

KIC 005724440

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})
005724440-01	OBS	No	3.075059	132.461637	83.1	18.389	10.6	9.7	3.59	7348	3.30	12304.70
005724440-02	OBS	No	1.008533	131.648958	240.5	3.209	11.9	13.5	3.59	7348	6.54	54402.91
005724440-03	OBS	No	37.488006	136.363379	1233.6	1.611	8.2	7.4	3.59	7348	13.24	438.55
005724440-04	OBS	No	44.941198	134.485362	1035.2	3.436	8.0	8.1	3.59	7348	12.72	344.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005724440-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
005724440-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005724440-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
005724440-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

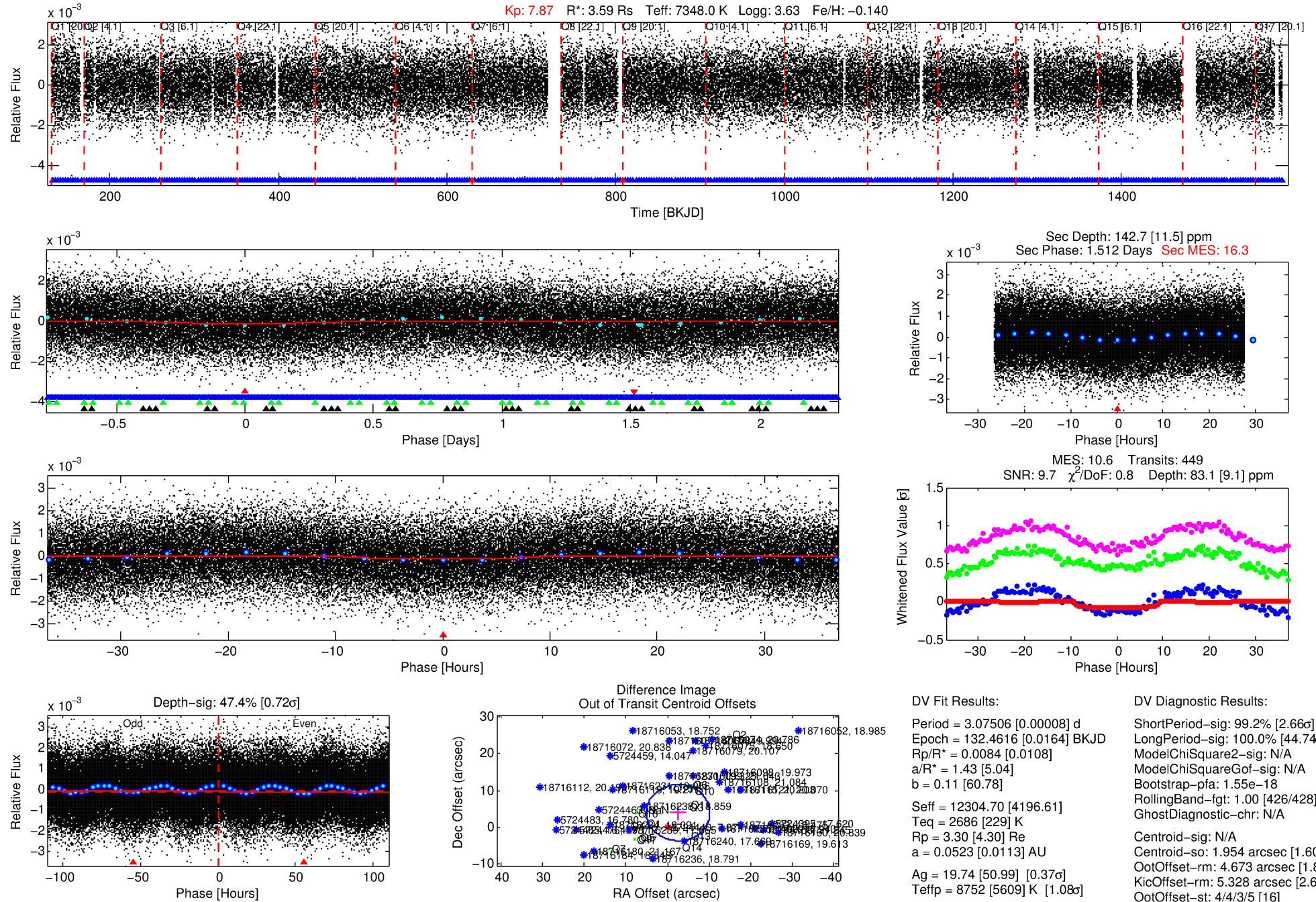
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005724440-01

No Significant Match Found

DV One-Page Summary

KIC: 5724440 Candidate: 1 of 4 Period: 3.075 d



DV Fit Results:

Period = 3.07506 [0.00008] d
Epoch = 132.4616 [0.0164] BKJD
Rp/R* = 0.0084 [0.0108]
a/R* = 1.43 [5.04]
b = 0.11 [60.78]
Seff = 12304.70 [4196.61]
Teq = 2686 [229] K
Rp = 3.30 [4.30] Re
a = 0.0523 [0.0113] AU
Ag = 19.74 [50.99] [0.37σ]
Teffp = 8752 [5609] K [1.08σ]

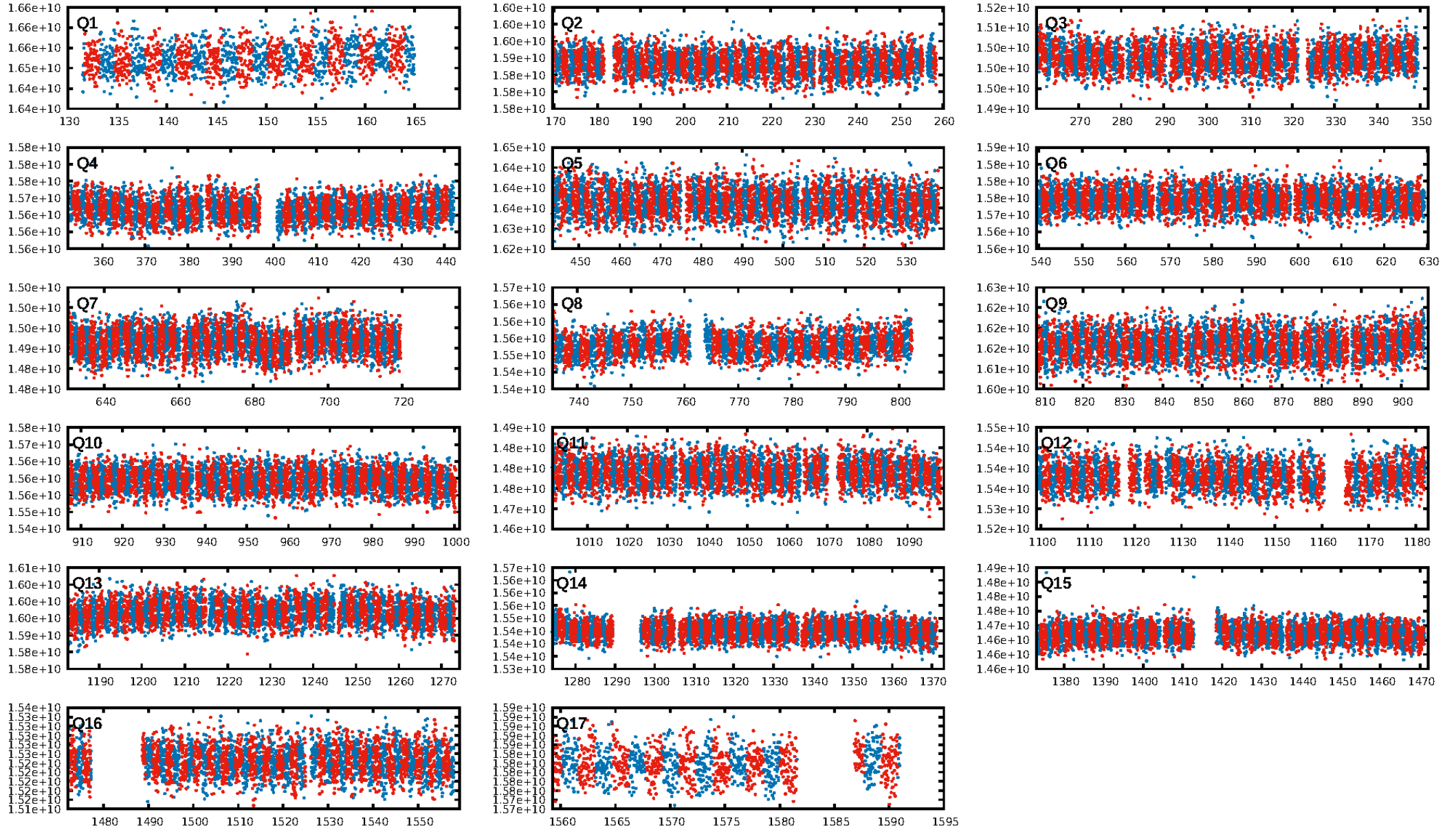
DV Diagnostic Results:

ShortPeriod-sig: 99.2% [2.66σ]
LongPeriod-sig: 100.0% [44.74σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.55e-18
RollingBand-fgt: 1.00 [426/428]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: 1.954 arcsec [1.60σ]
OotOffset-rm: 4.673 arcsec [1.83σ]
KicOffset-rm: 5.328 arcsec [2.65σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.00 [0/16]
DiffImageOverlap-fno: 0.00 [0/17]

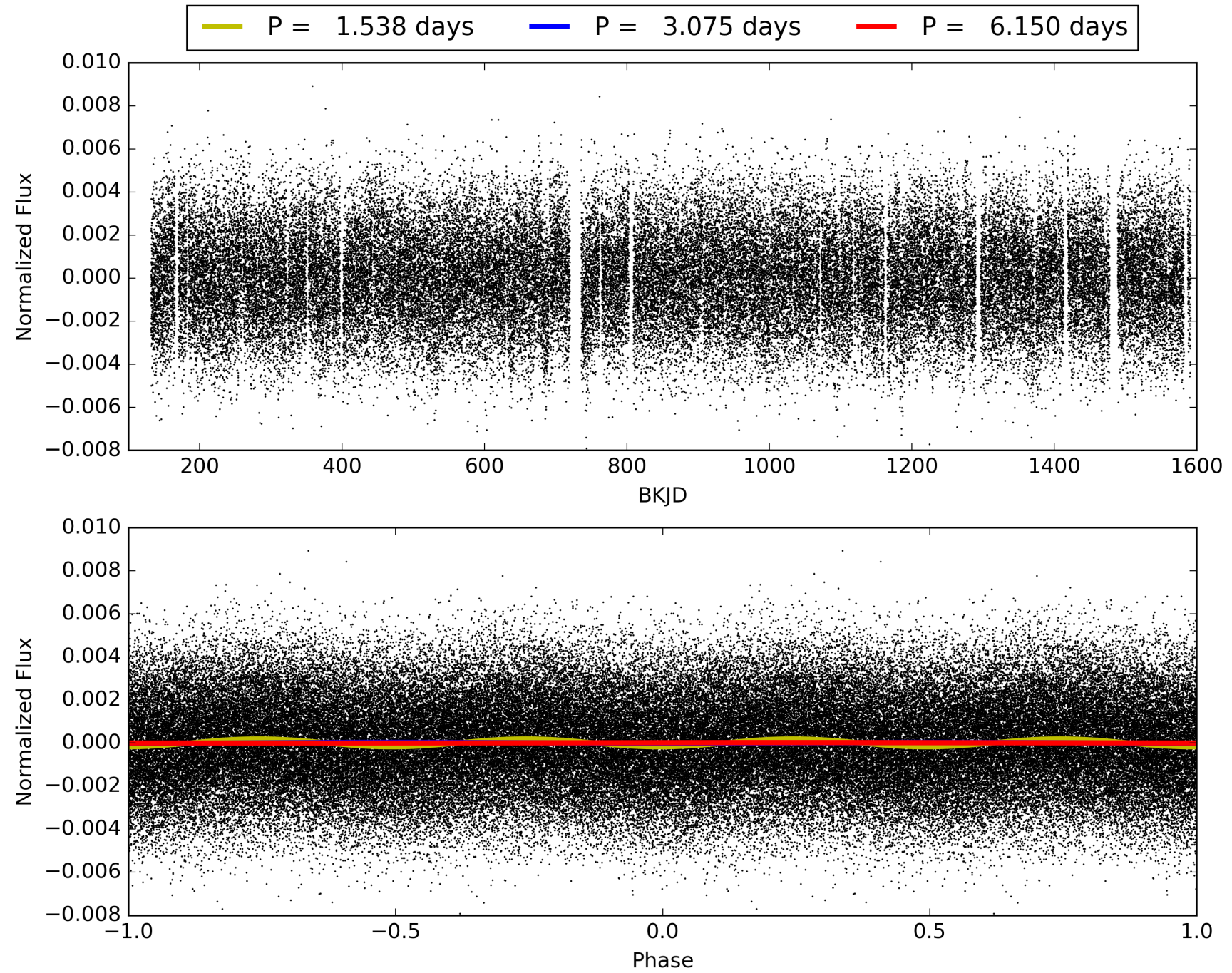
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:16:16 Z

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

TCE 005724440-01, PDC Light Curves

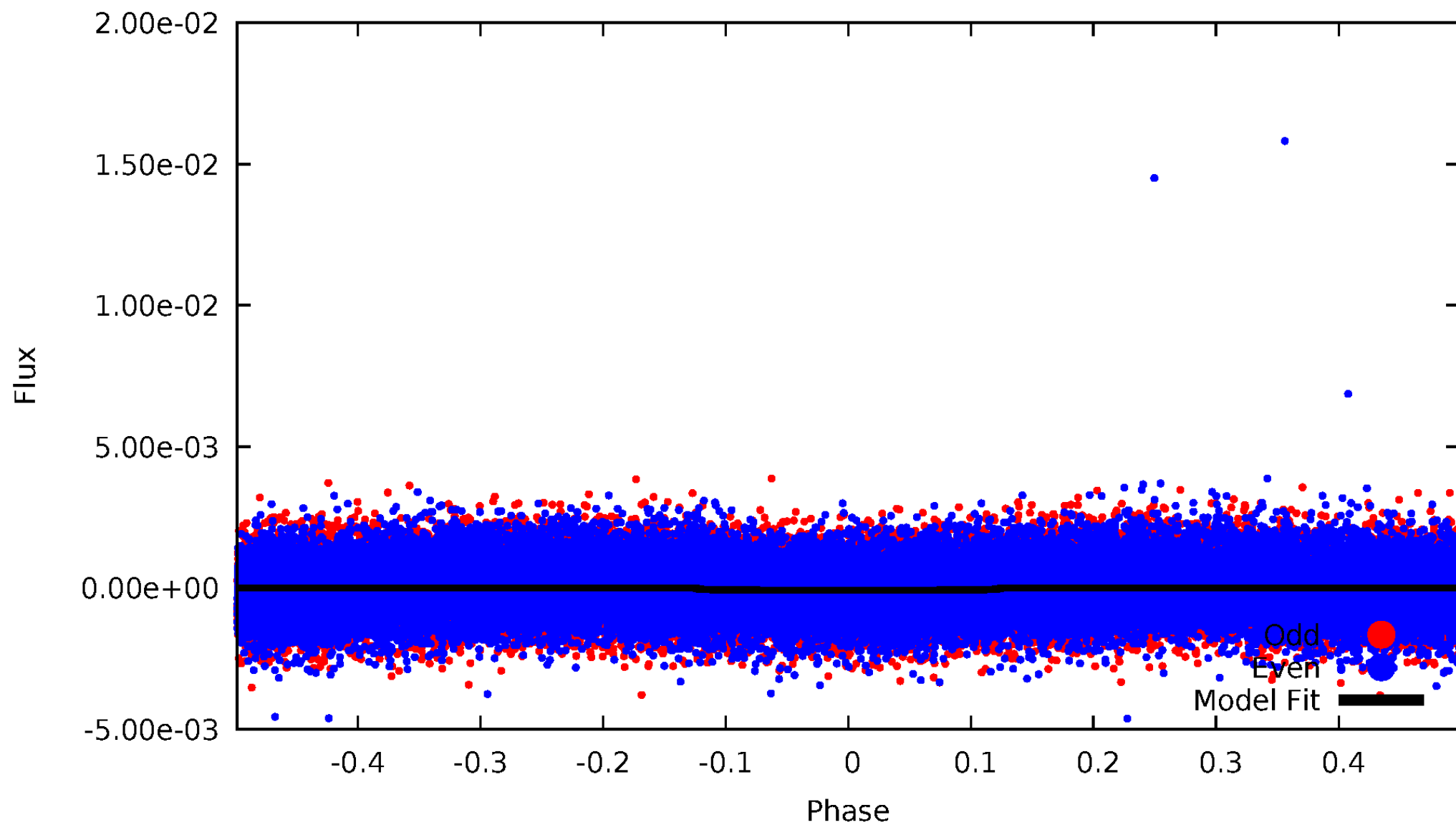


TCE 005724440-01



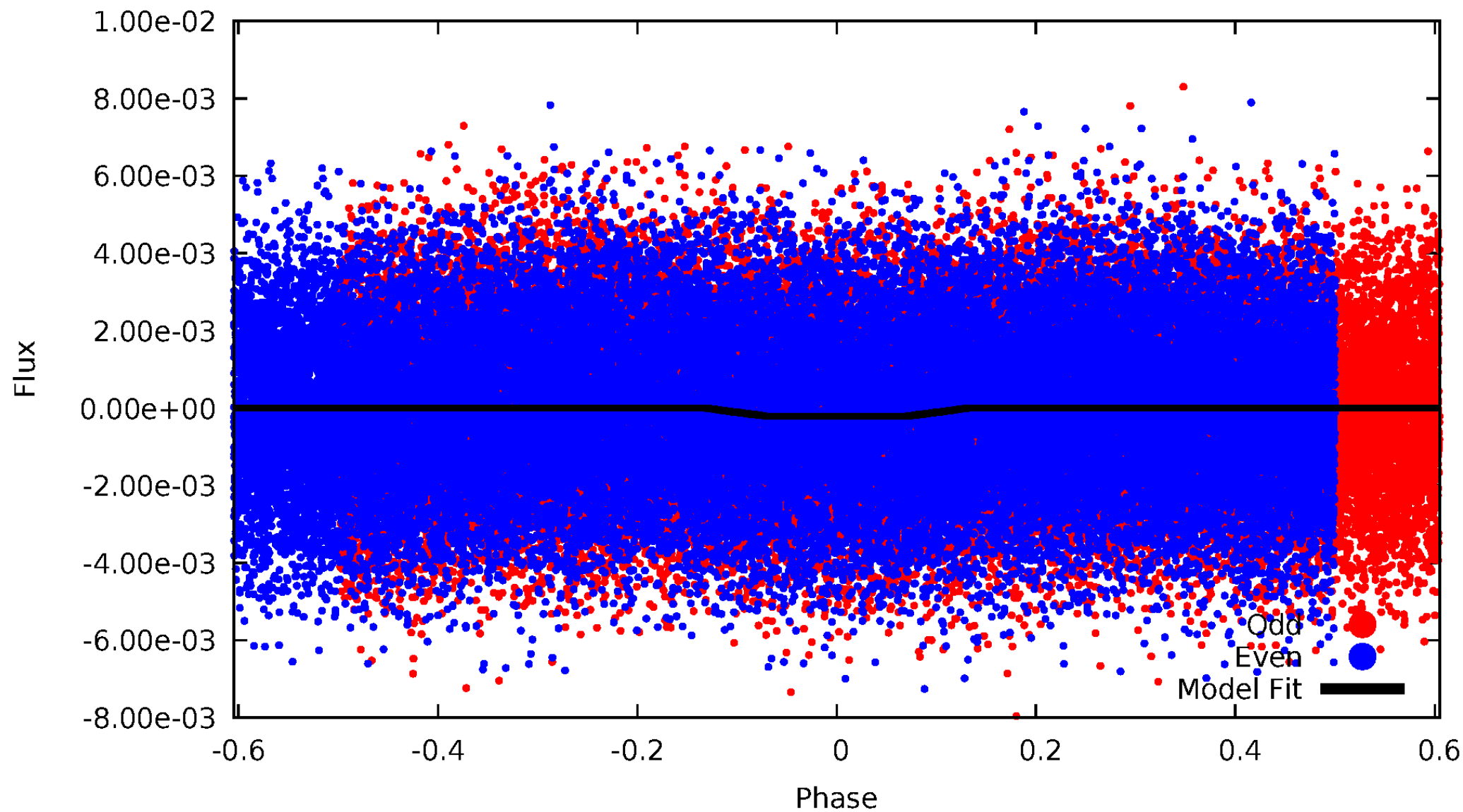
DV Odd/Even

TCE 005724440-01

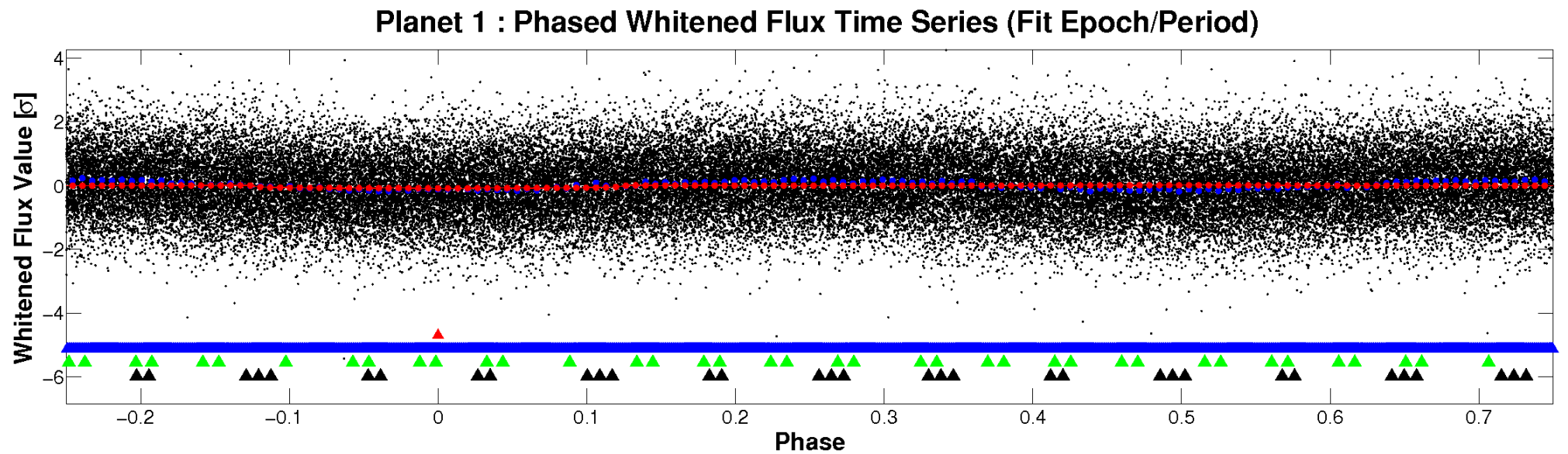
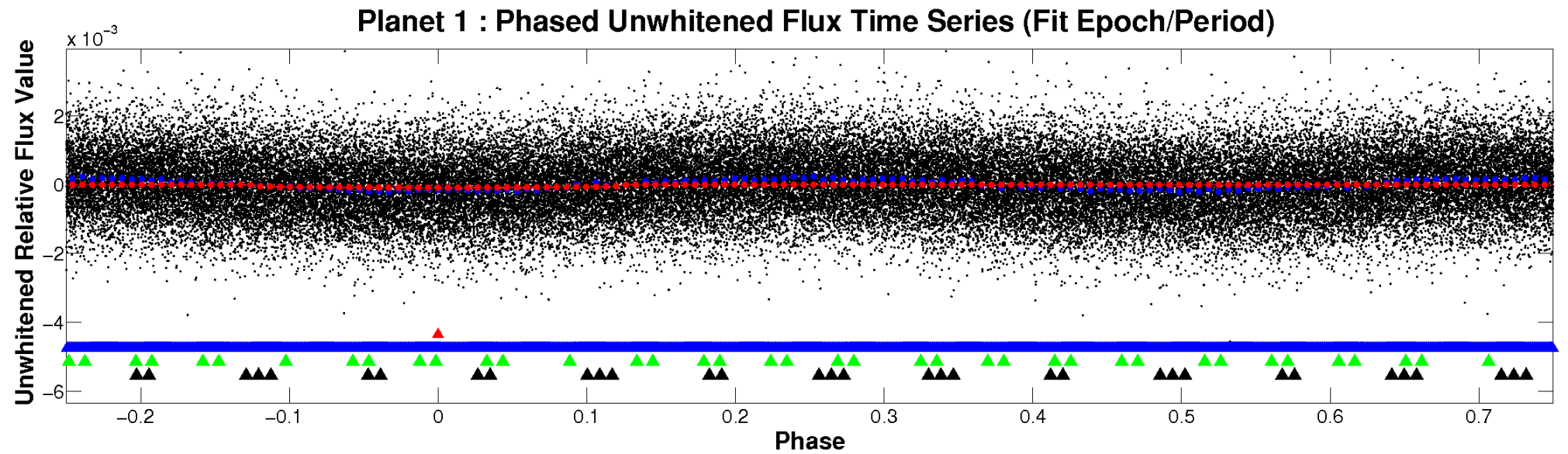


ALT Odd/Even

TCE 005724440-01

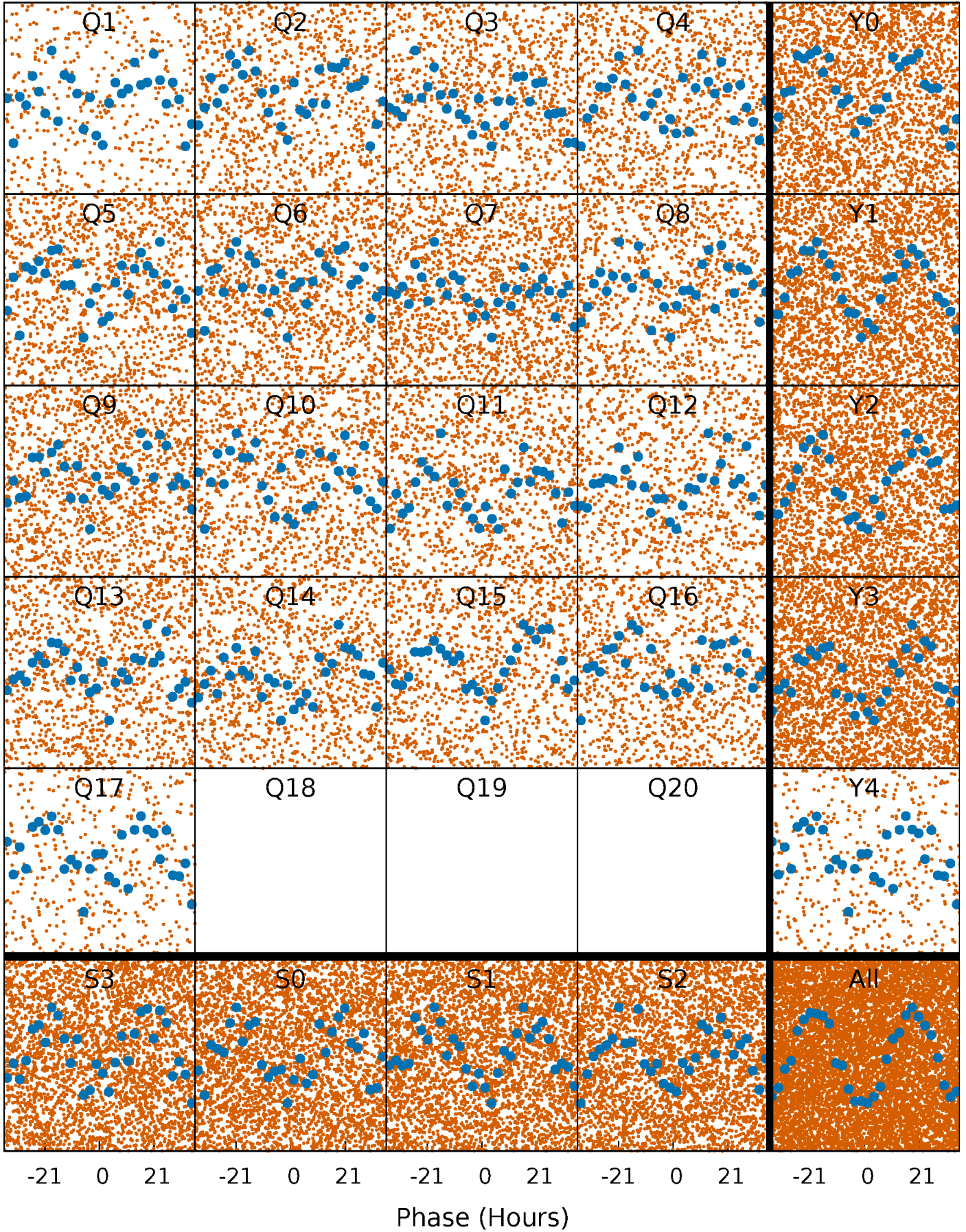


Non-Whitened Vs. Whitened Light Curve



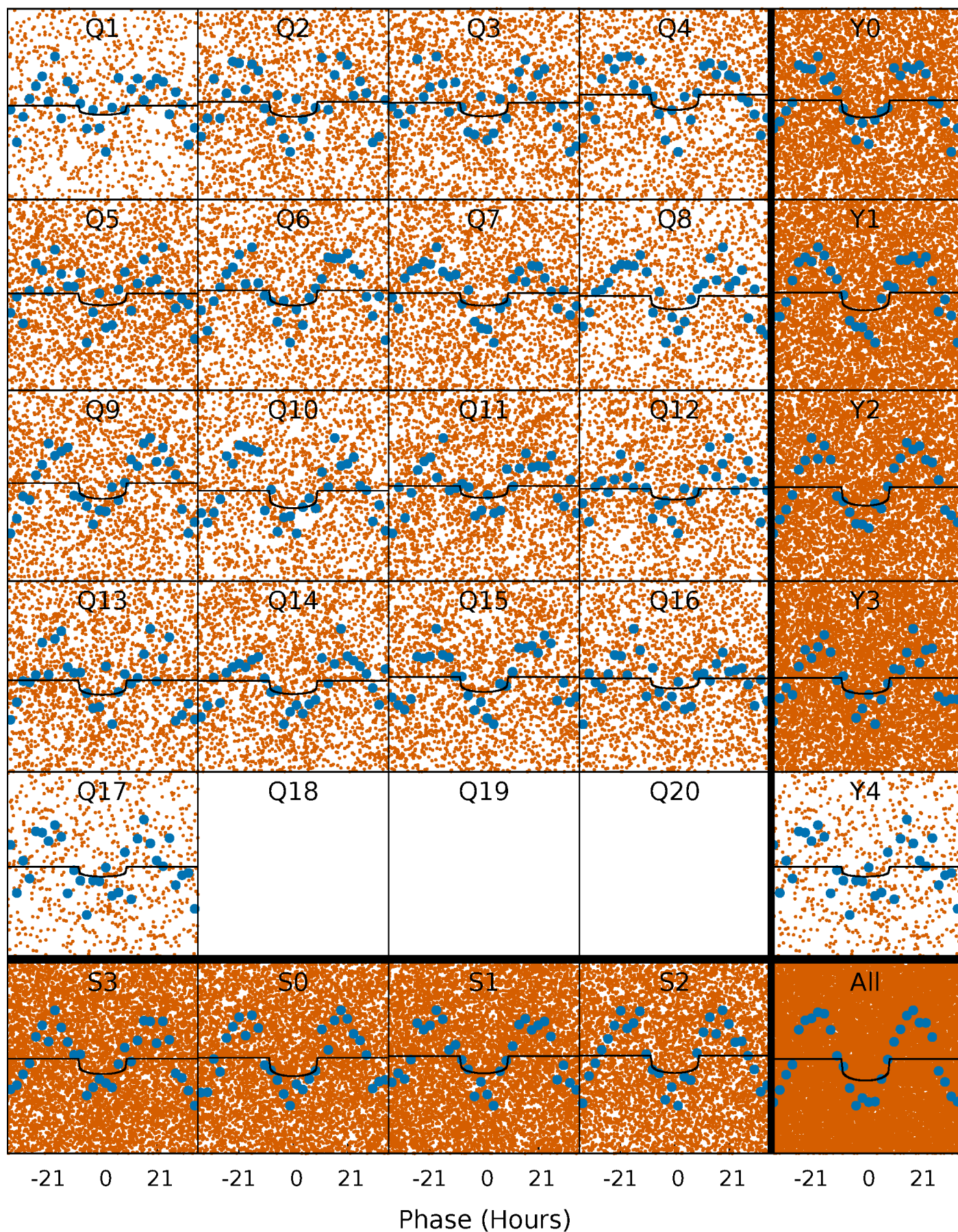
PDC Quarter-Phased Transit Curves

TCE 005724440-01 P= 3.075059 Days $T_0=132.461637$ (BKJD)



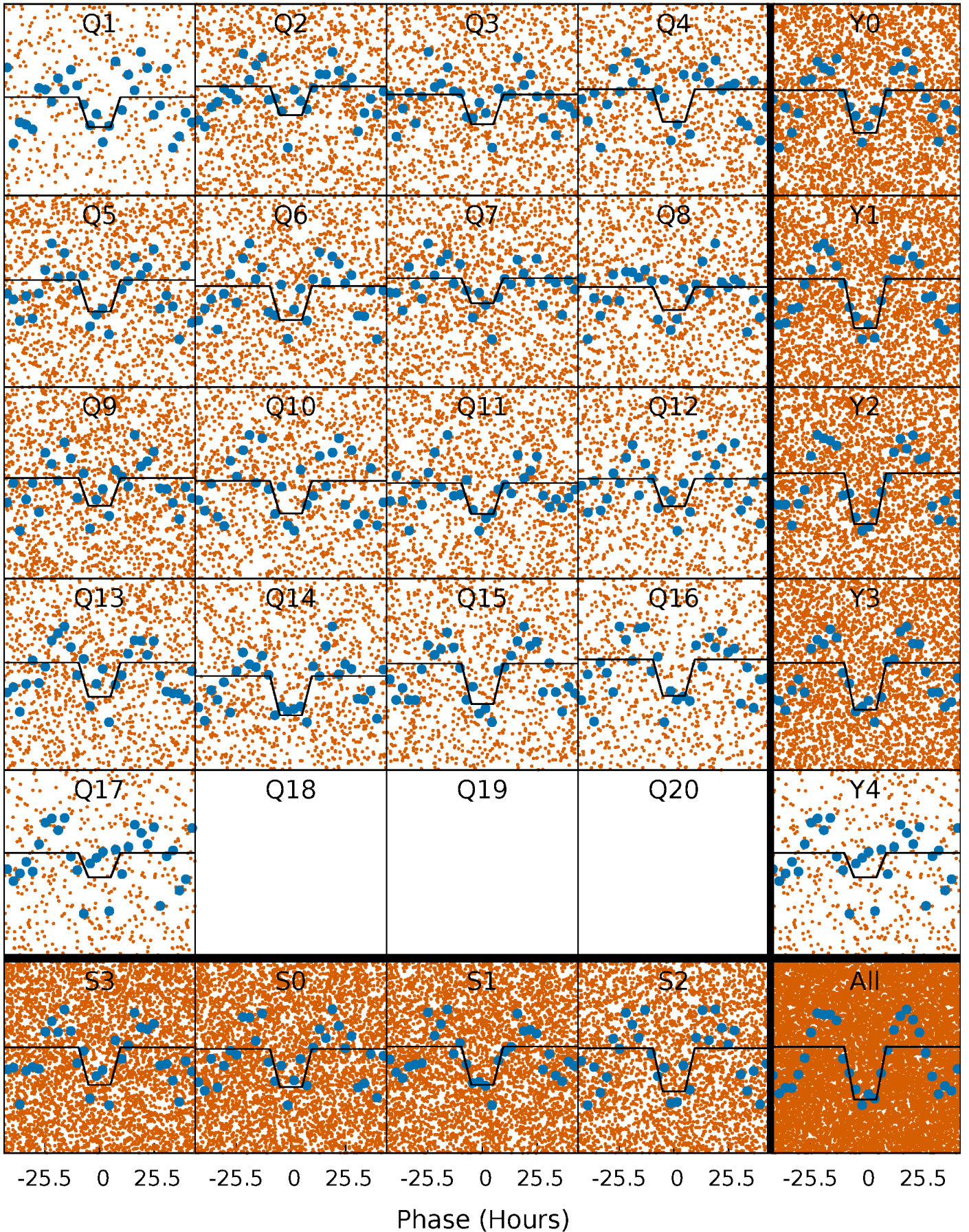
DV Quarter-Phased Transit Curves

TCE 005724440-01 P= 3.075059 Days $T_0=132.461637$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

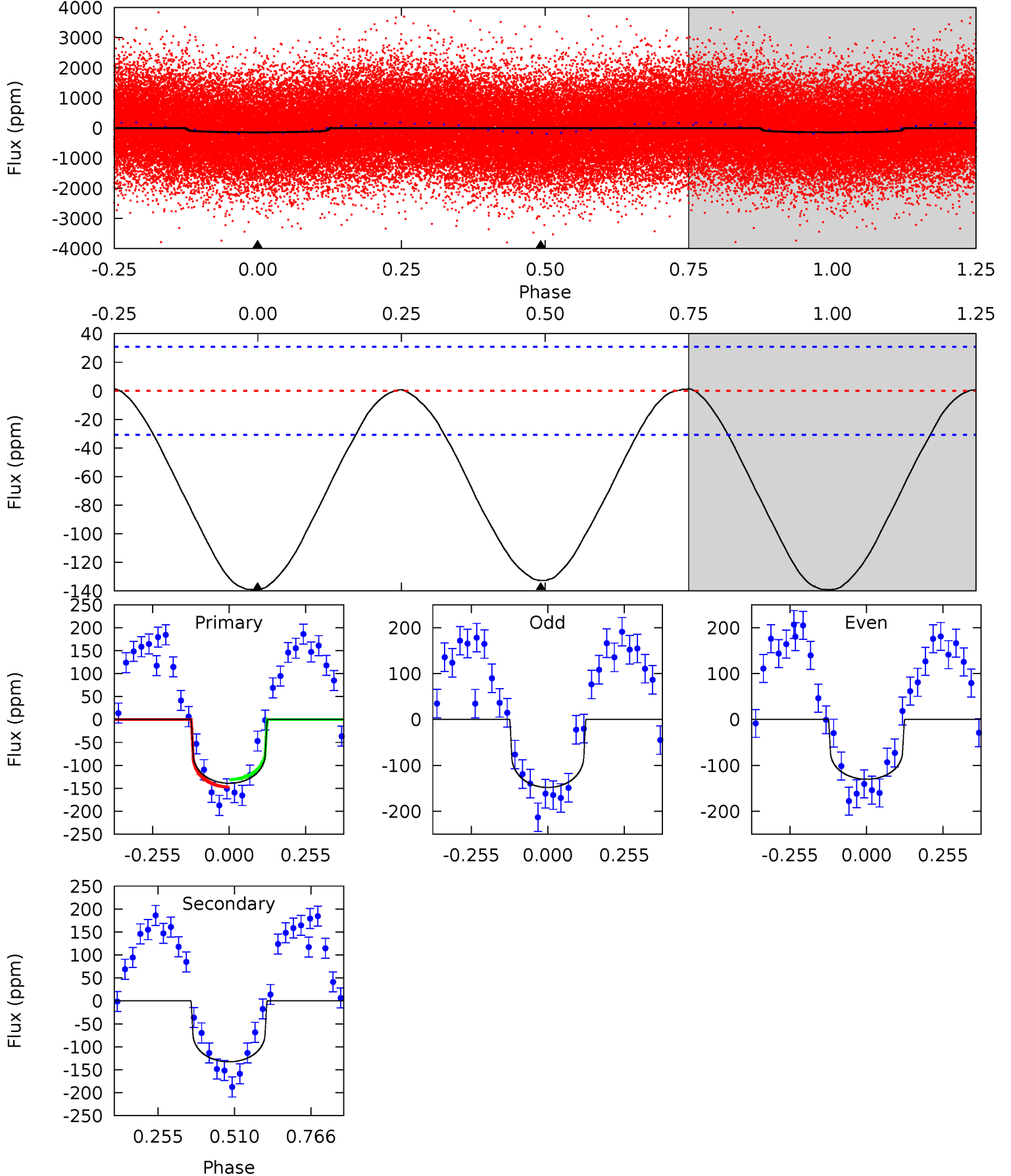
TCE 005724440-01 P= 3.075133 Days $T_0=132.421680$ (BKJD)



DV Model-Shift Uniqueness Test

005724440-01, P = 3.075059 Days, E = 129.386578 Days

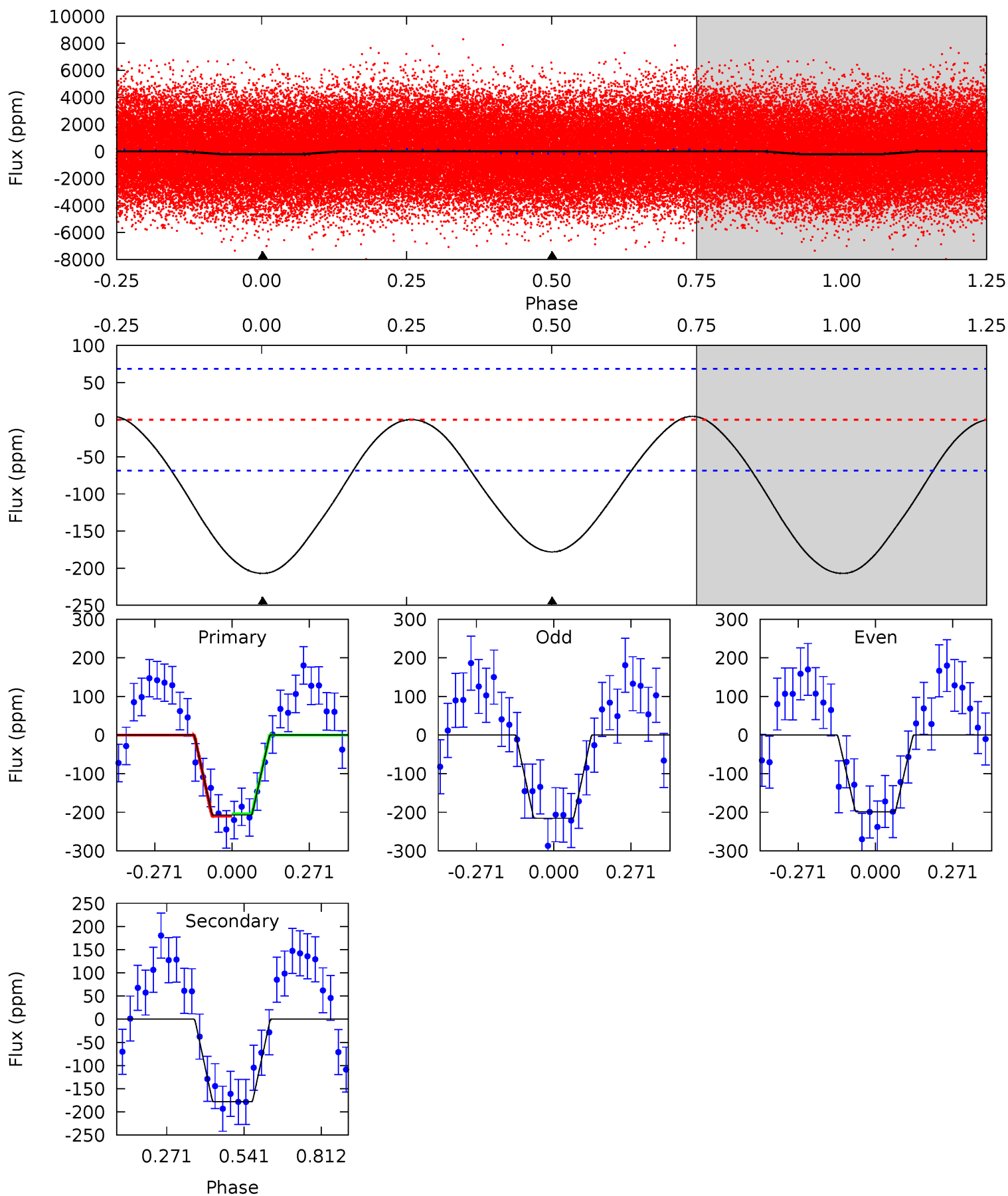
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	18.8	0	0	4.36	1.14	0.19	19.7	19.7	18.8	18.8	1.27	1.00	0.01	1.16



Alt Model-Shift Uniqueness Test

005724440-01, P = 3.075133 Days, E = 129.346547 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.1	11.3	0	0	4.35	1.10	0.19	13.1	13.1	11.3	11.3	0.54	0.77	0.02	0.17



Stellar Parameters For KIC 005724440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7348^{+132}_{-161}	$3.633^{+0.187}_{-0.033}$	$-0.140^{+0.150}_{-0.150}$	$3.593^{+0.146}_{-0.873}$	$2.023^{+0.028}_{-0.239}$	$0.061^{+0.063}_{-0.007}$
	+2%/-2%	+5%/-1%	+107%/-107%	+4%/-24%	+1%/-12%	+102%/-12%
Source	SPE4	SPE4	SPE4	DSEP		

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

Secondary Eclipse Parameters for KIC 005724440-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-133 ± 7	$4.30^{+3.58}_{-2.78}$	3698^{+122}_{-220}	7330^{+8202}_{-2050}	11^{+72}_{-8}
Alt.	-178 ± 16	$5.97^{+3.72}_{-3.51}$	3693^{+135}_{-202}	6622^{+5019}_{-1510}	$7.601^{+36.244}_{-4.839}$

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 $A_{obs} \gg 1.0$

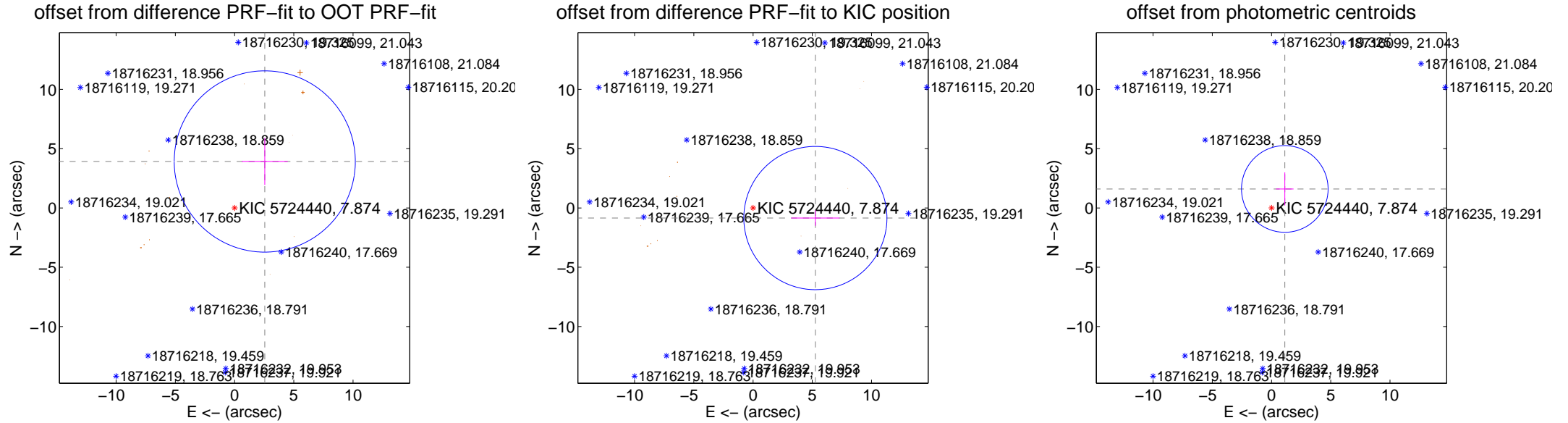
DV Centroid Data

Supplemental centroid analysis for 005724440-01. **Kepler magnitude: 7.87.** Transit SNR 9.68

There are 0 quarters with good PRF difference image offsets

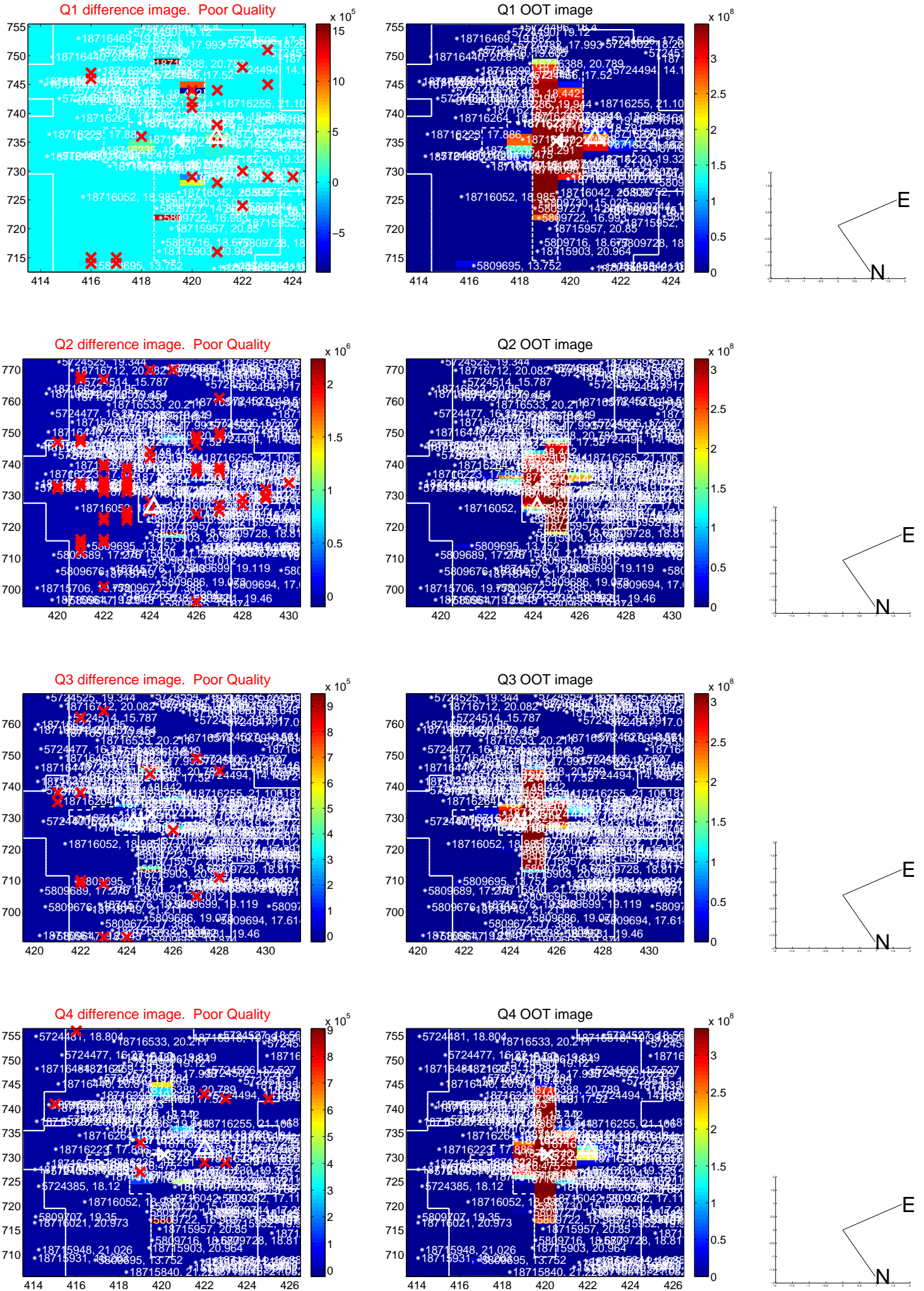
The direct PRF centroid is offset from the target star catalog position by about 1.01 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.673 ± 2.547	1.83	-2.548 ± 1.940	3.917 ± 1.977
PRF-fit source offset from KIC position	5.328 ± 2.013	2.65	-5.259 ± 2.036	-0.851 ± 0.651
photometric centroid source offset	1.95 ± 1.22	1.60	-1.12 ± 0.74	1.60 ± 1.39

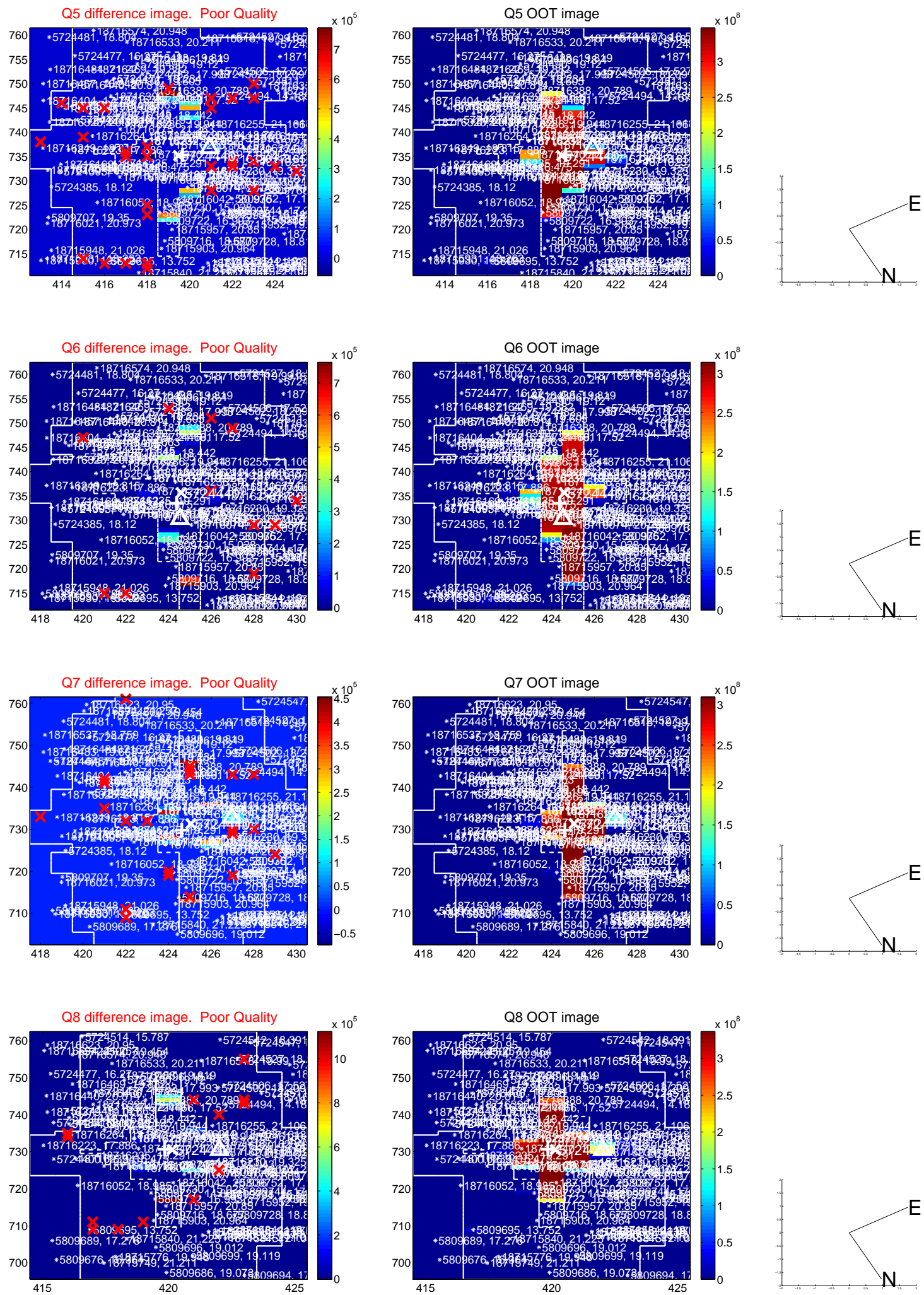


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

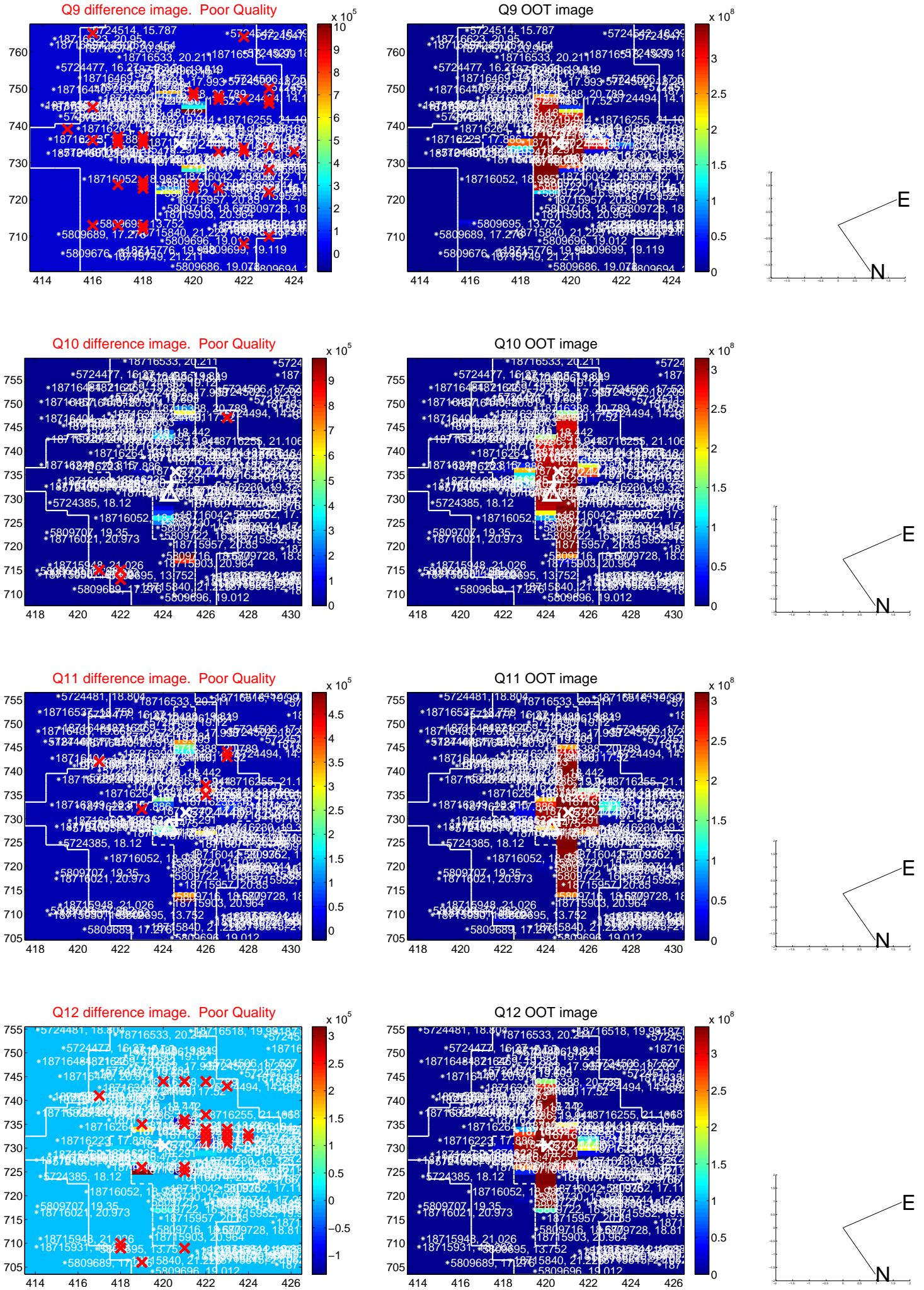
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



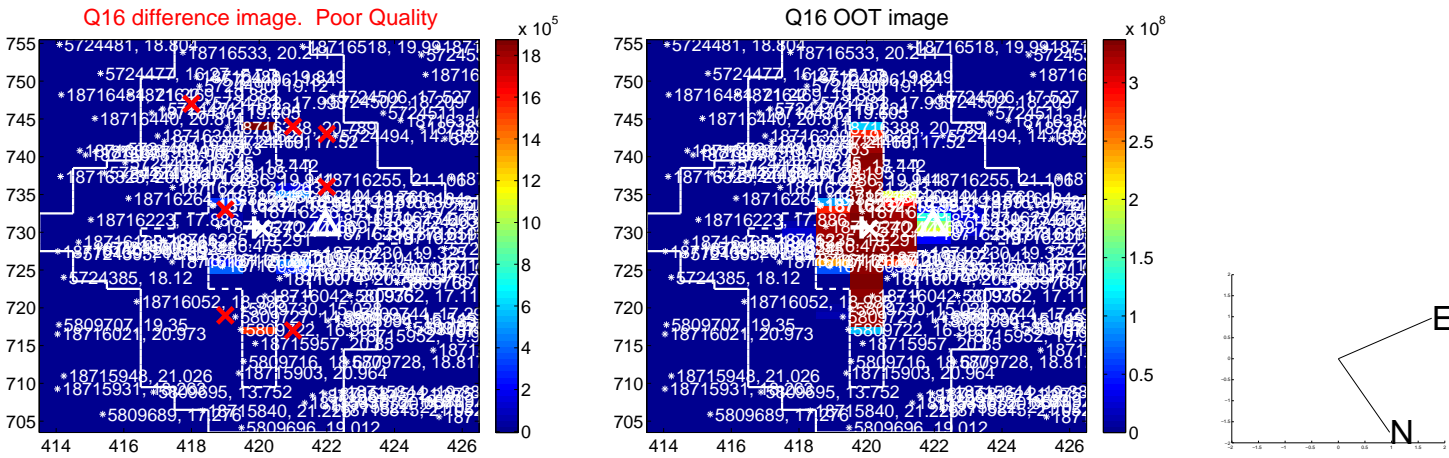
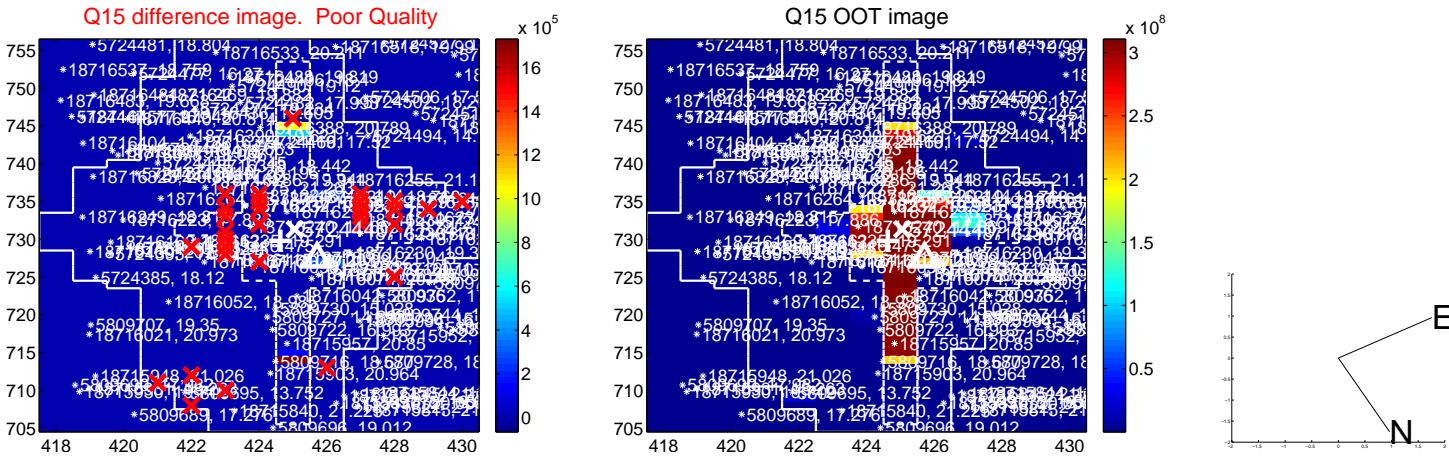
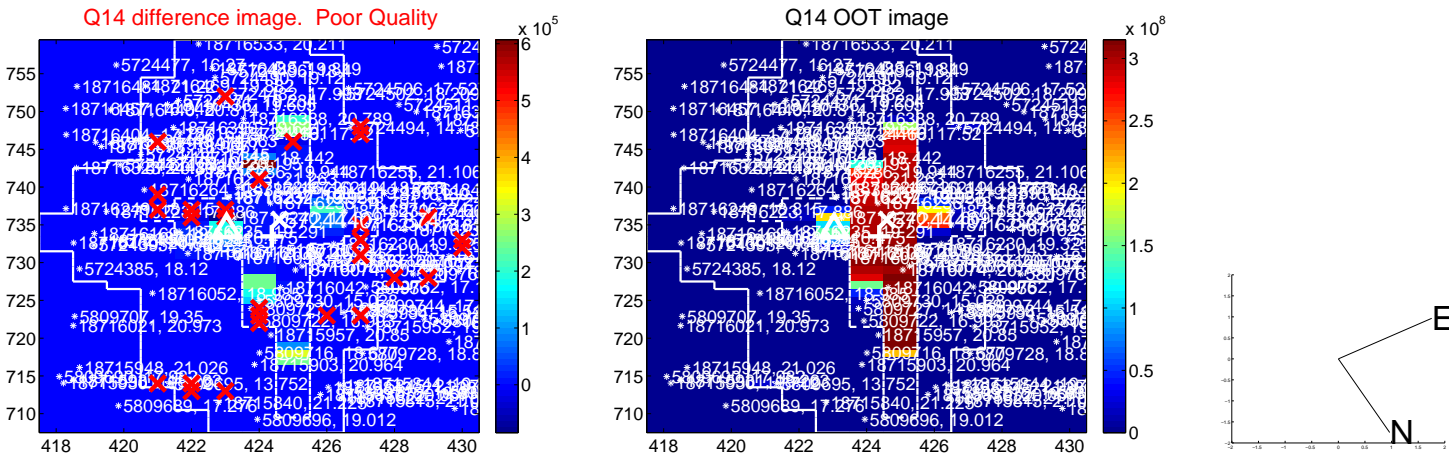
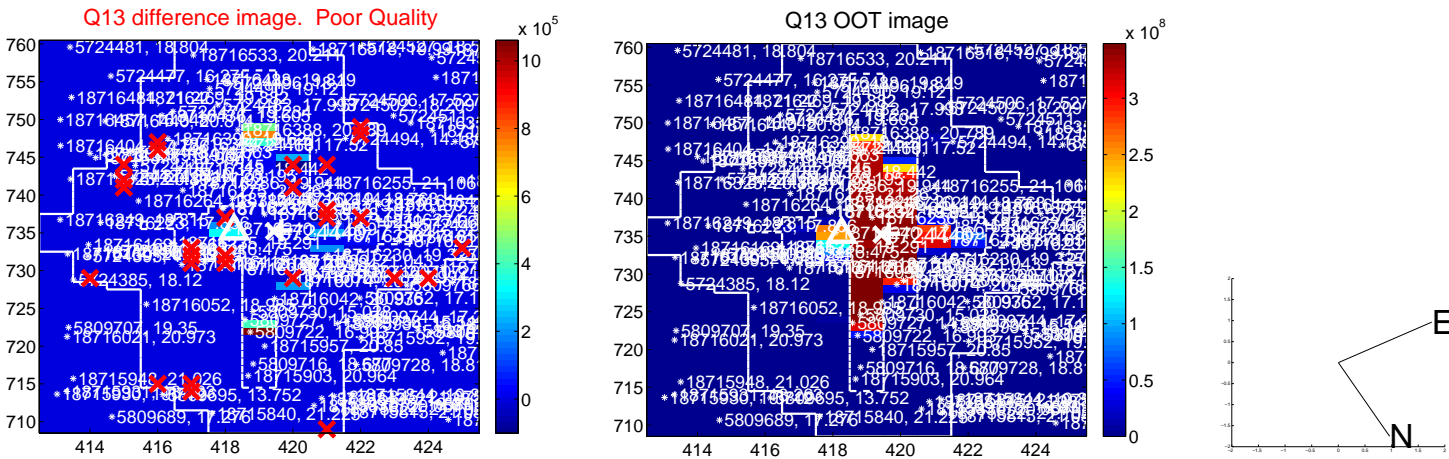
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



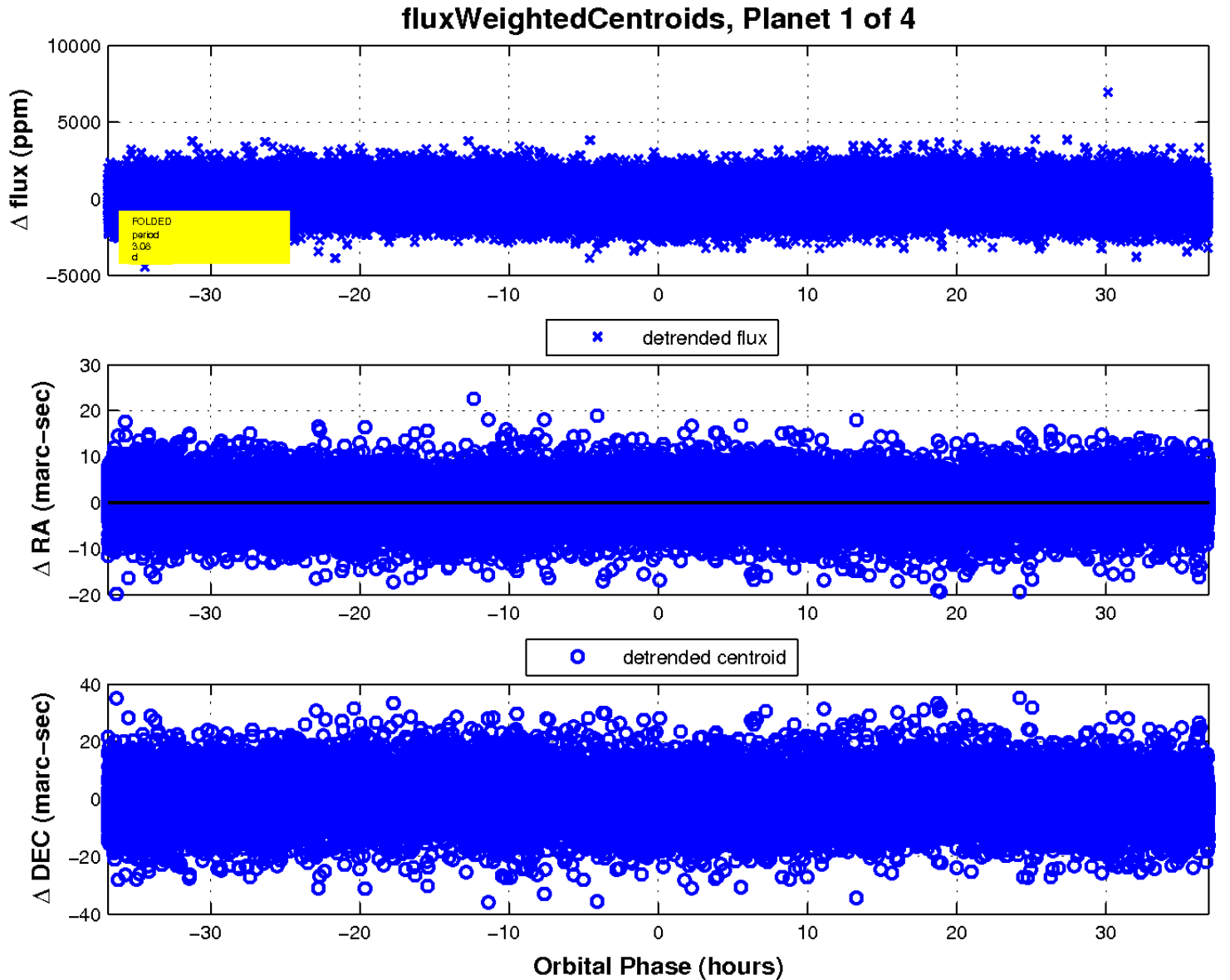
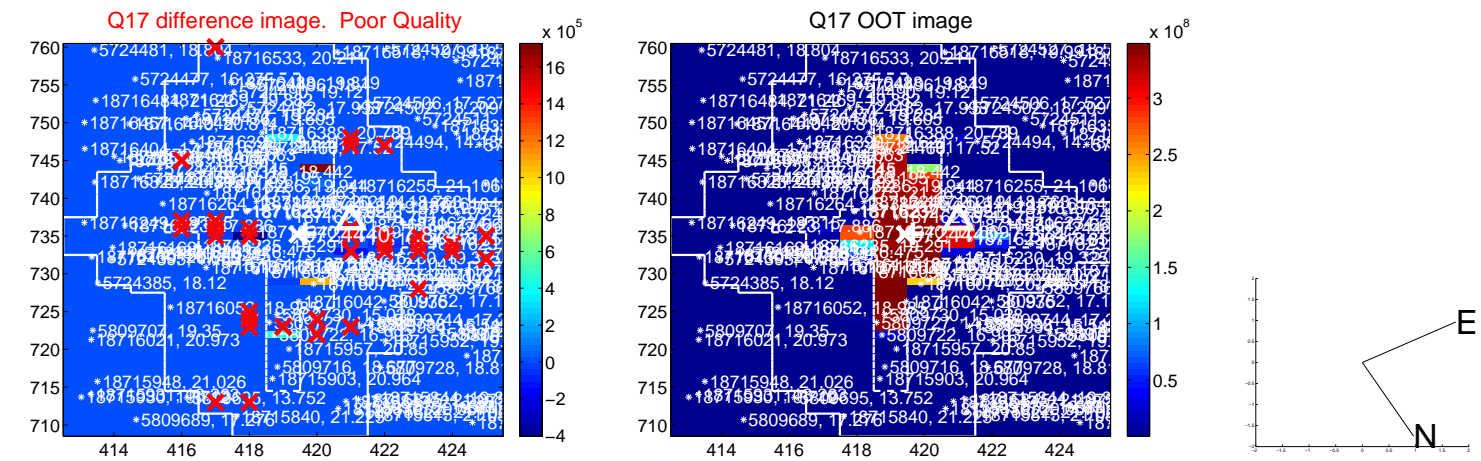
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



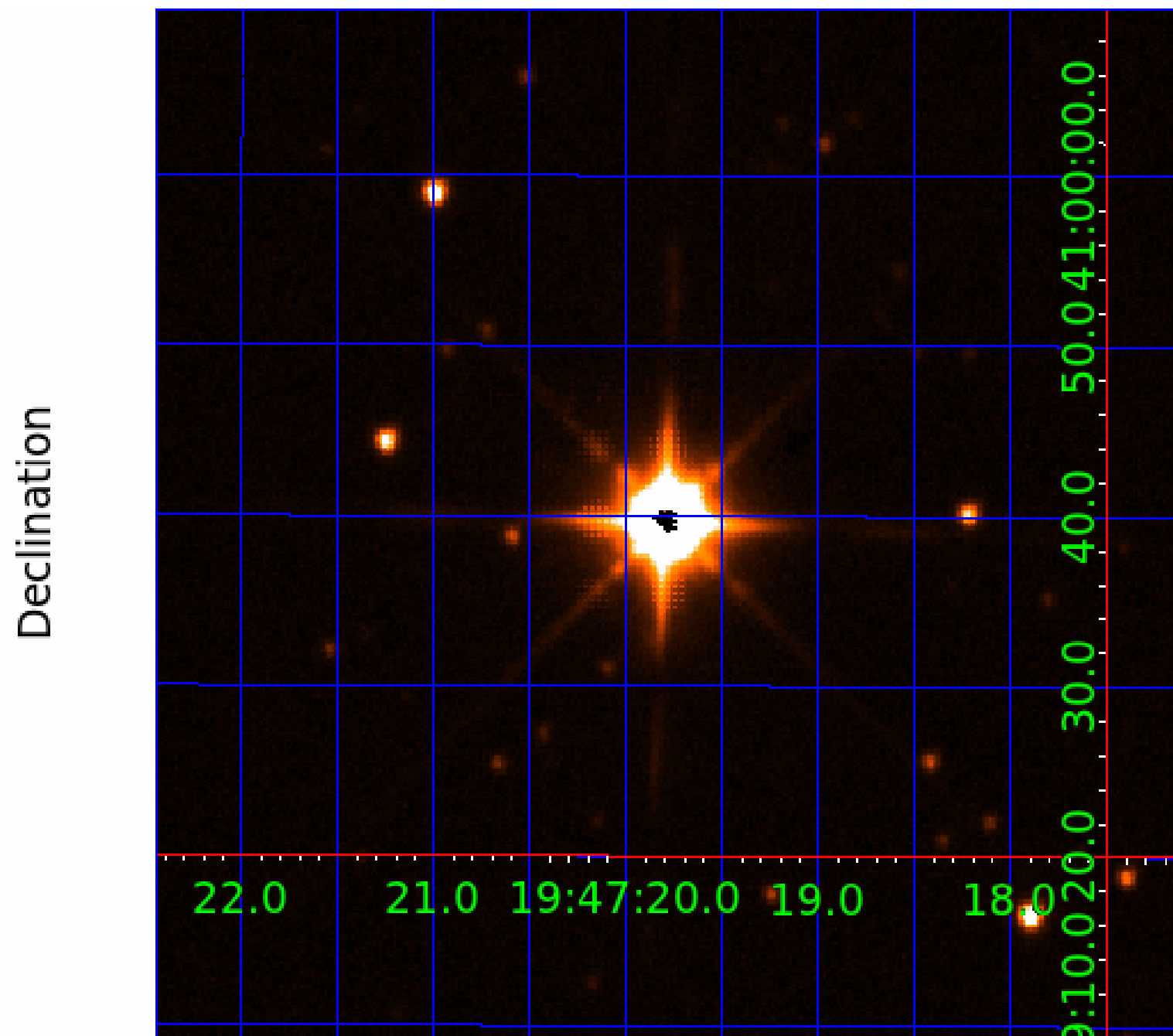
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 005724440

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})
005724440-01	OBS	No	3.075059	132.461637	83.1	18.389	10.6	9.7	3.59	7348	3.30	12304.70
005724440-02	OBS	No	1.008533	131.648958	240.5	3.209	11.9	13.5	3.59	7348	6.54	54402.91
005724440-03	OBS	No	37.488006	136.363379	1233.6	1.611	8.2	7.4	3.59	7348	13.24	438.55
005724440-04	OBS	No	44.941198	134.485362	1035.2	3.436	8.0	8.1	3.59	7348	12.72	344.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005724440-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
005724440-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005724440-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
005724440-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

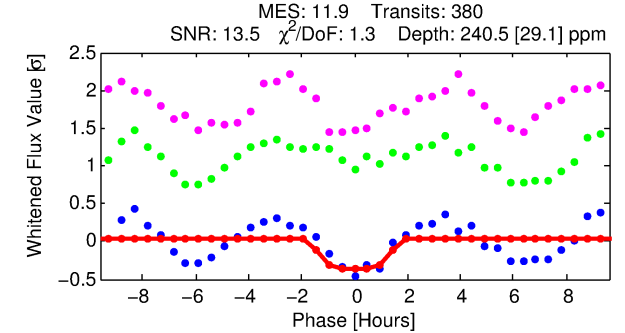
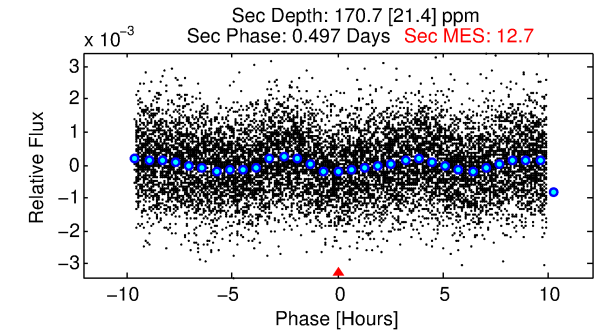
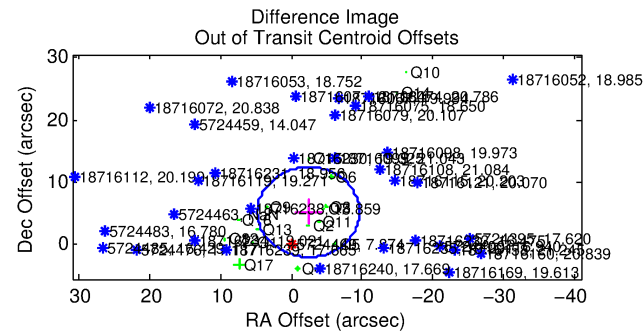
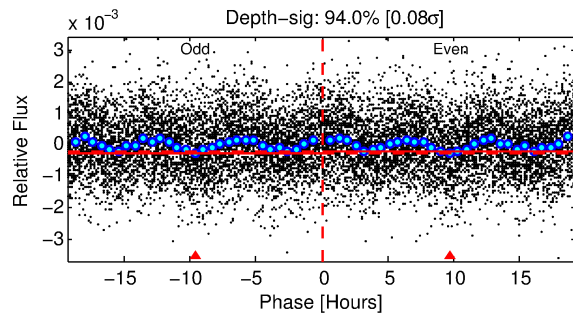
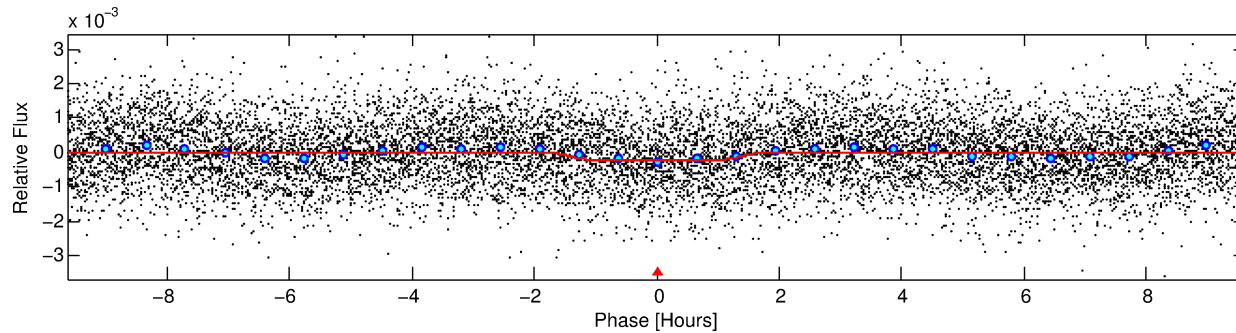
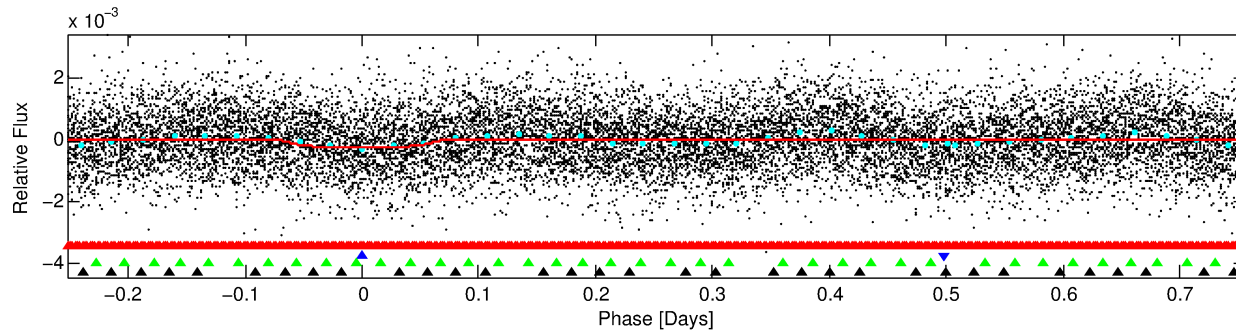
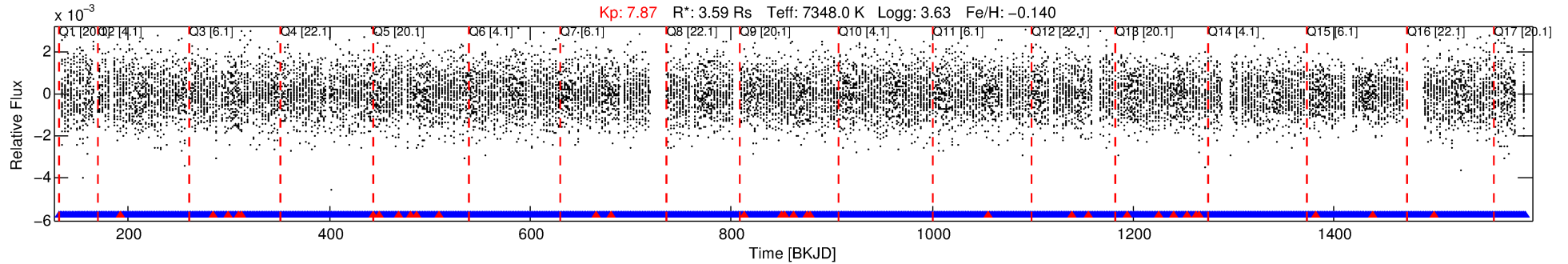
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005724440-02

No Significant Match Found

DV One-Page Summary

KIC: 5724440 Candidate: 2 of 4 Period: 1.009 d



DV Fit Results:

Period = 1.00853 [0.00001] d
Epoch = 131.6490 [0.0039] BKJD
 $R_p/R^* = 0.0167$ [0.0059]
 $a/R^* = 1.45$ [1.60]
 $b = 0.91$ [0.42]
 $\text{Seff} = 54402.91$ [18554.52]
 $T_{\text{eq}} = 3894$ [332] K
 $R_p = 6.54$ [2.82] R_{e}
 $a = 0.0249$ [0.0054] AU
 $A_g = 1.36$ [1.08] [0.33 σ]
 $T_{\text{effp}} = 6502$ [1186] K [2.12 σ]

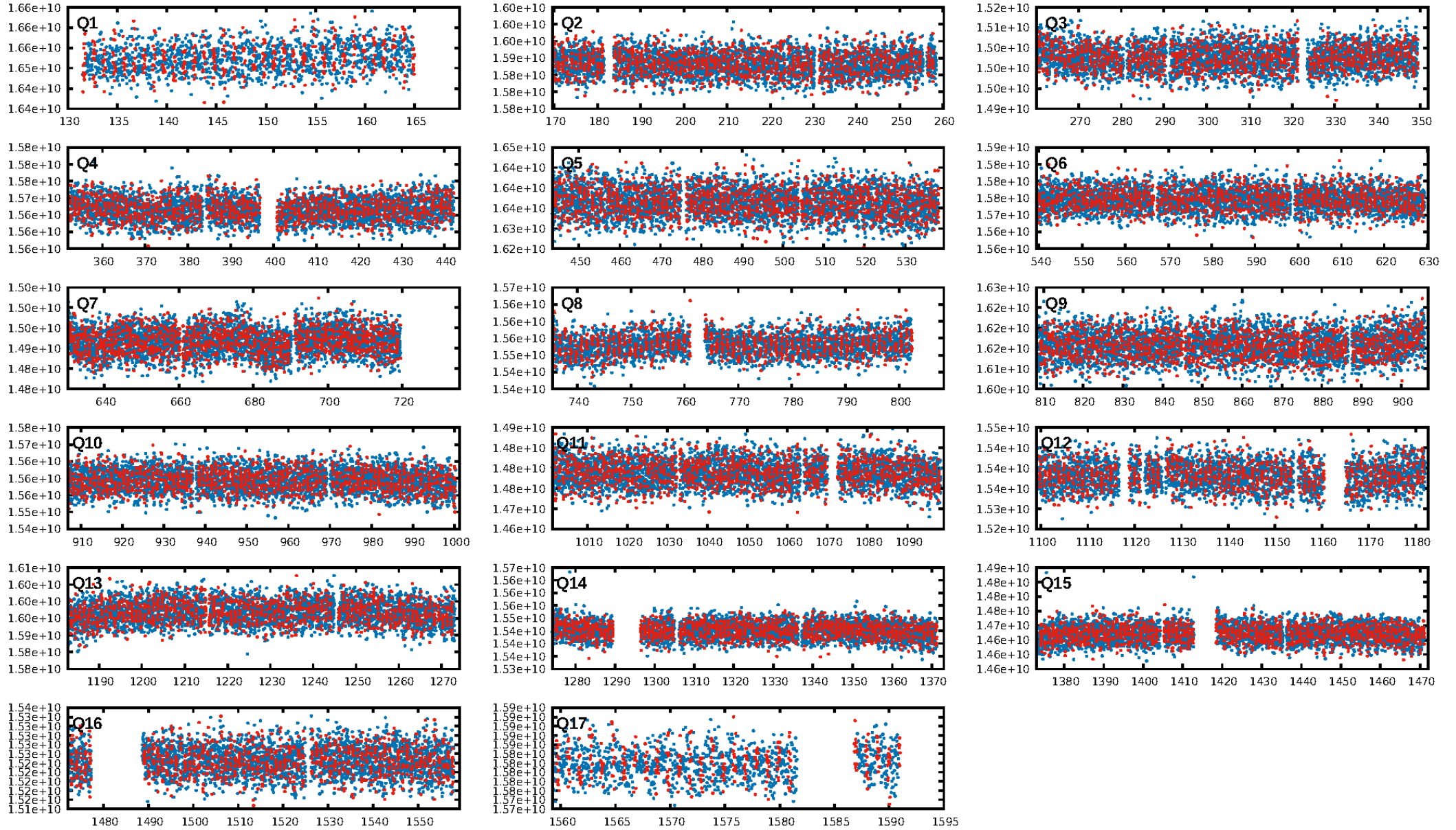
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 99.2% [2.66 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.49e-16
RollingBand-fgt: 0.91 [333/364]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: 2.894 arcsec [5.94 σ]
OotOffset-rm: 5.742 arcsec [2.39 σ]
KicOffset-rm: 11.518 arcsec [3.35 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

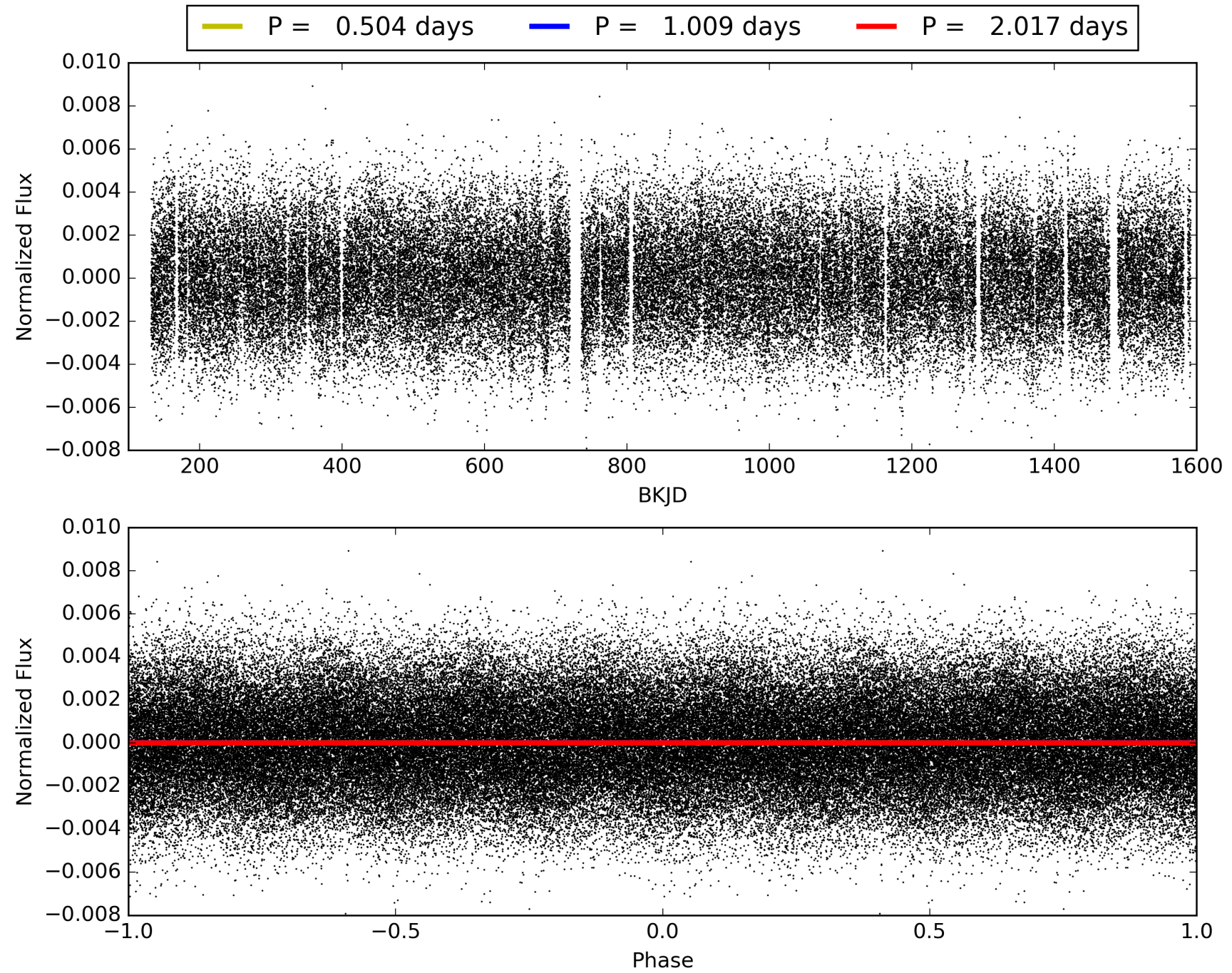
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:16:29 Z

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TCE 005724440-02, PDC Light Curves

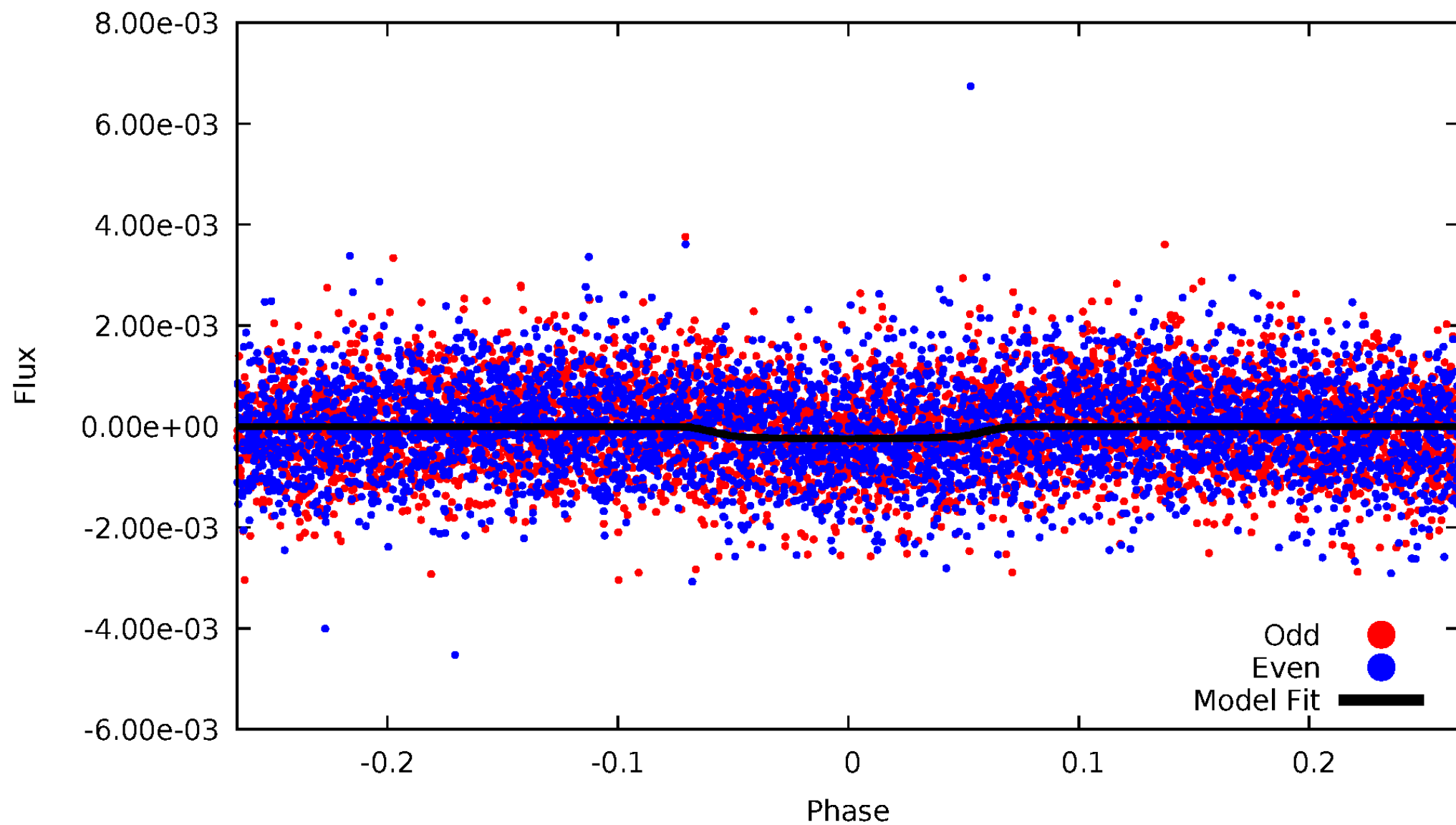


TCE 005724440-02



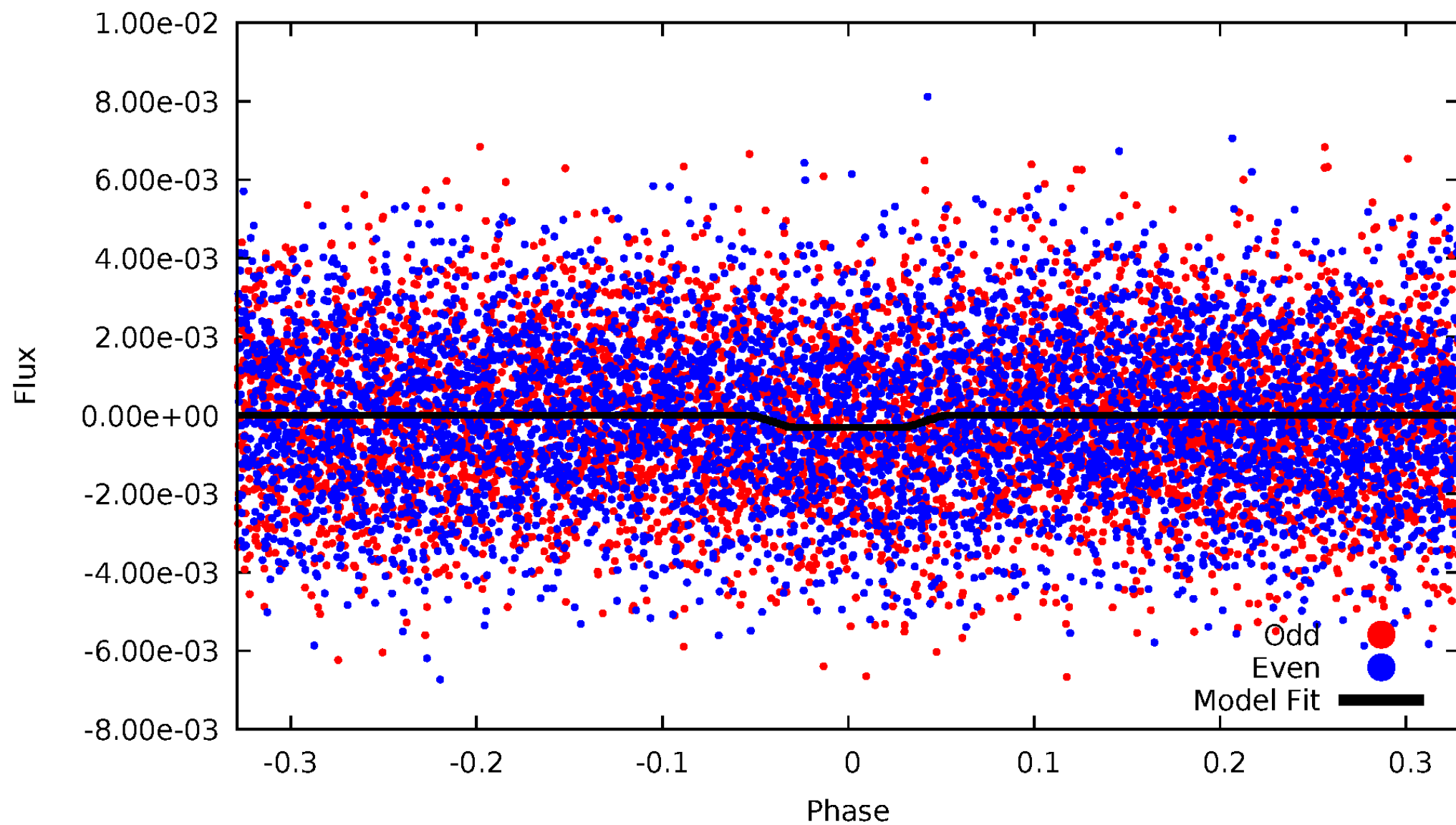
DV Odd/Even

TCE 005724440-02



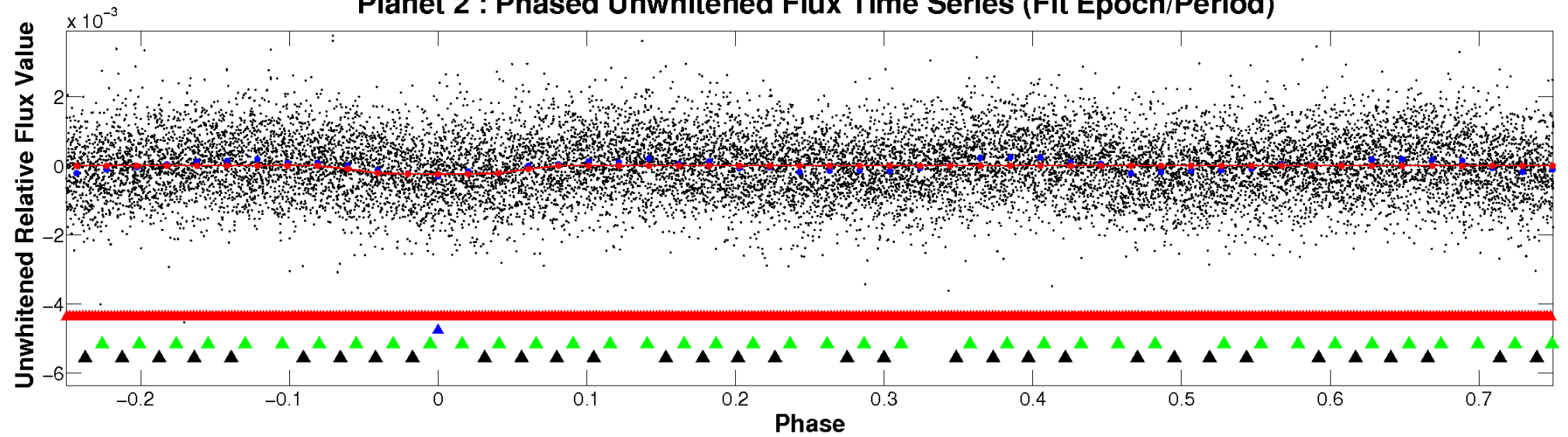
ALT Odd/Even

TCE 005724440-02

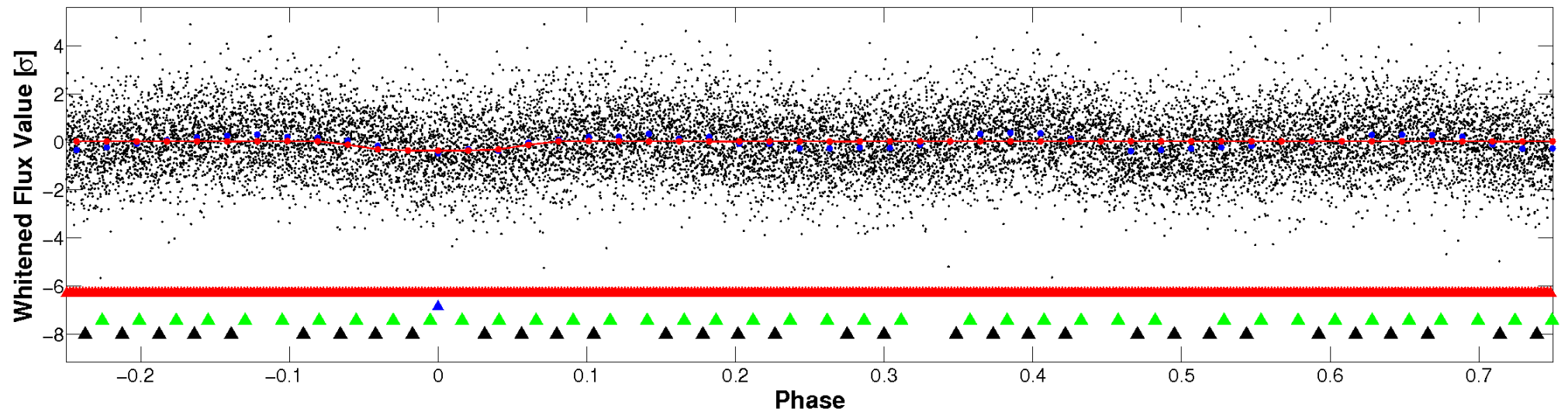


Non-Whitened Vs. Whitened Light Curve

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

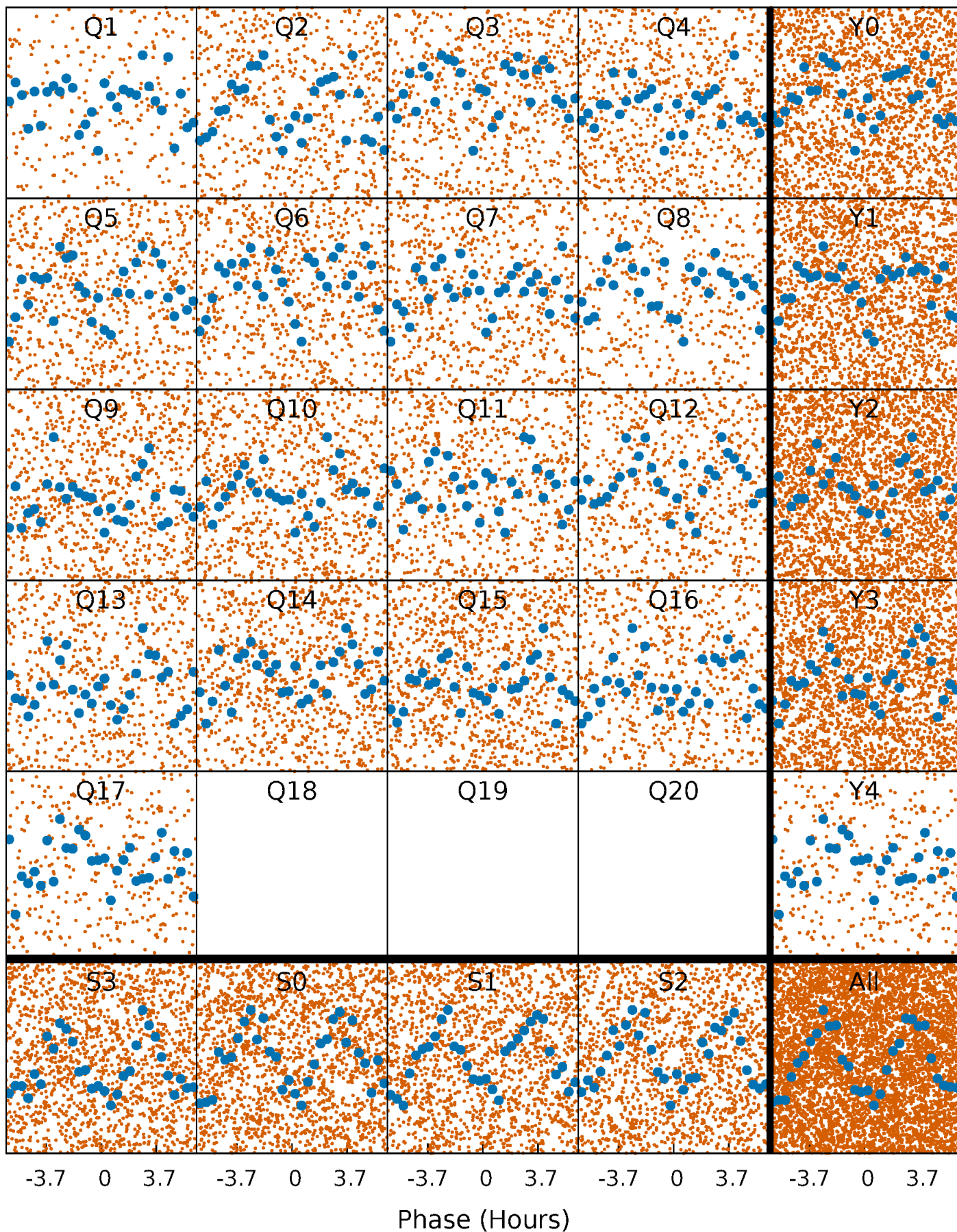


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



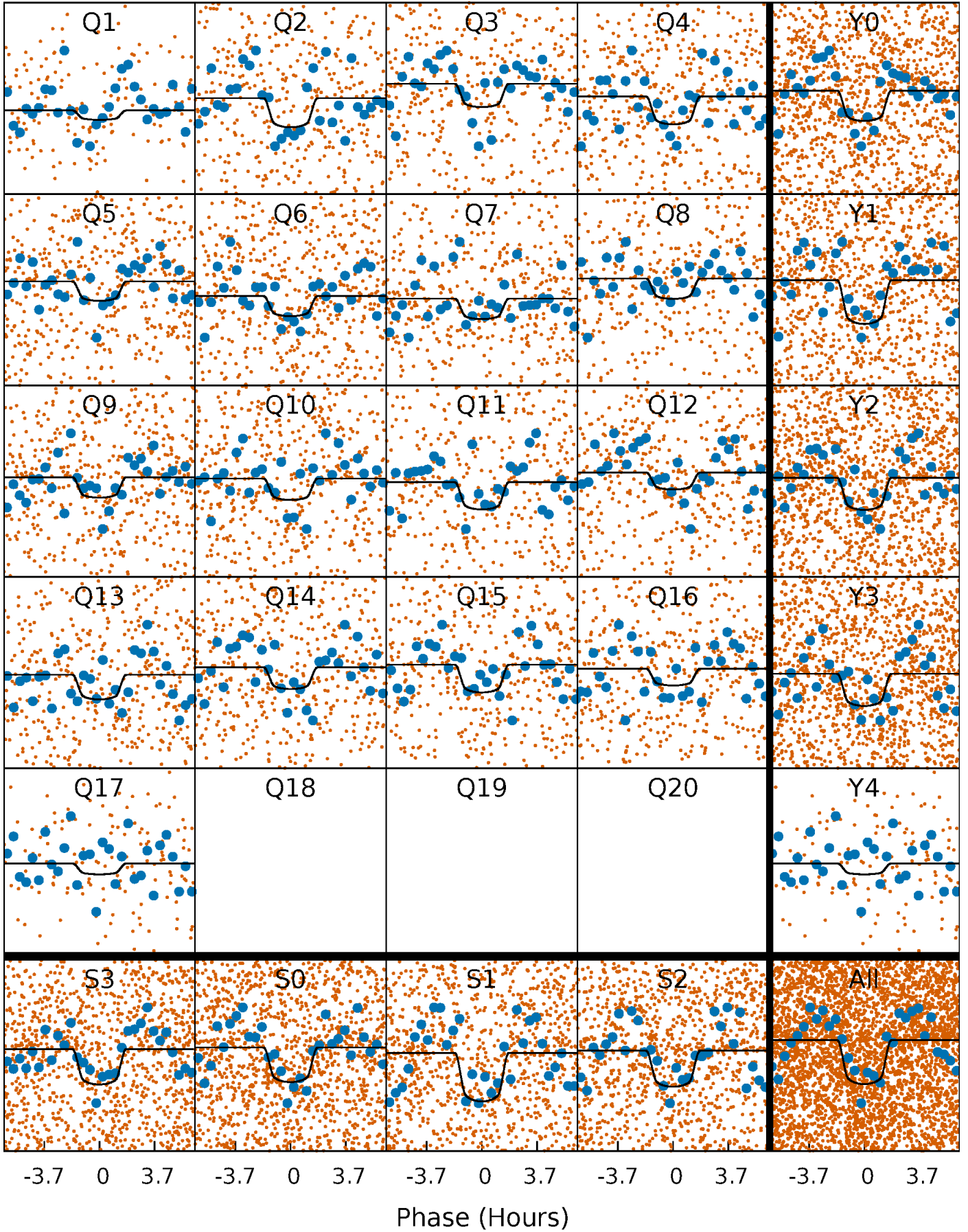
PDC Quarter-Phased Transit Curves

TCE 005724440-02 P= 1.008533 Days $T_0=131.648958$ (BKJD)



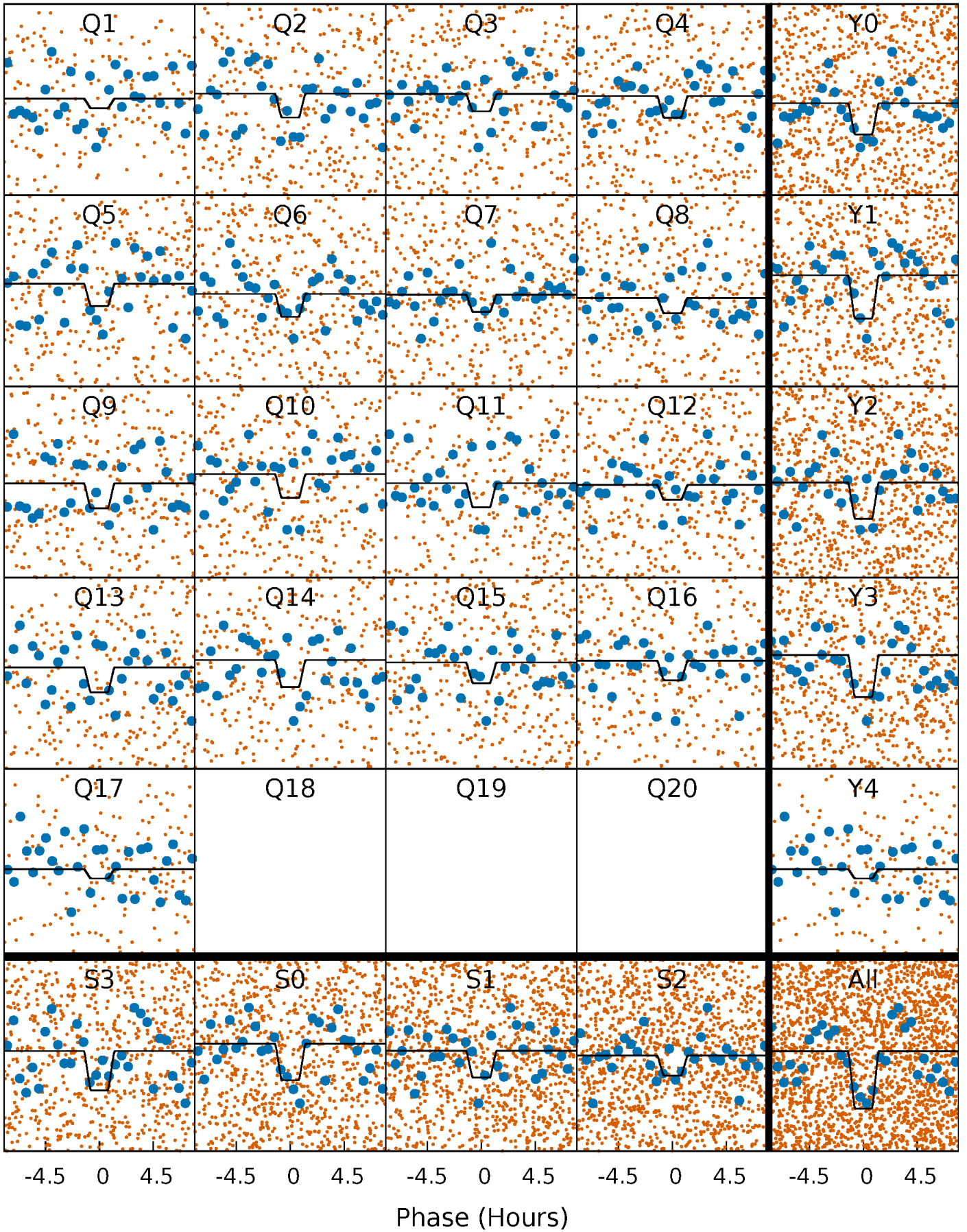
DV Quarter-Phased Transit Curves

TCE 005724440-02 P= 1.008533 Days $T_0=131.648958$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

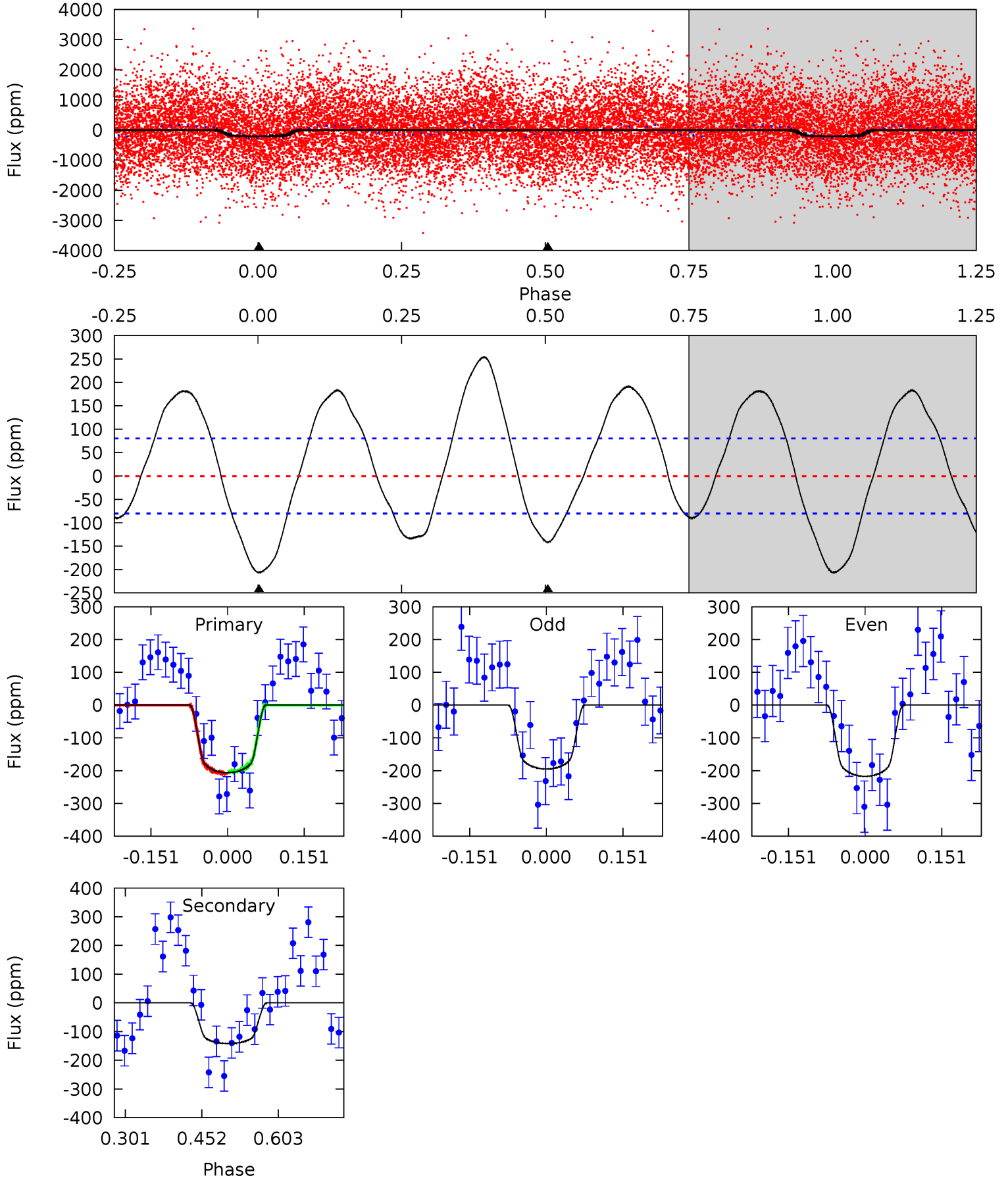
TCE 005724440-02 P= 1.008551 Days $T_0=131.648303$ (BKJD)



DV Model-Shift Uniqueness Test

005724440-02, P = 1.008533 Days, E = 131.648958 Days

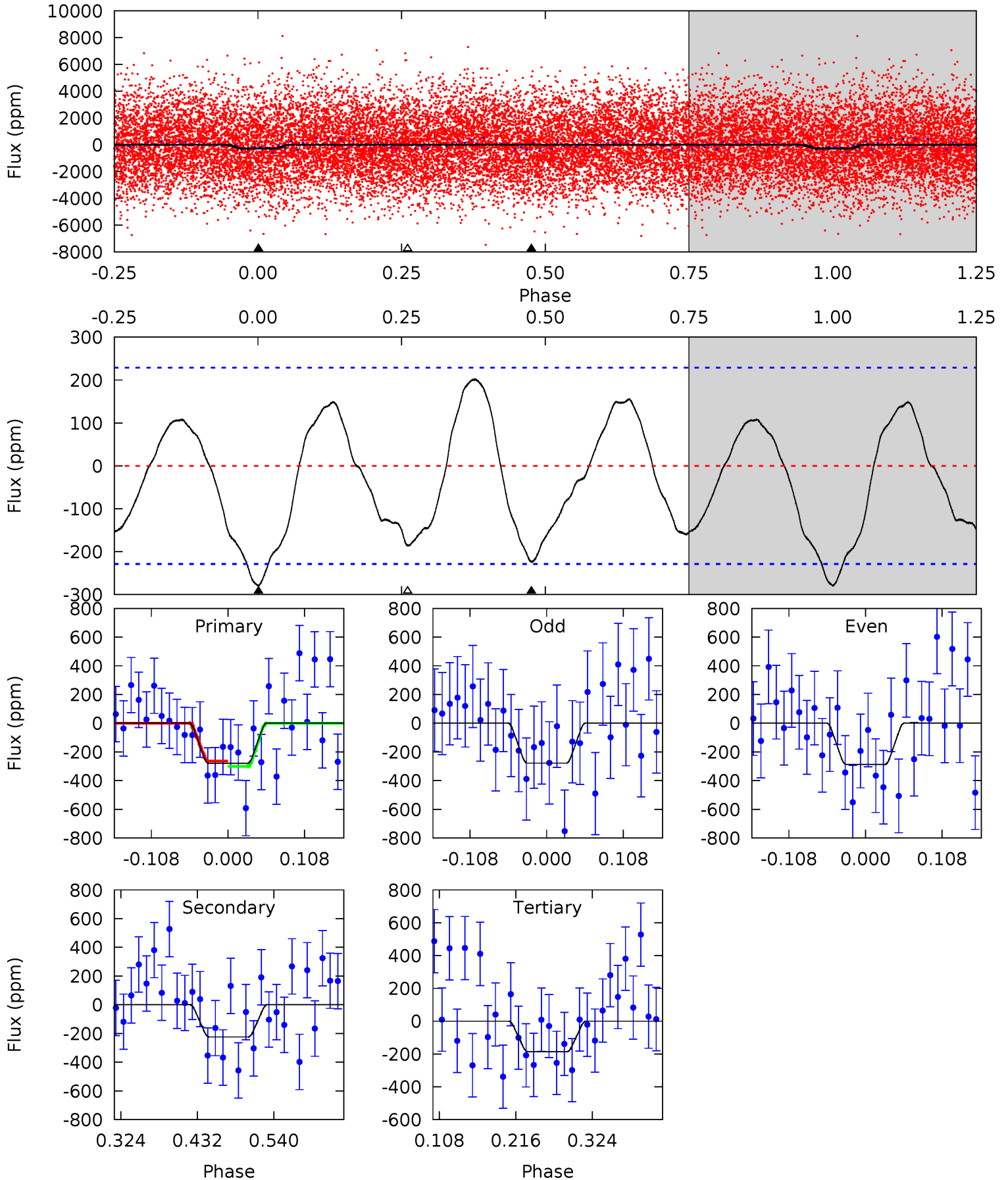
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	7.90	0	0	4.48	1.44	5.40	11.5	11.5	7.90	7.90	0.62	0.85	0.55	0.14



Alt Model-Shift Uniqueness Test

005724440-02, P = 1.008551 Days, E = 131.648303 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.56	4.45	3.69	0	4.55	1.61	2.24	1.86	5.56	0.76	4.45	0.09	0.73	0.42	0.37



Stellar Parameters For KIC 005724440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7348^{+132}_{-161}	$3.633^{+0.187}_{-0.033}$	$-0.140^{+0.150}_{-0.150}$	$3.593^{+0.146}_{-0.873}$	$2.023^{+0.028}_{-0.239}$	$0.061^{+0.063}_{-0.007}$
	+2%/-2%	+5%/-1%	+107%/-107%	+4%/-24%	+1%/-12%	+102%/-12%
Source	SPE4	SPE4	SPE4	DSEP		

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

Secondary Eclipse Parameters for KIC 005724440-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-142 ± 18	$6.33^{+2.13}_{-2.23}$	5356^{+172}_{-293}	5621^{+1720}_{-966}	$1.187^{+1.675}_{-0.531}$
Alt.	-224 ± 50	$6.60^{+2.44}_{-2.23}$	5362^{+181}_{-291}	6295^{+2059}_{-1118}	$1.694^{+2.303}_{-0.813}$

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 $A_{obs} \gg 1.0$

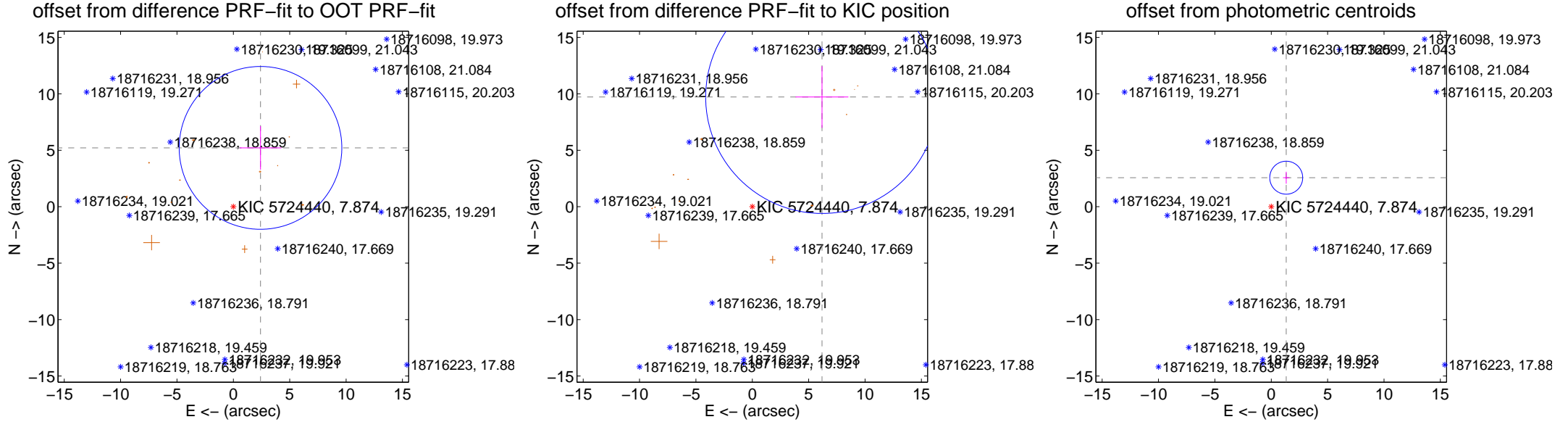
DV Centroid Data

Supplemental centroid analysis for 005724440-02. **Kepler magnitude: 7.87.** Transit SNR 13.50

There are 0 quarters with good PRF difference image offsets

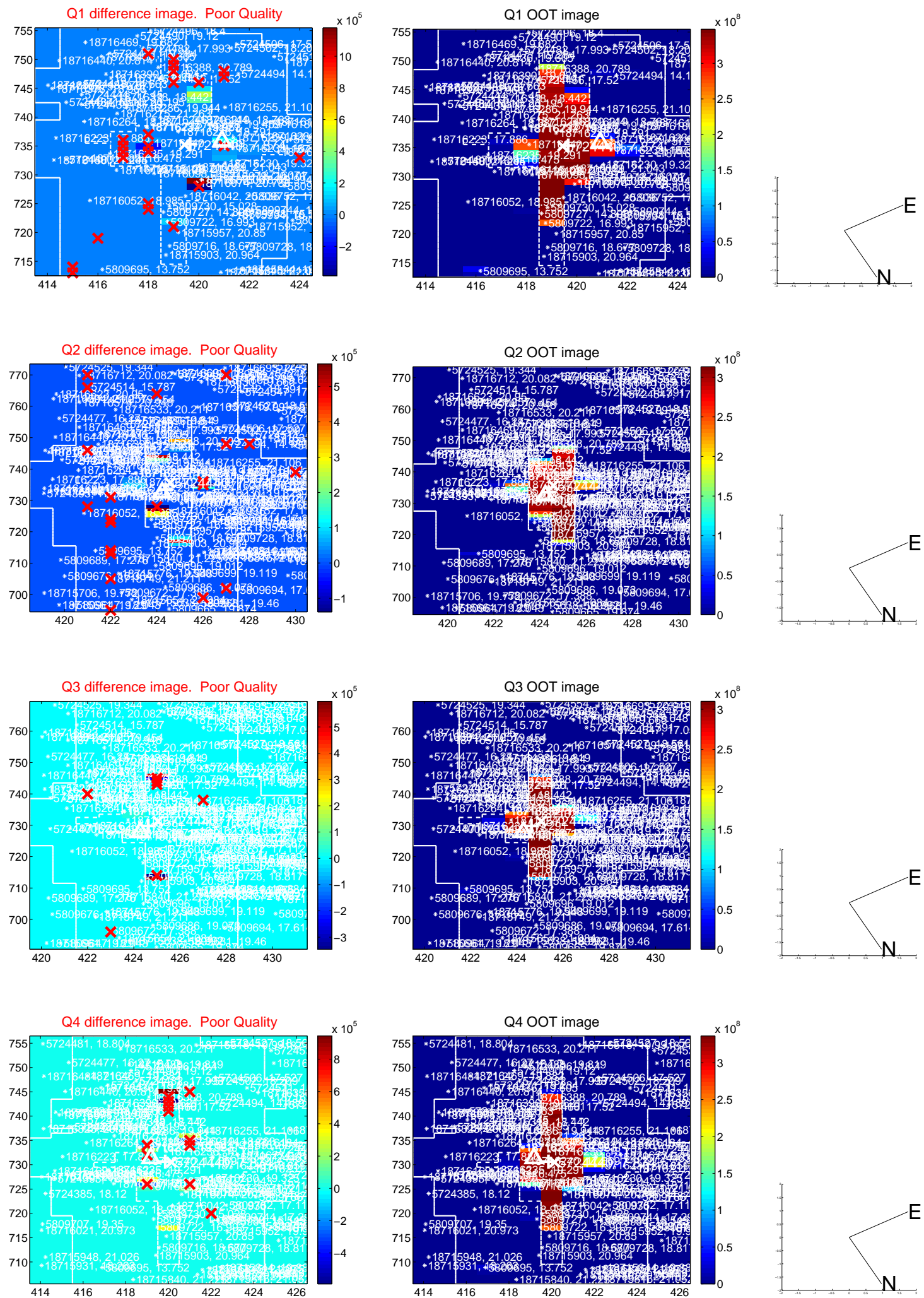
The direct PRF centroid is offset from the target star catalog position by about 1.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.742 ± 2.404	2.39	-2.408 ± 1.849	5.213 ± 1.926
PRF-fit source offset from KIC position	11.518 ± 3.438	3.35	-6.181 ± 2.345	9.719 ± 2.732
photometric centroid source offset	2.89 ± 0.49	5.94	-1.33 ± 0.28	2.57 ± 0.53

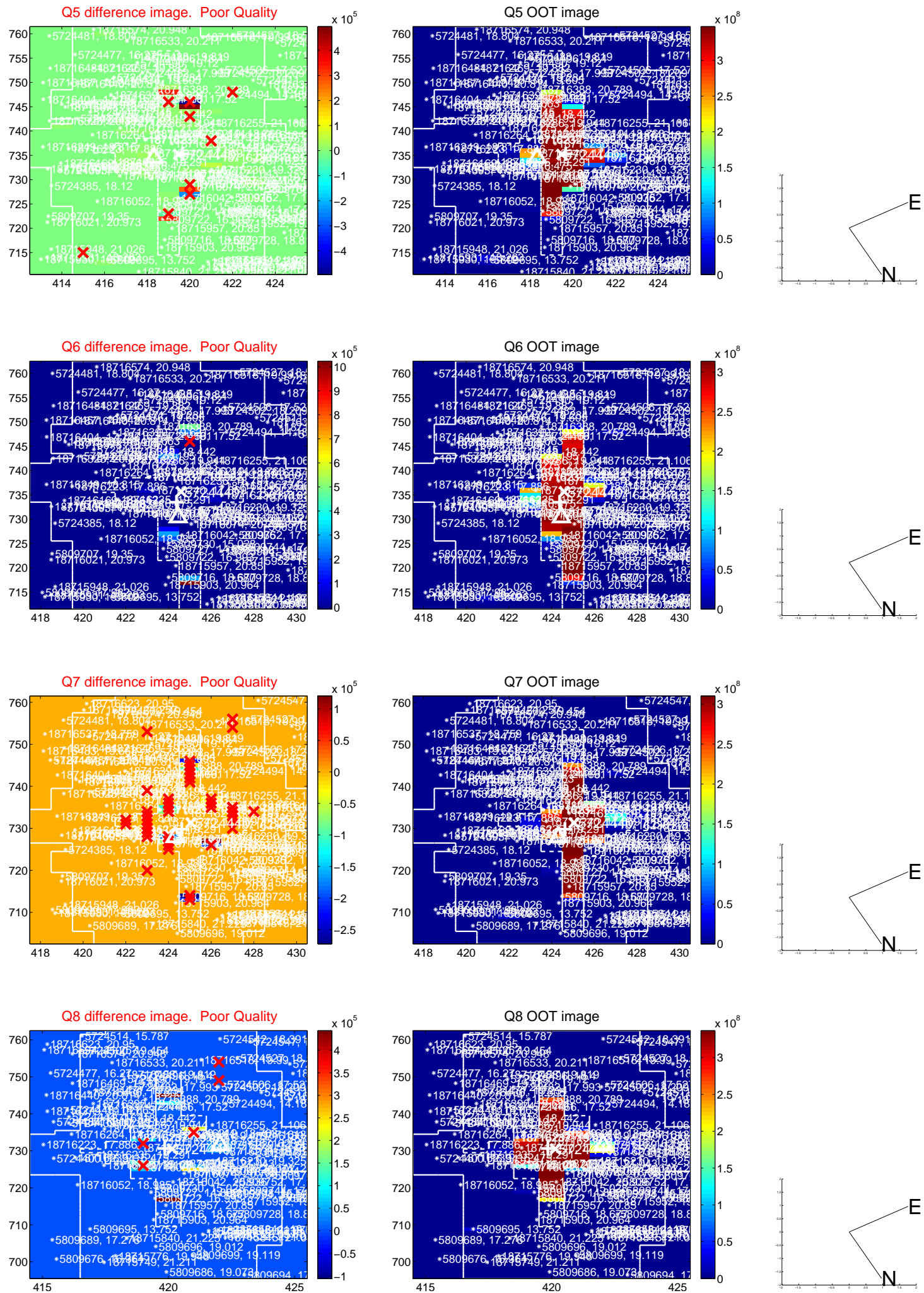


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

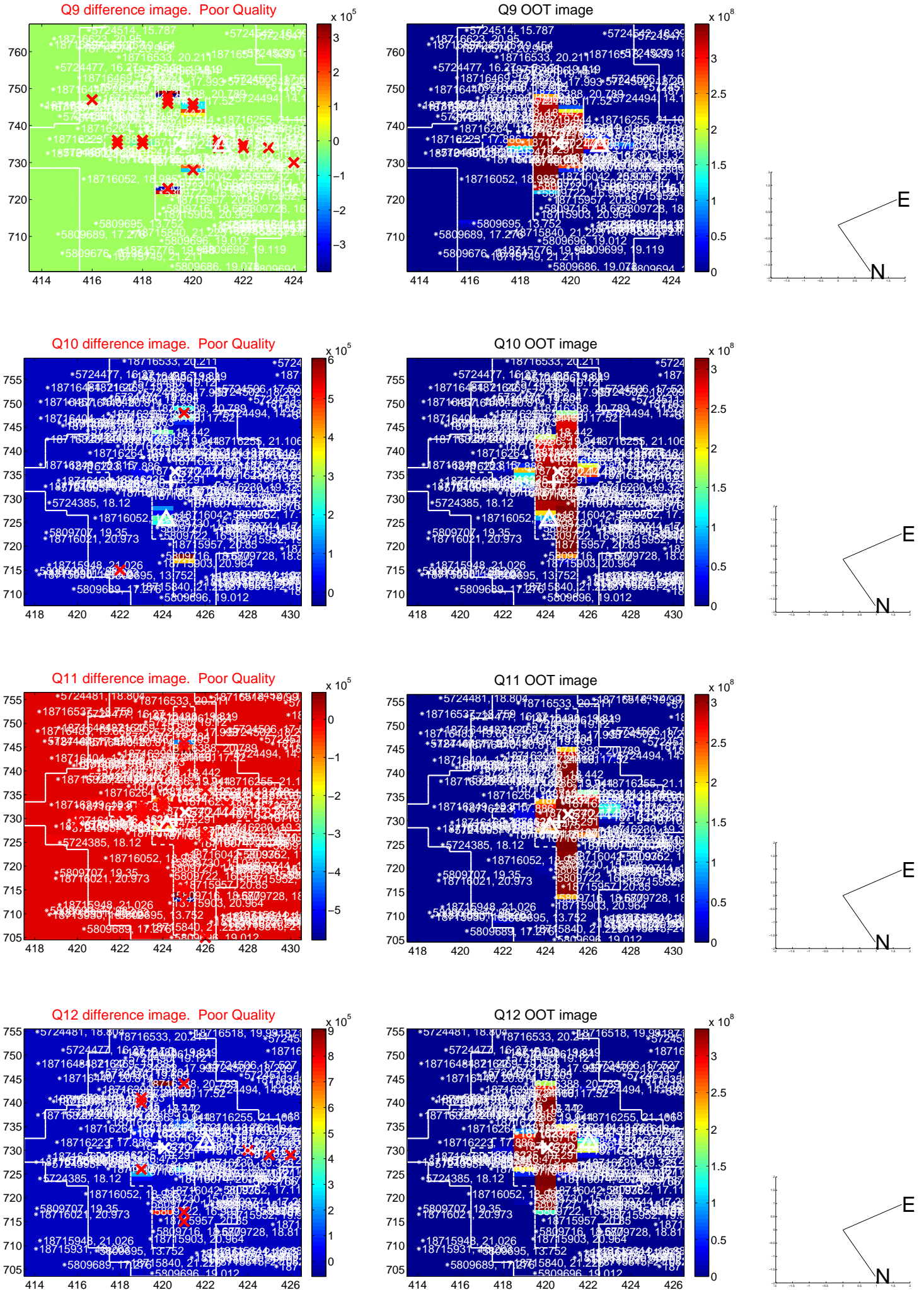
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



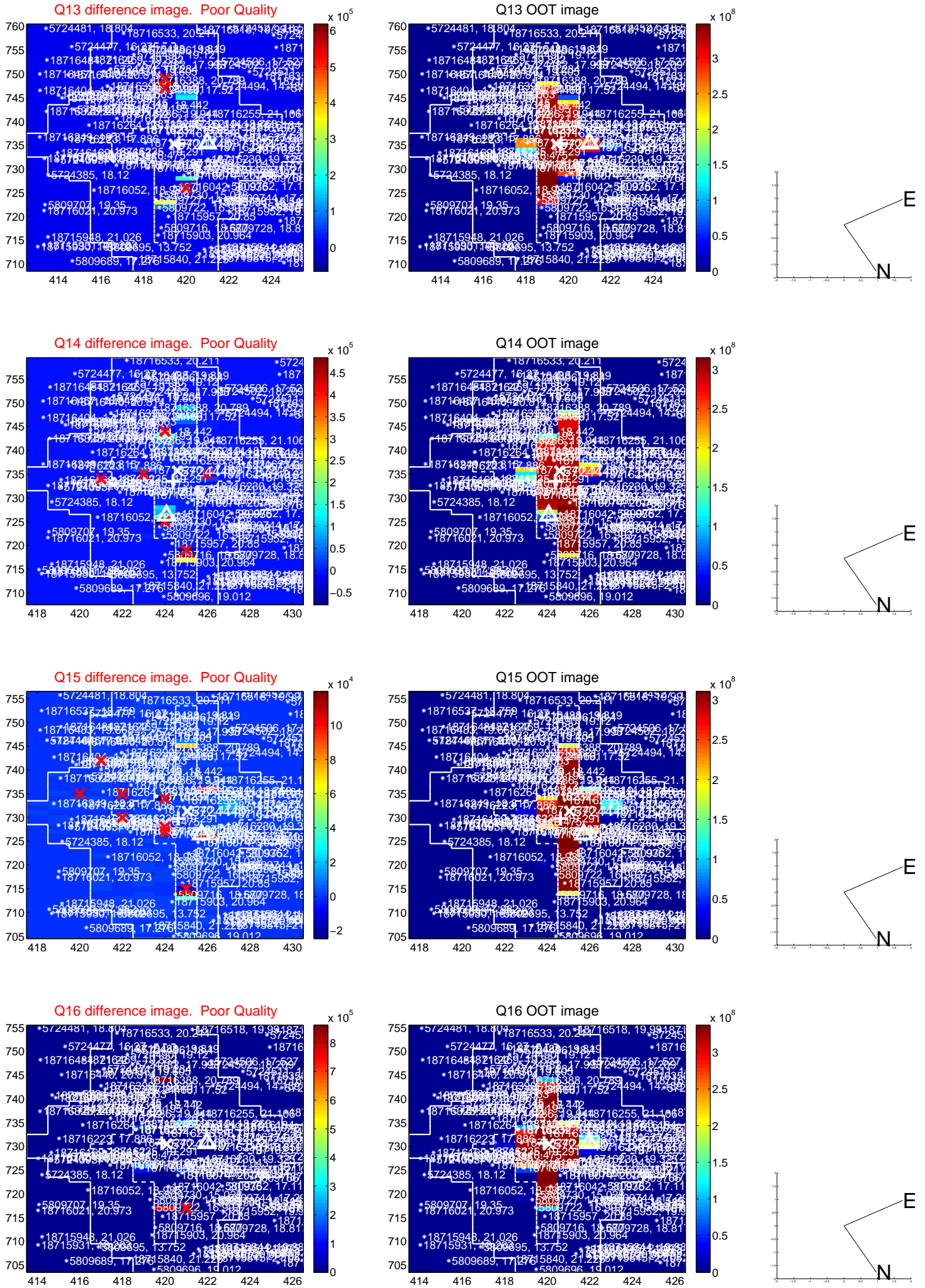
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



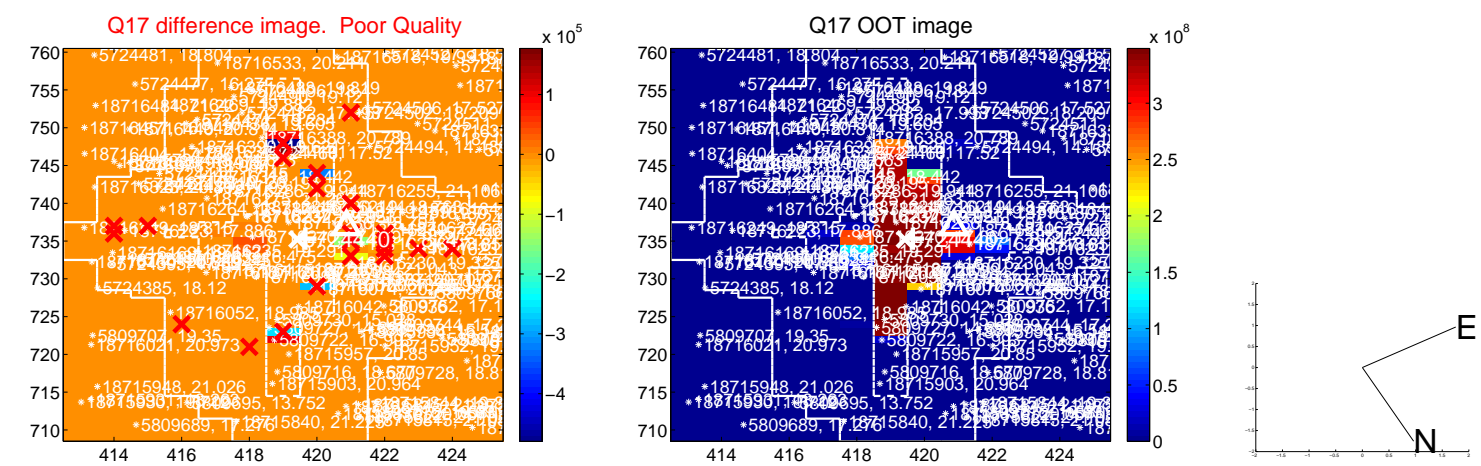
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



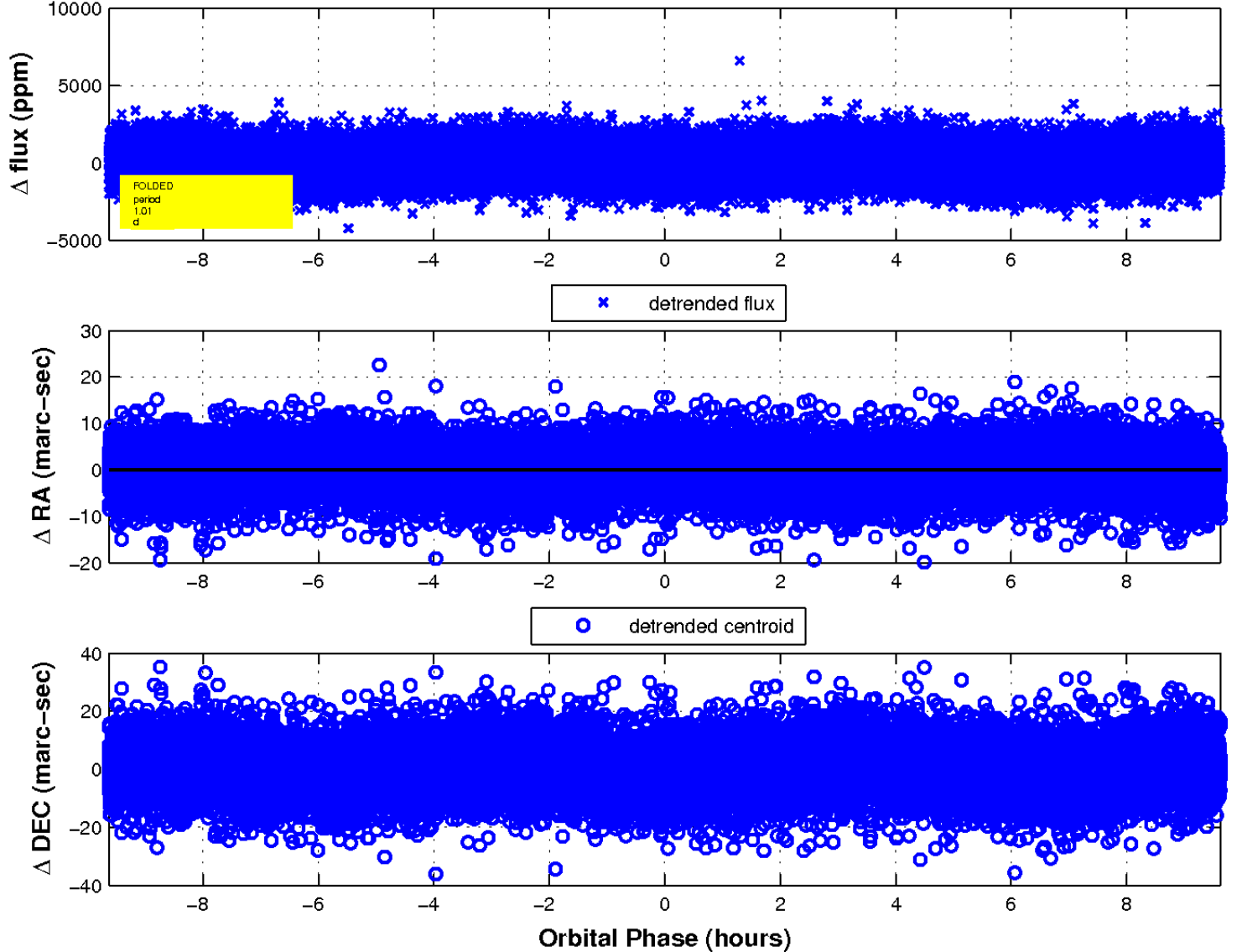
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



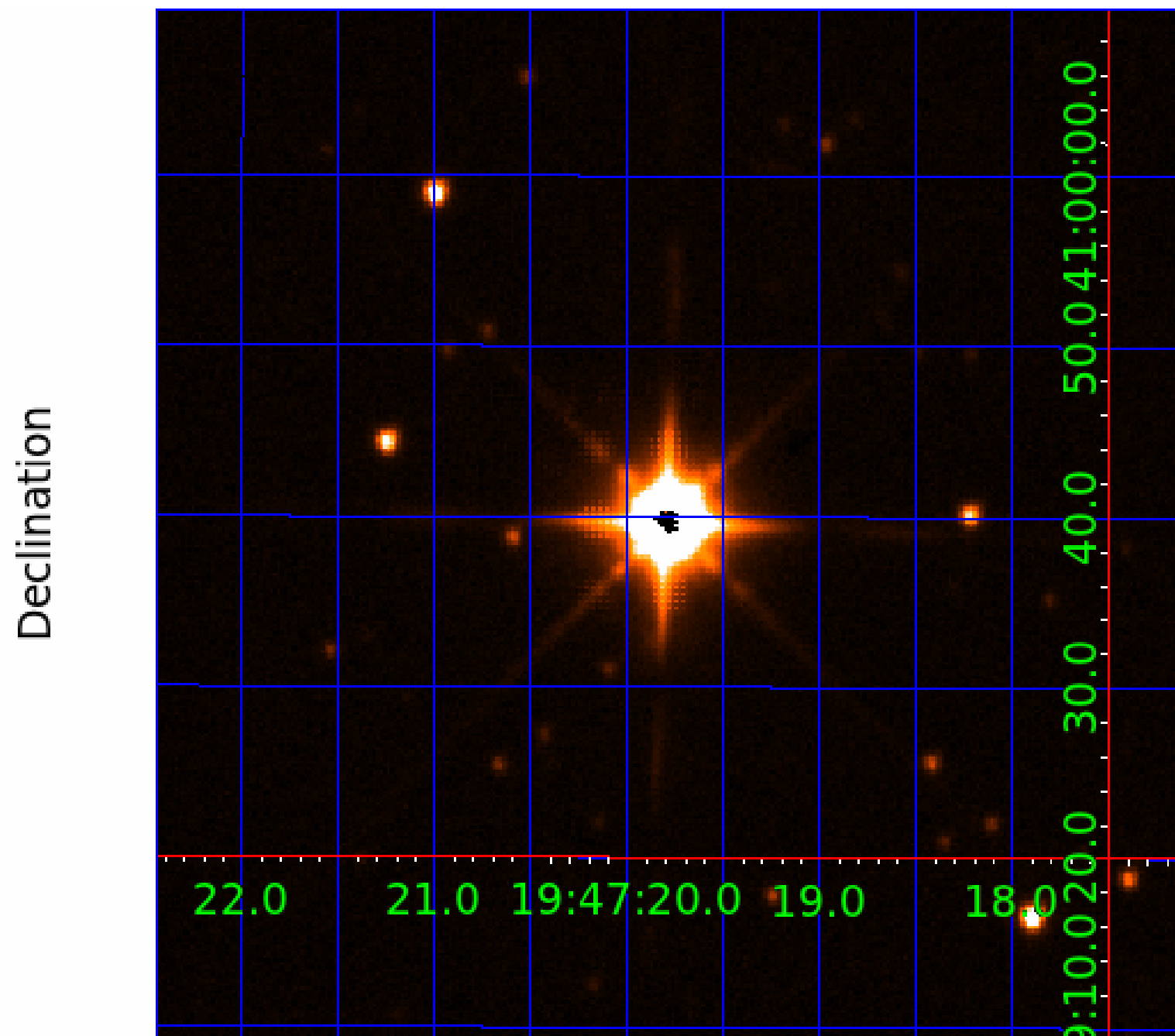
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 4



UKIRT Image



KIC 005724440

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})
005724440-01	OBS	No	3.075059	132.461637	83.1	18.389	10.6	9.7	3.59	7348	3.30	12304.70
005724440-02	OBS	No	1.008533	131.648958	240.5	3.209	11.9	13.5	3.59	7348	6.54	54402.91
005724440-03	OBS	No	37.488006	136.363379	1233.6	1.611	8.2	7.4	3.59	7348	13.24	438.55
005724440-04	OBS	No	44.941198	134.485362	1035.2	3.436	8.0	8.1	3.59	7348	12.72	344.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005724440-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
005724440-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005724440-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
005724440-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

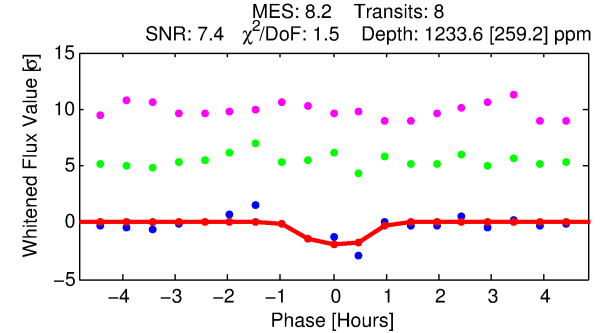
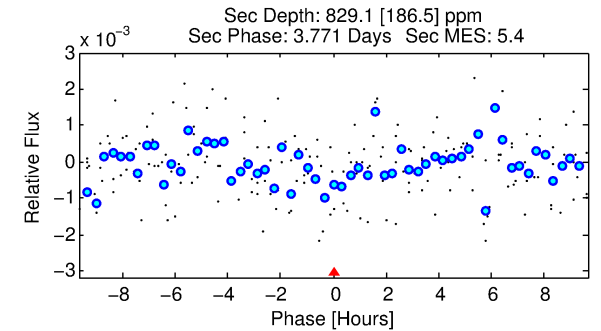
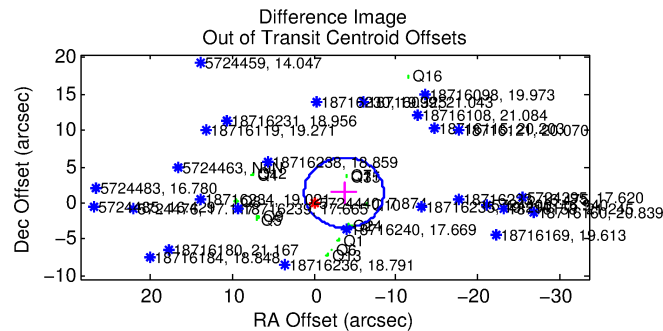
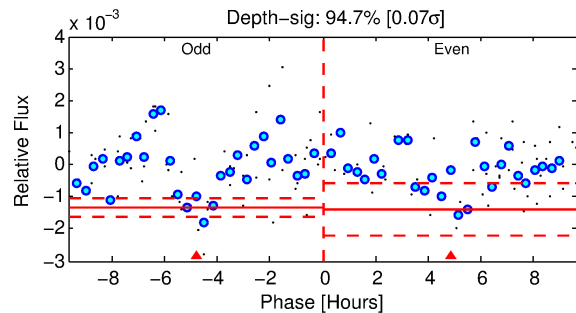
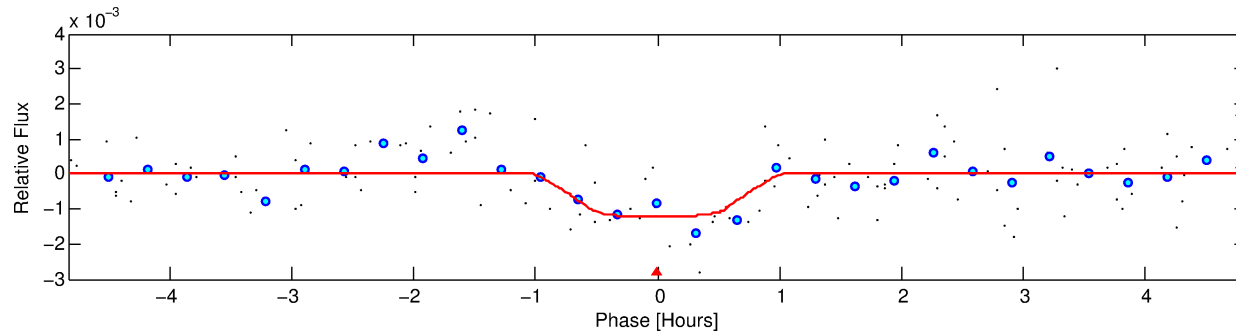
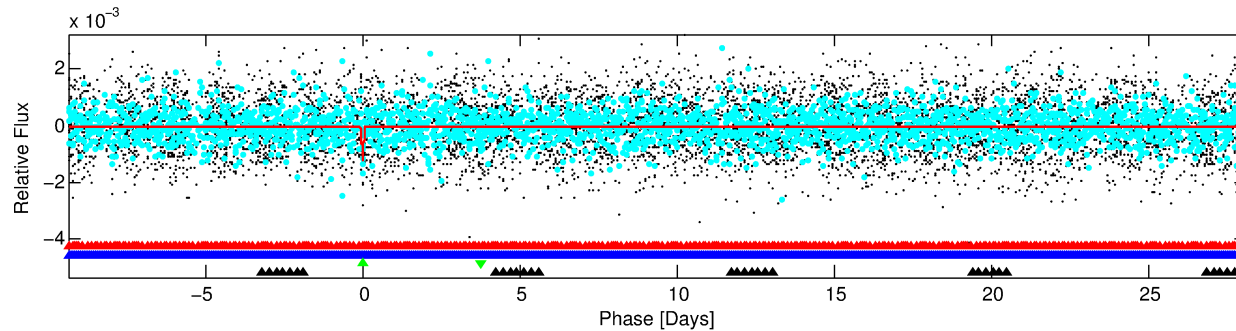
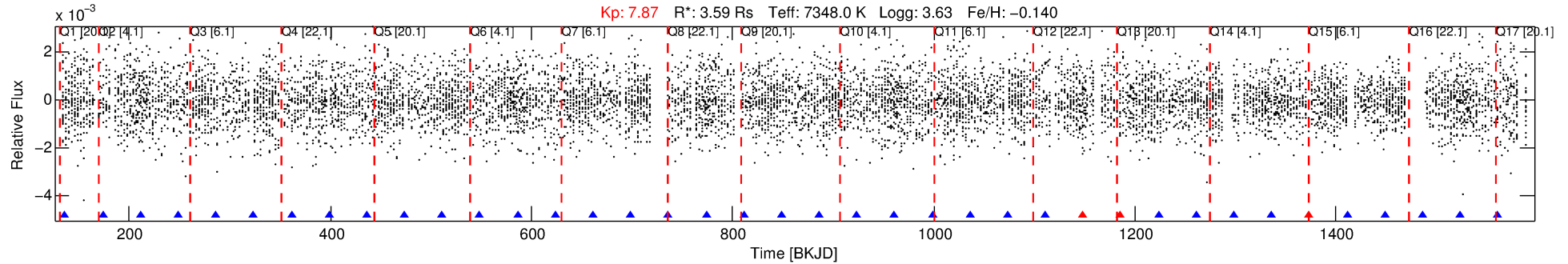
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005724440-03

No Significant Match Found

DV One-Page Summary

KIC: 5724440 Candidate: 3 of 4 Period: 37.488 d



DV Fit Results:

Period = 37.48801 [0.00052] d
Epoch = 136.3634 [0.0093] BKJD
 $R_p/R^* = 0.0338$ [0.0819]
 $a/R^* = 151.99$ [1969.10]
 $b = 0.58$ [14.98]
 $\text{Seff} = 438.55$ [149.57]
 $T_{\text{eq}} = 1167$ [99] K
 $R_p = 13.24$ [32.29] R_e
 $a = 0.2773$ [0.0600] AU
 $\text{Ag} = 200.14$ [974.81] [0.20 σ]
 $T_{\text{eff}} = 6786$ [8245] K [0.68 σ]

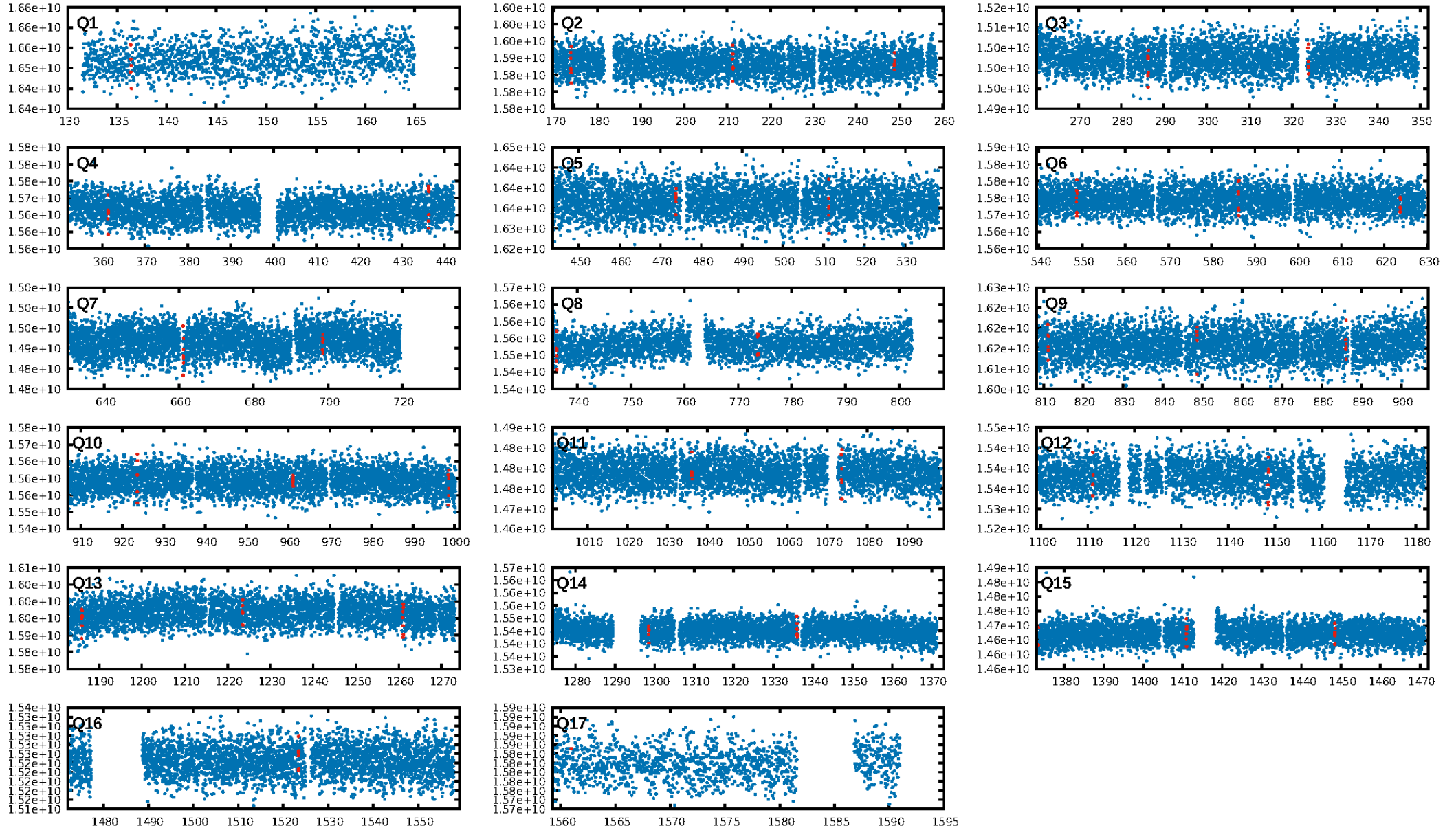
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [44.74 σ]
LongPeriod-sig: 100.0% [47.14 σ]
ModelChiSquare2-sig: 17.1%
ModelChiSquareGof-sig: 91.8%
Bootstrap-pfa: 1.77e-08
RollingBand-fgt: 0.62 [5/8]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: 2.438 arcsec [2.96 σ]
OotOffset-rm: 3.909 arcsec [2.43 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-rm: 9.685 arcsec [4.51 σ]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.00 [0/16]
DiffImageOverlap-fno: 0.44 [7/16]

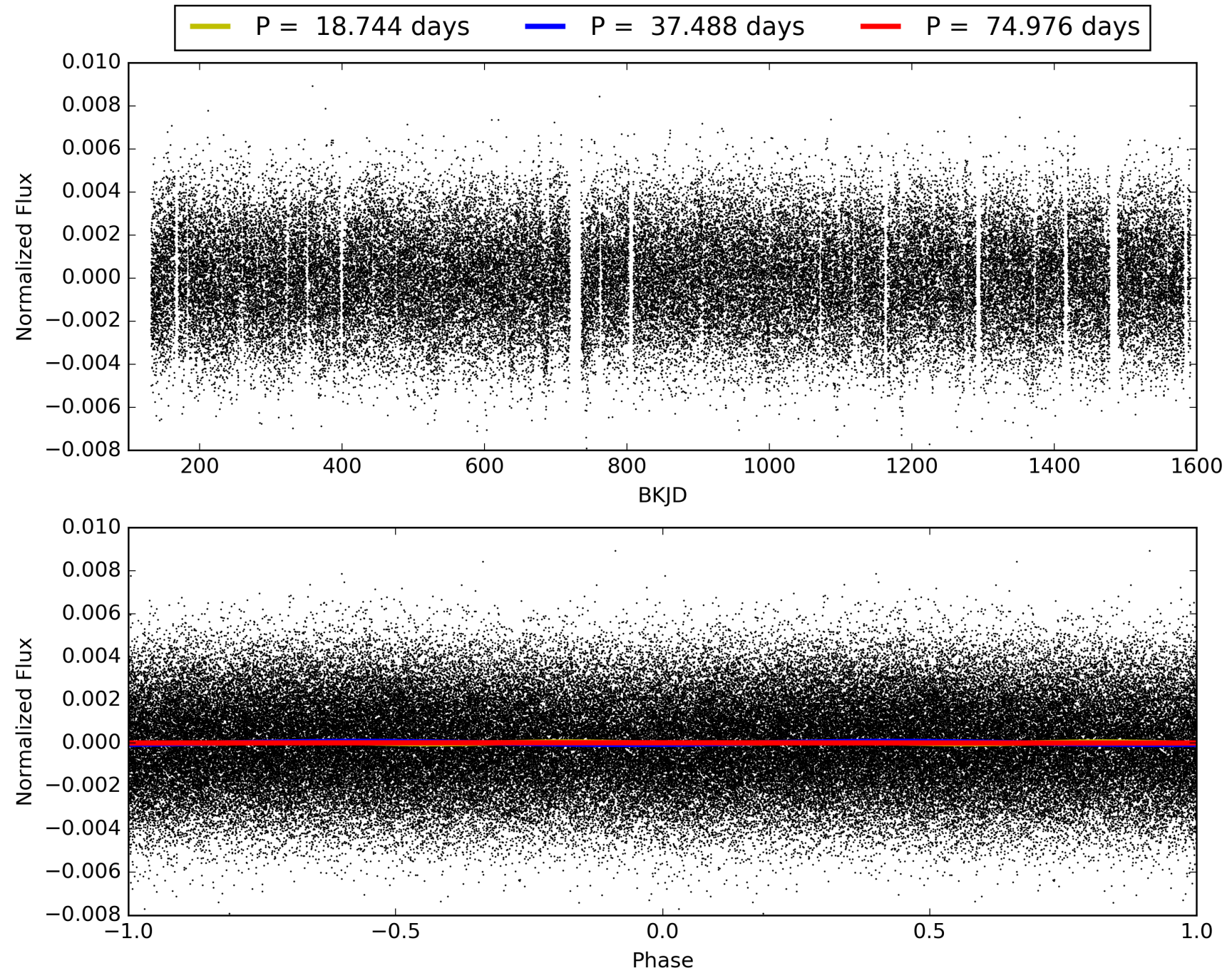
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:16:35 Z

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

TCE 005724440-03, PDC Light Curves

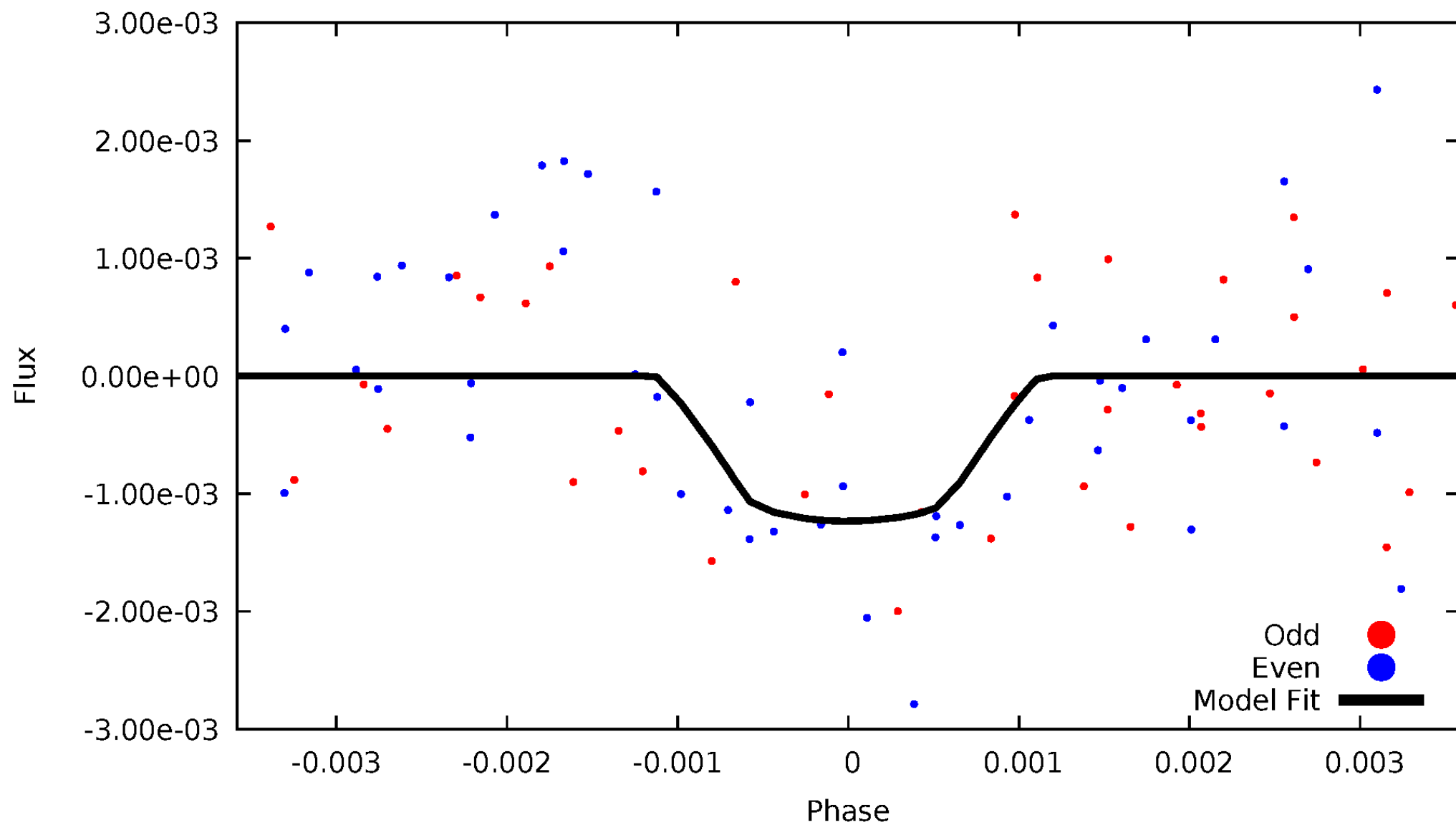


TCE 005724440-03



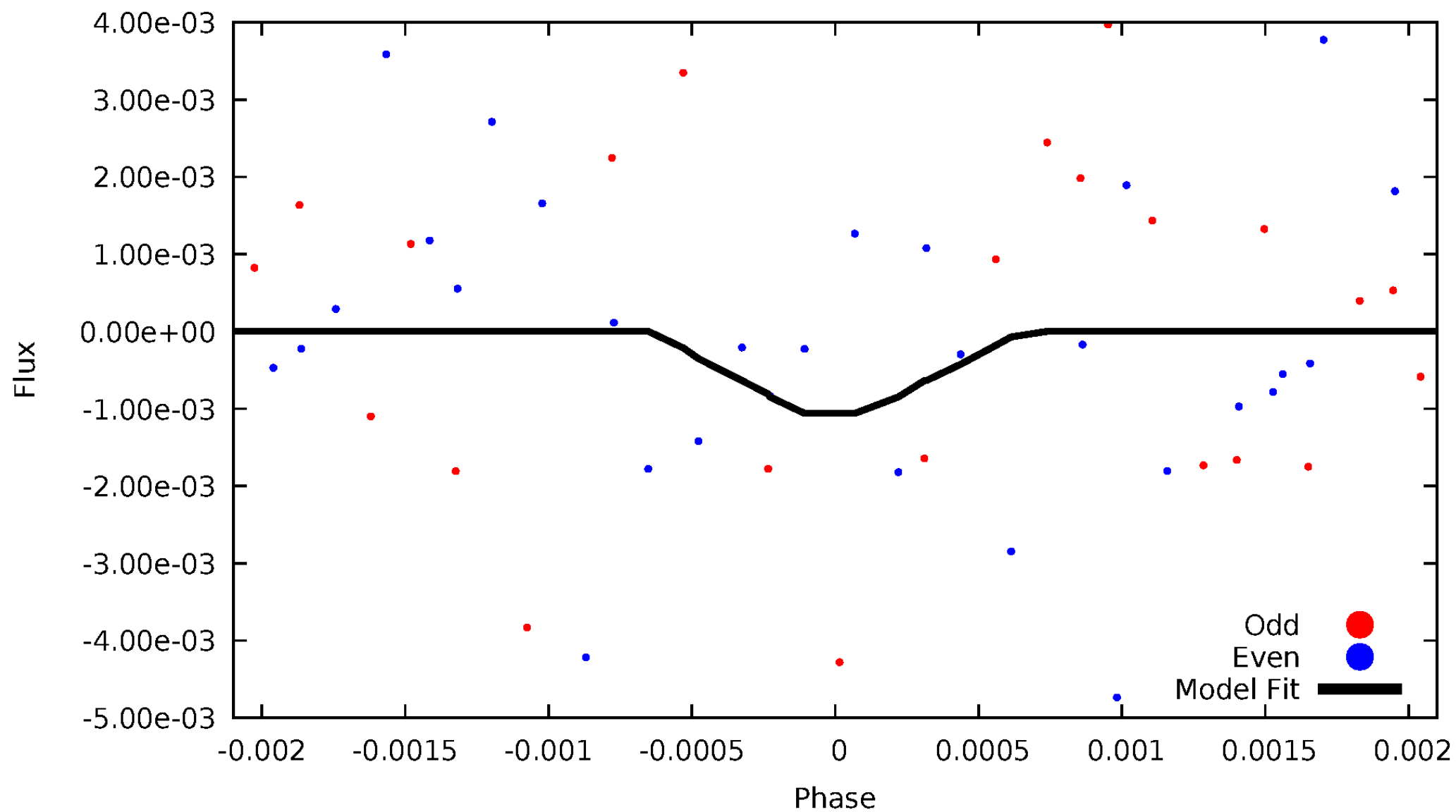
DV Odd/Even

TCE 005724440-03



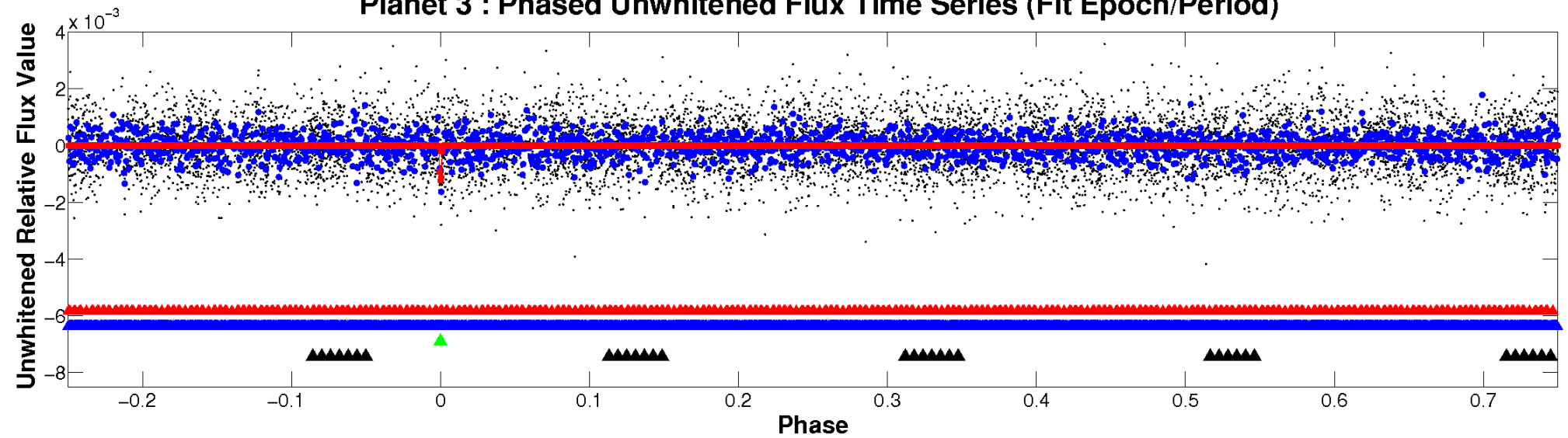
ALT Odd/Even

TCE 005724440-03

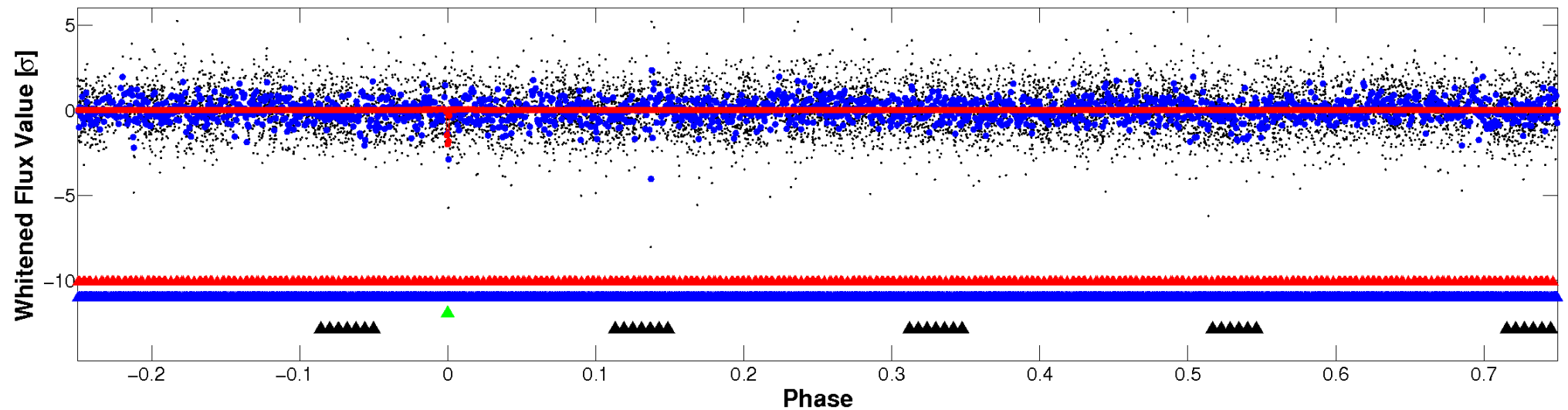


Non-Whitened Vs. Whitened Light Curve

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

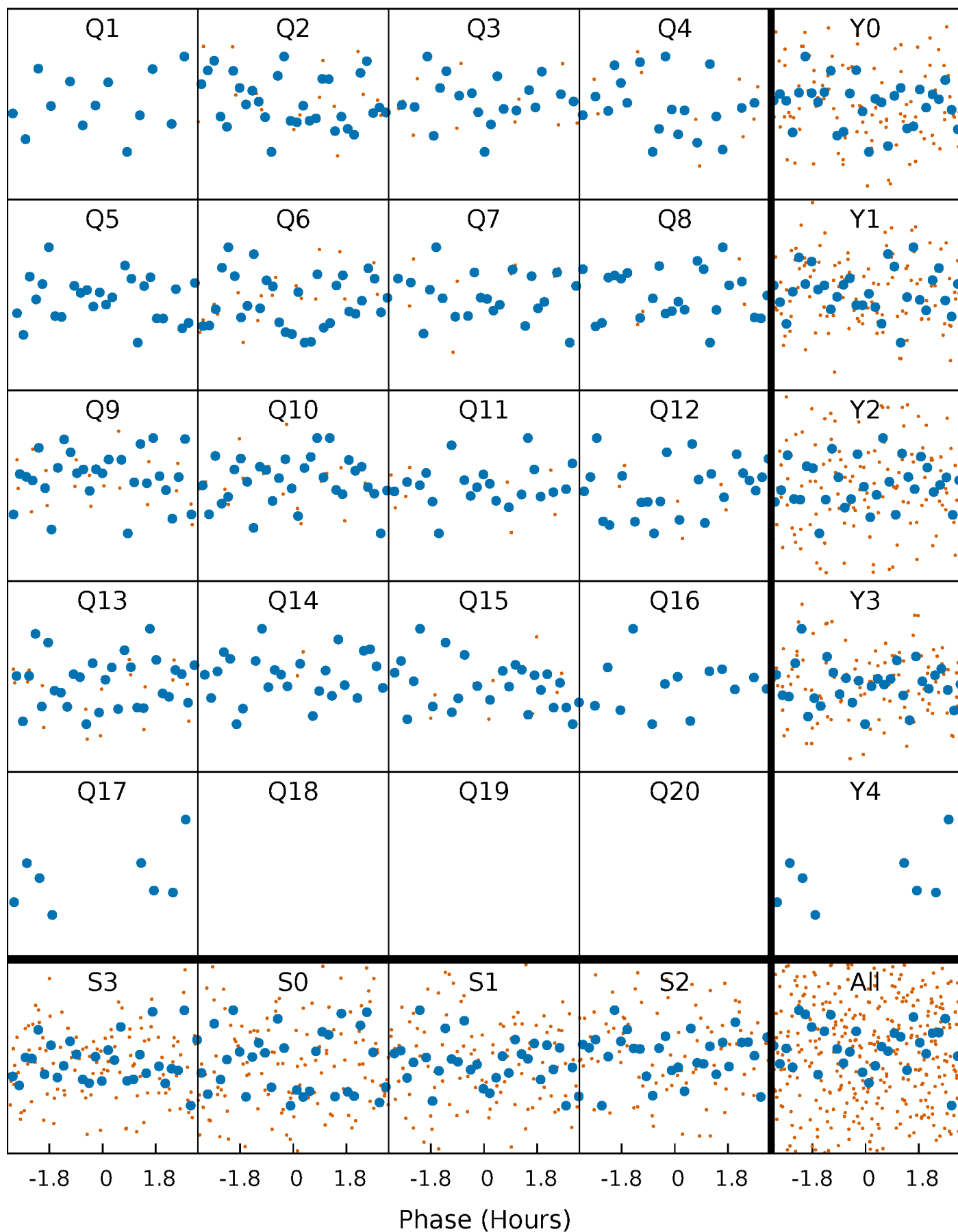


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



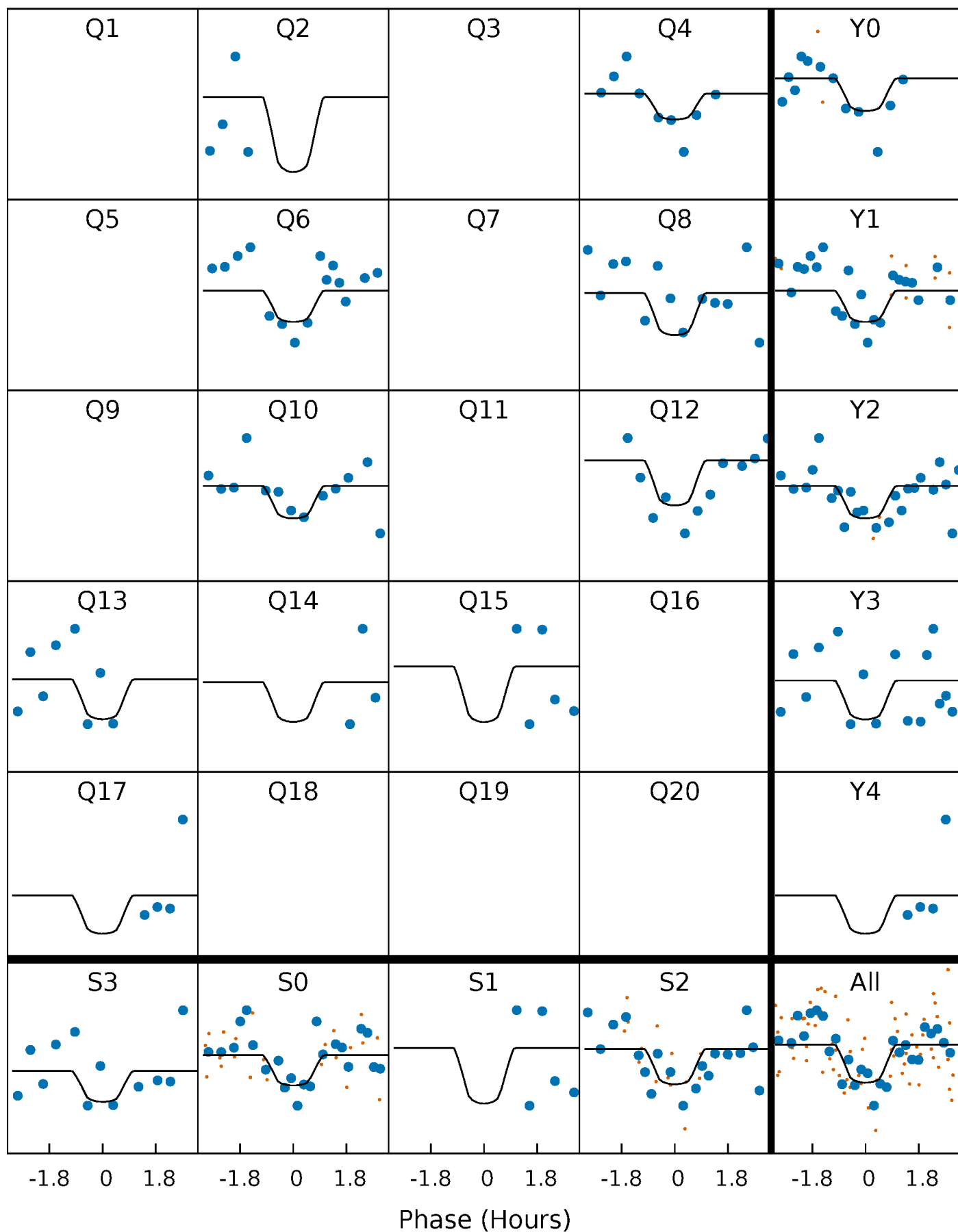
PDC Quarter-Phased Transit Curves

TCE 005724440-03 P= 37.488006 Days $T_0=136.363379$ (BKJD)



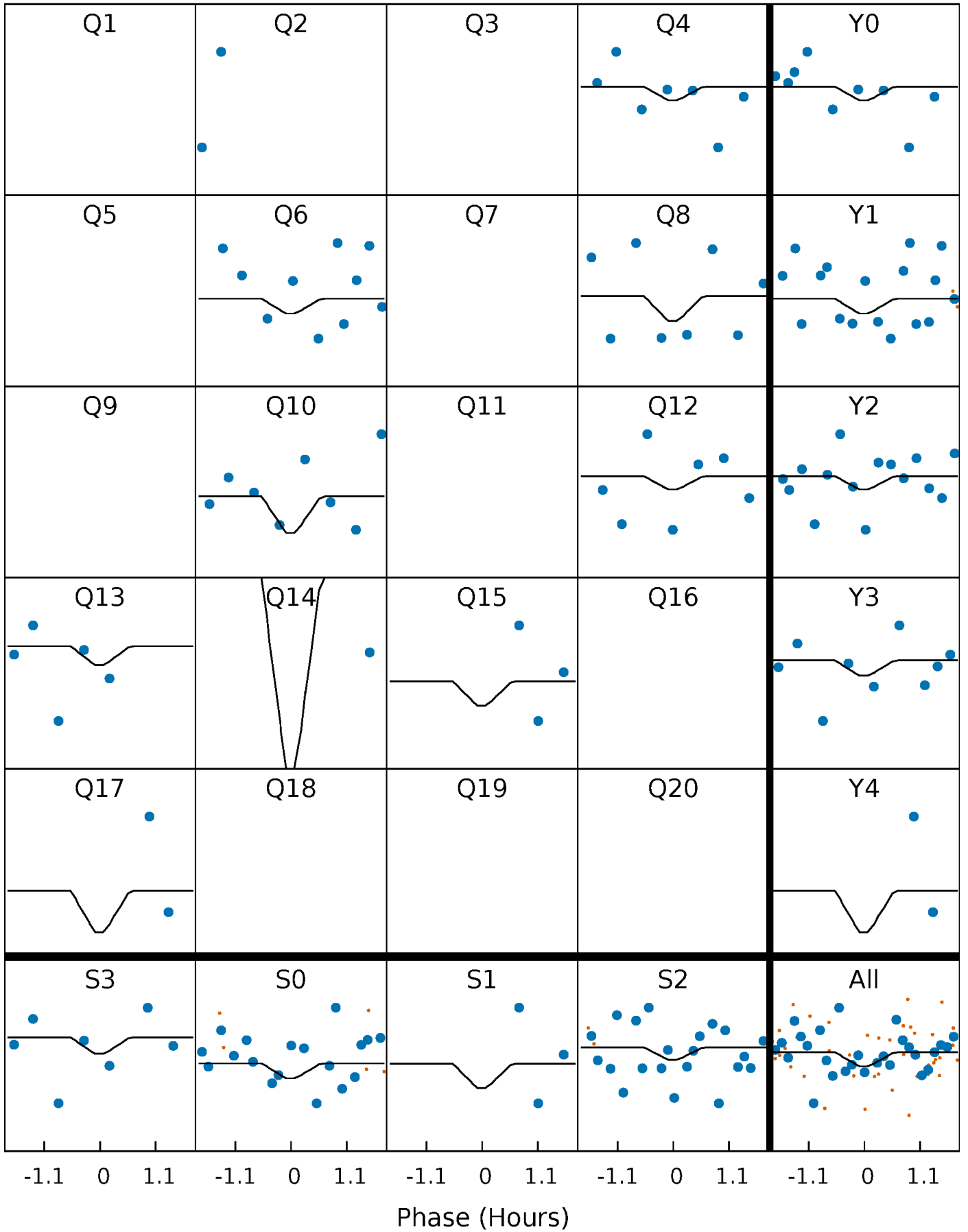
DV Quarter-Phased Transit Curves

TCE 005724440-03 P= 37.488006 Days $T_0=136.363379$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

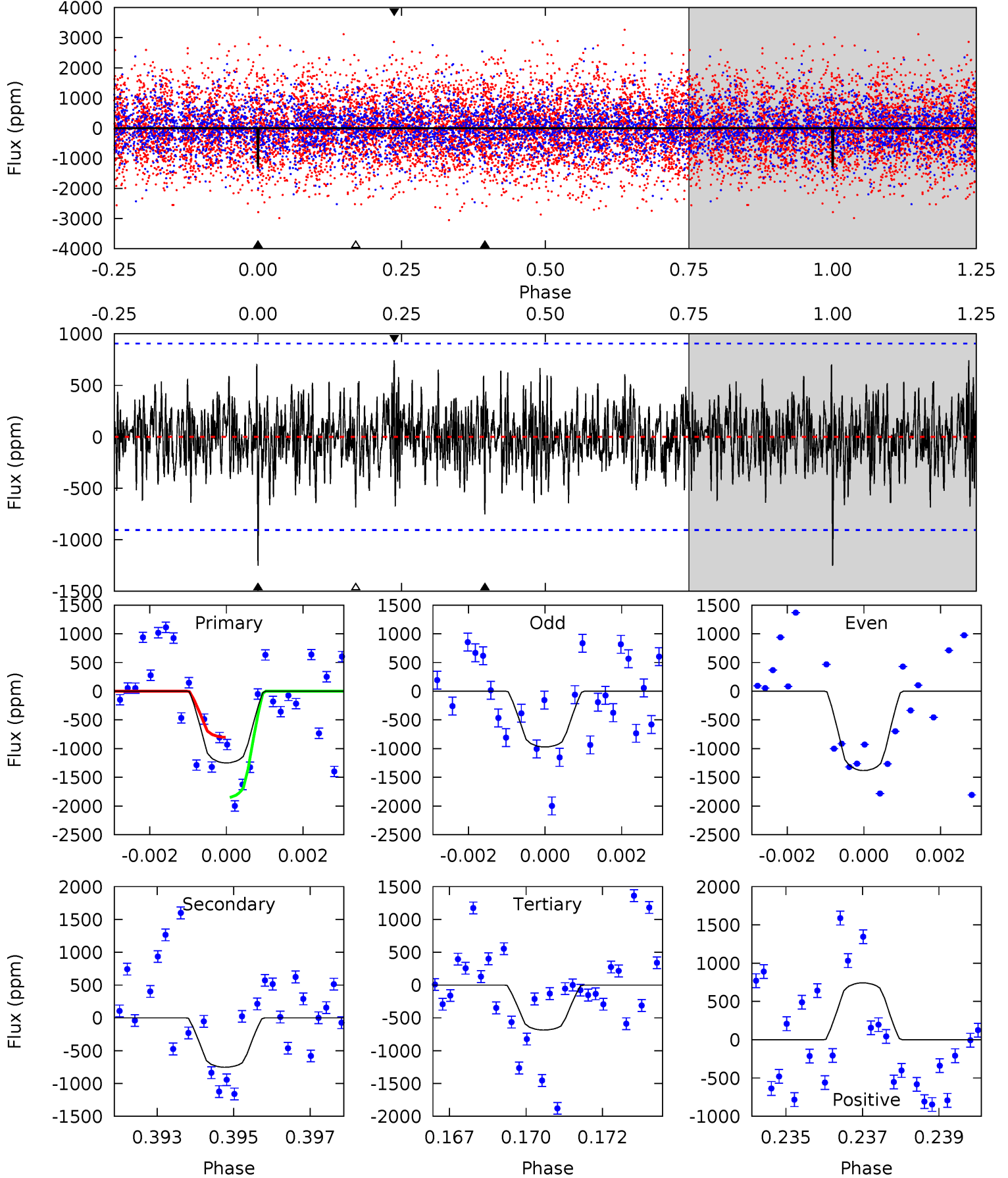
TCE 005724440-03 P= 37.488590 Days $T_0=136.357896$ (BKJD)



DV Model-Shift Uniqueness Test

005724440-03, P = 37.488006 Days, E = 98.875373 Days

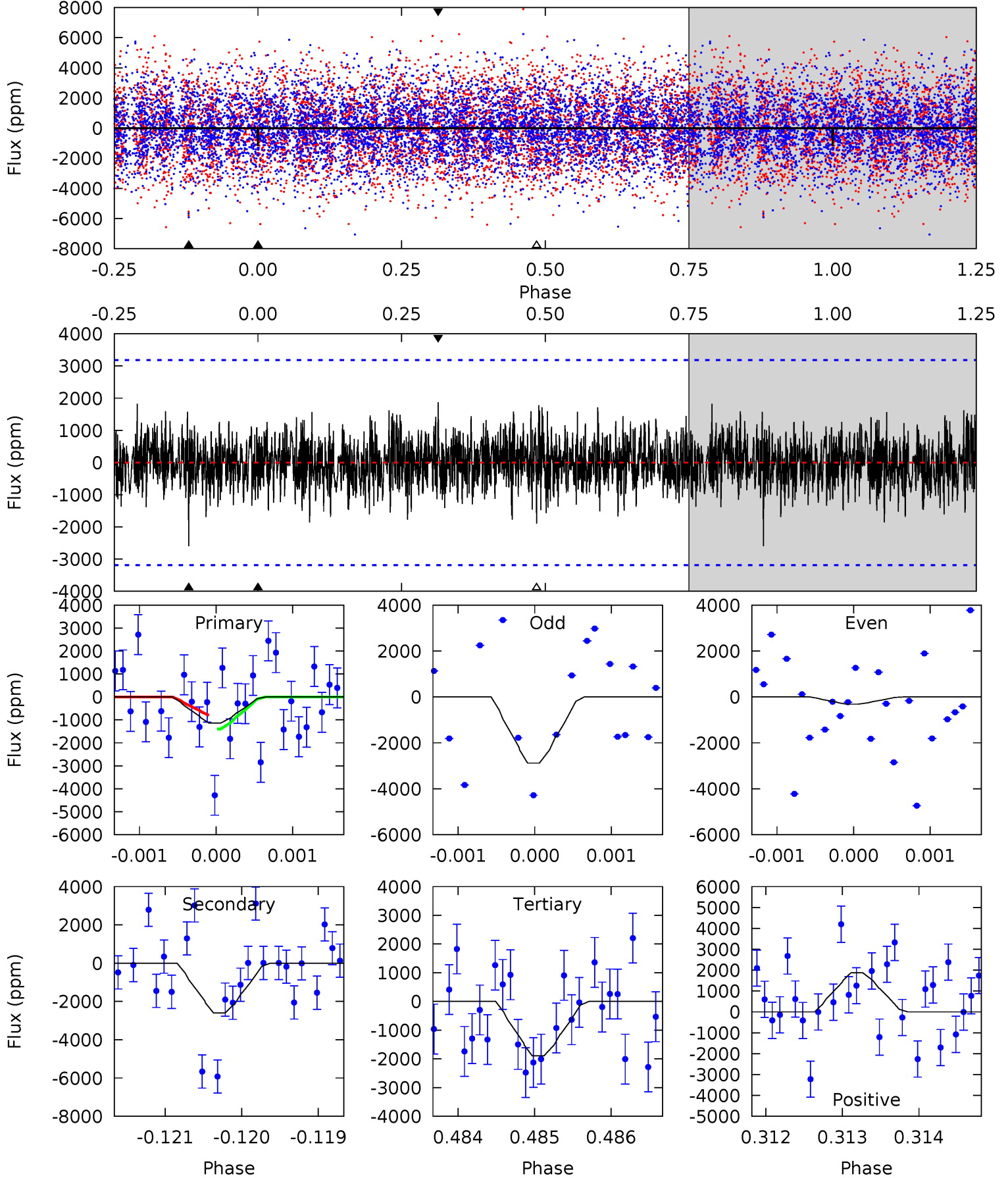
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.32	4.41	4.01	4.35	5.30	3.05	1.30	3.30	2.97	0.39	0.06	1.17	0.96	0.37	3.07



Alt Model-Shift Uniqueness Test

005724440-03, P = 37.488590 Days, E = 98.869306 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.94	4.43	3.23	3.19	5.43	3.25	0.97	-1.29	-1.26	1.20	1.23	2.07	1.25	0.42	0.50



Stellar Parameters For KIC 005724440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7348^{+132}_{-161}	$3.633^{+0.187}_{-0.033}$	$-0.140^{+0.150}_{-0.150}$	$3.593^{+0.146}_{-0.873}$	$2.023^{+0.028}_{-0.239}$	$0.061^{+0.063}_{-0.007}$
	+2%/-2%	+5%/-1%	+107%/-107%	+4%/-24%	+1%/-12%	+102%/-12%
Source	SPE4	SPE4	SPE4	DSEP		

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

Secondary Eclipse Parameters for KIC 005724440-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-753 ± 171	$26.55^{+26.13}_{-18.48}$	1605^{+54}_{-92}	4587^{+3963}_{-977}	43^{+428}_{-32}
Alt.	-2598 ± 587	$26.05^{+24.08}_{-17.74}$	1611^{+51}_{-93}	6179^{+7188}_{-1560}	160^{+1414}_{-117}

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

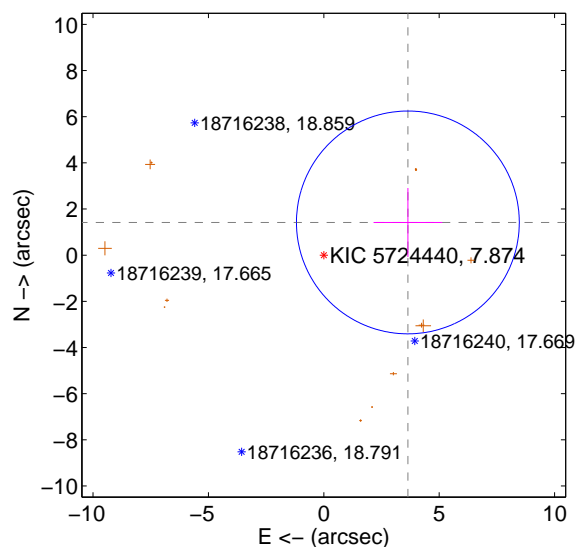
Supplemental centroid analysis for 005724440-03. **Kepler magnitude: 7.87.** Transit SNR 7.37

There are 0 quarters with good PRF difference image offsets

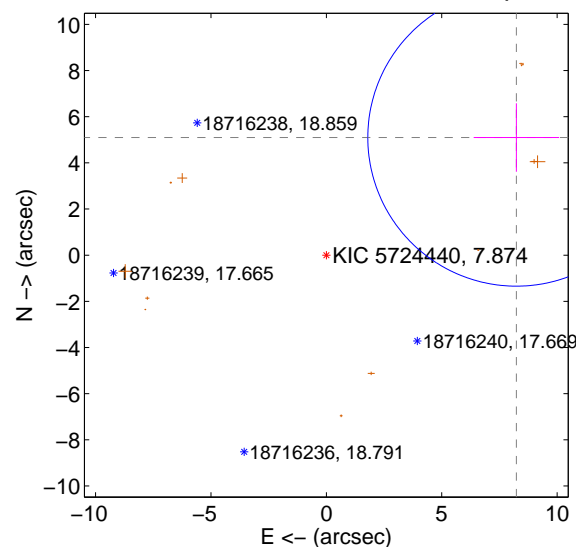
The direct PRF centroid is offset from the target star catalog position by about 1.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.909 ± 1.609	2.43	-3.643 ± 1.488	1.419 ± 1.494
PRF-fit source offset from KIC position	9.685 ± 2.147	4.51	-8.236 ± 1.853	5.097 ± 1.483
photometric centroid source offset	2.44 ± 0.82	2.96	-1.04 ± 0.48	2.20 ± 0.88

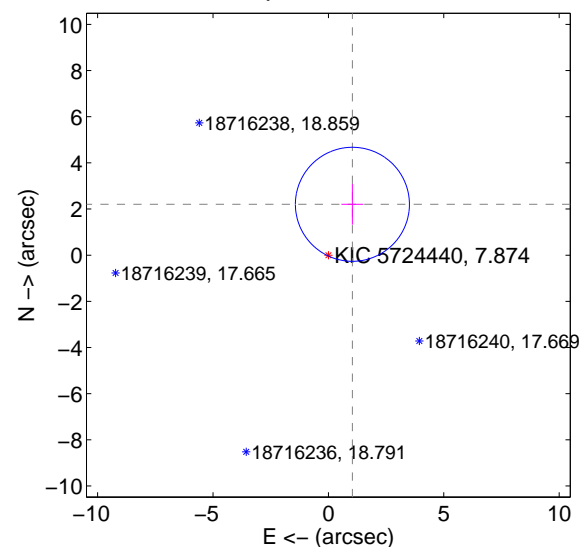
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

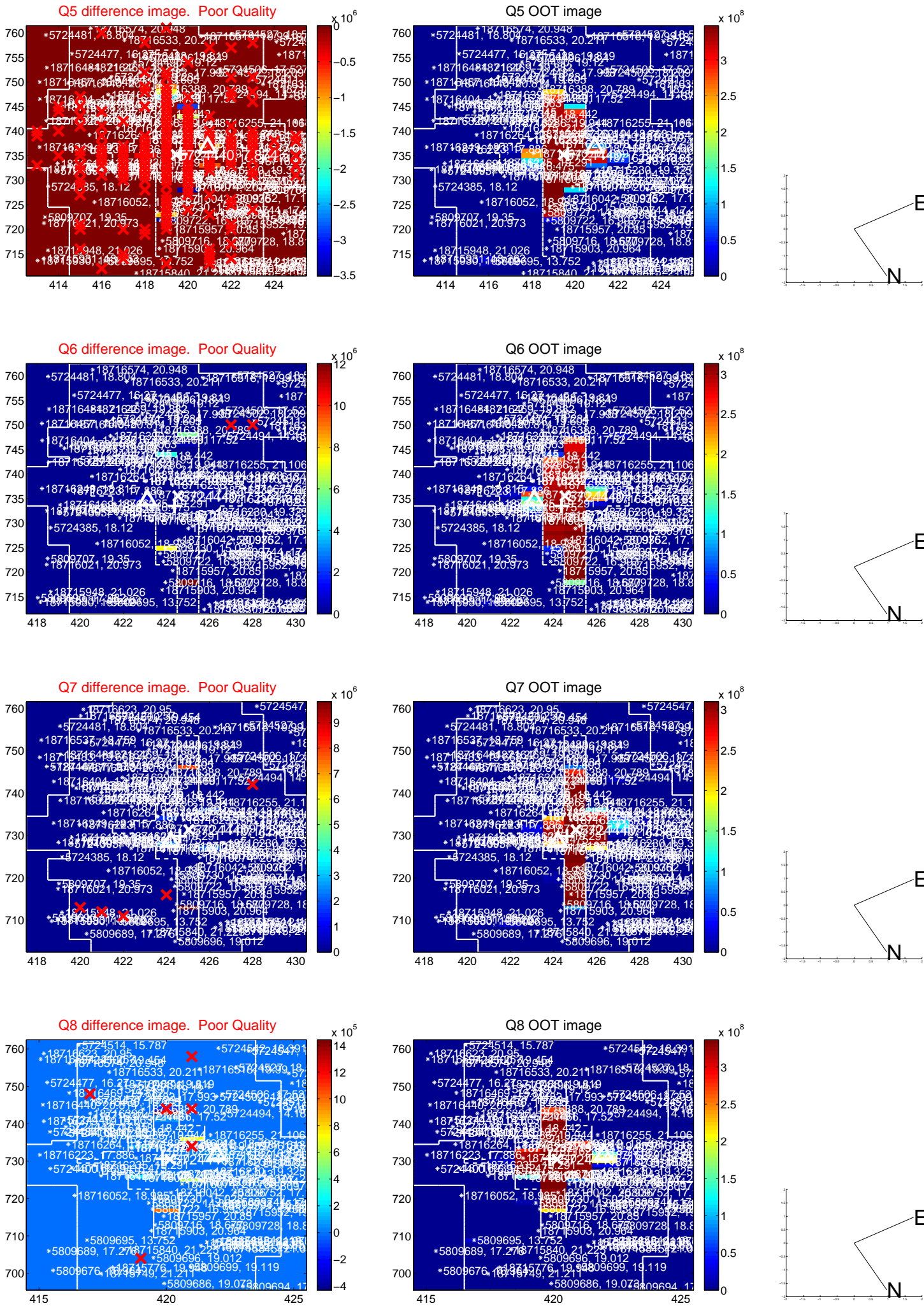


offset from photometric centroids

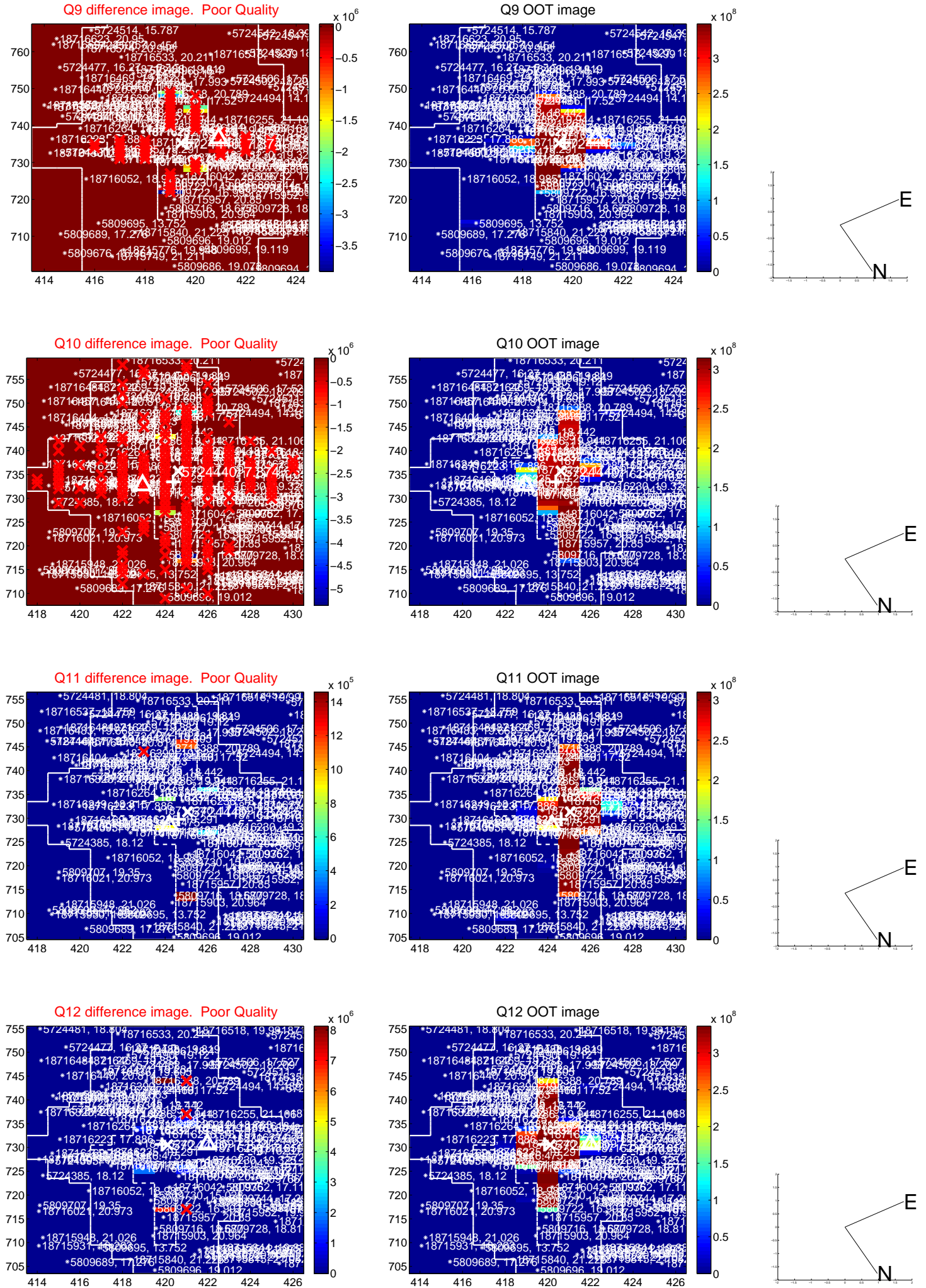


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

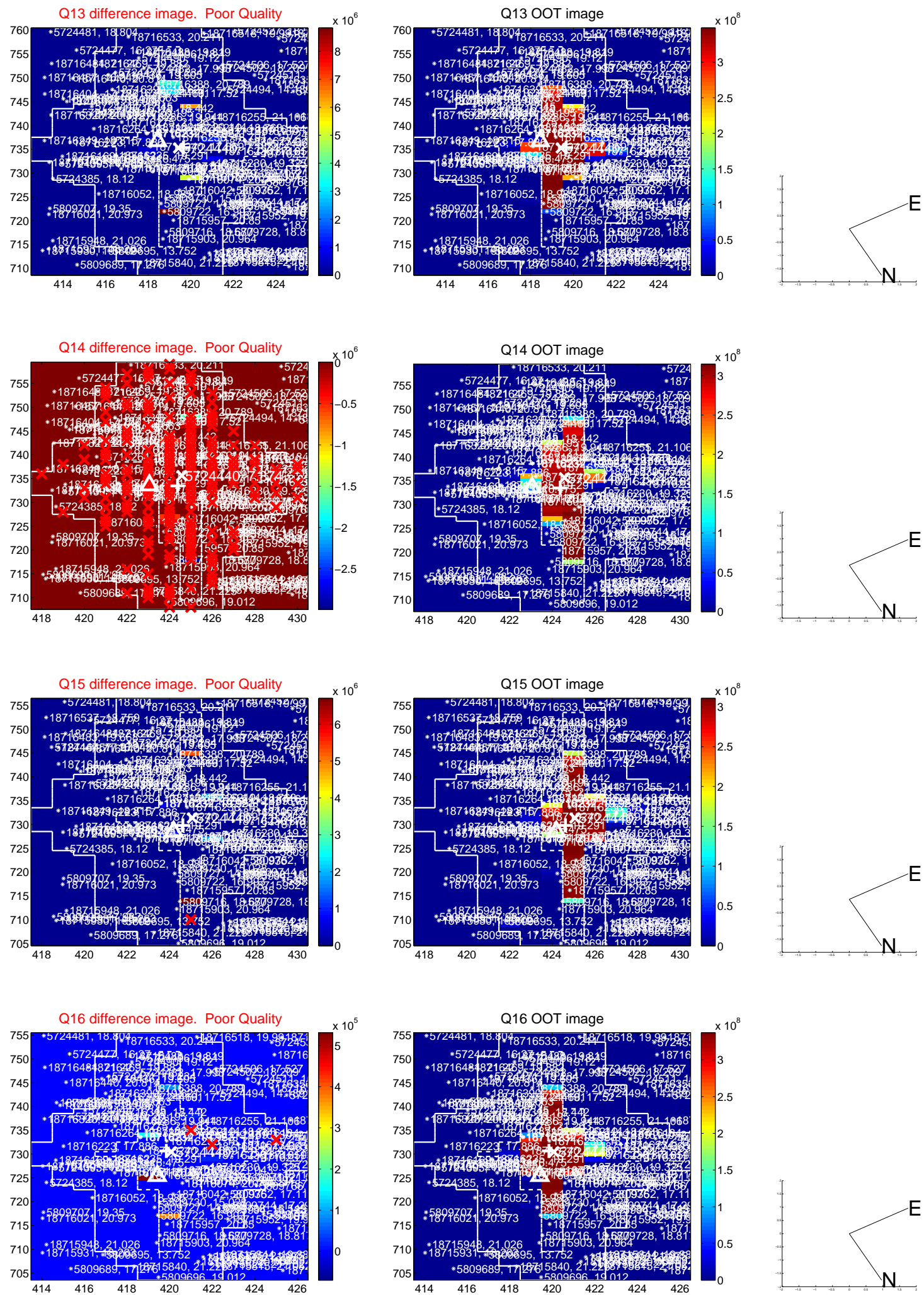
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



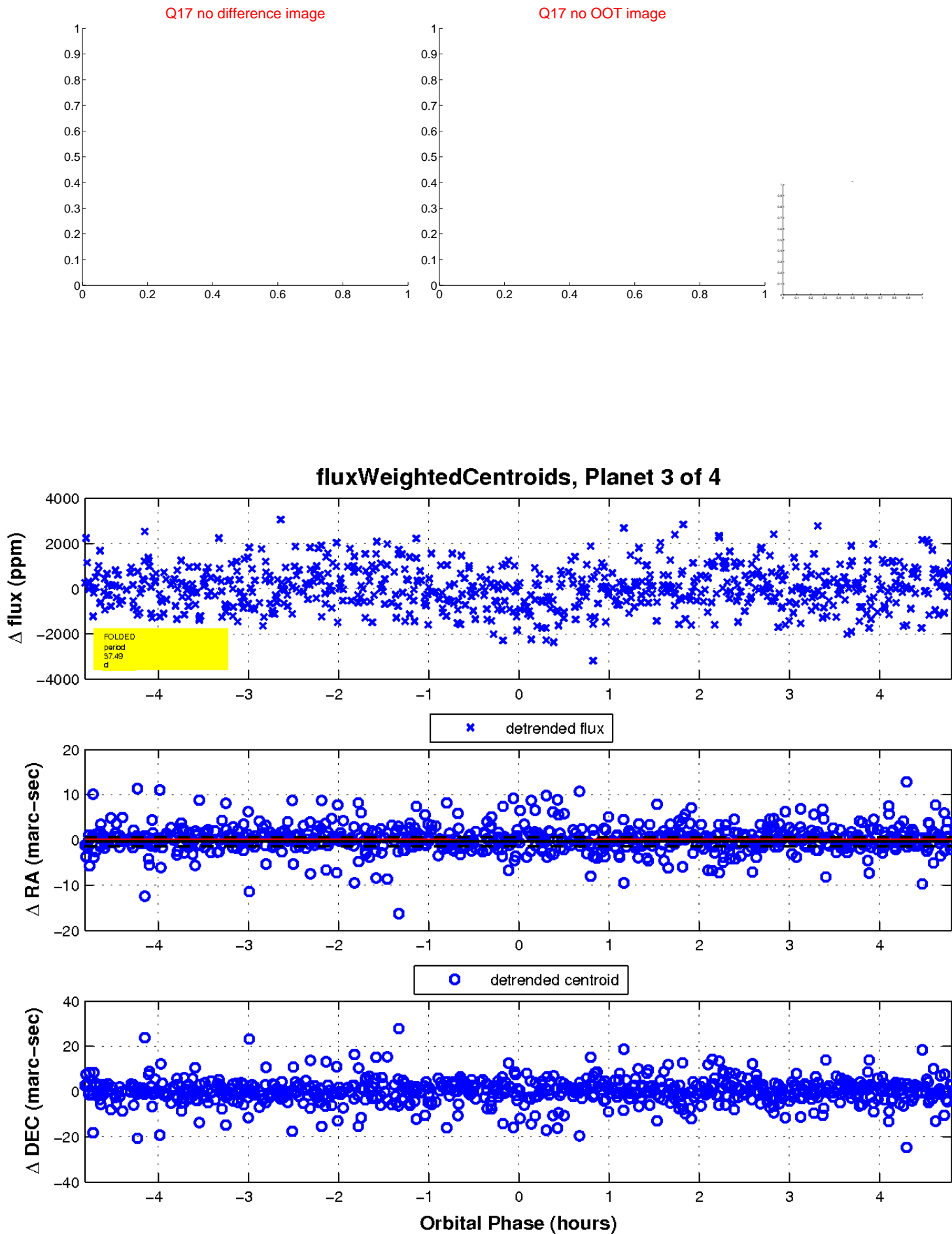
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



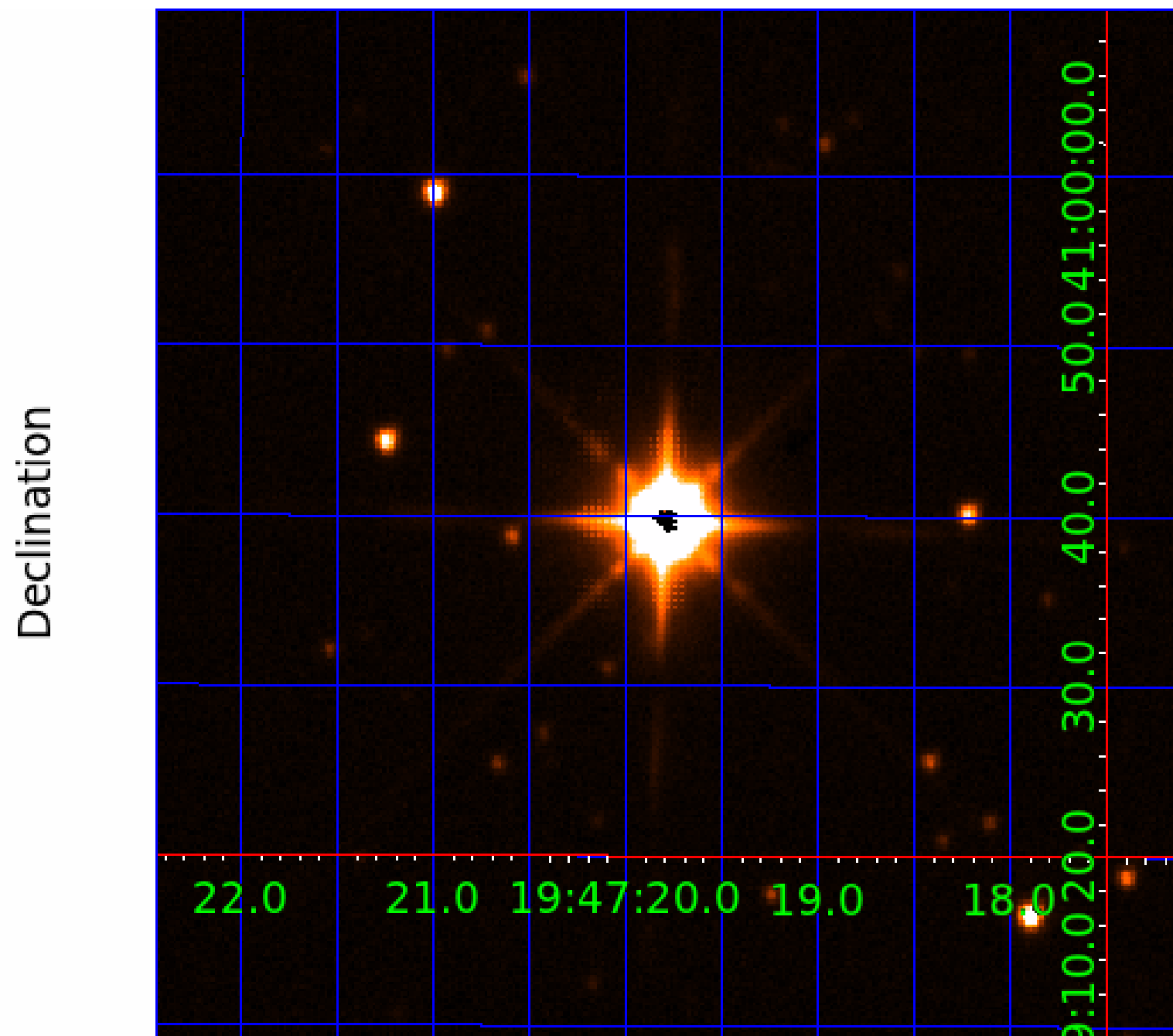
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 005724440

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})
005724440-01	OBS	No	3.075059	132.461637	83.1	18.389	10.6	9.7	3.59	7348	3.30	12304.70
005724440-02	OBS	No	1.008533	131.648958	240.5	3.209	11.9	13.5	3.59	7348	6.54	54402.91
005724440-03	OBS	No	37.488006	136.363379	1233.6	1.611	8.2	7.4	3.59	7348	13.24	438.55
005724440-04	OBS	No	44.941198	134.485362	1035.2	3.436	8.0	8.1	3.59	7348	12.72	344.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005724440-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
005724440-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005724440-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
005724440-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

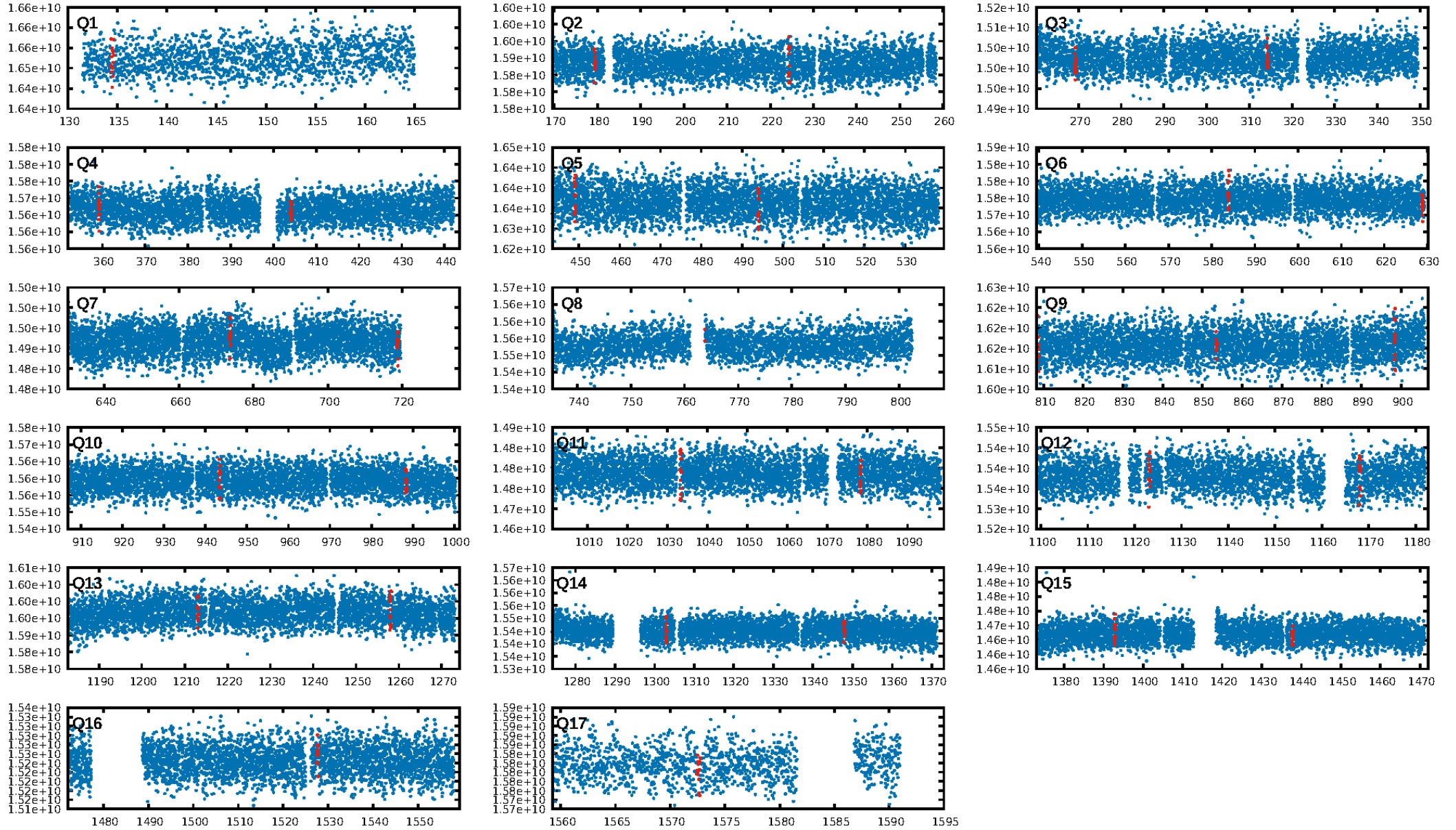
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005724440-04

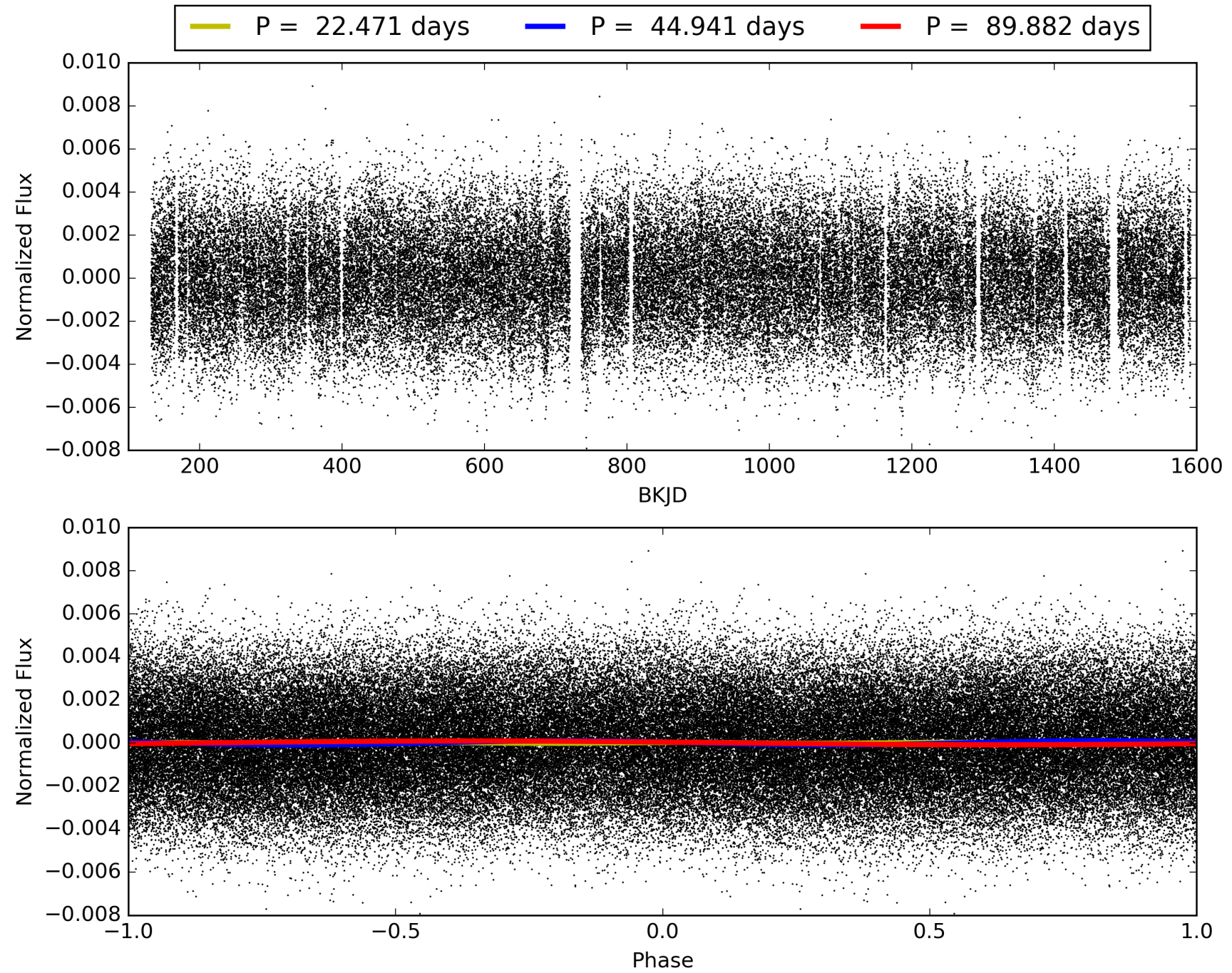
No Significant Match Found

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

TCE 005724440-04, PDC Light Curves

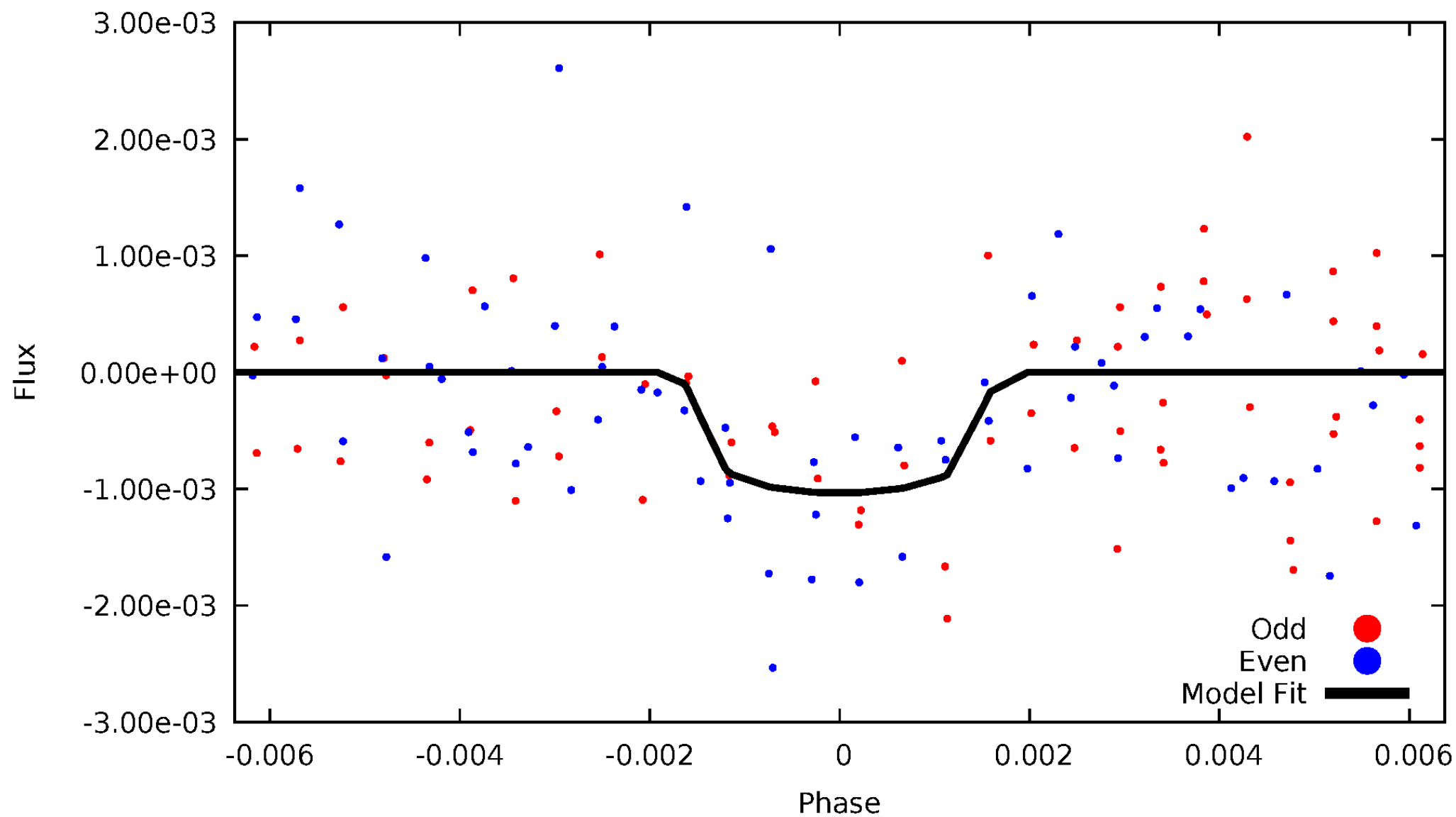


TCE 005724440-04



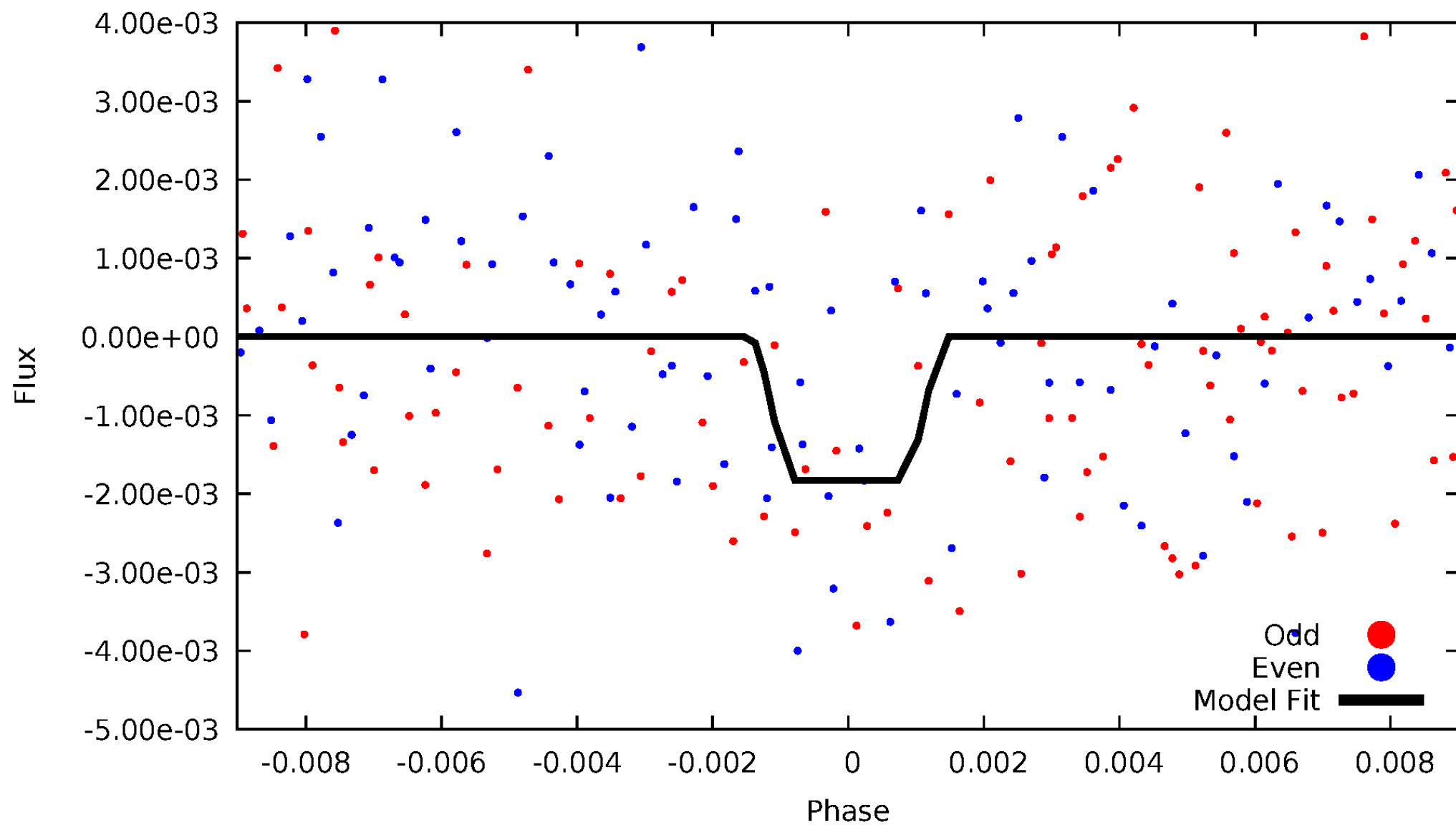
DV Odd/Even

TCE 005724440-04



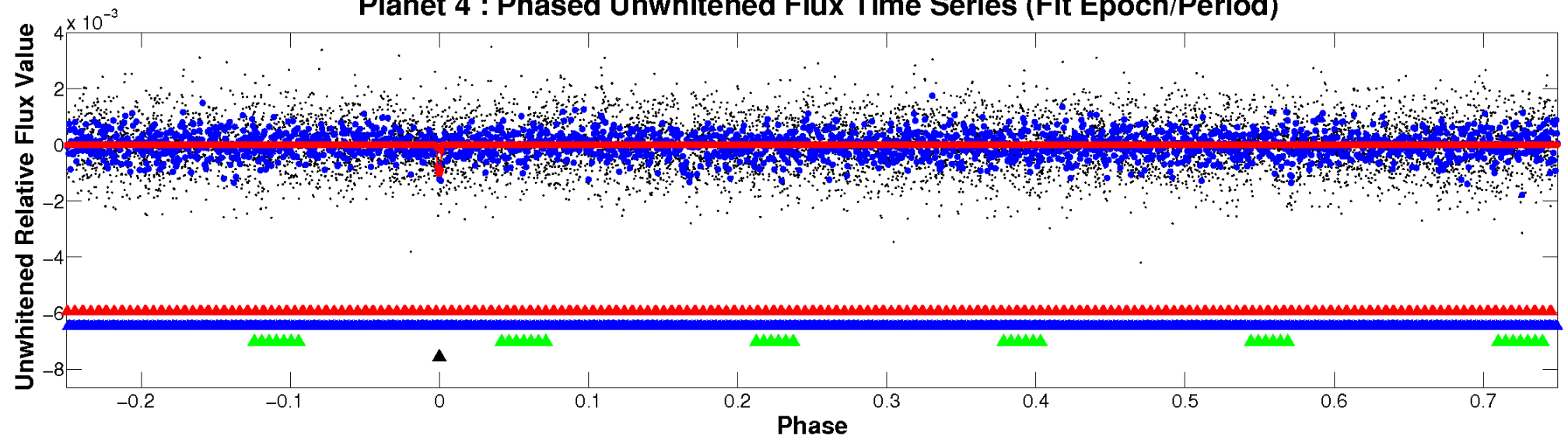
ALT Odd/Even

TCE 005724440-04

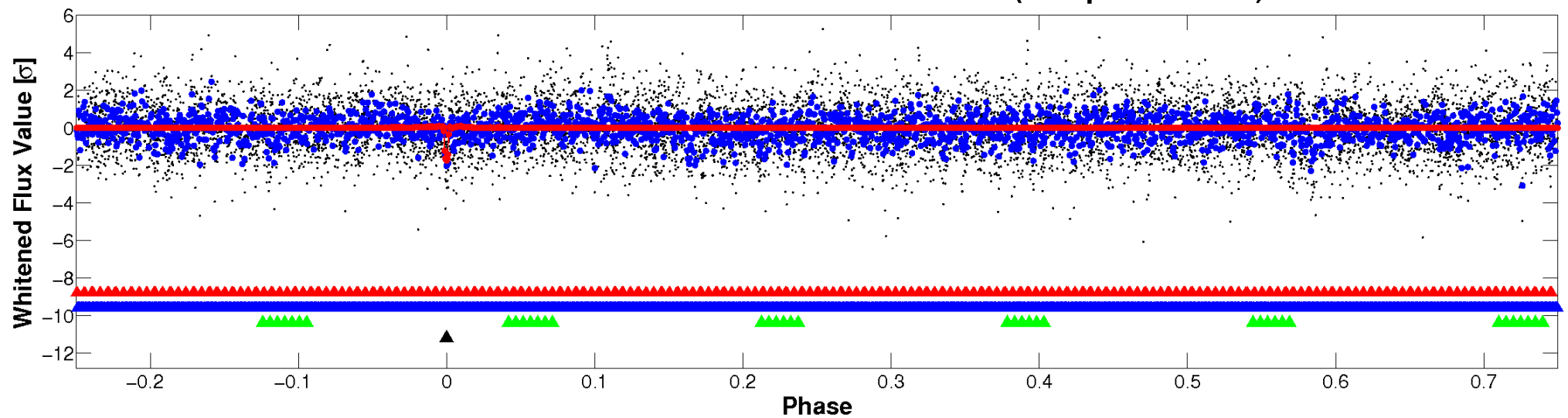


Non-Whitened Vs. Whitened Light Curve

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

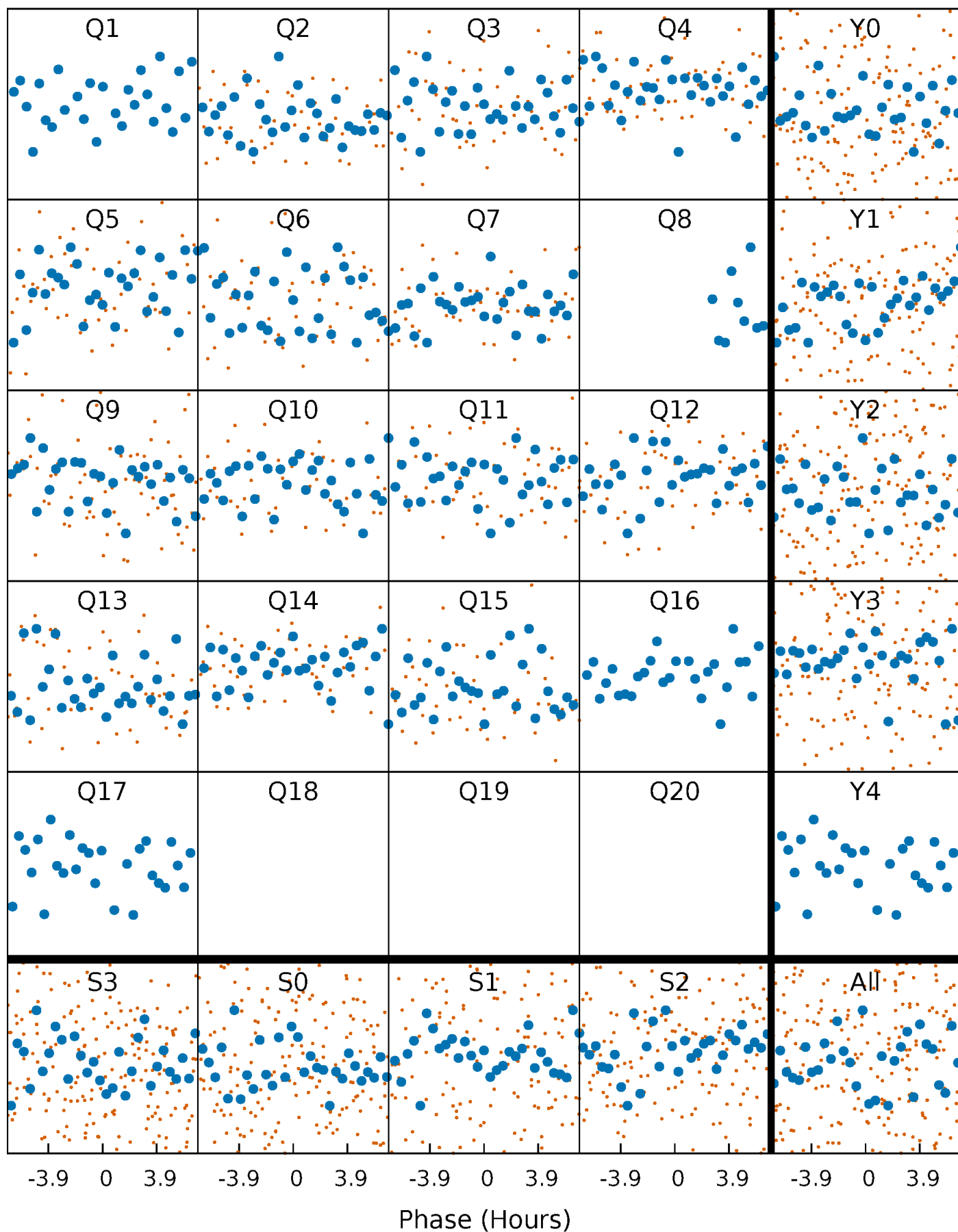


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



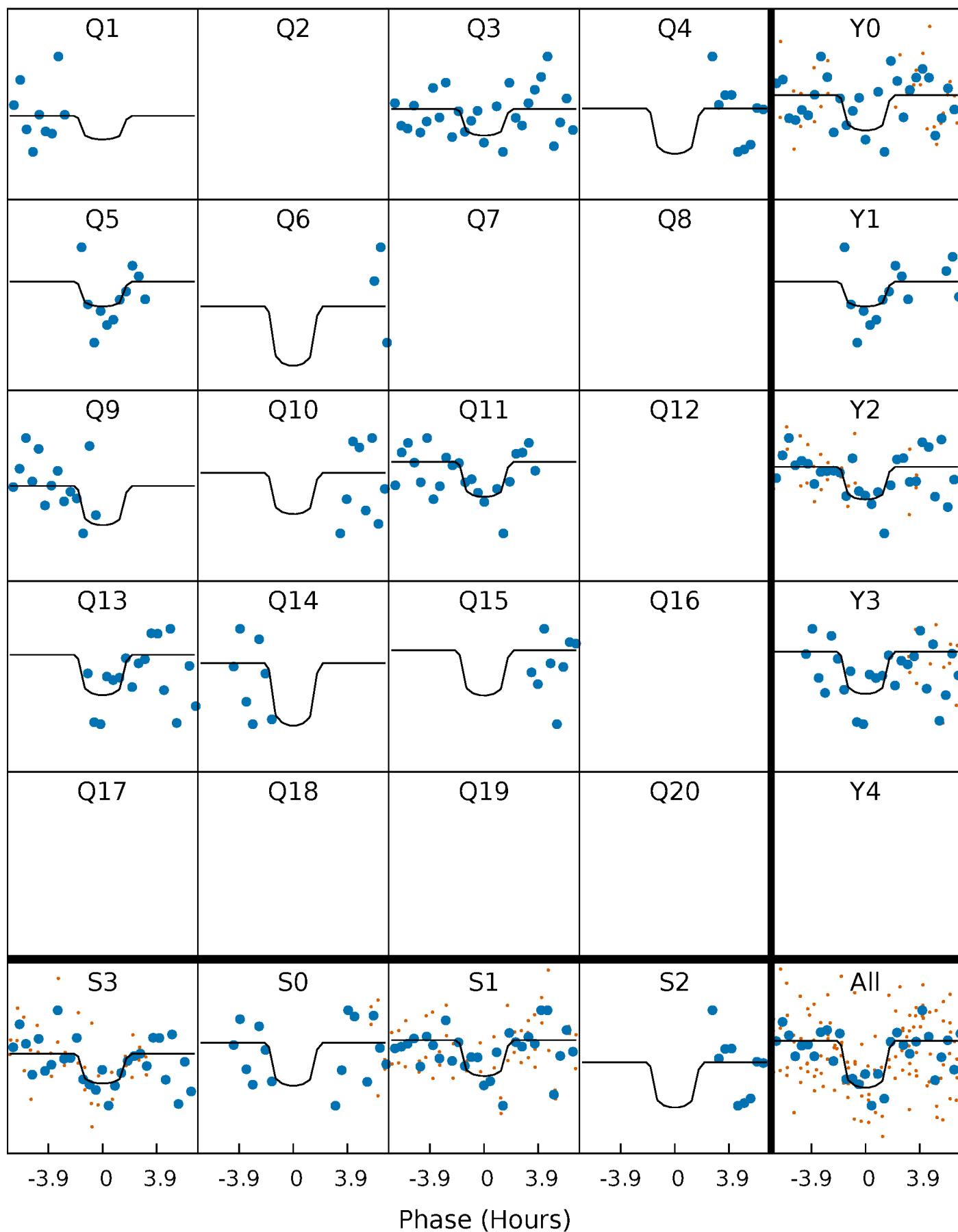
PDC Quarter-Phased Transit Curves

TCE 005724440-04 P= 44.941198 Days $T_0=134.485362$ (BKJD)



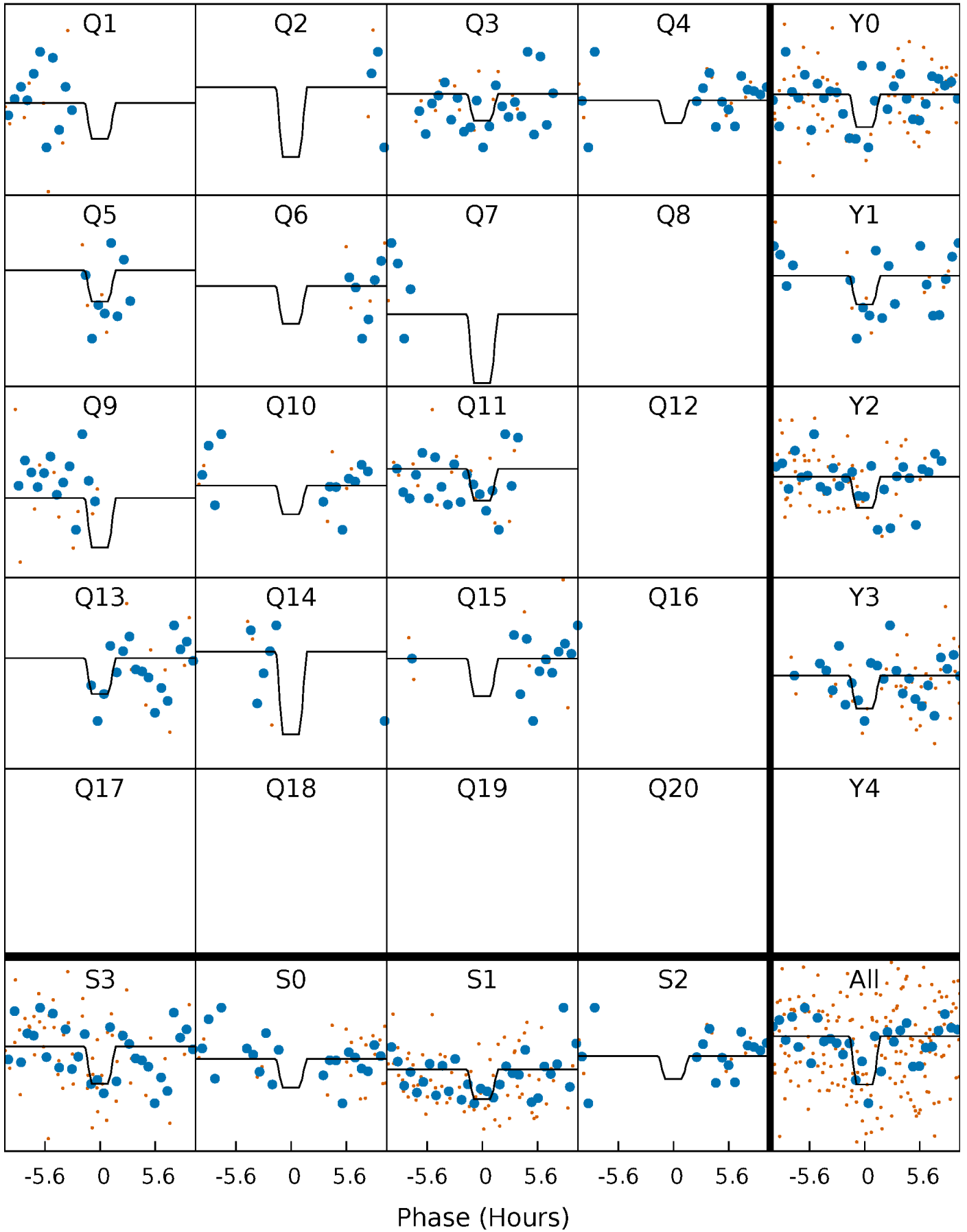
DV Quarter-Phased Transit Curves

TCE 005724440-04 $P = 44.941198$ Days $T_0 = 134.485362$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

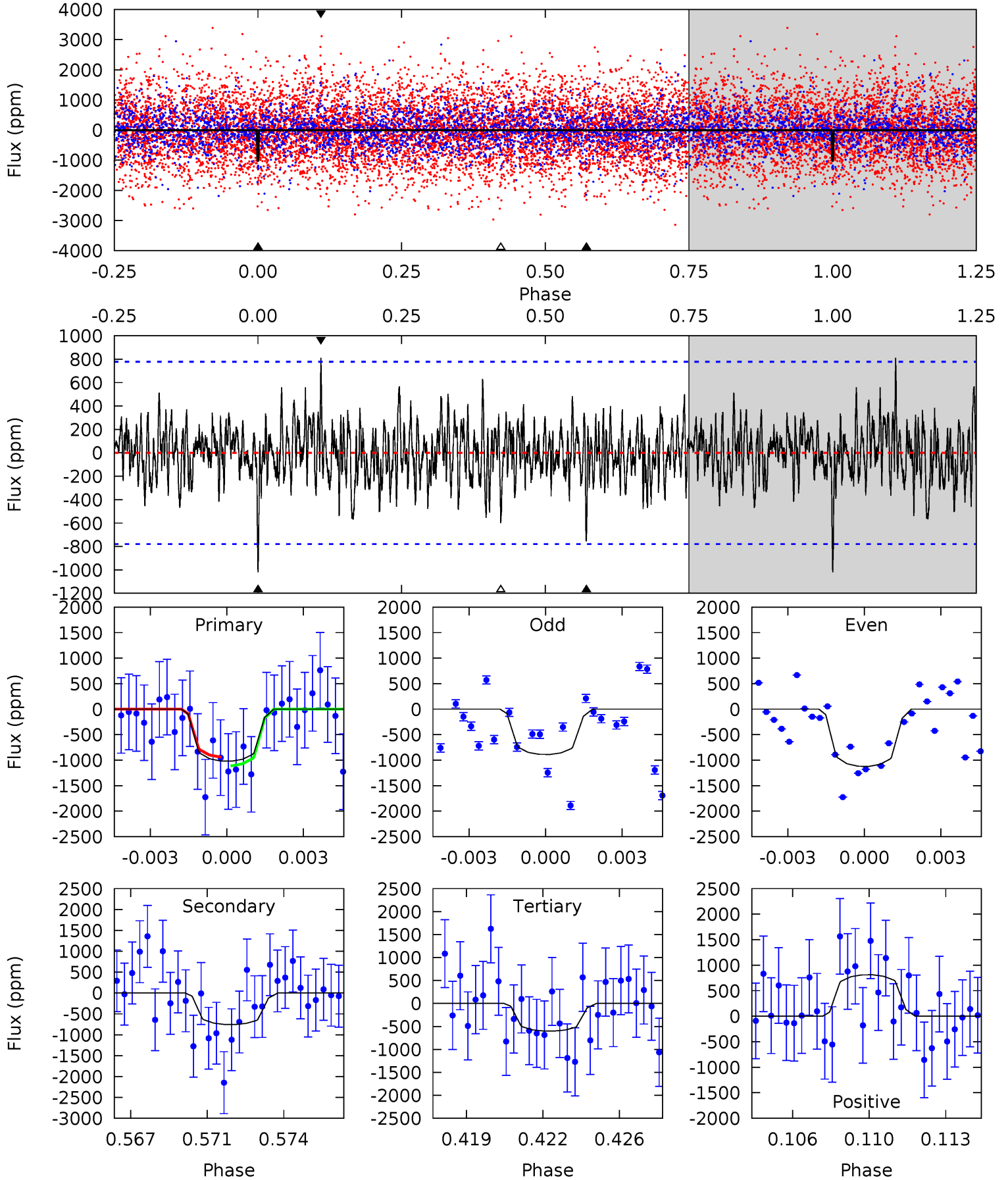
TCE 005724440-04 $P = 44.940872$ Days $T_0 = 134.489902$ (BKJD)



DV Model-Shift Uniqueness Test

005724440-04, P = 44.941198 Days, E = 89.544164 Days

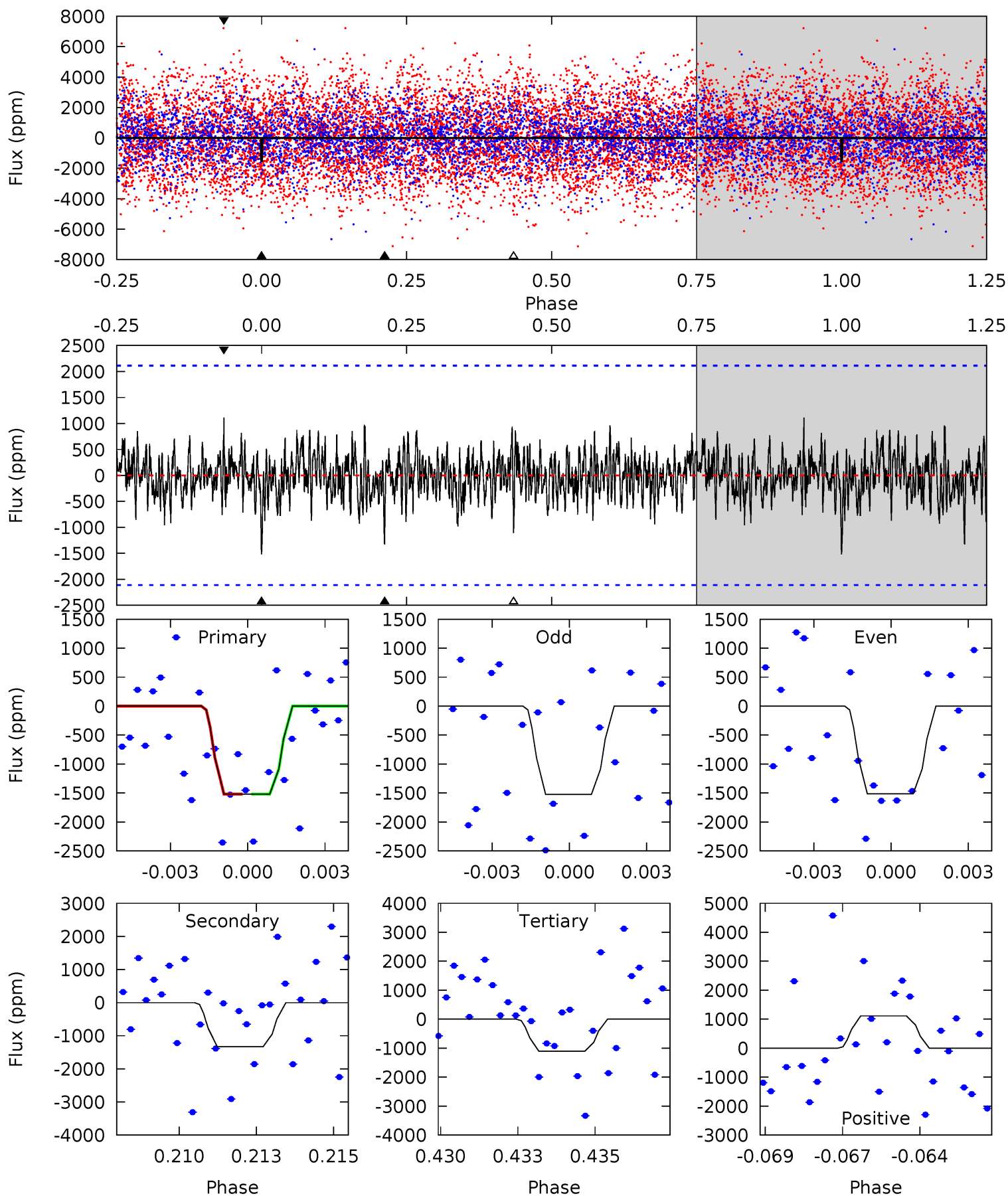
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.85	5.07	4.04	5.45	5.24	2.95	1.32	2.81	1.40	1.03	-0.38	0.78	0.90	0.44	0.57



Alt Model-Shift Uniqueness Test

005724440-04, P = 44.940872 Days, E = 89.549030 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.80	3.32	2.78	2.78	5.28	3.02	0.85	1.02	1.02	0.55	0.54	0.01	0.99	0.42	0.00



Stellar Parameters For KIC 005724440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7348^{+132}_{-161}	$3.633^{+0.187}_{-0.033}$	$-0.140^{+0.150}_{-0.150}$	$3.593^{+0.146}_{-0.873}$	$2.023^{+0.028}_{-0.239}$	$0.061^{+0.063}_{-0.007}$
	+2%/-2%	+5%/-1%	+107%/-107%	+4%/-24%	+1%/-12%	+102%/-12%
Source	SPE4	SPE4	SPE4	DSEP		

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

Secondary Eclipse Parameters for KIC 005724440-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-754 ± 149	$15.00^{+13.05}_{-9.25}$	1515^{+48}_{-90}	5979^{+4828}_{-1452}	178^{+1095}_{-129}
Alt.	-1328 ± 400	$17.27^{+13.62}_{-10.13}$	1511^{+51}_{-77}	6402^{+4831}_{-1600}	236^{+1174}_{-170}

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 $A_{obs} \gg 1.0$

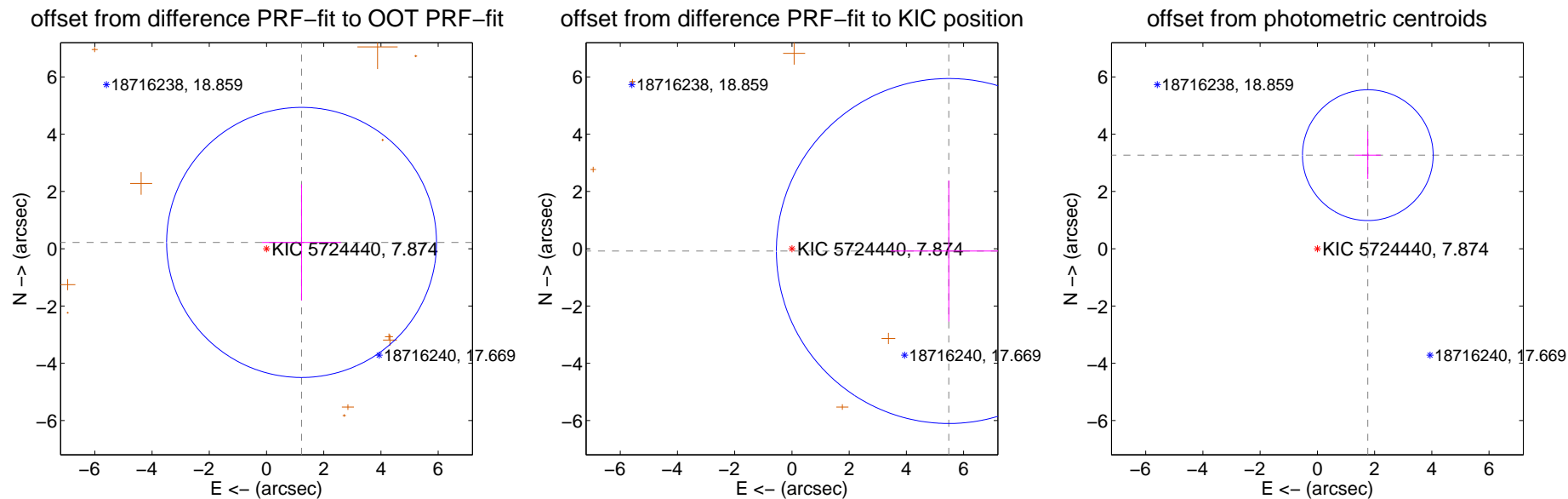
DV Centroid Data

Supplemental centroid analysis for 005724440-04. **Kepler magnitude: 7.87.** Transit SNR 8.05

There are 0 quarters with good PRF difference image offsets

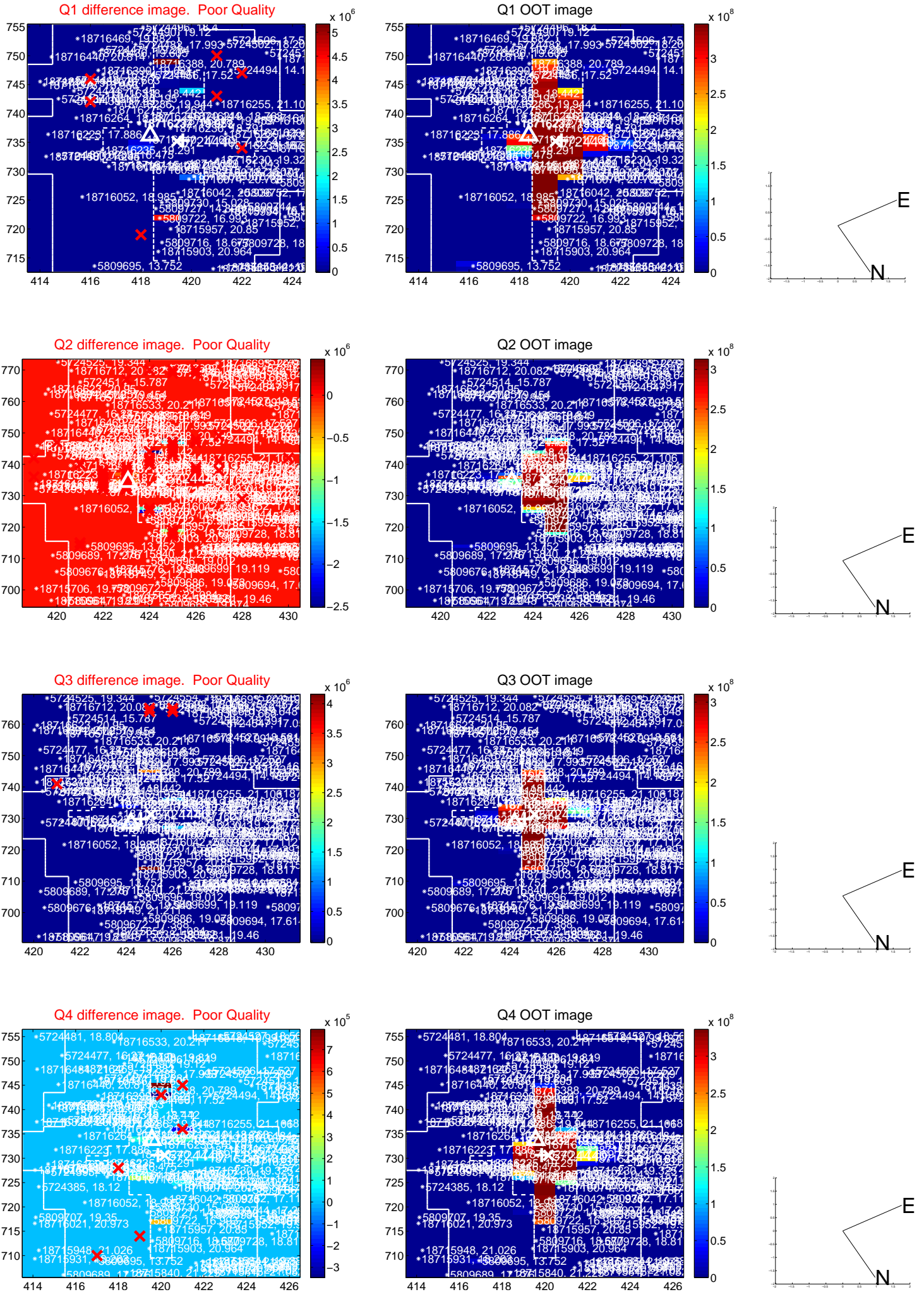
The direct PRF centroid is offset from the target star catalog position by about 1.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.245 ± 1.572	0.79	-1.225 ± 1.382	0.220 ± 2.027
PRF-fit source offset from KIC position	5.482 ± 2.008	2.73	-5.482 ± 2.034	-0.080 ± 2.465
photometric centroid source offset	3.71 ± 0.76	4.88	-1.76 ± 0.45	3.27 ± 0.83

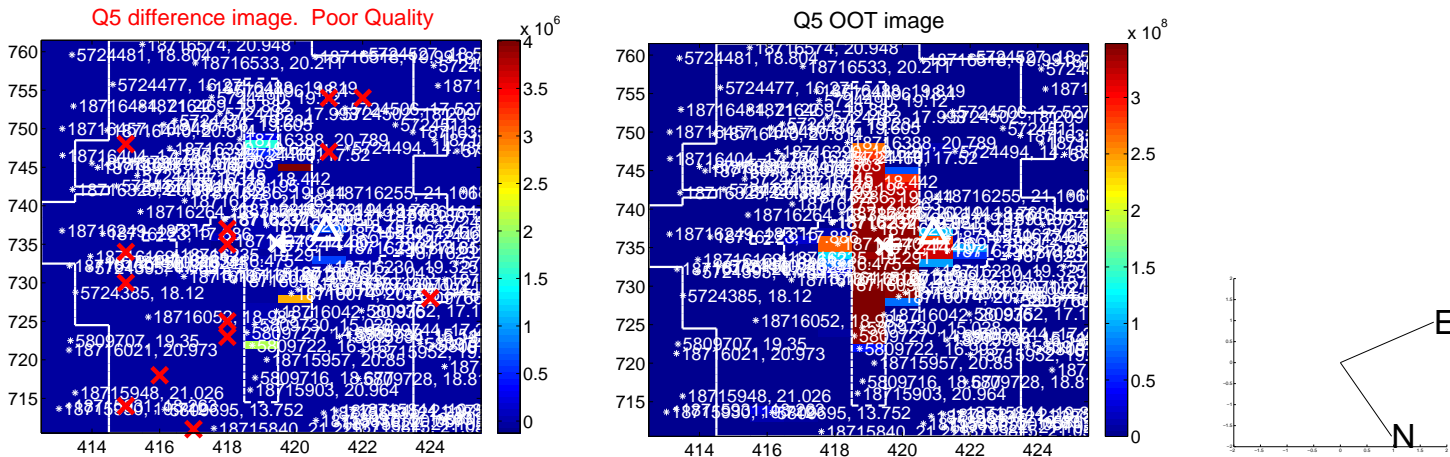


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

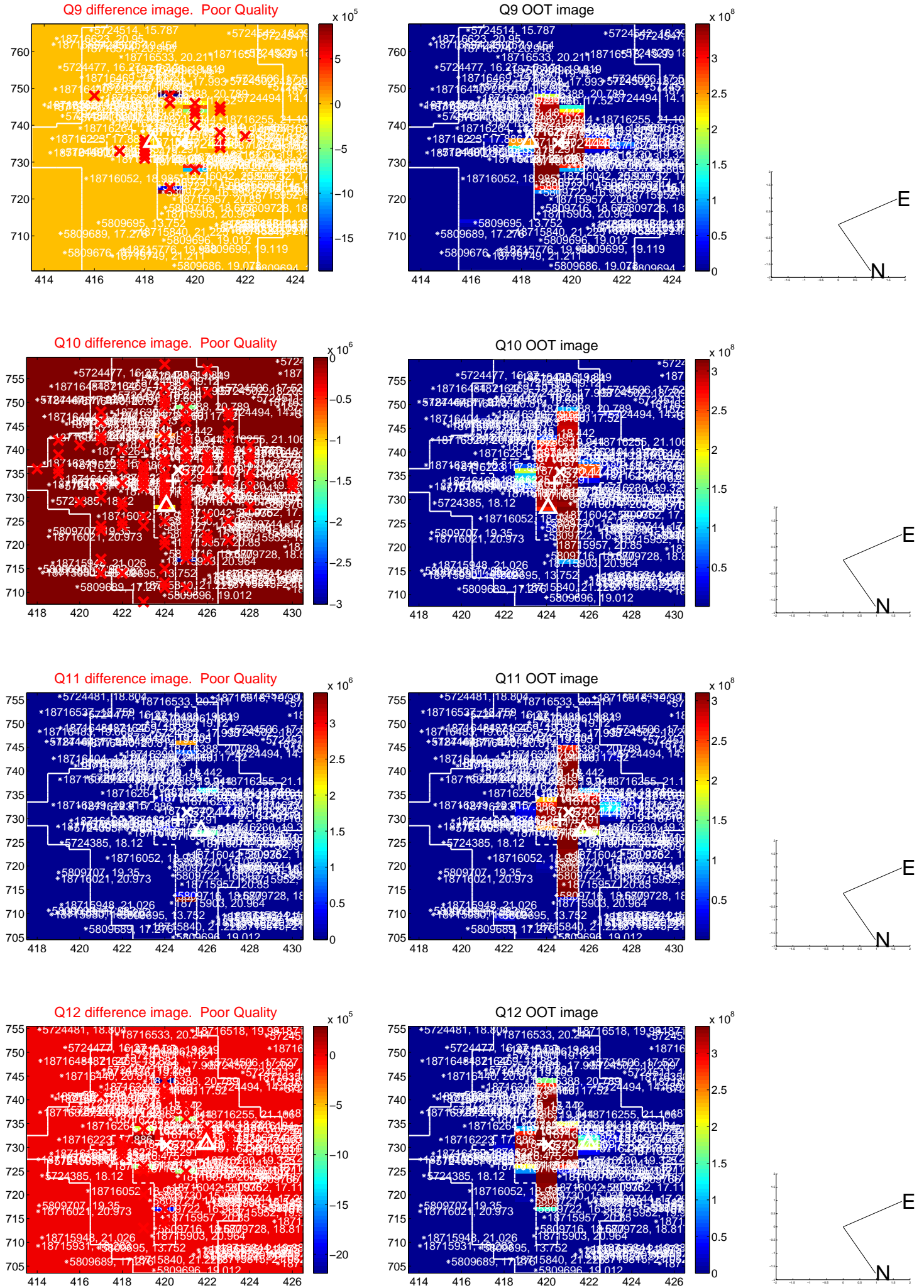
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



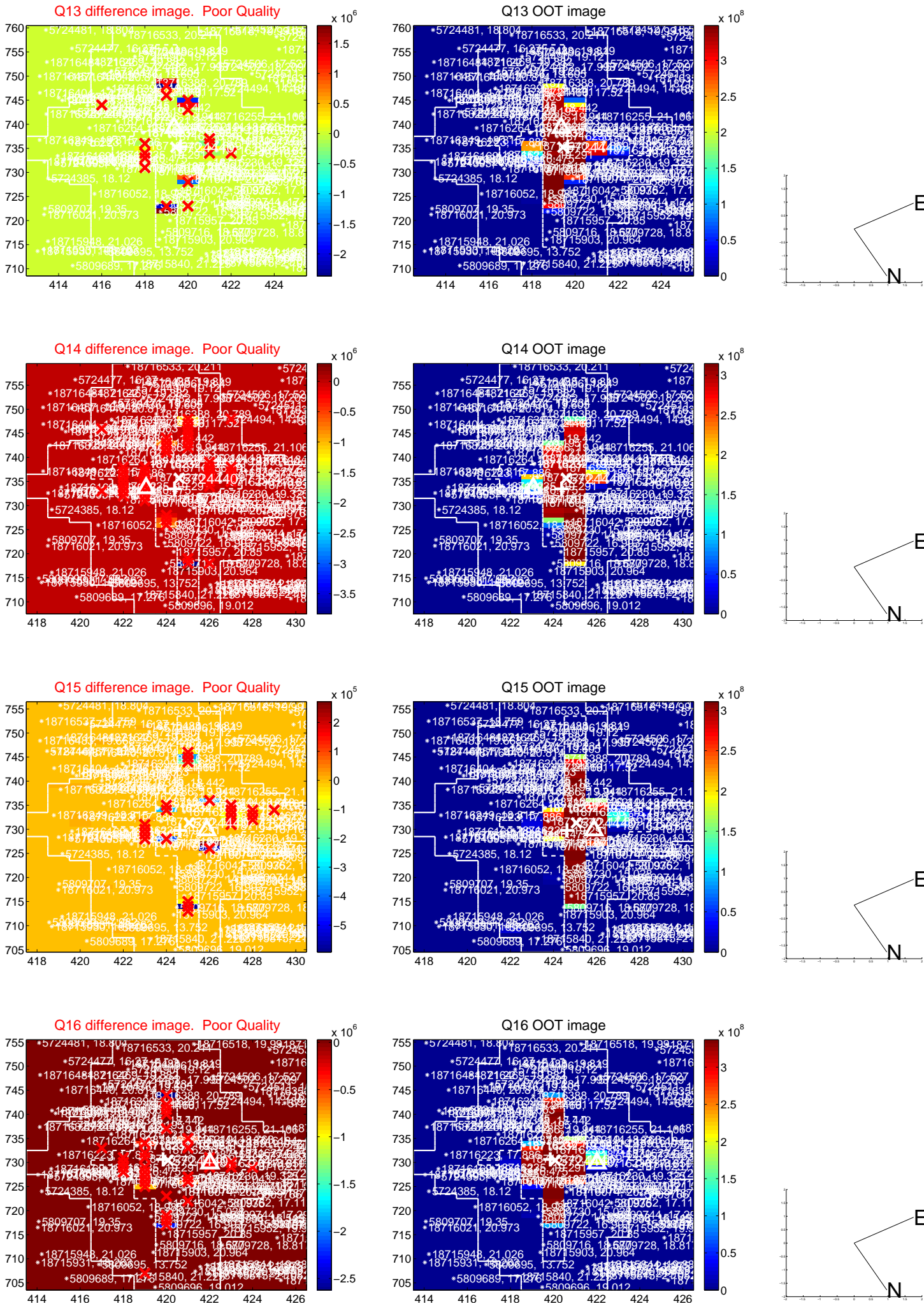
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



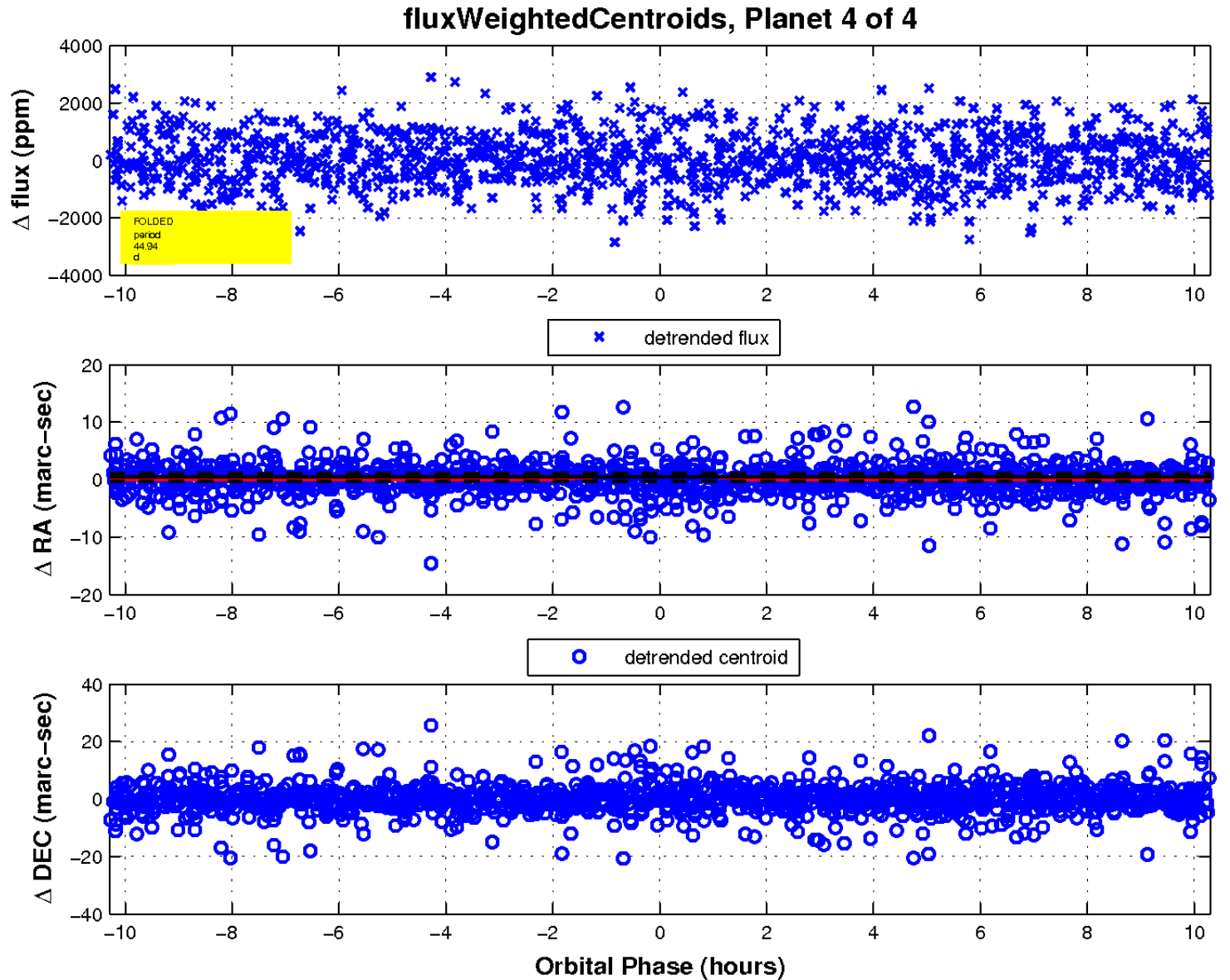
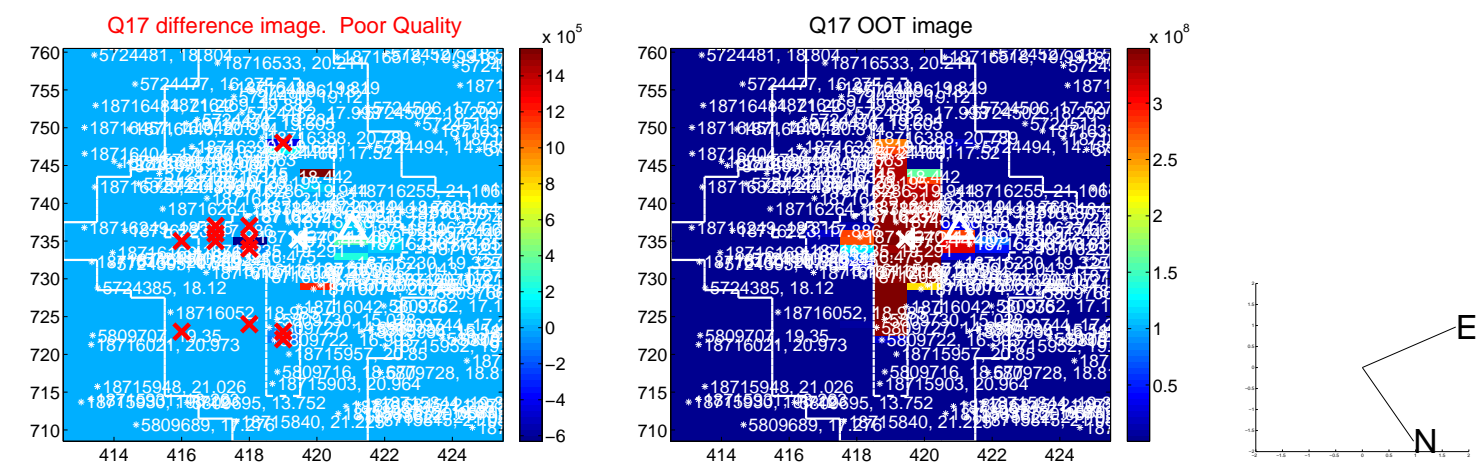
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

