

KIC 009471974

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})
009471974-01	OBS	0119.01	49.183945	141.911765	1655.1	11.616	250.0	246.5	2.06	5626	8.77	47.51
009471974-02	OBS	0119.02	190.322555	312.675262	1143.1	15.198	95.6	95.4	2.06	5626	7.63	7.82

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009471974-01	OBS	PC	0.96	0	0	0	0	CENT_KIC_POS
009471974-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

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

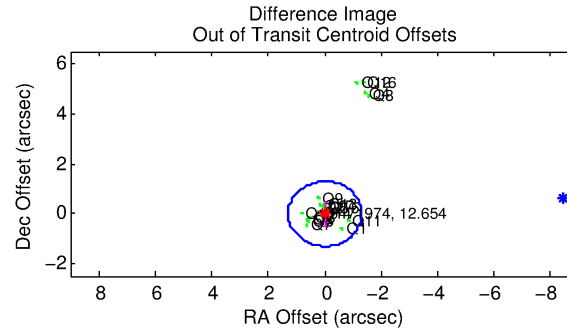
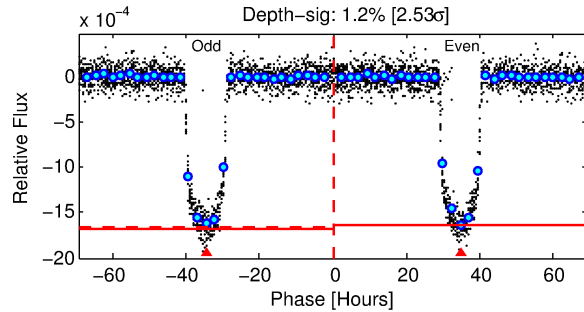
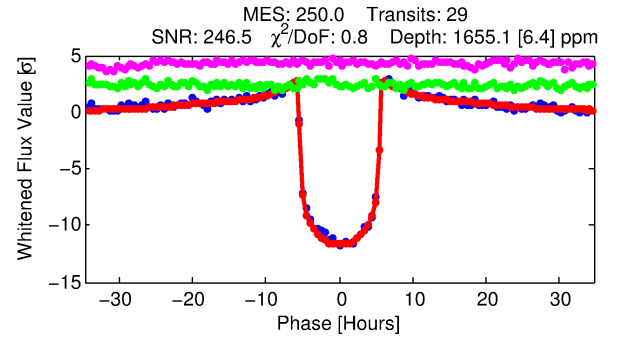
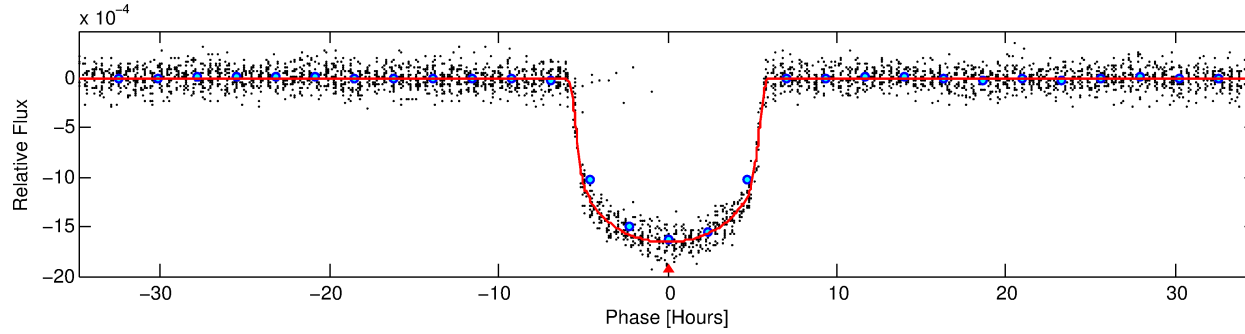
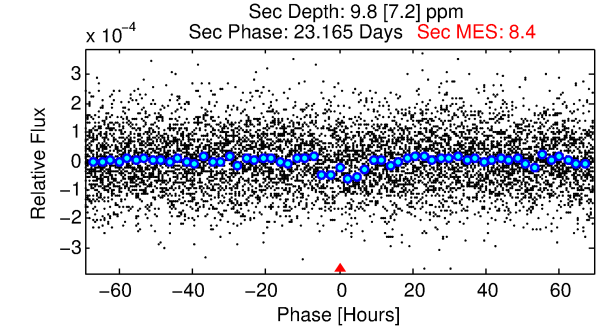
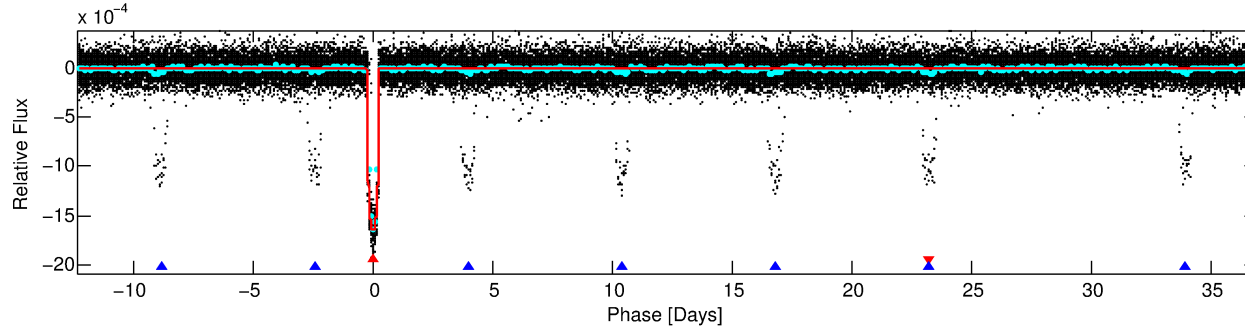
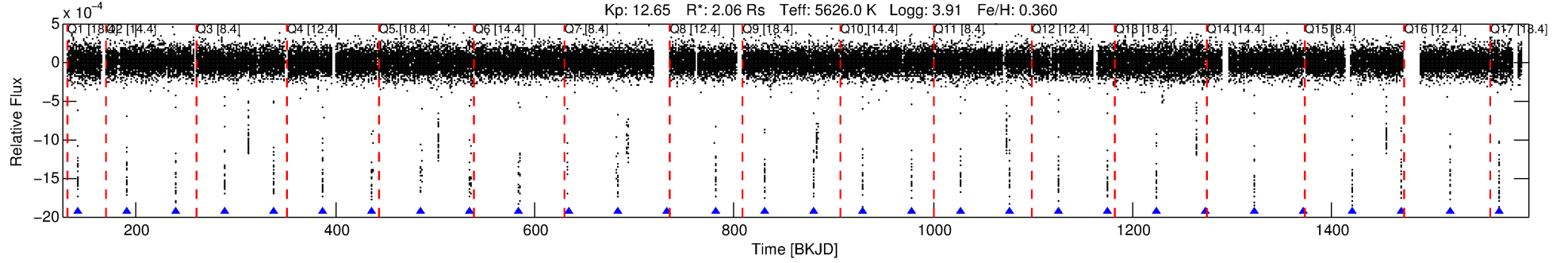
Ephemeris Match Information For 009471974-01

No Significant Match Found

DV One-Page Summary

KIC: 9471974 Candidate: 1 of 2 Period: 49.184 d
KOI: K00119.01 Name: Kepler-108b Corr: 0.990

Kp: 12.65 R*: 2.06 Rs Teff: 5626.0 K Logg: 3.91 Fe/H: 0.360



DV Fit Results:

Period = 49.18395 [0.00004] d
Epoch = 141.9118 [0.0006] BKJD
Rp/R* = 0.0391 [0.0004]
a/R* = 26.45 [1.11]
b = 0.64 [0.04]
Seff = 47.51 [4.70]
Teff = 669 [17] K
Rp = 8.77 [0.60] Re
a = 0.2827 [0.0153] AU
Ag = 5.61 [4.16] [1.11σ]
Teffp = 1593 [295] K [3.12σ]

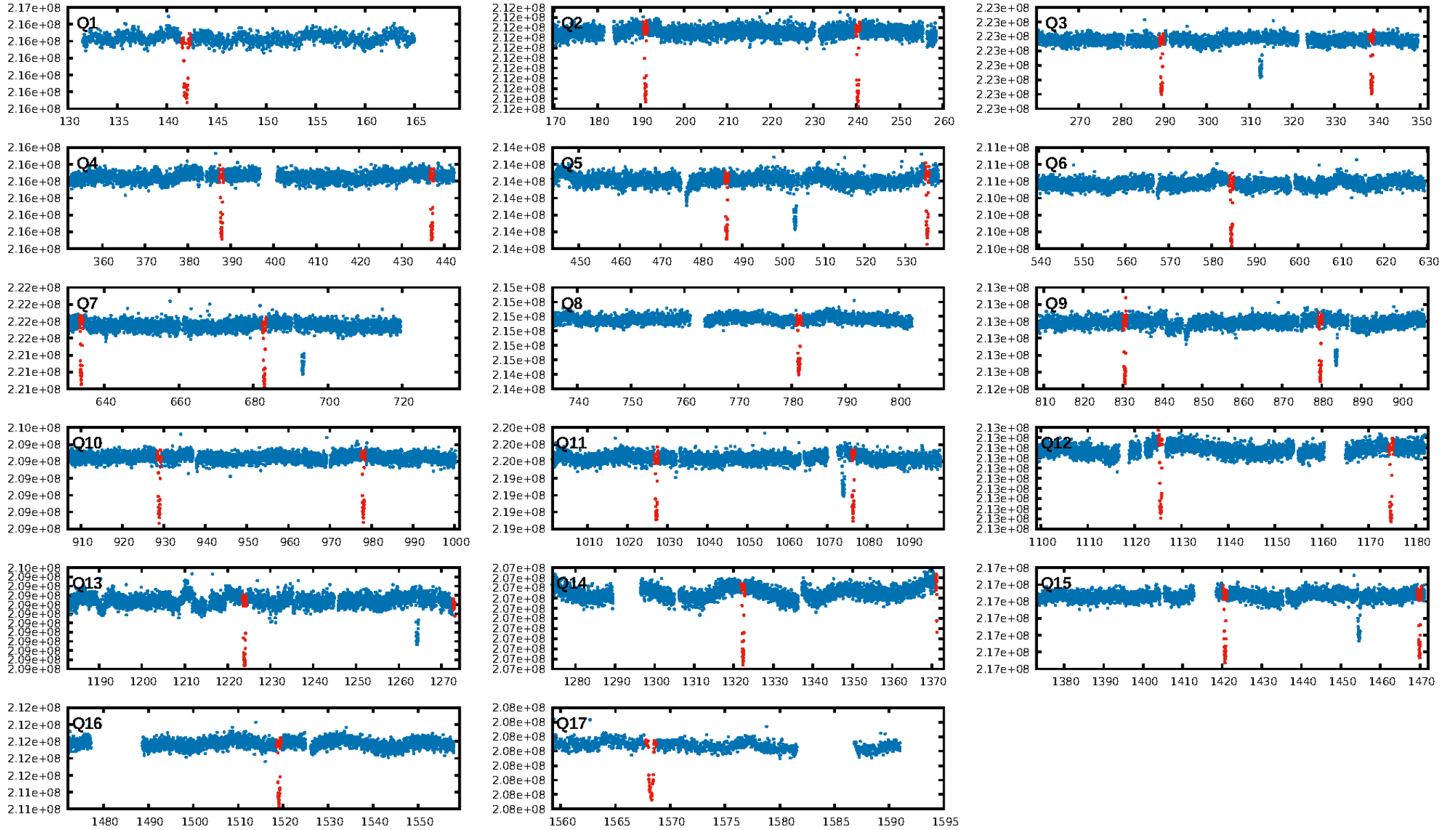
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [177.08σ]
ModelChiSquare2-sig: 68.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [27/27]
GhostDiagnostic-chr: 12.51
Centroid-sig: 0.0%
Centroid-so: 1.150 arcsec [17.17σ]
OotOffset-rm: 0.014 arcsec [0.03σ]
KicOffset-rm: 0.473 arcsec [4.62σ]
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]

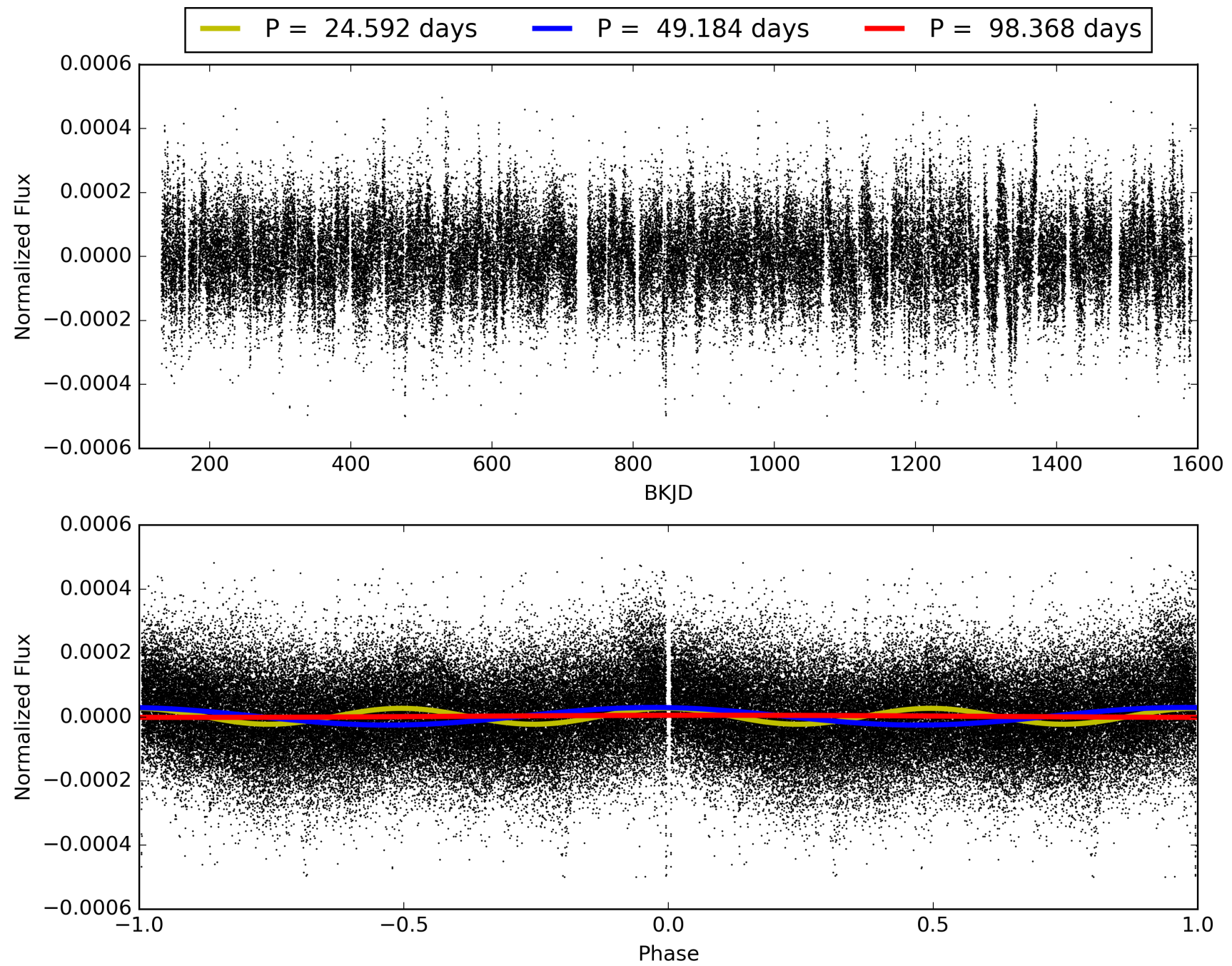
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:24:57 Z

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

TCE 009471974-01, PDC Light Curves

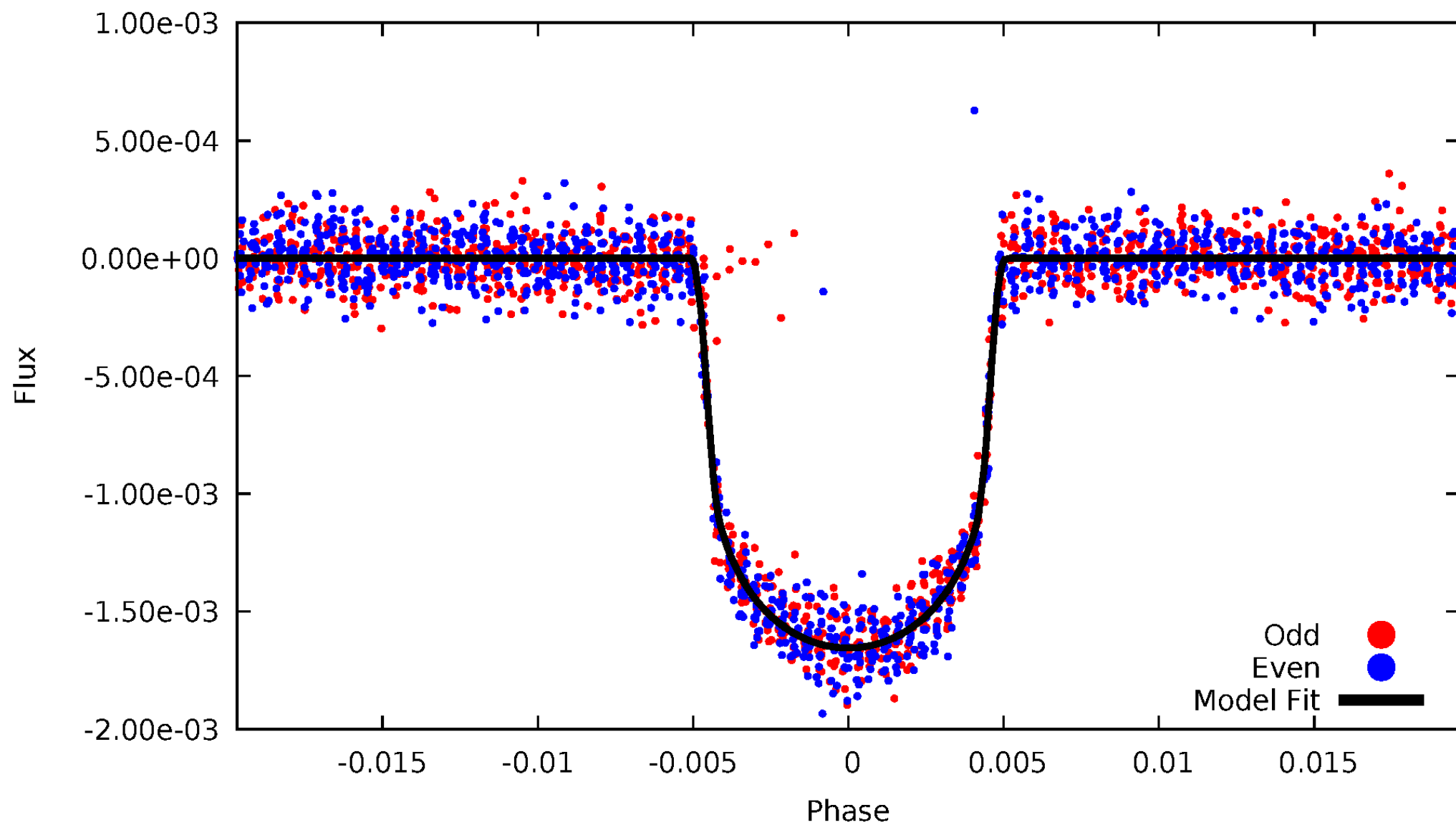


TCE 009471974-01



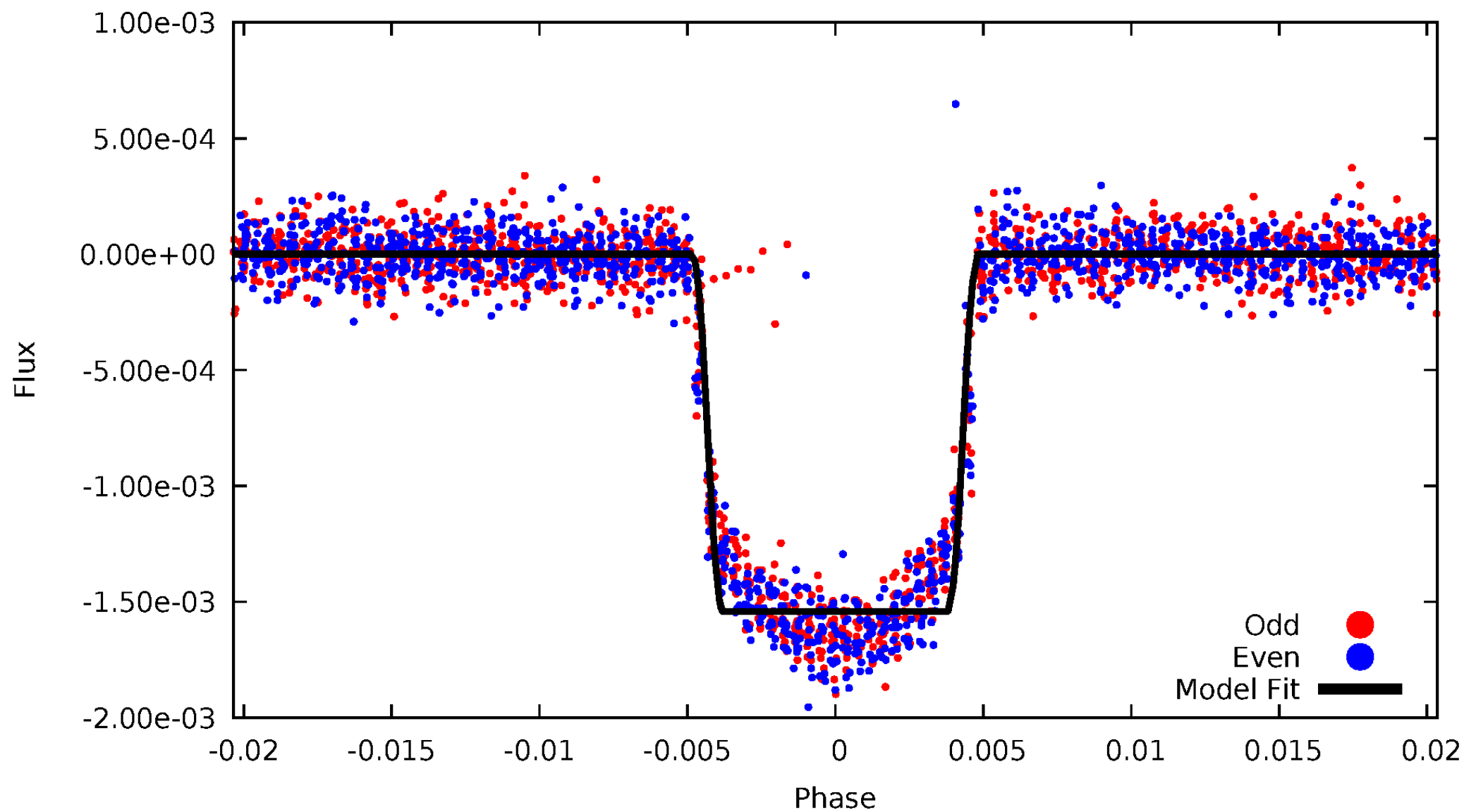
DV Odd/Even

TCE 009471974-01



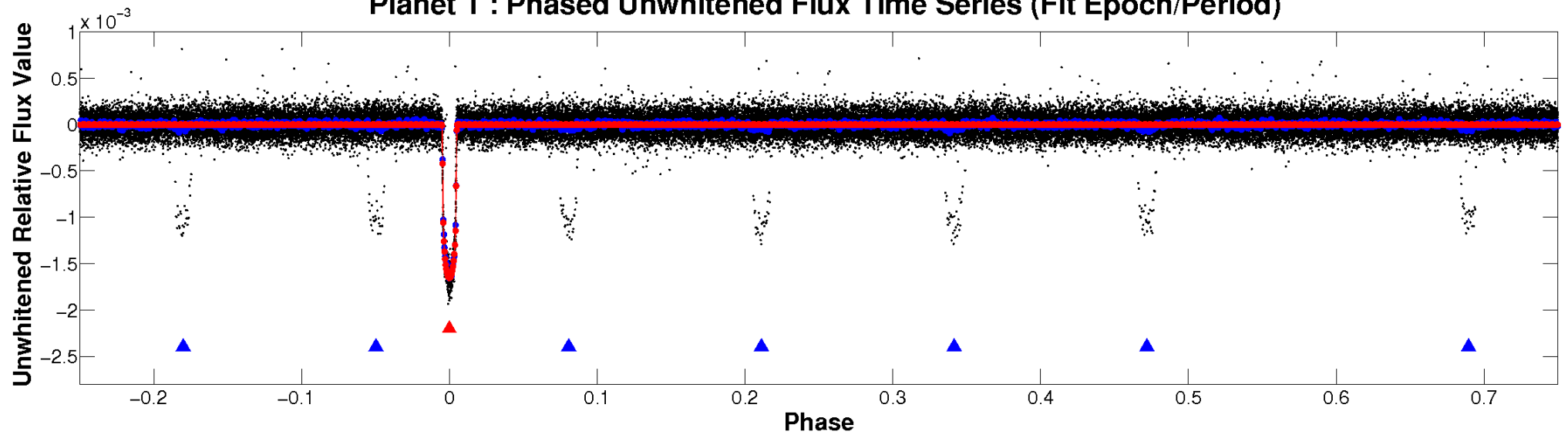
ALT Odd/Even

TCE 009471974-01

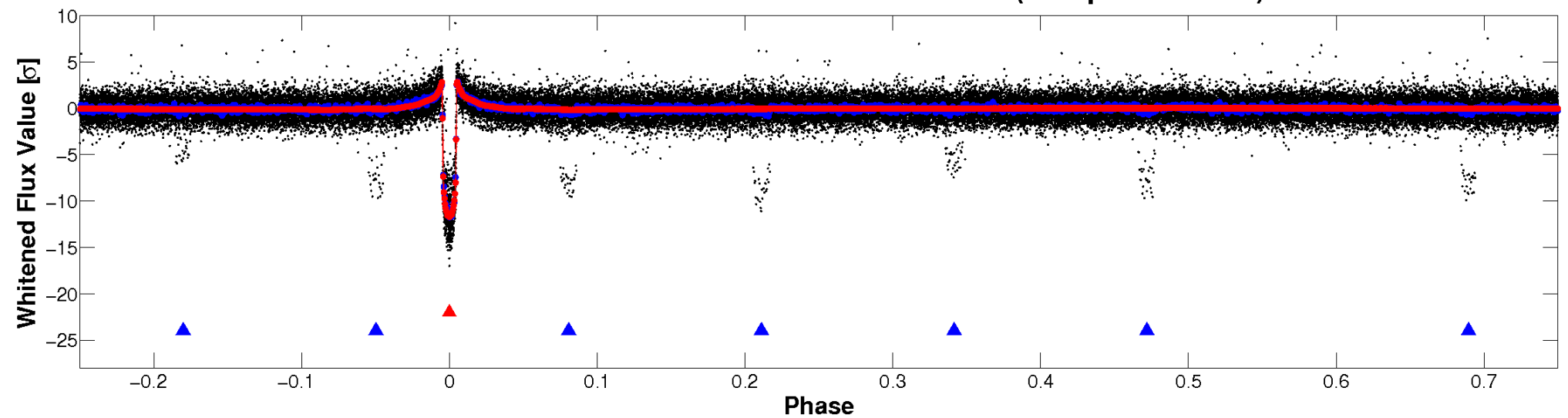


Non-Whitened Vs. Whitened Light Curve

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

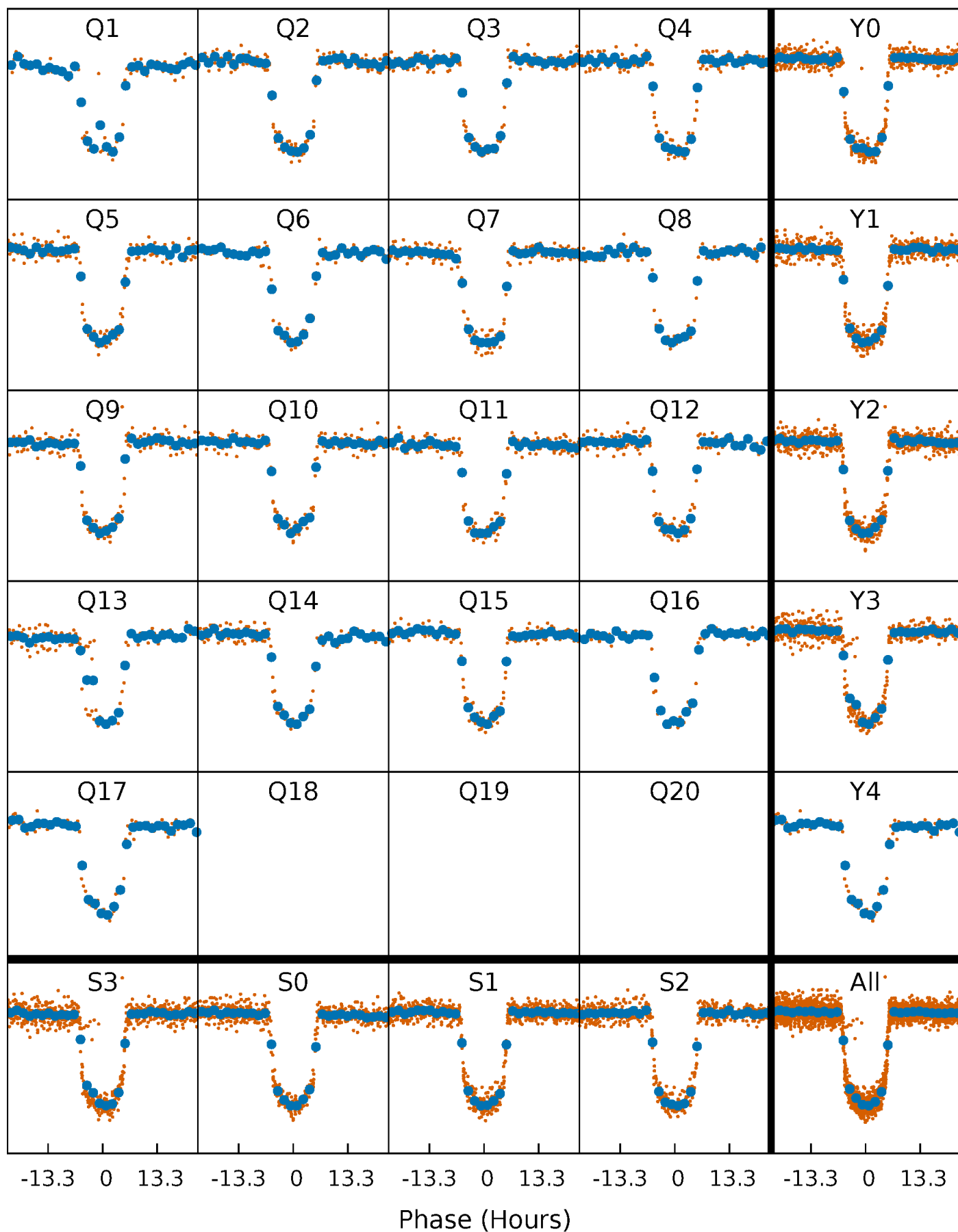


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



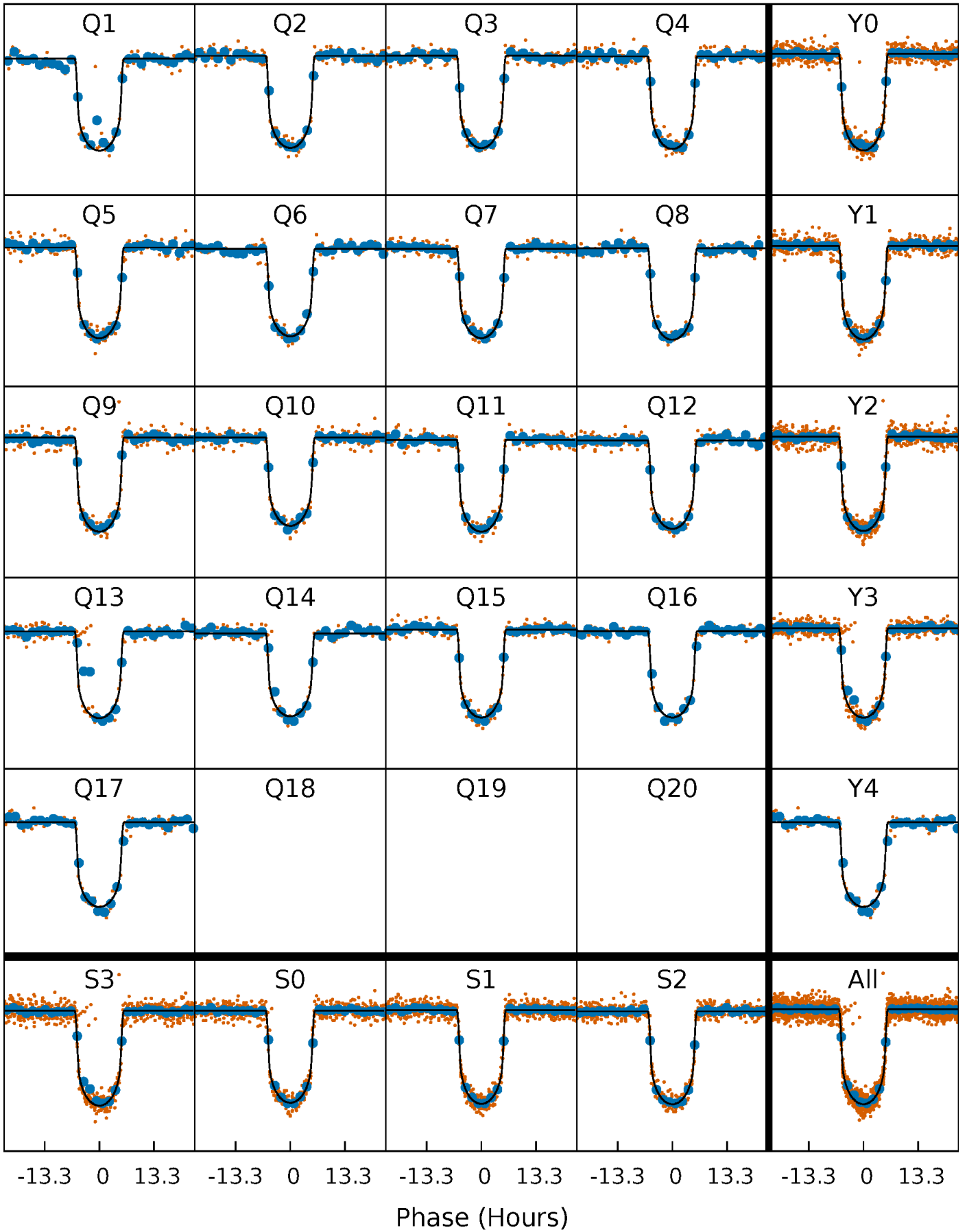
PDC Quarter-Phased Transit Curves

TCE 009471974-01 P= 49.183945 Days $T_0=141.911765$ (BKJD)



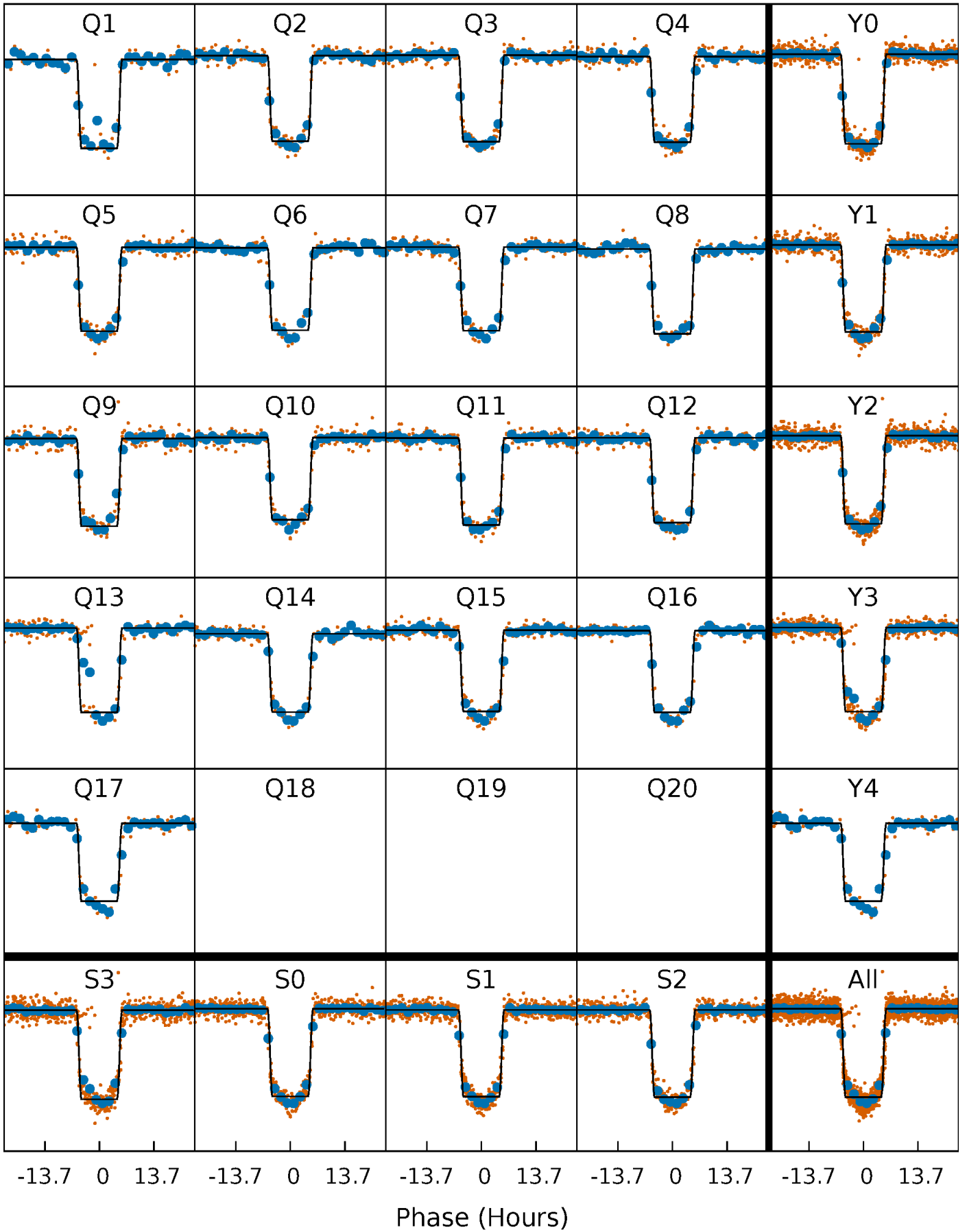
DV Quarter-Phased Transit Curves

TCE 009471974-01 P= 49.183945 Days $T_0=141.911765$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

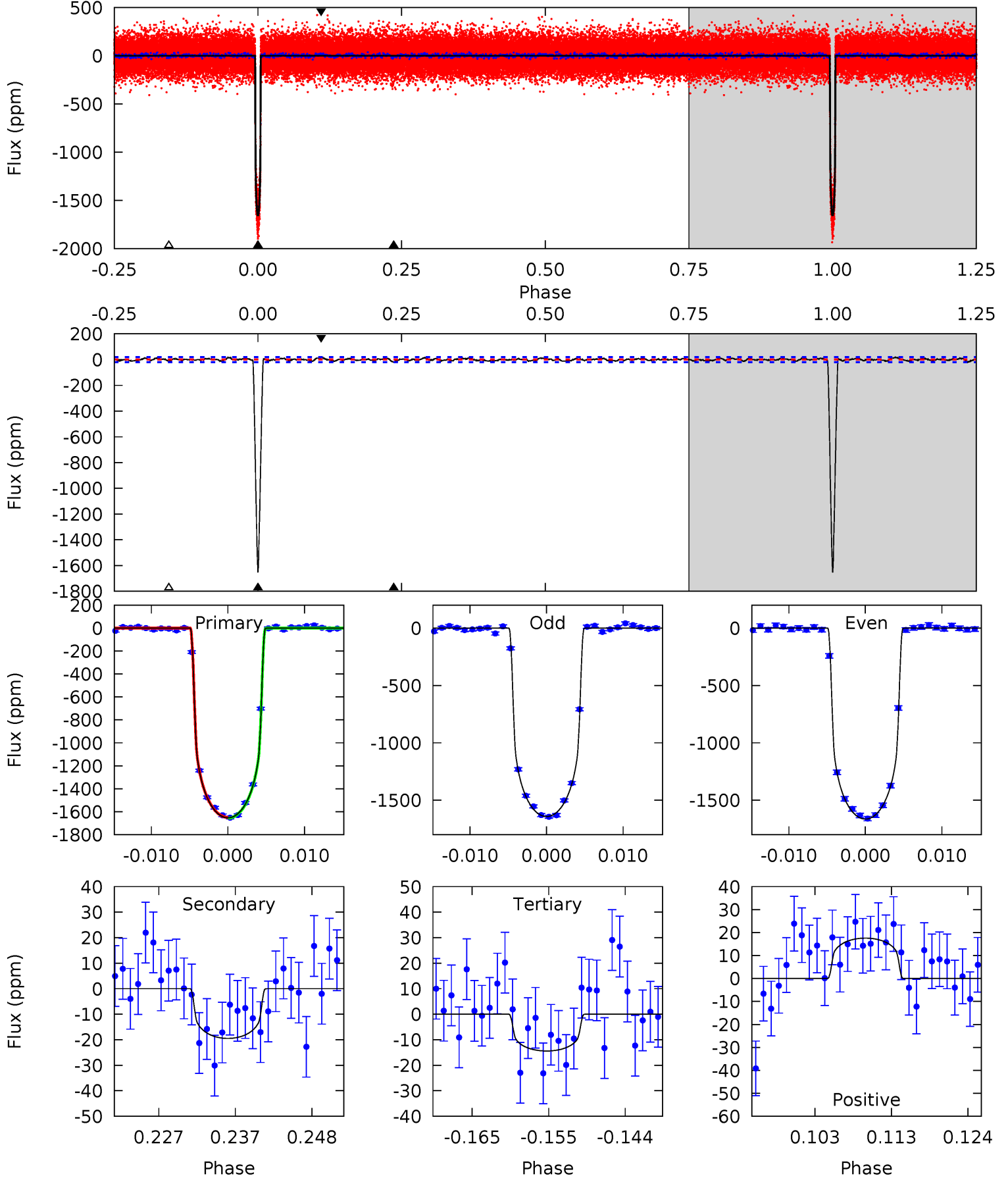
TCE 009471974-01 P= 49.183268 Days $T_0=141.920911$ (BKJD)



DV Model-Shift Uniqueness Test

009471974-01, P = 49.183945 Days, E = 92.727820 Days

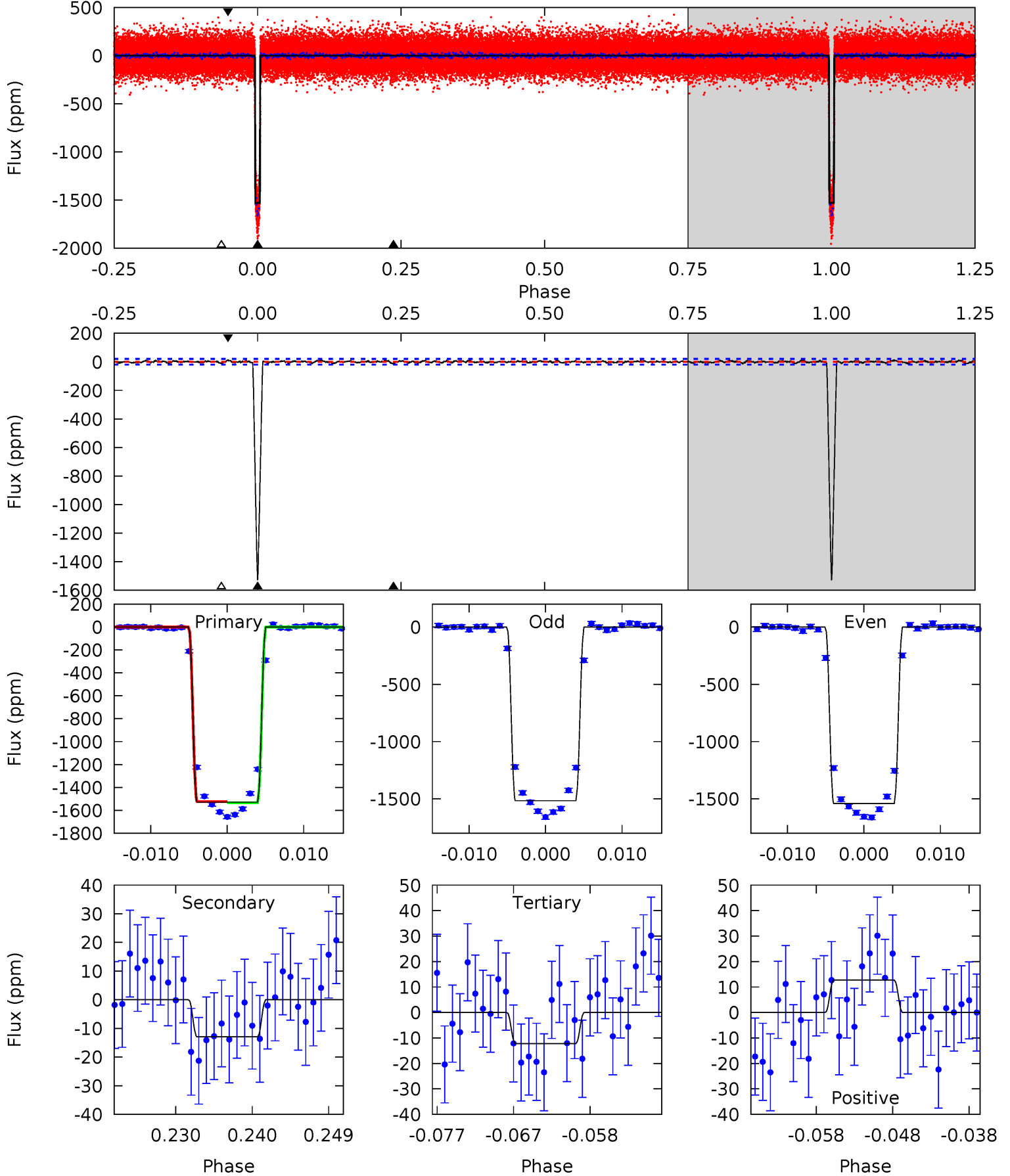
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
421.0	4.96	3.67	4.48	5.02	2.57	1.51	417.3	416.5	1.29	0.49	2.83	0.94	0.01	0.76



Alt Model-Shift Uniqueness Test

009471974-01, P = 49.183268 Days, E = 92.737643 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
381.1	3.23	3.05	3.17	5.03	2.59	1.02	378.0	377.9	0.18	0.05	3.17	0.96	0.01	1.39



Stellar Parameters For KIC 009471974

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5626^{+89}_{-78}	$3.907^{+0.040}_{-0.036}$	$0.360^{+0.100}_{-0.150}$	$2.057^{+0.125}_{-0.138}$	$1.247^{+0.082}_{-0.067}$	$0.202^{+0.033}_{-0.025}$
	+2%/-1%	+1%/-1%	+28%/-42%	+6%/-7%	+7%/-5%	+16%/-13%
Source	SPE72	AST8	SPE72	DSEP		

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

Secondary Eclipse Parameters for KIC 009471974-01 / KOI 0119.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-19 ± 4	$8.79^{+0.37}_{-0.32}$	937^{+18}_{-21}	2670^{+72}_{-83}	11^{+2}_{-2}
Alt.	-13 ± 4	$8.83^{+0.33}_{-0.32}$	935^{+21}_{-19}	2532^{+90}_{-116}	$7.368^{+2.316}_{-2.225}$

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 $A_{obs} \gg 1.0$

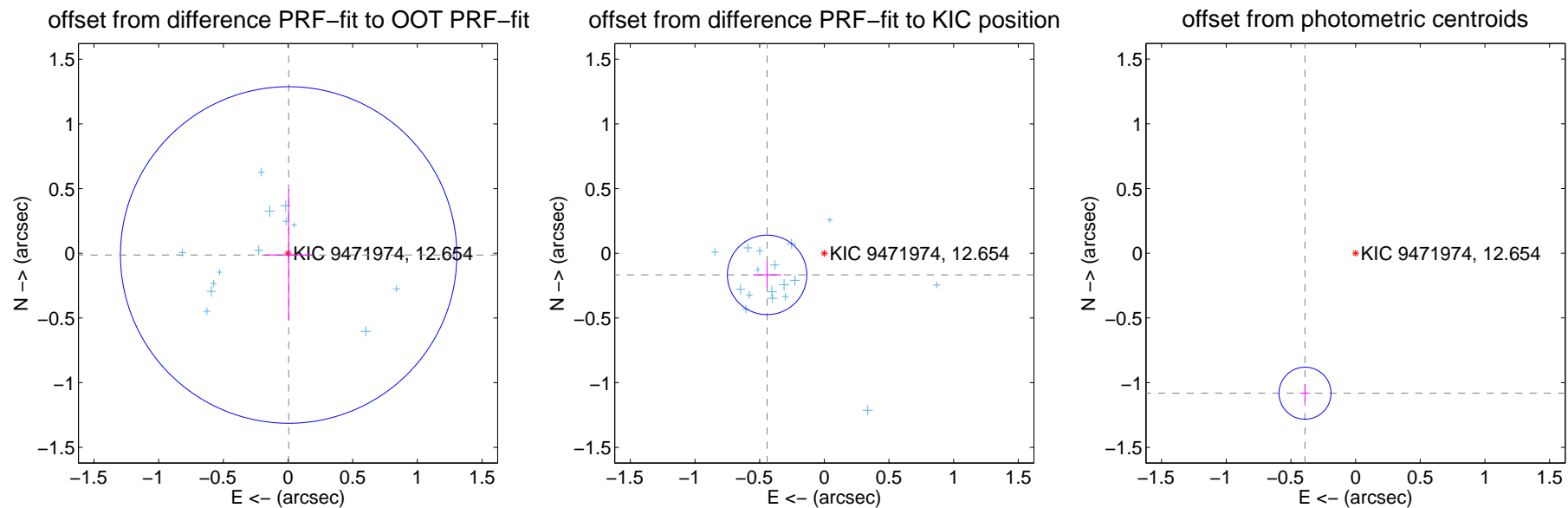
DV Centroid Data

Supplemental centroid analysis for 009471974-01. Kepler magnitude: 12.65. Transit SNR 246.45

There are 17 quarters with good PRF difference image offsets

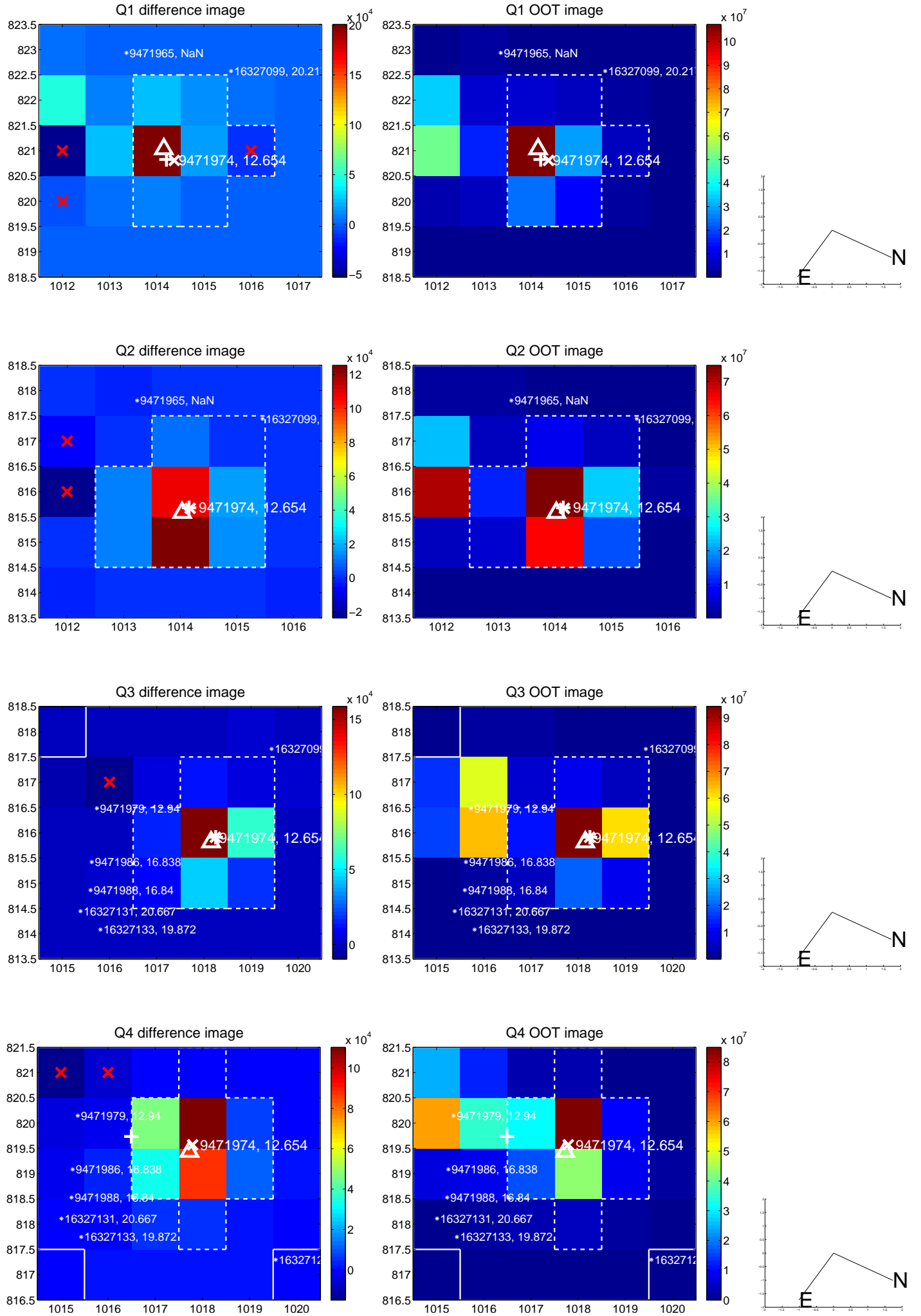
The direct PRF centroid is offset from the target star catalog position by about 0.68 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.014 ± 0.434	0.03	-0.005 ± 0.185	-0.013 ± 0.508
PRF-fit source offset from KIC position	0.473 ± 0.102	4.62	0.442 ± 0.109	-0.167 ± 0.100
photometric centroid source offset	1.15 ± 0.07	17.17	0.39 ± 0.04	-1.08 ± 0.07

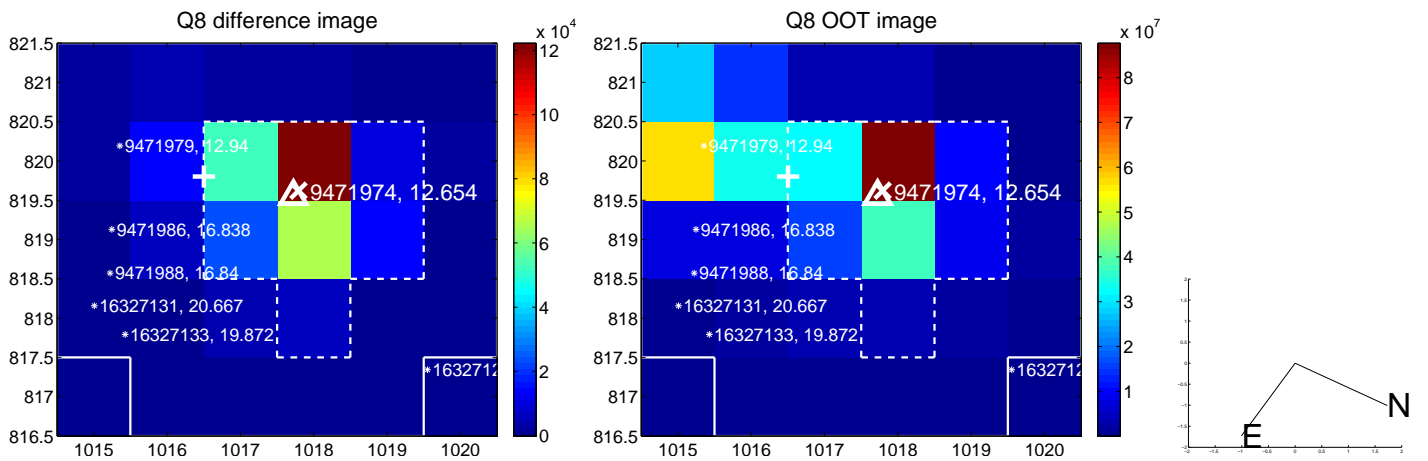
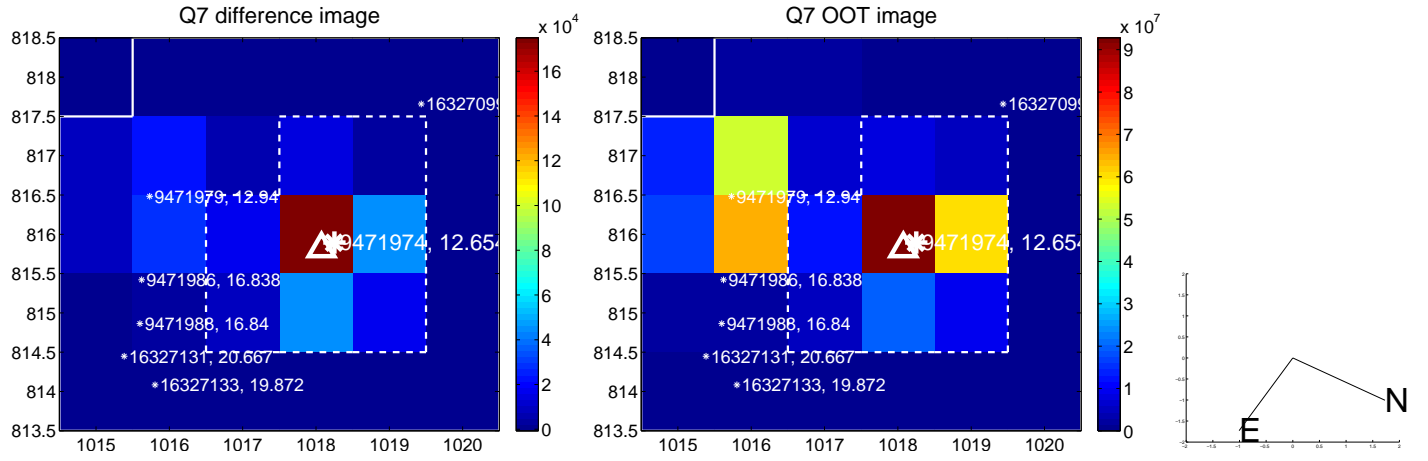
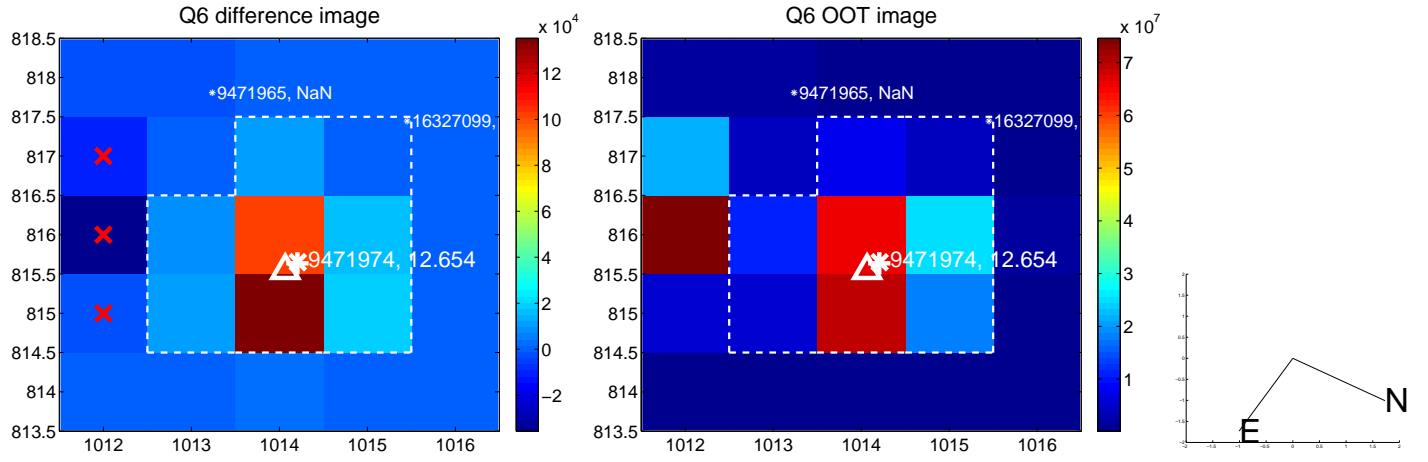
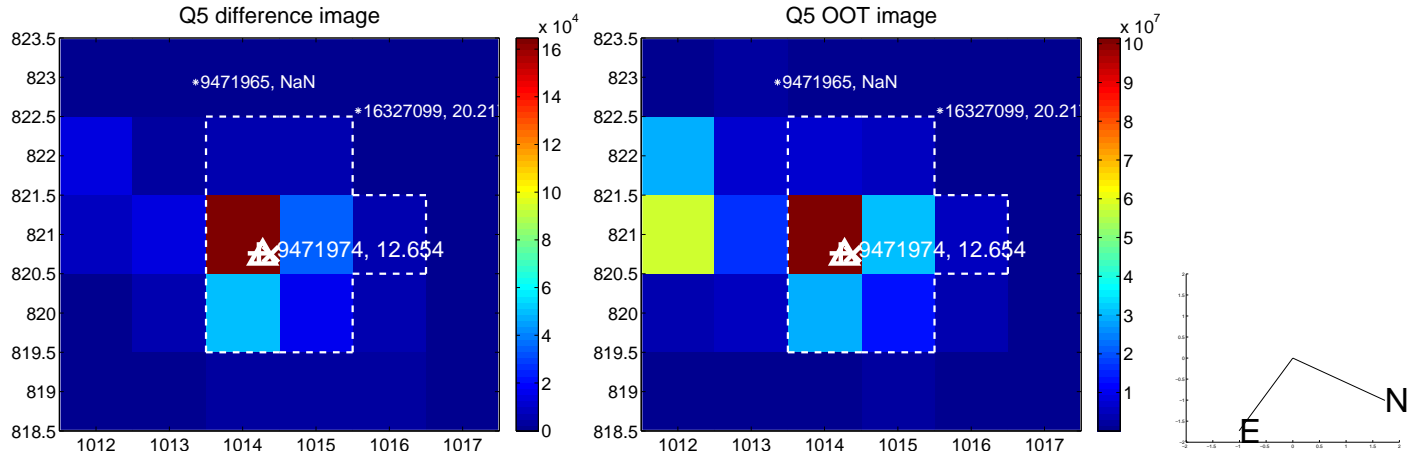


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

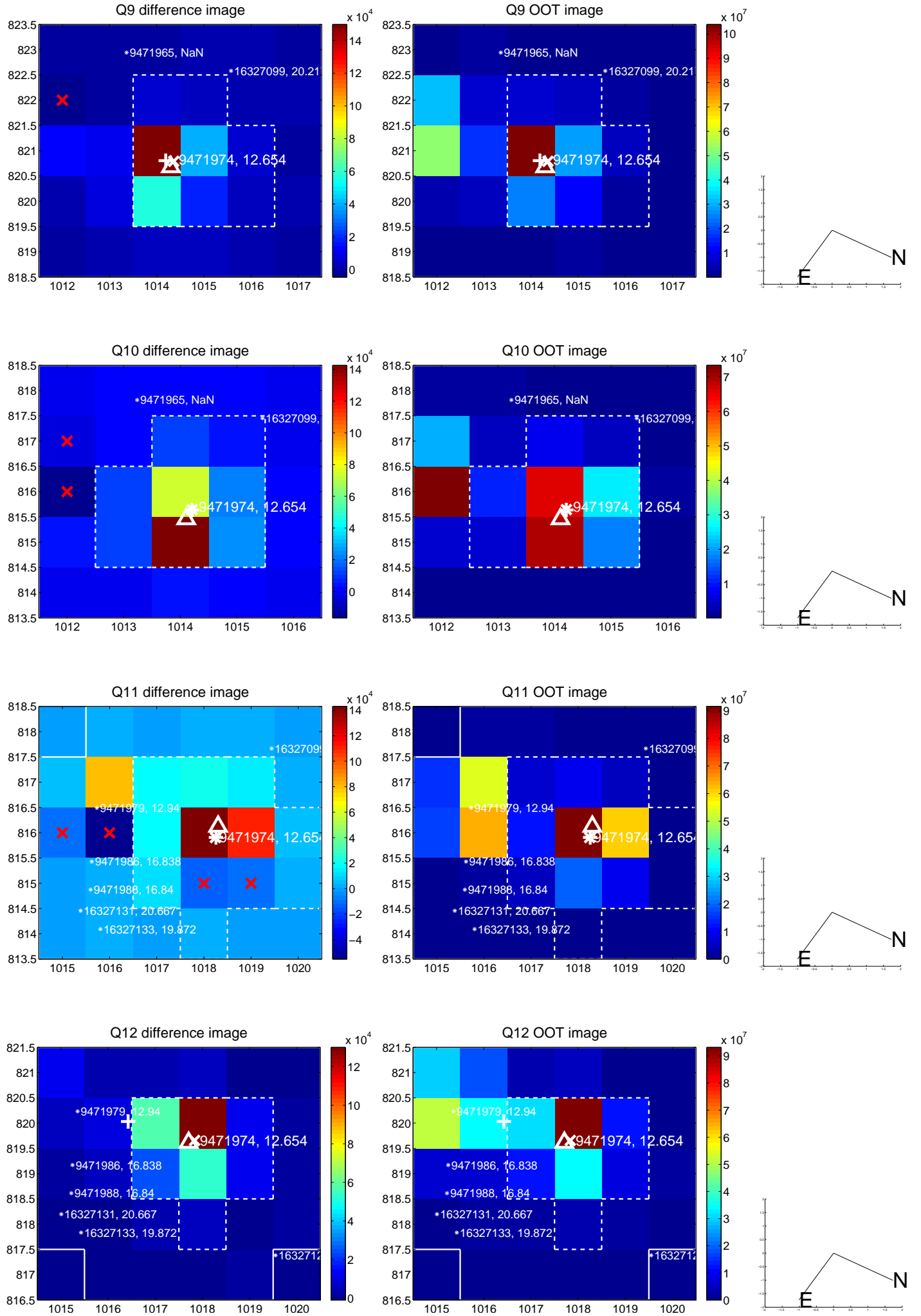
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



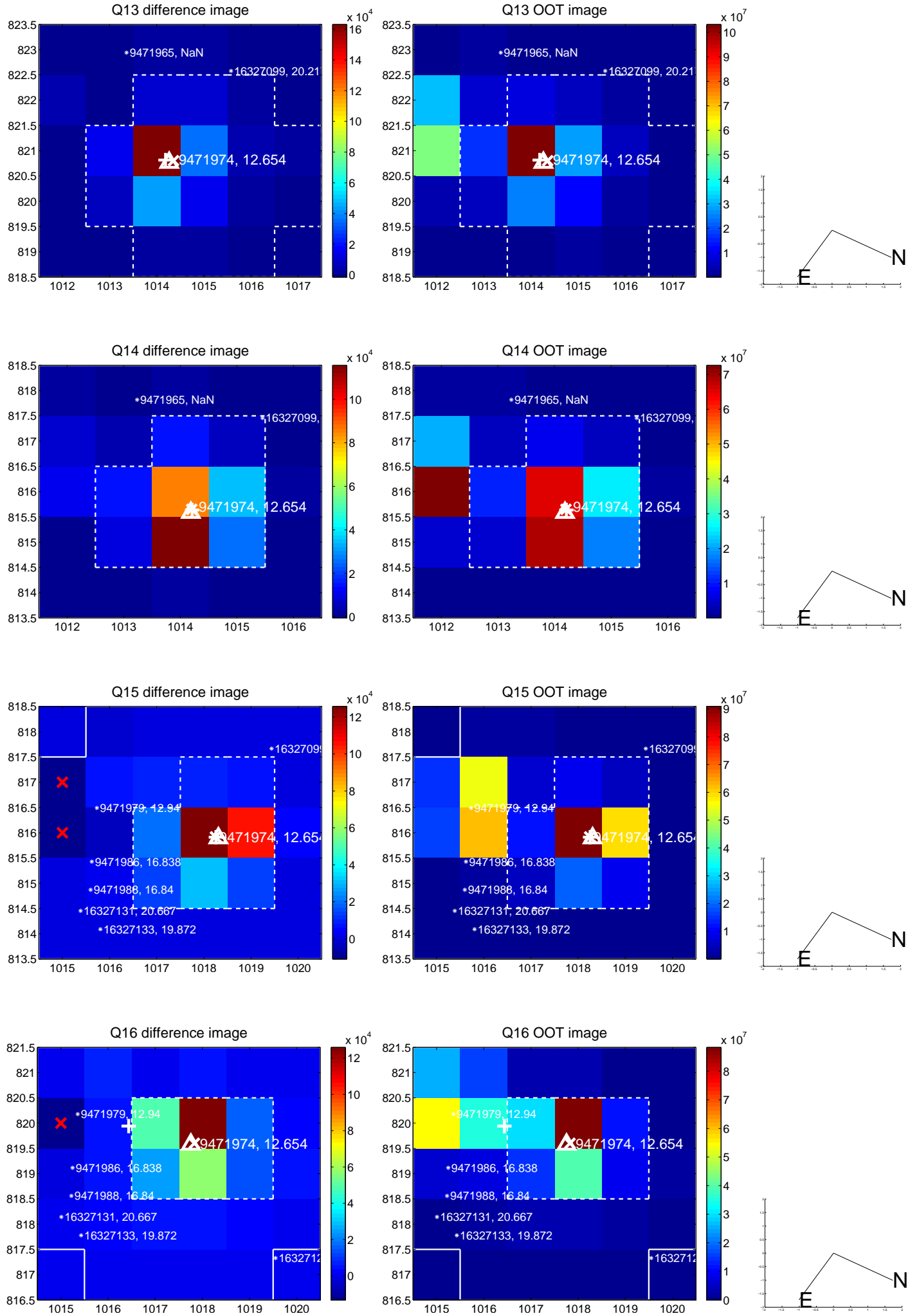
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



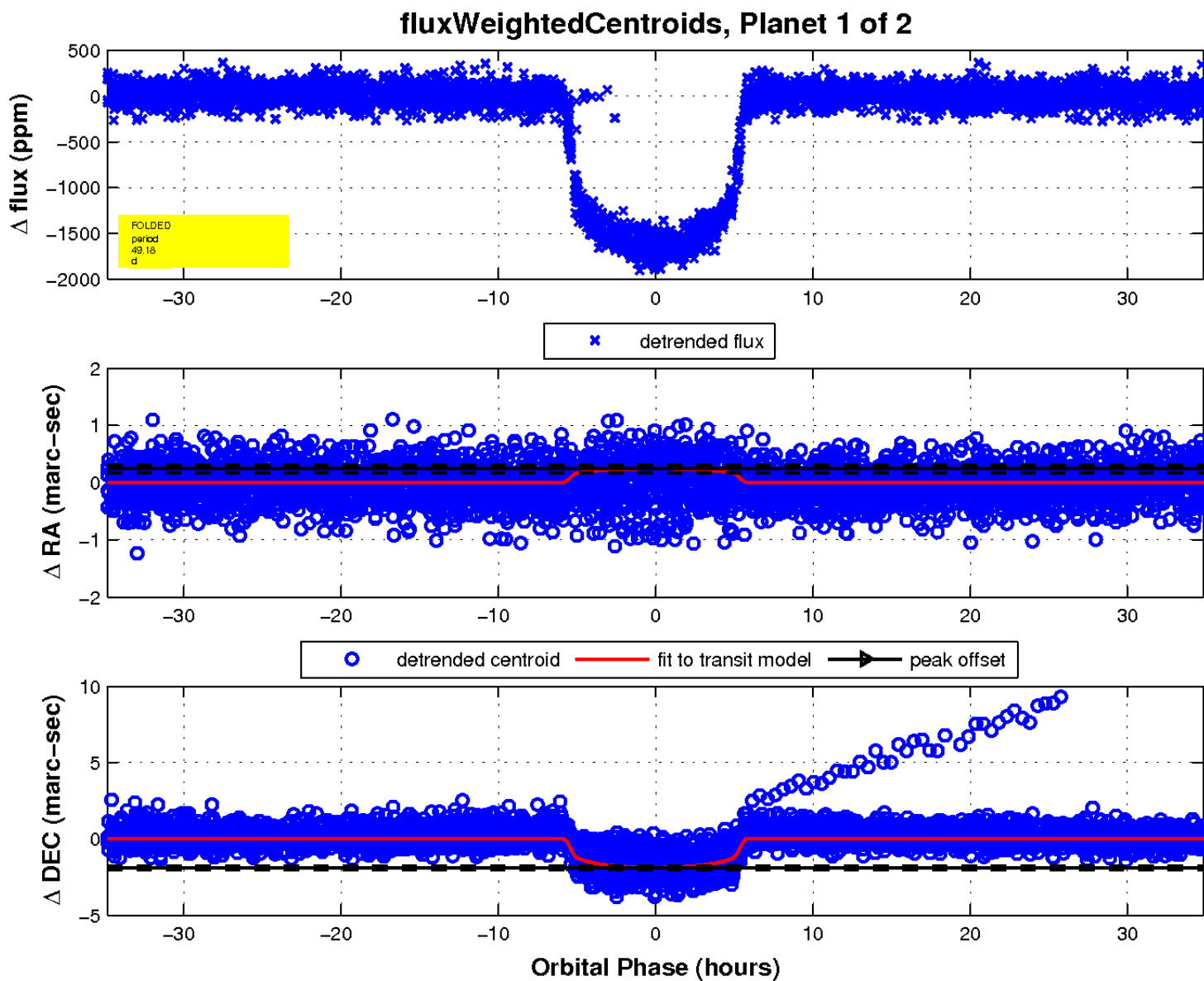
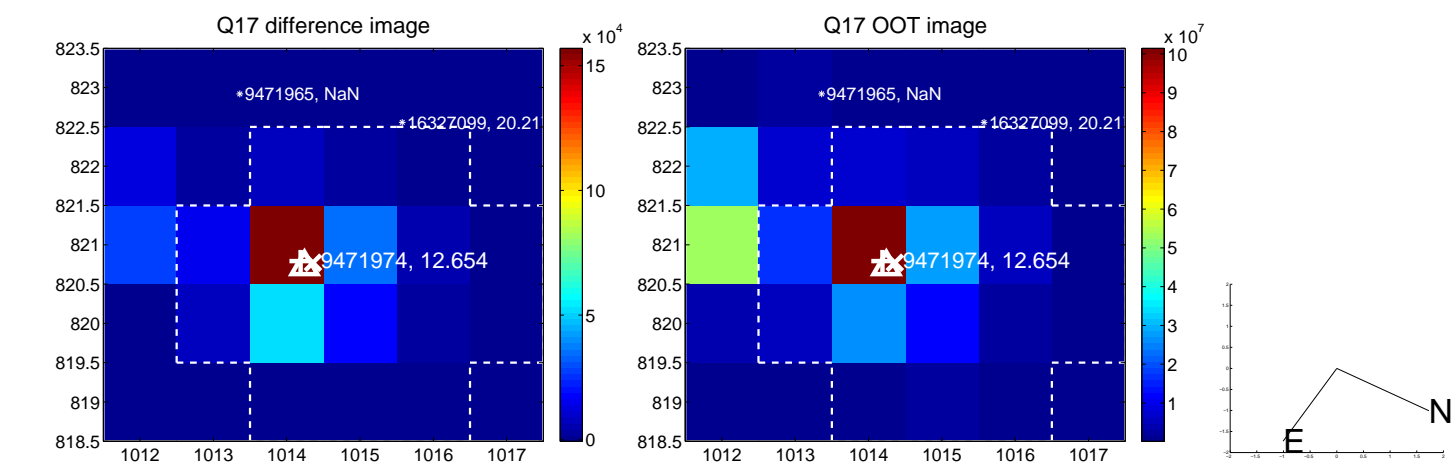
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

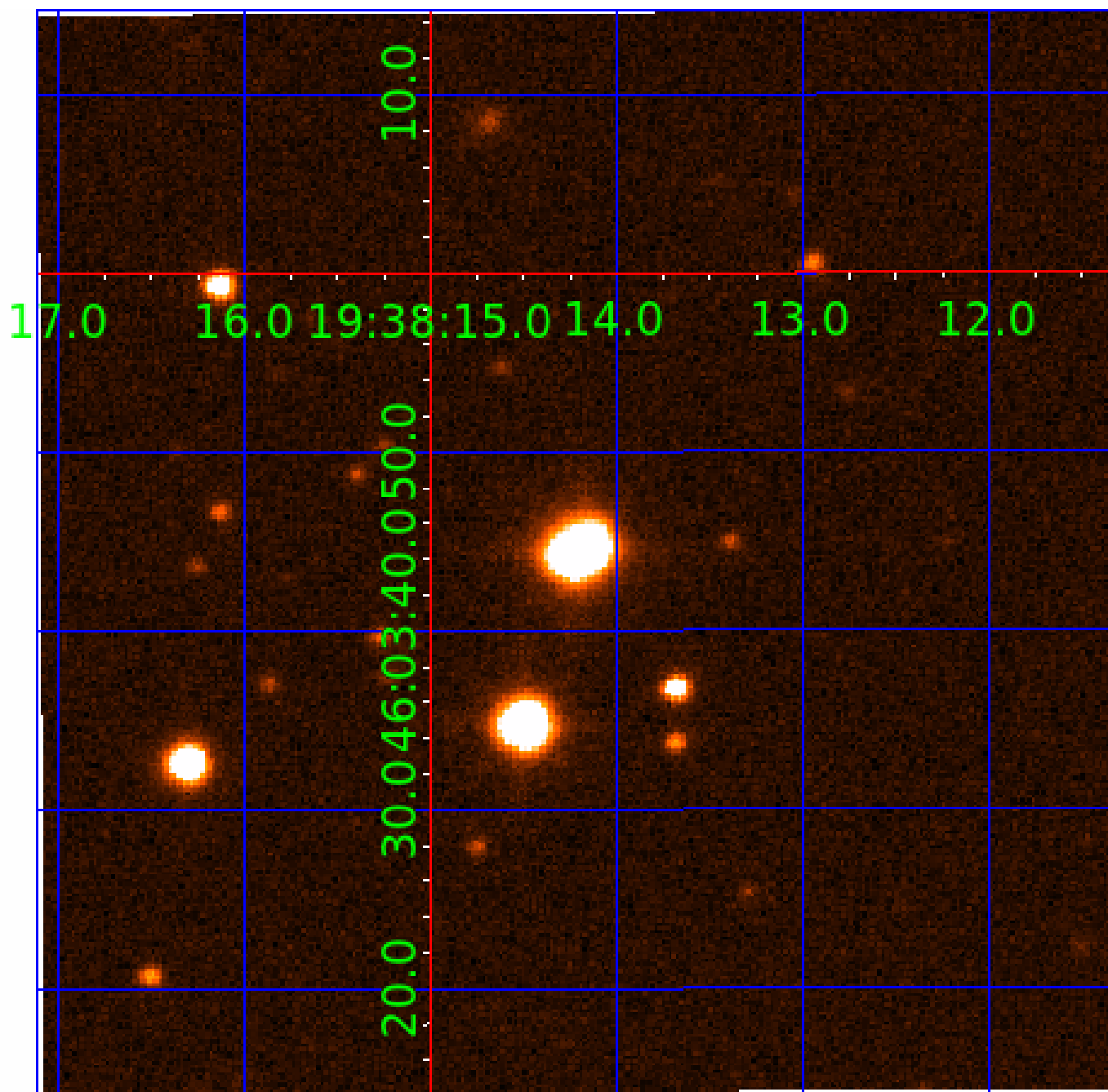


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009471974

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})
009471974-01	OBS	0119.01	49.183945	141.911765	1655.1	11.616	250.0	246.5	2.06	5626	8.77	47.51
009471974-02	OBS	0119.02	190.322555	312.675262	1143.1	15.198	95.6	95.4	2.06	5626	7.63	7.82

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009471974-01	OBS	PC	0.96	0	0	0	0	CENT_KIC_POS
009471974-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

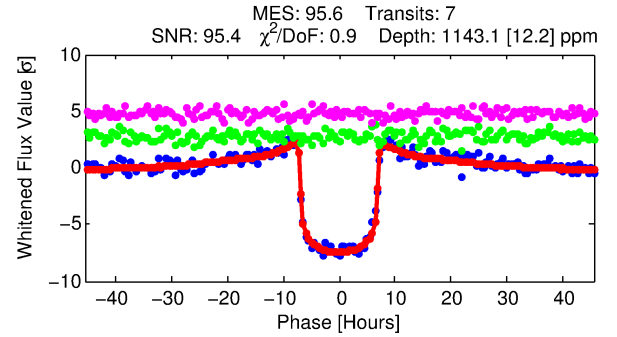
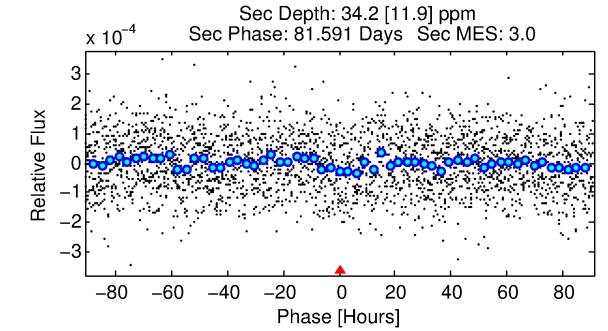
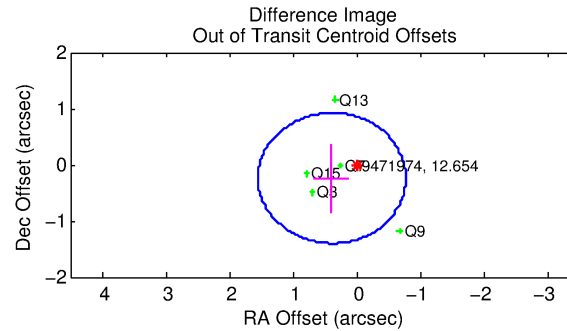
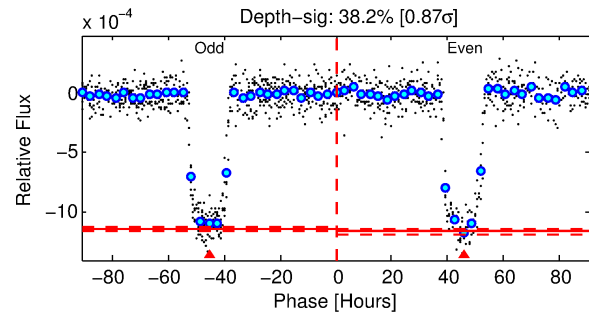
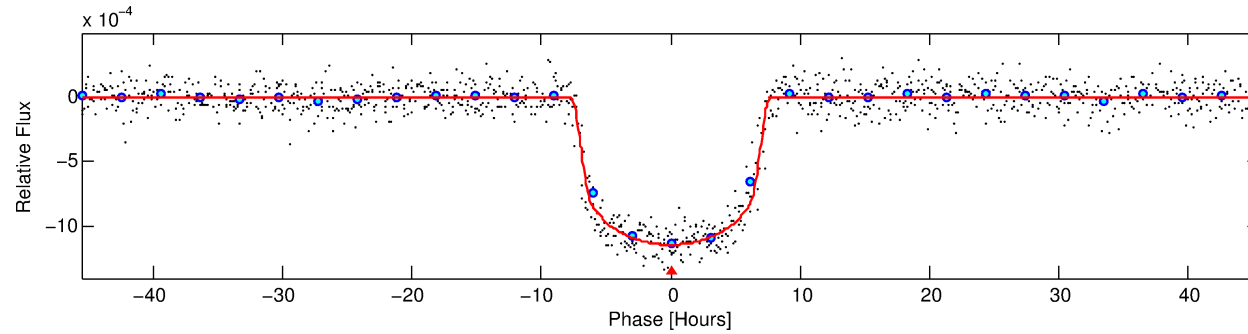
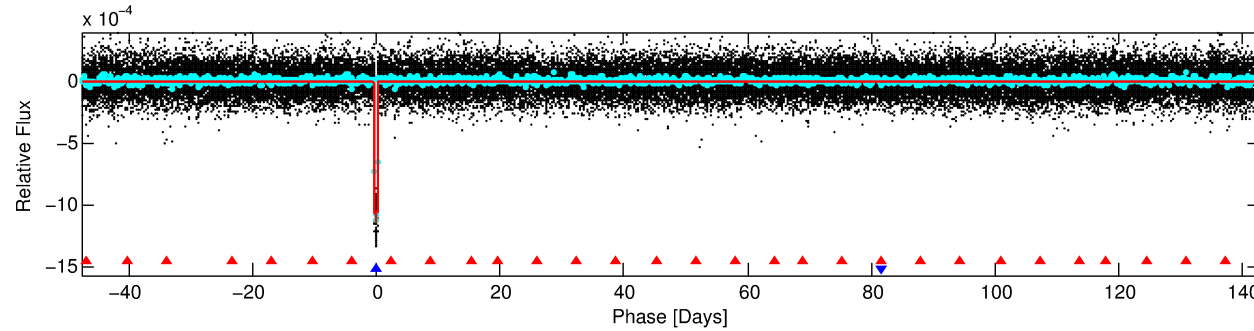
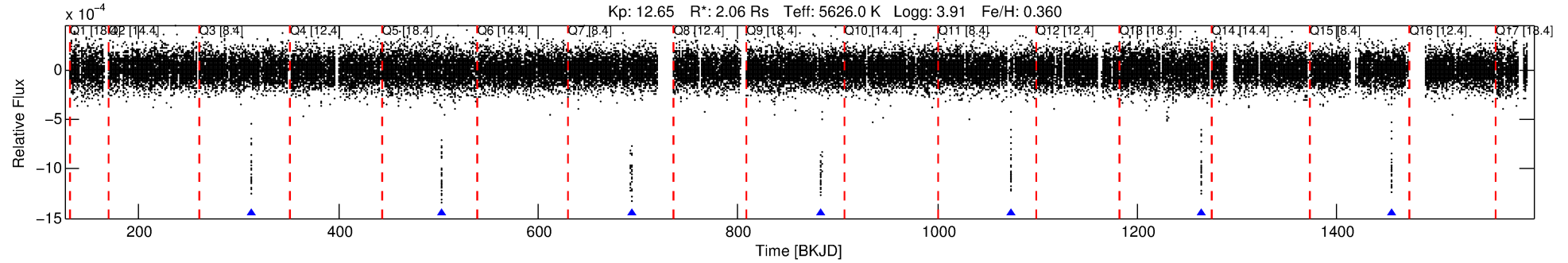
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009471974-02

No Significant Match Found

DV One-Page Summary

KIC: 9471974 Candidate: 2 of 2 Period: 190.323 d
KOI: K00119.02 Name: Kepler-108c Corr: 0.995



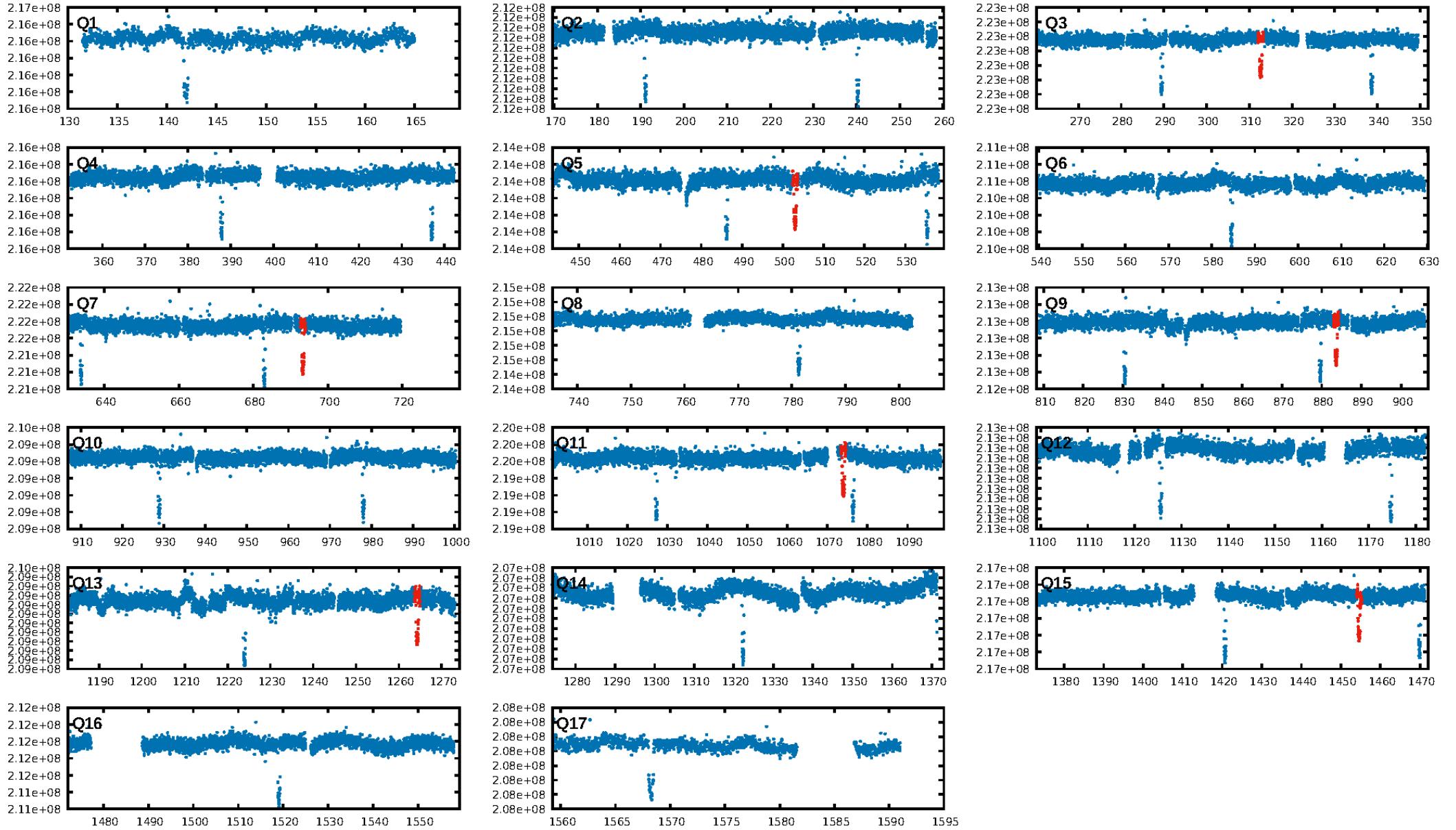
DV Fit Results:

Period = 190.32256 [0.00060] d
Epoch = 312.6753 [0.0021] BKJD
Rp/R* = 0.0340 [0.0006]
a/R* = 65.93 [4.19]
b = 0.77 [0.03]
Seff = 7.82 [0.77]
Teq = 426 [11] K
Rp = 7.63 [0.53] Re
a = 0.6969 [0.0378] AU
Ag = 157.17 [56.17] [2.78 σ]
Teffp = 2334 [207] K [9.20 σ]

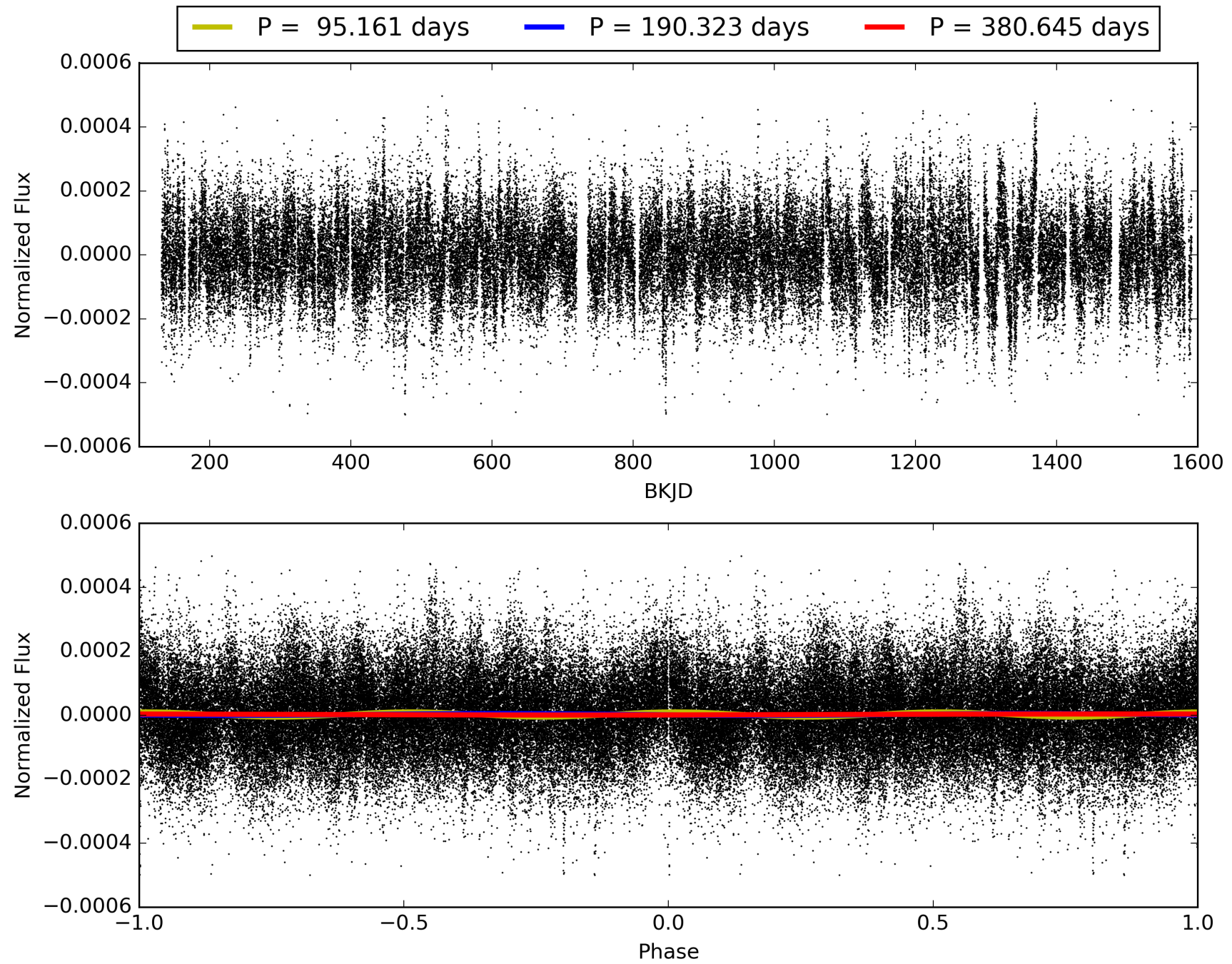
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [177.08 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 49.5%
ModelChiSquareGof-sig: 99.8%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: 6.911
Centroid-sig: 0.0%
Centroid-so: 1.370 arcsec [7.17 σ]
OotOffset-rm: 0.455 arcsec [1.18 σ]
KicOffset-rm: 0.472 arcsec [1.88 σ]
OotOffset-st: 0/3/0/2 [5]
KicOffset-st: 0/3/0/2 [5]
DiffImageQuality-fgm: 1.00 [5/5]
DiffImageOverlap-fno: 1.00 [5/5]

TCE 009471974-02, PDC Light Curves

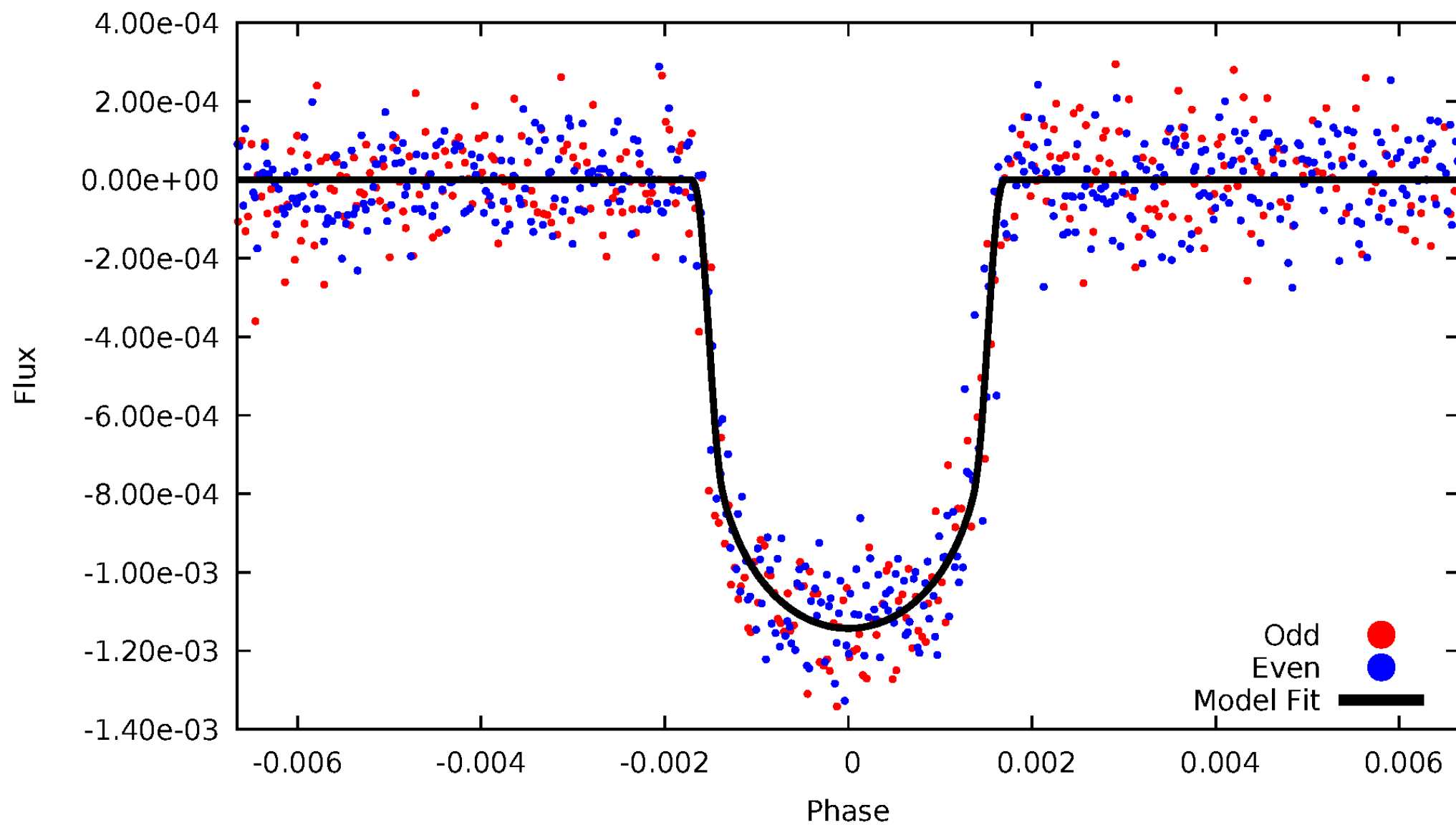


TCE 009471974-02



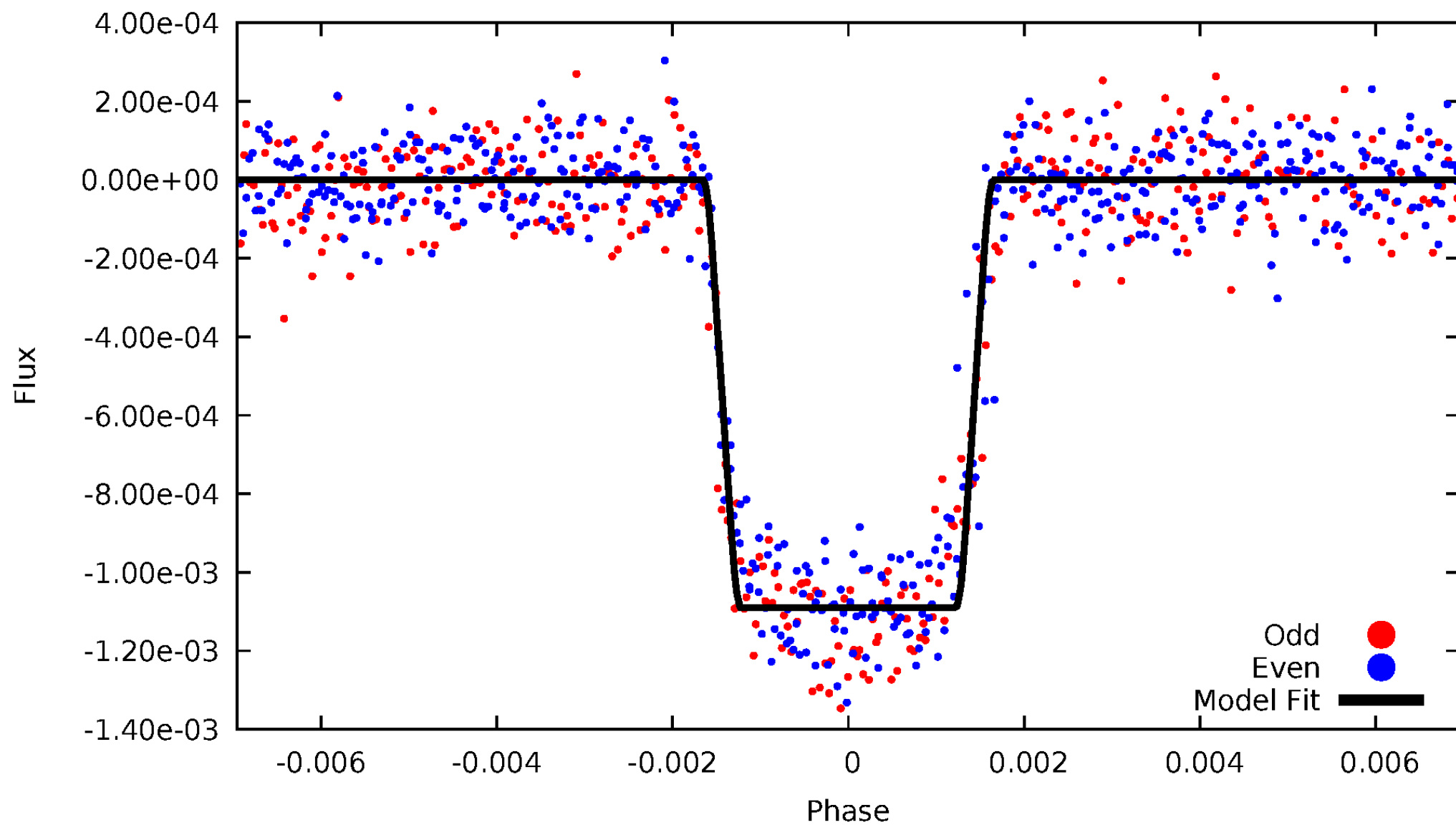
DV Odd/Even

TCE 009471974-02



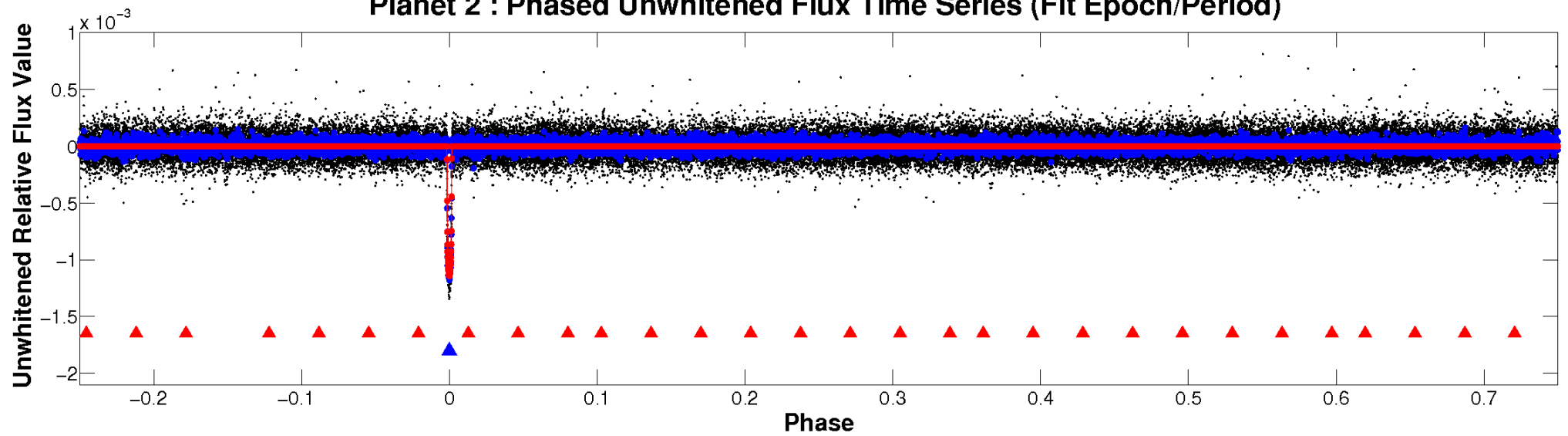
ALT Odd/Even

TCE 009471974-02

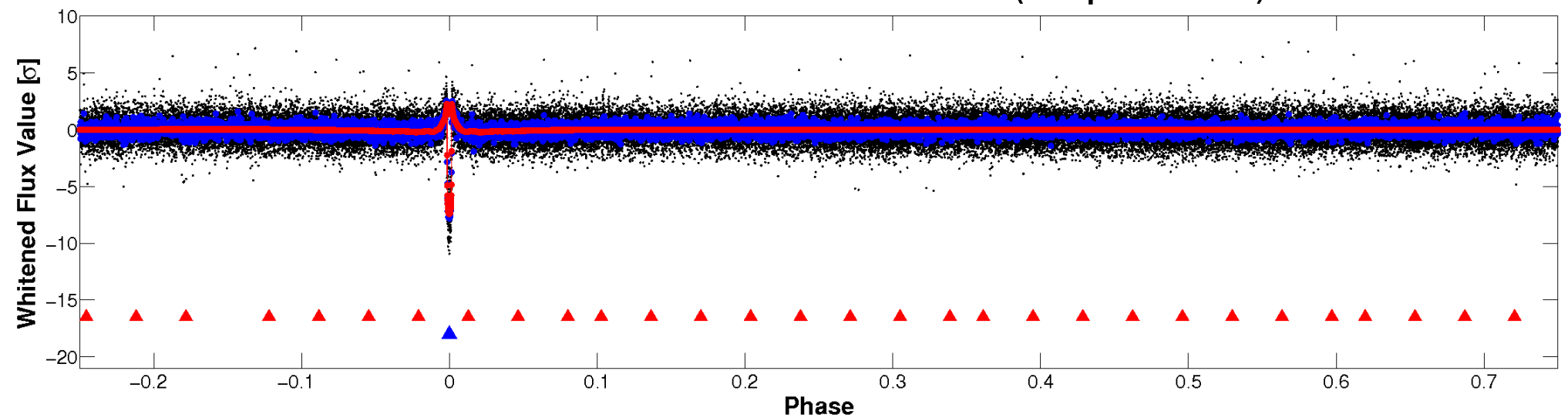


Non-Whitened Vs. Whitened Light Curve

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

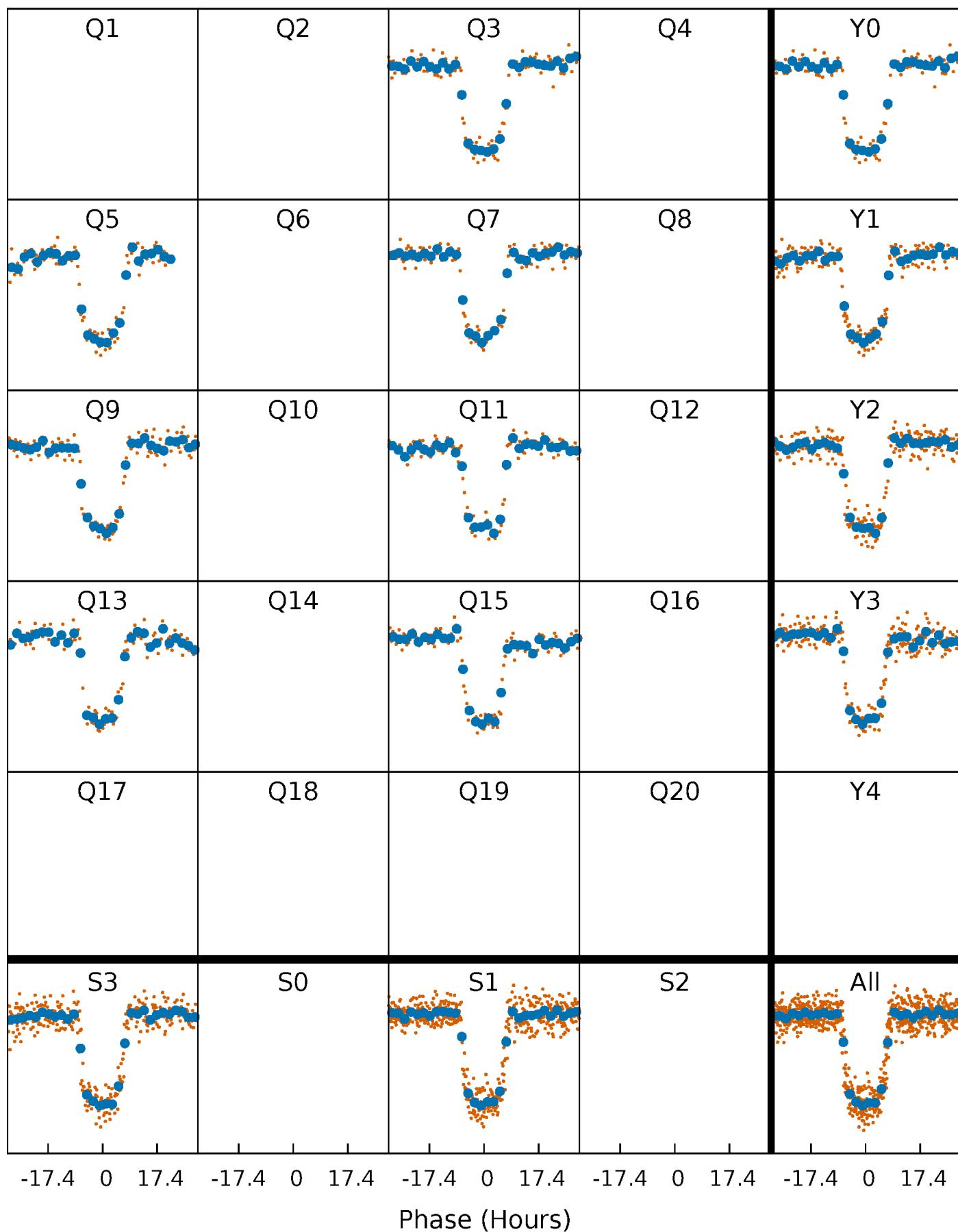


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



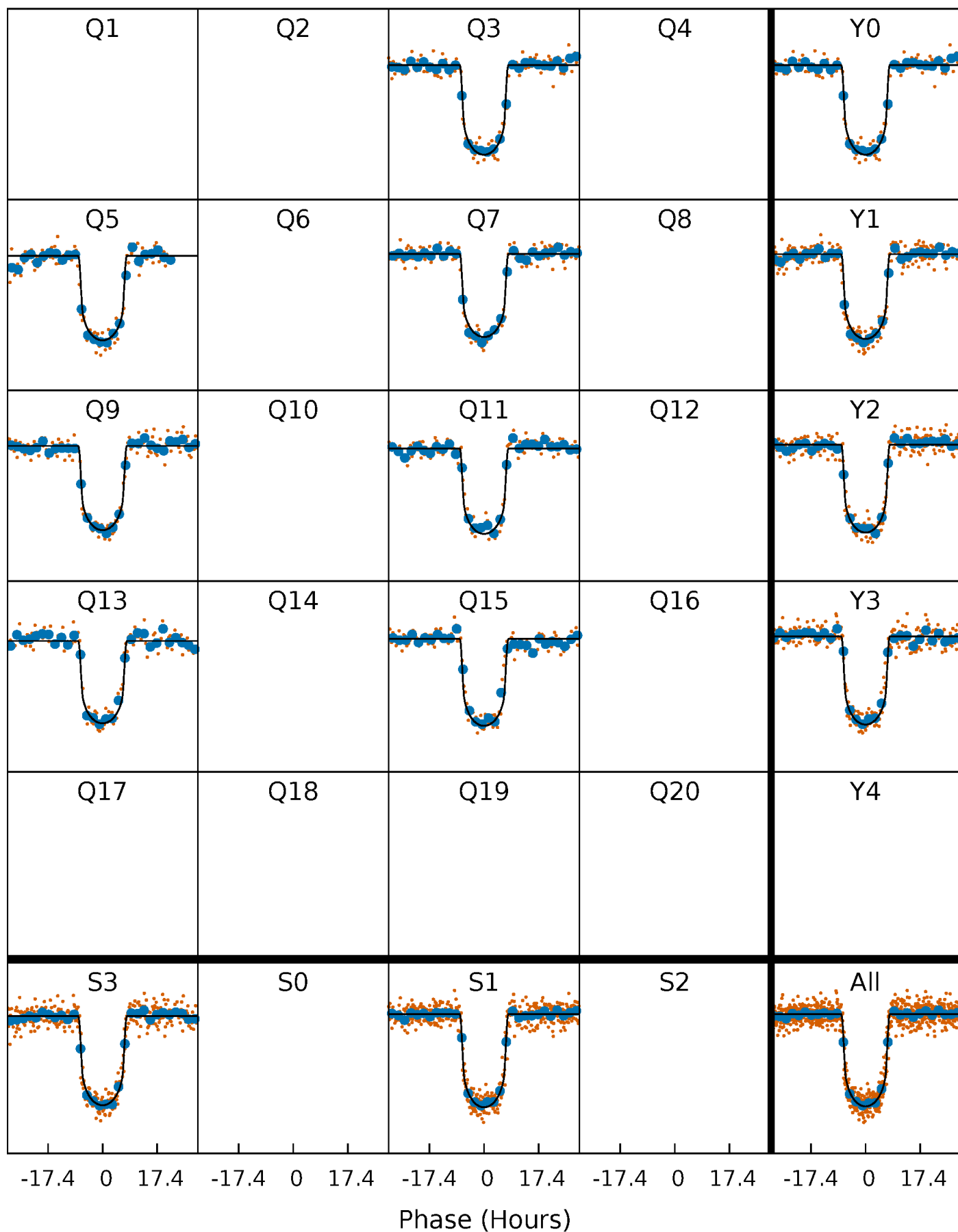
PDC Quarter-Phased Transit Curves

TCE 009471974-02 P=190.322555 Days $T_0=312.675262$ (BKJD)



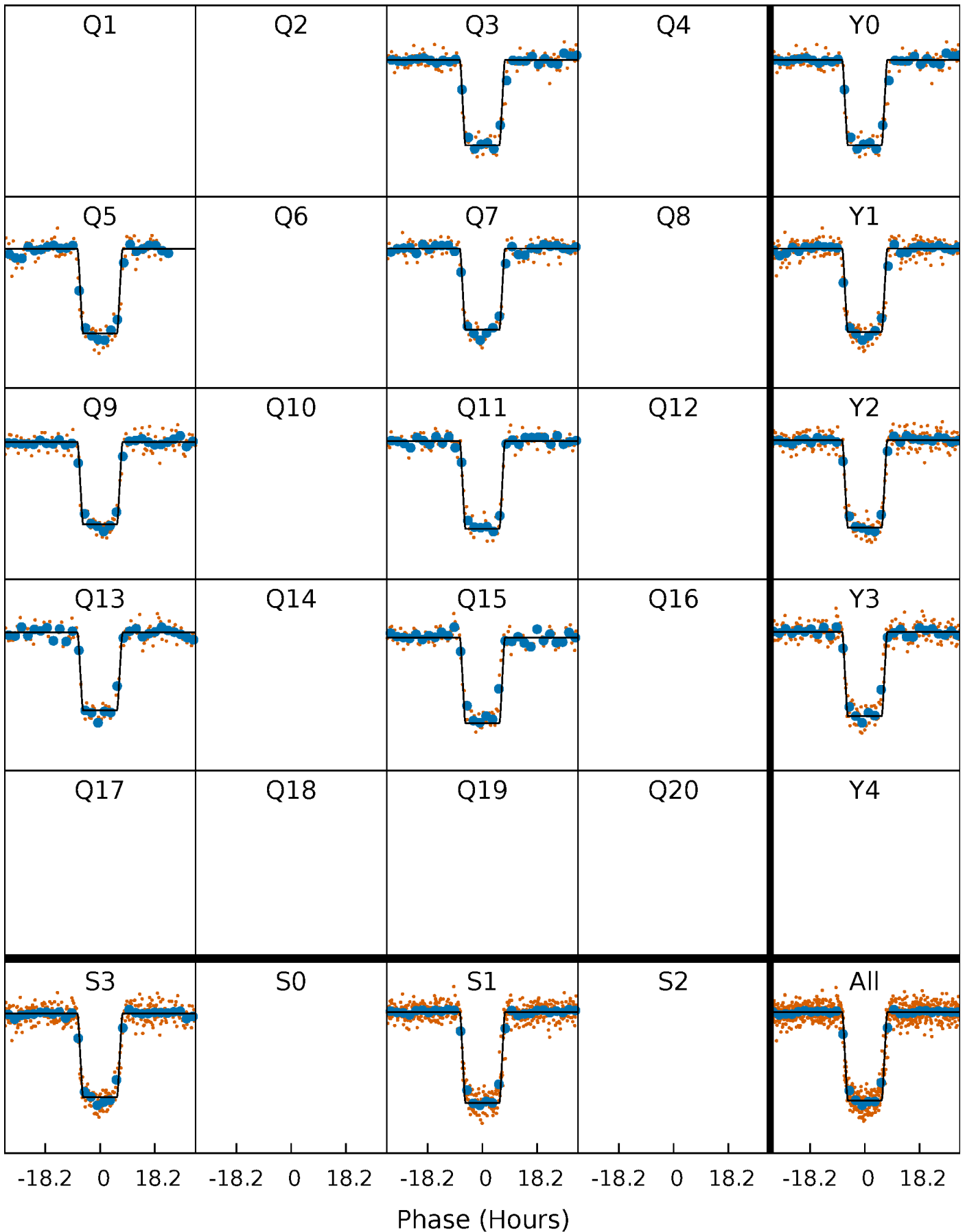
DV Quarter-Phased Transit Curves

TCE 009471974-02 $P=190.322555$ Days $T_0=312.675262$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

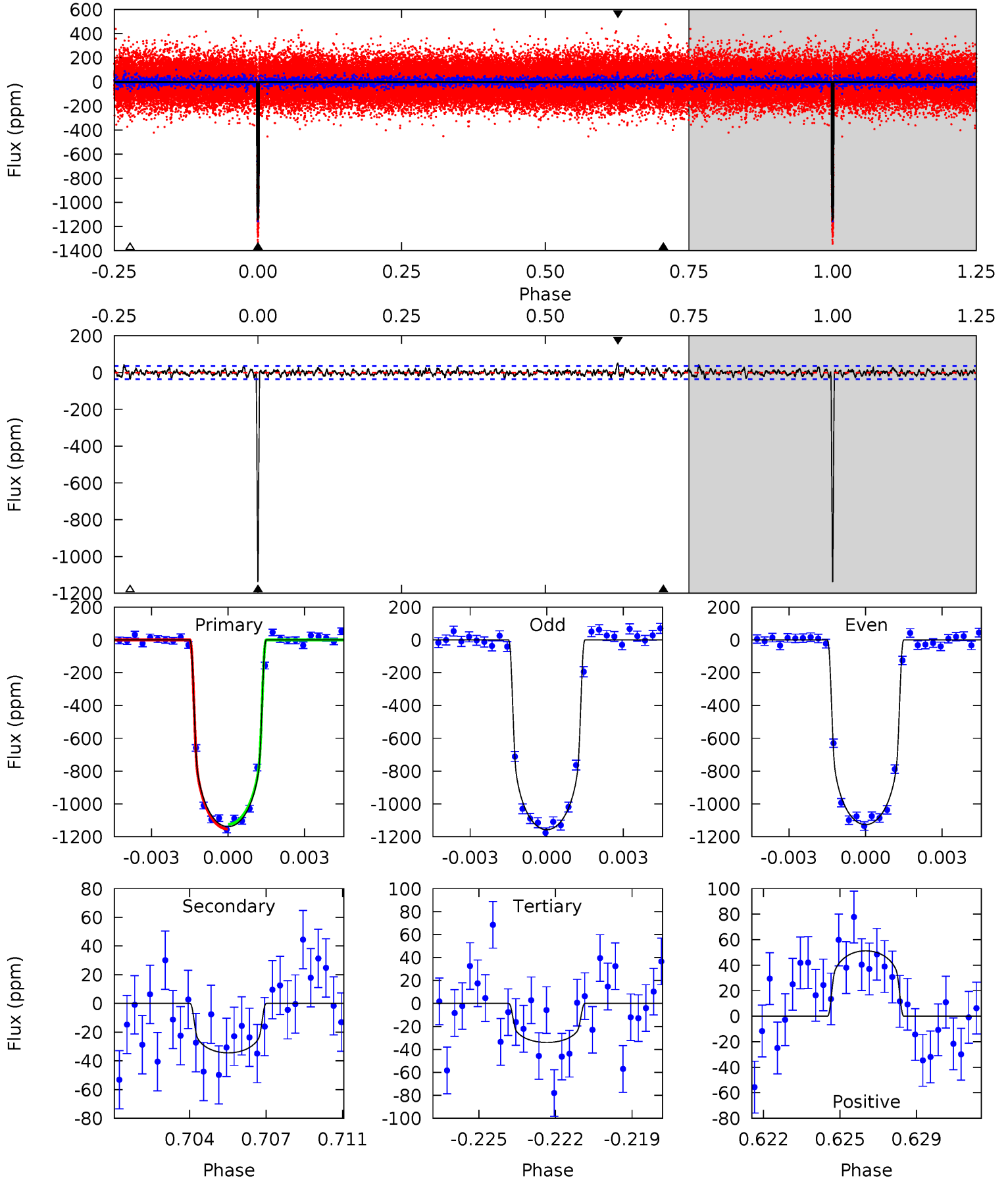
TCE 009471974-02 $P=190.324989$ Days $T_0=312.665991$ (BKJD)



DV Model-Shift Uniqueness Test

009471974-02, $P = 190.322555$ Days, $E = 122.352707$ Days

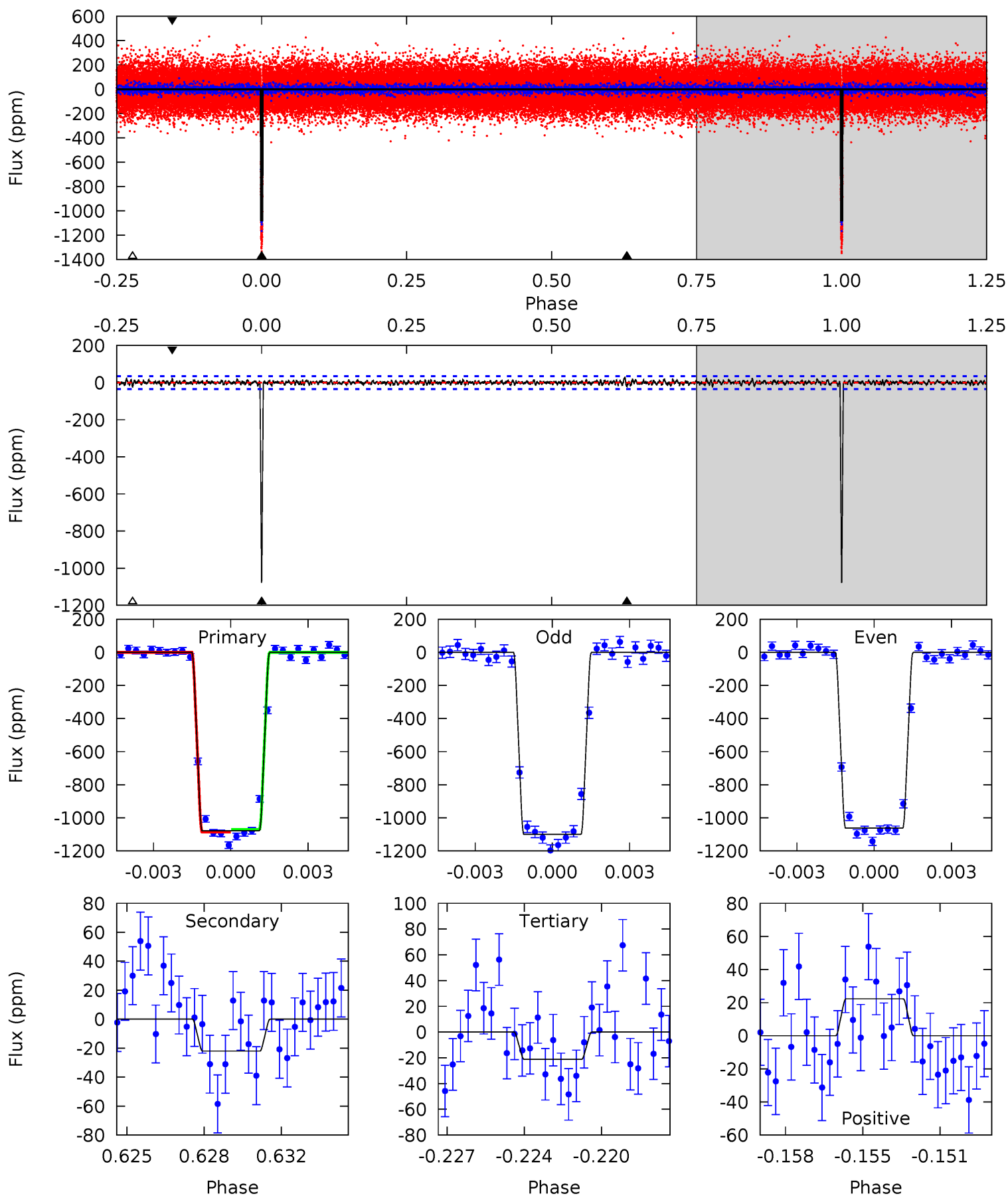
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
167.6	5.06	5.00	7.54	5.23	2.93	1.60	162.6	160.0	0.07	-2.47	2.26	1.00	0.04	2.16



Alt Model-Shift Uniqueness Test

009471974-02, P = 190.324989 Days, E = 122.341002 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
160.3	3.27	3.16	3.32	5.24	2.94	0.97	157.2	157.0	0.11	-0.04	2.76	0.99	0.03	1.19



Stellar Parameters For KIC 009471974

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5626^{+89}_{-78}	$3.907^{+0.040}_{-0.036}$	$0.360^{+0.100}_{-0.150}$	$2.057^{+0.125}_{-0.138}$	$1.247^{+0.082}_{-0.067}$	$0.202^{+0.033}_{-0.025}$
	+2%/-1%	+1%/-1%	+28%/-42%	+6%/-7%	+7%/-5%	+16%/-13%
Source	SPE72	AST8	SPE72	DSEP		

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

Secondary Eclipse Parameters for KIC 009471974-02 / KOI 0119.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-34 ± 7	$7.65^{+0.31}_{-0.31}$	596^{+13}_{-12}	3001^{+90}_{-99}	158^{+36}_{-33}
Alt.	-22 ± 7	$7.44^{+0.28}_{-0.33}$	596^{+13}_{-12}	2848^{+114}_{-138}	108^{+34}_{-33}

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

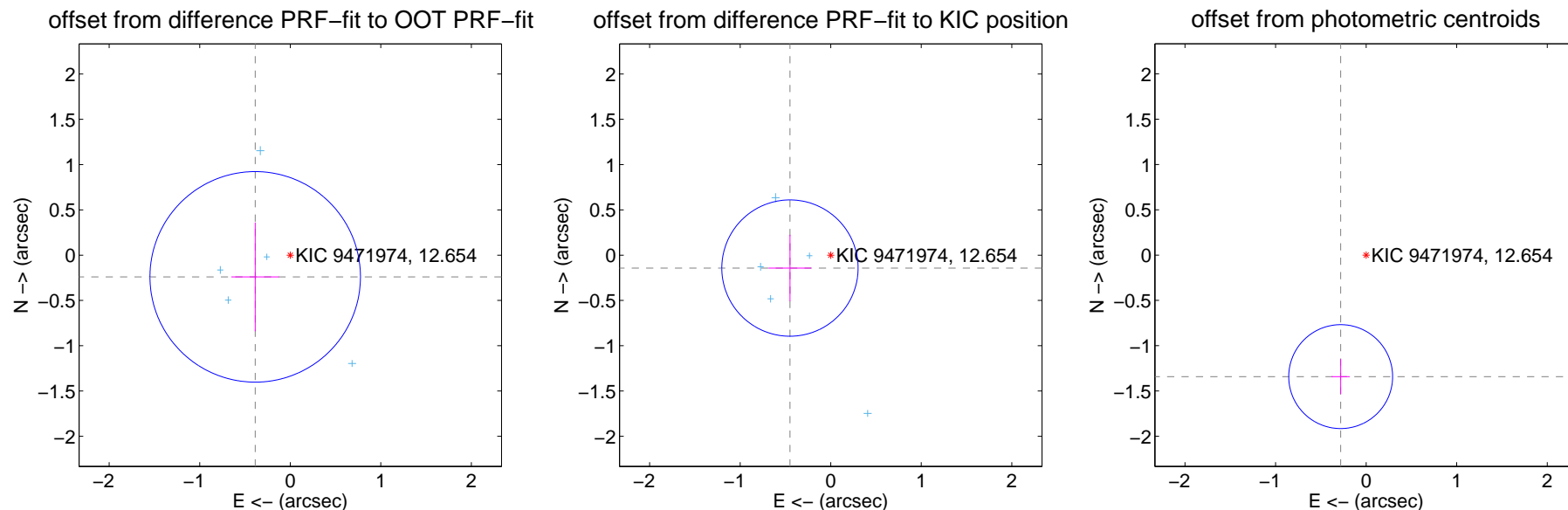
DV Centroid Data

Supplemental centroid analysis for 009471974-02. Kepler magnitude: 12.65. Transit SNR 95.42

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.455 ± 0.387	1.18	0.387 ± 0.263	-0.240 ± 0.601
PRF-fit source offset from KIC position	0.472 ± 0.251	1.88	0.450 ± 0.236	-0.143 ± 0.367
photometric centroid source offset	1.37 ± 0.19	7.17	0.28 ± 0.10	-1.34 ± 0.19



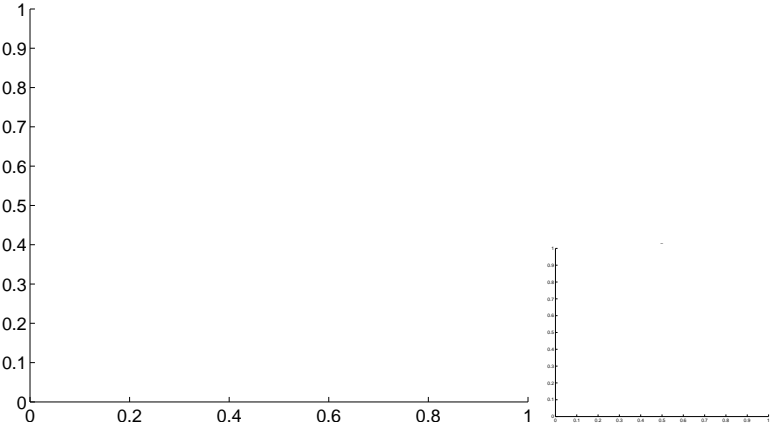
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

Q1 no difference image



Q1 no OOT image



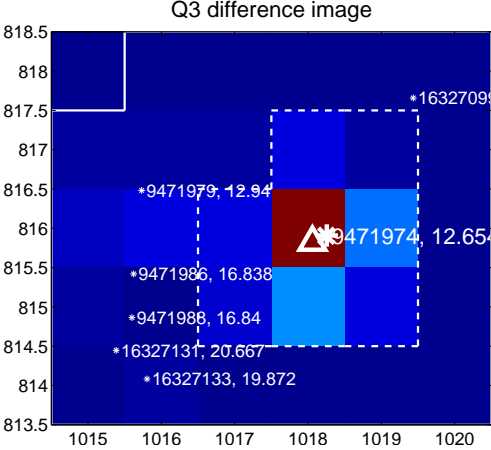
Q2 no difference image



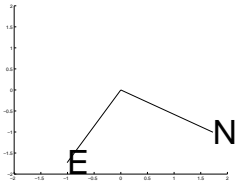
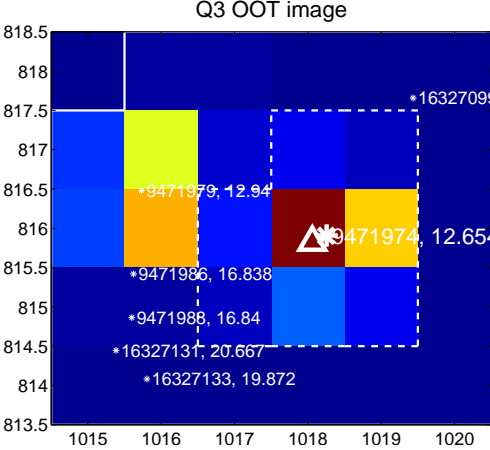
Q2 no OOT image



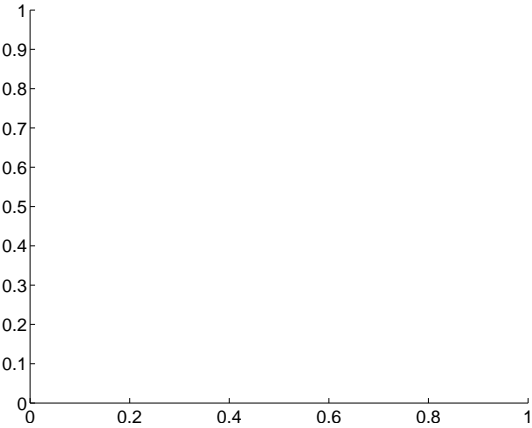
Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 no OOT image



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

Q5 no difference image



Q5 no OOT image



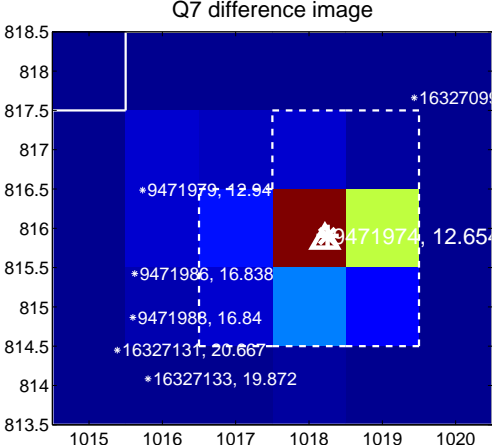
Q6 no difference image



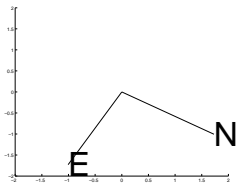
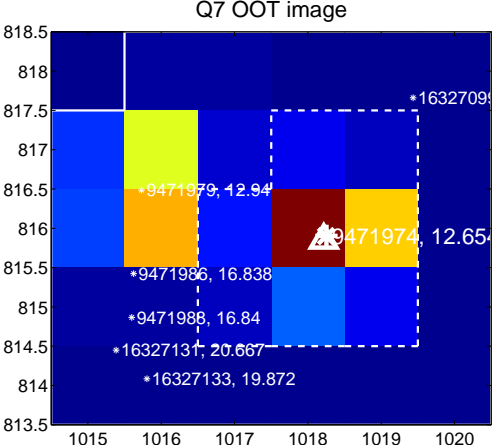
Q6 no OOT image



Q7 difference image



Q7 OOT image



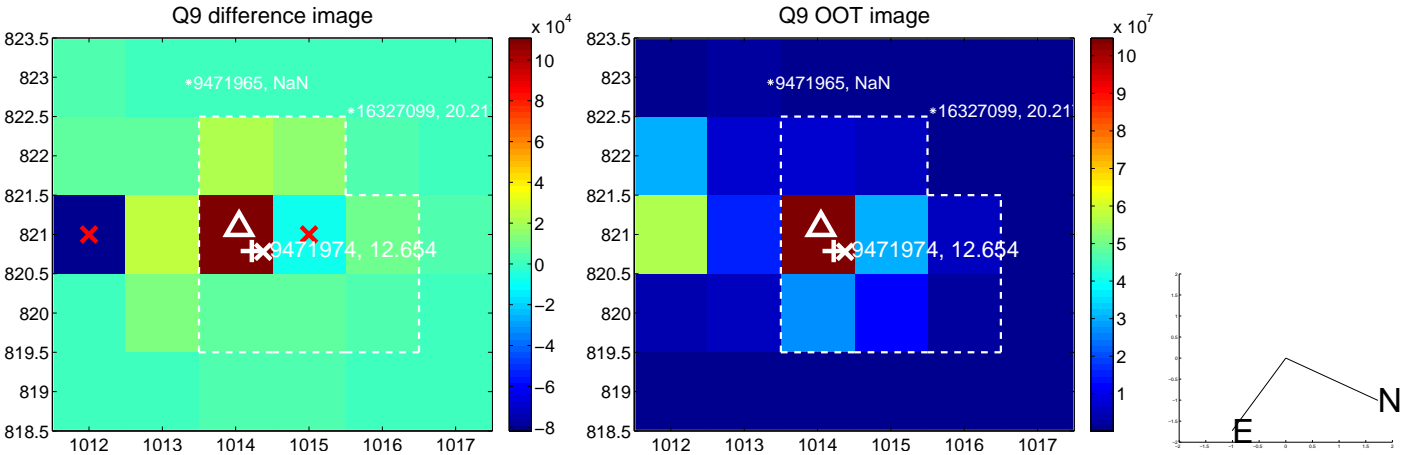
Q8 no difference image



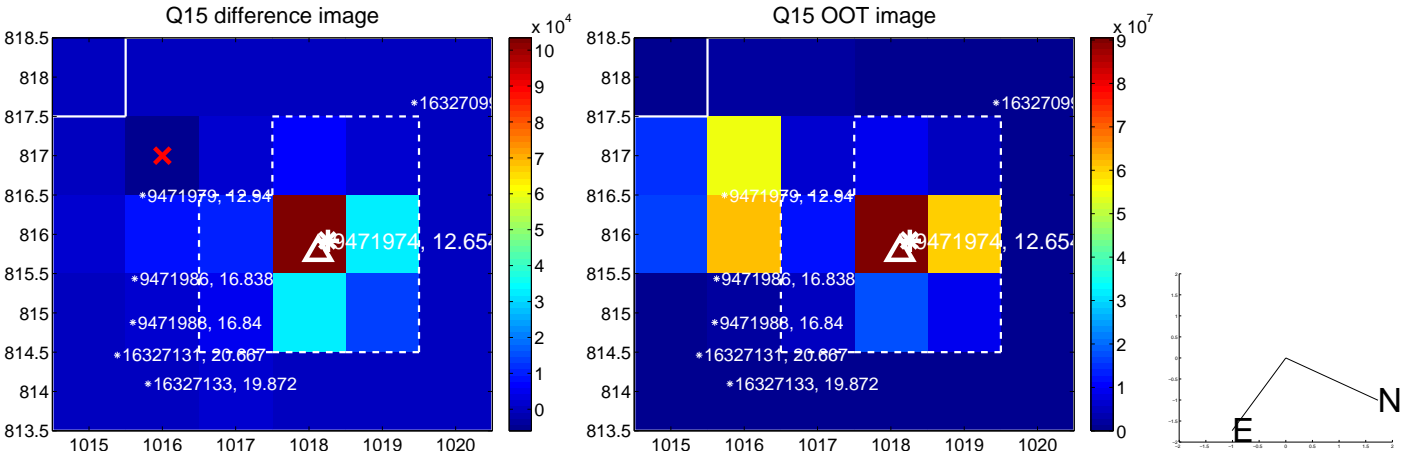
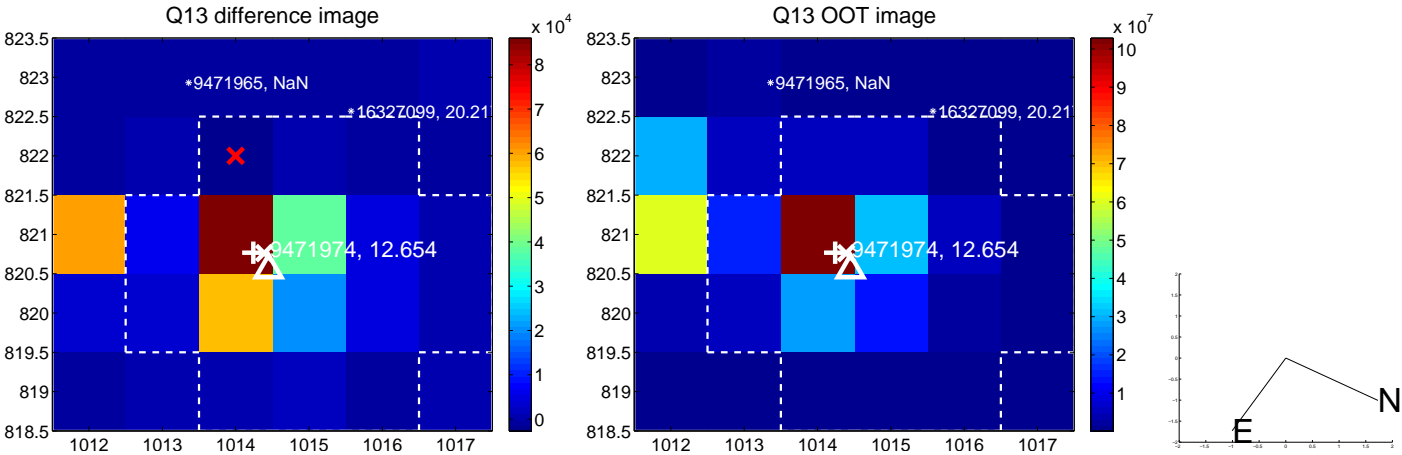
Q8 no OOT image



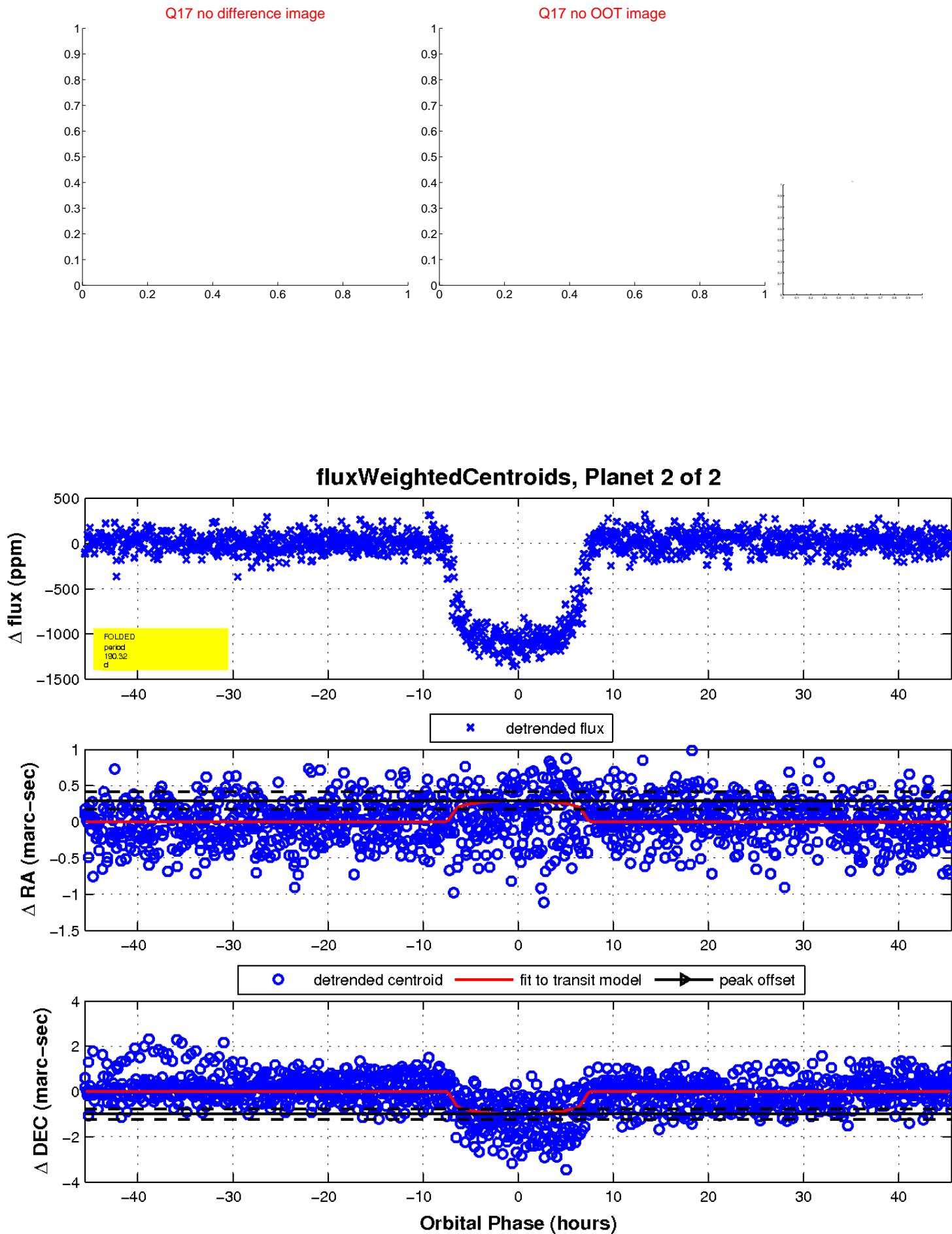
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

