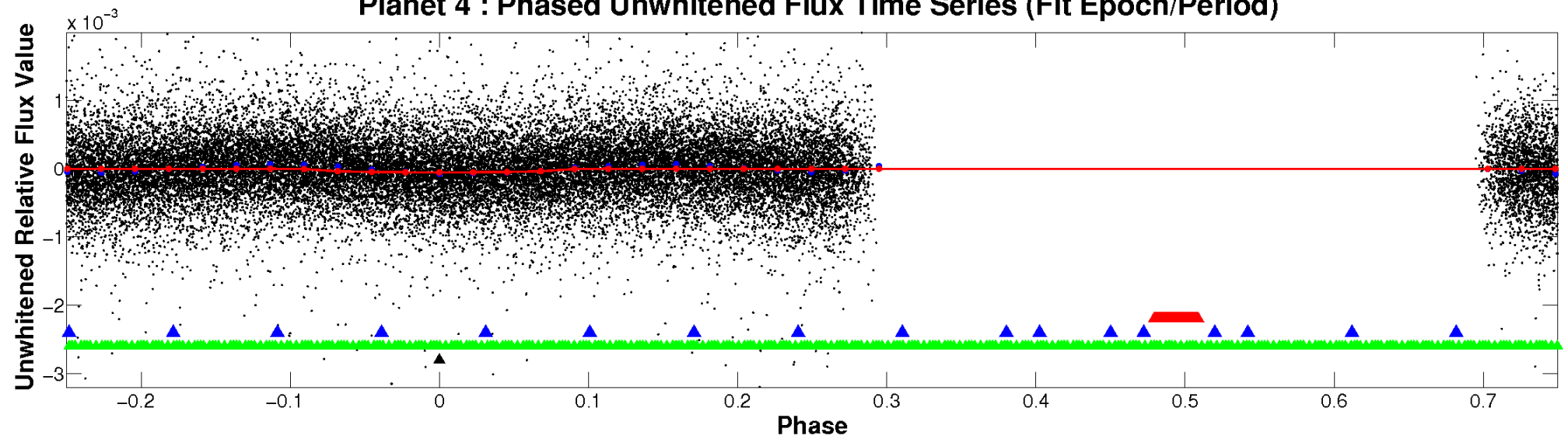
ALT Odd/Even

TCE 007138446-04

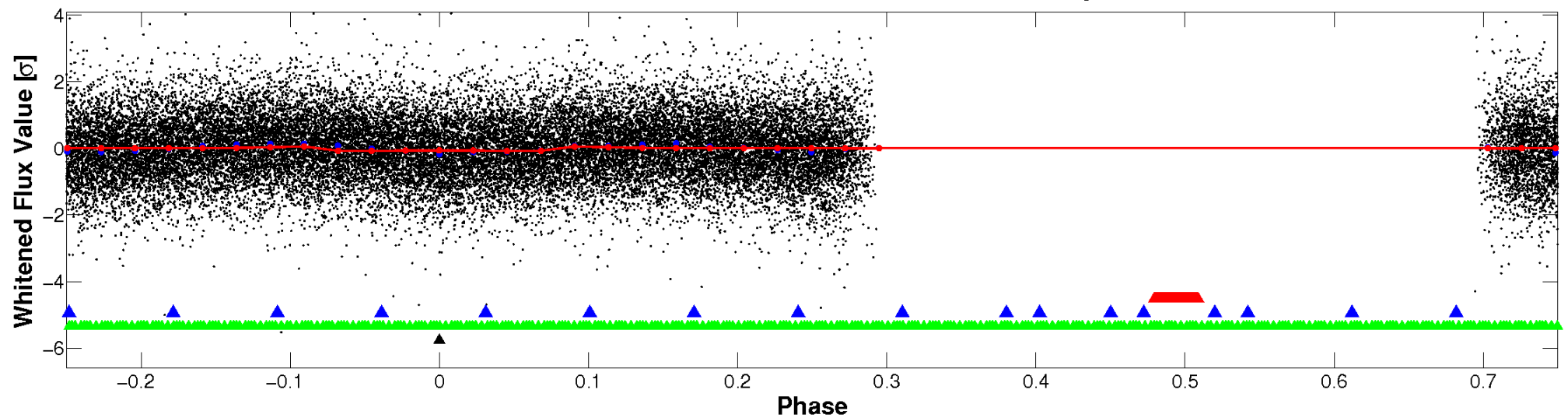


Non-Whitened Vs. Whitened Light Curve

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

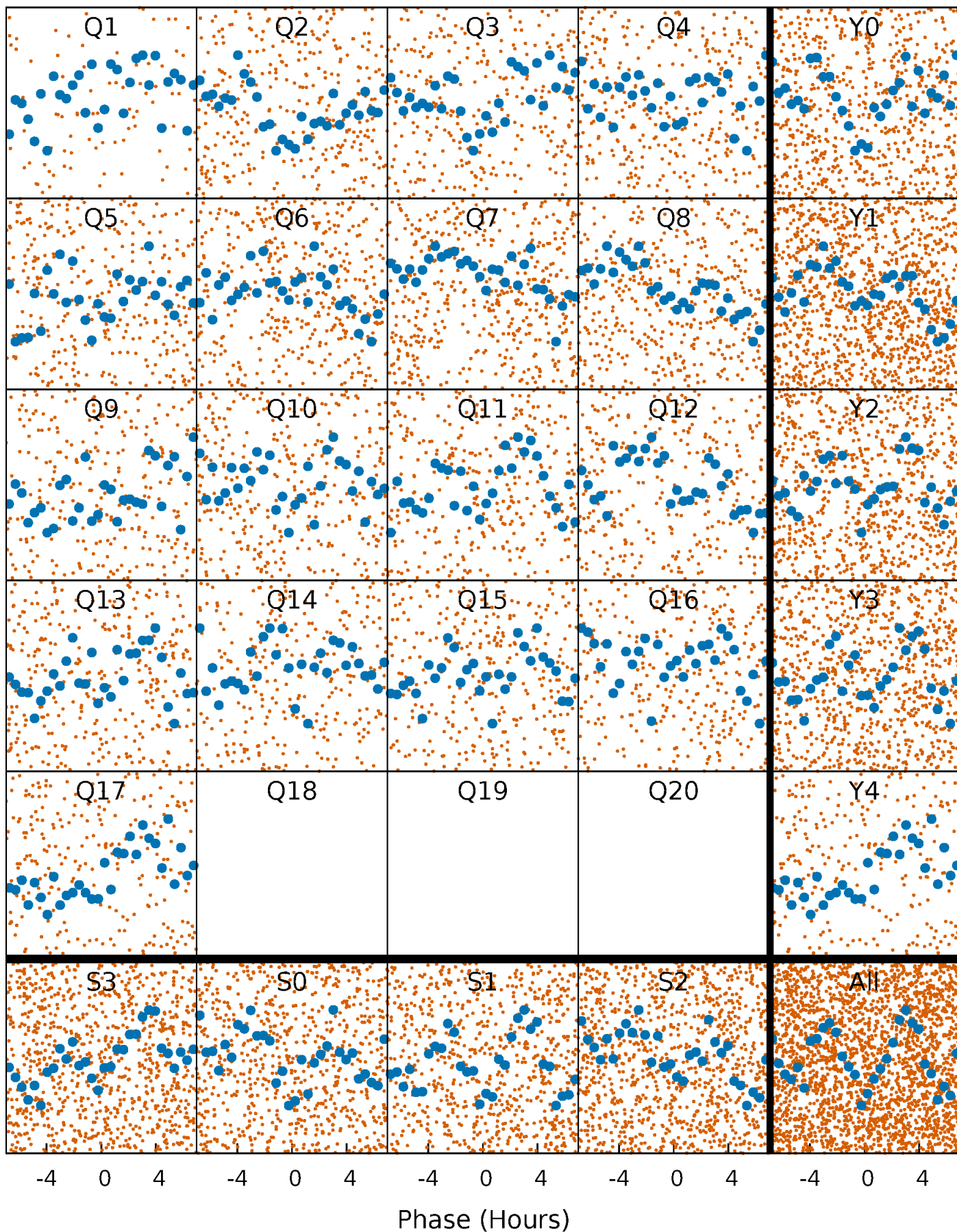


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



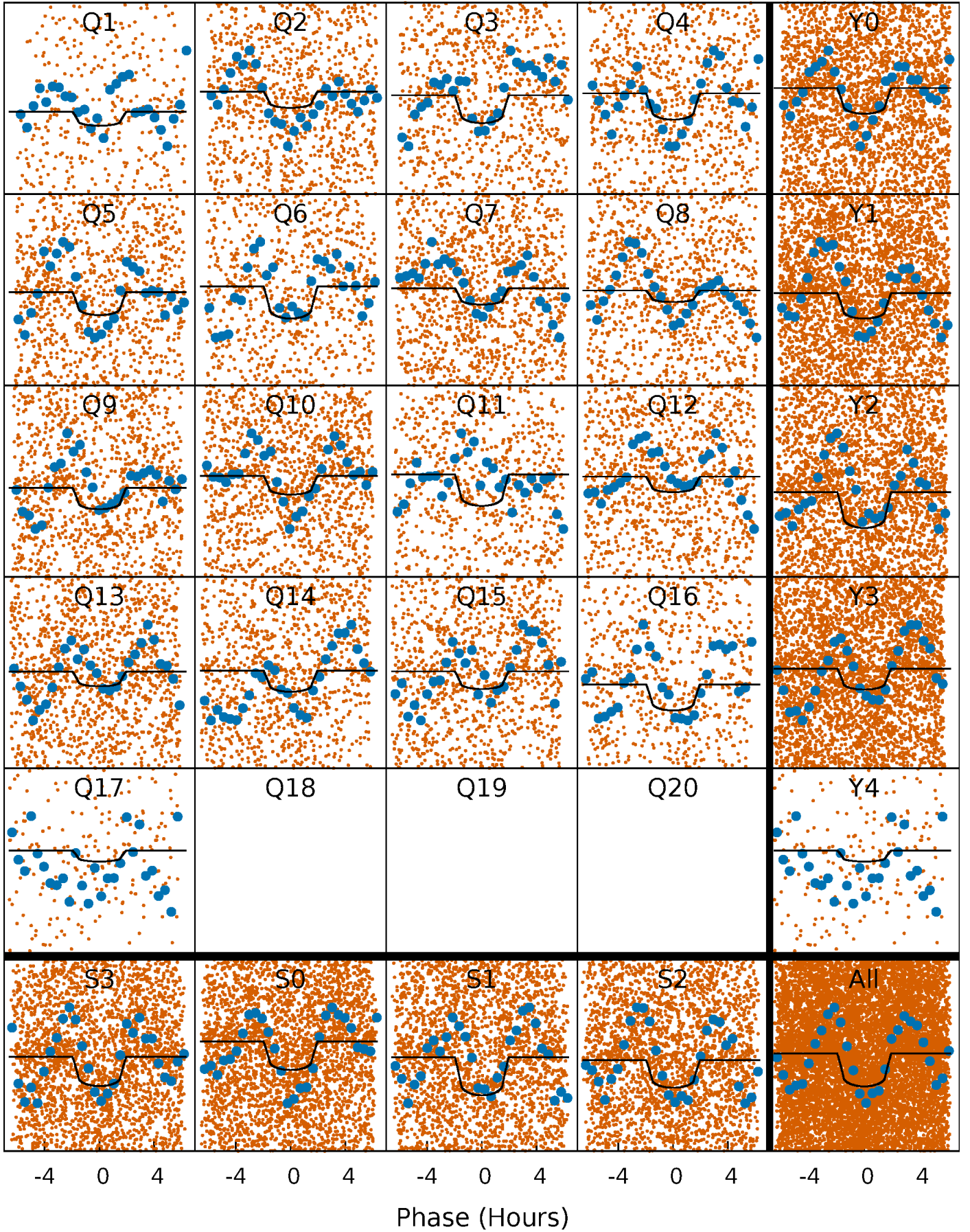
PDC Quarter-Phased Transit Curves

TCE 007138446-04 P= 0.901038 Days $T_0=131.947827$ (BKJD)



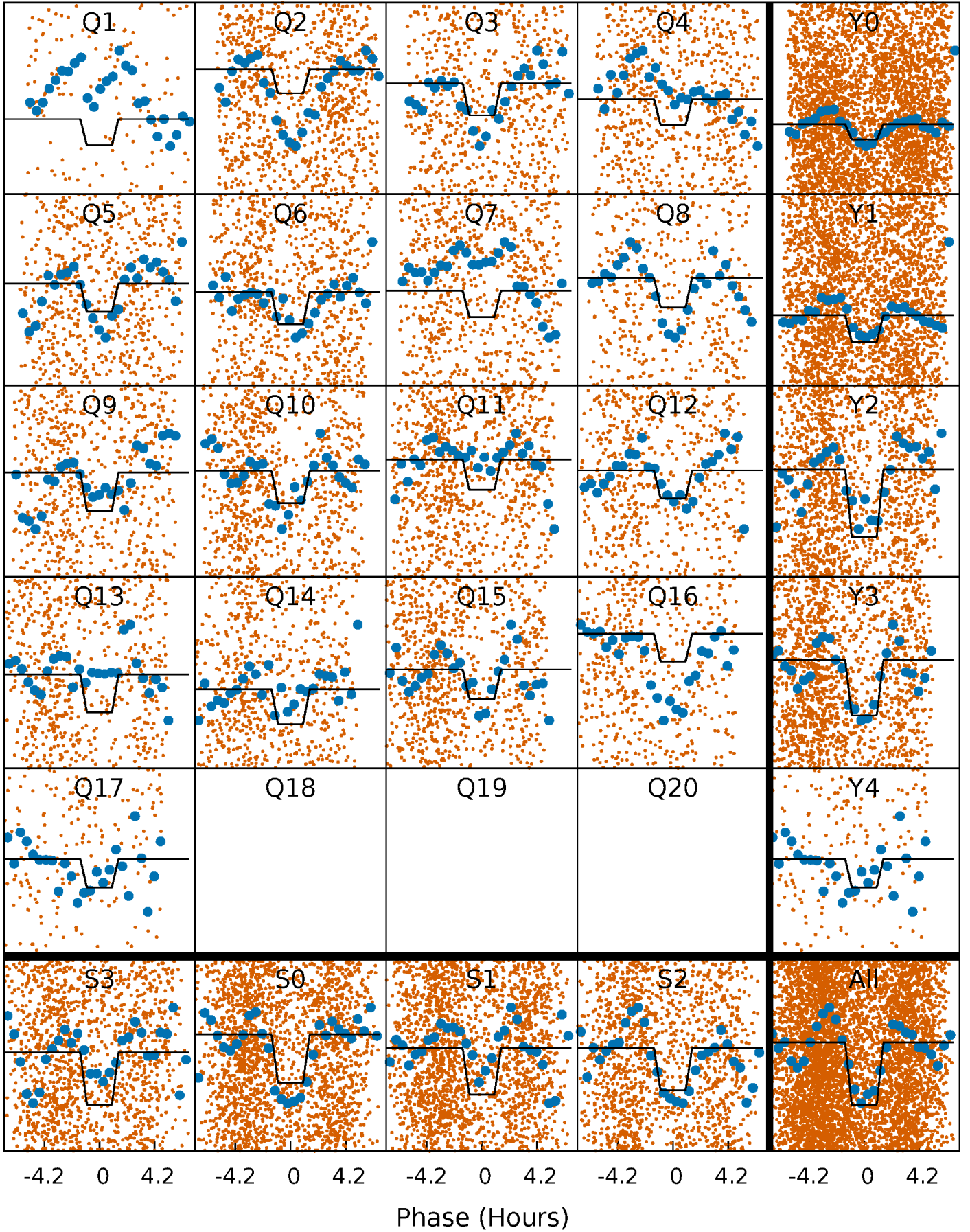
DV Quarter-Phased Transit Curves

TCE 007138446-04 P= 0.901038 Days $T_0=131.947827$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

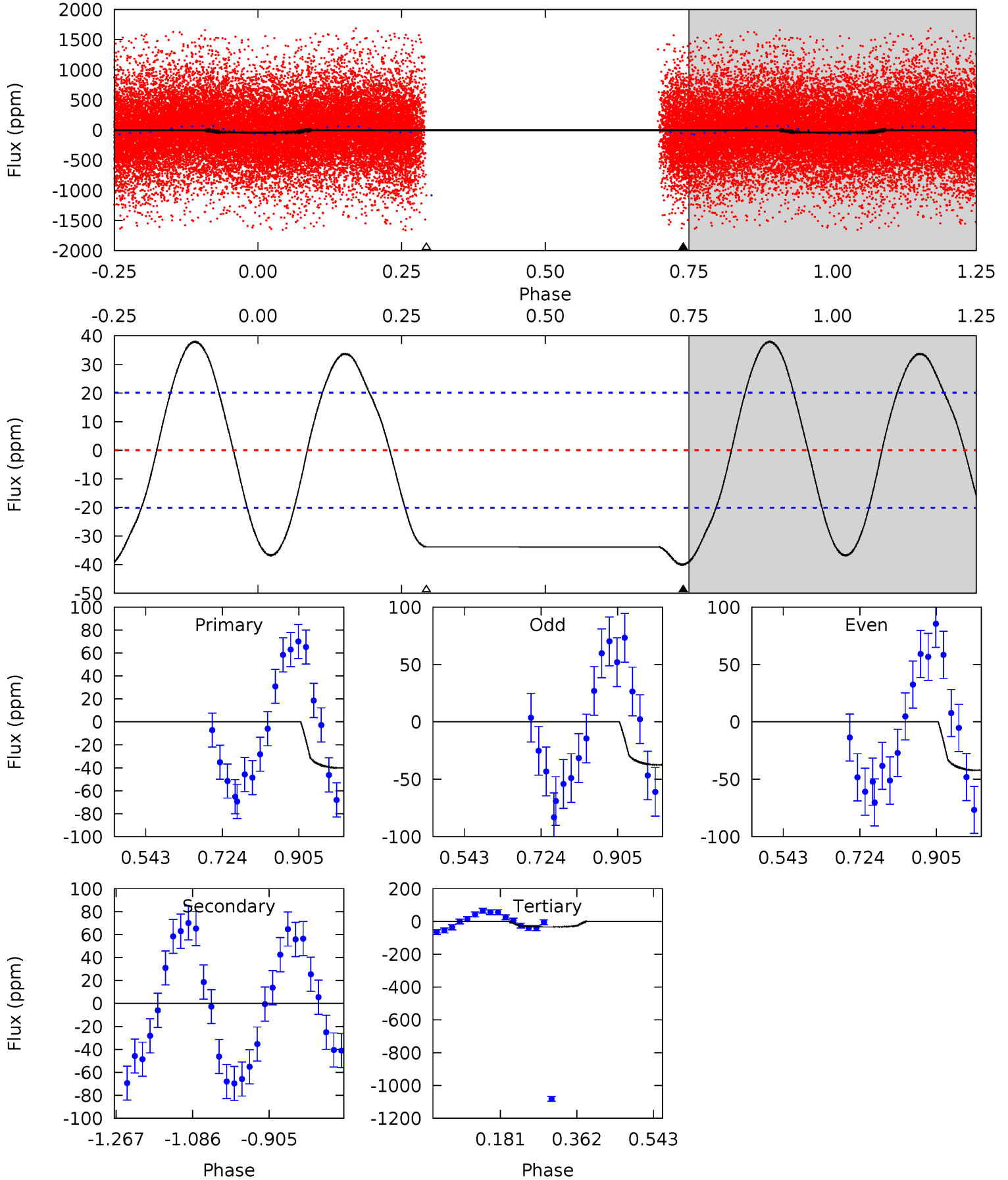
TCE 007138446-04 P= 0.901076 Days $T_0=131.928463$ (BKJD)



DV Model-Shift Uniqueness Test

007138446-04, P = 0.901038 Days, E = 131.046789 Days

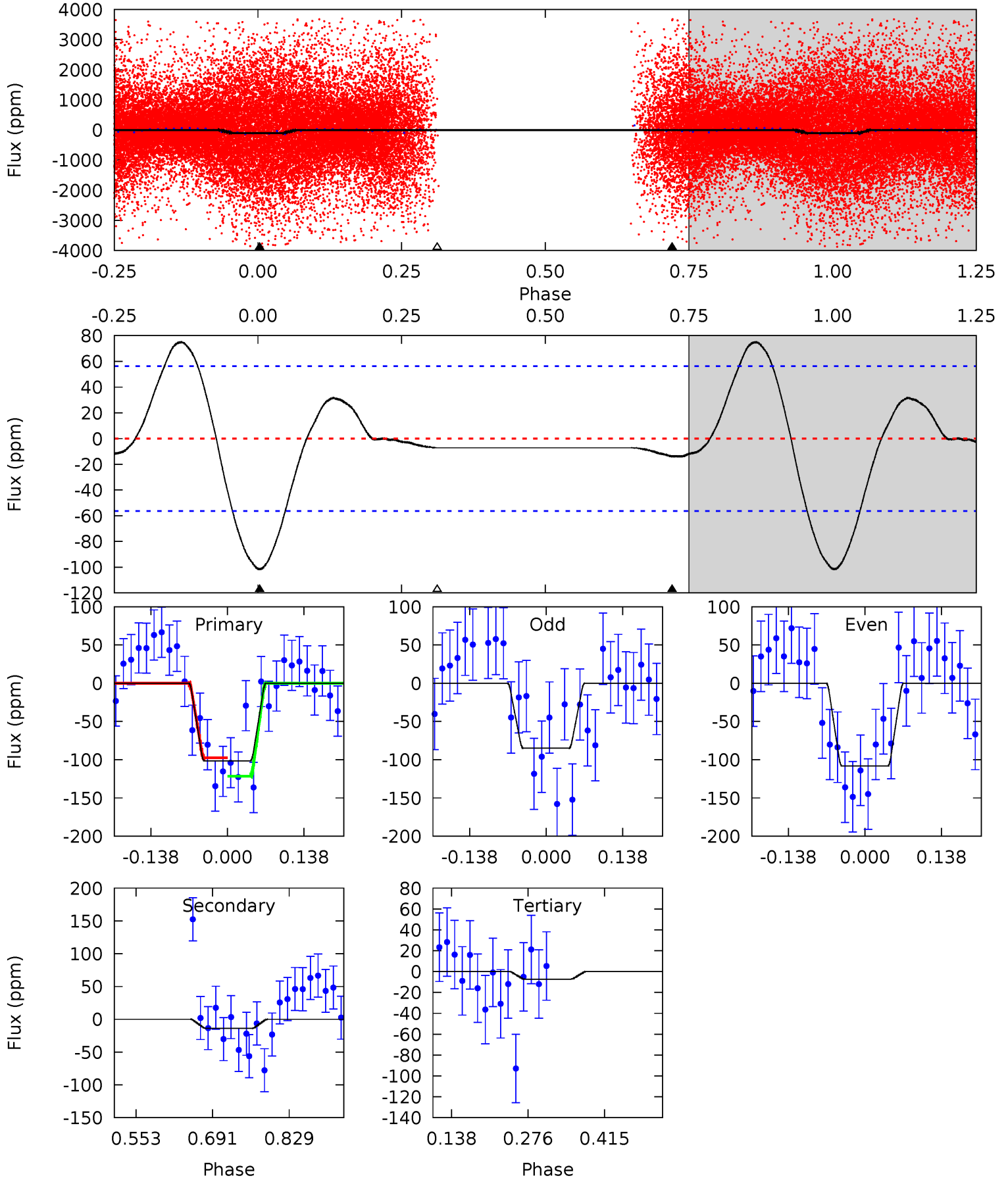
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.86	0	7.46	0	4.44	1.34	5.19	1.40	8.86	-7.46	0	0.52	0.93	0.49	6.09



Alt Model-Shift Uniqueness Test

007138446-04, P = 0.901076 Days, E = 131.027387 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.11	1.10	0.58	0	4.50	1.48	1.47	7.53	8.11	0.53	1.10	0.95	0.72	0.42	1.24



Stellar Parameters For KIC 007138446

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7096^{+171}_{-256}	$4.133^{+0.175}_{-0.193}$	$-0.300^{+0.300}_{-0.350}$	$1.657^{+0.502}_{-0.411}$	$1.363^{+0.214}_{-0.235}$	$0.422^{+0.416}_{-0.211}$
	+2%/-4%	+4%/-5%	+100%/-117%	+30%/-25%	+16%/-17%	+99%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007138446-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 5	$1.27^{+0.75}_{-0.67}$	3971^{+315}_{-257}	-3696^{+7642}_{-1037}	$-0.003^{+0.746}_{-0.945}$
Alt.	-14 ± 13	$1.97^{+0.74}_{-0.64}$	3969^{+312}_{-274}	3889^{+1268}_{-7376}	$0.718^{+1.521}_{-0.629}$

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

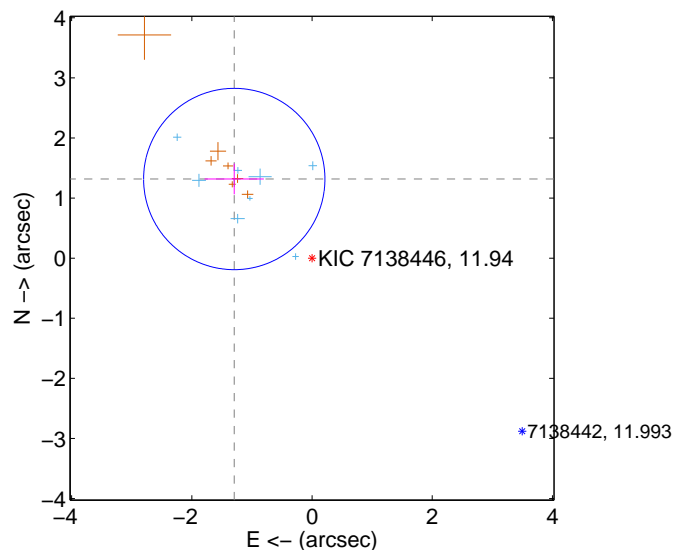
Supplemental centroid analysis for 007138446-04. **Kepler magnitude: 11.94.** Transit SNR 7.50

There are 8 quarters with good PRF difference image offsets

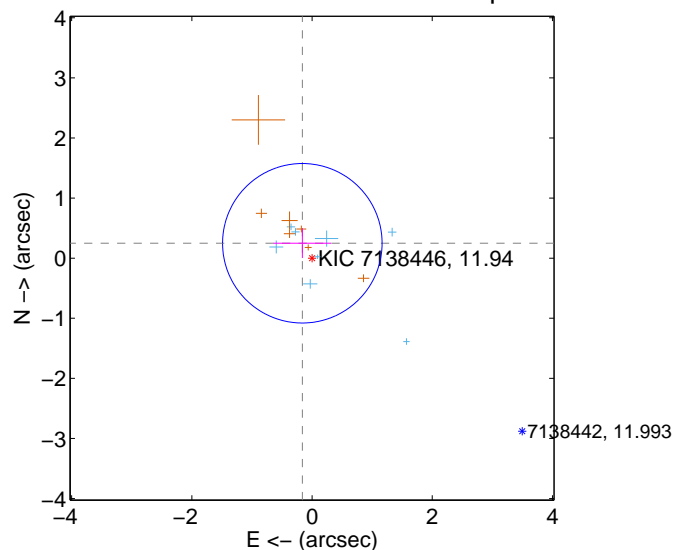
The OOT PRF centroid is offset from the target star catalog position by about 2.32 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.846 ± 0.503	3.67	1.294 ± 0.493	1.317 ± 0.255
PRF-fit source offset from KIC position	0.296 ± 0.442	0.67	0.162 ± 0.481	0.248 ± 0.246
photometric centroid source offset	0.70 ± 0.48	1.46	-0.51 ± 0.48	-0.47 ± 0.48

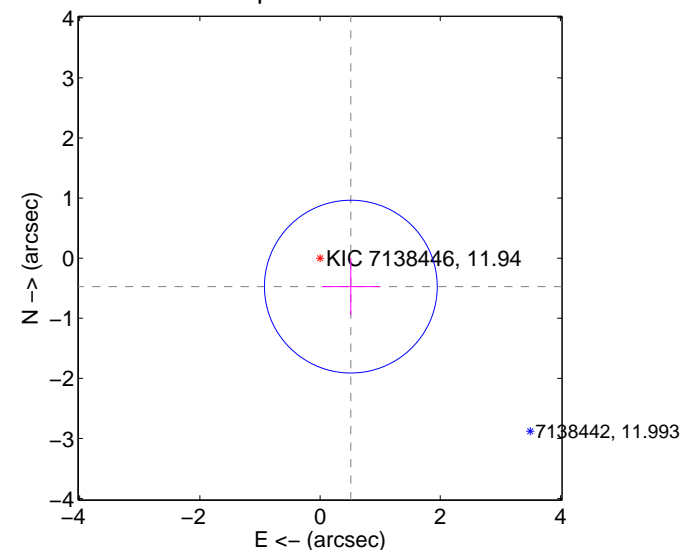
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

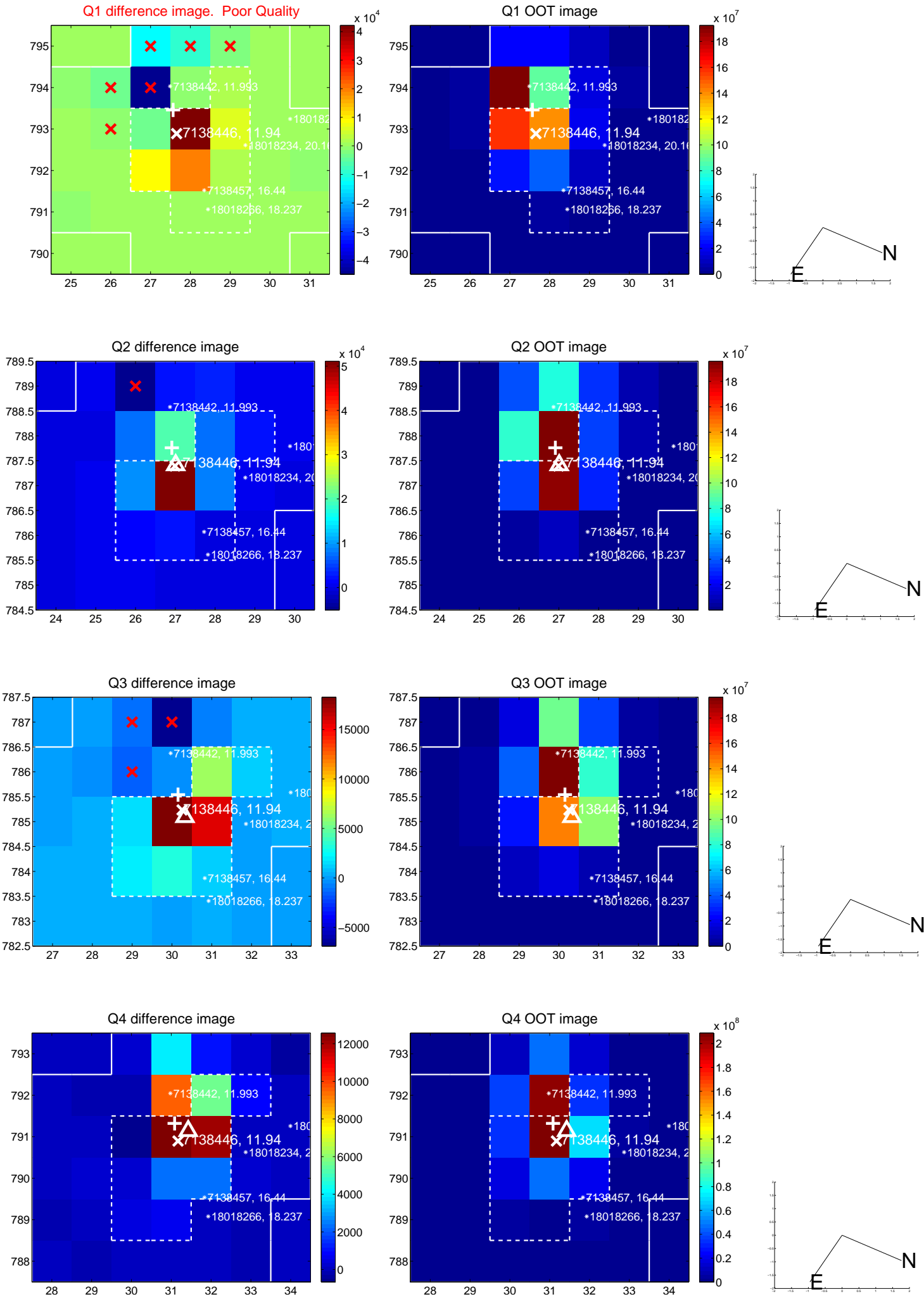


offset from photometric centroids

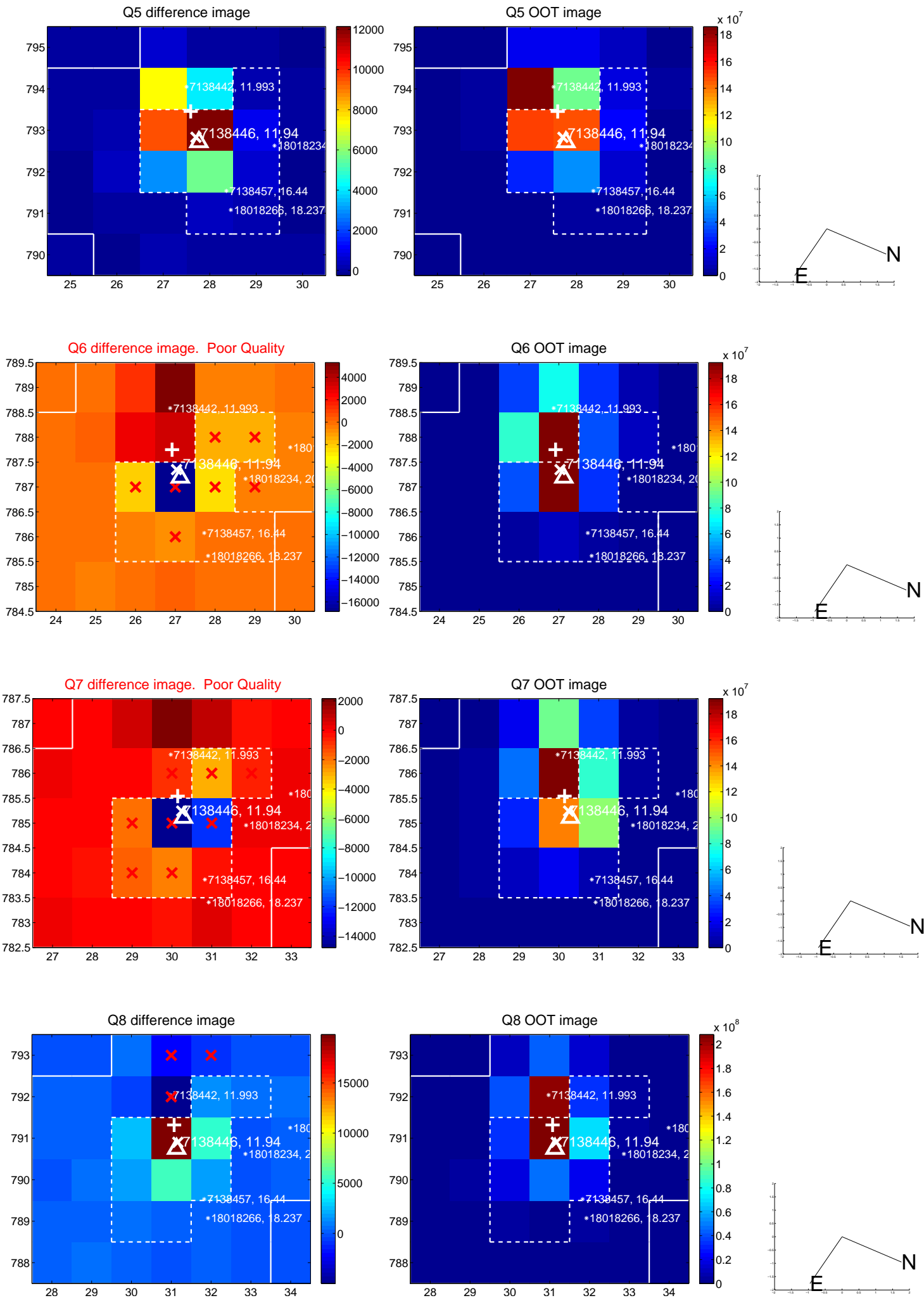


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

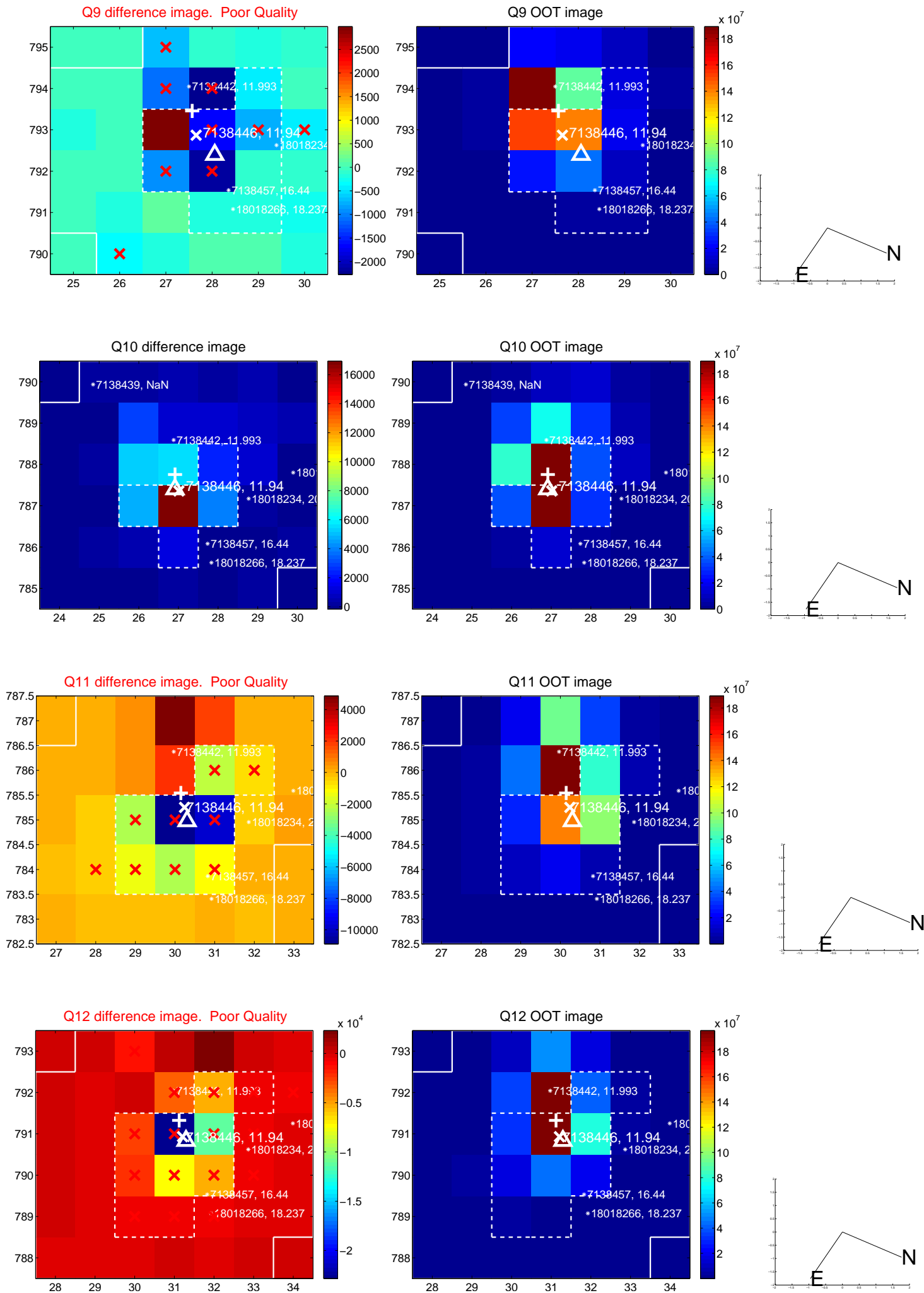
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



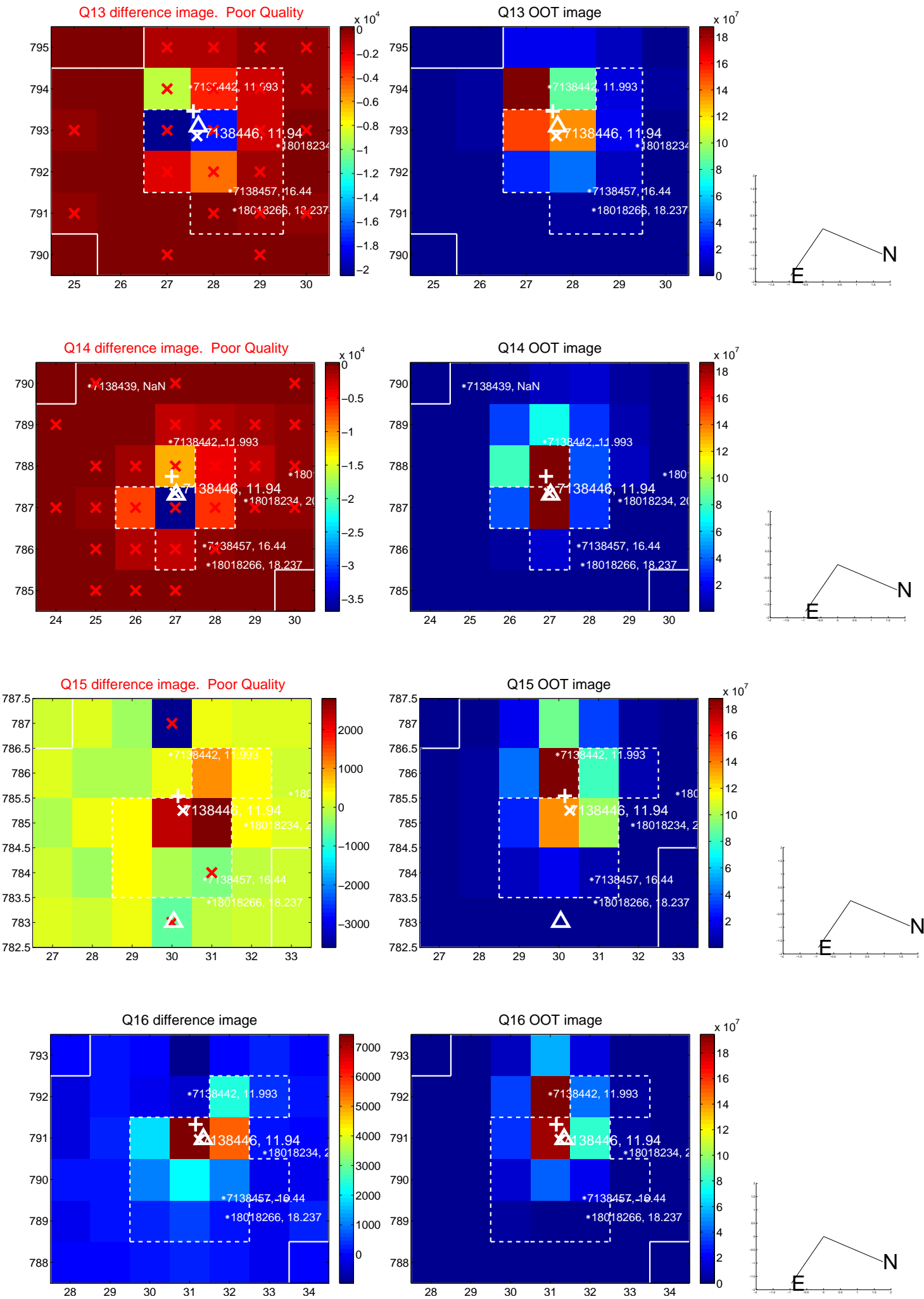
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



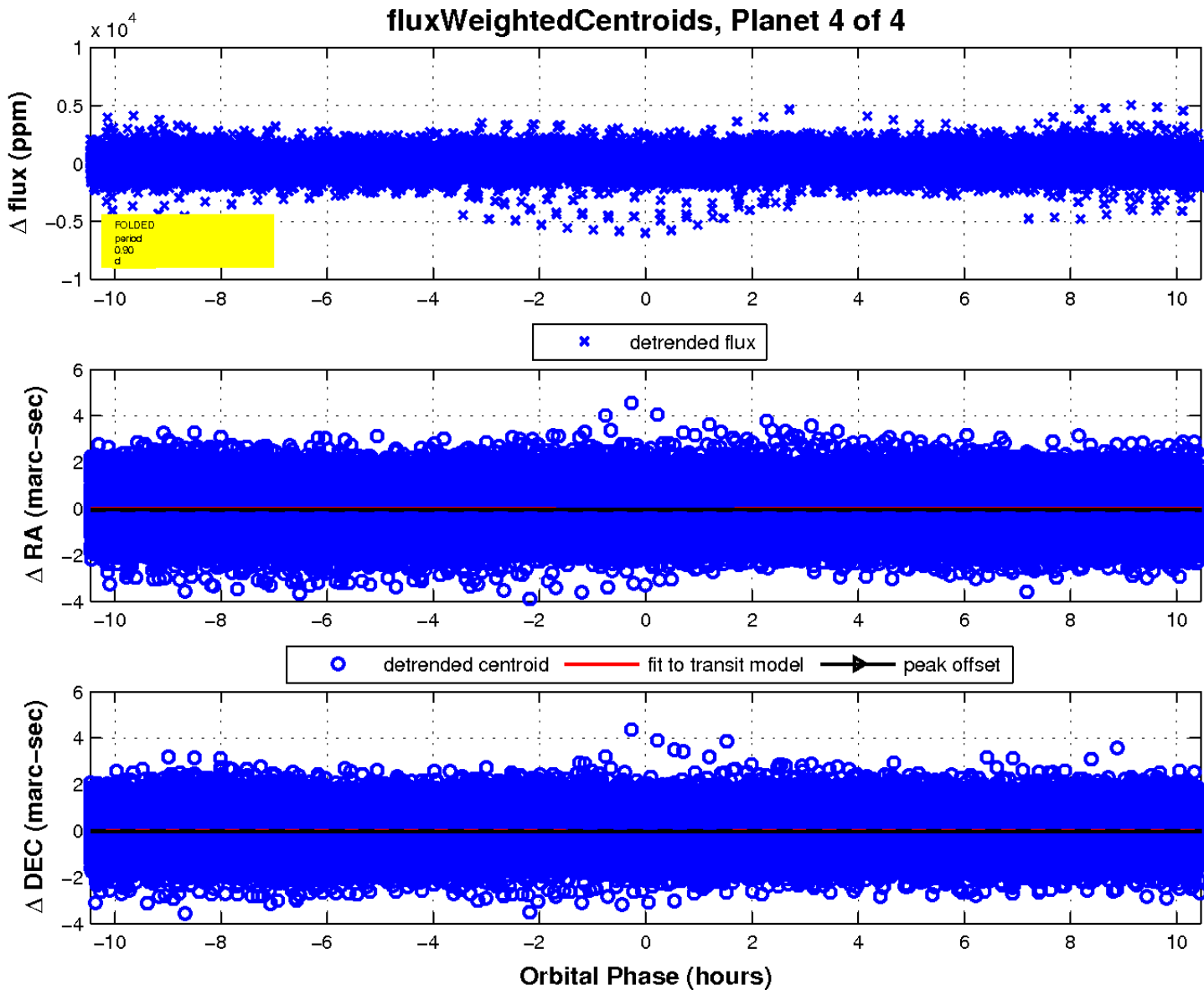
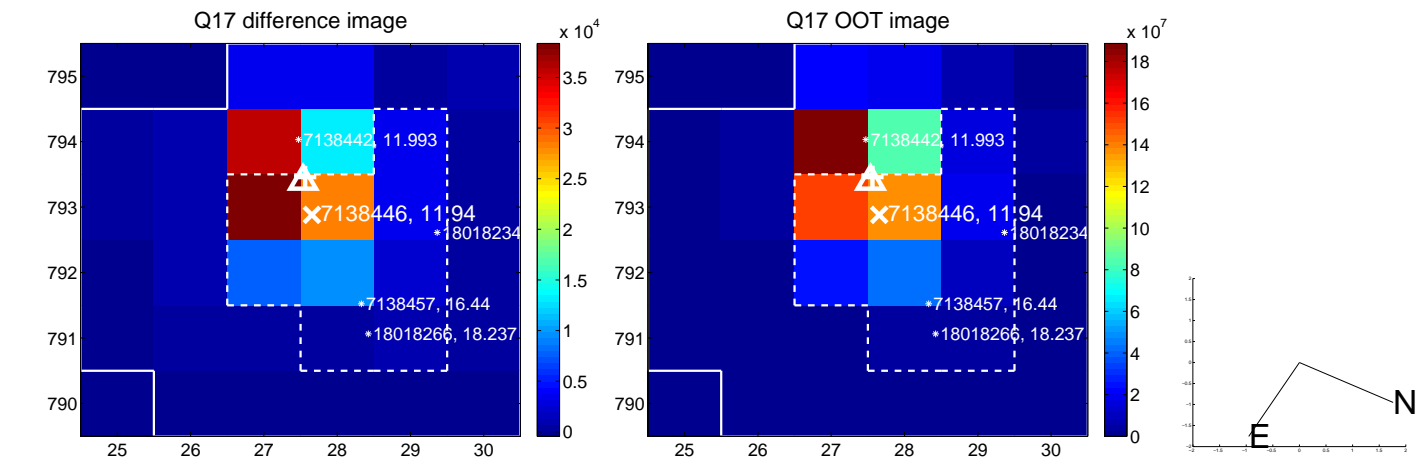
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

