

KIC 003951334

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})
003951334-01	OBS	No	1.448925	133.030861	4.1	10.624	9.2	3.9	2.50	6531	0.59	12471.80
003951334-02	OBS	No	44.165722	161.305411	168.5	1.169	10.5	12.2	2.50	6531	3.68	130.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003951334-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
003951334-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—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.

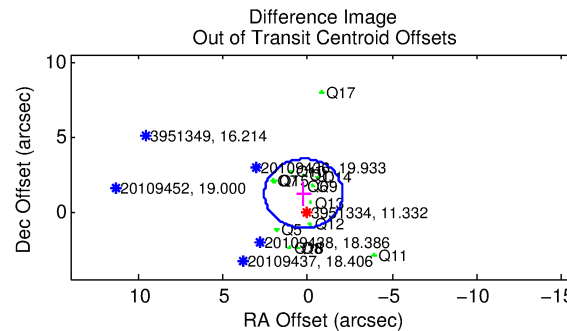
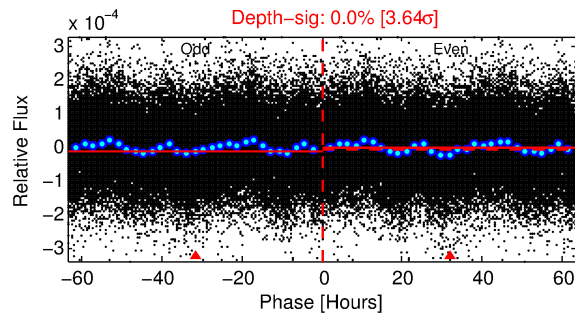
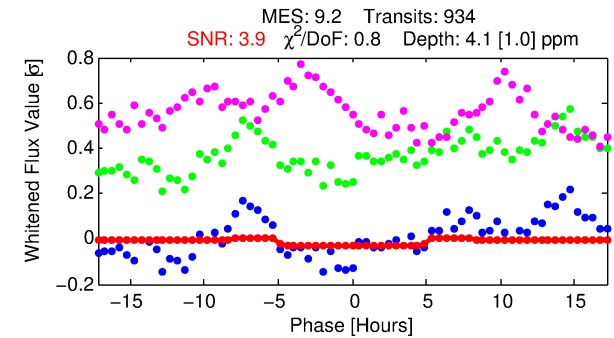
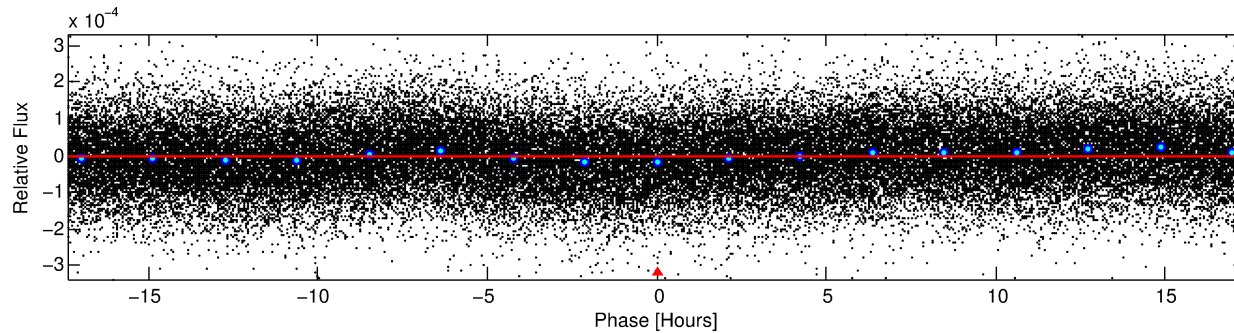
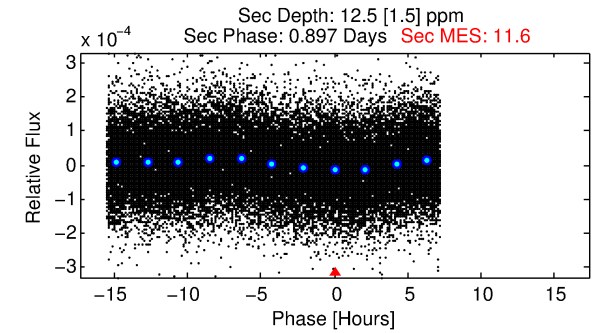
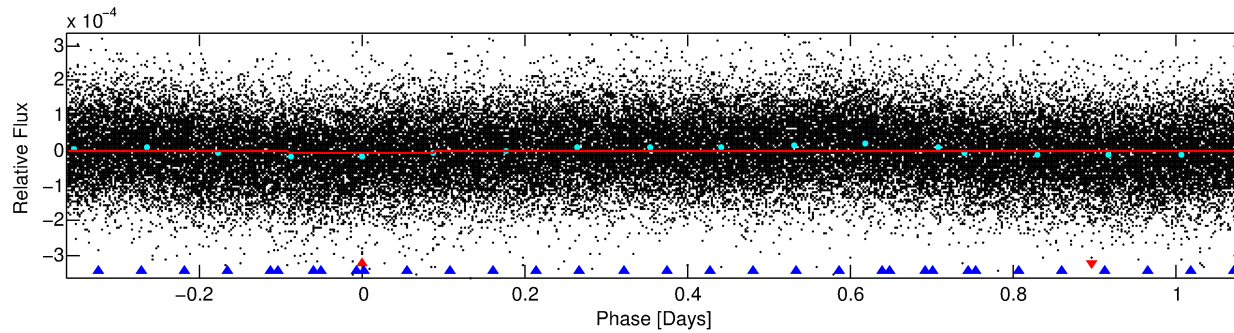
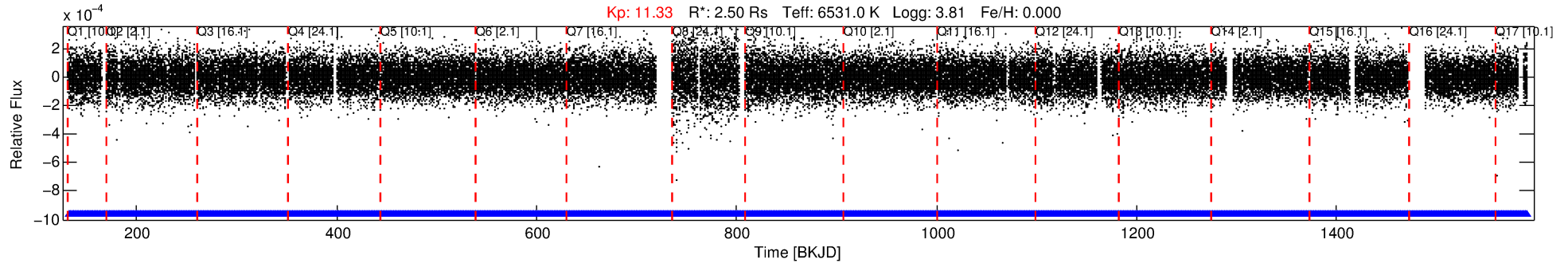
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003951334-01

No Significant Match Found

DV One-Page Summary

KIC: 3951334 Candidate: 1 of 2 Period: 1.449 d



DV Fit Results:

Period = 1.44893 [0.00006] d
Epoch = 133.0309 [0.0155] BKJD
Rp/R* = 0.0022 [0.0016]
a/R* = 1.05 [0.43]
b = 0.90 [0.97]
Seff = 12471.80 [6331.72]
Teq = 2695 [342] K
Rp = 0.59 [0.49] Re
a = 0.0286 [0.0088] AU
Ag = 16.26 [26.19] [0.58σ]
Teffp = 8367 [3212] K [1.76σ]

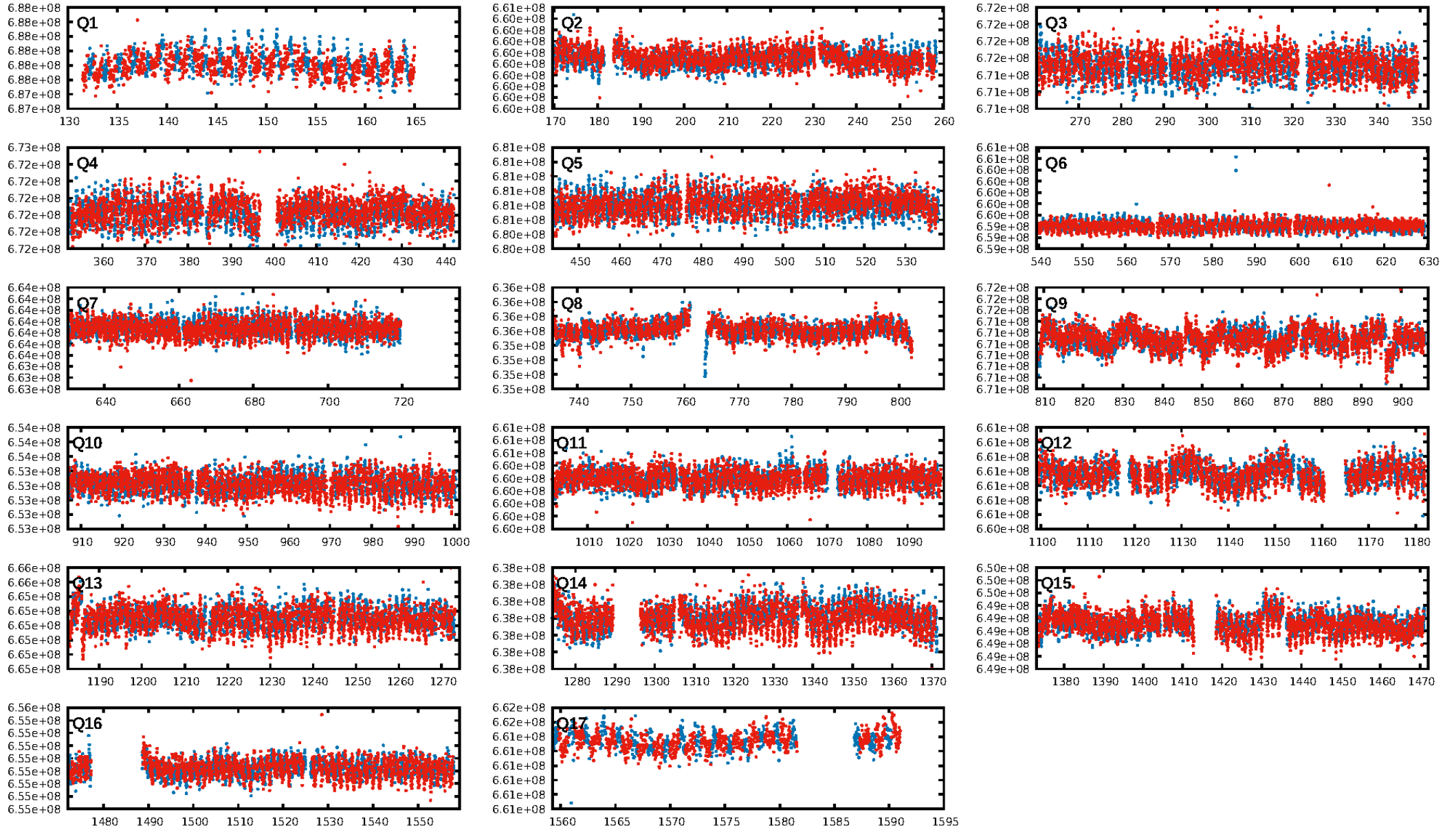
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [95.92σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.49e-48
RollingBand-fgt: 1.00 [892/892]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 1.229 arcsec [1.59σ]
KicOffset-rm: 1.154 arcsec [1.59σ]
OotOffset-st: 3/3/3/5 [14]
KicOffset-st: 3/3/3/5 [14]
DiffImageQuality-fgm: 0.71 [10/14]
DiffImageOverlap-fno: 1.00 [17/17]

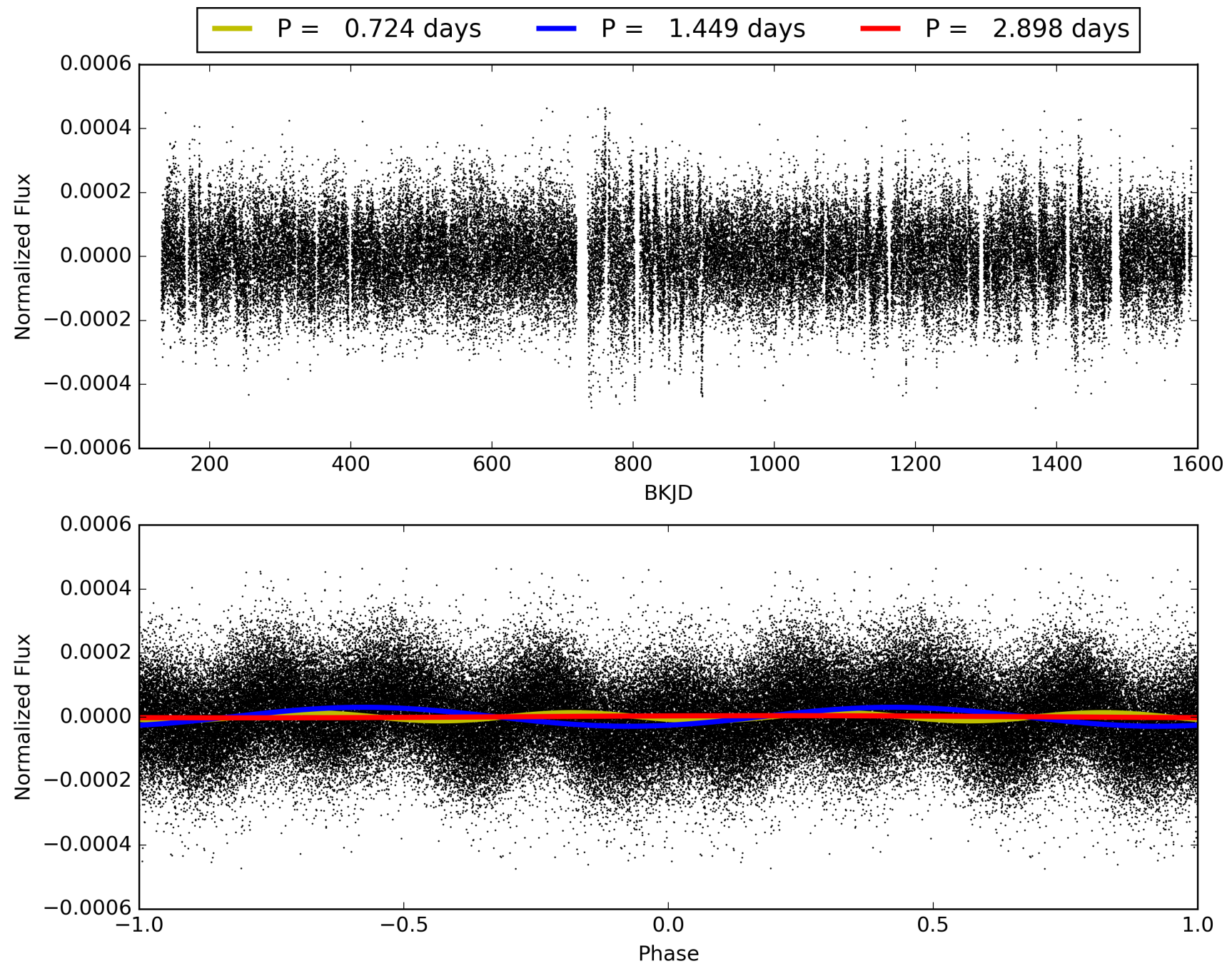
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:22:11 Z

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

TCE 003951334-01, PDC Light Curves

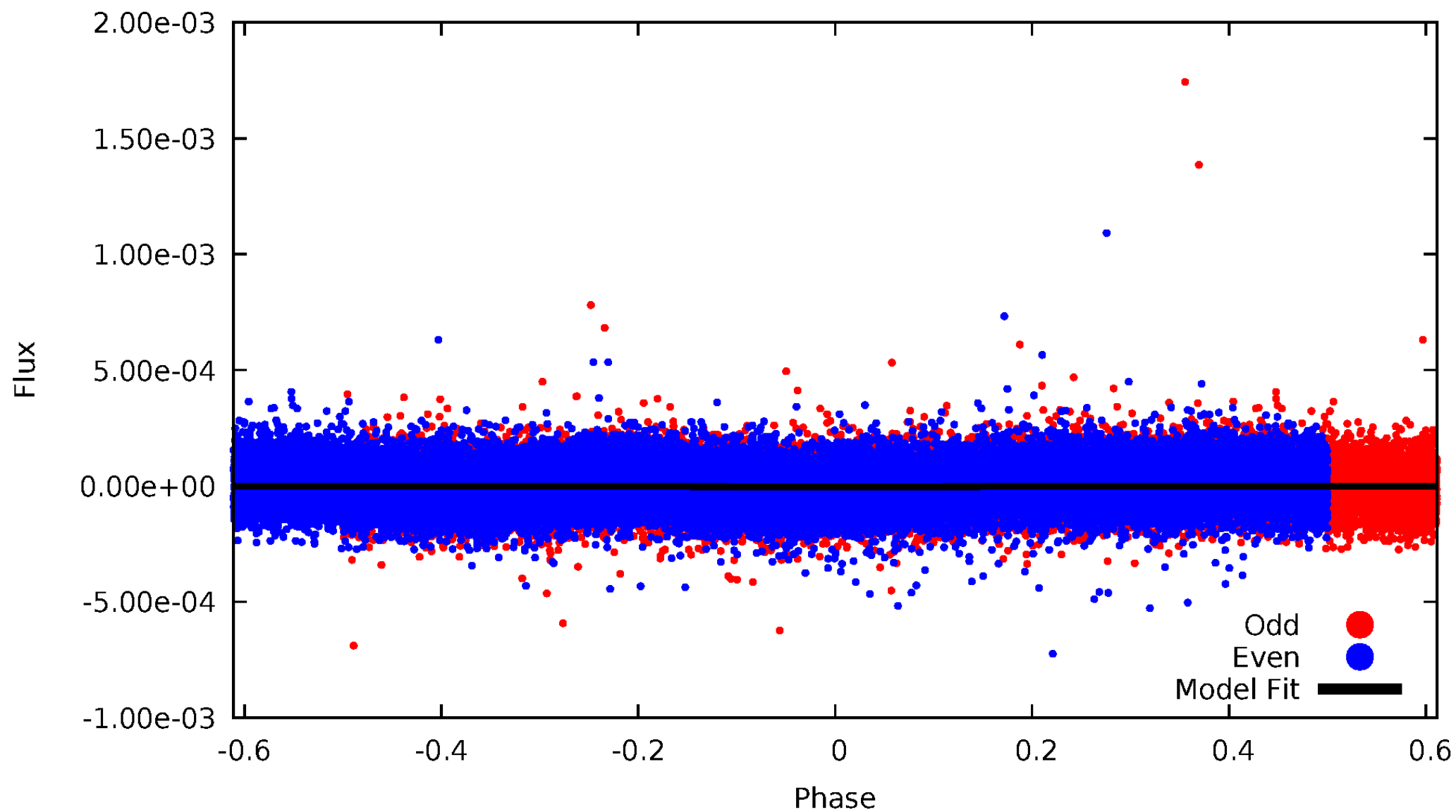


TCE 003951334-01



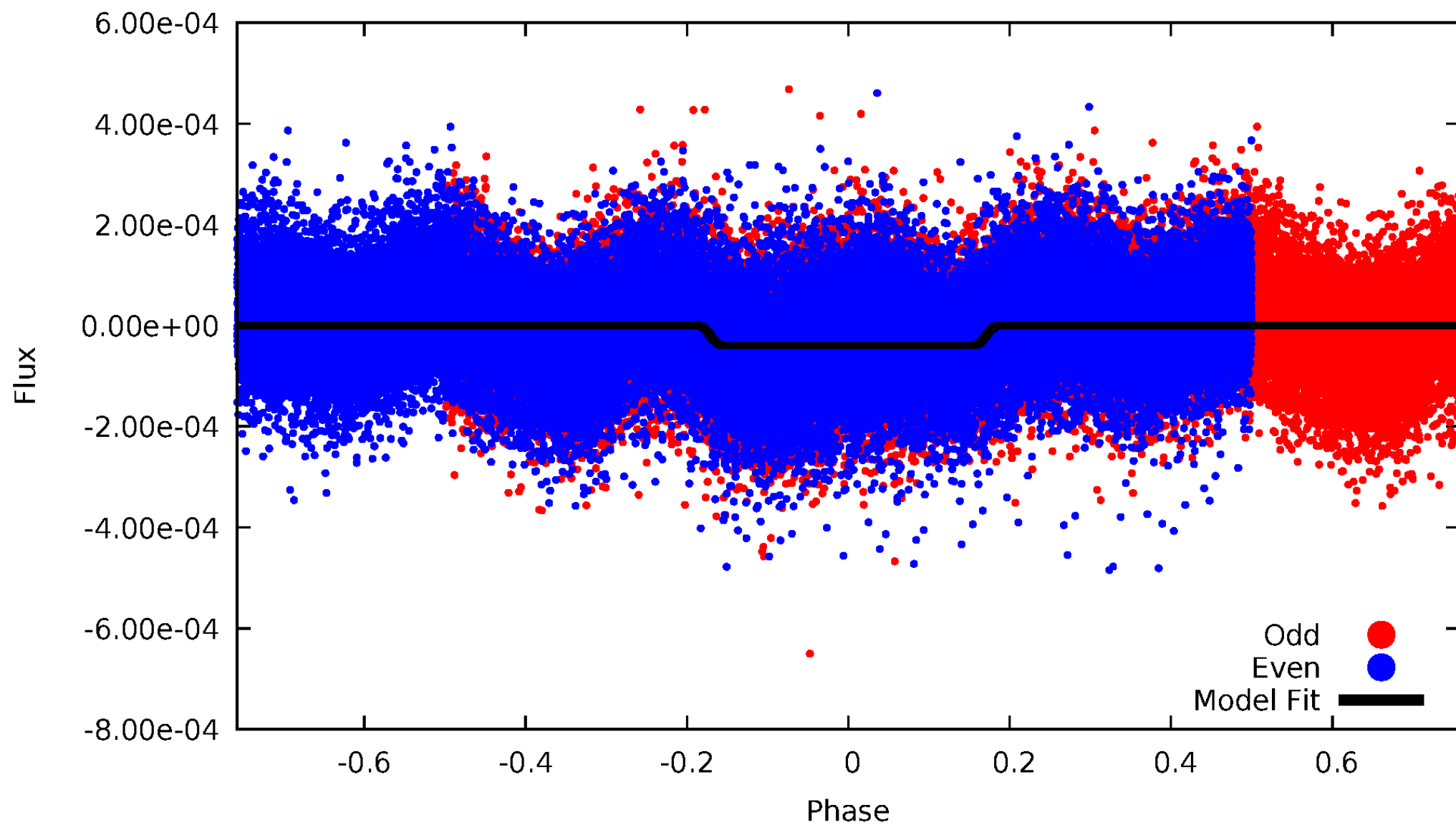
DV Odd/Even

TCE 003951334-01



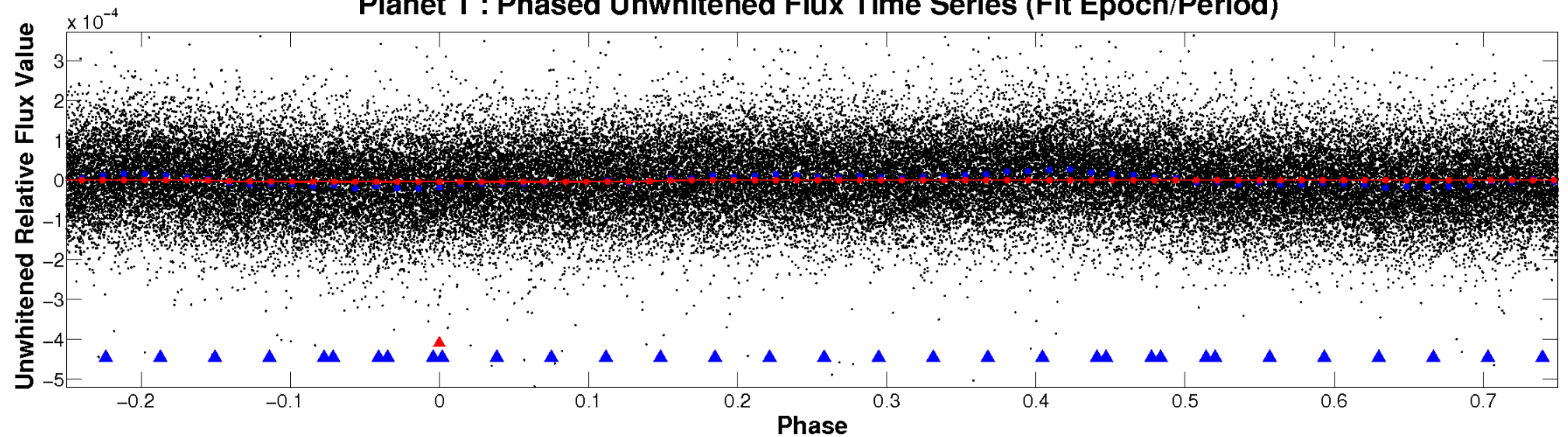
ALT Odd/Even

TCE 003951334-01

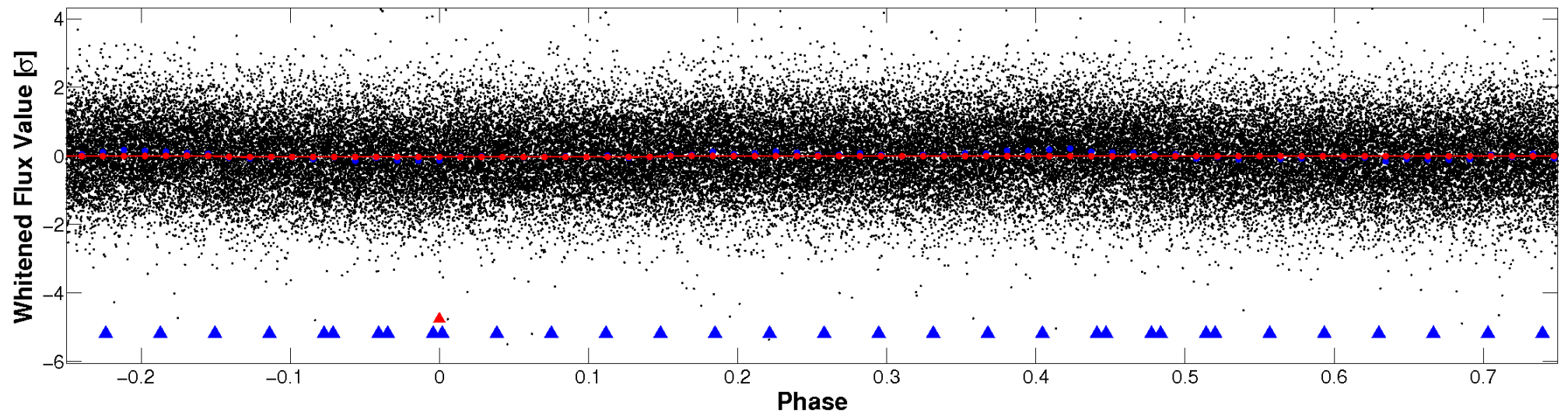


Non-Whitened Vs. Whitened Light Curve

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

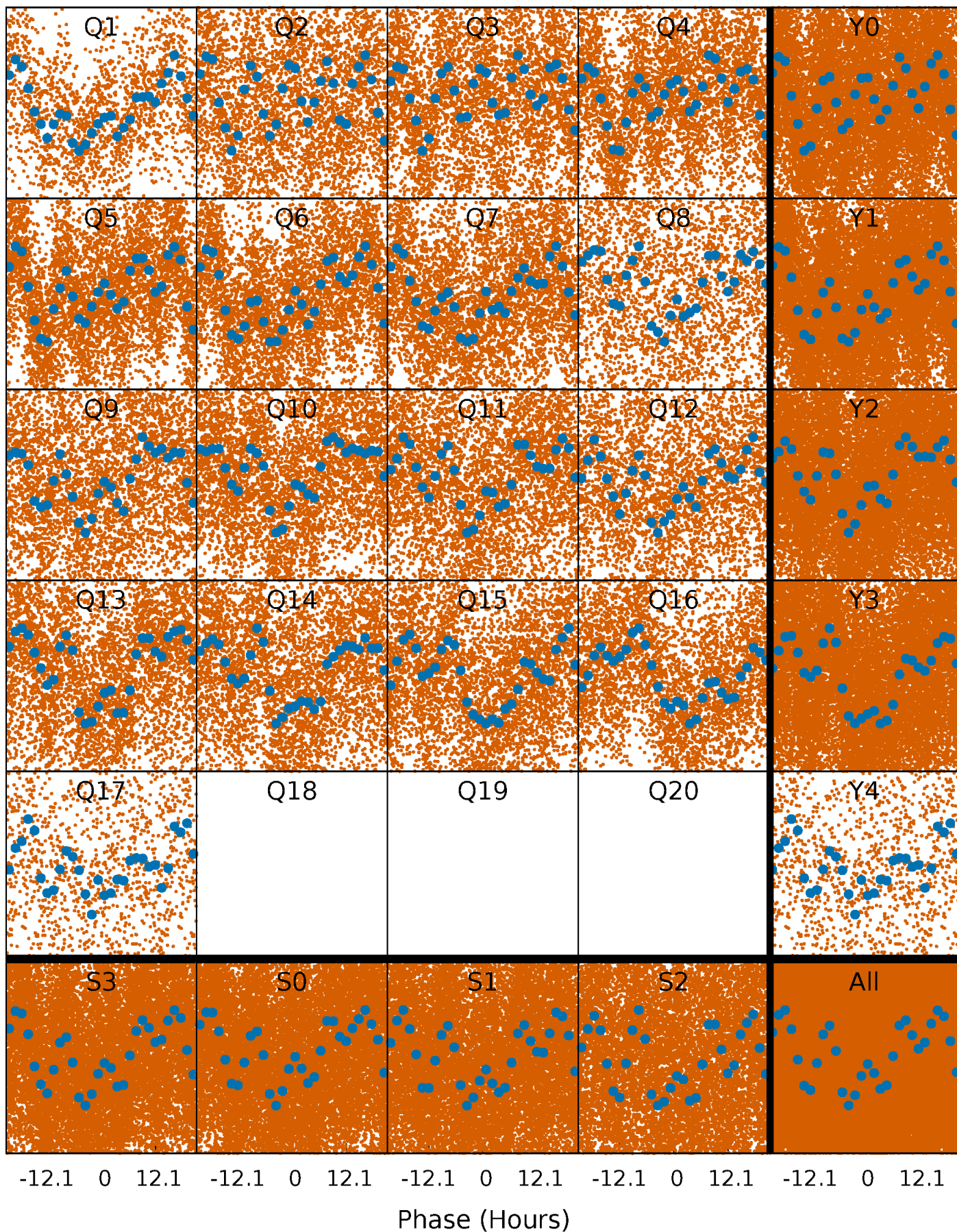


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



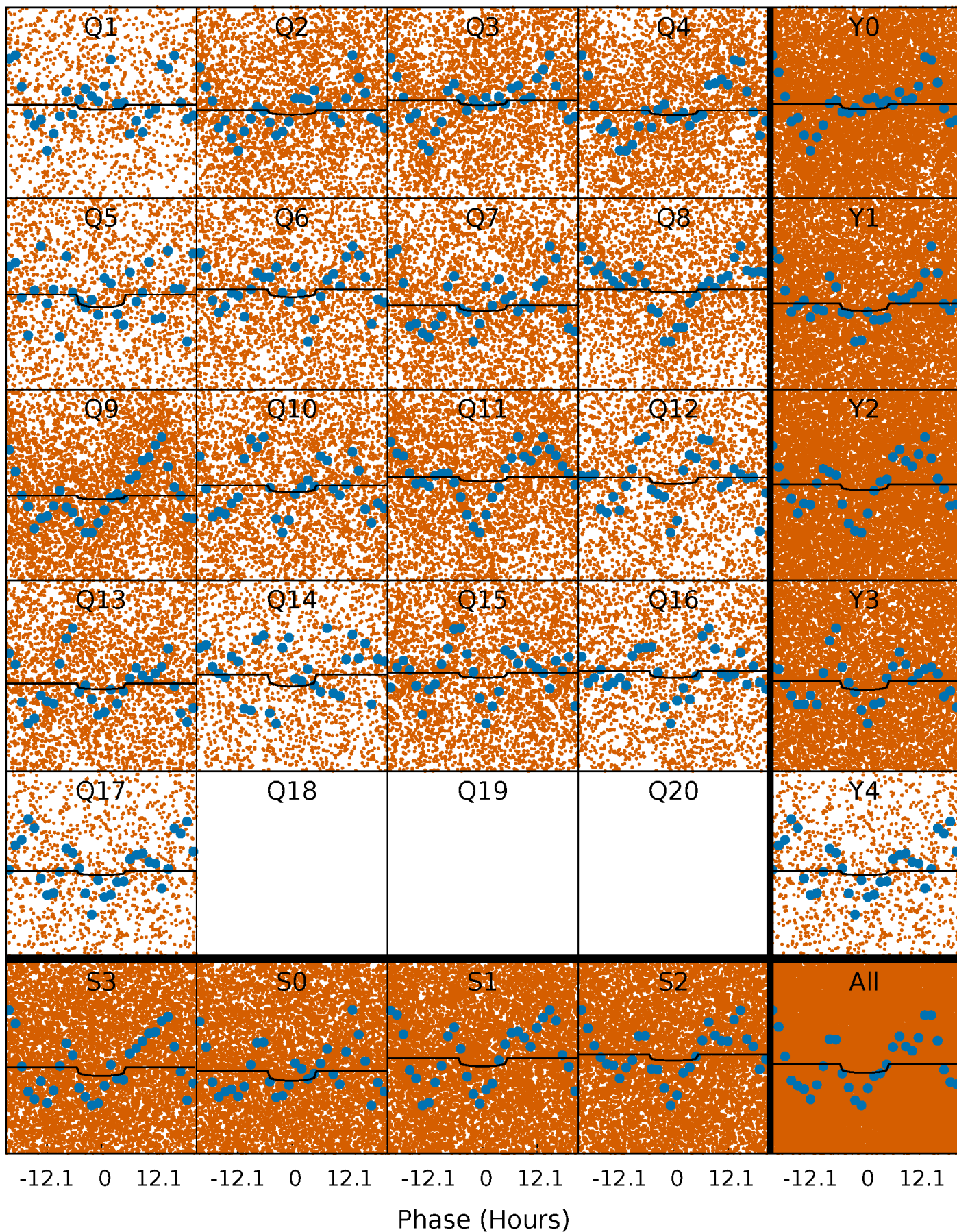
PDC Quarter-Phased Transit Curves

TCE 003951334-01 P= 1.448925 Days $T_0=133.030860$ (BKJD)



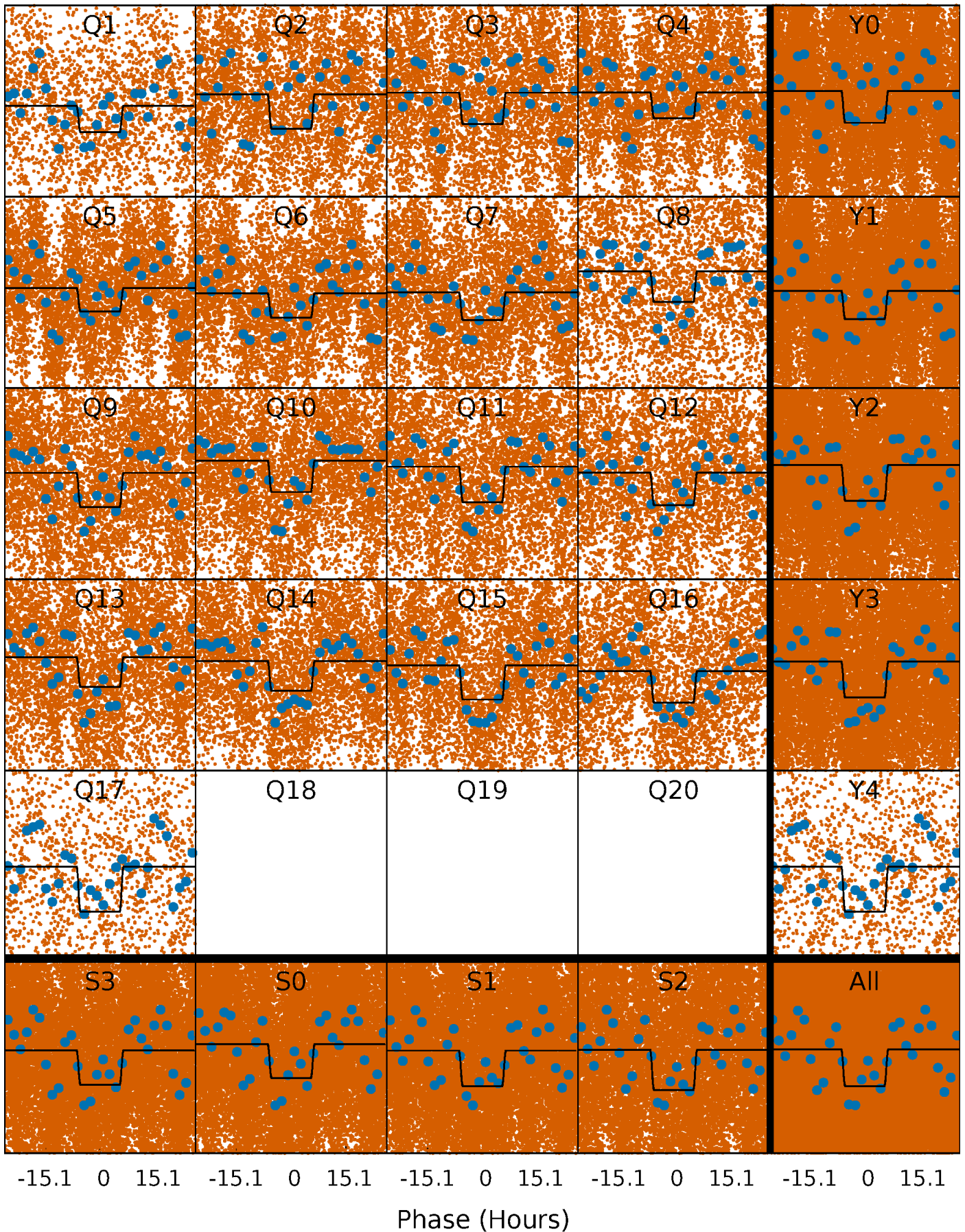
DV Quarter-Phased Transit Curves

TCE 003951334-01 P= 1.448925 Days $T_0=133.030860$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

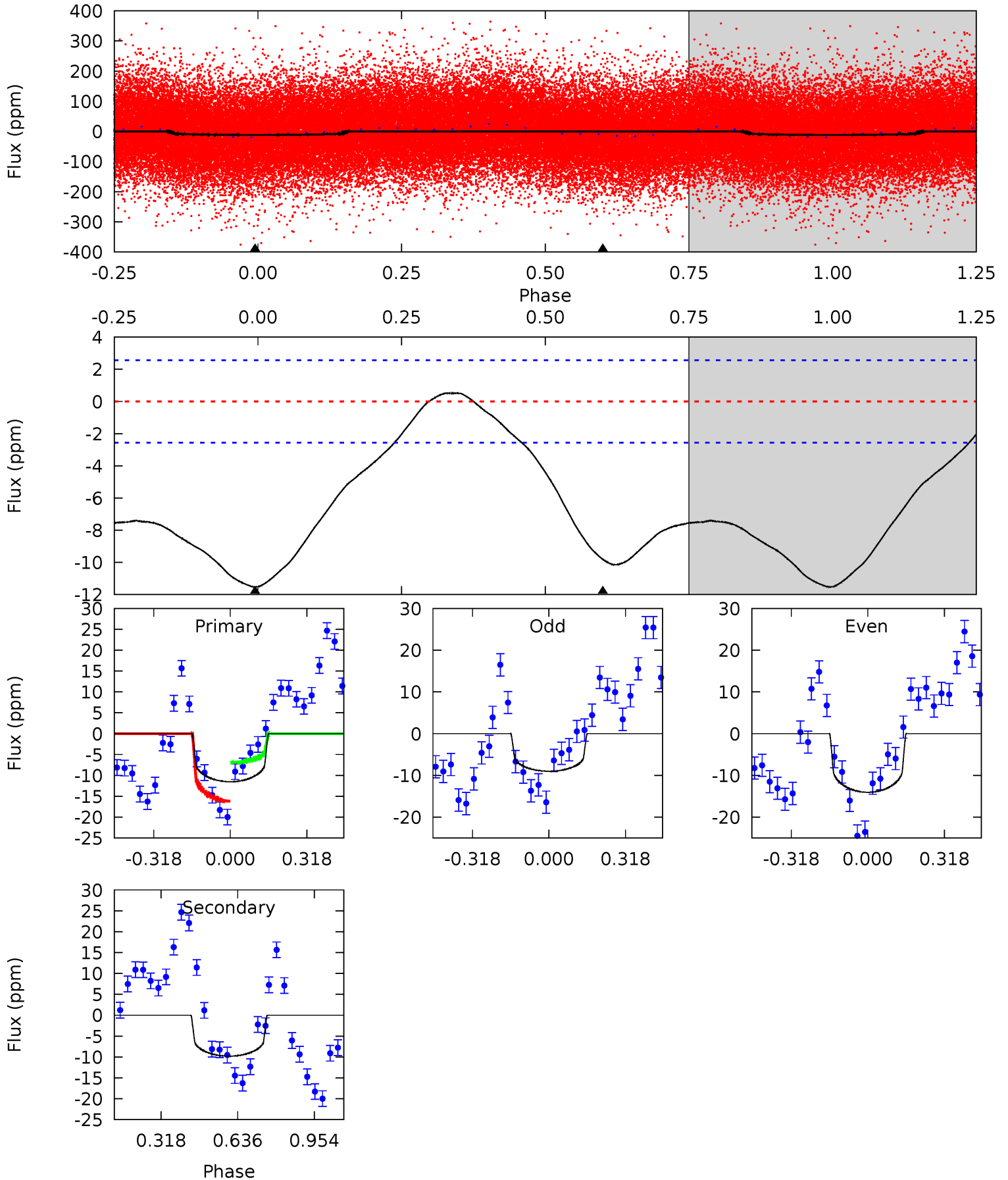
TCE 003951334-01 P= 1.449057 Days $T_0=132.969939$ (BKJD)



DV Model-Shift Uniqueness Test

003951334-01, P = 1.448925 Days, E = 130.133010 Days

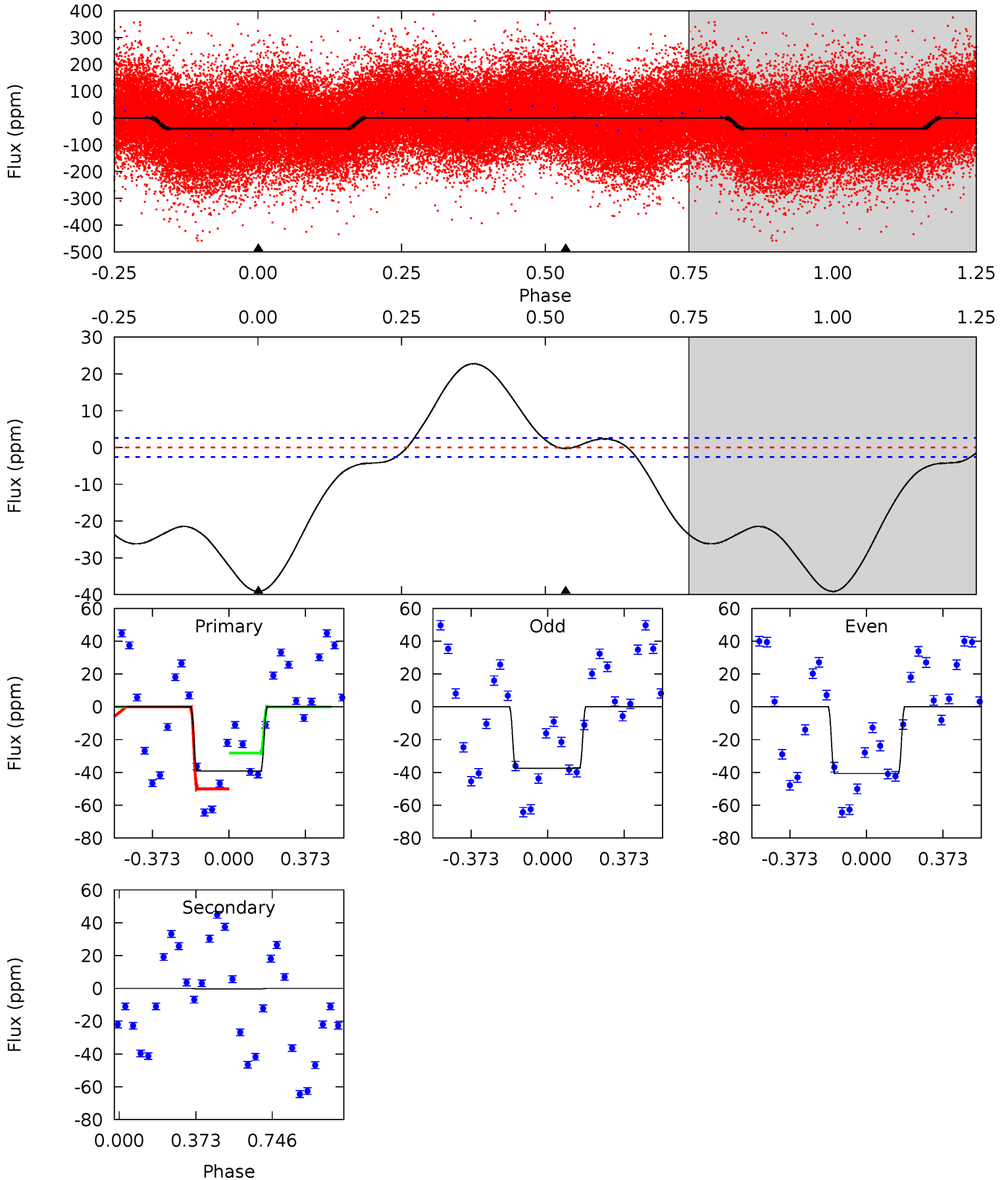
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.4	16.5	0	0	4.32	1.00	1.46	19.4	19.4	16.5	16.5	4.26	1.06	0.04	7.85



Alt Model-Shift Uniqueness Test

003951334-01, P = 1.449057 Days, E = 130.071825 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
65.2	0.49	0	0	4.28	0.89	19.0	65.2	65.2	0.49	0.49	2.62	0.99	0.37	18.3



Stellar Parameters For KIC 003951334

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6531^{+156}_{-176}	$3.813^{+0.292}_{-0.097}$	$0.000^{+0.250}_{-0.250}$	$2.499^{+0.531}_{-0.797}$	$1.482^{+0.233}_{-0.257}$	$0.134^{+0.239}_{-0.047}$
	+2%/-3%	+8%/-3%	+inf%/-inf%	+21%/-32%	+16%/-17%	+179%/-35%
Source	PHO1	FLK73	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 003951334-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-10 ± 1	$0.61^{+0.43}_{-0.36}$	3696^{+204}_{-300}	7572^{+7137}_{-1800}	12^{+63}_{-8}
Alt.	-0 ± 1	$1.58^{+0.53}_{-0.48}$	3671^{+227}_{-331}	-3396^{+464}_{-246}	$0.044^{+0.139}_{-0.104}$

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 $A_{obs} \gg 1.0$

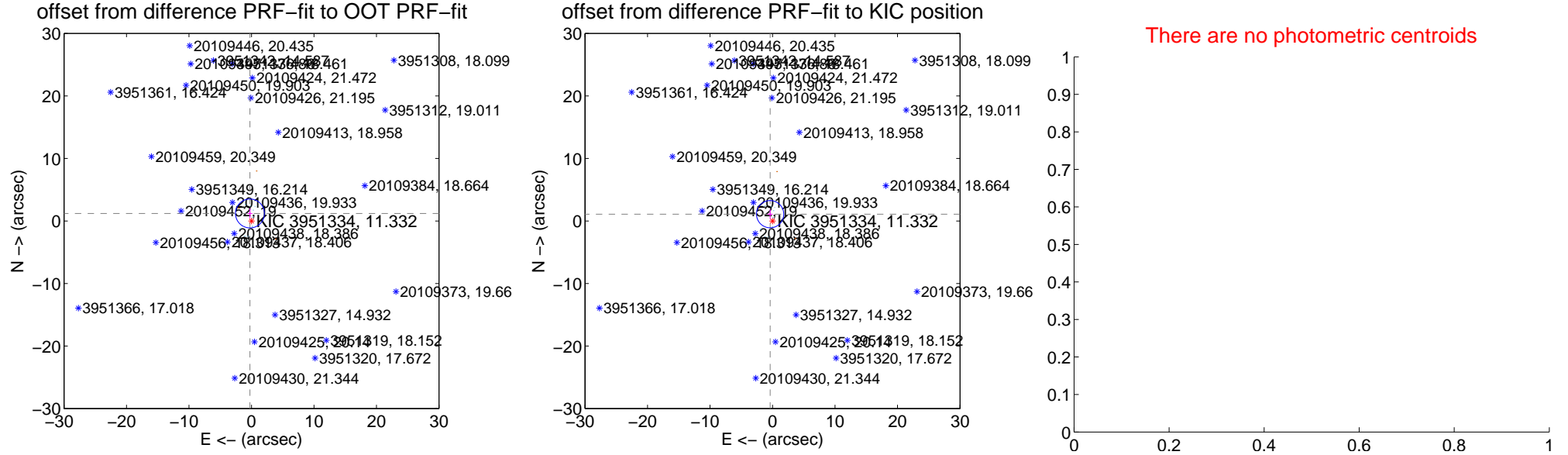
DV Centroid Data

Supplemental centroid analysis for 003951334-01. **Kepler magnitude: 11.33.** Transit SNR 3.92

There are 10 quarters with good PRF difference image offsets

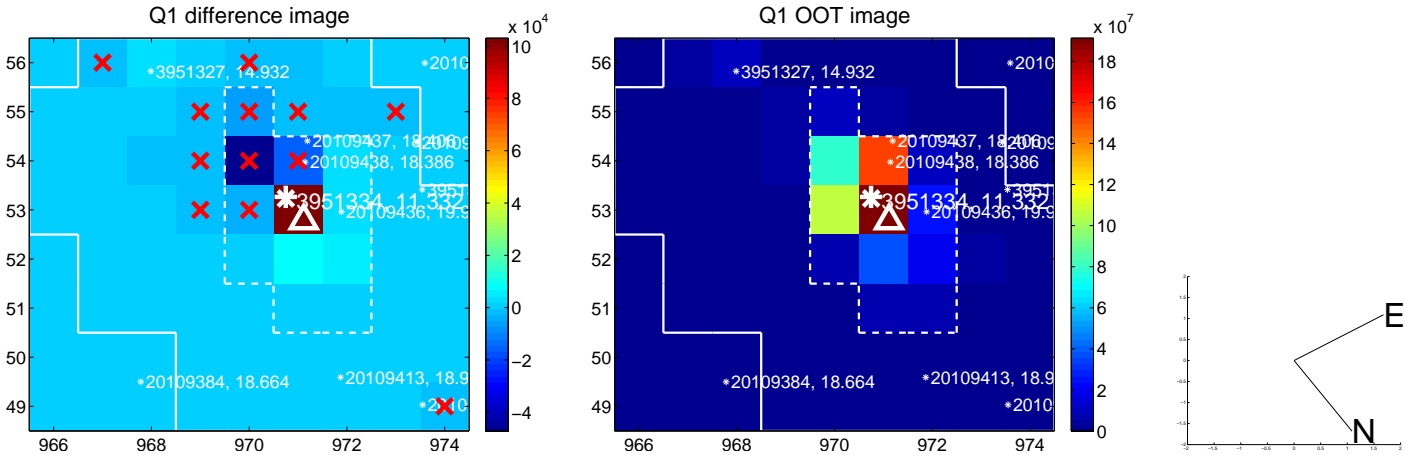
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.229 ± 0.771	1.59	0.247 ± 0.386	1.204 ± 0.772
PRF-fit source offset from KIC position	1.154 ± 0.726	1.59	0.383 ± 0.398	1.089 ± 0.752
photometric centroid source offset	—	—	—	—

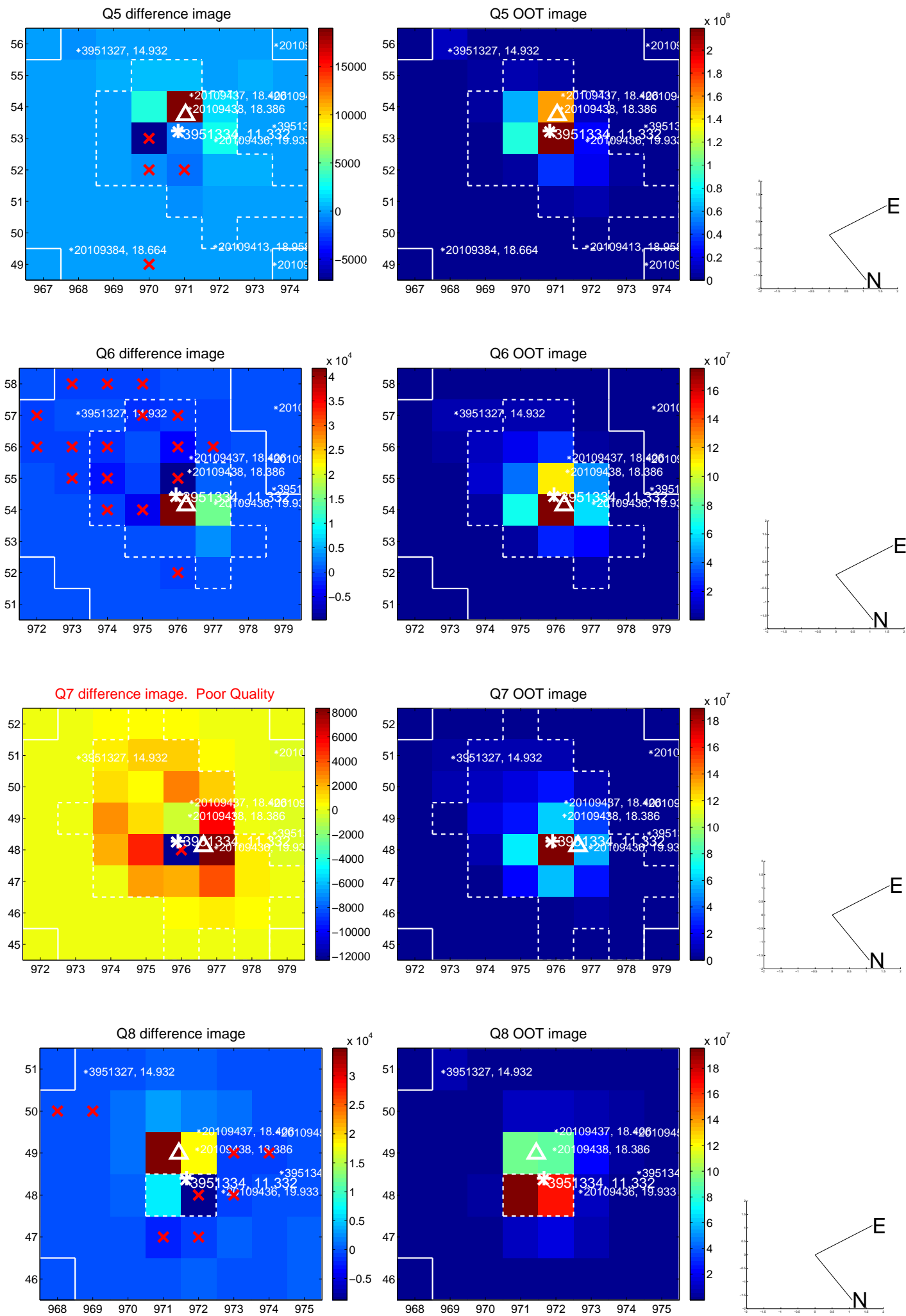


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

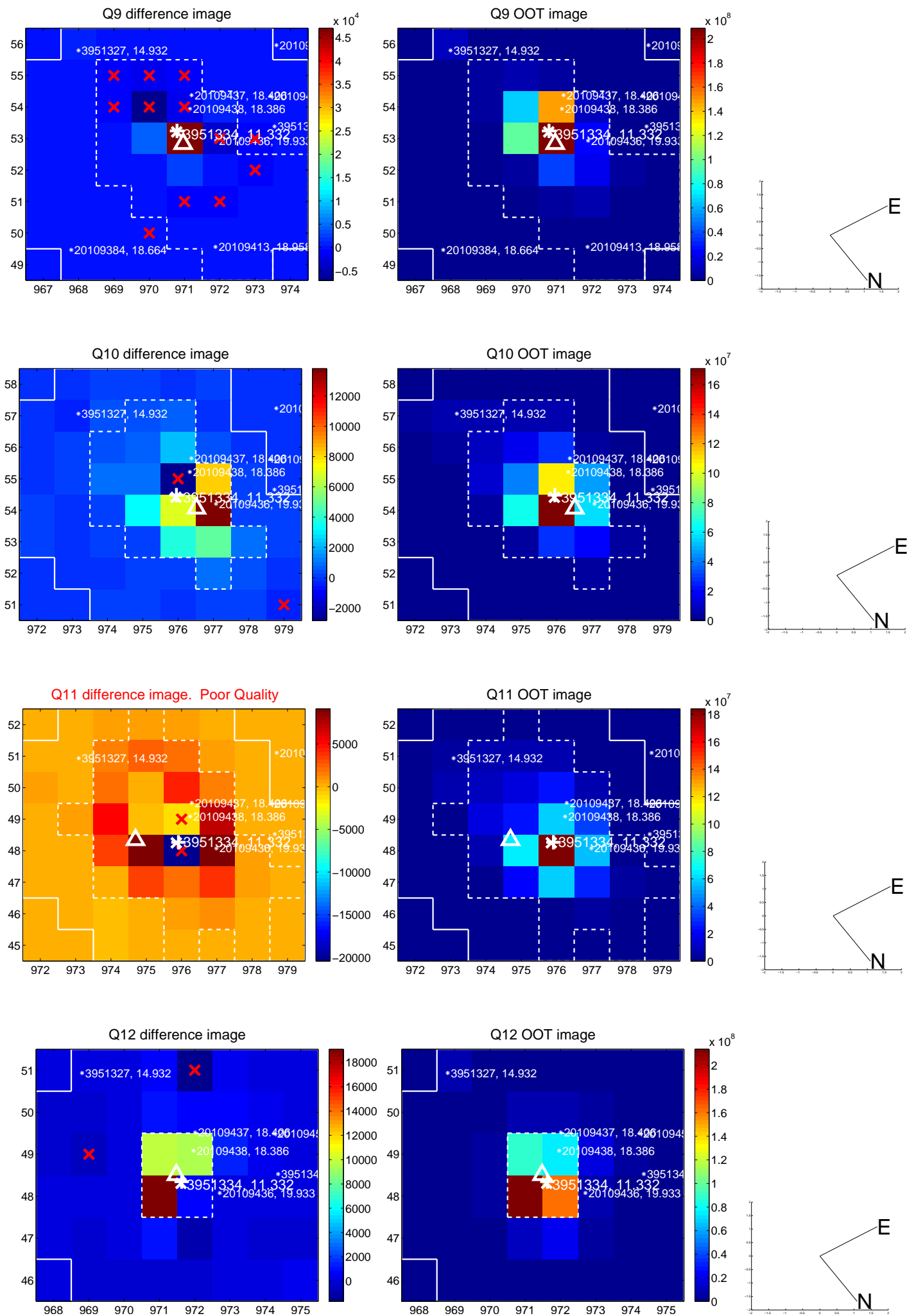
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



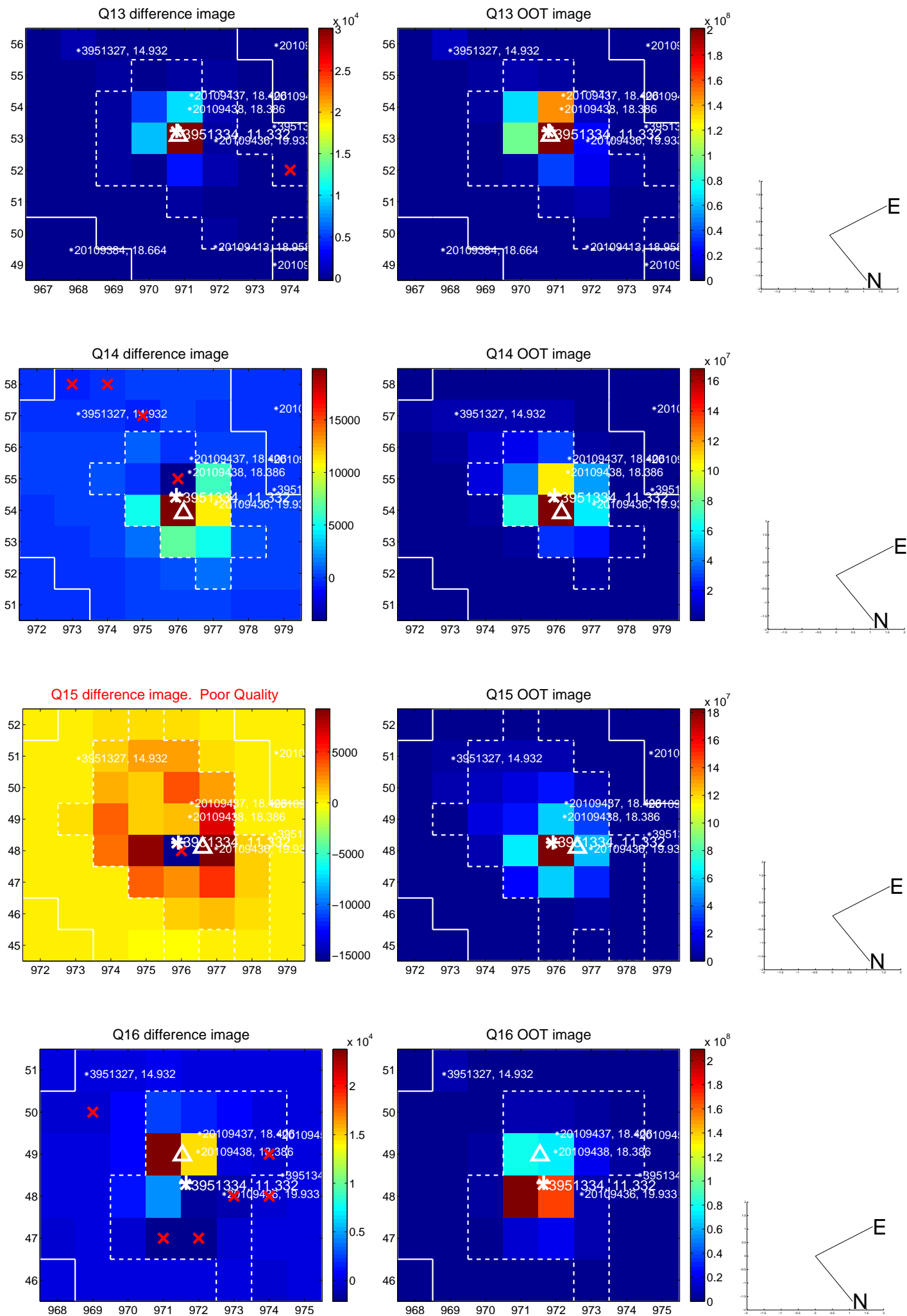
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



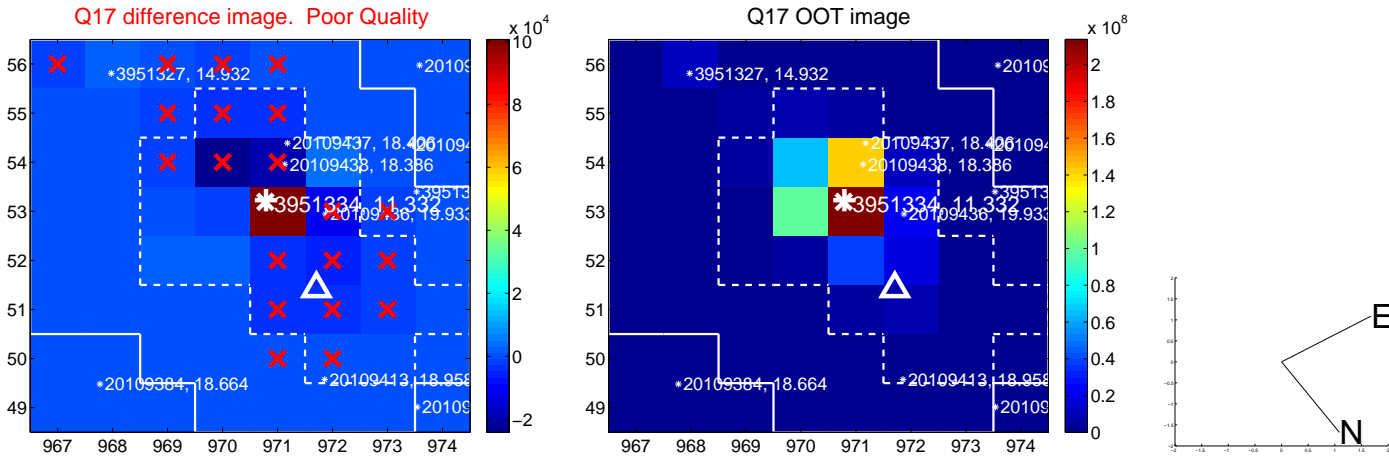
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

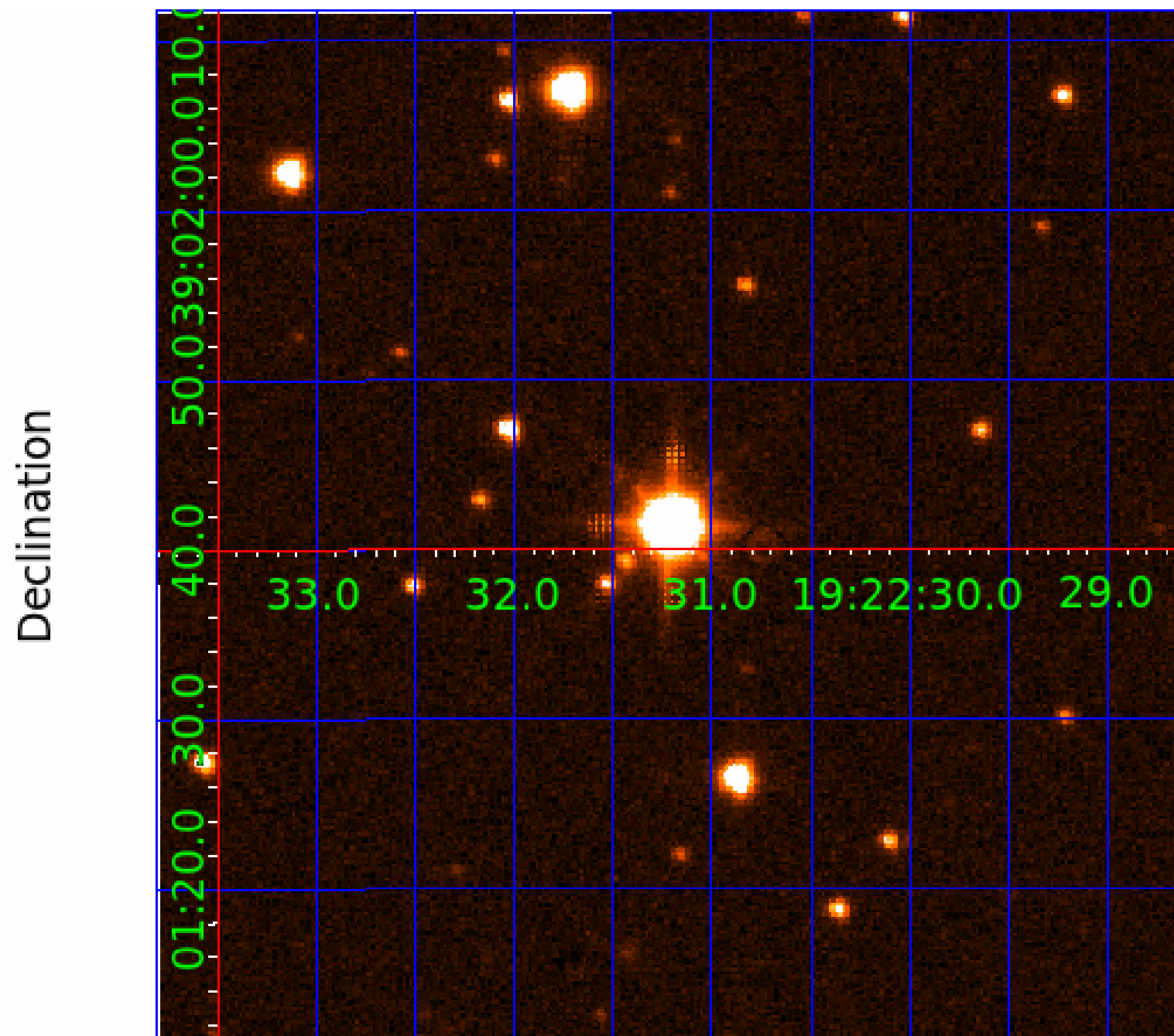


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image



KIC 003951334

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})
003951334-01	OBS	No	1.448925	133.030861	4.1	10.624	9.2	3.9	2.50	6531	0.59	12471.80
003951334-02	OBS	No	44.165722	161.305411	168.5	1.169	10.5	12.2	2.50	6531	3.68	130.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003951334-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
003951334-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—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.

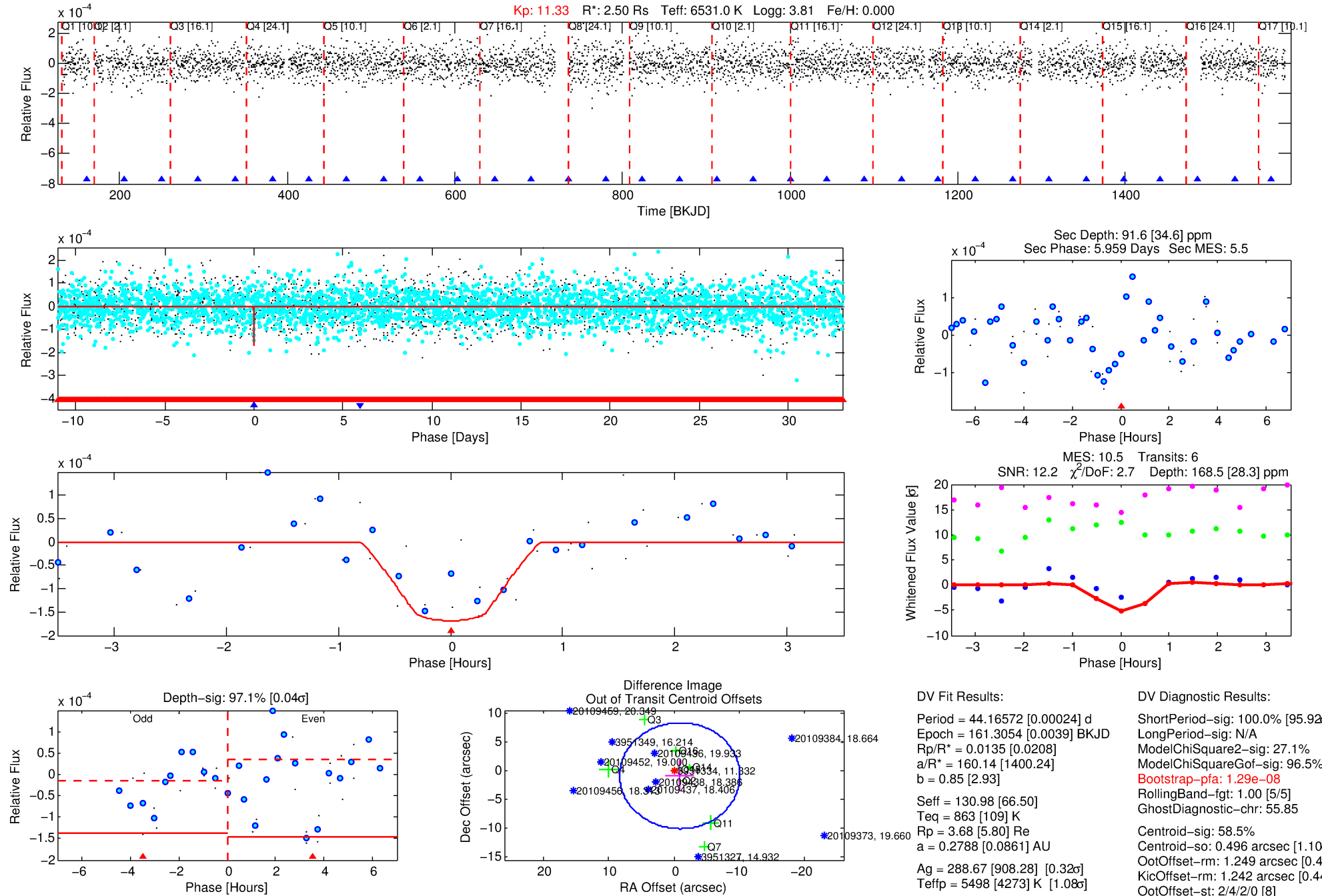
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003951334-02

No Significant Match Found

DV One-Page Summary

KIC: 3951334 Candidate: 2 of 2 Period: 44.166 d



DV Fit Results:

Period = 44.16572 [0.00024] d
Epoch = 161.3054 [0.0039] BKJD
Rp/R* = 0.0135 [0.0208]
a/R* = 160.14 [1400.24]
b = 0.85 [2.93]
Seff = 130.98 [66.50]
Teq = 863 [109] K
Rp = 3.68 [5.80] Re
a = 0.2788 [0.0861] AU
Ag = 288.67 [908.28] [0.32 σ]
Teff = 5498 [4273] K [1.08 σ]

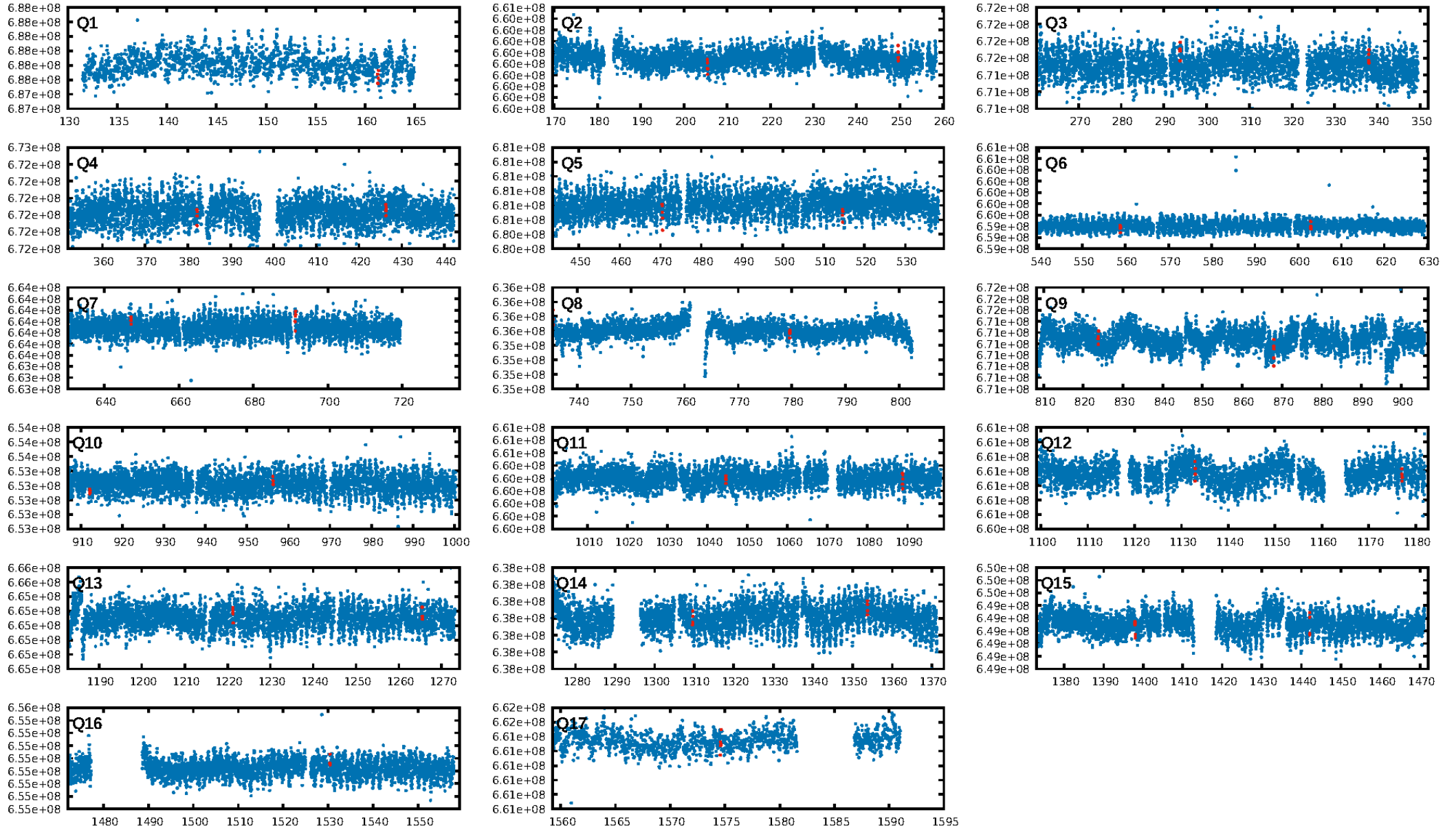
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [95.92 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 27.1%
ModelChiSquareGof-sig: 96.5%
Bootstrap-pfa: 1.29e-08
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 55.85
Centroid-sig: 58.5%
Centroid-so: 0.496 arcsec [1.10 σ]
OotOffset-rm: 1.249 arcsec [0.41 σ]
KicOffset-rm: 1.242 arcsec [0.44 σ]
OotOffset-st: 2/4/2/0 [8]
KicOffset-st: 2/4/2/0 [8]
DiffImageQuality-fgm: 0.25 [2/8]
DiffImageOverlap-fno: 0.71 [12/17]

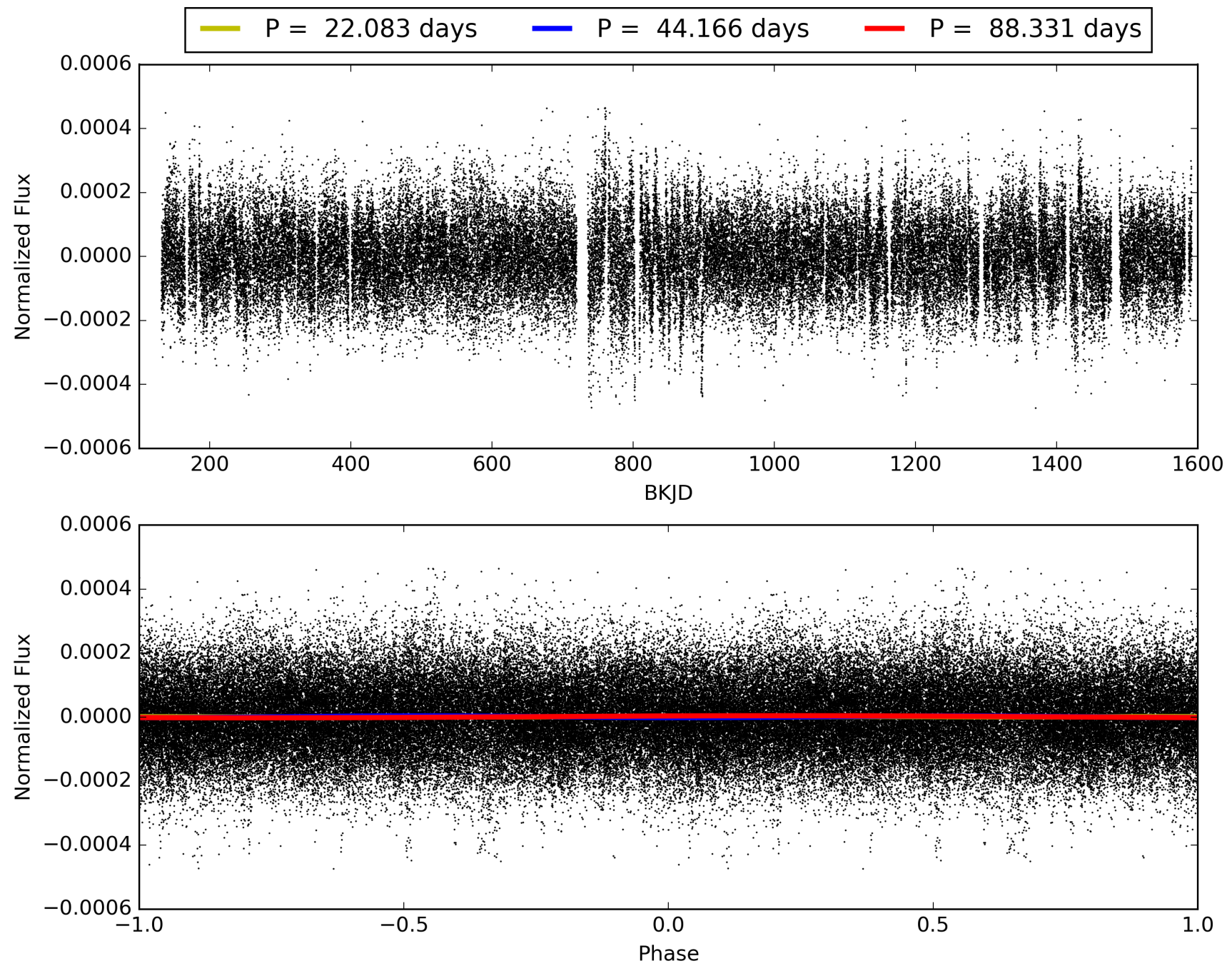
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:22:22 Z

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

TCE 003951334-02, PDC Light Curves

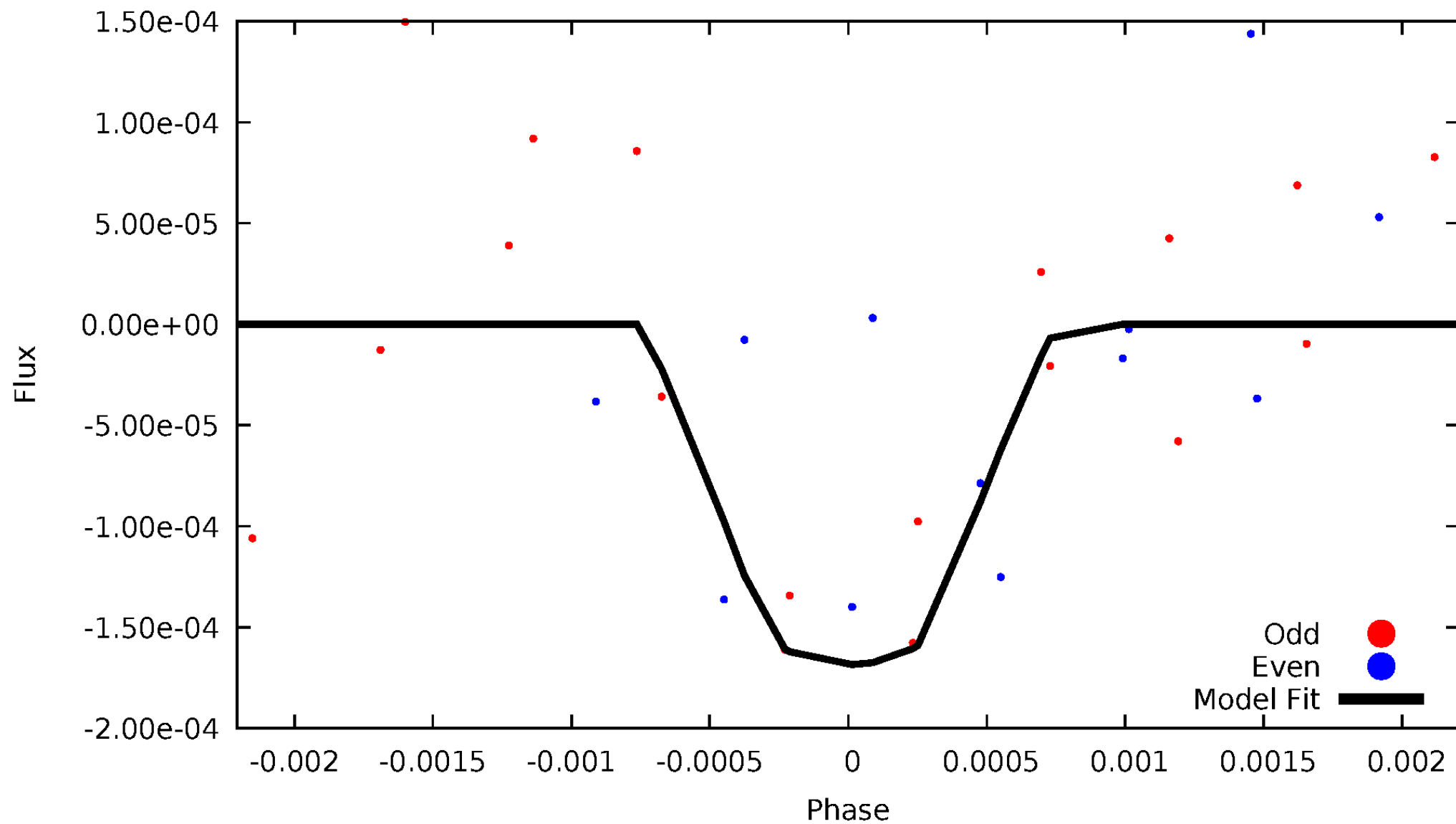


TCE 003951334-02



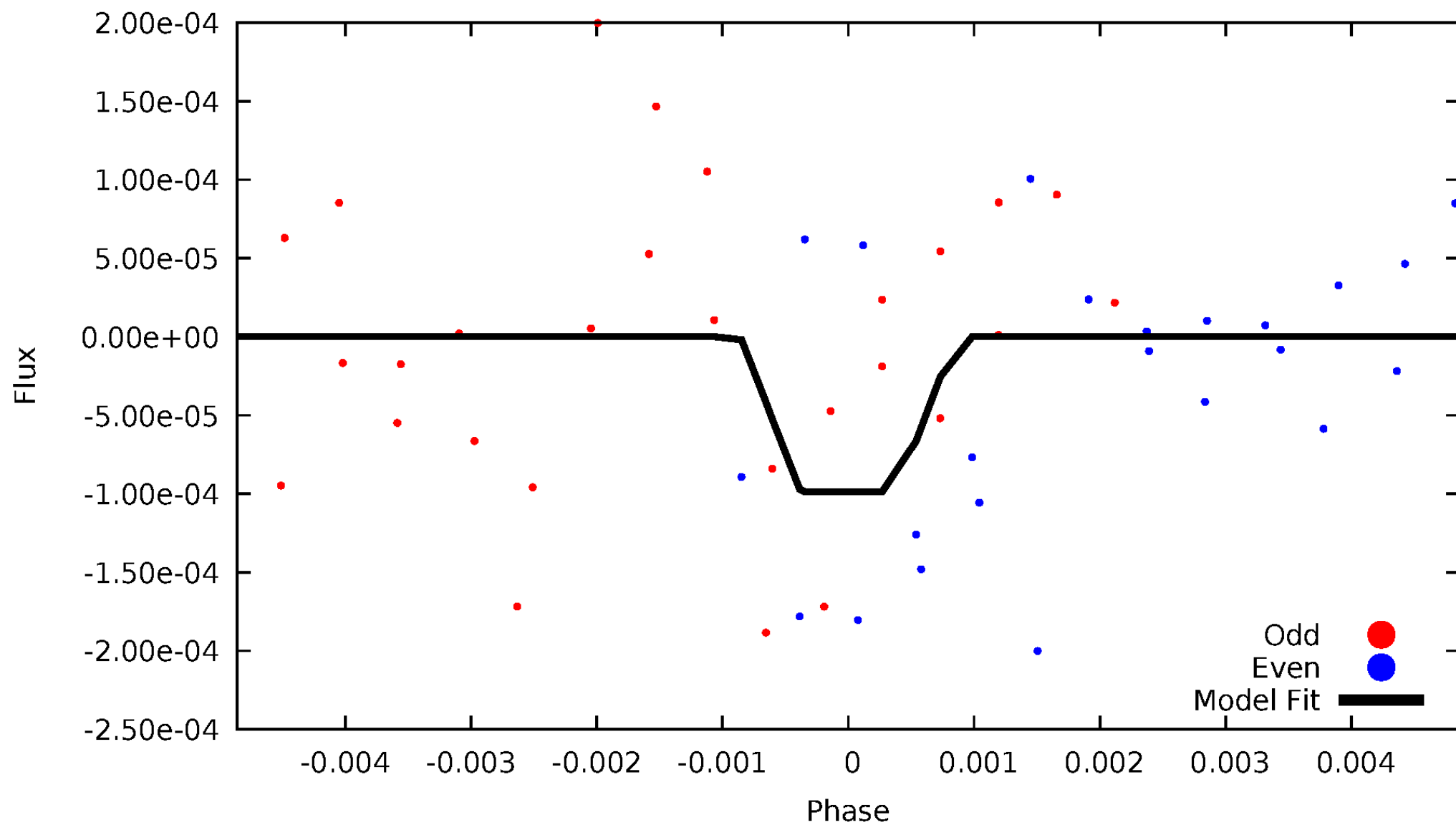
DV Odd/Even

TCE 003951334-02



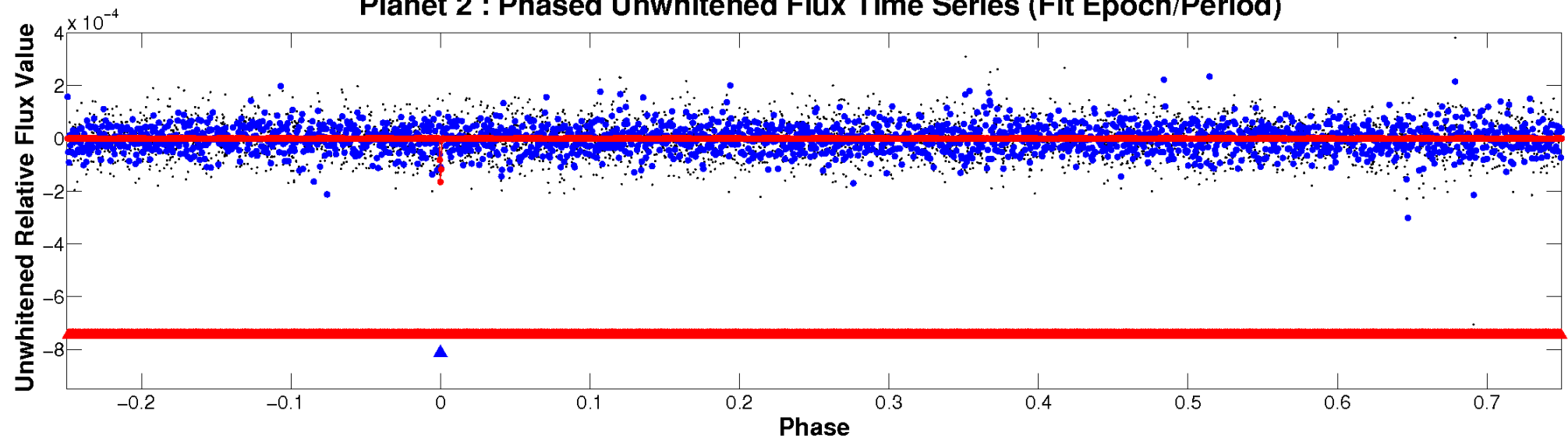
ALT Odd/Even

TCE 003951334-02

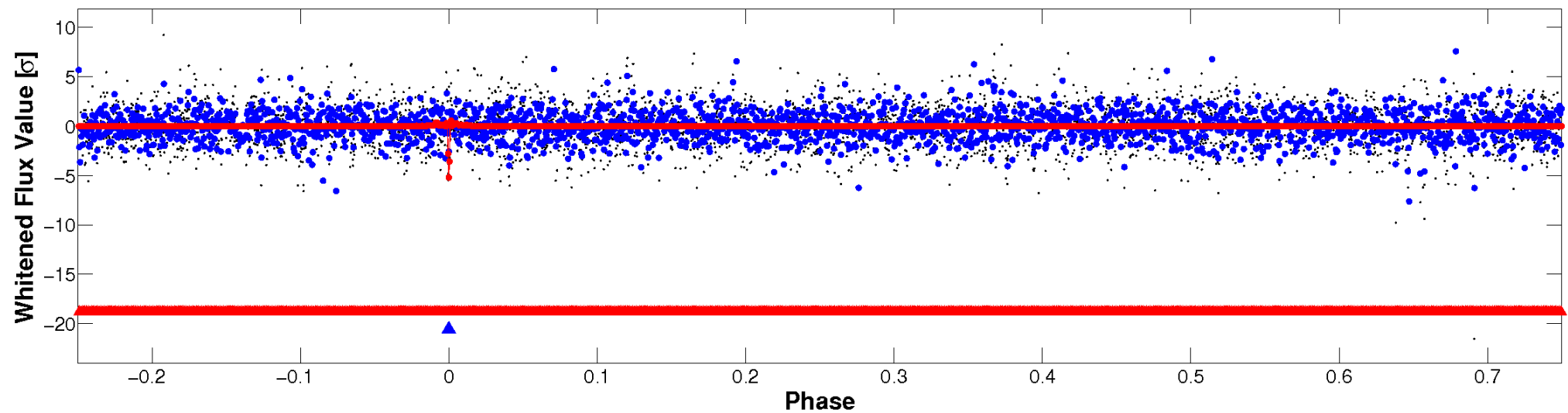


Non-Whitened Vs. Whitened Light Curve

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

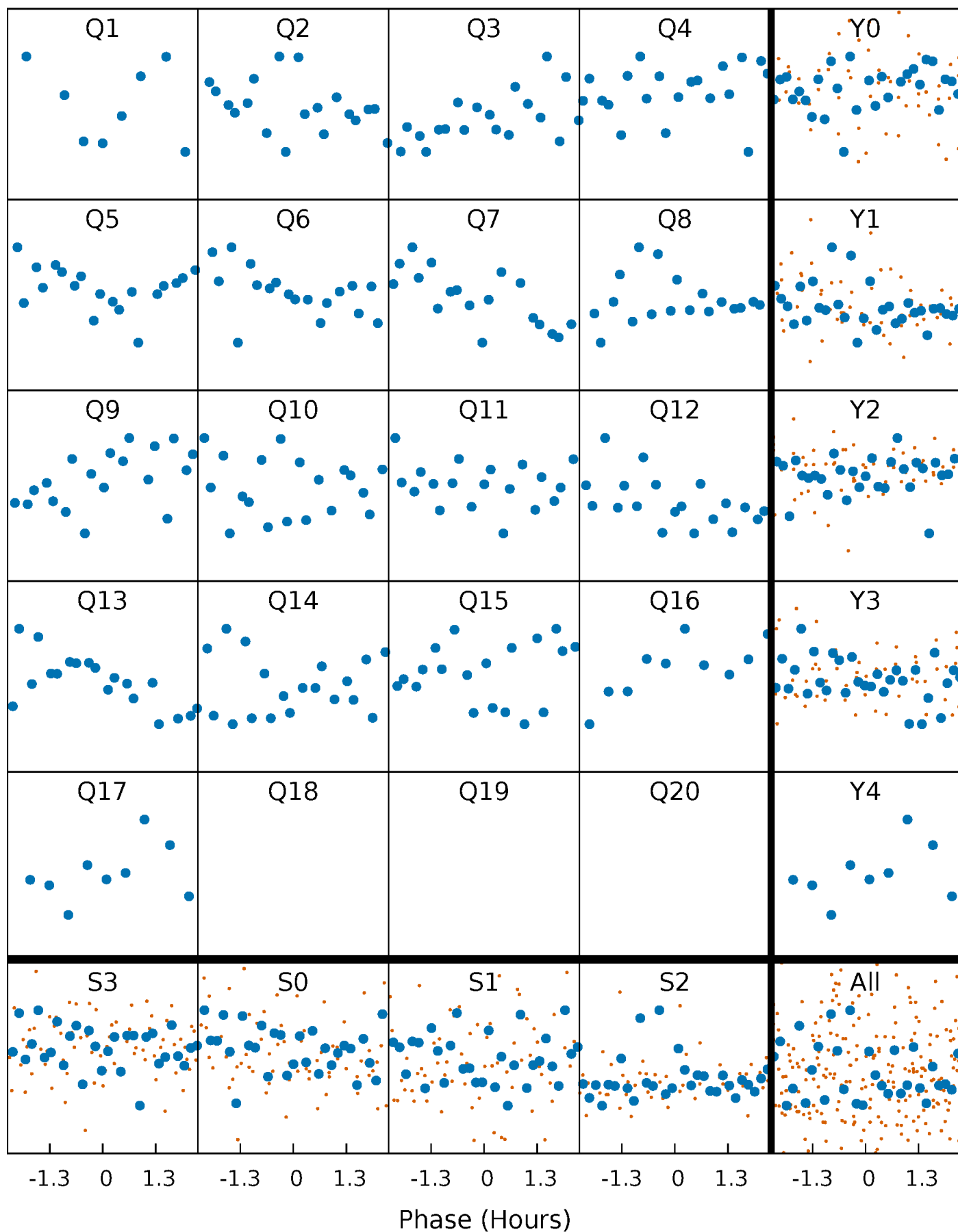


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



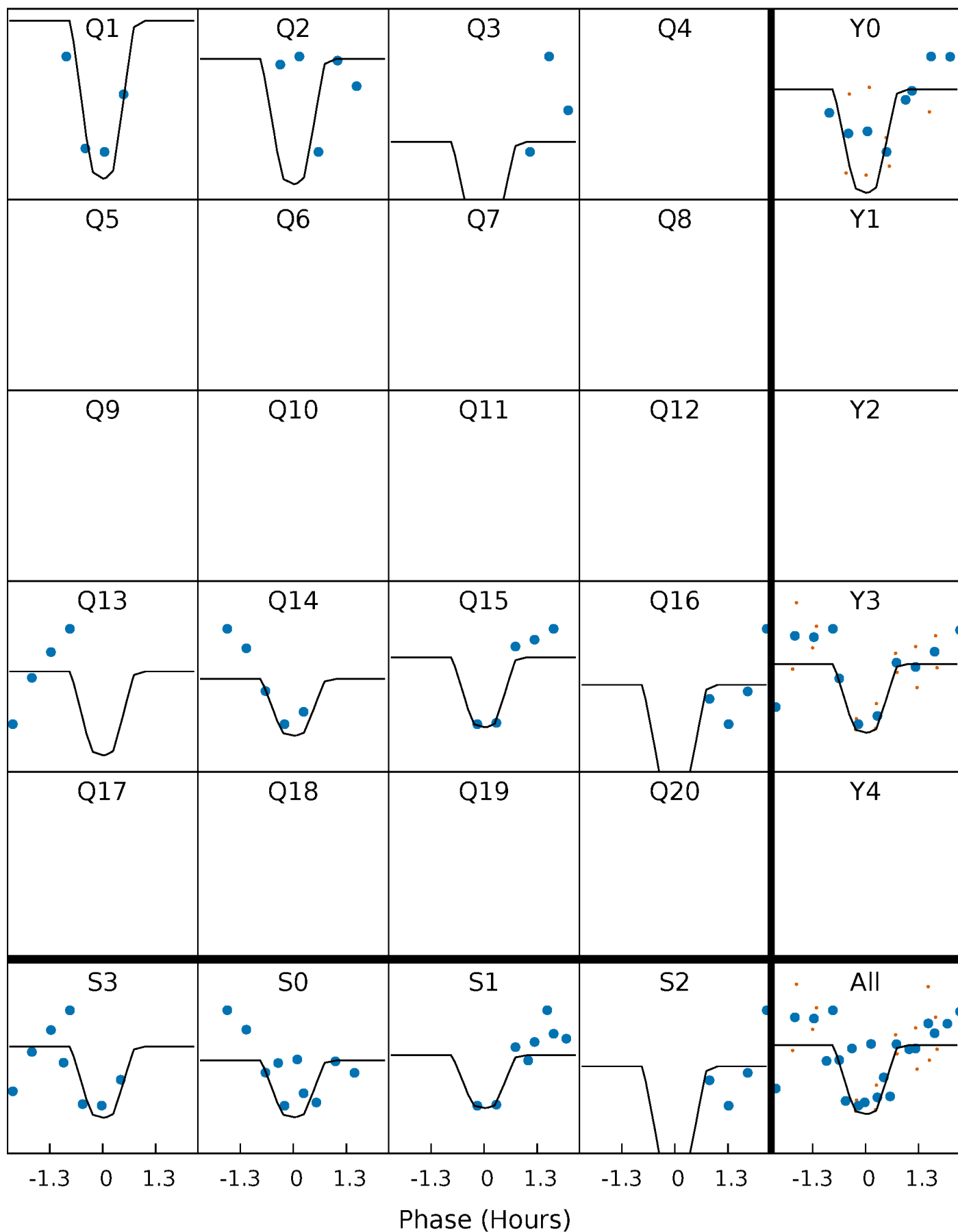
PDC Quarter-Phased Transit Curves

TCE 003951334-02 P= 44.165722 Days $T_0=161.305411$ (BKJD)



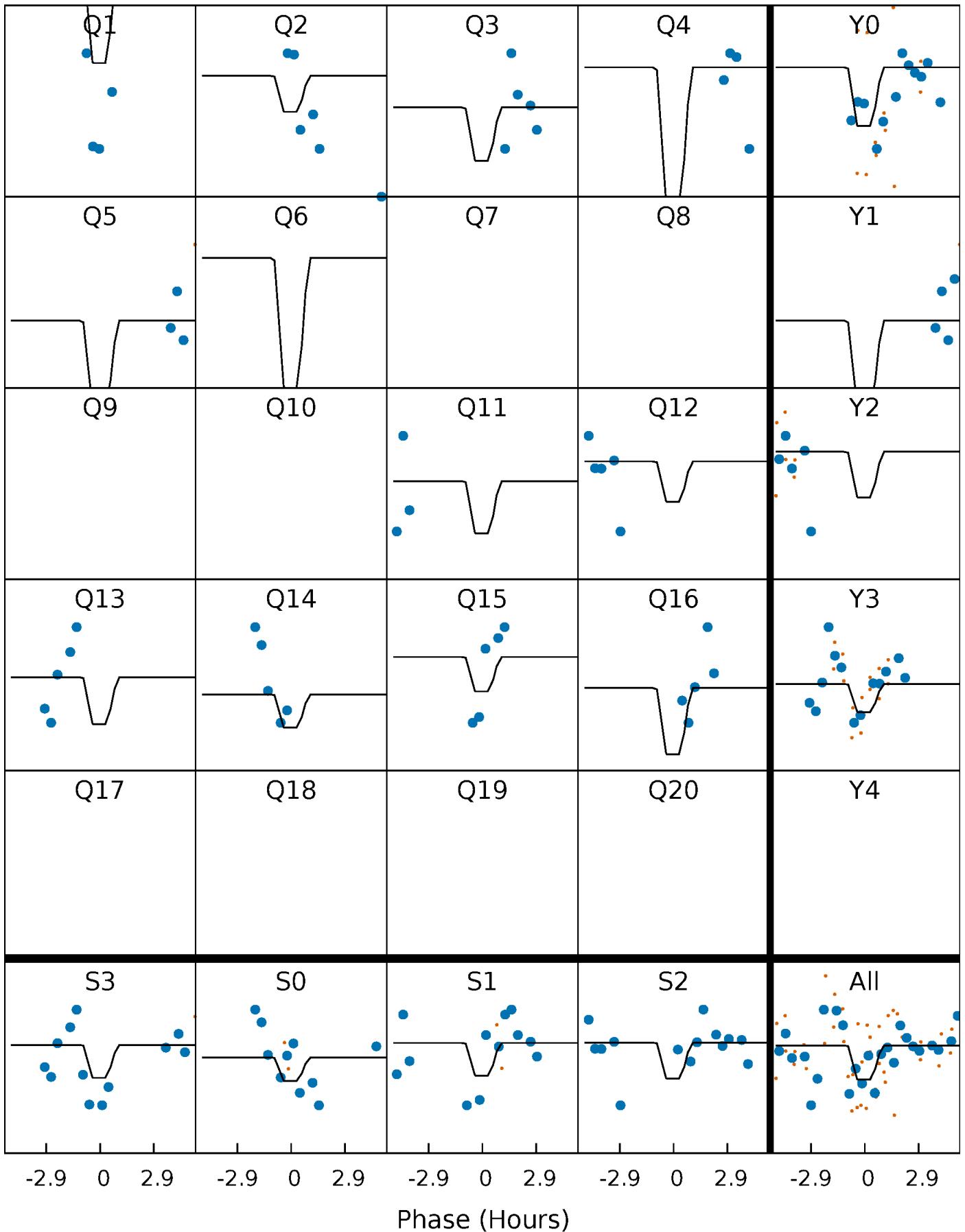
DV Quarter-Phased Transit Curves

TCE 003951334-02 P= 44.165722 Days $T_0=161.305411$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

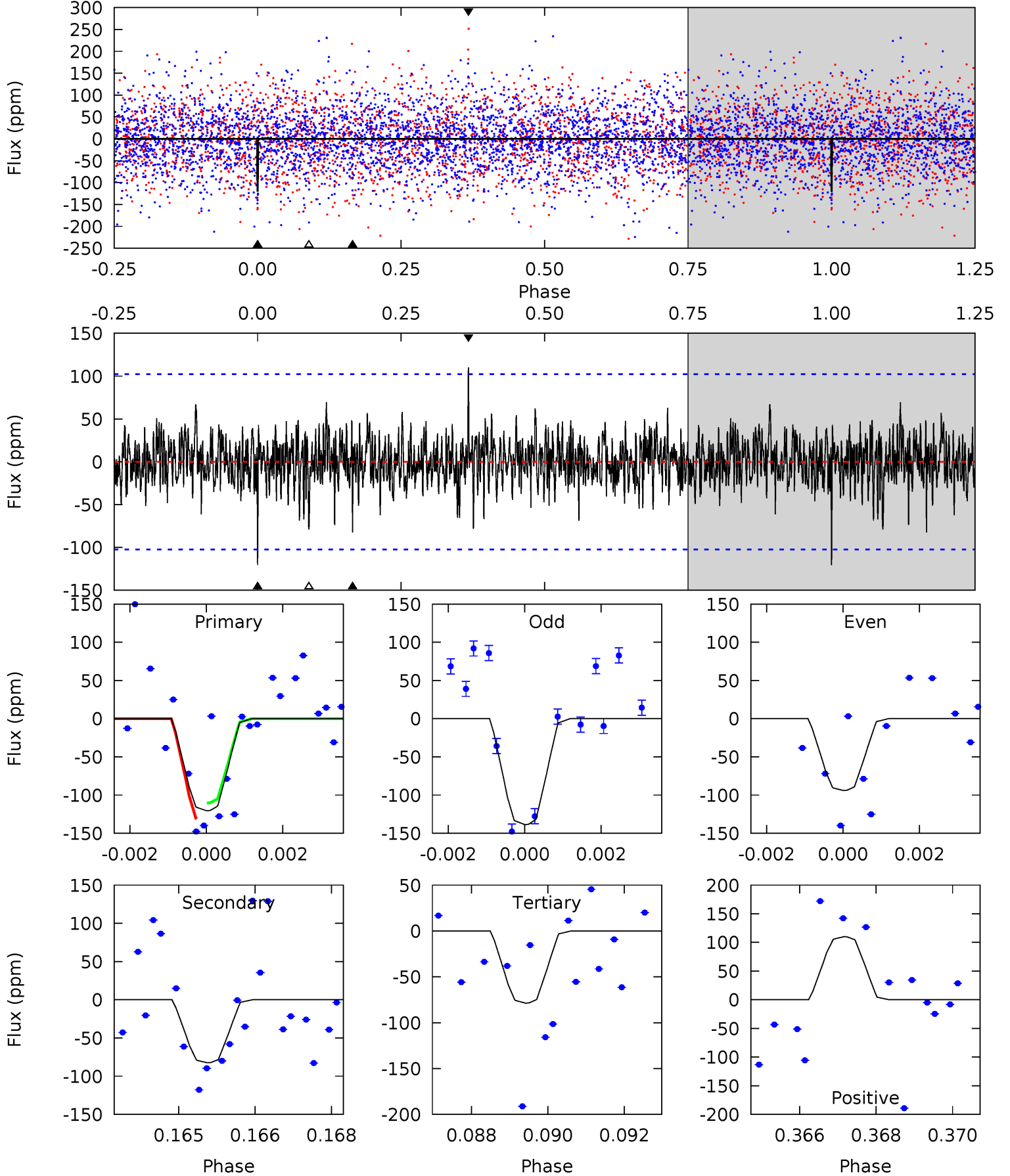
TCE 003951334-02 P= 44.166466 Days $T_0=161.302650$ (BKJD)



DV Model-Shift Uniqueness Test

003951334-02, P = 44.165722 Days, E = 117.139689 Days

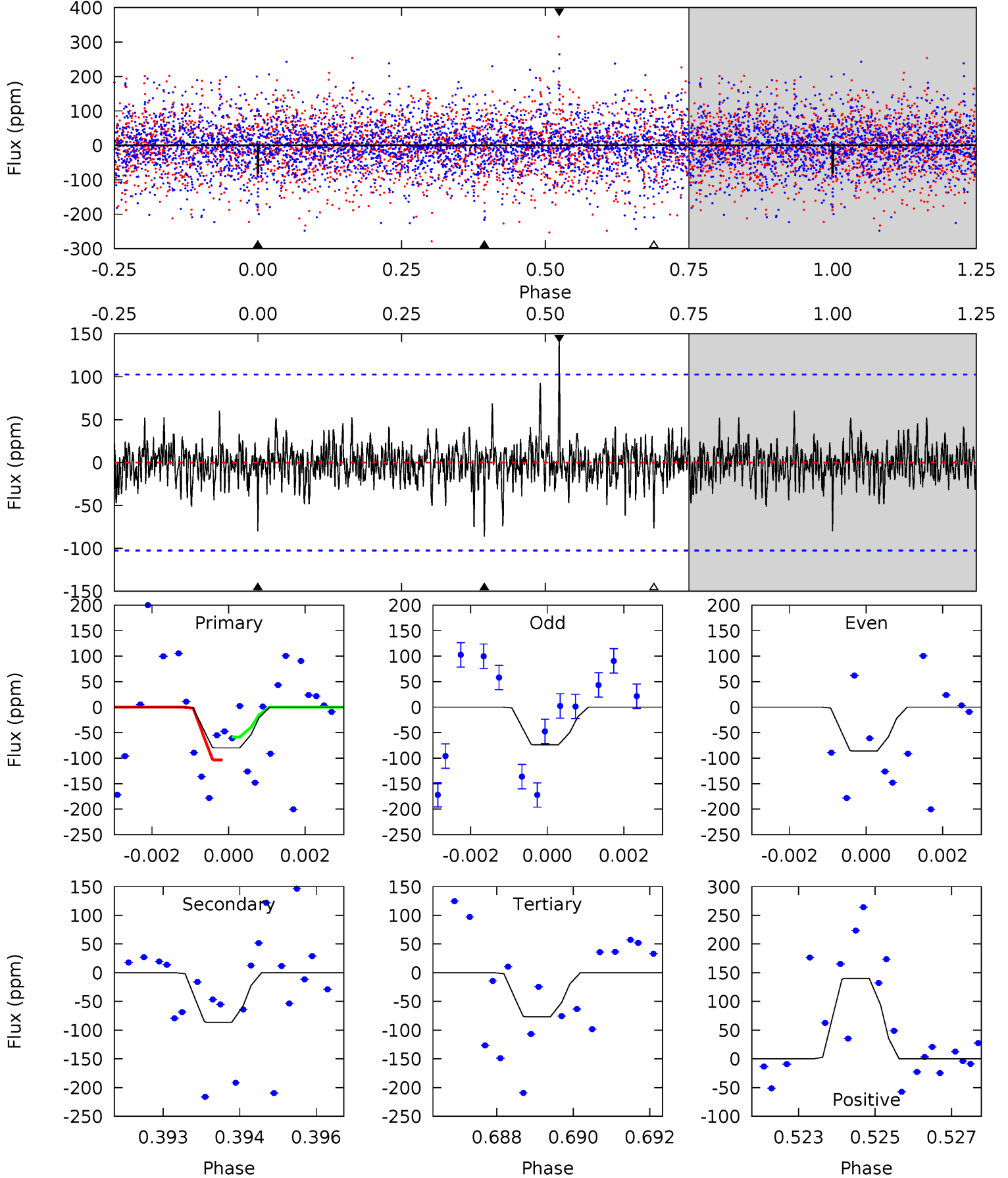
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.32	4.32	4.13	5.77	5.36	3.14	1.17	2.19	0.55	0.19	-1.45	1.18	0.84	0.48	0.51



Alt Model-Shift Uniqueness Test

003951334-02, P = 44.166466 Days, E = 117.136184 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.16	4.49	3.99	7.29	5.34	3.12	1.02	0.17	-3.13	0.51	-2.80	0.31	1.02	0.62	1.16



Stellar Parameters For KIC 003951334

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6531^{+156}_{-176}	$3.813^{+0.292}_{-0.097}$	$0.000^{+0.250}_{-0.250}$	$2.499^{+0.531}_{-0.797}$	$1.482^{+0.233}_{-0.257}$	$0.134^{+0.239}_{-0.047}$
	+2%/-3%	+8%/-3%	+inf%/-inf%	+21%/-32%	+16%/-17%	+179%/-35%
Source	PHO1	FLK73	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 003951334-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-82 ± 19	$5.00^{+4.34}_{-3.34}$	1179^{+78}_{-93}	4595^{+3495}_{-987}	141^{+1238}_{-104}
Alt.	-86 ± 19	$4.57^{+4.70}_{-3.14}$	1186^{+71}_{-104}	4815^{+4039}_{-1105}	178^{+1570}_{-138}

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

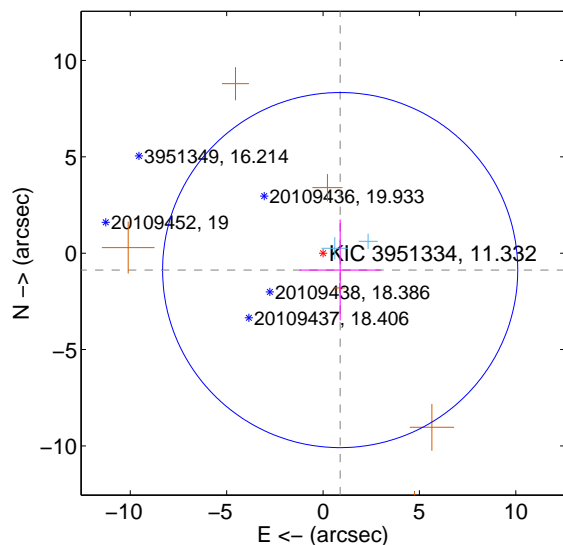
Supplemental centroid analysis for 003951334-02. **Kepler magnitude: 11.33.** Transit SNR 12.24

There are 2 quarters with good PRF difference image offsets

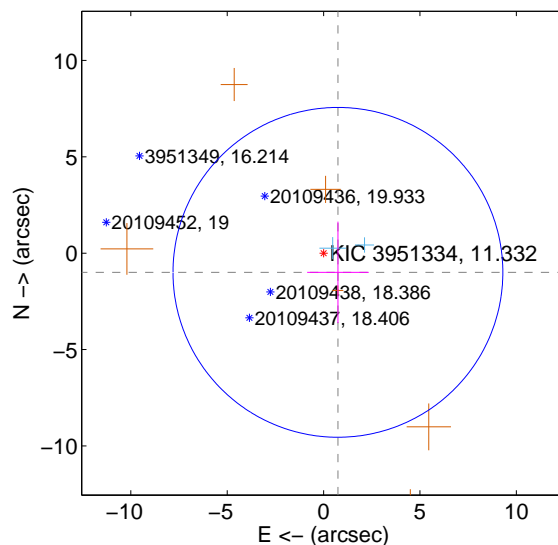
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.249 ± 3.070	0.41	-0.888 ± 2.105	-0.877 ± 2.619
PRF-fit source offset from KIC position	1.242 ± 2.851	0.44	-0.744 ± 1.599	-0.995 ± 2.630
photometric centroid source offset	0.50 ± 0.45	1.10	0.23 ± 0.40	-0.44 ± 0.46

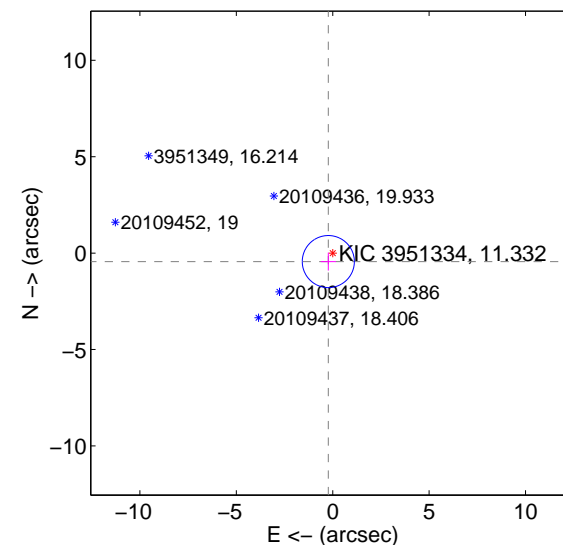
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

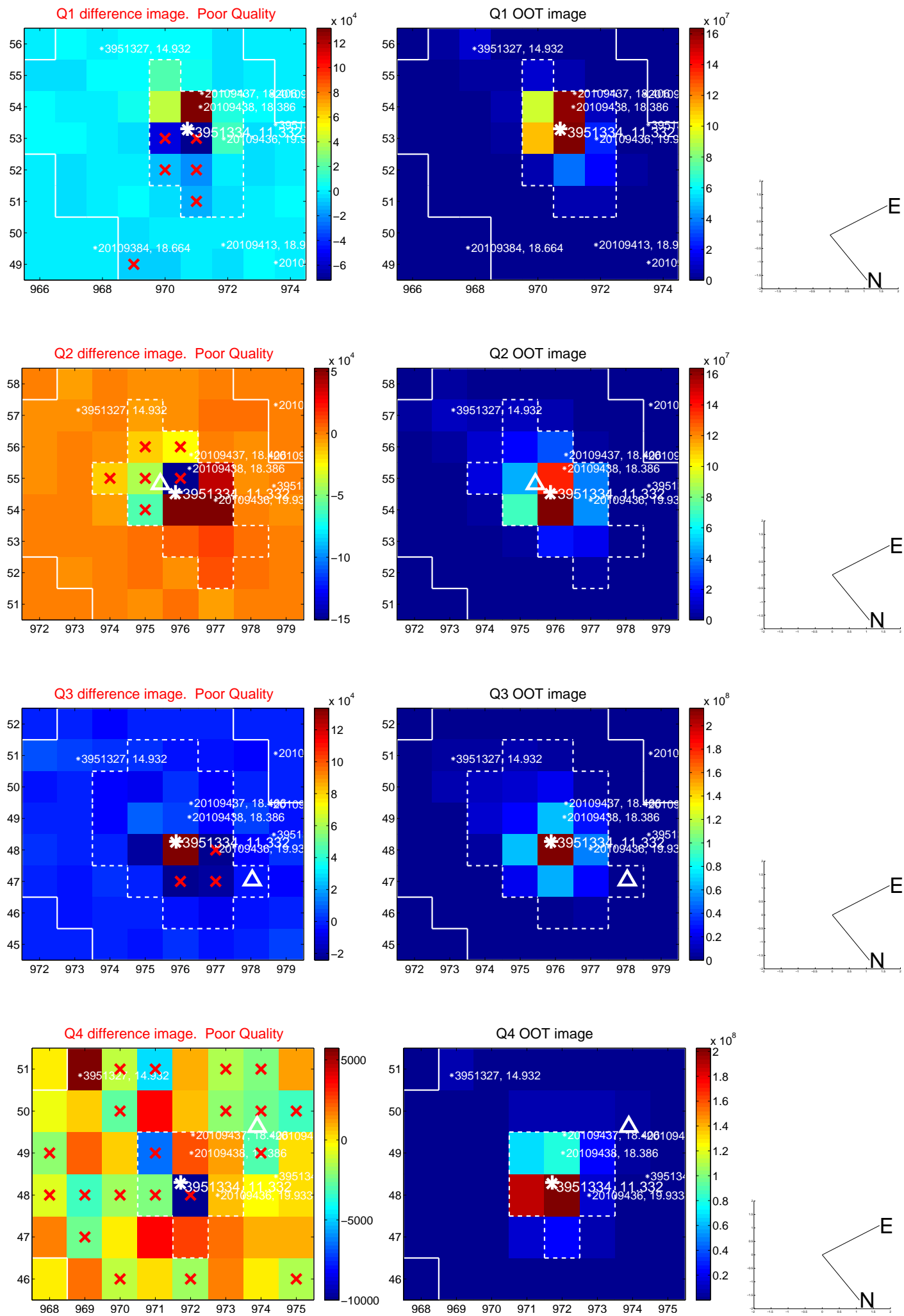


offset from photometric centroids

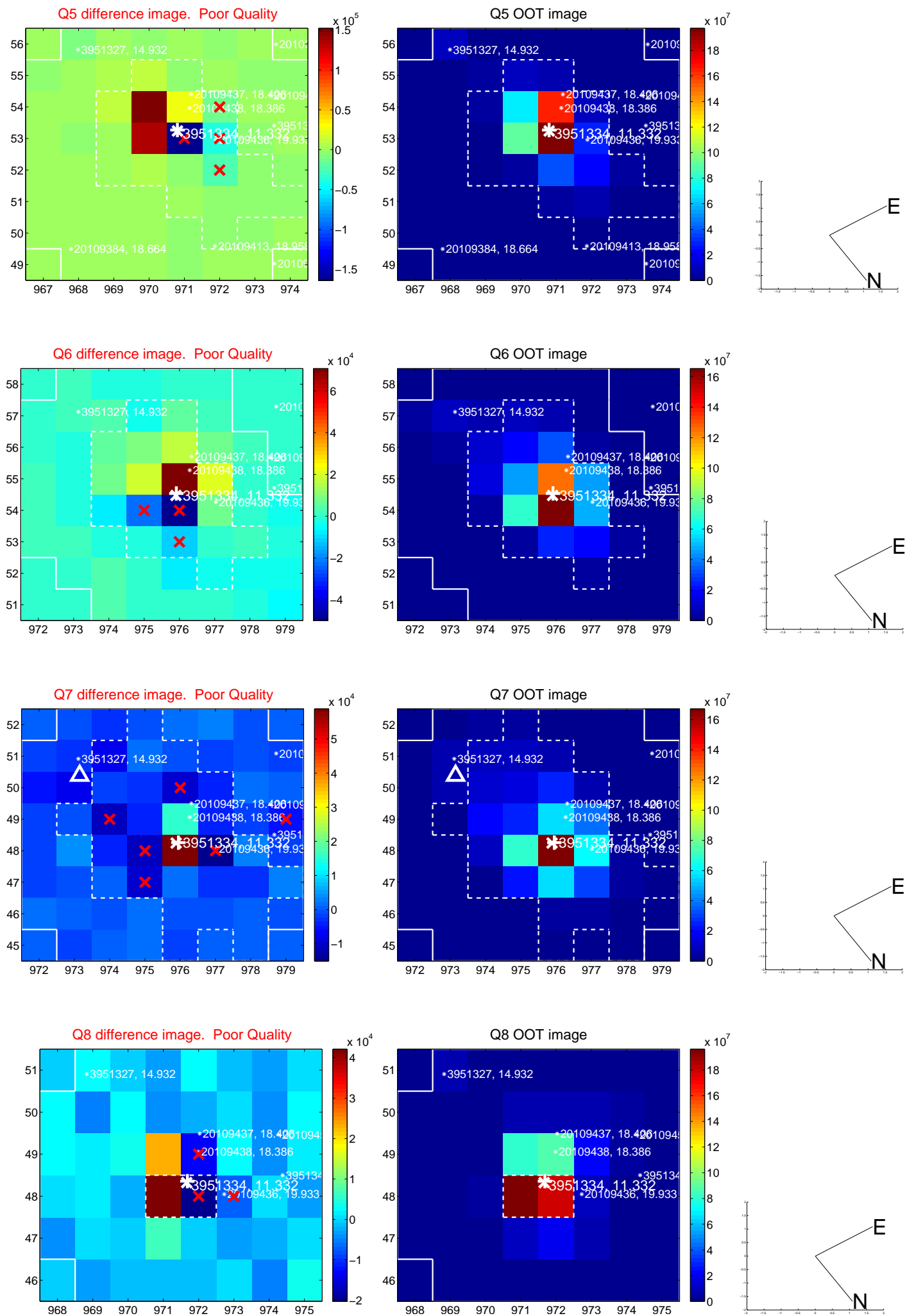


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

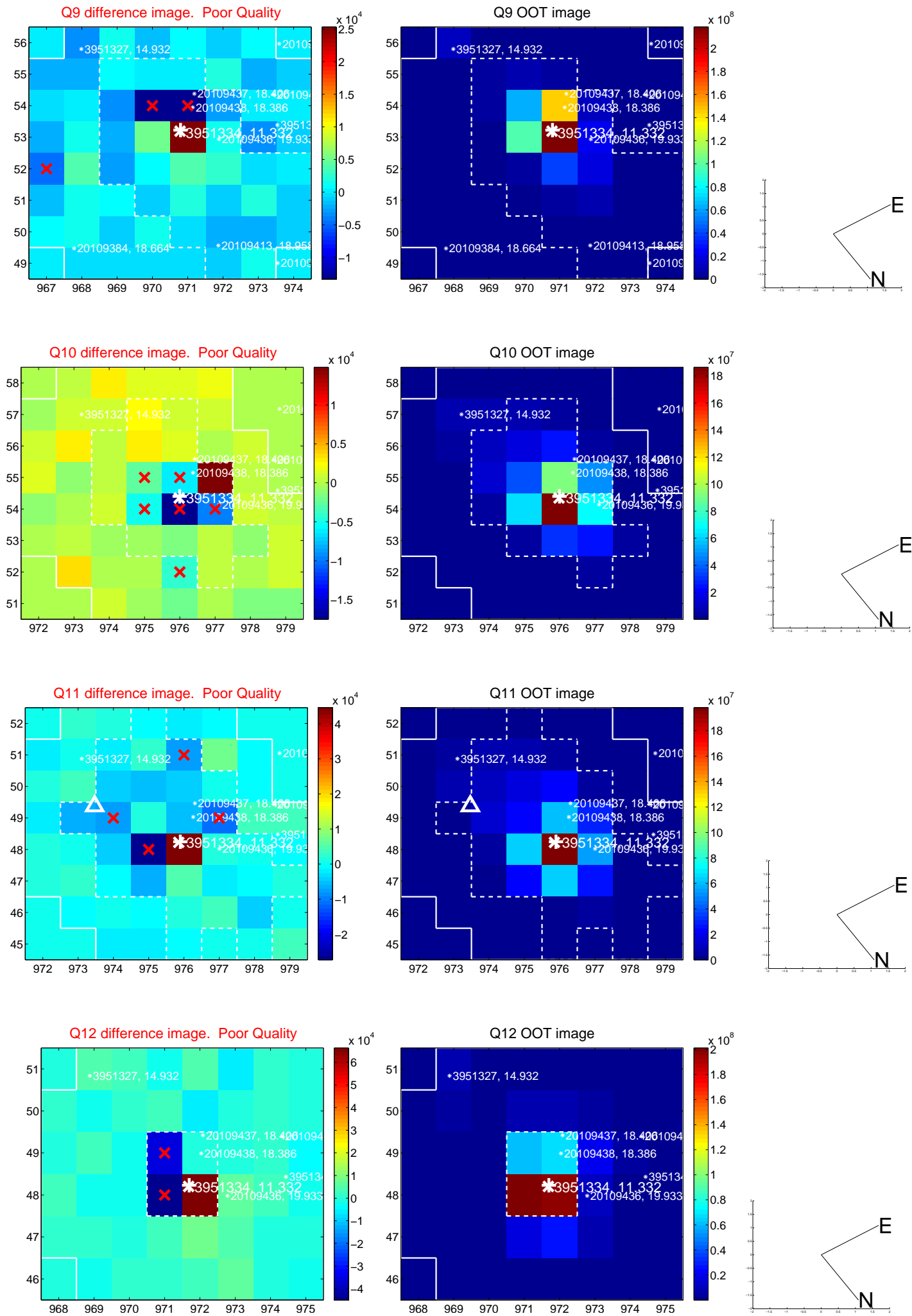
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



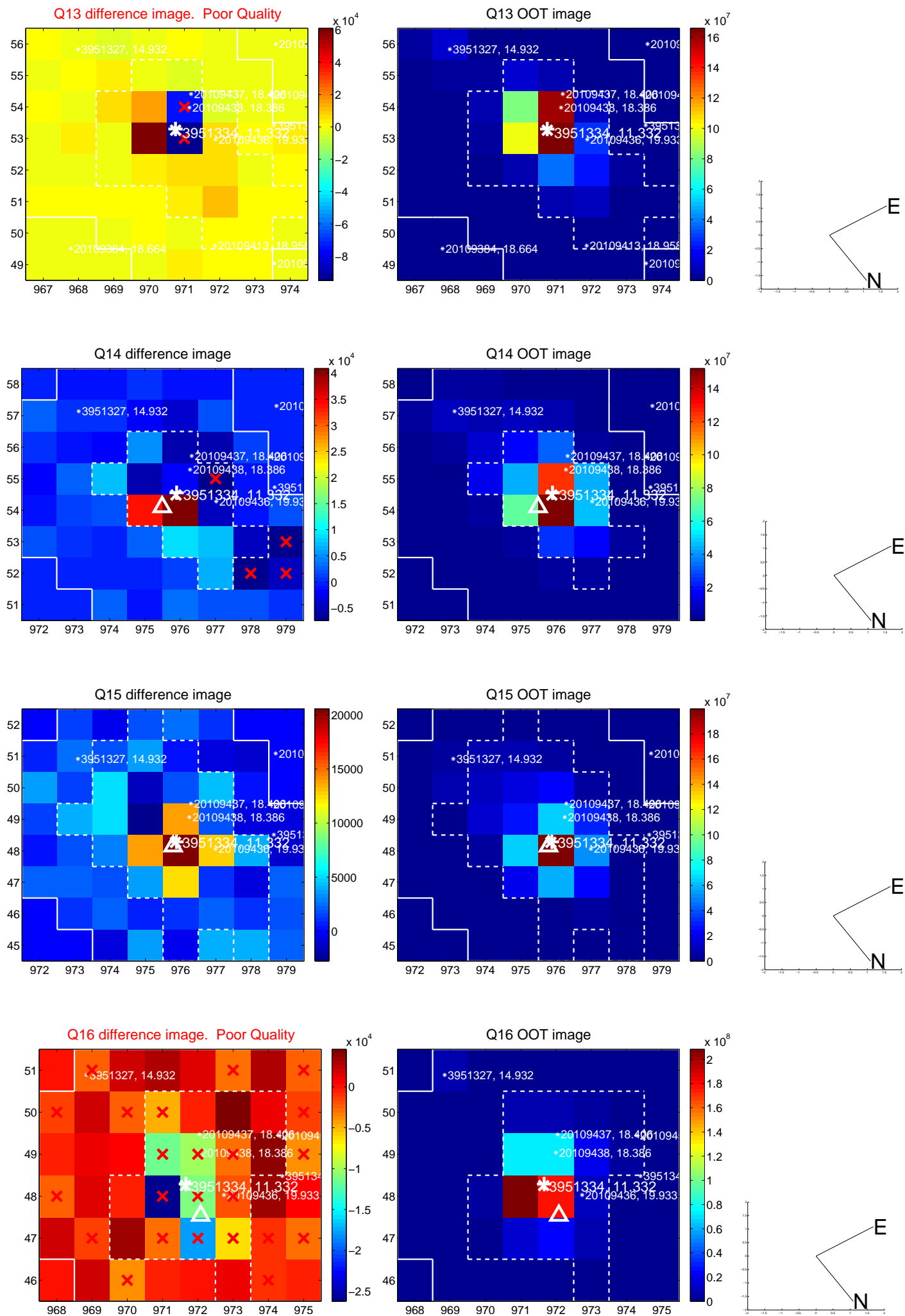
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



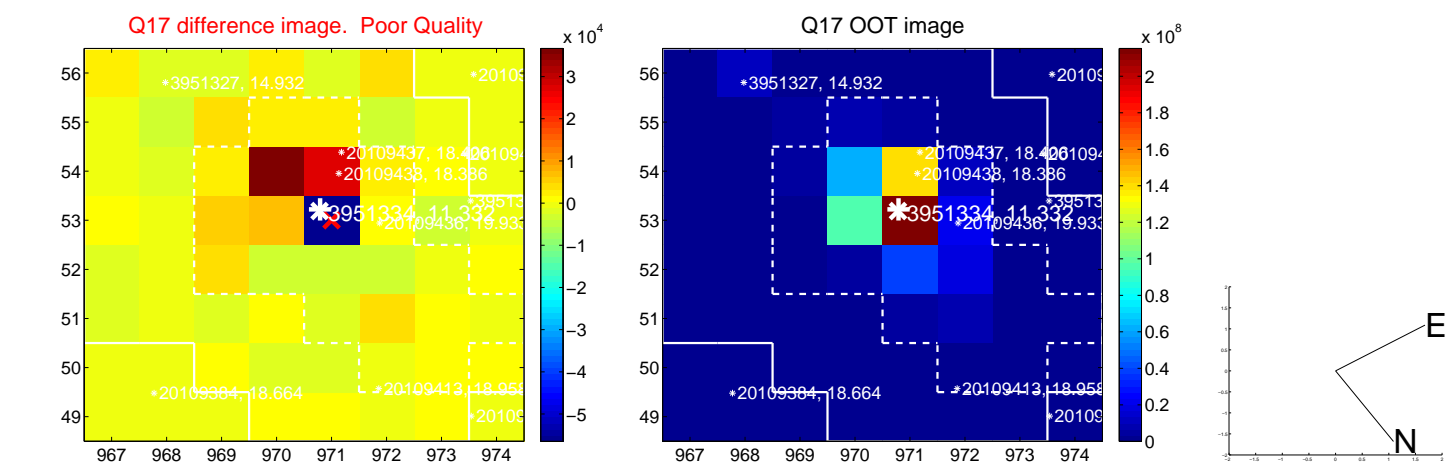
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



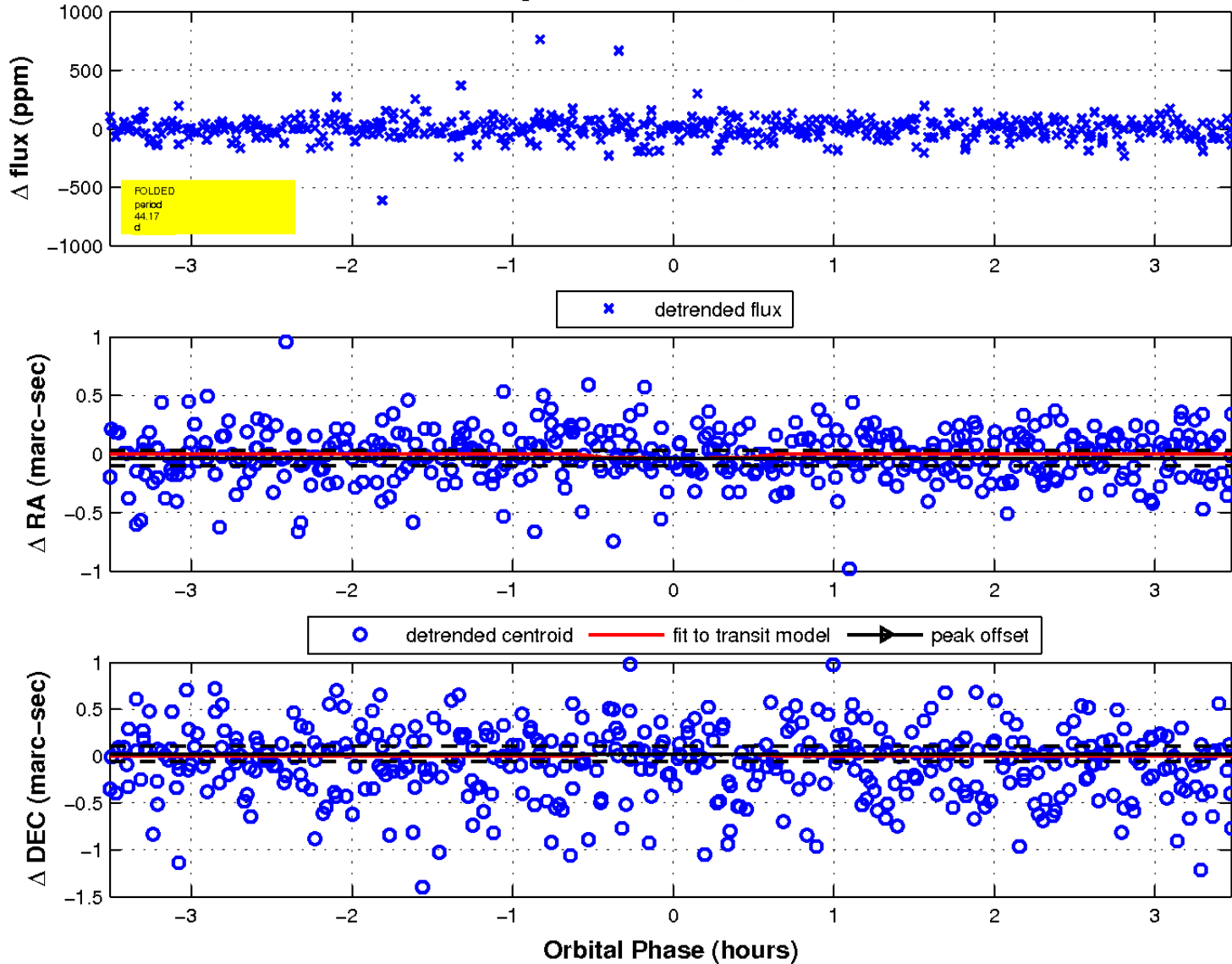
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

