

KIC 009451096

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})
009451096-01	OBS	7173.01	1.250398	131.730879	217015.5	3.479	13937.3	10693.3	1.66	6297	93.93	7435.20
009451096-02	OBS	No	1.250392	132.354944	24379.7	2.000	7998.8	-1.0	1.66	6297	26.18	7435.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009451096-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009451096-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS

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.

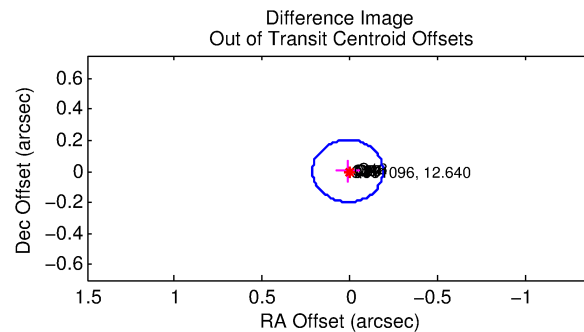
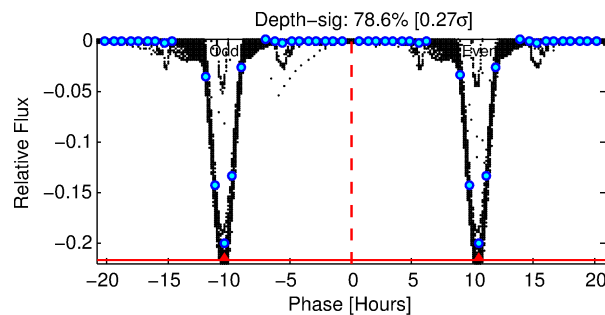
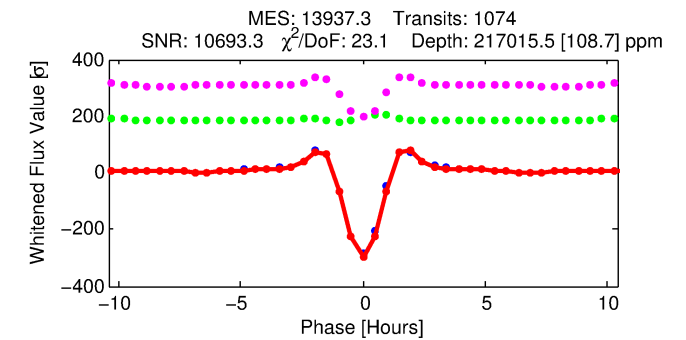
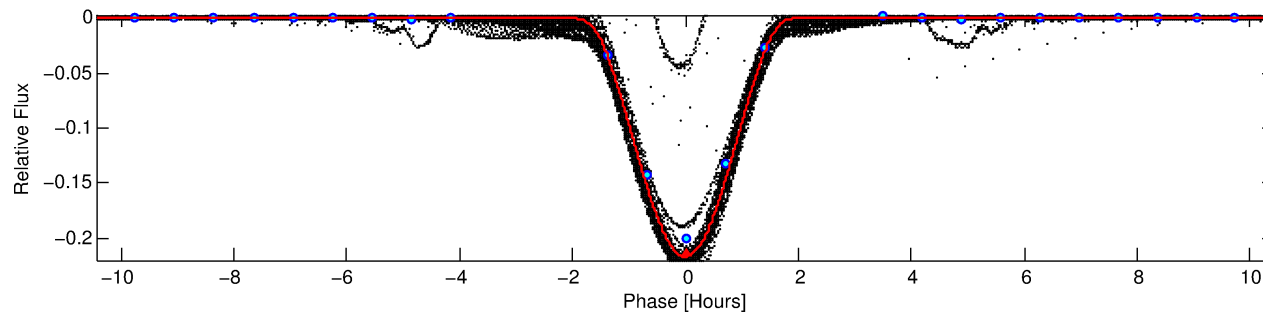
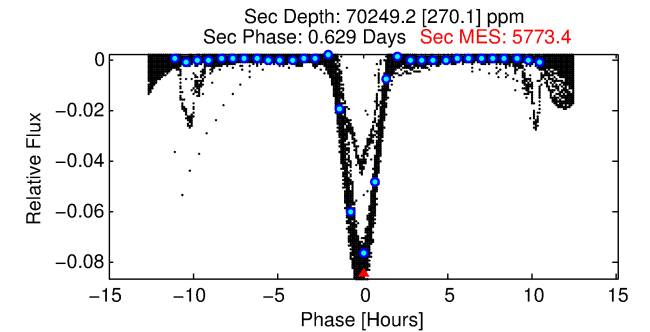
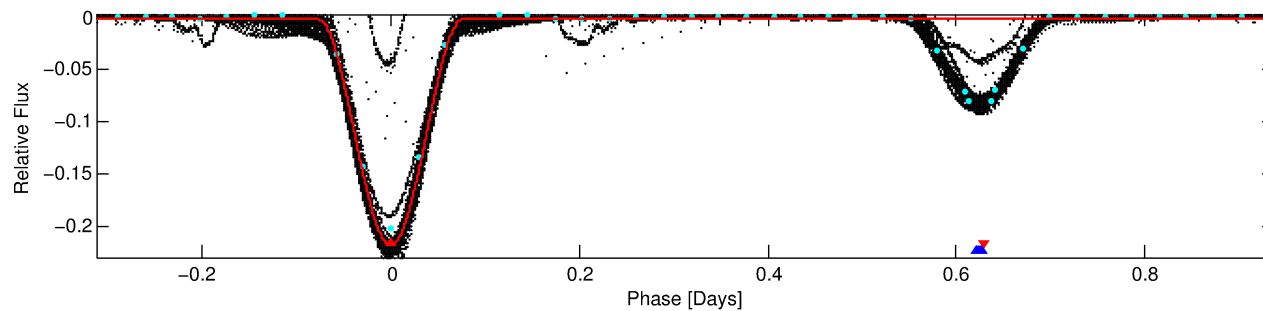
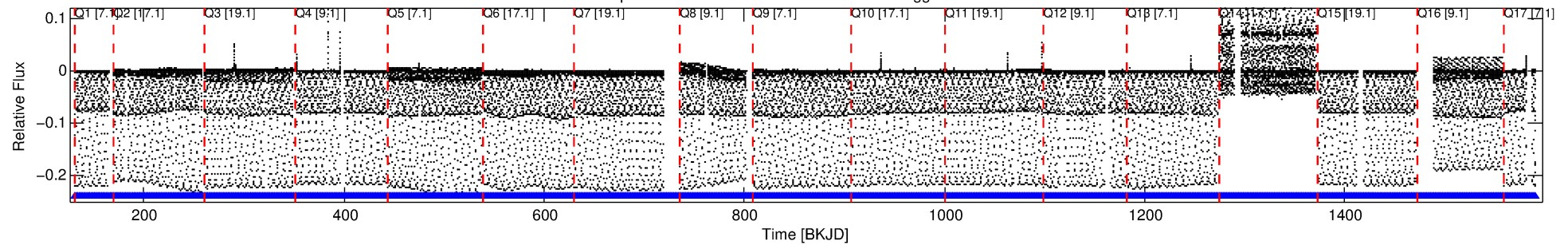
Ephemeris Match Information For 009451096-01

No Significant Match Found

DV One-Page Summary

KIC: 9451096 Candidate: 1 of 2 Period: 1.250 d
KOI: K07173.01 Corr: 0.967

Kp: 12.64 R*: 1.66 Rs Teff: 6297.0 K Logg: 4.01 Fe/H: -0.500



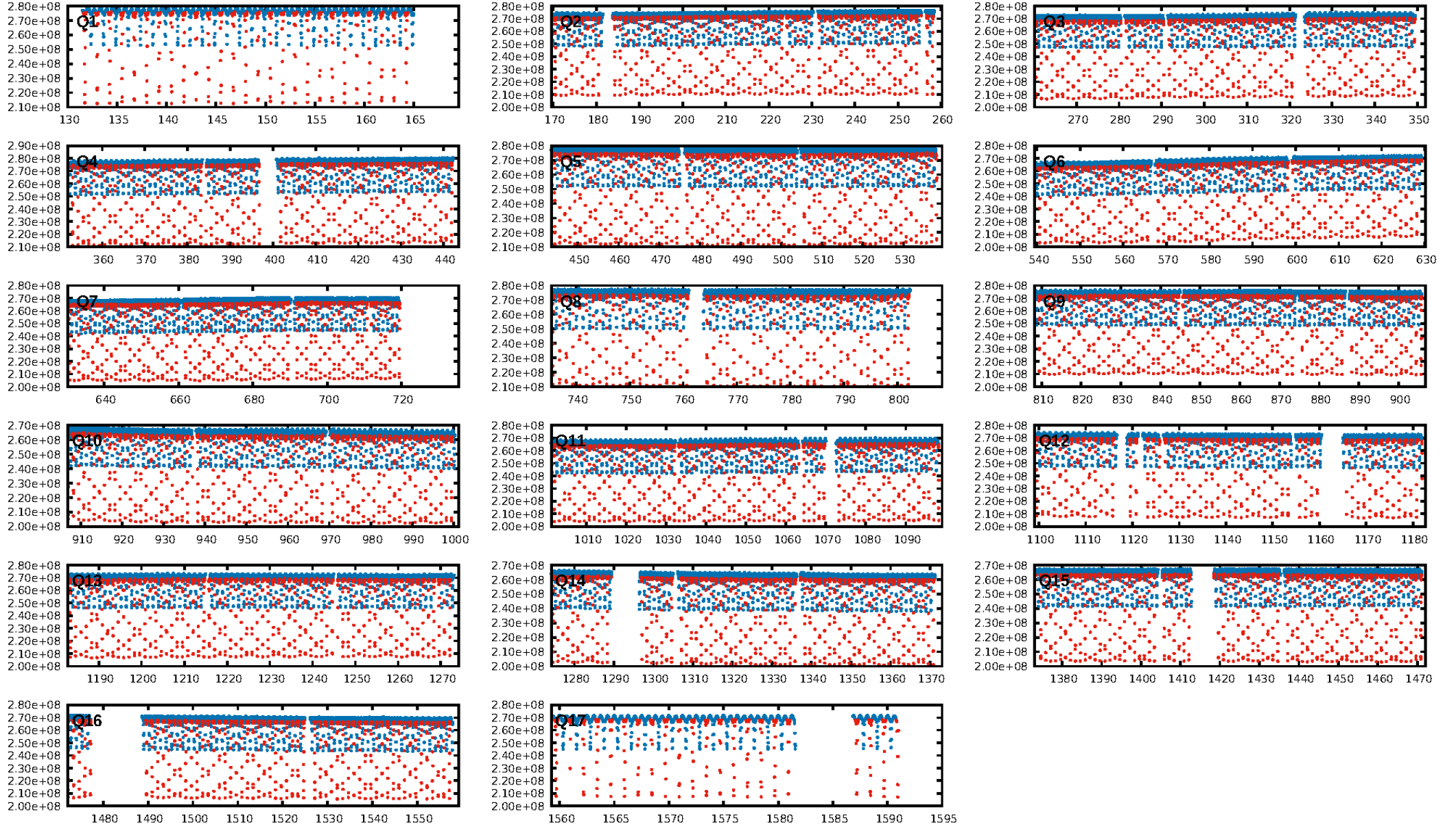
DV Fit Results:

Period = 1.25040 [0.00000] d
Epoch = 131.7309 [0.0000] BKJD
Rp/R* = 0.5176 [0.0049]
a/R* = 3.85 [0.00]
b = 0.70 [0.01]
Seff = 7435.20 [4934.01]
Teff = 2368 [393] K
Rp = 93.93 [36.50] Re
a = 0.0229 [0.0090] AU
Ag = 2.30 [1.48] [0.87σ]
Teffp = 4506 [176] K [4.97σ]

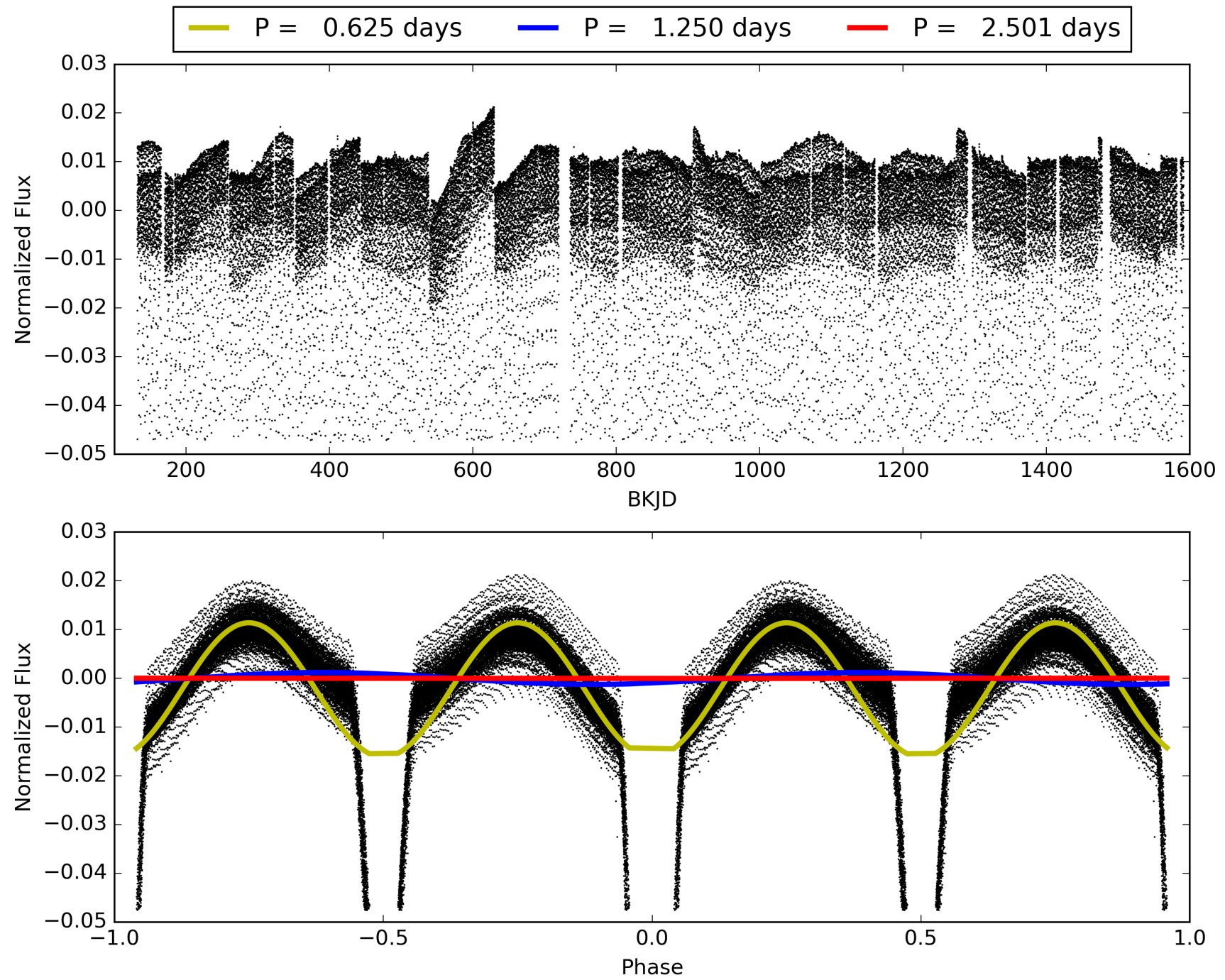
DV Diagnostic Results:

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 [1025/1025]
GhostDiagnostic-chr: 1.356
Centroid-sig: N/A
Centroid-so: 0.045 arcsec [233.26σ]
OotOffset-rm: 0.014 arcsec [0.21σ]
KicOffset-rm: 0.012 arcsec [0.18σ]
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]

TCE 009451096-01, PDC Light Curves

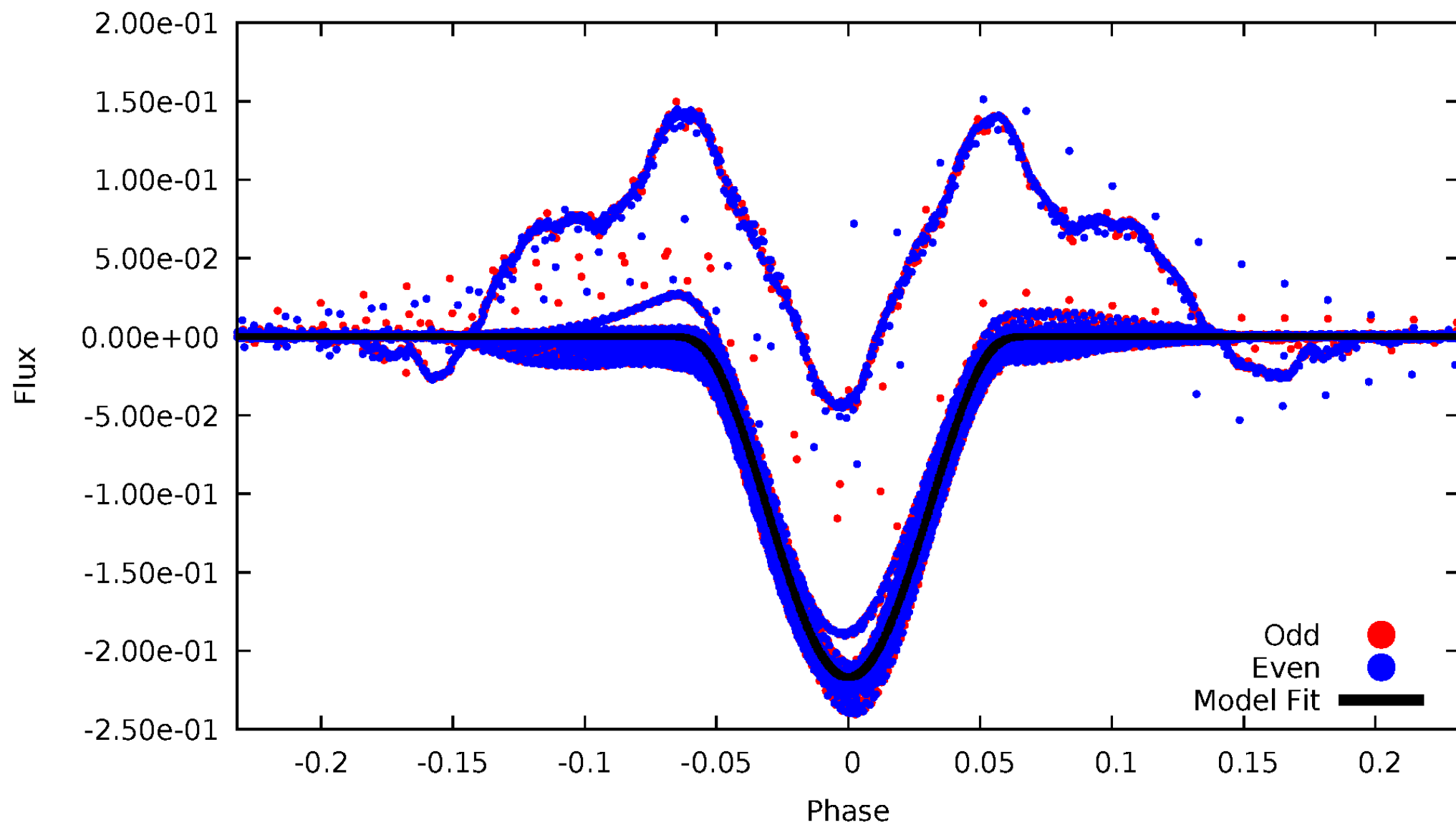


TCE 009451096-01



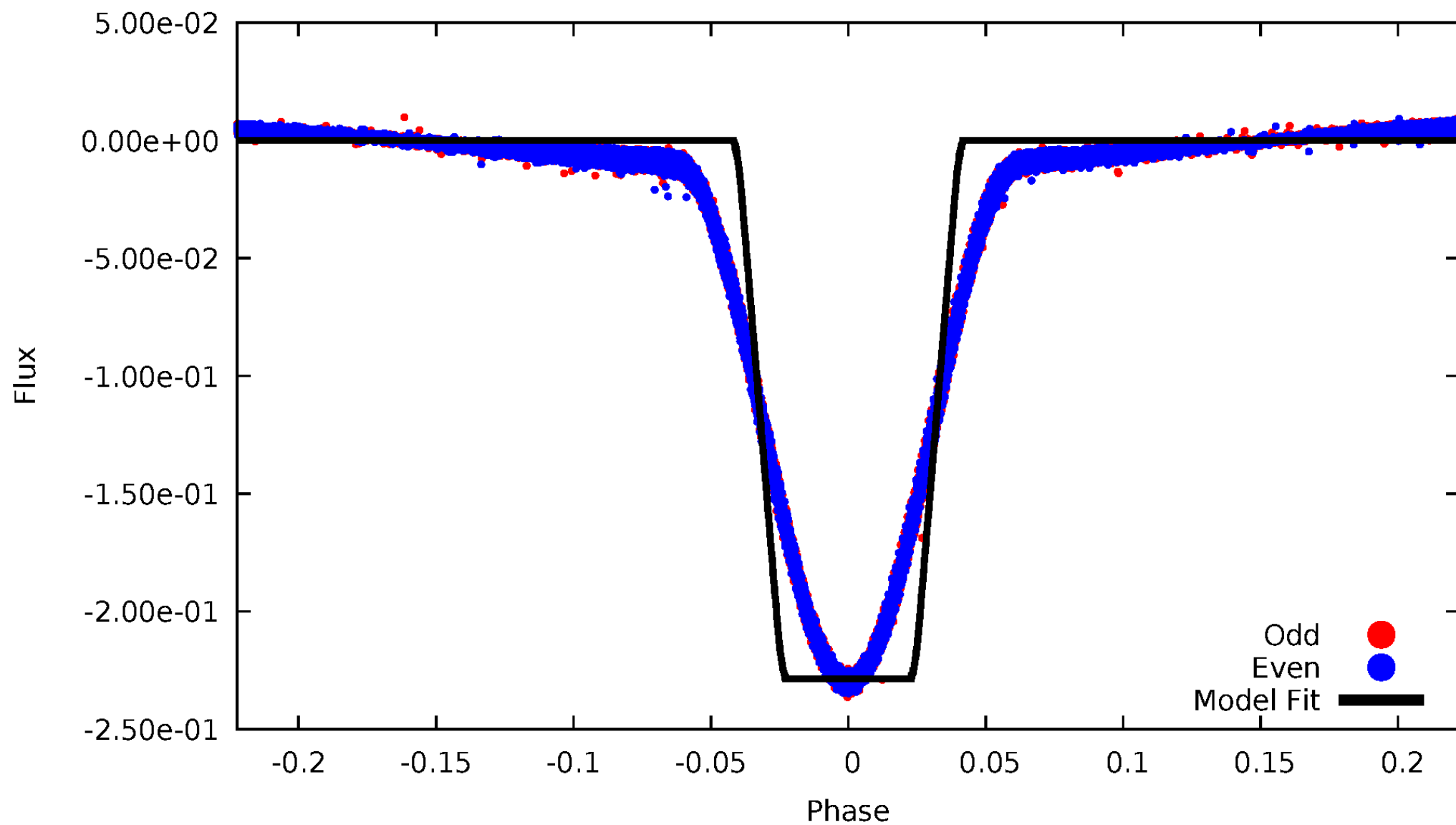
DV Odd/Even

TCE 009451096-01



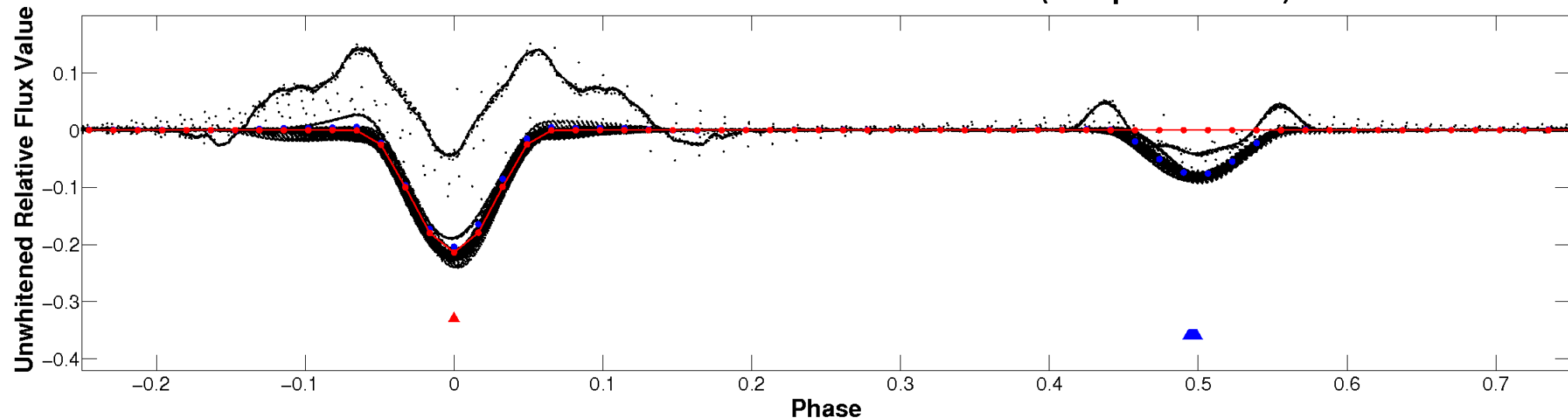
ALT Odd/Even

TCE 009451096-01

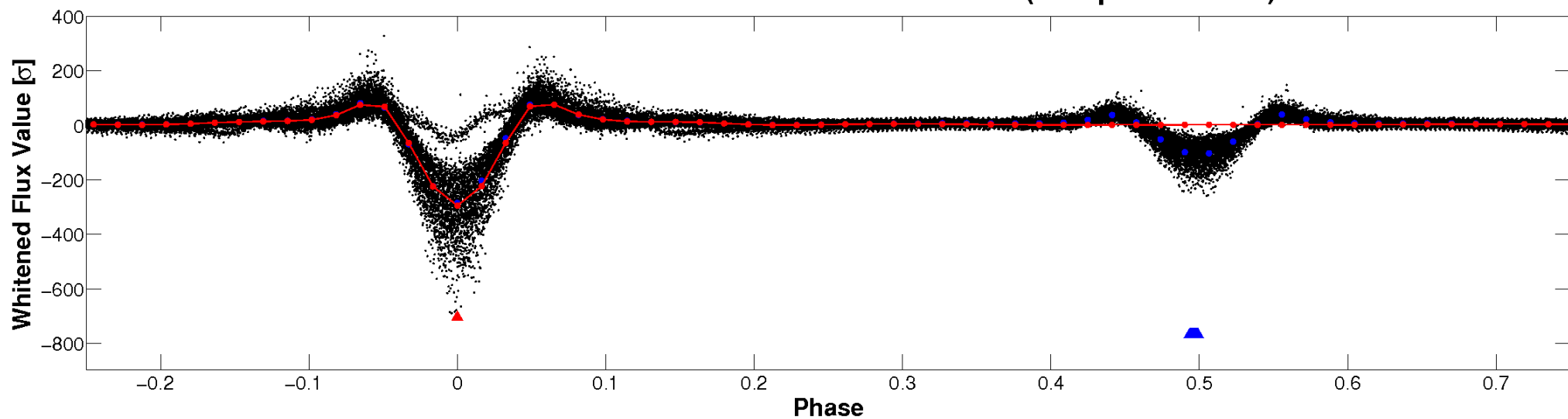


Non-Whitened Vs. Whitened Light Curve

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

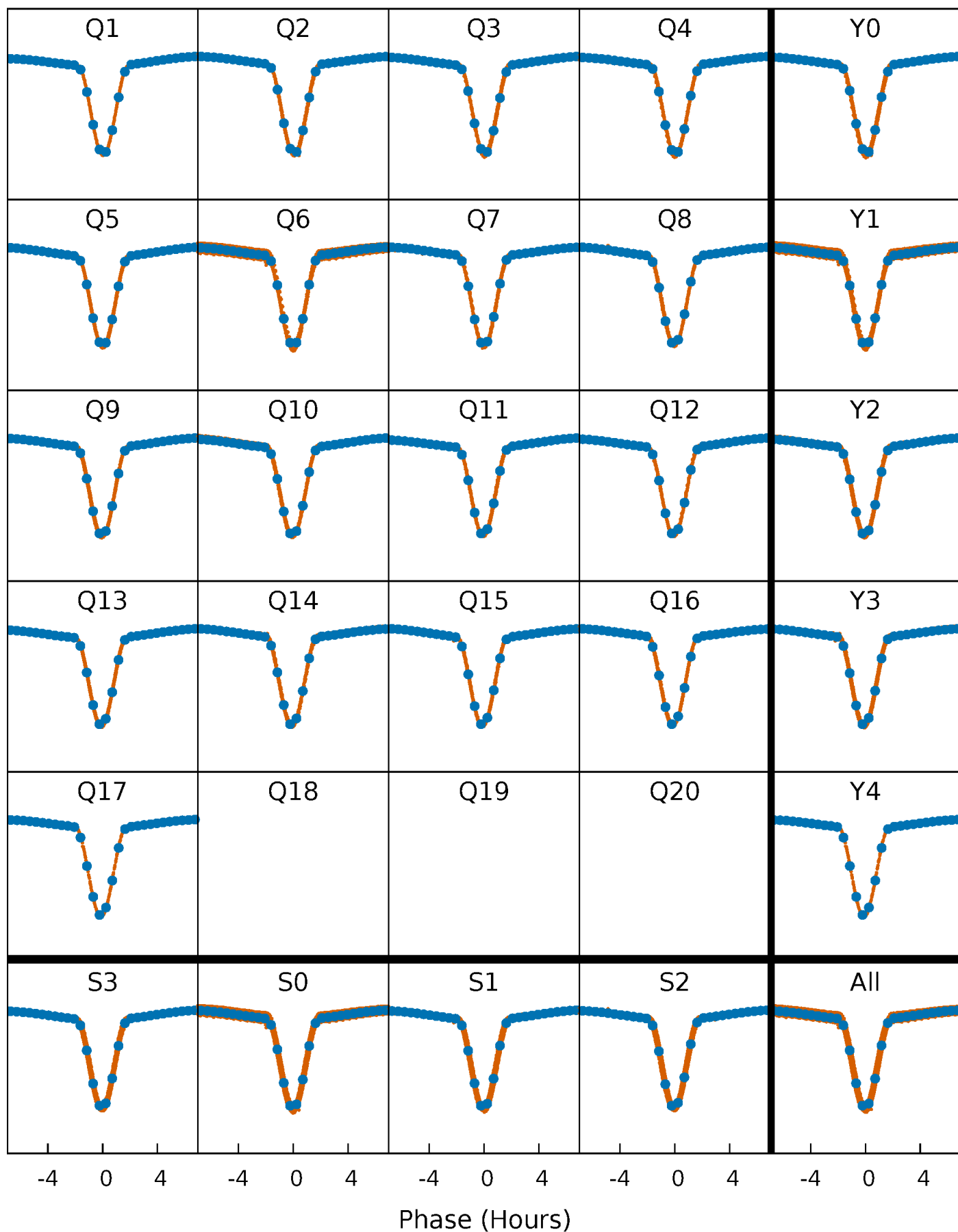


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



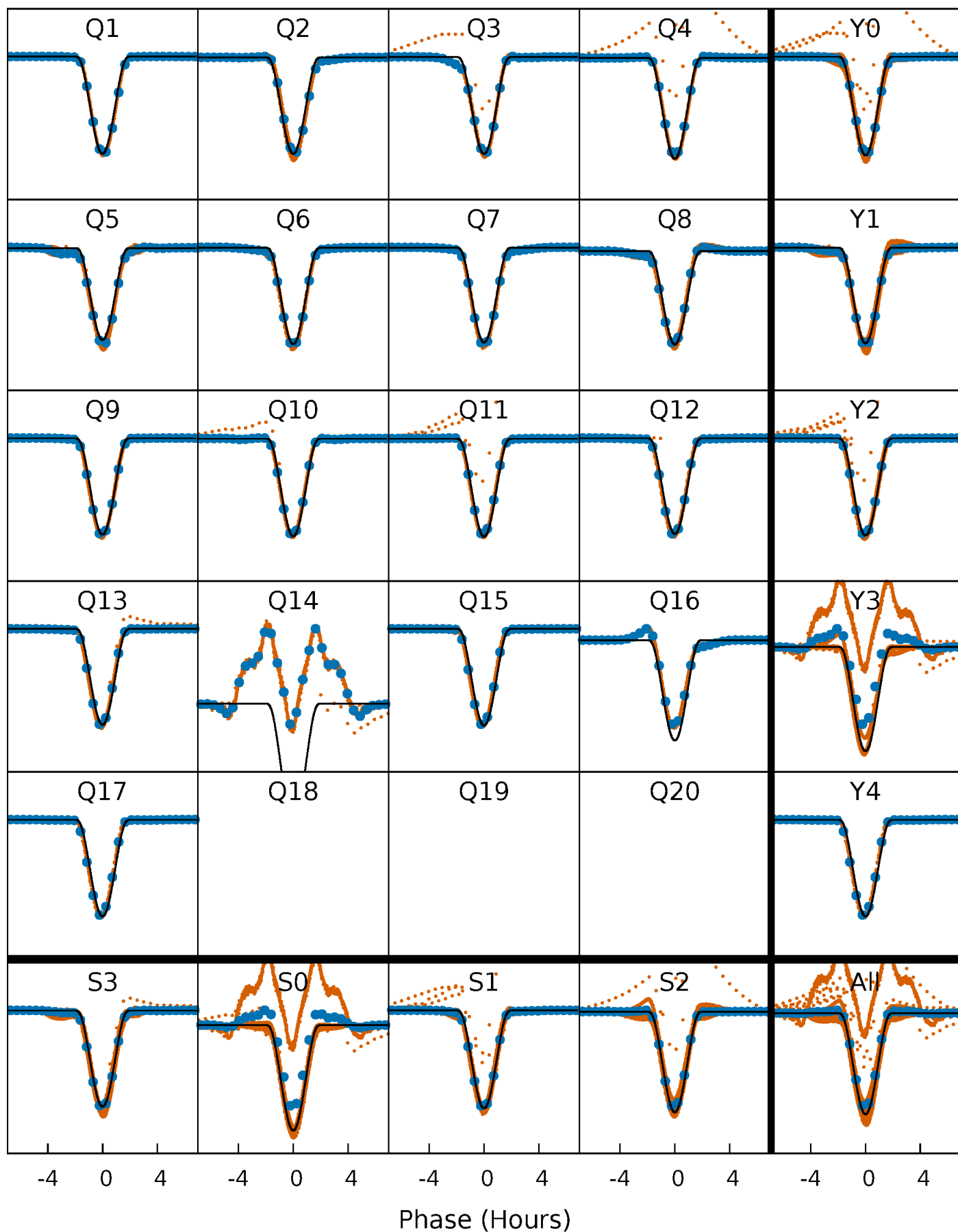
PDC Quarter-Phased Transit Curves

TCE 009451096-01 P= 1.250398 Days $T_0=131.730879$ (BKJD)



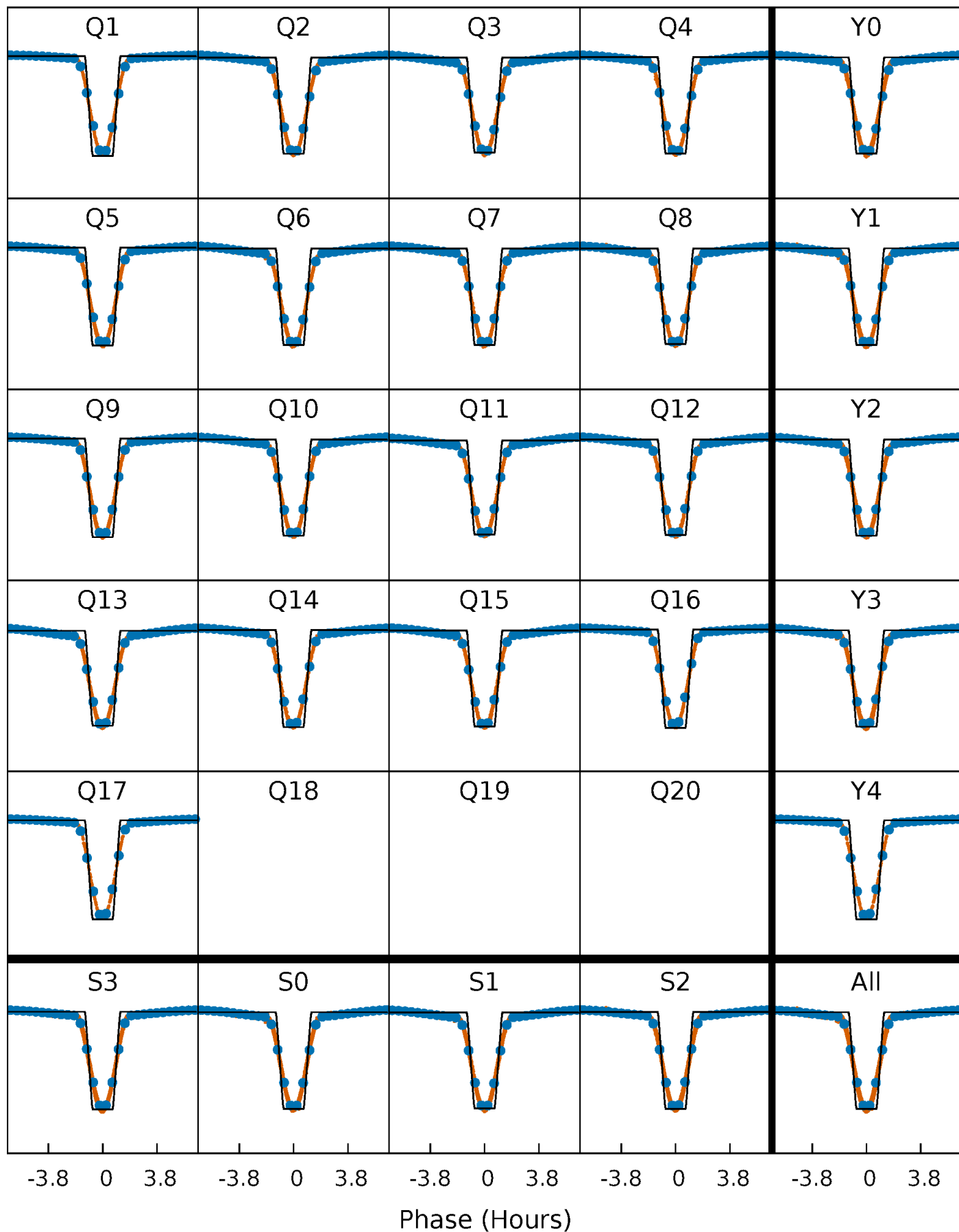
DV Quarter-Phased Transit Curves

TCE 009451096-01 P= 1.250398 Days $T_0=131.730879$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

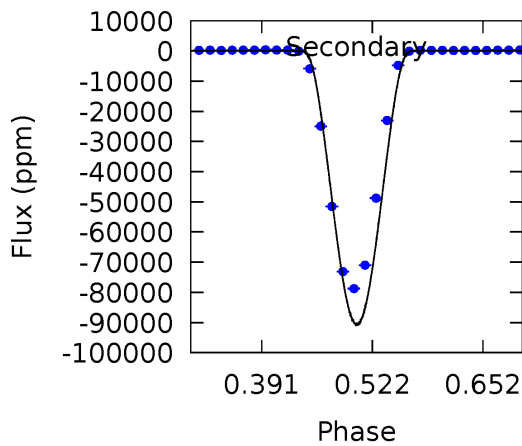
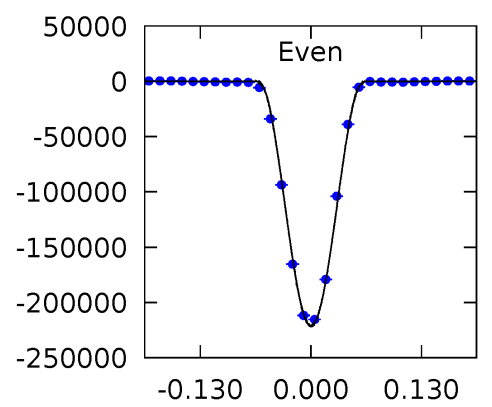
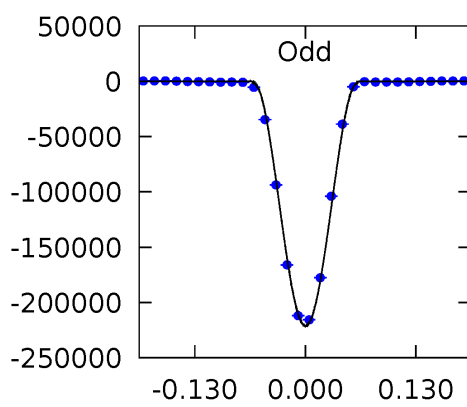
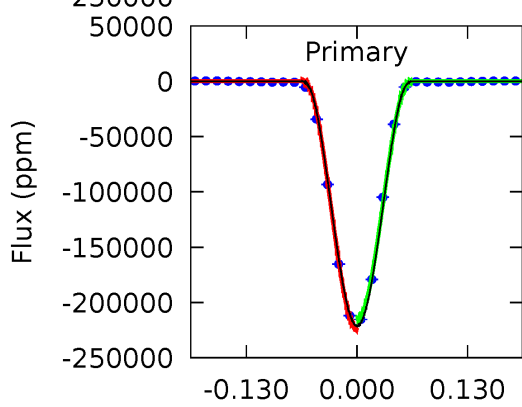
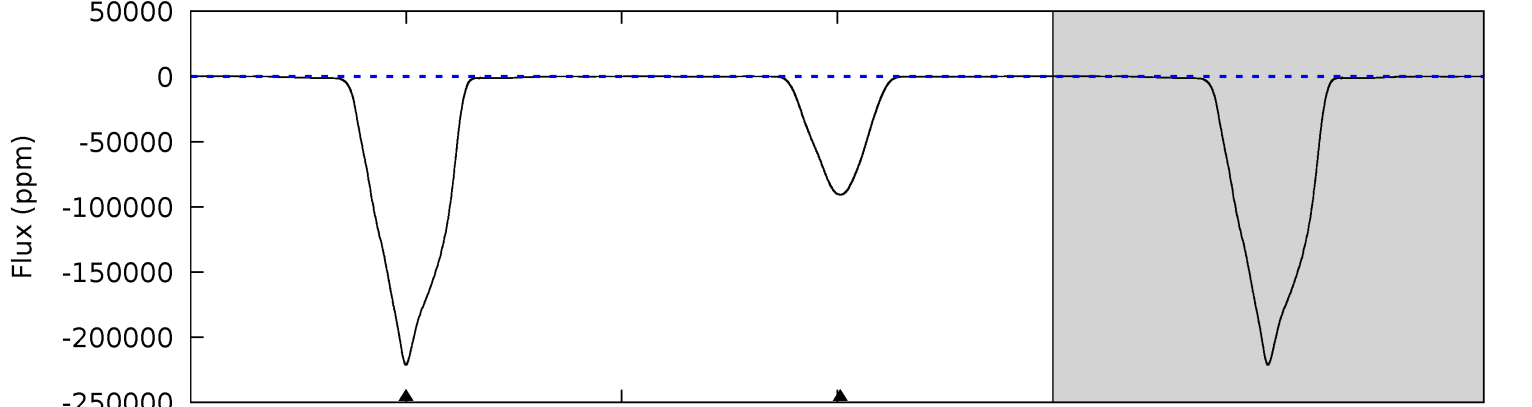
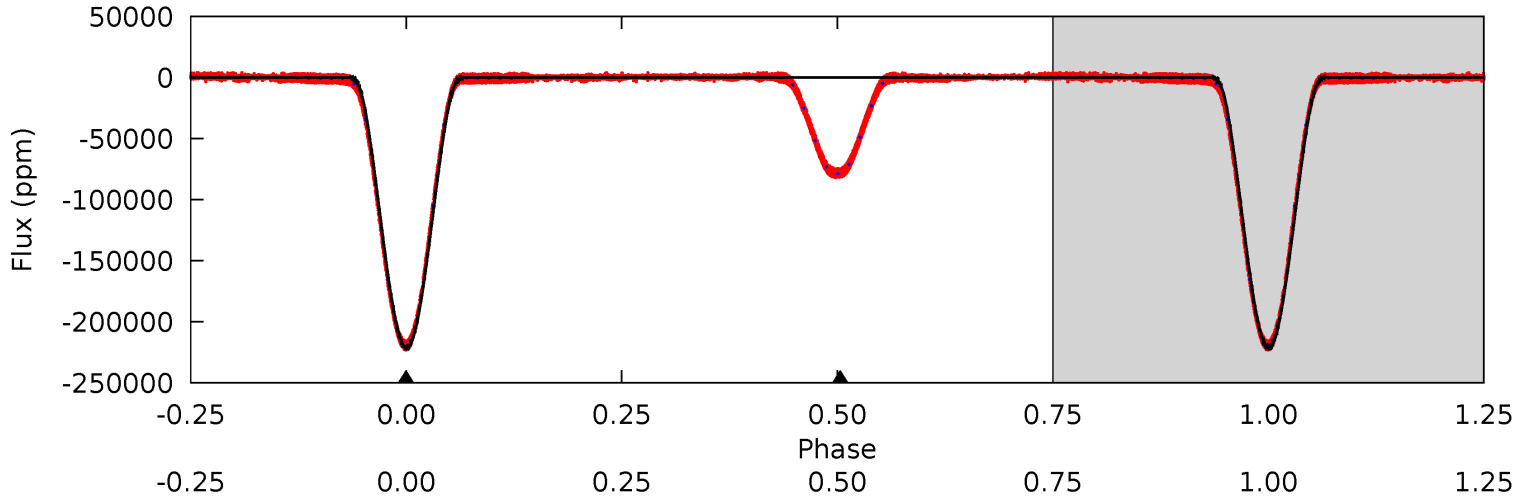
TCE 009451096-01 P= 1.250392 Days $T_0=131.732832$ (BKJD)



DV Model-Shift Uniqueness Test

009451096-01, P = 1.250398 Days, E = 130.480481 Days

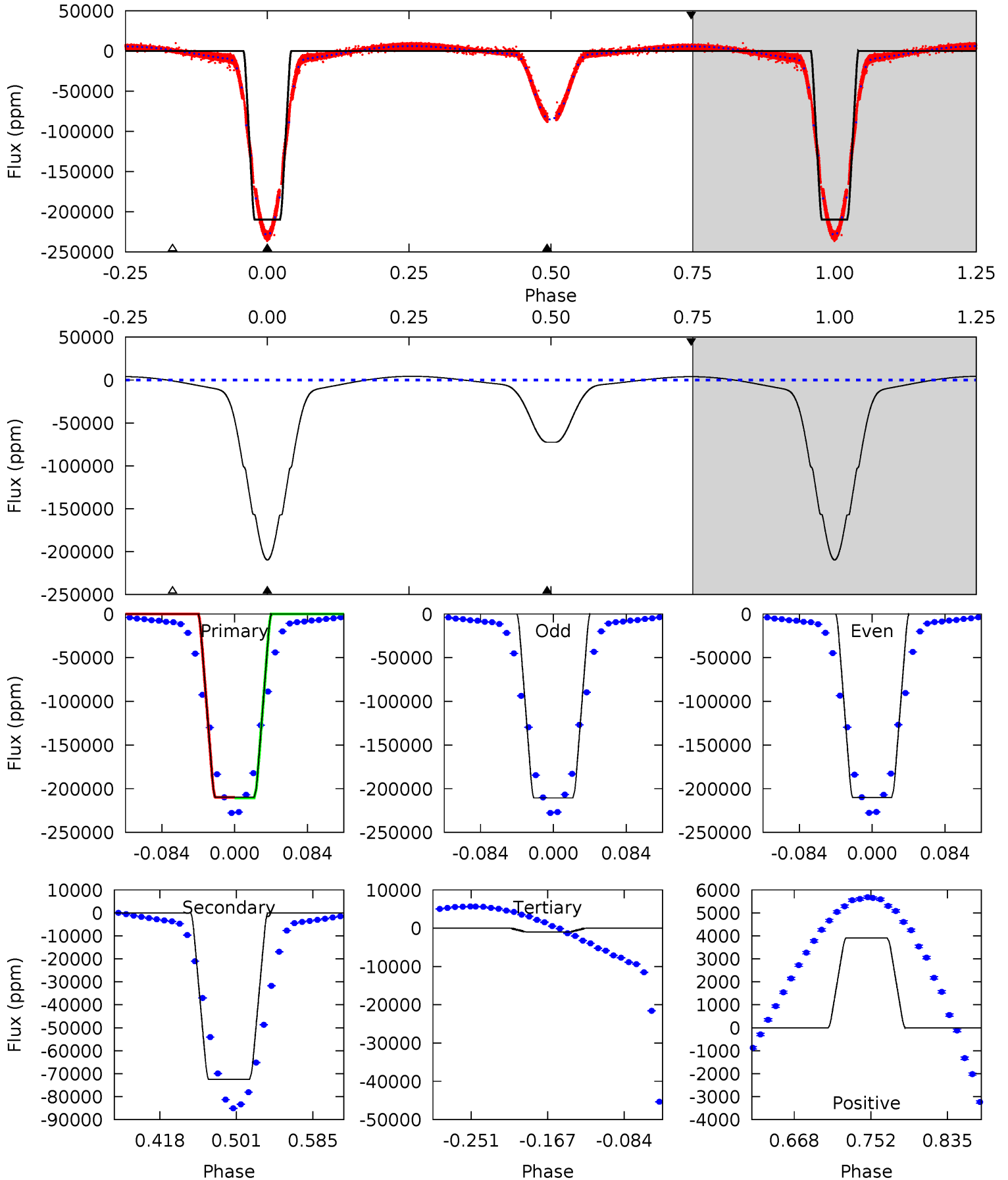
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17365	7121	0	0	4.51	1.51	14.3	17365	17365	7121	7121	0.02	0.93	0.00	0



Alt Model-Shift Uniqueness Test

009451096-01, P = 1.250392 Days, E = 130.482440 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3292	1138	15.5	61.4	4.60	1.73	65.5	3277	3231	1123	1077	4.31	1.00	0.02	4.64



Stellar Parameters For KIC 009451096

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6297^{+199}_{-244}	$4.006^{+0.385}_{-0.137}$	$-0.500^{+0.300}_{-0.300}$	$1.663^{+0.431}_{-0.646}$	$1.023^{+0.152}_{-0.152}$	$0.313^{+0.930}_{-0.141}$
	+3%/-4%	+10%/-3%	+60%/-60%	+26%/-39%	+15%/-15%	+297%/-45%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009451096-01 / KOI 7173.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-90658 ± 13	$90.79^{+14.48}_{-17.08}$	3219^{+283}_{-318}	4901^{+143}_{-164}	$3.531^{+1.718}_{-0.865}$
Alt.	-72472 ± 64	$85.03^{+11.75}_{-18.26}$	3233^{+264}_{-348}	4820^{+123}_{-161}	$3.165^{+1.860}_{-0.690}$

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 $A_{obs} \gg 1.0$

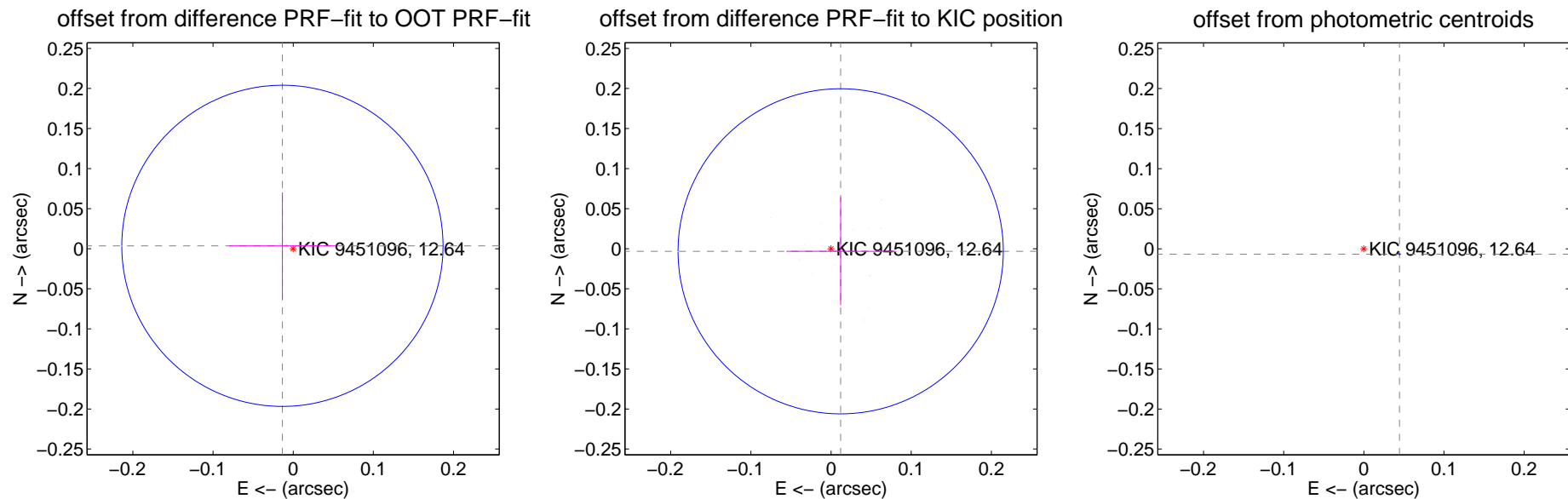
DV Centroid Data

Supplemental centroid analysis for 009451096-01. Kepler magnitude: 12.64. Transit SNR 10693.29

There are 17 quarters with good PRF difference image offsets

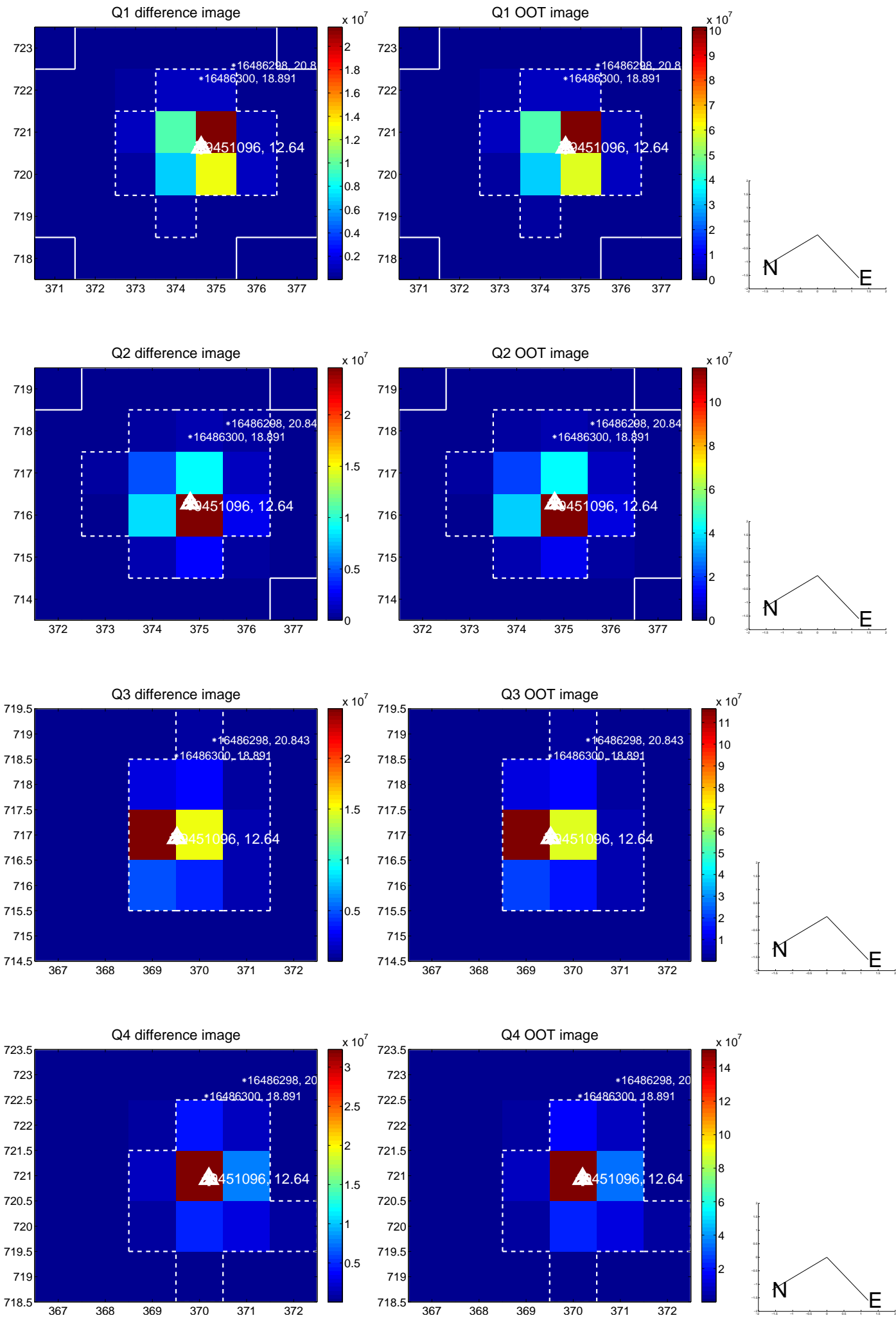
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.014 ± 0.067	0.21	0.013 ± 0.067	0.004 ± 0.067
PRF-fit source offset from KIC position	0.012 ± 0.068	0.18	-0.012 ± 0.068	-0.003 ± 0.067
photometric centroid source offset	0.05 ± 0.00	233.26	-0.04 ± 0.00	-0.01 ± 0.00

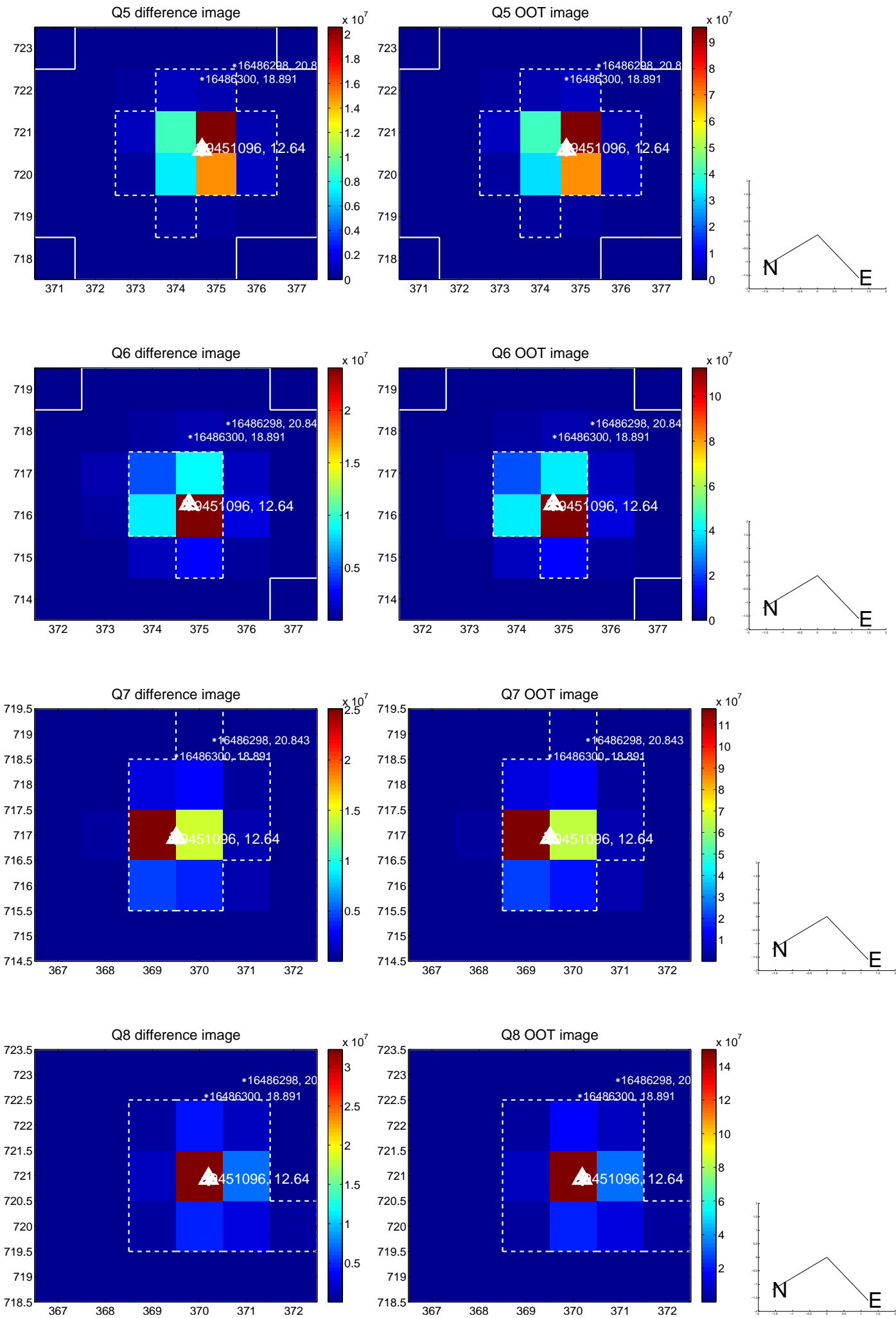


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

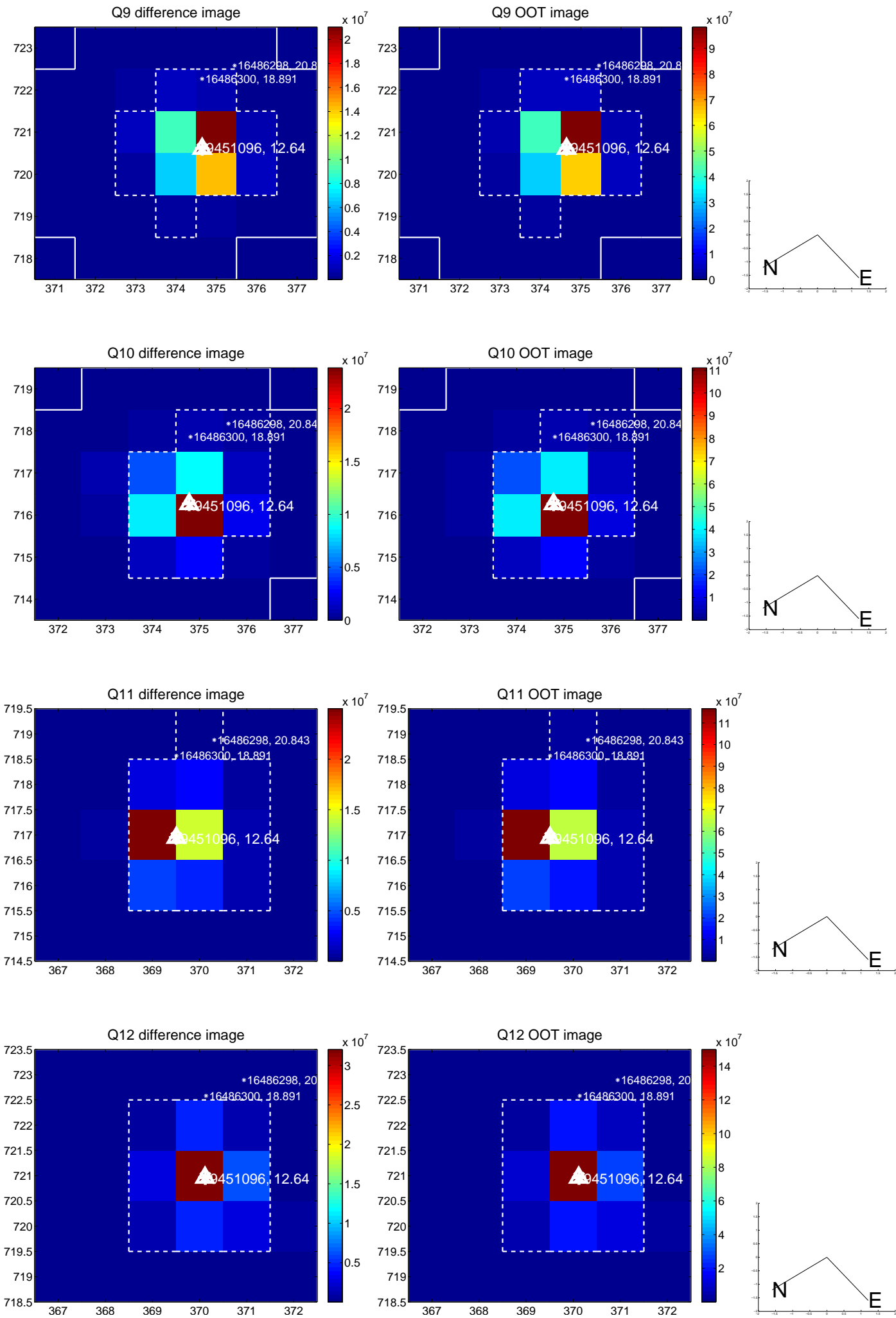
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



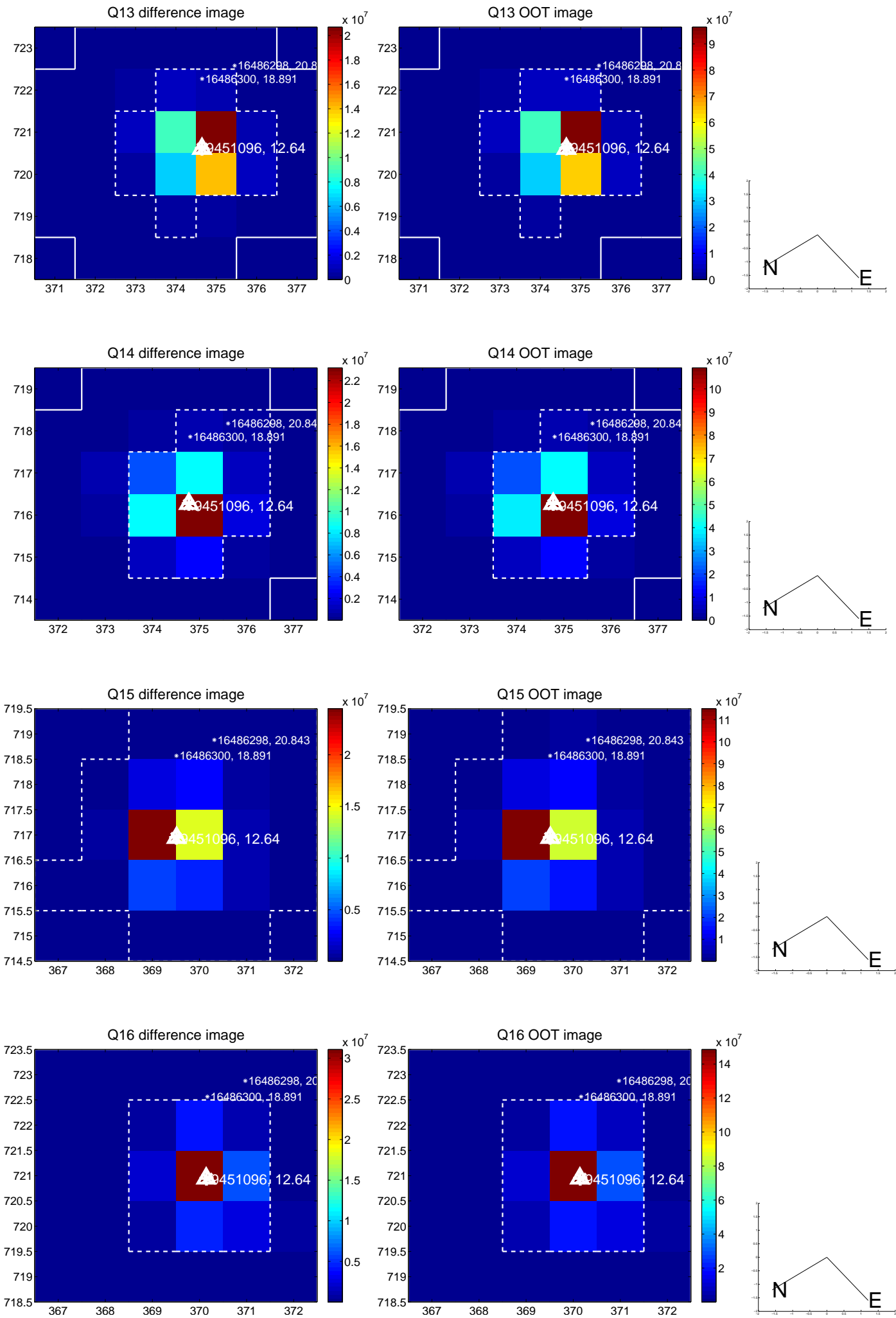
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



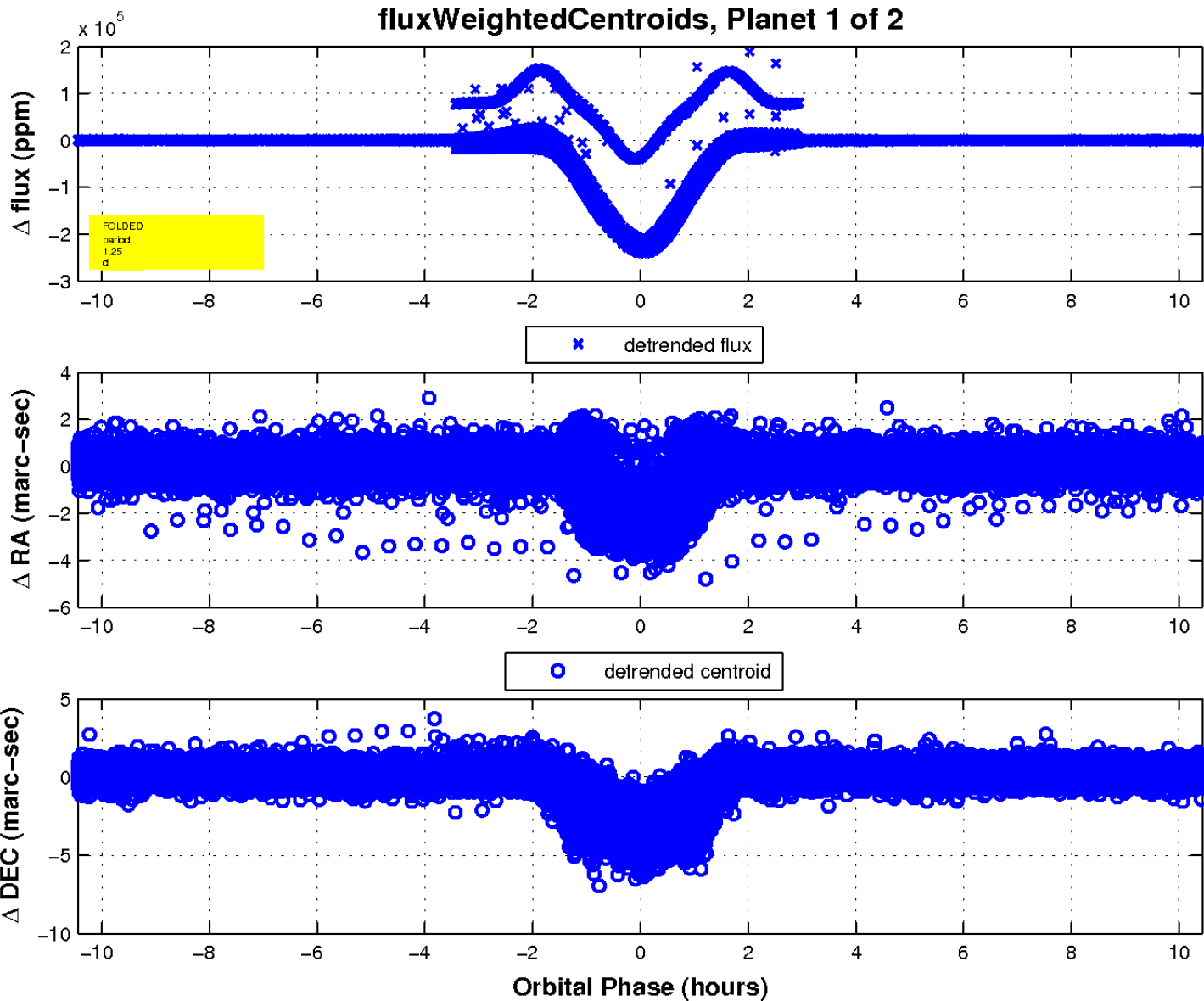
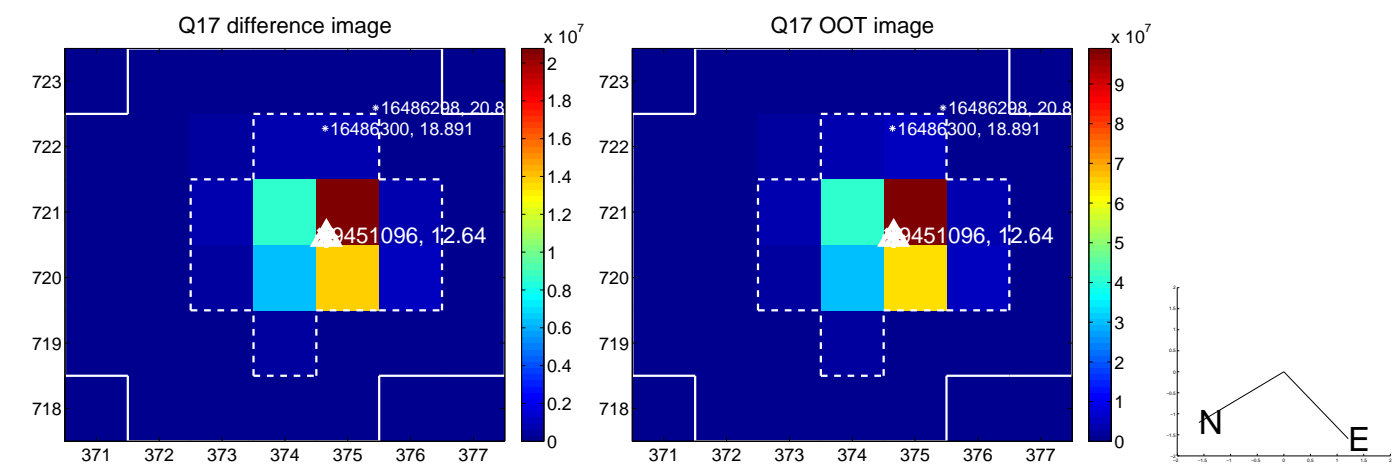
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

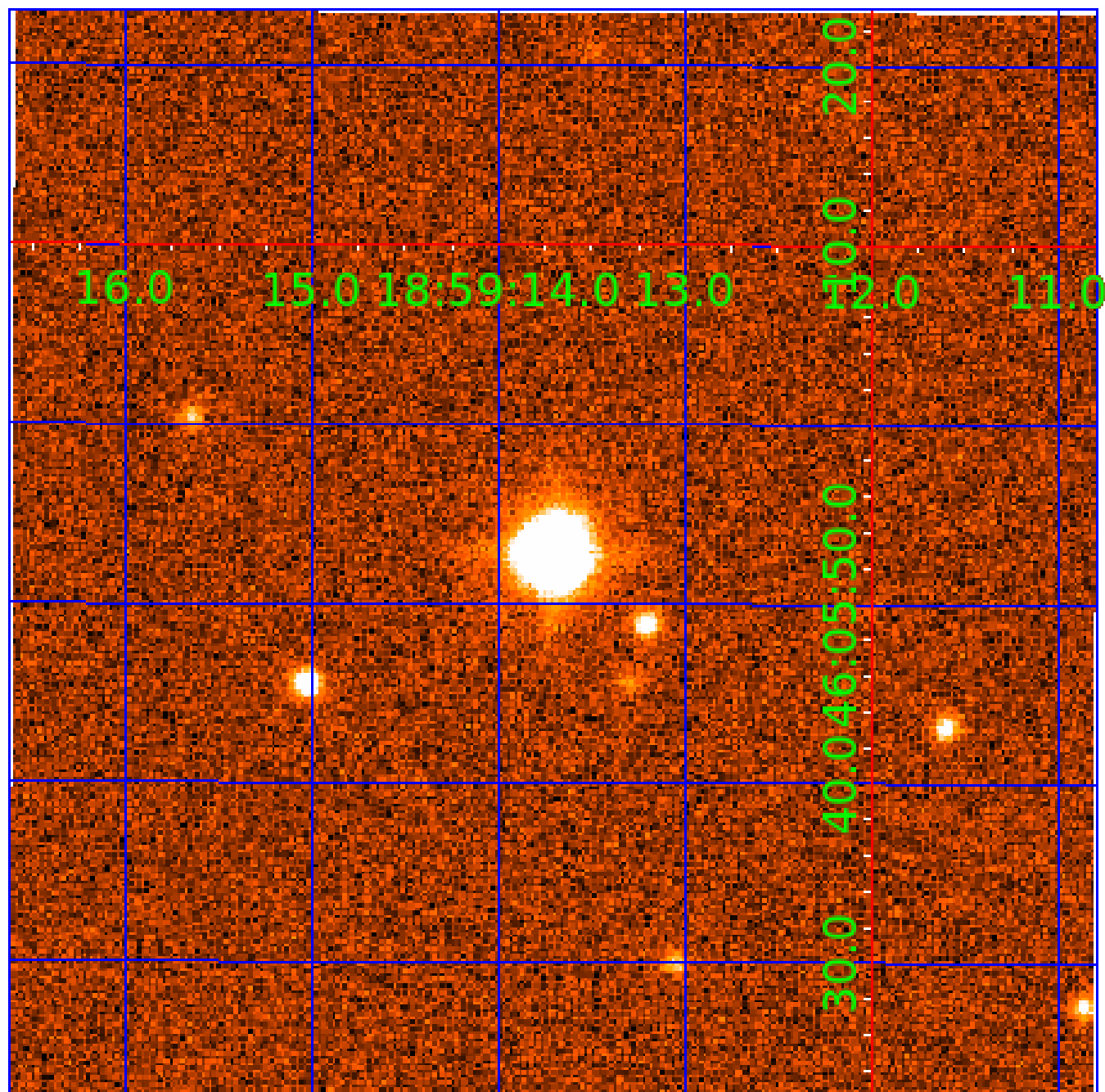


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009451096

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})
009451096-01	OBS	7173.01	1.250398	131.730879	217015.5	3.479	13937.3	10693.3	1.66	6297	93.93	7435.20
009451096-02	OBS	No	1.250392	132.354944	24379.7	2.000	7998.8	-1.0	1.66	6297	26.18	7435.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009451096-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009451096-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS

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.

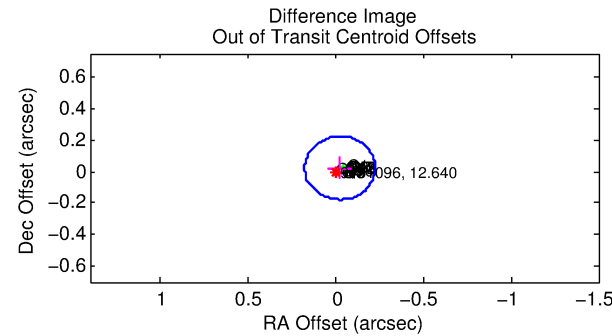
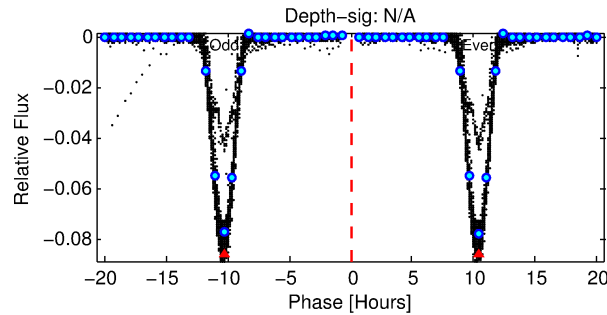
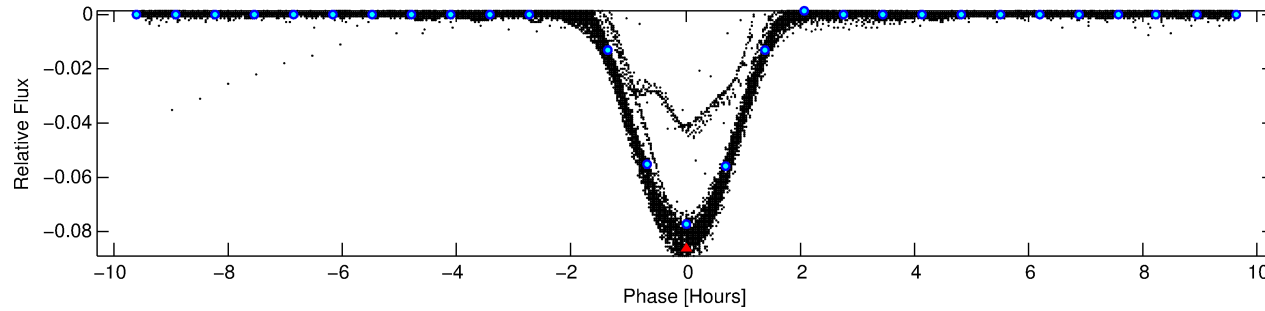
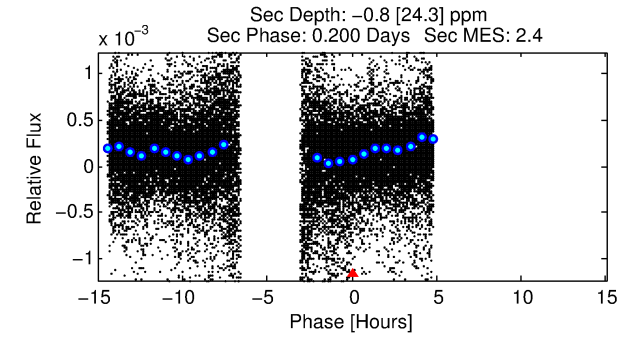
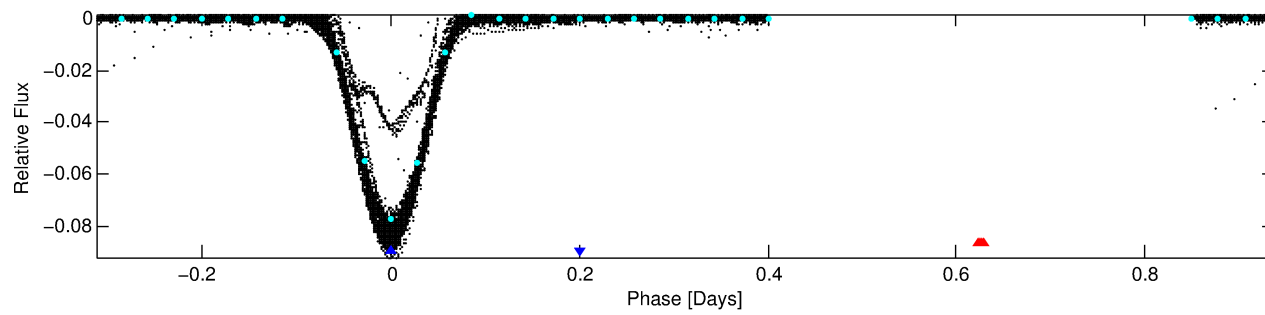
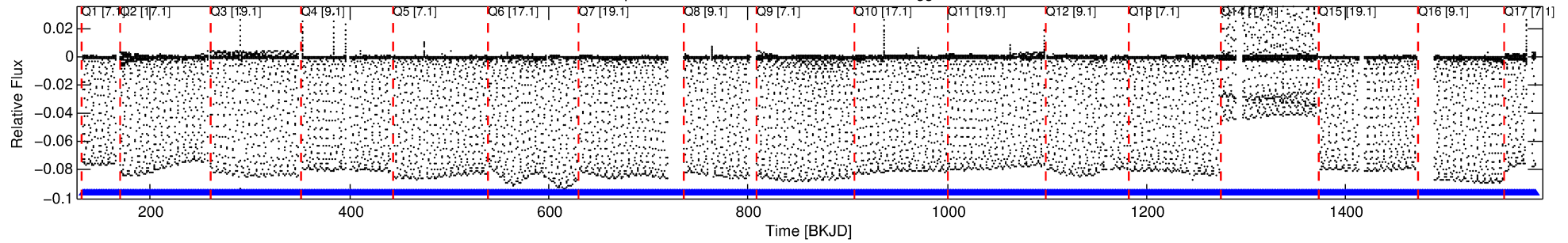
Ephemeris Match Information For 009451096-02

No Significant Match Found

DV One-Page Summary

KIC: 9451096 Candidate: 2 of 2 Period: 1.250 d
KOI: K07173 Corr: No Ephemeris Match

Kp: 12.64 R*: 1.66 Rs Teff: 6297.0 K Logg: 4.01 Fe/H: -0.500



TPS TCE Results:

Period = 1.25039 d
Epoch = 132.3549 BKJD

DV fit results are unavailable

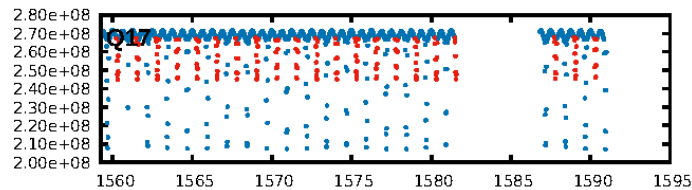
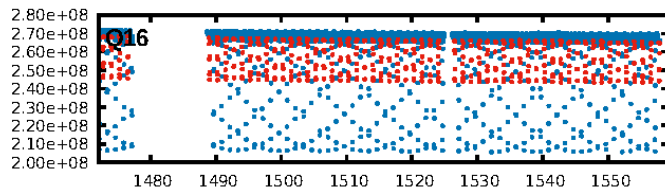
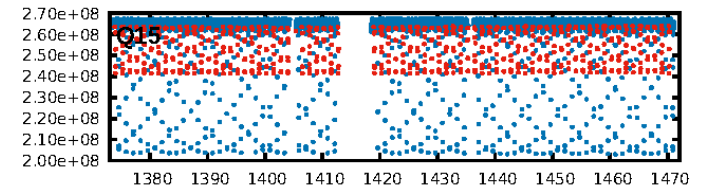
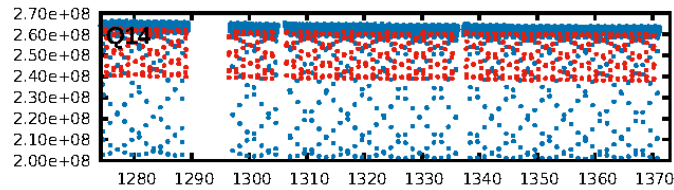
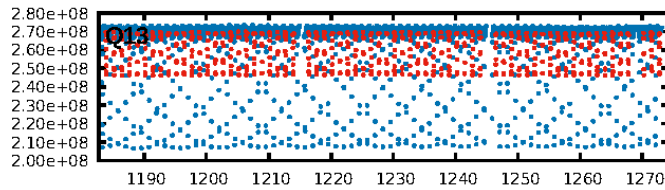
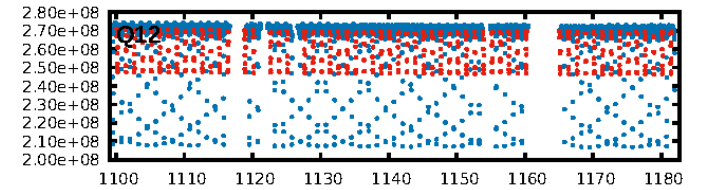
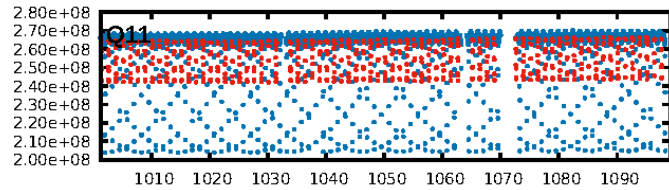
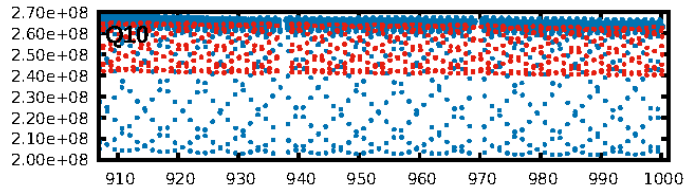
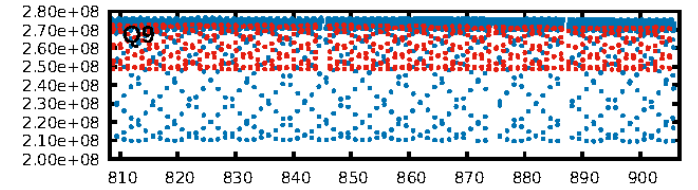
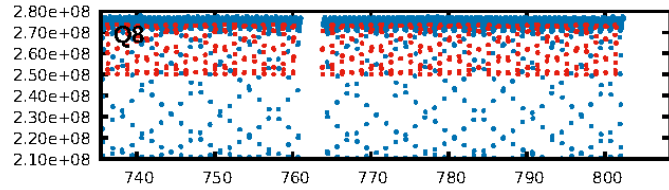
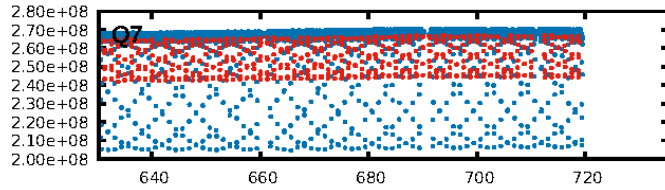
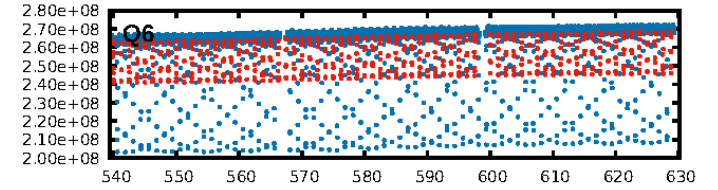
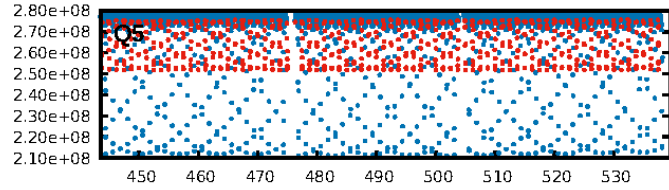
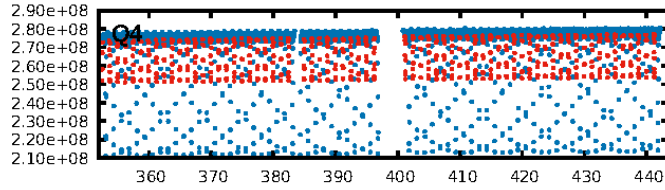
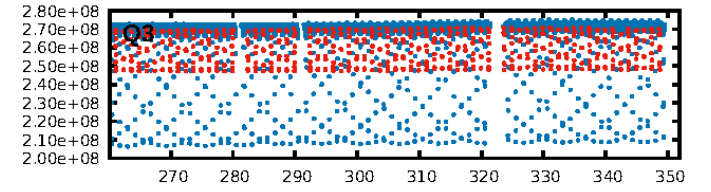
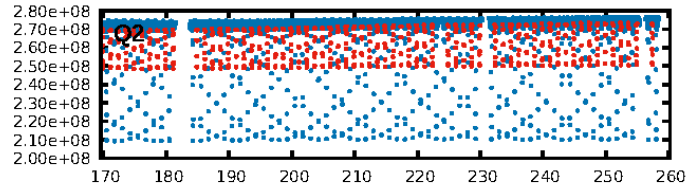
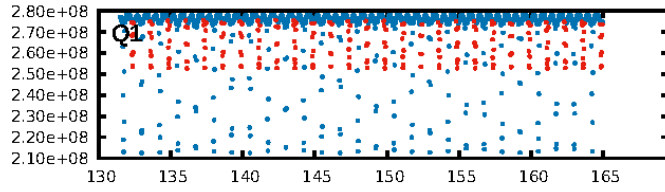
DV Diagnostic Results:

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 [1024/1024]
GhostDiagnostic-chr: 1.437
Centroid-sig: N/A
Centroid-so: 0.059 arcsec [226.39σ]
OotOffset-rm: 0.034 arcsec [0.51σ]
KicOffset-rm: 0.048 arcsec [0.70σ]
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]

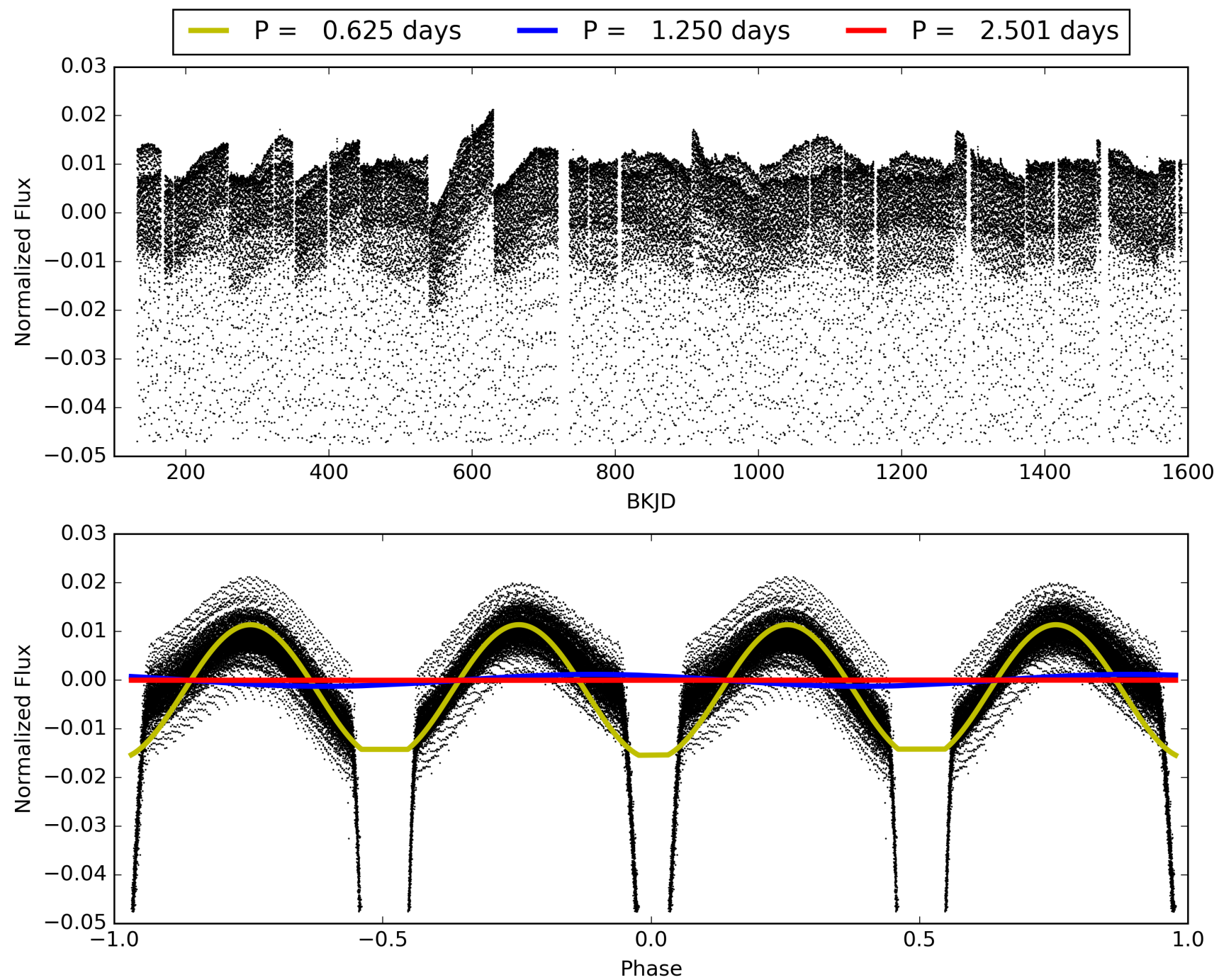
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009451096-02, PDC Light Curves

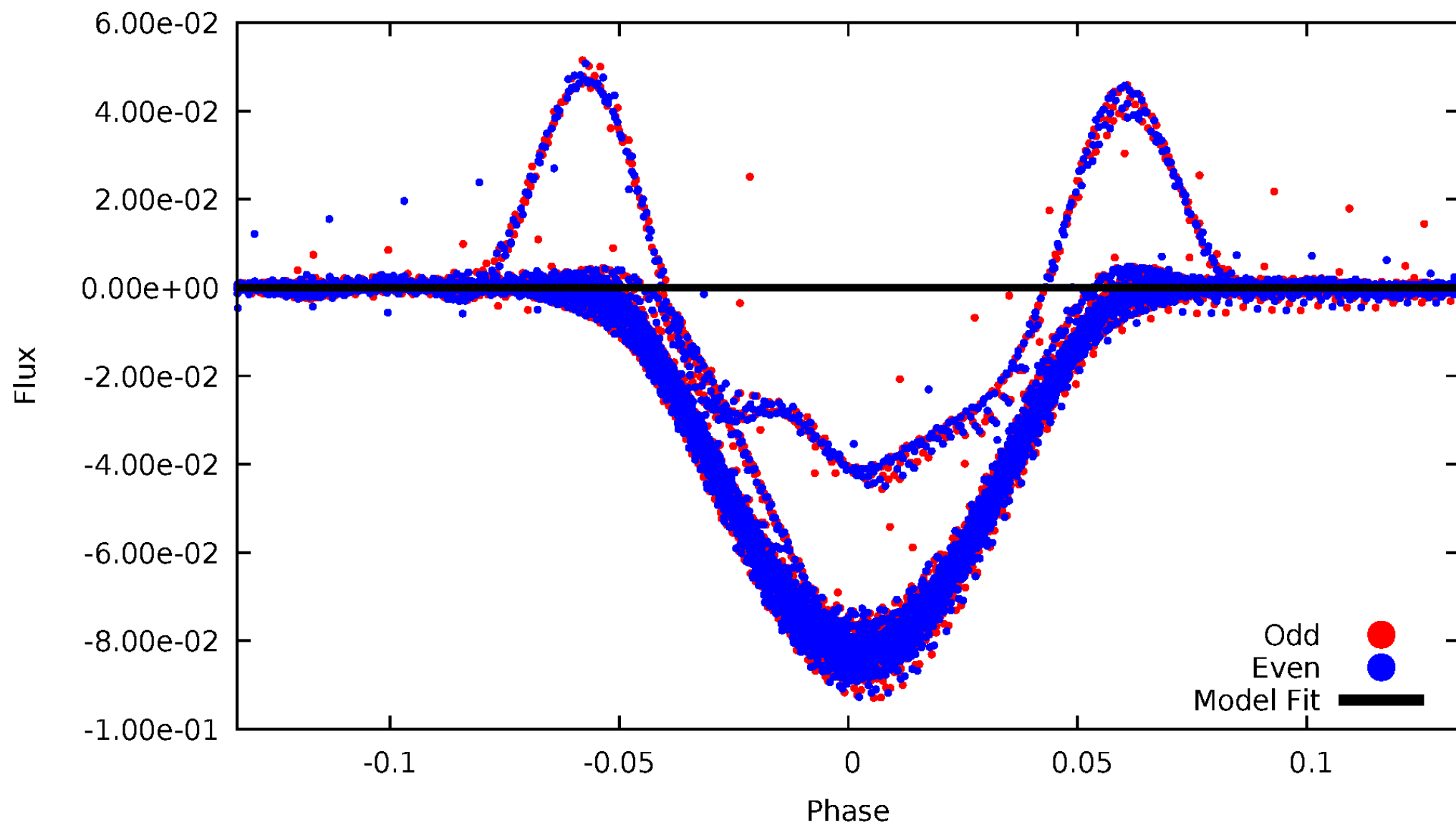


TCE 009451096-02



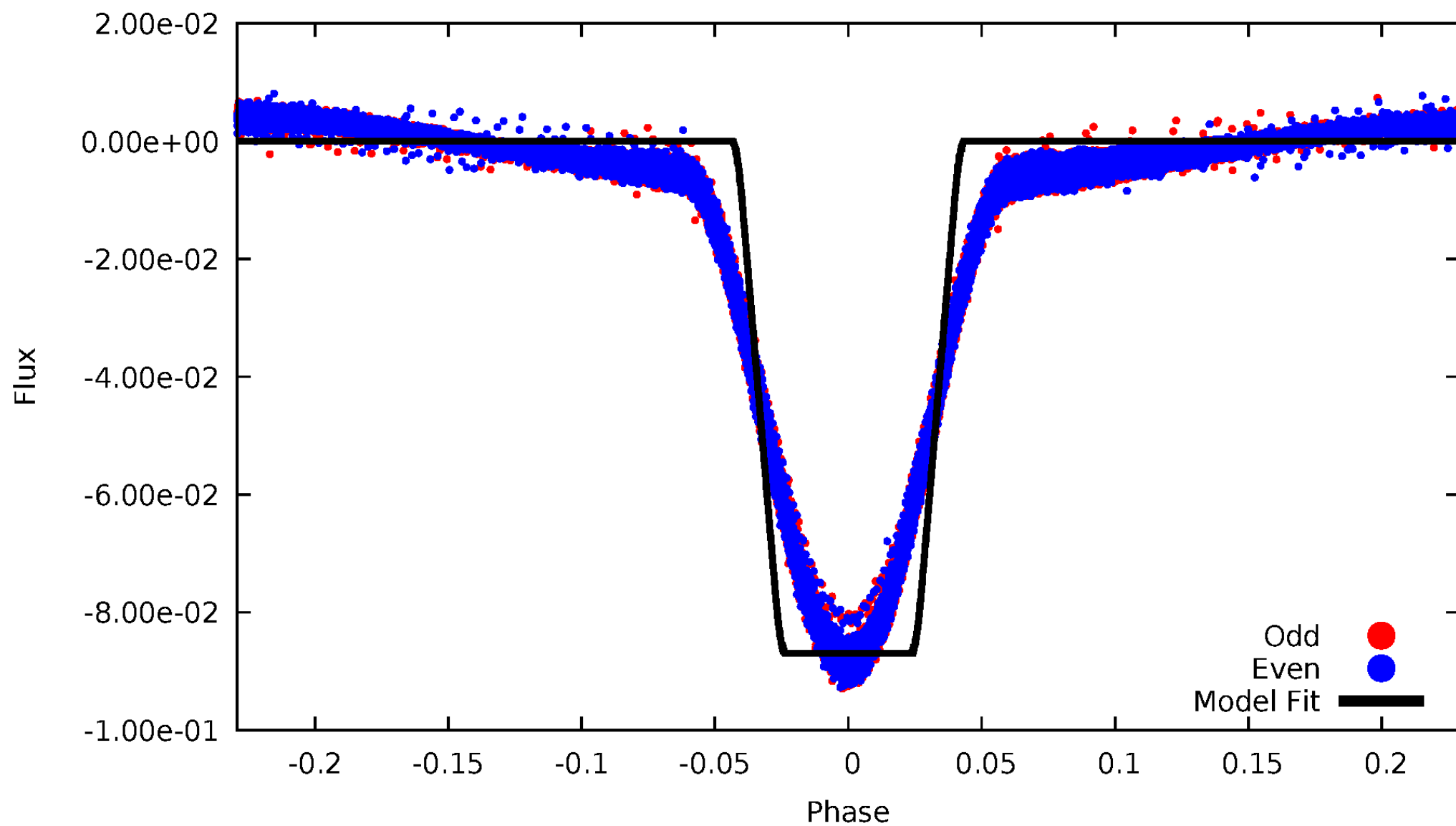
DV Odd/Even

TCE 009451096-02



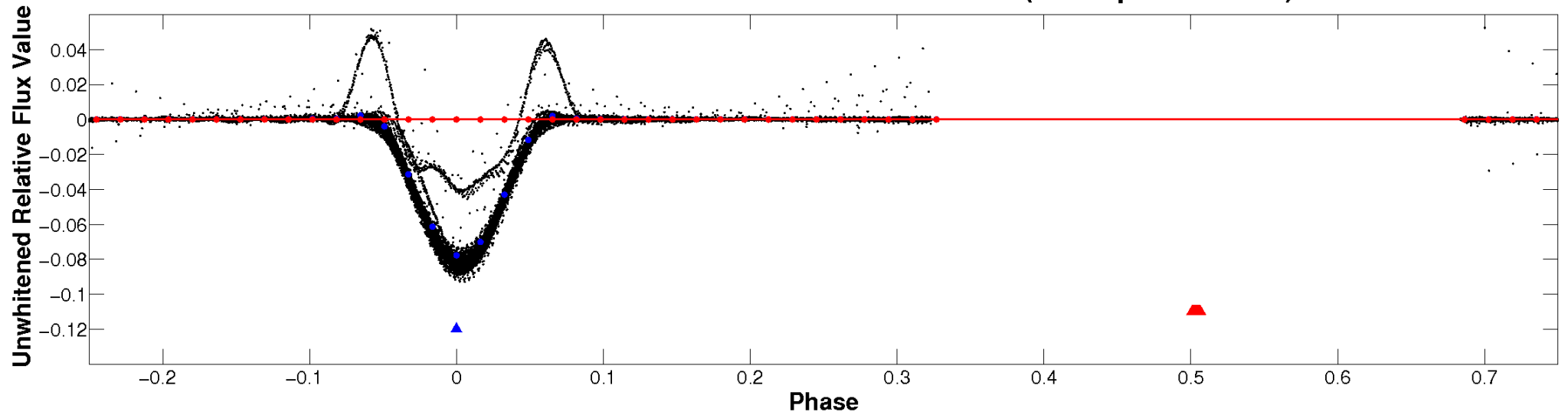
ALT Odd/Even

TCE 009451096-02

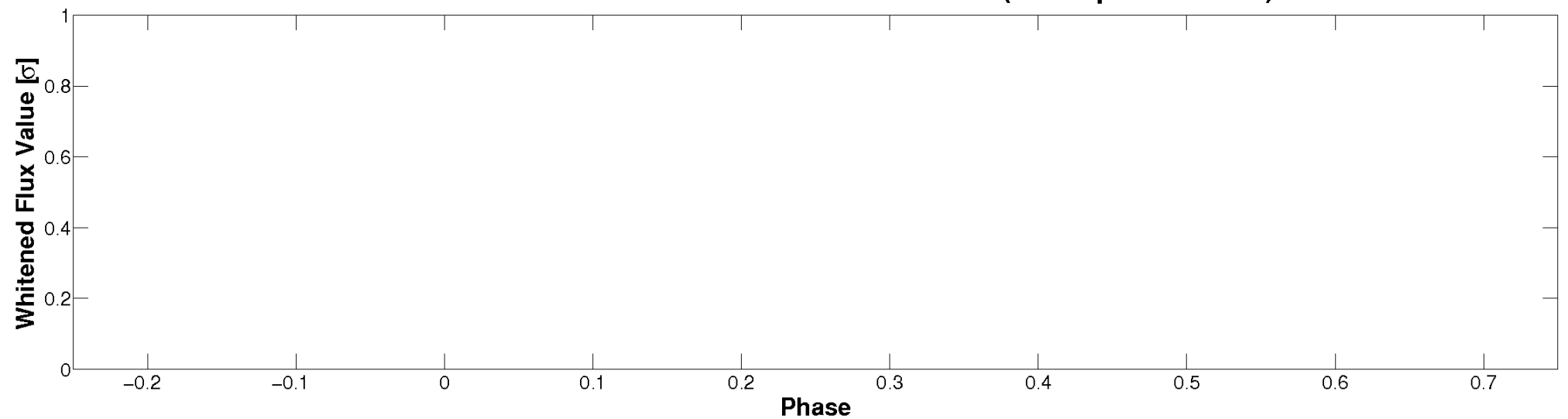


Non-Whitened Vs. Whitened Light Curve

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

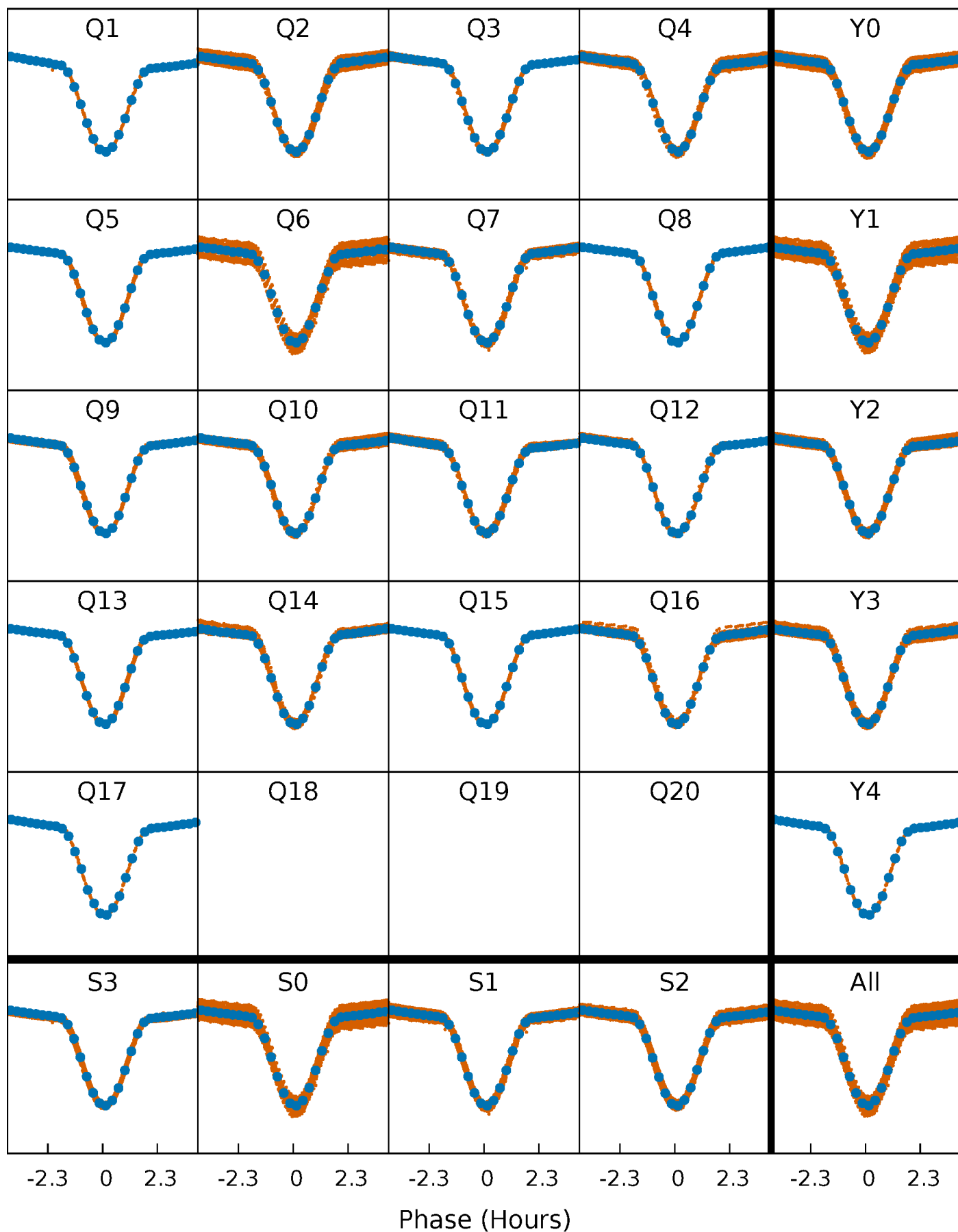


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



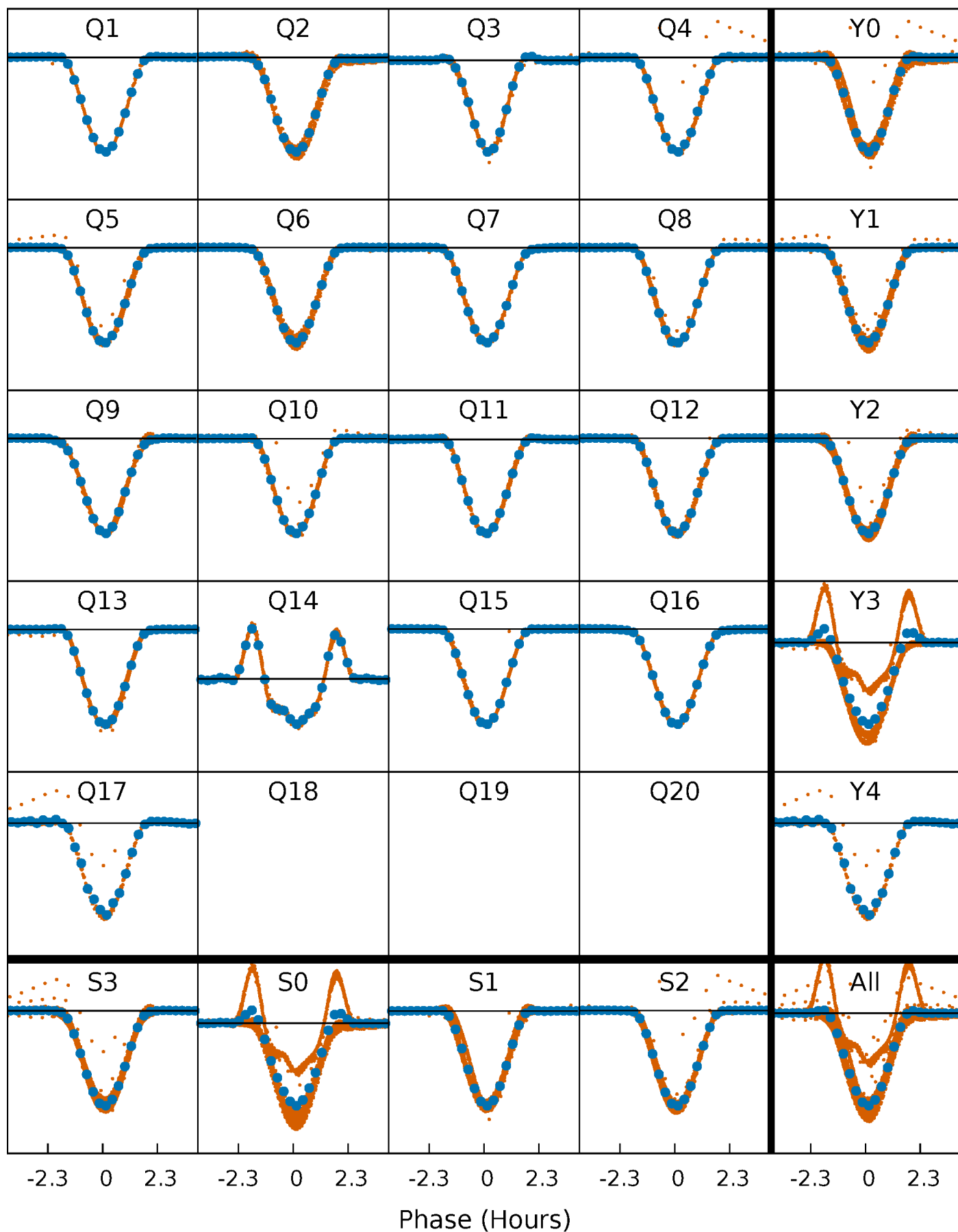
PDC Quarter-Phased Transit Curves

TCE 009451096-02 P= 1.250392 Days $T_0=132.354944$ (BKJD)



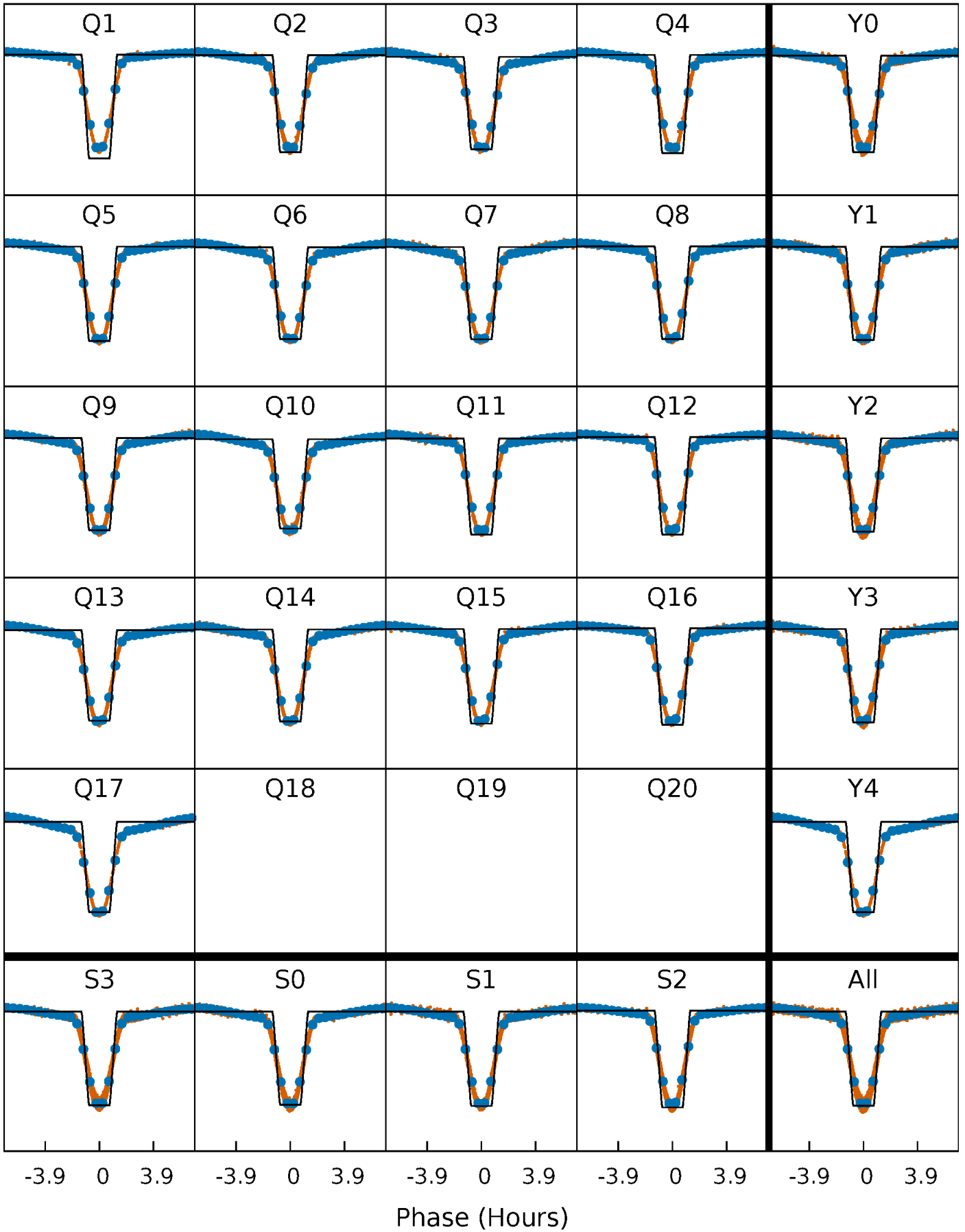
DV Quarter-Phased Transit Curves

TCE 009451096-02 P= 1.250392 Days $T_0=132.354944$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

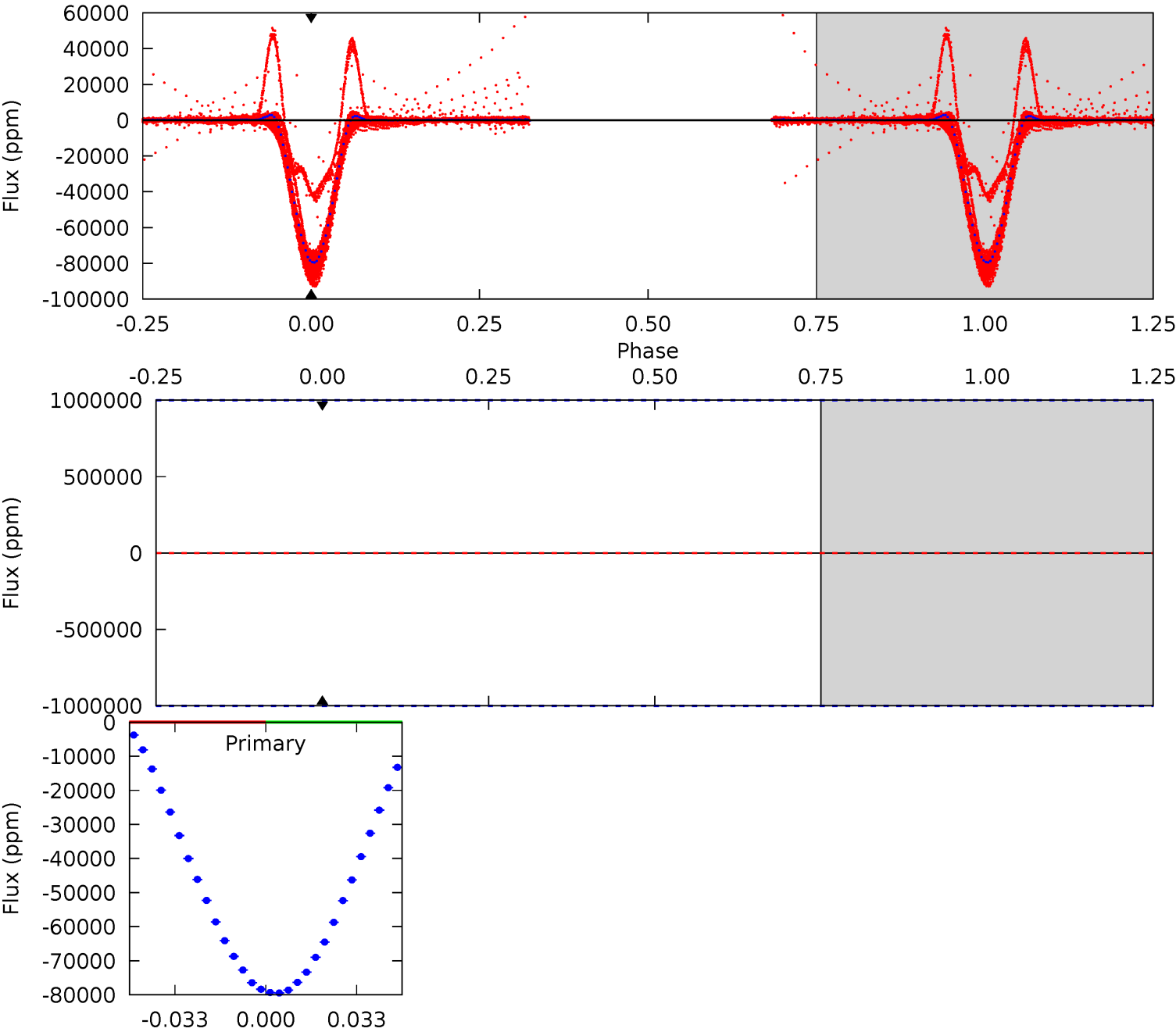
TCE 009451096-02 $P = 1.250392$ Days $T_0 = 132.358596$ (BKJD)



DV Model-Shift Uniqueness Test

009451096-02, P = 1.250392 Days, E = 131.104552 Days

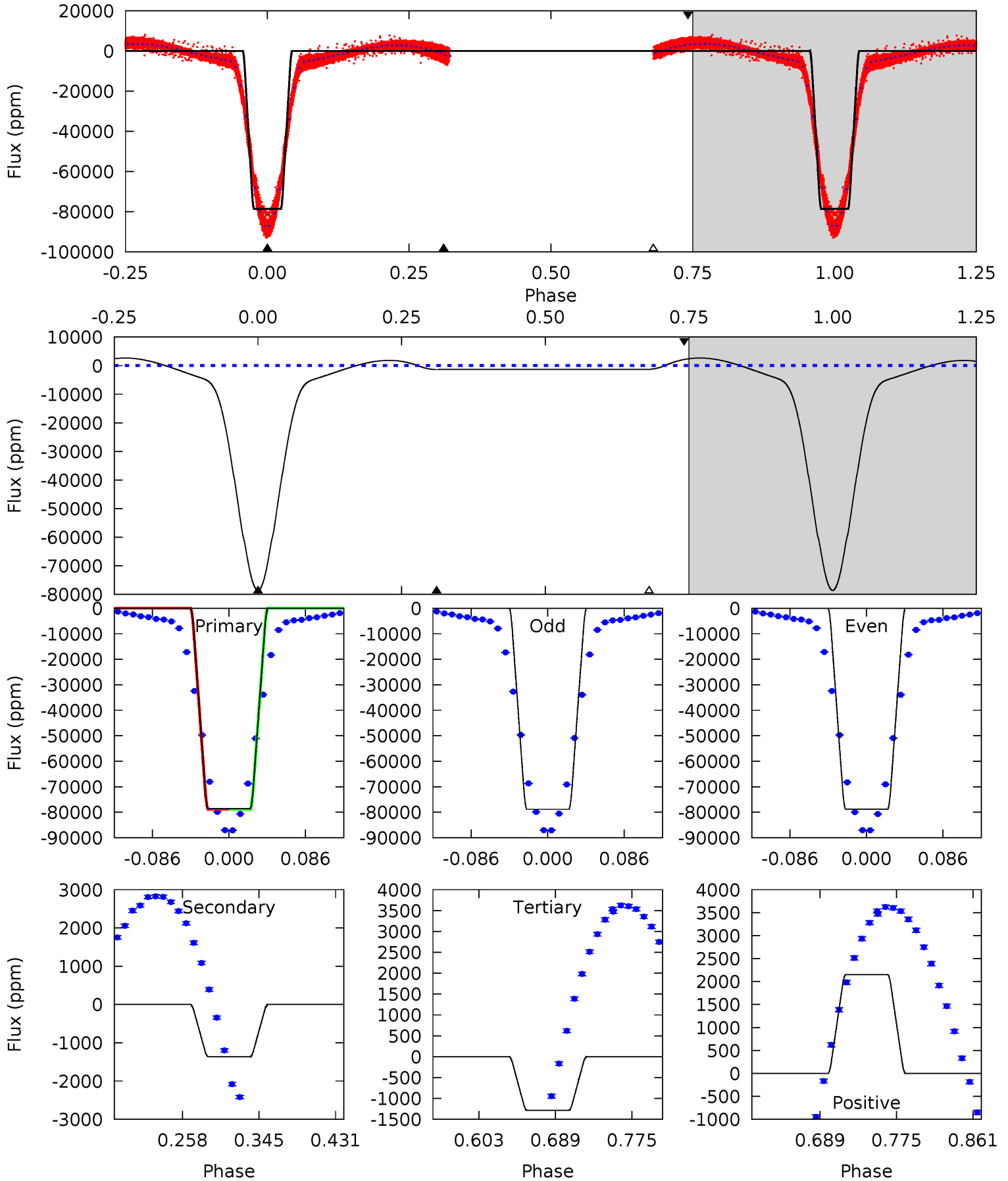
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009451096-02, P = 1.250392 Days, E = 131.108204 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2227	38.6	36.3	60.9	4.60	1.72	67.1	2191	2166	2.27	-22.2	0.19	1.00	0.03	0.17



Stellar Parameters For KIC 009451096

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6297^{+199}_{-244}	$4.006^{+0.385}_{-0.137}$	$-0.500^{+0.300}_{-0.300}$	$1.663^{+0.431}_{-0.646}$	$1.023^{+0.152}_{-0.152}$	$0.313^{+0.930}_{-0.141}$
	+3%/-4%	+10%/-3%	+60%/-60%	+26%/-39%	+15%/-15%	+297%/-45%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009451096-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$25.68^{+20.16}_{-15.03}$	3229^{+274}_{-374}	2984^{+8307}_{-13350}	$0.416^{+72.132}_{-56.210}$
Alt.	-1363 ± 35	$48.66^{+22.17}_{-18.66}$	3241^{+240}_{-356}	-2828^{+5610}_{-336}	$0.169^{+0.271}_{-0.090}$

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 $A_{obs} \gg 1.0$

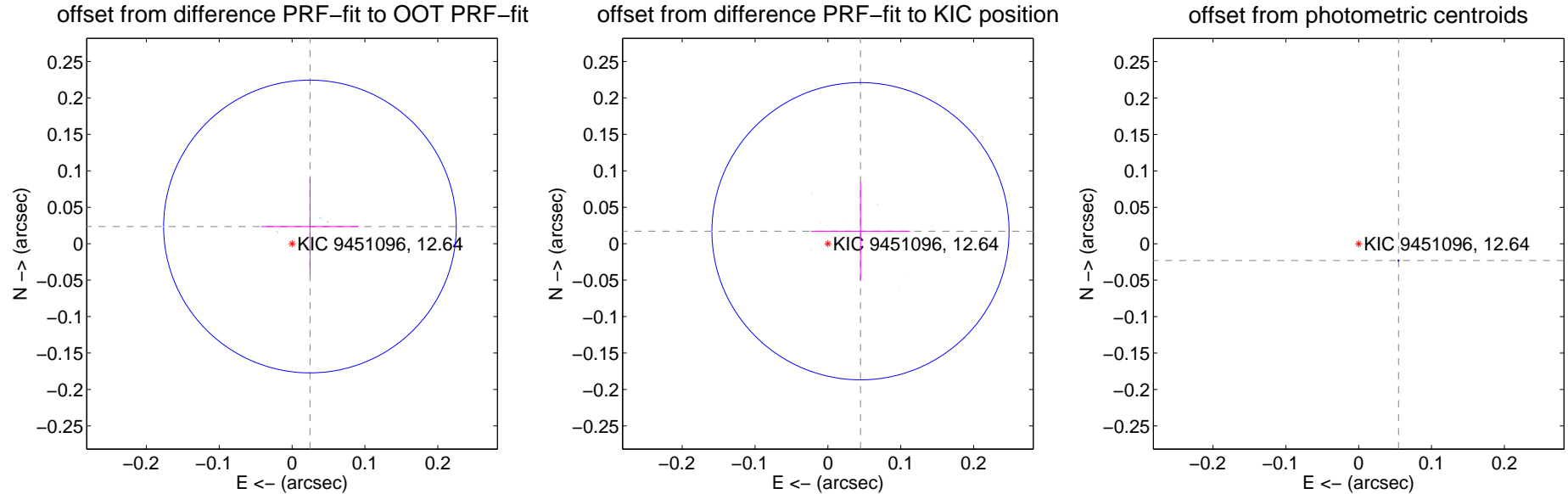
DV Centroid Data

Supplemental centroid analysis for 009451096-02. Kepler magnitude: 12.64. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

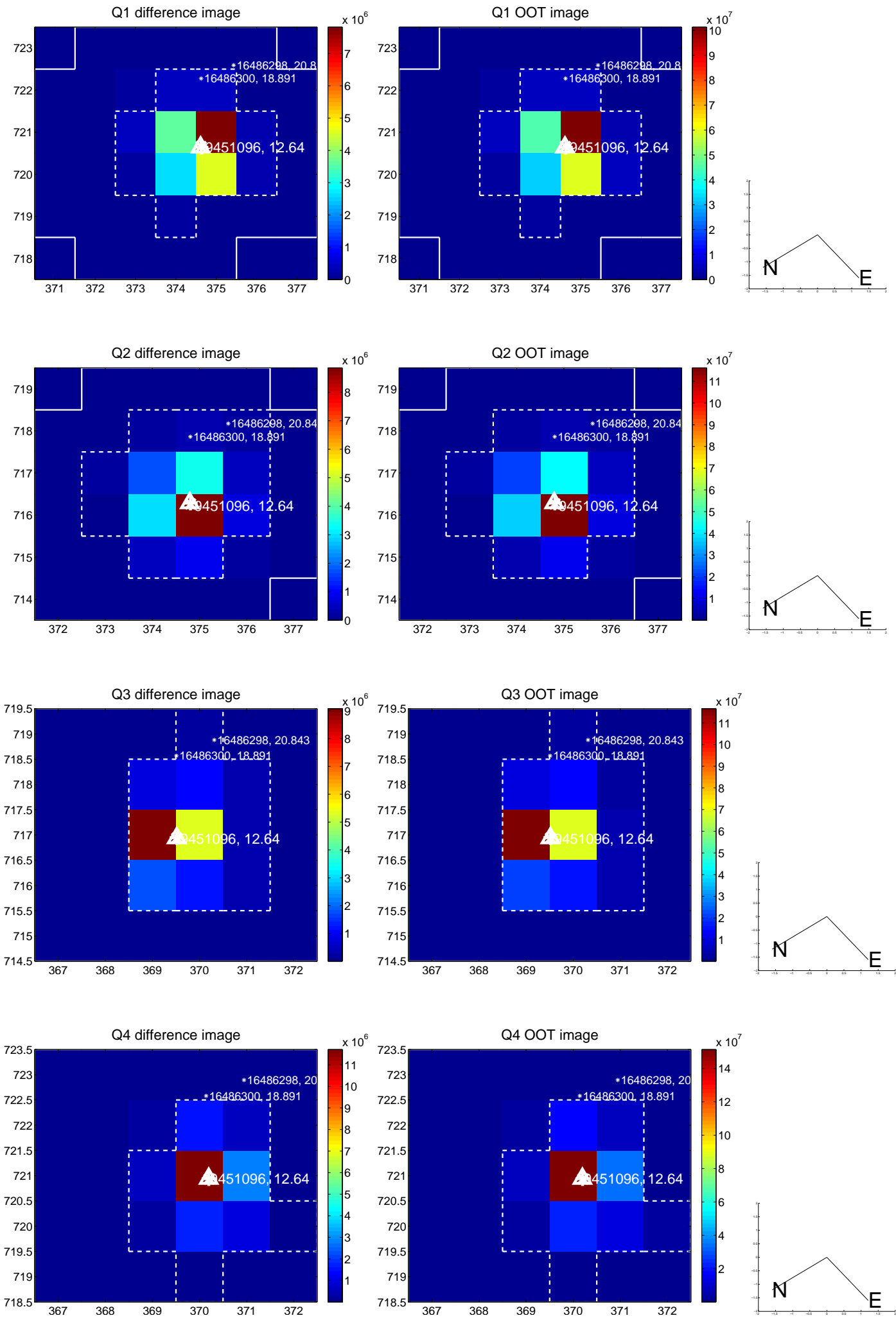
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.034 ± 0.067	0.51	-0.025 ± 0.067	0.024 ± 0.067
PRF-fit source offset from KIC position	0.048 ± 0.068	0.70	-0.045 ± 0.068	0.017 ± 0.067
photometric centroid source offset	0.06 ± 0.00	226.39	-0.05 ± 0.00	-0.02 ± 0.00

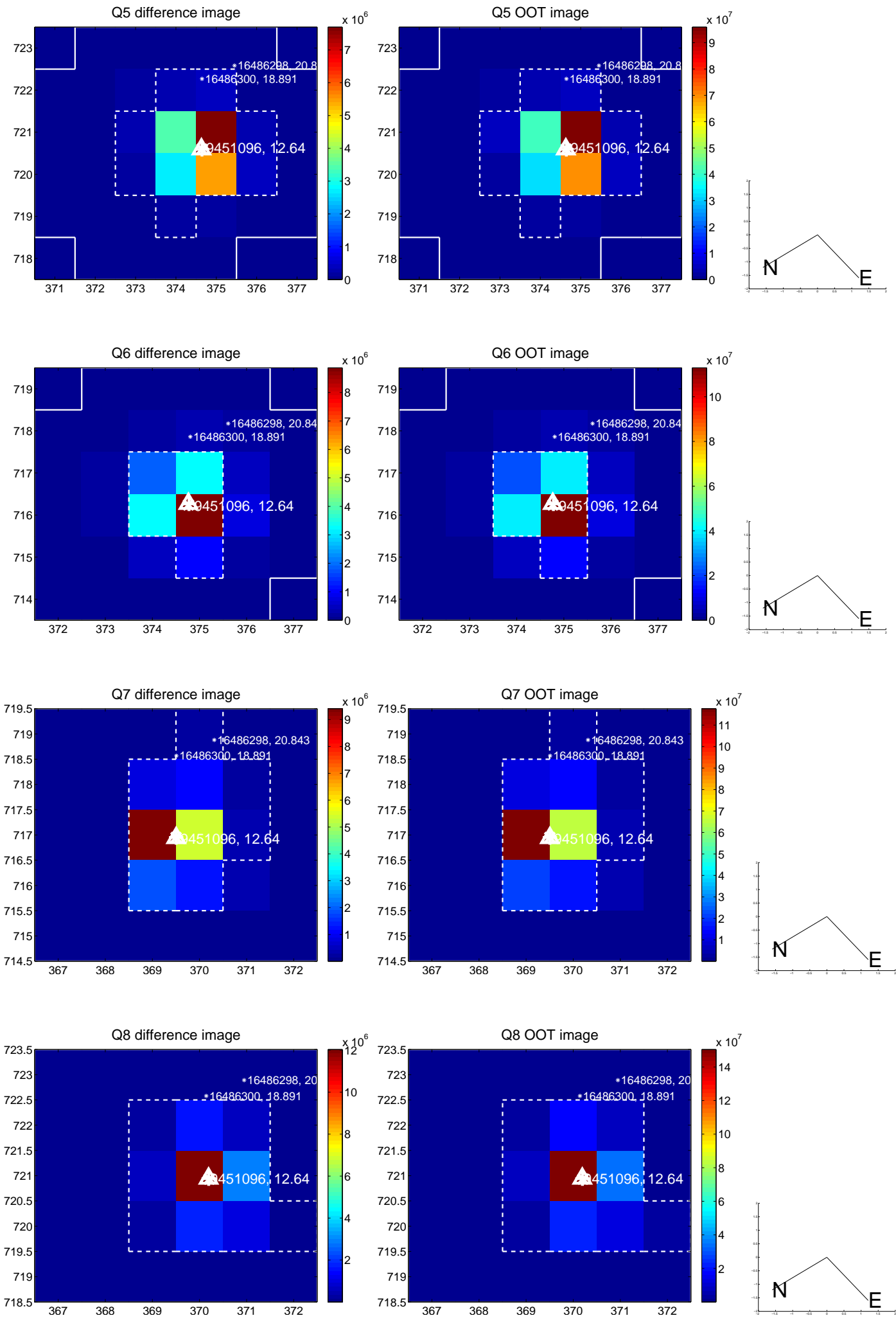


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

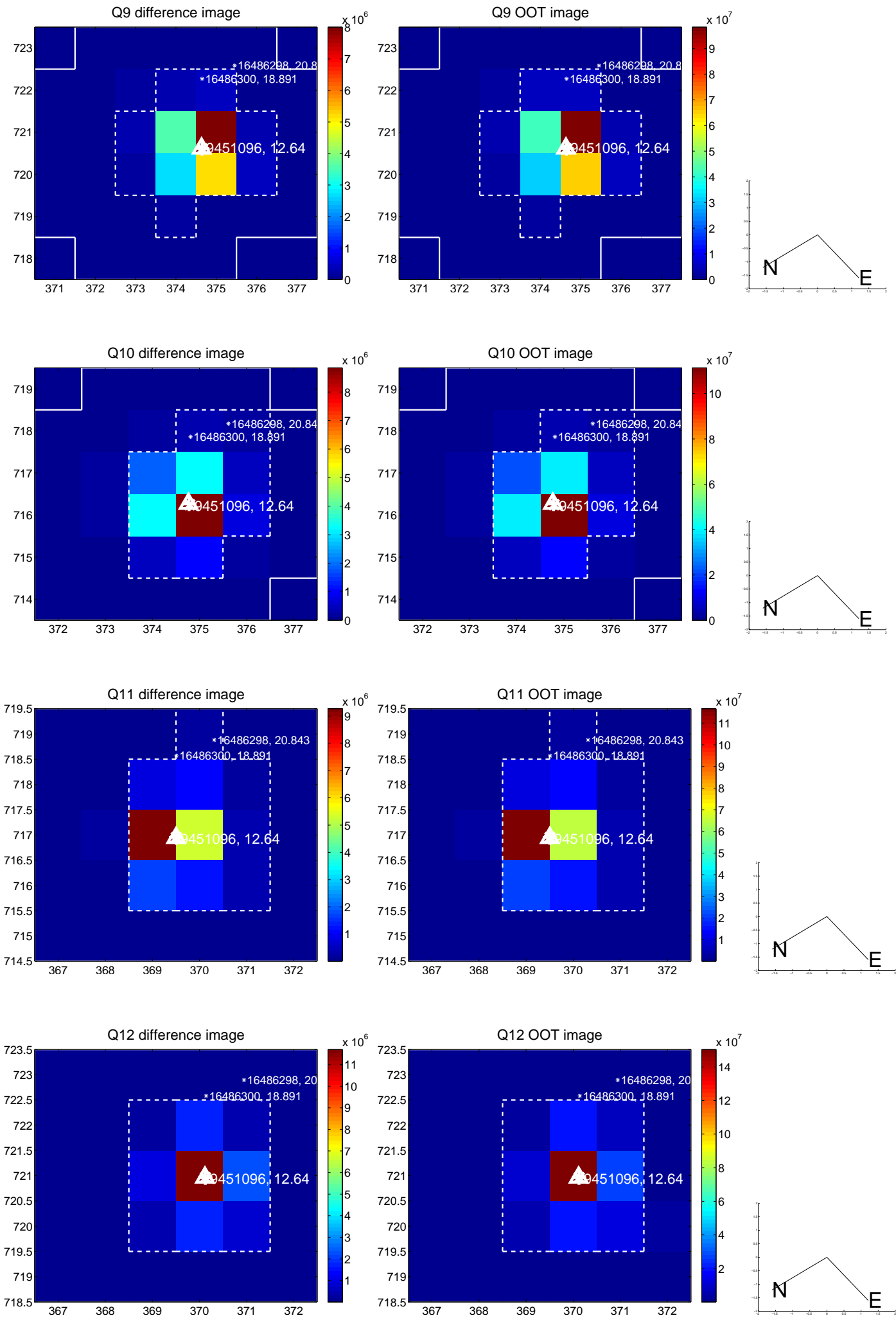
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



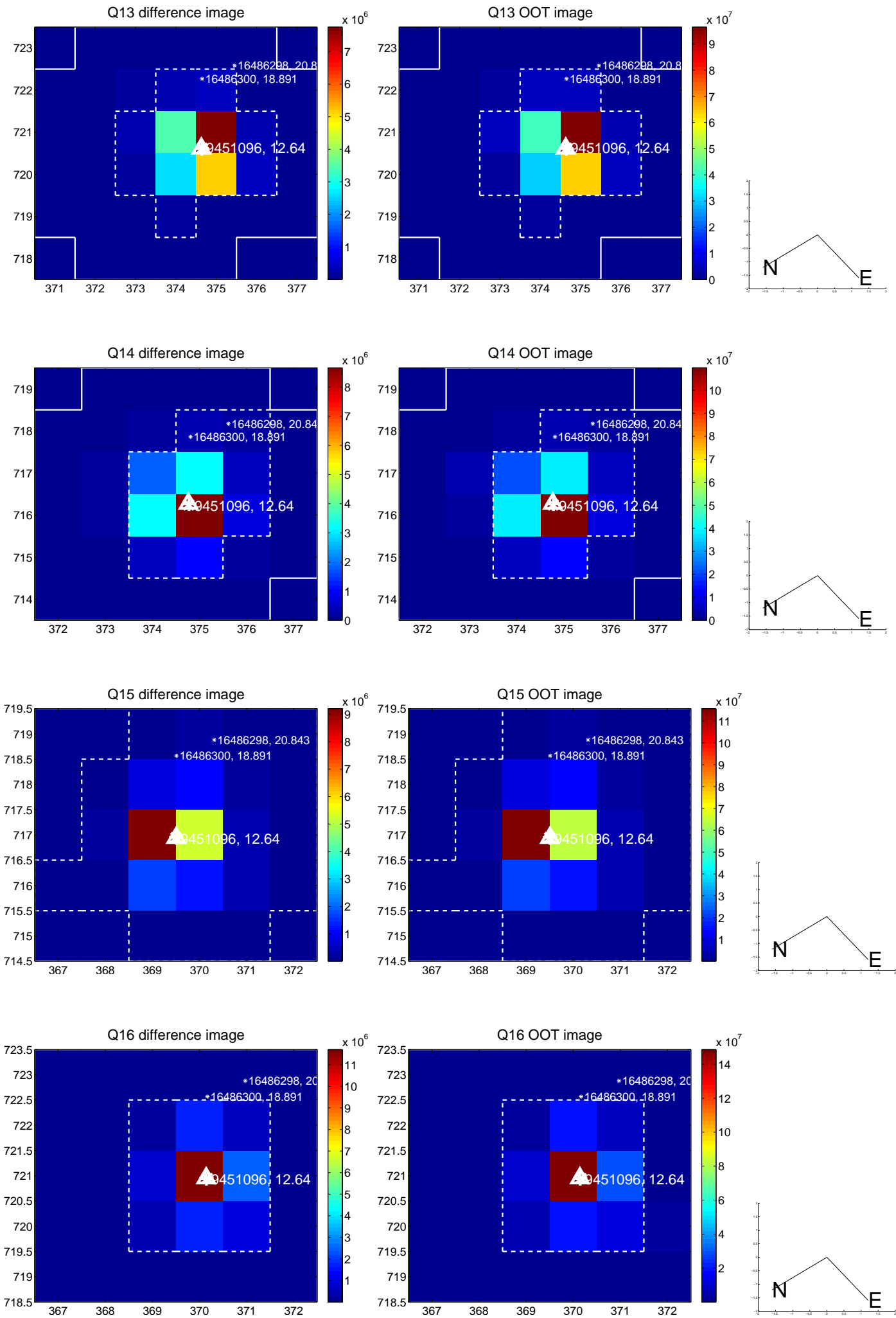
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



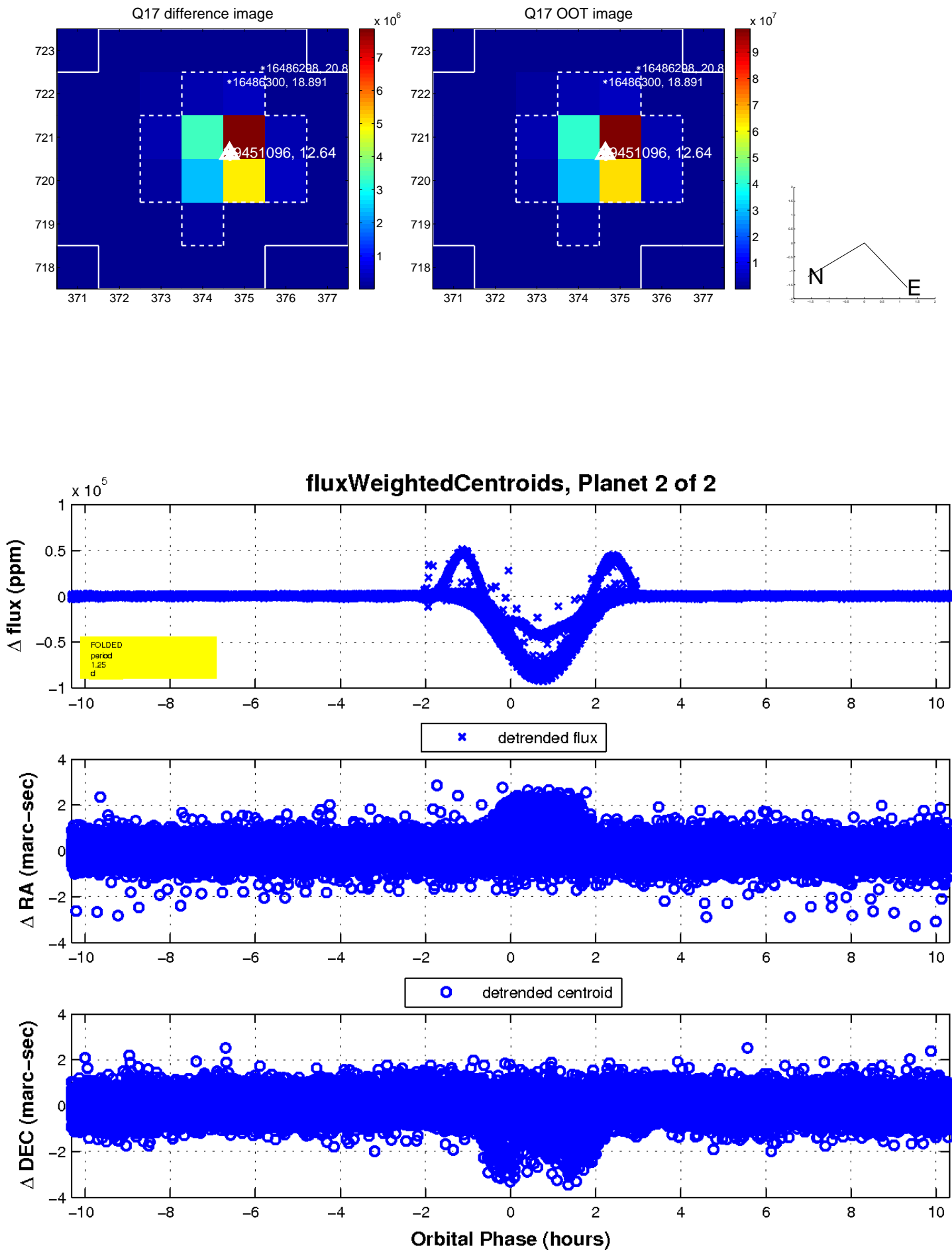
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

