

KIC 004042590

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})
004042590-01	OBS	No	1.037002	131.926224	208.3	5.740	16.3	14.9	1.94	7299	3.52	18090.19
004042590-02	OBS	No	1.037046	132.428331	244.2	3.812	23.9	23.6	1.94	7299	3.25	18089.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004042590-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004042590-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

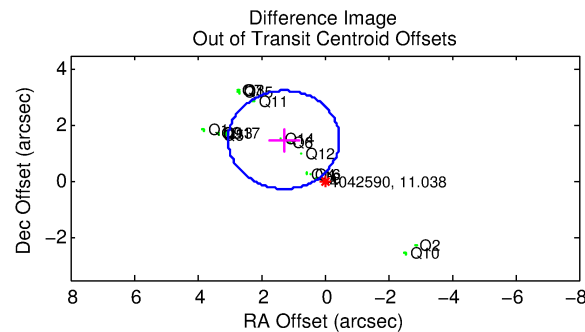
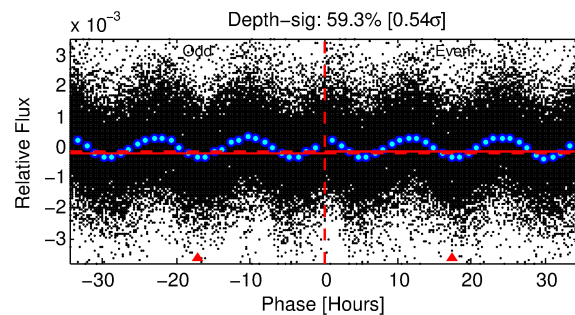
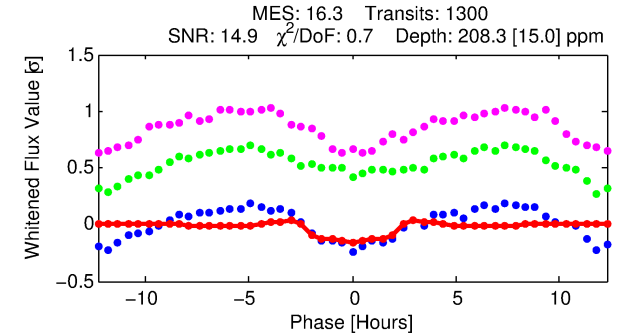
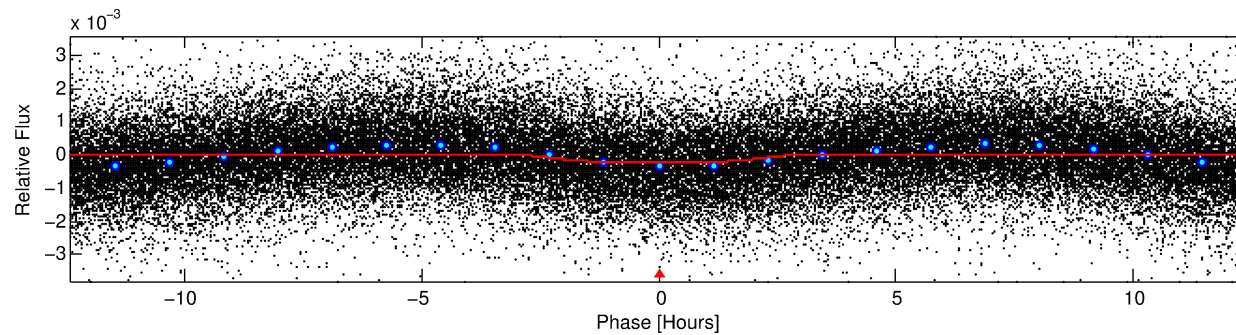
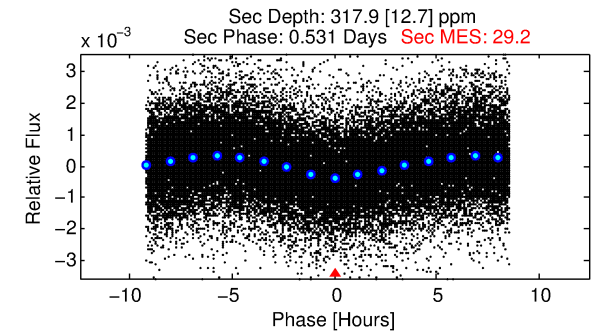
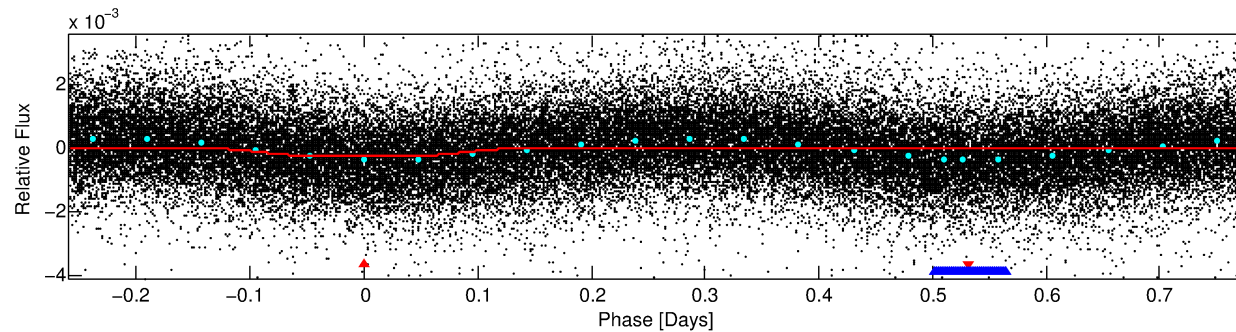
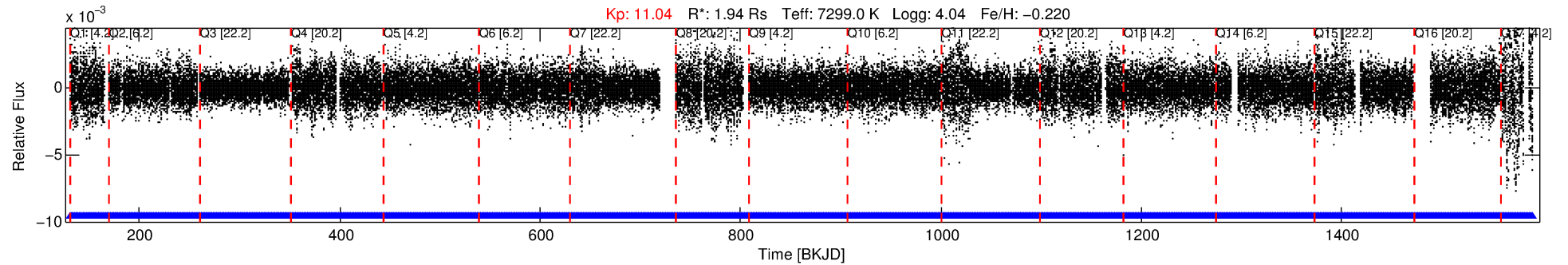
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004042590-01

No Significant Match Found

DV One-Page Summary

KIC: 4042590 Candidate: 1 of 2 Period: 1.037 d



DV Fit Results:

Period = 1.03700 [0.00001] d
Epoch = 131.9262 [0.0030] BKJD
Rp/R* = 0.0166 [0.0006]
a/R* = 1.08 [0.01]
b = 0.97 [0.01]
Seff = 18090.19 [7804.03]
Teq = 2957 [319] K
Rp = 3.52 [1.01] Re
a = 0.0230 [0.0059] AU
Ag = 7.47 [3.04] [2.13σ]
Teffp = 7559 [355] K [9.64σ]

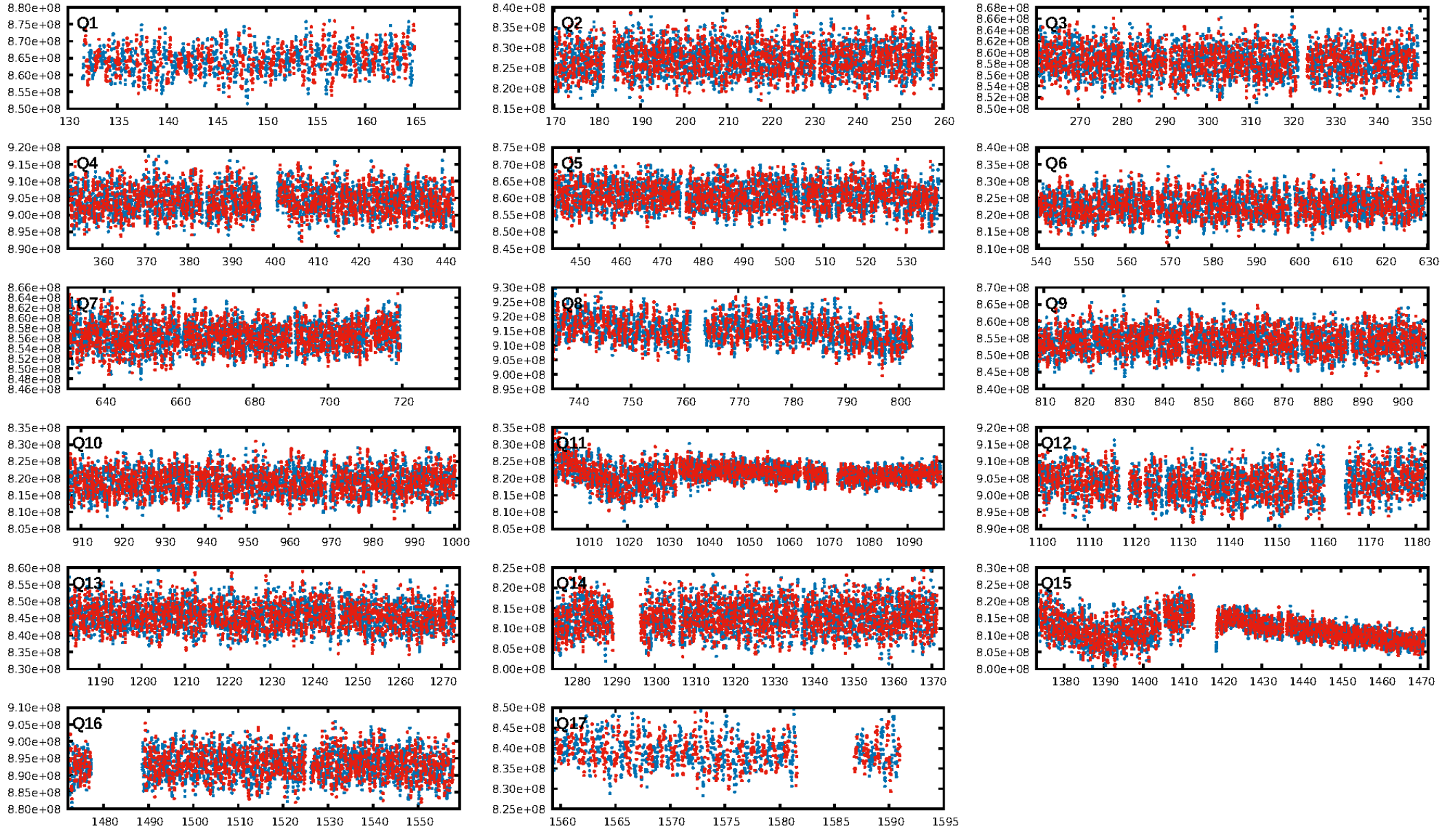
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1240/1240]
GhostDiagnostic-chr: 3.131
Centroid-sig: 0.0%
Centroid-so: 0.890 arcsec [6.24σ]
OotOffset-rm: 1.970 arcsec [3.38σ]
KicOffset-rm: 2.334 arcsec [4.16σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.76 [13/17]
DiffImageOverlap-fno: 0.00 [0/17]

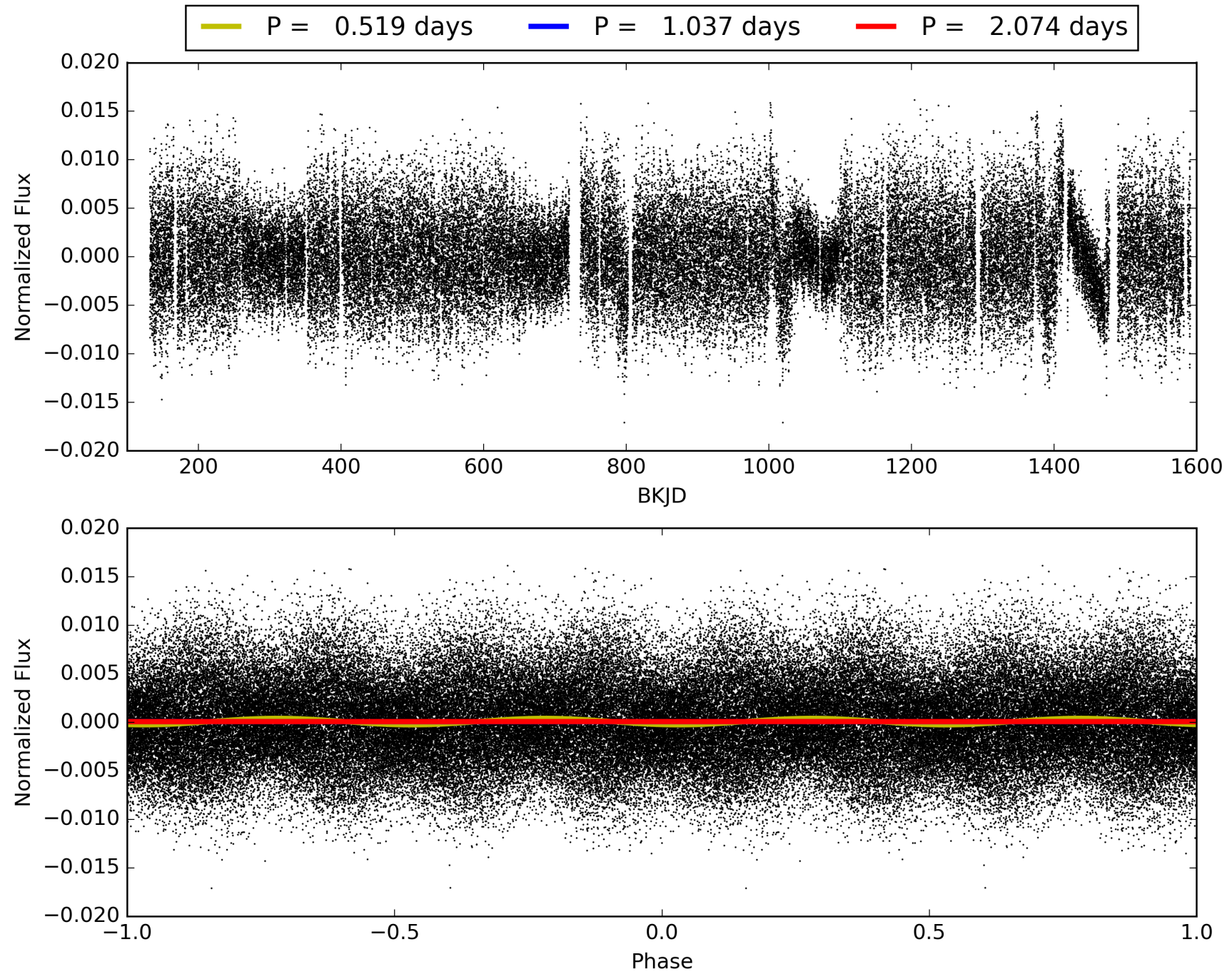
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:59:51 Z

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

TCE 004042590-01, PDC Light Curves

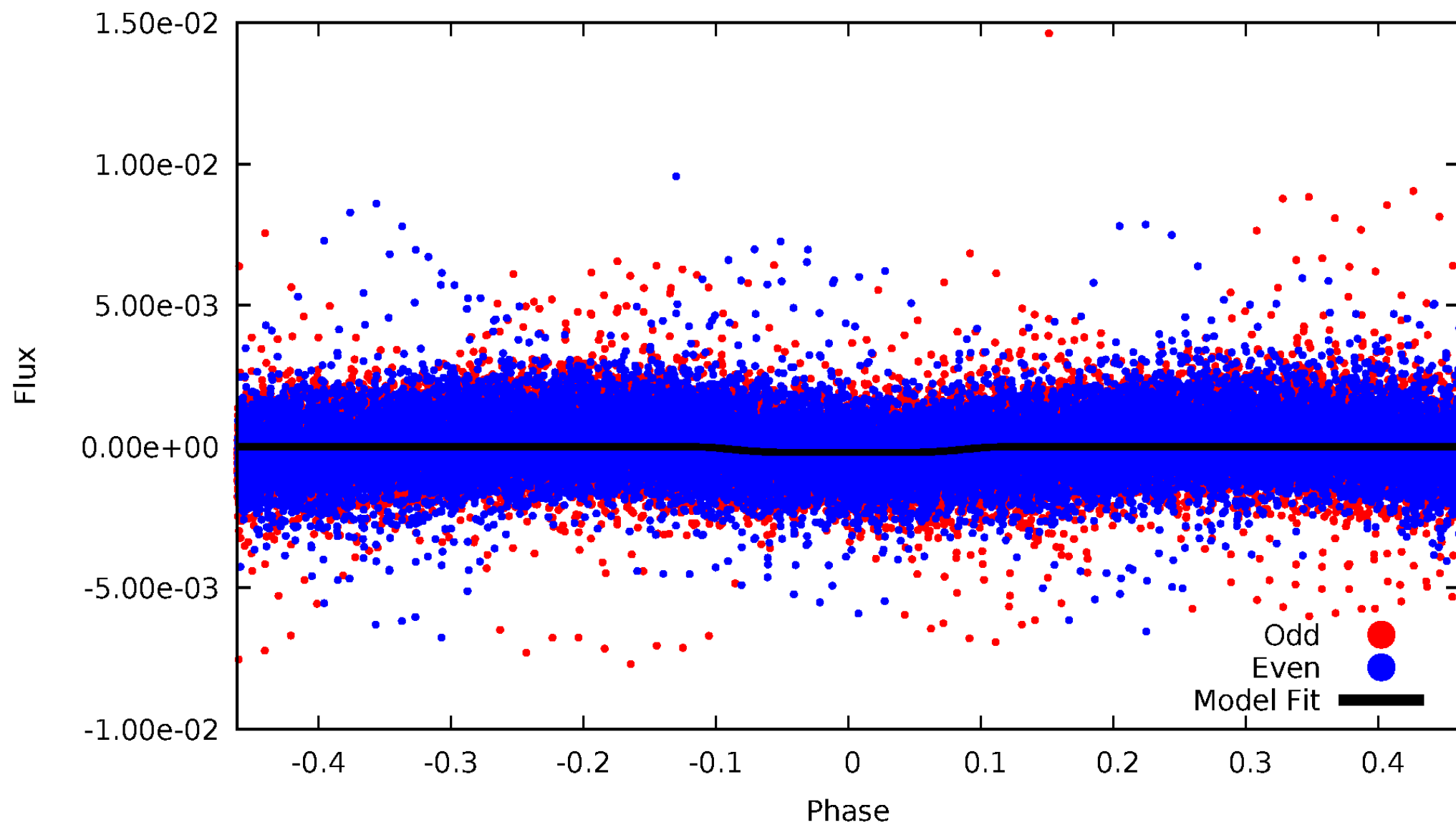


TCE 004042590-01



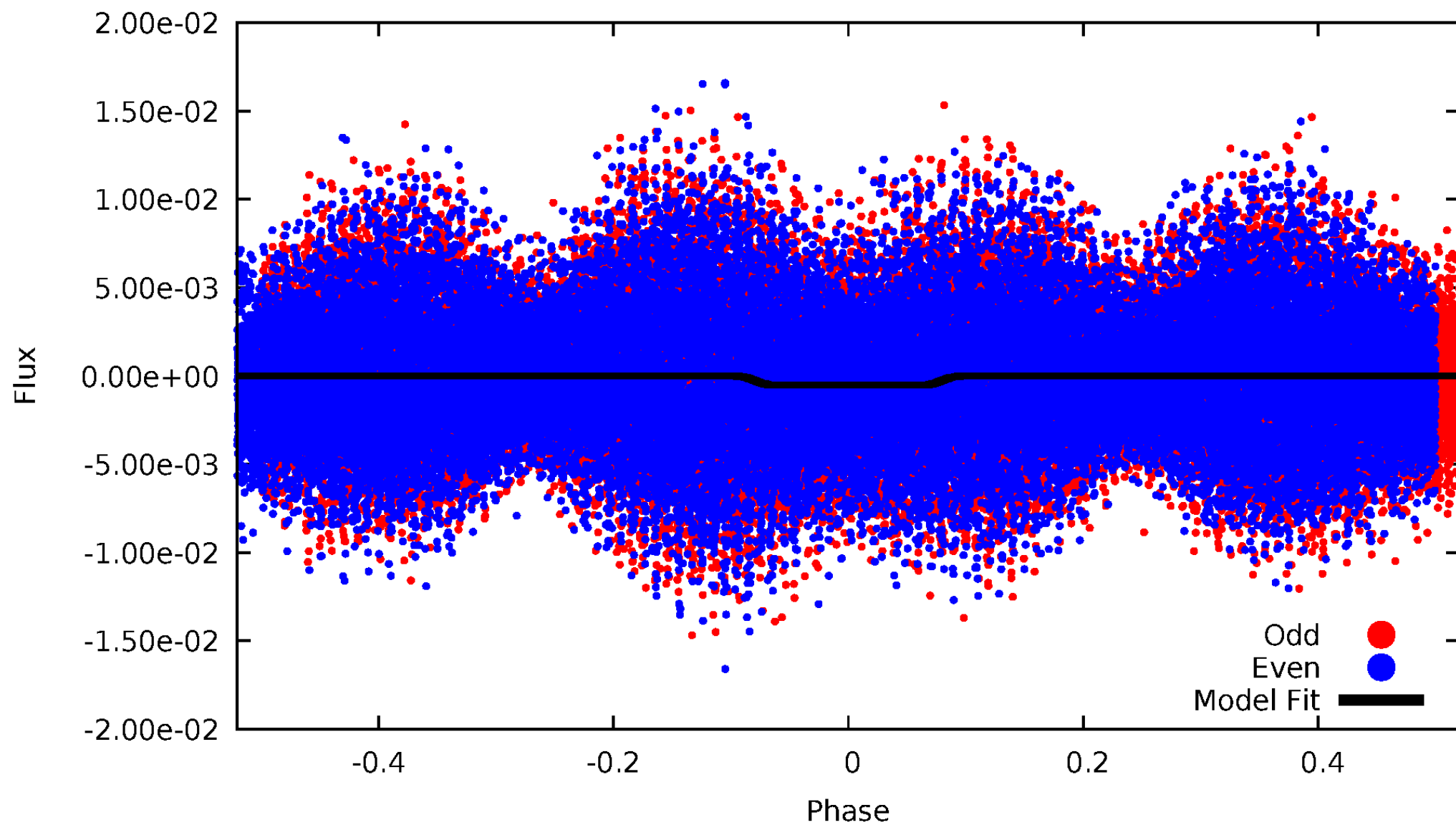
DV Odd/Even

TCE 004042590-01



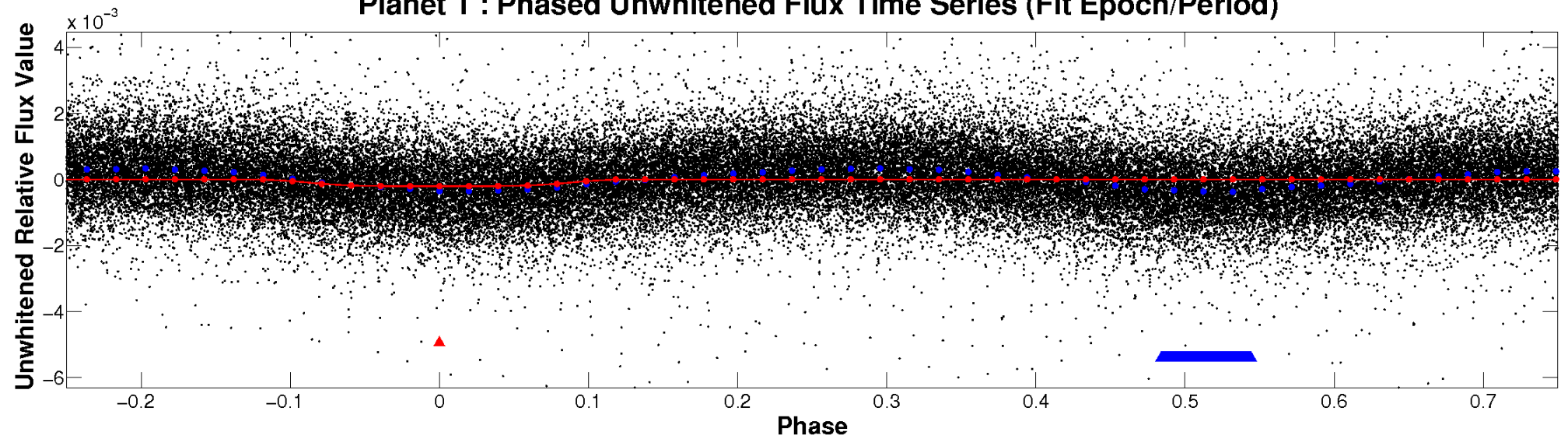
ALT Odd/Even

TCE 004042590-01

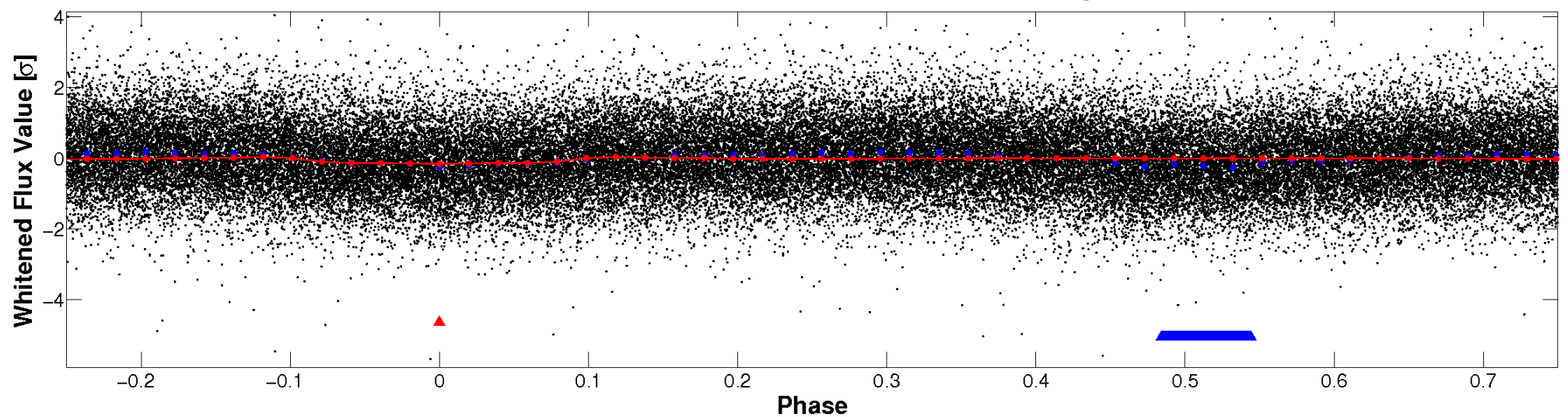


Non-Whitened Vs. Whitened Light Curve

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

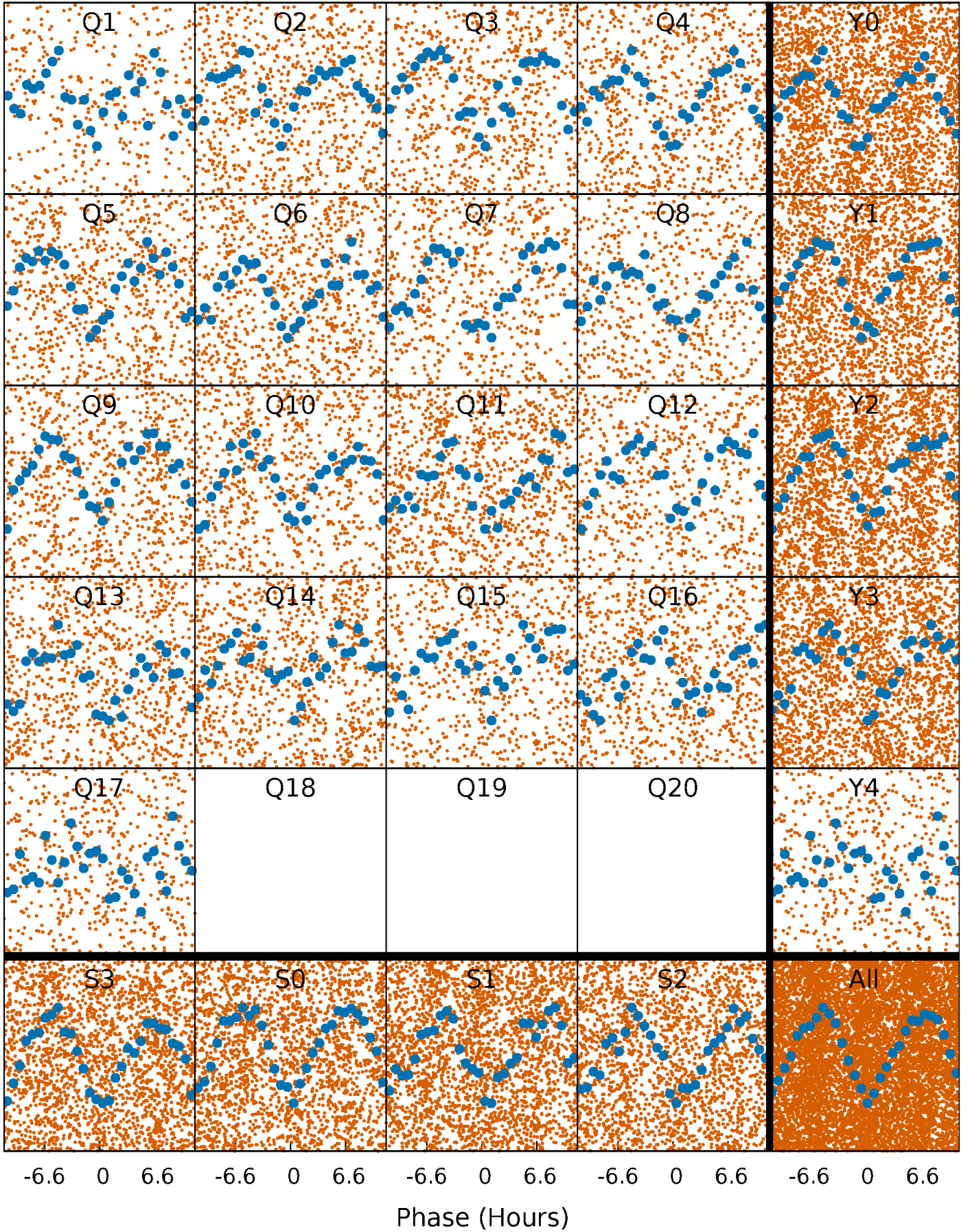


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



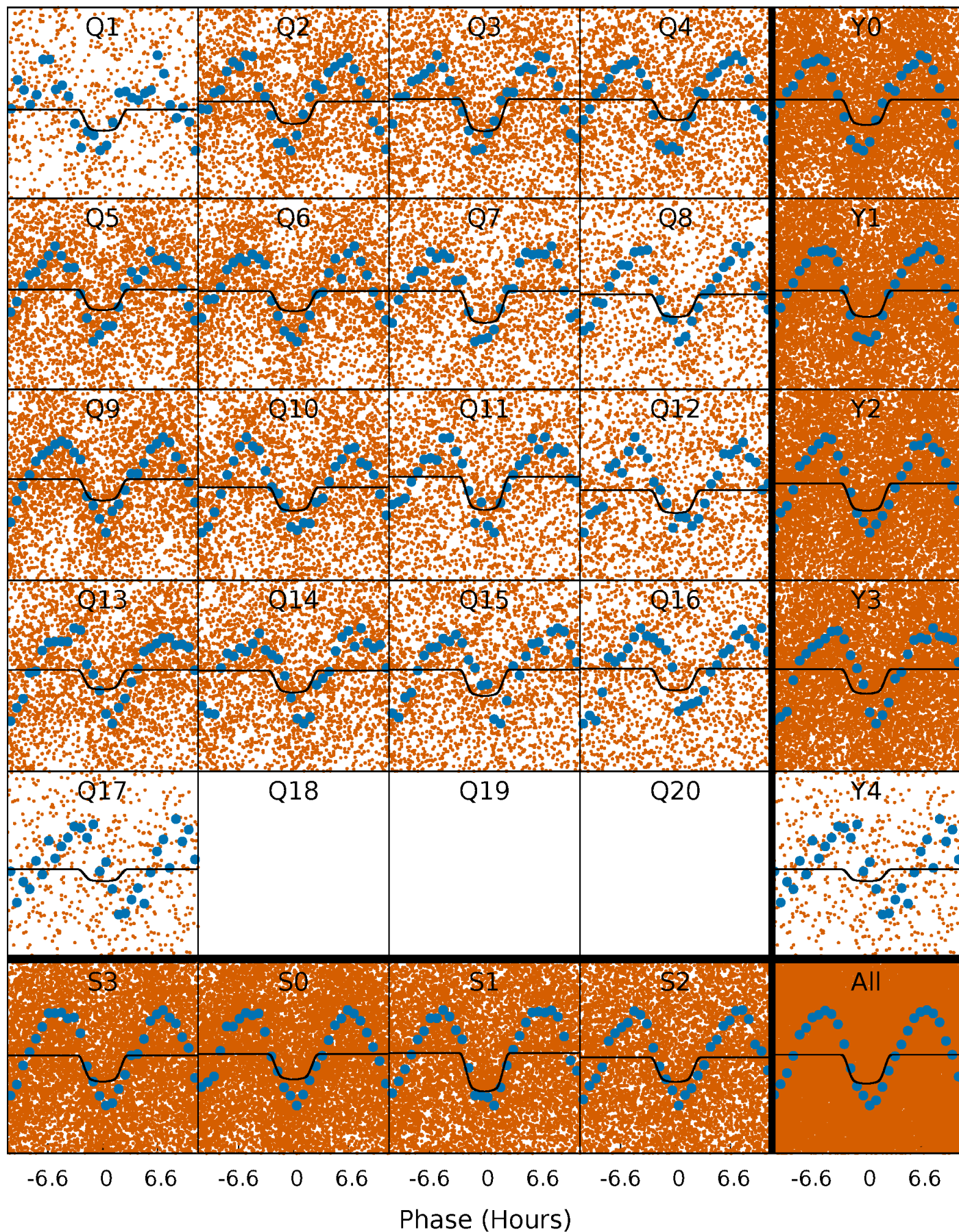
PDC Quarter-Phased Transit Curves

TCE 004042590-01 P= 1.037002 Days $T_0=131.926224$ (BKJD)



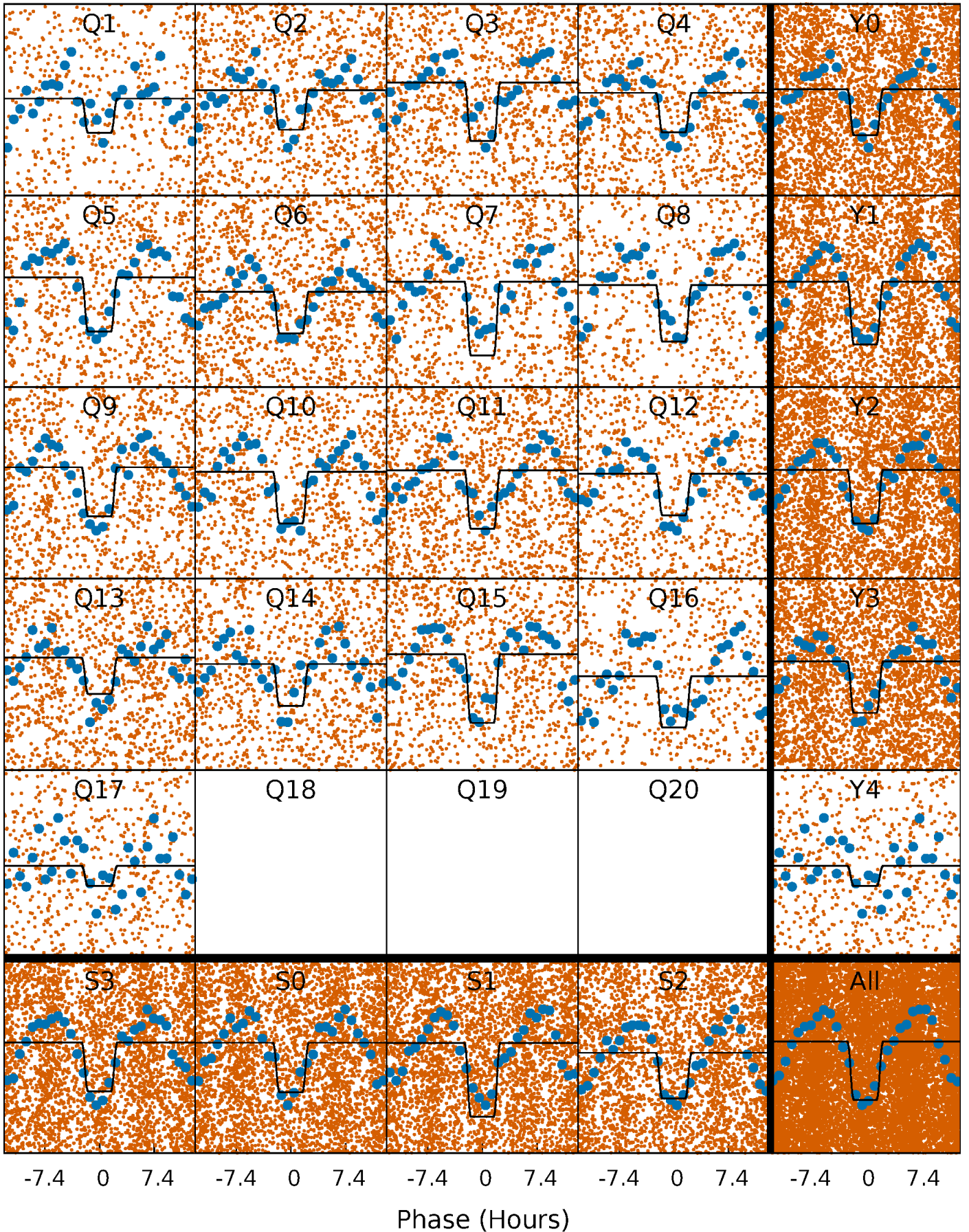
DV Quarter-Phased Transit Curves

TCE 004042590-01 P= 1.037002 Days $T_0=131.926224$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

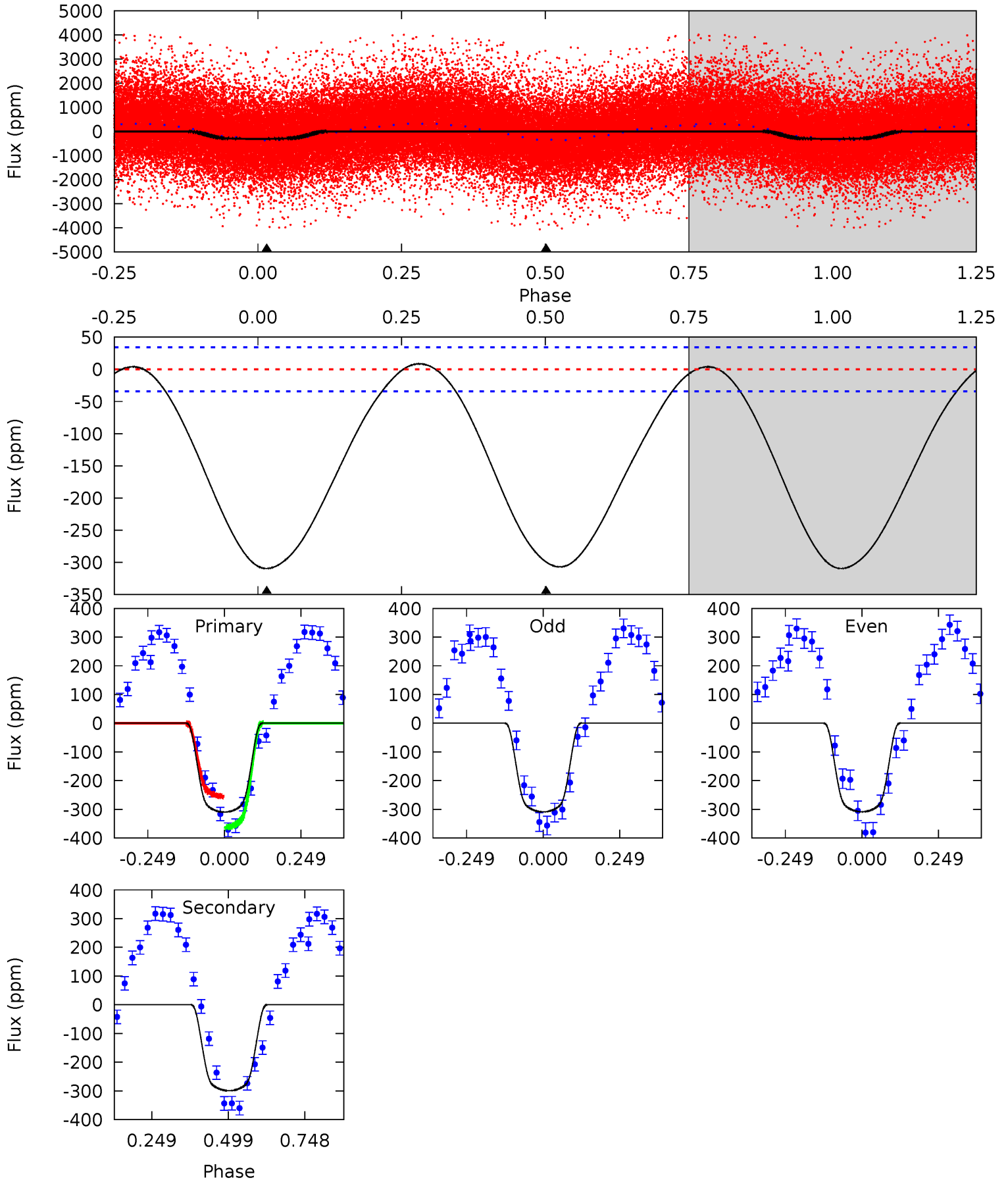
TCE 004042590-01 P= 1.037094 Days $T_0=131.884880$ (BKJD)



DV Model-Shift Uniqueness Test

004042590-01, P = 1.037002 Days, E = 130.889222 Days

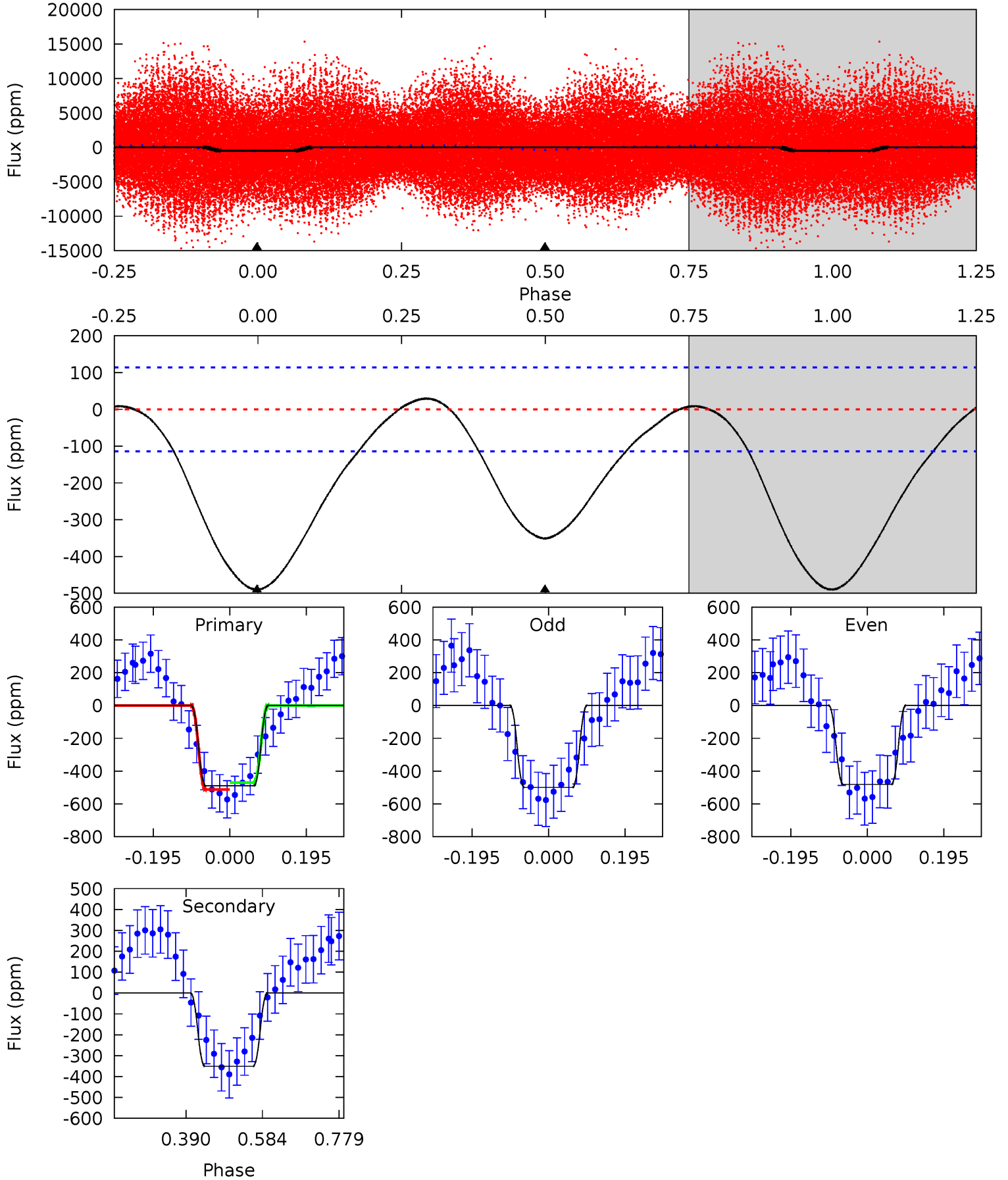
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.6	38.3	0	0	4.37	1.15	1.17	39.6	39.6	38.3	38.3	0.03	1.00	0.03	7.22



Alt Model-Shift Uniqueness Test

004042590-01, P = 1.037094 Days, E = 130.847786 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	13.6	0	0	4.42	1.30	0.98	19.0	19.0	13.6	13.6	0.35	1.08	0.06	0.81



Stellar Parameters For KIC 004042590

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7299^{+228}_{-304}	$4.041^{+0.228}_{-0.171}$	$-0.220^{+0.250}_{-0.350}$	$1.940^{+0.551}_{-0.551}$	$1.507^{+0.211}_{-0.281}$	$0.291^{+0.406}_{-0.129}$
	+3%/-4%	+6%/-4%	+114%/-159%	+28%/-28%	+14%/-19%	+140%/-44%
Source	KIC0	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 004042590-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-299 ± 8	$3.45^{+0.60}_{-0.53}$	4086^{+325}_{-338}	7354^{+328}_{-346}	$7.300^{+2.540}_{-1.917}$
Alt.	-351 ± 26	$4.80^{+0.78}_{-0.75}$	4088^{+354}_{-327}	6402^{+239}_{-289}	$4.353^{+1.559}_{-1.046}$

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

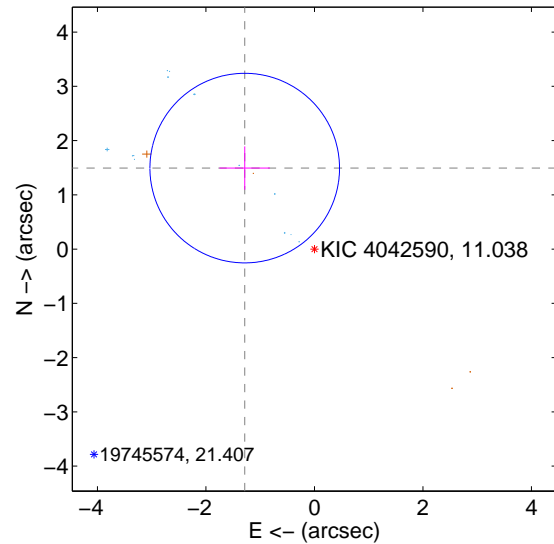
Supplemental centroid analysis for 004042590-01. **Kepler magnitude: 11.04.** Transit SNR 14.86

There are 13 quarters with good PRF difference image offsets

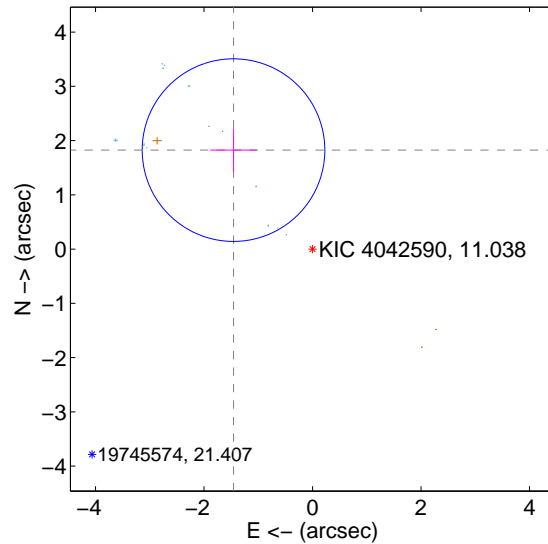
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.970 ± 0.582	3.38	1.285 ± 0.466	1.493 ± 0.399
PRF-fit source offset from KIC position	2.334 ± 0.561	4.16	1.456 ± 0.430	1.824 ± 0.397
photometric centroid source offset	0.89 ± 0.14	6.24	0.69 ± 0.15	0.56 ± 0.13

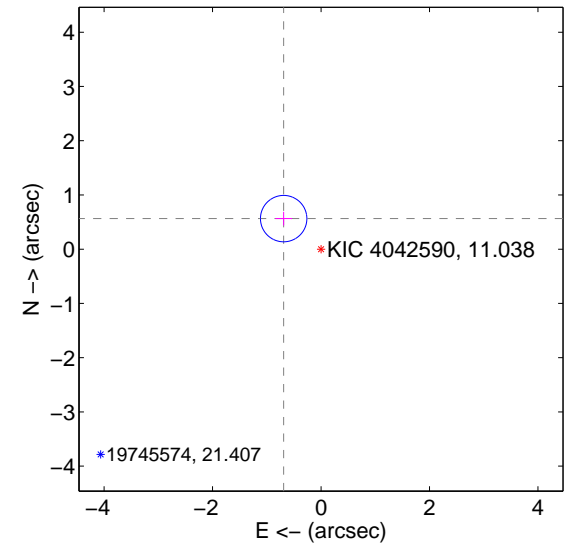
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

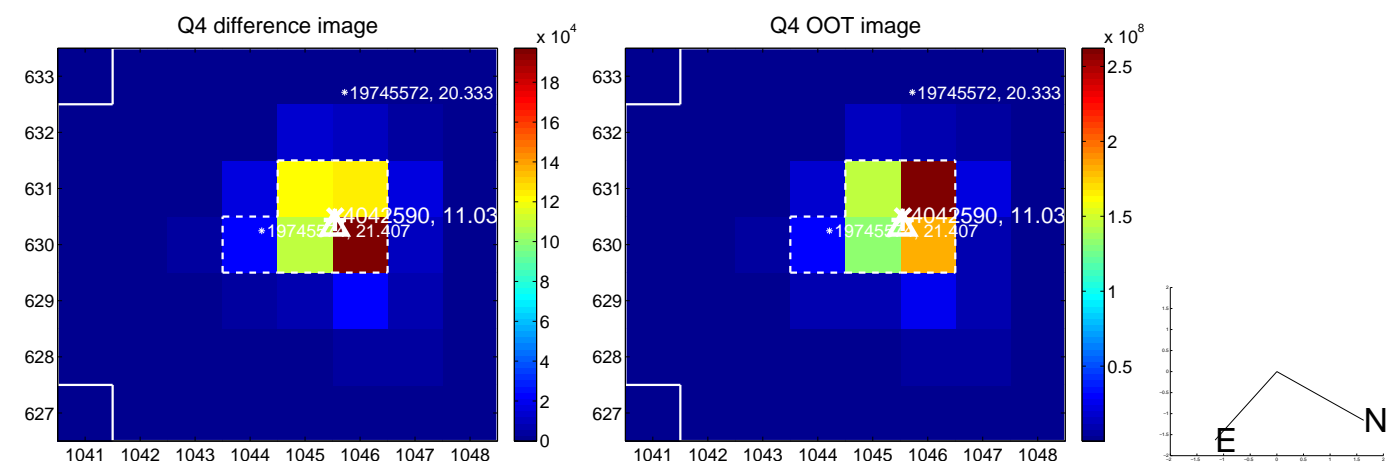
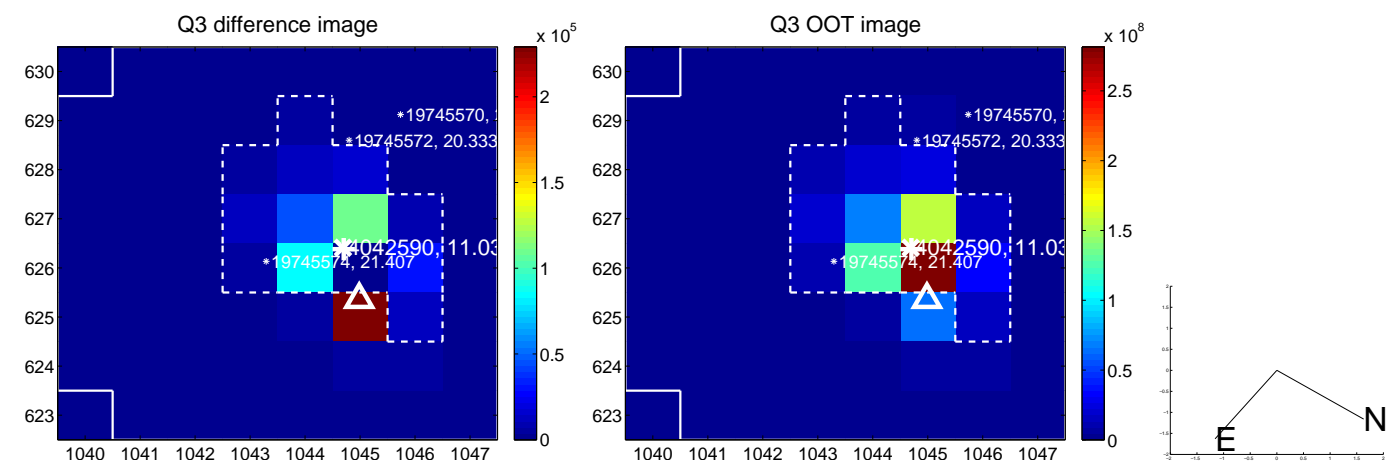
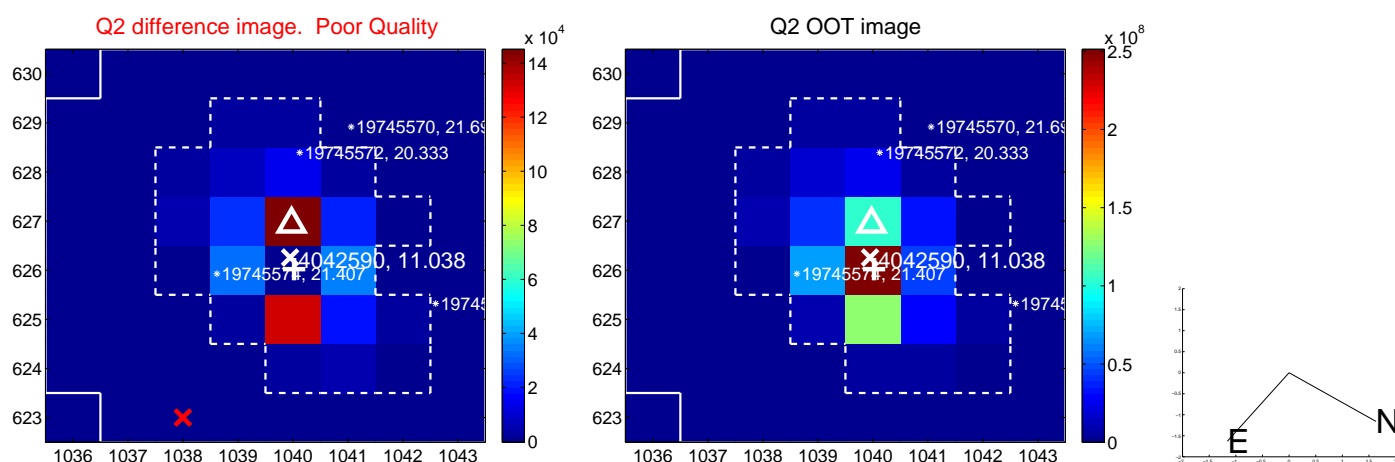
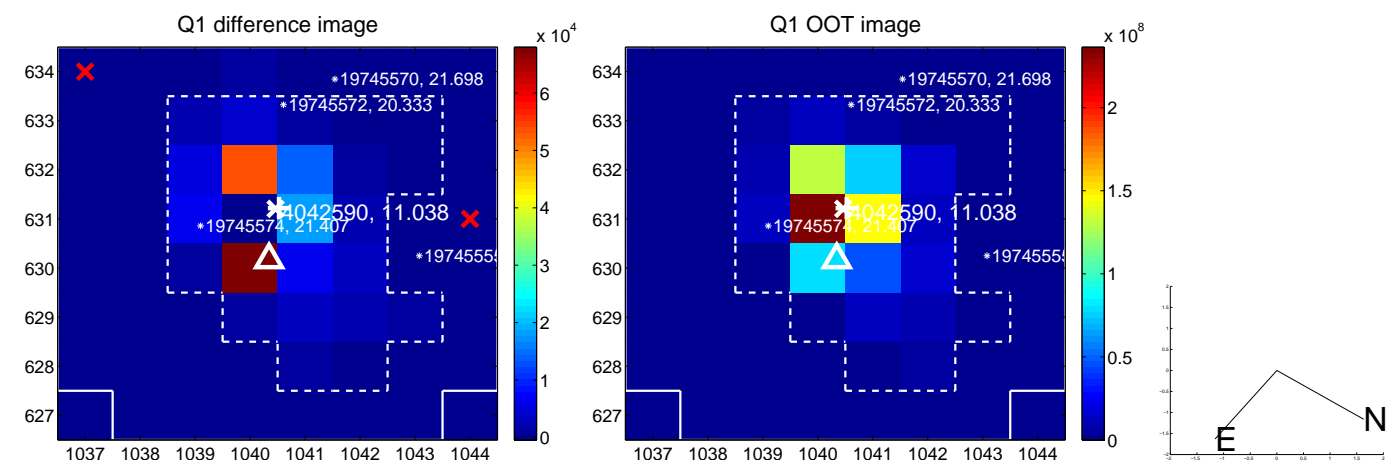


offset from photometric centroids

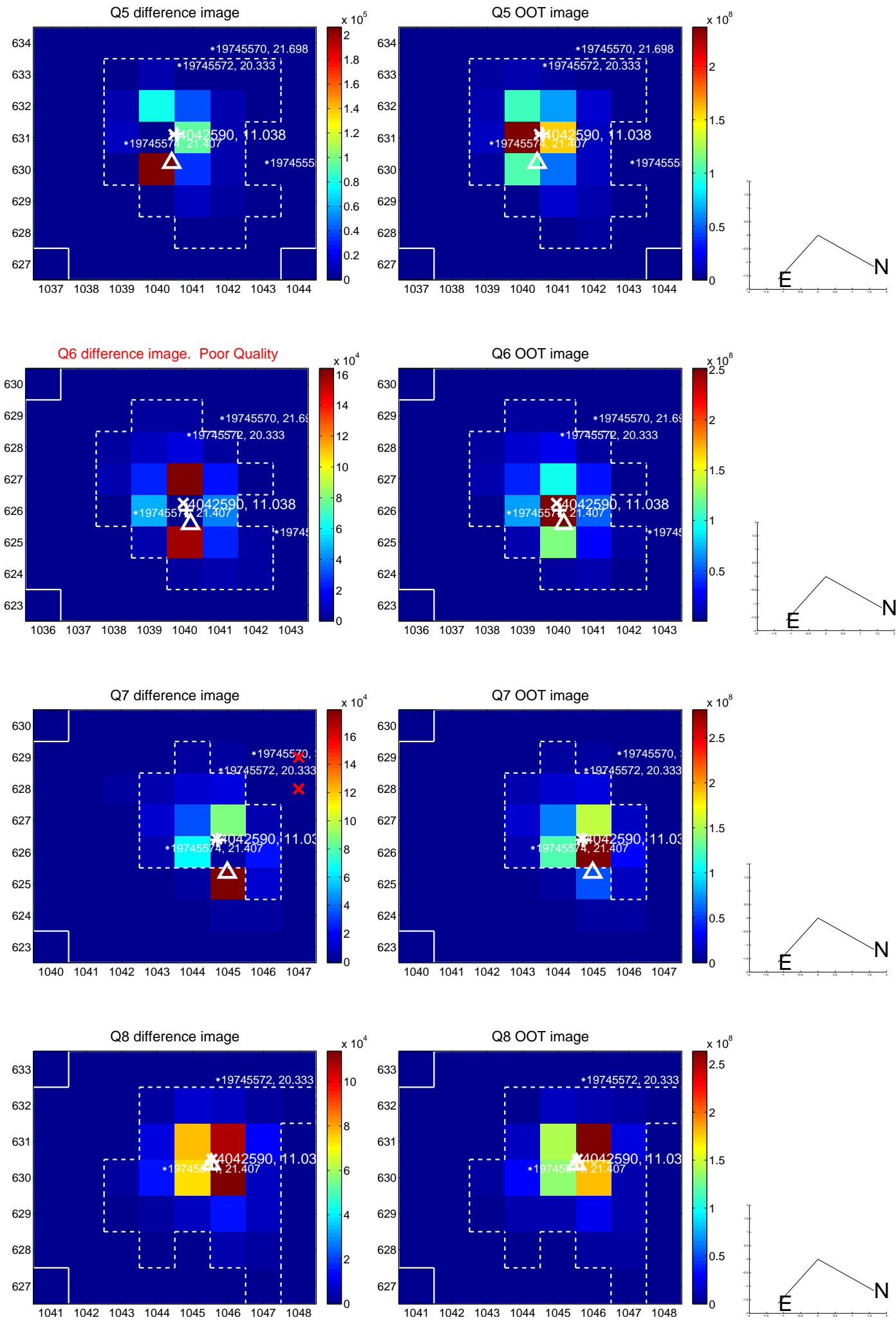


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

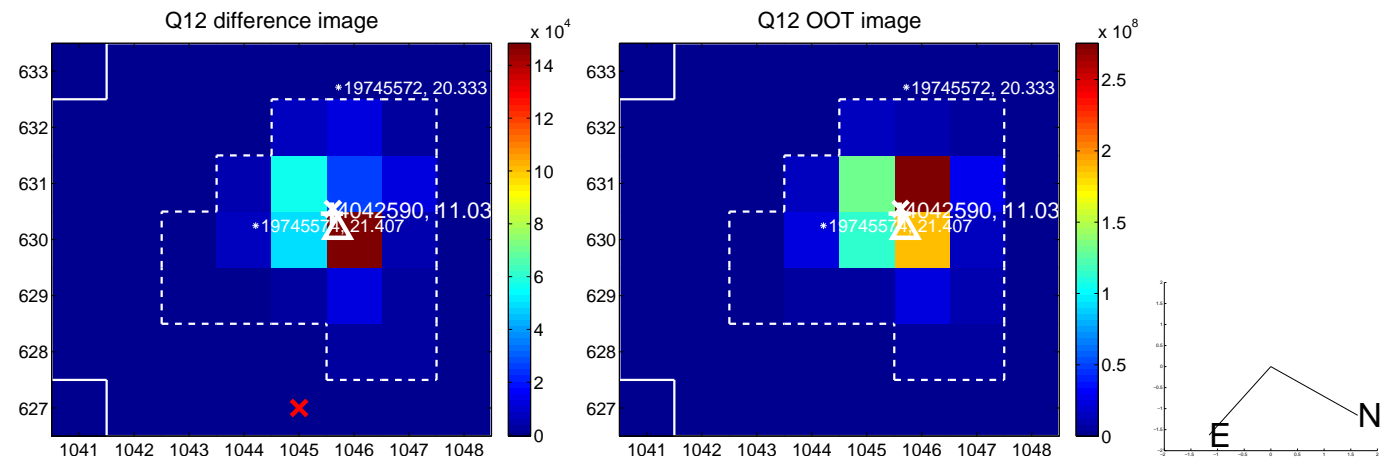
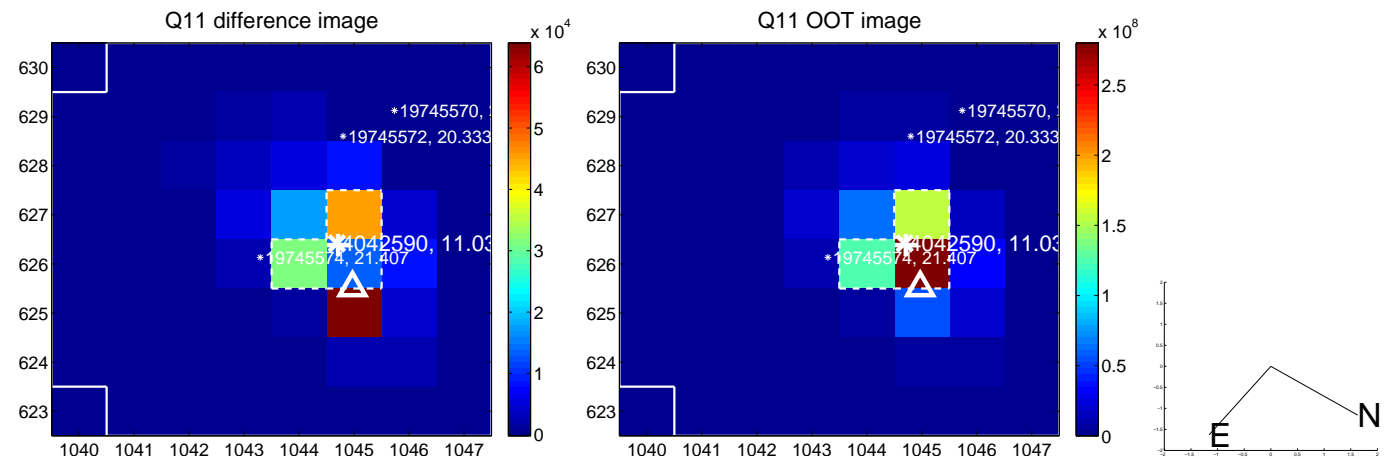
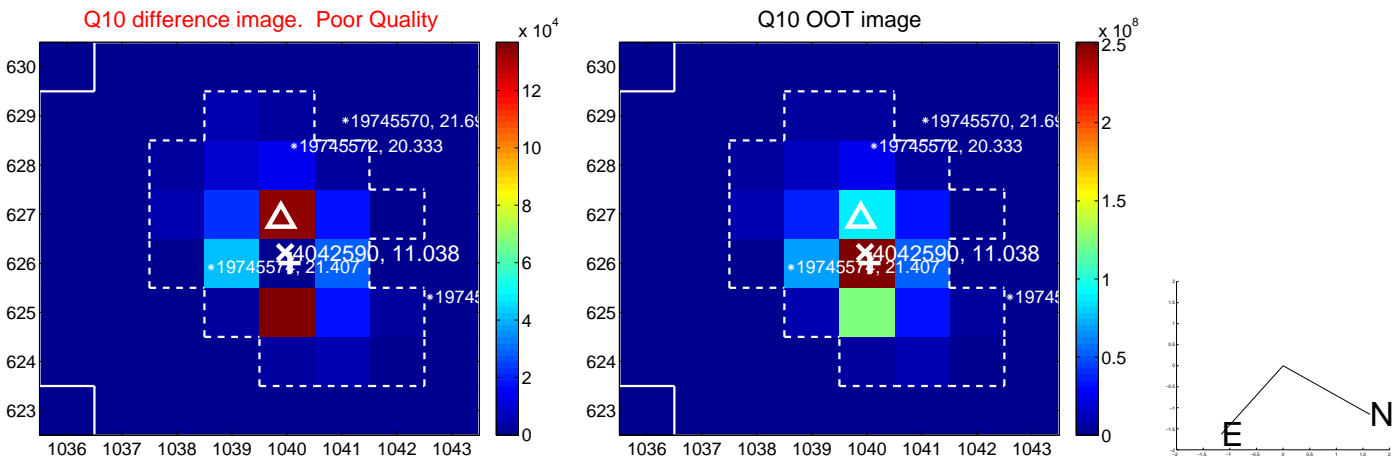
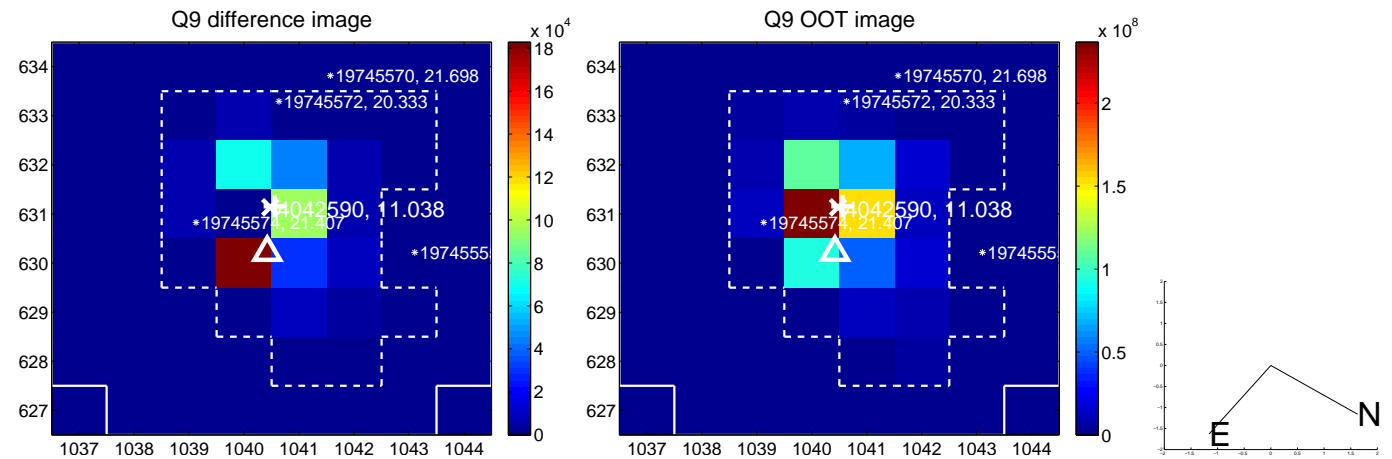
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



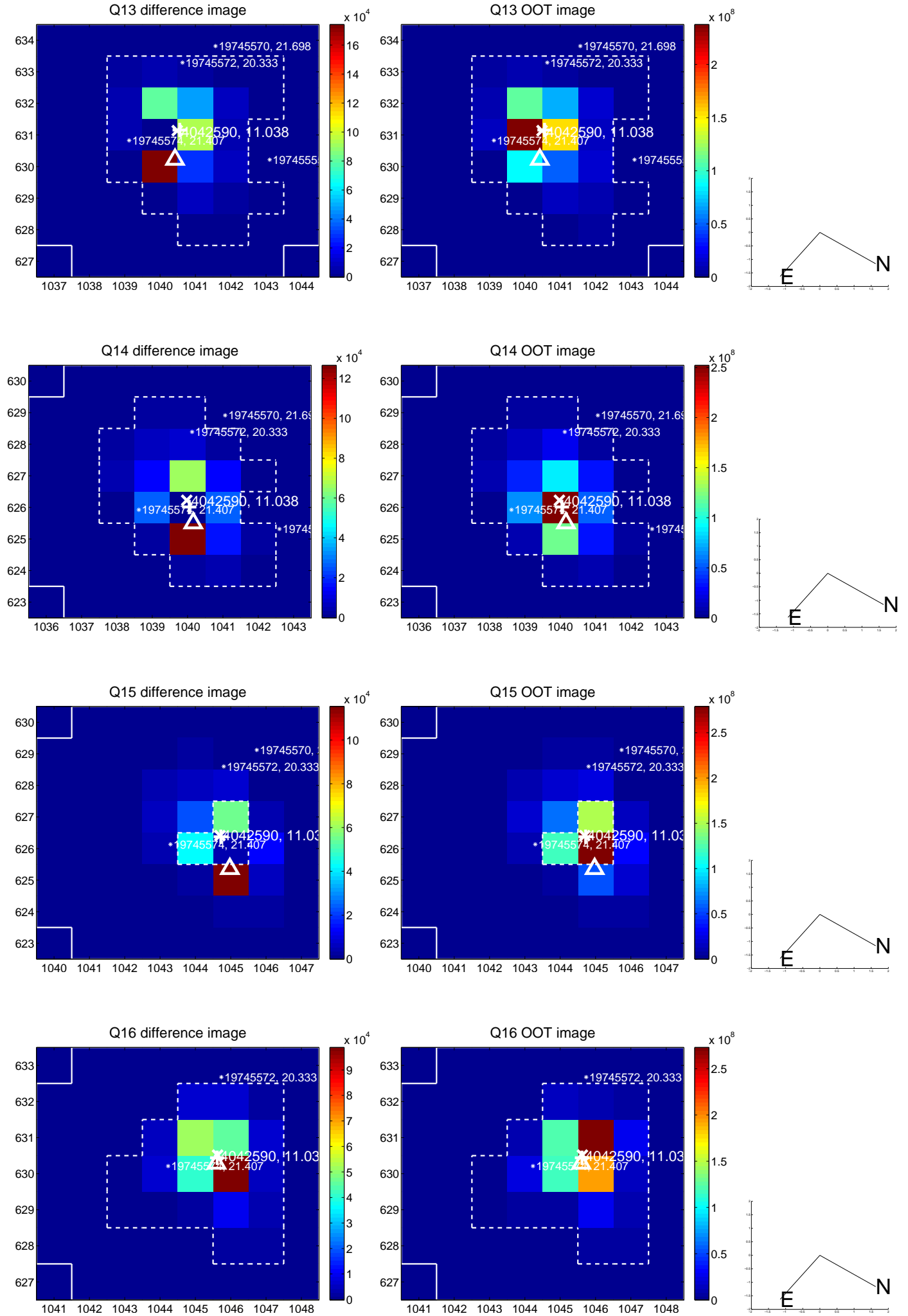
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



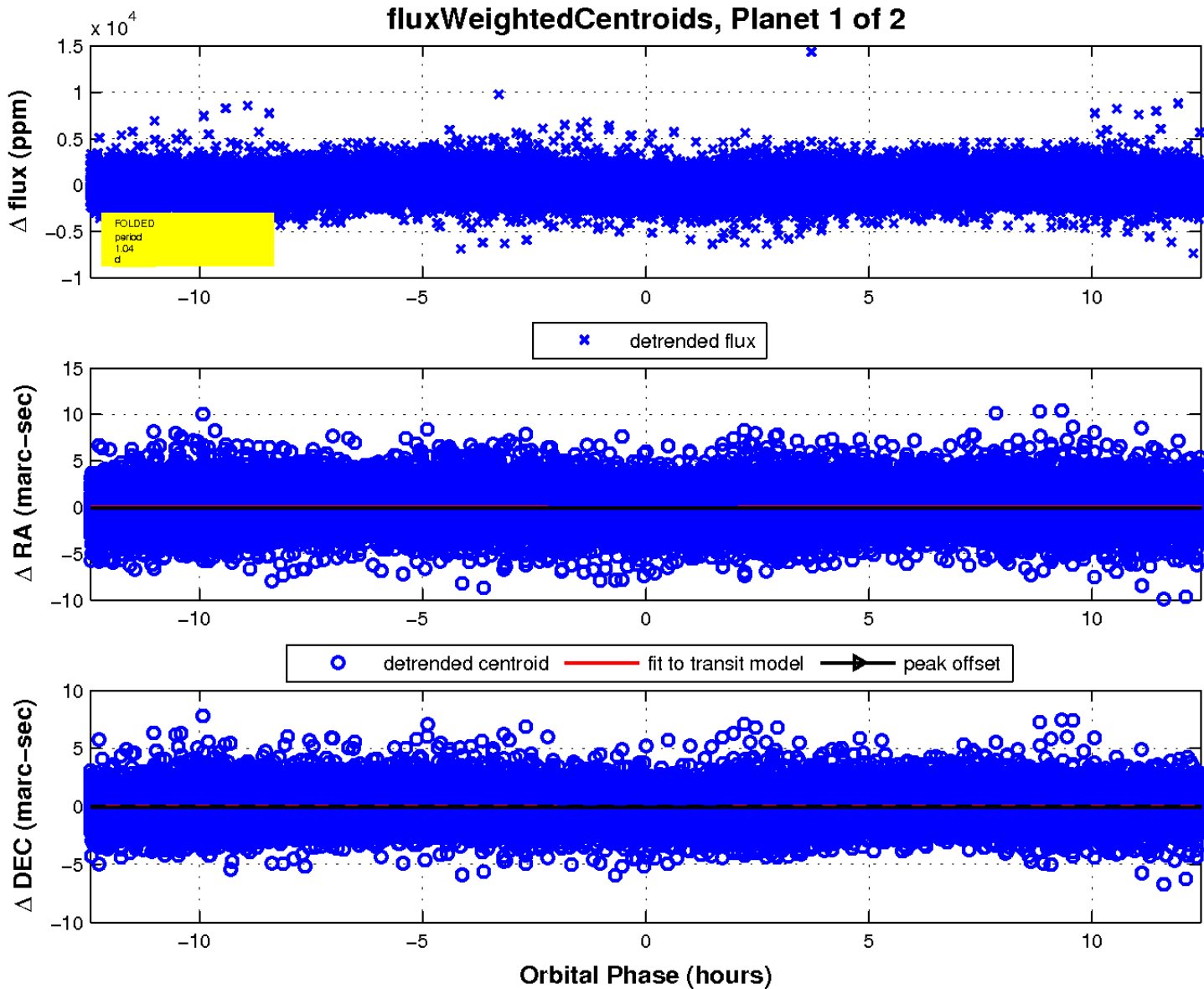
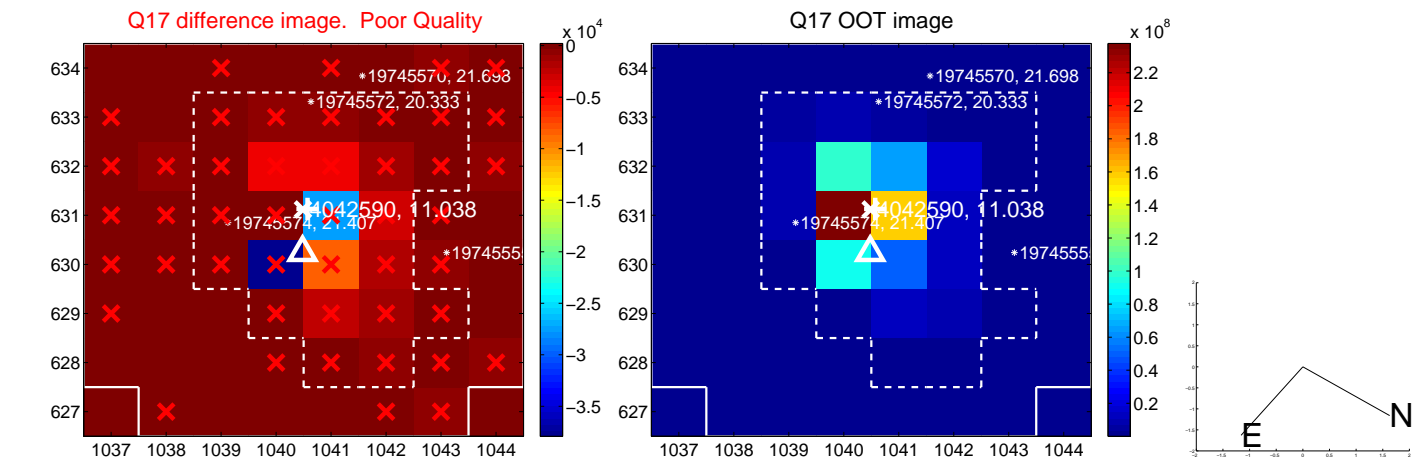
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

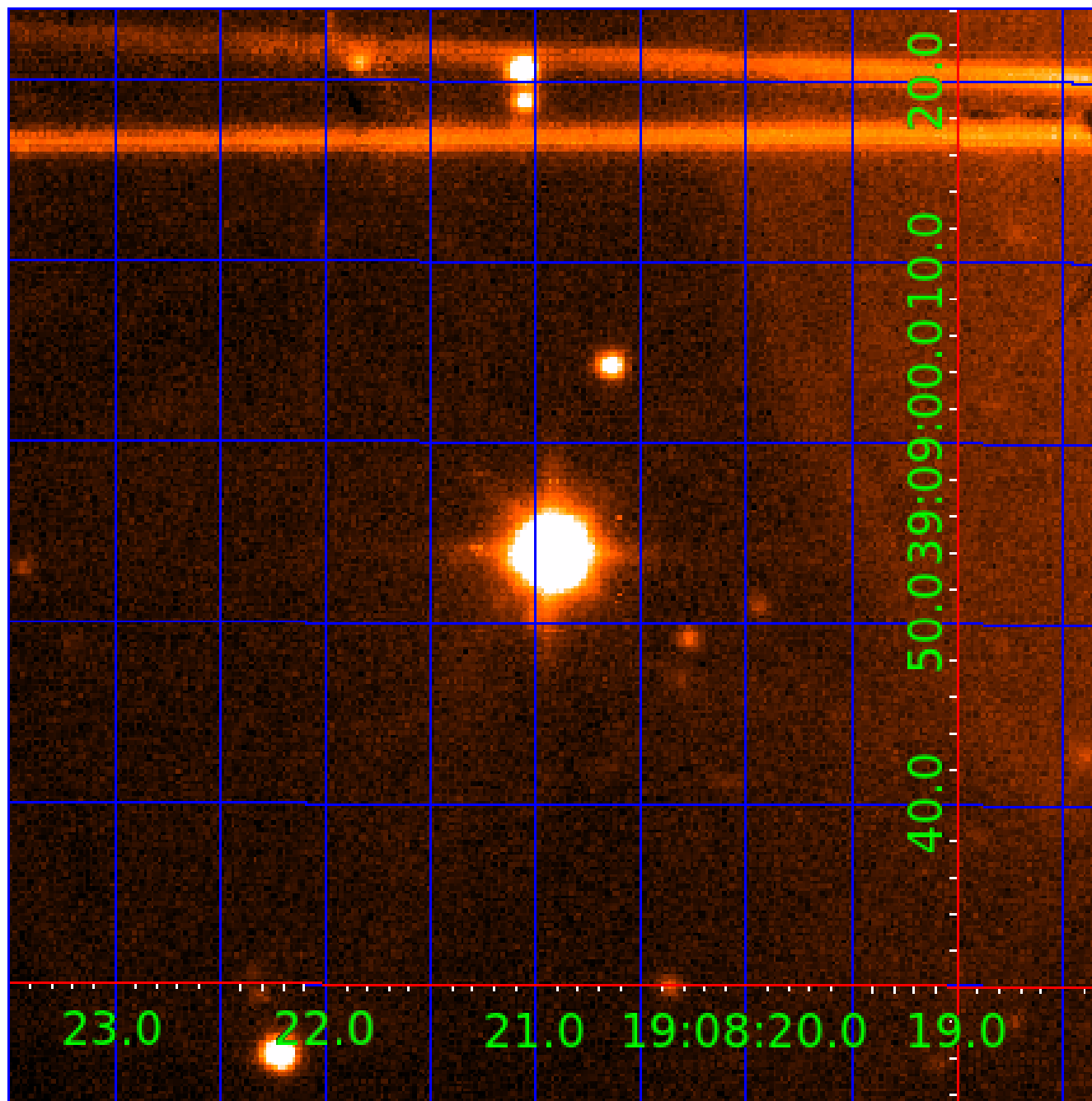


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004042590

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})
004042590-01	OBS	No	1.037002	131.926224	208.3	5.740	16.3	14.9	1.94	7299	3.52	18090.19
004042590-02	OBS	No	1.037046	132.428331	244.2	3.812	23.9	23.6	1.94	7299	3.25	18089.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004042590-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
004042590-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

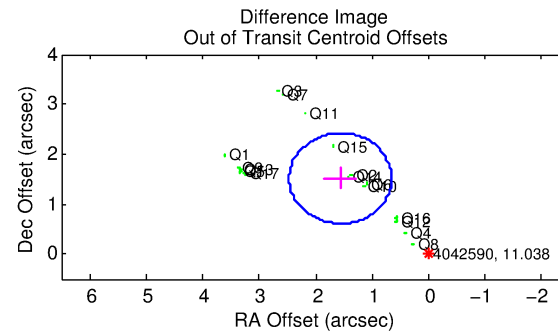
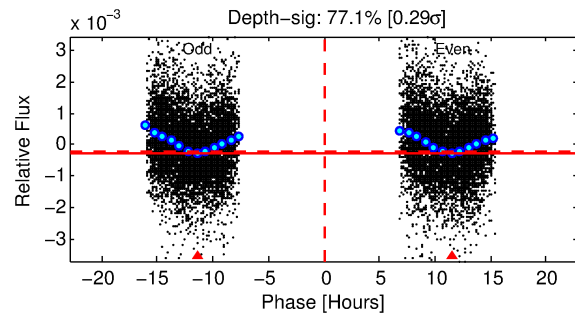
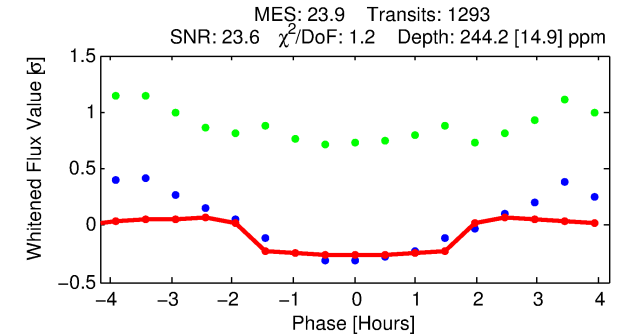
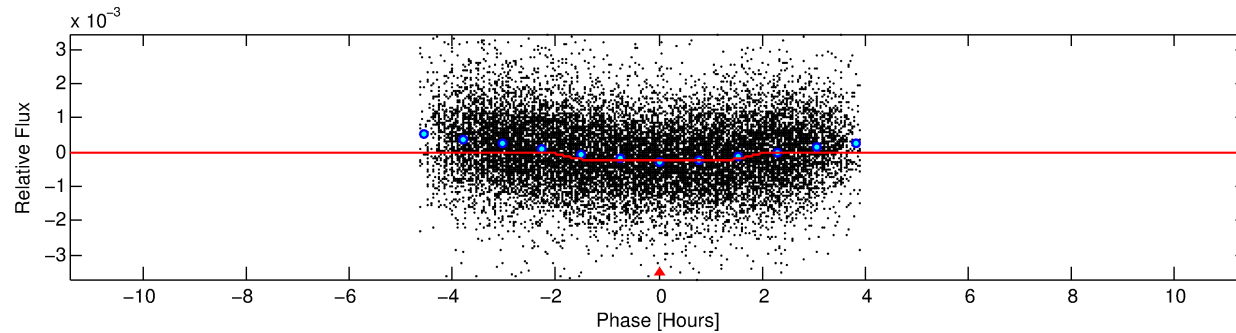
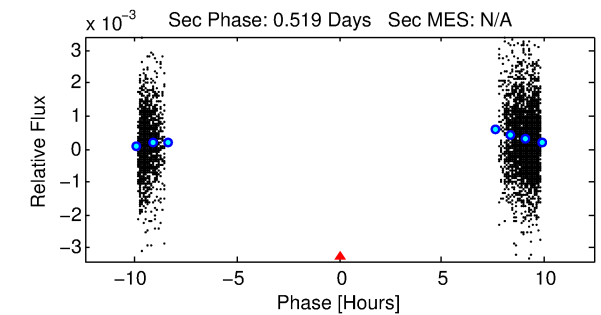
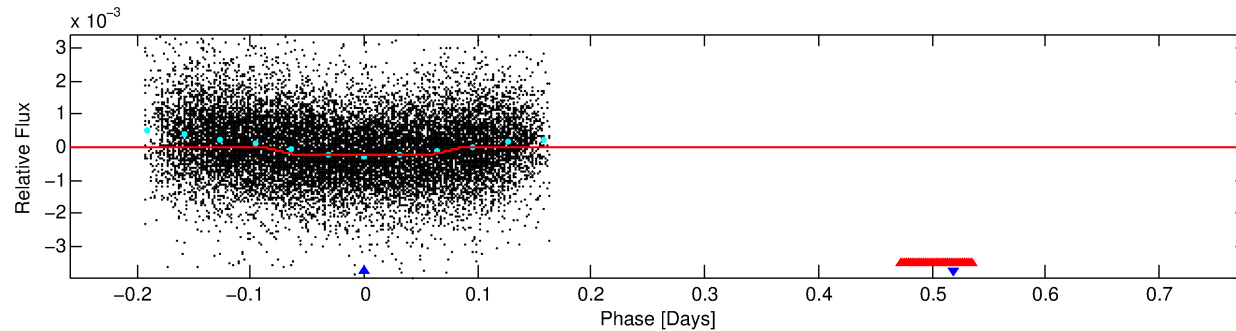
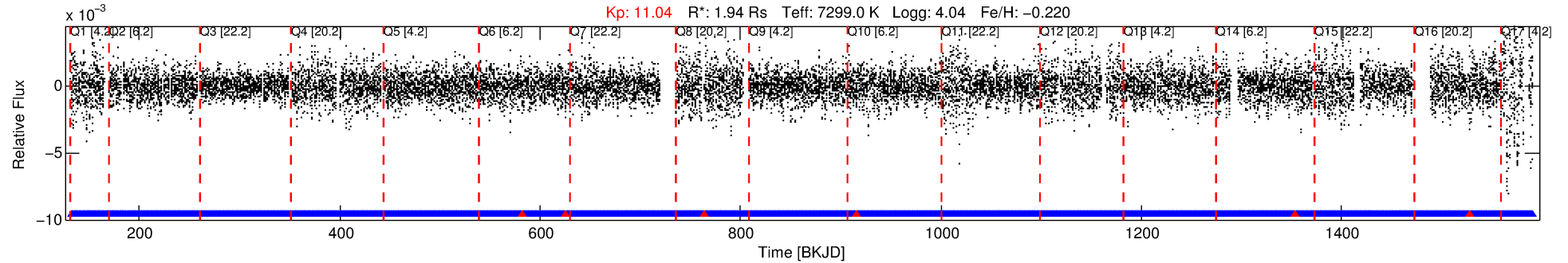
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004042590-02

No Significant Match Found

DV One-Page Summary

KIC: 4042590 Candidate: 2 of 2 Period: 1.037 d



DV Fit Results:

Period = 1.03705 [0.00001] d
Epoch = 132.4283 [0.0016] BKJD
Rp/R* = 0.0154 [0.0043]
a/R* = 1.73 [1.91]
b = 0.70 [1.20]
Seff = 18089.16 [7803.59]
Teq = 2957 [319] K
Rp = 3.25 [1.29] Re
a = 0.0230 [0.0059] AU

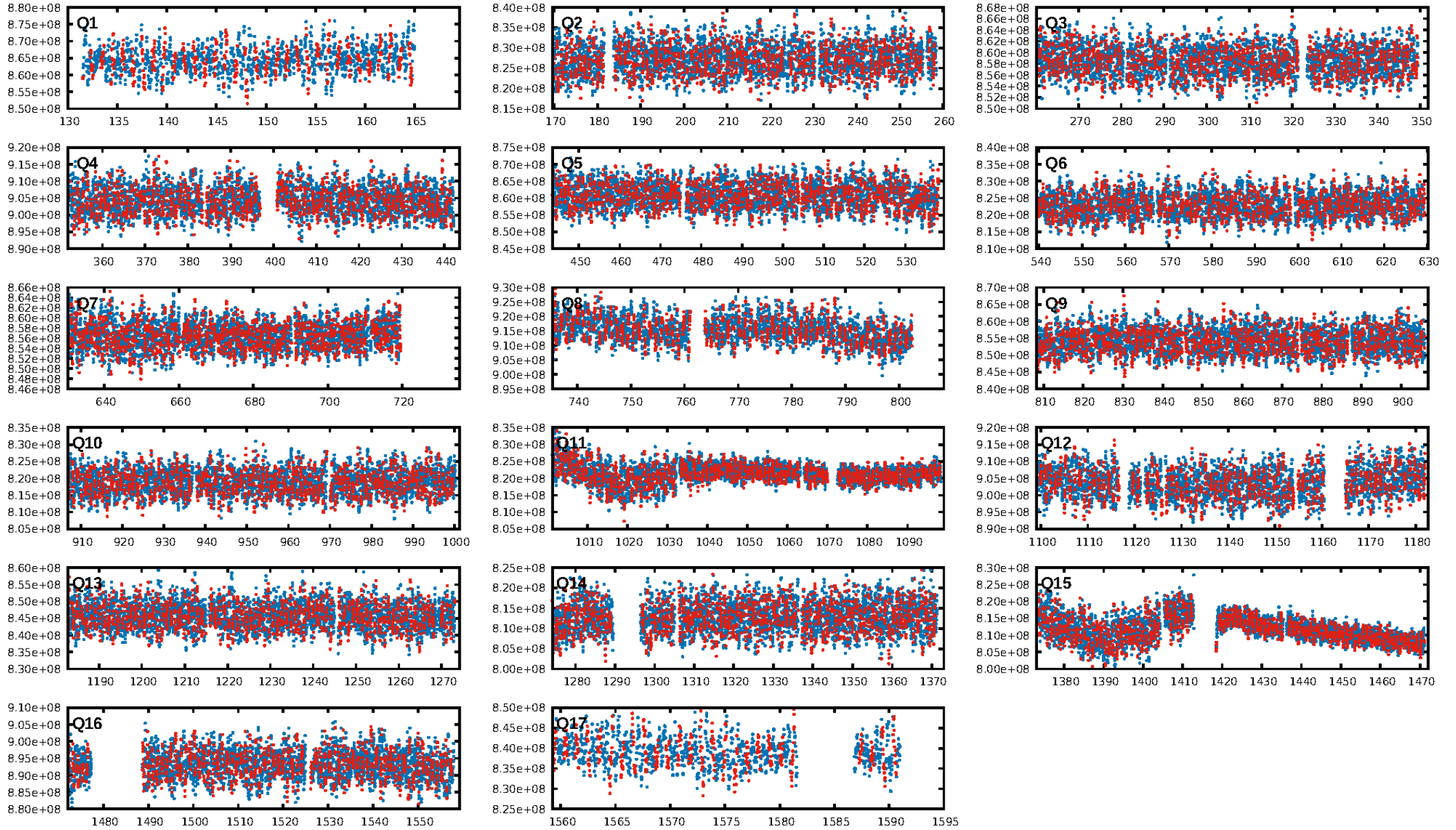
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1229/1235]
GhostDiagnostic-chr: 2.535
Centroid-sig: 0.0%
Centroid-so: 0.897 arcsec [7.60σ]
OotOffset-rm: 2.177 arcsec [7.21σ]
KicOffset-rm: 2.857 arcsec [9.84σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.88 [15/17]
DiffImageOverlap-fno: 0.82 [14/17]

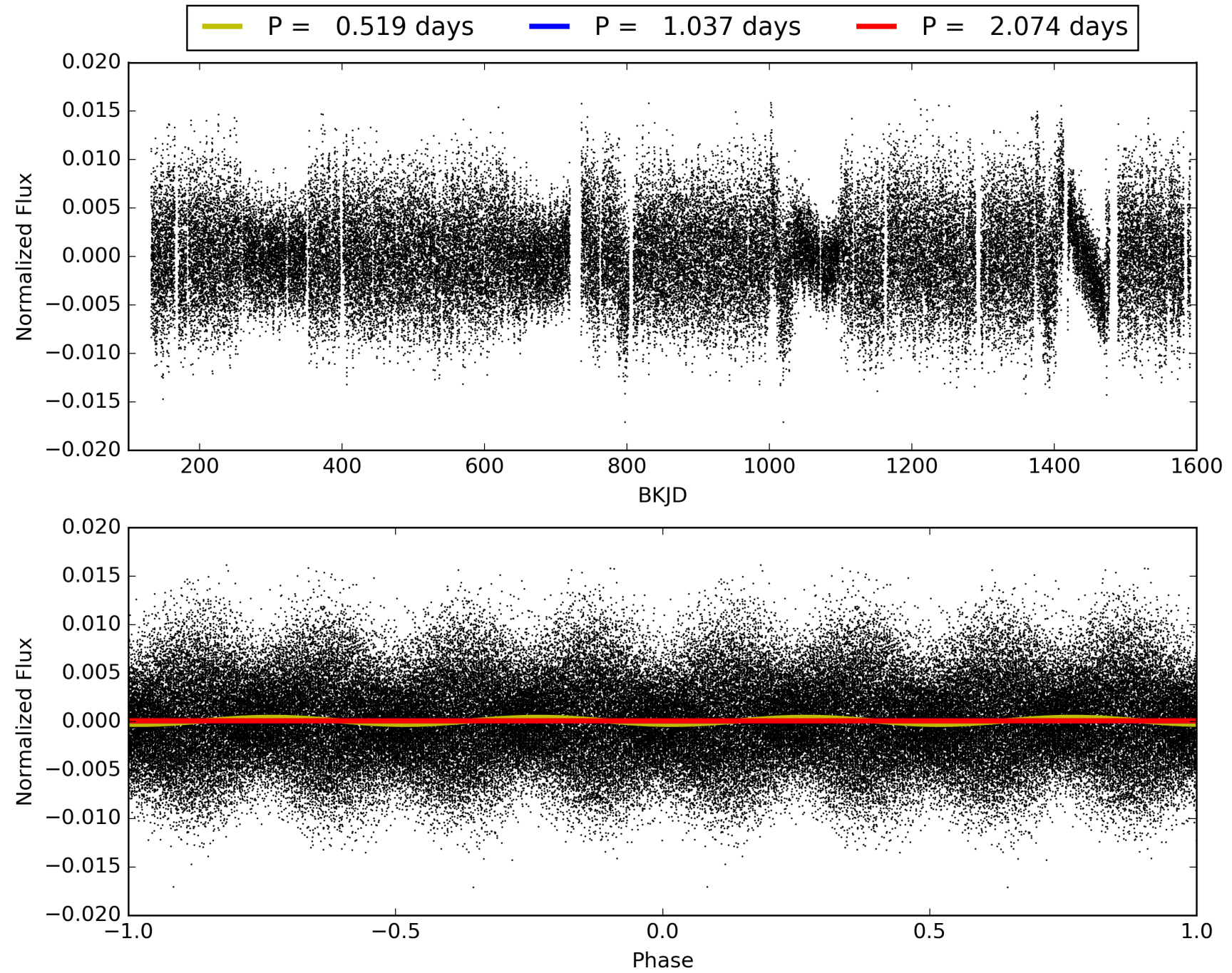
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 20:00:08 Z

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

TCE 004042590-02, PDC Light Curves

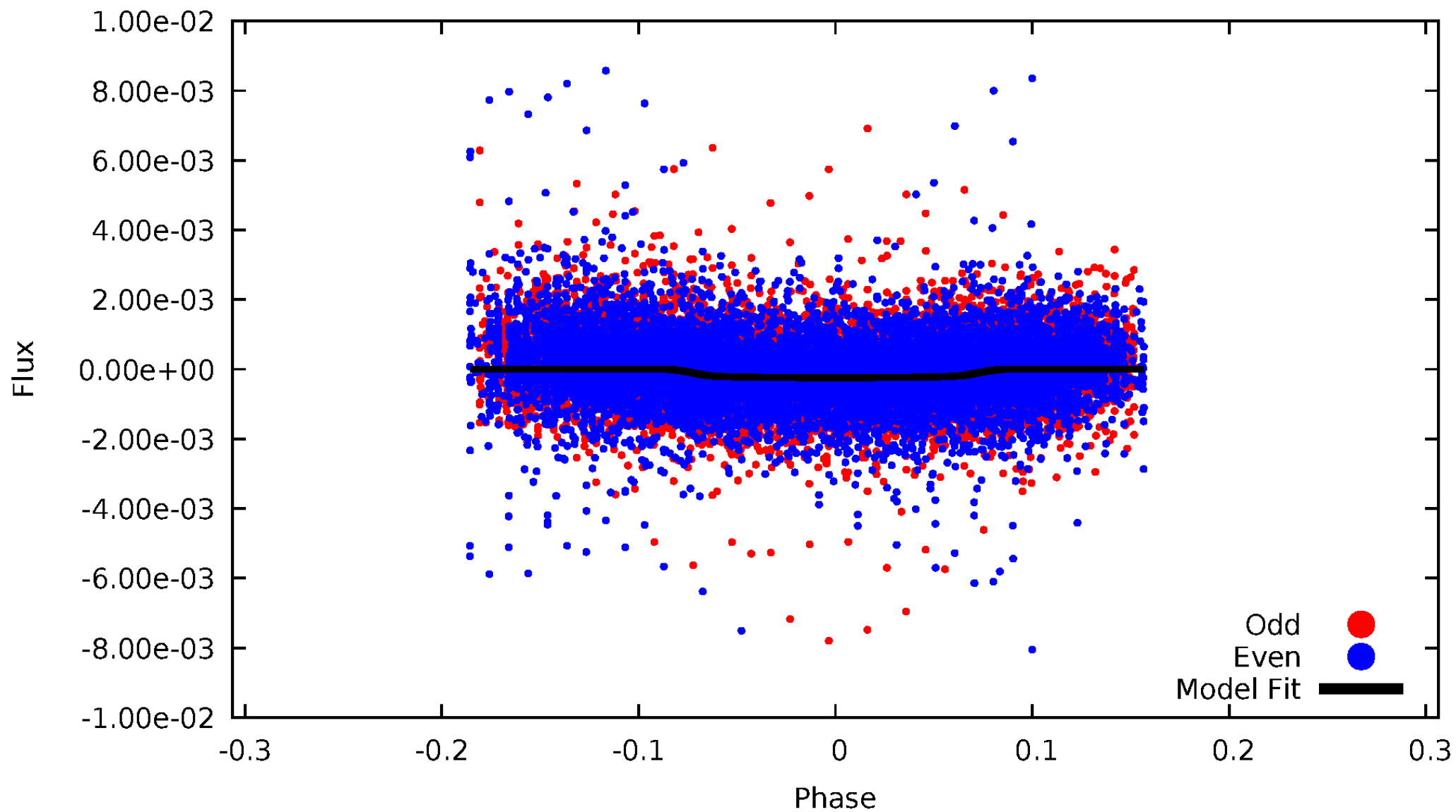


TCE 004042590-02



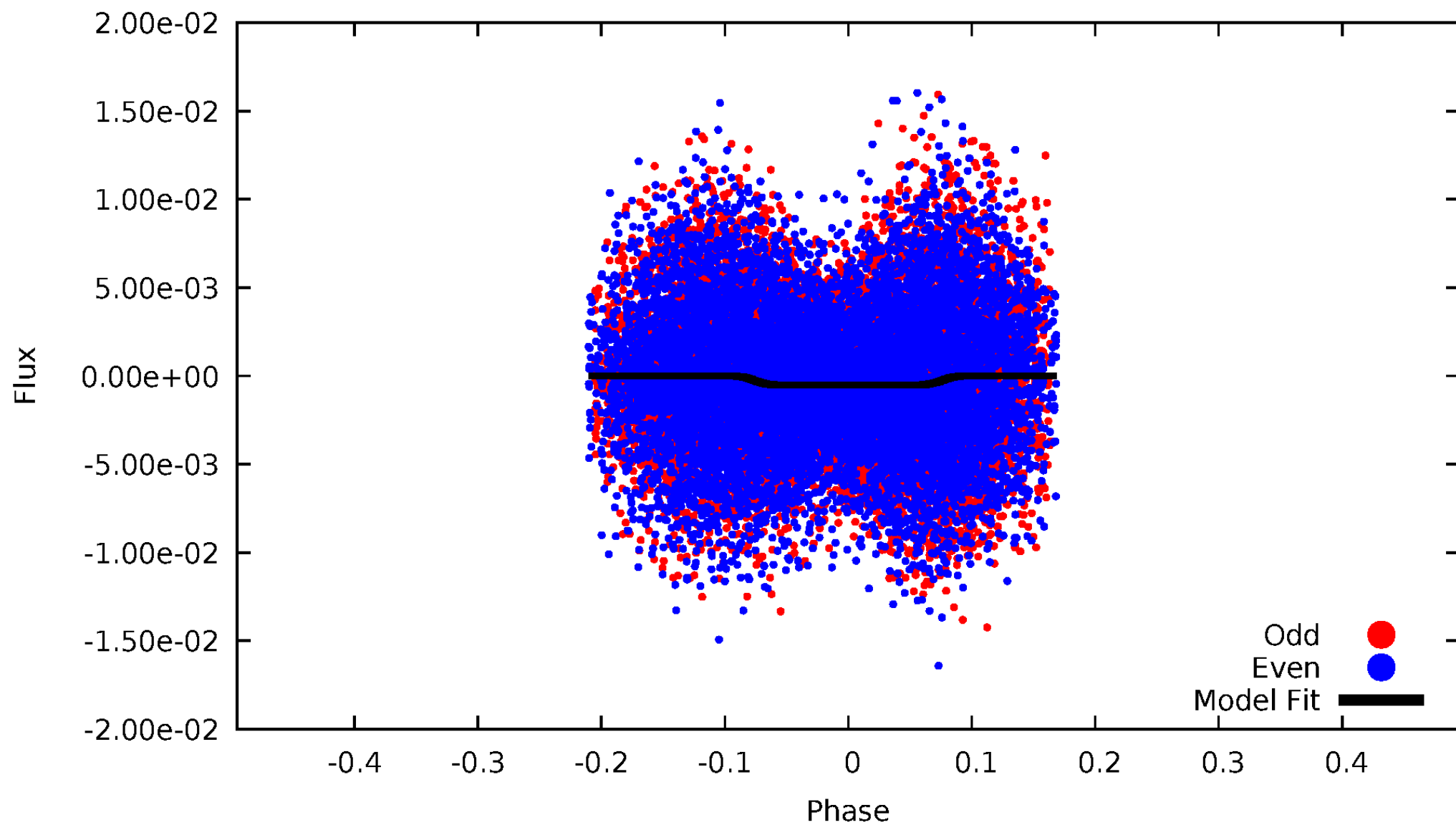
DV Odd/Even

TCE 004042590-02



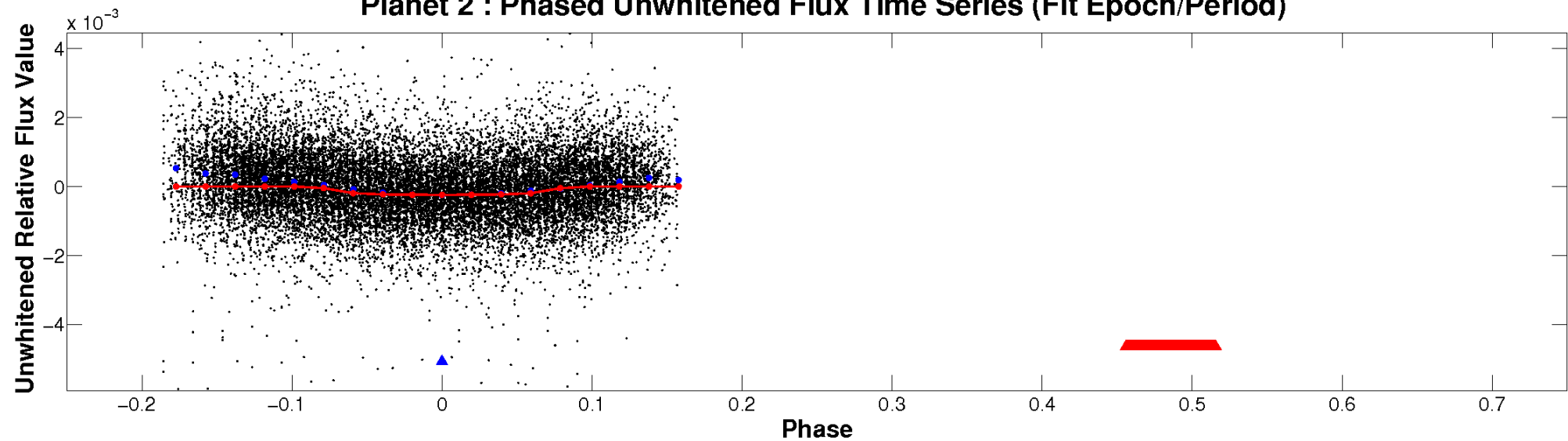
ALT Odd/Even

TCE 004042590-02

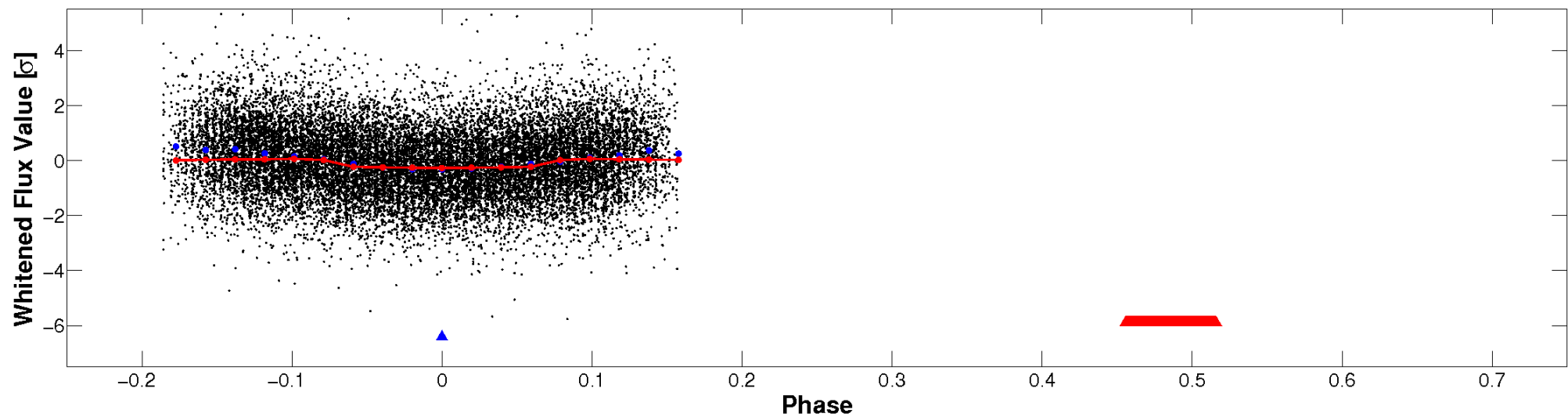


Non-Whitened Vs. Whitened Light Curve

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

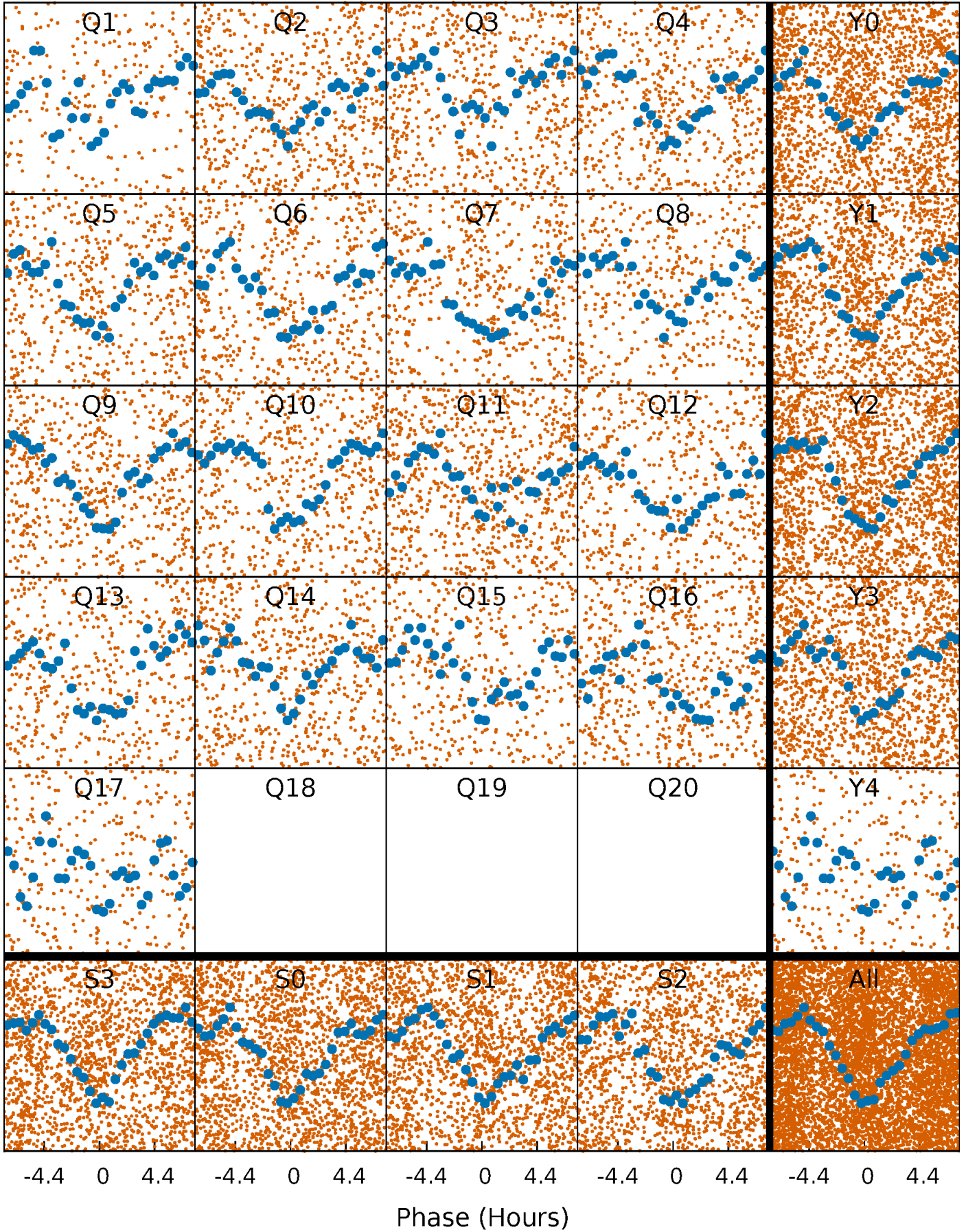


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



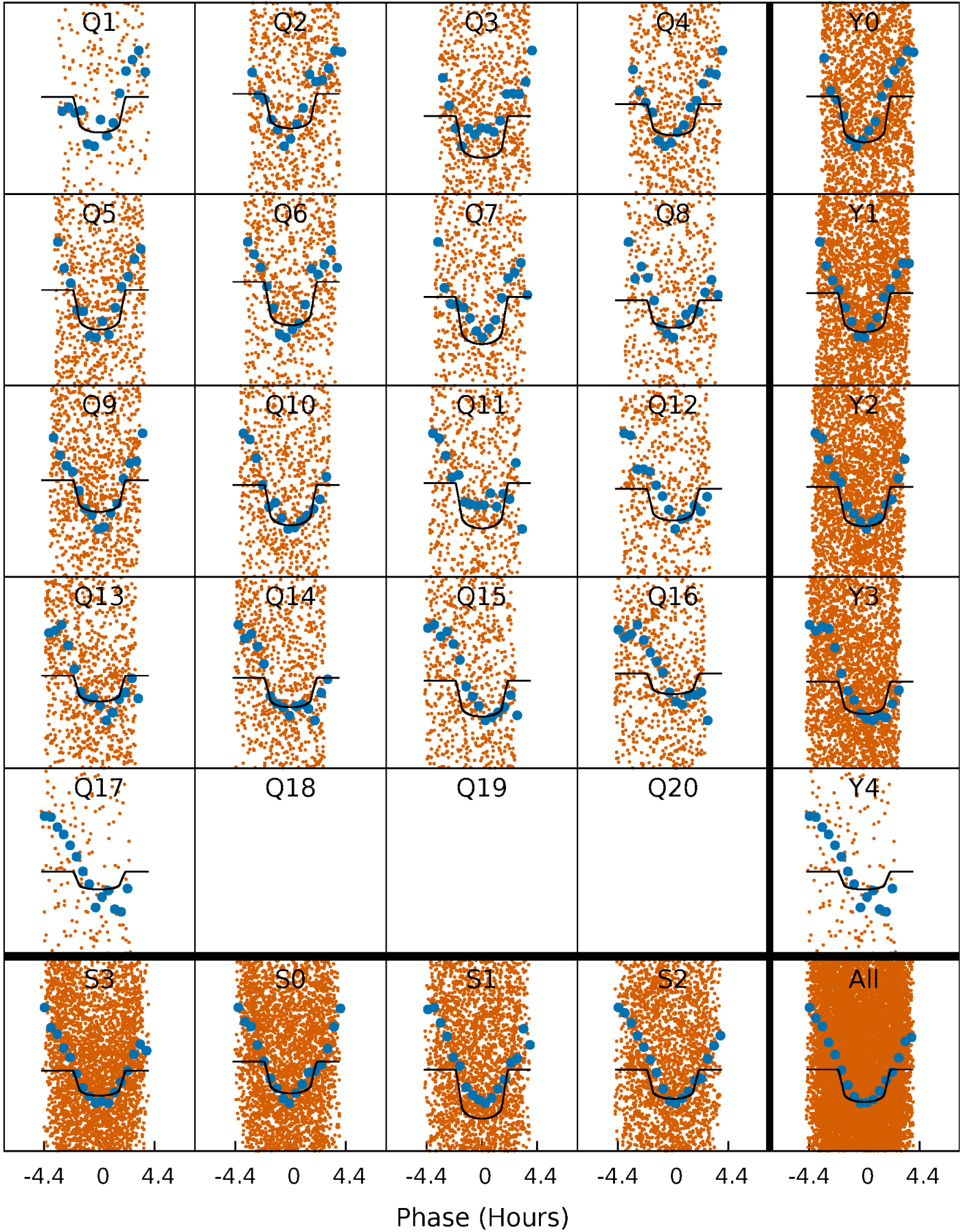
PDC Quarter-Phased Transit Curves

TCE 004042590-02 P= 1.037046 Days $T_0=132.428331$ (BKJD)



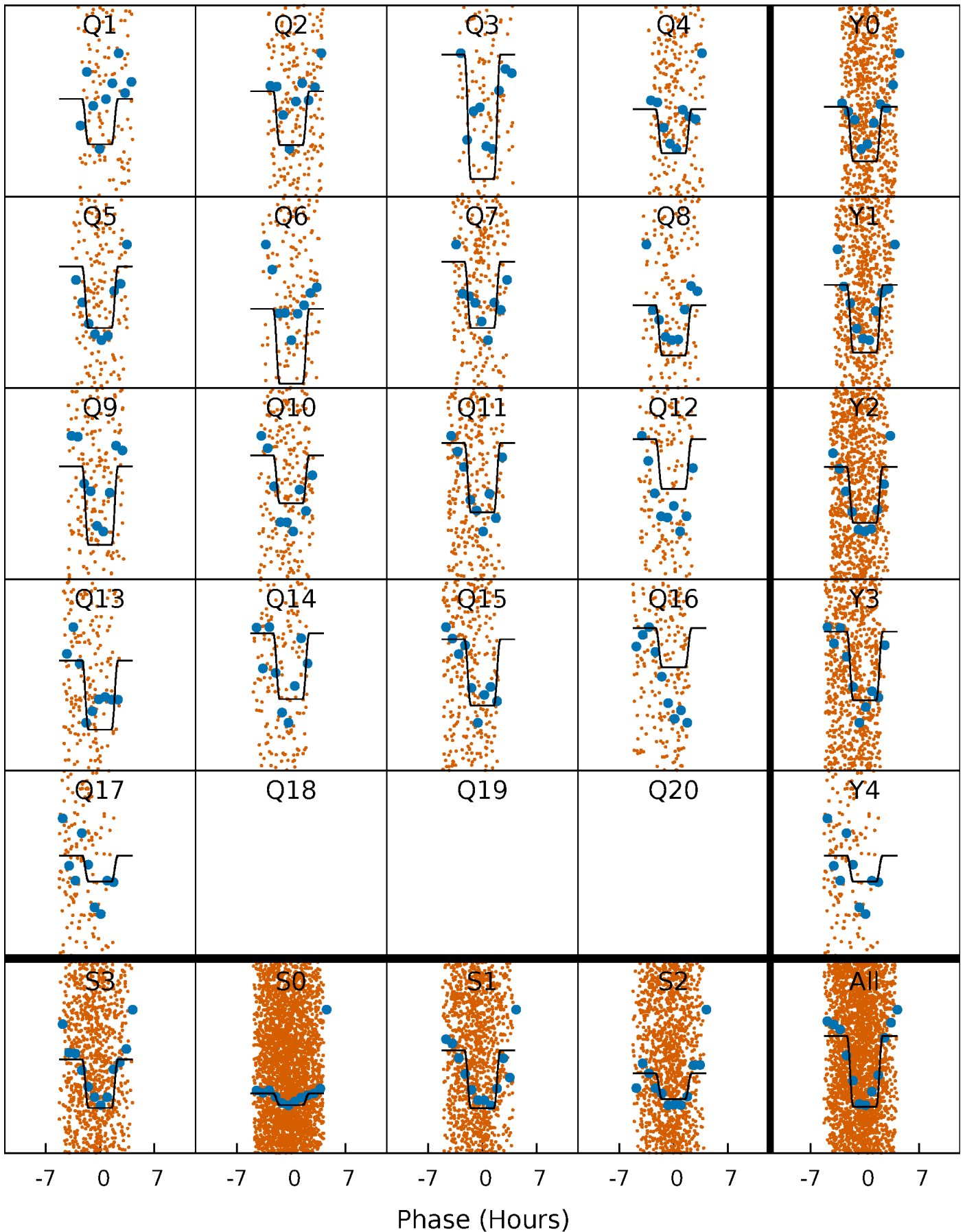
DV Quarter-Phased Transit Curves

TCE 004042590-02 P= 1.037046 Days $T_0=132.428331$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

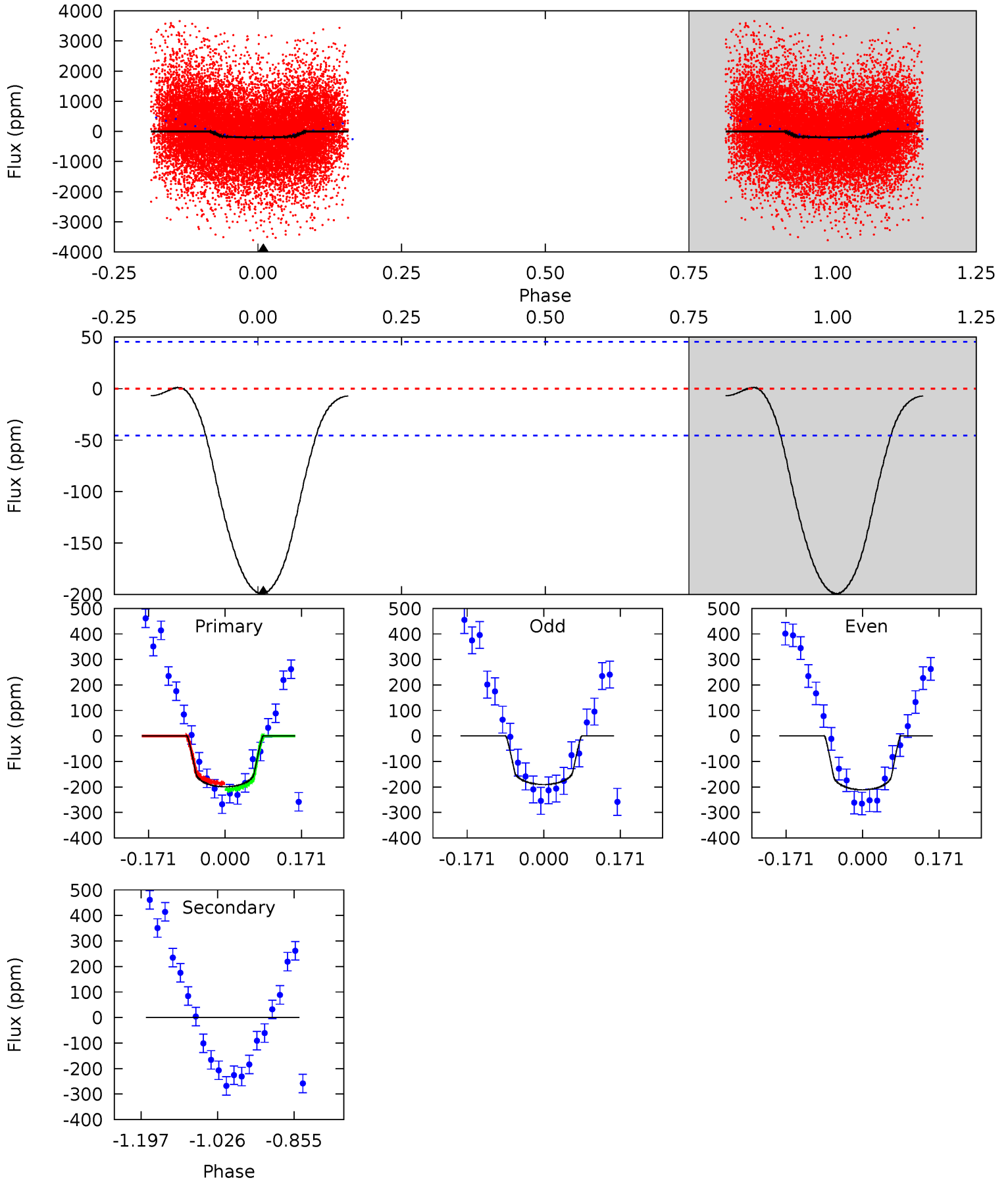
TCE 004042590-02 P= 1.037073 Days $T_0=132.415998$ (BKJD)



DV Model-Shift Uniqueness Test

004042590-02, P = 1.037046 Days, E = 131.391285 Days

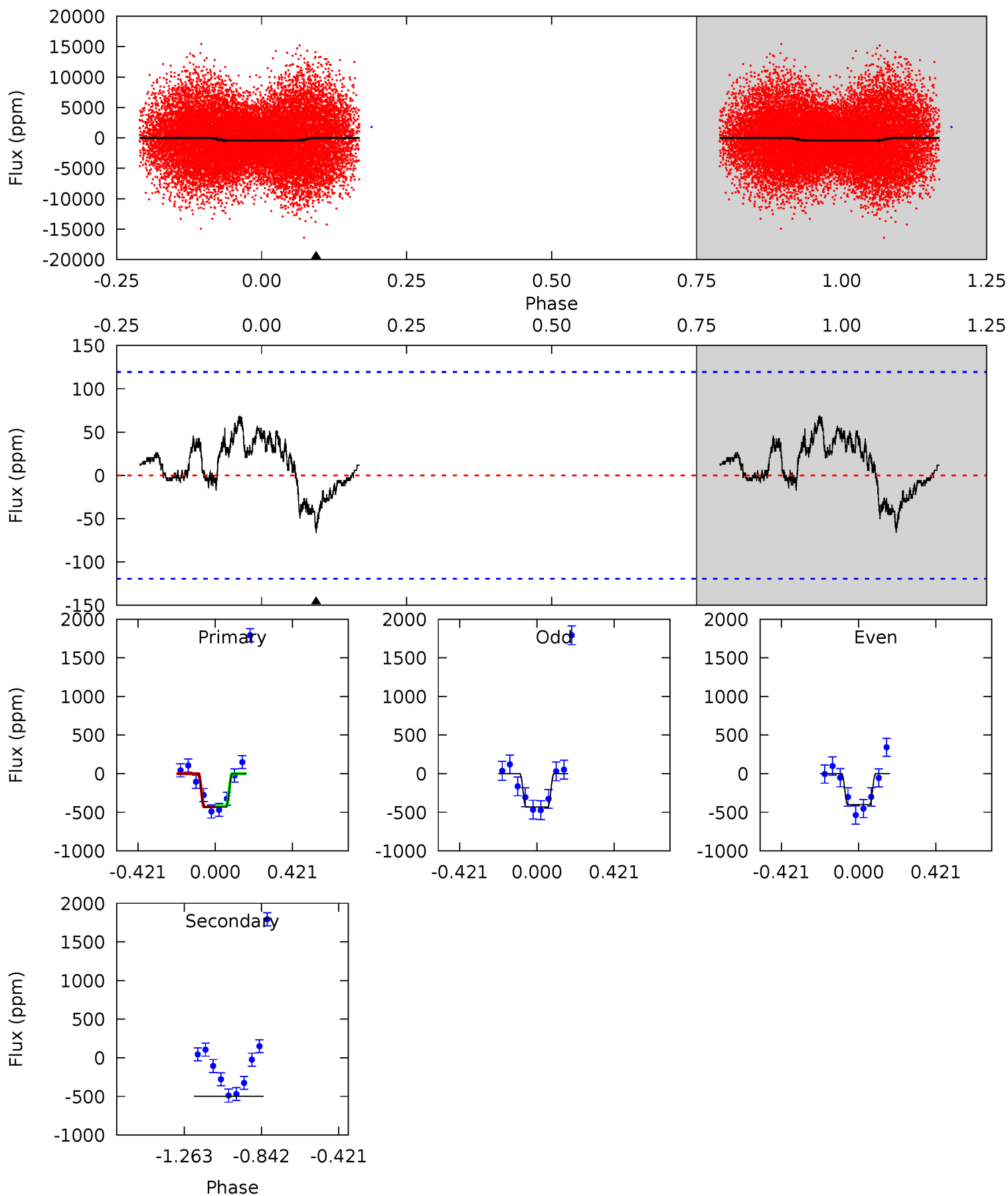
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.5	0	0	0	4.45	1.37	0.25	19.5	19.5	0	0	1.02	1.02	0.01	1.27



Alt Model-Shift Uniqueness Test

004042590-02, P = 1.037073 Days, E = 131.378925 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.35	0	0	0	4.25	0.80	0.35	2.35	2.35	0	0	0.08	0	0.51	0.26



Stellar Parameters For KIC 004042590

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7299^{+228}_{-304}	$4.041^{+0.228}_{-0.171}$	$-0.220^{+0.250}_{-0.350}$	$1.940^{+0.551}_{-0.551}$	$1.507^{+0.211}_{-0.281}$	$0.291^{+0.406}_{-0.129}$
	+3%/-4%	+6%/-4%	+114%/-159%	+28%/-28%	+14%/-19%	+140%/-44%
Source	KIC0	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 004042590-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 10	$3.17^{+1.05}_{-1.01}$	4090^{+311}_{-338}	-3714^{+6316}_{-554}	$0.003^{+0.326}_{-0.333}$
Alt.	0 ± 28	$4.66^{+1.19}_{-1.05}$	4132^{+294}_{-362}	-3746^{+6832}_{-585}	$-0.002^{+0.407}_{-0.385}$

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

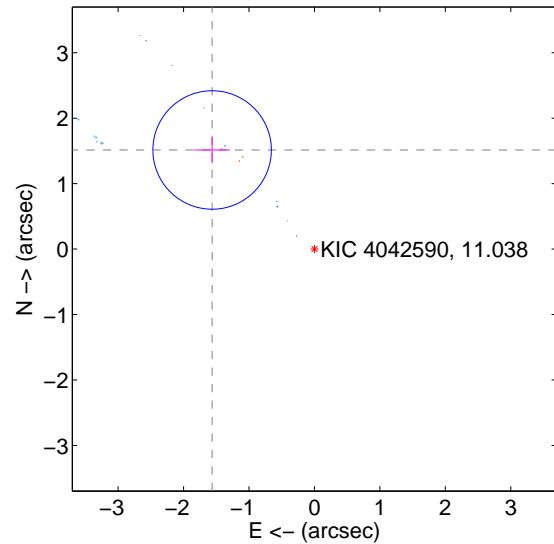
Supplemental centroid analysis for 004042590-02. **Kepler magnitude: 11.04.** Transit SNR 23.63

There are 15 quarters with good PRF difference image offsets

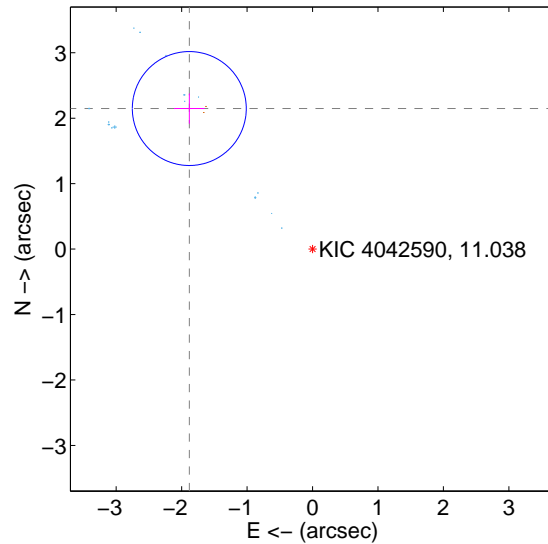
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.177 ± 0.302	7.21	1.563 ± 0.272	1.514 ± 0.205
PRF-fit source offset from KIC position	2.857 ± 0.290	9.84	1.883 ± 0.234	2.148 ± 0.230
photometric centroid source offset	0.90 ± 0.12	7.60	0.74 ± 0.12	0.50 ± 0.10

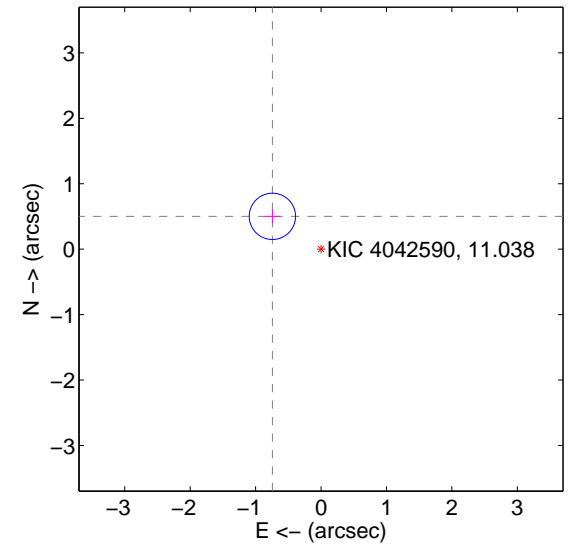
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

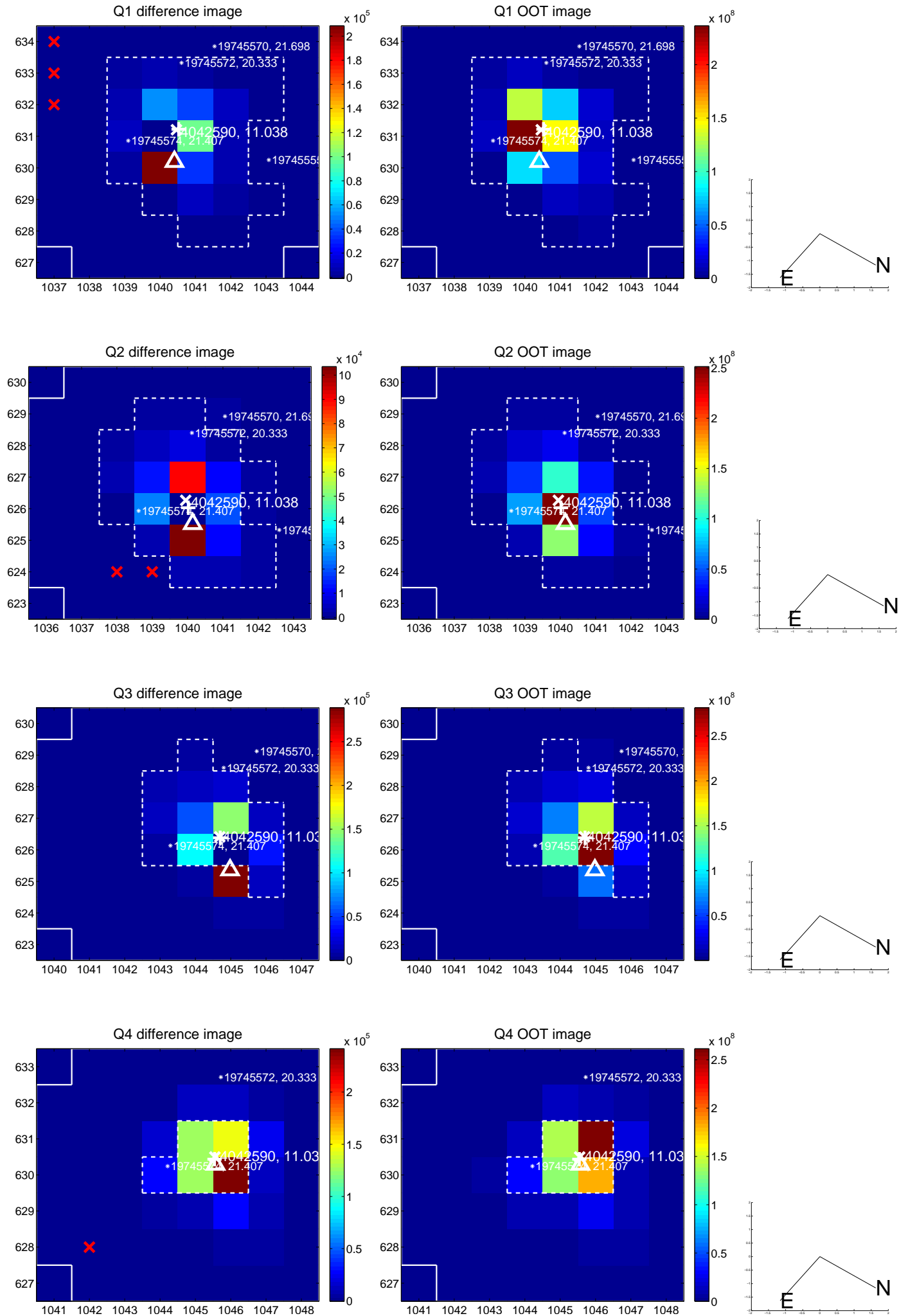


offset from photometric centroids

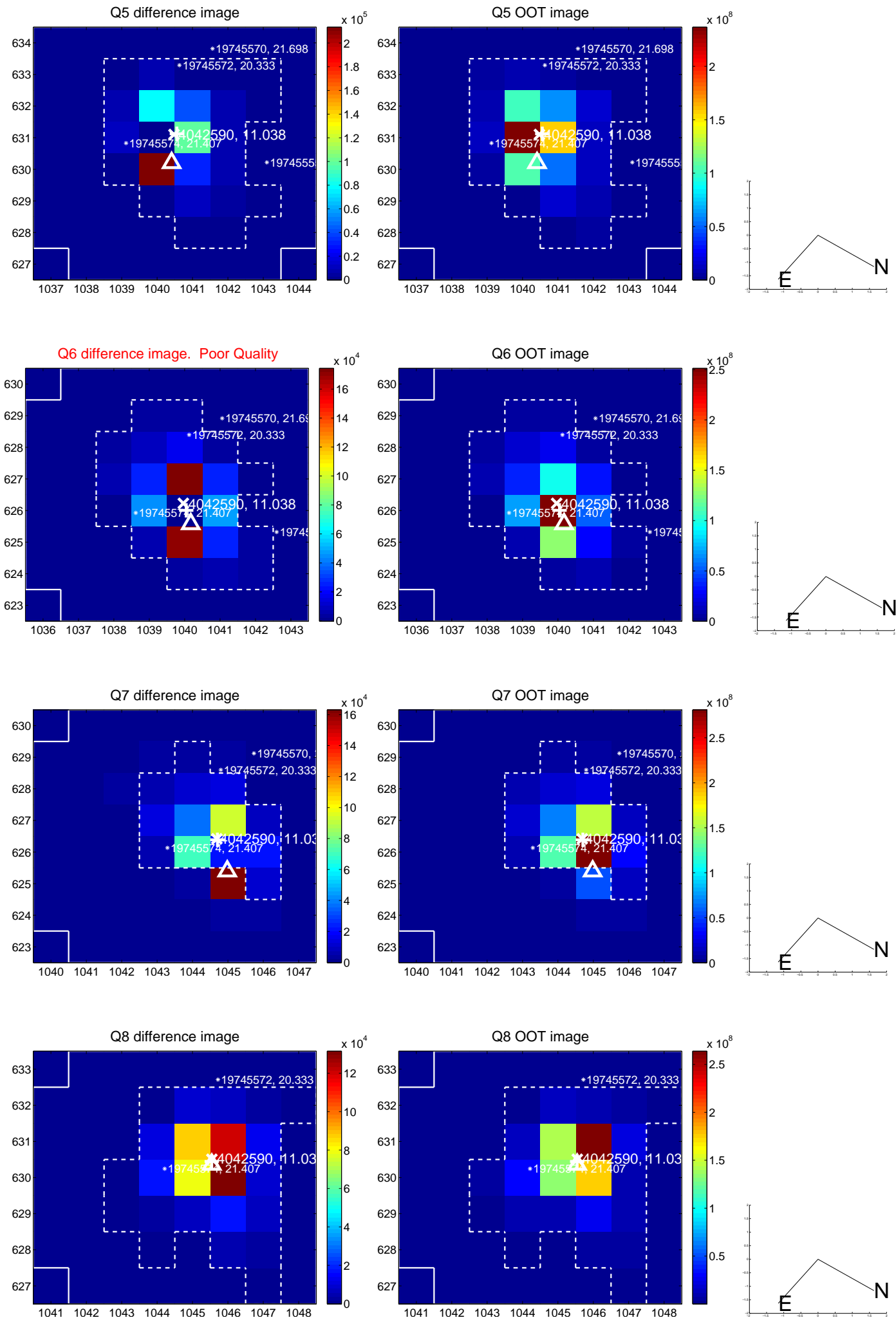


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

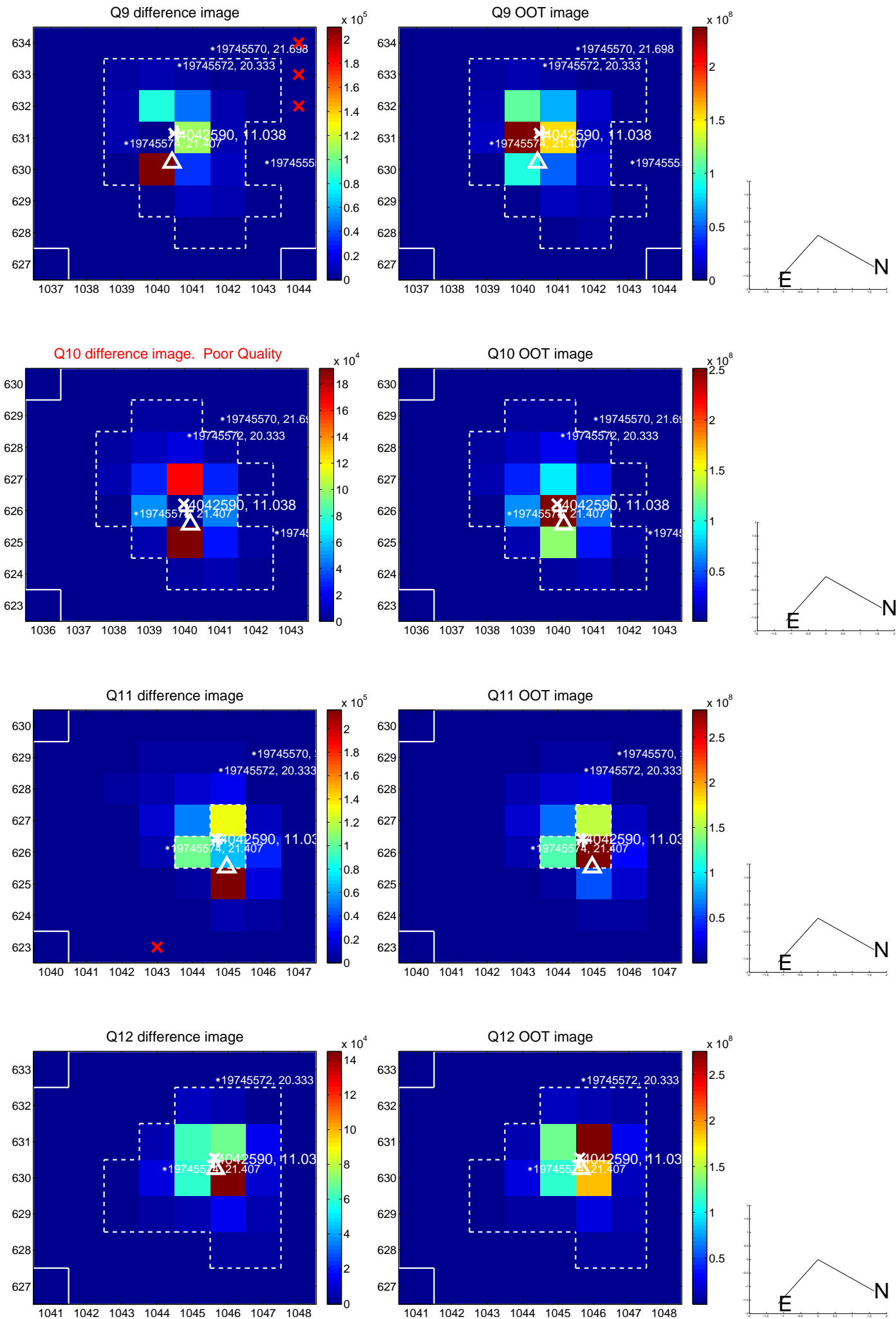
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



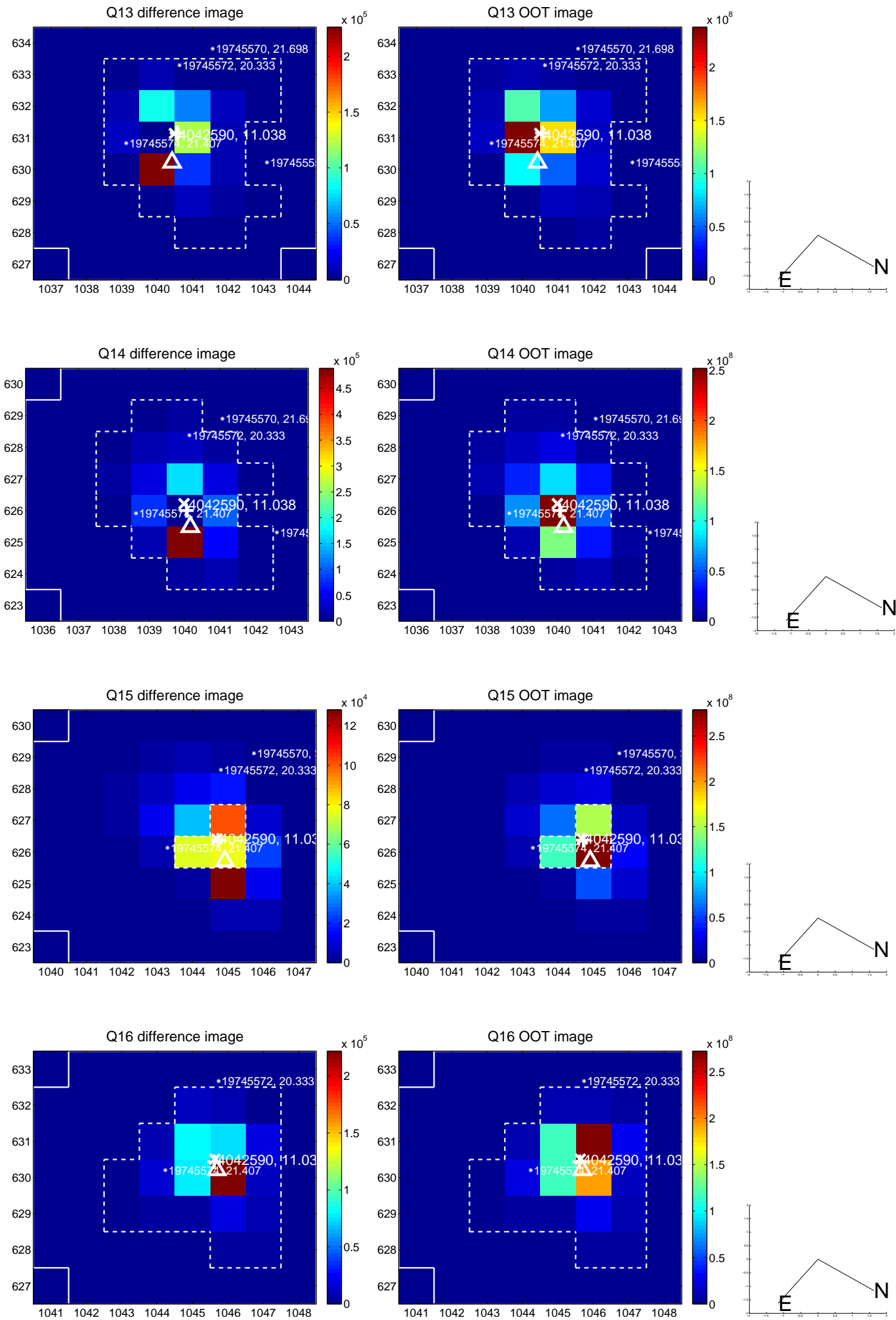
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



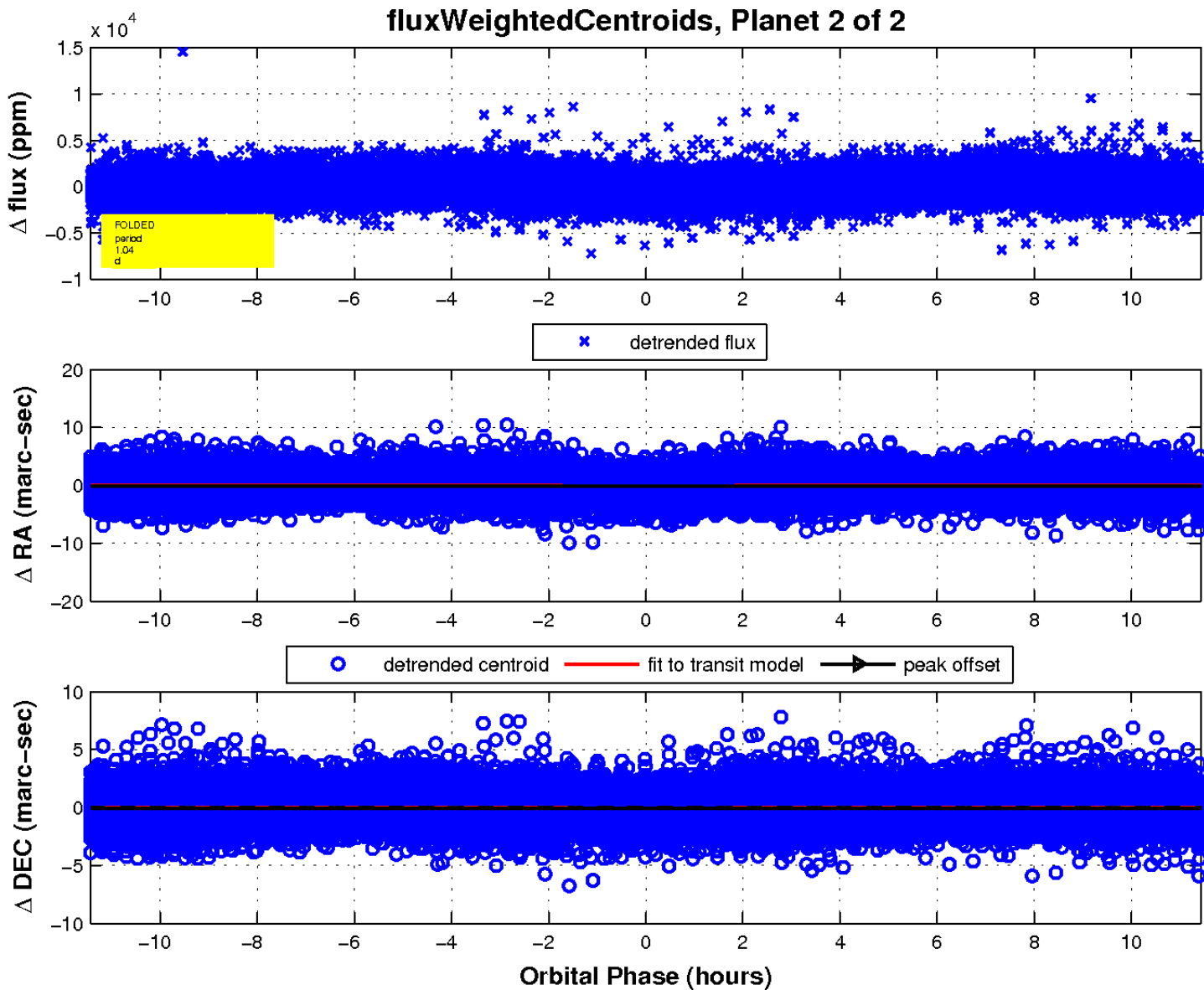
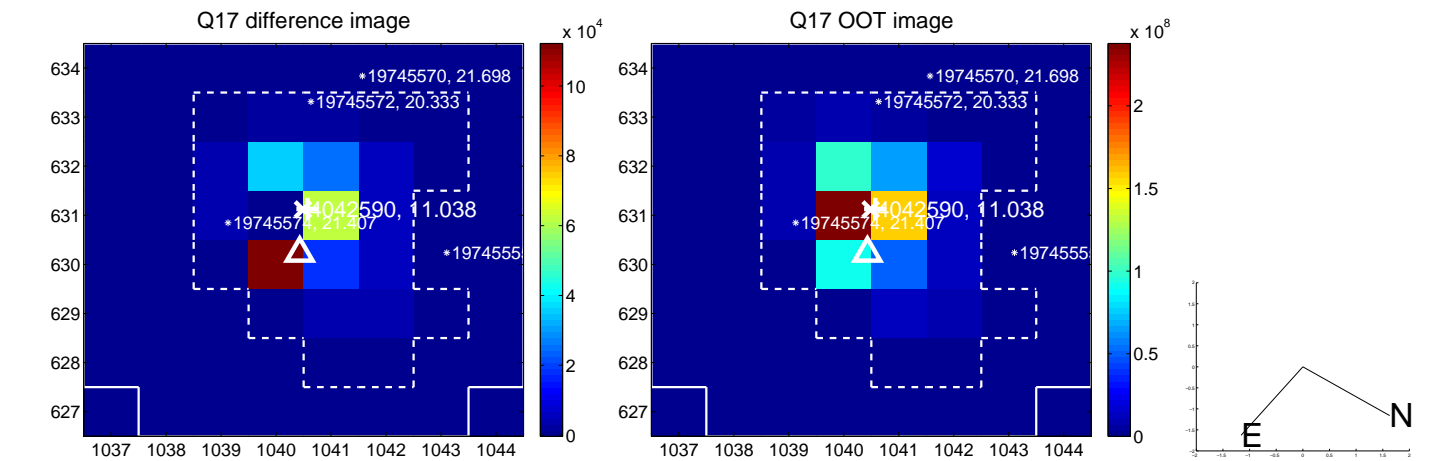
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

