

KIC 002436421

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})
002436421-01	OBS	No	1.437356	133.161414	21.8	6.352	9.6	2.7	2.37	7115	1.22	14680.10
002436421-02	OBS	No	1.437522	132.405323	118.0	6.942	10.4	12.9	2.37	7115	4.06	14677.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002436421-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002436421-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

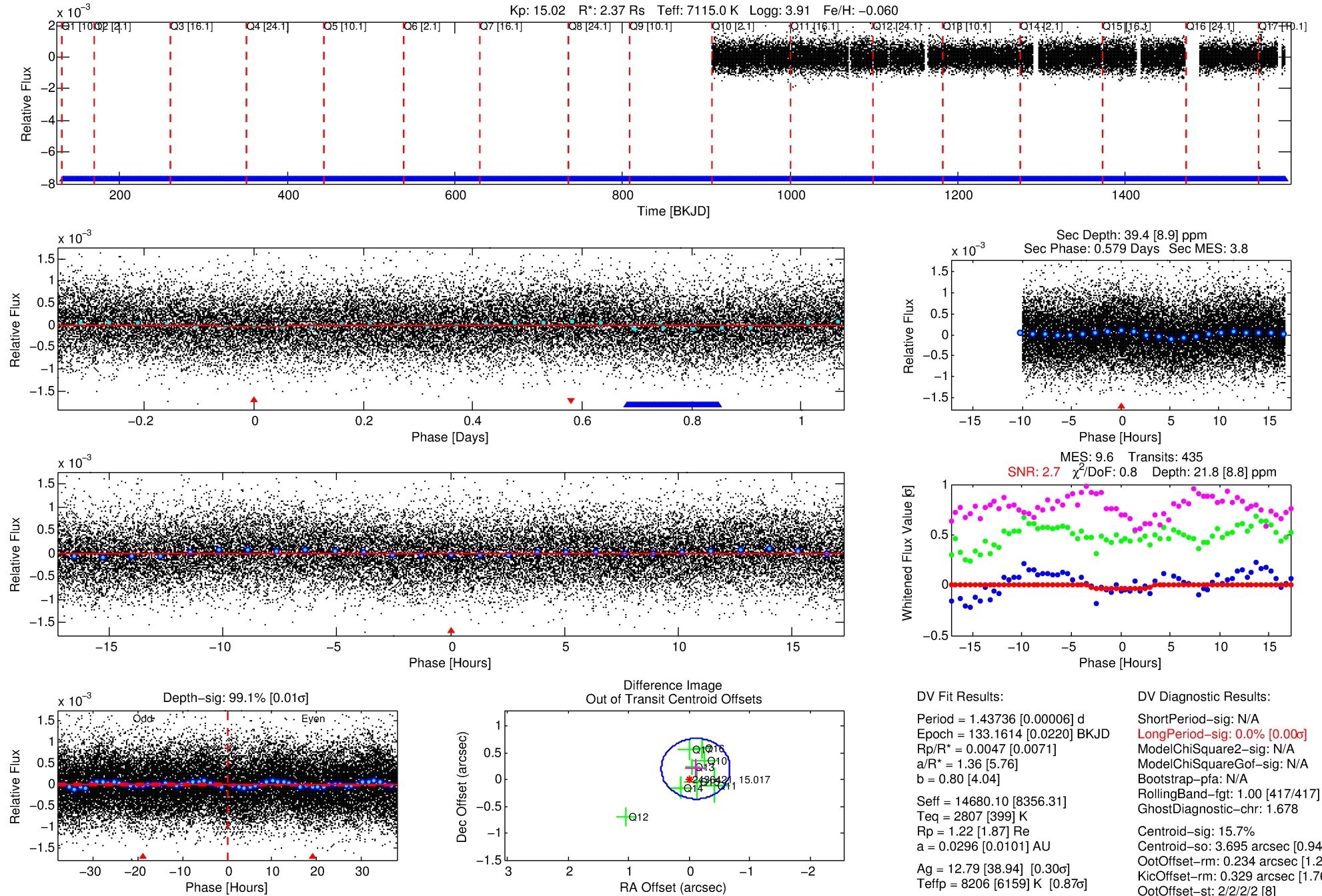
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002436421-01

No Significant Match Found

DV One-Page Summary

KIC: 2436421 Candidate: 1 of 2 Period: 1.437 d



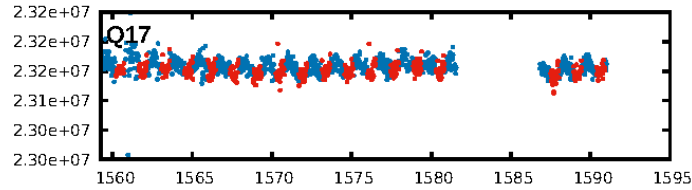
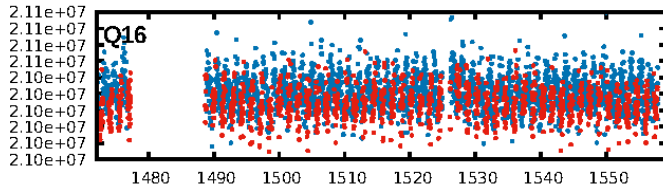
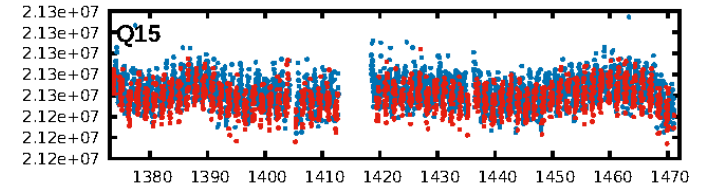
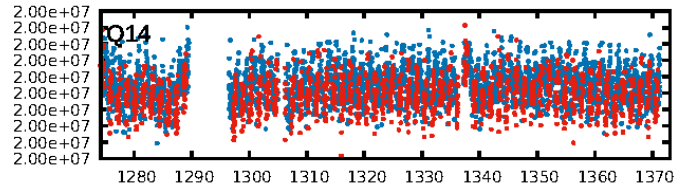
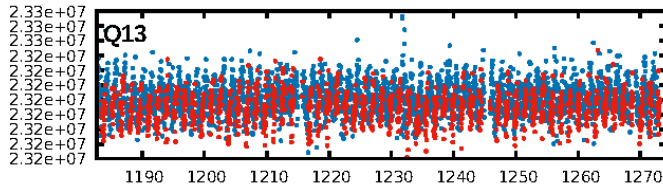
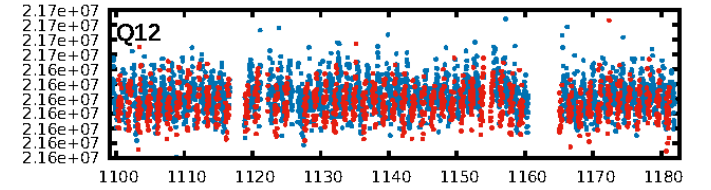
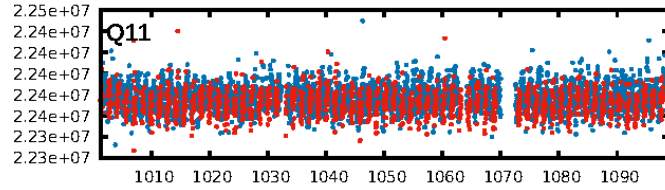
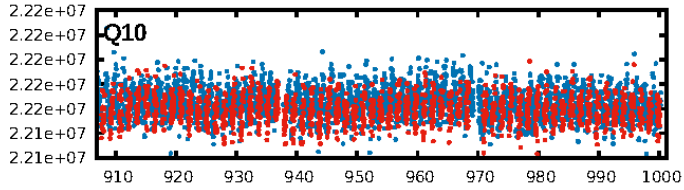
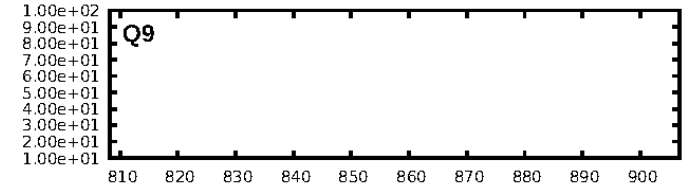
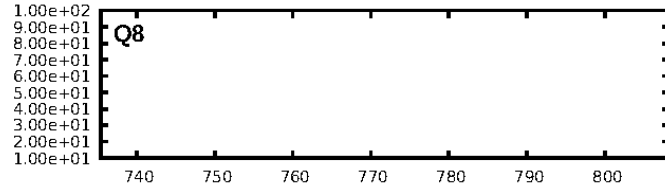
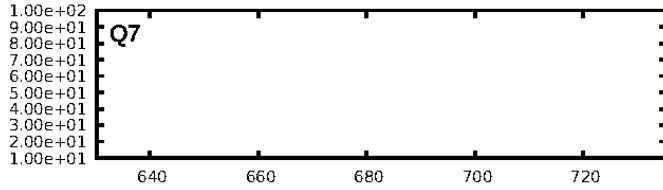
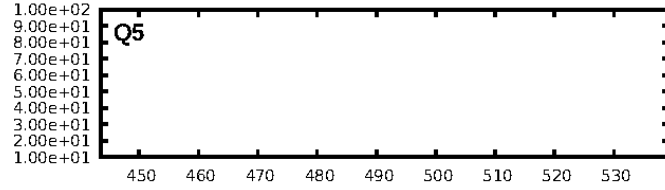
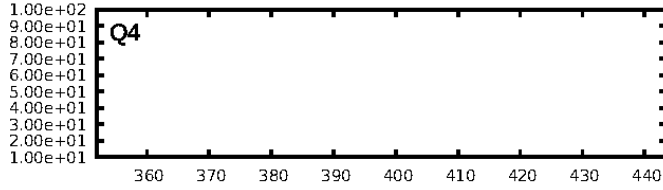
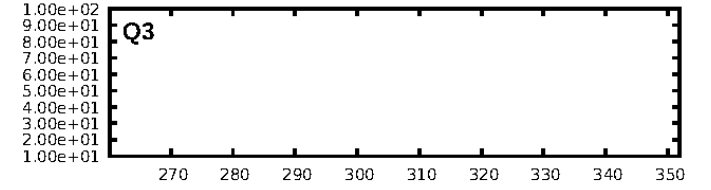
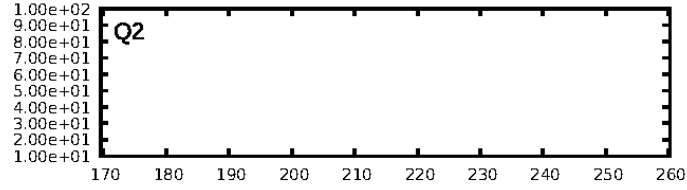
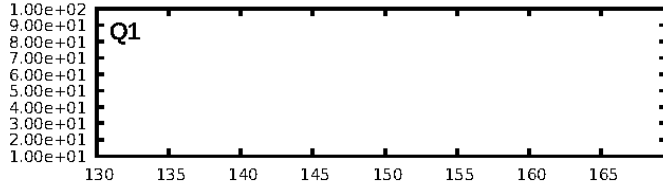
DV Fit Results:

Period = 1.43736 [0.00006] d
Epoch = 133.1614 [0.0220] BKJD
Rp/R* = 0.0047 [0.0071]
a/R* = 1.36 [5.76]
b = 0.80 [4.04]
Seff = 14680.10 [8356.31]
Teff = 2807 [399] K
Rp = 1.22 [1.87] Re
a = 0.0296 [0.0101] AU
Ag = 12.79 [38.94] [0.30 σ]
Teffp = 8206 [6159] K [0.87 σ]

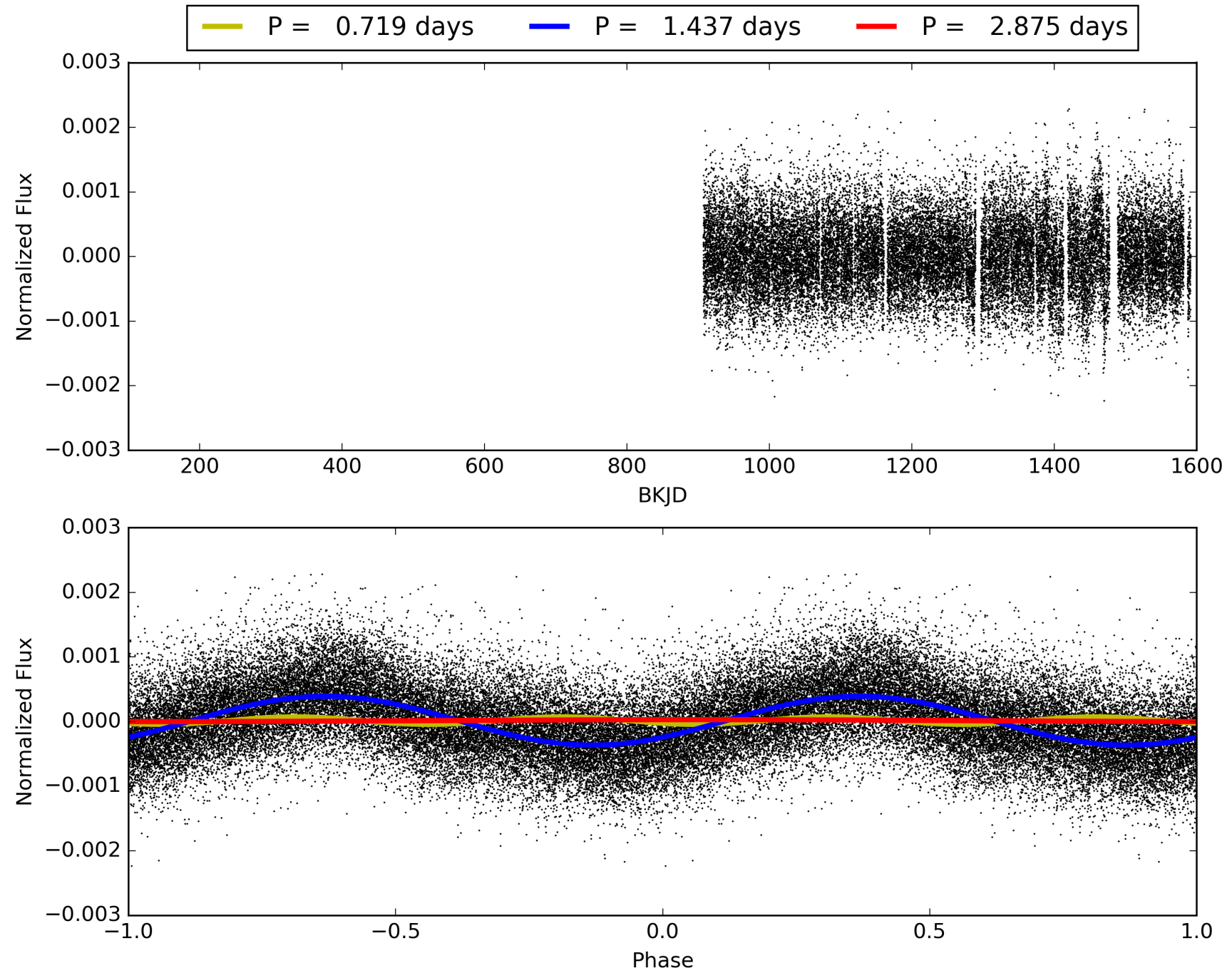
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [417/417]
GhostDiagnostic-chr: 1.678
Centroid-sig: 15.7%
Centroid-so: 3.695 arcsec [0.94 σ]
OotOffset-rm: 0.234 arcsec [1.24 σ]
KicOffset-rm: 0.329 arcsec [1.76 σ]
OotOffset-st: 2/2/2/2 [8]
KicOffset-st: 2/2/2/2 [8]
DiffImageQuality-fgm: 1.00 [8/8]
DiffImageOverlap-fno: 0.00 [0/8]

TCE 002436421-01, PDC Light Curves

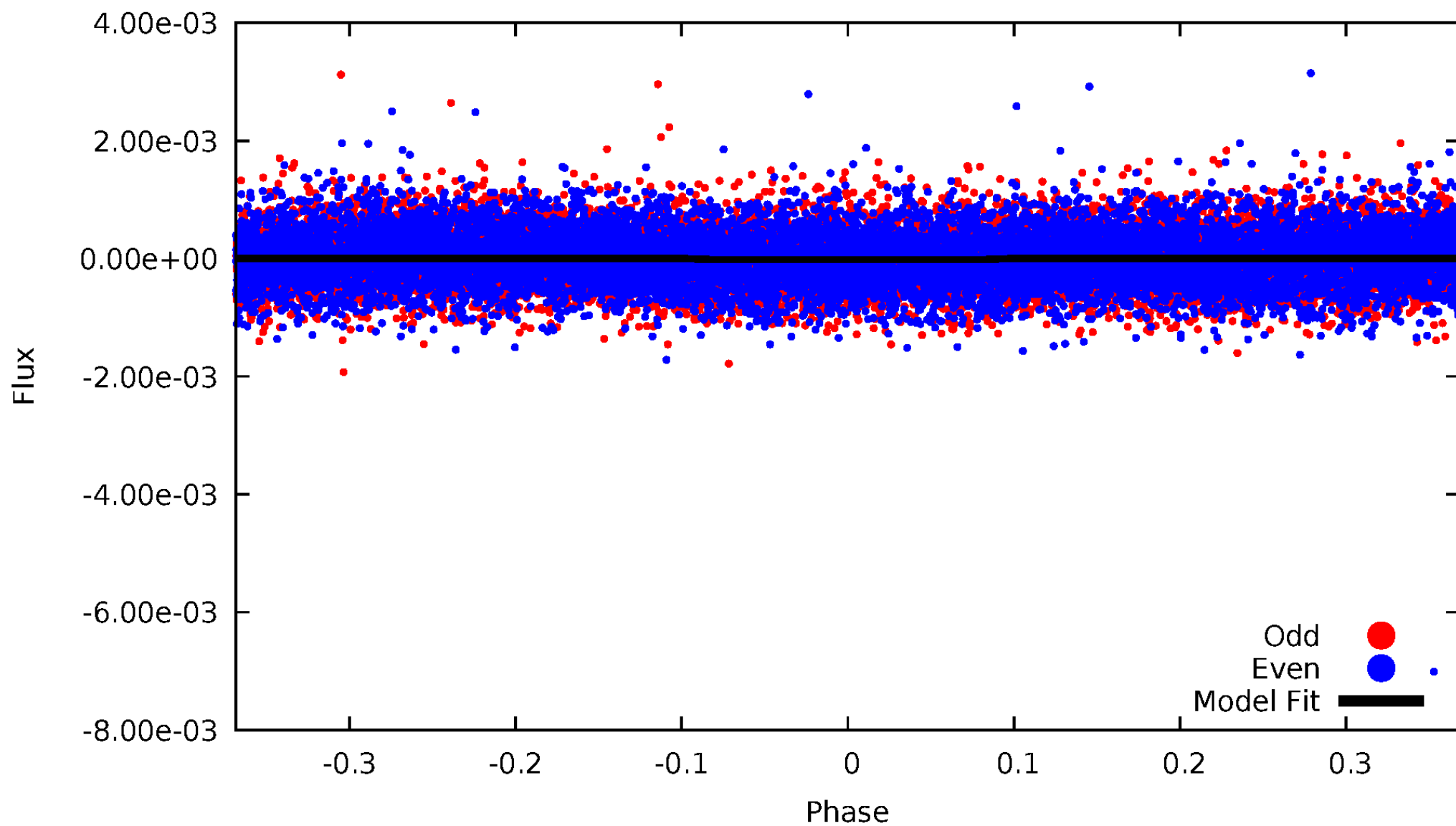


TCE 002436421-01



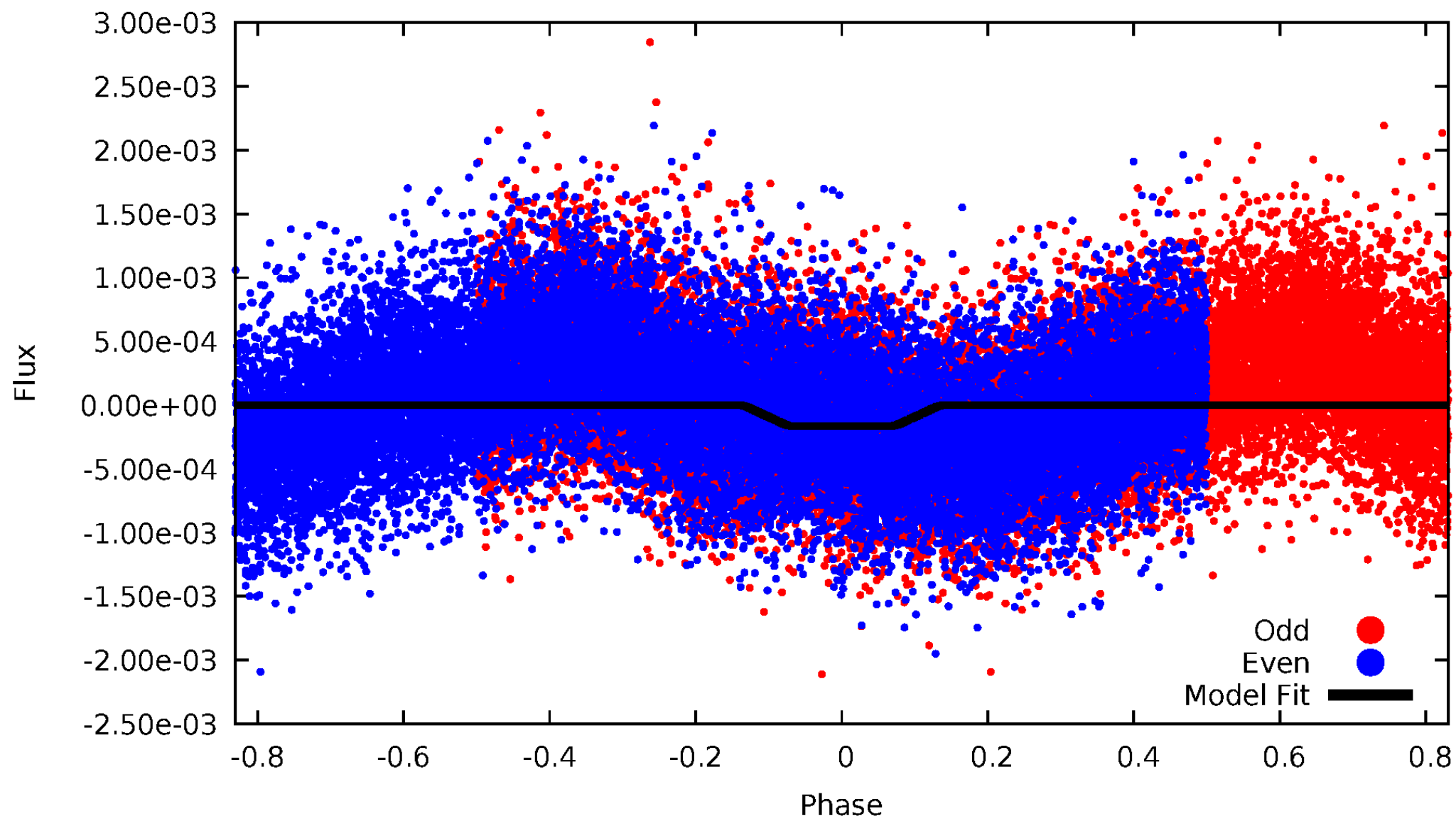
DV Odd/Even

TCE 002436421-01



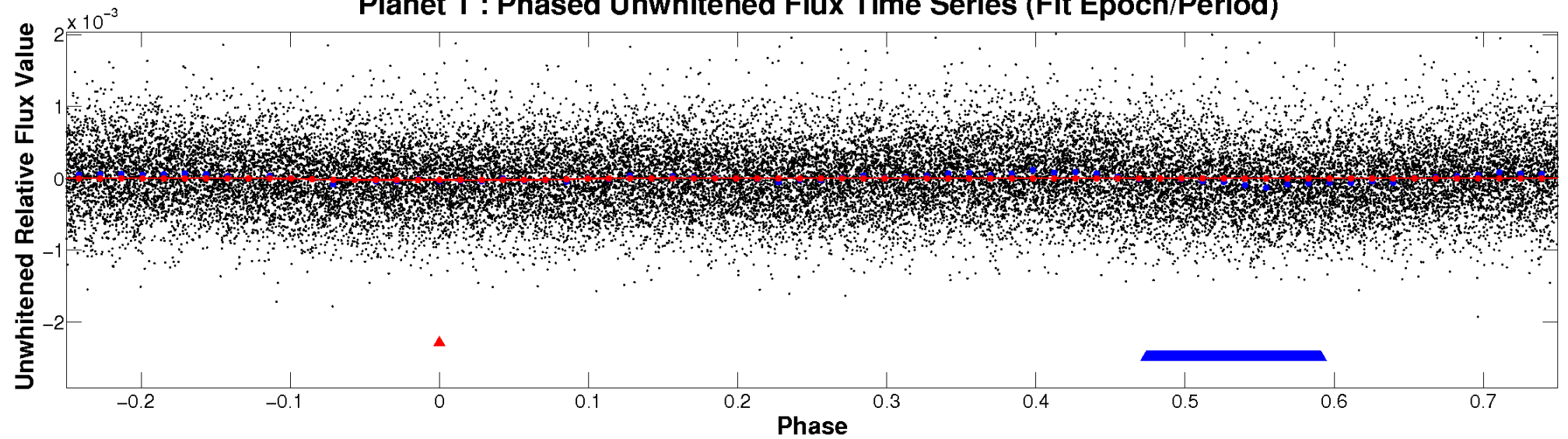
ALT Odd/Even

TCE 002436421-01

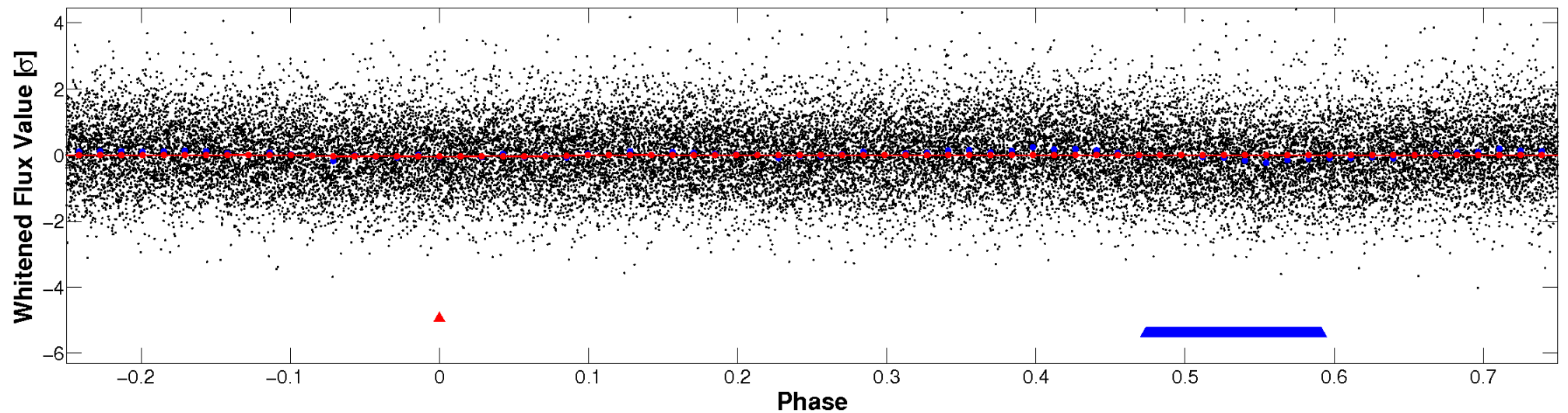


Non-Whitened Vs. Whitened Light Curve

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

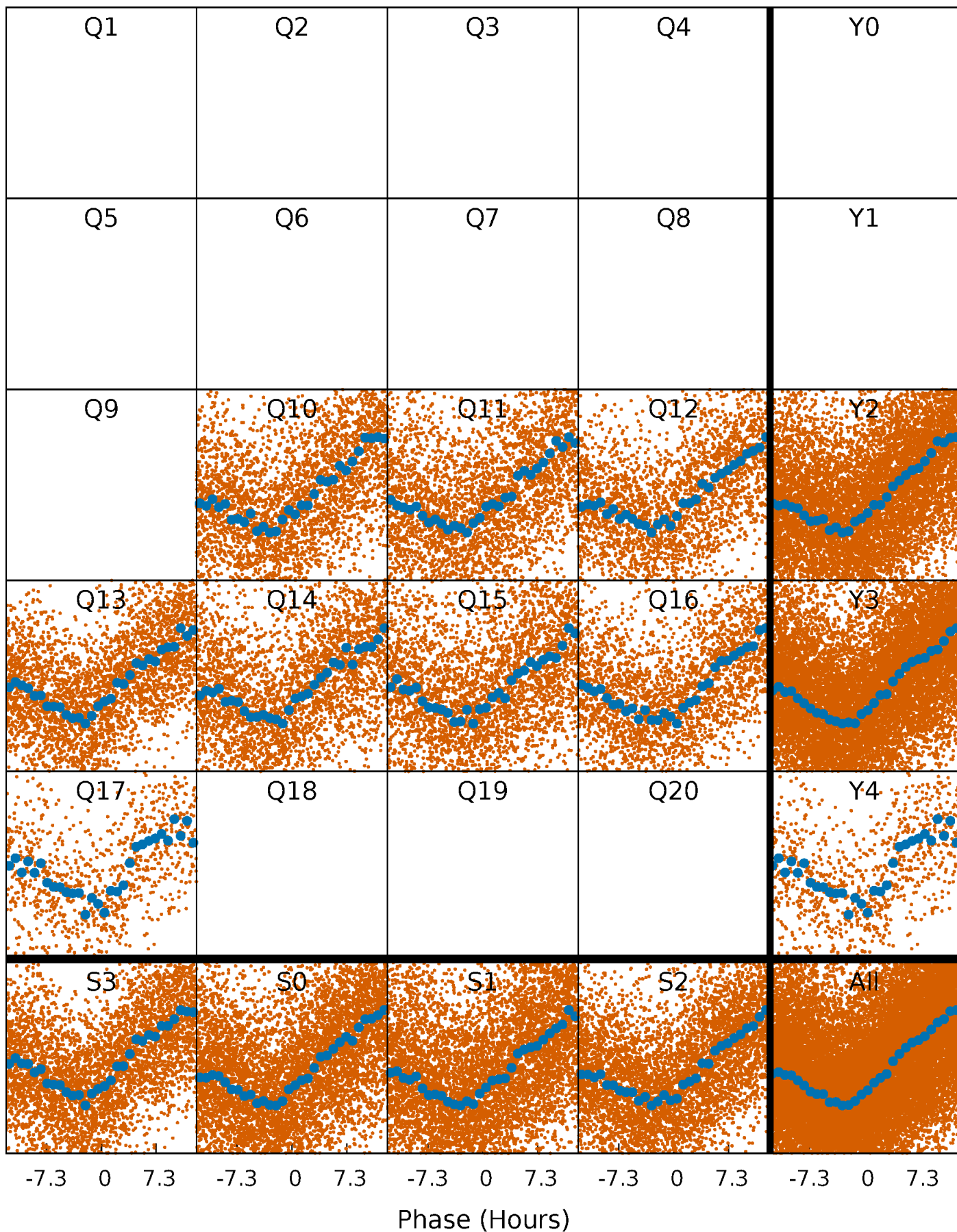


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



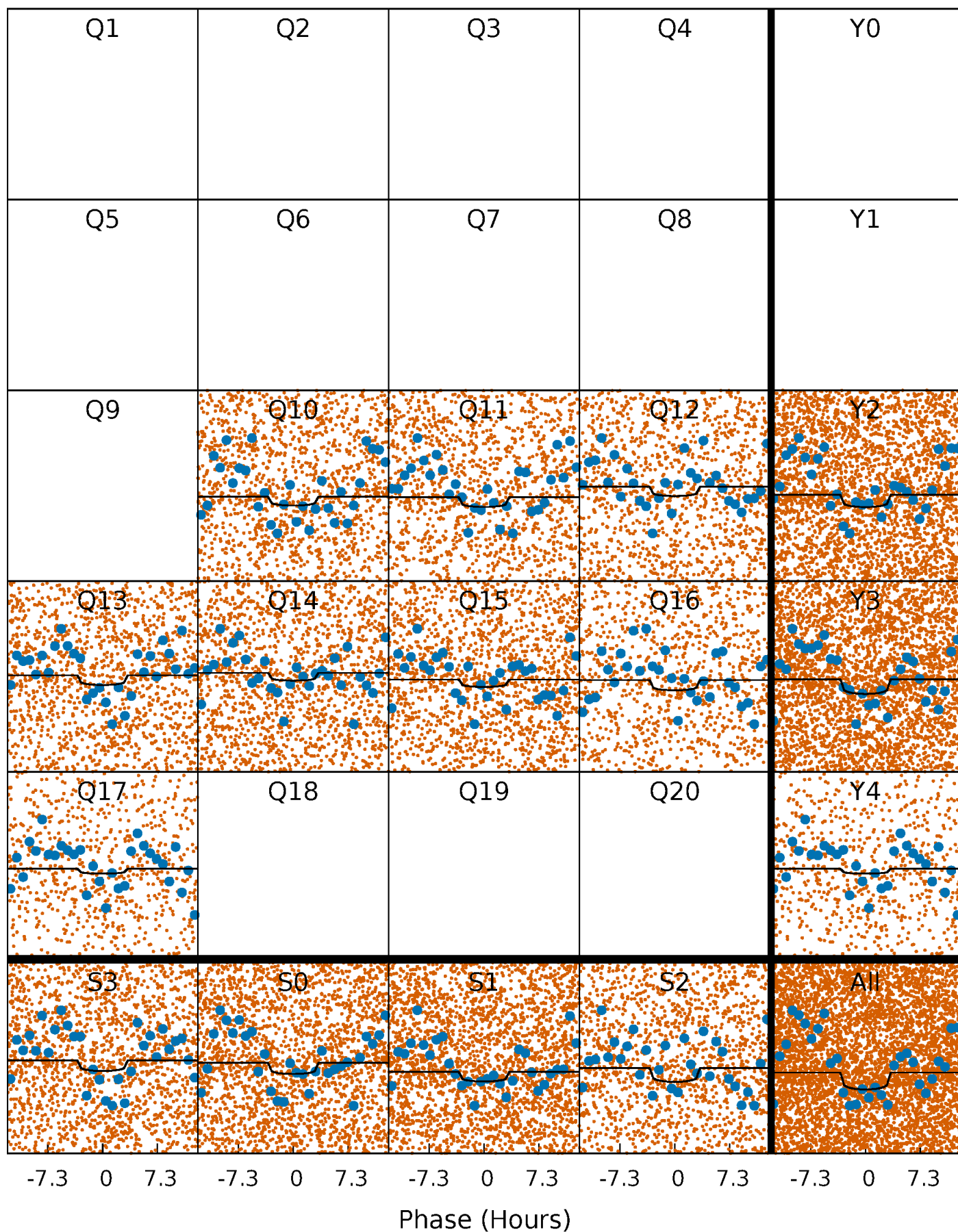
PDC Quarter-Phased Transit Curves

TCE 002436421-01 P= 1.437356 Days $T_0=133.161414$ (BKJD)



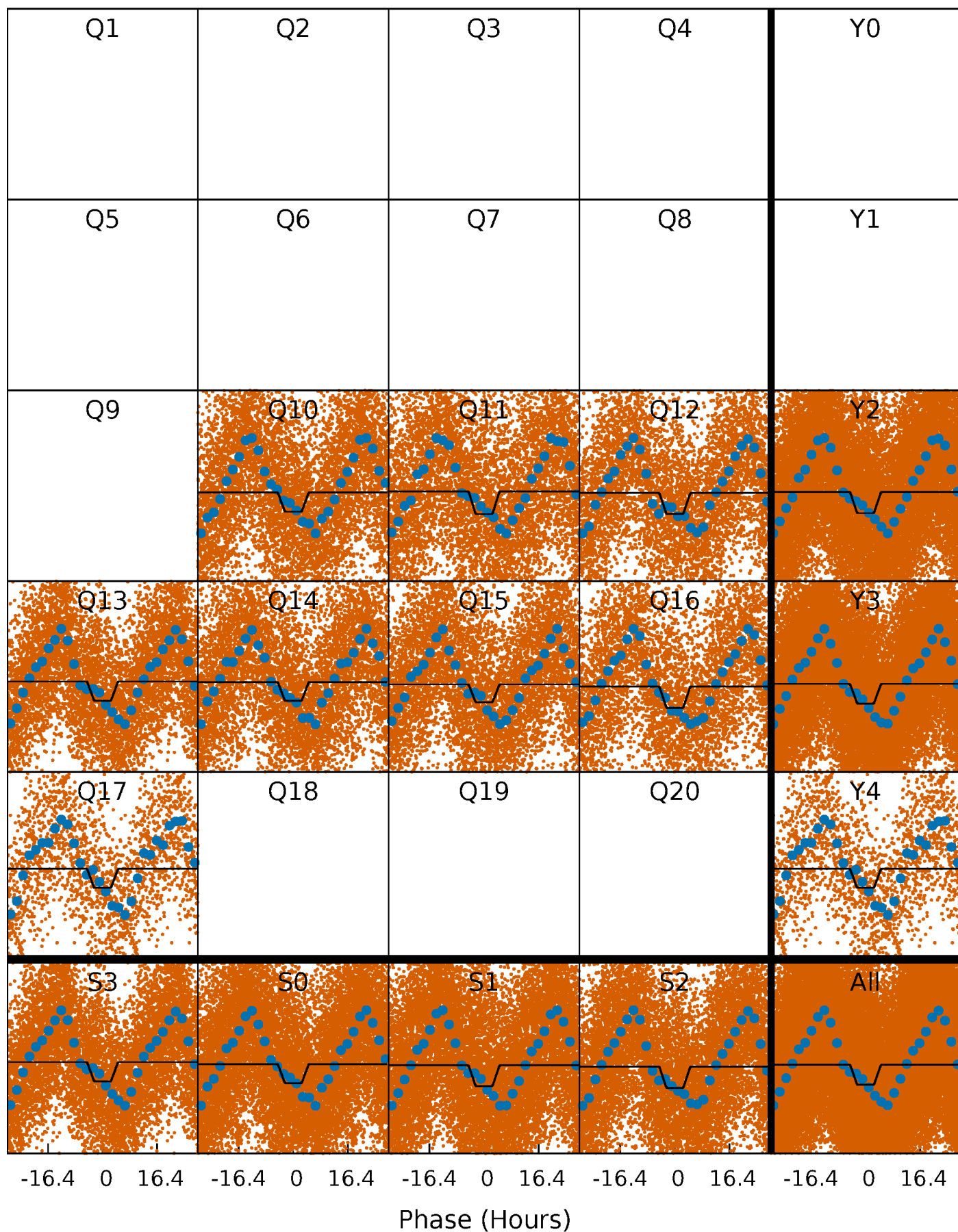
DV Quarter-Phased Transit Curves

TCE 002436421-01 P= 1.437356 Days $T_0=133.161414$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

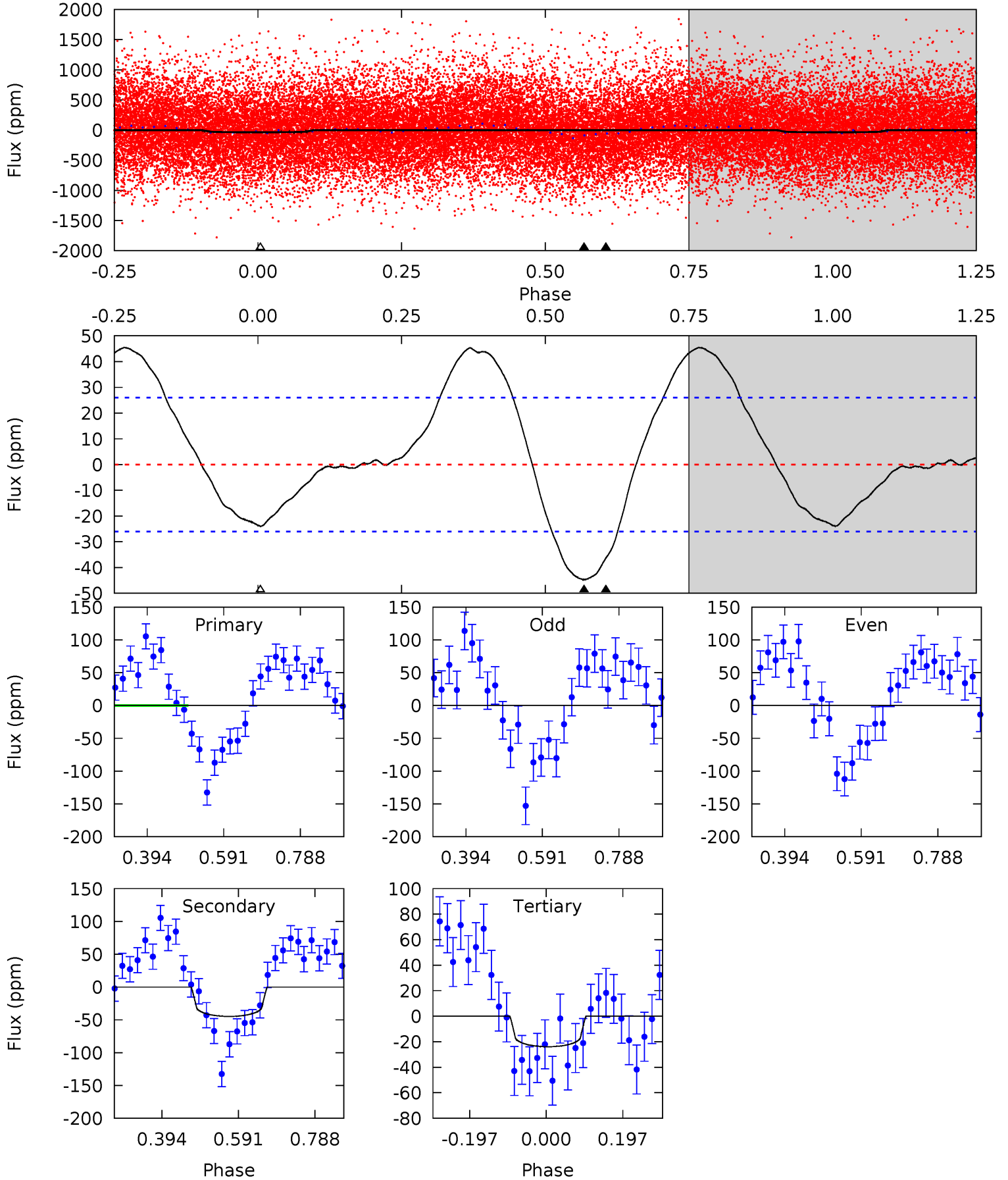
TCE 002436421-01 P= 1.437609 Days $T_0=132.611349$ (BKJD)



DV Model-Shift Uniqueness Test

002436421-01, P = 1.437356 Days, E = 133.161414 Days

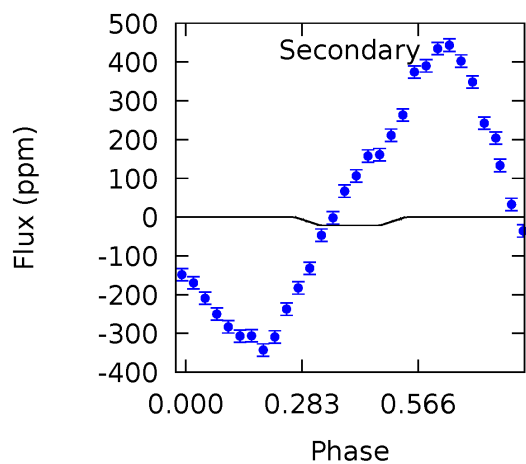
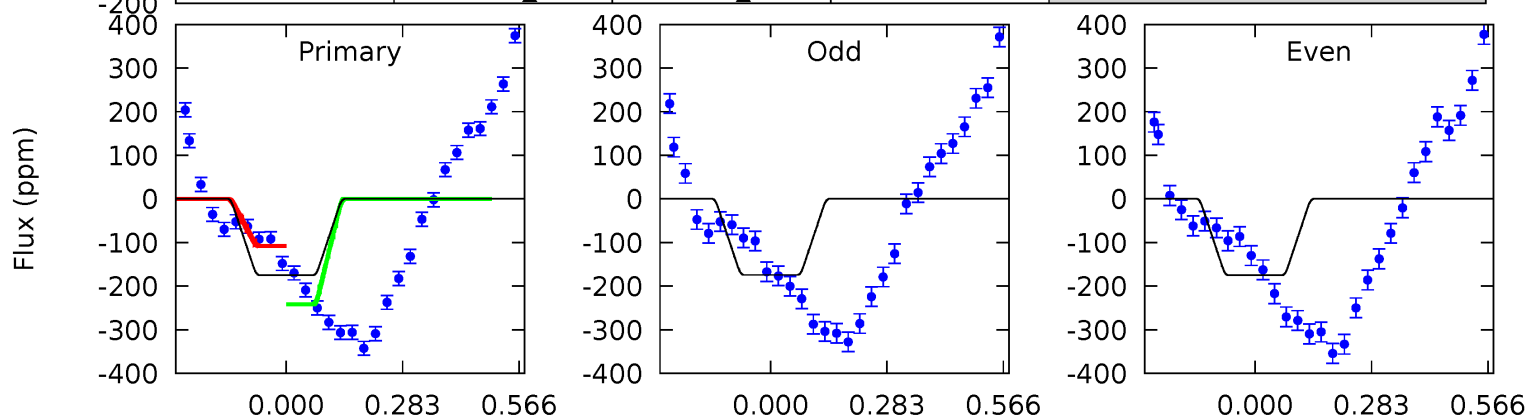
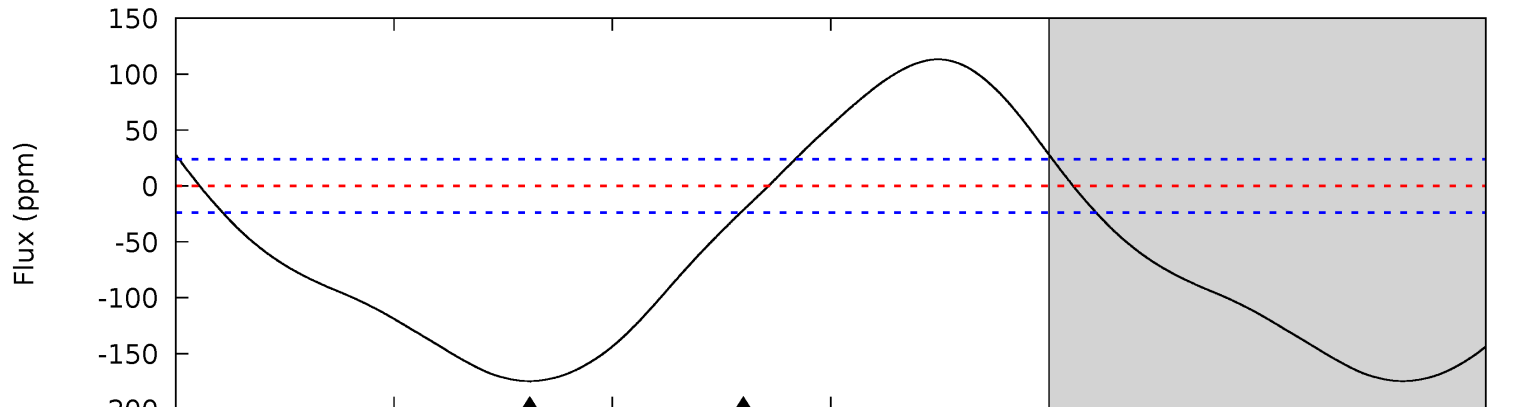
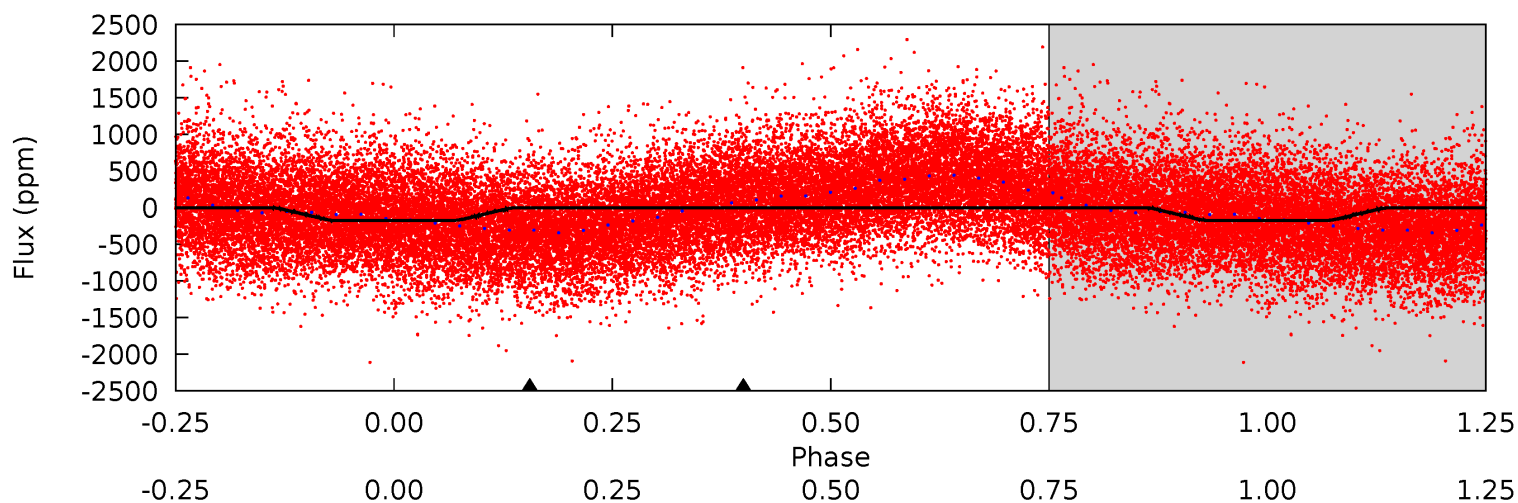
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.17	7.60	4.06	0	4.42	1.29	3.15	2.11	6.17	3.54	7.60	2.75	0.97	0.50	0.69



Alt Model-Shift Uniqueness Test

002436421-01, P = 1.437609 Days, E = 132.611349 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.7	3.89	0	0	4.34	1.07	8.97	31.7	31.7	3.89	3.89	0.06	1.07	0.39	13.2



Stellar Parameters For KIC 002436421

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7115^{+200}_{-314}	$3.913^{+0.315}_{-0.135}$	$-0.060^{+0.250}_{-0.350}$	$2.365^{+0.574}_{-0.862}$	$1.669^{+0.193}_{-0.358}$	$0.178^{+0.388}_{-0.068}$
	+3%/-4%	+8%/-3%	+417%/-583%	+24%/-36%	+12%/-21%	+218%/-39%
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 002436421-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-45 ± 6	$1.61^{+1.63}_{-1.08}$	3836^{+313}_{-360}	7037^{+10754}_{-2124}	$8.320^{+70.399}_{-6.348}$
Alt.	-21 ± 6	$3.14^{+2.00}_{-1.56}$	3827^{+295}_{-355}	4064^{+1823}_{-1205}	$1.005^{+3.506}_{-0.645}$

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 $A_{obs} \gg 1.0$

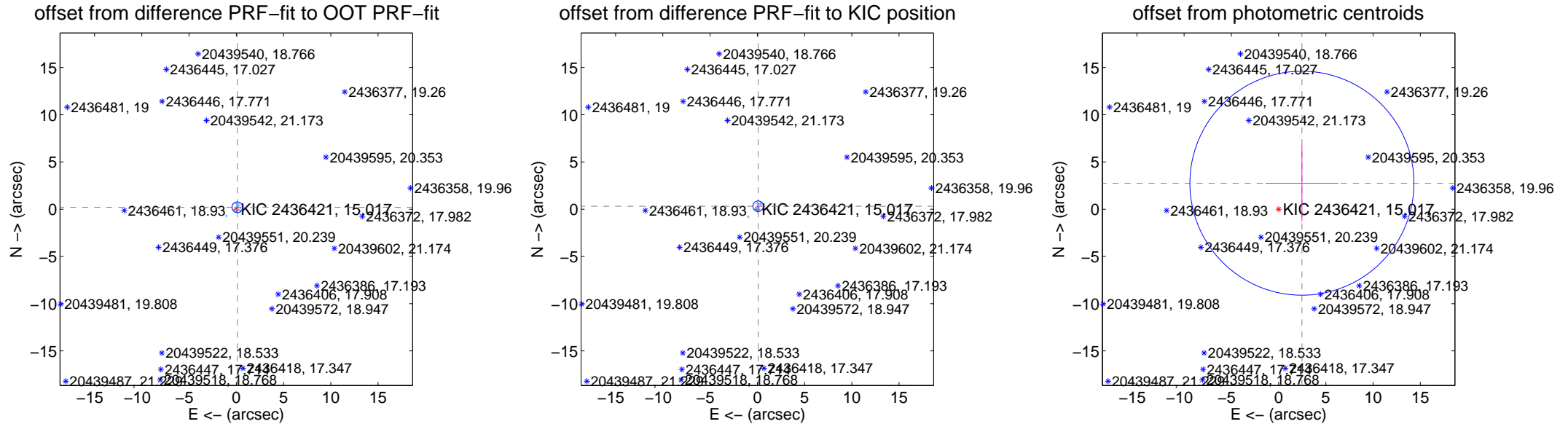
DV Centroid Data

Supplemental centroid analysis for 002436421-01. Kepler magnitude: 15.02. Transit SNR 2.69

There are 8 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	0.234 ± 0.189	1.24	-0.109 ± 0.156	0.207 ± 0.163
PRF-fit source offset from KIC position	0.329 ± 0.187	1.76	-0.092 ± 0.150	0.316 ± 0.160
photometric centroid source offset	3.70 ± 3.95	0.94	-2.47 ± 3.85	2.75 ± 4.03



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

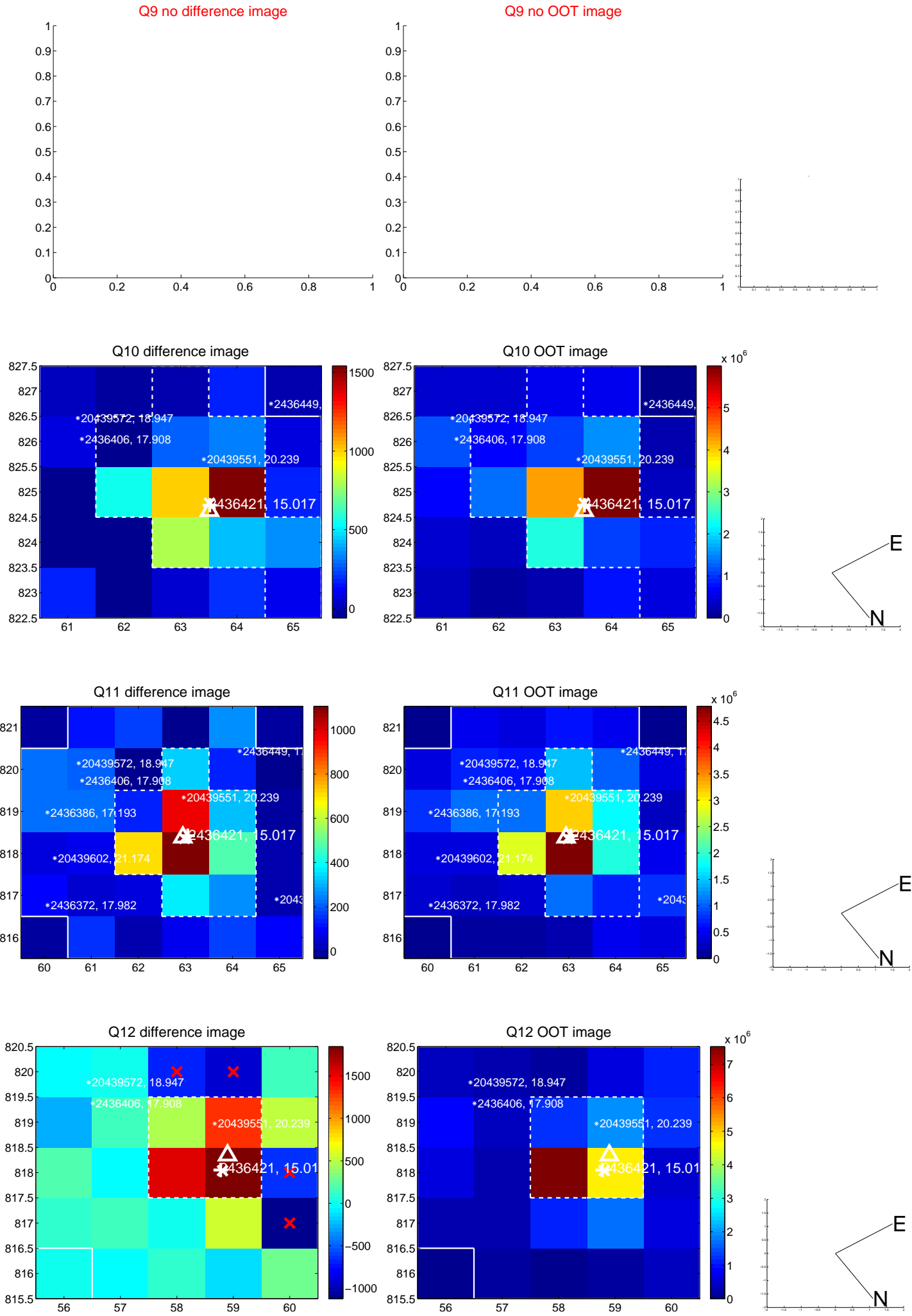
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



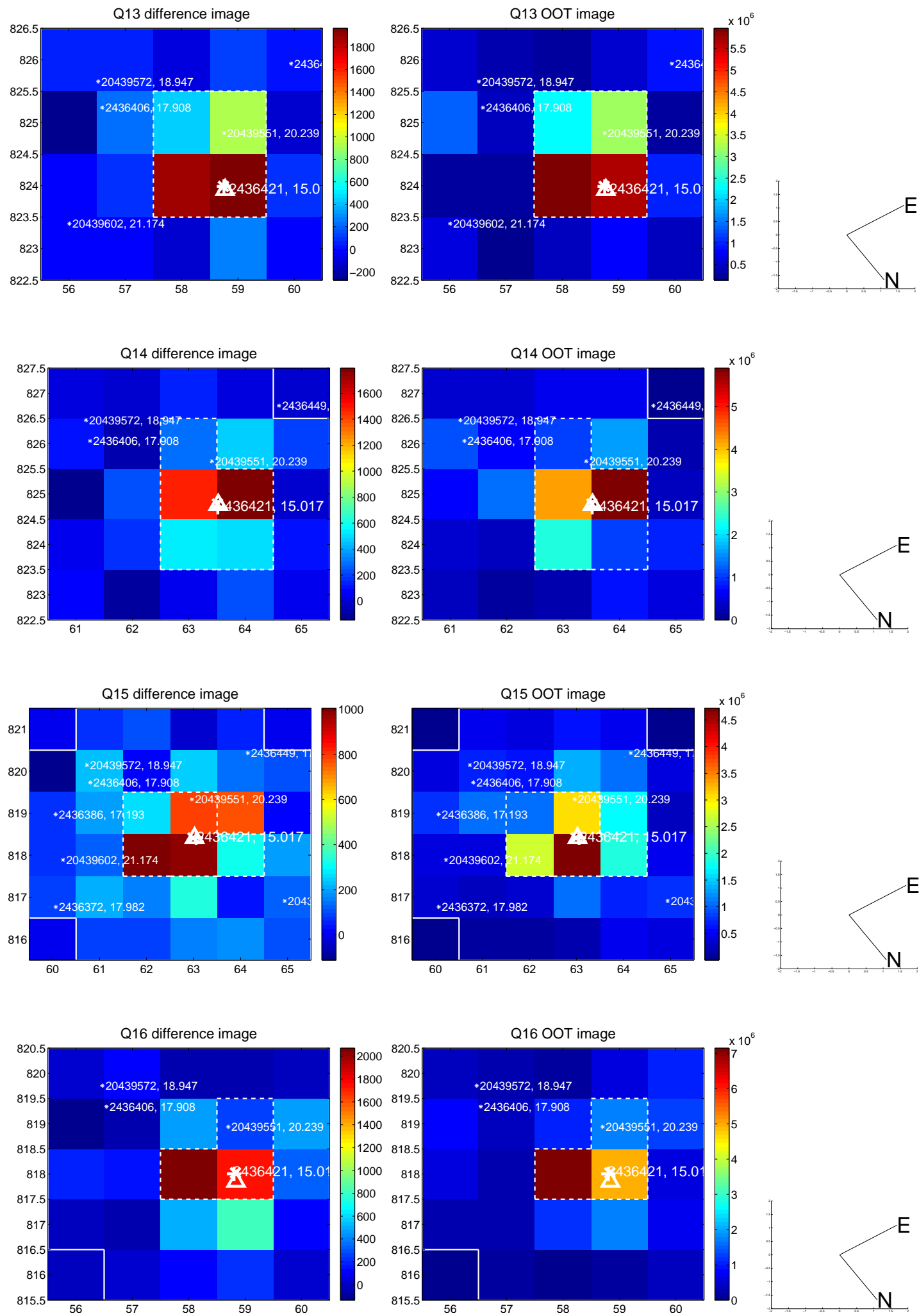
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



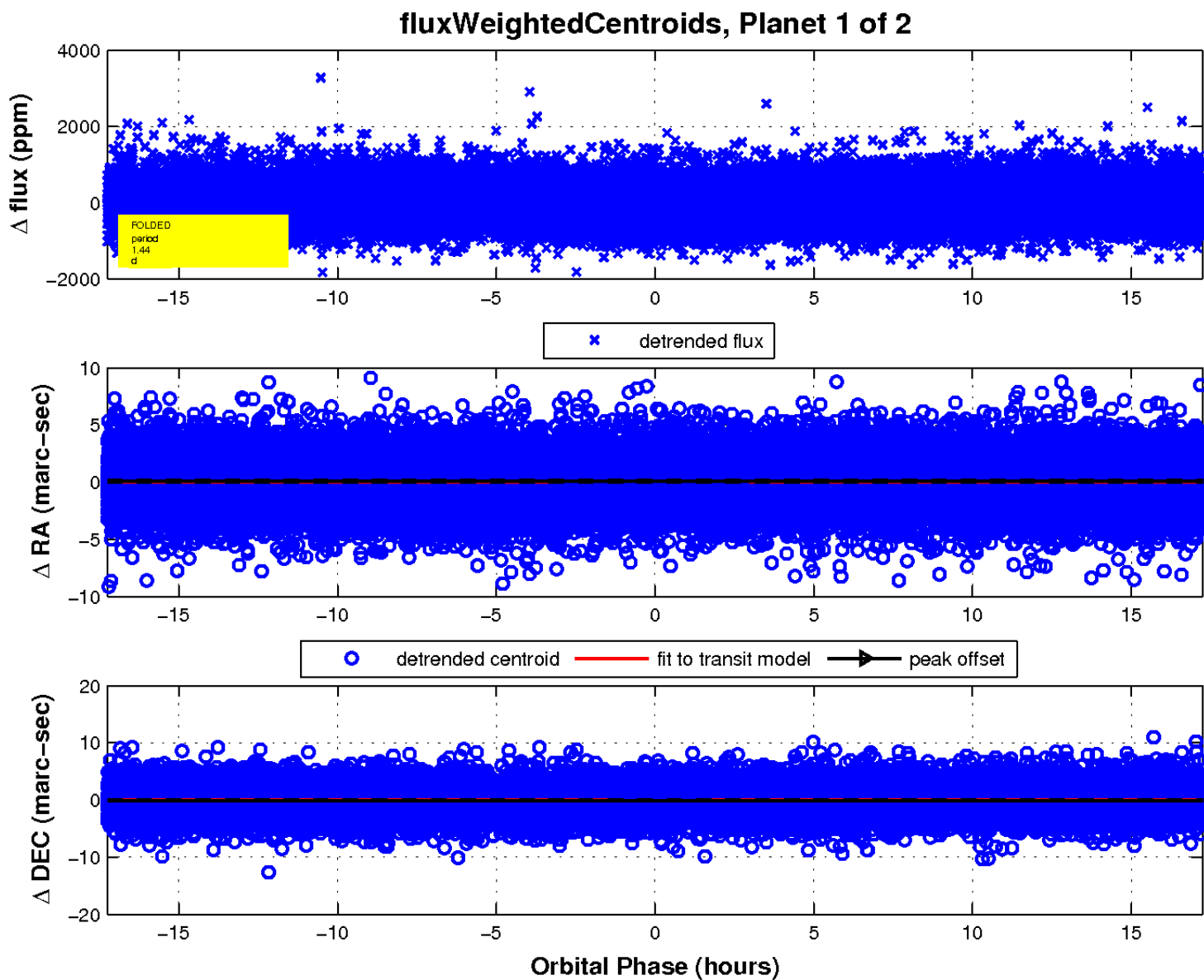
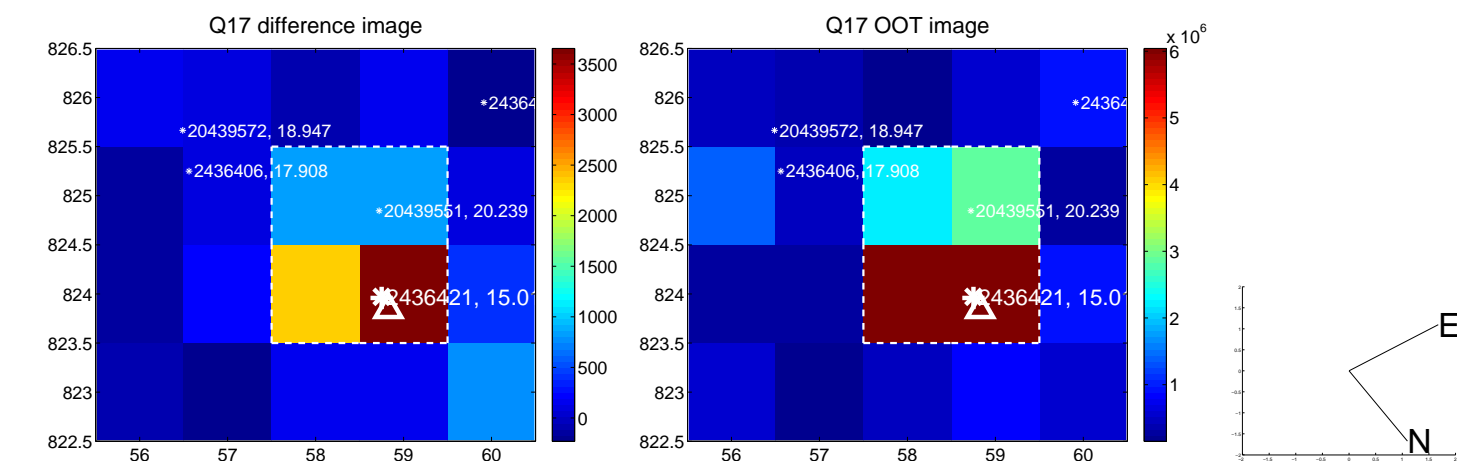
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

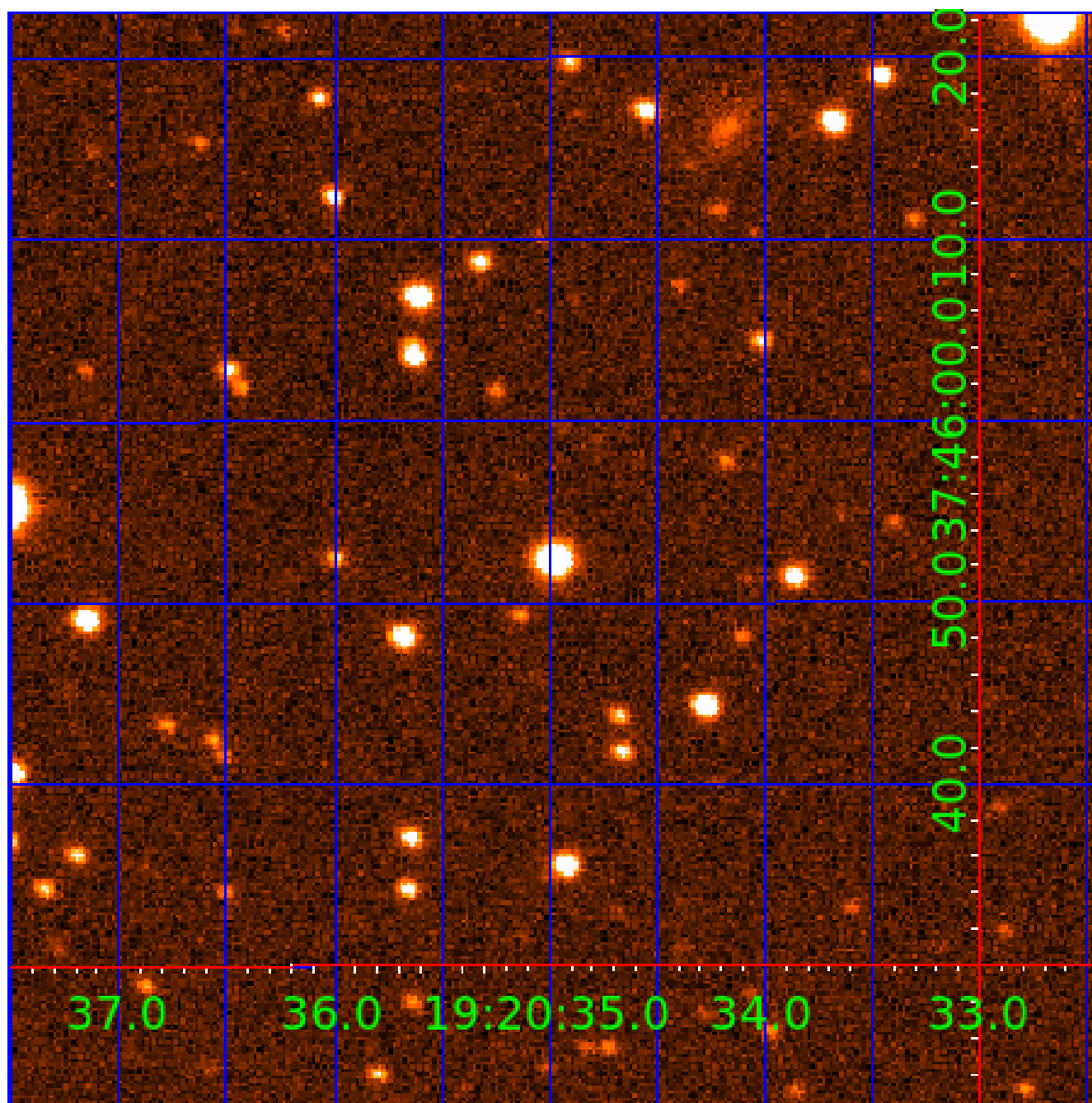


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002436421

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})
002436421-01	OBS	No	1.437356	133.161414	21.8	6.352	9.6	2.7	2.37	7115	1.22	14680.10
002436421-02	OBS	No	1.437522	132.405323	118.0	6.942	10.4	12.9	2.37	7115	4.06	14677.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002436421-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002436421-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

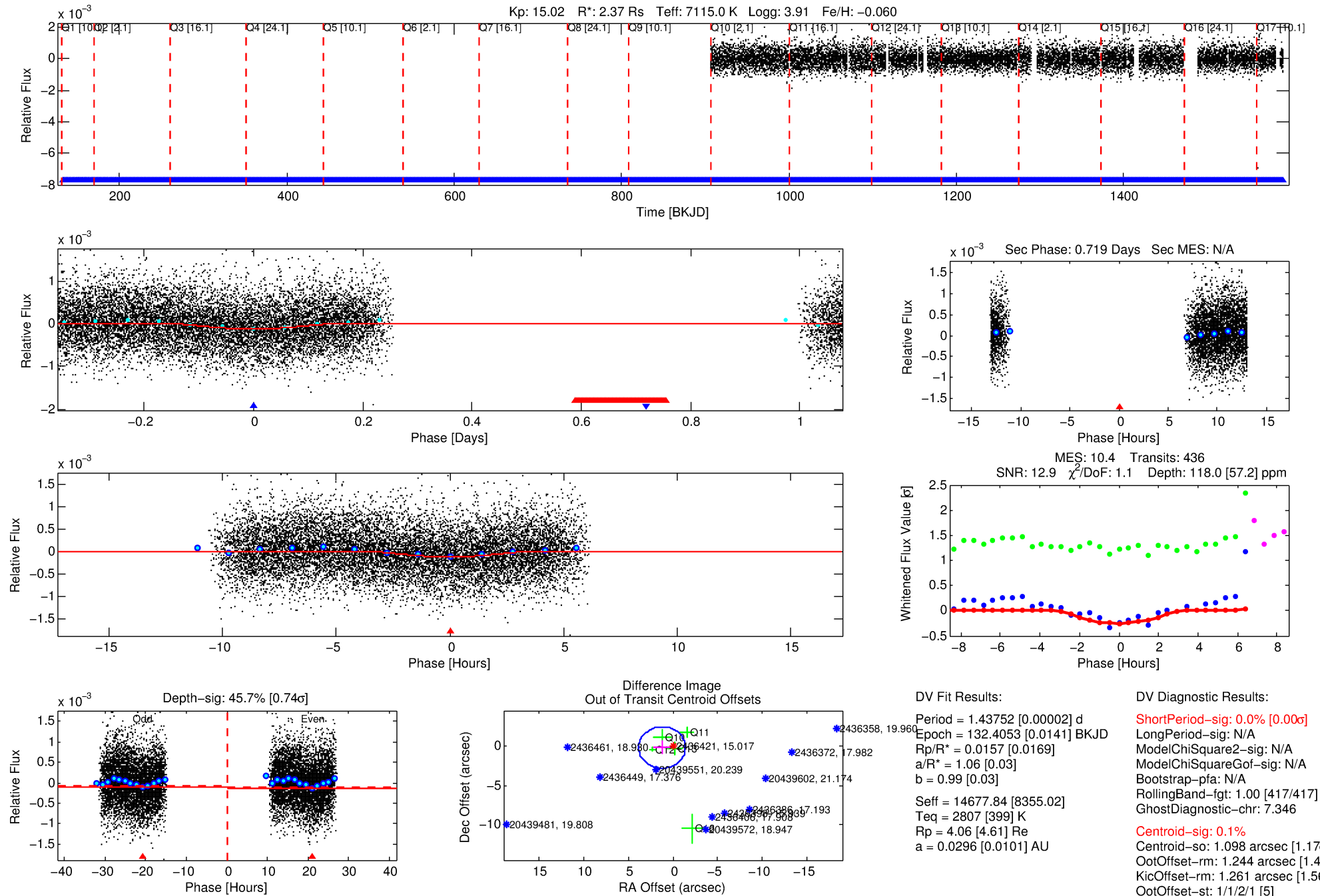
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002436421-02

No Significant Match Found

DV One-Page Summary

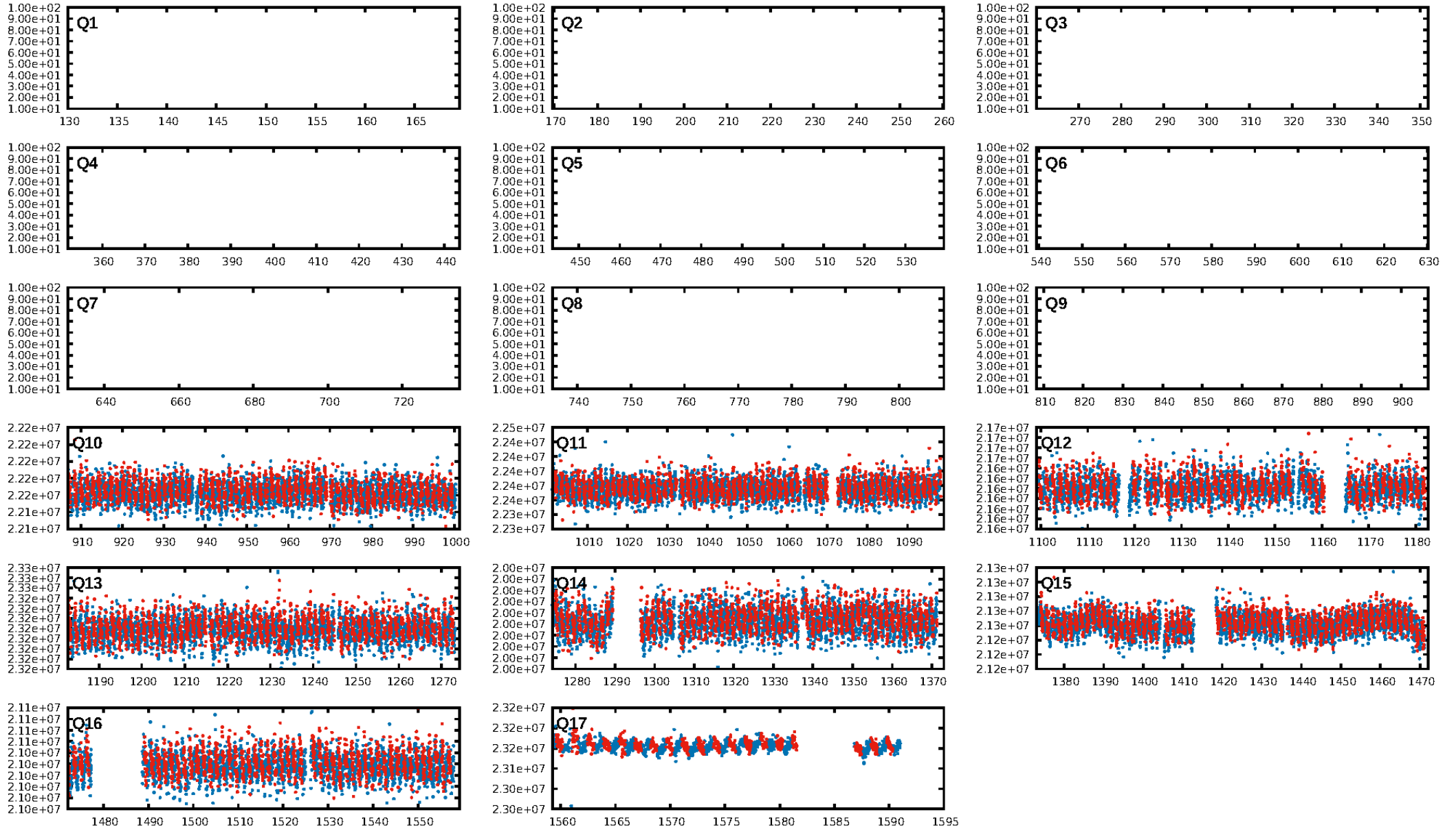
KIC: 2436421 Candidate: 2 of 2 Period: 1.438 d



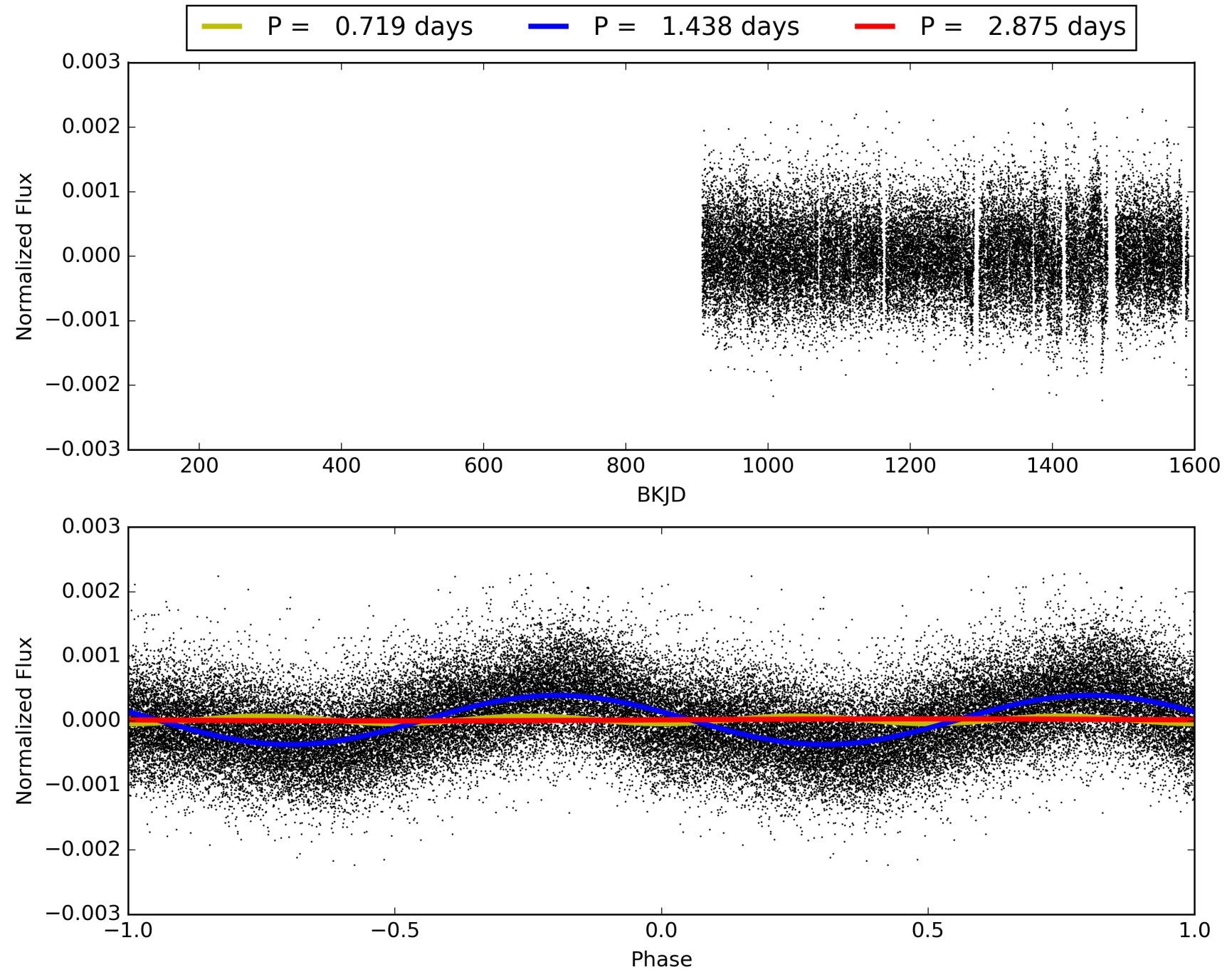
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:50:50 Z

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

TCE 002436421-02, PDC Light Curves

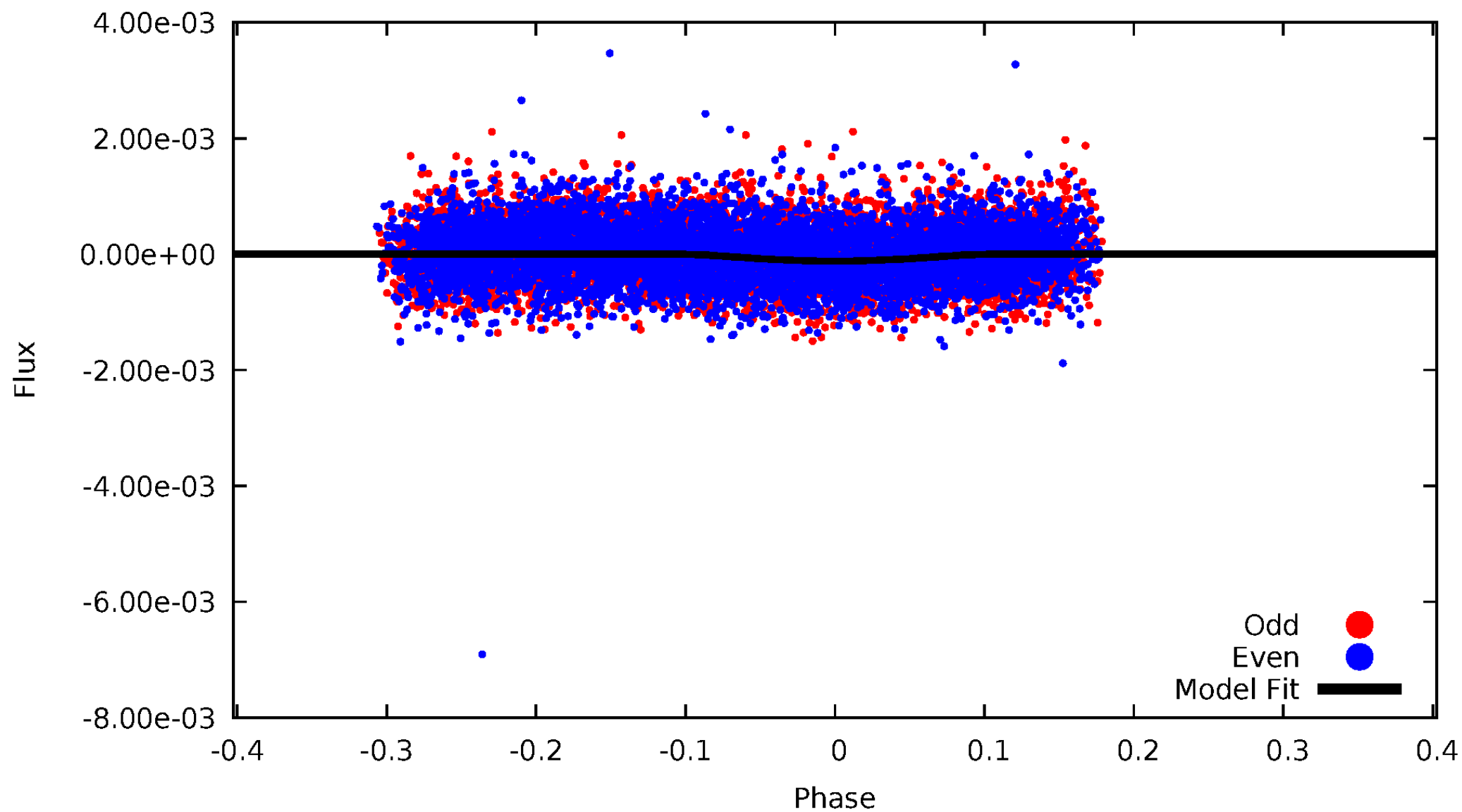


TCE 002436421-02



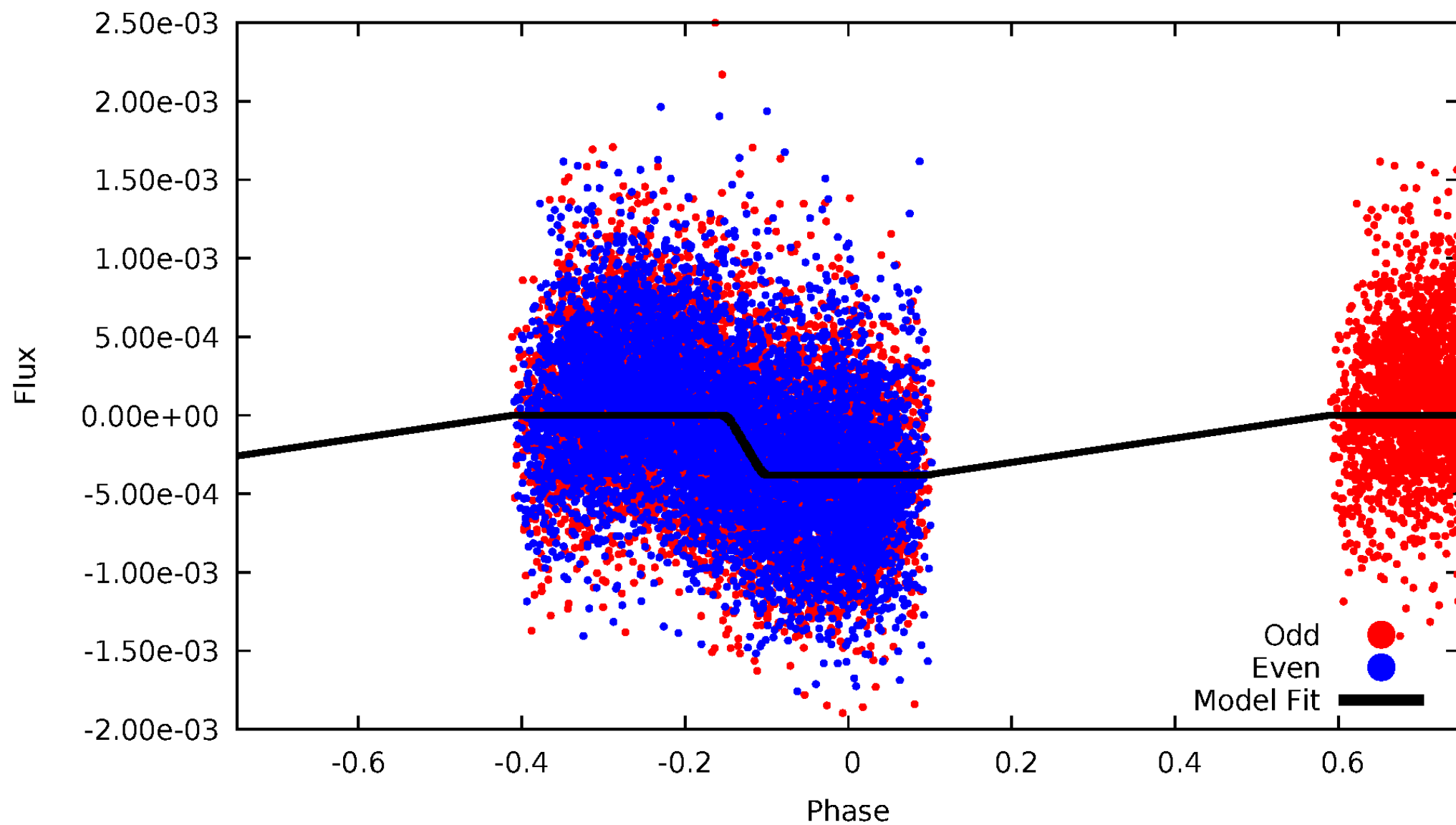
DV Odd/Even

TCE 002436421-02



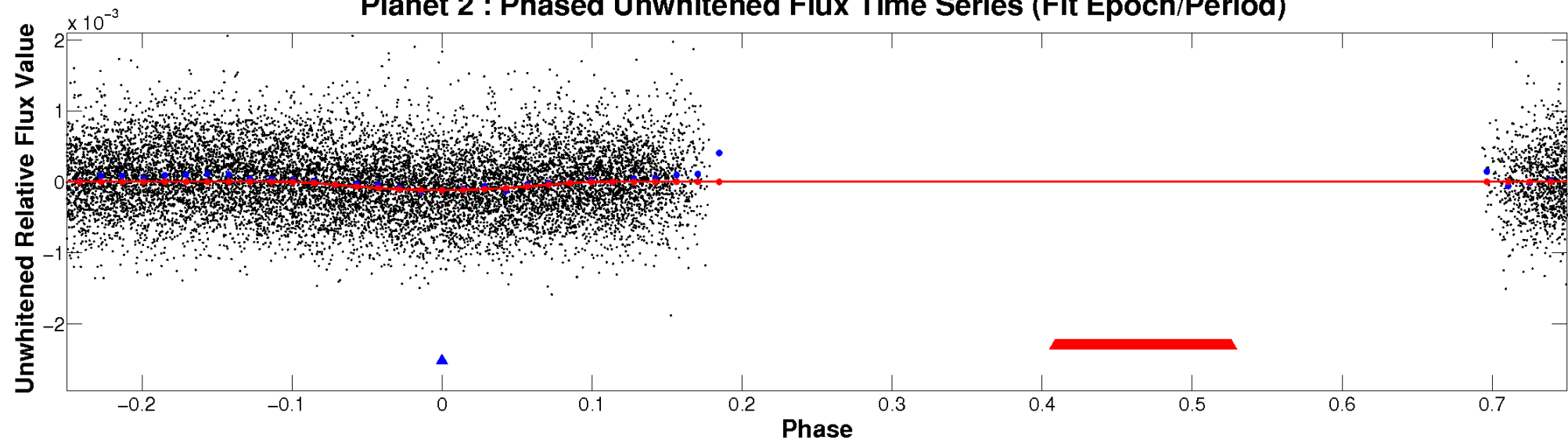
ALT Odd/Even

TCE 002436421-02

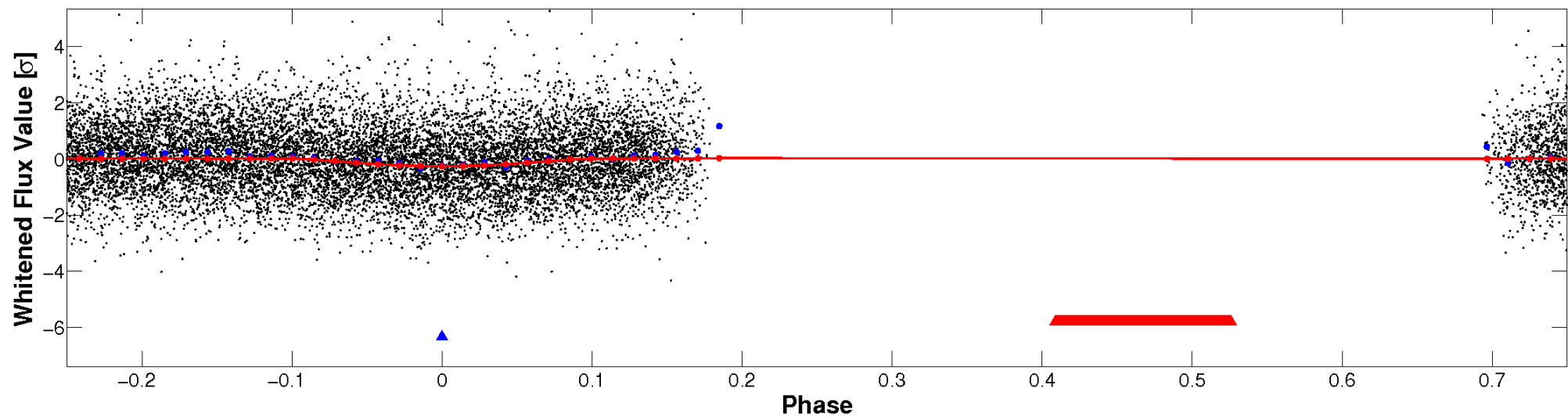


Non-Whitened Vs. Whitened Light Curve

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

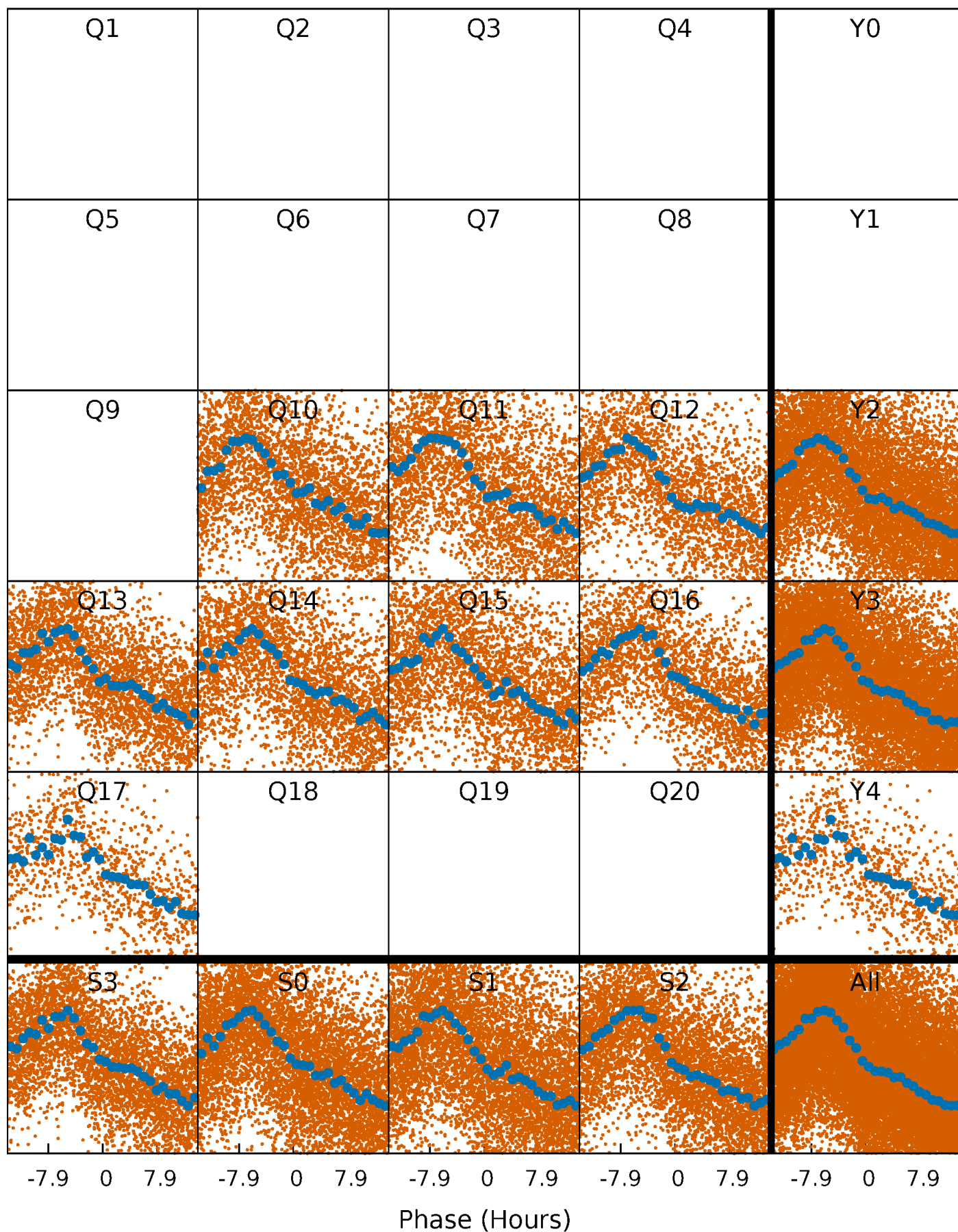


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



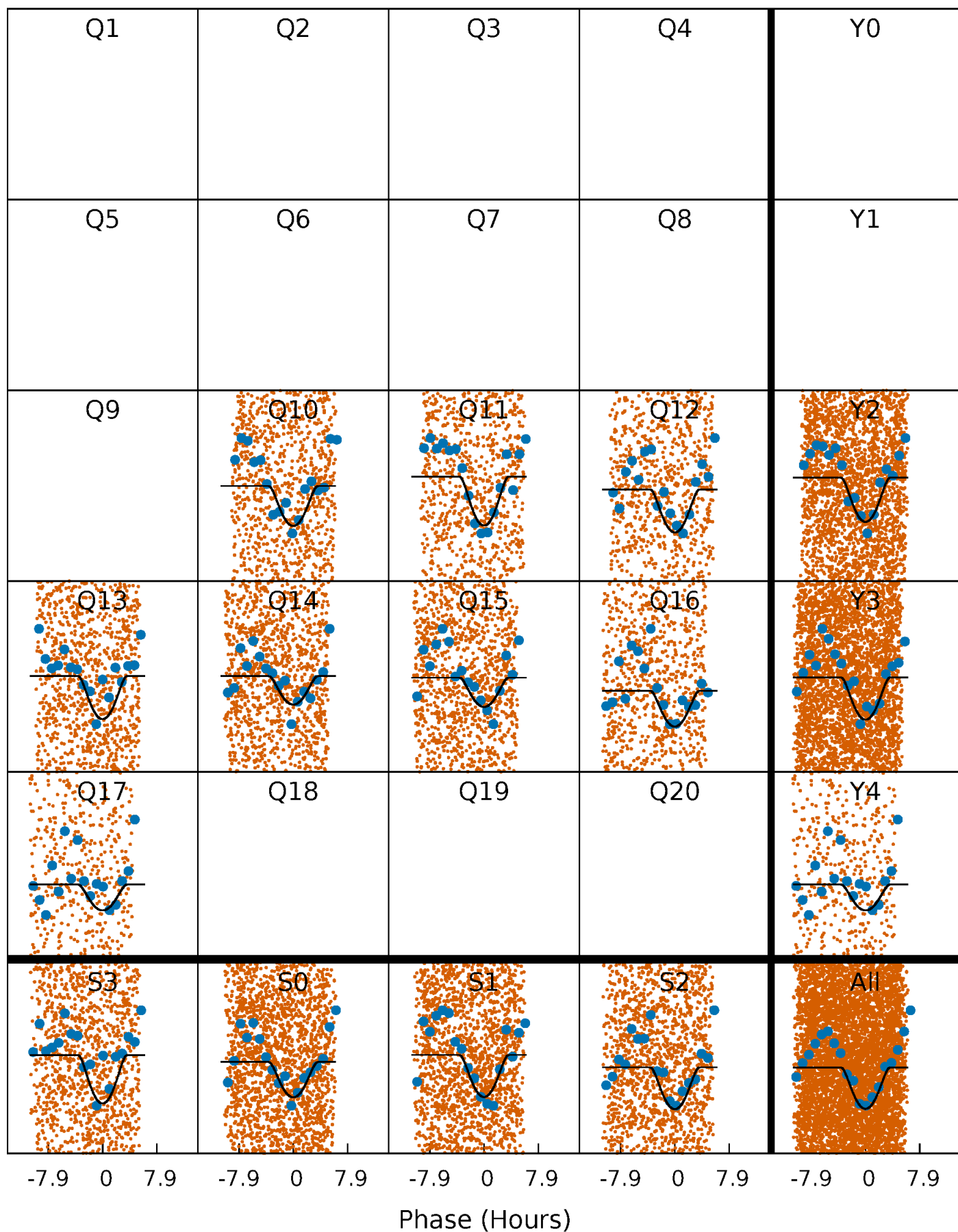
PDC Quarter-Phased Transit Curves

TCE 002436421-02 P= 1.437522 Days $T_0=132.405323$ (BKJD)



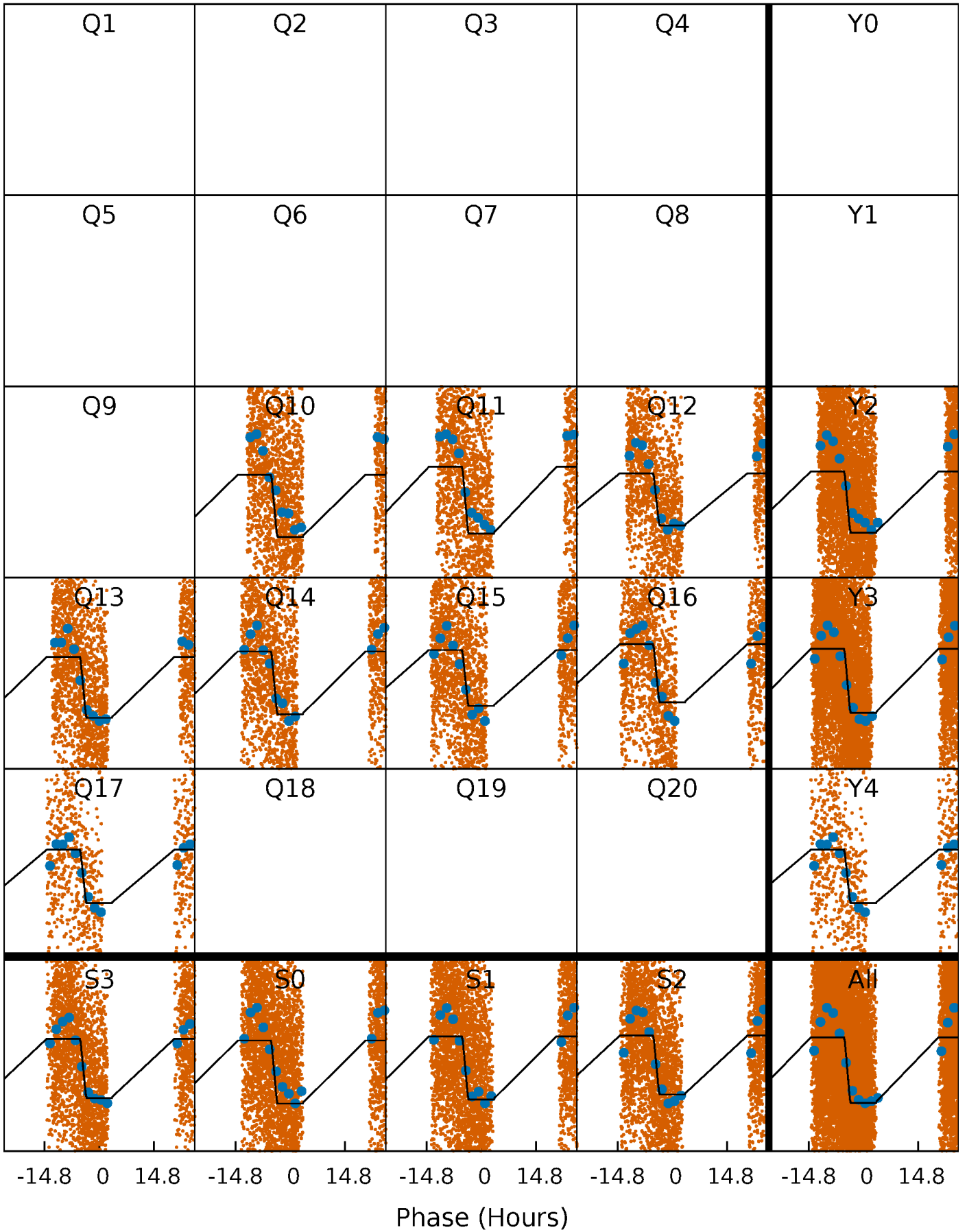
DV Quarter-Phased Transit Curves

TCE 002436421-02 P= 1.437522 Days $T_0=132.405323$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

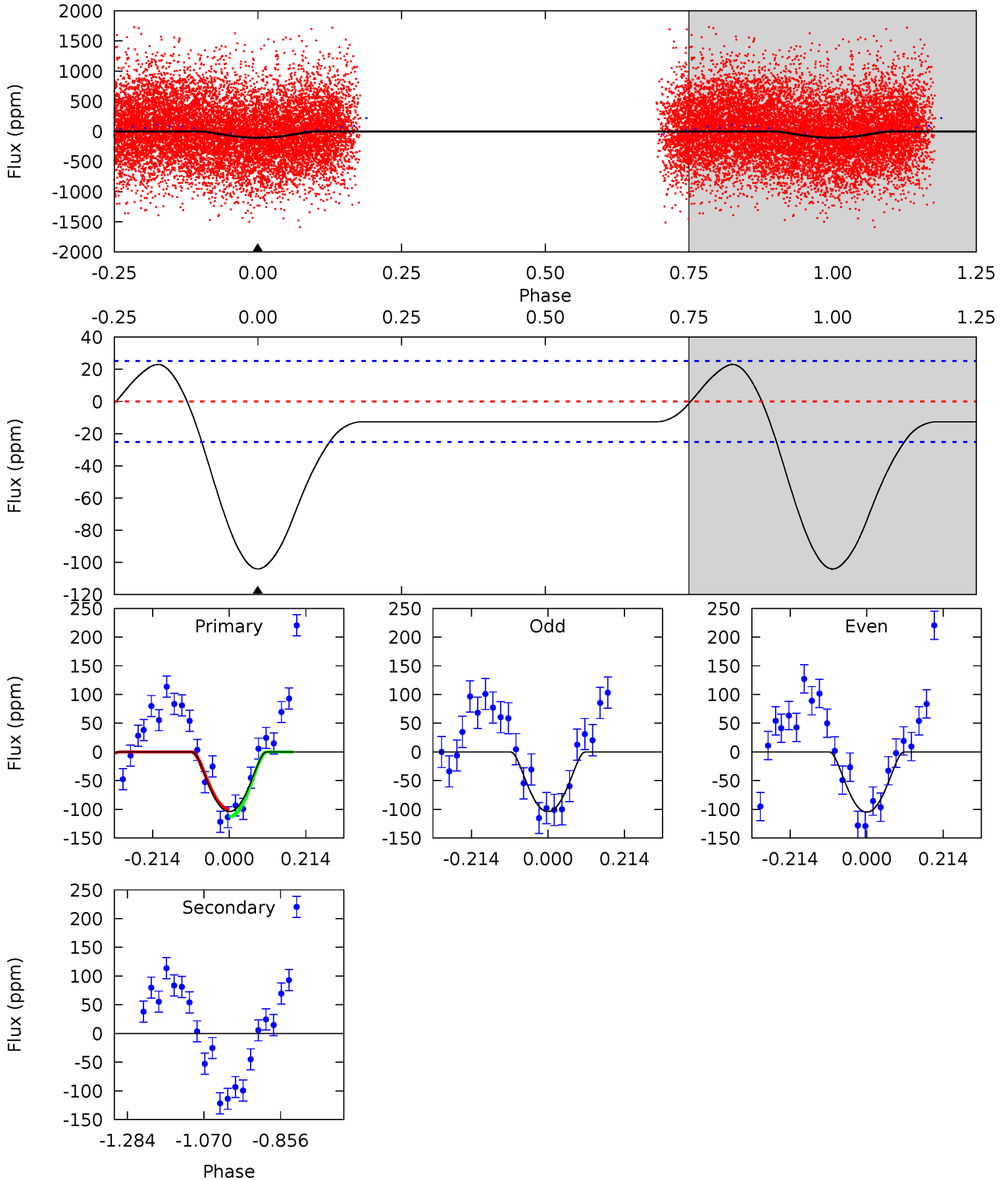
TCE 002436421-02 $P = 1.437608$ Days $T_0 = 132.468450$ (BKJD)



DV Model-Shift Uniqueness Test

002436421-02, P = 1.437522 Days, E = 132.405323 Days

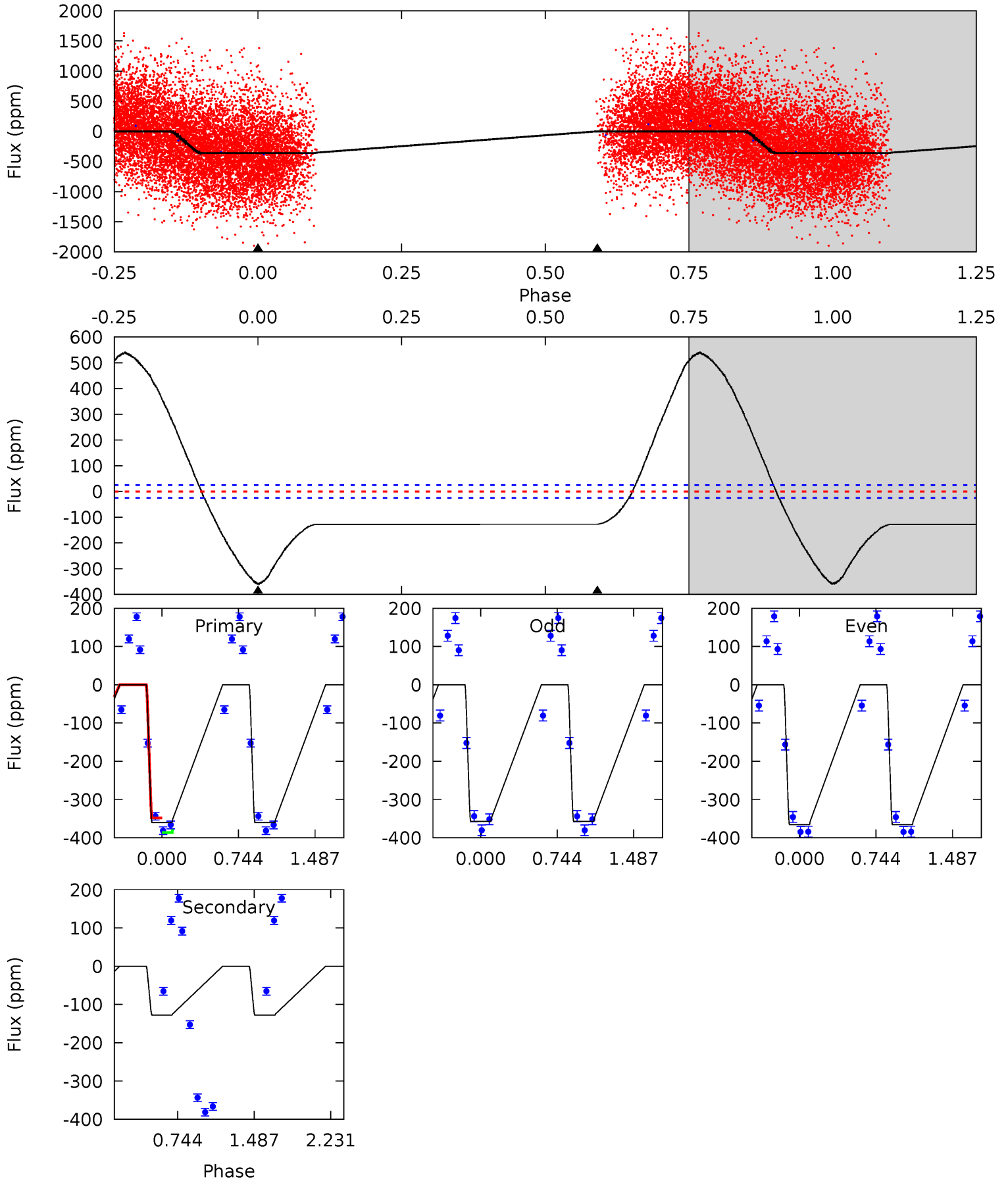
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	0	0	0	4.40	1.24	1.33	18.2	18.2	0	0	0.09	1.01	0.18	1.12



Alt Model-Shift Uniqueness Test

002436421-02, P = 1.437608 Days, E = 132.468450 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.8	21.2	0	0	4.12	0.33	11.1	59.8	59.8	21.2	21.2	0.70	1.02	0.60	2.83



Stellar Parameters For KIC 002436421

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7115^{+200}_{-314}	$3.913^{+0.315}_{-0.135}$	$-0.060^{+0.250}_{-0.350}$	$2.365^{+0.574}_{-0.862}$	$1.669^{+0.193}_{-0.358}$	$0.178^{+0.388}_{-0.068}$
	+3%/-4%	+8%/-3%	+417%/-583%	+24%/-36%	+12%/-21%	+218%/-39%
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 002436421-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 6	$4.78^{+4.09}_{-3.03}$	3854^{+275}_{-373}	-3582^{+567}_{-374}	$-0.001^{+0.176}_{-0.179}$
Alt.	-127 ± 6	$5.28^{+4.30}_{-3.28}$	3859^{+299}_{-370}	4914^{+3694}_{-1184}	$2.103^{+13.252}_{-1.435}$

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 $A_{obs} \gg 1.0$

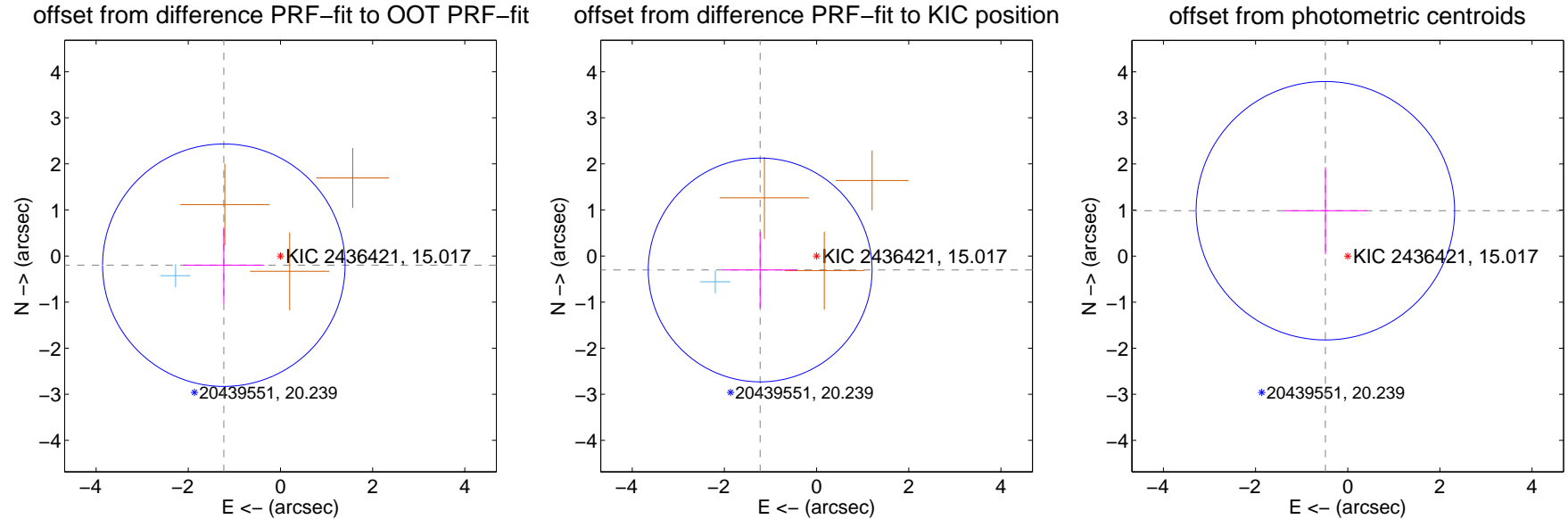
DV Centroid Data

Supplemental centroid analysis for 002436421-02. Kepler magnitude: 15.02. Transit SNR 12.86

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.244 ± 0.877	1.42	1.228 ± 0.878	-0.199 ± 0.816
PRF-fit source offset from KIC position	1.261 ± 0.809	1.56	1.224 ± 0.809	-0.303 ± 0.821
photometric centroid source offset	1.10 ± 0.93	1.17	0.48 ± 0.90	0.98 ± 0.94



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

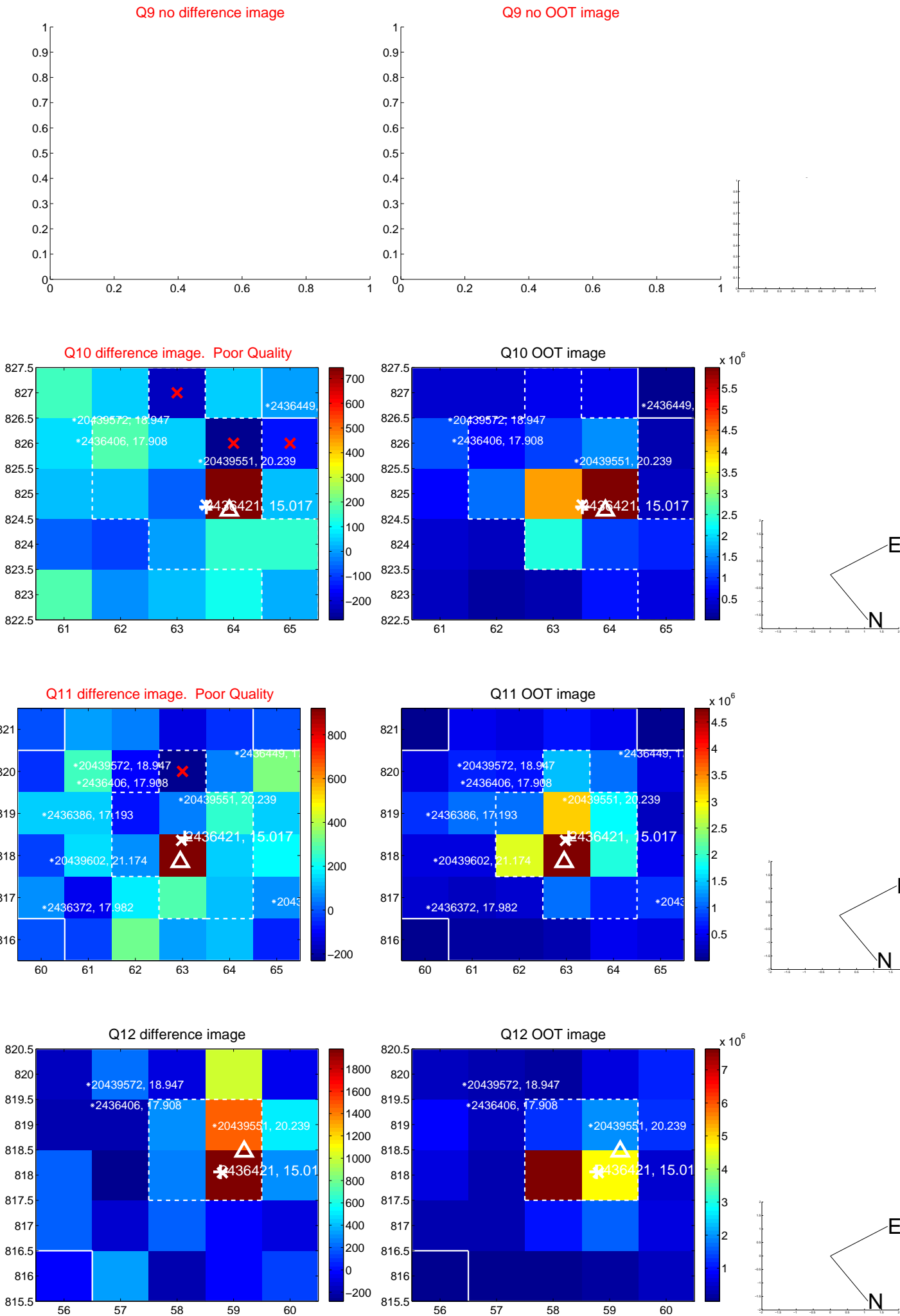
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



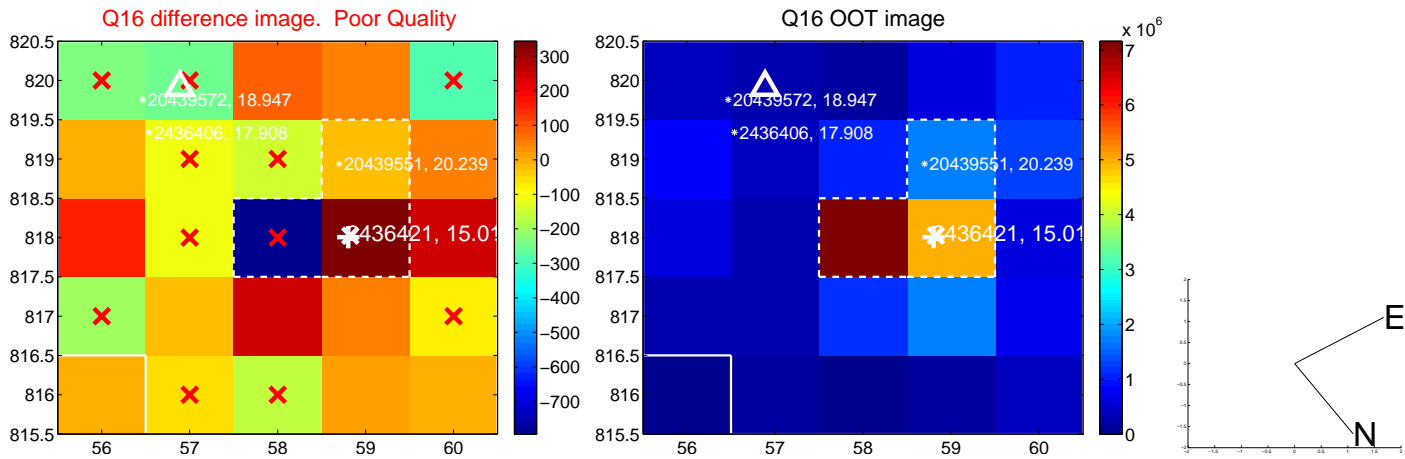
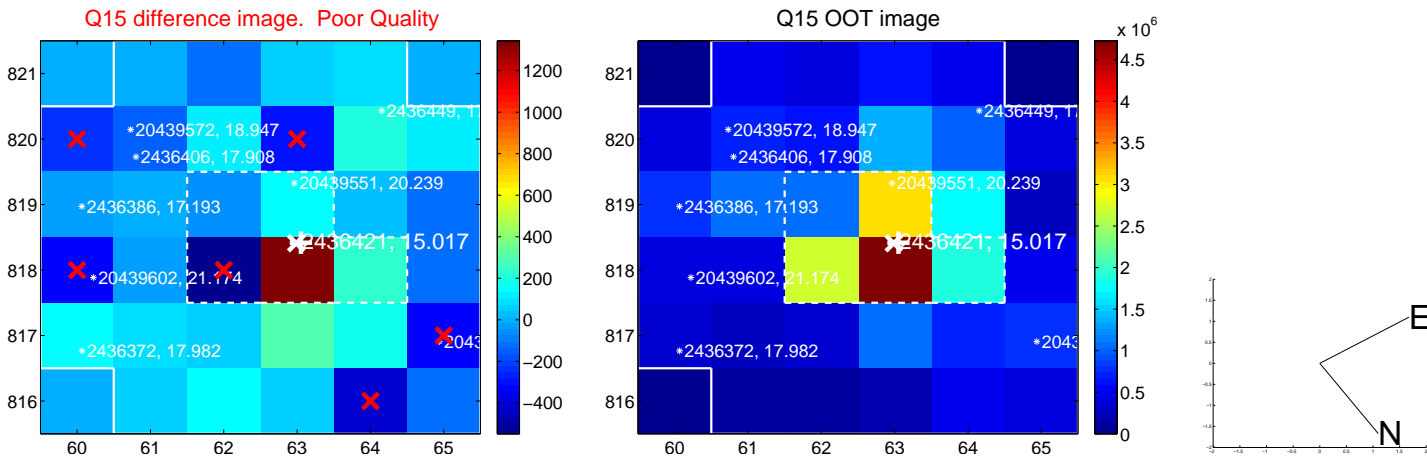
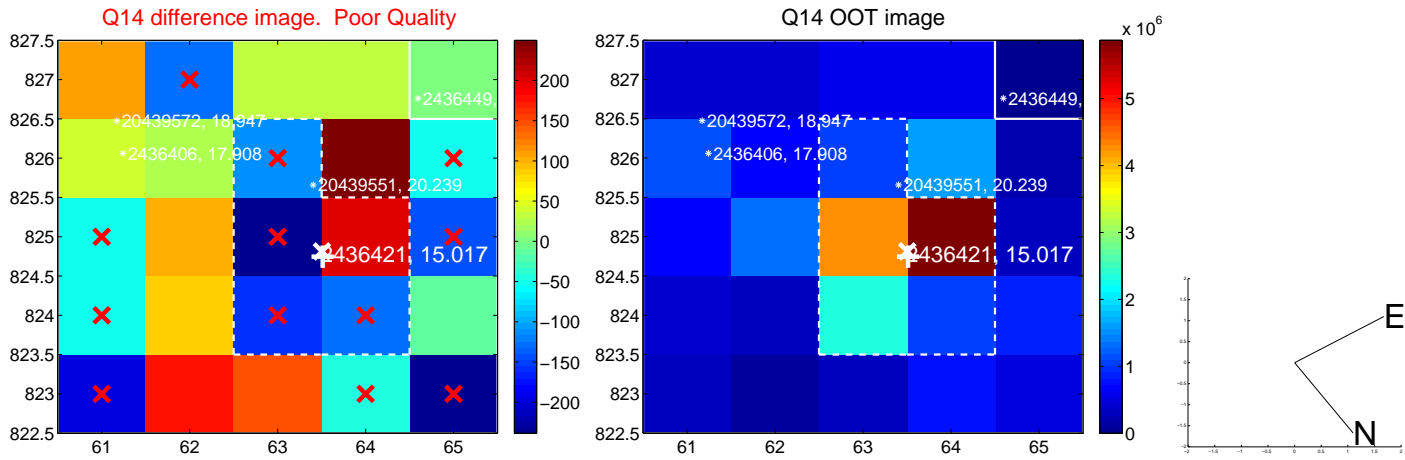
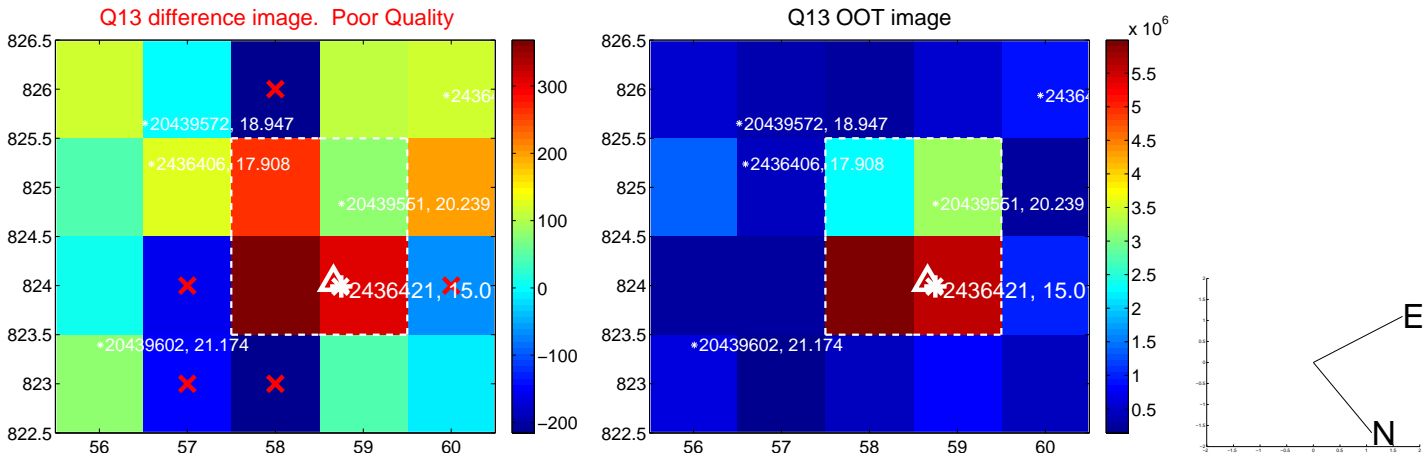
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

