

KIC 002857323

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})
002857323-02	OBS	No	322.496599	445.899643	18013.9	3.269	63.1	67.7	2.07	7956	29.02	12.07
002857323-03	OBS	No	186.912585	162.331613	1238.4	10.500	33.7	-1.0	2.07	7956	7.39	24.99

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002857323-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002857323-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

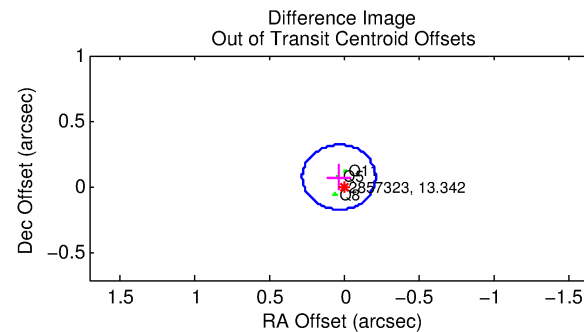
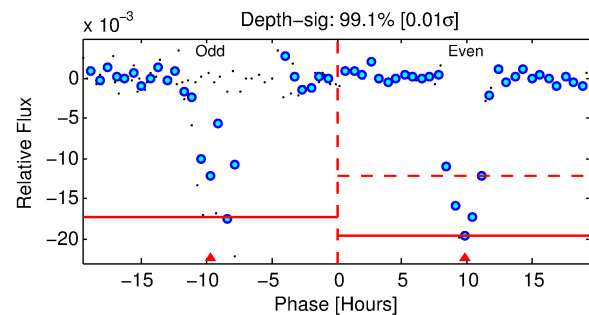
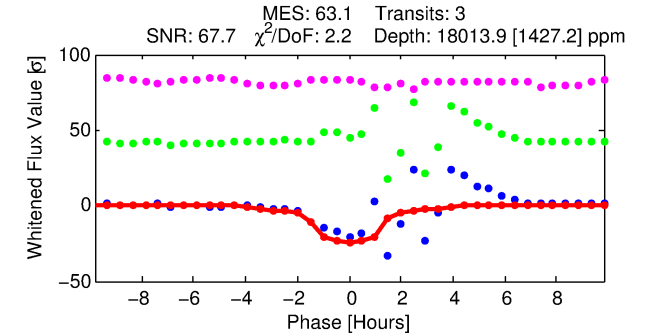
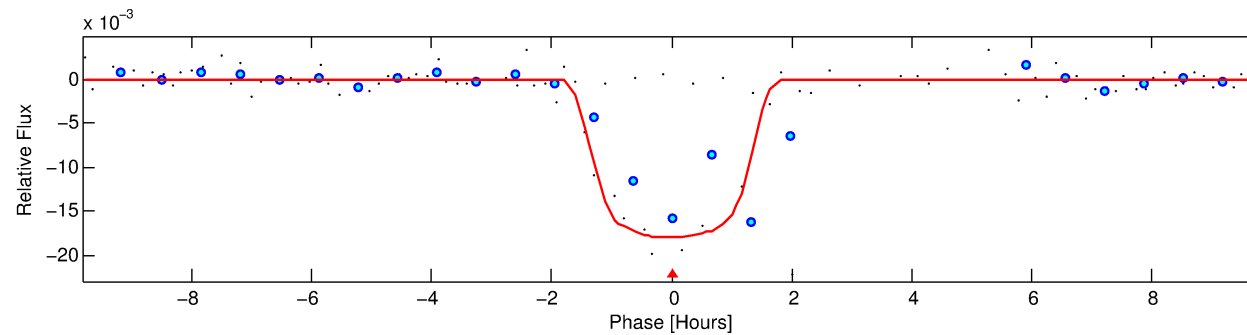
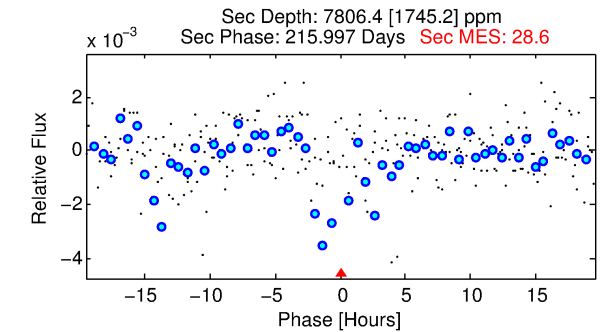
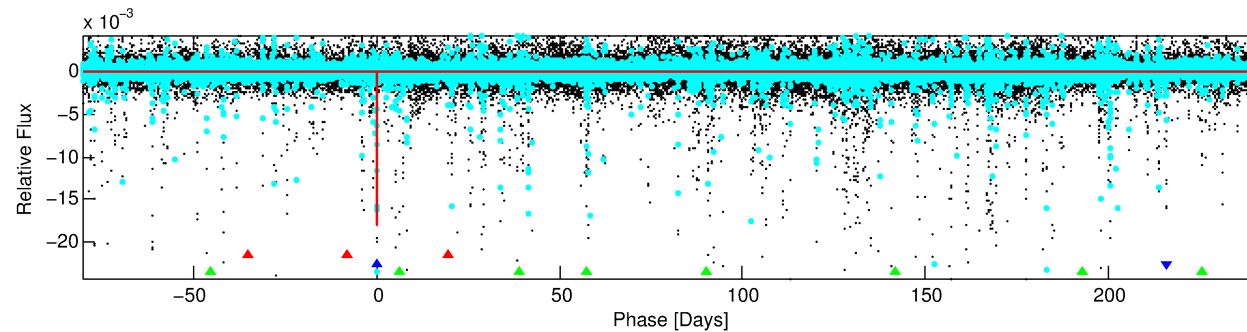
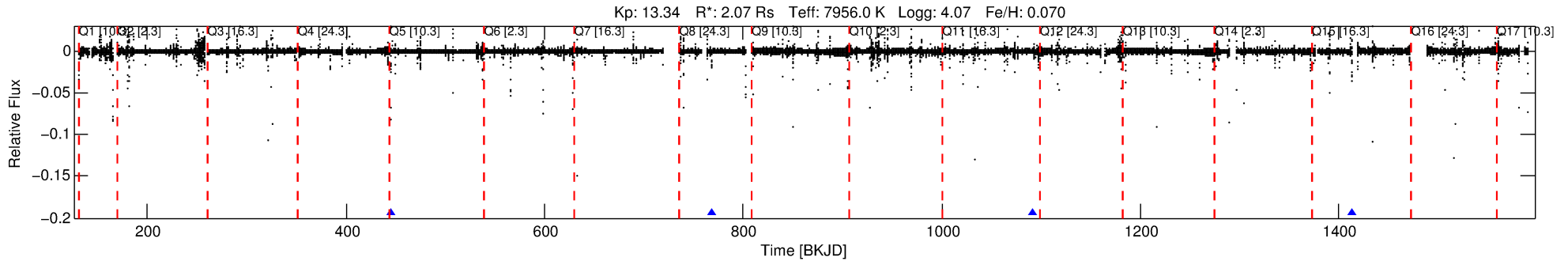
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002857323-02

No Significant Match Found

DV One-Page Summary

KIC: 2857323 Candidate: 2 of 3 Period: 322.497 d



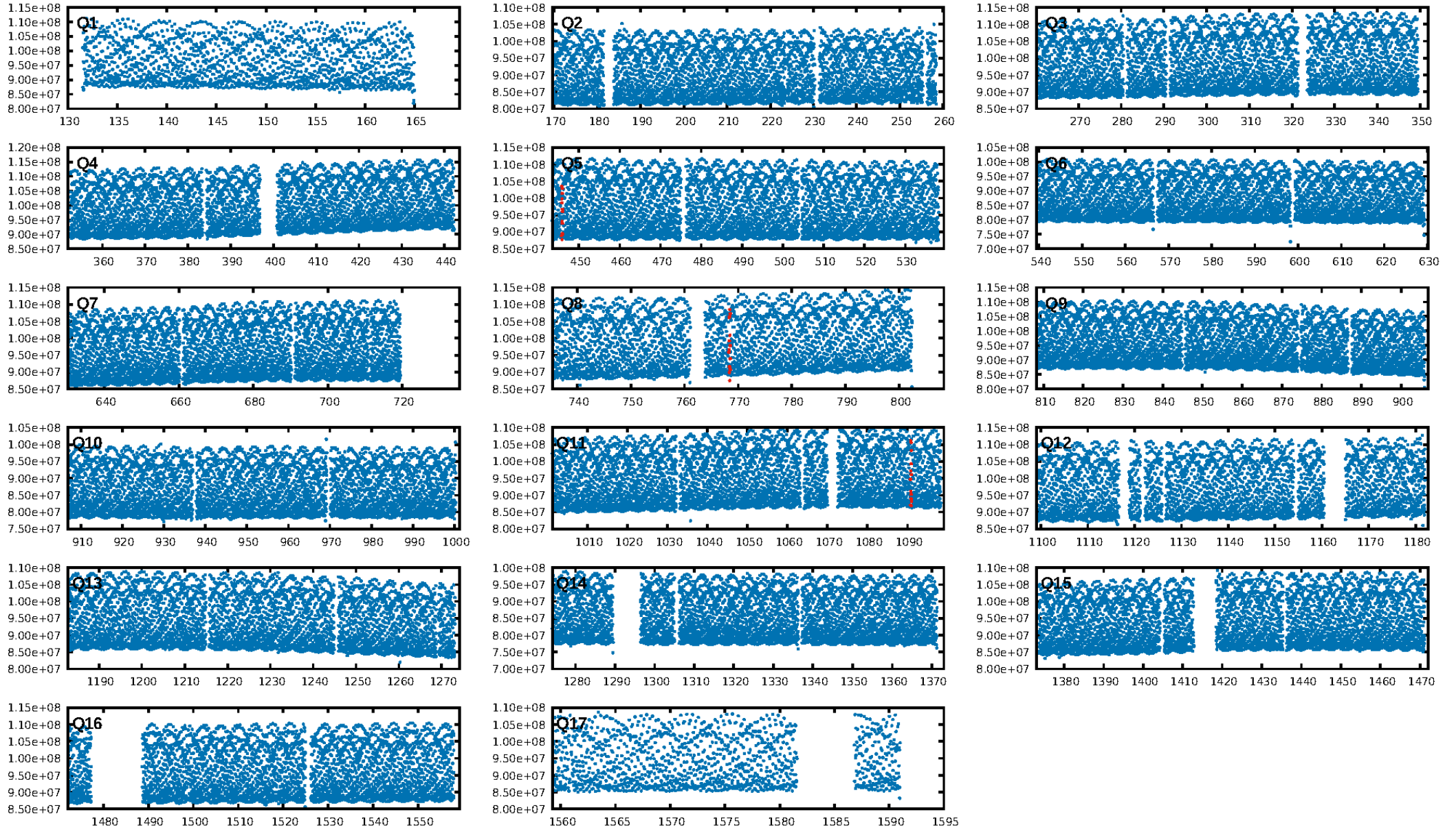
DV Fit Results:

Period = 322.49660 [0.00427] d
Epoch = 445.8996 [0.0052] BKJD
Rp/R* = 0.1284 [0.0201]
a/R* = 749.73 [607.68]
b = 0.53 [1.10]
Seff = 12.08 [4.13]
Teq = 475 [41] K
Rp = 29.02 [8.63] Re
a = 1.1297 [0.2351] AU
Ag = 6506.84 [3159.89] [2.06σ]
Teffp = 6601 [694] K [8.81σ]

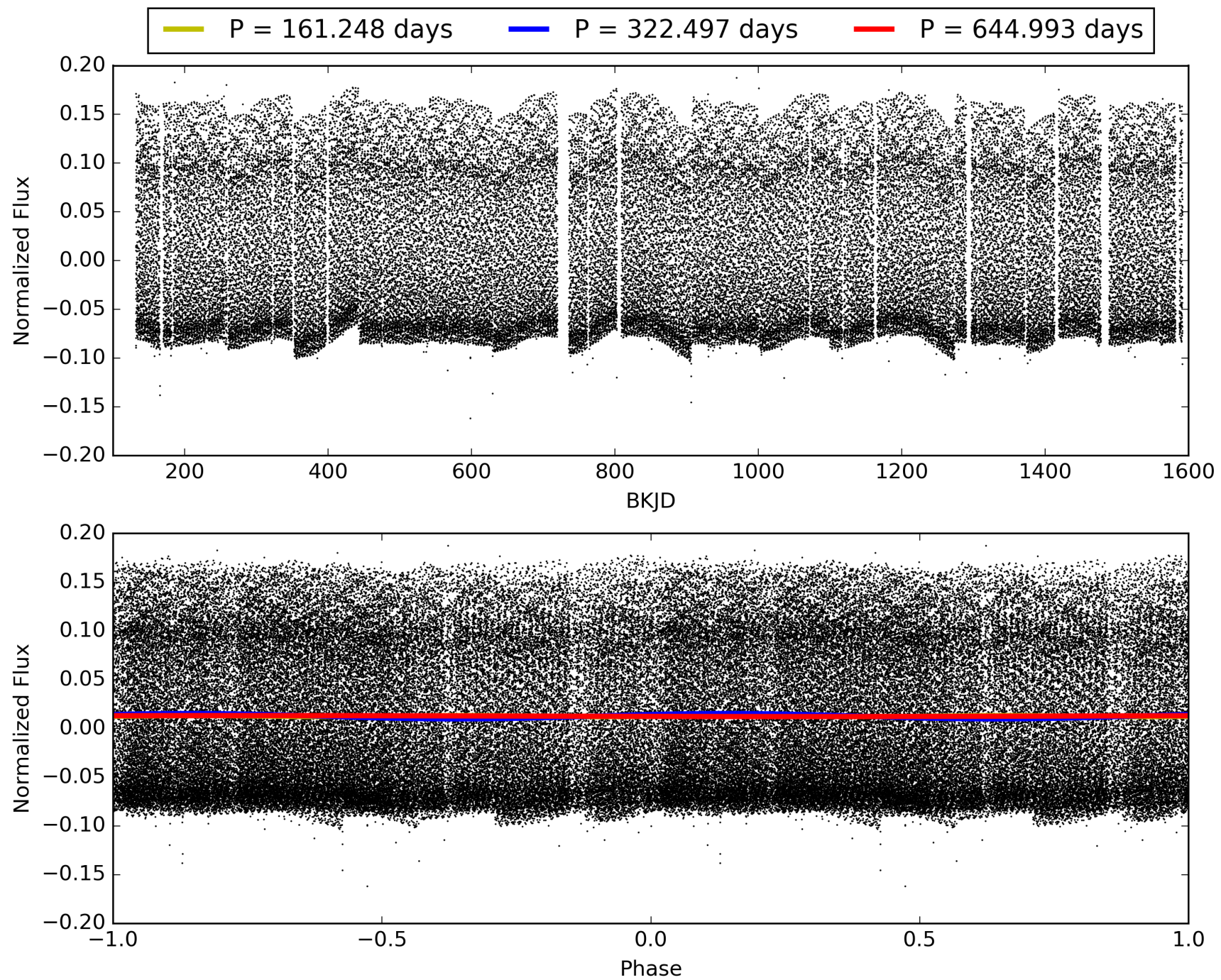
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [295.90σ]
LongPeriod-sig: 100.0% [277.44σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 3.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.6716
Centroid-sig: N/A
Centroid-so: 0.181 arcsec [3.22σ]
OotOffset-rm: 0.084 arcsec [1.02σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 0.055 arcsec [0.72σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 002857323-02, PDC Light Curves

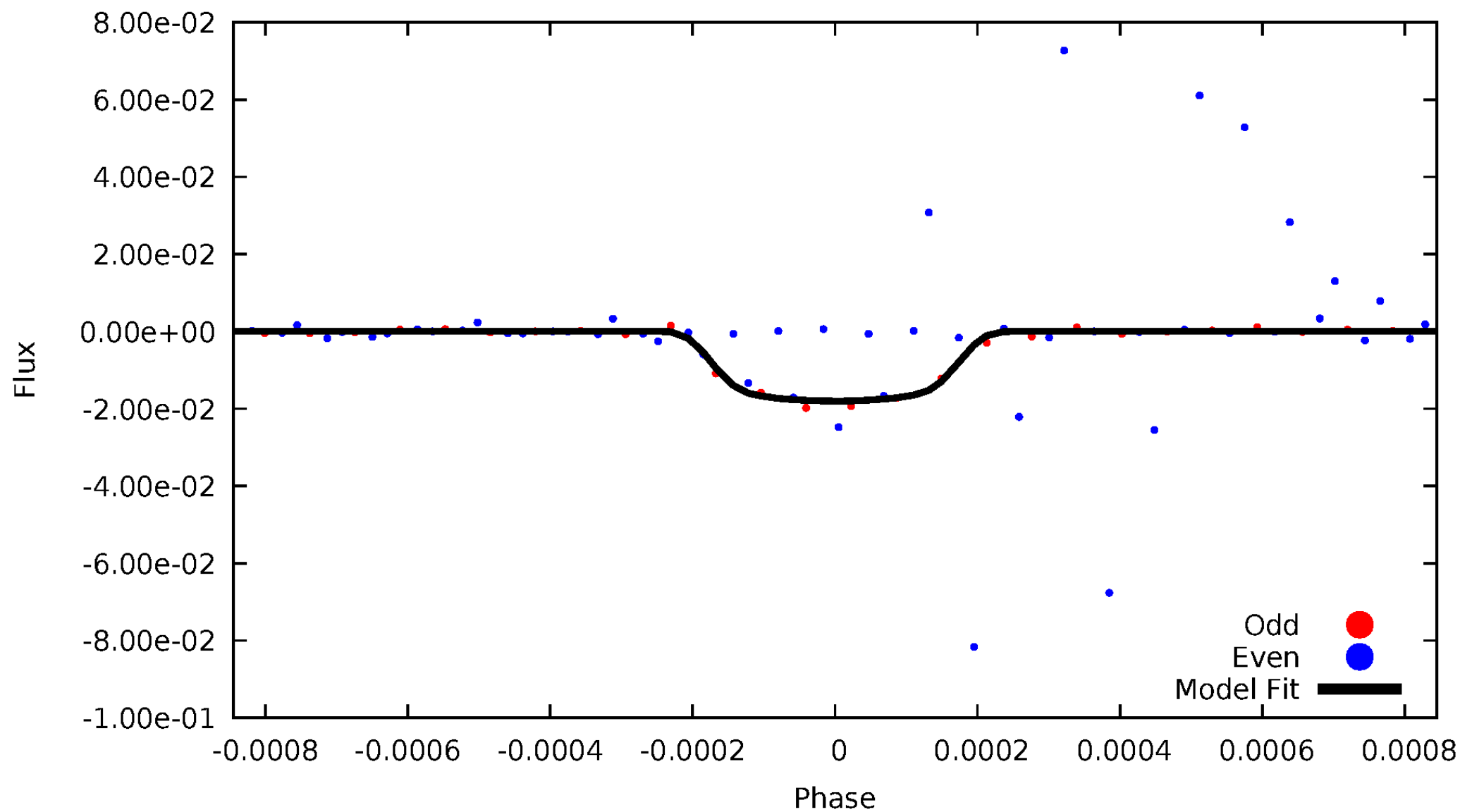


TCE 002857323-02



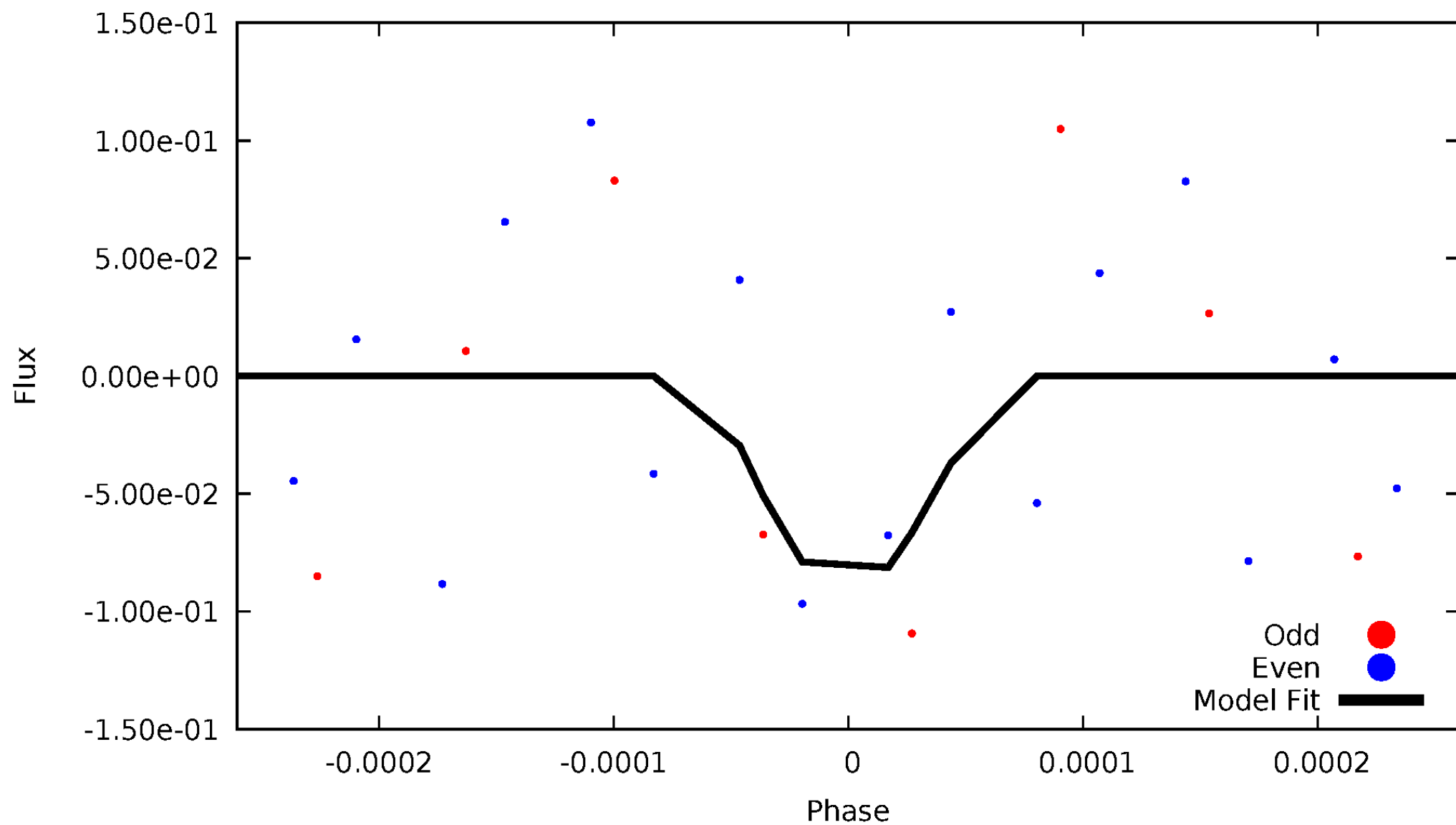
DV Odd/Even

TCE 002857323-02



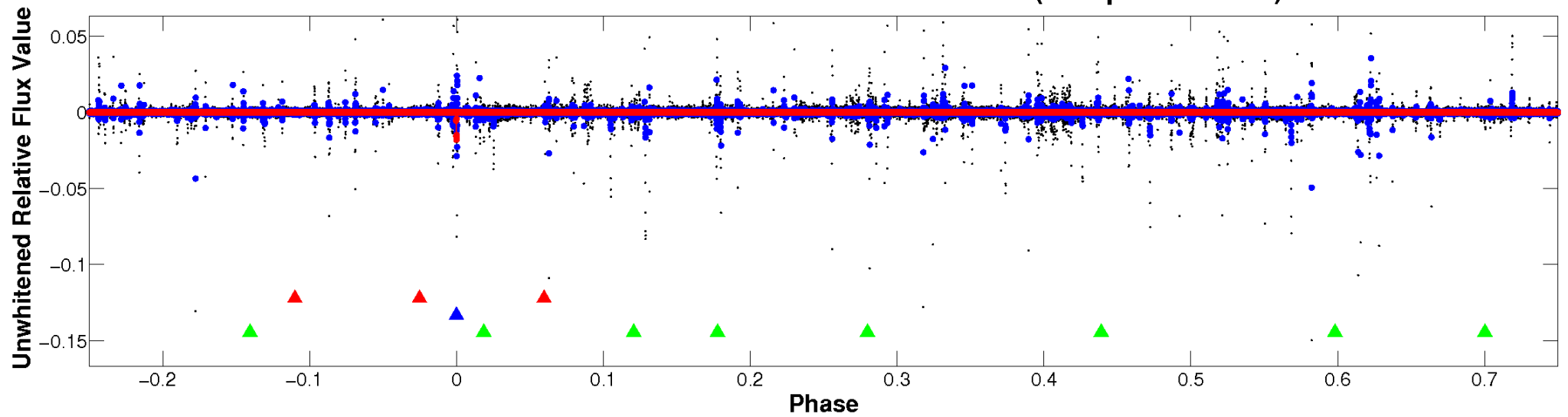
ALT Odd/Even

TCE 002857323-02

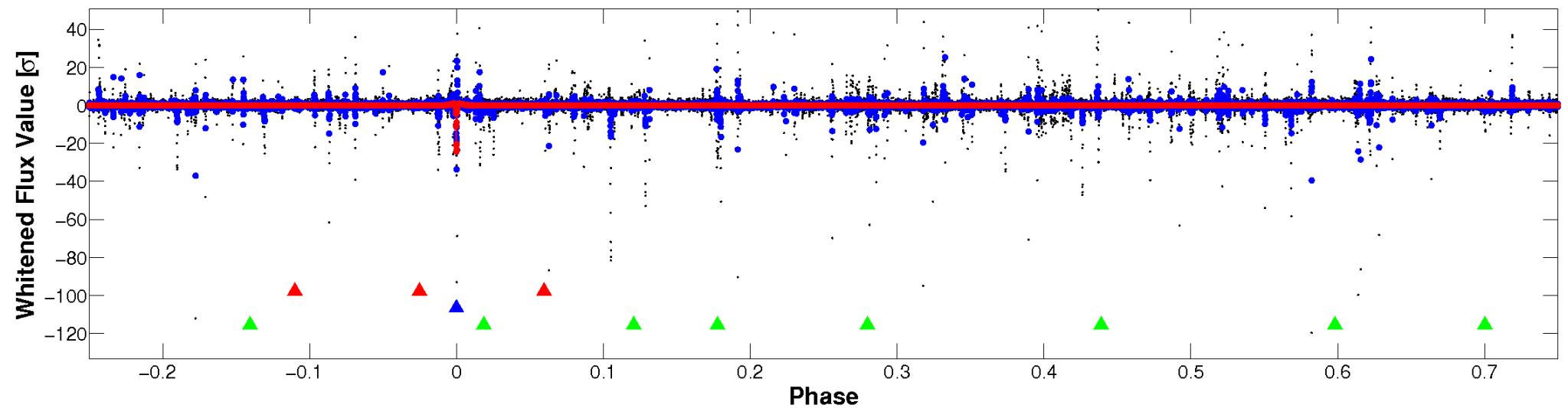


Non-Whitened Vs. Whitened Light Curve

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

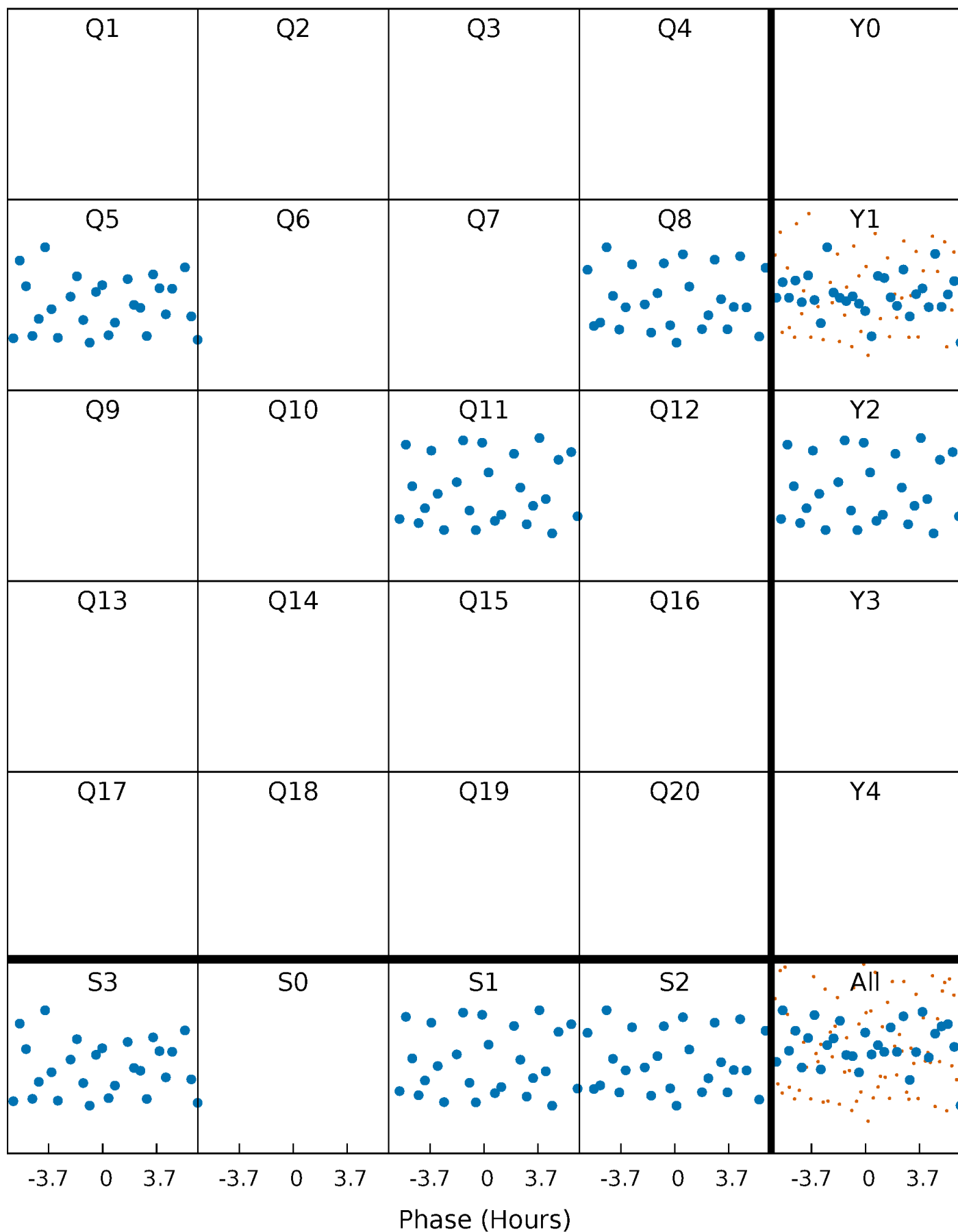


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



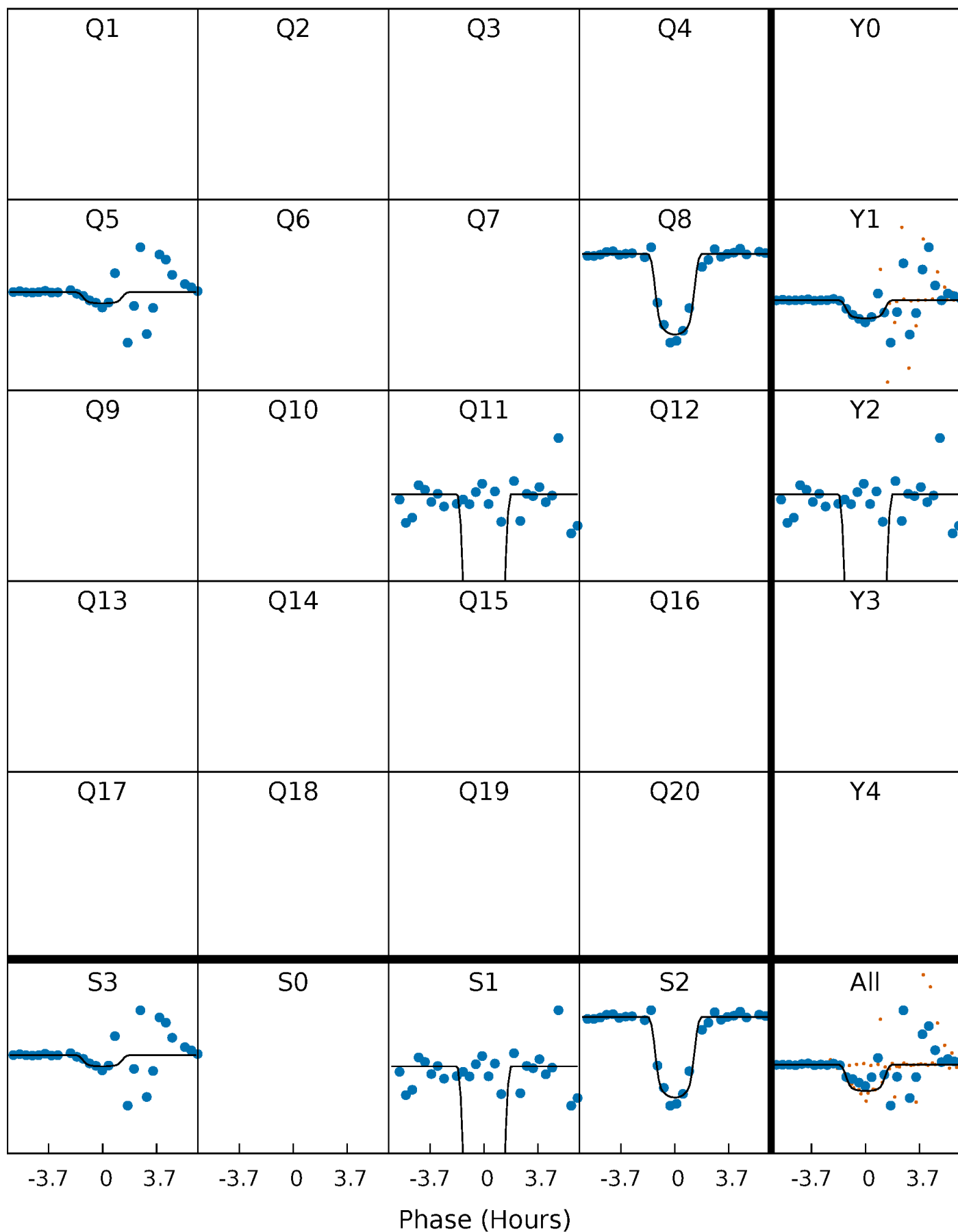
PDC Quarter-Phased Transit Curves

TCE 002857323-02 $P=322.496599$ Days $T_0=445.899643$ (BKJD)



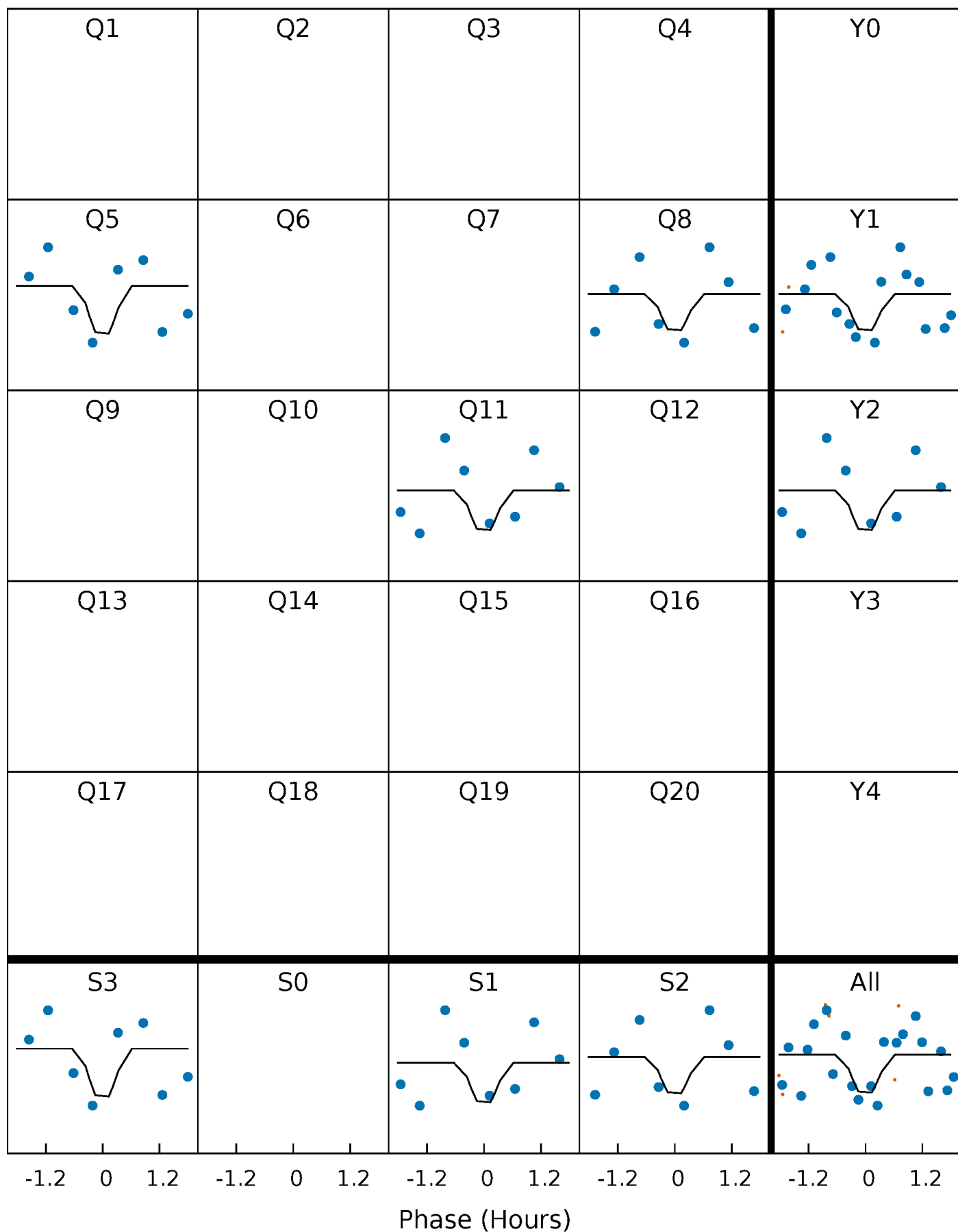
DV Quarter-Phased Transit Curves

TCE 002857323-02 $P=322.496599$ Days $T_0=445.899643$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

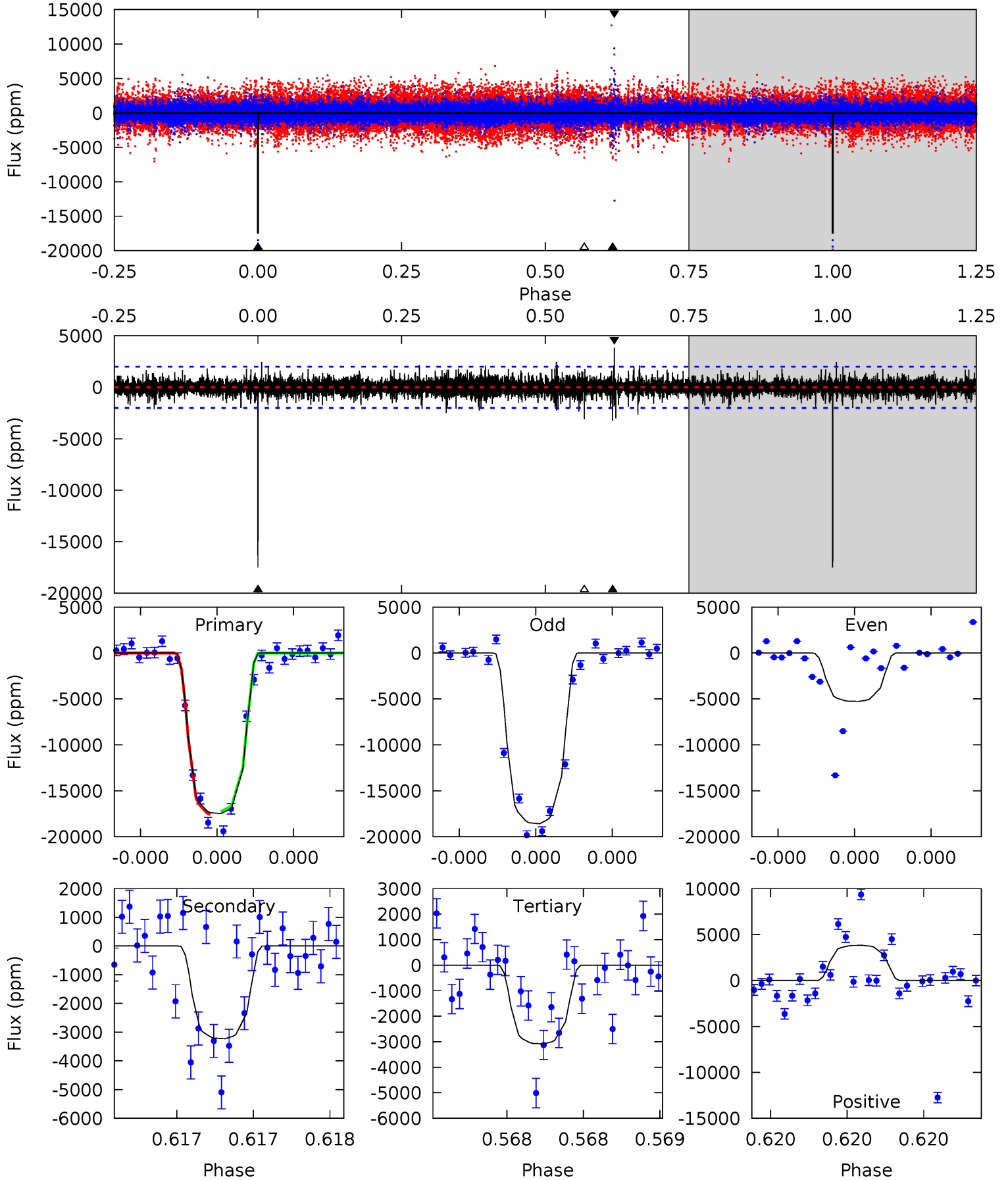
TCE 002857323-02 P=322.528177 Days $T_0=445.866664$ (BKJD)



DV Model-Shift Uniqueness Test

002857323-02, P = 322.496599 Days, E = 123.403044 Days

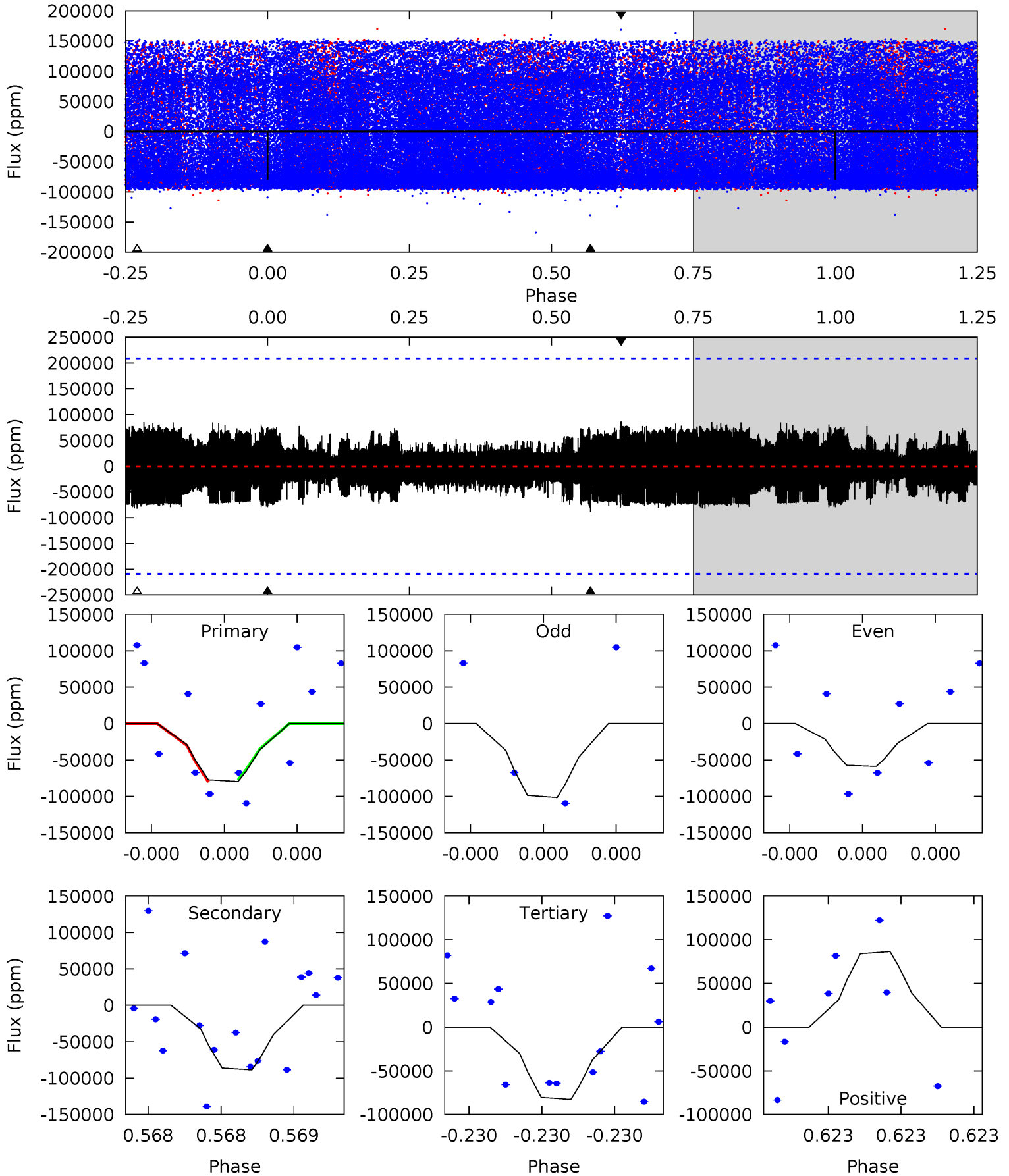
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.1	9.05	8.65	10.7	5.59	3.51	1.35	40.4	38.3	0.40	-1.69	18.6	0.80	0.18	0



Alt Model-Shift Uniqueness Test

002857323-02, P = 322.528177 Days, E = 123.338487 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.23	2.49	2.32	2.42	5.86	3.92	0.86	-0.09	-0.19	0.17	0.06	0.66	1.14	0.49	0.04



Stellar Parameters For KIC 002857323

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7956^{+216}_{-339}	$4.072^{+0.130}_{-0.159}$	$0.070^{+0.250}_{-0.400}$	$2.072^{+0.524}_{-0.429}$	$1.845^{+0.183}_{-0.314}$	$0.292^{+0.193}_{-0.137}$
	+3%/-4%	+3%/-4%	+357%/-571%	+25%/-21%	+10%/-17%	+66%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 002857323-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3226 ± 356	$29.34^{+6.20}_{-6.19}$	667^{+42}_{-43}	5198^{+474}_{-346}	2617^{+1557}_{-859}
Alt.	-88648 ± 35665	$75.76^{+10.37}_{-9.41}$	664^{+49}_{-39}	7505^{+1155}_{-1059}	11373^{+6890}_{-5164}

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 $A_{obs} \gg 1.0$

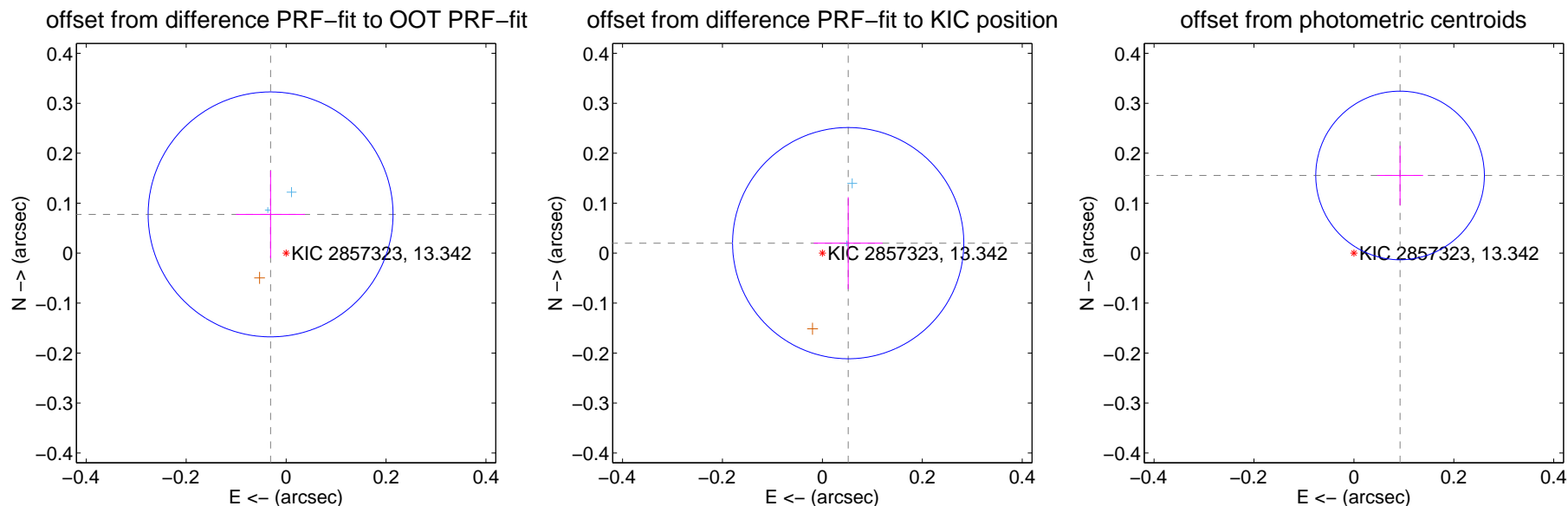
DV Centroid Data

Supplemental centroid analysis for 002857323-02. Kepler magnitude: 13.34. Transit SNR 67.68

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.084 ± 0.082	1.02	0.031 ± 0.069	0.078 ± 0.088
PRF-fit source offset from KIC position	0.055 ± 0.077	0.72	-0.052 ± 0.069	0.020 ± 0.092
photometric centroid source offset	0.18 ± 0.06	3.22	-0.09 ± 0.05	0.16 ± 0.06

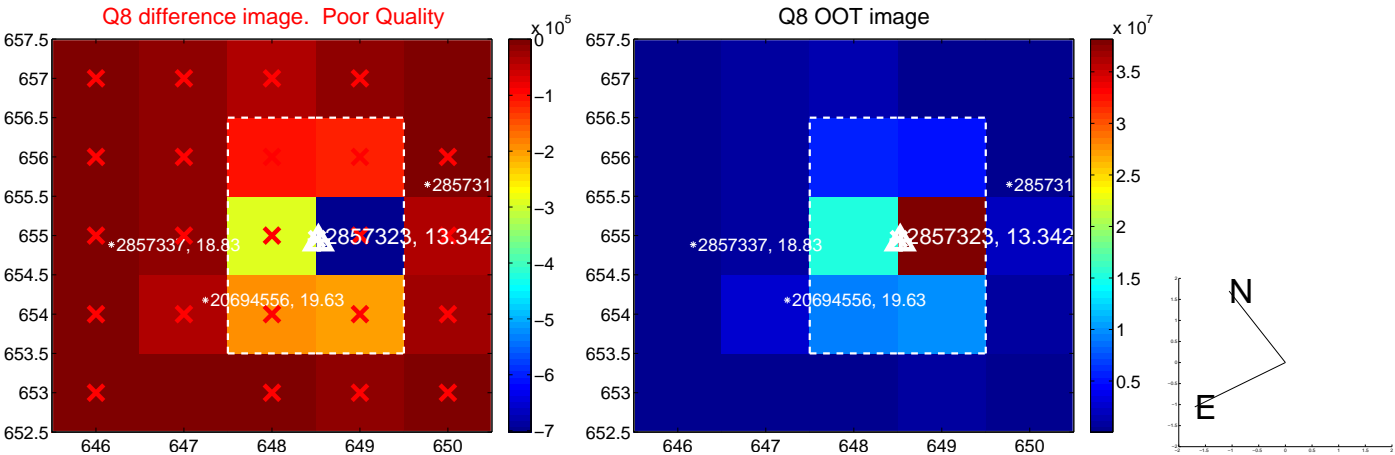
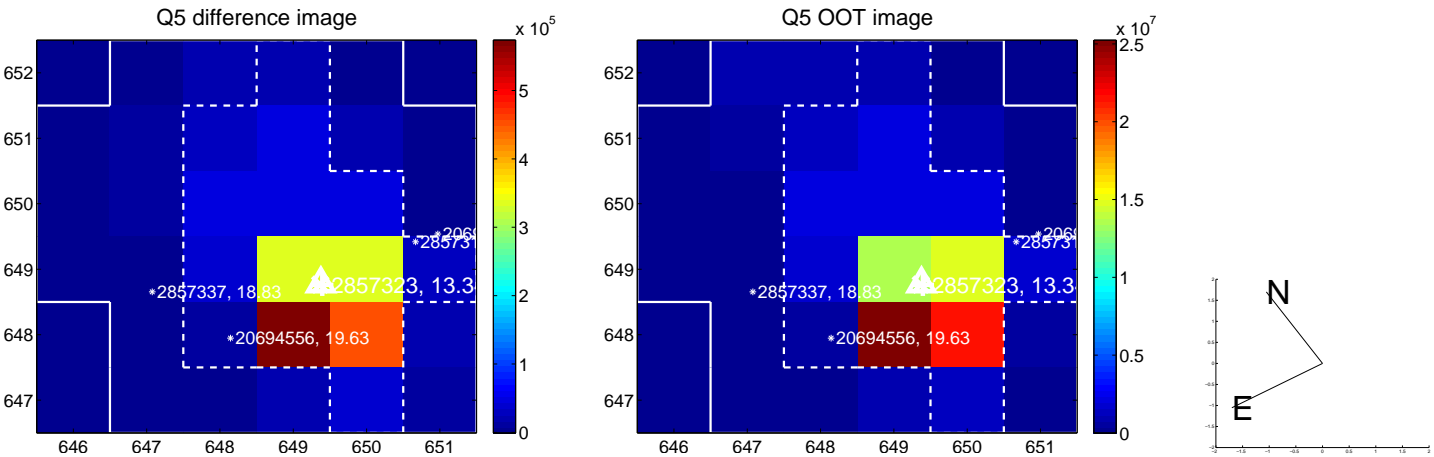


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

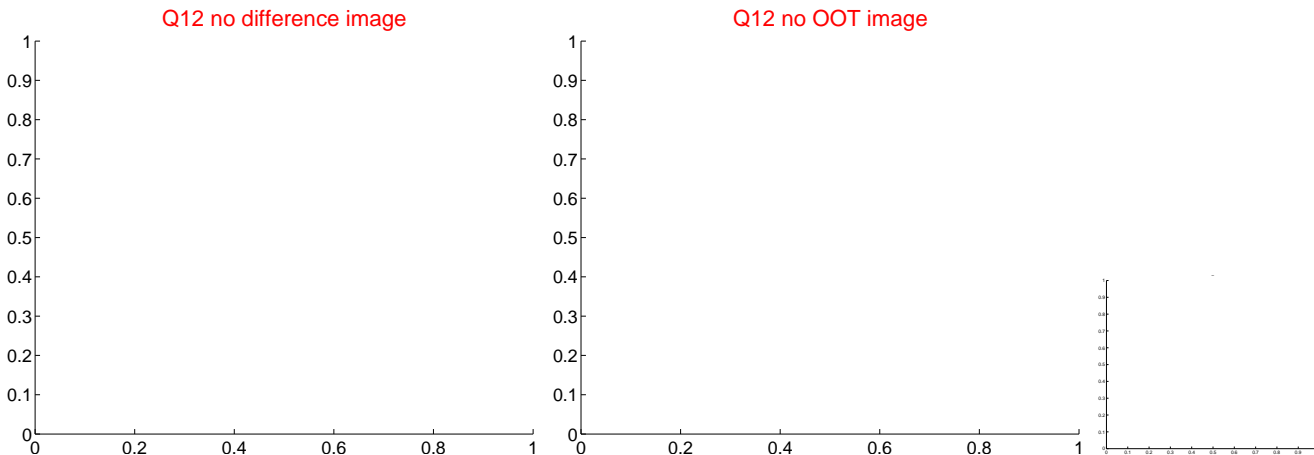
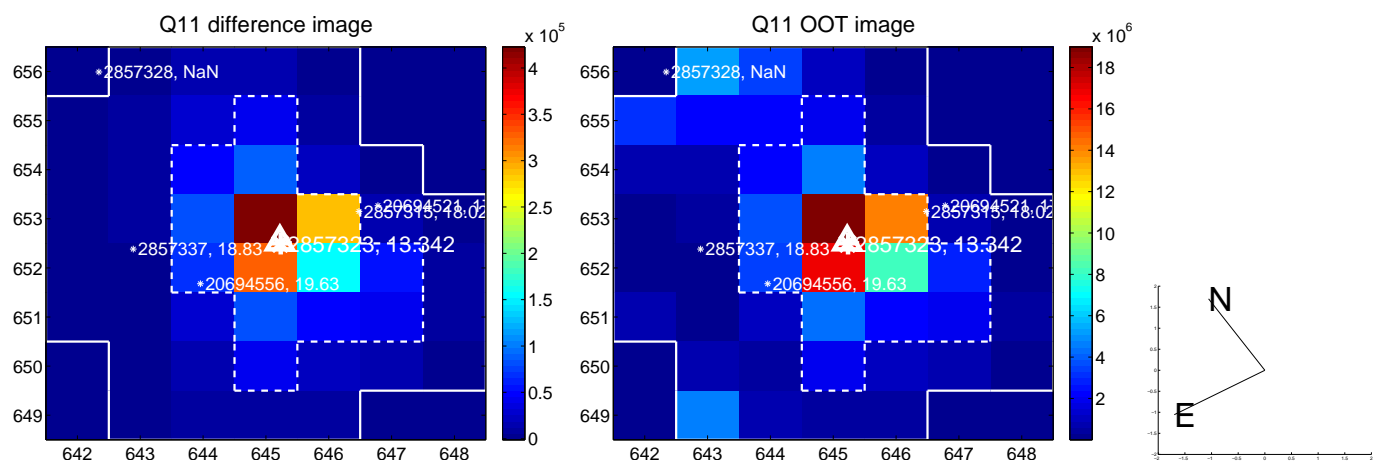
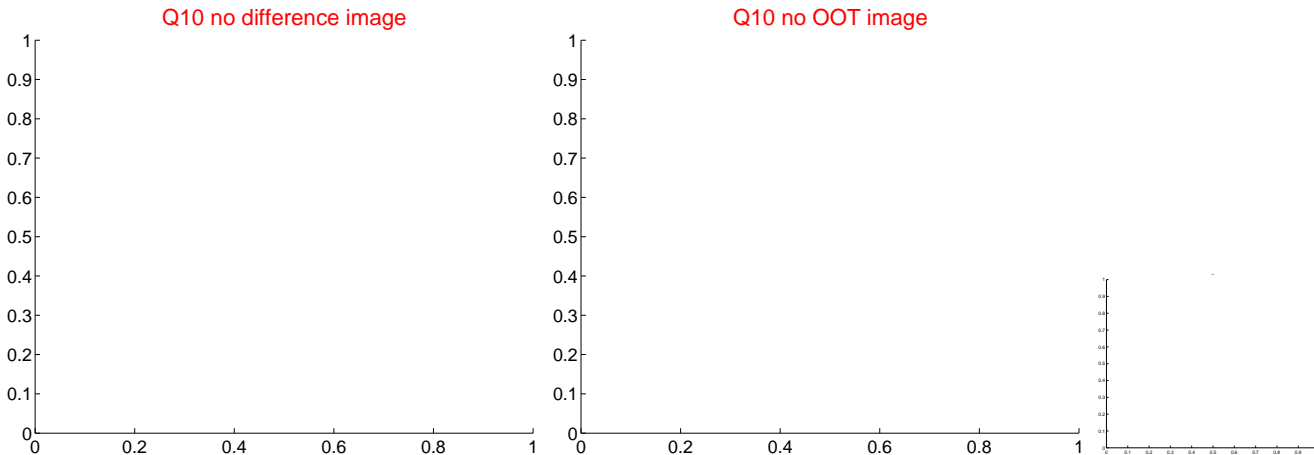
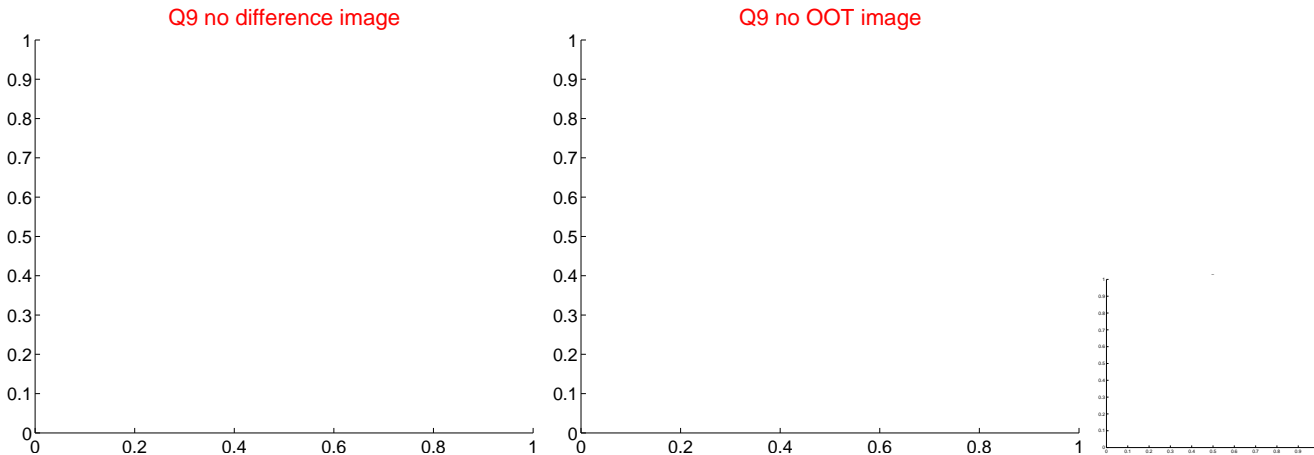
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



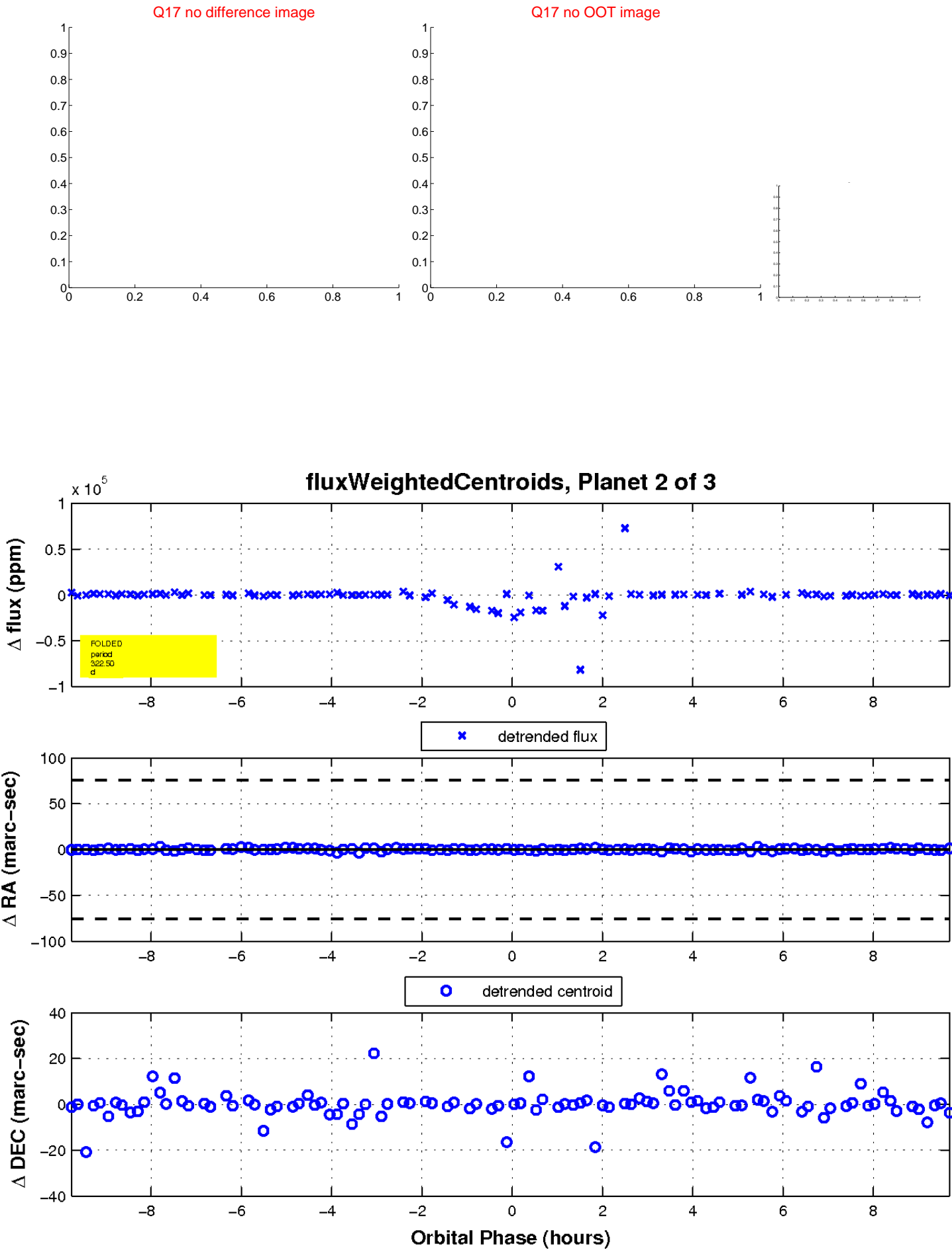
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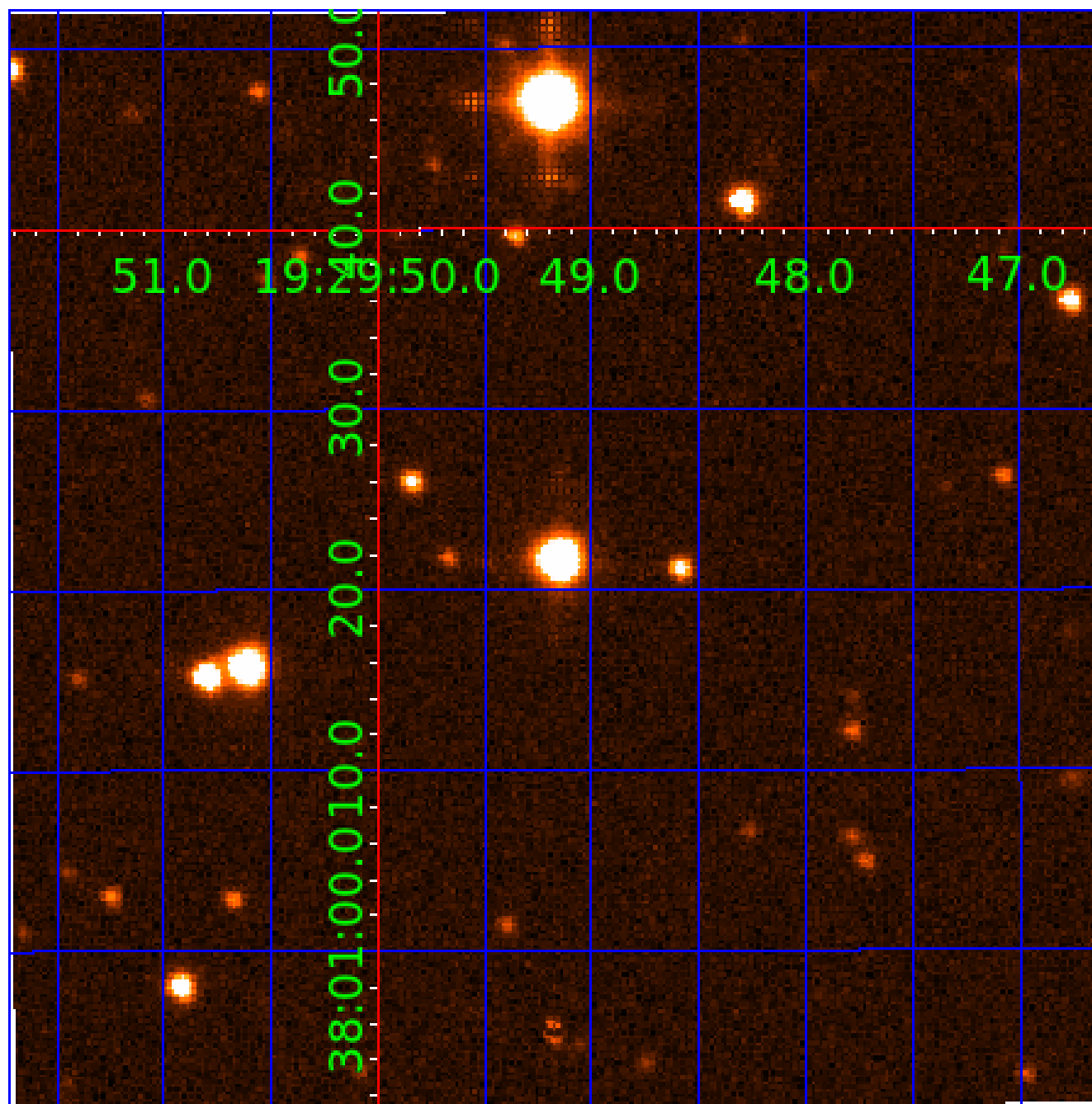


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002857323

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})
002857323-02	OBS	No	322.496599	445.899643	18013.9	3.269	63.1	67.7	2.07	7956	29.02	12.07
002857323-03	OBS	No	186.912585	162.331613	1238.4	10.500	33.7	-1.0	2.07	7956	7.39	24.99

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002857323-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002857323-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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.

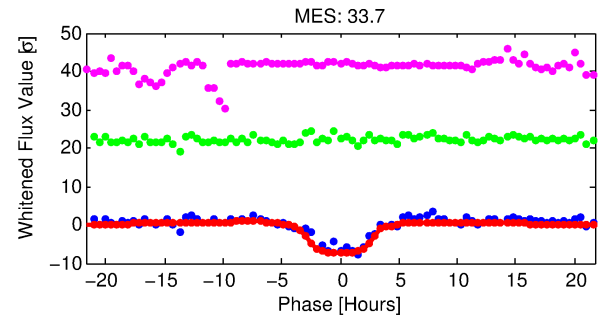
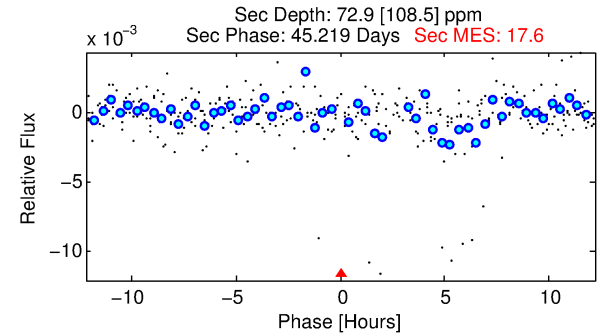
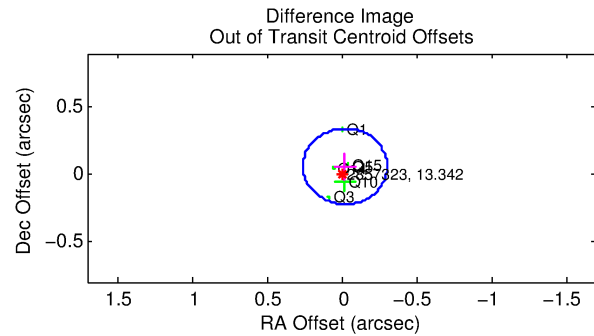
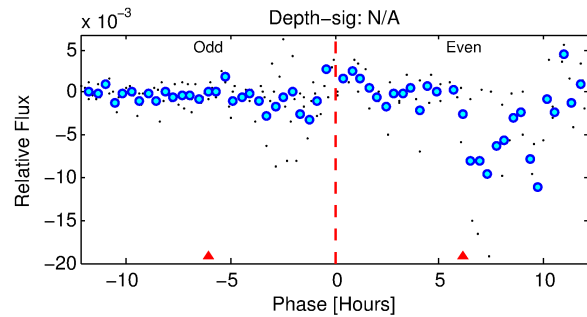
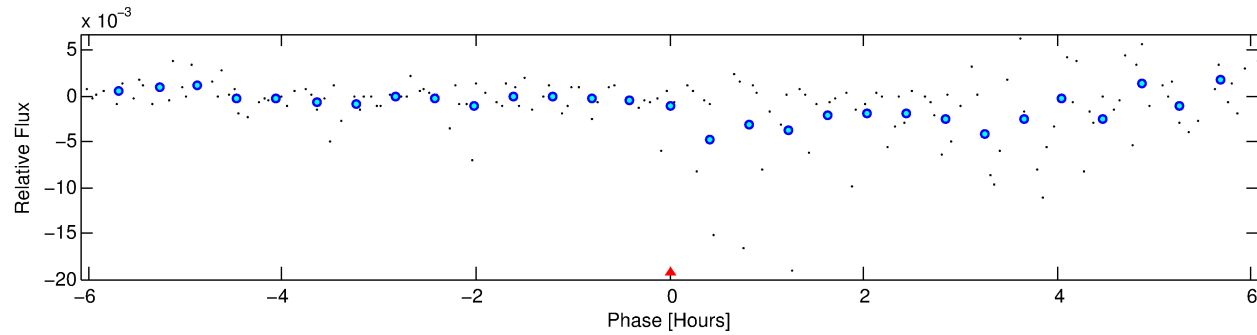
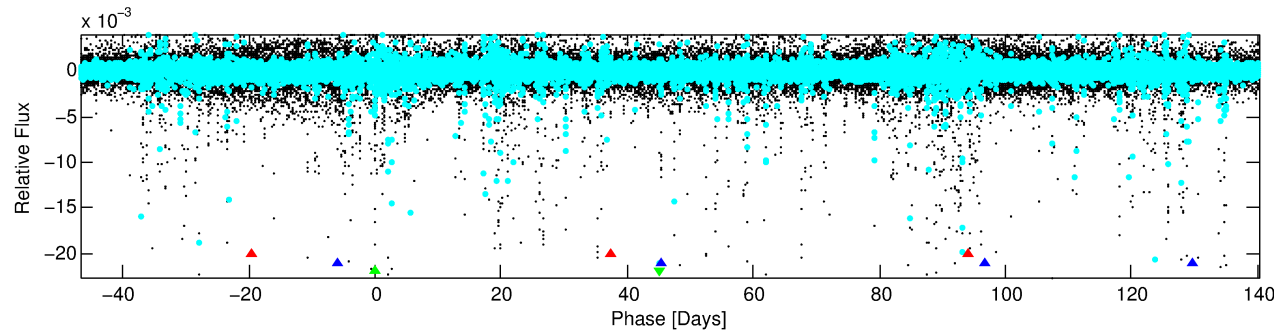
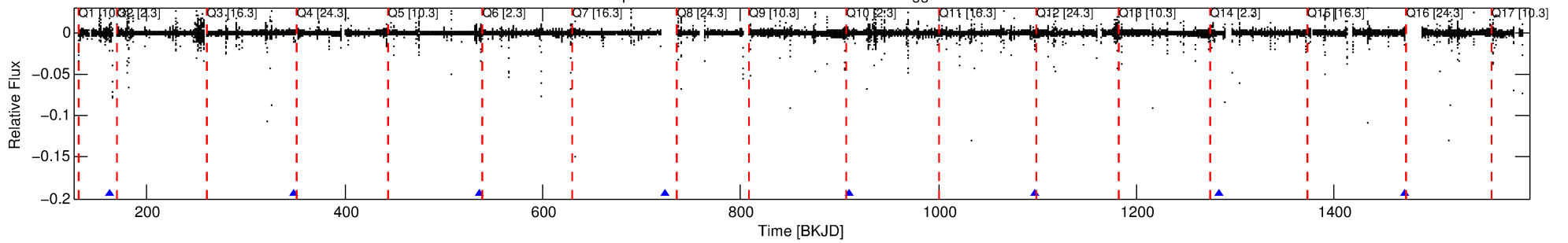
Ephemeris Match Information For 002857323-03

No Significant Match Found

DV One-Page Summary

KIC: 2857323 Candidate: 3 of 3 Period: 186.913 d

Kp: 13.34 R*: 2.07 Rs Teff: 7956.0 K Logg: 4.07 Fe/H: 0.070



TPS TCE Results:

Period = 186.91258 d
Epoch = 162.3316 BKJD

DV fit results are unavailable

DV Diagnostic Results:

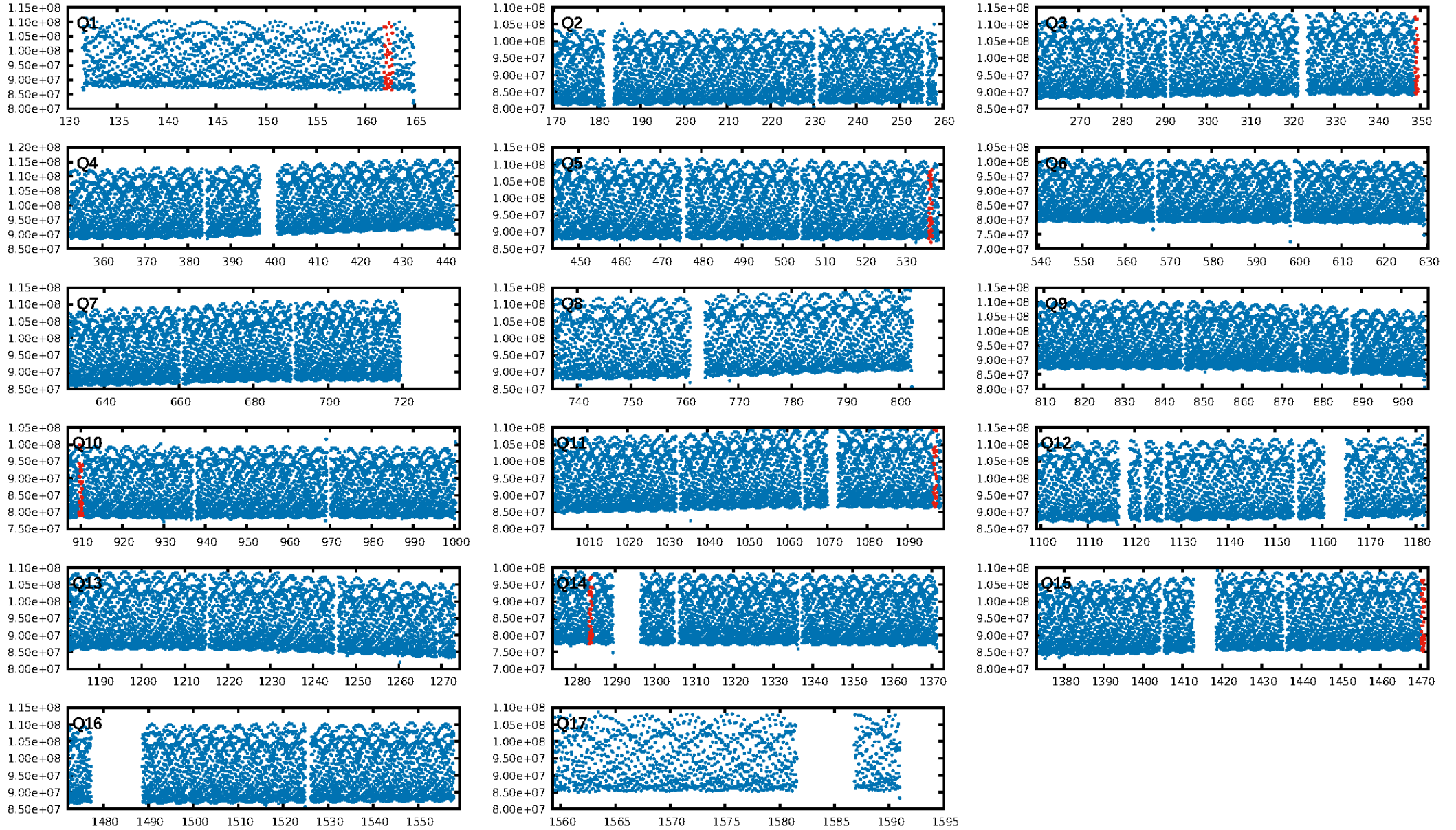
ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [295.90σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 1.303

Centroid-sig: N/A
Centroid-so: 0.606 arcsec [7.25σ]
OotOffset-rm: 0.065 arcsec [0.69σ]
KicOffset-rm: 0.103 arcsec [1.24σ]
OotOffset-st: 2/2/0/2 [6]
KicOffset-st: 2/2/0/2 [6]
DiffImageQuality-fgm: 0.67 [4/6]
DiffImageOverlap-fno: 1.00 [6/6]

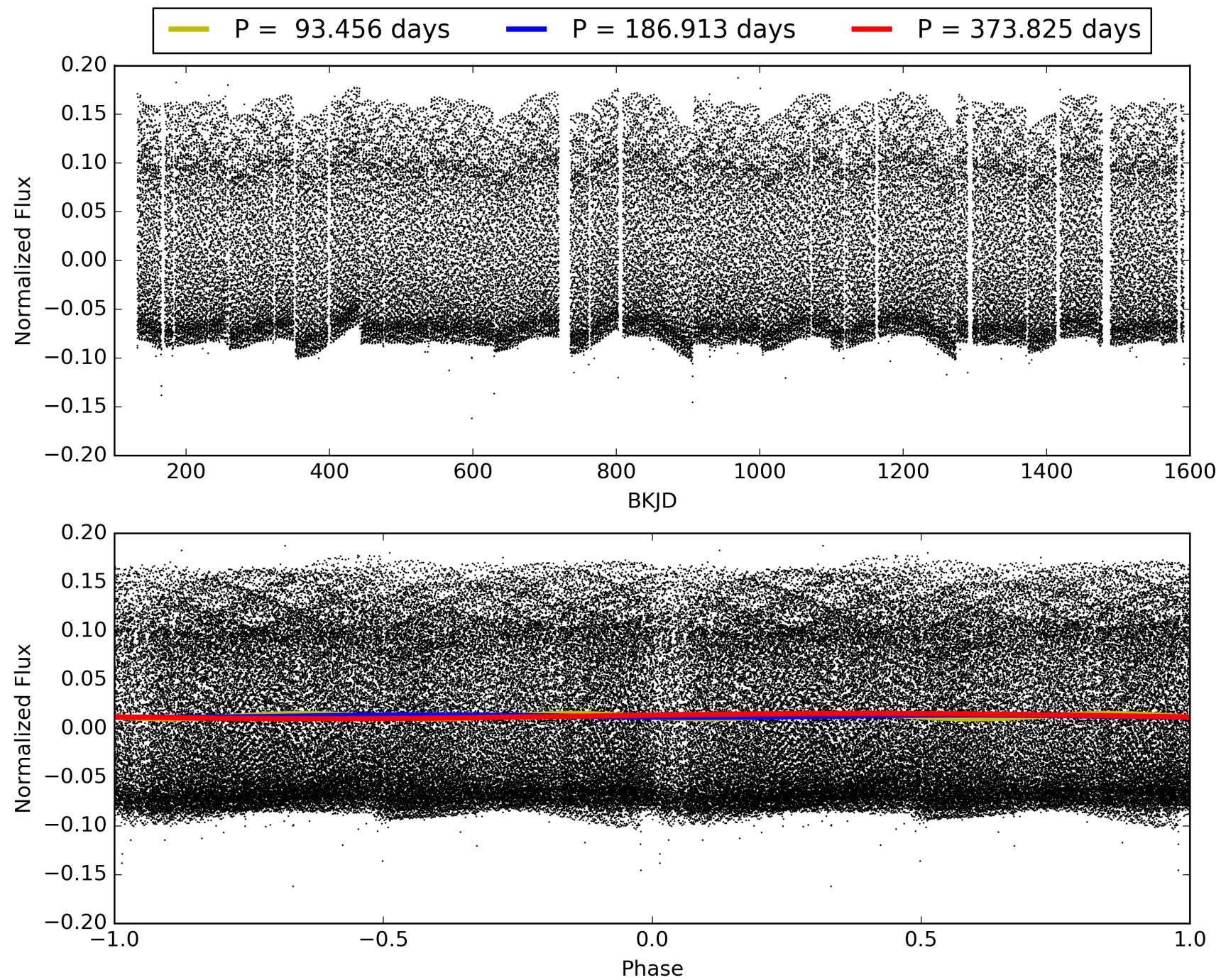
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:43:34 Z

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

TCE 002857323-03, PDC Light Curves

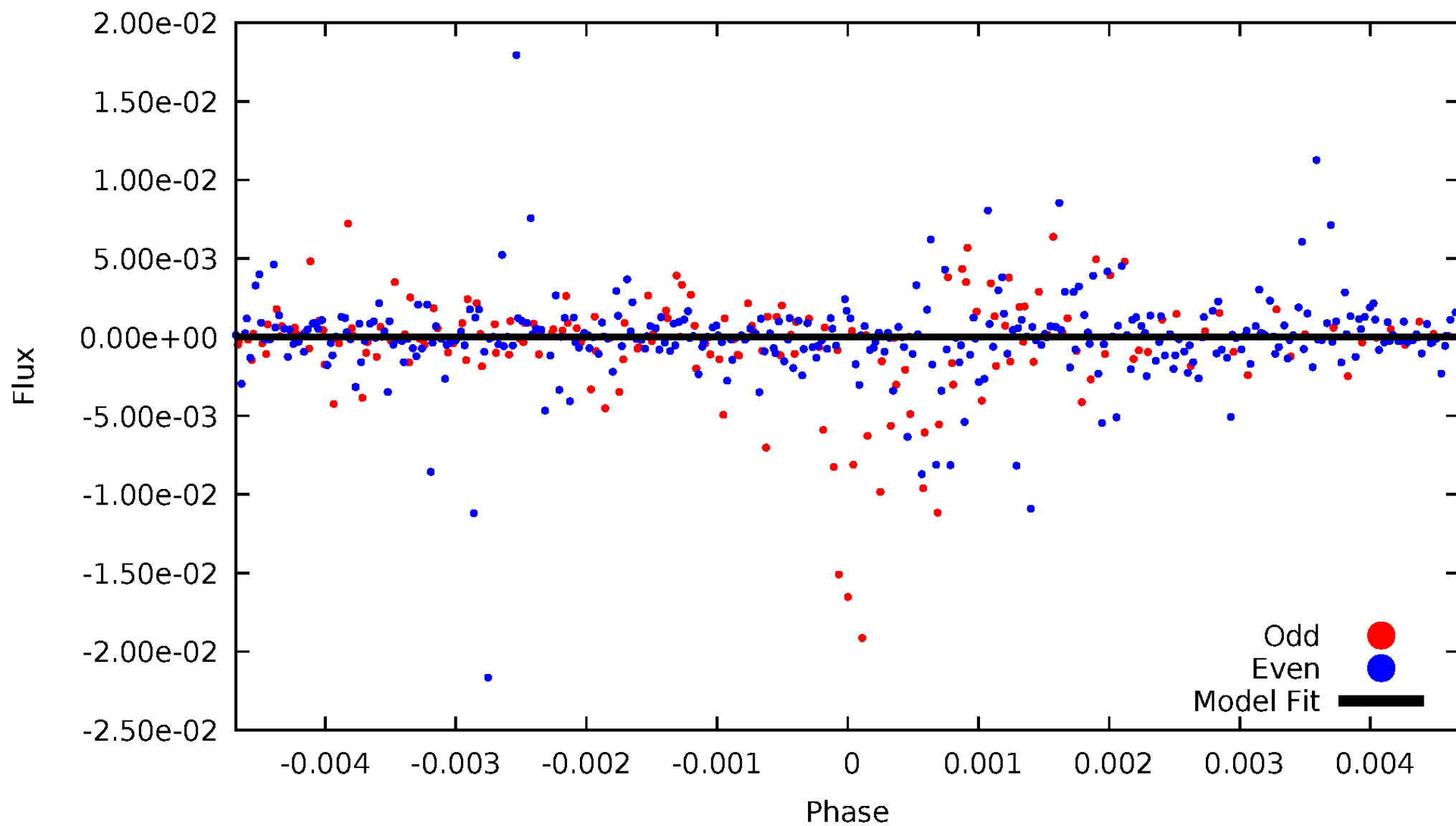


TCE 002857323-03



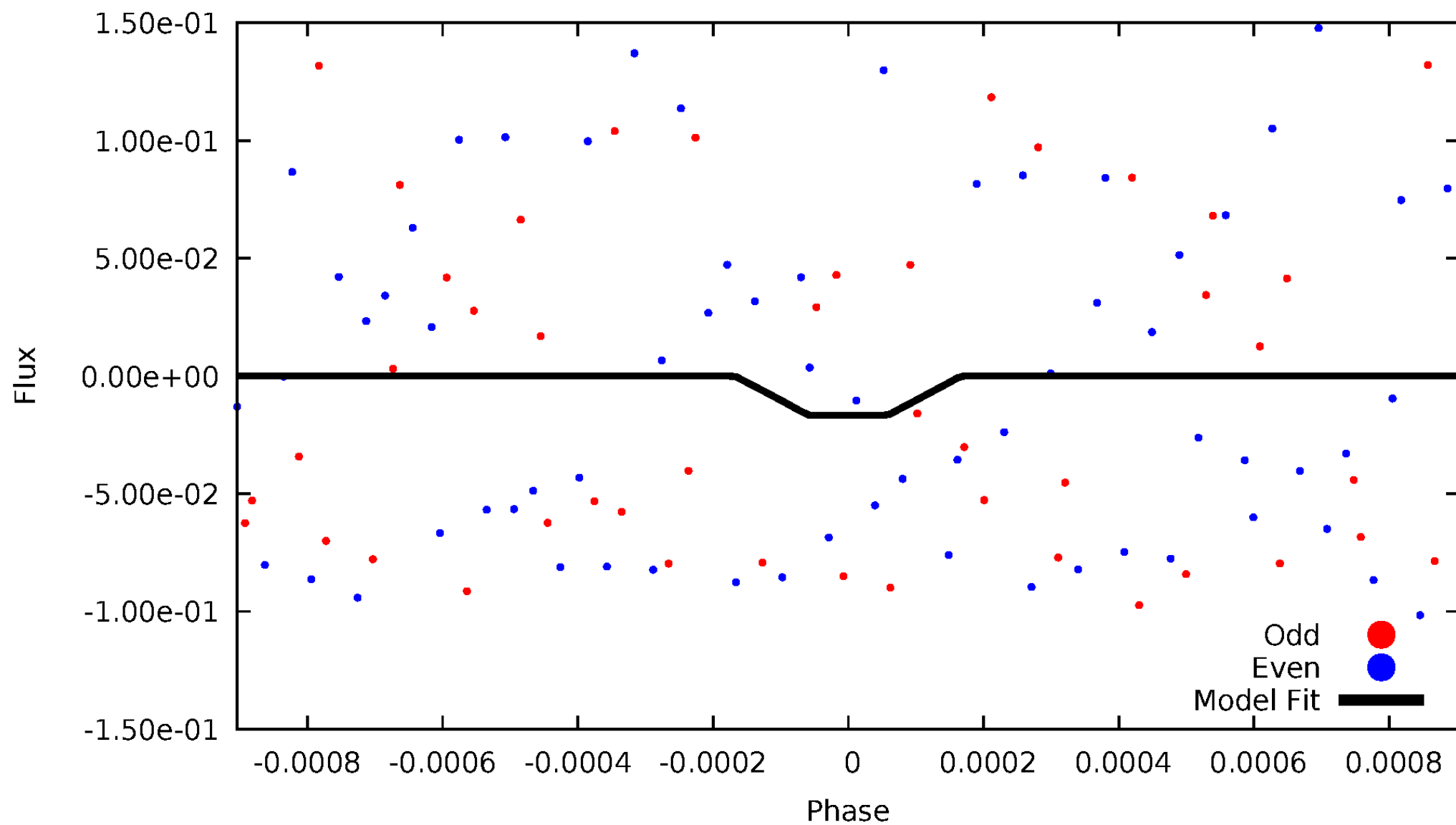
DV Odd/Even

TCE 002857323-03



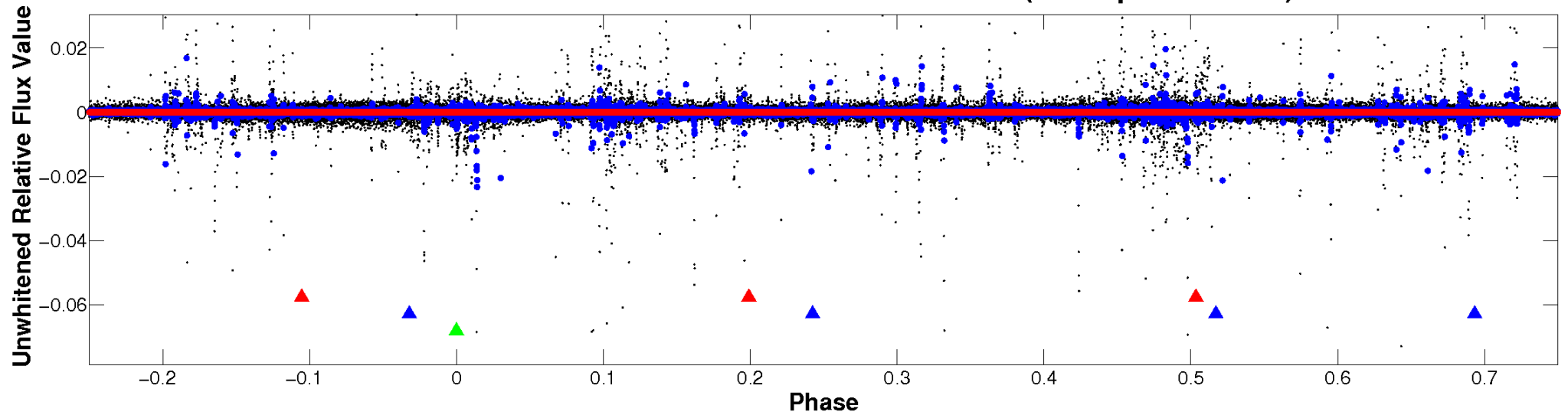
ALT Odd/Even

TCE 002857323-03

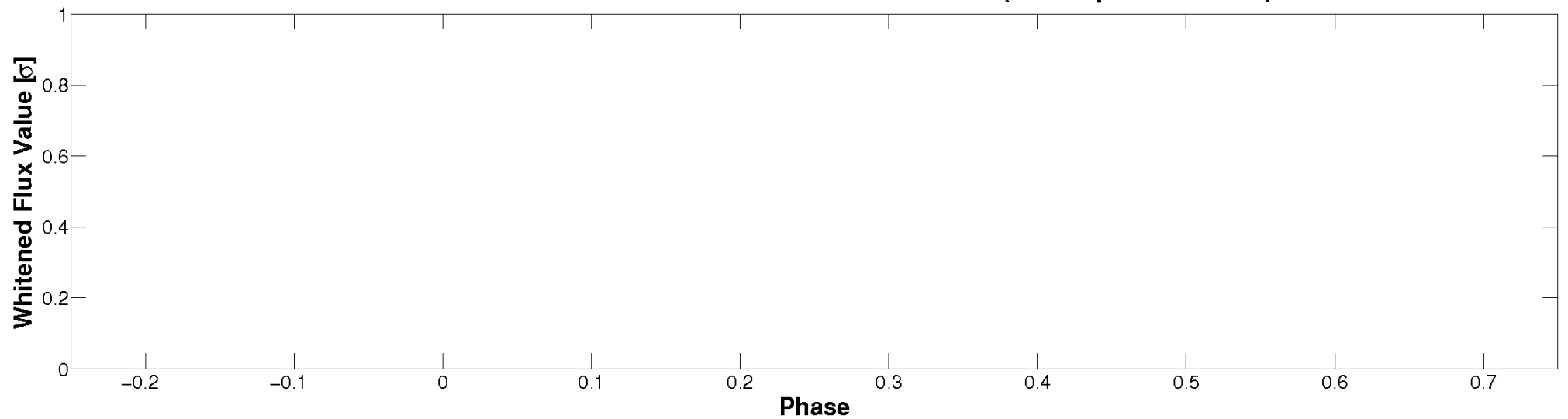


Non-Whitened Vs. Whitened Light Curve

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

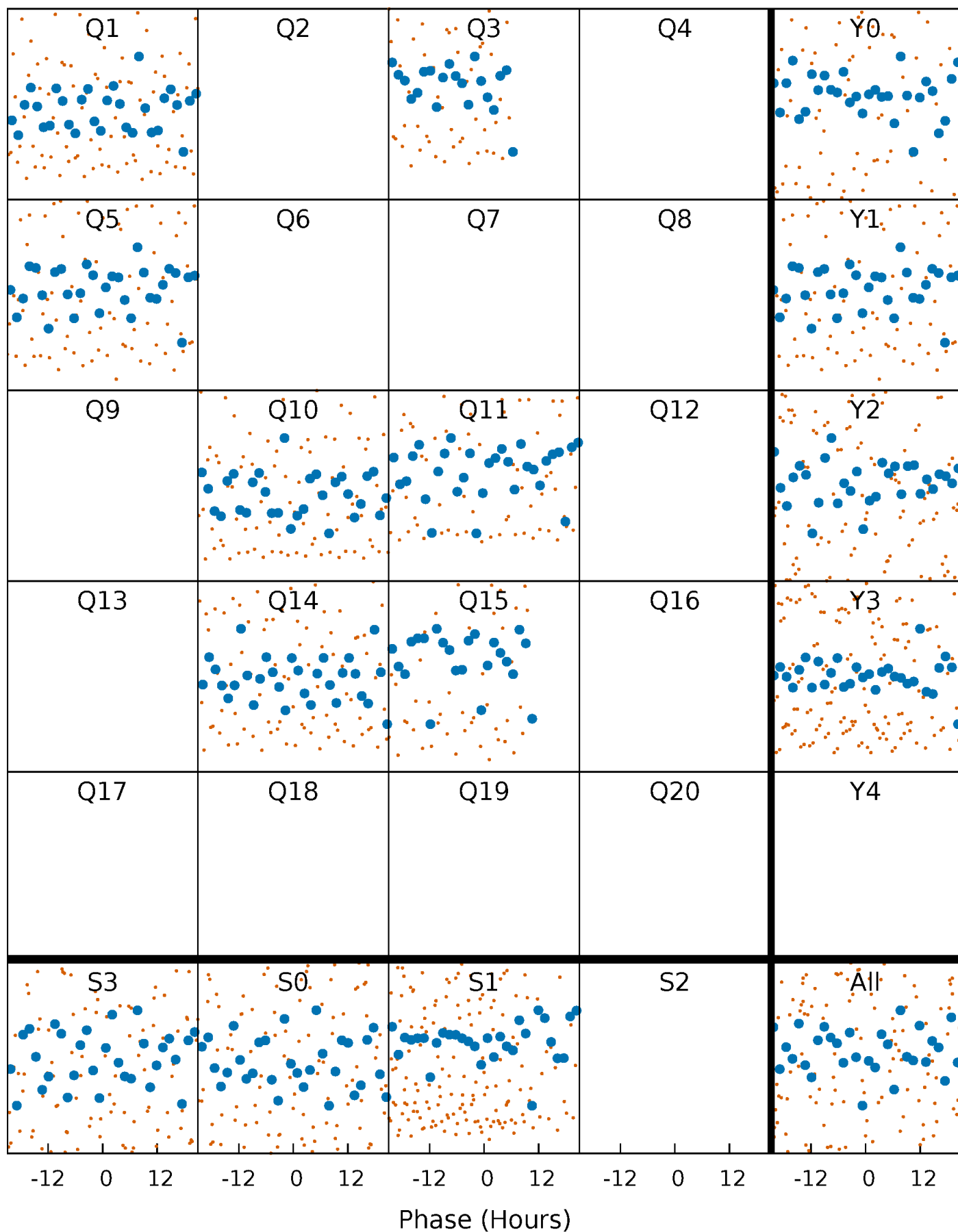


Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)



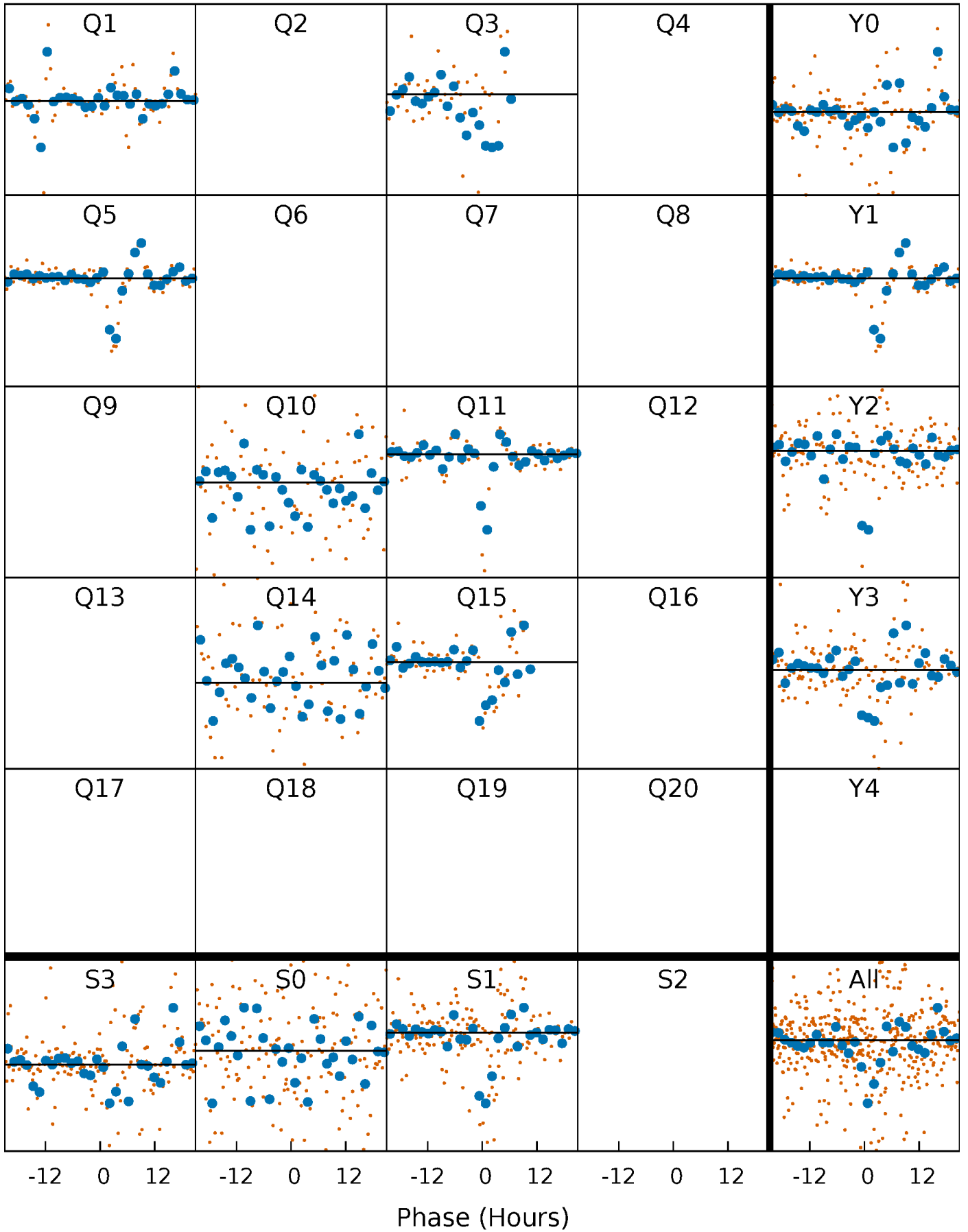
PDC Quarter-Phased Transit Curves

TCE 002857323-03 P=186.912585 Days $T_0=162.331614$ (BKJD)



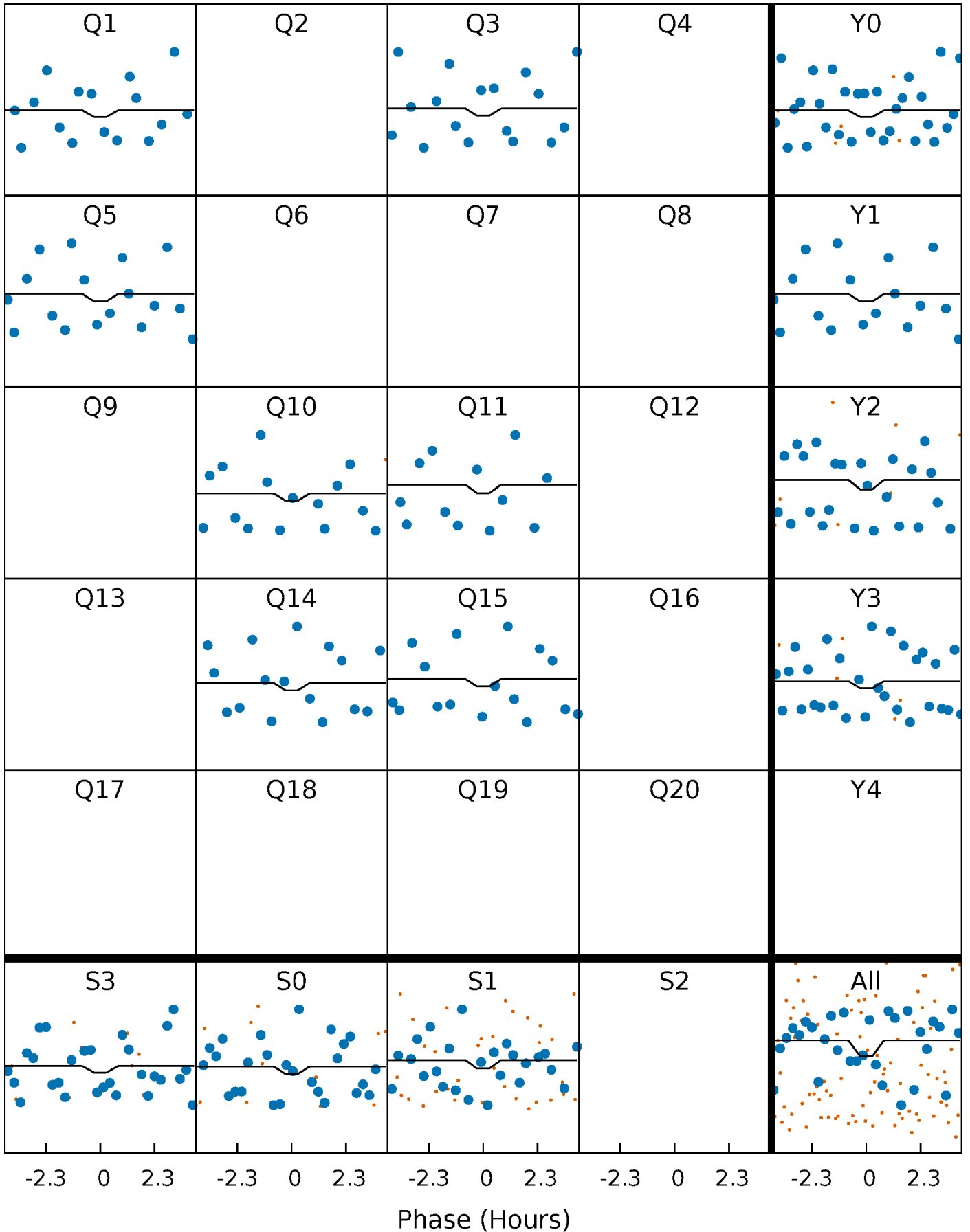
DV Quarter-Phased Transit Curves

TCE 002857323-03 $P=186.912585$ Days $T_0=162.331614$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

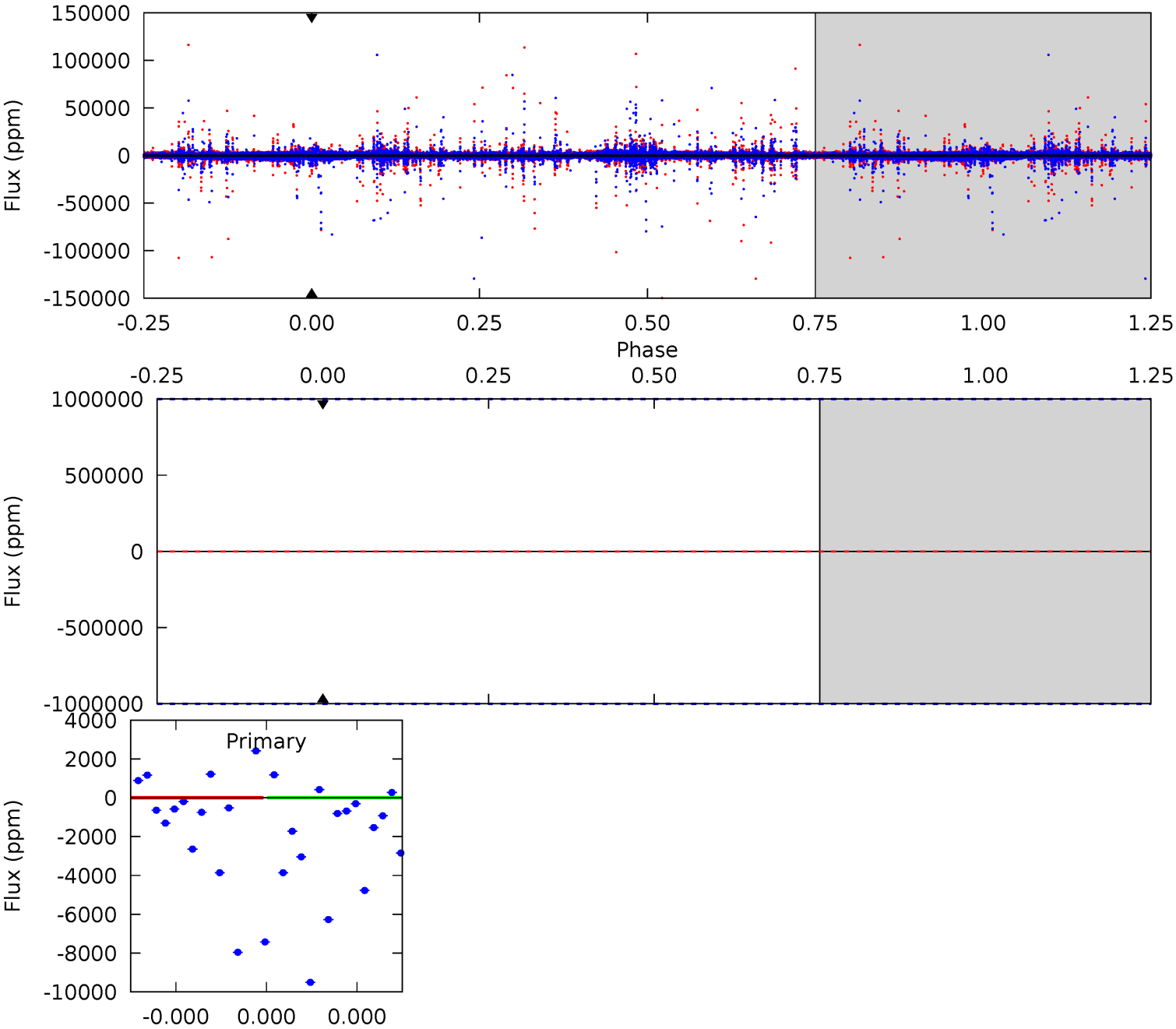
TCE 002857323-03 $P=186.912585$ Days $T_0=162.299937$ (BKJD)



DV Model-Shift Uniqueness Test

002857323-03, P = 186.912585 Days, E = 162.331614 Days

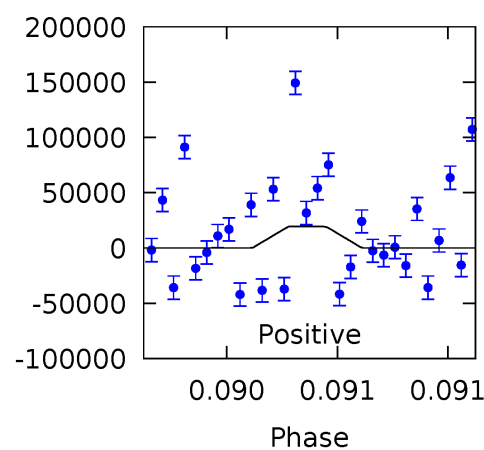
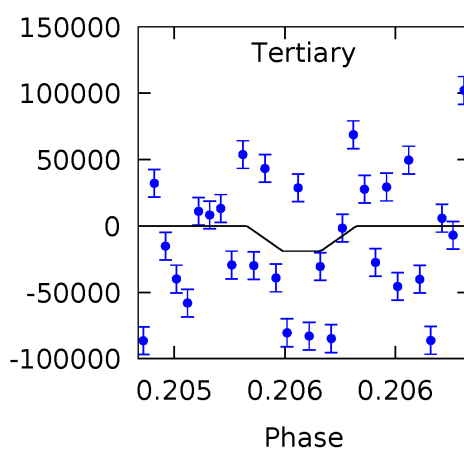
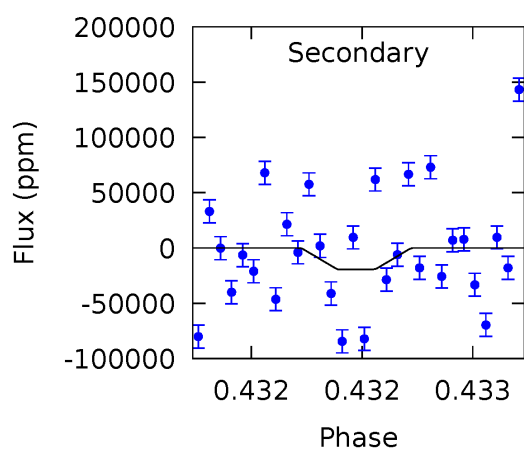
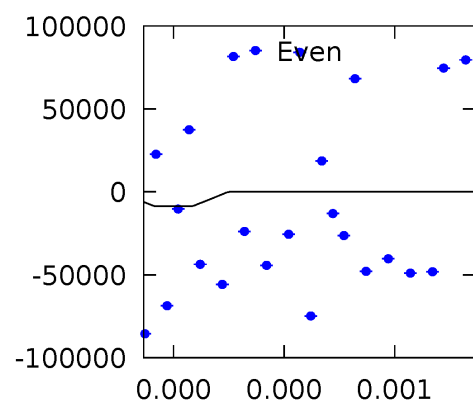
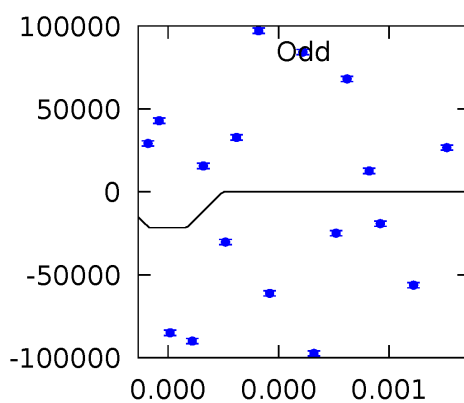
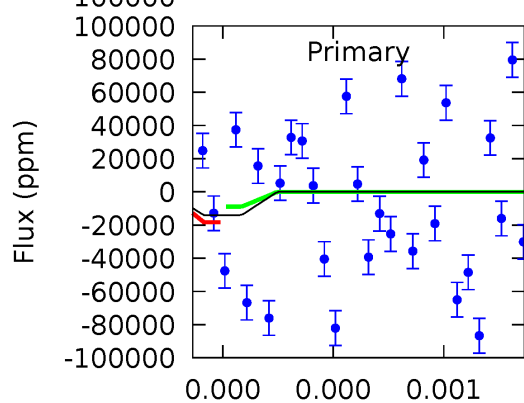
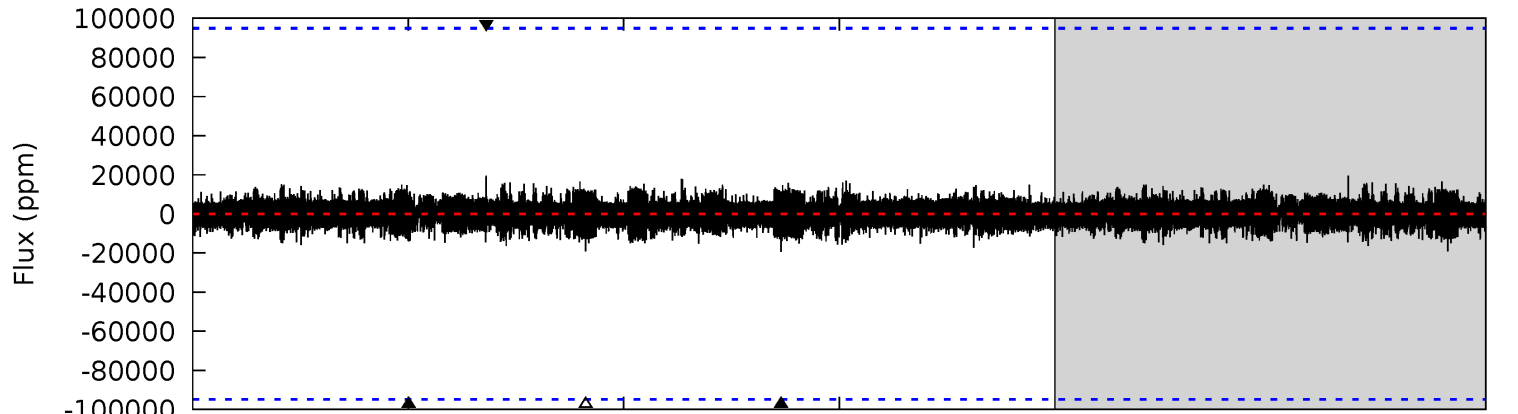
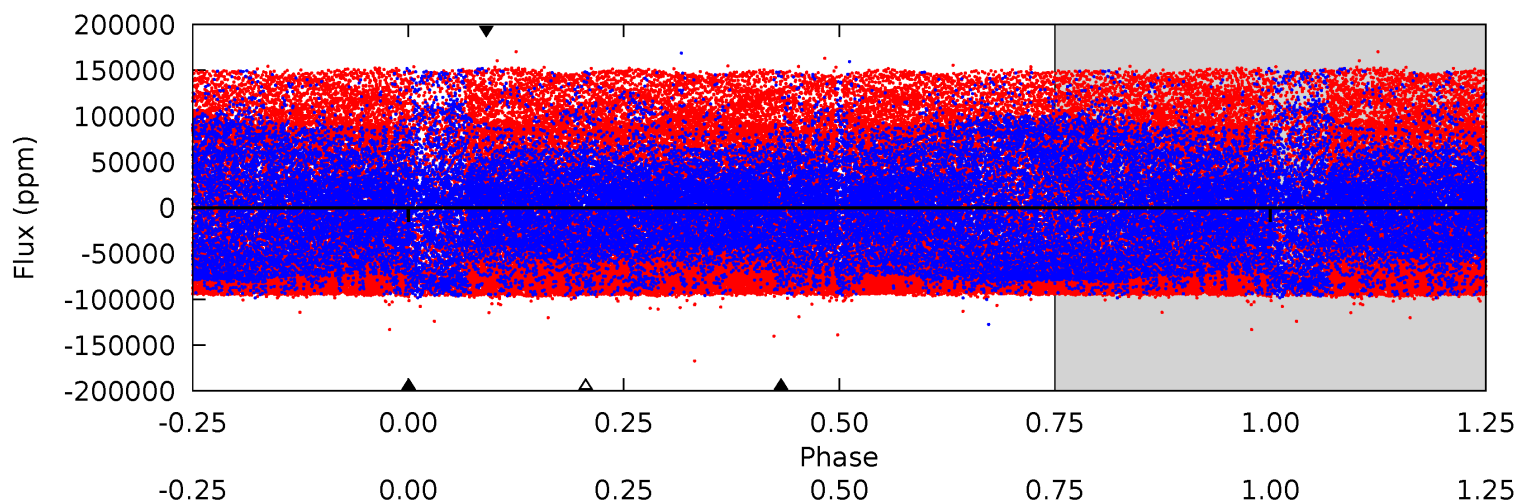
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

002857323-03, P = 186.912585 Days, E = 162.299937 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.83	1.14	1.13	1.15	5.64	3.58	0.27	-0.30	-0.32	0.01	-0.01	0.37	0.59	0.50	0.28



Stellar Parameters For KIC 002857323

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7956^{+216}_{-339}	$4.072^{+0.130}_{-0.159}$	$0.070^{+0.250}_{-0.400}$	$2.072^{+0.524}_{-0.429}$	$1.845^{+0.183}_{-0.314}$	$0.292^{+0.193}_{-0.137}$
	+3%/-4%	+3%/-4%	+357%/-571%	+25%/-21%	+10%/-17%	+66%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 002857323-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$18.29^{+17.82}_{-12.85}$	796^{+53}_{-46}	-5022^{+45232}_{-38304}	$-1175.131^{+181745.147}_{-172876.393}$
Alt.	-19238 ± 16815	$31.75^{+23.04}_{-19.51}$	797^{+48}_{-48}	7431^{+8018}_{-3276}	5214^{+30727}_{-4799}

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

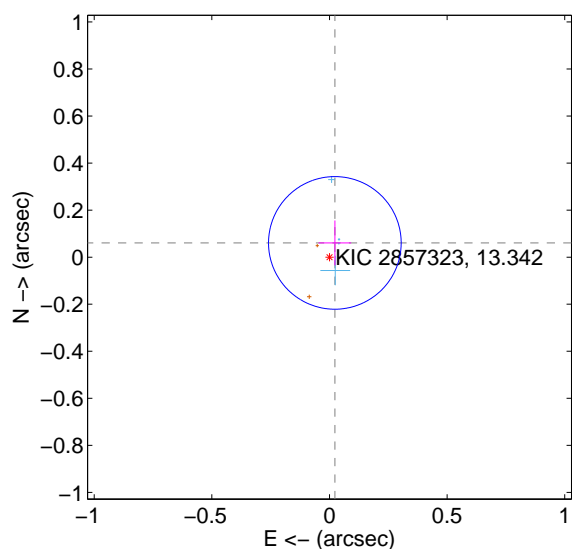
Supplemental centroid analysis for 002857323-03. Kepler magnitude: 13.34. Transit SNR -1.00

There are 4 quarters with good PRF difference image offsets

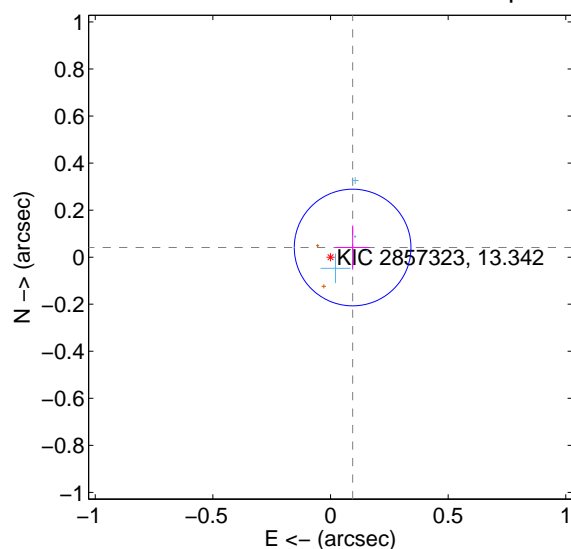
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.065 ± 0.094	0.69	-0.023 ± 0.070	0.061 ± 0.095
PRF-fit source offset from KIC position	0.103 ± 0.083	1.24	-0.094 ± 0.073	0.041 ± 0.094
photometric centroid source offset	0.61 ± 0.08	7.25	-0.18 ± 0.05	0.58 ± 0.09

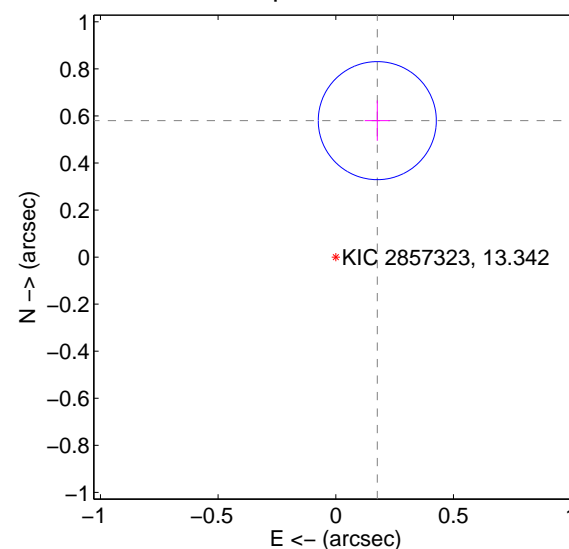
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

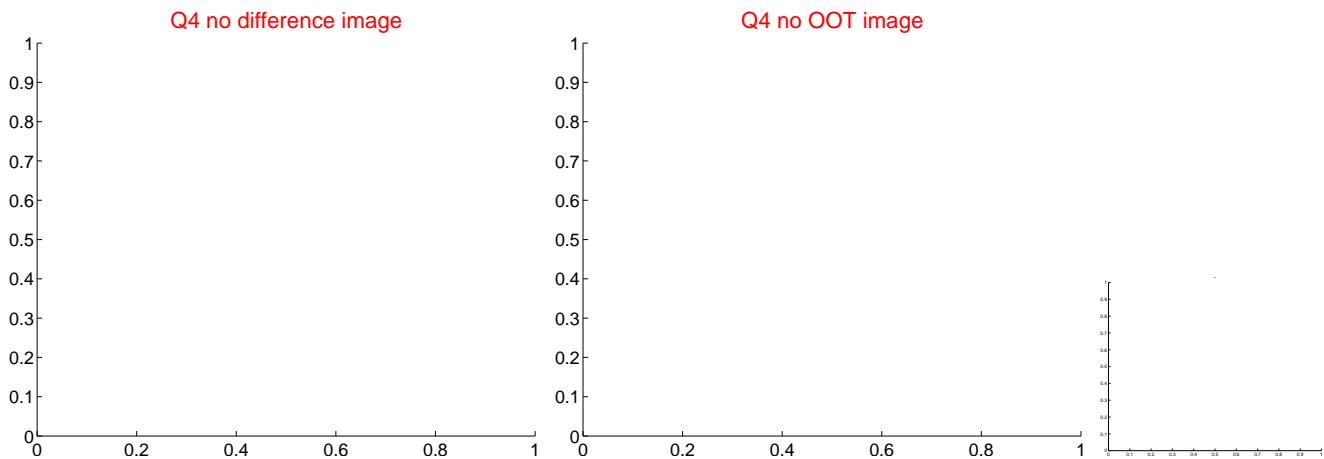
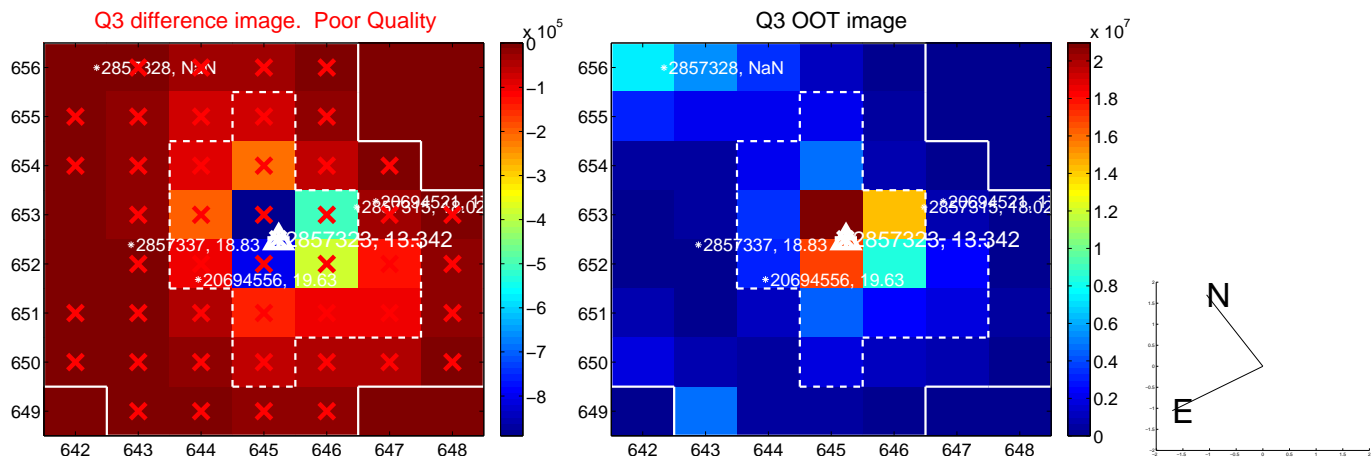
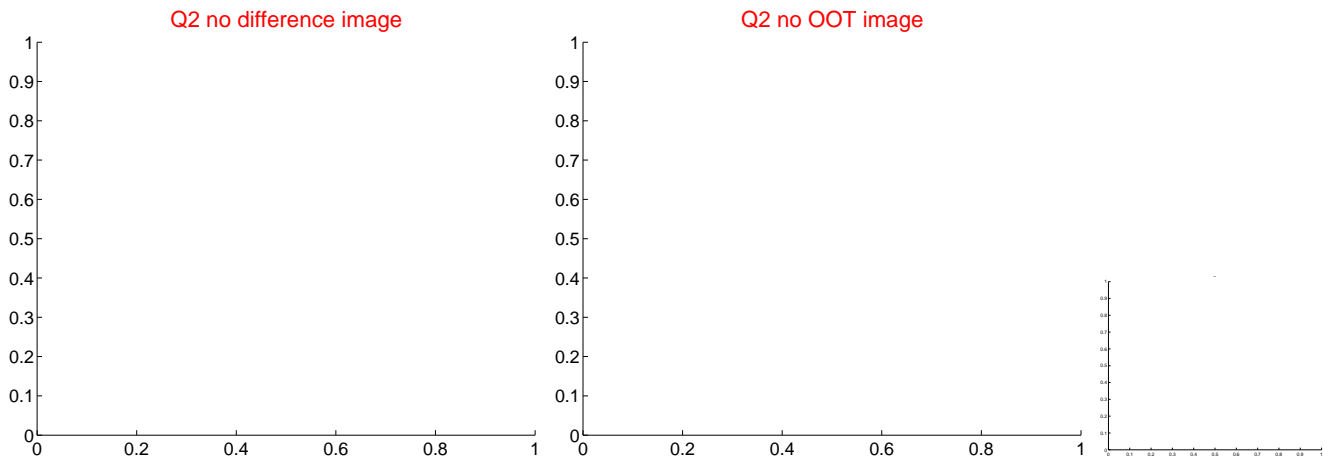
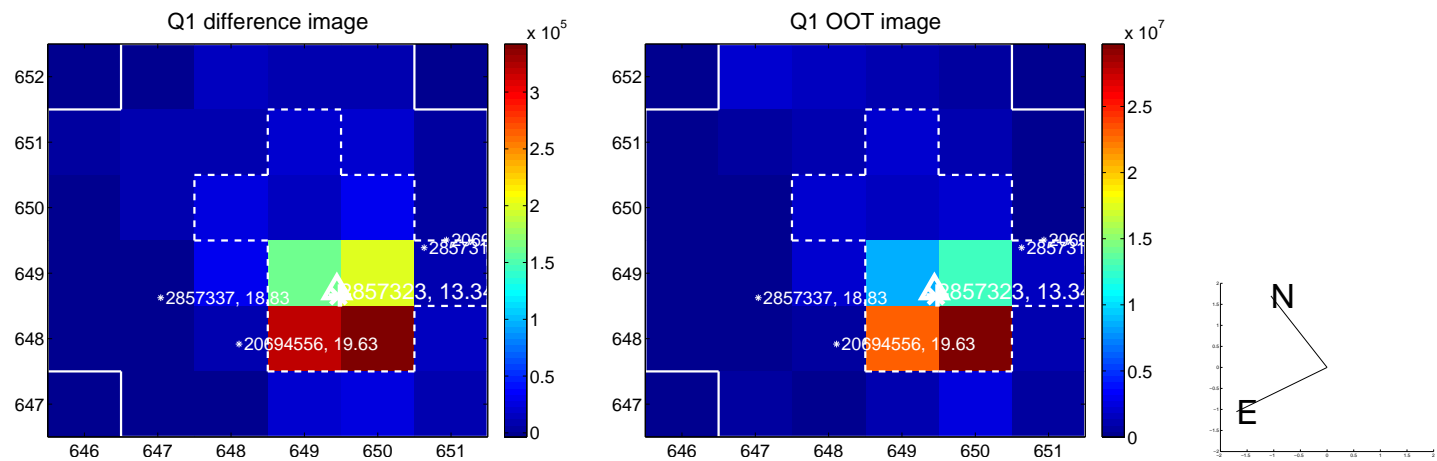


offset from photometric centroids

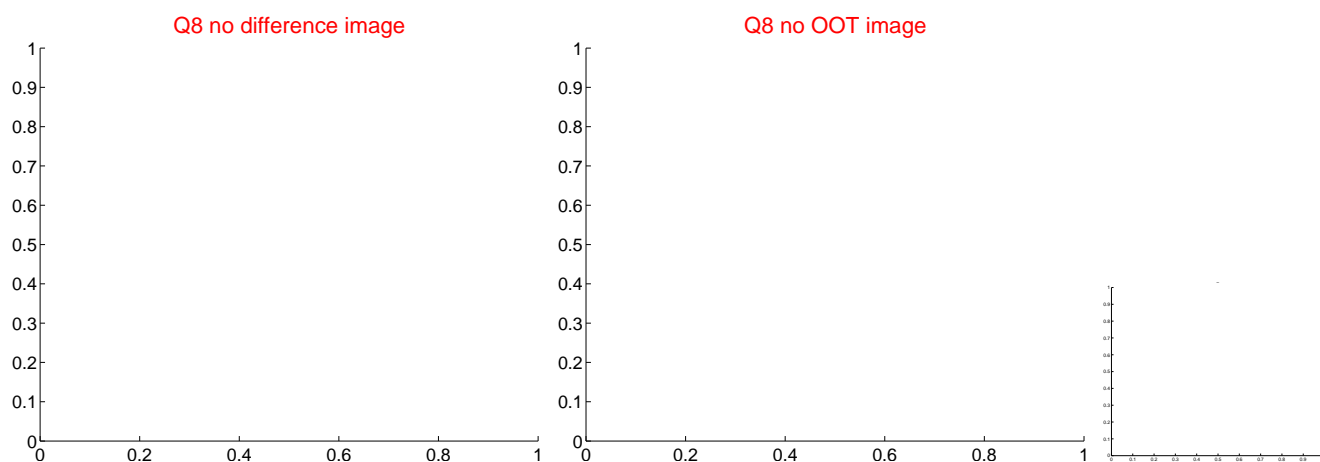
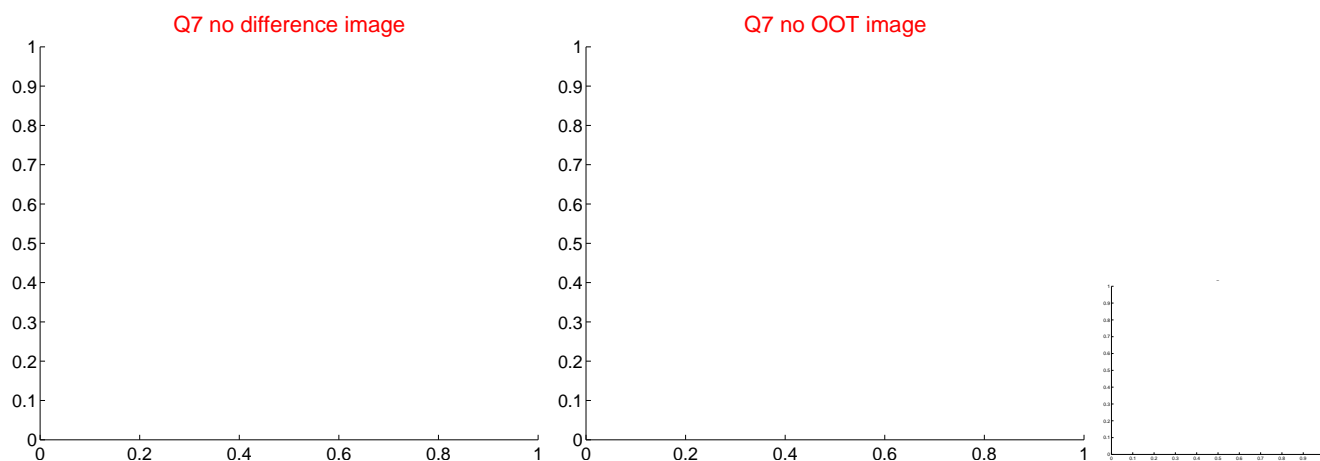
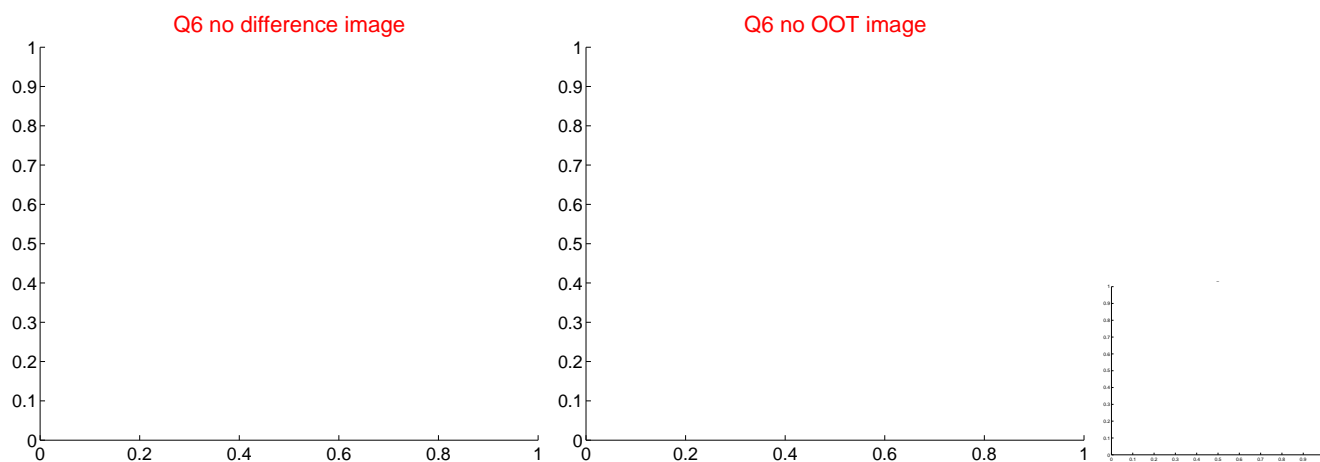
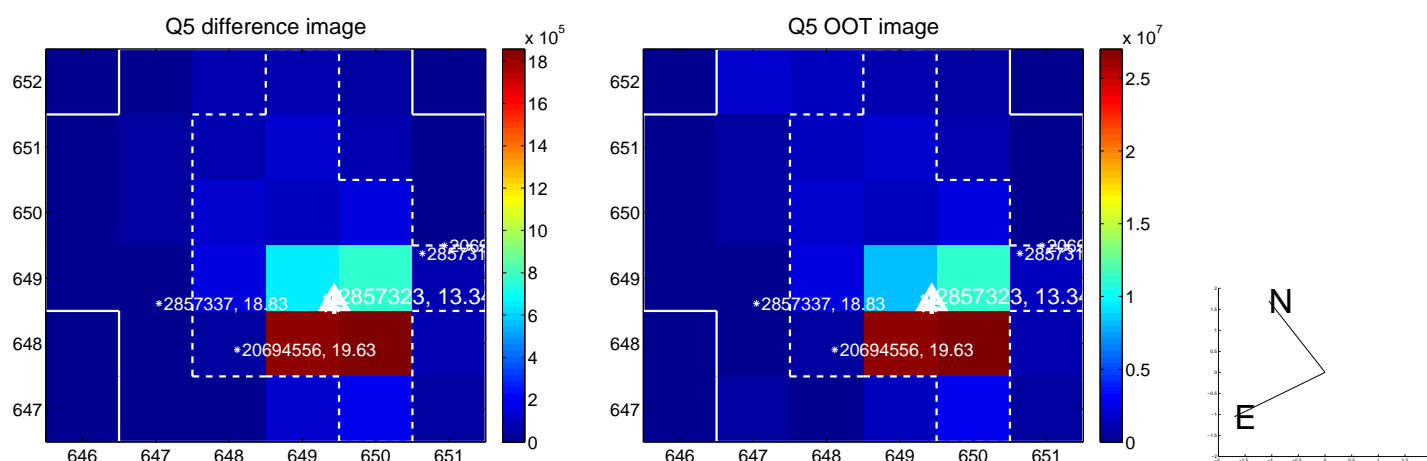


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

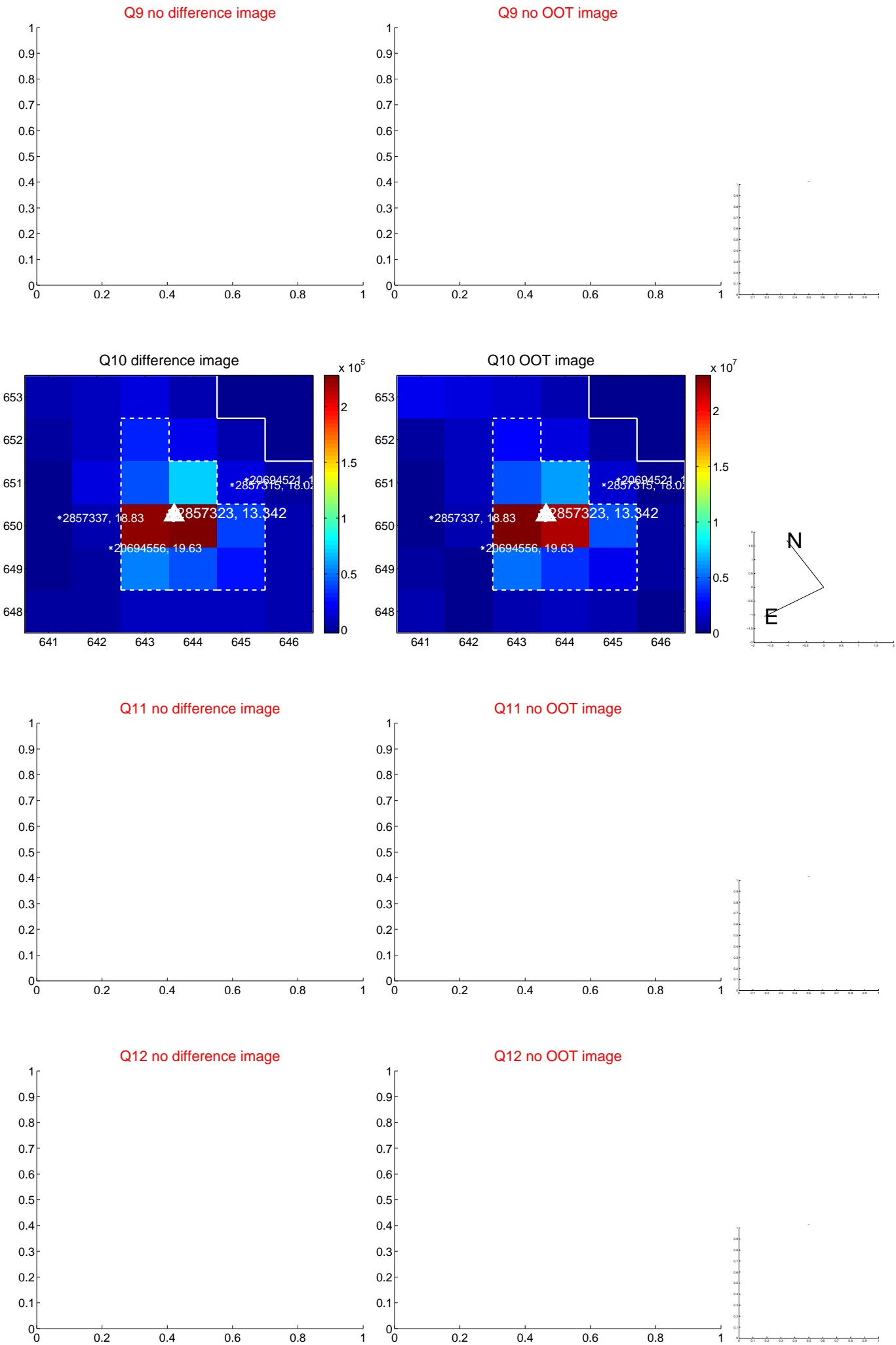
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



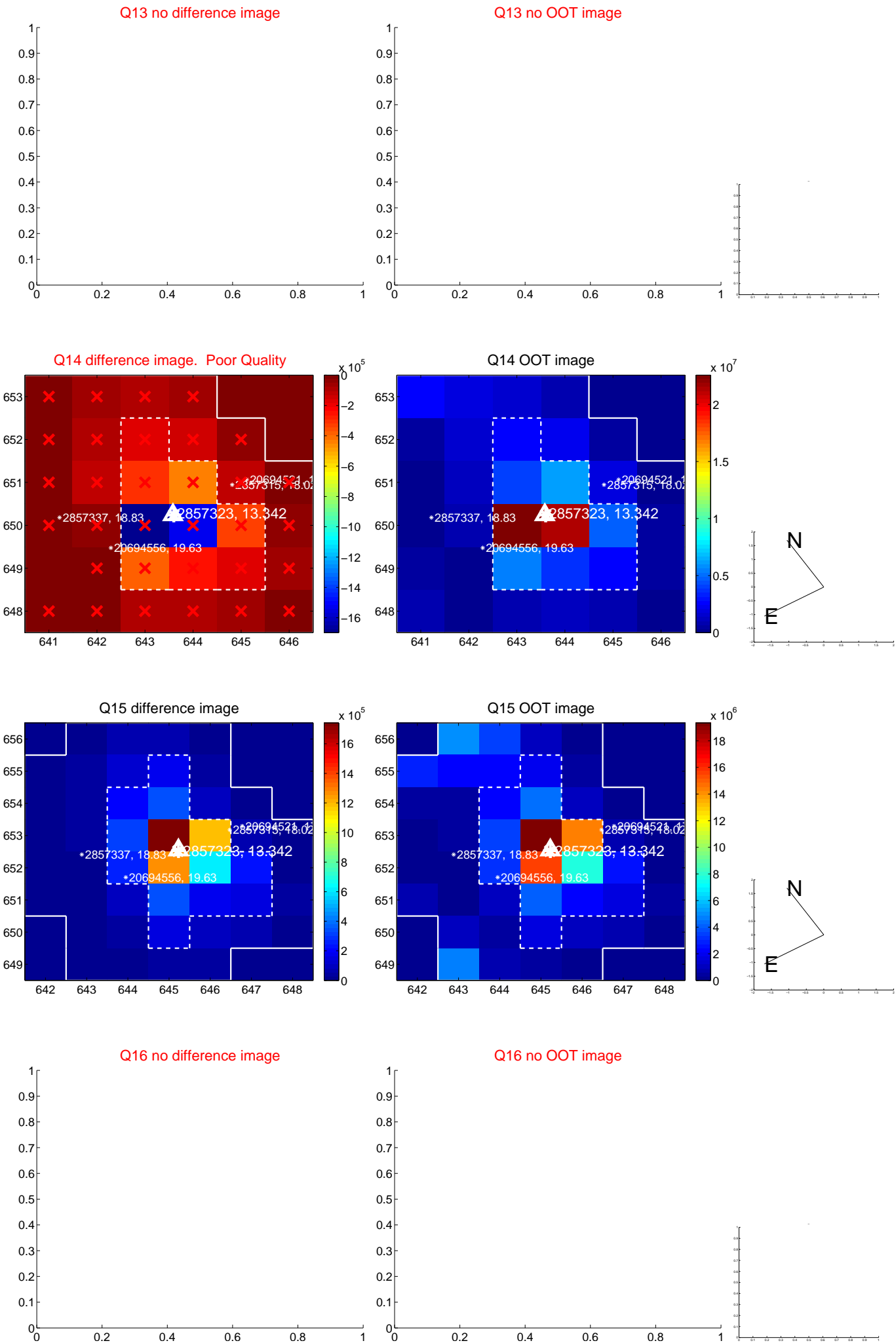
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



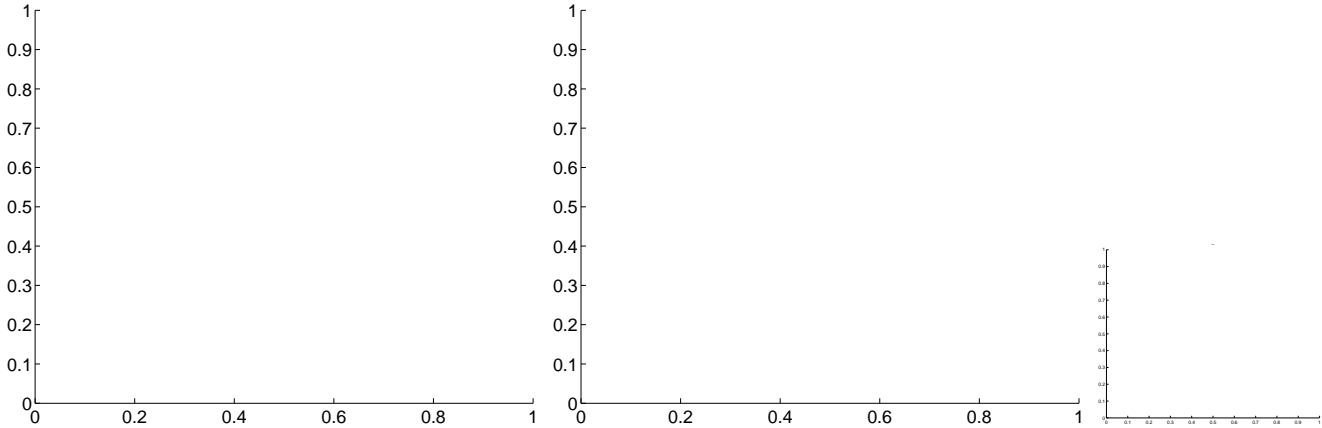
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



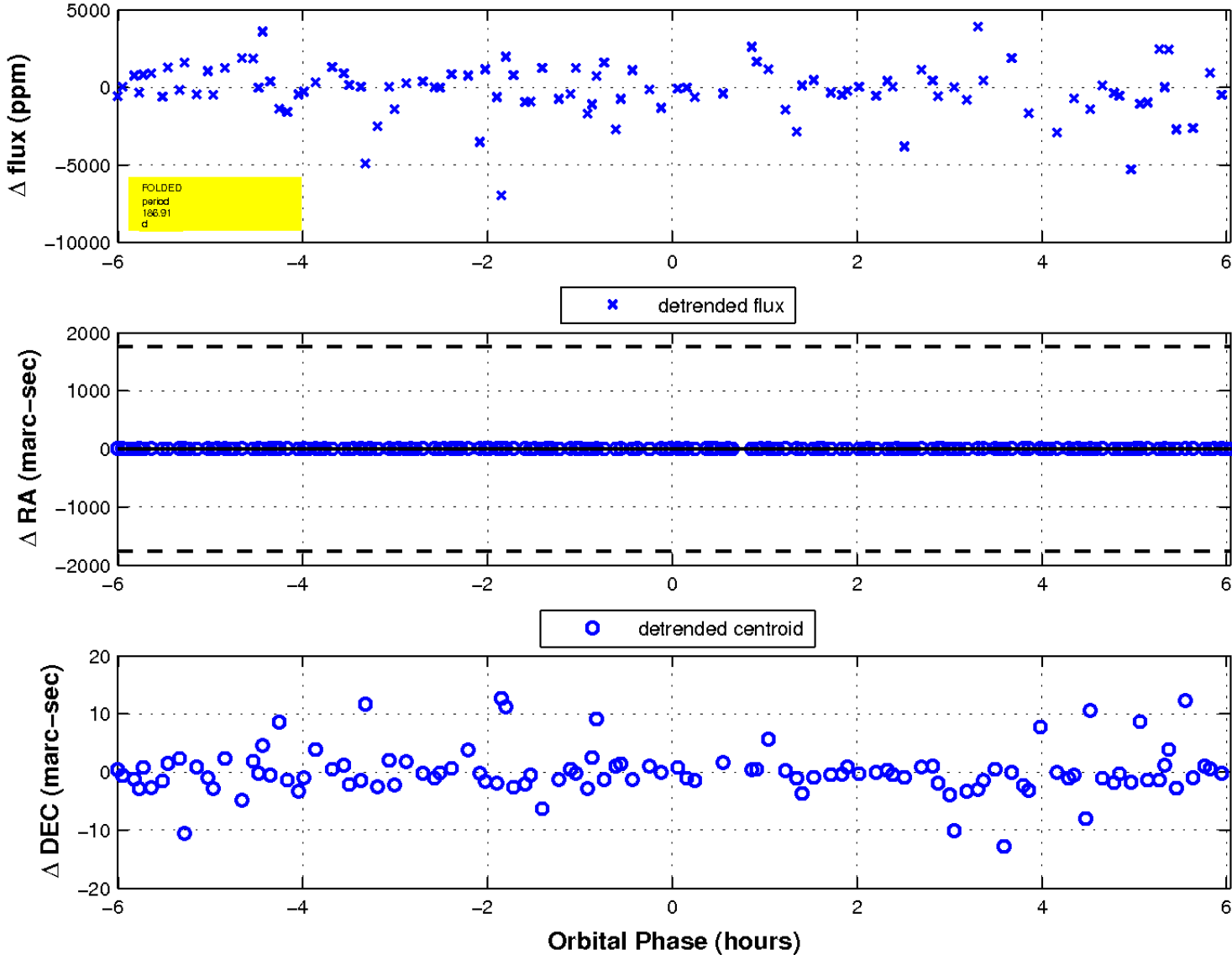
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

