

KIC 009474969

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})
009474969-01	OBS	7178.01	21.570507	151.793219	134202.6	13.839	15279.3	14369.0	1.69	6322	63.72	172.23
009474969-02	OBS	No	21.570511	146.540926	118380.2	12.042	15892.5	8523.2	1.69	6322	58.72	172.23
009474969-04	OBS	No	292.120493	324.234382	1026.9	6.720	25.9	14.4	1.69	6322	6.74	5.33
009474969-05	OBS	No	312.456377	281.002919	1478.4	15.000	59.8	-1.0	1.69	6322	6.54	4.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009474969-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009474969-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD
009474969-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009474969-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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.

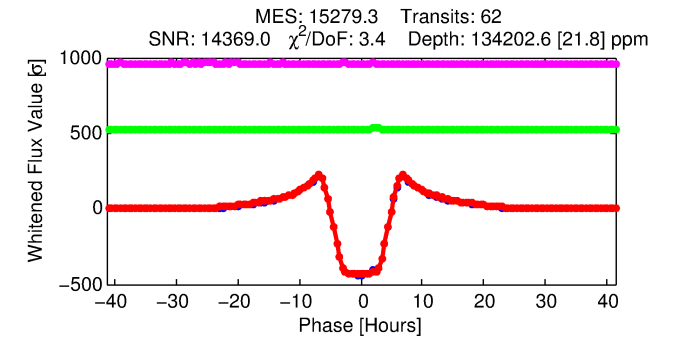
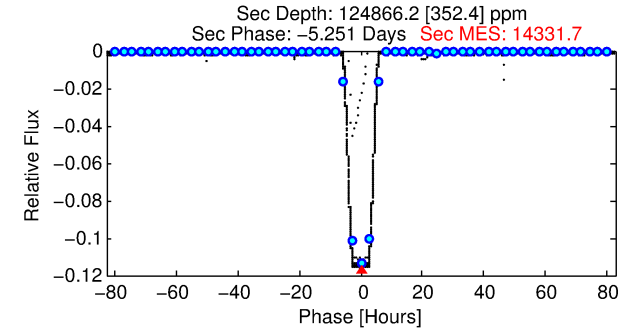
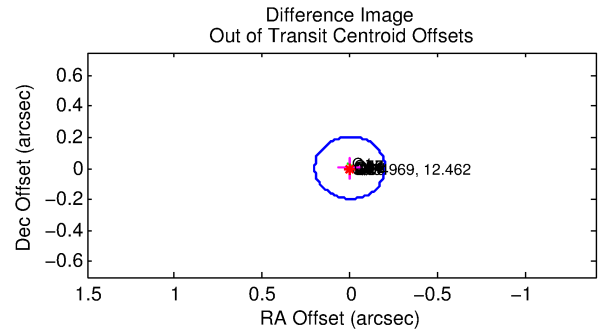
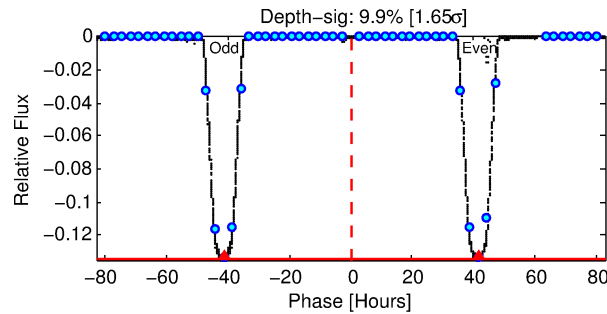
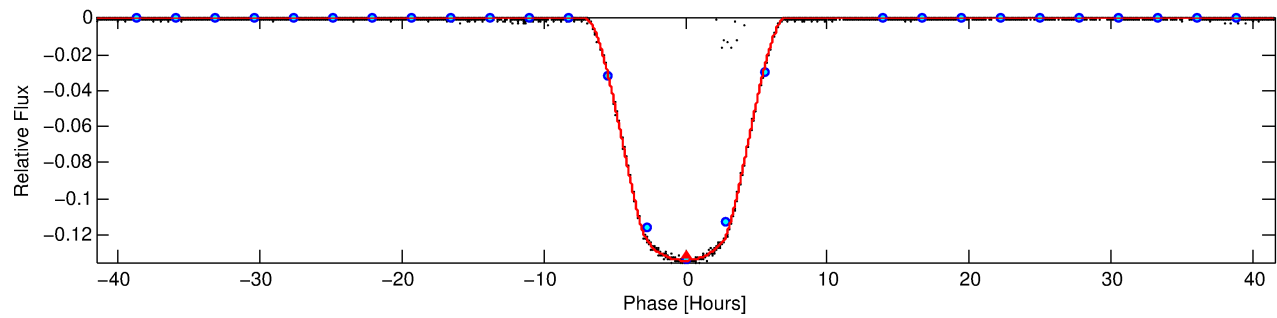
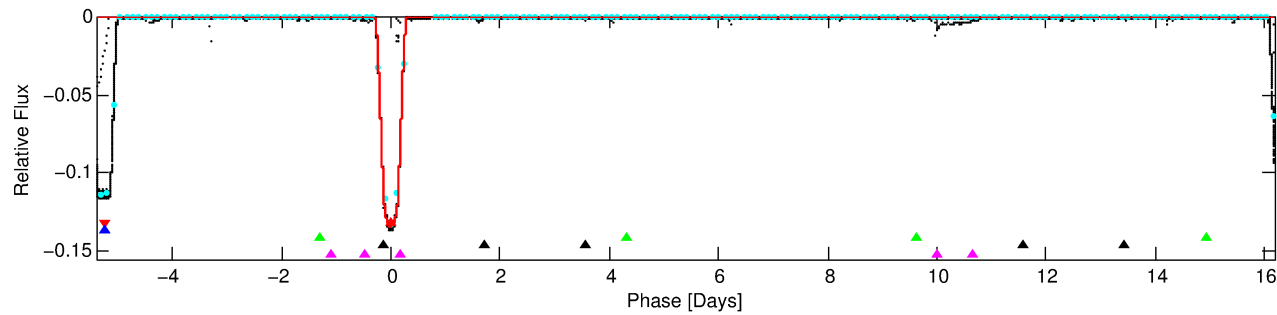
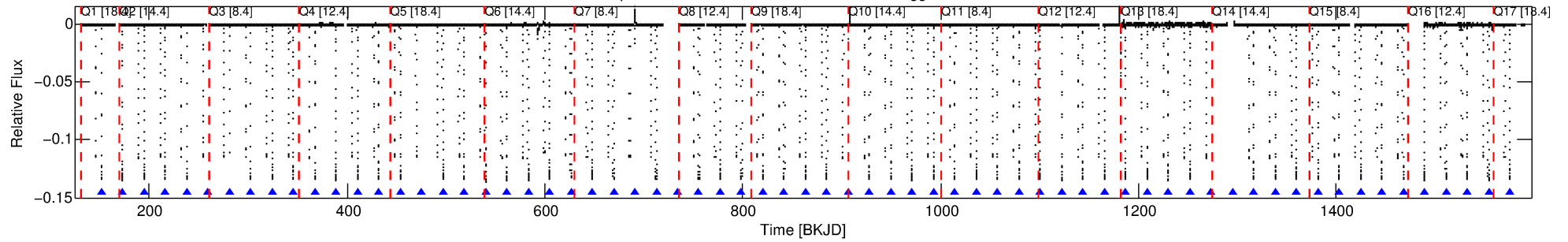
Ephemeris Match Information For 009474969-01

No Significant Match Found

DV One-Page Summary

KIC: 9474969 Candidate: 1 of 5 Period: 21.571 d
KOI: K07178.01 Corr: 0.999

Kp: 12.46 R*: 1.69 Rs Teff: 6322.0 K Logg: 4.00 Fe/H: -0.460



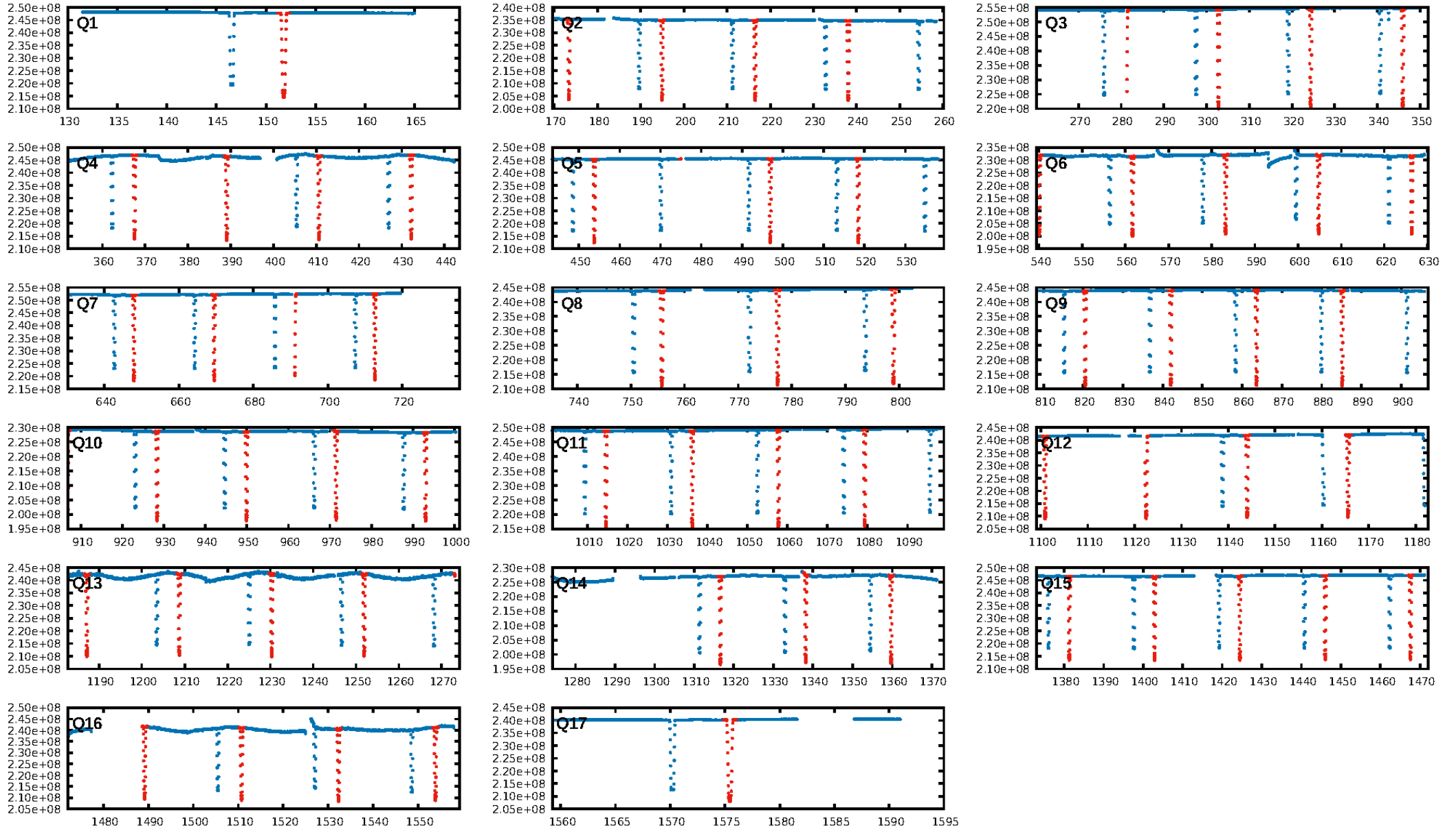
DV Fit Results:

Period = 21.57051 [0.00000] d
Epoch = 151.7932 [0.0000] BKJD
Rp/R* = 0.3451 [0.0000]
a/R* = 15.36 [0.00]
b = 0.39 [0.00]
Seff = 172.23 [82.14]
Teff = 924 [110] K
Rp = 63.72 [19.02] Re
a = 0.1542 [0.0446] AU
Ag = 402.54 [186.75] [2.15σ]
Teffp = 6397 [177] K [26.24σ]

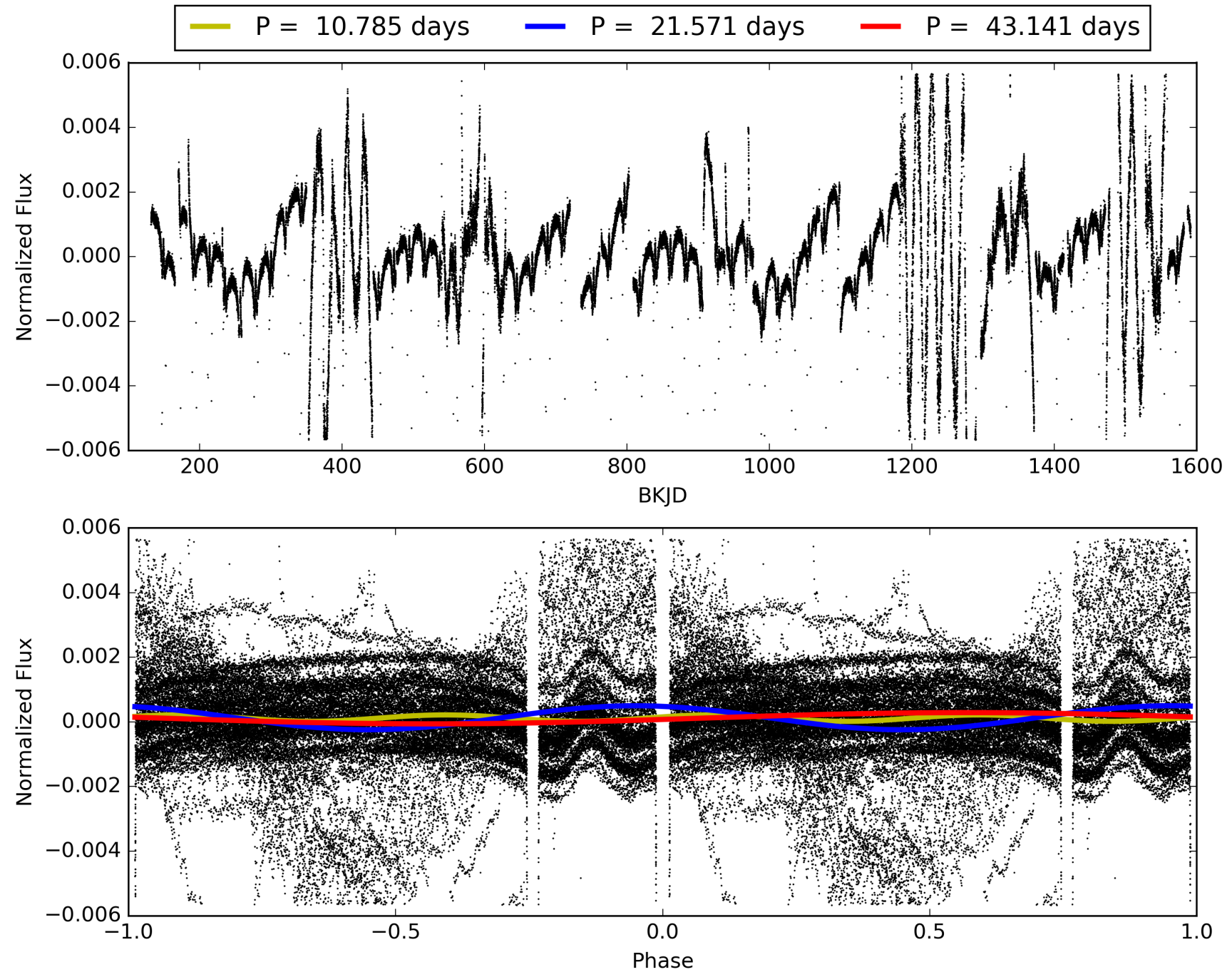
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [60/60]
GhostDiagnostic-chr: 10.35
Centroid-sig: 0.0%
Centroid-so: 0.101 arcsec [259.77σ]
OotOffset-rm: 0.005 arcsec [0.07σ]
KicOffset-rm: 0.183 arcsec [2.74σ]
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 009474969-01, PDC Light Curves

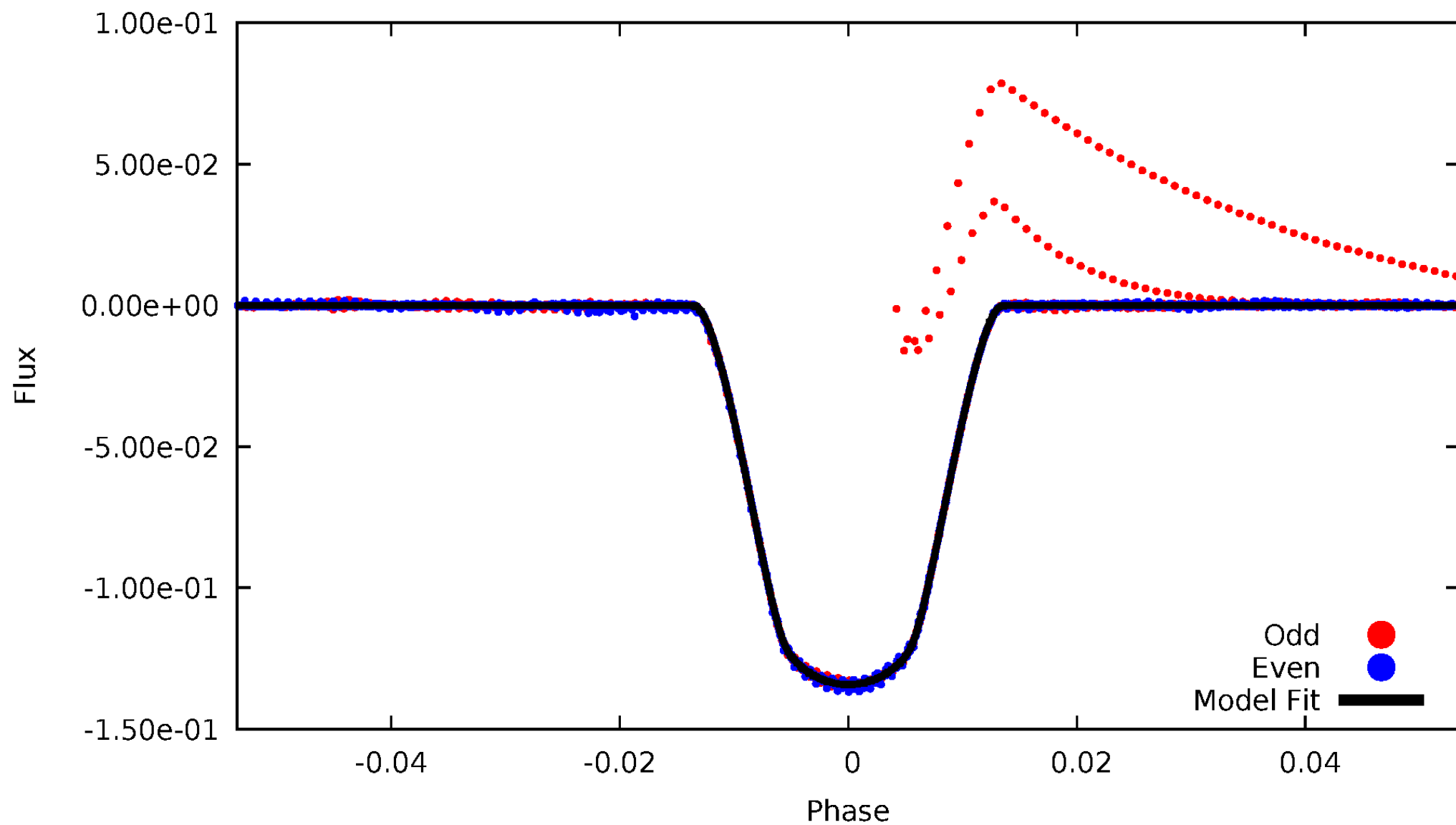


TCE 009474969-01



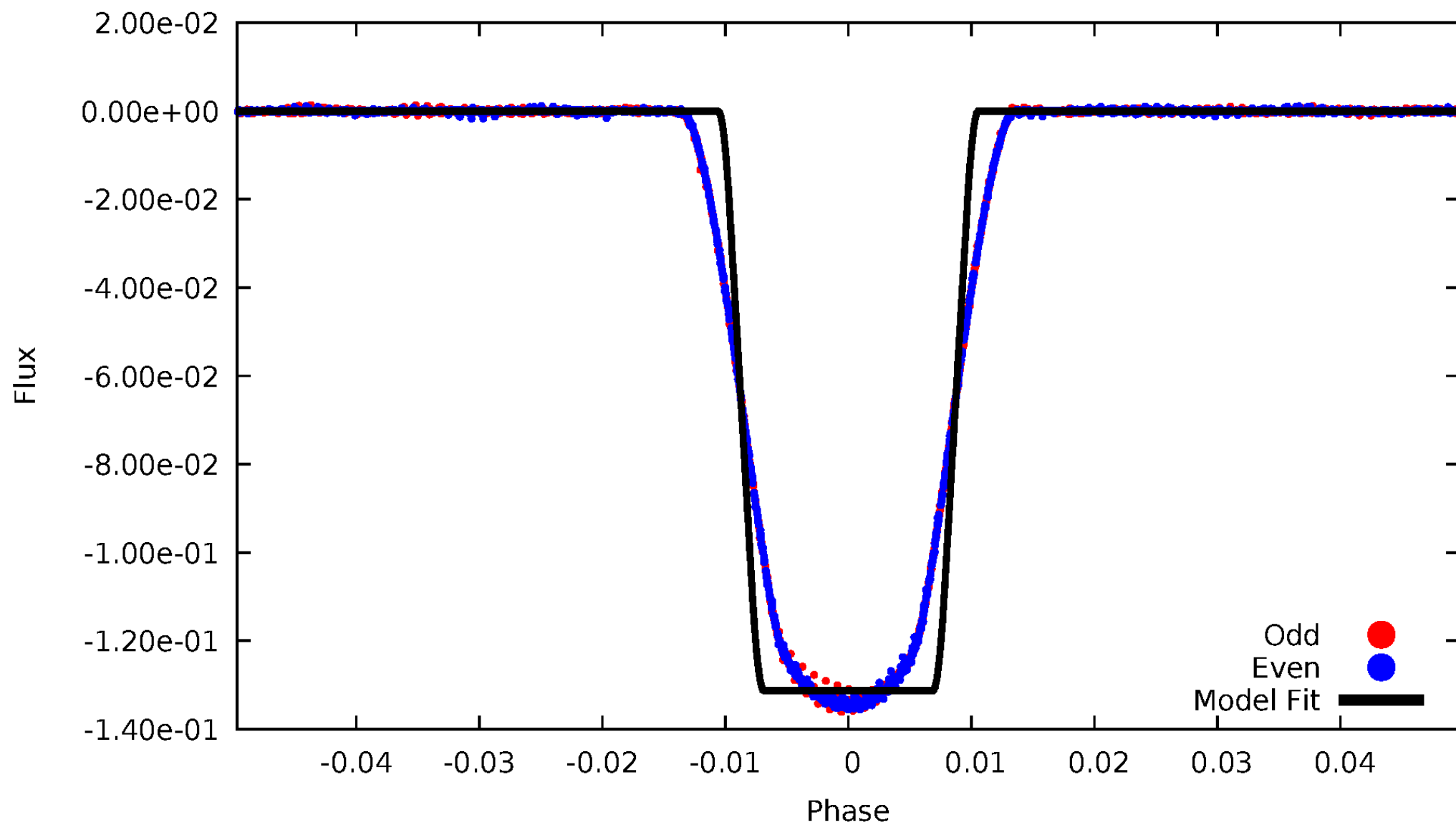
DV Odd/Even

TCE 009474969-01



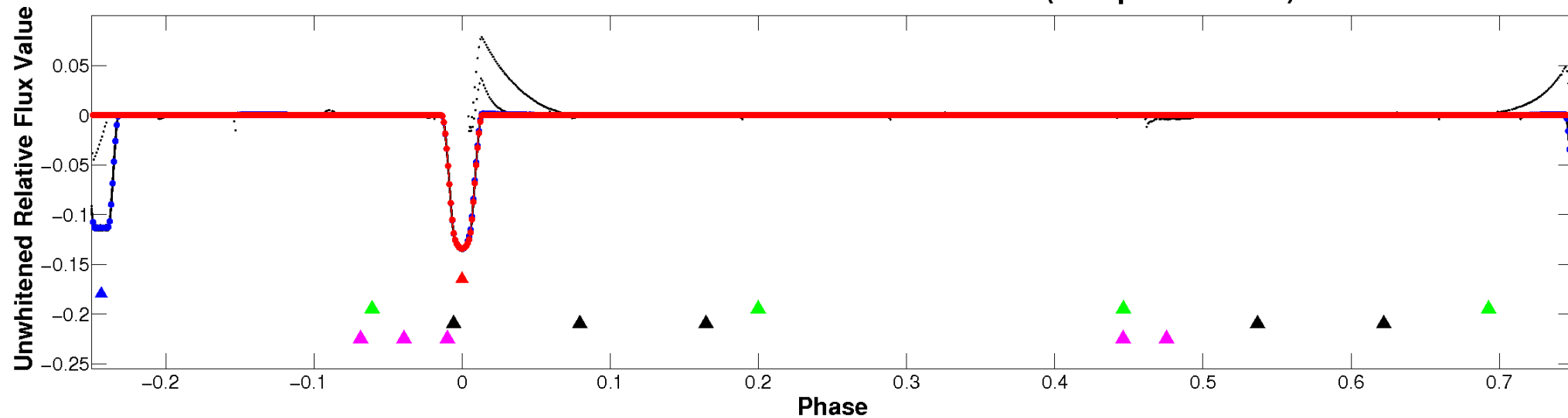
ALT Odd/Even

TCE 009474969-01

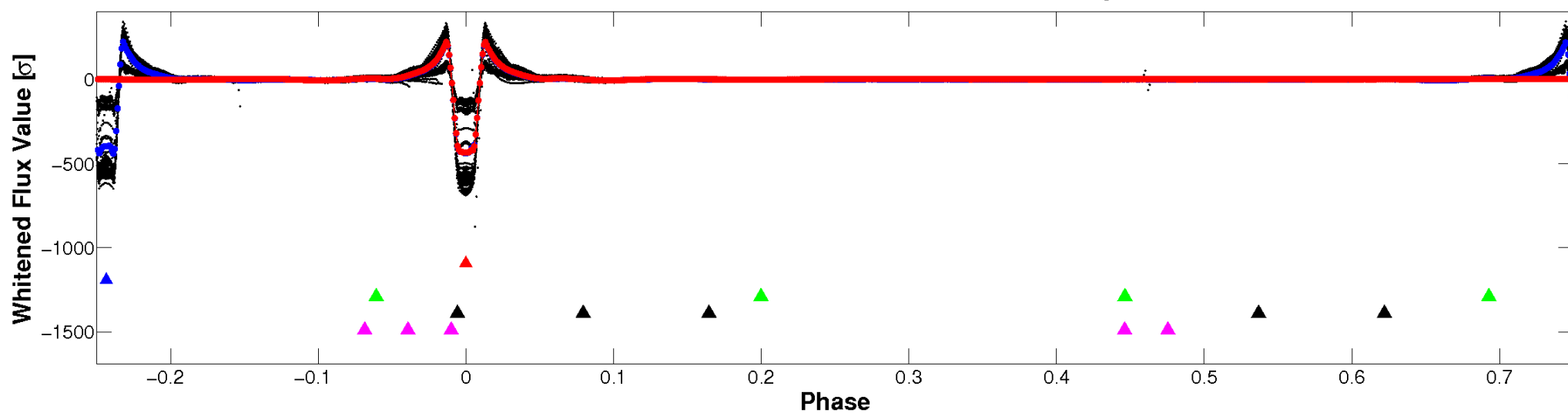


Non-Whitened Vs. Whitened Light Curve

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

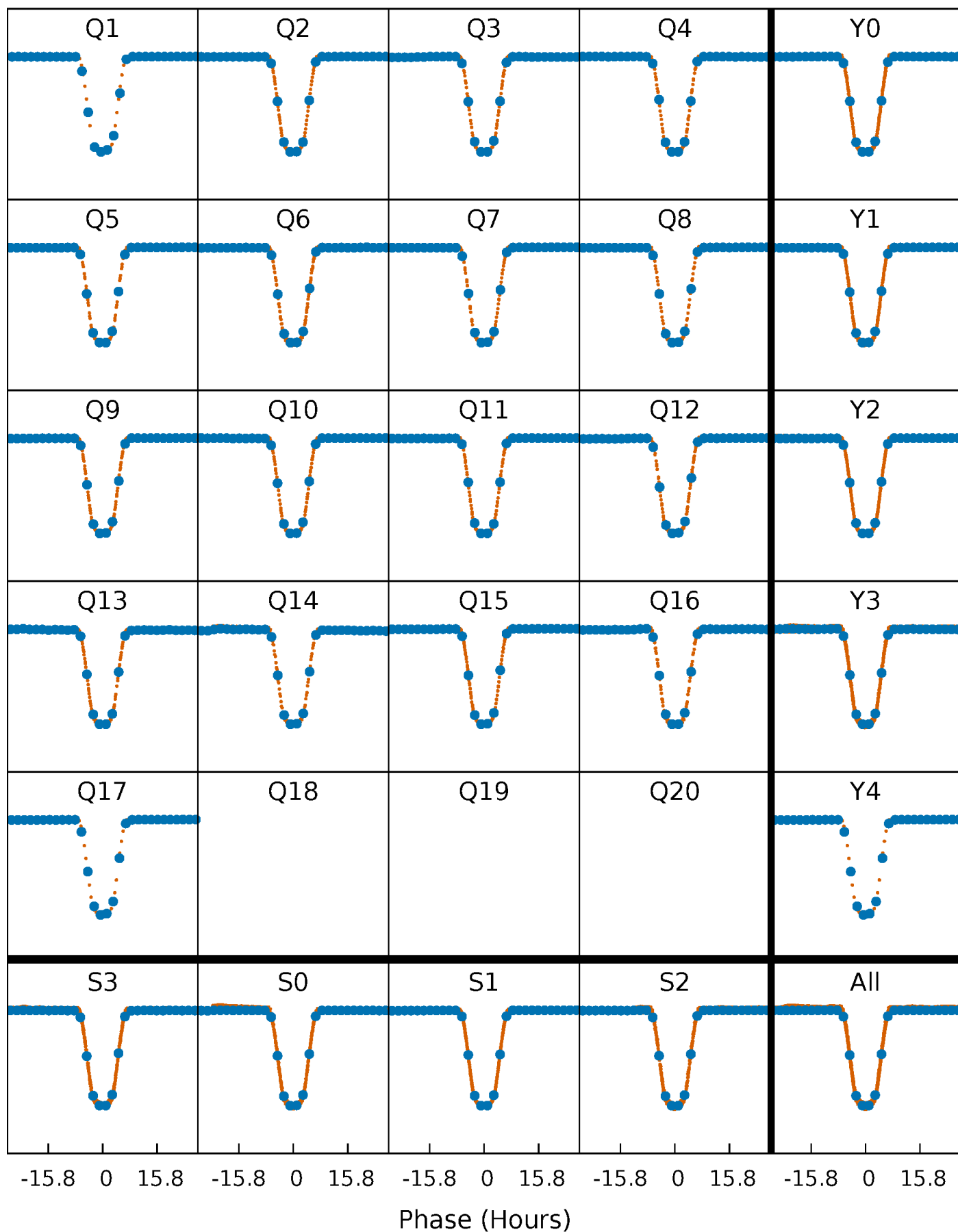


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



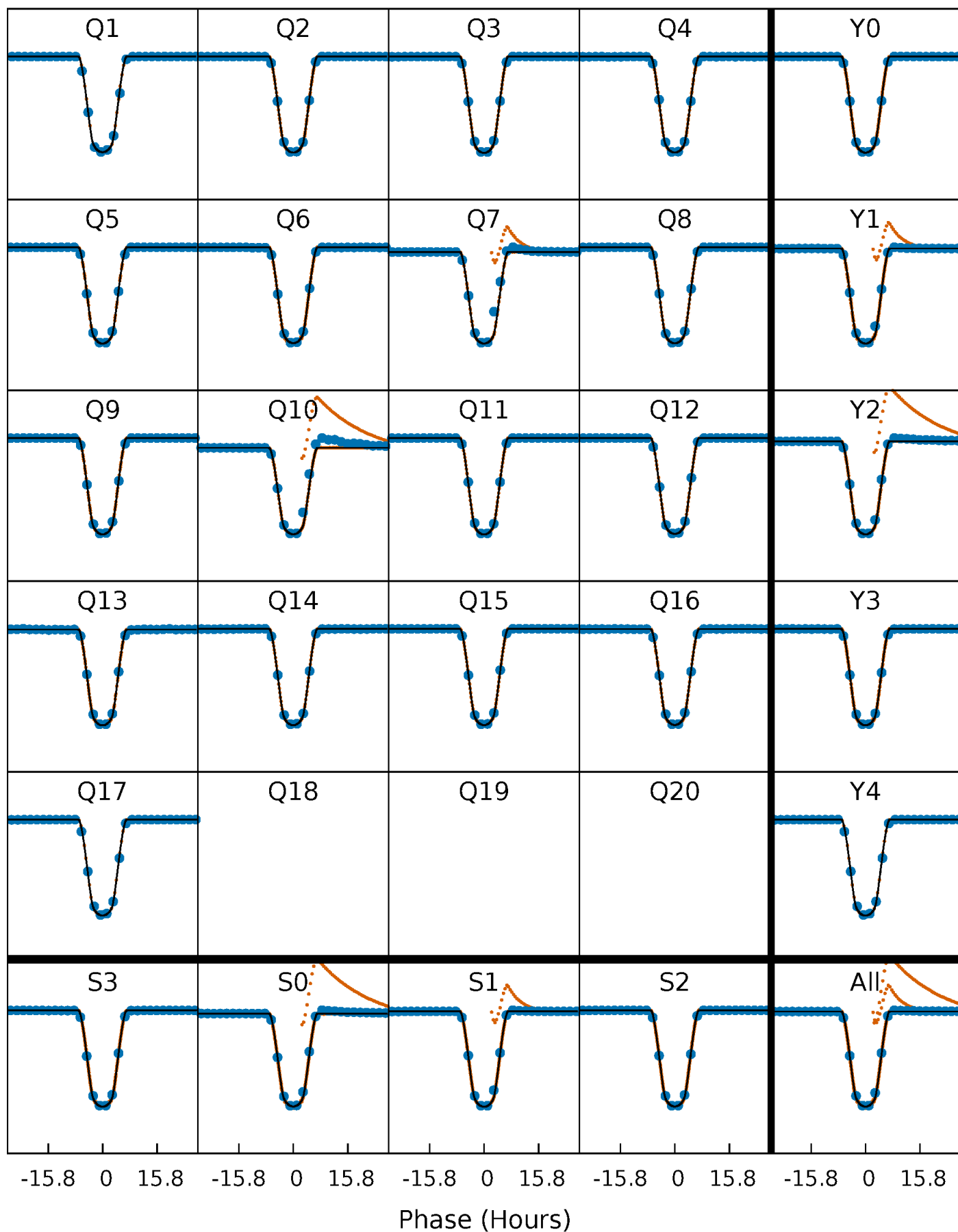
PDC Quarter-Phased Transit Curves

TCE 009474969-01 P= 21.570507 Days $T_0=151.793219$ (BKJD)



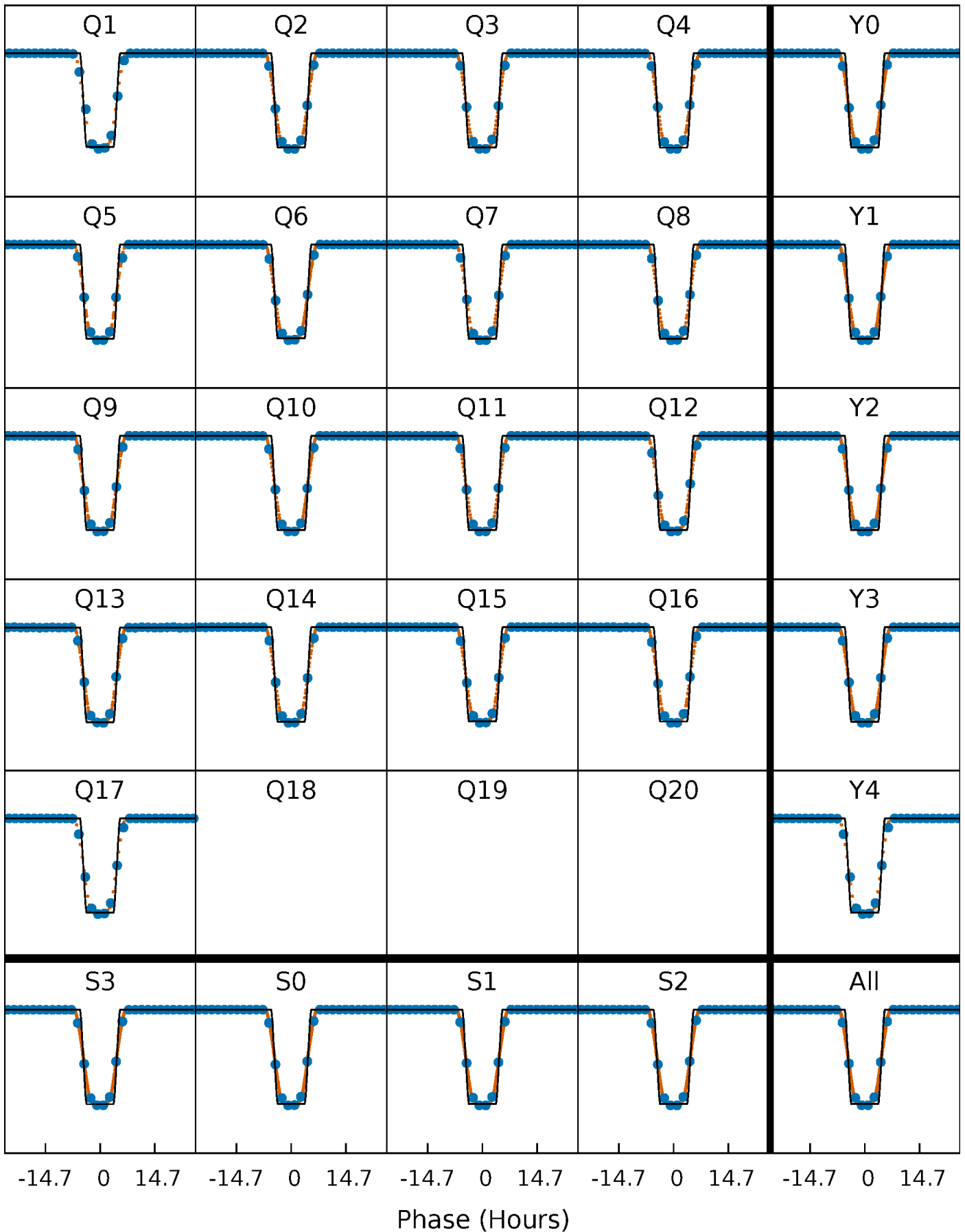
DV Quarter-Phased Transit Curves

TCE 009474969-01 P= 21.570507 Days $T_0=151.793219$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

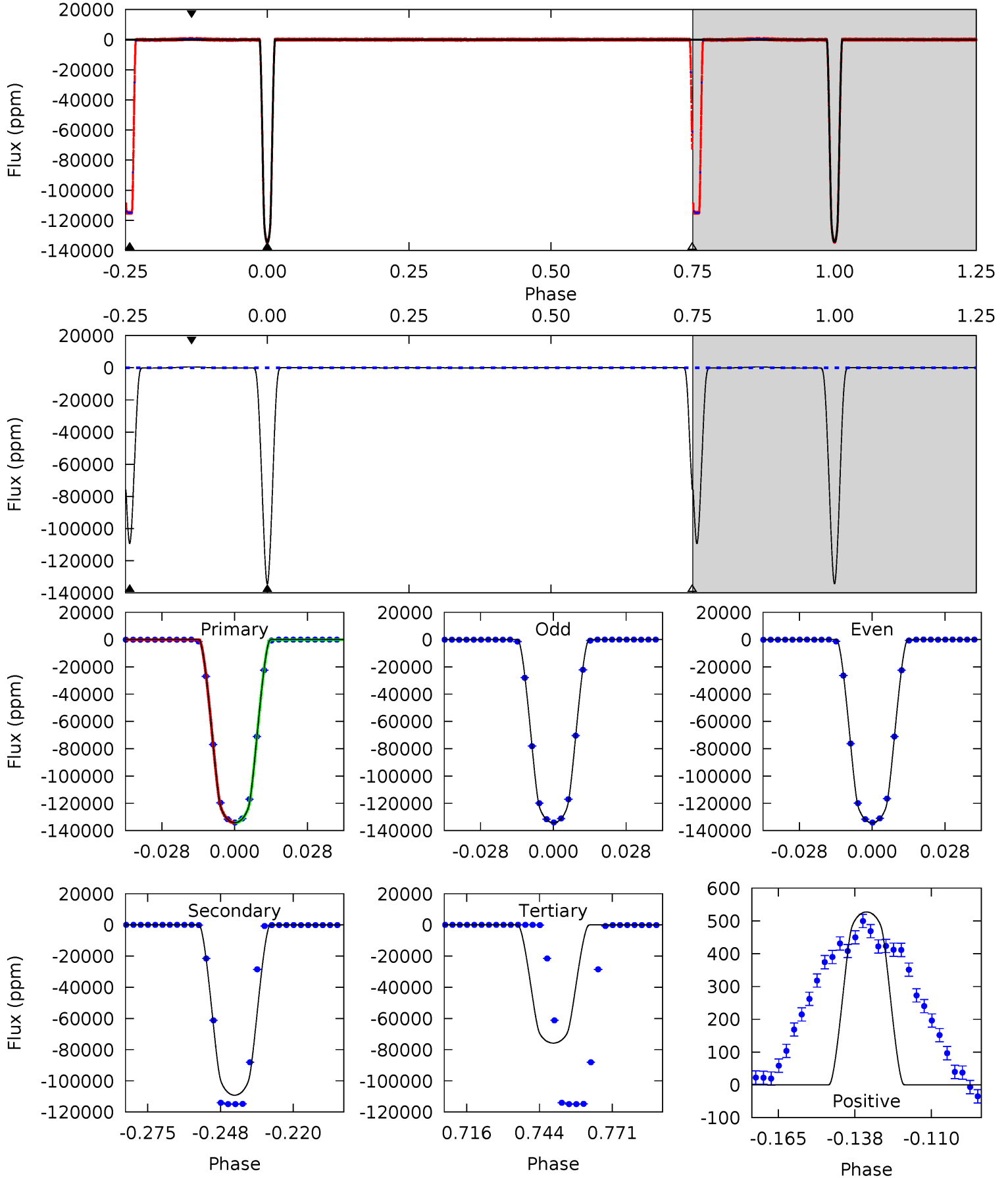
TCE 009474969-01 P= 21.570508 Days $T_0=151.793216$ (BKJD)



DV Model-Shift Uniqueness Test

009474969-01, P = 21.570507 Days, E = 130.222712 Days

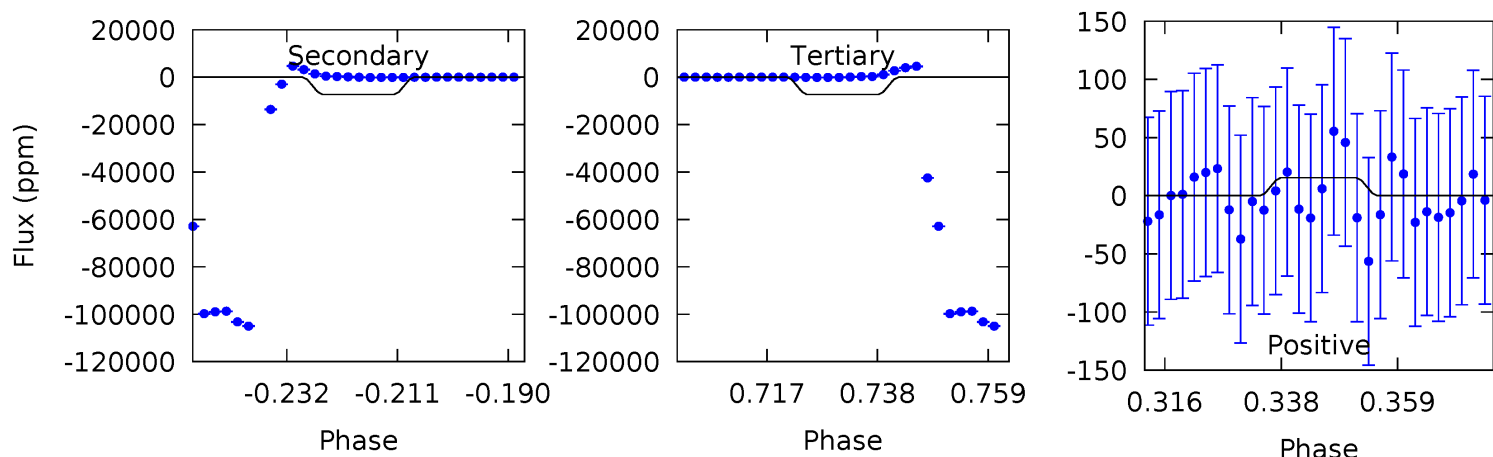
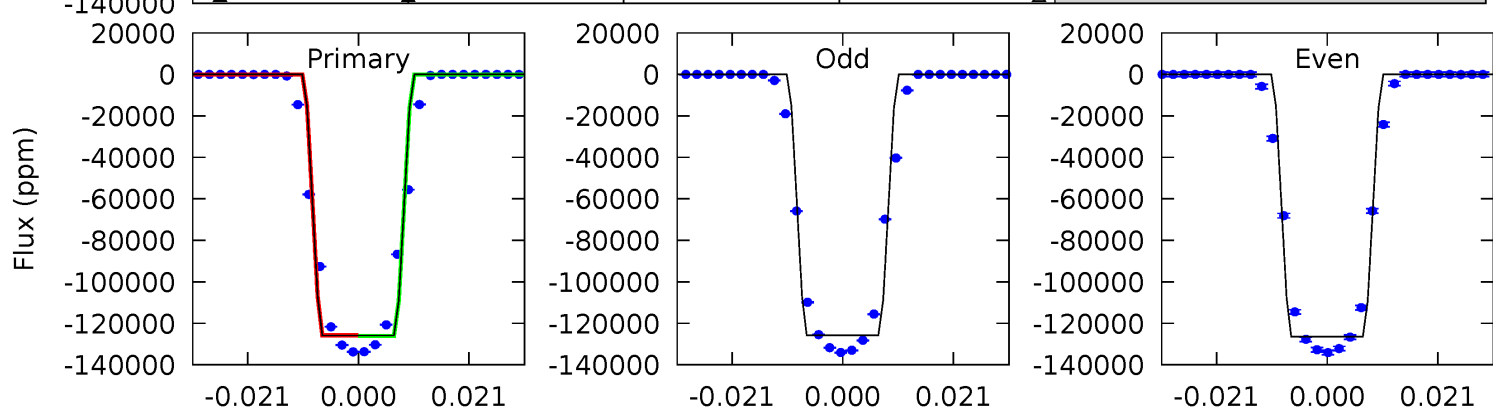
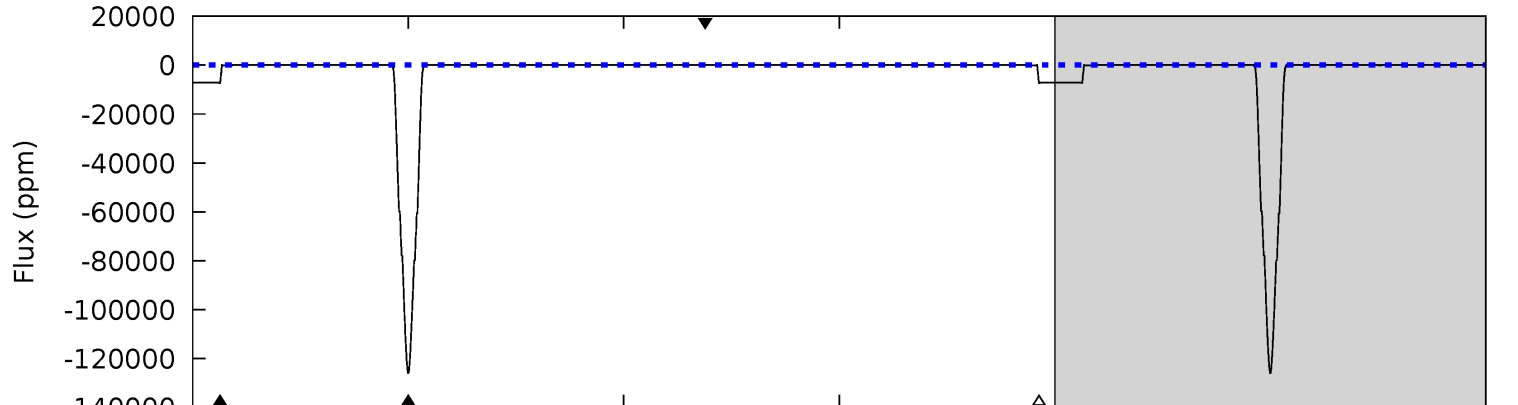
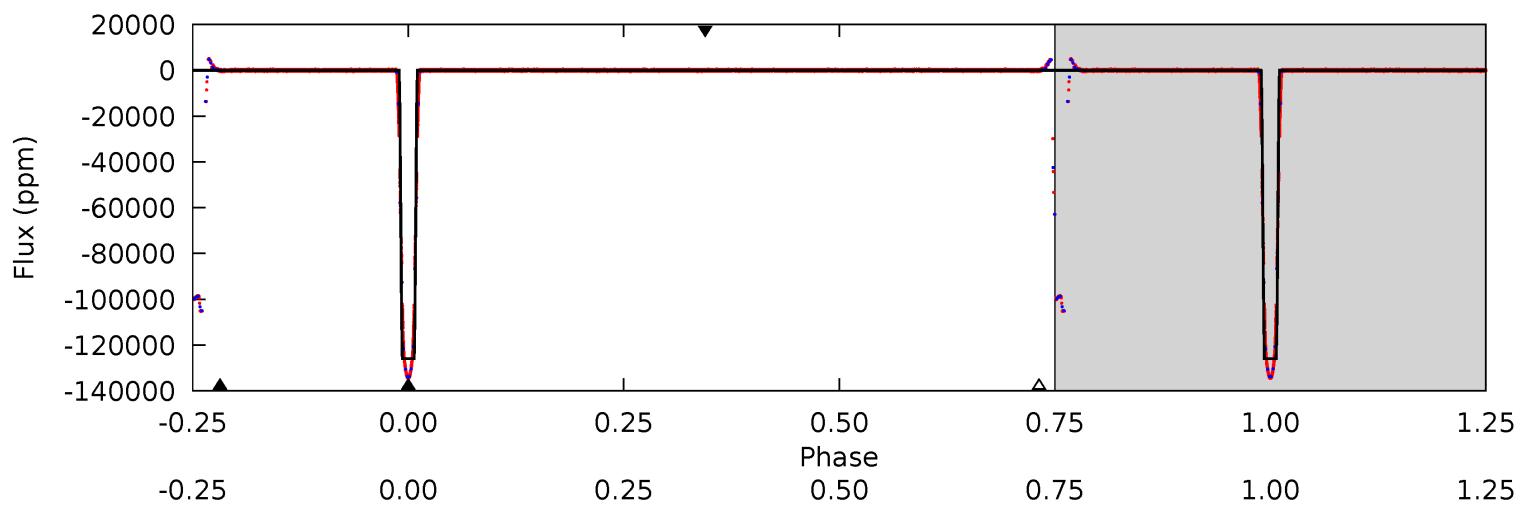
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2461	2002	1389	9.66	4.83	2.20	78.6	1072	2451	612.8	1992	0.20	0.97	0.00	0.27



Alt Model-Shift Uniqueness Test

009474969-01, P = 21.570508 Days, E = 130.222708 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1215	70.3	70.2	0.15	4.88	2.31	5.55	1145	1215	0.05	70.1	2.65	1.00	0.00	1.73



Stellar Parameters For KIC 009474969

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6322^{+175}_{-175}	$4.003^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.300}$	$1.692^{+0.336}_{-0.505}$	$1.051^{+0.174}_{-0.139}$	$0.305^{+0.539}_{-0.108}$
	+3%/-3%	+7%/-3%	+76%/-65%	+20%/-30%	+17%/-13%	+177%/-35%
Source	PHO1	FLK73	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 009474969-01 / KOI 7178.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-109222 ± 55	$62.68^{+7.99}_{-10.36}$	1271^{+79}_{-98}	6373^{+158}_{-165}	413^{+161}_{-76}
Alt.	-7281 ± 104	$66.59^{+7.25}_{-12.12}$	1273^{+79}_{-107}	3533^{+61}_{-60}	22^{+9}_{-4}

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 $A_{obs} \gg 1.0$

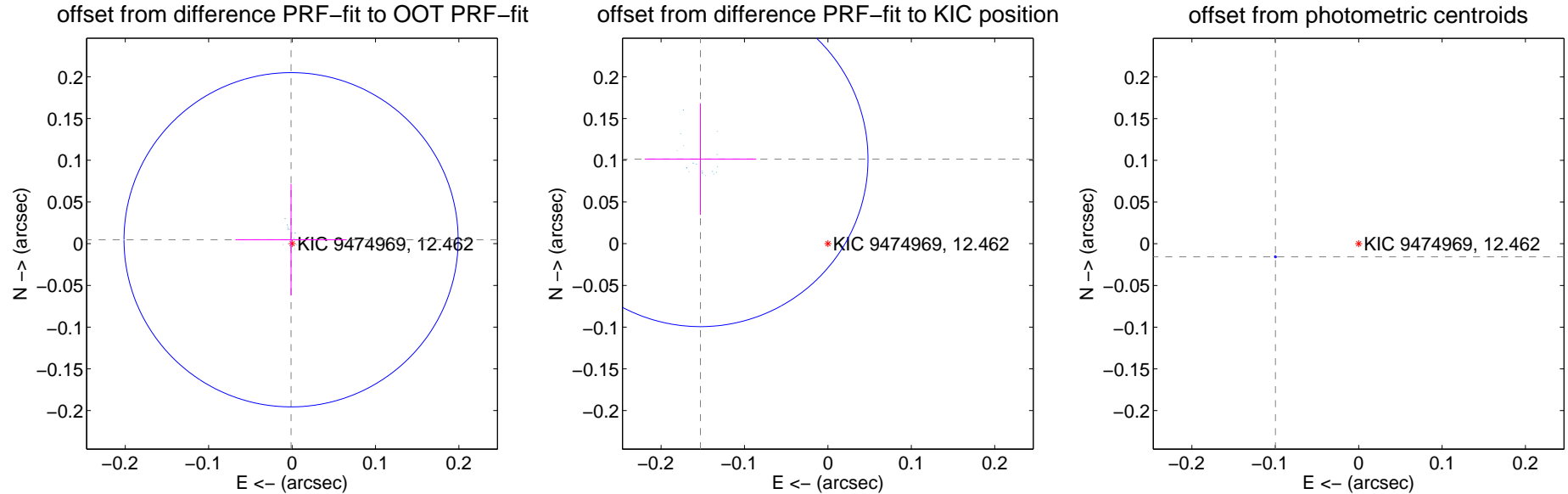
DV Centroid Data

Supplemental centroid analysis for 009474969-01. Kepler magnitude: 12.46. Transit SNR 14368.95

There are 17 quarters with good PRF difference image offsets

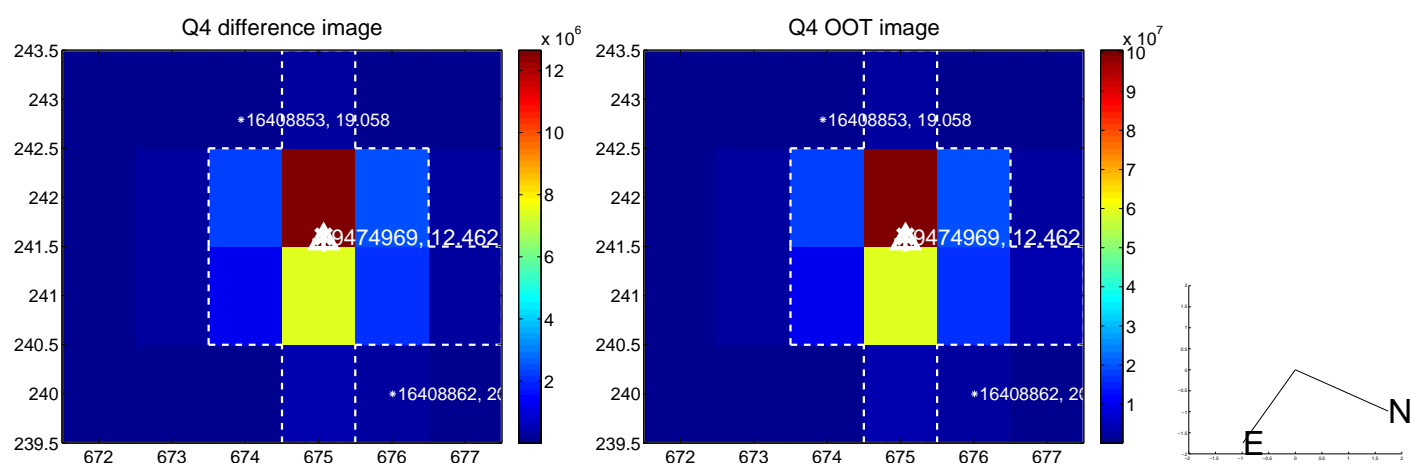
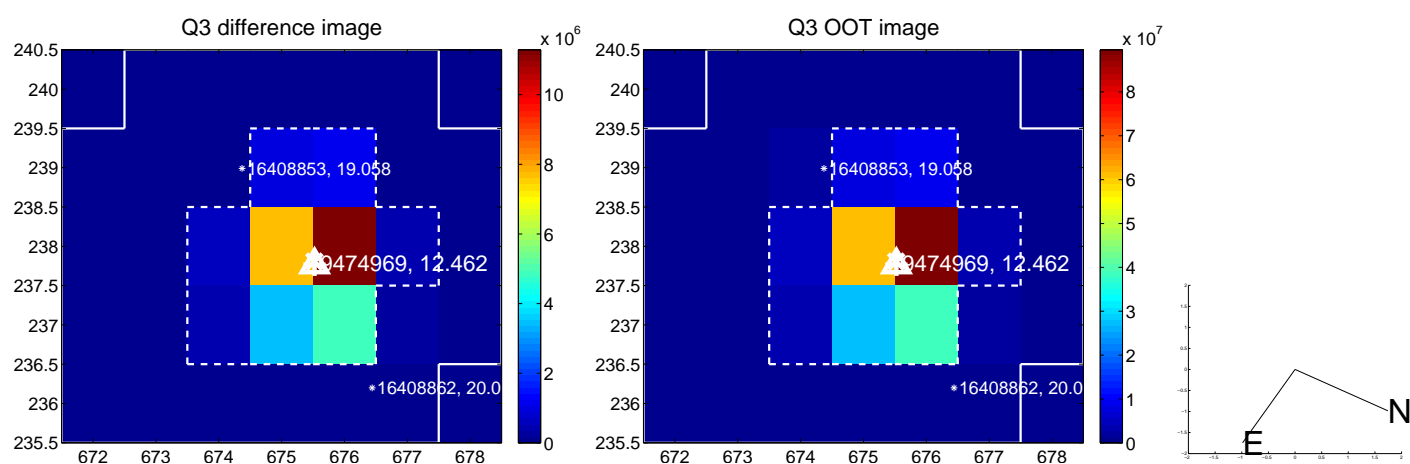
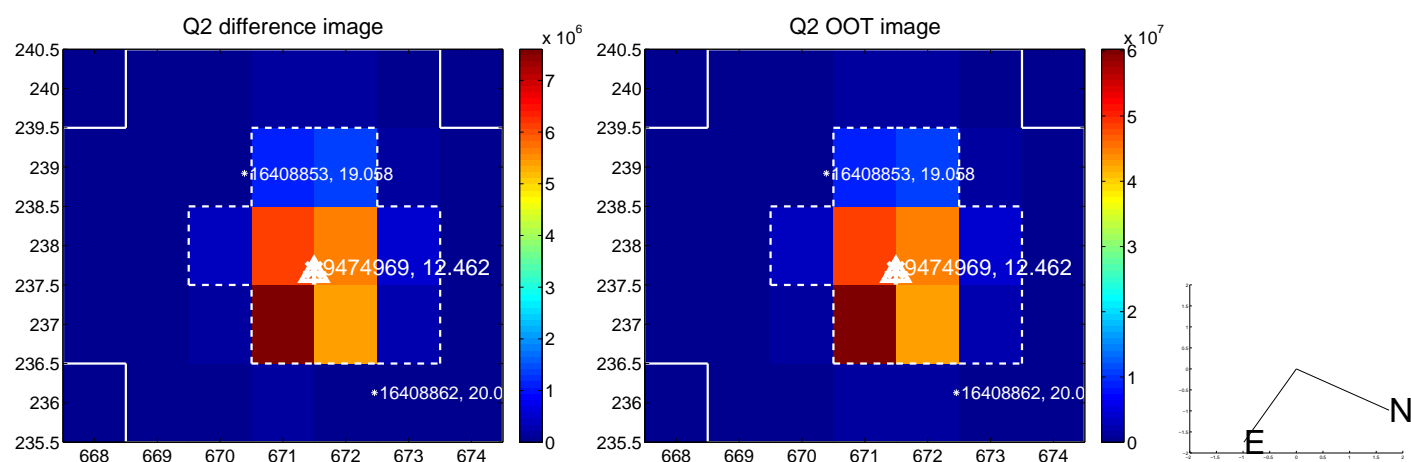
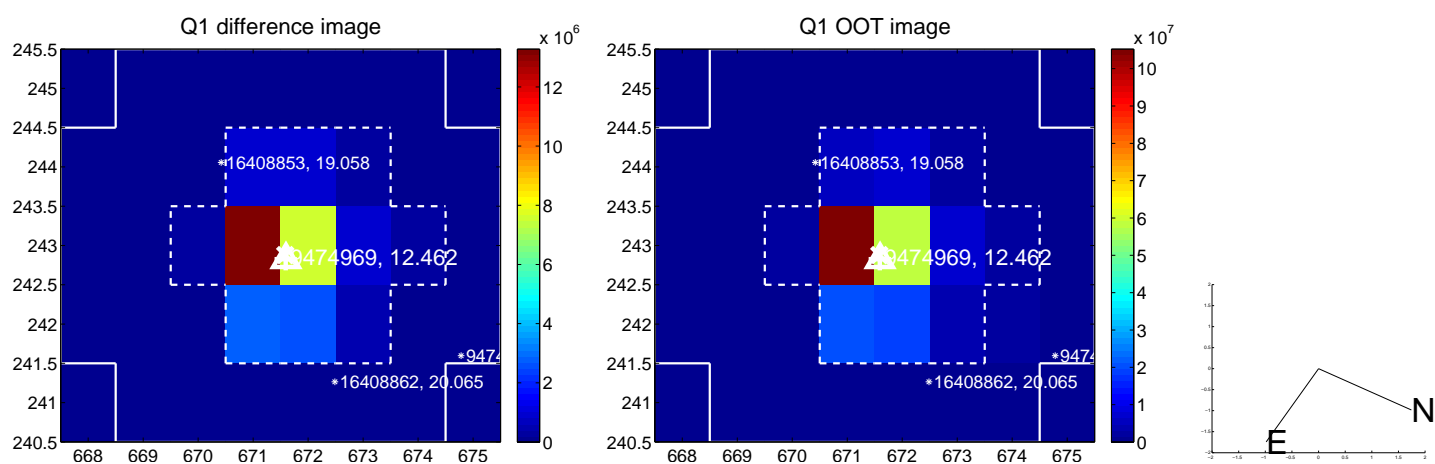
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.005 ± 0.067	0.07	0.001 ± 0.067	0.005 ± 0.067
PRF-fit source offset from KIC position	0.183 ± 0.067	2.74	0.153 ± 0.067	0.101 ± 0.067
photometric centroid source offset	0.10 ± 0.00	259.77	0.10 ± 0.00	-0.02 ± 0.00

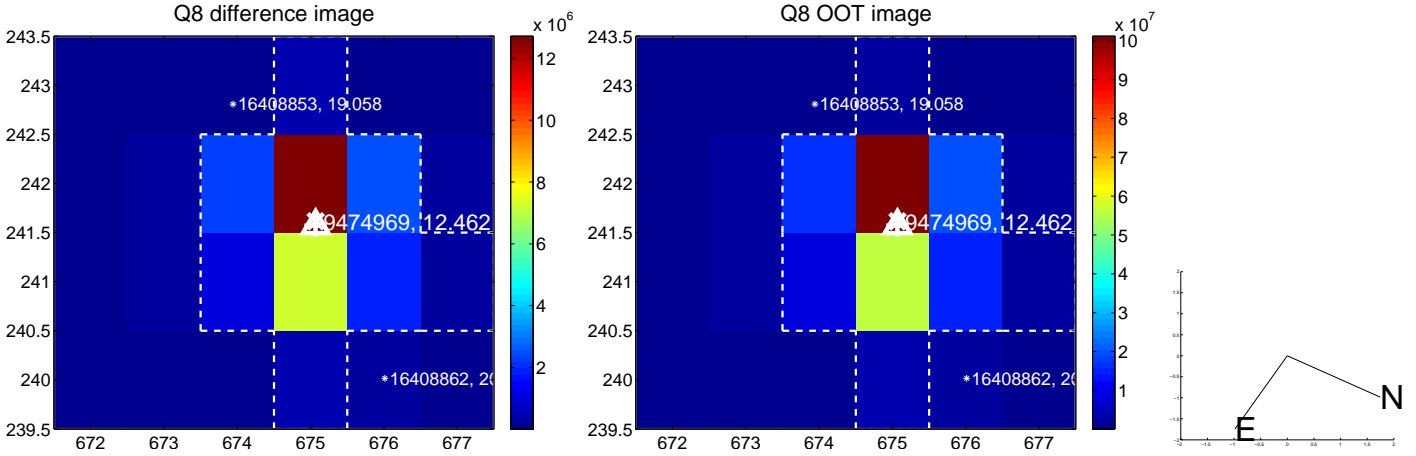
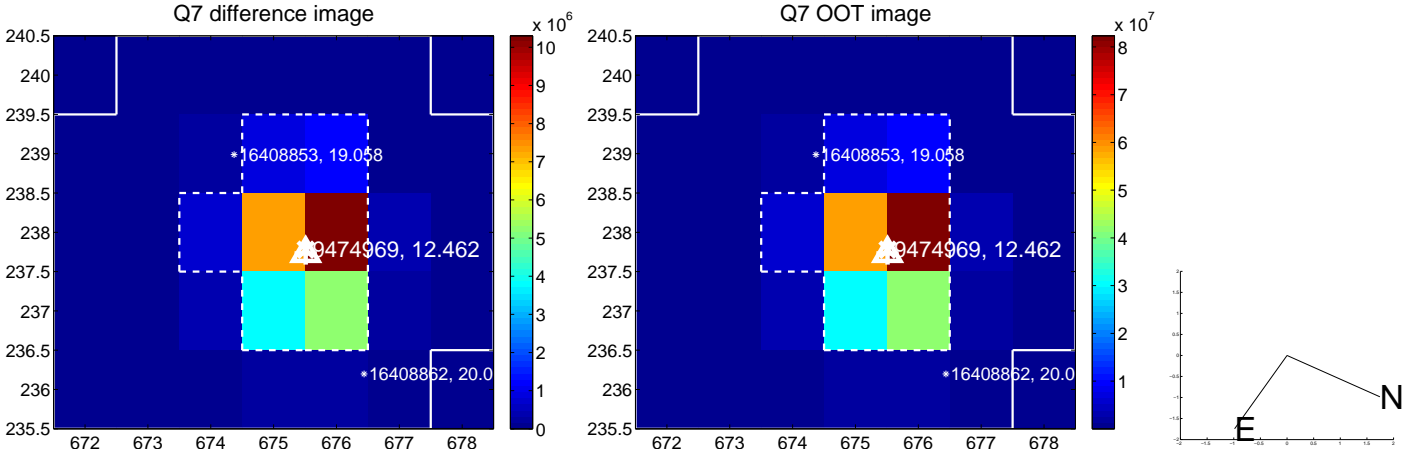
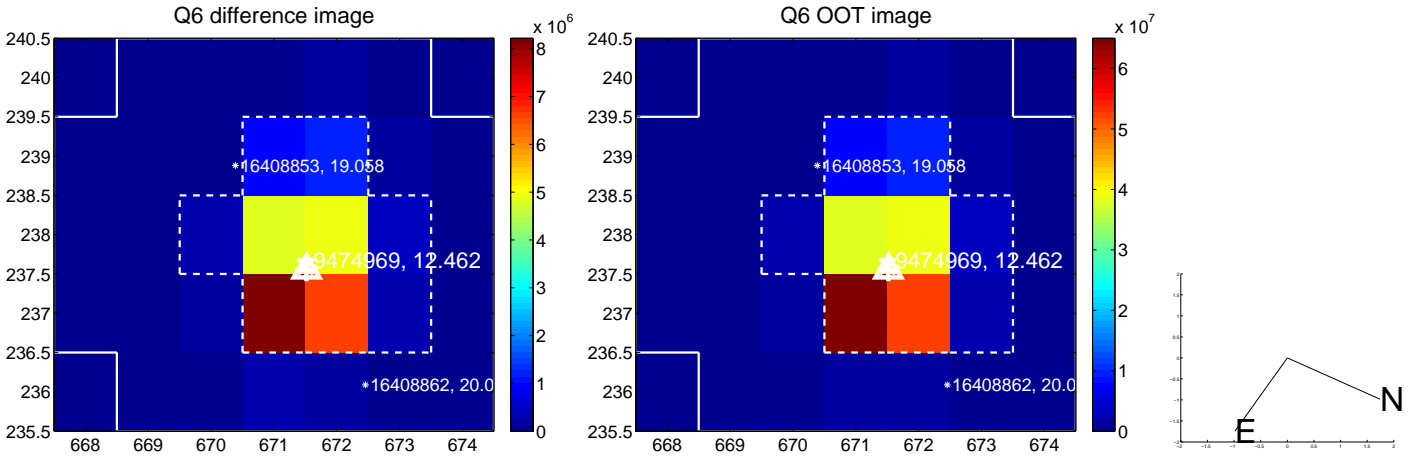
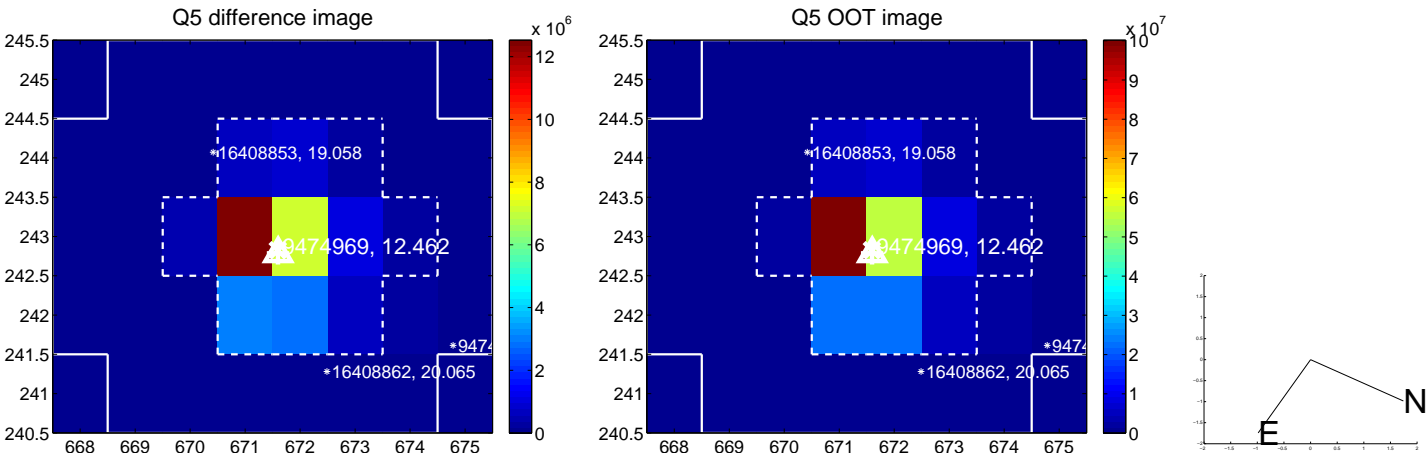


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

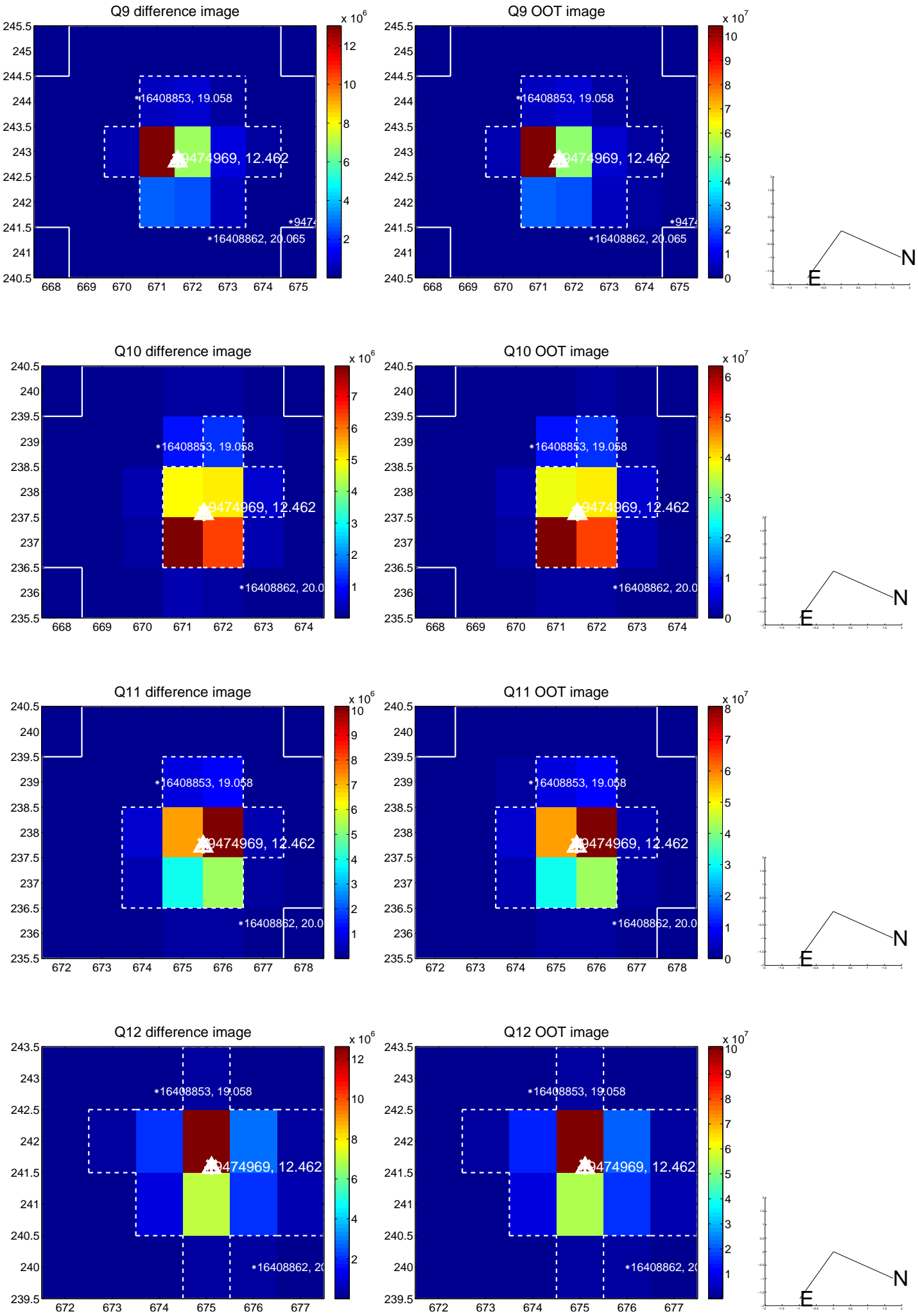
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



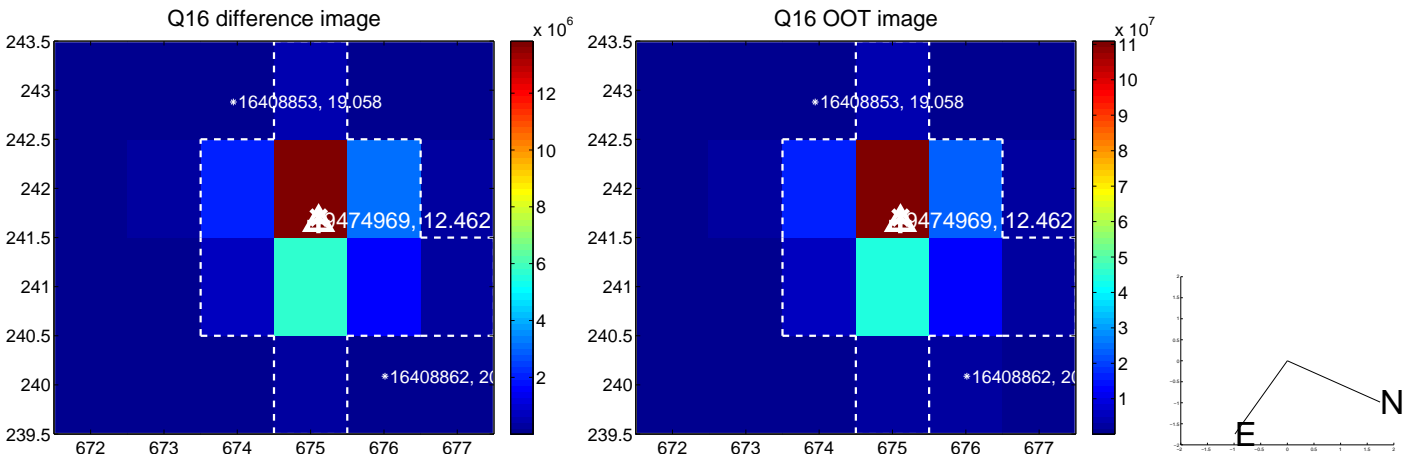
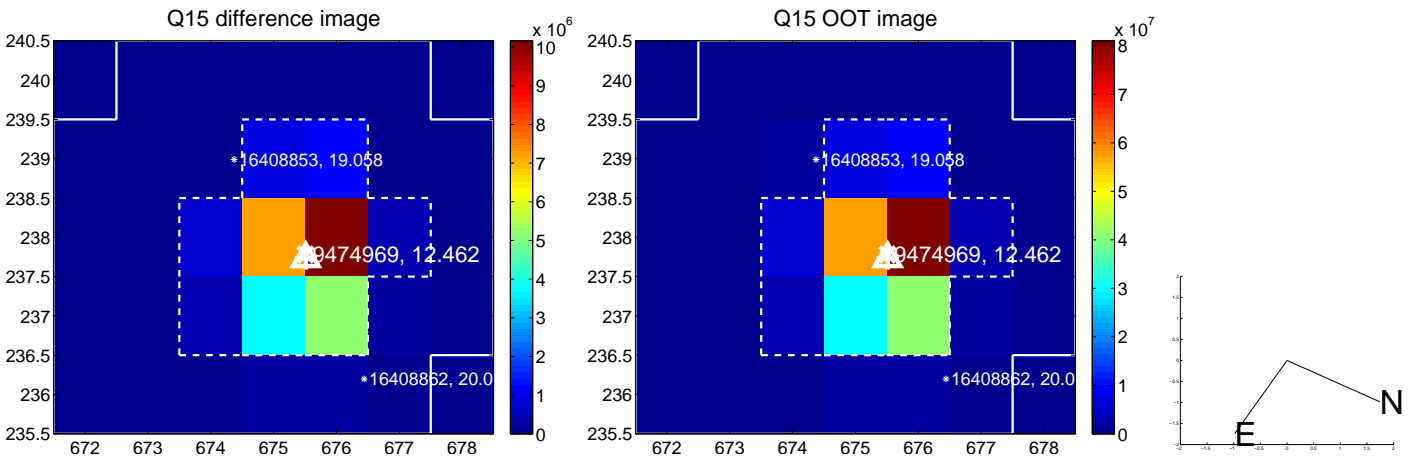
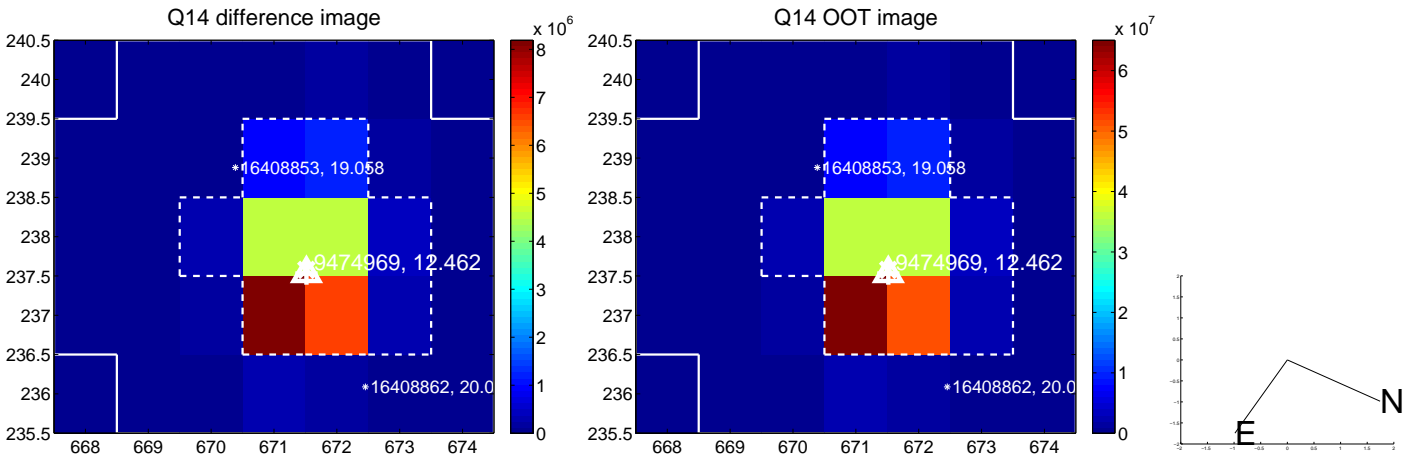
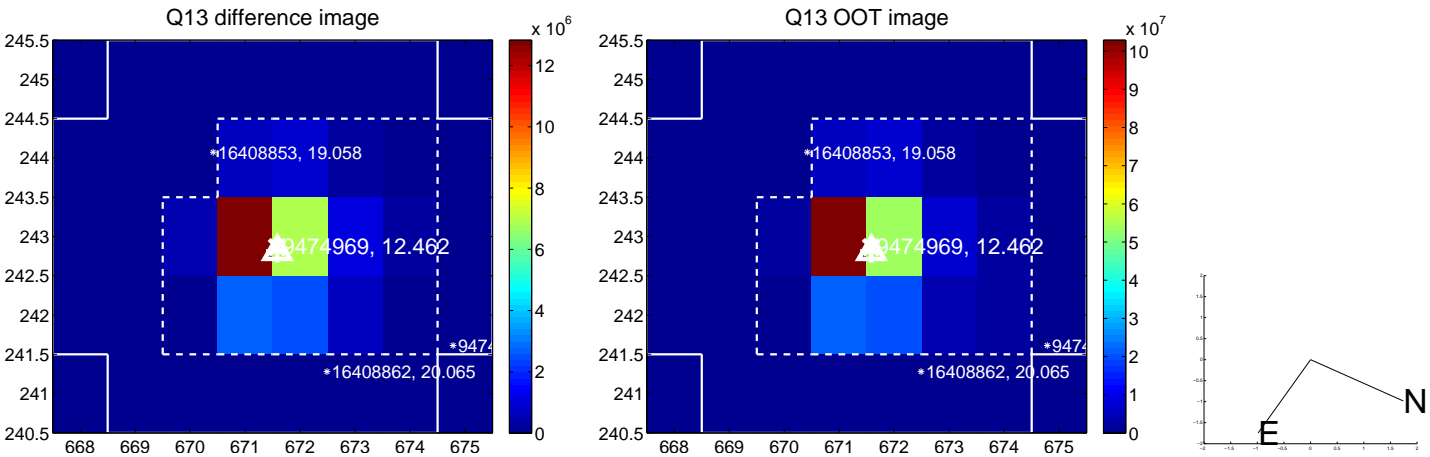
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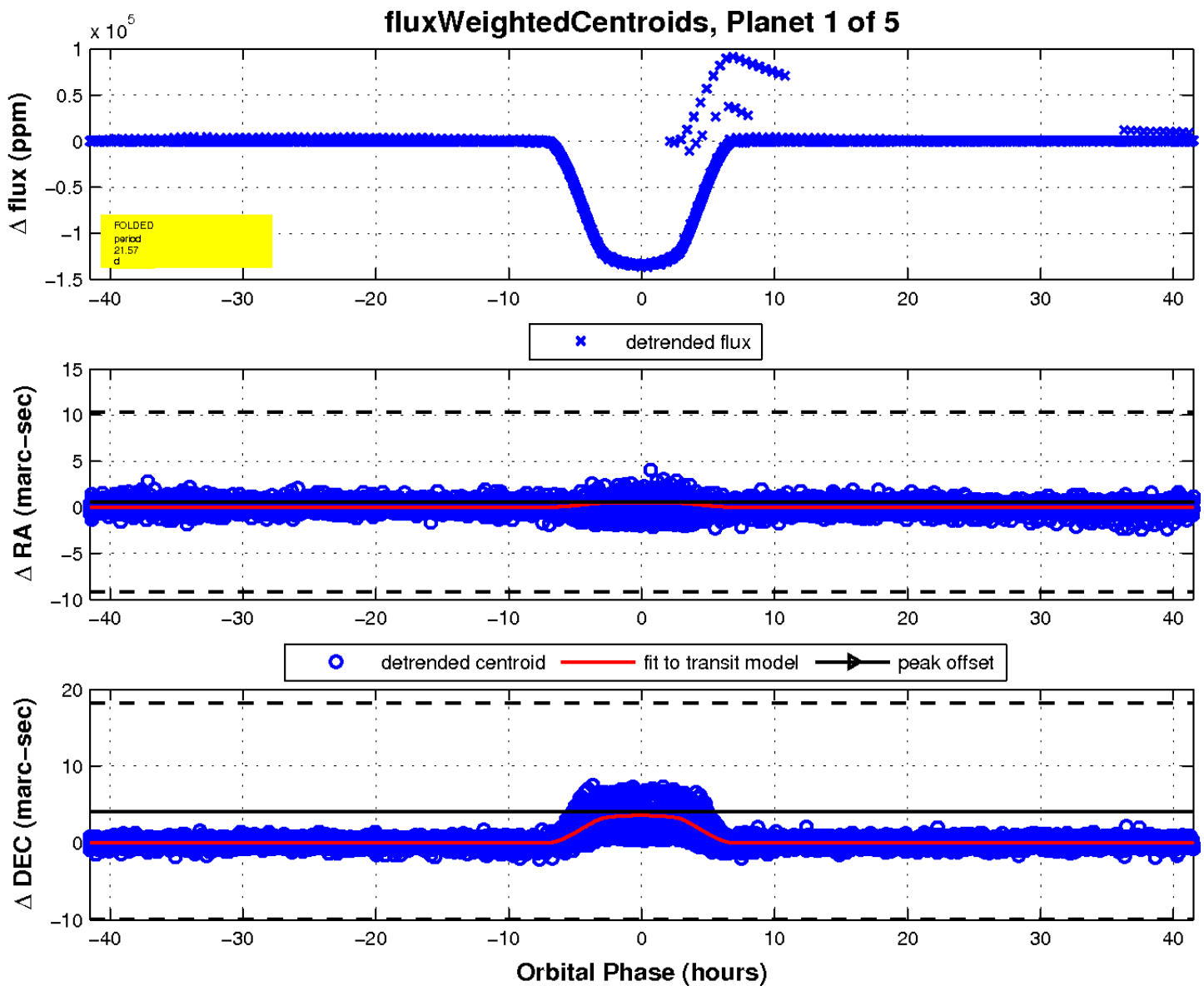
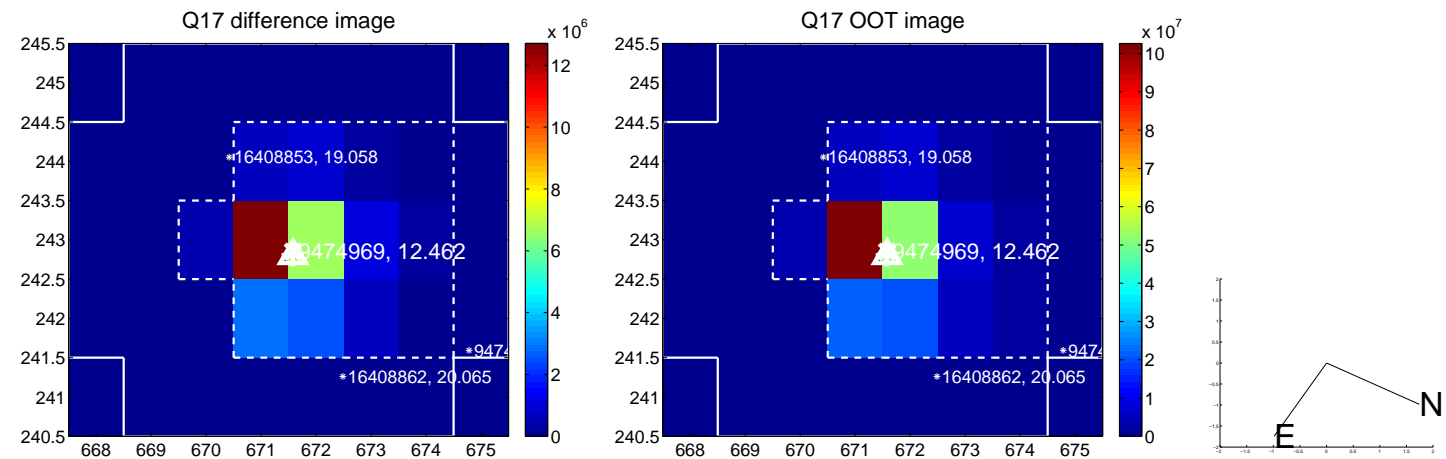
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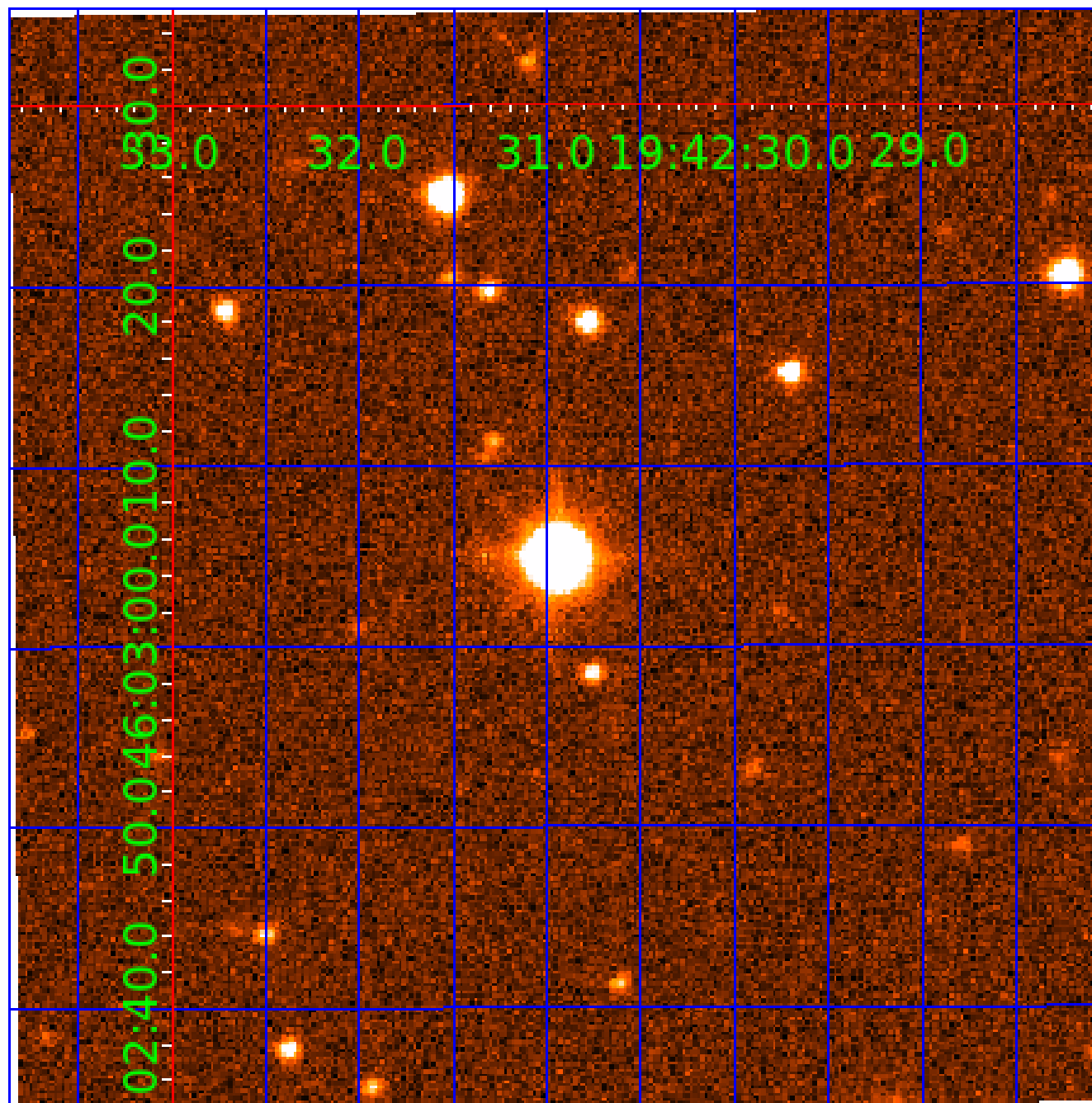


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UKIRT Image

Declination



KIC 009474969

Q1-17 DR25 TCE Parameters

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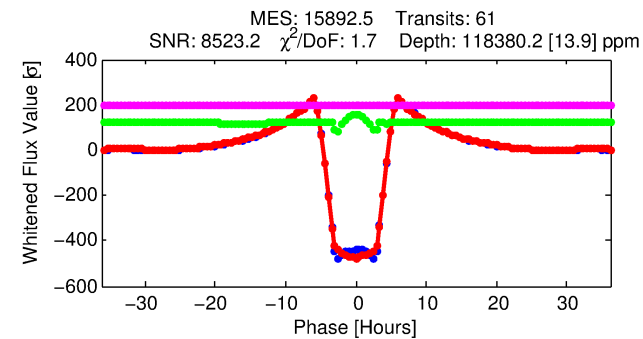
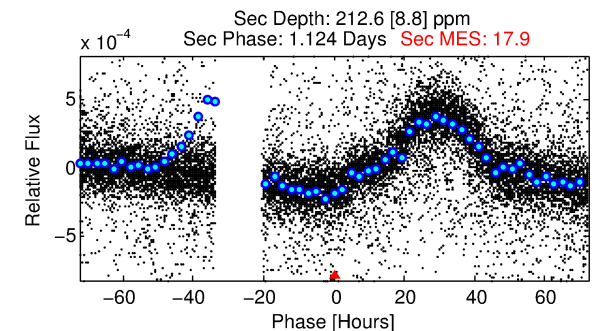
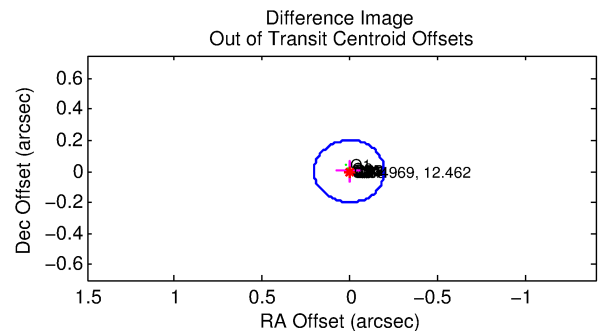
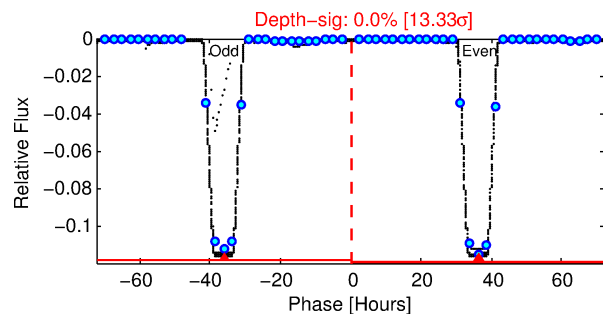
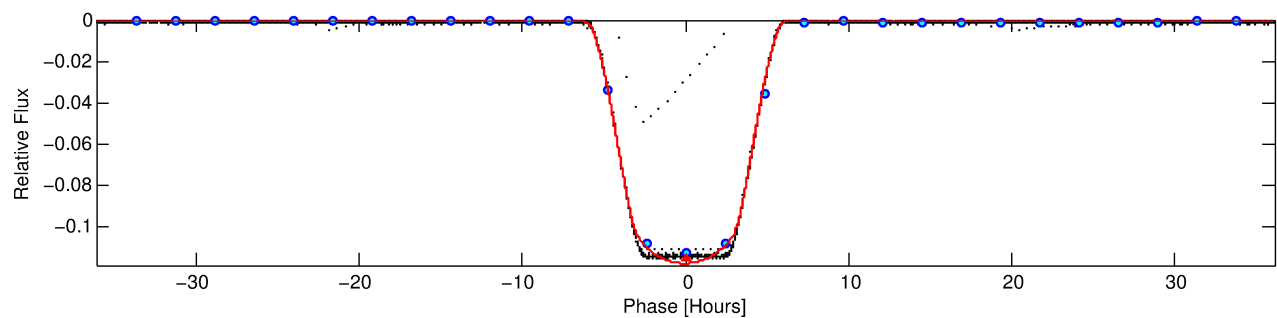
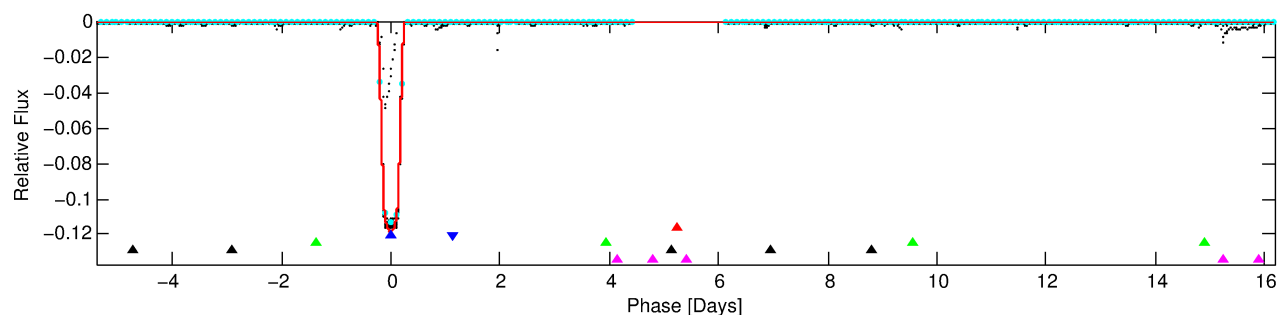
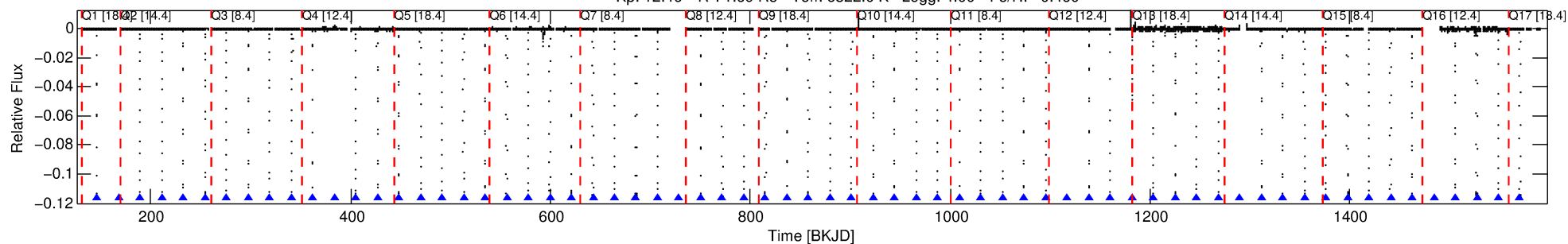
Ephemeris Match Information For 009474969-02

No Significant Match Found

DV One-Page Summary

KIC: 9474969 Candidate: 2 of 5 Period: 21.571 d
KOI: K07178 Corr: No Ephemeris Match

Kp: 12.46 R*: 1.69 Rs Teff: 6322.0 K Logg: 4.00 Fe/H: -0.460



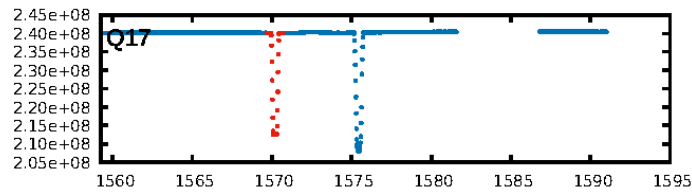
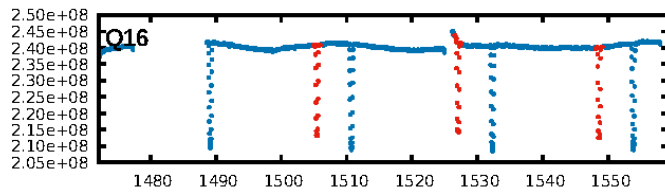
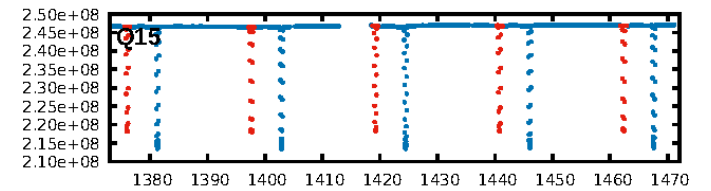
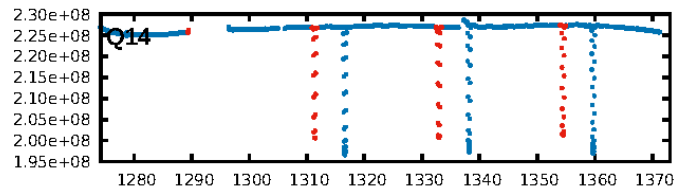
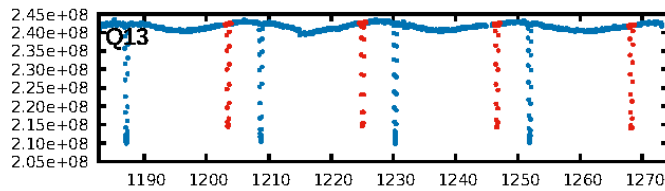
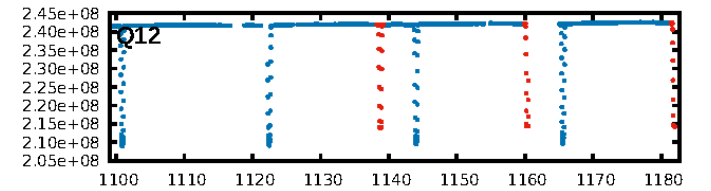
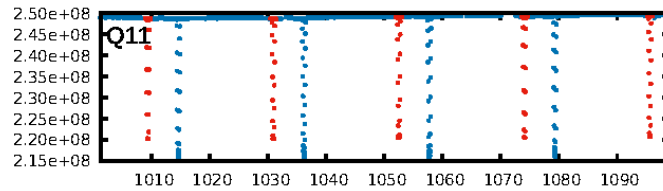
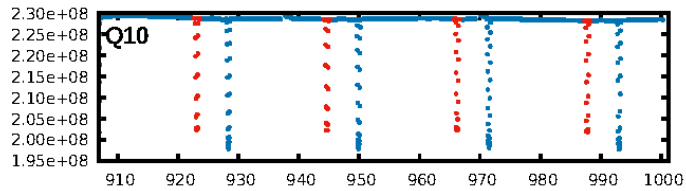
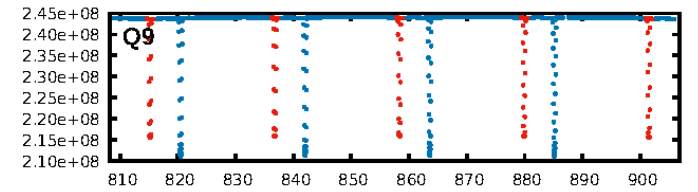
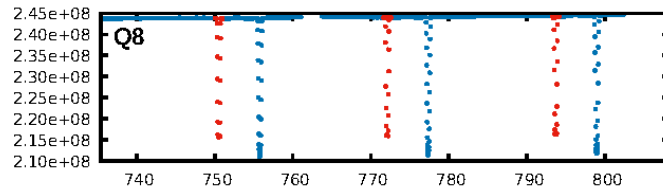
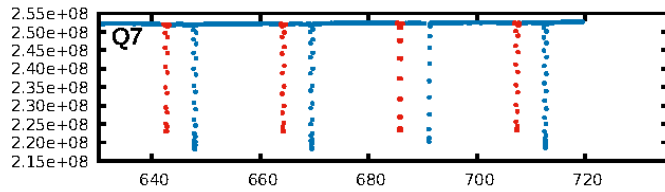
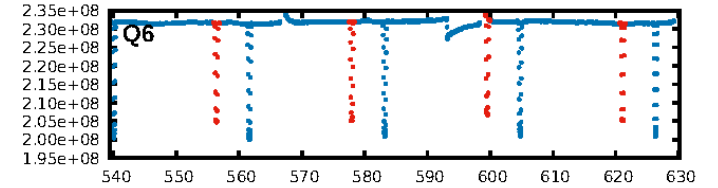
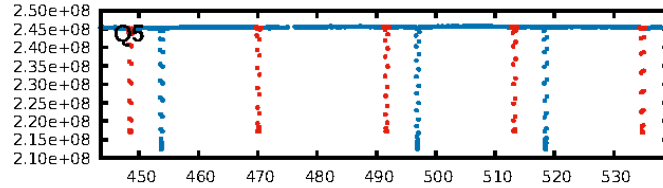
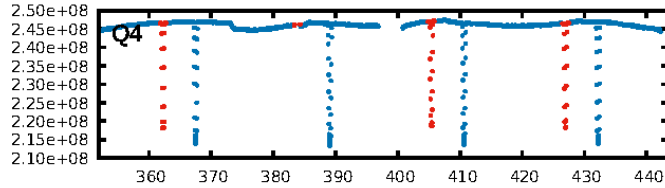
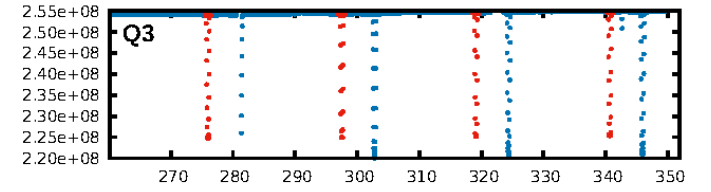
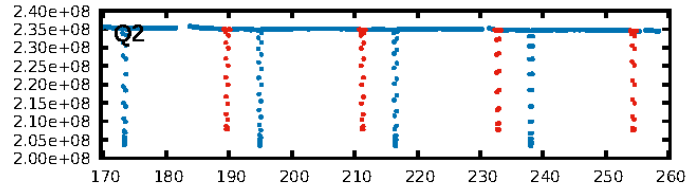
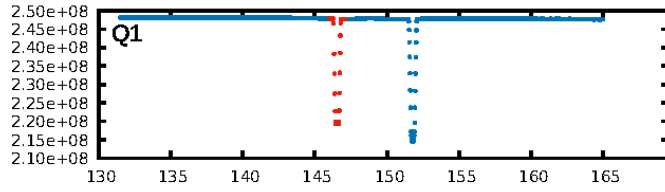
DV Fit Results:

Period = 21.57051 [0.00000] d
Epoch = 146.5409 [0.0000] BKJD
Rp/R* = 0.3180 [0.0000]
a/R* = 18.05 [0.00]
b = 0.00 [0.65]
Seff = 172.23 [82.14]
Teq = 924 [110] K
Rp = 58.72 [17.52] Re
a = 0.1542 [0.0446] AU
Ag = 0.81 [0.38] [-0.51σ]
Teffp = 1354 [40] K [3.67σ]

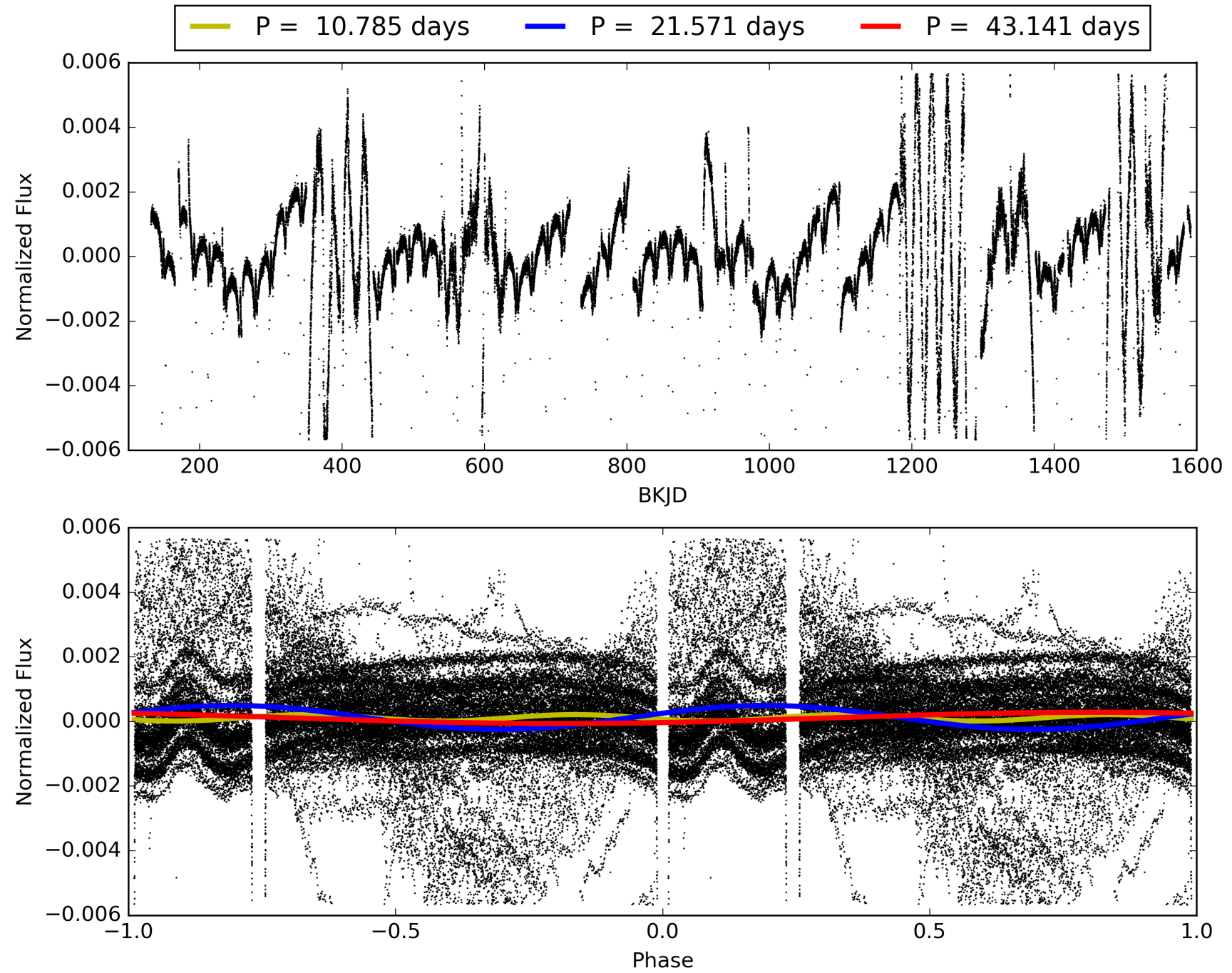
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [470.87σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 82.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [59/59]
GhostDiagnostic-chr: 6.641
Centroid-sig: 0.0%
Centroid-so: 0.105 arcsec [249.21σ]
OotOffset-rm: 0.006 arcsec [0.09σ]
KicOffset-rm: 0.181 arcsec [2.70σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 009474969-02, PDC Light Curves

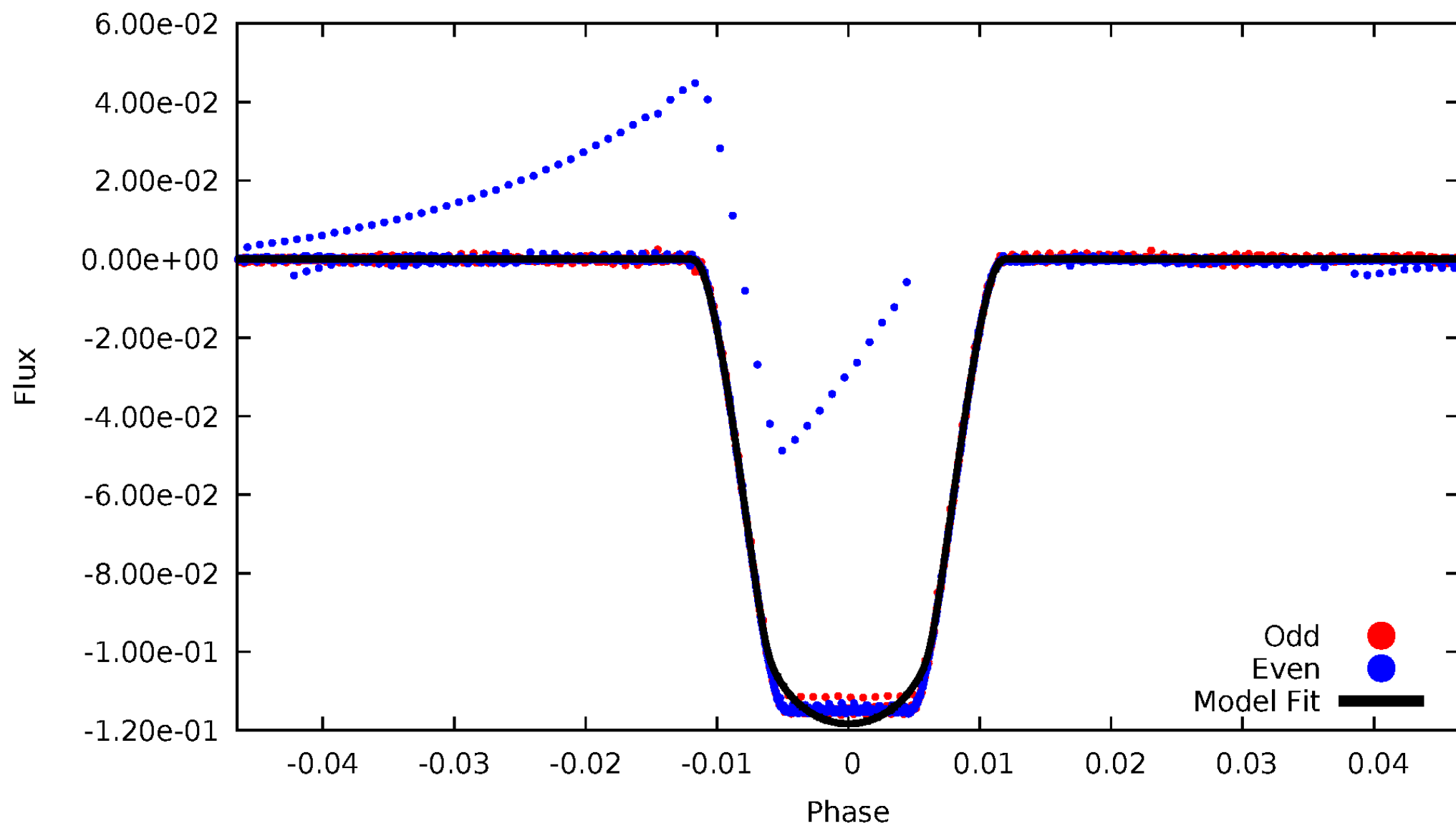


TCE 009474969-02



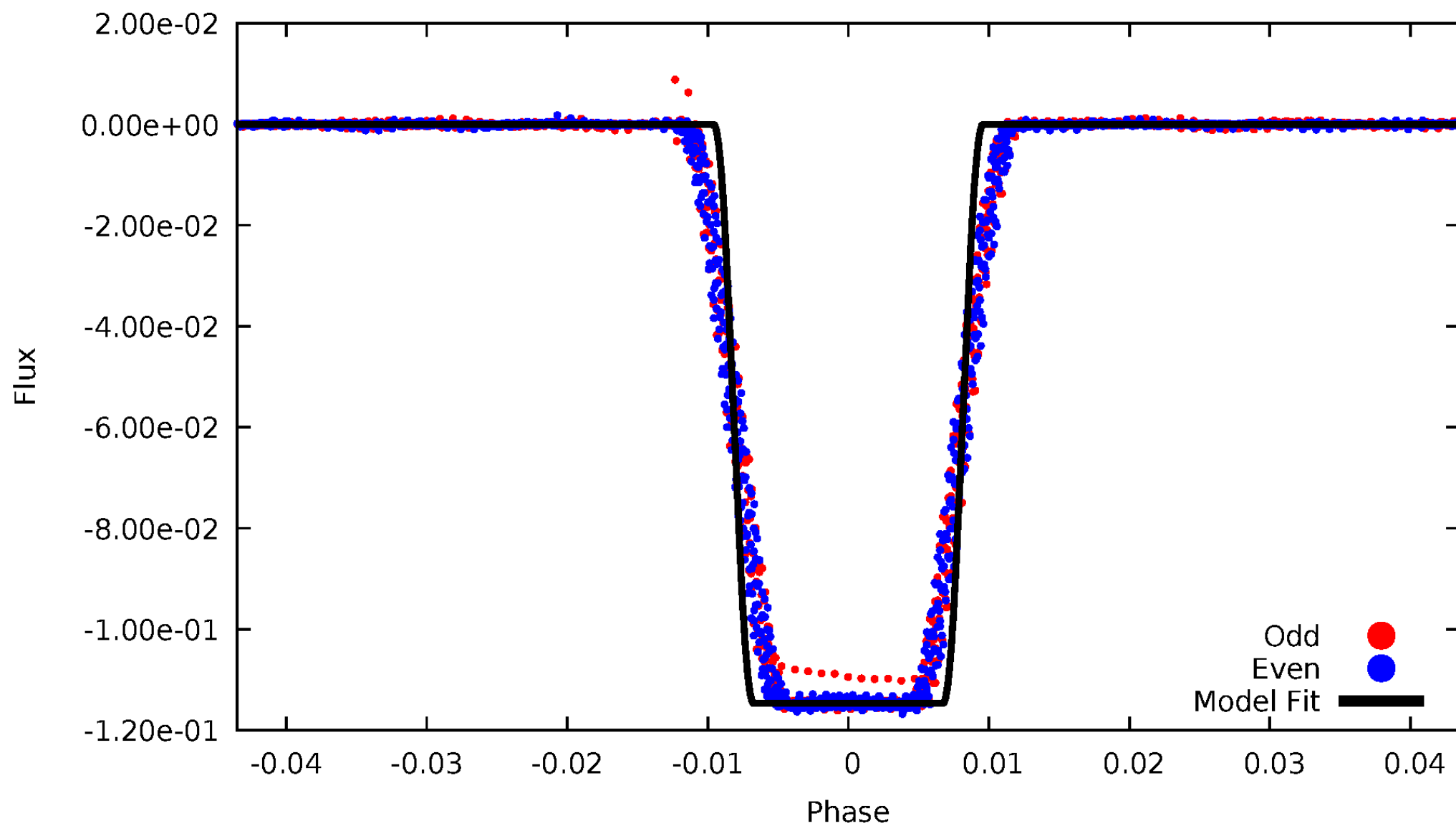
DV Odd/Even

TCE 009474969-02



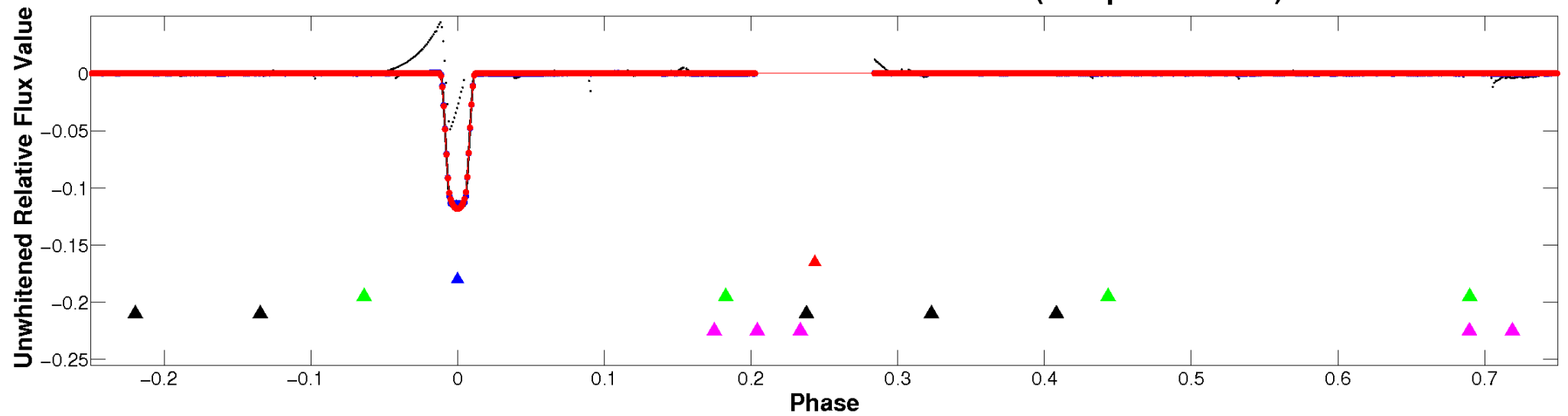
ALT Odd/Even

TCE 009474969-02

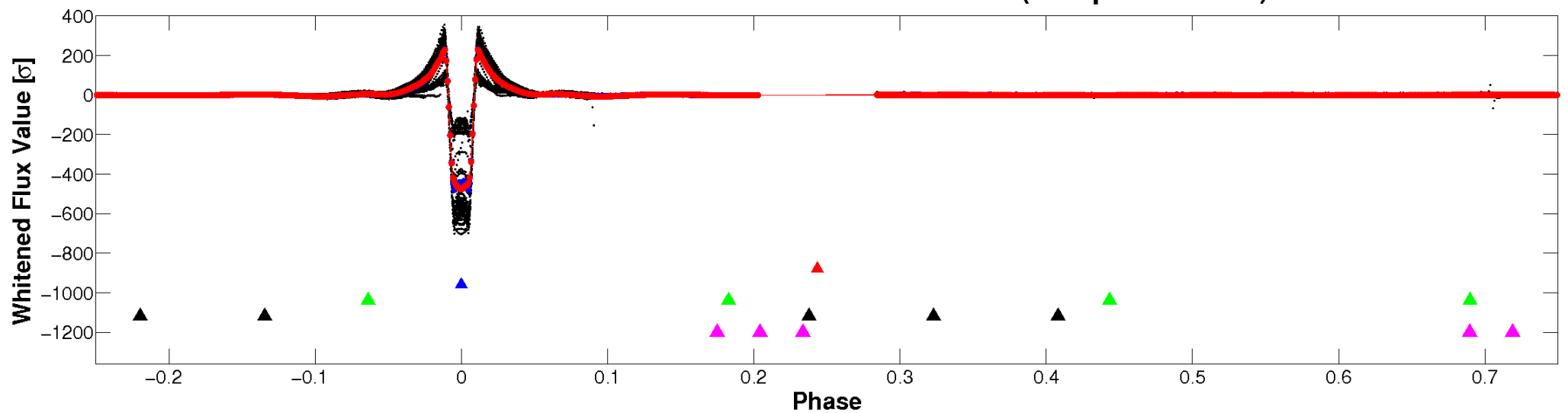


Non-Whitened Vs. Whitened Light Curve

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

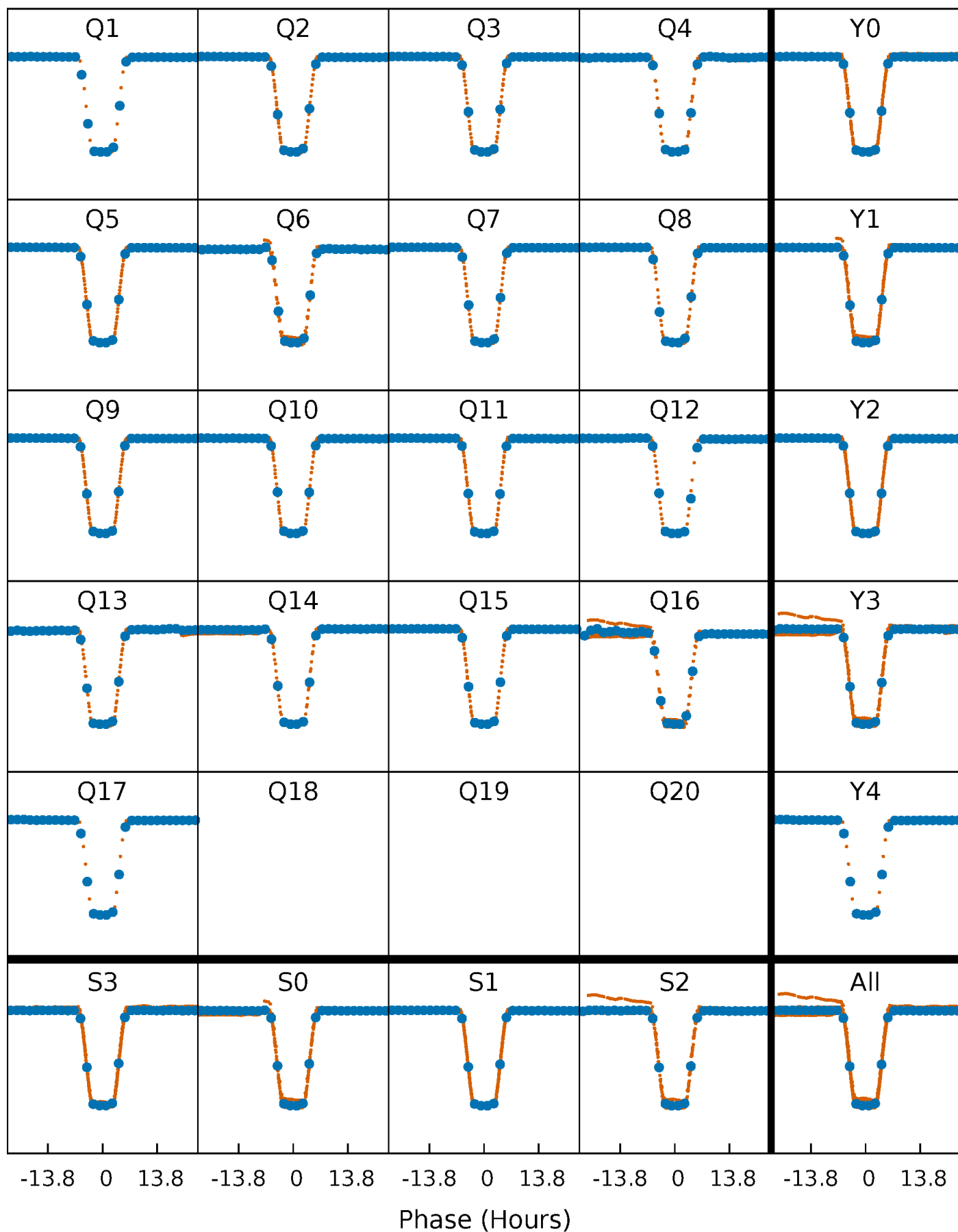


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



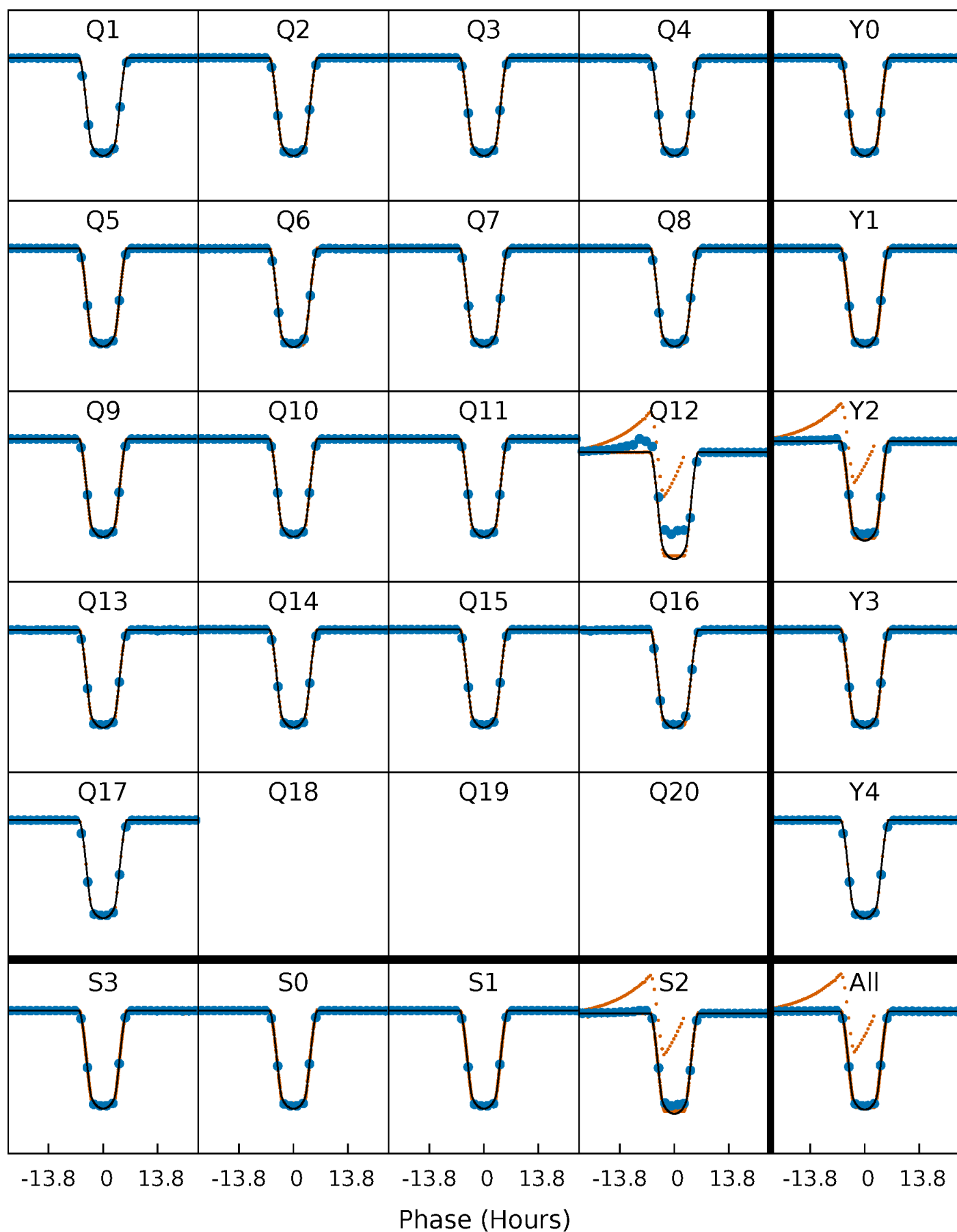
PDC Quarter-Phased Transit Curves

TCE 009474969-02 P= 21.570511 Days $T_0=146.540926$ (BKJD)



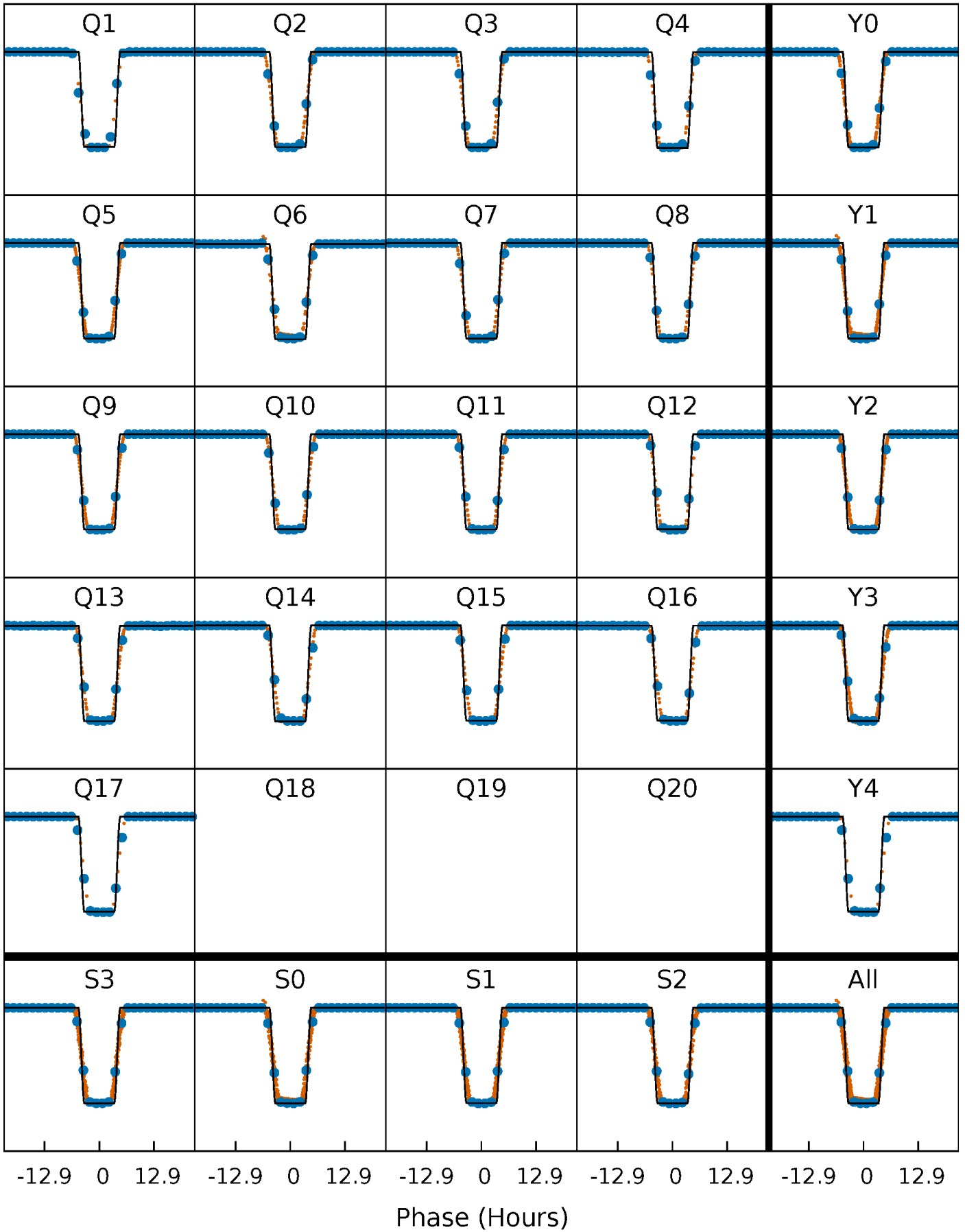
DV Quarter-Phased Transit Curves

TCE 009474969-02 P= 21.570511 Days $T_0=146.540926$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

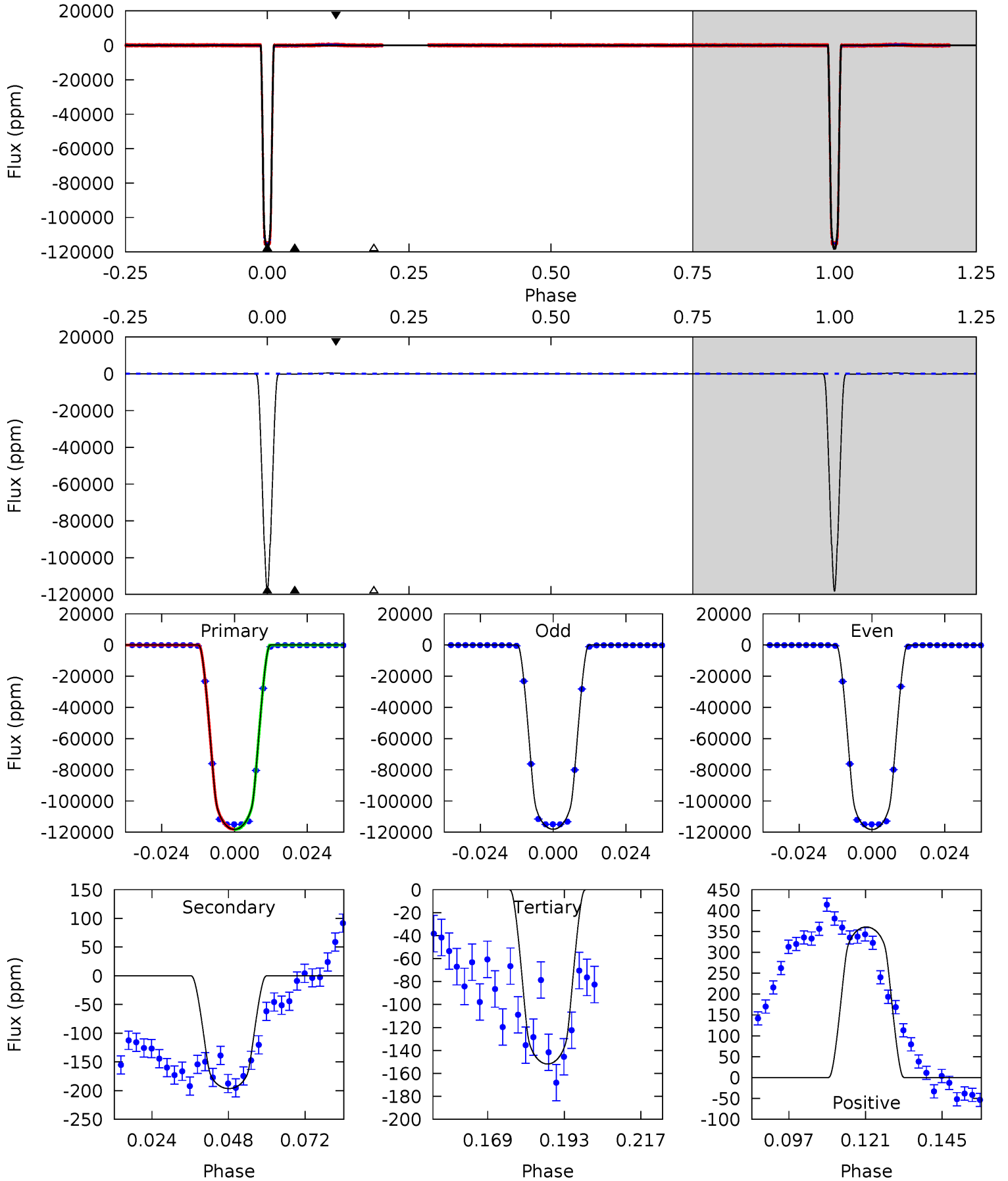
TCE 009474969-02 P= 21.570086 Days $T_0=146.553941$ (BKJD)



DV Model-Shift Uniqueness Test

009474969-02, P = 21.570511 Days, E = 124.970415 Days

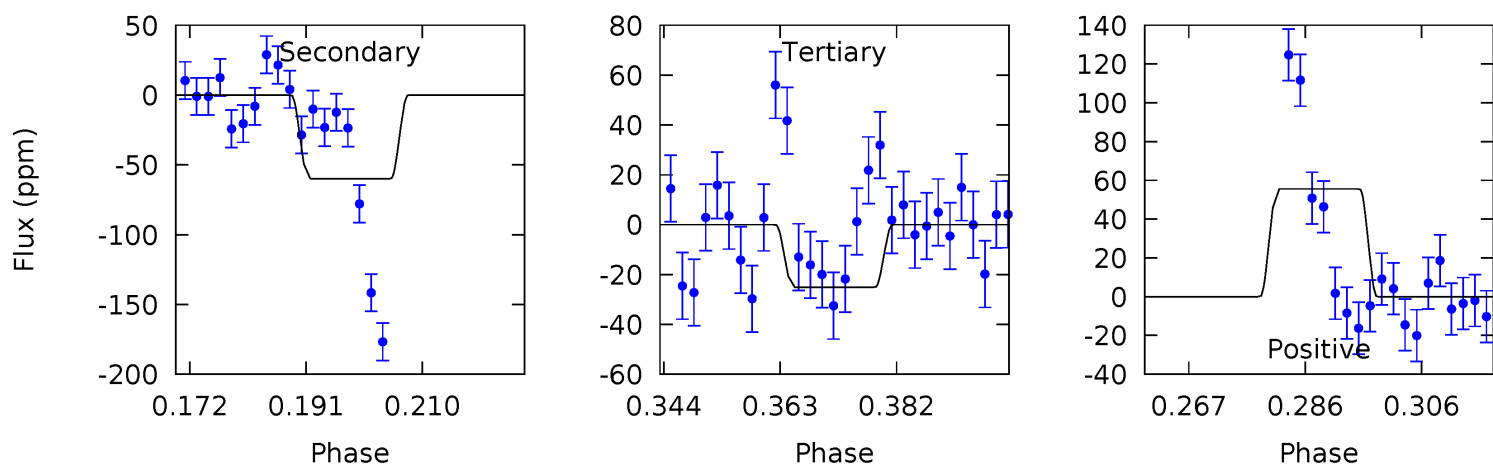
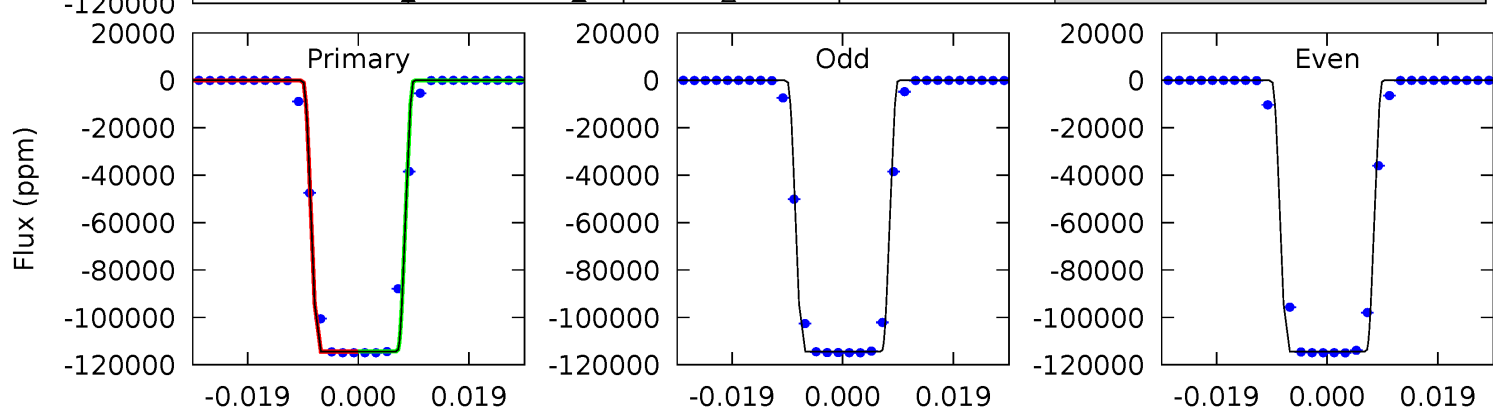
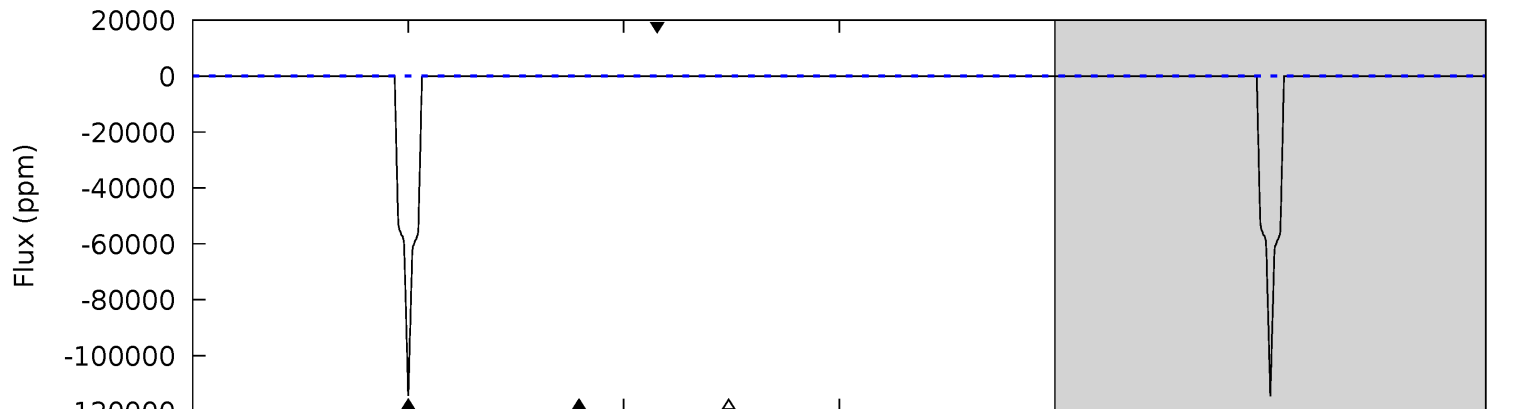
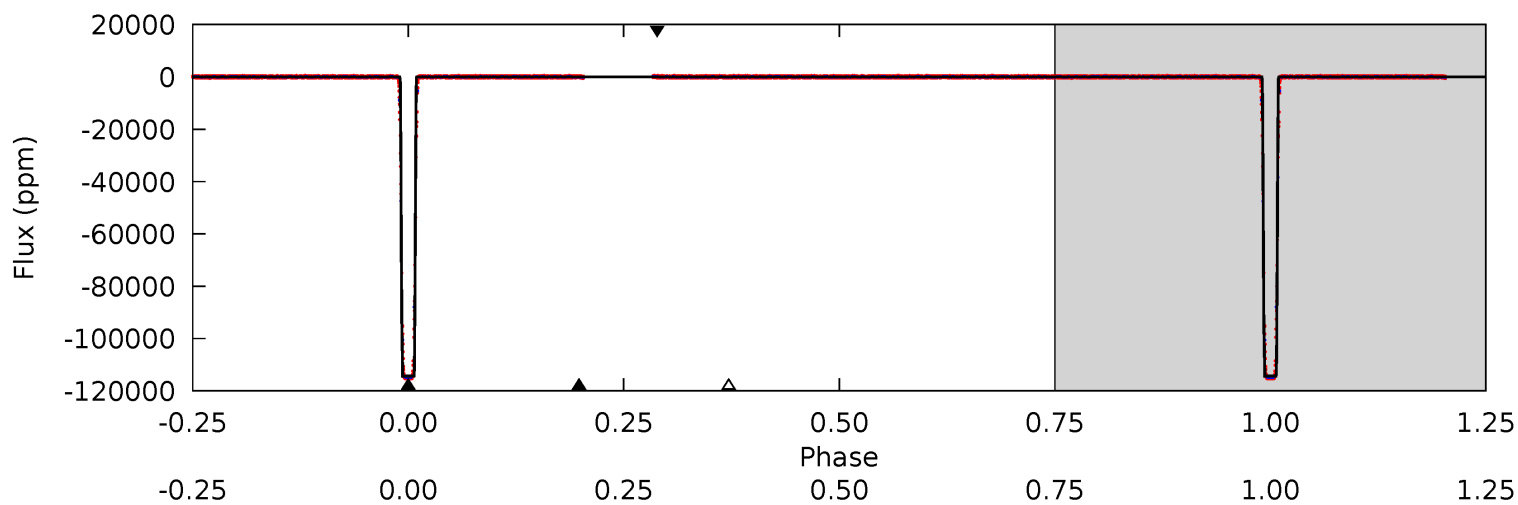
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21349	35.5	27.4	65.1	4.85	2.25	15.8	21322	21284	8.07	-29.7	20.1	0.99	0.00	14.1



Alt Model-Shift Uniqueness Test

009474969-02, P = 21.570086 Days, E = 124.983855 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18858	9.89	4.14	9.16	4.90	2.34	1.24	18854	18849	5.75	0.72	1.80	1.00	0.00	5.84



Stellar Parameters For KIC 009474969

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6322^{+175}_{-175}	$4.003^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.300}$	$1.692^{+0.336}_{-0.505}$	$1.051^{+0.174}_{-0.139}$	$0.305^{+0.539}_{-0.108}$
	+3%/-3%	+7%/-3%	+76%/-65%	+20%/-30%	+17%/-13%	+177%/-35%
Source	PHO1	FLK73	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 009474969-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-197 ± 6	$58.31^{+6.59}_{-9.64}$	1273^{+84}_{-101}	2144^{+48}_{-48}	$0.774^{+0.317}_{-0.147}$
Alt.	-60 ± 6	$61.78^{+7.98}_{-9.31}$	1274^{+87}_{-98}	-1817^{+352}_{-103}	$0.209^{+0.080}_{-0.043}$

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

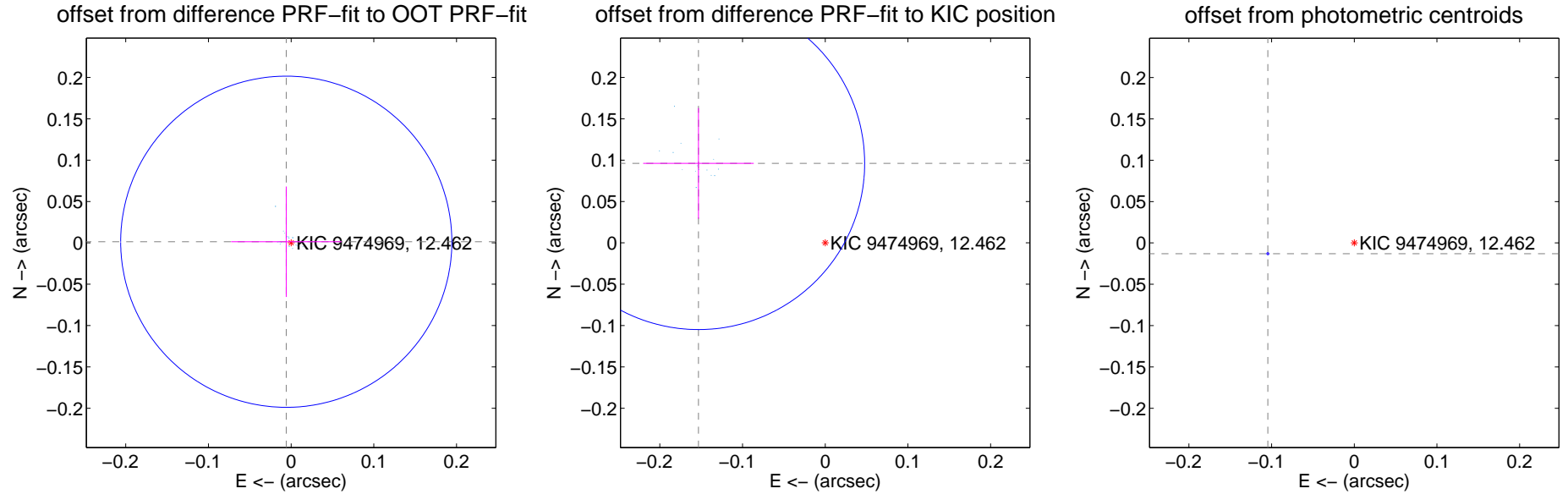
DV Centroid Data

Supplemental centroid analysis for 009474969-02. Kepler magnitude: 12.46. Transit SNR 8523.16

There are 16 quarters with good PRF difference image offsets

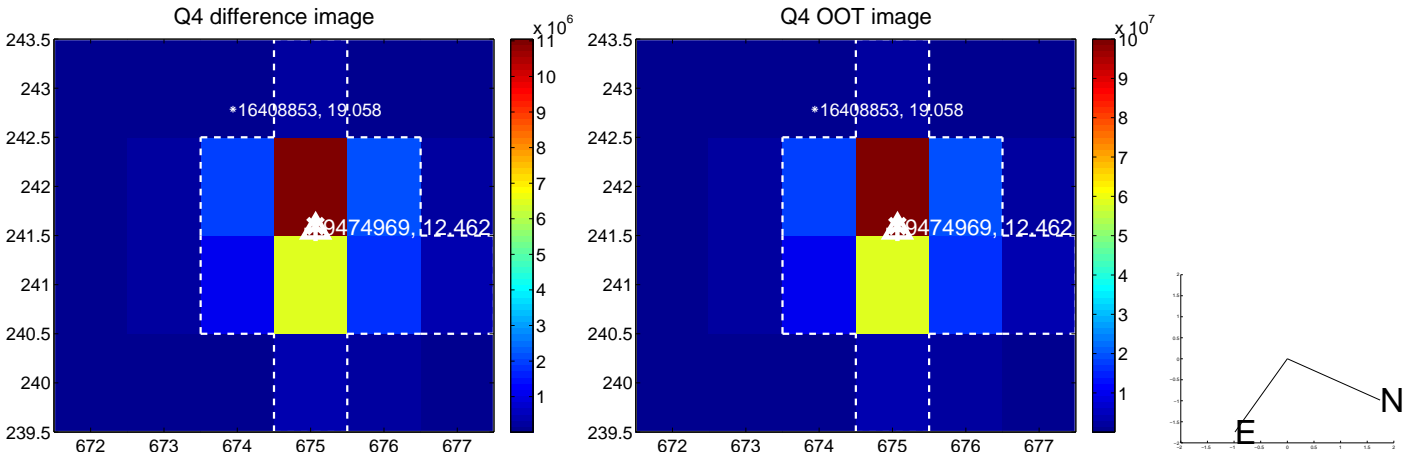
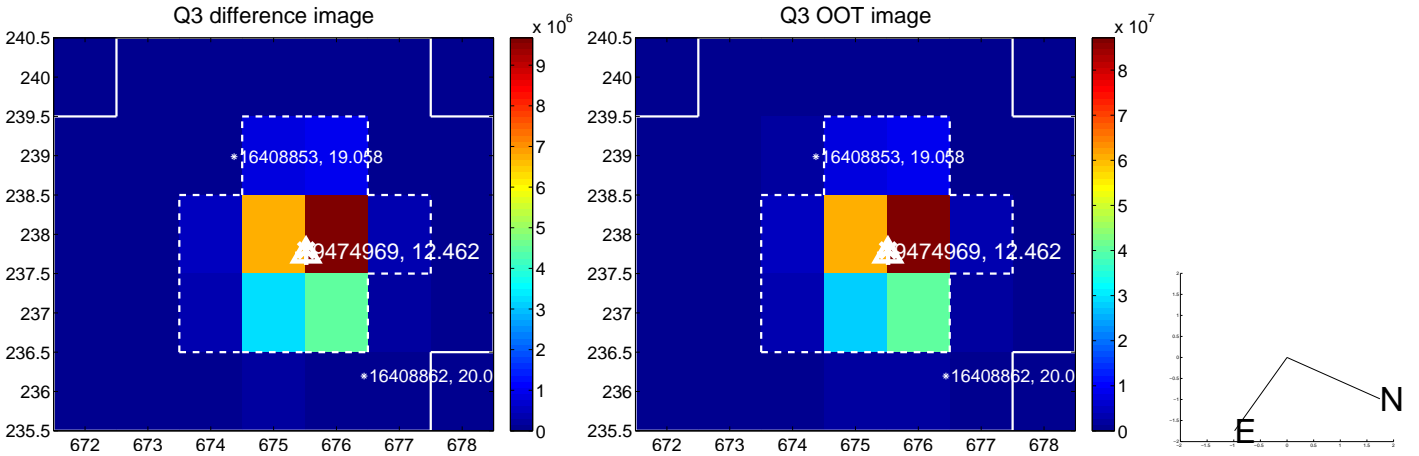
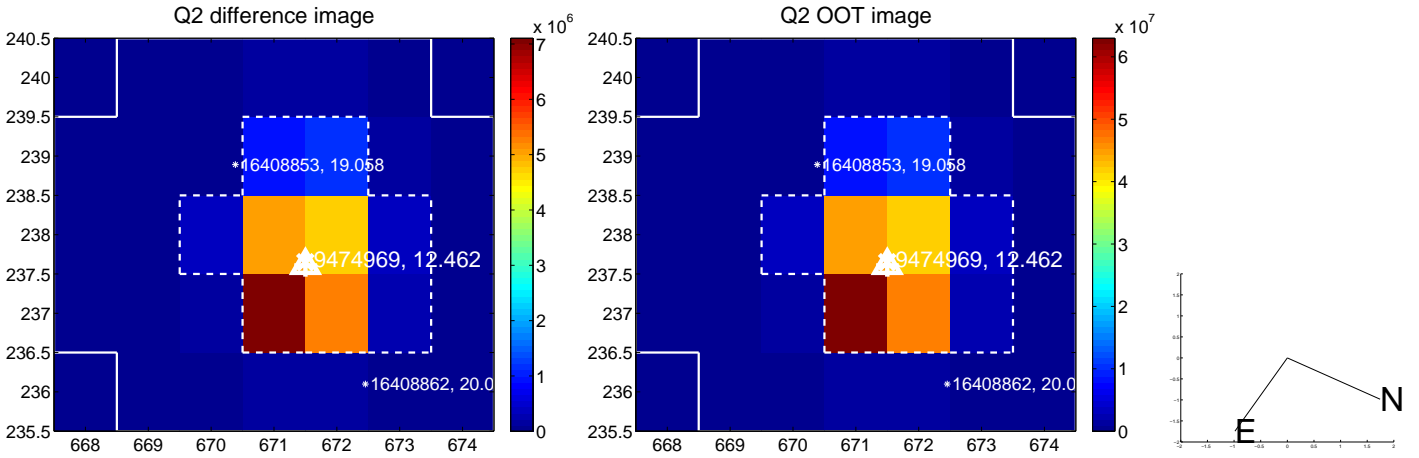
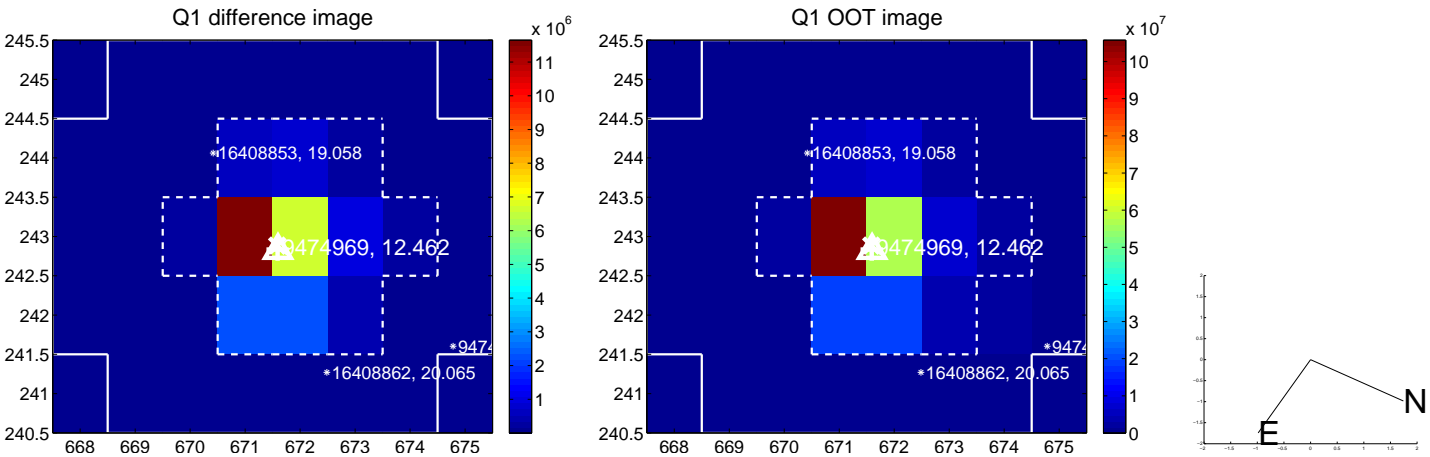
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.006 ± 0.067	0.09	0.006 ± 0.067	0.001 ± 0.067
PRF-fit source offset from KIC position	0.181 ± 0.067	2.70	0.153 ± 0.067	0.096 ± 0.067
photometric centroid source offset	0.11 ± 0.00	249.21	0.10 ± 0.00	-0.01 ± 0.00

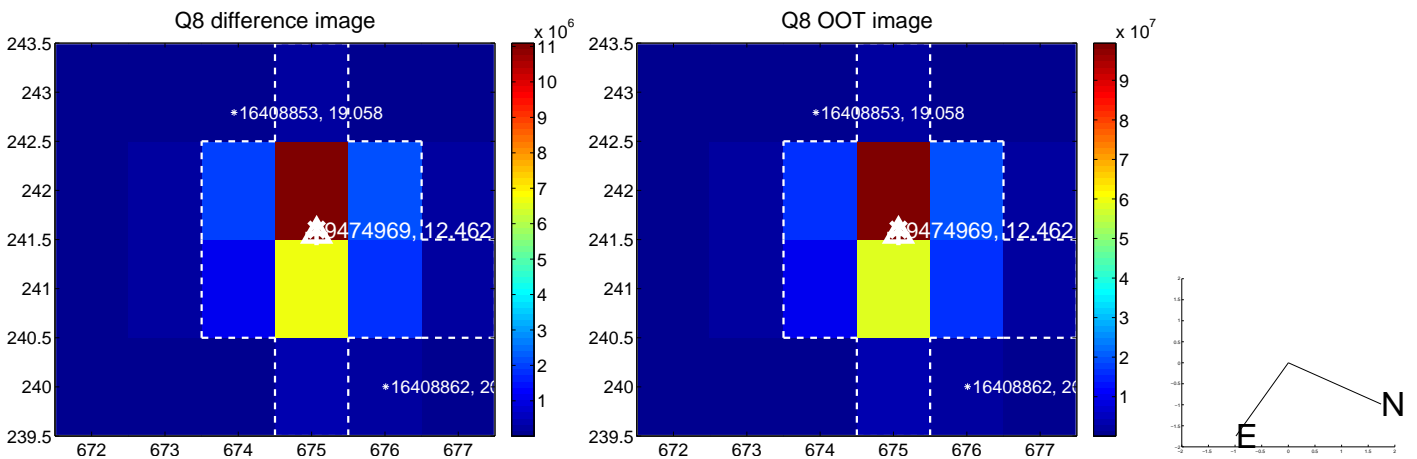
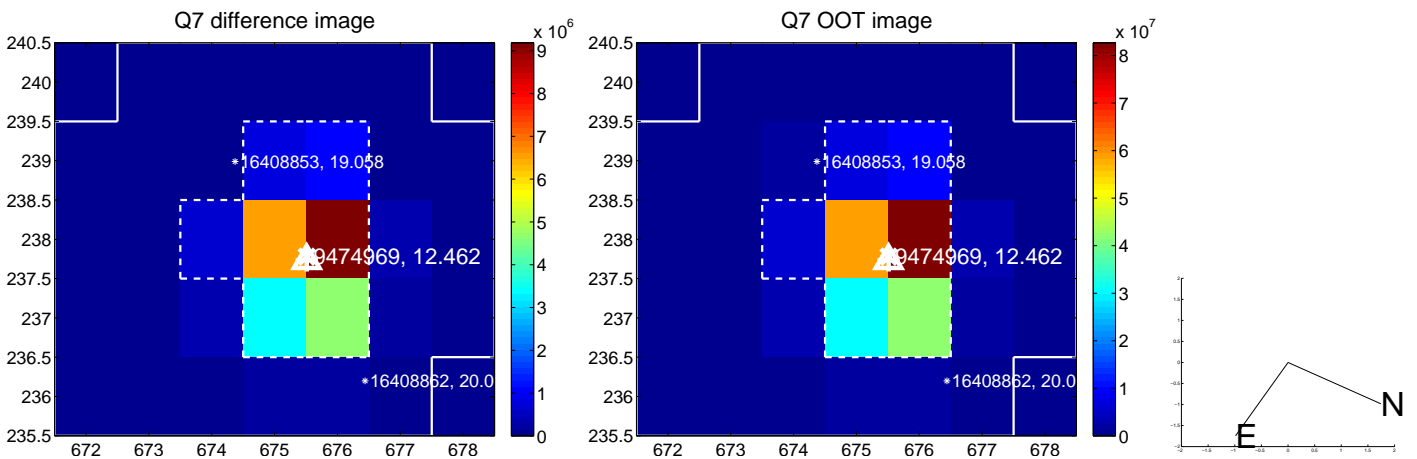
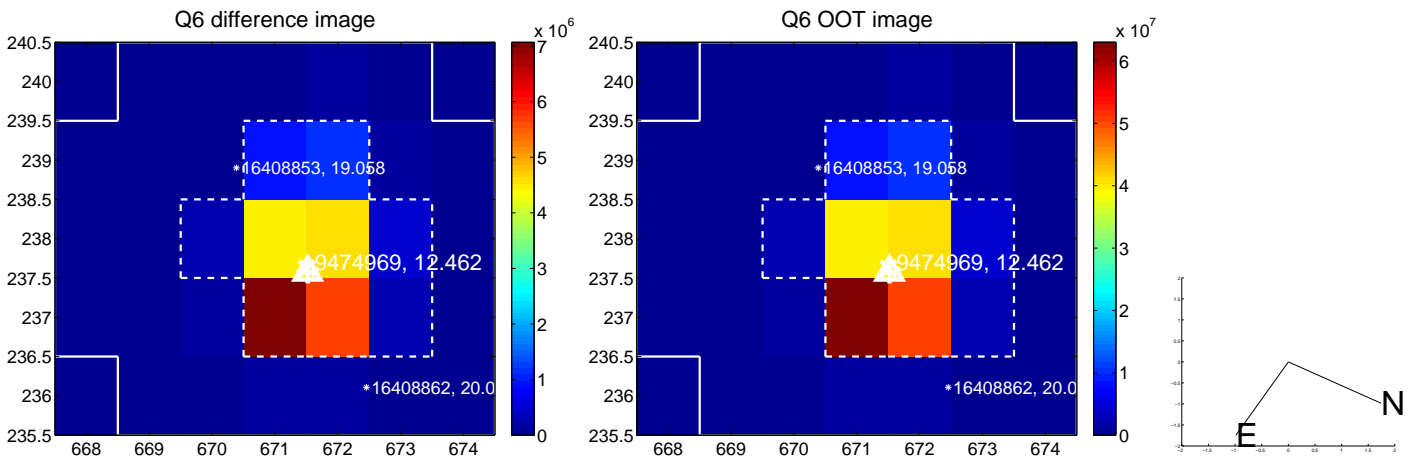
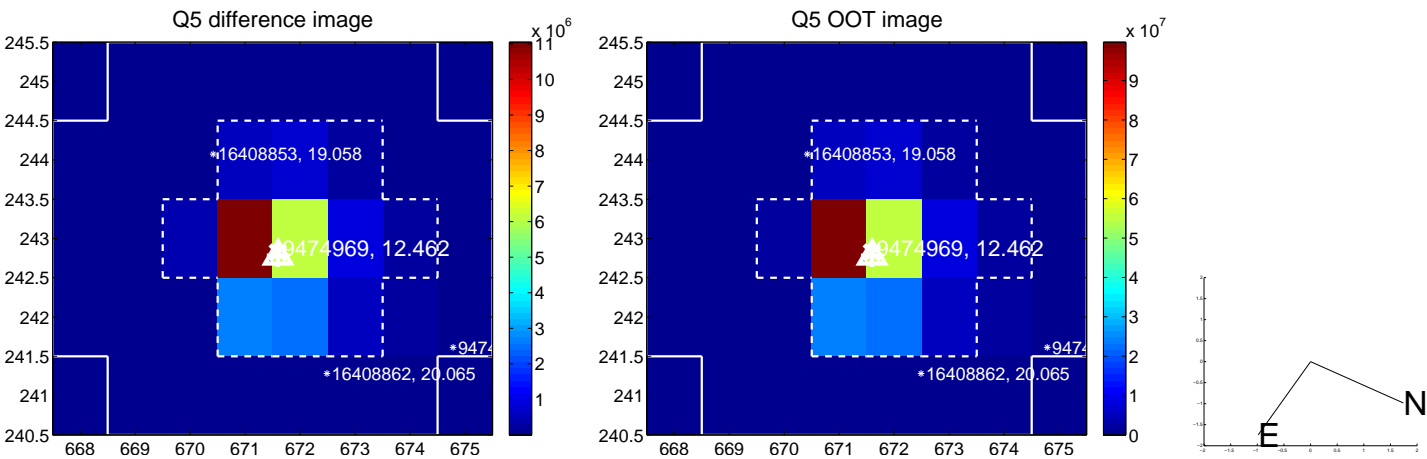


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

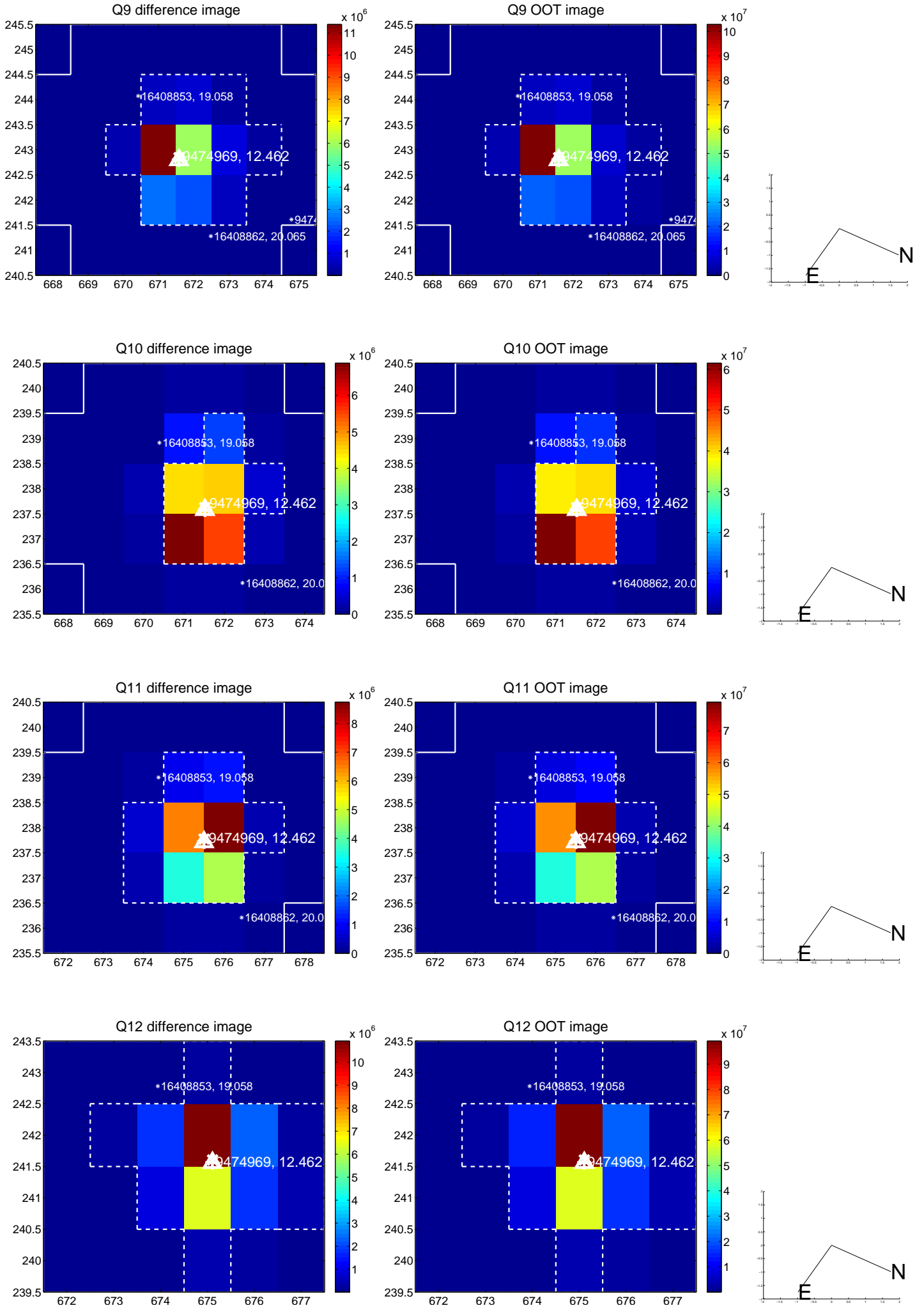
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



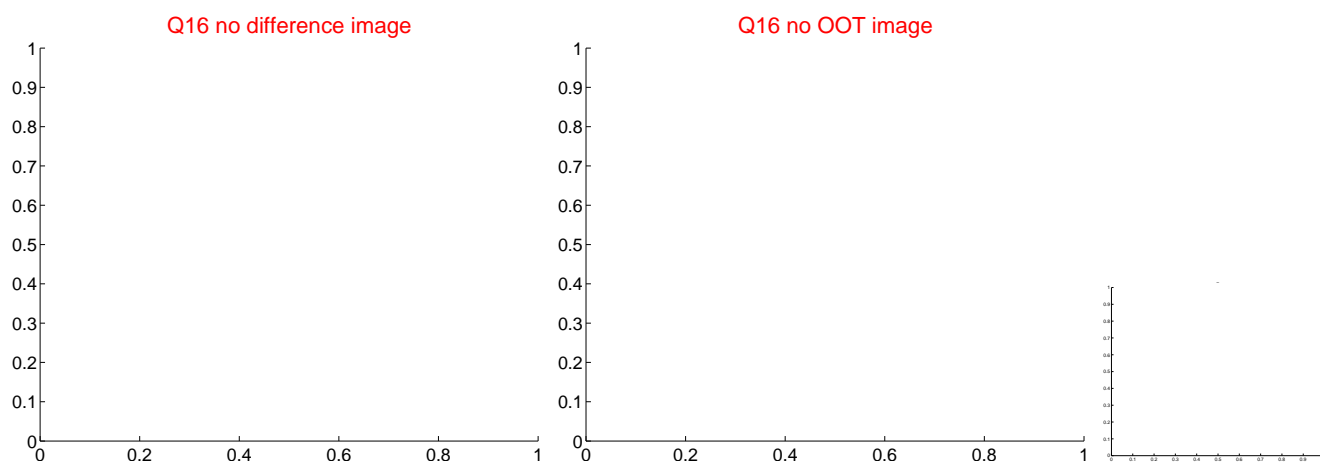
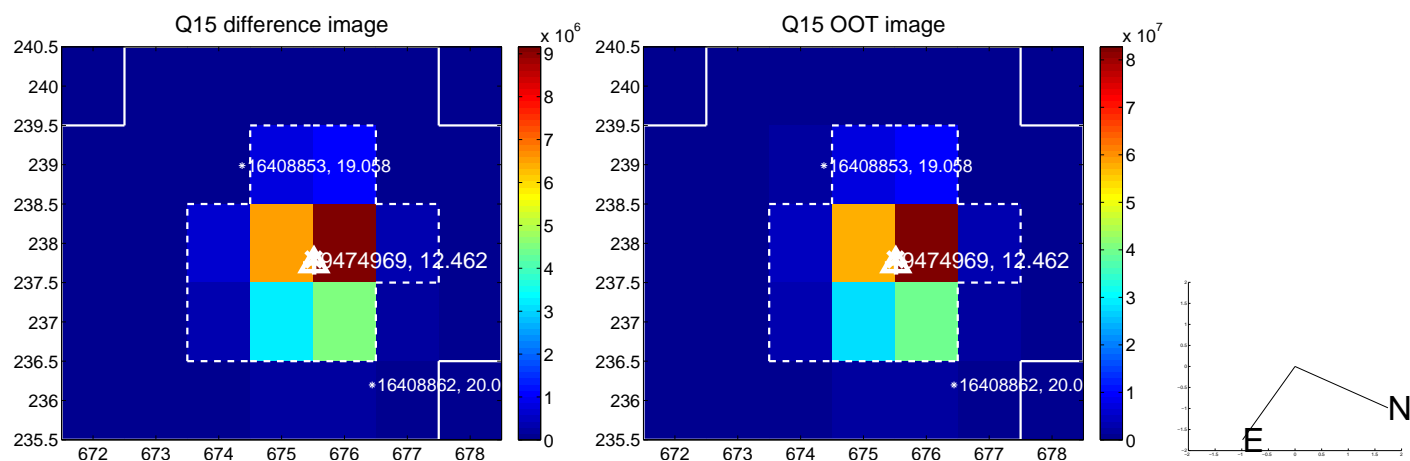
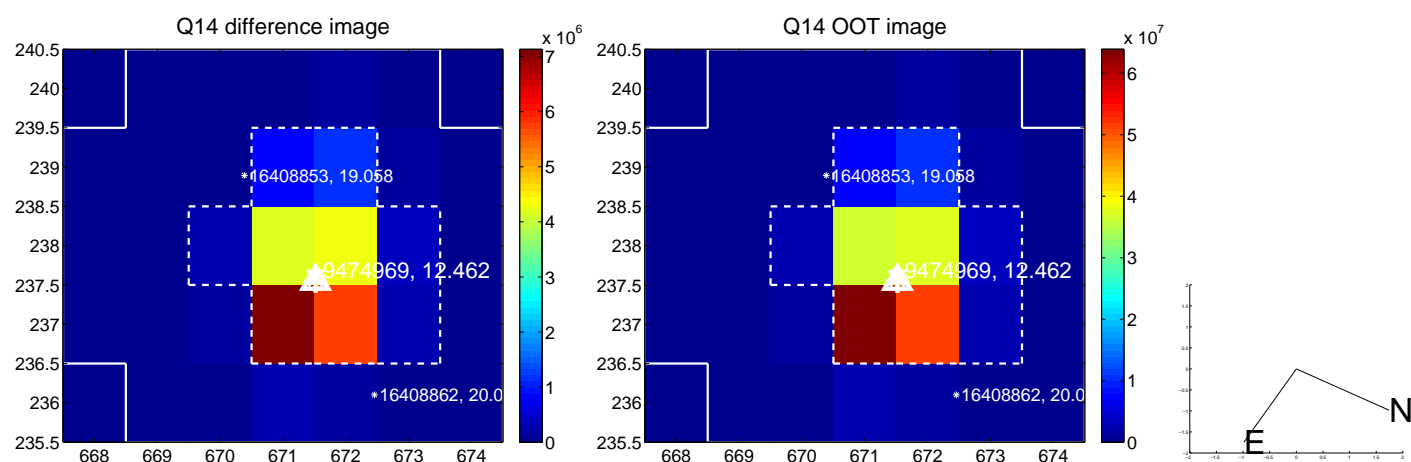
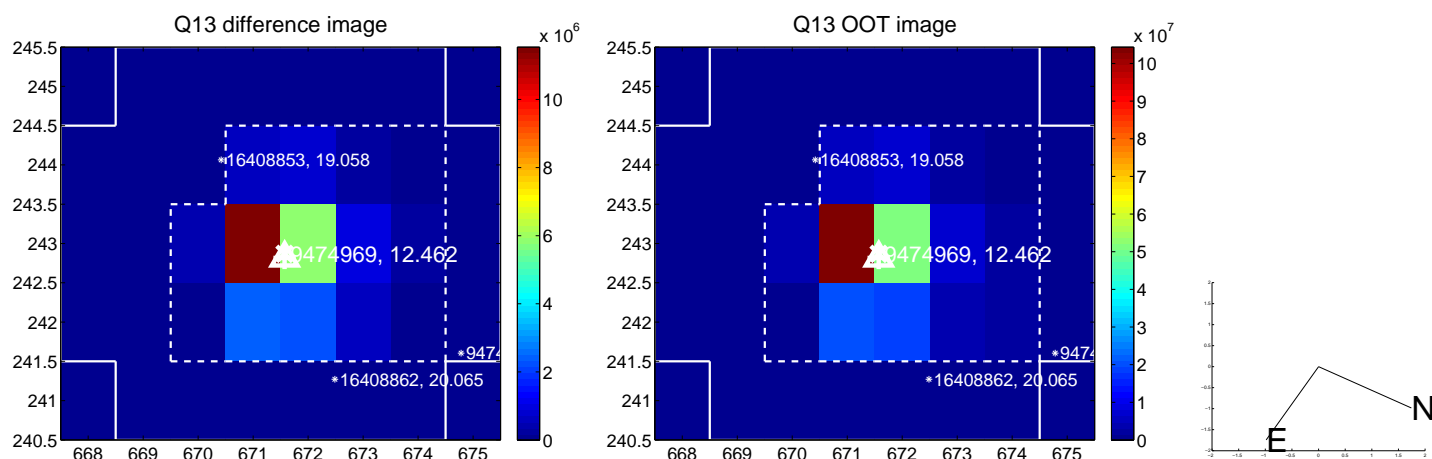
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



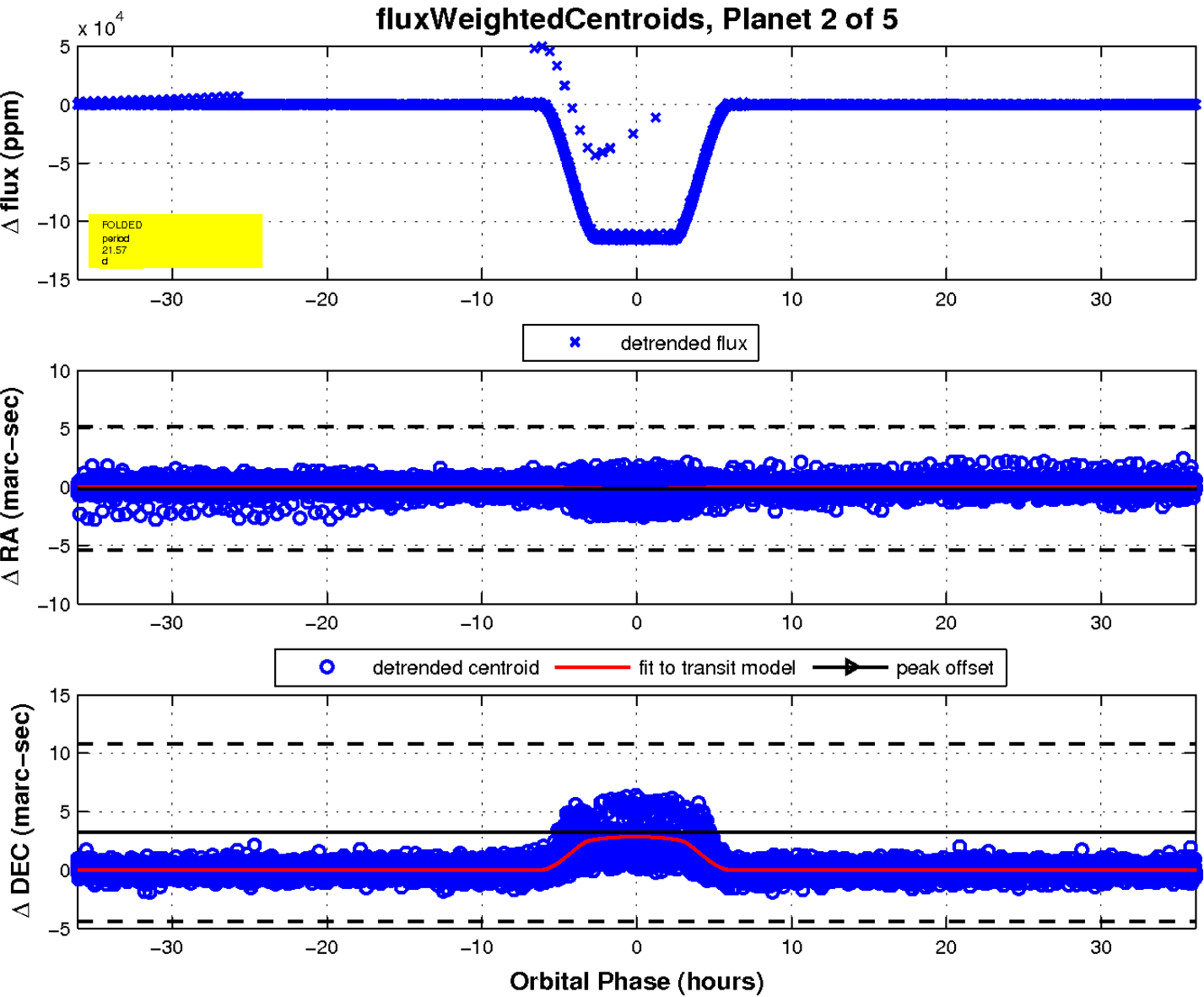
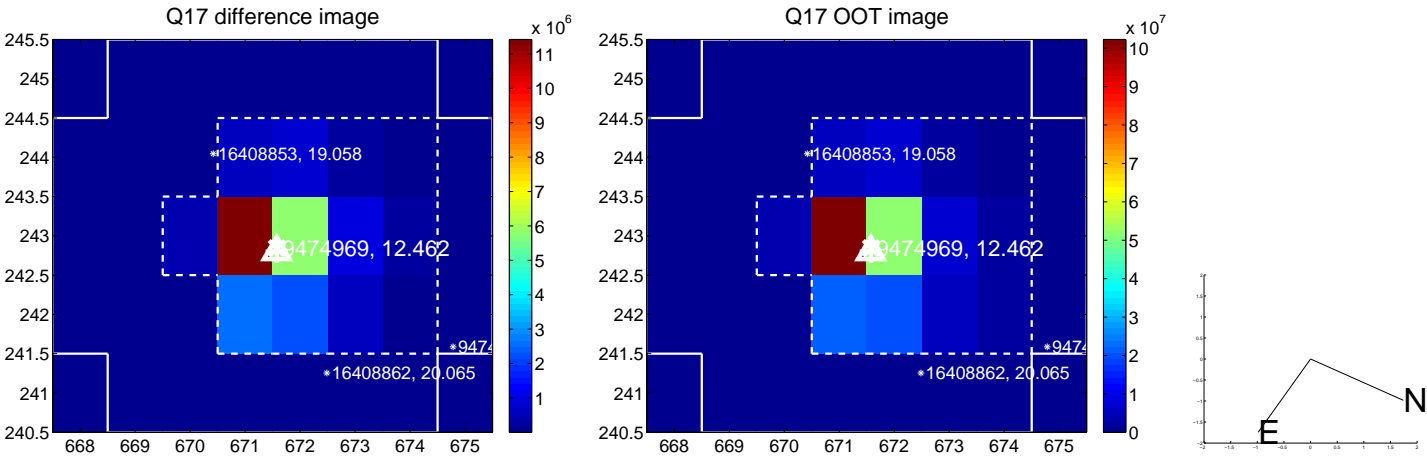
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

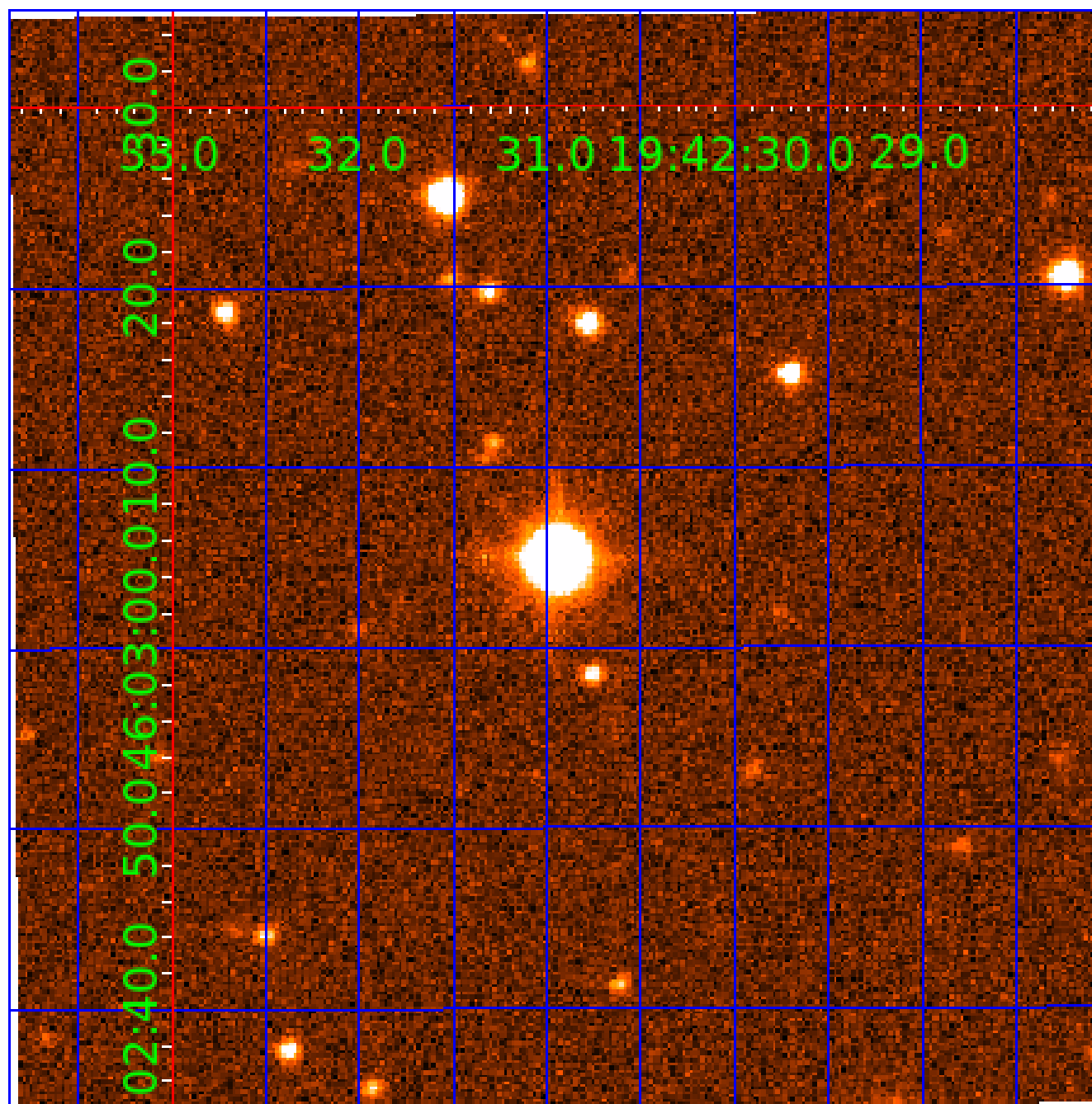


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009474969

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})
009474969-01	OBS	7178.01	21.570507	151.793219	134202.6	13.839	15279.3	14369.0	1.69	6322	63.72	172.23
009474969-02	OBS	No	21.570511	146.540926	118380.2	12.042	15892.5	8523.2	1.69	6322	58.72	172.23
009474969-04	OBS	No	292.120493	324.234382	1026.9	6.720	25.9	14.4	1.69	6322	6.74	5.33
009474969-05	OBS	No	312.456377	281.002919	1478.4	15.000	59.8	-1.0	1.69	6322	6.54	4.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009474969-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009474969-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD
009474969-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009474969-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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.

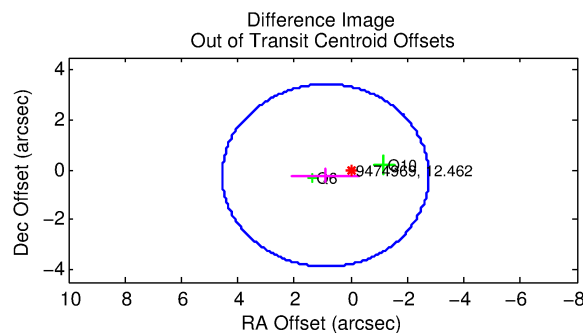
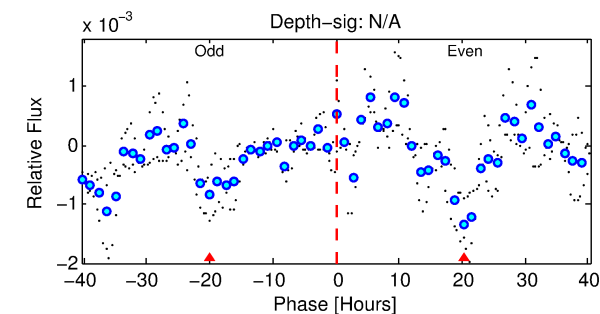
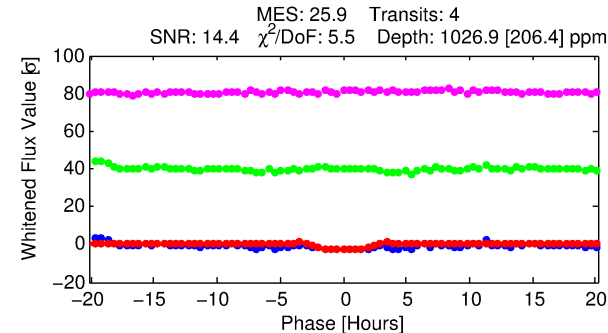
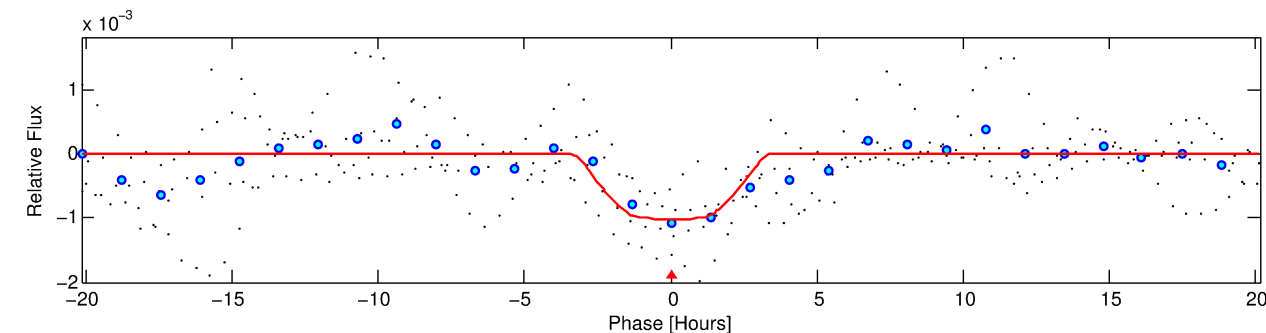
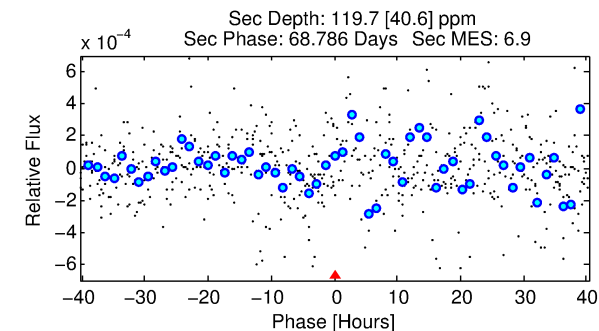
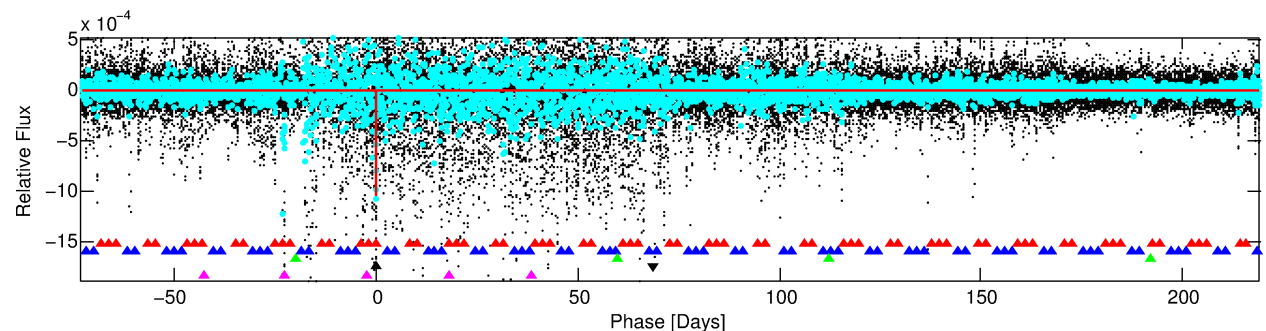
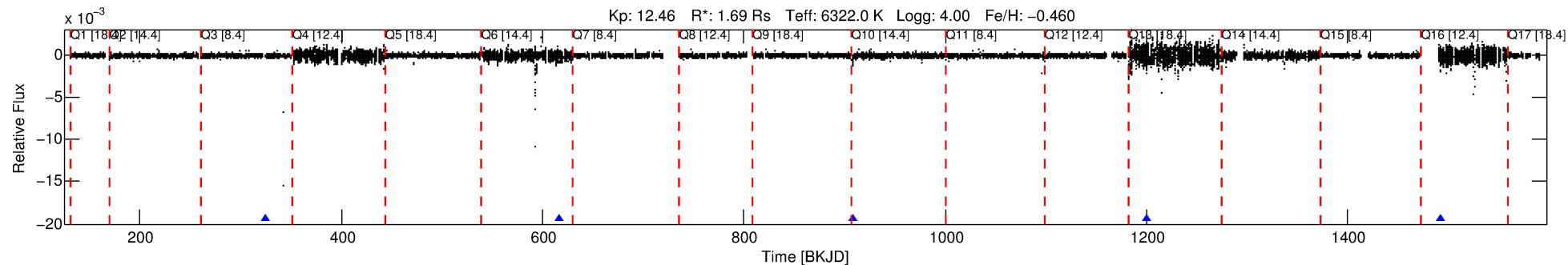
Ephemeris Match Information For 009474969-04

No Significant Match Found

DV One-Page Summary

KIC: 9474969 Candidate: 4 of 5 Period: 292.120 d

KOI: K07178 Corr: No Ephemeris Match



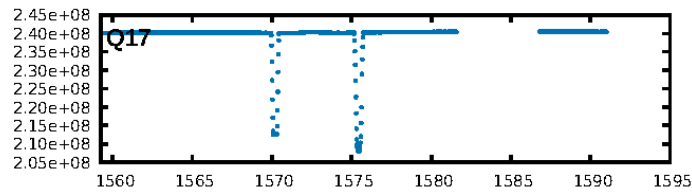
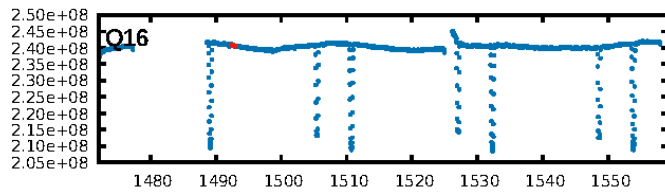
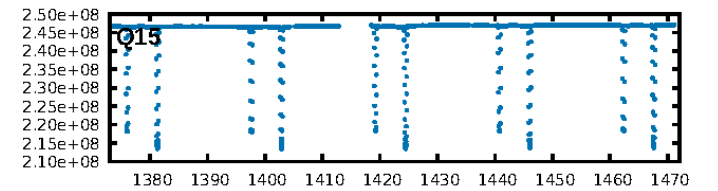
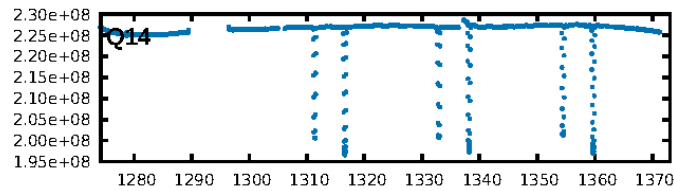
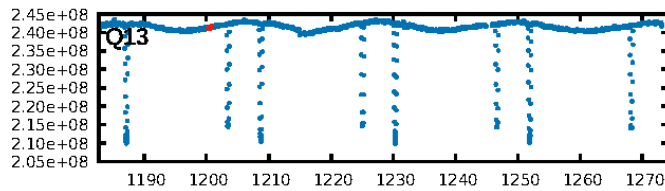
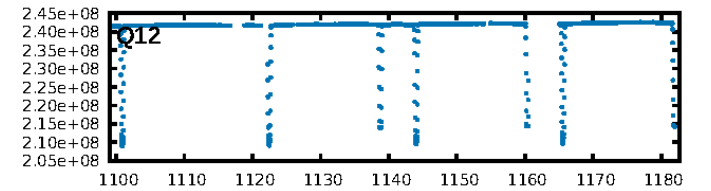
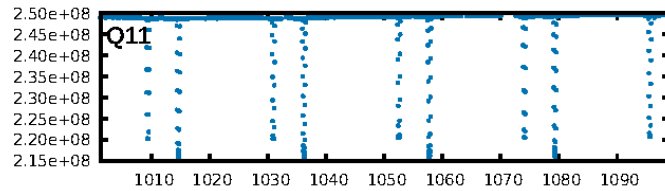
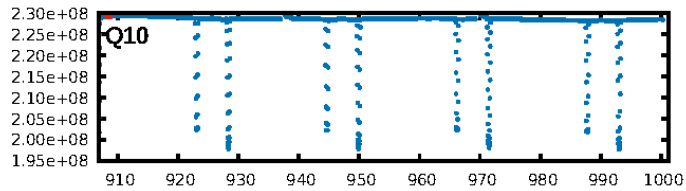
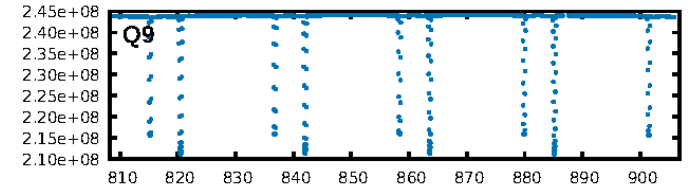
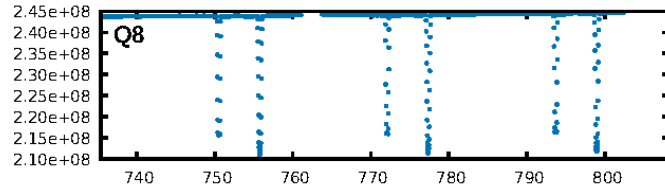
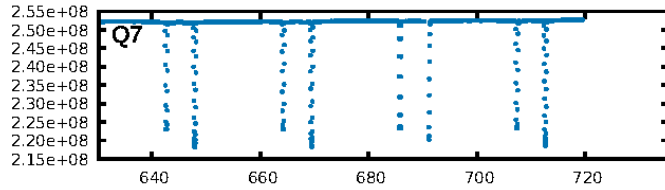
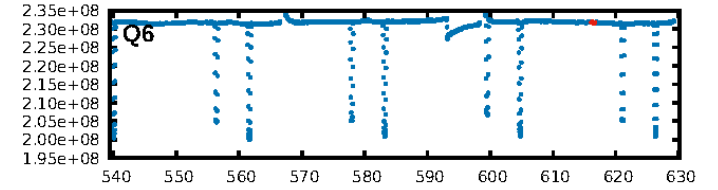
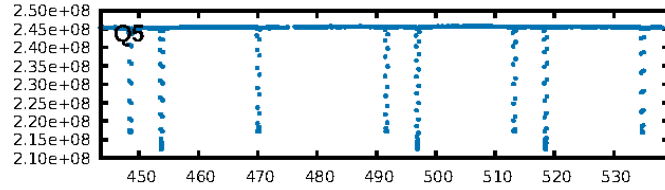
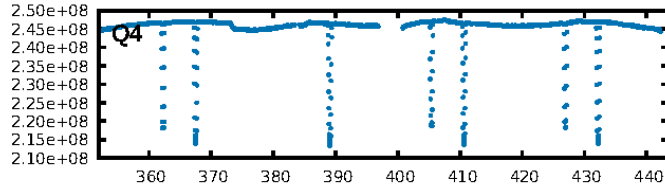
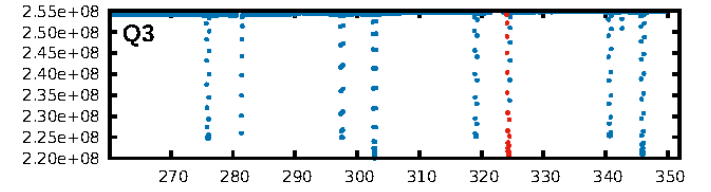
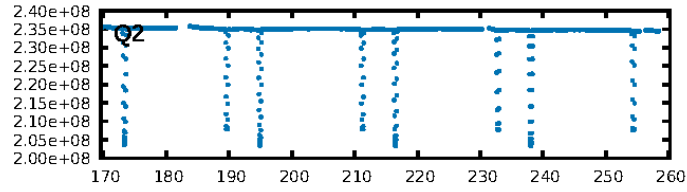
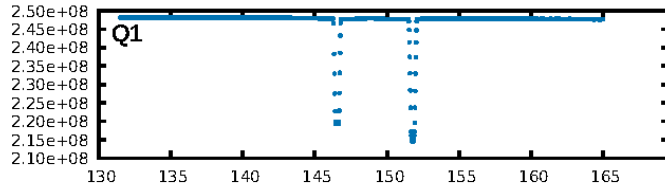
DV Fit Results:

Period = 292.12049 [0.00996] d
Epoch = 324.2344 [0.0259] BKJD
Rp/R* = 0.0365 [0.0044]
a/R* = 137.10 [28.68]
b = 0.95 [0.02]
Seff = 5.34 [2.54]
Teq = 388 [46] K
Rp = 6.74 [2.17] Re
a = 0.8763 [0.2532] AU
Ag = 1112.72 [692.86] [1.60 σ]
Teffp = 3461 [372] K [8.20 σ]

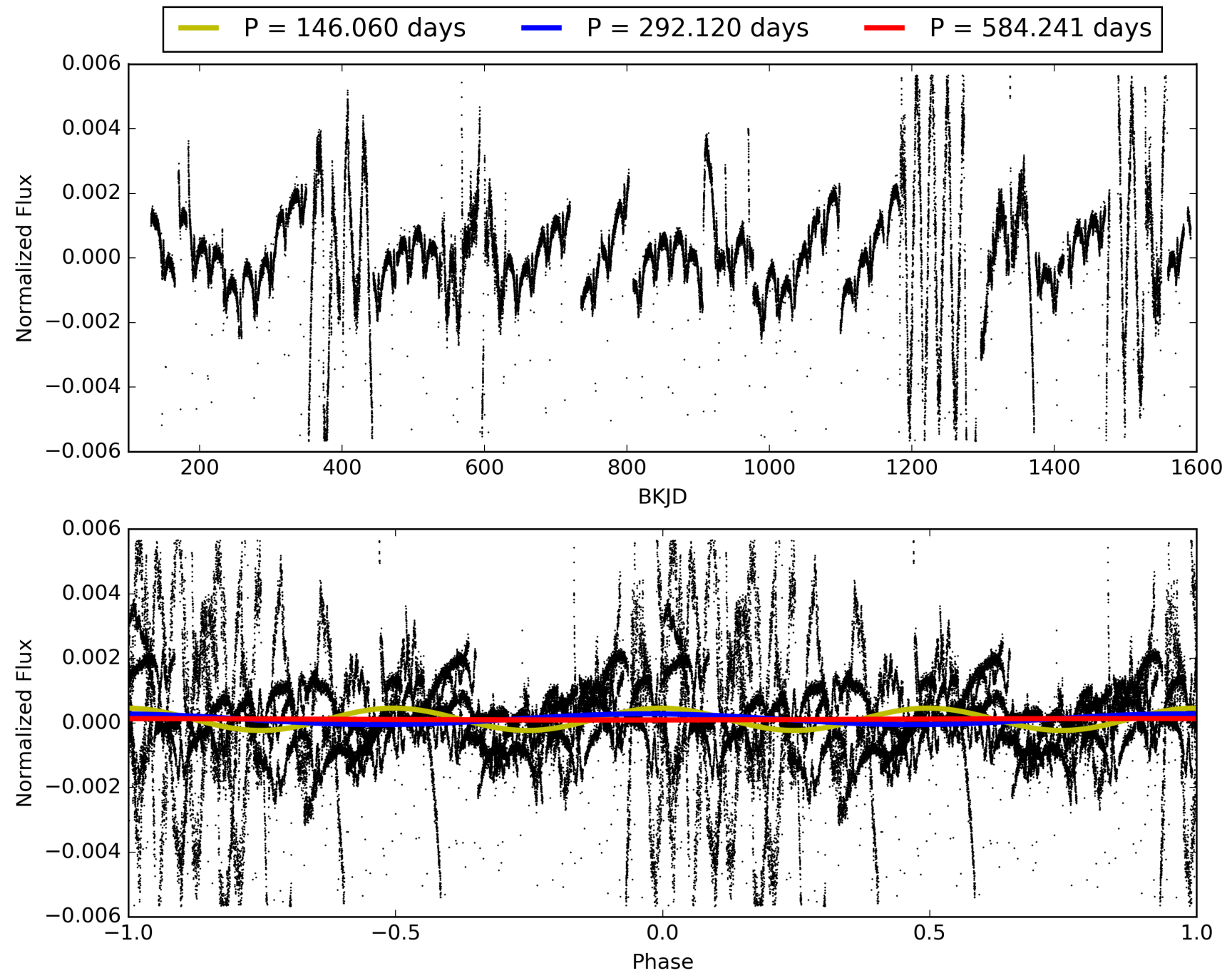
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [470.87 σ]
LongPeriod-sig: 100.0% [29.69 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.05429
Centroid-sig: 0.0%
Centroid-so: 0.786 arcsec [3.66 σ]
OotOffset-rm: 0.924 arcsec [0.76 σ]
OotOffset-st: 2/0/0/0 [2]
KicOffset-rm: 1.042 arcsec [0.86 σ]
KicOffset-st: 2/0/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 009474969-04, PDC Light Curves

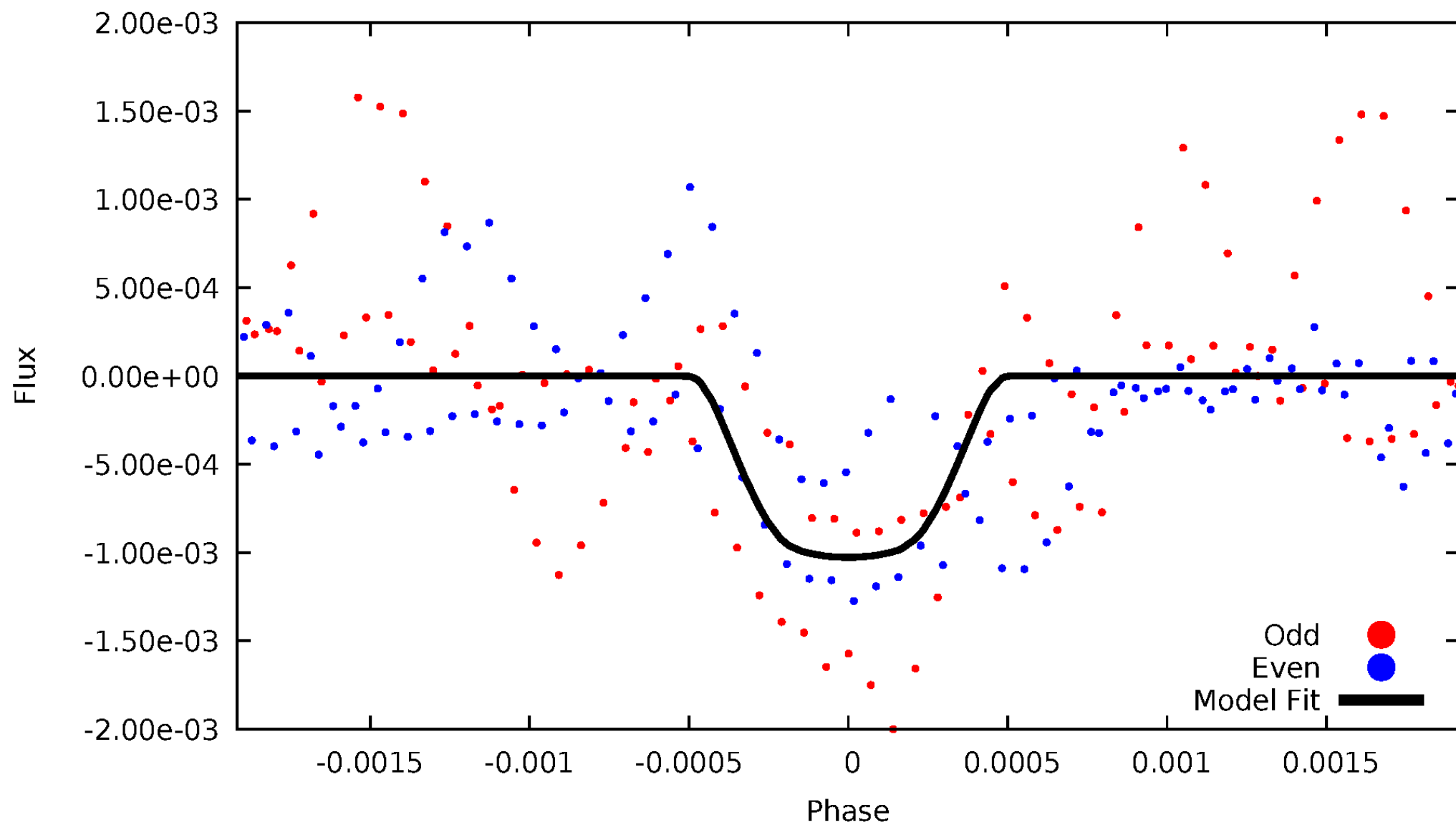


TCE 009474969-04



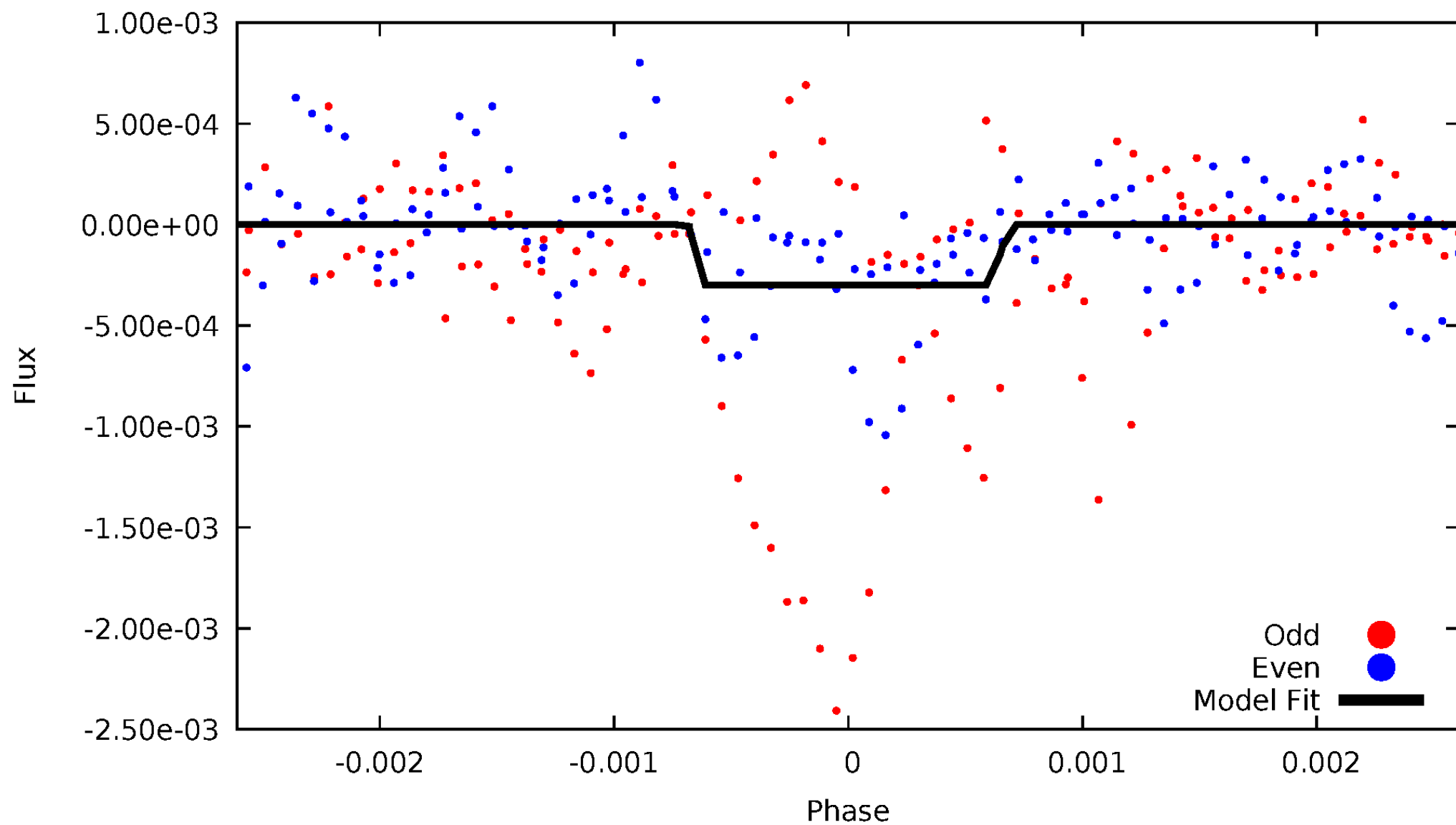
DV Odd/Even

TCE 009474969-04



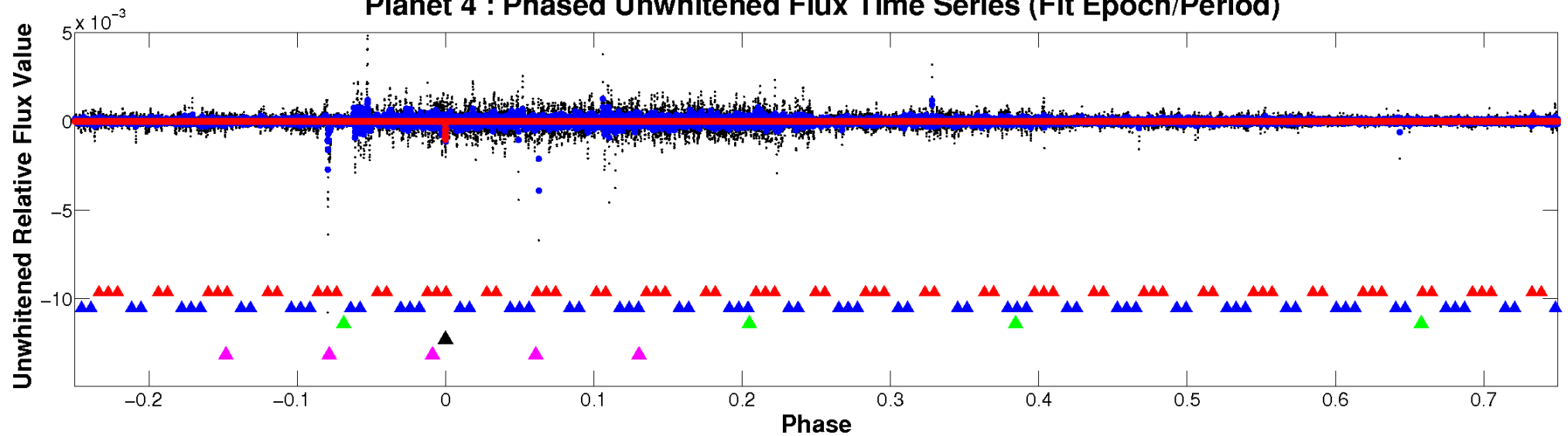
ALT Odd/Even

TCE 009474969-04

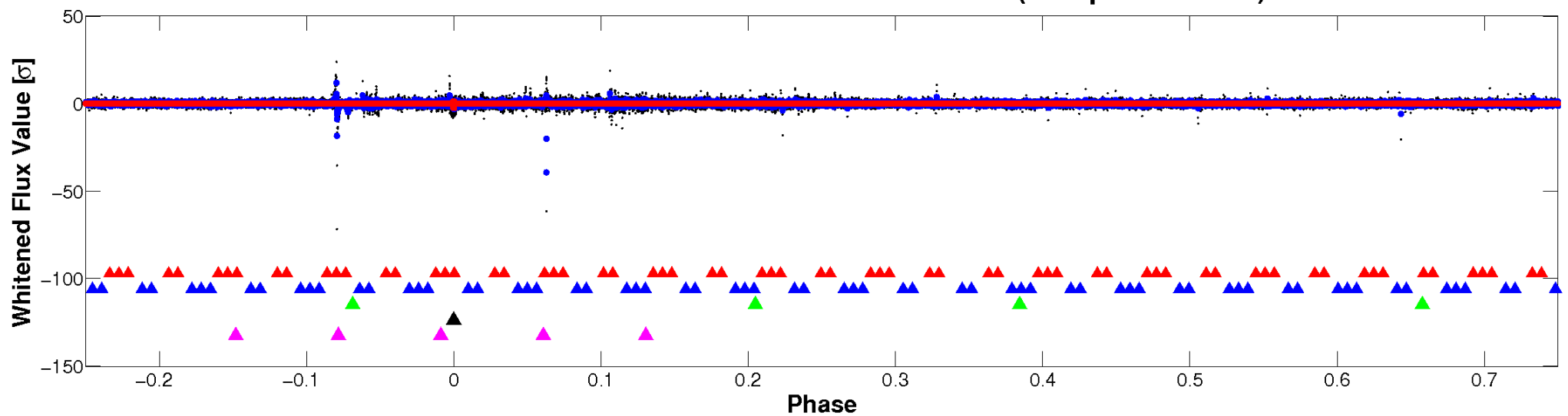


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

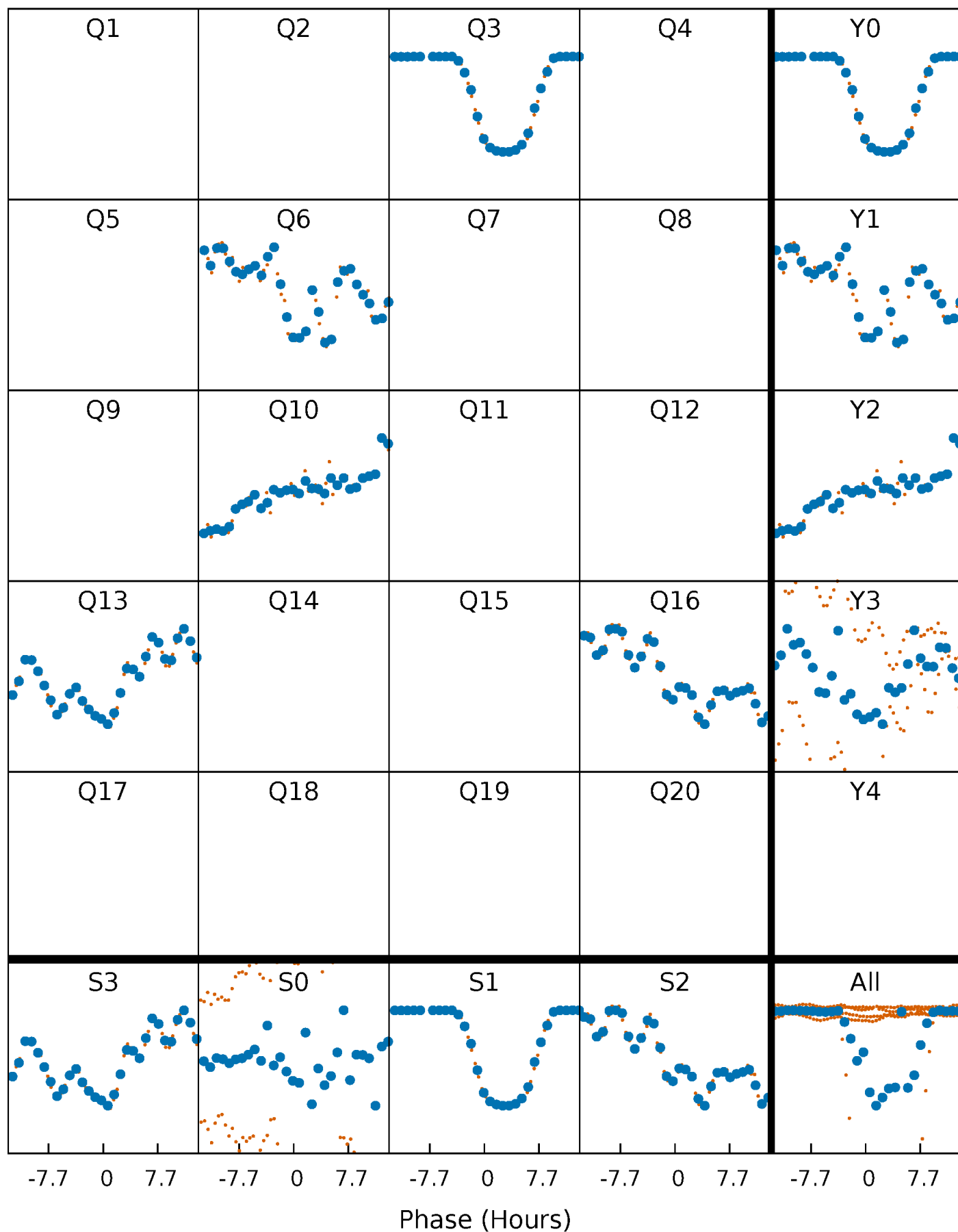


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



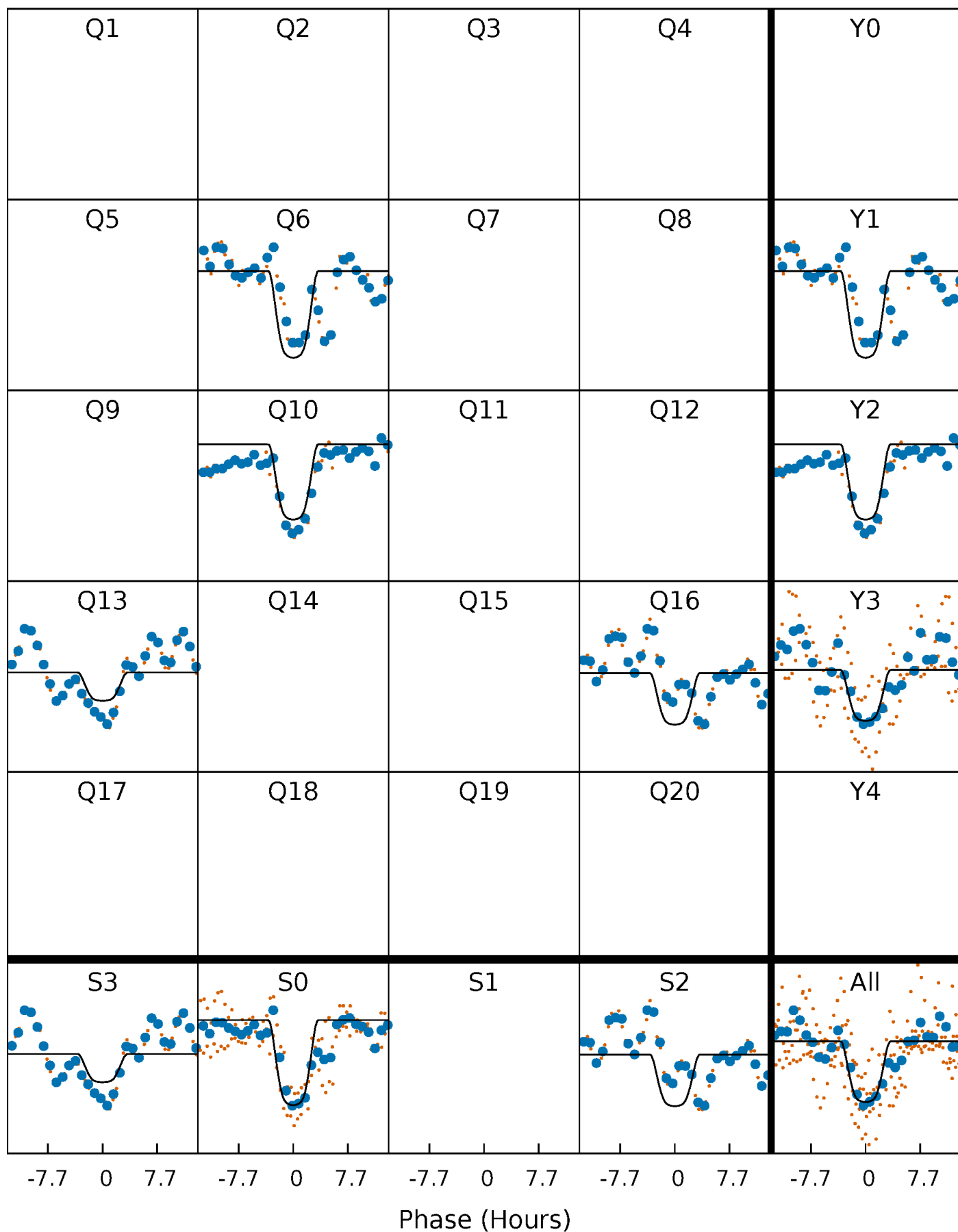
PDC Quarter-Phased Transit Curves

TCE 009474969-04 P=292.120493 Days $T_0=324.234381$ (BKJD)



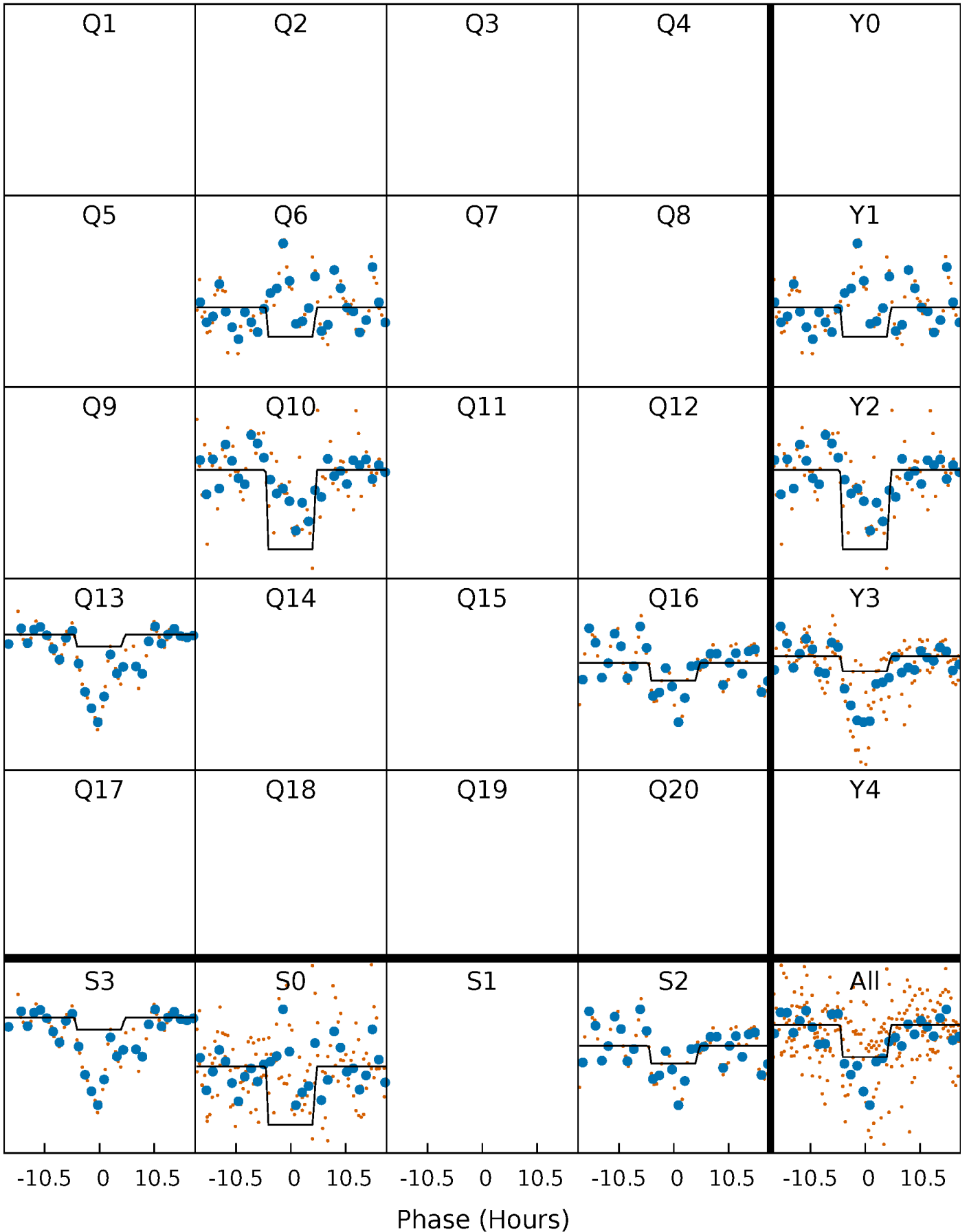
DV Quarter-Phased Transit Curves

TCE 009474969-04 $P=292.120493$ Days $T_0=324.234381$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

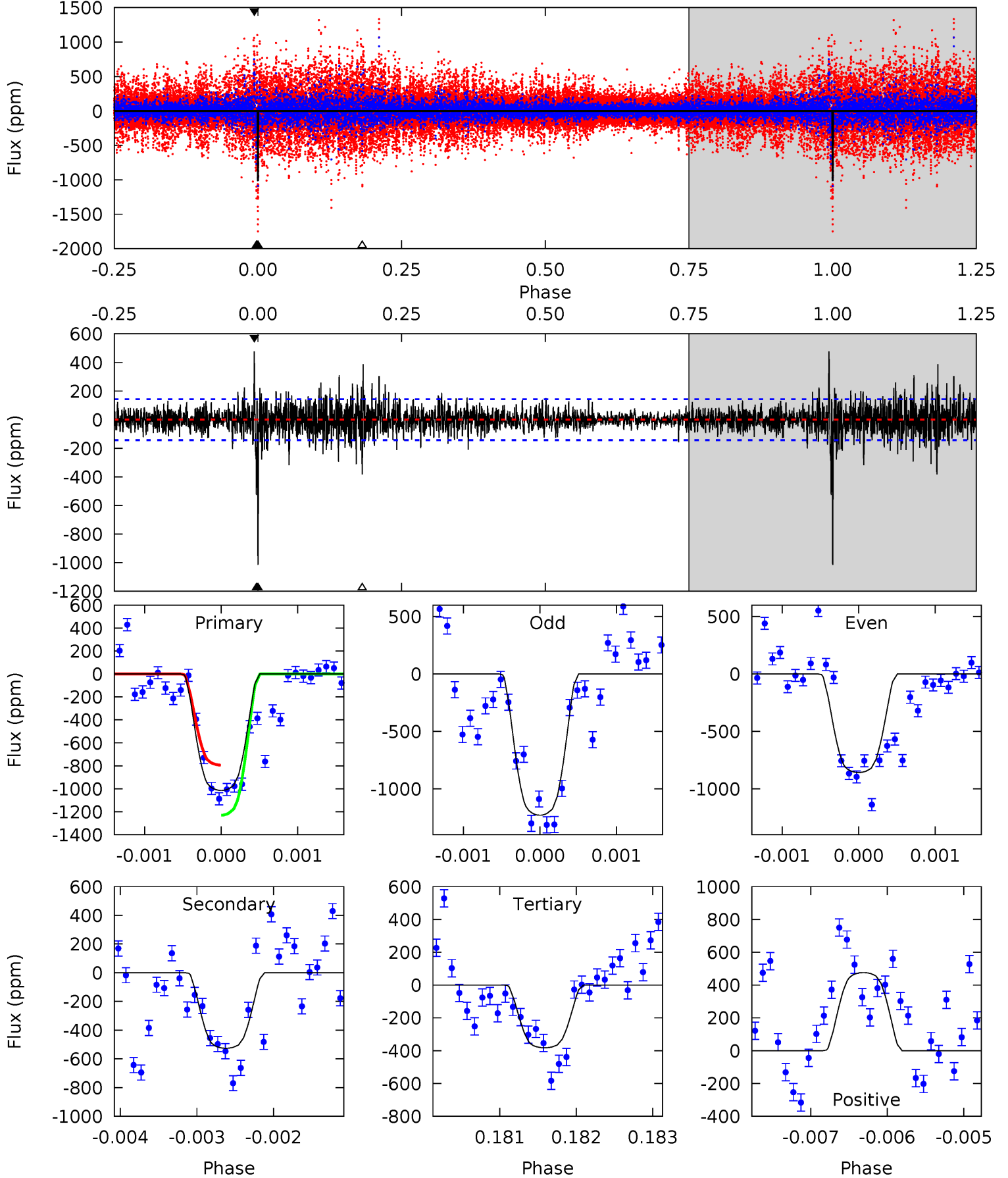
TCE 009474969-04 $P=292.179474$ Days $T_0=324.113461$ (BKJD)



DV Model-Shift Uniqueness Test

009474969-04, P = 292.120493 Days, E = 32.113888 Days

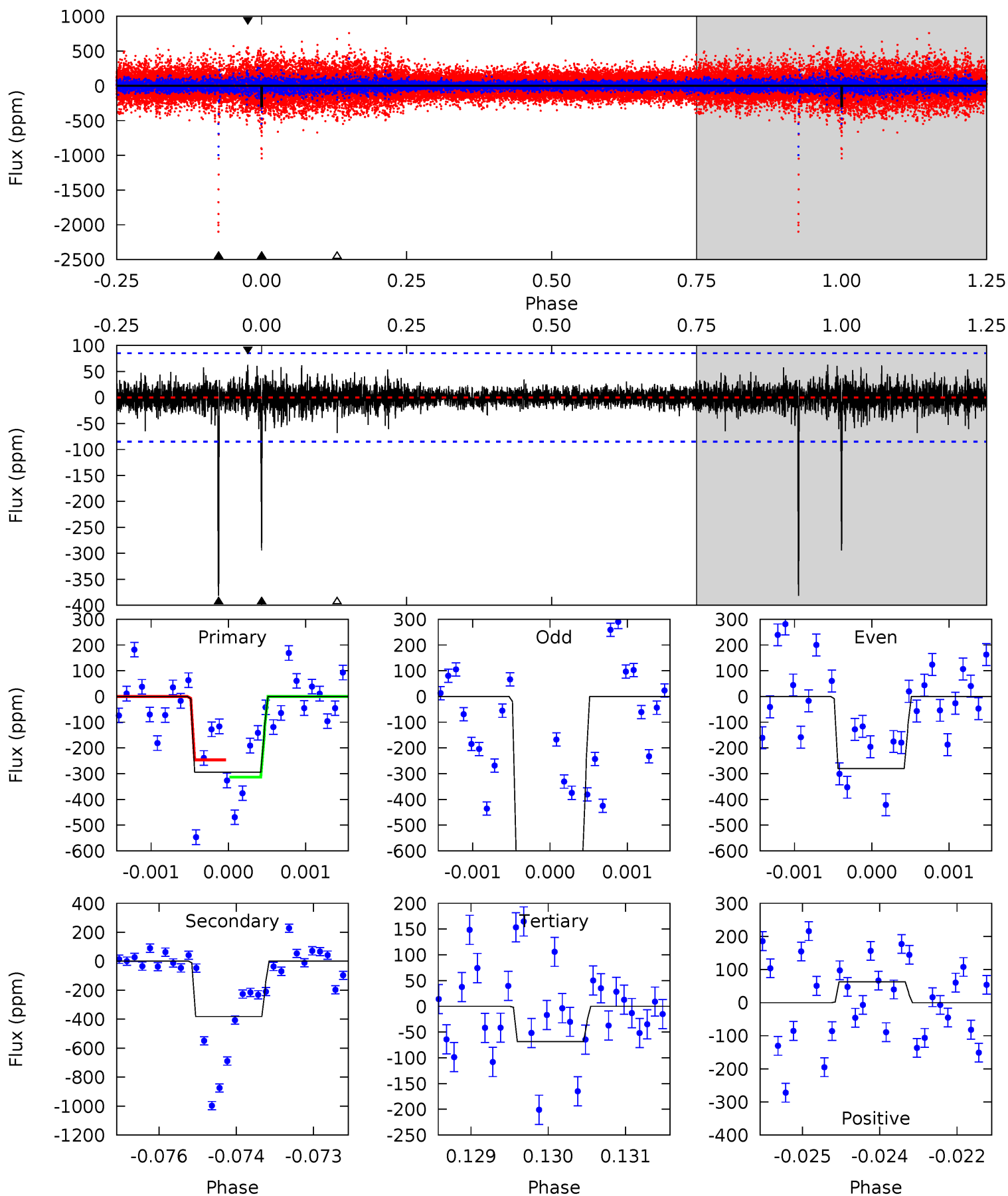
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.8	20.1	14.6	18.2	5.45	3.29	2.42	24.2	20.6	5.50	1.92	5.55	1.04	0.32	7.96



Alt Model-Shift Uniqueness Test

009474969-04, P = 292.179474 Days, E = 31.933987 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.7	24.2	4.34	3.99	5.39	3.19	0.82	14.3	14.7	19.9	20.2	10.8	1.50	0.14	2.14



Stellar Parameters For KIC 009474969

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6322^{+175}_{-175}	$4.003^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.300}$	$1.692^{+0.336}_{-0.505}$	$1.051^{+0.174}_{-0.139}$	$0.305^{+0.539}_{-0.108}$
	+3%/-3%	+7%/-3%	+76%/-65%	+20%/-30%	+17%/-13%	+177%/-35%
Source	PHO1	FLK73	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 009474969-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-526 ± 26	$6.54^{+1.28}_{-1.31}$	536^{+32}_{-48}	5075^{+320}_{-271}	5234^{+2845}_{-1502}
Alt.	-382 ± 16	$3.11^{+0.93}_{-0.92}$	535^{+34}_{-42}	6696^{+1215}_{-758}	17007^{+16907}_{-6872}

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 $A_{obs} \gg 1.0$

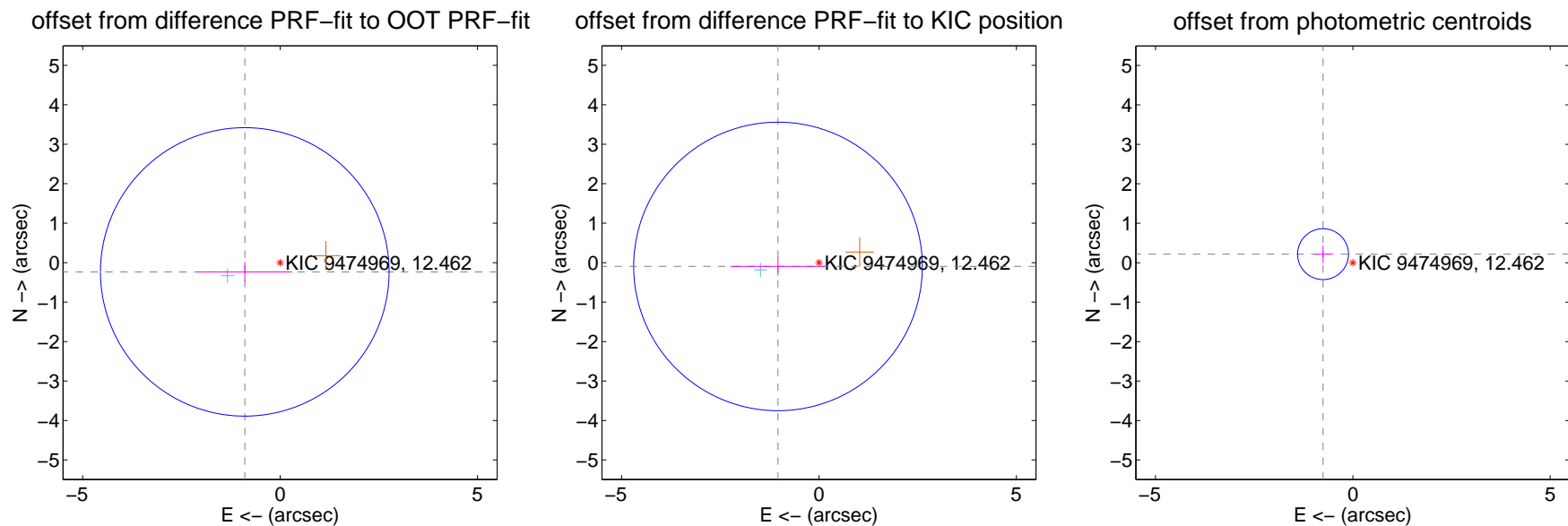
DV Centroid Data

Supplemental centroid analysis for 009474969-04. Kepler magnitude: 12.46. Transit SNR 14.43

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.924 ± 1.218	0.76	0.894 ± 1.195	-0.234 ± 0.253
PRF-fit source offset from KIC position	1.042 ± 1.218	0.86	1.038 ± 1.204	-0.096 ± 0.226
photometric centroid source offset	0.79 ± 0.21	3.66	0.76 ± 0.21	0.22 ± 0.22



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.

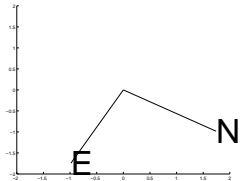
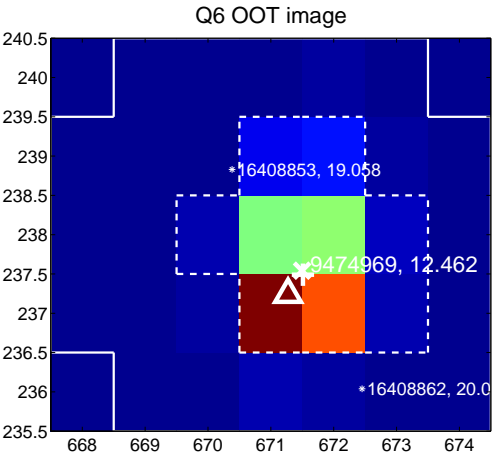
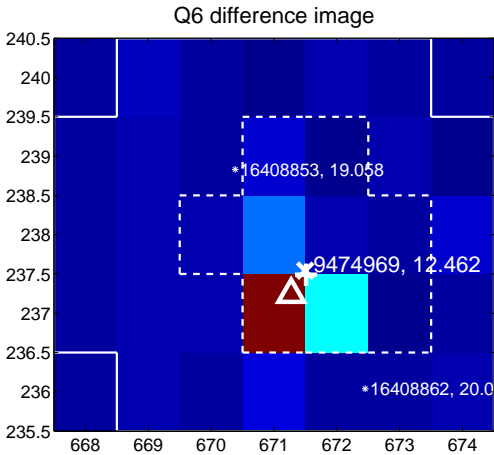


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

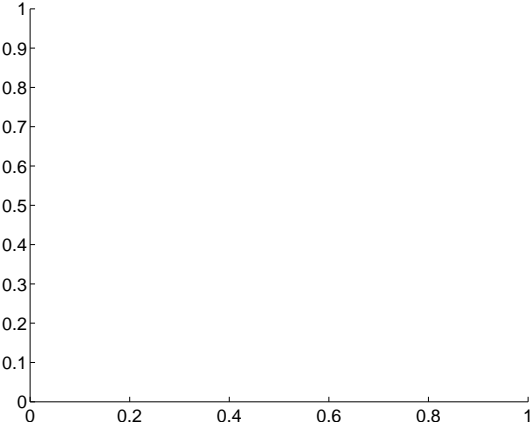
Q5 no difference image



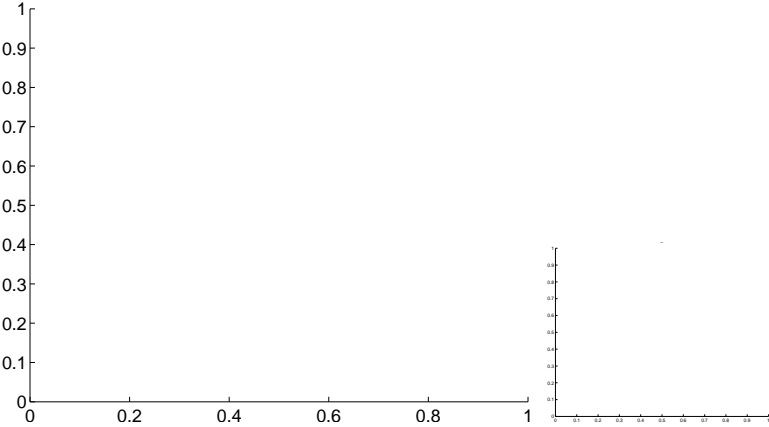
Q5 no OOT image



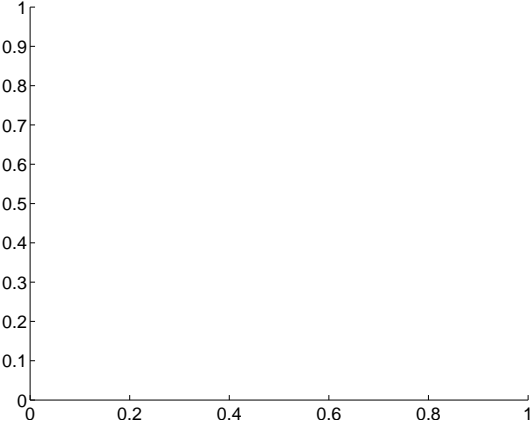
Q7 no difference image



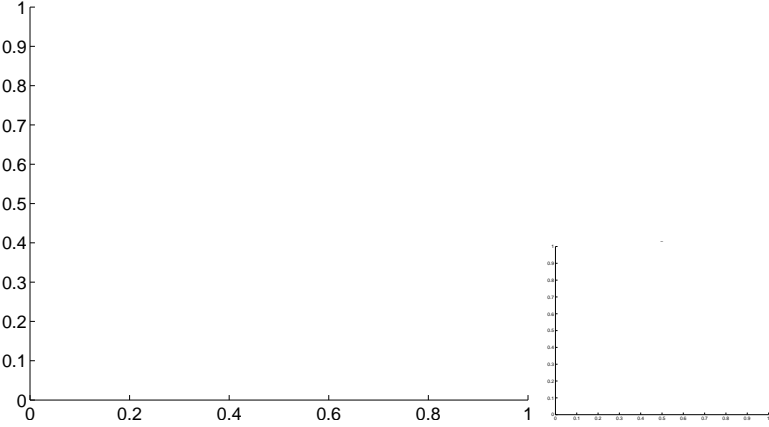
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



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

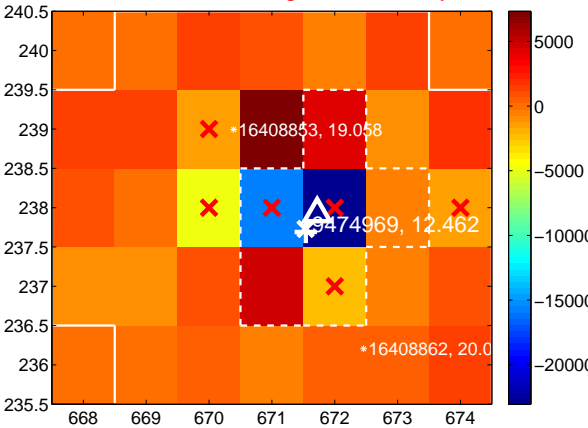
Q9 no difference image



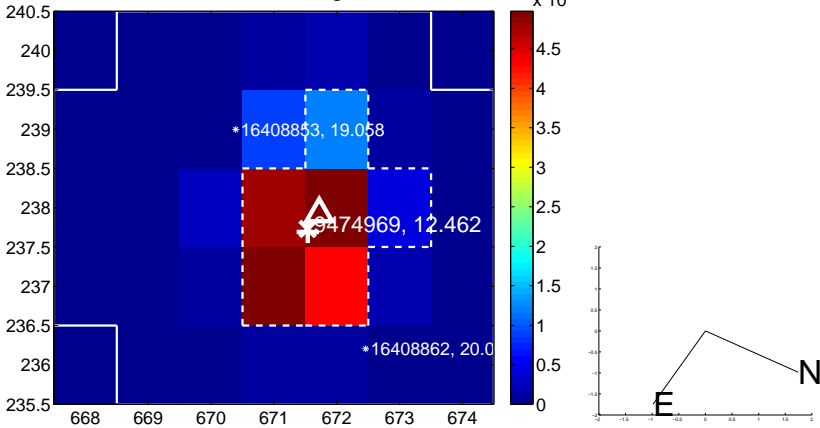
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



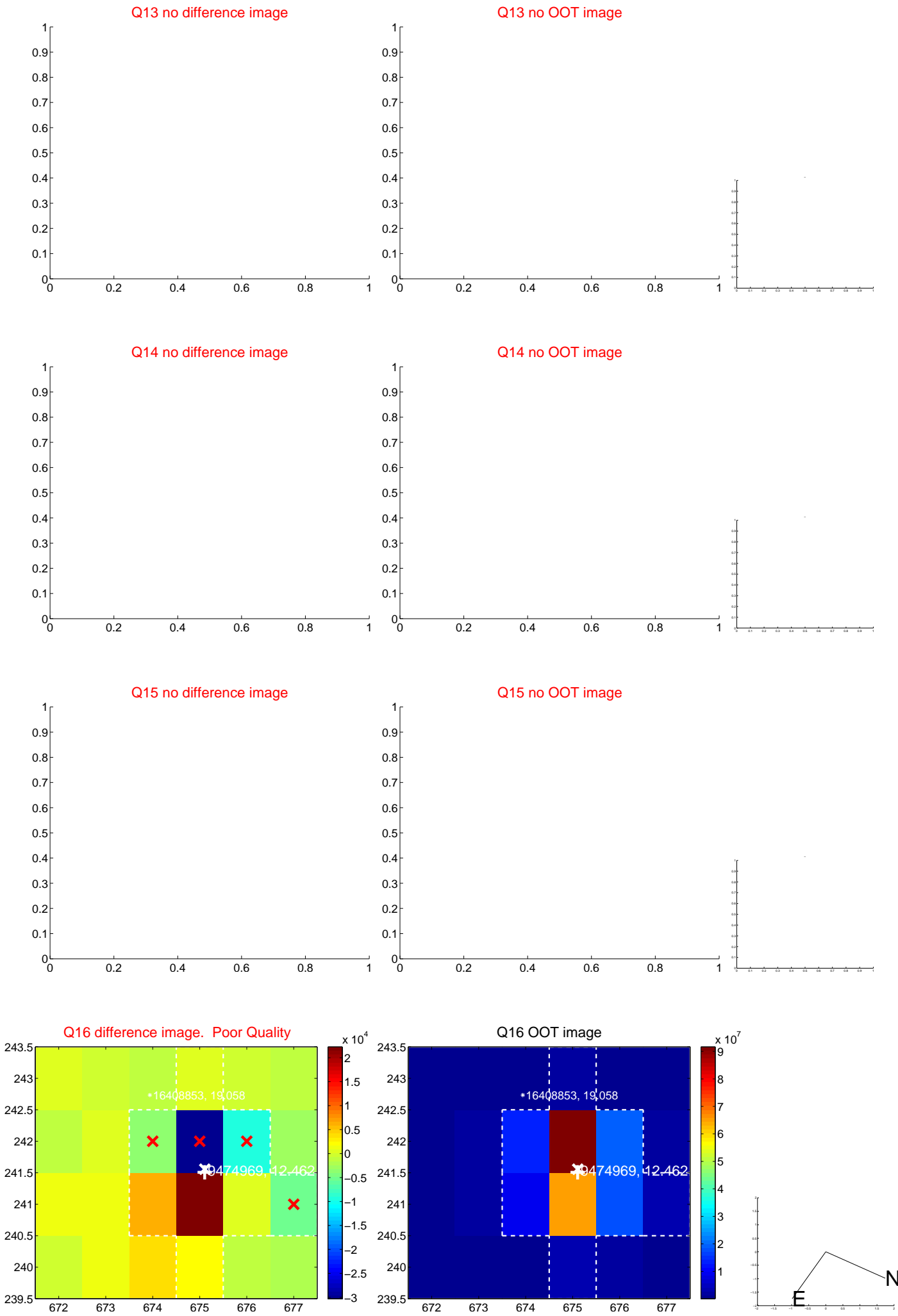
Q12 no difference image



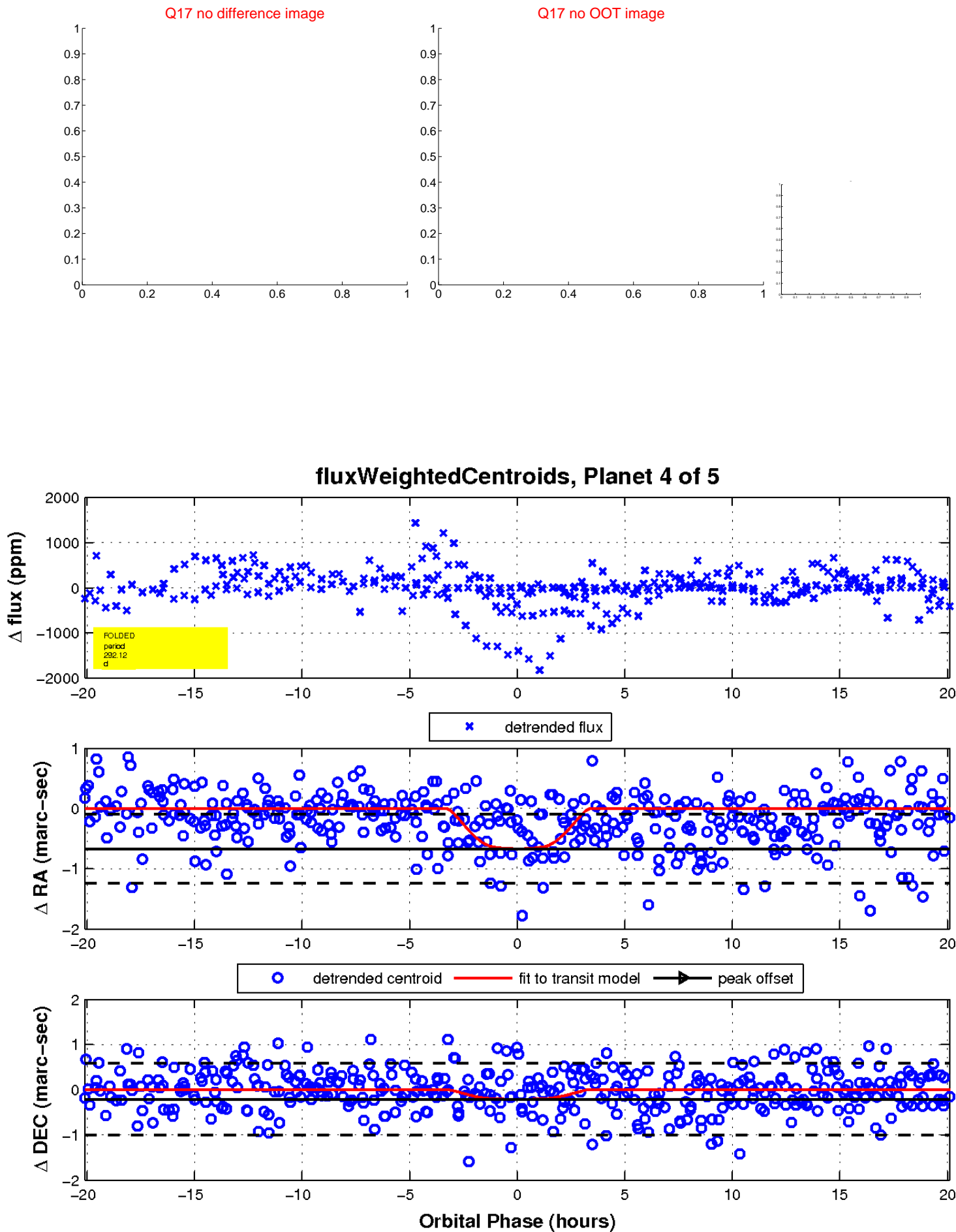
Q12 no OOT image



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

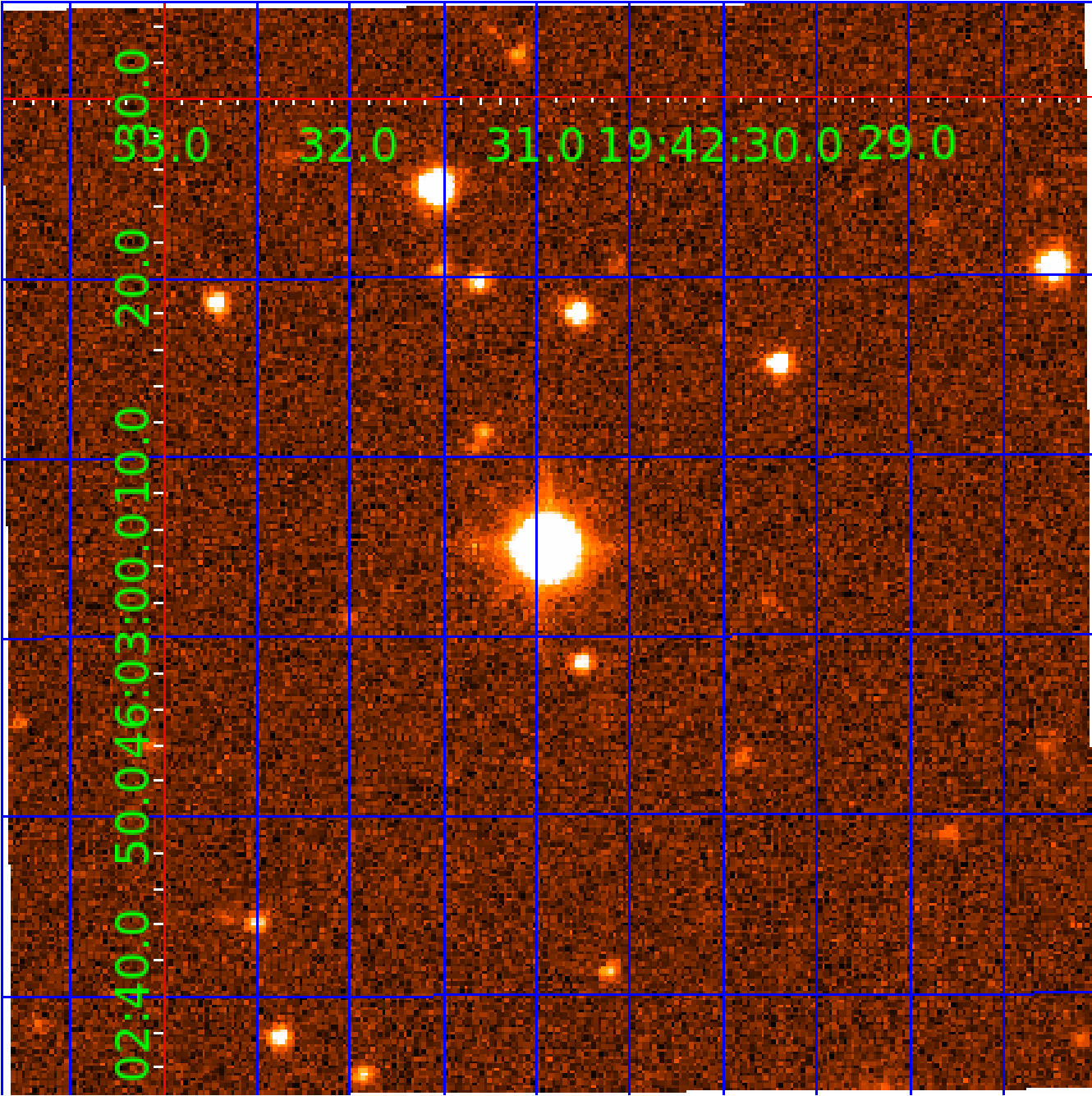


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009474969

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})
009474969-01	OBS	7178.01	21.570507	151.793219	134202.6	13.839	15279.3	14369.0	1.69	6322	63.72	172.23
009474969-02	OBS	No	21.570511	146.540926	118380.2	12.042	15892.5	8523.2	1.69	6322	58.72	172.23
009474969-04	OBS	No	292.120493	324.234382	1026.9	6.720	25.9	14.4	1.69	6322	6.74	5.33
009474969-05	OBS	No	312.456377	281.002919	1478.4	15.000	59.8	-1.0	1.69	6322	6.54	4.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009474969-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009474969-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD
009474969-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009474969-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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 009474969-05

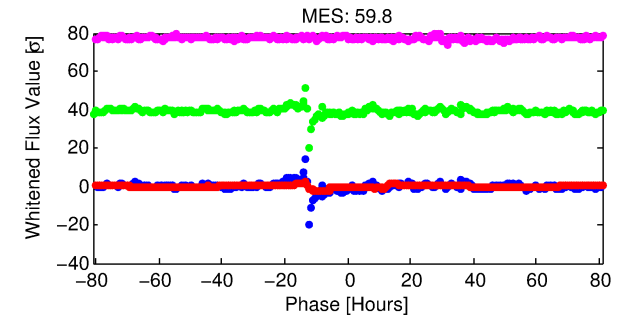
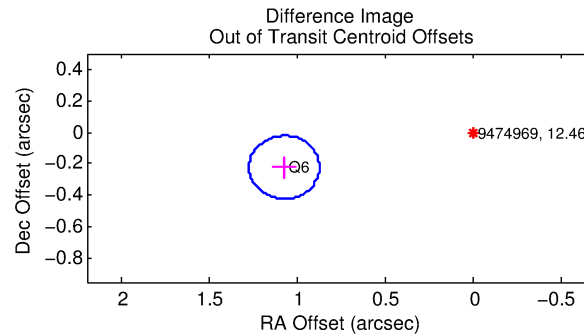
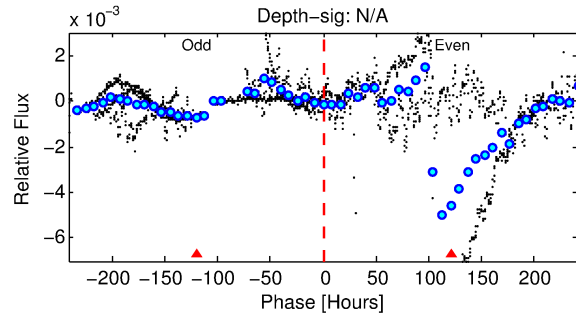
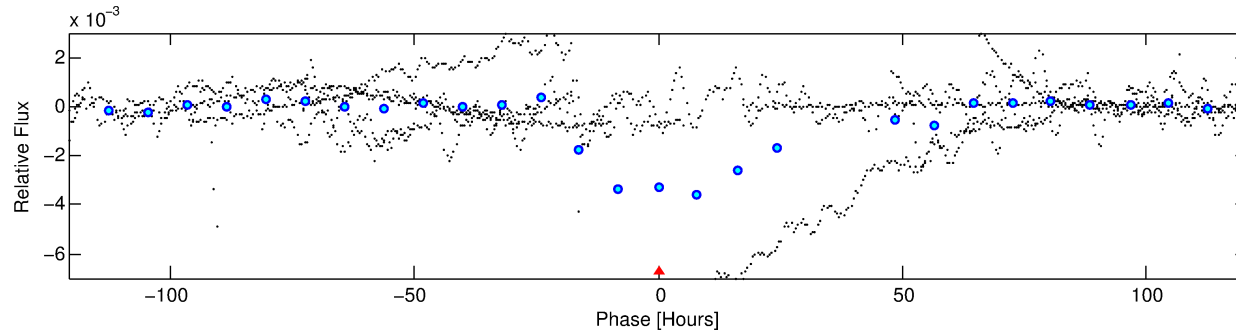
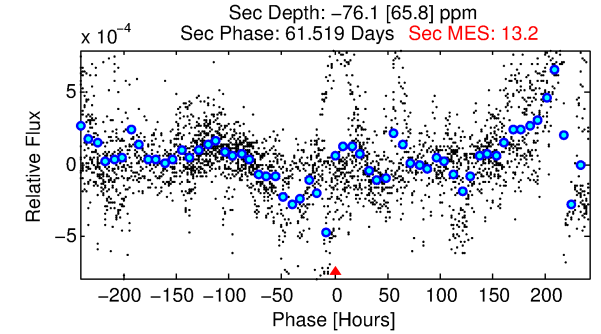
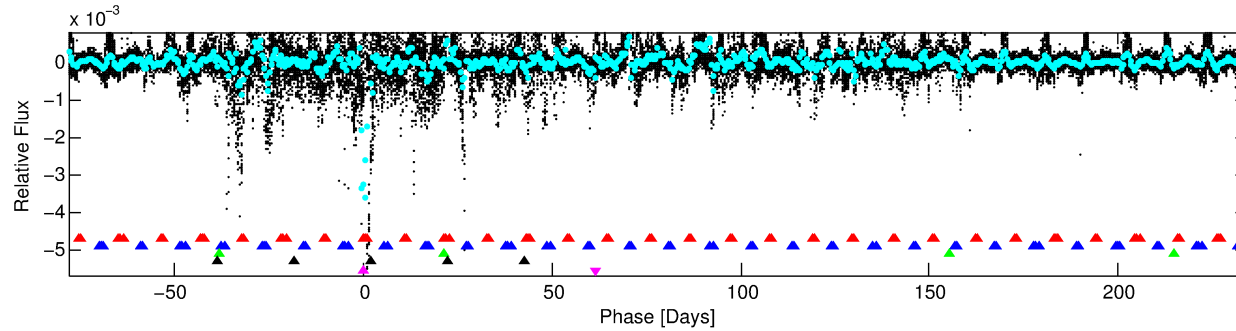
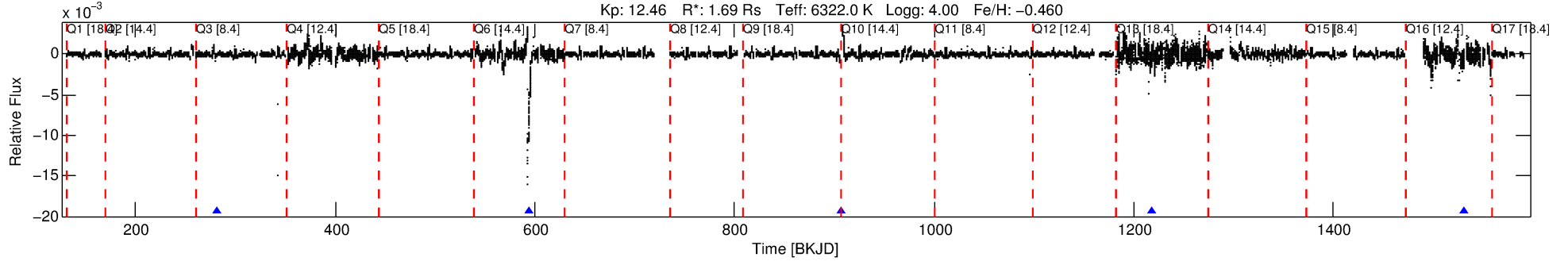
No Significant Match Found

DV One-Page Summary

KIC: 9474969 Candidate: 5 of 5 Period: 312.456 d

KOI: K07178 Corr: No Ephemeris Match

Kp: 12.46 R*: 1.69 Rs Teff: 6322.0 K Logg: 4.00 Fe/H: -0.460



TPS TCE Results:

Period = 312.45638 d
Epoch = 281.0029 BKJD

DV fit results are unavailable

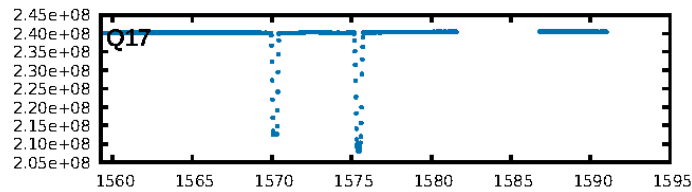
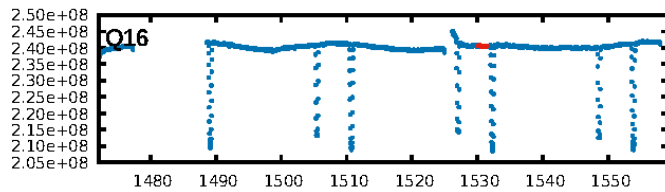
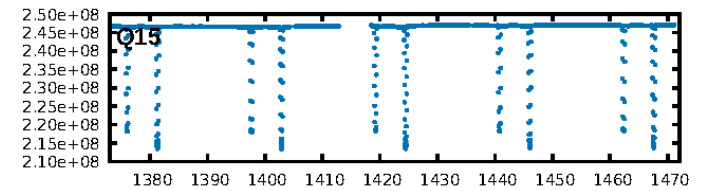
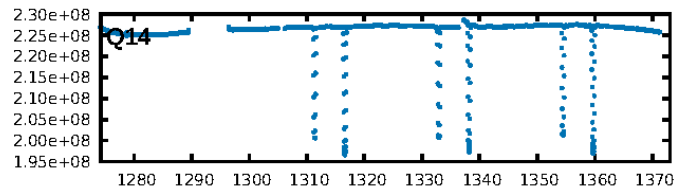
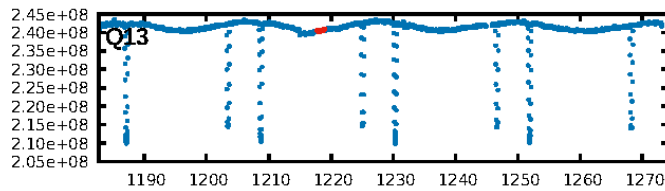
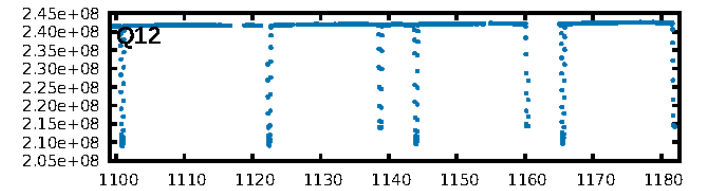
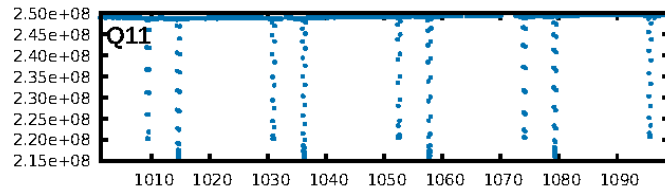
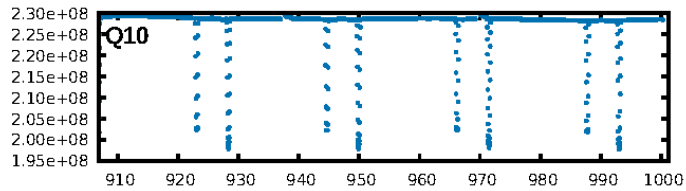
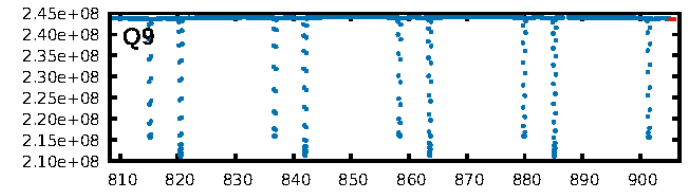
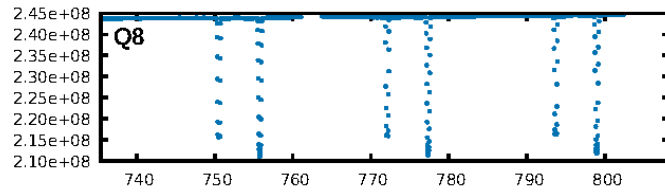
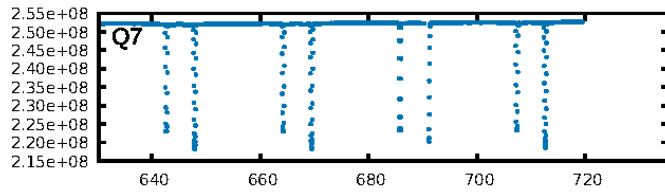
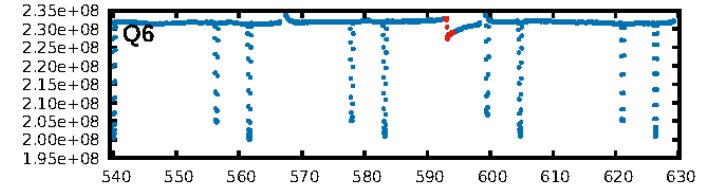
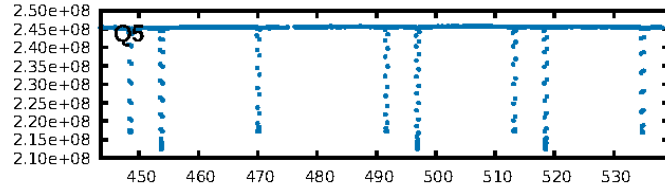
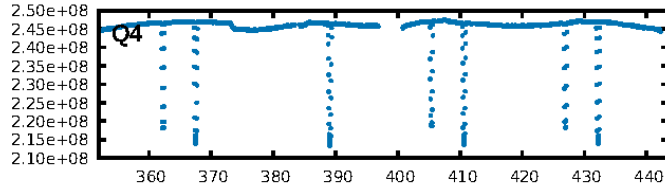
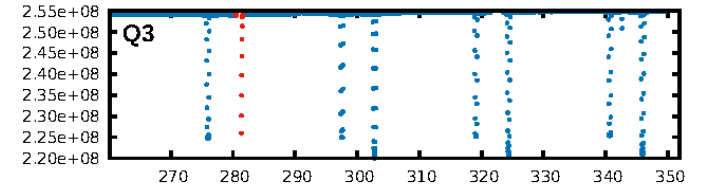
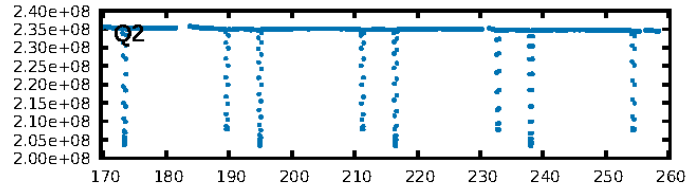
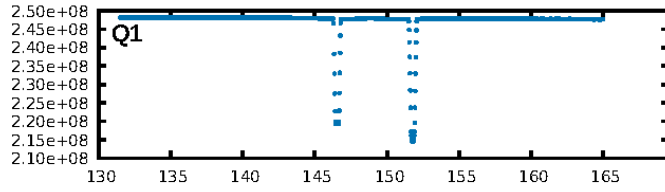
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [29.69σ]
LongPeriod-sig: 100.0% [70.96σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.7884
Centroid-sig: 45.9%
Centroid-so: 0.107 arcsec [2.58σ]
OotOffset-rm: 1.098 arcsec [16.45σ]
KicOffset-rm: 1.217 arcsec [18.23σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
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DiffImageOverlap-fno: 1.00 [1/1]

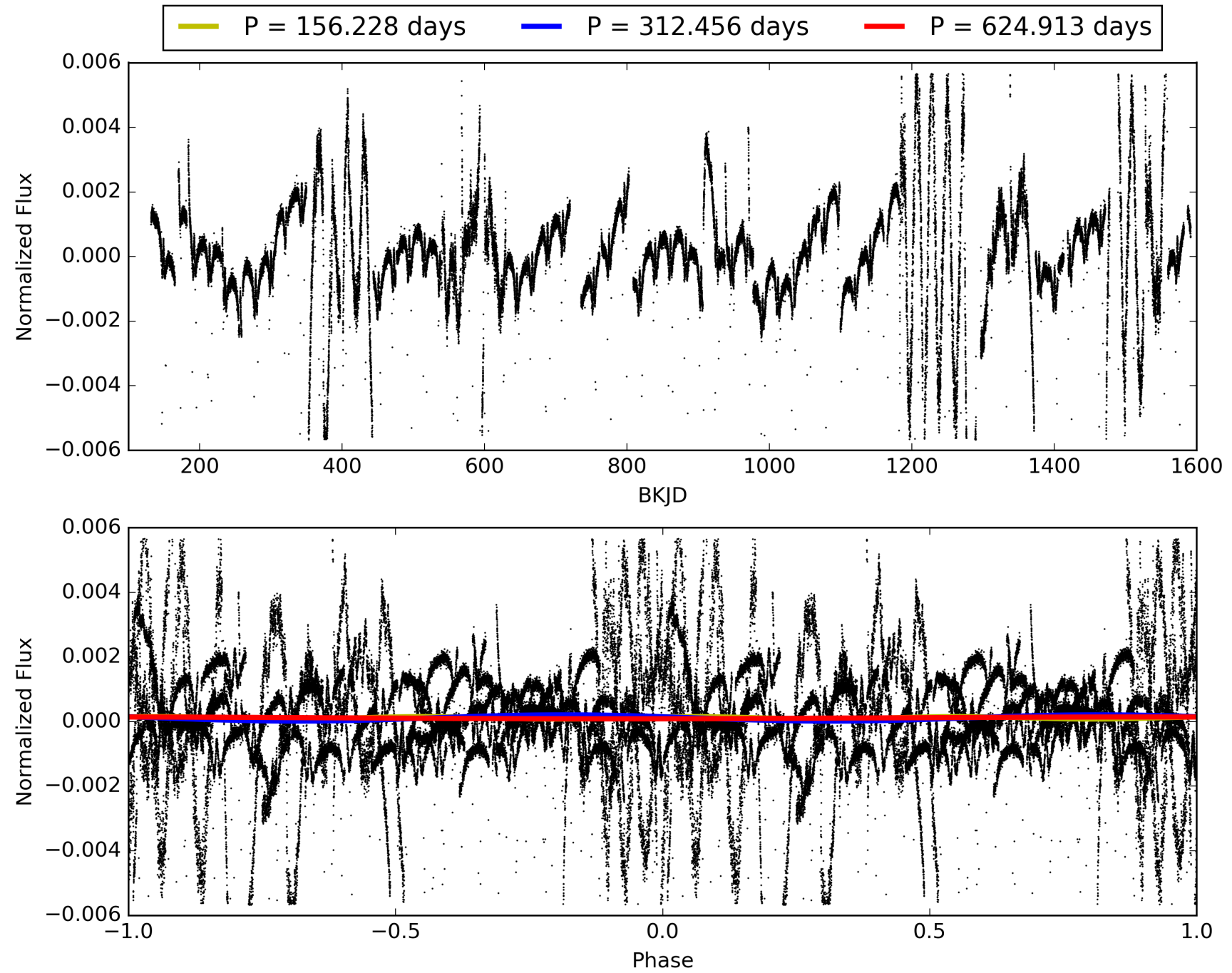
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 09:24:07 Z

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

TCE 009474969-05, PDC Light Curves

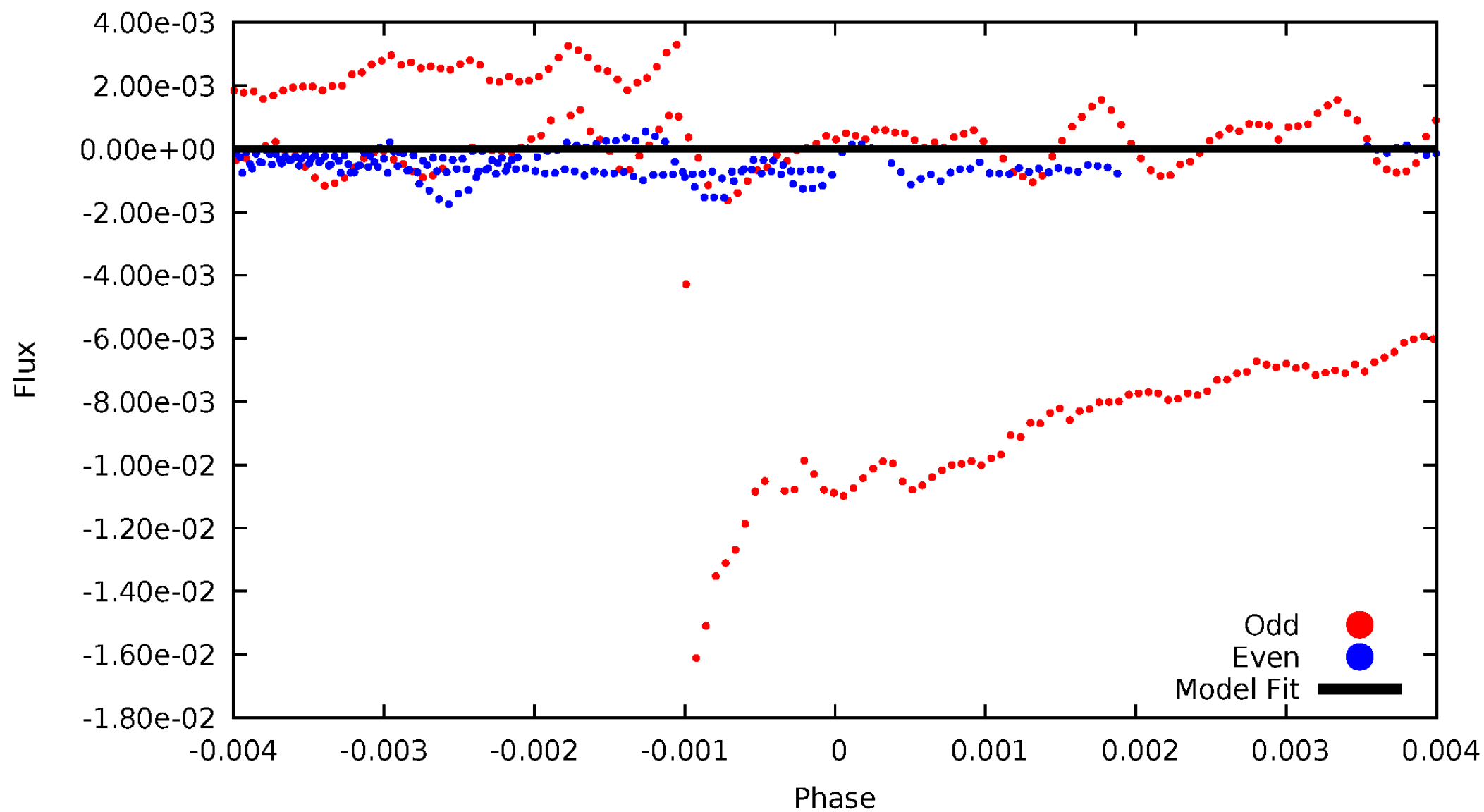


TCE 009474969-05



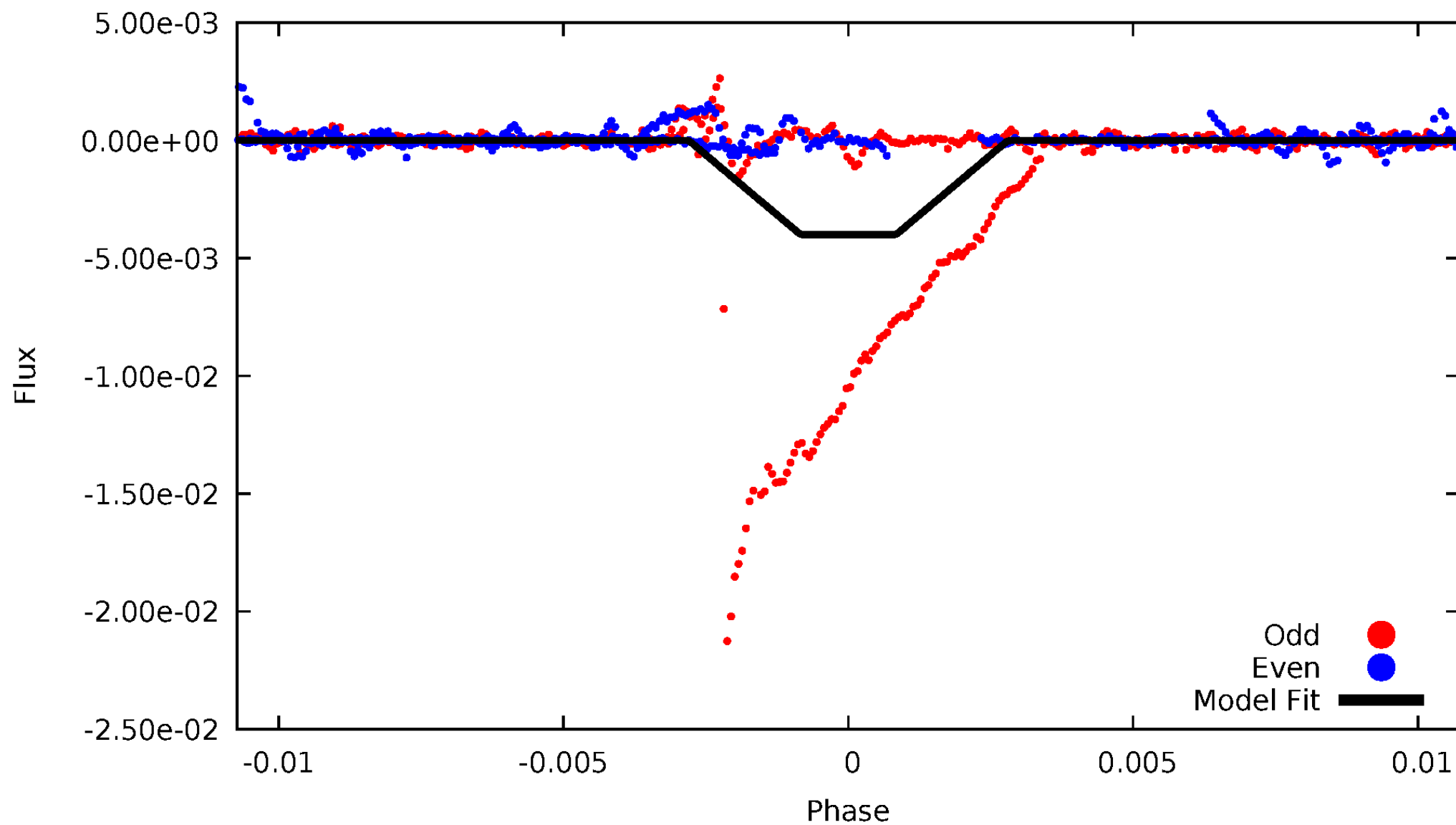
DV Odd/Even

TCE 009474969-05

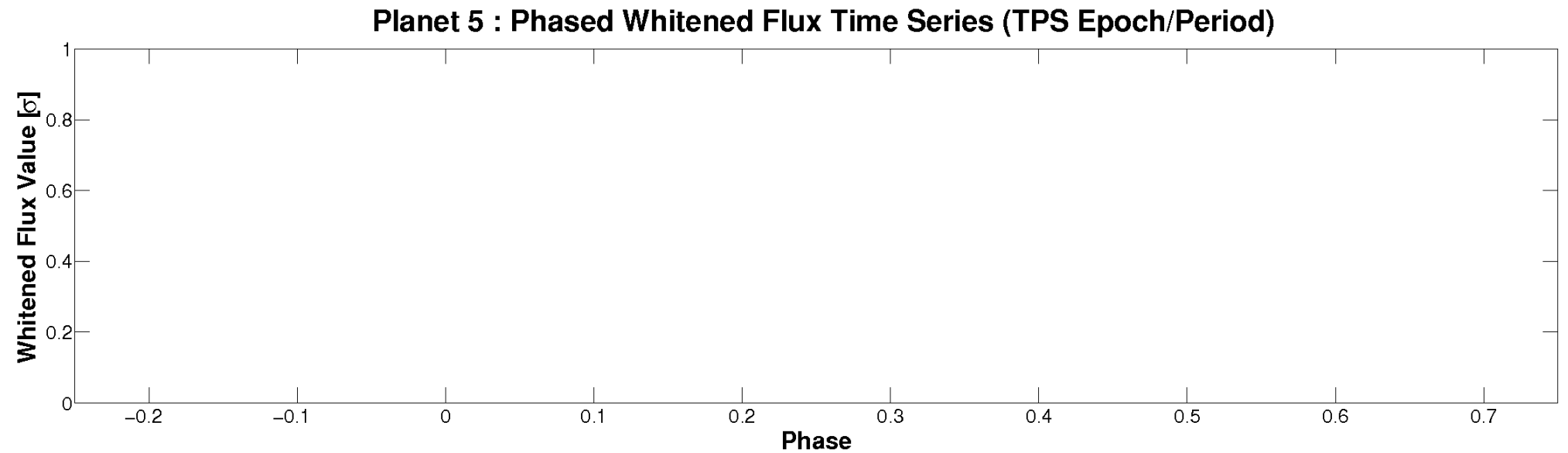
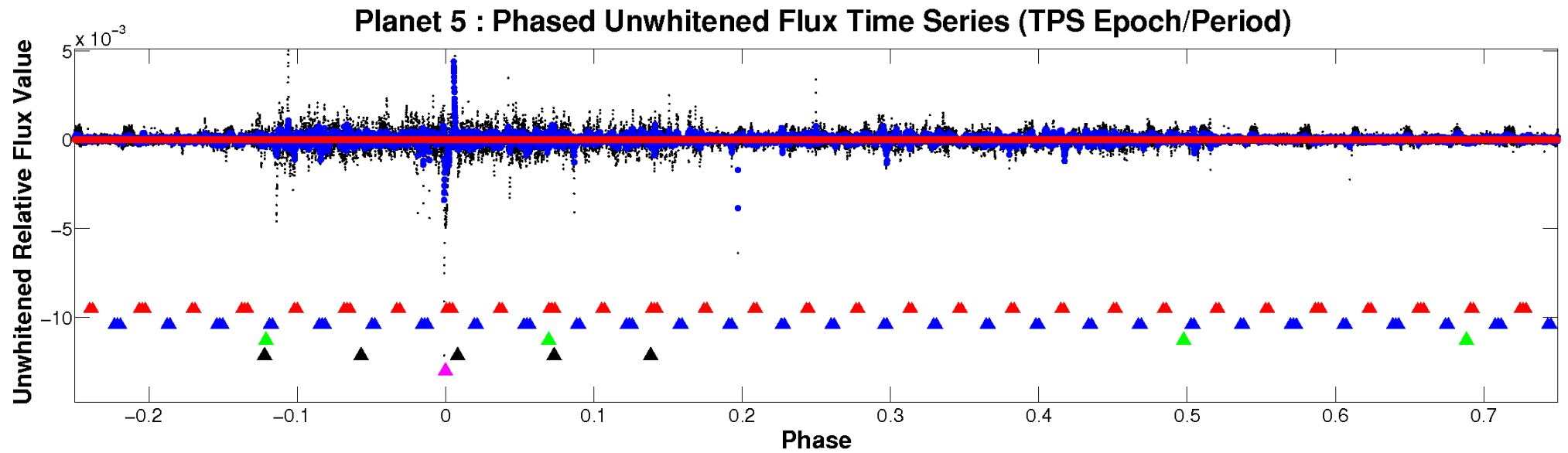


ALT Odd/Even

TCE 009474969-05

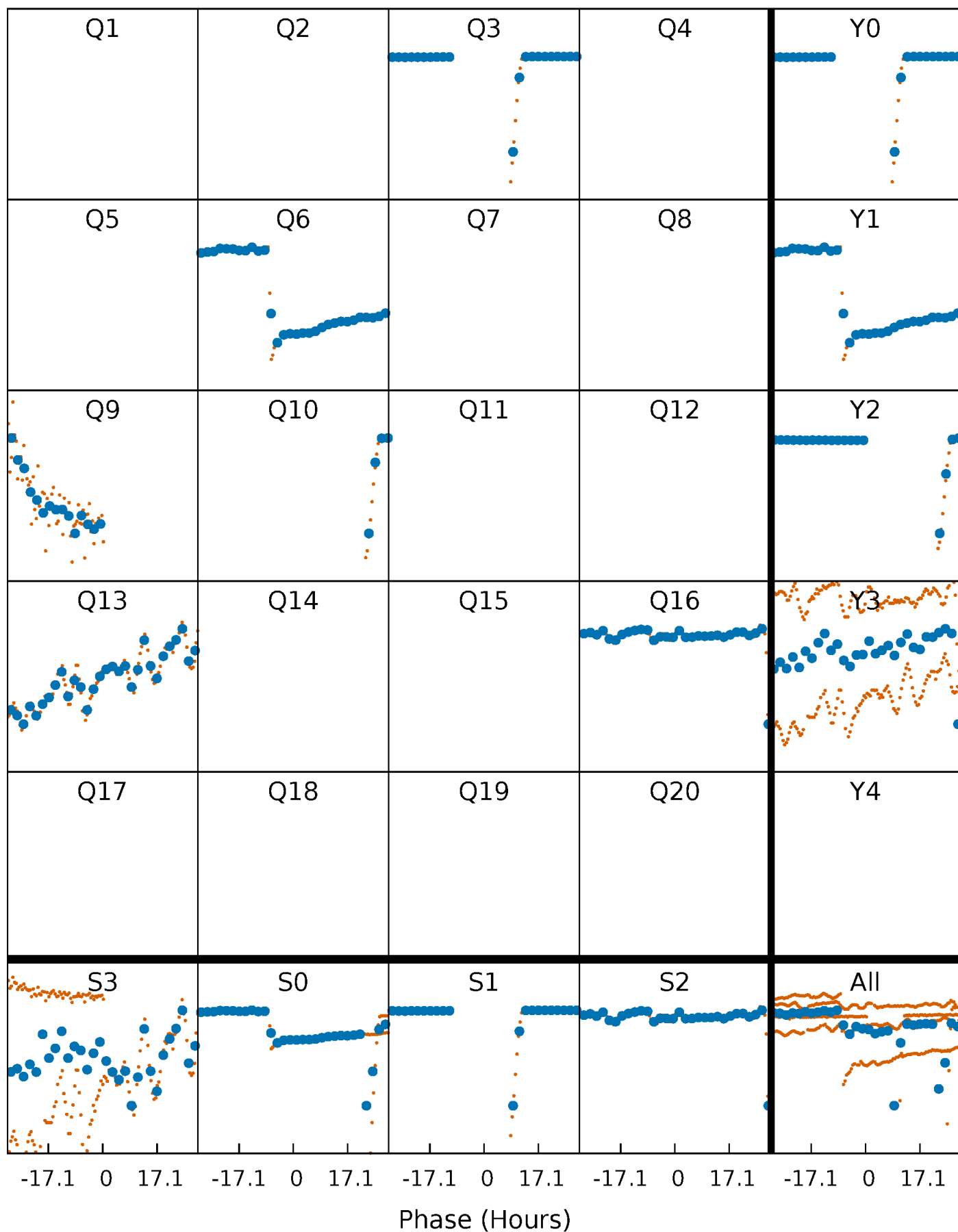


Non-Whitened Vs. Whitened Light Curve



PDC Quarter-Phased Transit Curves

TCE 009474969-05 $P=312.456377$ Days $T_0=281.002919$ (BKJD)



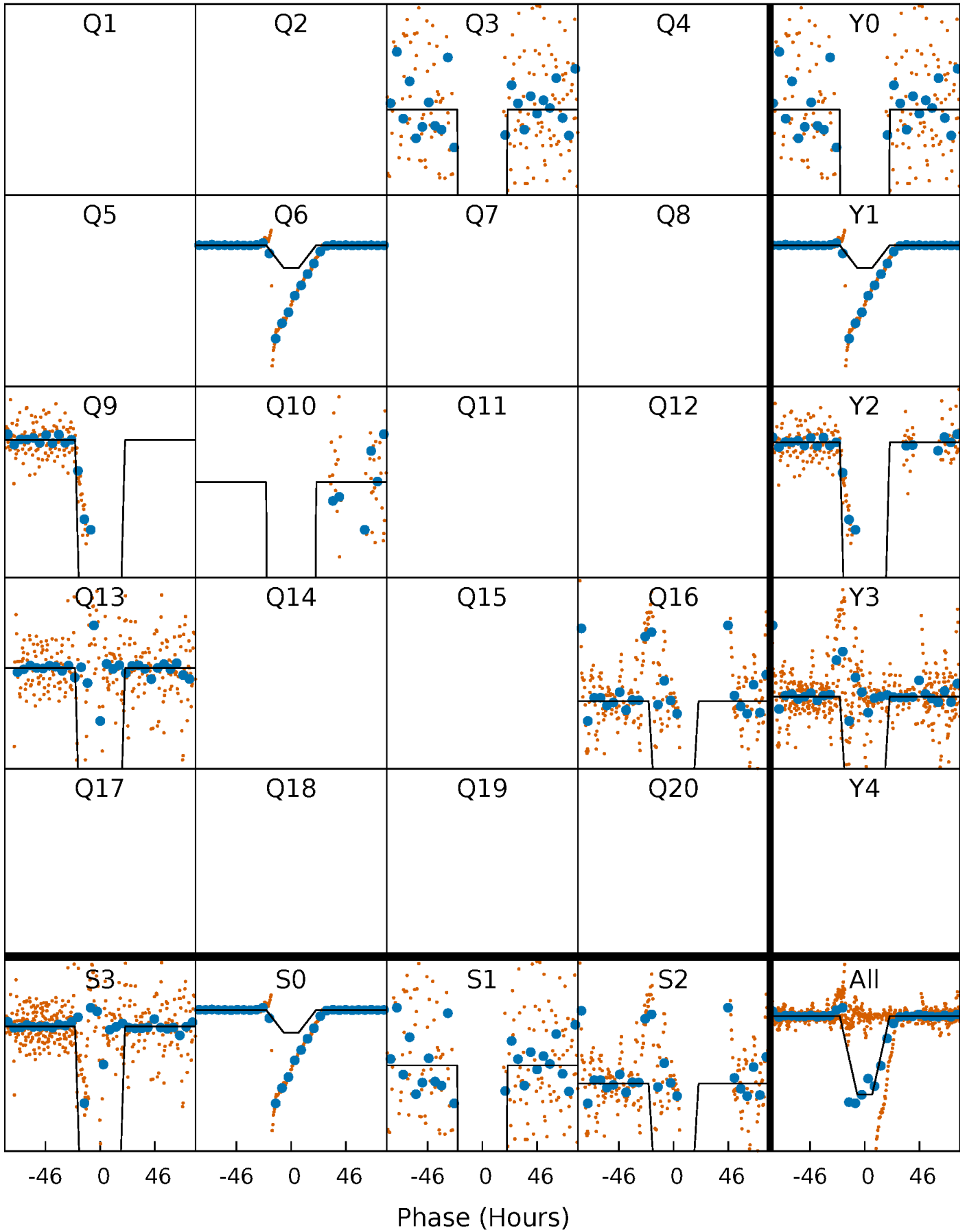
DV Quarter-Phased Transit Curves

TCE 009474969-05 $P=312.456377$ Days $T_0=281.002919$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

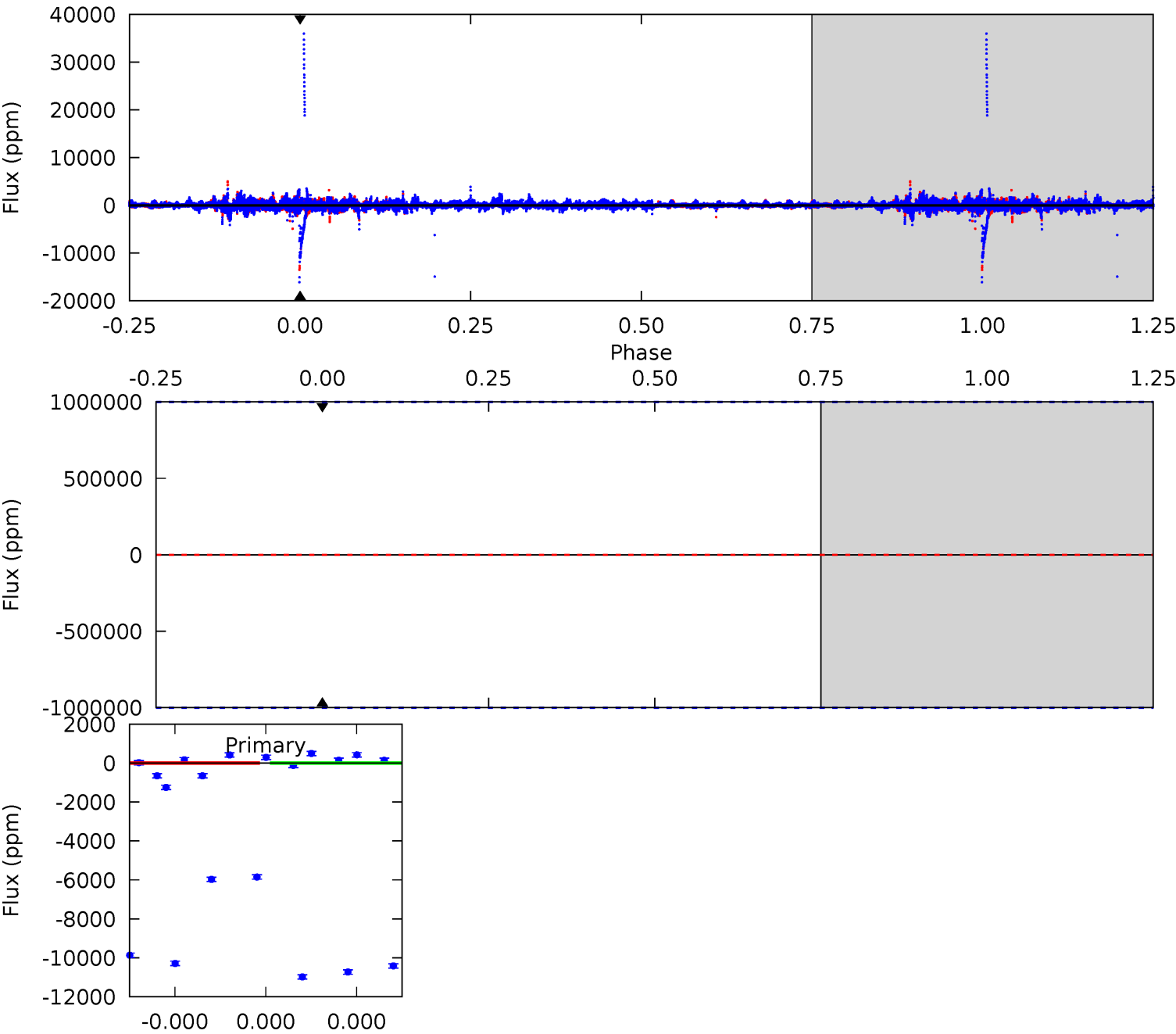
TCE 009474969-05 $P=312.456377$ Days $T_0=281.378284$ (BKJD)



DV Model-Shift Uniqueness Test

009474969-05, P = 312.456377 Days, E = 281.002919 Days

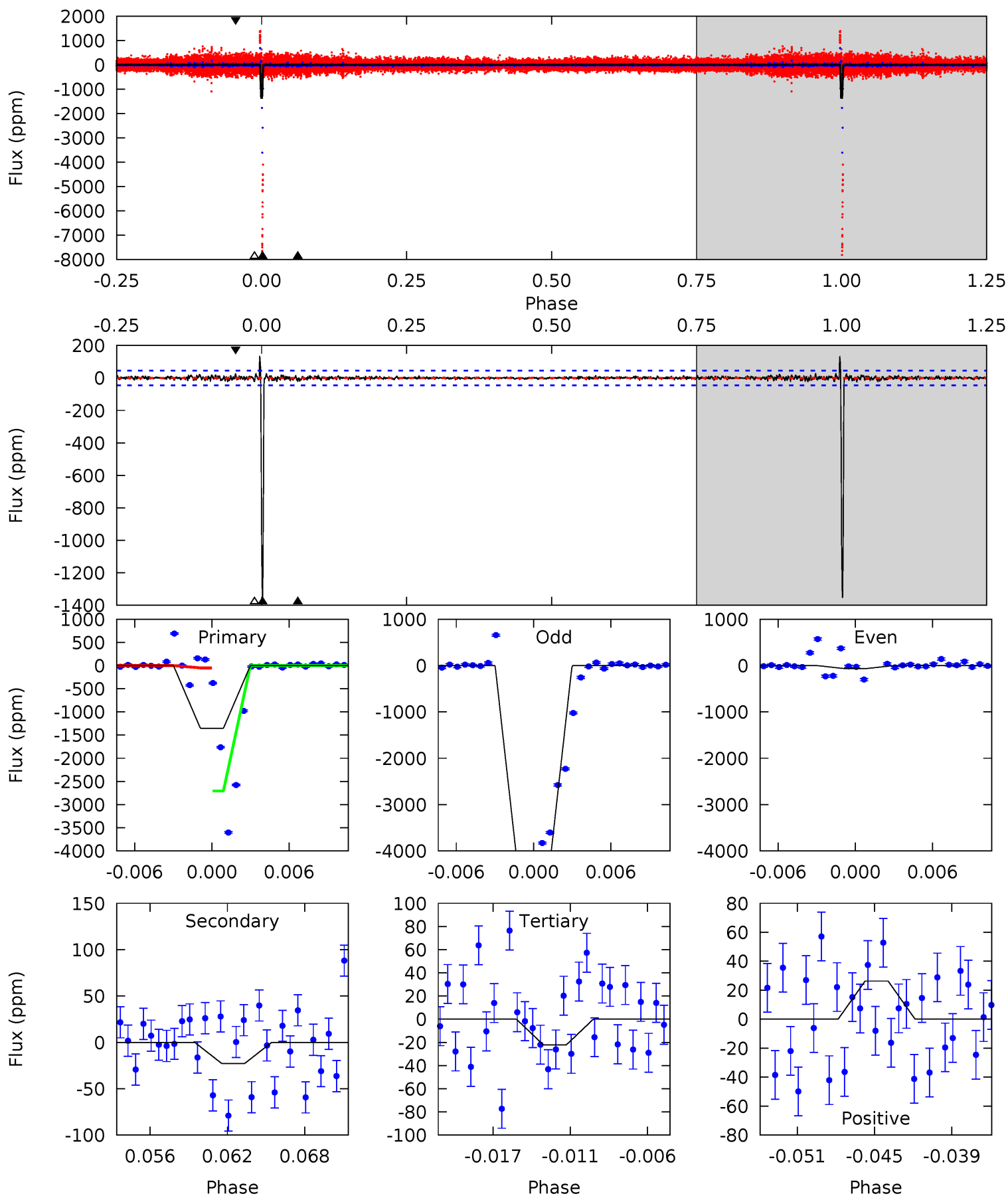
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009474969-05, $P = 312.456377$ Days, $E = 281.378284$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
153.9	2.59	2.52	2.99	5.14	2.77	0.59	151.4	151.0	0.07	-0.40	127.1	60.0	0.09	150.7



Stellar Parameters For KIC 009474969

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6322^{+175}_{-175}	$4.003^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.300}$	$1.692^{+0.336}_{-0.505}$	$1.051^{+0.174}_{-0.139}$	$0.305^{+0.539}_{-0.108}$
	+3%/-3%	+7%/-3%	+76%/-65%	+20%/-30%	+17%/-13%	+177%/-35%
Source	PHO1	FLK73	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 009474969-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$15.01^{+12.86}_{-9.79}$	521^{+33}_{-37}	4227^{+17192}_{-25132}	$2271^{+345633}_{-347013}$
Alt.	-23 ± 9	$17.09^{+15.81}_{-11.40}$	524^{+32}_{-43}	2292^{+730}_{-302}	34^{+283}_{-26}

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 $A_{obs} \gg 1.0$

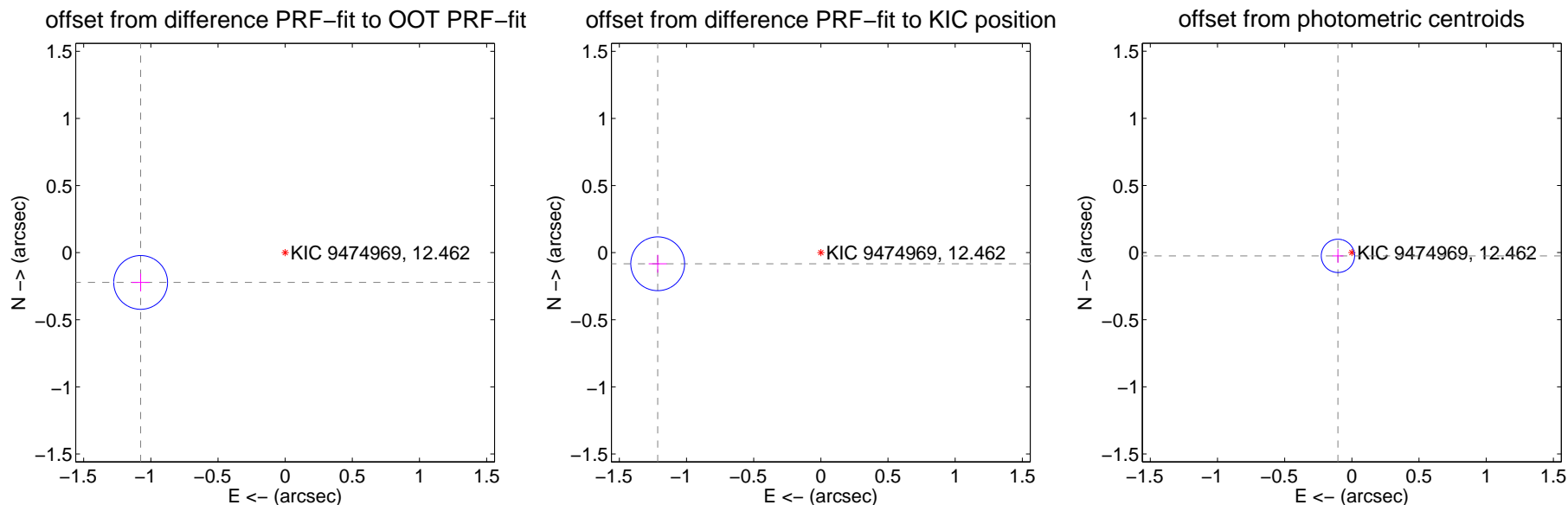
DV Centroid Data

Supplemental centroid analysis for 009474969-05. Kepler magnitude: 12.46. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.098 ± 0.067	16.45	1.076 ± 0.067	-0.222 ± 0.067
PRF-fit source offset from KIC position	1.217 ± 0.067	18.23	1.214 ± 0.067	-0.083 ± 0.067
photometric centroid source offset	0.11 ± 0.04	2.58	0.10 ± 0.04	-0.02 ± 0.05

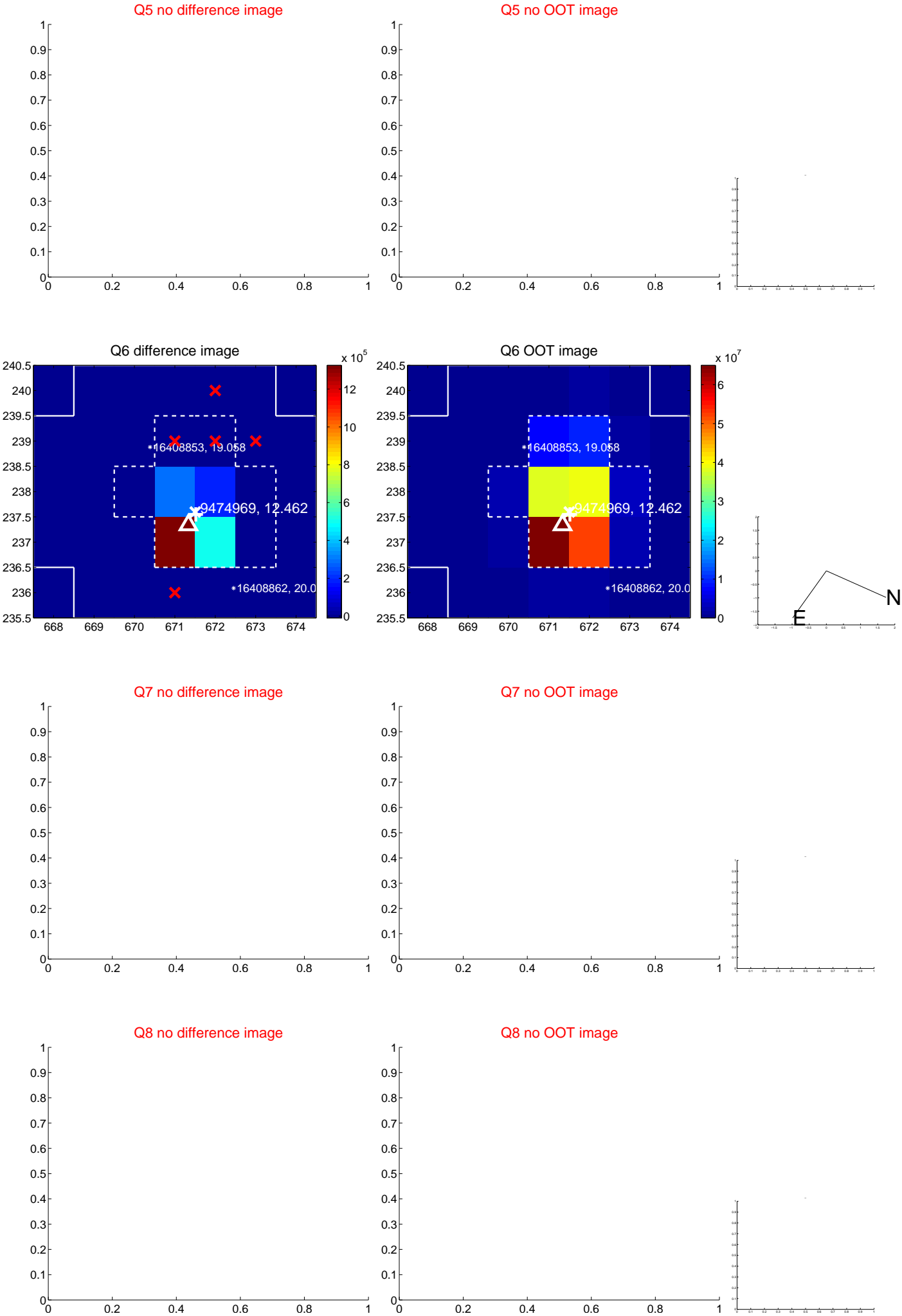


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



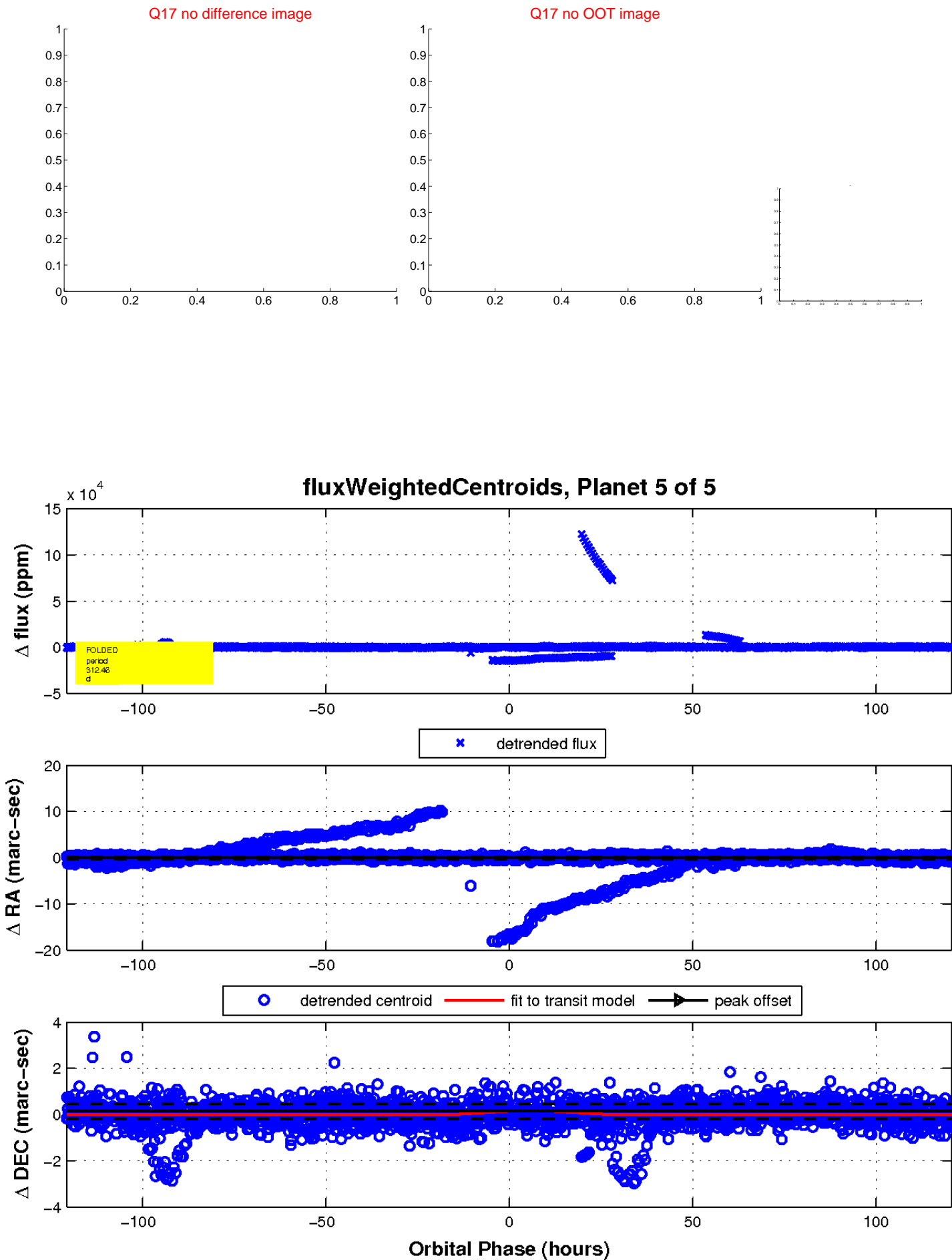
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

