

KIC 009665170

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})
009665170-01	OBS	No	2.672172	132.276430	28.0	13.935	7.5	6.8	0.82	5520	0.45	416.87
009665170-02	OBS	No	325.808030	133.748980	566.5	10.776	28.2	11.1	0.82	5520	2.22	0.69

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009665170-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009665170-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—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.

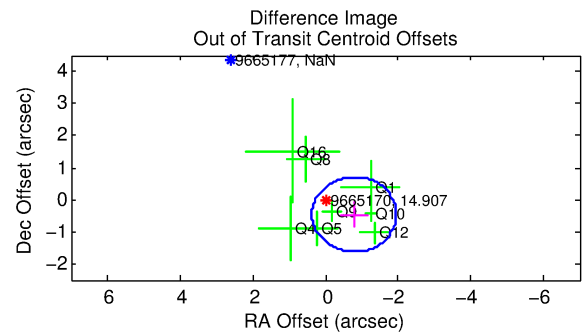
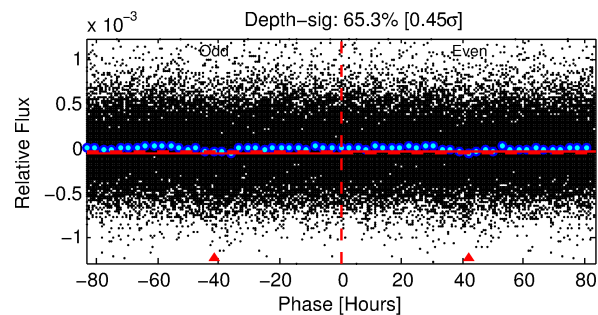
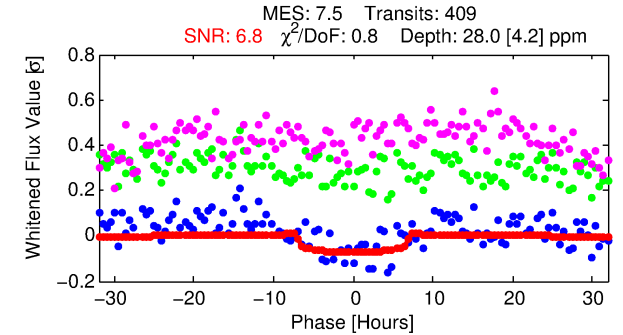
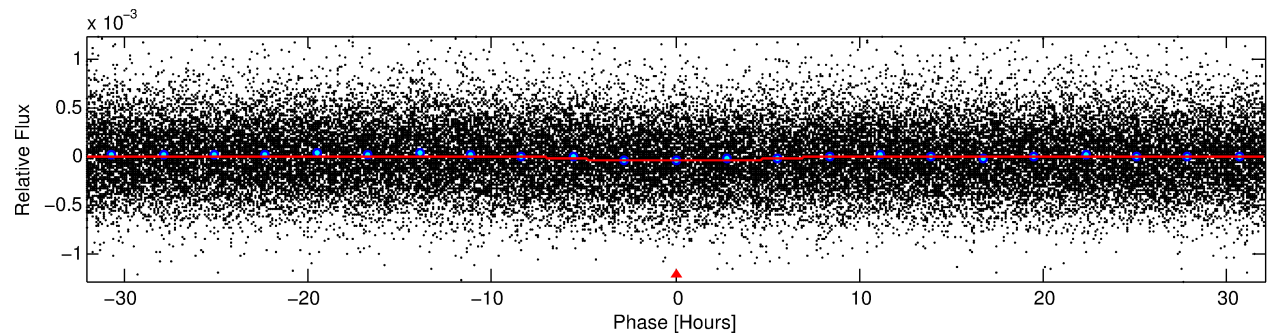
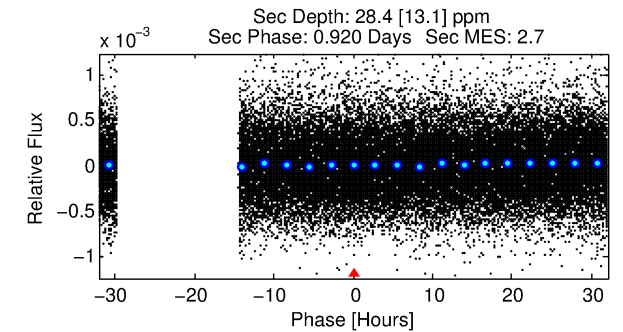
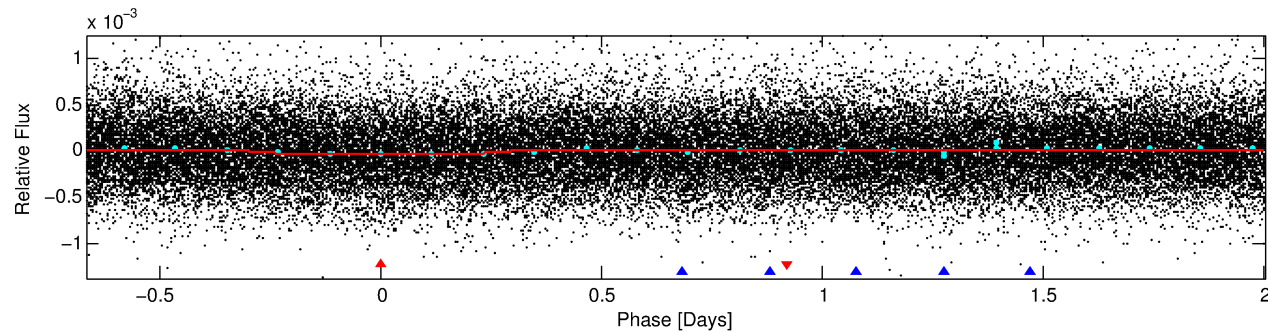
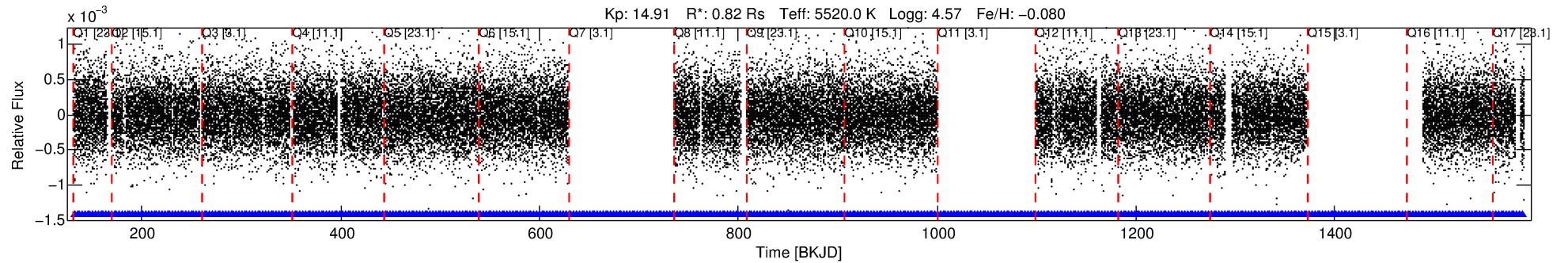
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009665170-01

No Significant Match Found

DV One-Page Summary

KIC: 9665170 Candidate: 1 of 2 Period: 2.672 d



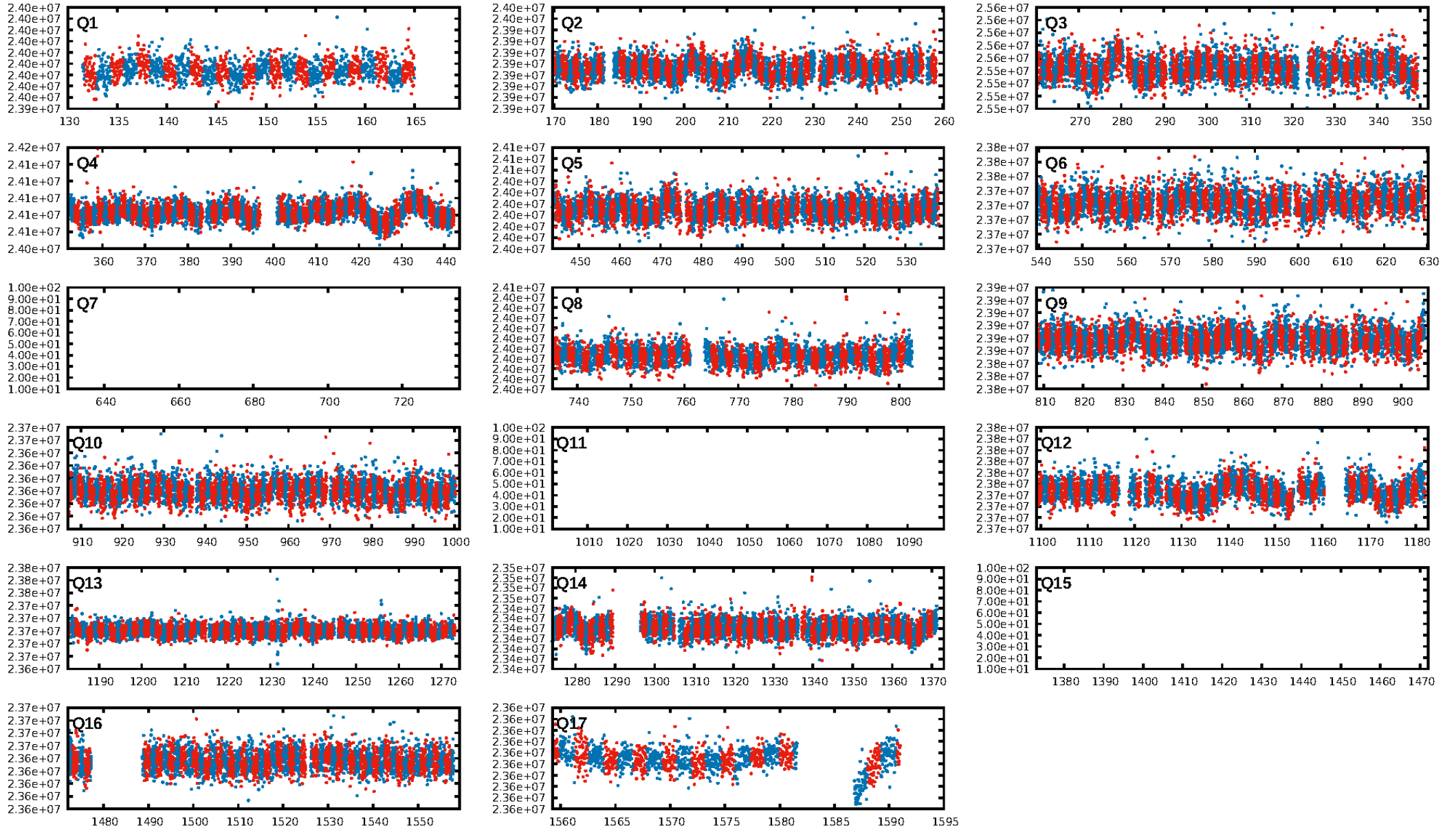
DV Fit Results:

Period = 2.67217 [0.00008] d
Epoch = 132.2764 [0.0192] BKJD
Rp/R* = 0.0051 [0.0052]
a/R* = 1.38 [2.76]
b = 0.65 [3.83]
Seff = 416.87 [120.75]
Teff = 1152 [83] K
Rp = 0.45 [0.47] Re
a = 0.0365 [0.0066] AU
Ag = 100.96 [211.59] [0.47σ]
Teffp = 5647 [2940] K [1.53σ]

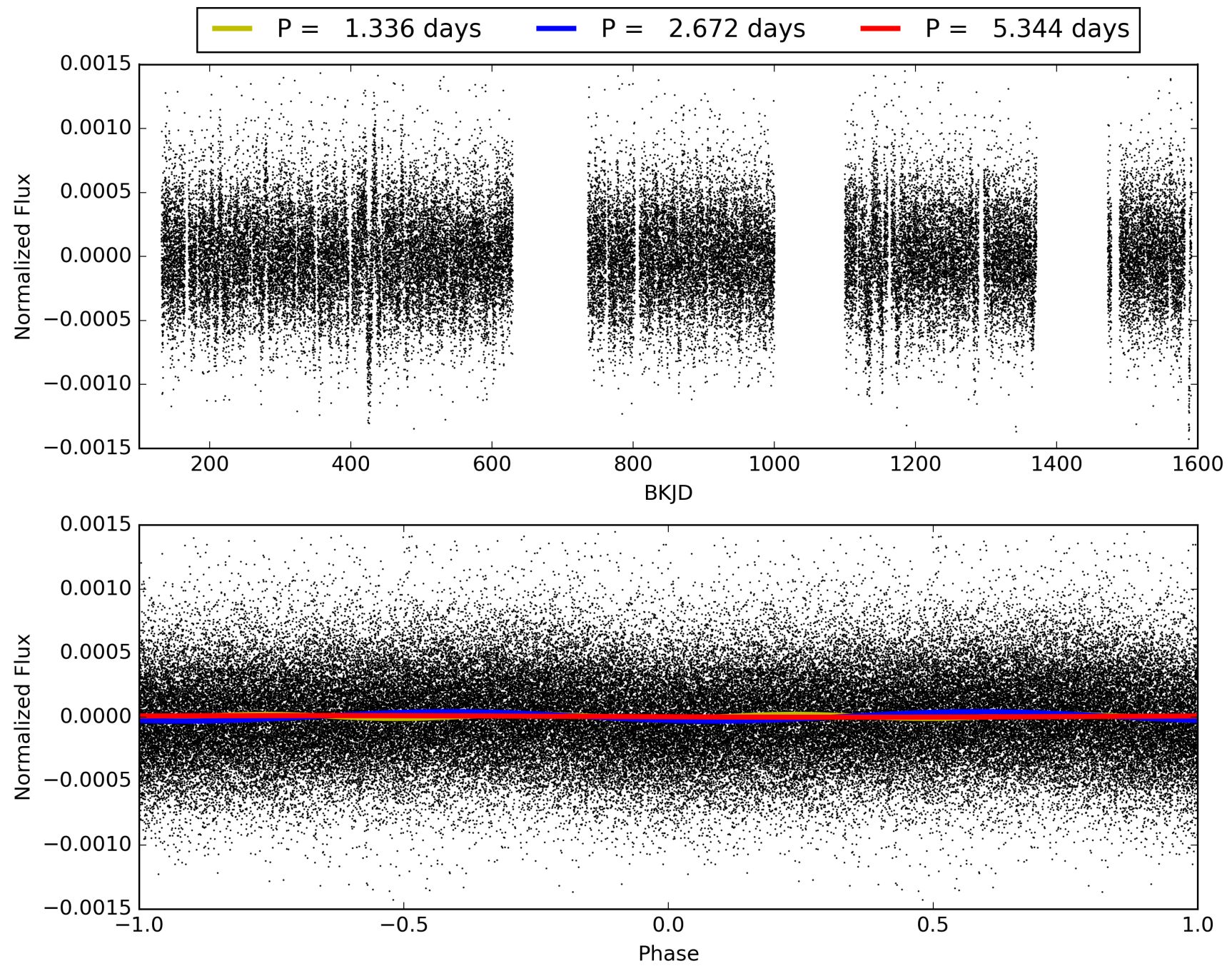
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [440.25σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.78e-11
RollingBand-fgt: 1.00 [385/385]
GhostDiagnostic-chr: 1.867
Centroid-sig: 34.0%
Centroid-so: 1.691 arcsec [0.90σ]
OotOffset-rm: 0.911 arcsec [2.35σ]
KicOffset-rm: 0.748 arcsec [1.87σ]
OotOffset-st: 1/0/4/3 [8]
KicOffset-st: 1/0/4/3 [8]
DiffImageQuality-fgm: 0.75 [6/8]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 009665170-01, PDC Light Curves

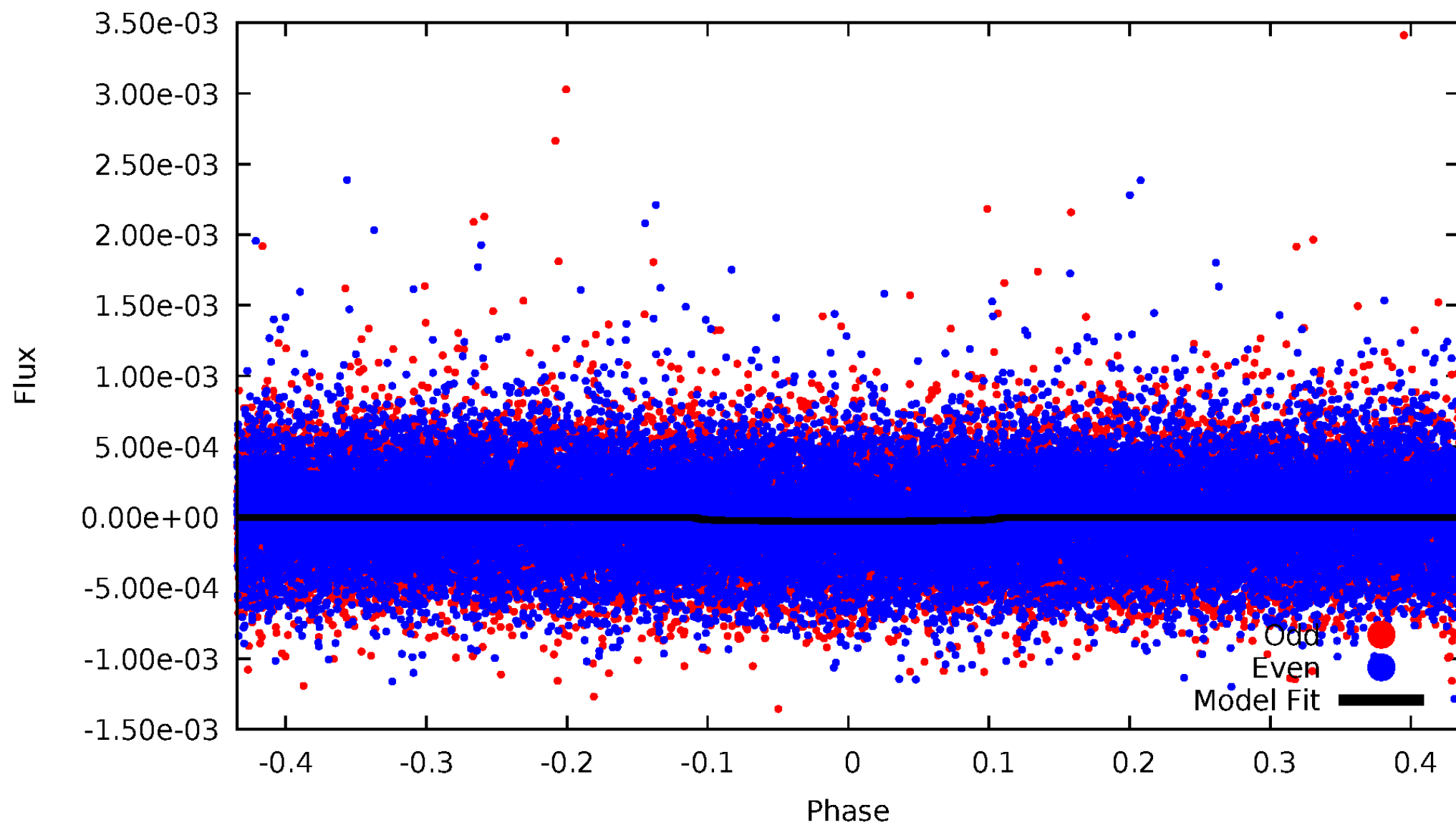


TCE 009665170-01



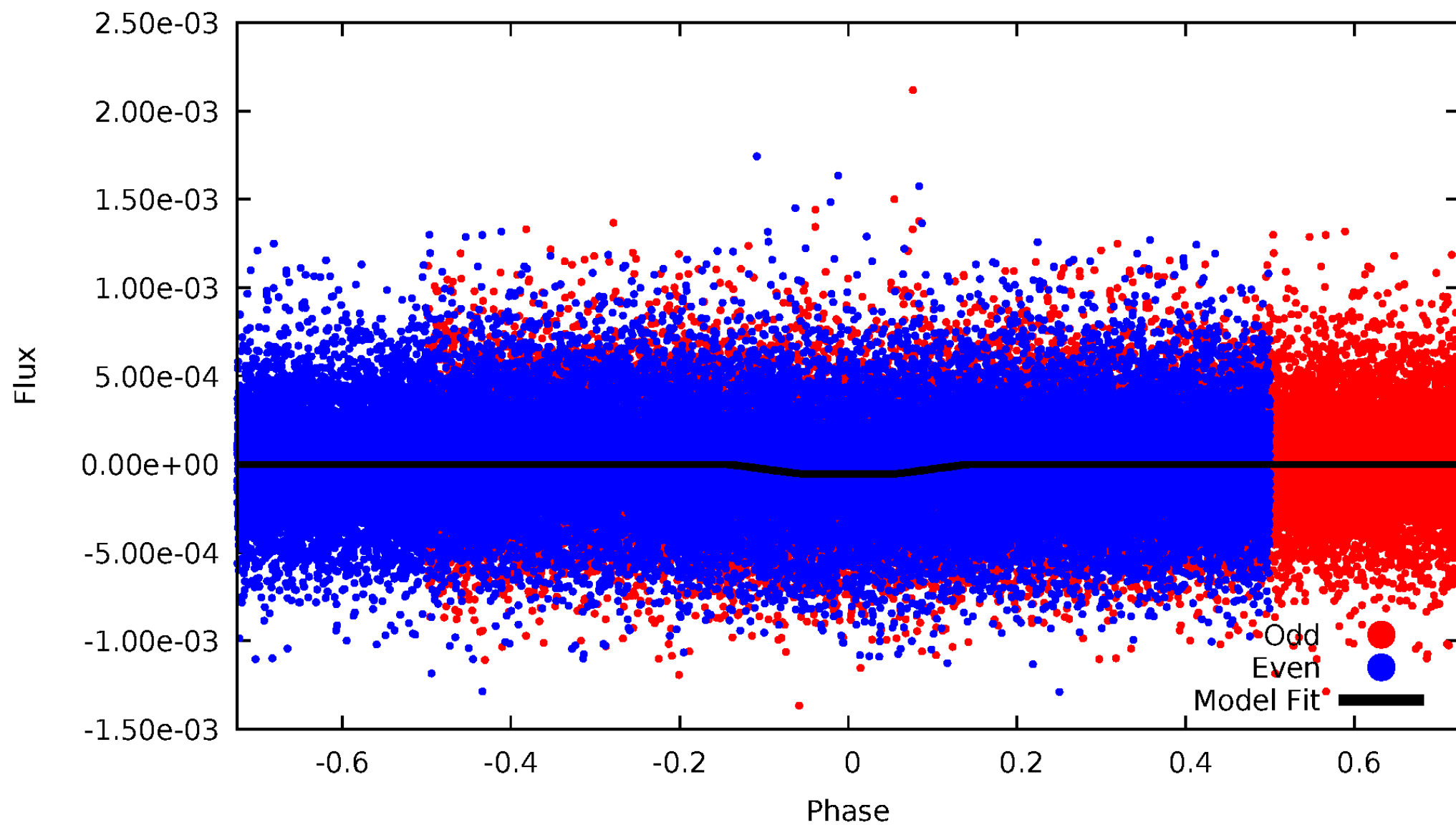
DV Odd/Even

TCE 009665170-01



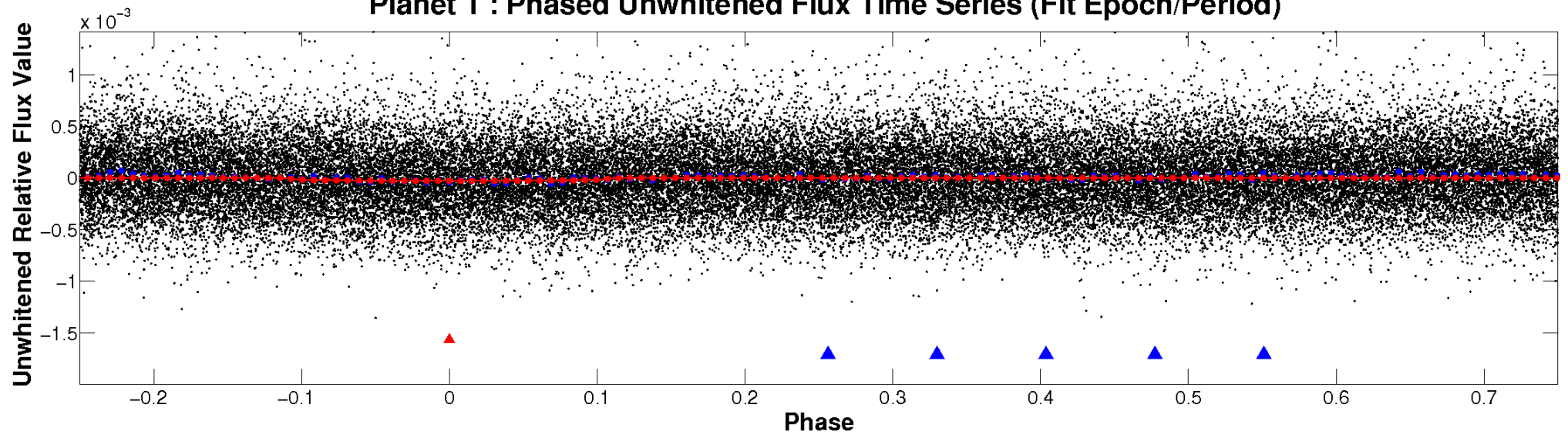
ALT Odd/Even

TCE 009665170-01

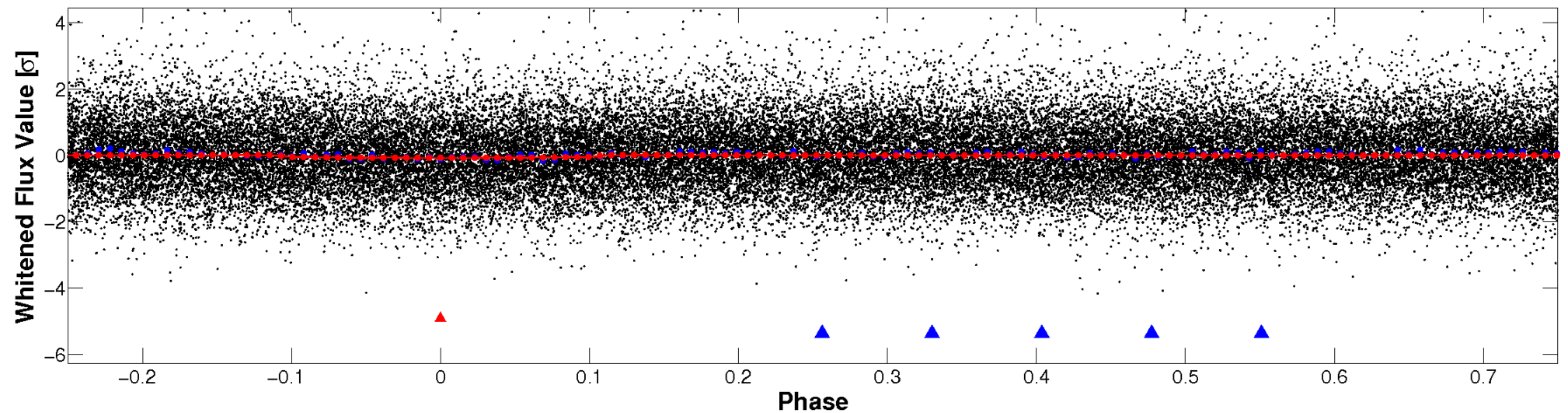


Non-Whitened Vs. Whitened Light Curve

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

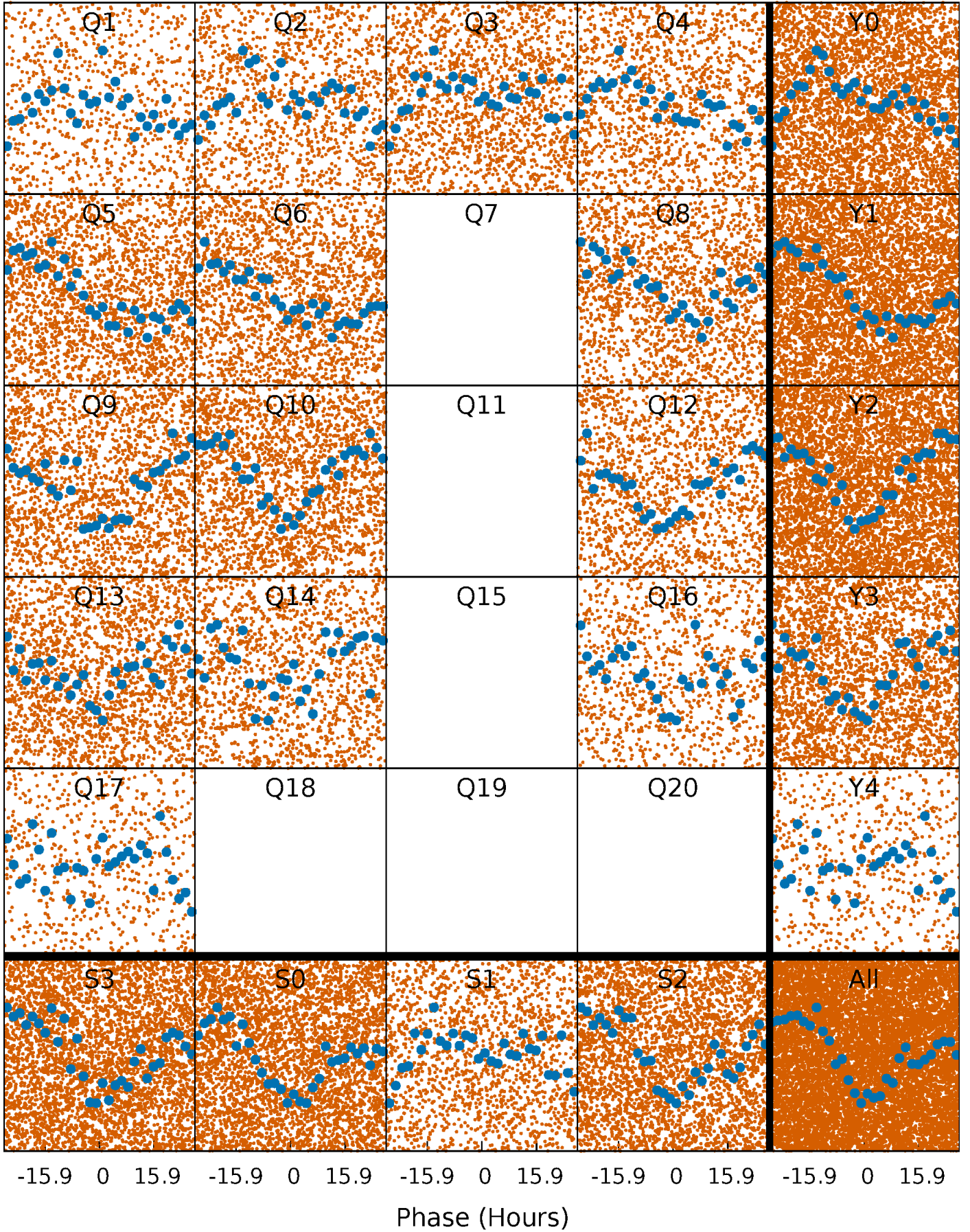


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



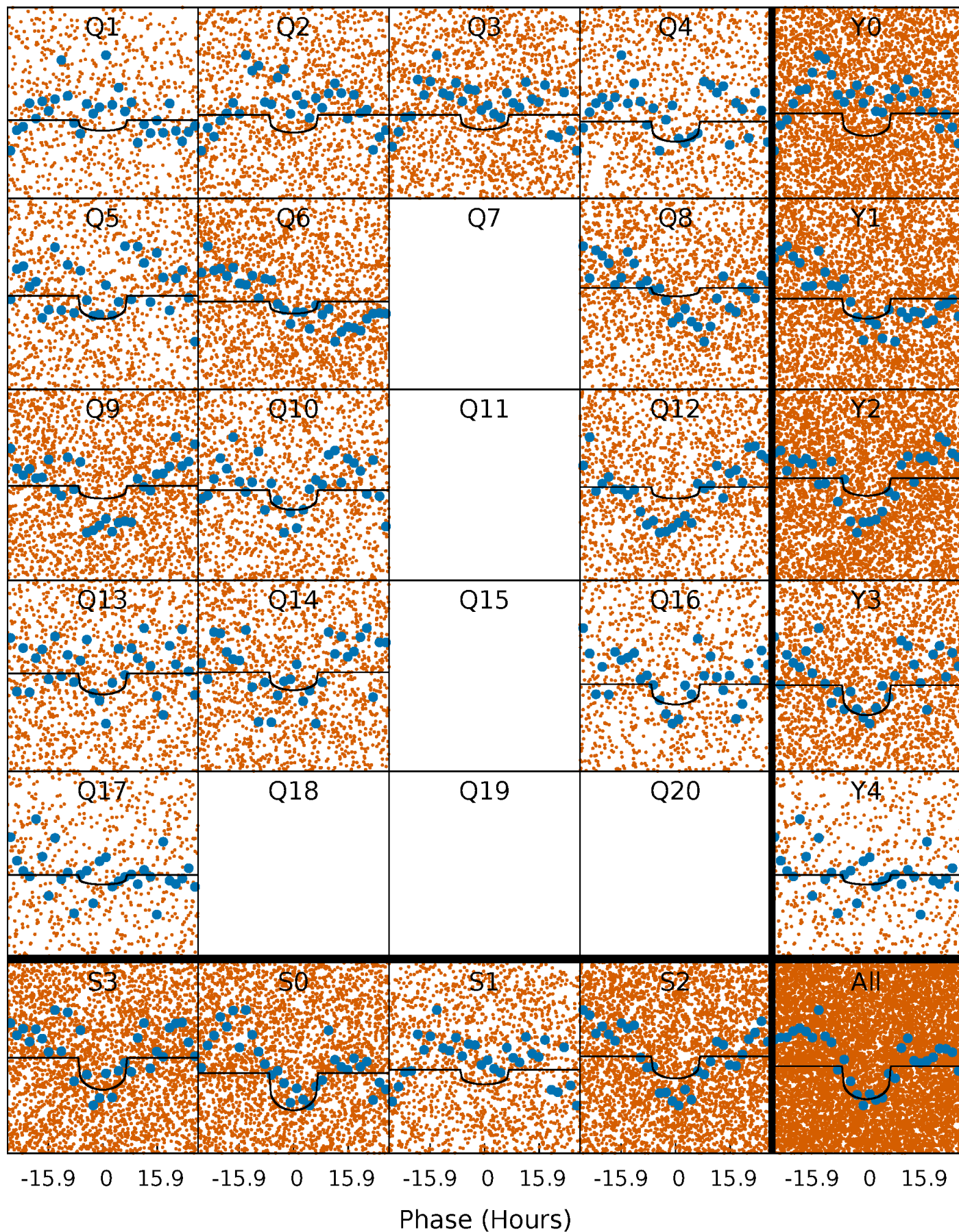
PDC Quarter-Phased Transit Curves

TCE 009665170-01 P= 2.672172 Days $T_0=132.276430$ (BKJD)



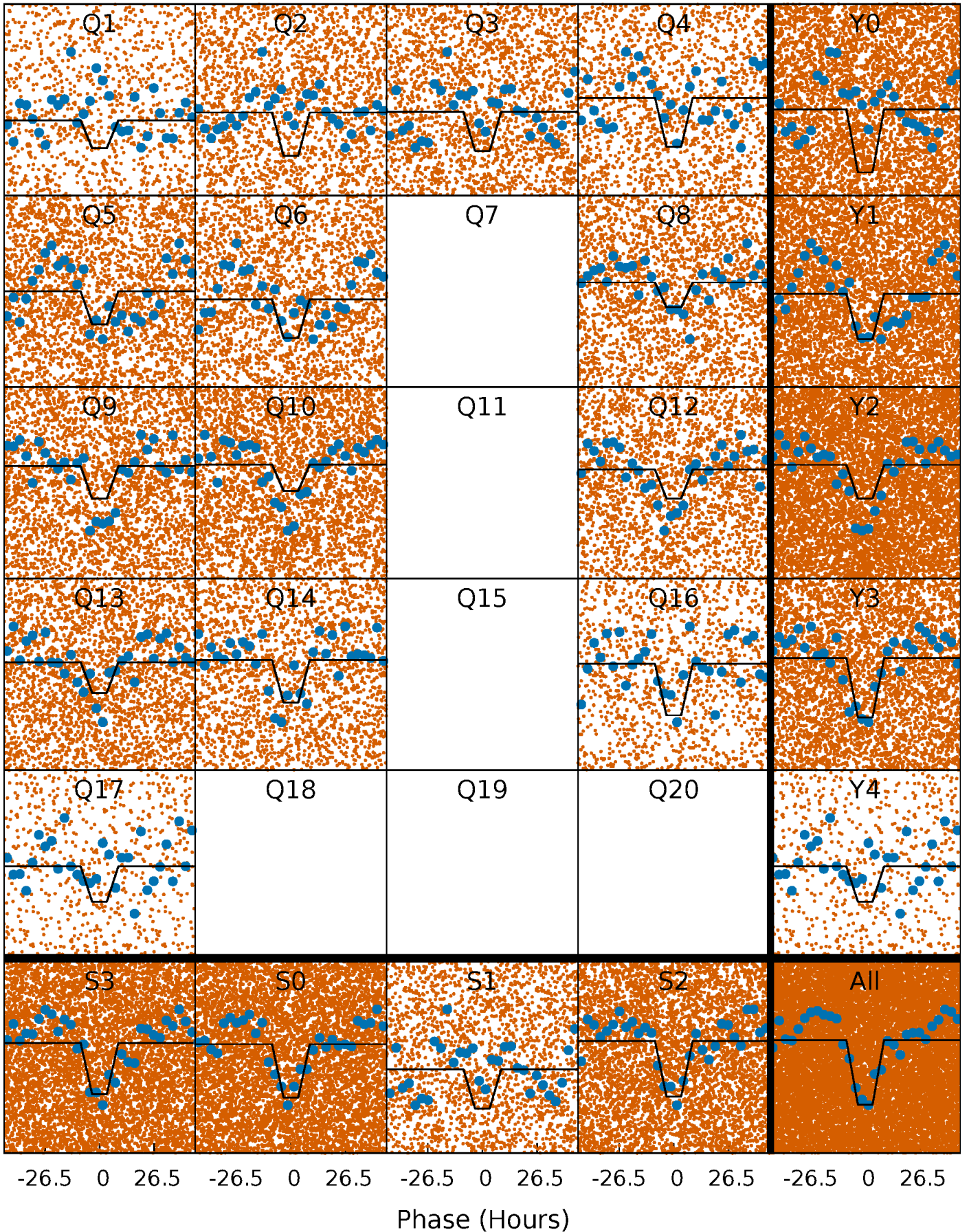
DV Quarter-Phased Transit Curves

TCE 009665170-01 P= 2.672172 Days $T_0=132.276430$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

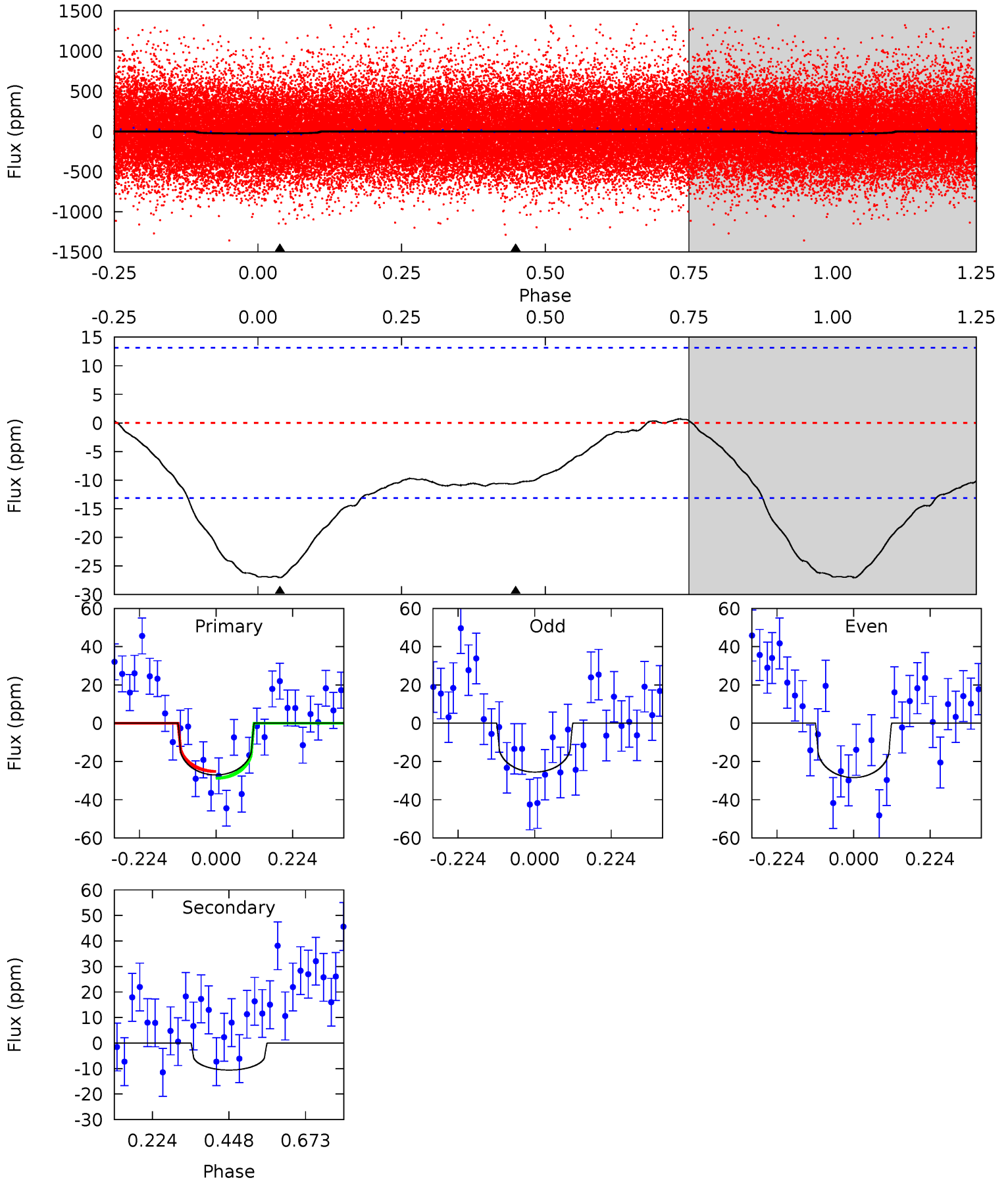
TCE 009665170-01 P= 2.671864 Days $T_0=132.381594$ (BKJD)



DV Model-Shift Uniqueness Test

009665170-01, P = 2.672172 Days, E = 129.604258 Days

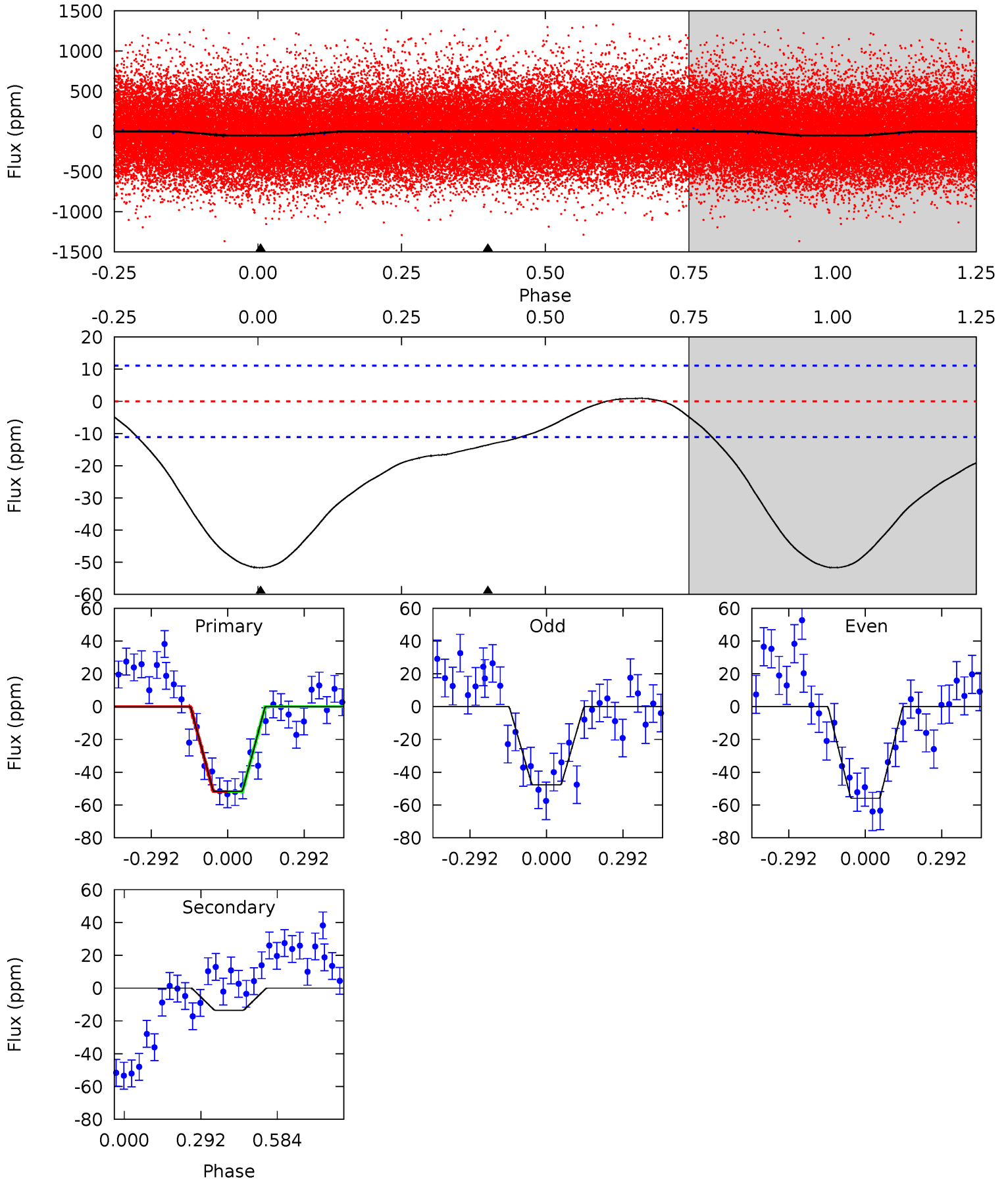
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.04	3.54	0	0	4.39	1.22	0.56	9.04	9.04	3.54	3.54	0.48	1.16	0.03	0.59



Alt Model-Shift Uniqueness Test

009665170-01, P = 2.671864 Days, E = 129.709730 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.1	5.27	0	0	4.33	1.05	0.72	20.1	20.1	5.27	5.27	1.61	1.46	0.02	0.03



Stellar Parameters For KIC 009665170

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5520^{+149}_{-166}	$4.572^{+0.036}_{-0.144}$	$-0.080^{+0.300}_{-0.300}$	$0.818^{+0.176}_{-0.075}$	$0.917^{+0.083}_{-0.102}$	$2.358^{+0.453}_{-0.962}$
	+3%/-3%	+1%/-3%	+375%/-375%	+22%/-9%	+9%/-11%	+19%/-41%
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 009665170-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-11 ± 3	$0.57^{+0.44}_{-0.33}$	1637^{+86}_{-67}	4190^{+2042}_{-781}	22^{+112}_{-15}
Alt.	-14 ± 3	$0.73^{+0.48}_{-0.40}$	1638^{+95}_{-75}	3991^{+1575}_{-623}	18^{+68}_{-12}

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

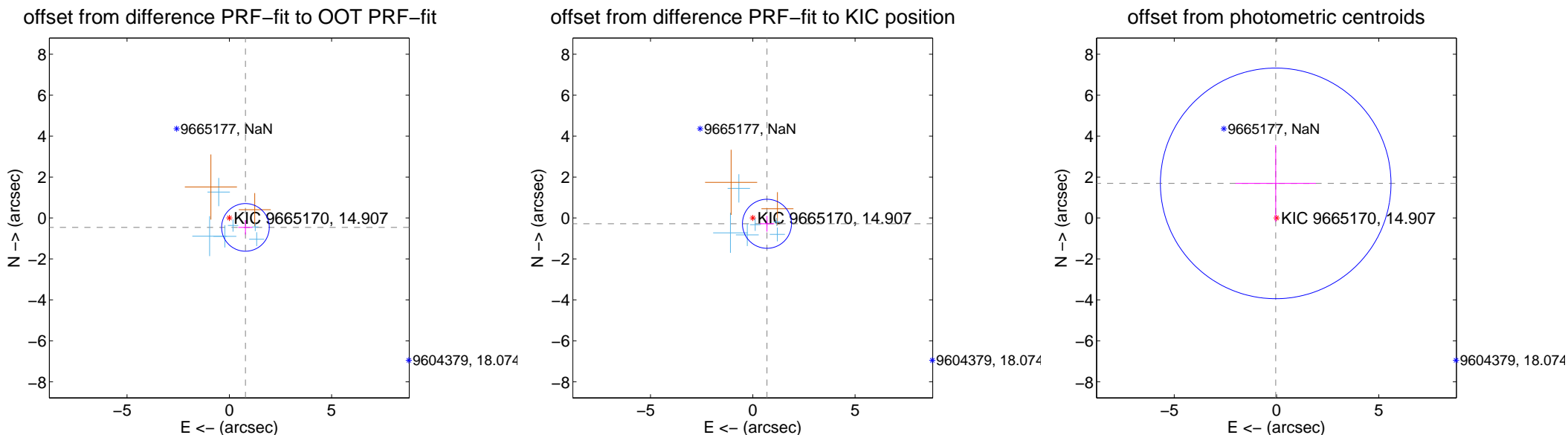
DV Centroid Data

Supplemental centroid analysis for 009665170-01. Kepler magnitude: 14.91. Transit SNR 6.79

There are 6 quarters with good PRF difference image offsets

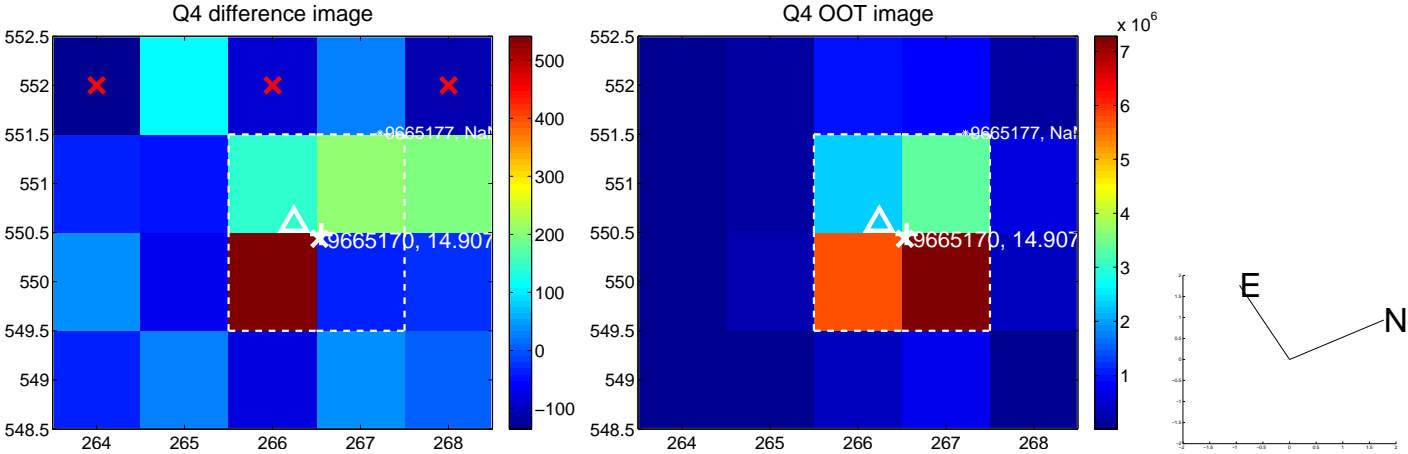
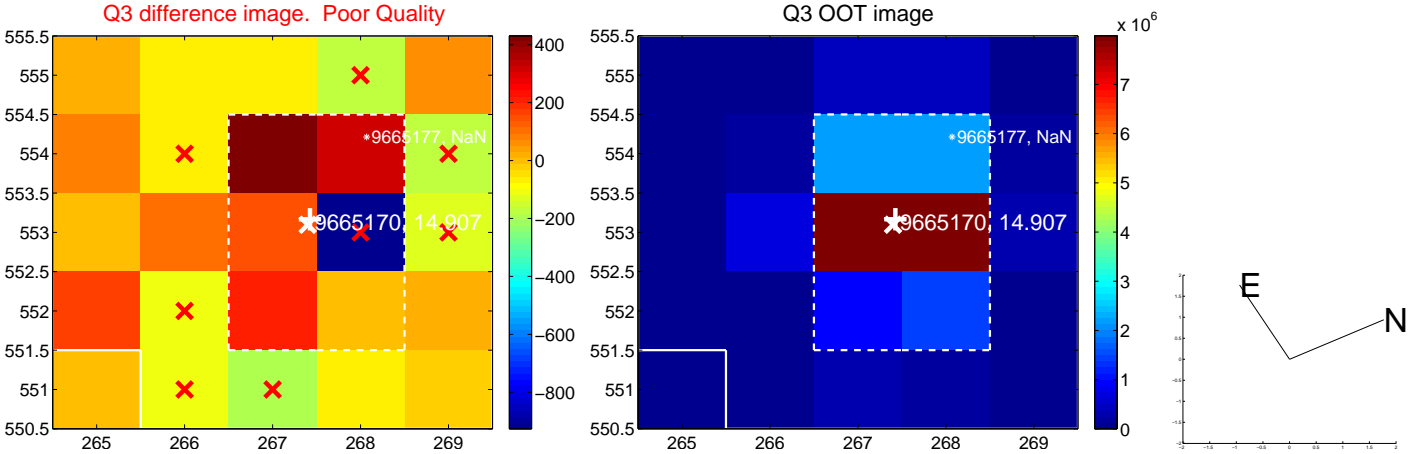
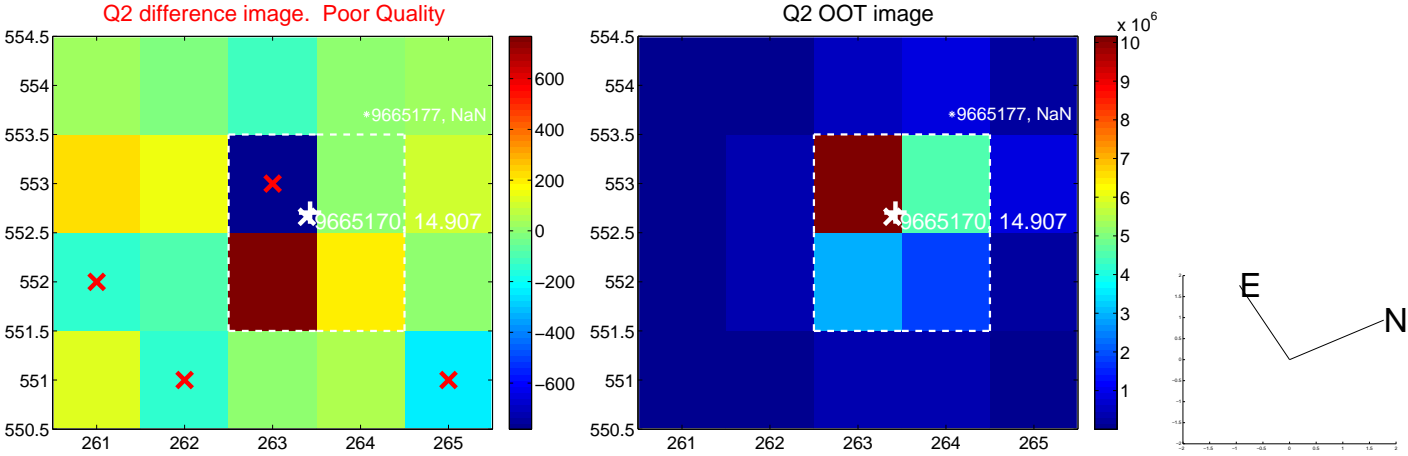
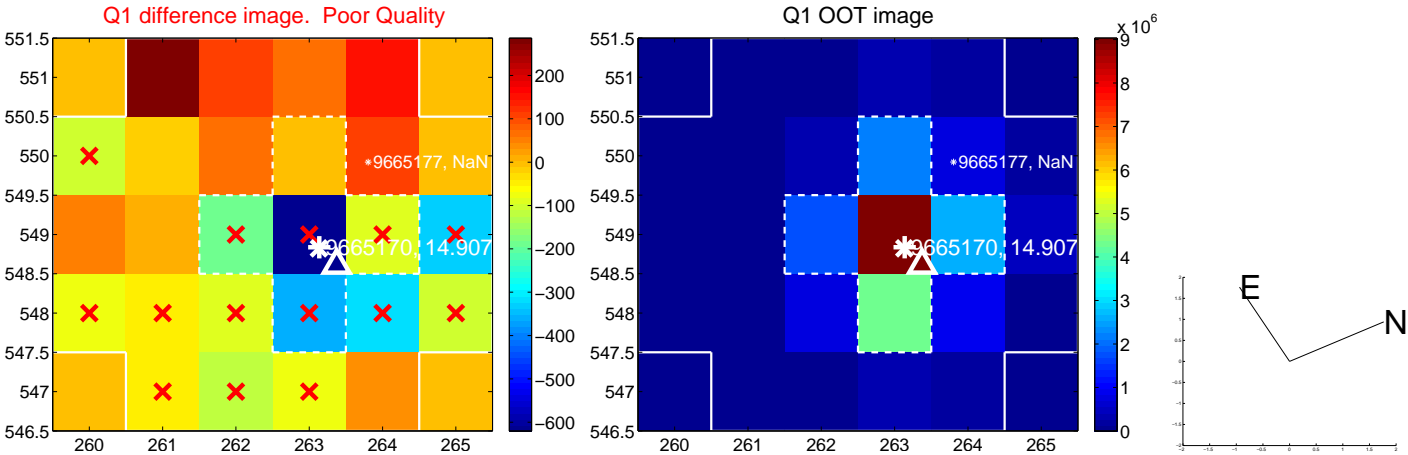
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.911 ± 0.388	2.35	-0.787 ± 0.348	-0.459 ± 0.351
PRF-fit source offset from KIC position	0.748 ± 0.399	1.87	-0.692 ± 0.354	-0.282 ± 0.385
photometric centroid source offset	1.69 ± 1.88	0.90	0.04 ± 1.97	1.69 ± 1.88

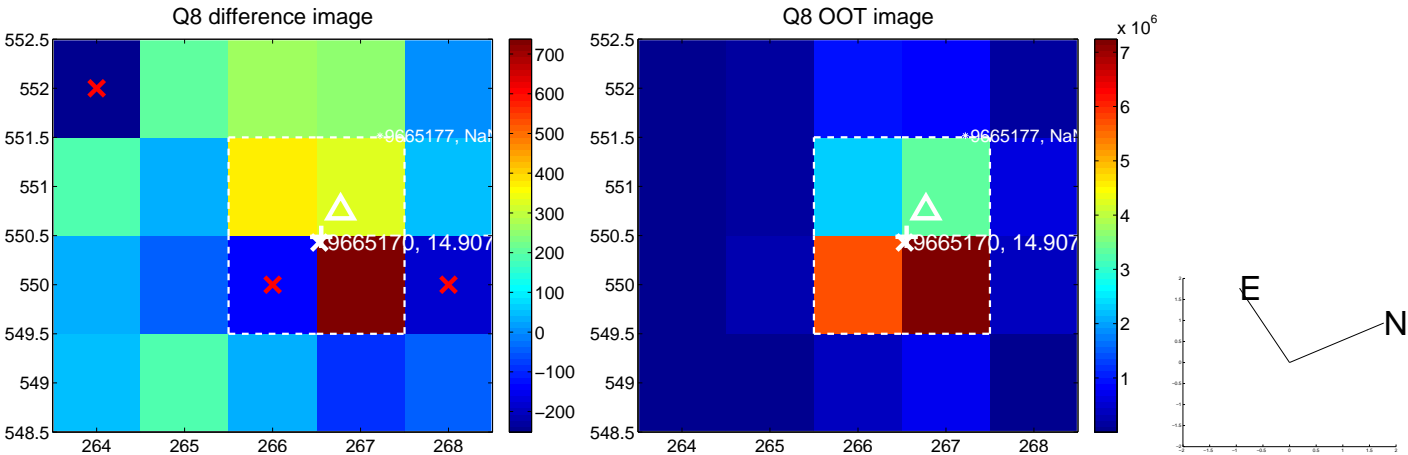
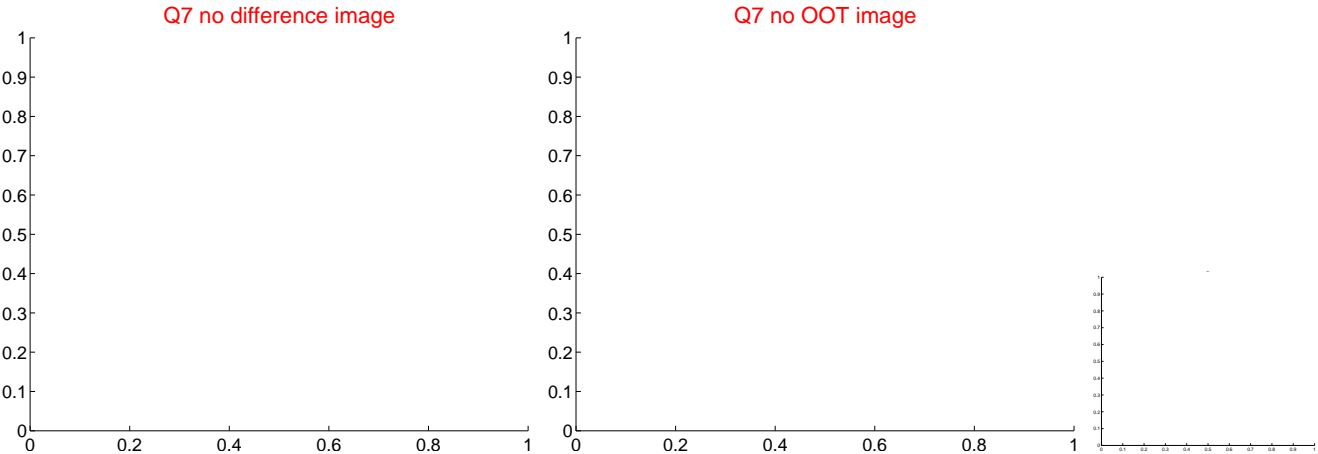
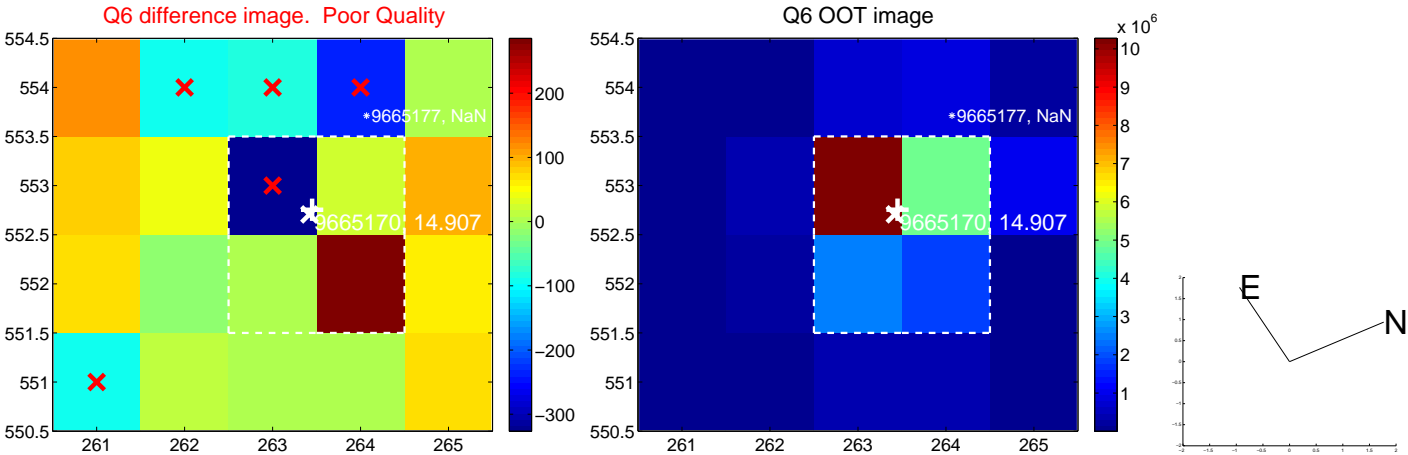
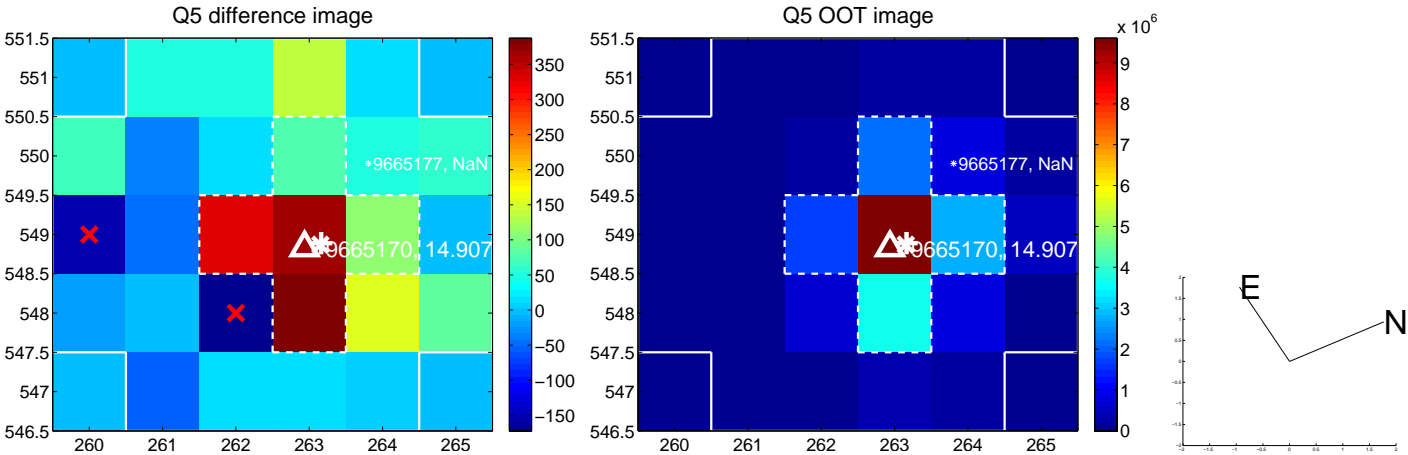


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

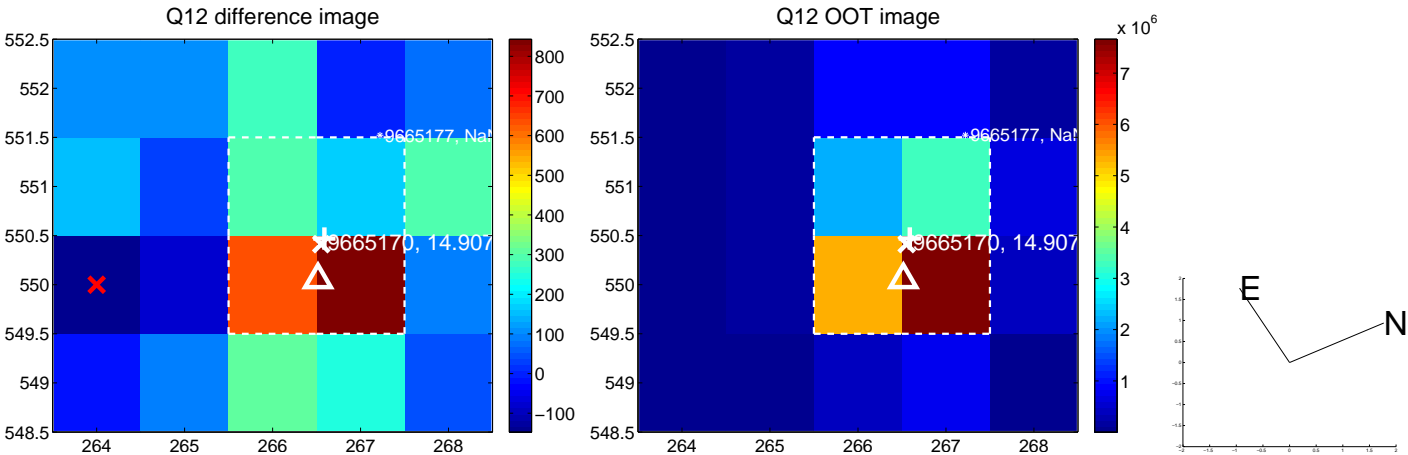
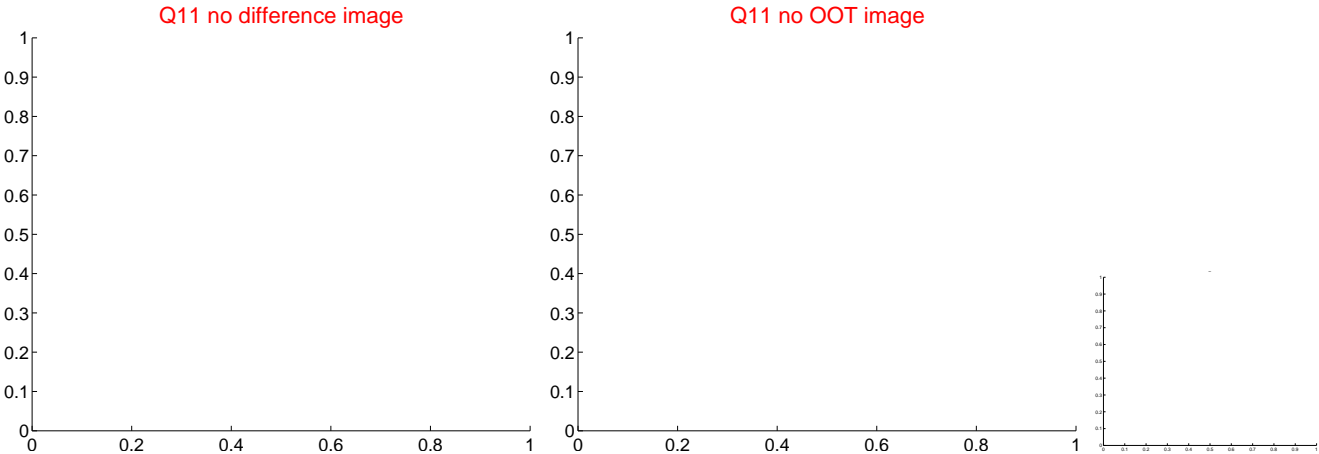
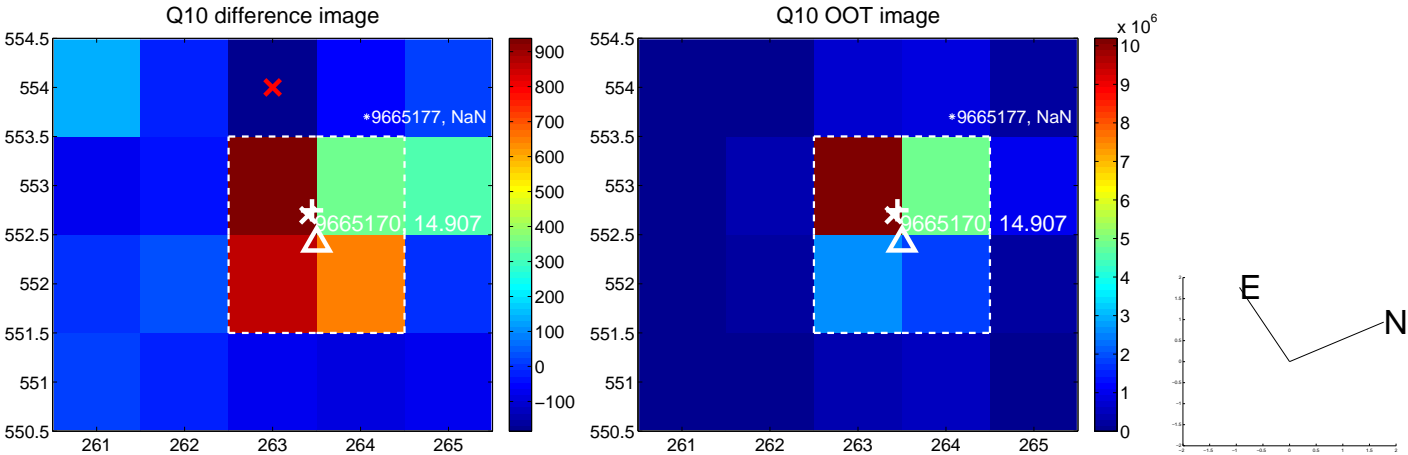
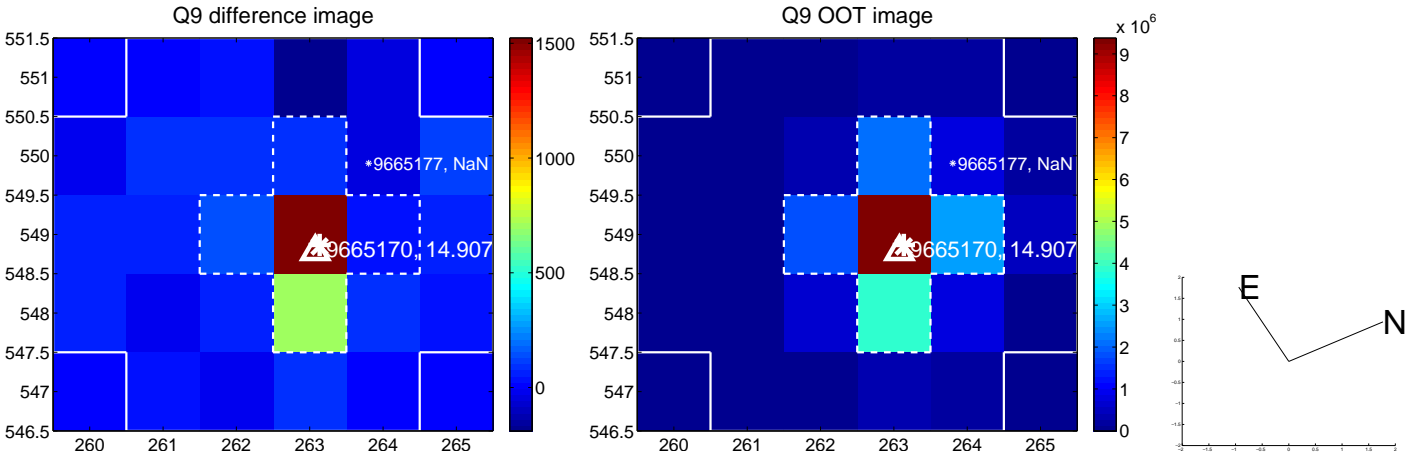
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



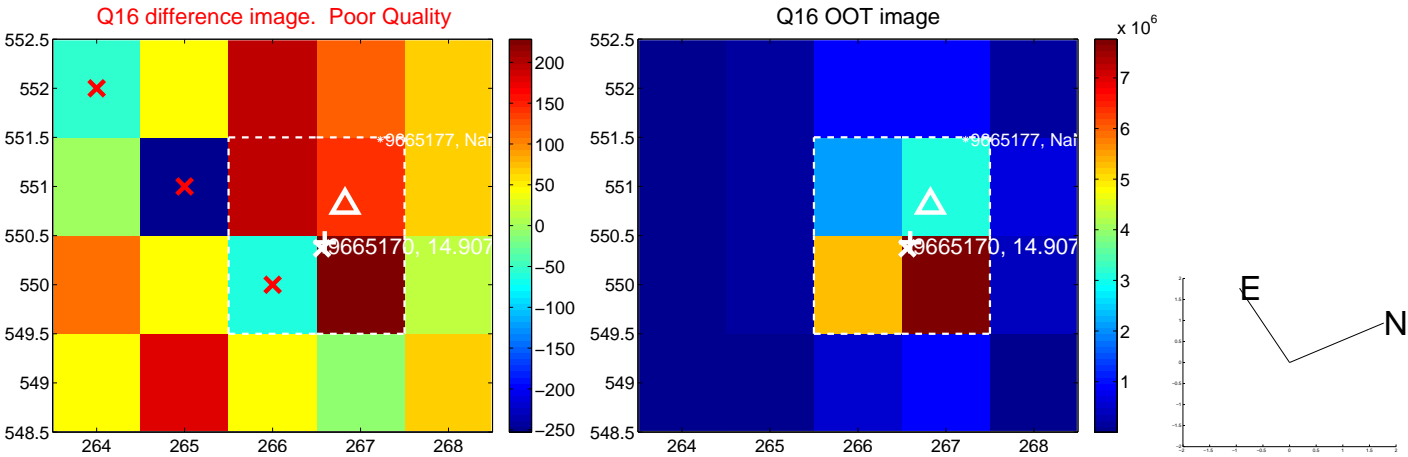
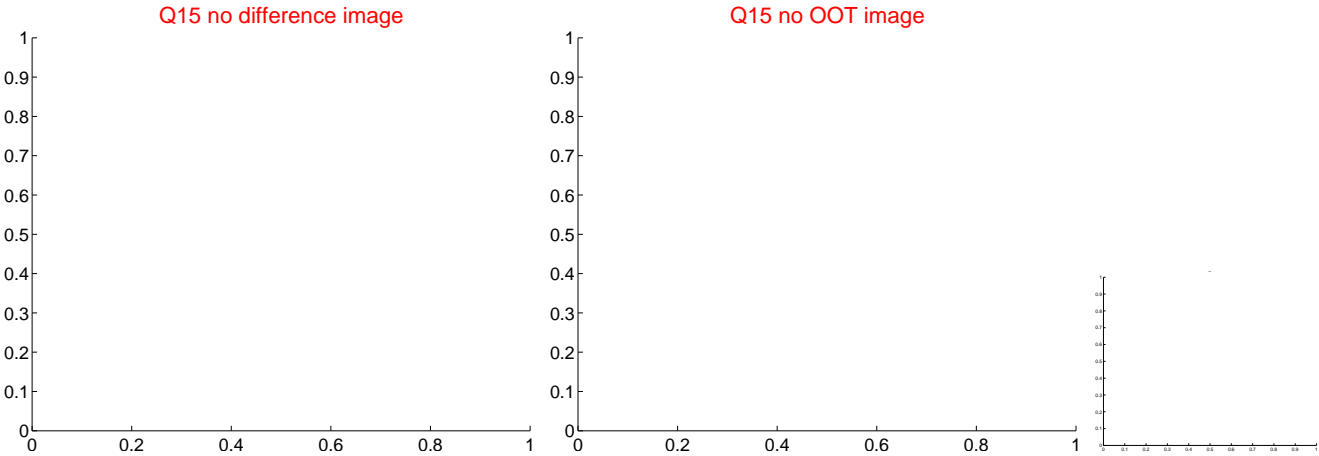
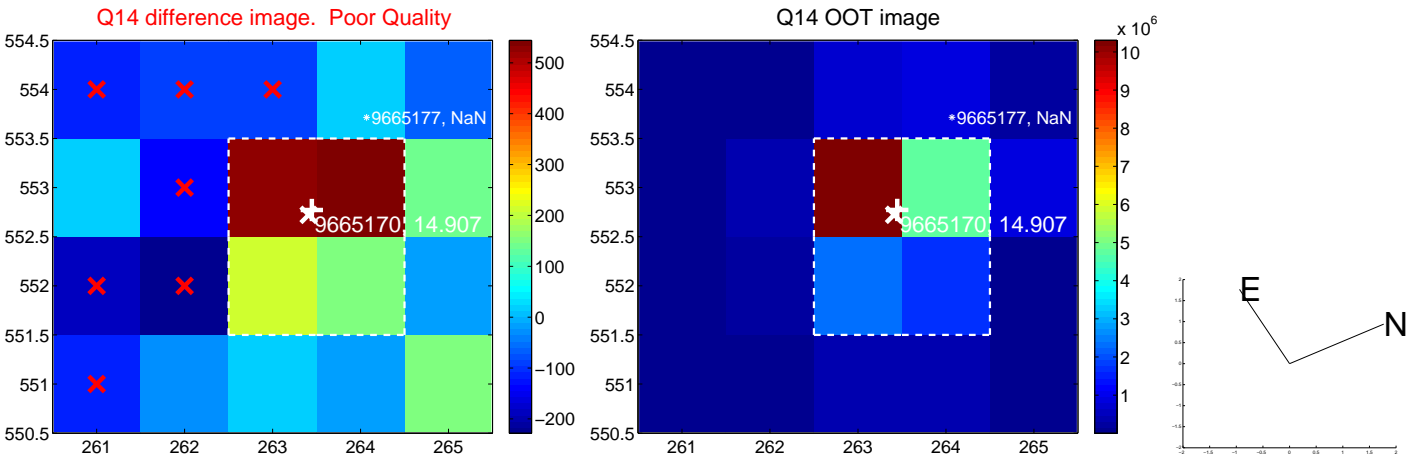
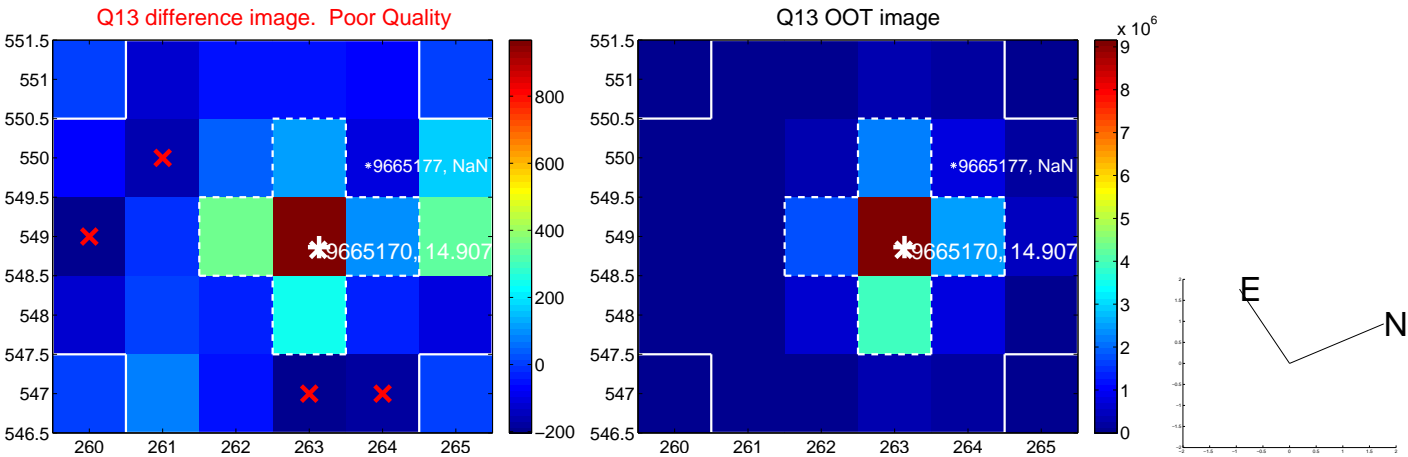
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



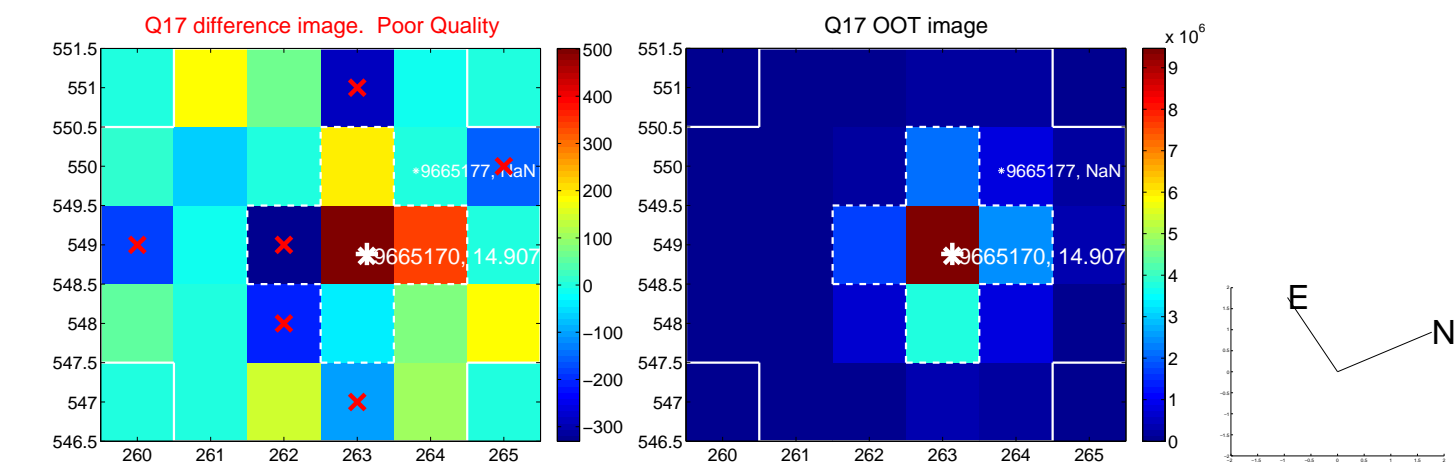
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



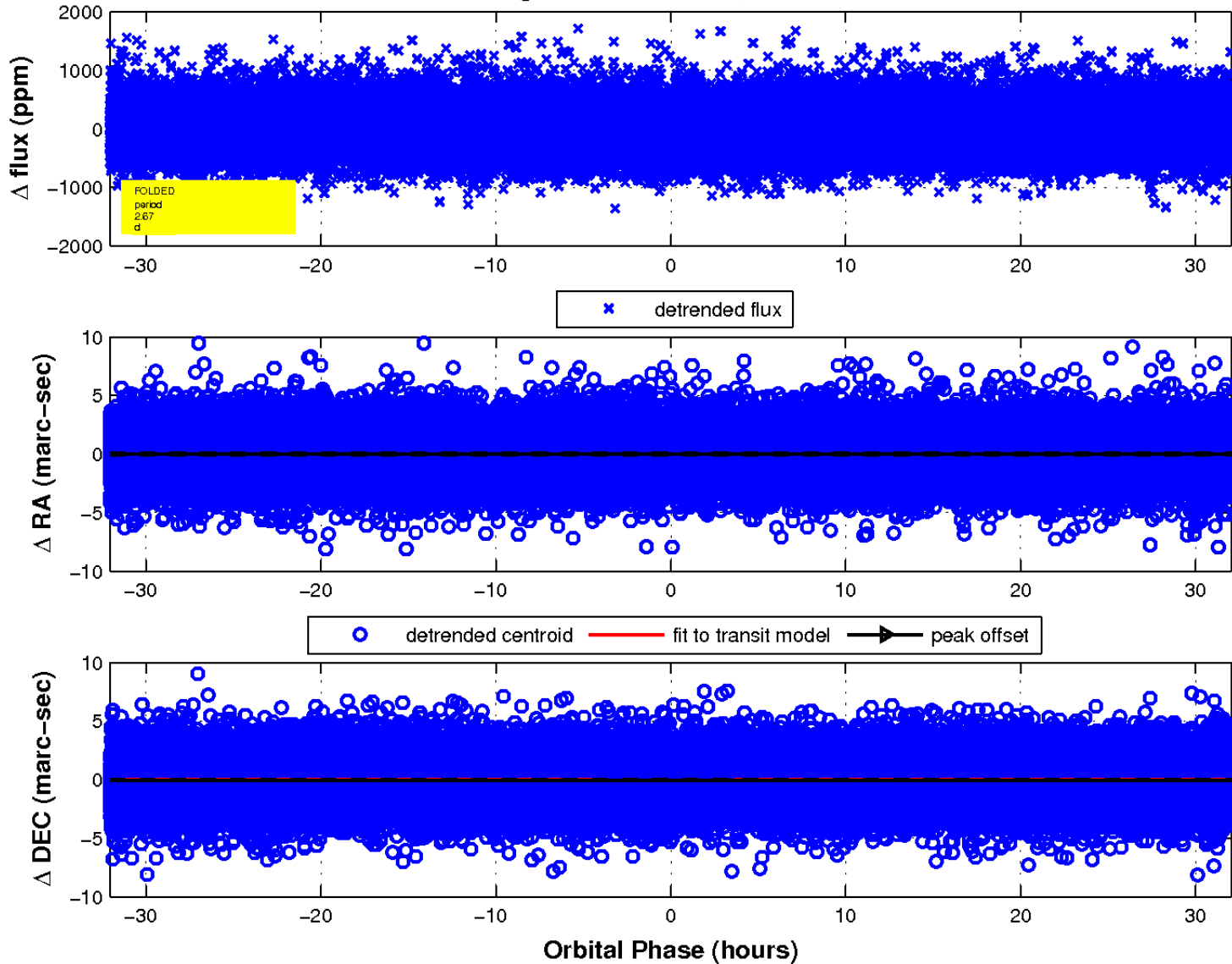
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

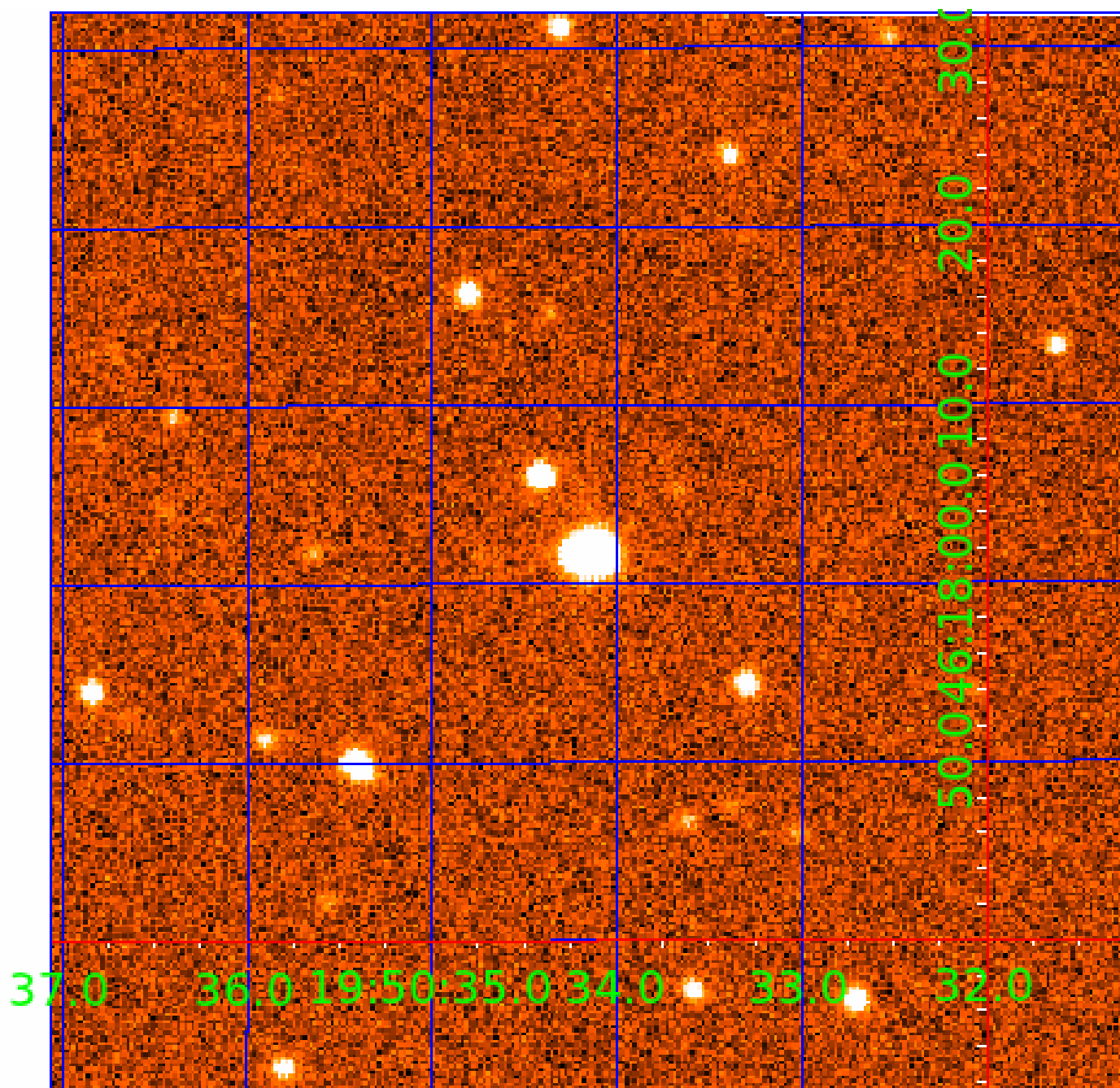


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009665170

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})
009665170-01	OBS	No	2.672172	132.276430	28.0	13.935	7.5	6.8	0.82	5520	0.45	416.87
009665170-02	OBS	No	325.808030	133.748980	566.5	10.776	28.2	11.1	0.82	5520	2.22	0.69

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009665170-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009665170-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—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.

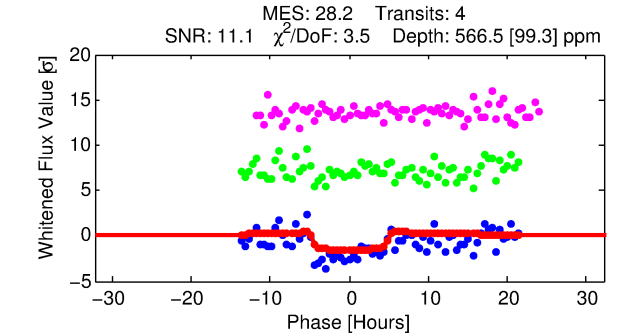
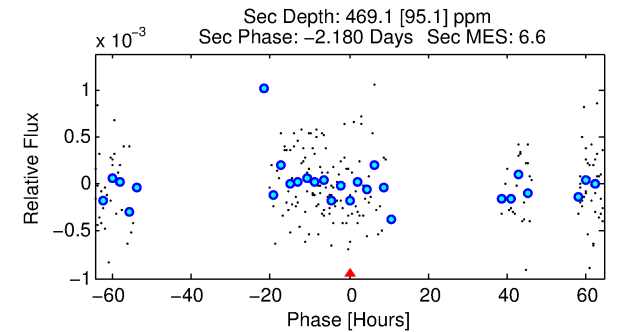
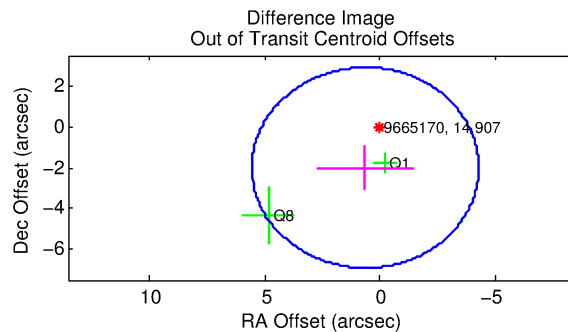
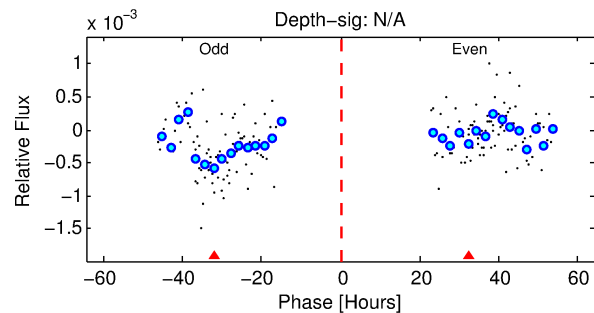
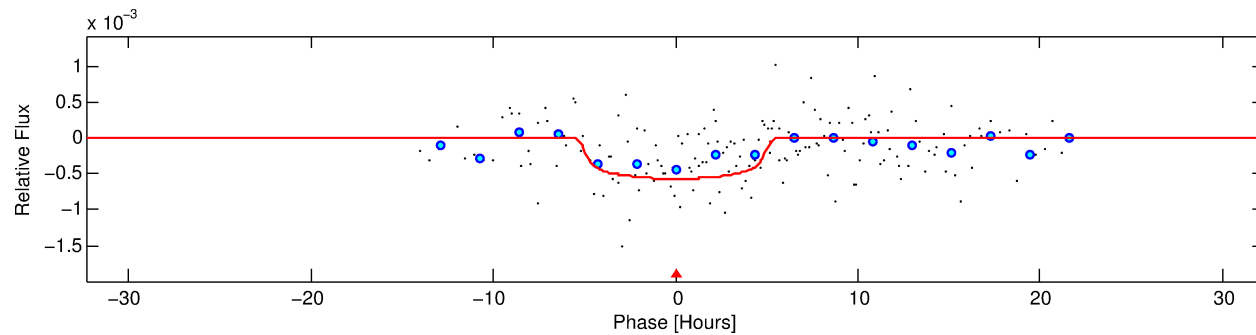
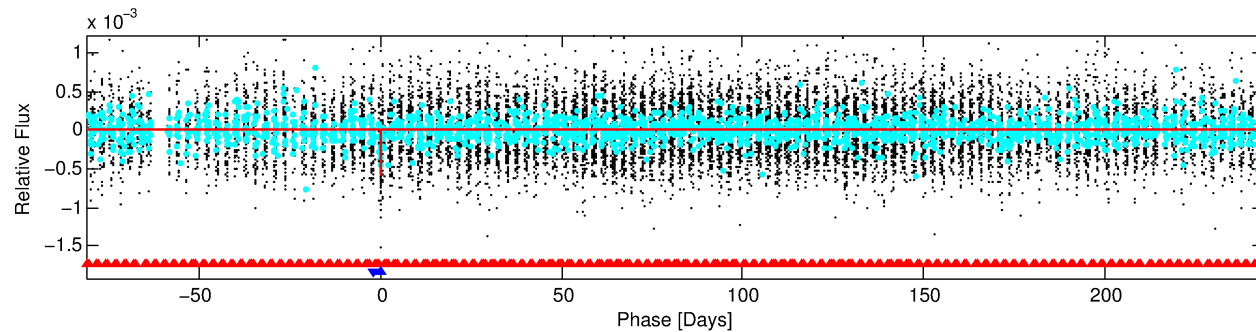
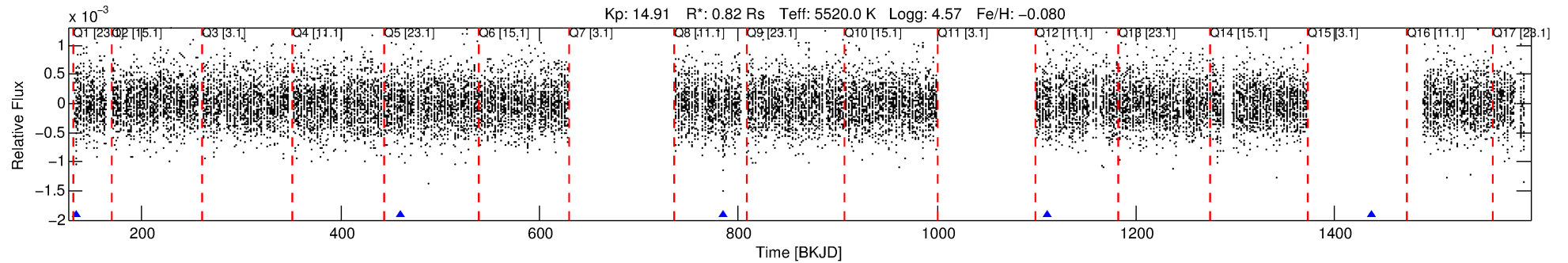
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009665170-02

No Significant Match Found

DV One-Page Summary

KIC: 9665170 Candidate: 2 of 2 Period: 325.808 d



DV Fit Results:

Period = 325.80803 [0.01639] d
Epoch = 133.7490 [0.0237] BKJD
Rp/R* = 0.0249 [0.0079]
a/R* = 133.99 [170.96]
b = 0.84 [0.44]
Seff = 0.69 [0.20]
Teff = 232 [17] K
Rp = 2.22 [0.85] Re
a = 0.8985 [0.1627] AU
Ag = 42115.51 [30044.64] [1.40σ]
Teffp = 5146 [867] K [5.67σ]

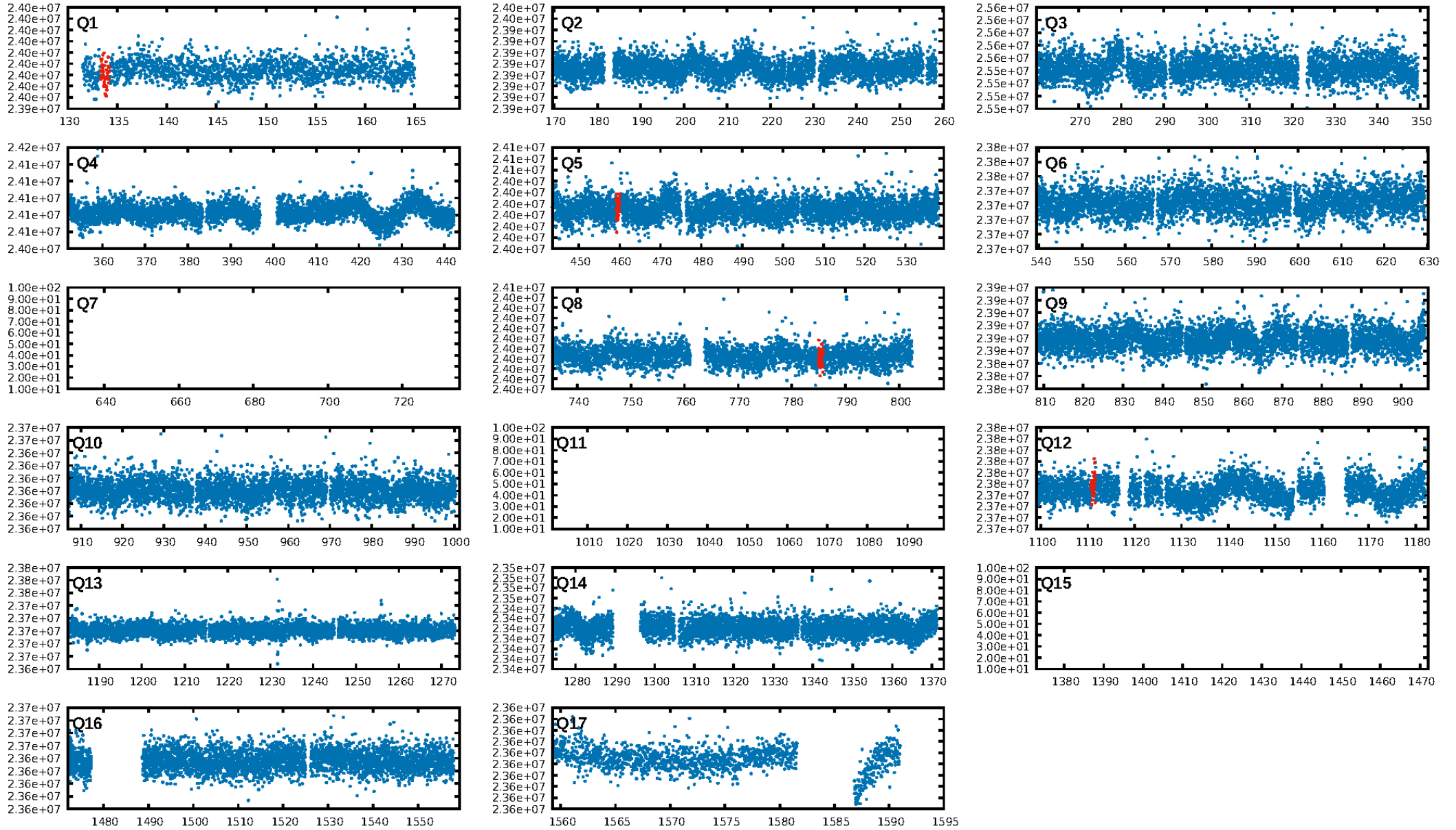
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [440.25σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 1.51e-55
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.046
Centroid-sig: 17.0%
Centroid-so: 1.126 arcsec [1.05σ]
OotOffset-rm: 2.106 arcsec [1.29σ]
KicOffset-rm: 2.047 arcsec [1.05σ]
OotOffset-st: 0/0/1/1 [2]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.50 [2/4]

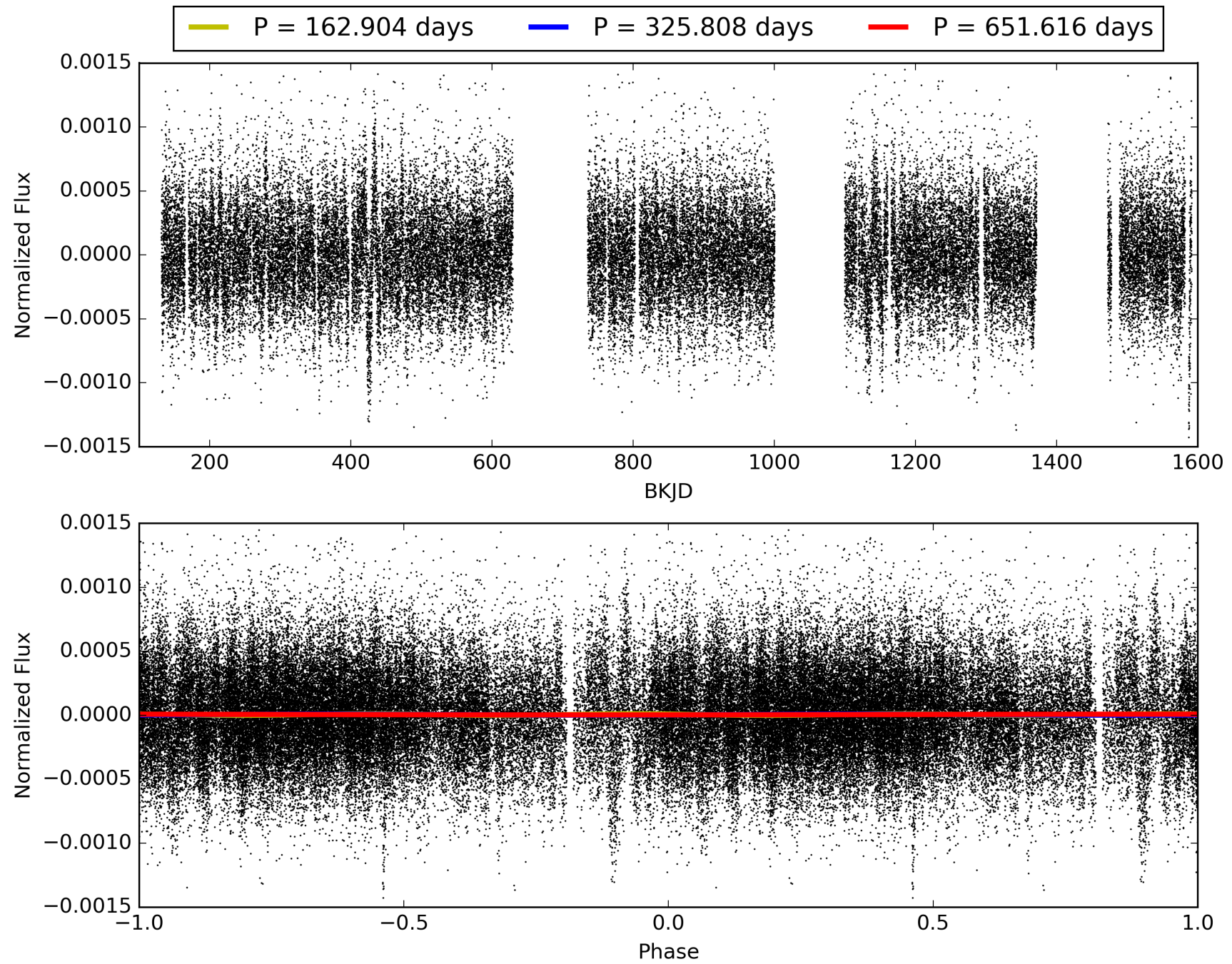
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:16 Z

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

TCE 009665170-02, PDC Light Curves

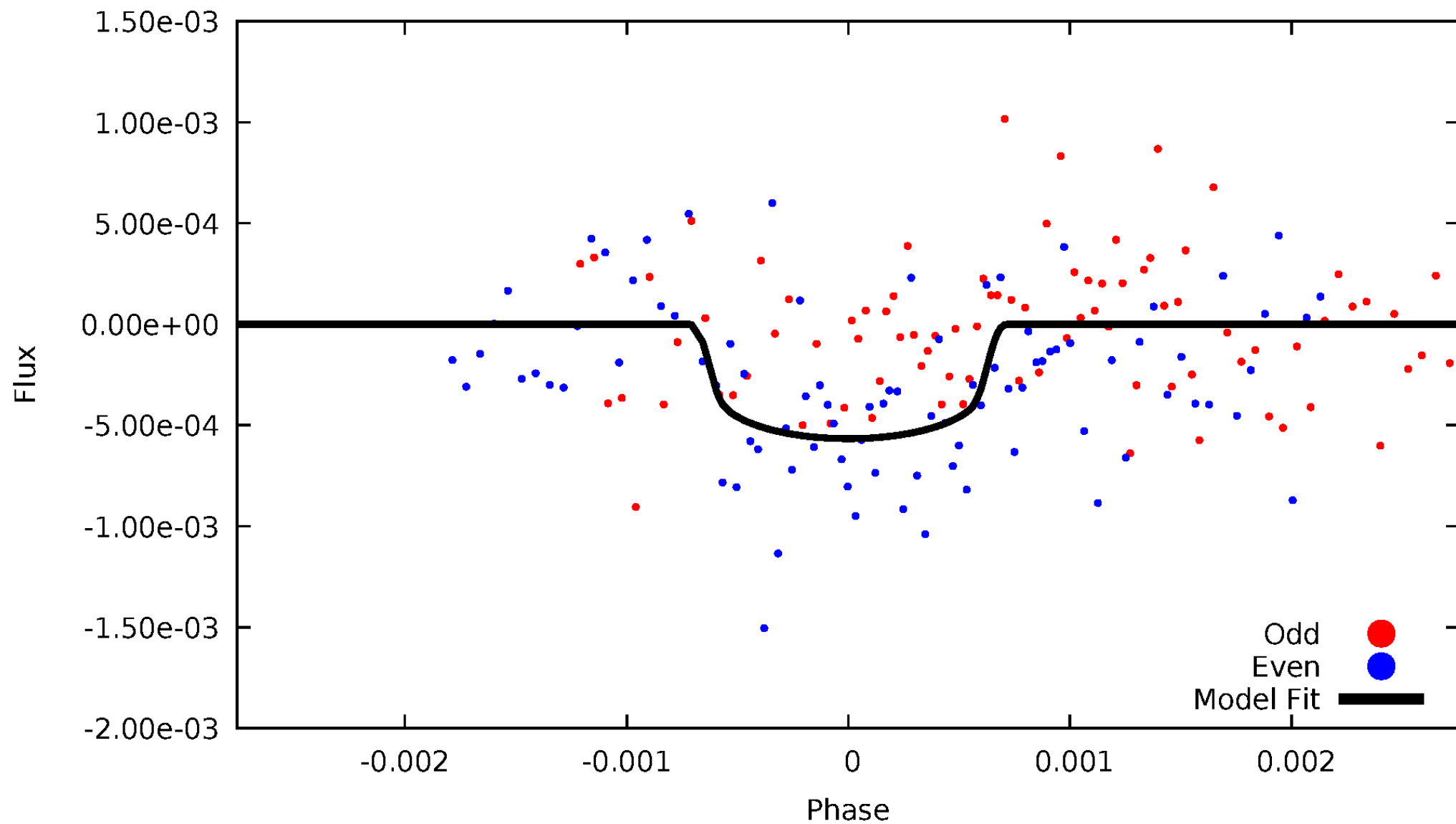


TCE 009665170-02



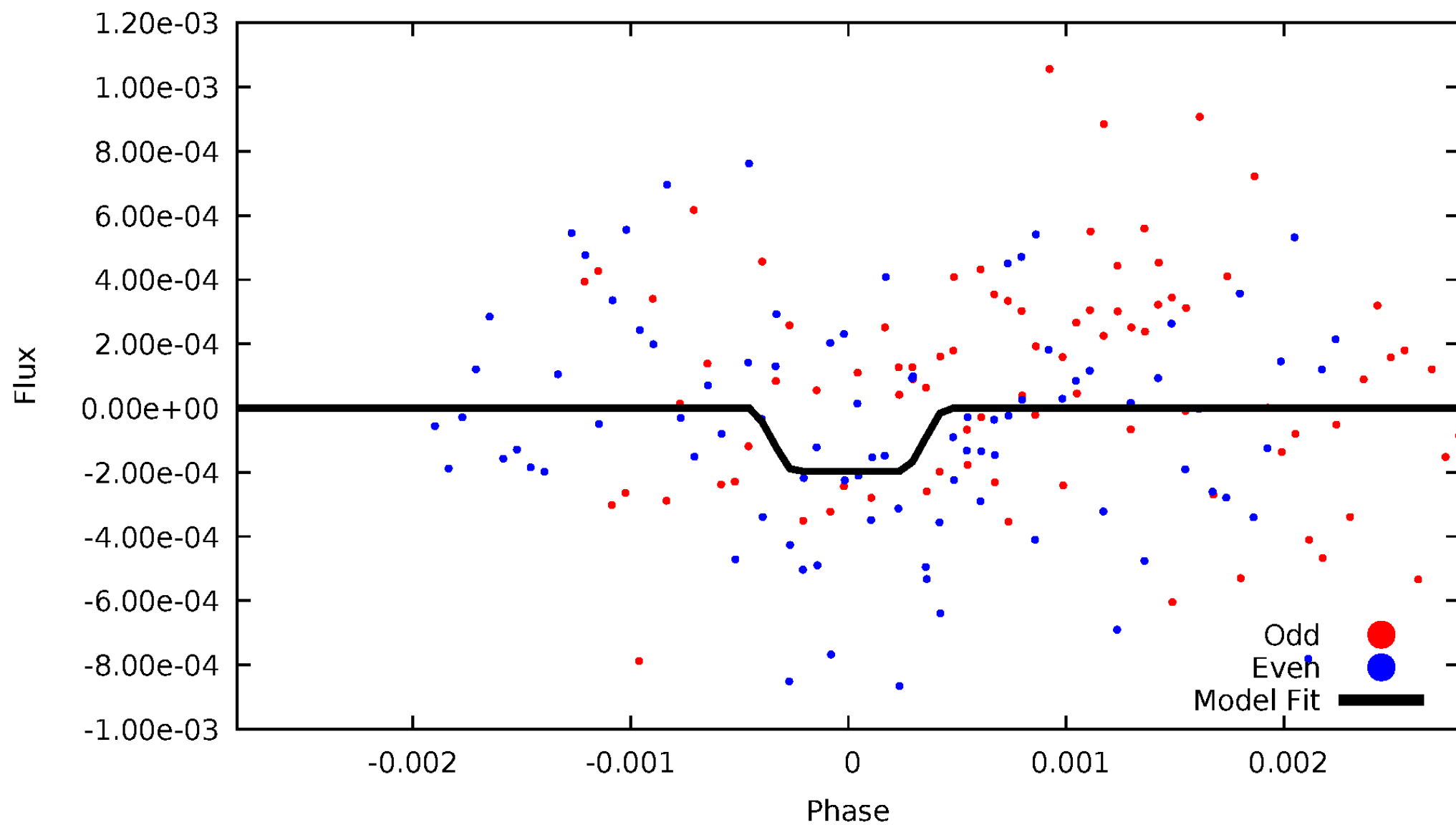
DV Odd/Even

TCE 009665170-02



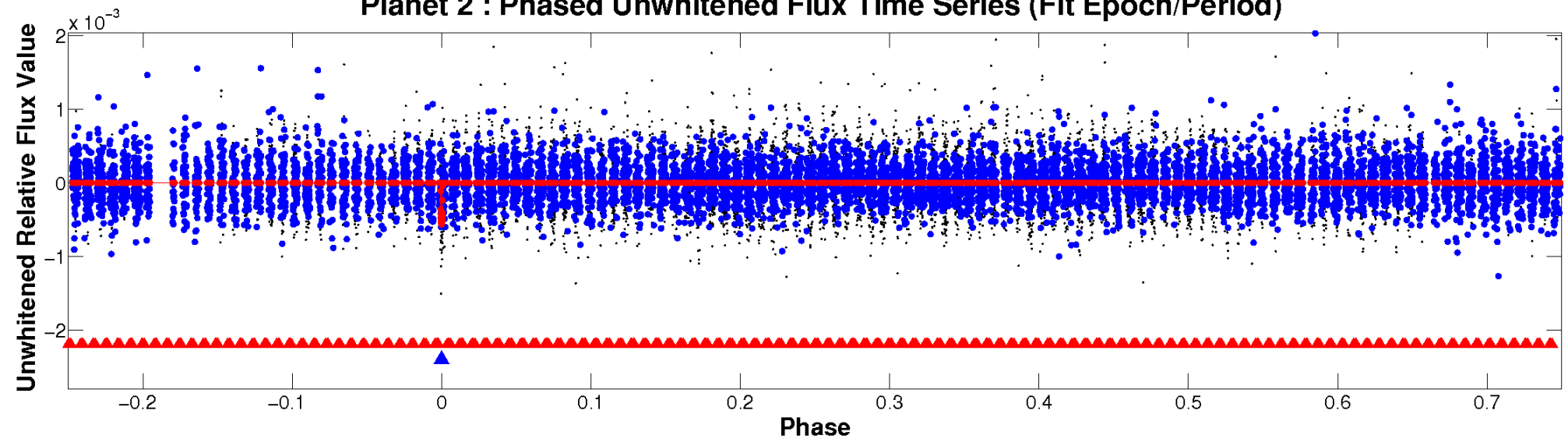
ALT Odd/Even

TCE 009665170-02

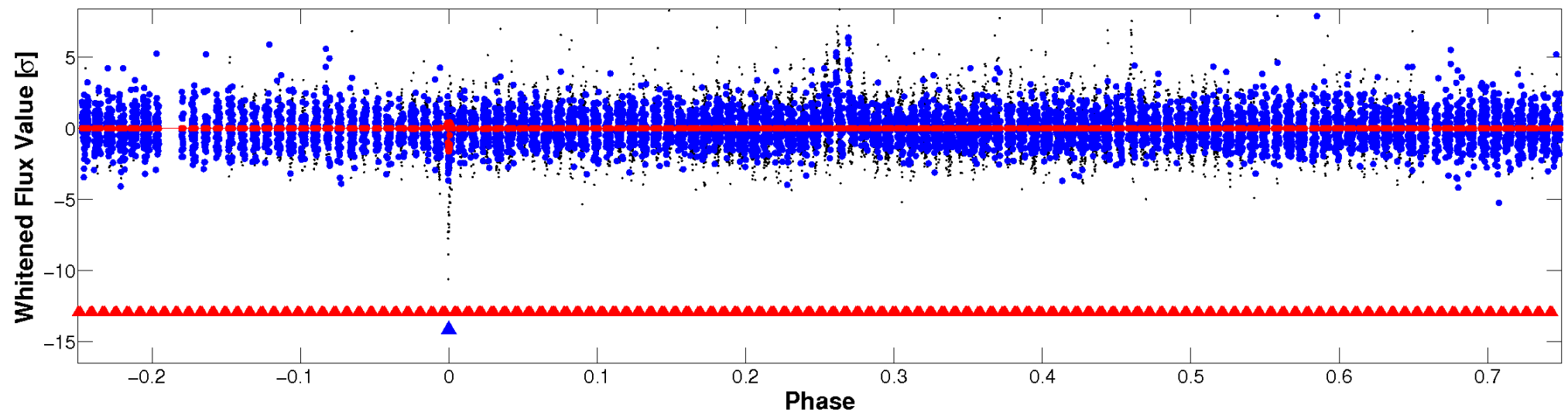


Non-Whitened Vs. Whitened Light Curve

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

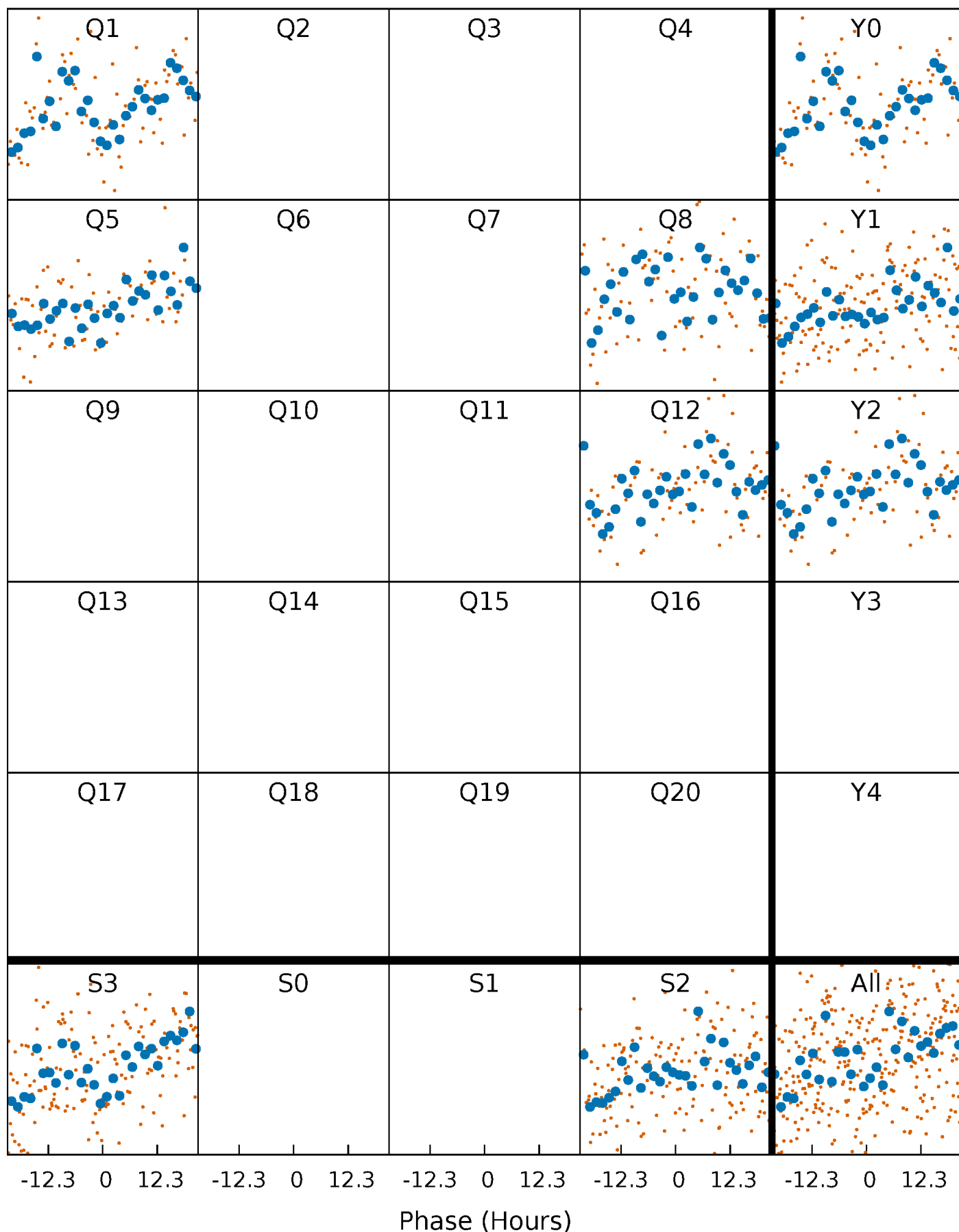


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



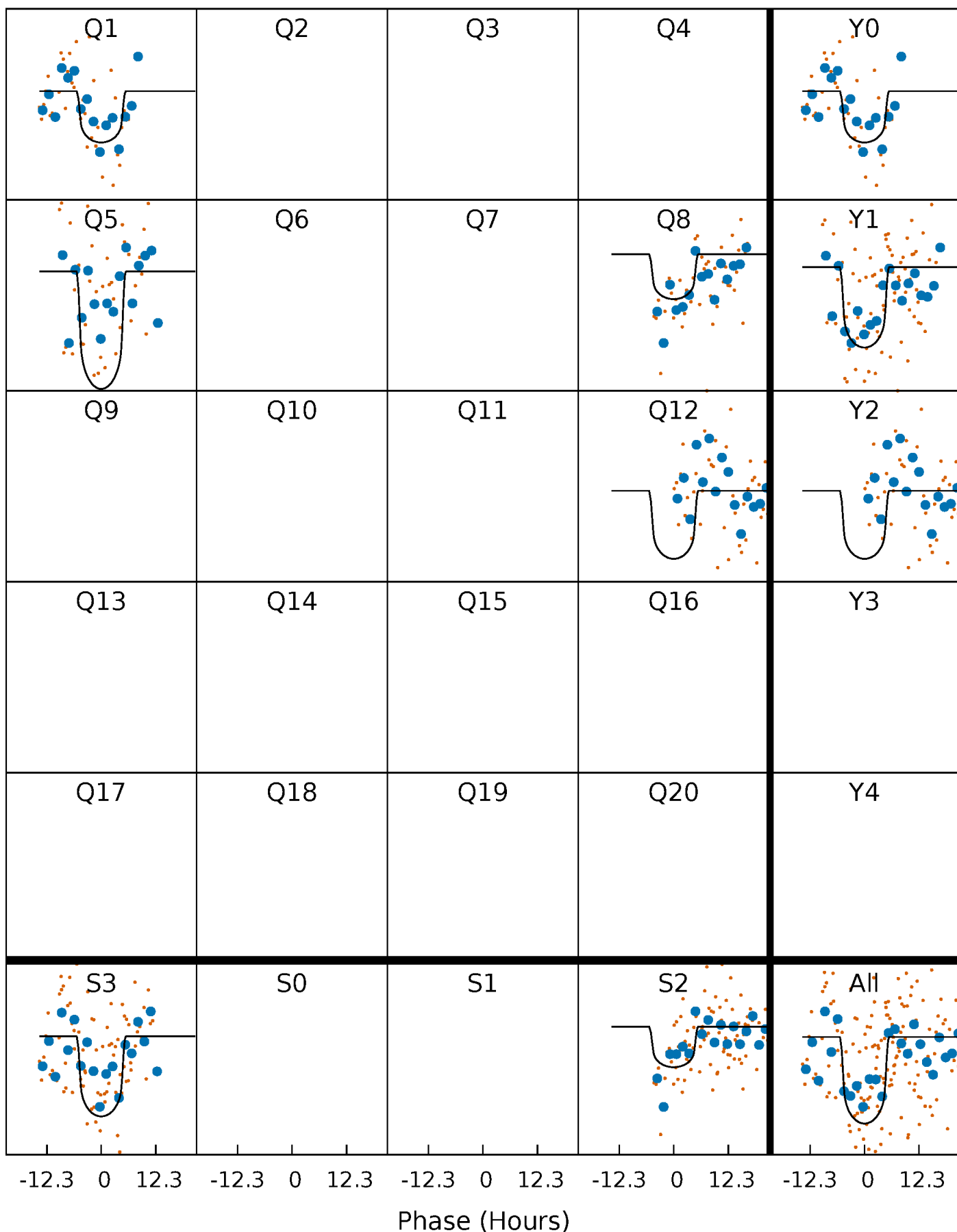
PDC Quarter-Phased Transit Curves

TCE 009665170-02 P=325.808030 Days $T_0=133.748980$ (BKJD)



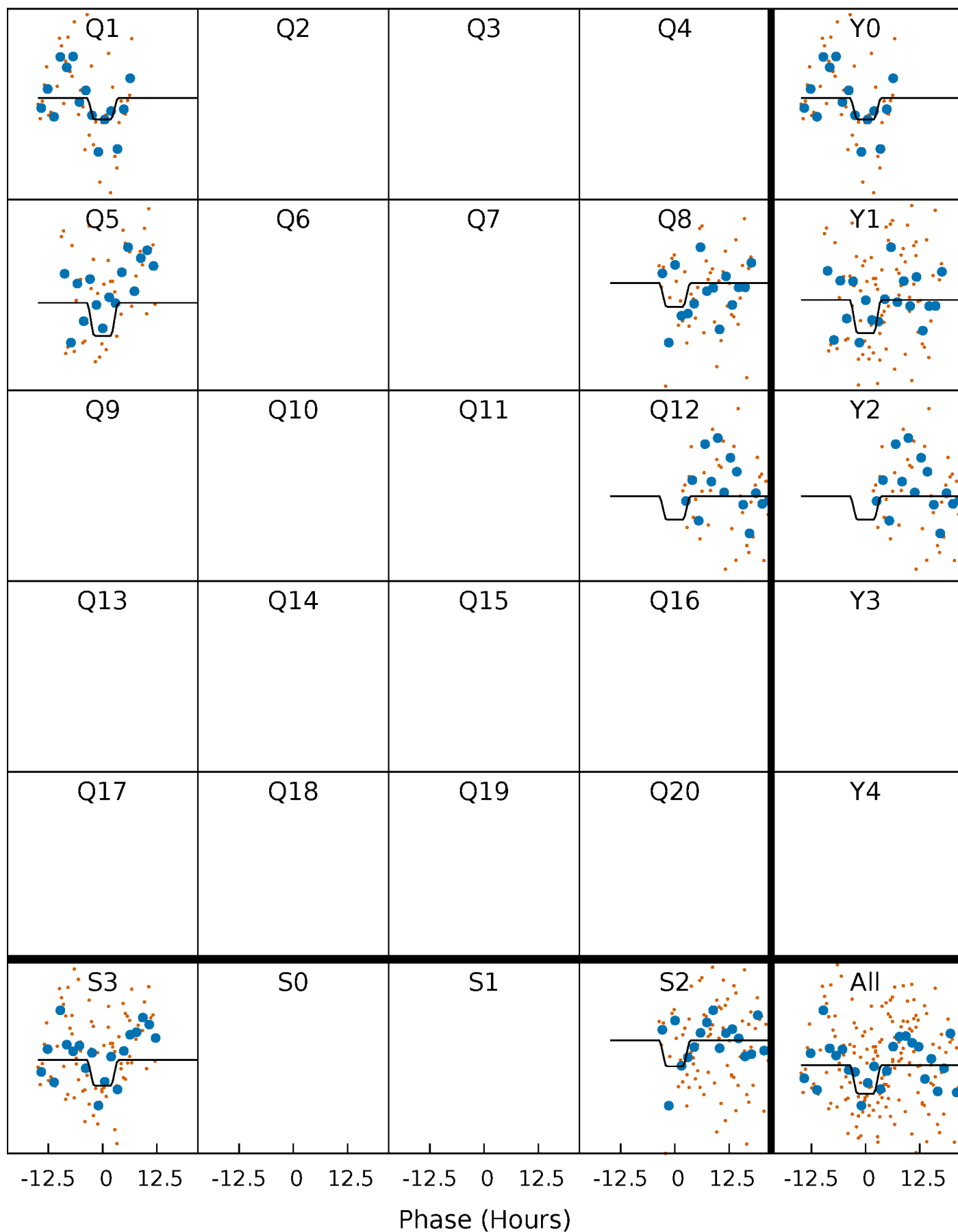
DV Quarter-Phased Transit Curves

TCE 009665170-02 P=325.808030 Days $T_0=133.748980$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

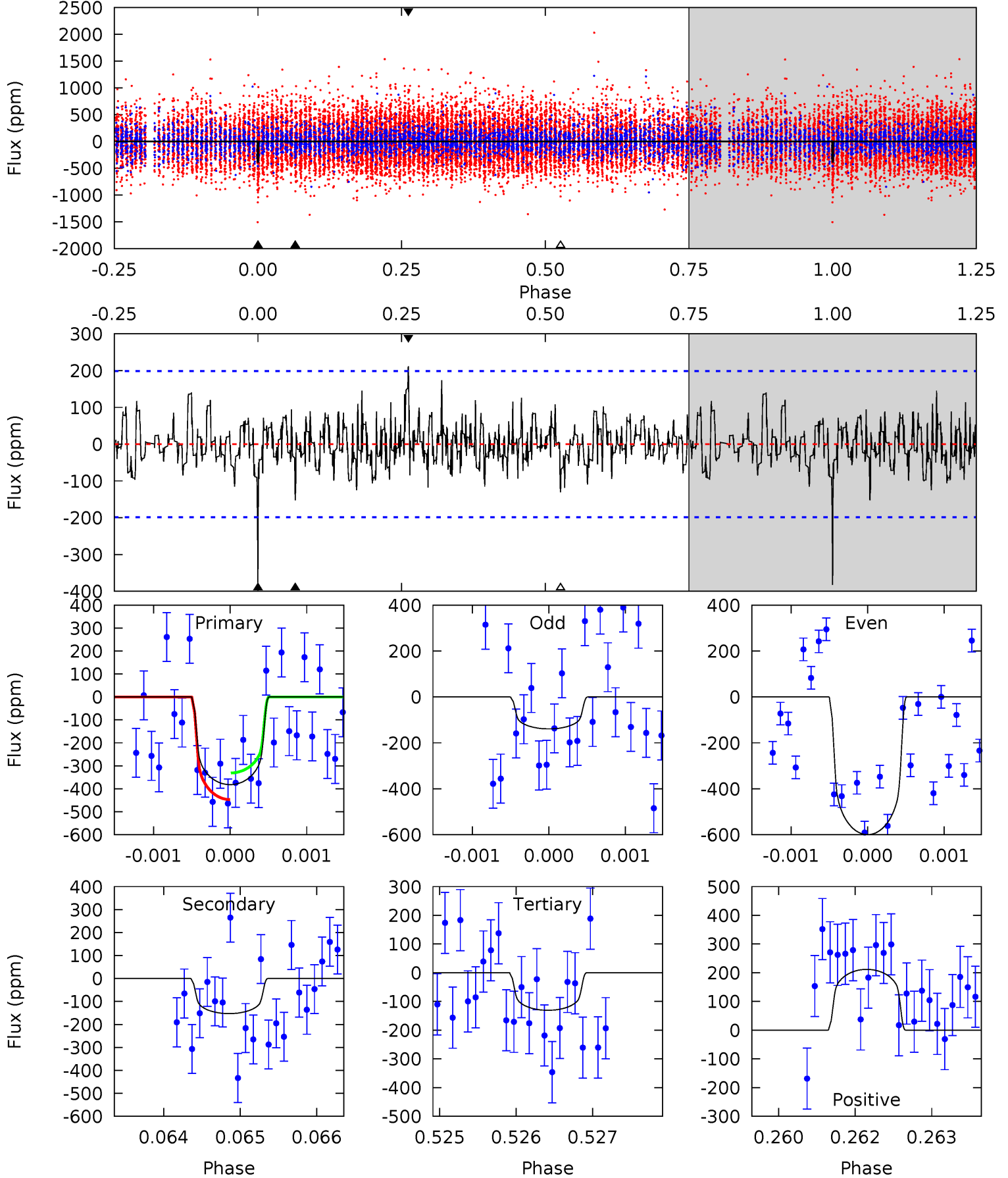
TCE 009665170-02 P=325.772247 Days $T_0=133.785433$ (BKJD)



DV Model-Shift Uniqueness Test

009665170-02, P = 325.808030 Days, E = 133.748980 Days

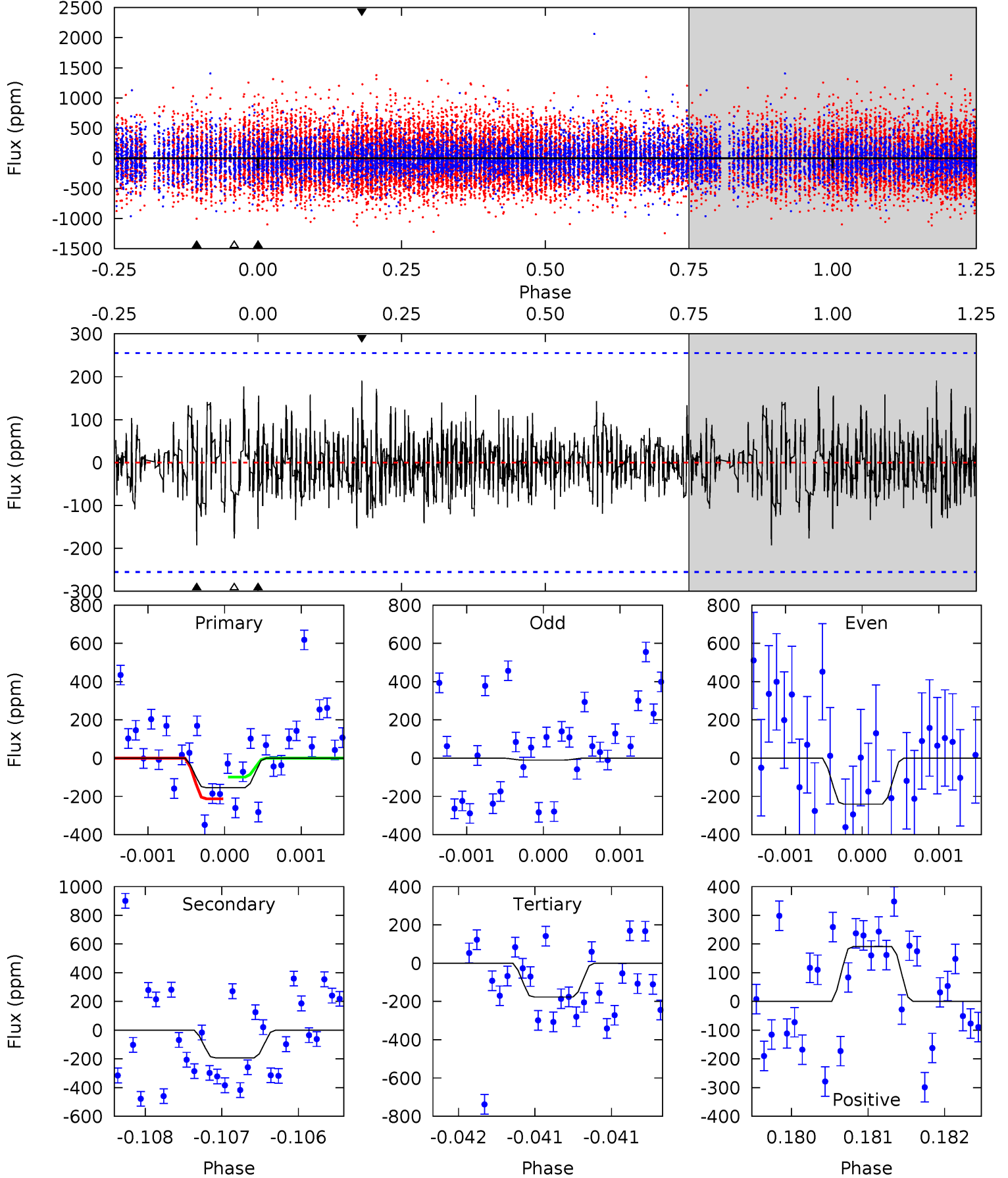
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	4.15	3.55	5.75	5.39	3.19	1.28	6.82	4.62	0.60	-1.60	6.16	1.13	0.36	1.55



Alt Model-Shift Uniqueness Test

009665170-02, $P = 325.772247$ Days, $E = 133.785433$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.32	4.14	3.79	4.09	5.47	3.33	1.07	-0.47	-0.78	0.35	0.05	2.41	1.22	0.50	1.21



Stellar Parameters For KIC 009665170

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5520^{+149}_{-166}	$4.572^{+0.036}_{-0.144}$	$-0.080^{+0.300}_{-0.300}$	$0.818^{+0.176}_{-0.075}$	$0.917^{+0.083}_{-0.102}$	$2.358^{+0.453}_{-0.962}$
	+3%/-3%	+1%/-3%	+375%/-375%	+22%/-9%	+9%/-11%	+19%/-41%
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 009665170-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-153 ± 37	$2.27^{+0.76}_{-0.73}$	331^{+18}_{-15}	4150^{+728}_{-435}	12515^{+16449}_{-5821}
Alt.	-193 ± 47	$1.36^{+0.71}_{-0.69}$	333^{+15}_{-15}	5388^{+2378}_{-902}	$45829^{+137883}_{-27367}$

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

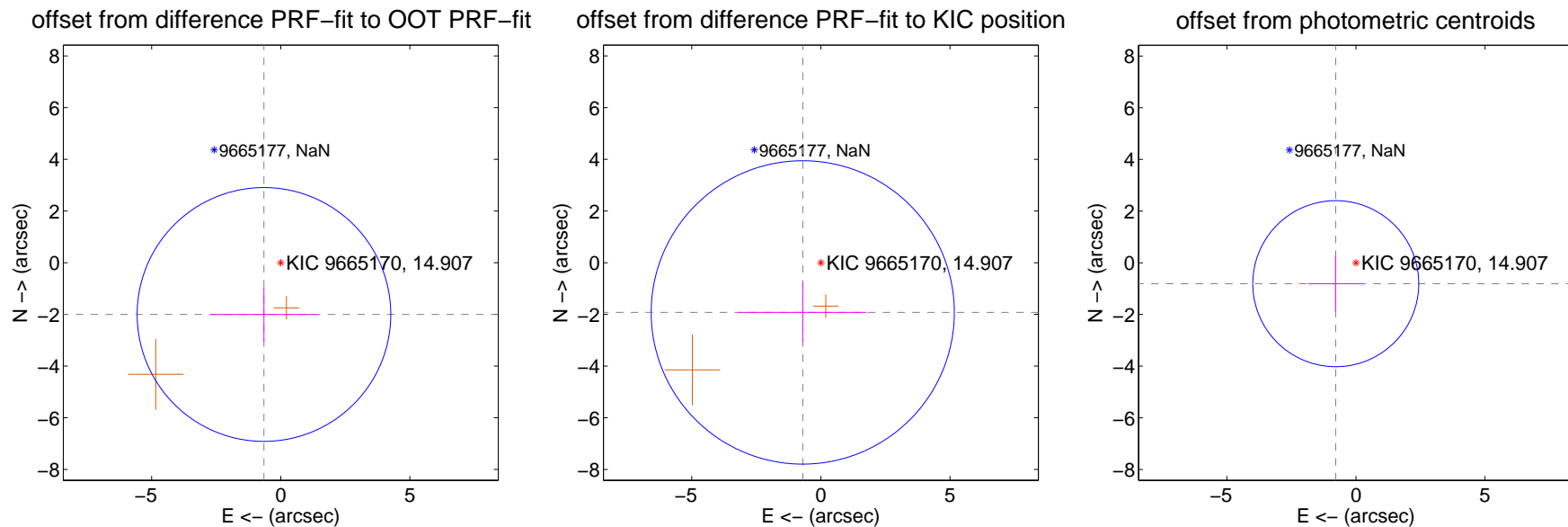
DV Centroid Data

Supplemental centroid analysis for 009665170-02. Kepler magnitude: 14.91. Transit SNR 11.14

There are 0 quarters with good PRF difference image offsets

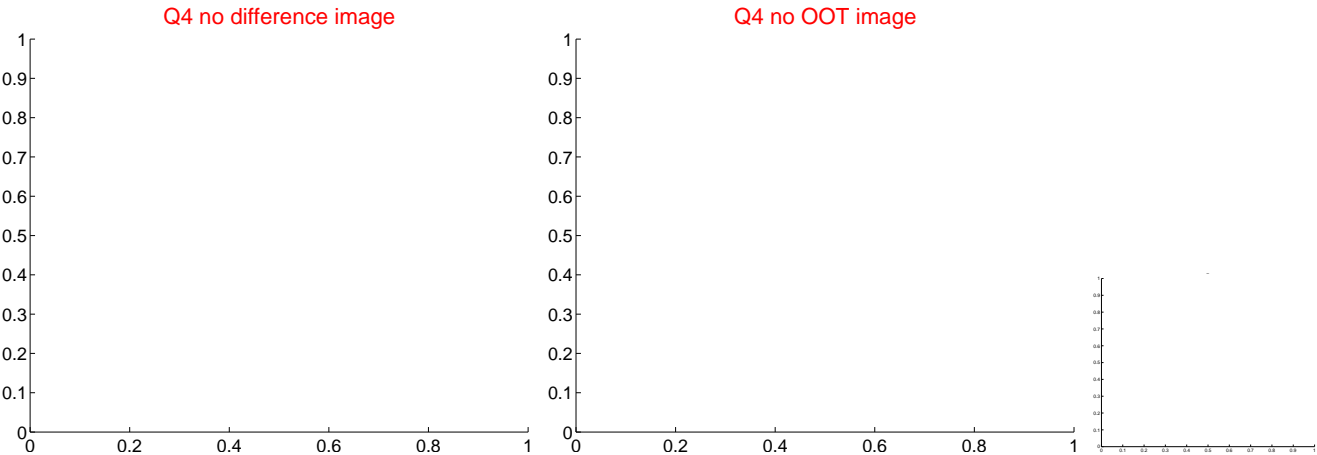
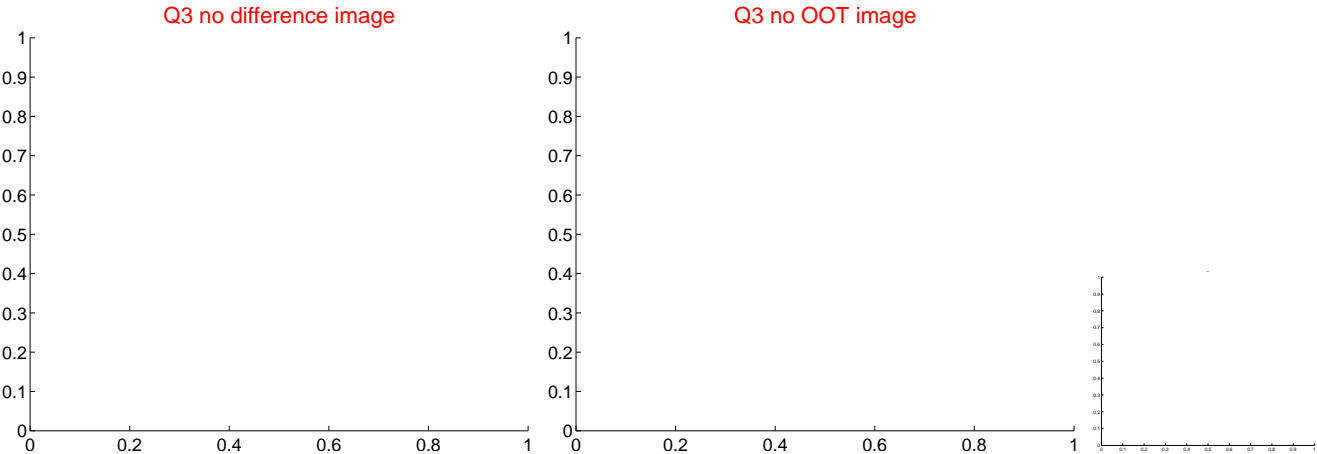
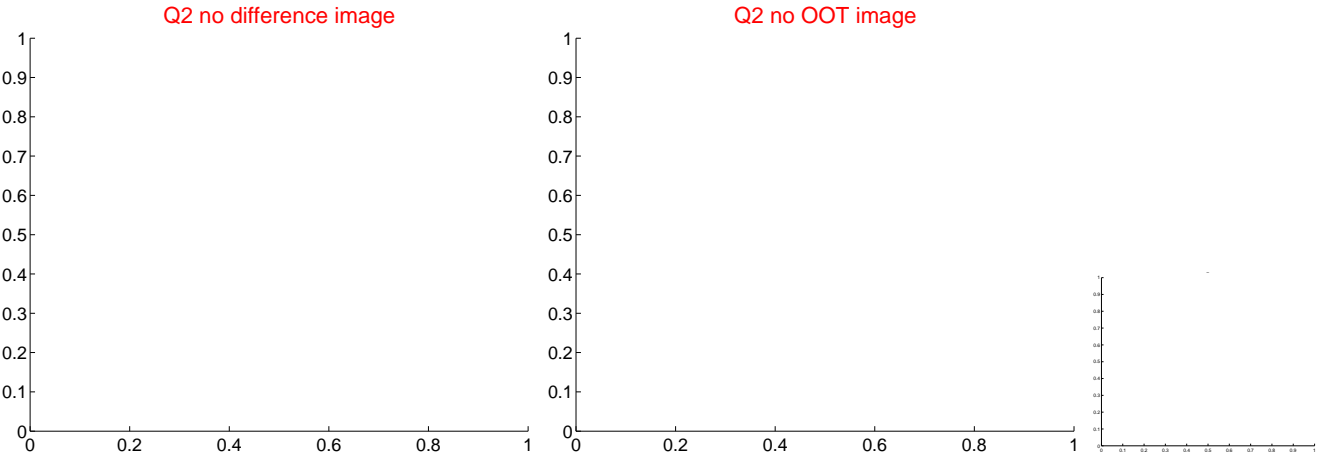
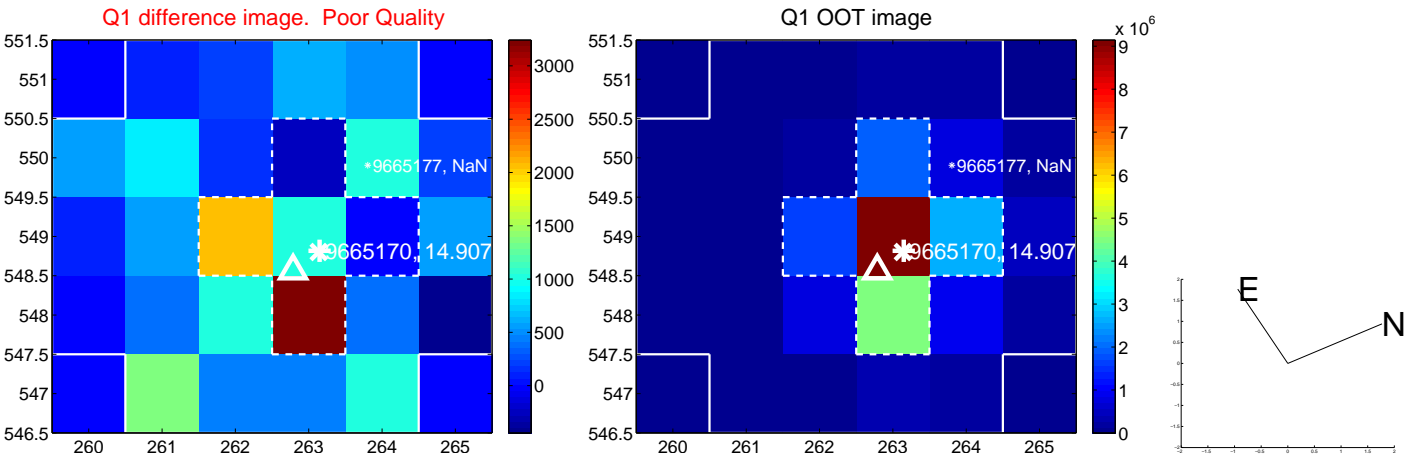
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.106 ± 1.637	1.29	0.650 ± 2.067	-2.004 ± 1.051
PRF-fit source offset from KIC position	2.047 ± 1.956	1.05	0.701 ± 2.473	-1.924 ± 1.182
photometric centroid source offset	1.13 ± 1.07	1.05	0.78 ± 1.07	-0.81 ± 1.07

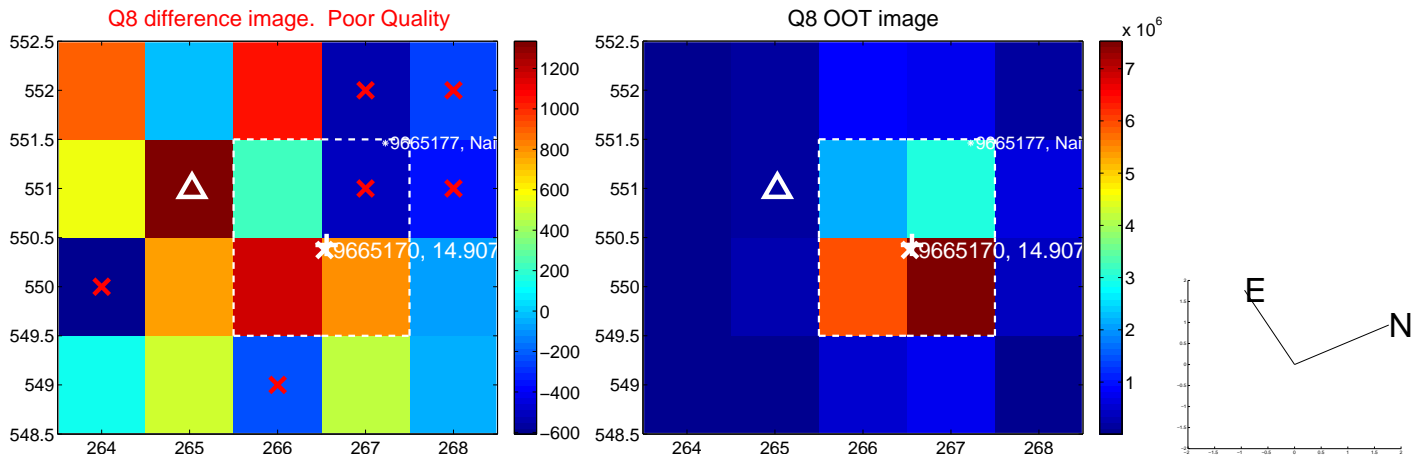
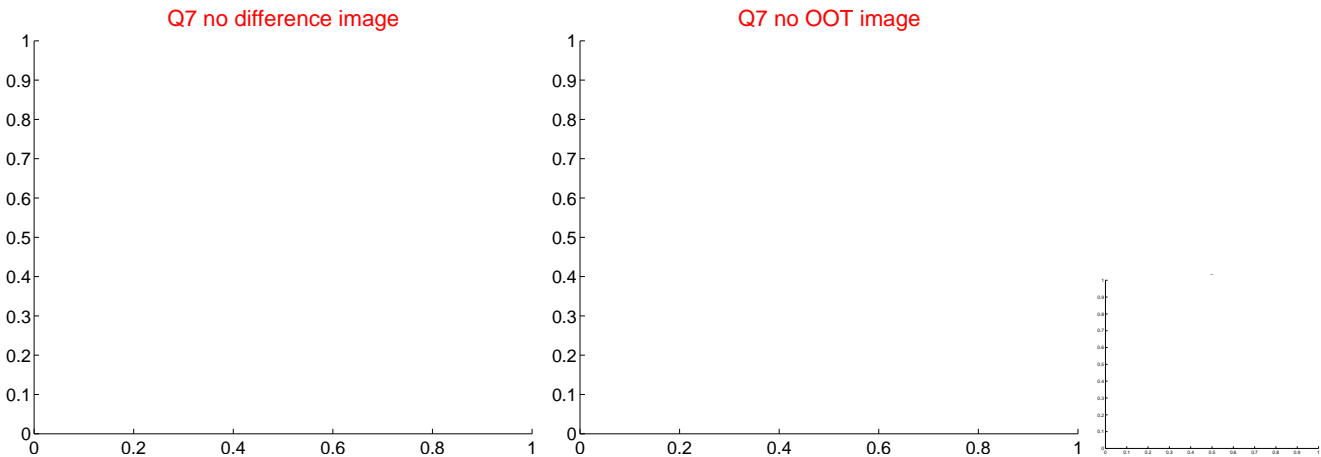
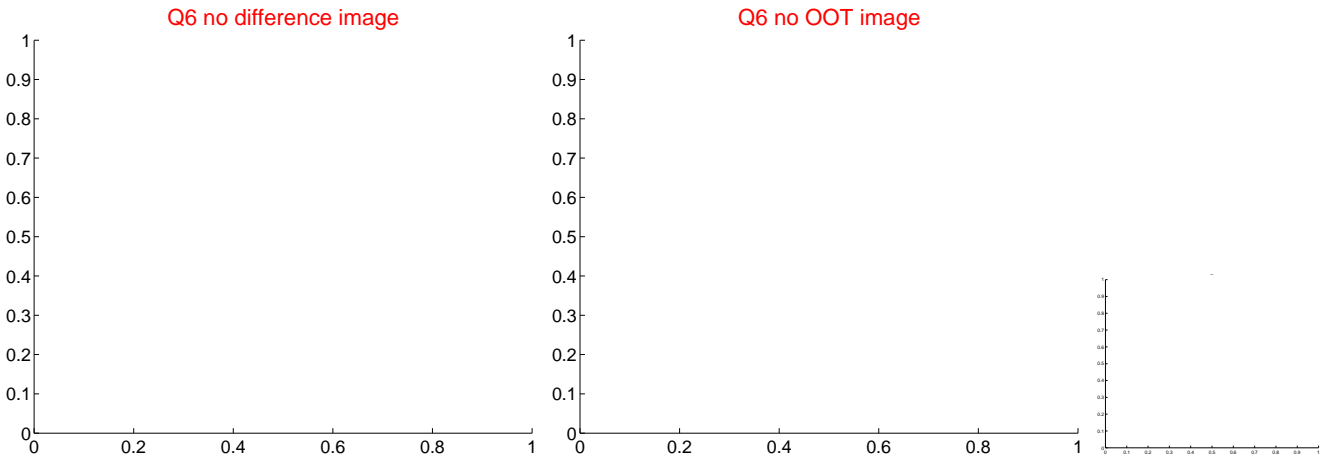
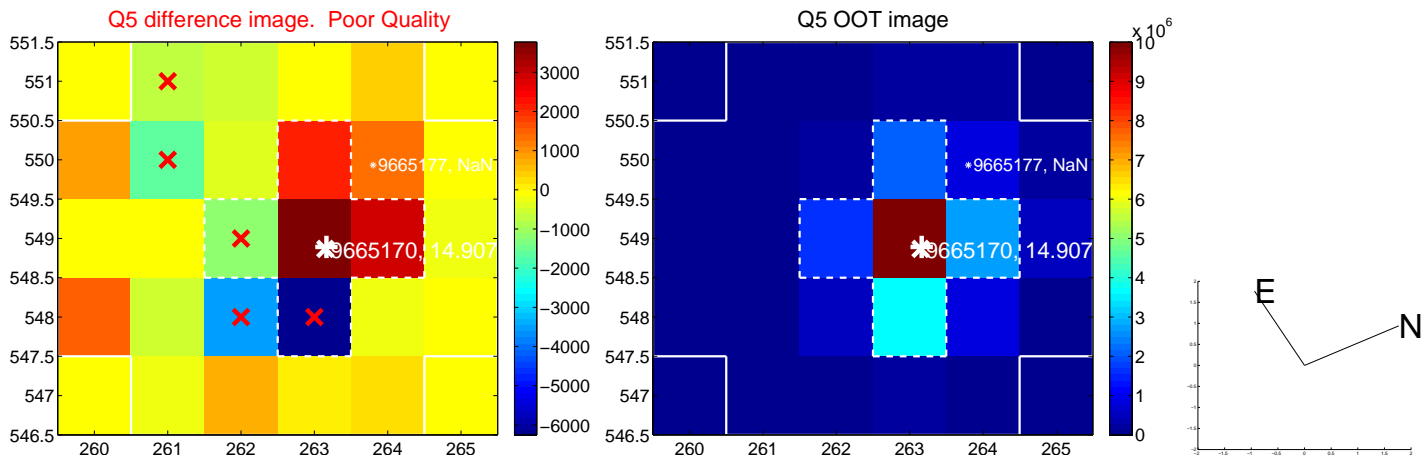


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

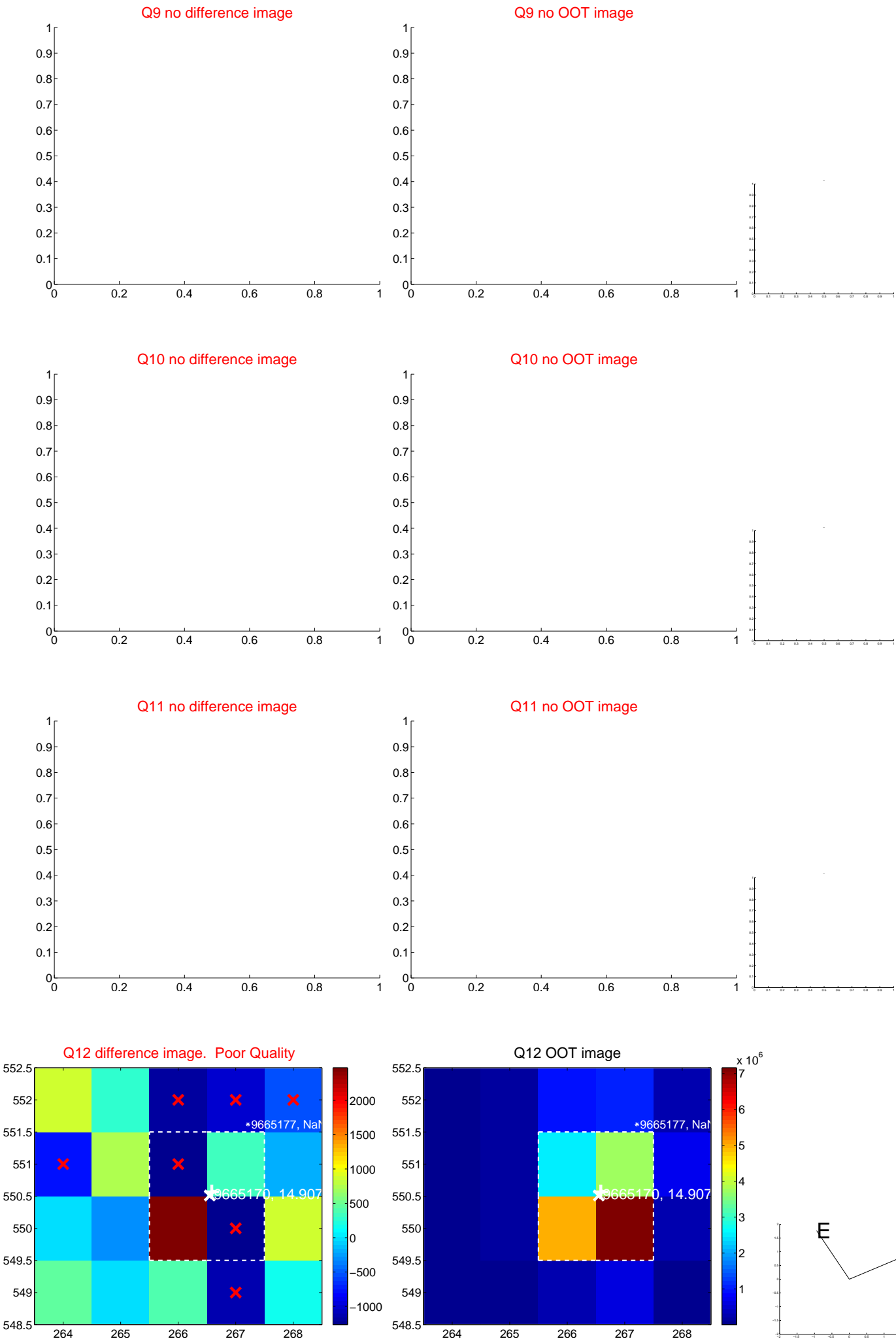
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



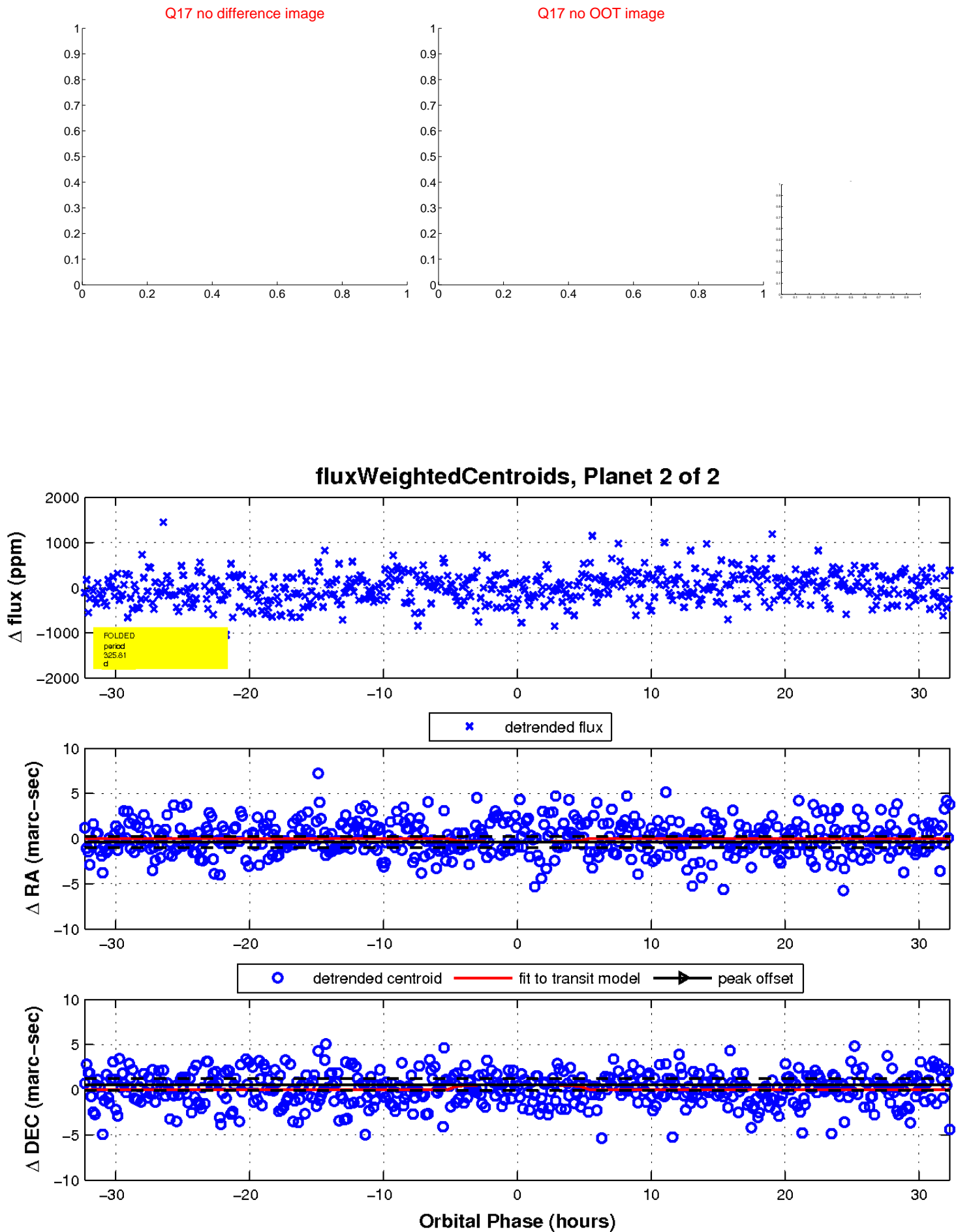
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

