

KIC 004370956

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})
004370956-01	OBS	No	0.546412	131.560384	6.0	4.087	8.7	4.5	1.73	6468	0.43	23226.23
004370956-02	OBS	No	8.194135	133.476619	206.5	1.500	28.0	-1.0	1.73	6468	2.51	628.06
004370956-03	OBS	No	8.190508	134.032331	1486.8	0.799	19.1	24.0	1.73	6468	7.40	628.43
004370956-04	OBS	No	4.097475	133.929744	96.9	1.500	13.5	-1.0	1.73	6468	1.72	1582.40
004370956-05	OBS	No	10.539084	135.243248	345.0	1.354	10.5	9.3	1.73	6468	3.24	449.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004370956-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004370956-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_SATURATED
004370956-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
004370956-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—SWEET_NTL—LPP_DV—NO_FITS—SAME_NTL_PERIOD—CENT_SATURATED
004370956-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

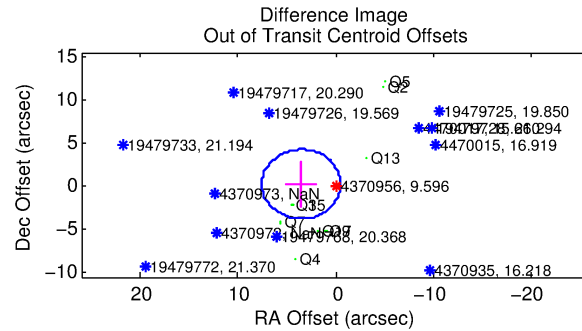
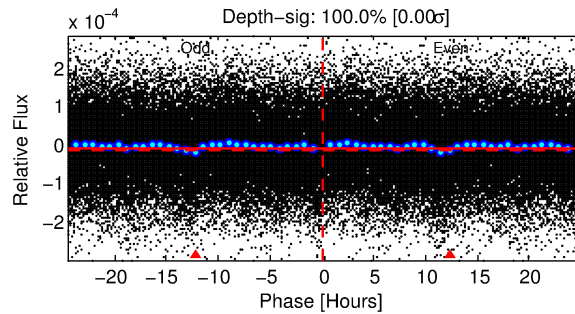
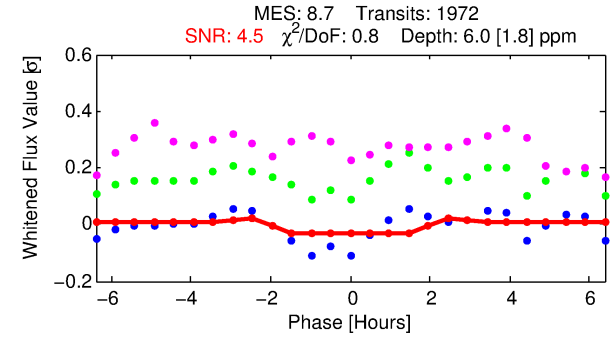
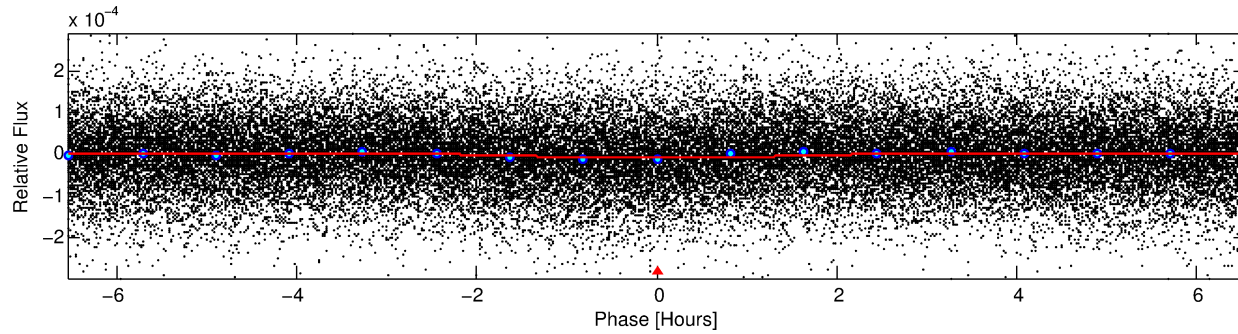
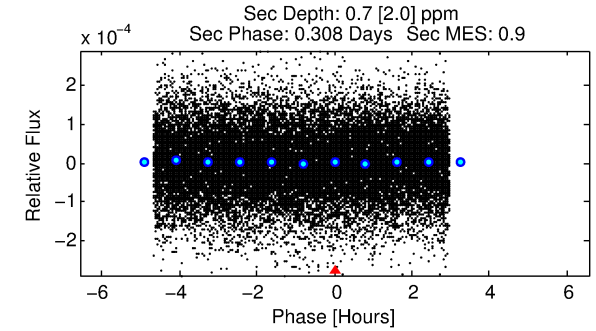
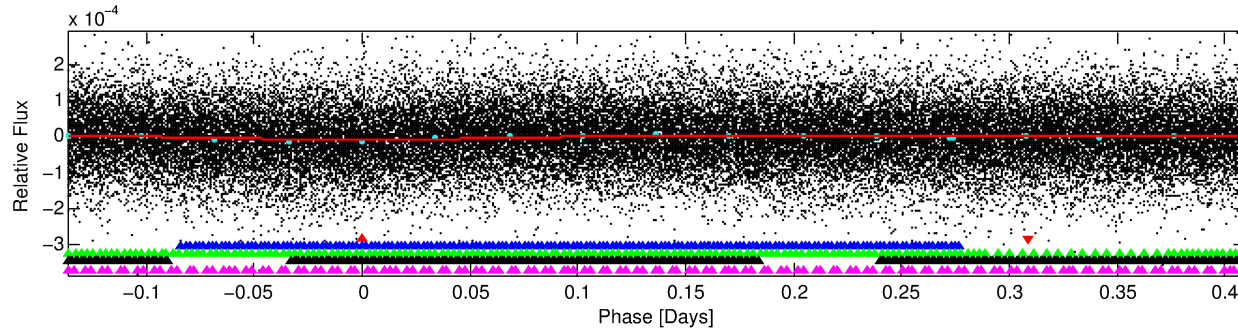
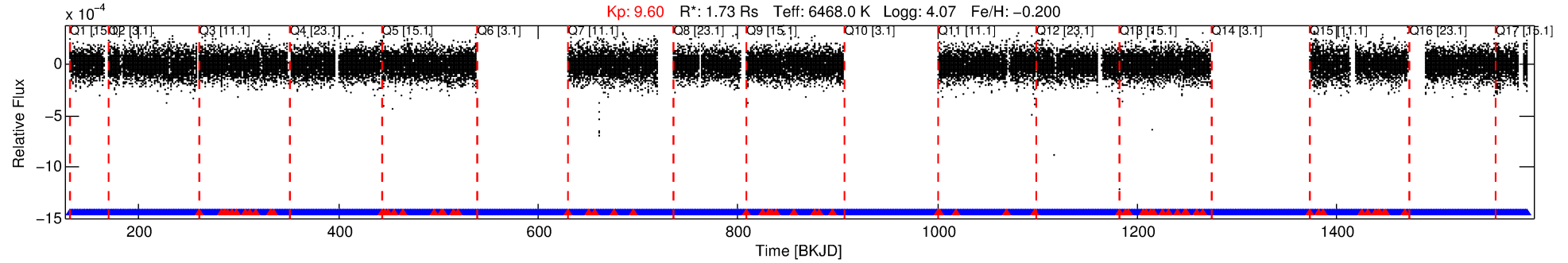
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004370956-01

No Significant Match Found

DV One-Page Summary

KIC: 4370956 Candidate: 1 of 5 Period: 0.546 d



DV Fit Results:

Period = 0.54641 [0.00002] d
Epoch = 131.5604 [0.0050] BKJD
 $R_p/R^* = 0.0023$ [0.0024]
 $a/R^* = 1.19$ [1.99]
 $b = 0.29$ [17.99]
 $S_{\text{eff}} = 23226.23$ [11726.89]
 $T_{\text{eq}} = 3148$ [397] K
 $R_p = 0.43$ [0.48] R_e
 $a = 0.0142$ [0.0044] AU
 $A_g = 0.43$ [1.51] $[-0.38\sigma]$
 $T_{\text{eff}} = 3933$ [3450] K [0.23σ]

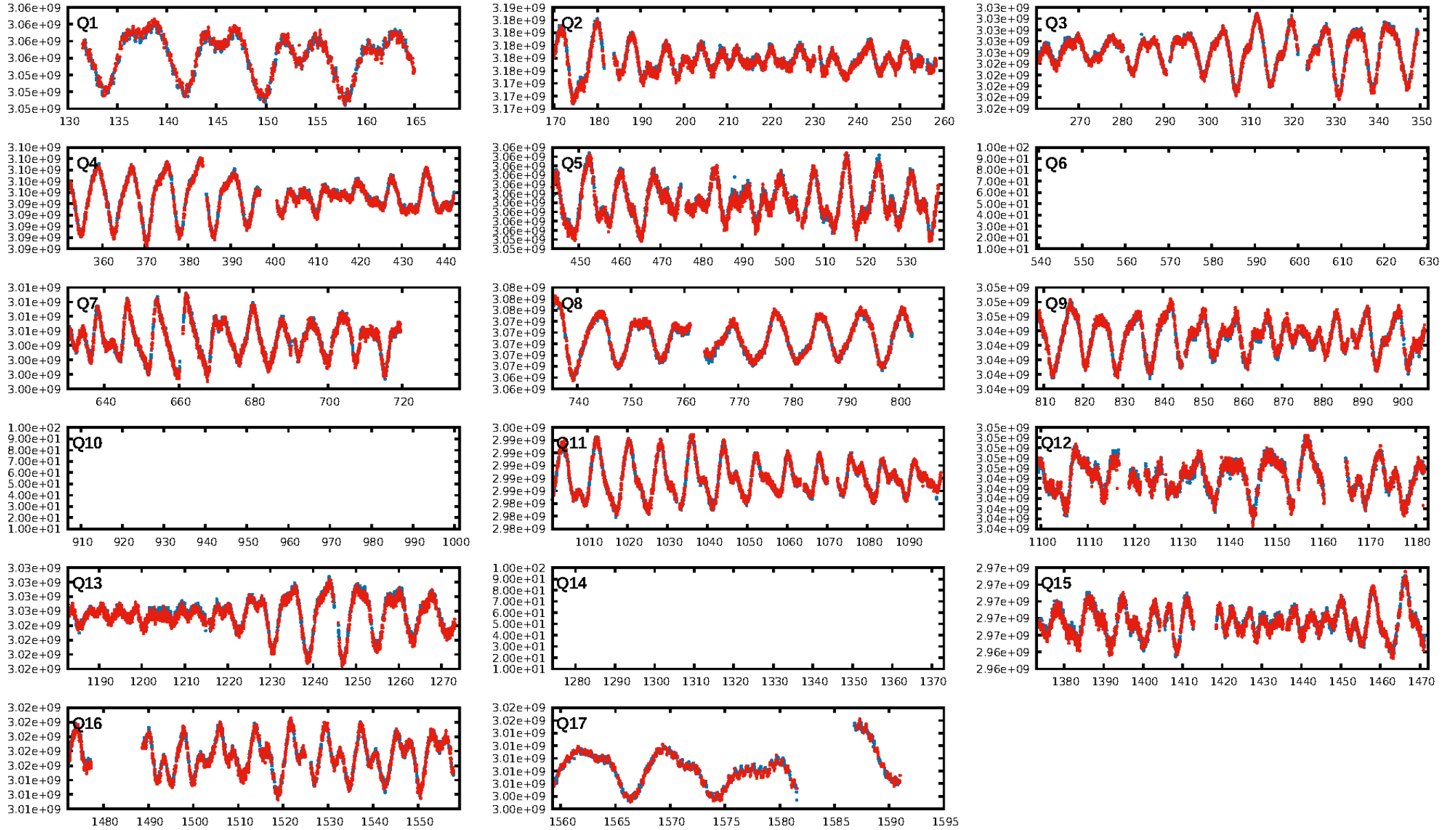
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [19.58σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.25e-03
RollingBand-fgt: 0.97 [1796/1861]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 6.756 arcsec [3.66σ]
OotOffset-rm: 3.541 arcsec [2.65σ]
KicOffset-rm: 3.281 arcsec [3.74σ]
OotOffset-st: 1/3/1/4 [9]
KicOffset-st: 1/3/1/4 [9]
DiffImageQuality-fgm: 0.33 [3/9]
DiffImageOverlap-fno: 1.00 [14/14]

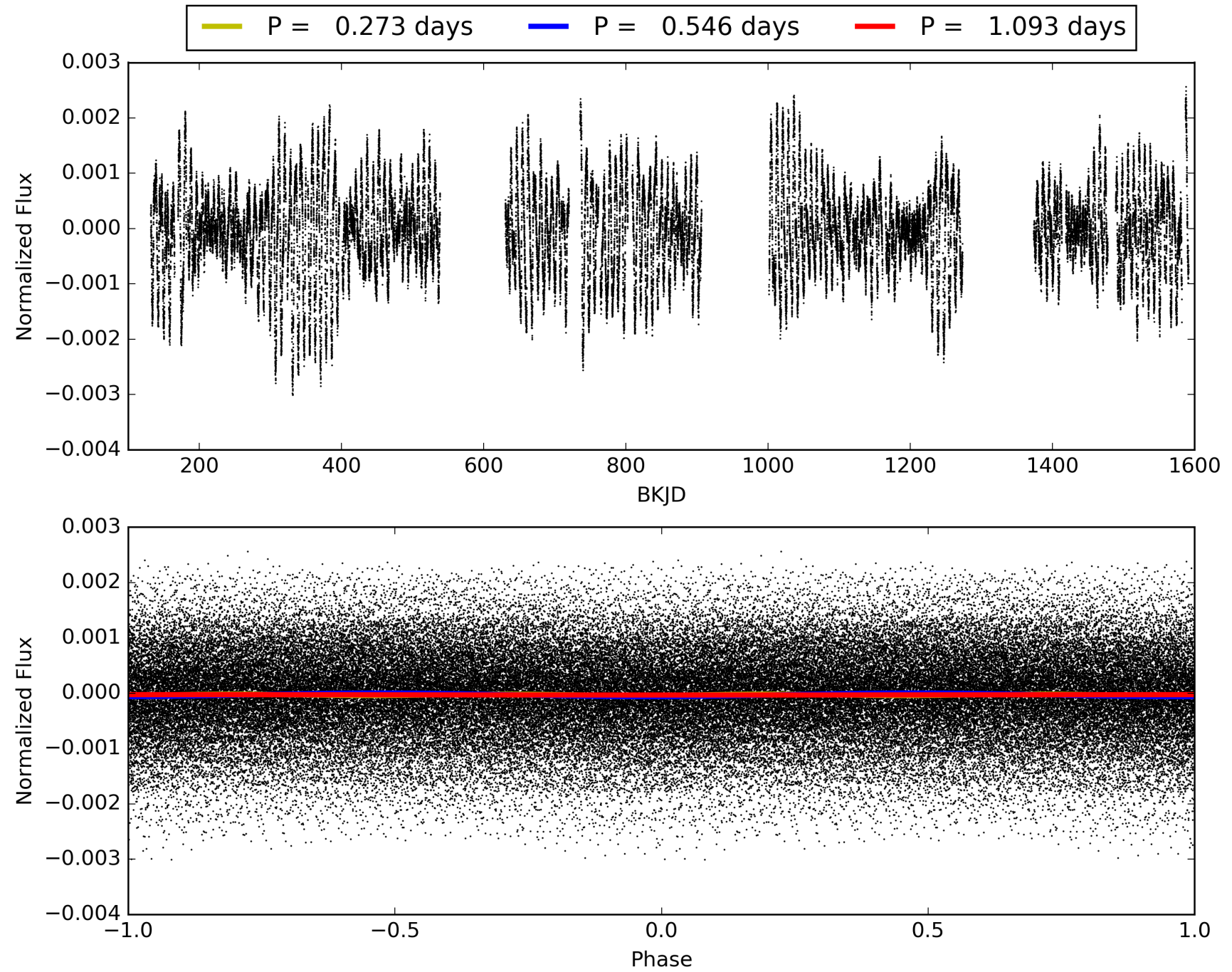
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:05:42 Z

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

TCE 004370956-01, PDC Light Curves

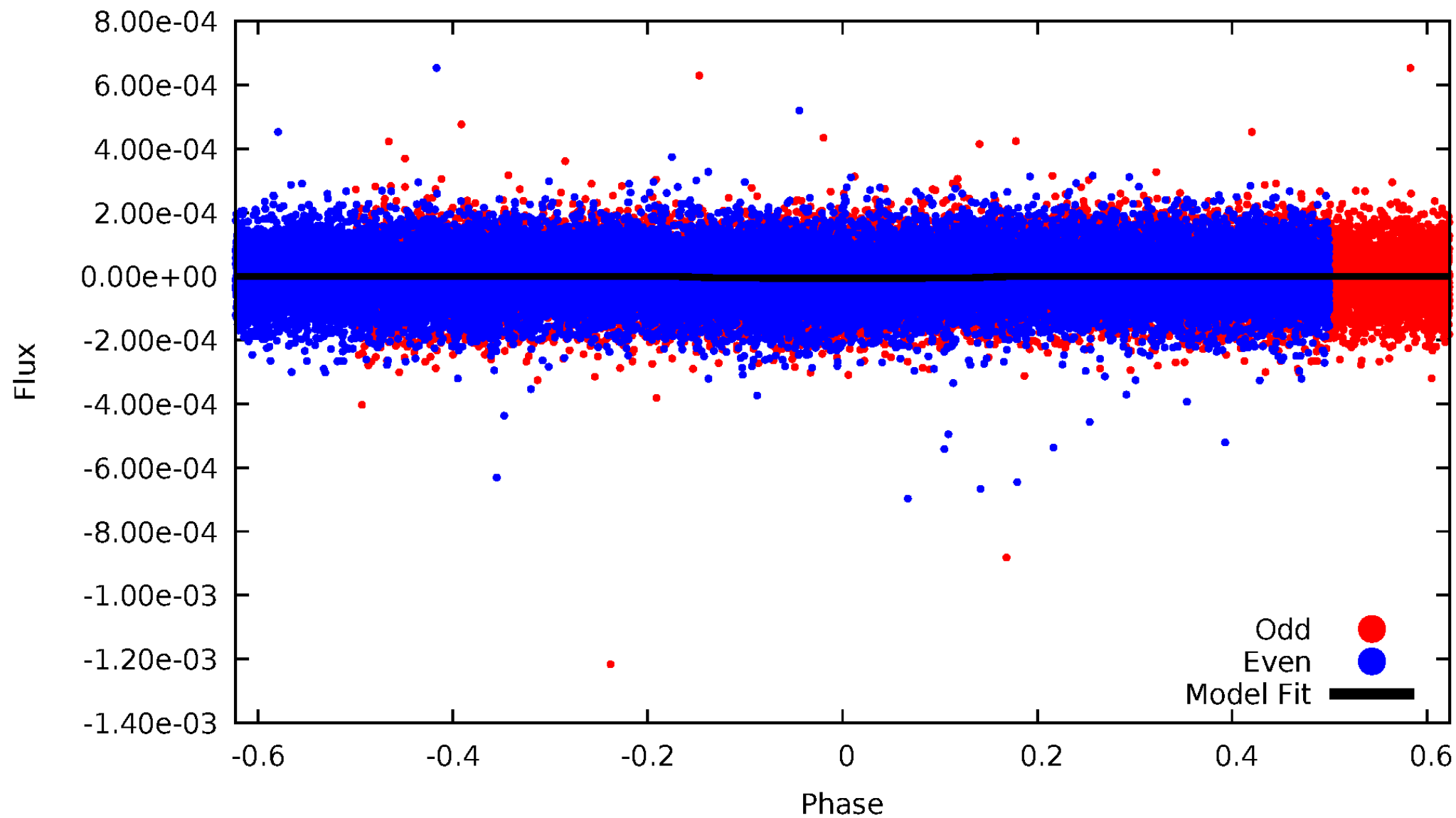


TCE 004370956-01



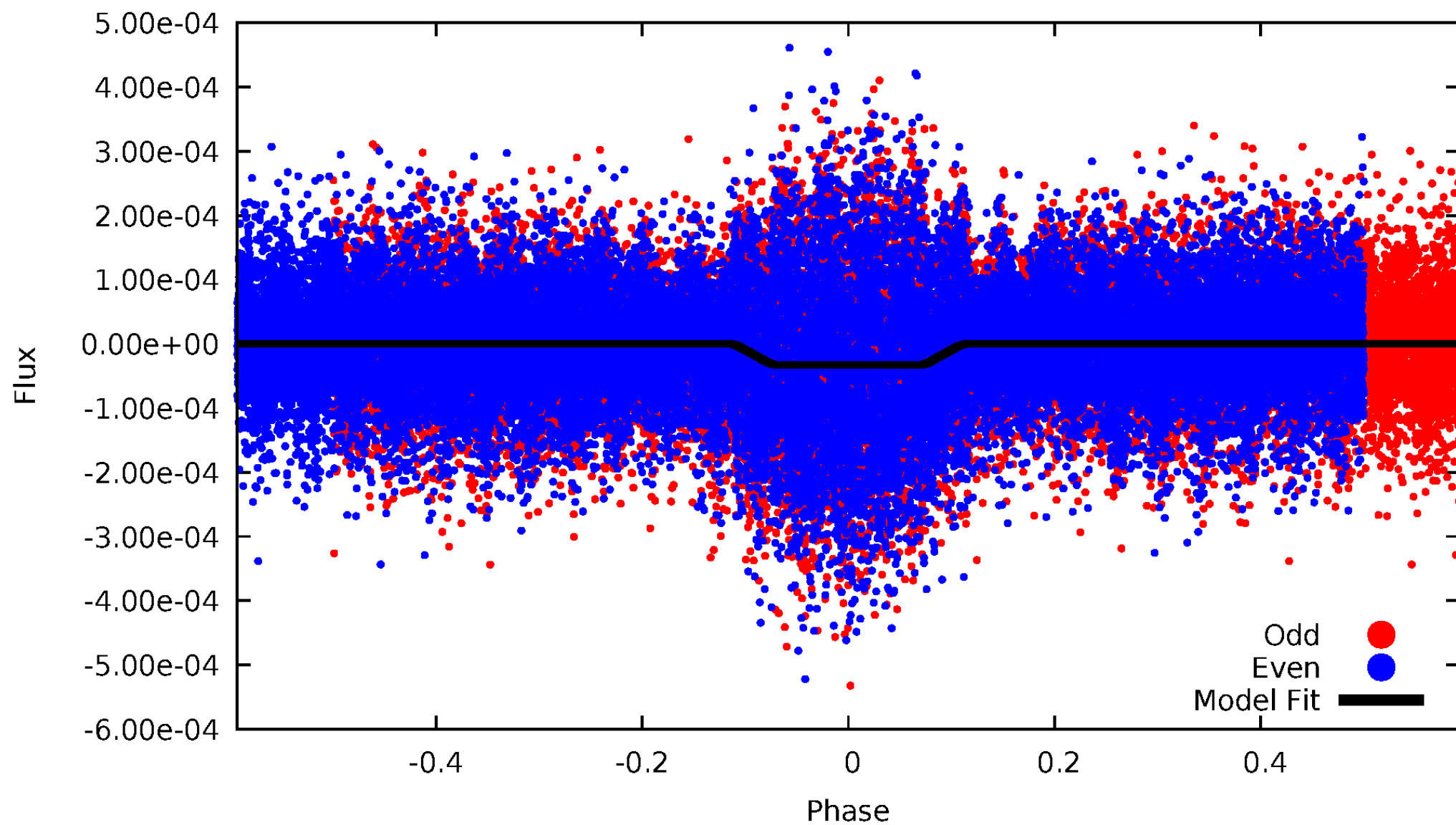
DV Odd/Even

TCE 004370956-01



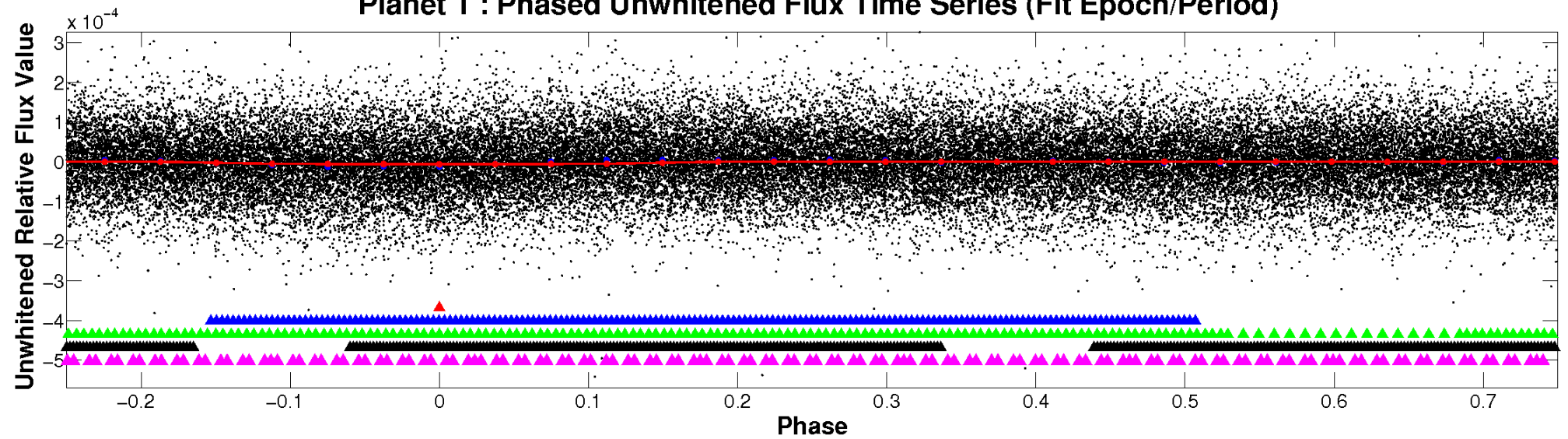
ALT Odd/Even

TCE 004370956-01

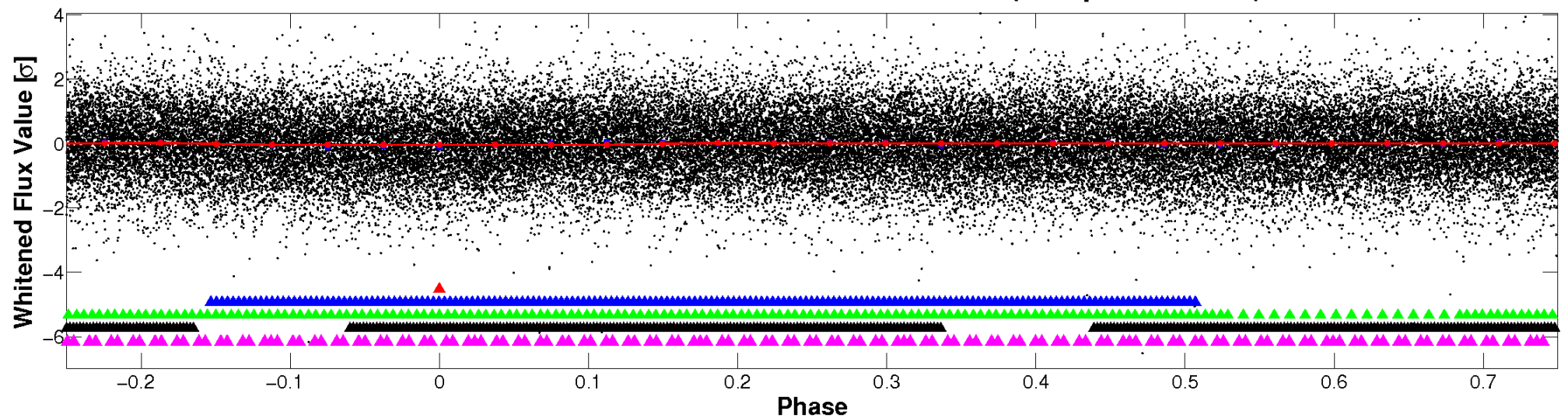


Non-Whitened Vs. Whitened Light Curve

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

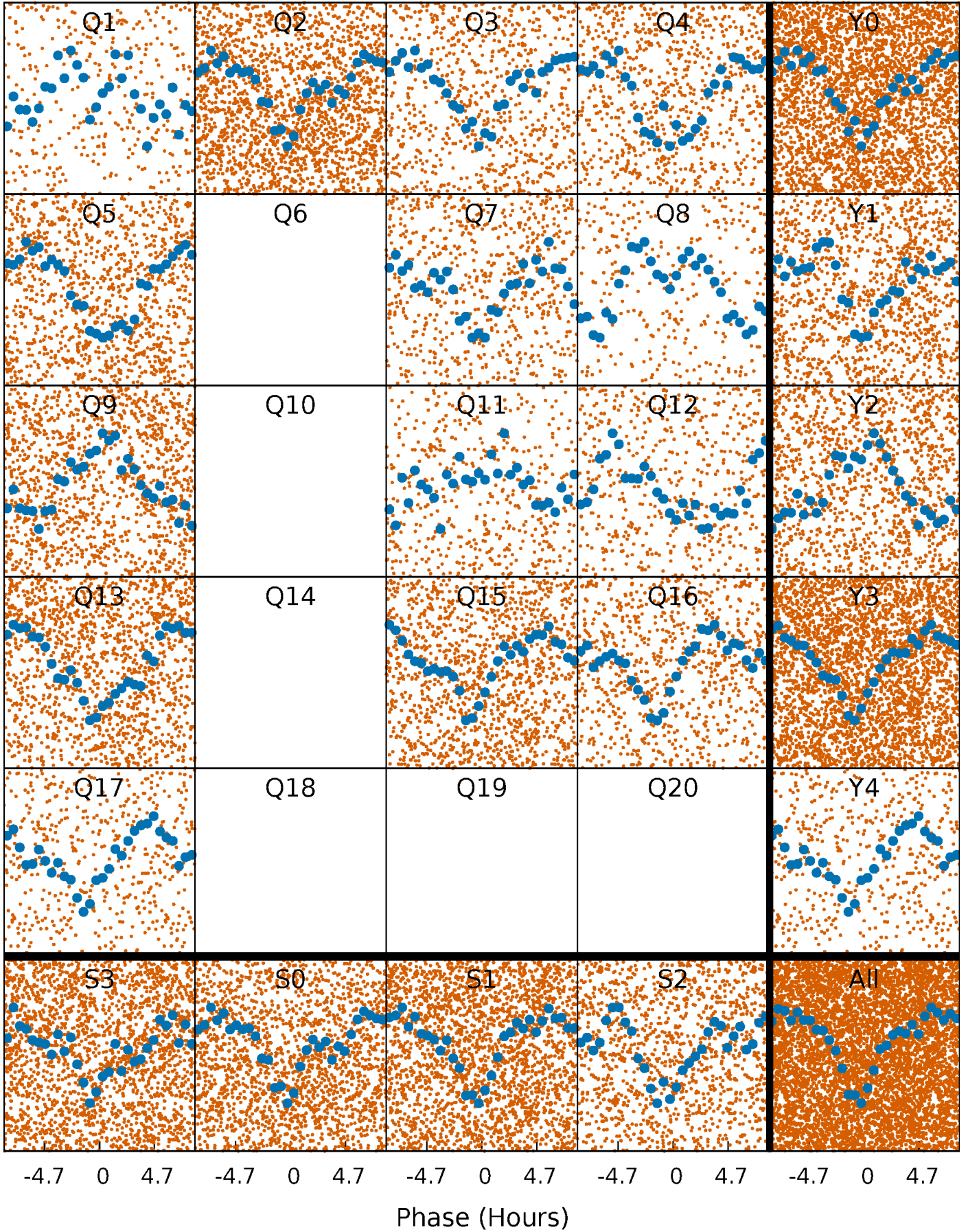


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



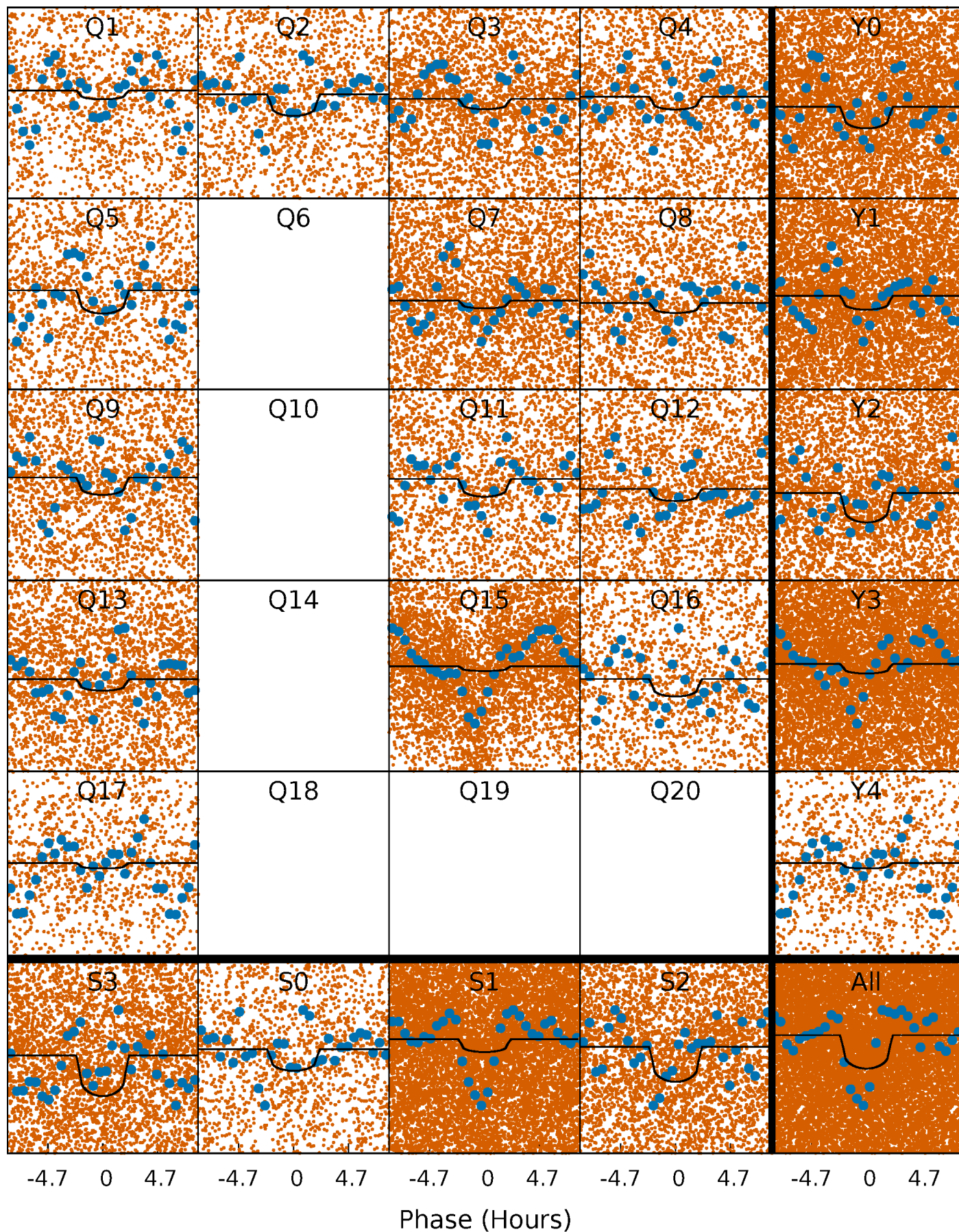
PDC Quarter-Phased Transit Curves

TCE 004370956-01 P= 0.546412 Days $T_0=131.560384$ (BKJD)



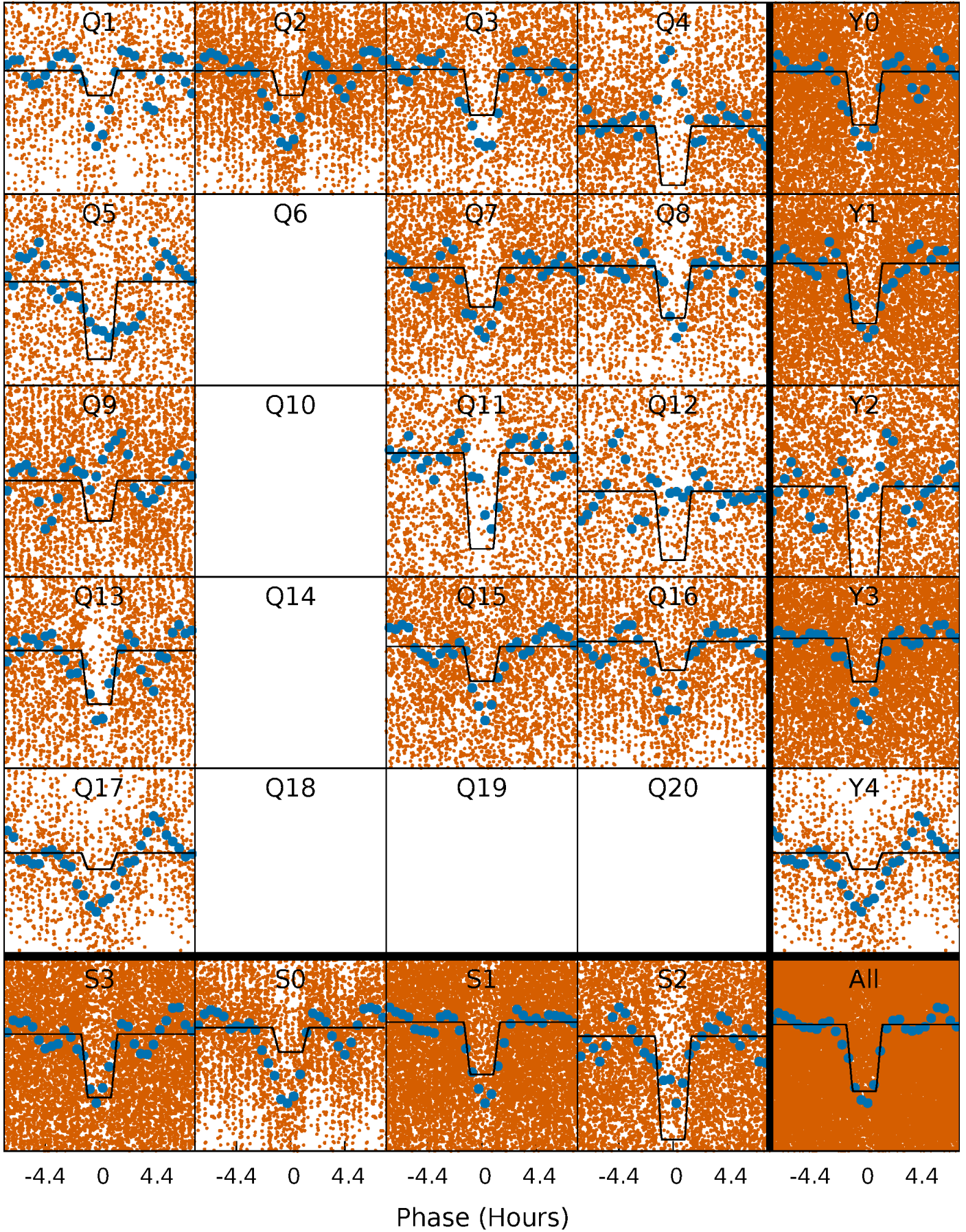
DV Quarter-Phased Transit Curves

TCE 004370956-01 P= 0.546412 Days $T_0=131.560384$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

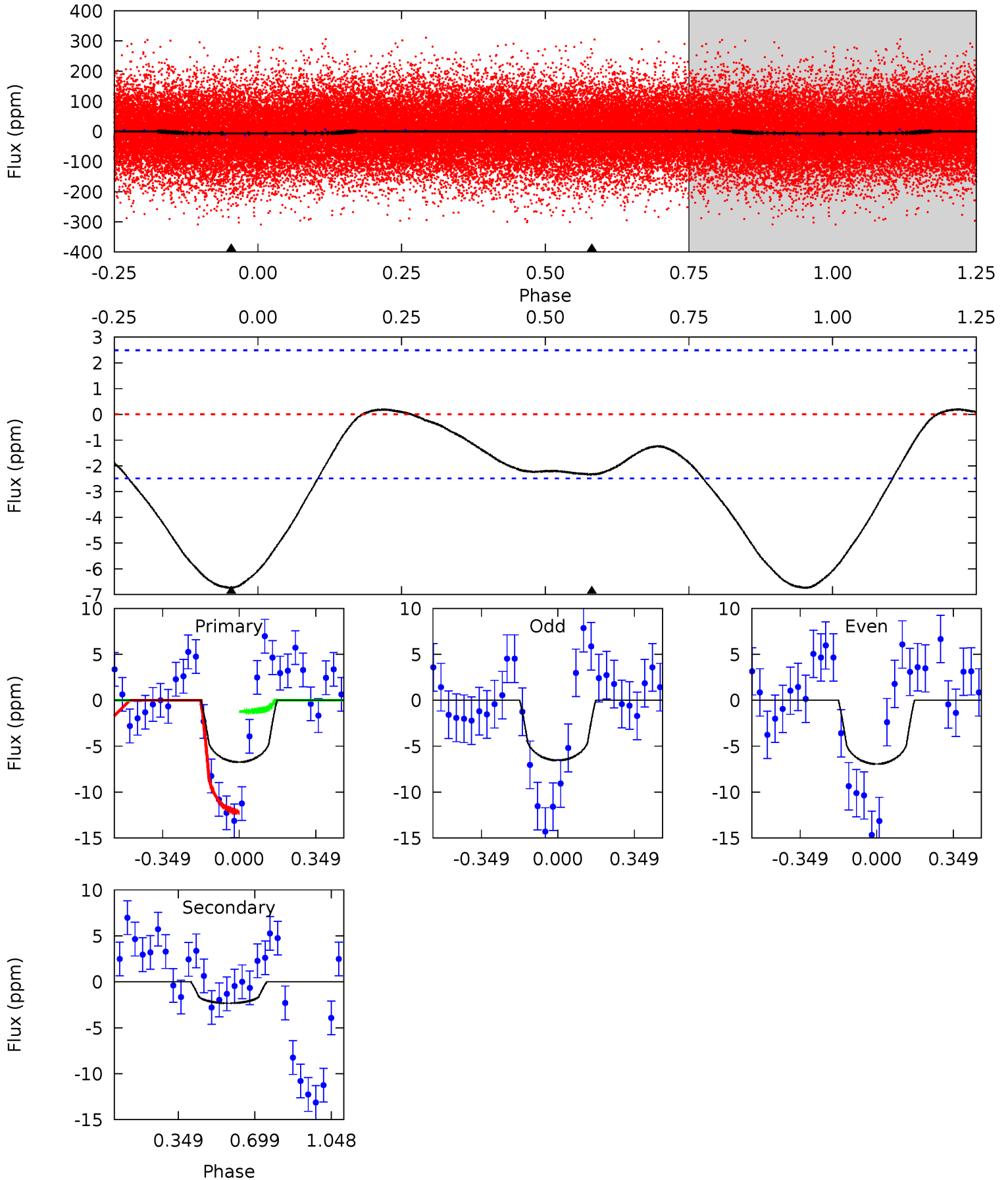
TCE 004370956-01 P= 0.546398 Days $T_0=131.551722$ (BKJD)



DV Model-Shift Uniqueness Test

004370956-01, P = 0.546412 Days, E = 131.013972 Days

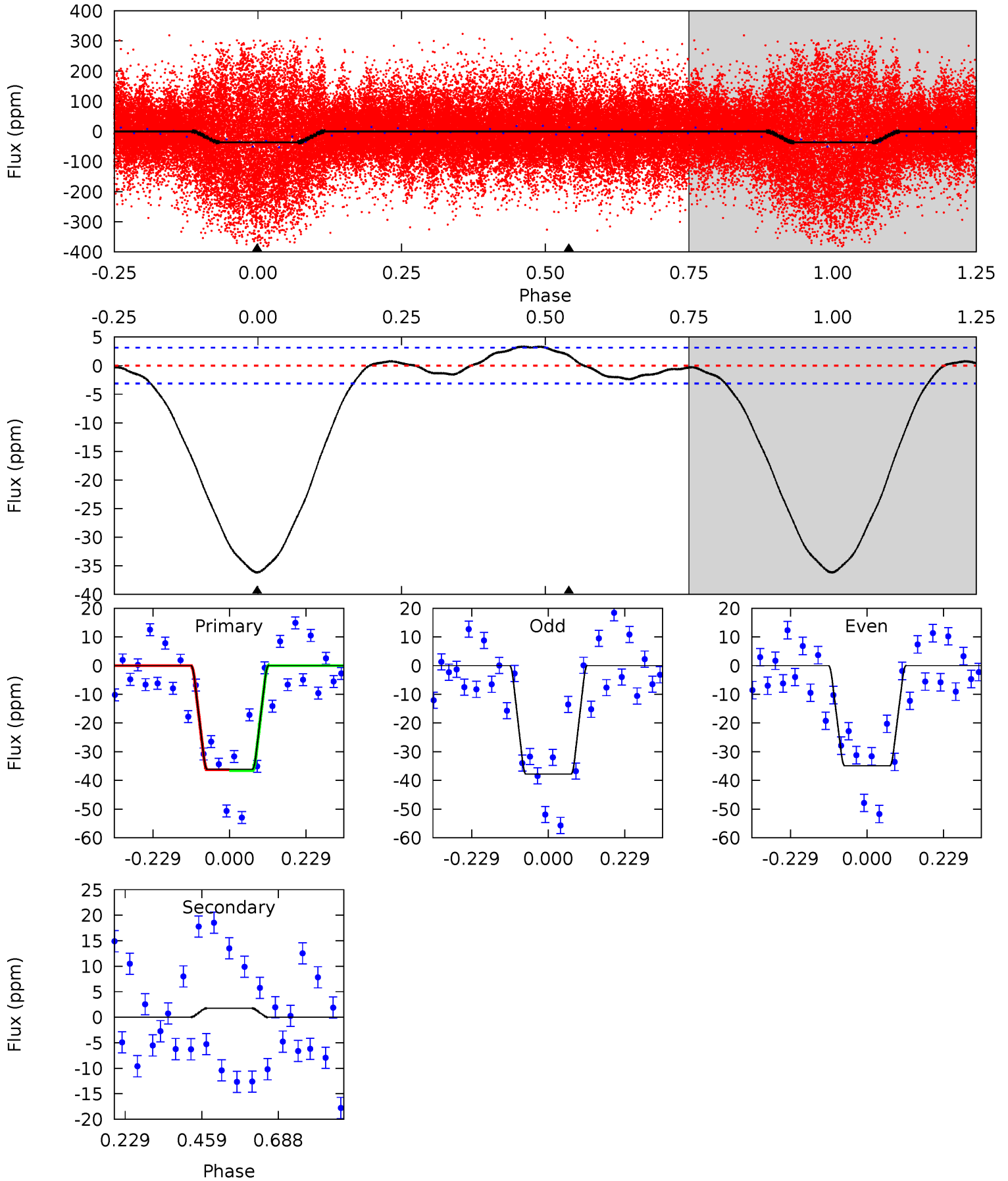
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	4.03	0	0	4.30	0.94	0.34	11.6	11.6	4.03	4.03	0.34	0.96	0.03	9.57



Alt Model-Shift Uniqueness Test

004370956-01, P = 0.546398 Days, E = 131.005324 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
50.7	-2.46	0	0	4.39	1.20	1.01	50.7	50.7	-2.46	-2.46	2.03	0.91	0.08	0.20



Stellar Parameters For KIC 004370956

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6468^{+181}_{-227}	$4.070^{+0.280}_{-0.172}$	$-0.200^{+0.250}_{-0.300}$	$1.730^{+0.477}_{-0.583}$	$1.288^{+0.172}_{-0.257}$	$0.350^{+0.659}_{-0.150}$
	+3%/-4%	+7%/-4%	+125%/-150%	+28%/-34%	+13%/-20%	+188%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004370956-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2 ± 1	$0.51^{+0.44}_{-0.30}$	4342^{+372}_{-390}	4402^{+3213}_{-7066}	$0.908^{+5.576}_{-0.629}$
Alt.	2 ± 1	$1.04^{+0.53}_{-0.44}$	4359^{+374}_{-371}	-4292^{+294}_{-438}	$-0.168^{+0.107}_{-0.352}$

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

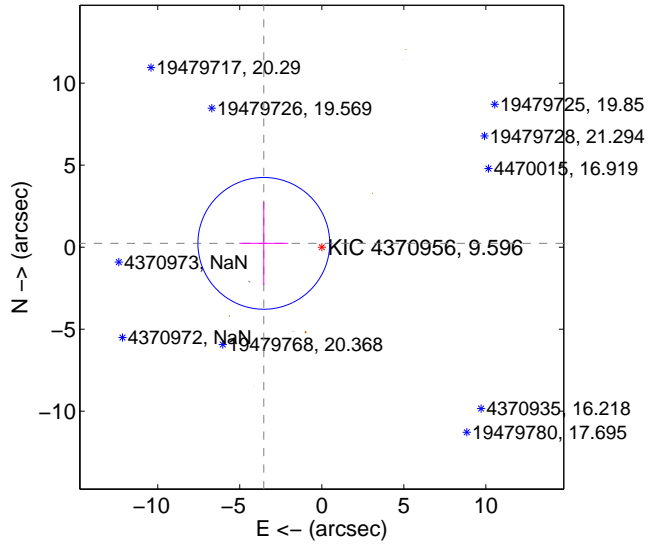
Supplemental centroid analysis for 004370956-01. **Kepler magnitude: 9.60.** Transit SNR 4.51

There are 3 quarters with good PRF difference image offsets

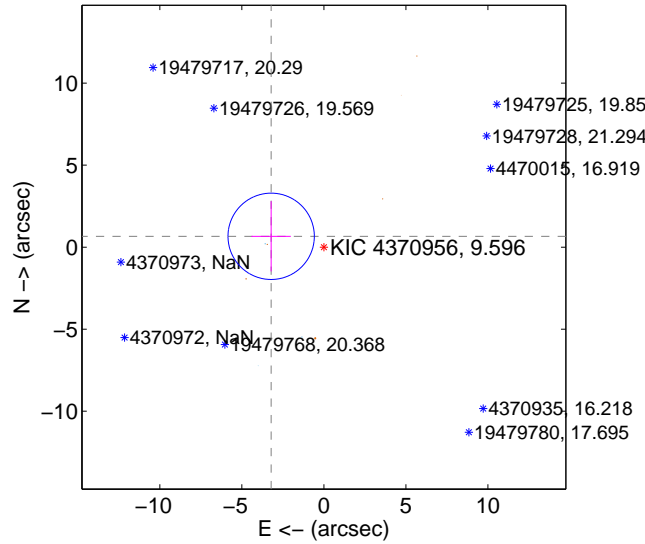
The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.541 ± 1.339	2.65	3.534 ± 1.491	0.232 ± 2.534
PRF-fit source offset from KIC position	3.281 ± 0.877	3.74	3.214 ± 1.201	0.662 ± 2.140
photometric centroid source offset	6.76 ± 1.85	3.66	-3.02 ± 1.42	6.04 ± 1.94

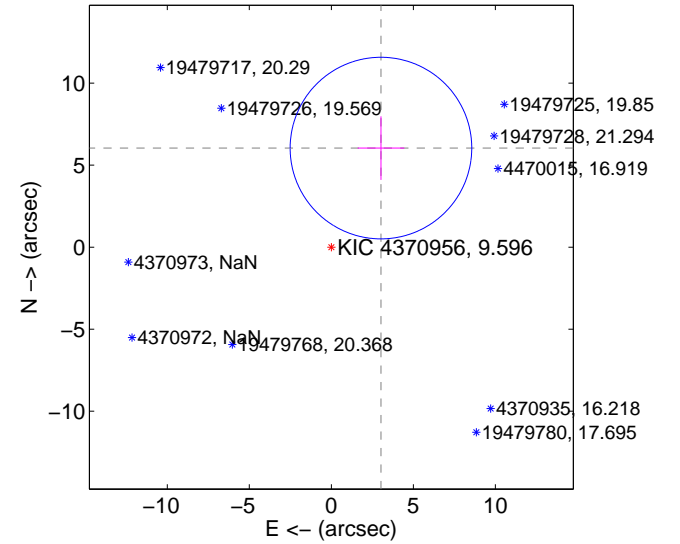
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

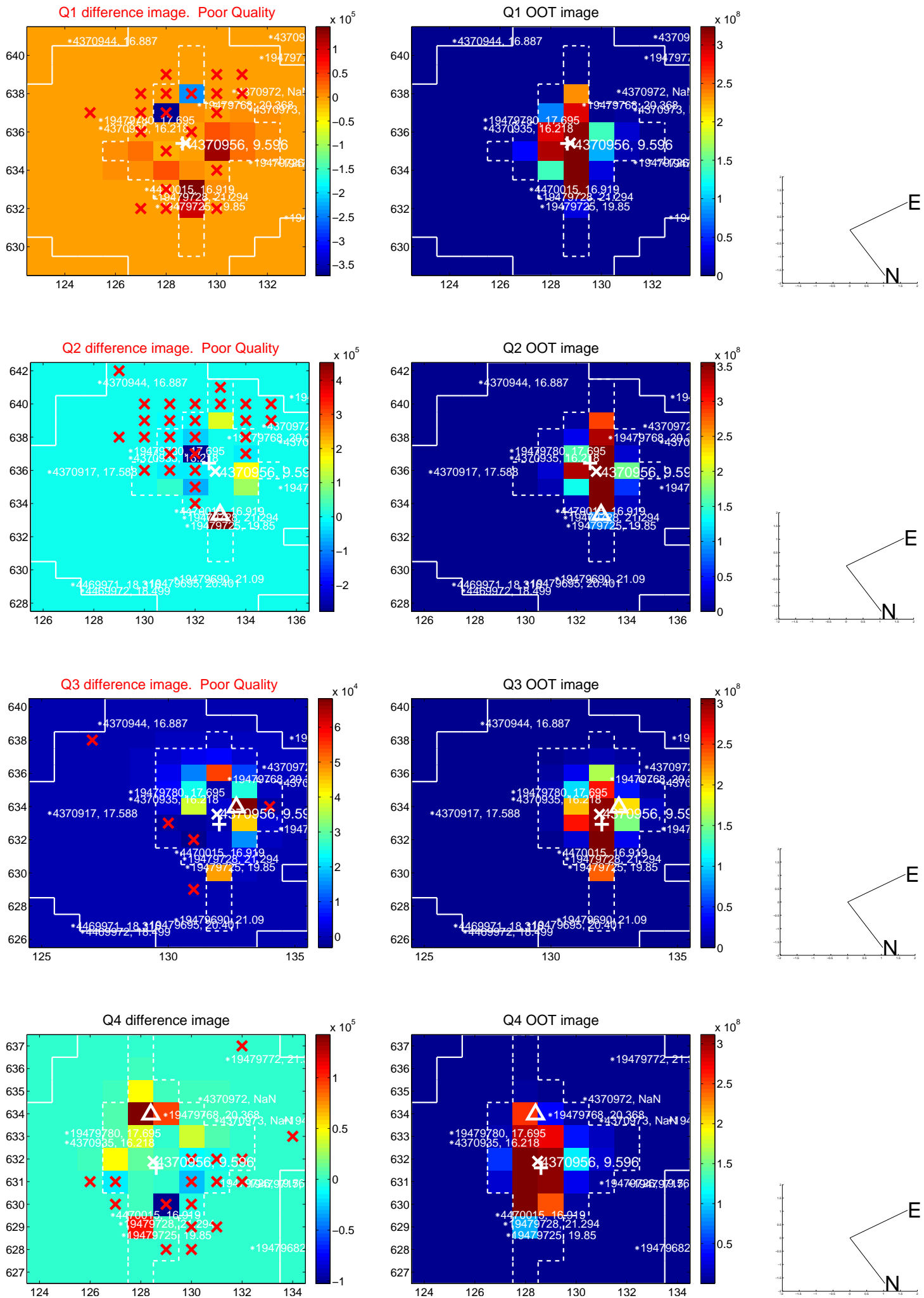


offset from photometric centroids

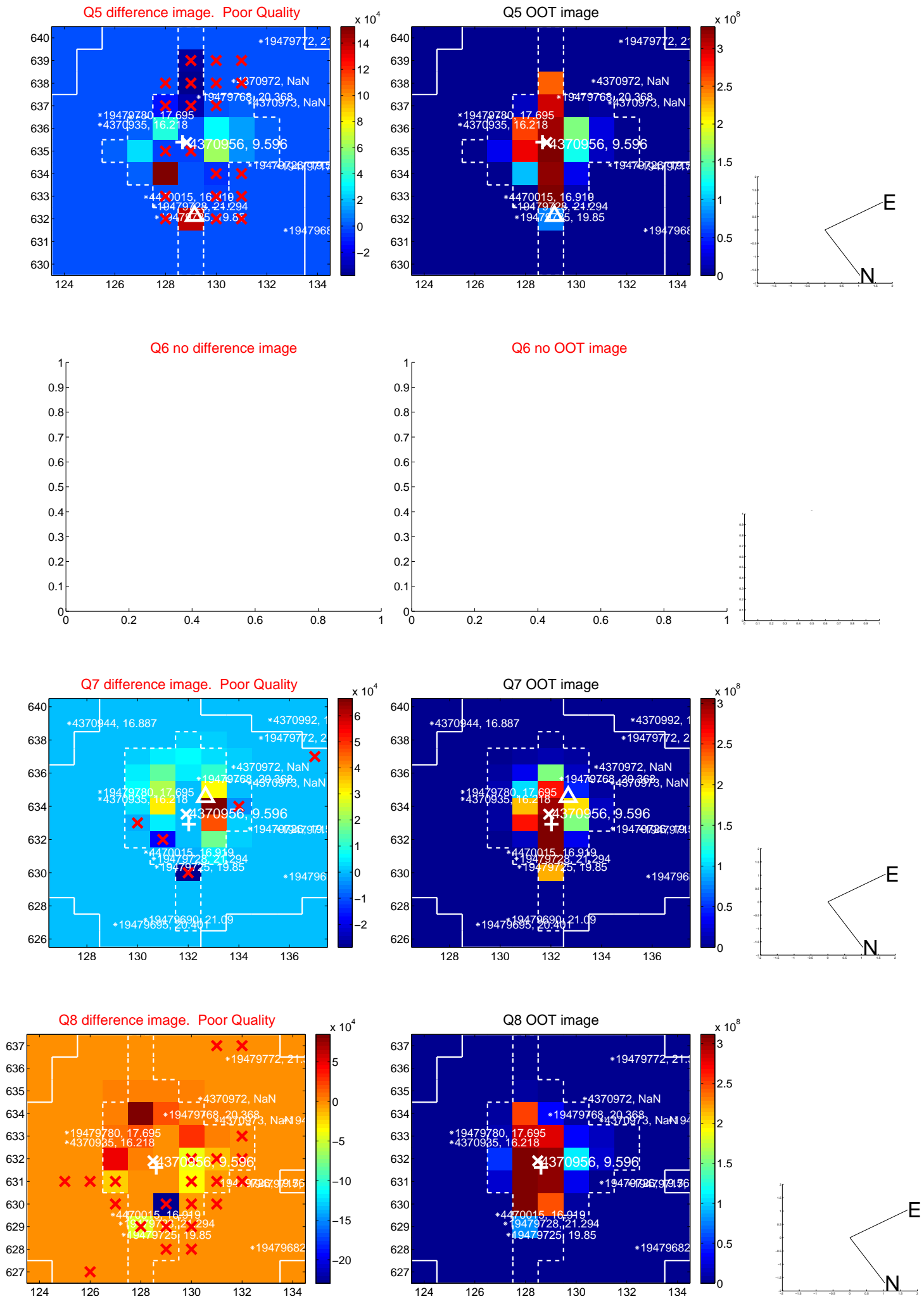


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

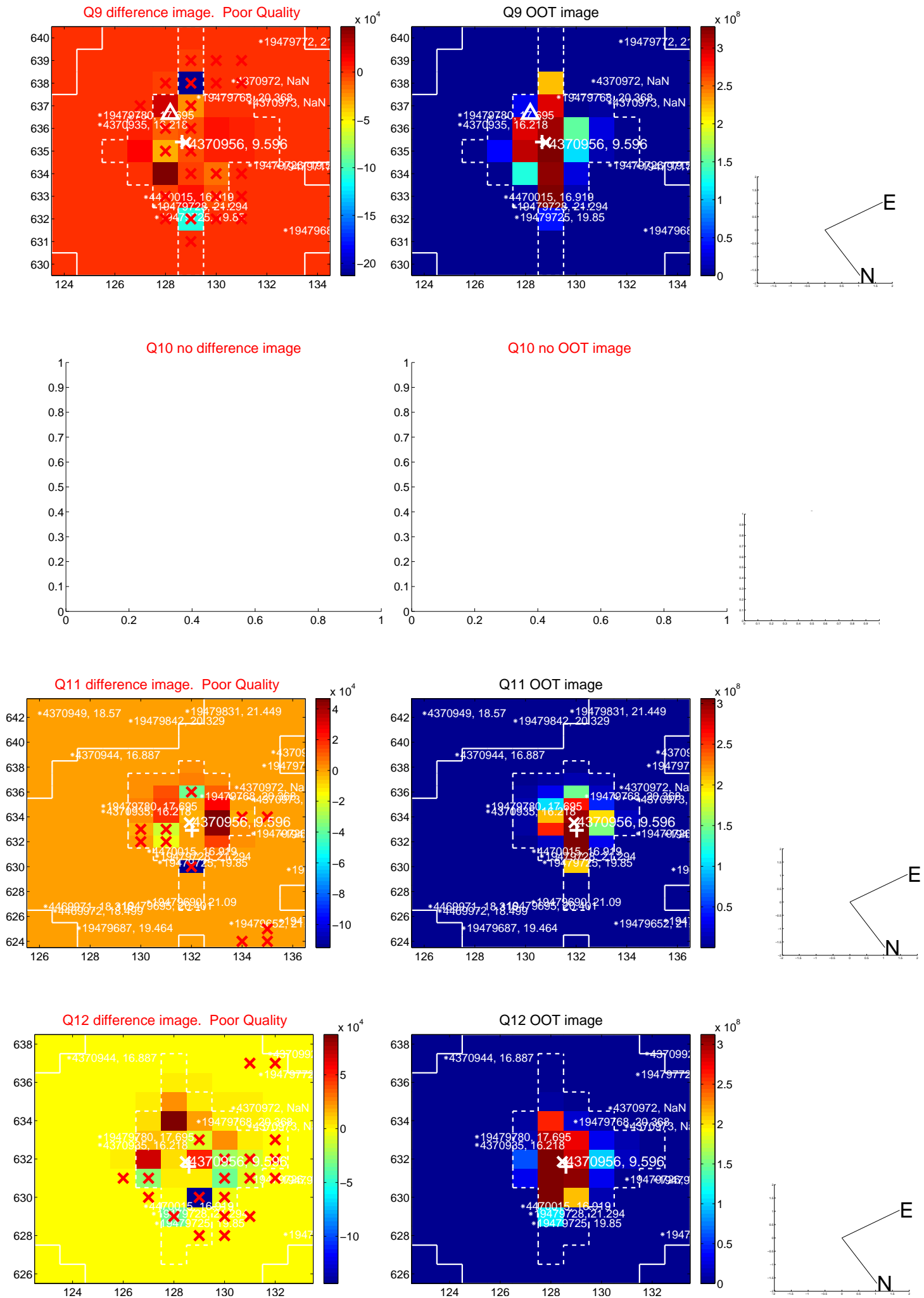
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



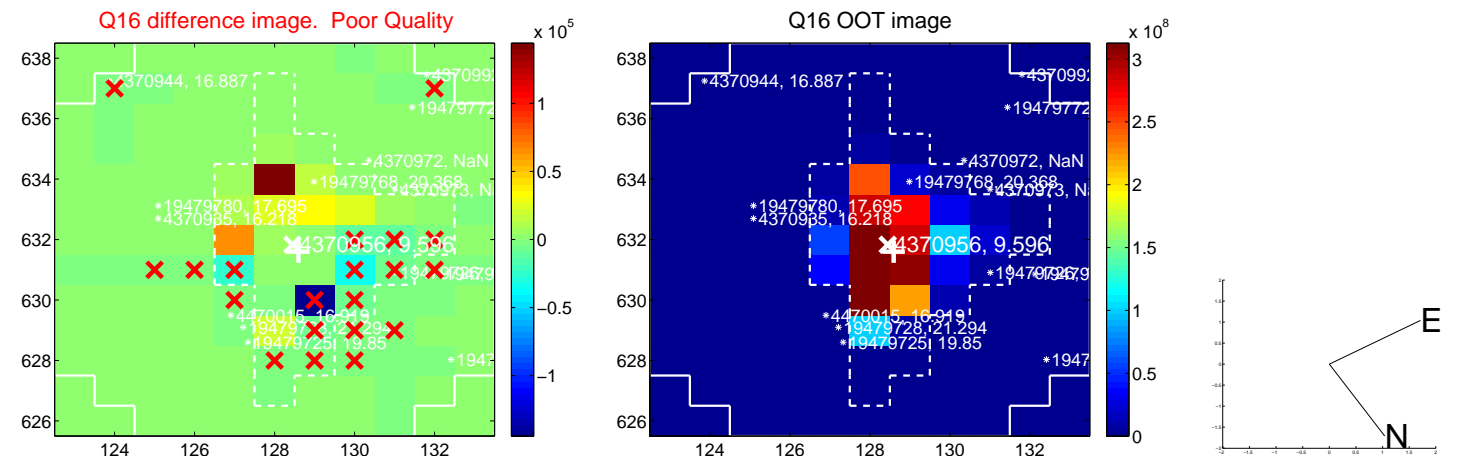
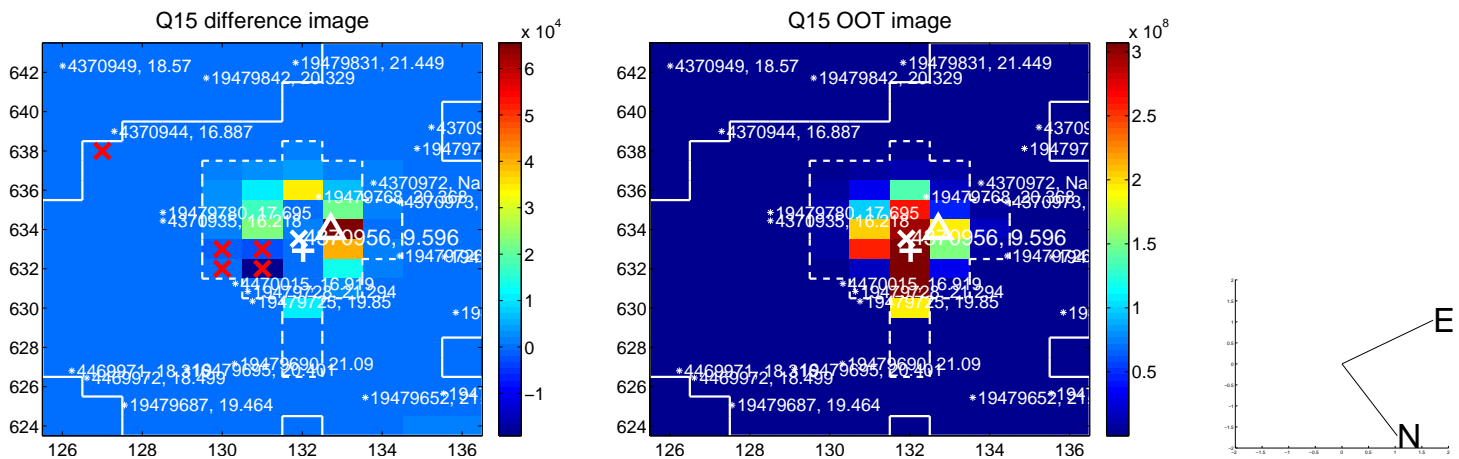
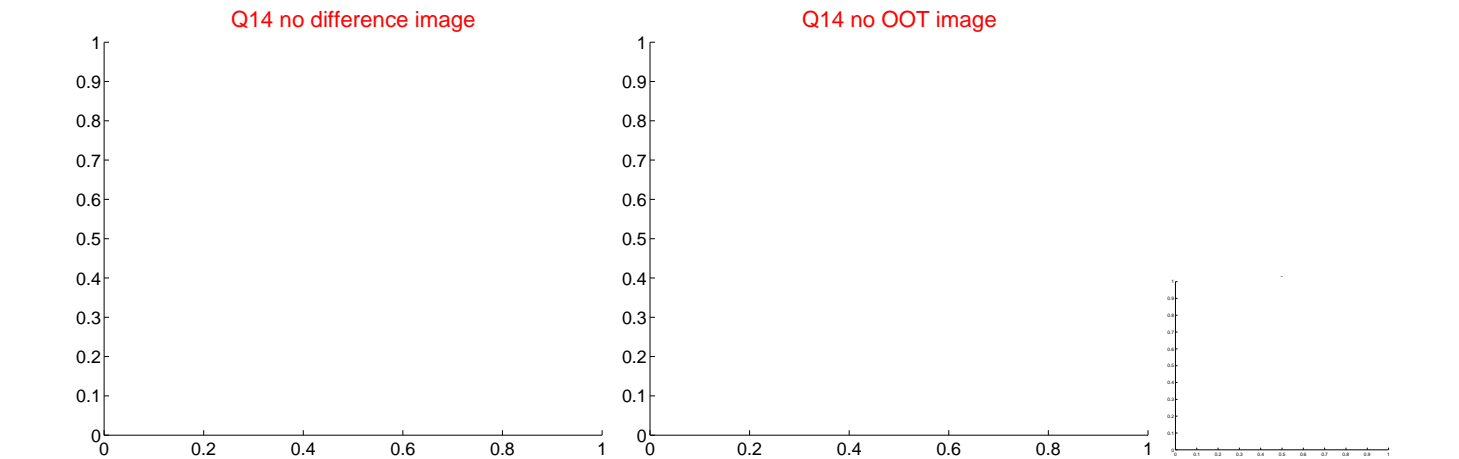
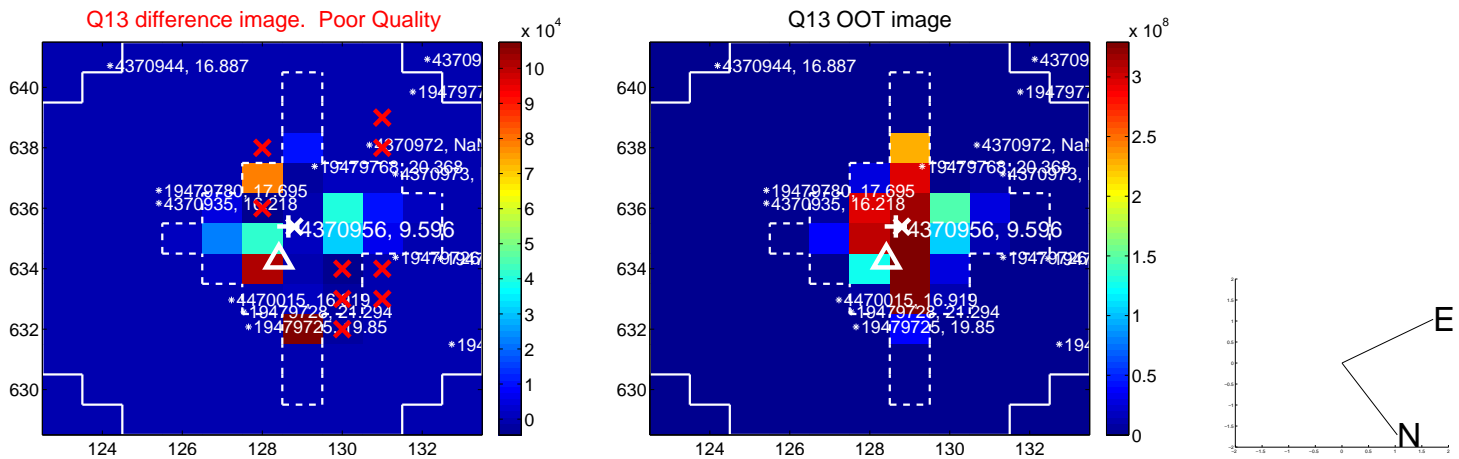
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



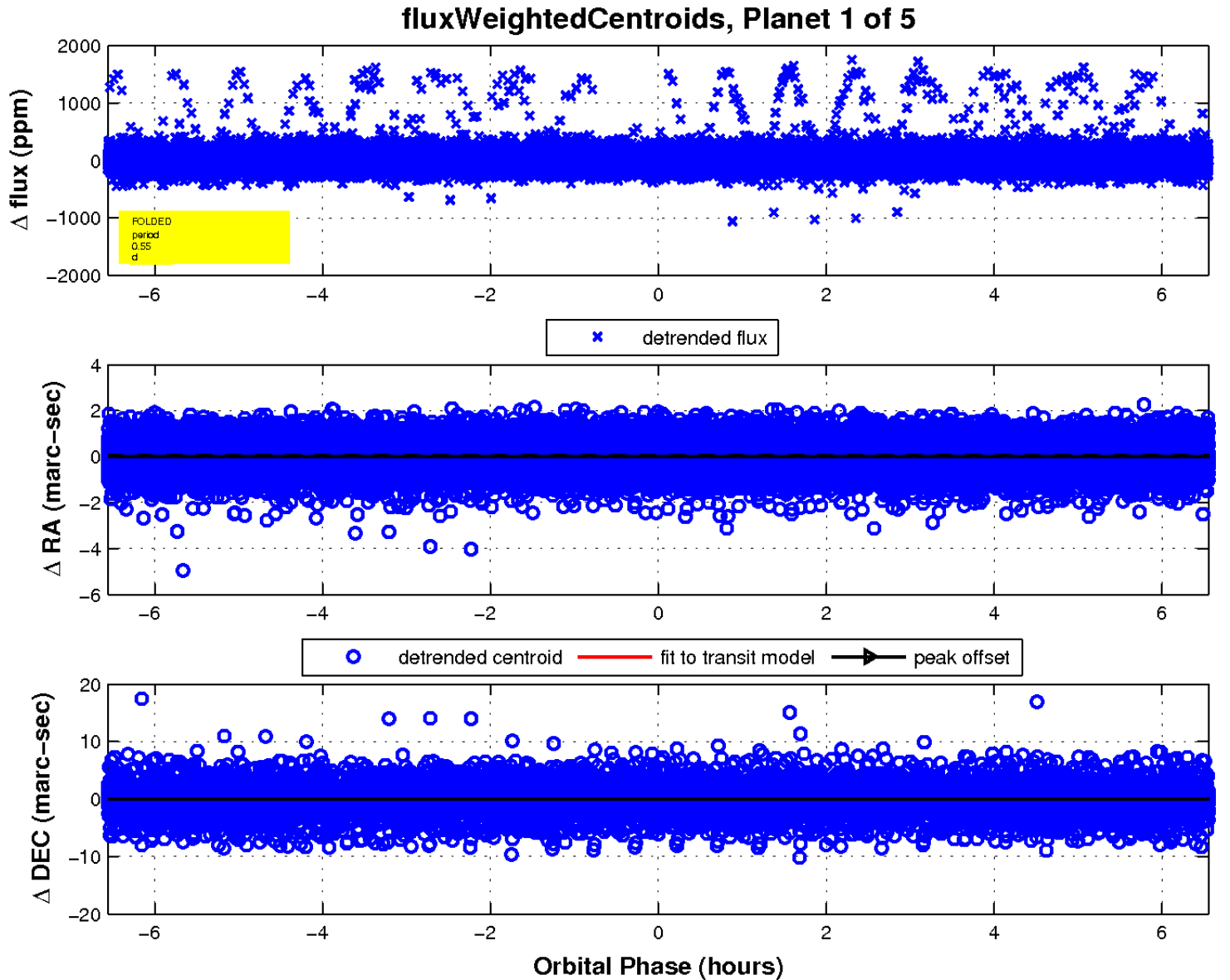
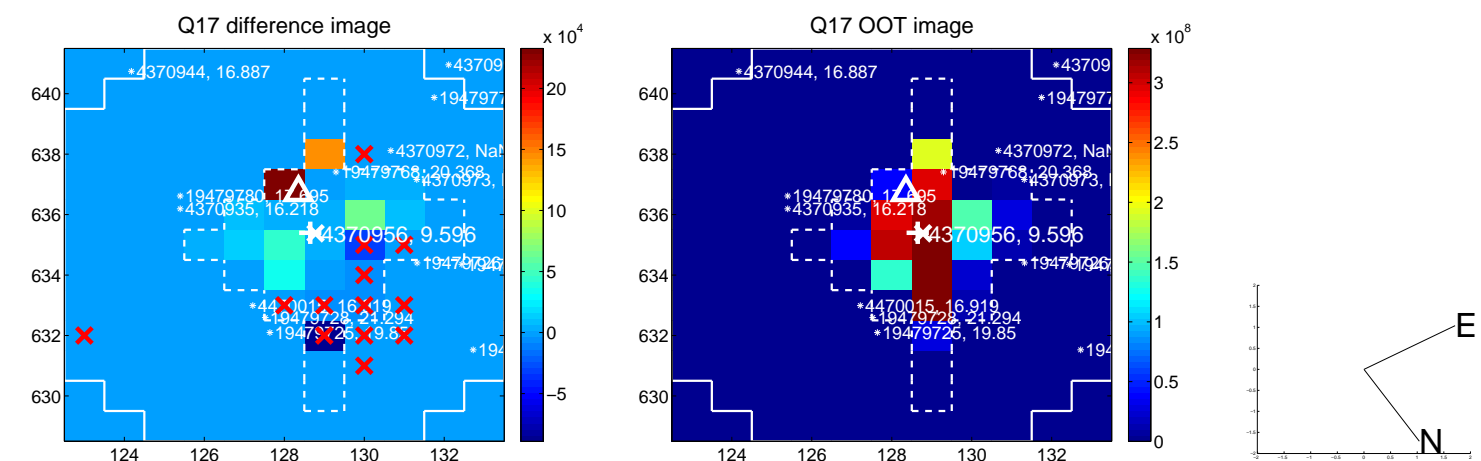
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



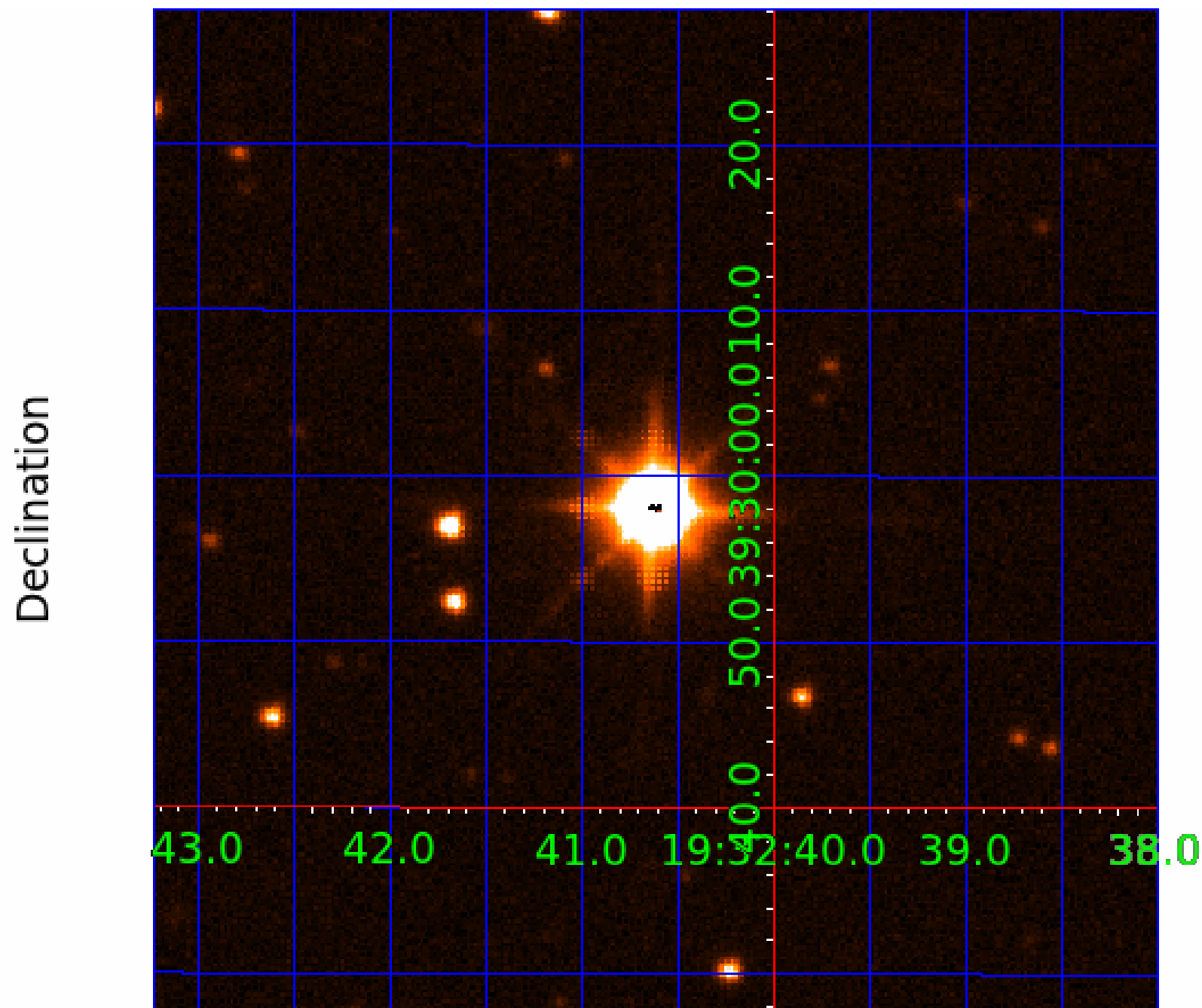
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 004370956

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})
004370956-01	OBS	No	0.546412	131.560384	6.0	4.087	8.7	4.5	1.73	6468	0.43	23226.23
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004370956-03	OBS	No	8.190508	134.032331	1486.8	0.799	19.1	24.0	1.73	6468	7.40	628.43
004370956-04	OBS	No	4.097475	133.929744	96.9	1.500	13.5	-1.0	1.73	6468	1.72	1582.40
004370956-05	OBS	No	10.539084	135.243248	345.0	1.354	10.5	9.3	1.73	6468	3.24	449.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004370956-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004370956-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_SATURATED
004370956-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
004370956-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—SWEET_NTL—LPP_DV—NO_FITS—SAME_NTL_PERIOD—CENT_SATURATED
004370956-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

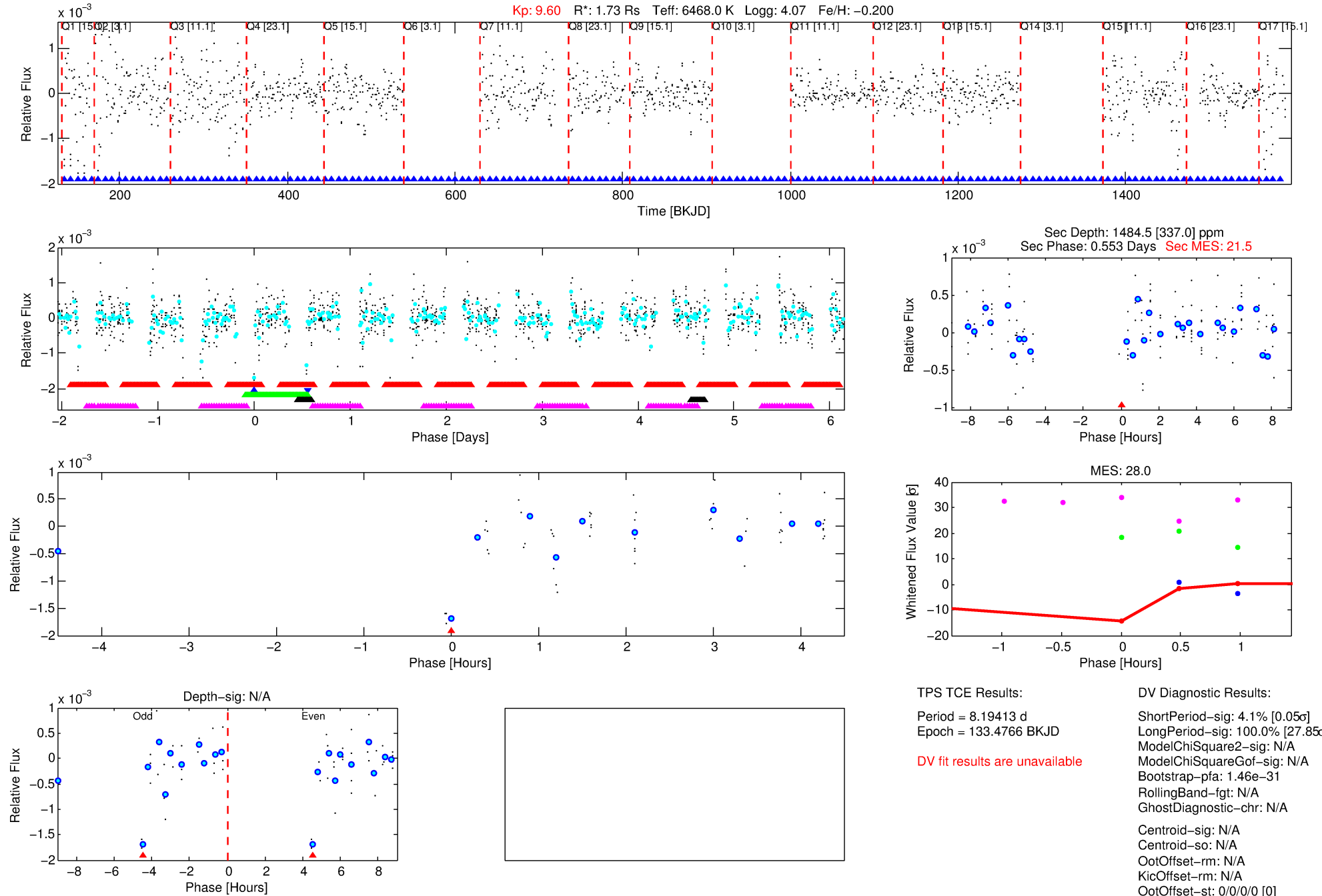
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004370956-02

No Significant Match Found

DV One-Page Summary

KIC: 4370956 Candidate: 2 of 5 Period: 8.194 d



TPS TCE Results:

Period = 8.19413 d
Epoch = 133.4766 BKJD

DV fit results are unavailable

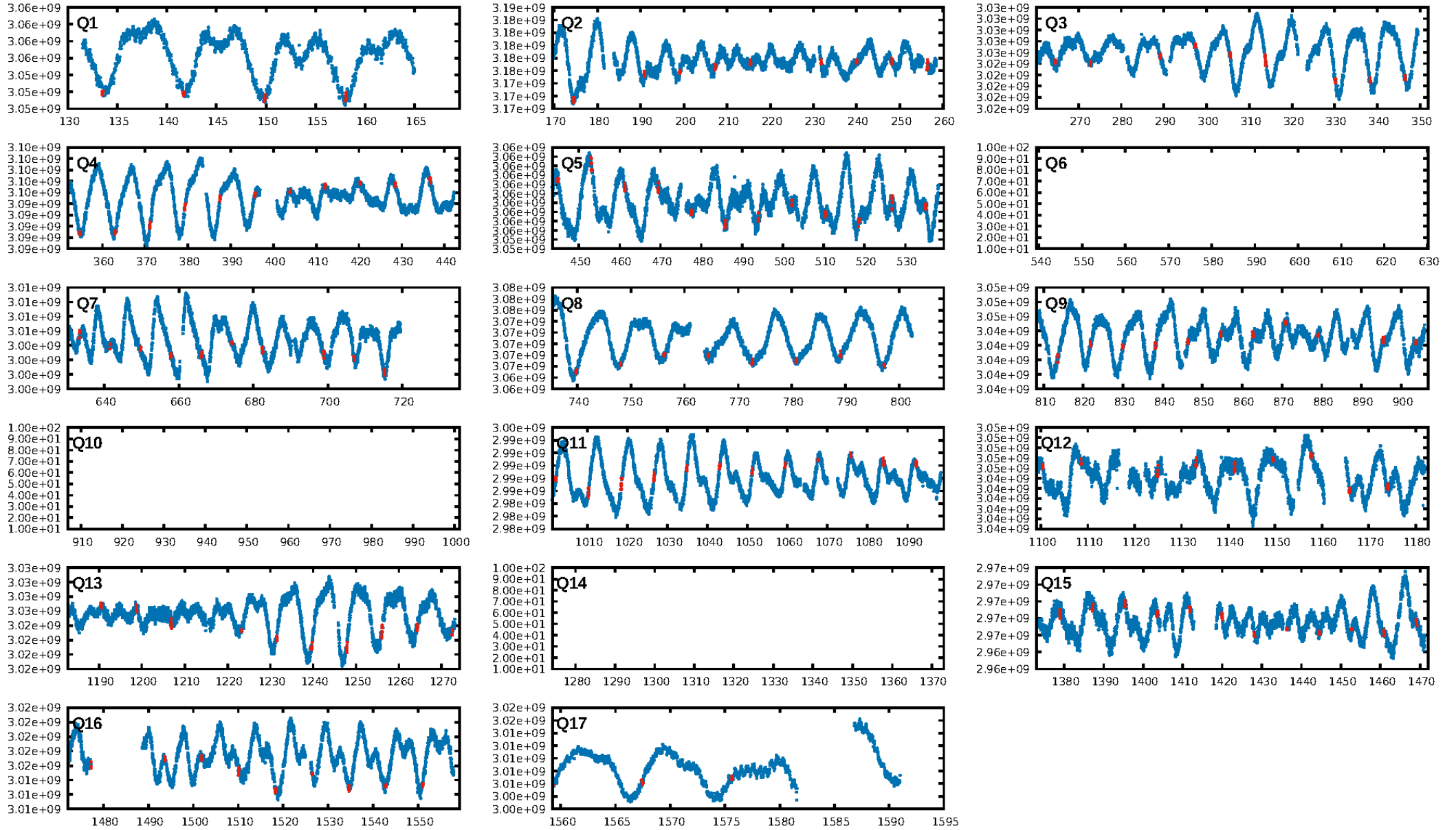
DV Diagnostic Results:

ShortPeriod-sig: 4.1% [0.05 σ]
LongPeriod-sig: 100.0% [27.85 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.46e-31
RollingBand-fgt: N/A
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0 [0]
KicOffset-st: 0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: N/A

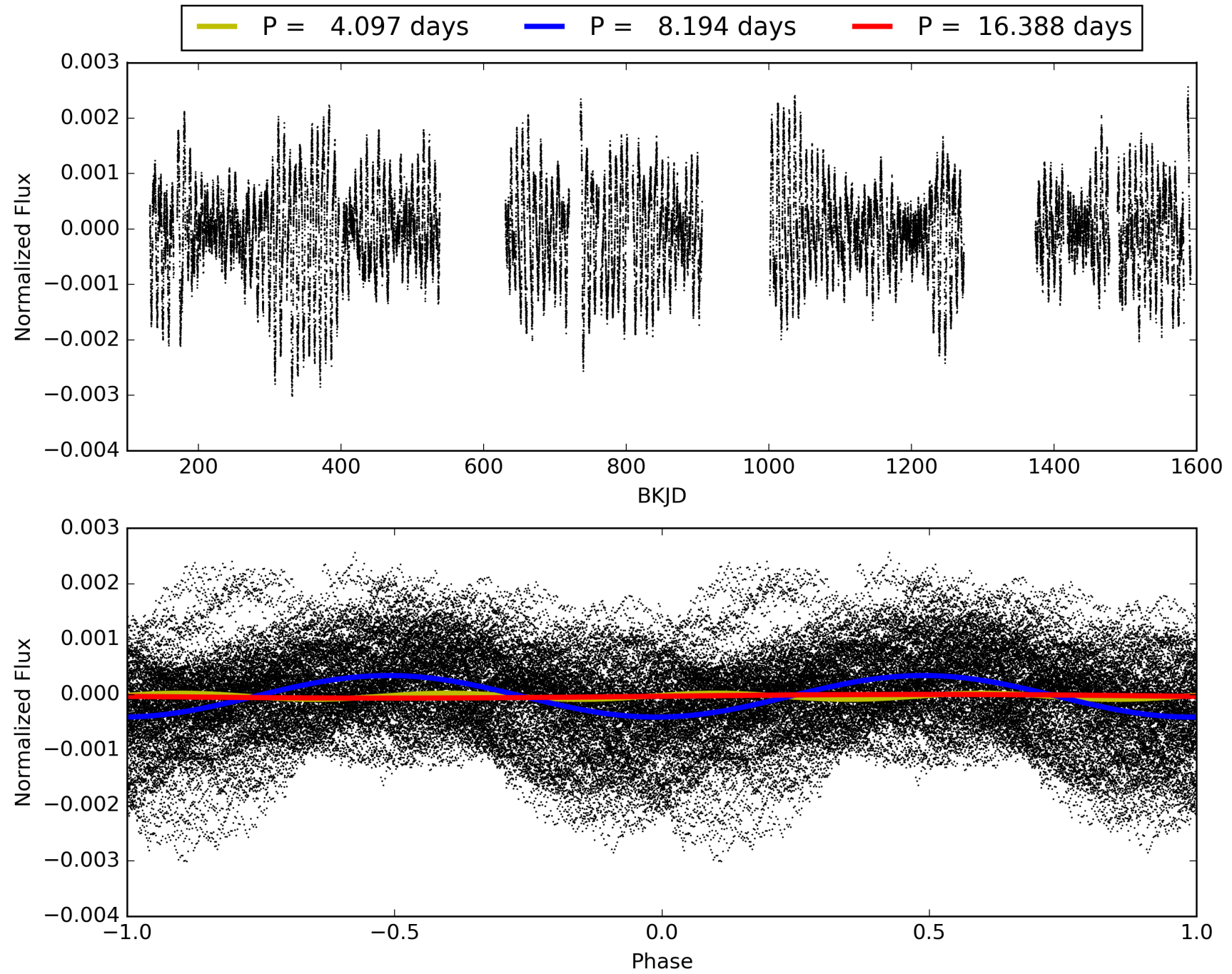
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:05:52 Z

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

TCE 004370956-02, PDC Light Curves

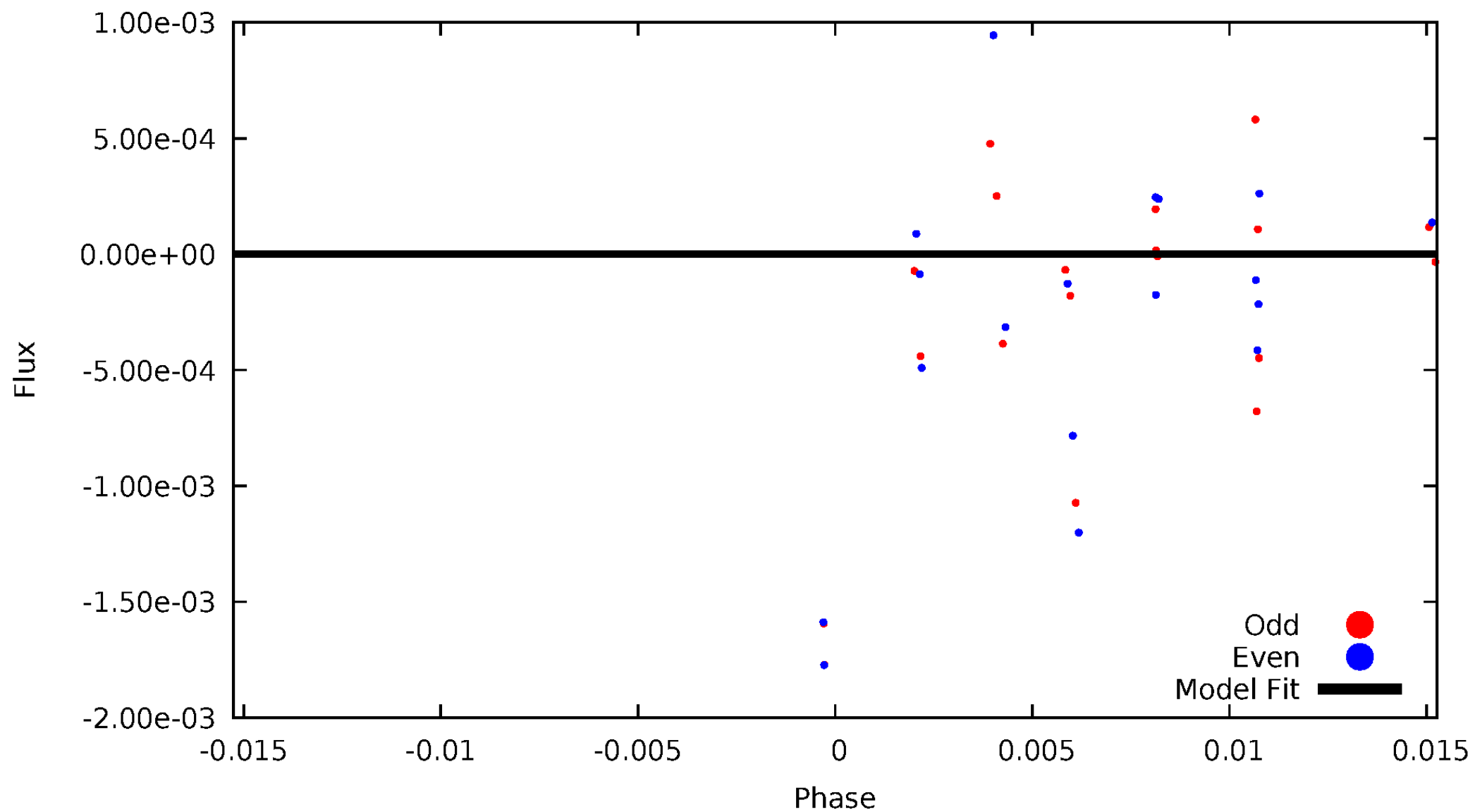


TCE 004370956-02



DV Odd/Even

TCE 004370956-02

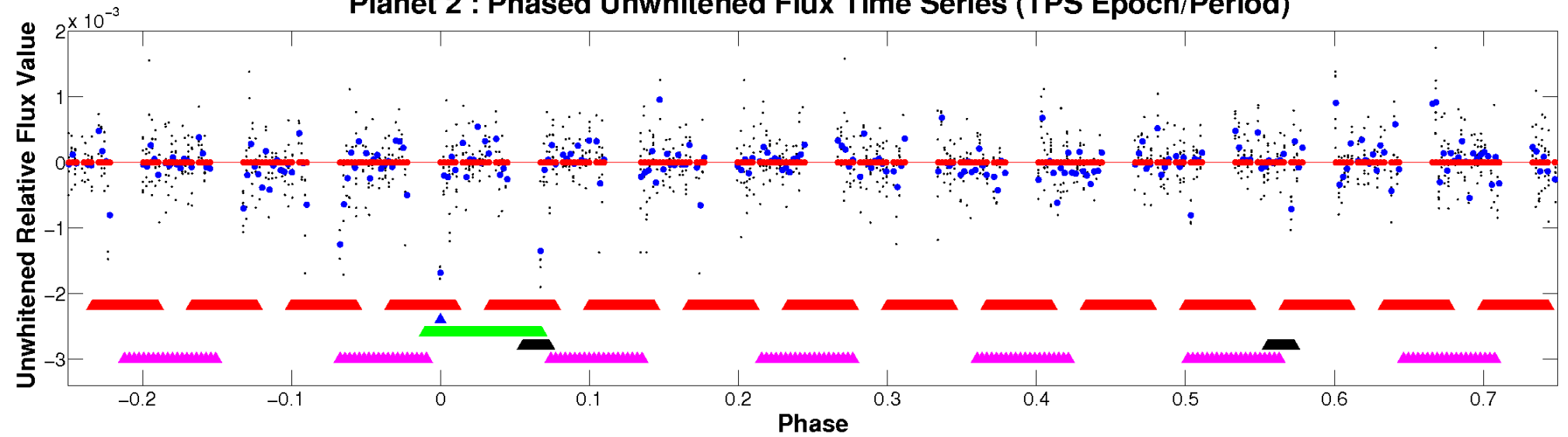


ALT Odd/Even

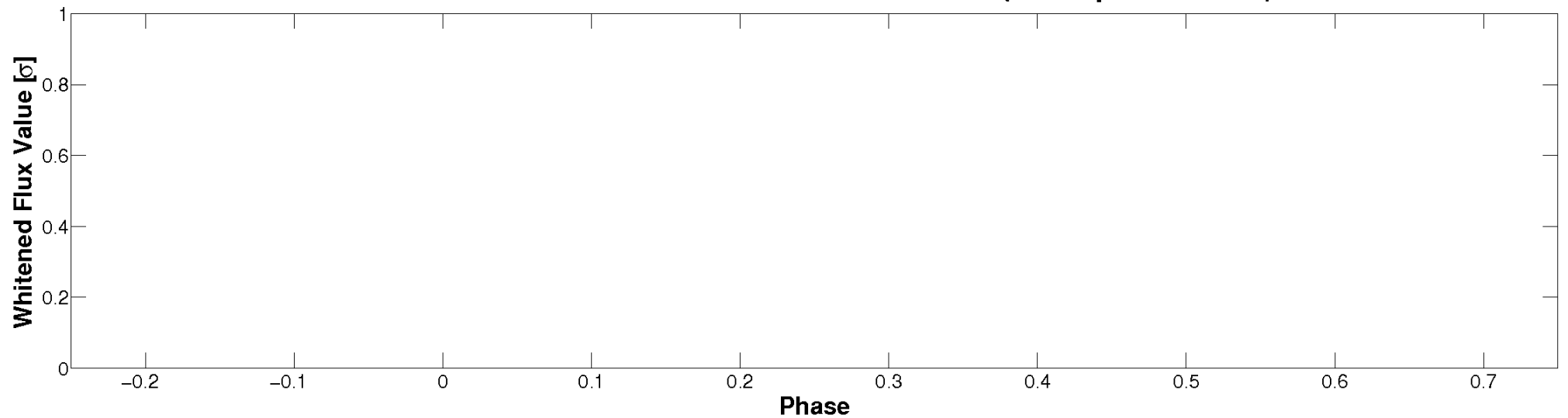
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

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

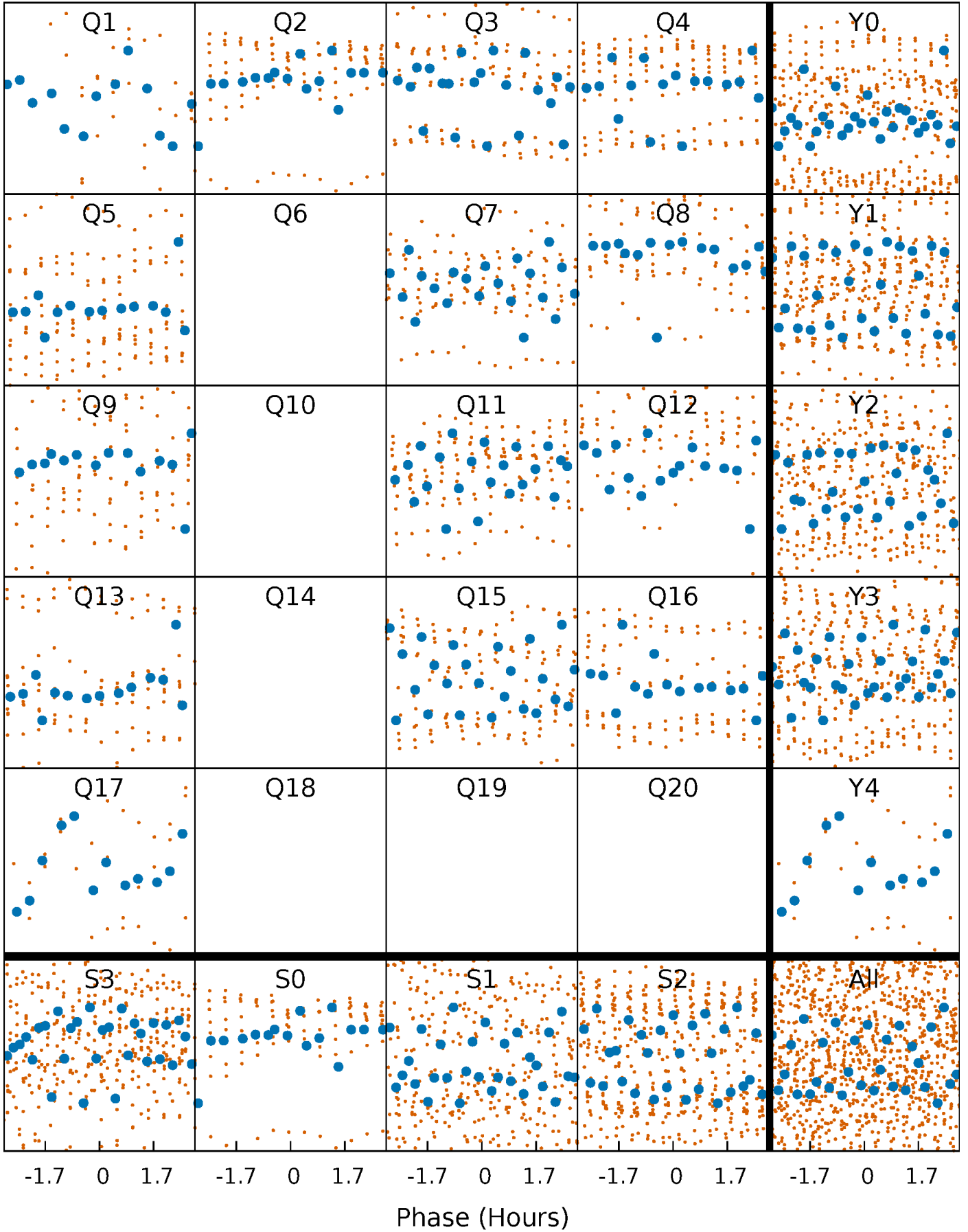


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



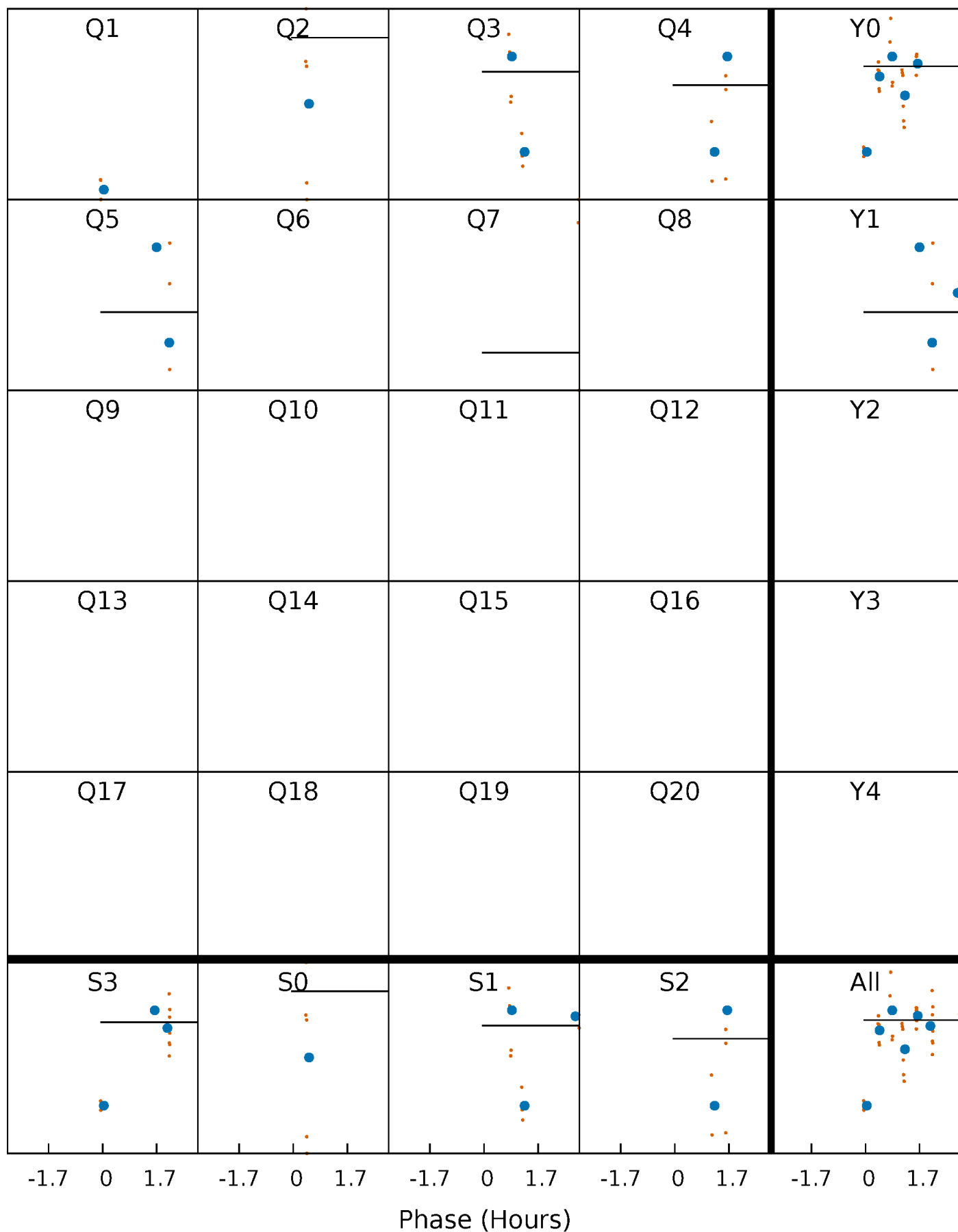
PDC Quarter-Phased Transit Curves

TCE 004370956-02 P= 8.194135 Days $T_0=133.476619$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 004370956-02 P= 8.194135 Days $T_0=133.476619$ (BKJD)

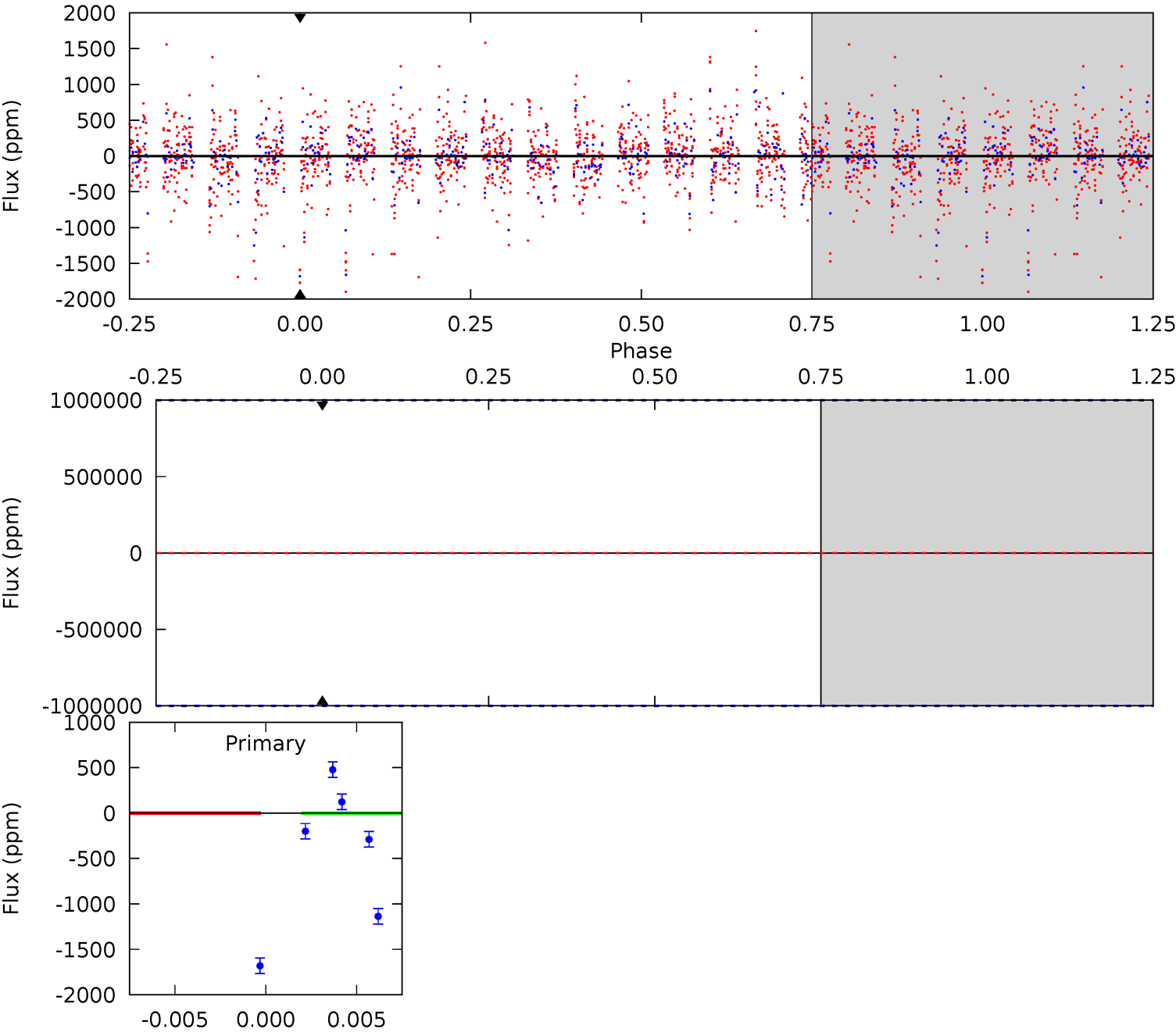


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

004370956-02, P = 8.194135 Days, E = 125.282484 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 004370956

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6468^{+181}_{-227}	$4.070^{+0.280}_{-0.172}$	$-0.200^{+0.250}_{-0.300}$	$1.730^{+0.477}_{-0.583}$	$1.288^{+0.172}_{-0.257}$	$0.350^{+0.659}_{-0.150}$
	+3%/-4%	+7%/-4%	+125%/-150%	+28%/-34%	+13%/-20%	+188%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004370956-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$12.58^{+14.78}_{-8.26}$	1769^{+146}_{-156}	-4973^{+32745}_{-23704}	$-48.266^{+4265.964}_{-4422.848}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

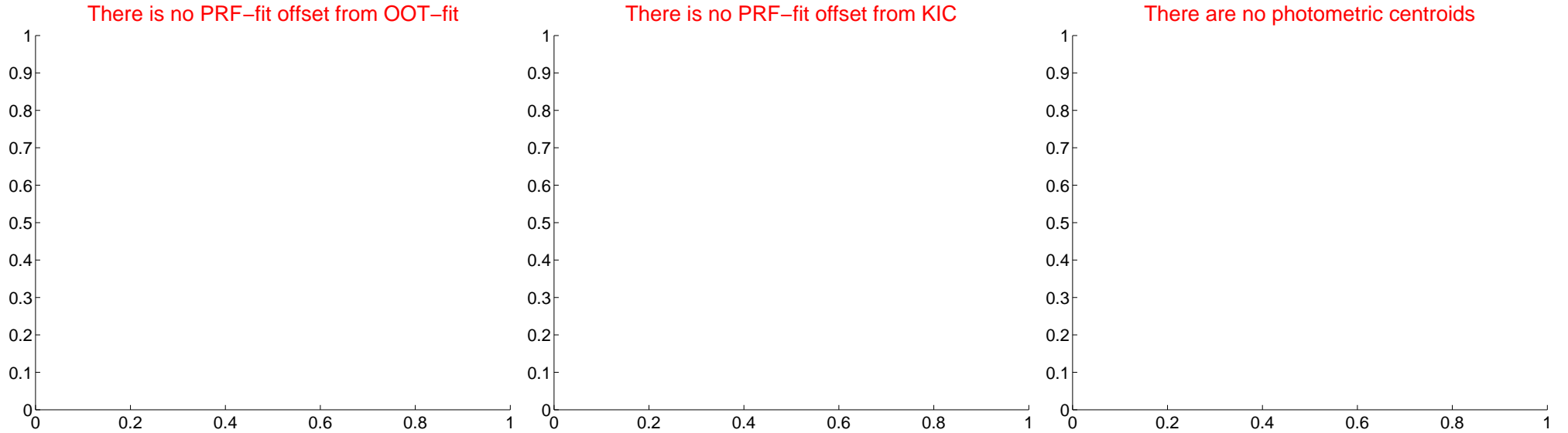
DV Centroid Data

Supplemental centroid analysis for 004370956-02. **Kepler magnitude: 9.60.** Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
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.

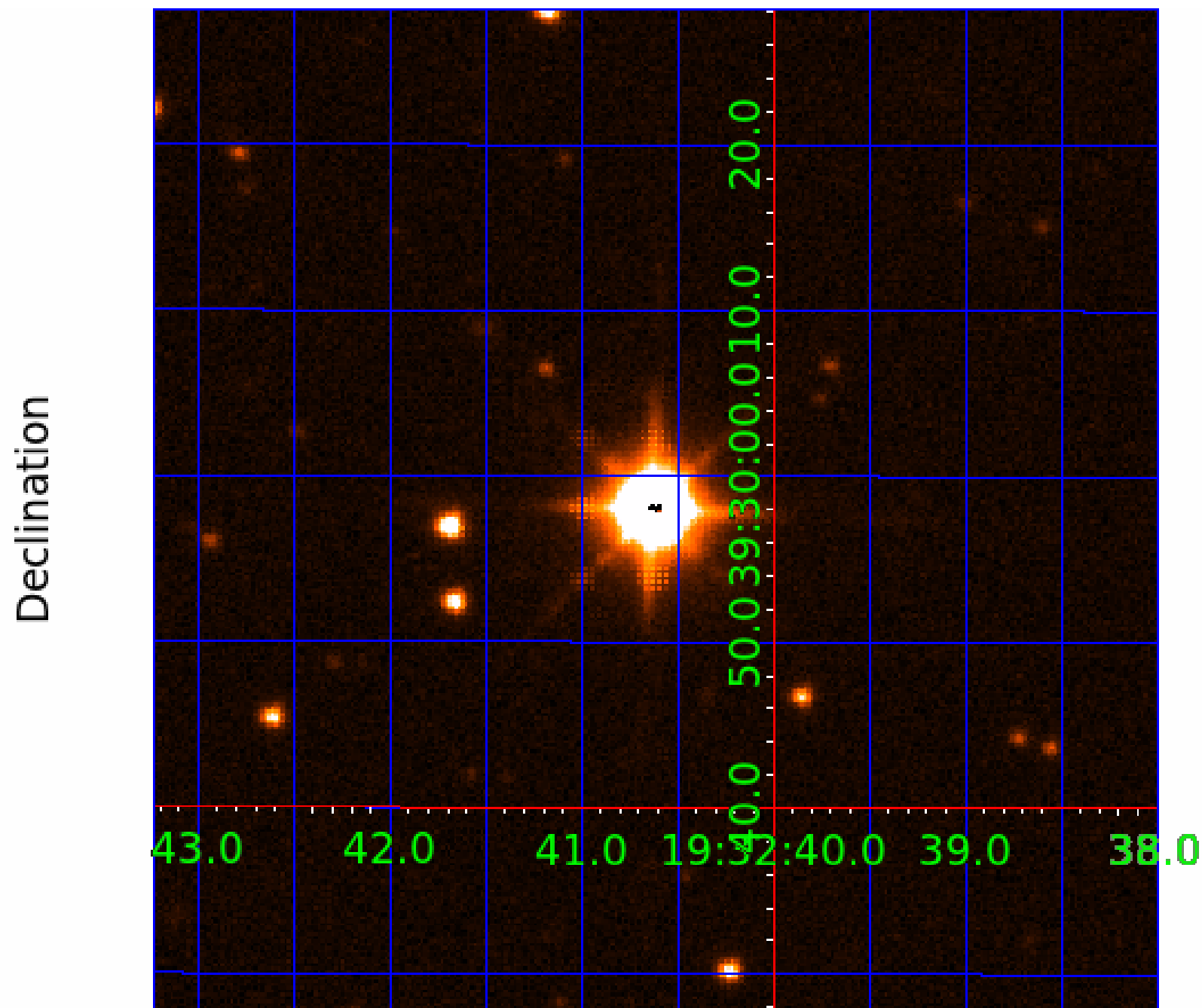


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image



KIC 004370956

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})
004370956-01	OBS	No	0.546412	131.560384	6.0	4.087	8.7	4.5	1.73	6468	0.43	23226.23
004370956-02	OBS	No	8.194135	133.476619	206.5	1.500	28.0	-1.0	1.73	6468	2.51	628.06
004370956-03	OBS	No	8.190508	134.032331	1486.8	0.799	19.1	24.0	1.73	6468	7.40	628.43
004370956-04	OBS	No	4.097475	133.929744	96.9	1.500	13.5	-1.0	1.73	6468	1.72	1582.40
004370956-05	OBS	No	10.539084	135.243248	345.0	1.354	10.5	9.3	1.73	6468	3.24	449.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004370956-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004370956-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_SATURATED
004370956-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
004370956-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—SWEET_NTL—LPP_DV—NO_FITS—SAME_NTL_PERIOD—CENT_SATURATED
004370956-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

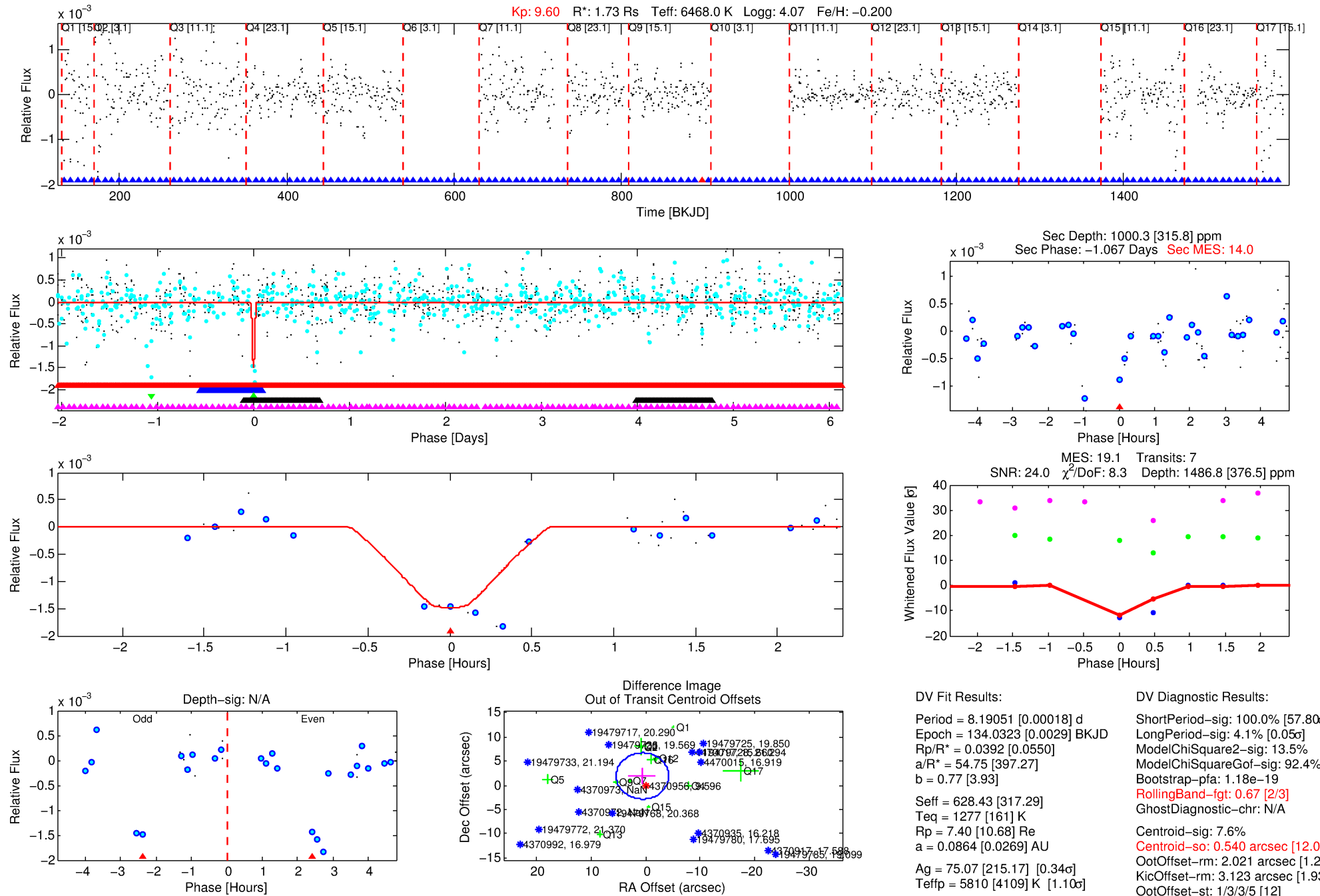
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004370956-03

No Significant Match Found

DV One-Page Summary

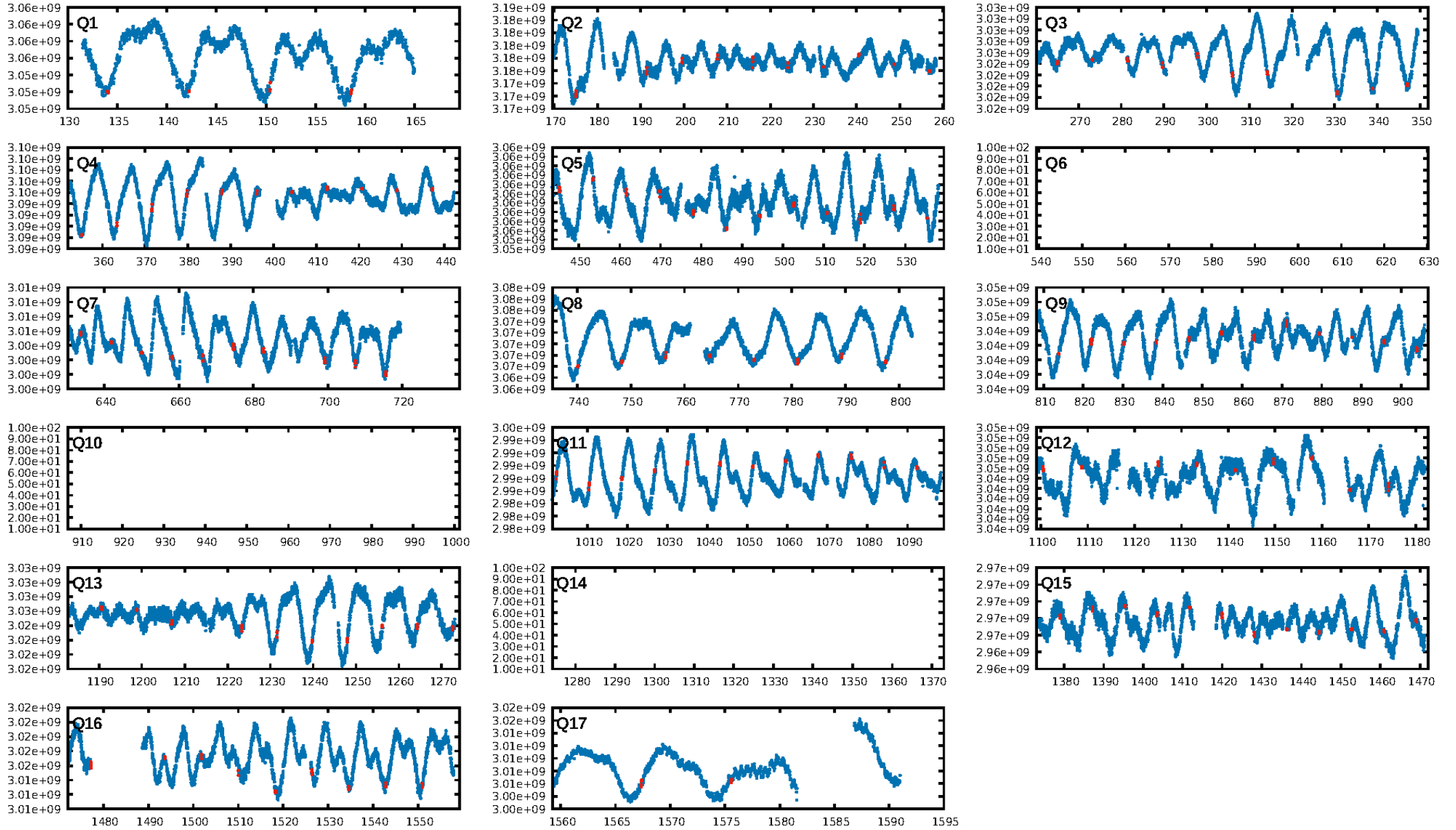
KIC: 4370956 Candidate: 3 of 5 Period: 8.191 d



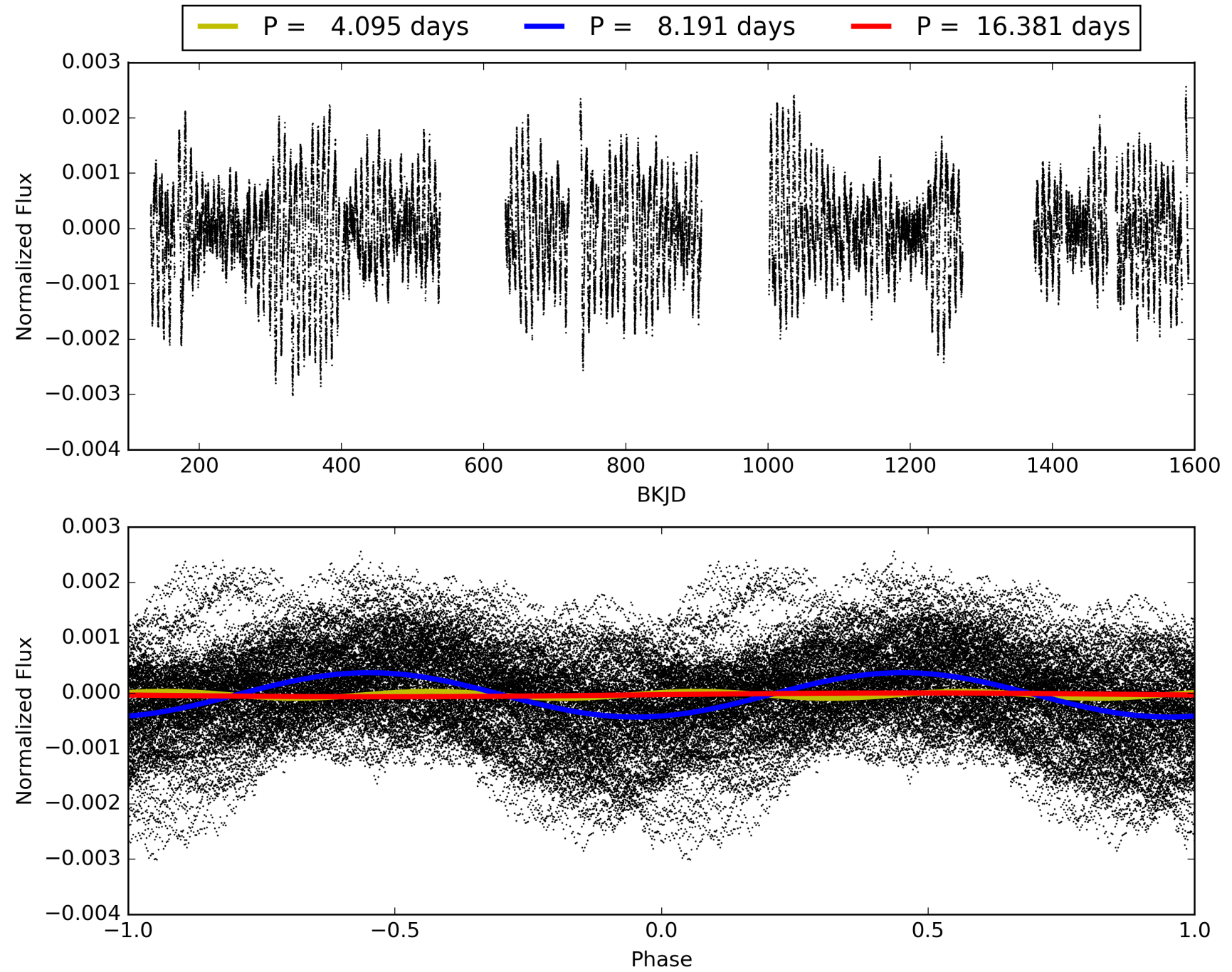
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:05:55 Z

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

TCE 004370956-03, PDC Light Curves

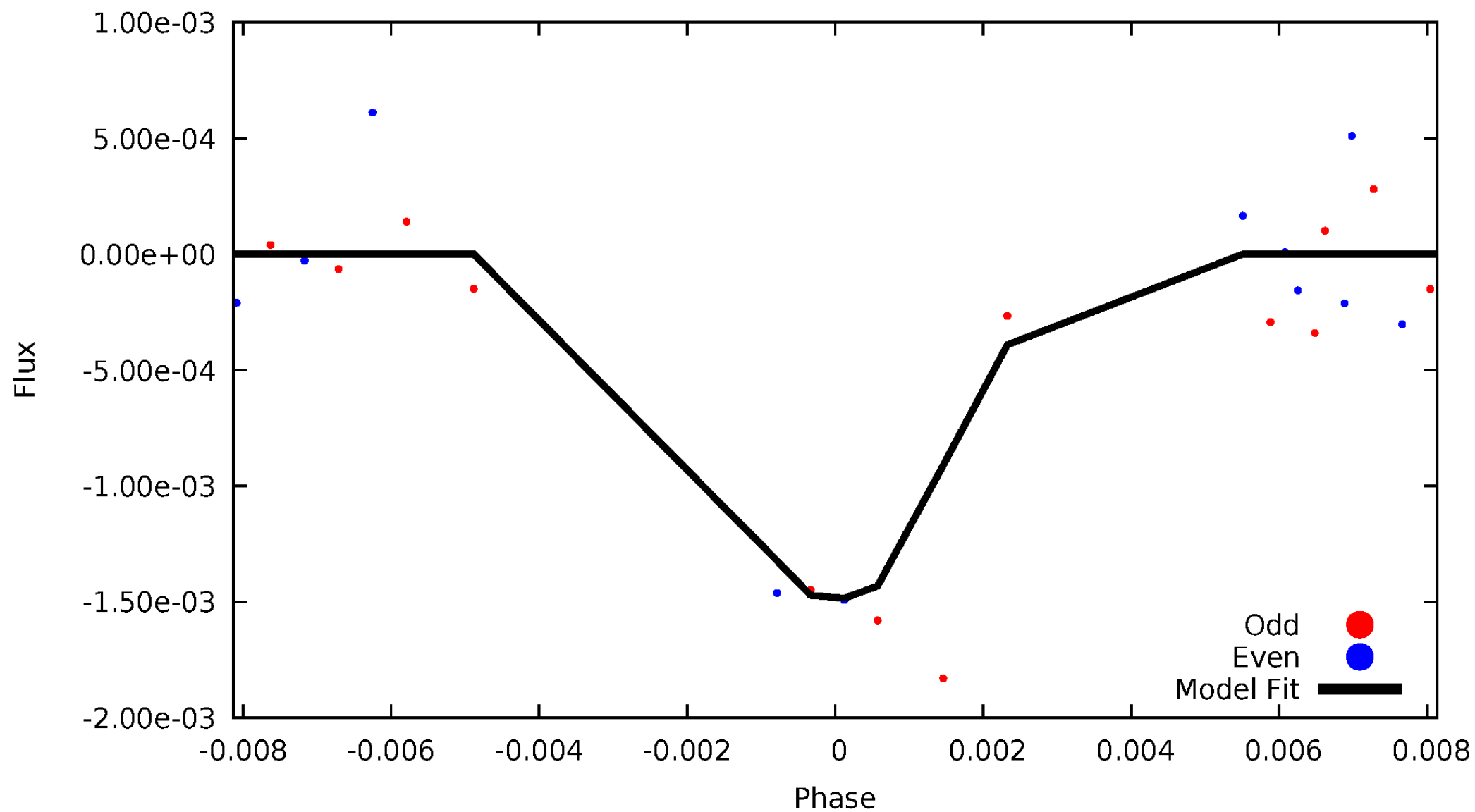


TCE 004370956-03



DV Odd/Even

TCE 004370956-03

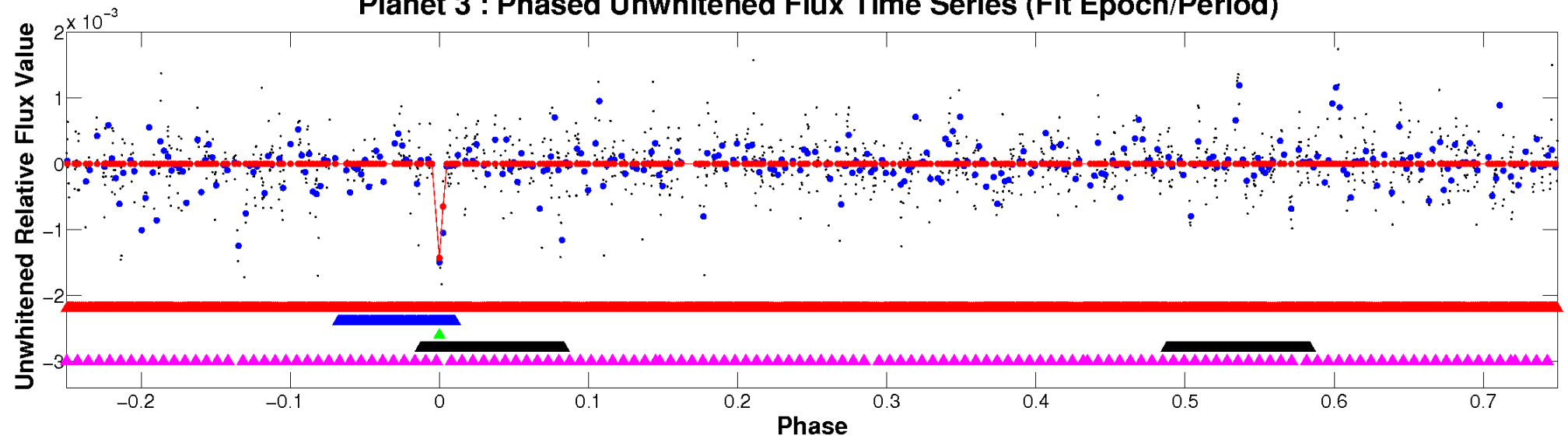


ALT Odd/Even

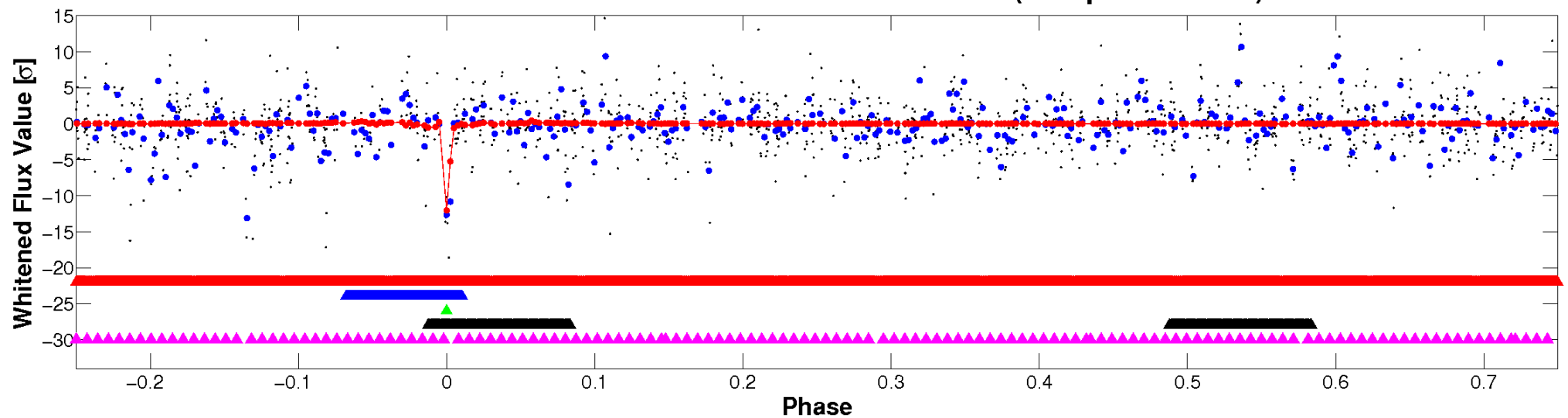
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

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

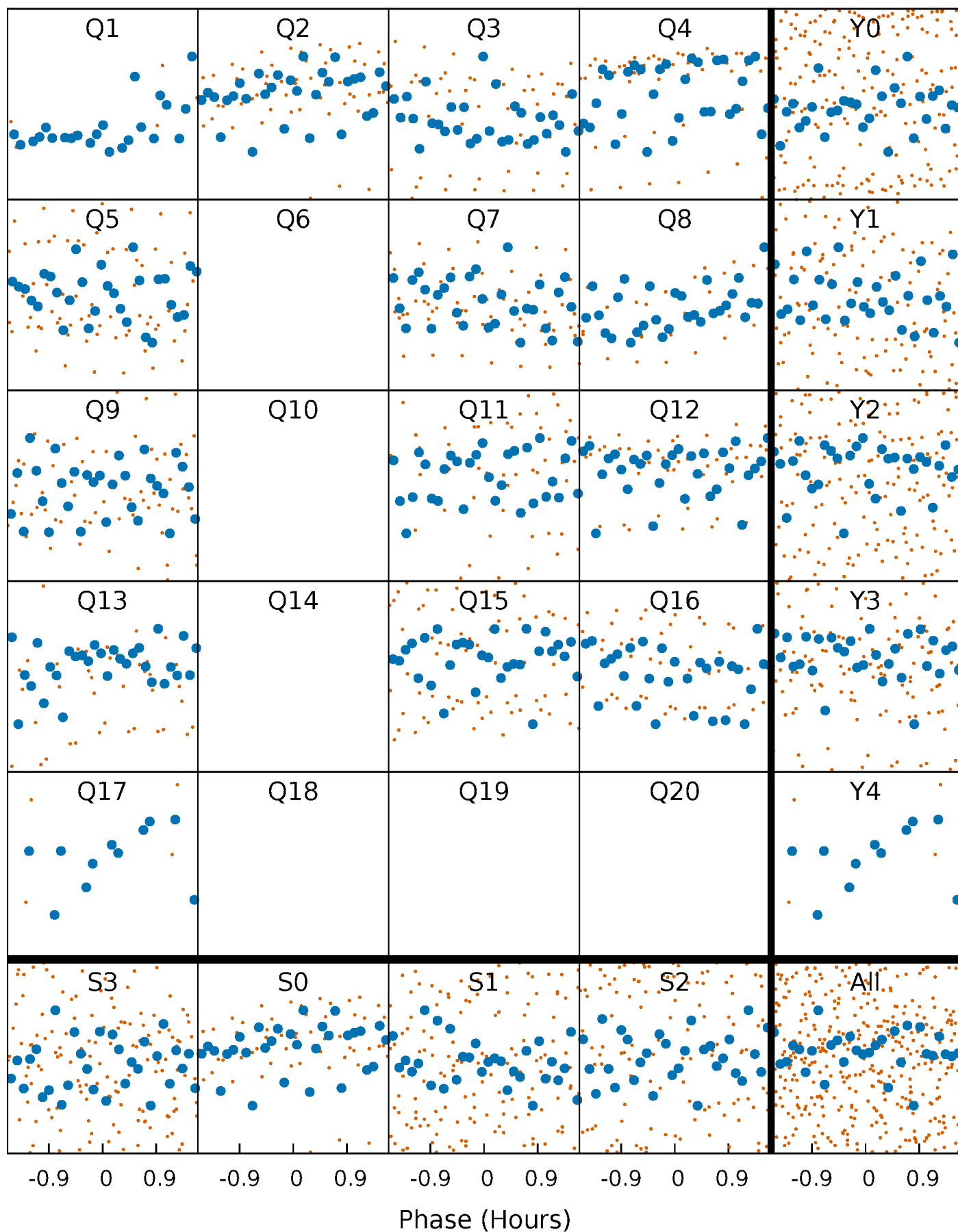


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



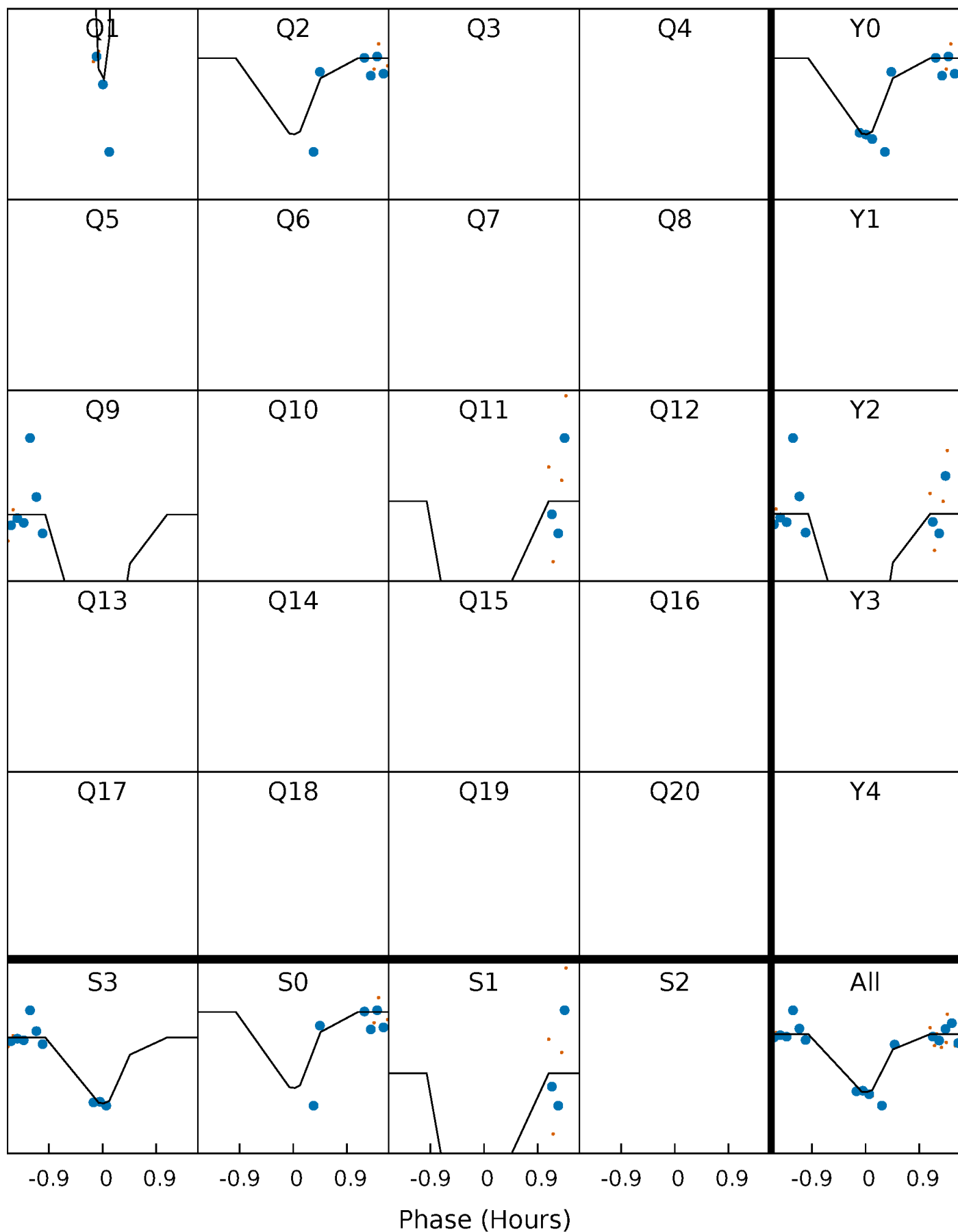
PDC Quarter-Phased Transit Curves

TCE 004370956-03 P= 8.190508 Days $T_0=134.032331$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 004370956-03 P= 8.190508 Days $T_0=134.032331$ (BKJD)

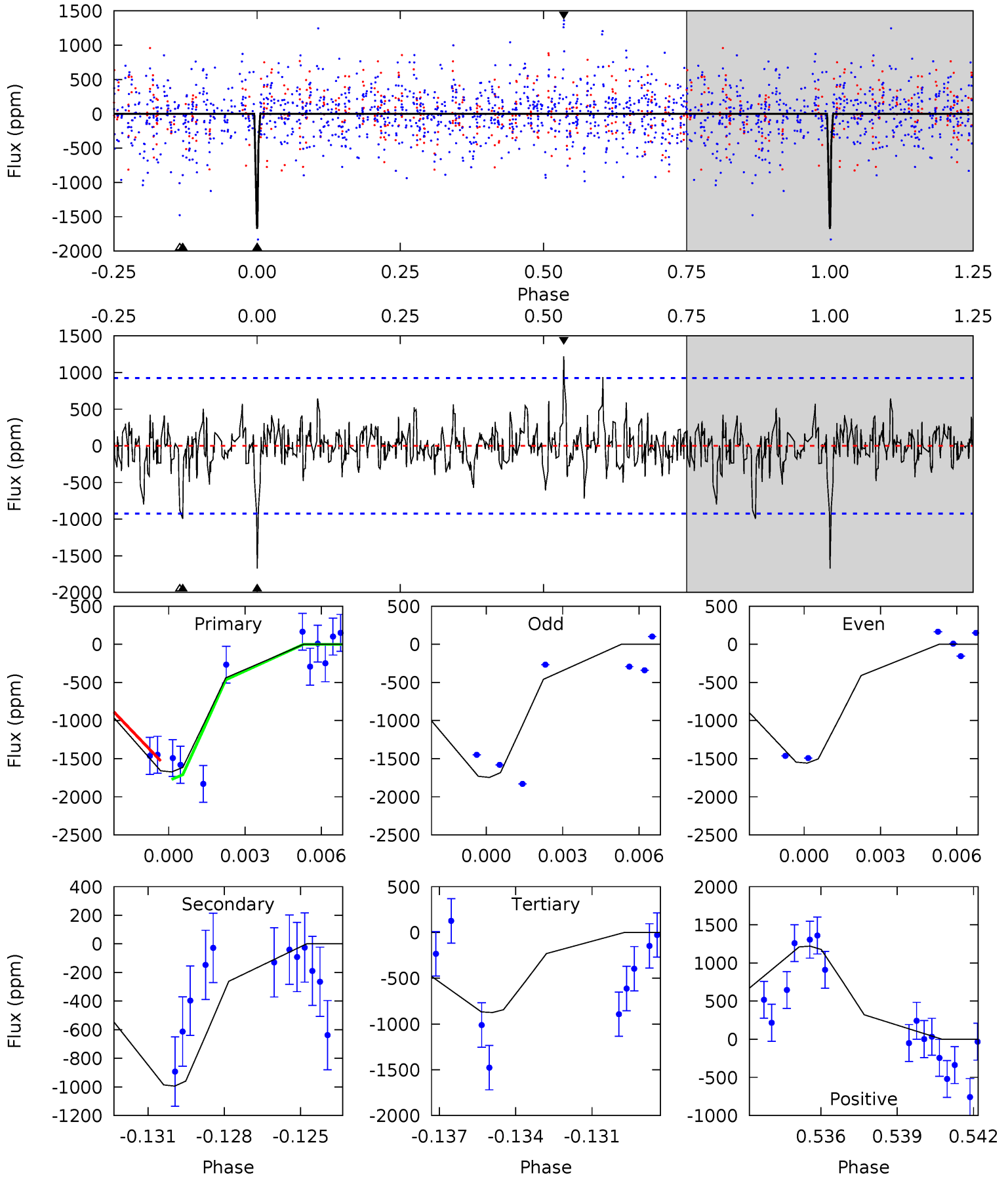


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

004370956-03, P = 8.190508 Days, E = 125.841823 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.50	5.64	4.97	6.93	5.25	2.96	1.25	4.53	2.57	0.68	-1.28	0.48	0	0.42	0.58



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 004370956

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6468^{+181}_{-227}	$4.070^{+0.280}_{-0.172}$	$-0.200^{+0.250}_{-0.300}$	$1.730^{+0.477}_{-0.583}$	$1.288^{+0.172}_{-0.257}$	$0.350^{+0.659}_{-0.150}$
	+3%/-4%	+7%/-4%	+125%/-150%	+28%/-34%	+13%/-20%	+188%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004370956-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-995 ± 176	$10.40^{+8.85}_{-6.98}$	1764^{+138}_{-155}	4860^{+3650}_{-1013}	37^{+288}_{-26}
Alt.	N/A	N/A	N/A	N/A	N/A

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

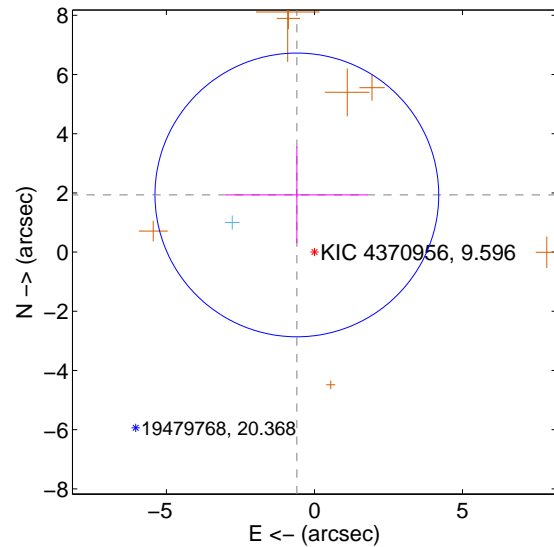
Supplemental centroid analysis for 004370956-03. **Kepler magnitude: 9.60.** Transit SNR 24.00

There are 2 quarters with good PRF difference image offsets

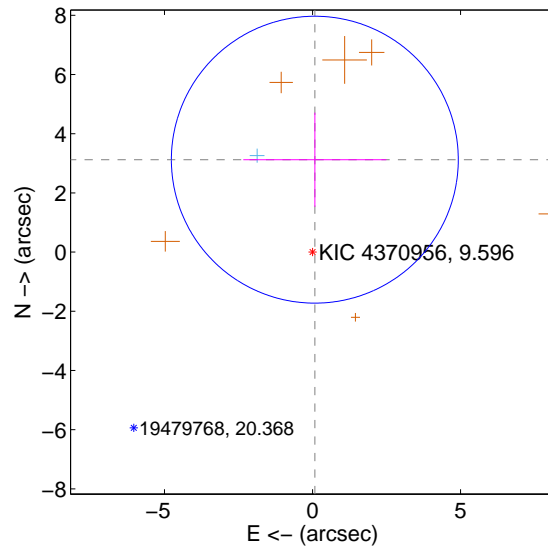
The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.021 ± 1.598	1.26	0.594 ± 2.388	1.932 ± 1.633
PRF-fit source offset from KIC position	3.123 ± 1.616	1.93	-0.078 ± 2.417	3.122 ± 1.591
photometric centroid source offset	0.54 ± 0.04	12.03	-0.11 ± 0.04	0.53 ± 0.05

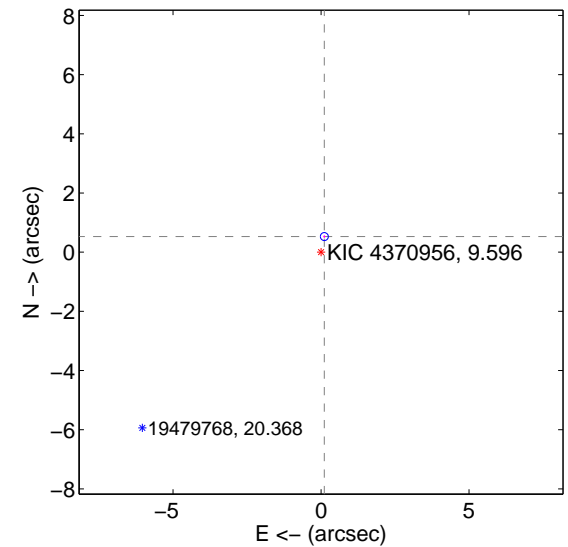
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

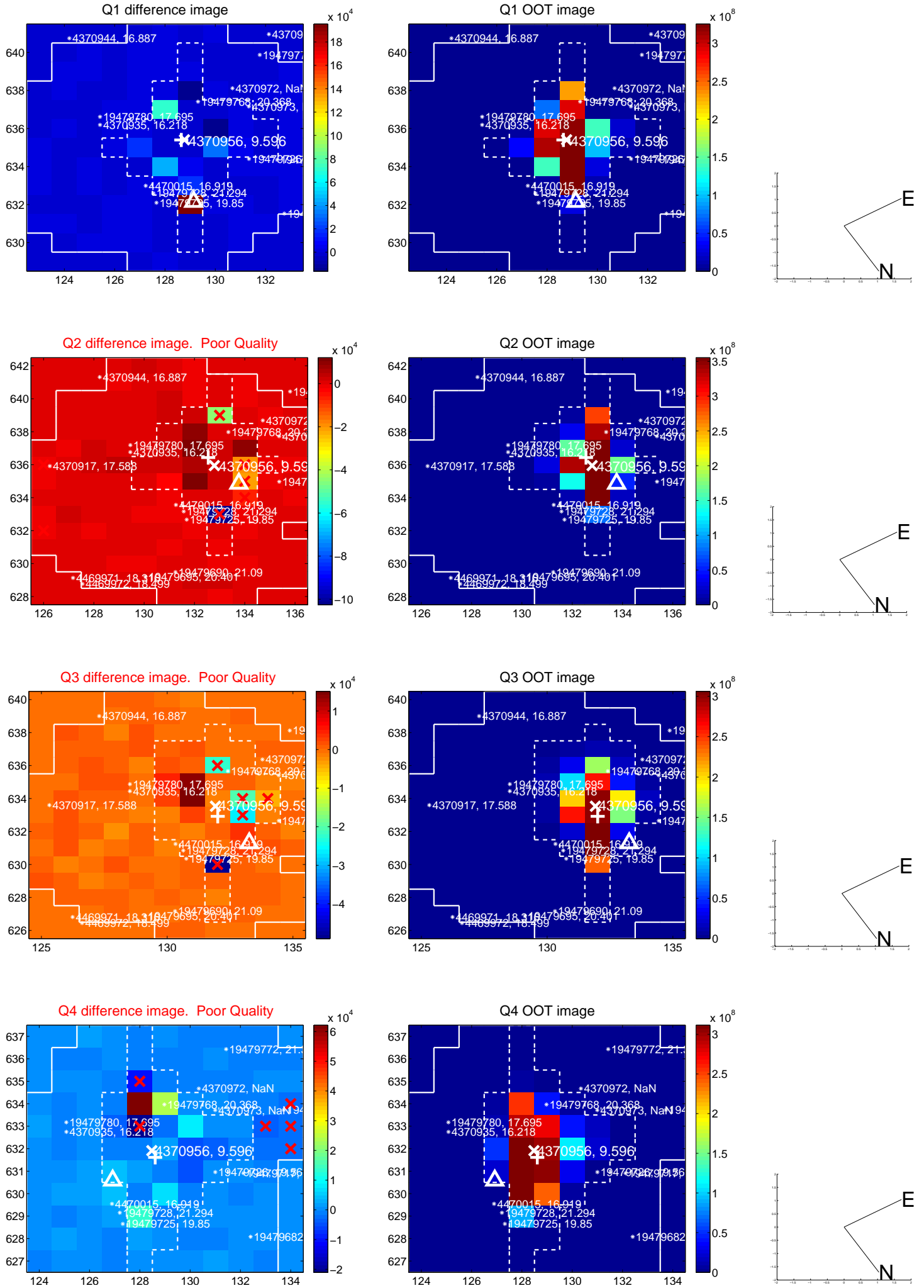


offset from photometric centroids

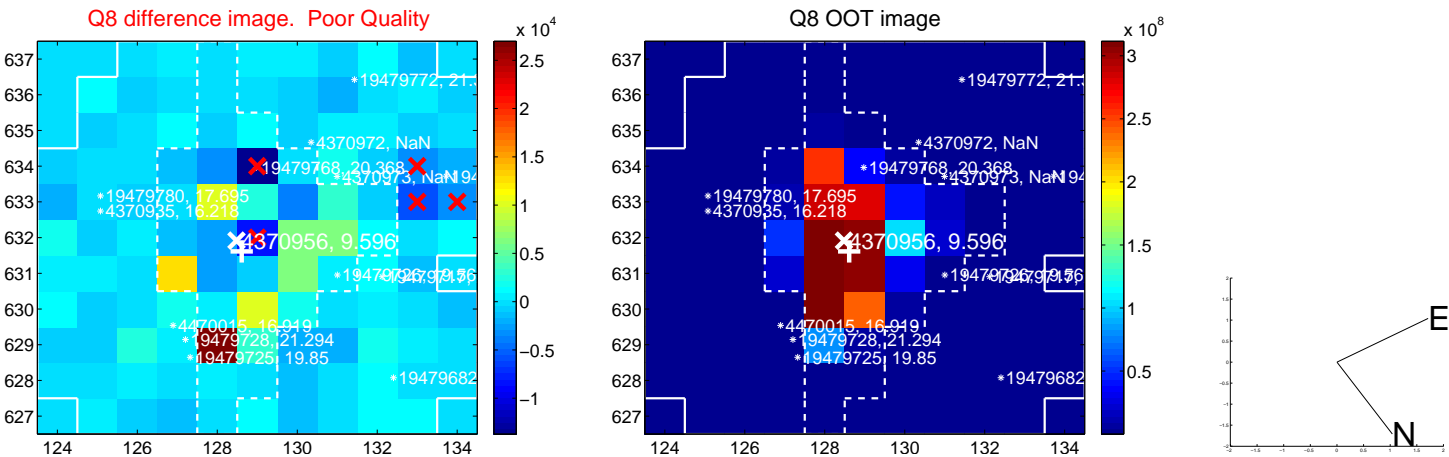
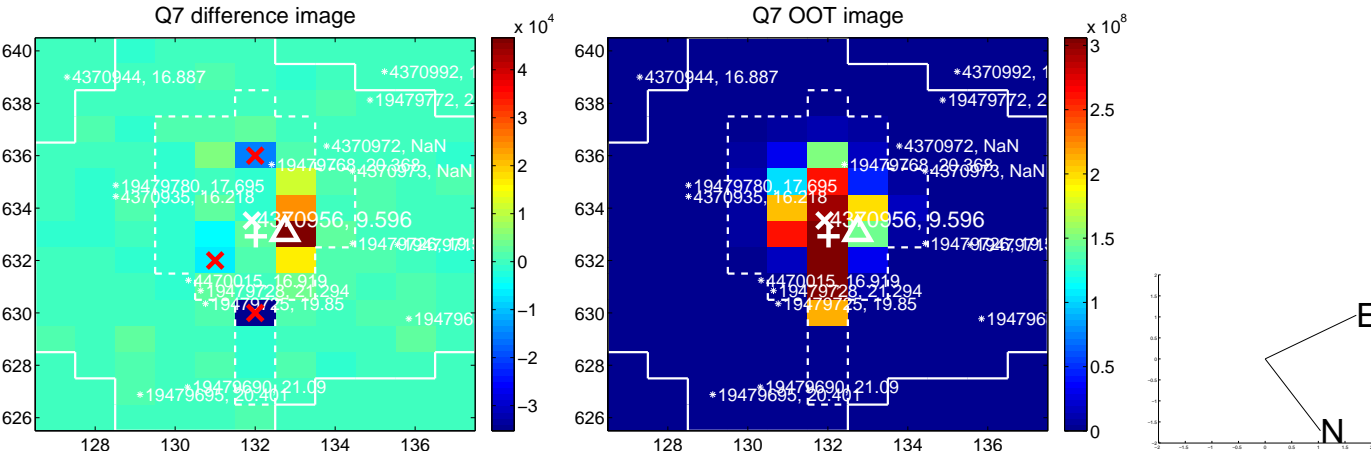
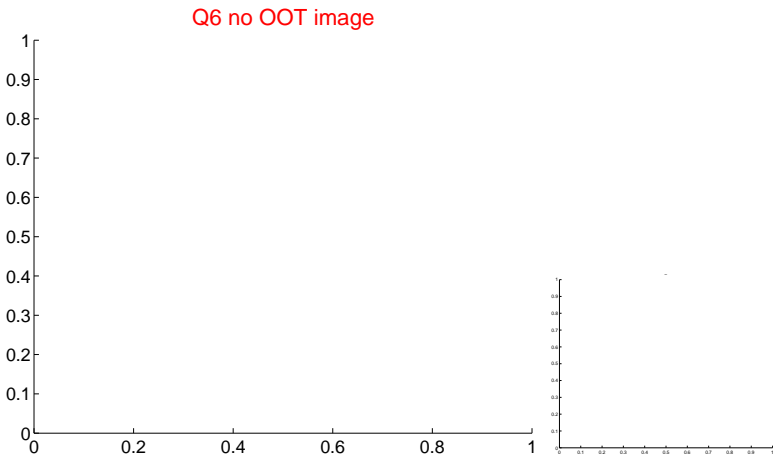
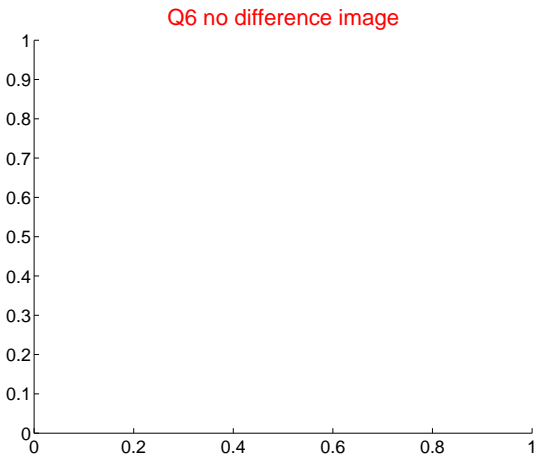
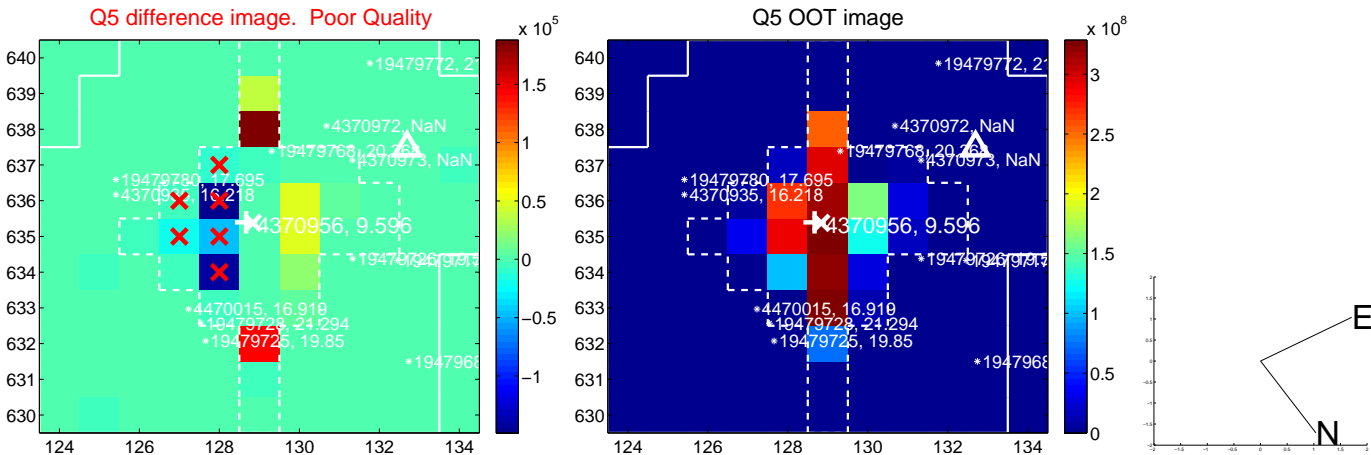


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

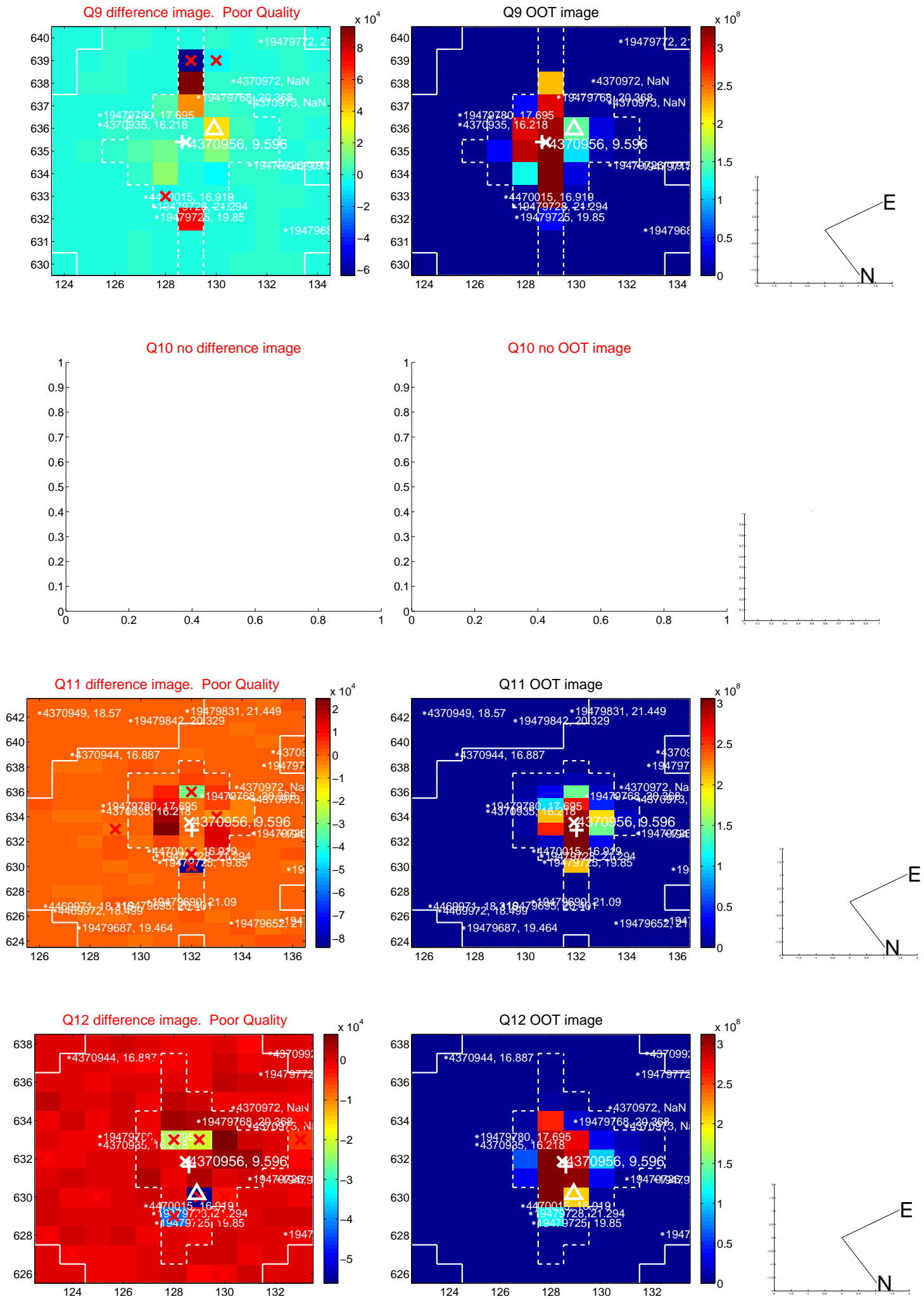
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



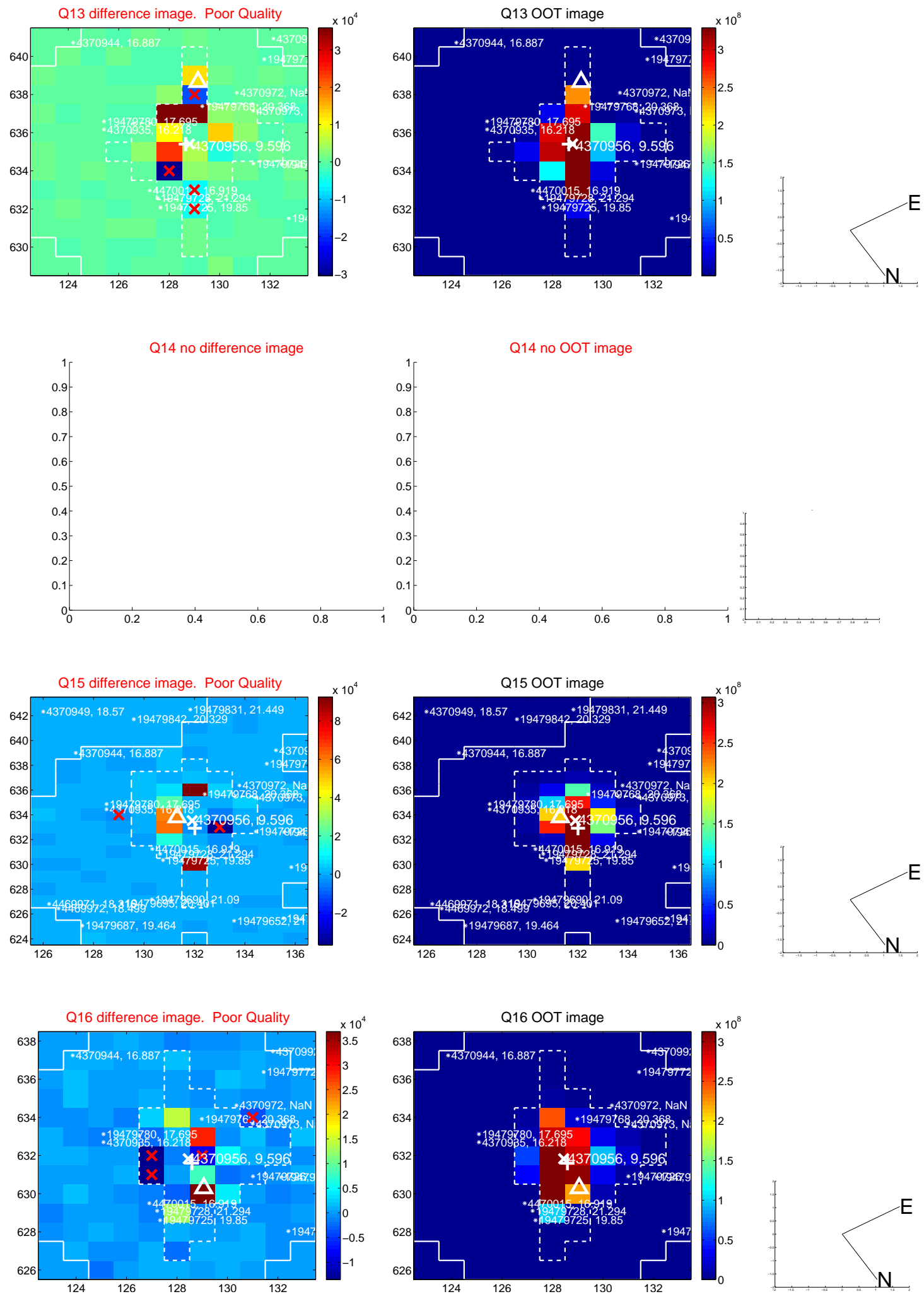
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



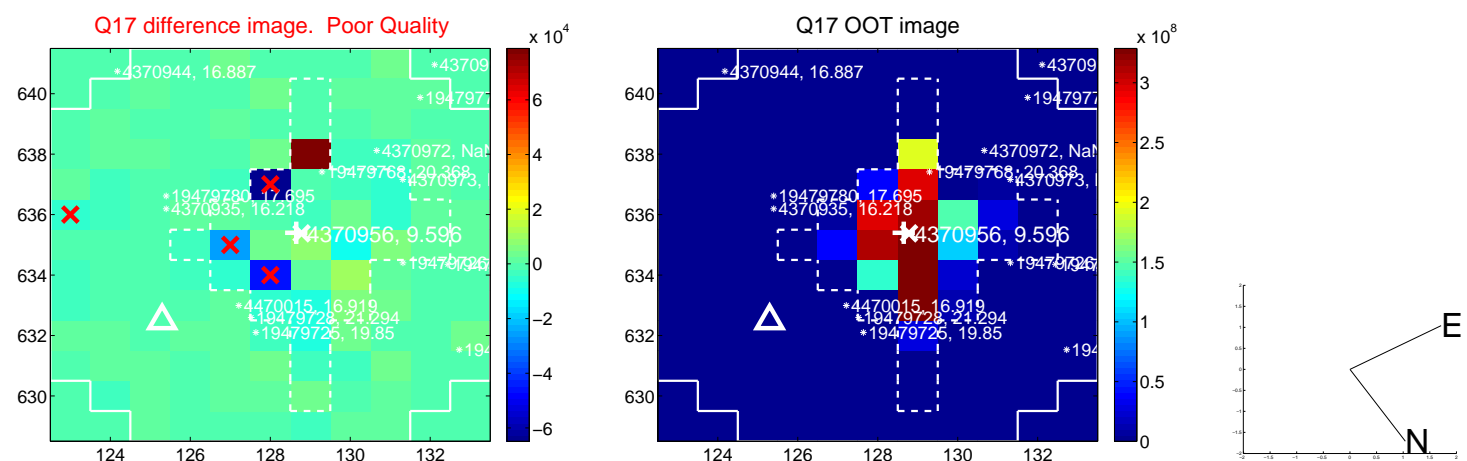
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



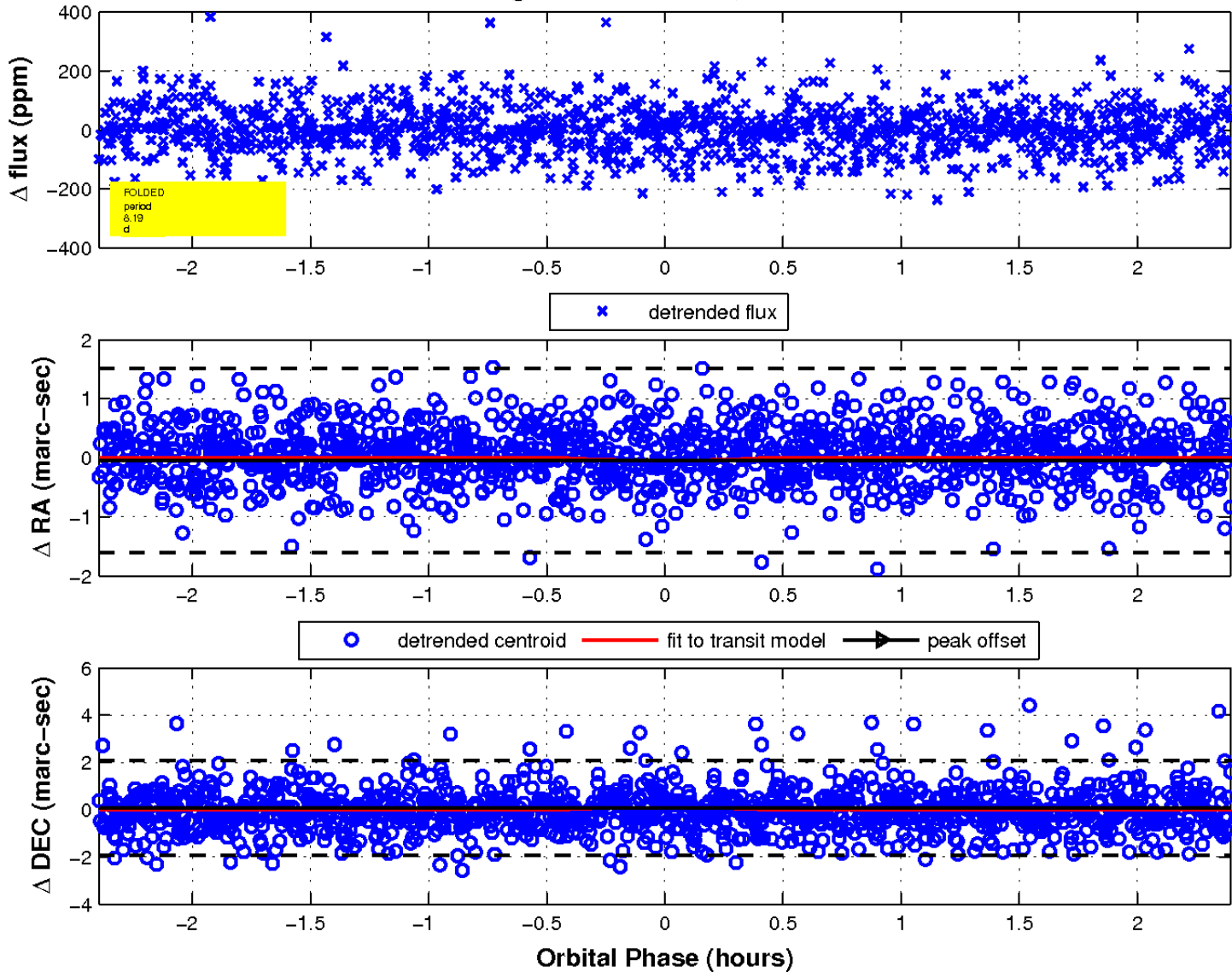
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



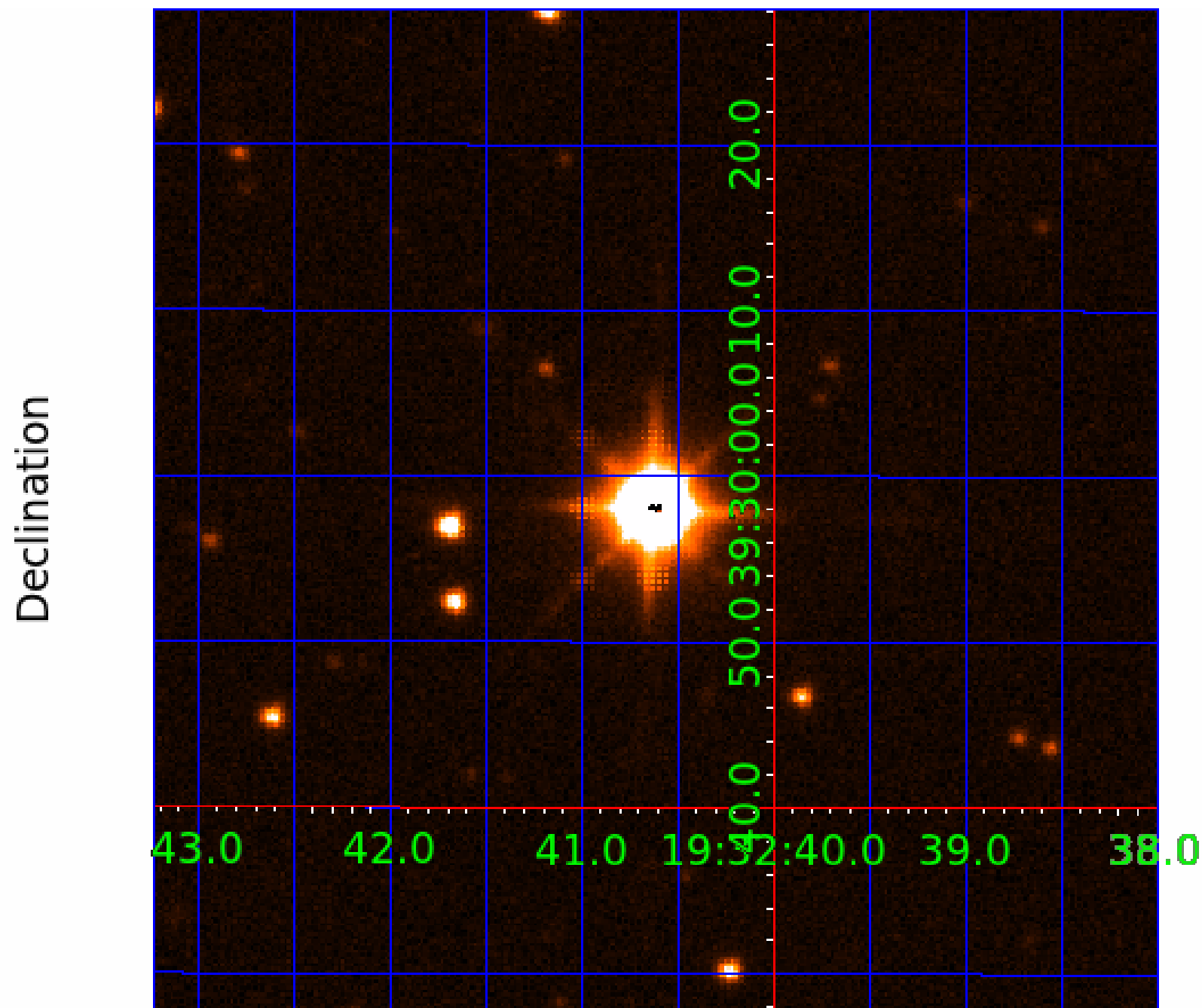
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 3 of 5



UKIRT Image



KIC 004370956

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})
004370956-01	OBS	No	0.546412	131.560384	6.0	4.087	8.7	4.5	1.73	6468	0.43	23226.23
004370956-02	OBS	No	8.194135	133.476619	206.5	1.500	28.0	-1.0	1.73	6468	2.51	628.06
004370956-03	OBS	No	8.190508	134.032331	1486.8	0.799	19.1	24.0	1.73	6468	7.40	628.43
004370956-04	OBS	No	4.097475	133.929744	96.9	1.500	13.5	-1.0	1.73	6468	1.72	1582.40
004370956-05	OBS	No	10.539084	135.243248	345.0	1.354	10.5	9.3	1.73	6468	3.24	449.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004370956-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004370956-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_SATURATED
004370956-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
004370956-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—SWEET_NTL—LPP_DV—NO_FITS—SAME_NTL_PERIOD—CENT_SATURATED
004370956-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

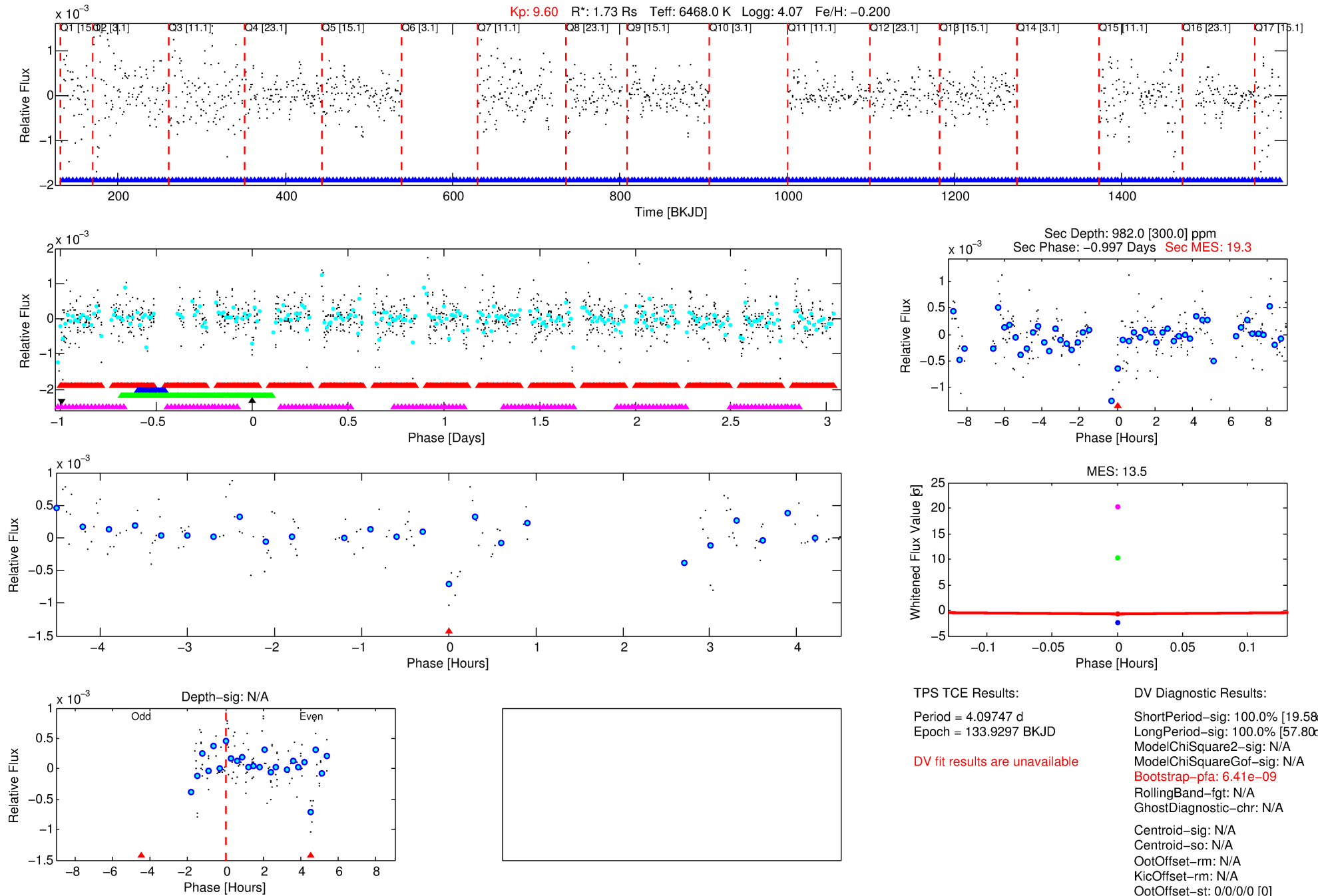
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004370956-04

No Significant Match Found

DV One-Page Summary

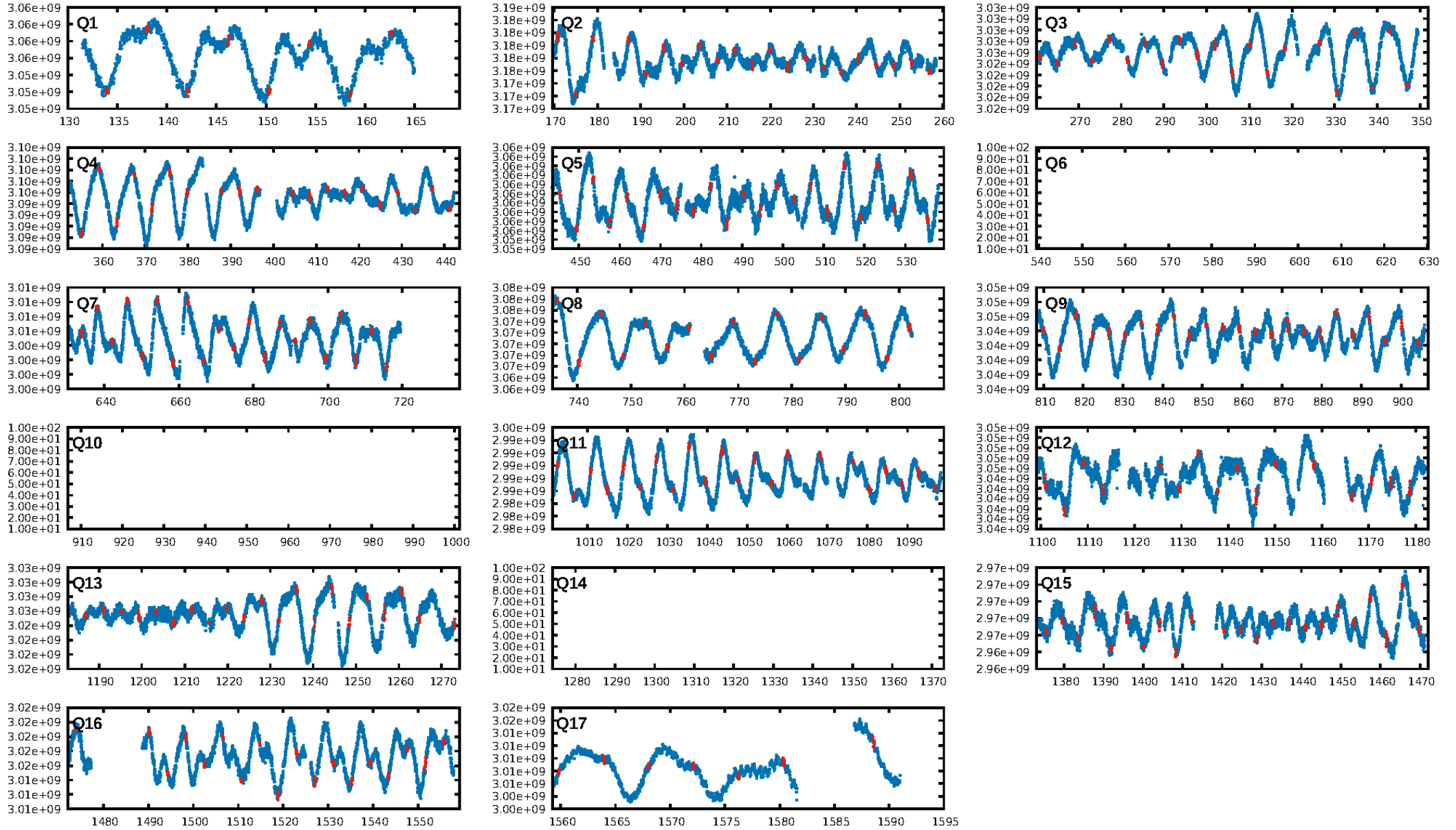
KIC: 4370956 Candidate: 4 of 5 Period: 4.097 d



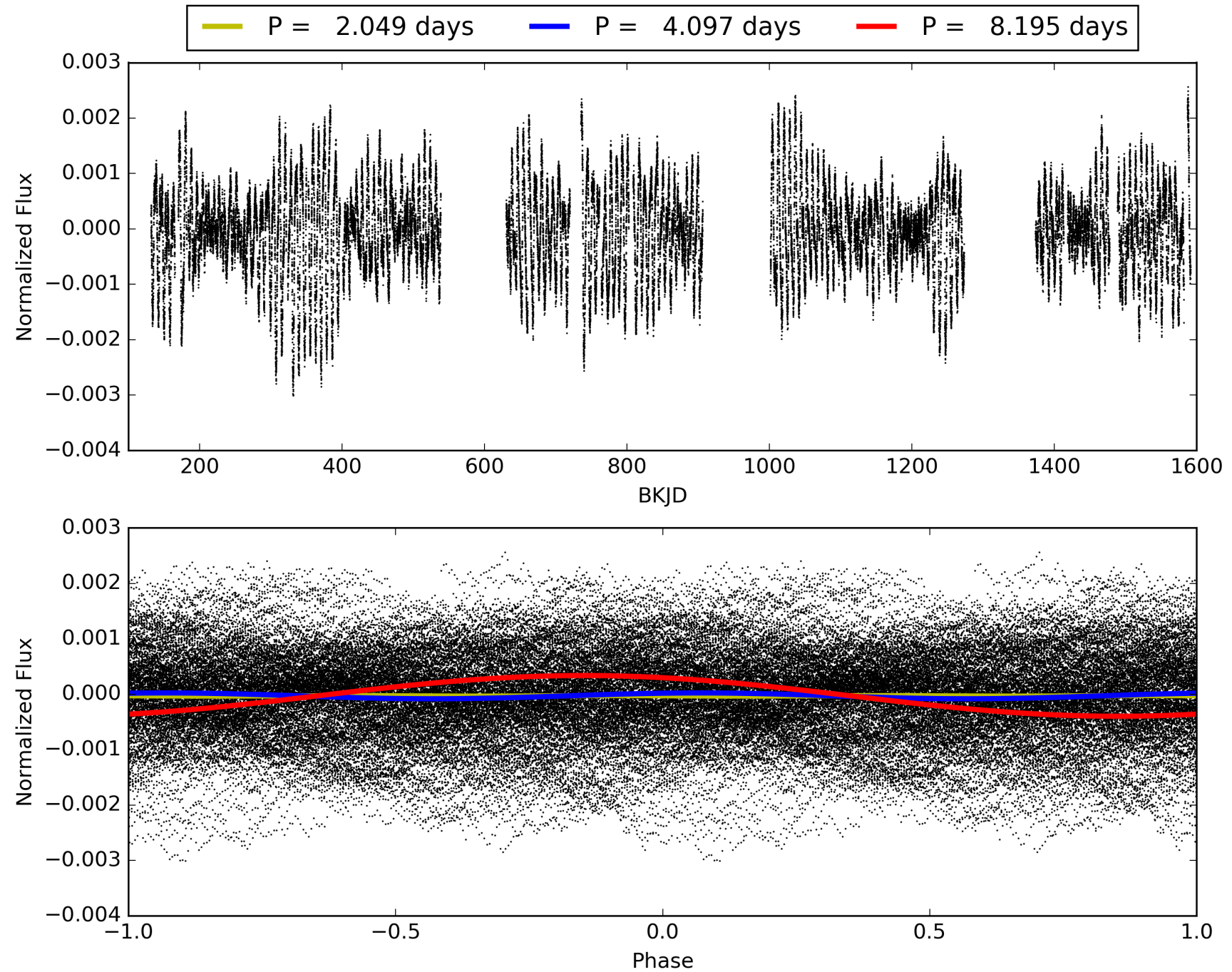
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:05:58 Z

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

TCE 004370956-04, PDC Light Curves

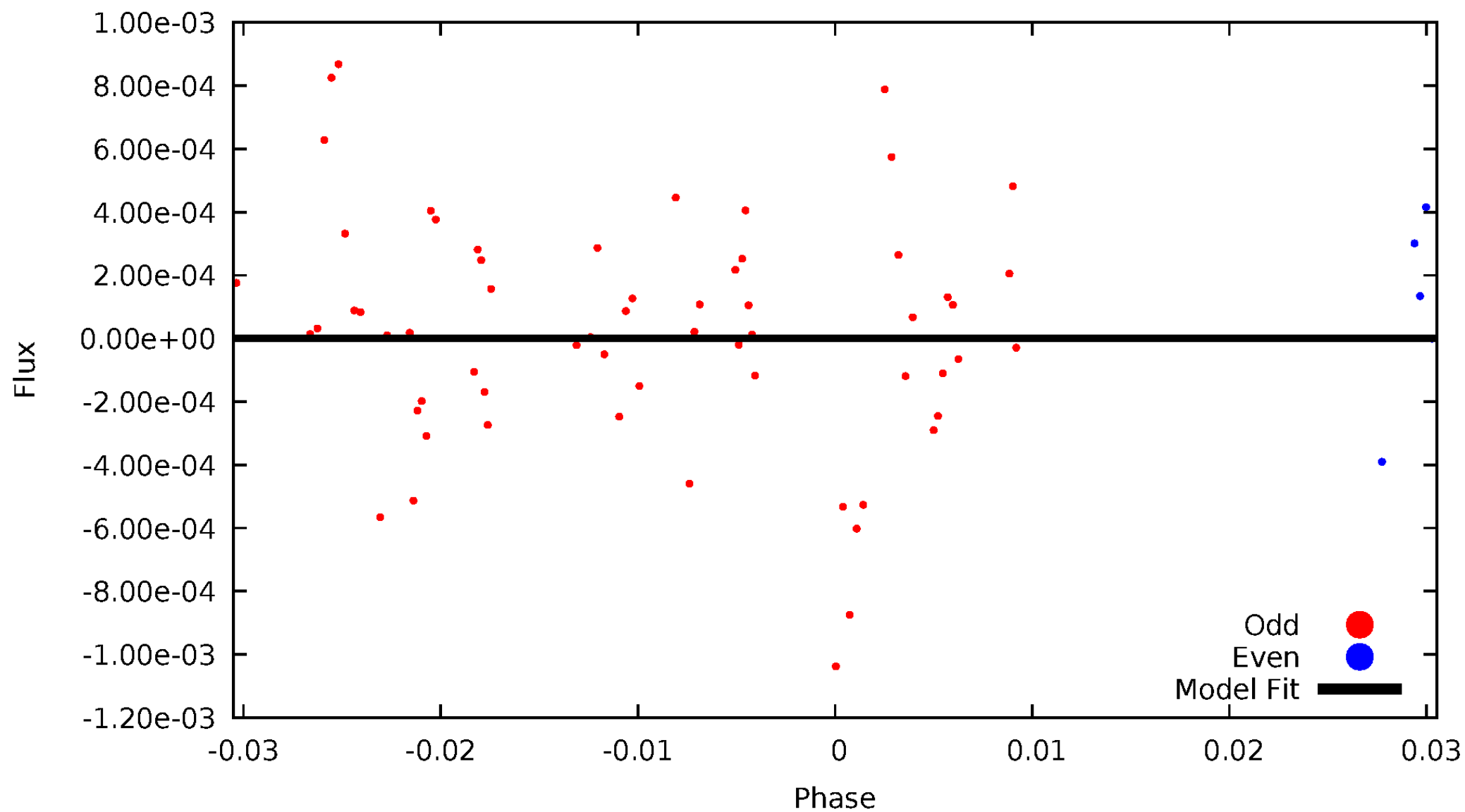


TCE 004370956-04



DV Odd/Even

TCE 004370956-04

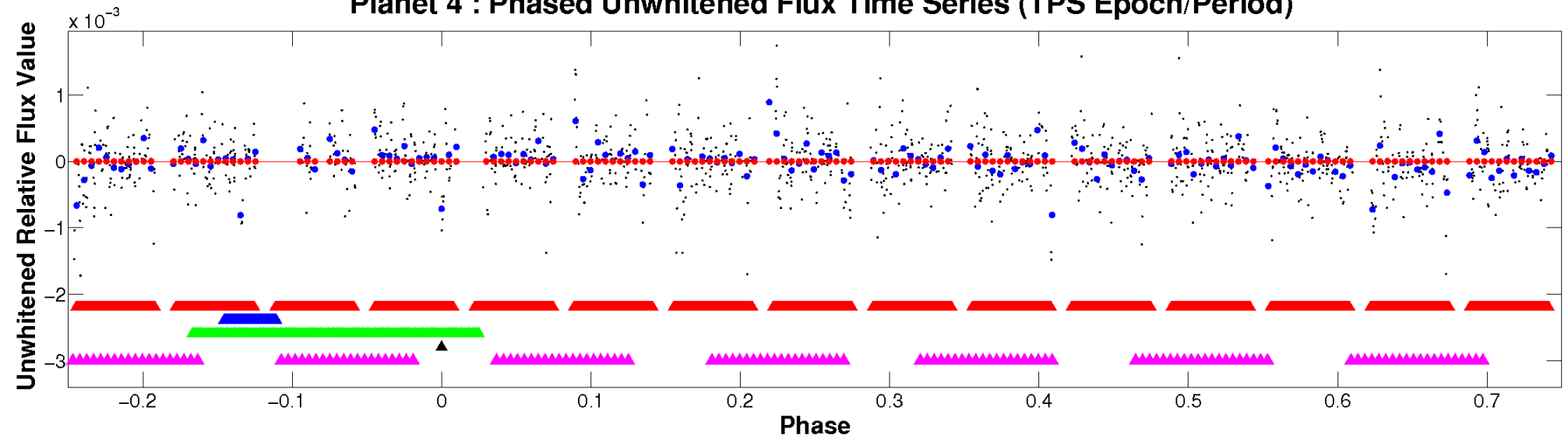


ALT Odd/Even

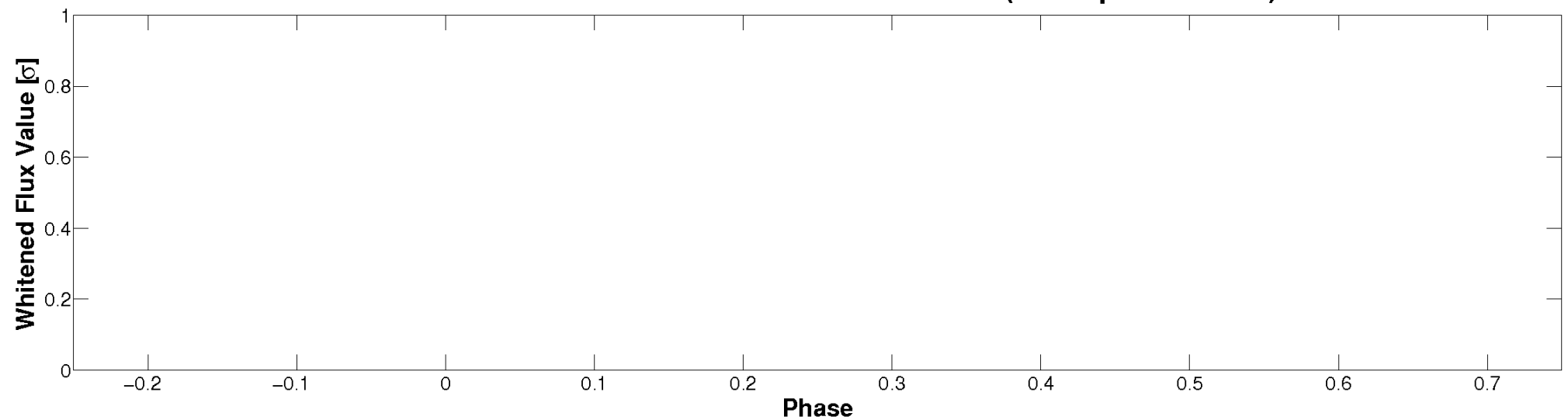
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

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

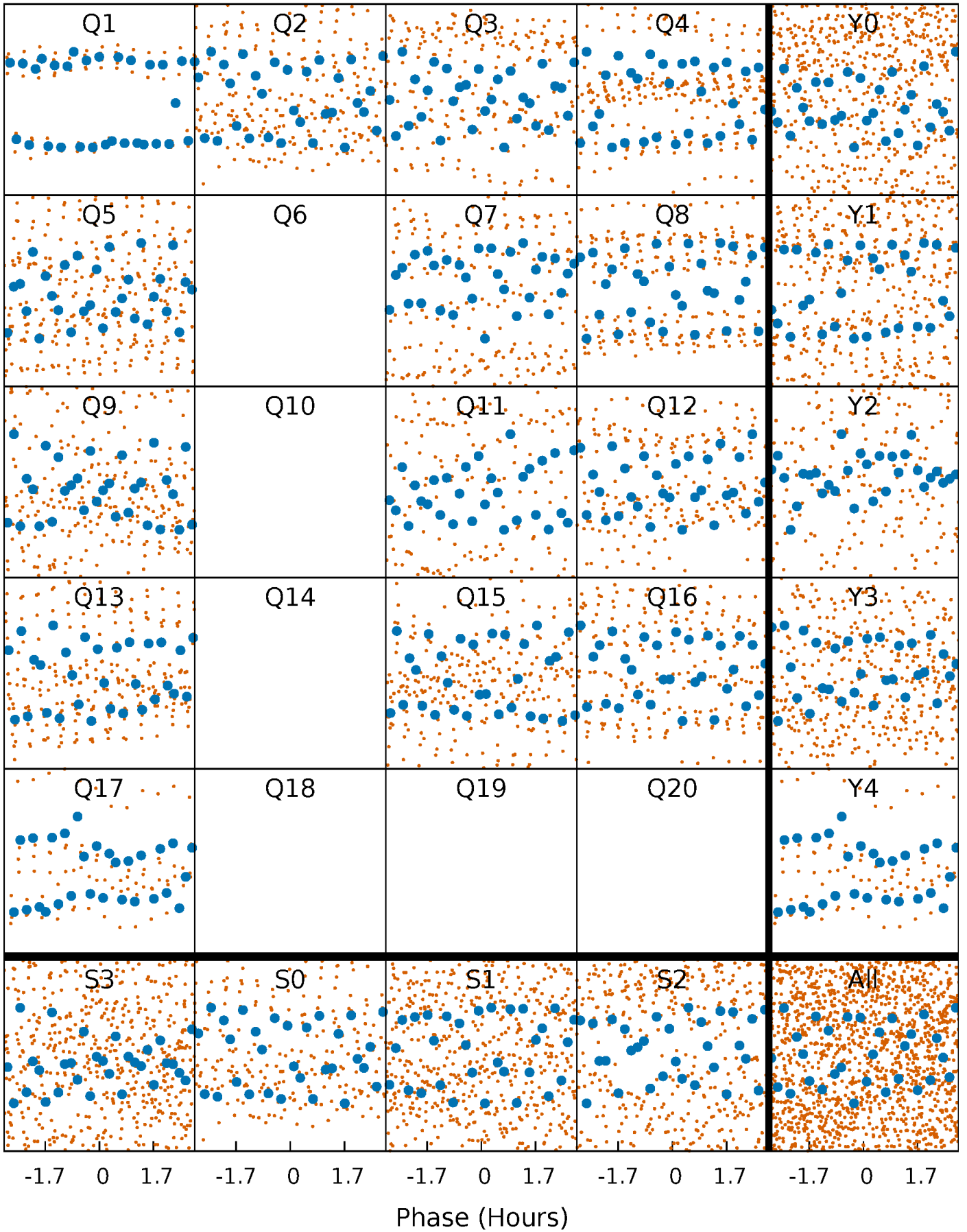


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



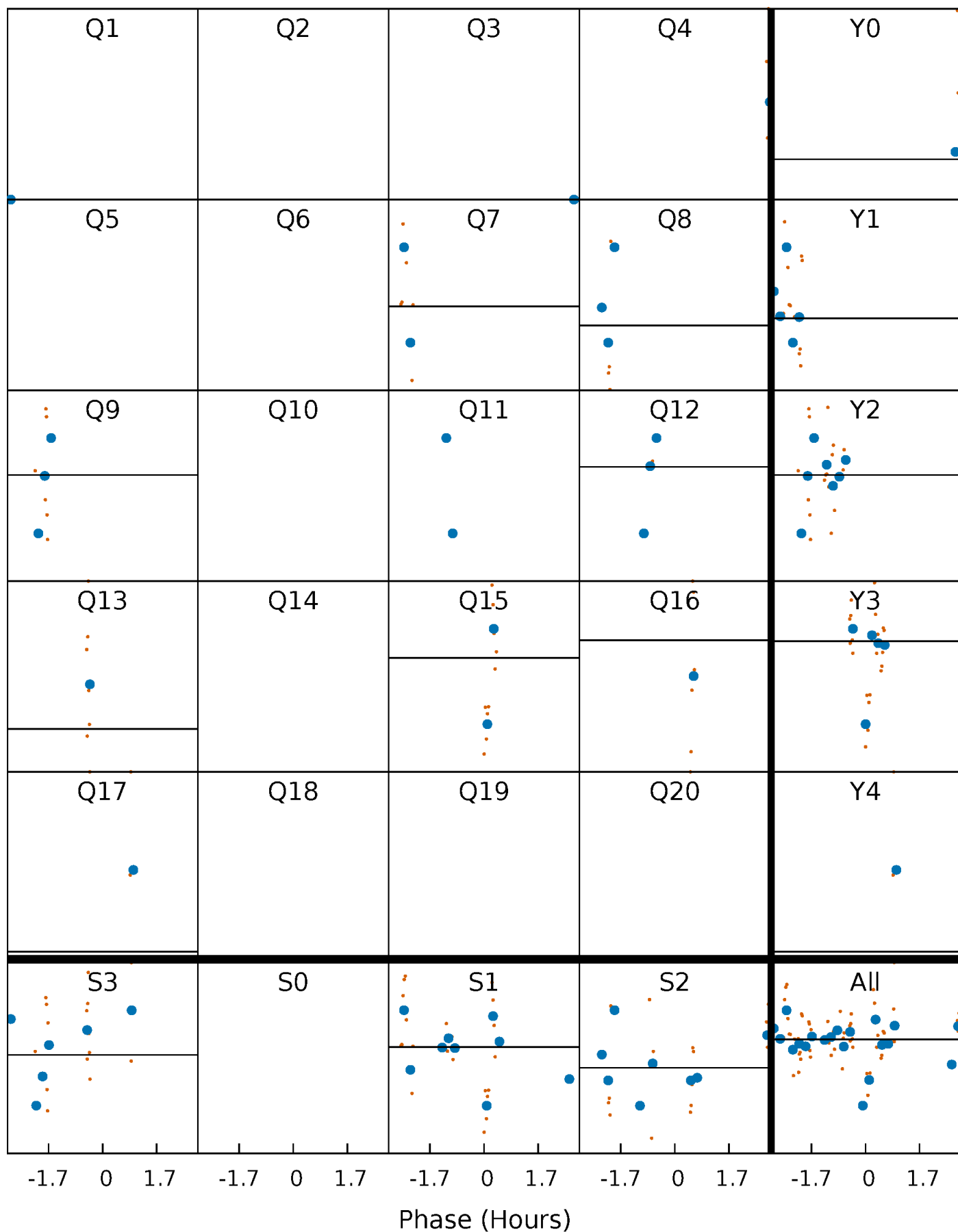
PDC Quarter-Phased Transit Curves

TCE 004370956-04 $P = 4.097475$ Days $T_0 = 133.929744$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 004370956-04 P= 4.097475 Days $T_0=133.929744$ (BKJD)

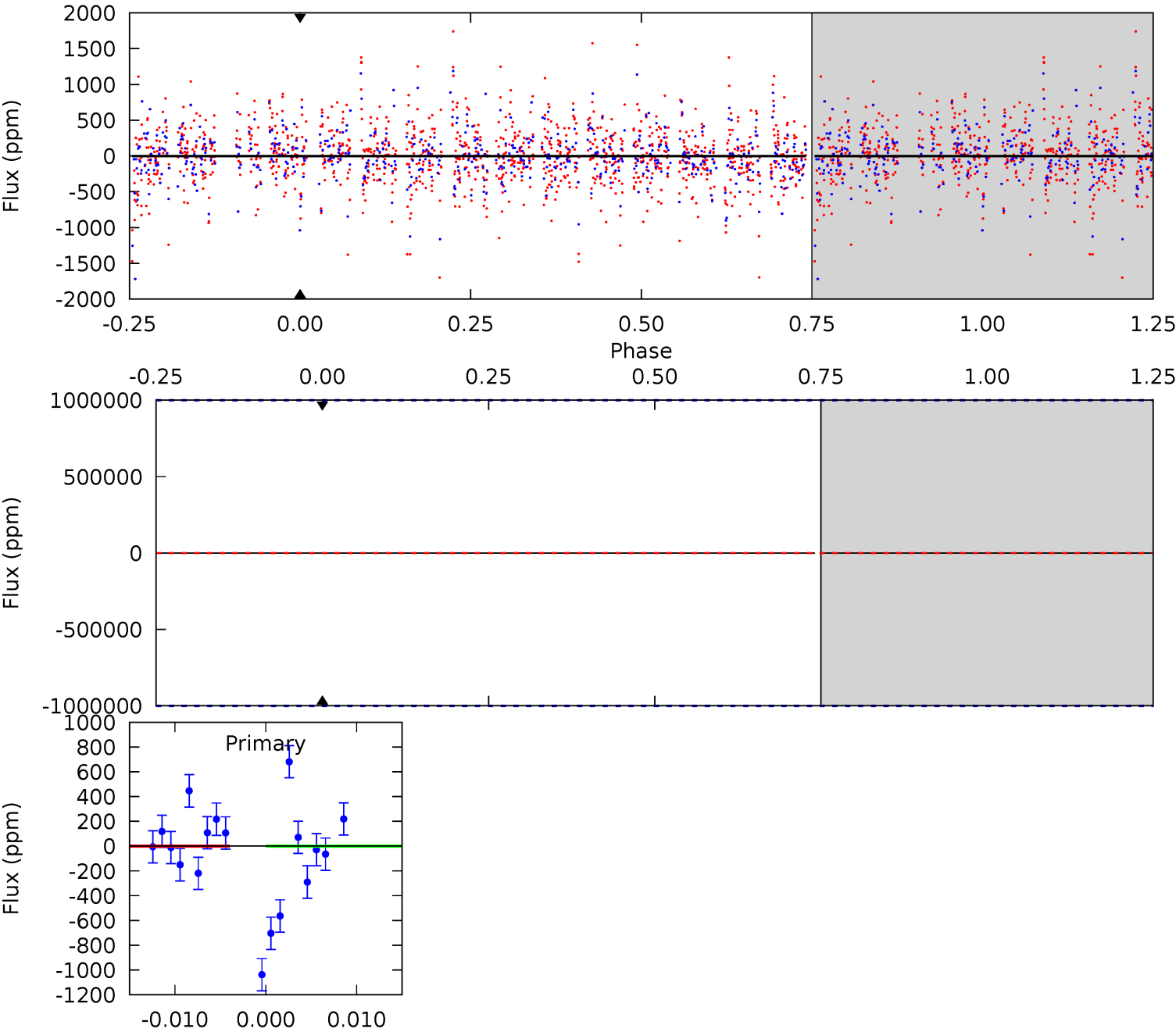


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

004370956-04, P = 4.097475 Days, E = 129.832269 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 004370956

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6468^{+181}_{-227}	$4.070^{+0.280}_{-0.172}$	$-0.200^{+0.250}_{-0.300}$	$1.730^{+0.477}_{-0.583}$	$1.288^{+0.172}_{-0.257}$	$0.350^{+0.659}_{-0.150}$
	+3%/-4%	+7%/-4%	+125%/-150%	+28%/-34%	+13%/-20%	+188%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004370956-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$13.20^{+15.15}_{-9.42}$	2231^{+188}_{-224}	4249^{+27160}_{-28920}	$9.305^{+1978.103}_{-1234.198}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

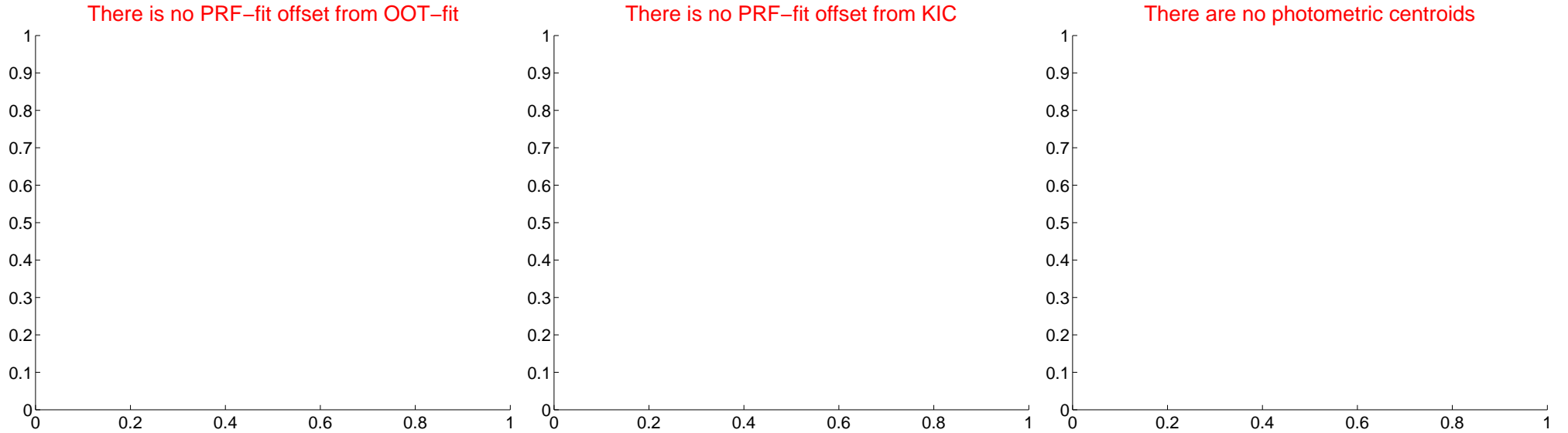
DV Centroid Data

Supplemental centroid analysis for 004370956-04. **Kepler magnitude: 9.60.** Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
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.

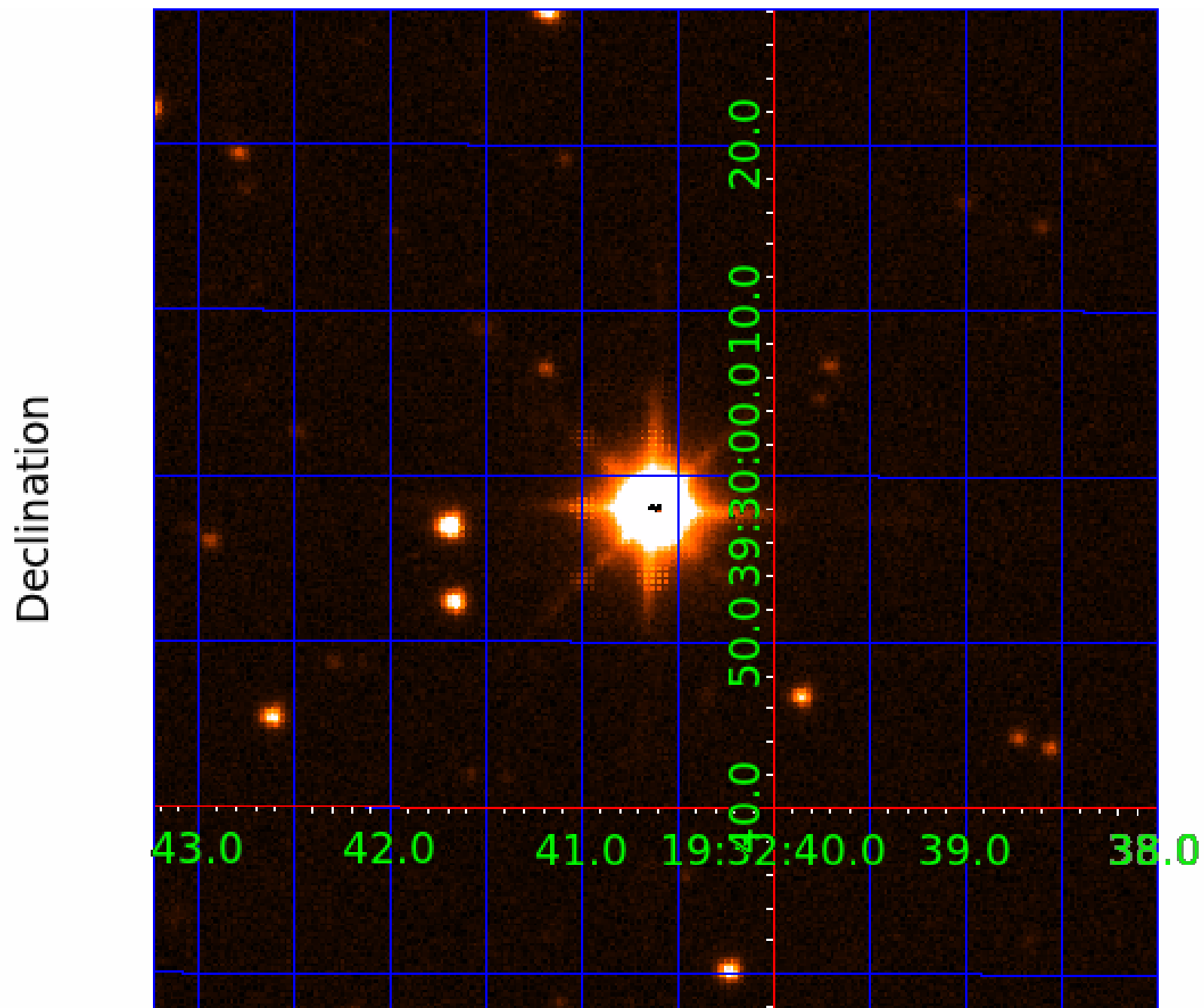


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image



KIC 004370956

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})
004370956-01	OBS	No	0.546412	131.560384	6.0	4.087	8.7	4.5	1.73	6468	0.43	23226.23
004370956-02	OBS	No	8.194135	133.476619	206.5	1.500	28.0	-1.0	1.73	6468	2.51	628.06
004370956-03	OBS	No	8.190508	134.032331	1486.8	0.799	19.1	24.0	1.73	6468	7.40	628.43
004370956-04	OBS	No	4.097475	133.929744	96.9	1.500	13.5	-1.0	1.73	6468	1.72	1582.40
004370956-05	OBS	No	10.539084	135.243248	345.0	1.354	10.5	9.3	1.73	6468	3.24	449.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004370956-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004370956-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_SATURATED
004370956-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
004370956-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—SWEET_NTL—LPP_DV—NO_FITS—SAME_NTL_PERIOD—CENT_SATURATED
004370956-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

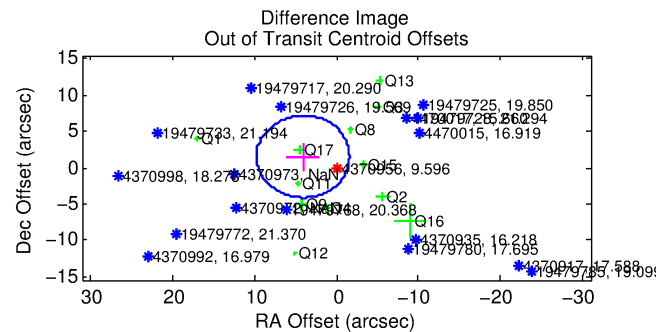
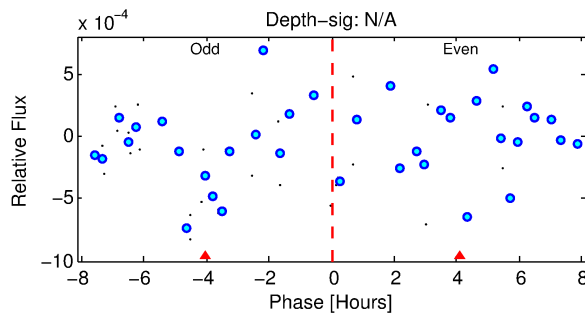
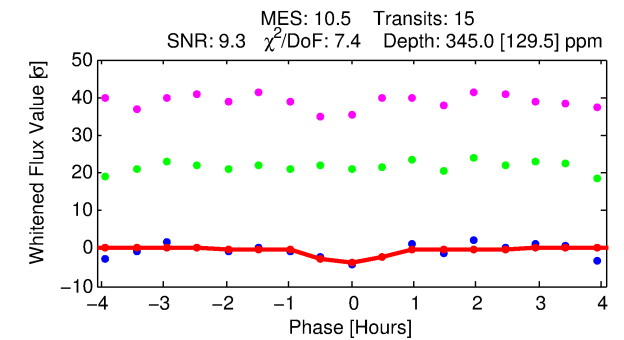
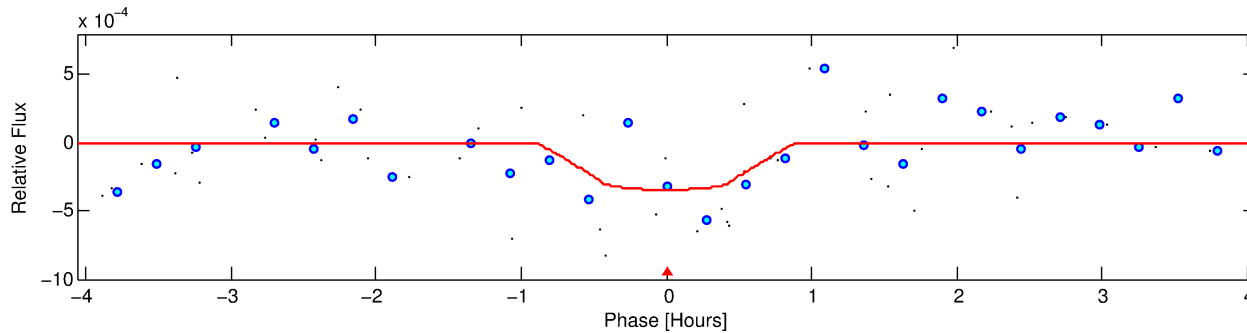
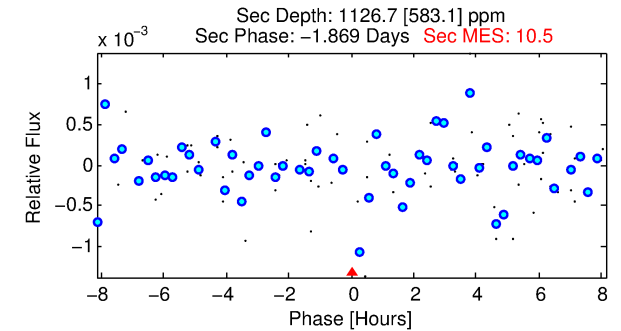
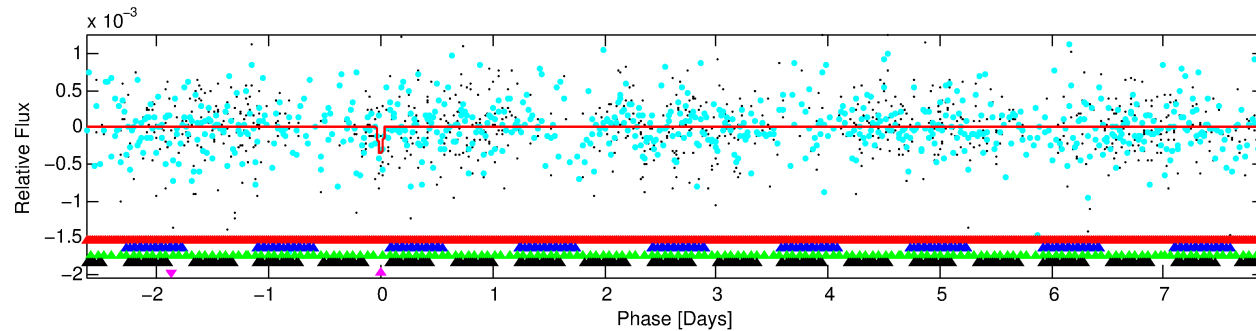
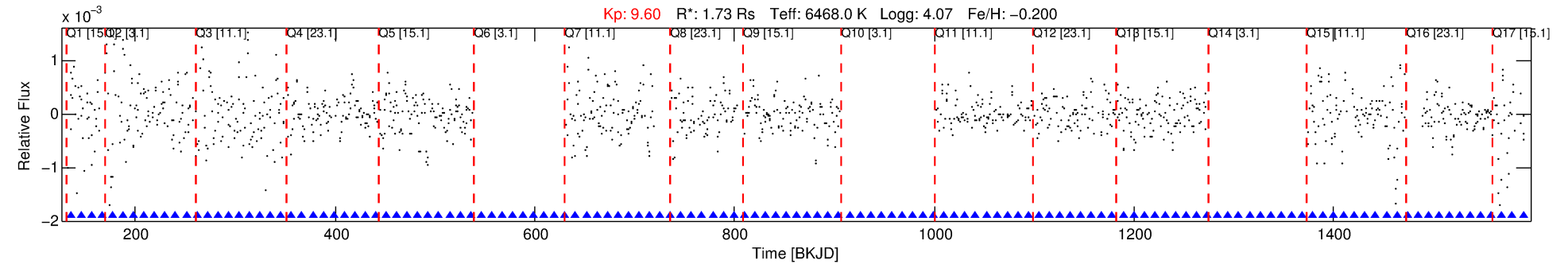
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004370956-05

No Significant Match Found

DV One-Page Summary

KIC: 4370956 Candidate: 5 of 5 Period: 10.539 d



DV Fit Results:

Period = 10.53908 [0.00028] d
Epoch = 135.2432 [0.0212] BKJD
Rp/R* = 0.0172 [0.0858]
a/R* = 60.14 [1536.13]
b = 0.11 [241.78]
Seff = 449.02 [226.71]
Teq = 1174 [148] K
Rp = 3.24 [16.23] Re
a = 0.1022 [0.0318] AU
Ag = 615.49 [6157.83] [0.10σ]
Teffp = 9039 [22585] K [0.35σ]

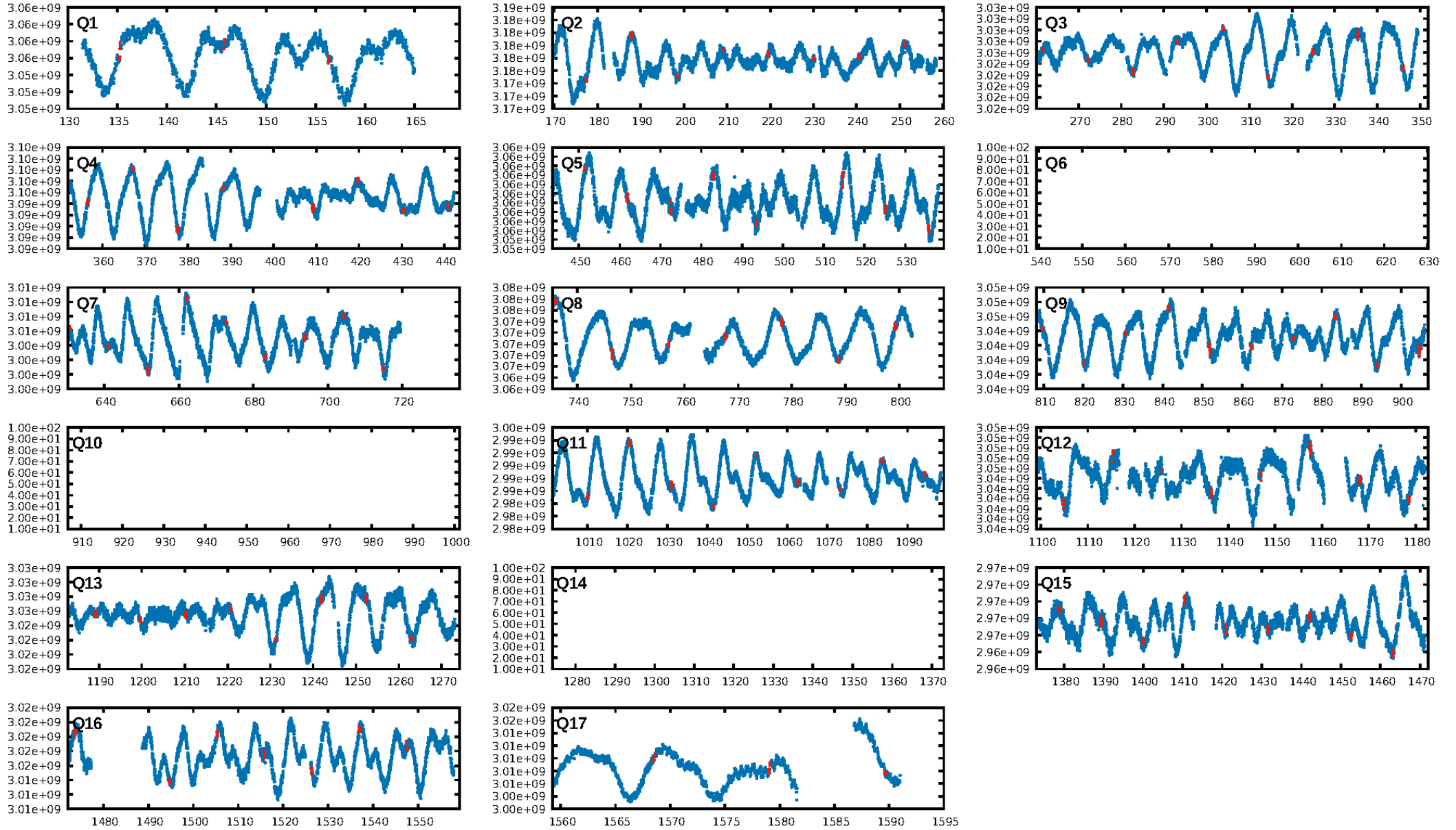
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.85σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 1.3%
Bootstrap-pfa: 4.82e-06
RollingBand-fgt: 1.00 [14/14]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.4%
Centroid-so: 0.325 arcsec [1.84σ]
OotOffset-rm: 4.342 arcsec [2.30σ]
KicOffset-rm: 4.643 arcsec [2.75σ]
OotOffset-st: 1/3/4/4 [12]
KicOffset-st: 1/3/4/4 [12]
DiffImageQuality-fgm: 0.00 [0/12]
DiffImageOverlap-fno: 0.00 [0/14]

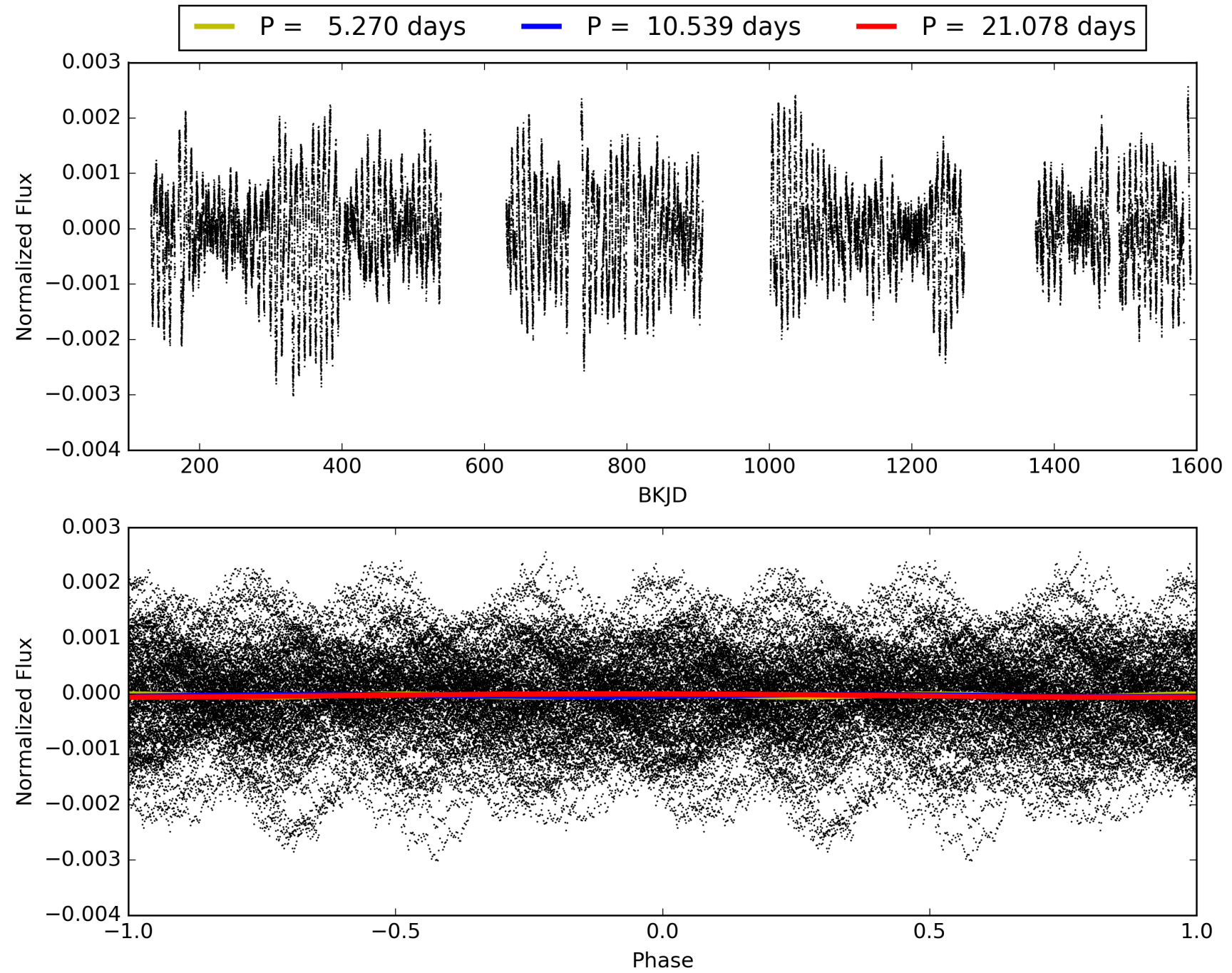
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:06:00 Z

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

TCE 004370956-05, PDC Light Curves

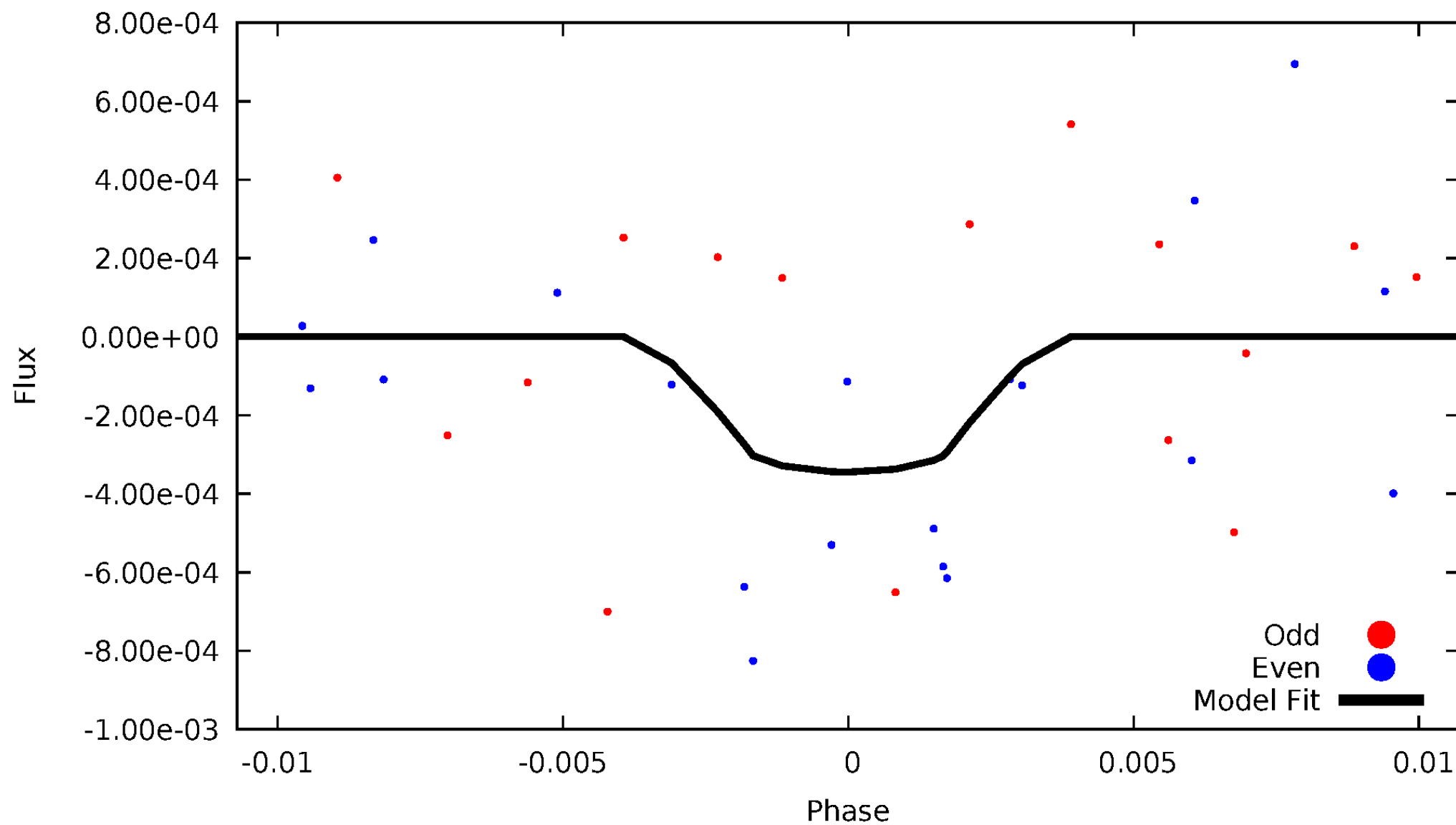


TCE 004370956-05



DV Odd/Even

TCE 004370956-05

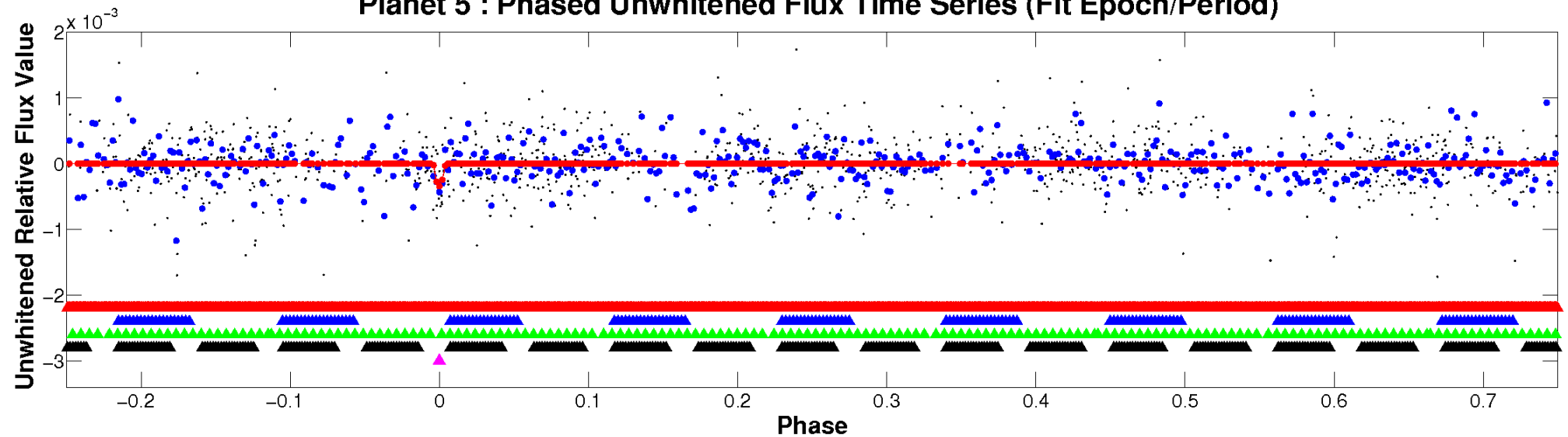


ALT Odd/Even

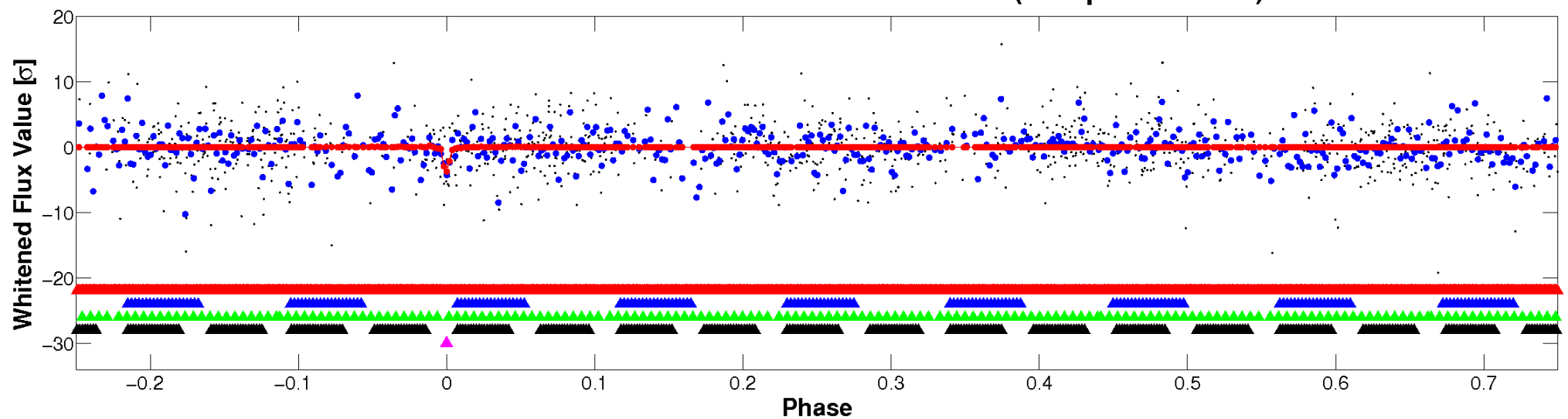
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

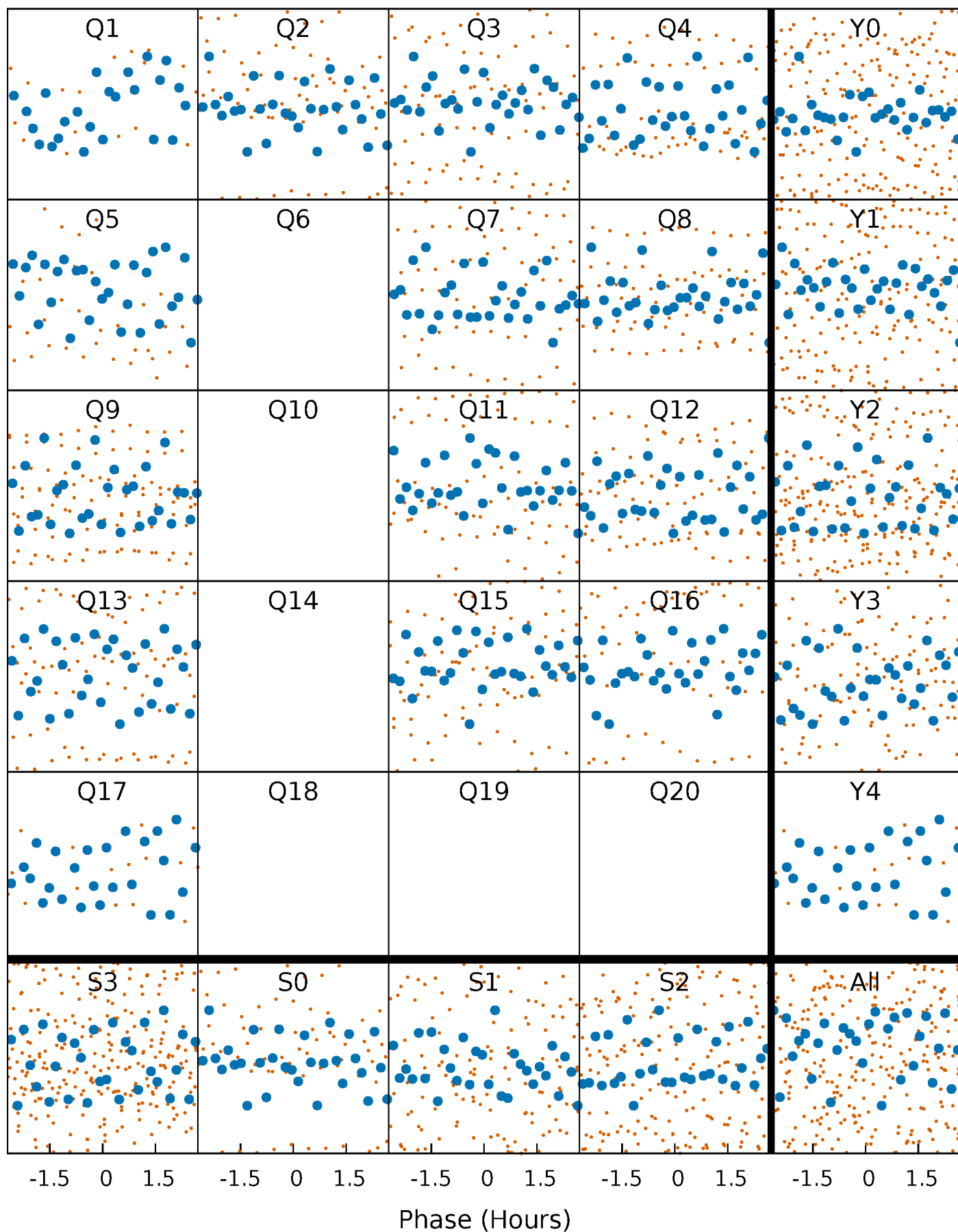


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



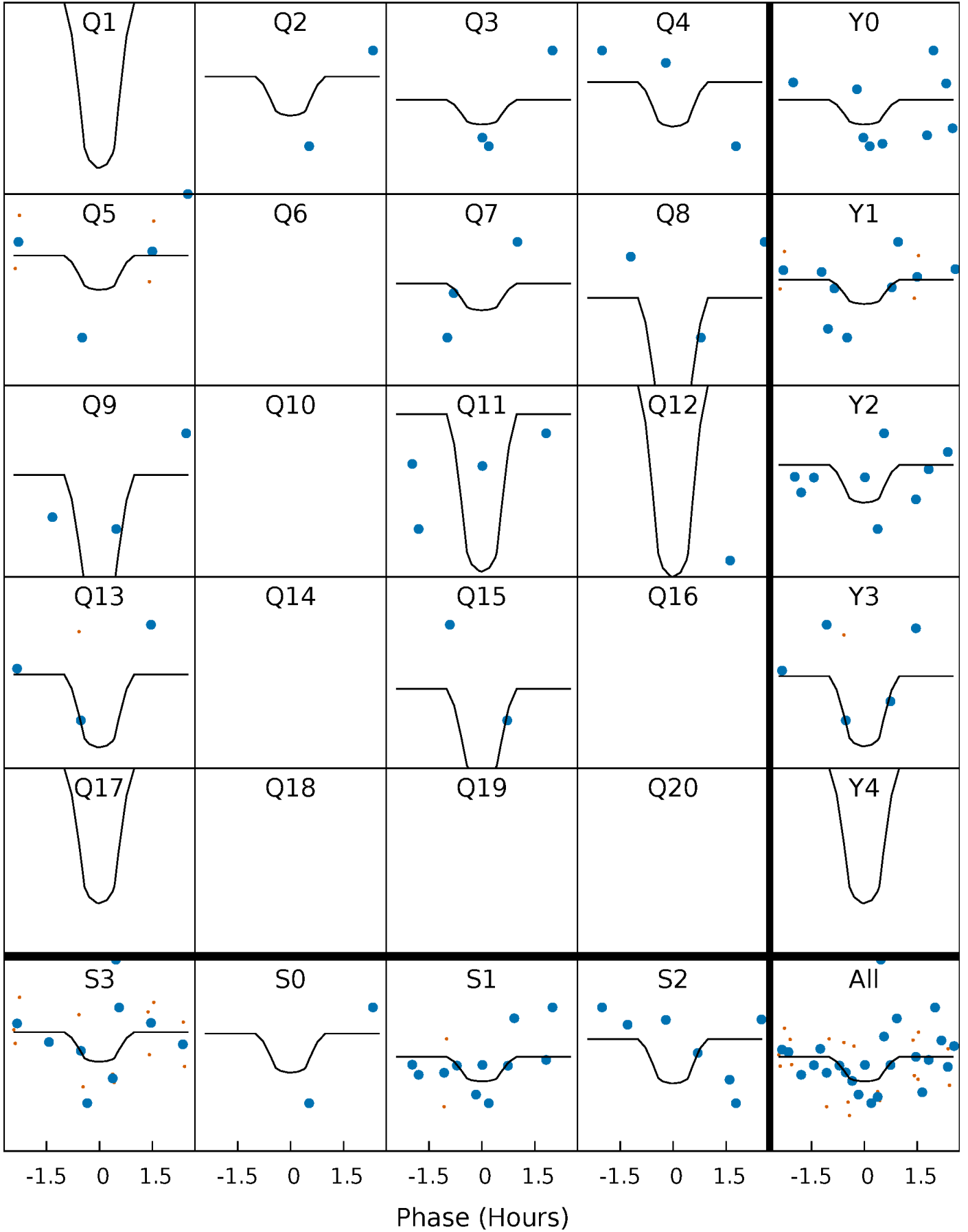
PDC Quarter-Phased Transit Curves

TCE 004370956-05 $P = 10.539084$ Days $T_0 = 135.243248$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 004370956-05 P= 10.539084 Days $T_0=135.243248$ (BKJD)

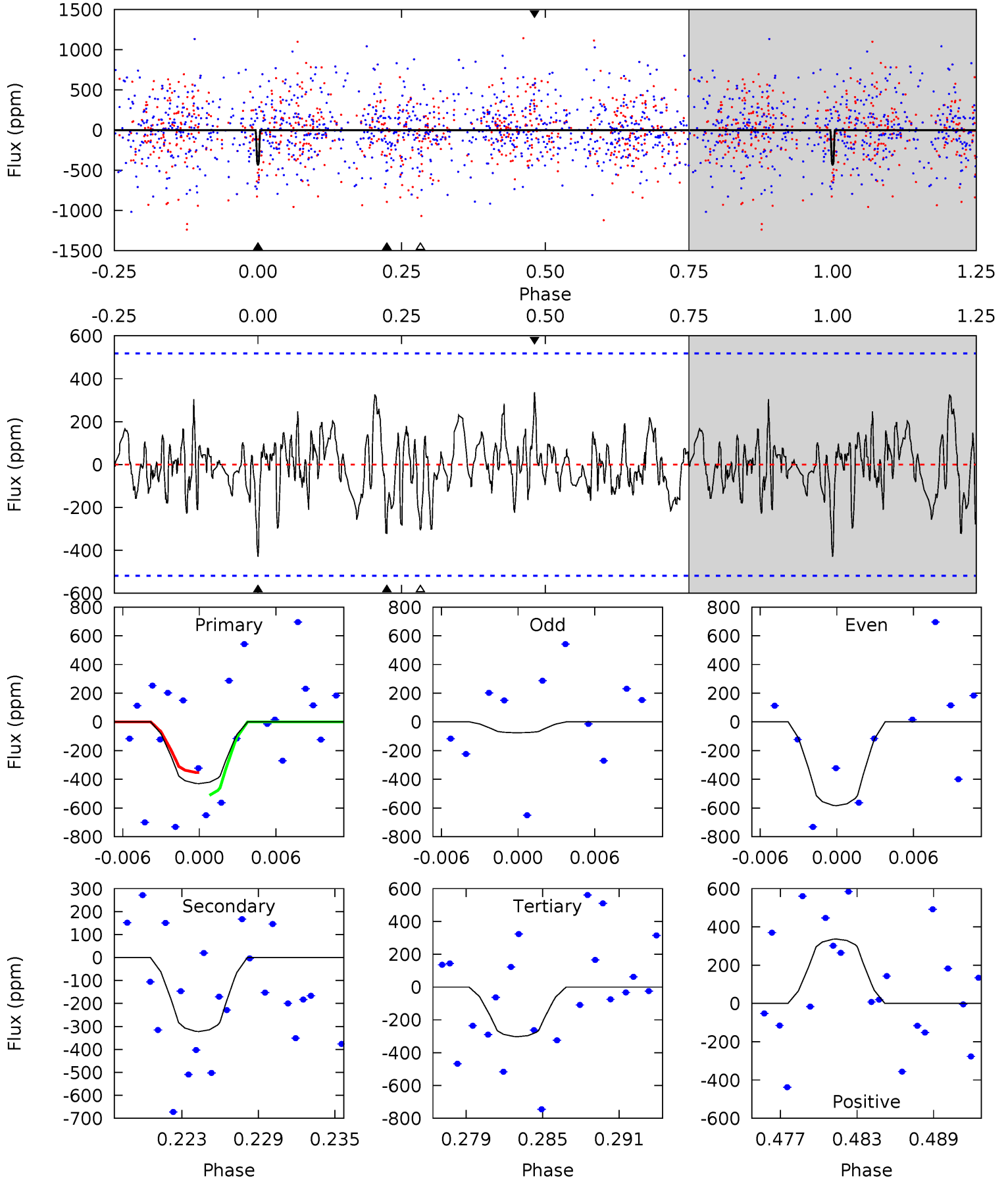


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

004370956-05, P = 10.539084 Days, E = 124.704164 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.24	3.18	2.99	3.32	5.12	2.74	1.12	1.26	0.92	0.19	-0.14	2.10	0	0.44	0.79



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 004370956

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6468^{+181}_{-227}	$4.070^{+0.280}_{-0.172}$	$-0.200^{+0.250}_{-0.300}$	$1.730^{+0.477}_{-0.583}$	$1.288^{+0.172}_{-0.257}$	$0.350^{+0.659}_{-0.150}$
	+3%/-4%	+7%/-4%	+125%/-150%	+28%/-34%	+13%/-20%	+188%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004370956-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-322±101	$11.63^{+12.20}_{-7.92}$	1621^{+131}_{-153}	3747^{+2415}_{-814}	12^{+123}_{-10}
Alt.	N/A	N/A	N/A	N/A	N/A

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

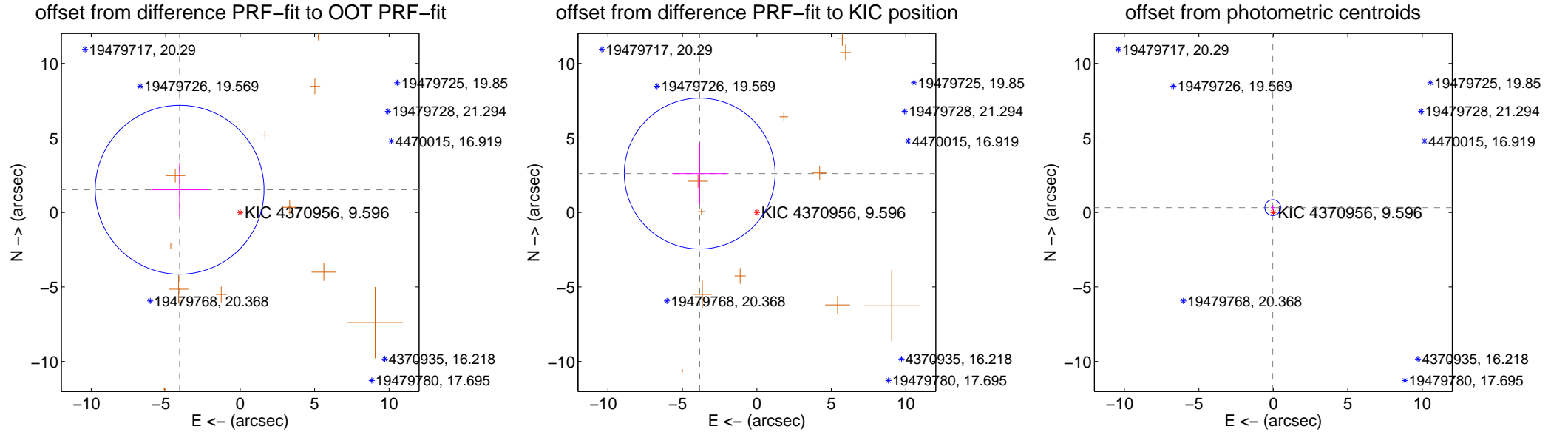
DV Centroid Data

Supplemental centroid analysis for 004370956-05. **Kepler magnitude: 9.60.** Transit SNR 9.35

There are 0 quarters with good PRF difference image offsets

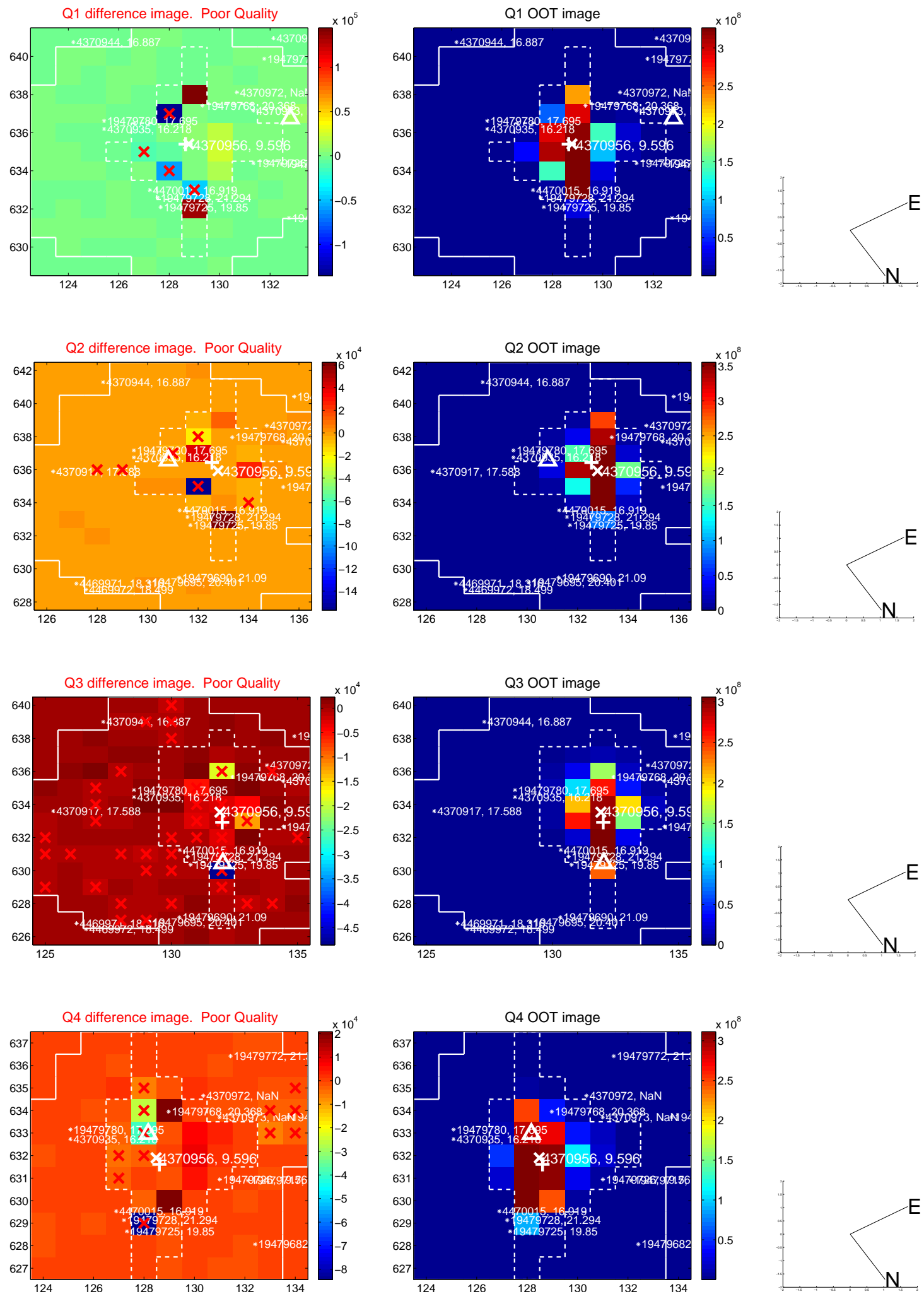
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.342 ± 1.890	2.30	4.066 ± 1.912	1.523 ± 1.790
PRF-fit source offset from KIC position	4.643 ± 1.688	2.75	3.841 ± 1.849	2.609 ± 2.052
photometric centroid source offset	0.33 ± 0.18	1.84	0.04 ± 0.14	0.32 ± 0.18

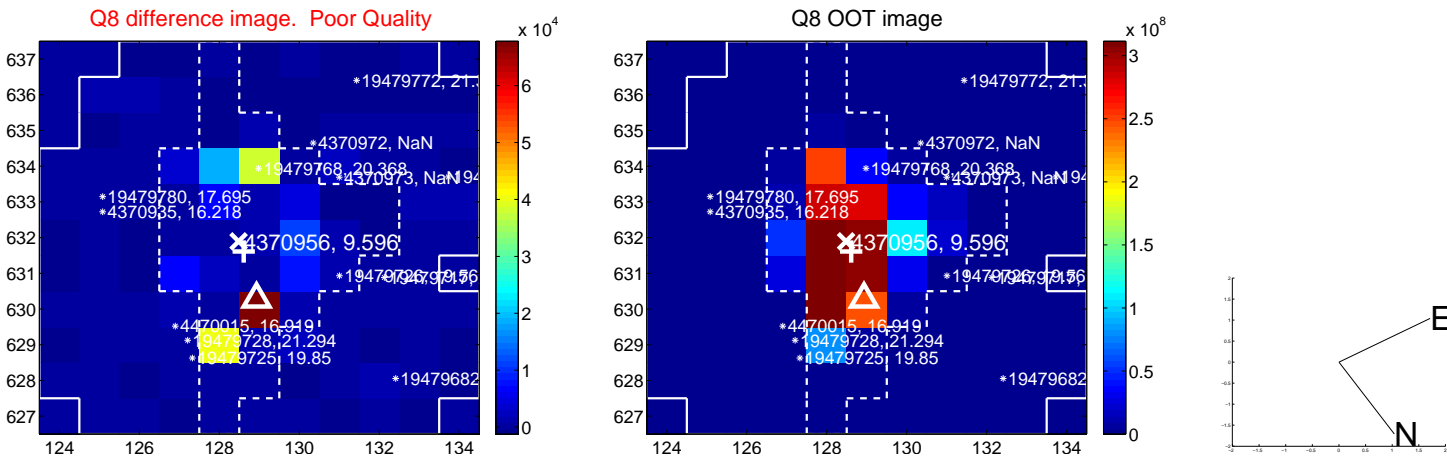
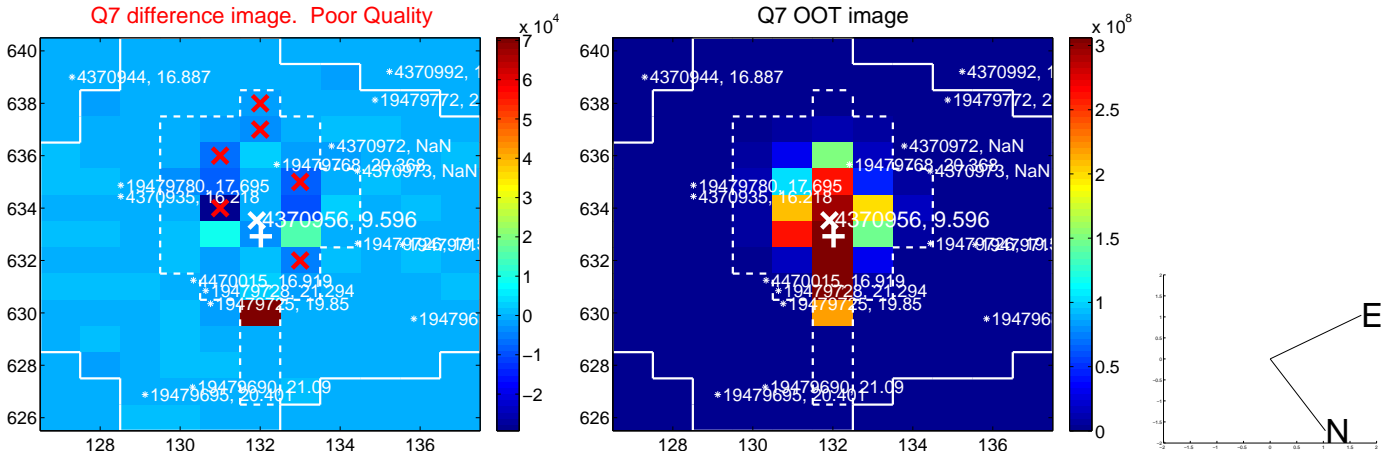
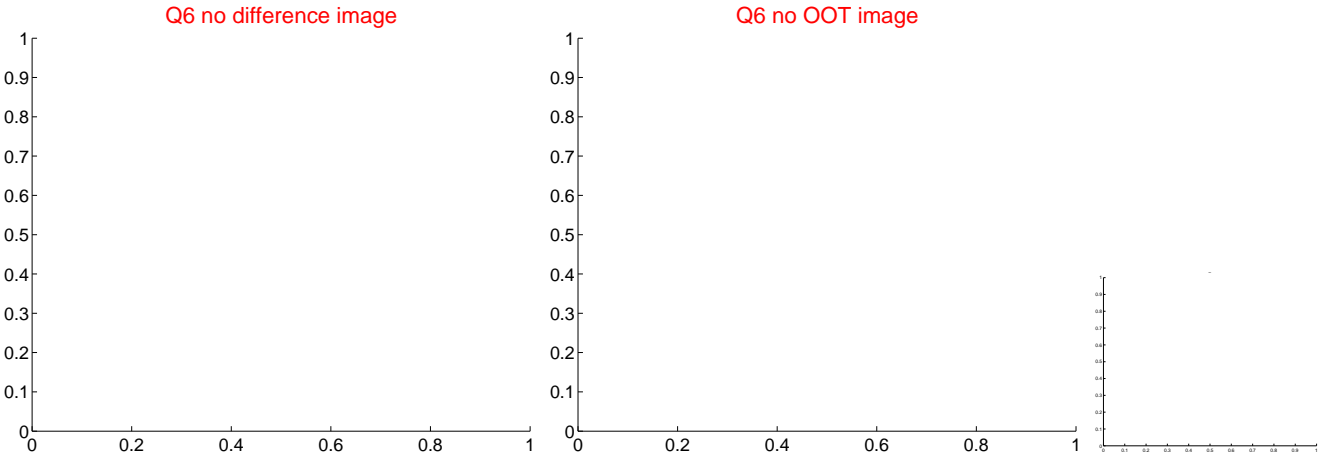
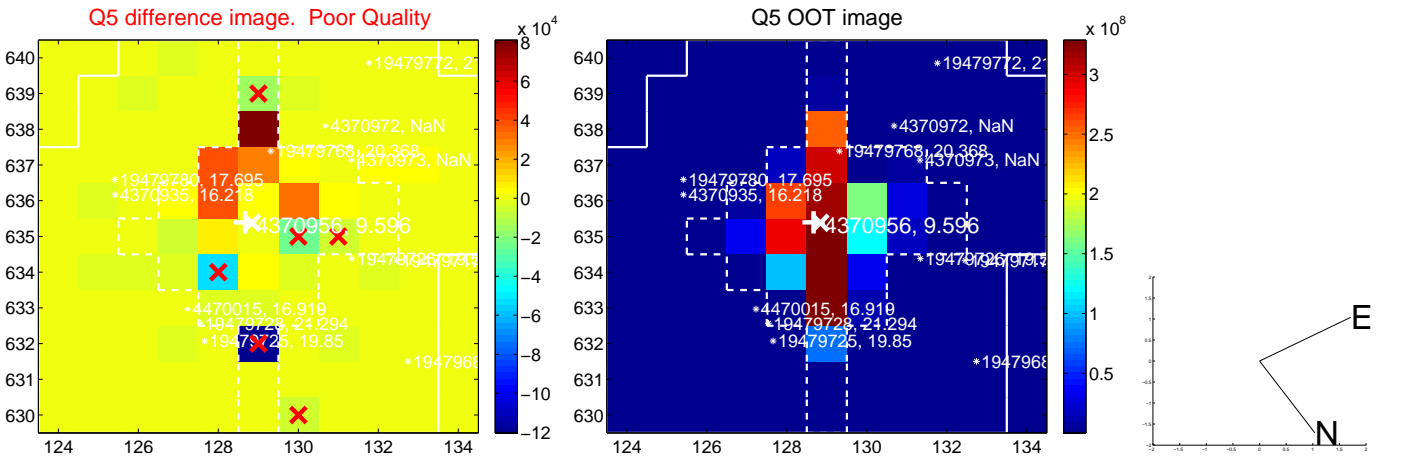


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

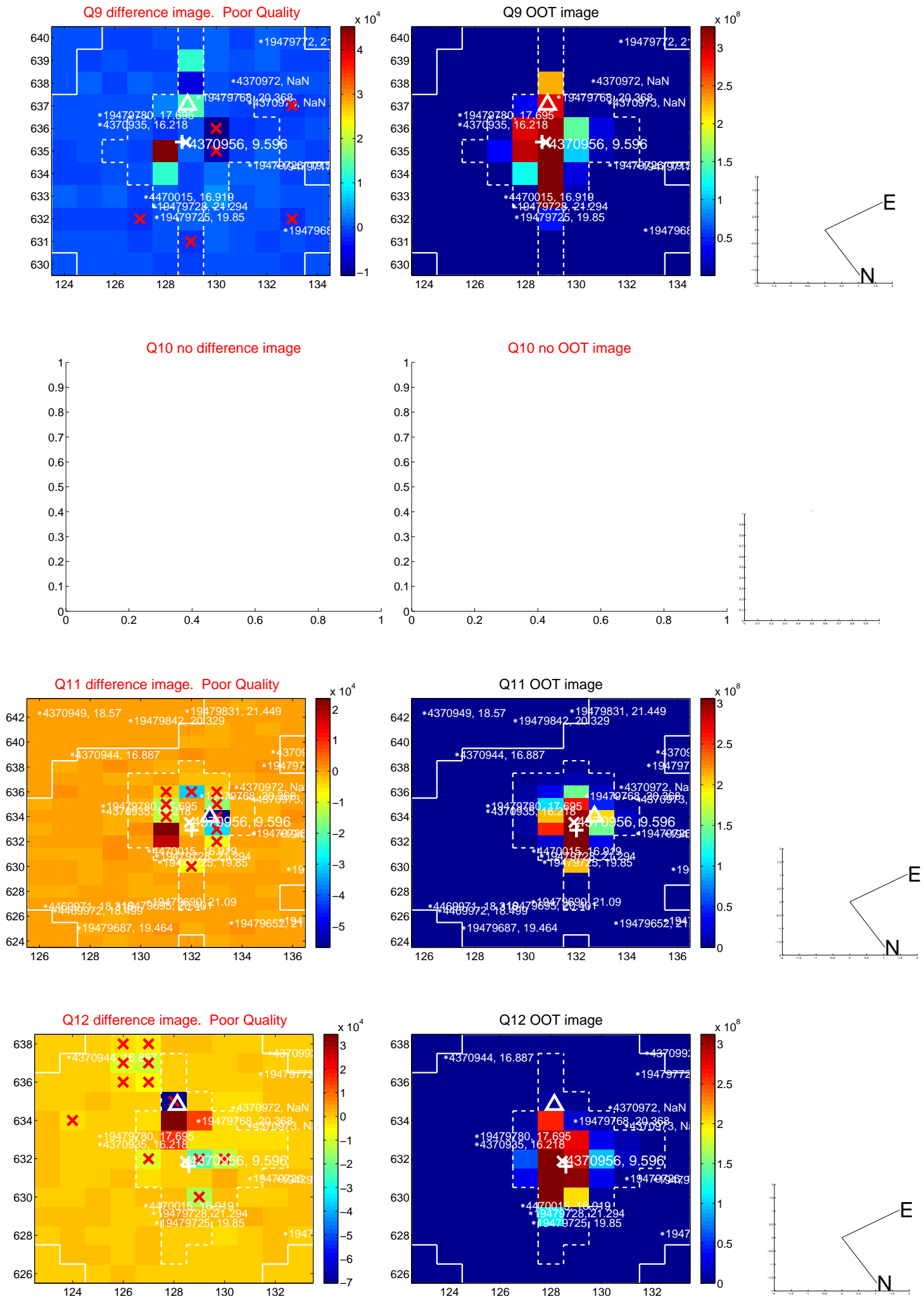
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



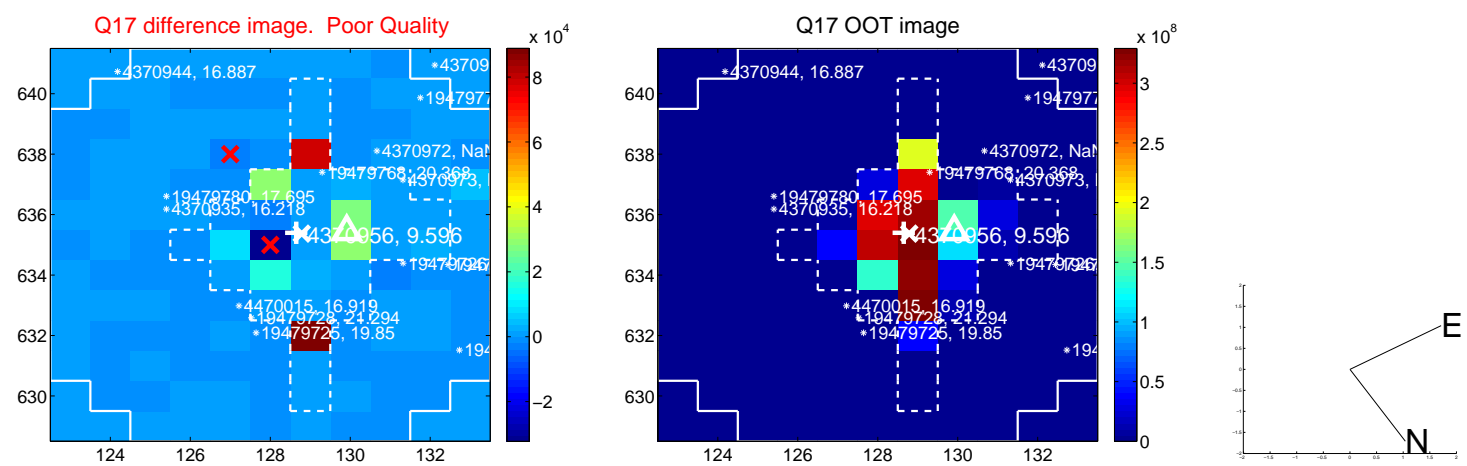
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



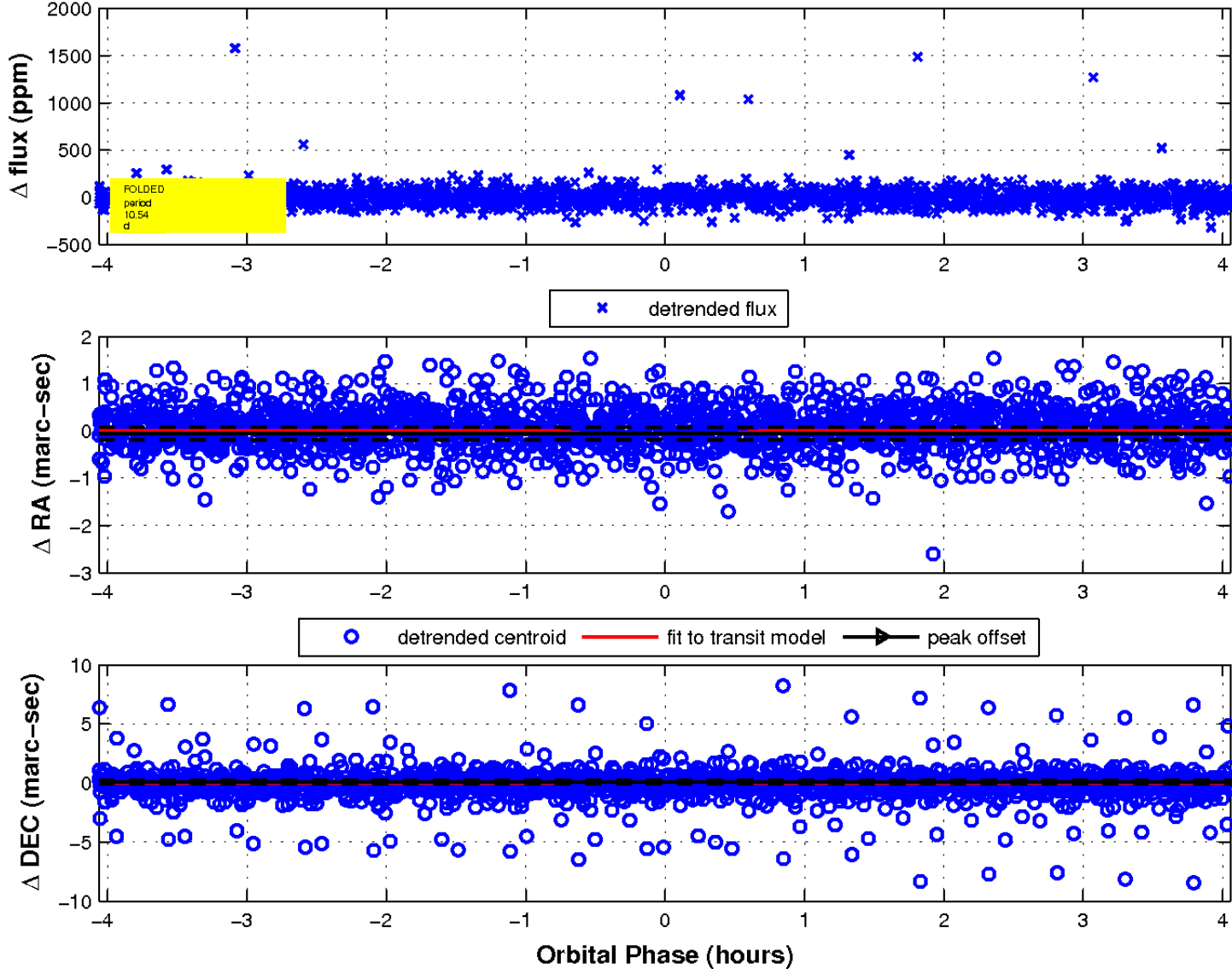
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 5 of 5



UKIRT Image

