

KIC 009368220

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})
009368220-01	OBS	No	0.658334	131.626529	402.9	2.864	15.2	18.3	1.71	6883	4.00	21081.68
009368220-02	OBS	No	0.565038	131.545030	0.9	4.436	13.0	0.0	1.71	6883	0.19	25846.20

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009368220-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009368220-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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.

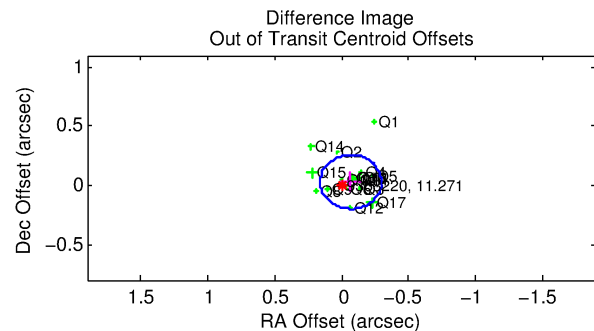
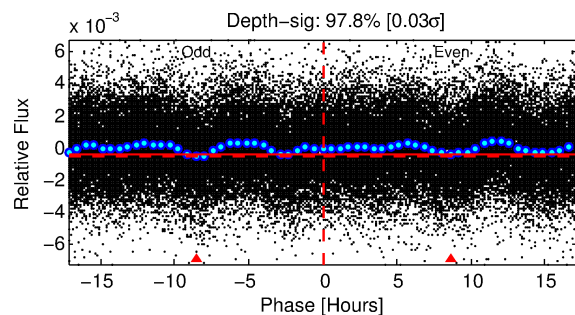
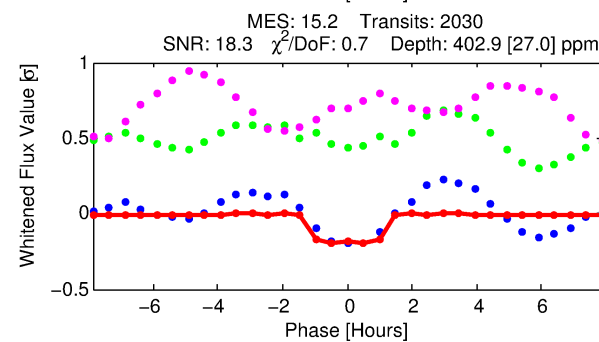
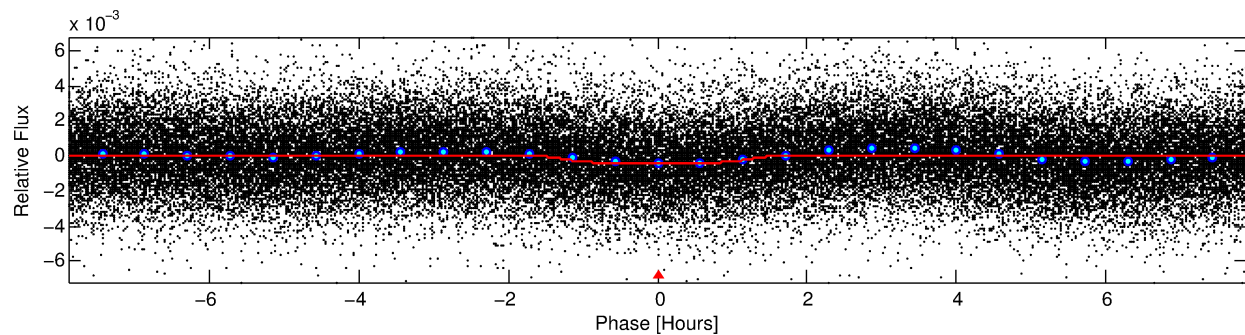
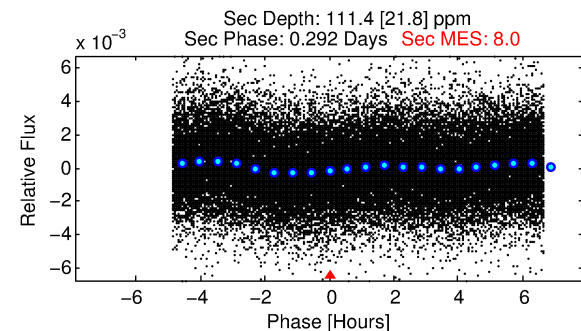
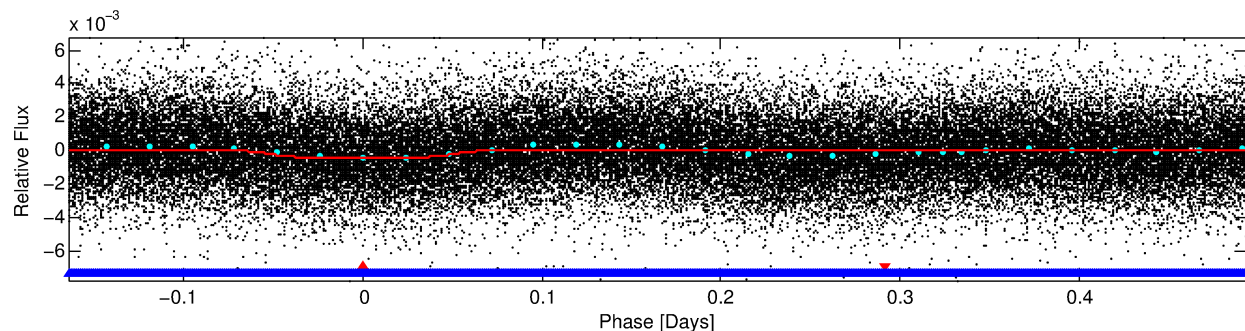
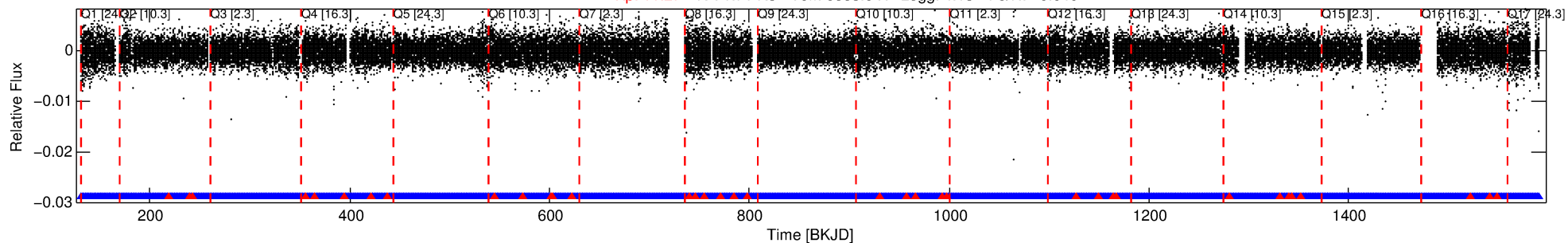
Ephemeris Match Information For 009368220-01

No Significant Match Found

DV One-Page Summary

KIC: 9368220 Candidate: 1 of 2 Period: 0.658 d

Kp: 11.27 R*: 1.71 Rs Teff: 6883.0 K Logg: 4.13 Fe/H: -0.040



DV Fit Results:

Period = 0.65833 [0.00001] d
Epoch = 131.6265 [0.0014] BKJD
Rp/R* = 0.0214 [0.0021]
a/R* = 1.27 [0.25]
b = 0.90 [0.11]
Seff = 21081.68 [8052.05]
Teq = 3073 [293] K
Rp = 4.00 [1.35] Re
a = 0.0167 [0.0043] AU
Ag = 1.07 [0.48] [0.14σ]
Teffp = 4831 [366] K [3.75σ]

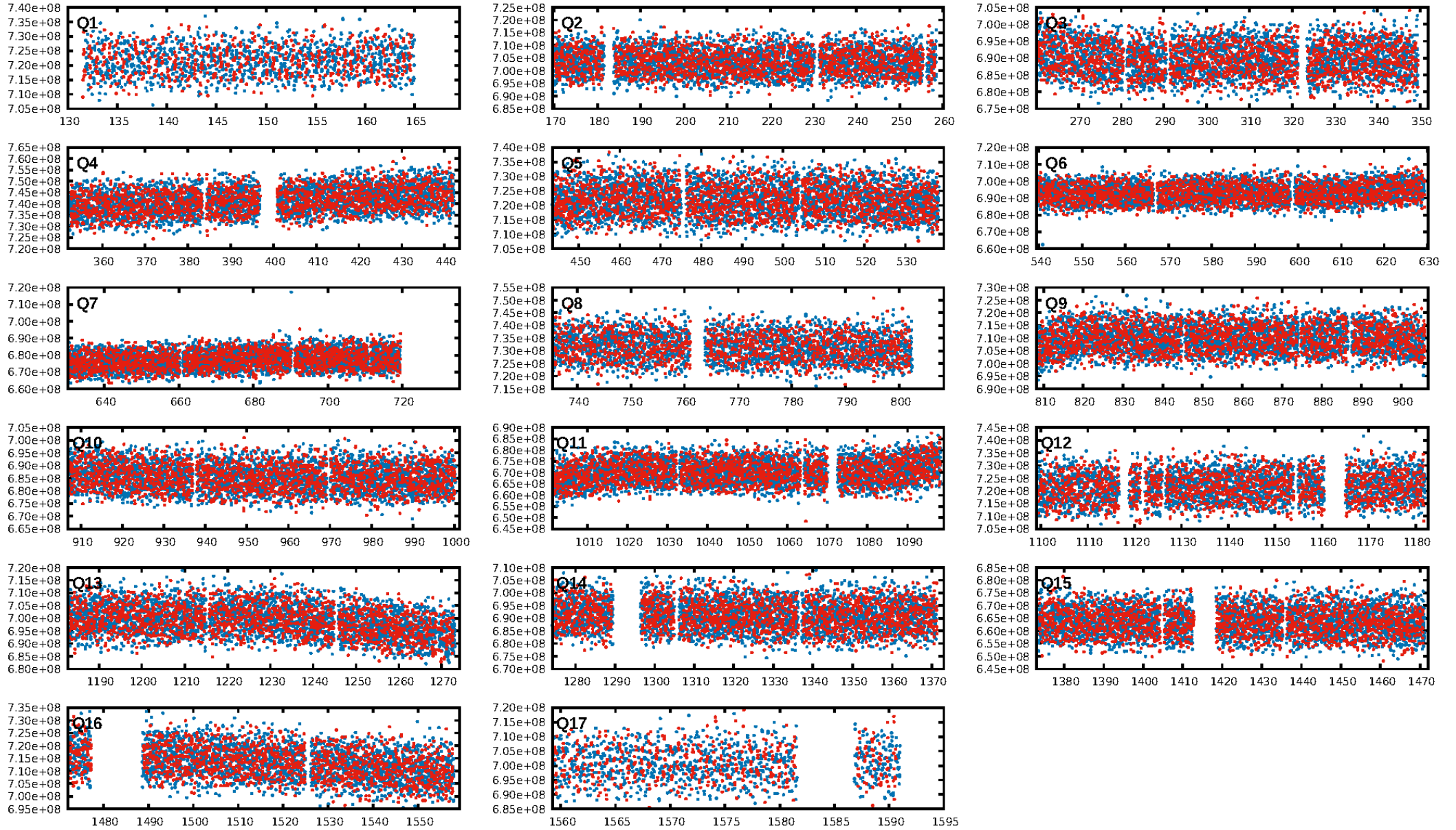
DV Diagnostic Results:

ShortPeriod-sig: 32.8% [0.42σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [1898/1939]
GhostDiagnostic-chr: 1.635
Centroid-sig: 0.0%
Centroid-so: 0.236 arcsec [9.95σ]
OotOffset-rm: 0.074 arcsec [0.98σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.051 arcsec [0.67σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

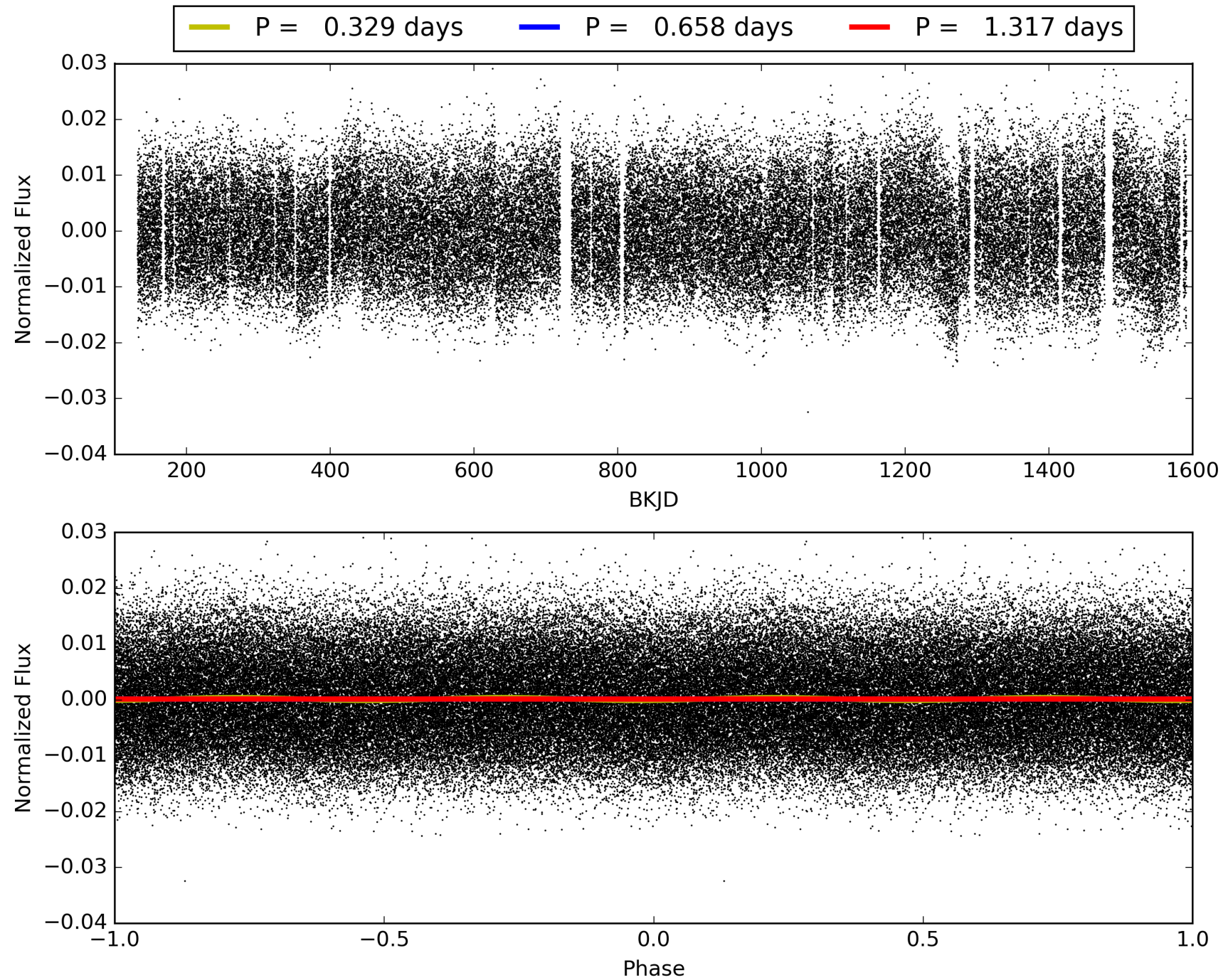
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:01:24 Z

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

TCE 009368220-01, PDC Light Curves

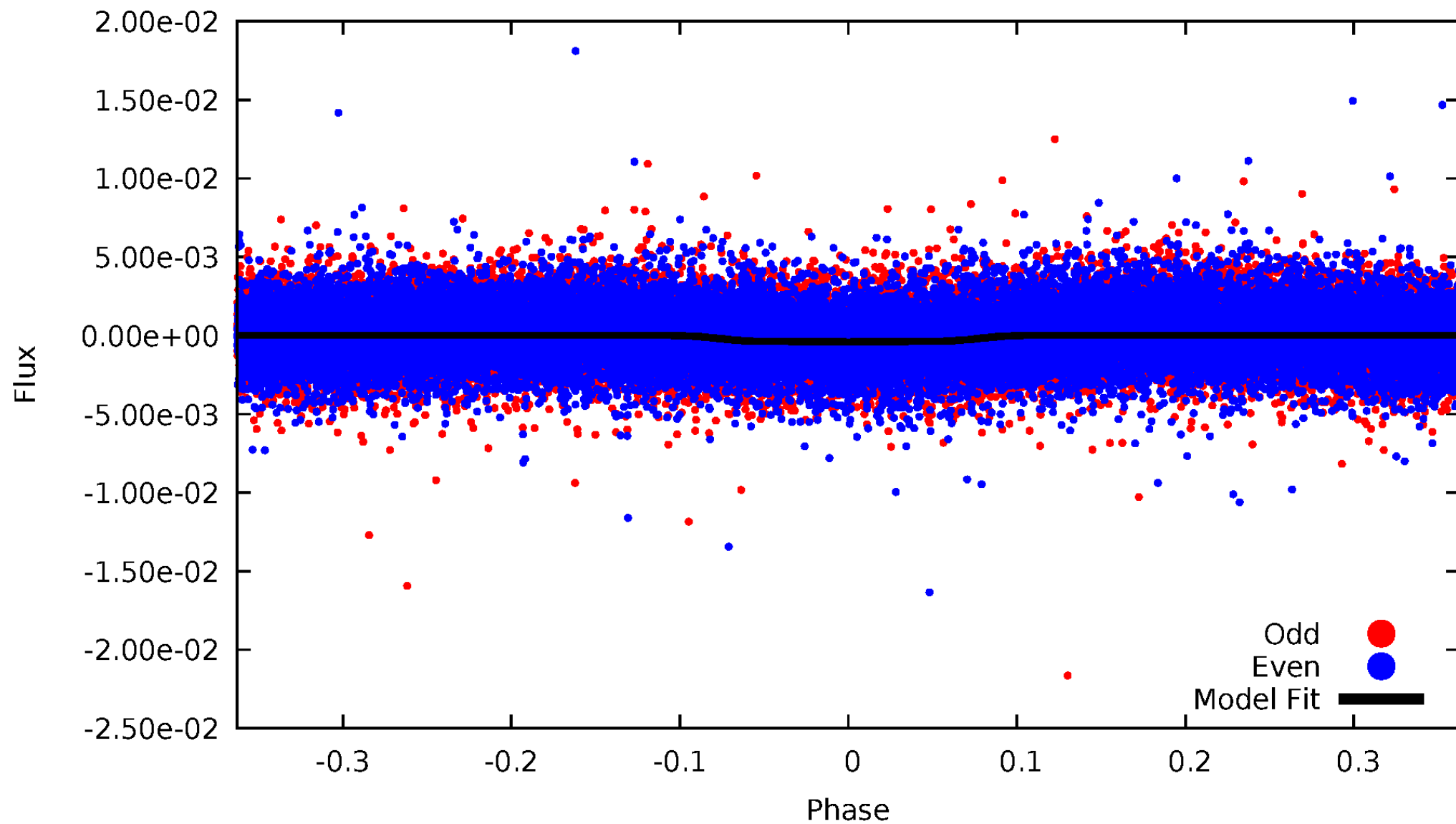


TCE 009368220-01



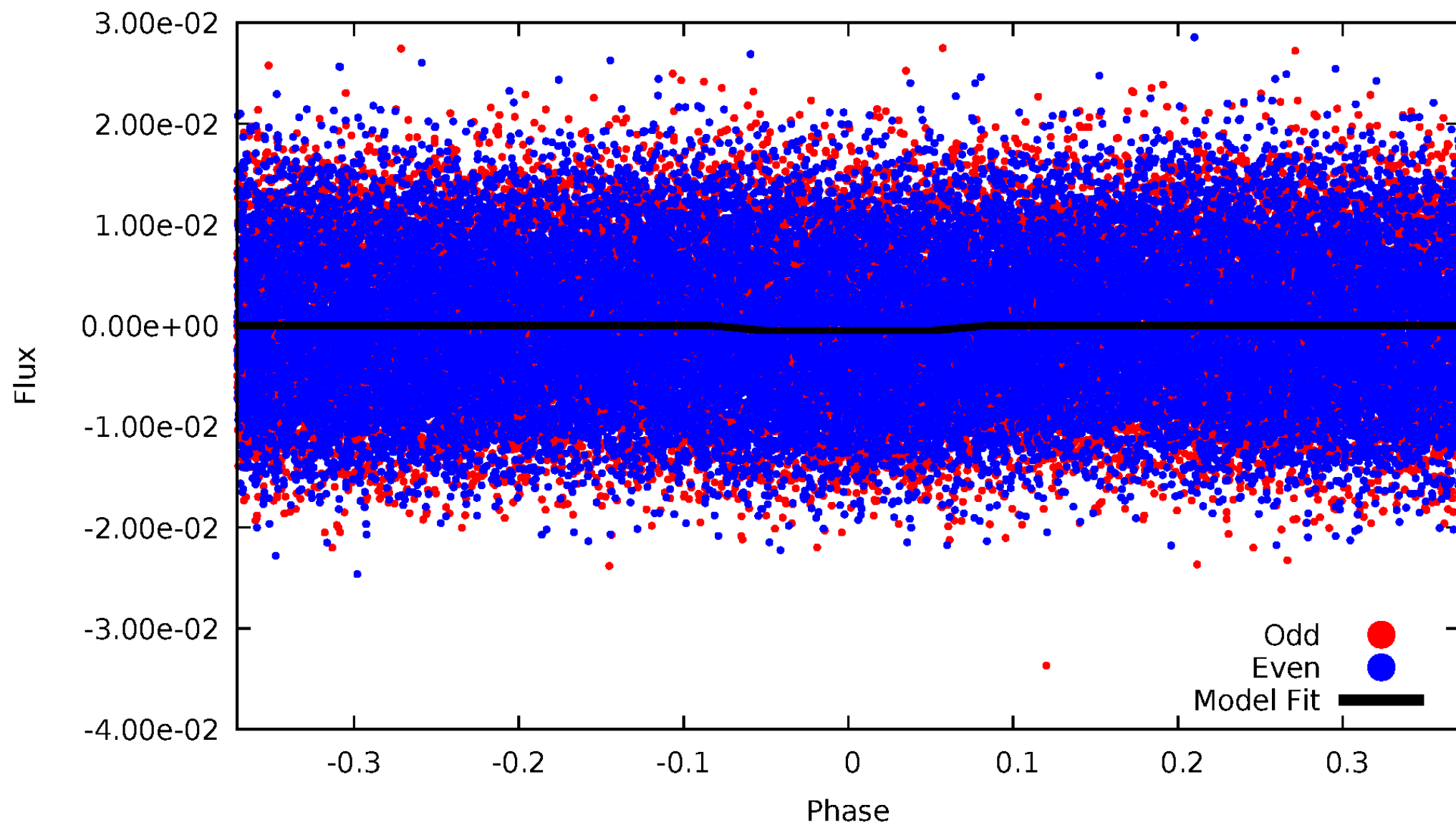
DV Odd/Even

TCE 009368220-01



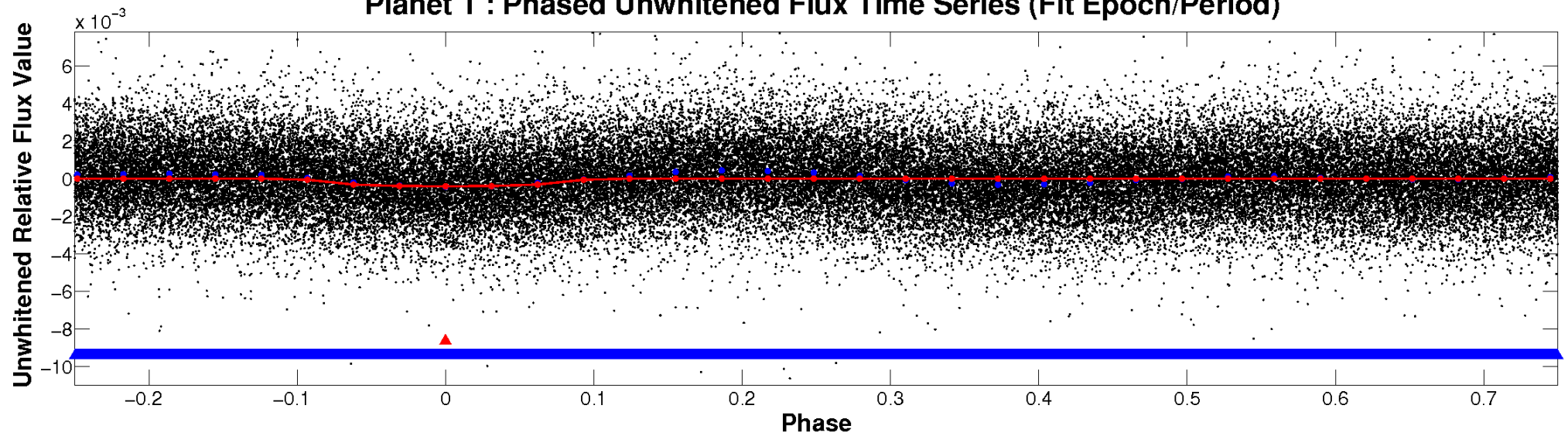
ALT Odd/Even

TCE 009368220-01

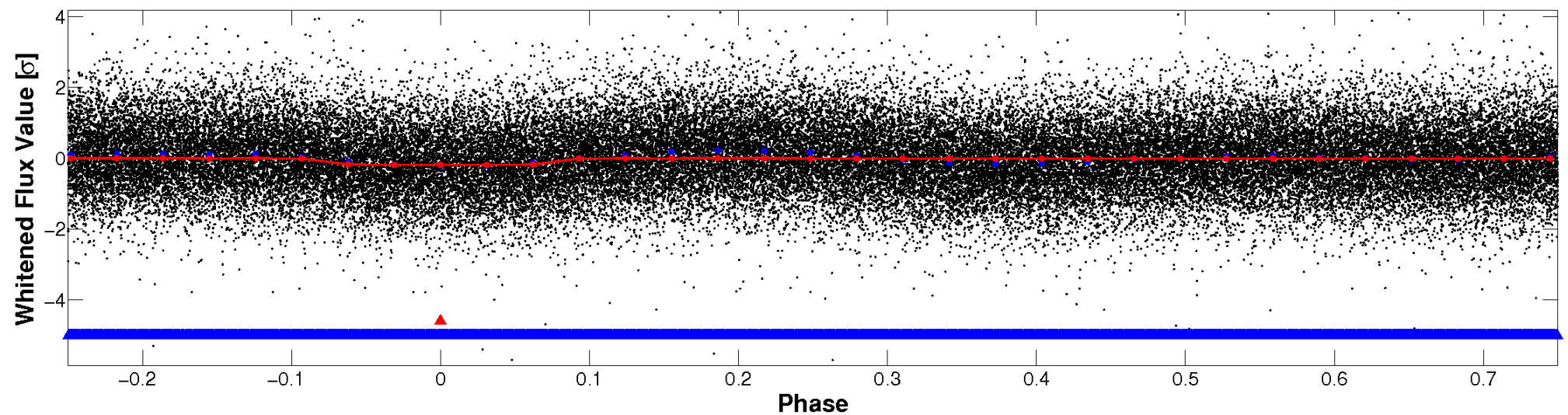


Non-Whitened Vs. Whitened Light Curve

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

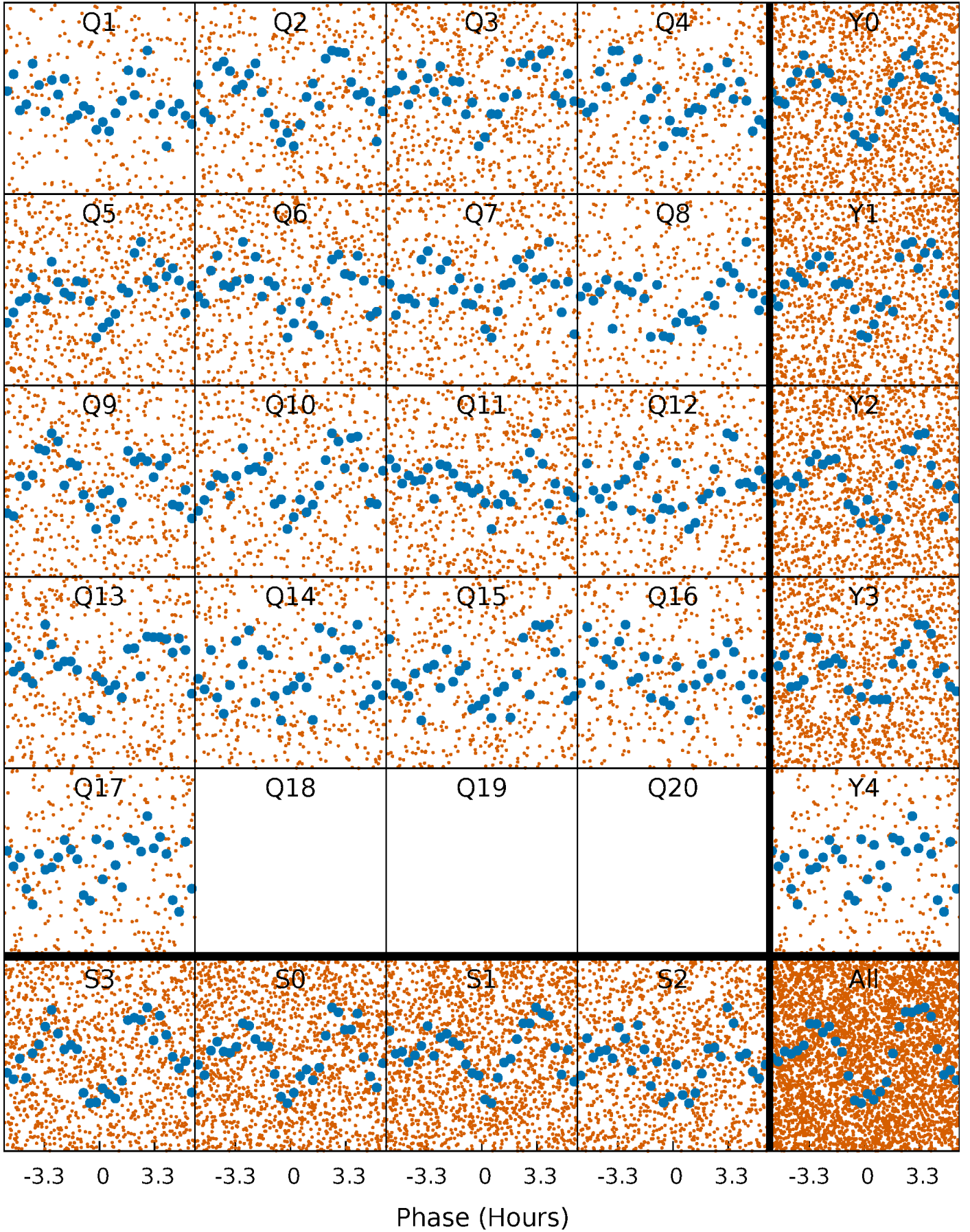


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



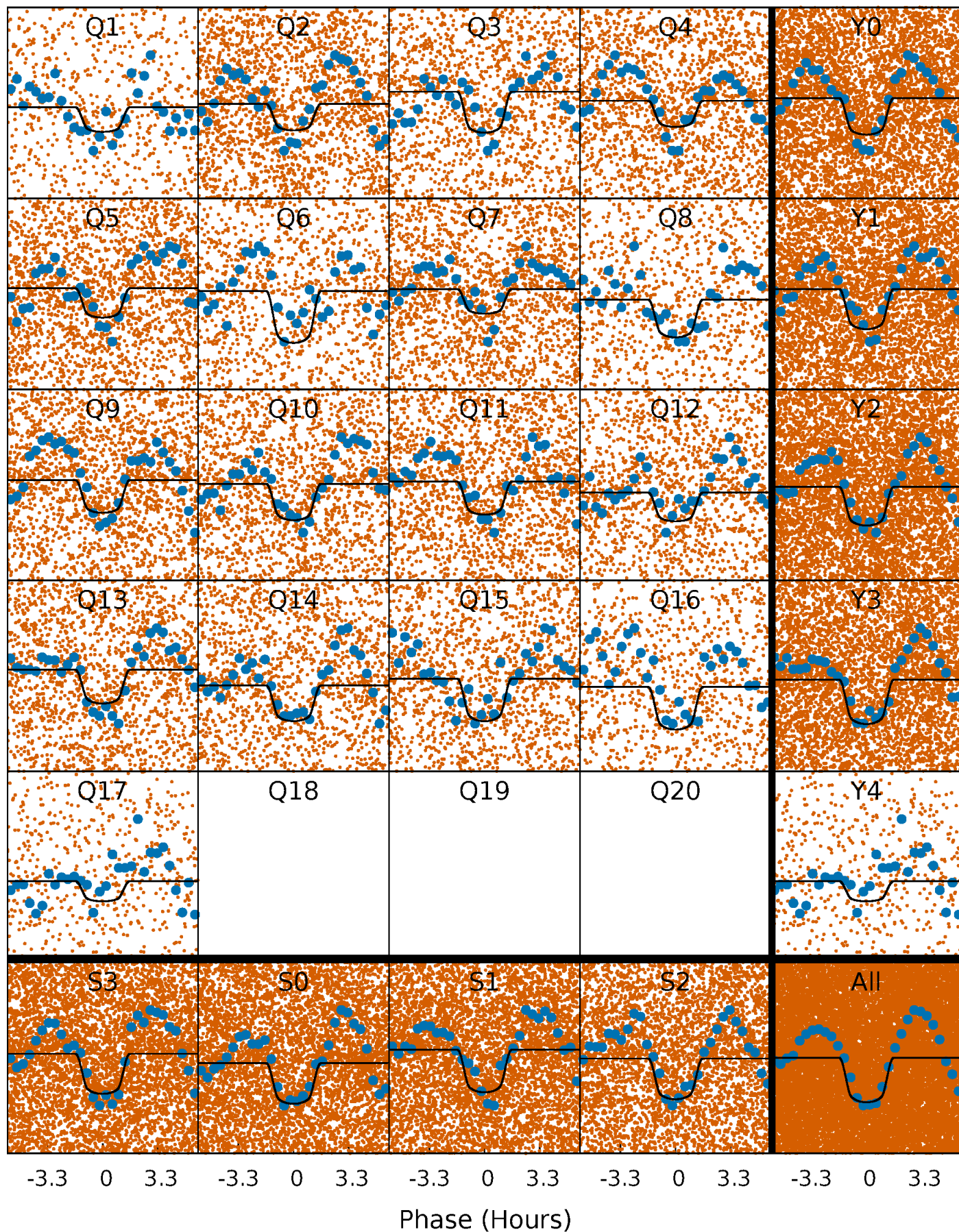
PDC Quarter-Phased Transit Curves

TCE 009368220-01 P= 0.658334 Days $T_0=131.626529$ (BKJD)



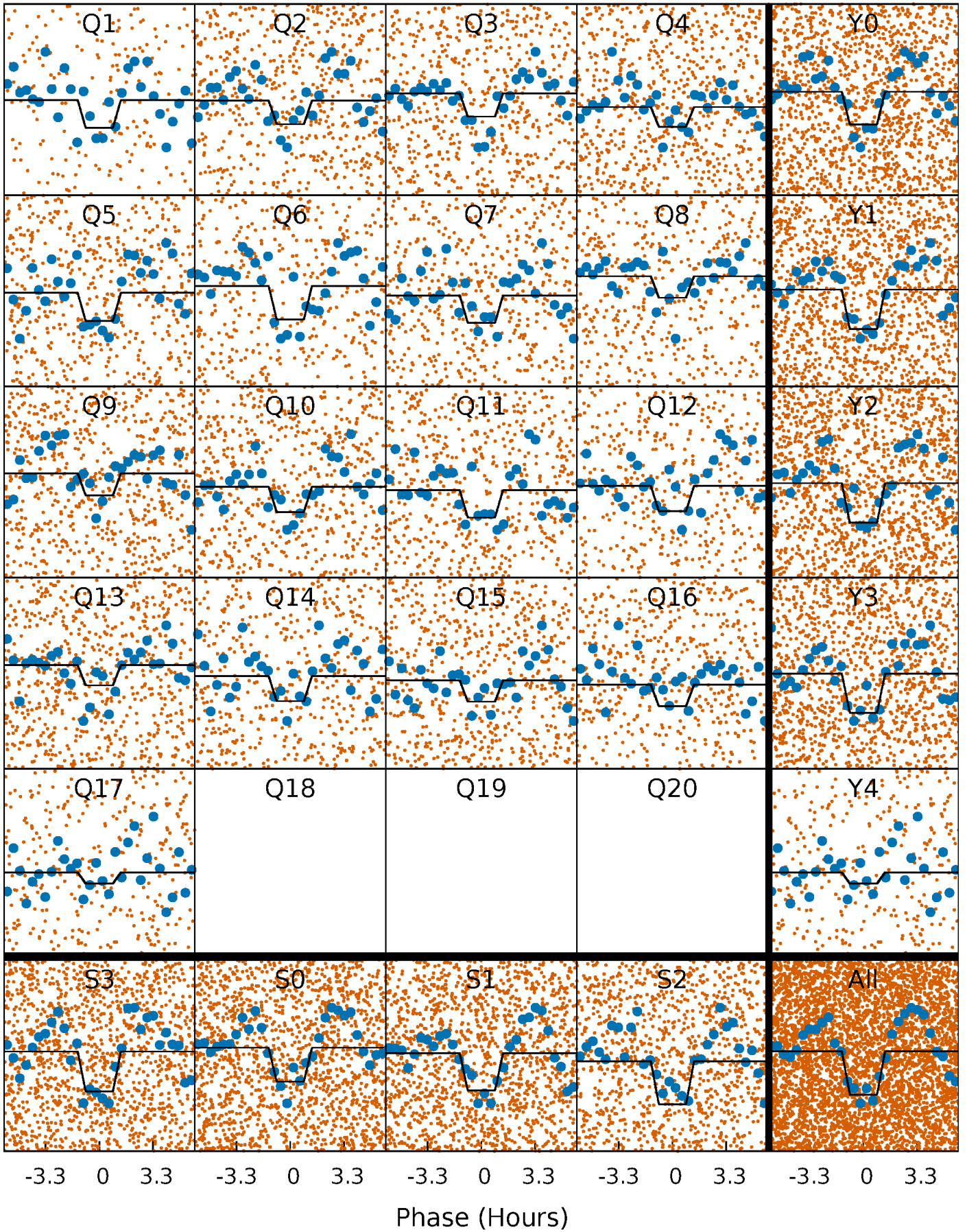
DV Quarter-Phased Transit Curves

TCE 009368220-01 P= 0.658334 Days $T_0=131.626529$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

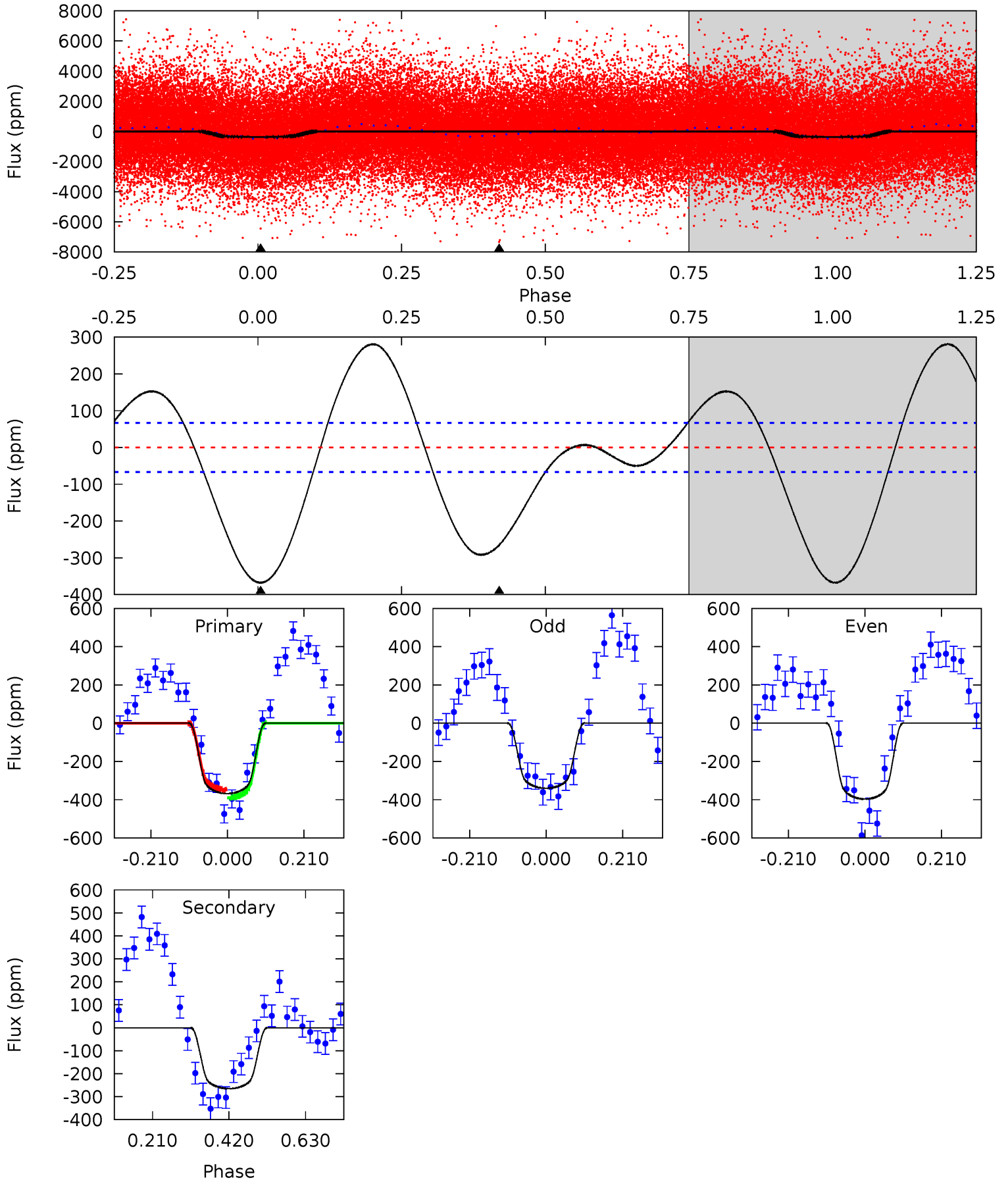
TCE 009368220-01 P= 0.658338 Days $T_0=131.626445$ (BKJD)



DV Model-Shift Uniqueness Test

009368220-01, P = 0.658334 Days, E = 130.968195 Days

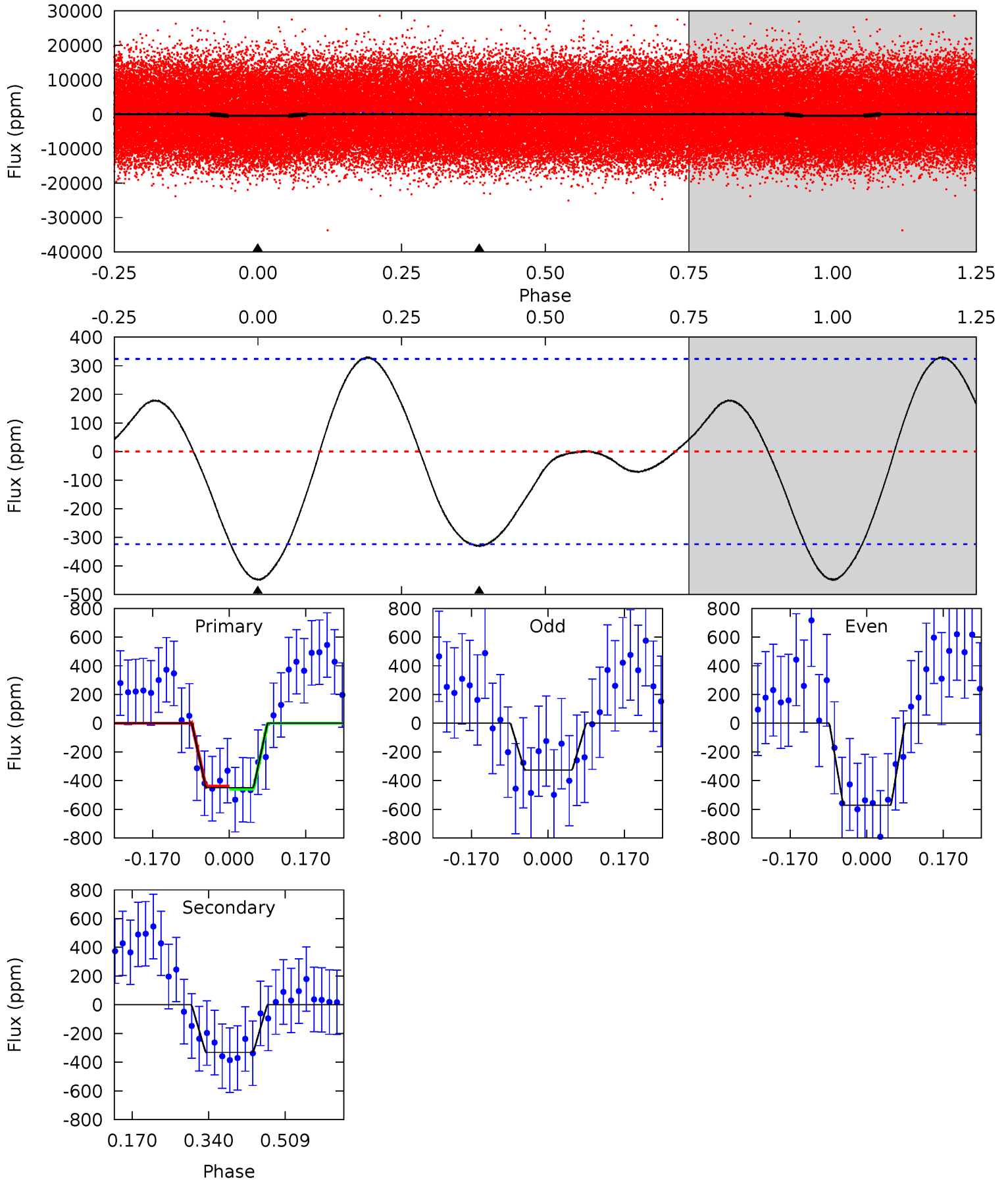
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.2	17.5	0	0	4.41	1.25	4.28	24.2	24.2	17.5	17.5	1.87	1.01	0.43	1.37



Alt Model-Shift Uniqueness Test

009368220-01, P = 0.658338 Days, E = 130.968107 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.19	4.56	0	0	4.45	1.37	1.75	6.19	6.19	4.56	4.56	1.68	0.84	0.42	0.15



Stellar Parameters For KIC 009368220

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6883^{+172}_{-224}	$4.128^{+0.153}_{-0.187}$	$-0.040^{+0.250}_{-0.350}$	$1.709^{+0.553}_{-0.369}$	$1.438^{+0.213}_{-0.234}$	$0.406^{+0.336}_{-0.215}$
	+2%/-3%	+4%/-5%	+625%/-875%	+32%/-22%	+15%/-16%	+83%/-53%
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 009368220-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-265 ± 15	$3.99^{+0.80}_{-0.55}$	4309^{+331}_{-267}	5777^{+354}_{-352}	$2.474^{+0.935}_{-0.693}$
Alt.	-332 ± 73	$4.09^{+0.78}_{-0.63}$	4300^{+342}_{-269}	6066^{+540}_{-518}	$2.992^{+1.242}_{-1.043}$

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

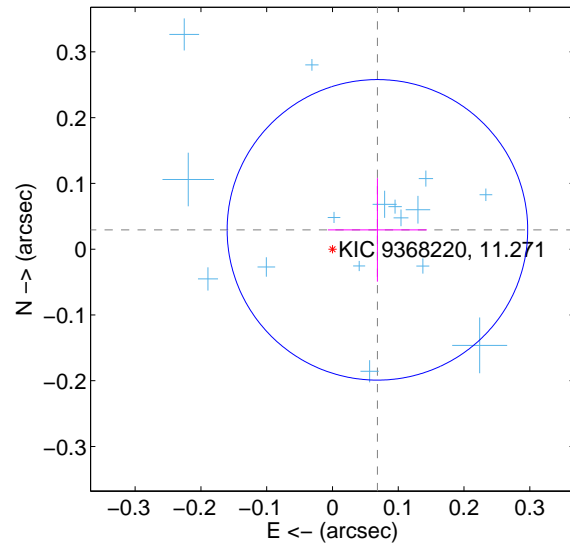
Supplemental centroid analysis for 009368220-01. **Kepler magnitude: 11.27.** Transit SNR 18.33

There are 17 quarters with good PRF difference image offsets

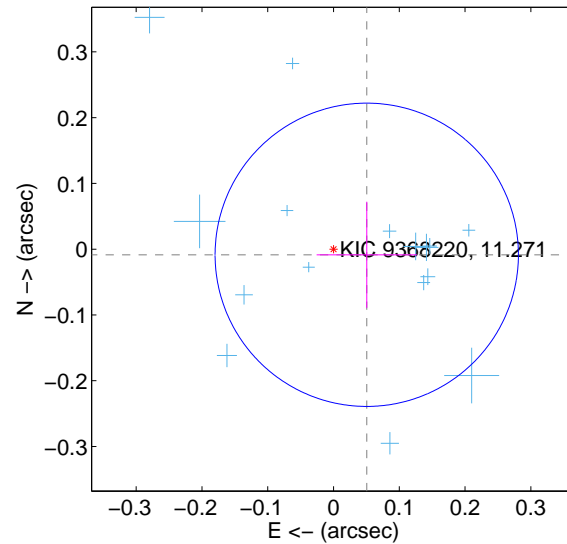
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.074 ± 0.076	0.98	-0.068 ± 0.075	0.029 ± 0.079
PRF-fit source offset from KIC position	0.051 ± 0.077	0.67	-0.051 ± 0.076	-0.009 ± 0.081
photometric centroid source offset	0.24 ± 0.02	9.95	-0.17 ± 0.03	-0.16 ± 0.02

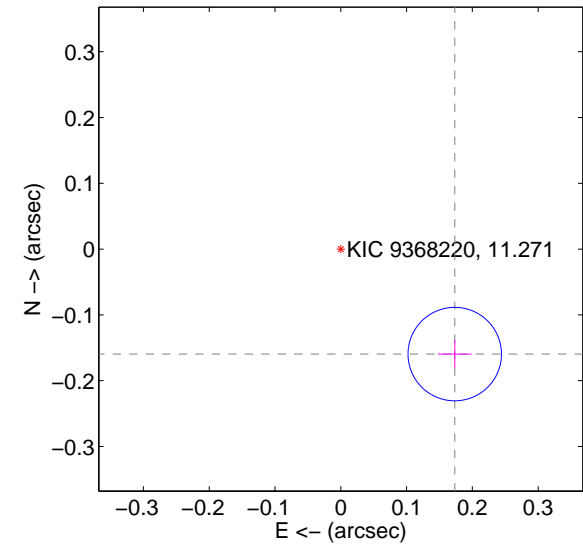
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

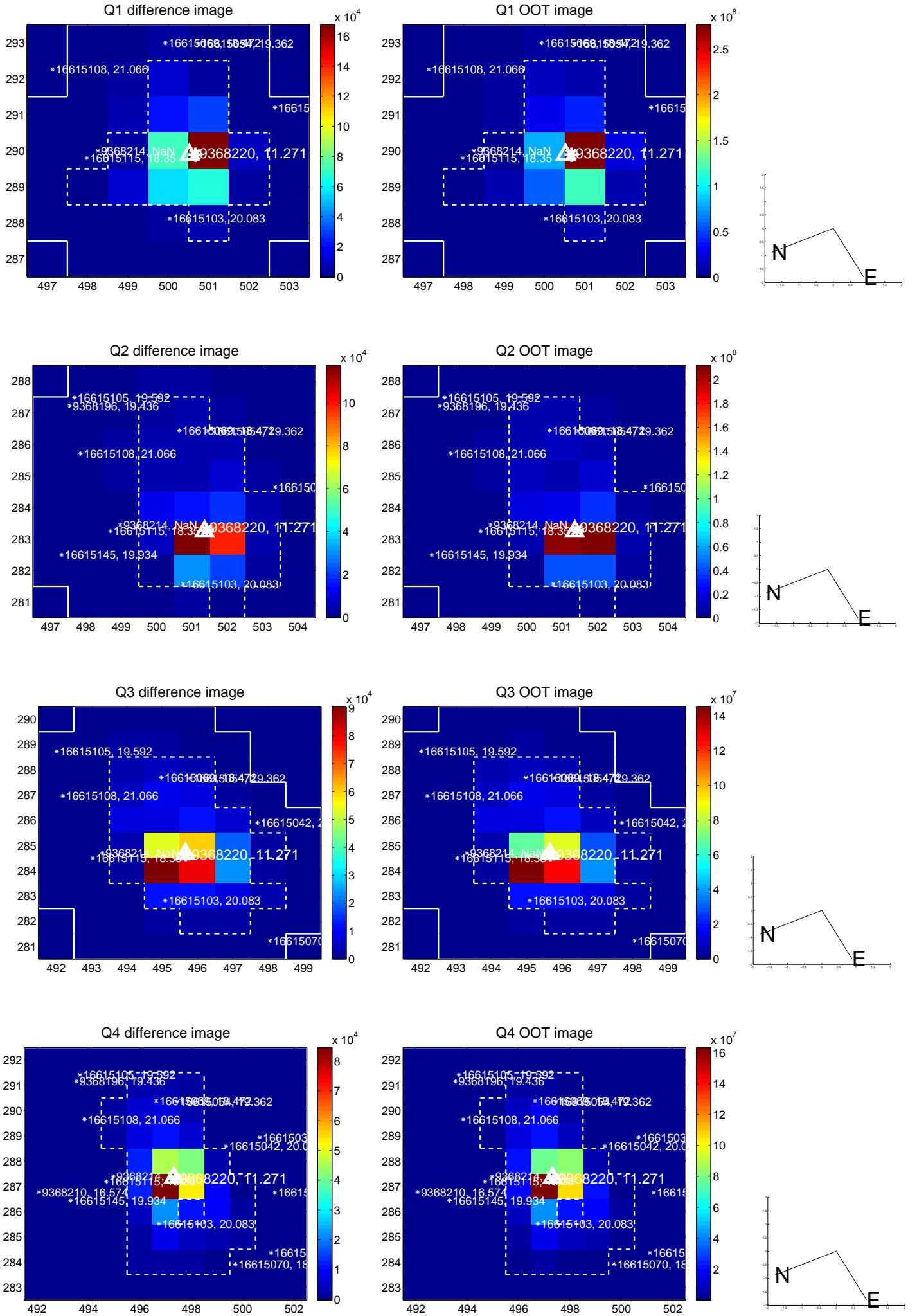


offset from photometric centroids

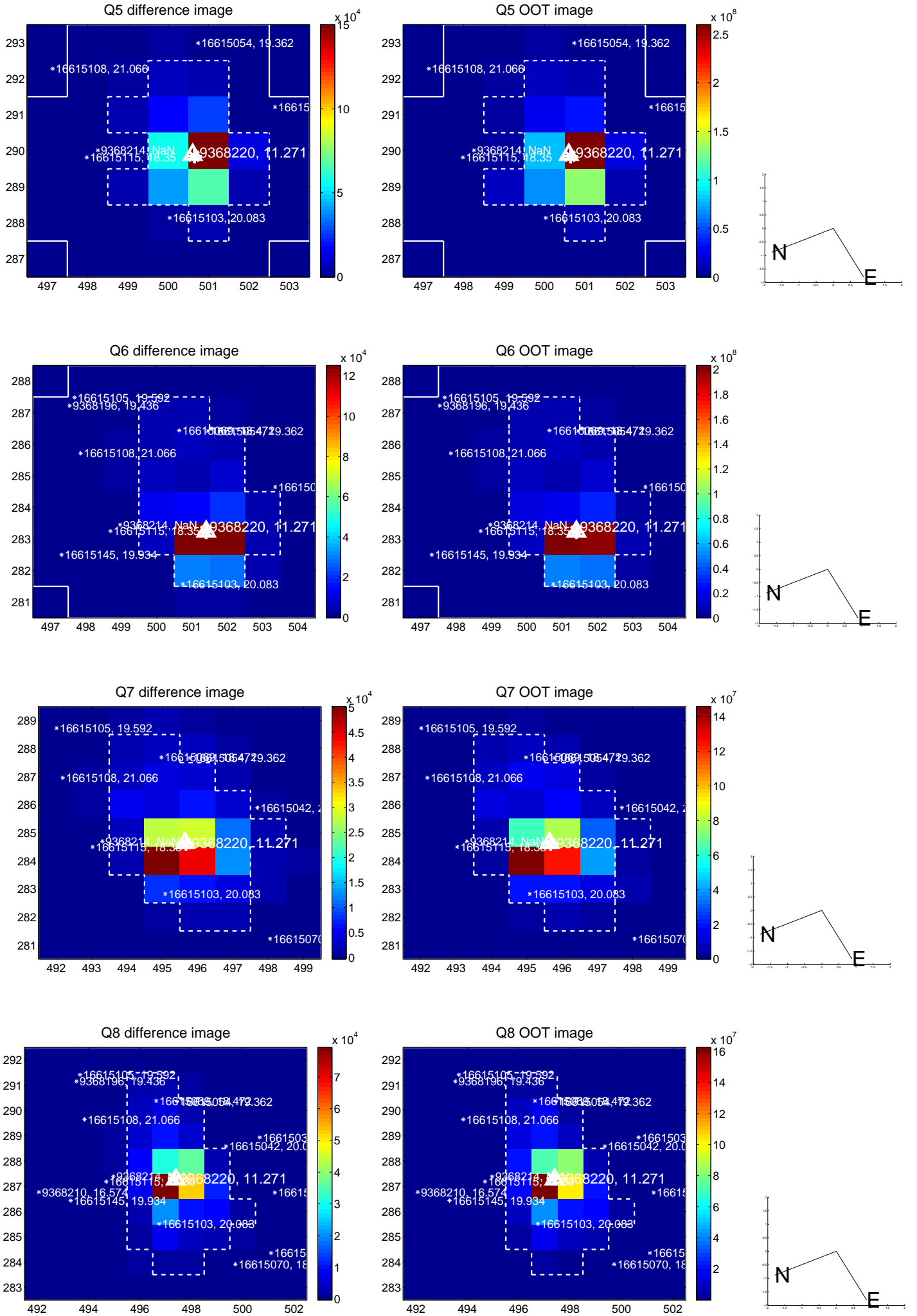


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

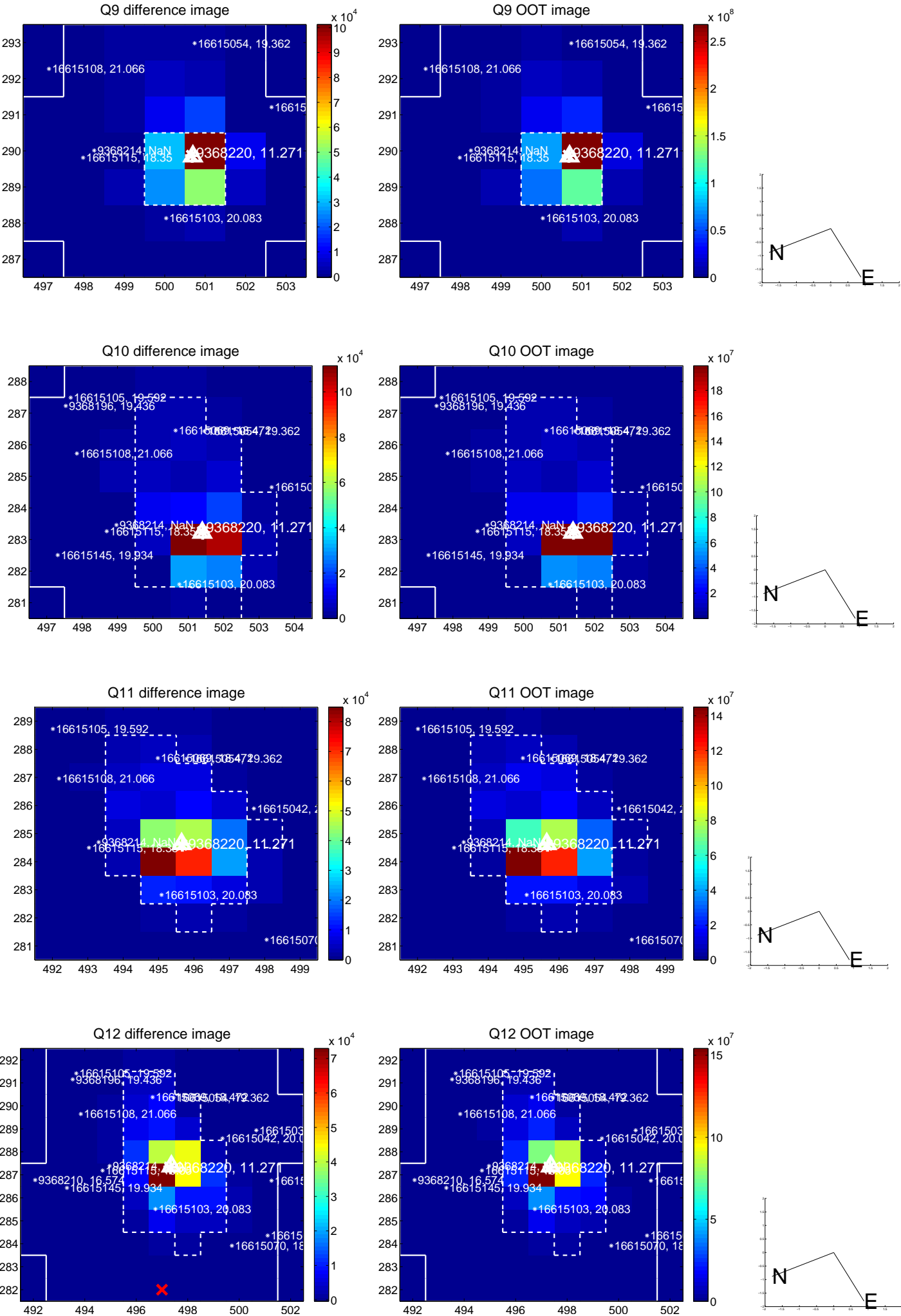
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



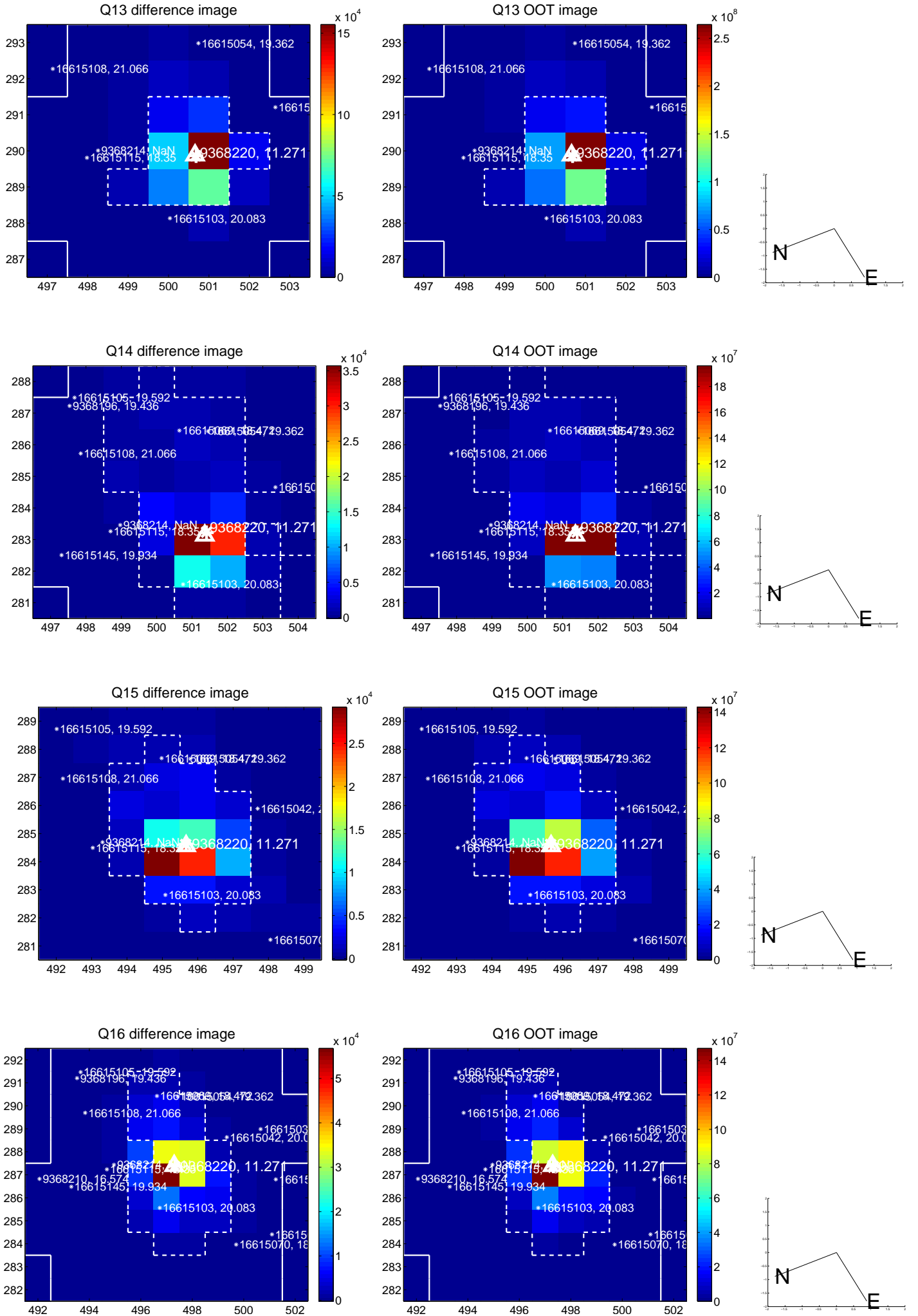
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



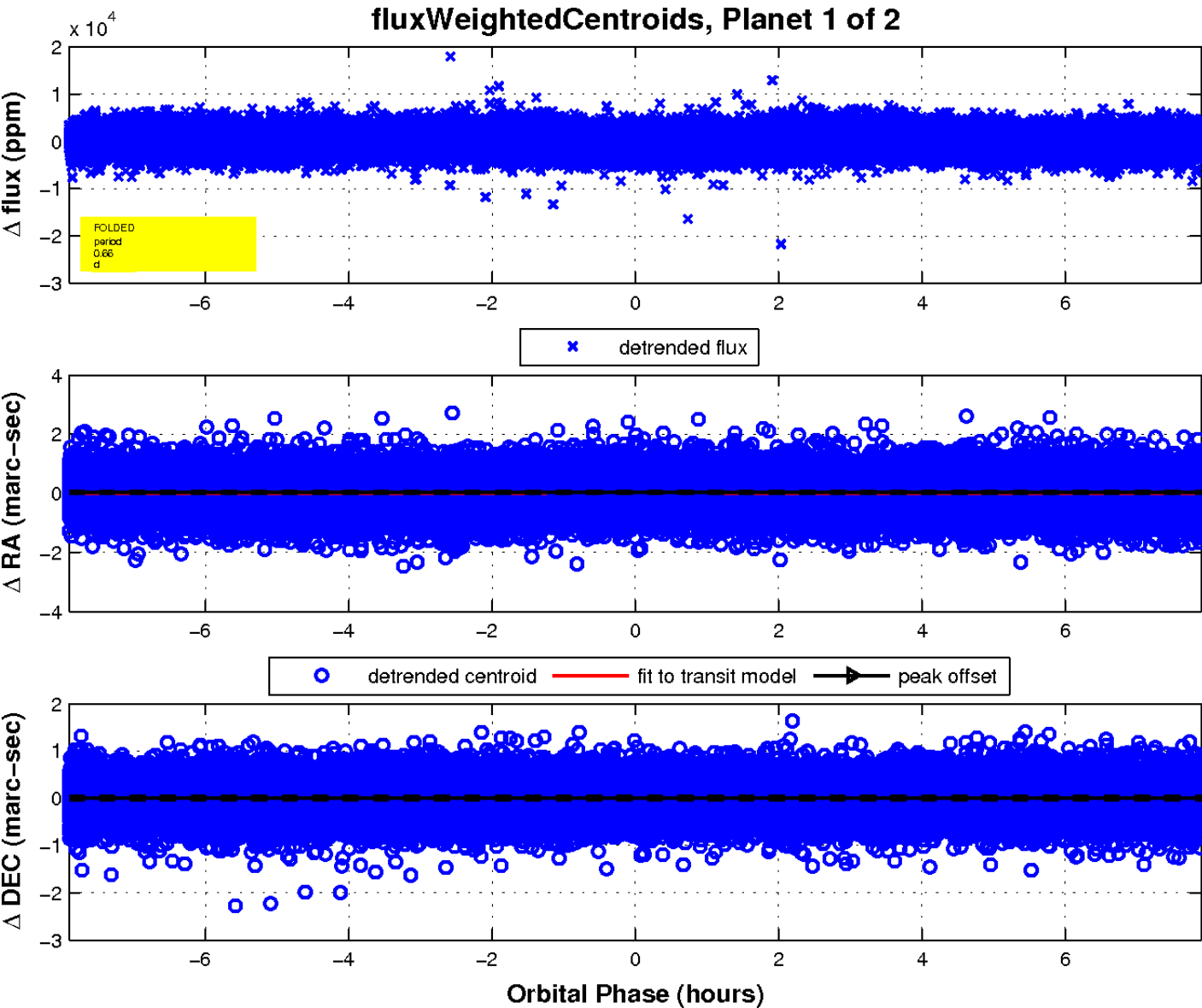
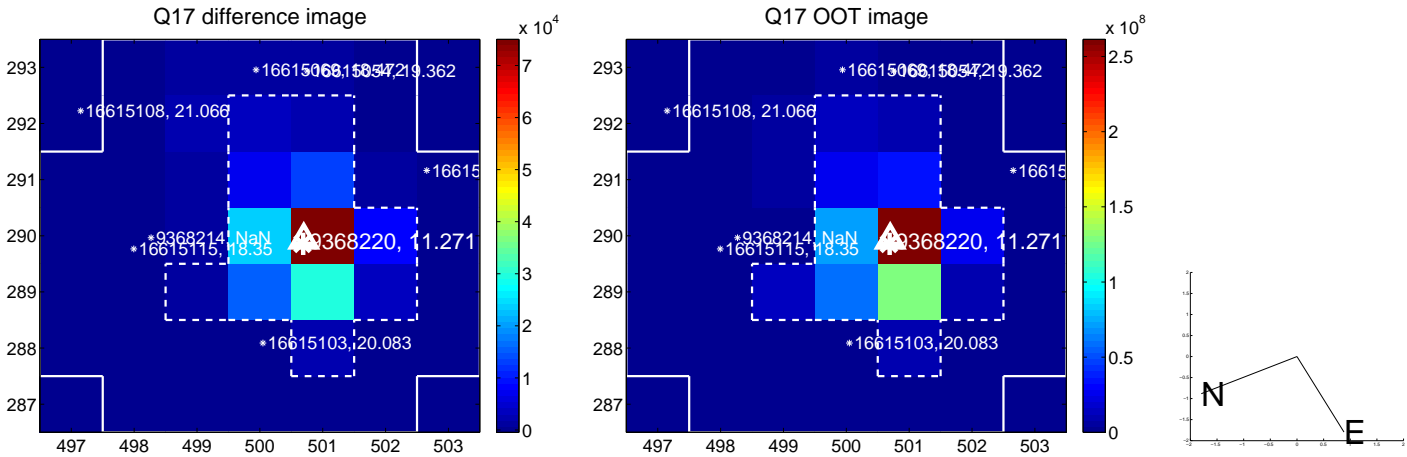
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

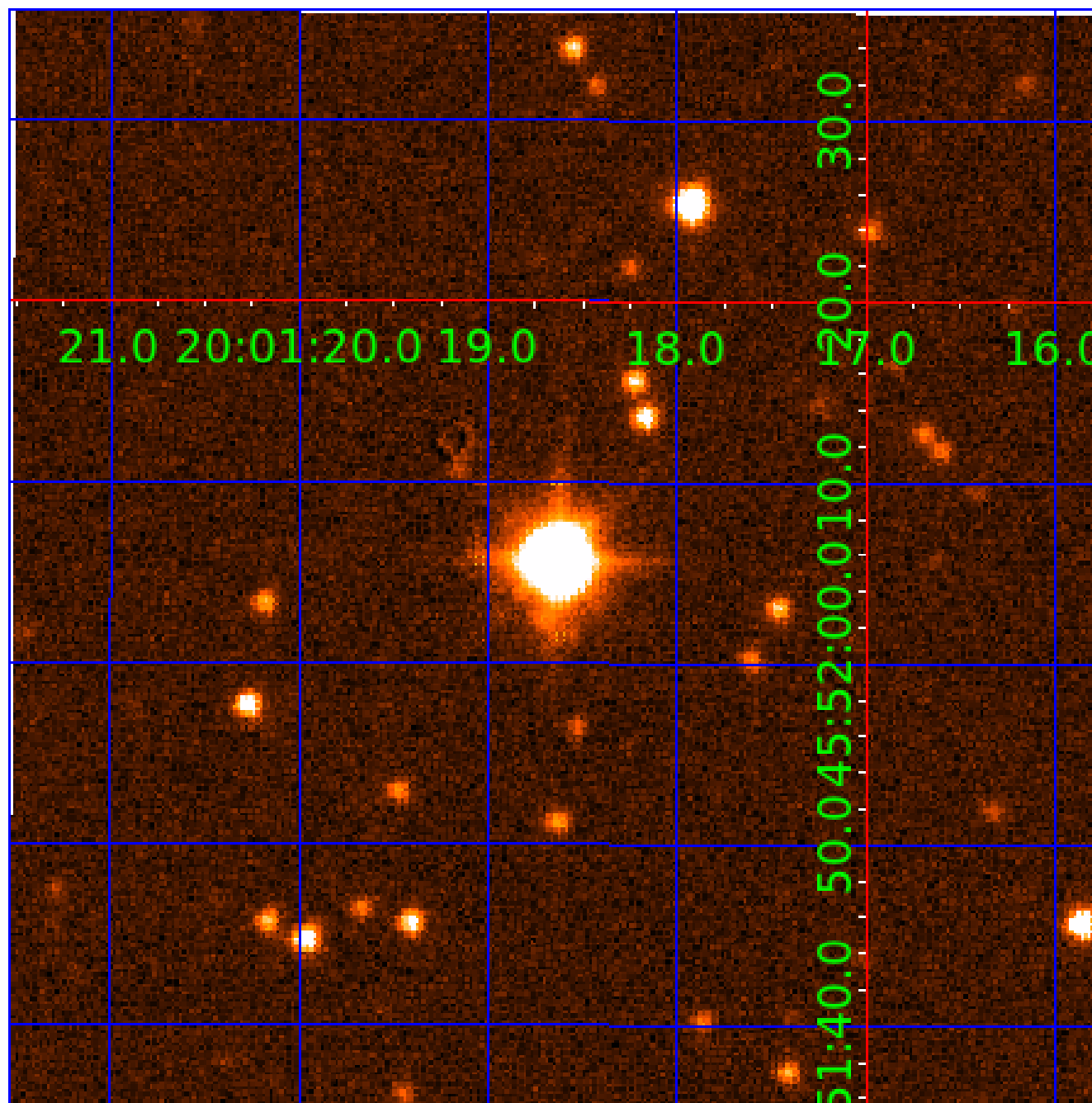


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009368220

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})
009368220-01	OBS	No	0.658334	131.626529	402.9	2.864	15.2	18.3	1.71	6883	4.00	21081.68
009368220-02	OBS	No	0.565038	131.545030	0.9	4.436	13.0	0.0	1.71	6883	0.19	25846.20

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009368220-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
009368220-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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.

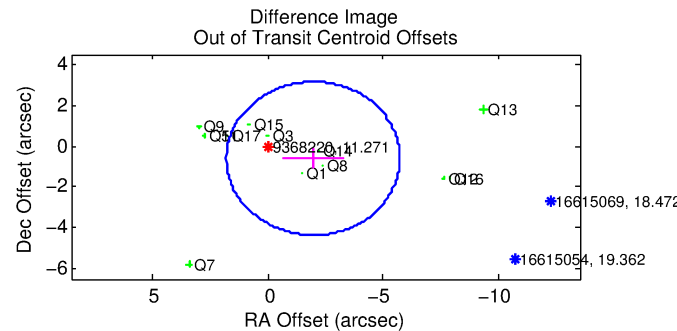
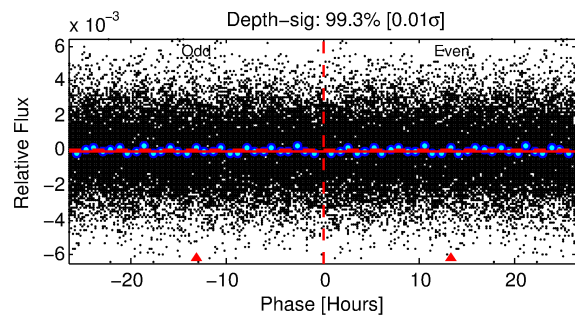
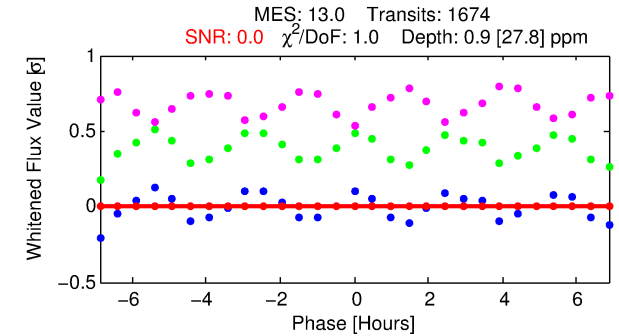
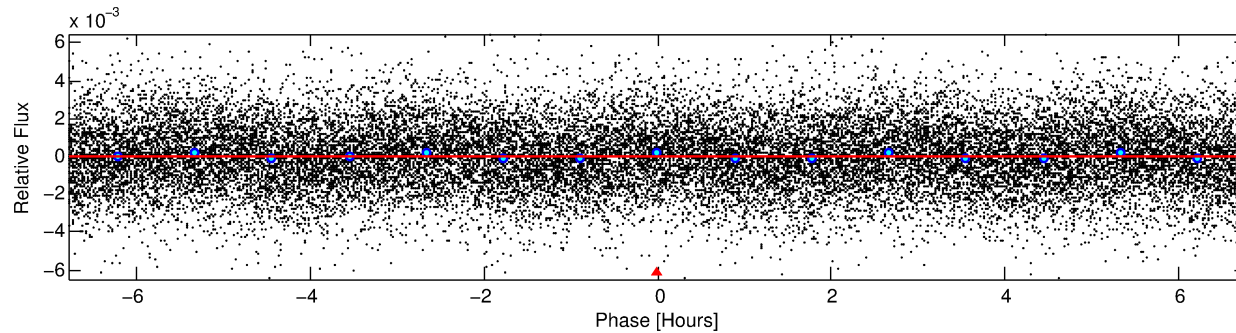
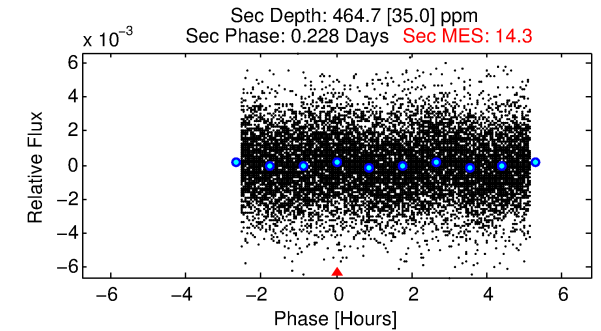
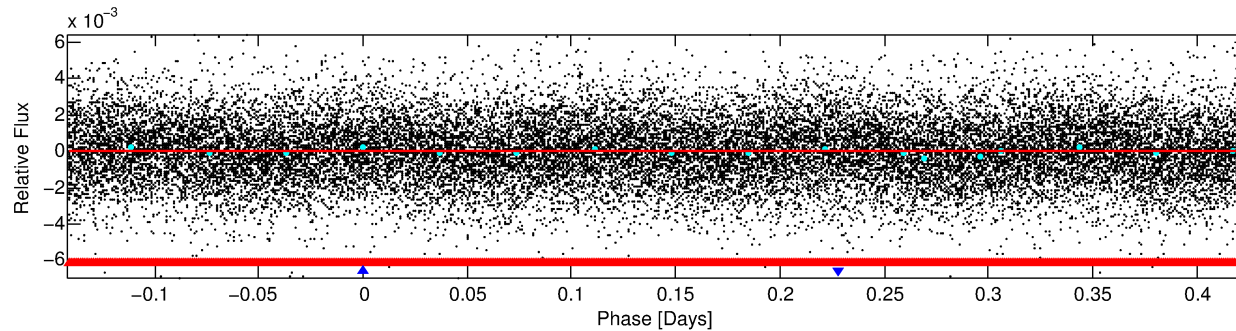
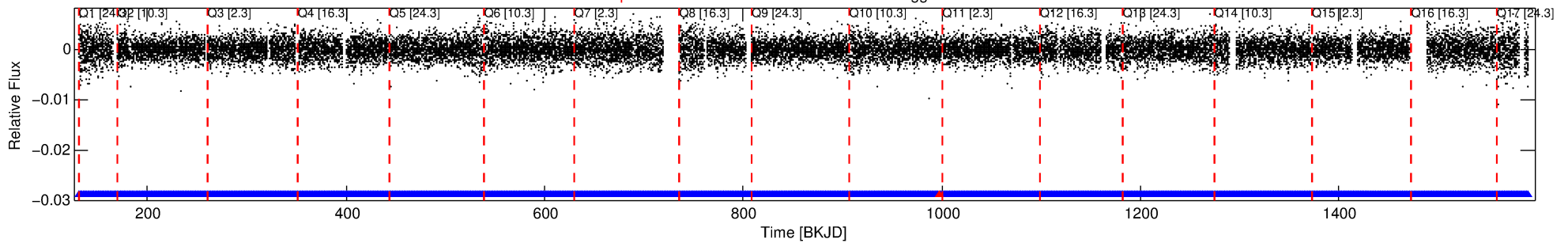
Ephemeris Match Information For 009368220-02

No Significant Match Found

DV One-Page Summary

KIC: 9368220 Candidate: 2 of 2 Period: 0.565 d

Kp: 11.27 R*: 1.71 Rs Teff: 6883.0 K Logg: 4.13 Fe/H: -0.040



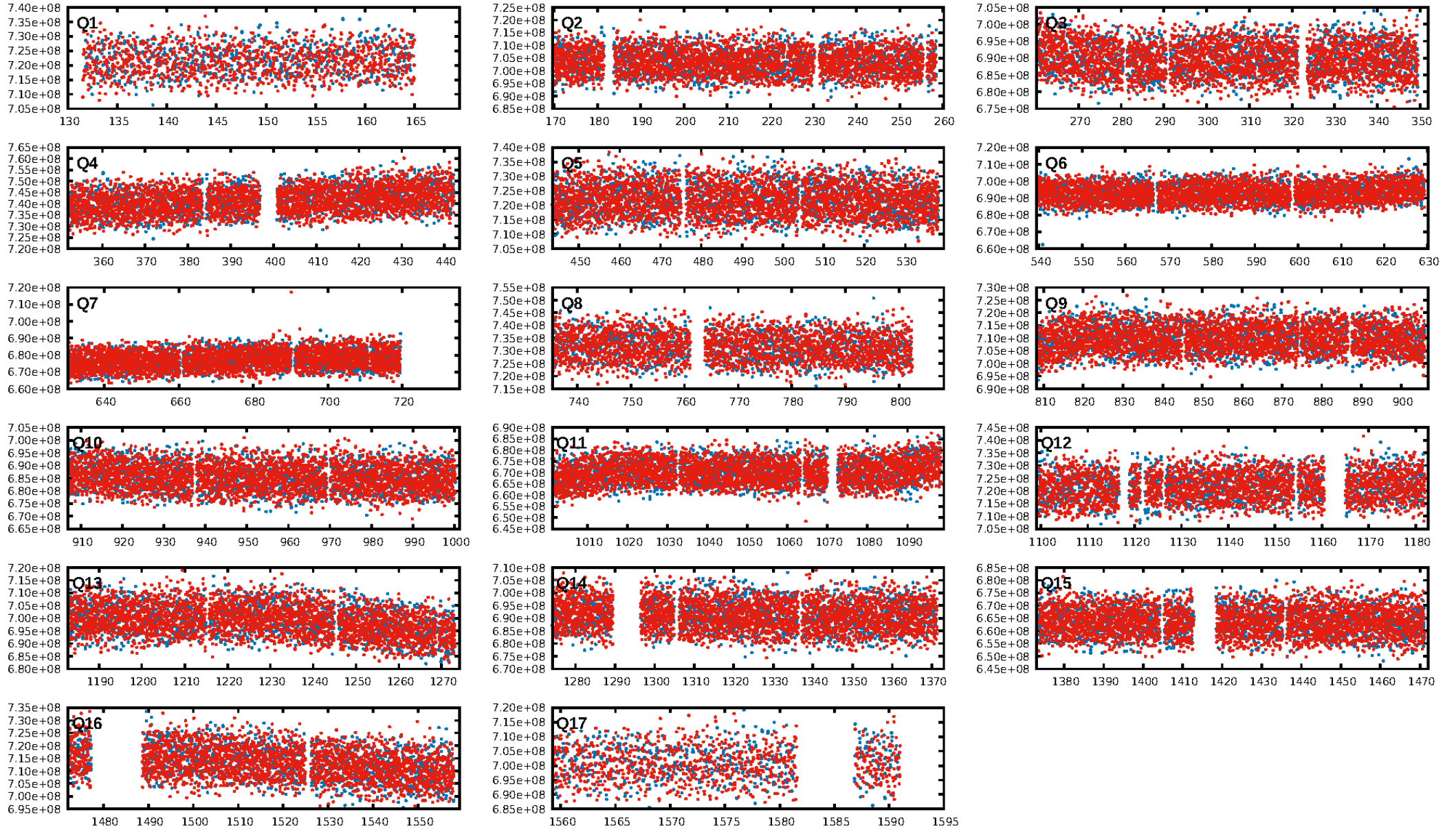
DV Fit Results:

Period = 0.56504 [0.00242] d
Epoch = 131.5450 [0.9467] BKJD
Rp/R* = 0.0010 [0.0411]
a/R* = 1.05 [23.28]
b = 0.85 [78.14]
Seff = 25846.20 [9872.93]
Teq = 3233 [309] K
Rp = 0.19 [7.67] Re
a = 0.0151 [0.0039] AU
Ag = 1663.00 [136528.99] [0.01σ]
Teffp = 31922 [655185] K [0.04σ]

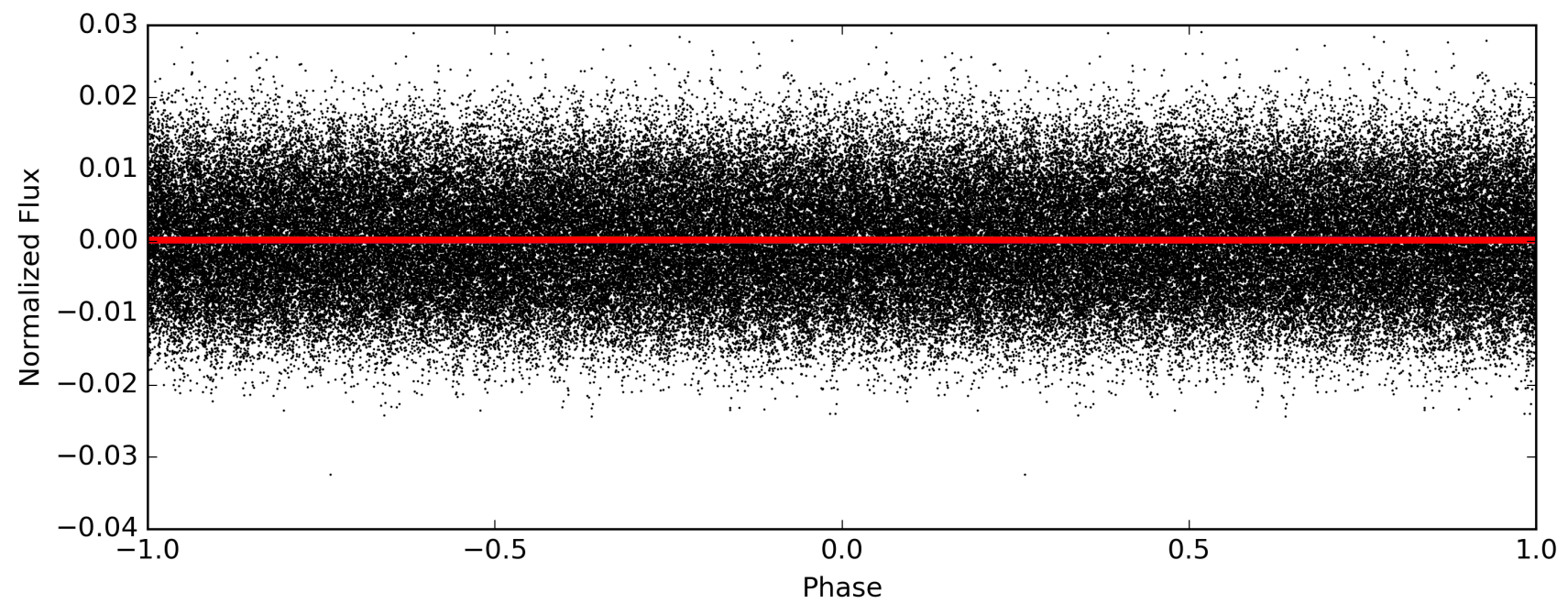
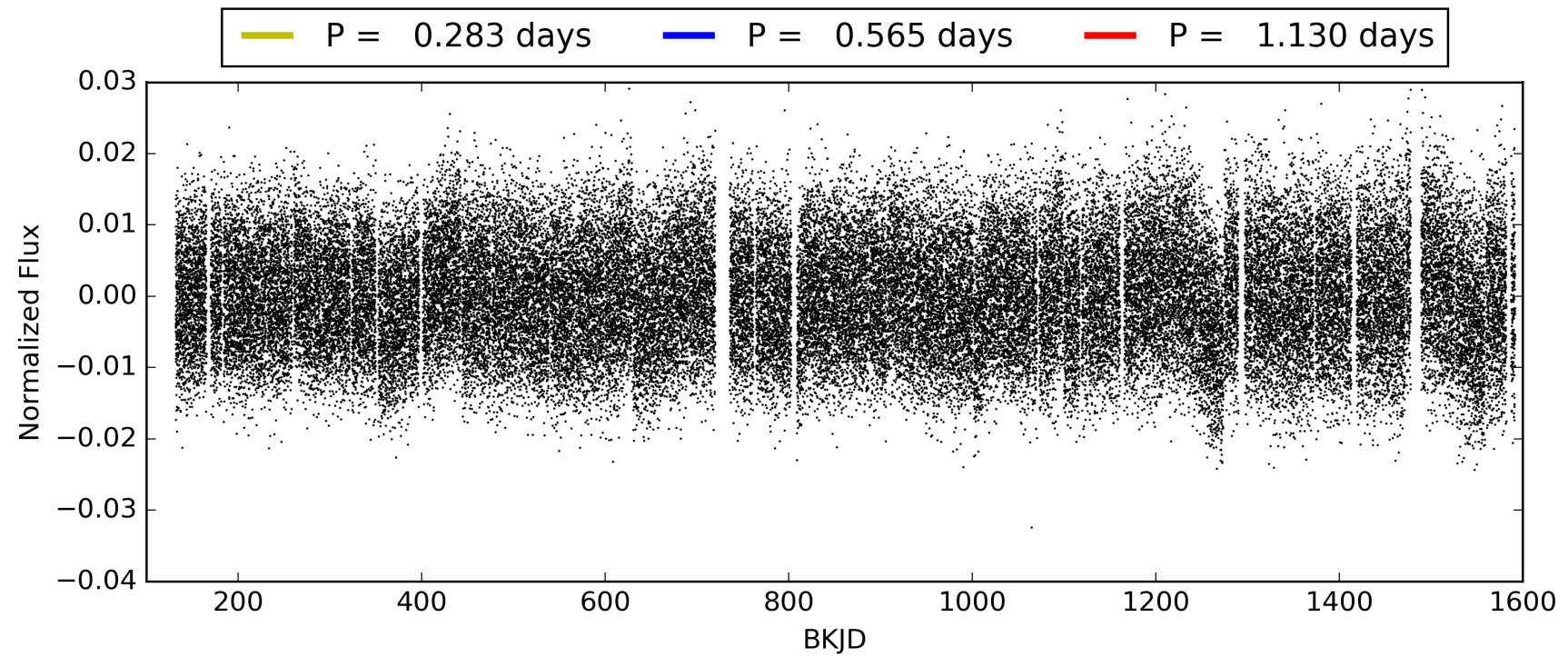
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 32.8% [0.42σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1594/1595]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 2.052 arcsec [1.64σ]
KicOffset-rm: 2.041 arcsec [1.92σ]
OotOffset-st: 1/4/3/5 [13]
KicOffset-st: 1/4/3/5 [13]
DiffImageQuality-fgm: 0.38 [5/13]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009368220-02, PDC Light Curves

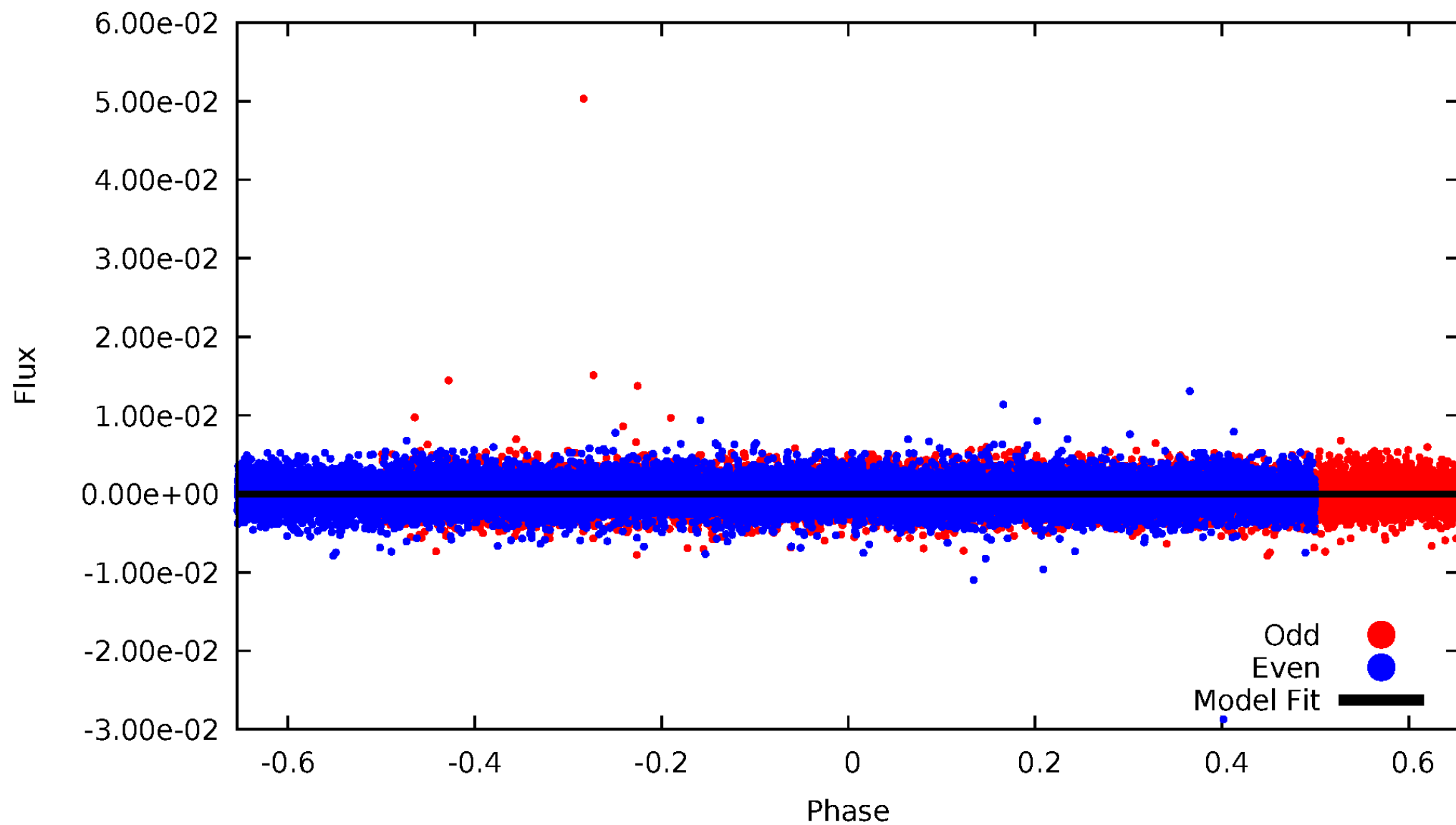


TCE 009368220-02



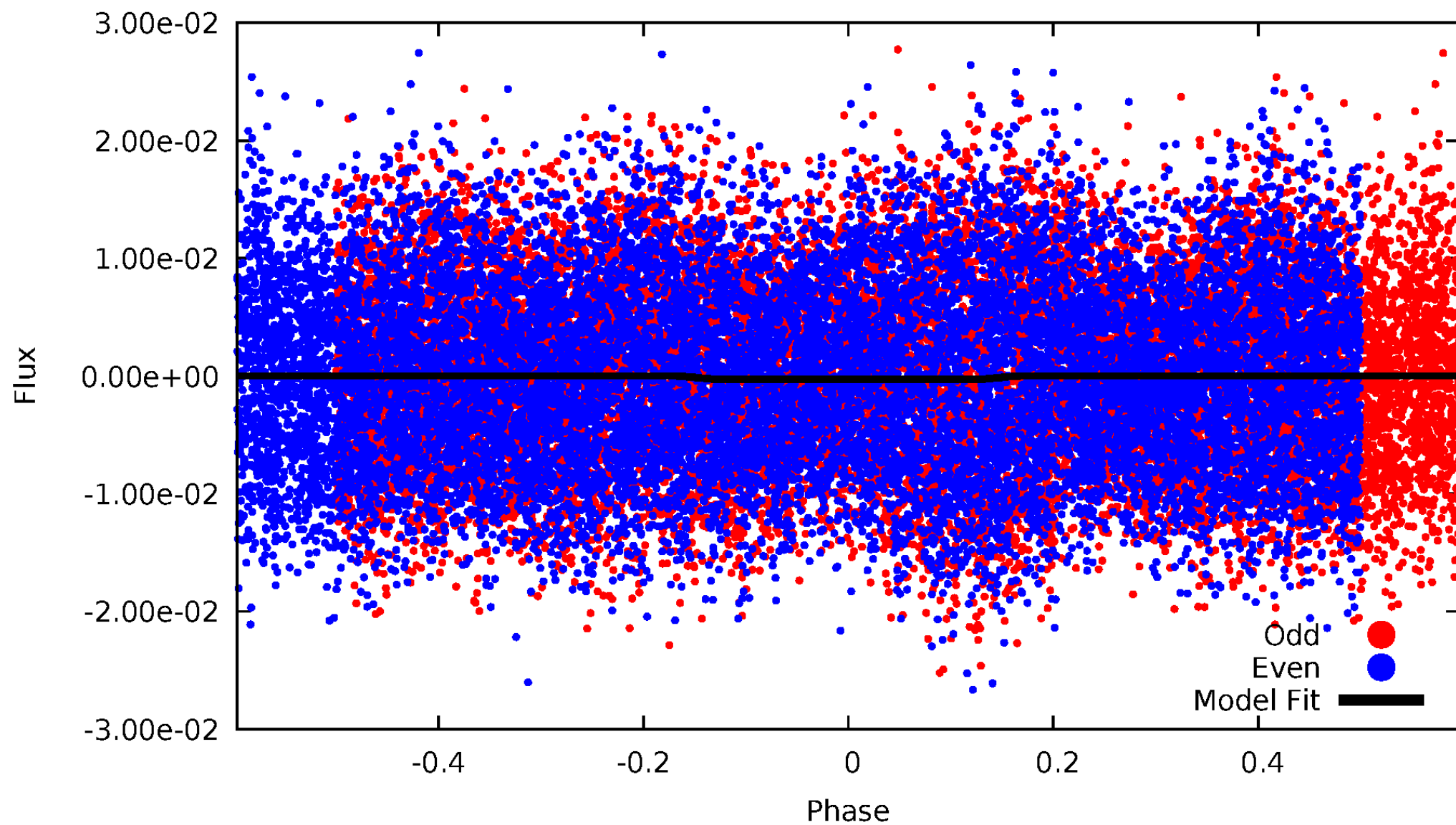
DV Odd/Even

TCE 009368220-02



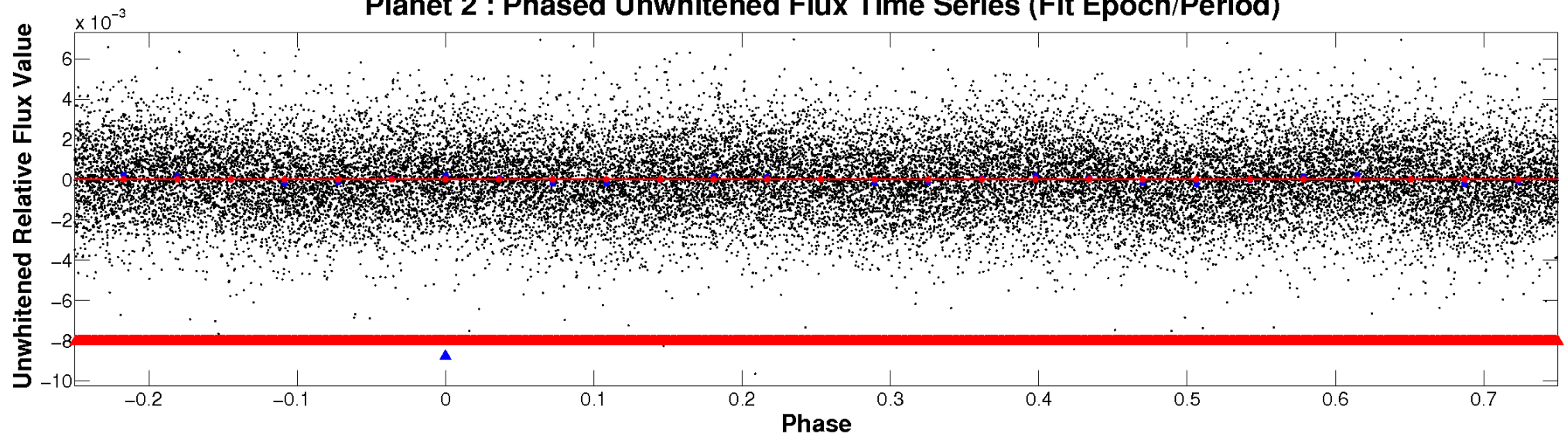
ALT Odd/Even

TCE 009368220-02

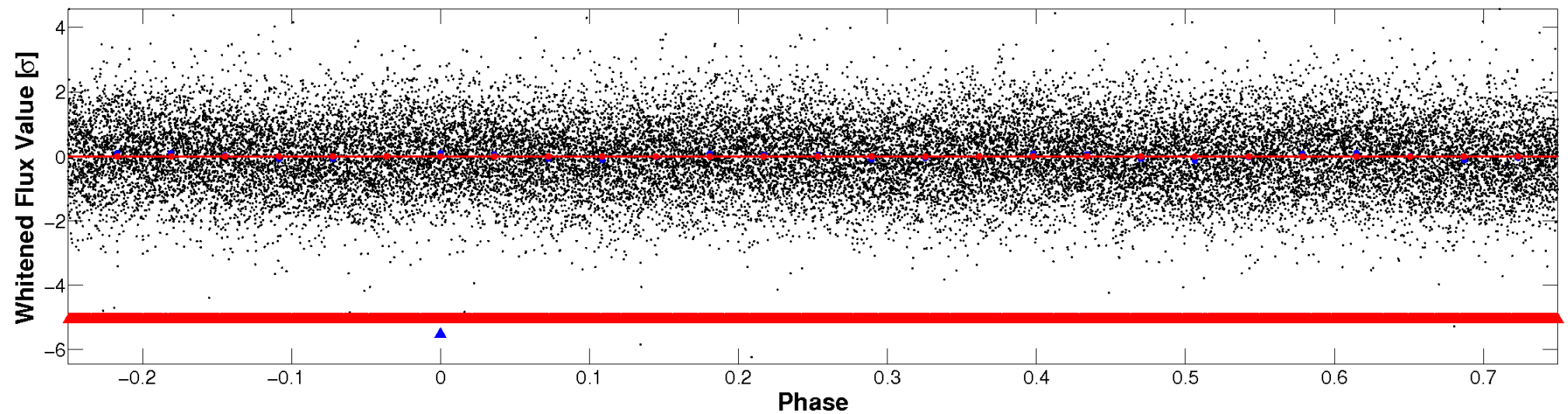


Non-Whitened Vs. Whitened Light Curve

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

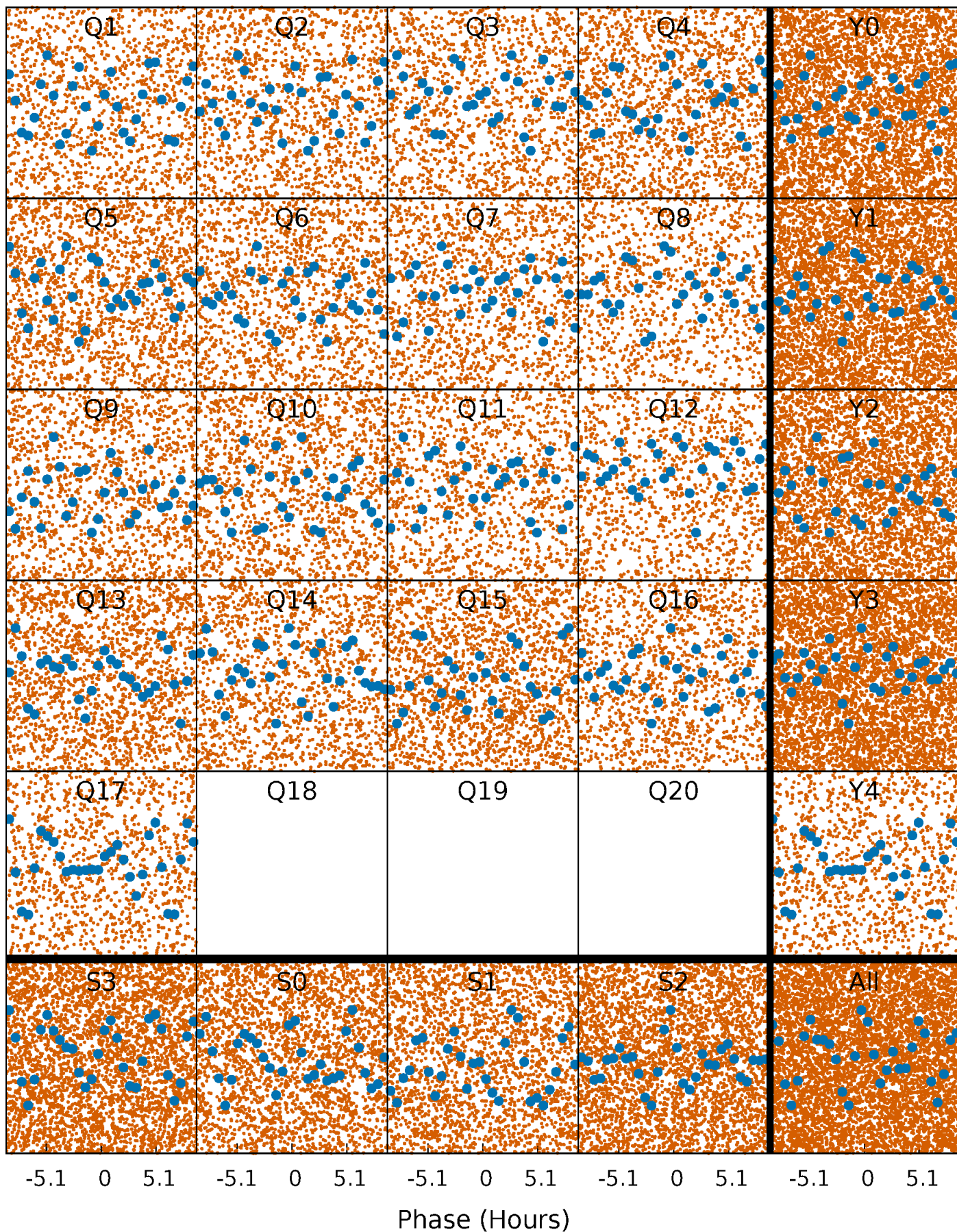


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



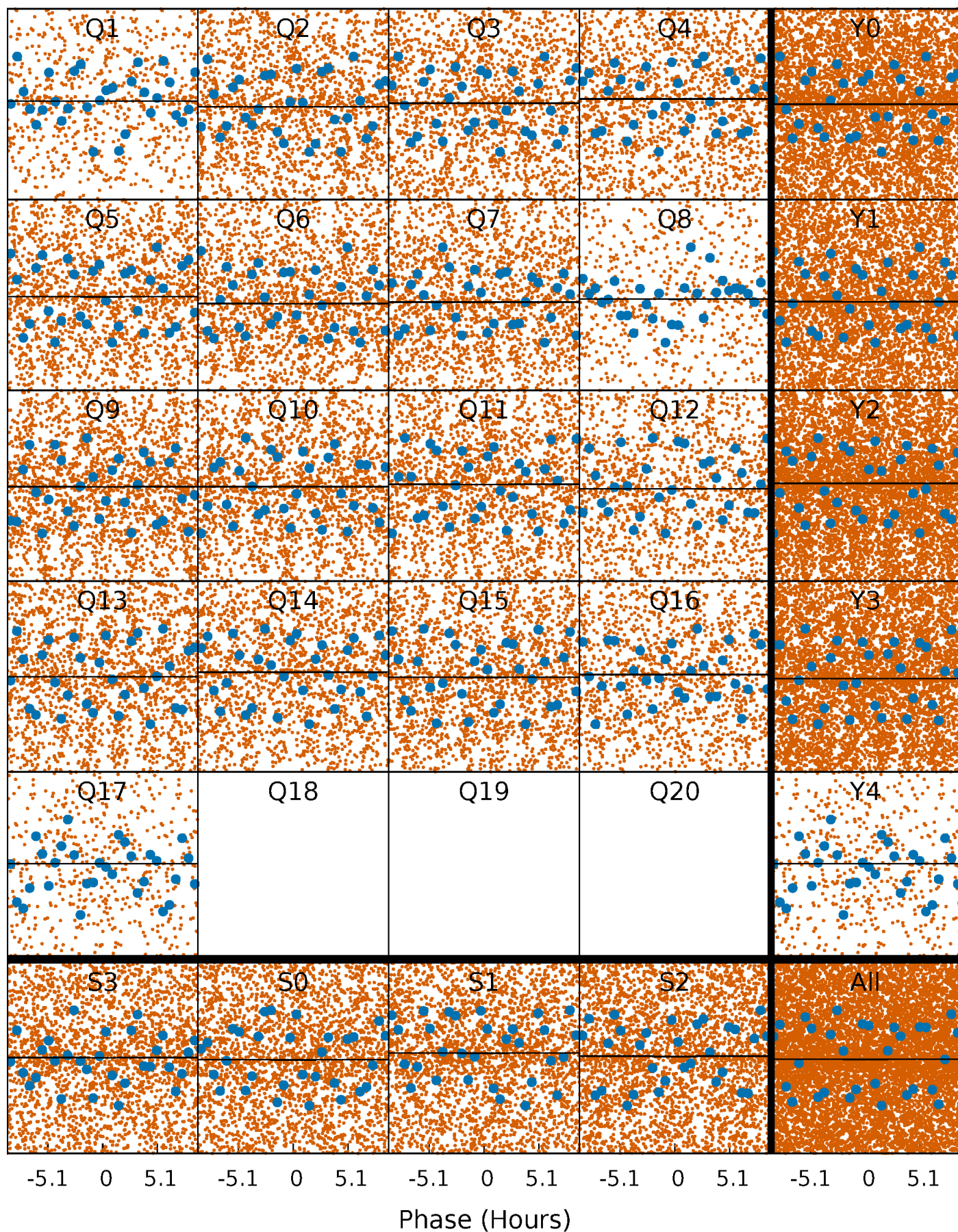
PDC Quarter-Phased Transit Curves

TCE 009368220-02 P= 0.565038 Days $T_0=131.545030$ (BKJD)



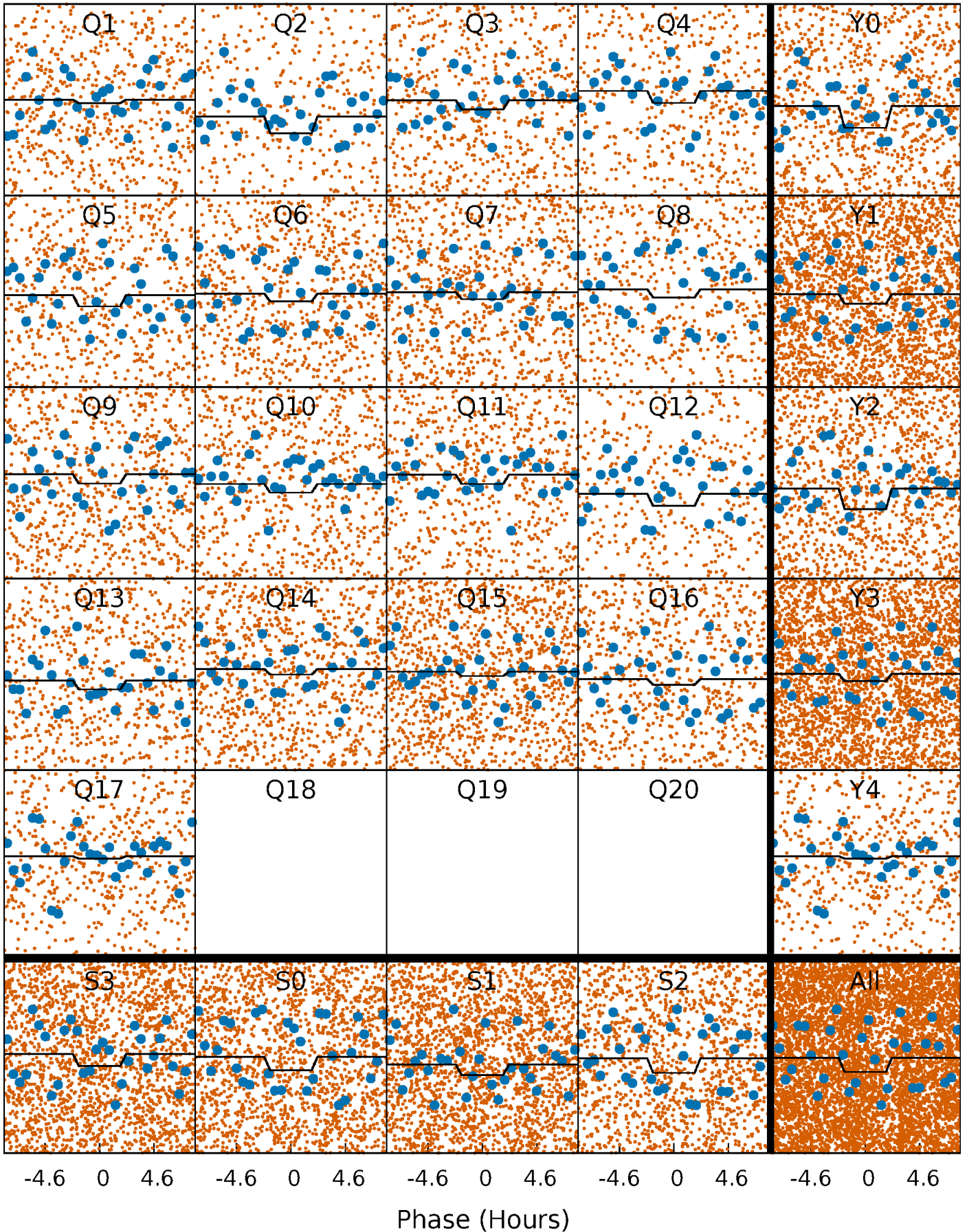
DV Quarter-Phased Transit Curves

TCE 009368220-02 P= 0.565038 Days $T_0=131.545030$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

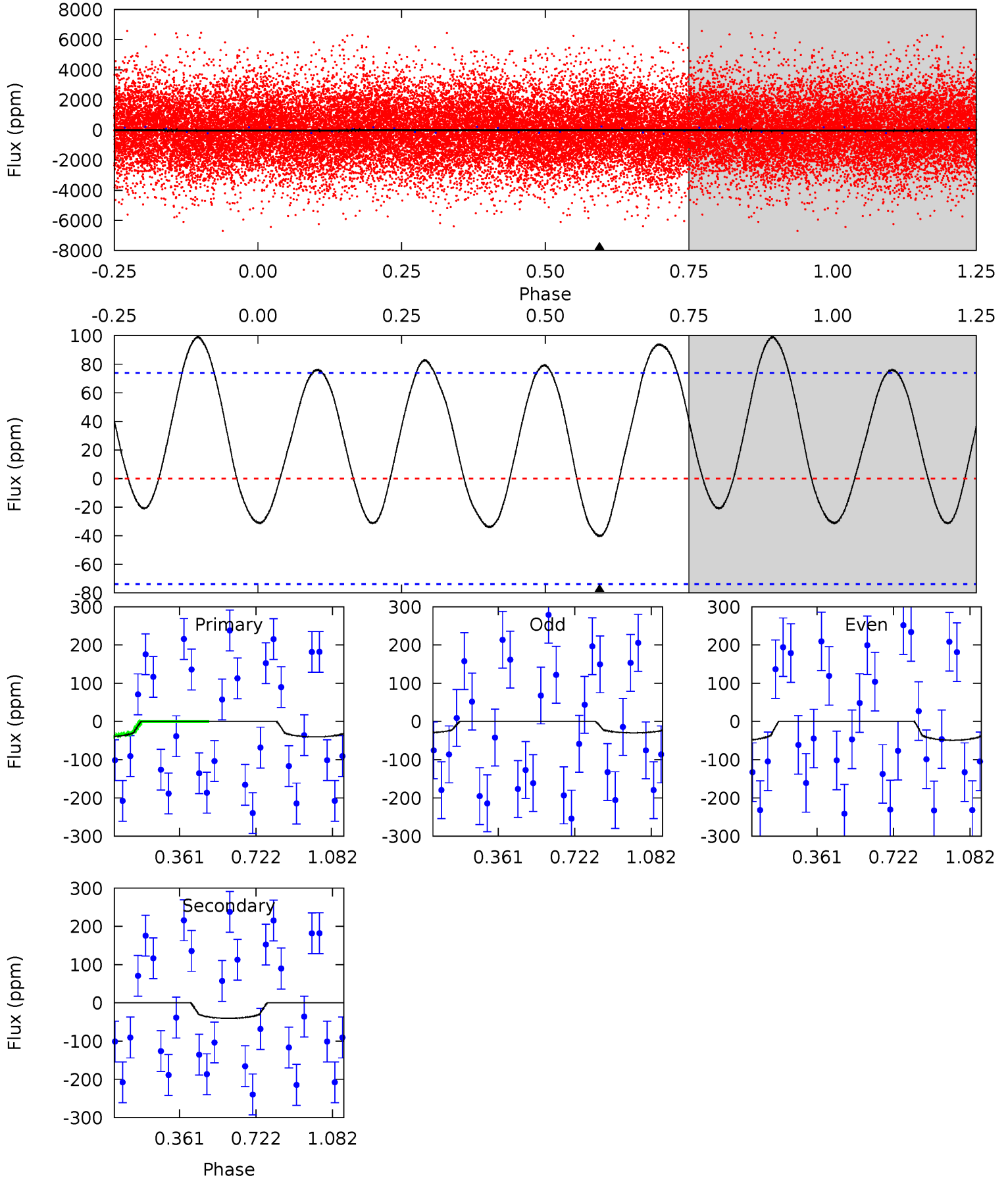
TCE 009368220-02 P= 0.564972 Days $T_0=131.567041$ (BKJD)



DV Model-Shift Uniqueness Test

009368220-02, P = 0.565038 Days, E = 131.545030 Days

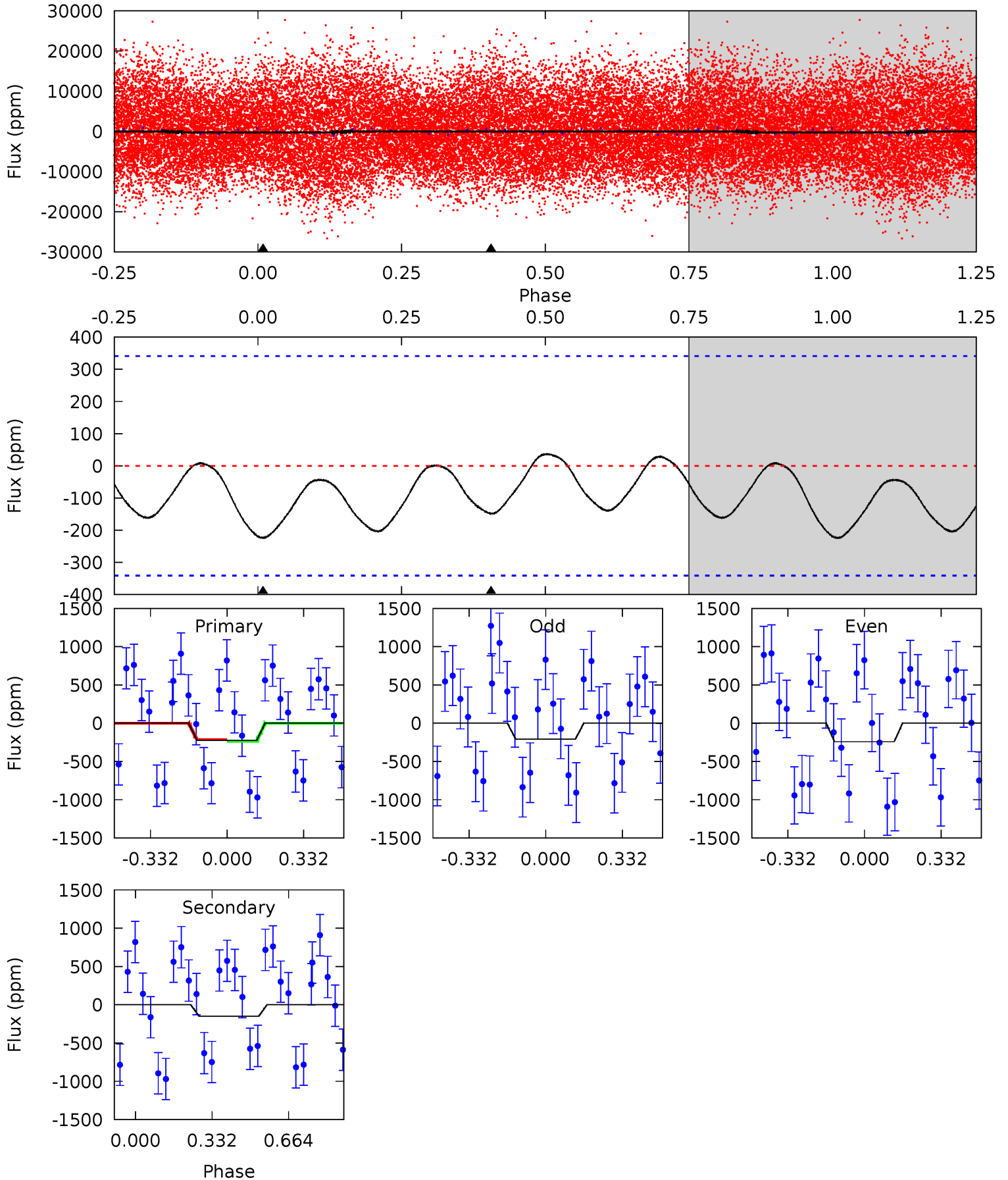
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.34	2.34	0	0	4.29	0.91	2.15	2.34	2.34	2.34	2.34	0.58	0.68	0.71	0.10



Alt Model-Shift Uniqueness Test

009368220-02, P = 0.564972 Days, E = 131.567041 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.84	1.88	0	0	4.31	0.97	0.39	2.84	2.84	1.88	1.88	0.22	1.73	0.14	0.14



Stellar Parameters For KIC 009368220

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6883^{+172}_{-224}	$4.128^{+0.153}_{-0.187}$	$-0.040^{+0.250}_{-0.350}$	$1.709^{+0.553}_{-0.369}$	$1.438^{+0.213}_{-0.234}$	$0.406^{+0.336}_{-0.215}$
	+2%/-3%	+4%/-5%	+625%/-875%	+32%/-22%	+15%/-16%	+83%/-53%
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 009368220-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-40 ± 17	$5.15^{+6.12}_{-3.65}$	4531^{+331}_{-283}	-3462^{+9131}_{-523}	$0.166^{+1.857}_{-0.132}$
Alt.	-149 ± 79	$6.78^{+6.20}_{-4.86}$	4526^{+326}_{-295}	3015^{+4225}_{-6805}	$0.353^{+4.479}_{-0.268}$

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 $A_{obs} \gg 1.0$

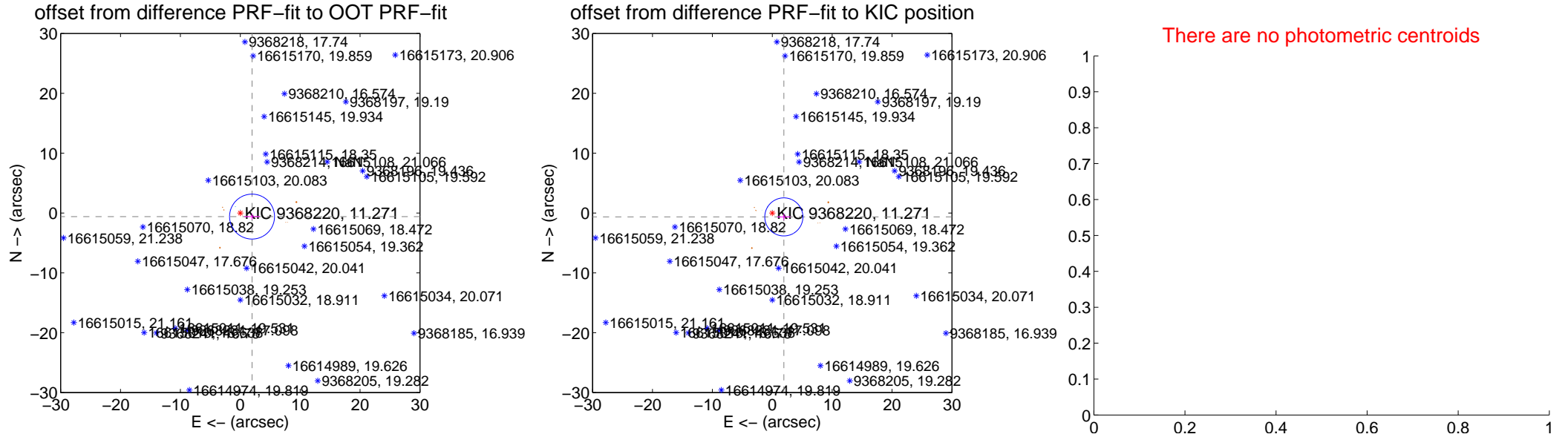
DV Centroid Data

Supplemental centroid analysis for 009368220-02. **Kepler magnitude: 11.27.** Transit SNR 0.05

There are 5 quarters with good PRF difference image offsets

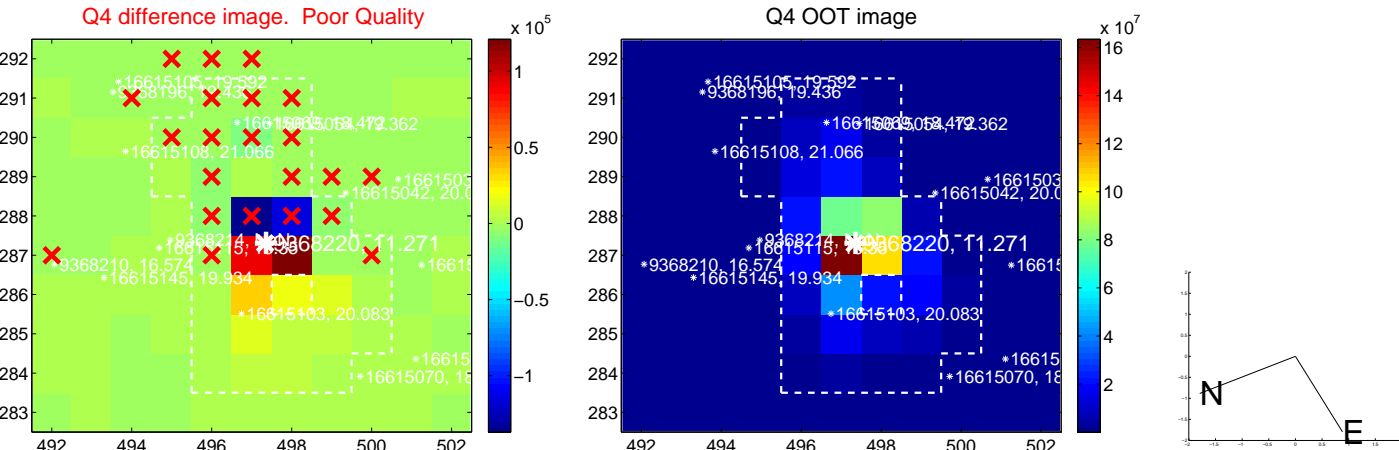
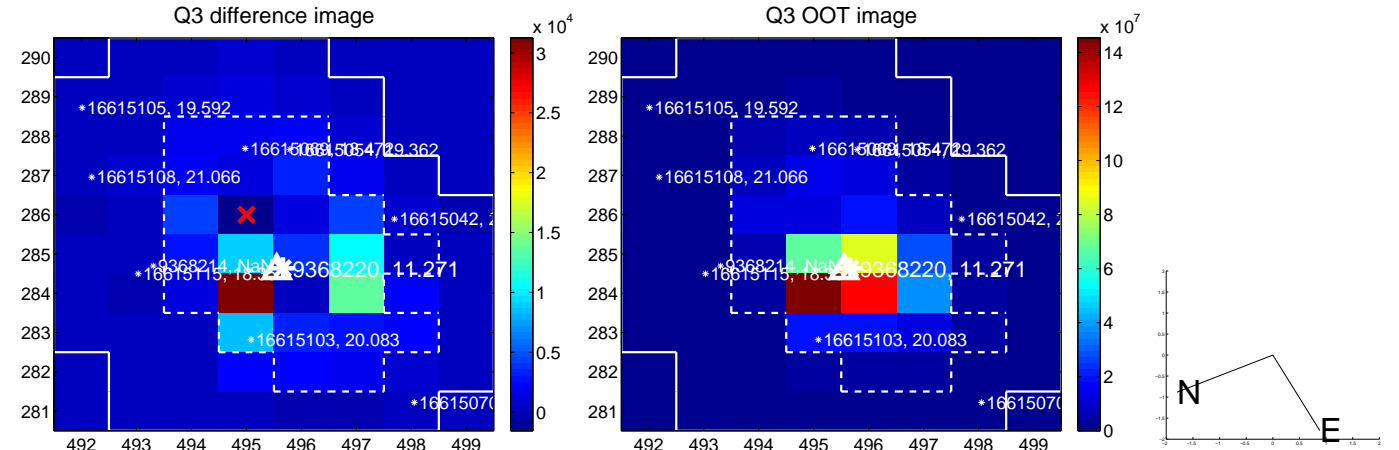
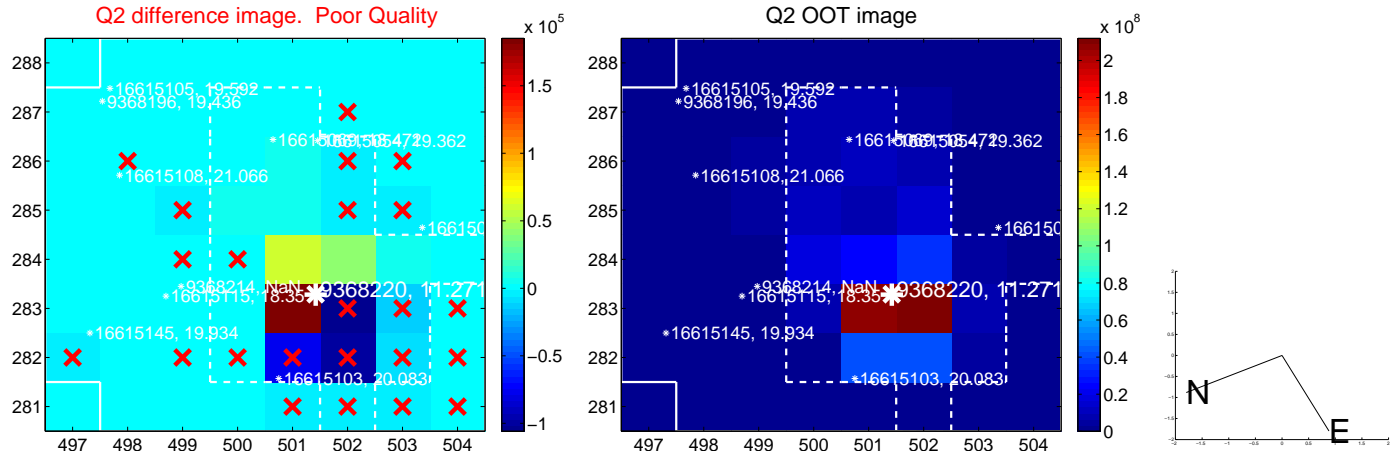
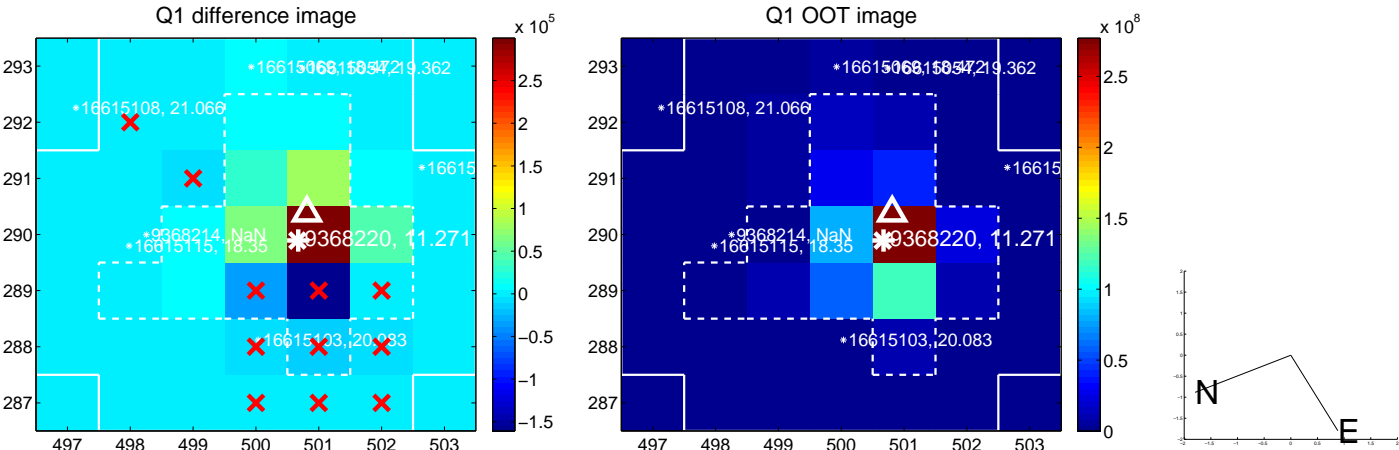
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.052 ± 1.251	1.64	-1.962 ± 1.303	-0.599 ± 0.470
PRF-fit source offset from KIC position	2.041 ± 1.061	1.92	-1.935 ± 1.101	-0.651 ± 0.521
photometric centroid source offset	—	—	—	—

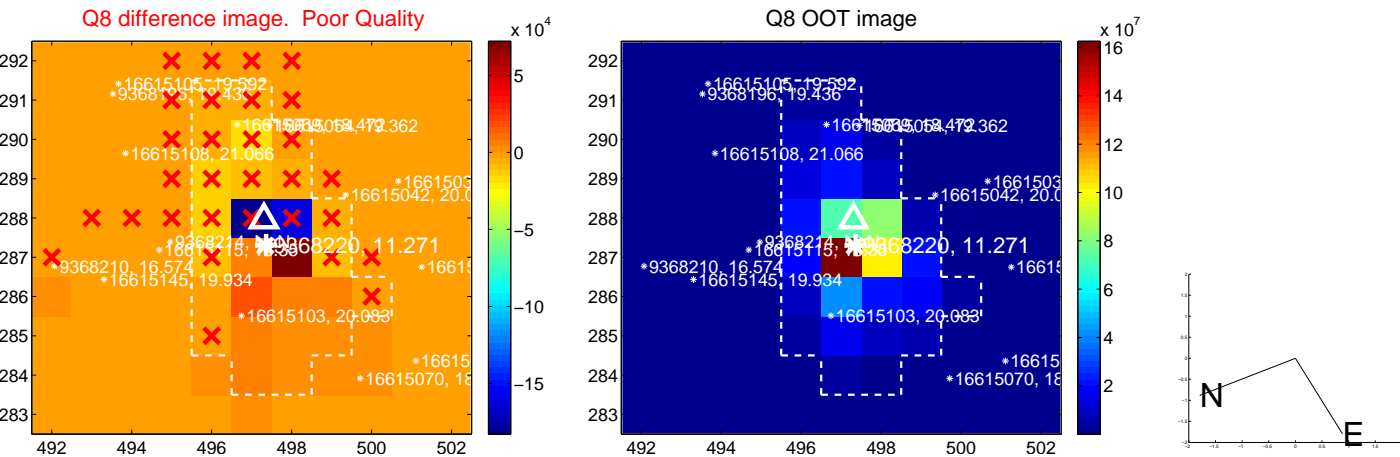
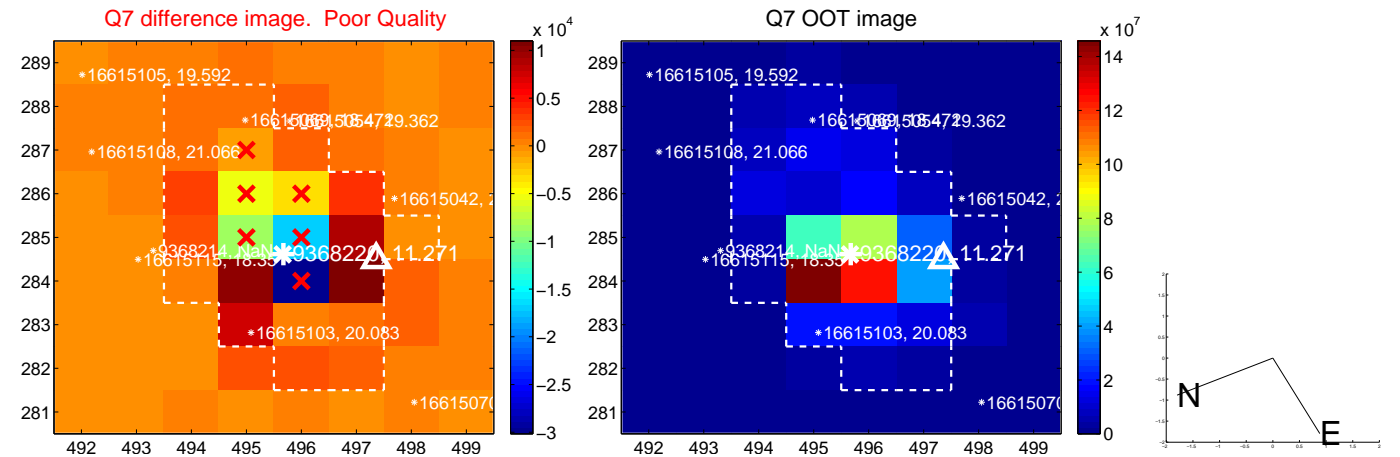
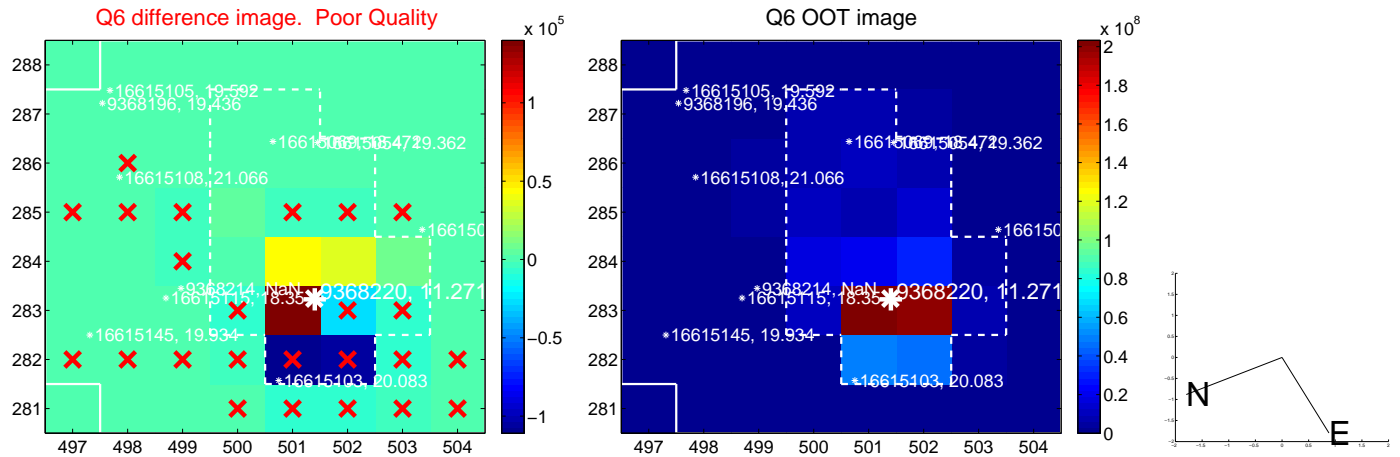
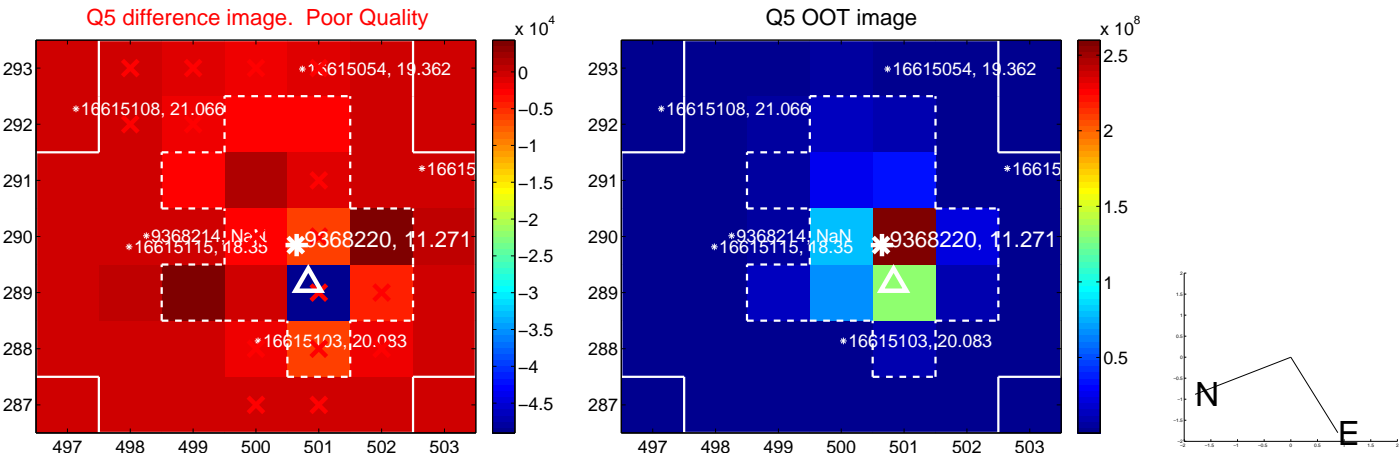


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

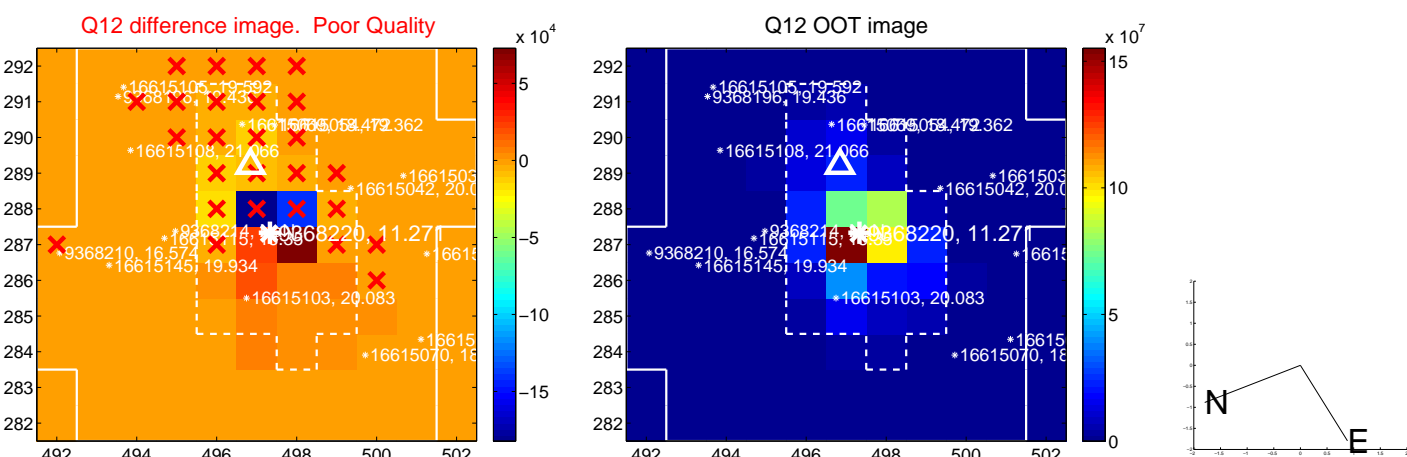
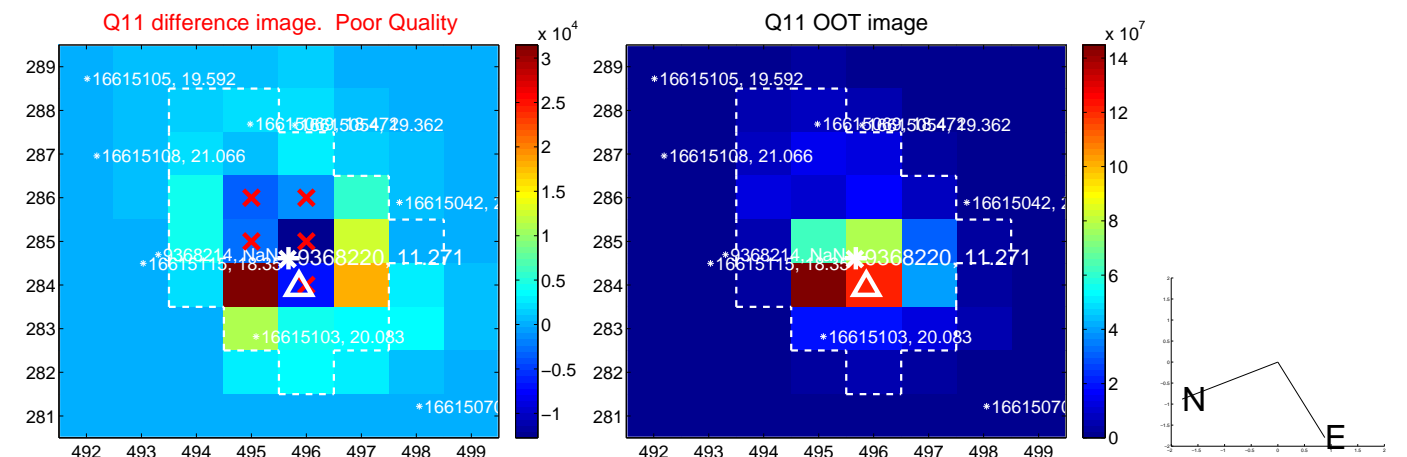
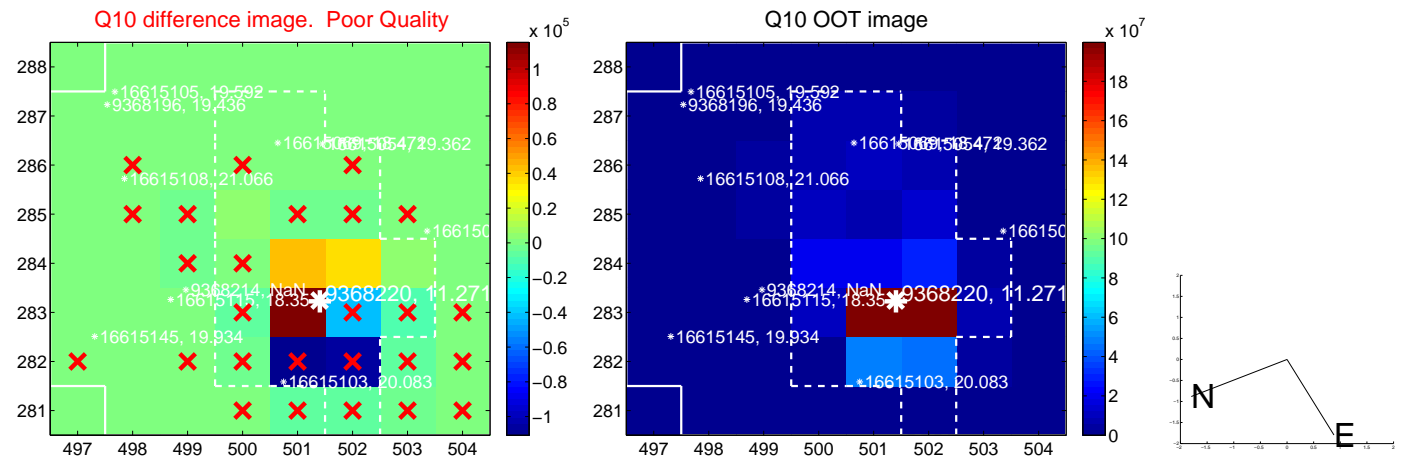
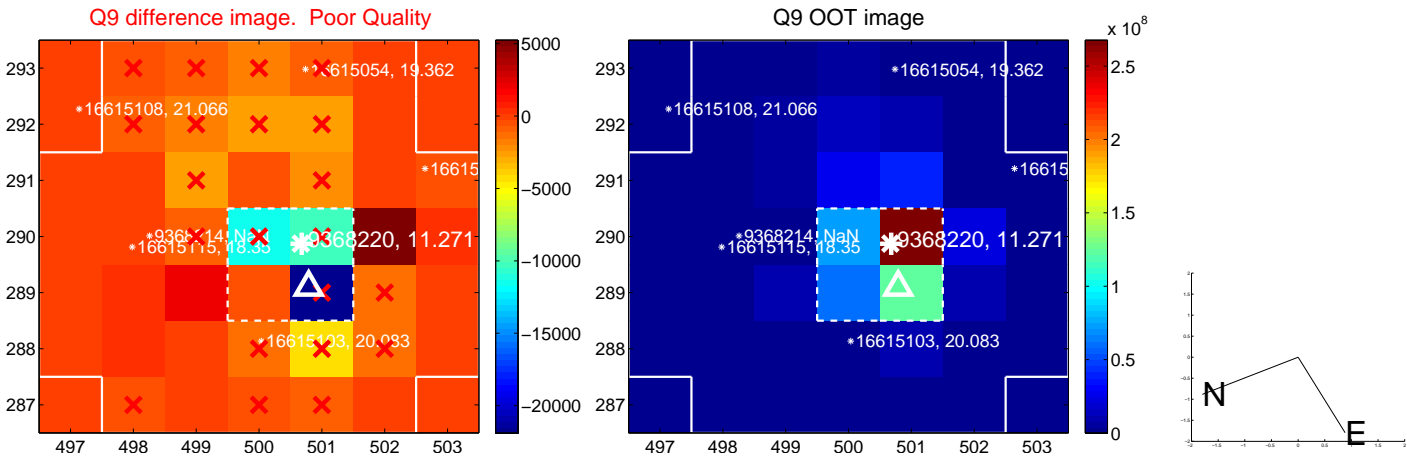
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



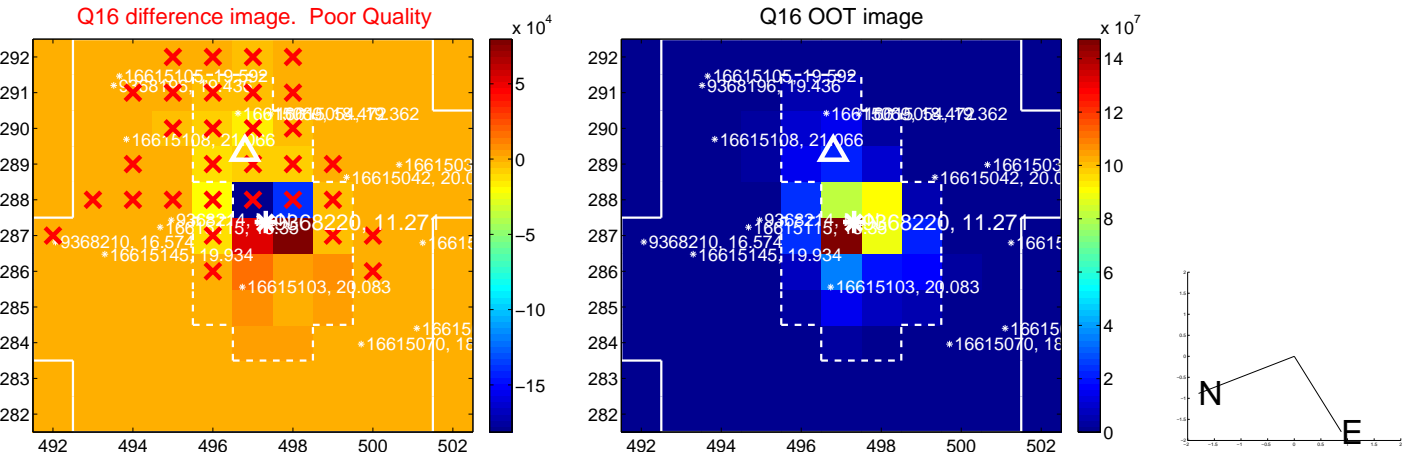
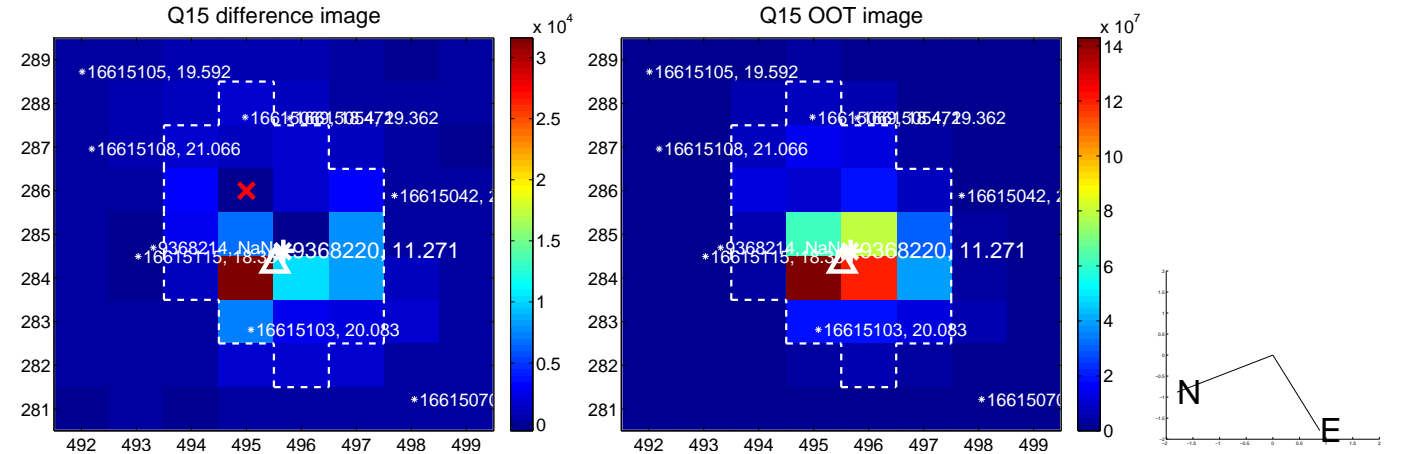
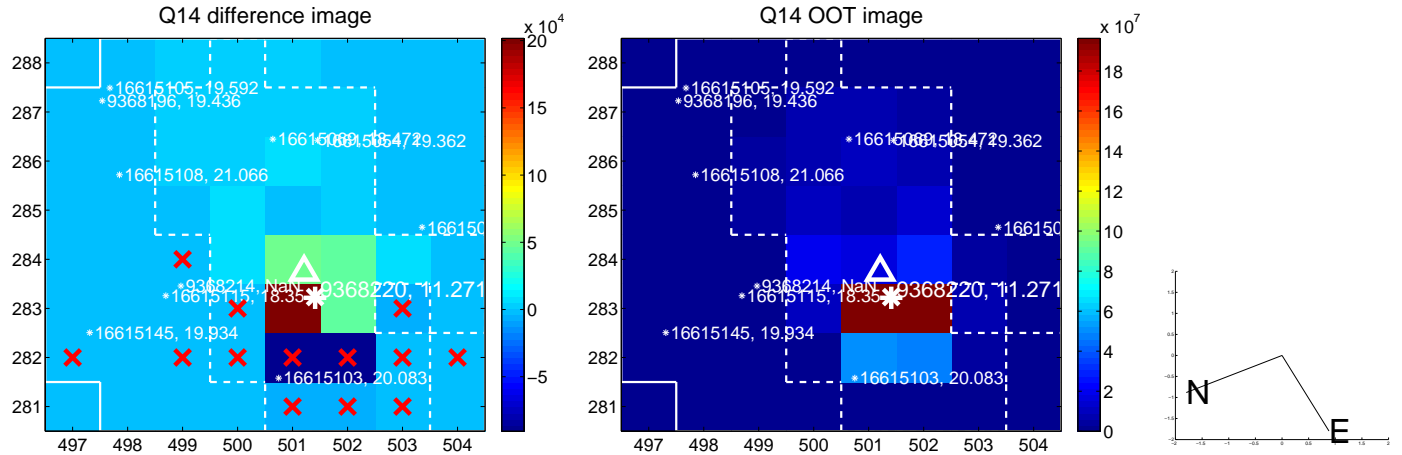
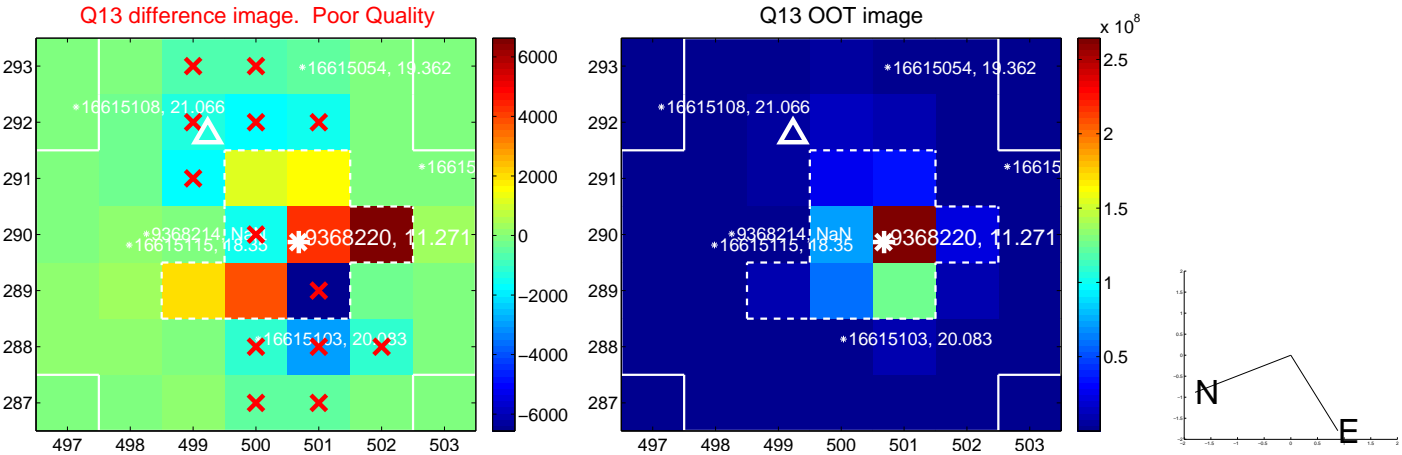
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



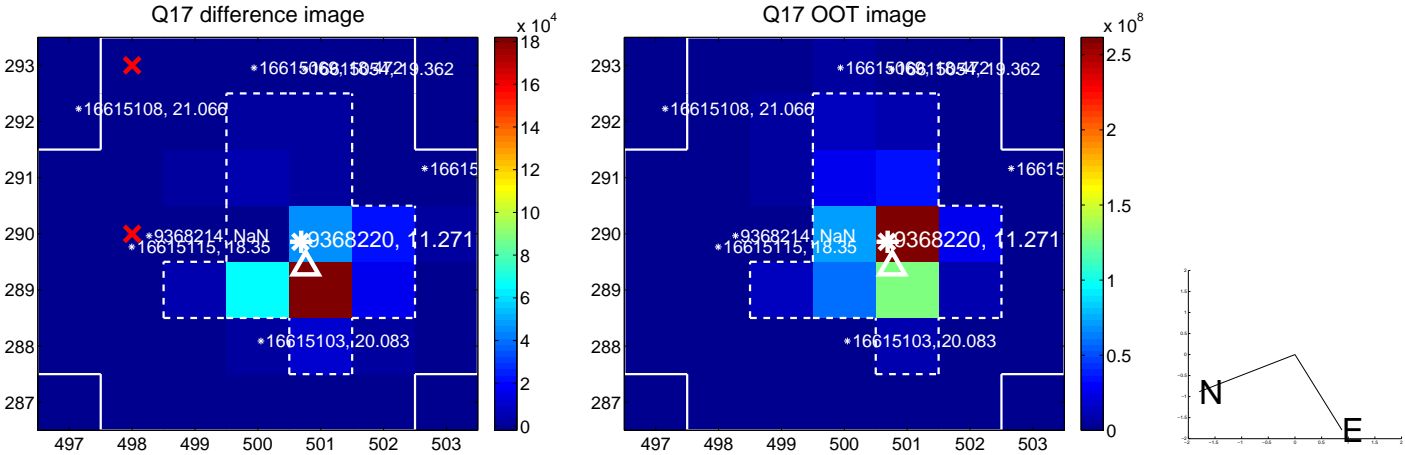
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



folded centroid time series figure for this object.

UKIRT Image

Declination

