

KIC 009364290

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})
009364290-01	OBS	2374.01	5.262092	136.380397	190.9	3.327	17.5	18.8	1.31	5587	2.14	437.21
009364290-02	OBS	2374.02	12.162764	137.526008	305.2	1.936	13.1	14.3	1.31	5587	2.78	143.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009364290-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009364290-02	OBS	PC	1.00	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.

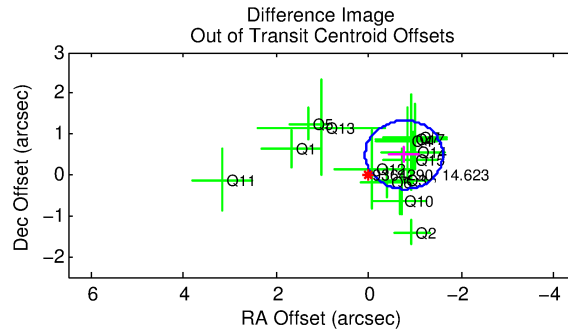
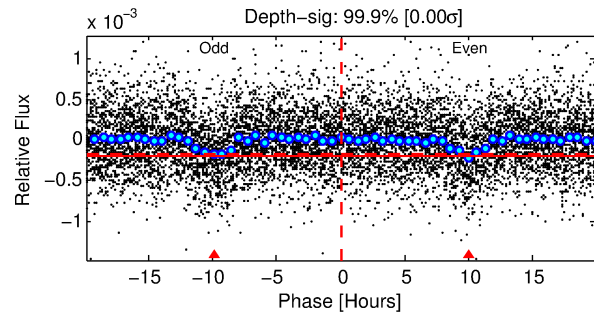
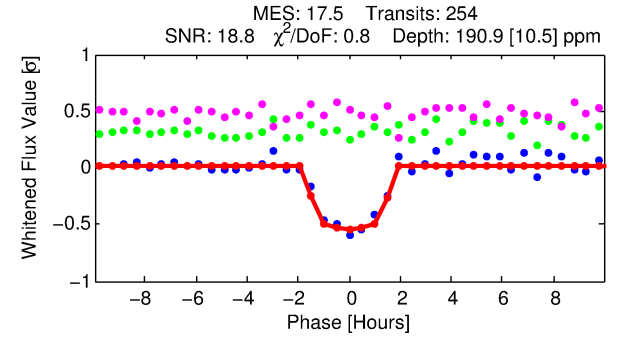
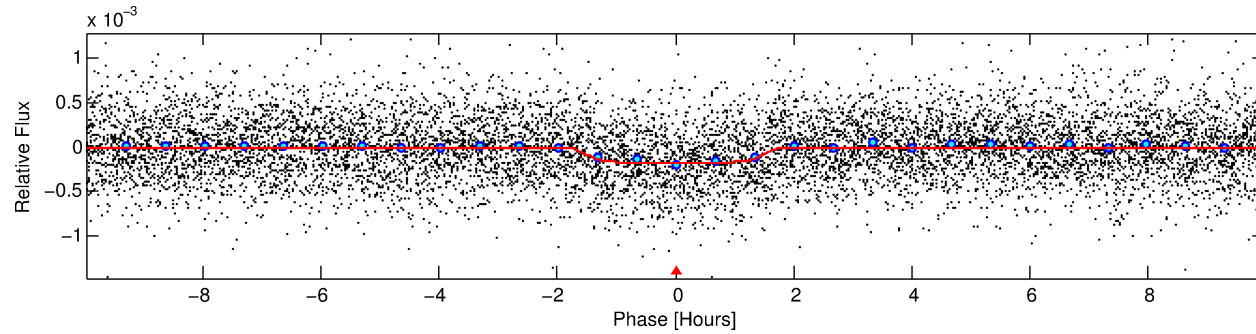
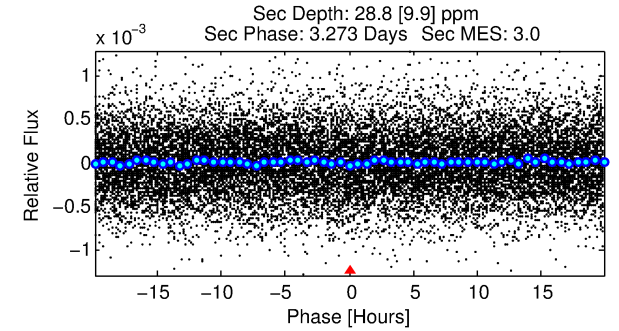
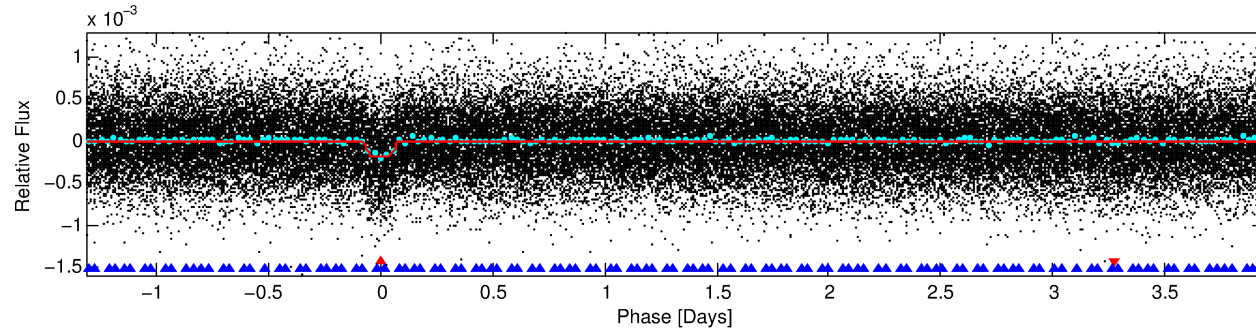
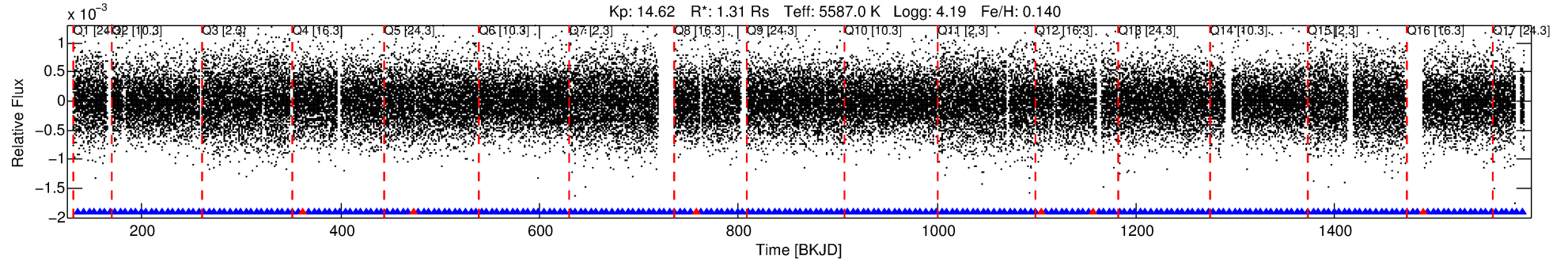
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009364290-01

No Significant Match Found

DV One-Page Summary

KIC: 9364290 Candidate: 1 of 2 Period: 5.262 d
KOI: K02374.01 Name: Kepler-382b Corr: 0.982



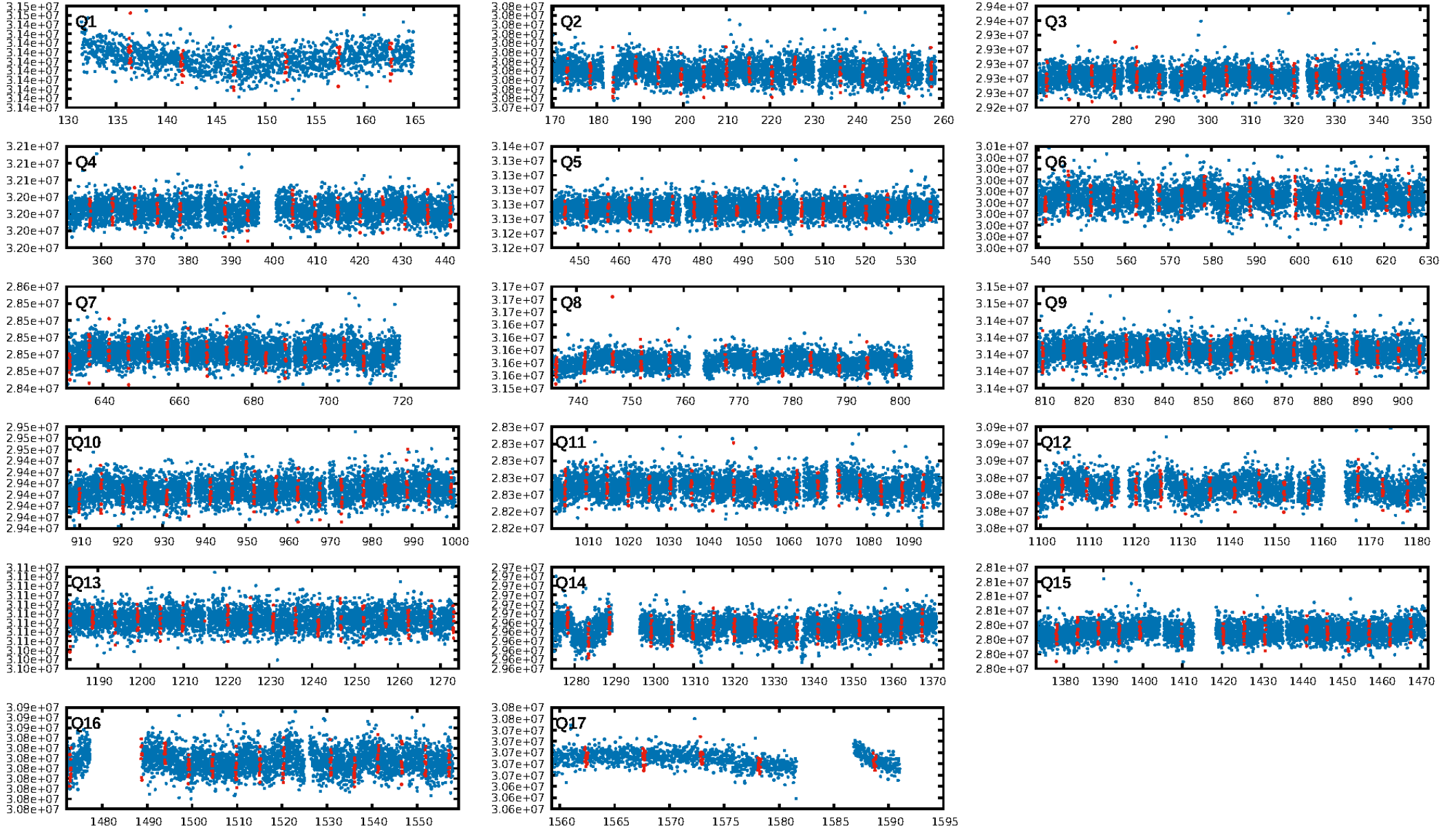
DV Fit Results:

Period = 5.26209 [0.00002] d
Epoch = 136.3804 [0.0032] BKJD
Rp/R* = 0.0150 [0.0051]
a/R* = 6.05 [8.92]
b = 0.89 [0.37]
Seff = 437.21 [142.39]
Teff = 1166 [95] K
Rp = 2.14 [0.86] Re
a = 0.0585 [0.0118] AU
Ag = 11.85 [9.80] [1.11σ]
Teffp = 3345 [639] K [3.37σ]

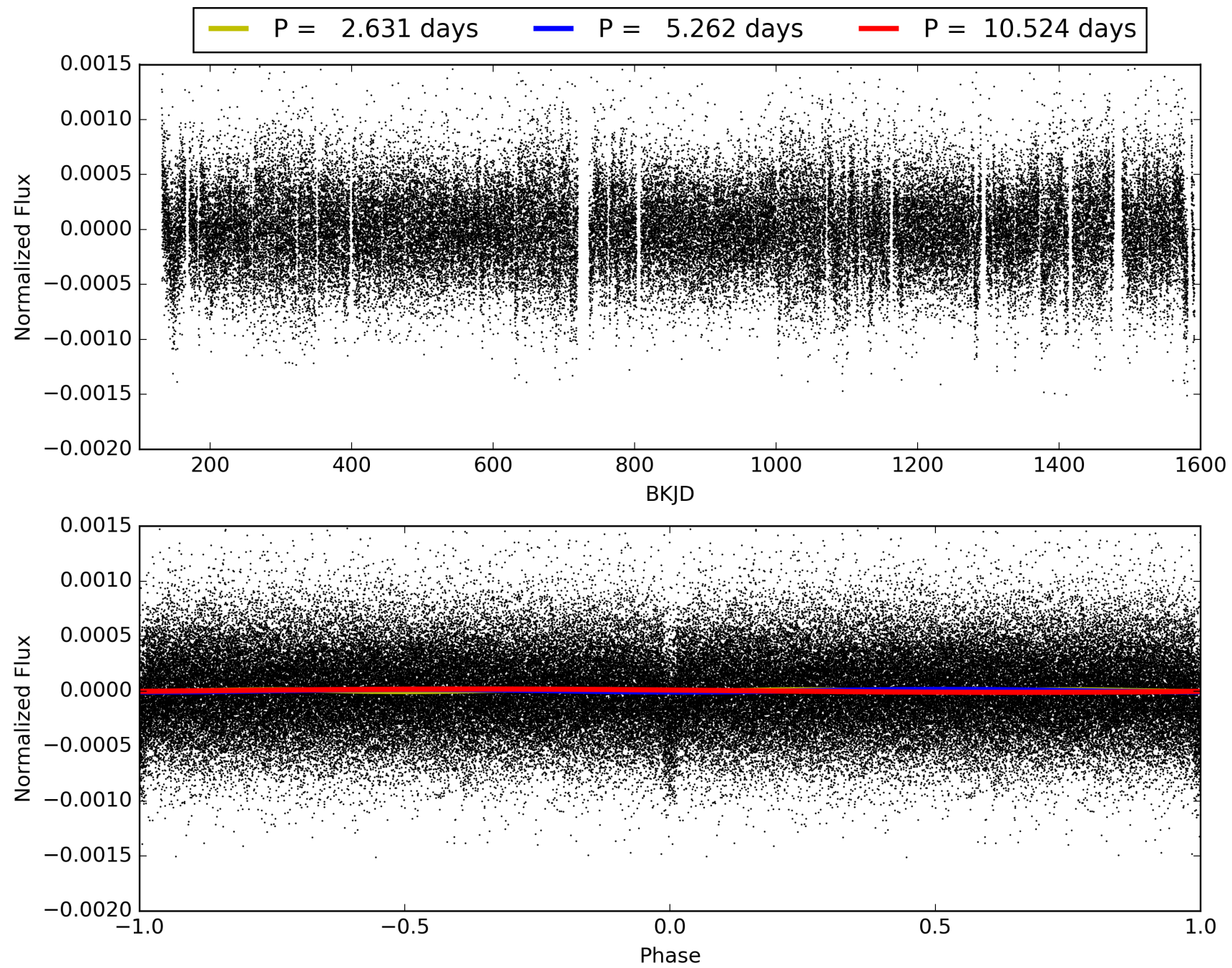
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [43.03σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.69e-67
RollingBand-fgt: 0.98 [237/243]
GhostDiagnostic-chr: 1.724
Centroid-sig: 1.8%
Centroid-so: 1.578 arcsec [2.21σ]
OotOffset-rm: 0.906 arcsec [3.24σ]
KicOffset-rm: 0.719 arcsec [2.41σ]
OotOffset-st: 4/4/2/4 [14]
KicOffset-st: 4/4/2/4 [14]
DiffImageQuality-fgm: 0.79 [11/14]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009364290-01, PDC Light Curves

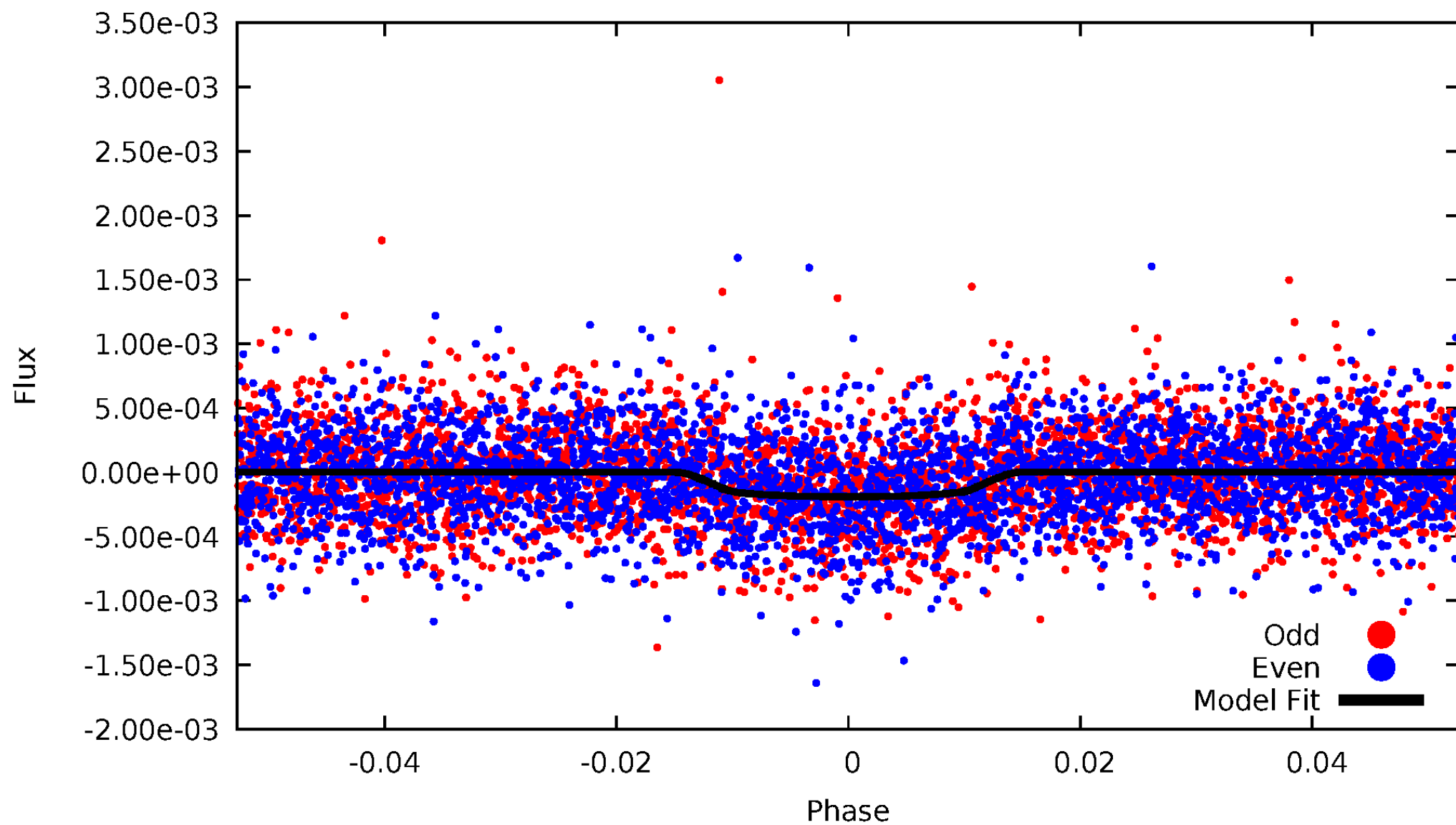


TCE 009364290-01



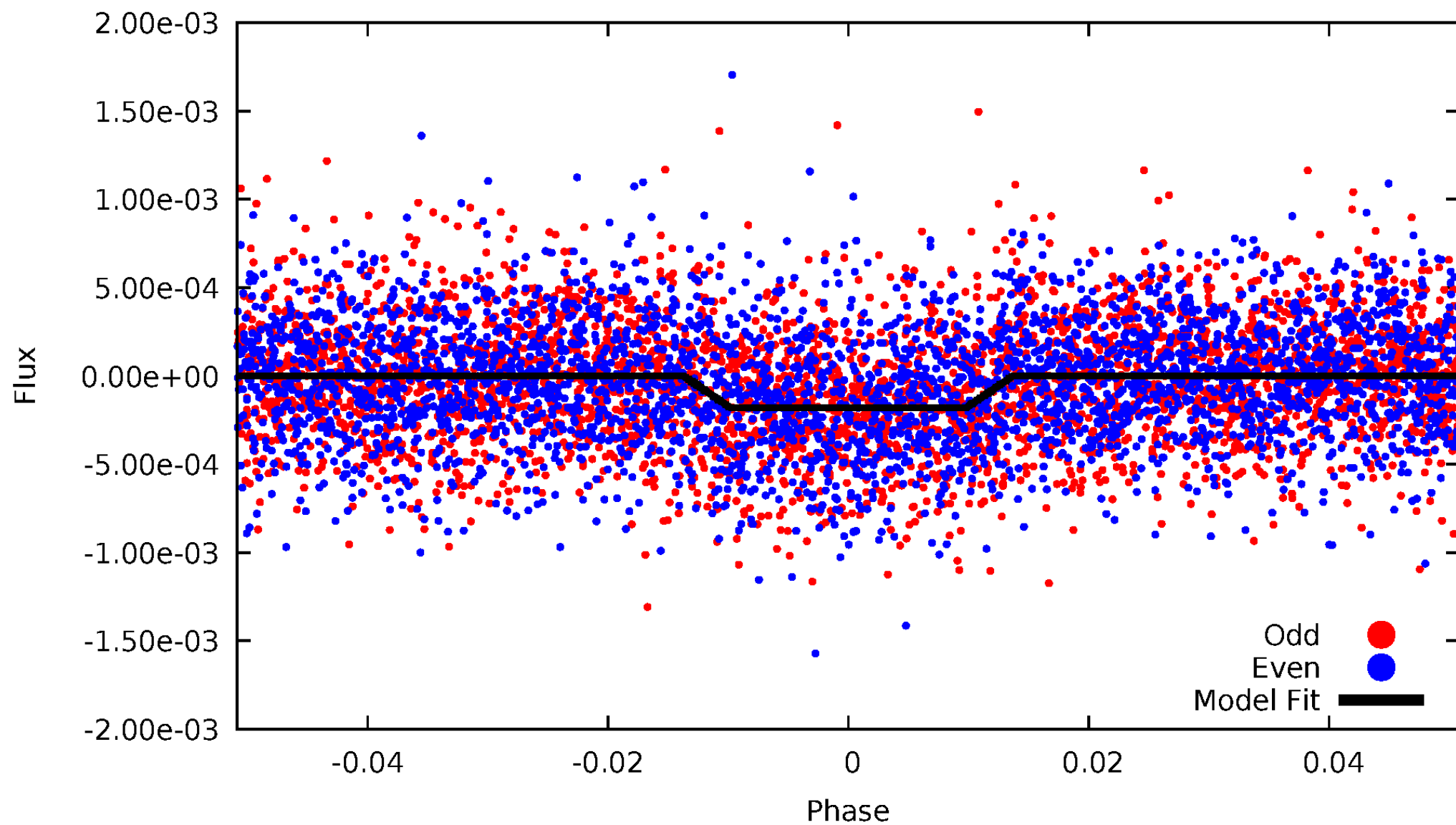
DV Odd/Even

TCE 009364290-01



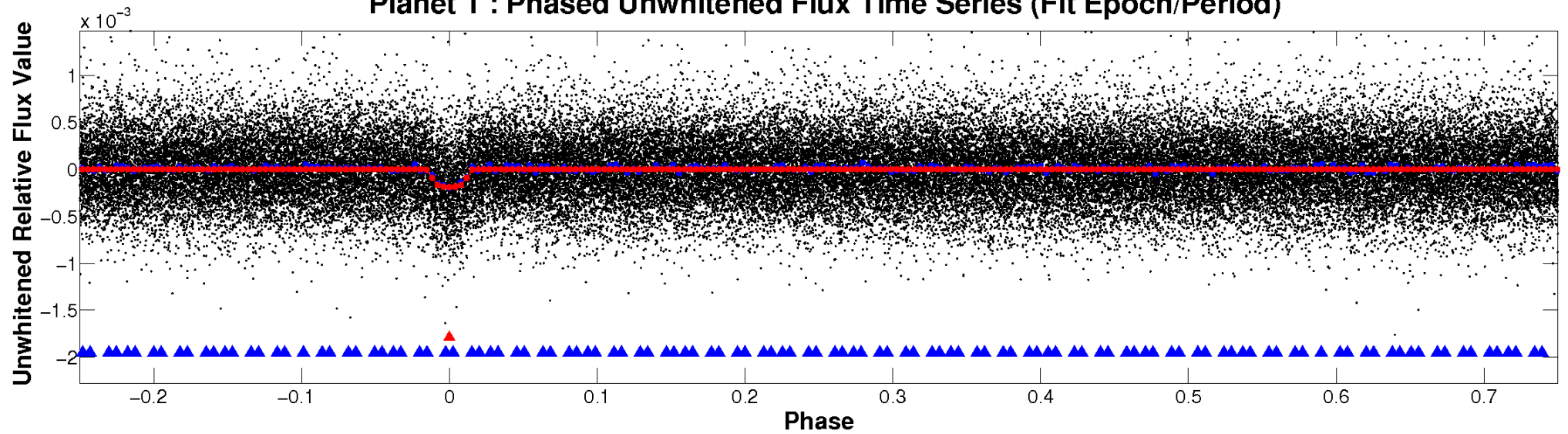
ALT Odd/Even

TCE 009364290-01

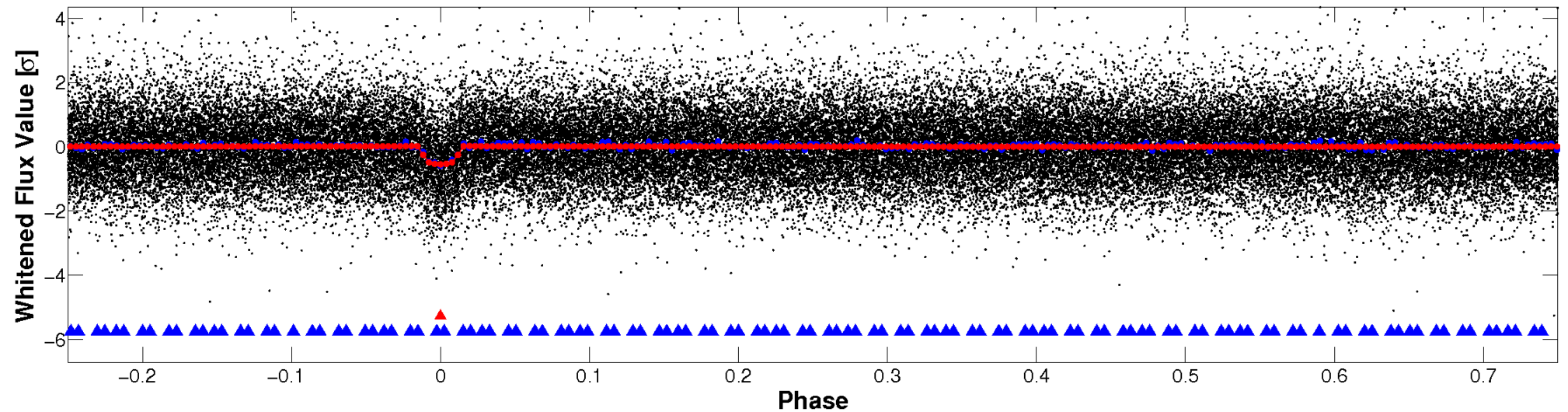


Non-Whitened Vs. Whitened Light Curve

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

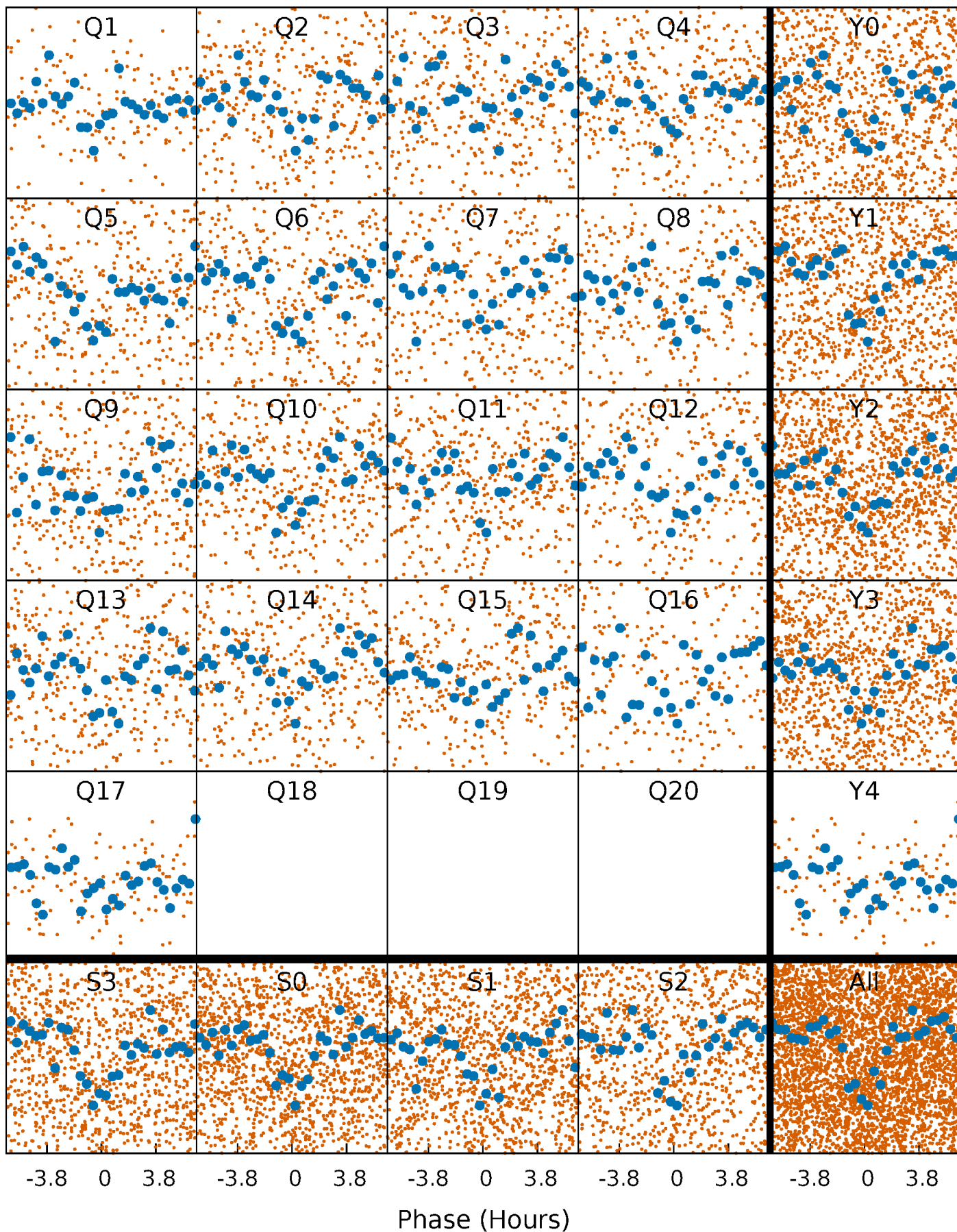


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



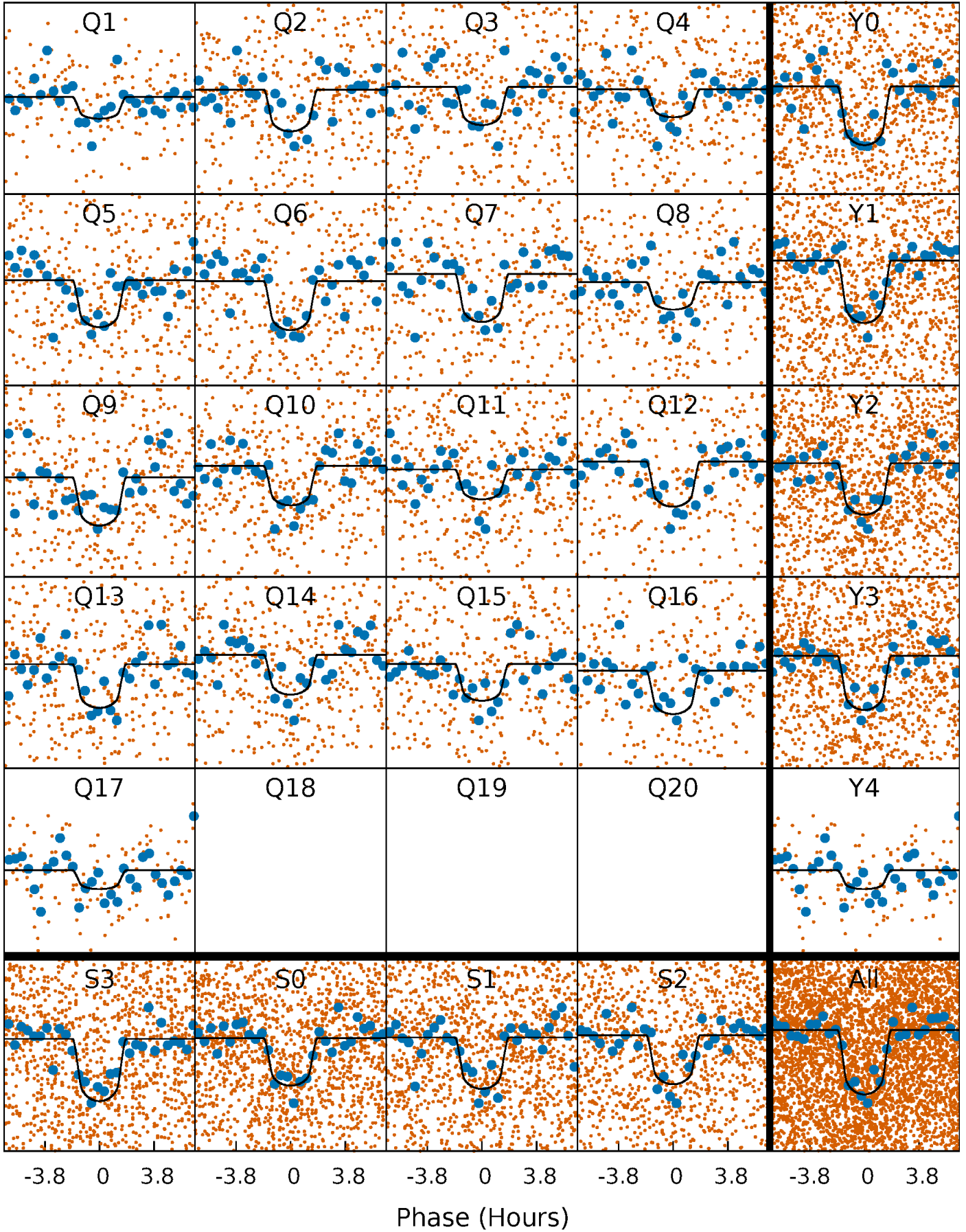
PDC Quarter-Phased Transit Curves

TCE 009364290-01 P= 5.262092 Days $T_0=136.380397$ (BKJD)



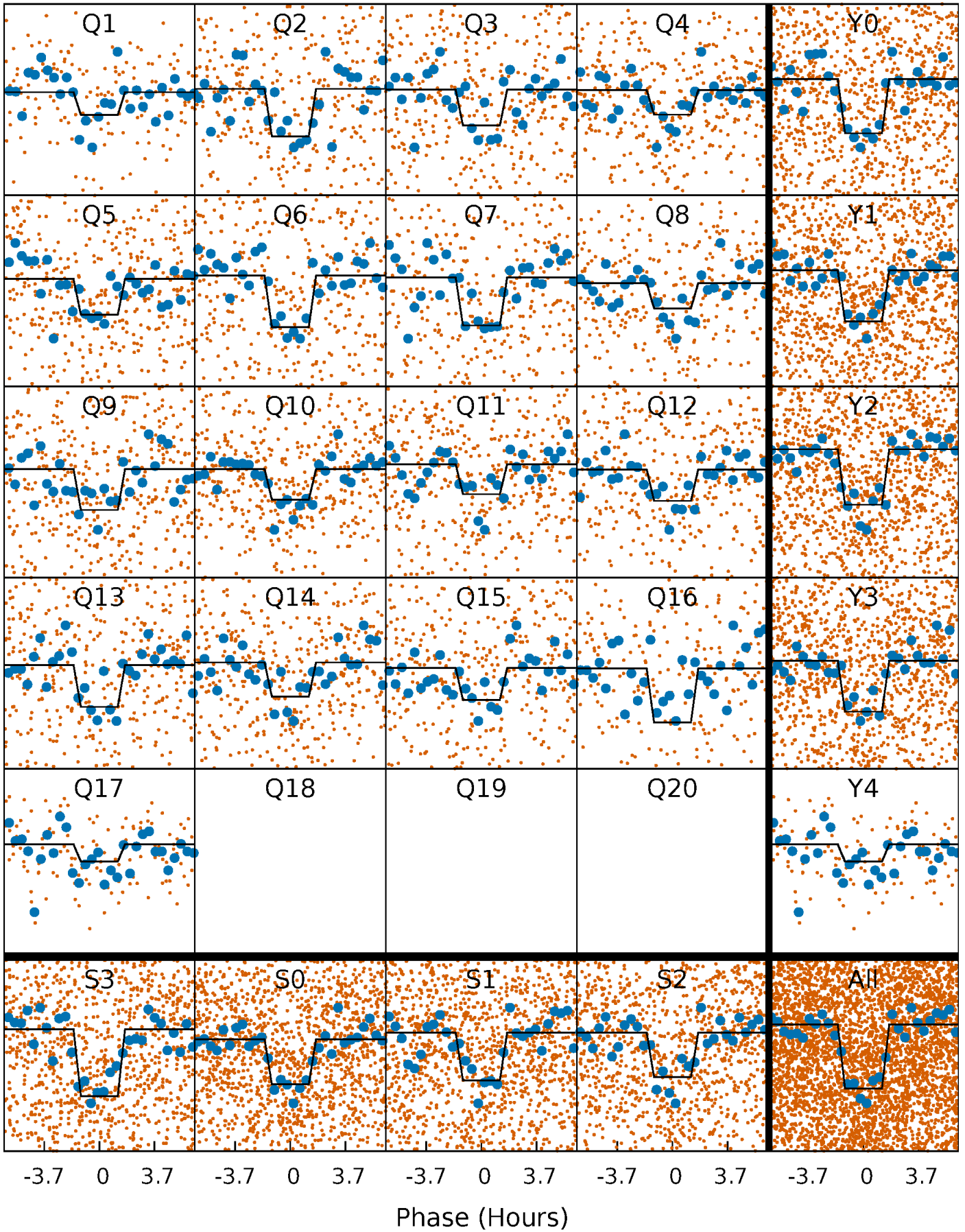
DV Quarter-Phased Transit Curves

TCE 009364290-01 P= 5.262092 Days $T_0=136.380397$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

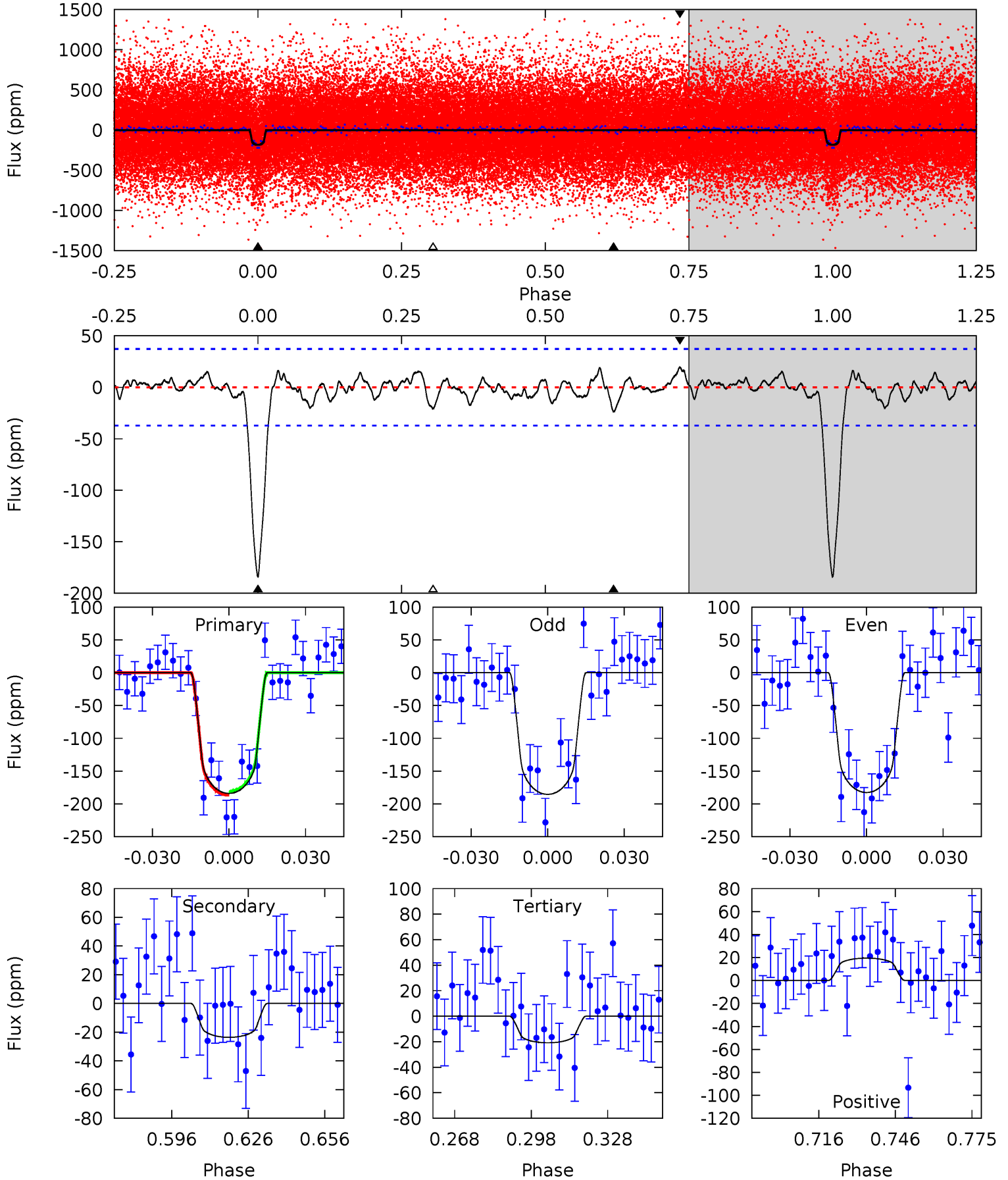
TCE 009364290-01 P= 5.262101 Days $T_0=136.379427$ (BKJD)



DV Model-Shift Uniqueness Test

009364290-01, P = 5.262092 Days, E = 131.118305 Days

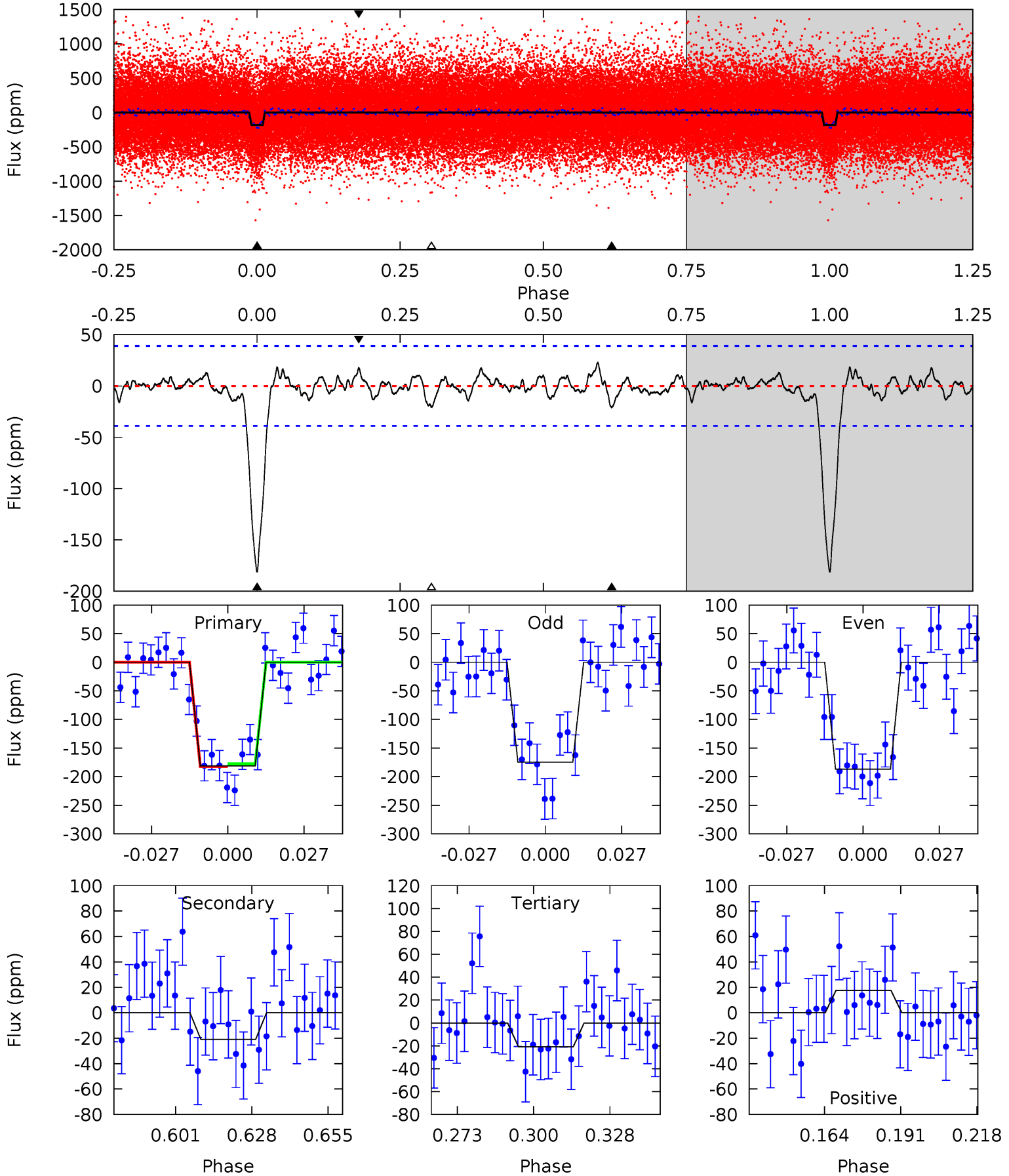
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.8	3.06	2.70	2.52	4.81	2.17	0.98	21.1	21.3	0.36	0.54	0.18	1.02	0.10	0.36



Alt Model-Shift Uniqueness Test

009364290-01, P = 5.262101 Days, E = 131.117326 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.5	2.59	2.58	2.19	4.83	2.21	0.87	19.9	20.3	0.01	0.40	0.78	0.98	0.11	0.32



Stellar Parameters For KIC 009364290

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5587^{+75}_{-75}	$4.188^{+0.188}_{-0.101}$	$0.140^{+0.150}_{-0.150}$	$1.309^{+0.208}_{-0.277}$	$0.963^{+0.073}_{-0.053}$	$0.605^{+0.577}_{-0.183}$
	+1%/-1%	+4%/-2%	+107%/-107%	+16%/-21%	+8%/-6%	+95%/-30%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 009364290-01 / KOI 2374.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-24 ± 8	$2.12^{+0.77}_{-0.76}$	1619^{+80}_{-91}	3573^{+581}_{-384}	$9.612^{+15.131}_{-4.980}$
Alt.	-21 ± 8	$1.85^{+0.75}_{-0.74}$	1622^{+75}_{-94}	3666^{+707}_{-446}	11^{+19}_{-6}

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 $A_{obs} \gg 1.0$

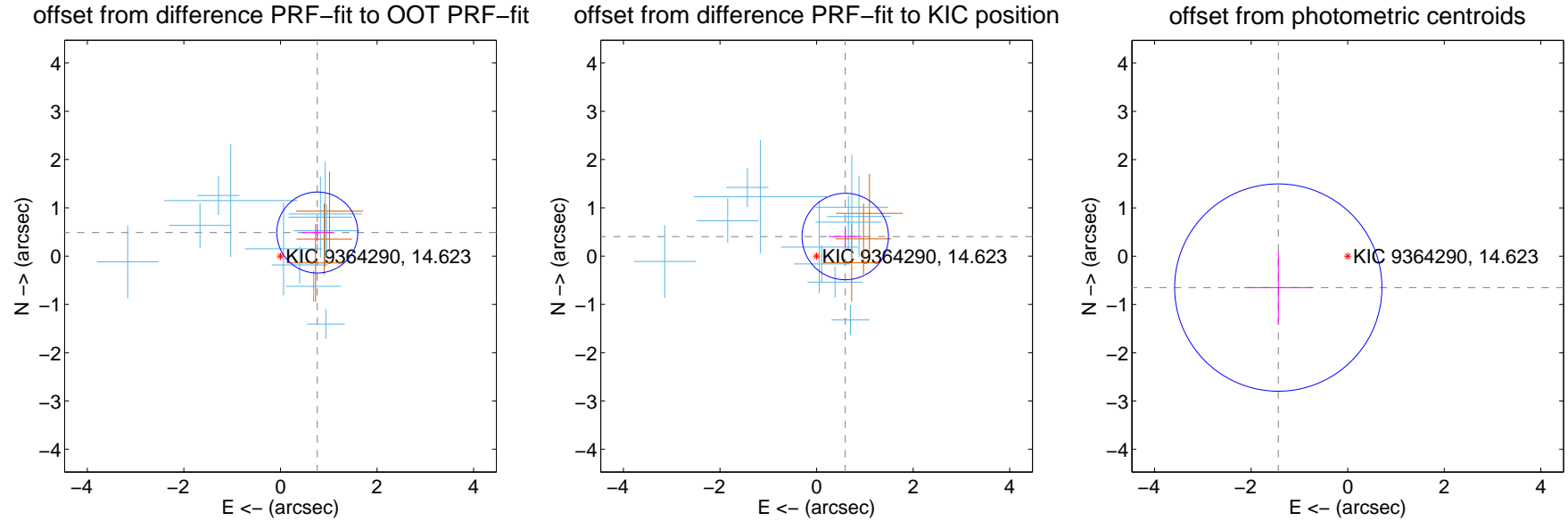
DV Centroid Data

Supplemental centroid analysis for 009364290-01. Kepler magnitude: 14.62. Transit SNR 18.79

There are 11 quarters with good PRF difference image offsets

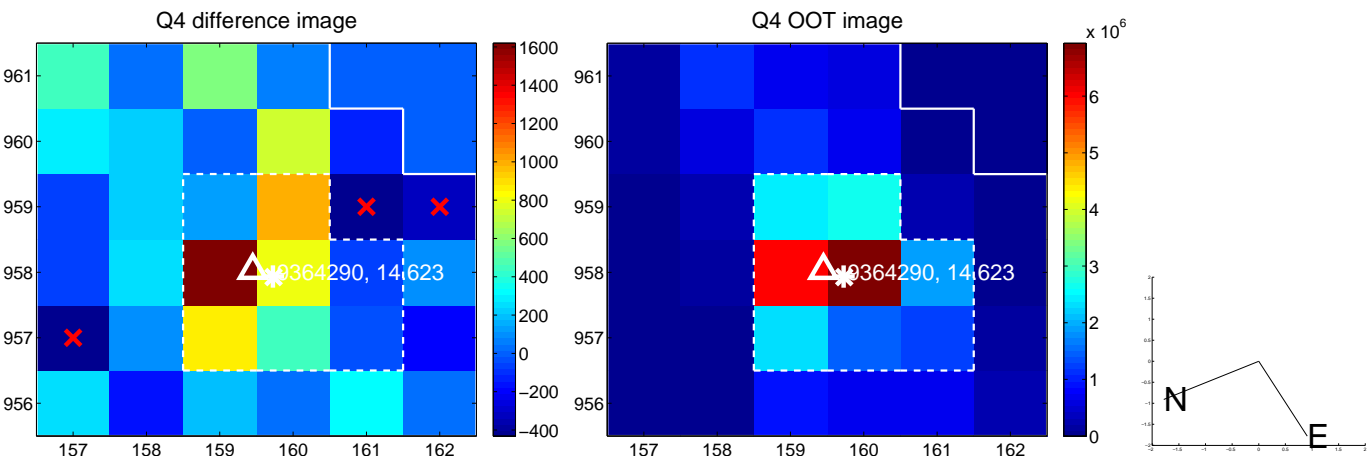
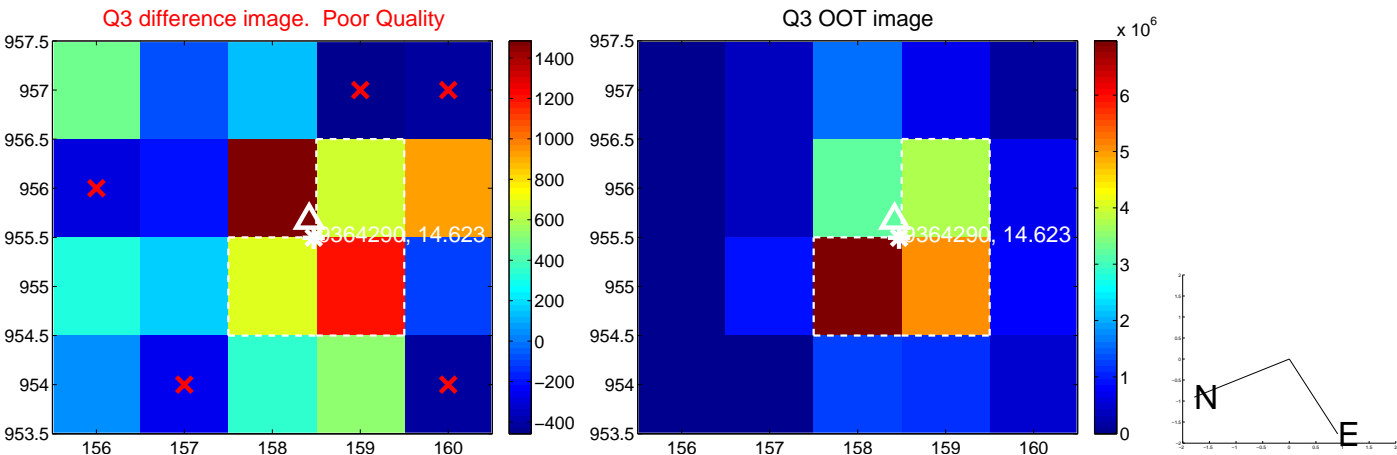
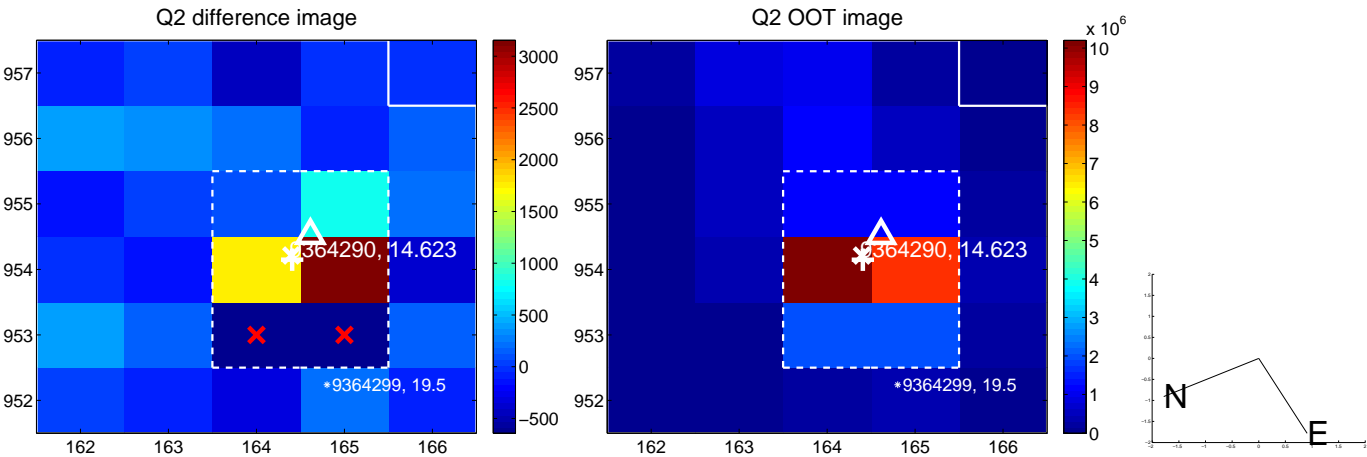
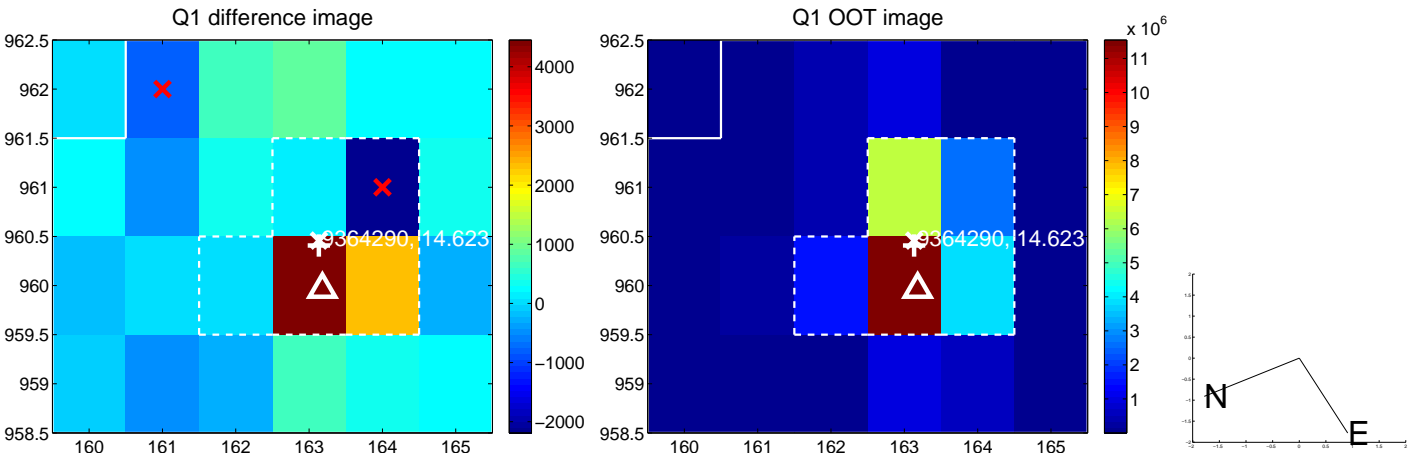
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.906 ± 0.280	3.24	-0.763 ± 0.320	0.489 ± 0.180
PRF-fit source offset from KIC position	0.719 ± 0.298	2.41	-0.593 ± 0.342	0.406 ± 0.217
photometric centroid source offset	1.58 ± 0.72	2.21	1.44 ± 0.71	-0.65 ± 0.76

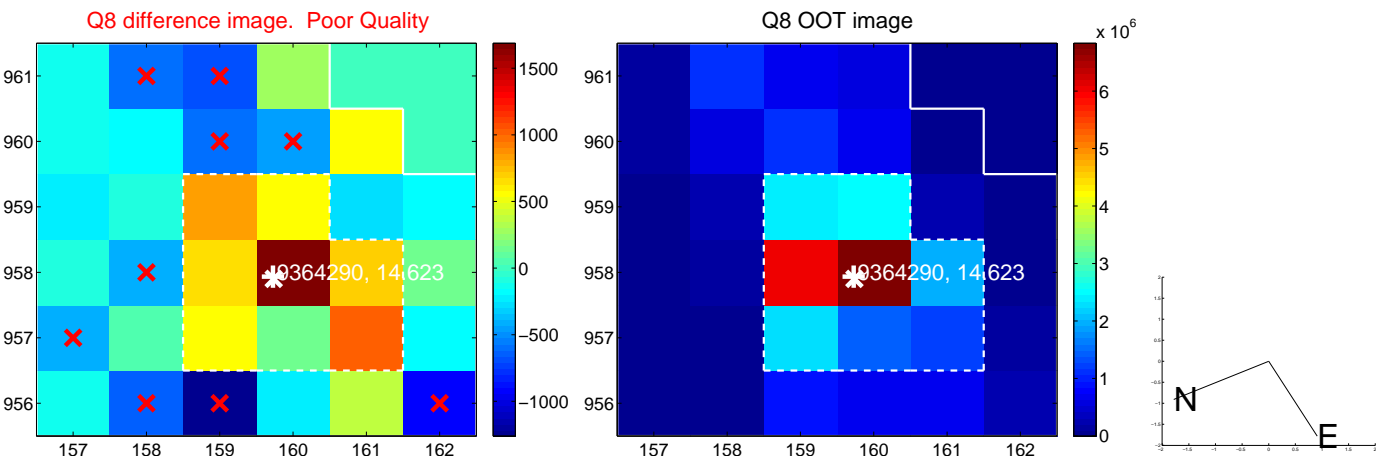
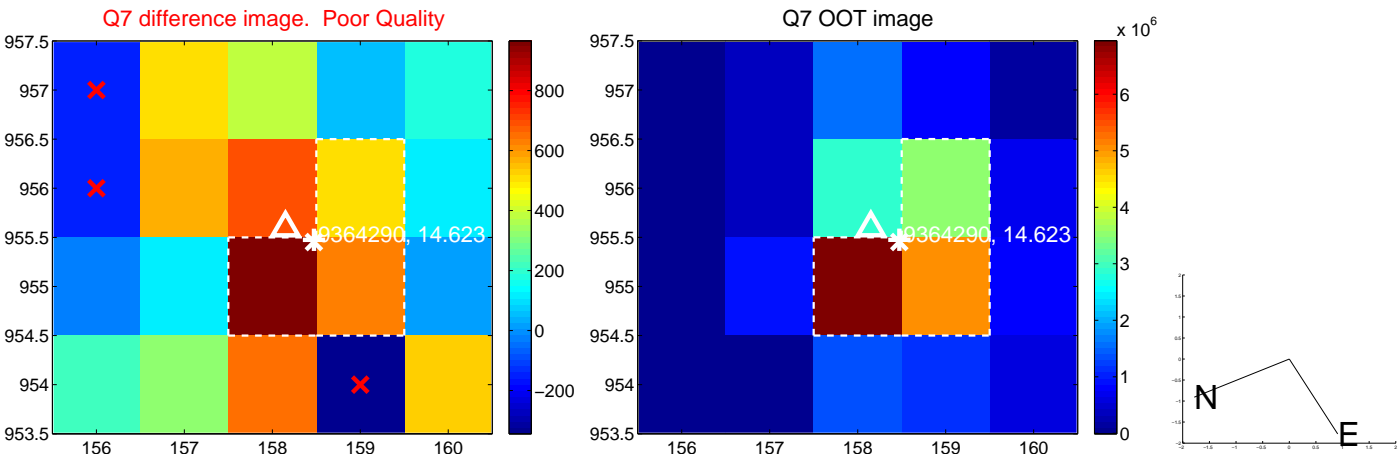
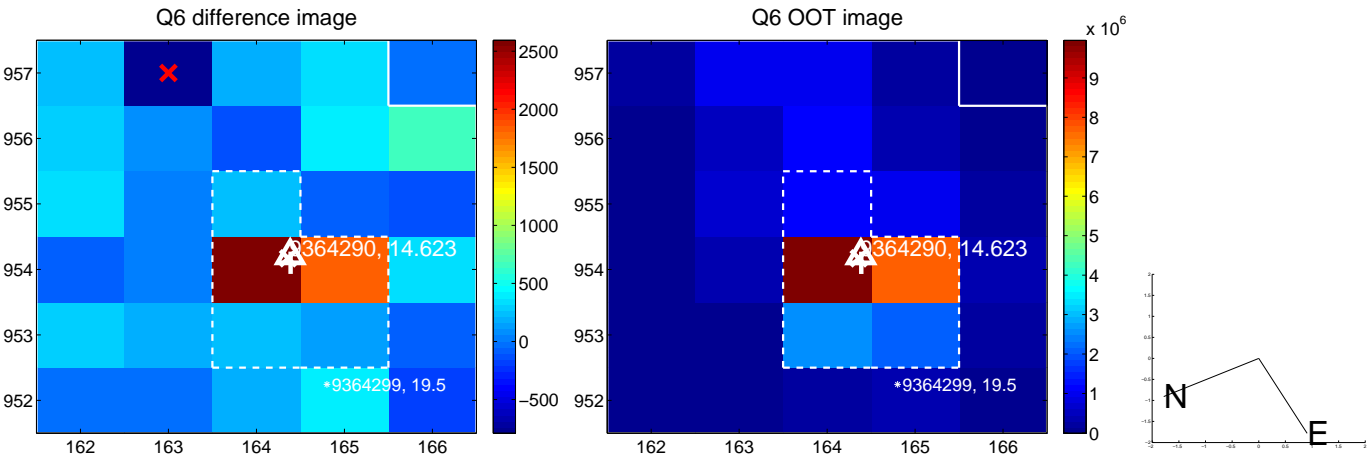
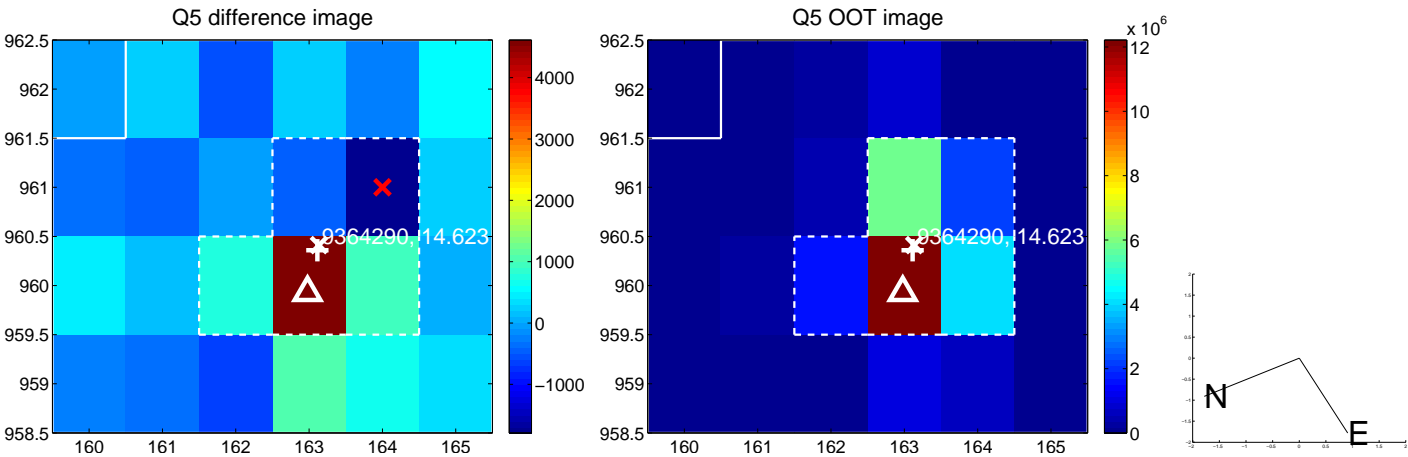


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

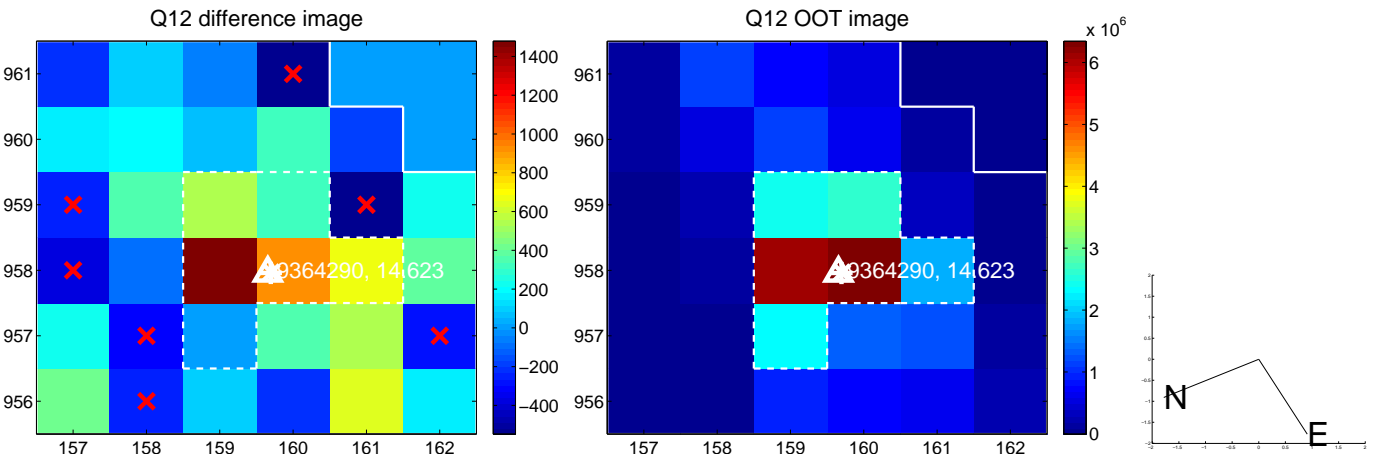
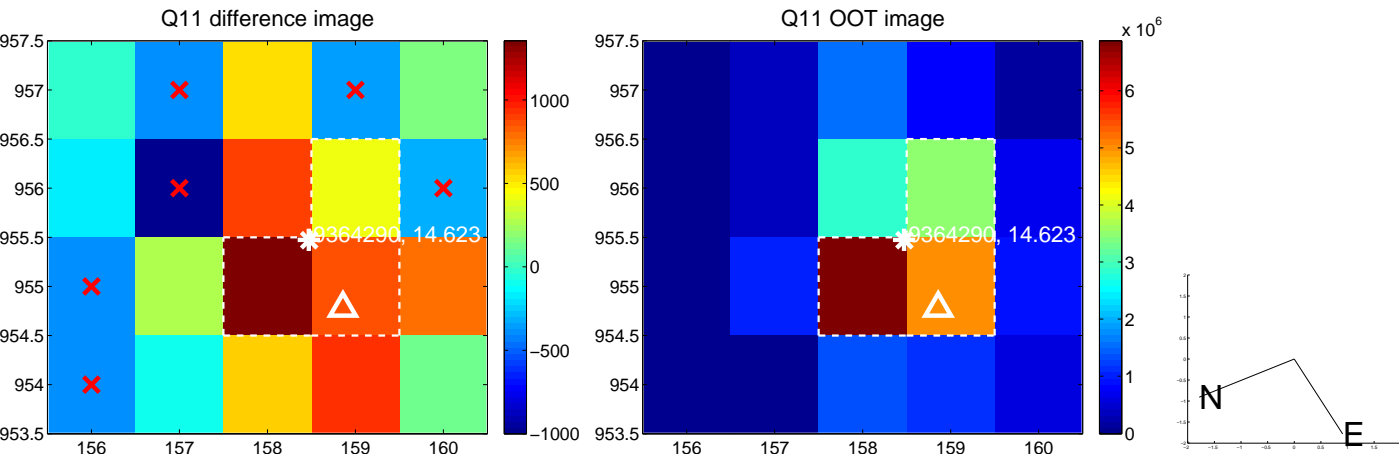
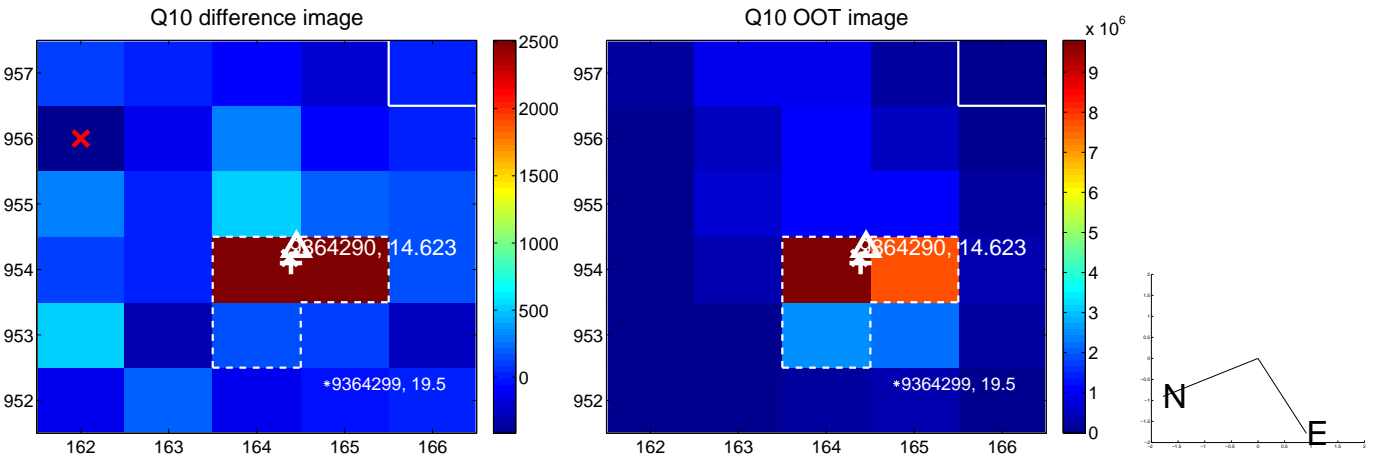
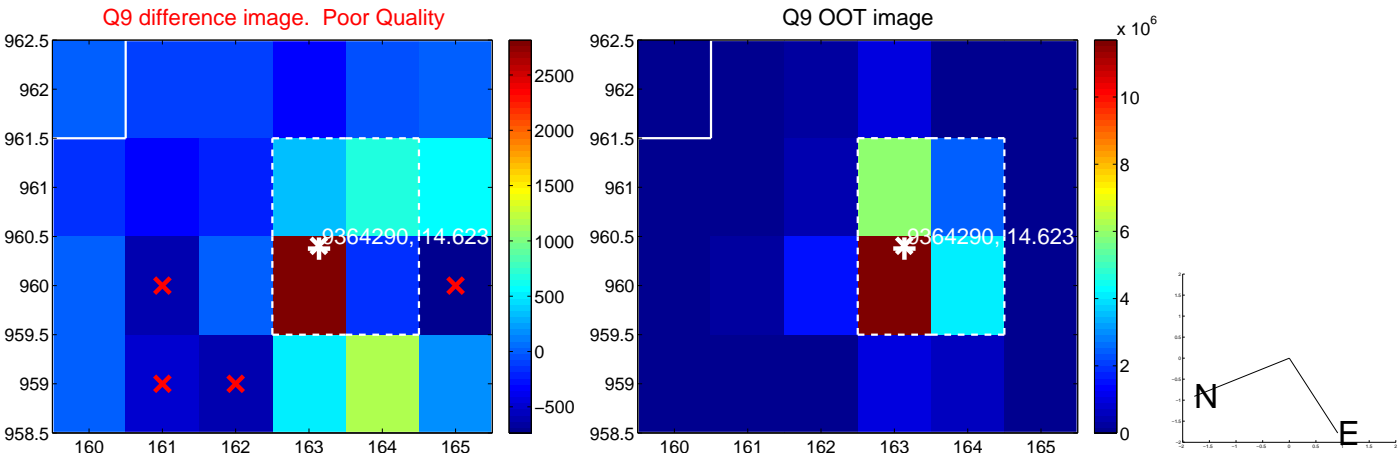
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



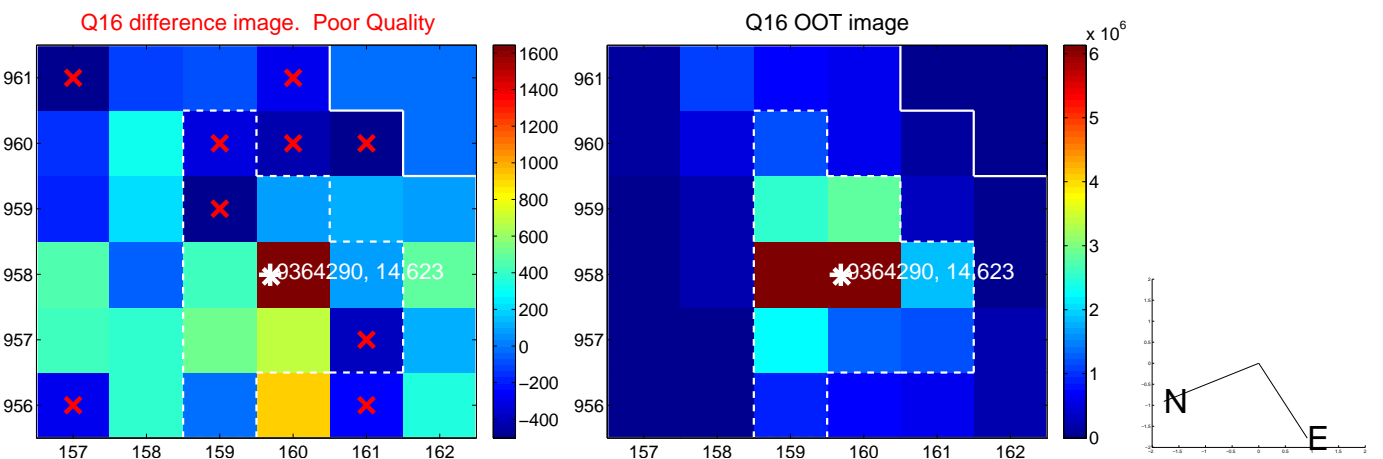
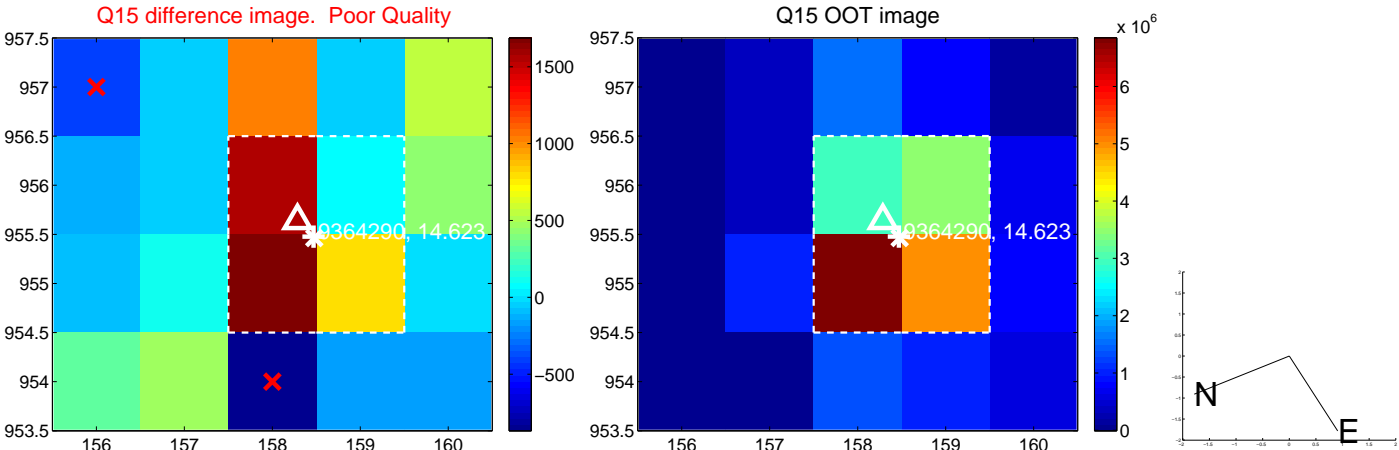
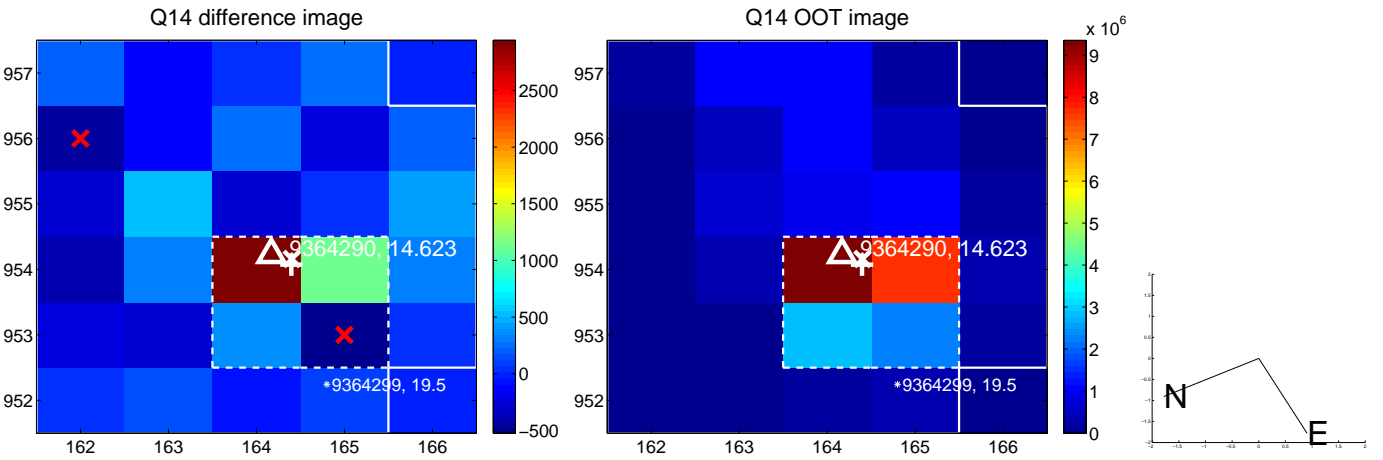
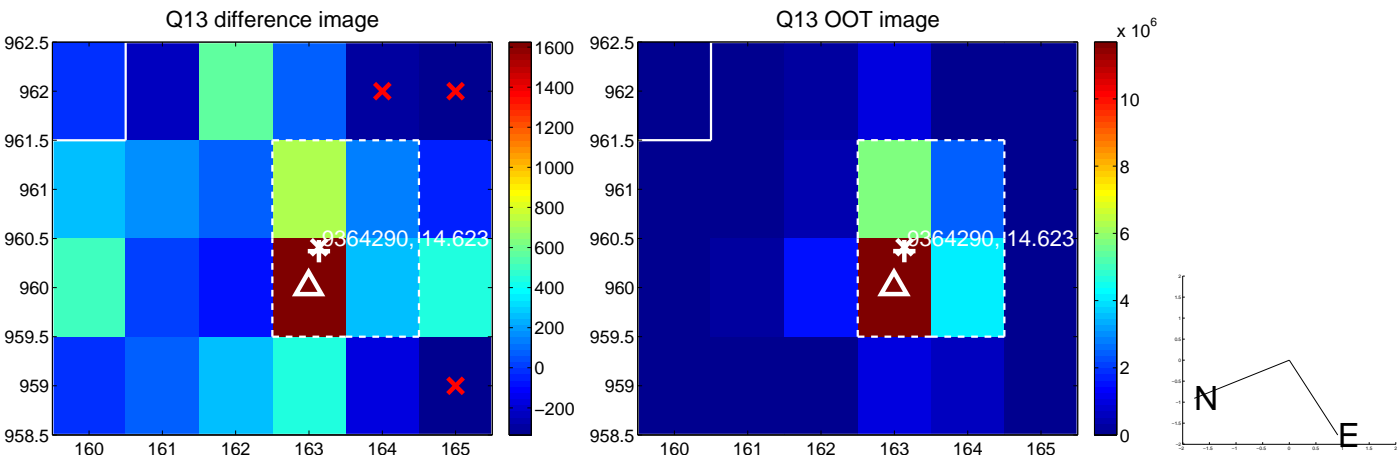
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



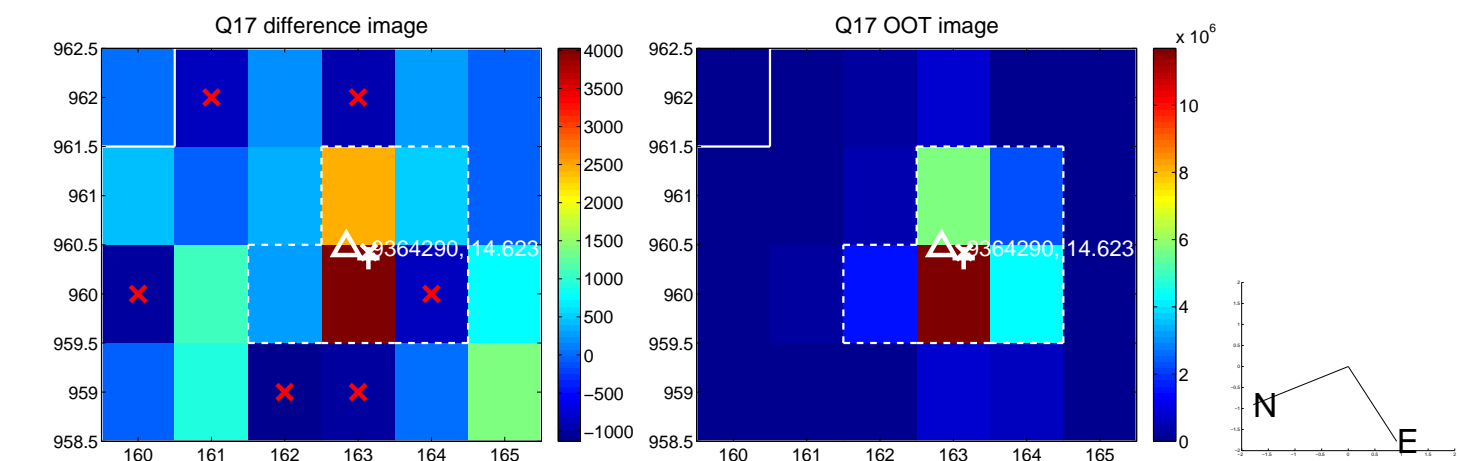
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



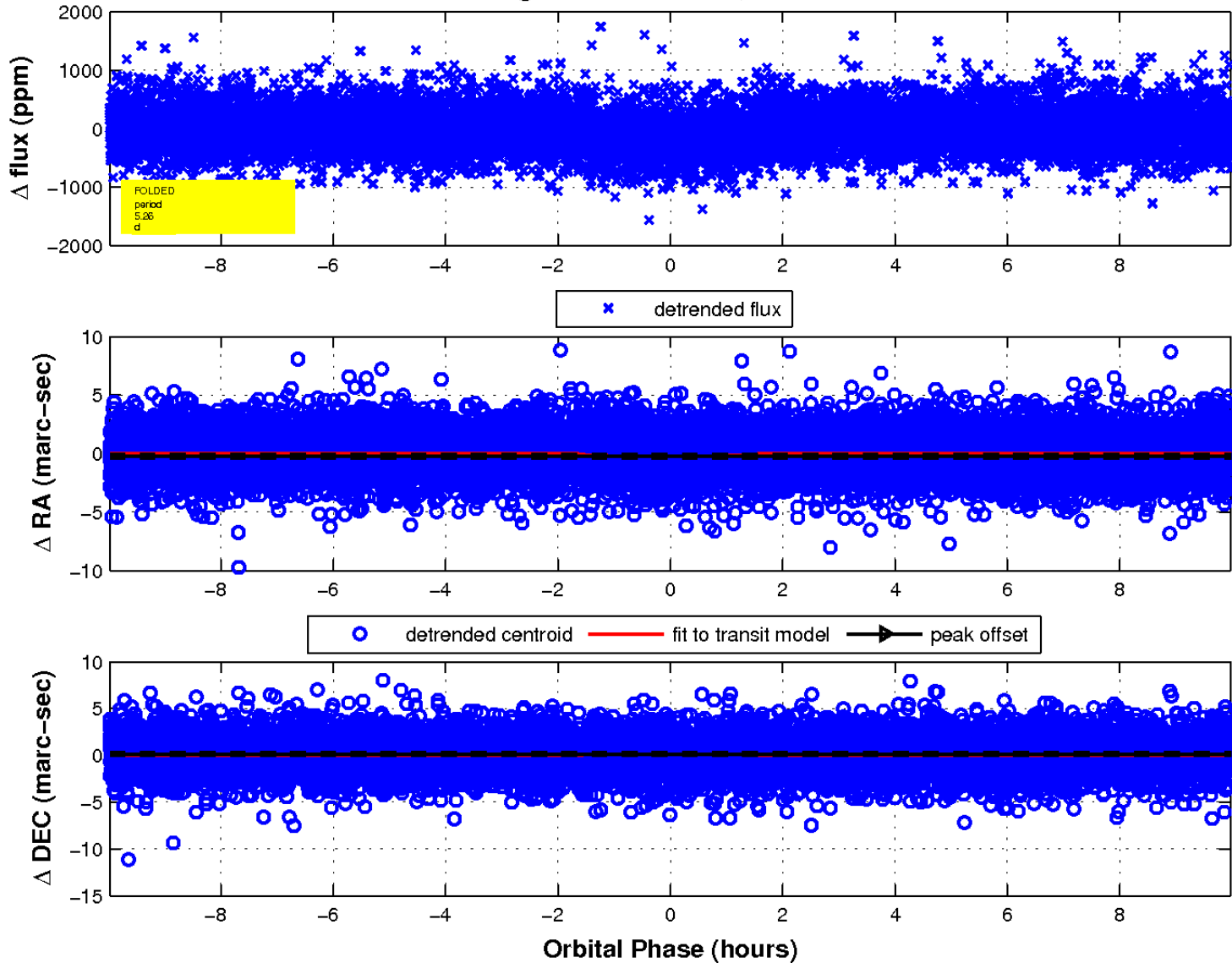
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

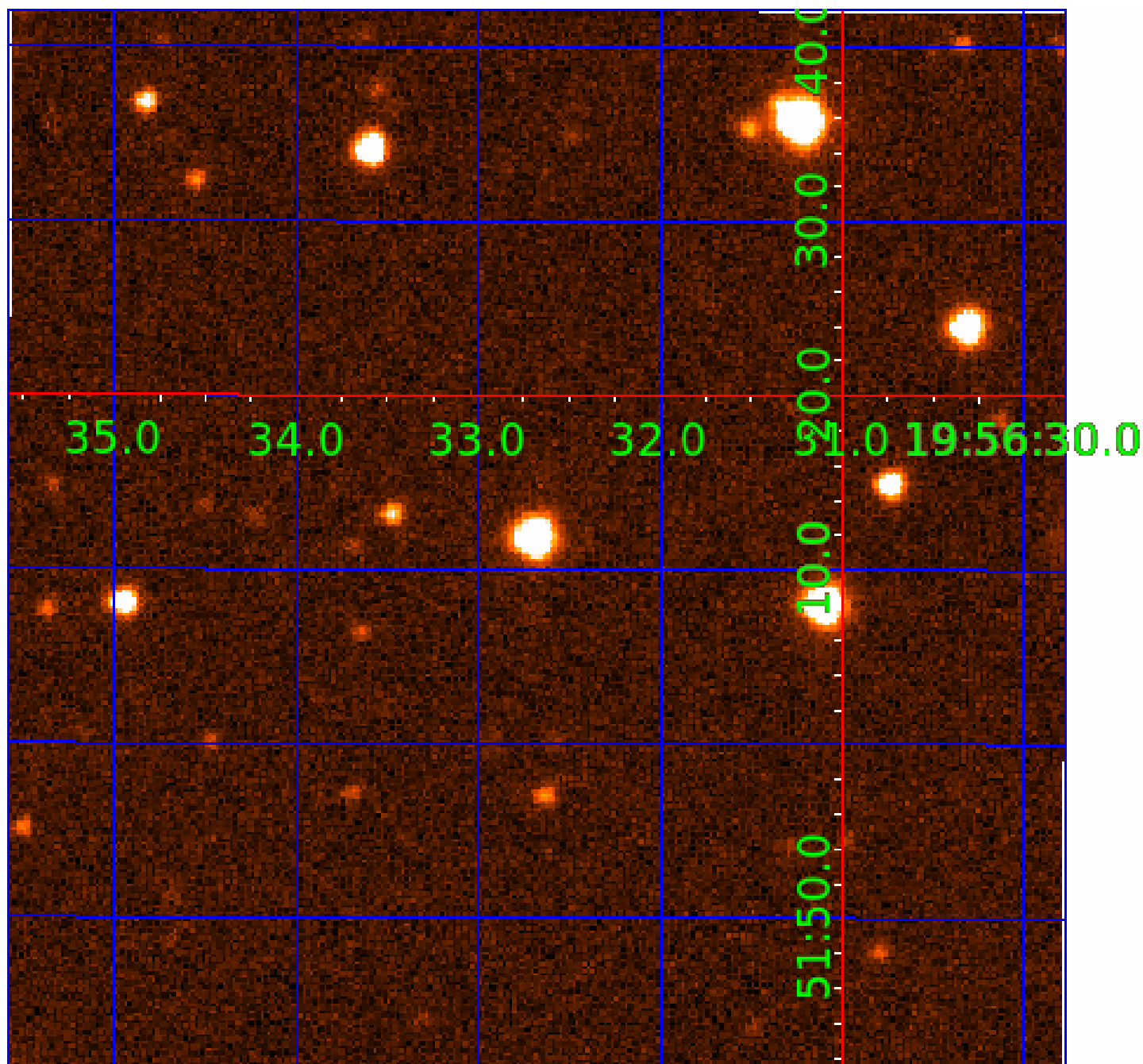


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009364290

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})
009364290-01	OBS	2374.01	5.262092	136.380397	190.9	3.327	17.5	18.8	1.31	5587	2.14	437.21
009364290-02	OBS	2374.02	12.162764	137.526008	305.2	1.936	13.1	14.3	1.31	5587	2.78	143.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009364290-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009364290-02	OBS	PC	1.00	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.

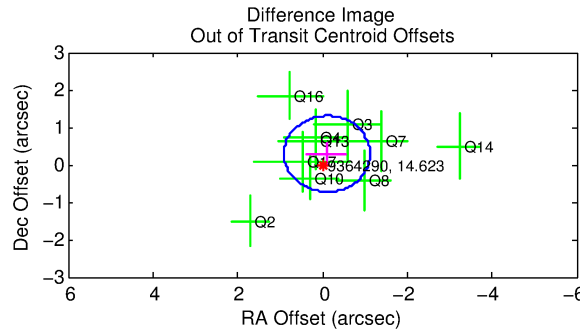
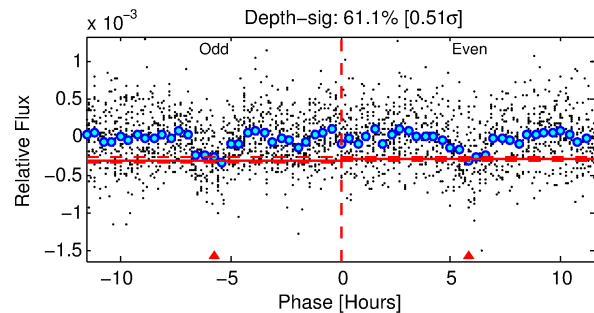
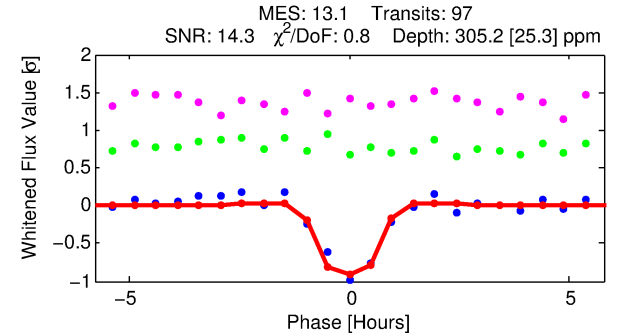
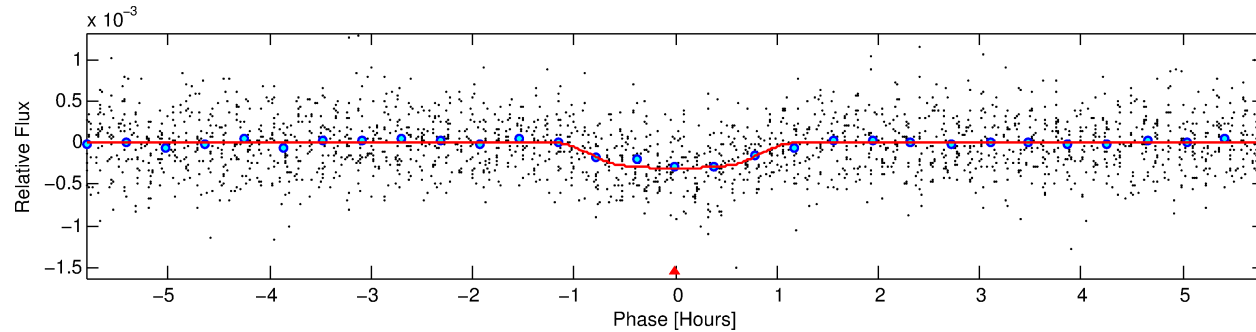
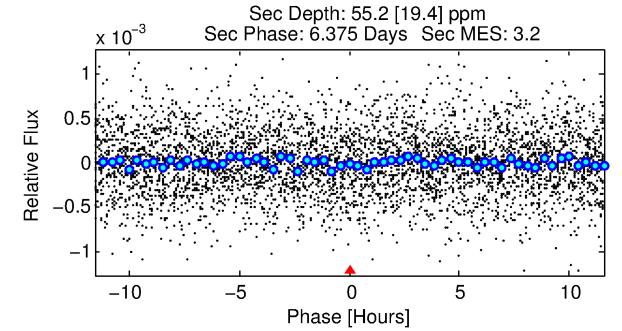
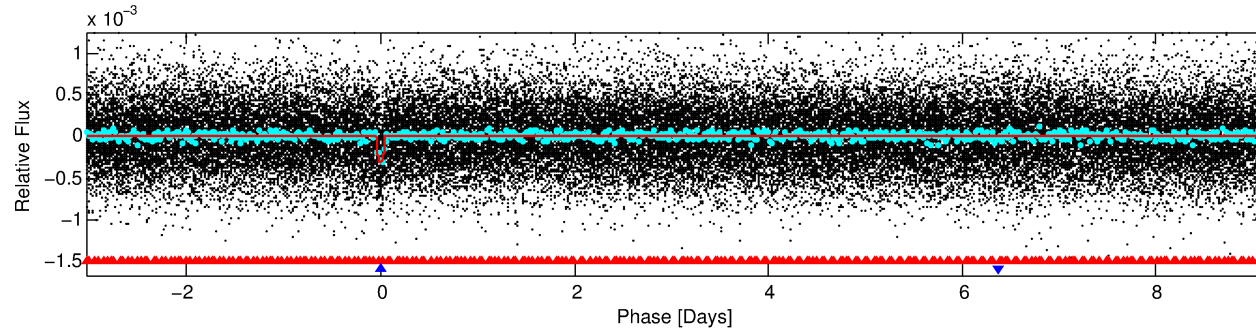
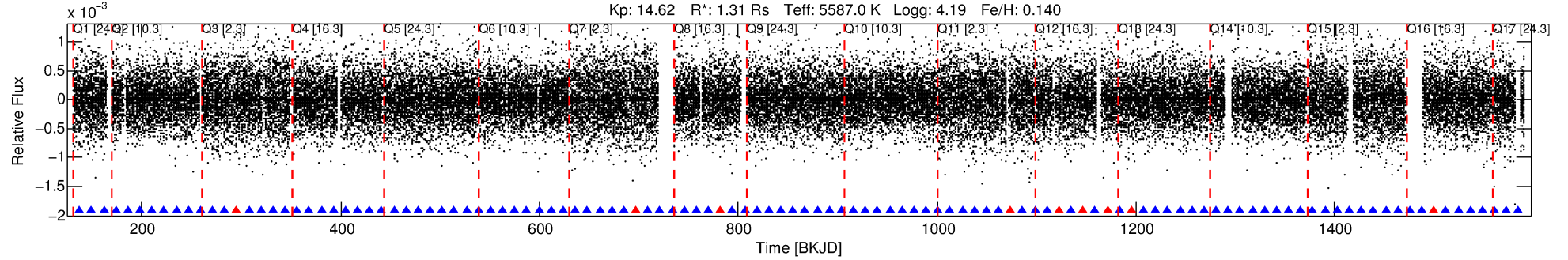
Ephemeris Match Information For 009364290-02

No Significant Match Found

DV One-Page Summary

KIC: 9364290 Candidate: 2 of 2 Period: 12.163 d
KOI: K02374.02 Name: Kepler-382c Corr: 0.972

Kp: 14.62 R*: 1.31 Rs Teff: 5587.0 K Logg: 4.19 Fe/H: 0.140



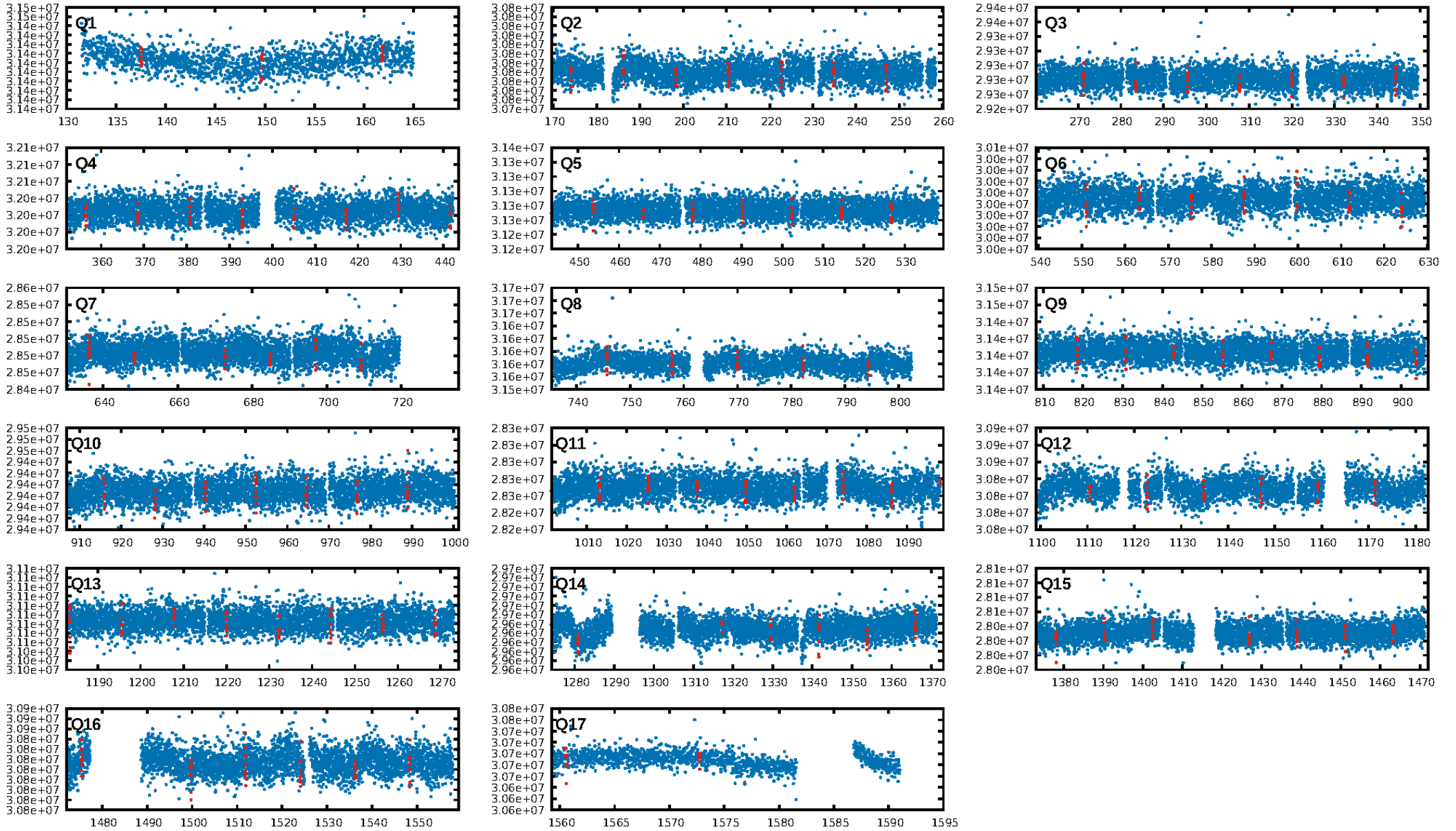
DV Fit Results:

Period = 12.16276 [0.00005] d
Epoch = 137.5260 [0.0035] BKJD
Rp/R* = 0.0195 [0.0089]
a/R* = 21.81 [44.64]
b = 0.91 [0.39]
Seff = 143.06 [46.59]
Teff = 882 [72] K
Rp = 2.78 [1.40] Re
a = 0.1023 [0.0206] AU
Ag = 40.96 [42.25] [0.95σ]
Teffp = 3449 [847] K [3.02σ]

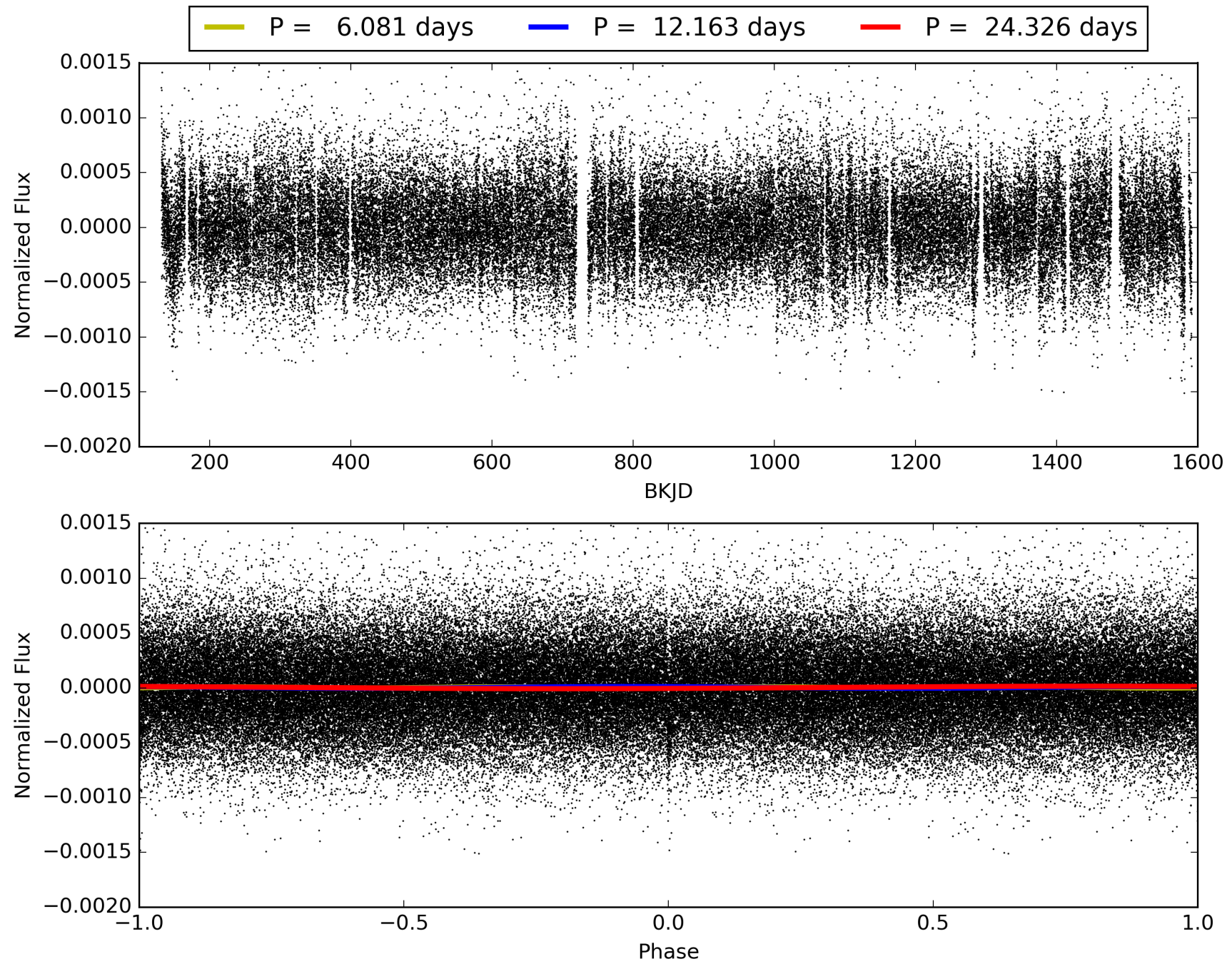
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [43.03σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.16e-38
RollingBand-fgt: 0.90 [83/92]
GhostDiagnostic-chr: 18.5
Centroid-sig: 7.9%
Centroid-so: 1.327 arcsec [1.41σ]
OotOffset-rm: 0.307 arcsec [0.91σ]
KicOffset-rm: 0.416 arcsec [1.06σ]
OotOffset-st: 3/2/3/2 [10]
KicOffset-st: 3/2/3/2 [10]
DiffImageQuality-fgm: 0.70 [7/10]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009364290-02, PDC Light Curves

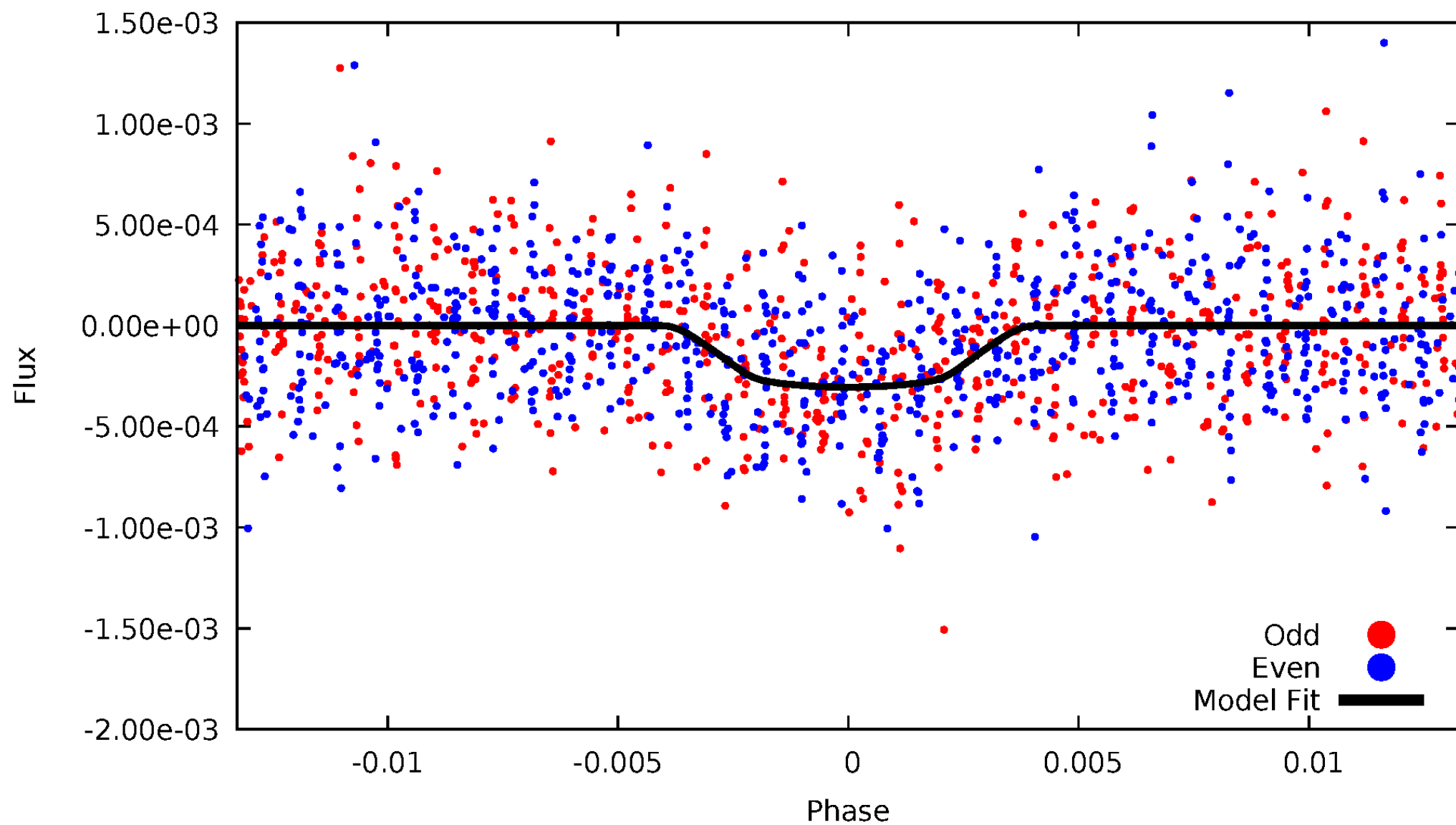


TCE 009364290-02



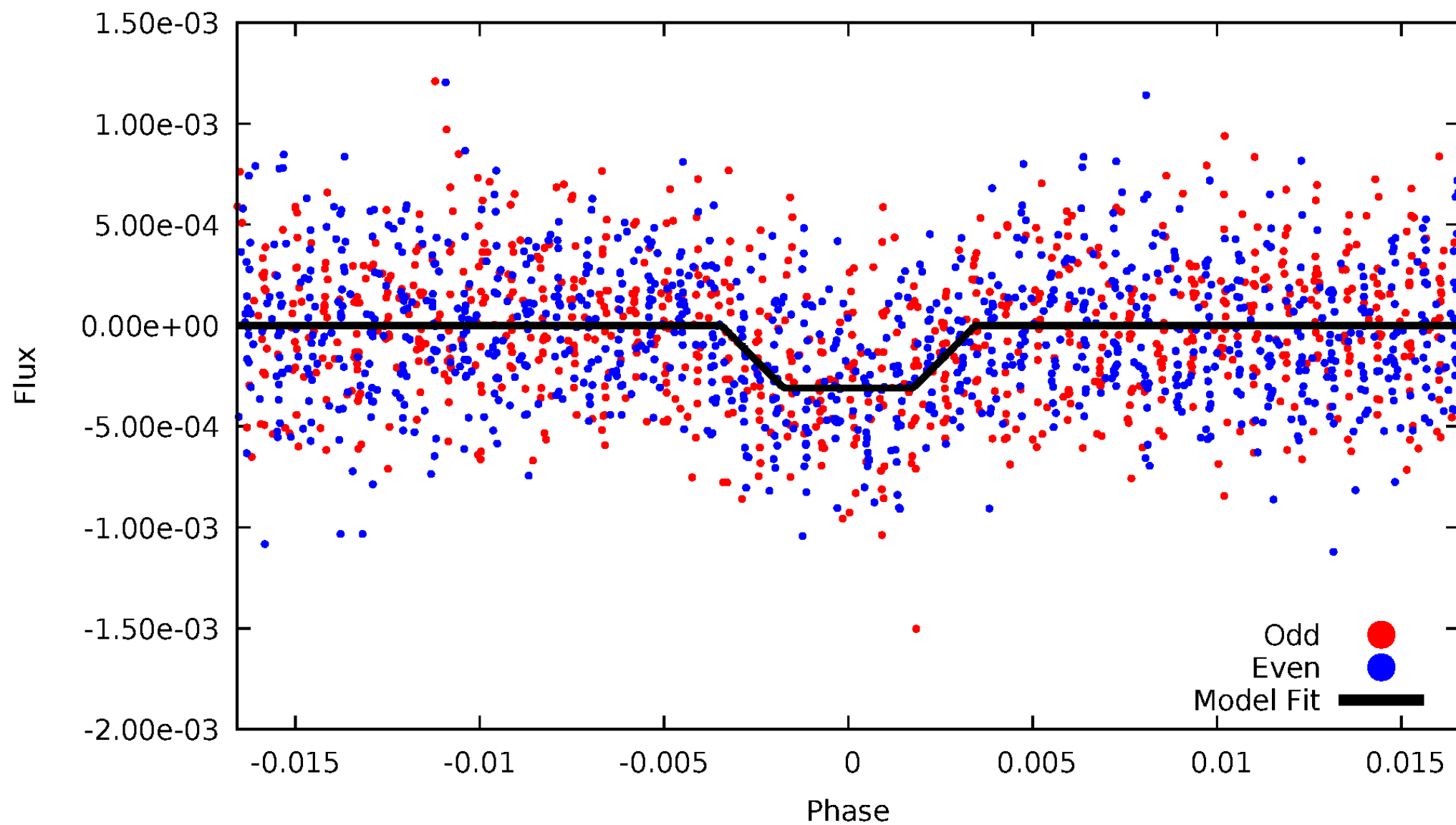
DV Odd/Even

TCE 009364290-02



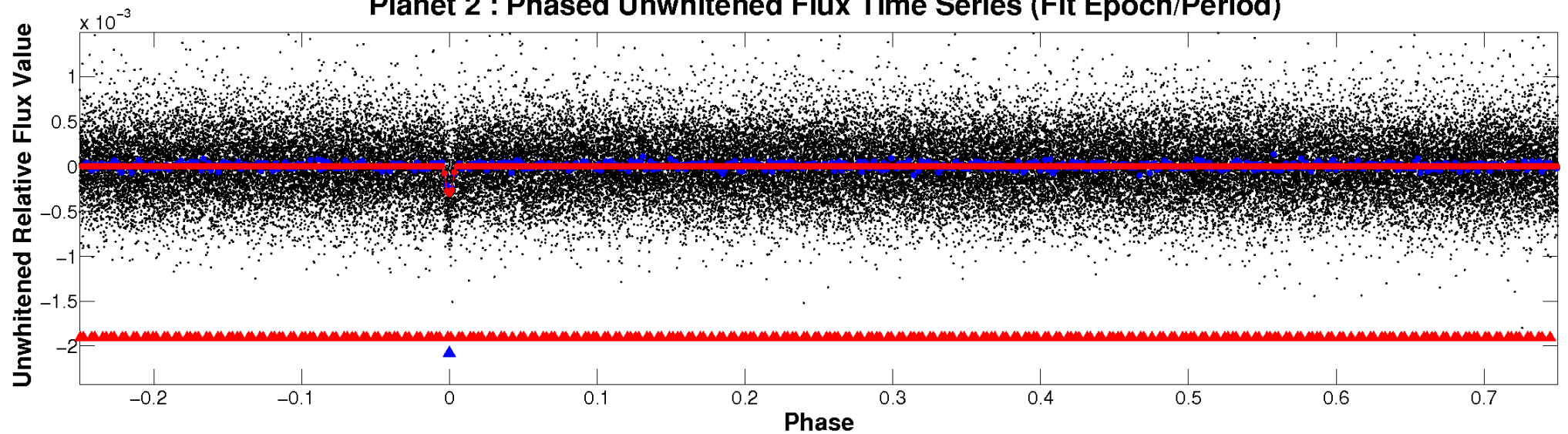
ALT Odd/Even

TCE 009364290-02

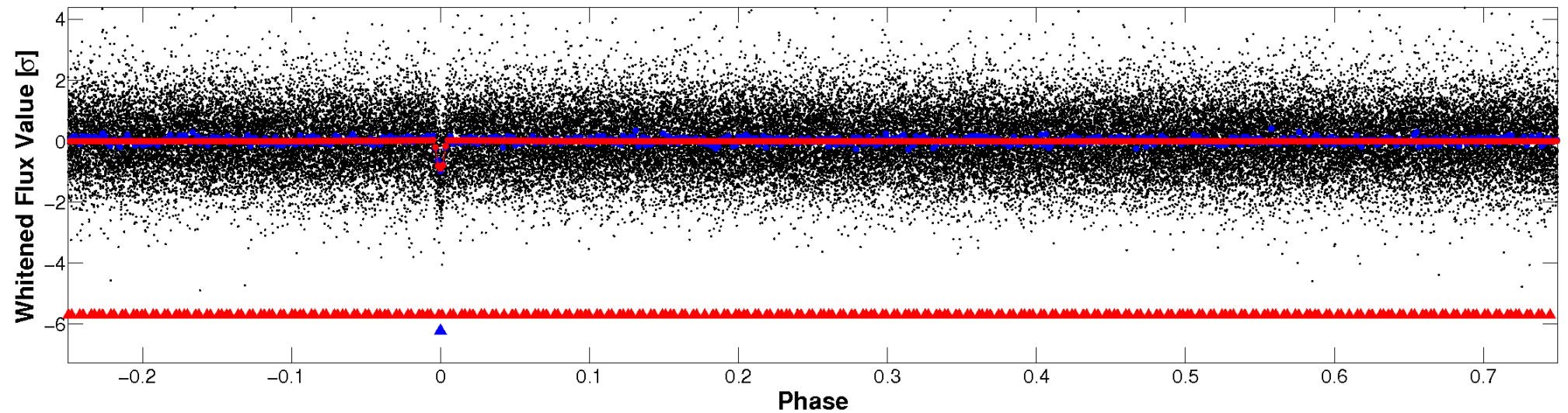


Non-Whitened Vs. Whitened Light Curve

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

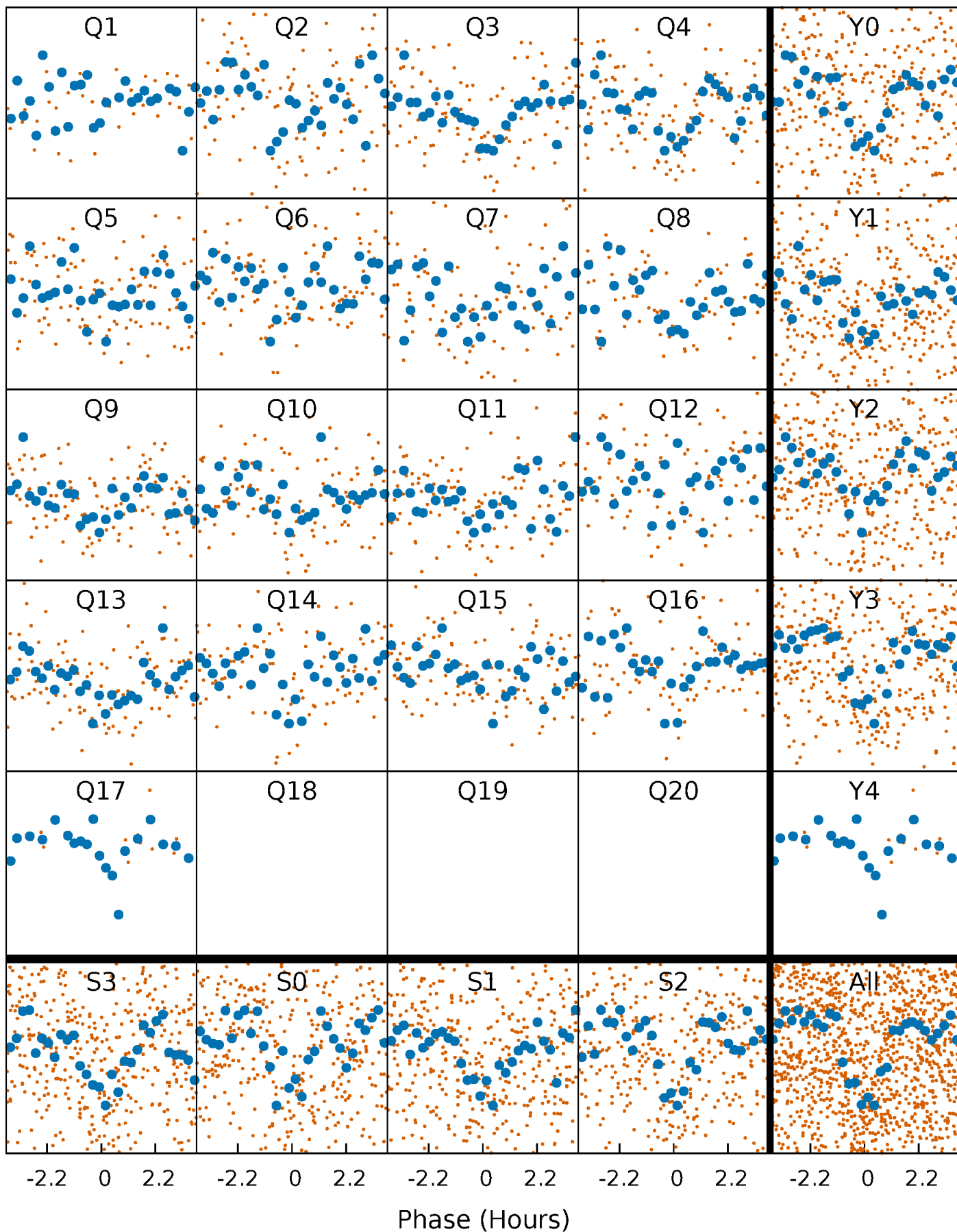


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



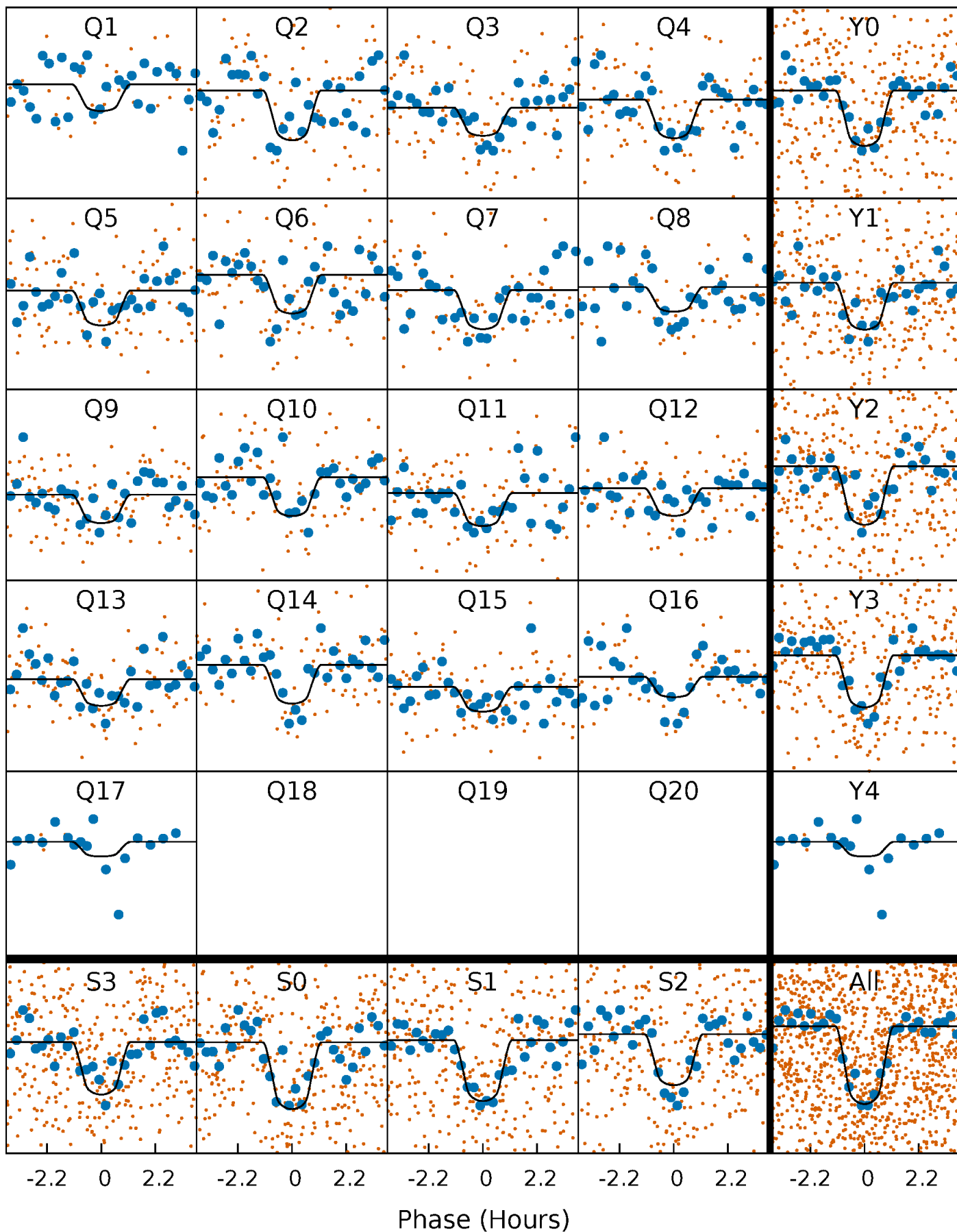
PDC Quarter-Phased Transit Curves

TCE 009364290-02 P= 12.162764 Days $T_0=137.526008$ (BKJD)



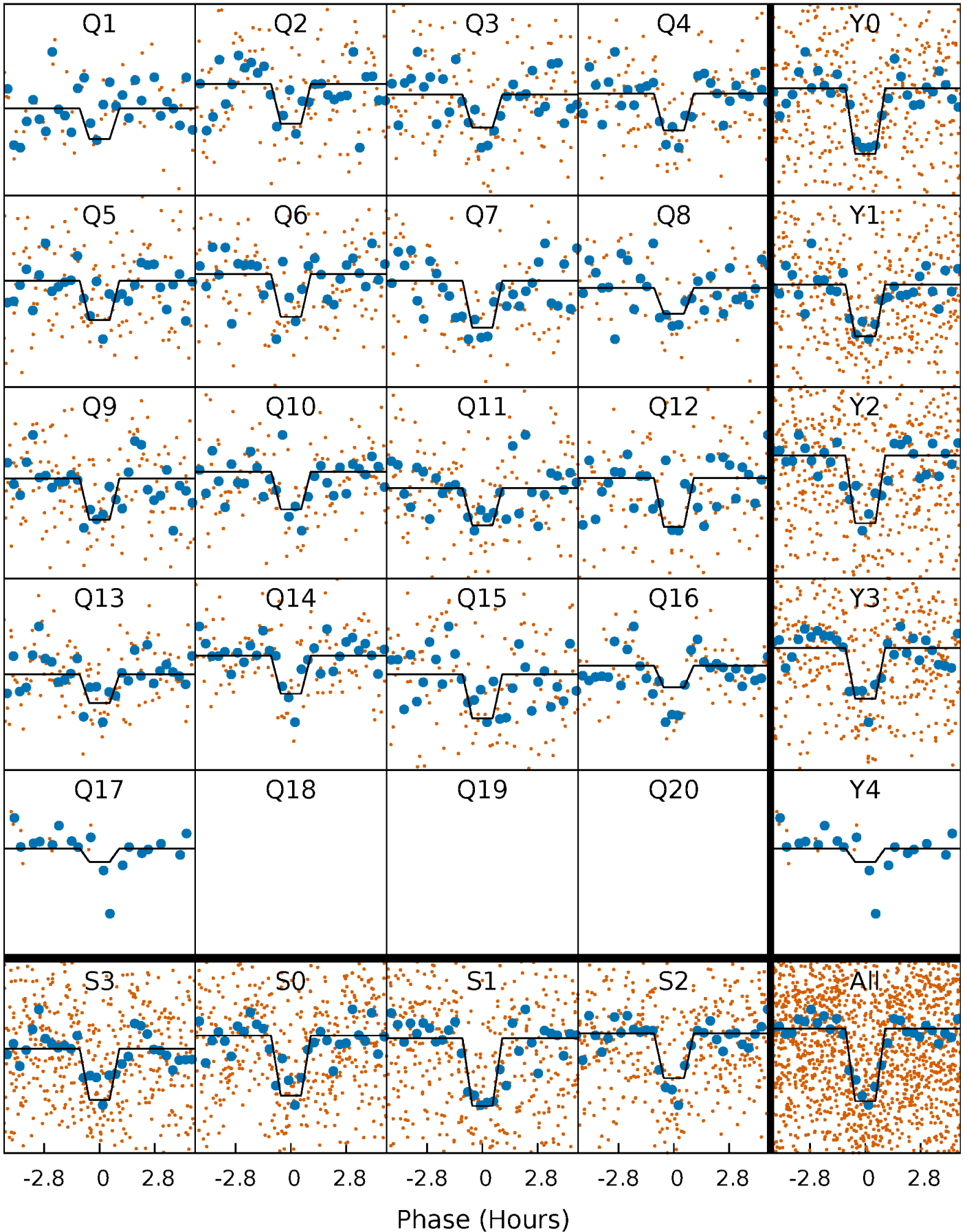
DV Quarter-Phased Transit Curves

TCE 009364290-02 P= 12.162764 Days $T_0=137.526008$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

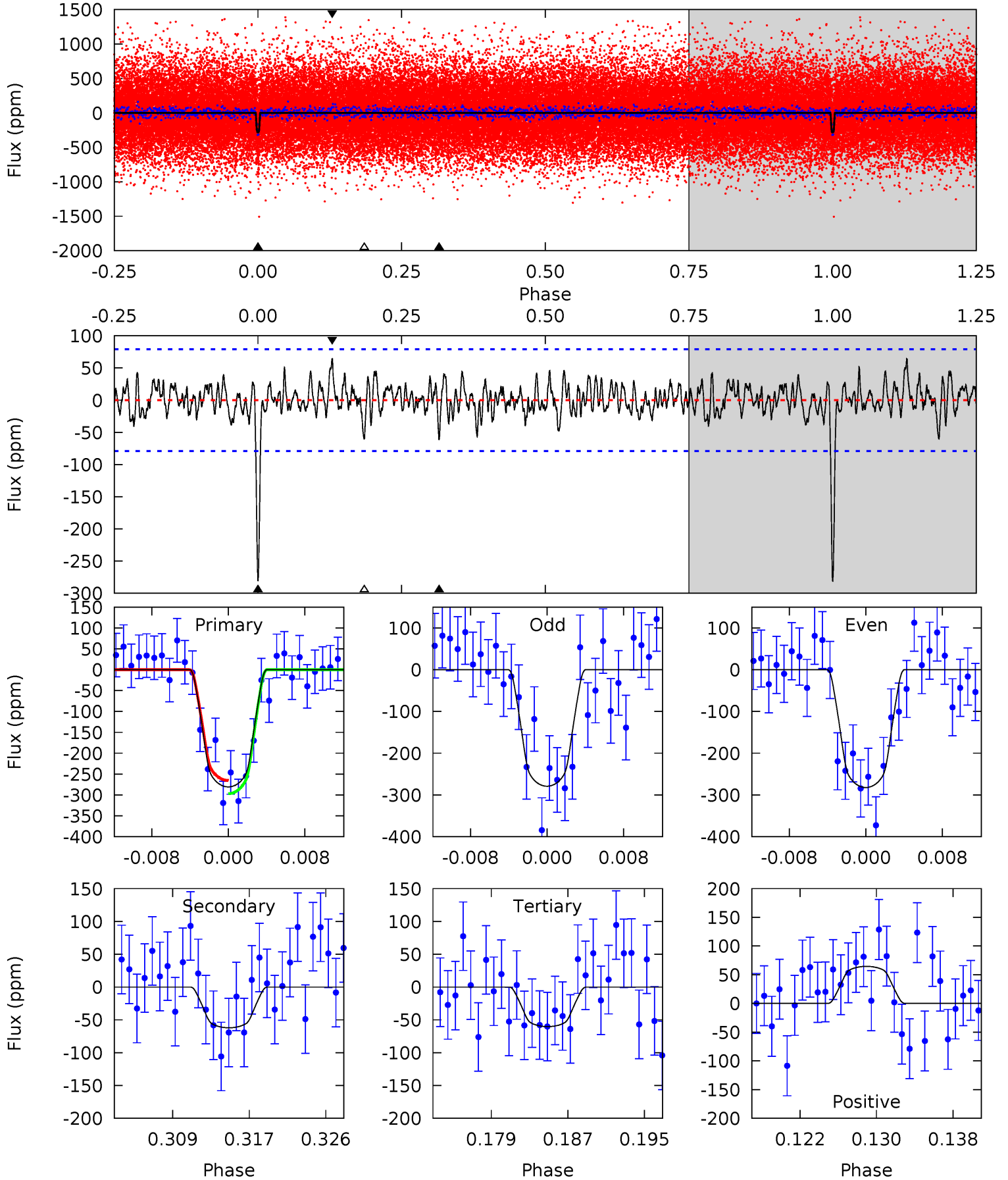
TCE 009364290-02 $P = 12.162777$ Days $T_0 = 137.527346$ (BKJD)



DV Model-Shift Uniqueness Test

009364290-02, $P = 12.162764$ Days, $E = 125.363244$ Days

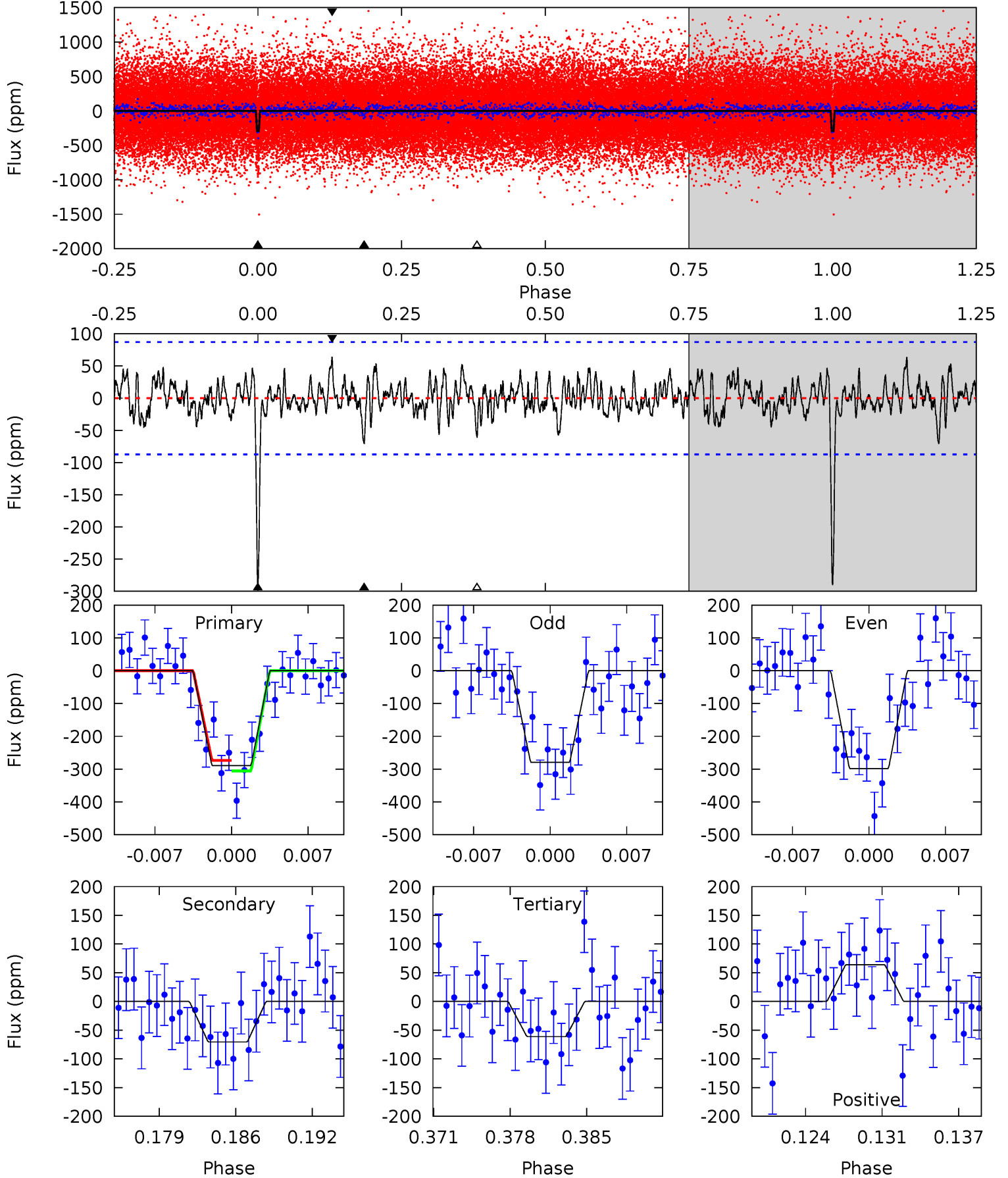
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.0	3.98	3.87	4.14	5.07	2.65	1.20	14.1	13.9	0.11	-0.16	0.10	1.04	0.19	1.02



Alt Model-Shift Uniqueness Test

009364290-02, $P = 12.162777$ Days, $E = 125.364569$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	4.13	3.58	3.75	5.10	2.70	1.19	13.3	13.2	0.55	0.38	0.55	1.07	0.18	0.95



Stellar Parameters For KIC 009364290

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5587^{+75}_{-75}	$4.188^{+0.188}_{-0.101}$	$0.140^{+0.150}_{-0.150}$	$1.309^{+0.208}_{-0.277}$	$0.963^{+0.073}_{-0.053}$	$0.605^{+0.577}_{-0.183}$
	+1%/-1%	+4%/-2%	+107%/-107%	+16%/-21%	+8%/-6%	+95%/-30%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 009364290-02 / KOI 2374.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-62 ± 16	$2.68^{+1.29}_{-1.24}$	1226^{+51}_{-70}	3857^{+1088}_{-435}	47^{+132}_{-25}
Alt.	-71 ± 17	$2.50^{+1.31}_{-1.16}$	1226^{+54}_{-69}	4084^{+1222}_{-562}	64^{+180}_{-38}

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

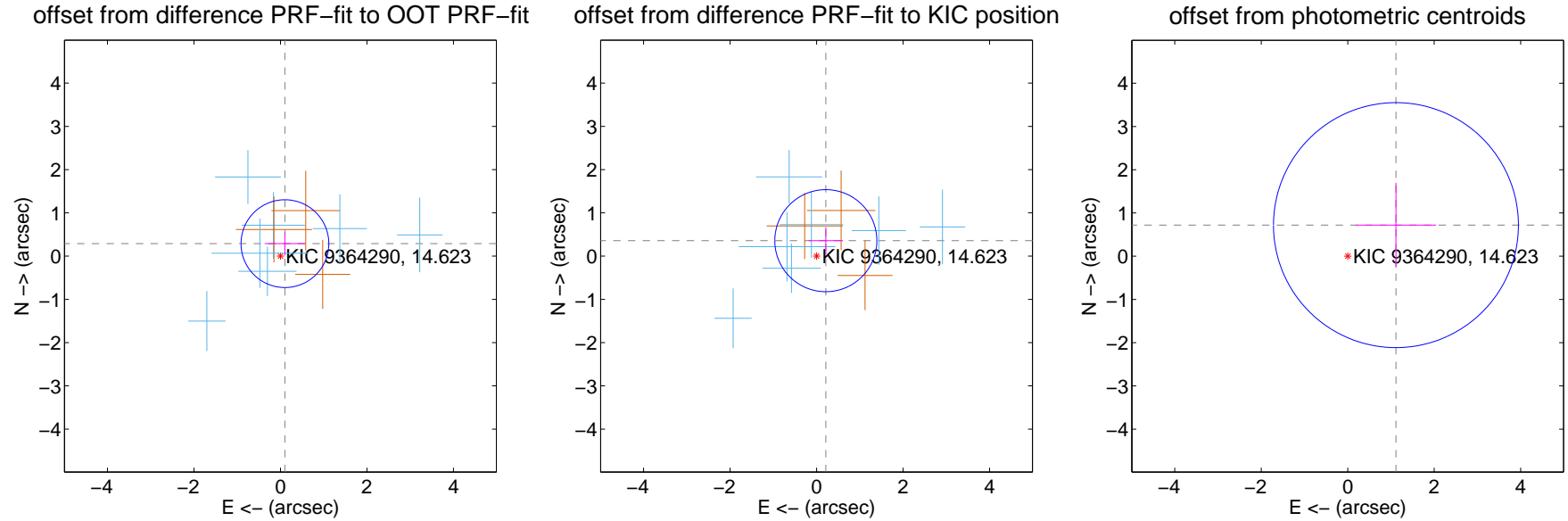
DV Centroid Data

Supplemental centroid analysis for 009364290-02. Kepler magnitude: 14.62. Transit SNR 14.30

There are 7 quarters with good PRF difference image offsets

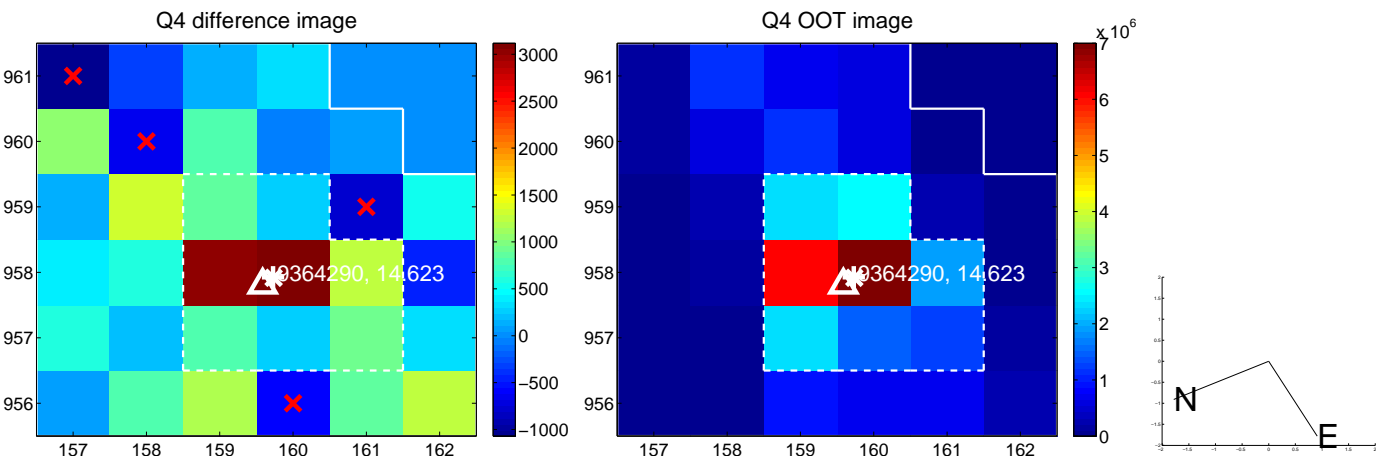
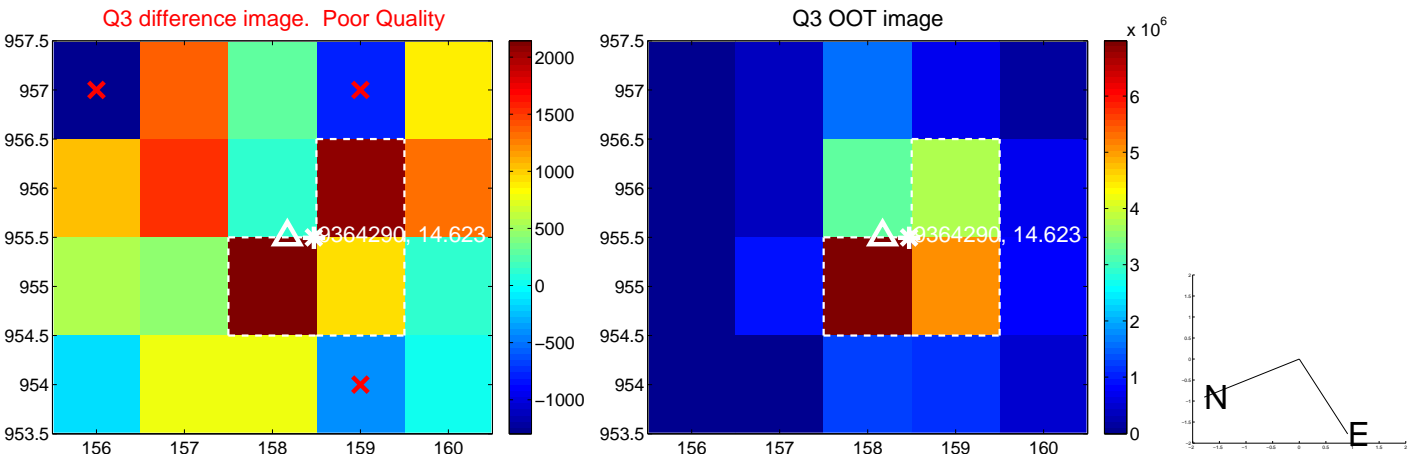
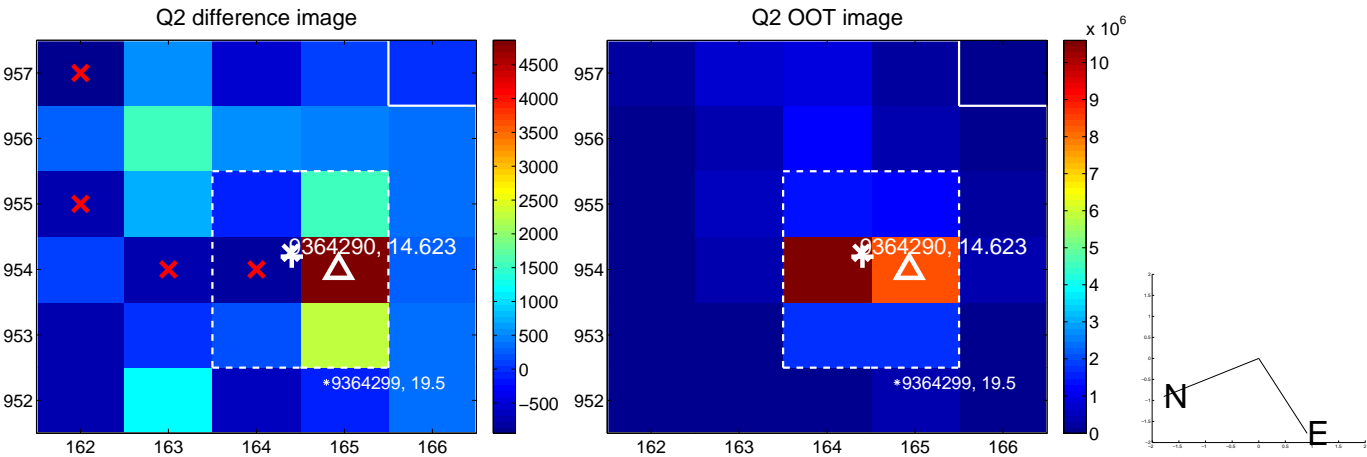
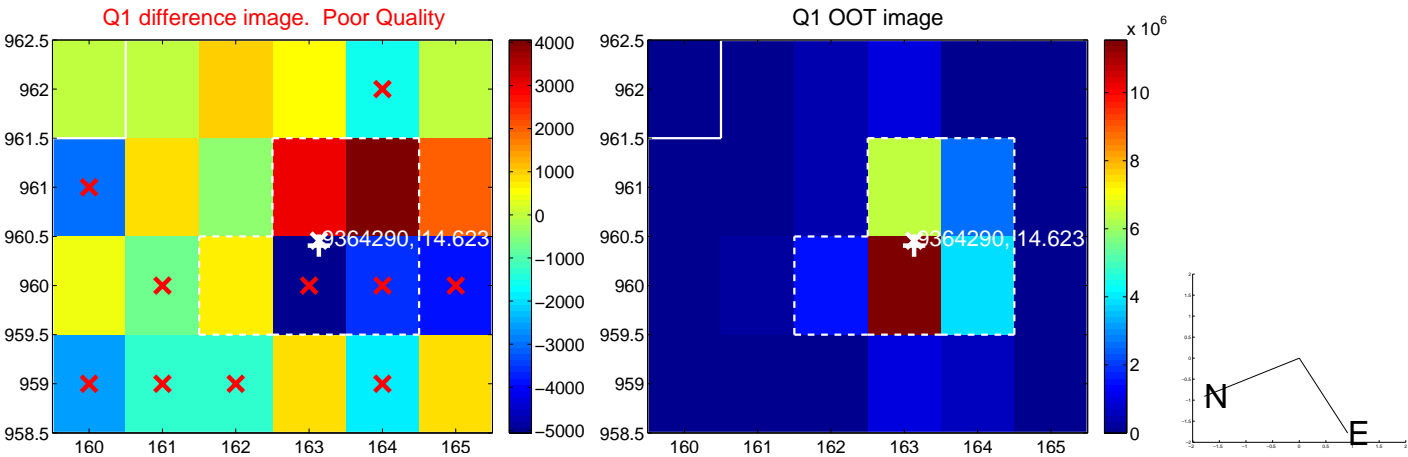
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.307 ± 0.338	0.91	-0.103 ± 0.469	0.289 ± 0.269
PRF-fit source offset from KIC position	0.416 ± 0.393	1.06	-0.214 ± 0.397	0.357 ± 0.313
photometric centroid source offset	1.33 ± 0.94	1.41	-1.12 ± 0.93	0.72 ± 0.98

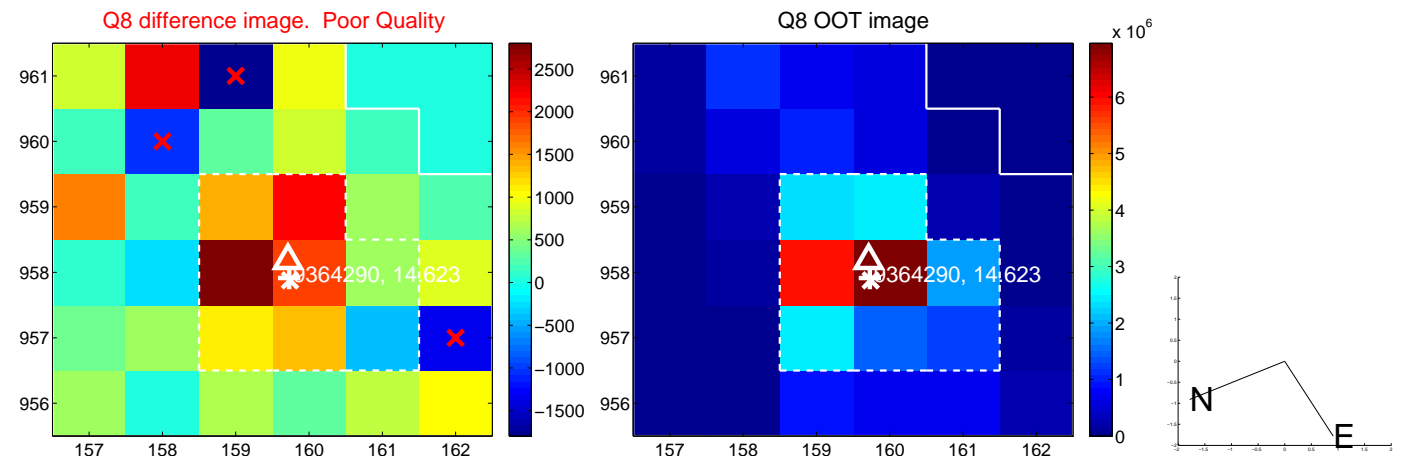
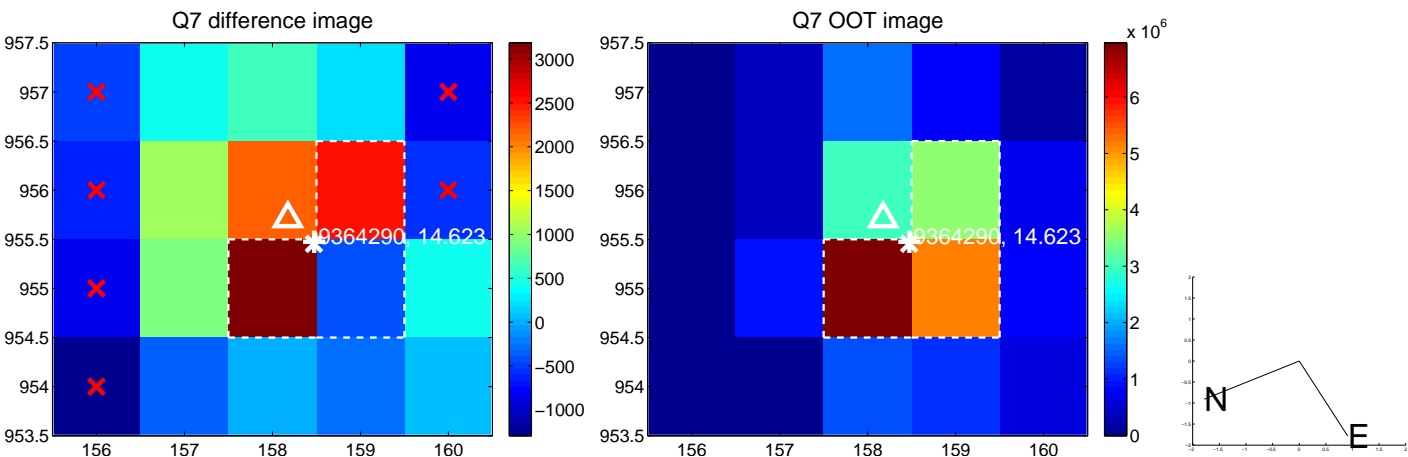
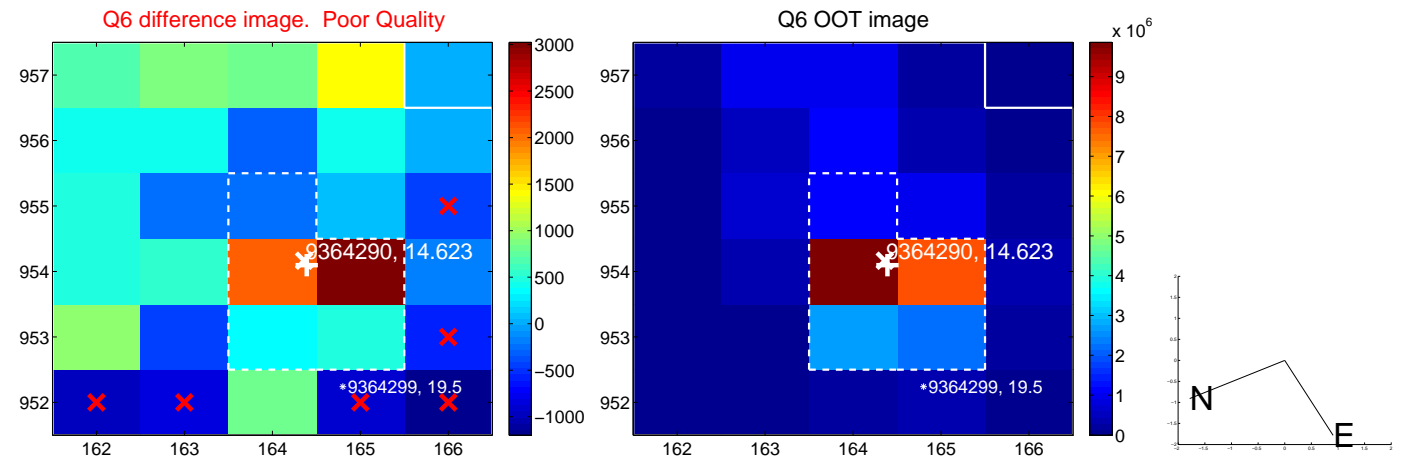
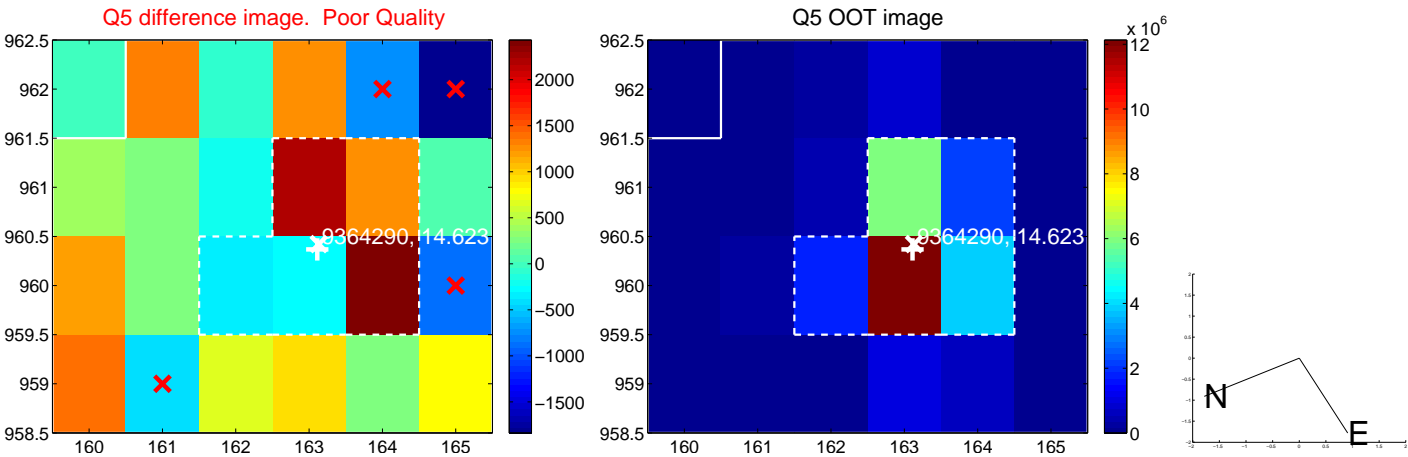


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

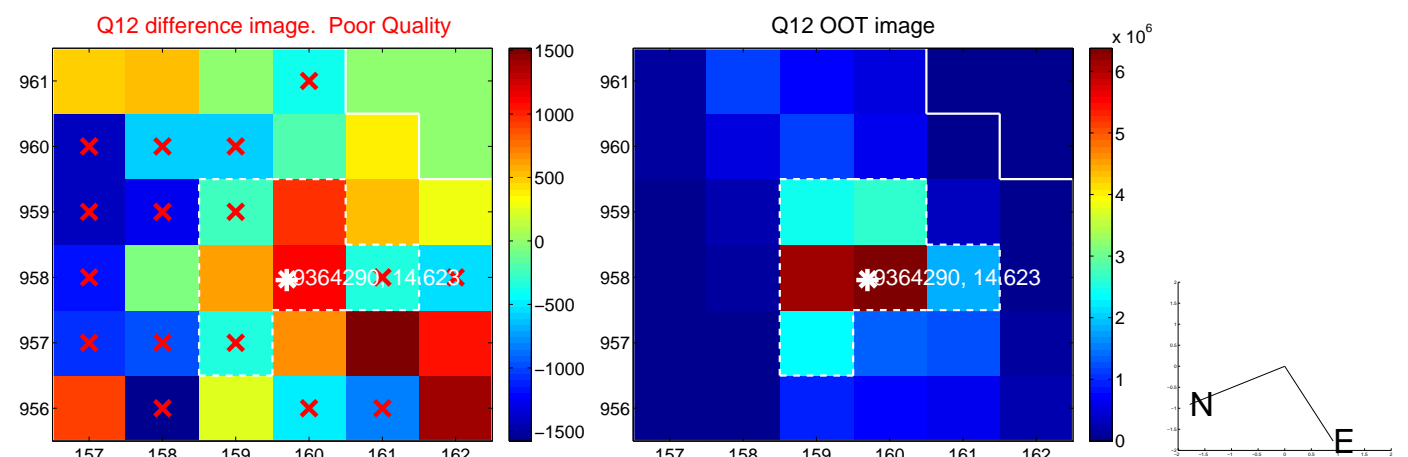
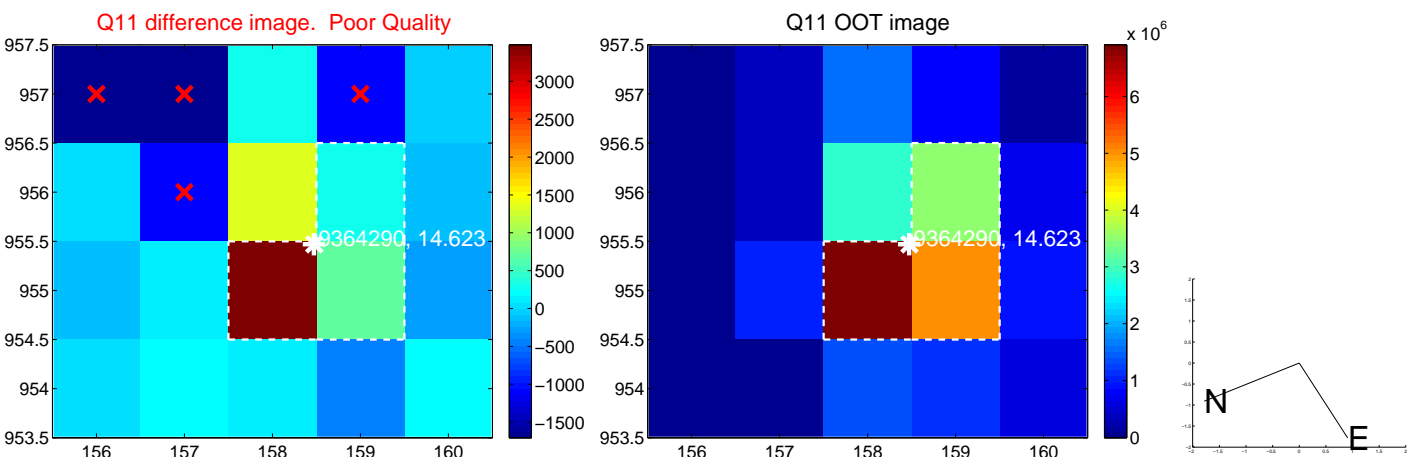
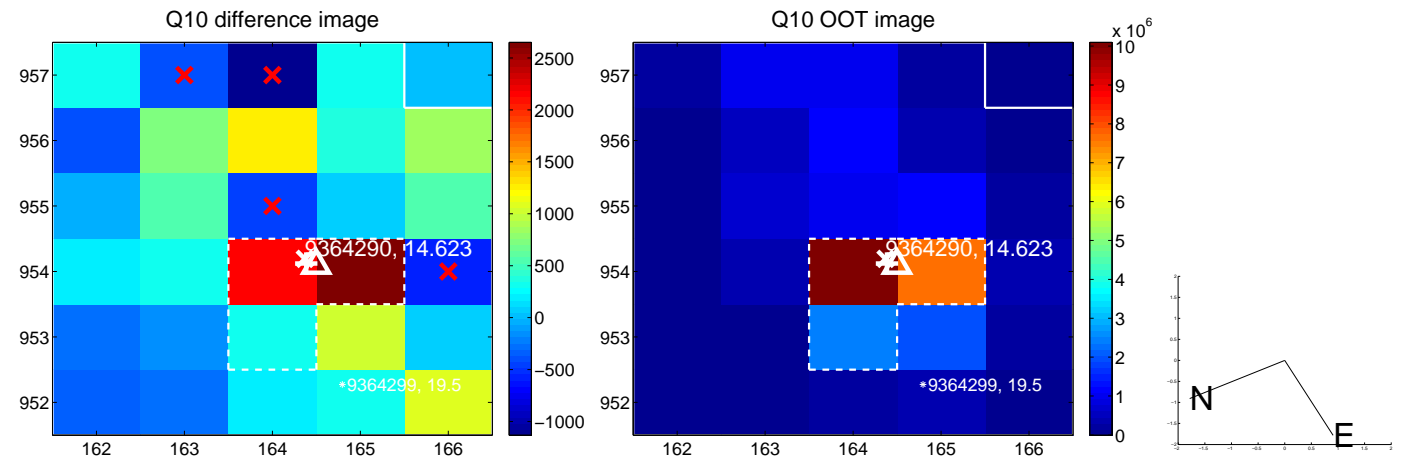
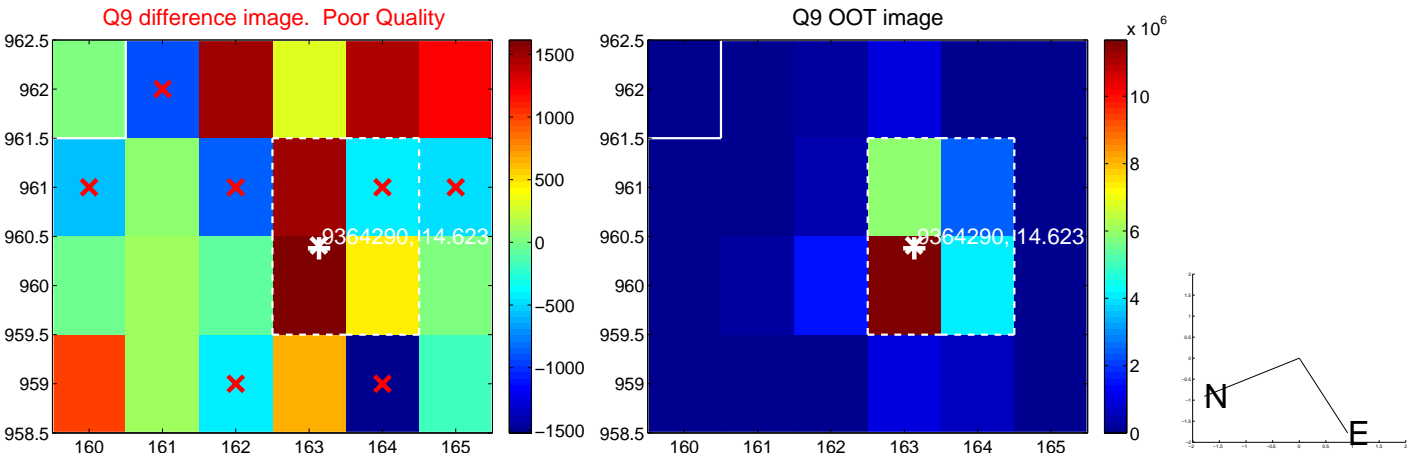
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



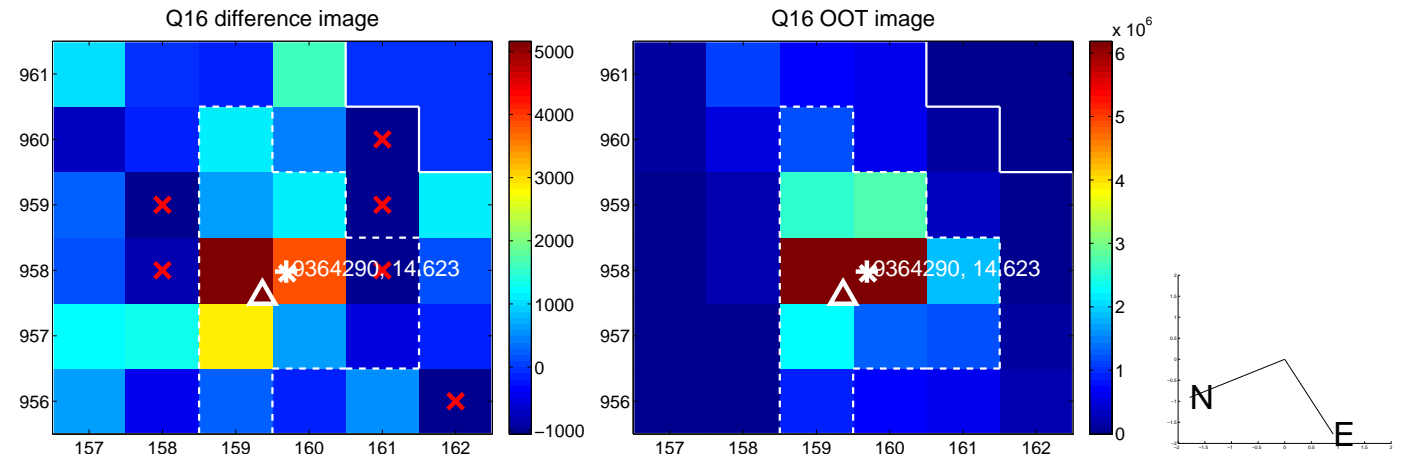
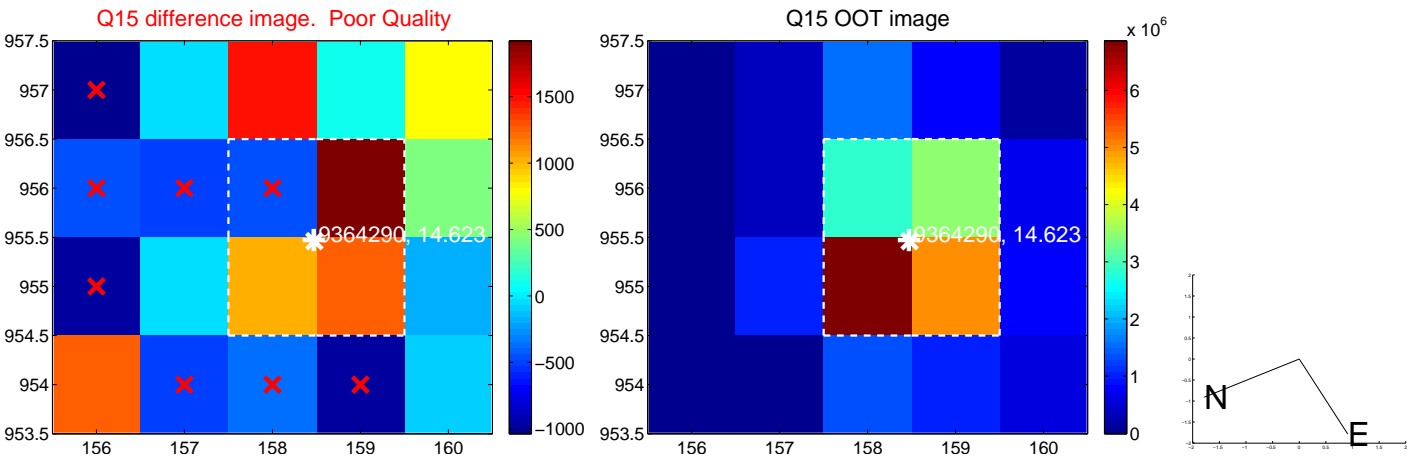
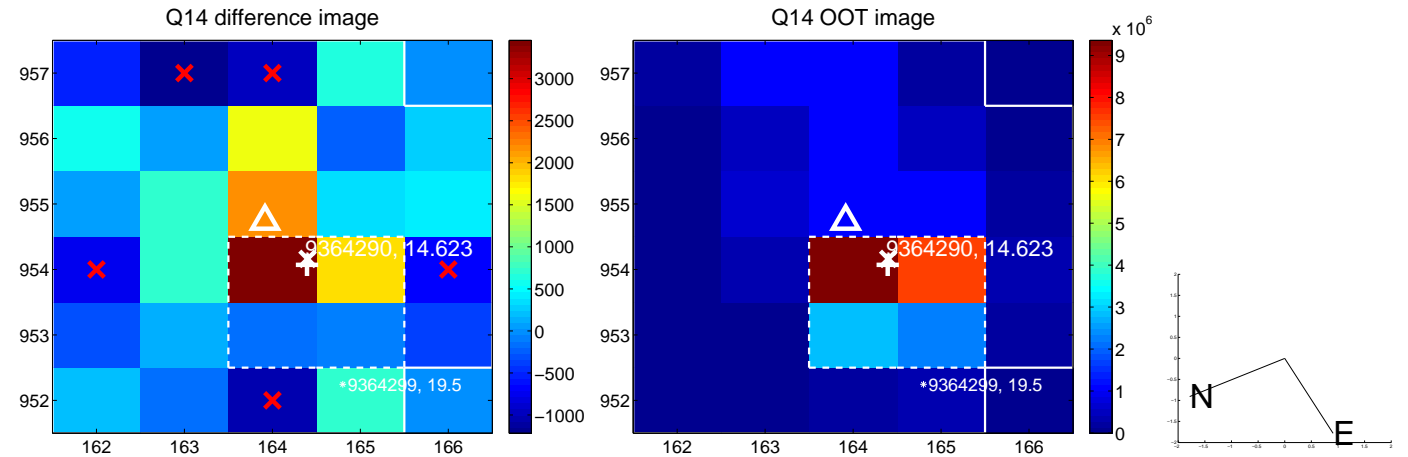
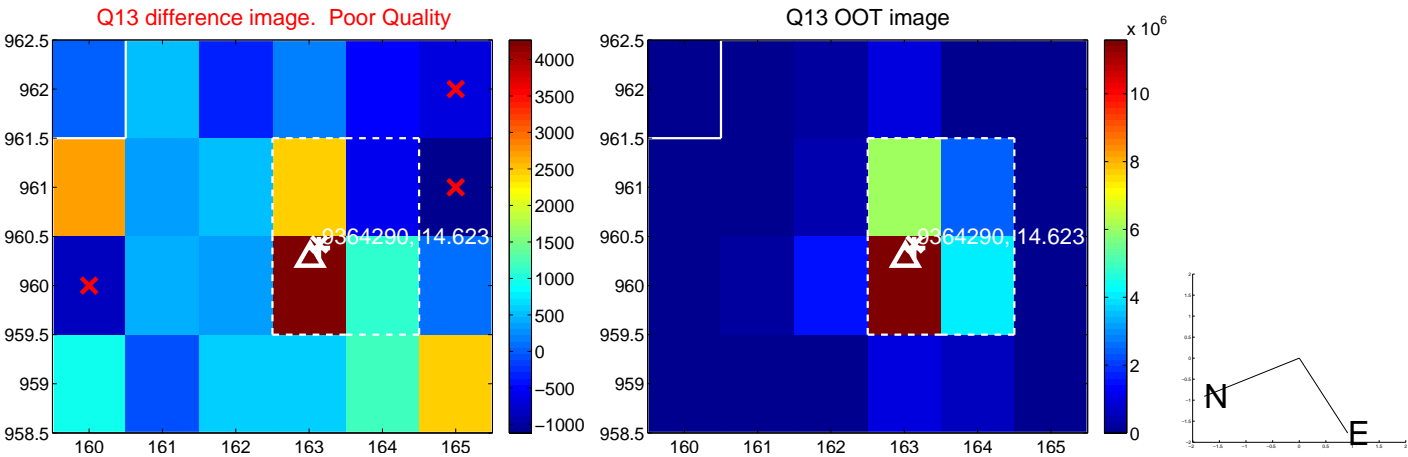
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



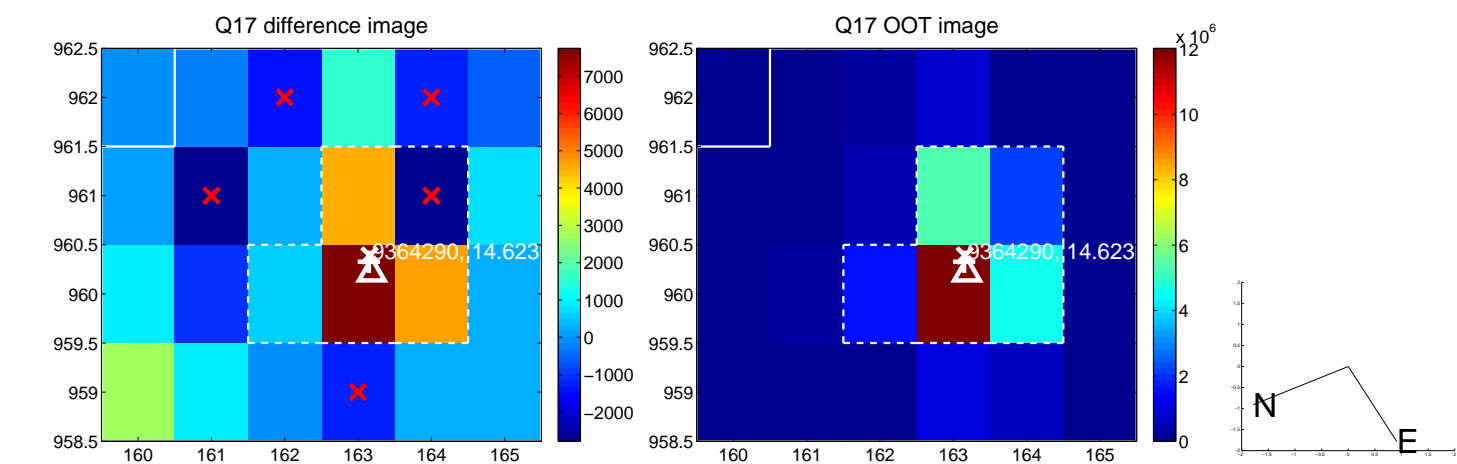
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



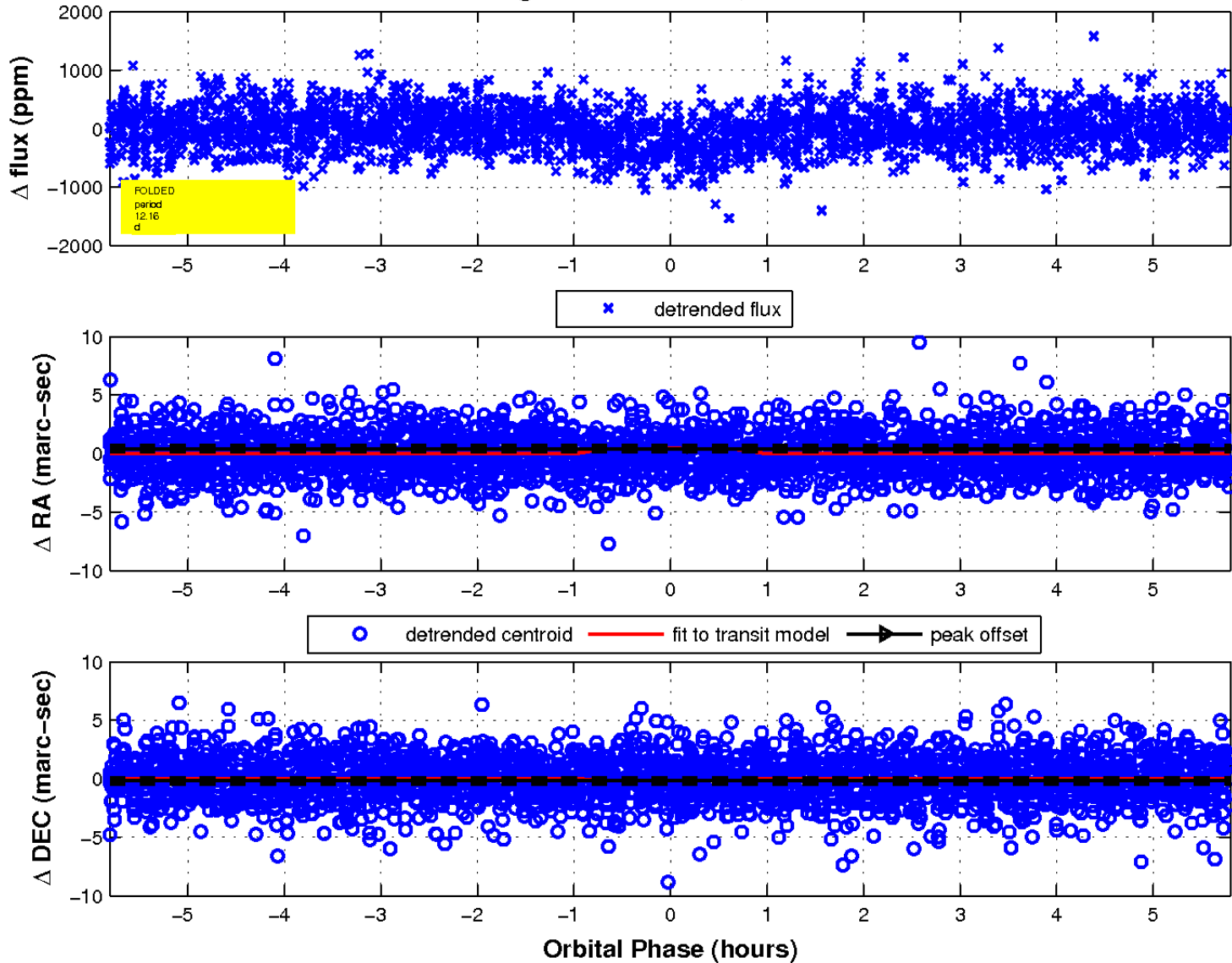
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

