

KIC 008332521

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})
008332521-01	OBS	4567.02	4.672453	135.241825	73.5	4.217	9.4	10.0	0.99	6146	0.98	413.13
008332521-02	OBS	4567.01	14.744615	135.034422	101.0	6.765	7.2	7.7	0.99	6146	1.14	89.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008332521-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008332521-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

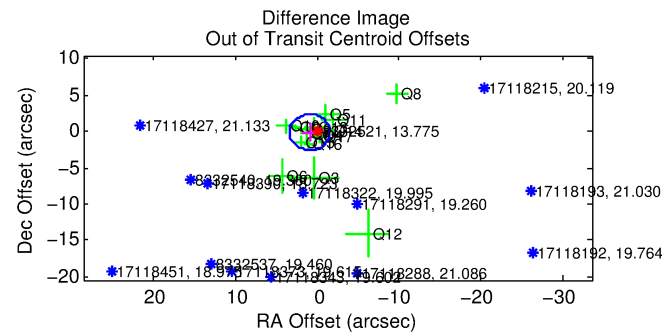
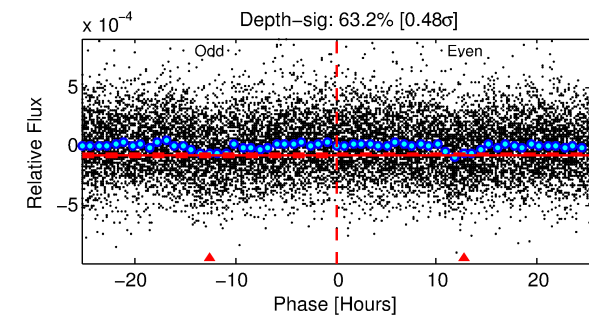
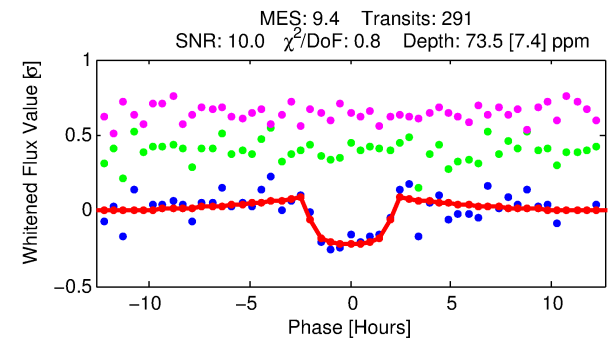
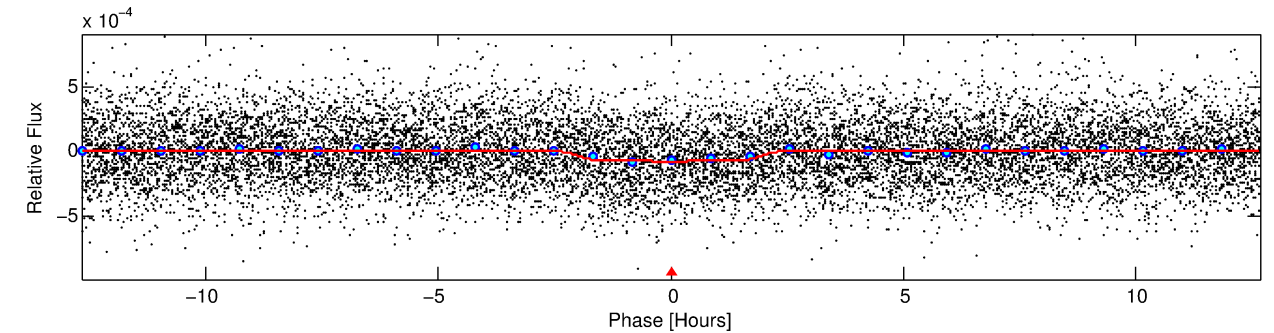
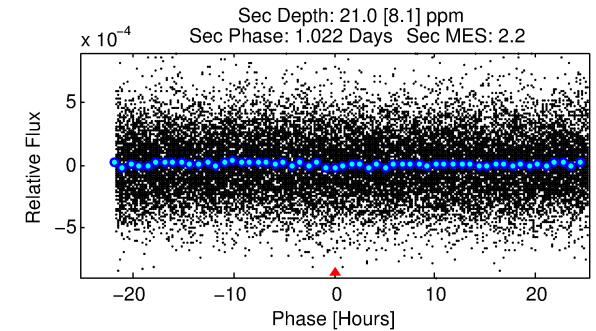
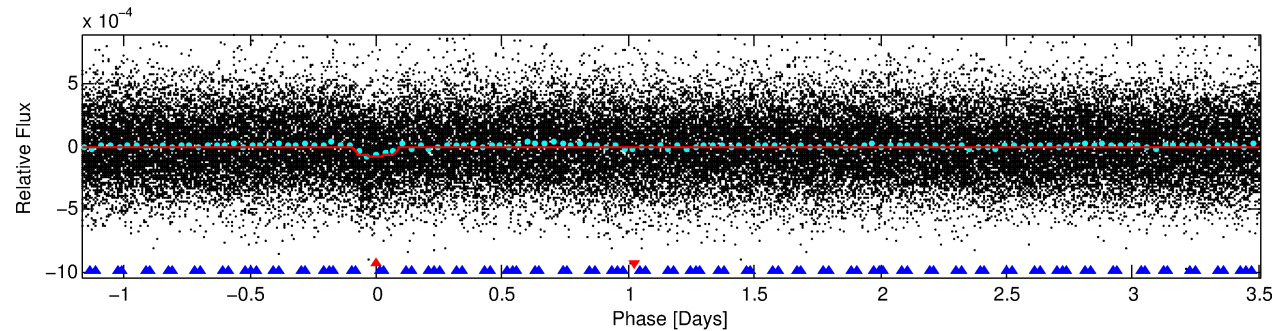
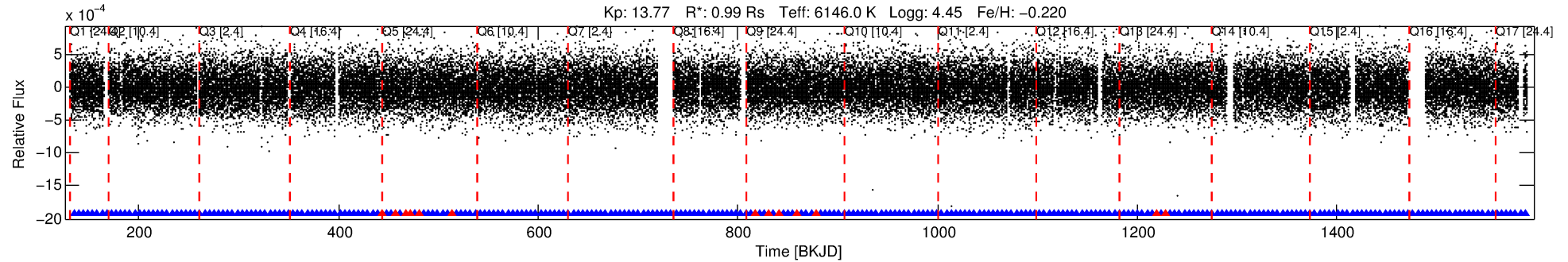
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008332521-01

No Significant Match Found

DV One-Page Summary

KIC: 8332521 Candidate: 1 of 2 Period: 4.672 d
KOI: K04567.02 Corr: 0.889



DV Fit Results:

Period = 4.67245 [0.00003] d
Epoch = 135.2418 [0.0050] BKJD
Rp/R* = 0.0091 [0.0034]
a/R* = 4.16 [7.83]
b = 0.89 [0.48]
Seff = 413.13 [169.64]
Teq = 1150 [118] K
Rp = 0.98 [0.49] Re
a = 0.0549 [0.0150] AU
Ag = 35.92 [33.43] [1.04σ]
Teffp = 4351 [928] K [3.42σ]

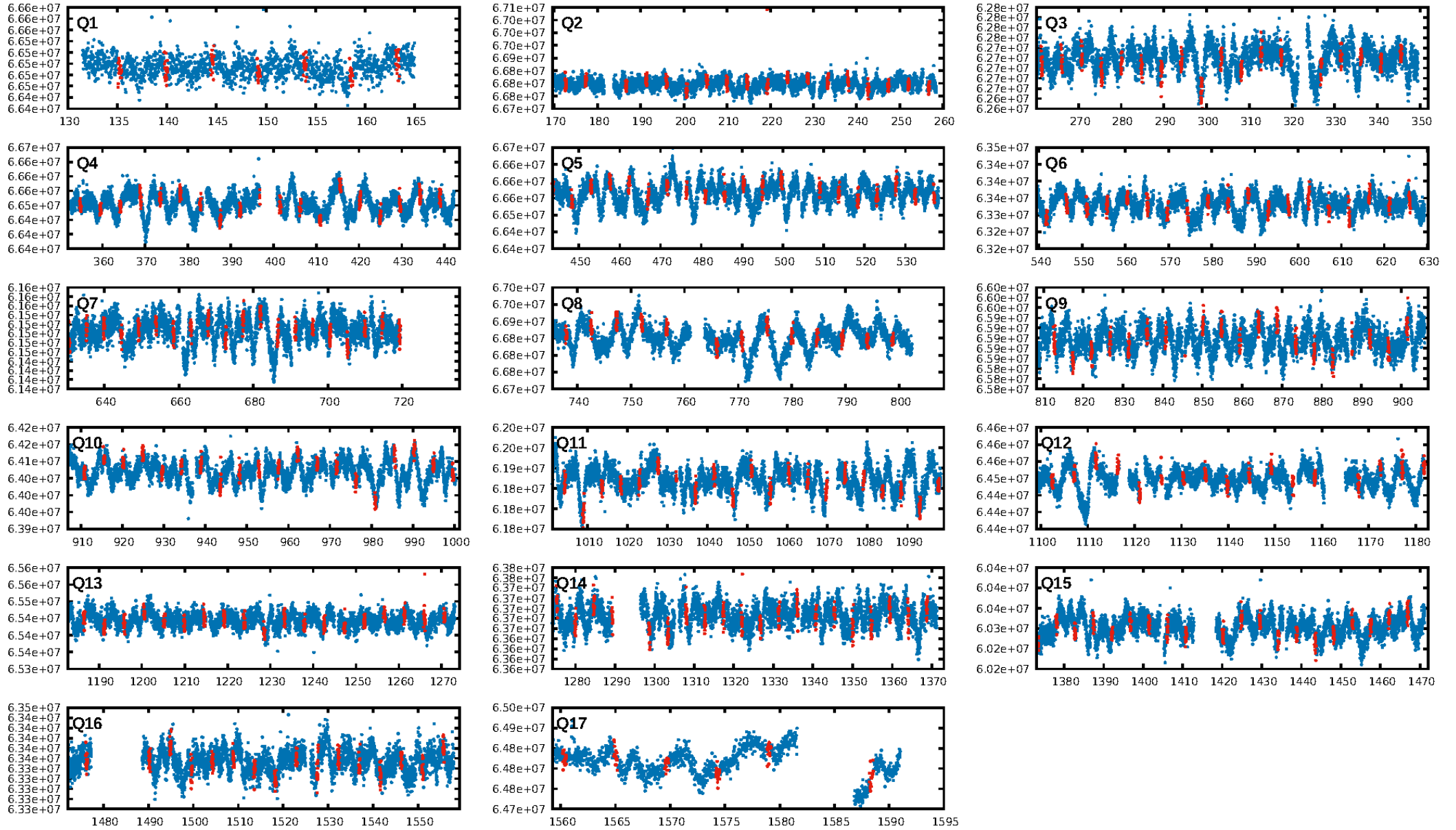
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [30.32σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.11e-20
RollingBand-fgt: 0.95 [265/278]
GhostDiagnostic-chr: 14.83
Centroid-sig: 66.4%
Centroid-so: 0.593 arcsec [0.59σ]
OotOffset-rm: 0.917 arcsec [1.11σ]
KicOffset-rm: 0.470 arcsec [0.57σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.50 [8/16]
DiffImageOverlap-fno: 1.00 [17/17]

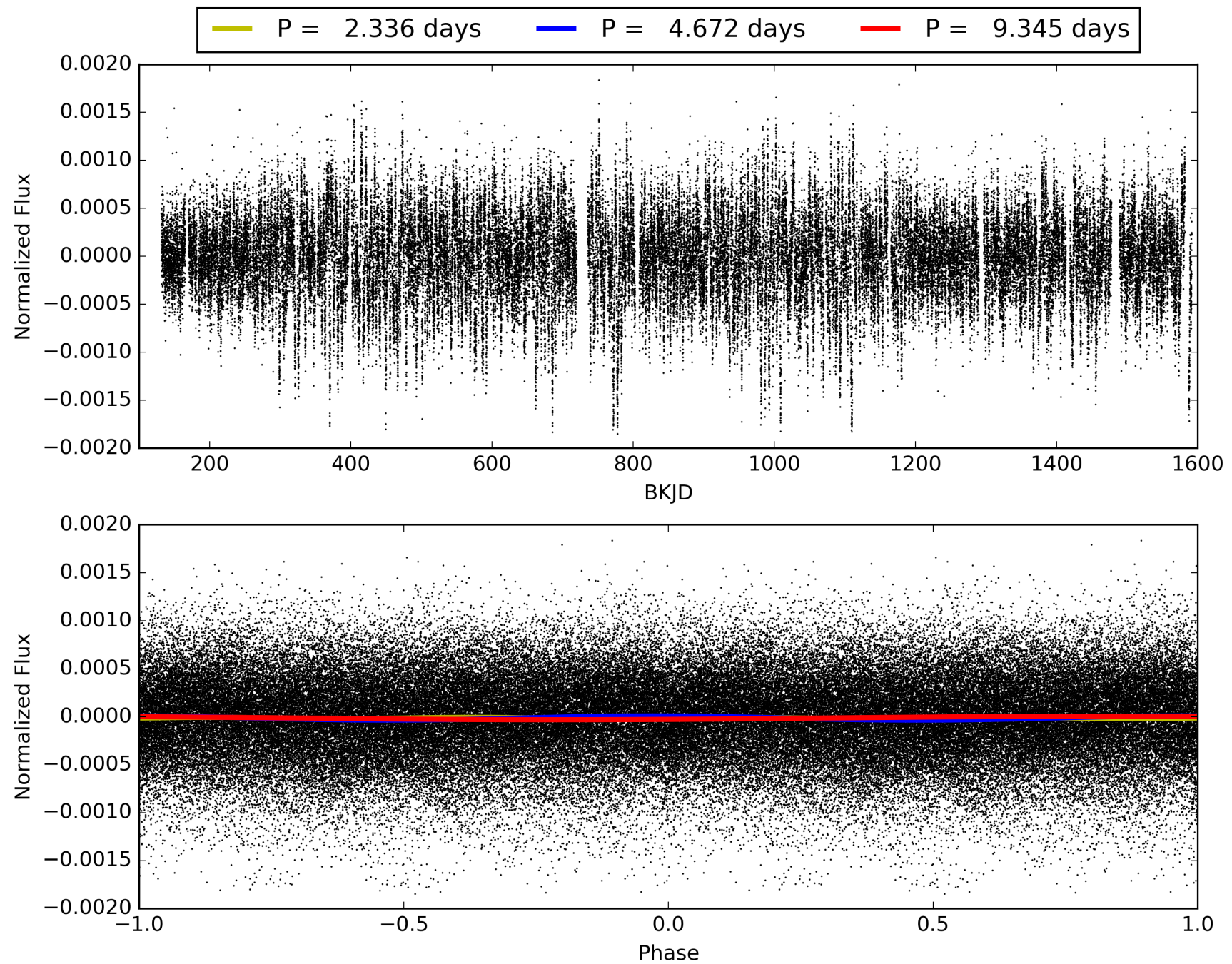
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:52:17 Z

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

TCE 008332521-01, PDC Light Curves

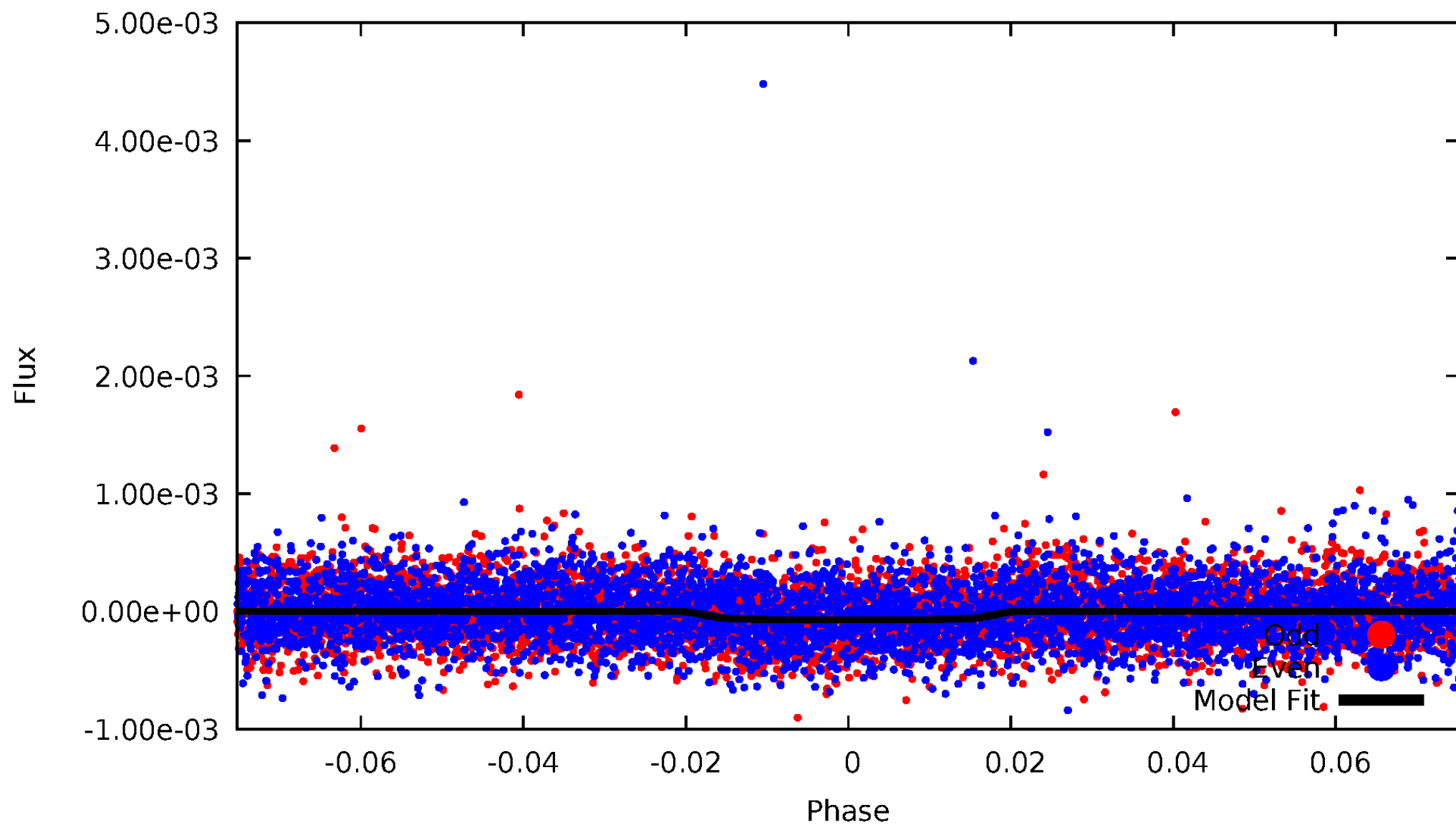


TCE 008332521-01



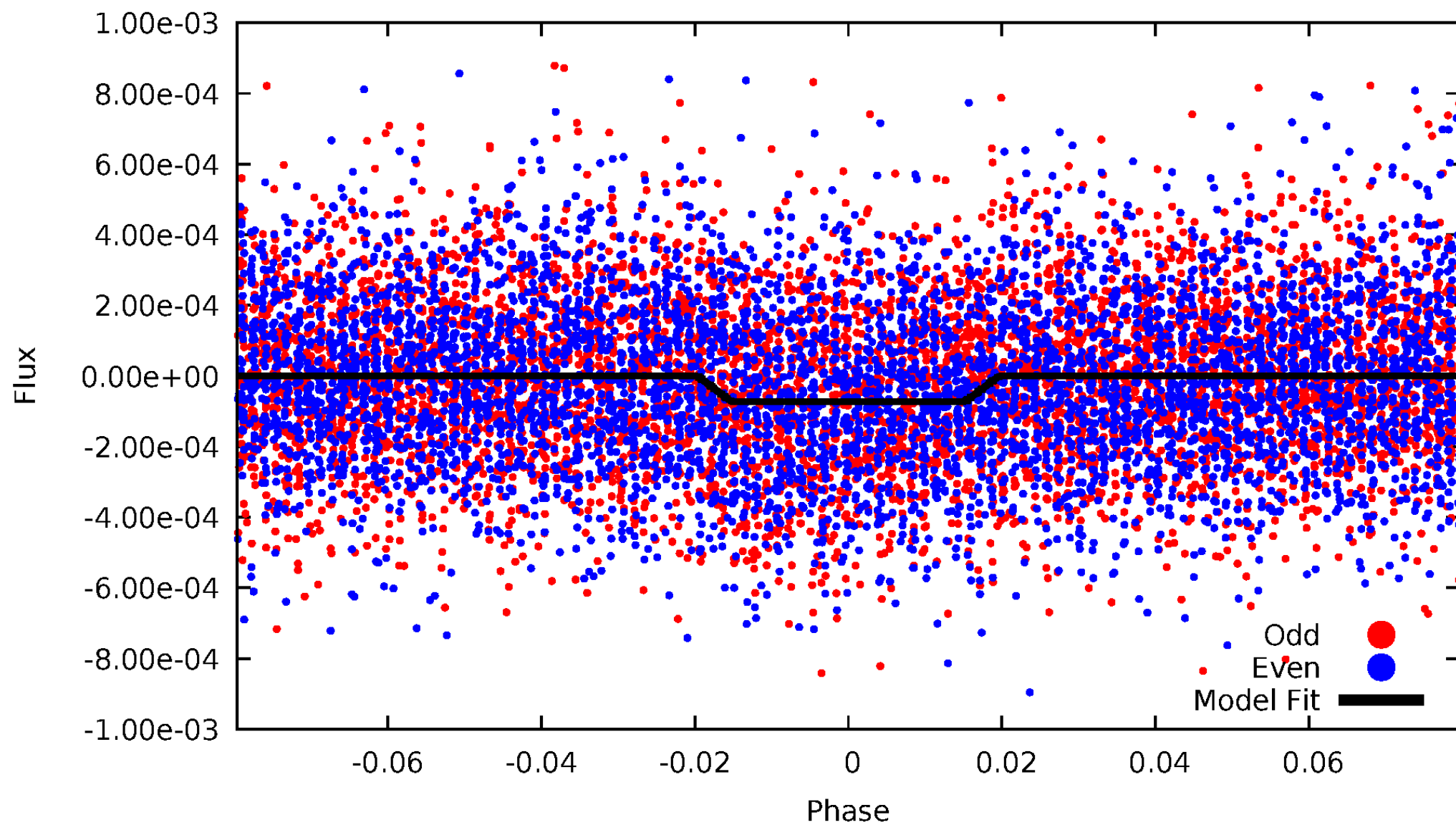
DV Odd/Even

TCE 008332521-01



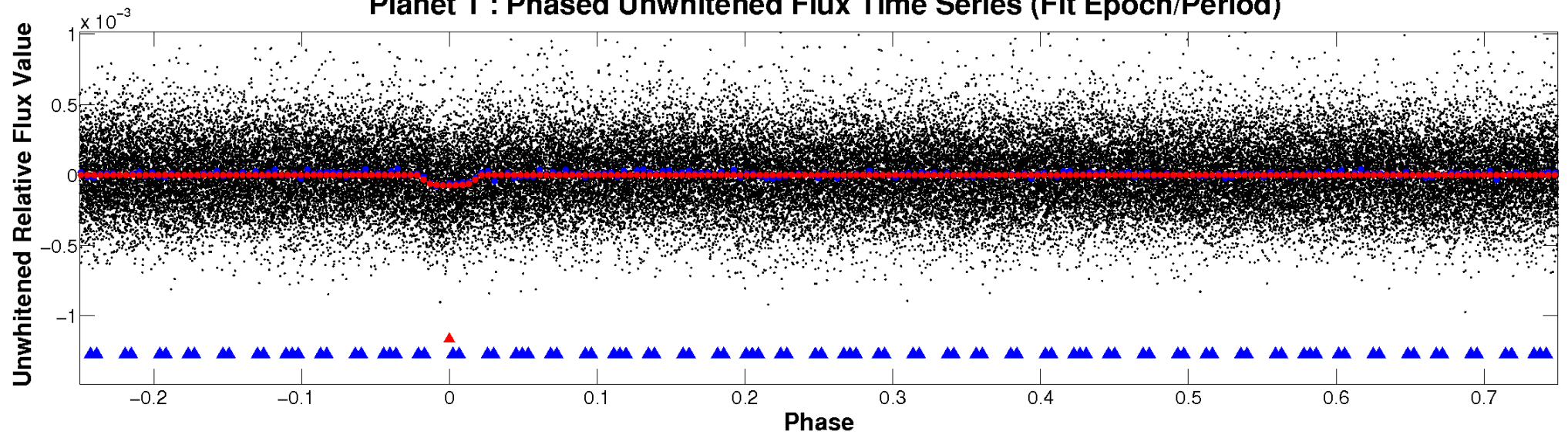
ALT Odd/Even

TCE 008332521-01

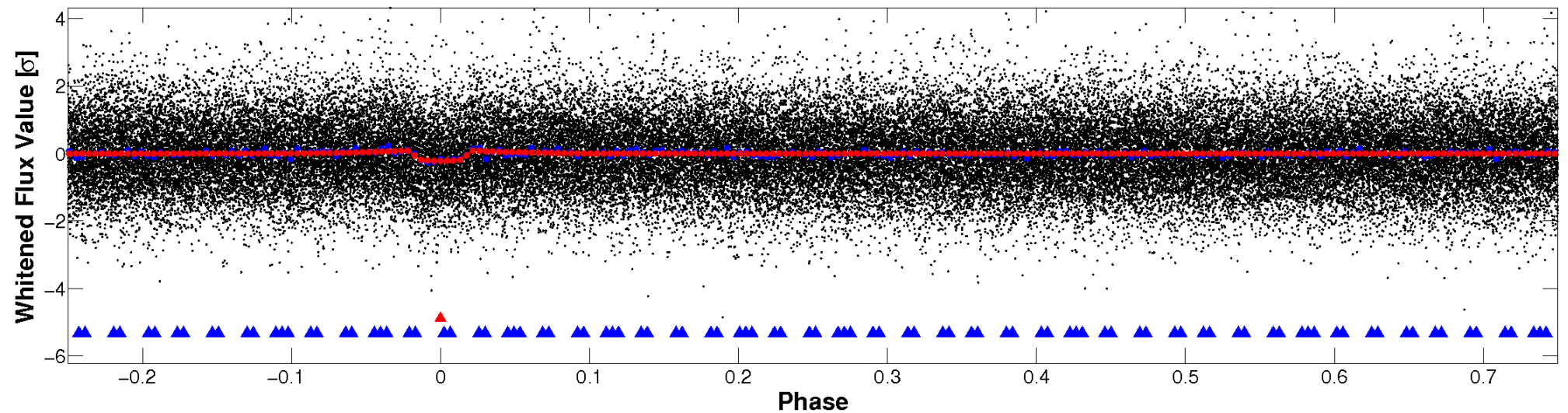


Non-Whitened Vs. Whitened Light Curve

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

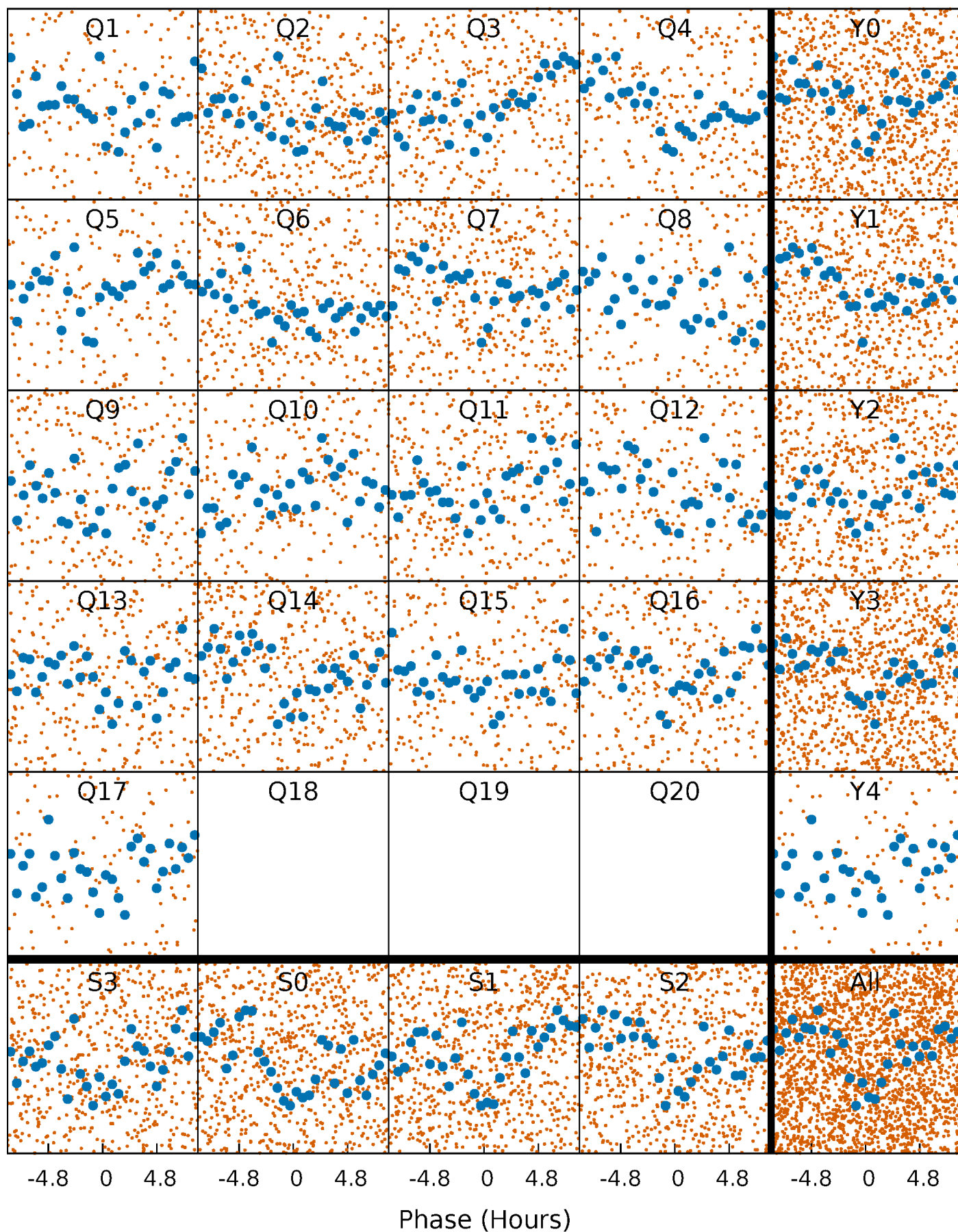


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



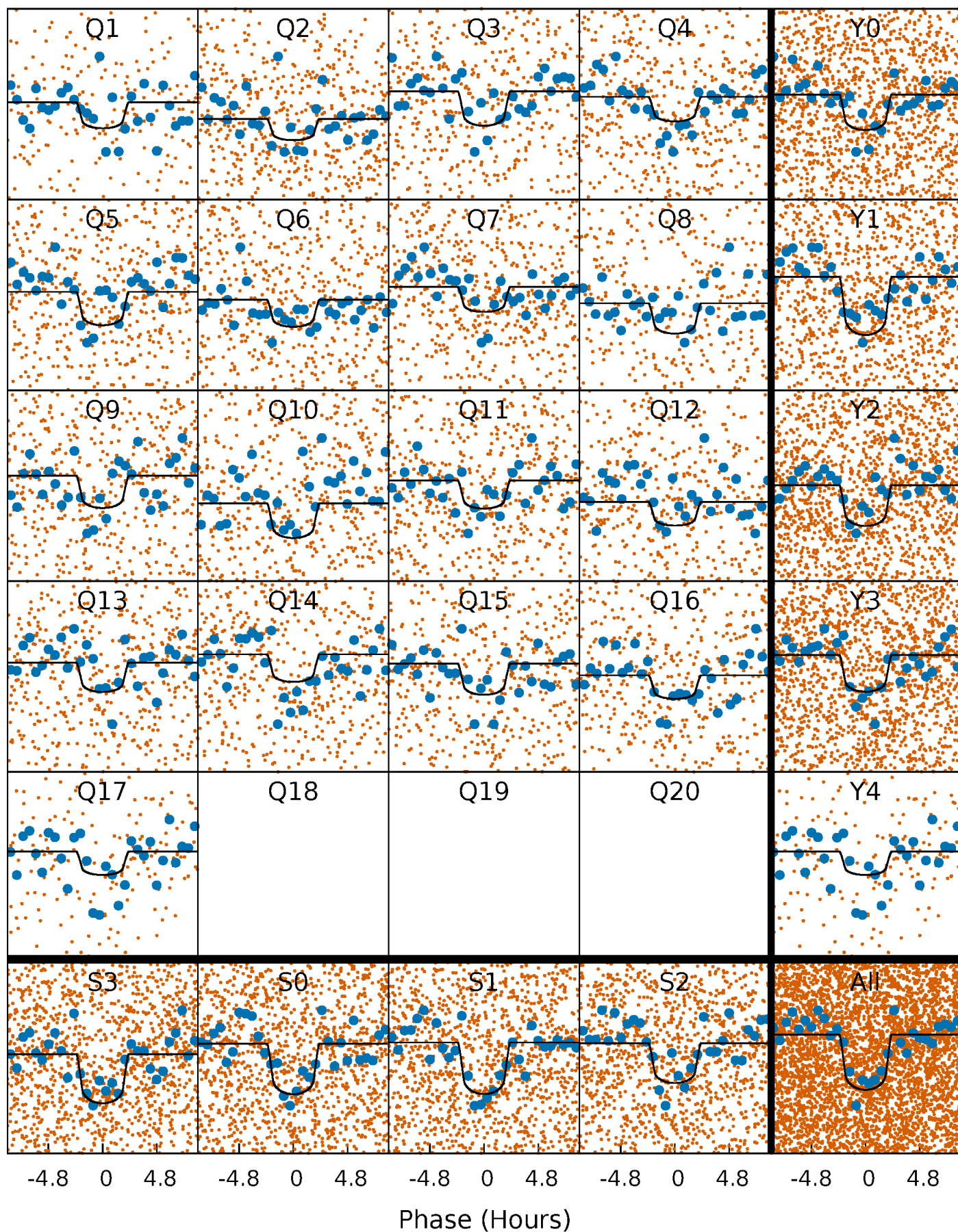
PDC Quarter-Phased Transit Curves

TCE 008332521-01 P= 4.672453 Days $T_0=135.241825$ (BKJD)



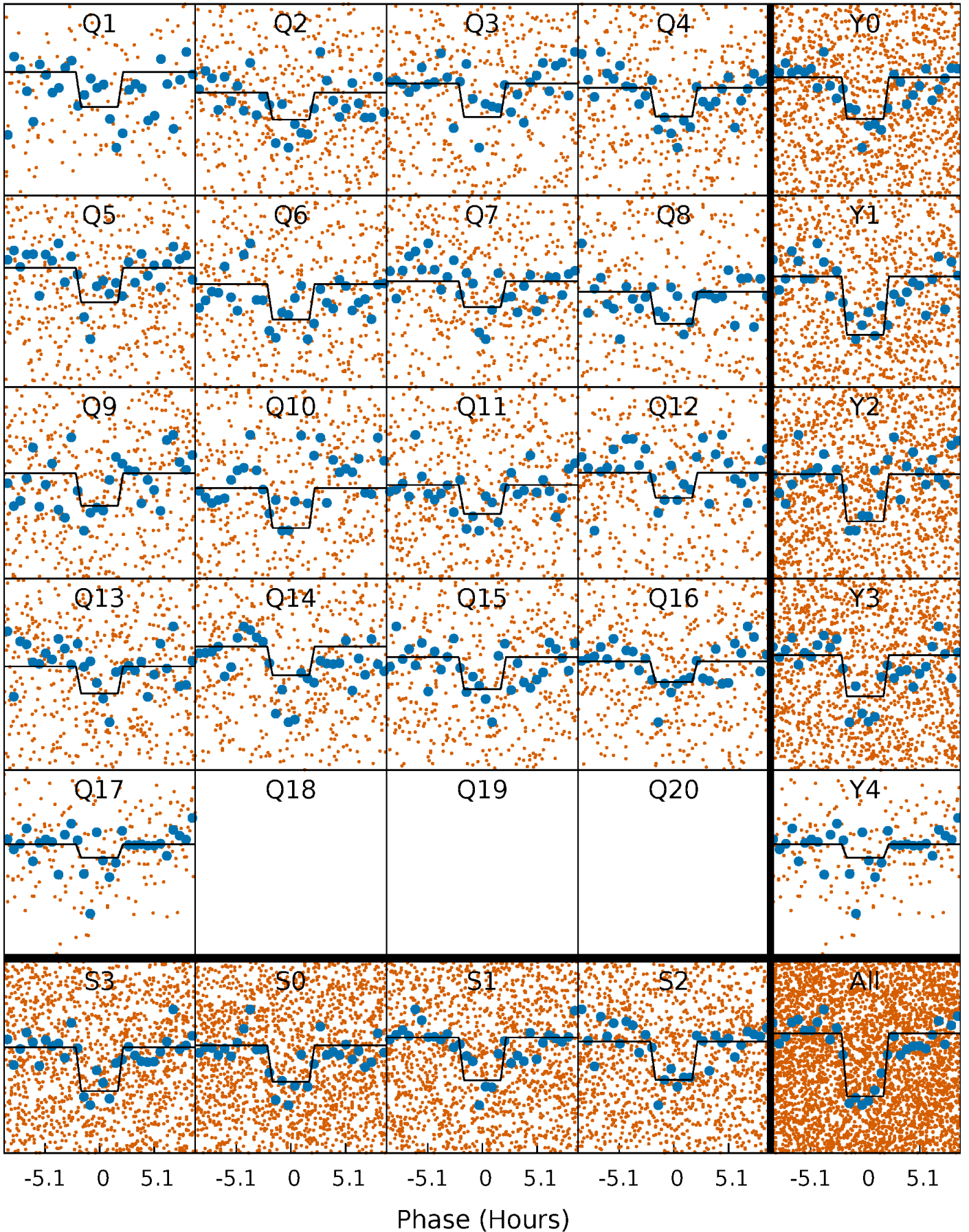
DV Quarter-Phased Transit Curves

TCE 008332521-01 P= 4.672453 Days $T_0=135.241825$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

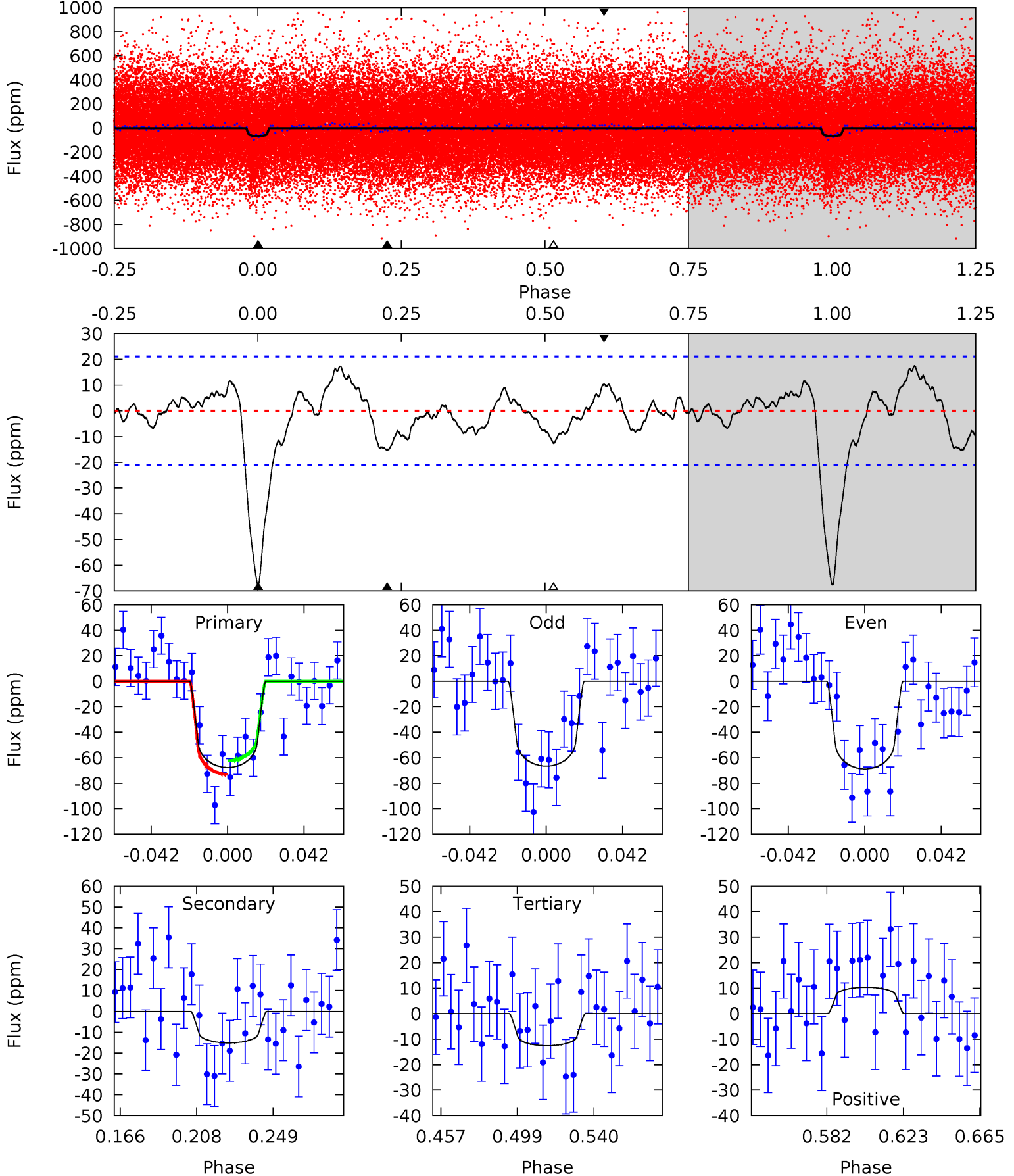
TCE 008332521-01 P= 4.672570 Days $T_0=135.225118$ (BKJD)



DV Model-Shift Uniqueness Test

008332521-01, P = 4.672453 Days, E = 130.569372 Days

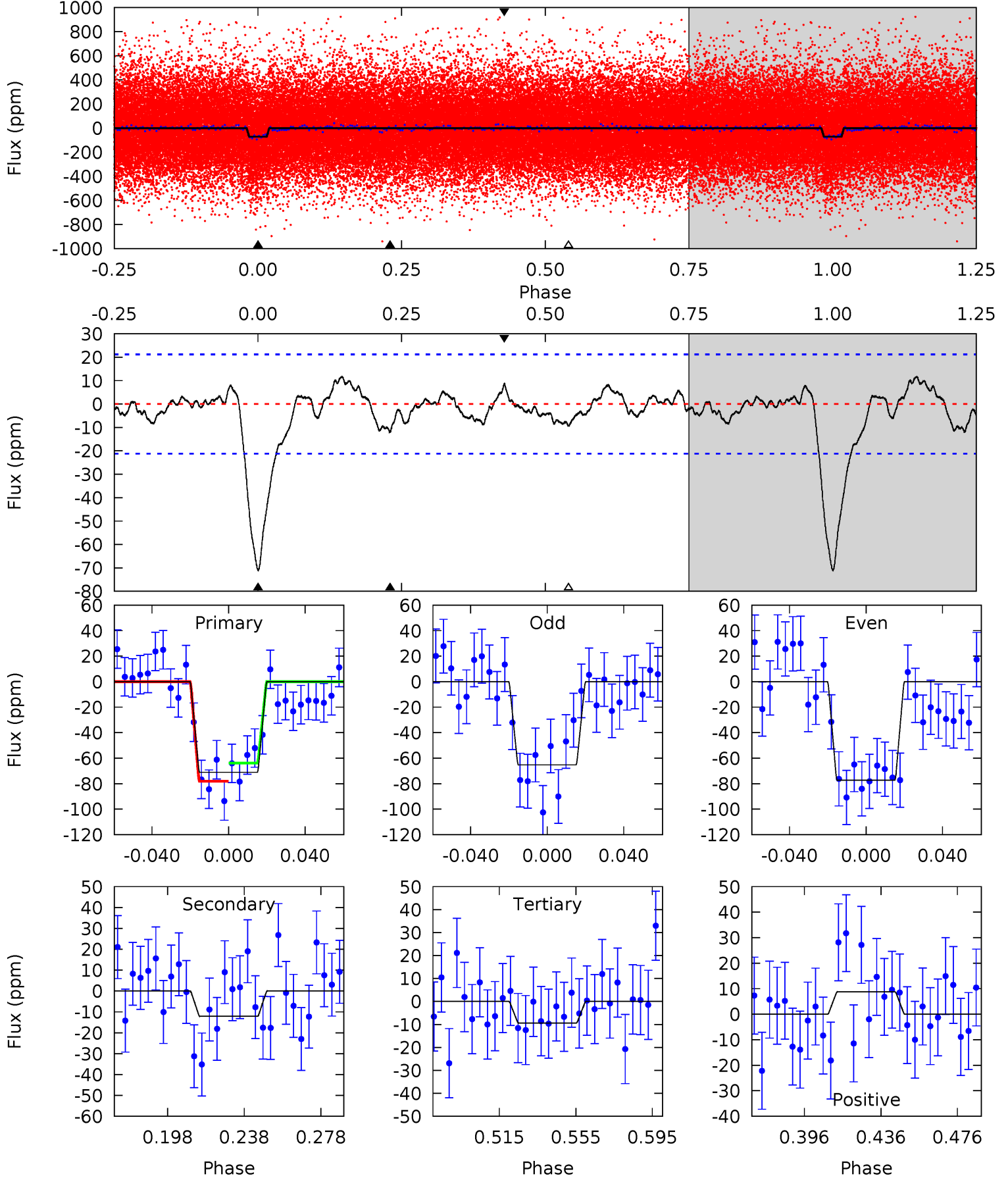
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	3.41	2.83	2.32	4.75	2.04	1.35	12.4	12.9	0.58	1.09	0.25	0.99	0.20	1.20



Alt Model-Shift Uniqueness Test

008332521-01, P = 4.672570 Days, E = 130.552548 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	2.72	2.11	1.96	4.76	2.06	1.07	13.8	14.0	0.61	0.75	1.35	1.10	0.14	1.60



Stellar Parameters For KIC 008332521

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6146^{+170}_{-192}	$4.454^{+0.070}_{-0.210}$	$-0.220^{+0.250}_{-0.300}$	$0.987^{+0.328}_{-0.109}$	$1.006^{+0.154}_{-0.115}$	$1.473^{+0.450}_{-0.813}$
	+3%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-11%	+31%/-55%
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 008332521-01 / KOI 4567.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-15 ± 4	$1.03^{+0.37}_{-0.38}$	1636^{+123}_{-82}	4226^{+910}_{-485}	22^{+37}_{-11}
Alt.	-12 ± 4	$0.94^{+0.42}_{-0.37}$	1631^{+125}_{-85}	4146^{+1074}_{-581}	22^{+41}_{-13}

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 $A_{obs} \gg 1.0$

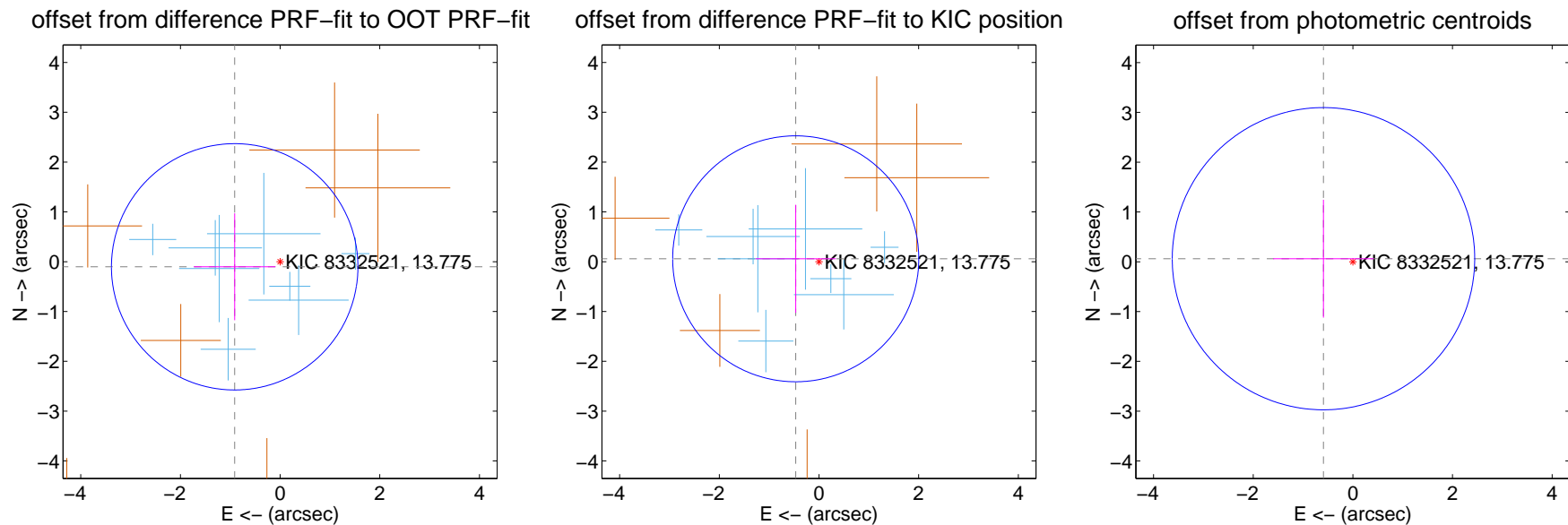
DV Centroid Data

Supplemental centroid analysis for 008332521-01. Kepler magnitude: 13.78. Transit SNR 10.03

There are 8 quarters with good PRF difference image offsets

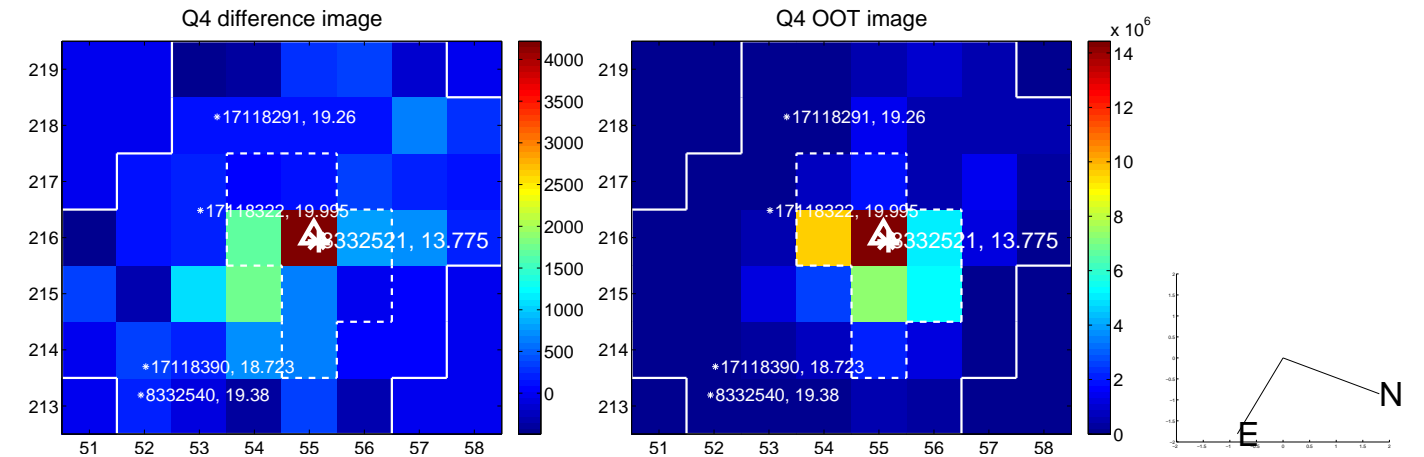
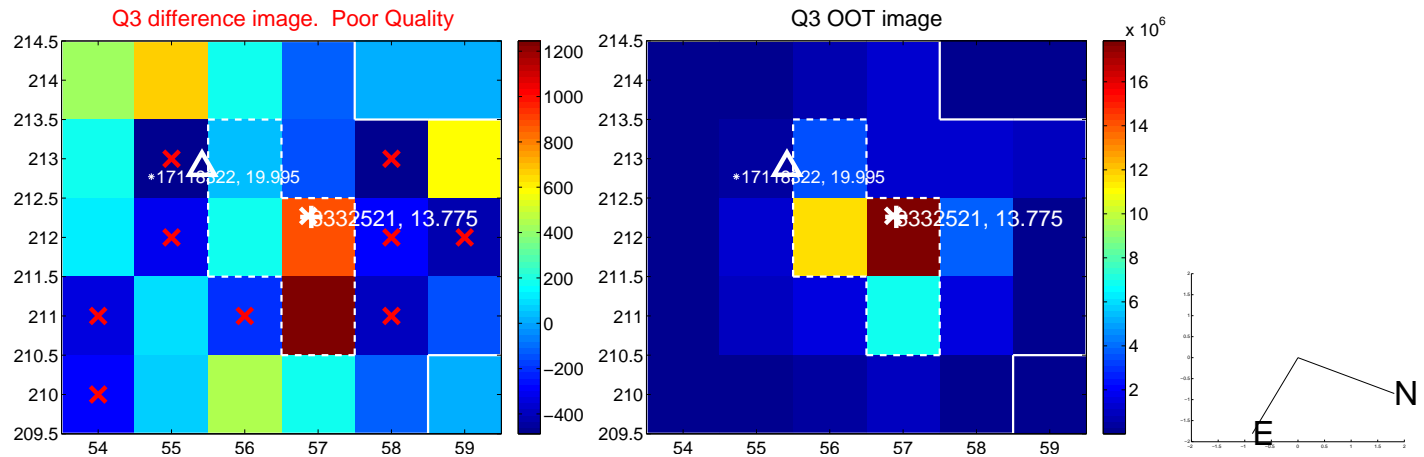
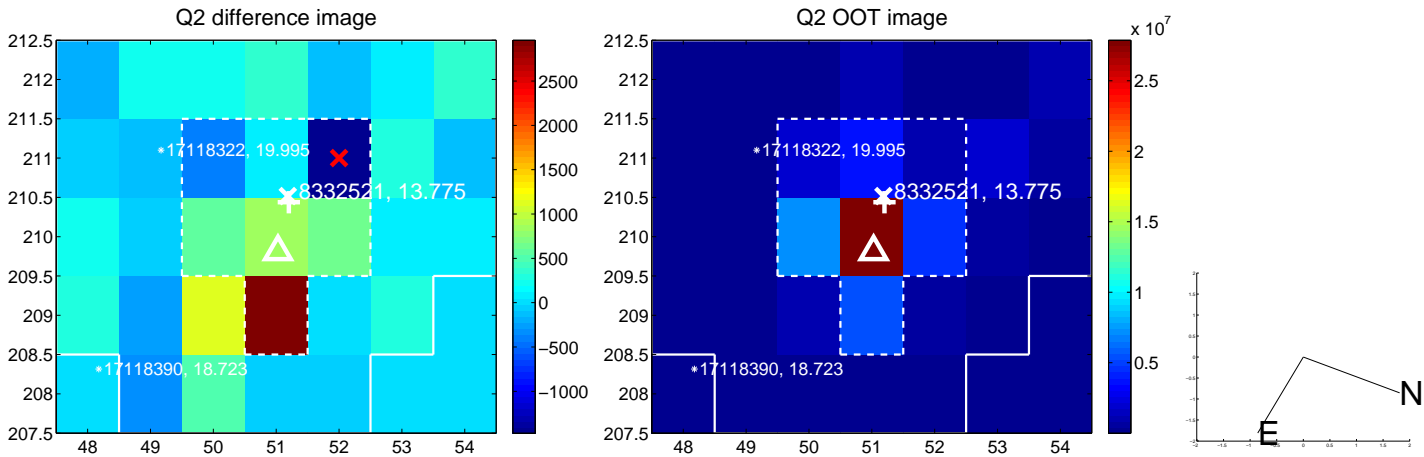
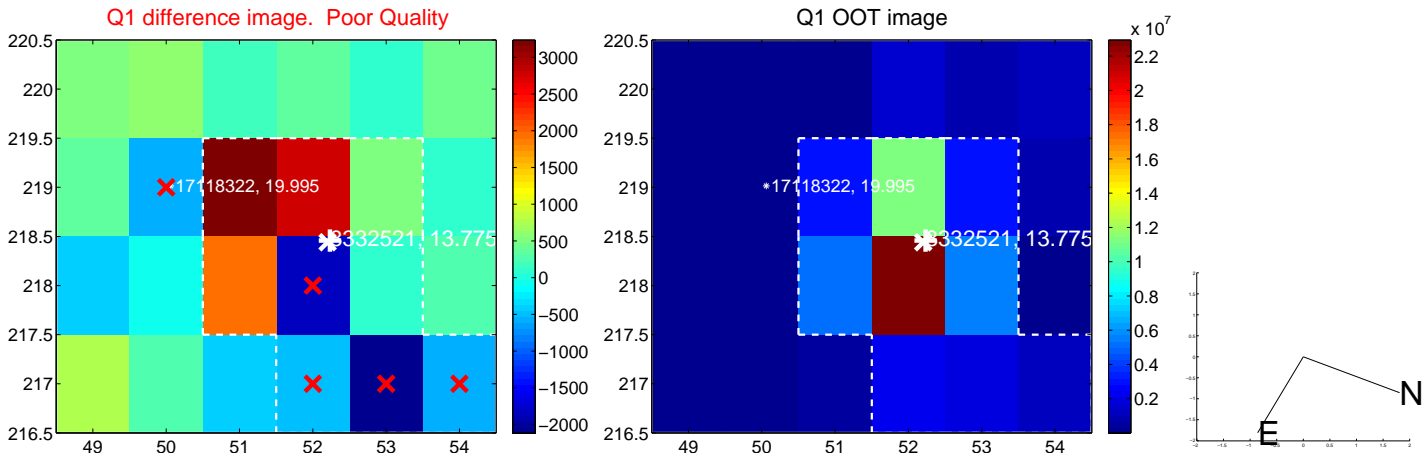
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.917 ± 0.824	1.11	0.911 ± 0.819	-0.103 ± 1.073
PRF-fit source offset from KIC position	0.470 ± 0.823	0.57	0.467 ± 0.804	0.058 ± 1.084
photometric centroid source offset	0.59 ± 1.01	0.59	0.59 ± 1.01	0.06 ± 1.18

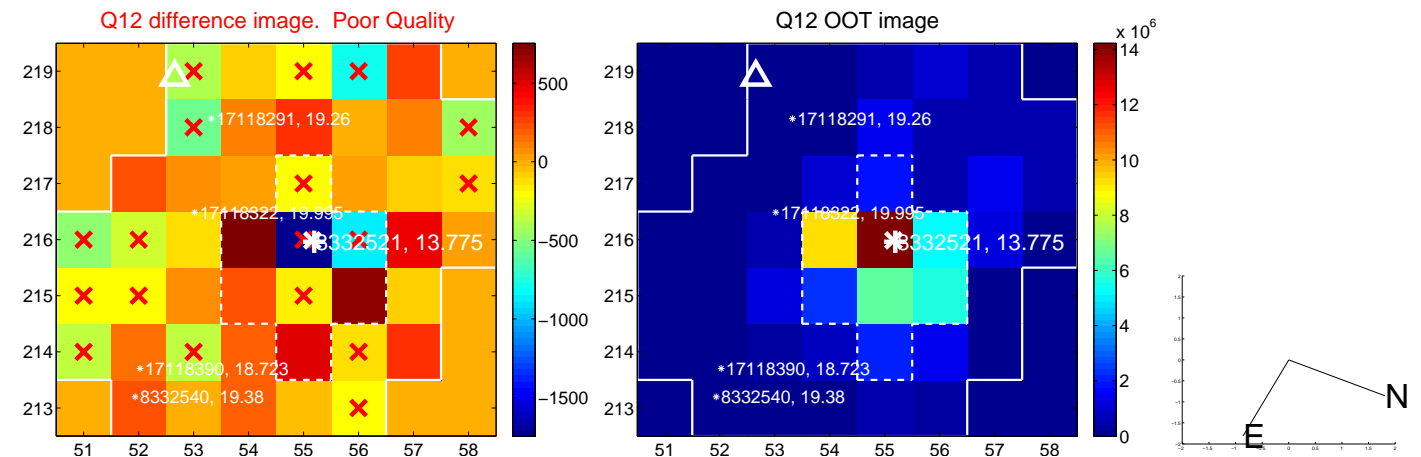
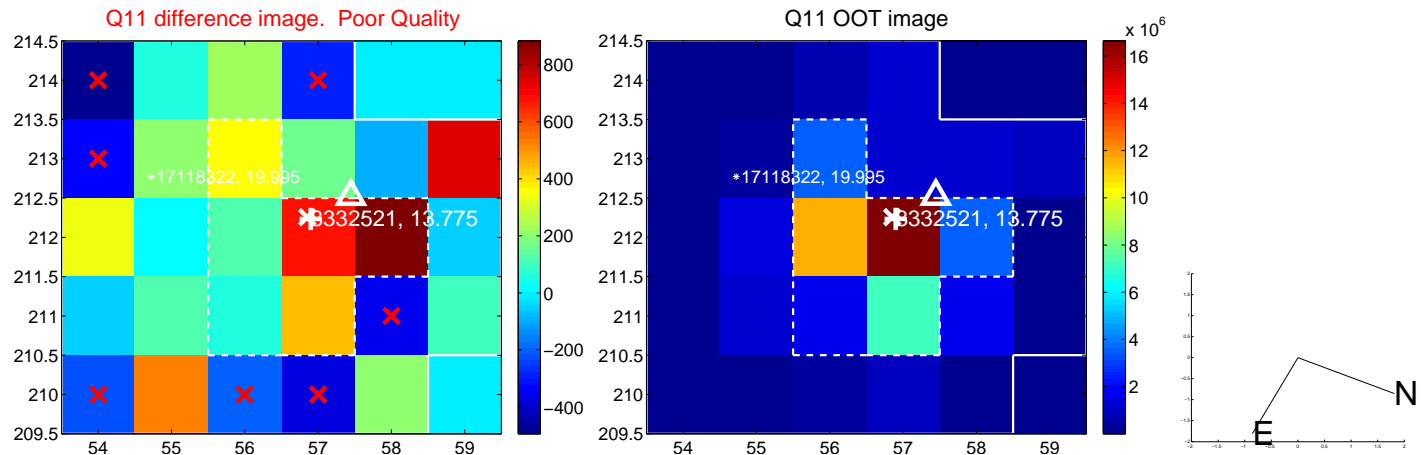
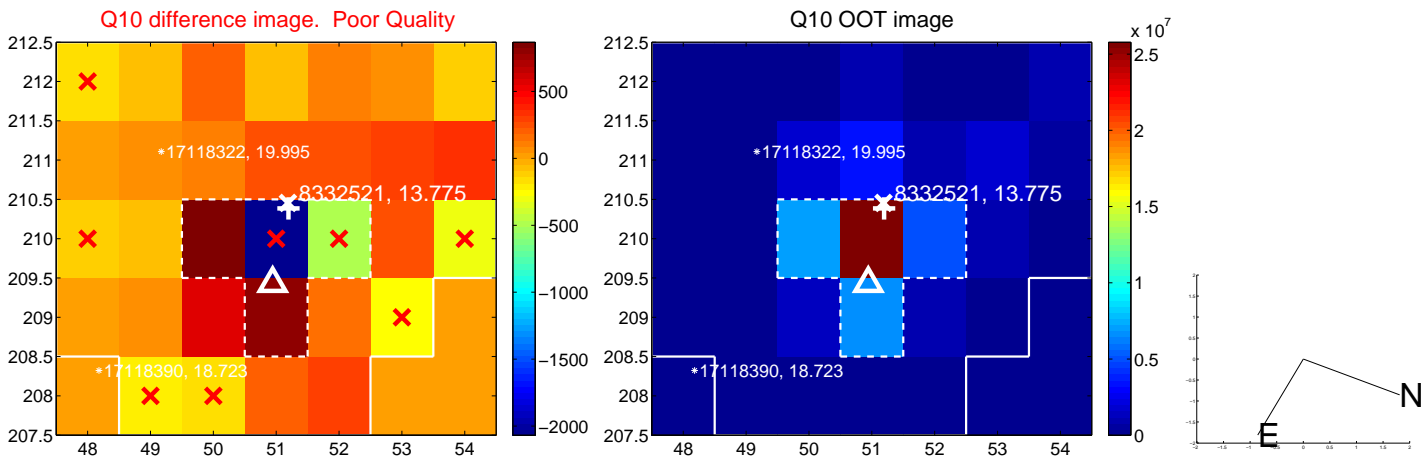
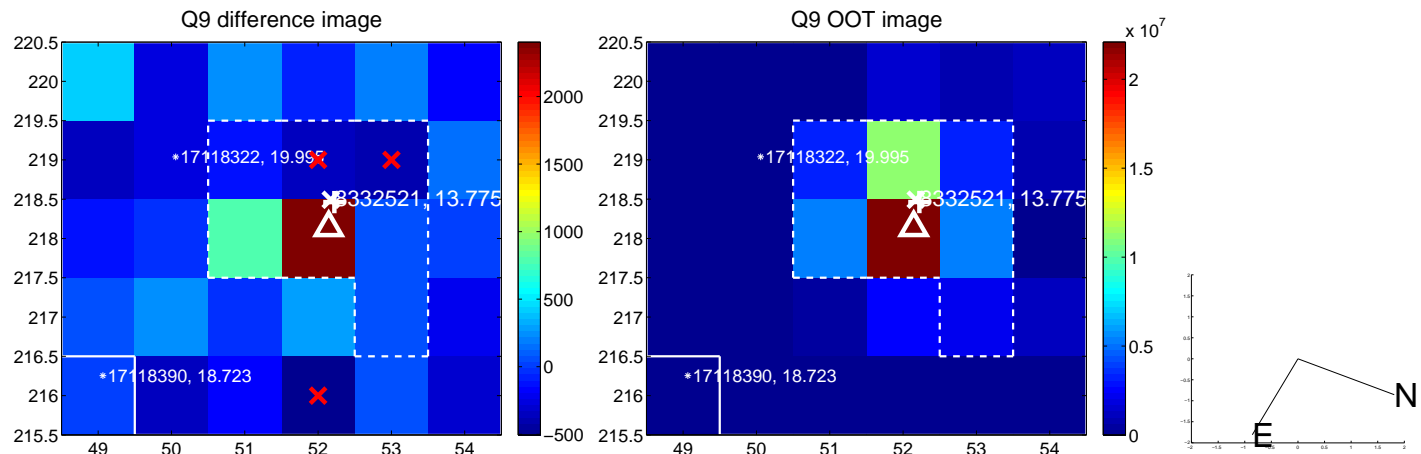


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

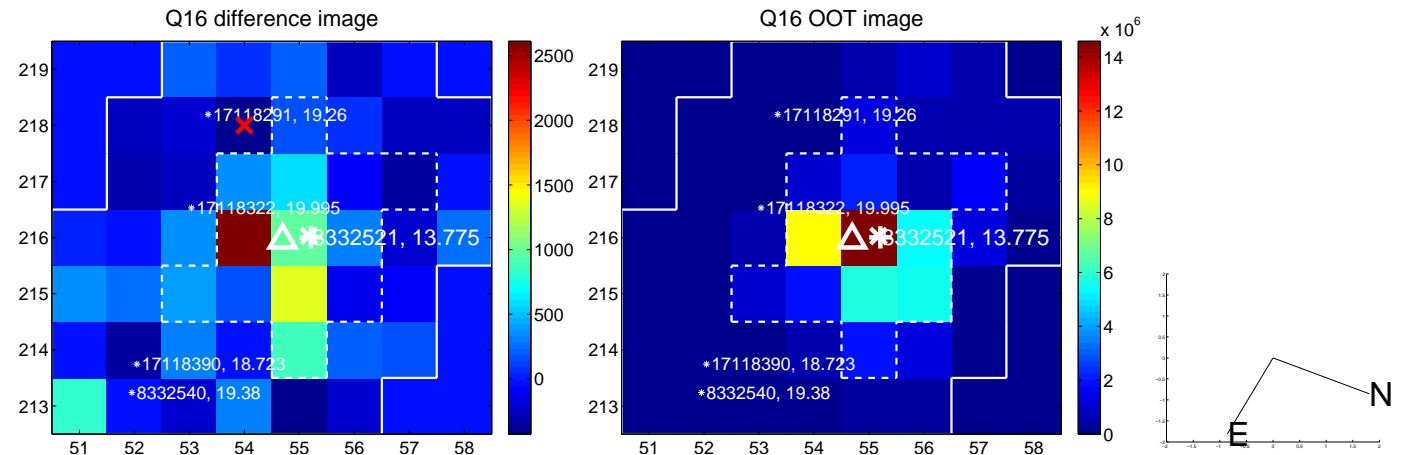
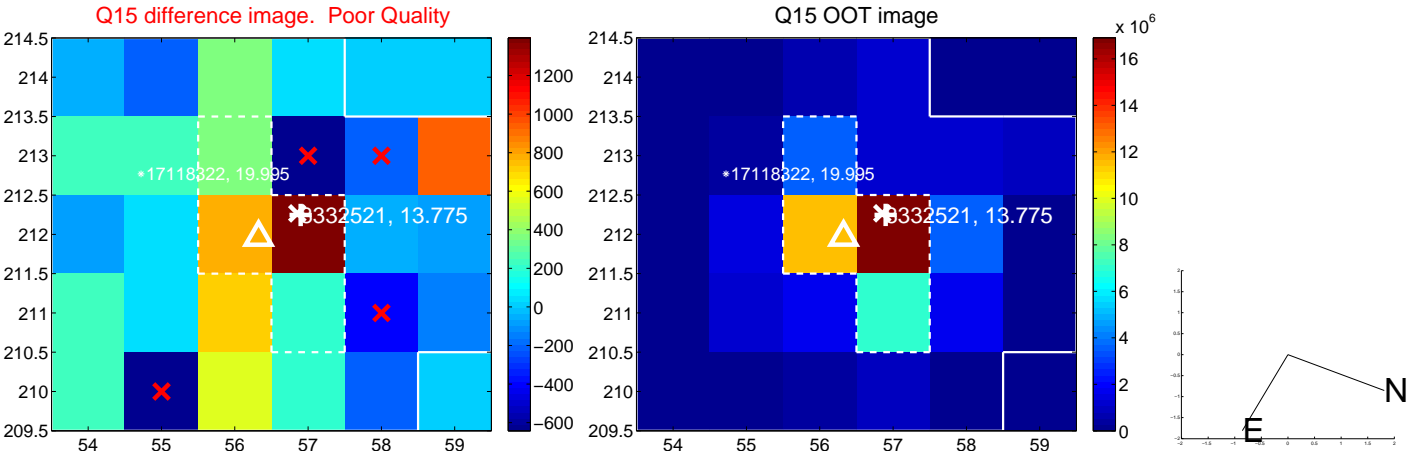
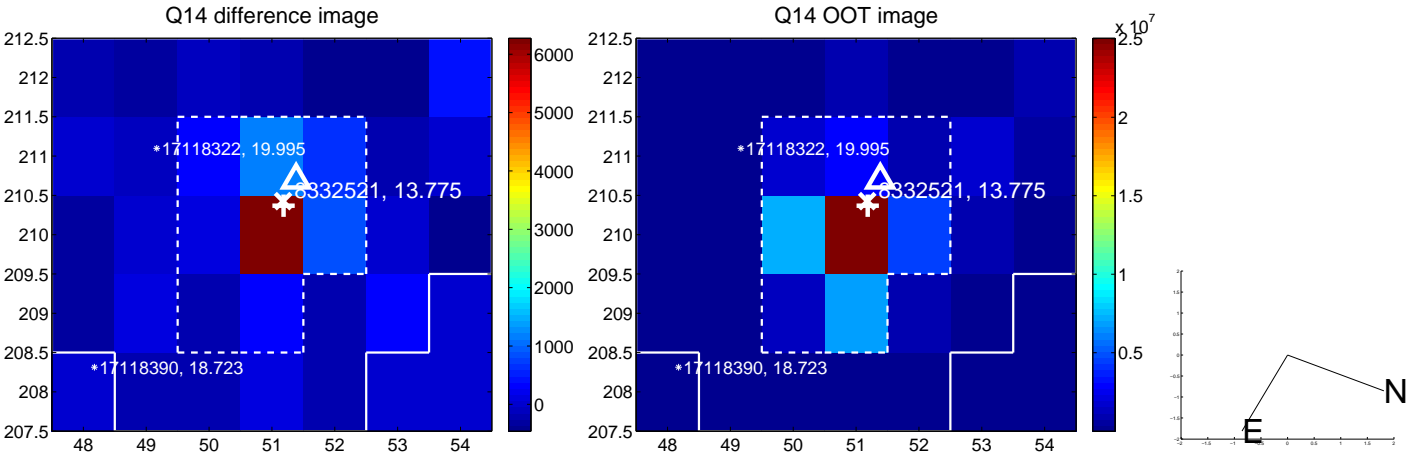
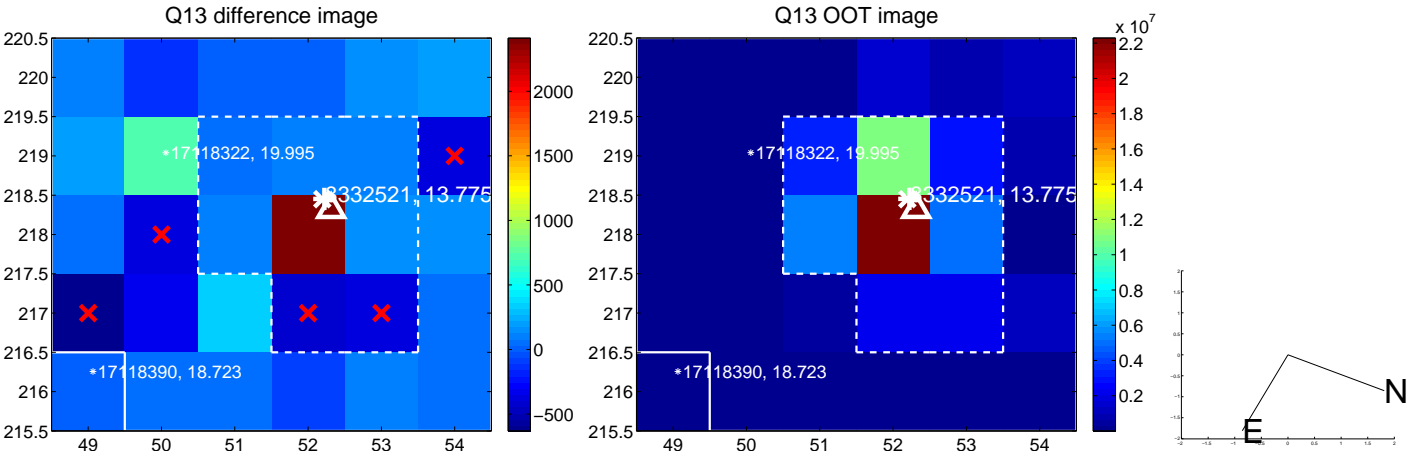
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

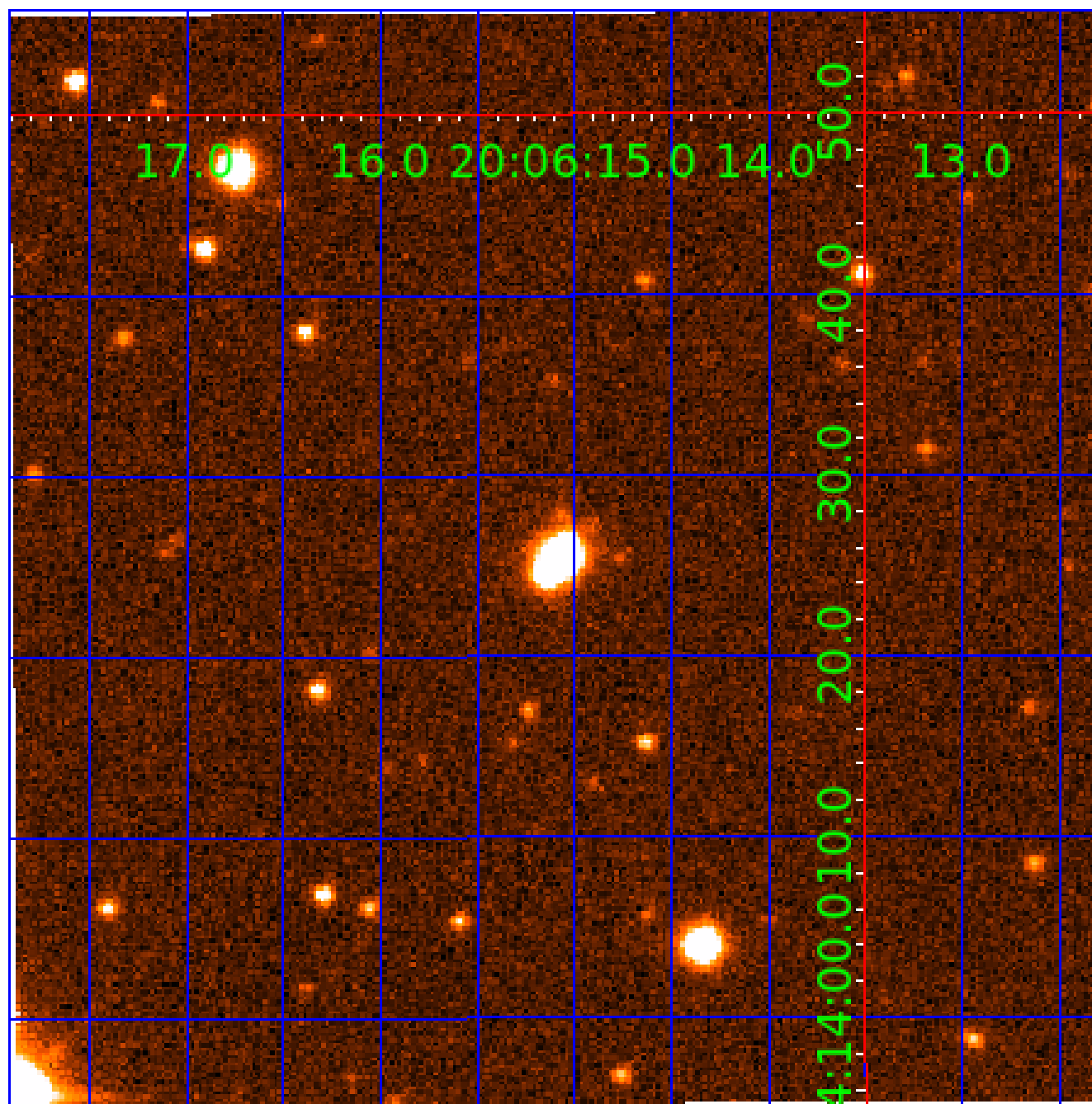


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008332521

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})
008332521-01	OBS	4567.02	4.672453	135.241825	73.5	4.217	9.4	10.0	0.99	6146	0.98	413.13
008332521-02	OBS	4567.01	14.744615	135.034422	101.0	6.765	7.2	7.7	0.99	6146	1.14	89.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008332521-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
008332521-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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.

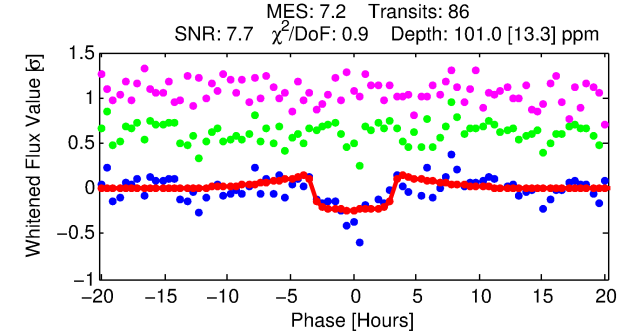
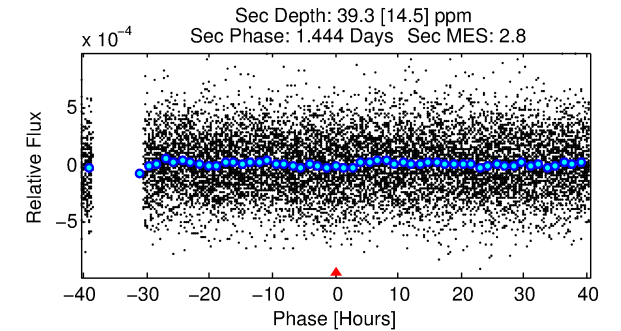
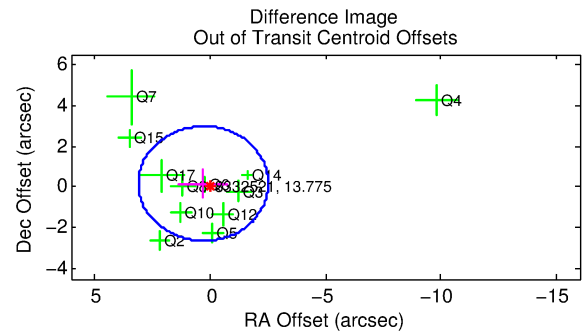
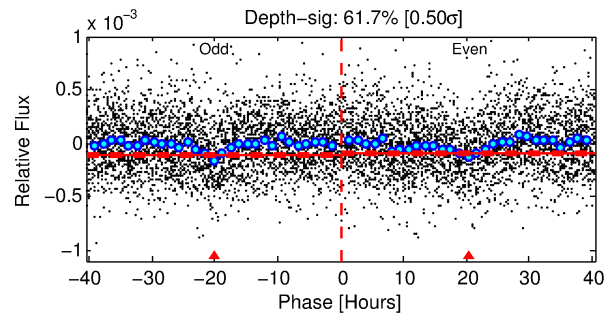
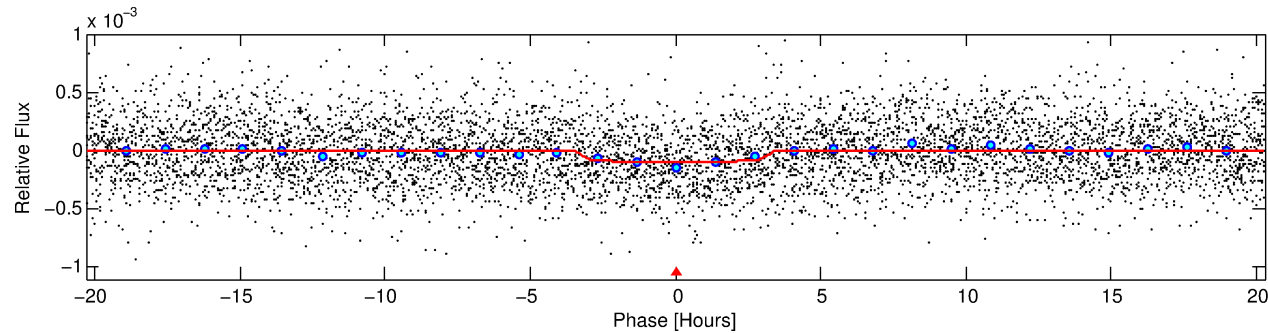
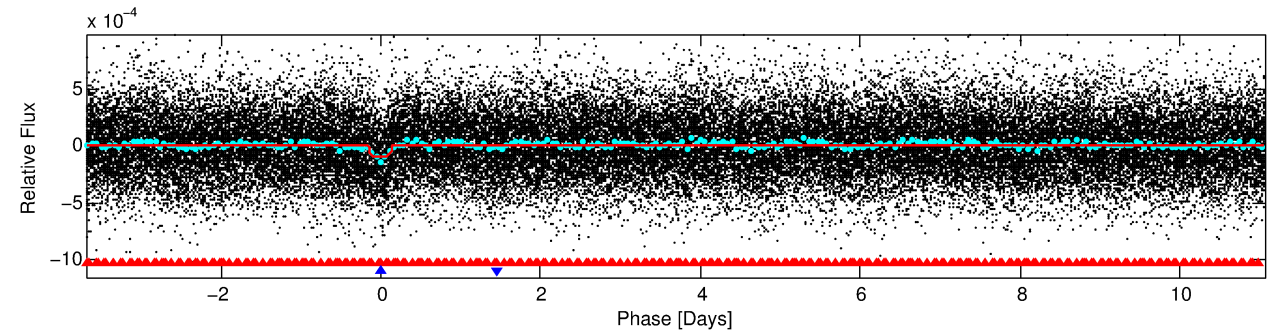
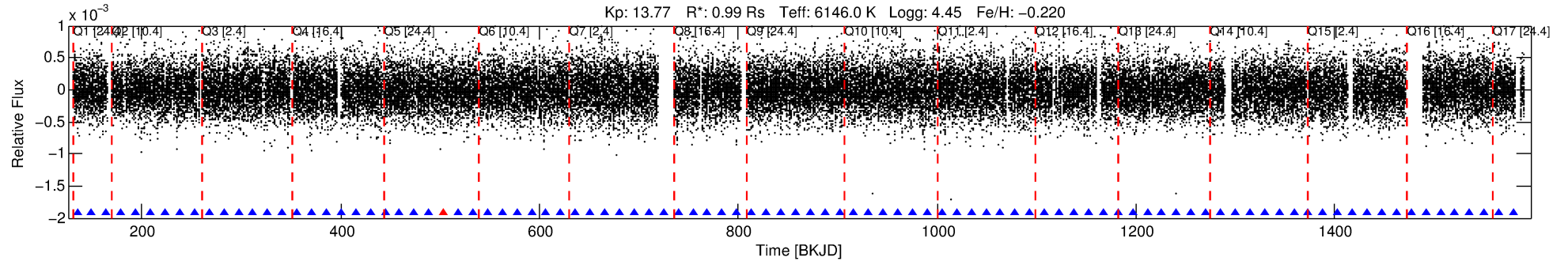
Ephemeris Match Information For 008332521-02

No Significant Match Found

DV One-Page Summary

KIC: 8332521 Candidate: 2 of 2 Period: 14.745 d

KOI: K04567.01 Corr: 0.863



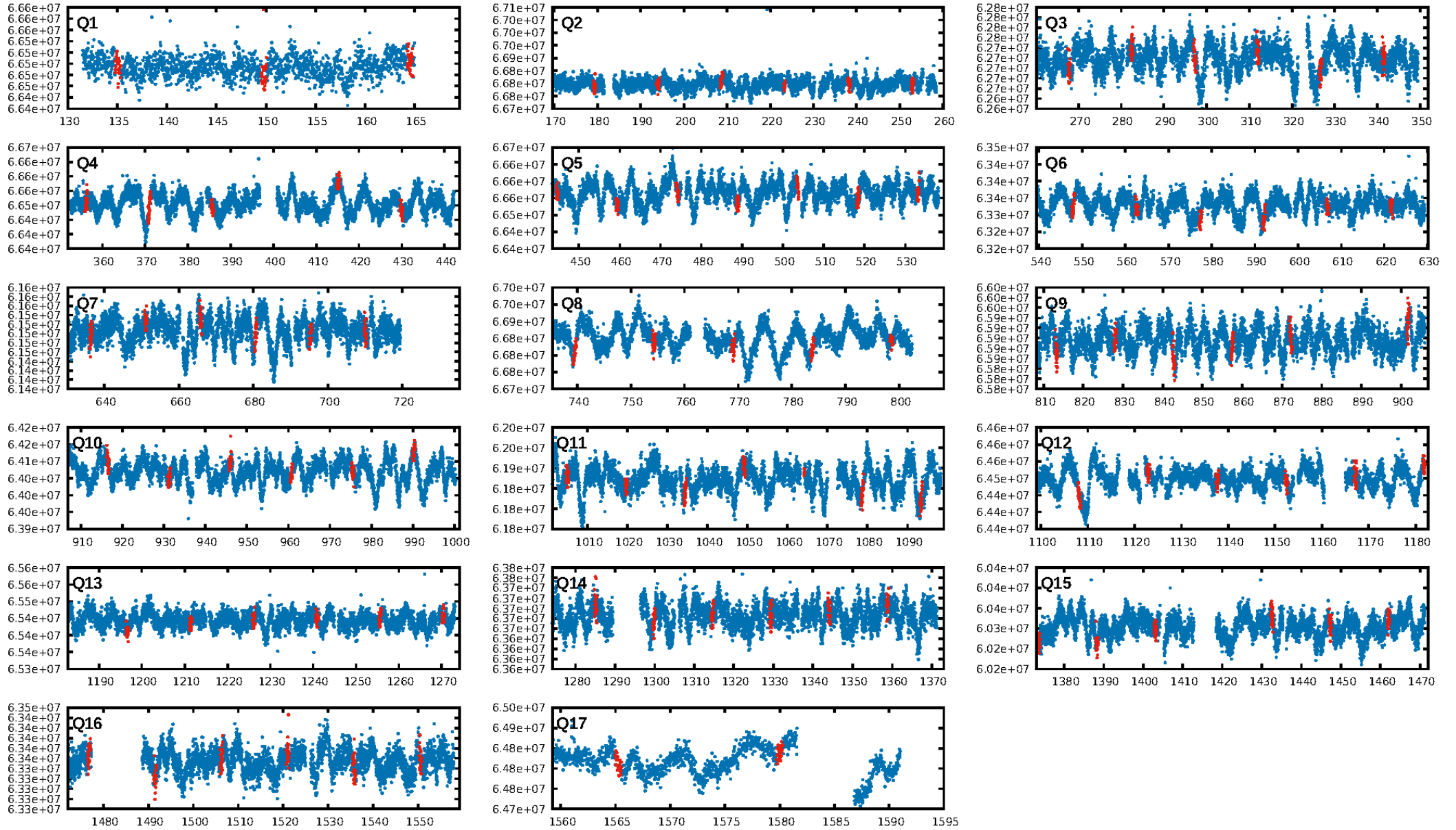
DV Fit Results:

Period = 14.74462 [0.00019] d
Epoch = 135.0344 [0.0106] BKJD
Rp/R* = 0.0106 [0.0037]
a/R* = 8.59 [15.30]
b = 0.87 [0.51]
Seff = 89.25 [36.65]
Teq = 784 [80] K
Rp = 1.14 [0.55] Re
a = 0.1181 [0.0324] AU
Ag = 232.65 [205.71] [1.13 σ]
Teffp = 4733 [950] K [4.14 σ]

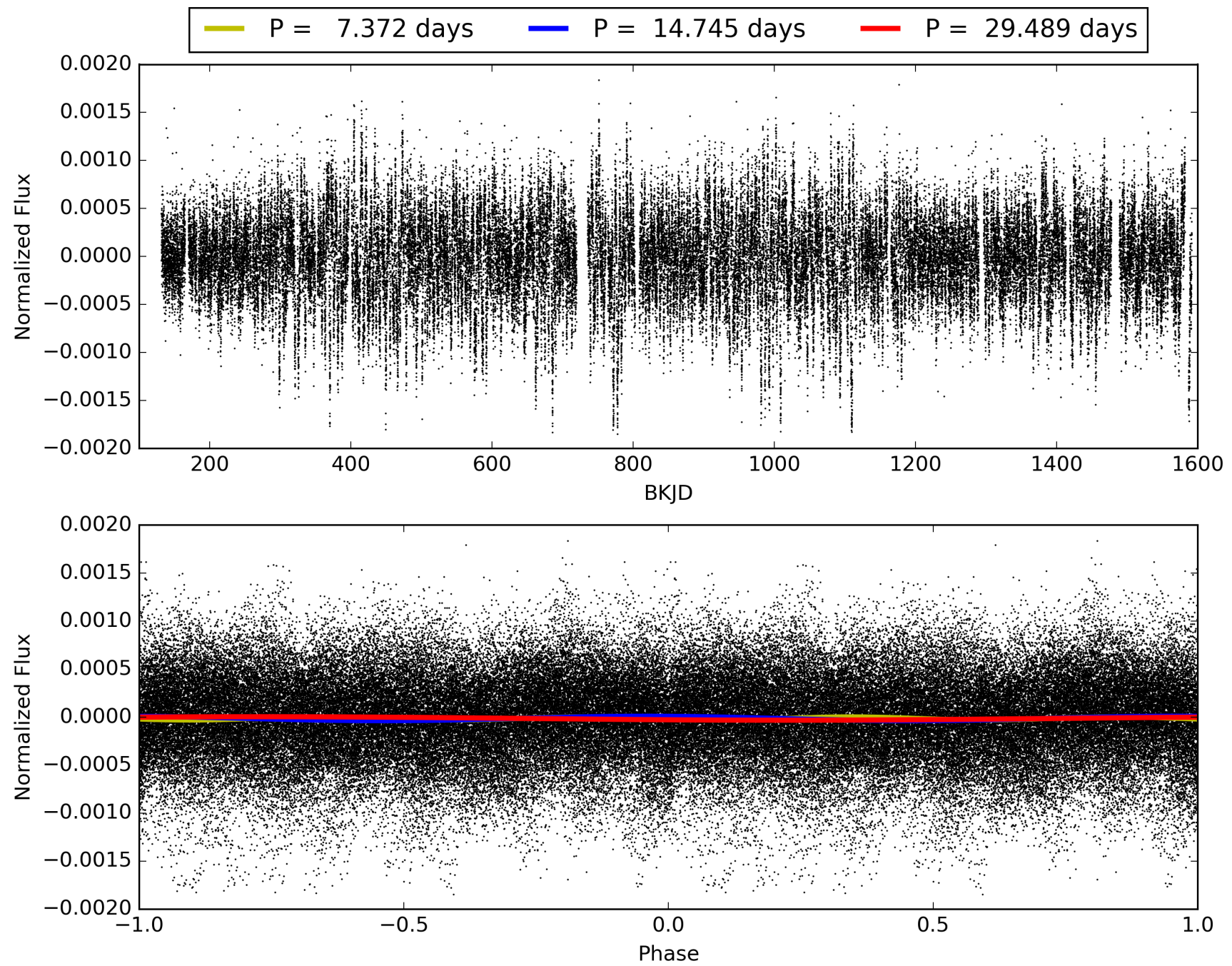
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.32 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.5%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 6.21e-13
RollingBand-fgt: 0.99 [80/81]
GhostDiagnostic-chr: 4.097
Centroid-sig: 21.6%
Centroid-so: 0.433 arcsec [0.35 σ]
OotOffset-rm: 0.327 arcsec [0.35 σ]
KicOffset-rm: 0.390 arcsec [0.61 σ]
OotOffset-st: 4/3/3/2 [12]
KicOffset-st: 4/3/3/2 [12]
DiffImageQuality-fgm: 0.50 [6/12]
DiffImageOverlap-fno: 0.94 [16/17]

TCE 008332521-02, PDC Light Curves

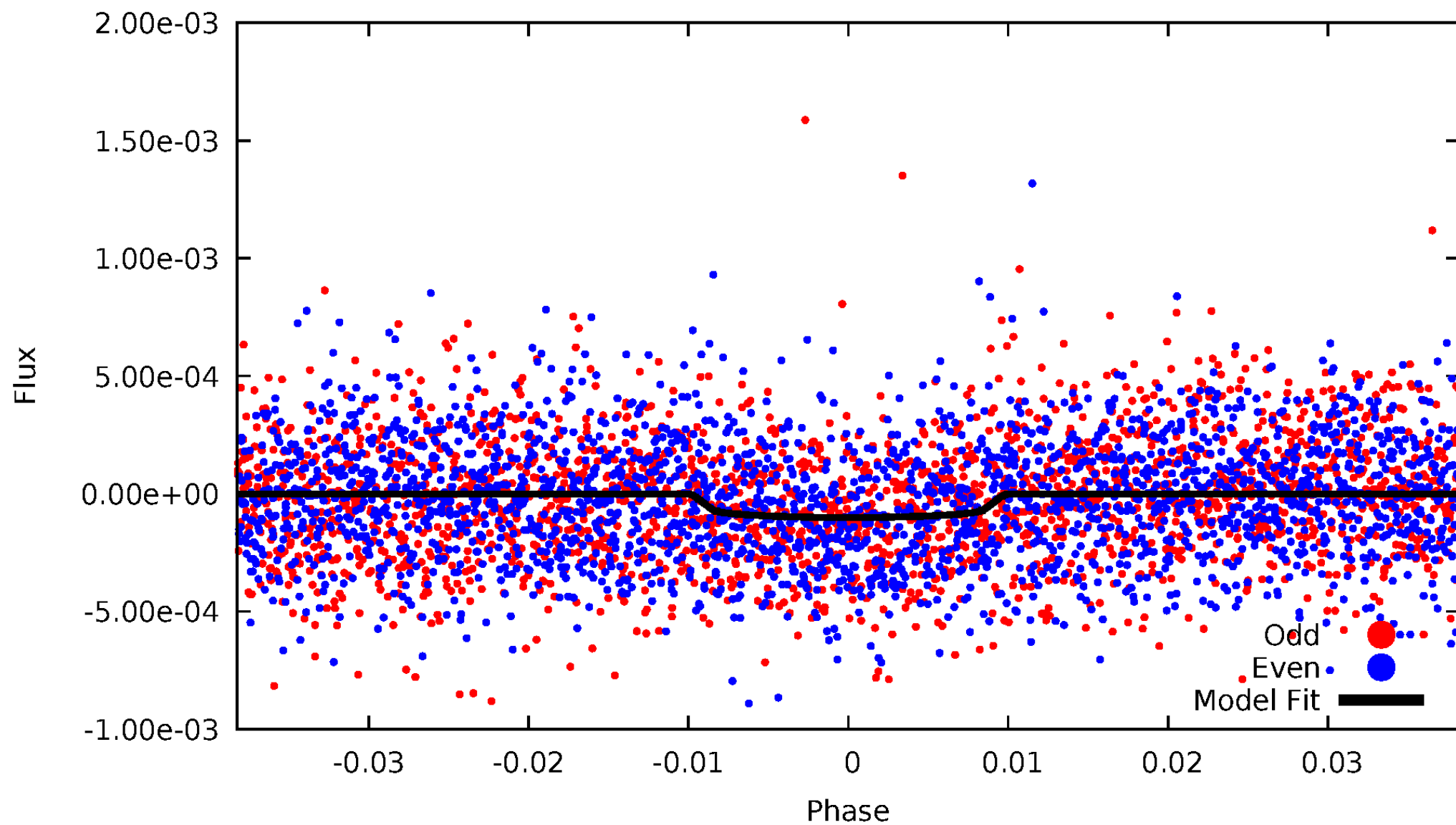


TCE 008332521-02



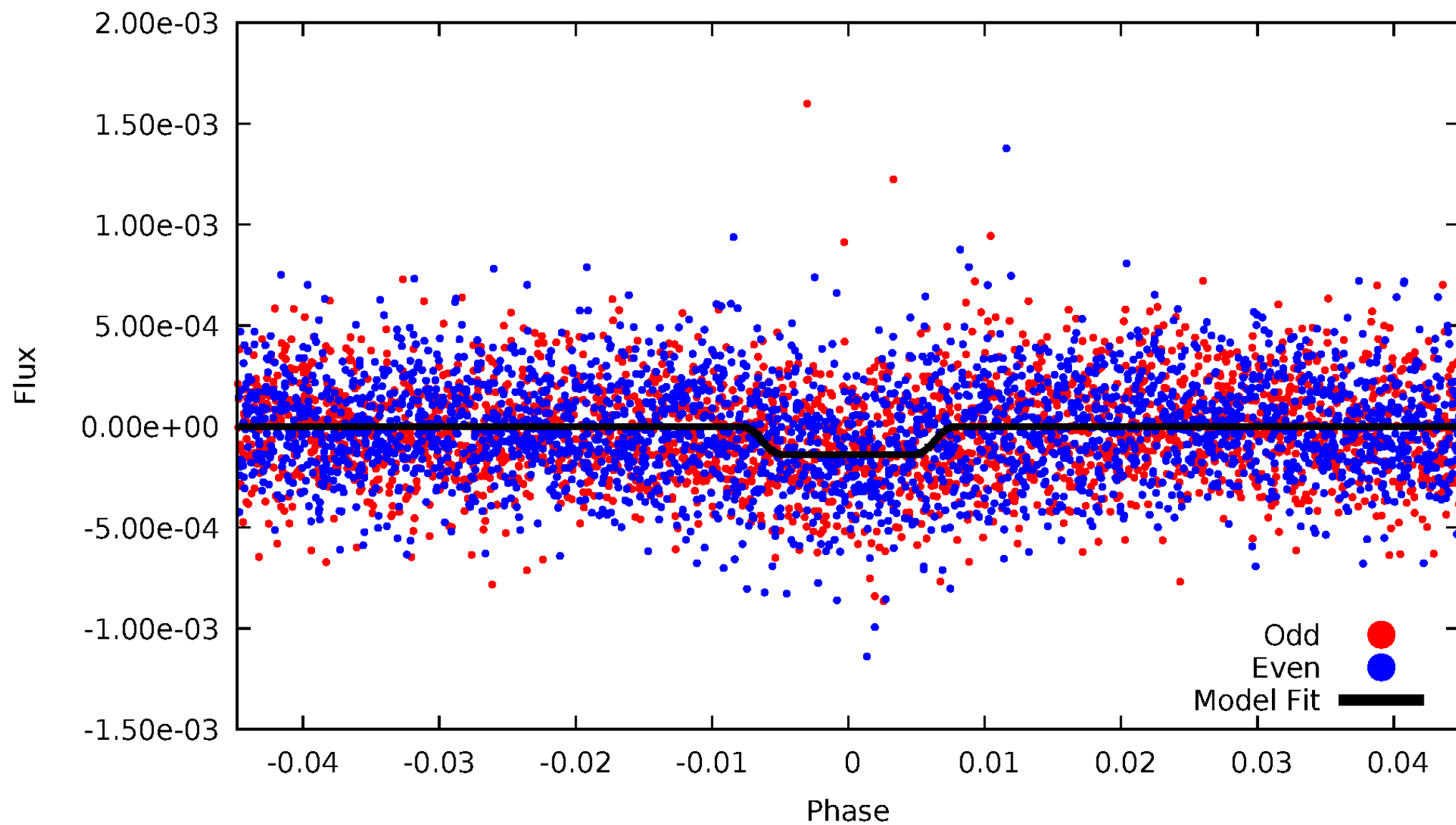
DV Odd/Even

TCE 008332521-02



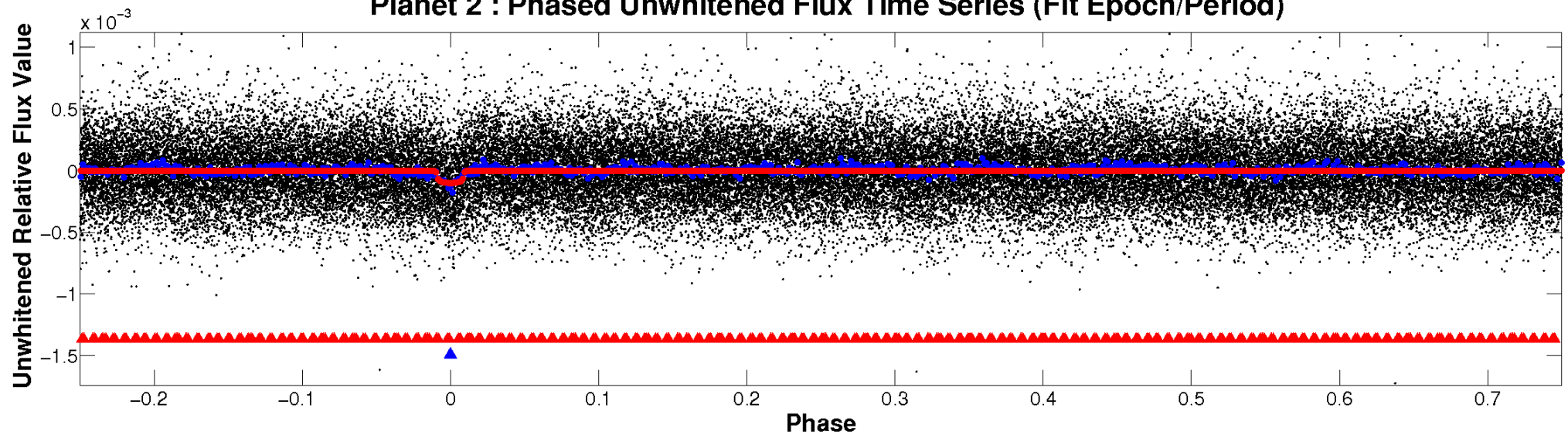
ALT Odd/Even

TCE 008332521-02

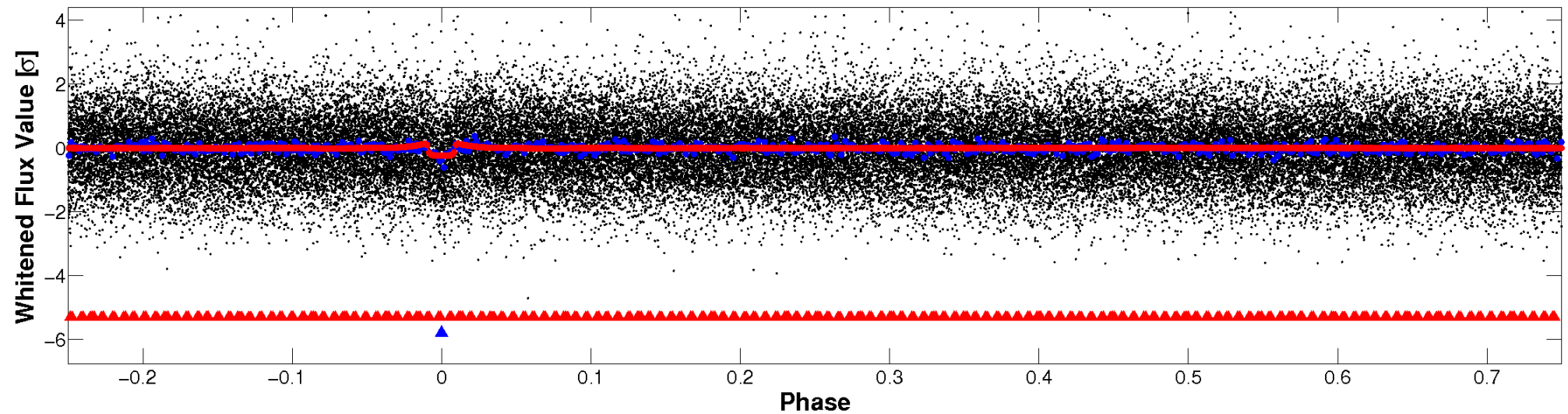


Non-Whitened Vs. Whitened Light Curve

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

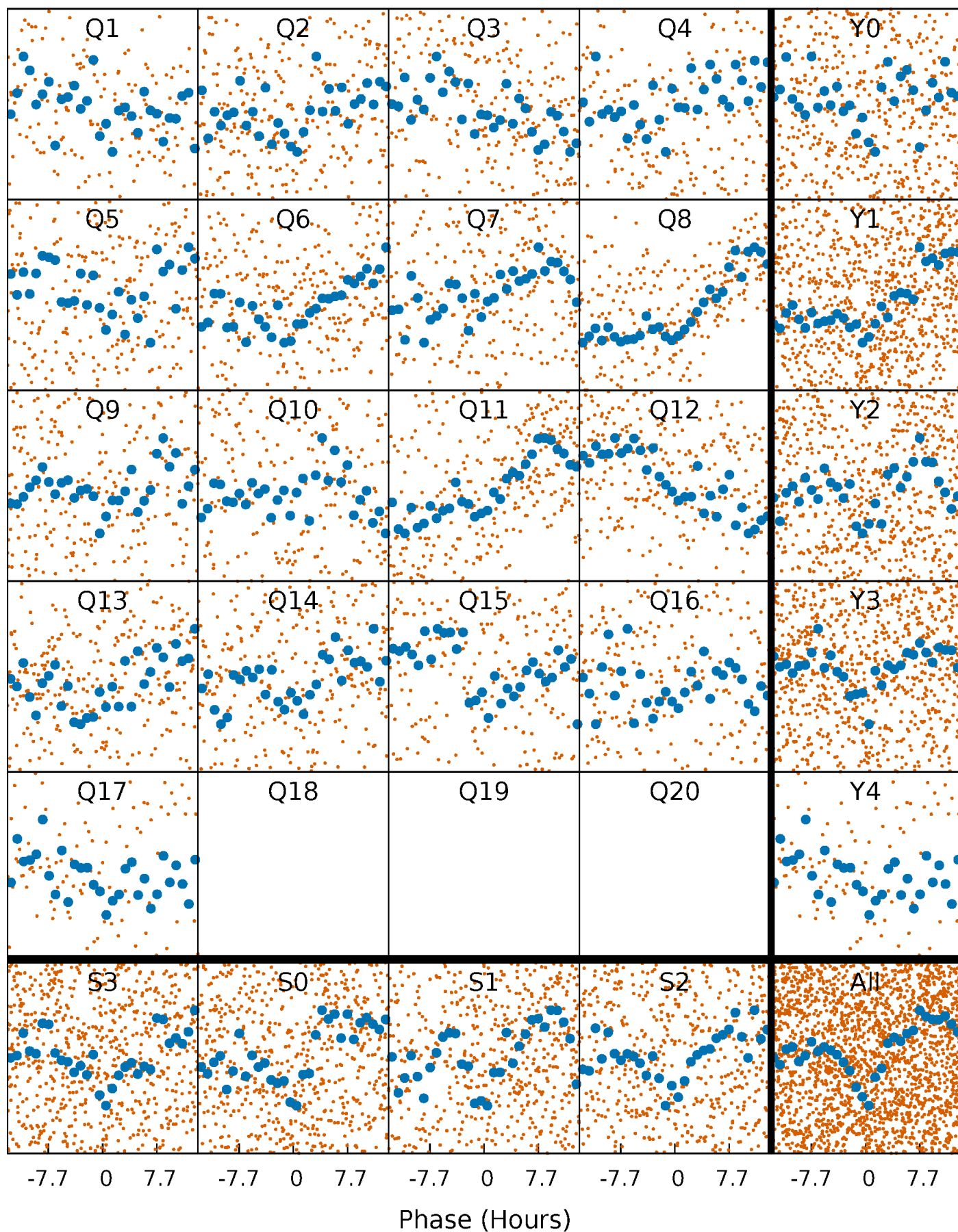


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



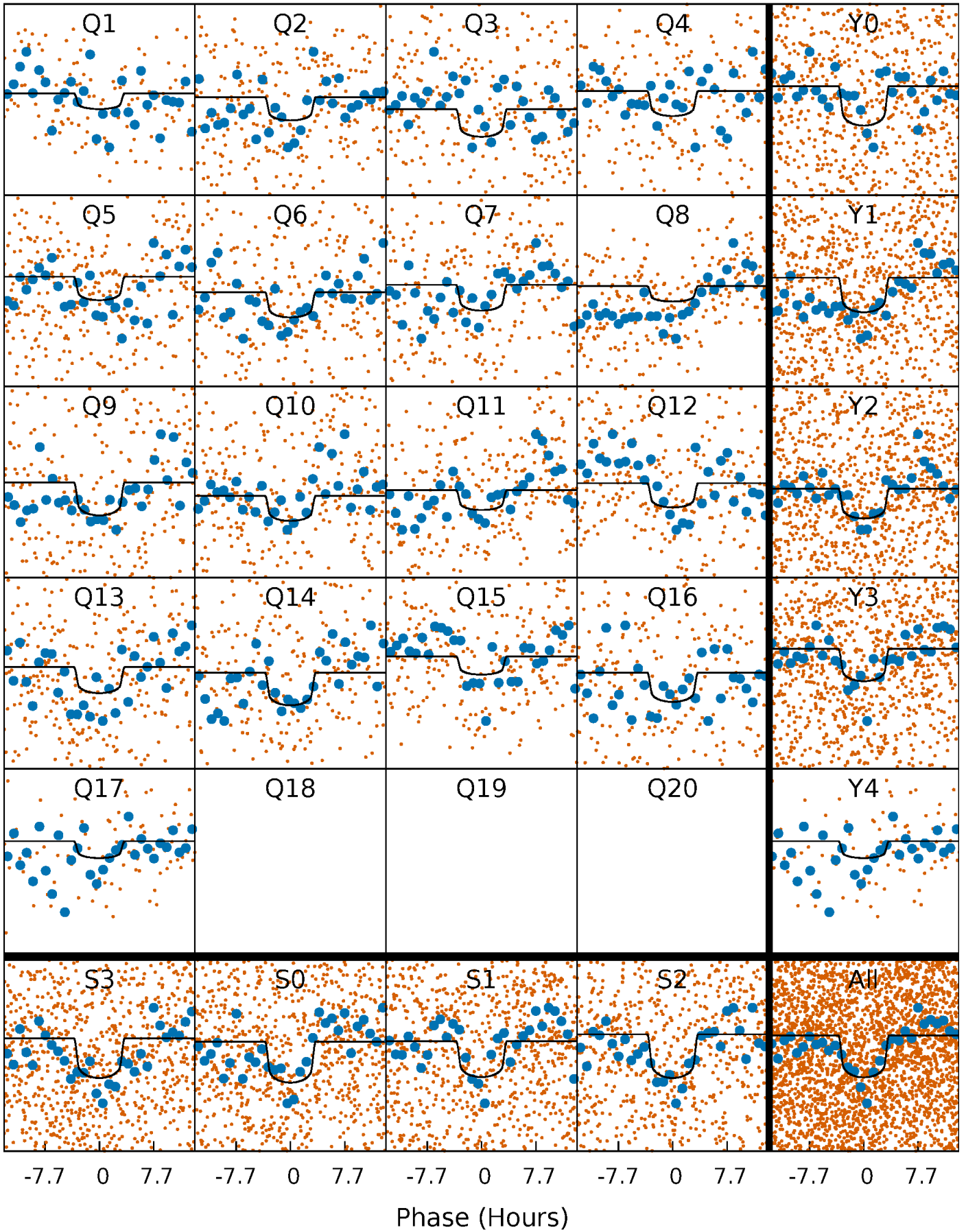
PDC Quarter-Phased Transit Curves

TCE 008332521-02 P= 14.744615 Days $T_0=135.034422$ (BKJD)



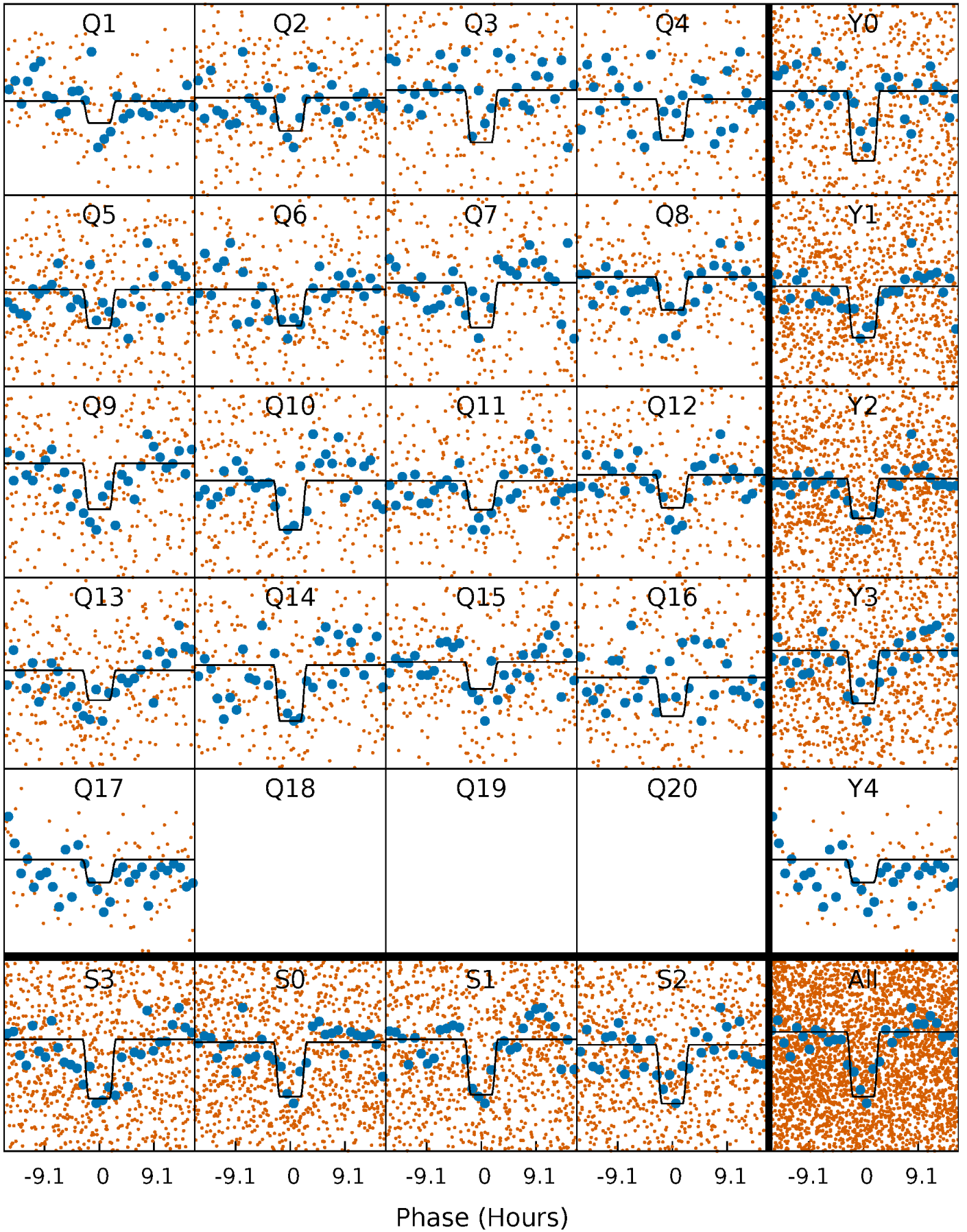
DV Quarter-Phased Transit Curves

TCE 008332521-02 P= 14.744615 Days $T_0=135.034422$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

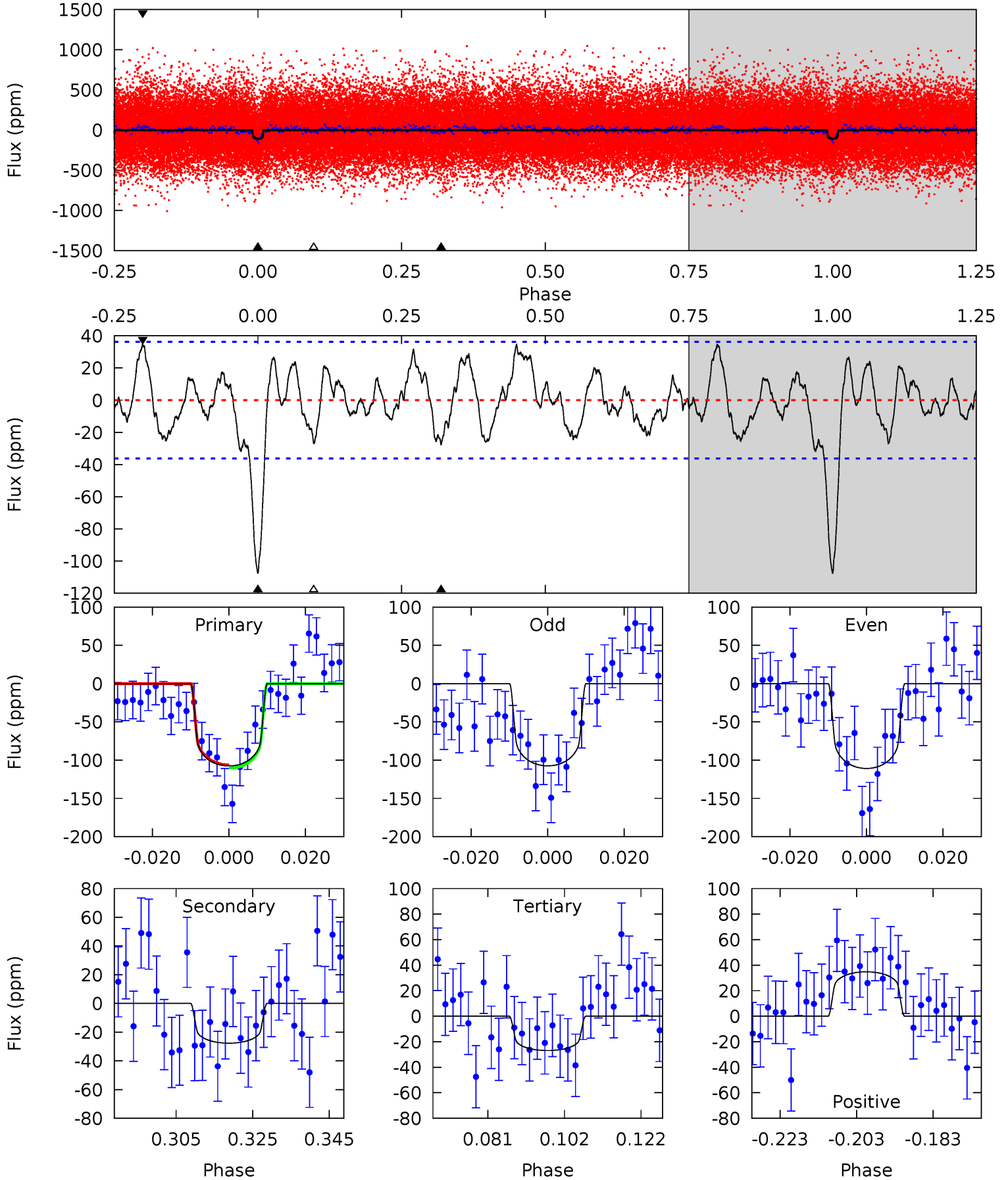
TCE 008332521-02 P= 14.744549 Days $T_0=135.039331$ (BKJD)



DV Model-Shift Uniqueness Test

008332521-02, P = 14.744615 Days, E = 120.289807 Days

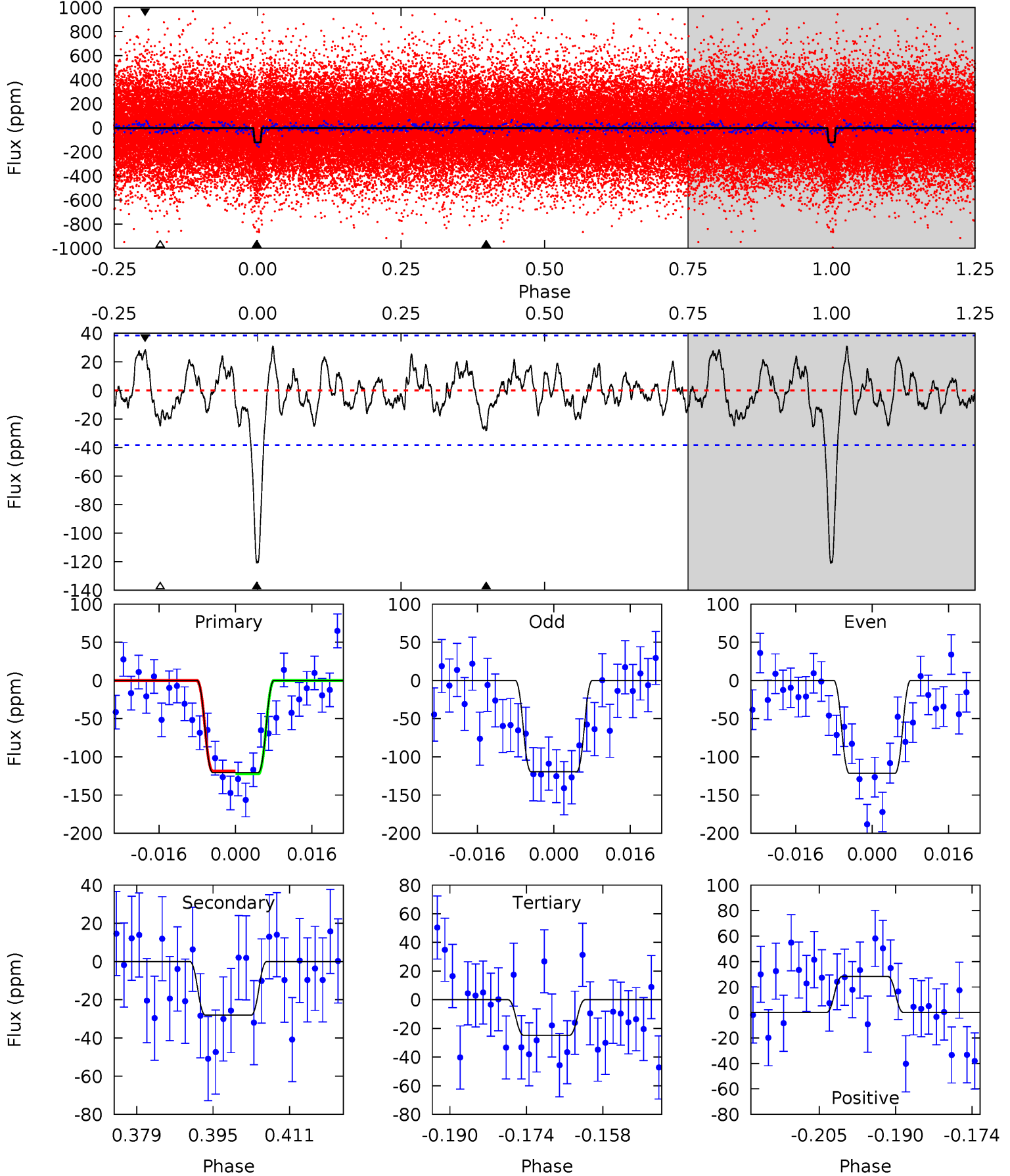
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	3.73	3.62	4.69	4.89	2.32	1.95	10.9	9.81	0.11	-0.96	0.23	0.81	0.24	0.28



Alt Model-Shift Uniqueness Test

008332521-02, P = 14.744549 Days, E = 120.294782 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	3.61	3.20	3.64	4.94	2.41	1.45	12.3	11.9	0.41	-0.03	0.13	0.93	0.20	0.24



Stellar Parameters For KIC 008332521

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6146^{+170}_{-192}	$4.454^{+0.070}_{-0.210}$	$-0.220^{+0.250}_{-0.300}$	$0.987^{+0.328}_{-0.109}$	$1.006^{+0.154}_{-0.115}$	$1.473^{+0.450}_{-0.813}$
	+3%/-3%	+2%/-5%	+114%/-136%	+33%/-11%	+15%/-11%	+31%/-55%
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 008332521-02 / KOI 4567.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-28 ± 7	$1.18^{+0.46}_{-0.42}$	1112^{+87}_{-51}	4483^{+991}_{-513}	143^{+219}_{-71}
Alt.	-28 ± 8	$1.32^{+0.49}_{-0.40}$	1114^{+86}_{-58}	4282^{+758}_{-459}	117^{+140}_{-60}

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

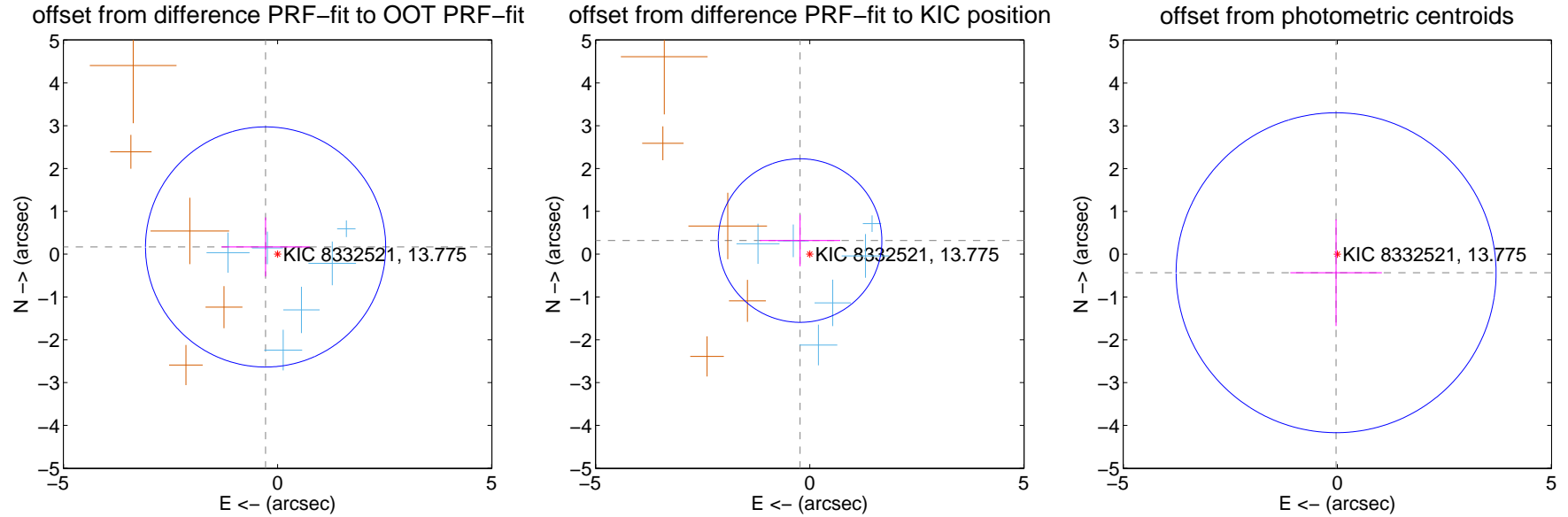
DV Centroid Data

Supplemental centroid analysis for 008332521-02. Kepler magnitude: 13.78. Transit SNR 7.69

There are 6 quarters with good PRF difference image offsets

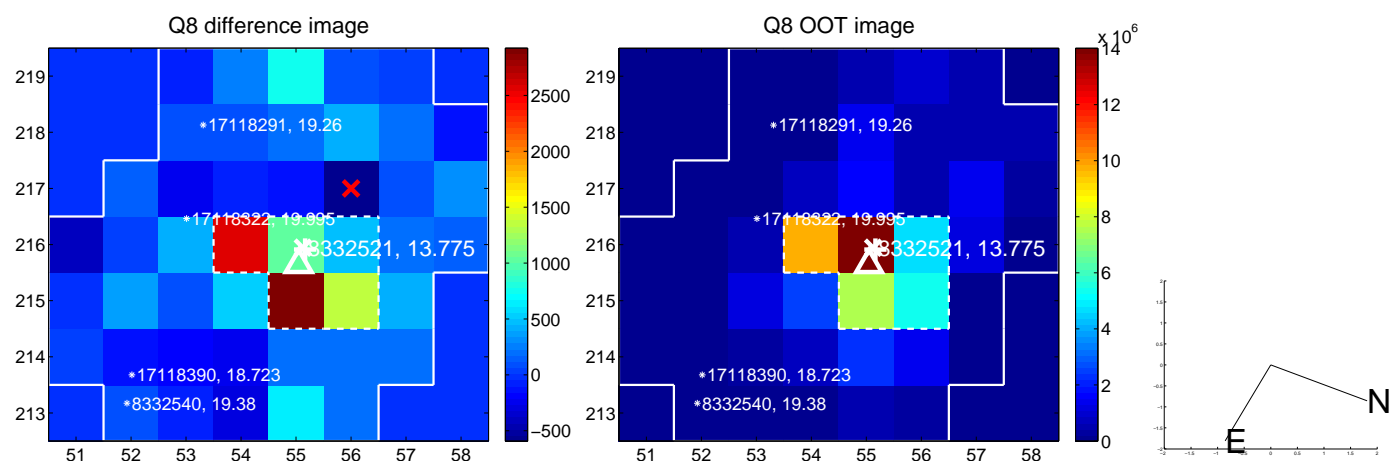
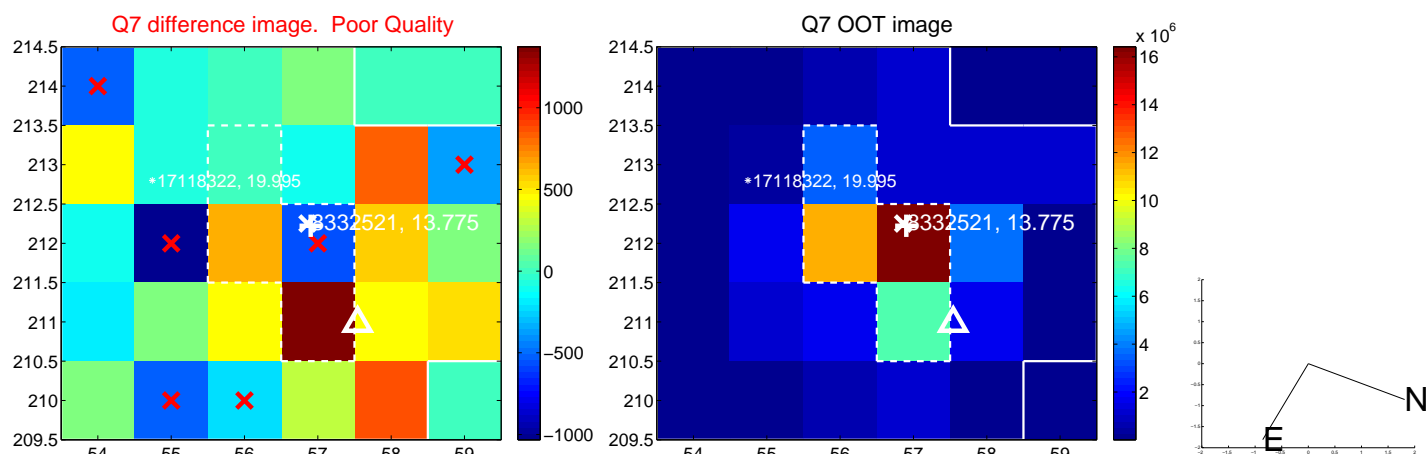
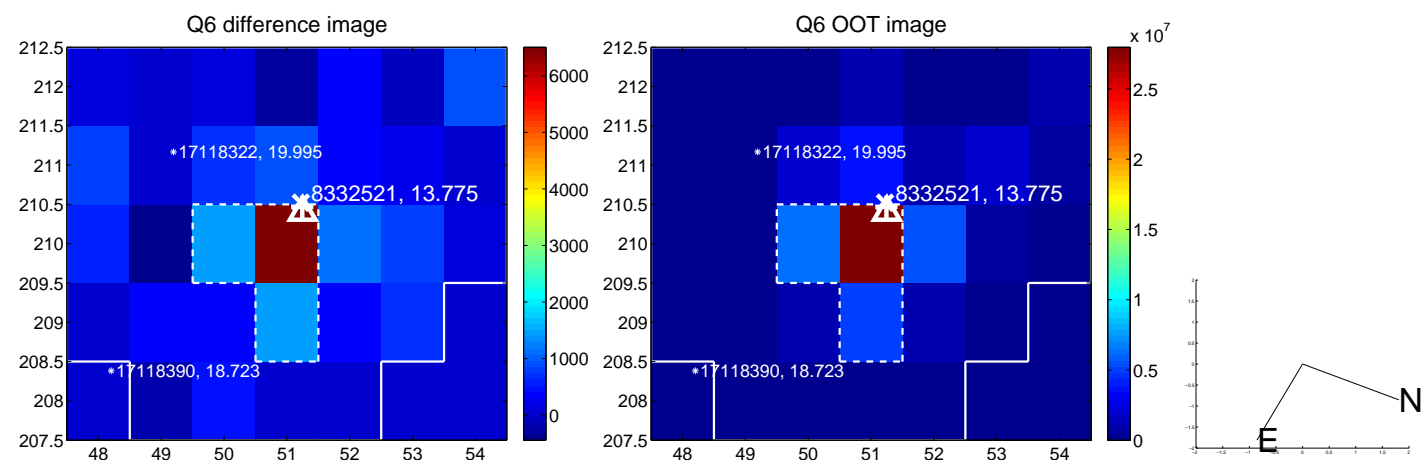
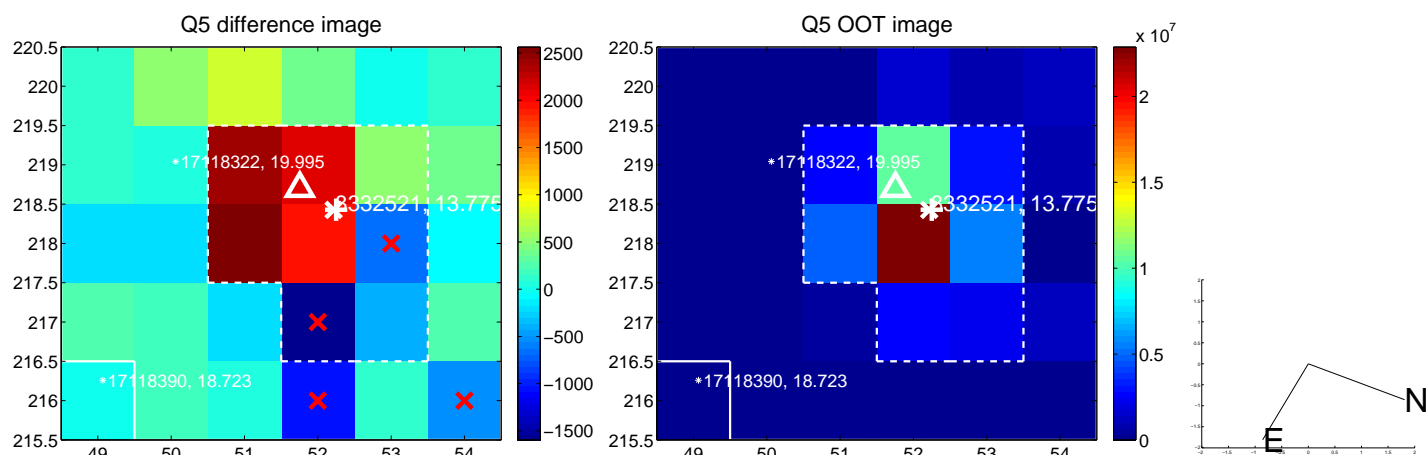
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.327 ± 0.935	0.35	0.280 ± 1.032	0.168 ± 0.690
PRF-fit source offset from KIC position	0.390 ± 0.637	0.61	0.227 ± 0.938	0.318 ± 0.601
photometric centroid source offset	0.43 ± 1.25	0.35	0.03 ± 1.07	-0.43 ± 1.25

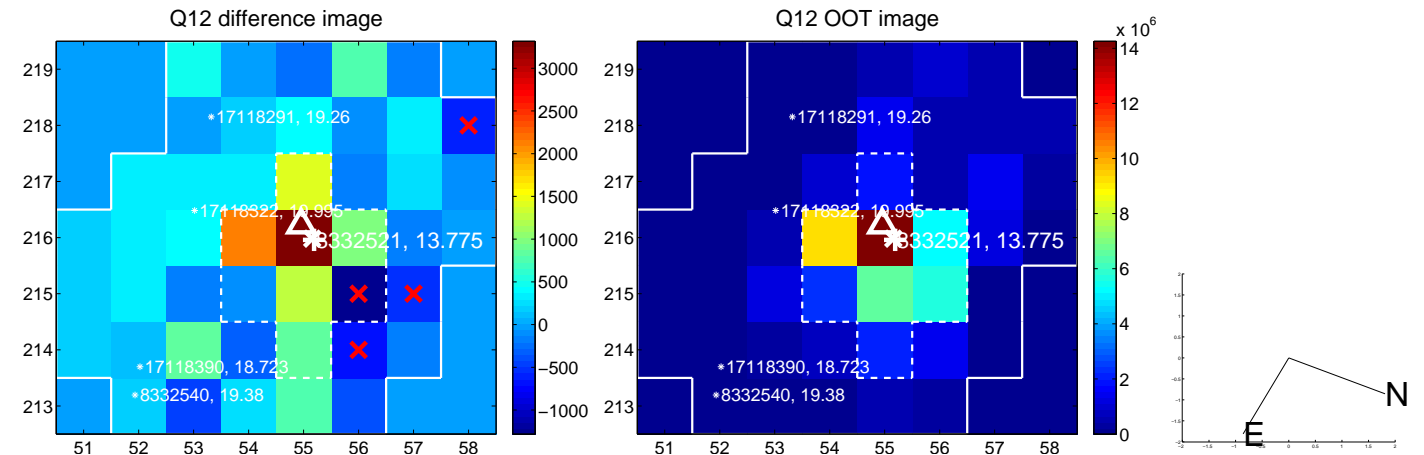
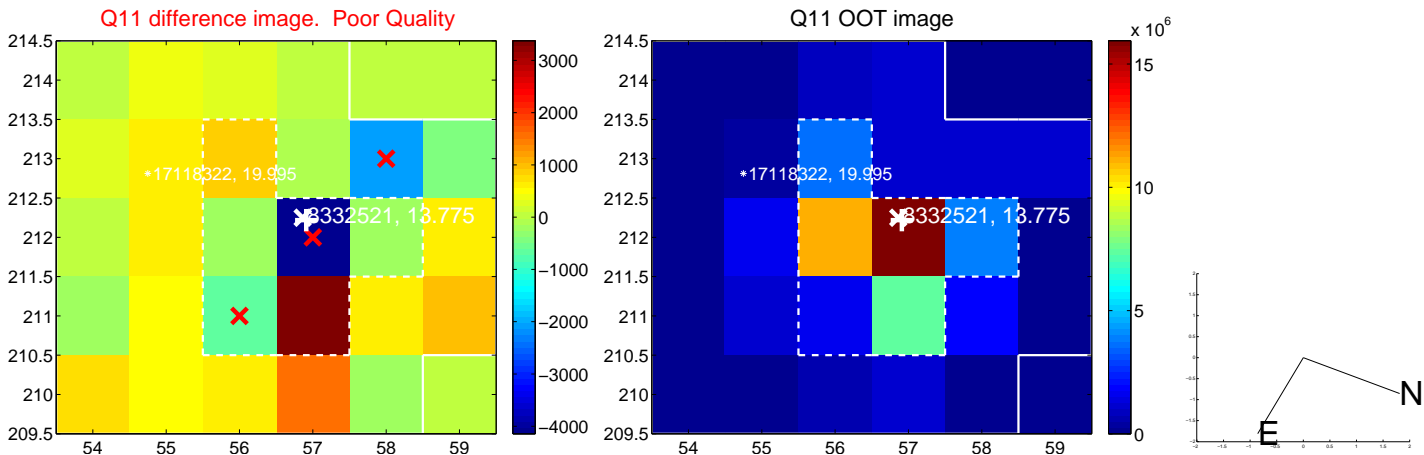
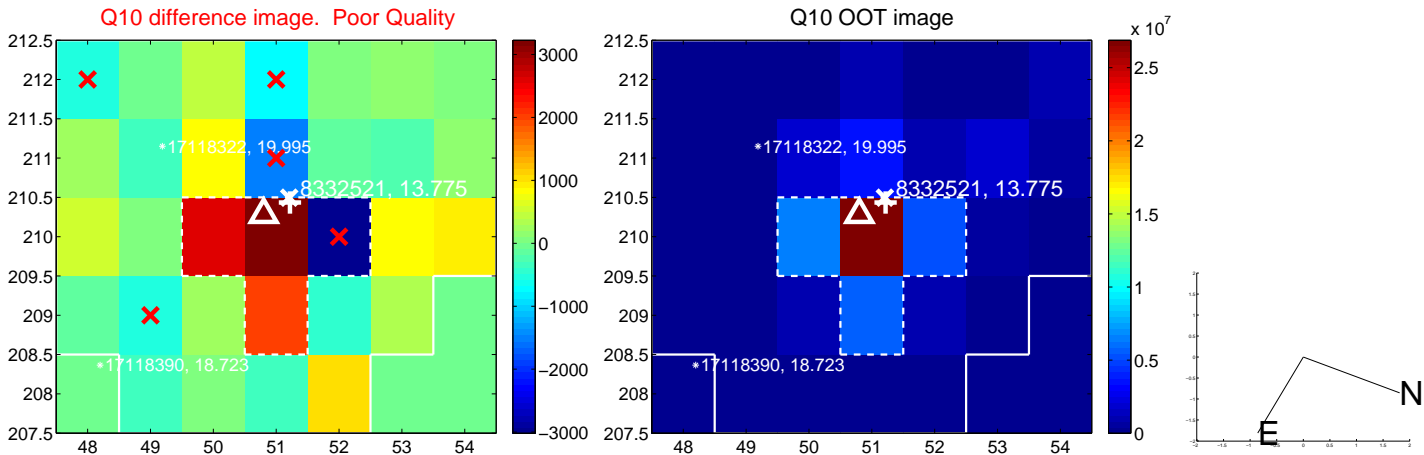
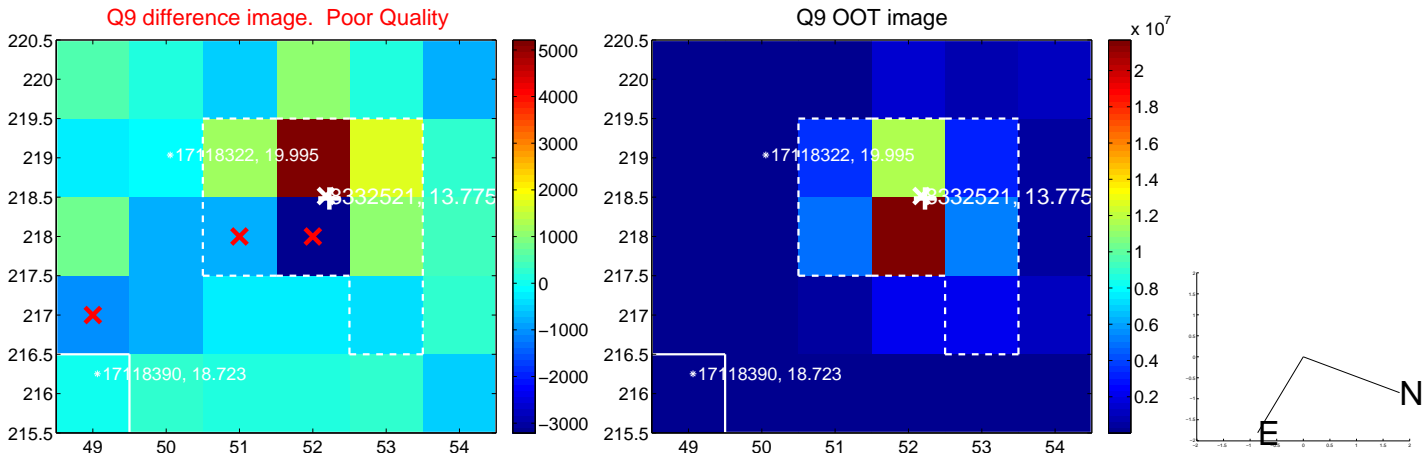


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

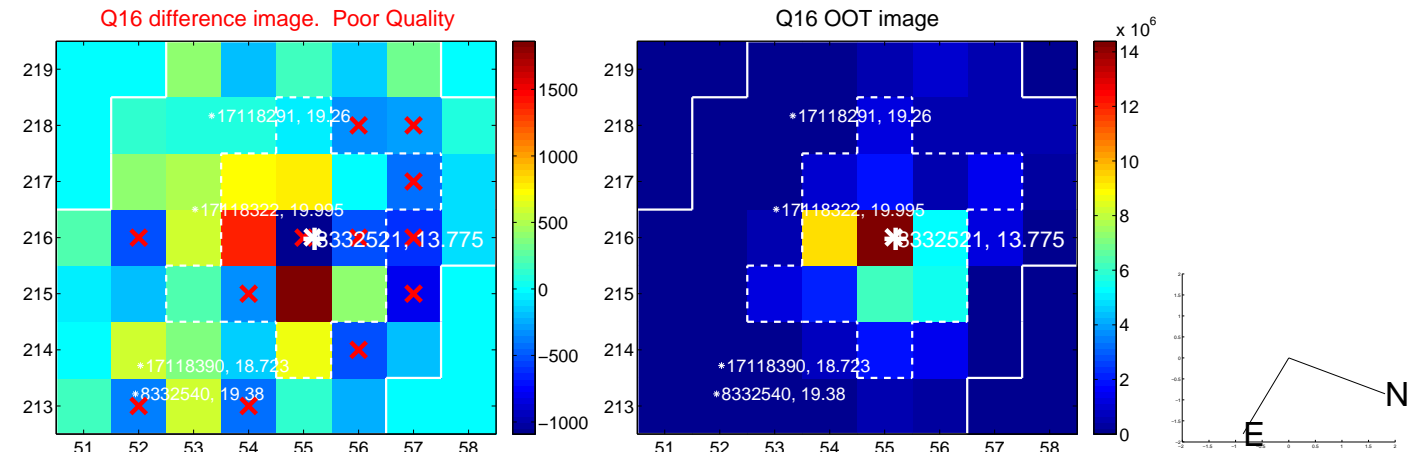
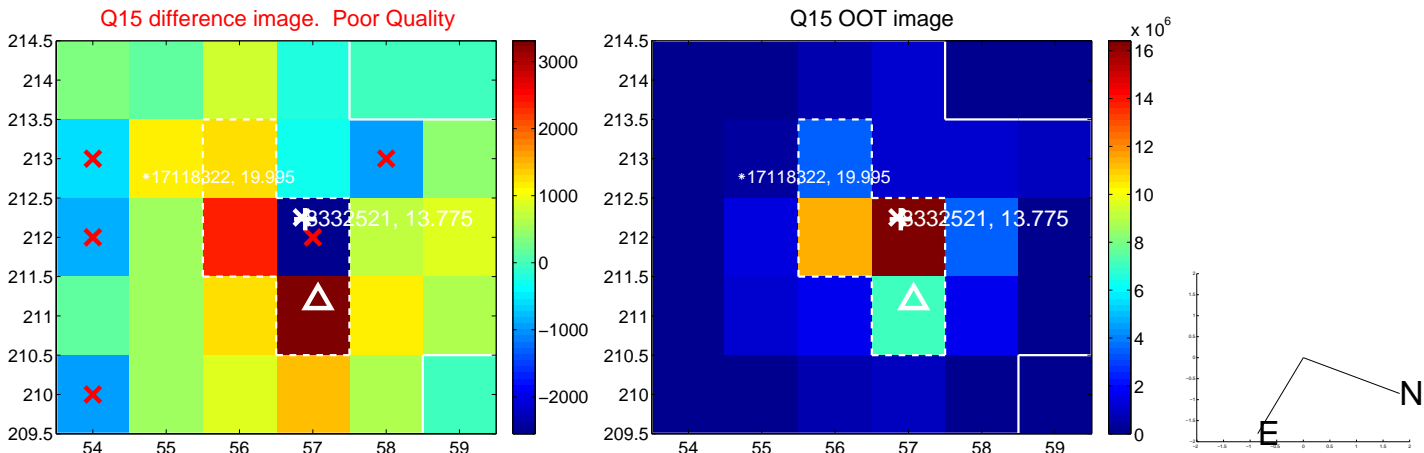
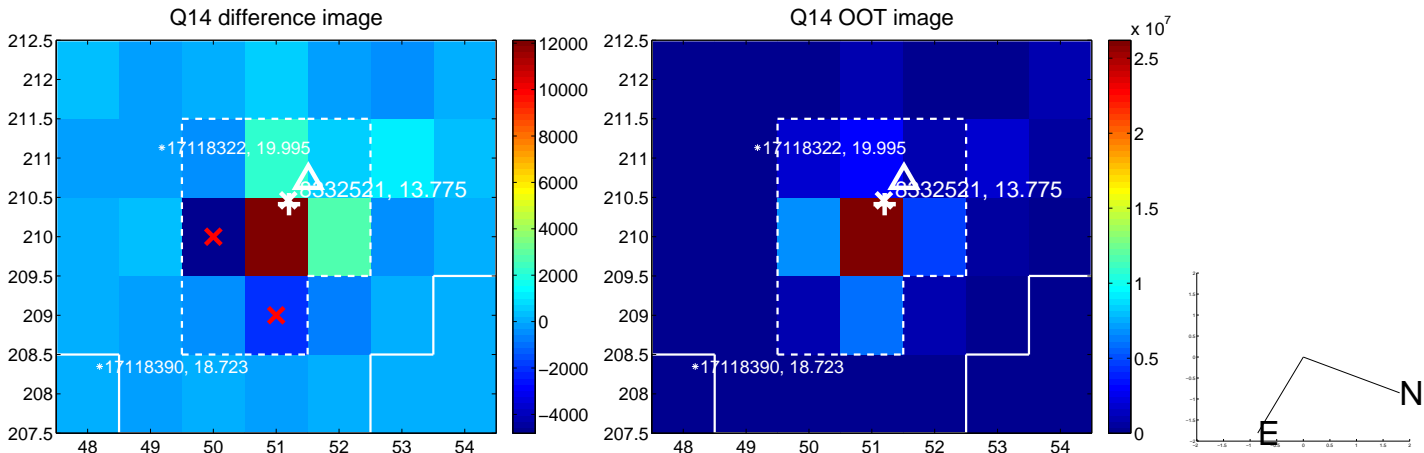
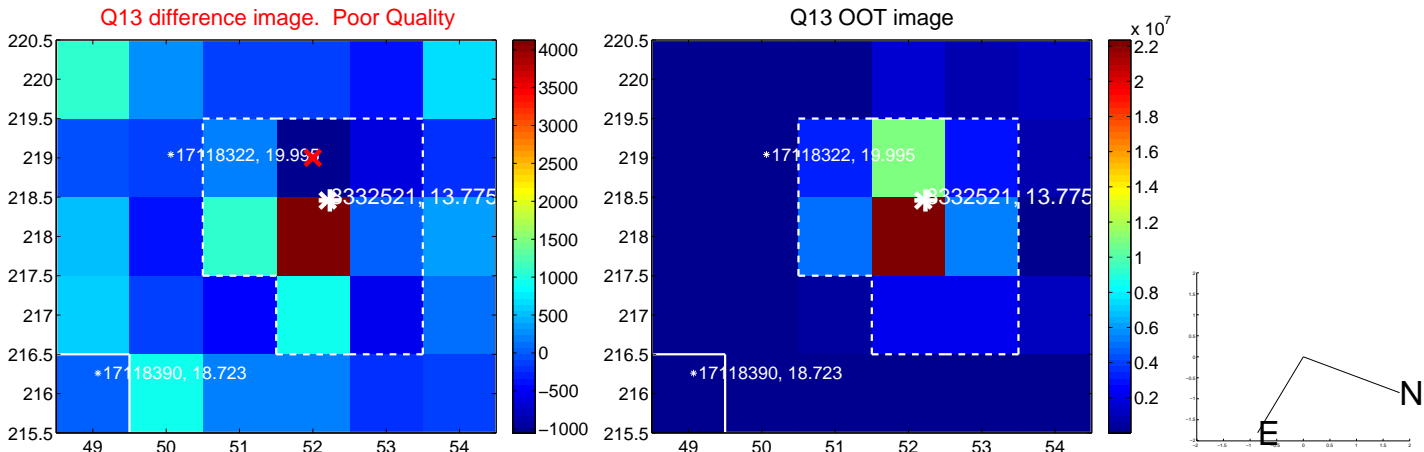
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



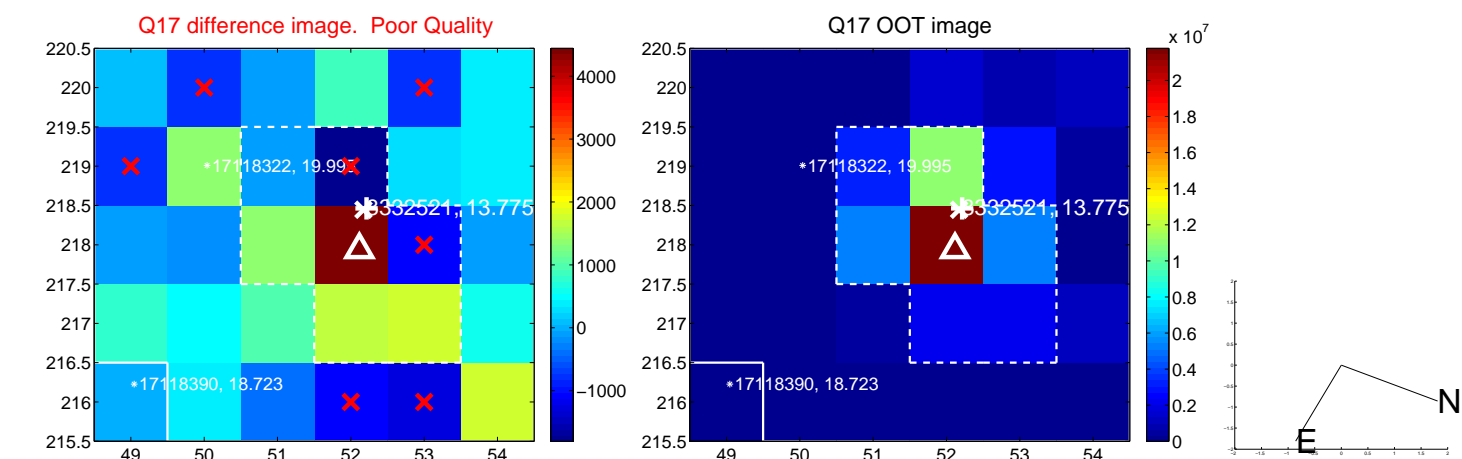
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



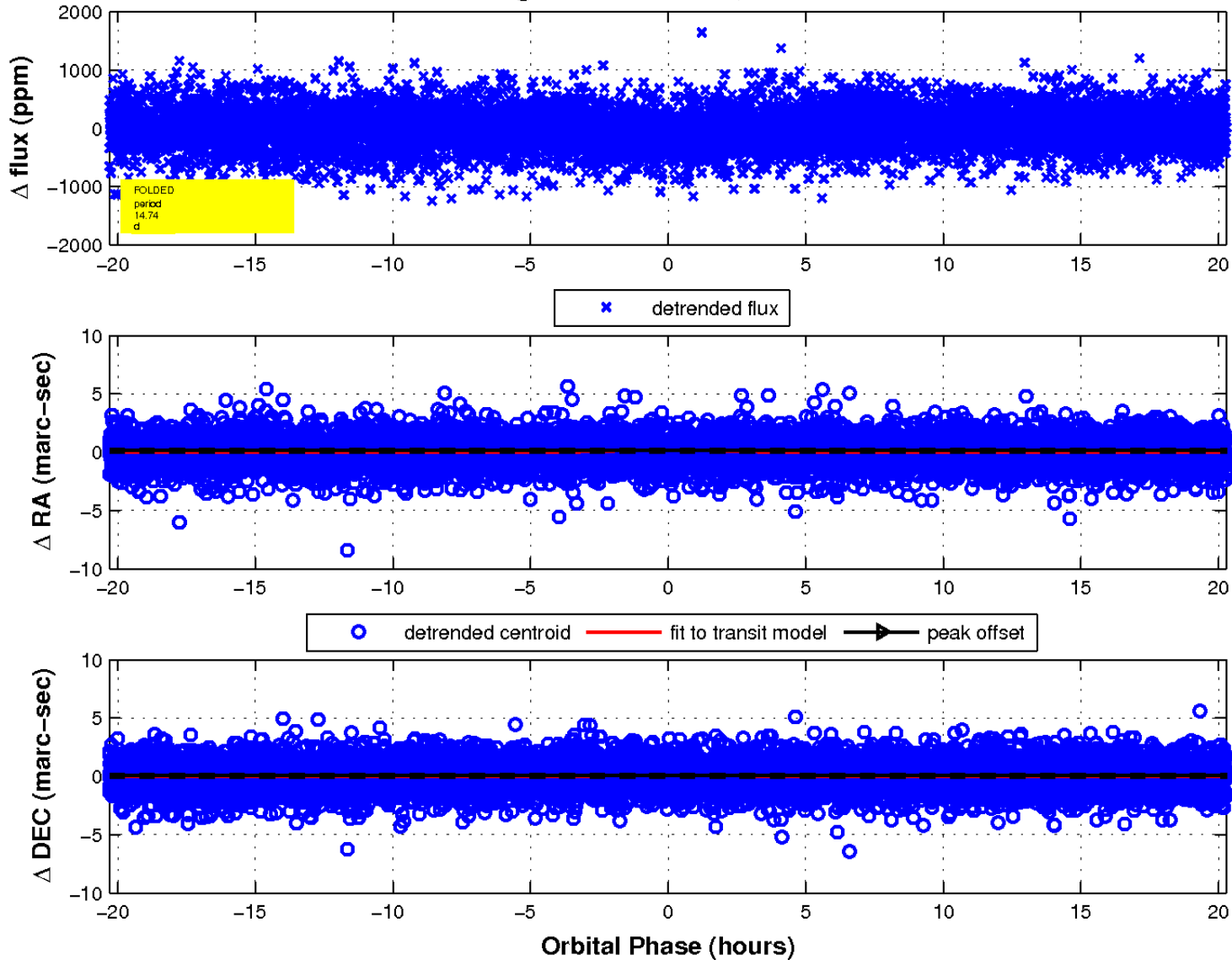
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

