

KIC 012365420

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})
012365420-01	OBS	No	0.693655	131.687797	46.0	3.534	12.6	11.3	2.76	7798	2.12	69012.43
012365420-02	OBS	No	1.025542	132.140364	110.7	11.961	9.9	16.8	2.76	7798	3.01	40974.52

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012365420-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
012365420-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_FEW_MEAS

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

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

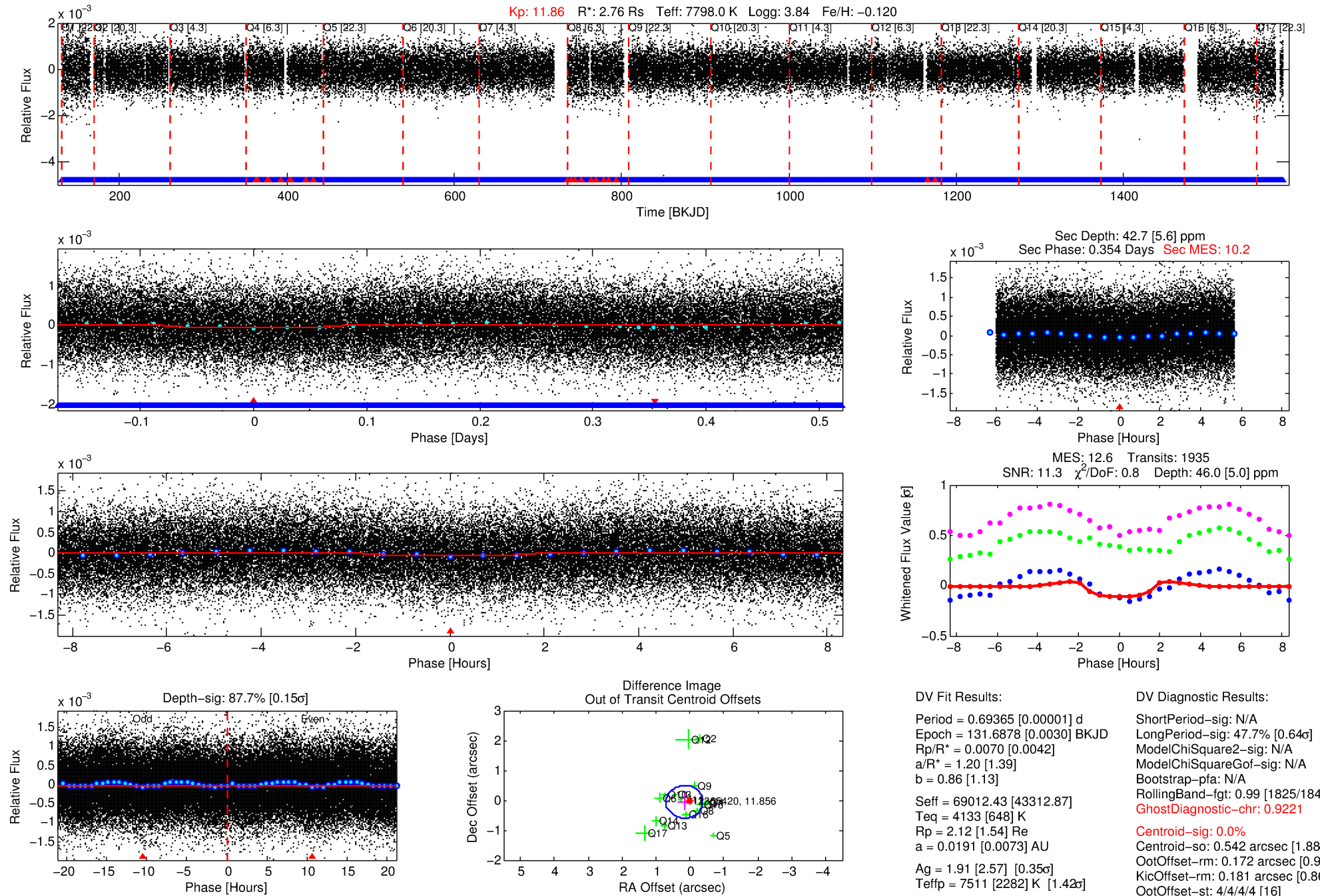
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012365420-01

No Significant Match Found

DV One-Page Summary

KIC: 12365420 Candidate: 1 of 2 Period: 0.694 d



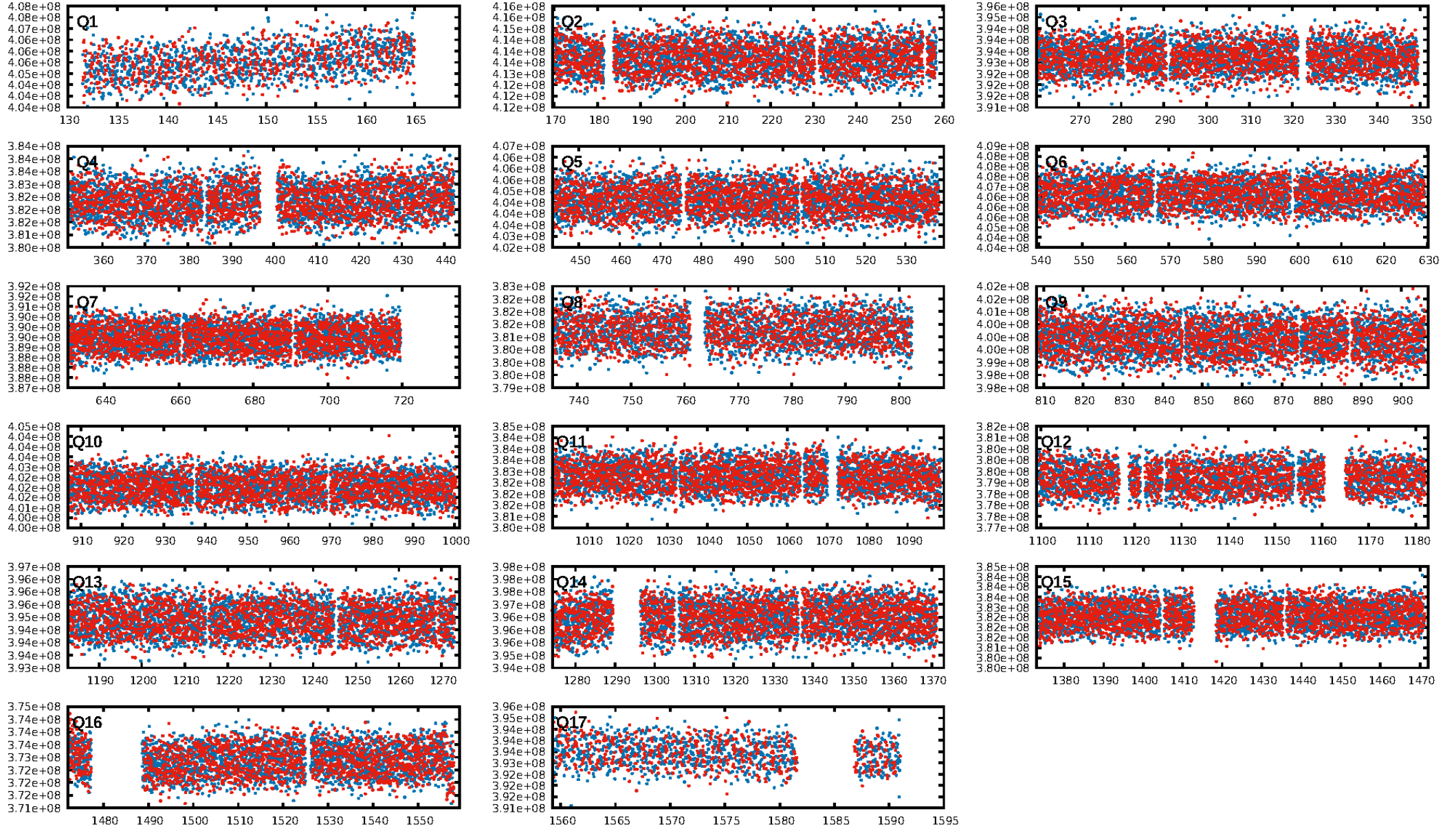
DV Fit Results:

Period = 0.69365 [0.00001] d
Epoch = 131.6878 [0.0030] BKJD
Rp/R* = 0.0070 [0.0042]
a/R* = 1.20 [1.39]
b = 0.86 [1.13]
Seff = 69012.43 [43312.87]
Teq = 4133 [648] K
Rp = 2.12 [1.54] Re
a = 0.0191 [0.0073] AU
Ag = 1.91 [2.57] [0.35 σ]
Teffp = 7511 [2282] K [1.42 σ]

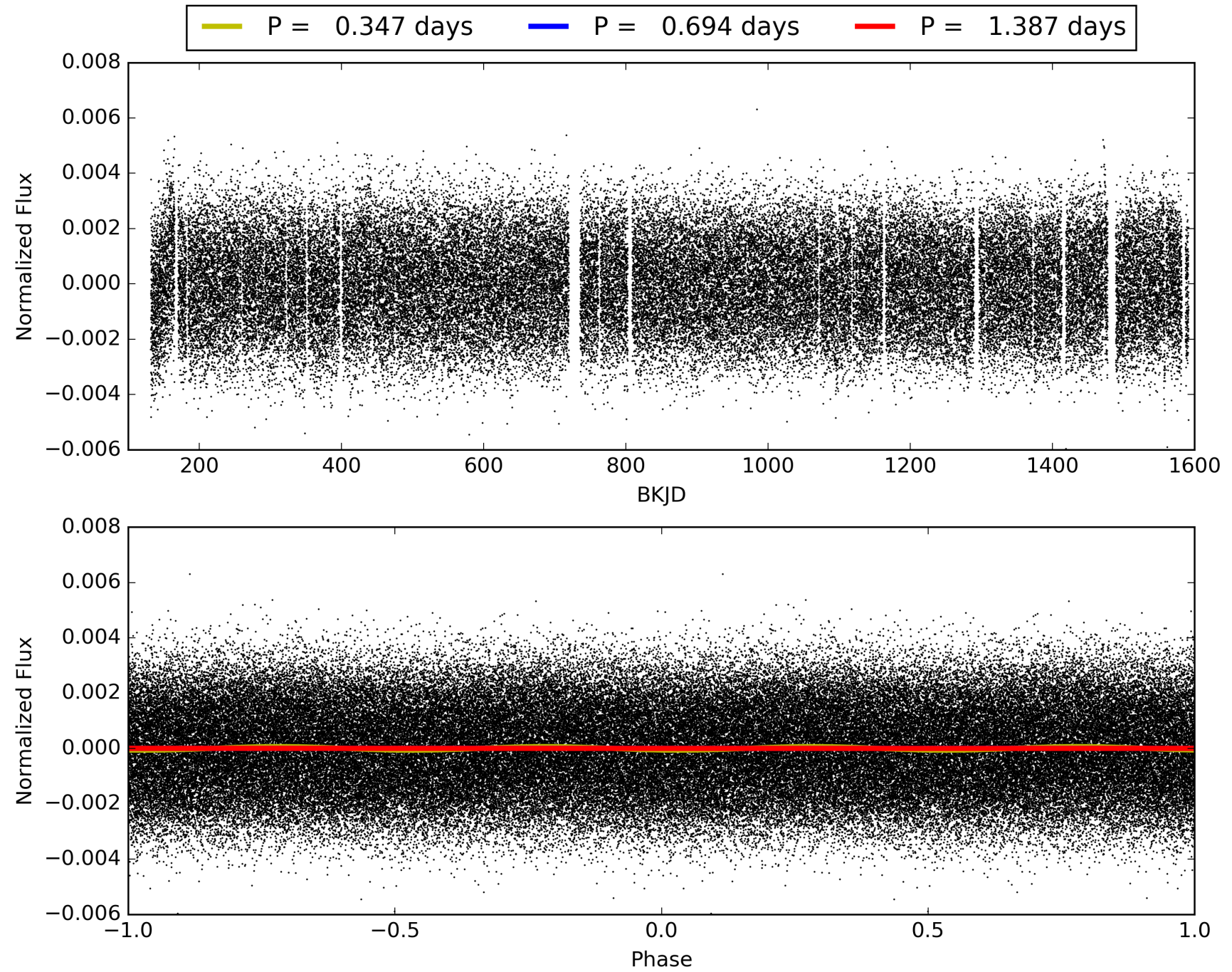
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 47.7% [0.64 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1825/1847]
GhostDiagnostic-chr: 0.9221
Centroid-sig: 0.0%
Centroid-so: 0.542 arcsec [1.88 σ]
OotOffset-rm: 0.172 arcsec [0.95 σ]
KicOffset-rm: 0.181 arcsec [0.86 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 012365420-01, PDC Light Curves

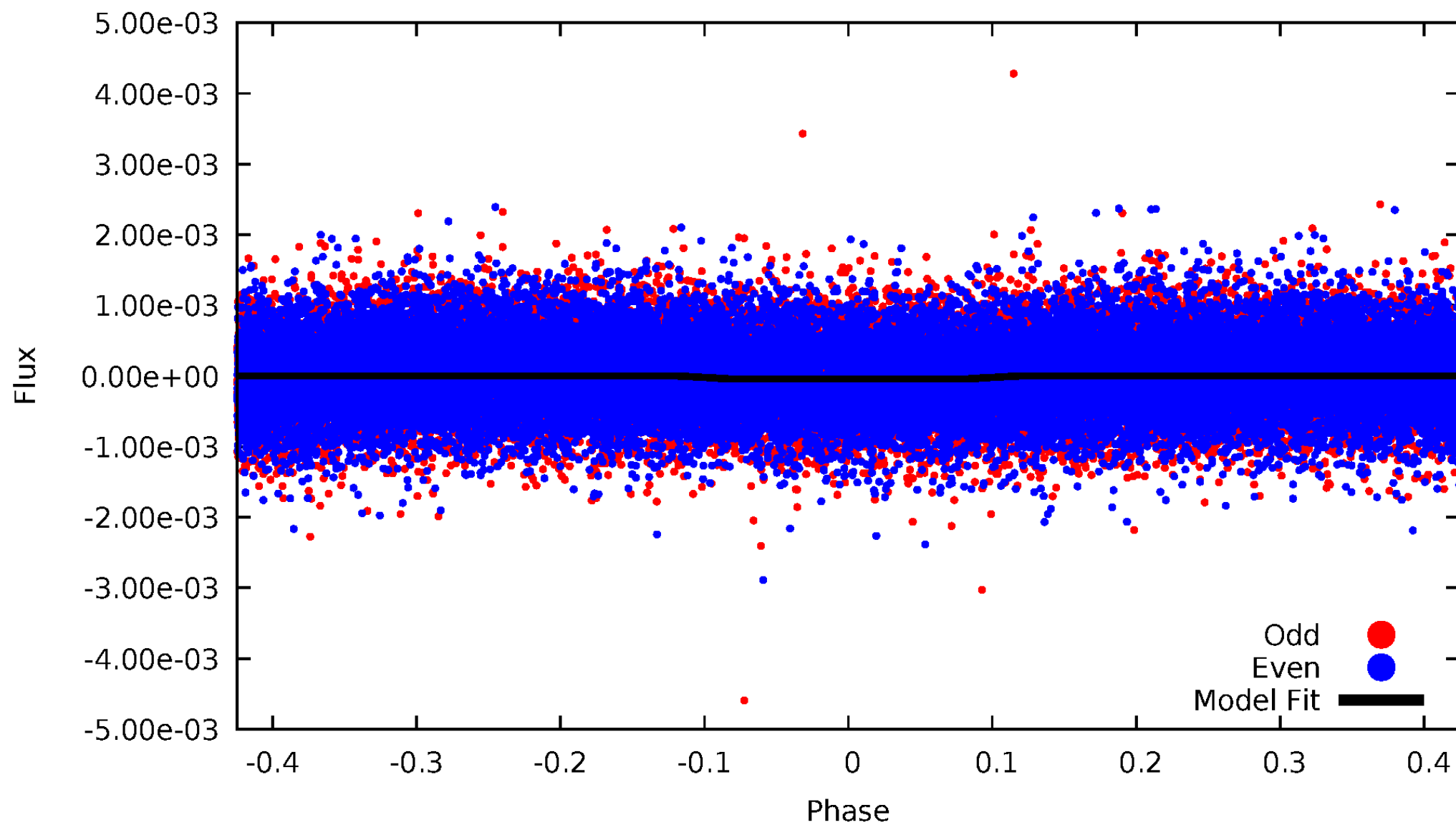


TCE 012365420-01



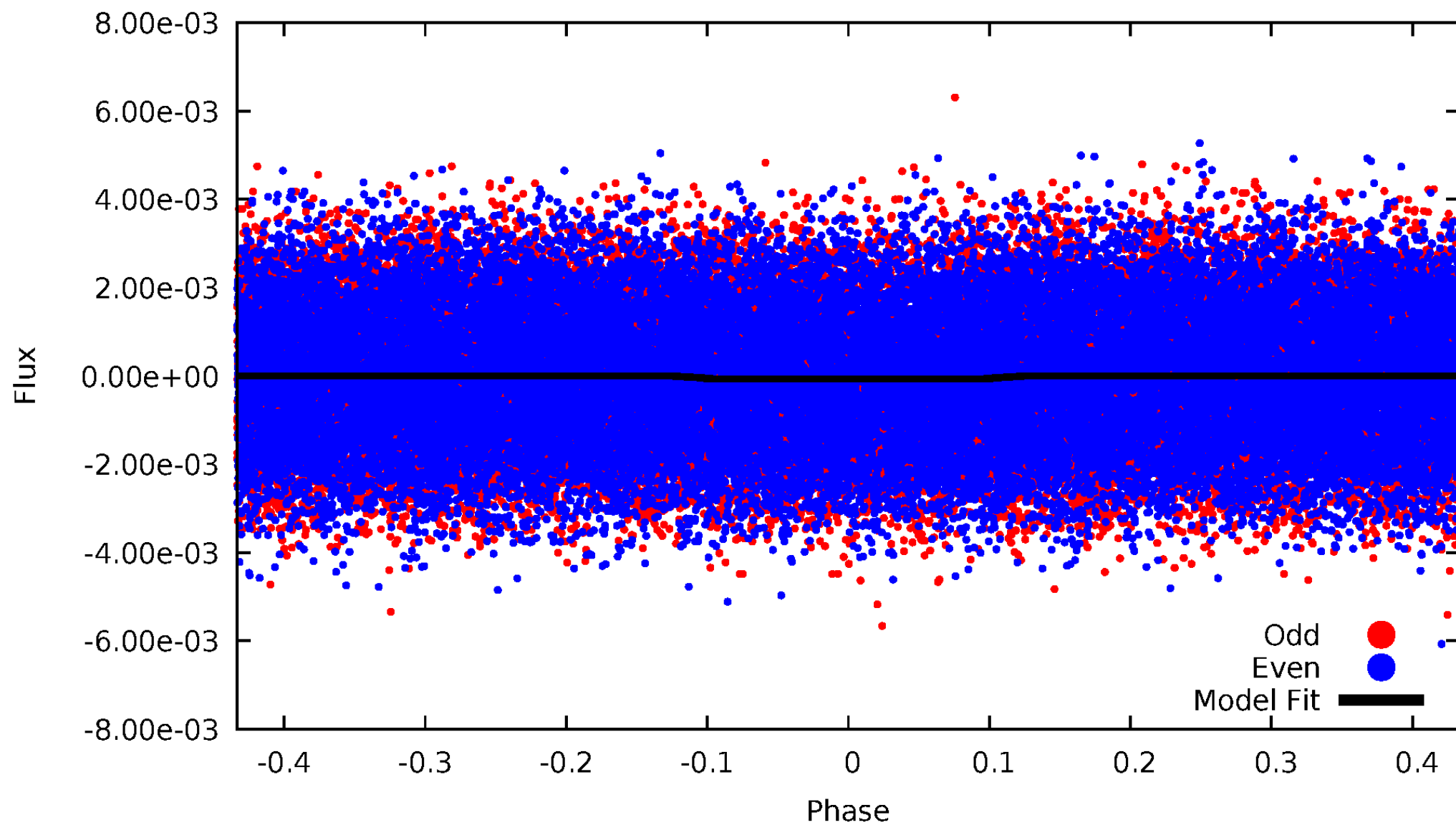
DV Odd/Even

TCE 012365420-01



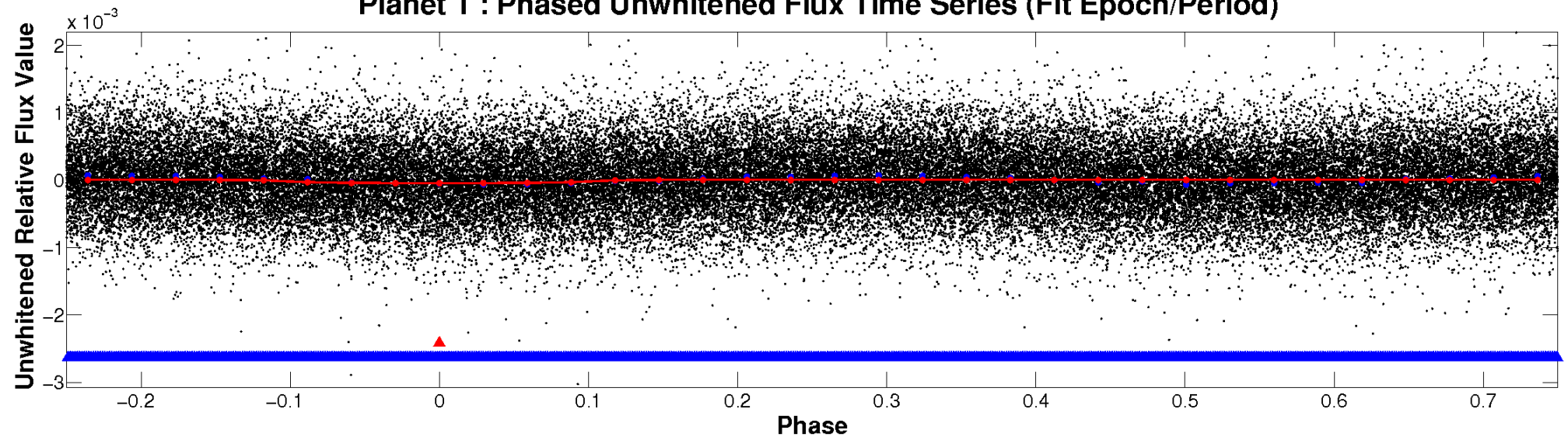
ALT Odd/Even

TCE 012365420-01

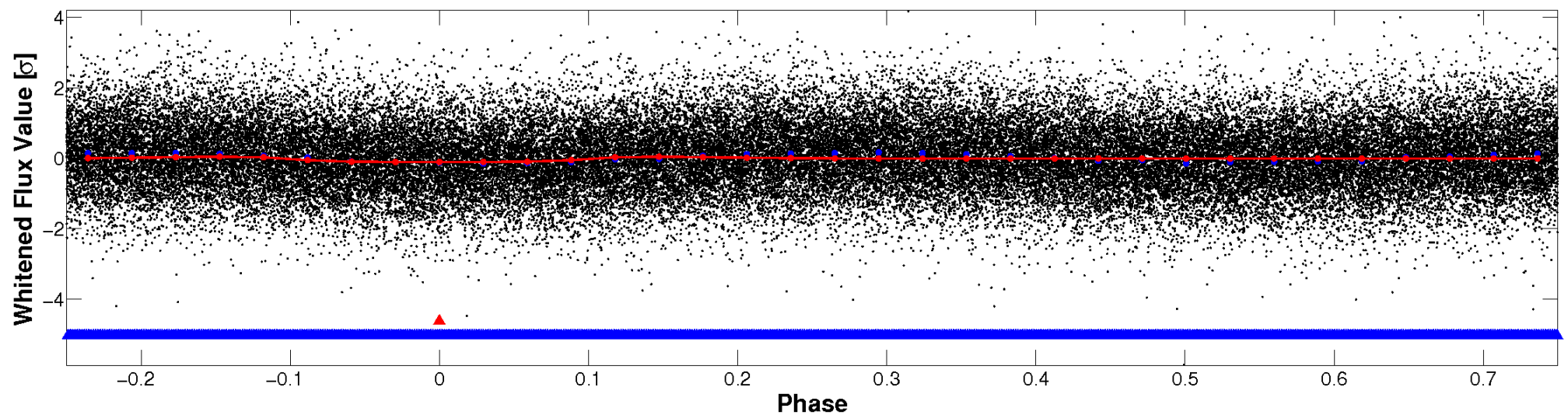


Non-Whitened Vs. Whitened Light Curve

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

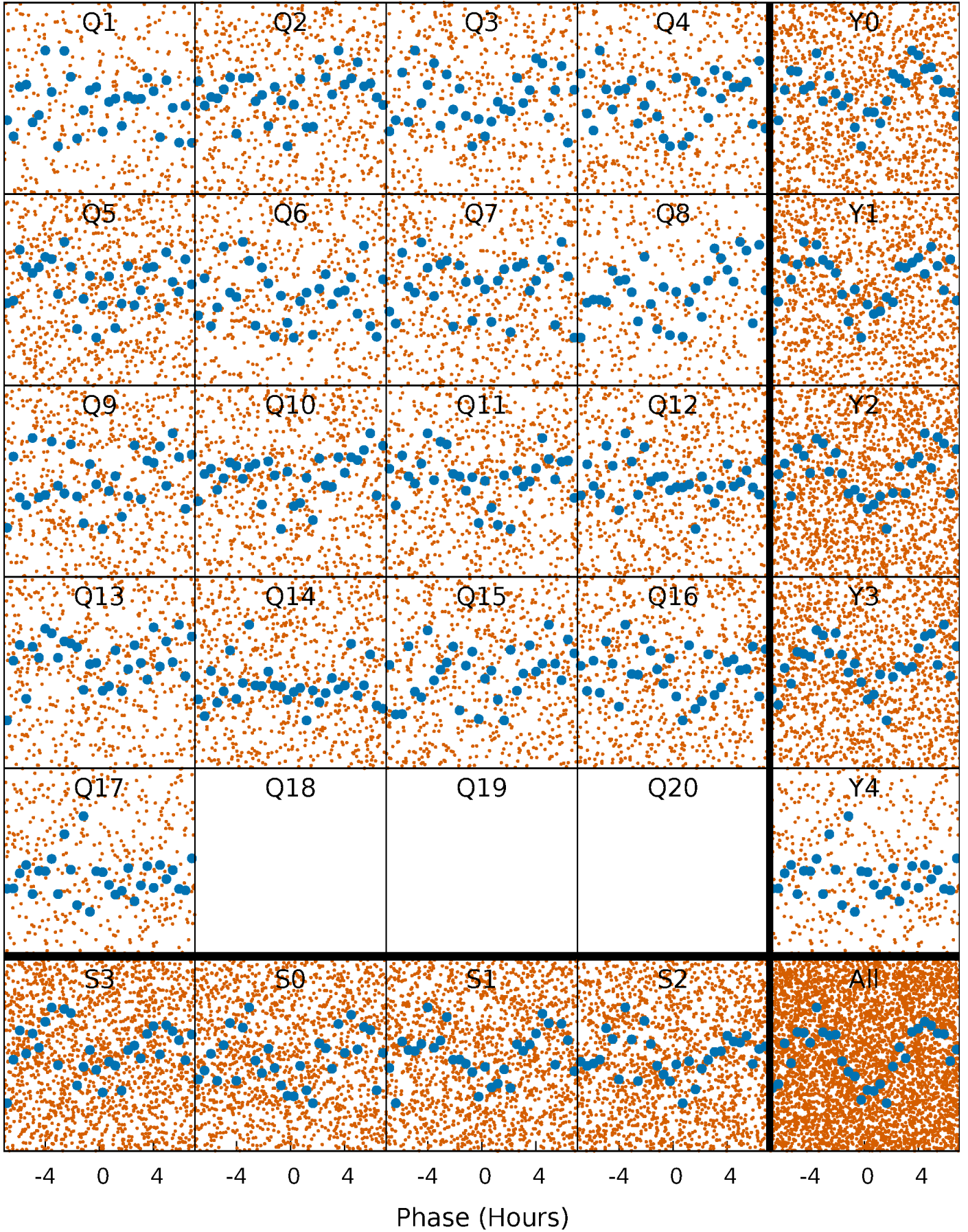


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



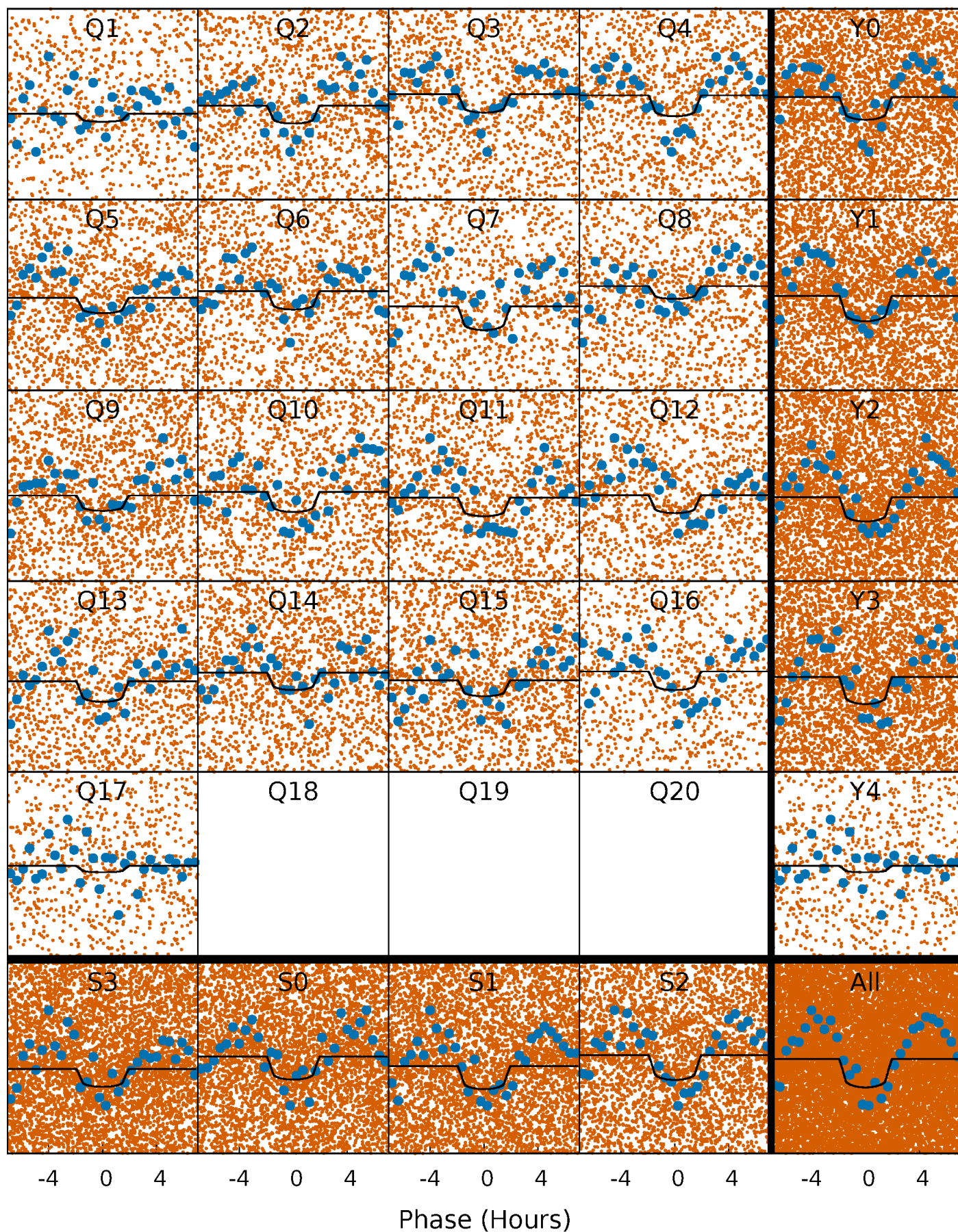
PDC Quarter-Phased Transit Curves

TCE 012365420-01 P= 0.693655 Days $T_0=131.687797$ (BKJD)



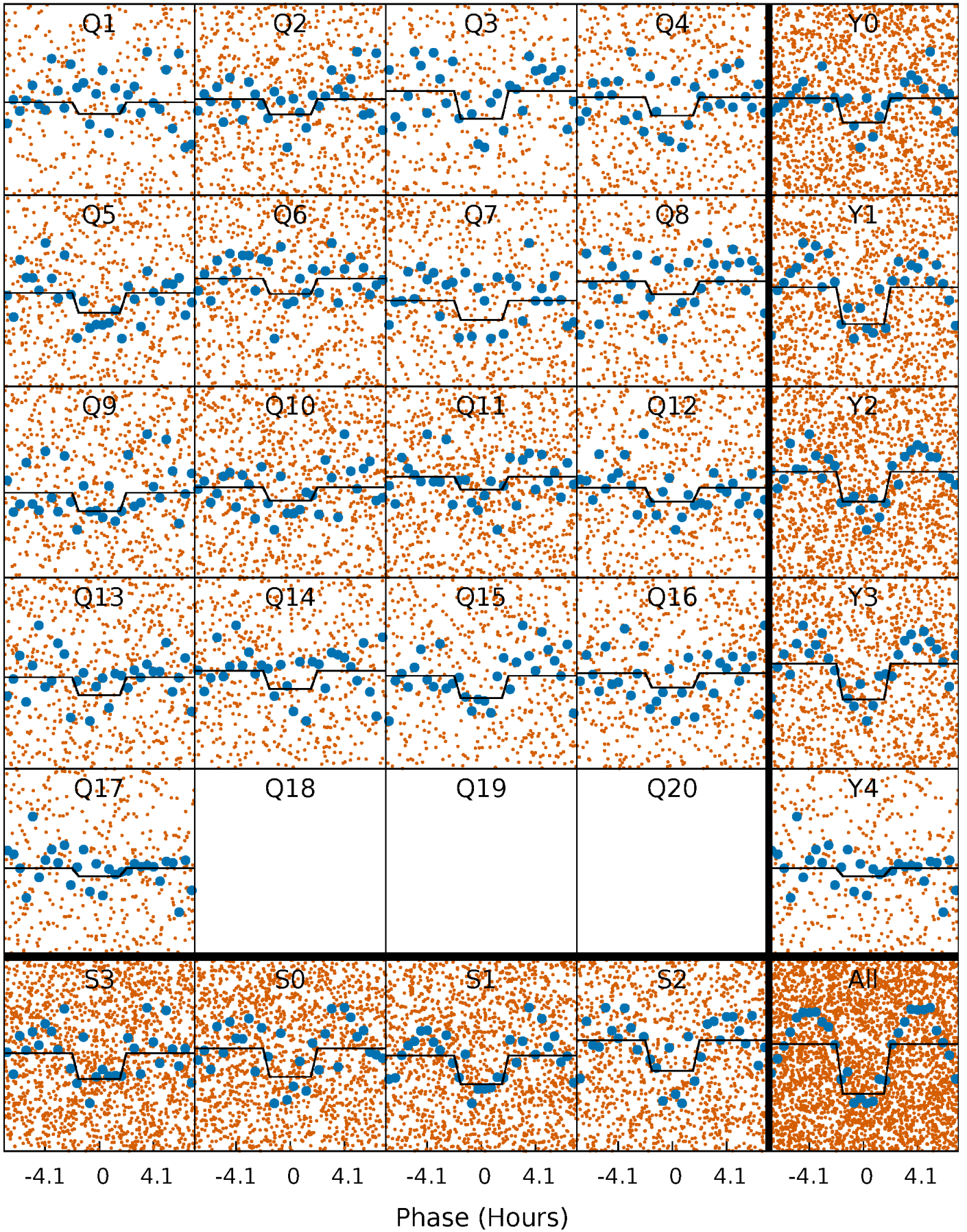
DV Quarter-Phased Transit Curves

TCE 012365420-01 P= 0.693655 Days $T_0=131.687797$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

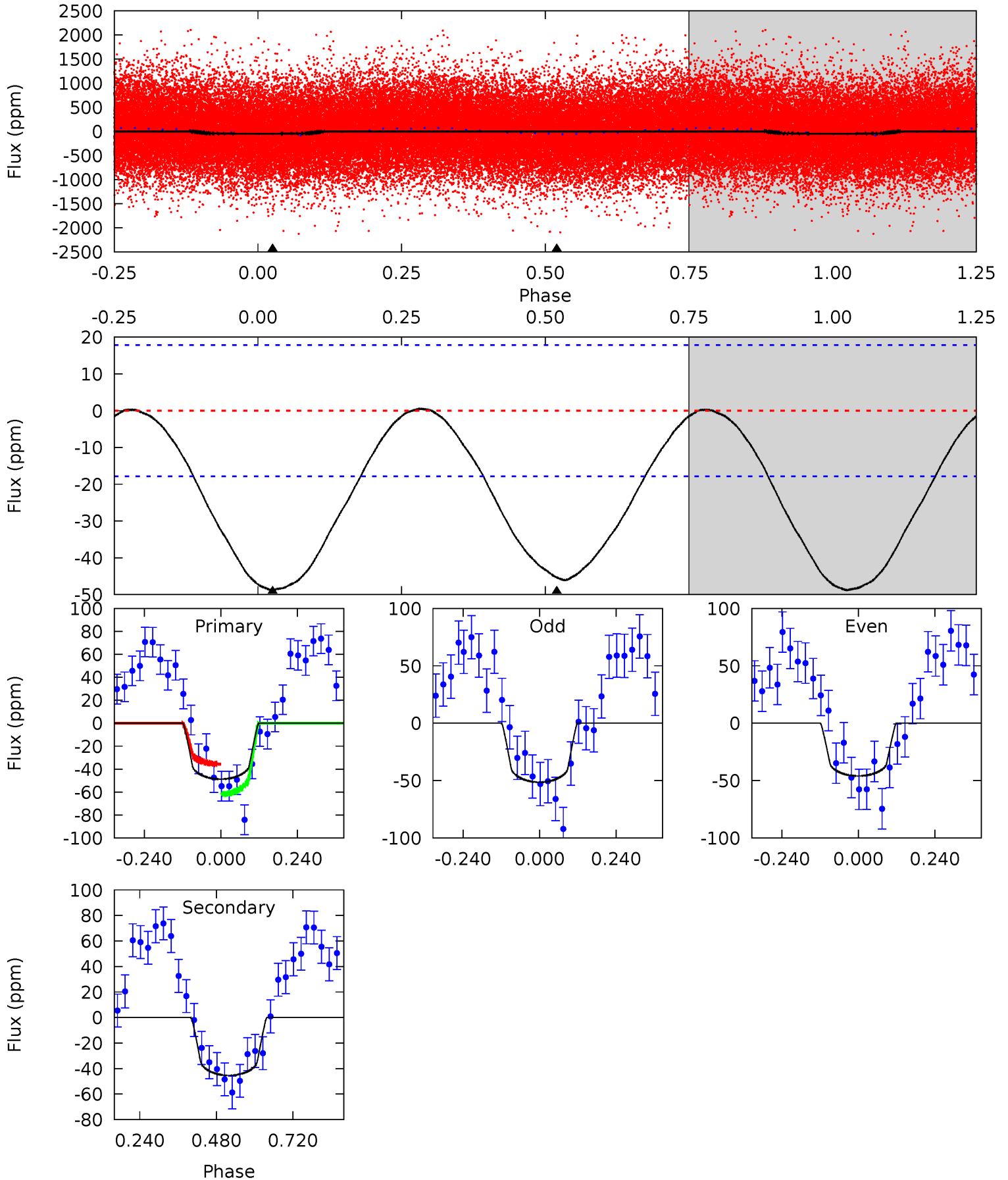
TCE 012365420-01 P= 0.693688 Days $T_0=131.674520$ (BKJD)



DV Model-Shift Uniqueness Test

012365420-01, P = 0.693655 Days, E = 130.994142 Days

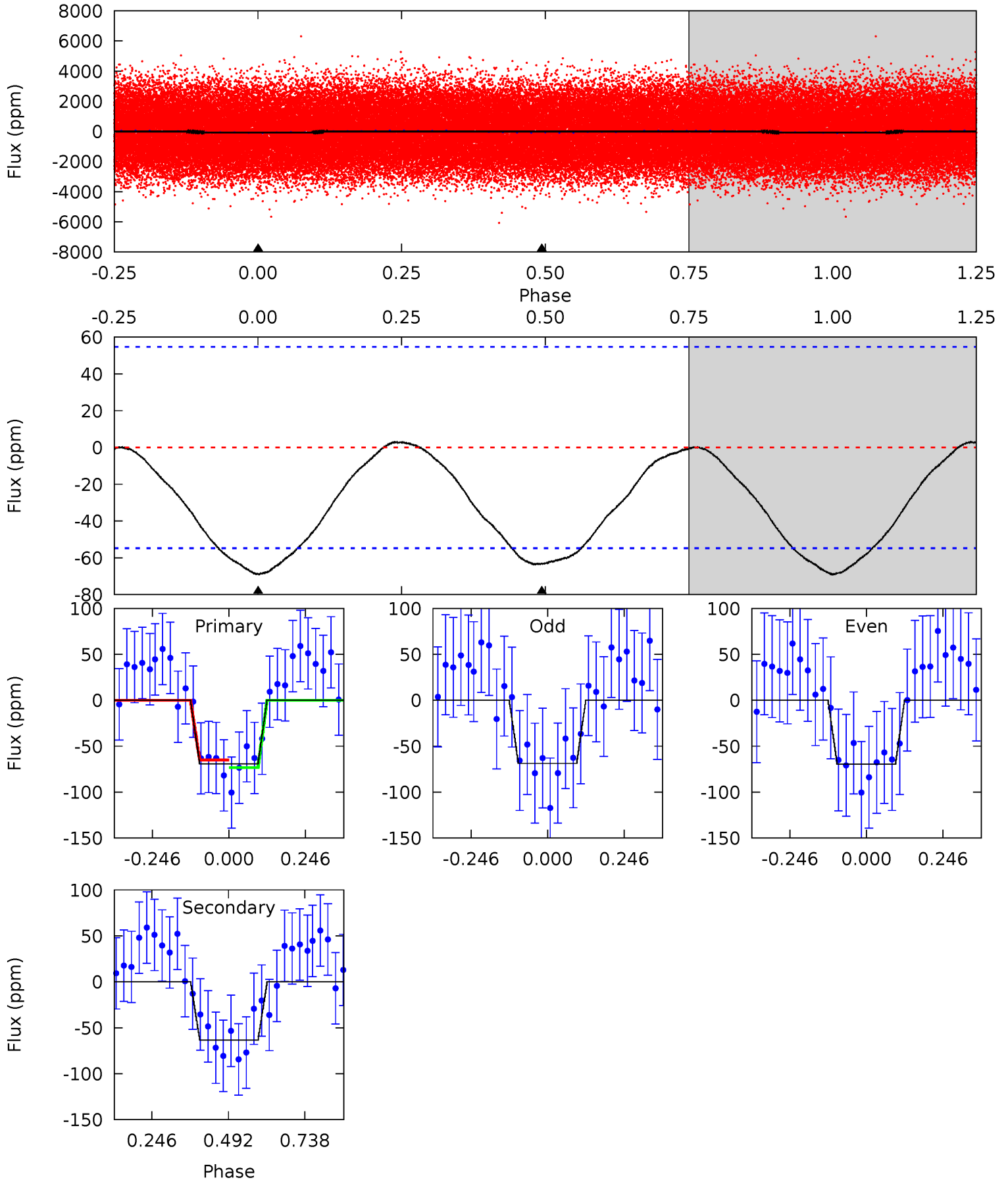
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	11.1	0	0	4.38	1.18	0.16	12.0	12.0	11.1	11.1	0.67	0.84	0.01	3.22



Alt Model-Shift Uniqueness Test

012365420-01, P = 0.693688 Days, E = 130.980832 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.53	5.08	0	0	4.37	1.16	0.16	5.53	5.53	5.08	5.08	0.03	1.00	0.04	0.33



Stellar Parameters For KIC 012365420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7798^{+216}_{-325}	$3.843^{+0.352}_{-0.088}$	$-0.120^{+0.200}_{-0.350}$	$2.757^{+0.375}_{-1.126}$	$1.934^{+0.087}_{-0.491}$	$0.130^{+0.340}_{-0.035}$
	+3%/-4%	+9%/-2%	+167%/-292%	+14%/-41%	+4%/-25%	+262%/-27%
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 012365420-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-45 ± 4	$1.92^{+1.23}_{-0.98}$	5634^{+355}_{-590}	7086^{+5011}_{-1847}	$2.331^{+7.757}_{-1.489}$
Alt.	-64 ± 13	$2.27^{+1.32}_{-1.10}$	5625^{+347}_{-592}	7065^{+4485}_{-1597}	$2.374^{+6.345}_{-1.436}$

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

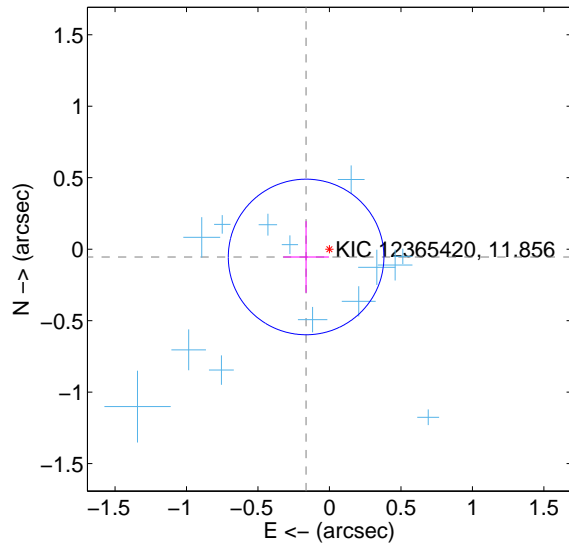
Supplemental centroid analysis for 012365420-01. **Kepler magnitude: 11.86.** Transit SNR 11.34

There are 16 quarters with good PRF difference image offsets

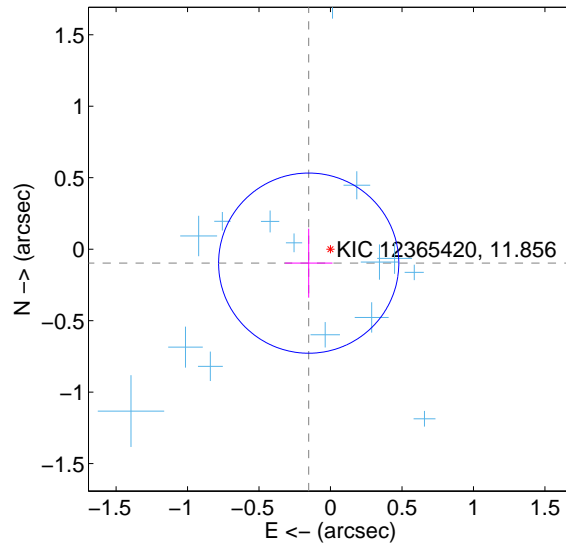
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.172 ± 0.181	0.95	0.163 ± 0.160	-0.055 ± 0.250
PRF-fit source offset from KIC position	0.181 ± 0.210	0.86	0.153 ± 0.167	-0.098 ± 0.241
photometric centroid source offset	0.54 ± 0.29	1.88	0.02 ± 0.23	0.54 ± 0.29

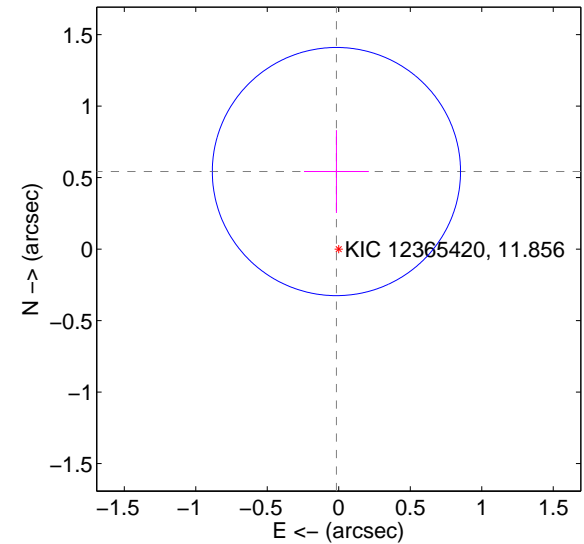
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

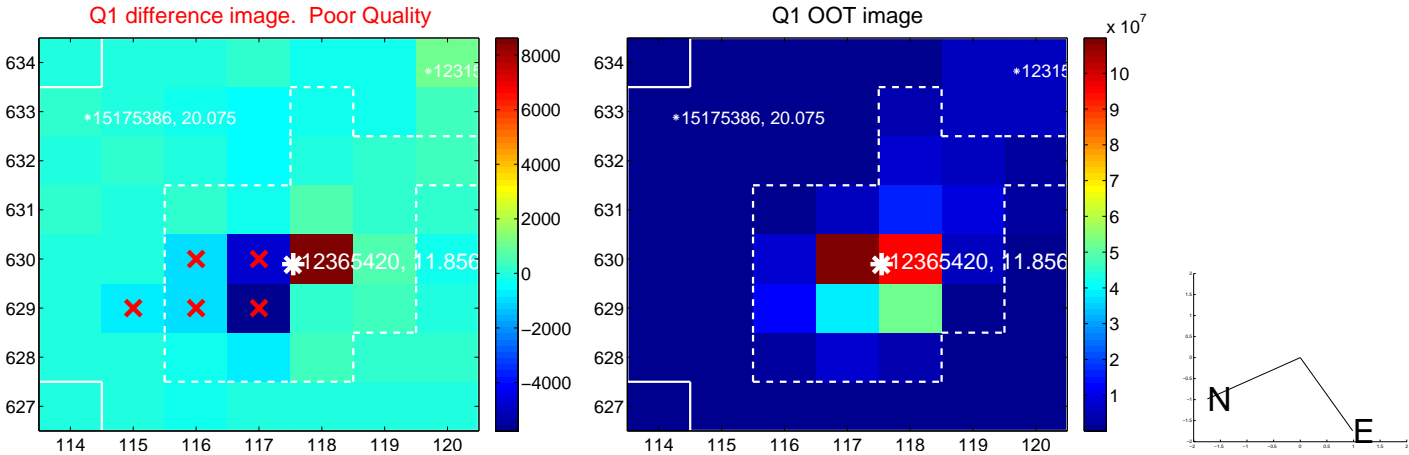


offset from photometric centroids

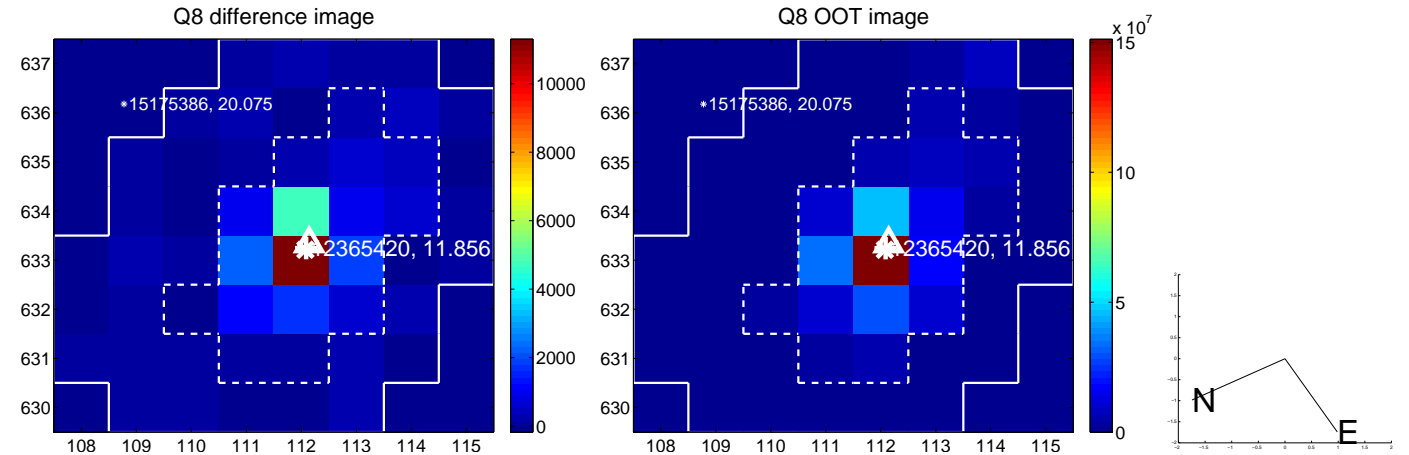
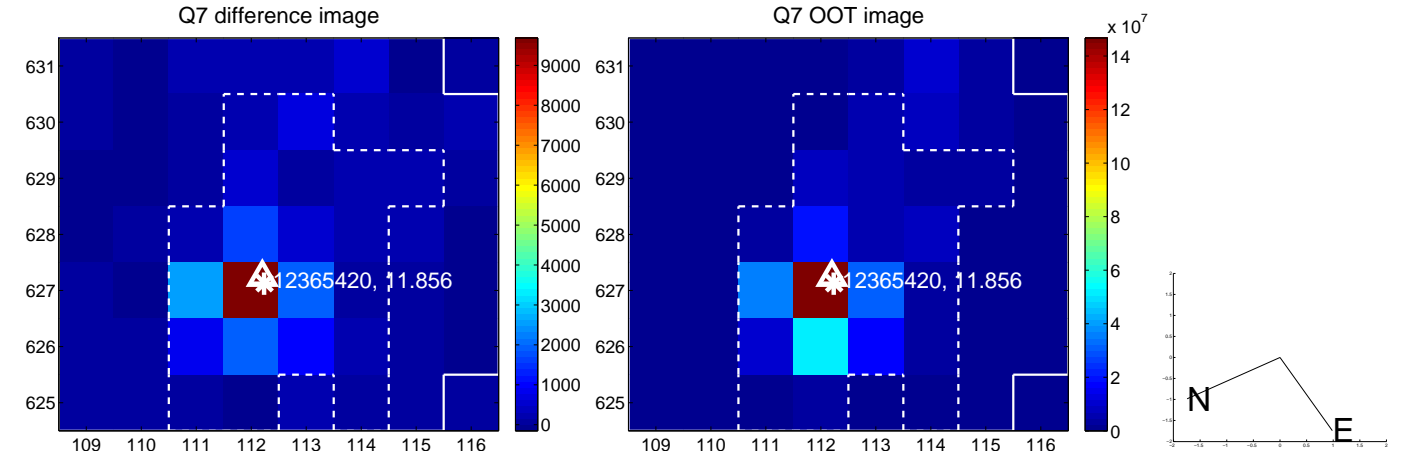
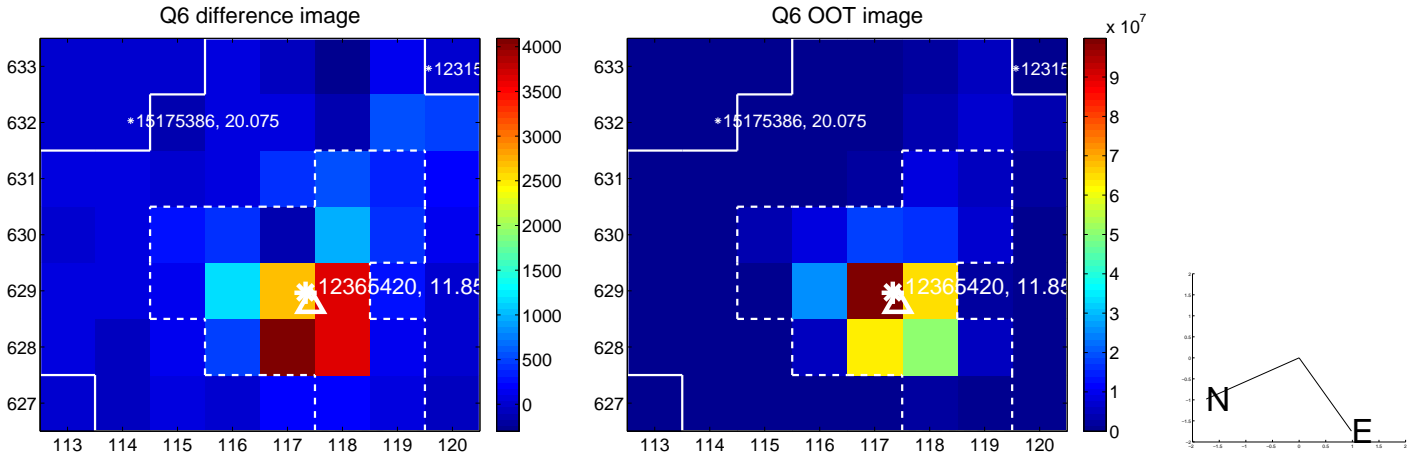
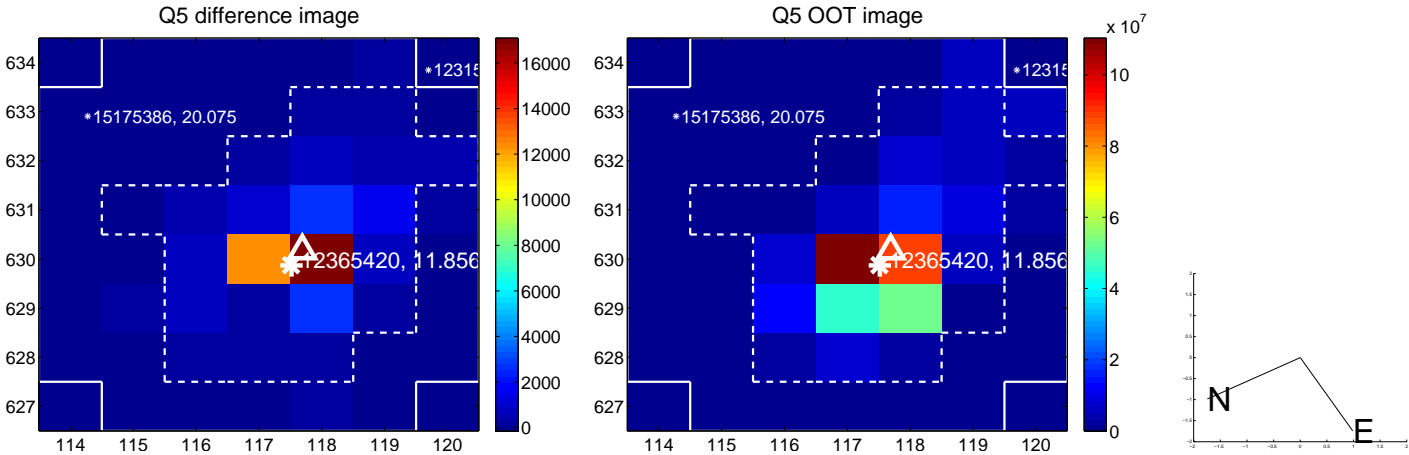


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

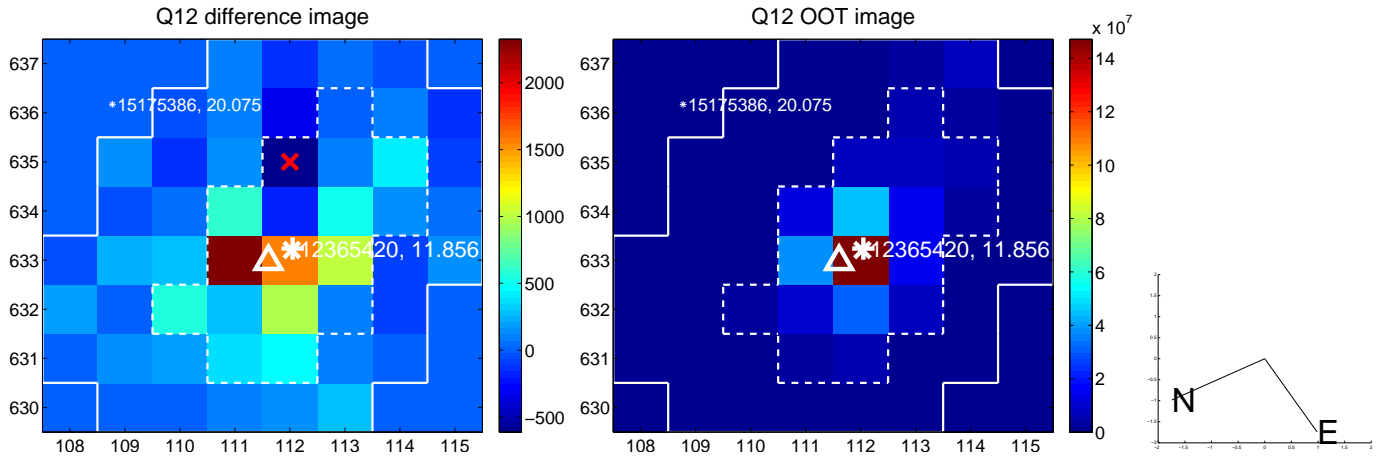
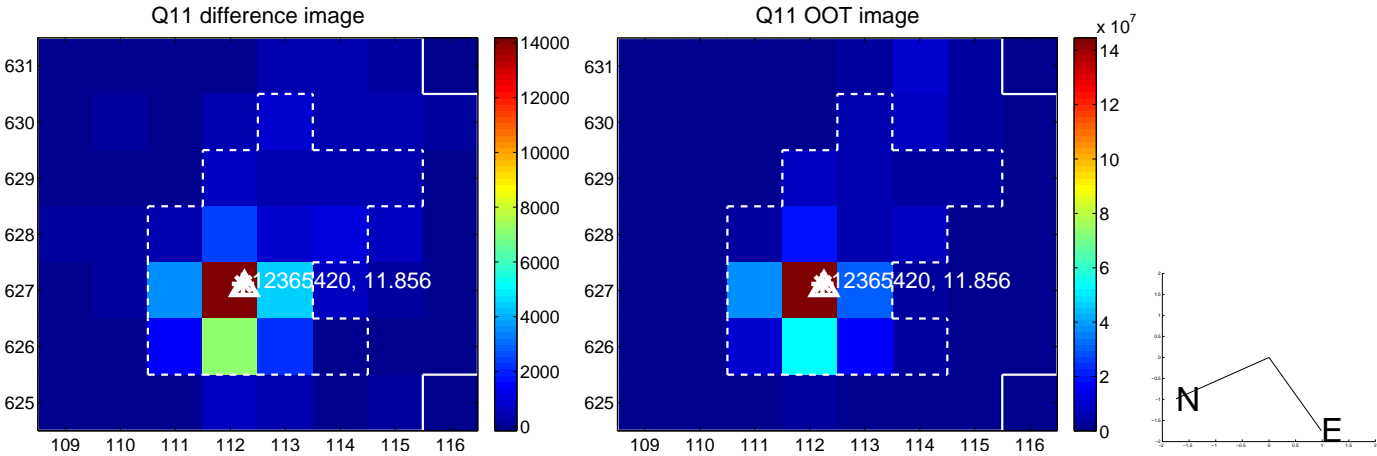
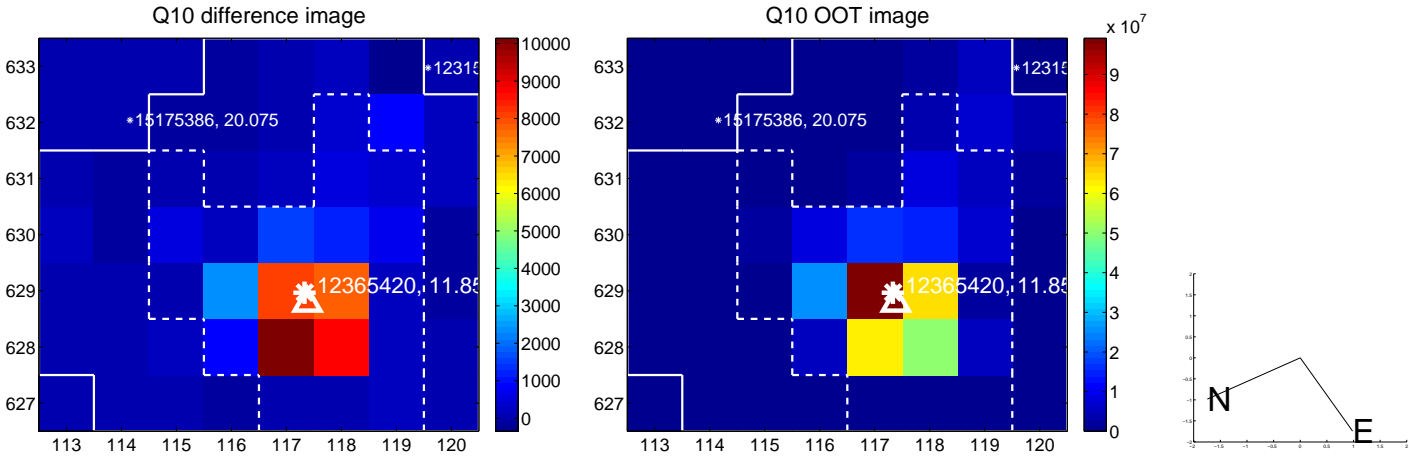
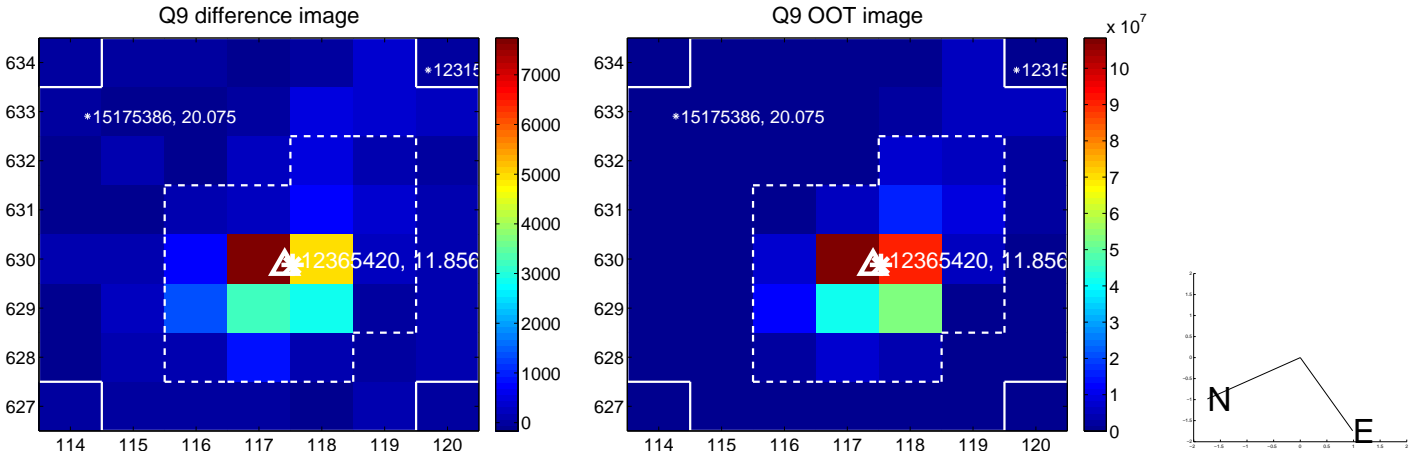
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



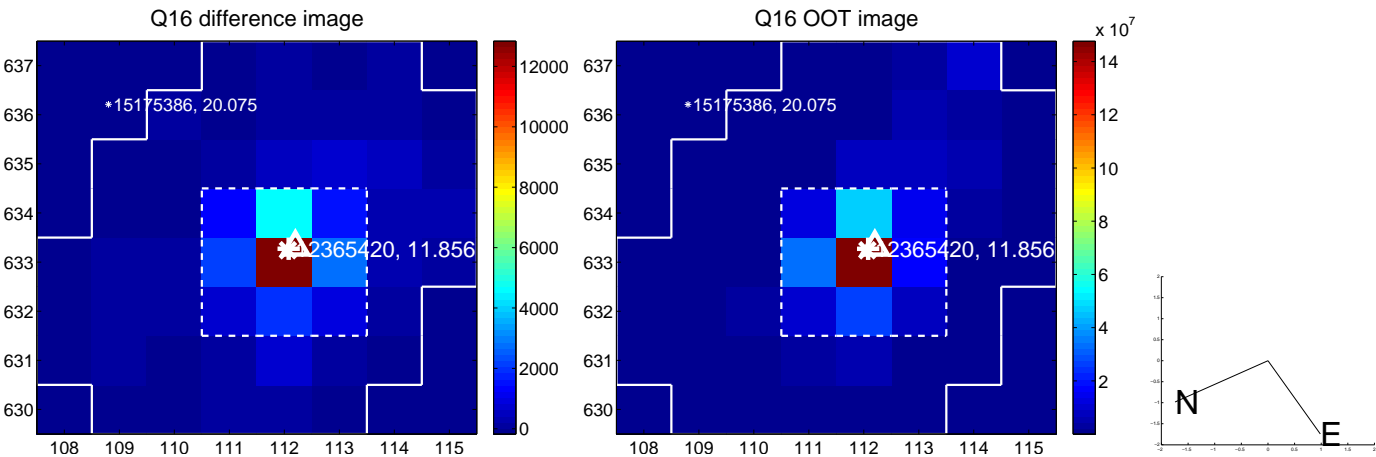
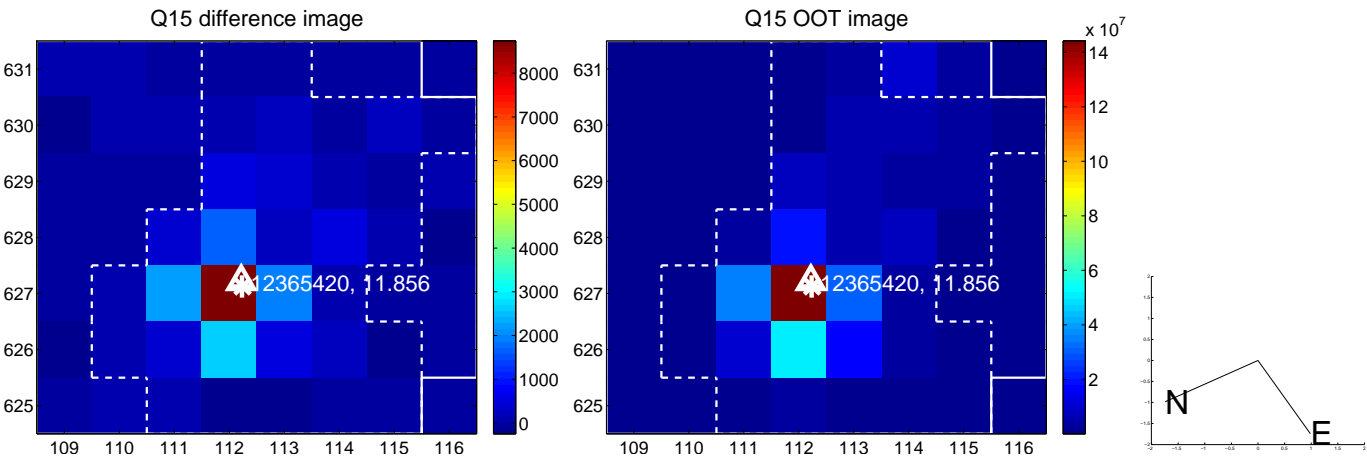
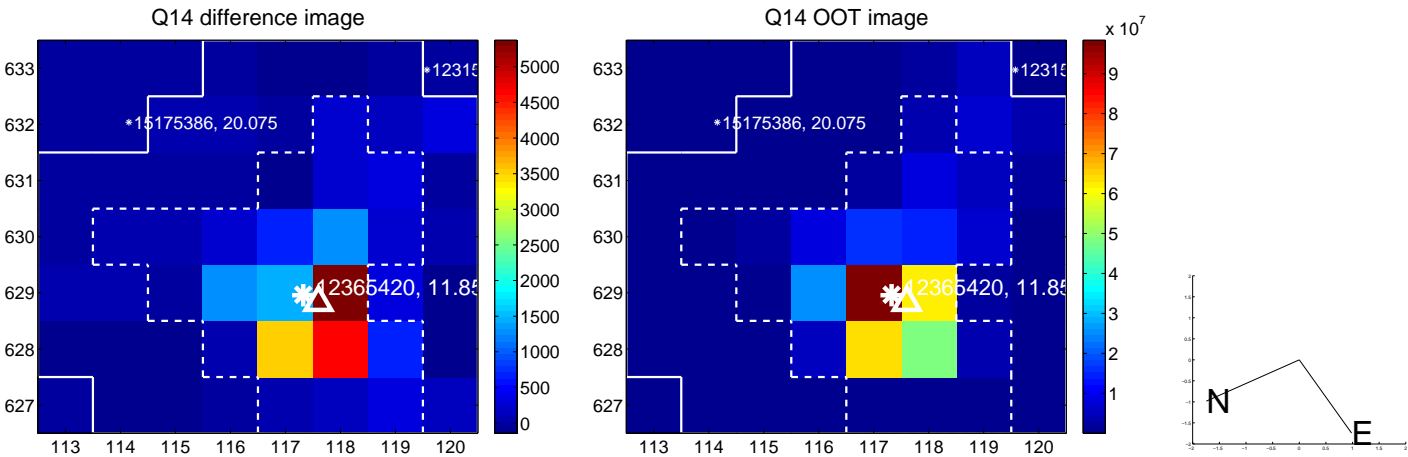
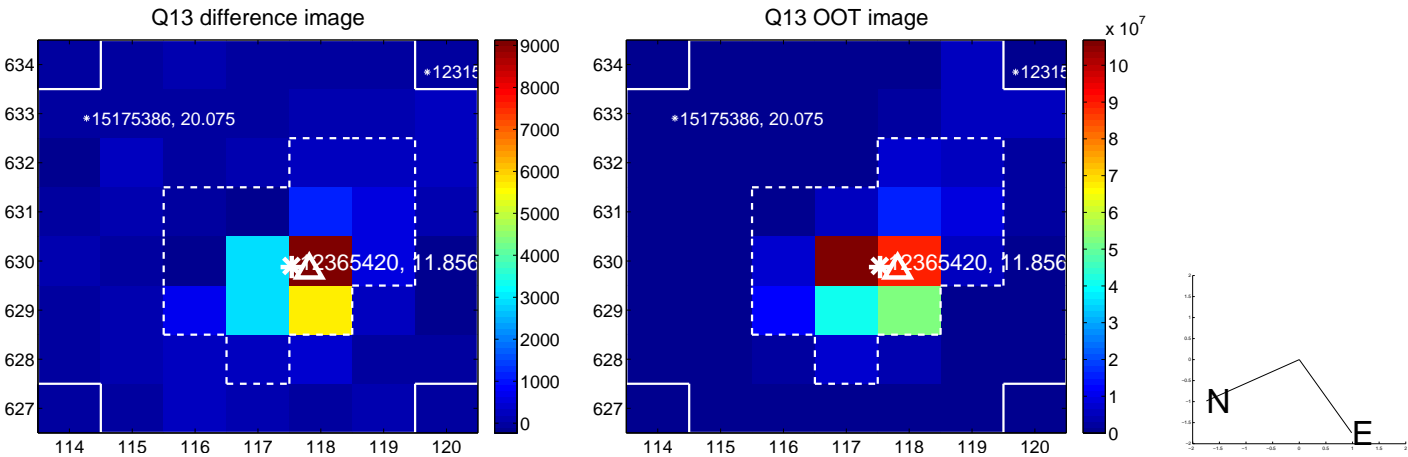
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



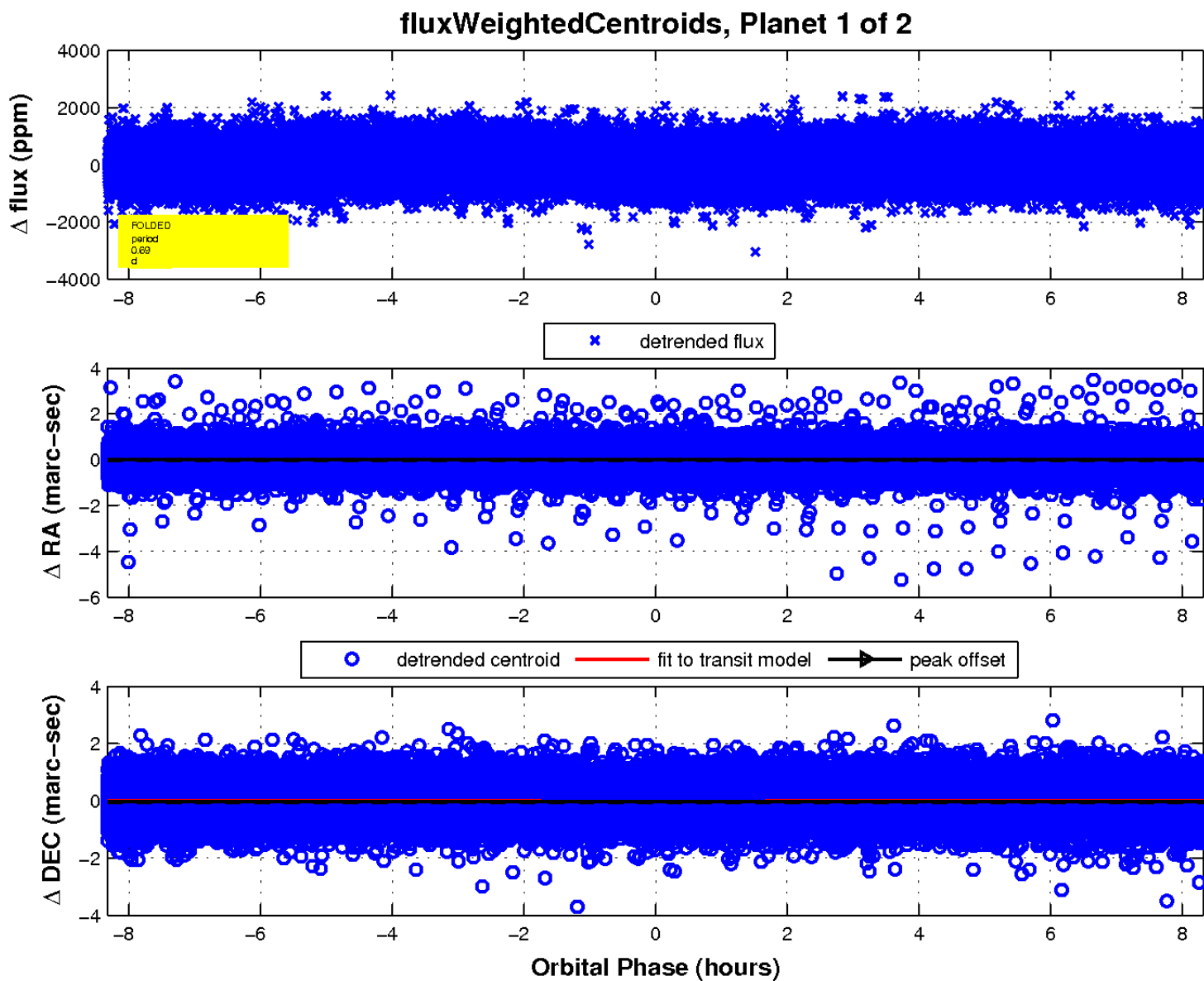
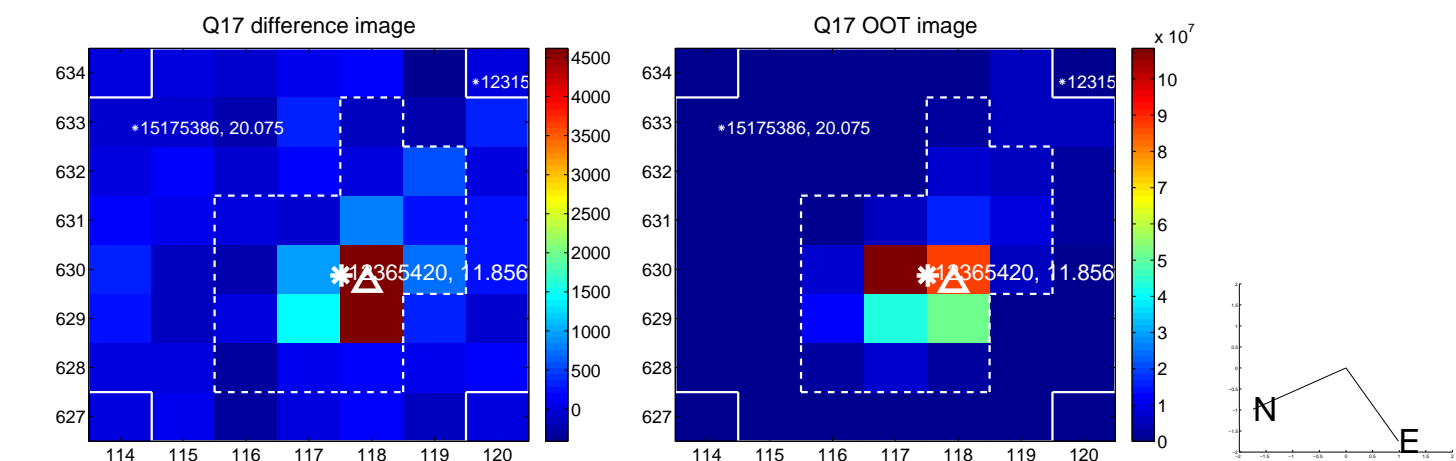
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



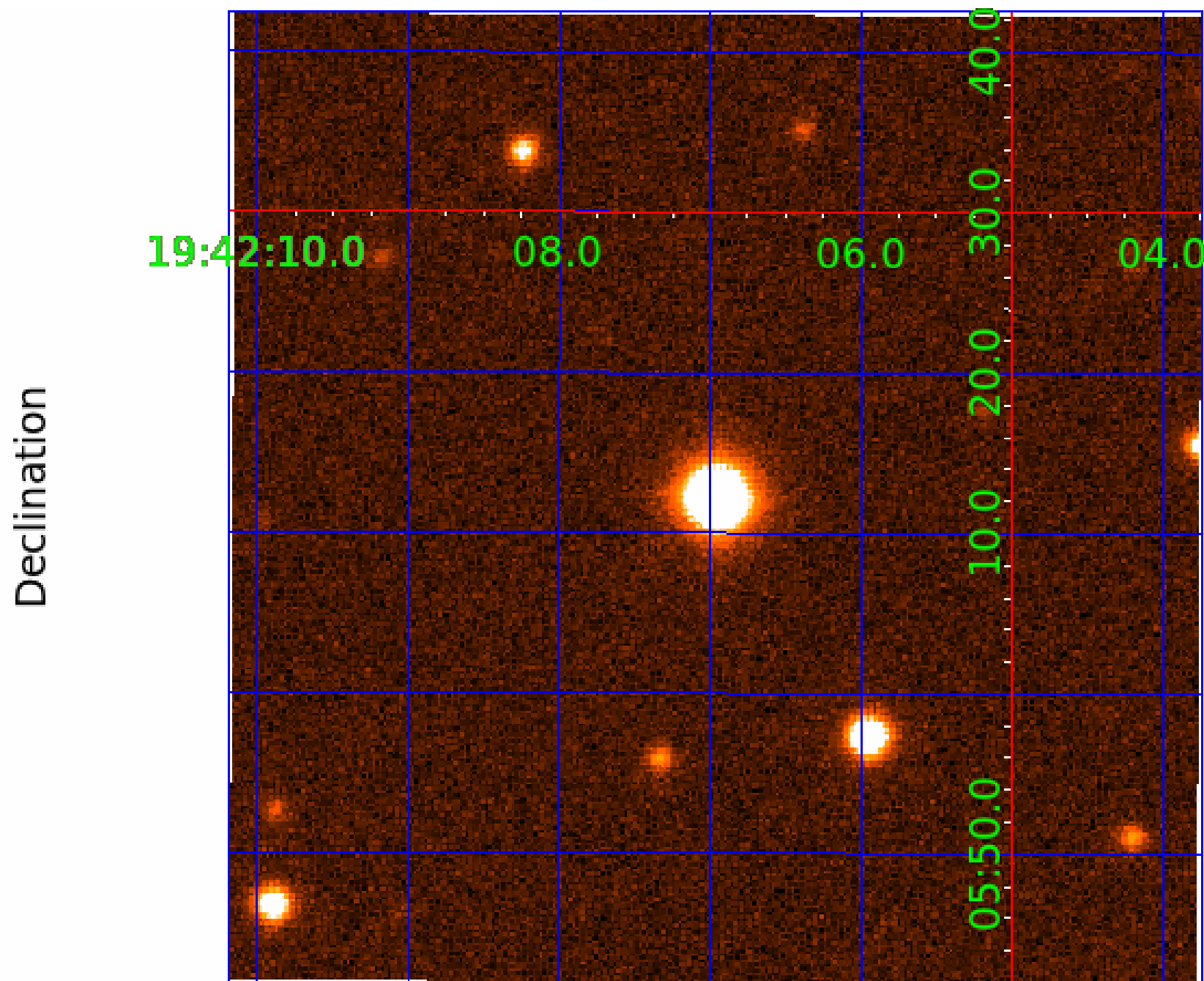
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 012365420

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})
012365420-01	OBS	No	0.693655	131.687797	46.0	3.534	12.6	11.3	2.76	7798	2.12	69012.43
012365420-02	OBS	No	1.025542	132.140364	110.7	11.961	9.9	16.8	2.76	7798	3.01	40974.52

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012365420-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
012365420-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_FEW_MEAS

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

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

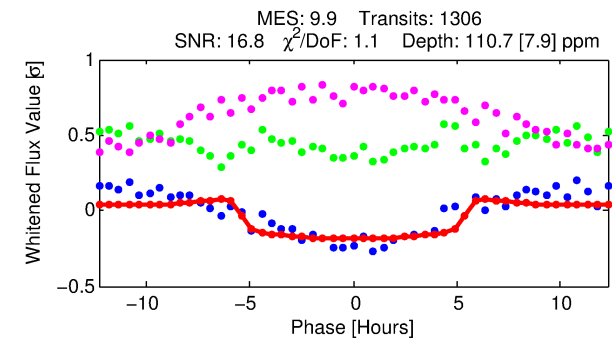
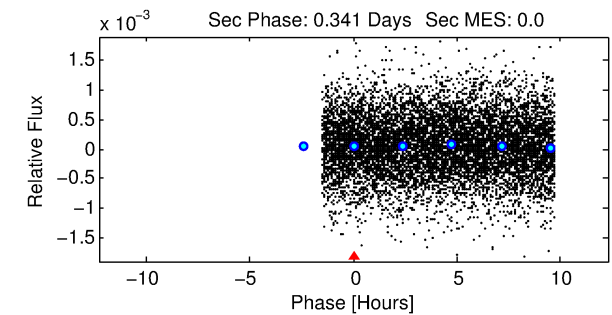
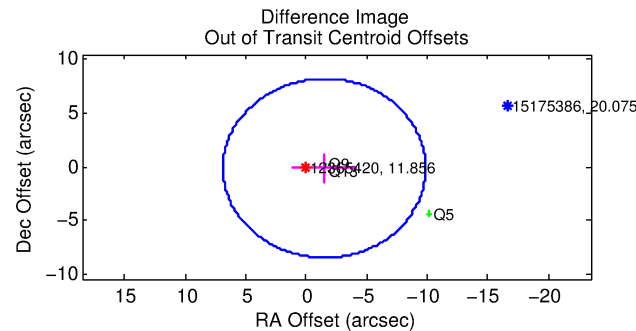
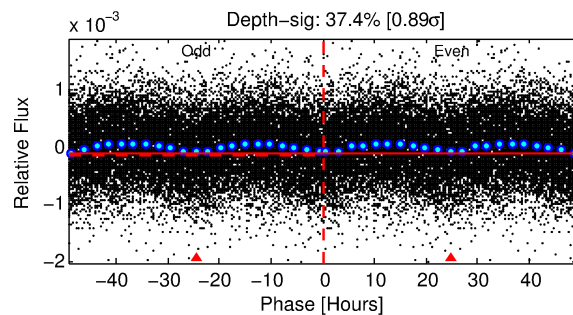
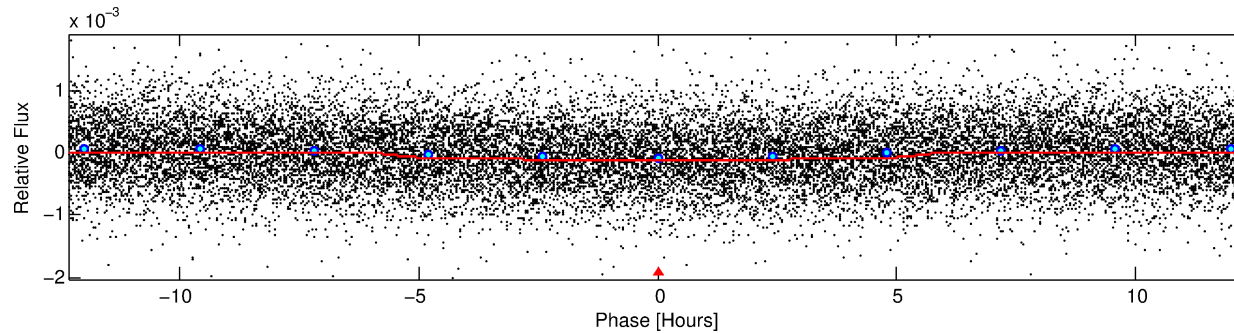
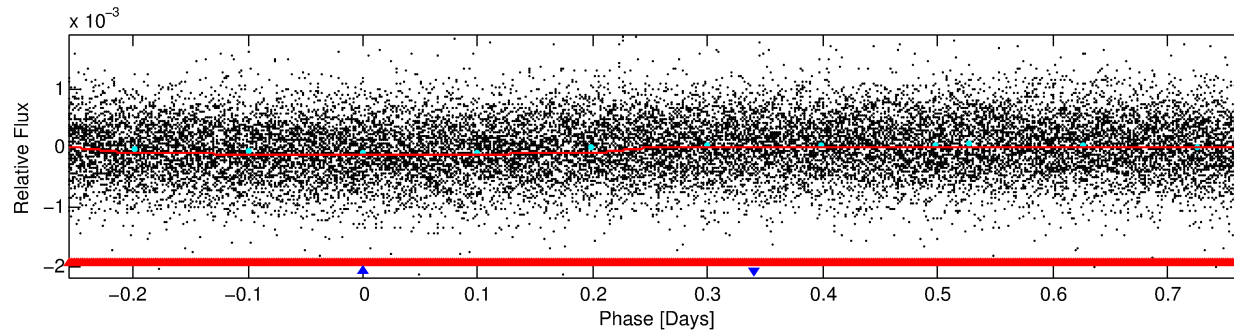
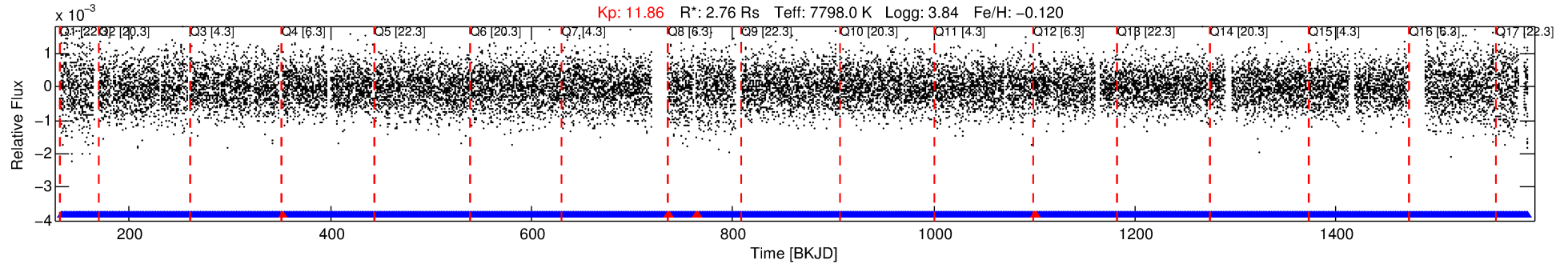
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012365420-02

No Significant Match Found

DV One-Page Summary

KIC: 12365420 Candidate: 2 of 2 Period: 1.026 d



DV Fit Results:

Period = 1.02554 [0.00001] d
Epoch = 132.1404 [0.0059] BKJD
 $R_p/R^* = 0.0100$ [0.0015]
 $a/R^* = 1.01$ [0.01]
 $b = 0.50$ [1.25]
 $\text{Seff} = 40974.52$ [25716.00]
 $T_{\text{eq}} = 3628$ [569] K
 $R_p = 3.01$ [1.30] R_e
 $a = 0.0248$ [0.0095] AU
 $\text{Ag} = \text{N/A}$
 $T_{\text{eff}} = \text{N/A}$

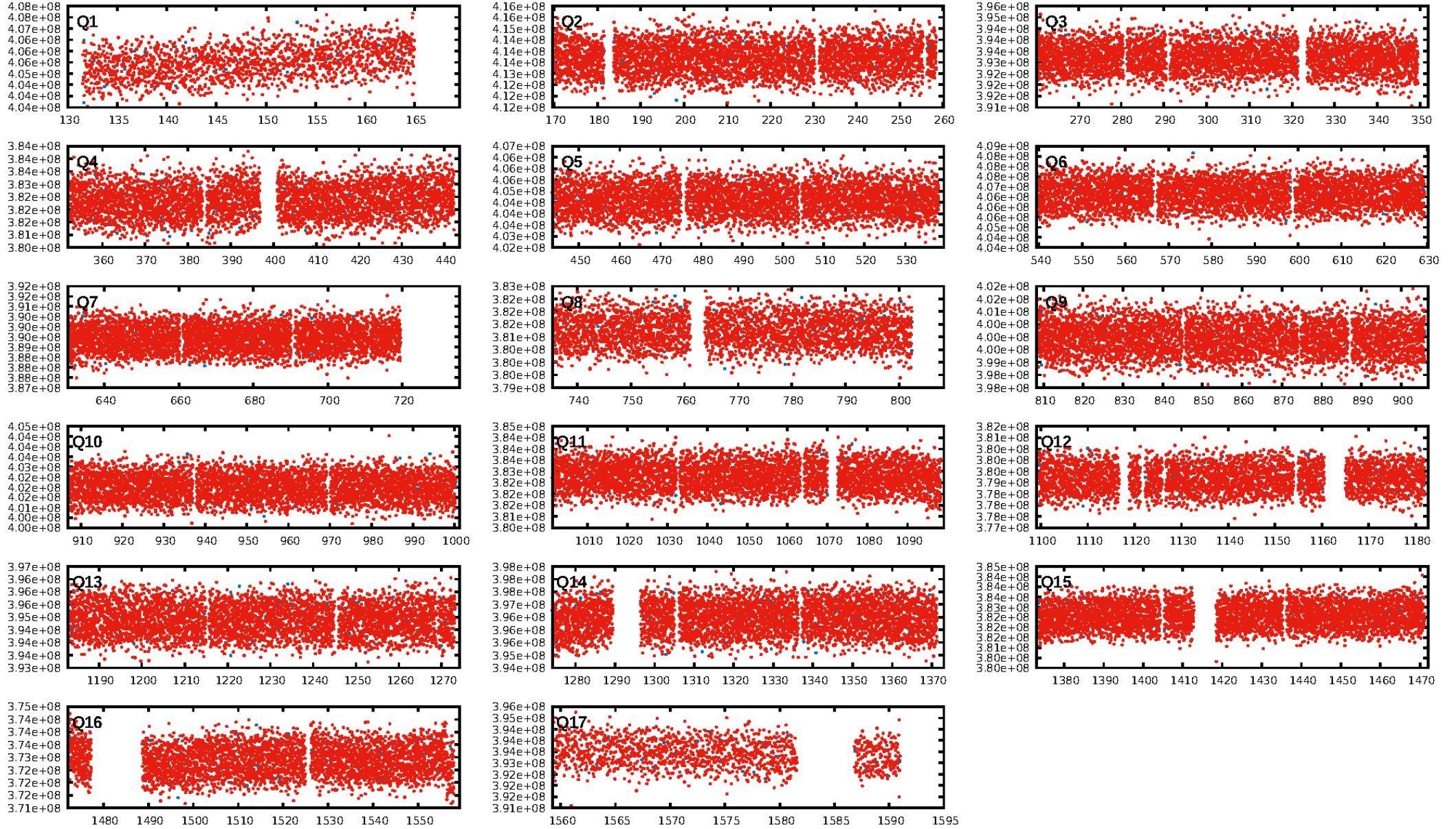
DV Diagnostic Results:

ShortPeriod-sig: 47.7% [0.64 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1238/1247]
GhostDiagnostic-chr: 1.411
Centroid-sig: 0.0%
Centroid-so: 0.274 arcsec [2.87 σ]
OotOffset-rm: 1.500 arcsec [0.54 σ]
KicOffset-rm: 1.471 arcsec [0.67 σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/17]

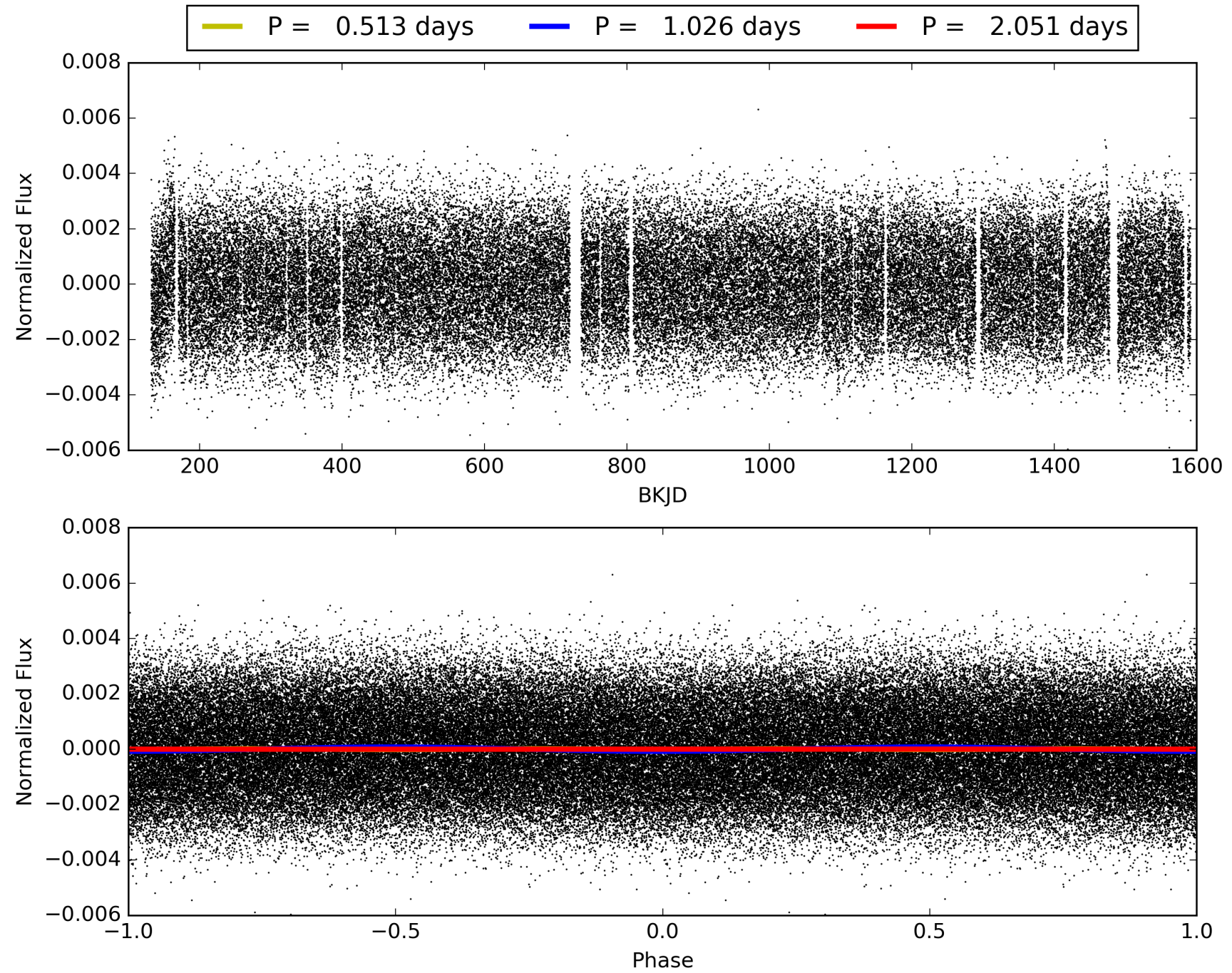
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 14:40:03 Z

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

TCE 012365420-02, PDC Light Curves

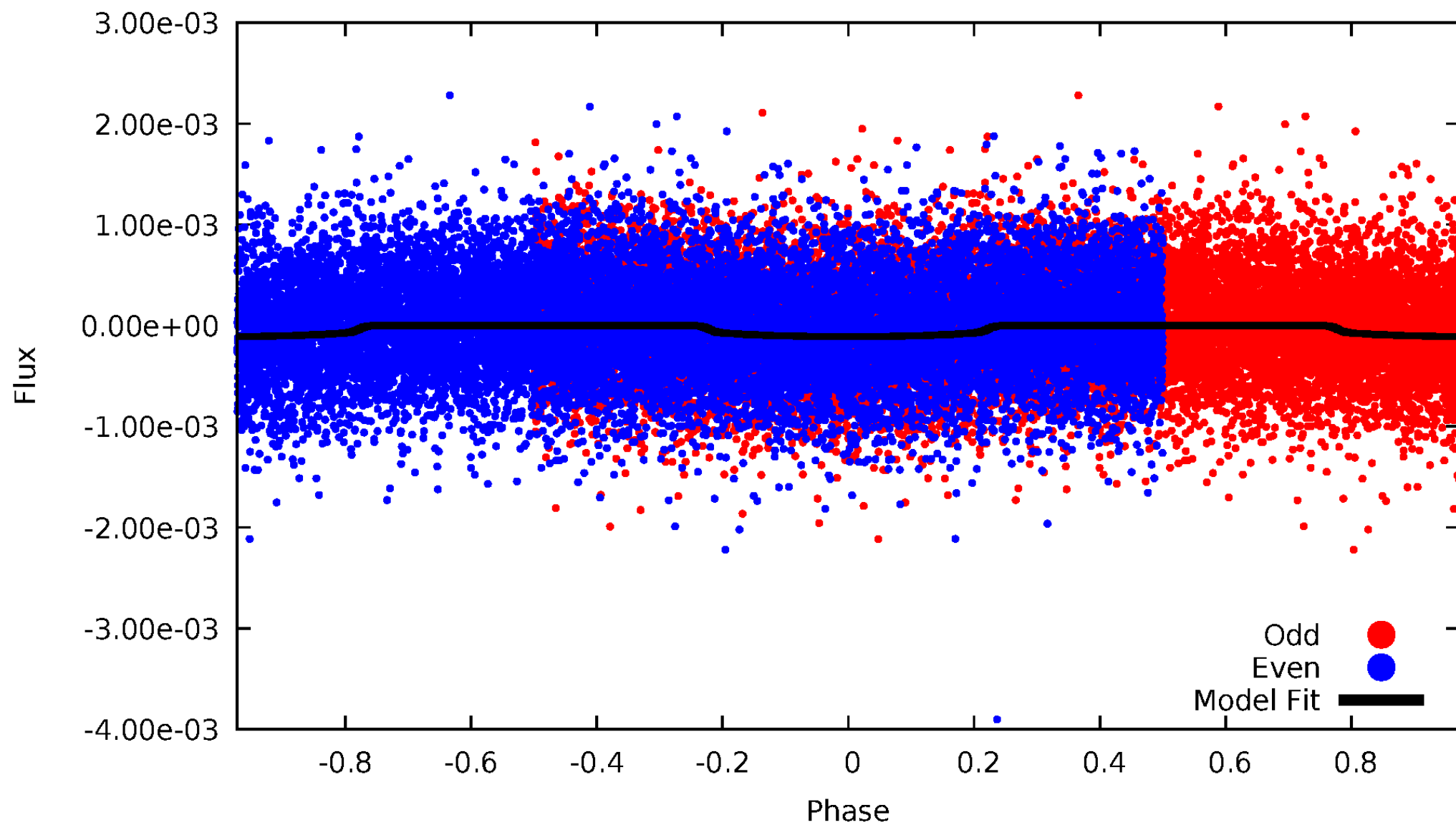


TCE 012365420-02



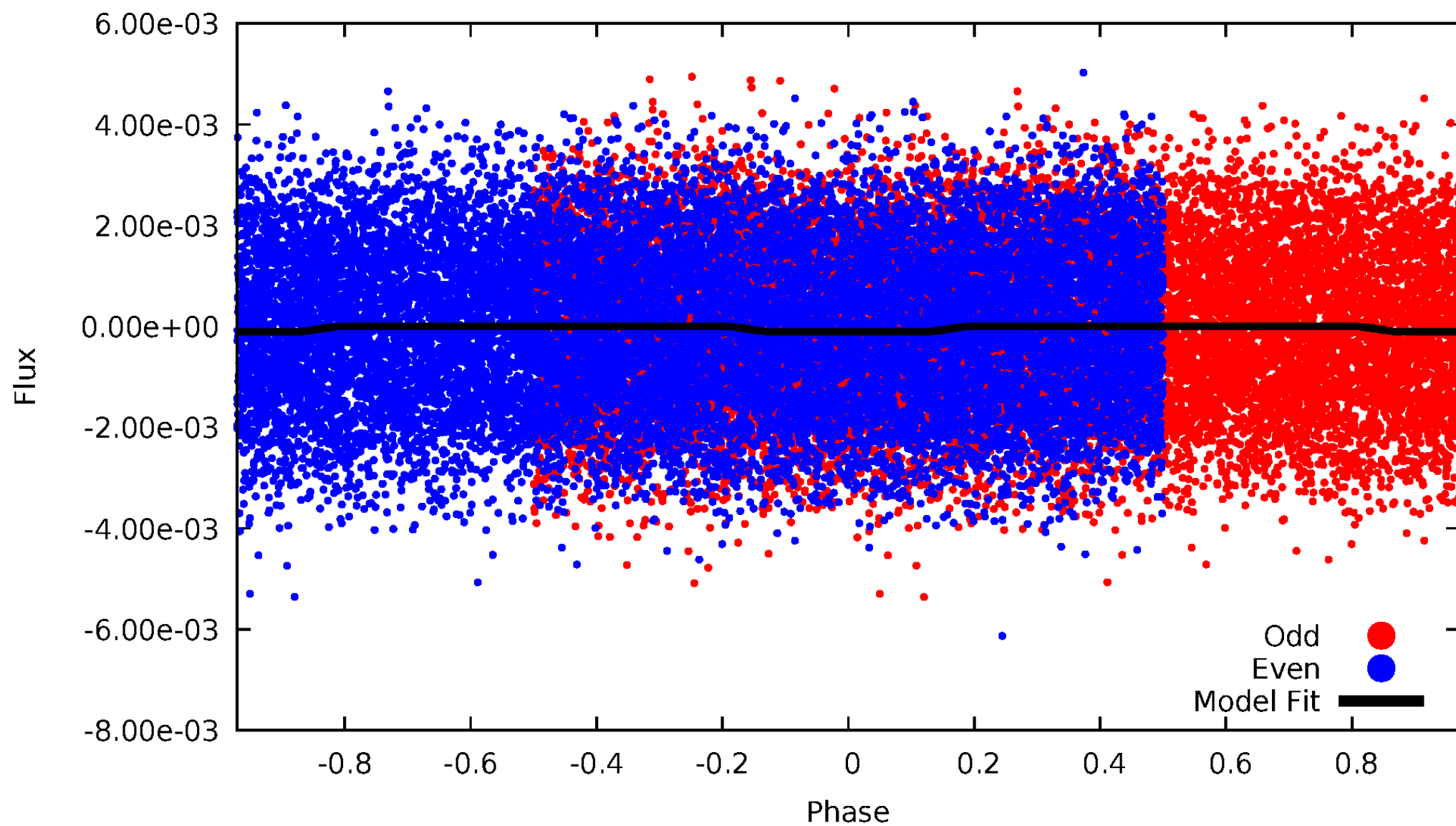
DV Odd/Even

TCE 012365420-02



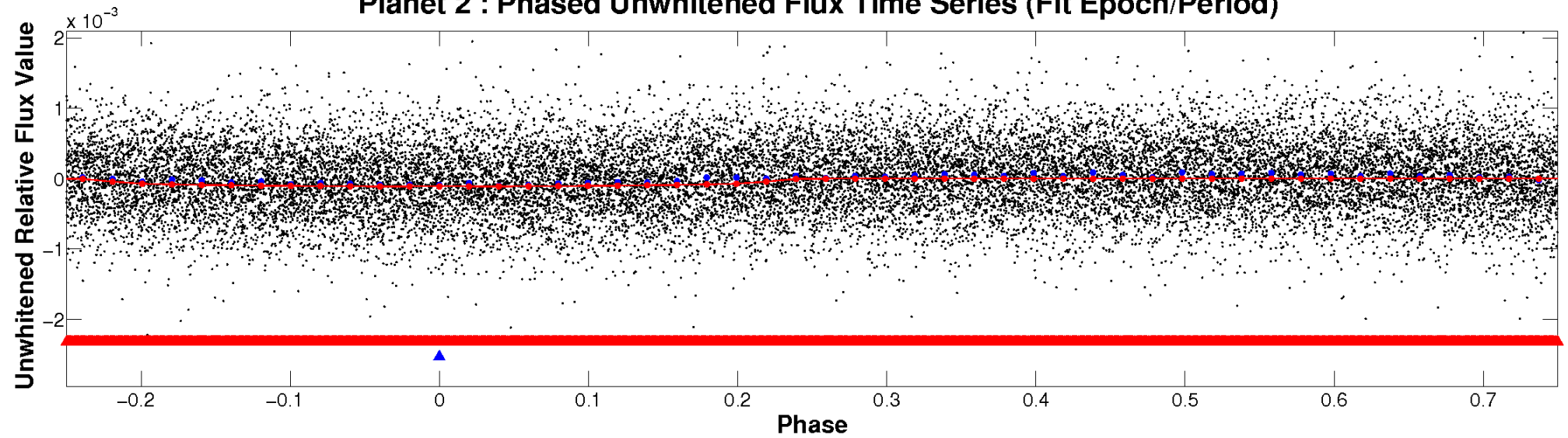
ALT Odd/Even

TCE 012365420-02

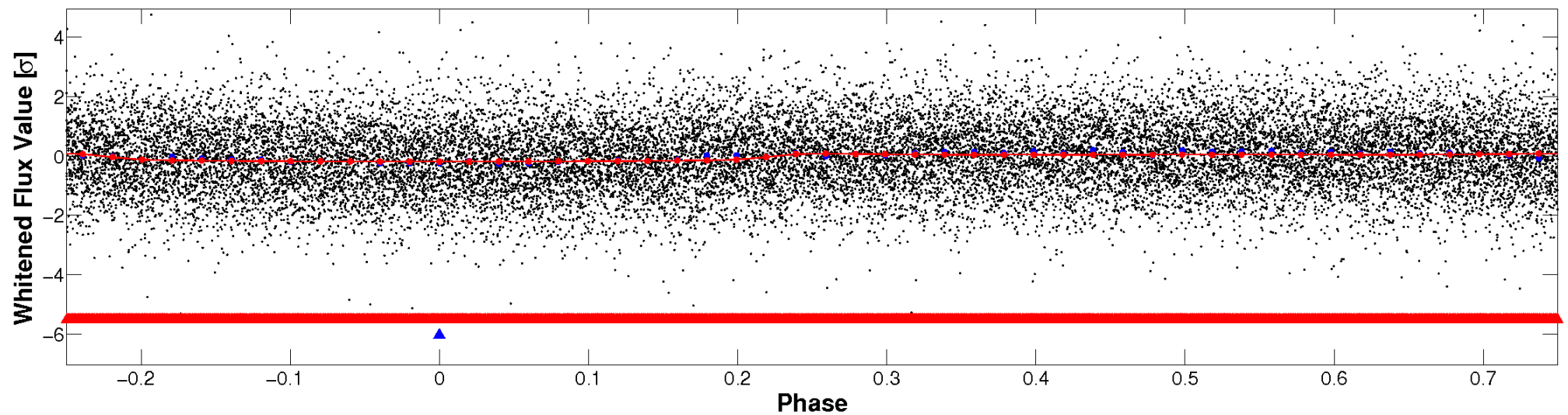


Non-Whitened Vs. Whitened Light Curve

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

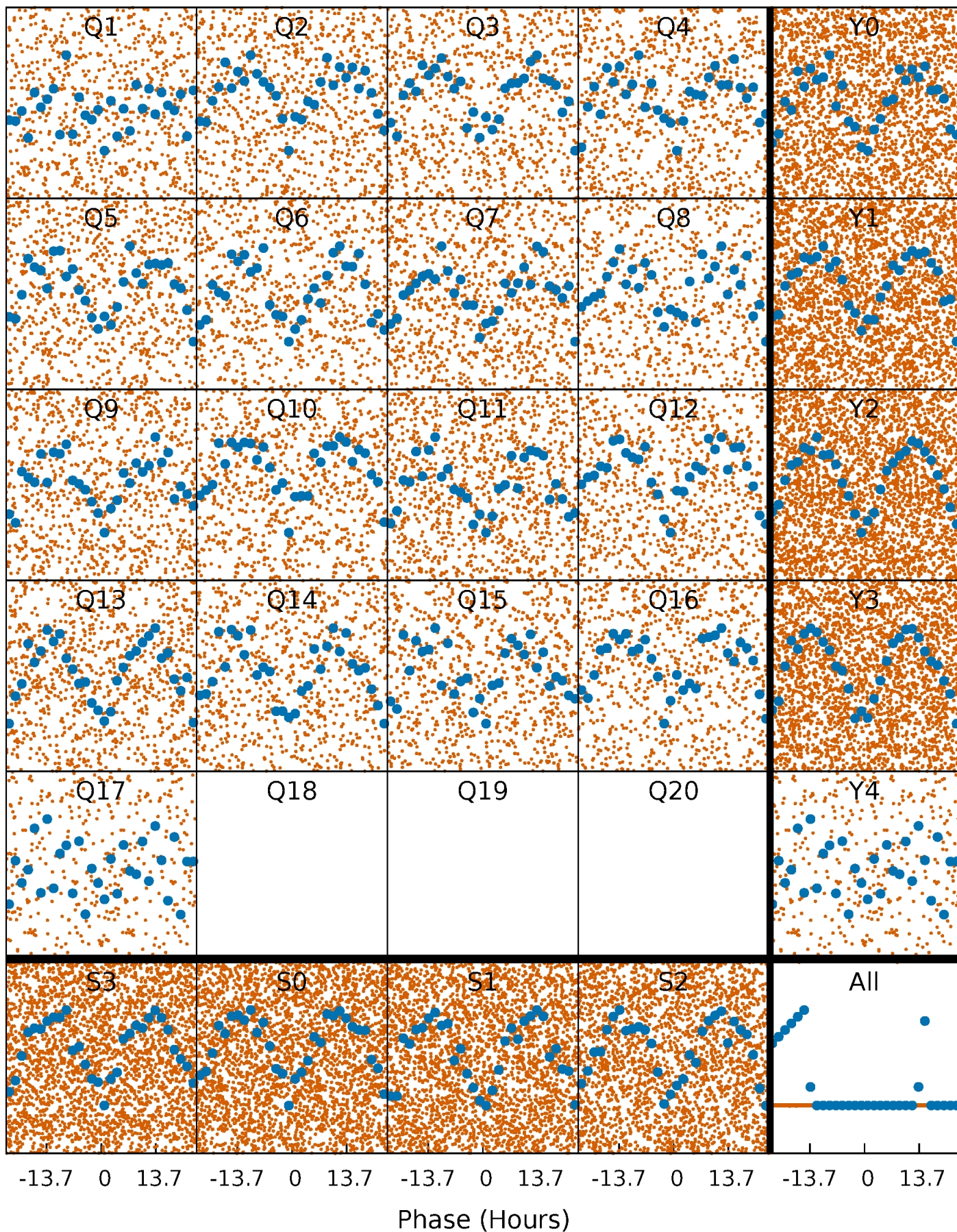


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



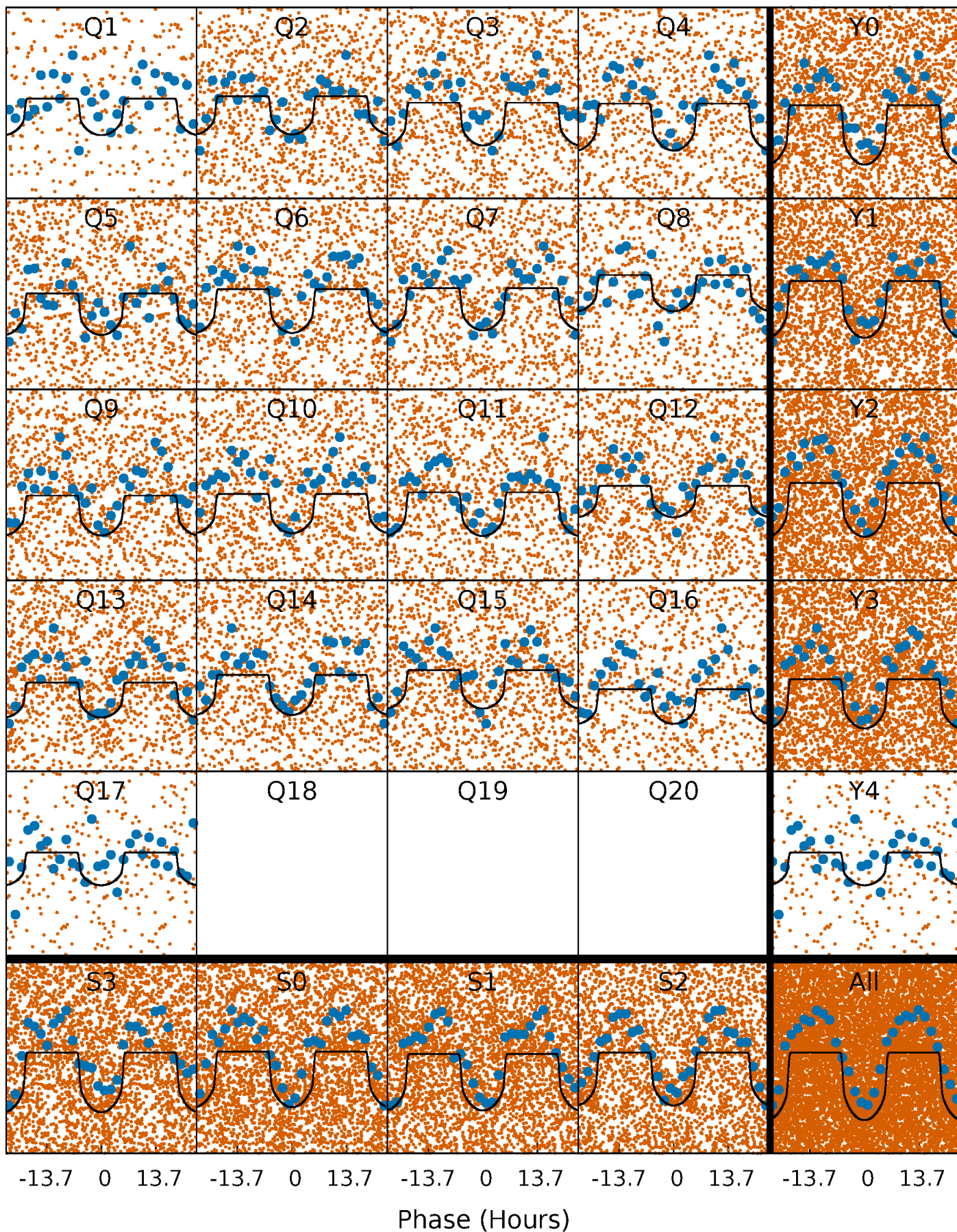
PDC Quarter-Phased Transit Curves

TCE 012365420-02 P= 1.025542 Days $T_0=132.140364$ (BKJD)



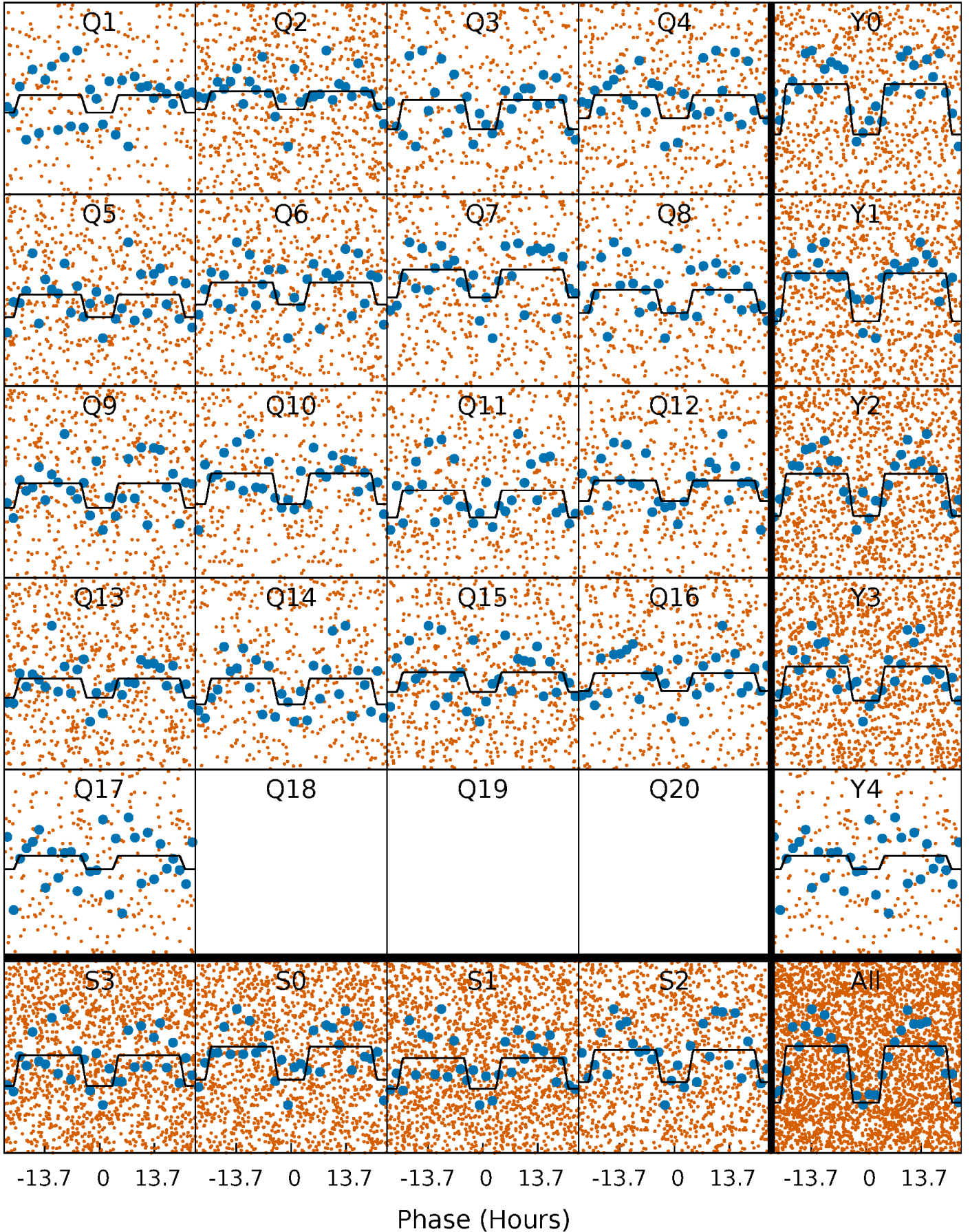
DV Quarter-Phased Transit Curves

TCE 012365420-02 $P = 1.025542$ Days $T_0 = 132.140364$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

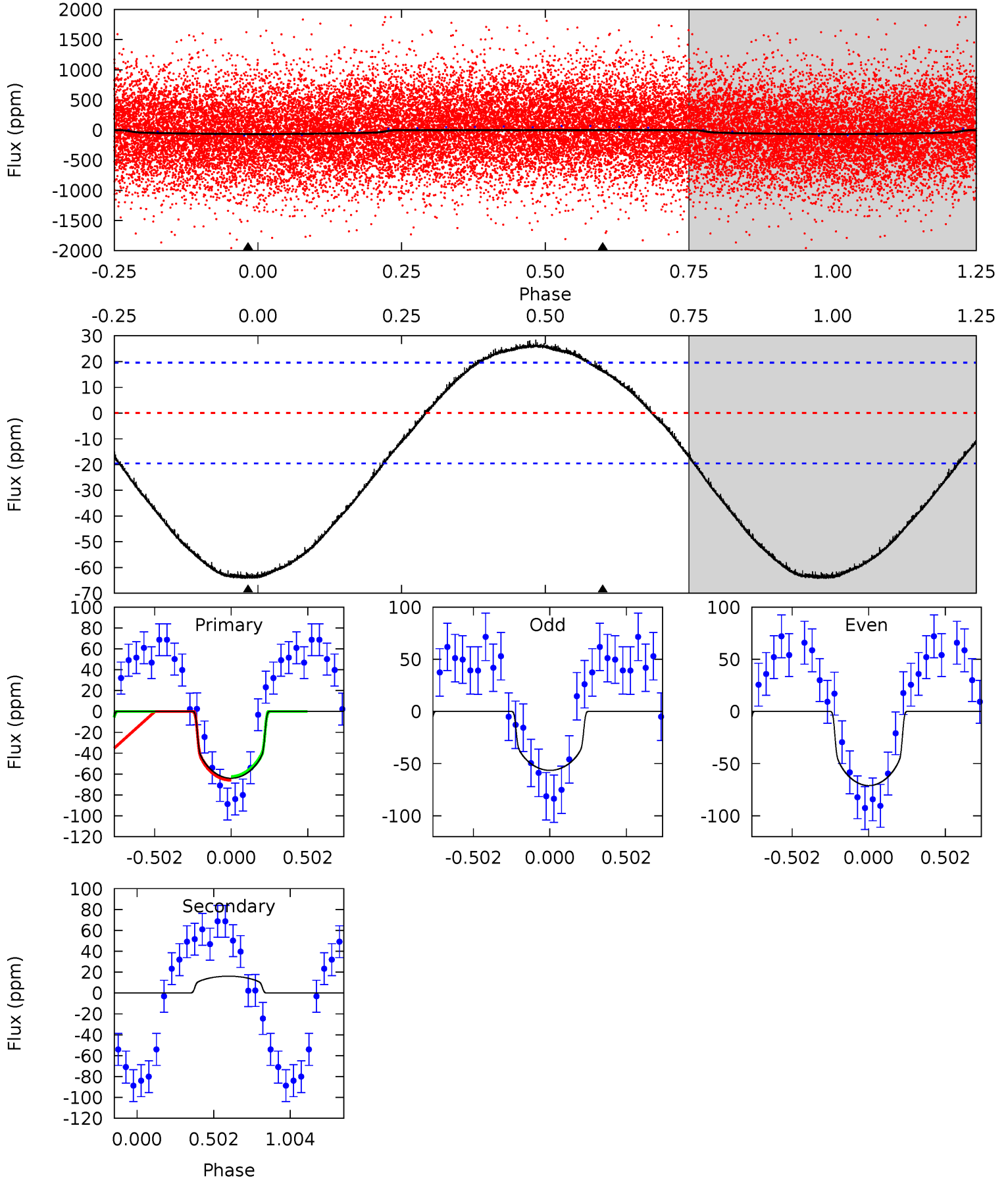
TCE 012365420-02 P= 1.025536 Days $T_0=132.140604$ (BKJD)



DV Model-Shift Uniqueness Test

012365420-02, P = 1.025542 Days, E = 131.114822 Days

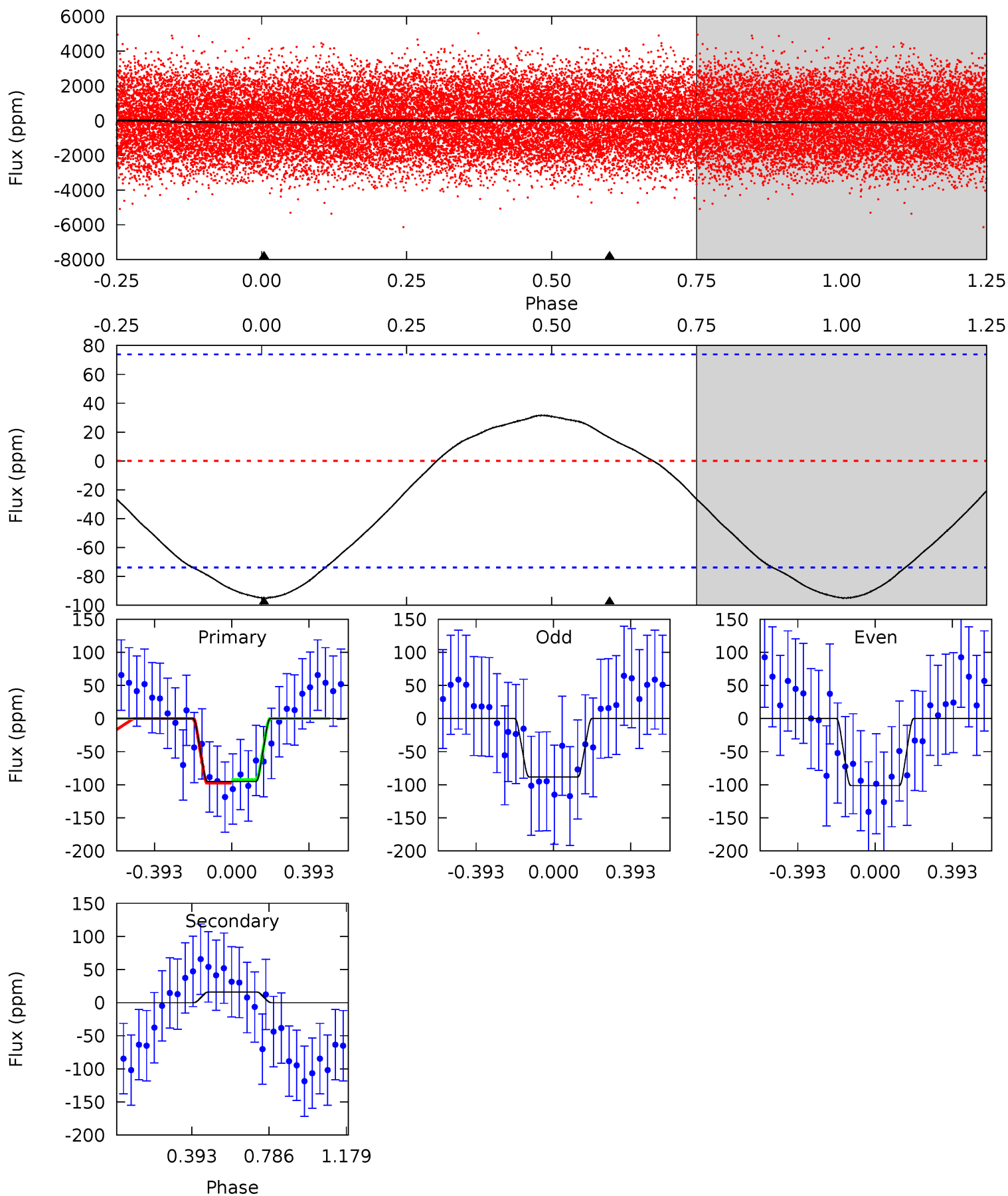
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	-3.48	0	0	4.21	0.67	1.67	13.8	13.8	-3.48	-3.48	1.57	0.76	0.31	0.36



Alt Model-Shift Uniqueness Test

012365420-02, P = 1.025536 Days, E = 131.115068 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.49	-0.93	0	0	4.27	0.85	0.62	5.49	5.49	-0.93	-0.93	0.37	1.32	0.25	0.15



Stellar Parameters For KIC 012365420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7798^{+216}_{-325}	$3.843^{+0.352}_{-0.088}$	$-0.120^{+0.200}_{-0.350}$	$2.757^{+0.375}_{-1.126}$	$1.934^{+0.087}_{-0.491}$	$0.130^{+0.340}_{-0.035}$
	+3%/-4%	+9%/-2%	+167%/-292%	+14%/-41%	+4%/-25%	+262%/-27%
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 012365420-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	16 ± 5	$2.74^{+0.65}_{-0.61}$	4910^{+356}_{-521}	-5334^{+383}_{-382}	$-0.685^{+0.272}_{-0.542}$
Alt.	16 ± 17	$2.83^{+0.60}_{-0.58}$	4938^{+337}_{-468}	-5282^{+1225}_{-835}	$-0.645^{+0.695}_{-0.910}$

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

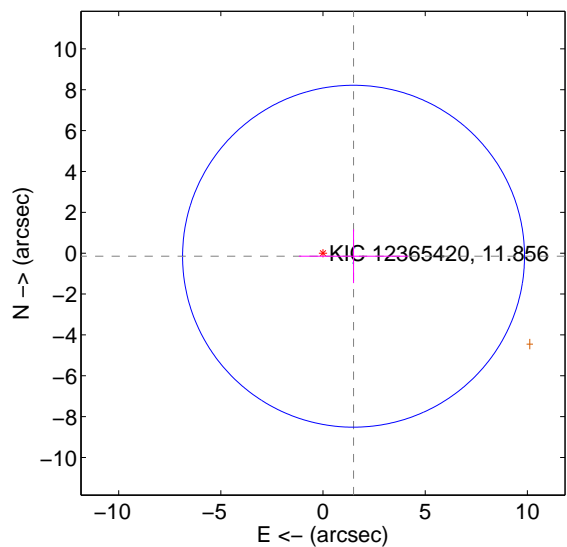
Supplemental centroid analysis for 012365420-02. **Kepler magnitude: 11.86.** Transit SNR 16.83

There are 2 quarters with good PRF difference image offsets

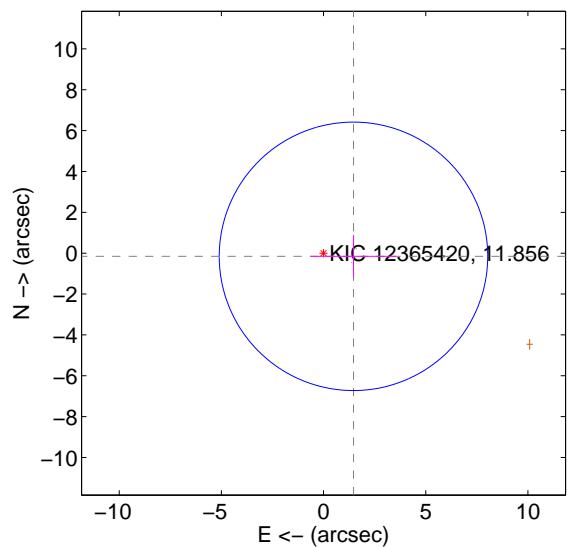
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.500 ± 2.789	0.54	-1.493 ± 2.674	-0.150 ± 1.316
PRF-fit source offset from KIC position	1.471 ± 2.190	0.67	-1.463 ± 2.094	-0.154 ± 1.039
photometric centroid source offset	0.27 ± 0.10	2.87	0.06 ± 0.07	-0.27 ± 0.10

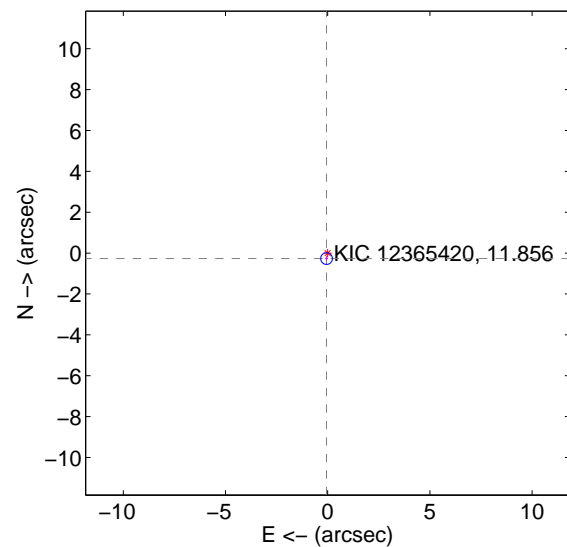
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

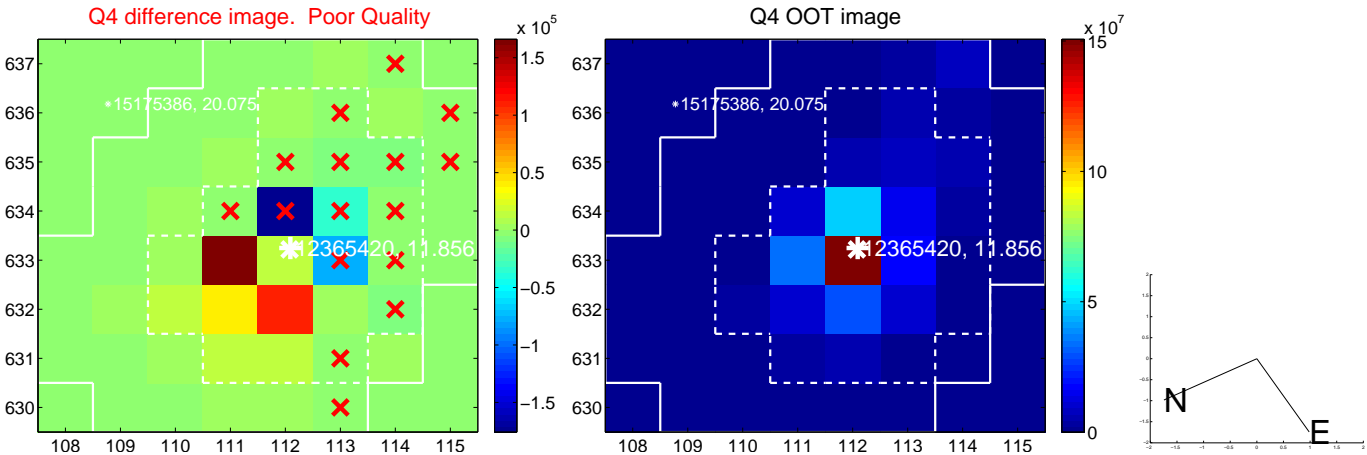
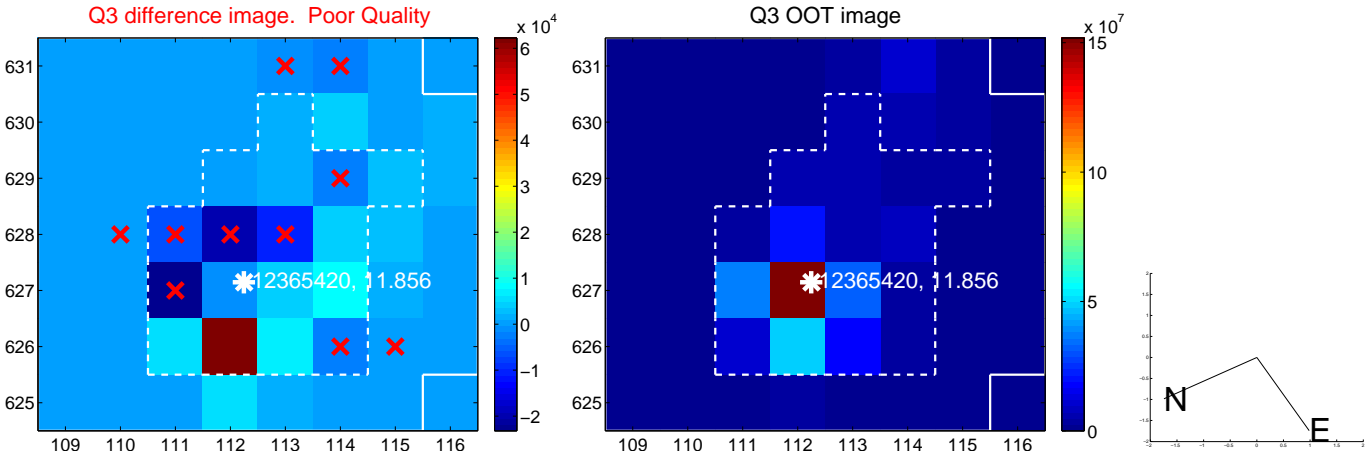
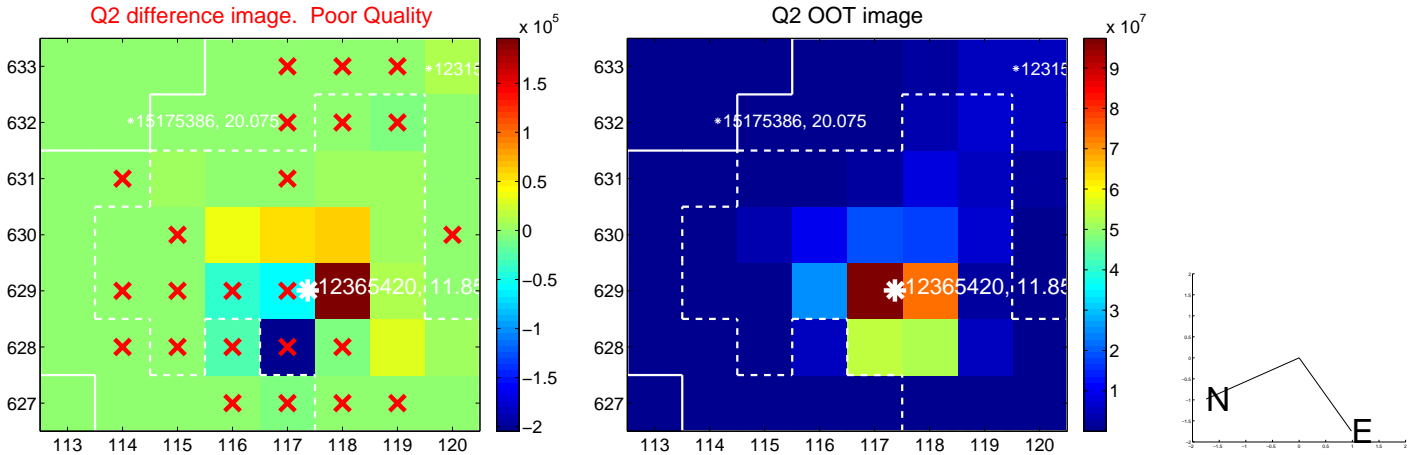
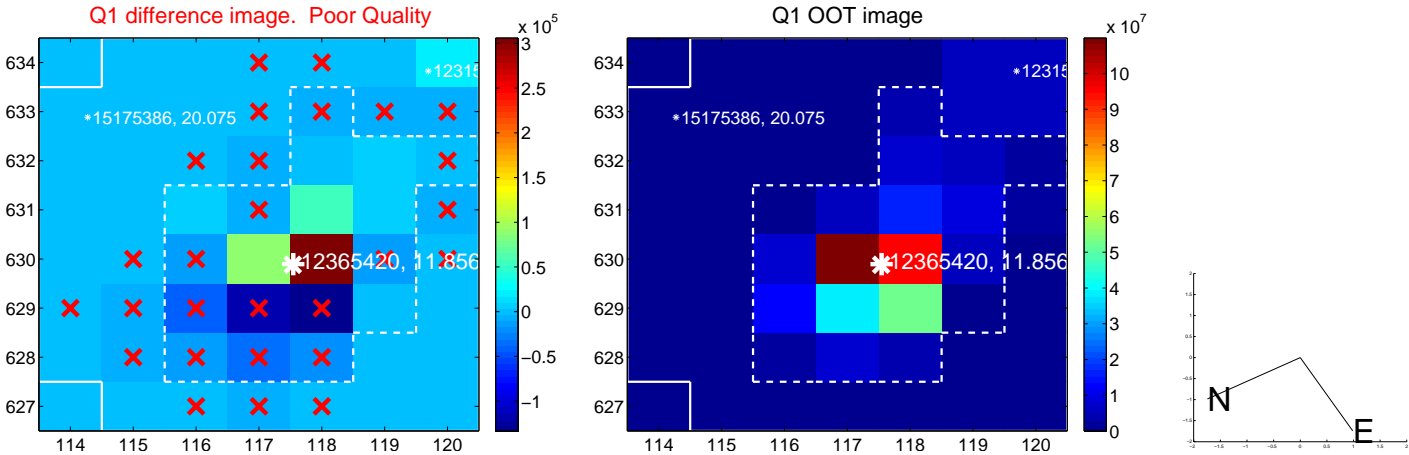


offset from photometric centroids

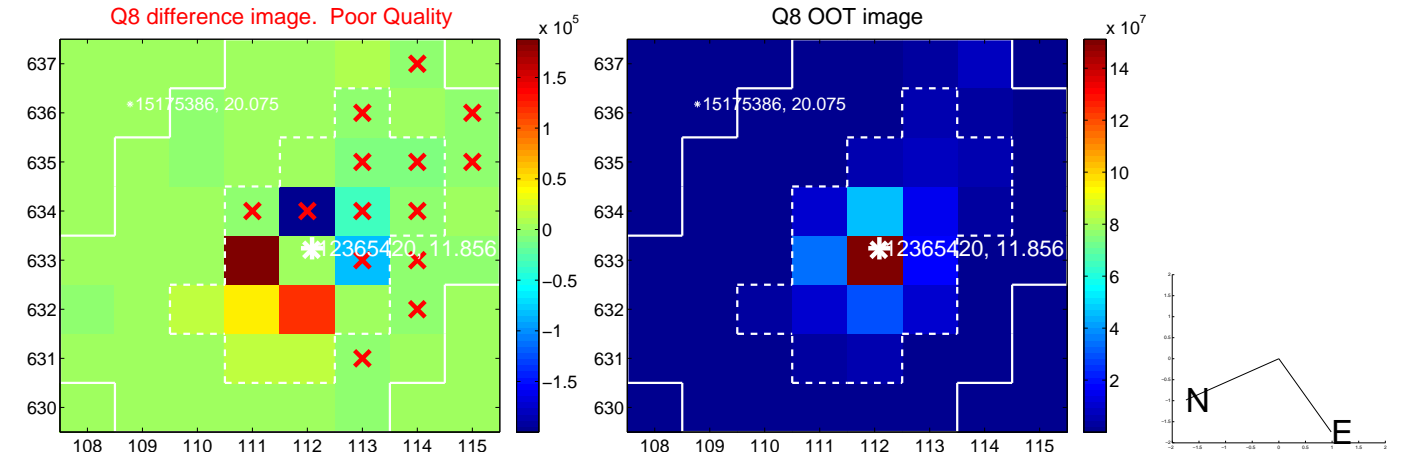
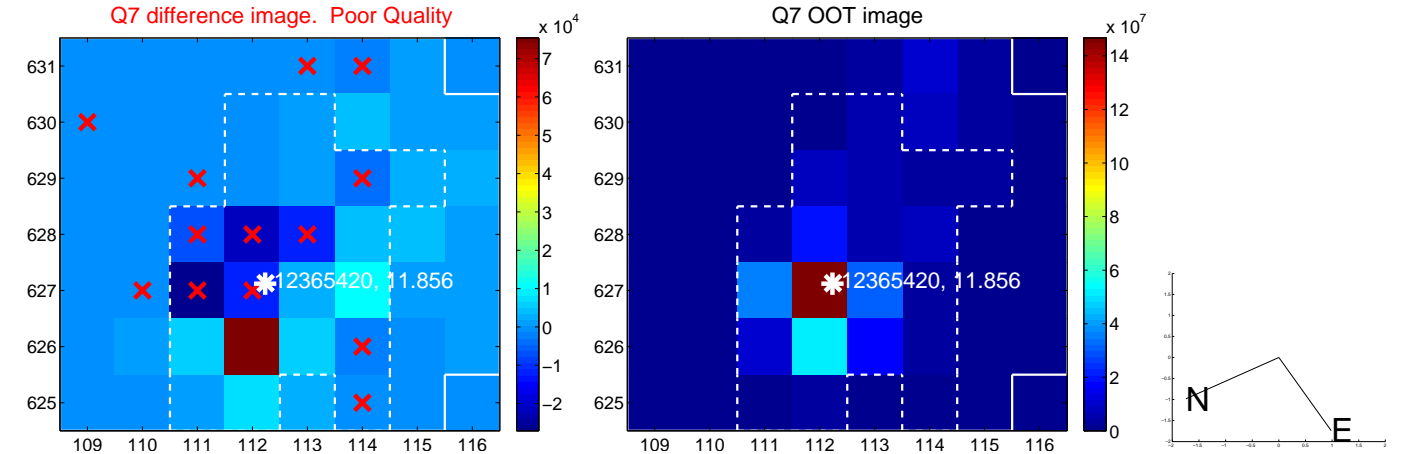
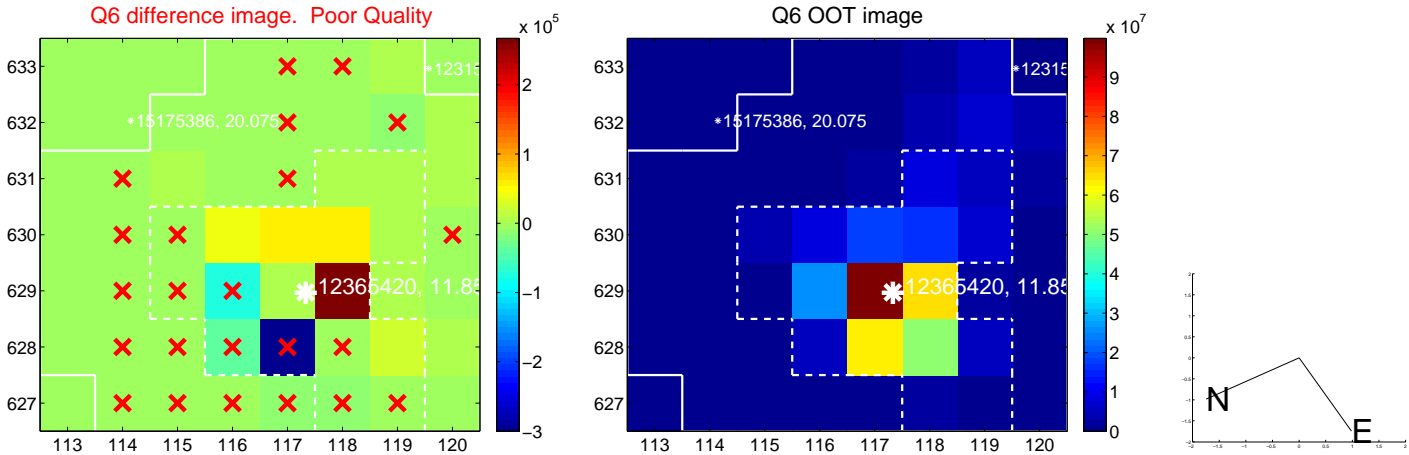
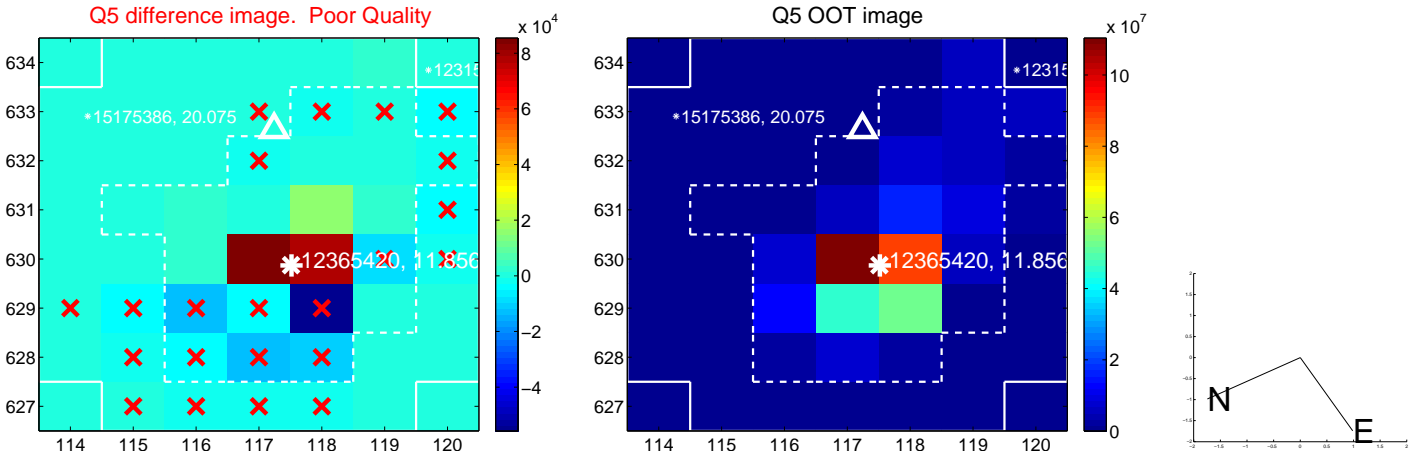


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

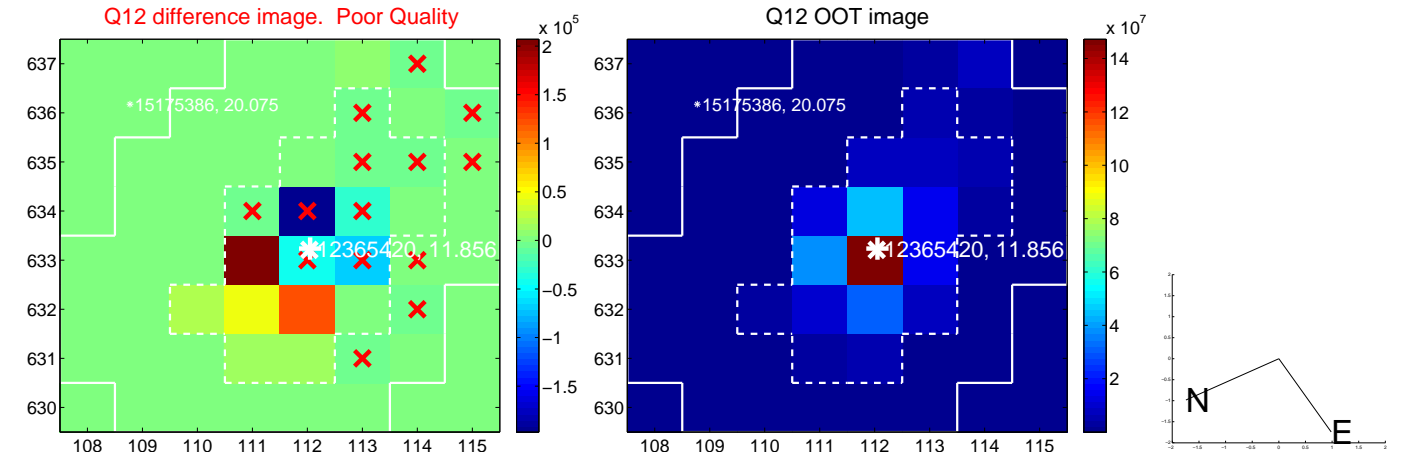
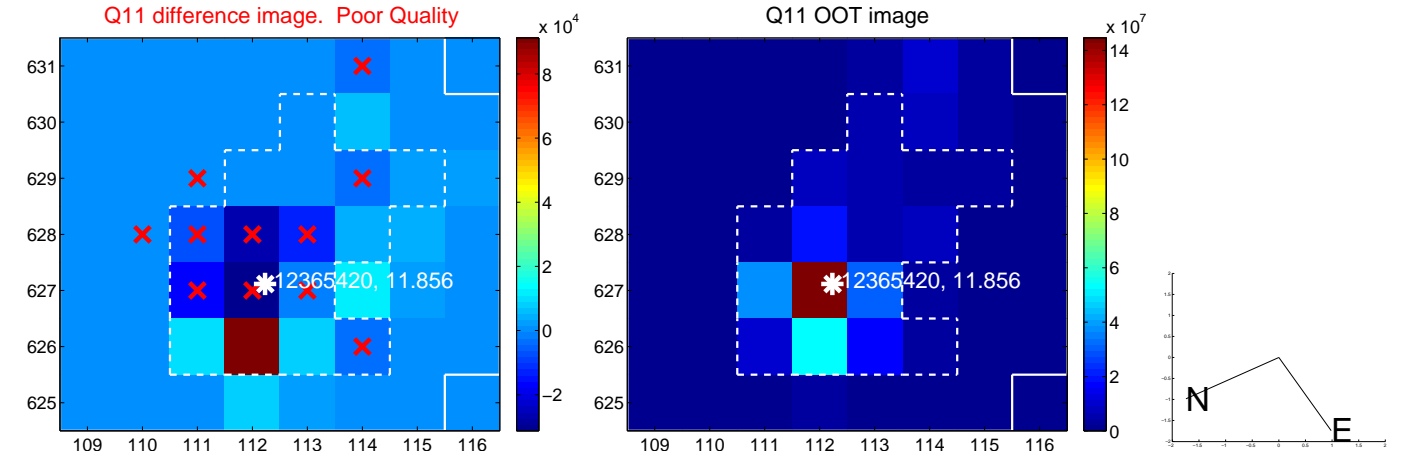
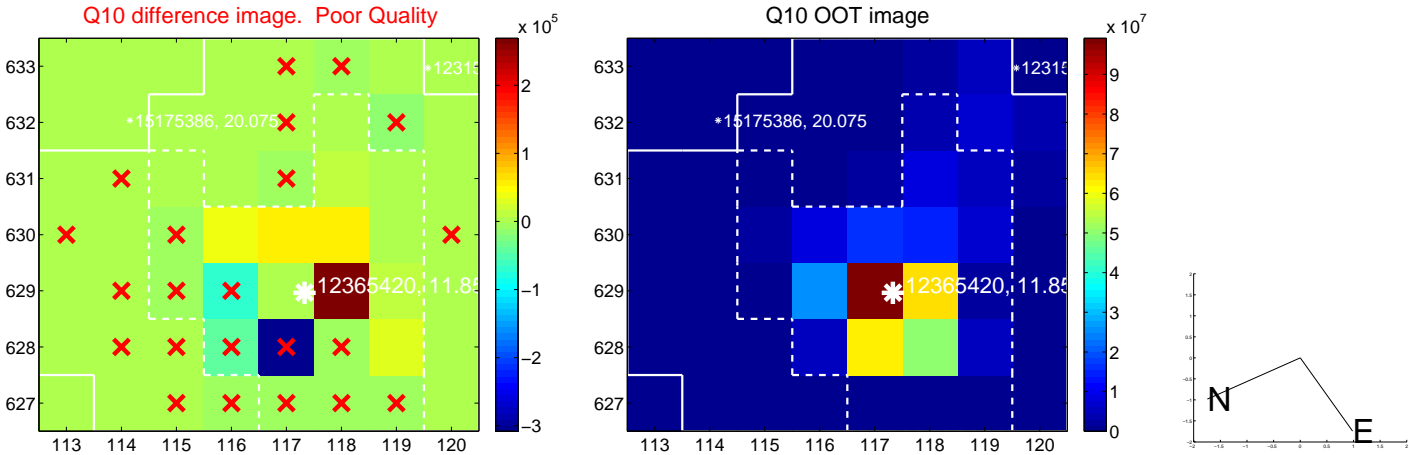
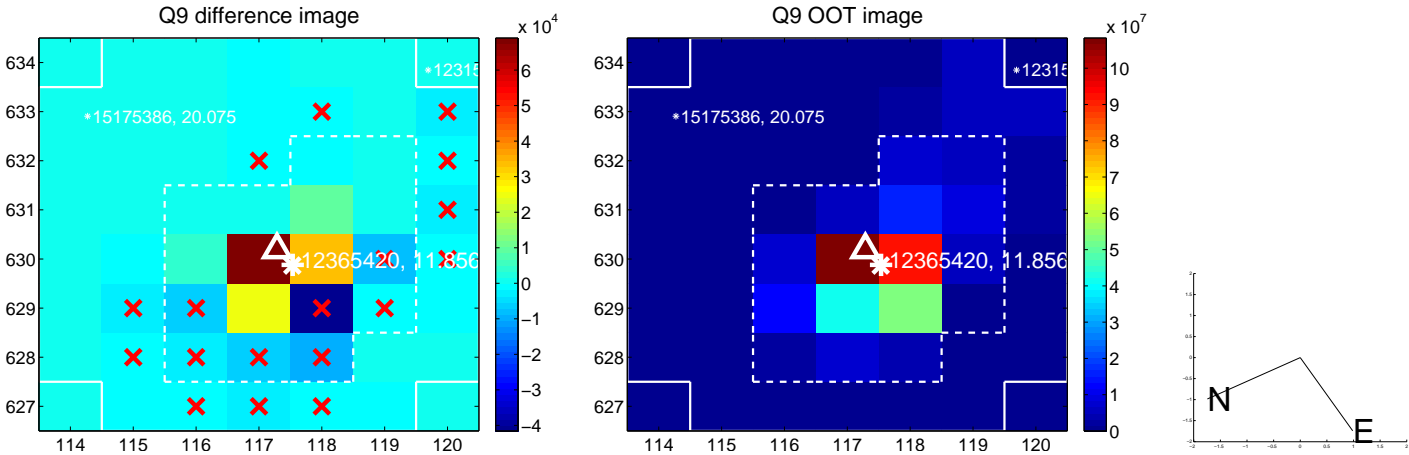
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



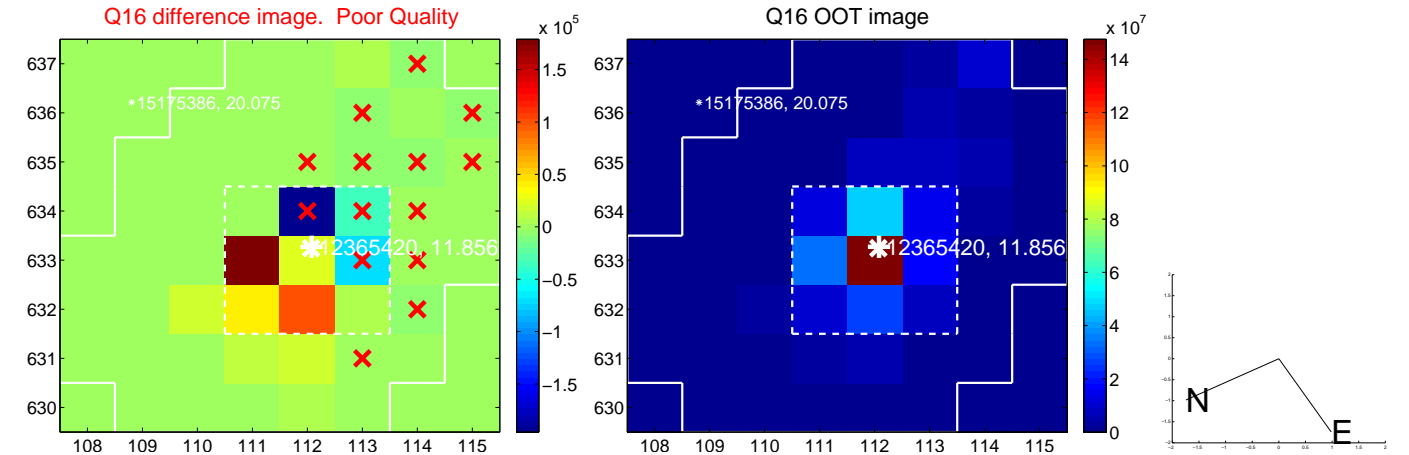
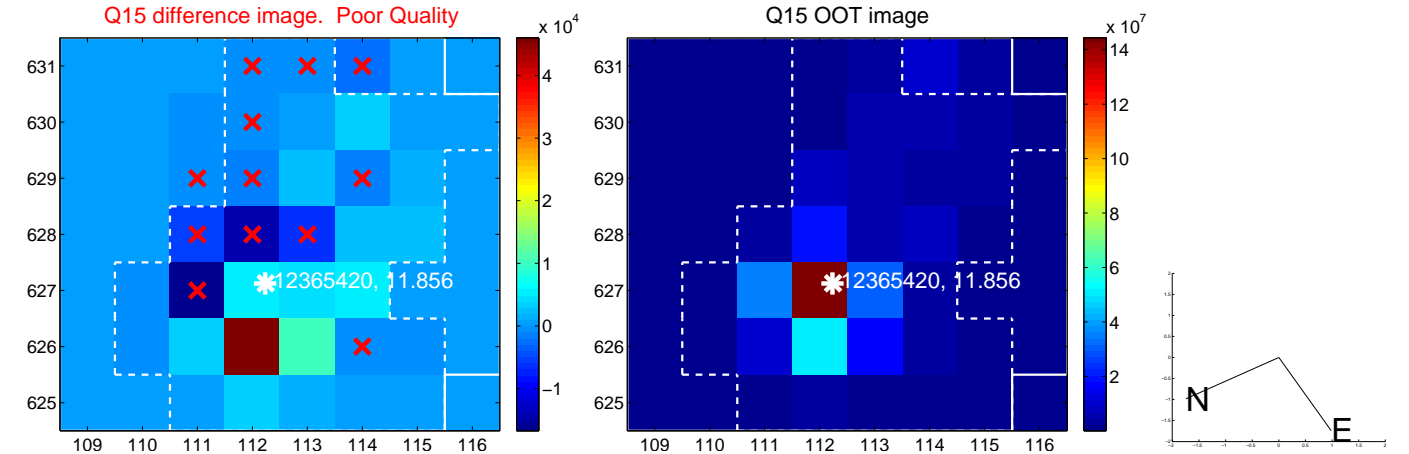
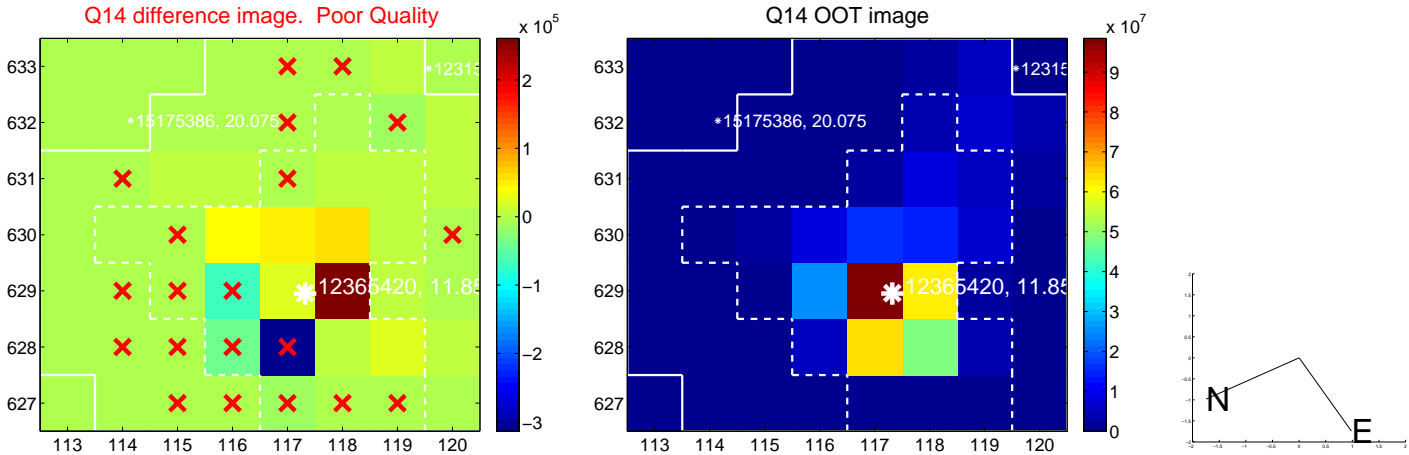
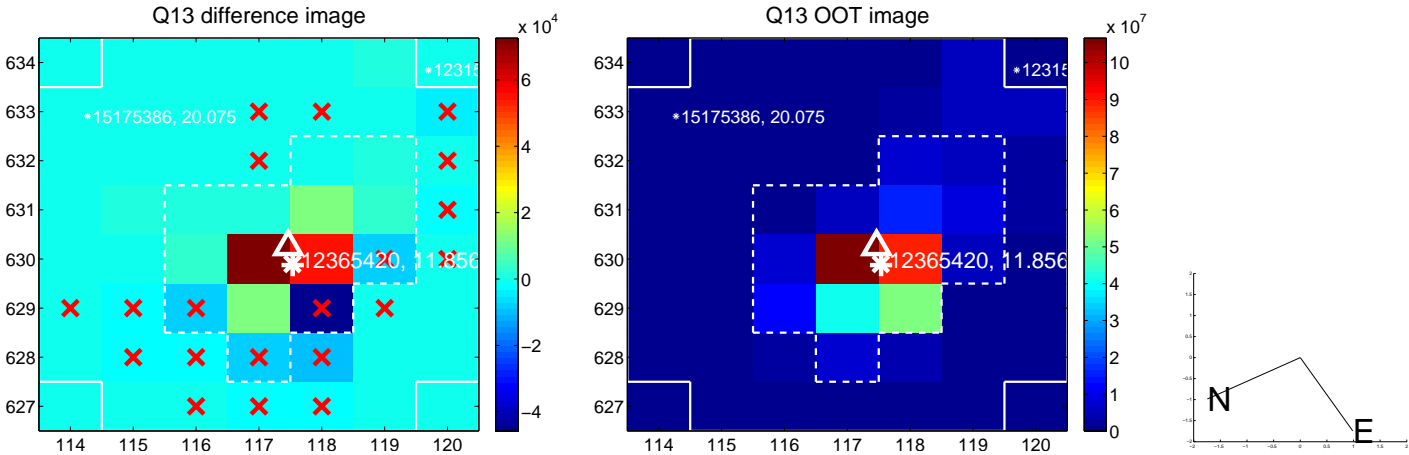
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



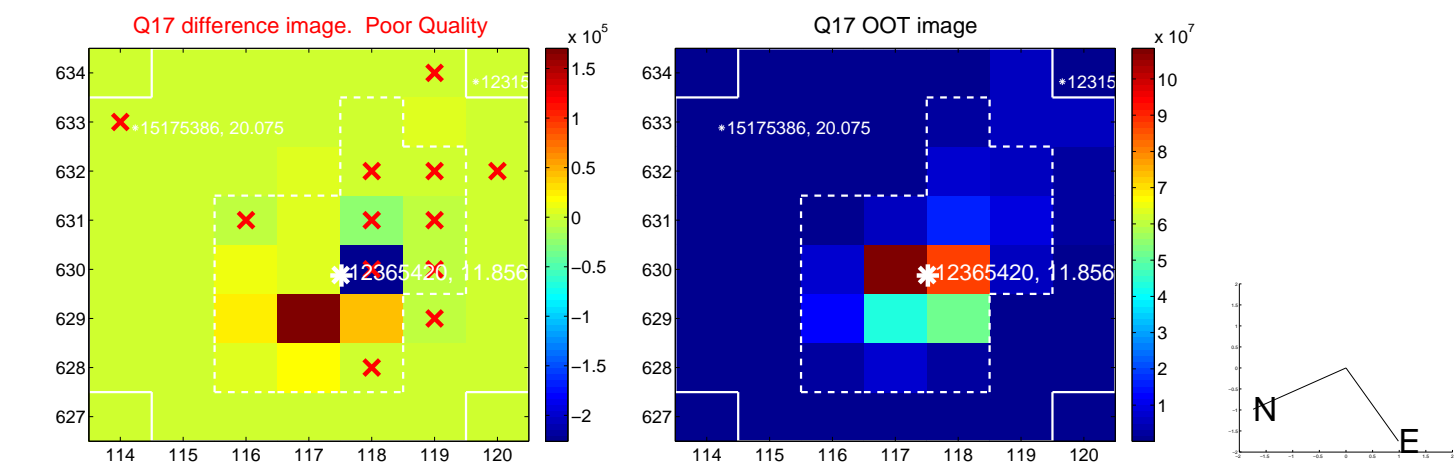
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



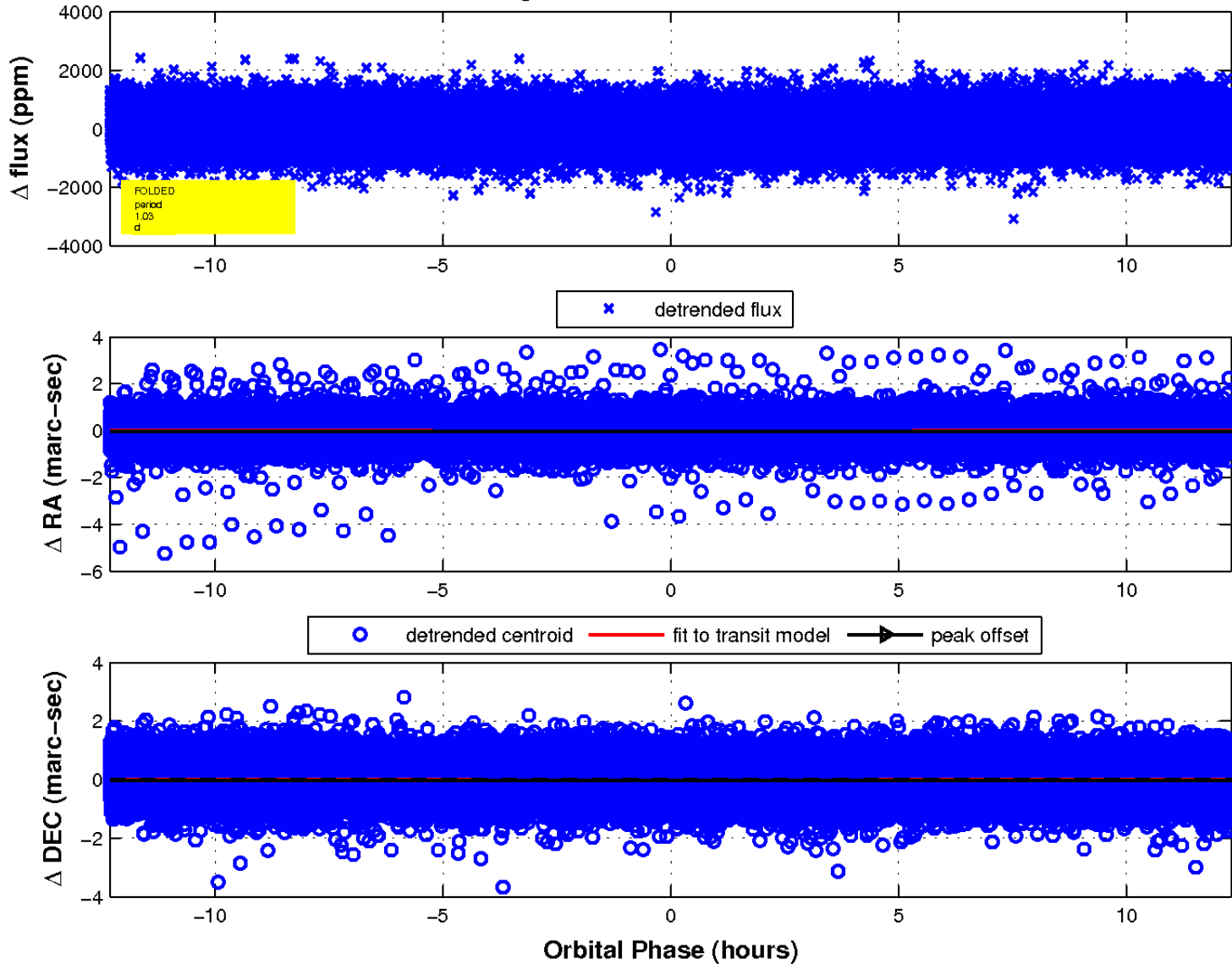
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

