

KIC 009334490

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})
009334490-01	OBS	7161.01	18.844932	149.948350	2874.7	5.535	181.7	70.9	0.69	5220	6.02	21.91
009334490-02	OBS	No	18.845020	140.372754	2305.5	5.645	155.5	67.2	0.69	5220	4.00	21.91

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009334490-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_KIC_POS—HALO_GHOST
009334490-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_KIC_POS—HALO_GHOST

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.

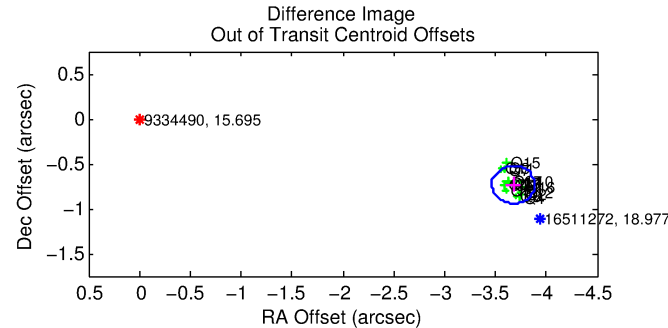
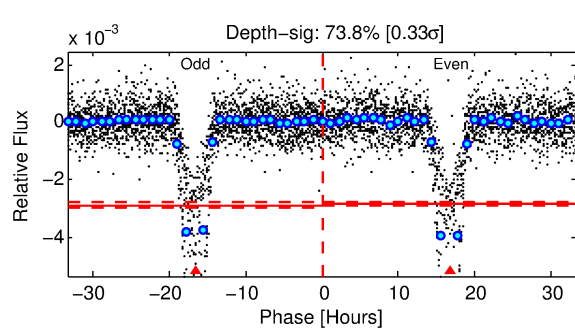
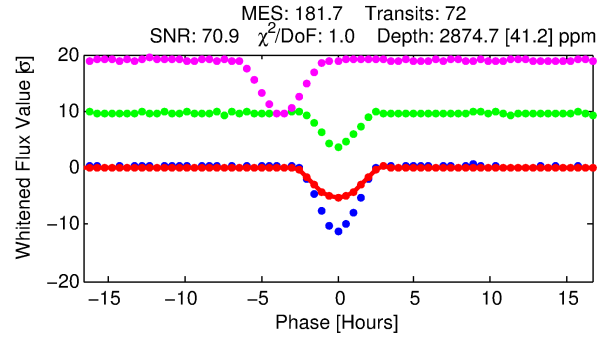
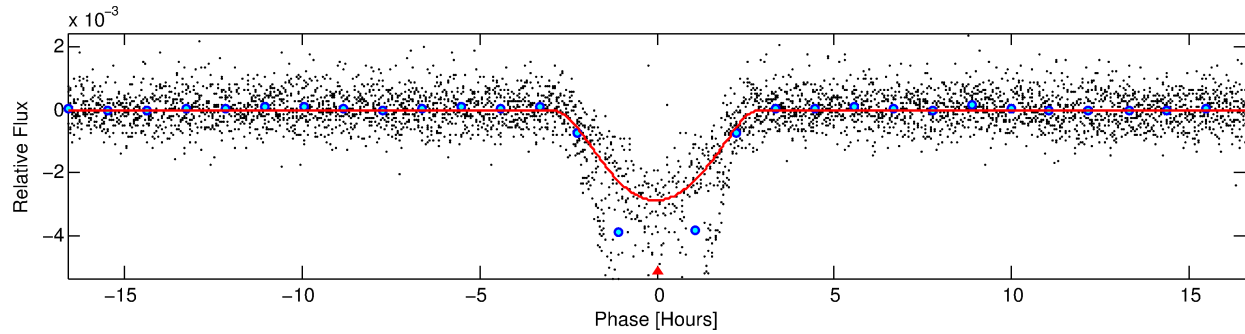
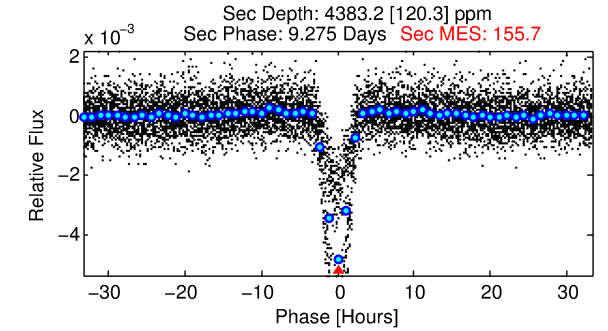
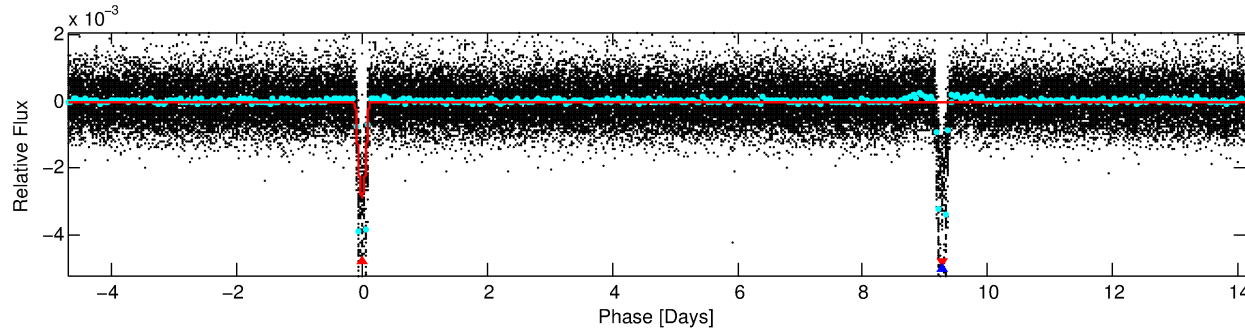
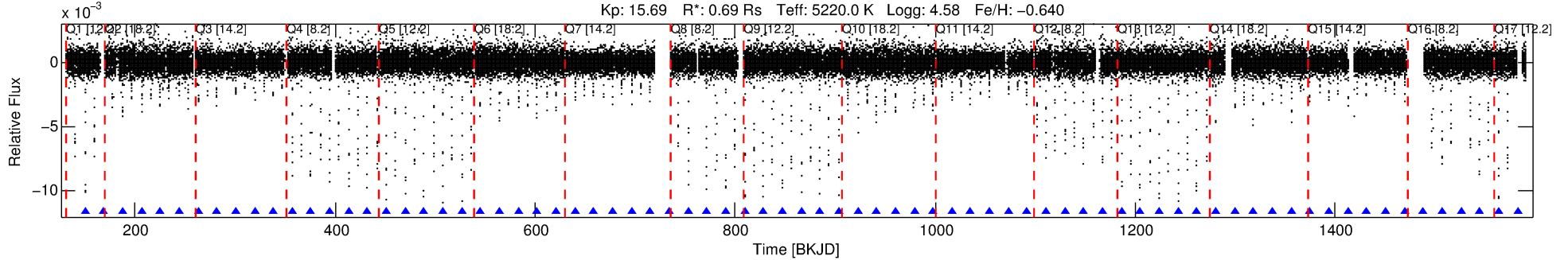
Ephemeris Match Information For 009334490-01

No Significant Match Found

DV One-Page Summary

KIC: 9334490 Candidate: 1 of 2 Period: 18.845 d
KOI: K07161.01 Corr: 0.976

Kp: 15.69 R*: 0.69 Rs Teff: 5220.0 K Logg: 4.58 Fe/H: -0.640



DV Fit Results:

Period = 18.84493 [0.00004] d
Epoch = 149.9483 [0.0016] BKJD
Rp/R* = 0.0794 [0.0231]
a/R* = 11.95 [0.96]
b = 0.98 [0.04]
Seff = 21.91 [4.34]
Teq = 552 [27] K
Rp = 6.02 [1.86] Re
a = 0.1211 [0.0116] AU
Ag = 976.30 [585.76] [1.67σ]
Teff = 4768 [711] K [5.92σ]

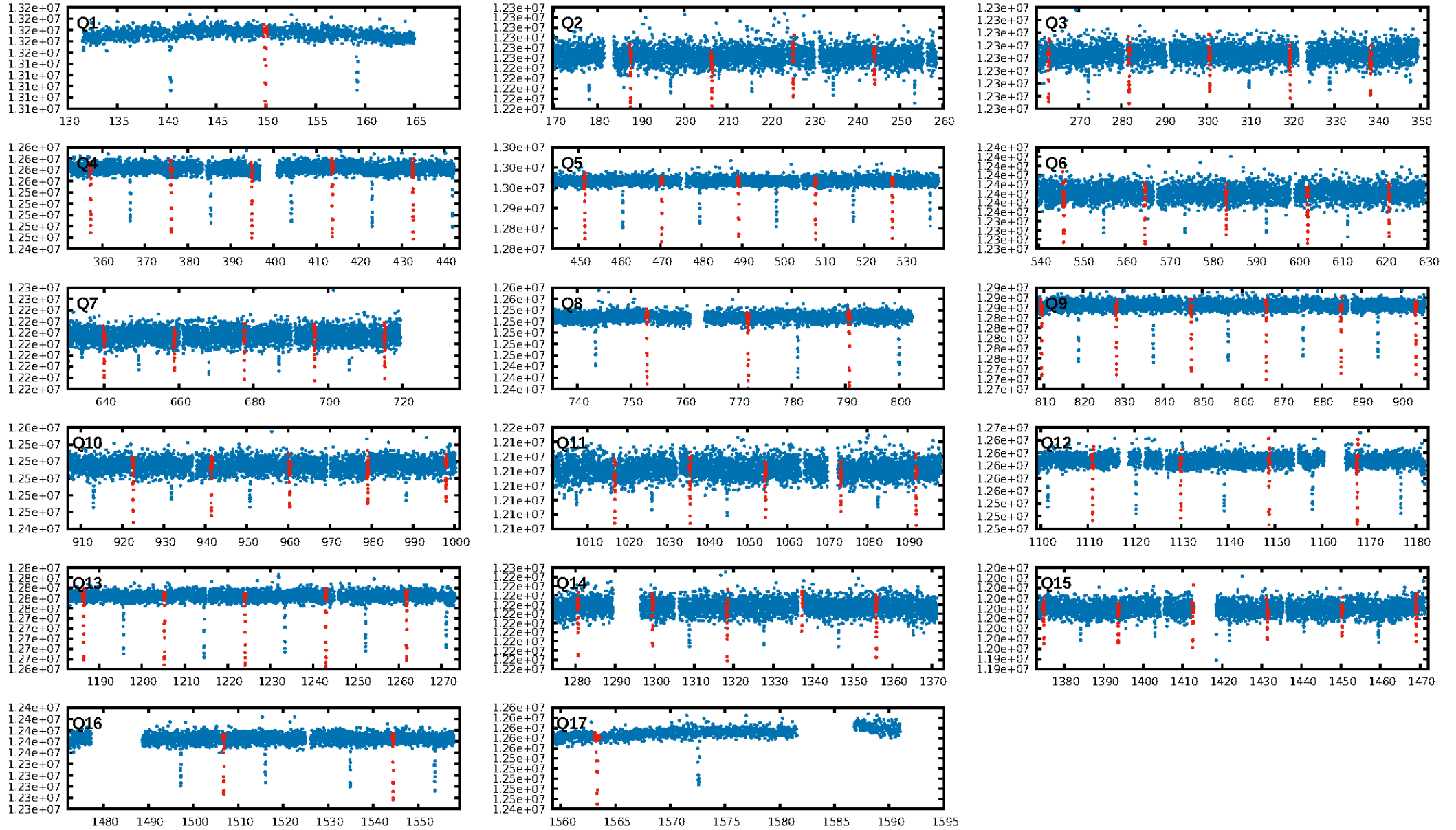
DV Diagnostic Results:

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 [70/70]
GhostDiagnostic-chr: -0.04926
Centroid-sig: 0.0%
Centroid-so: 15.487 arcsec [114.65σ]
OotOffset-rm: 3.747 arcsec [53.49σ]
KicOffset-rm: 4.131 arcsec [59.31σ]
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]

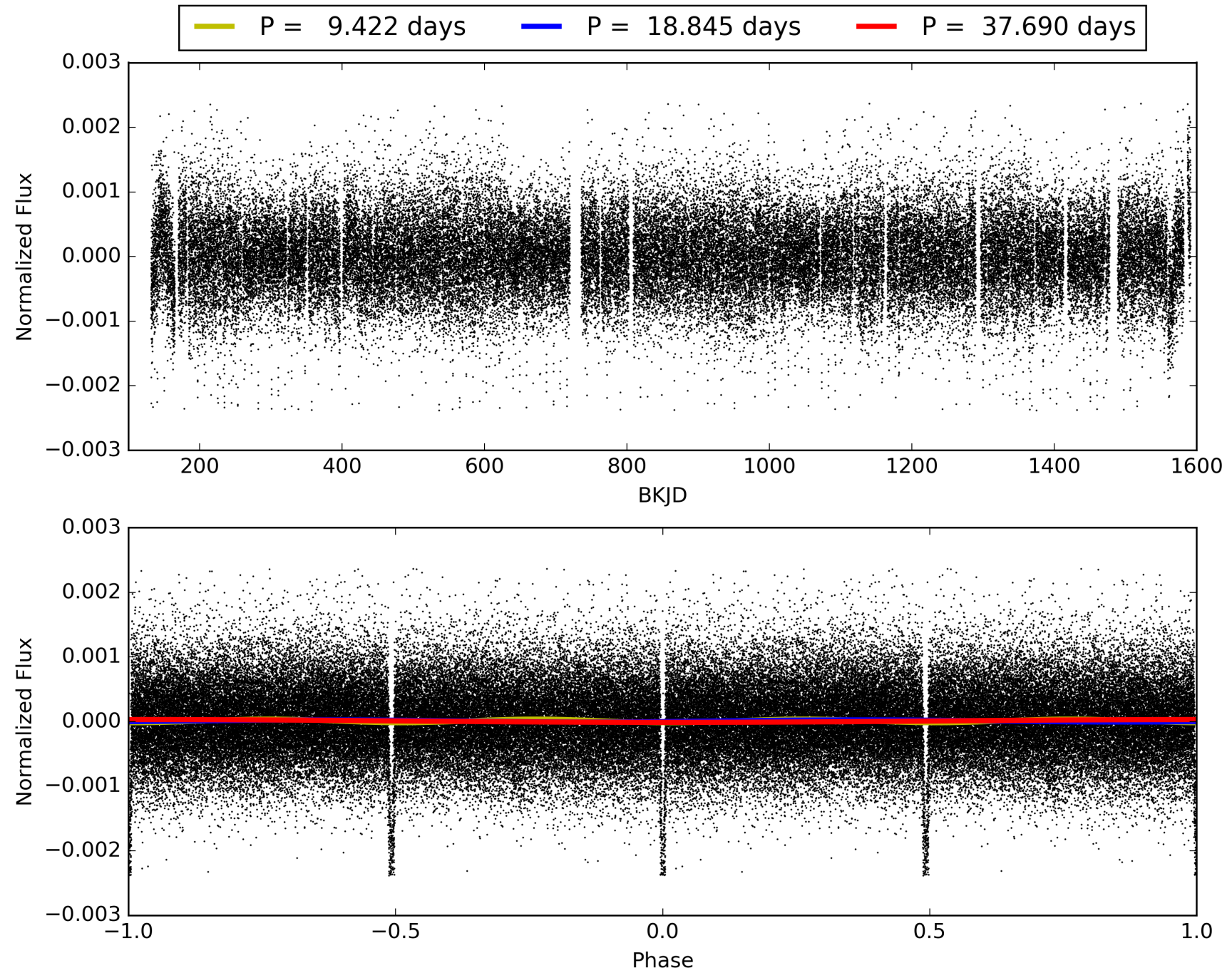
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009334490-01, PDC Light Curves

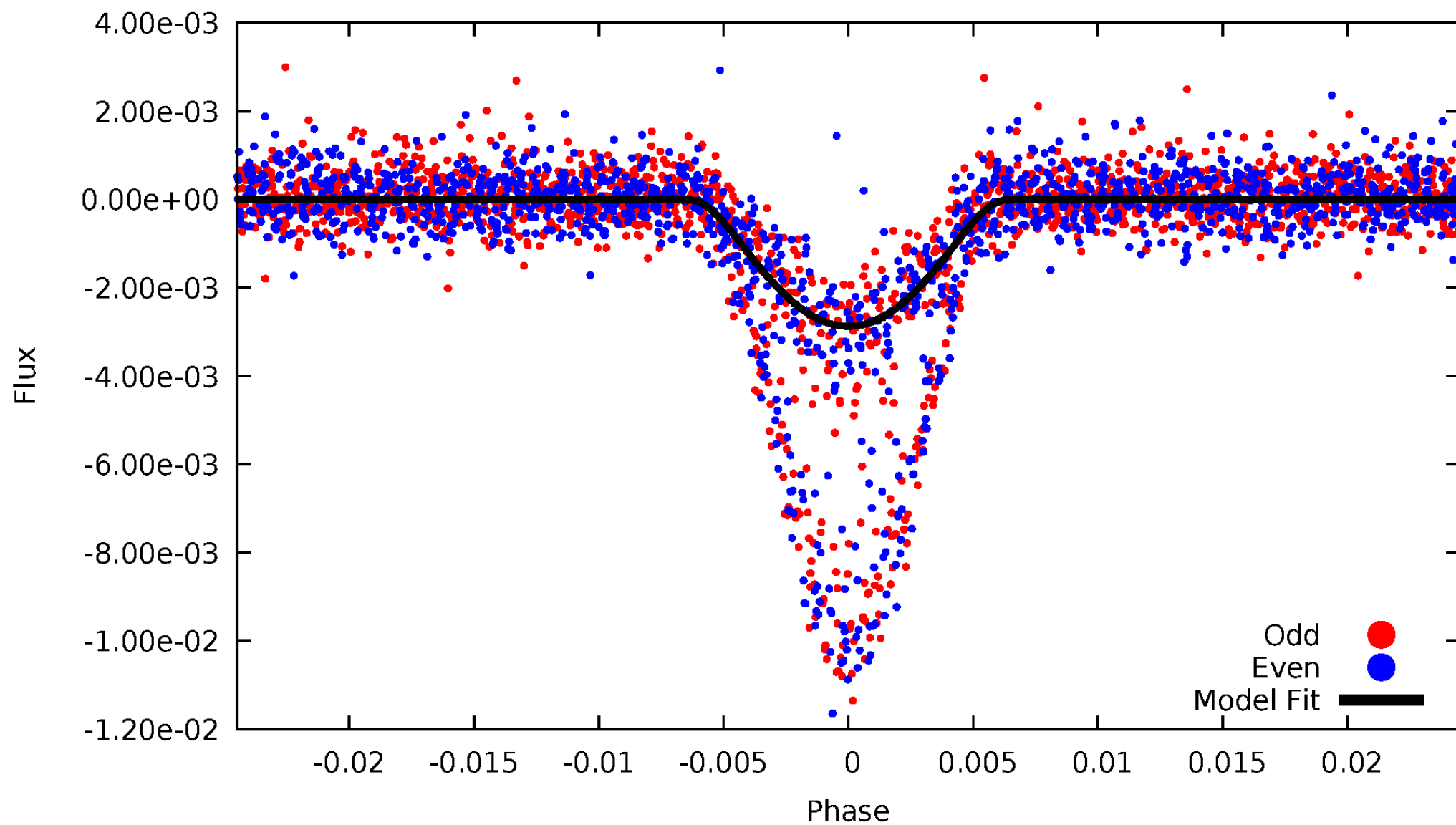


TCE 009334490-01



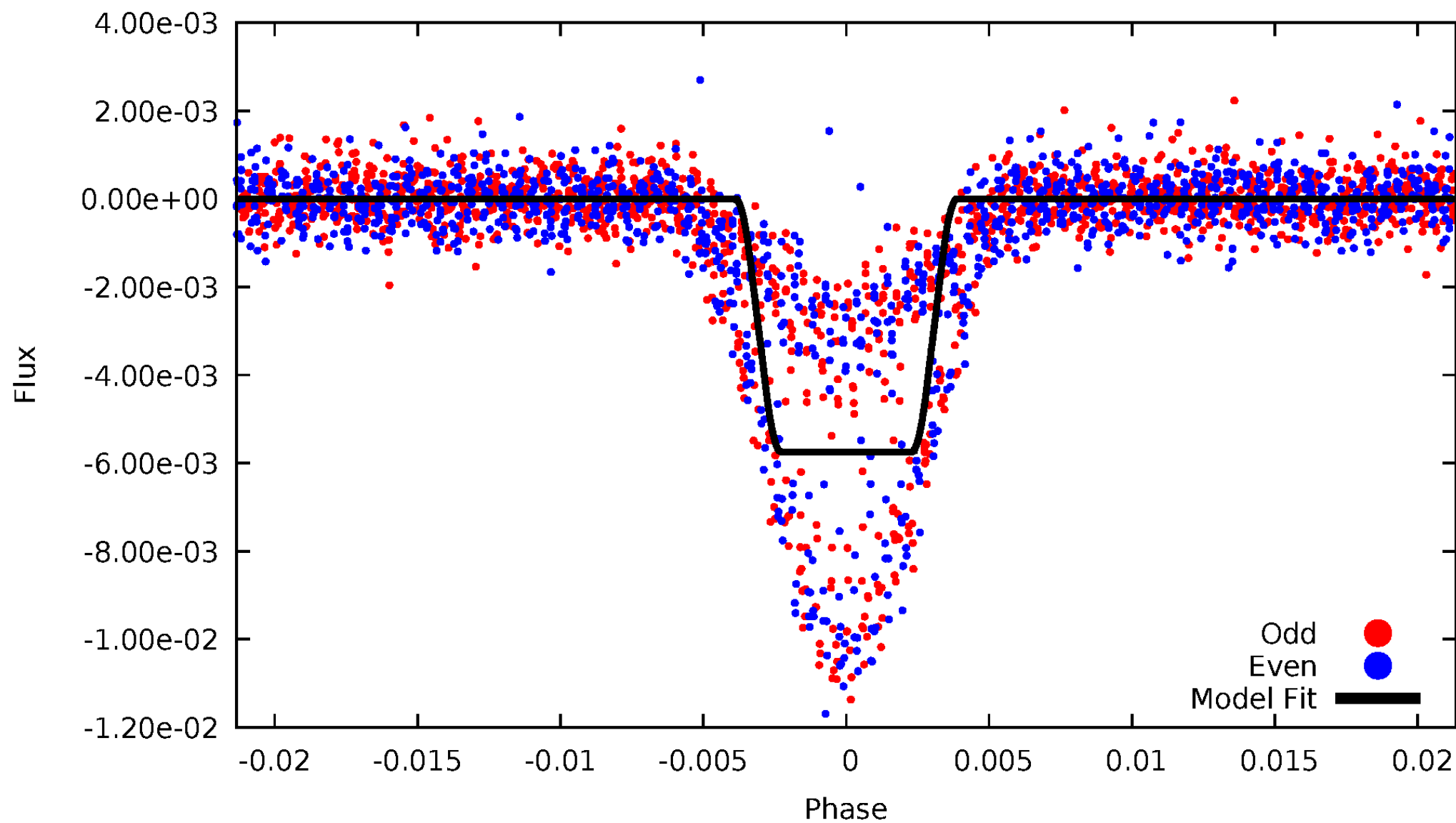
DV Odd/Even

TCE 009334490-01

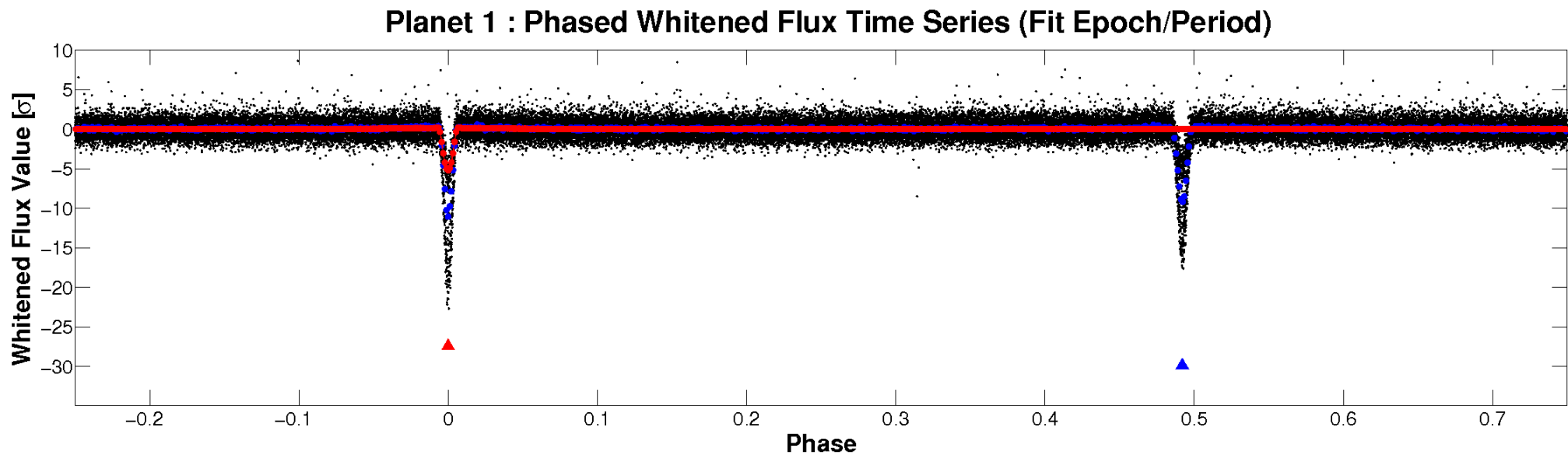
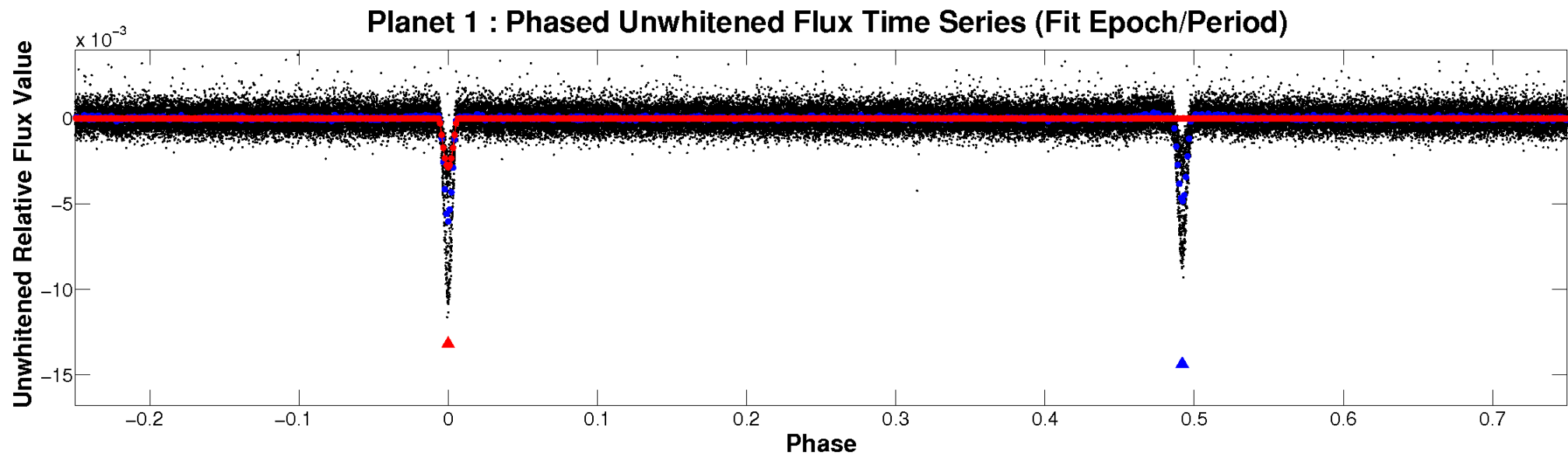


ALT Odd/Even

TCE 009334490-01

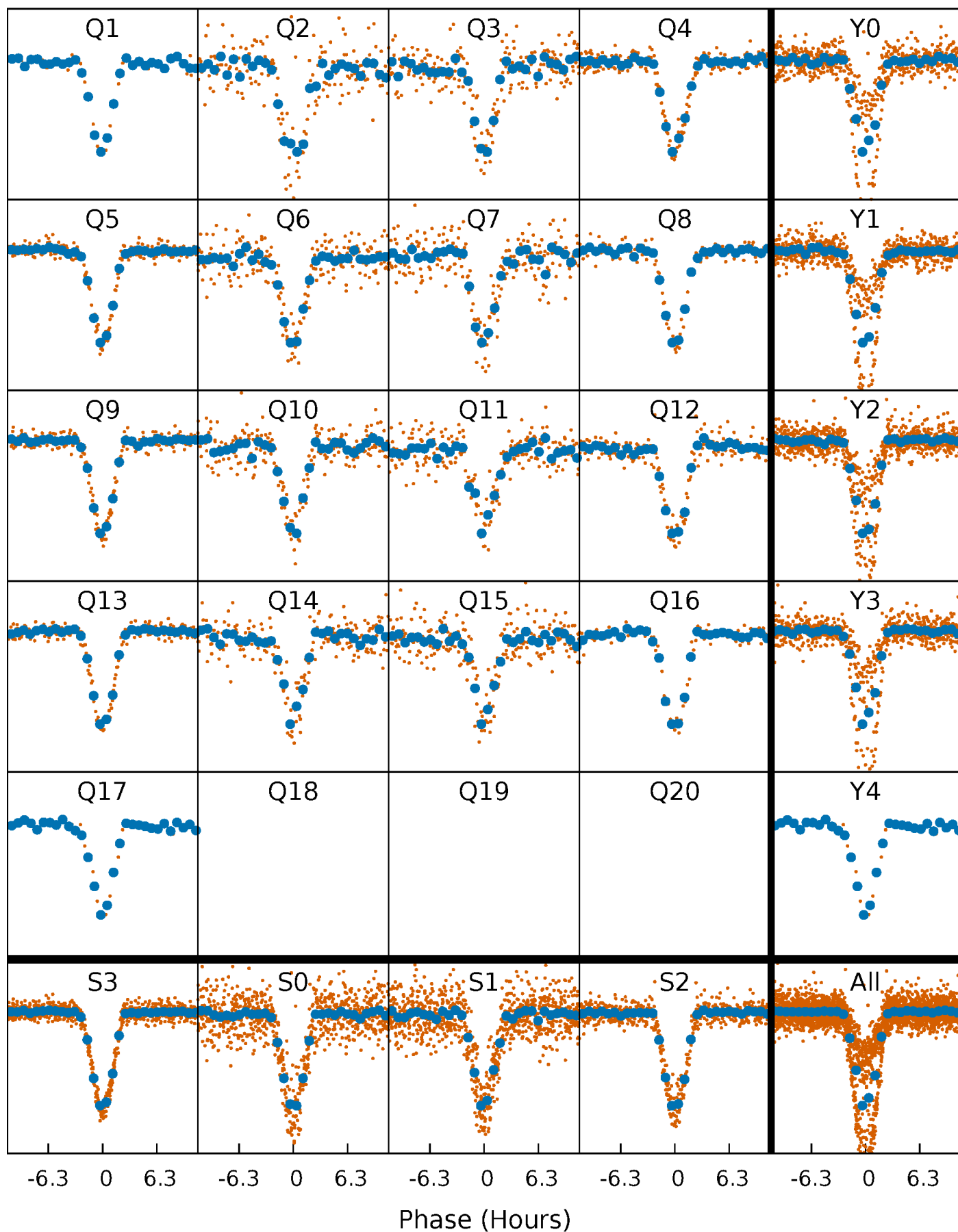


Non-Whitened Vs. Whitened Light Curve



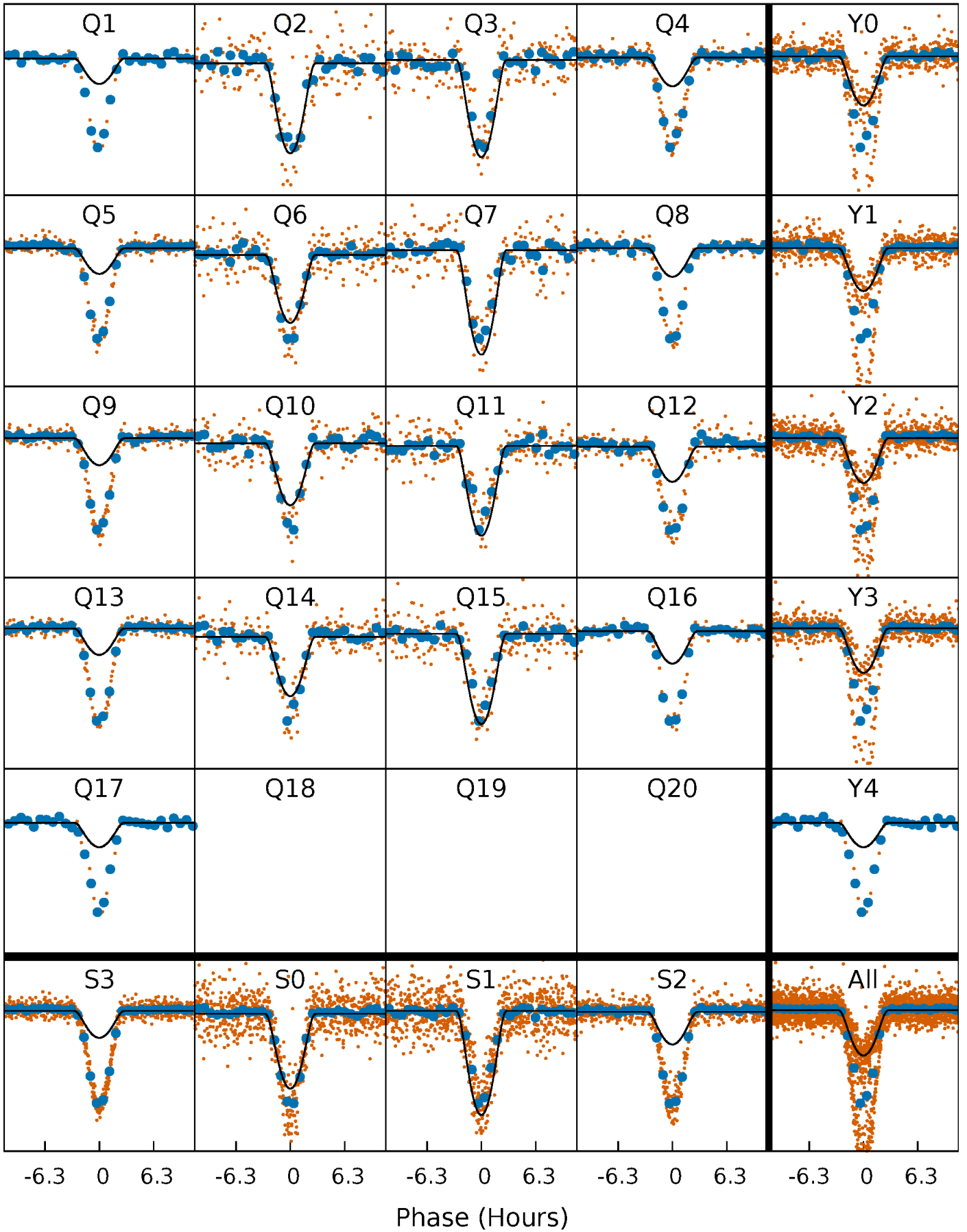
PDC Quarter-Phased Transit Curves

TCE 009334490-01 P= 18.844932 Days $T_0=149.948350$ (BKJD)



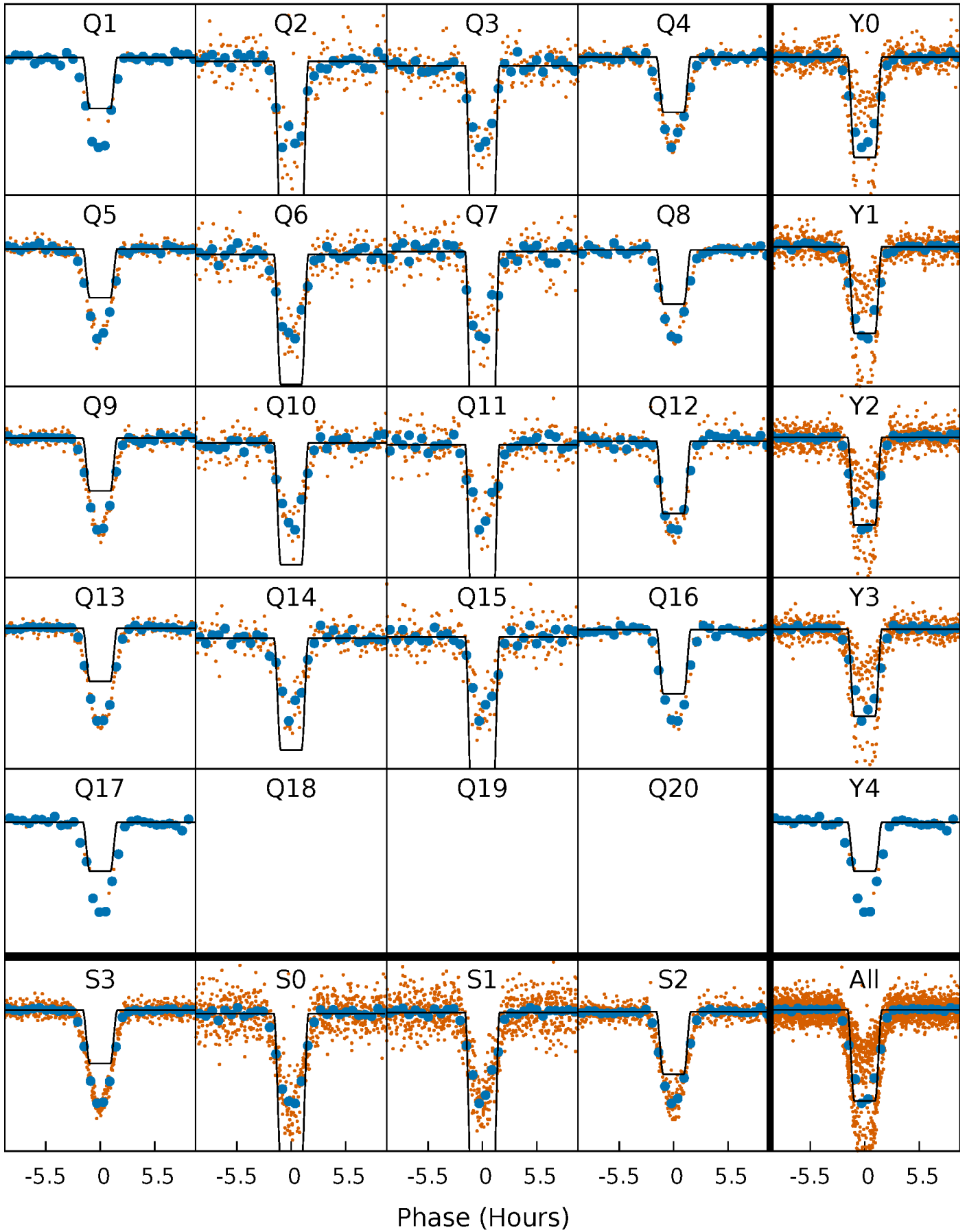
DV Quarter-Phased Transit Curves

TCE 009334490-01 P= 18.844932 Days $T_0=149.948350$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

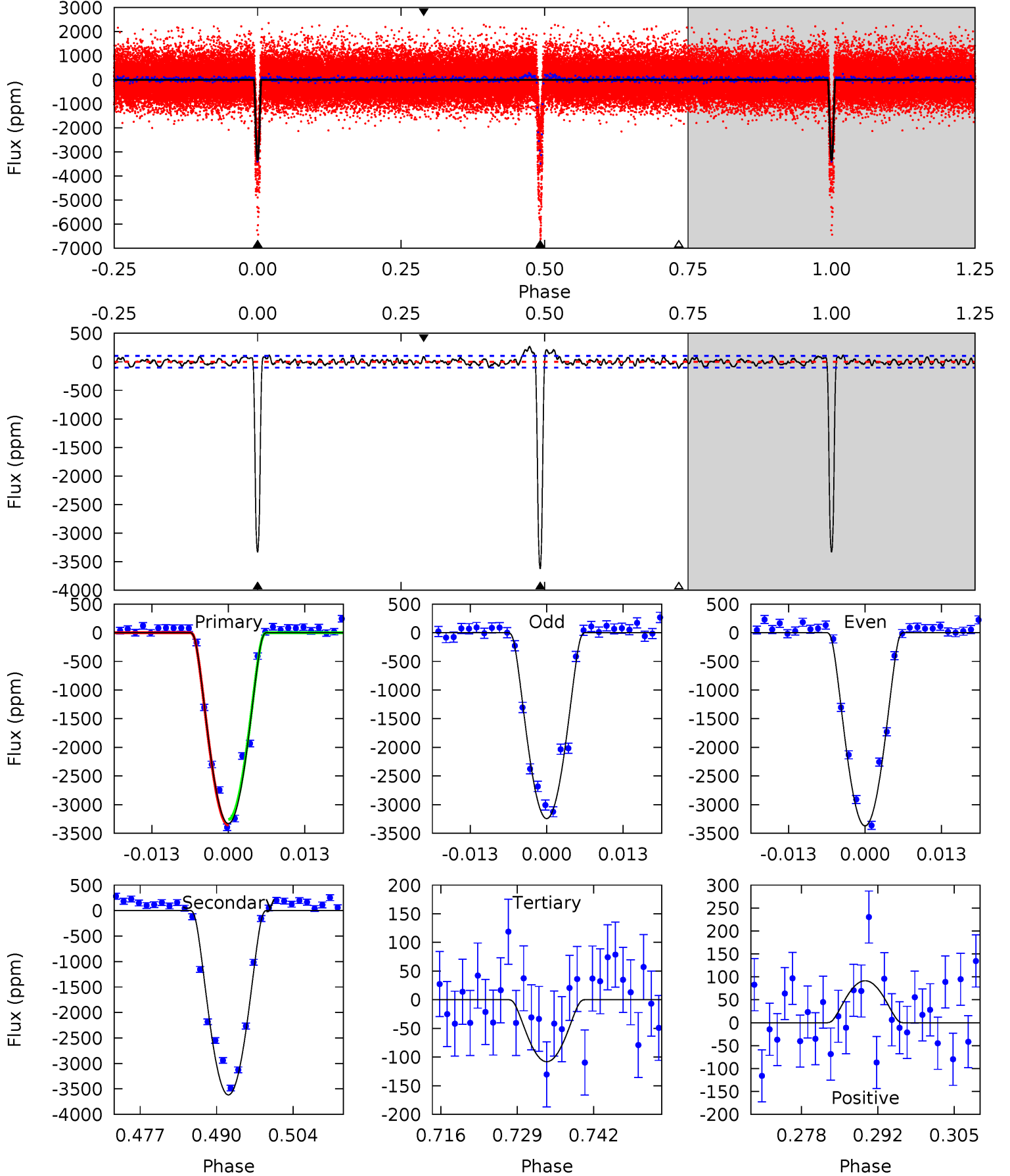
TCE 009334490-01 P= 18.844874 Days $T_0=149.950915$ (BKJD)



DV Model-Shift Uniqueness Test

009334490-01, P = 18.844932 Days, E = 131.103418 Days

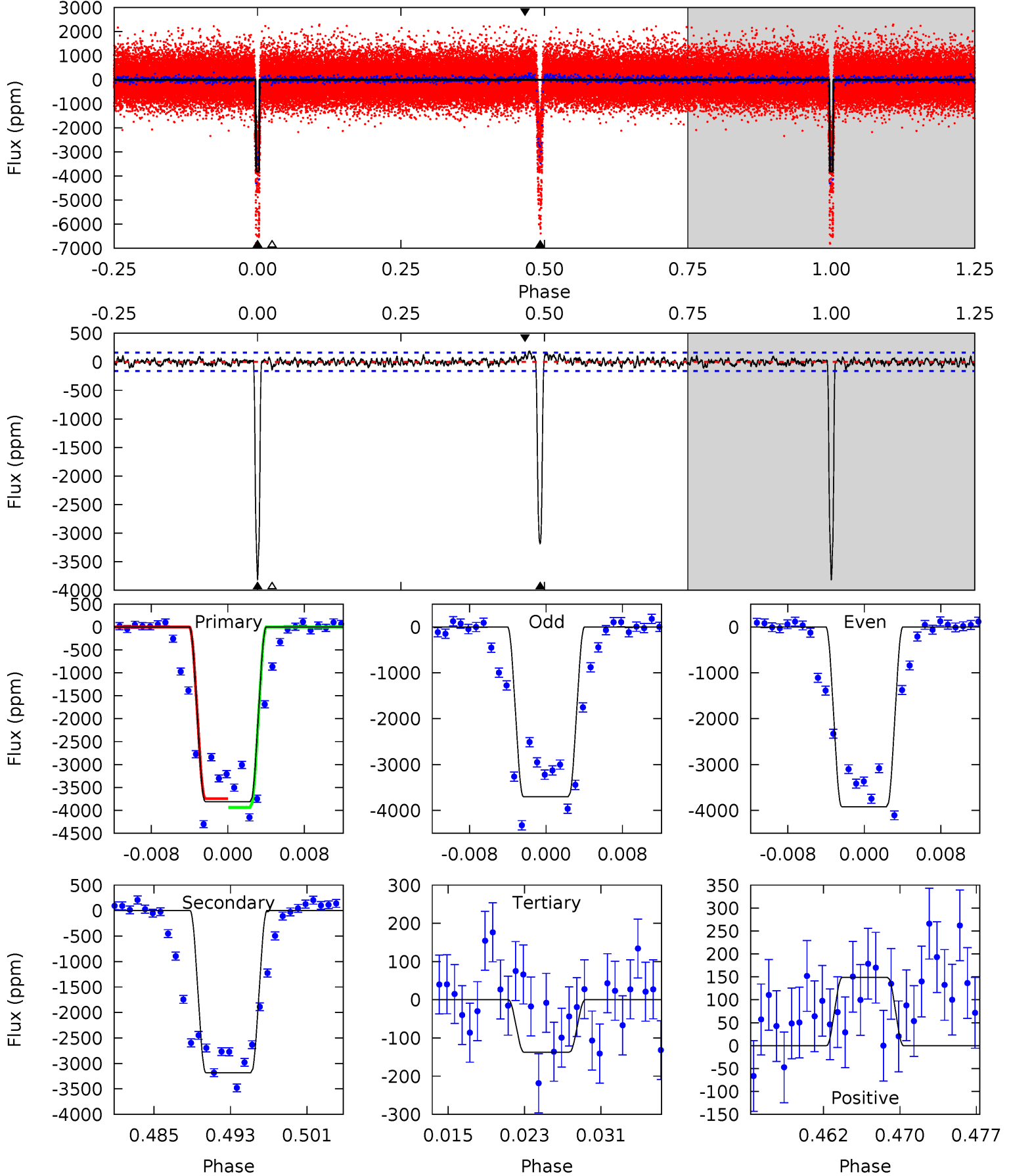
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
160.2	174.1	5.20	4.40	4.97	2.48	2.47	155.0	155.8	168.9	169.7	3.06	1.44	0.07	2.30



Alt Model-Shift Uniqueness Test

009334490-01, P = 18.844874 Days, E = 131.106041 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
120.3	100.5	4.34	4.70	5.08	2.66	1.41	116.0	115.6	96.2	95.8	3.45	1.43	0.05	2.82



Stellar Parameters For KIC 009334490

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5220^{+173}_{-157}	$4.578^{+0.084}_{-0.056}$	$-0.640^{+0.350}_{-0.300}$	$0.695^{+0.074}_{-0.066}$	$0.665^{+0.084}_{-0.034}$	$2.797^{+0.905}_{-0.574}$
	+3%/-3%	+2%/-1%	+55%/-47%	+11%/-9%	+13%/-5%	+32%/-21%
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 009334490-01 / KOI 7161.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3617 ± 21	$6.10^{+1.81}_{-1.76}$	769^{+32}_{-33}	4629^{+722}_{-433}	799^{+812}_{-319}
Alt.	-3184 ± 32	$5.73^{+1.68}_{-1.80}$	768^{+31}_{-30}	4641^{+773}_{-473}	804^{+883}_{-327}

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 $A_{obs} \gg 1.0$

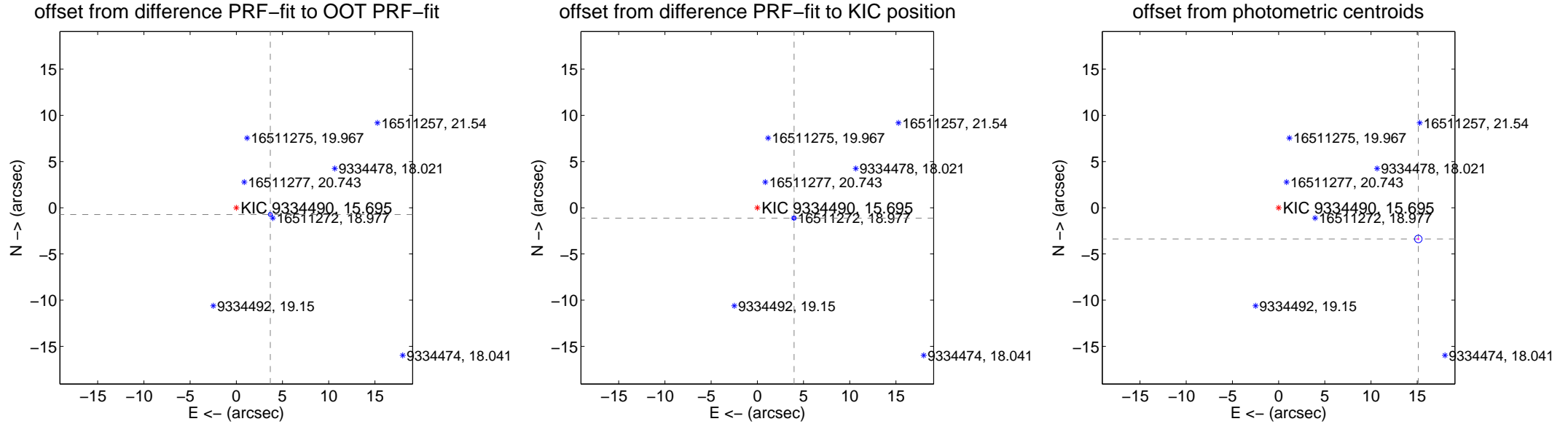
DV Centroid Data

Supplemental centroid analysis for 009334490-01. Kepler magnitude: 15.70. Transit SNR 70.93

There are 17 quarters with good PRF difference image offsets

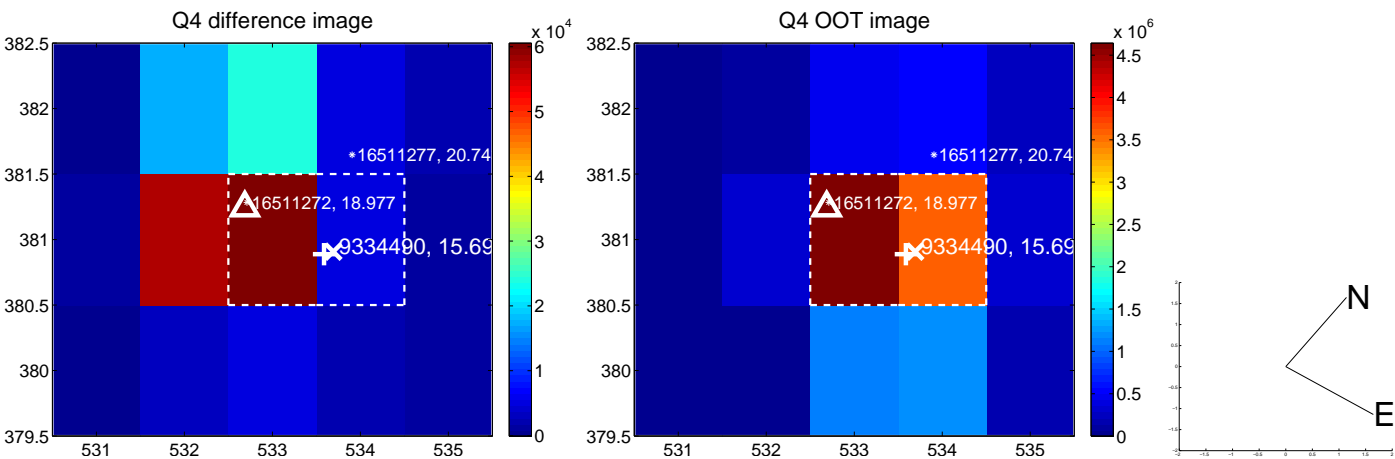
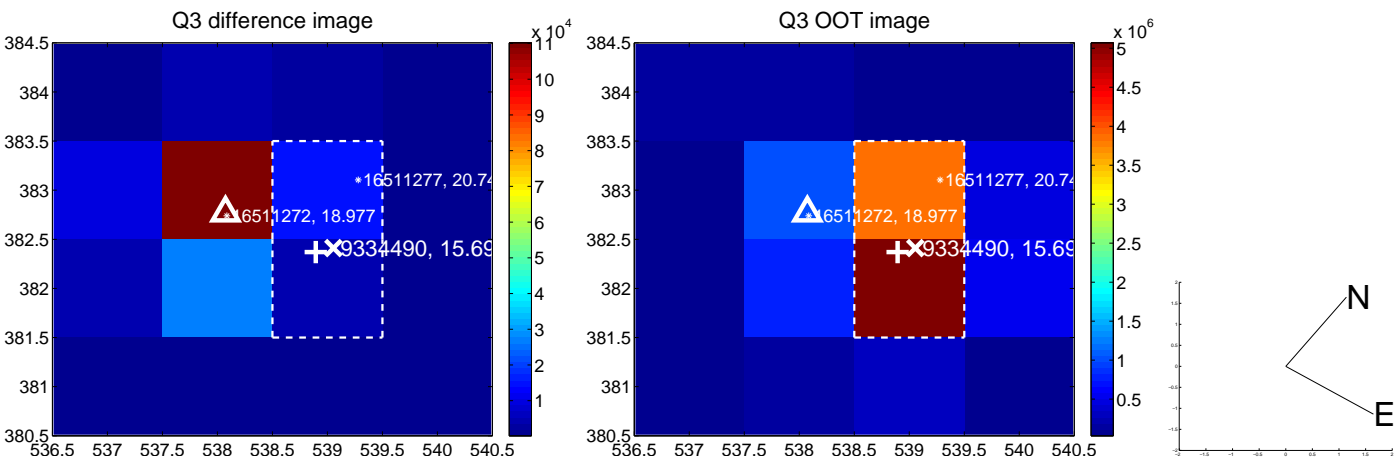
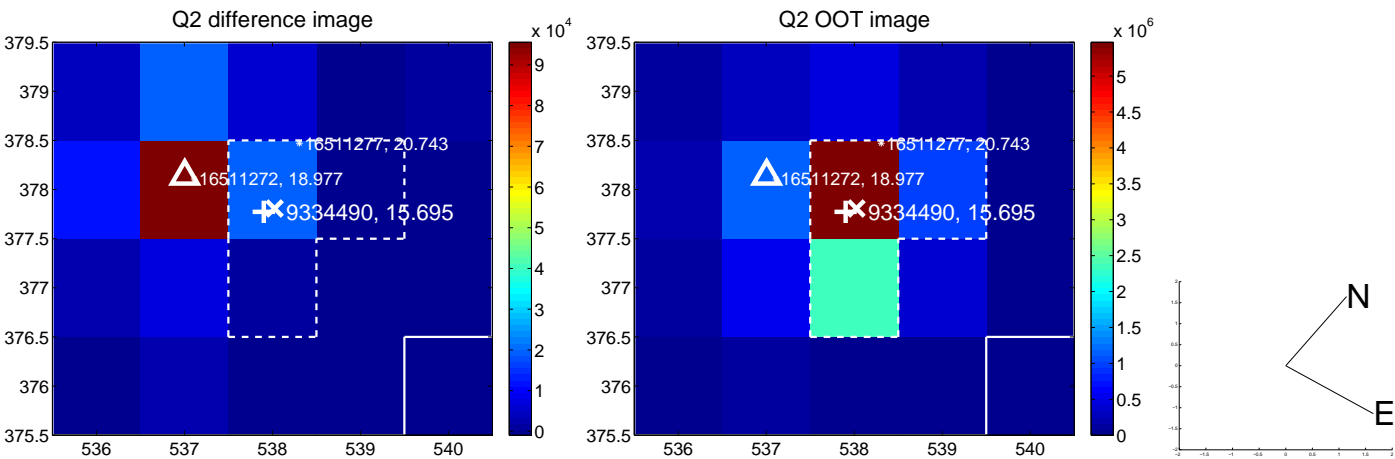
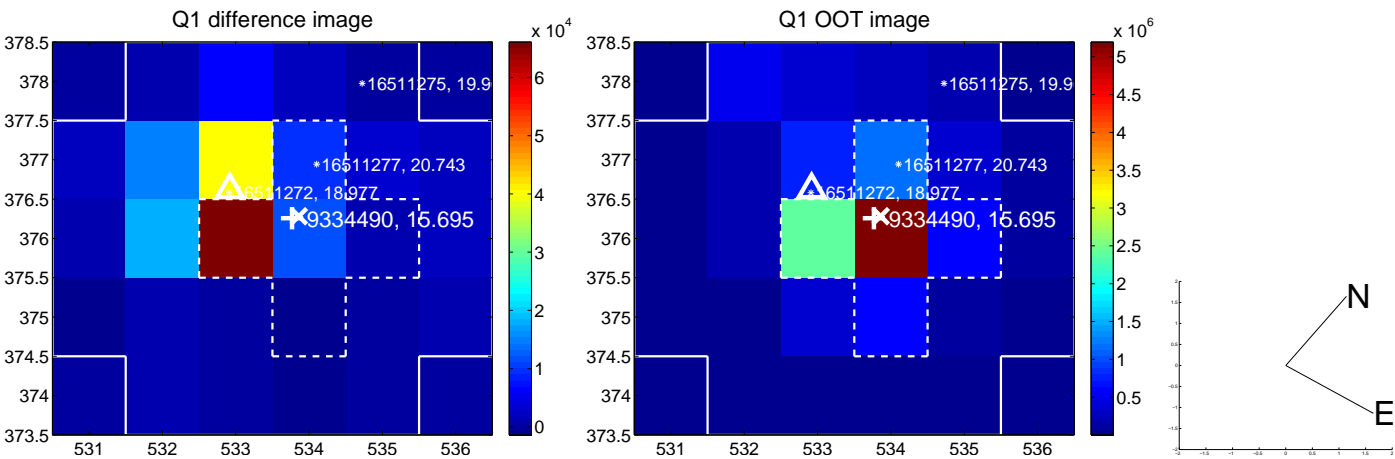
The direct PRF centroid is offset from the target star catalog position by about 0.46 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.747 \pm 0.070	53.49	-3.675 \pm 0.069	-0.732 \pm 0.073
PRF-fit source offset from KIC position	4.131 \pm 0.070	59.31	-3.976 \pm 0.070	-1.122 \pm 0.068
photometric centroid source offset	15.49 \pm 0.14	114.65	-15.11 \pm 0.14	-3.38 \pm 0.14

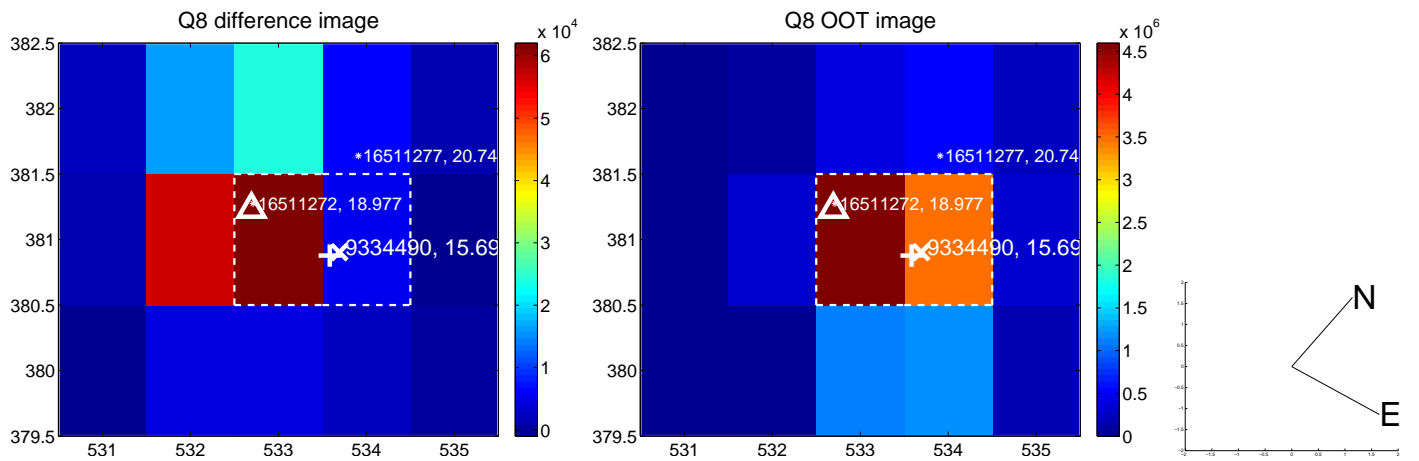
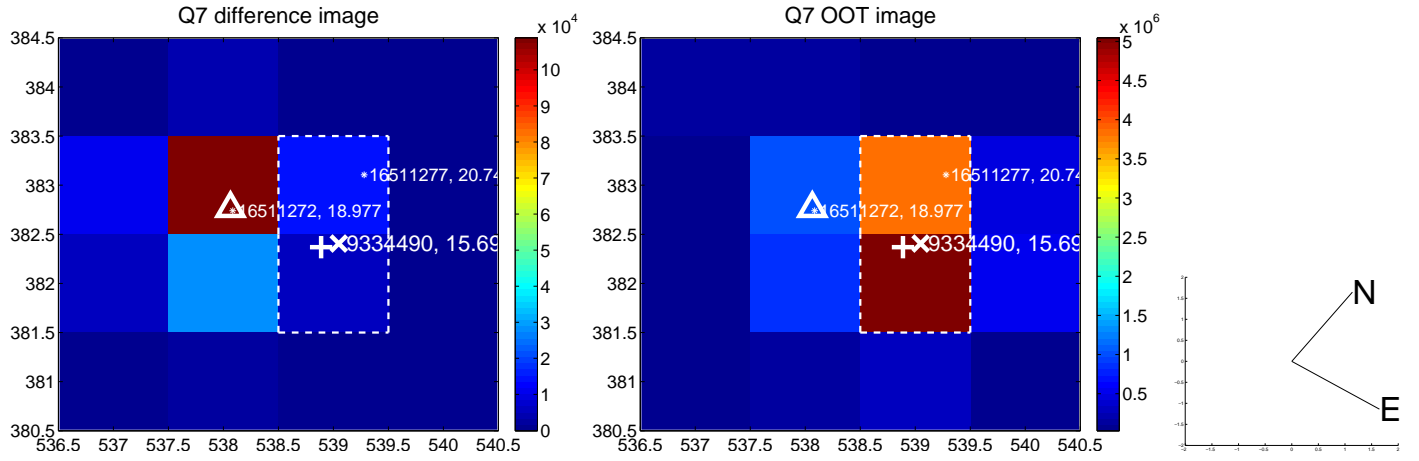
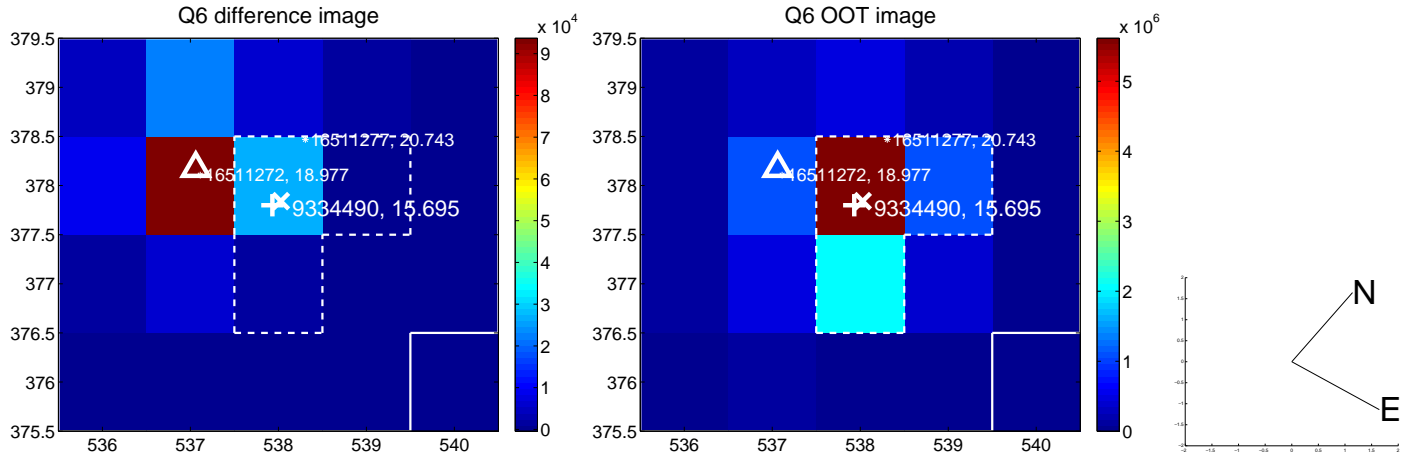
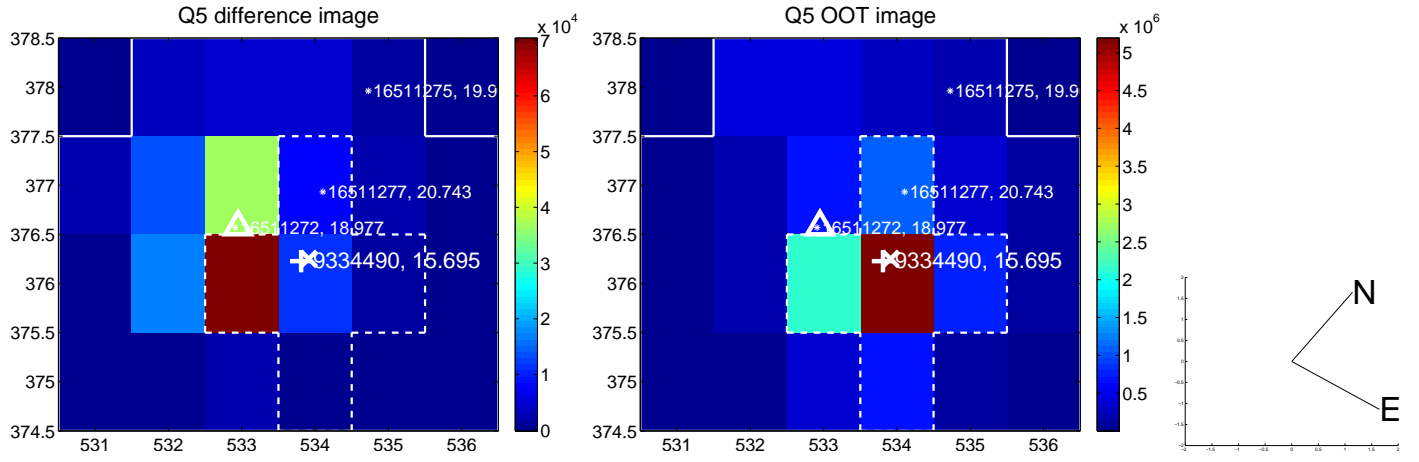


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

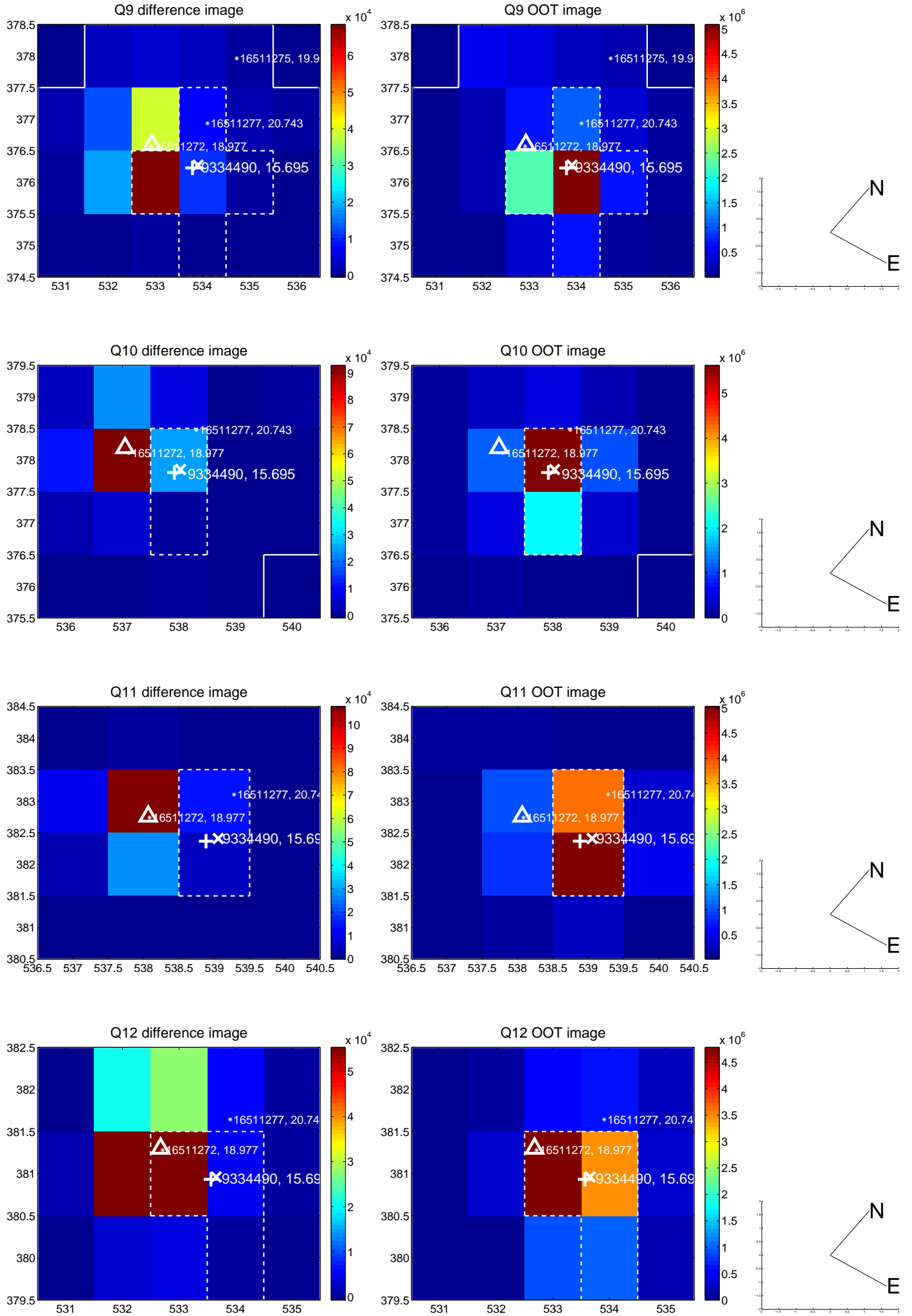
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



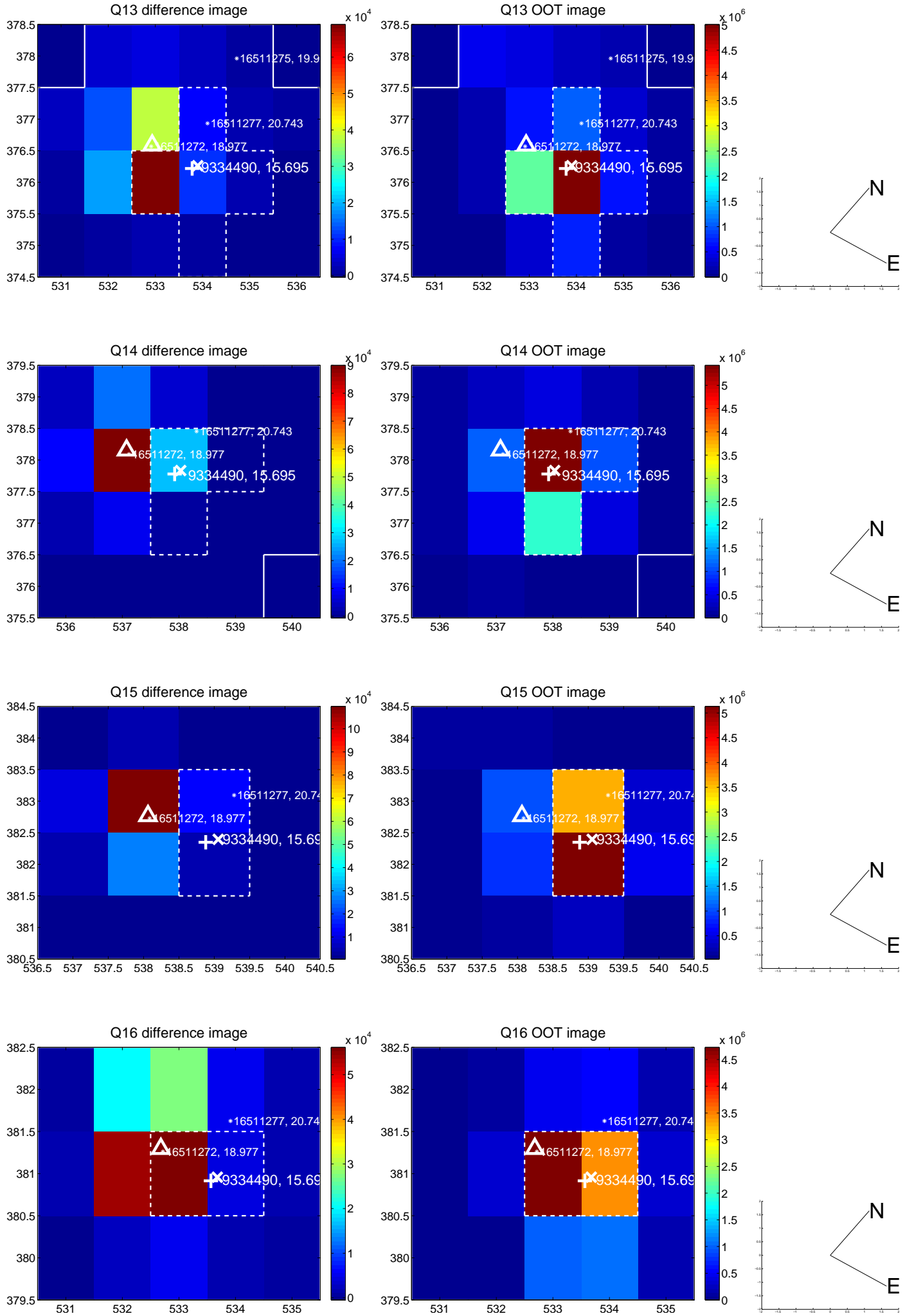
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



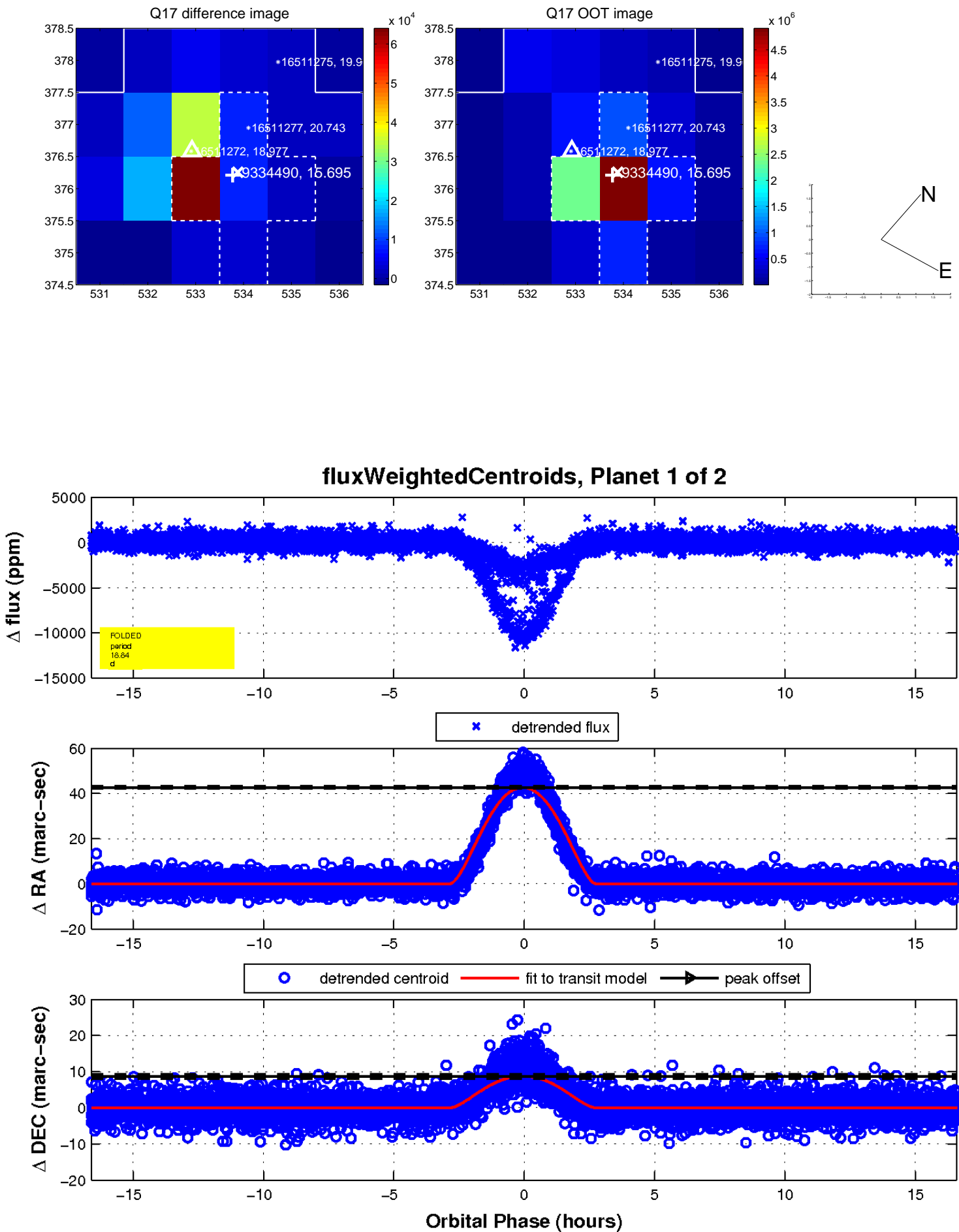
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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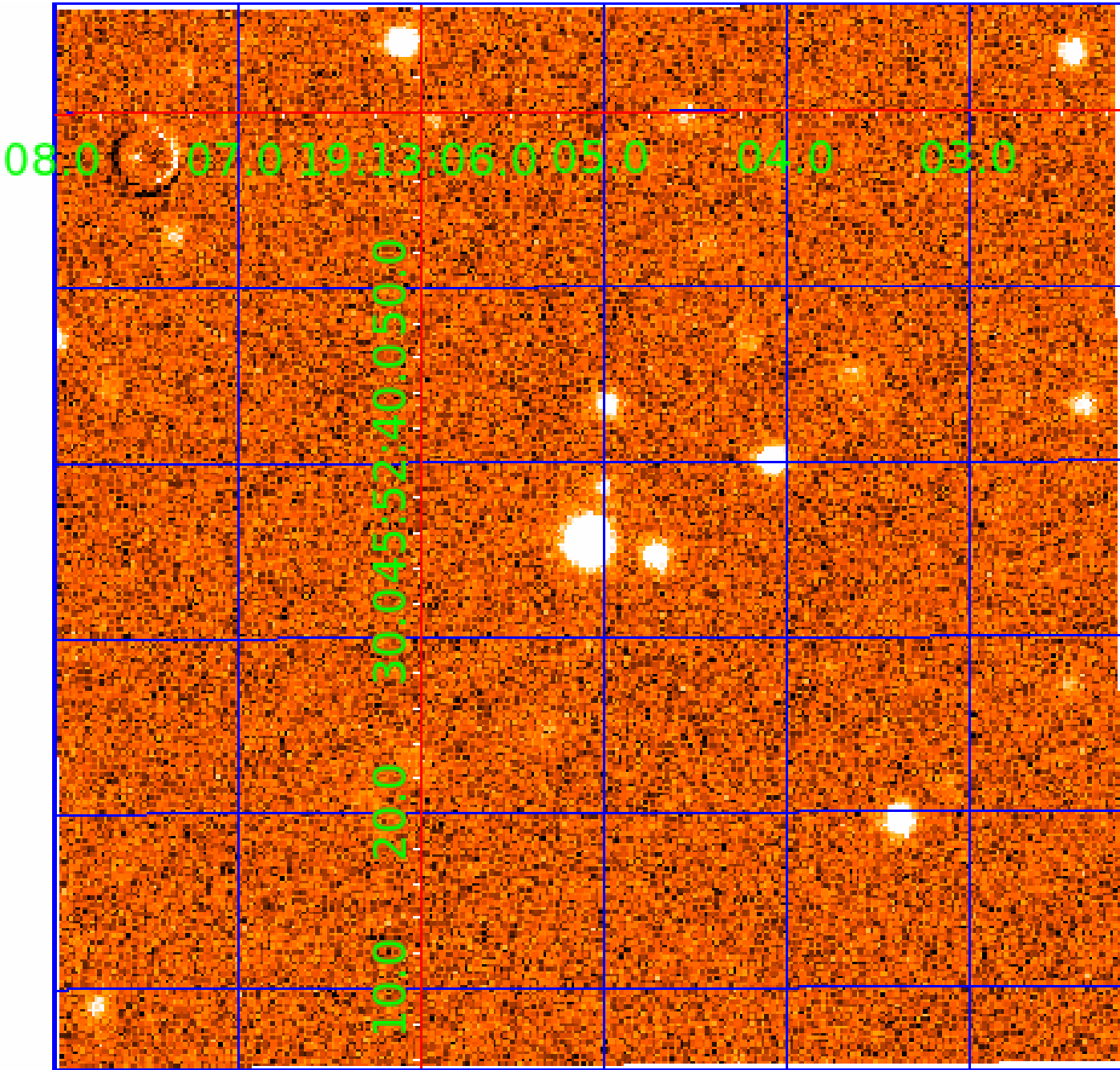


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009334490

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})
009334490-01	OBS	7161.01	18.844932	149.948350	2874.7	5.535	181.7	70.9	0.69	5220	6.02	21.91
009334490-02	OBS	No	18.845020	140.372754	2305.5	5.645	155.5	67.2	0.69	5220	4.00	21.91

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009334490-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_KIC_POS—HALO_GHOST
009334490-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_KIC_POS—HALO_GHOST

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.

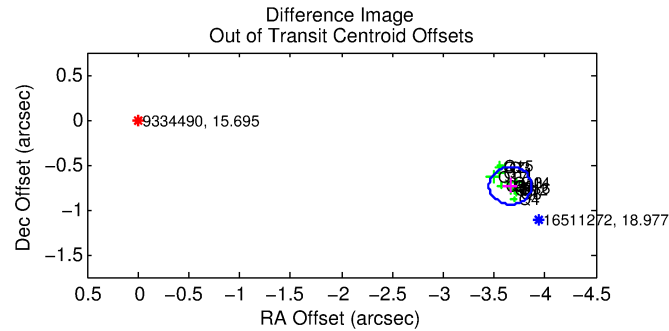
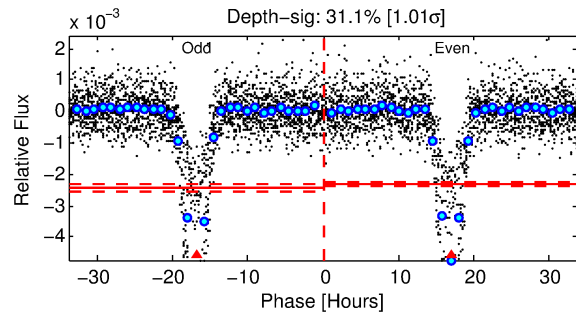
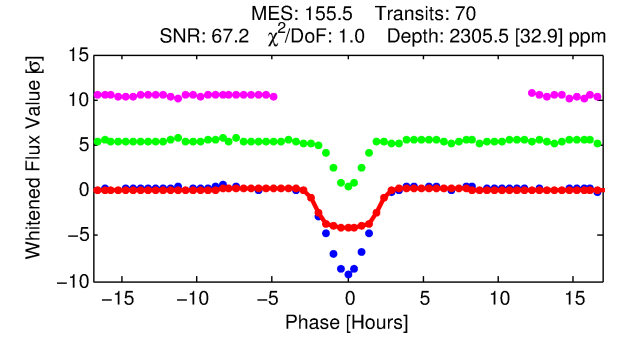
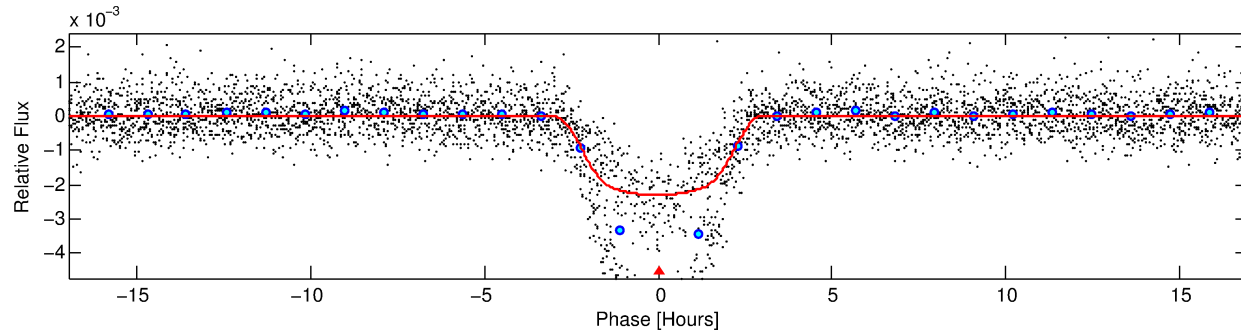
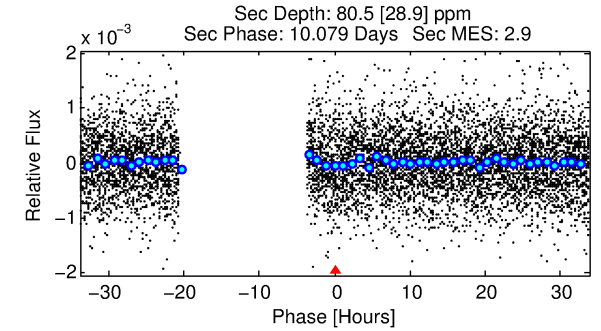
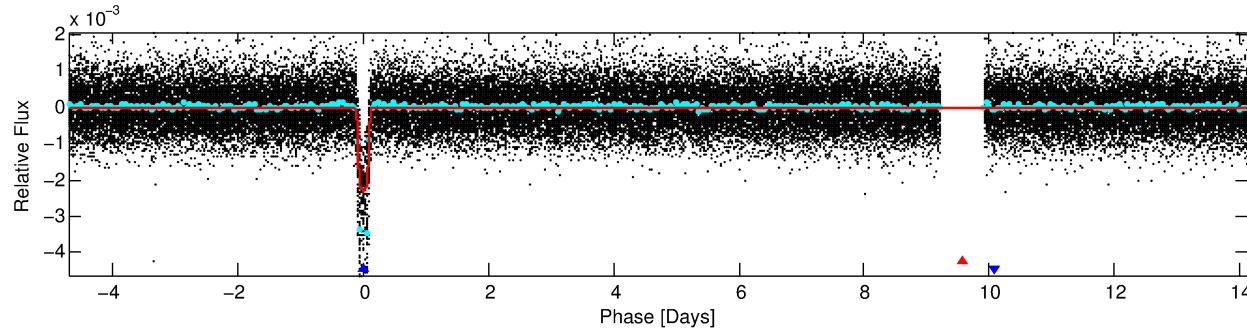
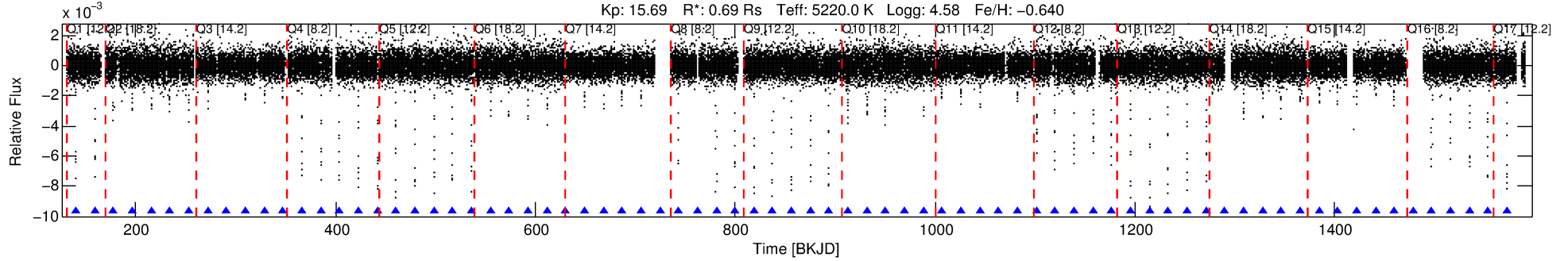
Ephemeris Match Information For 009334490-02

No Significant Match Found

DV One-Page Summary

KIC: 9334490 Candidate: 2 of 2 Period: 18.845 d
KOI: K07161 Corr: No Ephemeris Match

Kp: 15.69 R*: 0.69 Rs Teff: 5220.0 K Logg: 4.58 Fe/H: -0.640



DV Fit Results:

Period = 18.84502 [0.00004] d
Epoch = 140.3728 [0.0017] BKJD
Rp/R* = 0.0528 [0.0008]
a/R* = 14.01 [0.66]
b = 0.90 [0.01]
Seff = 21.91 [4.34]
Teff = 552 [27] K
Rp = 4.00 [0.43] Re
a = 0.1211 [0.0116] AU
Ag = 40.59 [15.80] [2.51σ]
Teffp = 2153 [207] K [7.68σ]

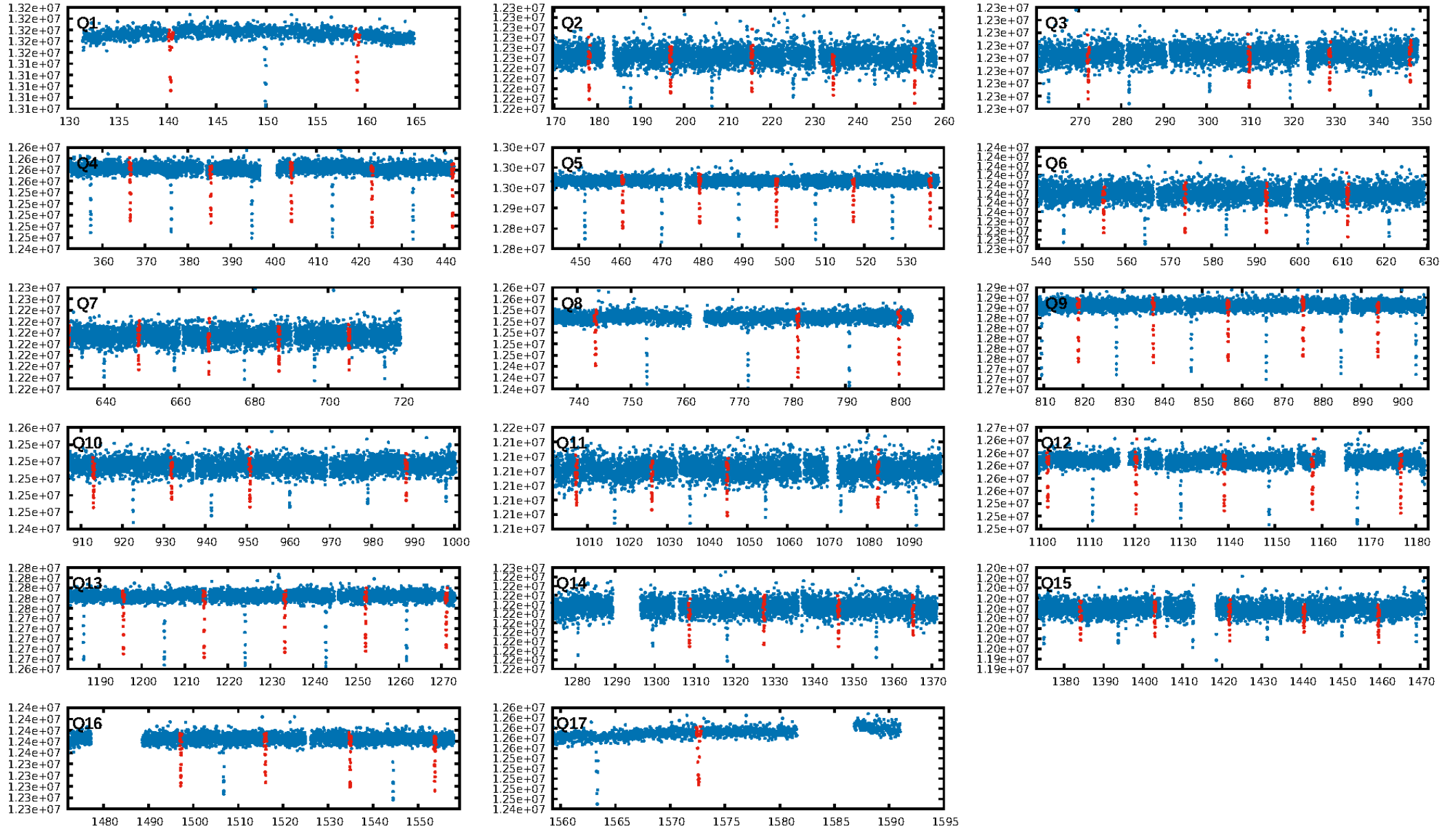
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [67/67]
GhostDiagnostic-chr: 0.02595
Centroid-sig: 0.0%
Centroid-so: 12.901 arcsec [88.04σ]
OotOffset-rm: 3.730 arcsec [53.63σ]
KicOffset-rm: 4.104 arcsec [59.38σ]
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]

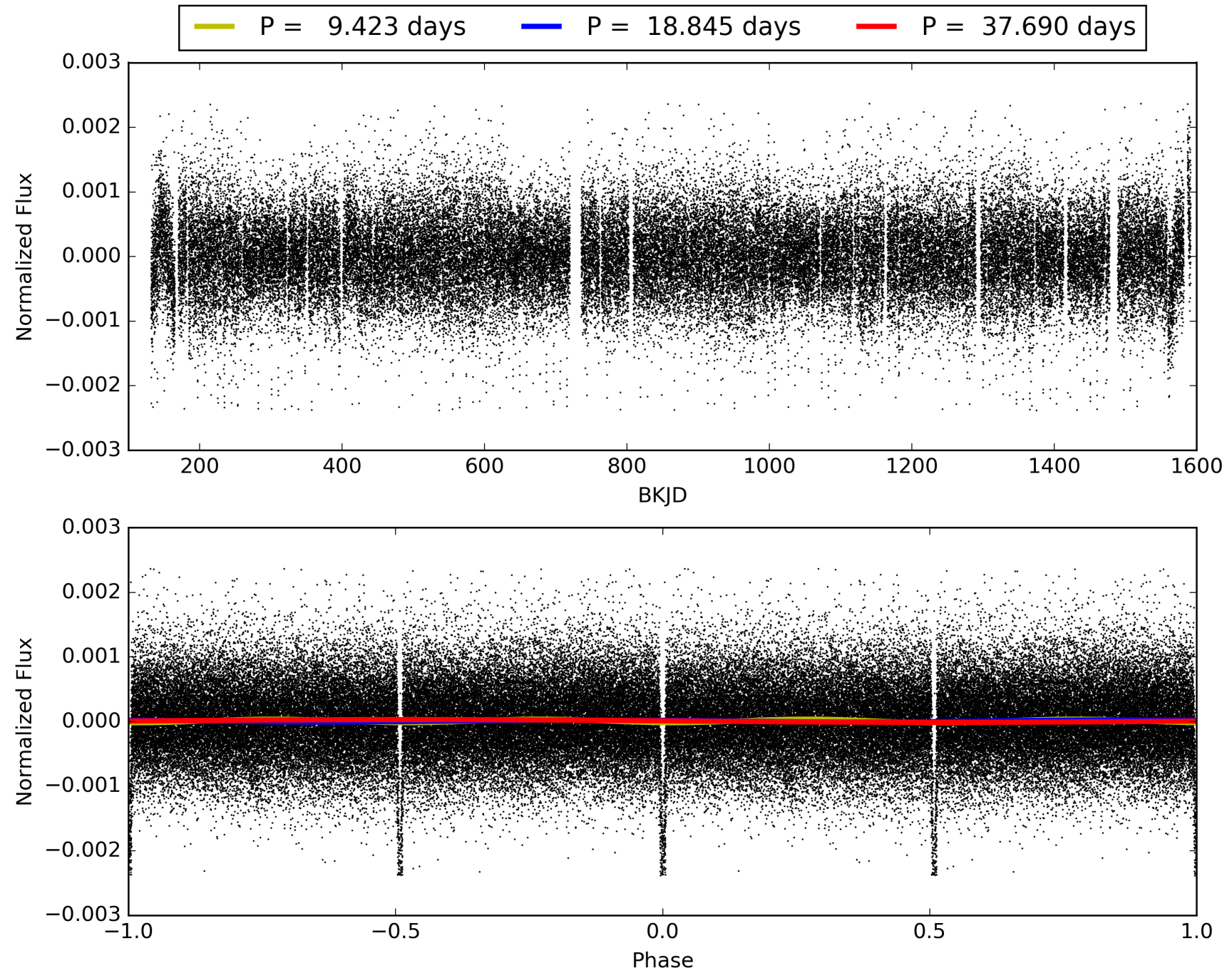
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009334490-02, PDC Light Curves

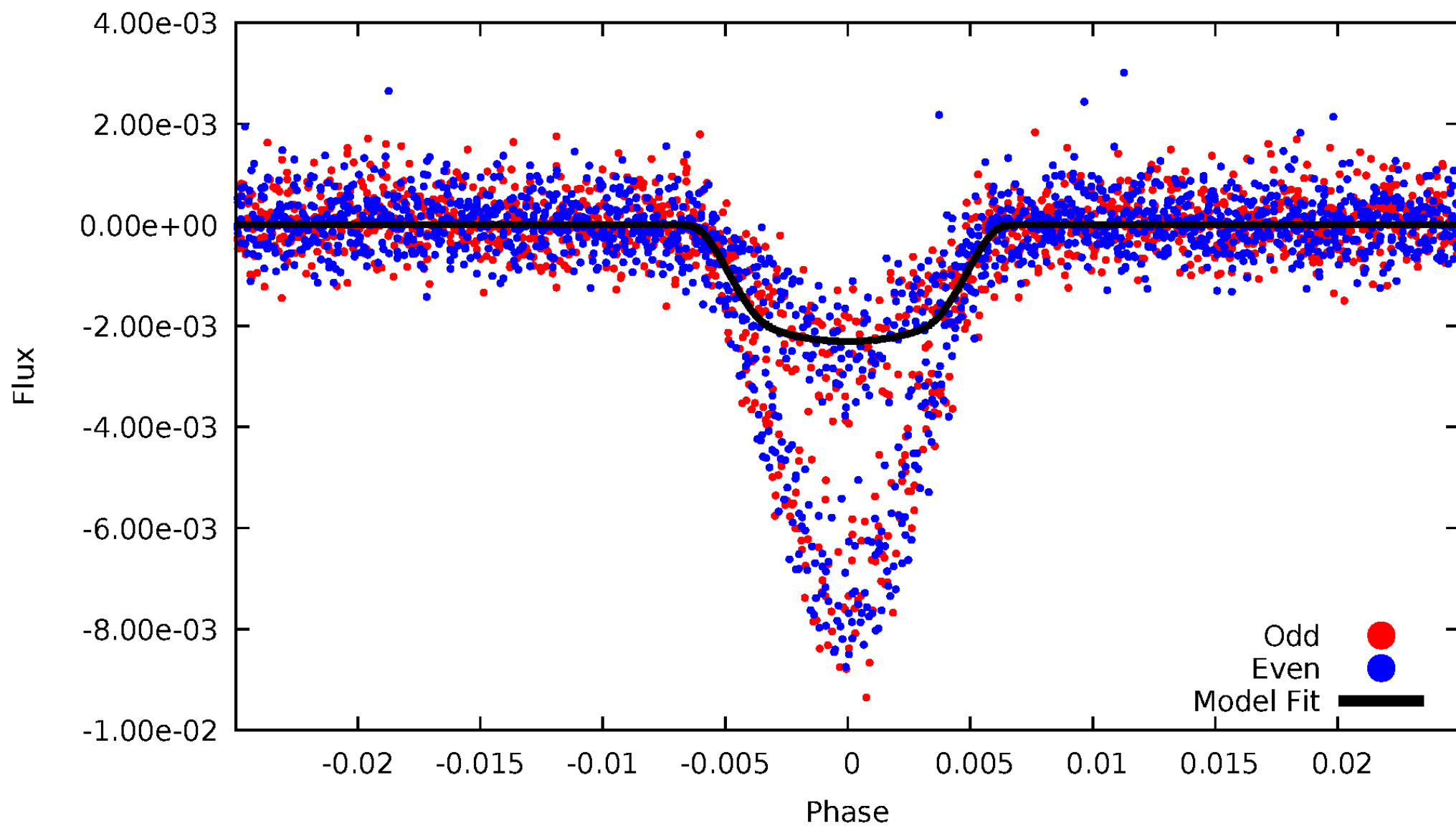


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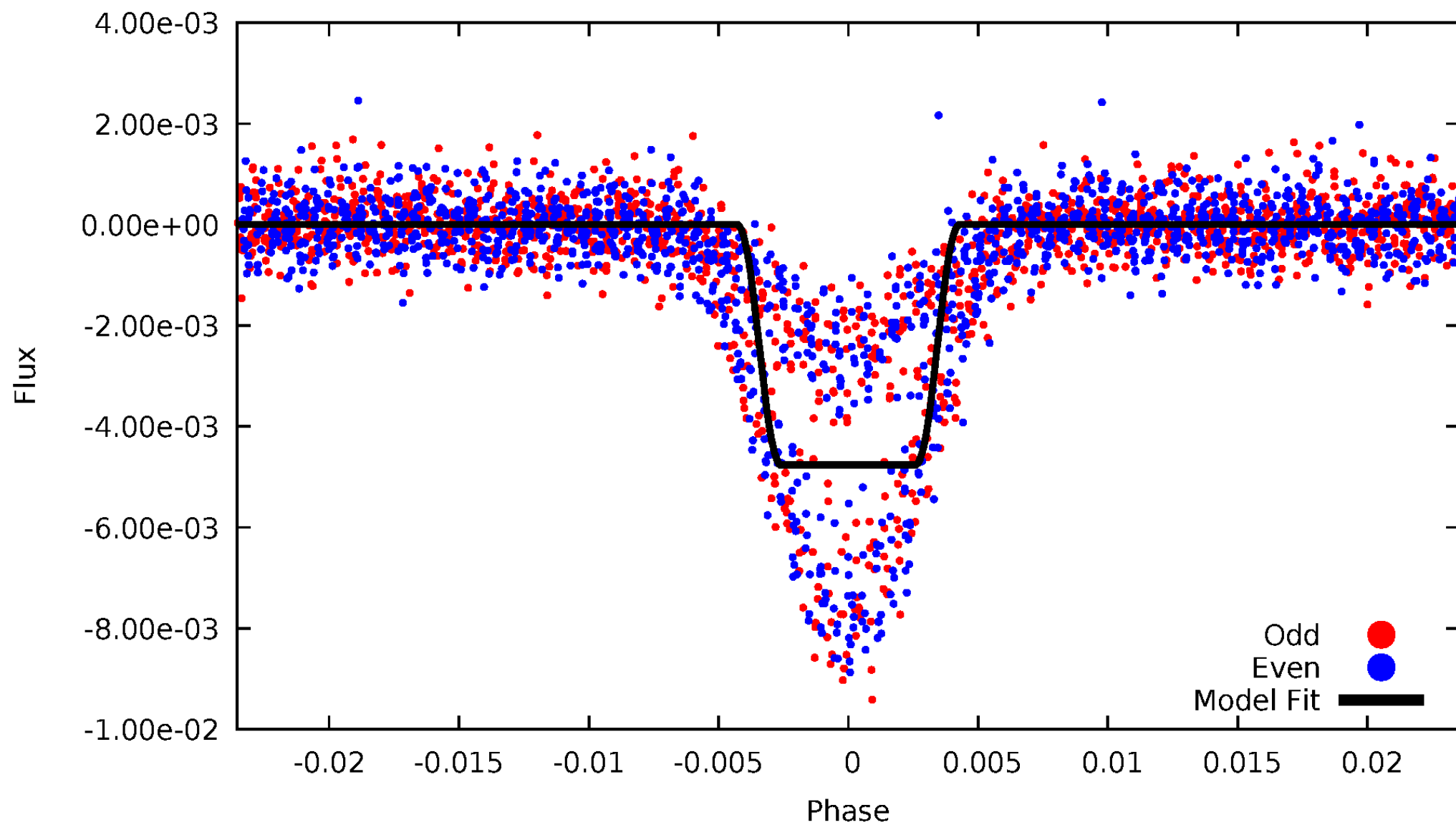
DV Odd/Even

TCE 009334490-02



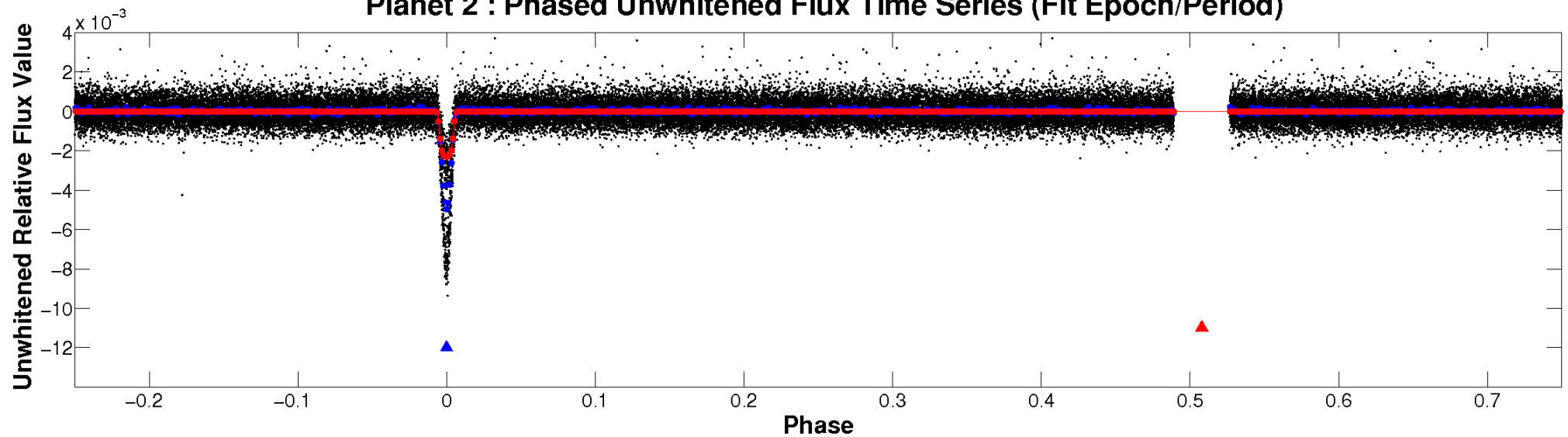
ALT Odd/Even

TCE 009334490-02

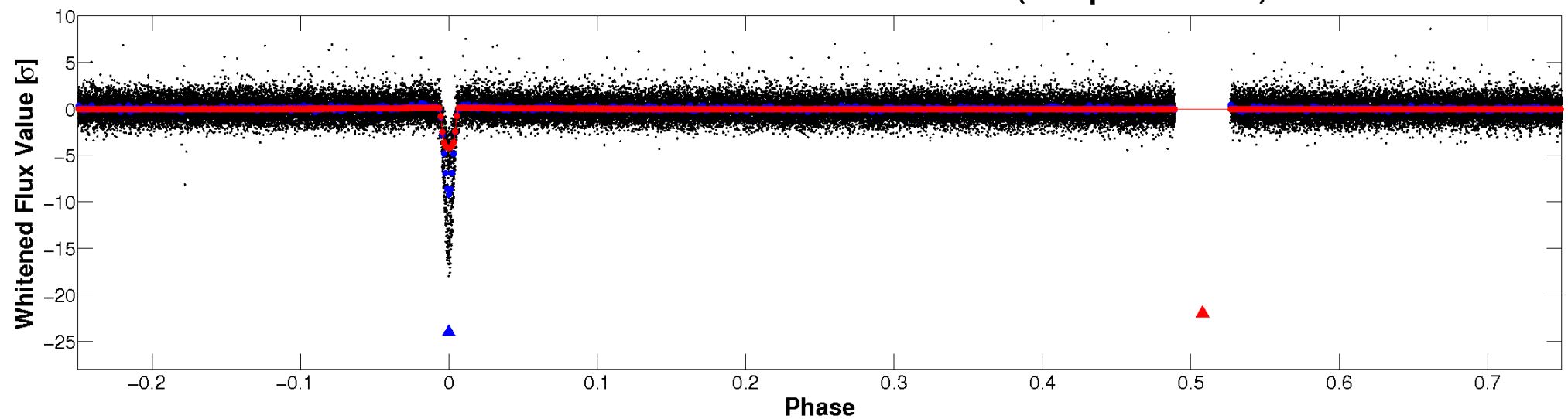


Non-Whitened Vs. Whitened Light Curve

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

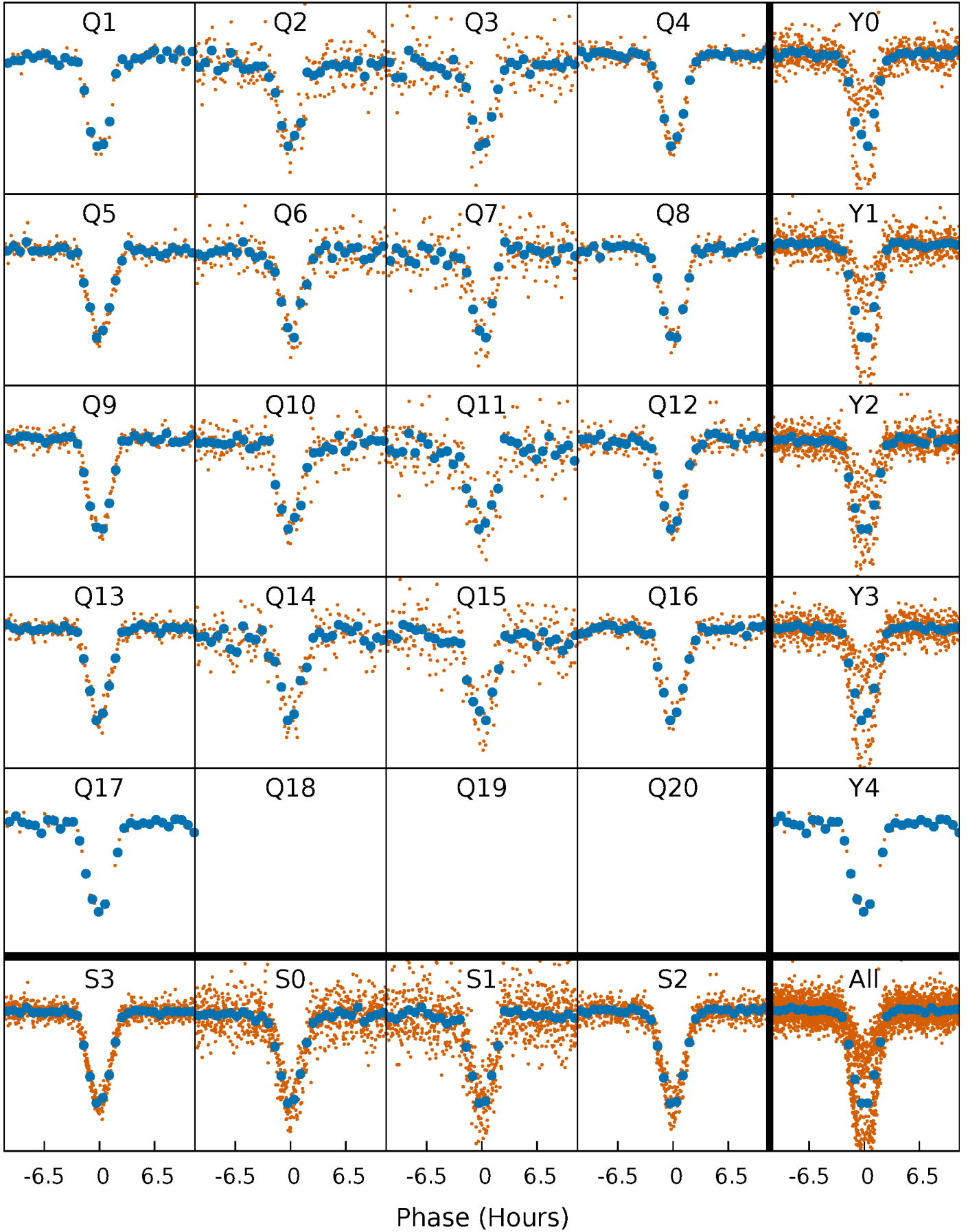


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



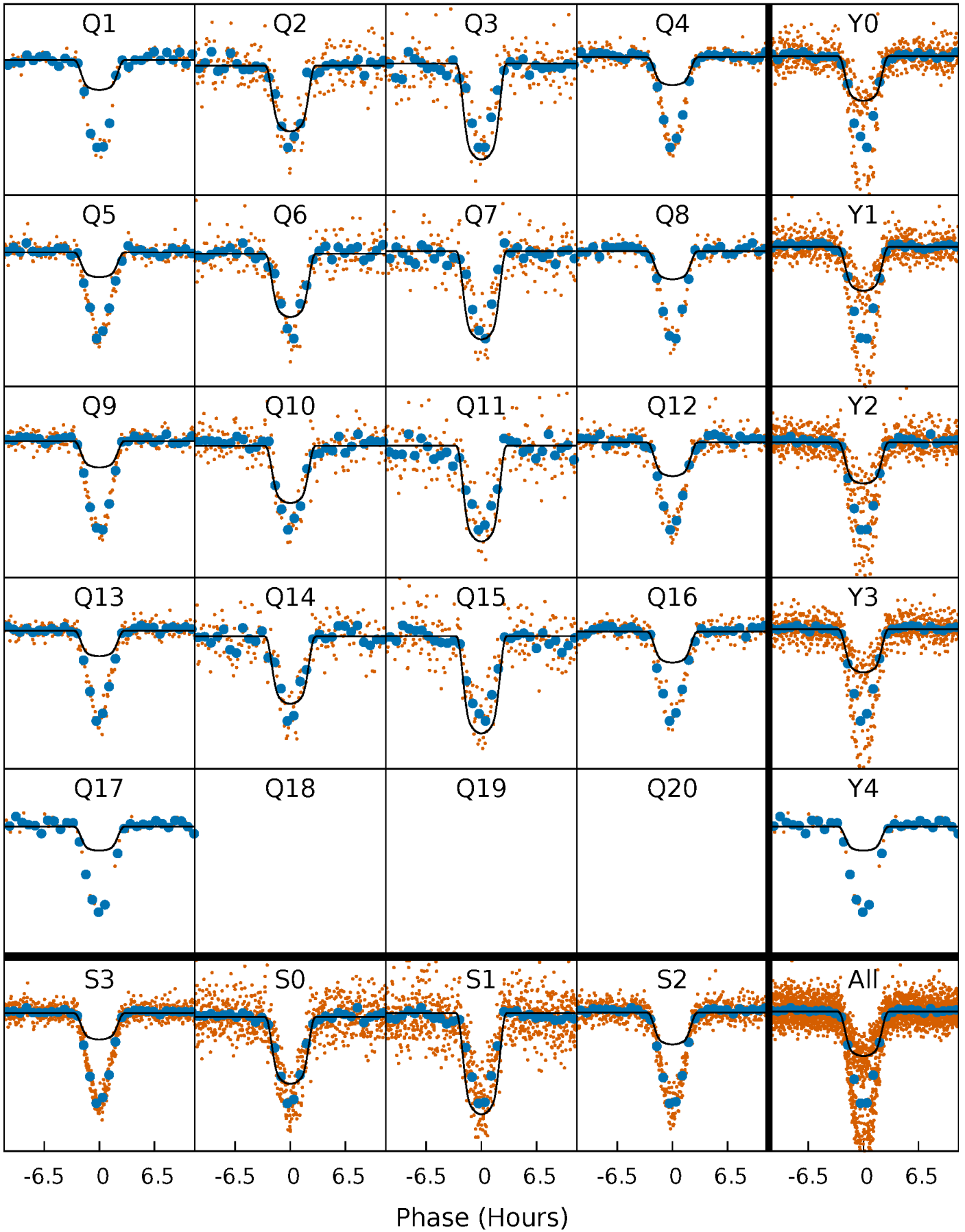
PDC Quarter-Phased Transit Curves

TCE 009334490-02 P= 18.845020 Days $T_0=140.372754$ (BKJD)



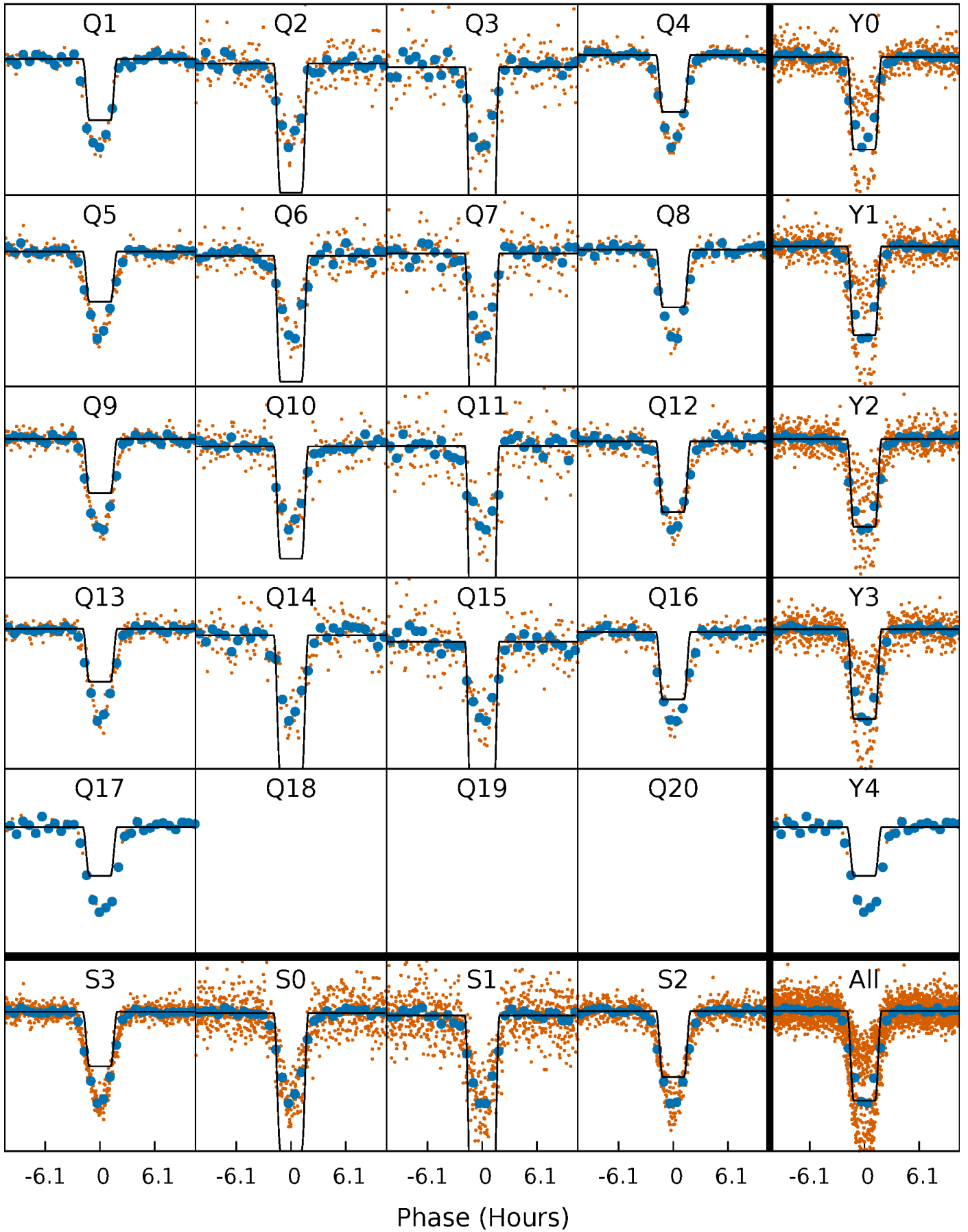
DV Quarter-Phased Transit Curves

TCE 009334490-02 P= 18.845020 Days $T_0=140.372754$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

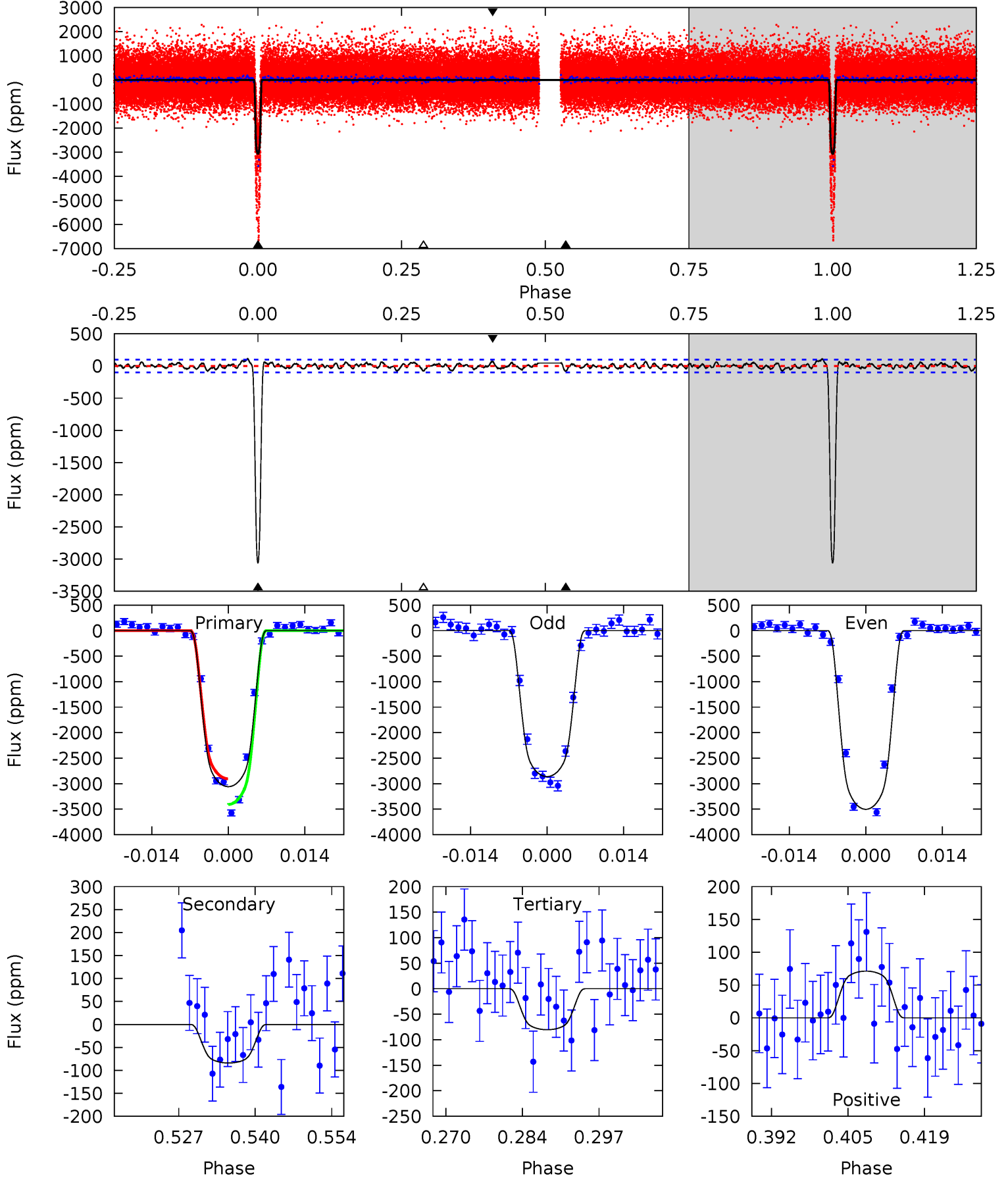
TCE 009334490-02 P= 18.844874 Days $T_0=140.378168$ (BKJD)



DV Model-Shift Uniqueness Test

009334490-02, P = 18.845020 Days, E = 121.527734 Days

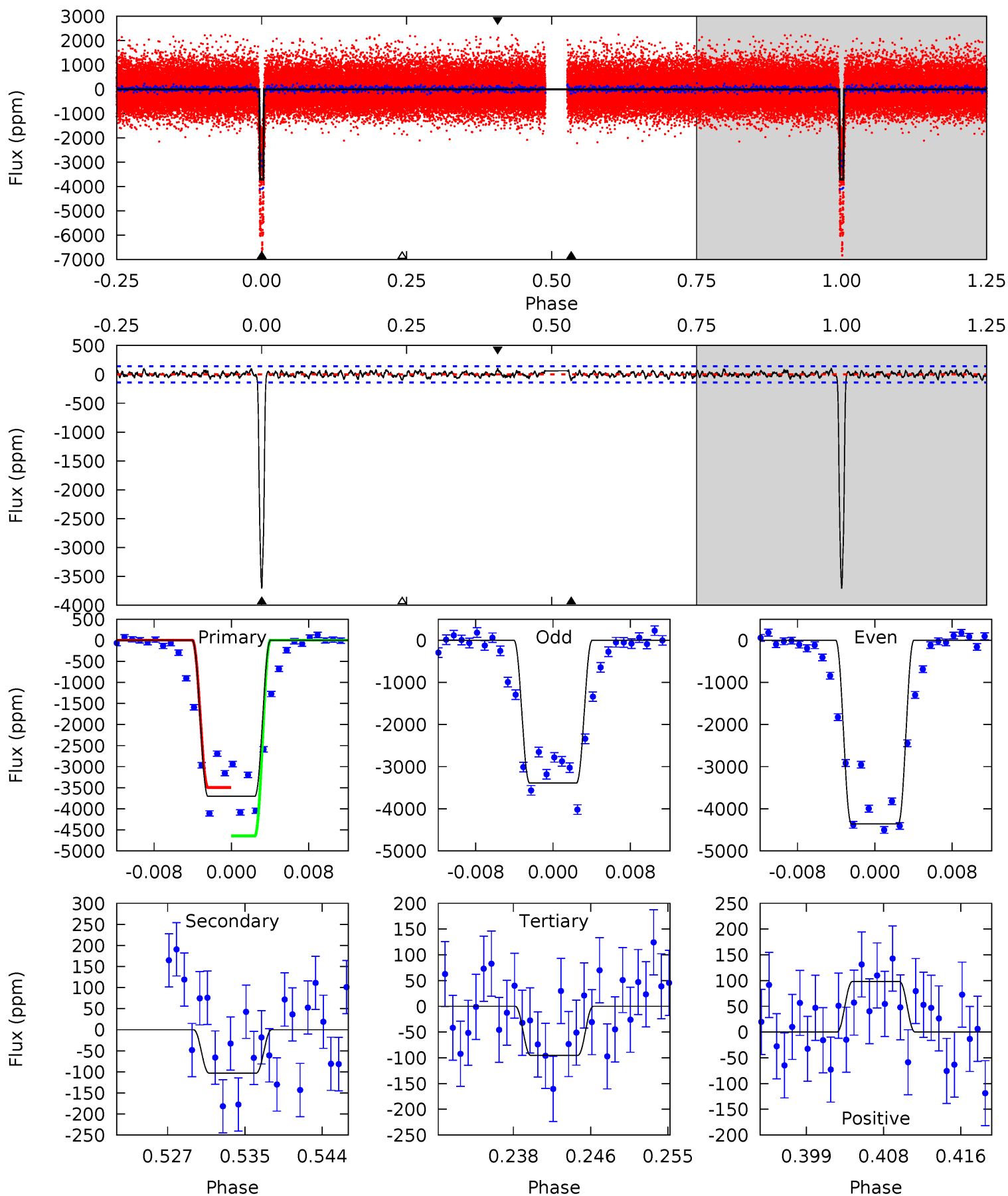
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
152.4	4.19	4.01	3.55	4.97	2.47	1.50	148.4	148.8	0.18	0.64	15.9	1.05	0.03	0



Alt Model-Shift Uniqueness Test

009334490-02, $P = 18.844874$ Days, $E = 121.533294$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
132.3	3.68	3.41	3.51	5.06	2.63	1.17	128.9	128.8	0.27	0.17	17.0	1.07	0.03	0



Stellar Parameters For KIC 009334490

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5220^{+173}_{-157}	$4.578^{+0.084}_{-0.056}$	$-0.640^{+0.350}_{-0.300}$	$0.695^{+0.074}_{-0.066}$	$0.665^{+0.084}_{-0.034}$	$2.797^{+0.905}_{-0.574}$
	+3%/-3%	+2%/-1%	+55%/-47%	+11%/-9%	+13%/-5%	+32%/-21%
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 009334490-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-84 ± 20	$4.00^{+0.26}_{-0.23}$	768^{+32}_{-31}	2867^{+104}_{-127}	43^{+11}_{-11}
Alt.	-103 ± 28	$5.22^{+0.32}_{-0.29}$	770^{+28}_{-30}	2745^{+115}_{-127}	31^{+10}_{-9}

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 $A_{obs} \gg 1.0$

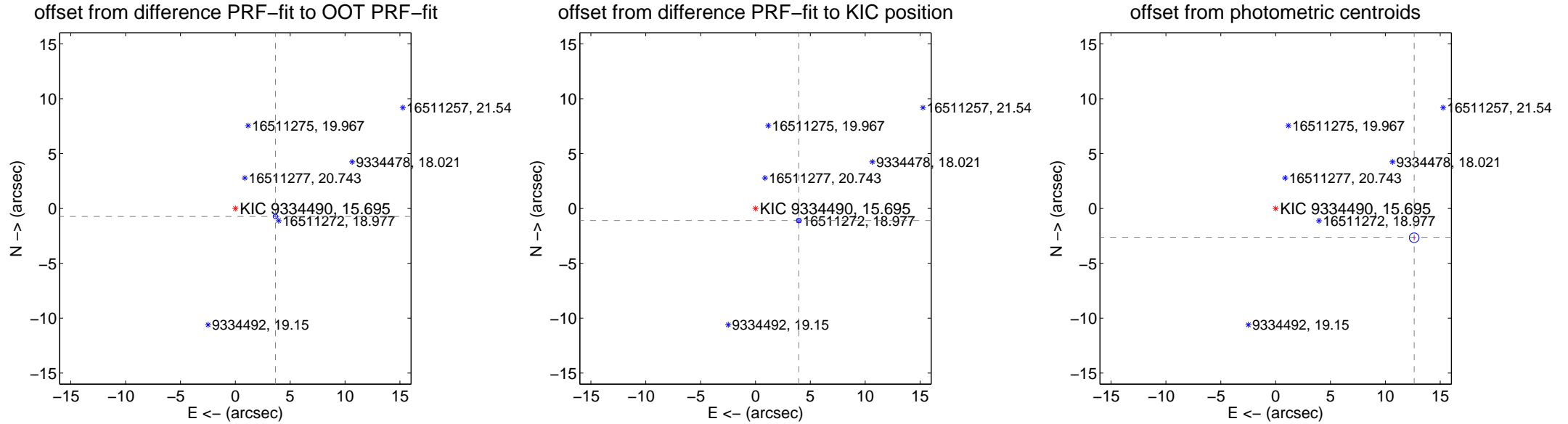
DV Centroid Data

Supplemental centroid analysis for 009334490-02. Kepler magnitude: 15.70. Transit SNR 67.23

There are 17 quarters with good PRF difference image offsets

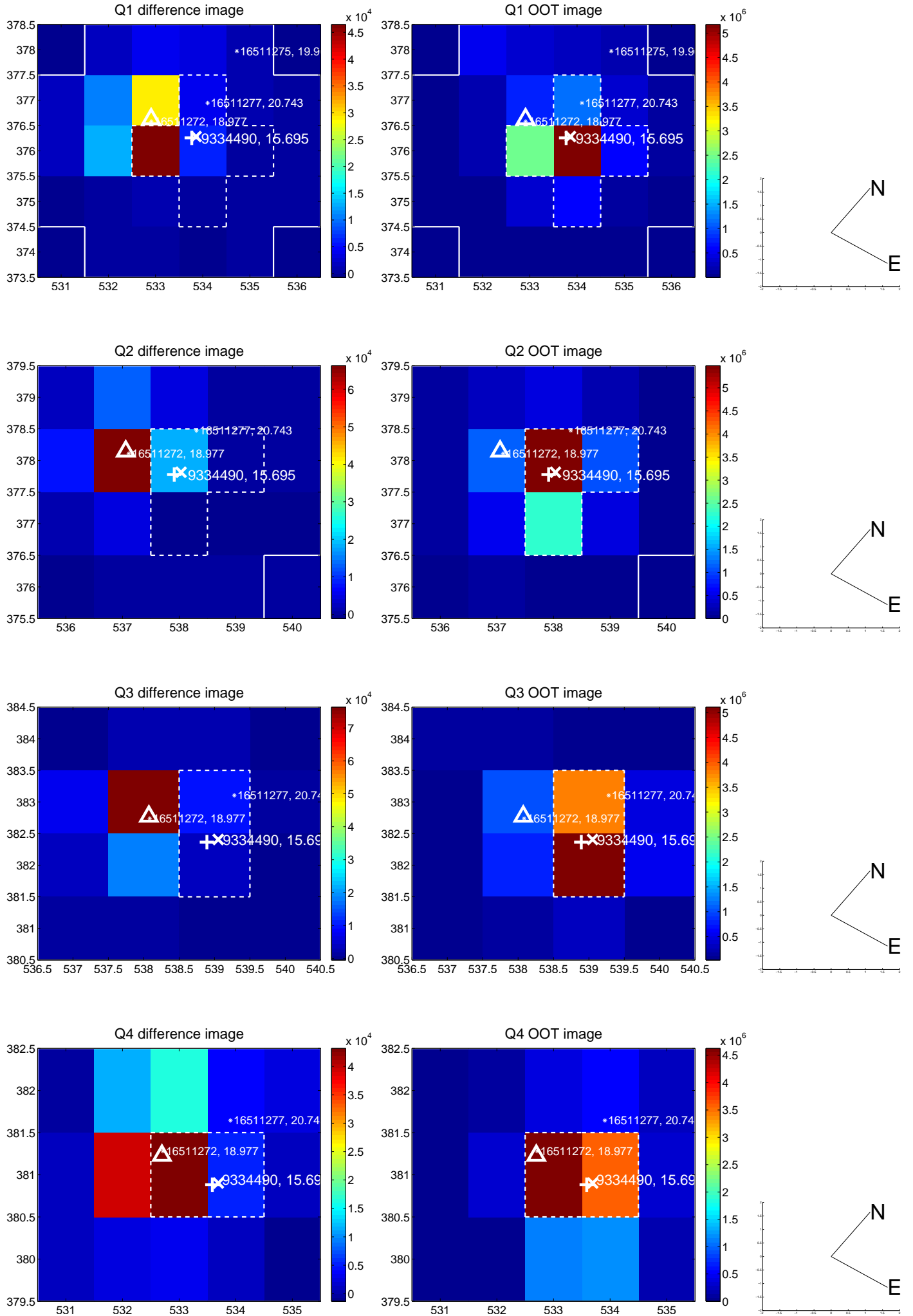
The direct PRF centroid is offset from the target star catalog position by about 0.47 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.730 ± 0.070	53.63	-3.658 ± 0.069	-0.733 ± 0.072
PRF-fit source offset from KIC position	4.104 ± 0.069	59.38	-3.954 ± 0.069	-1.098 ± 0.068
photometric centroid source offset	12.90 ± 0.15	88.04	-12.62 ± 0.15	-2.67 ± 0.15

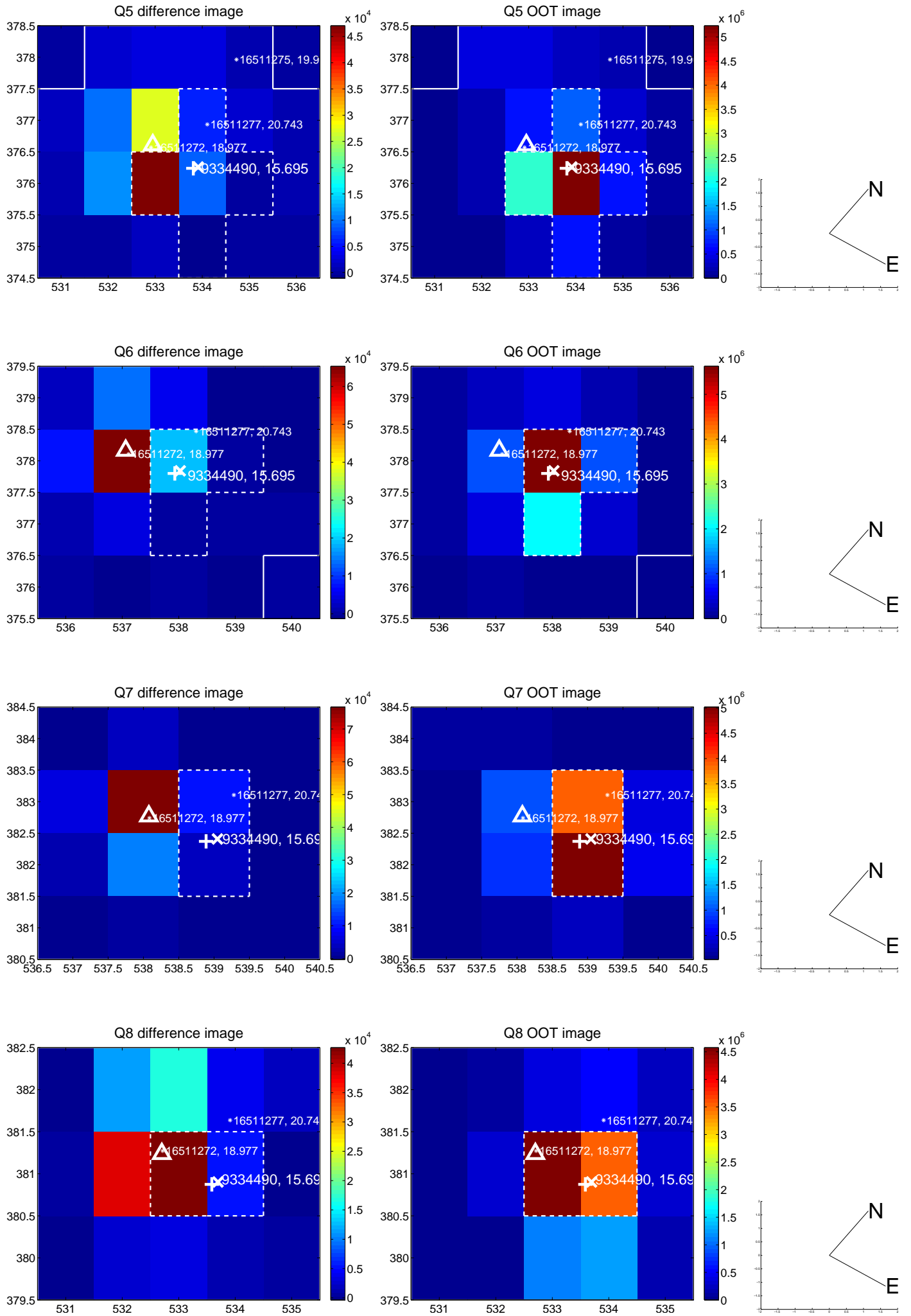


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

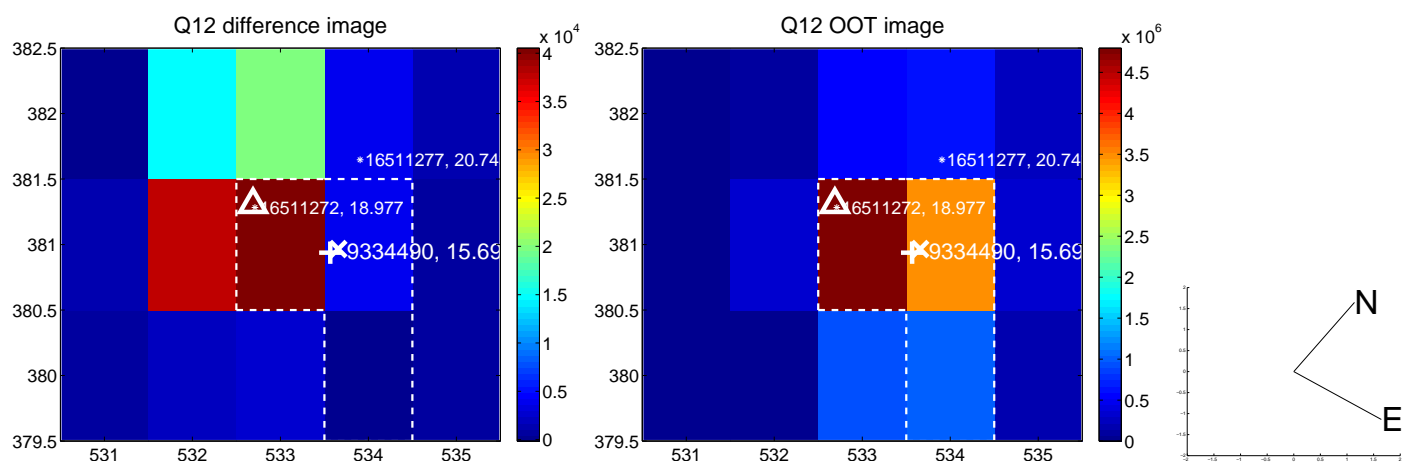
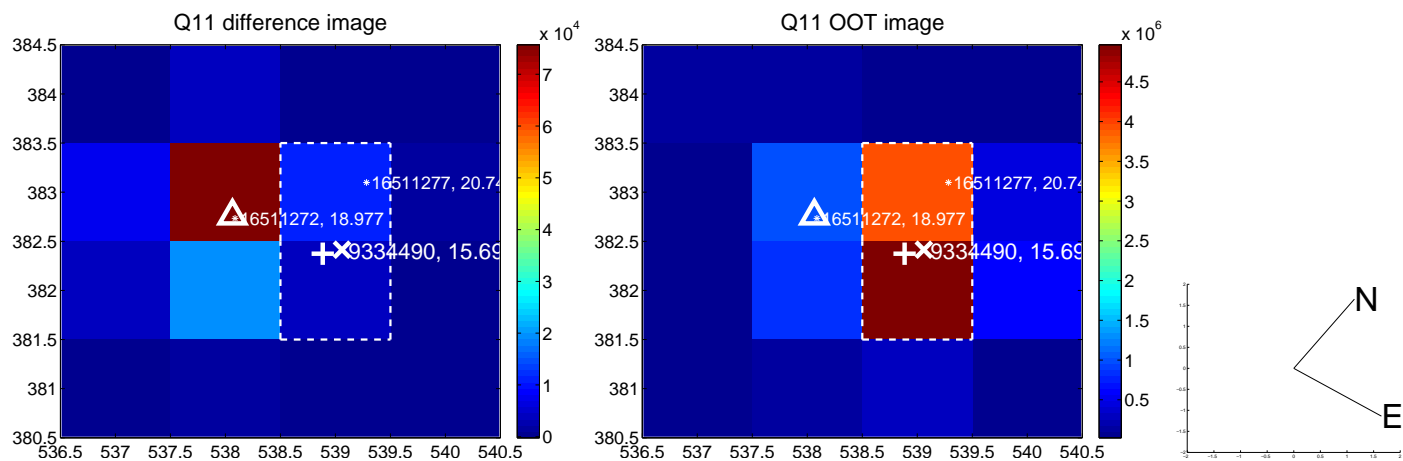
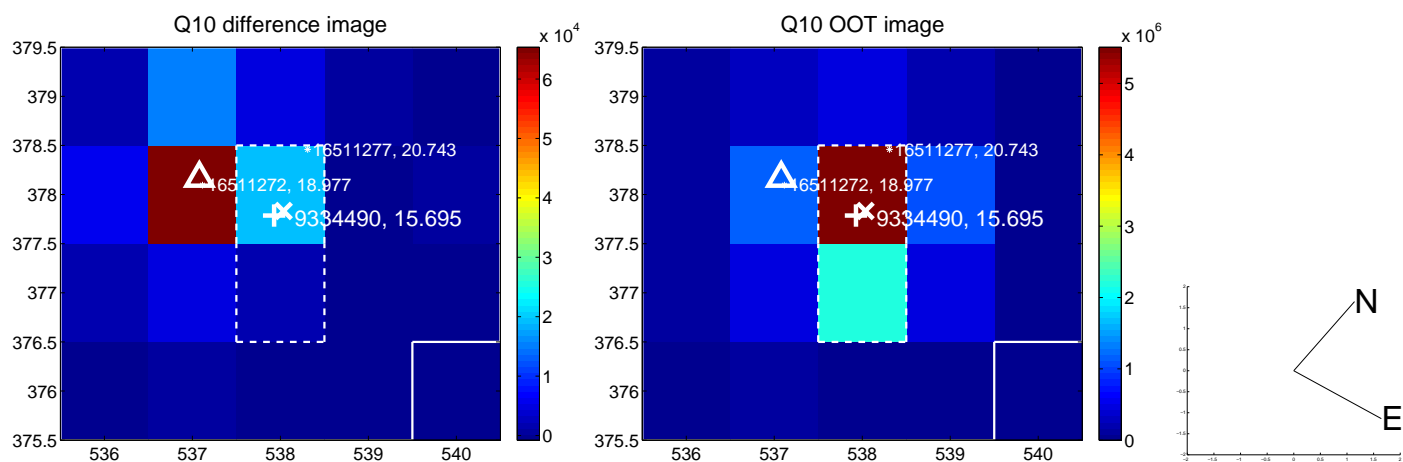
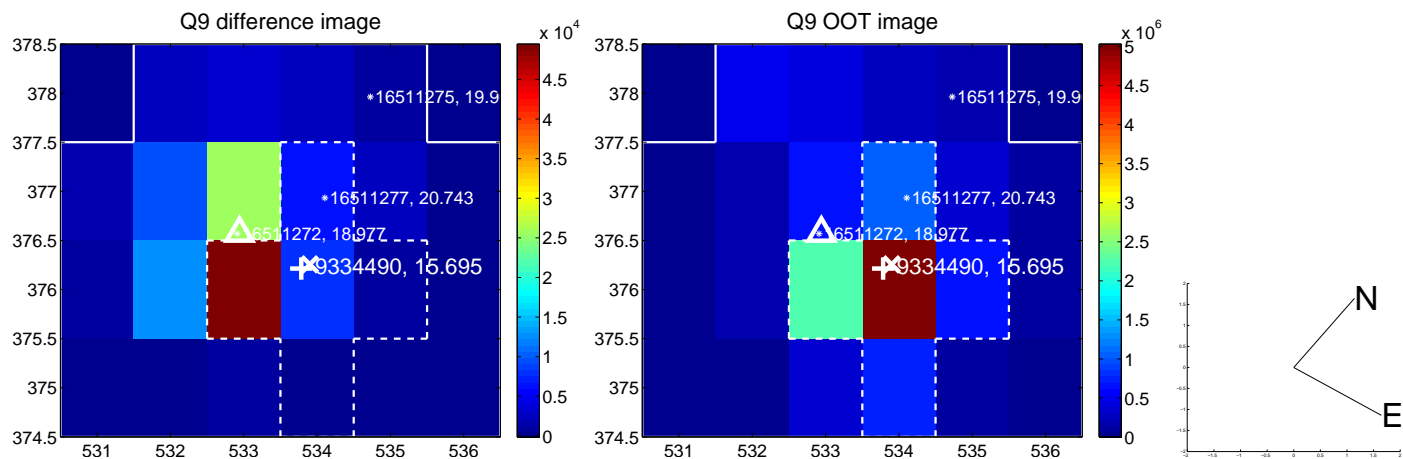
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



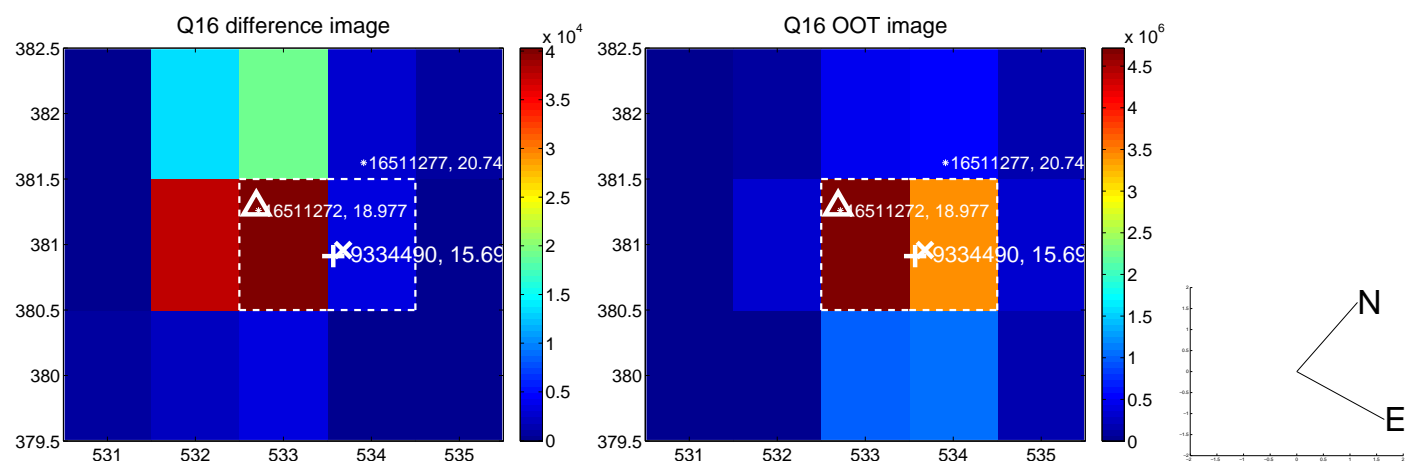
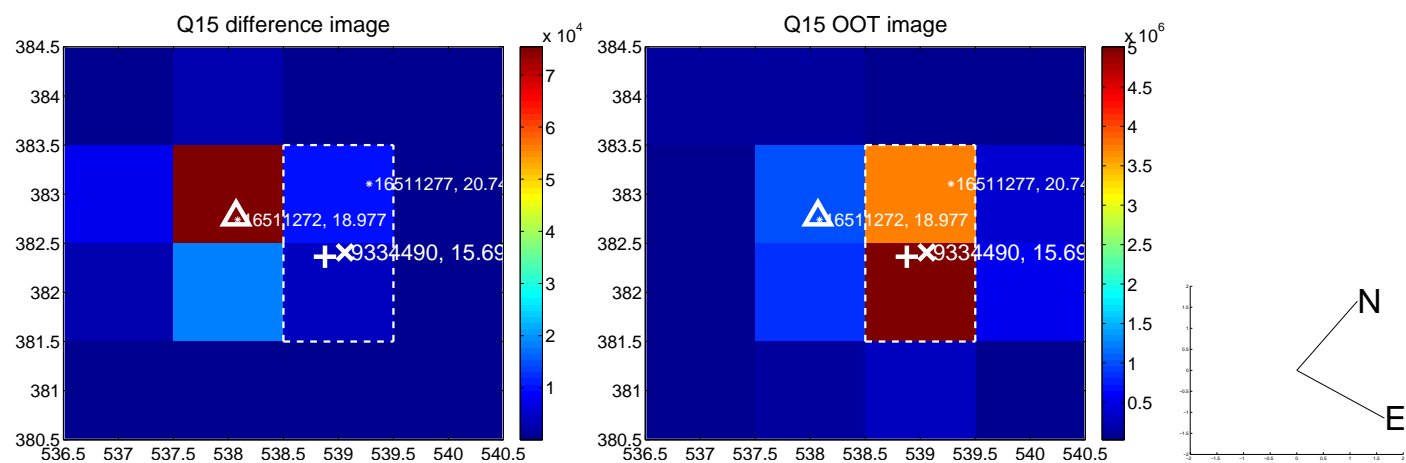
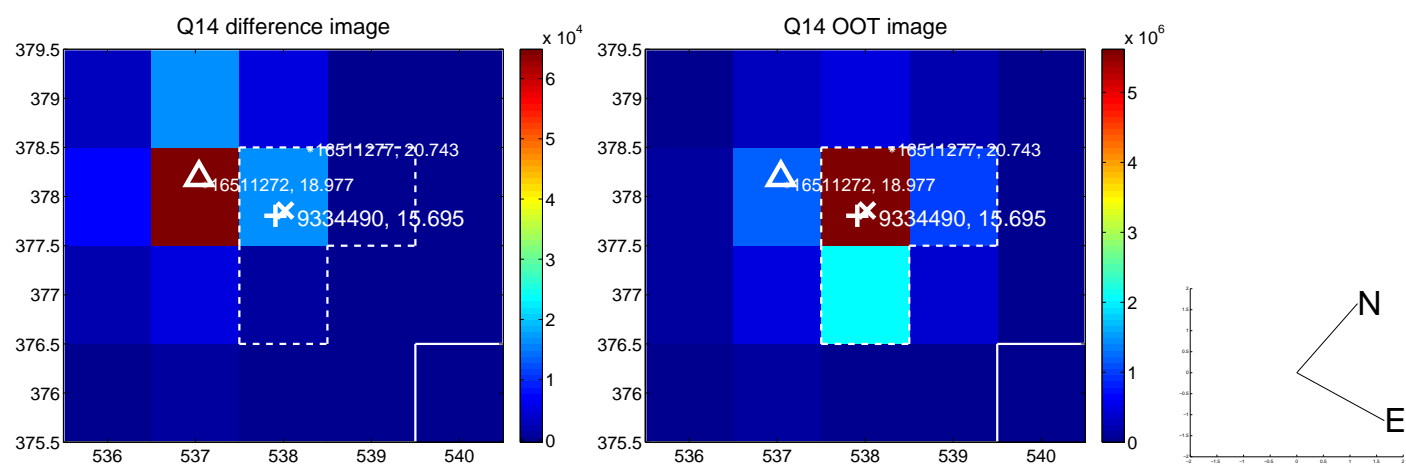
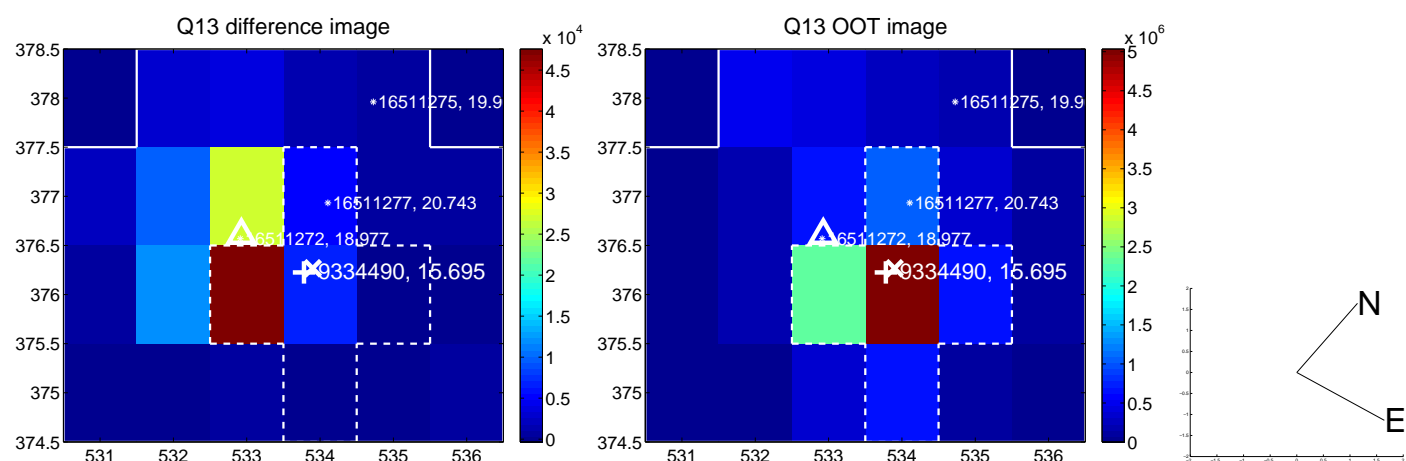
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



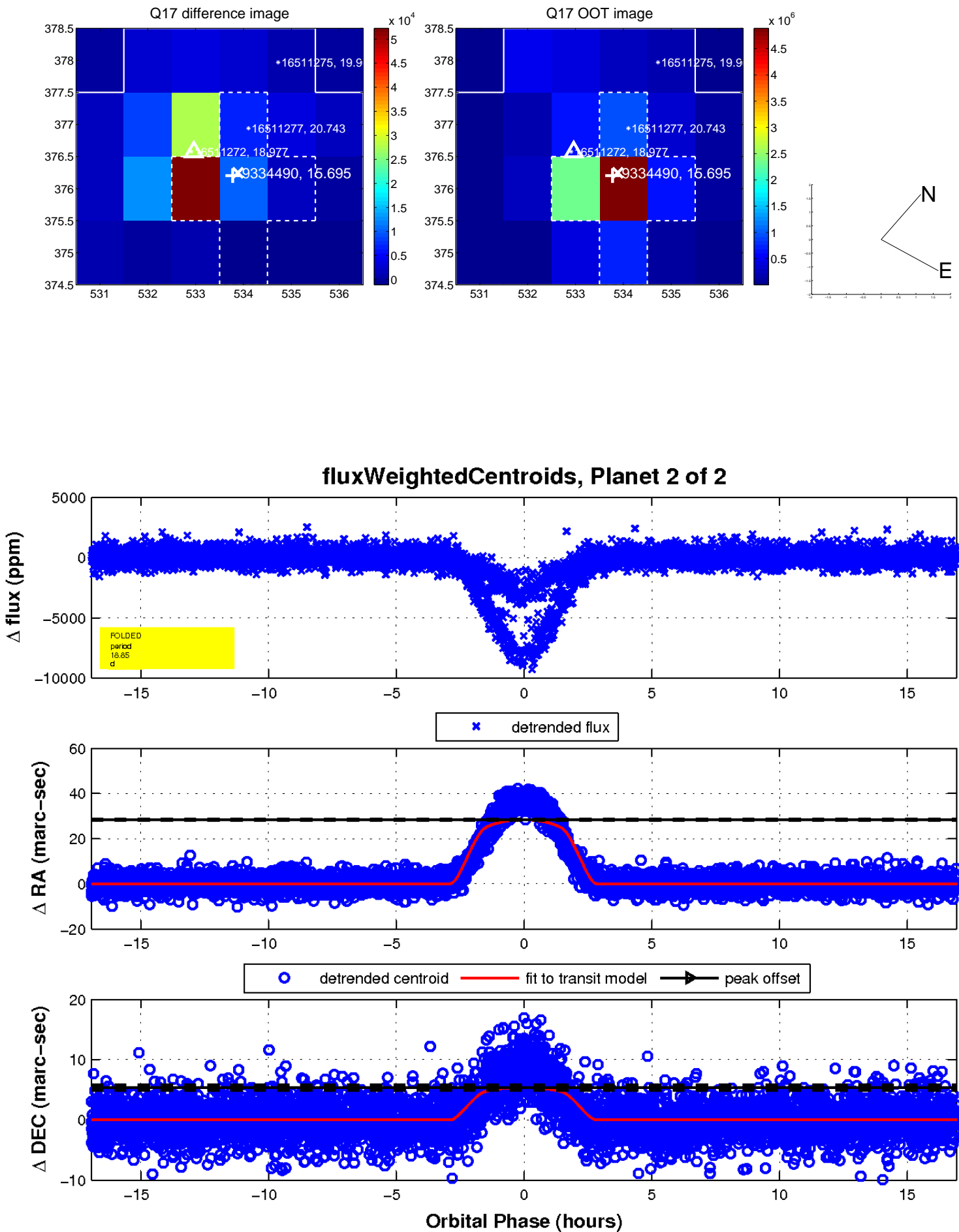
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

