

KIC 006109688

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})
006109688-01	OBS	6663.01	14.086783	140.286782	106415.5	10.107	1043.4	1198.9	1.89	7138	65.62	485.76
006109688-02	OBS	No	14.086810	133.883783	5639.3	4.893	68.2	84.2	1.89	7138	16.09	485.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006109688-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
006109688-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 006109688-01

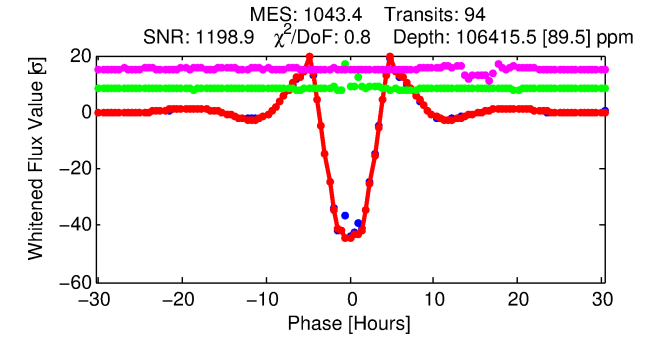
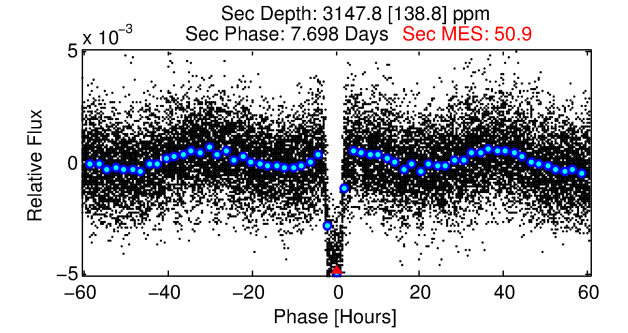
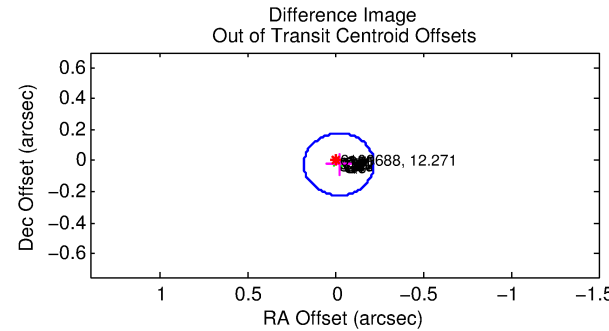
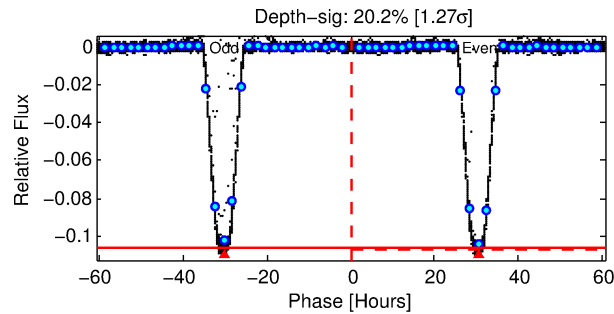
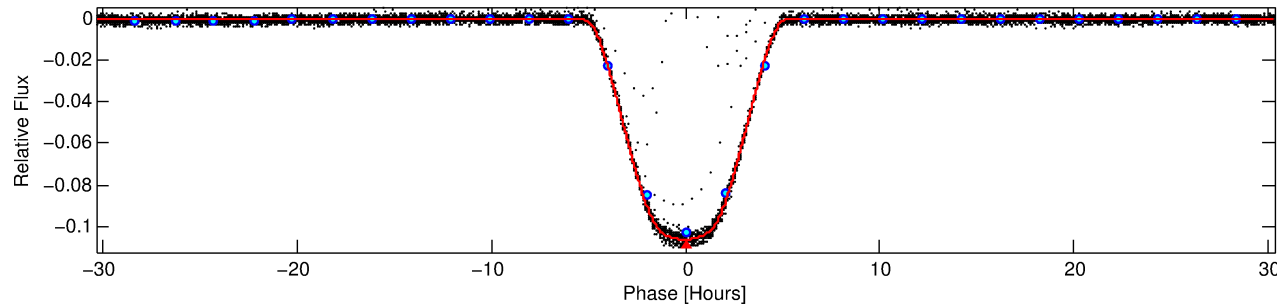
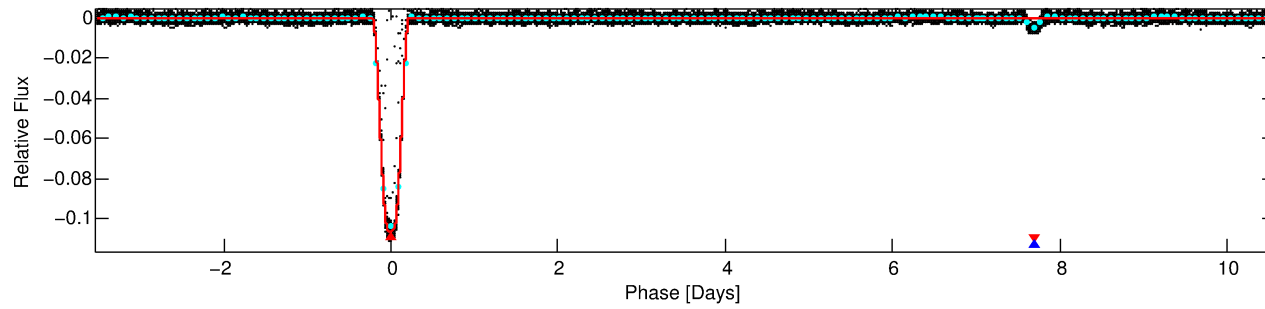
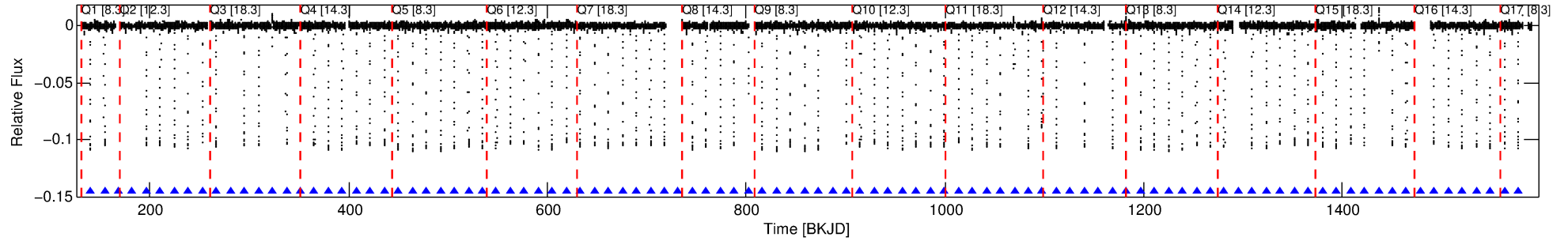
No Significant Match Found

DV One-Page Summary

KIC: 6109688 Candidate: 1 of 2 Period: 14.087 d

KOI: K06663.01 Corr: 0.999

Kp: 12.27 R*: 1.89 Rs Teff: 7138.0 K Logg: 4.06 Fe/H: -0.120



DV Fit Results:

Period = 14.08678 [0.00000] d
Epoch = 140.2868 [0.0001] BKJD
Rp/R* = 0.3182 [0.0002]
a/R* = 12.49 [0.01]
b = 0.61 [0.00]
Seff = 485.76 [192.90]
Teff = 1197 [119] K
Rp = 65.62 [20.07] Re
a = 0.1308 [0.0333] AU
Ag = 6.88 [2.54] [2.32σ]
Teffp = 2997 [120] K [10.65σ]

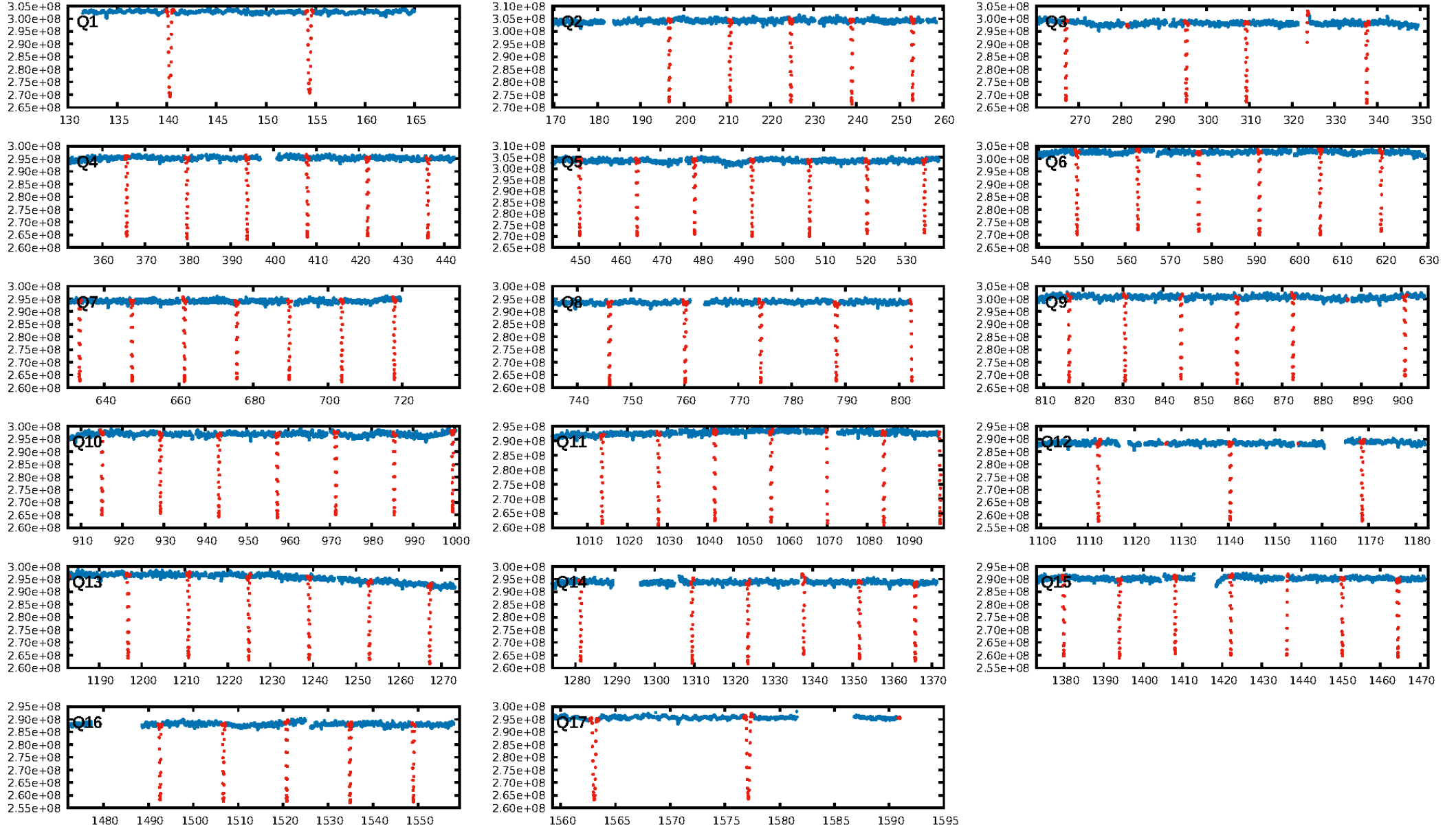
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [90/90]
GhostDiagnostic-chr: 1.898
Centroid-sig: 0.0%
Centroid-so: 0.135 arcsec [353.09σ]
OotOffset-rm: 0.029 arcsec [0.44σ]
KicOffset-rm: 0.099 arcsec [1.40σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

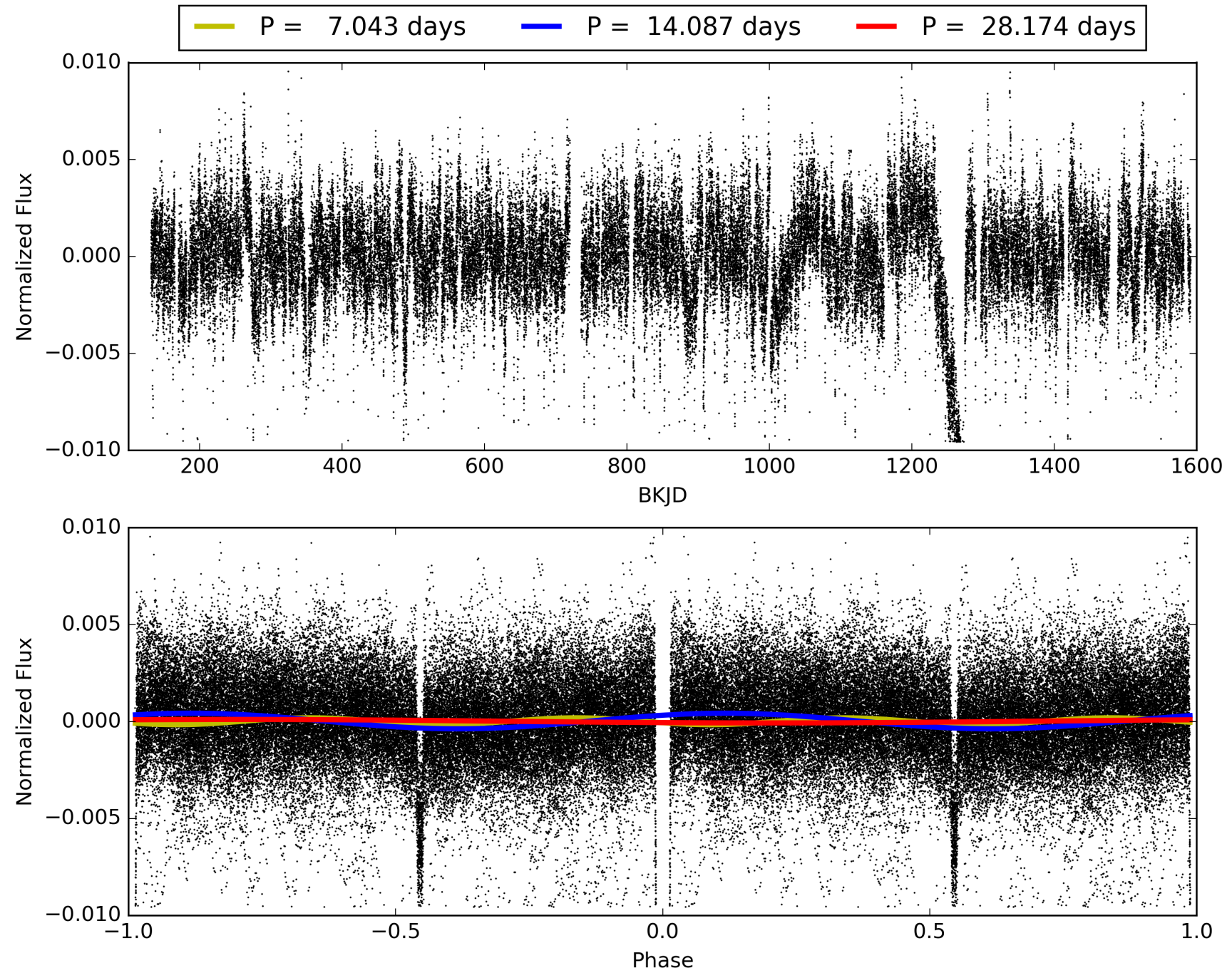
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:51:16 Z

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

TCE 006109688-01, PDC Light Curves

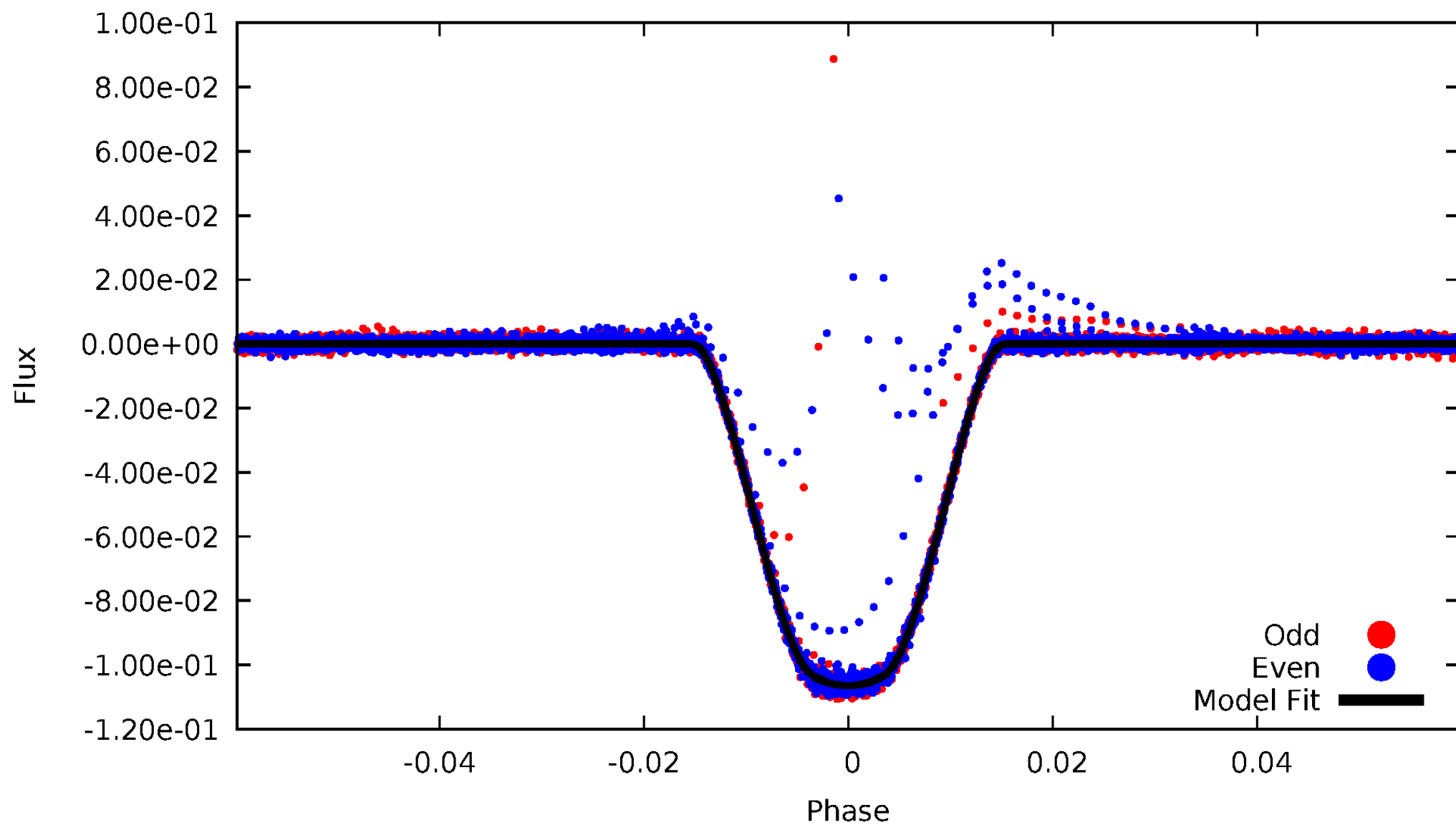


TCE 006109688-01



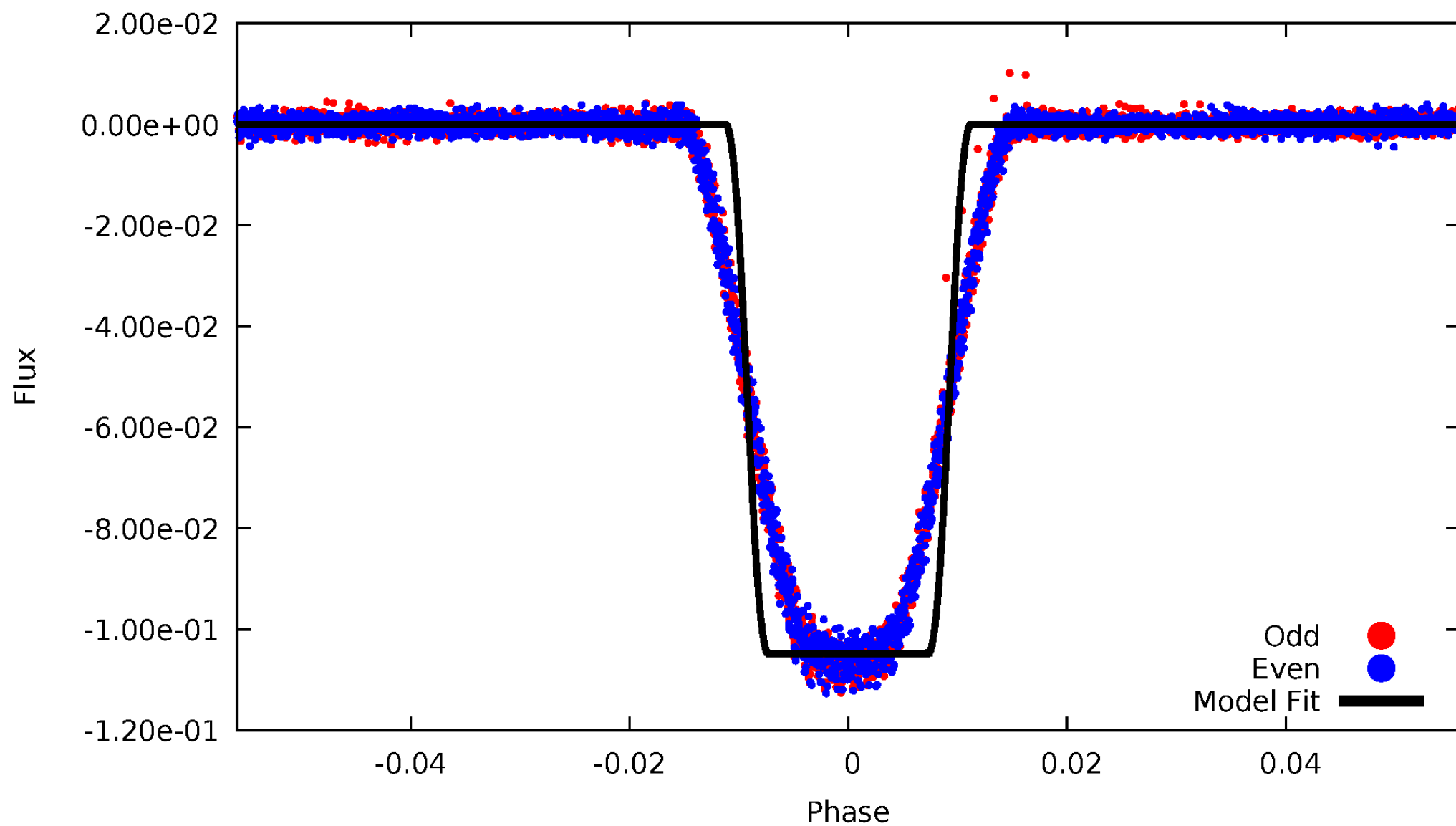
DV Odd/Even

TCE 006109688-01



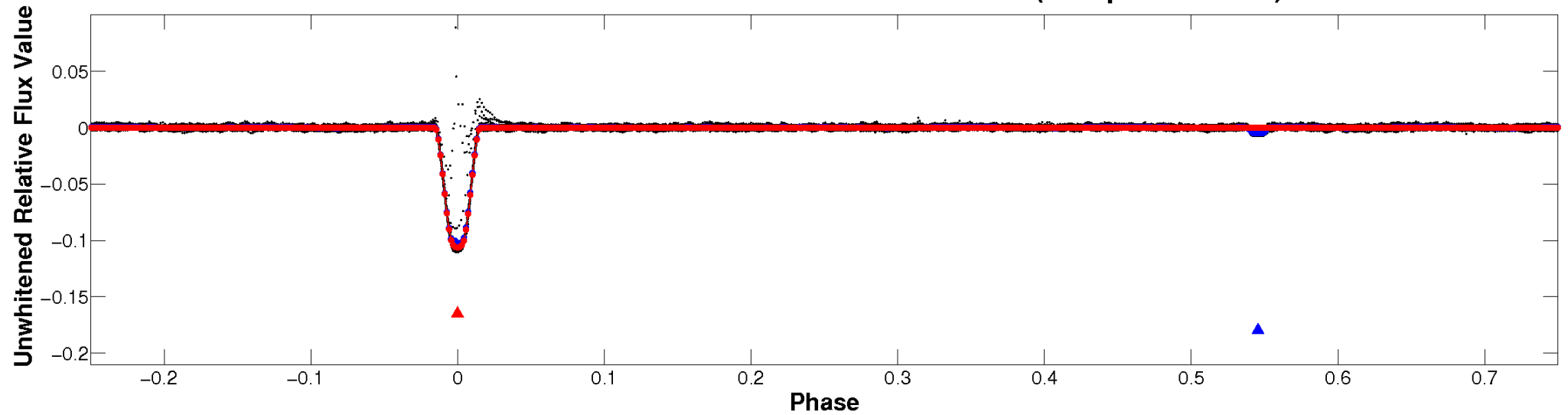
ALT Odd/Even

TCE 006109688-01

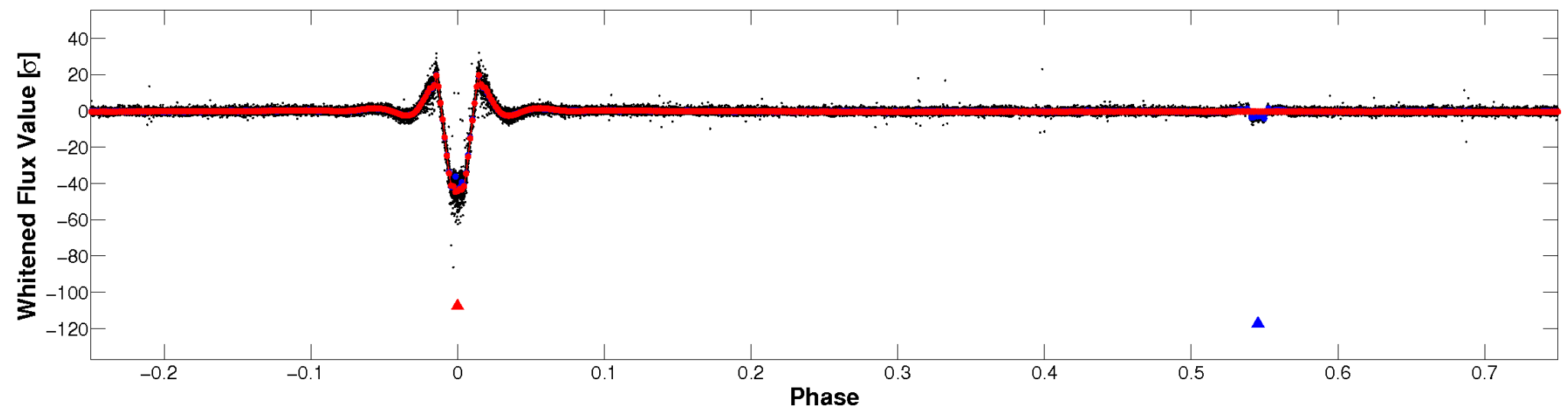


Non-Whitened Vs. Whitened Light Curve

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

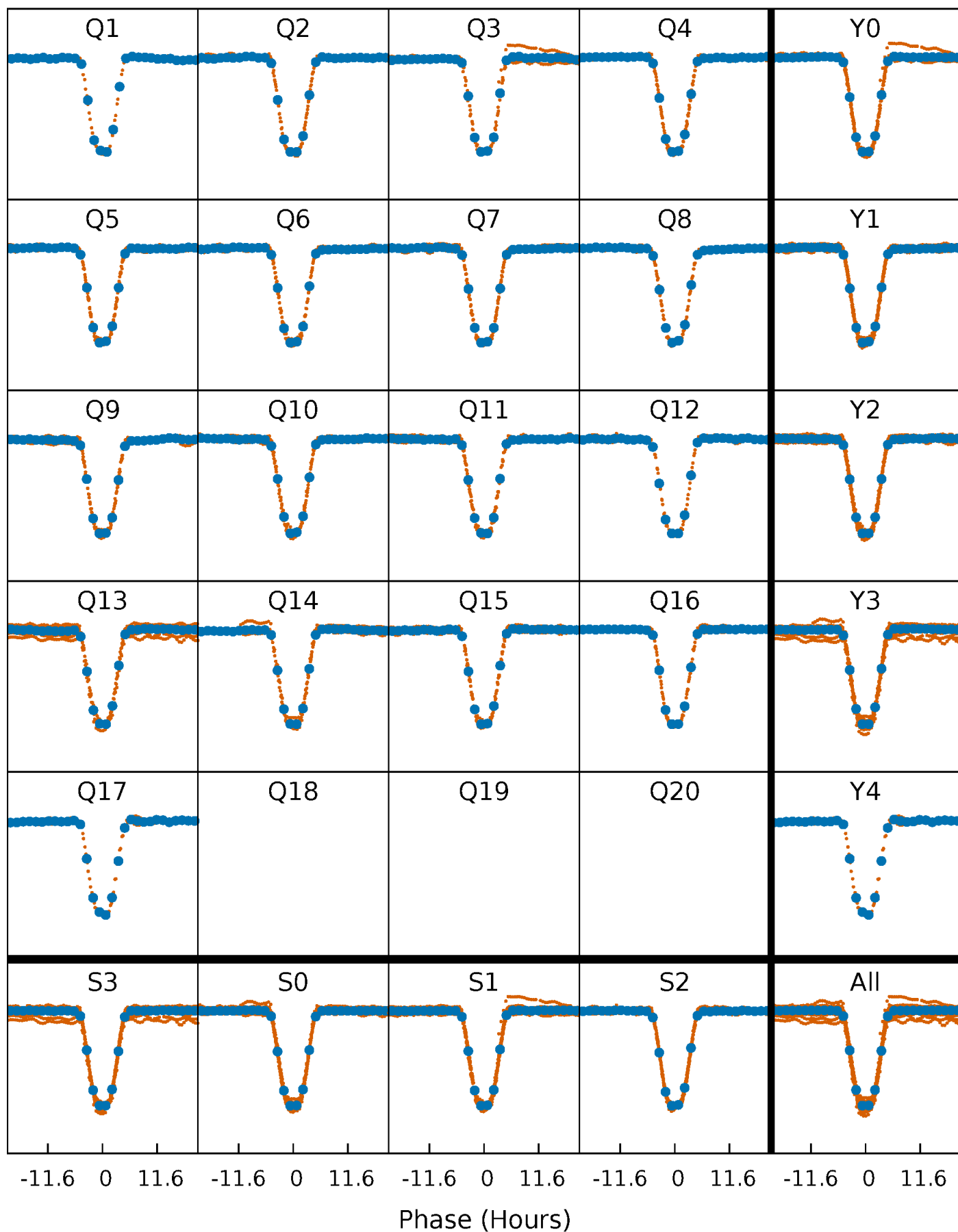


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



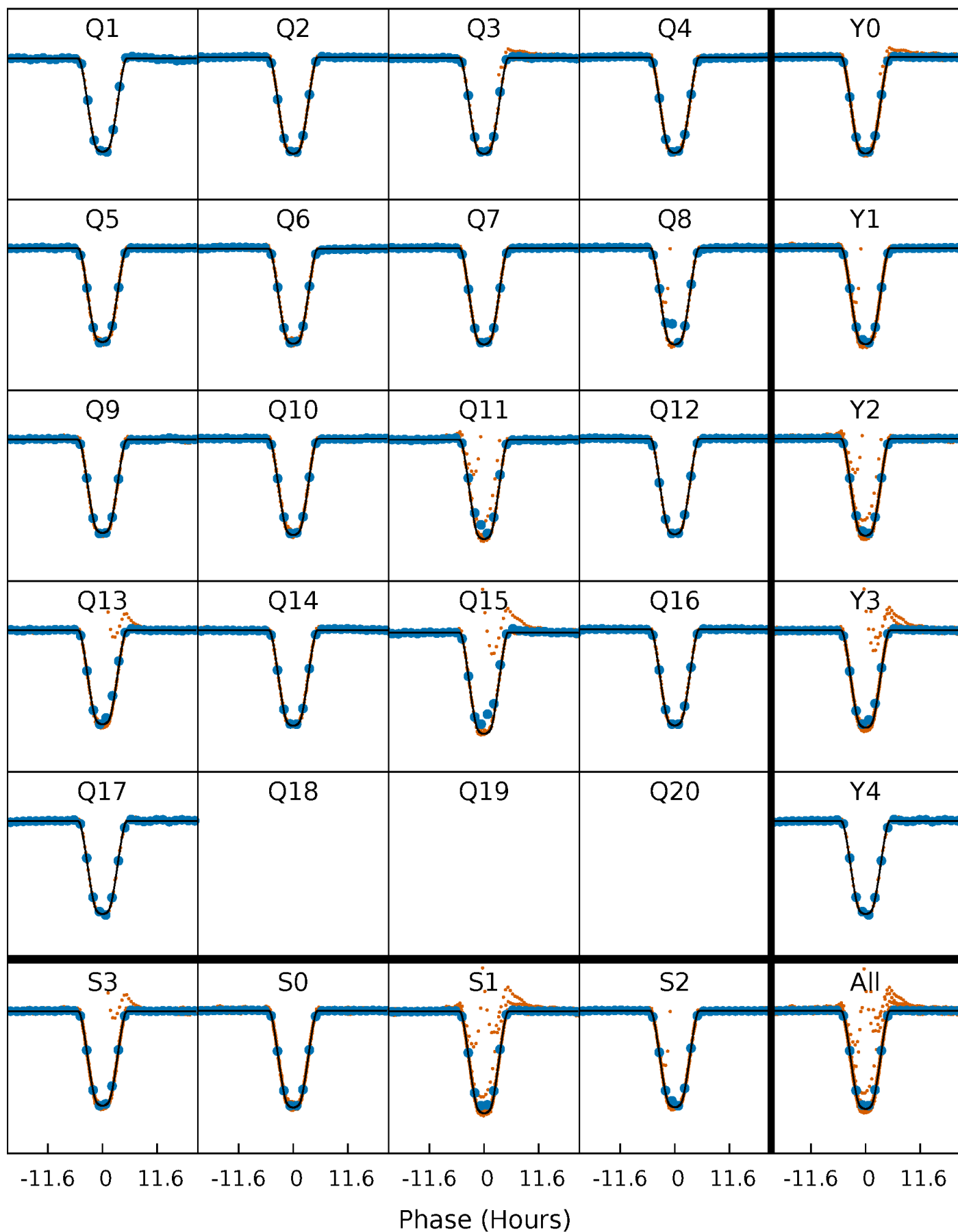
PDC Quarter-Phased Transit Curves

TCE 006109688-01 P= 14.086783 Days $T_0=140.286782$ (BKJD)



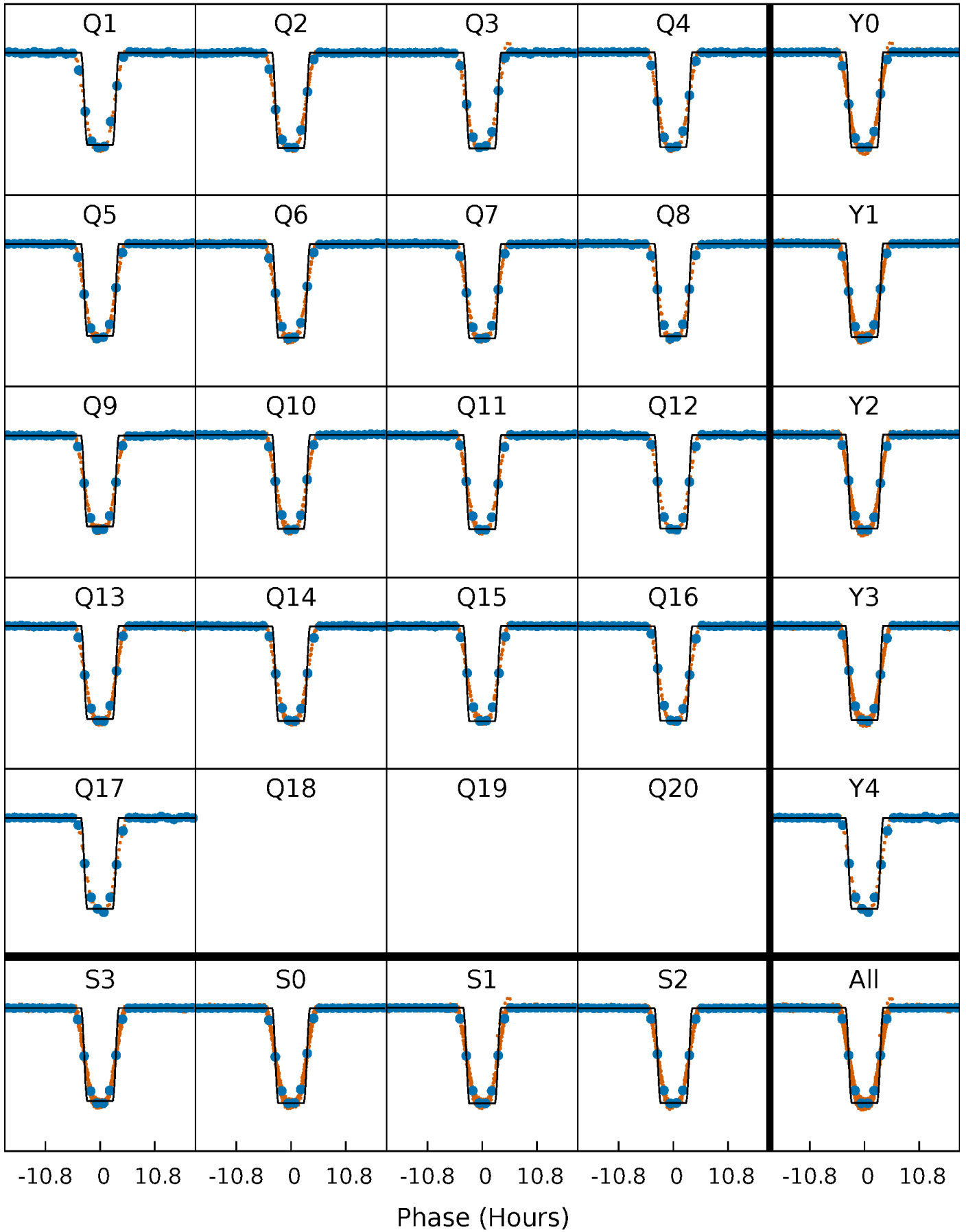
DV Quarter-Phased Transit Curves

TCE 006109688-01 P= 14.086783 Days $T_0=140.286782$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

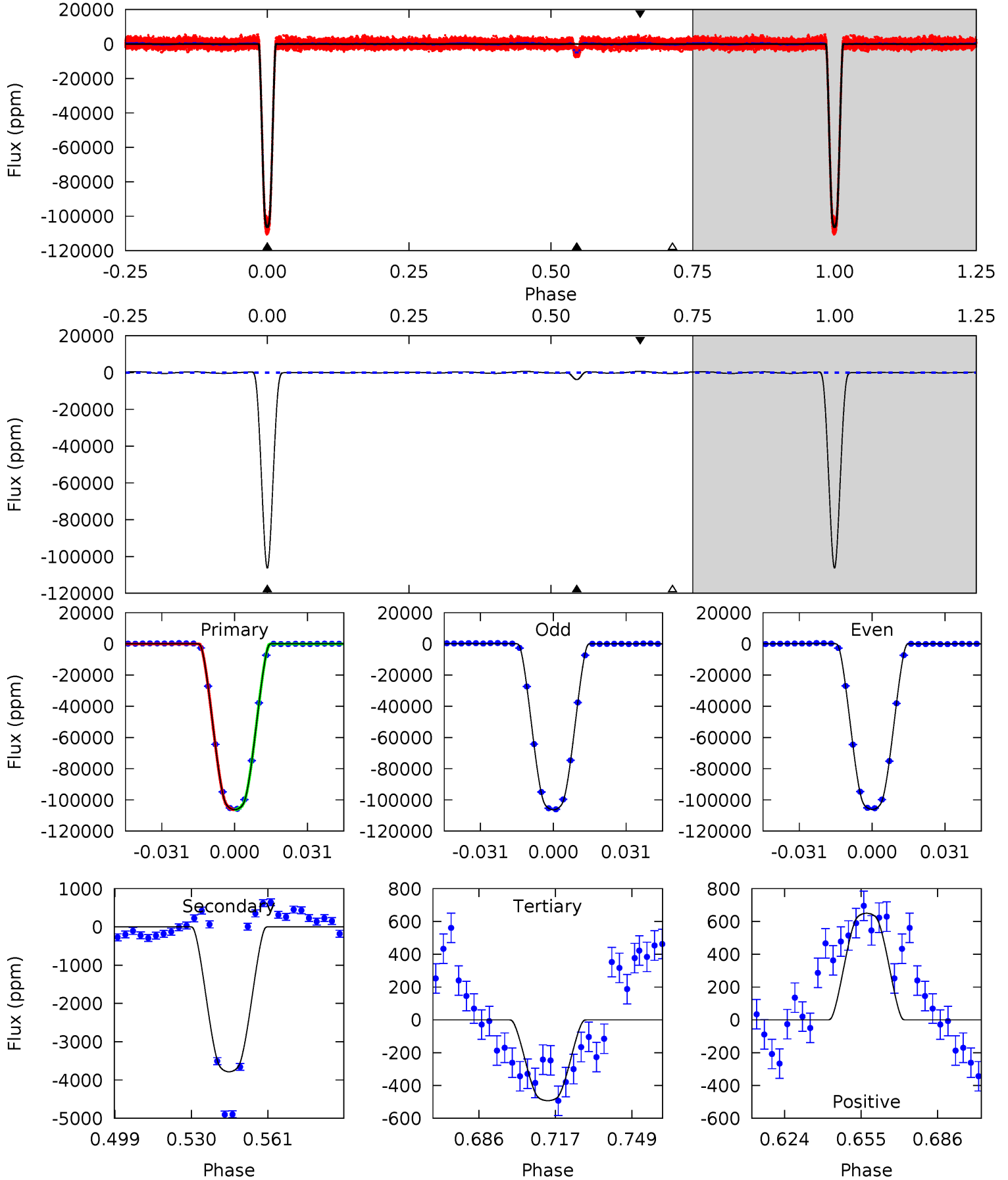
TCE 006109688-01 P= 14.086655 Days $T_0=140.293067$ (BKJD)



DV Model-Shift Uniqueness Test

006109688-01, P = 14.086783 Days, E = 126.199999 Days

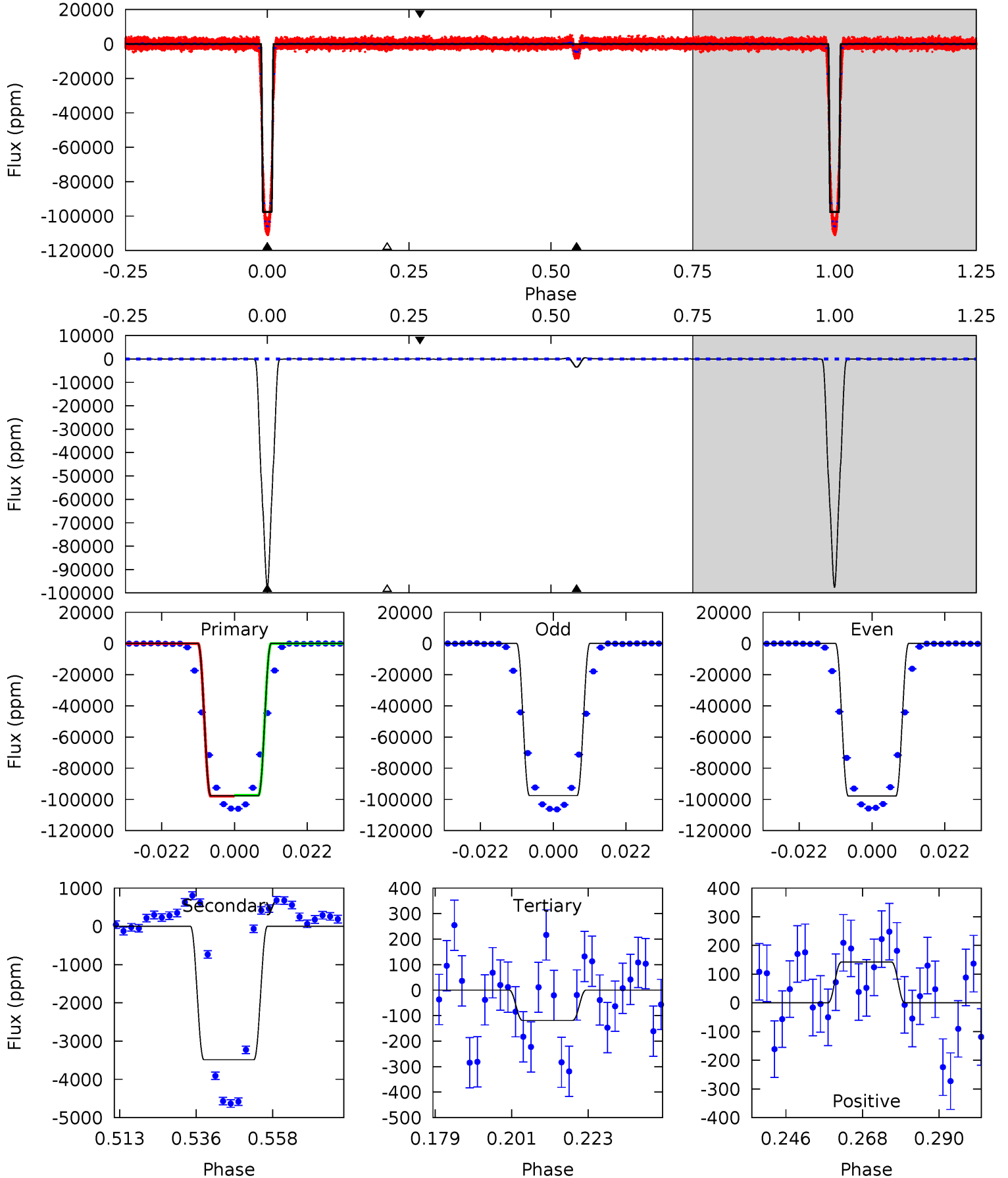
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3654	130.2	16.9	22.3	4.80	2.15	9.73	3637	3632	113.2	107.8	3.75	0.95	0.01	0.15



Alt Model-Shift Uniqueness Test

006109688-01, P = 14.086655 Days, E = 126.206412 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2776	99.1	3.39	4.05	4.87	2.28	1.68	2772	2772	95.7	95.1	3.54	0.99	0.01	7.22



Stellar Parameters For KIC 006109688

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7138^{+175}_{-275}	$4.062^{+0.198}_{-0.180}$	$-0.120^{+0.250}_{-0.350}$	$1.890^{+0.578}_{-0.473}$	$1.500^{+0.209}_{-0.232}$	$0.313^{+0.320}_{-0.160}$
	+2%/-4%	+5%/-4%	+208%/-292%	+31%/-25%	+14%/-15%	+102%/-51%
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 006109688-01 / KOI 6663.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-3786 ± 29	$65.63^{+11.36}_{-9.07}$	1666^{+135}_{-127}	3547^{+55}_{-82}	$8.249^{+2.586}_{-2.093}$
Alt.	-3486 ± 35	$66.70^{+10.14}_{-9.74}$	1663^{+126}_{-119}	3479^{+56}_{-73}	$7.312^{+2.312}_{-1.659}$

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

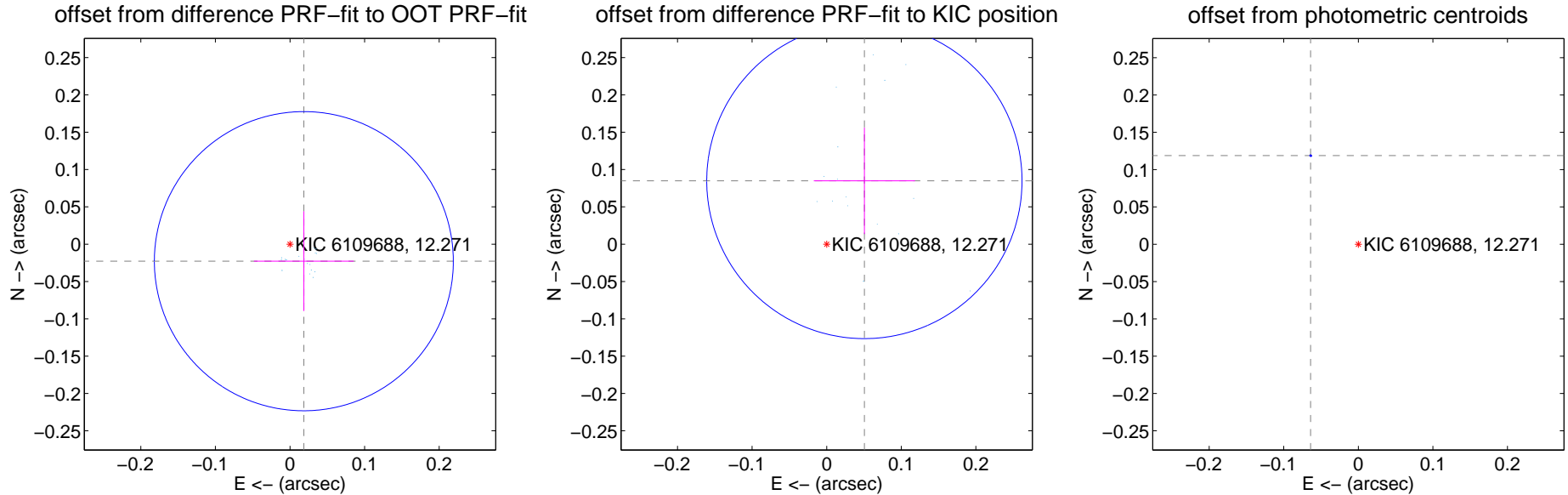
DV Centroid Data

Supplemental centroid analysis for 006109688-01. Kepler magnitude: 12.27. Transit SNR 1198.85

There are 17 quarters with good PRF difference image offsets

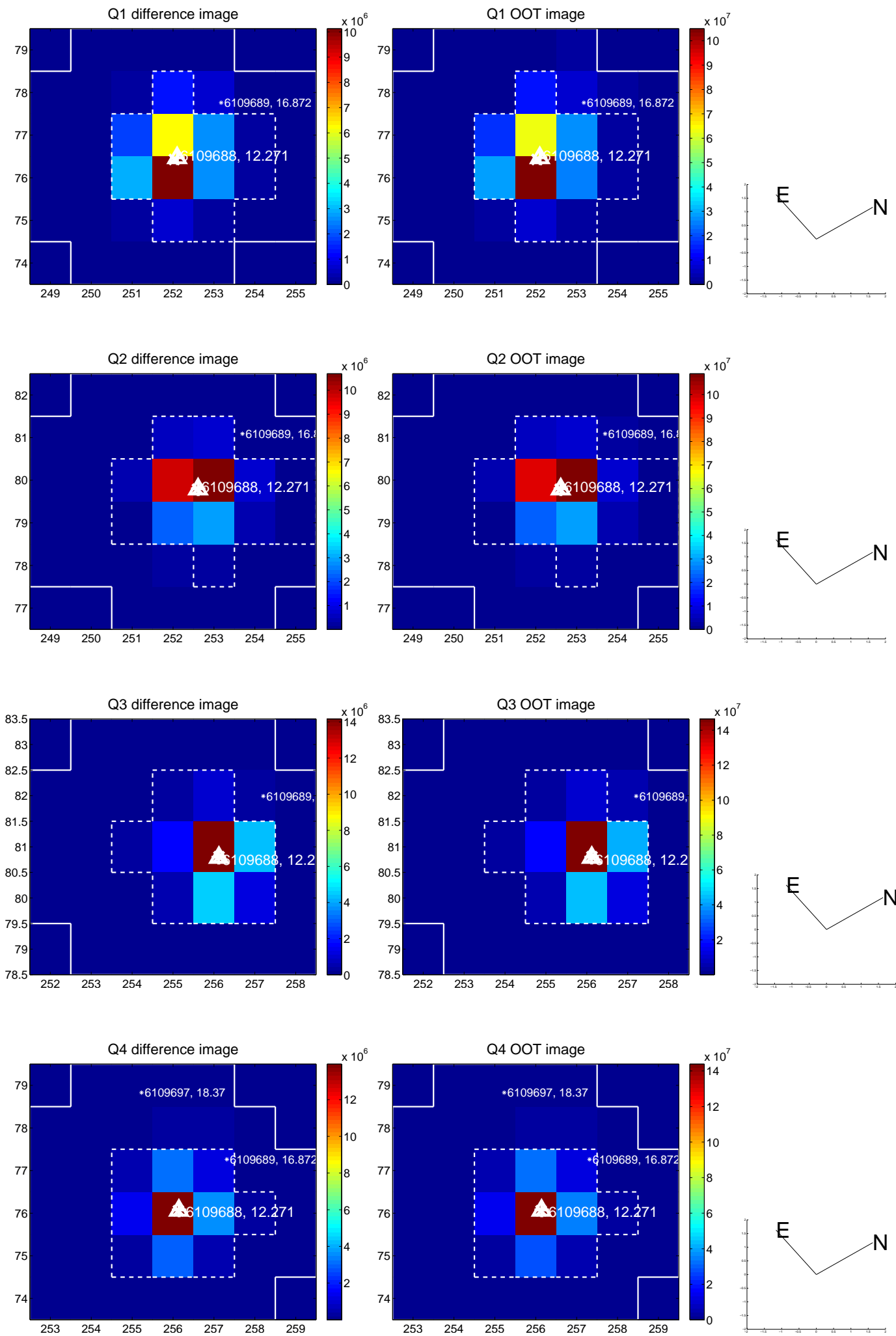
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.029 ± 0.067	0.44	-0.019 ± 0.067	-0.023 ± 0.067
PRF-fit source offset from KIC position	0.099 ± 0.070	1.40	-0.051 ± 0.068	0.085 ± 0.071
photometric centroid source offset	0.13 ± 0.00	353.09	0.06 ± 0.00	0.12 ± 0.00

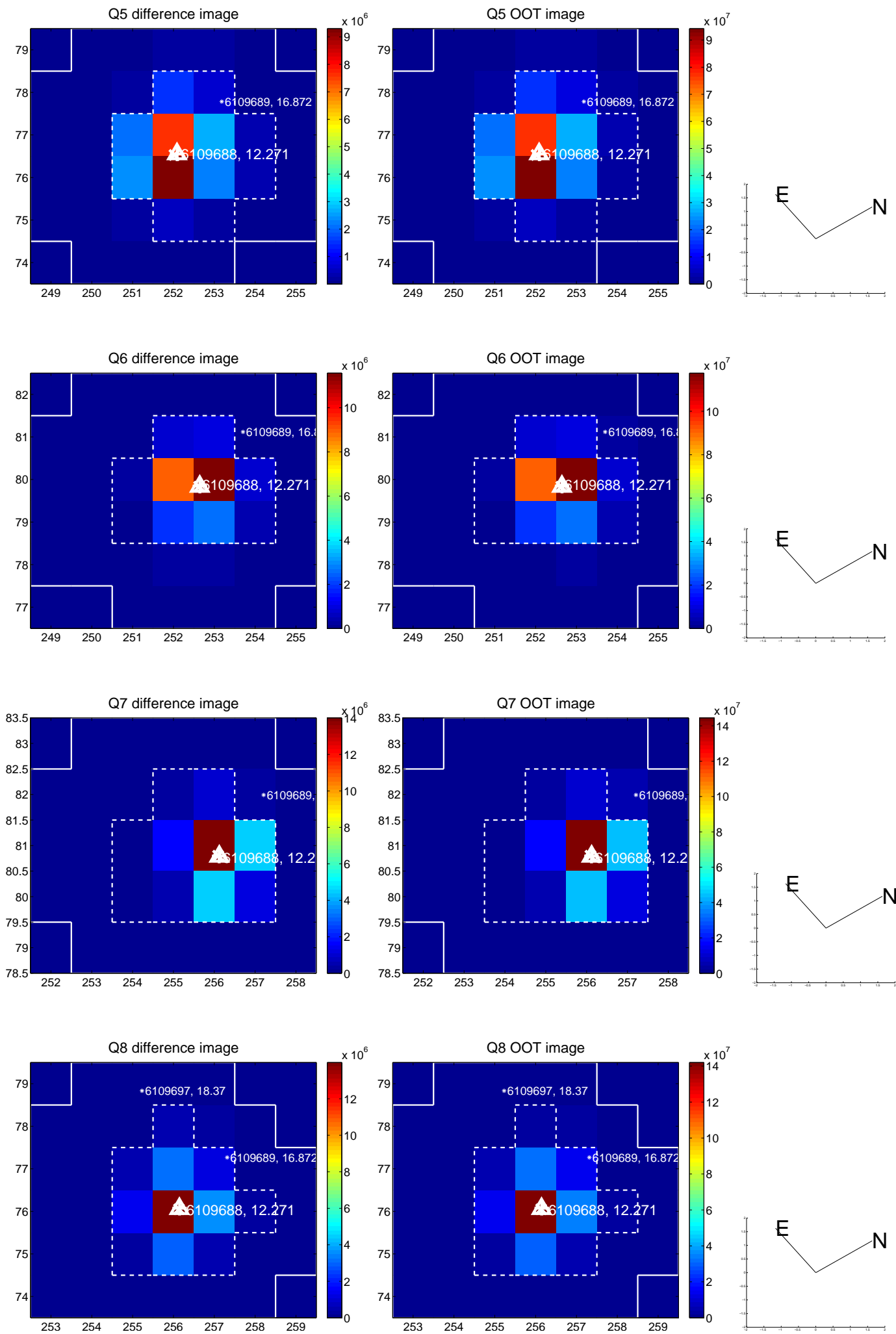


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

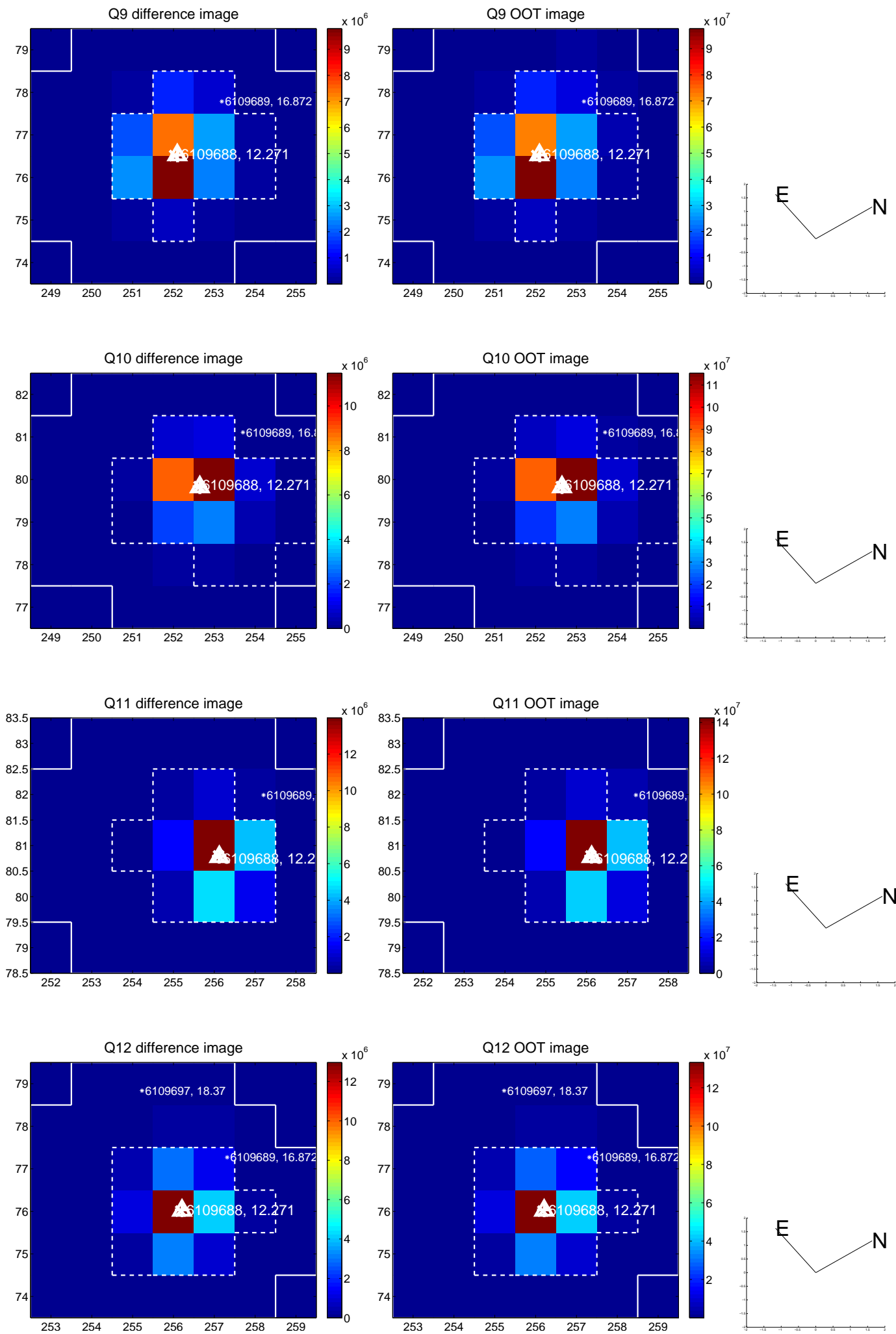
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



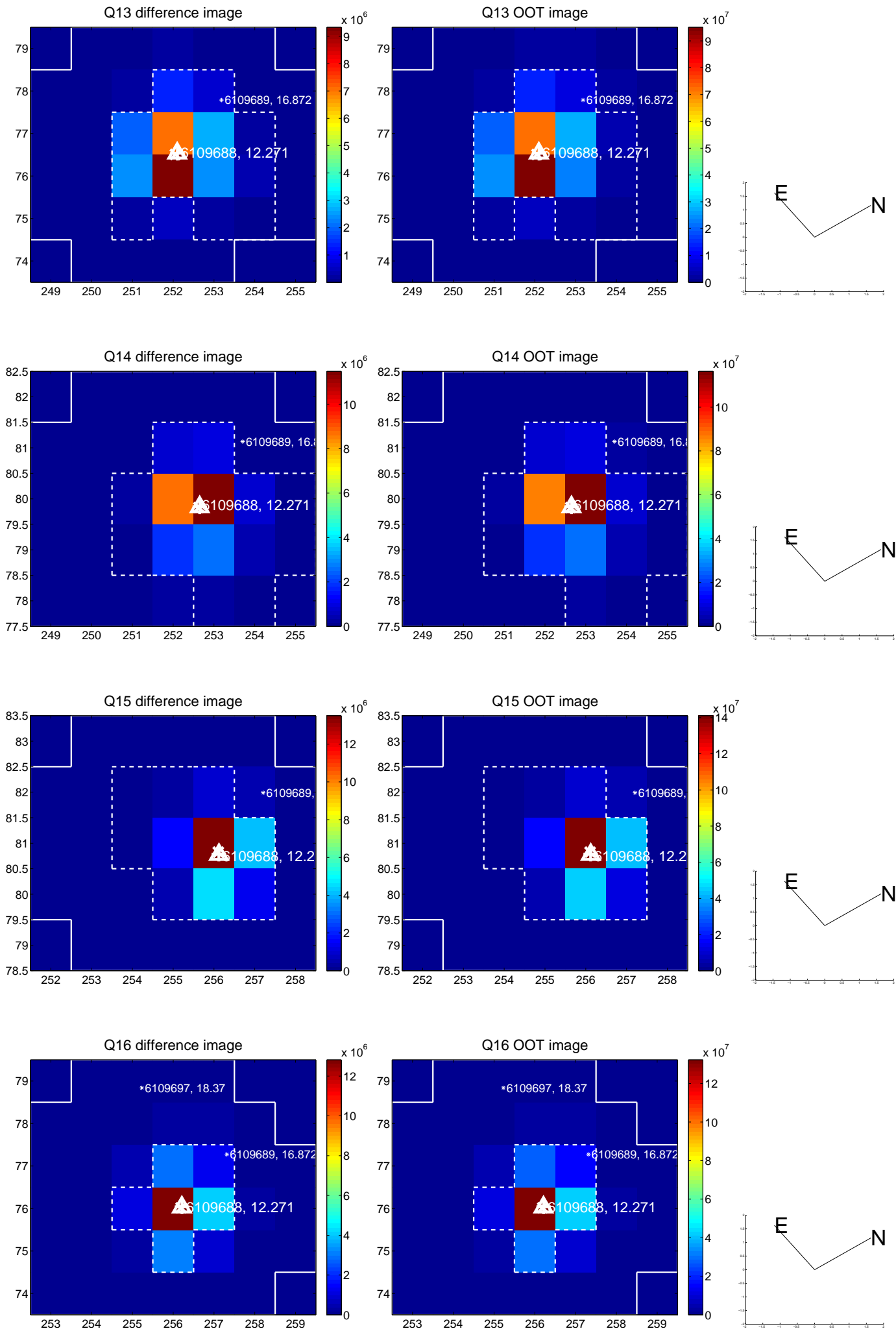
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



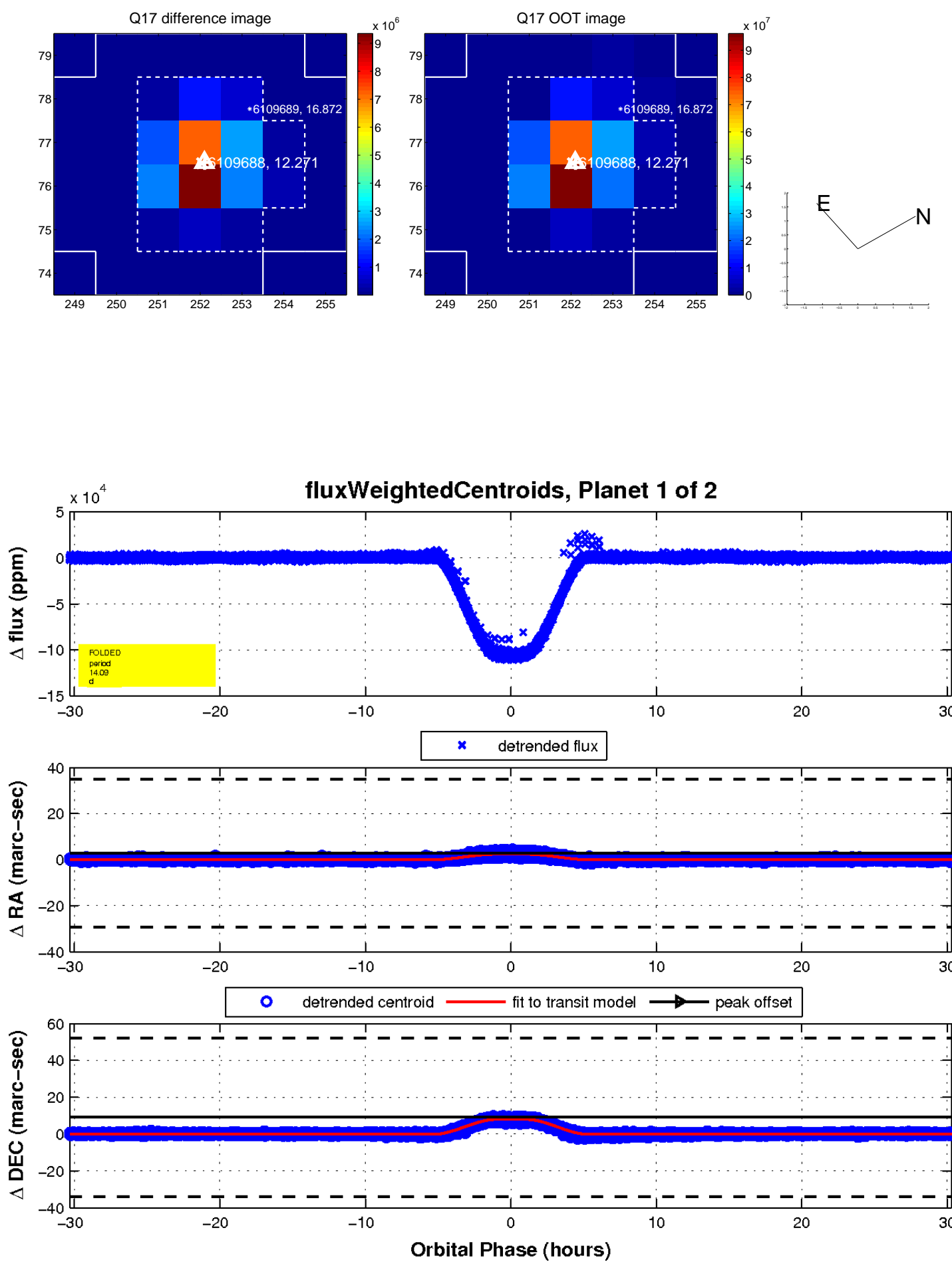
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

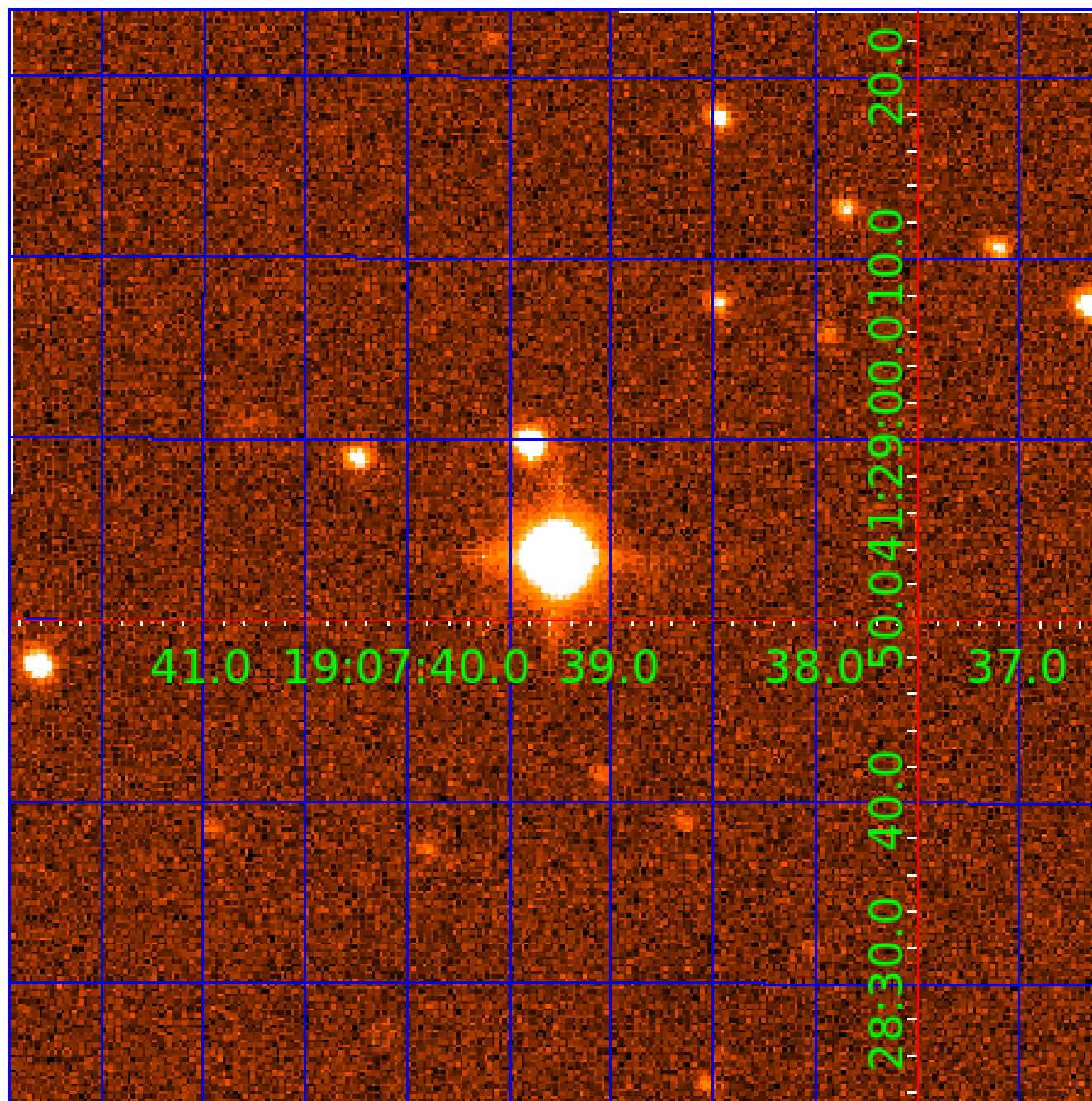


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006109688

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})
006109688-01	OBS	6663.01	14.086783	140.286782	106415.5	10.107	1043.4	1198.9	1.89	7138	65.62	485.76
006109688-02	OBS	No	14.086810	133.883783	5639.3	4.893	68.2	84.2	1.89	7138	16.09	485.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006109688-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
006109688-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 006109688-02

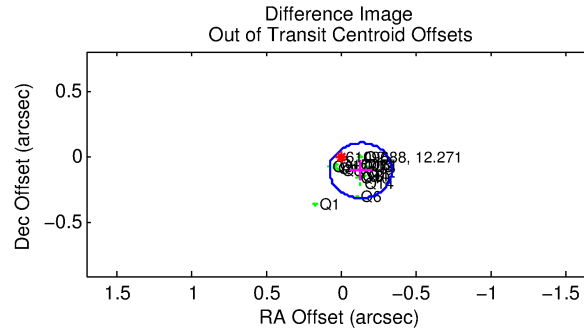
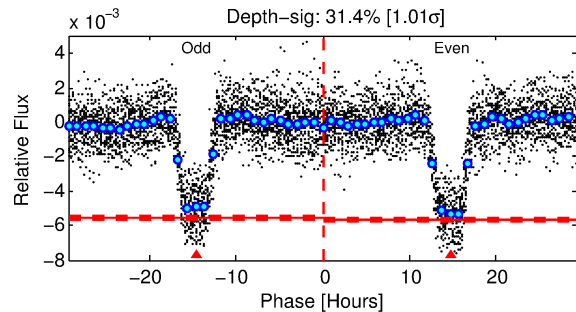
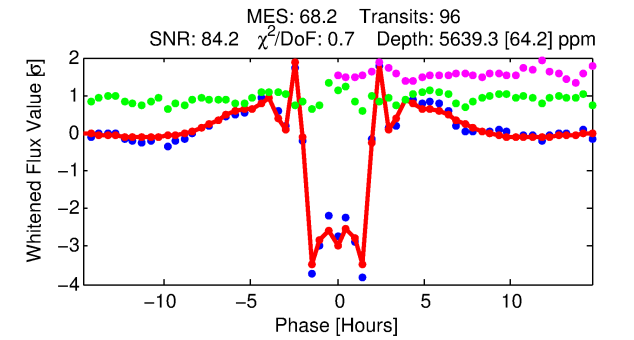
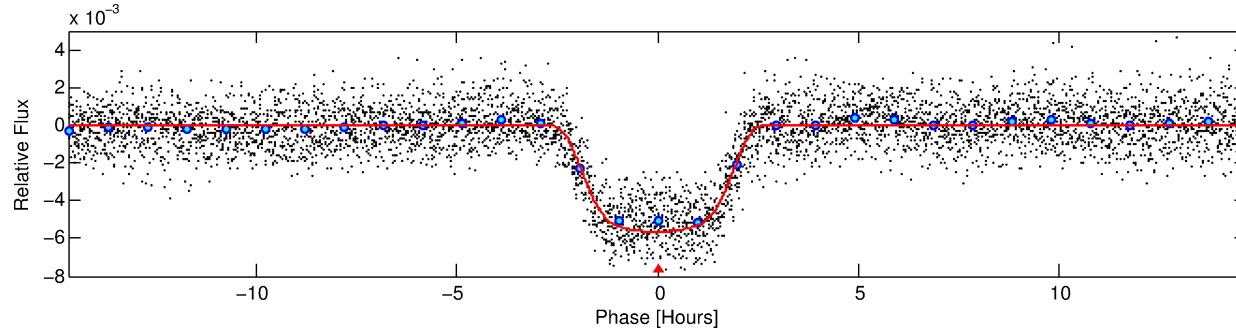
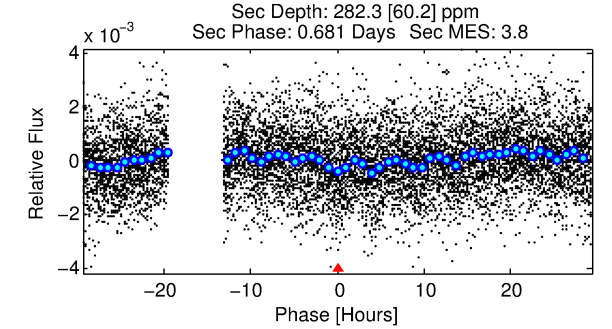
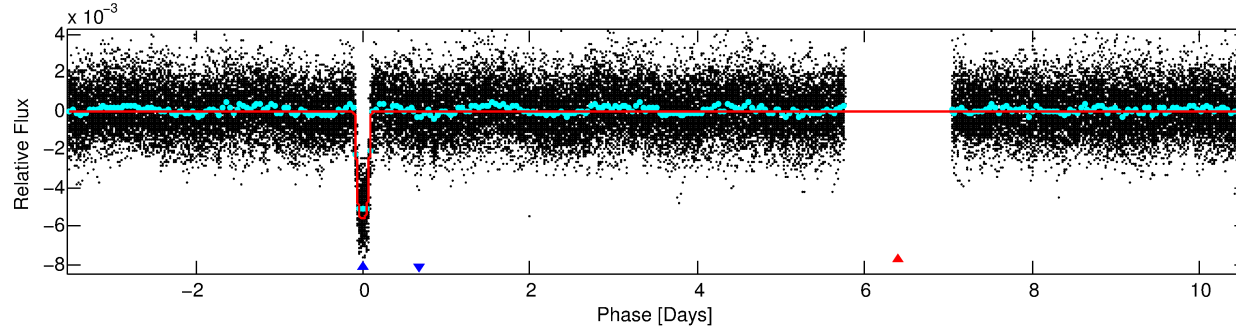
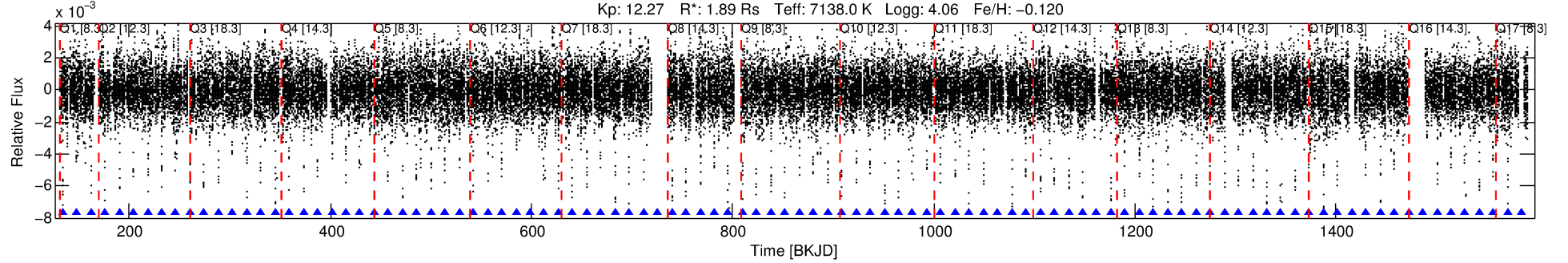
No Significant Match Found

DV One-Page Summary

KIC: 6109688 Candidate: 2 of 2 Period: 14.087 d

KOI: K06663 Corr: No Ephemeris Match

Kp: 12.27 R*: 1.89 Rs Teff: 7138.0 K Logg: 4.06 Fe/H: -0.120



DV Fit Results:

Period = 14.08681 [0.00001] d
Epoch = 133.8838 [0.0005] BKJD
Rp/R* = 0.0780 [0.0005]
a/R* = 14.40 [0.08]
b = 0.86 [0.00]
Seff = 485.76 [192.90]
Teff = 1197 [119] K
Rp = 16.09 [4.92] Re
a = 0.1308 [0.0333] AU
Ag = 10.26 [4.35] [2.13σ]
Teffp = 3312 [218] K [8.52σ]

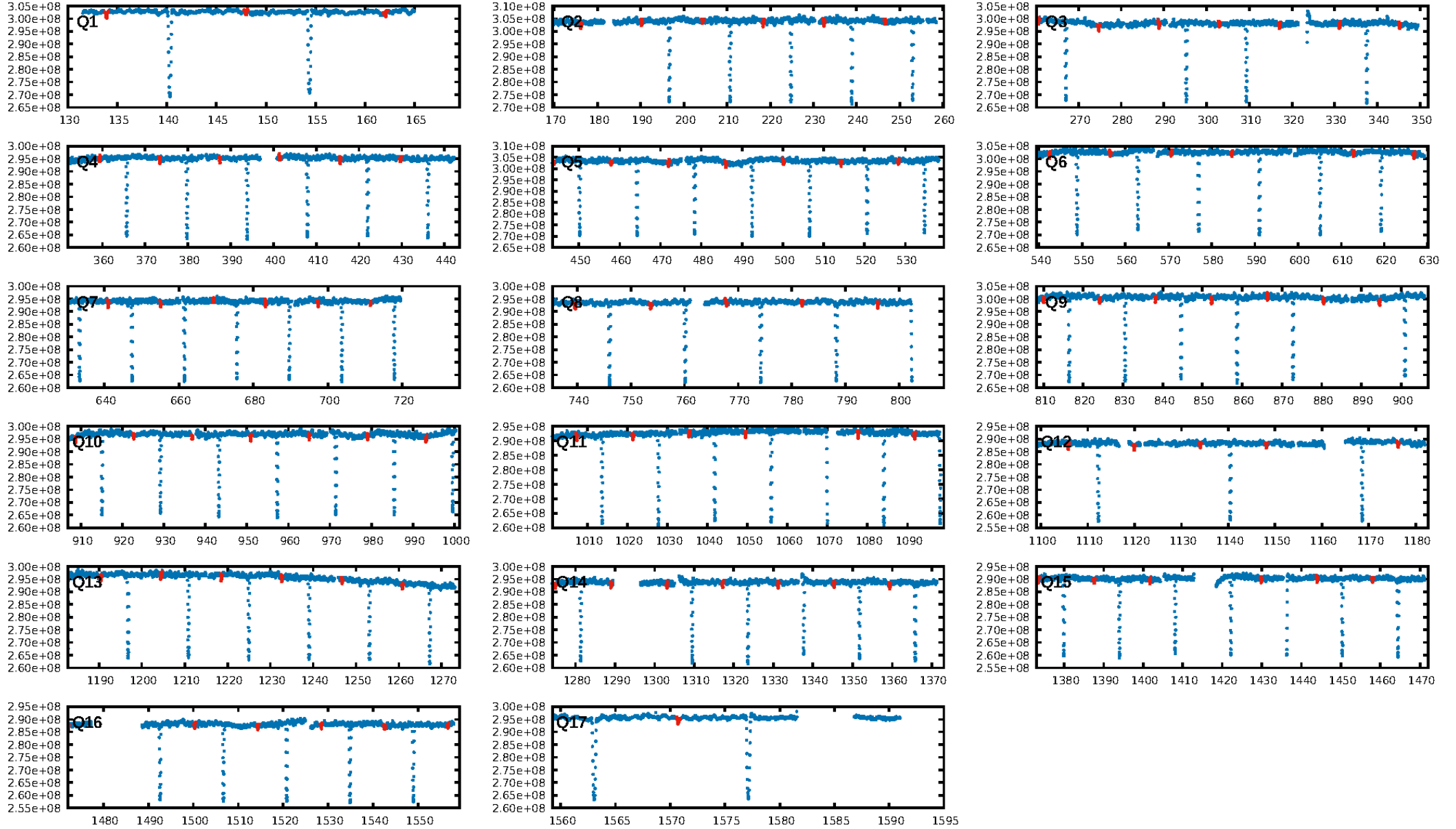
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 73.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [92/92]
GhostDiagnostic-chr: 1.577
Centroid-sig: 0.0%
Centroid-so: 0.050 arcsec [6.94σ]
OotOffset-rm: 0.169 arcsec [2.42σ]
KicOffset-rm: 0.127 arcsec [1.76σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

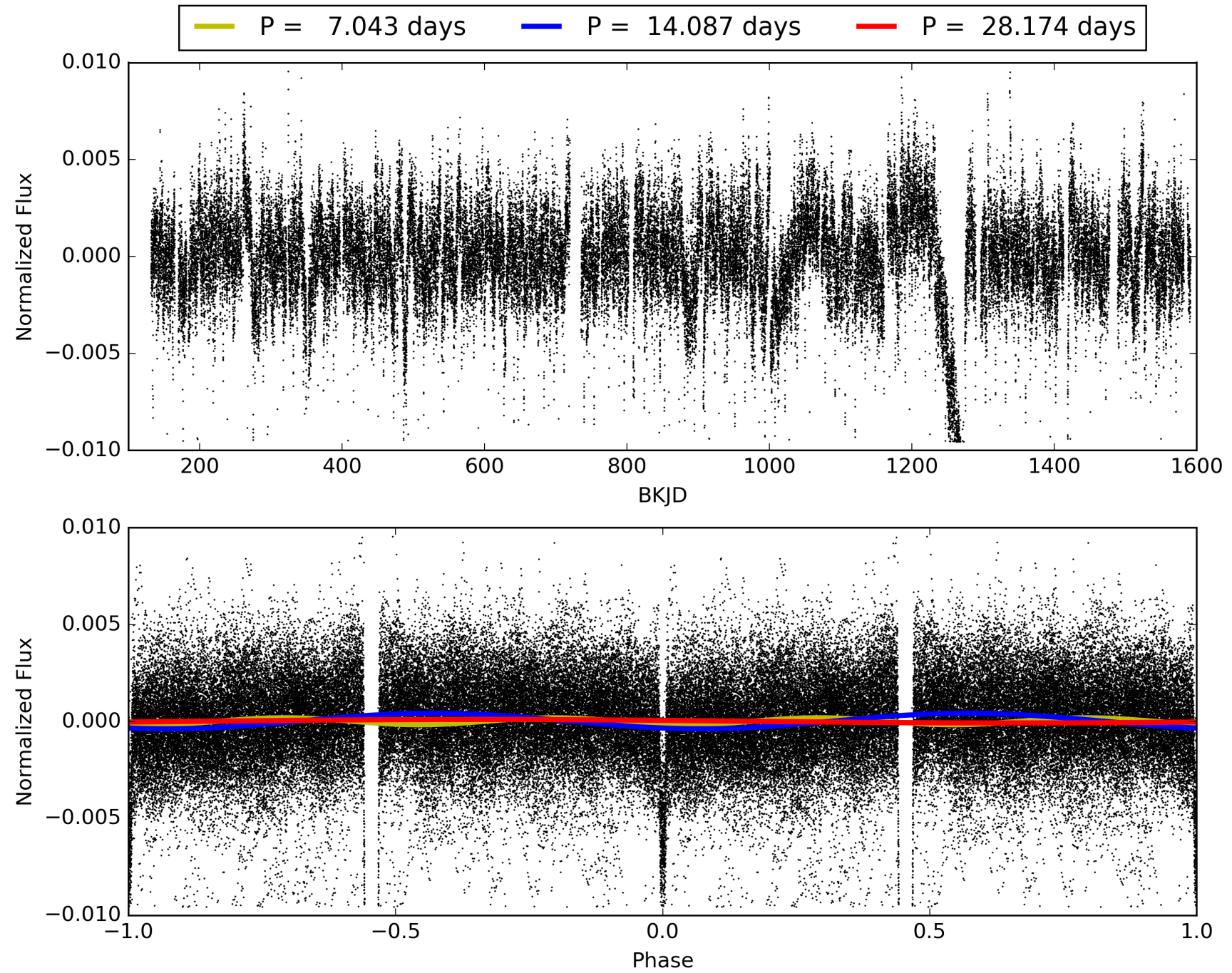
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:51:21 Z

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

TCE 006109688-02, PDC Light Curves

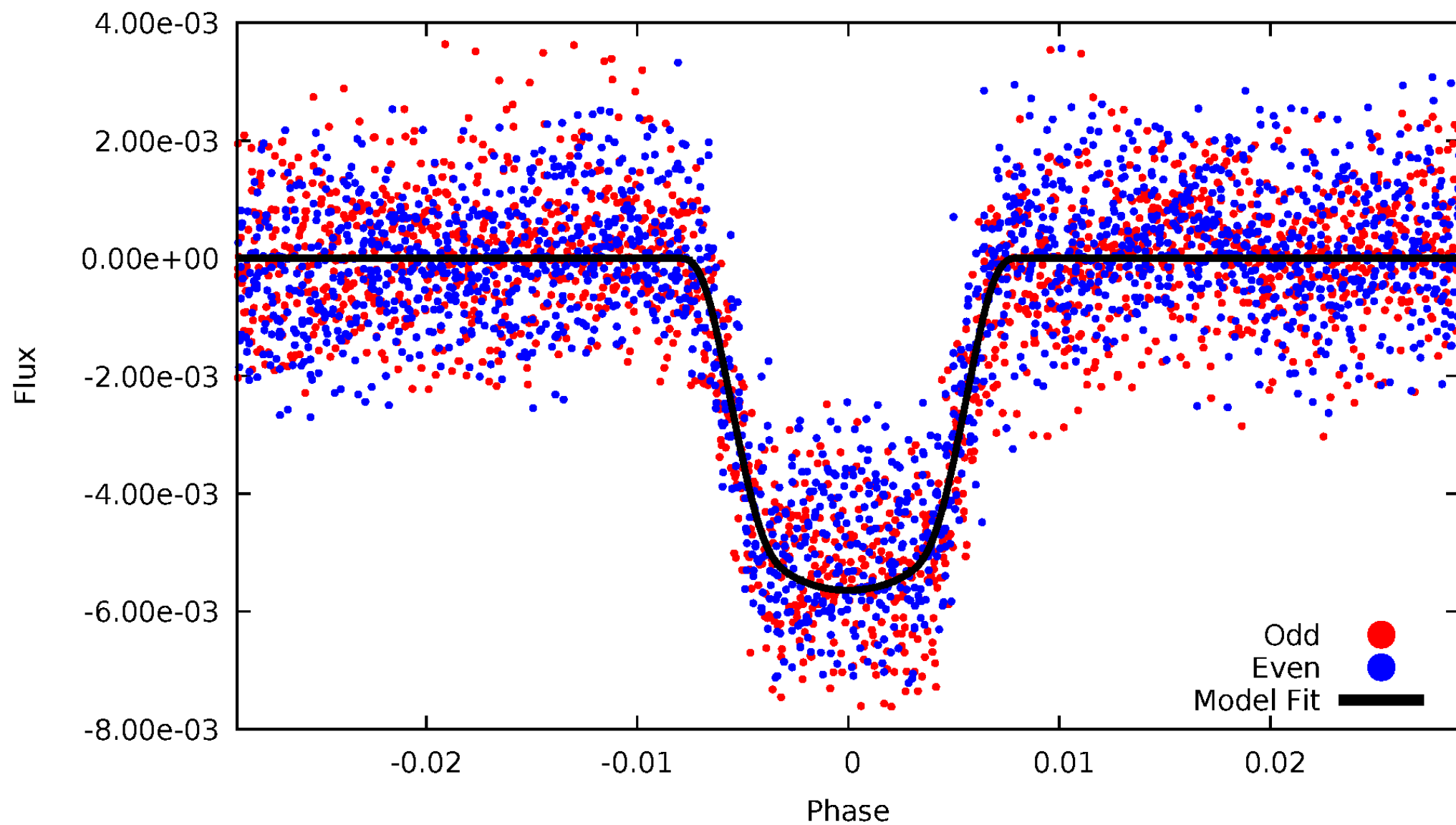


TCE 006109688-02



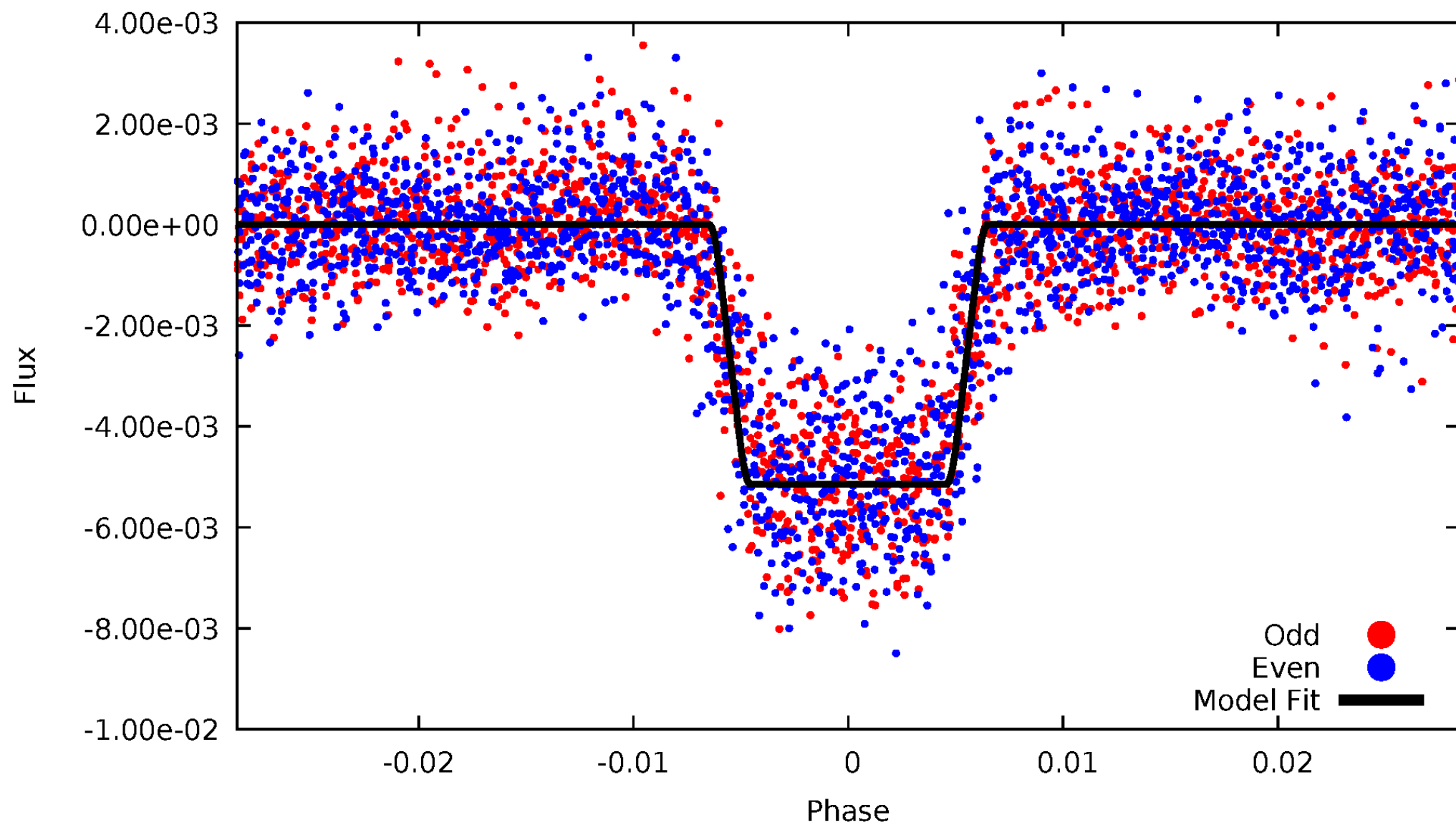
DV Odd/Even

TCE 006109688-02



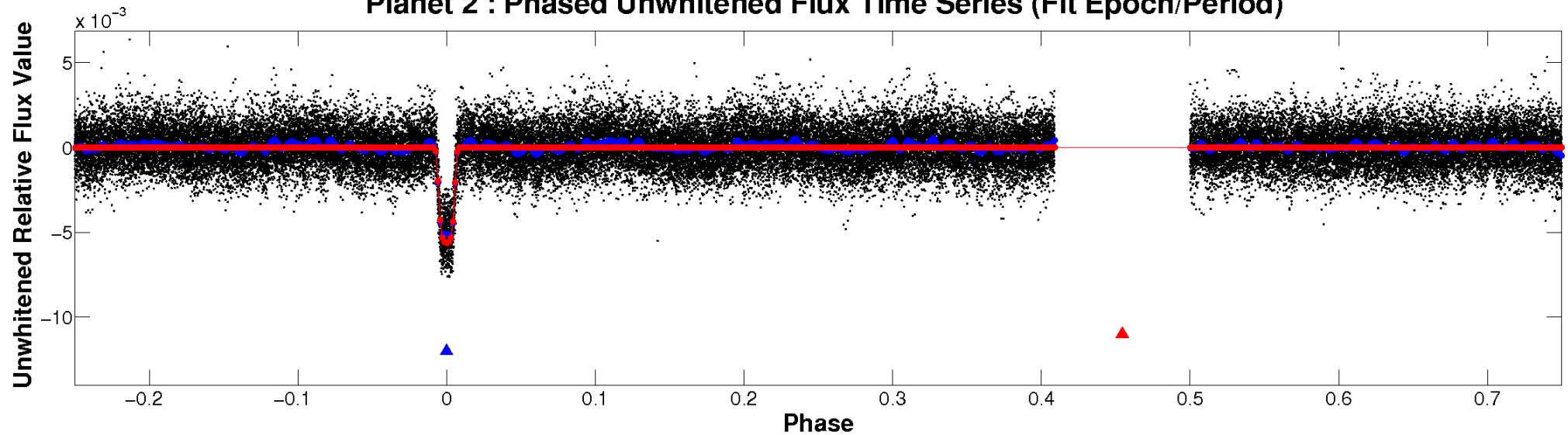
ALT Odd/Even

TCE 006109688-02

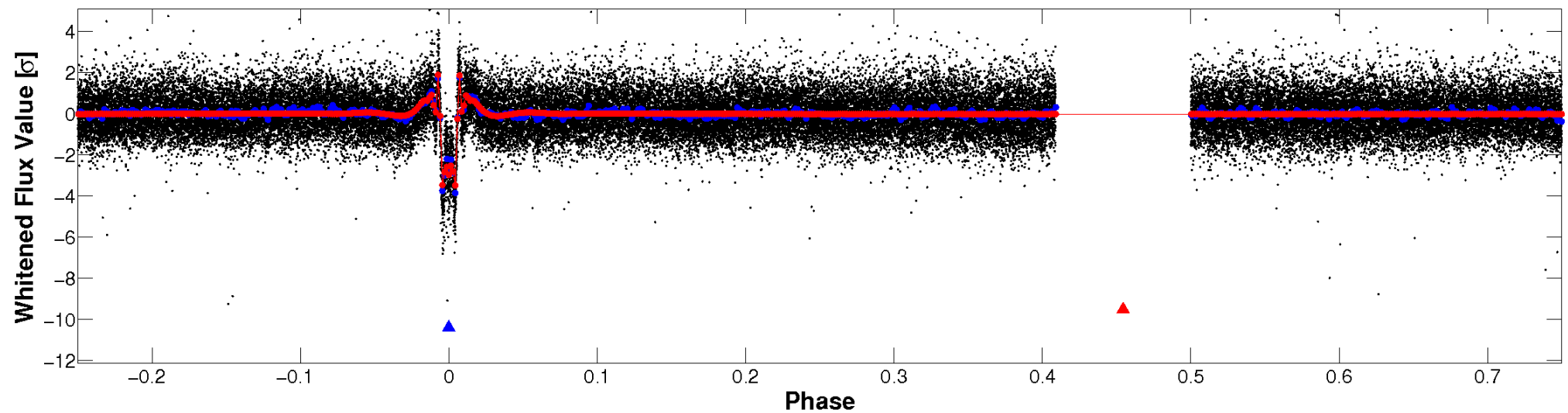


Non-Whitened Vs. Whitened Light Curve

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

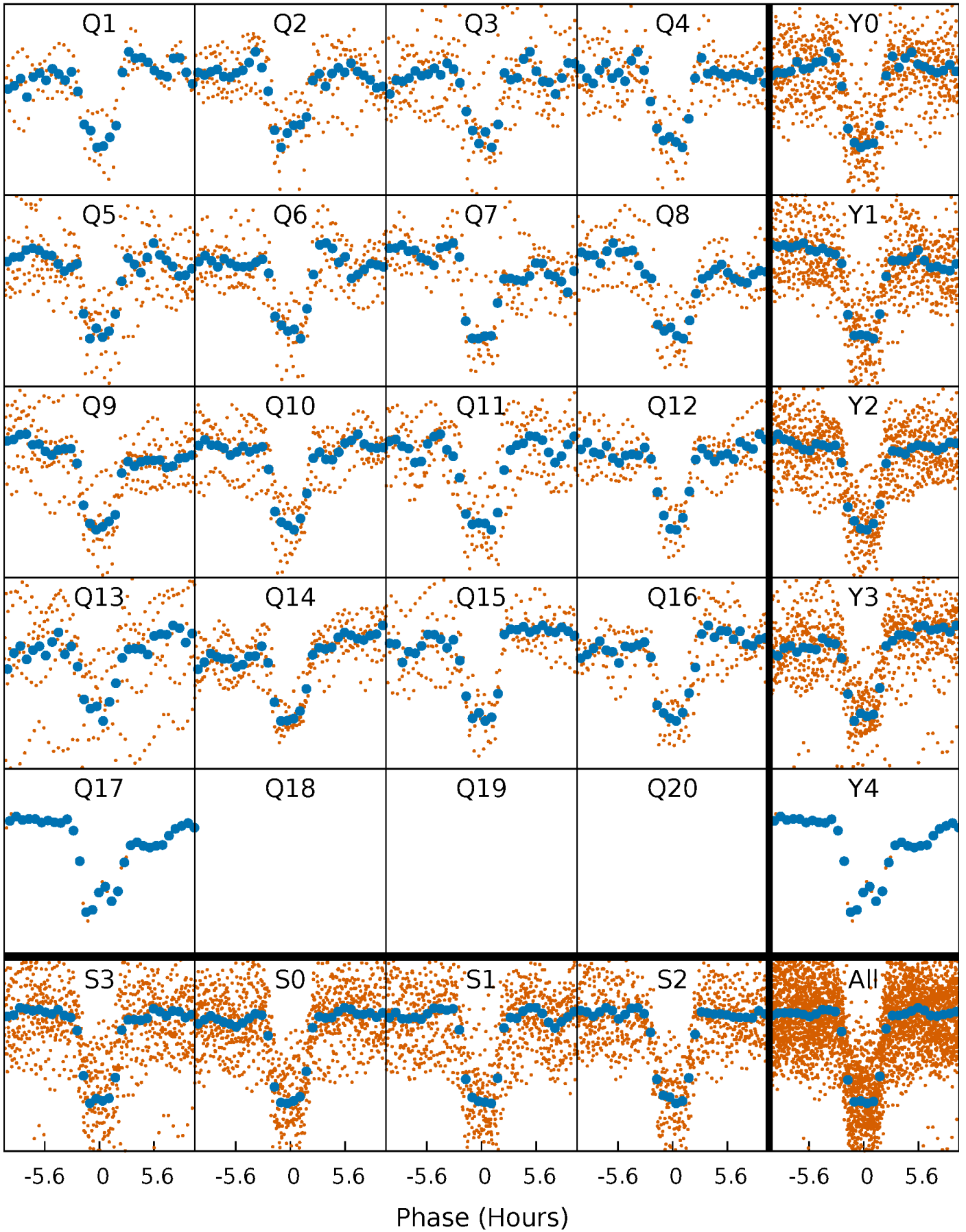


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



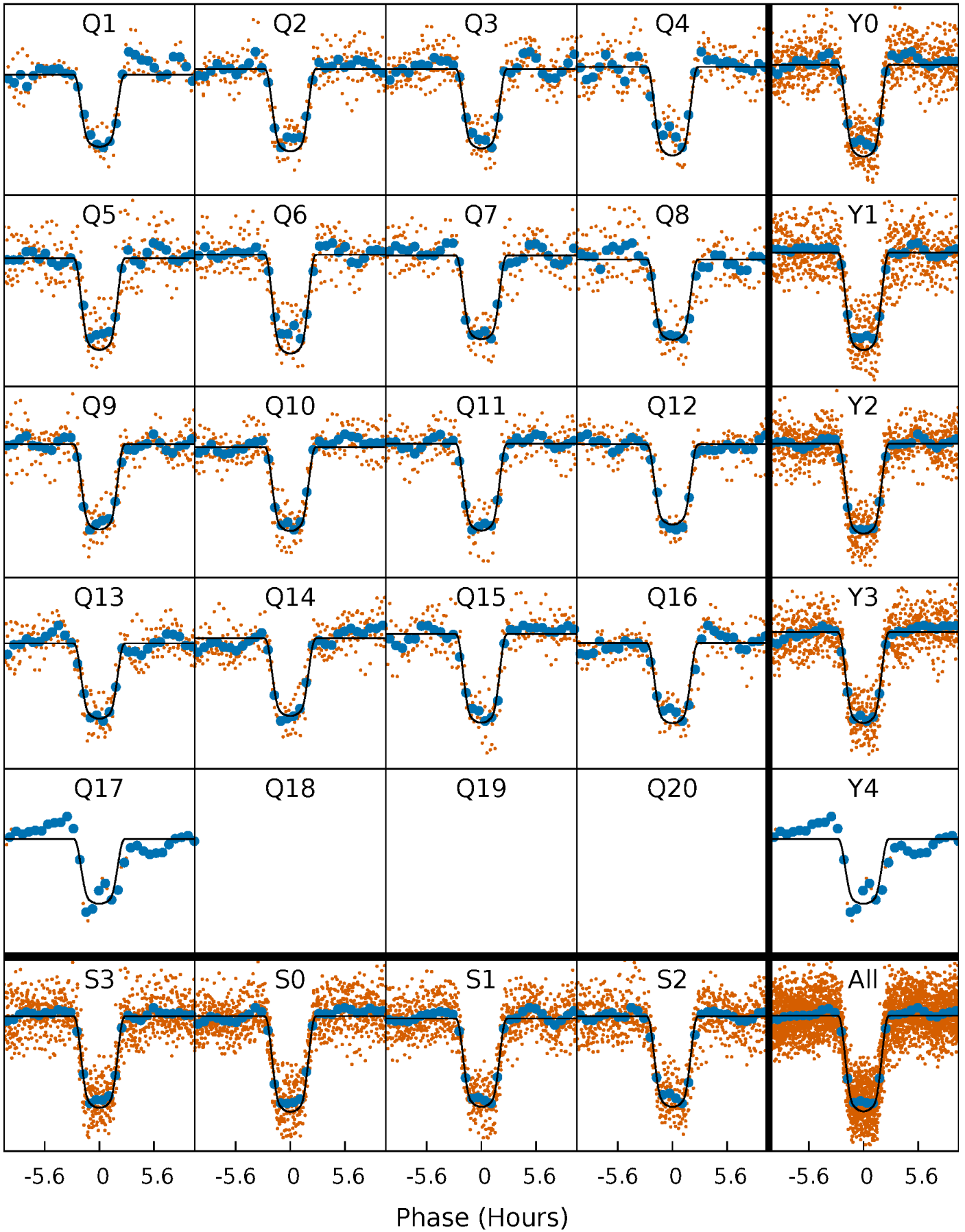
PDC Quarter-Phased Transit Curves

TCE 006109688-02 P= 14.086810 Days $T_0=133.883783$ (BKJD)



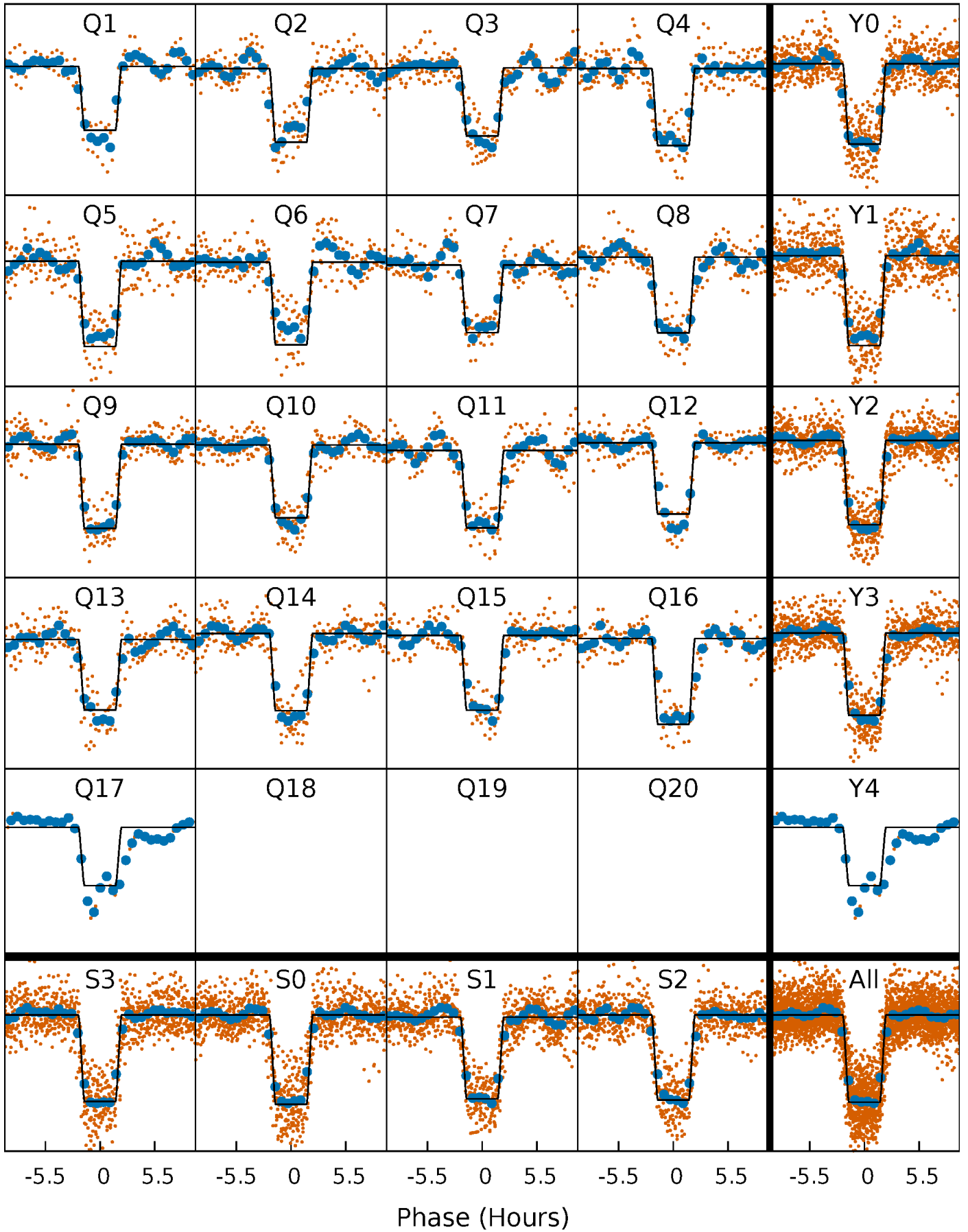
DV Quarter-Phased Transit Curves

TCE 006109688-02 P= 14.086810 Days $T_0=133.883783$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

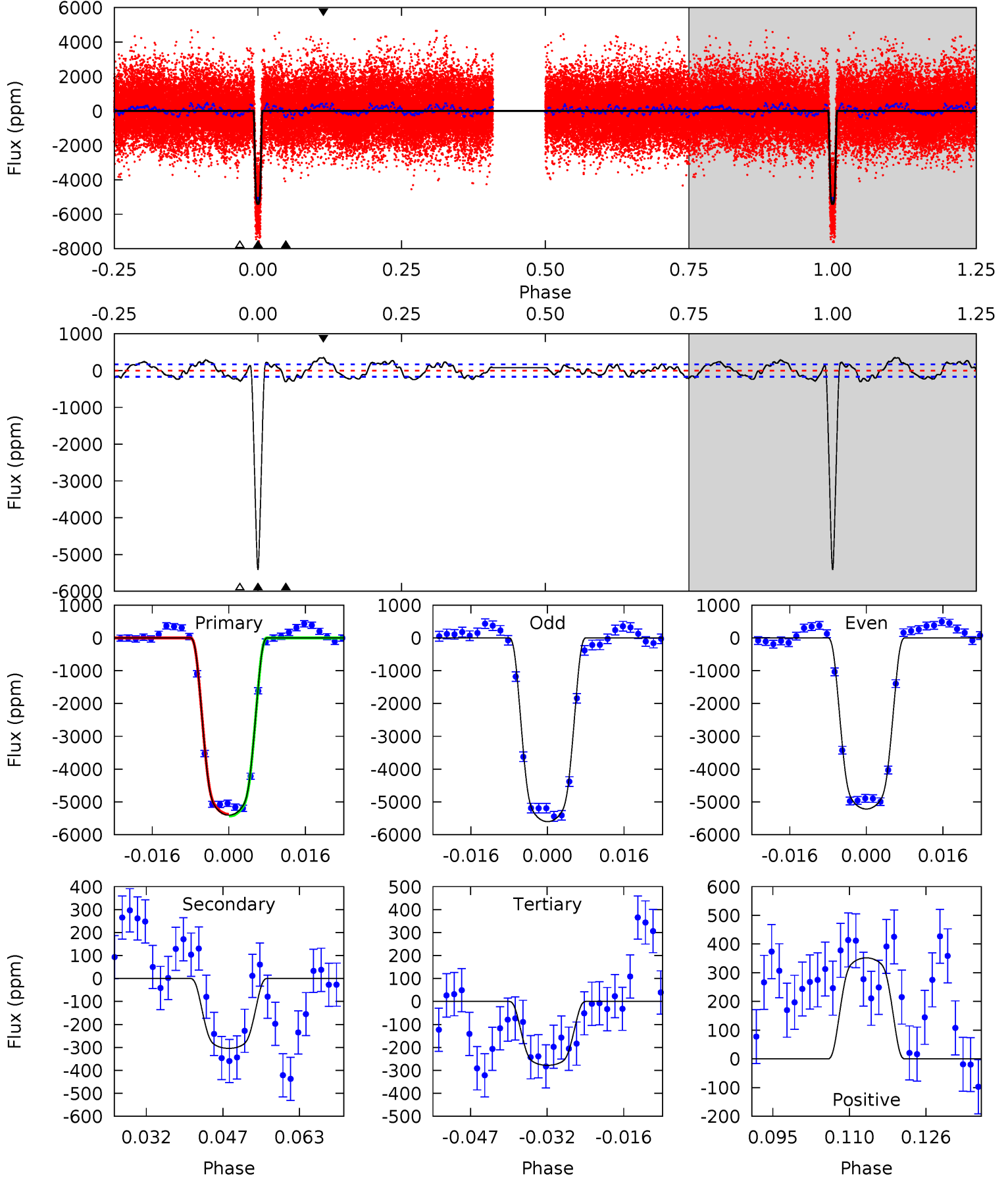
TCE 006109688-02 P= 14.086626 Days $T_0=133.892764$ (BKJD)



DV Model-Shift Uniqueness Test

006109688-02, P = 14.086810 Days, E = 119.796973 Days

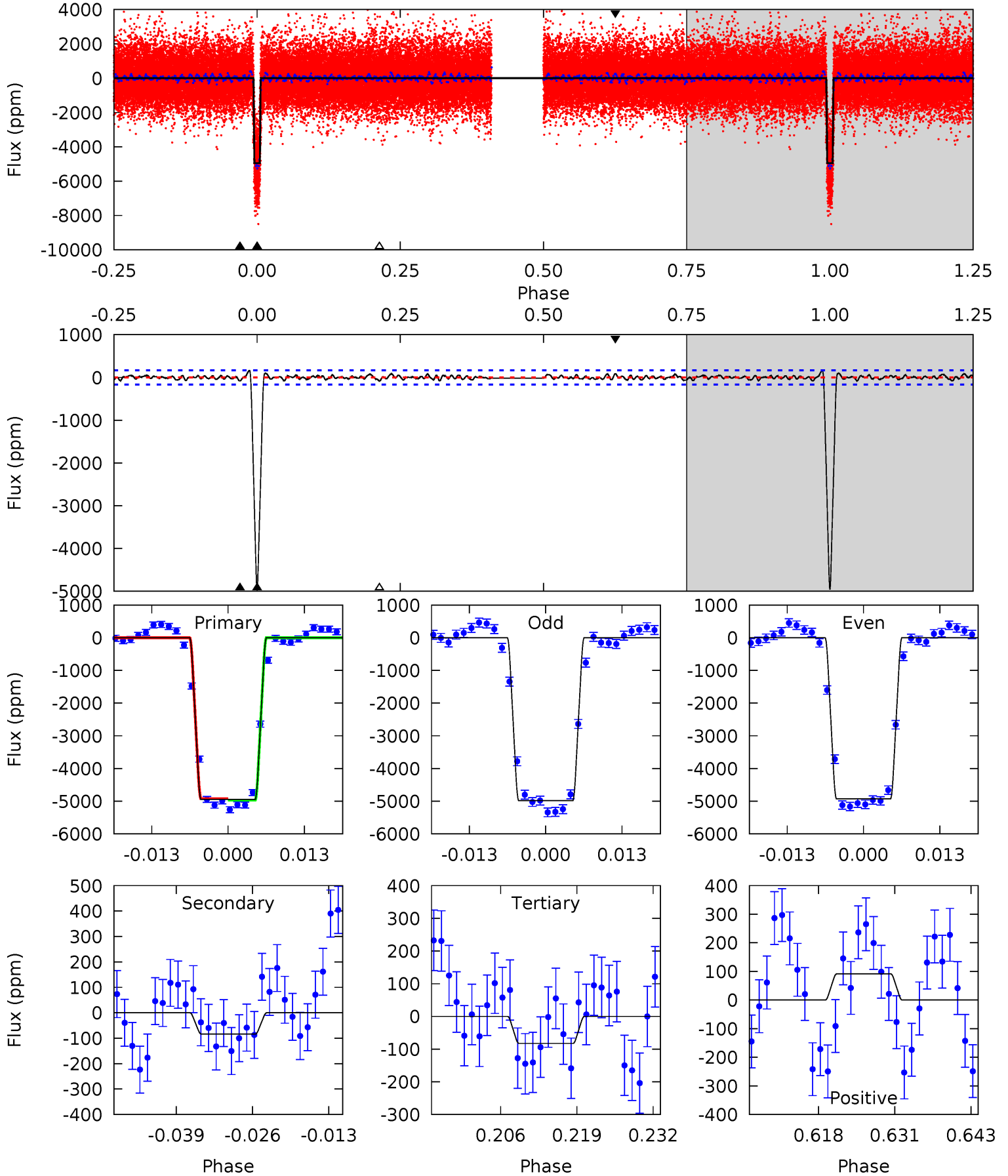
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
158.0	8.90	8.13	10.3	4.94	2.41	4.33	149.9	147.7	0.77	-1.38	5.62	1.01	0.06	0.78



Alt Model-Shift Uniqueness Test

006109688-02, $P = 14.086626$ Days, $E = 119.806138$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
147.0	2.49	2.46	2.71	4.98	2.49	1.02	144.6	144.3	0.03	-0.23	0.83	1.02	0.03	0.72



Stellar Parameters For KIC 006109688

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7138^{+175}_{-275}	$4.062^{+0.198}_{-0.180}$	$-0.120^{+0.250}_{-0.350}$	$1.890^{+0.578}_{-0.473}$	$1.500^{+0.209}_{-0.232}$	$0.313^{+0.320}_{-0.160}$
	+2%/-4%	+5%/-4%	+208%/-292%	+31%/-25%	+14%/-15%	+102%/-51%
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 006109688-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-304 ± 34	$15.88^{+2.82}_{-2.04}$	1661^{+136}_{-120}	3723^{+91}_{-104}	11^{+4}_{-3}
Alt.	-84 ± 34	$14.77^{+2.38}_{-2.01}$	1667^{+129}_{-126}	3102^{+187}_{-233}	$3.640^{+2.006}_{-1.592}$

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

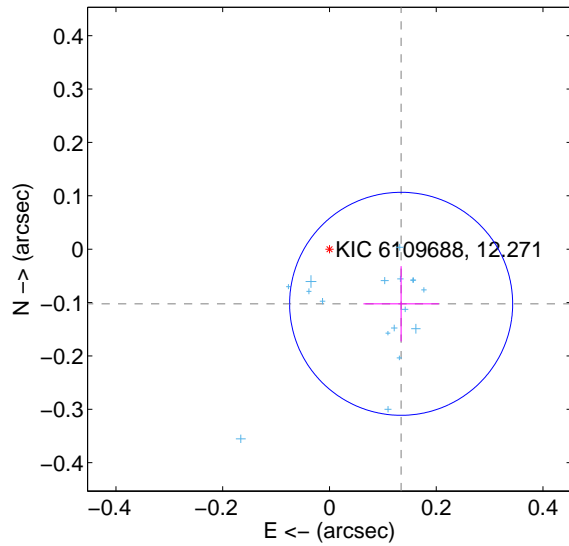
Supplemental centroid analysis for 006109688-02. Kepler magnitude: 12.27. Transit SNR 84.20

There are 17 quarters with good PRF difference image offsets

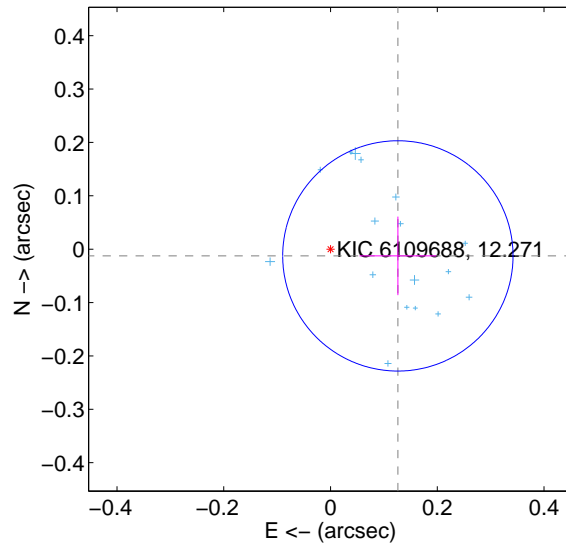
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.169 ± 0.070	2.42	-0.134 ± 0.071	-0.102 ± 0.071
PRF-fit source offset from KIC position	0.127 ± 0.072	1.76	-0.126 ± 0.072	-0.013 ± 0.074
photometric centroid source offset	0.05 ± 0.01	6.94	0.03 ± 0.01	0.04 ± 0.01

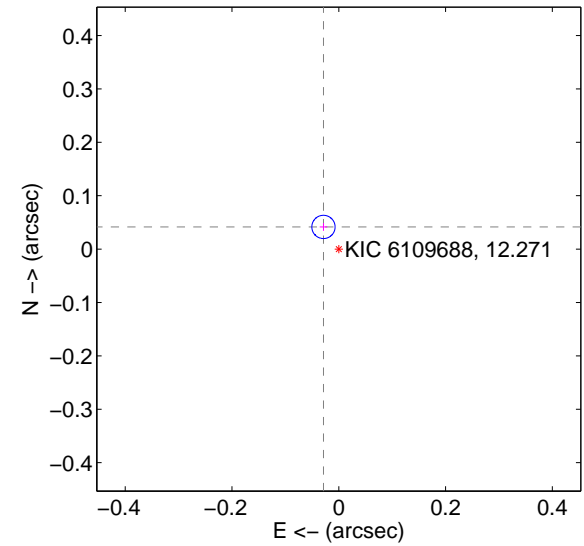
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

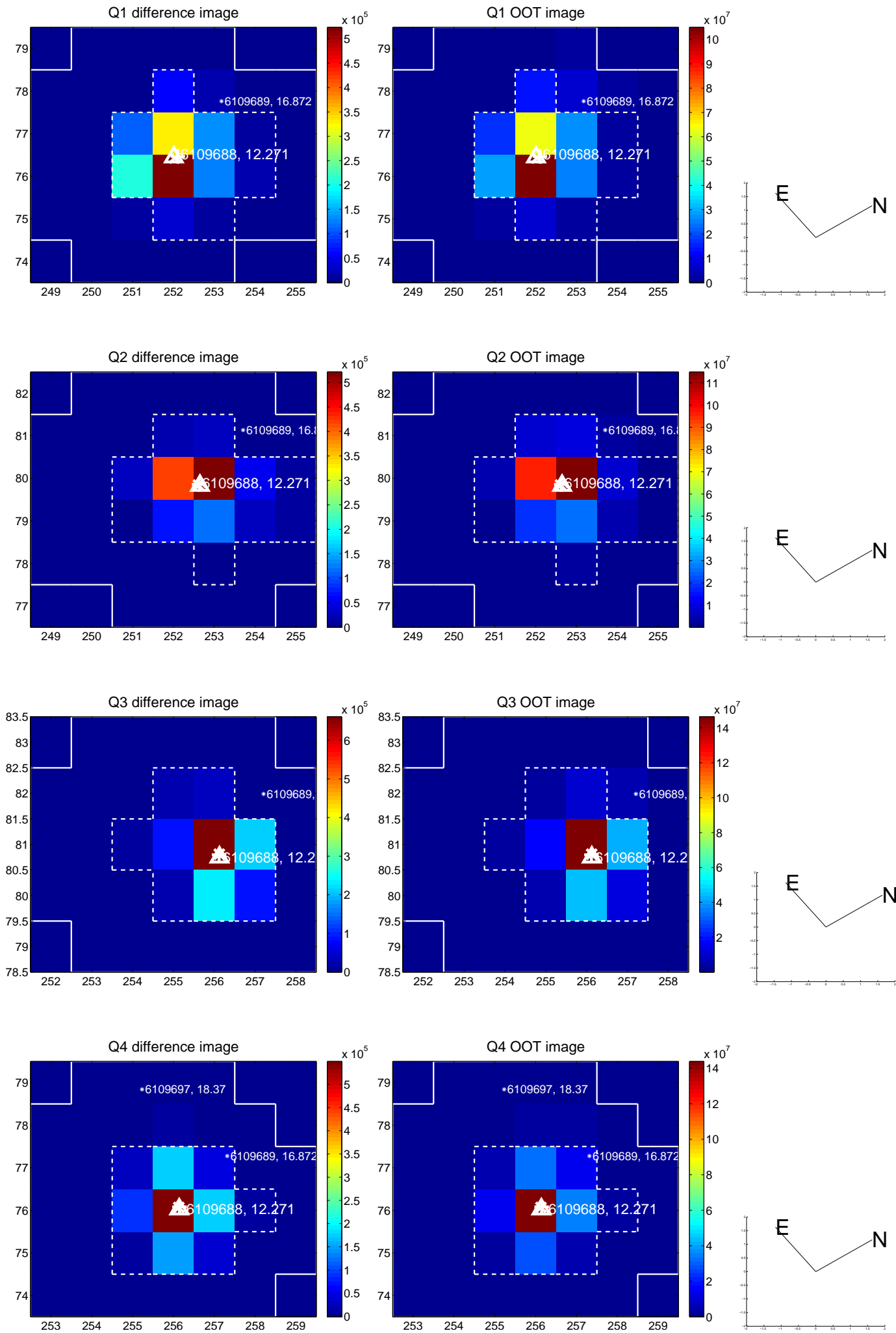


offset from photometric centroids

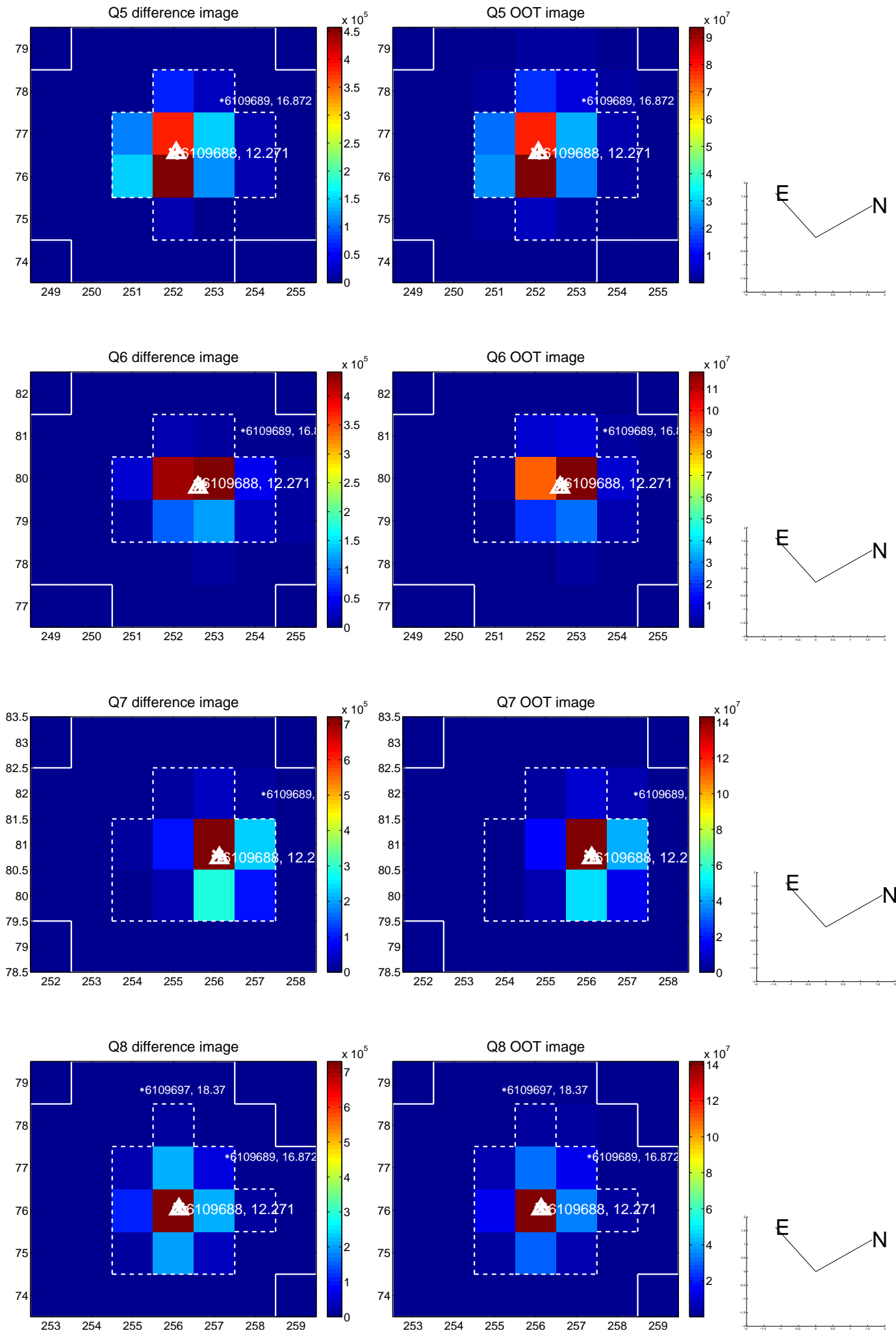


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

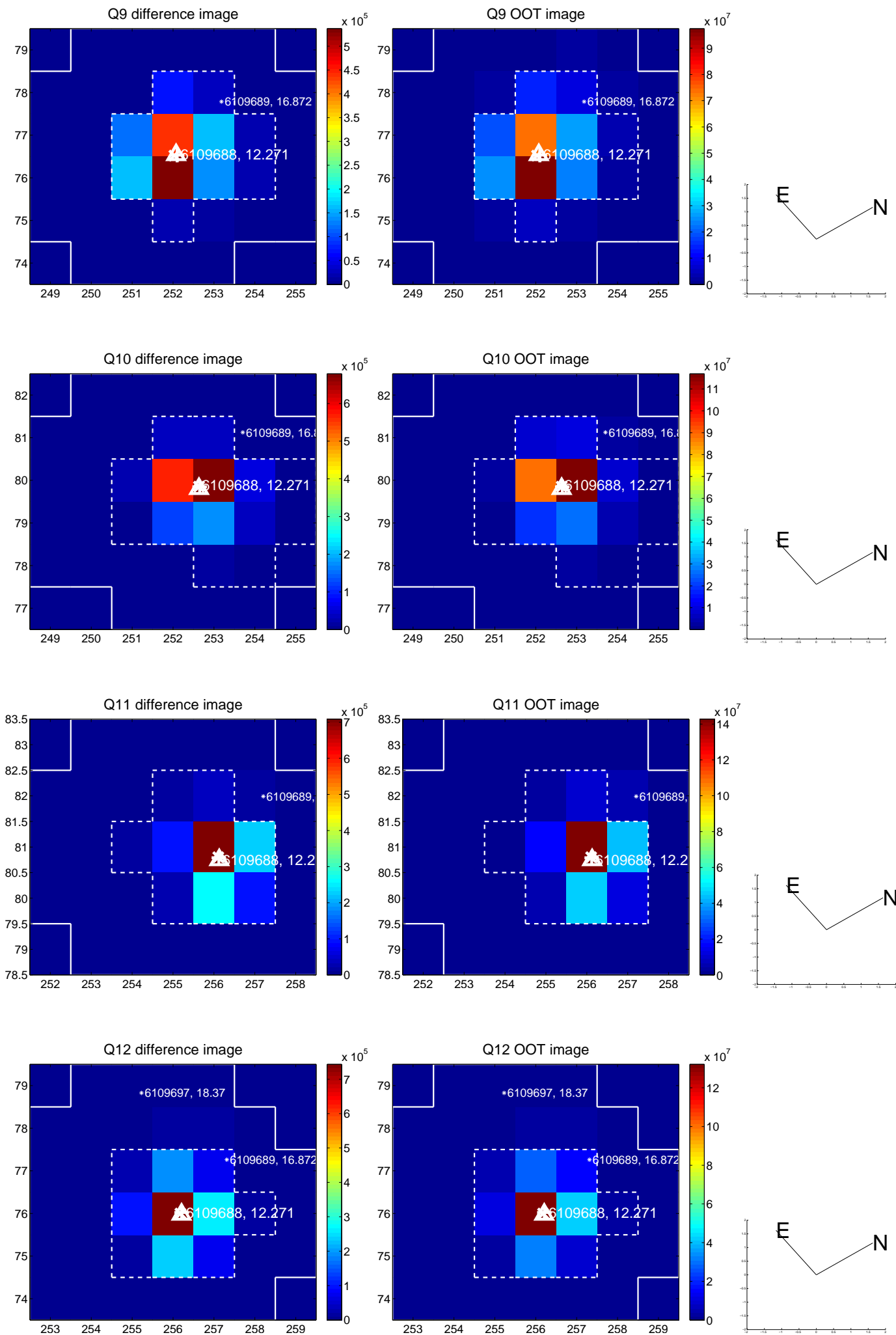
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



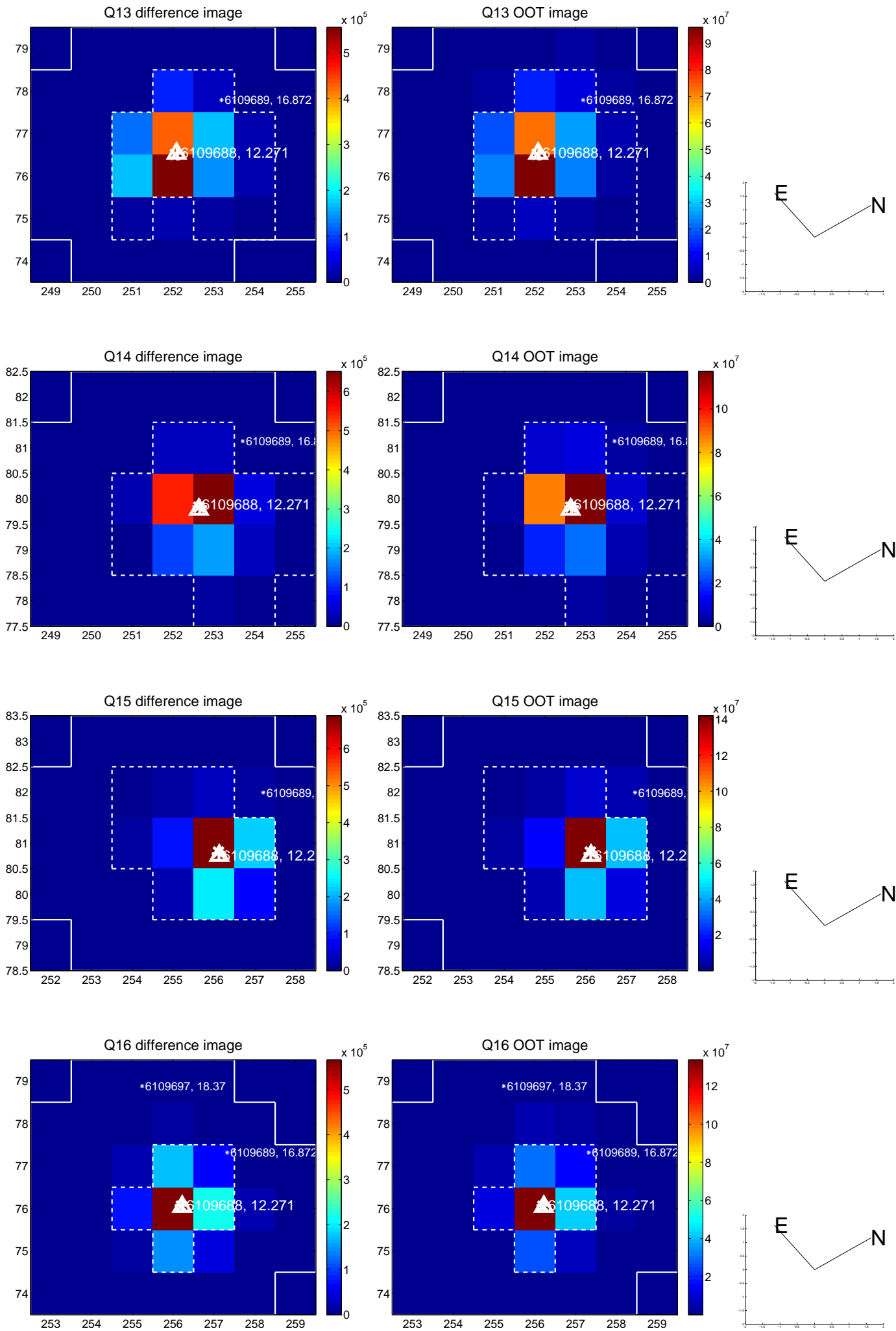
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



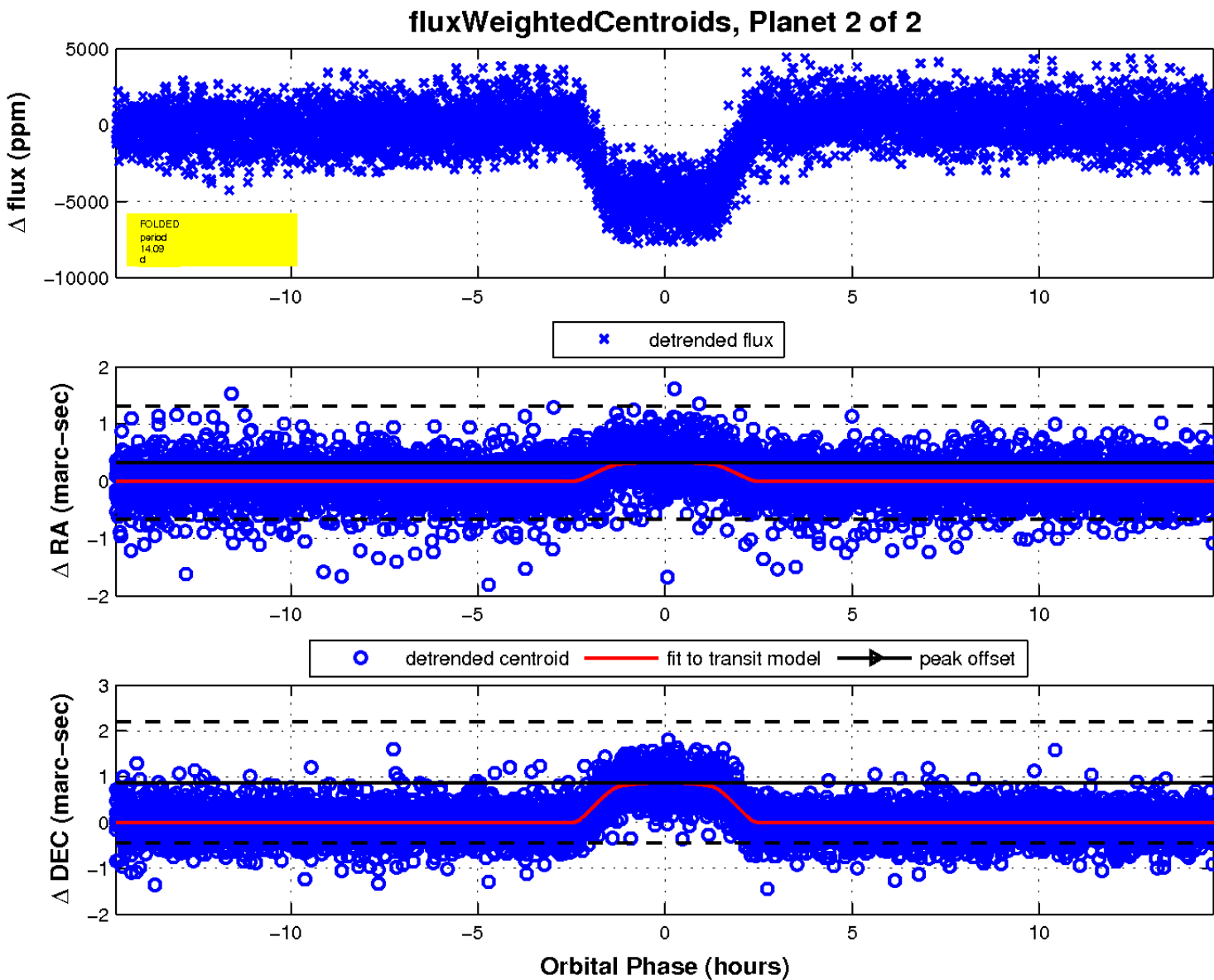
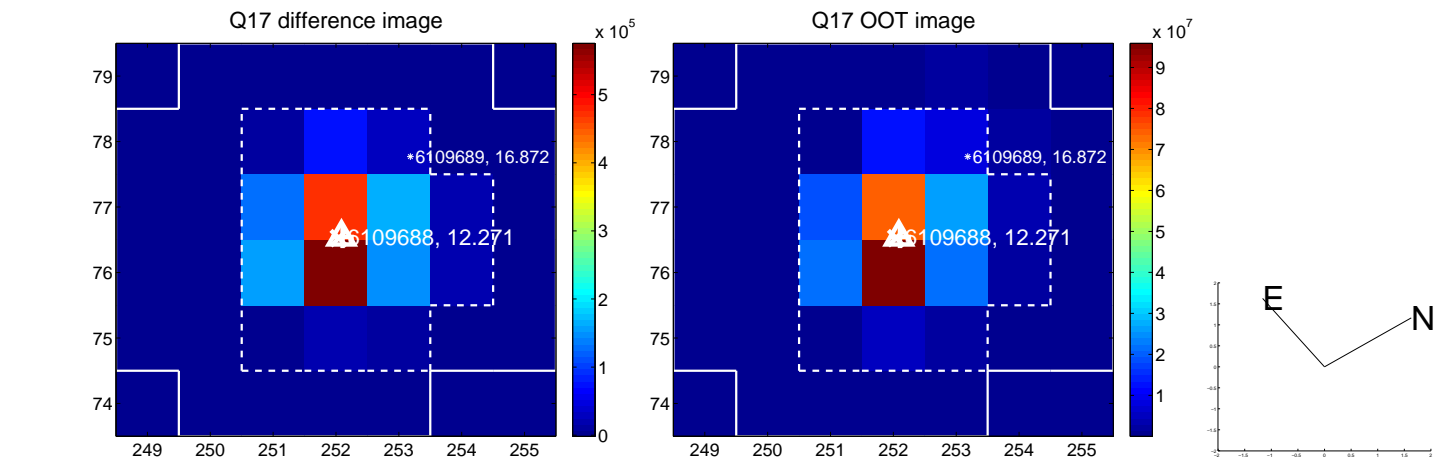
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

