

KIC 004472465

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})
004472465-01	OBS	No	1.035903	132.452482	63.5	3.803	10.2	10.1	3.63	7694	3.37	63695.55
004472465-02	OBS	No	0.690643	132.067261	53.5	2.721	7.3	7.8	3.63	7694	3.09	109361.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004472465-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004472465-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT

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

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

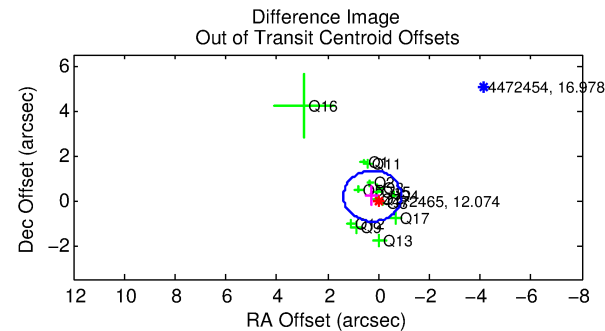
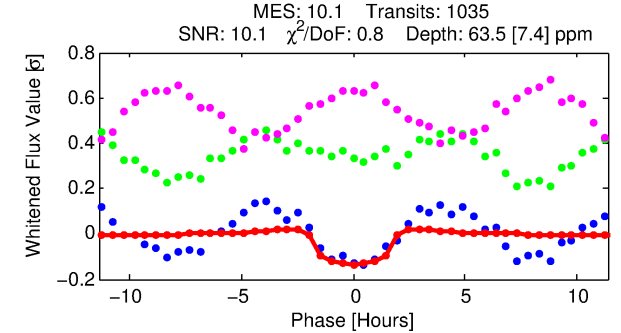
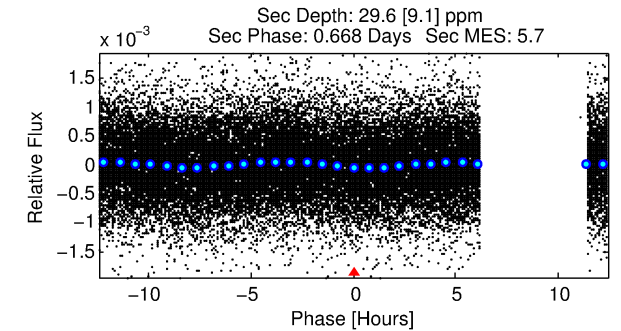
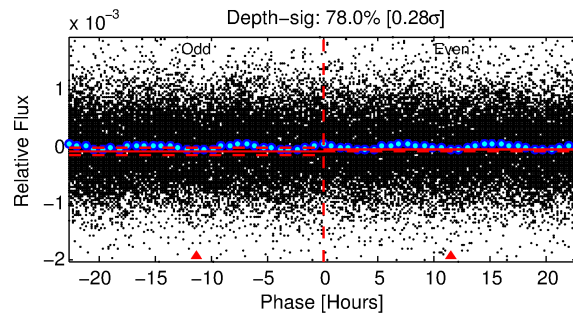
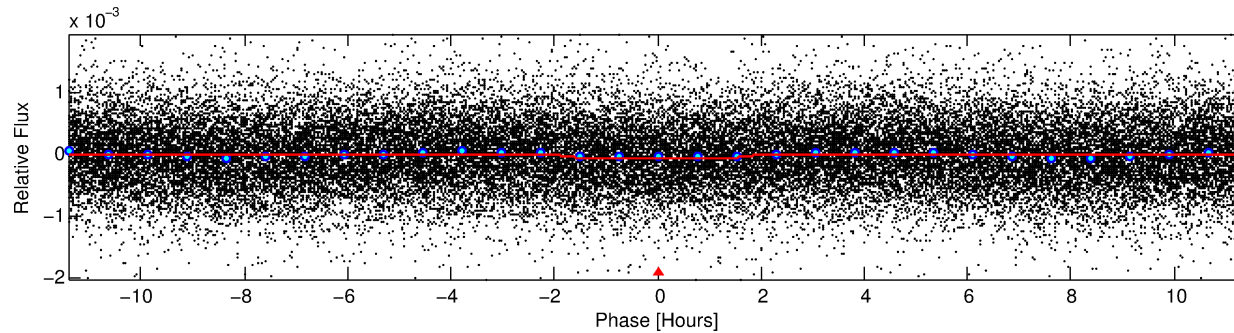
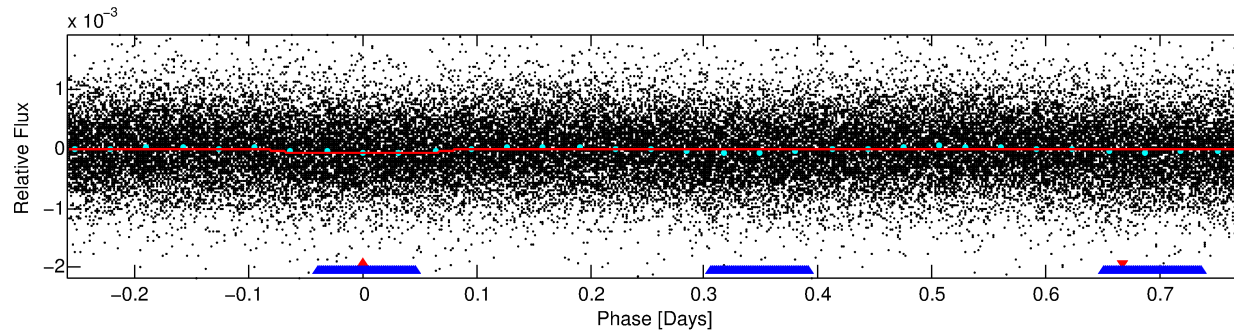
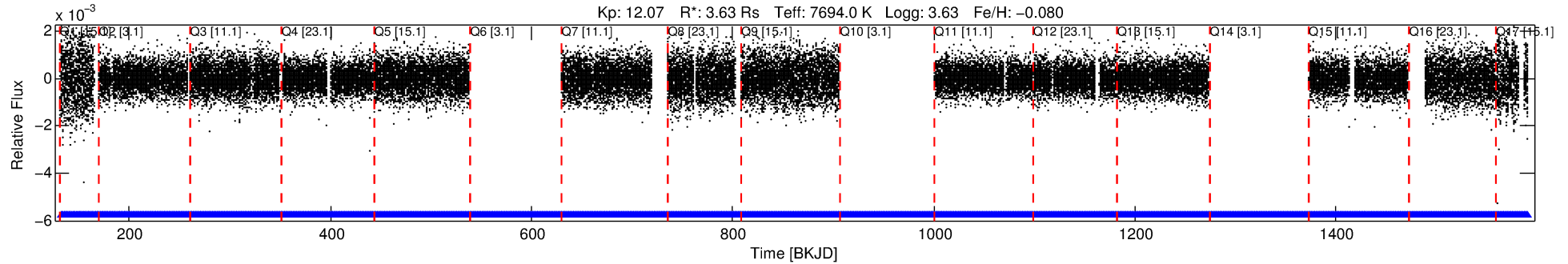
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004472465-01

No Significant Match Found

DV One-Page Summary

KIC: 4472465 Candidate: 1 of 2 Period: 1.036 d



DV Fit Results:

Period = 1.03590 [0.00001] d
Epoch = 132.4525 [0.0044] BKJD
Rp/R* = 0.0085 [0.0041]
a/R* = 1.33 [1.73]
b = 0.90 [0.62]
Seff = 63695.55 [52234.53]
Teff = 4051 [831] K
Rp = 3.37 [2.35] Re
a = 0.0255 [0.0126] AU
Ag = 0.93 [1.21] [-0.06 σ]
Teffp = 6151 [1591] K [1.17 σ]

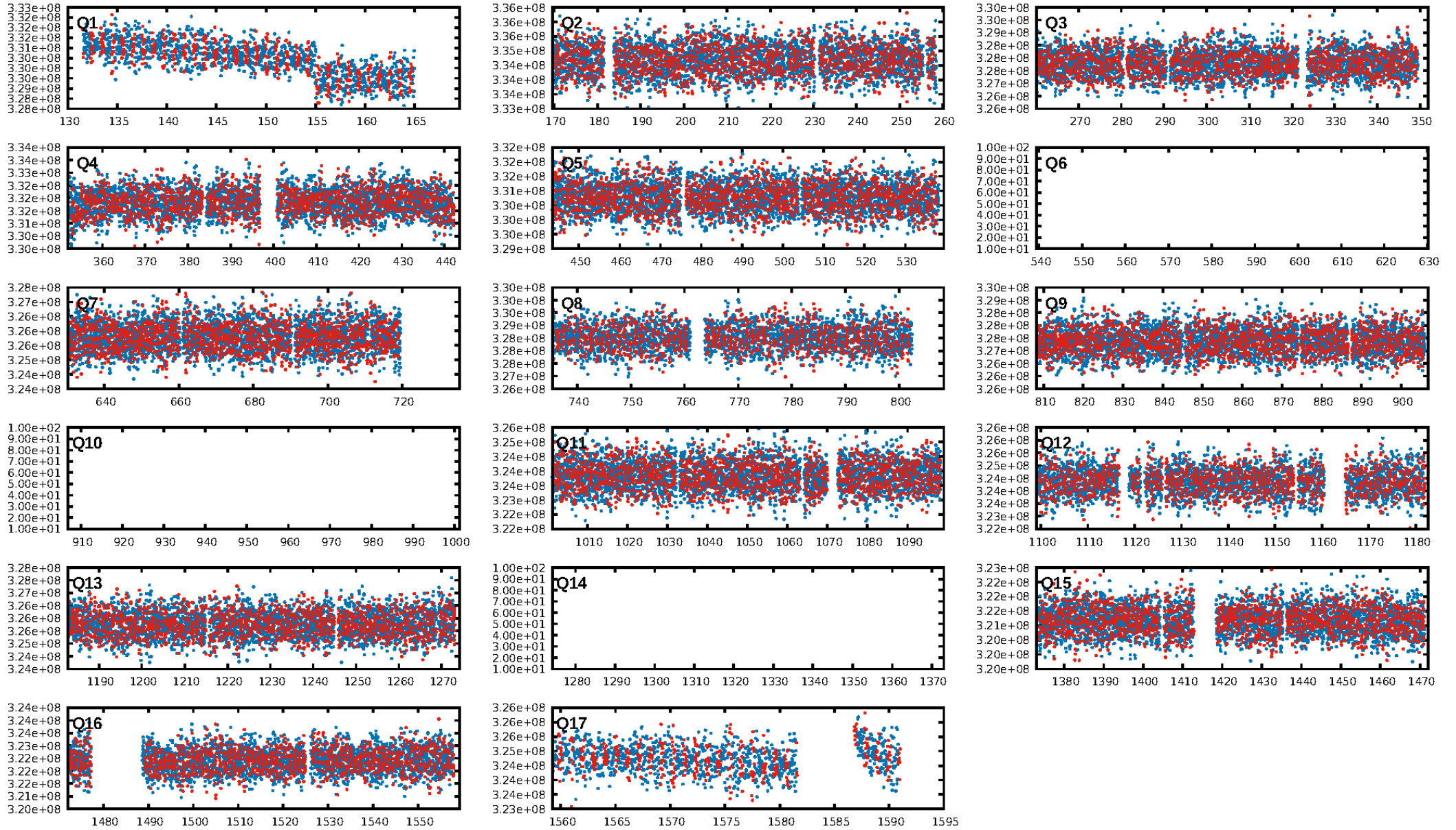
DV Diagnostic Results:

ShortPeriod-sig: 92.4% [1.77 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.37e-17
RollingBand-fgt: 1.00 [977/977]
GhostDiagnostic-chr: 1.953
Centroid-sig: N/A
Centroid-so: 0.044 arcsec [0.21 σ]
OotOffset-rm: 0.313 arcsec [0.83 σ]
KicOffset-rm: 0.414 arcsec [1.05 σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 0.00 [0/14]

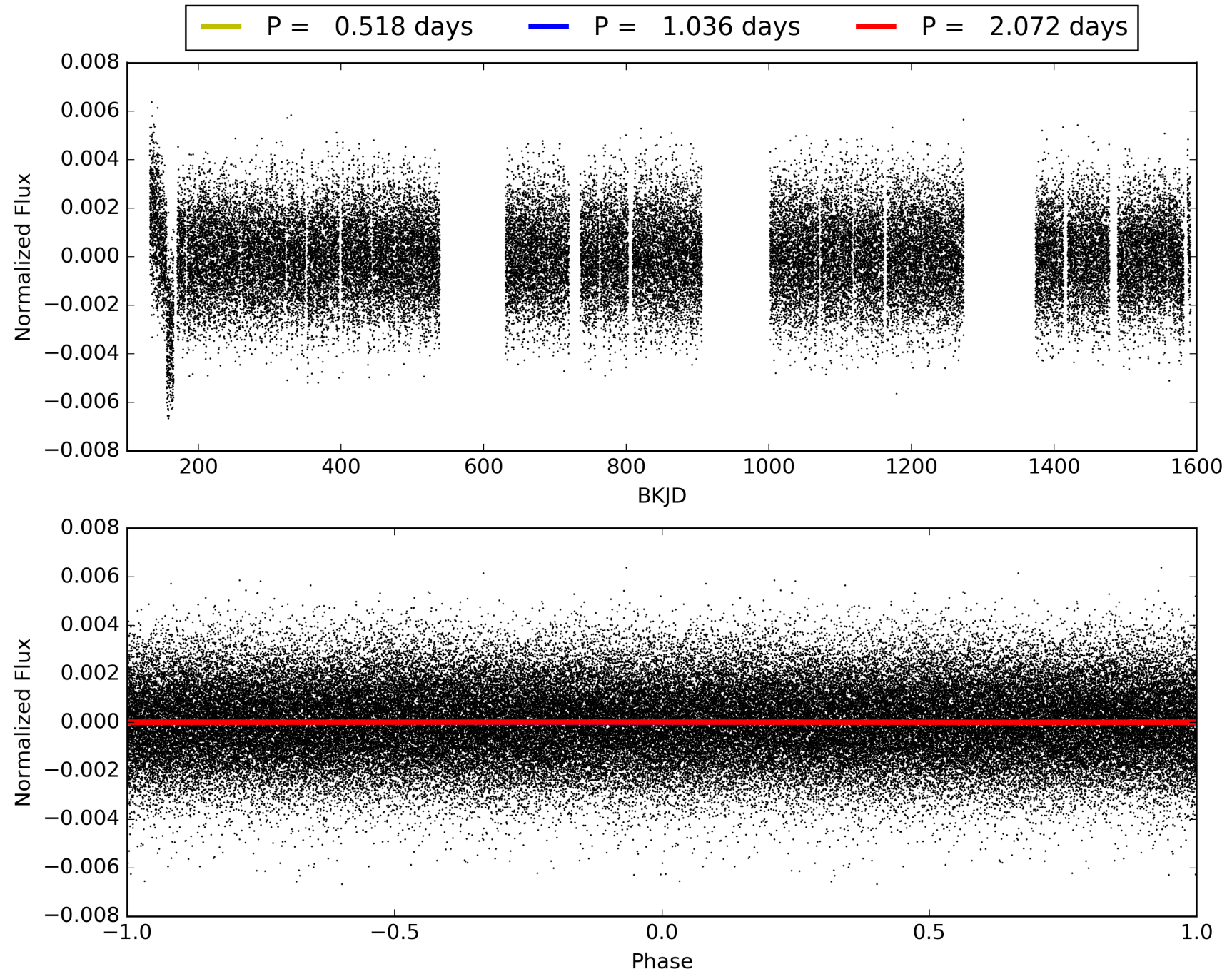
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:45:37 Z

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

TCE 004472465-01, PDC Light Curves

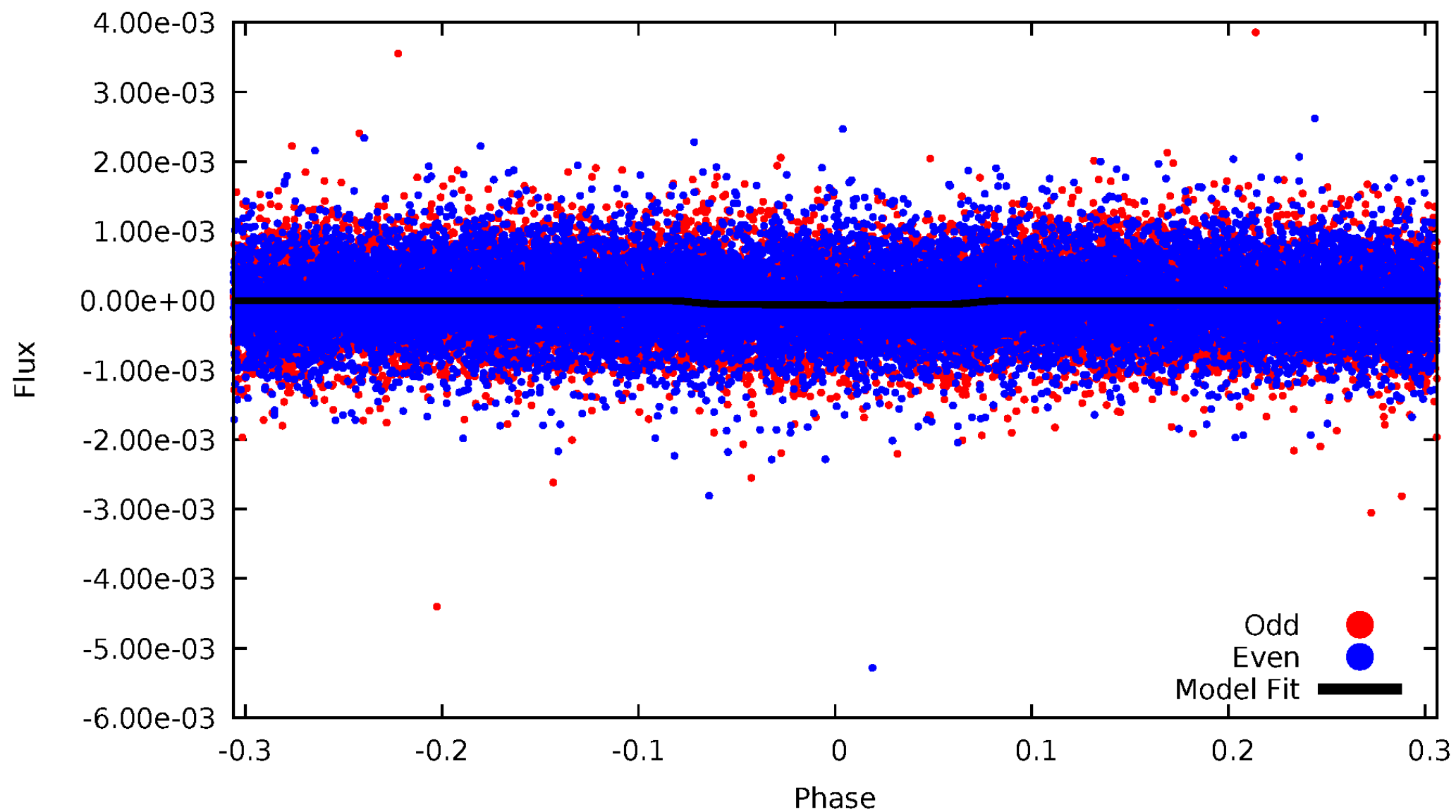


TCE 004472465-01



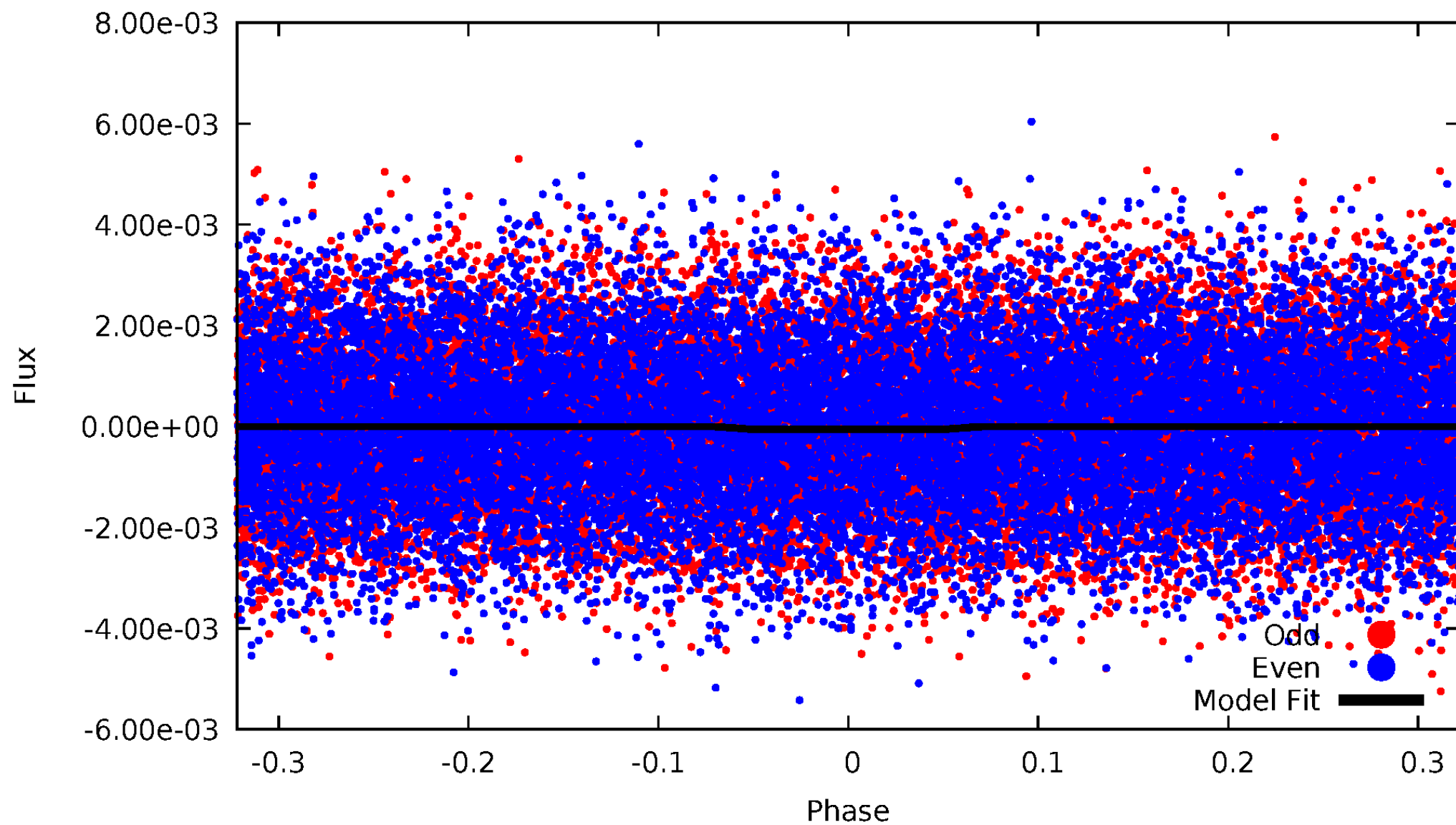
DV Odd/Even

TCE 004472465-01



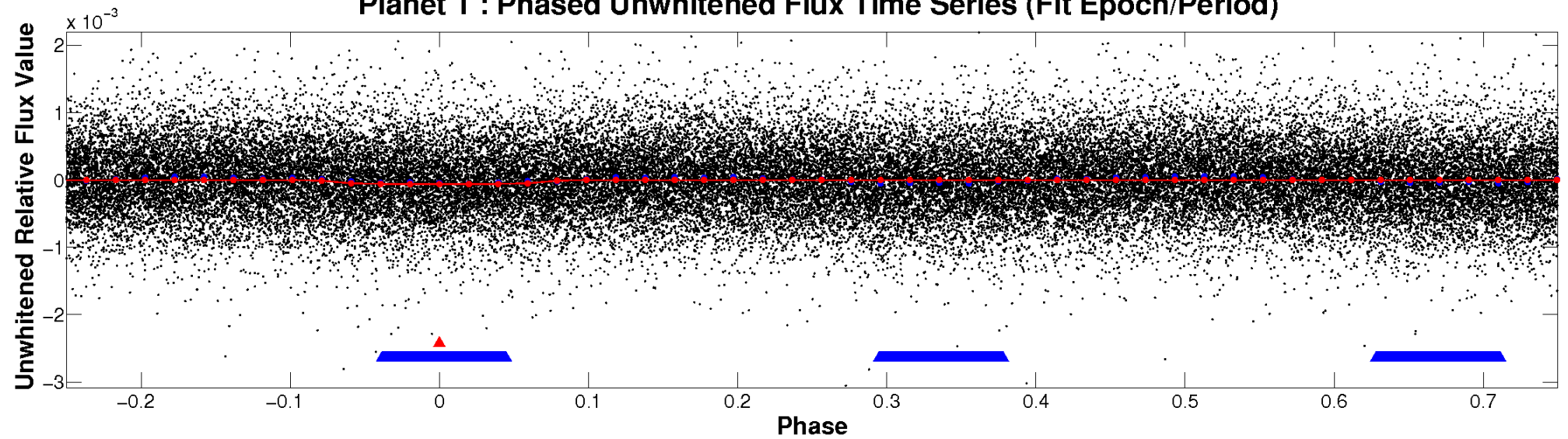
ALT Odd/Even

TCE 004472465-01

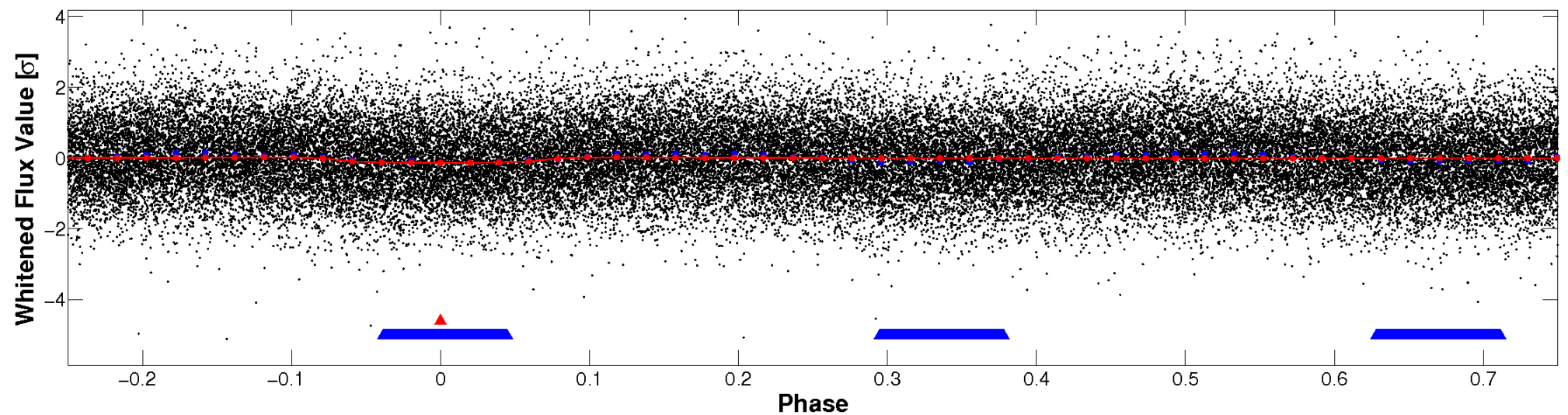


Non-Whitened Vs. Whitened Light Curve

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

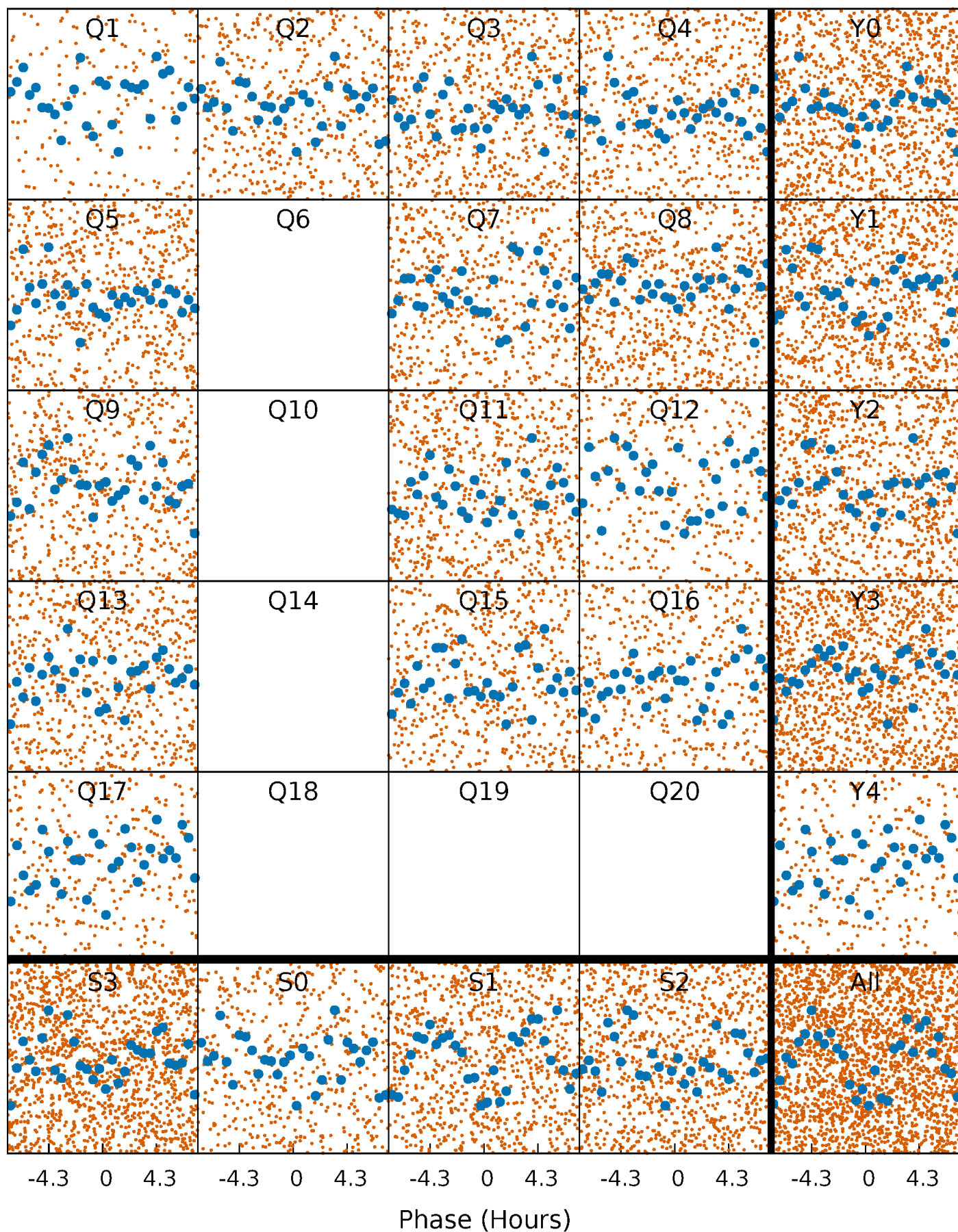


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



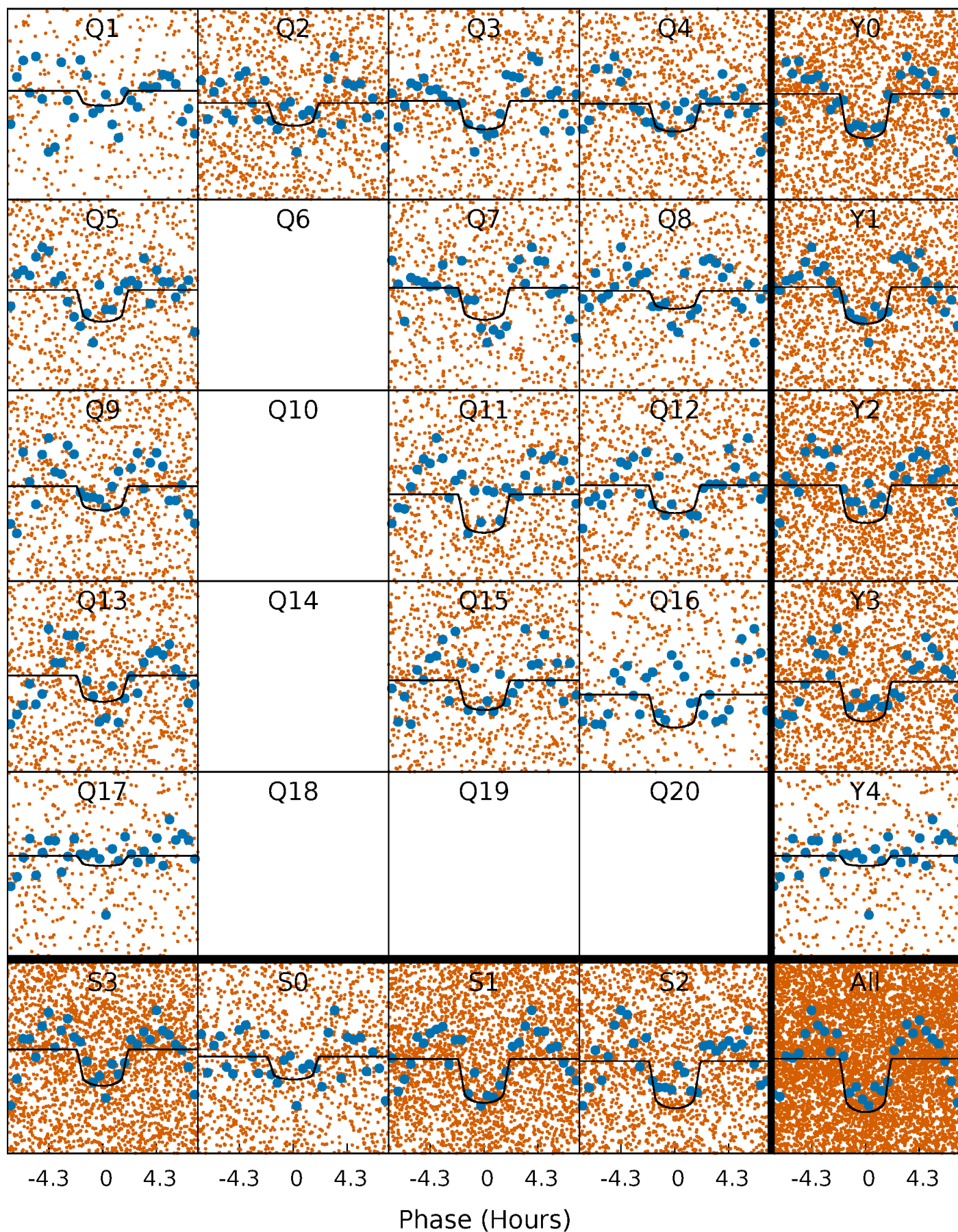
PDC Quarter-Phased Transit Curves

TCE 004472465-01 P= 1.035903 Days $T_0=132.452482$ (BKJD)



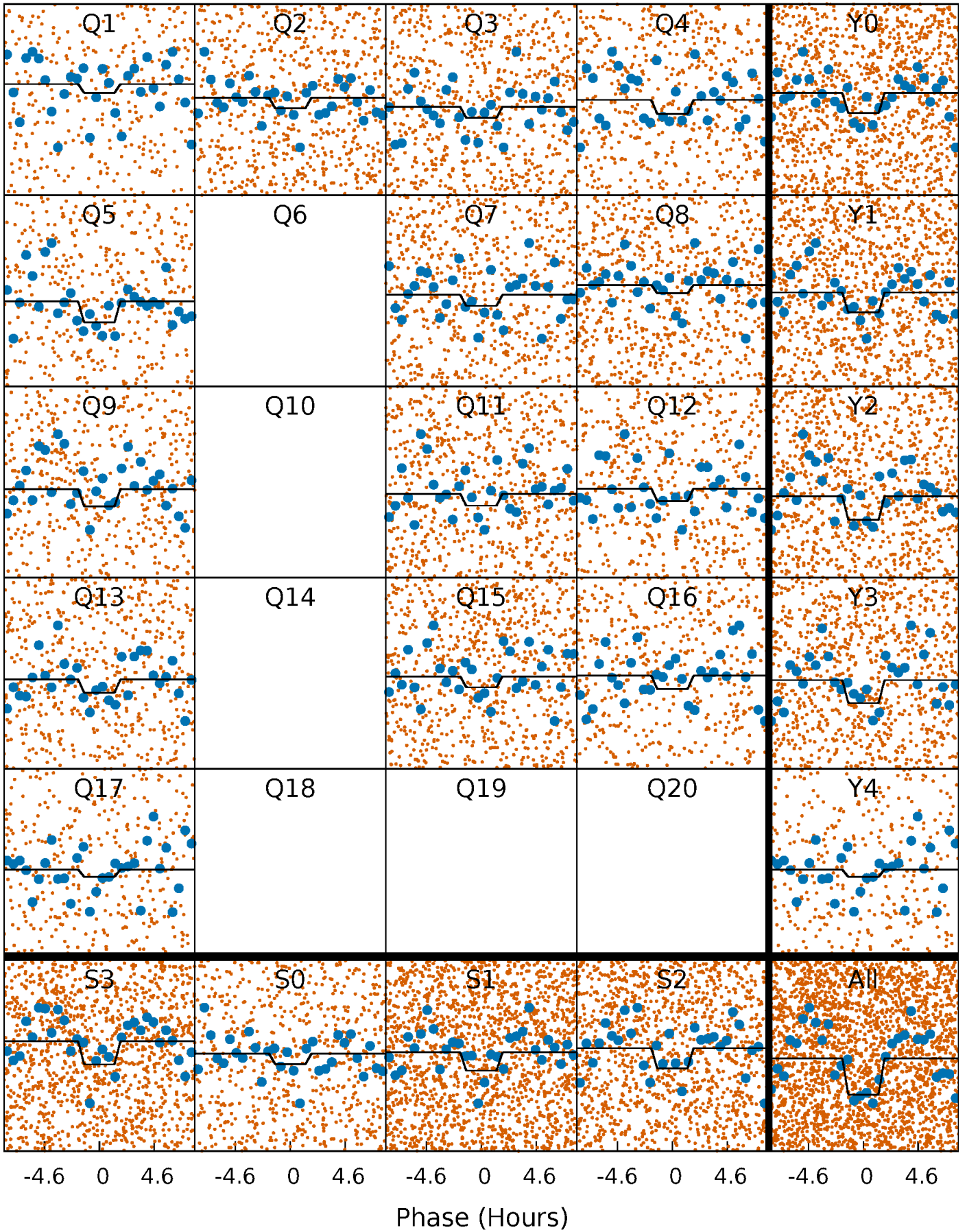
DV Quarter-Phased Transit Curves

TCE 004472465-01 P= 1.035903 Days $T_0=132.452482$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

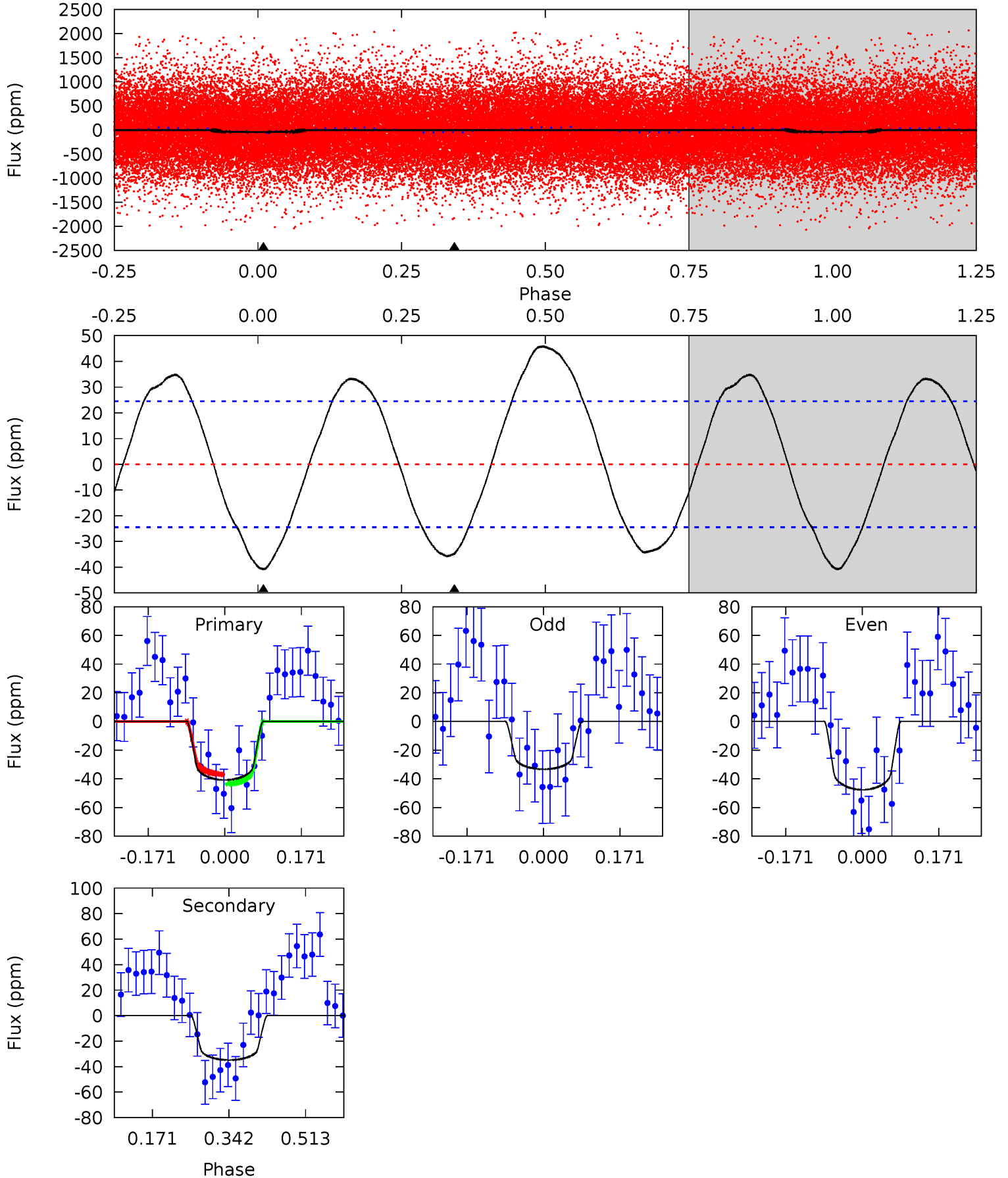
TCE 004472465-01 P= 1.035955 Days $T_0=132.427880$ (BKJD)



DV Model-Shift Uniqueness Test

004472465-01, P = 1.035903 Days, E = 131.416579 Days

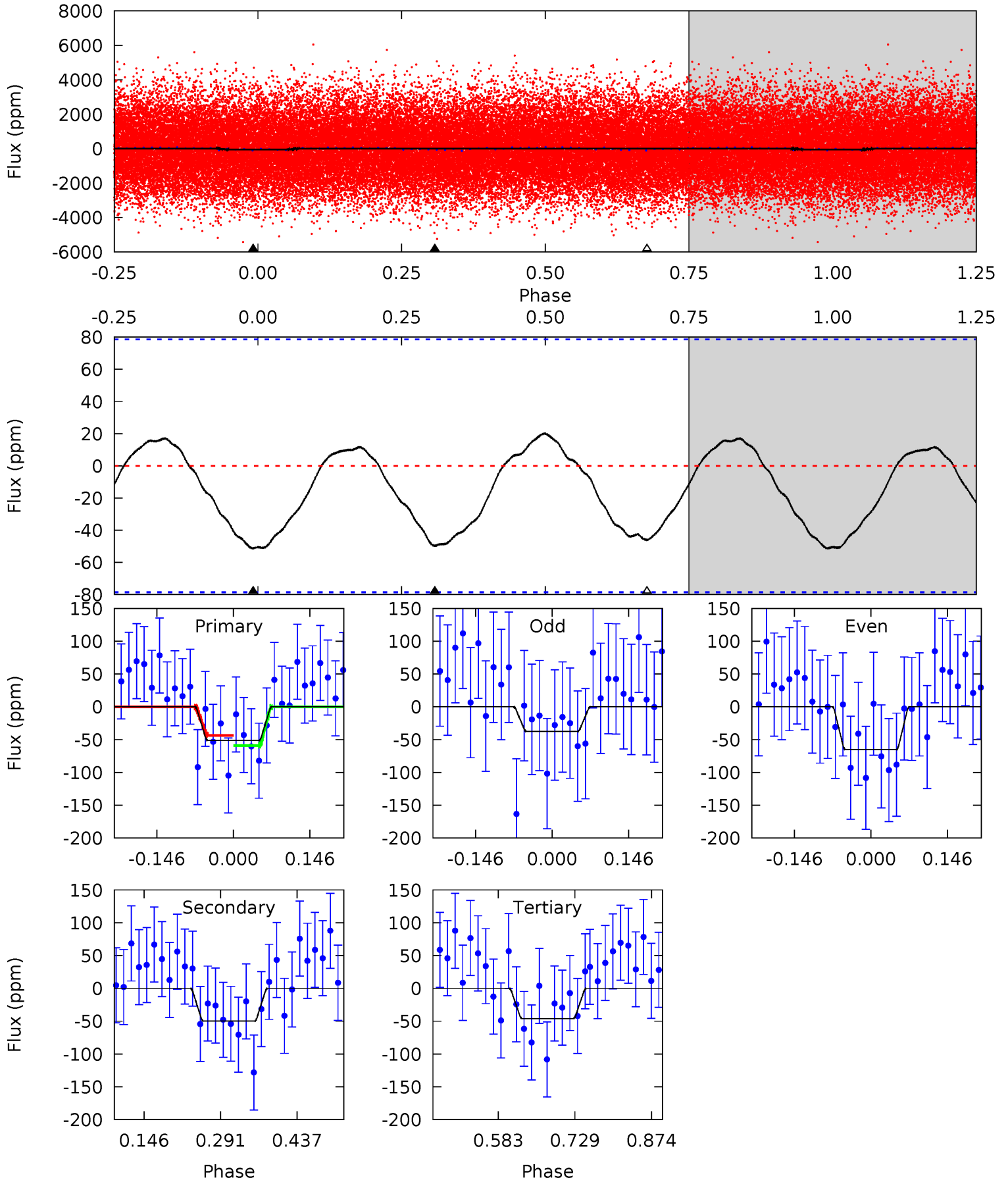
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.42	6.33	0	0	4.45	1.37	4.73	7.42	7.42	6.33	6.33	1.29	1.06	0.53	0.60



Alt Model-Shift Uniqueness Test

004472465-01, P = 1.035955 Days, E = 131.391925 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.93	2.84	2.63	0	4.49	1.45	1.29	0.30	2.93	0.21	2.84	0.79	1.35	0.28	0.44



Stellar Parameters For KIC 004472465

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7694^{+213}_{-320}	$3.631^{+0.476}_{-0.084}$	$-0.080^{+0.200}_{-0.300}$	$3.627^{+0.604}_{-1.812}$	$2.054^{+0.291}_{-0.499}$	$0.061^{+0.318}_{-0.017}$
	+3%/-4%	+13%/-2%	+250%/-375%	+17%/-50%	+14%/-24%	+525%/-28%
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 004472465-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-35 ± 5	$2.99^{+1.71}_{-1.42}$	5436^{+389}_{-663}	5904^{+2537}_{-1461}	$1.433^{+3.474}_{-0.863}$
Alt.	-50 ± 18	$2.66^{+1.71}_{-1.39}$	5460^{+379}_{-672}	7002^{+4496}_{-1877}	$2.499^{+7.963}_{-1.671}$

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

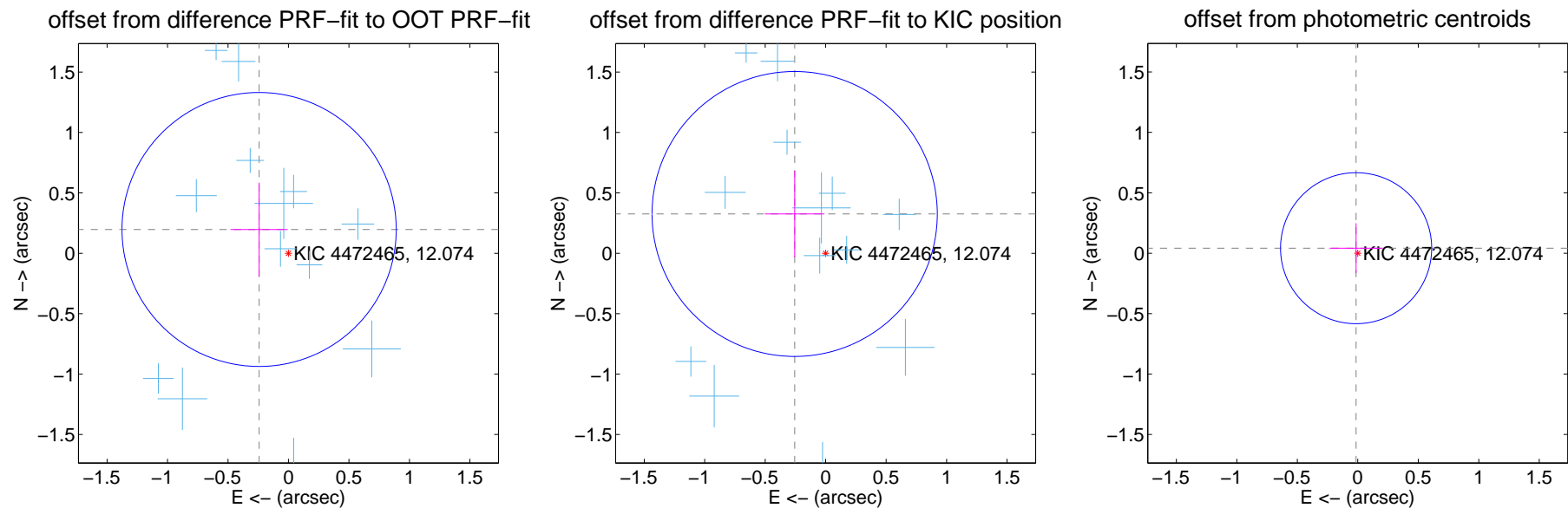
DV Centroid Data

Supplemental centroid analysis for 004472465-01. Kepler magnitude: 12.07. Transit SNR 10.11

There are 13 quarters with good PRF difference image offsets

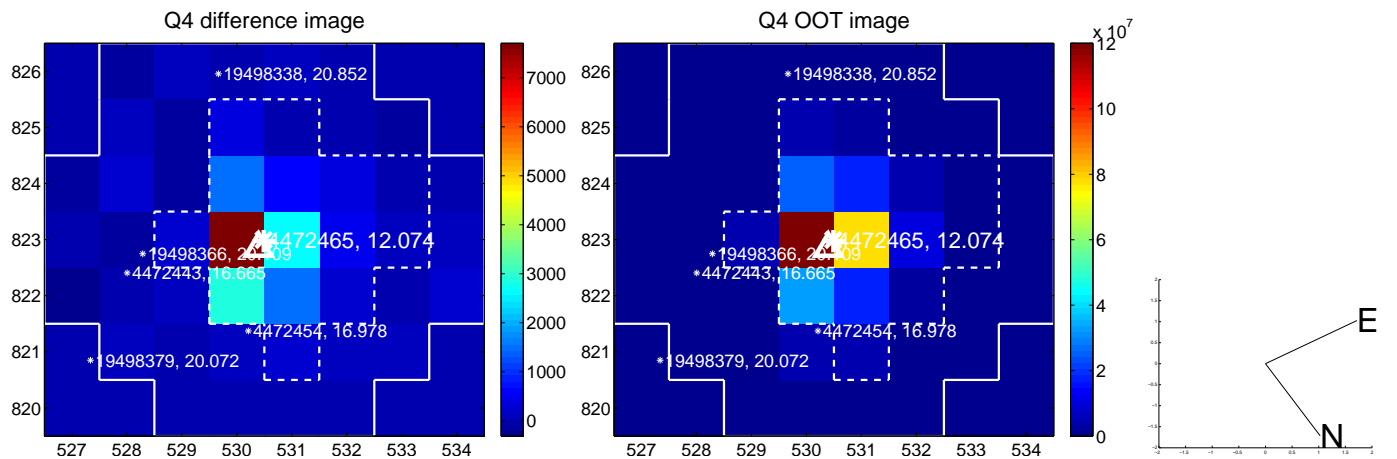
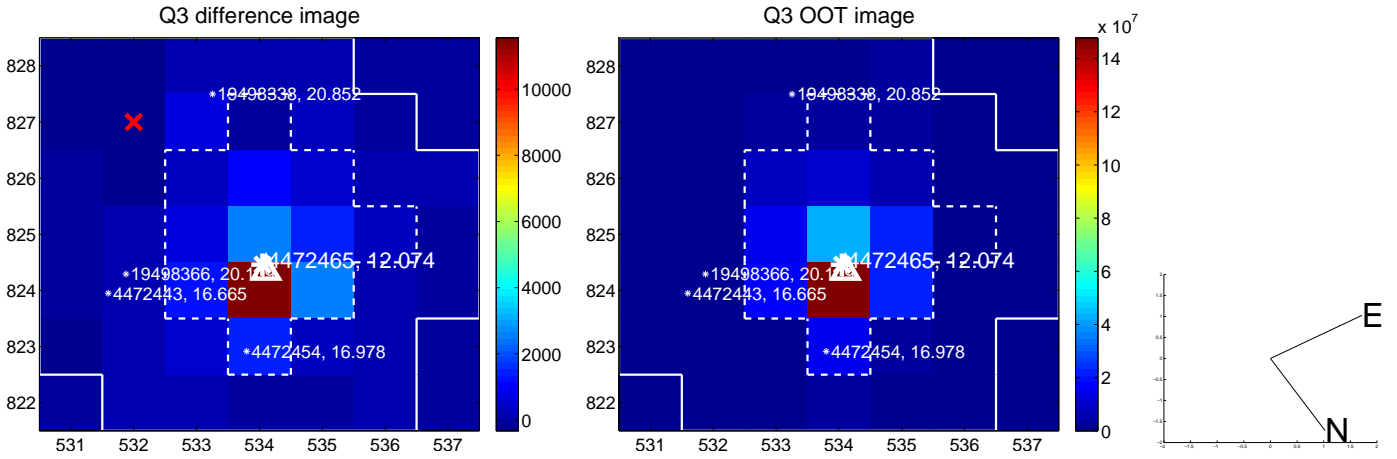
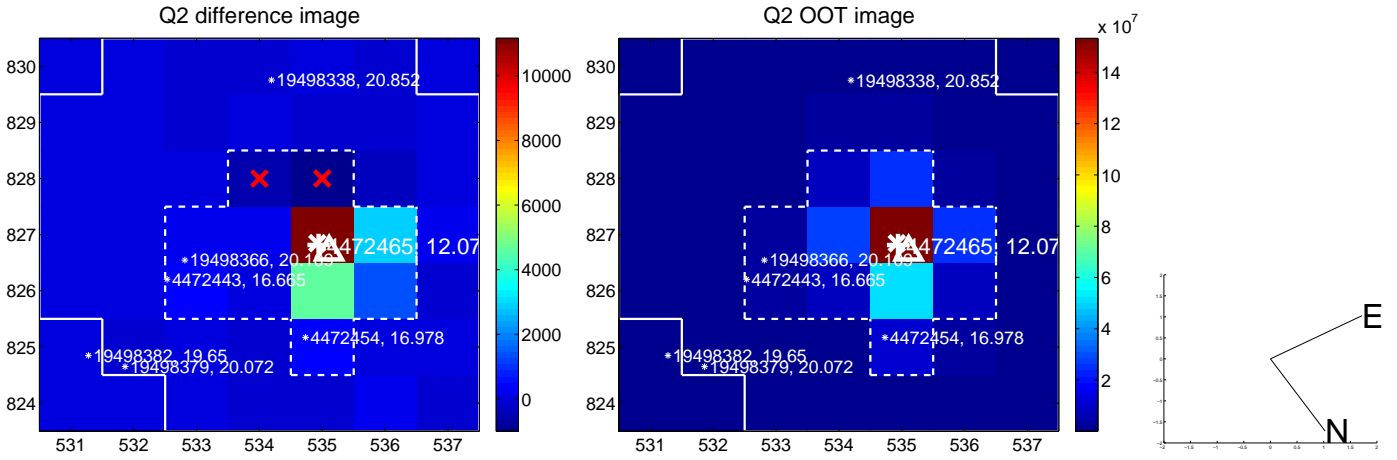
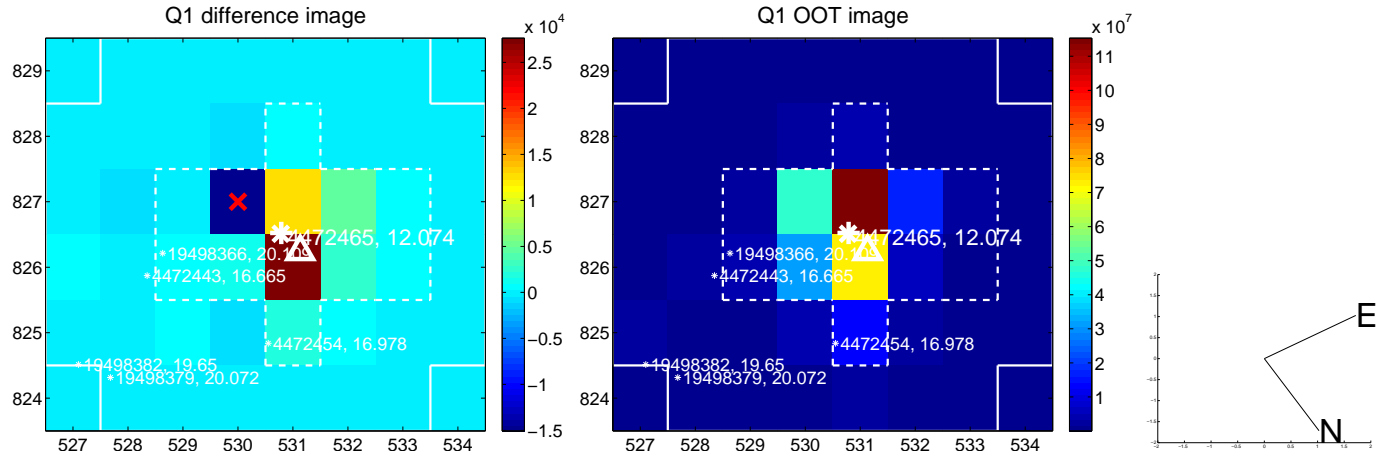
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.313 ± 0.378	0.83	0.243 ± 0.237	0.197 ± 0.387
PRF-fit source offset from KIC position	0.414 ± 0.393	1.05	0.256 ± 0.246	0.325 ± 0.358
photometric centroid source offset	0.04 ± 0.21	0.21	0.01 ± 0.22	0.04 ± 0.21

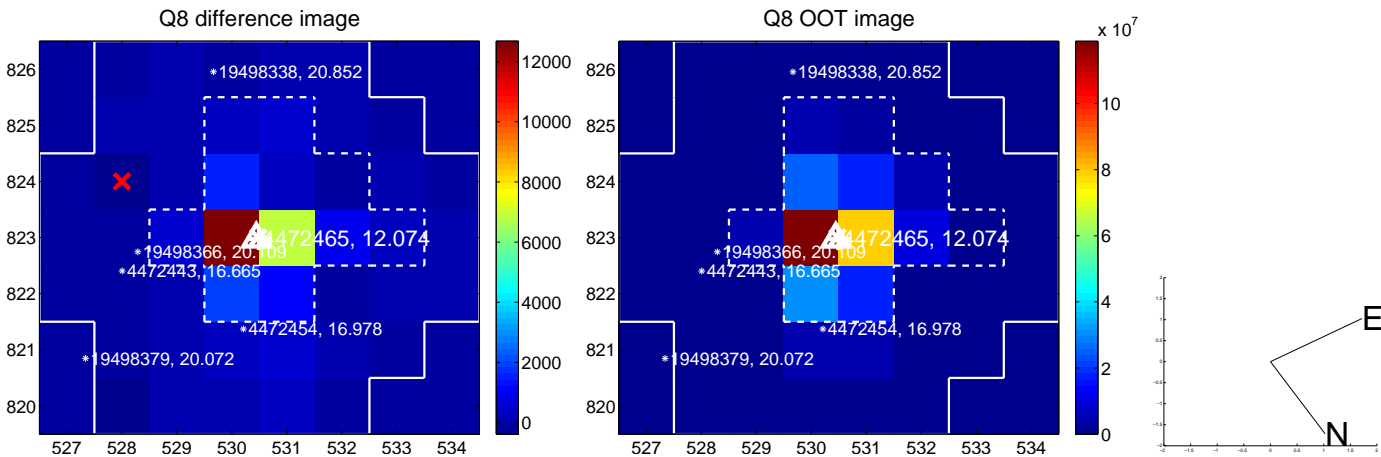
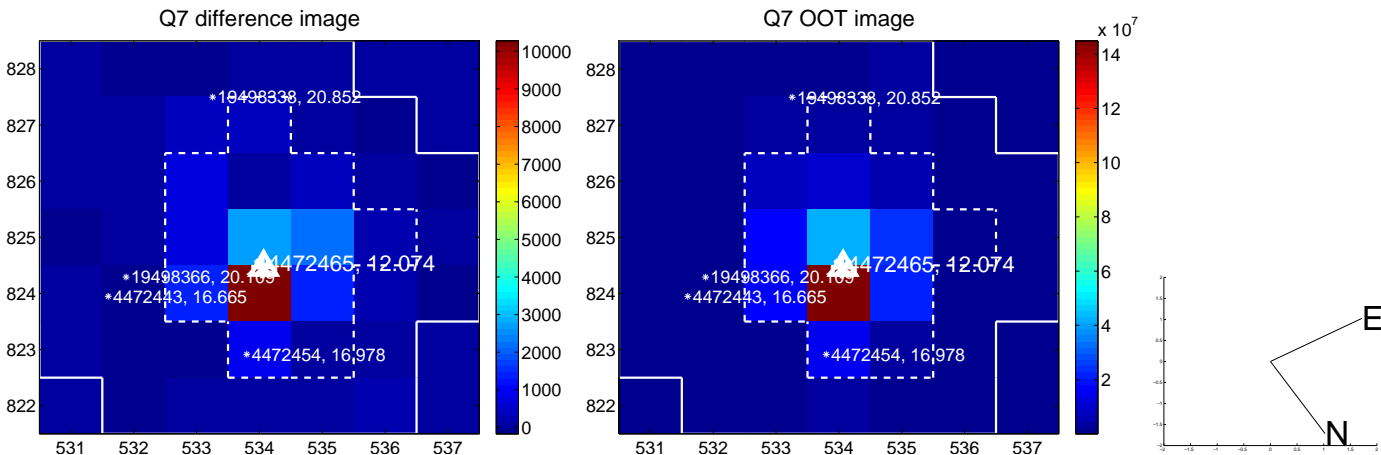
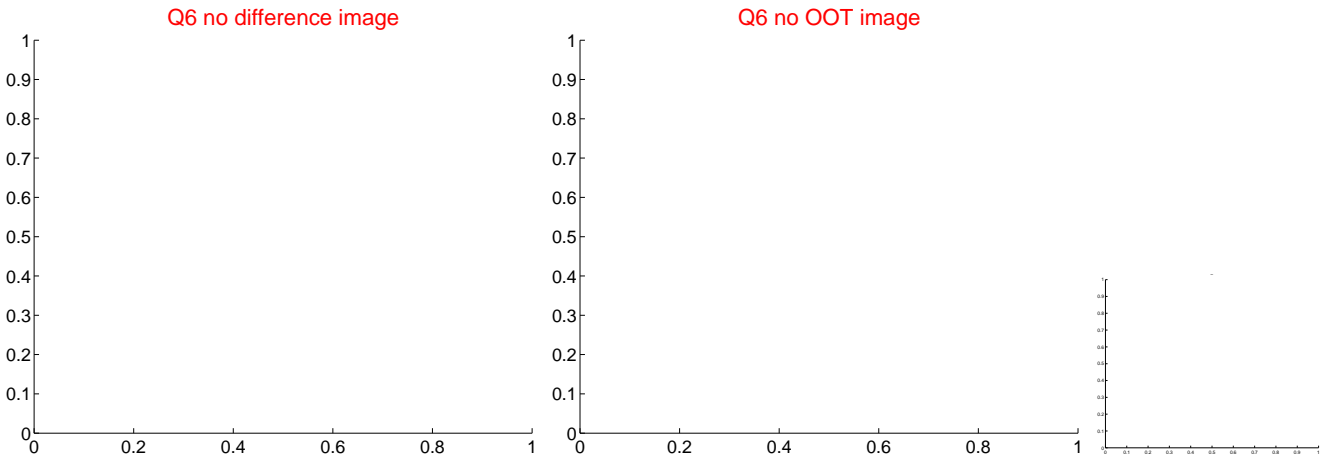
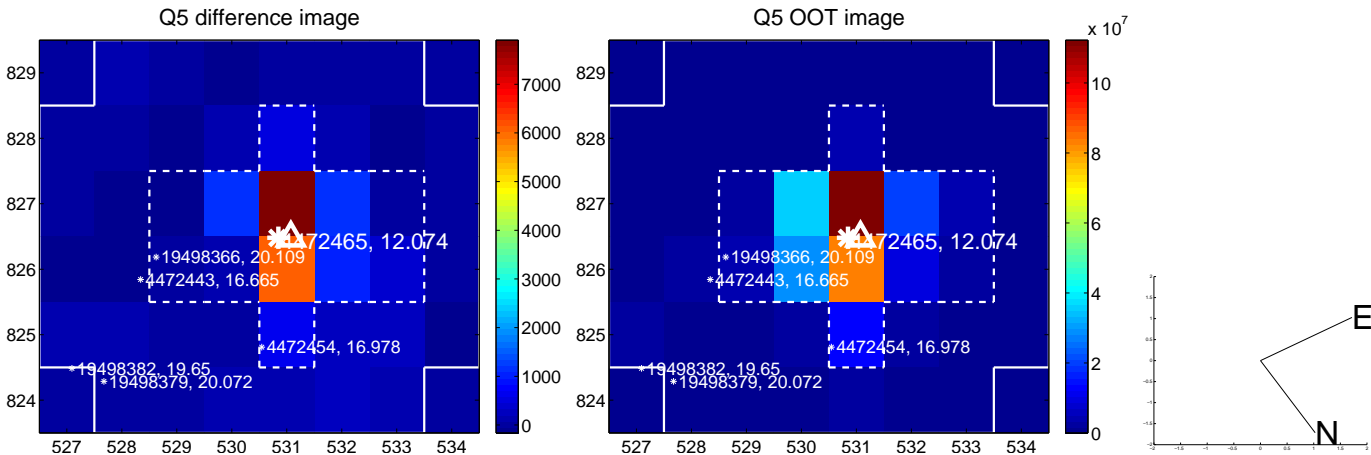


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

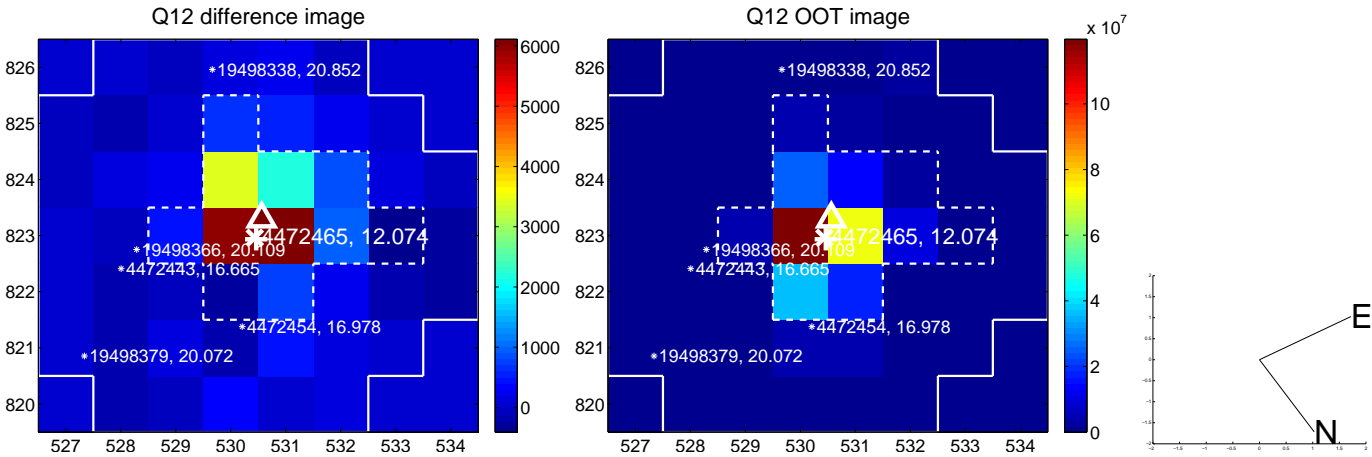
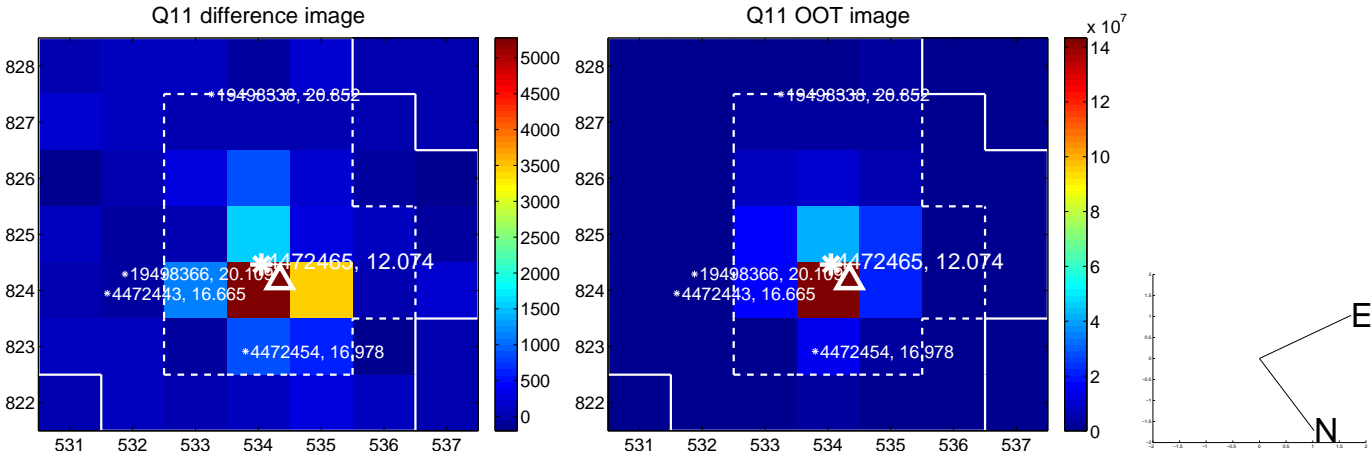
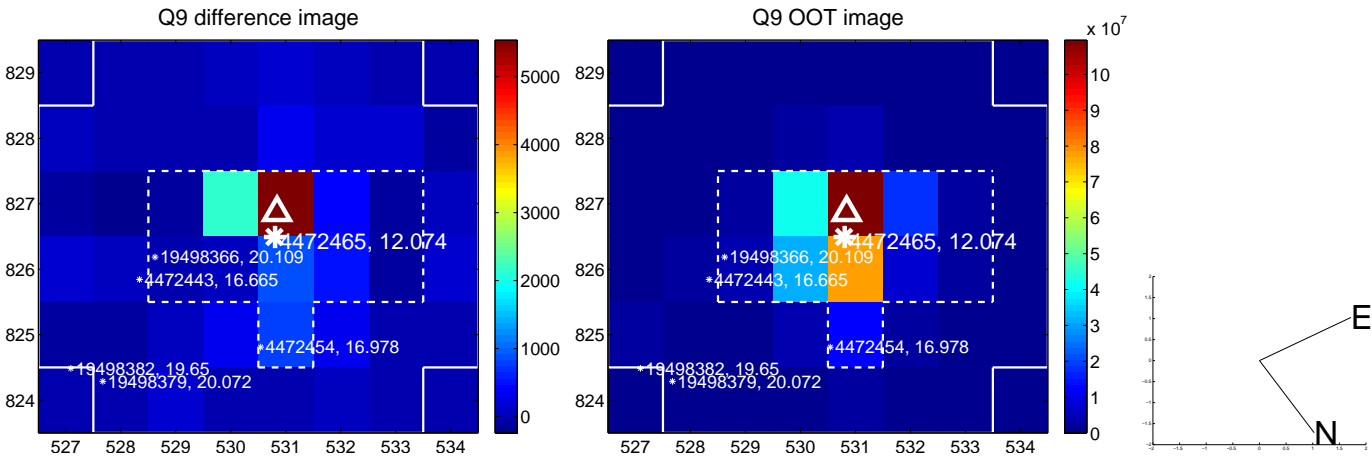
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



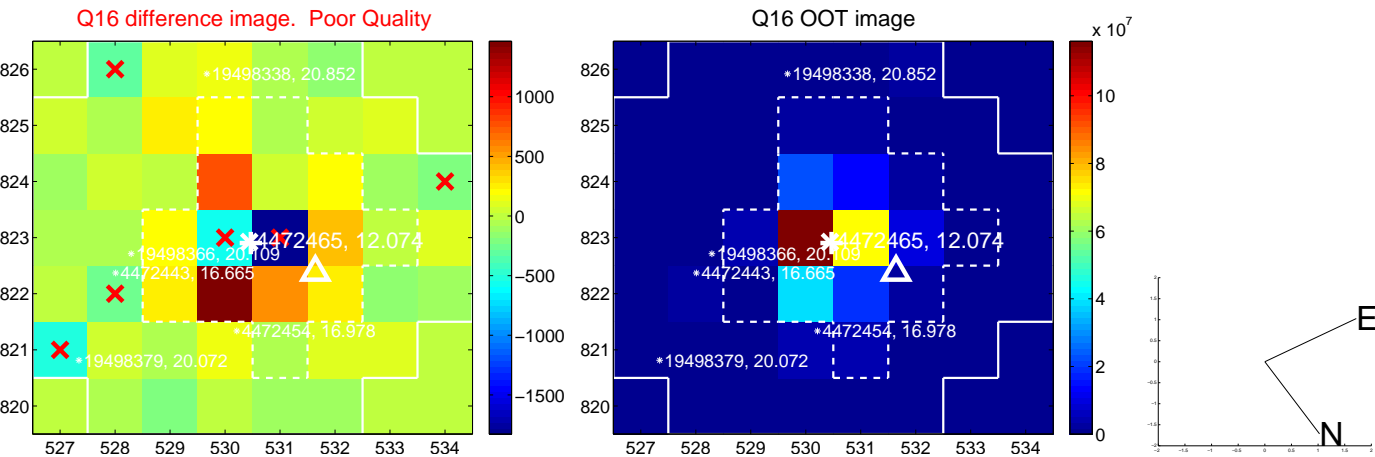
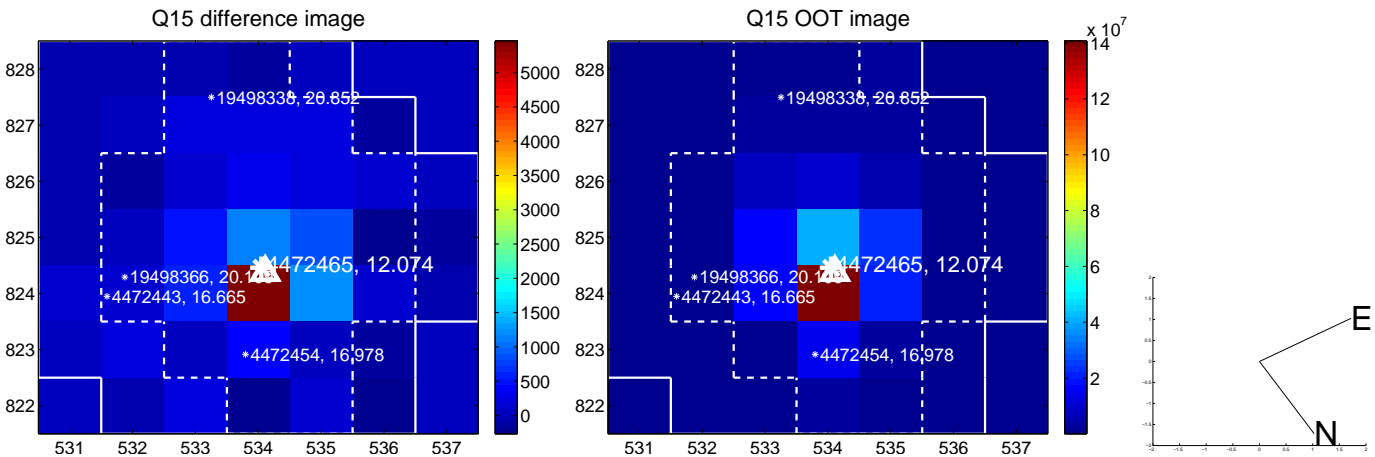
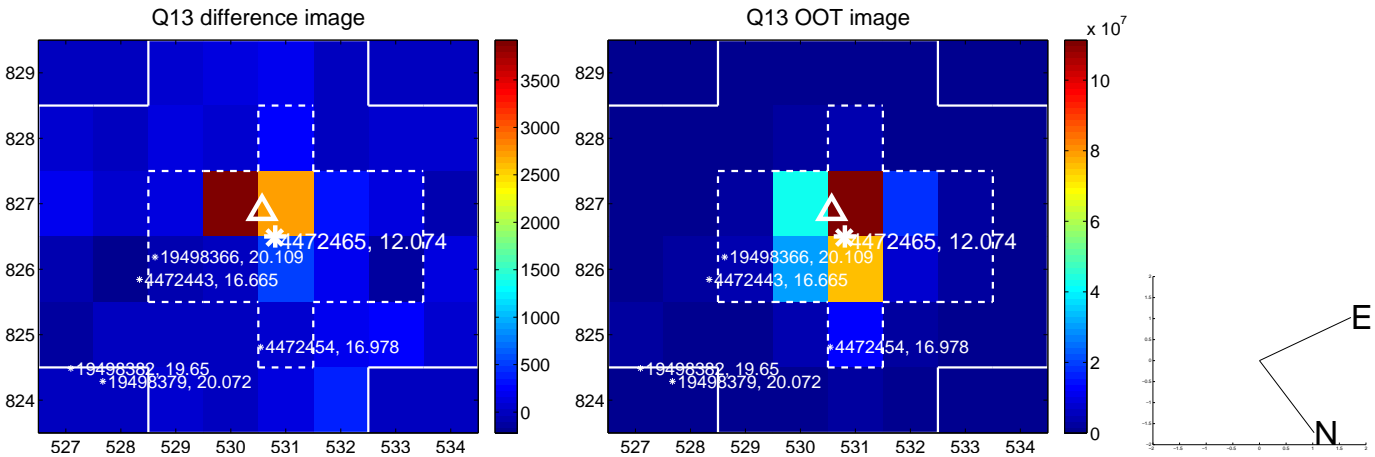
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



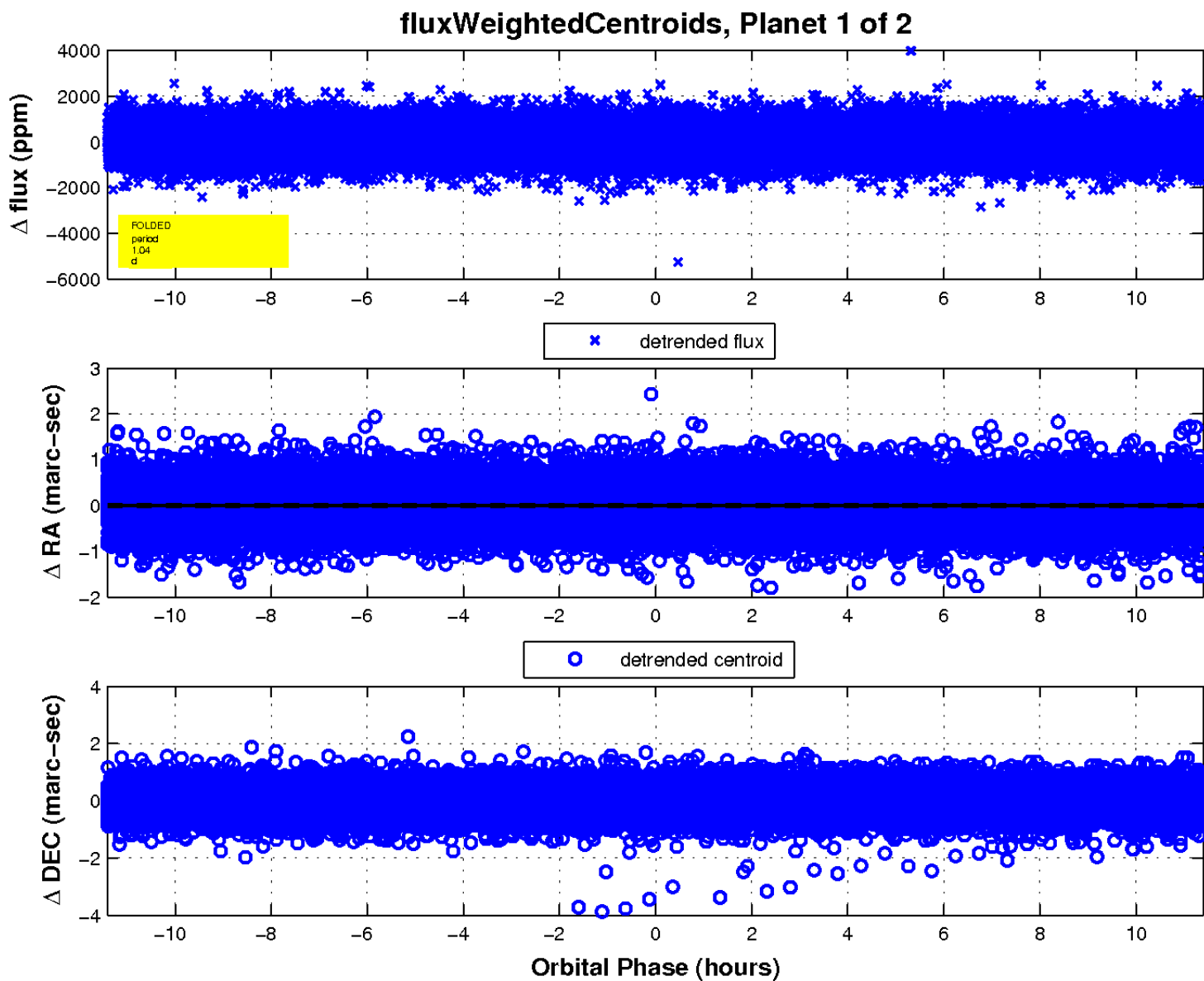
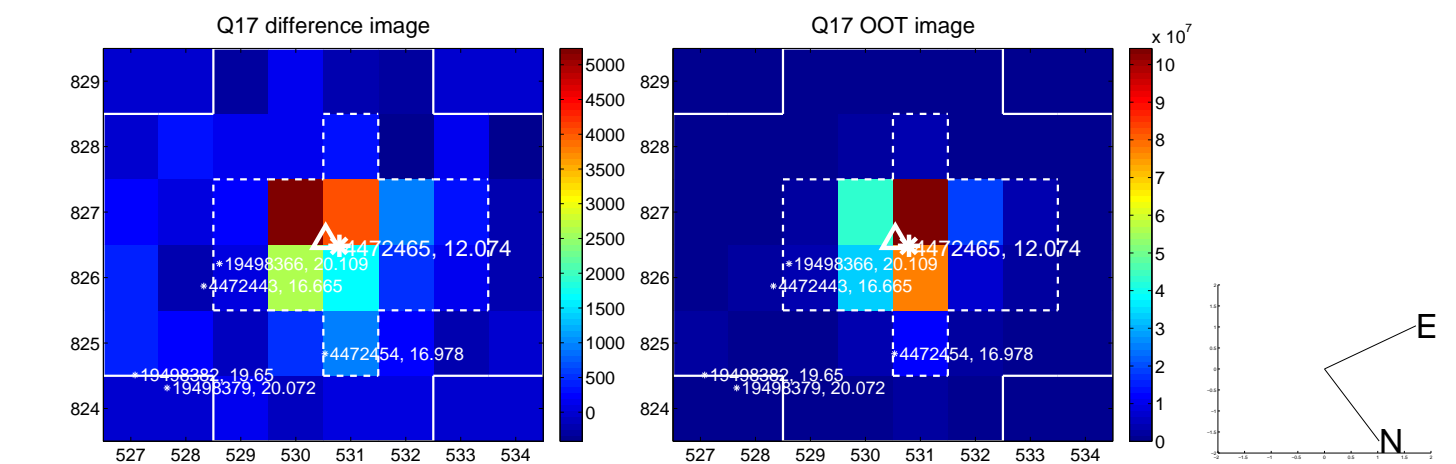
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

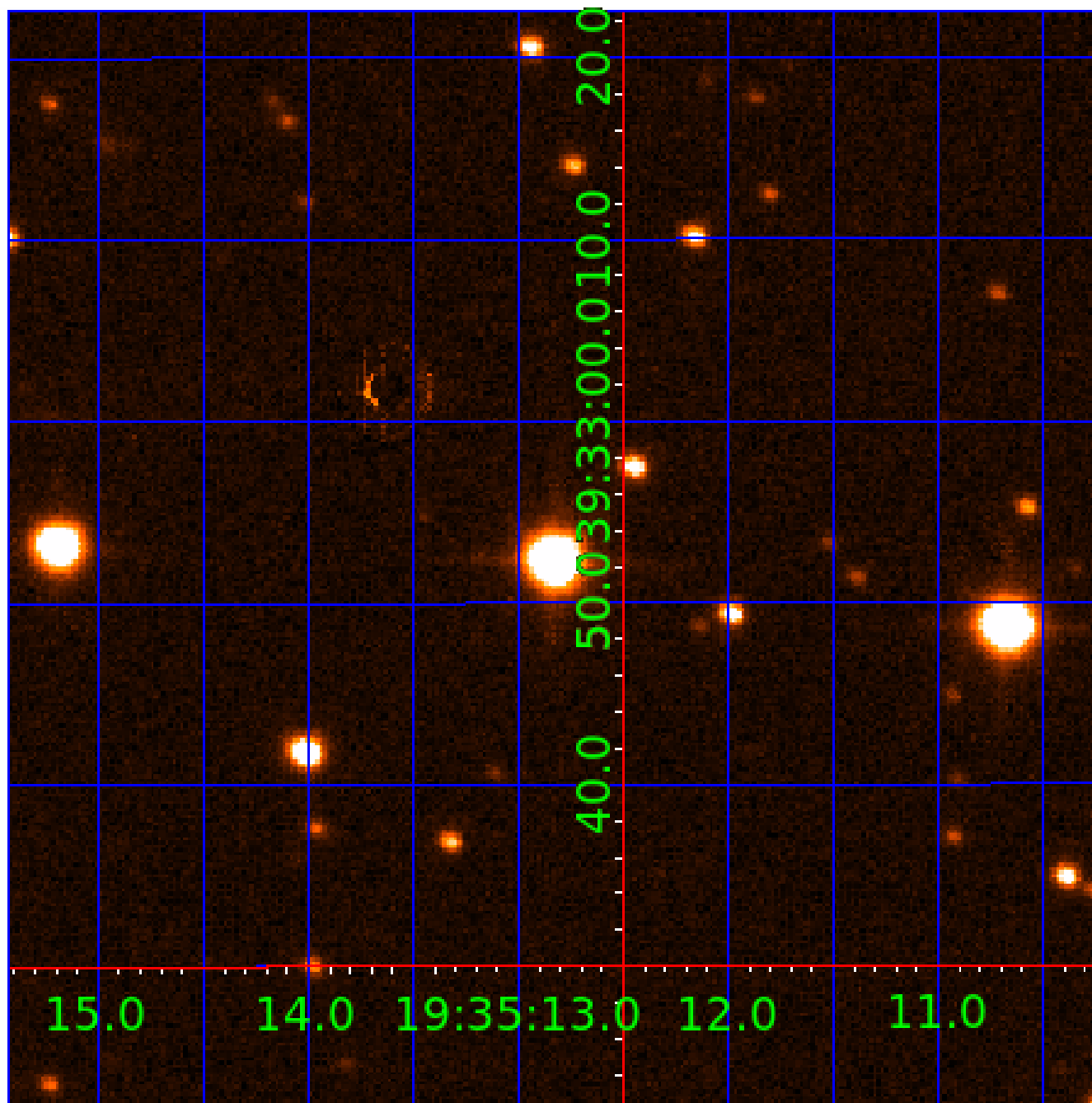


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004472465

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})
004472465-01	OBS	No	1.035903	132.452482	63.5	3.803	10.2	10.1	3.63	7694	3.37	63695.55
004472465-02	OBS	No	0.690643	132.067261	53.5	2.721	7.3	7.8	3.63	7694	3.09	109361.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004472465-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004472465-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT

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

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

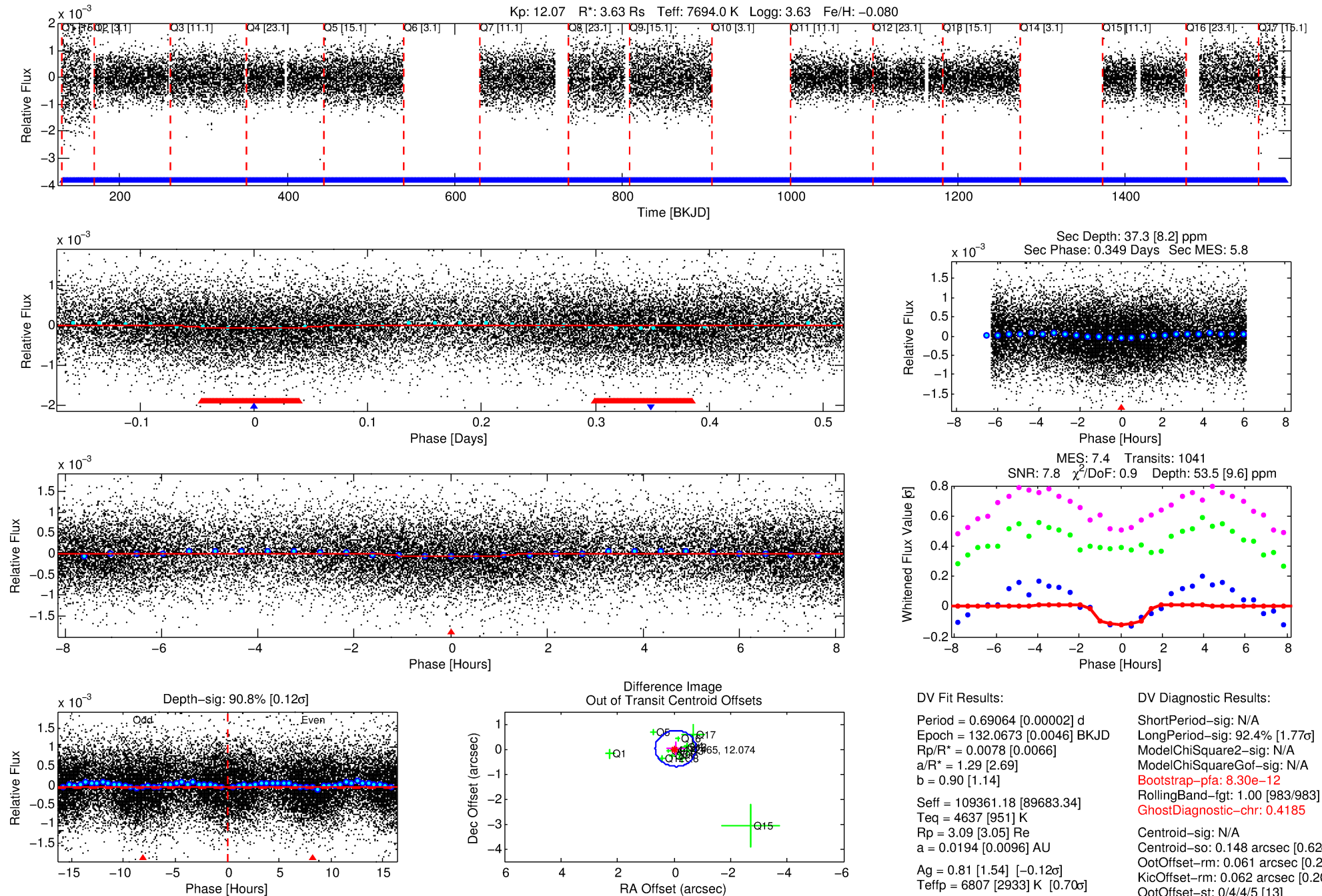
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004472465-02

No Significant Match Found

DV One-Page Summary

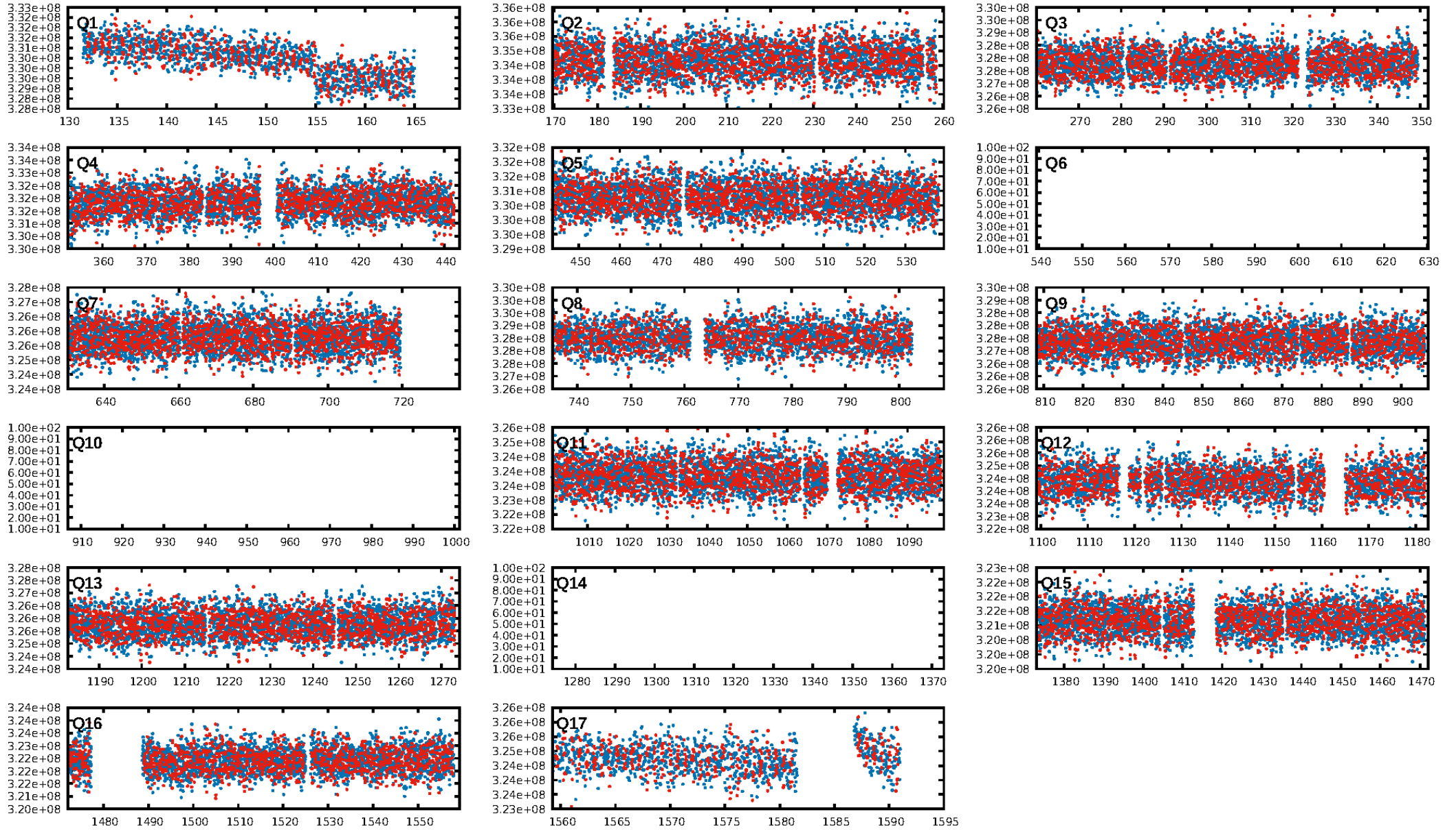
KIC: 4472465 Candidate: 2 of 2 Period: 0.691 d



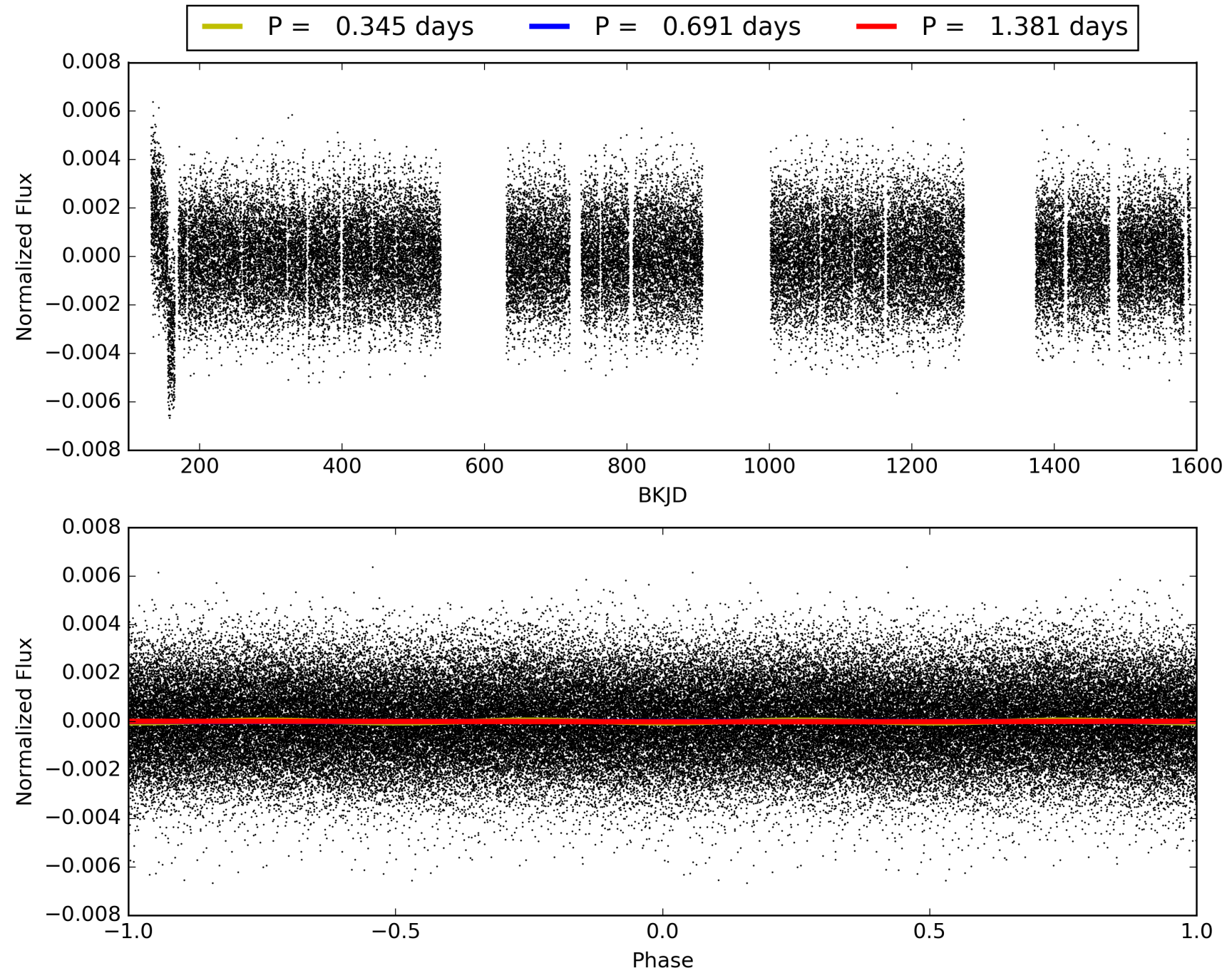
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:45:48 Z

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

TCE 004472465-02, PDC Light Curves

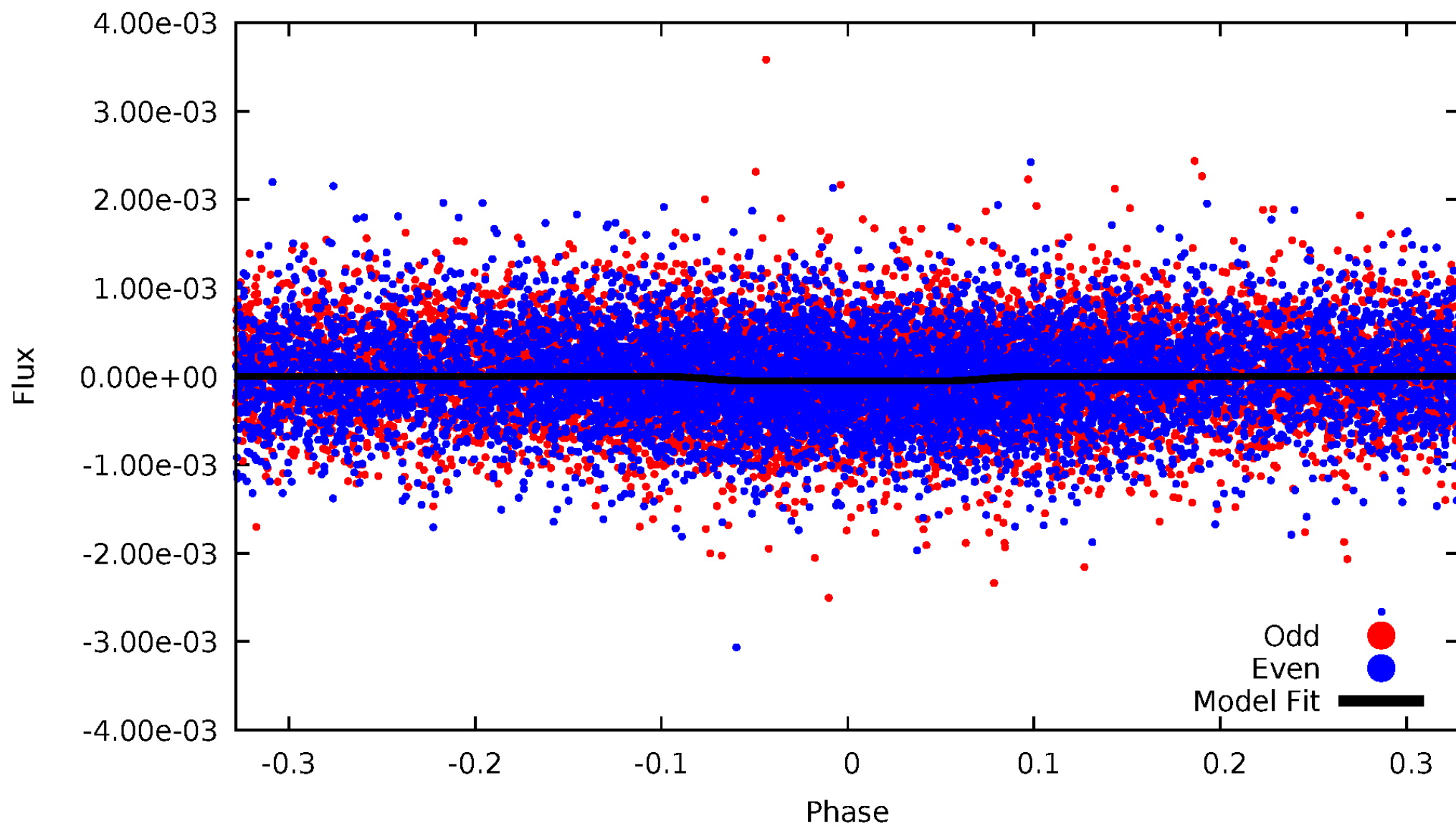


TCE 004472465-02



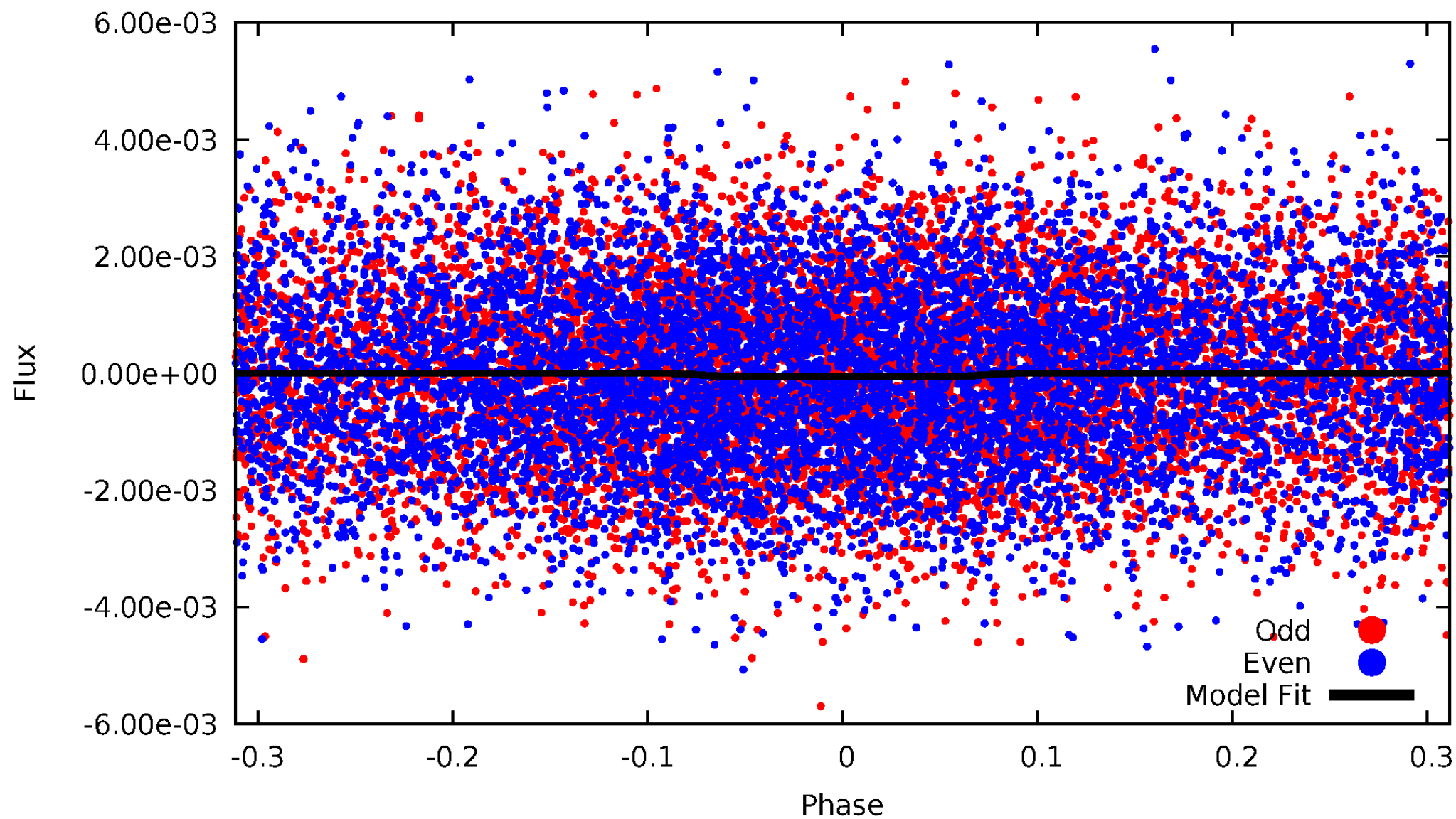
DV Odd/Even

TCE 004472465-02



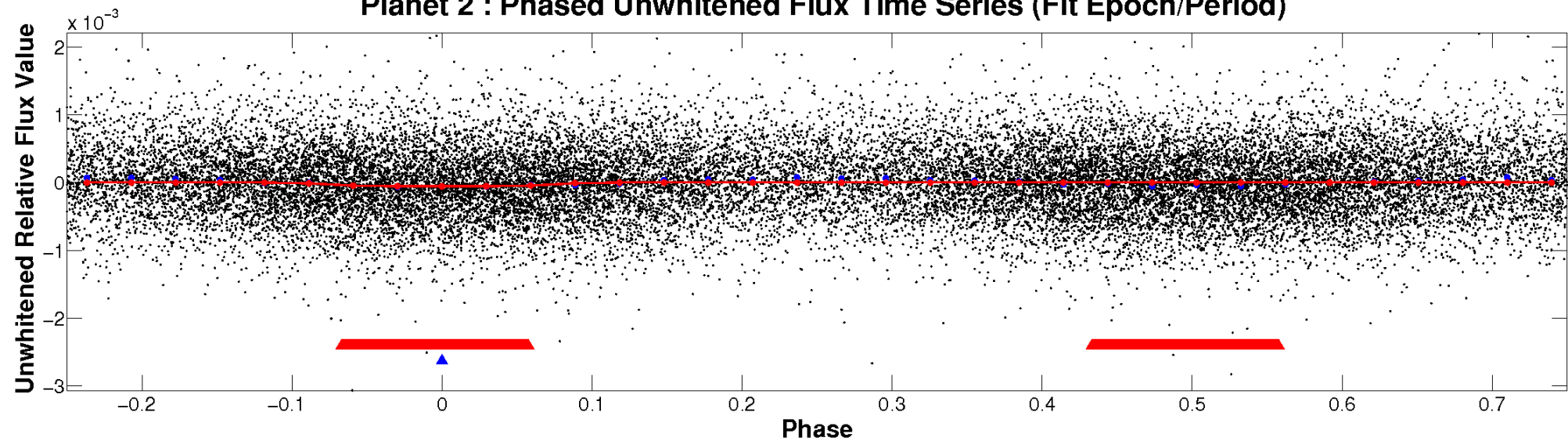
ALT Odd/Even

TCE 004472465-02

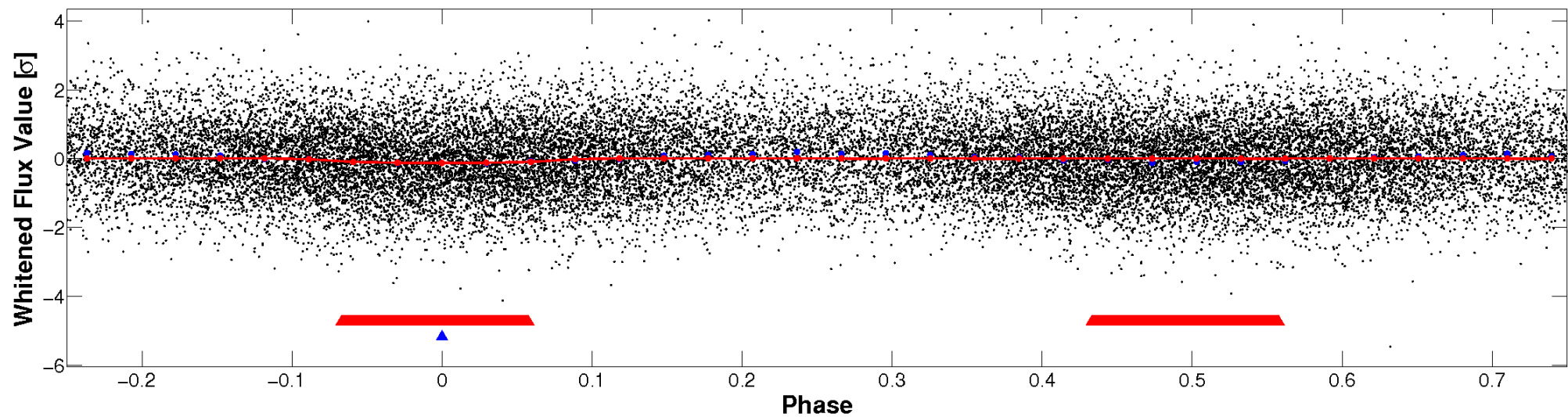


Non-Whitened Vs. Whitened Light Curve

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

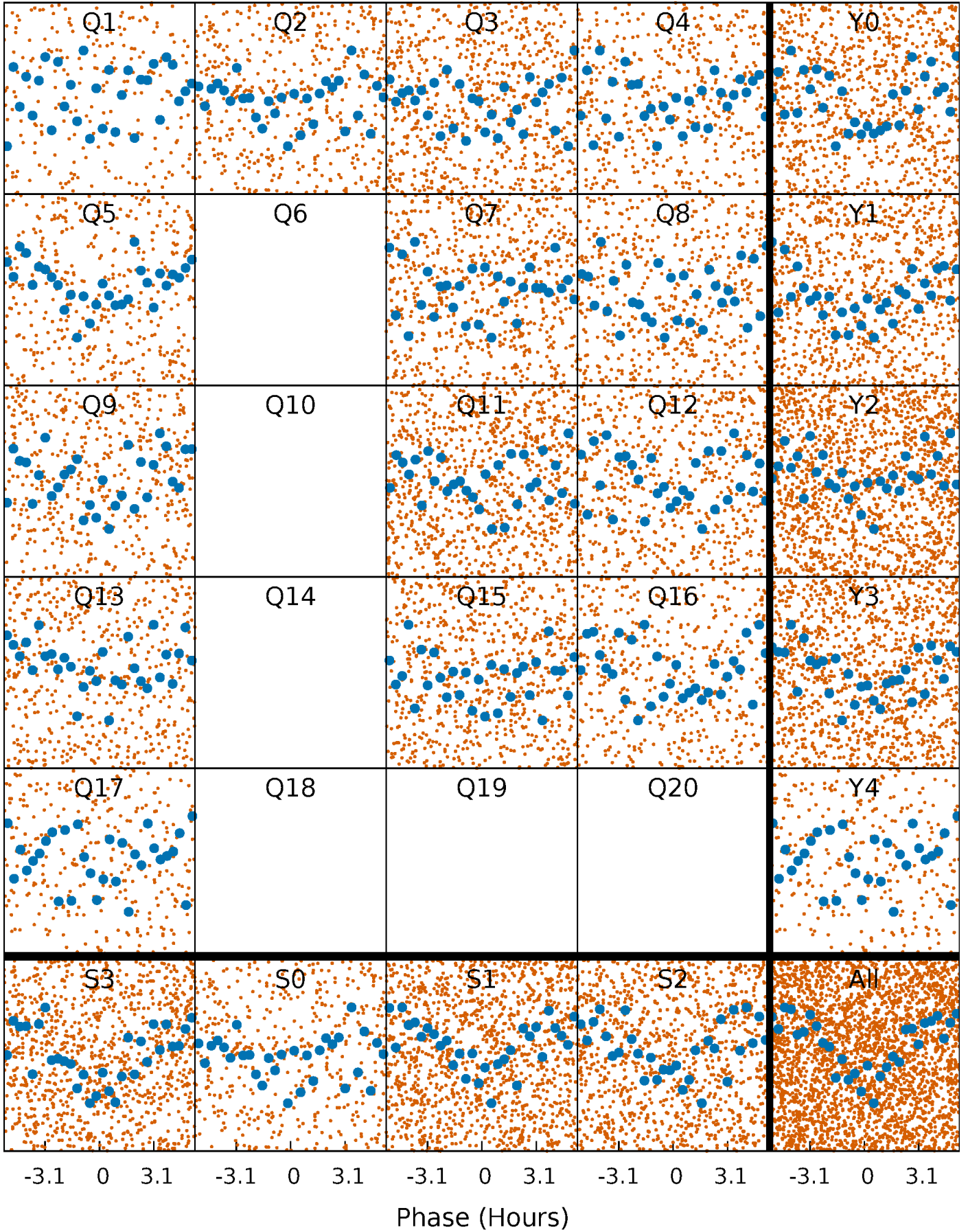


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



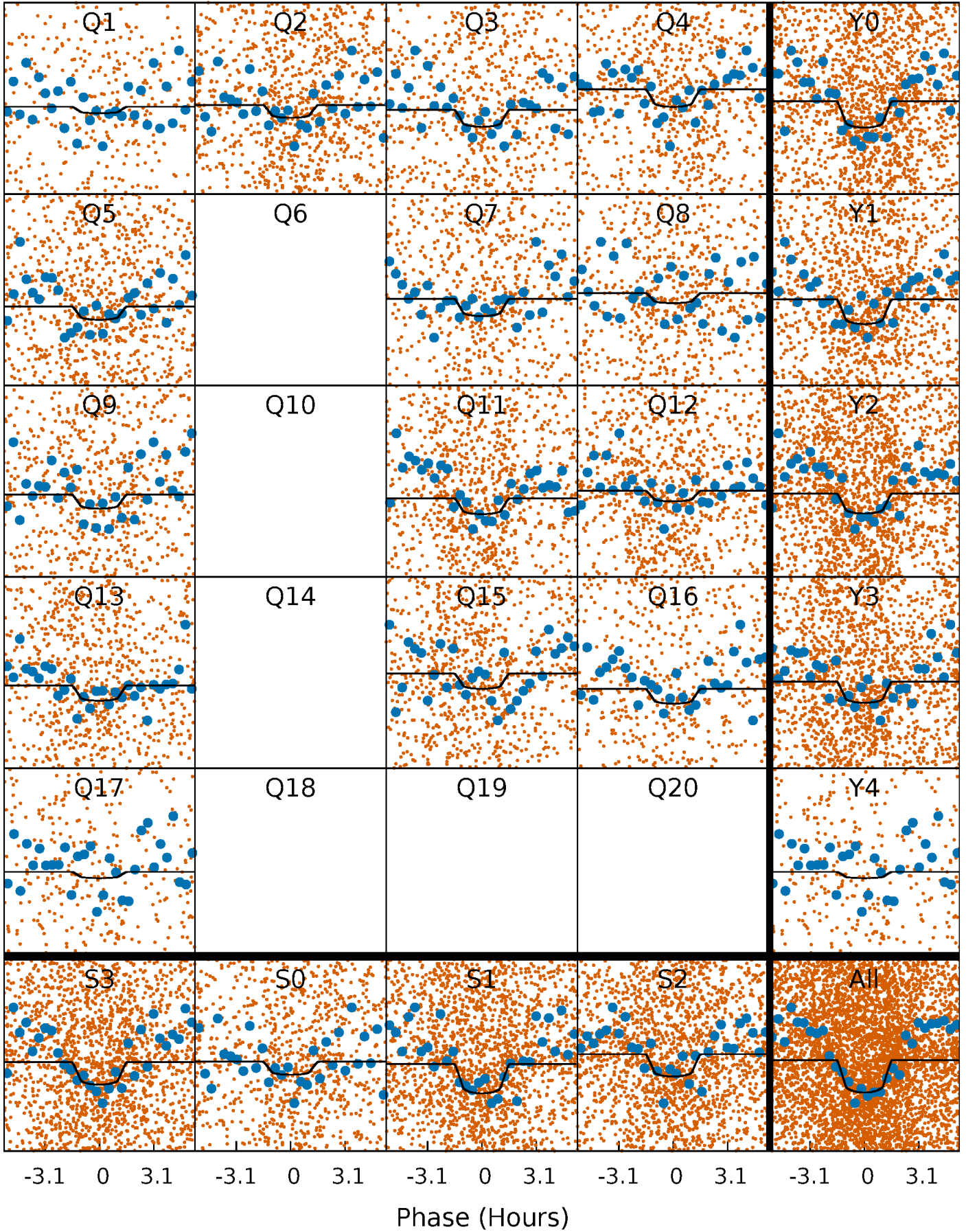
PDC Quarter-Phased Transit Curves

TCE 004472465-02 P= 0.690643 Days $T_0=132.067261$ (BKJD)



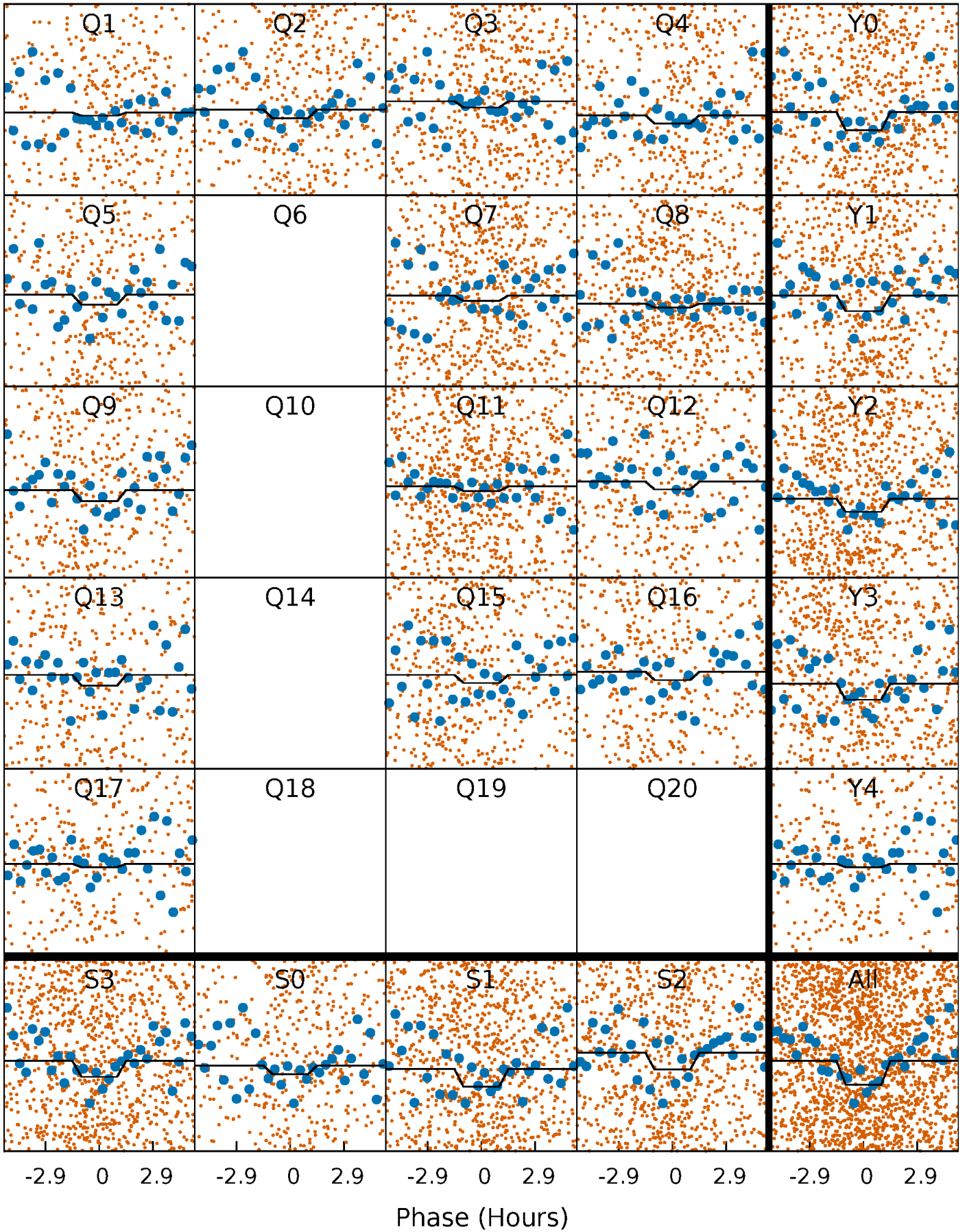
DV Quarter-Phased Transit Curves

TCE 004472465-02 P= 0.690643 Days $T_0=132.067261$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

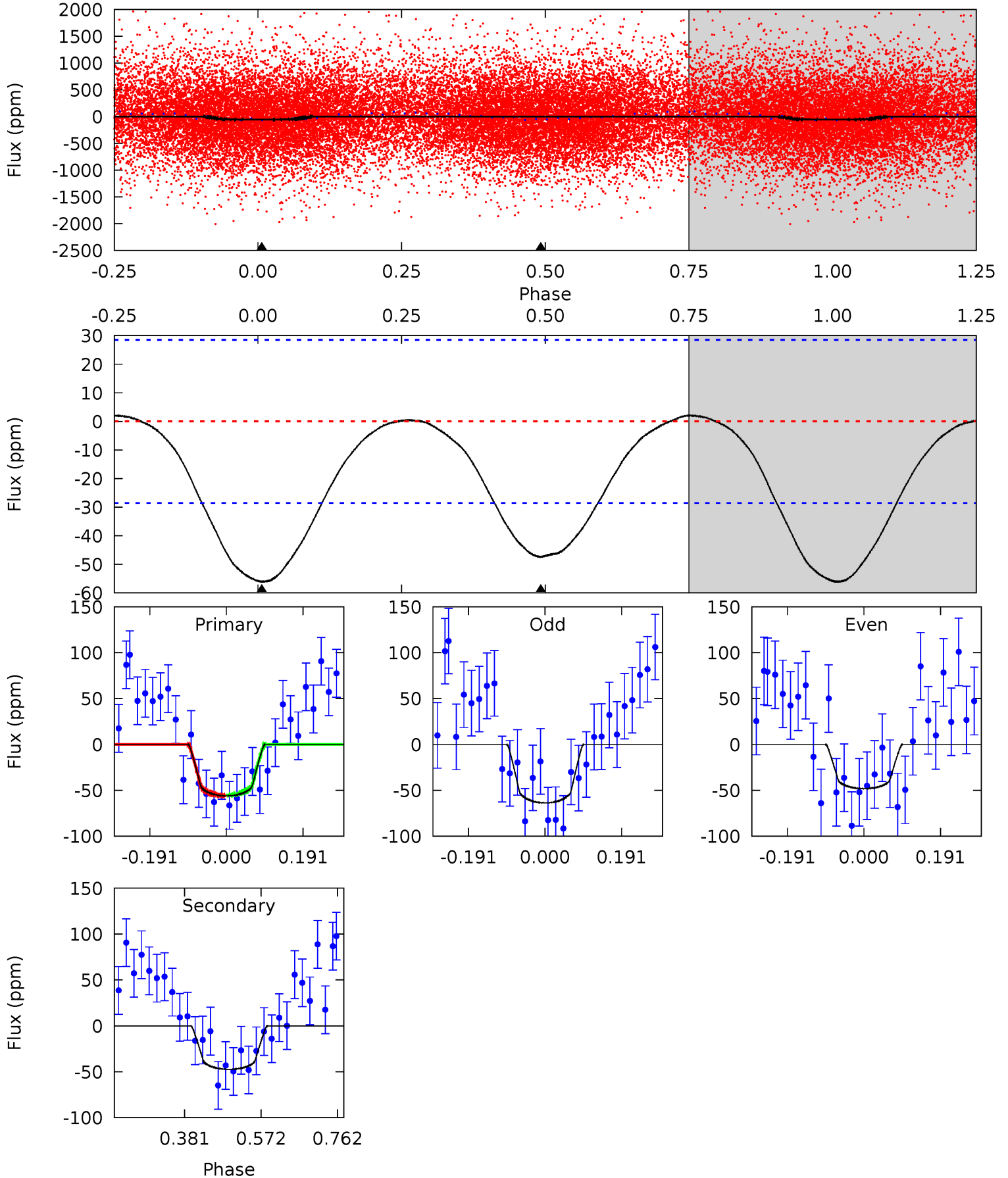
TCE 004472465-02 P= 0.690651 Days $T_0=132.067870$ (BKJD)



DV Model-Shift Uniqueness Test

004472465-02, P = 0.690643 Days, E = 131.376618 Days

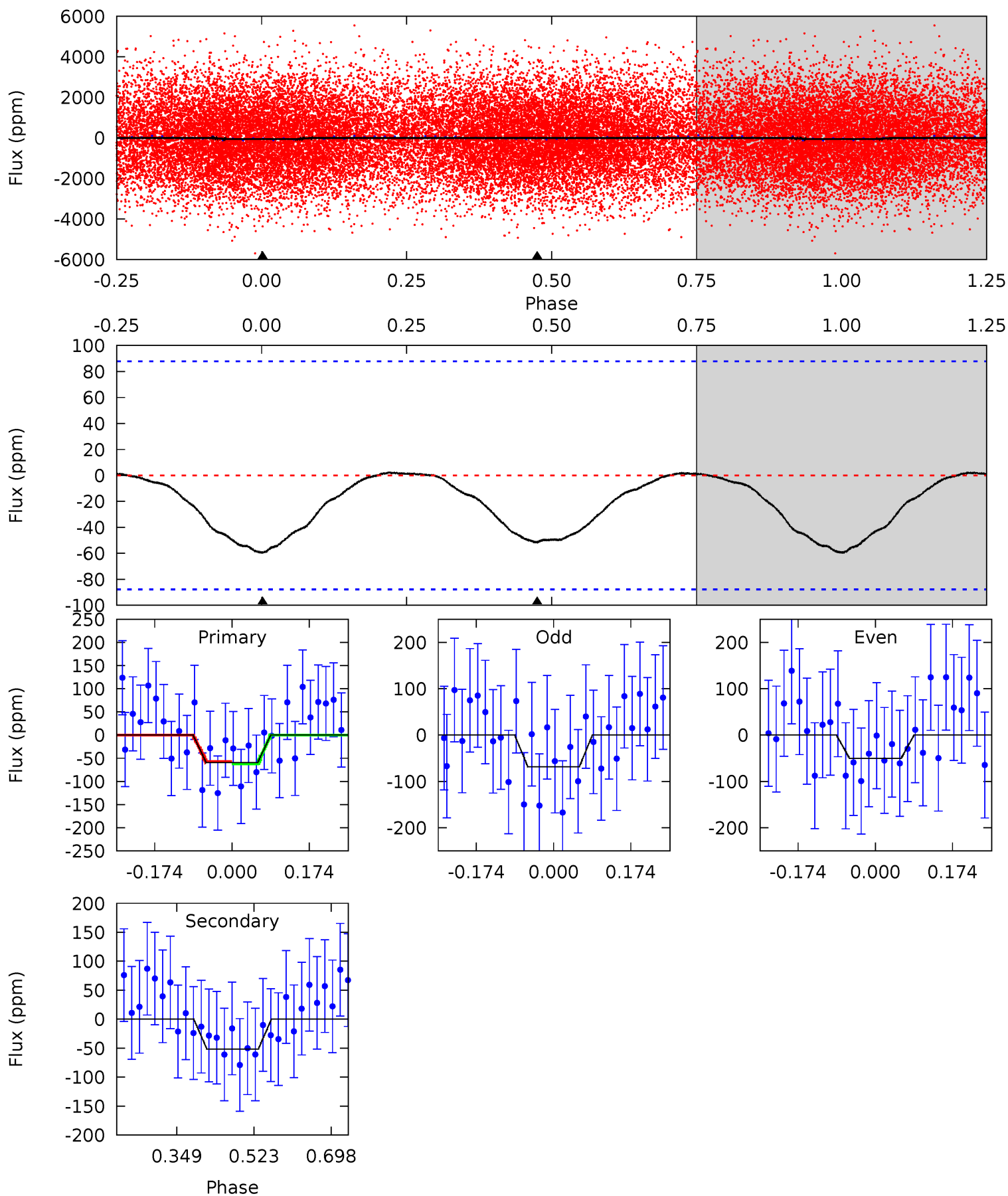
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.70	7.36	0	0	4.43	1.31	0.23	8.70	8.70	7.36	7.36	1.21	0.98	0.04	0.07



Alt Model-Shift Uniqueness Test

004472465-02, P = 0.690651 Days, E = 131.377219 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.01	2.61	0	0	4.45	1.36	0.15	3.01	3.01	2.61	2.61	0.45	1.01	0.04	0.12



Stellar Parameters For KIC 004472465

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7694^{+213}_{-320}	$3.631^{+0.476}_{-0.084}$	$-0.080^{+0.200}_{-0.300}$	$3.627^{+0.604}_{-1.812}$	$2.054^{+0.291}_{-0.499}$	$0.061^{+0.318}_{-0.017}$
	+3%/-4%	+13%/-2%	+250%/-375%	+17%/-50%	+14%/-24%	+525%/-28%
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 004472465-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-47 ± 6	$2.97^{+2.57}_{-1.91}$	6240^{+474}_{-727}	6190^{+7520}_{-2930}	$1.095^{+7.753}_{-0.768}$
Alt.	-52 ± 20	$3.06^{+2.27}_{-1.98}$	6227^{+482}_{-762}	6278^{+6687}_{-3011}	$1.127^{+8.092}_{-0.801}$

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 $A_{obs} \gg 1.0$

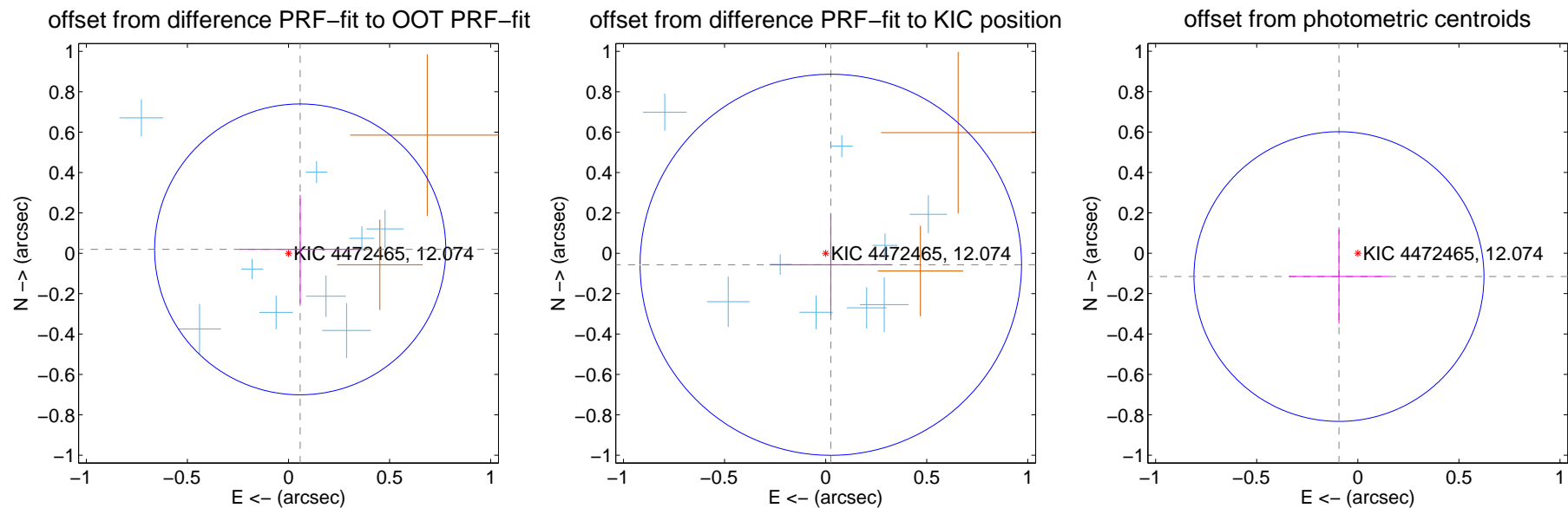
DV Centroid Data

Supplemental centroid analysis for 004472465-02. Kepler magnitude: 12.07. Transit SNR 7.79

There are 9 quarters with good PRF difference image offsets

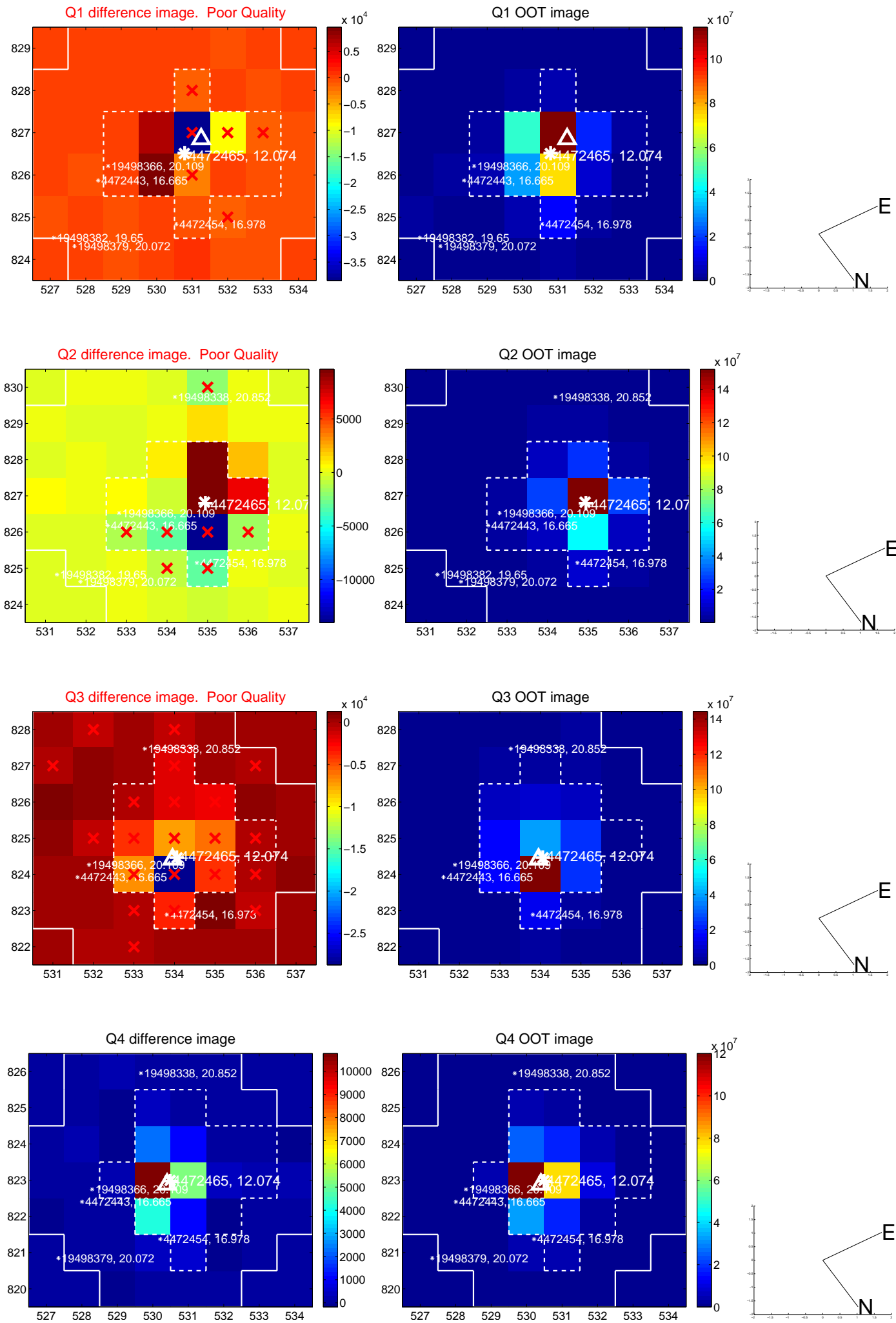
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.061 ± 0.240	0.25	-0.058 ± 0.300	0.019 ± 0.269
PRF-fit source offset from KIC position	0.062 ± 0.315	0.20	-0.025 ± 0.301	-0.057 ± 0.251
photometric centroid source offset	0.15 ± 0.24	0.62	0.09 ± 0.25	-0.12 ± 0.23

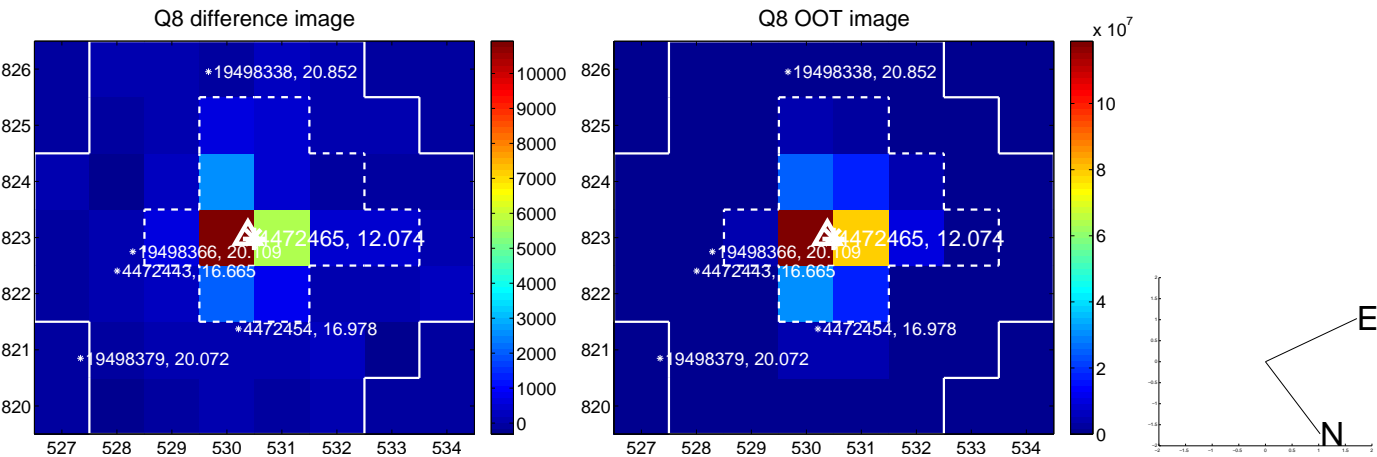
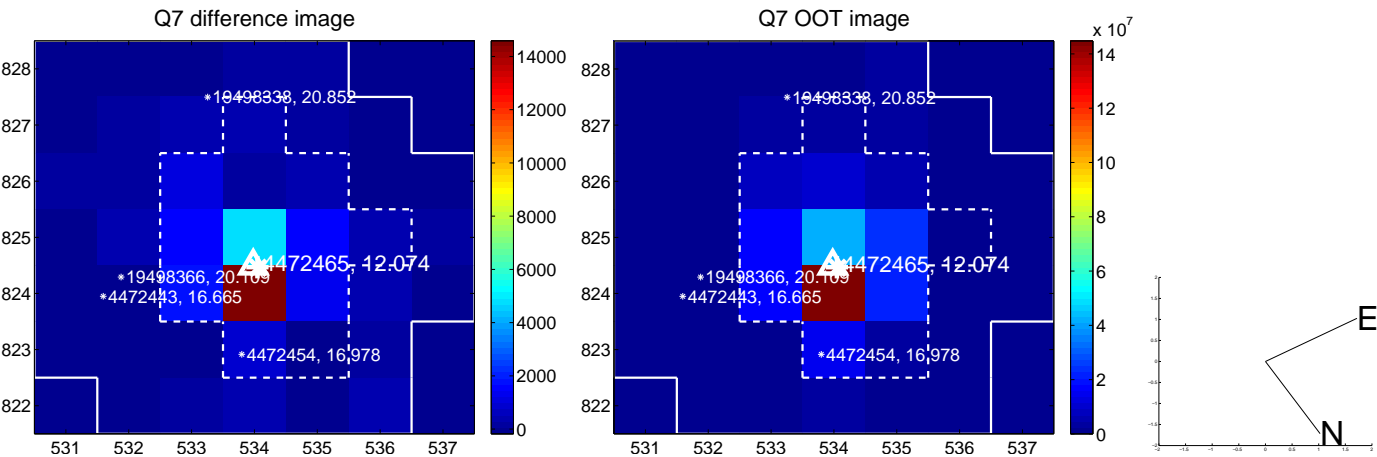
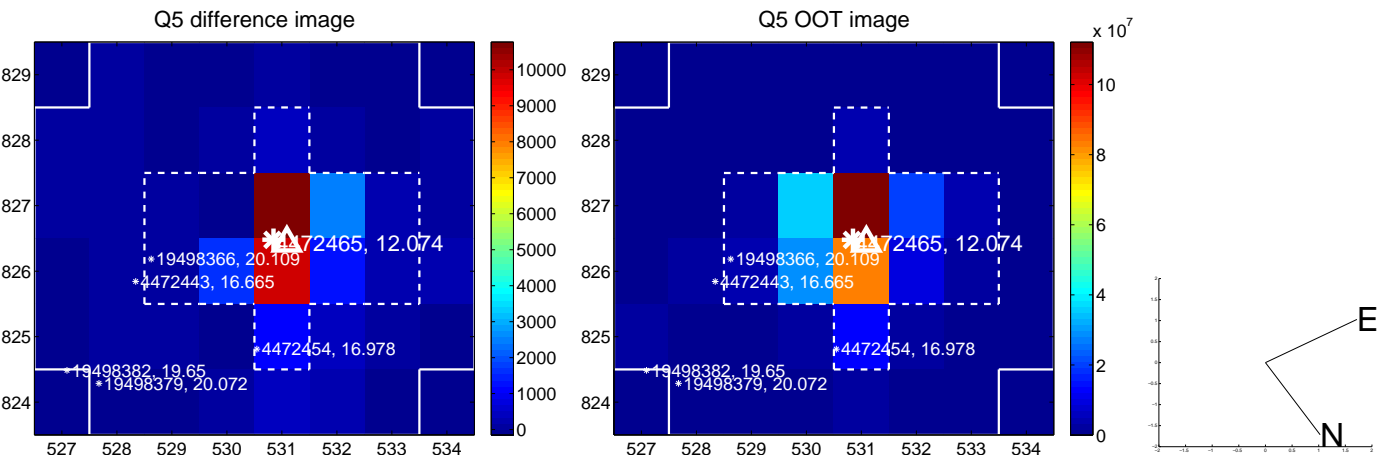


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

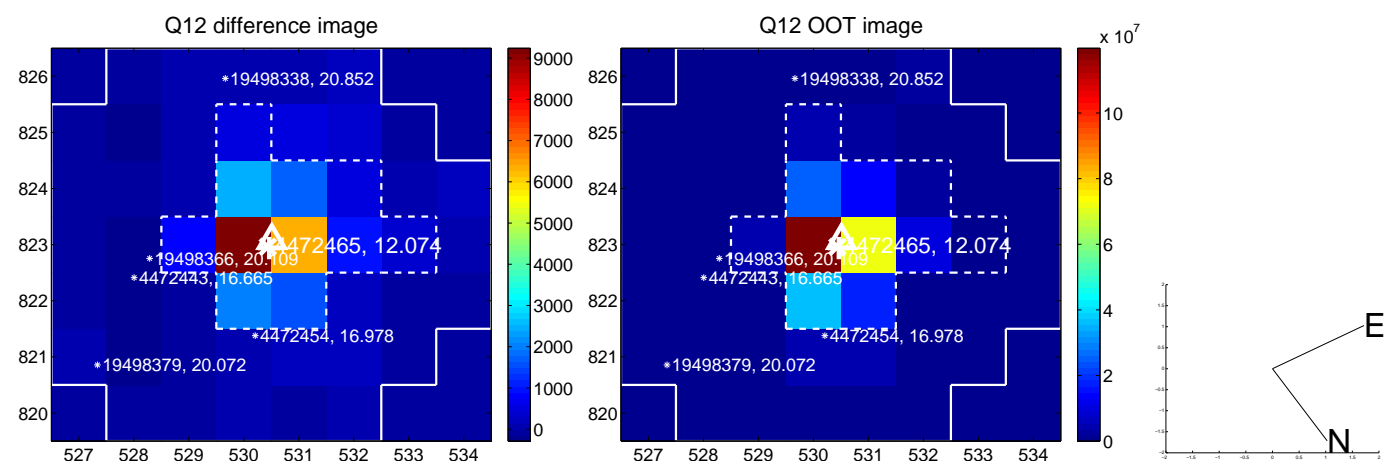
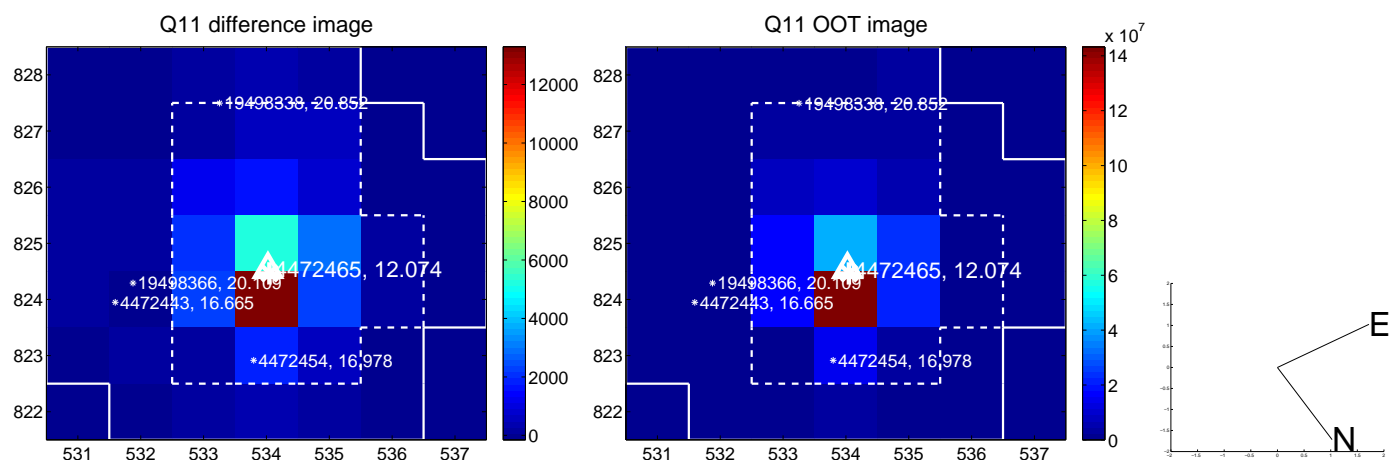
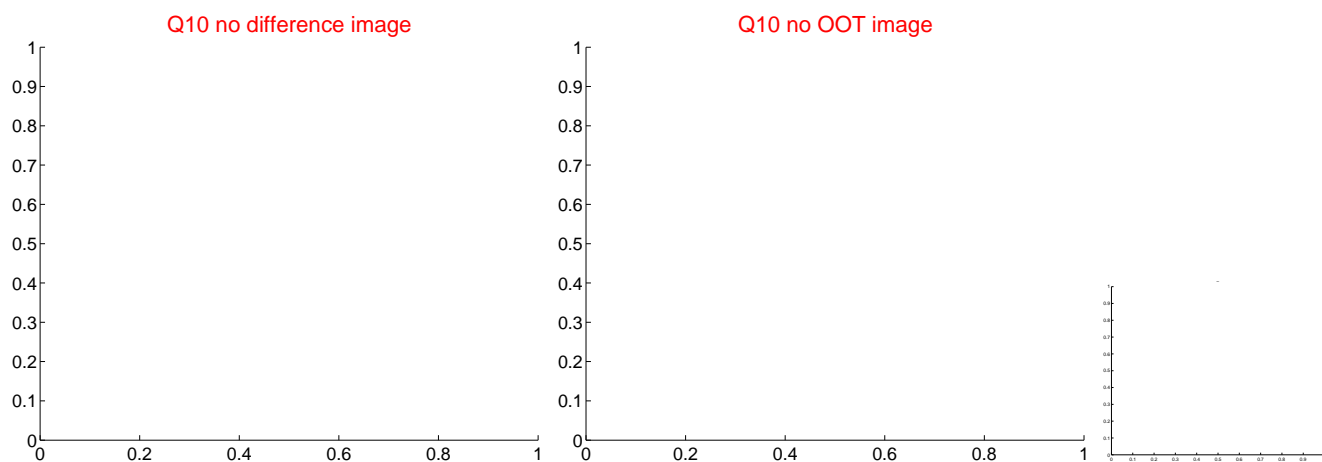
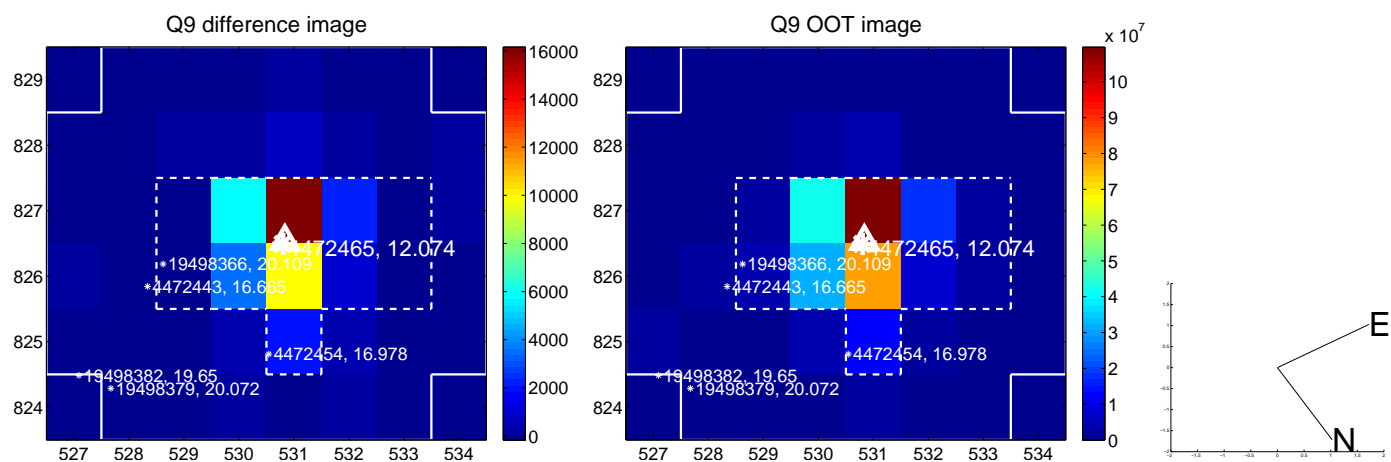
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



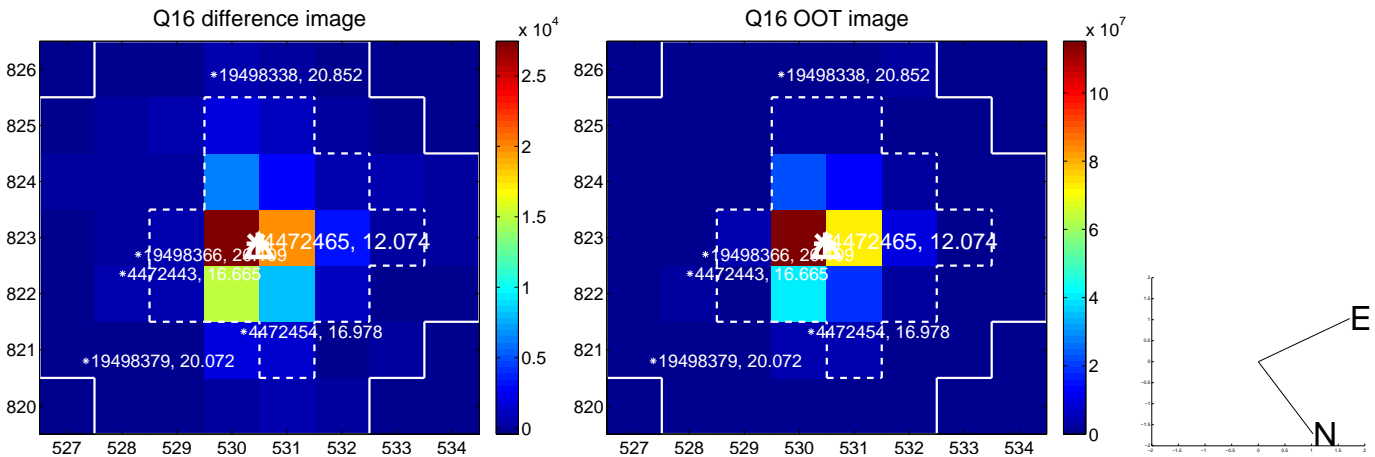
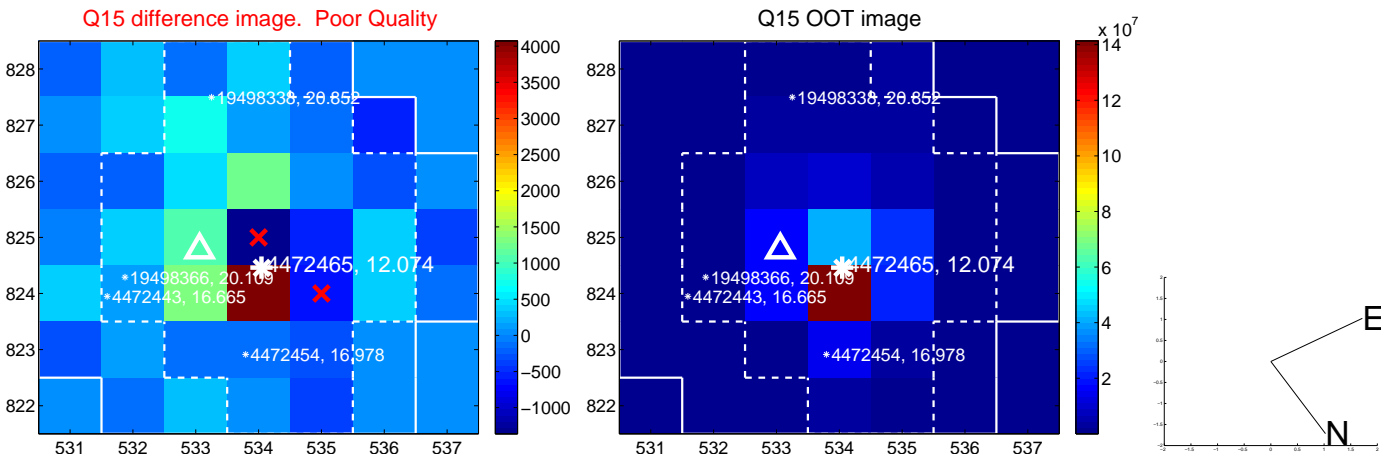
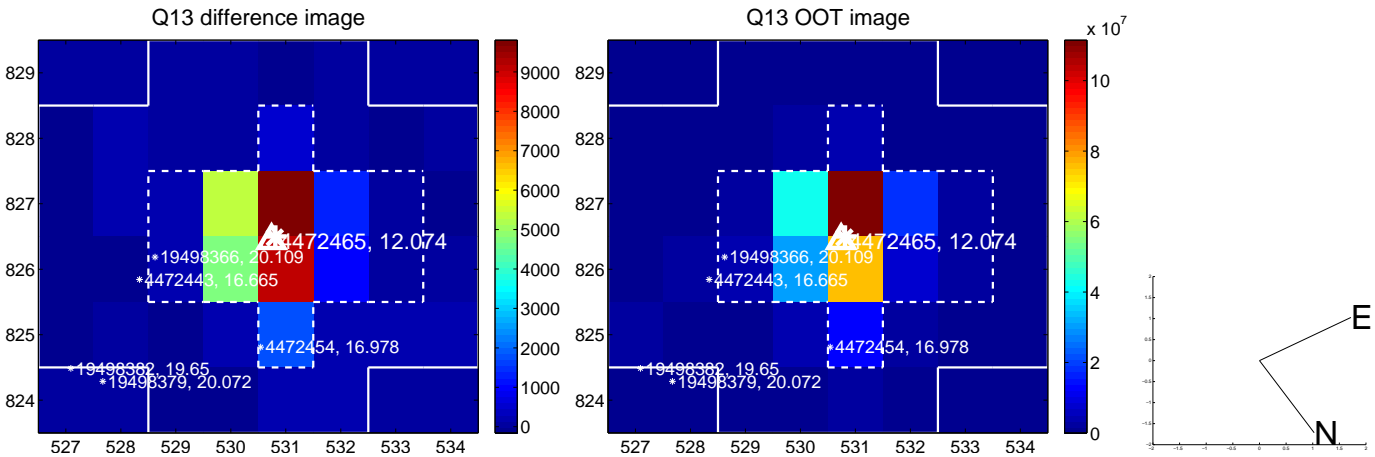
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



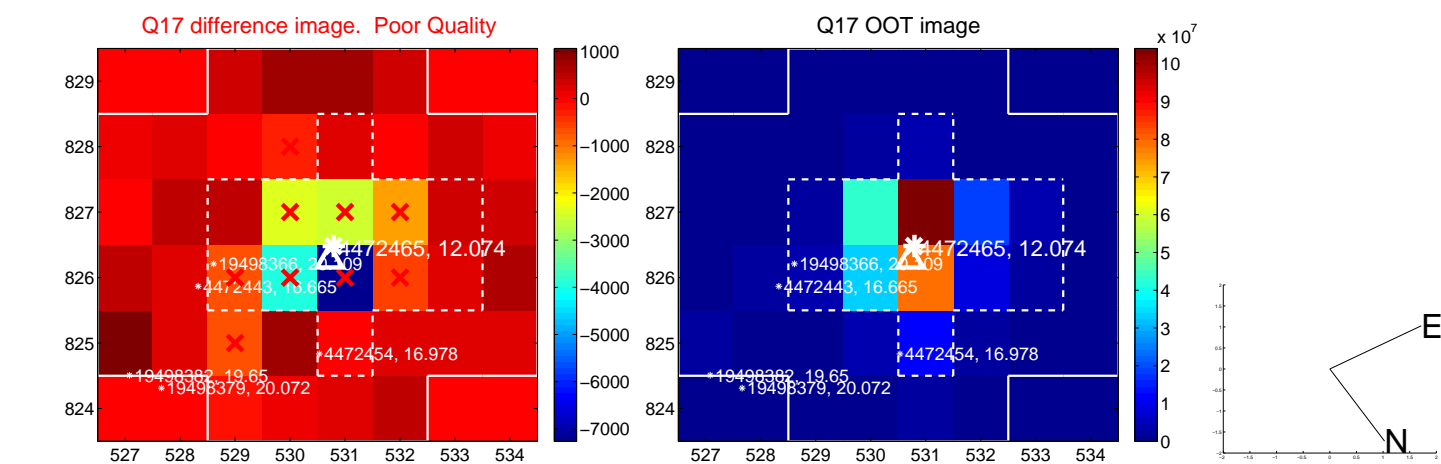
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



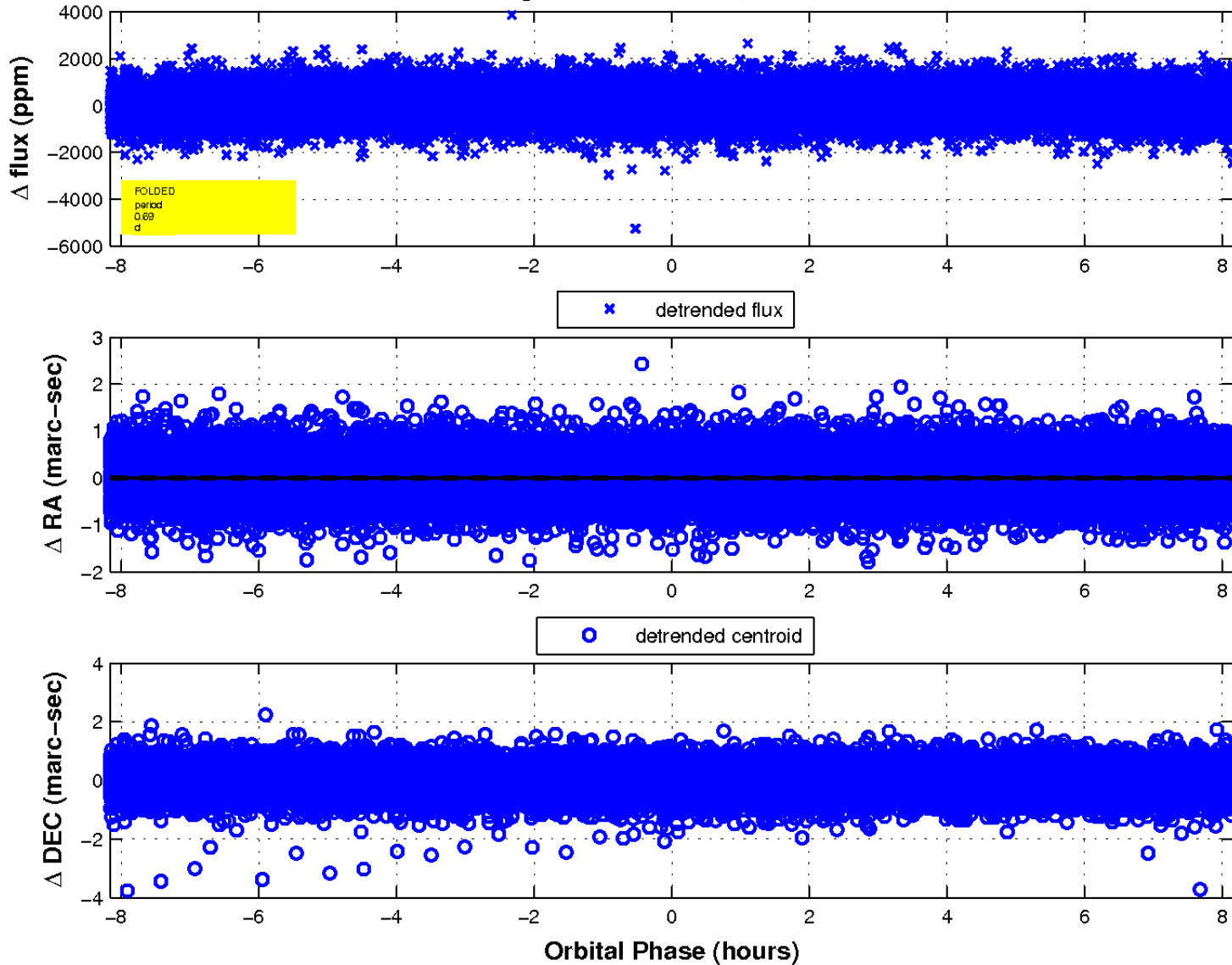
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

