

KIC 009528420

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})
009528420-01	OBS	1742.01	4.708470	134.153265	32428.3	6.006	2089.8	2013.9	1.06	6214	19.54	493.95
009528420-02	OBS	No	4.708422	131.806047	788.3	5.673	50.9	59.7	1.06	6214	3.38	493.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009528420-01	OBS	FP	0.23	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
009528420-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

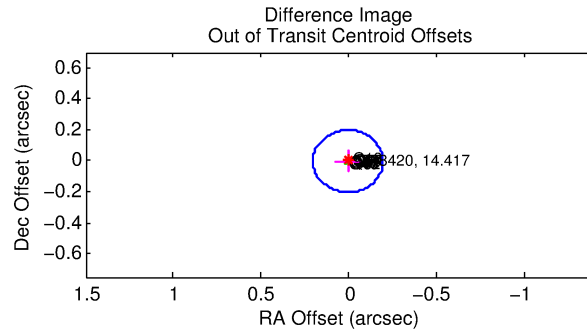
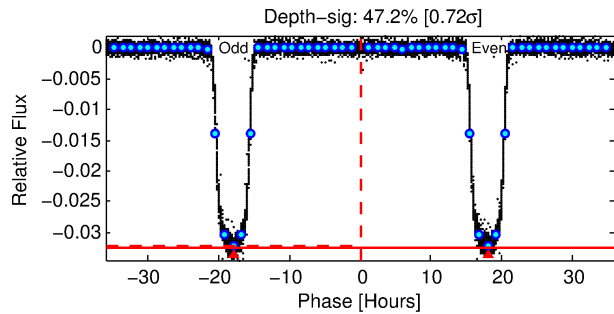
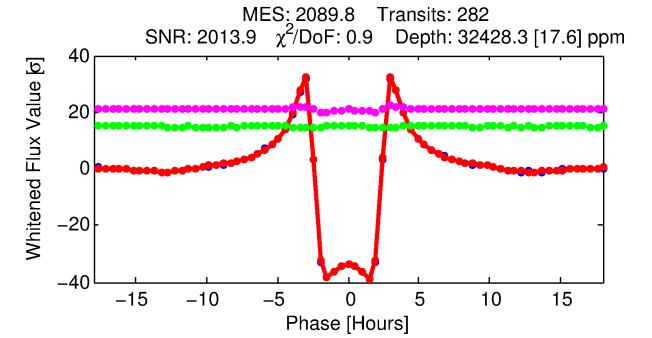
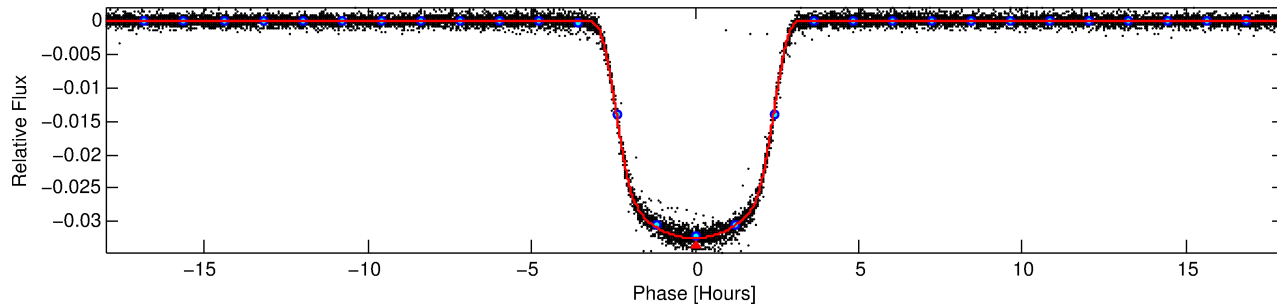
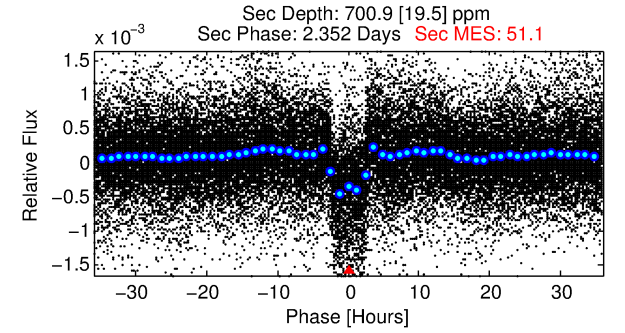
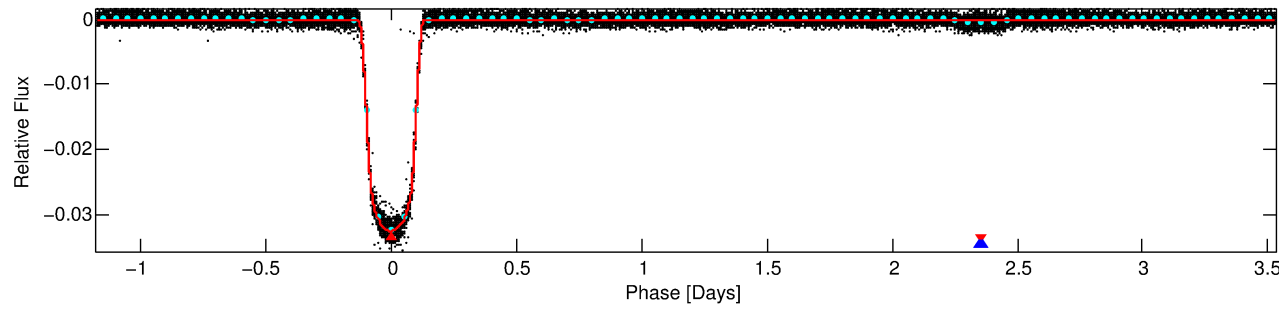
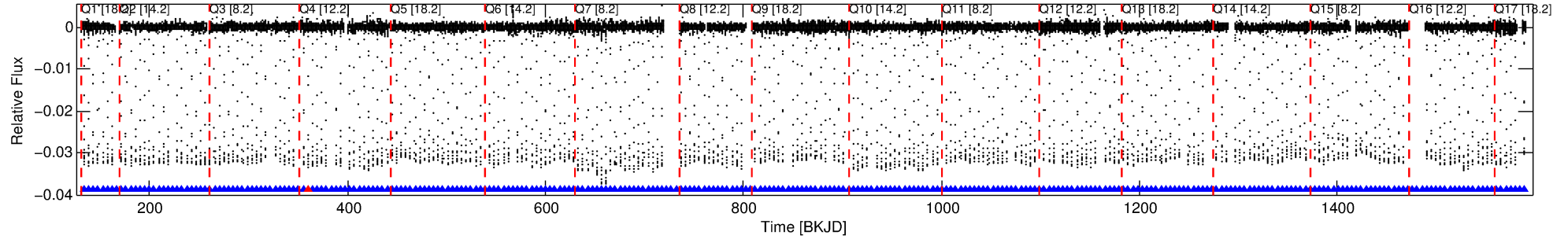
Ephemeris Match Information For 009528420-01

No Significant Match Found

DV One-Page Summary

KIC: 9528420 Candidate: 1 of 2 Period: 4.708 d
KOI: K01742.01 Corr: 0.998

Kp: 14.42 R*: 1.06 Rs Teff: 6214.0 K Logg: 4.39 Fe/H: -0.240



DV Fit Results:

Period = 4.70847 [0.00000] d
Epoch = 134.1533 [0.0000] BKJD
Rp/R* = 0.1688 [0.0001]
a/R* = 6.57 [0.01]
b = 0.42 [0.00]
Seff = 493.95 [195.50]
Teq = 1202 [119] K
Rp = 19.54 [6.01] Re
a = 0.0552 [0.0142] AU
Ag = 3.07 [1.15] [1.80σ]
Teffp = 2461 [83] K [8.67σ]

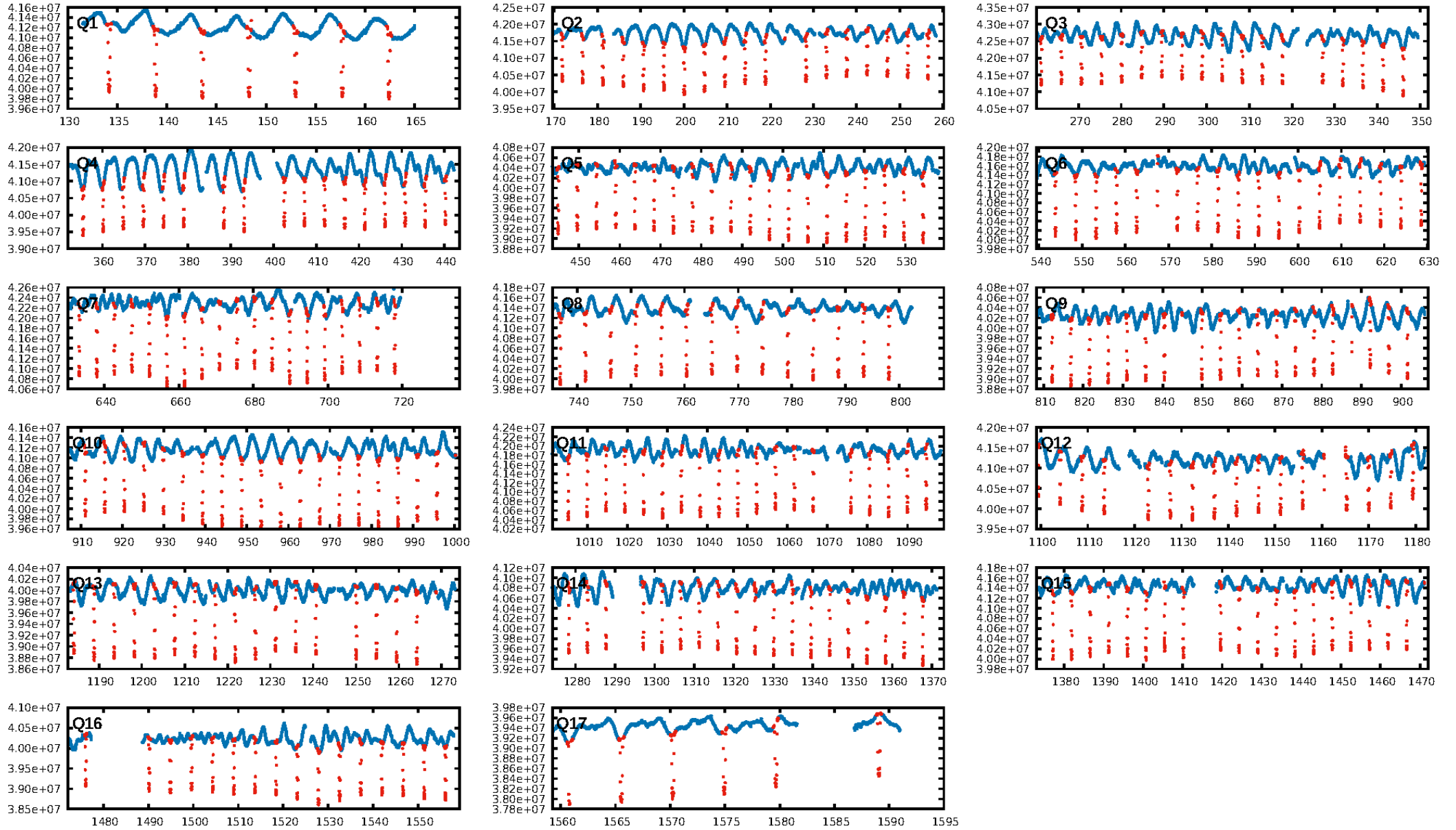
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [268/269]
GhostDiagnostic-chr: 2.935
Centroid-sig: 0.0%
Centroid-so: 0.137 arcsec [54.76σ]
OotOffset-rm: 0.007 arcsec [0.10σ]
KicOffset-rm: 0.074 arcsec [1.10σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

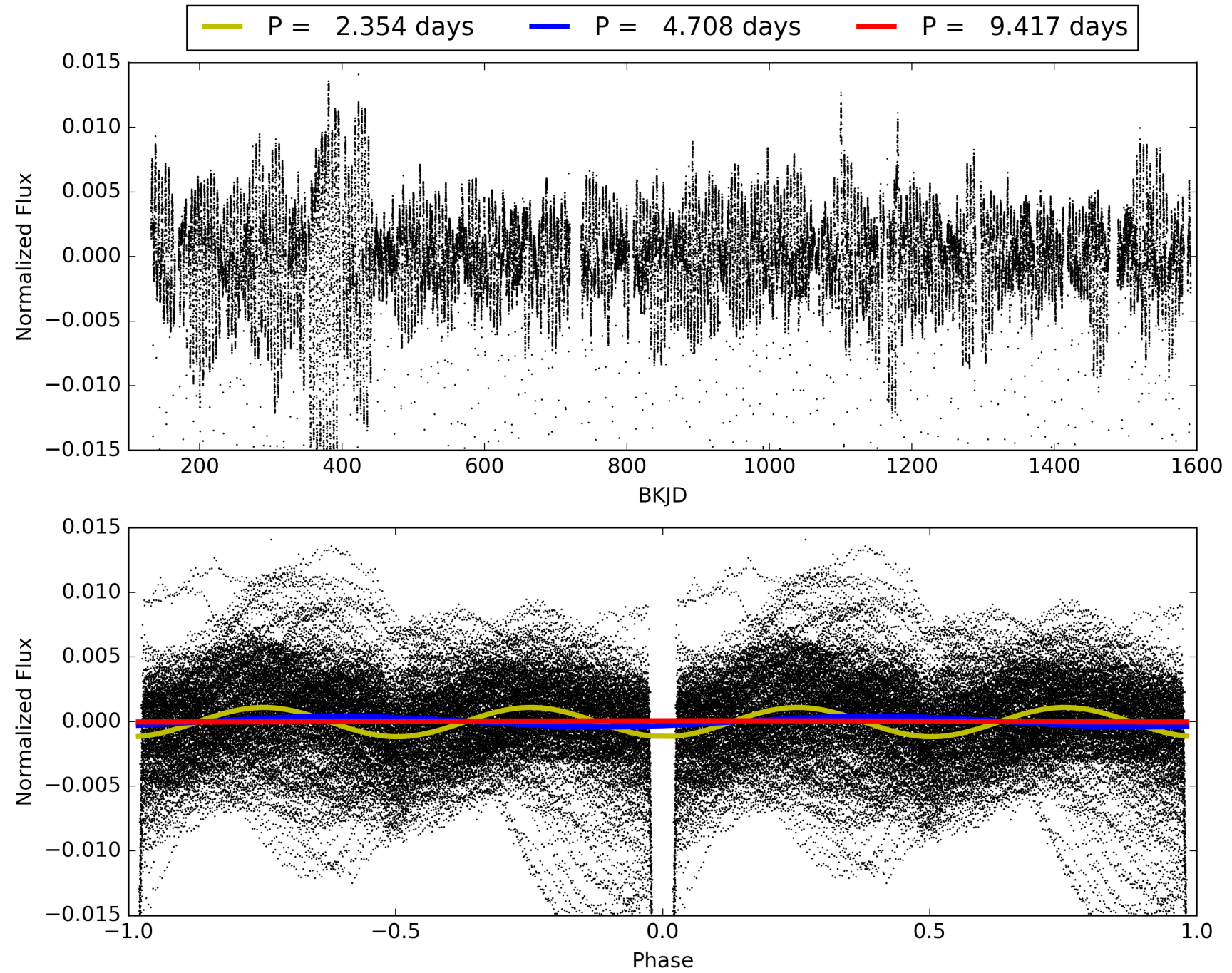
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:14:51 Z

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

TCE 009528420-01, PDC Light Curves

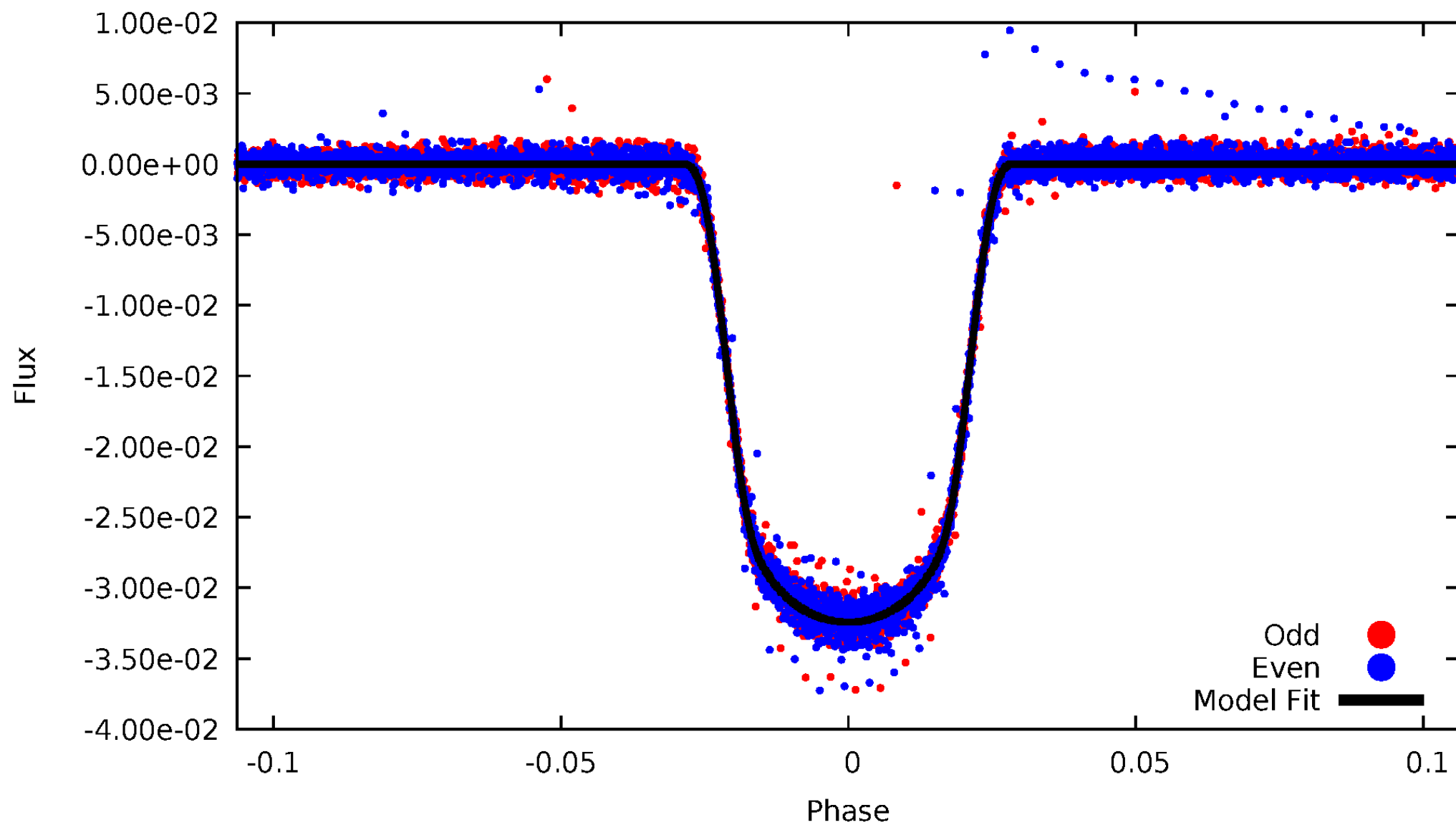


TCE 009528420-01



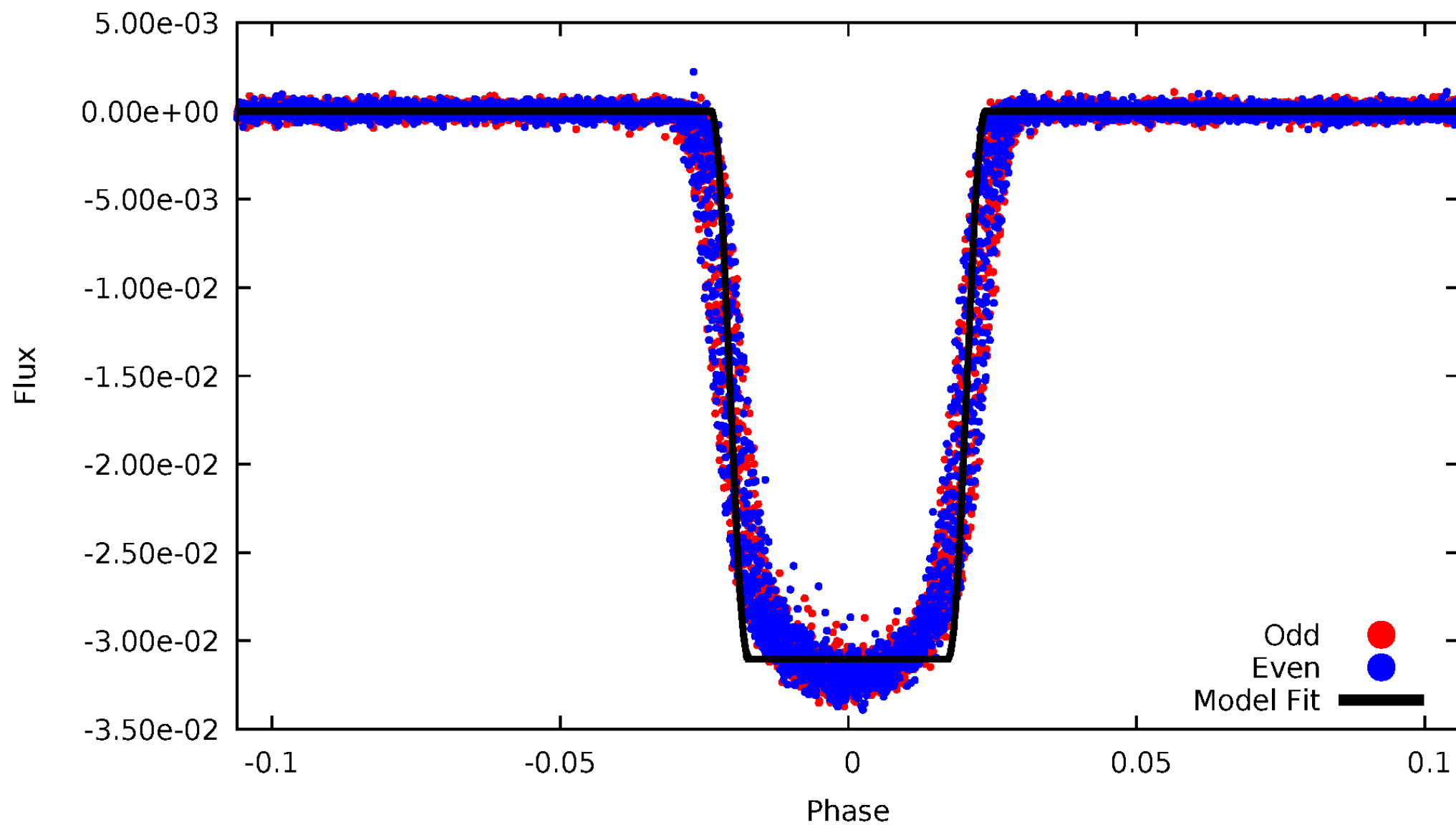
DV Odd/Even

TCE 009528420-01



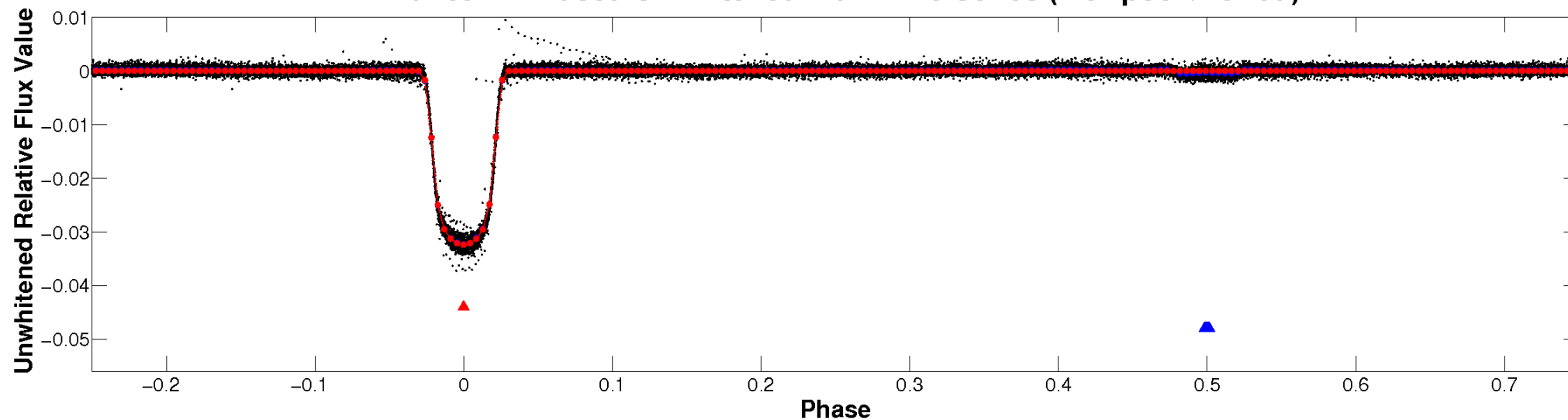
ALT Odd/Even

TCE 009528420-01

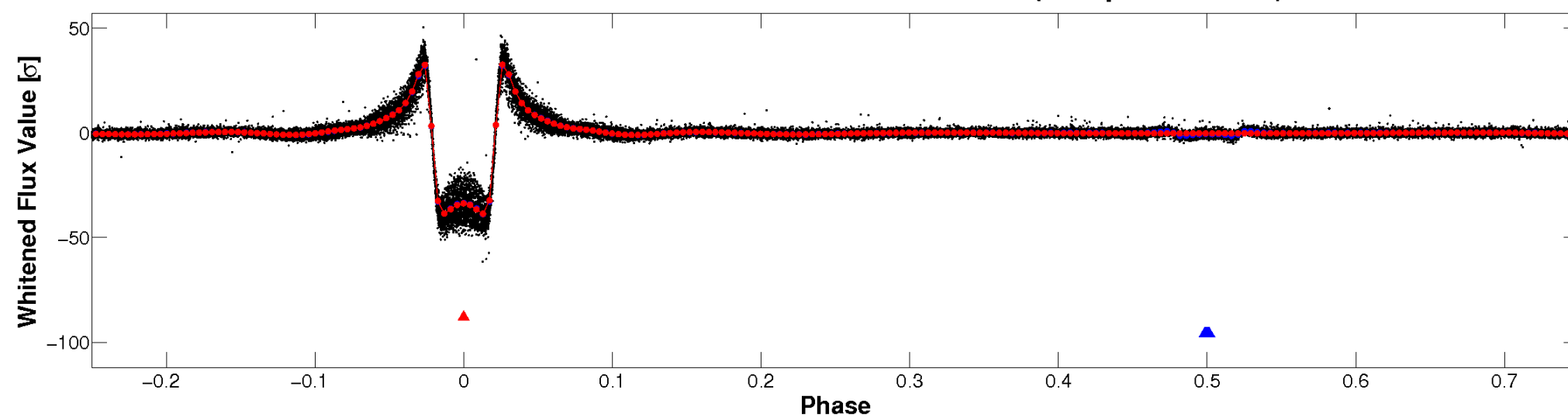


Non-Whitened Vs. Whitened Light Curve

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

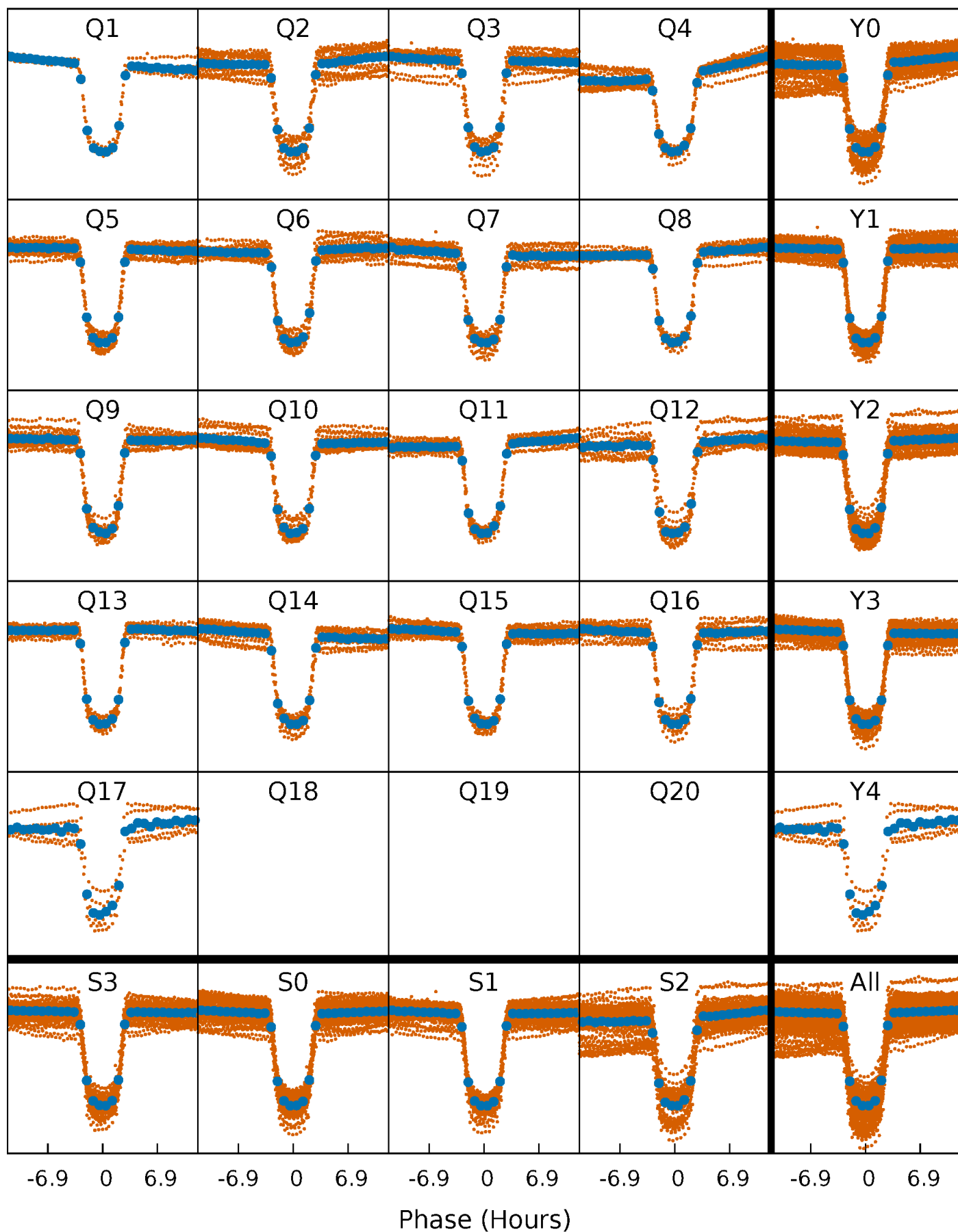


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



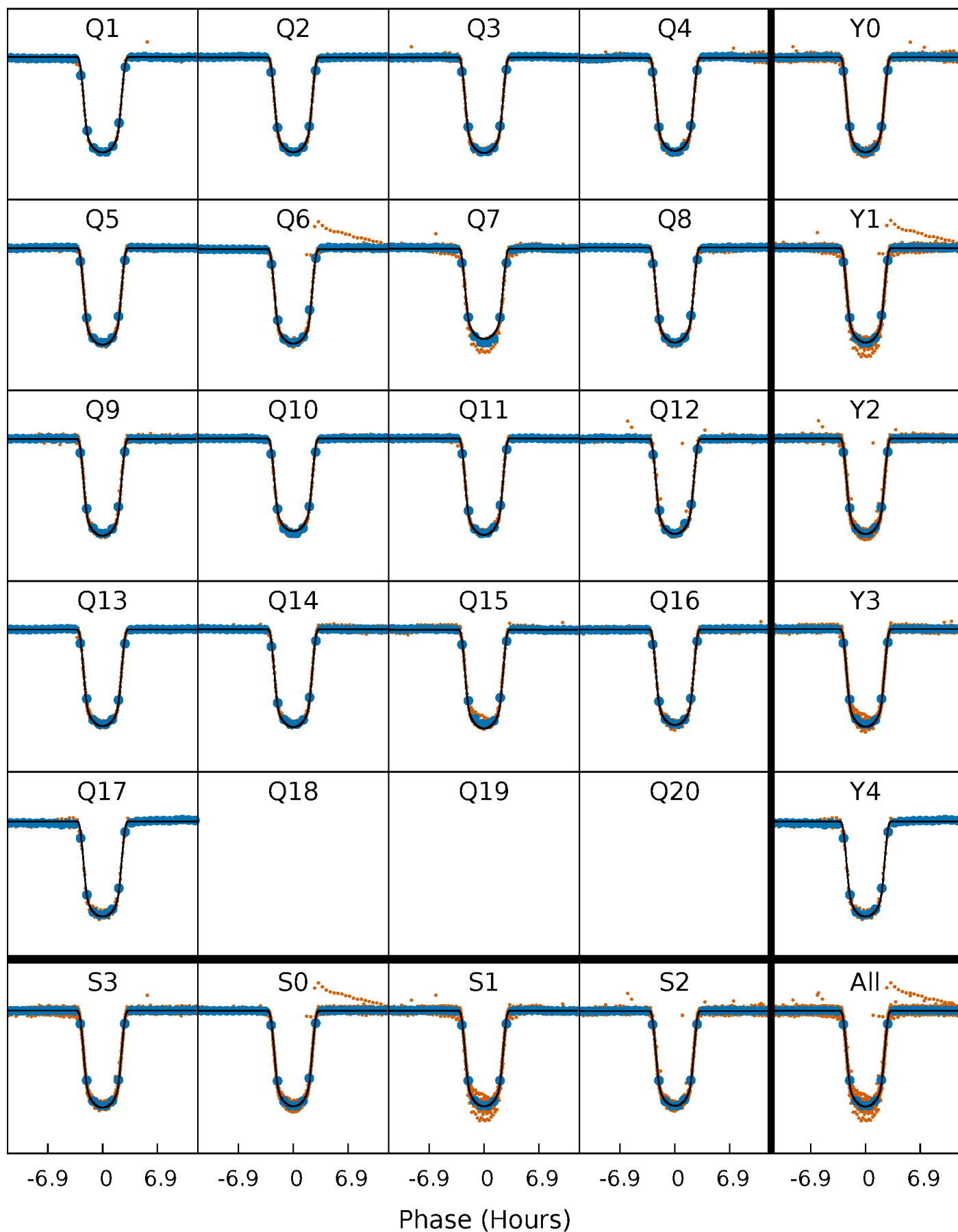
PDC Quarter-Phased Transit Curves

TCE 009528420-01 P= 4.708470 Days $T_0=134.153265$ (BKJD)



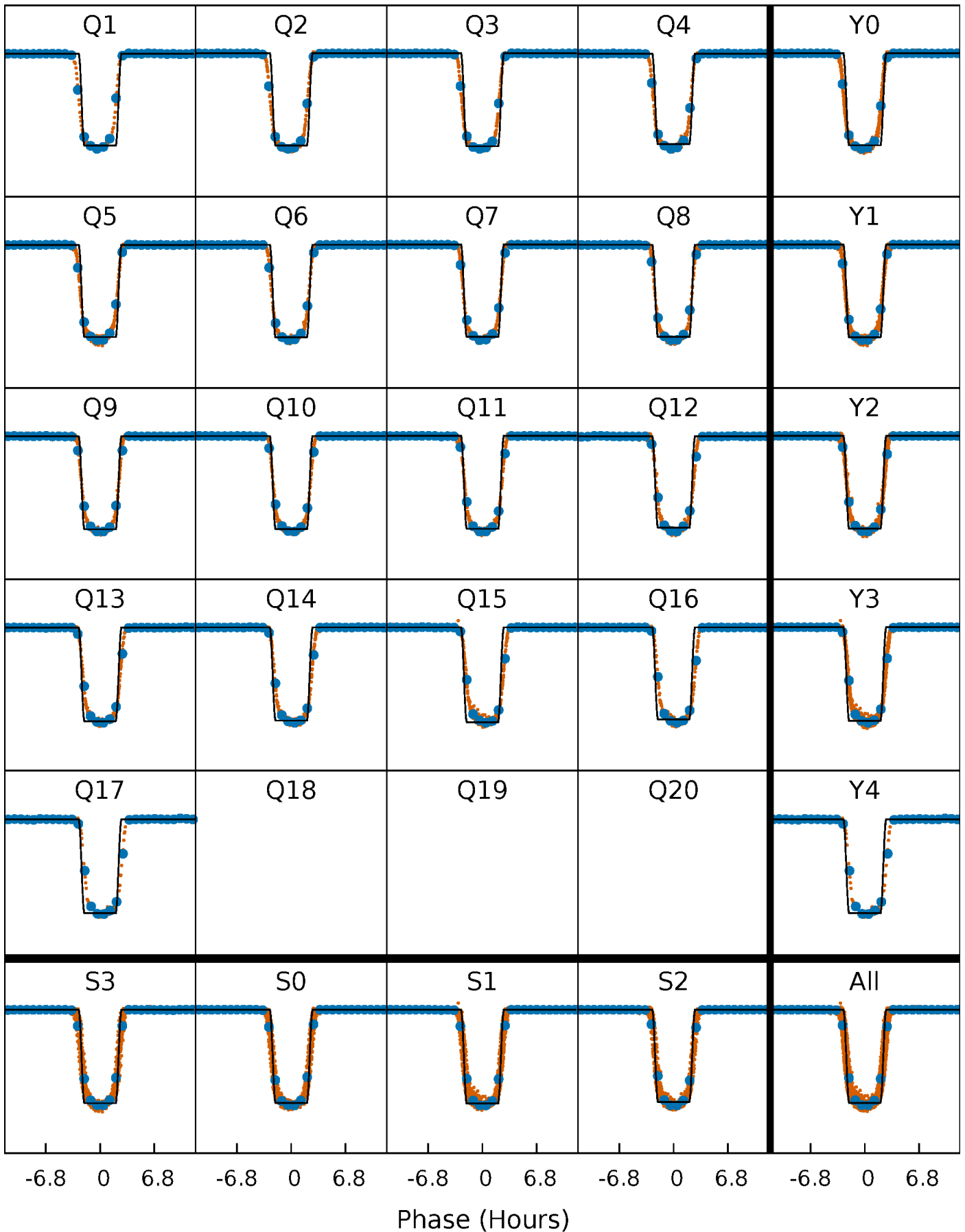
DV Quarter-Phased Transit Curves

TCE 009528420-01 P= 4.708470 Days $T_0=134.153265$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

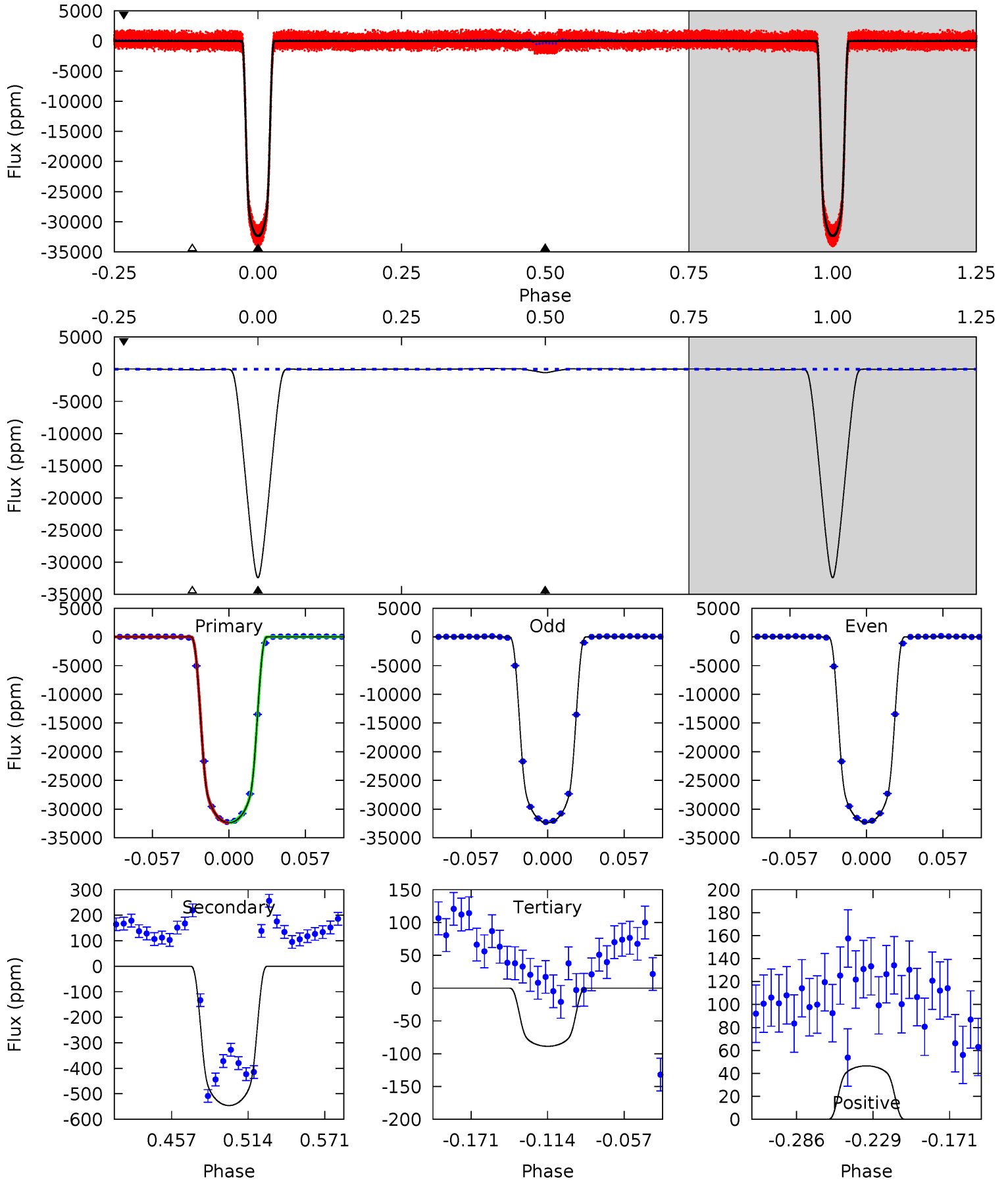
TCE 009528420-01 P= 4.708378 Days $T_0=134.166620$ (BKJD)



DV Model-Shift Uniqueness Test

009528420-01, P = 4.708470 Days, E = 129.444795 Days

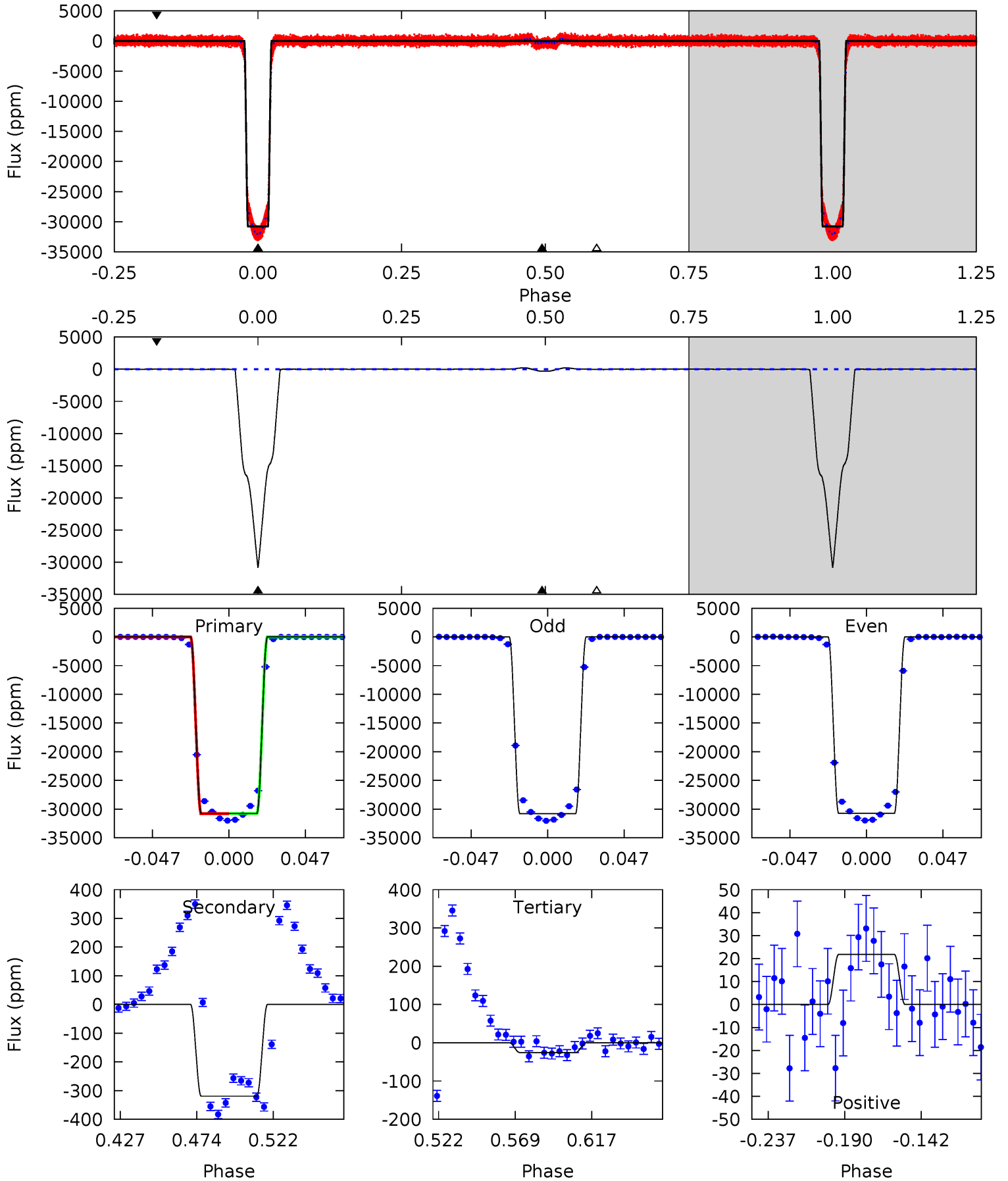
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4083	68.8	11.2	5.87	4.68	1.90	6.59	4072	4078	57.7	63.0	2.23	1.00	0.00	2.09



Alt Model-Shift Uniqueness Test

009528420-01, P = 4.708378 Days, E = 129.458242 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5203	54.0	4.32	3.68	4.72	1.98	3.11	5199	5200	49.7	50.3	3.58	1.00	0.01	3.73



Stellar Parameters For KIC 009528420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6214^{+169}_{-206}	$4.391^{+0.087}_{-0.203}$	$-0.240^{+0.250}_{-0.300}$	$1.061^{+0.326}_{-0.140}$	$1.006^{+0.158}_{-0.115}$	$1.187^{+0.467}_{-0.608}$
	+3%/-3%	+2%/-5%	+104%/-125%	+31%/-13%	+16%/-11%	+39%/-51%
Source	PHO1	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 009528420-01 / KOI 1742.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-546 ± 8	$19.94^{+3.39}_{-1.68}$	1700^{+133}_{-86}	2927^{+45}_{-61}	$2.279^{+0.386}_{-0.557}$
Alt.	-319 ± 6	$20.85^{+3.48}_{-1.85}$	1701^{+135}_{-95}	2638^{+46}_{-53}	$1.222^{+0.223}_{-0.296}$

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 $A_{obs} \gg 1.0$

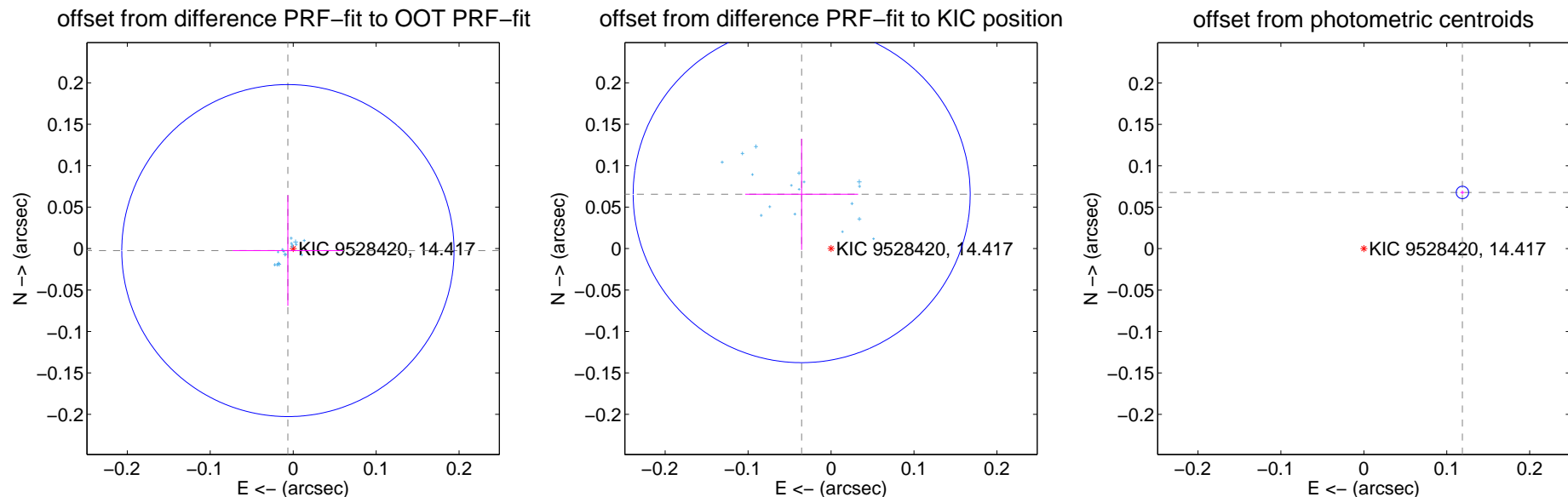
DV Centroid Data

Supplemental centroid analysis for 009528420-01. Kepler magnitude: 14.42. Transit SNR 2013.85

There are 17 quarters with good PRF difference image offsets

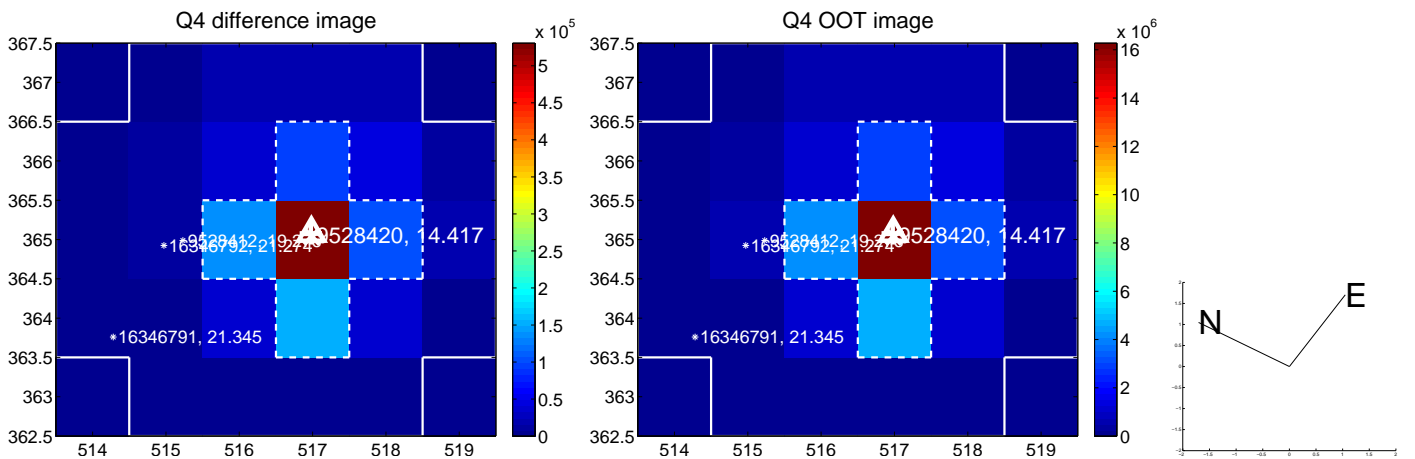
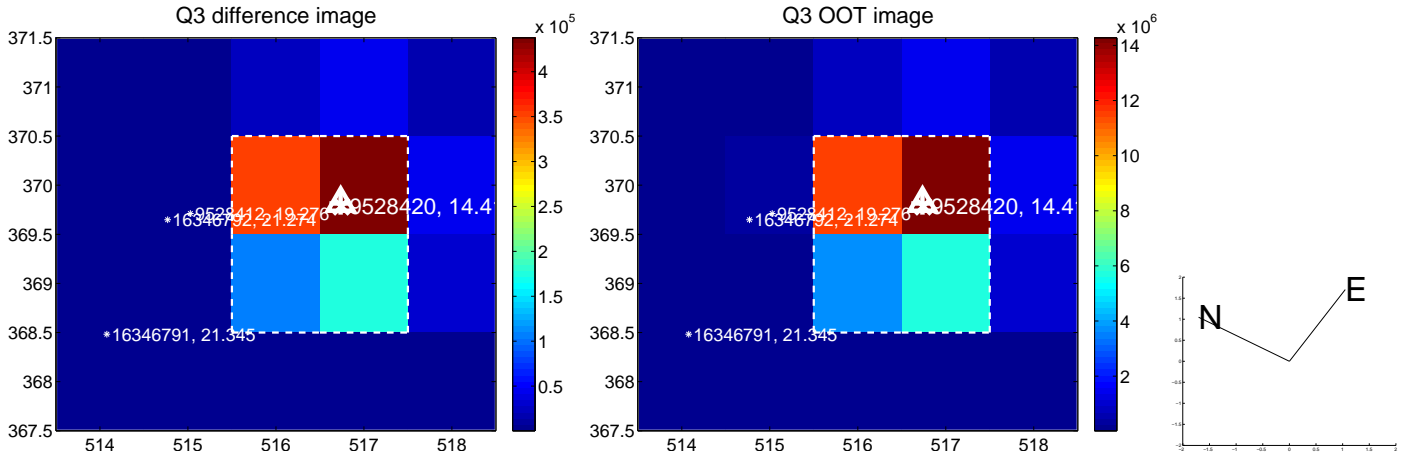
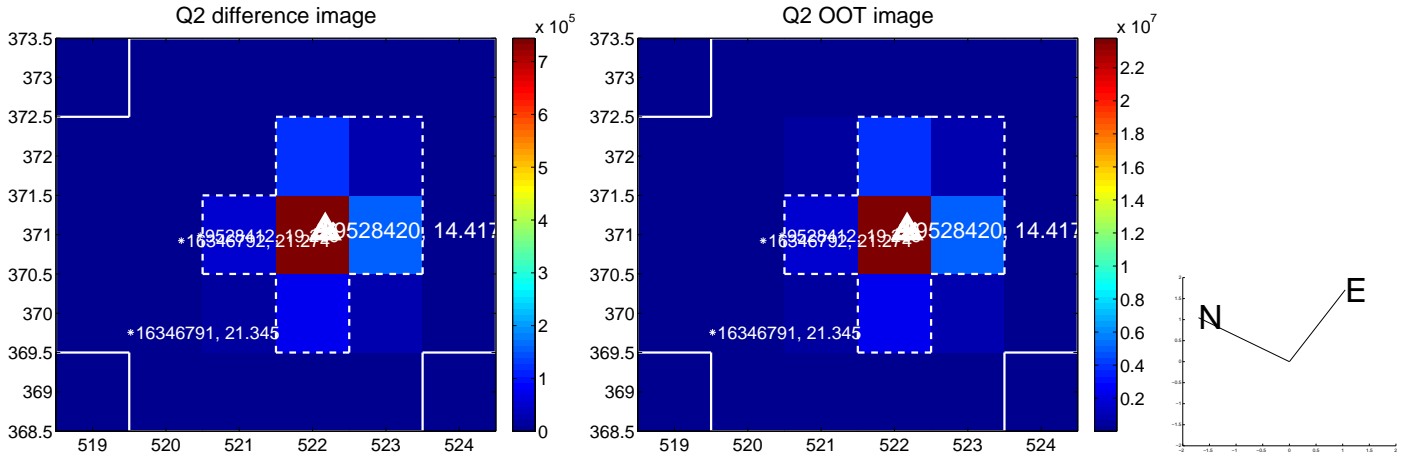
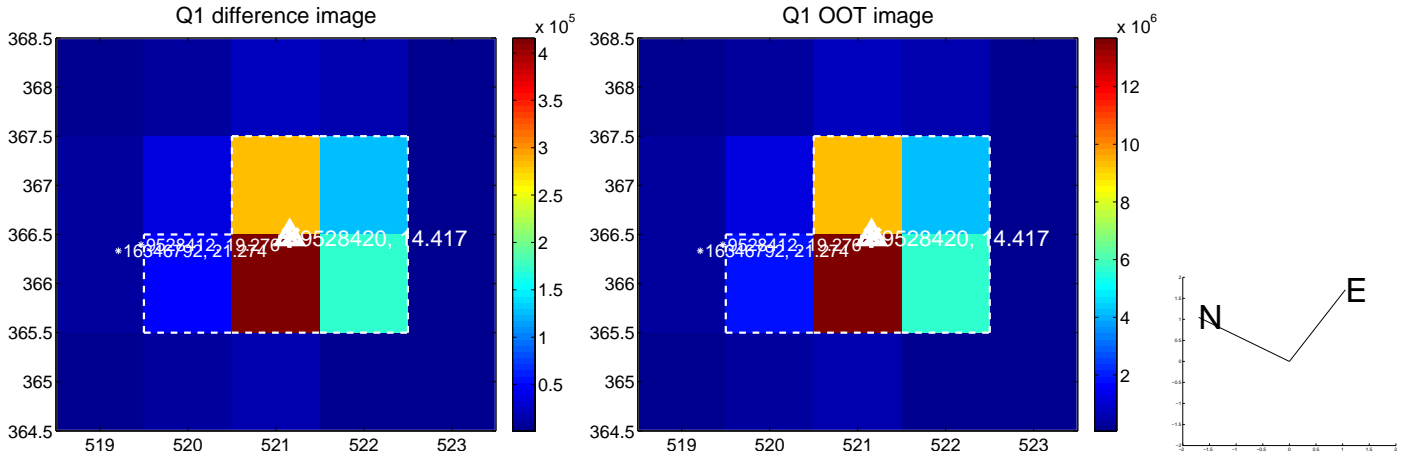
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.007 ± 0.067	0.10	0.006 ± 0.067	-0.002 ± 0.067
PRF-fit source offset from KIC position	0.074 ± 0.068	1.10	0.035 ± 0.068	0.066 ± 0.067
photometric centroid source offset	0.14 ± 0.00	54.76	-0.12 ± 0.00	0.07 ± 0.00

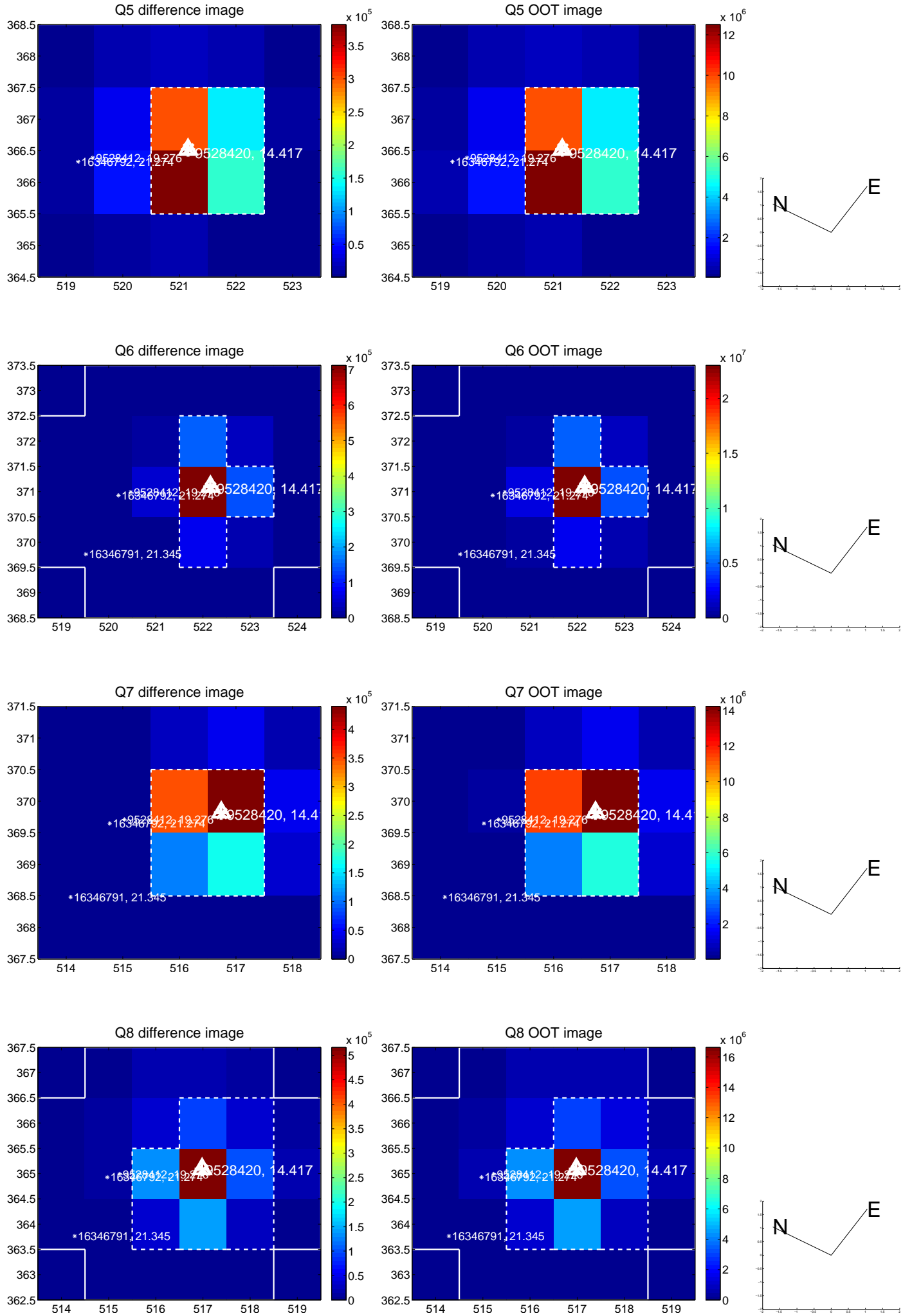


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

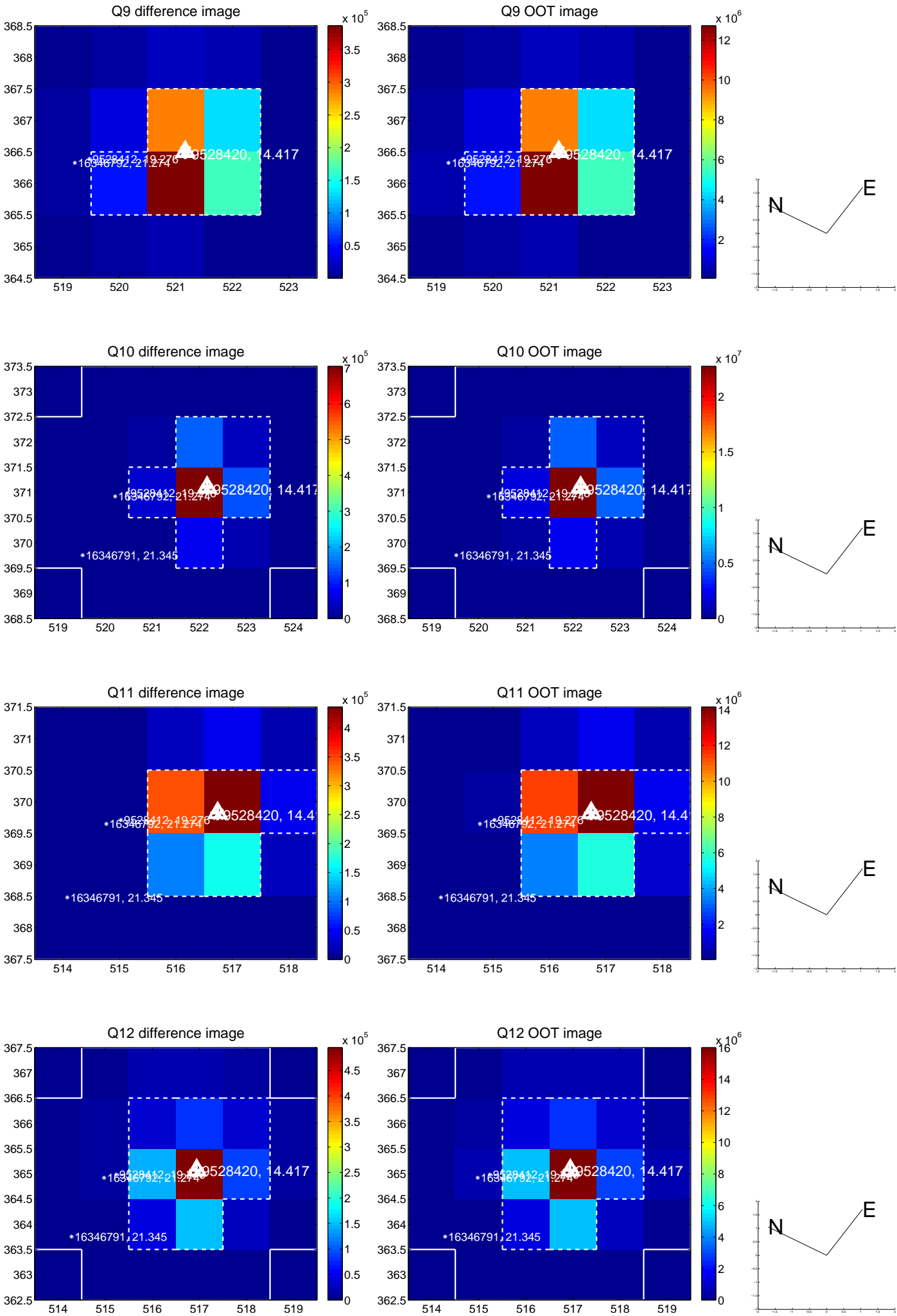
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



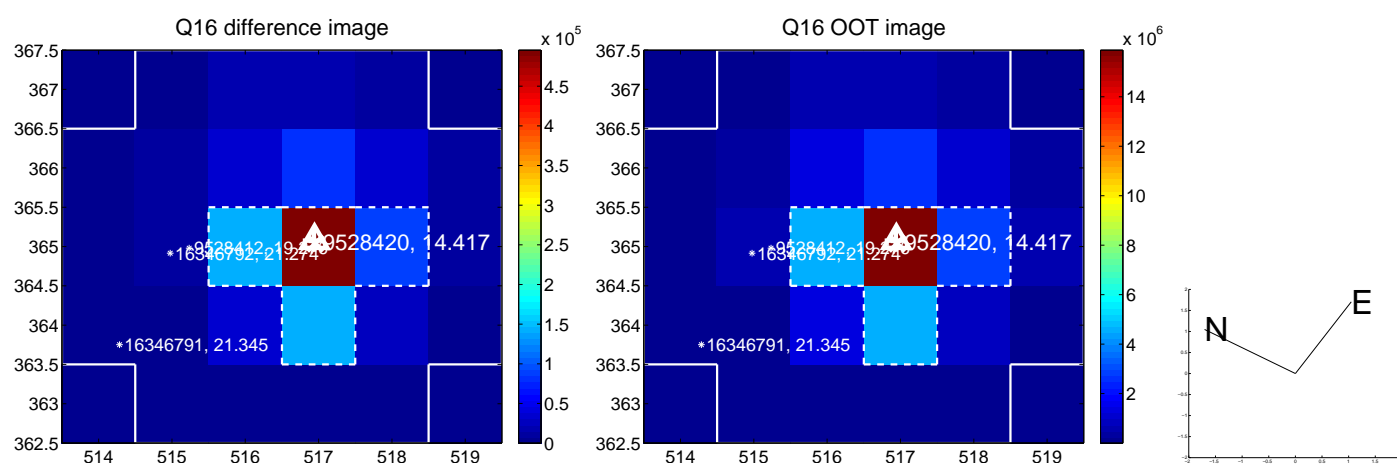
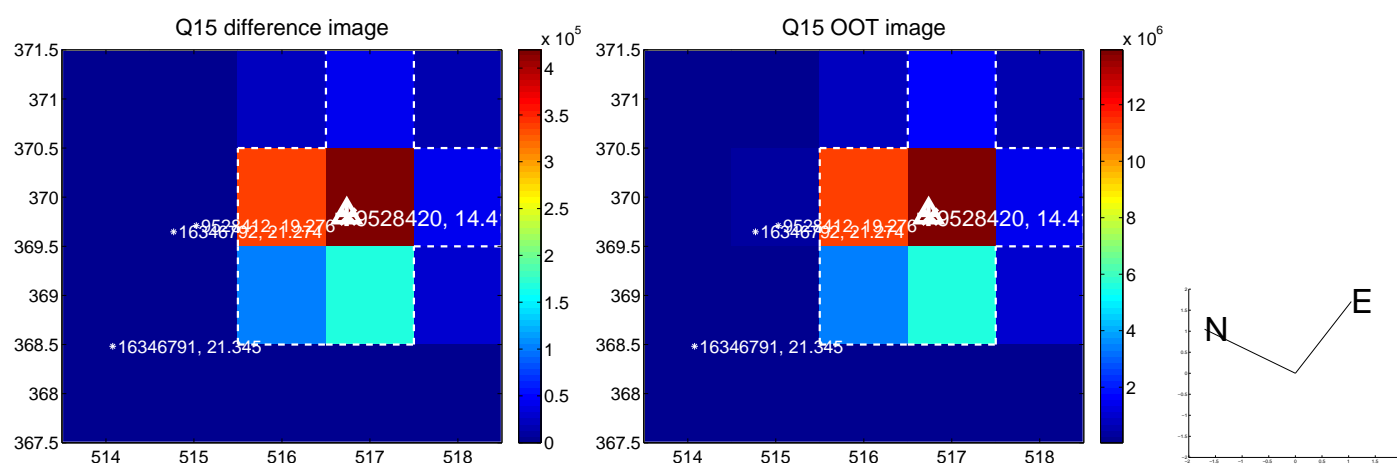
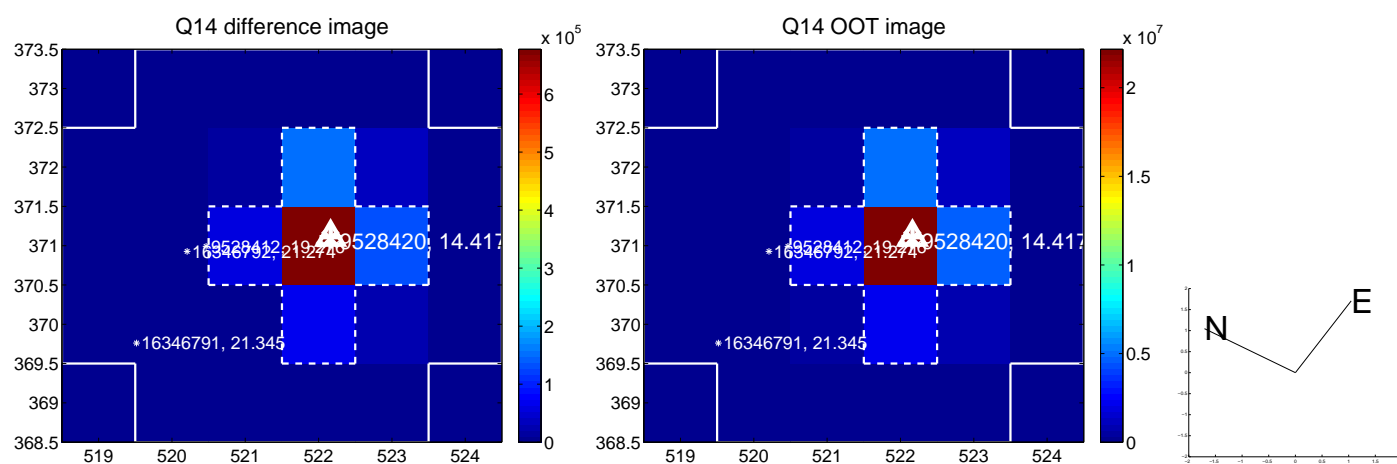
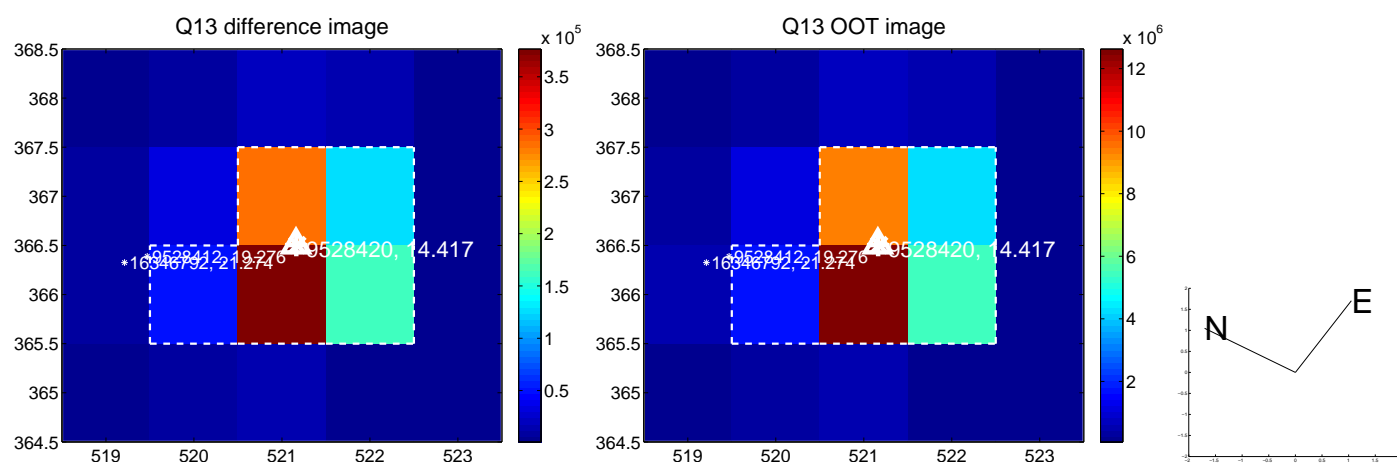
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



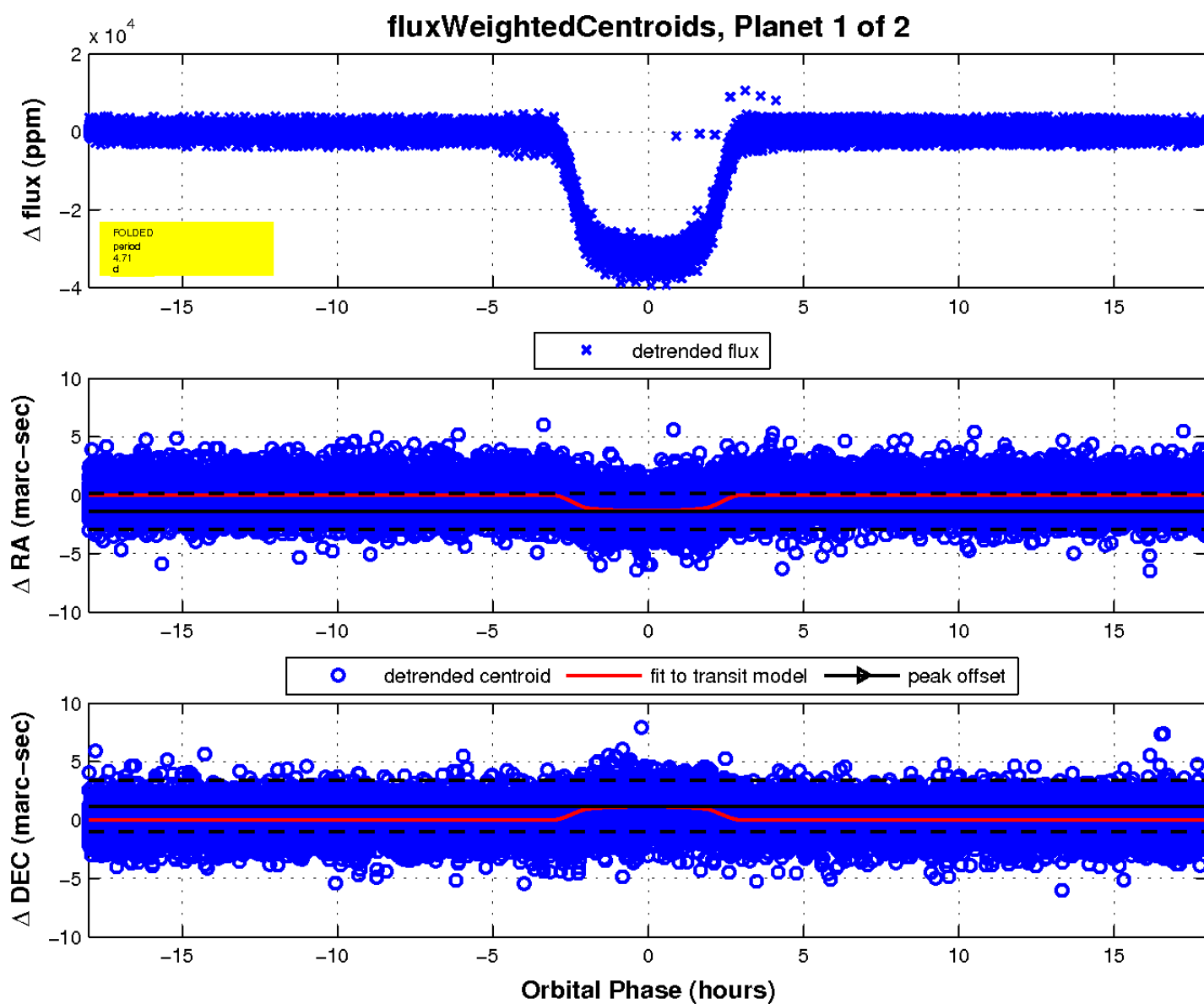
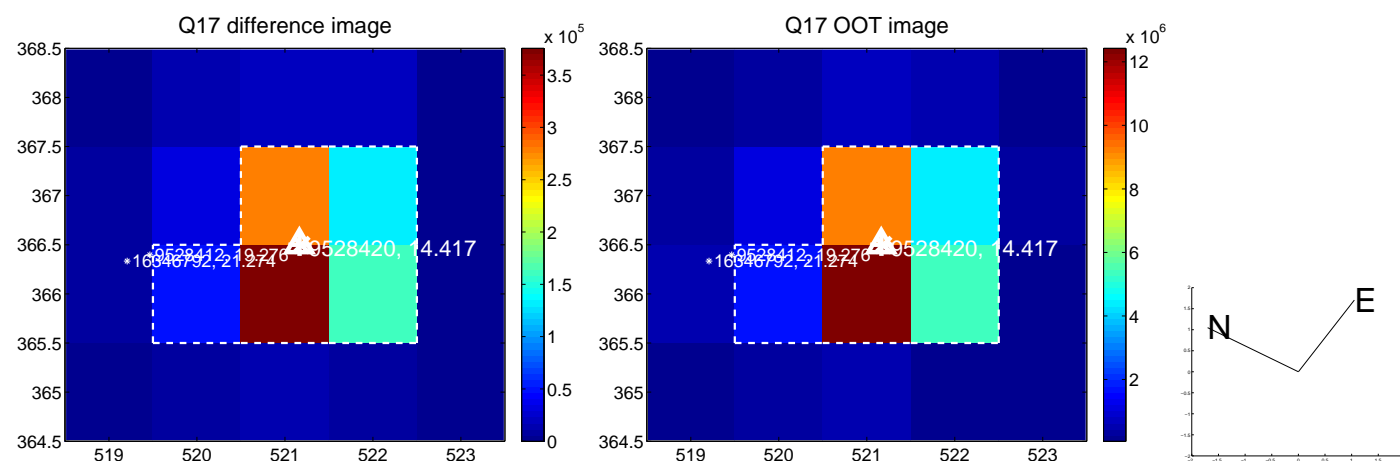
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

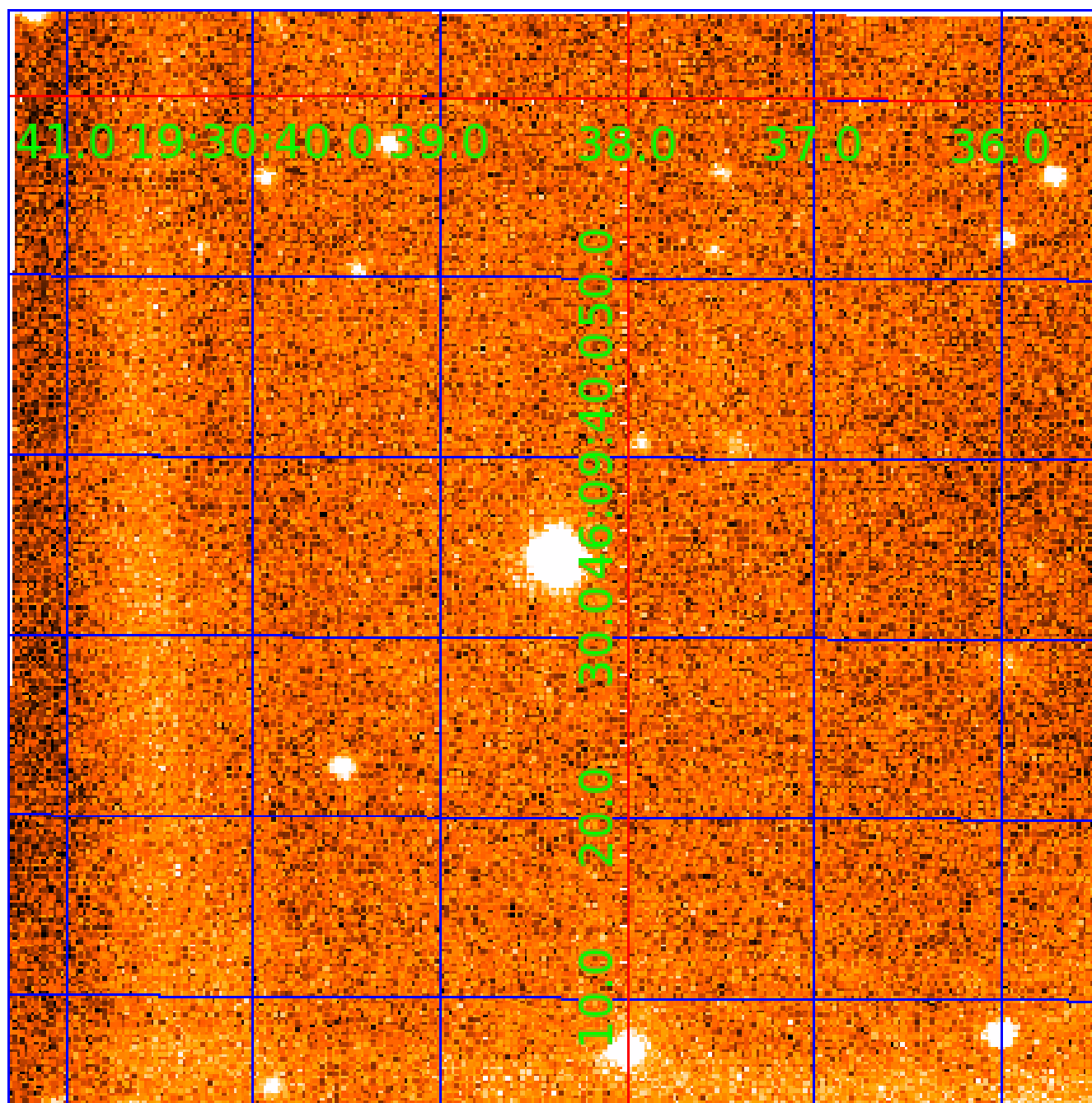


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



UKIRT Image

Declination



KIC 009528420

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})
009528420-01	OBS	1742.01	4.708470	134.153265	32428.3	6.006	2089.8	2013.9	1.06	6214	19.54	493.95
009528420-02	OBS	No	4.708422	131.806047	788.3	5.673	50.9	59.7	1.06	6214	3.38	493.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009528420-01	OBS	FP	0.23	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
009528420-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 009528420-02

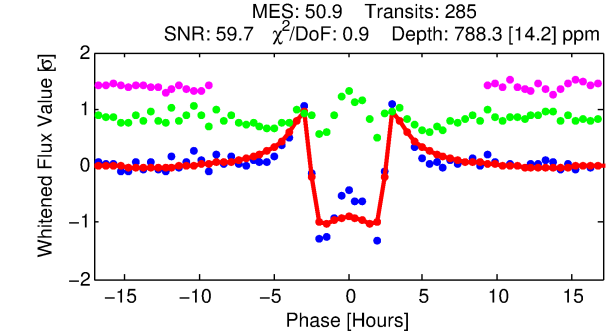
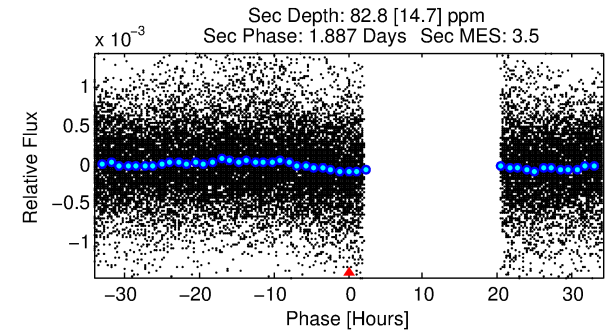
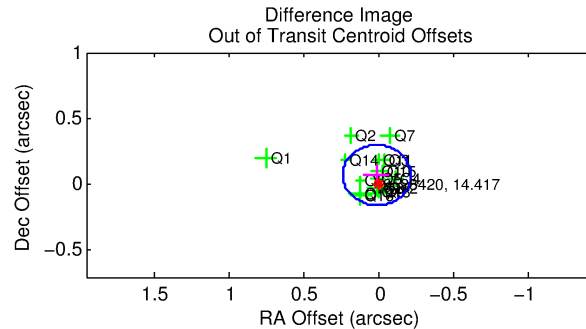
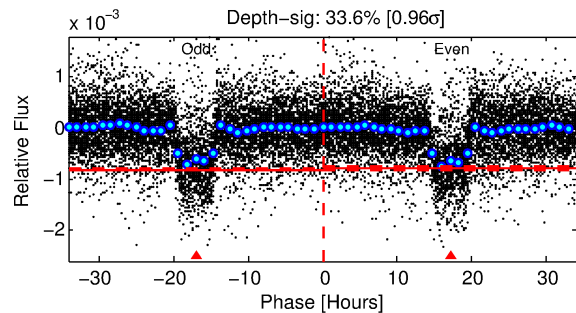
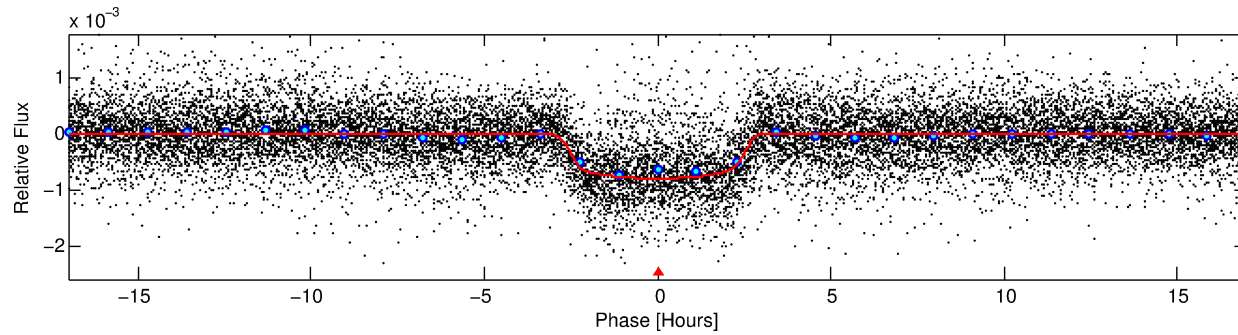
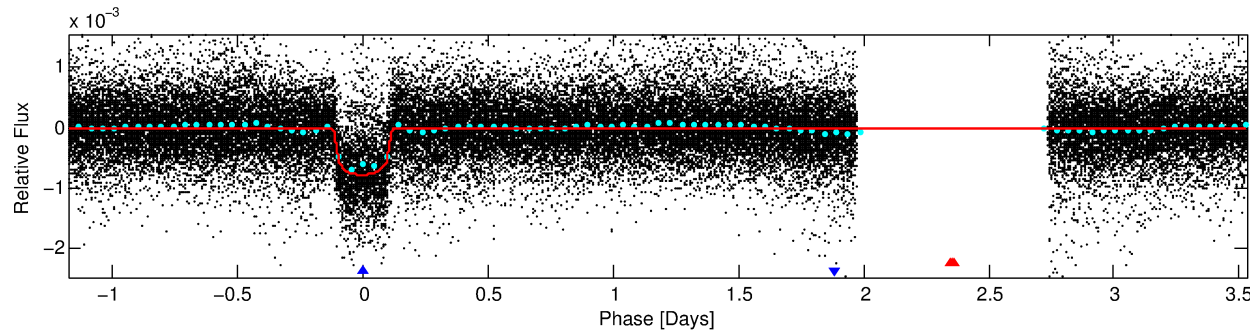
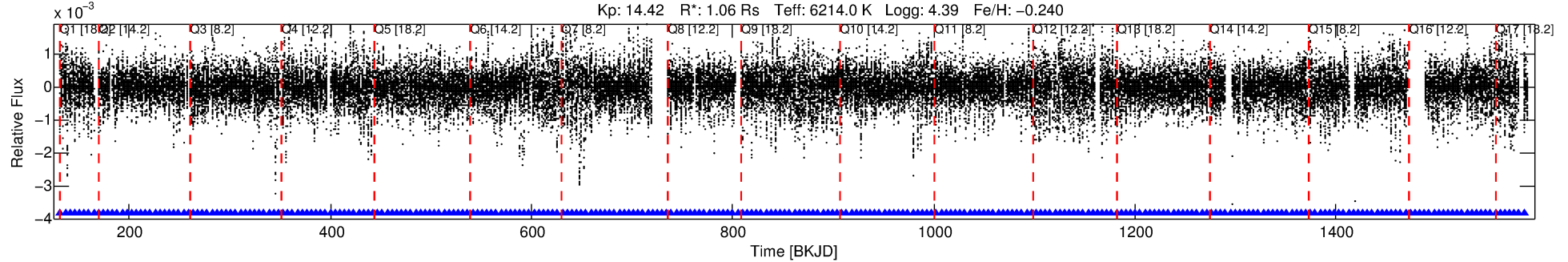
No Significant Match Found

DV One-Page Summary

KIC: 9528420 Candidate: 2 of 2 Period: 4.708 d

KOI: K01742 Corr: No Ephemeris Match

Kp: 14.42 R*: 1.06 Rs Teff: 6214.0 K Logg: 4.39 Fe/H: -0.240



DV Fit Results:

Period = 4.70842 [0.00001] d
Epoch = 131.8060 [0.0008] BKJD
Rp/R* = 0.0292 [0.0006]
a/R* = 3.79 [0.31]
b = 0.85 [0.03]
Seff = 493.96 [195.50]
Teq = 1202 [119] K
Rp = 3.38 [1.04] Re
a = 0.0552 [0.0142] AU
Ag = 12.17 [5.05] [2.21 sigma]
Teffp = 3472 [196] K [9.91 sigma]

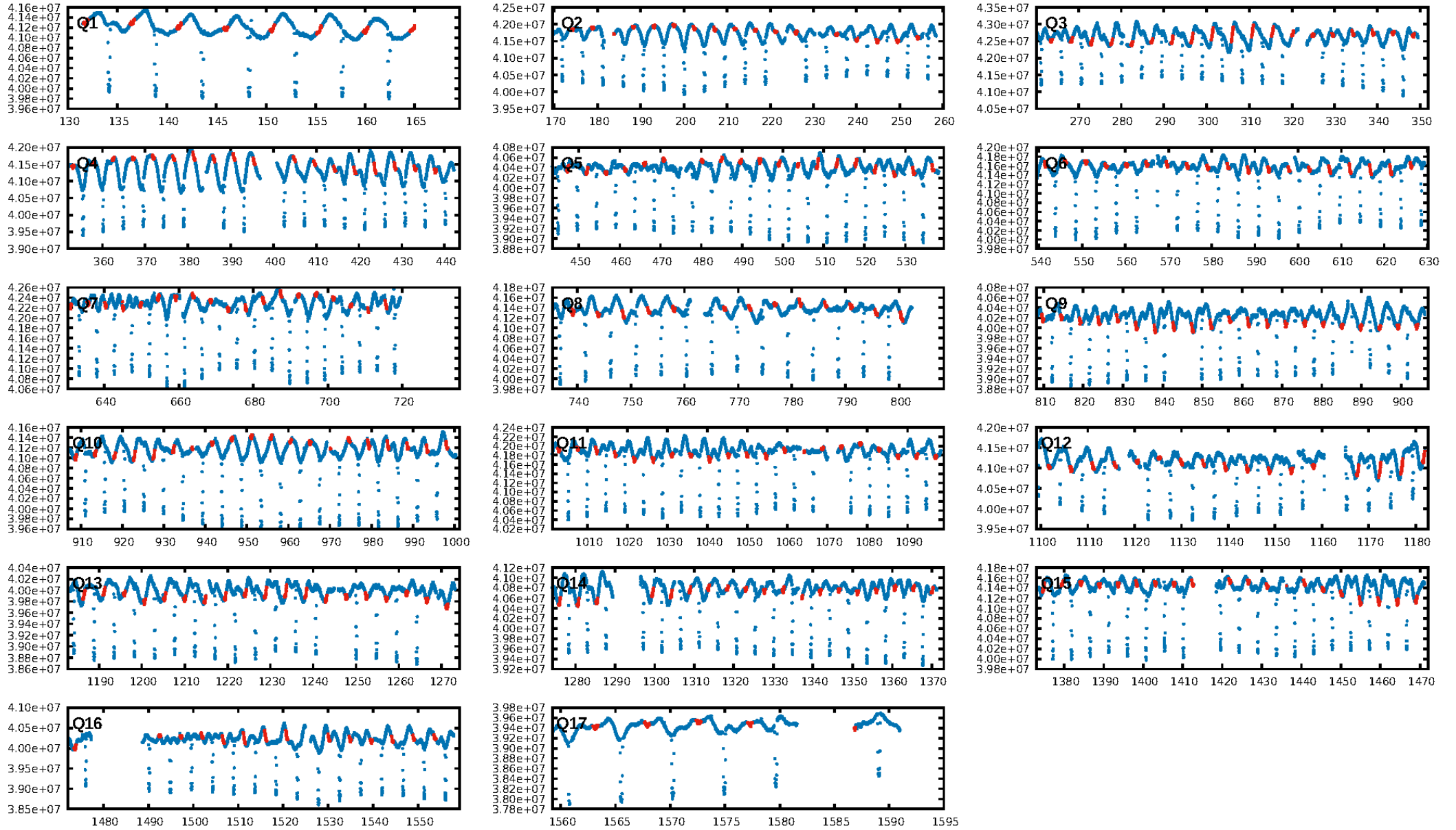
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 sigma]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [272/272]
GhostDiagnostic-chr: 1.81
Centroid-sig: 6.1%
Centroid-so: 0.207 arcsec [2.16 sigma]
OotOffset-rm: 0.071 arcsec [0.93 sigma]
KicOffset-rm: 0.155 arcsec [2.05 sigma]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

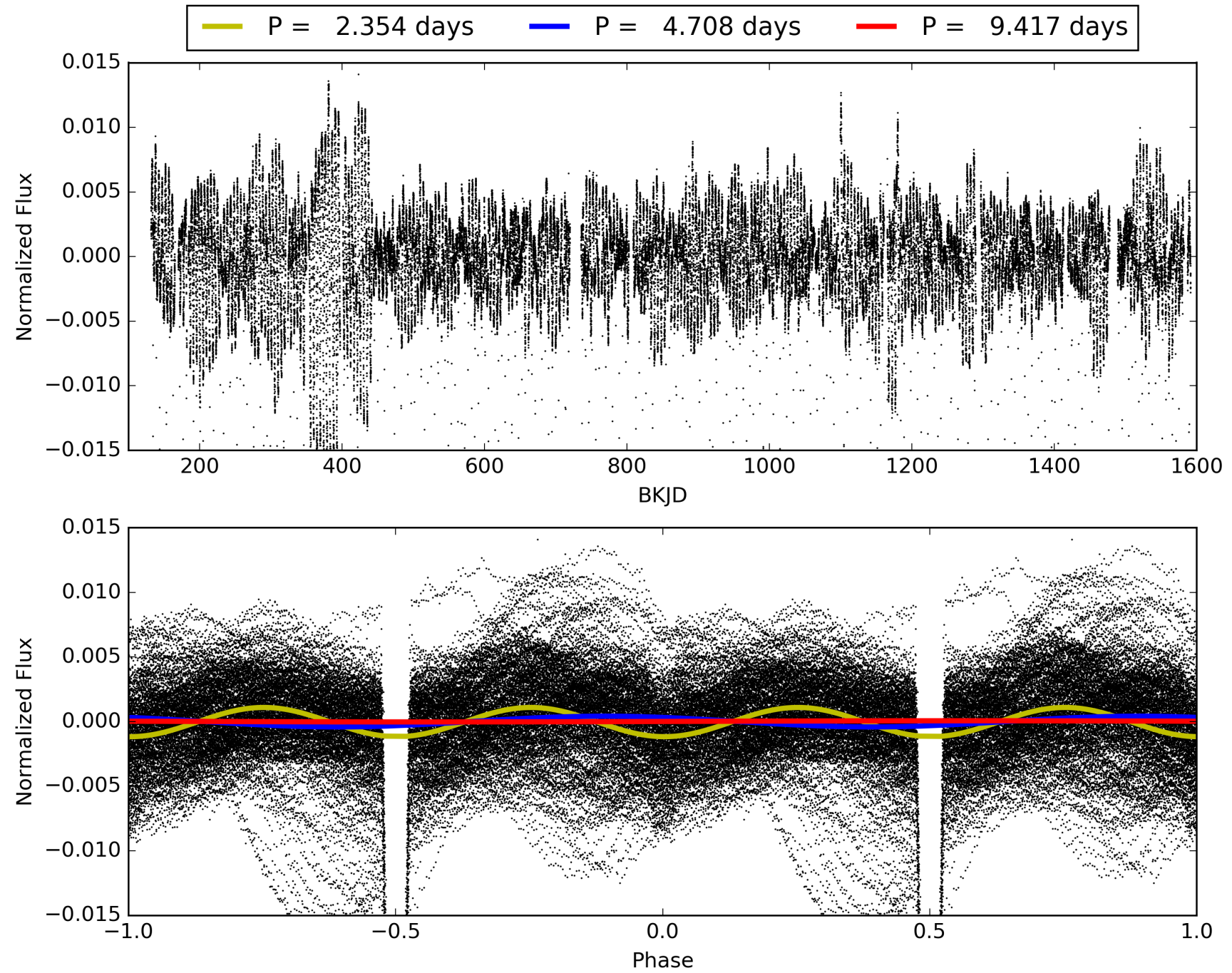
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009528420-02, PDC Light Curves

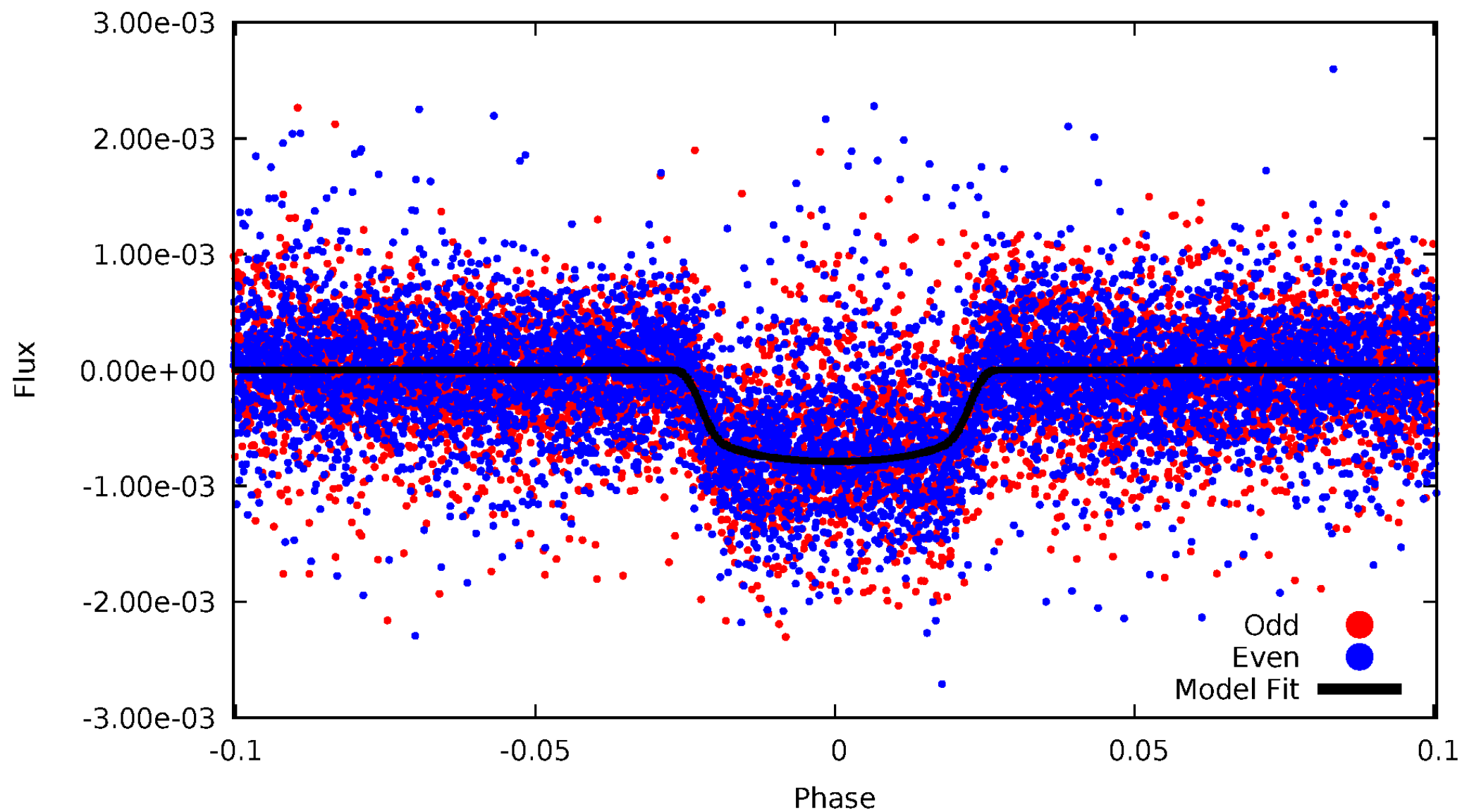


TCE 009528420-02



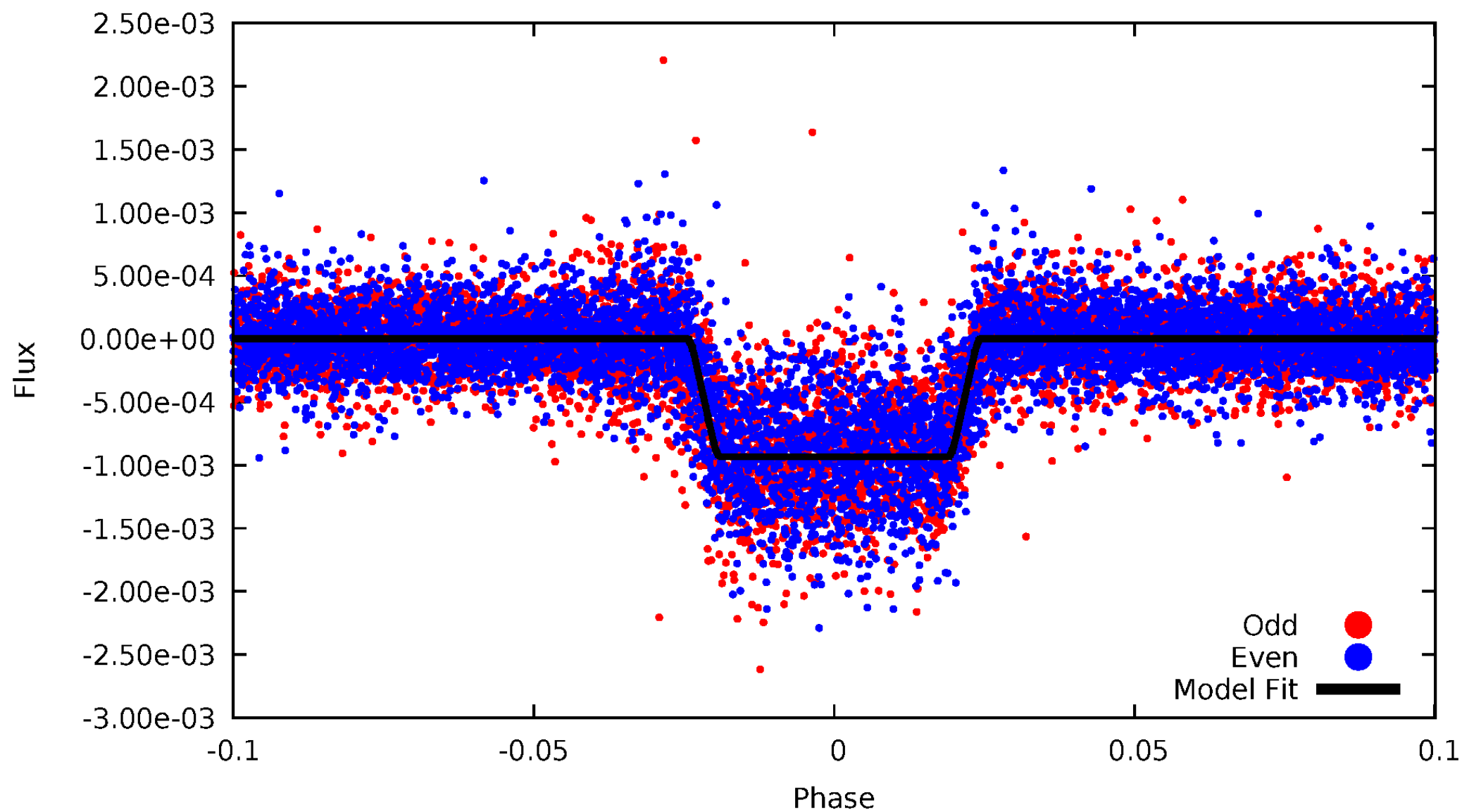
DV Odd/Even

TCE 009528420-02



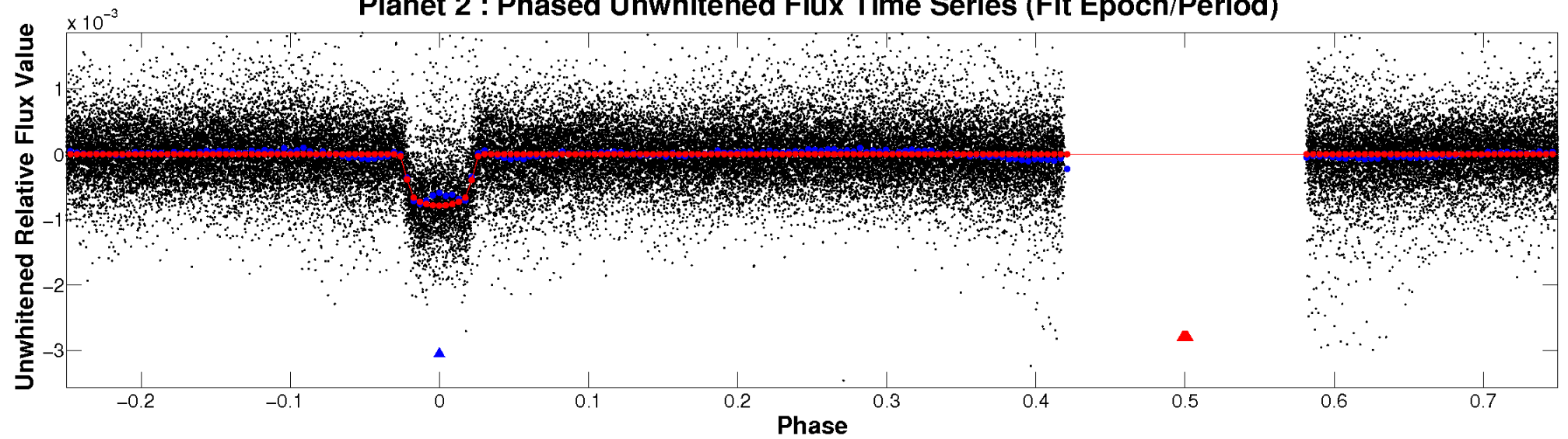
ALT Odd/Even

TCE 009528420-02

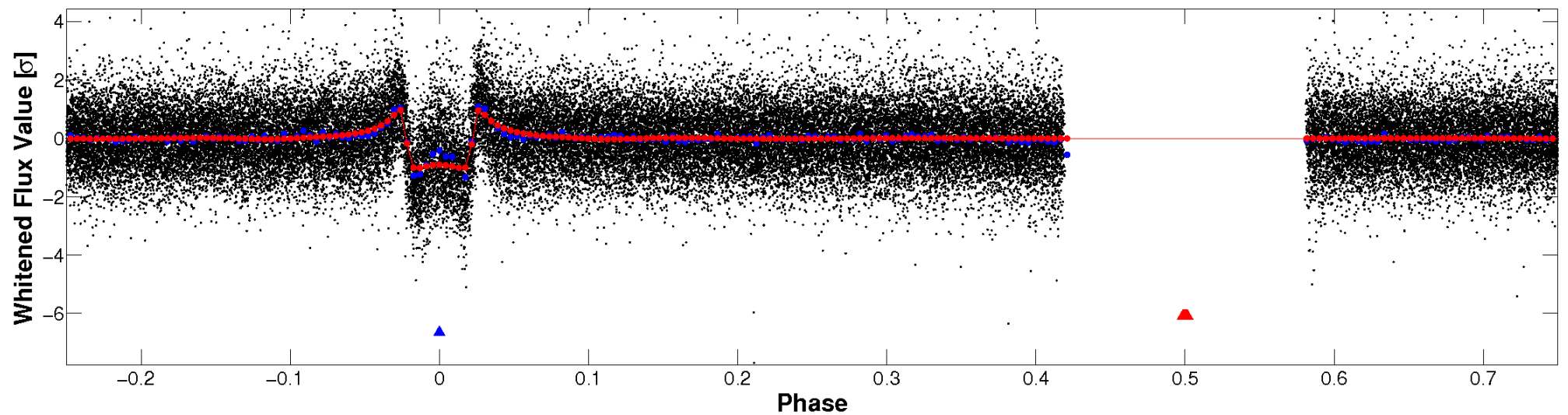


Non-Whitened Vs. Whitened Light Curve

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

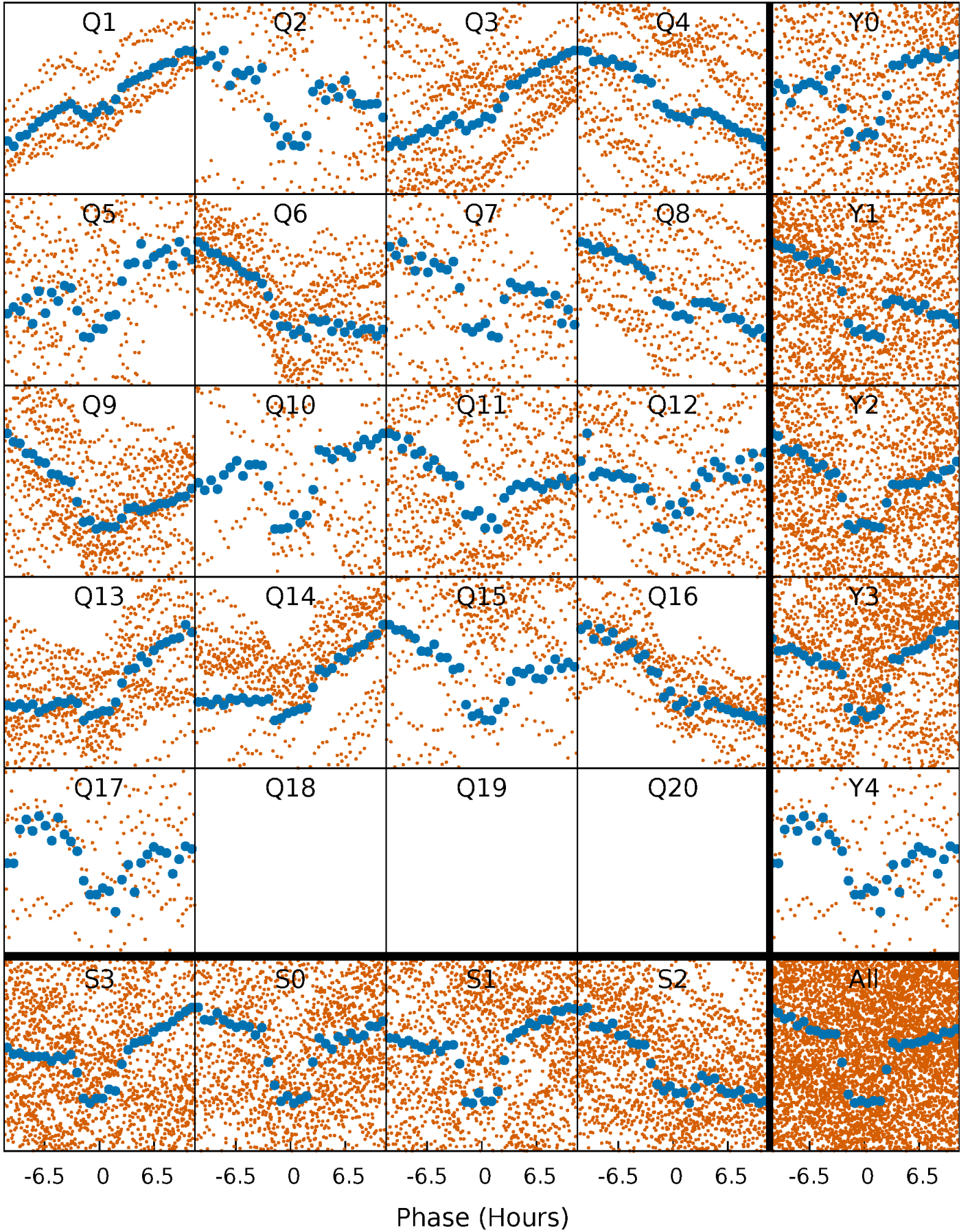


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



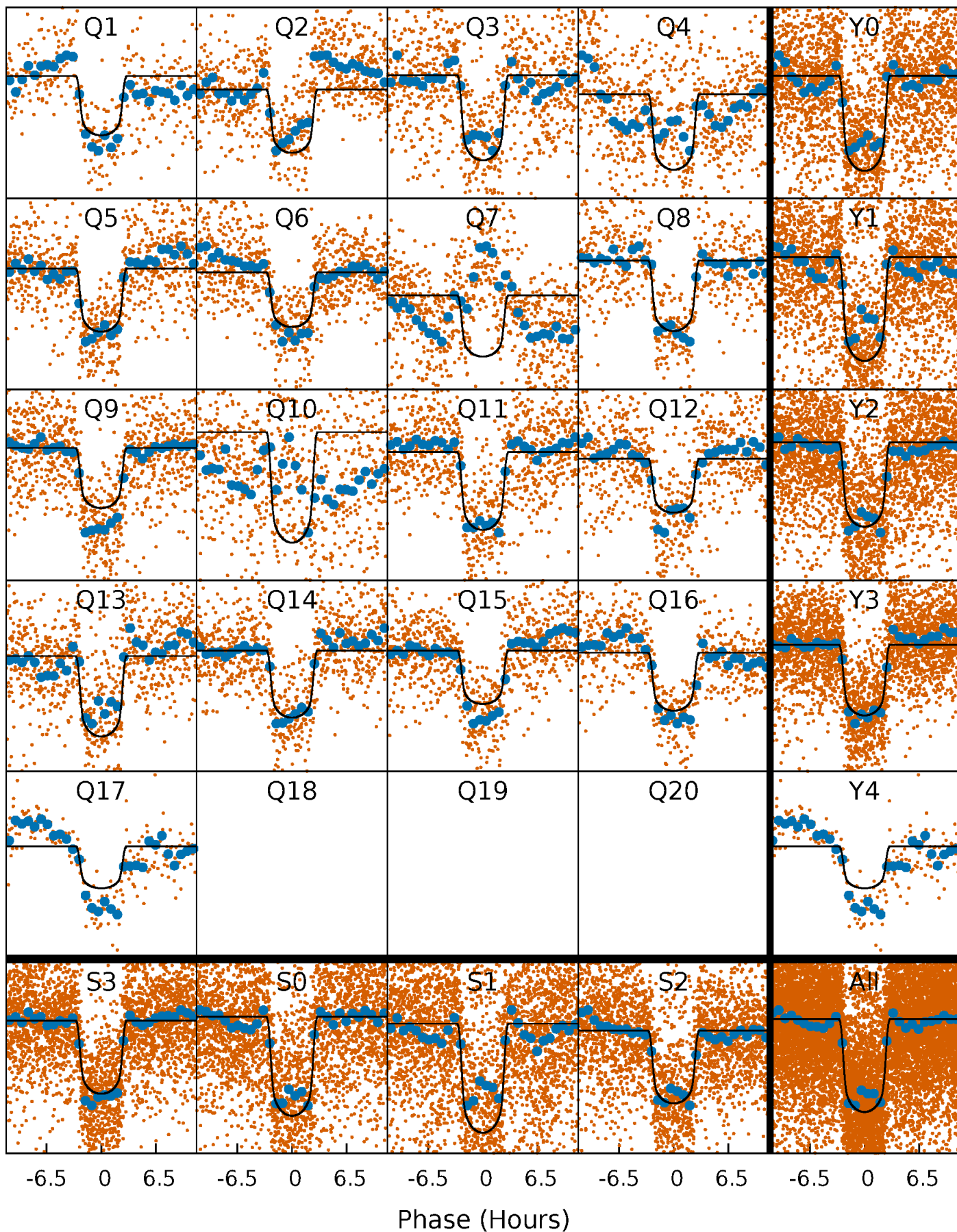
PDC Quarter-Phased Transit Curves

TCE 009528420-02 P= 4.708422 Days $T_0=131.806047$ (BKJD)



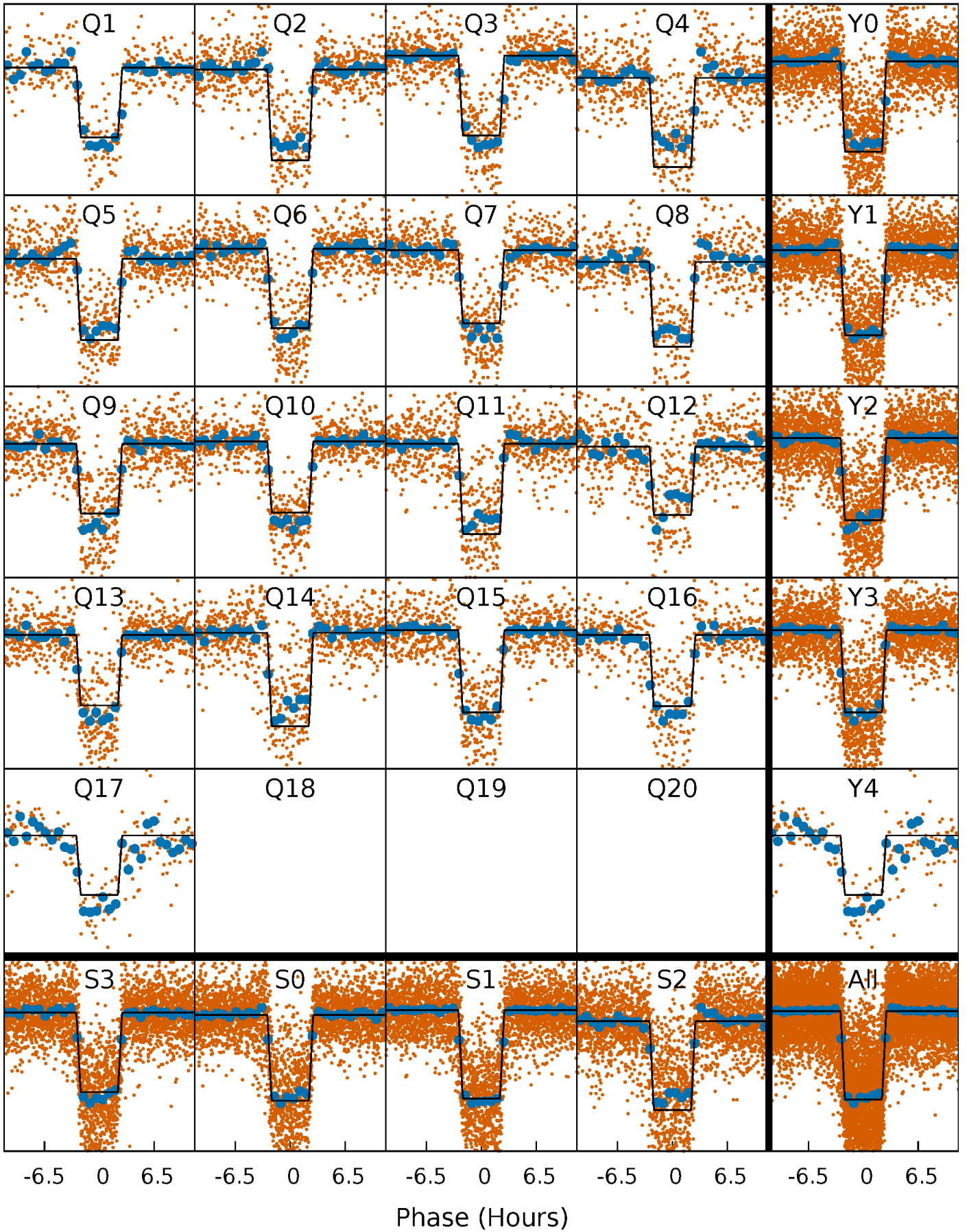
DV Quarter-Phased Transit Curves

TCE 009528420-02 $P = 4.708422$ Days $T_0 = 131.806047$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

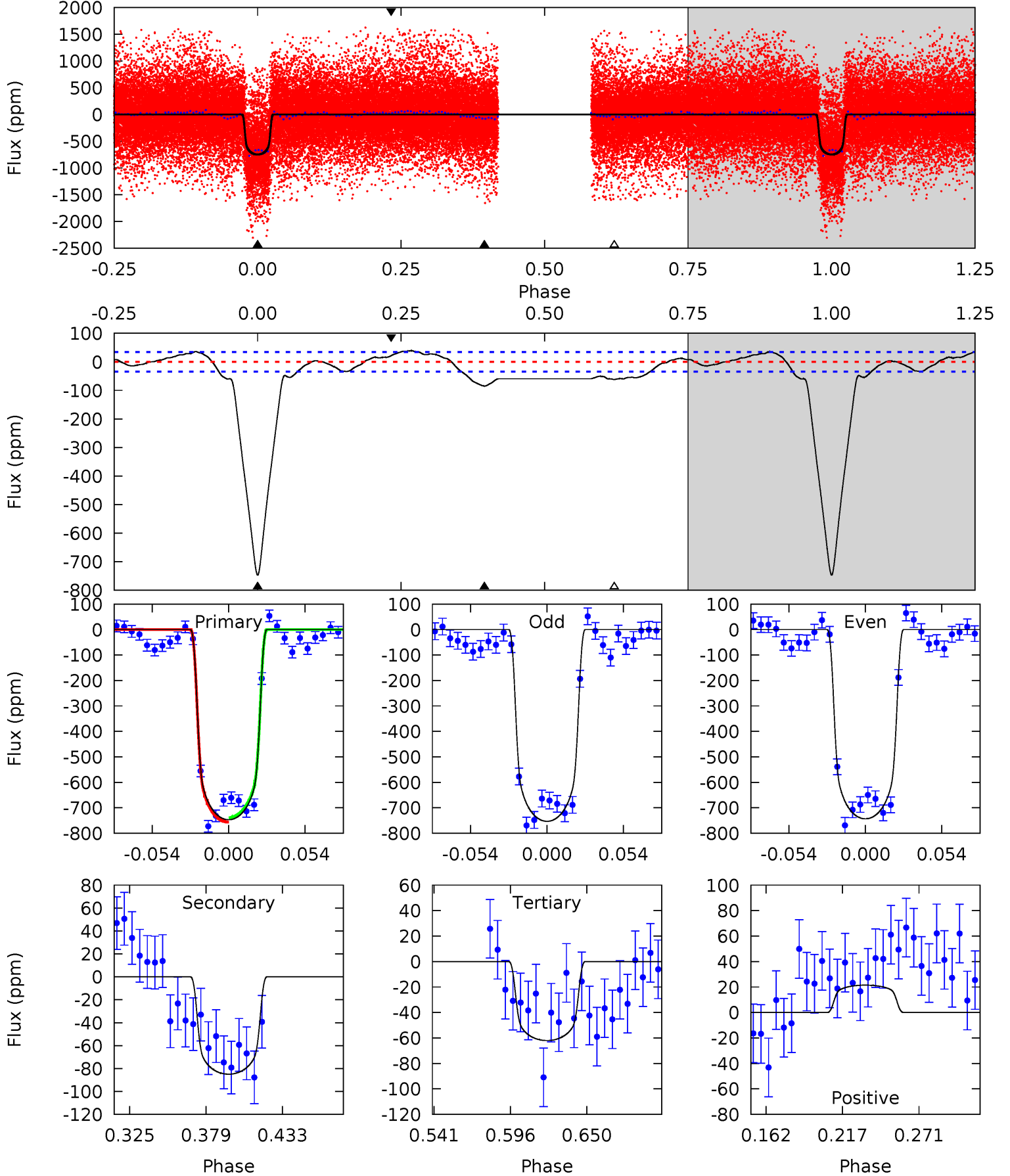
TCE 009528420-02 P= 4.708512 Days $T_0=131.792785$ (BKJD)



DV Model-Shift Uniqueness Test

009528420-02, P = 4.708422 Days, E = 127.097625 Days

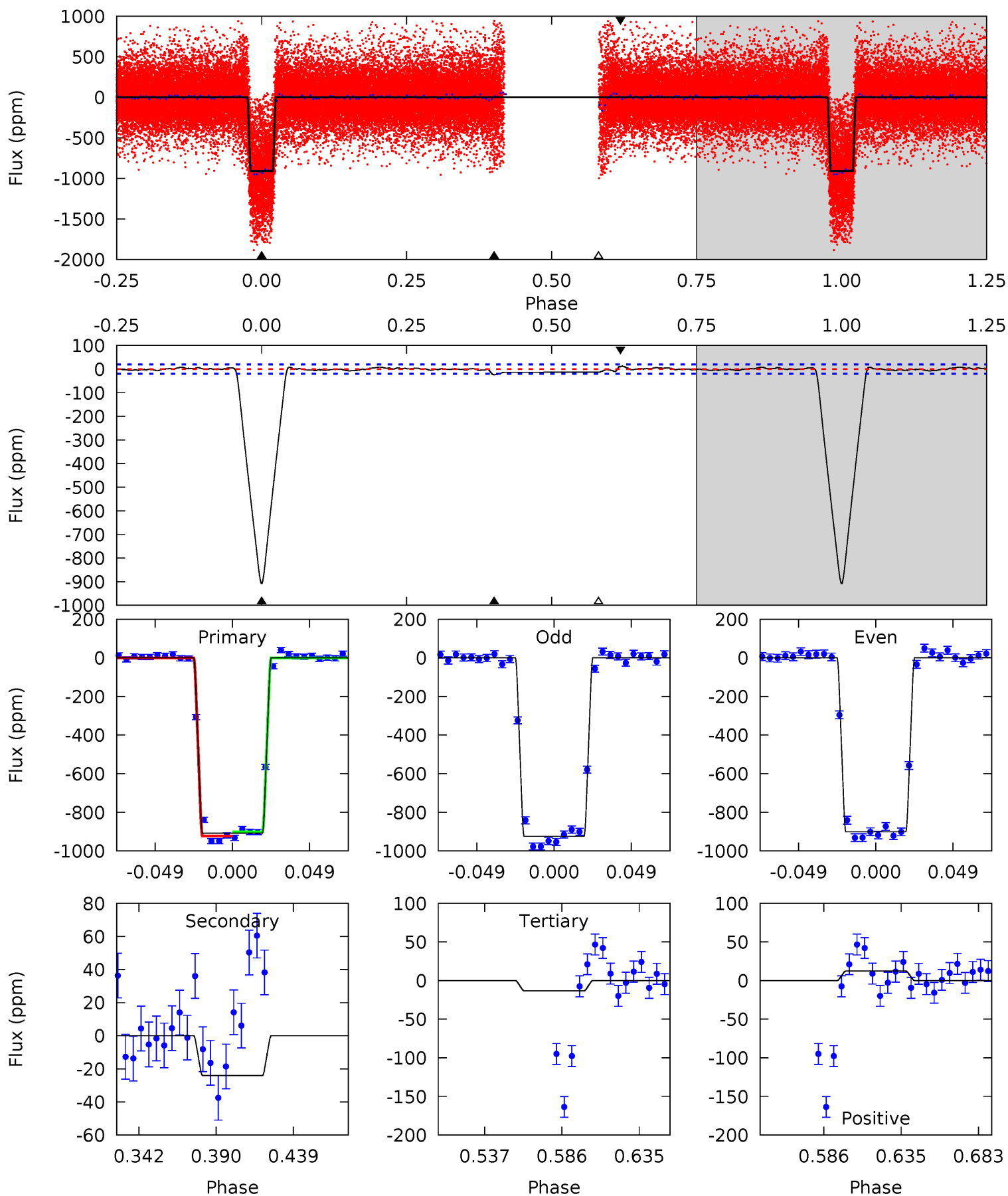
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
102.1	11.6	8.48	2.94	4.69	1.93	3.99	93.6	99.2	3.13	8.67	0.68	0.92	0.05	1.20



Alt Model-Shift Uniqueness Test

009528420-02, P = 4.708512 Days, E = 127.084273 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
215.7	5.70	3.13	2.89	4.71	1.97	0.94	212.5	212.8	2.57	2.81	2.78	1.00	0.01	2.68



Stellar Parameters For KIC 009528420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6214^{+169}_{-206}	$4.391^{+0.087}_{-0.203}$	$-0.240^{+0.250}_{-0.300}$	$1.061^{+0.326}_{-0.140}$	$1.006^{+0.158}_{-0.115}$	$1.187^{+0.467}_{-0.608}$
	+3%/-3%	+2%/-5%	+104%/-125%	+31%/-13%	+16%/-11%	+39%/-51%
Source	PHO1	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 009528420-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-85 ± 7	$3.41^{+0.59}_{-0.28}$	1695^{+118}_{-88}	3837^{+95}_{-110}	12^{+2}_{-3}
Alt.	-24 ± 4	$3.57^{+0.62}_{-0.28}$	1705^{+117}_{-85}	3062^{+104}_{-109}	$2.983^{+0.916}_{-0.805}$

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 $A_{obs} \gg 1.0$

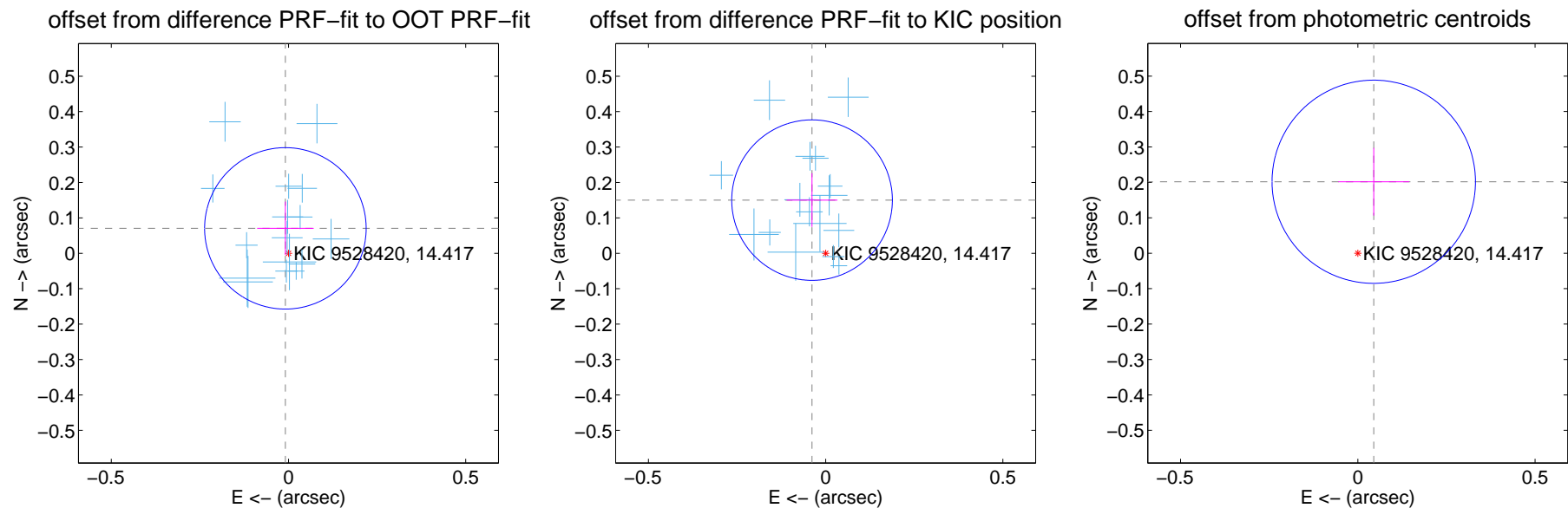
DV Centroid Data

Supplemental centroid analysis for 009528420-02. Kepler magnitude: 14.42. Transit SNR 59.69

There are 17 quarters with good PRF difference image offsets

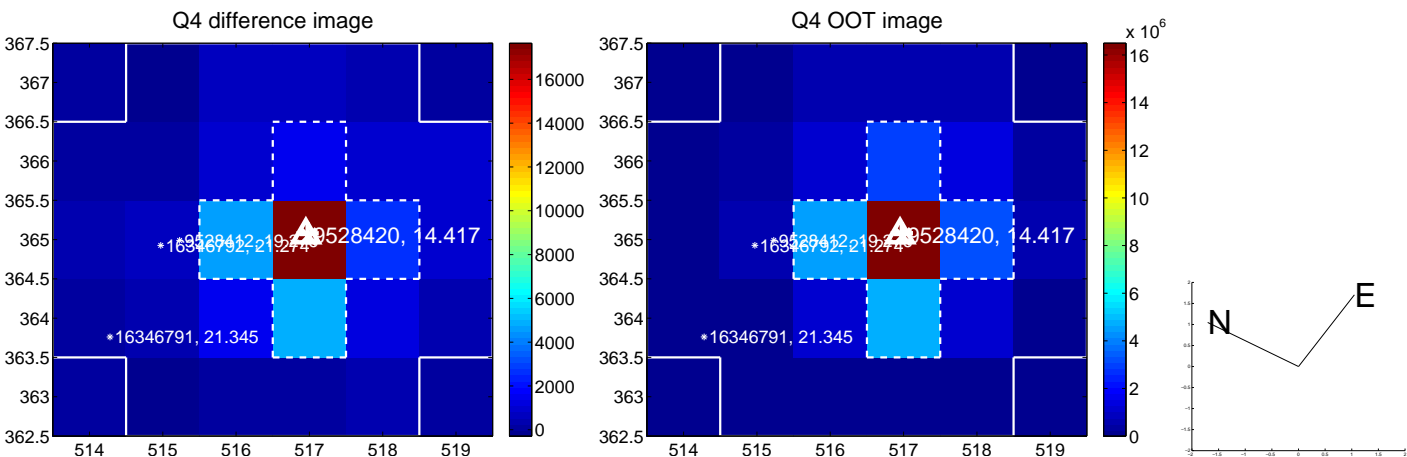
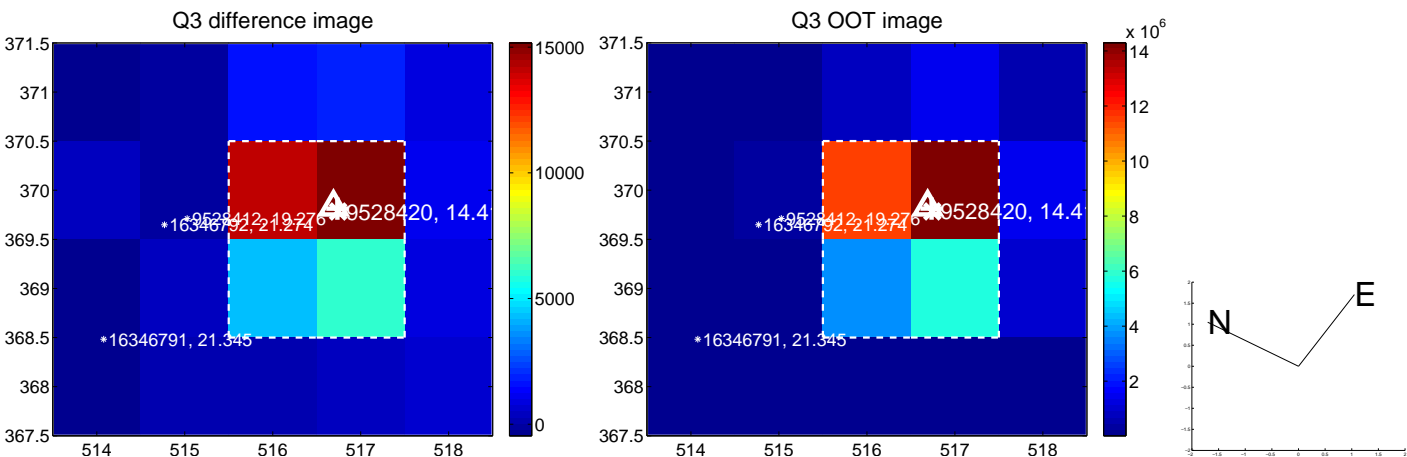
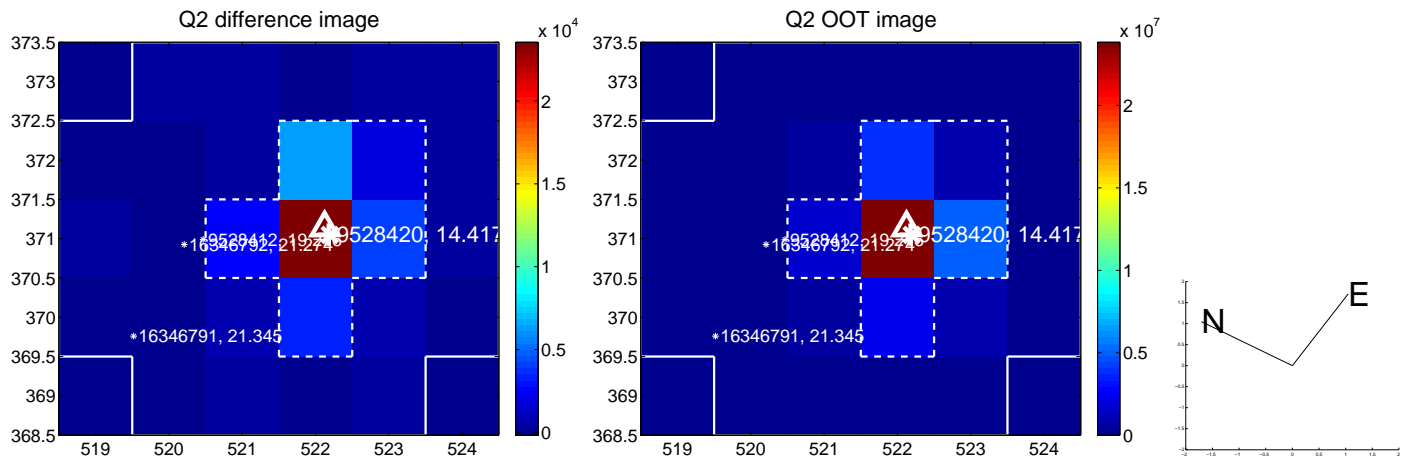
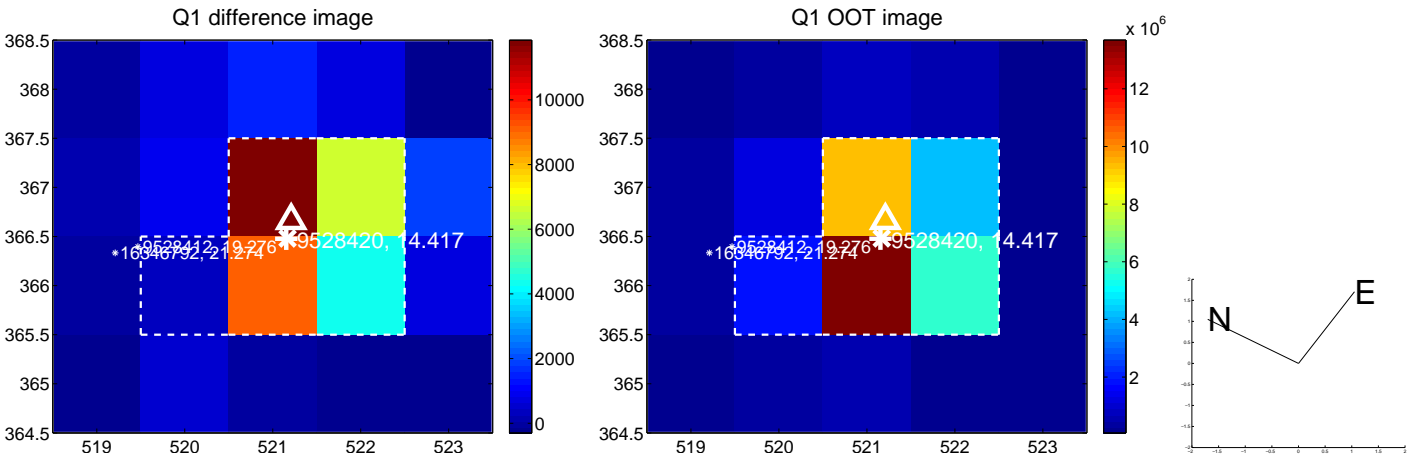
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.071 ± 0.076	0.93	0.009 ± 0.080	0.070 ± 0.075
PRF-fit source offset from KIC position	0.155 ± 0.076	2.05	0.038 ± 0.072	0.150 ± 0.076
photometric centroid source offset	0.21 ± 0.10	2.16	-0.04 ± 0.10	0.20 ± 0.10

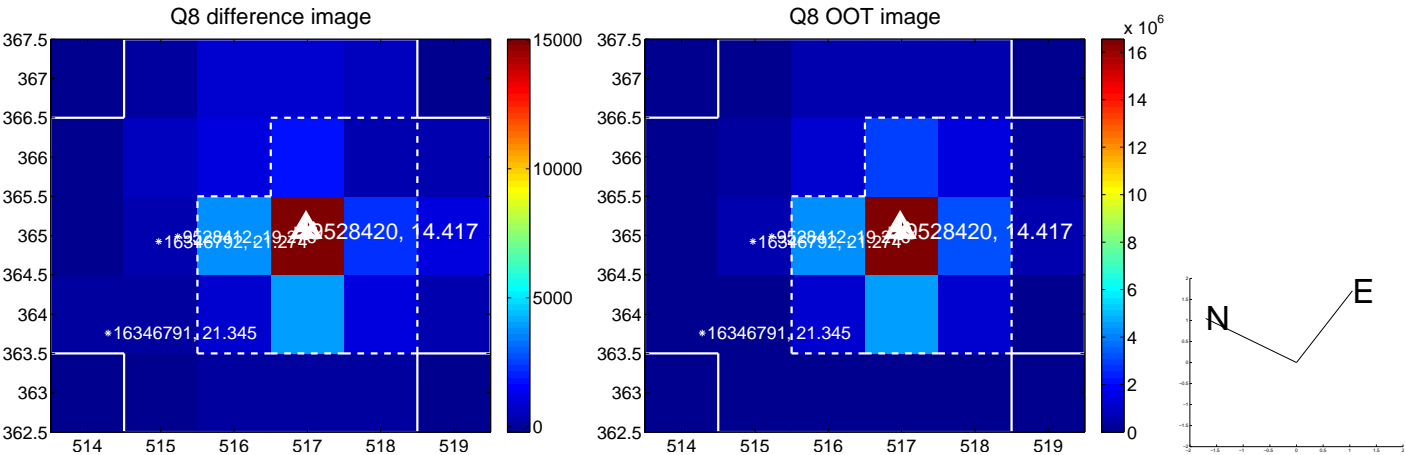
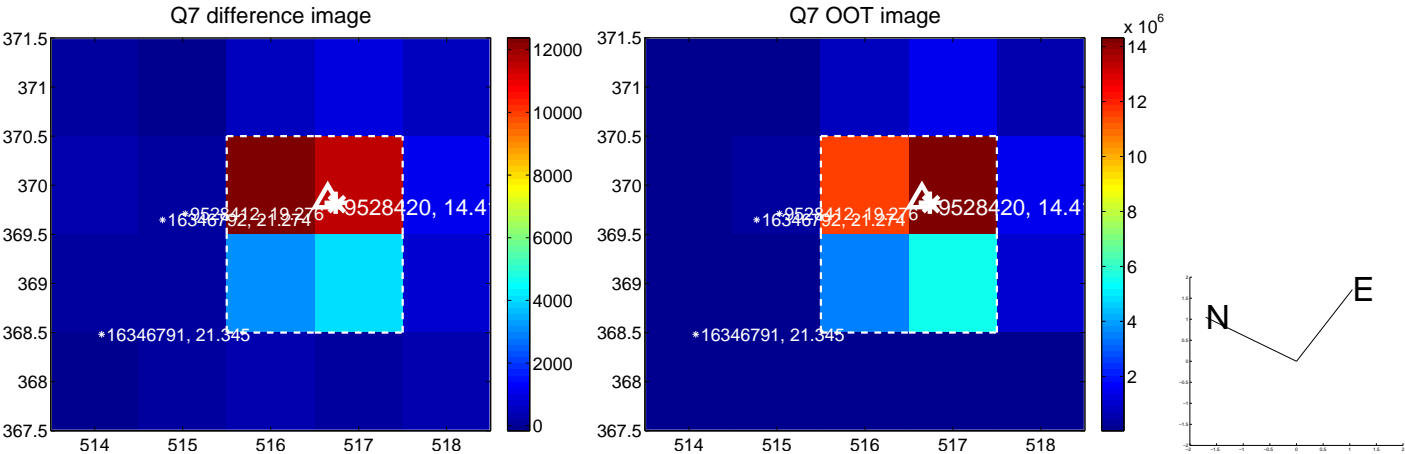
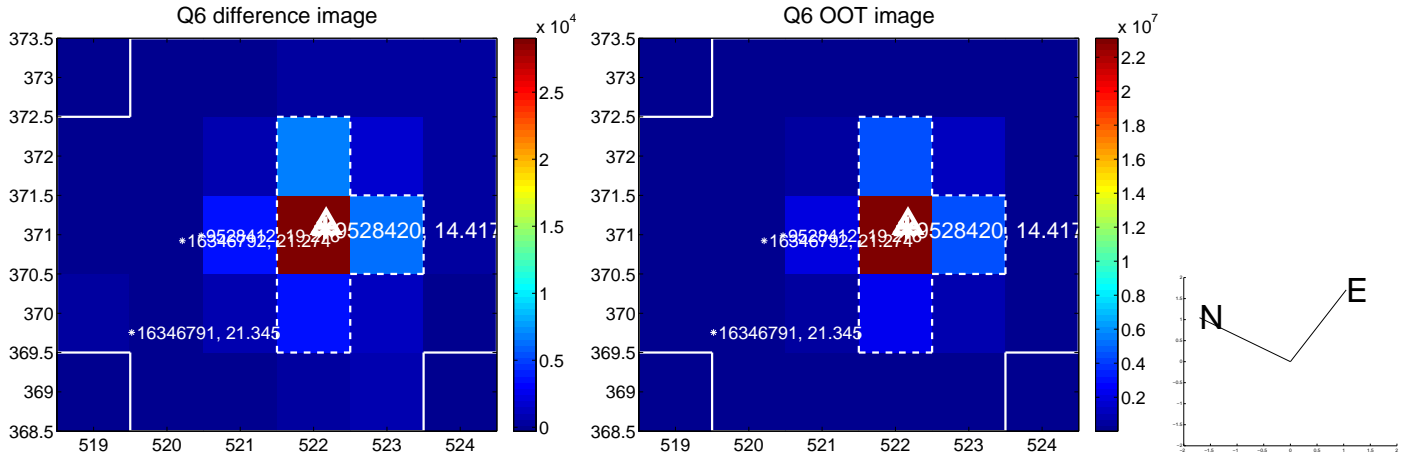
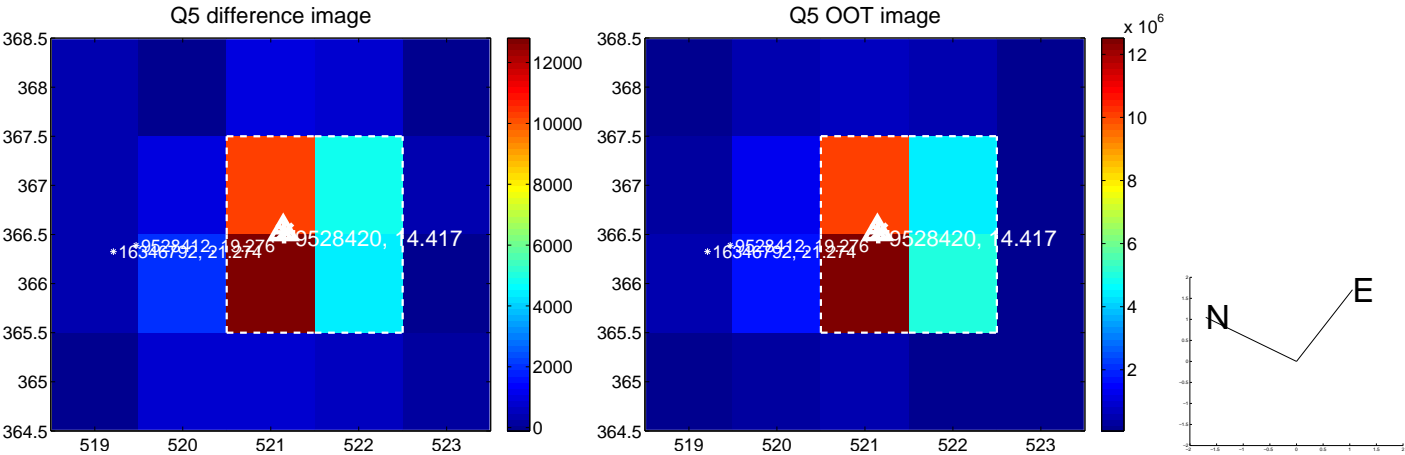


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

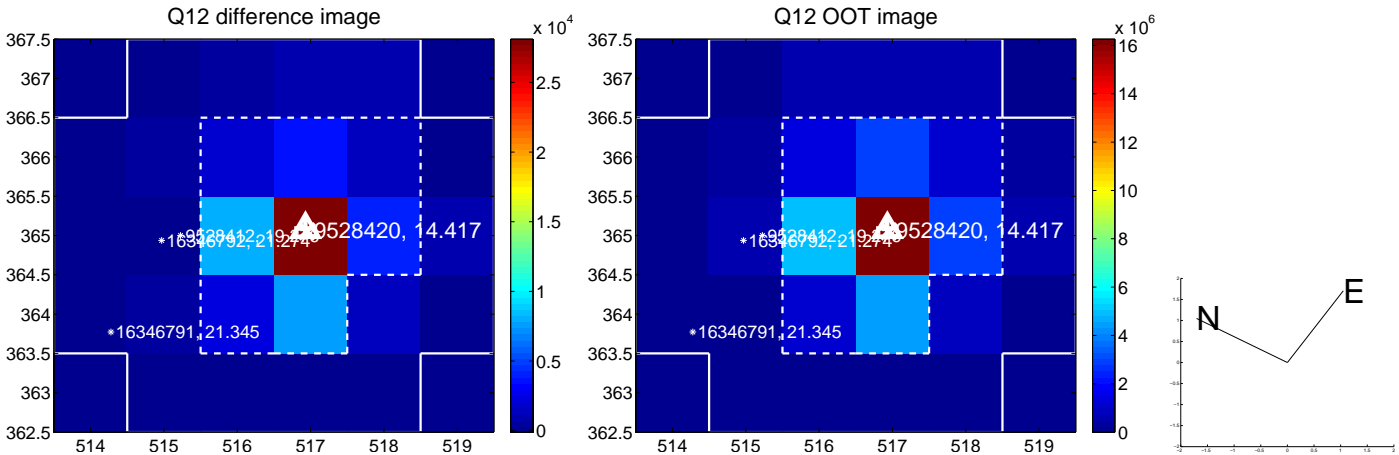
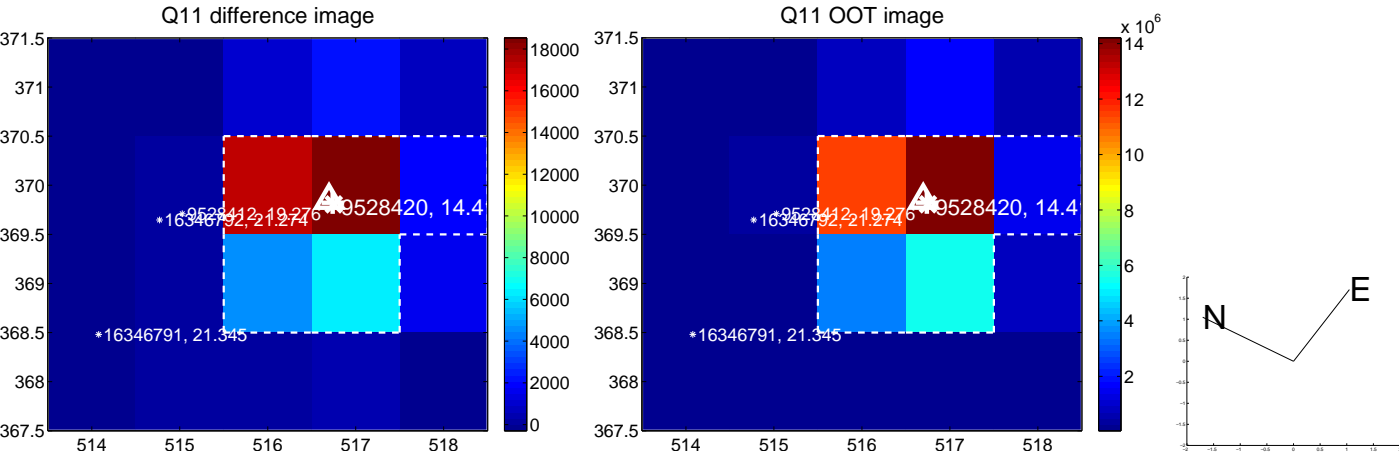
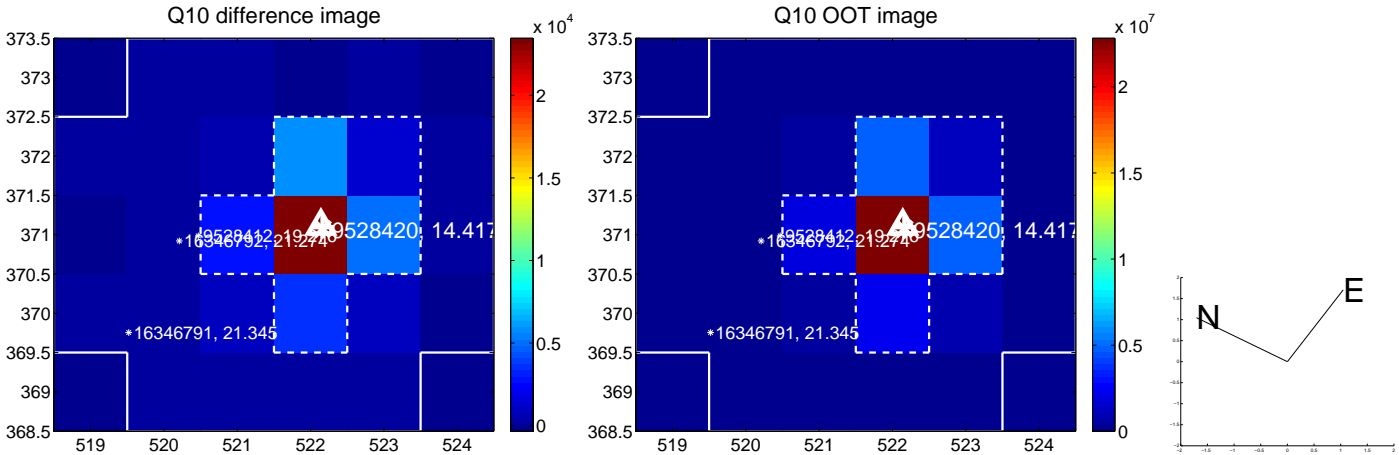
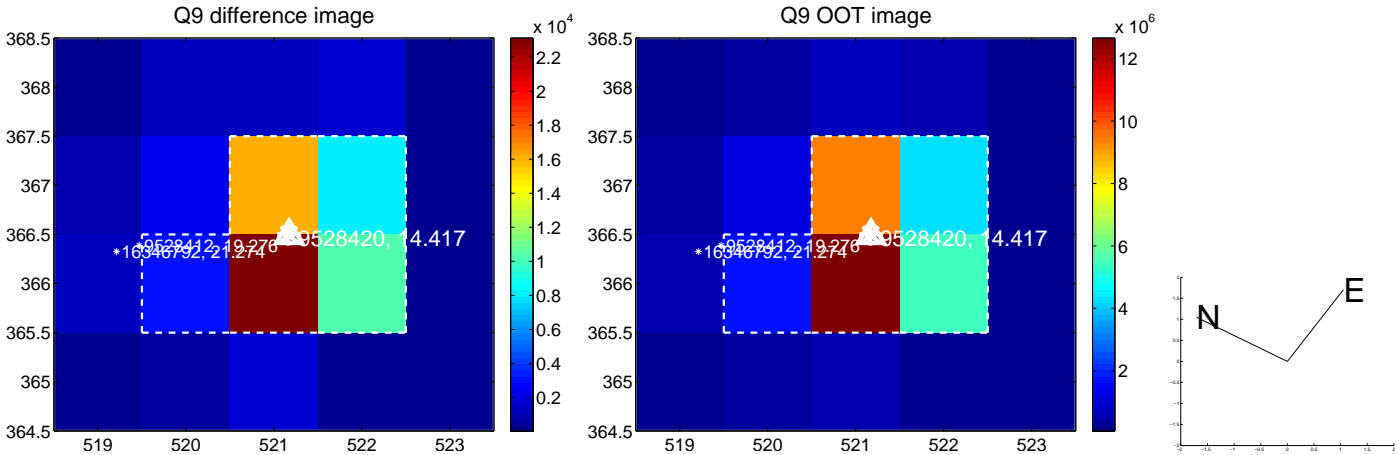
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



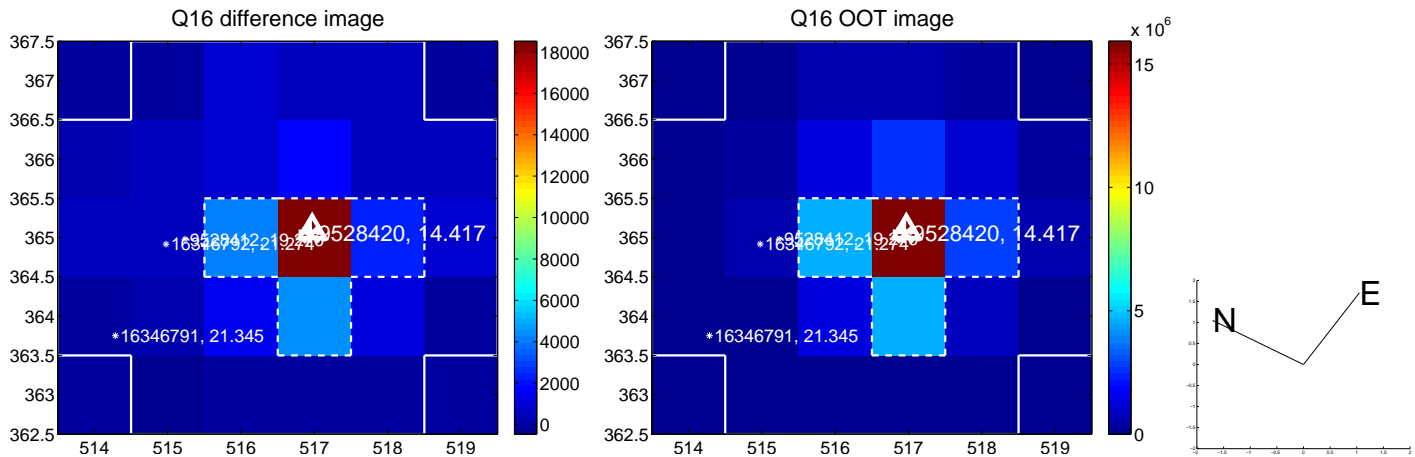
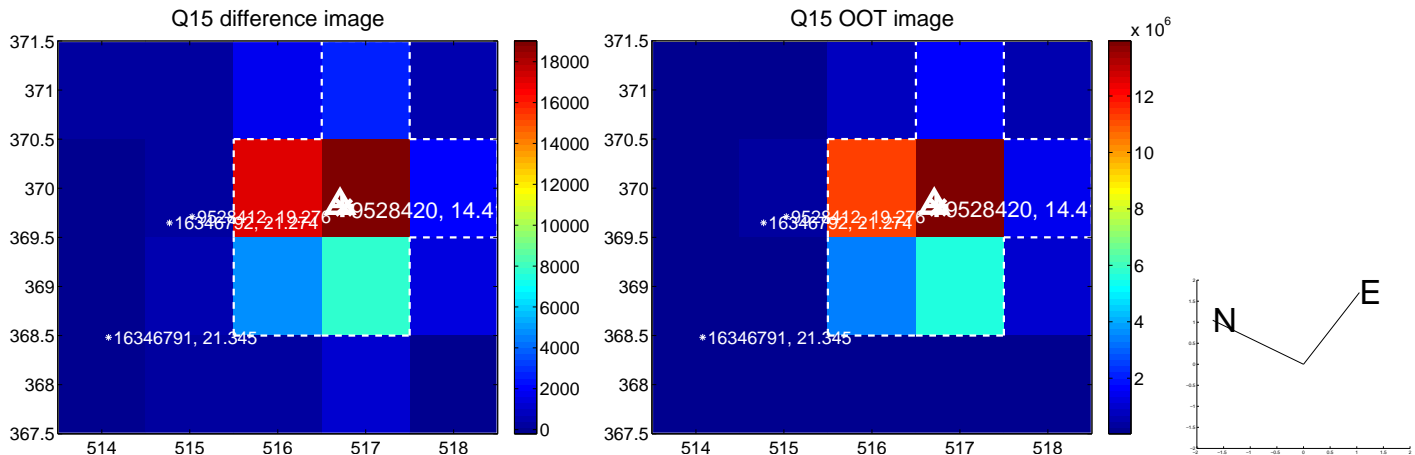
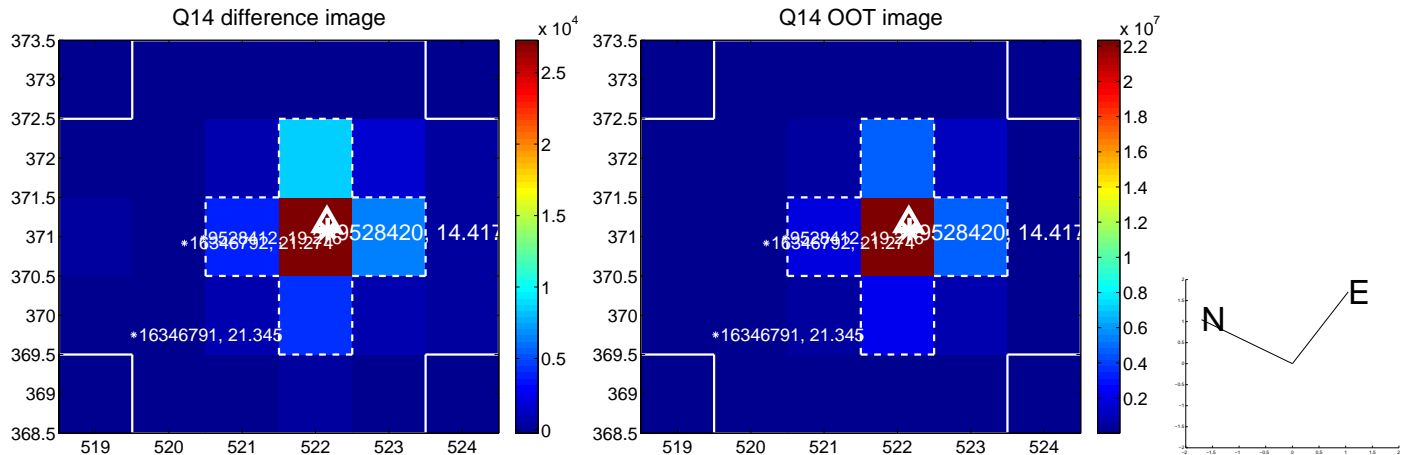
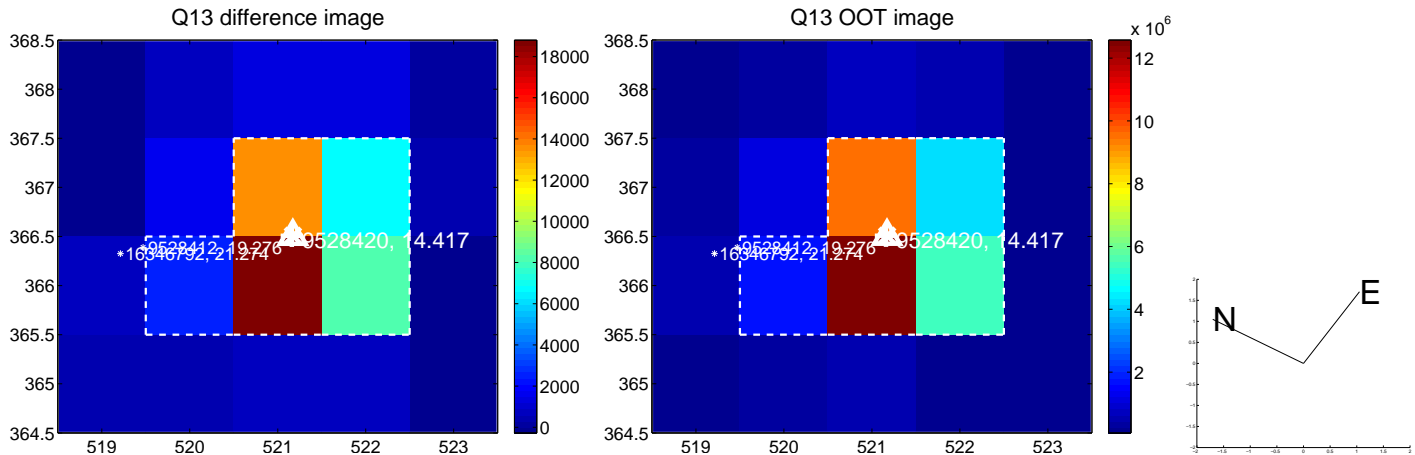
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



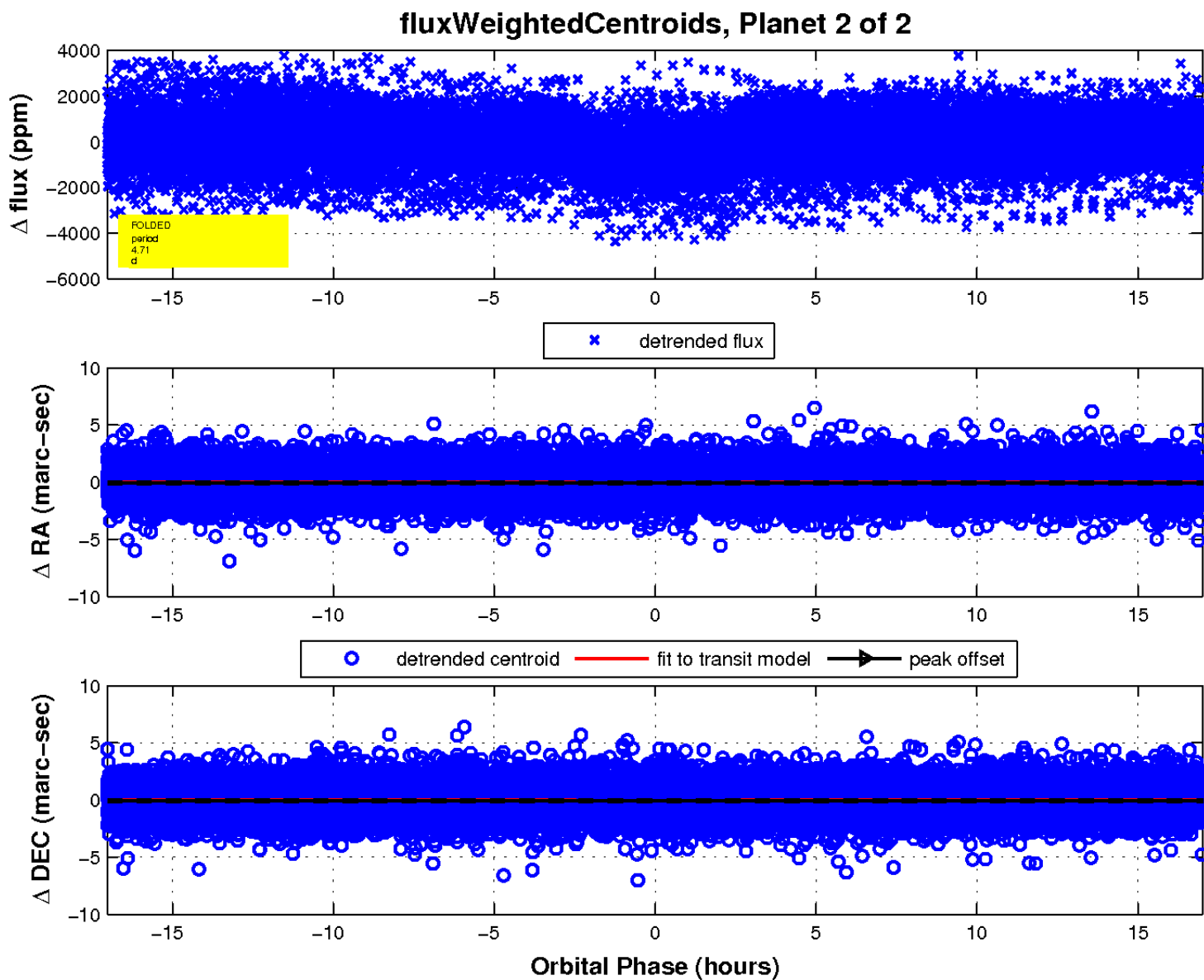
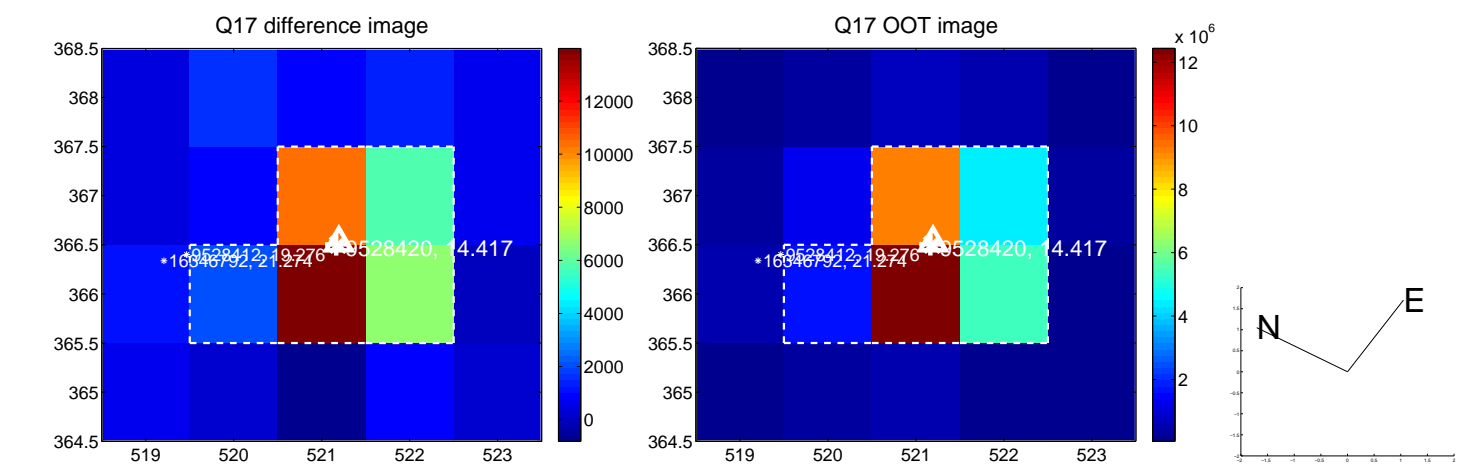
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

