

KIC 004774574

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})
004774574-01	OBS	No	329.680447	252.628149	1792.1	2.199	13.5	7.4	0.56	4508	2.41	0.20
004774574-02	OBS	No	352.528396	400.311513	2449.4	17.247	15.1	4.9	0.56	4508	2.89	0.18
004774574-03	OBS	No	319.495140	272.867458	1792.2	3.095	13.5	6.9	0.56	4508	2.55	0.21
004774574-04	OBS	No	215.801831	344.355189	1354.1	2.642	10.0	6.6	0.56	4508	2.48	0.35

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004774574-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
004774574-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

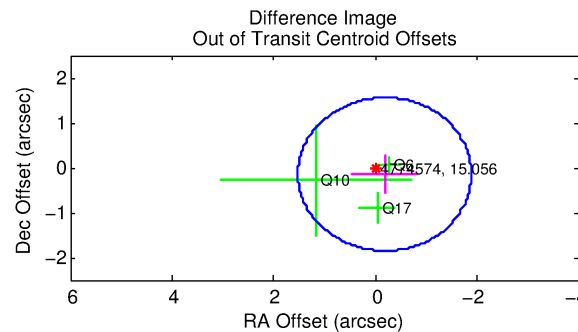
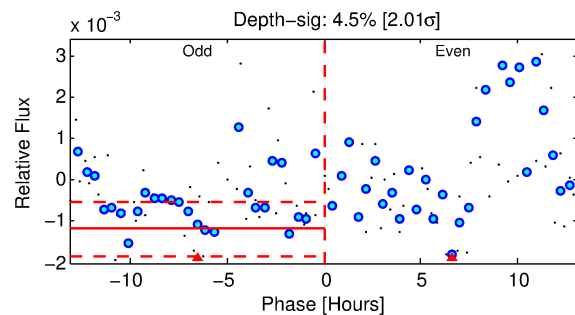
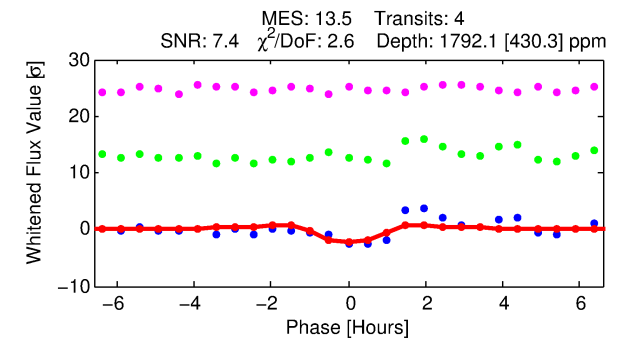
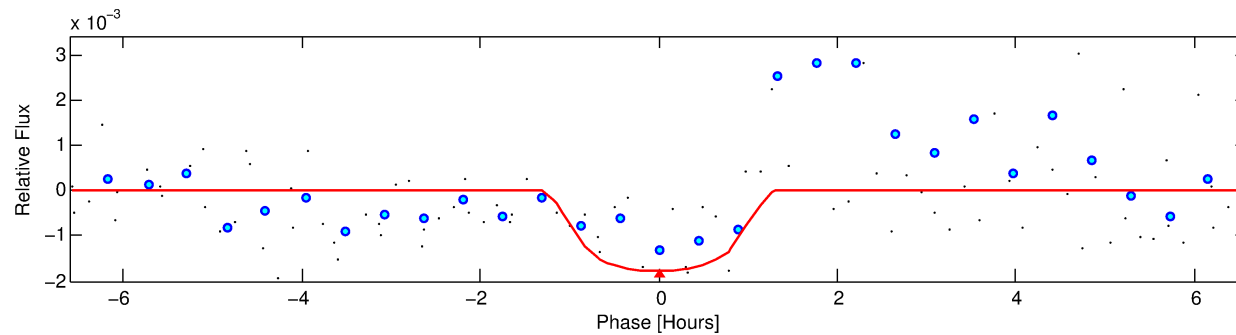
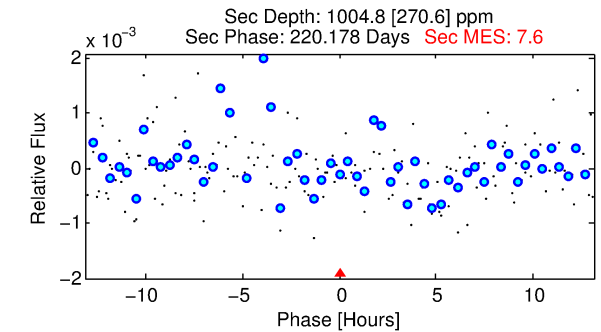
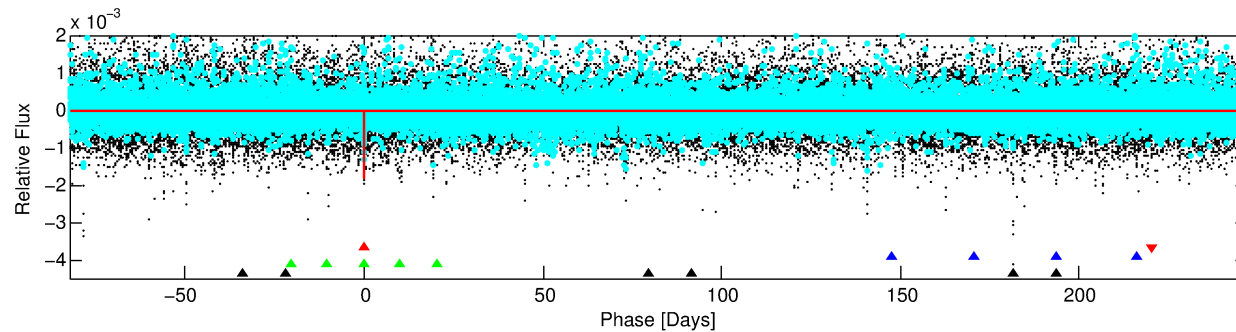
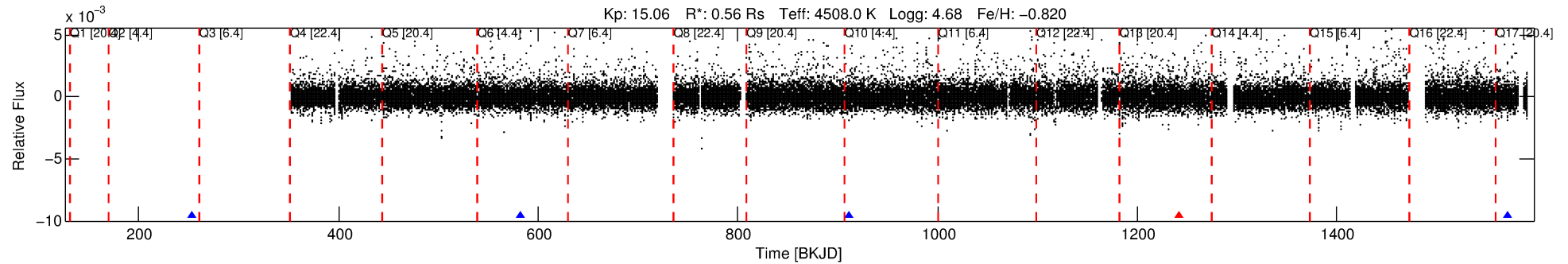
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004774574-01

No Significant Match Found

DV One-Page Summary

KIC: 4774574 Candidate: 1 of 4 Period: 329.680 d



DV Fit Results:

Period = 329.68045 [0.00524] d
Epoch = 252.6281 [0.0150] BKJD
Rp/R* = 0.0395 [0.1570]
a/R* = 1020.24 [13612.39]
b = 0.54 [18.09]
Seff = 0.20 [0.04]
Teq = 170 [8] K
Rp = 2.41 [9.58] Re
a = 0.7657 [0.0566] AU
Ag = 55860.78 [444527.39] [0.13 σ]
Teffp = 4039 [8037] K [0.48 σ]

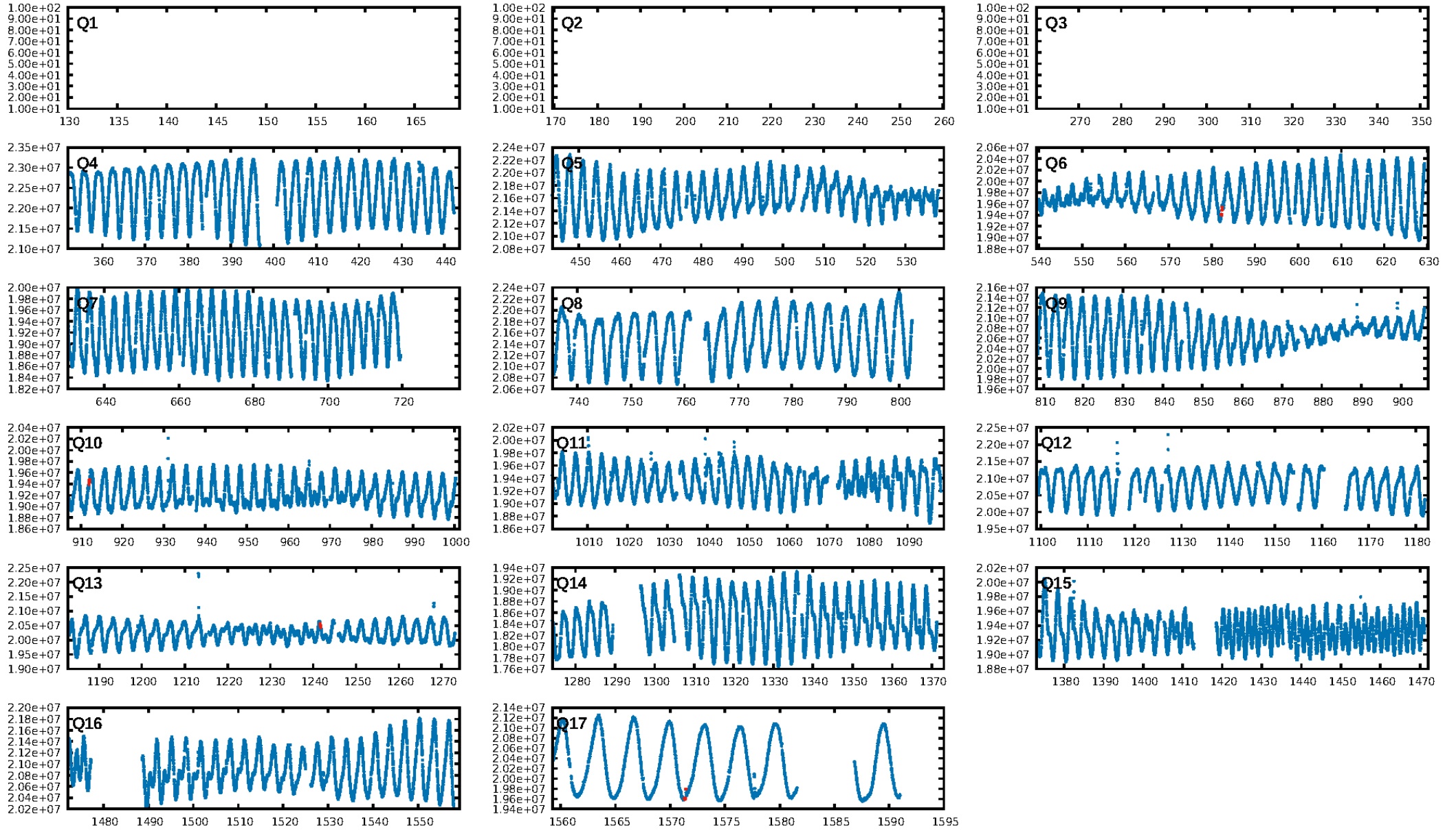
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [64.38 σ]
LongPeriod-sig: 100.0% [31.54 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 4.1%
Bootstrap-pfa: 1.31e-11
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 8.118
Centroid-sig: 15.3%
Centroid-so: 0.872 arcsec [0.61 σ]
OotOffset-rm: 0.232 arcsec [0.41 σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-rm: 0.019 arcsec [0.04 σ]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.75 [3/4]

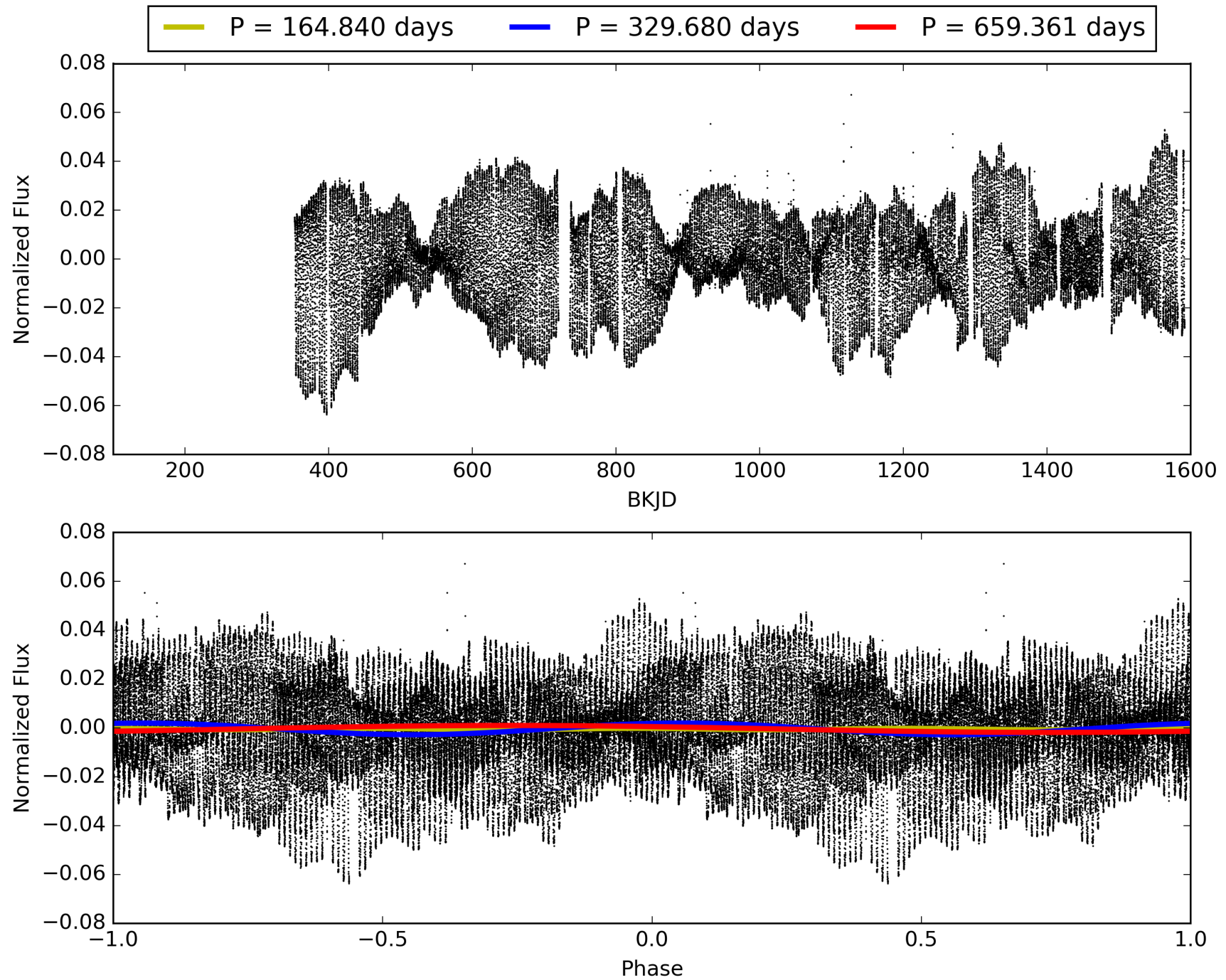
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:12:55 Z

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

TCE 004774574-01, PDC Light Curves

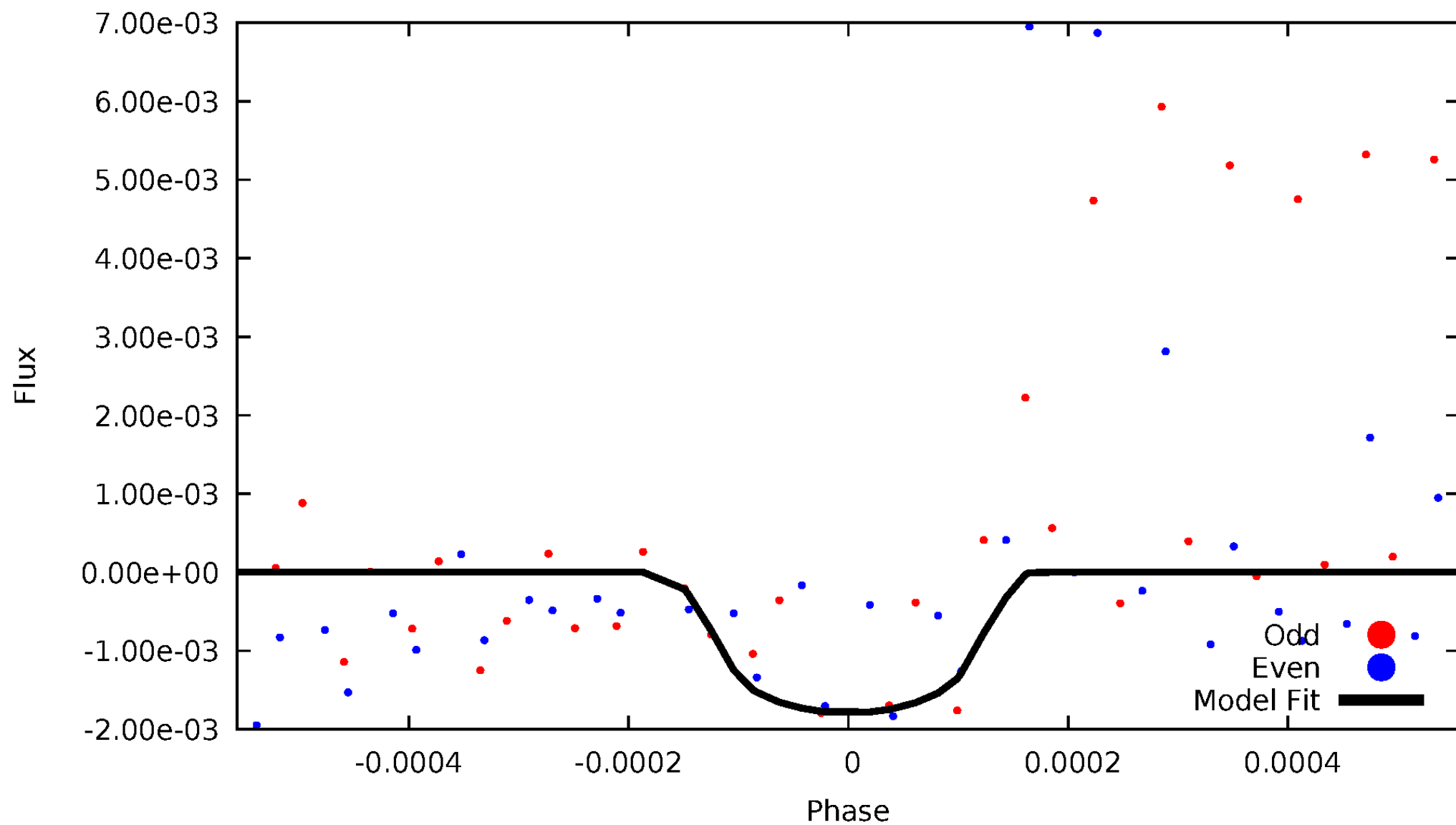


TCE 004774574-01



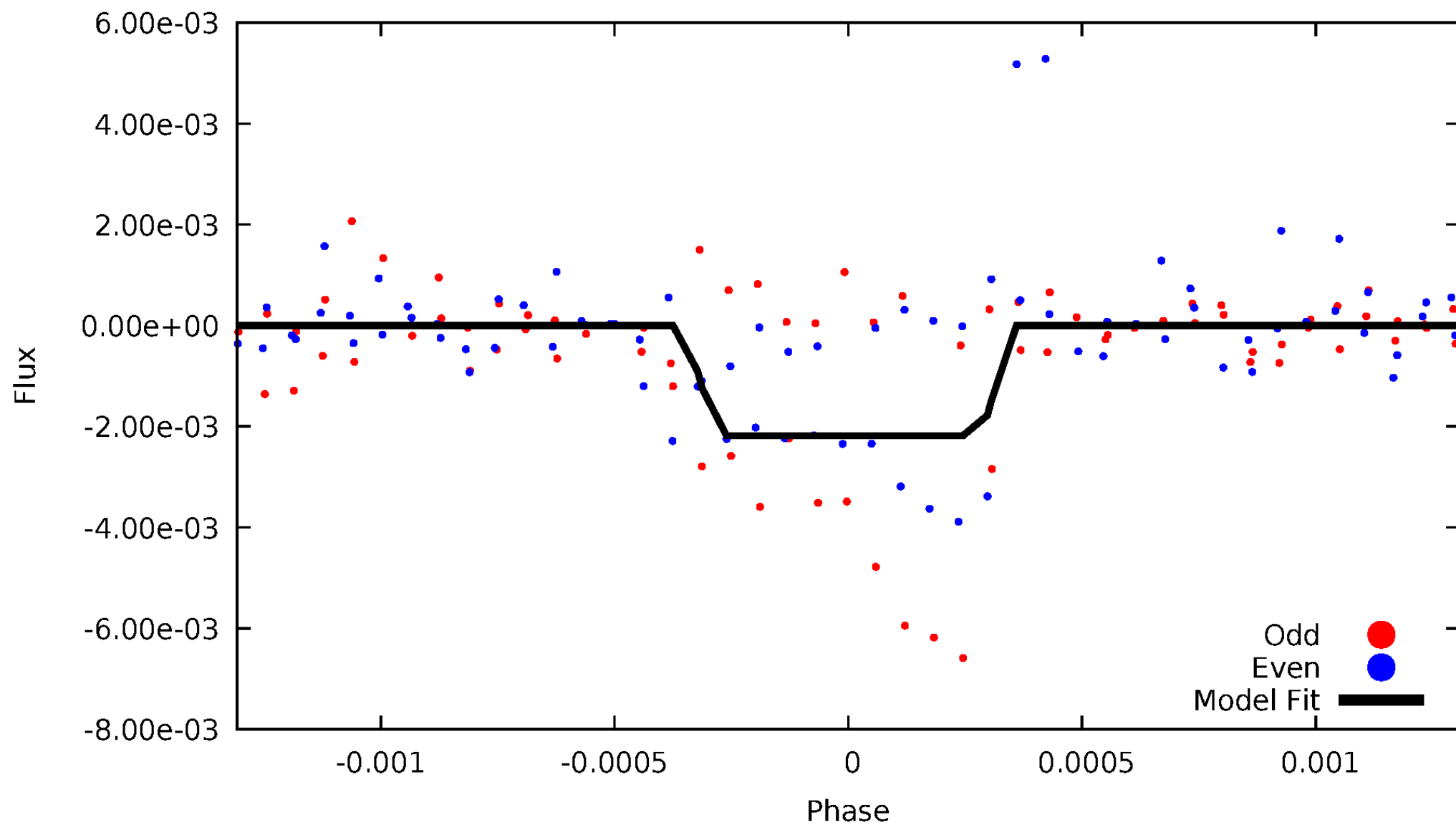
DV Odd/Even

TCE 004774574-01



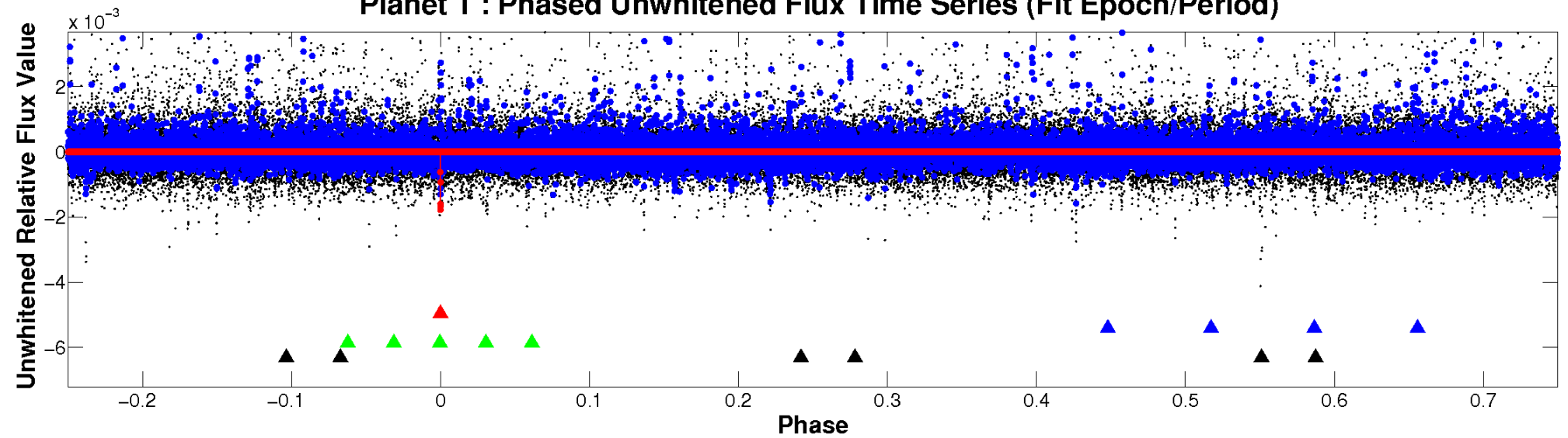
ALT Odd/Even

TCE 004774574-01

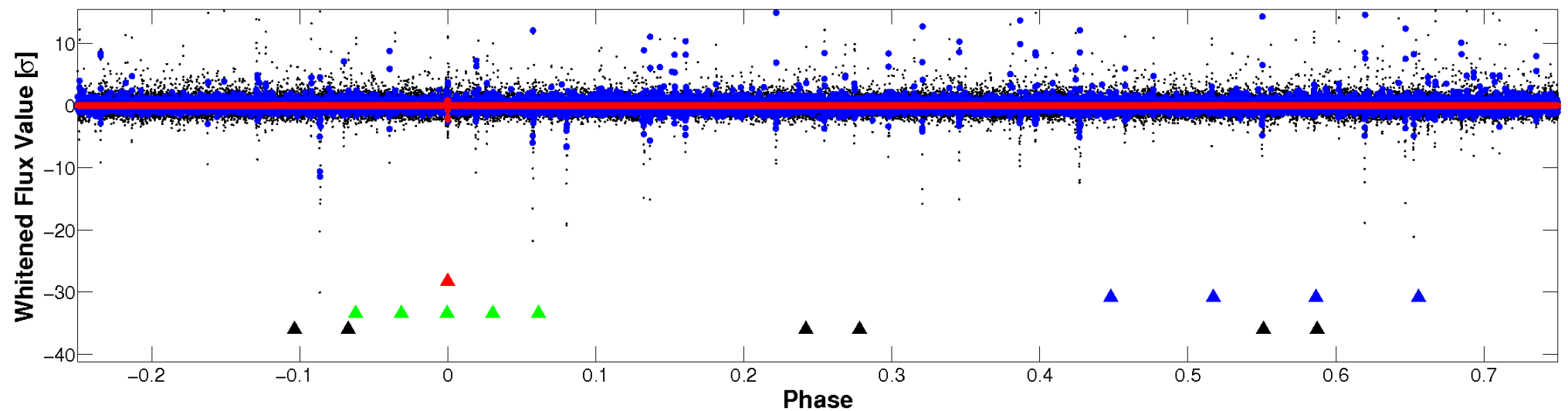


Non-Whitened Vs. Whitened Light Curve

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

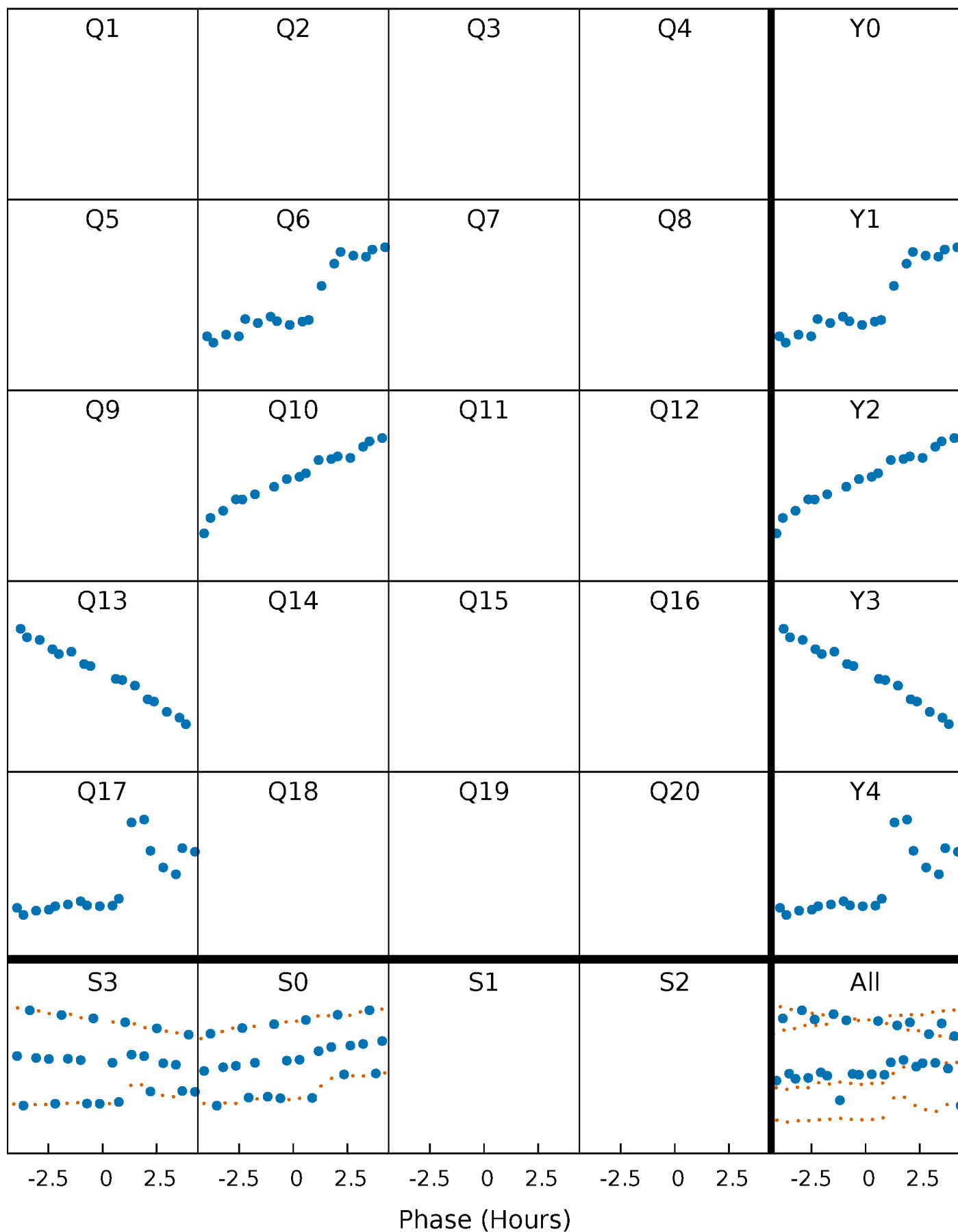


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



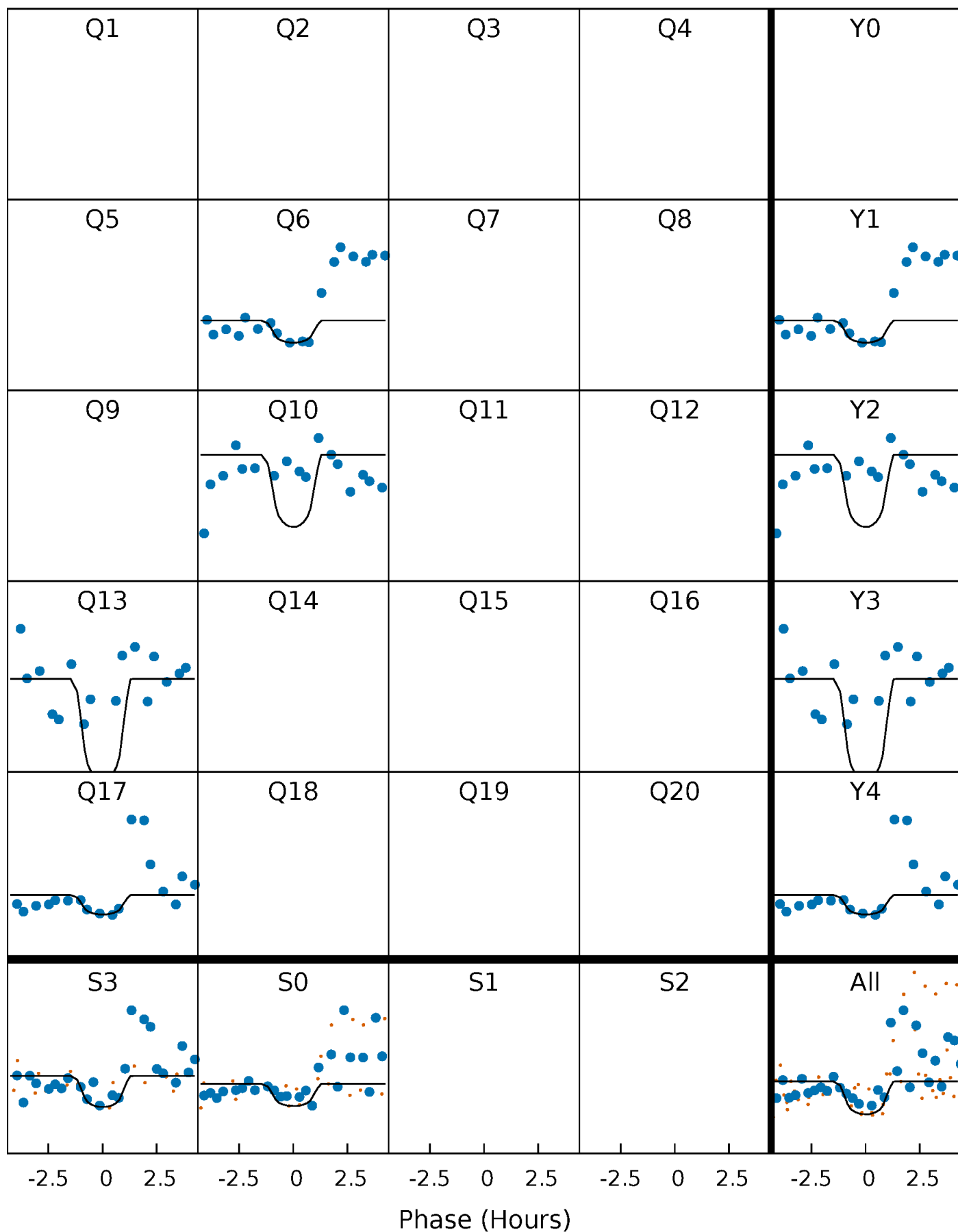
PDC Quarter-Phased Transit Curves

TCE 004774574-01 P=329.680447 Days $T_0=252.628149$ (BKJD)



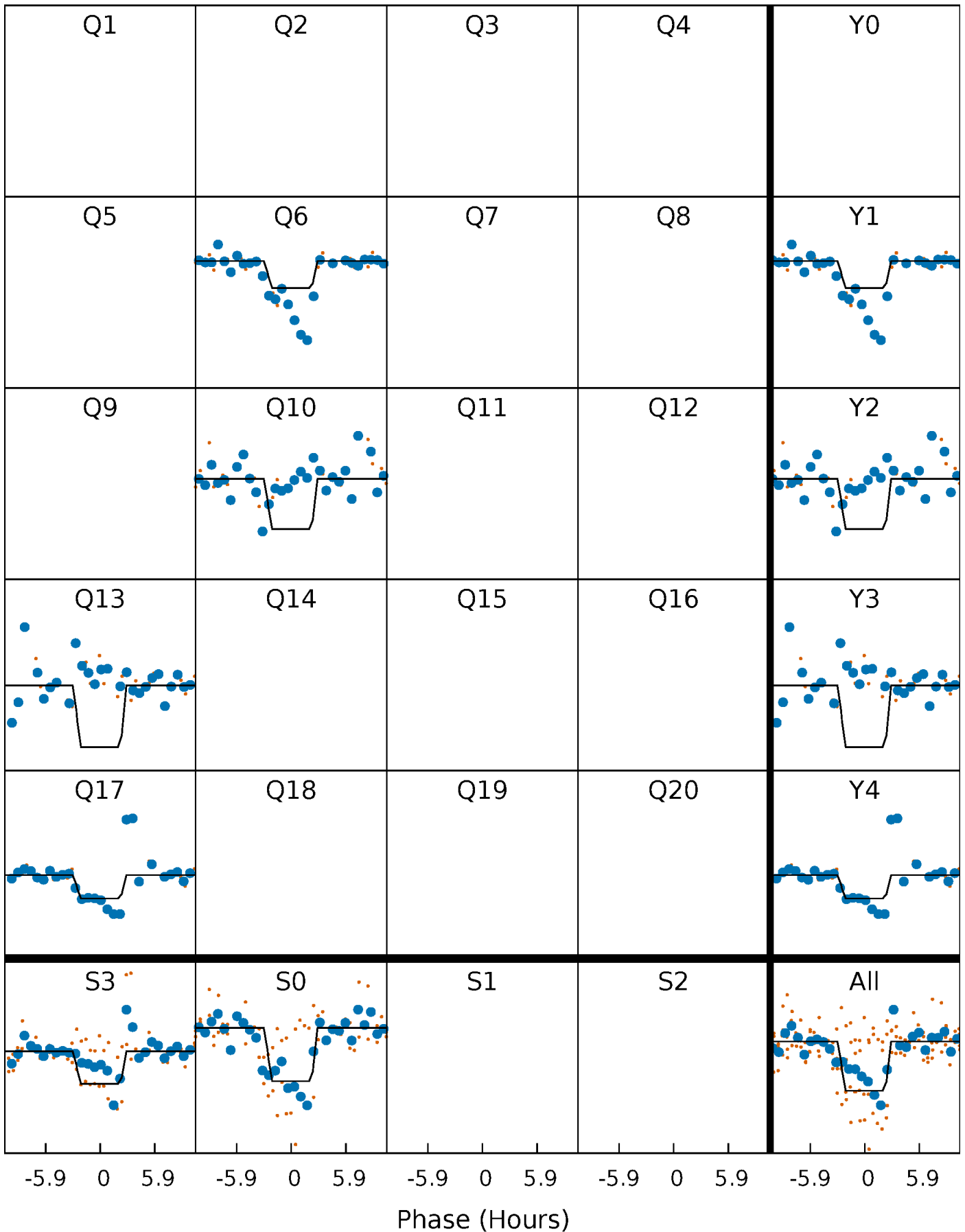
DV Quarter-Phased Transit Curves

TCE 004774574-01 P=329.680447 Days $T_0=252.628149$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

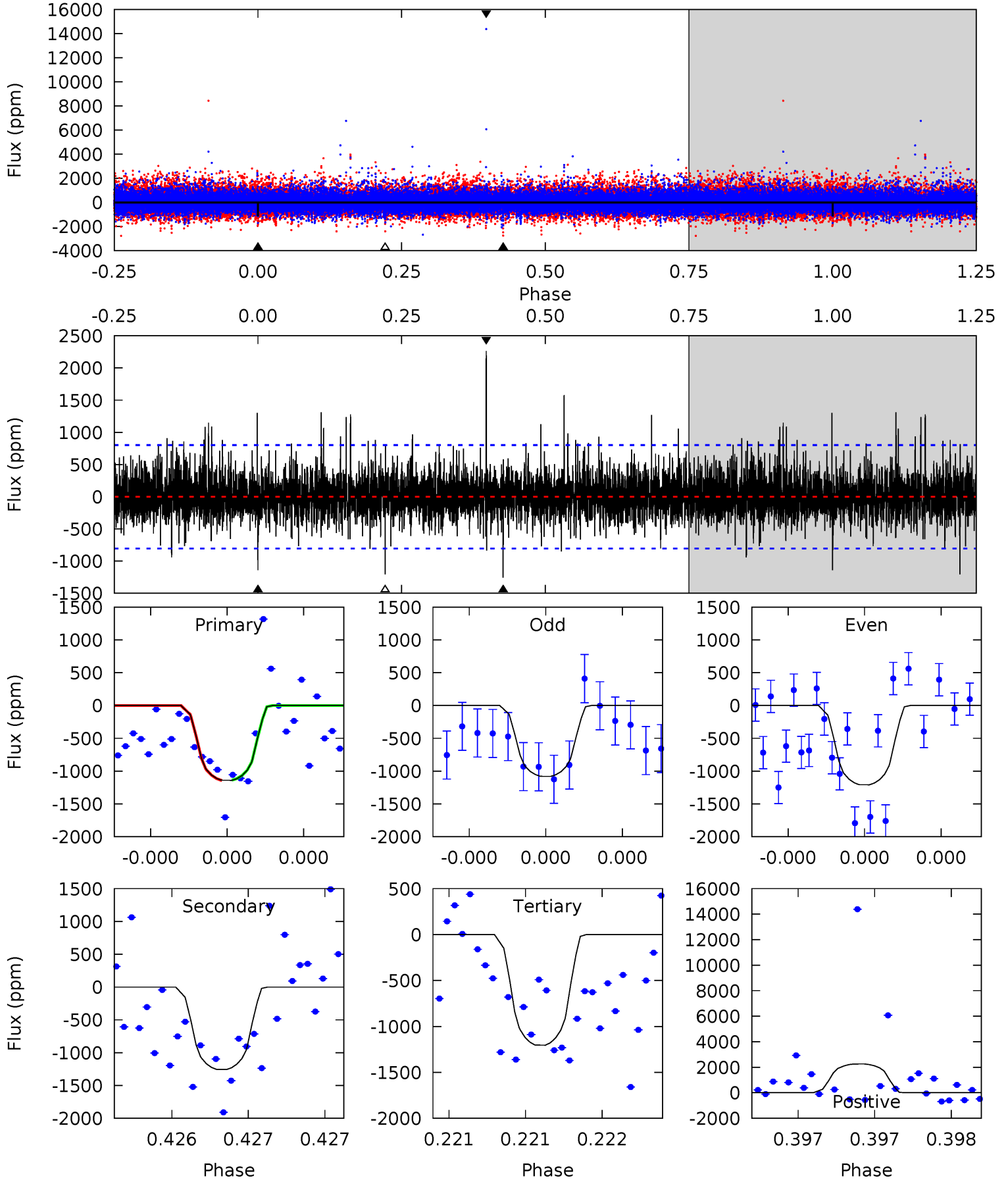
TCE 004774574-01 P=329.675057 Days $T_0=252.585438$ (BKJD)



DV Model-Shift Uniqueness Test

004774574-01, P = 329.680447 Days, E = 252.628149 Days

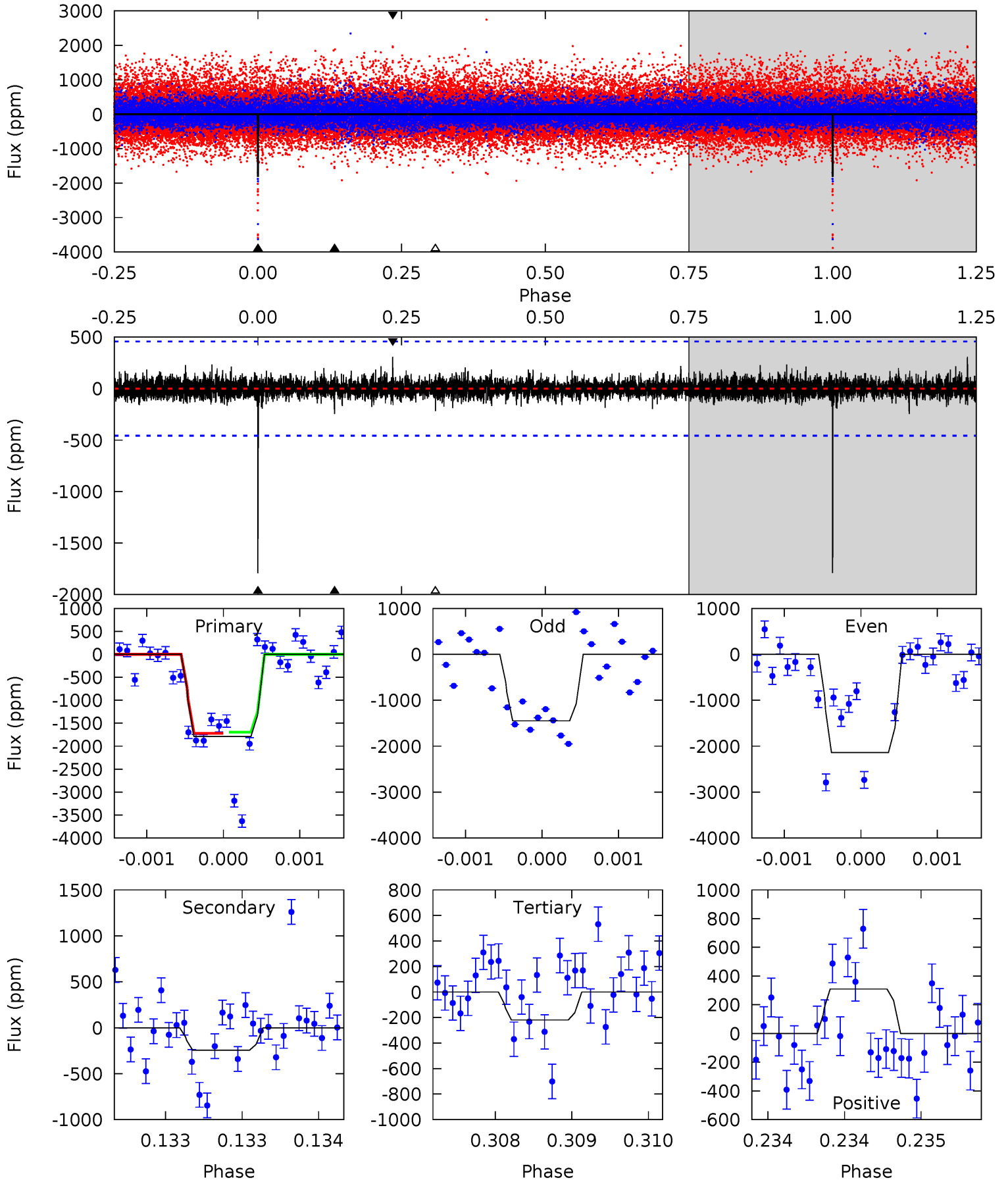
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.03	8.84	8.48	15.9	5.66	3.61	1.70	-0.44	-7.89	0.37	-7.08	0.38	1.00	0.64	0.02



Alt Model-Shift Uniqueness Test

004774574-01, $P = 329.675057$ Days, $E = 252.585438$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.6	2.95	2.64	3.73	5.52	3.40	0.60	18.9	17.8	0.31	-0.78	4.80	1.16	0.15	0.15



Stellar Parameters For KIC 004774574

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4508^{+143}_{-179}	$4.684^{+0.059}_{-0.027}$	$-0.820^{+0.300}_{-0.300}$	$0.559^{+0.044}_{-0.049}$	$0.551^{+0.053}_{-0.035}$	$4.436^{+1.119}_{-0.574}$
	+3%/-4%	+1%/-1%	+37%/-37%	+8%/-9%	+10%/-6%	+25%/-13%
Source	KIC0	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 004774574-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1256 ± 142	$8.00^{+7.71}_{-5.65}$	236^{+9}_{-10}	2941^{+1536}_{-483}	6543^{+73324}_{-4901}
Alt.	-245 ± 83	$7.37^{+7.96}_{-5.16}$	236^{+9}_{-11}	2394^{+972}_{-356}	1358^{+14879}_{-1040}

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

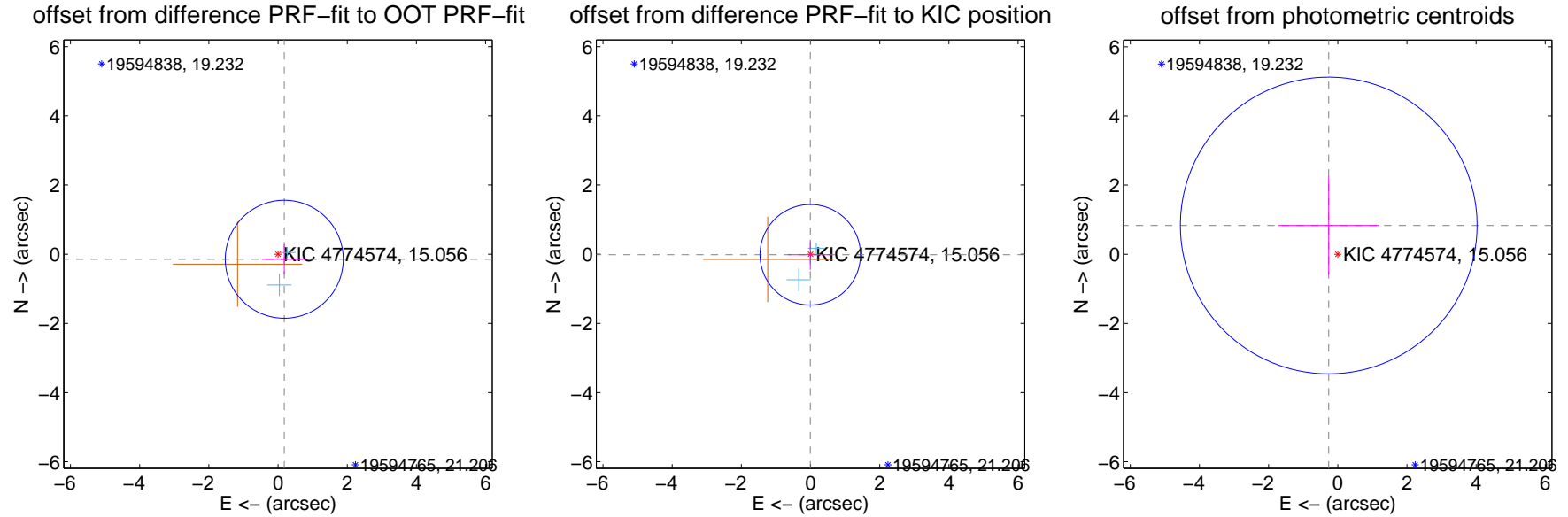
DV Centroid Data

Supplemental centroid analysis for 004774574-01. Kepler magnitude: 15.06. Transit SNR 7.36

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.232 ± 0.568	0.41	-0.180 ± 0.642	-0.147 ± 0.434
PRF-fit source offset from KIC position	0.019 ± 0.484	0.04	0.009 ± 0.642	-0.017 ± 0.434
photometric centroid source offset	0.87 ± 1.43	0.61	0.26 ± 1.46	0.83 ± 1.43

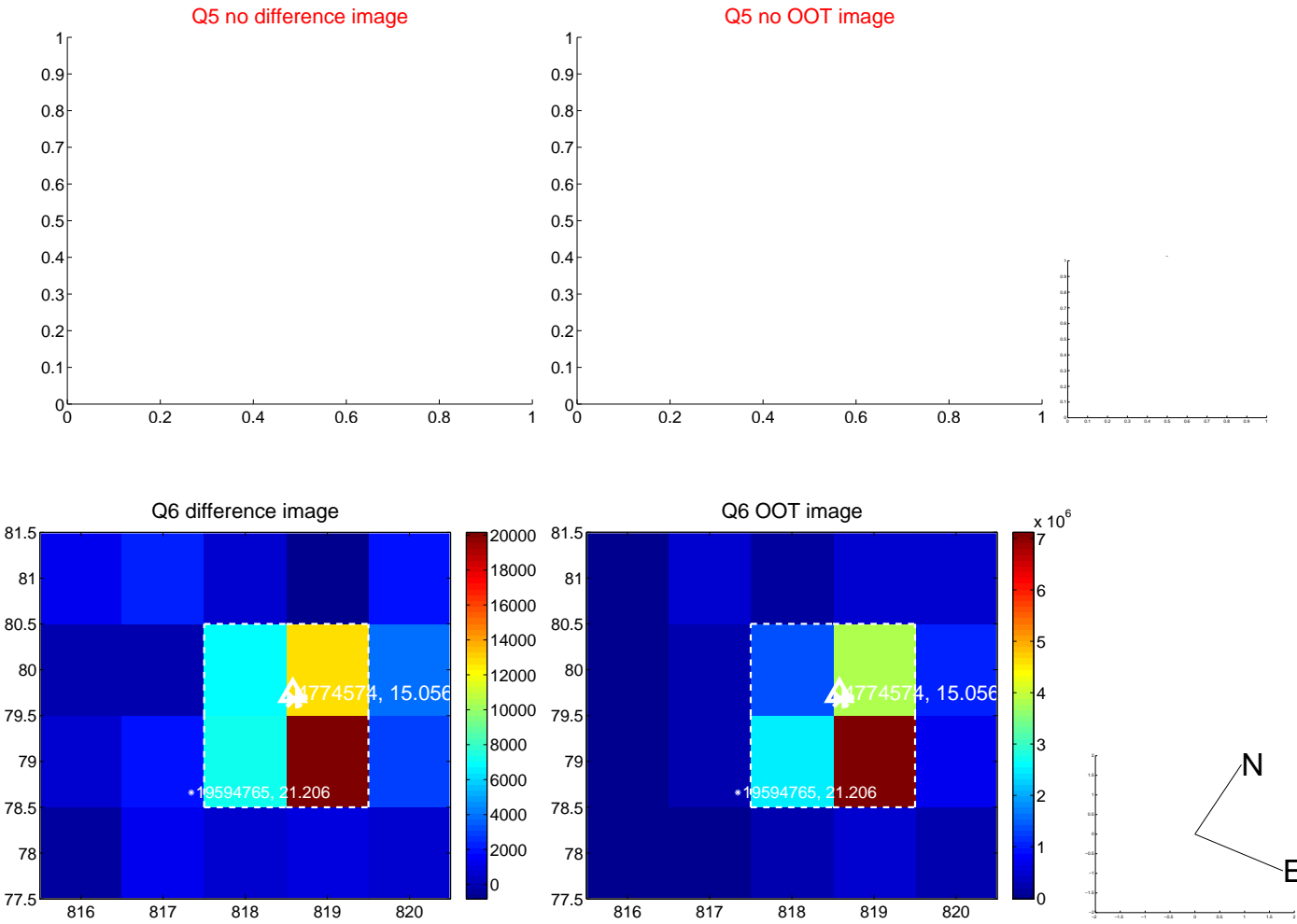


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000 are from the UKIRT catalog.

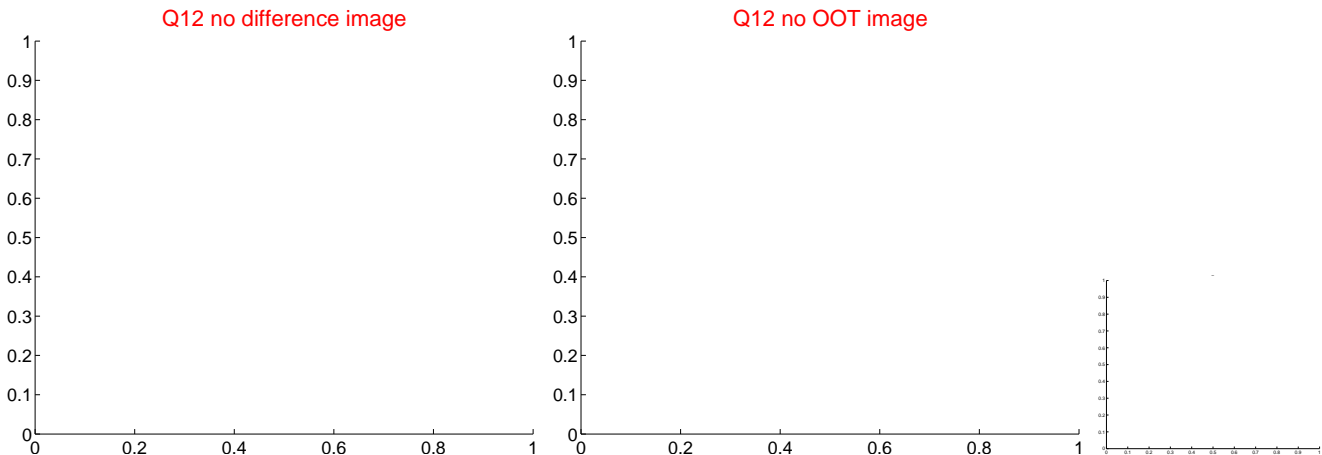
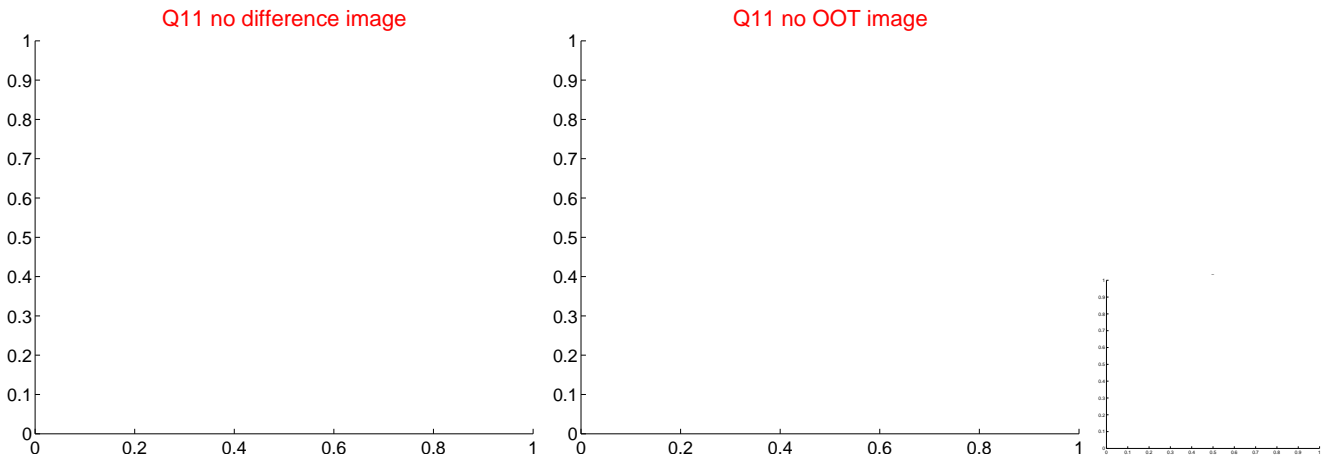
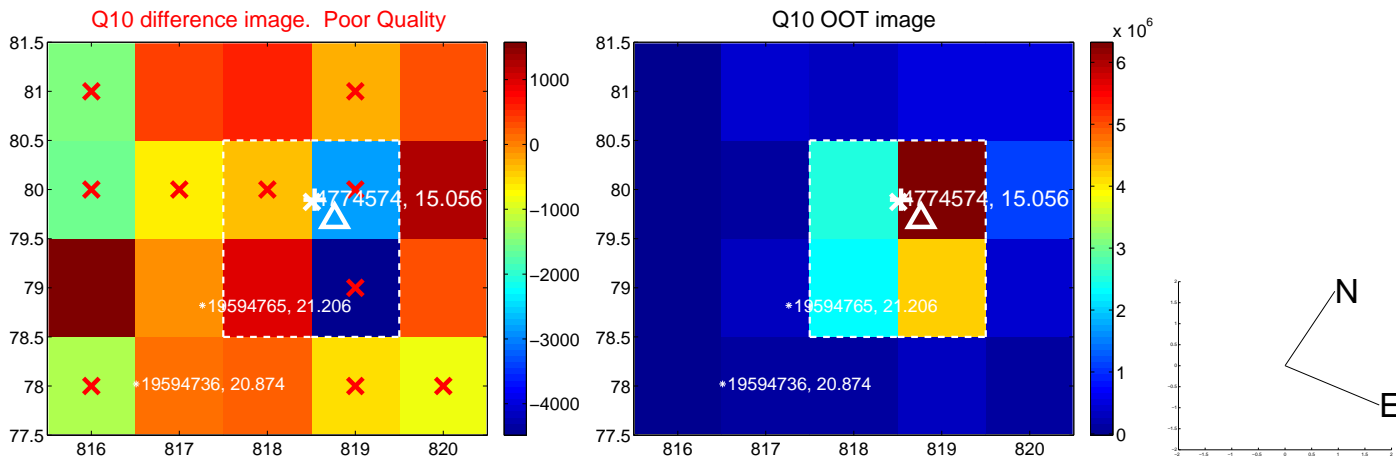
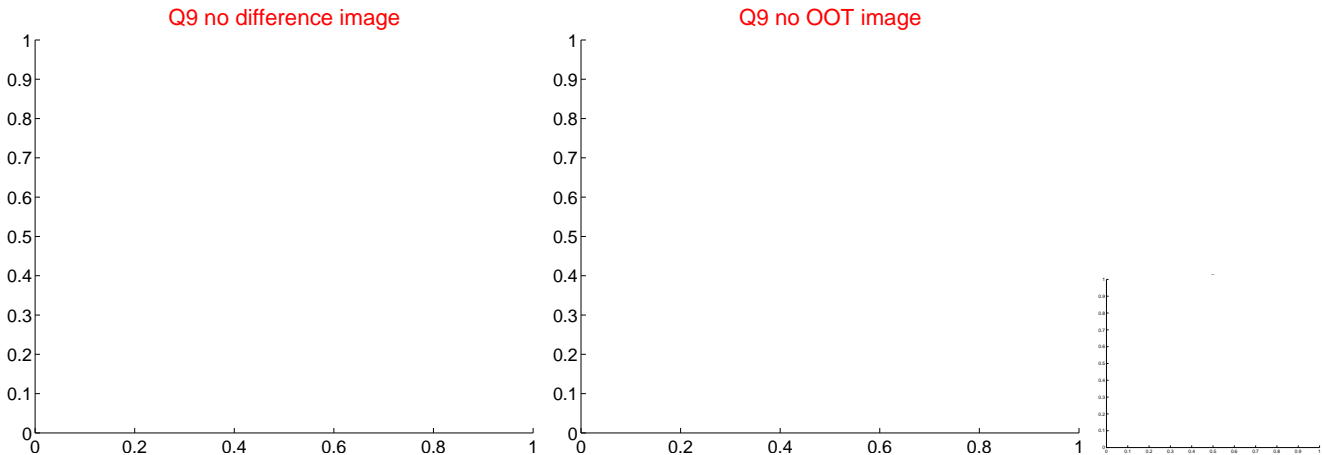
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



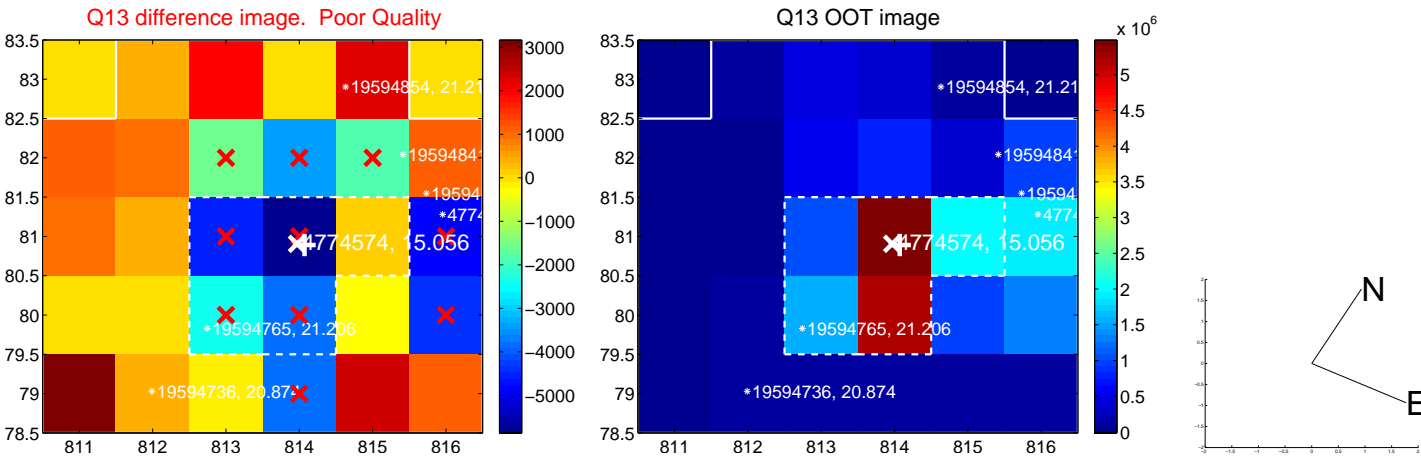
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



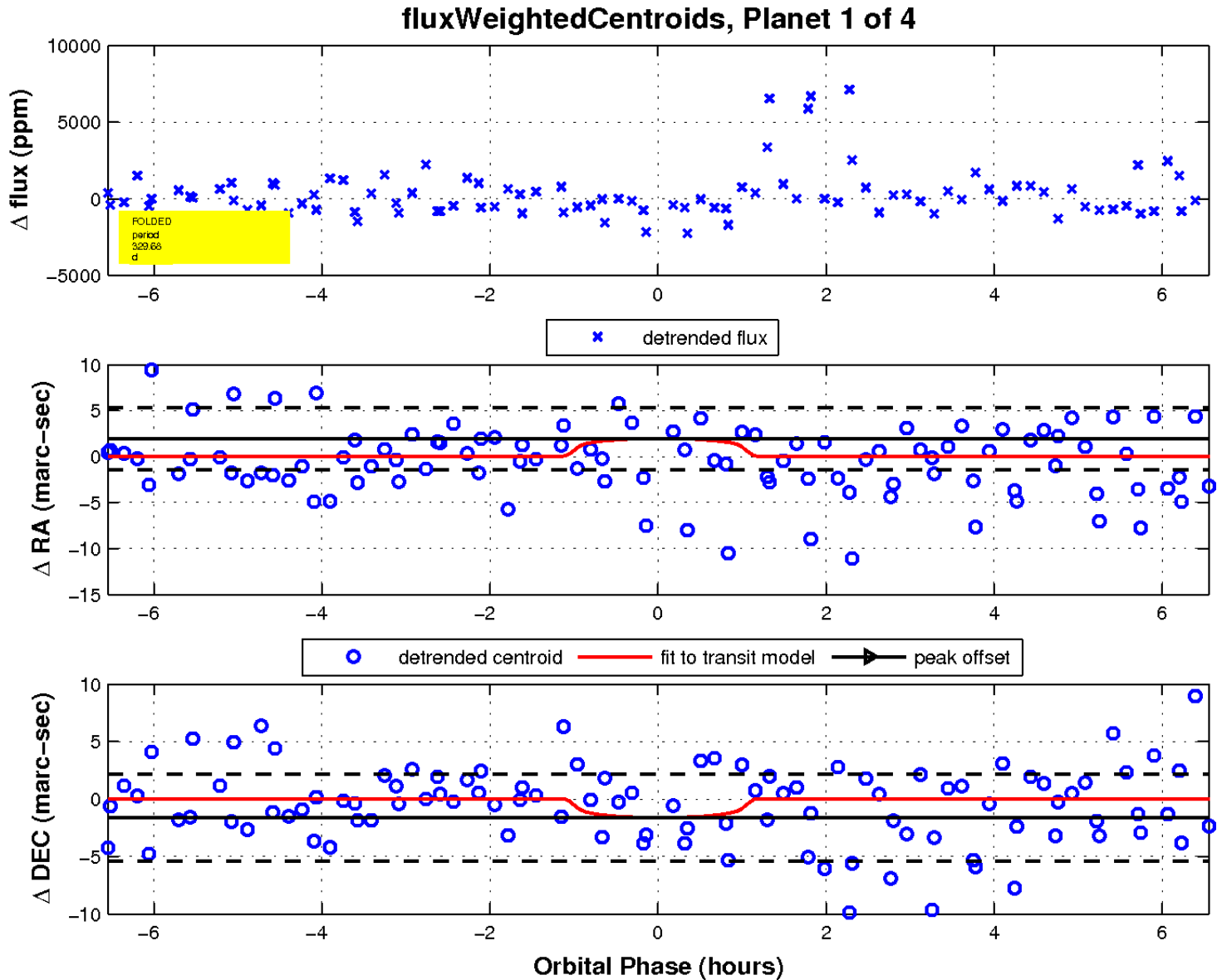
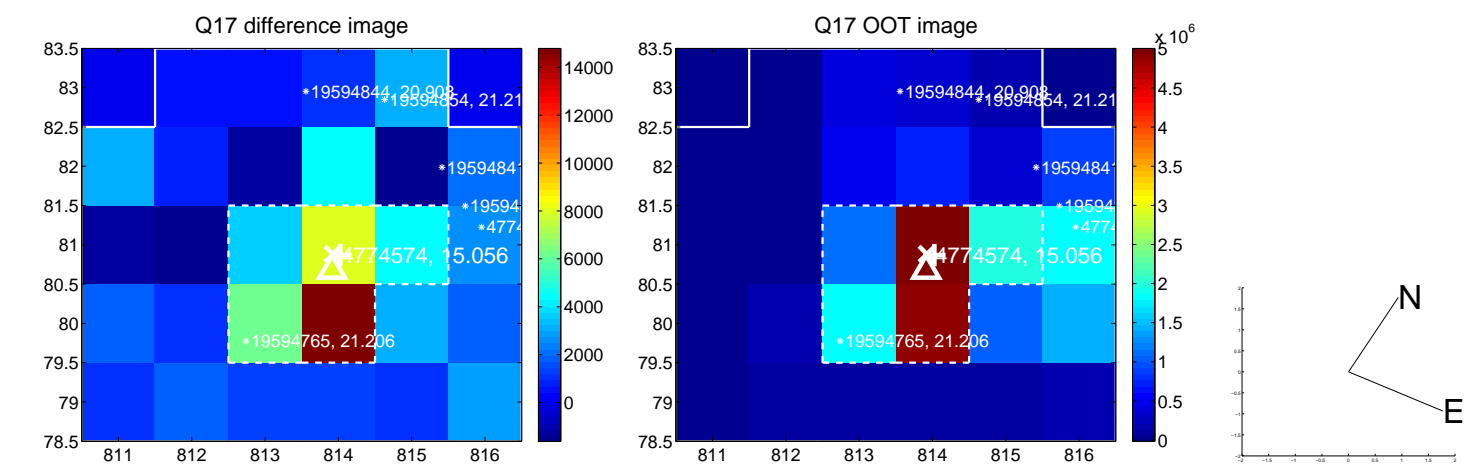
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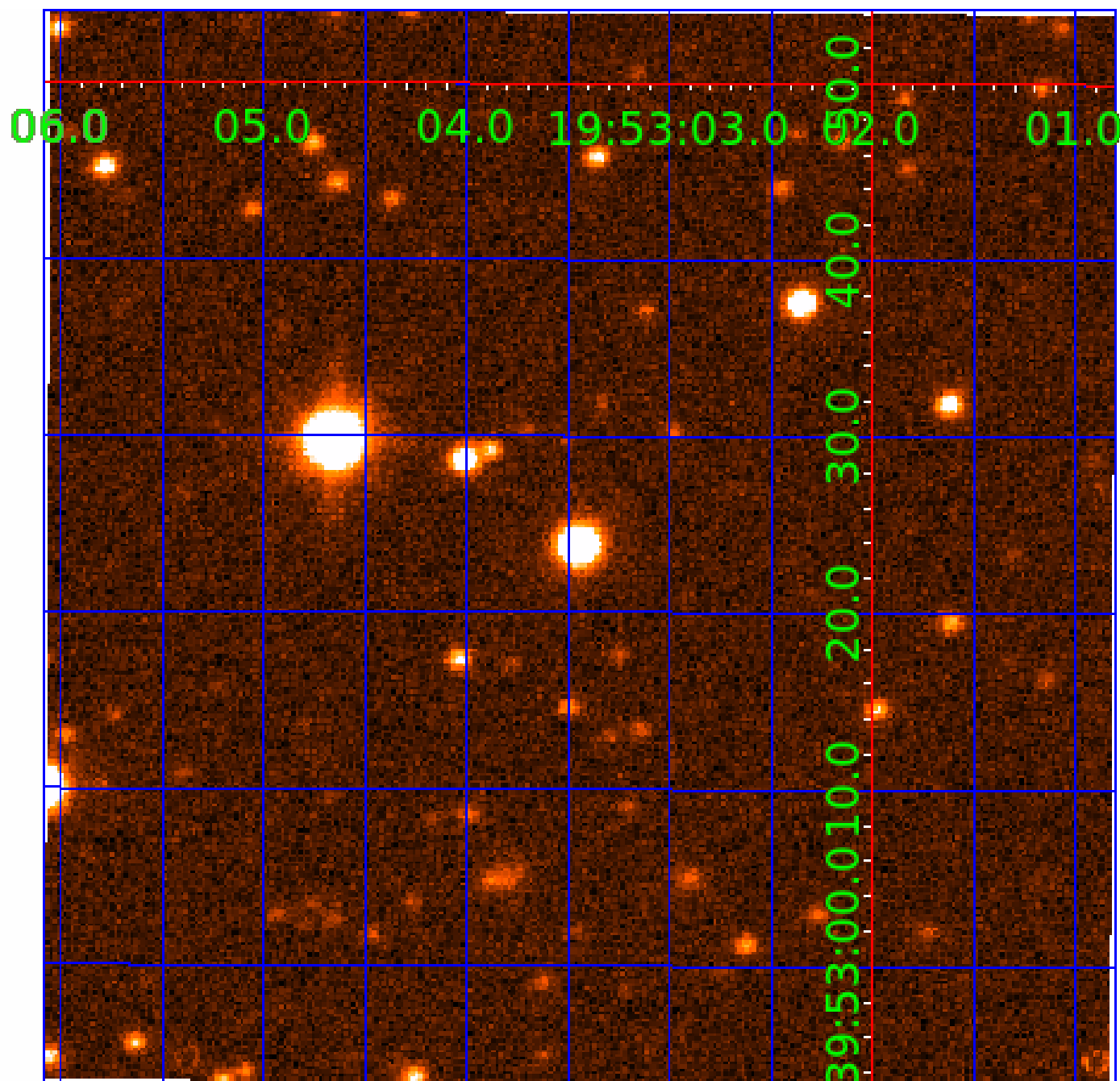


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004774574

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})
004774574-01	OBS	No	329.680447	252.628149	1792.1	2.199	13.5	7.4	0.56	4508	2.41	0.20
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Robovetter Results

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004774574-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
004774574-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

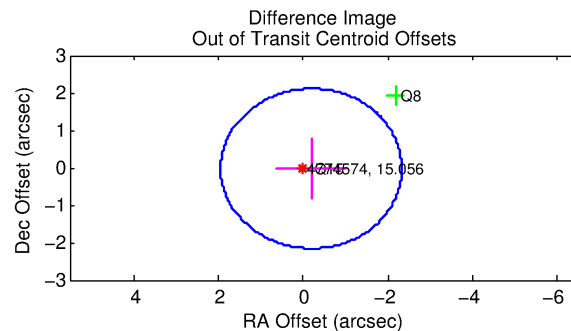
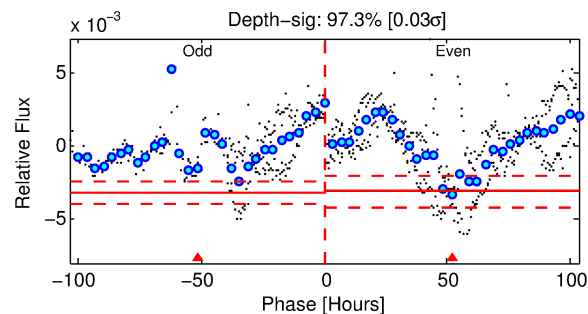
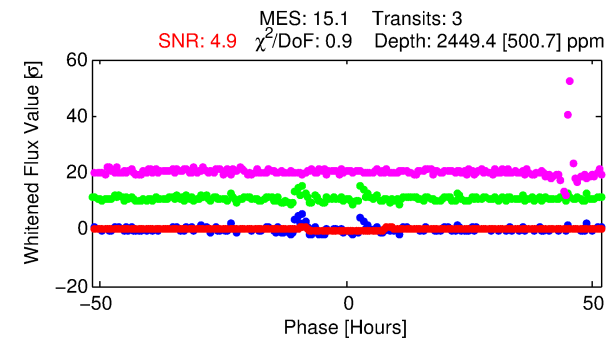
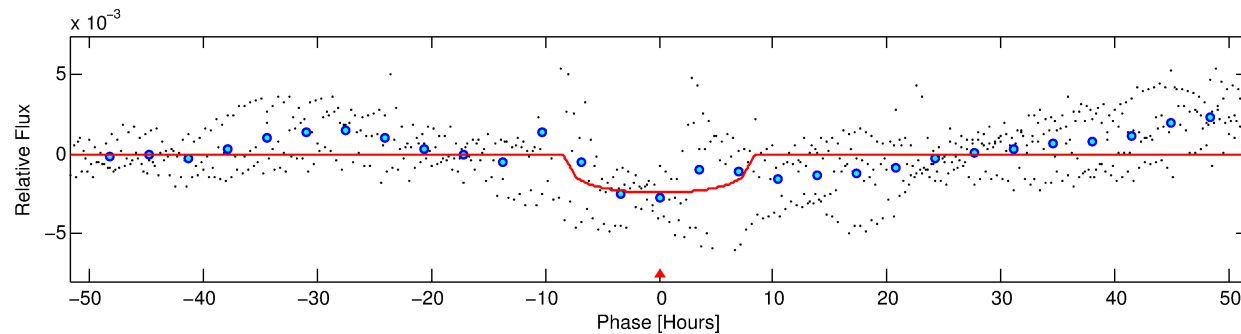
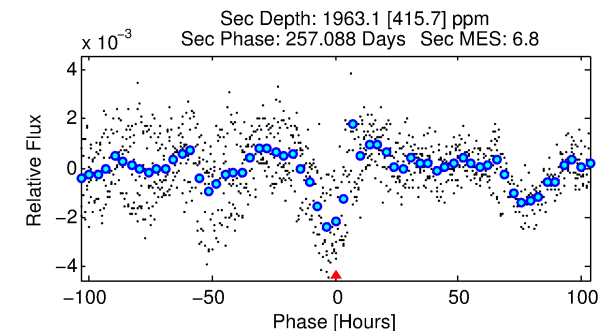
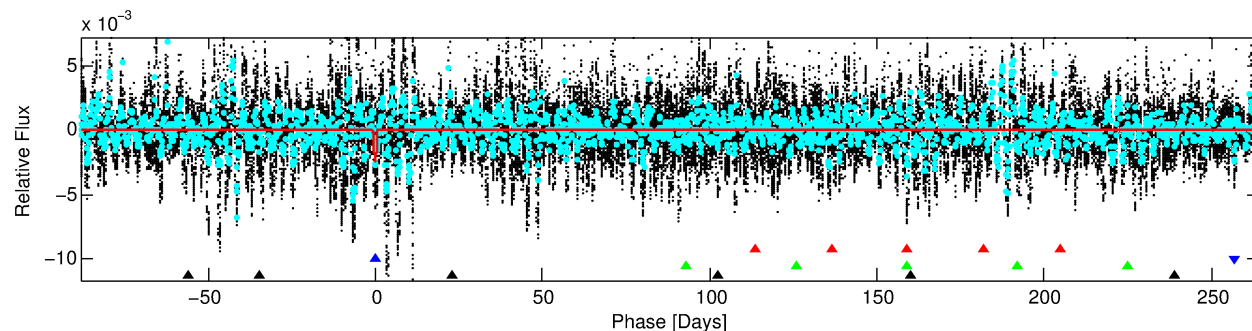
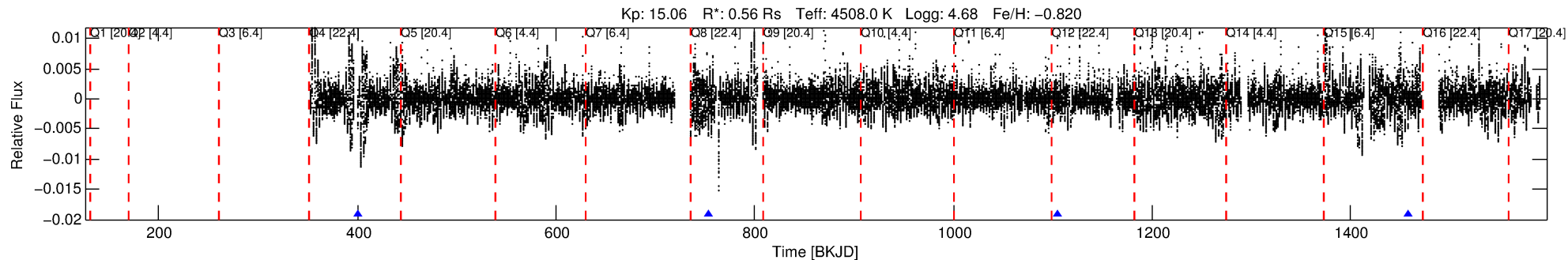
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004774574-02

No Significant Match Found

DV One-Page Summary

KIC: 4774574 Candidate: 2 of 4 Period: 352.528 d



DV Fit Results:

Period = 352.52840 [0.00885] d
Epoch = 400.3115 [0.0187] BKJD
Rp/R* = 0.0474 [0.0066]
a/R* = 128.80 [34.62]
b = 0.65 [0.25]
Seff = 0.18 [0.03]
Teq = 166 [8] K
Rp = 2.89 [0.48] Re
a = 0.8006 [0.0592] AU
Ag = 82770.65 [30363.99] [2.73σ]
Teff = 4358 [419] K [9.99σ]

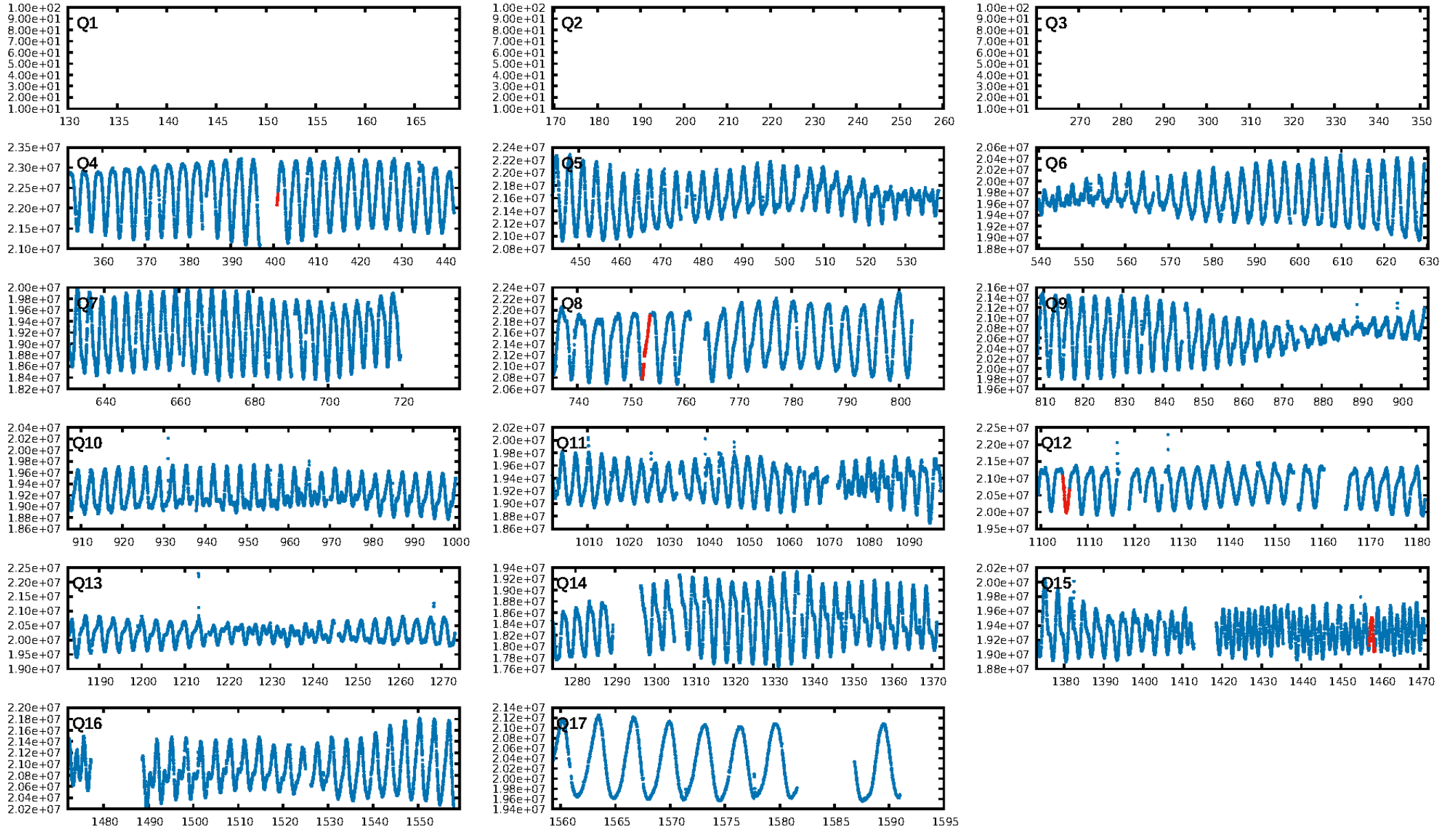
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [31.54σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 31.4%
ModelChiSquareGof-sig: 92.8%
Bootstrap-pfa: 1.86e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.215
Centroid-sig: 1.2%
Centroid-so: 1.714 arcsec [1.71σ]
OotOffset-rm: 0.197 arcsec [0.28σ]
KicOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

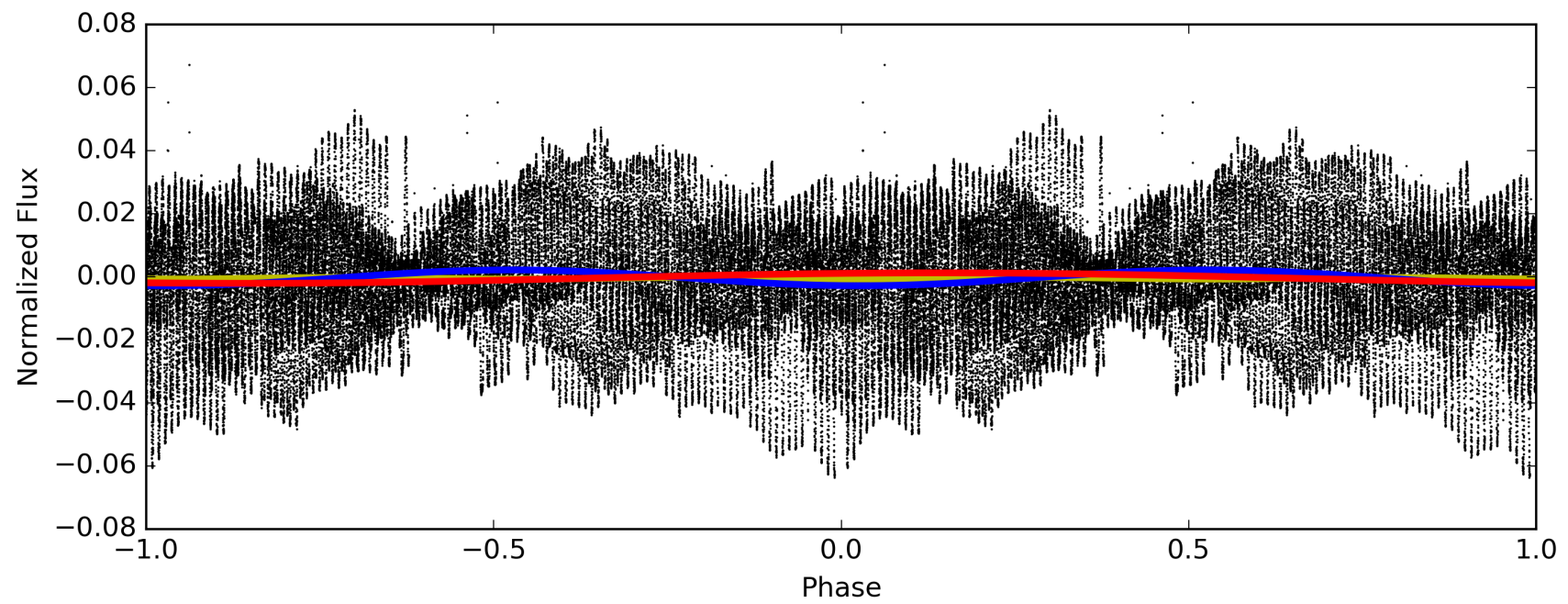
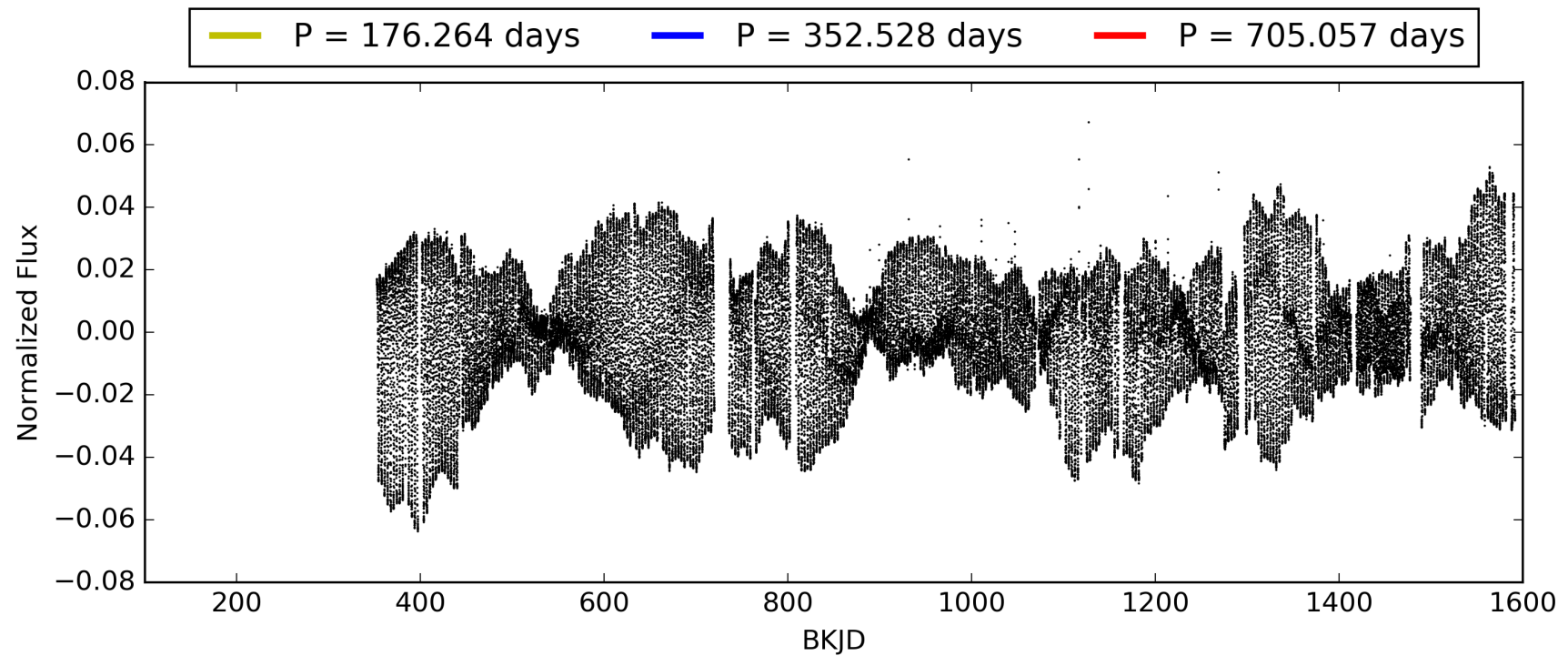
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:13:03 Z

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

TCE 004774574-02, PDC Light Curves

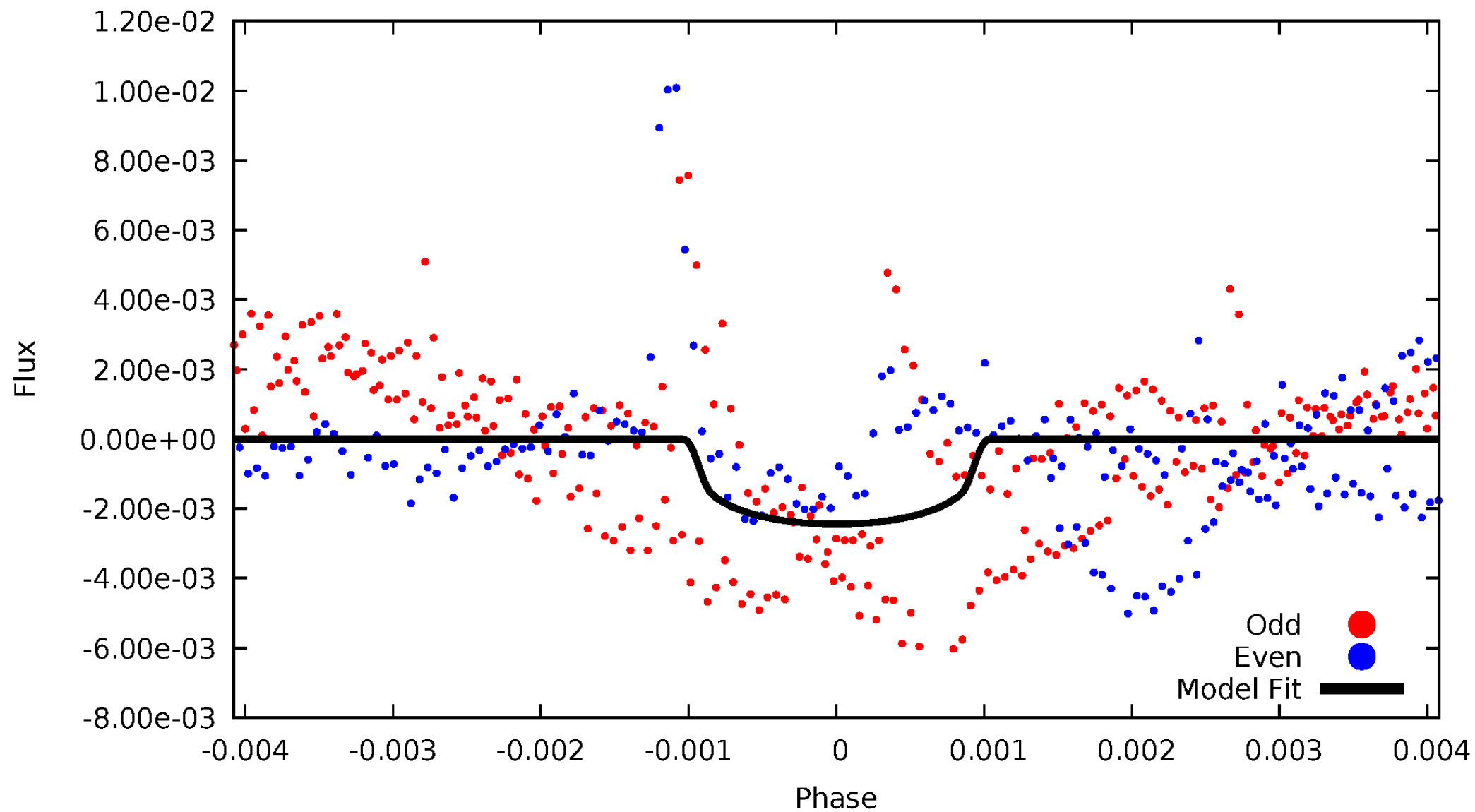


TCE 004774574-02



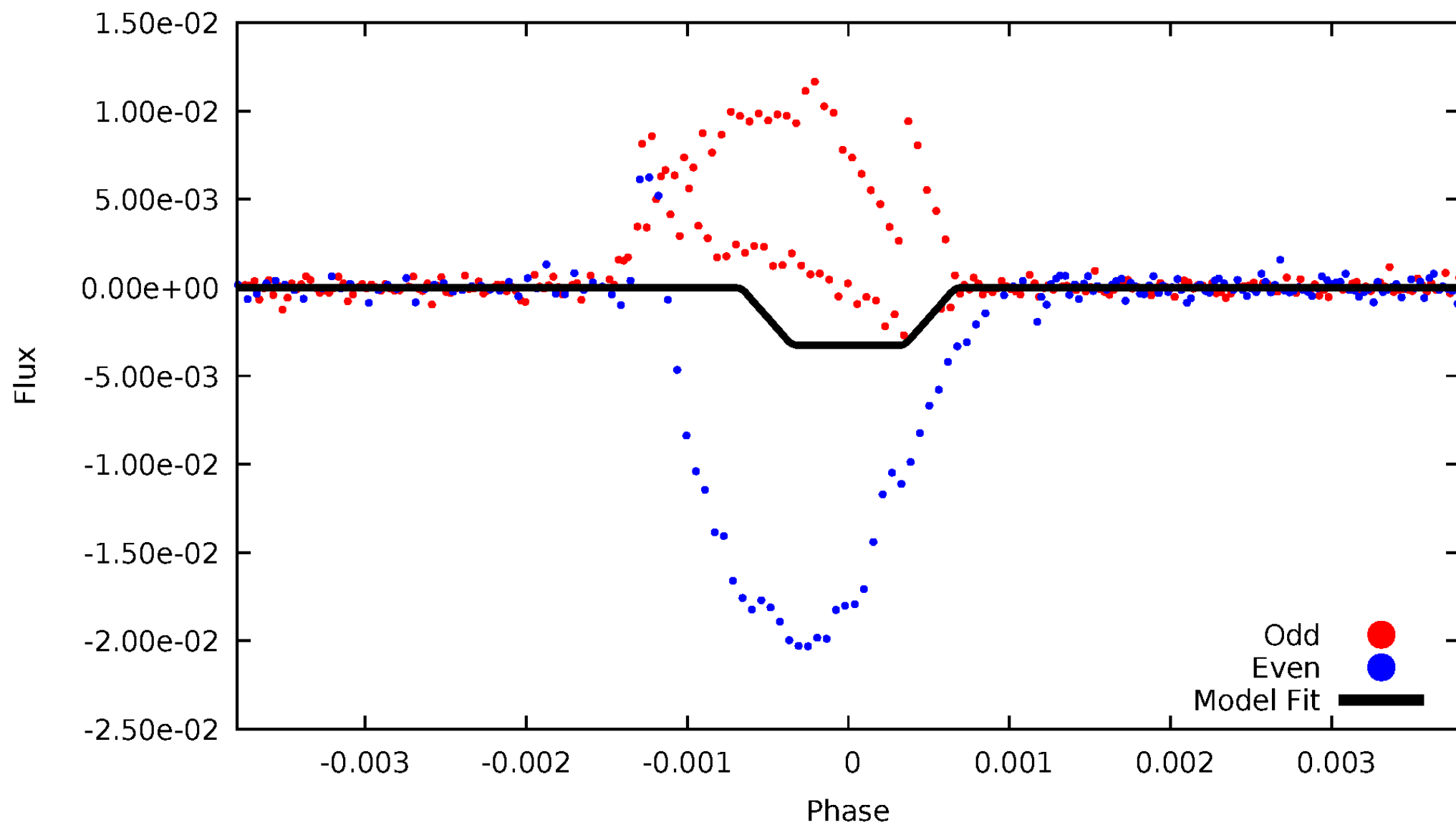
DV Odd/Even

TCE 004774574-02



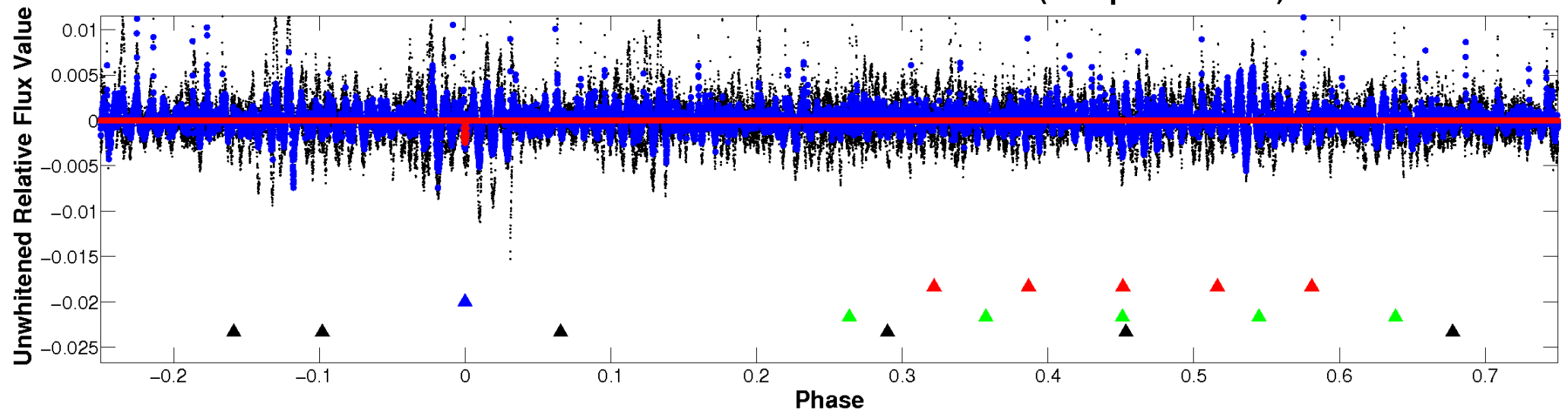
ALT Odd/Even

TCE 004774574-02

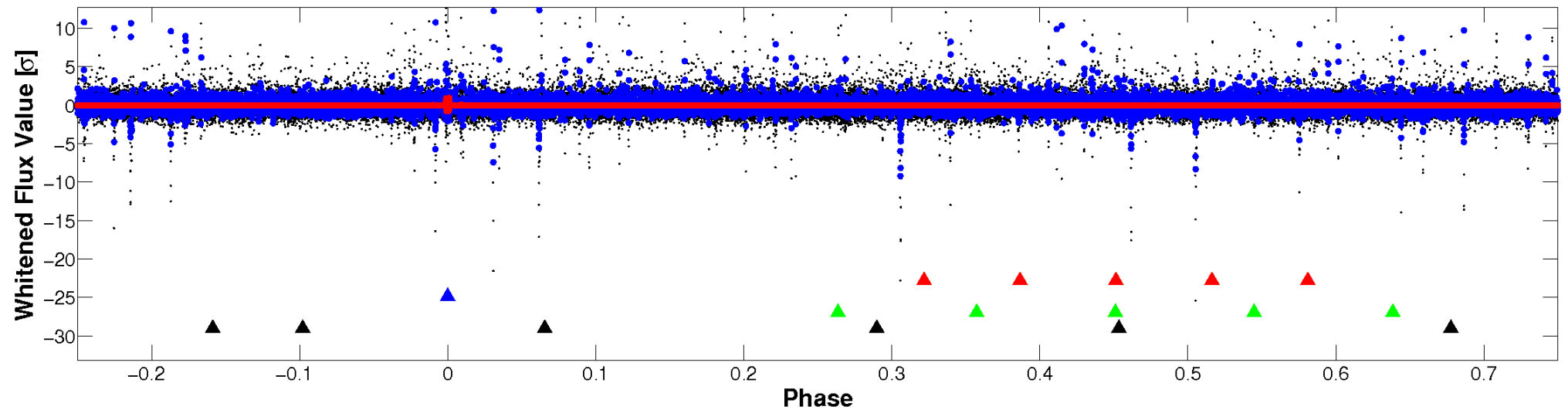


Non-Whitened Vs. Whitened Light Curve

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

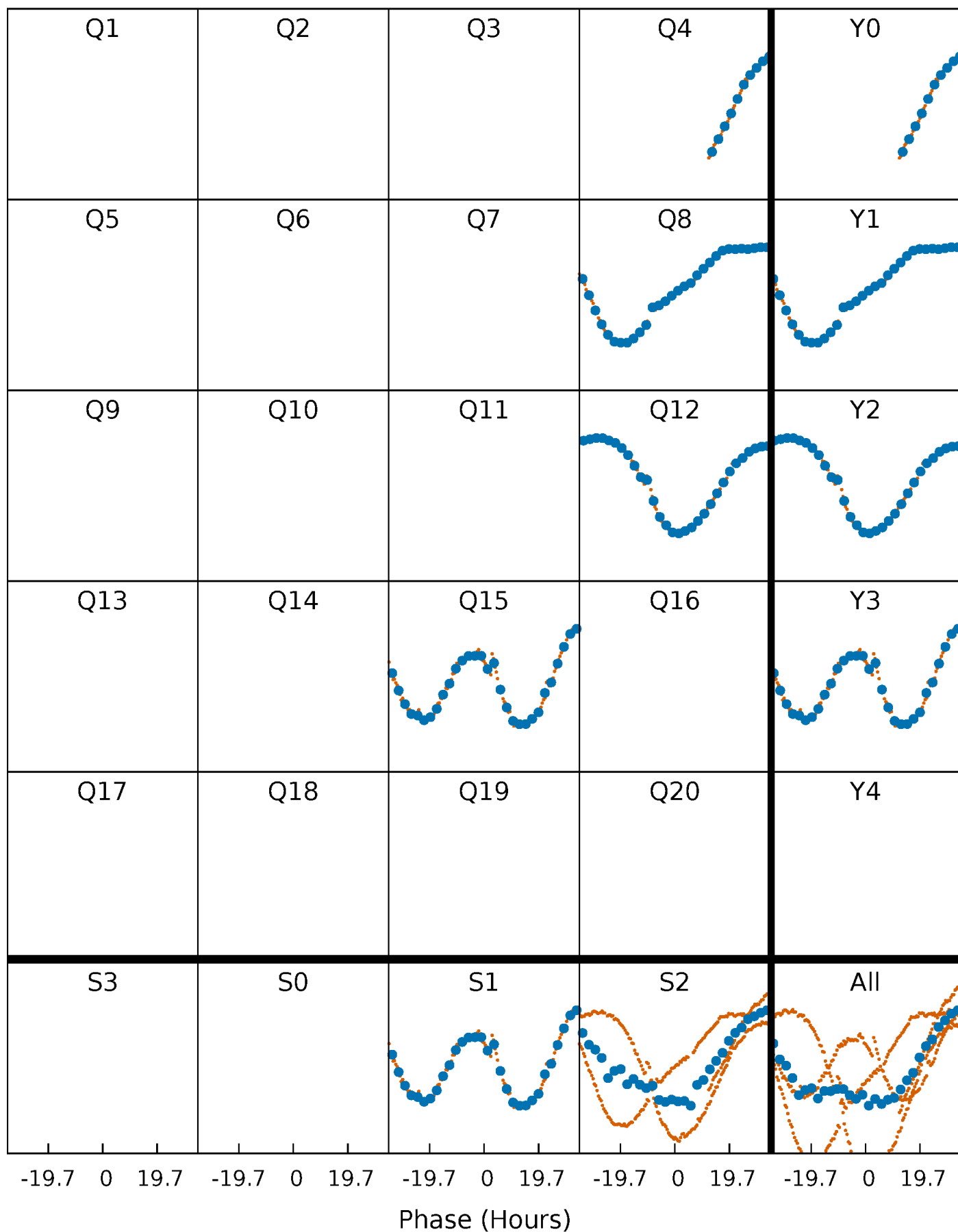


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



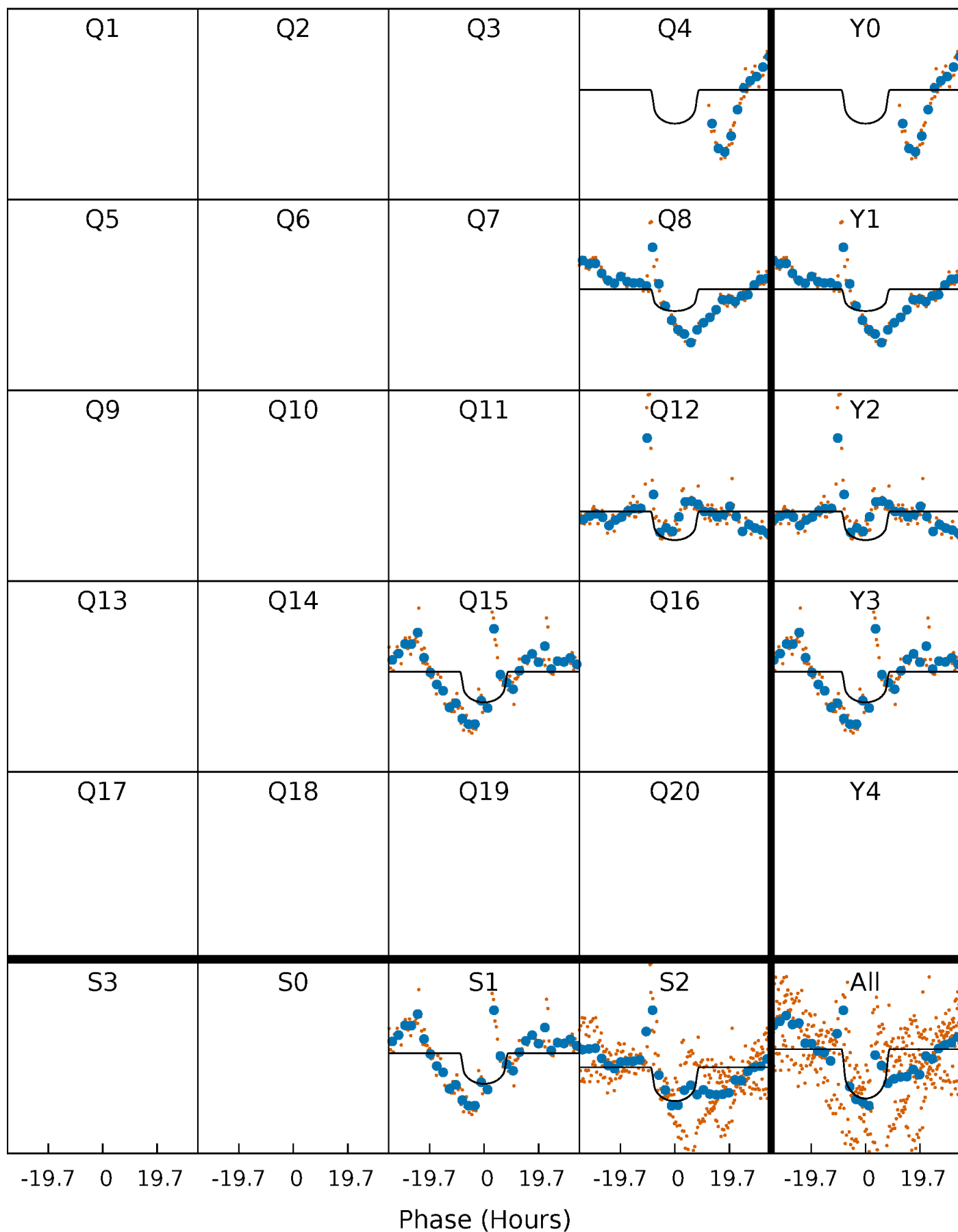
PDC Quarter-Phased Transit Curves

TCE 004774574-02 $P=352.528396$ Days $T_0=400.311513$ (BKJD)



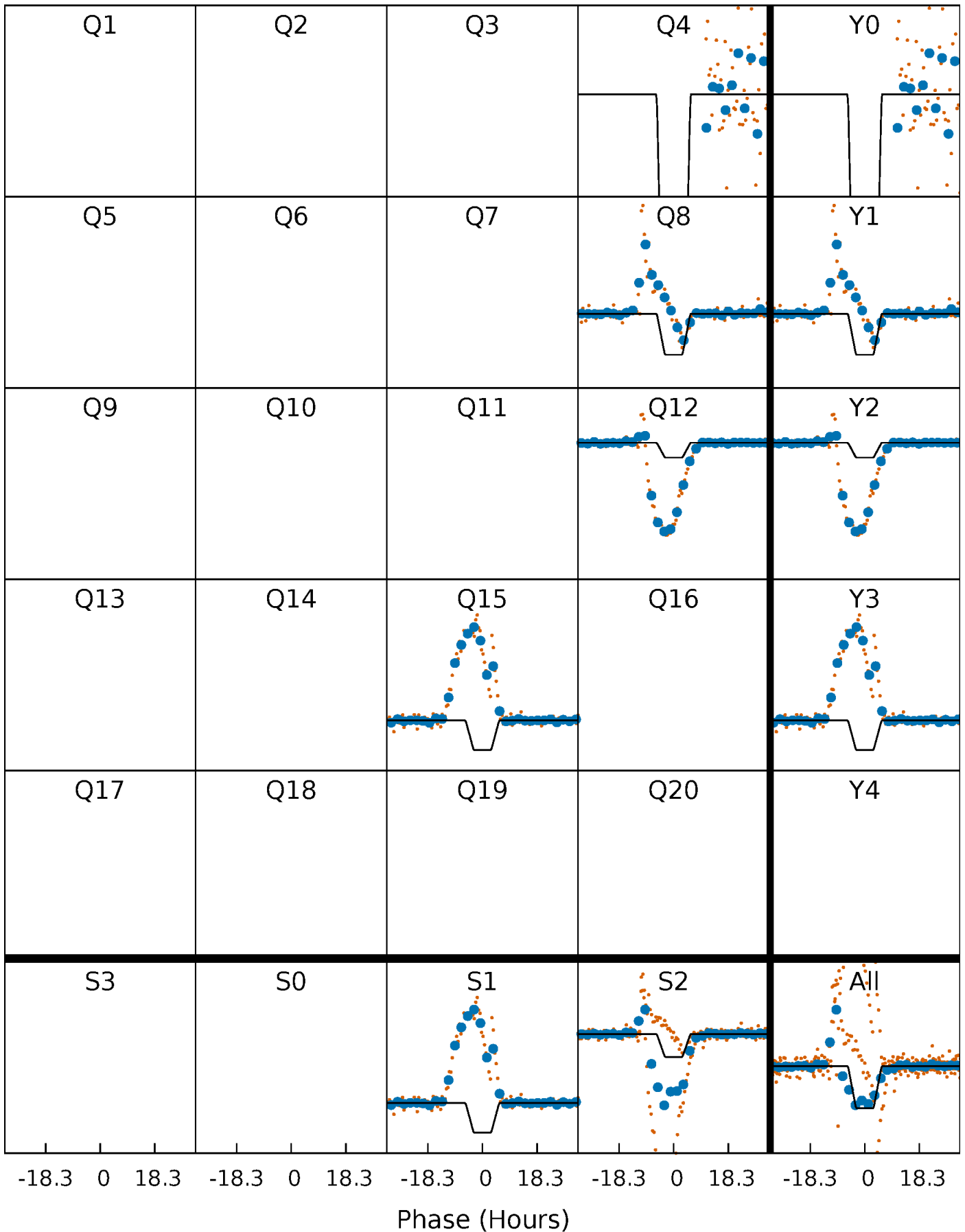
DV Quarter-Phased Transit Curves

TCE 004774574-02 P=352.528396 Days $T_0=400.311513$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

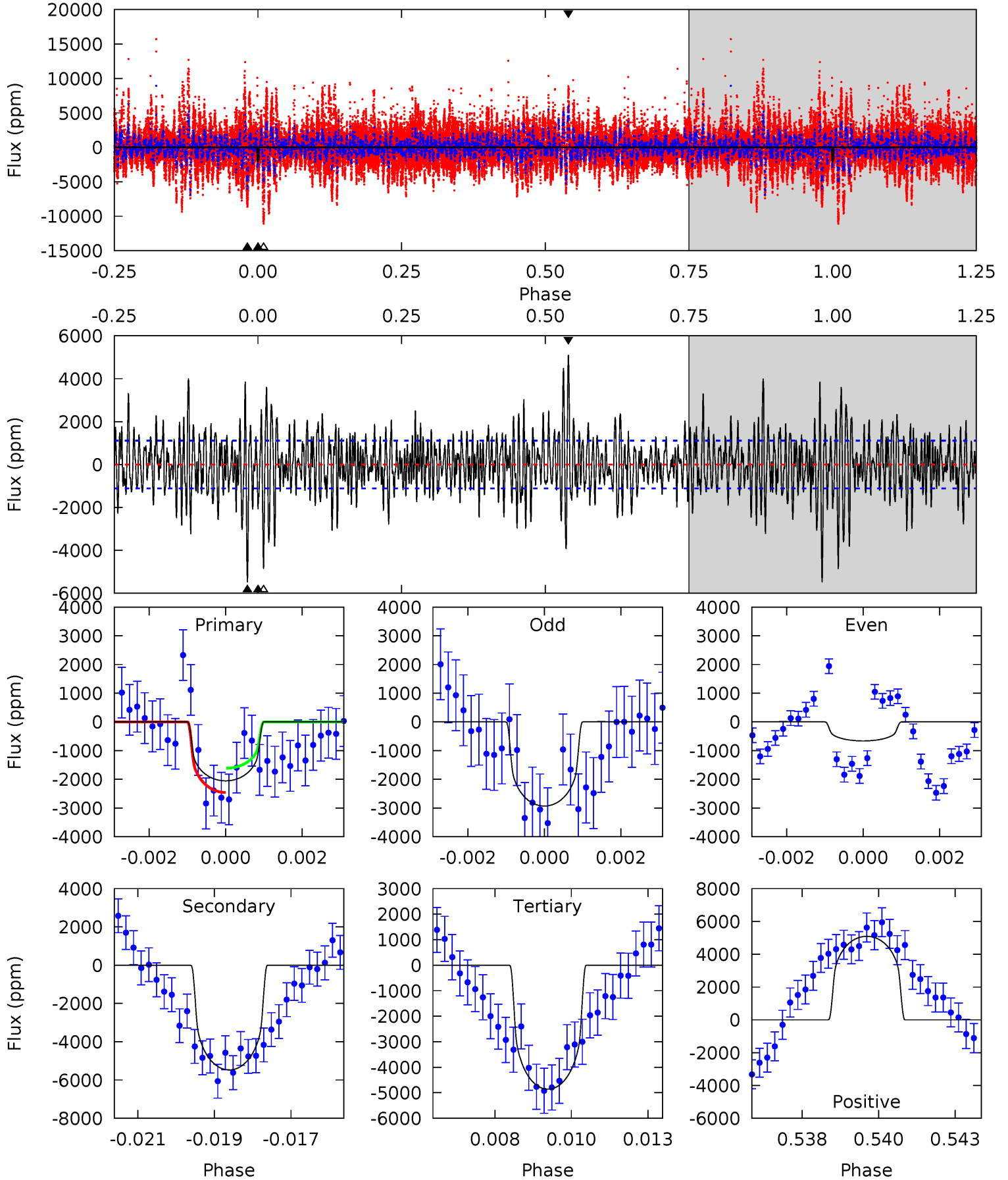
TCE 004774574-02 $P=352.485721$ Days $T_0=400.430530$ (BKJD)



DV Model-Shift Uniqueness Test

004774574-02, P = 352.528396 Days, E = 47.783117 Days

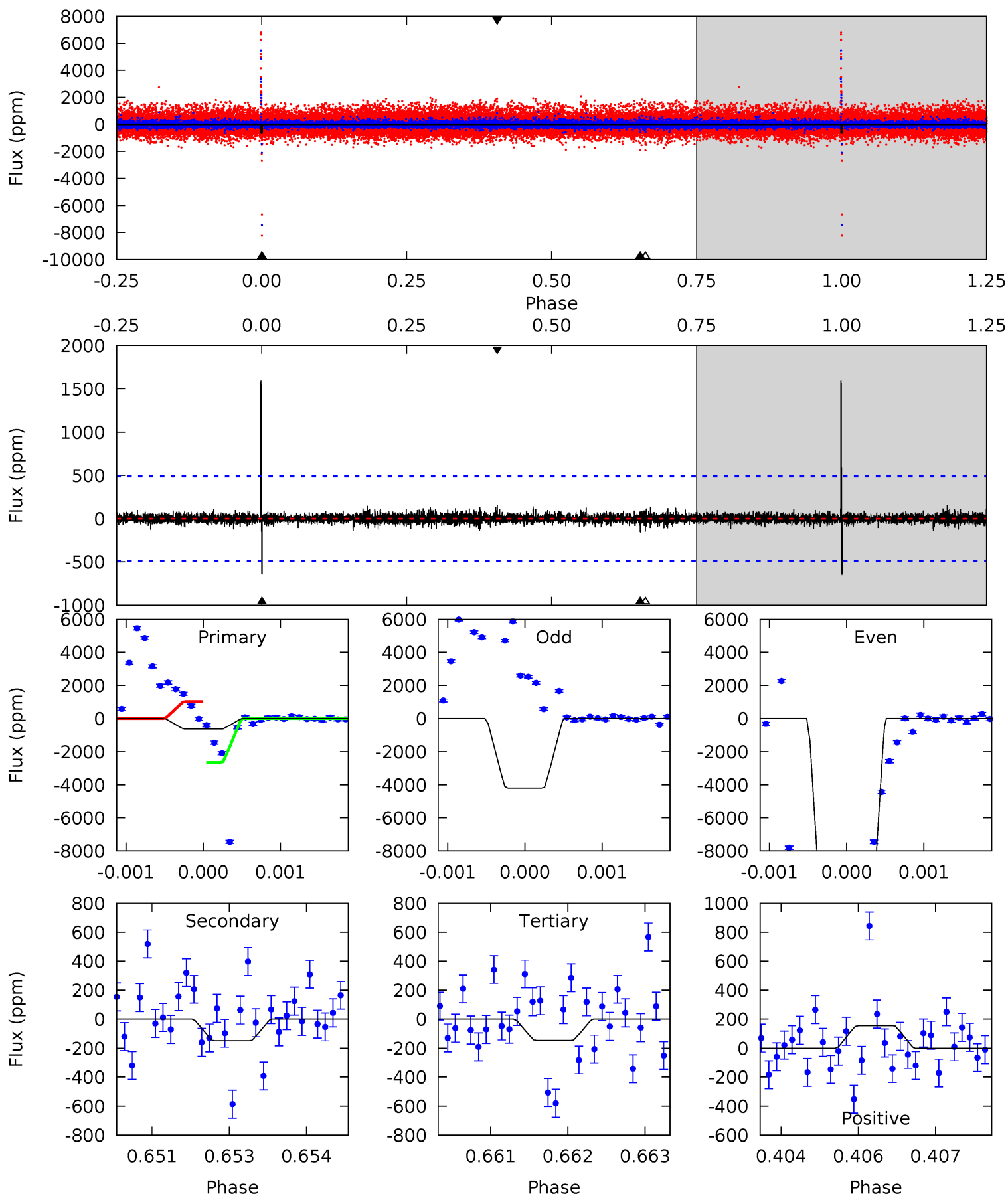
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.81	26.1	23.2	24.3	5.32	3.08	5.49	-13.4	-14.5	2.93	1.82	4.80	0.95	0.48	2.04



Alt Model-Shift Uniqueness Test

004774574-02, P = 352.485721 Days, E = 47.944809 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.06	1.65	1.62	1.72	5.40	3.21	0.42	5.43	5.34	0.02	-0.07	116.2	95.3	0.72	9.22



Stellar Parameters For KIC 004774574

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4508^{+143}_{-179}	$4.684^{+0.059}_{-0.027}$	$-0.820^{+0.300}_{-0.300}$	$0.559^{+0.044}_{-0.049}$	$0.551^{+0.053}_{-0.035}$	$4.436^{+1.119}_{-0.574}$
	+3%/-4%	+1%/-1%	+37%/-37%	+8%/-9%	+10%/-6%	+25%/-13%
Source	KIC0	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 004774574-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5474 ± 209	$2.87^{+0.42}_{-0.41}$	230^{+9}_{-10}	5413^{+437}_{-385}	237643^{+87840}_{-55761}
Alt.	-149 ± 90	$3.48^{+0.42}_{-0.44}$	231^{+9}_{-10}	2746^{+223}_{-311}	4420^{+3210}_{-2717}

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

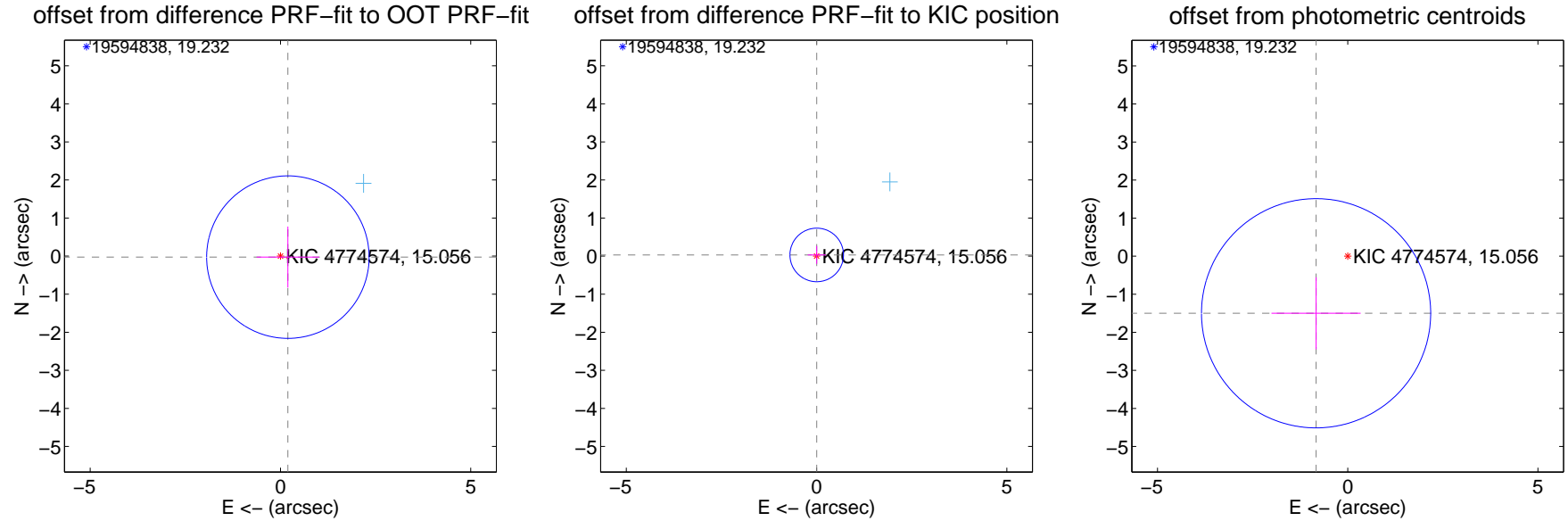
DV Centroid Data

Supplemental centroid analysis for 004774574-02. Kepler magnitude: 15.06. Transit SNR 4.95

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	0.197 ± 0.711	0.28	-0.195 ± 0.822	-0.026 ± 0.802
PRF-fit source offset from KIC position	0.032 ± 0.234	0.13	-0.004 ± 0.237	0.031 ± 0.234
photometric centroid source offset	1.71 ± 1.00	1.71	0.83 ± 1.17	-1.50 ± 0.95

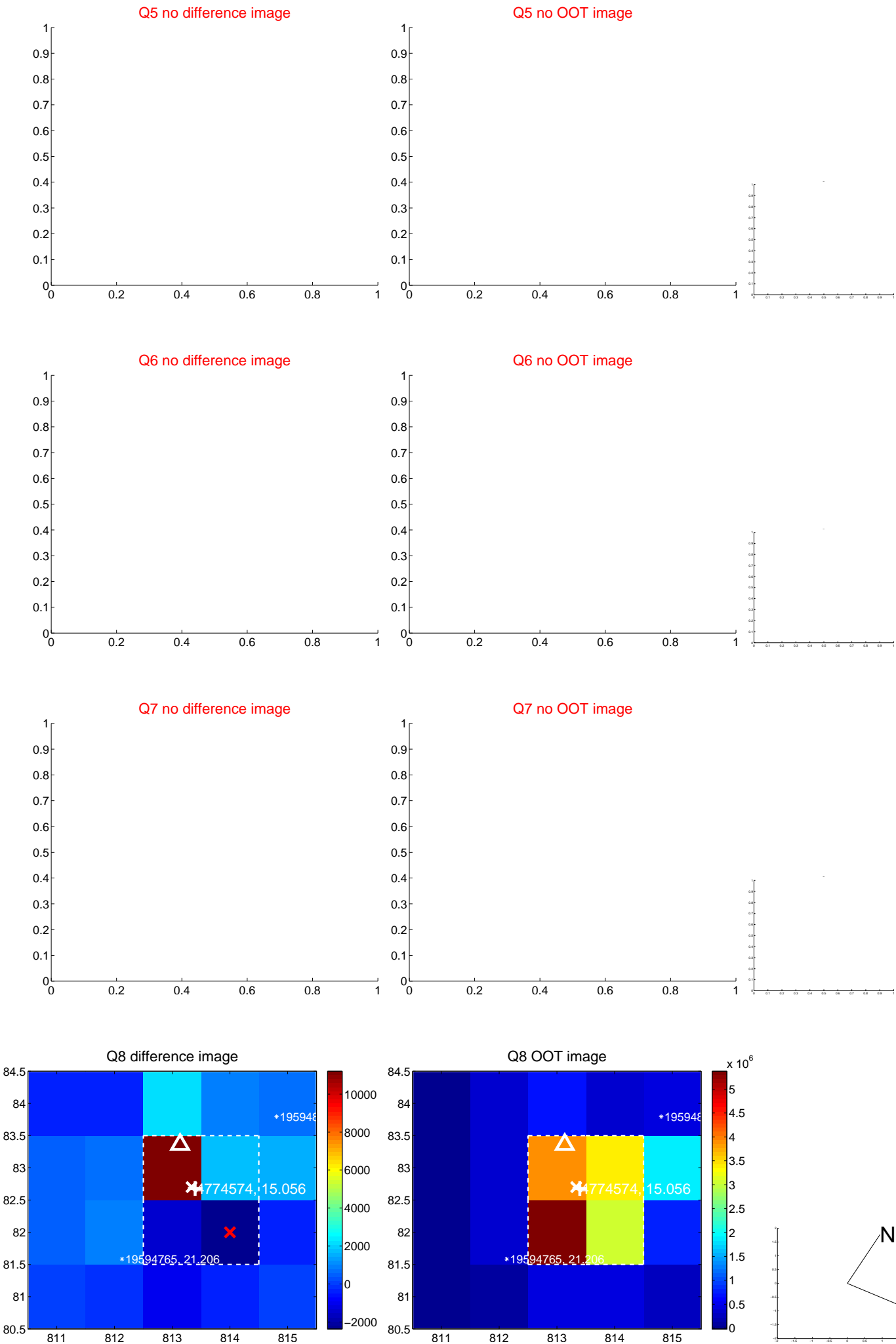


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

Q13 no difference image



Q13 no OOT image



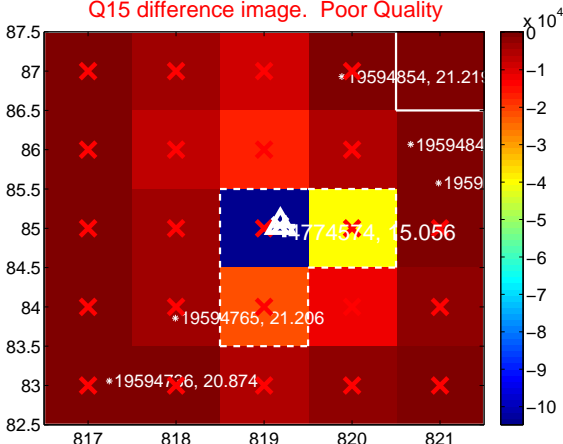
Q14 no difference image



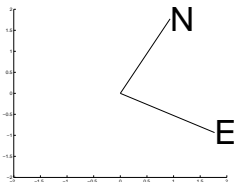
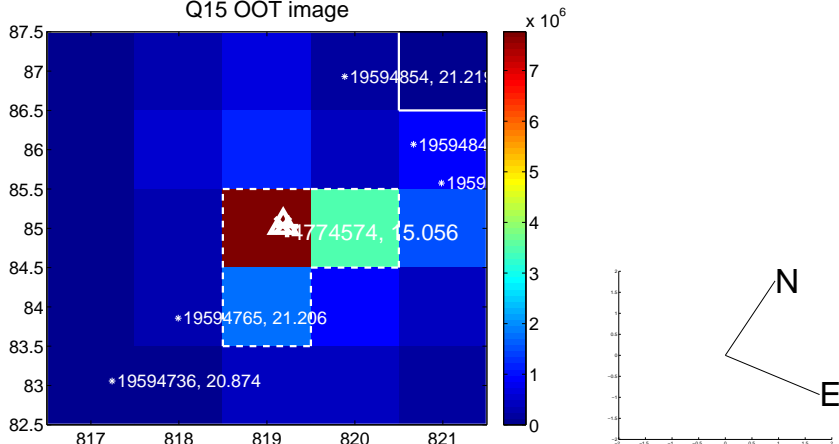
Q14 no OOT image



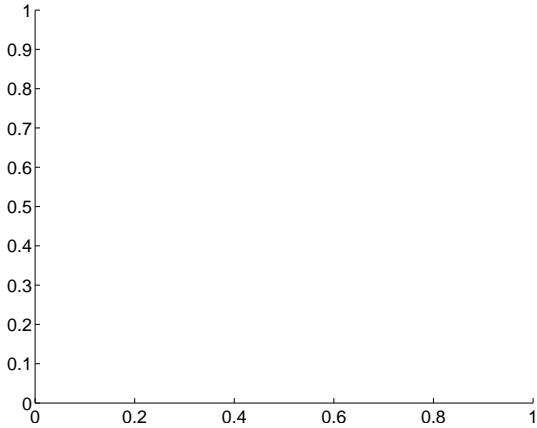
Q15 difference image. Poor Quality



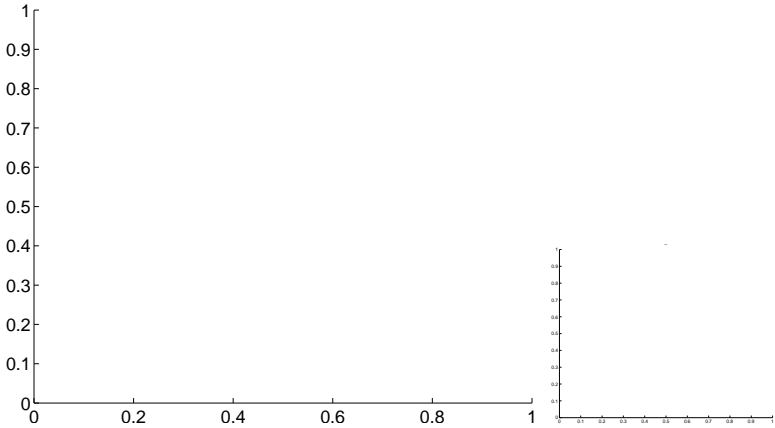
Q15 OOT image



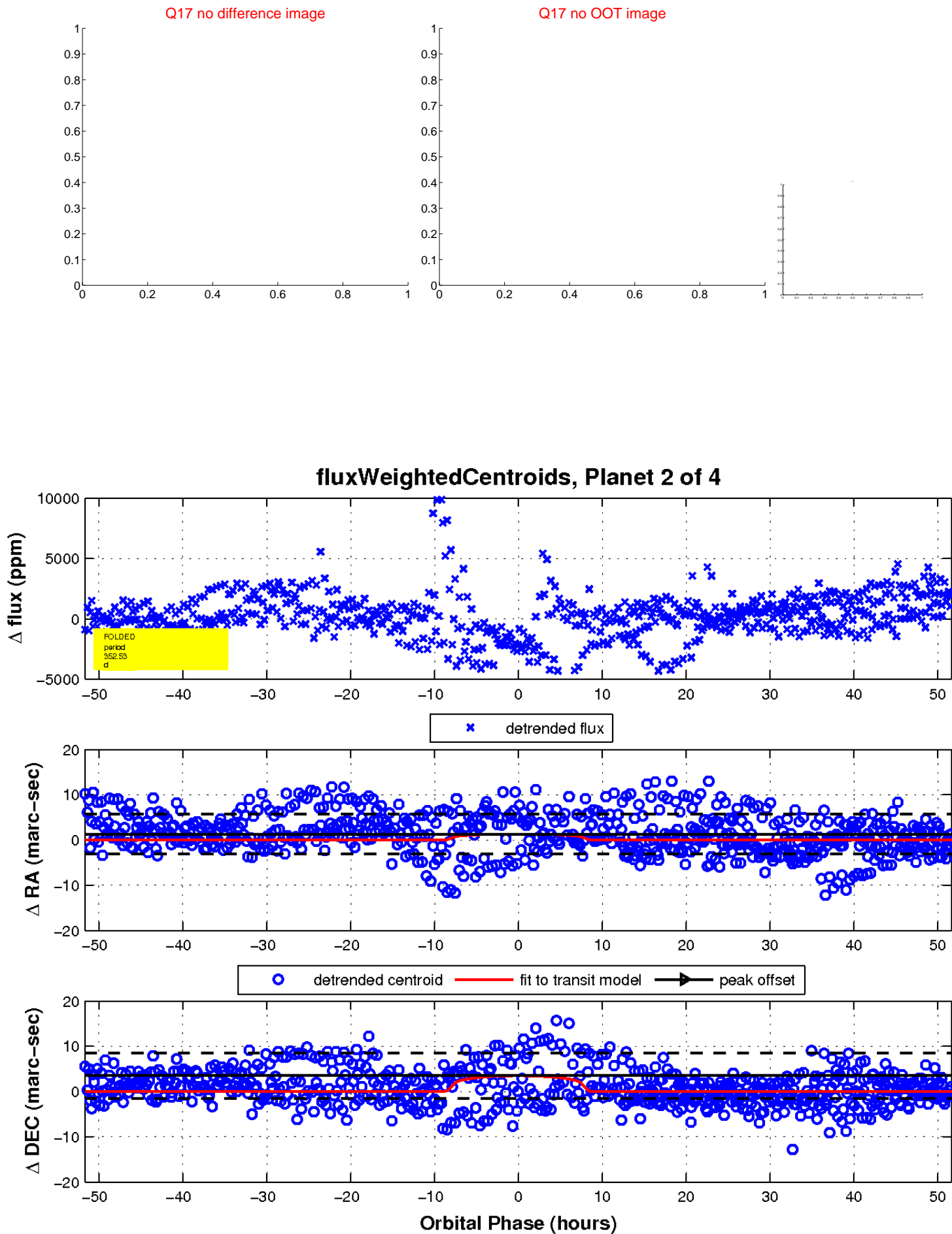
Q16 no difference image



Q16 no OOT image

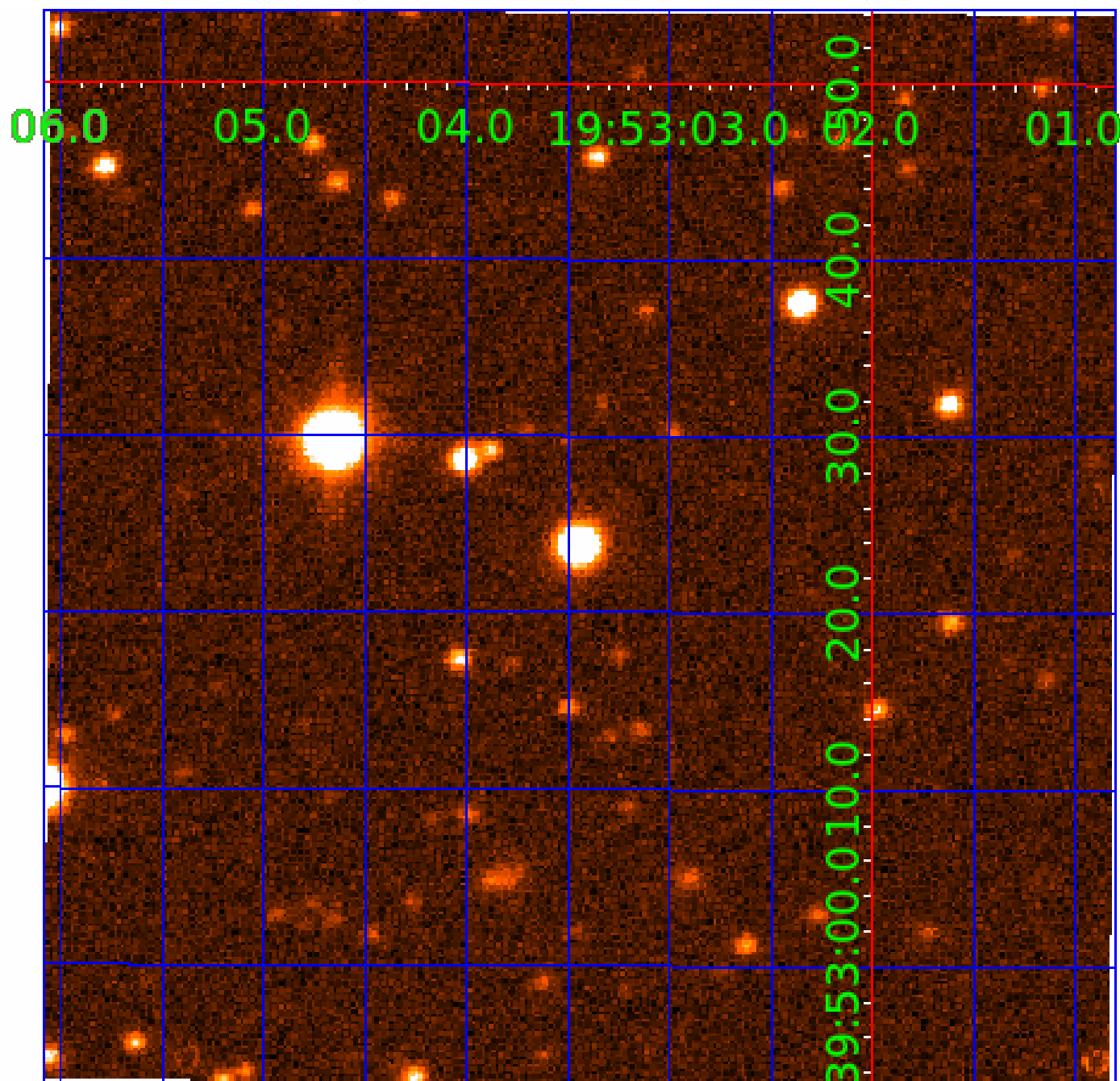


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004774574

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})
004774574-01	OBS	No	329.680447	252.628149	1792.1	2.199	13.5	7.4	0.56	4508	2.41	0.20
004774574-02	OBS	No	352.528396	400.311513	2449.4	17.247	15.1	4.9	0.56	4508	2.89	0.18
004774574-03	OBS	No	319.495140	272.867458	1792.2	3.095	13.5	6.9	0.56	4508	2.55	0.21
004774574-04	OBS	No	215.801831	344.355189	1354.1	2.642	10.0	6.6	0.56	4508	2.48	0.35

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004774574-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
004774574-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

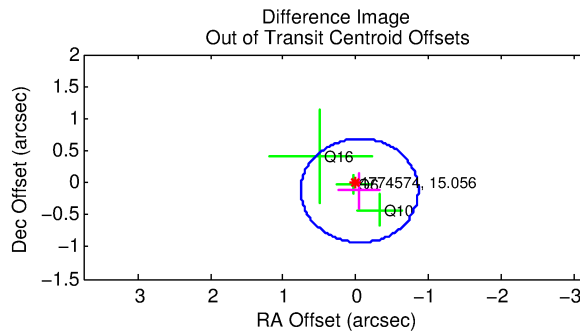
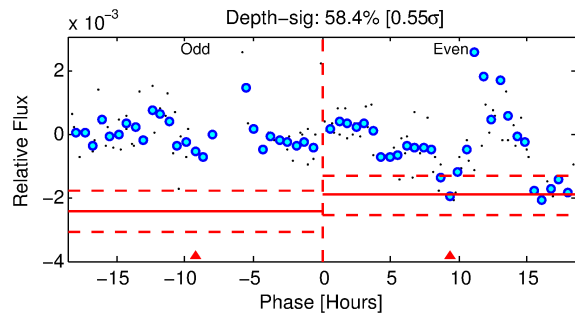
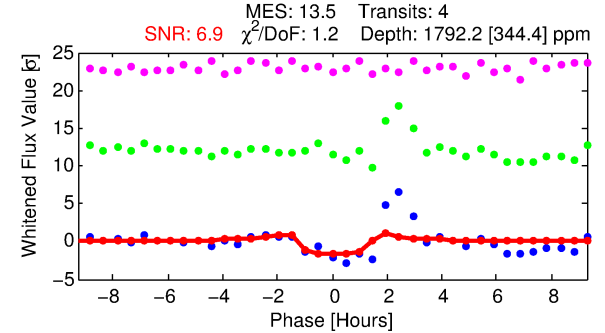
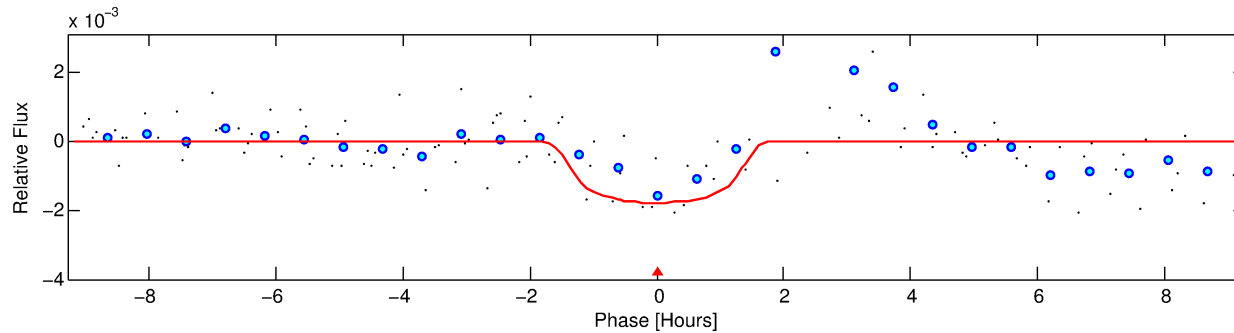
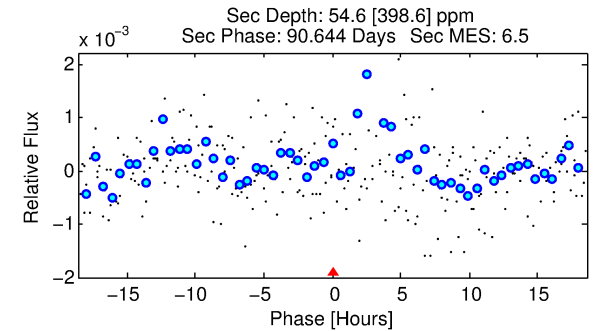
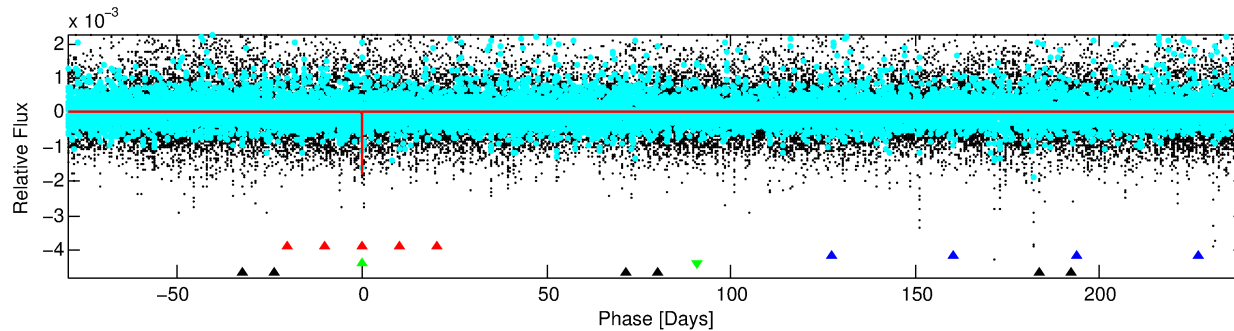
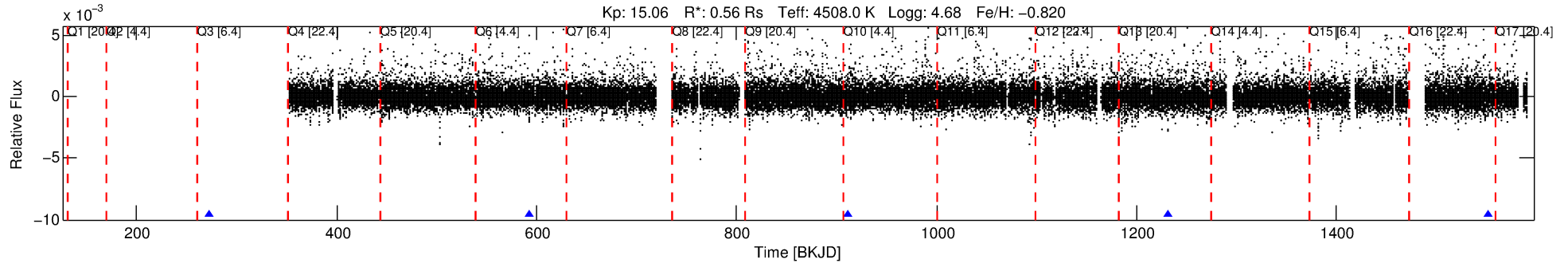
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004774574-03

No Significant Match Found

DV One-Page Summary

KIC: 4774574 Candidate: 3 of 4 Period: 319.495 d



DV Fit Results:

Period = 319.49514 [0.00349] d
Epoch = 272.8675 [0.0114] BKJD
Rp/R* = 0.0419 [0.0564]
a/R* = 589.38 [2700.16]
b = 0.73 [3.06]
Seff = 0.21 [0.04]
Teq = 172 [8] K
Rp = 2.55 [3.45] Re
a = 0.7498 [0.0554] AU
Ag = 2590.09 [20163.05] [0.13σ]
Teffp = 1894 [3686] K [0.47σ]

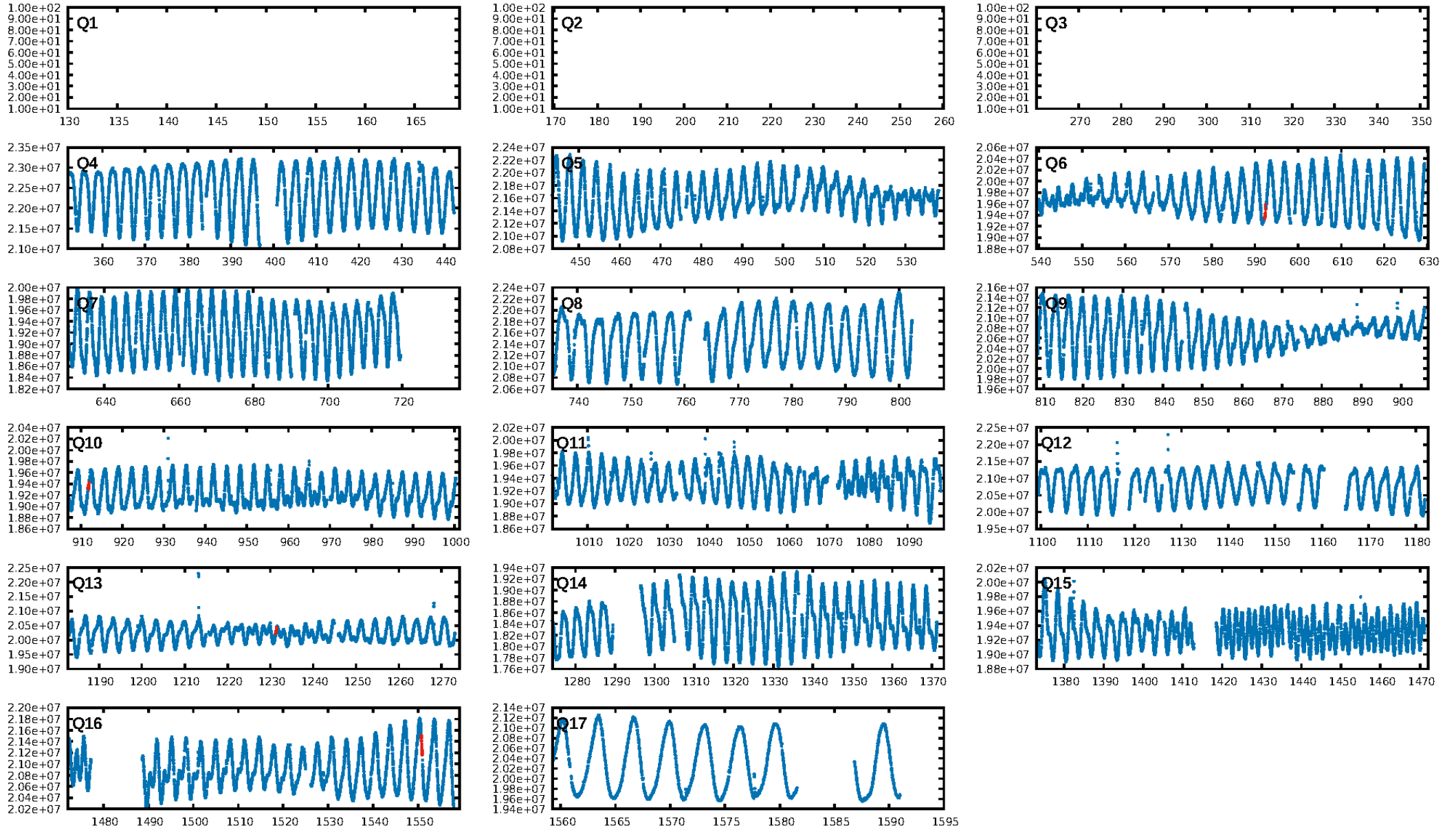
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [611.55σ]
LongPeriod-sig: 100.0% [64.38σ]
ModelChiSquare2-sig: 43.3%
ModelChiSquareGof-sig: 87.1%
Bootstrap-pfa: 1.15e-12
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.838
Centroid-sig: 32.2%
Centroid-so: 0.452 arcsec [0.39σ]
OotOffset-rm: 0.134 arcsec [0.50σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-rm: 0.086 arcsec [0.31σ]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.75 [3/4]

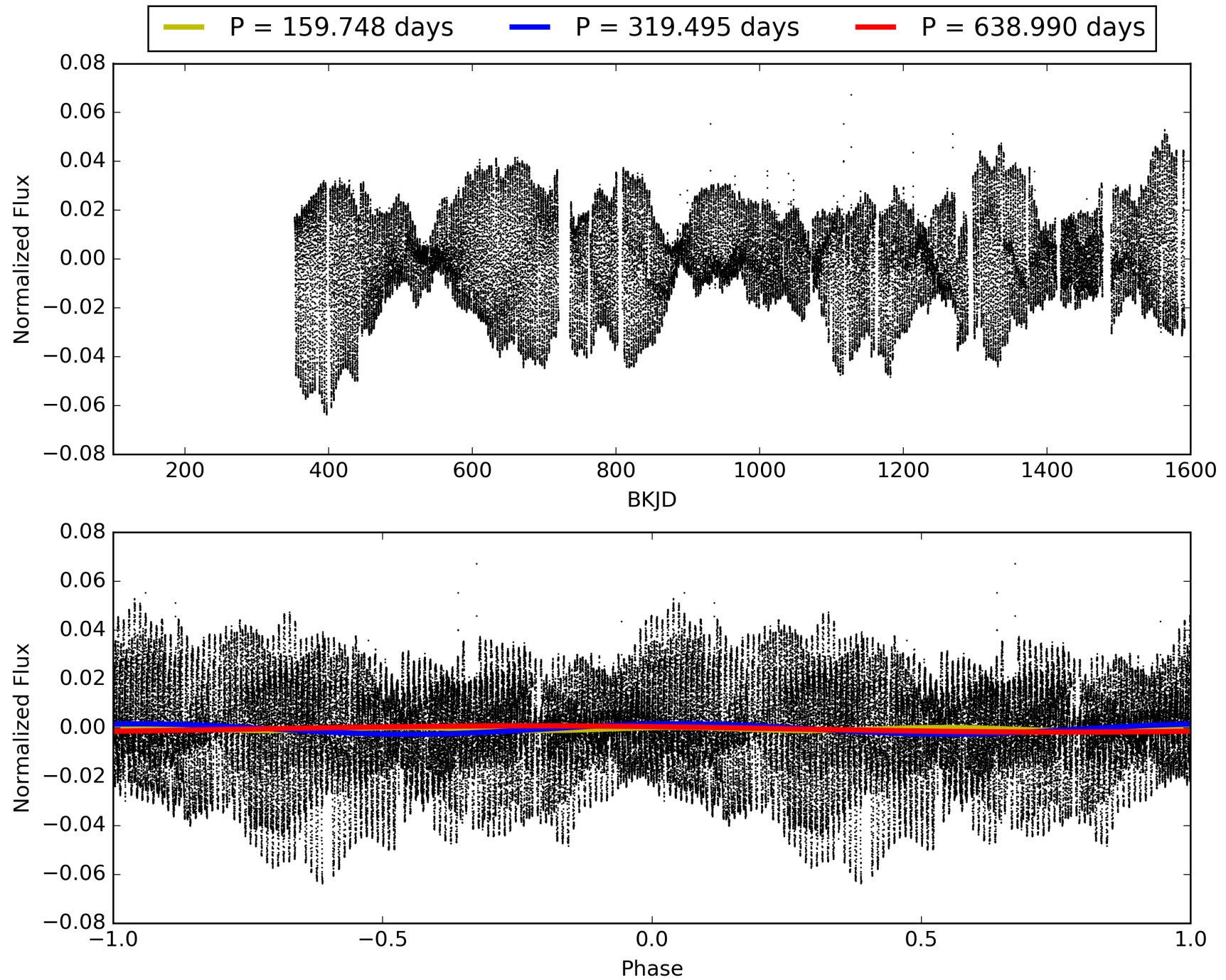
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:13:17 Z

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

TCE 004774574-03, PDC Light Curves

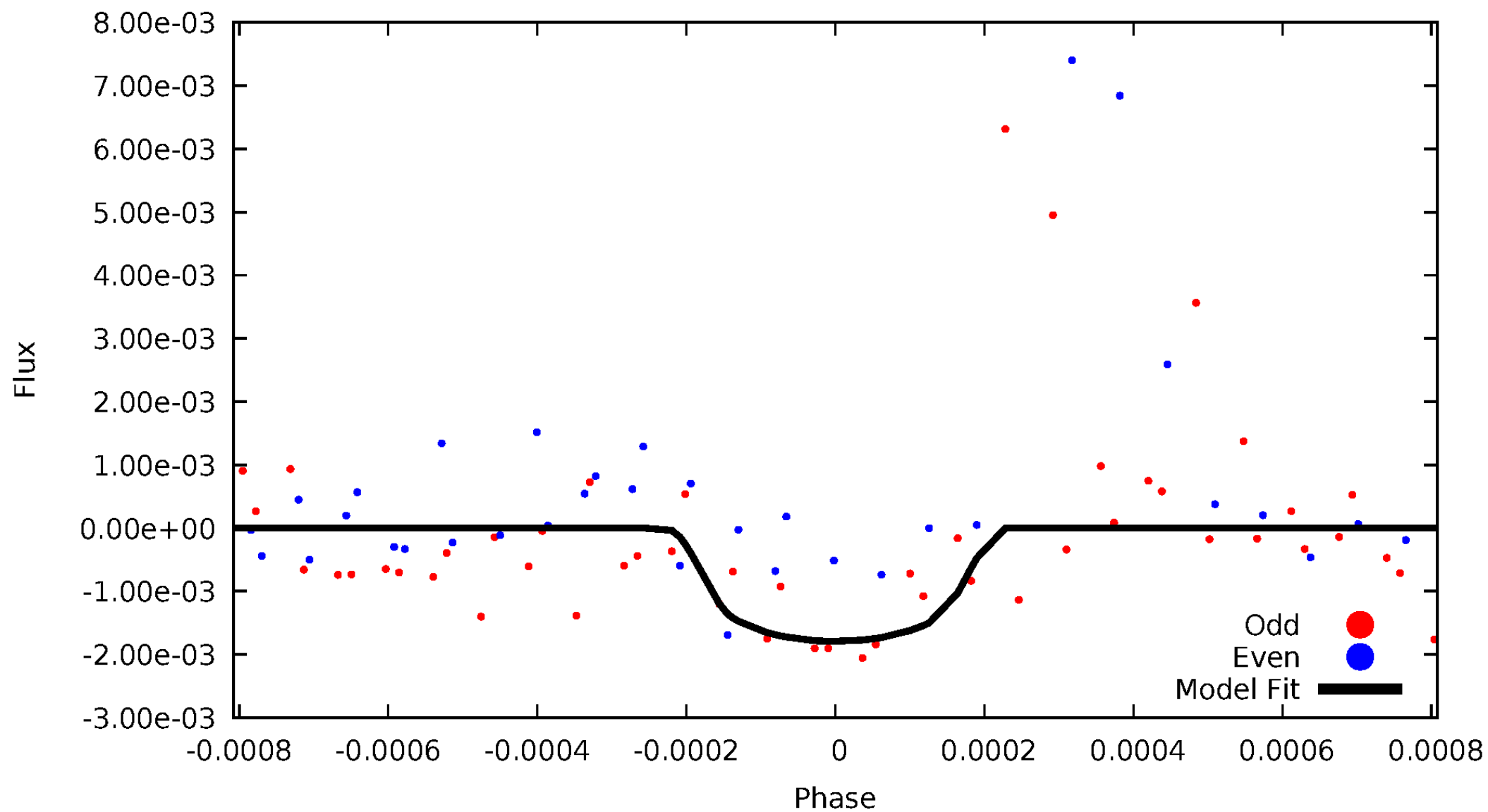


TCE 004774574-03



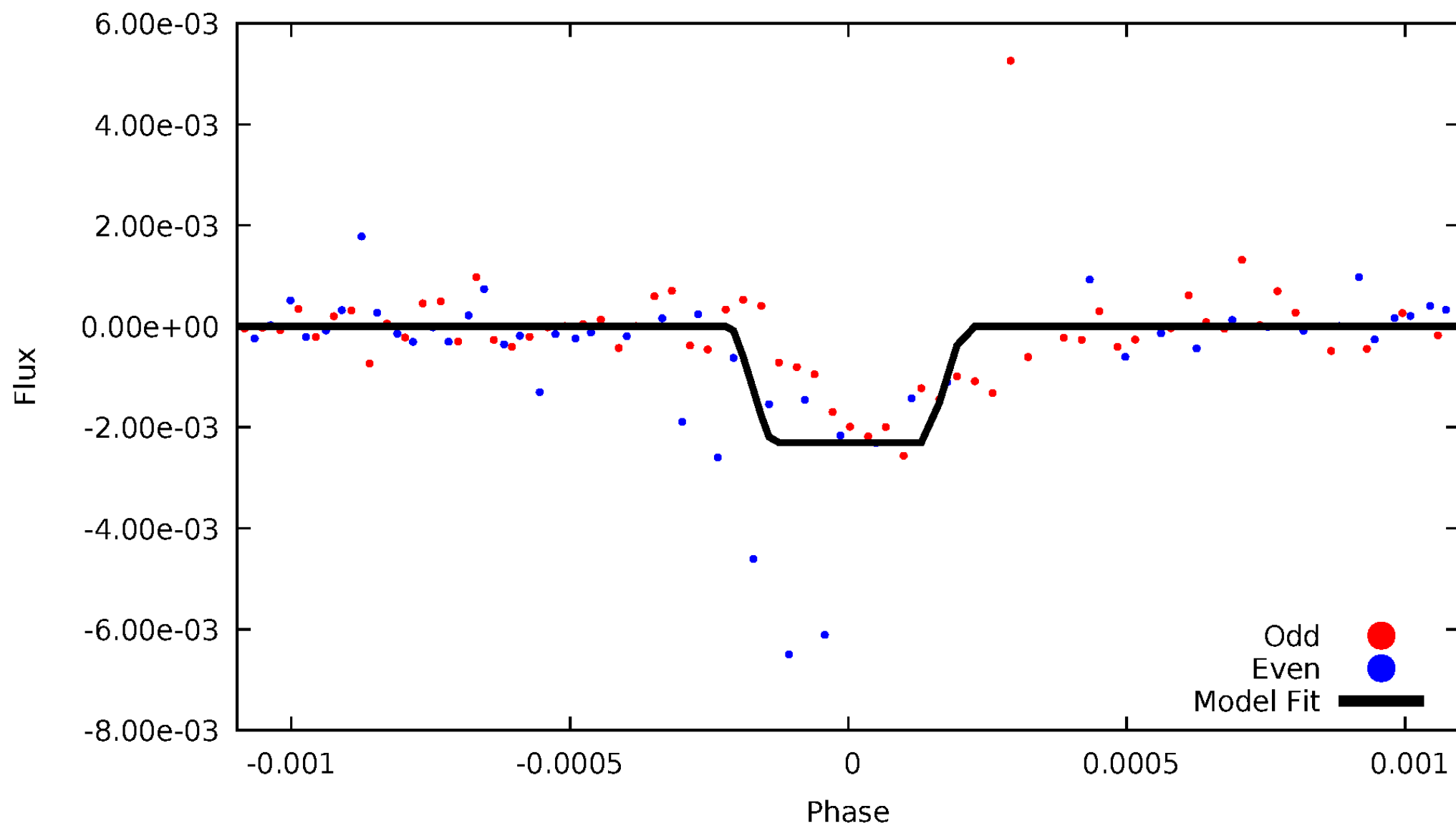
DV Odd/Even

TCE 004774574-03



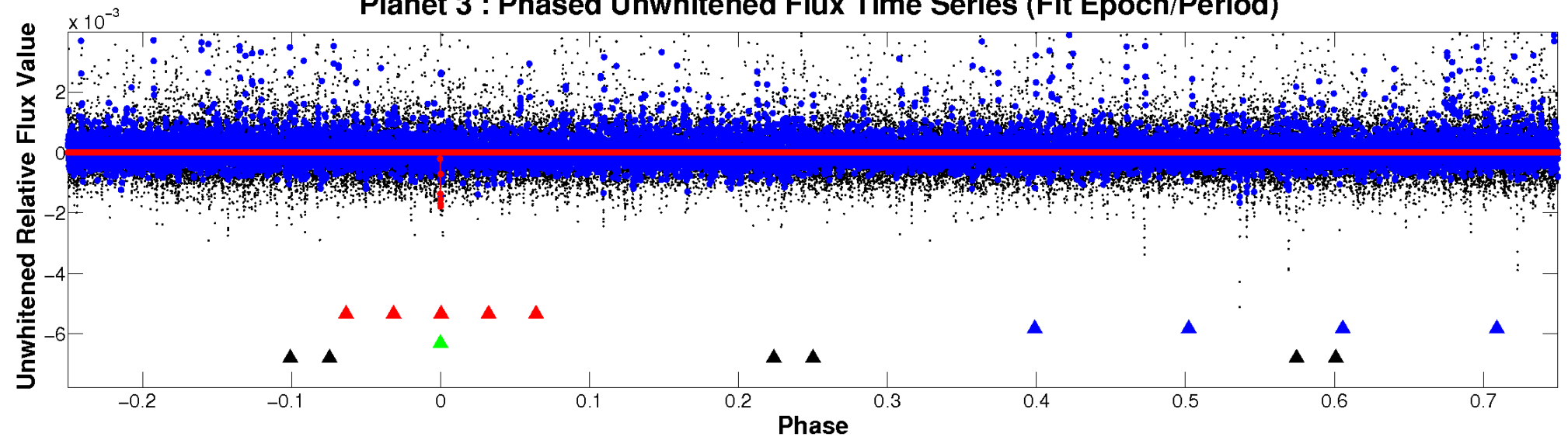
ALT Odd/Even

TCE 004774574-03

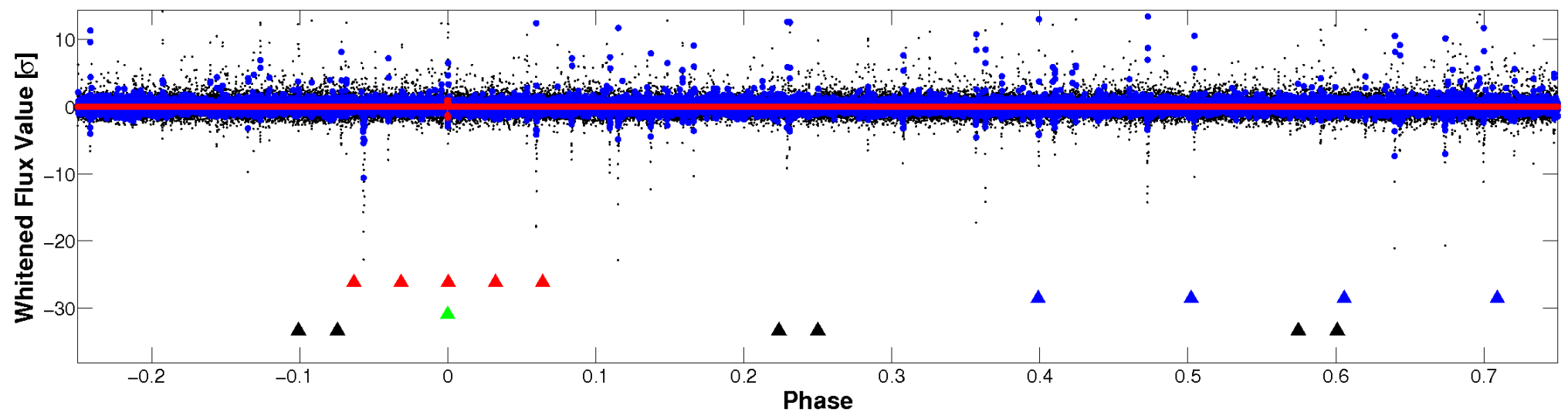


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

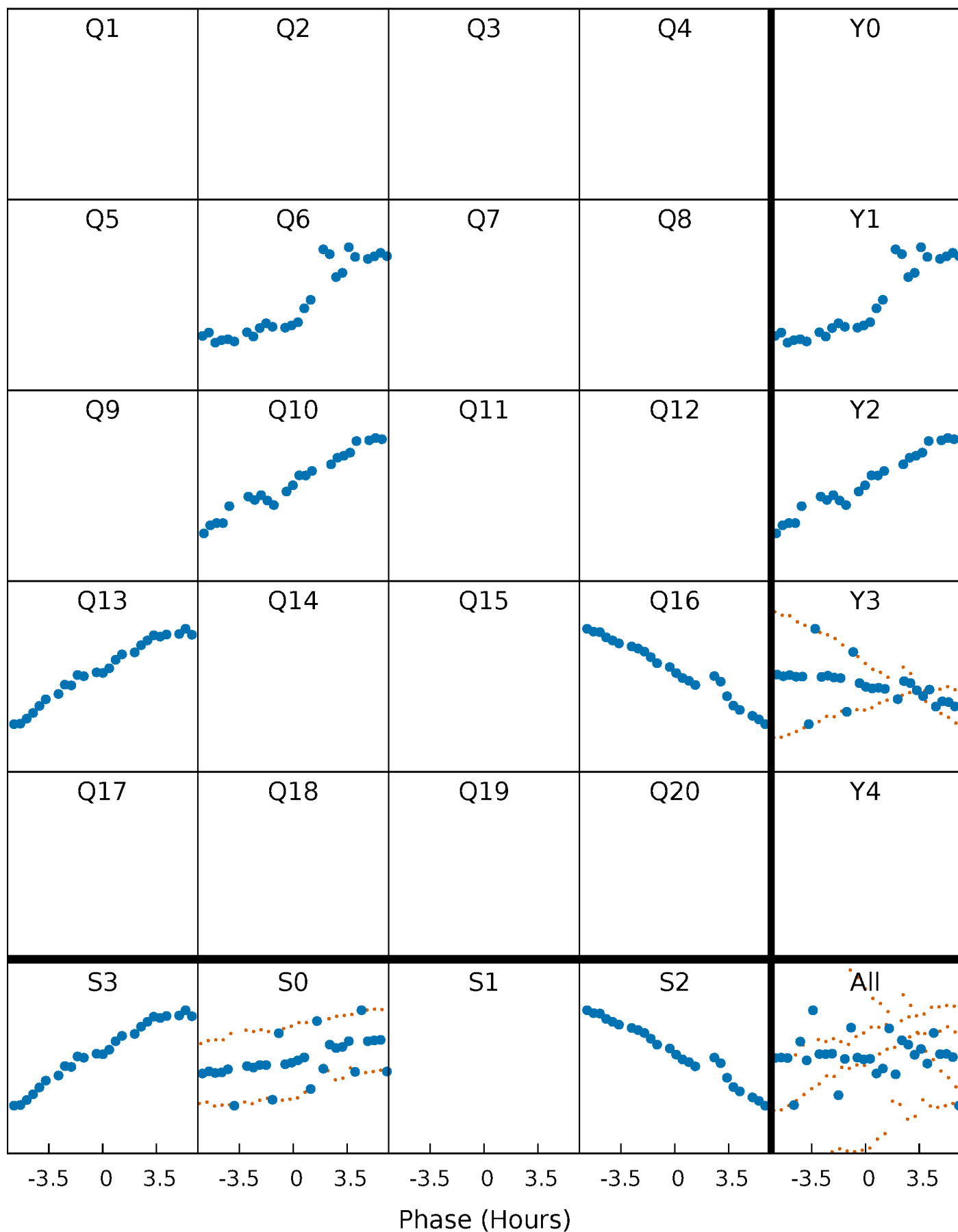


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



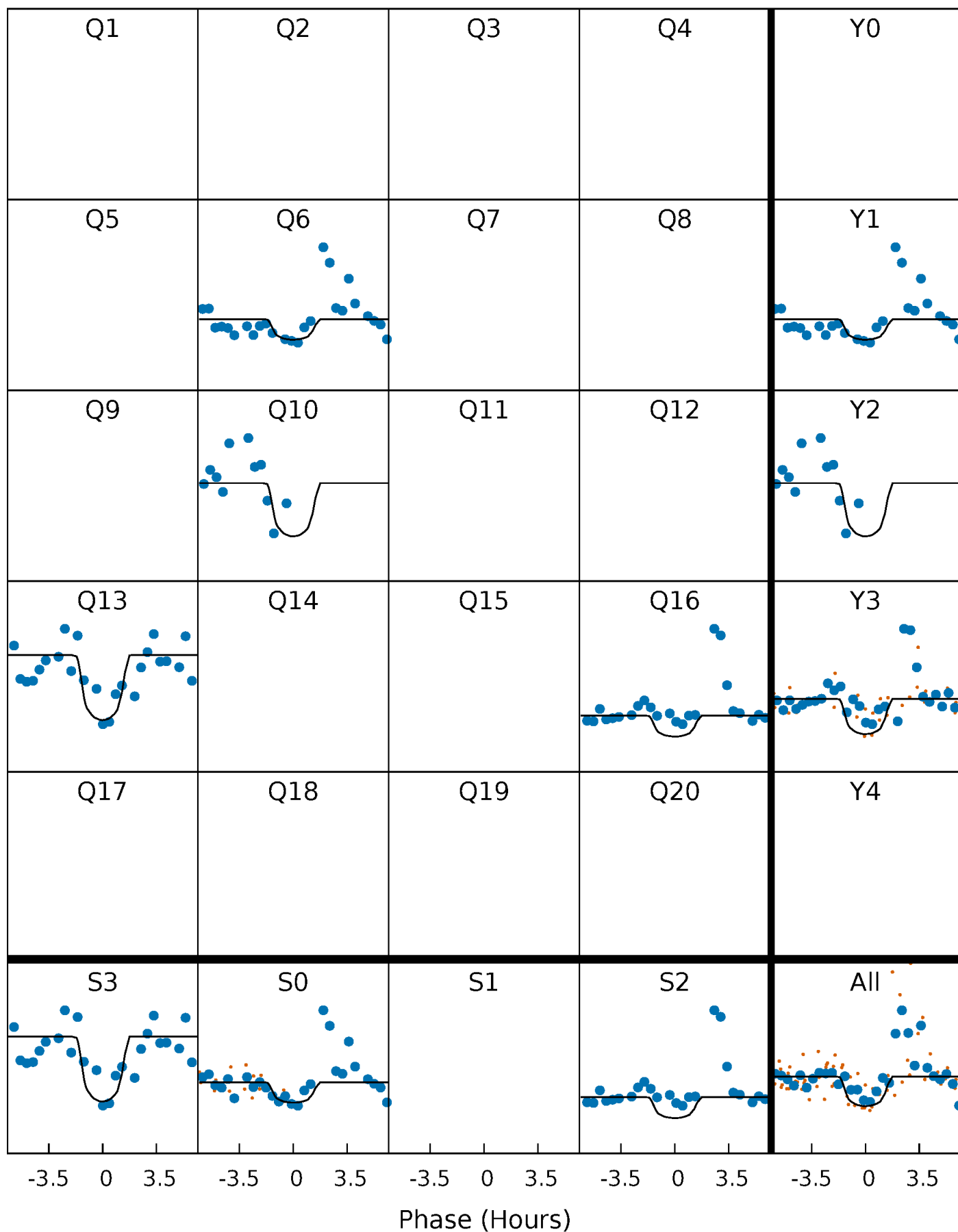
PDC Quarter-Phased Transit Curves

TCE 004774574-03 $P=319.495140$ Days $T_0=272.867458$ (BKJD)



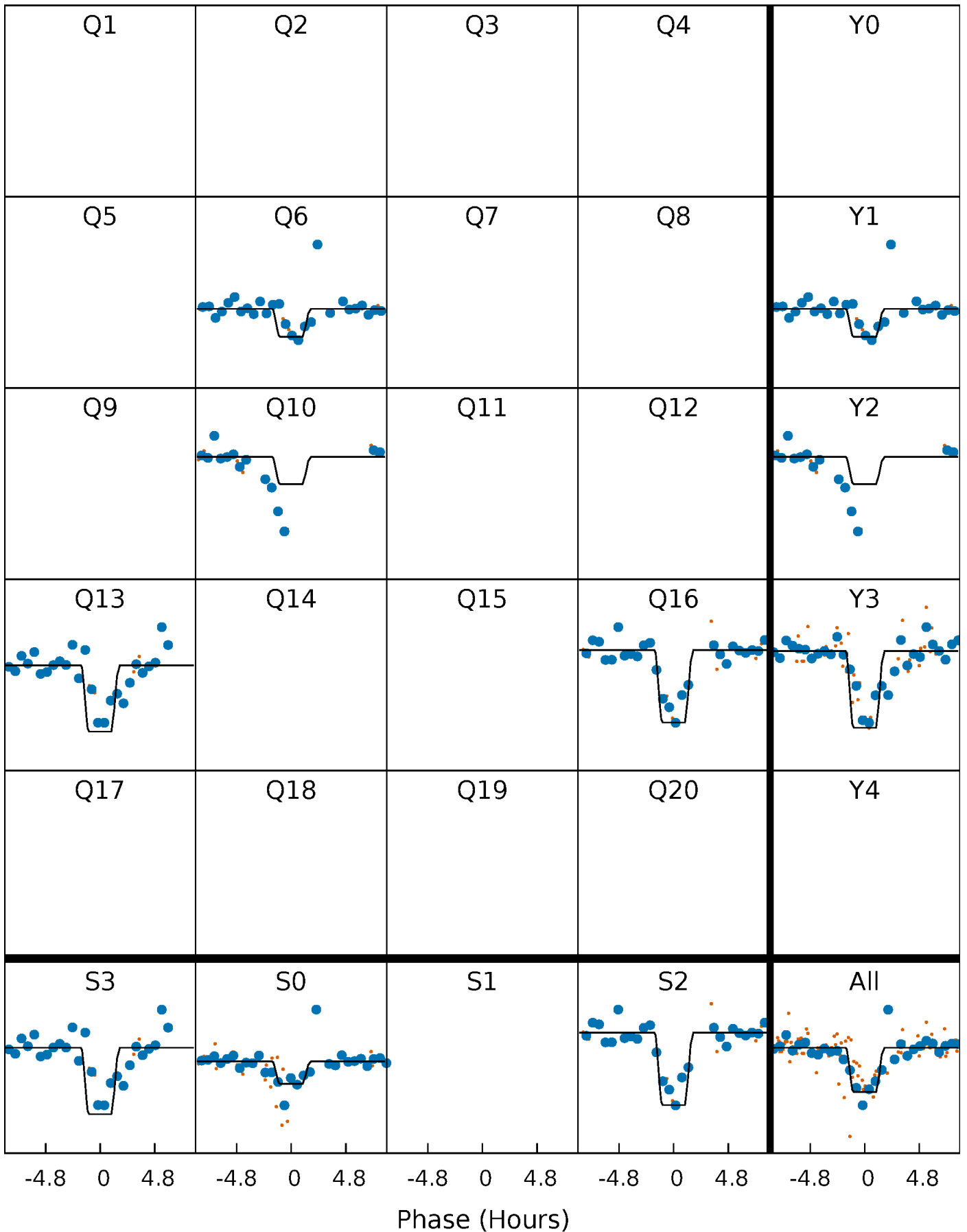
DV Quarter-Phased Transit Curves

TCE 004774574-03 $P=319.495140$ Days $T_0=272.867458$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

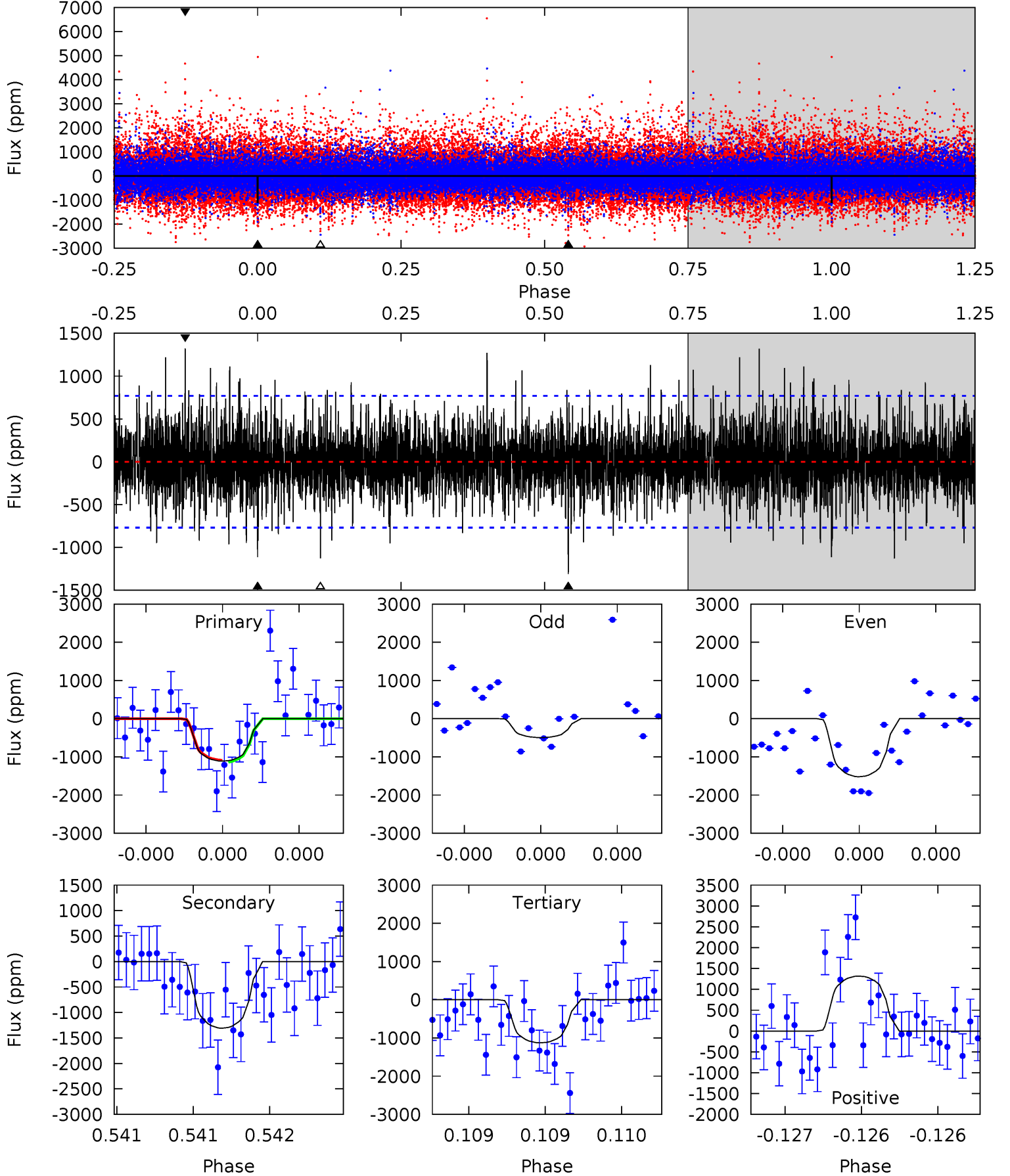
TCE 004774574-03 P=319.503176 Days $T_0=272.839232$ (BKJD)



DV Model-Shift Uniqueness Test

004774574-03, P = 319.495140 Days, E = 272.867458 Days

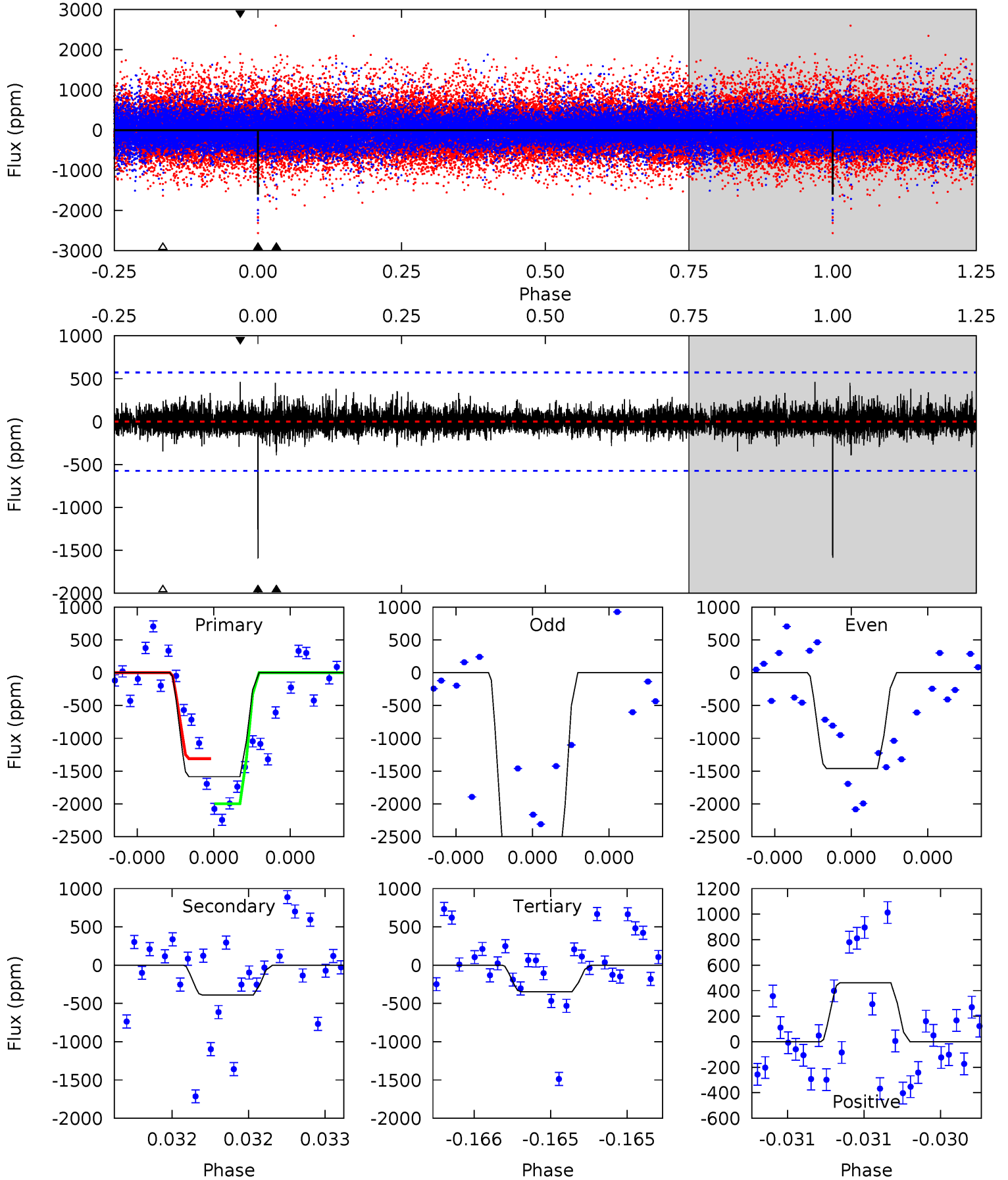
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.08	9.51	8.19	9.58	5.59	3.50	1.92	-0.11	-1.50	1.32	-0.07	3.17	0.83	0.50	0.17



Alt Model-Shift Uniqueness Test

004774574-03, P = 319.503176 Days, E = 272.839232 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	3.83	3.39	4.53	5.62	3.55	0.76	12.1	11.0	0.43	-0.70	7.81	1.67	0.23	3.25



Stellar Parameters For KIC 004774574

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4508^{+143}_{-179}	$4.684^{+0.059}_{-0.027}$	$-0.820^{+0.300}_{-0.300}$	$0.559^{+0.044}_{-0.049}$	$0.551^{+0.053}_{-0.035}$	$4.436^{+1.119}_{-0.574}$
	+3%/-4%	+1%/-1%	+37%/-37%	+8%/-9%	+10%/-6%	+25%/-13%
Source	KIC0	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 004774574-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1309 ± 138	$3.58^{+3.10}_{-2.49}$	238^{+9}_{-10}	3782^{+2372}_{-698}	$32559^{+297995}_{-23495}$
Alt.	-390 ± 102	$3.87^{+2.66}_{-2.51}$	238^{+10}_{-9}	3051^{+1171}_{-442}	8132^{+57065}_{-5595}

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

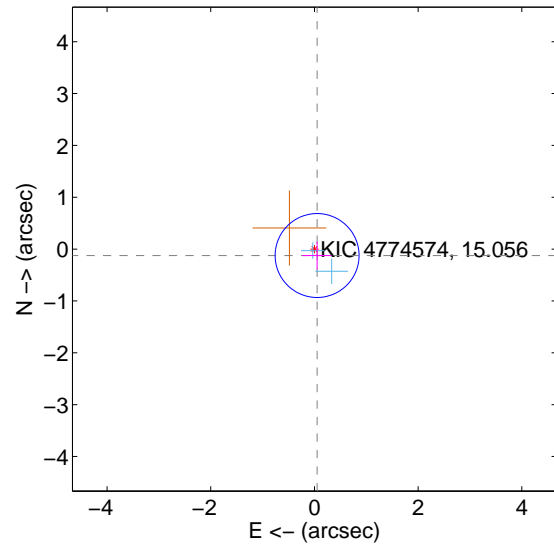
Supplemental centroid analysis for 004774574-03. Kepler magnitude: 15.06. Transit SNR 6.93

There are 2 quarters with good PRF difference image offsets

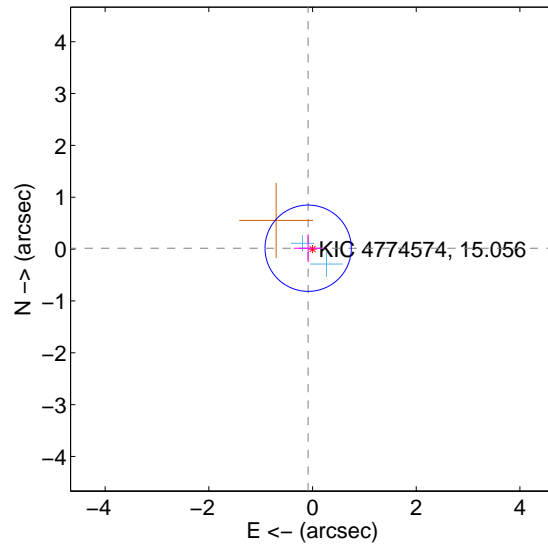
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.134 ± 0.270	0.50	-0.051 ± 0.278	-0.124 ± 0.268
PRF-fit source offset from KIC position	0.086 ± 0.277	0.31	0.084 ± 0.278	0.017 ± 0.268
photometric centroid source offset	0.45 ± 1.15	0.39	0.35 ± 1.18	-0.29 ± 1.10

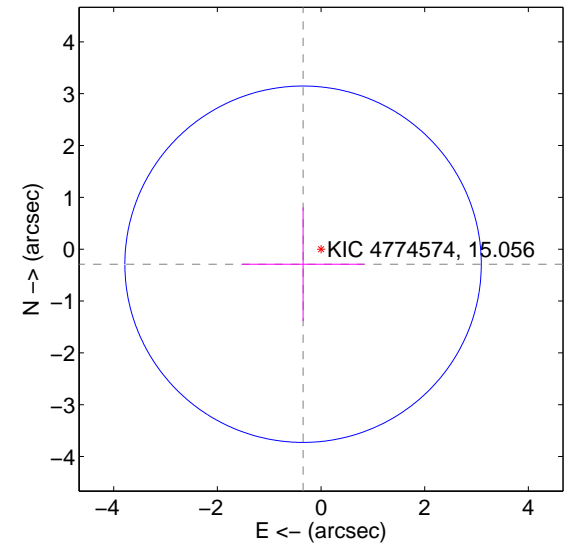
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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



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

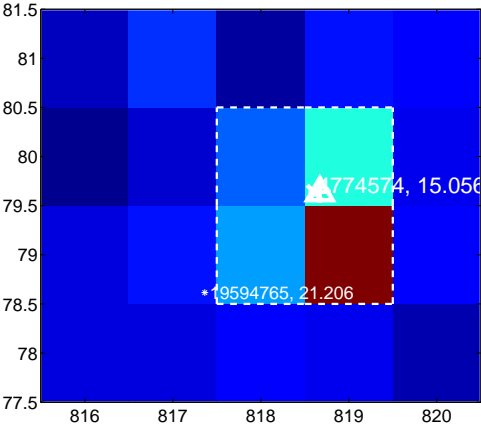
Q5 no difference image



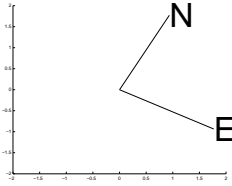
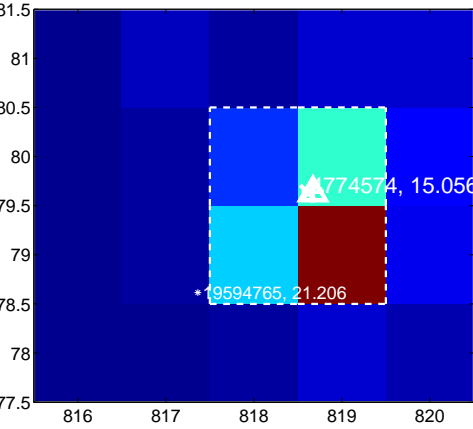
Q5 no OOT image



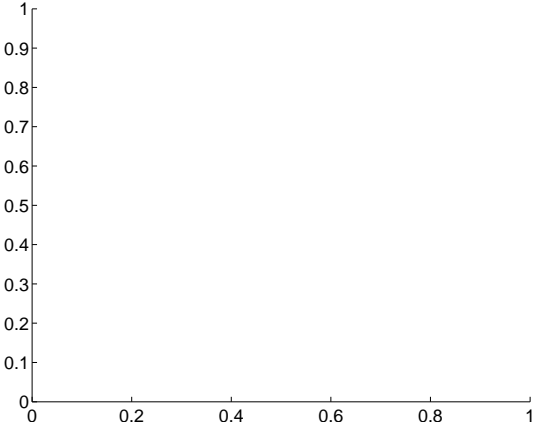
Q6 difference image



Q6 OOT image



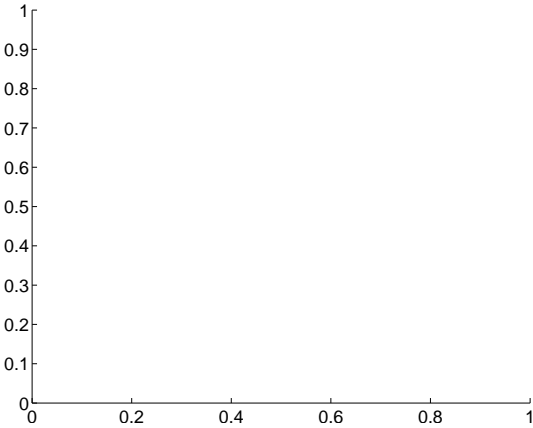
Q7 no difference image



Q7 no OOT image



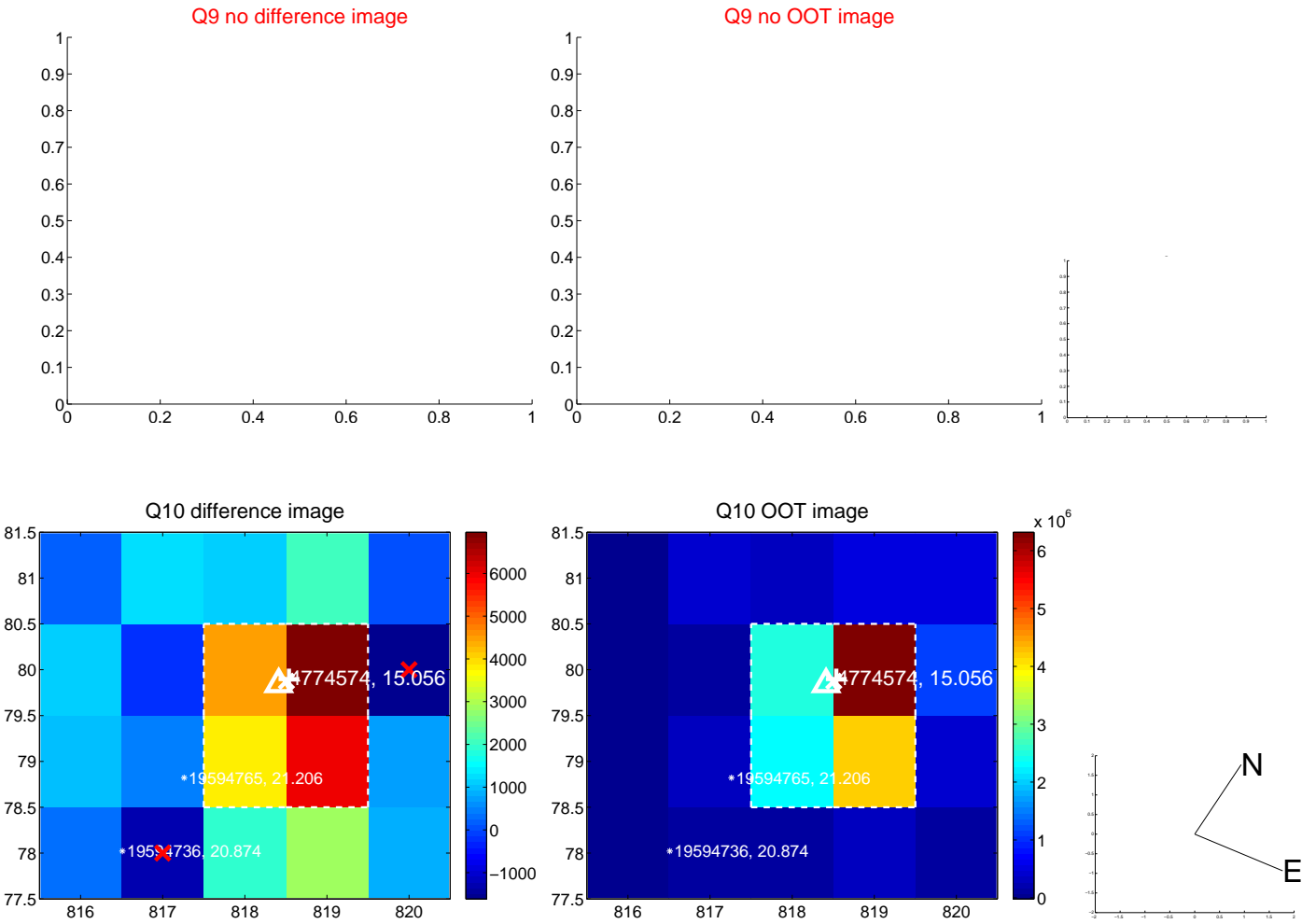
Q8 no difference image



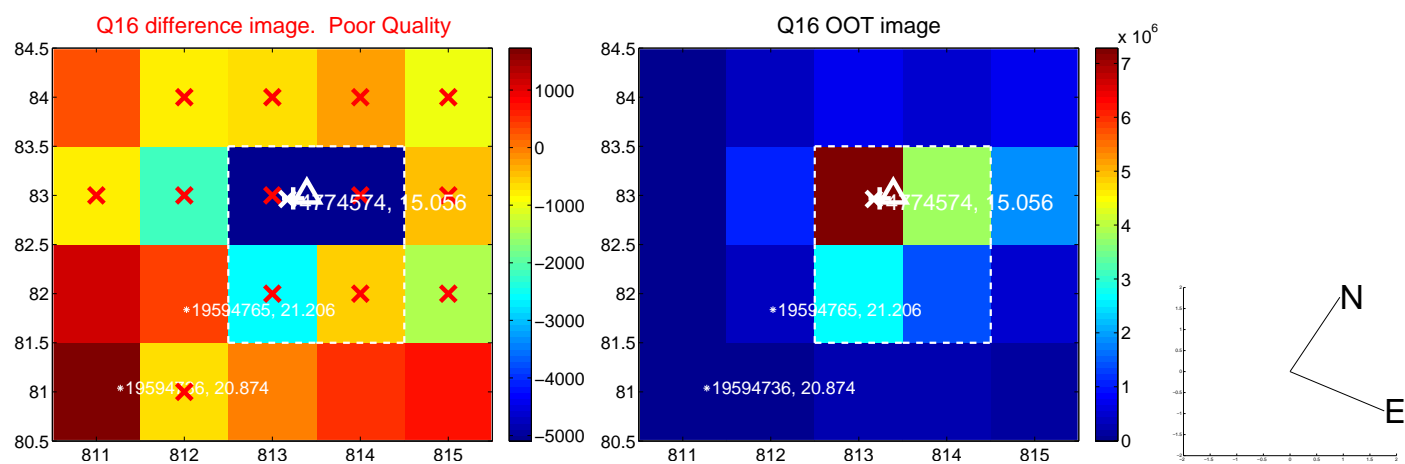
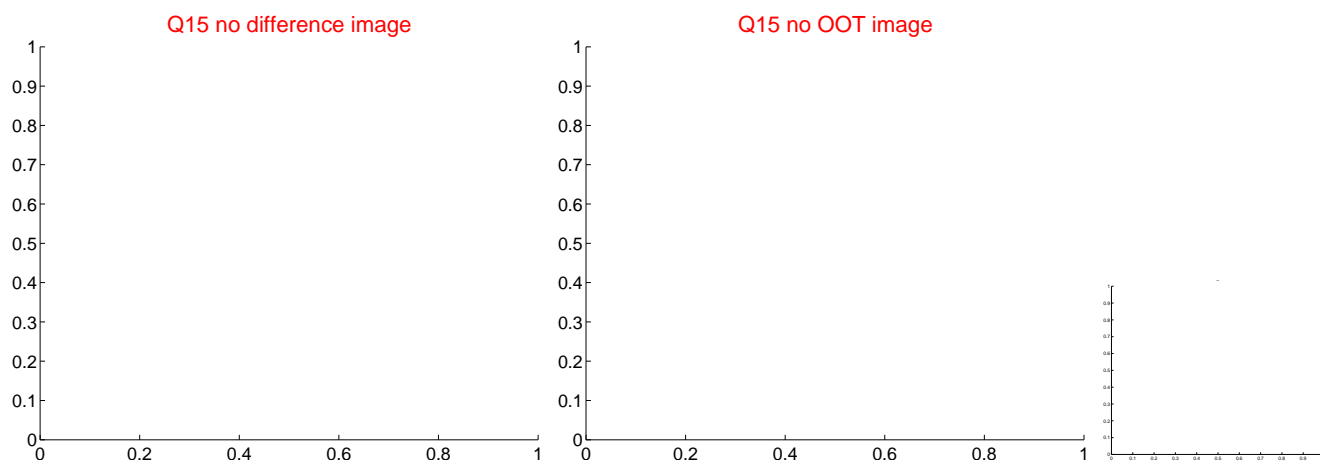
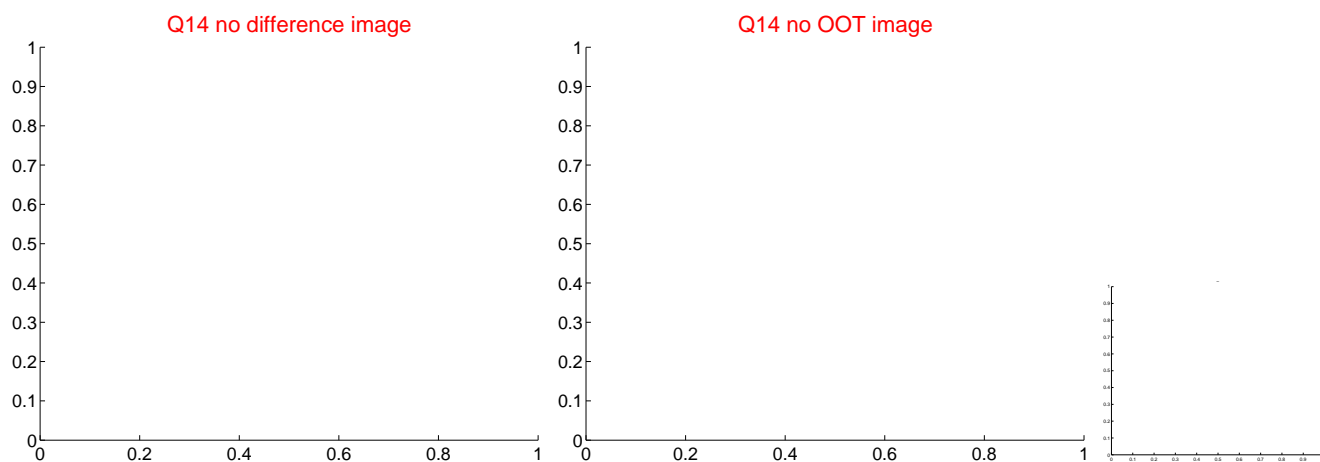
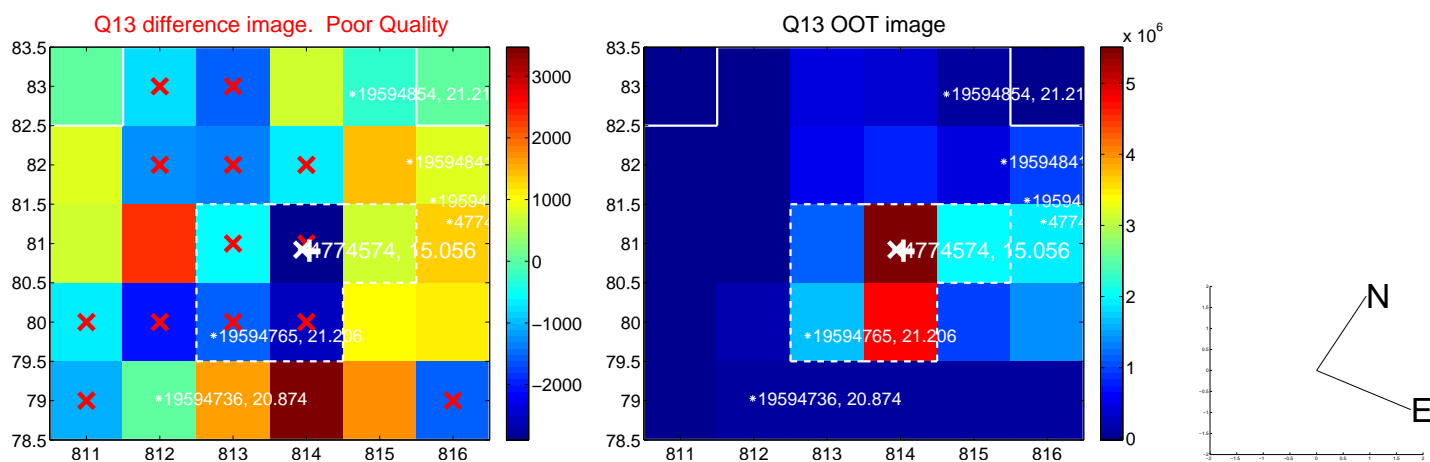
Q8 no OOT image



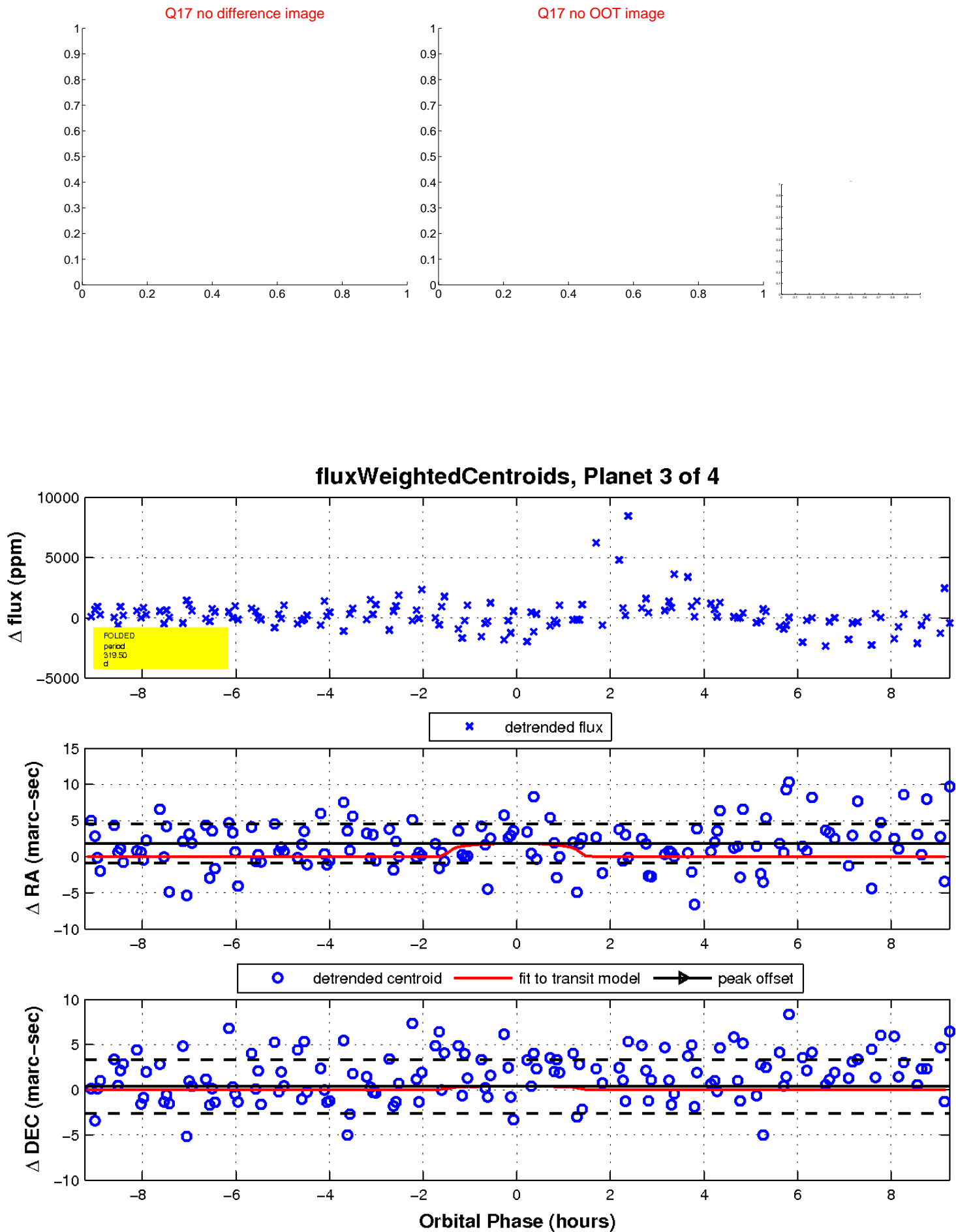
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

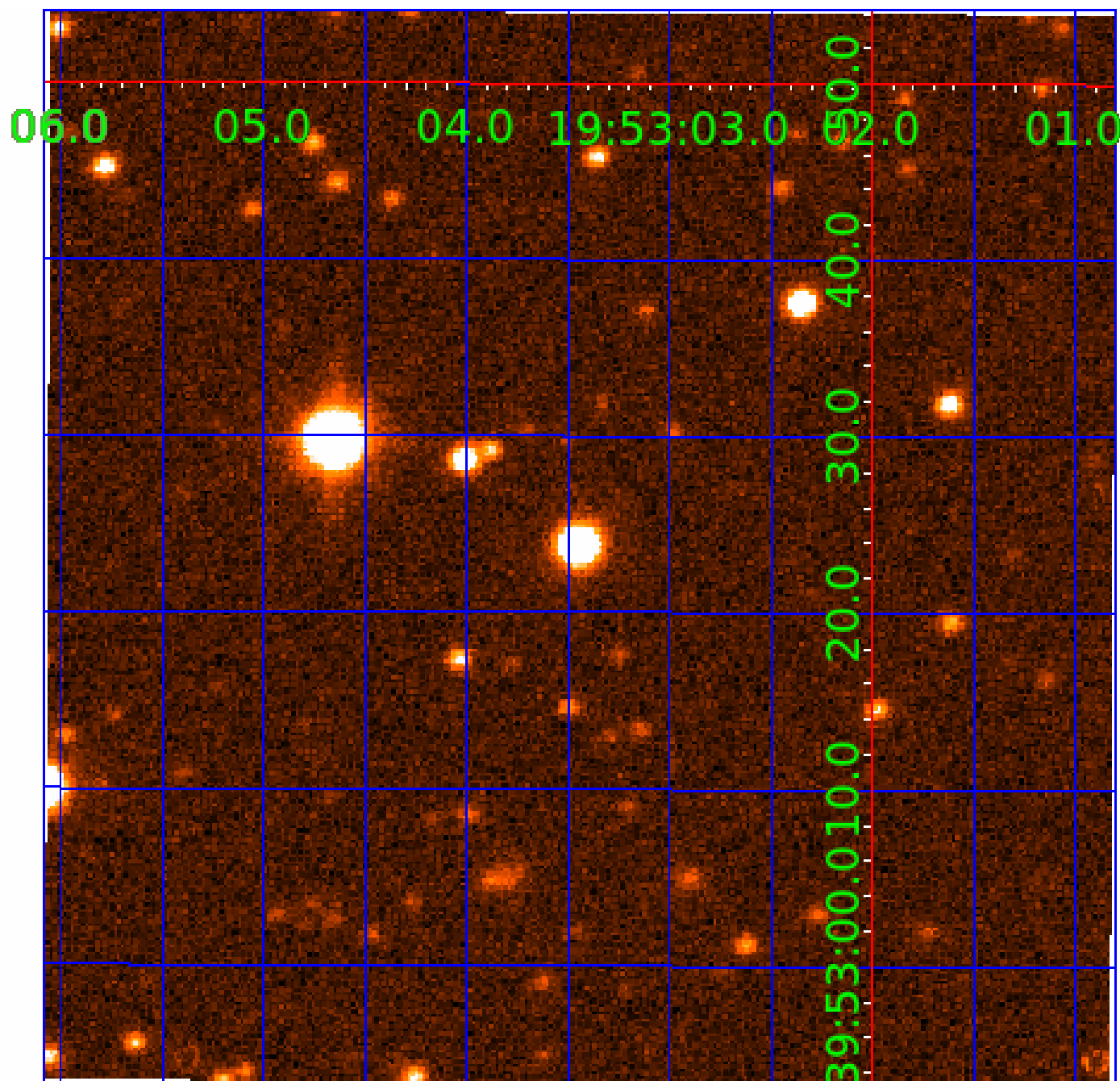


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004774574

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})
004774574-01	OBS	No	329.680447	252.628149	1792.1	2.199	13.5	7.4	0.56	4508	2.41	0.20
004774574-02	OBS	No	352.528396	400.311513	2449.4	17.247	15.1	4.9	0.56	4508	2.89	0.18
004774574-03	OBS	No	319.495140	272.867458	1792.2	3.095	13.5	6.9	0.56	4508	2.55	0.21
004774574-04	OBS	No	215.801831	344.355189	1354.1	2.642	10.0	6.6	0.56	4508	2.48	0.35

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004774574-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
004774574-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004774574-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

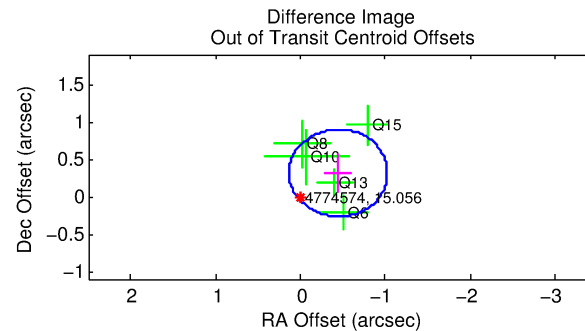
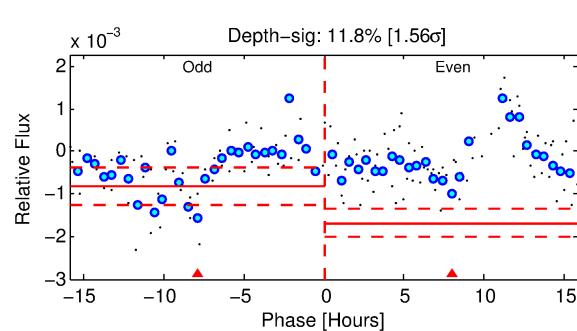
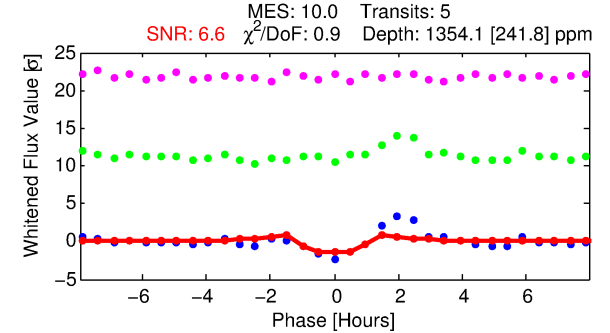
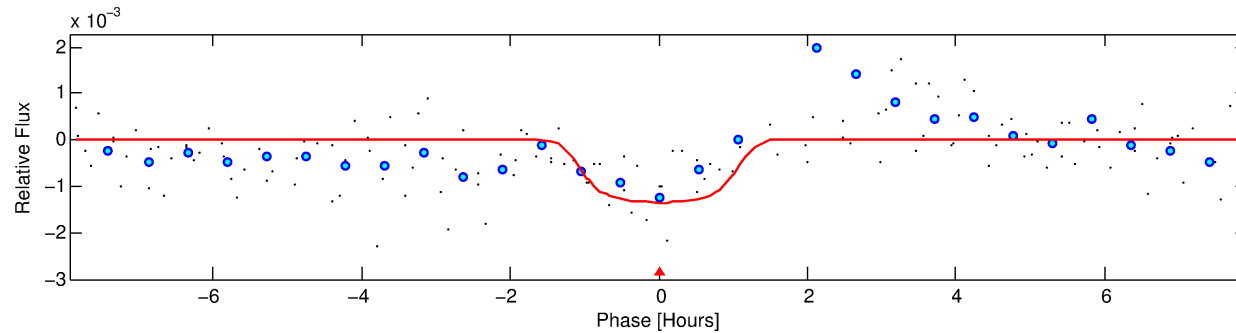
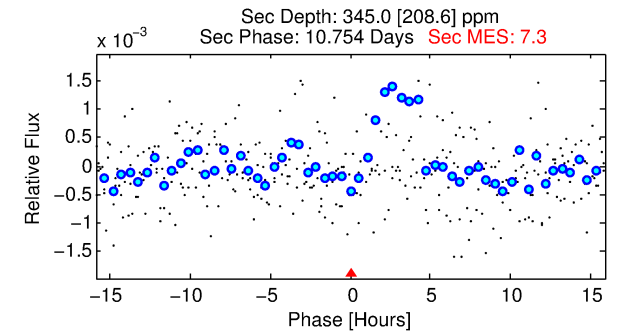
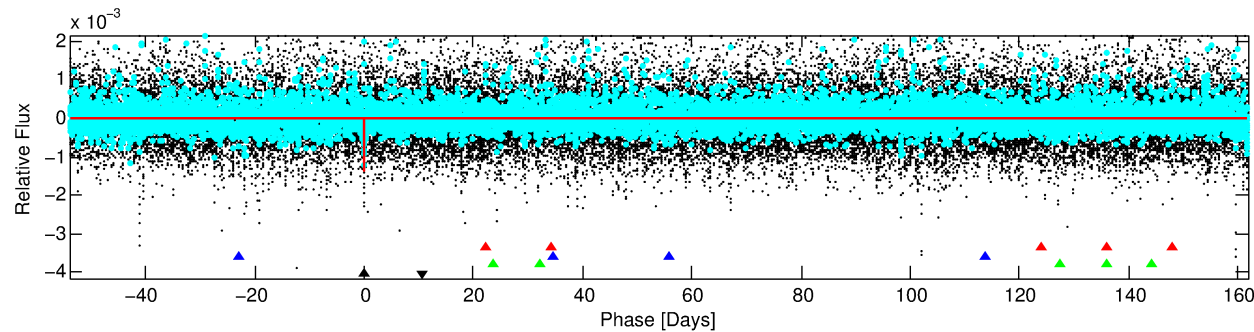
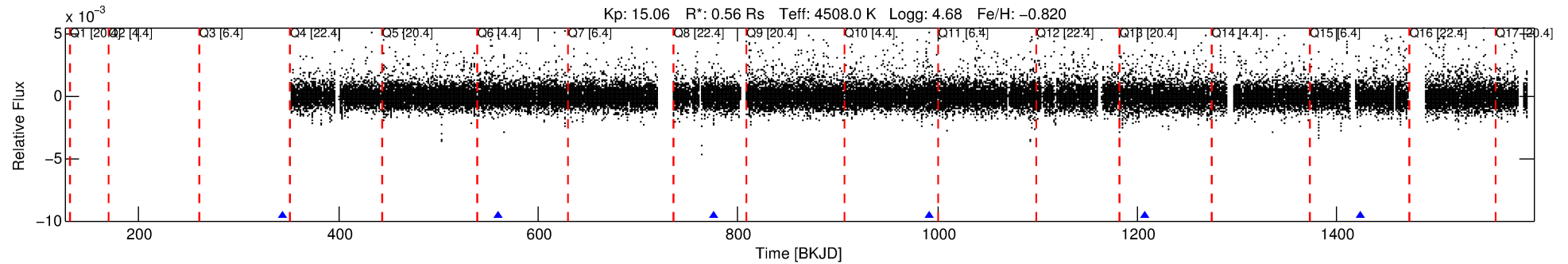
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004774574-04

No Significant Match Found

DV One-Page Summary

KIC: 4774574 Candidate: 4 of 4 Period: 215.802 d



DV Fit Results:

Period = 215.80183 [0.00275] d
Epoch = 344.3552 [0.0099] BKJD
Rp/R* = 0.0406 [0.0146]
a/R* = 340.60 [414.81]
b = 0.89 [0.30]
Seff = 0.35 [0.07]
Teq = 196 [9] K
Rp = 2.47 [0.92] Re
a = 0.5772 [0.0427] AU
Ag = 10327.28 [9789.68] [1.05 σ]
Teffp = 3050 [728] K [3.92 σ]

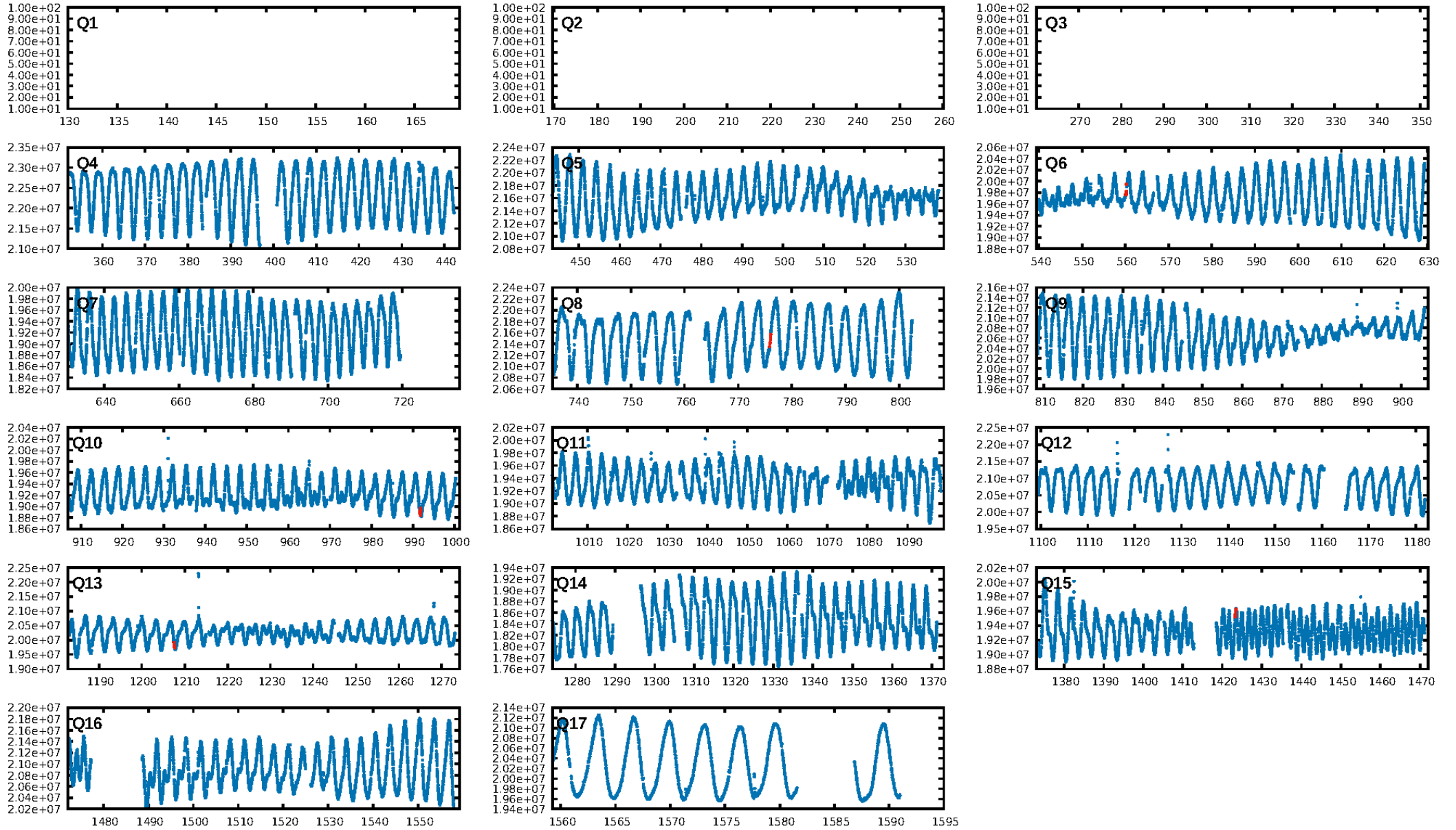
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [611.55 σ]
ModelChiSquare2-sig: 12.1%
ModelChiSquareGof-sig: 88.9%
Bootstrap-pfa: 2.94e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -2.939
Centroid-sig: 42.2%
Centroid-so: 0.708 arcsec [0.49 σ]
OotOffset-rm: 0.547 arcsec [2.82 σ]
OotOffset-st: 2/1/1/1 [5]
KicOffset-rm: 0.470 arcsec [2.10 σ]
KicOffset-st: 2/1/1/1 [5]
DiffImageQuality-fgm: 0.80 [4/5]
DiffImageOverlap-fno: 1.00 [5/5]

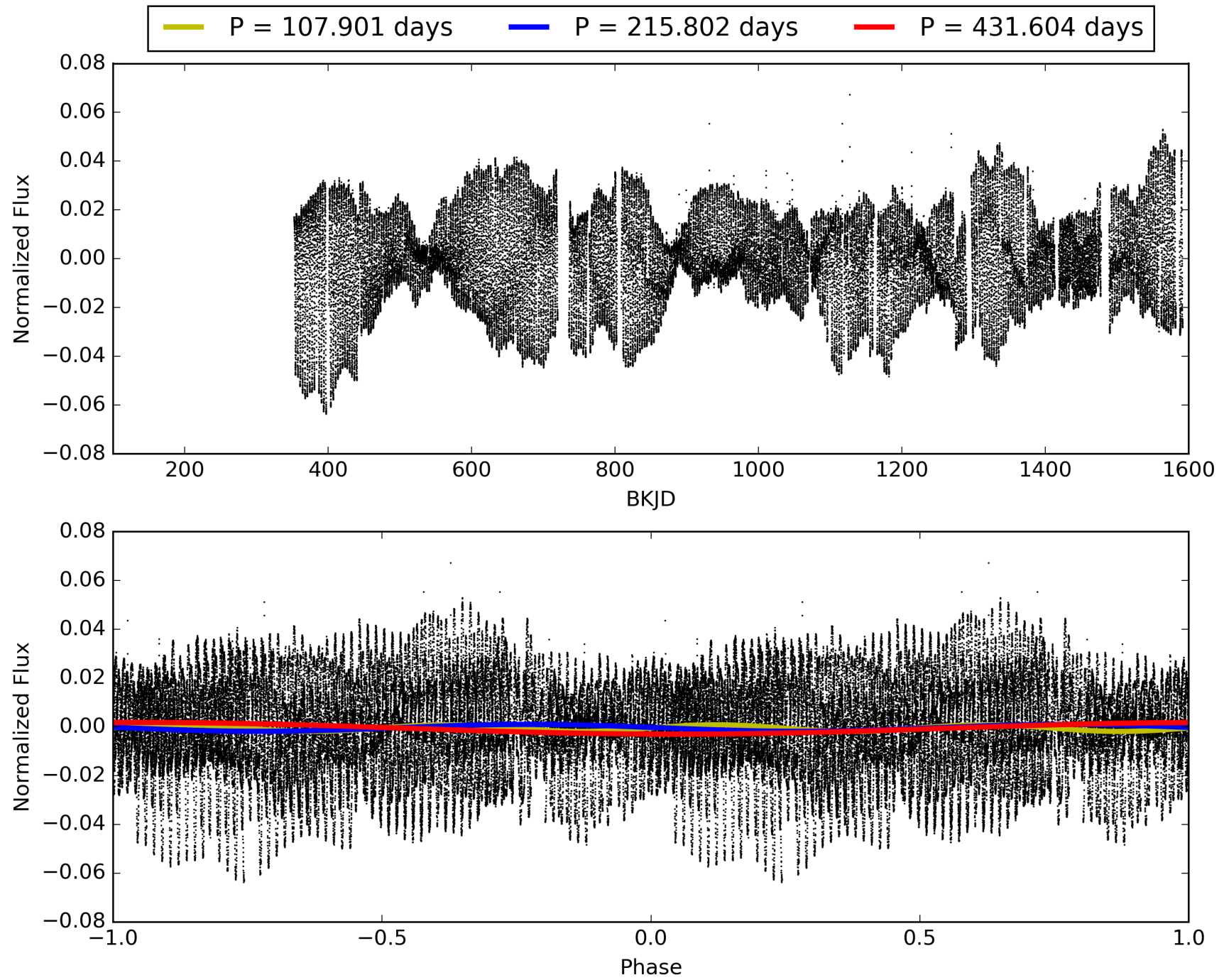
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:13:30 Z

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

TCE 004774574-04, PDC Light Curves

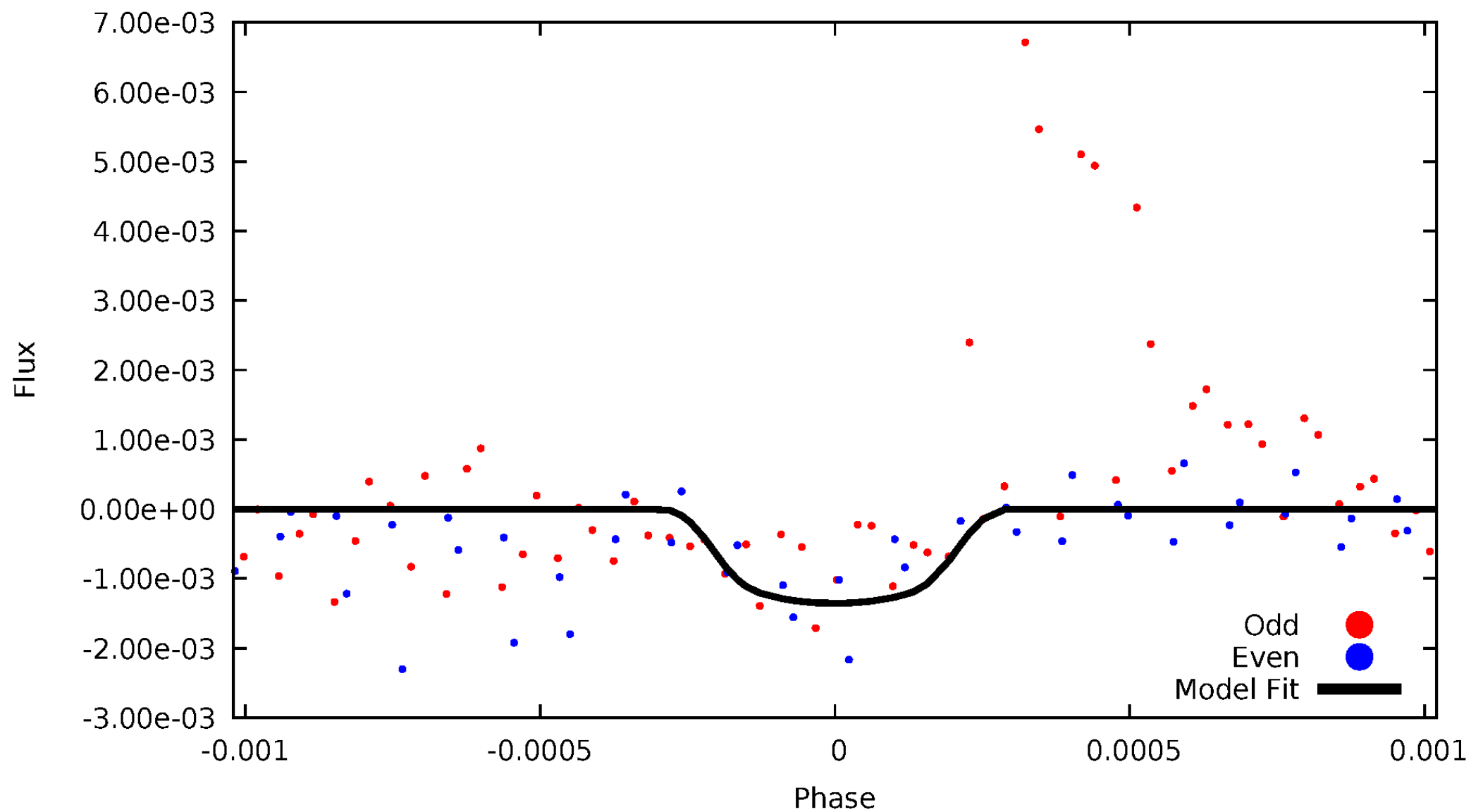


TCE 004774574-04



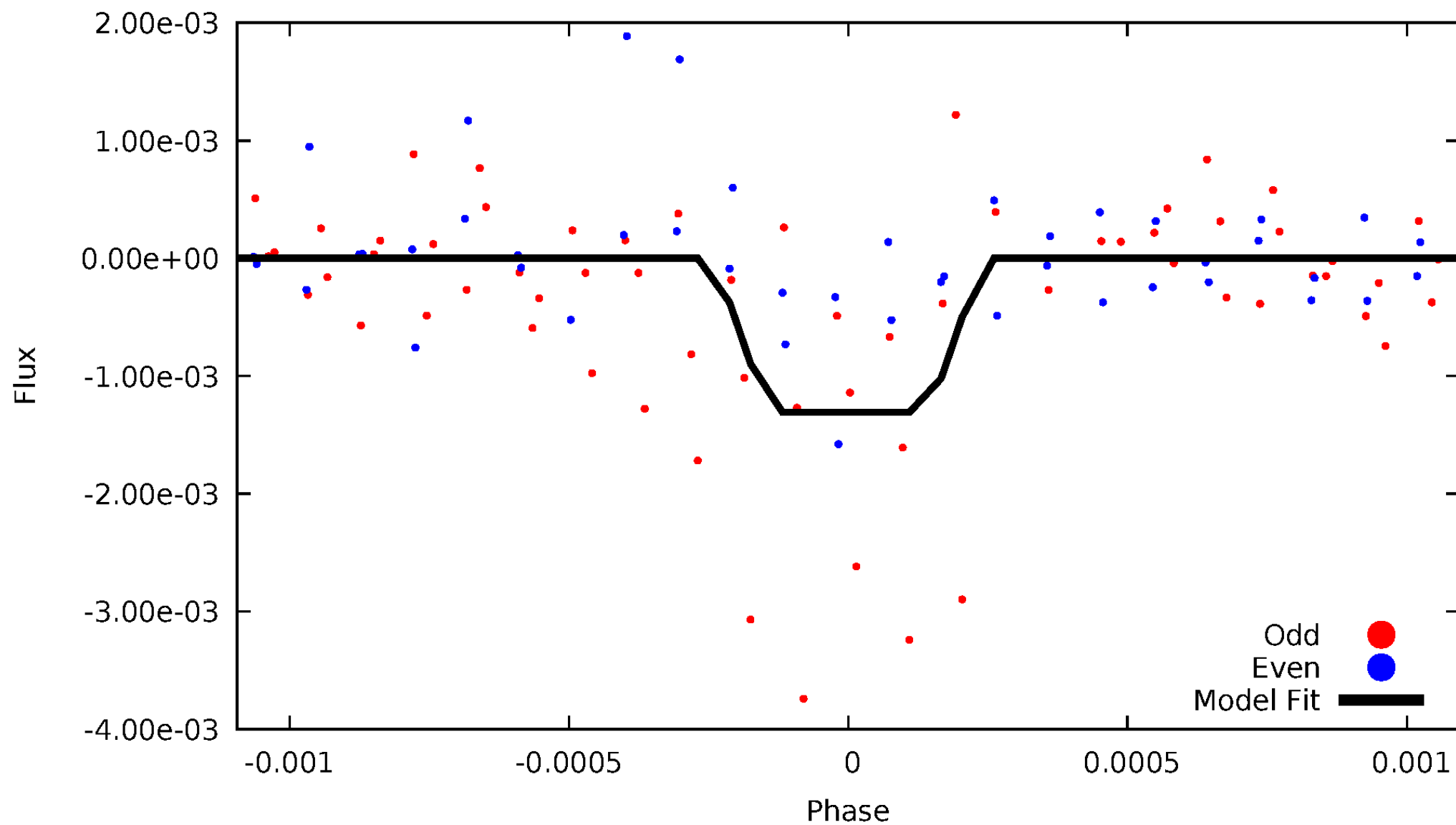
DV Odd/Even

TCE 004774574-04



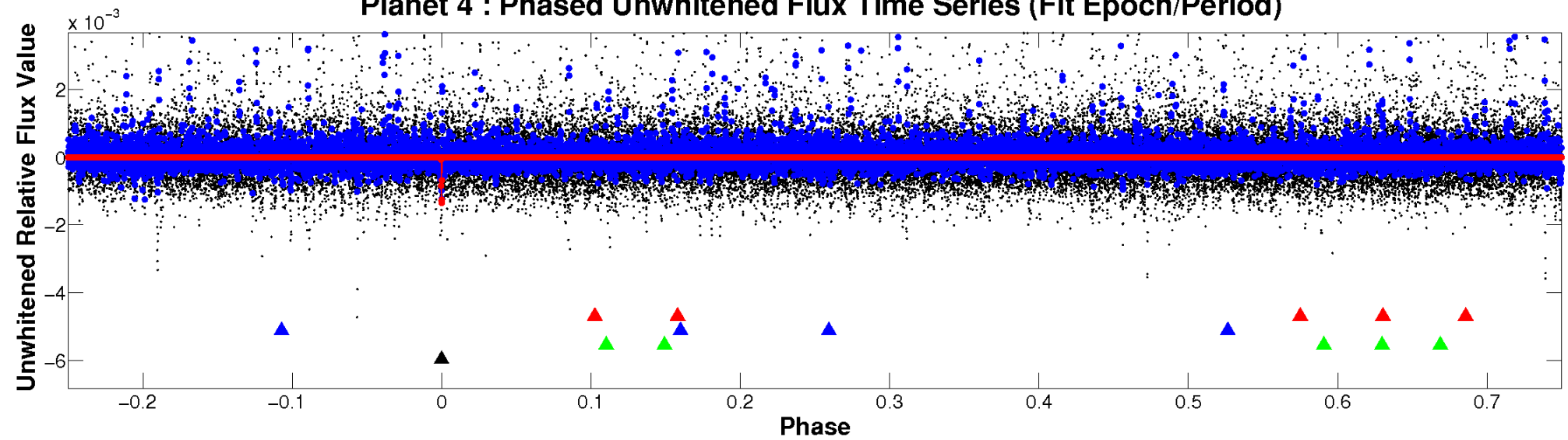
ALT Odd/Even

TCE 004774574-04

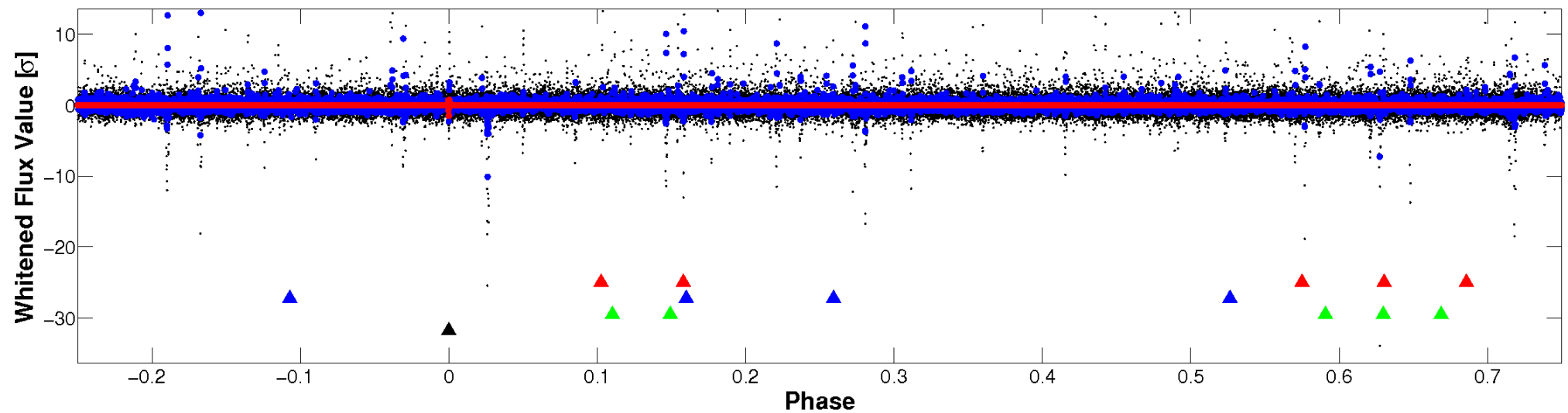


Non-Whitened Vs. Whitened Light Curve

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

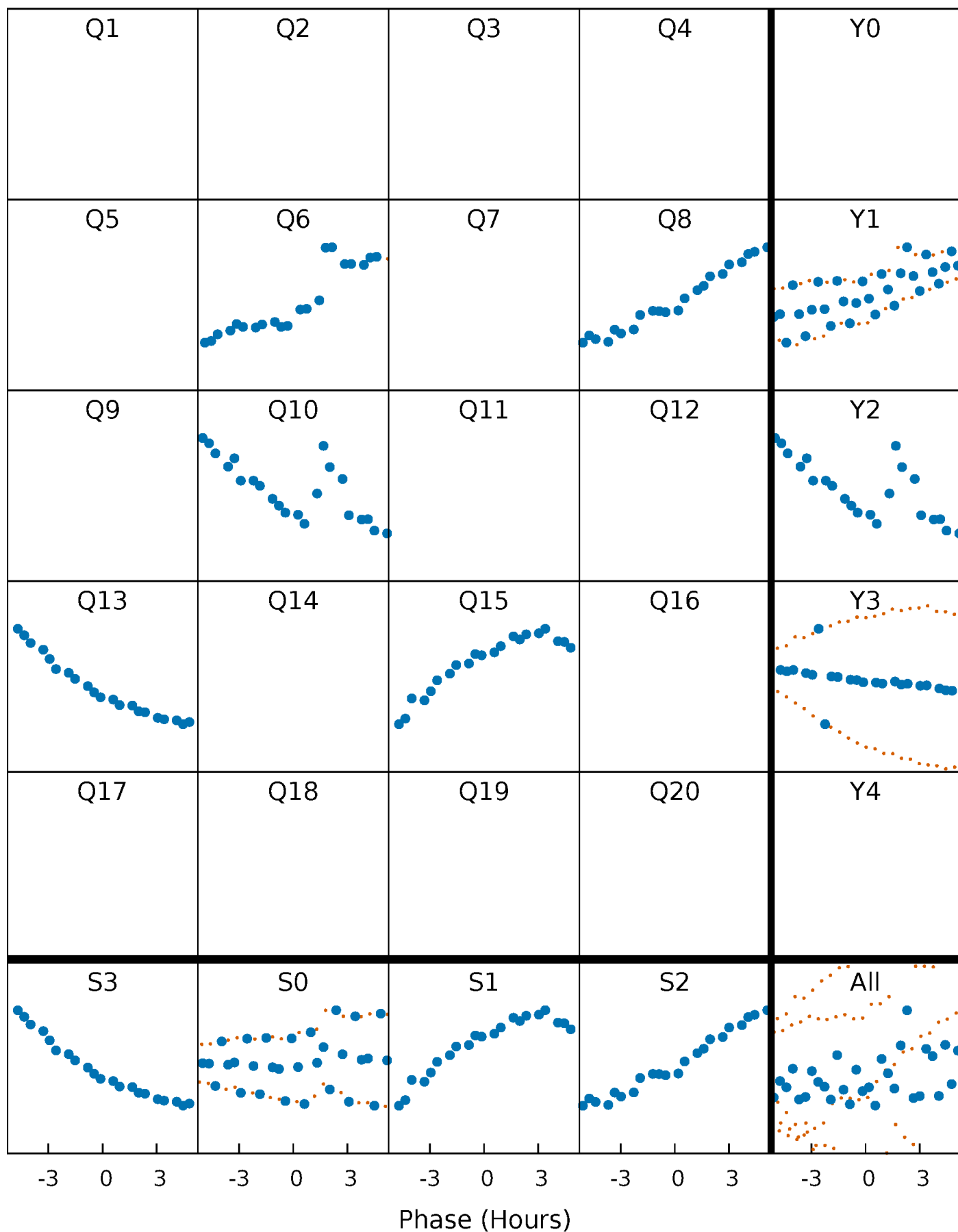


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



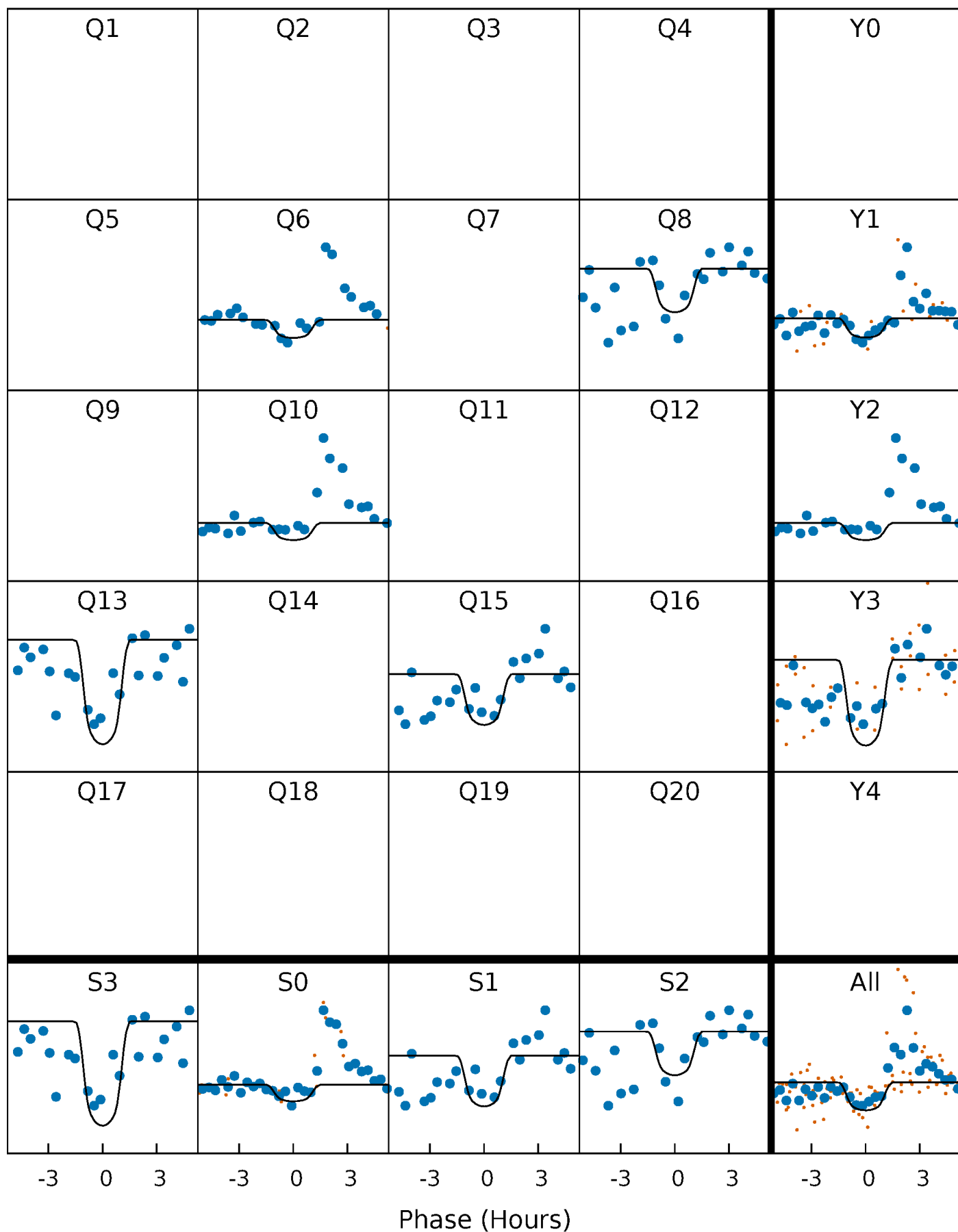
PDC Quarter-Phased Transit Curves

TCE 004774574-04 P=215.801831 Days $T_0=344.355189$ (BKJD)



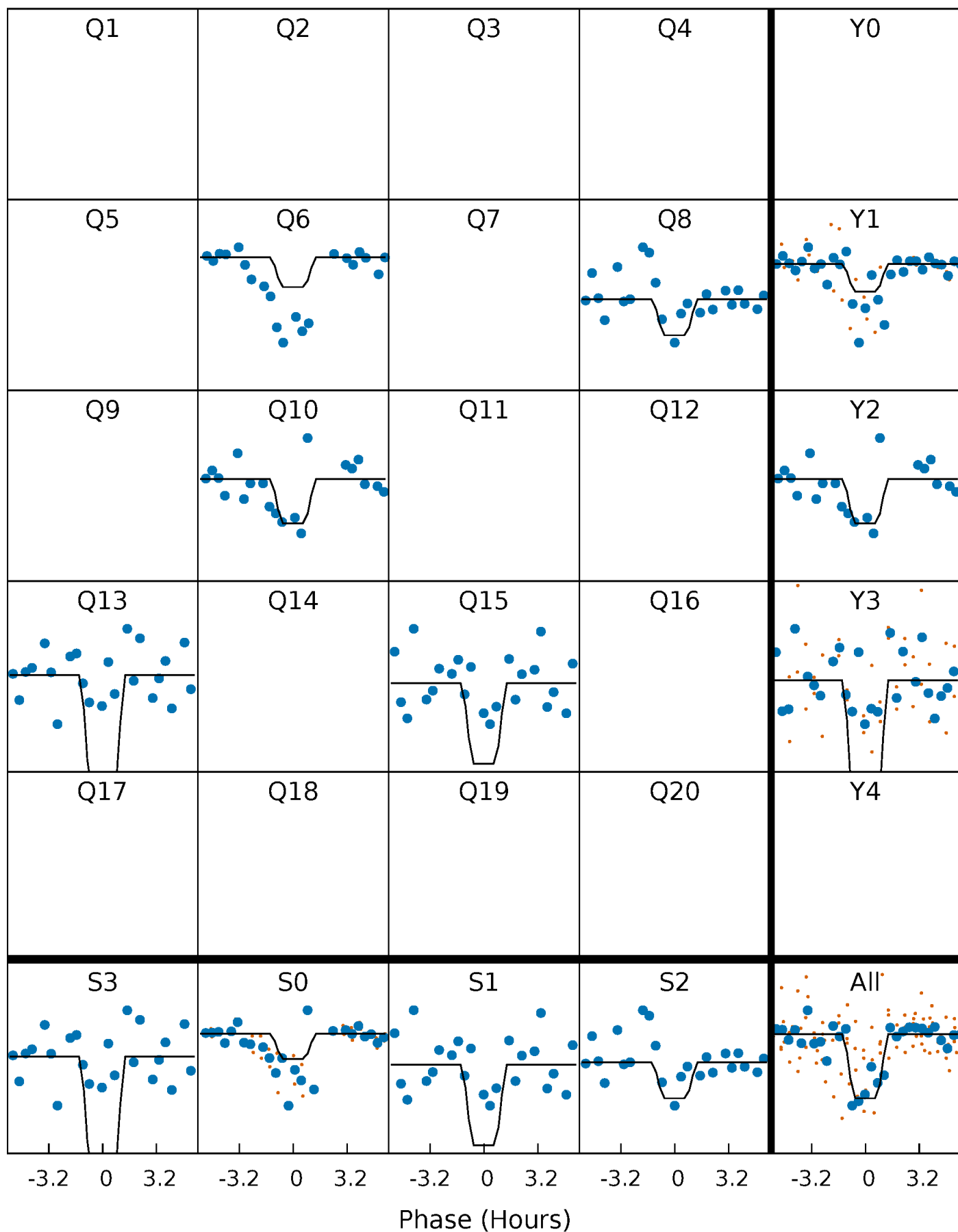
DV Quarter-Phased Transit Curves

TCE 004774574-04 P=215.801831 Days $T_0=344.355189$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

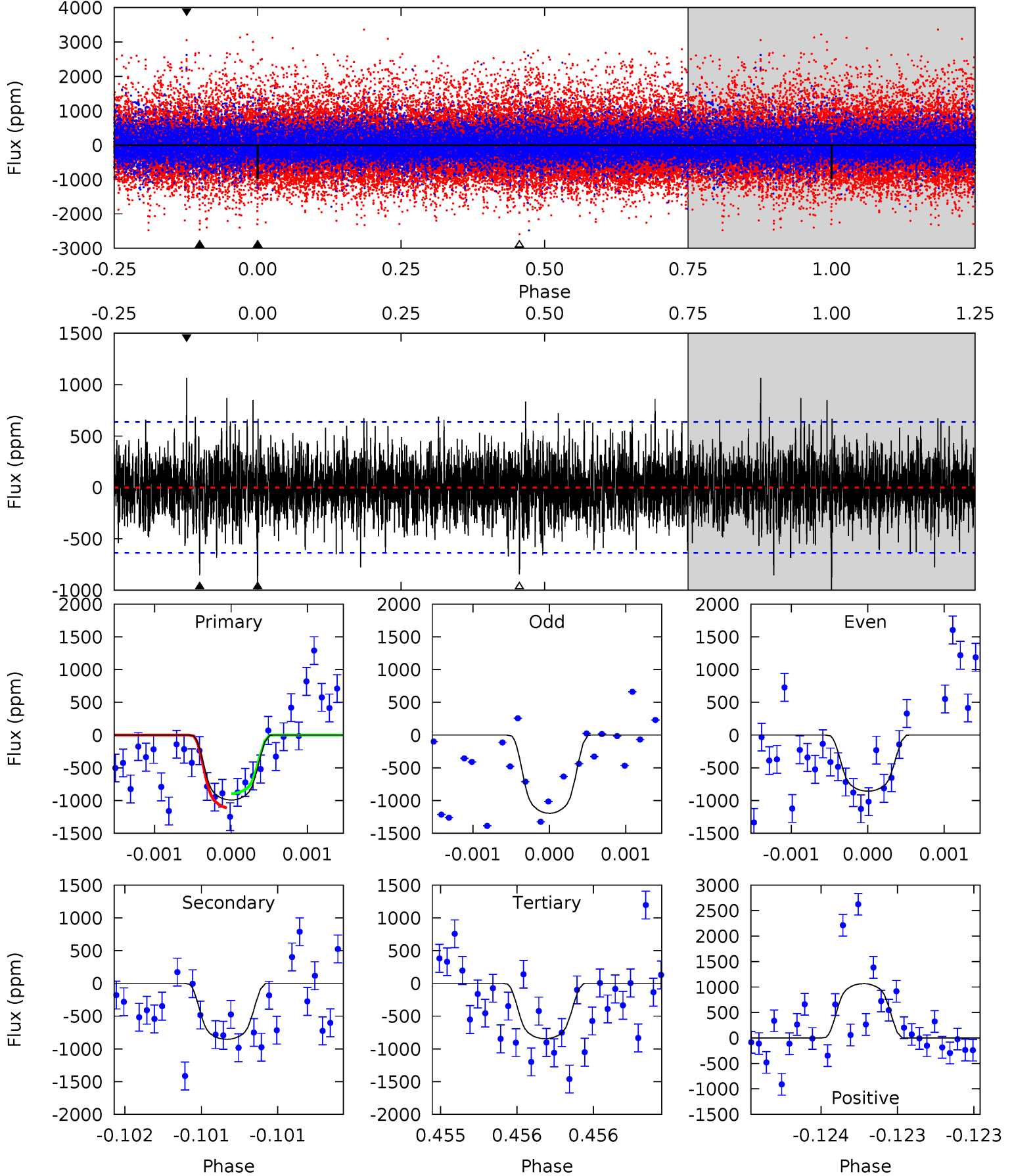
TCE 004774574-04 $P=215.800552$ Days $T_0=344.366750$ (BKJD)



DV Model-Shift Uniqueness Test

004774574-04, P = 215.801831 Days, E = 344.355189 Days

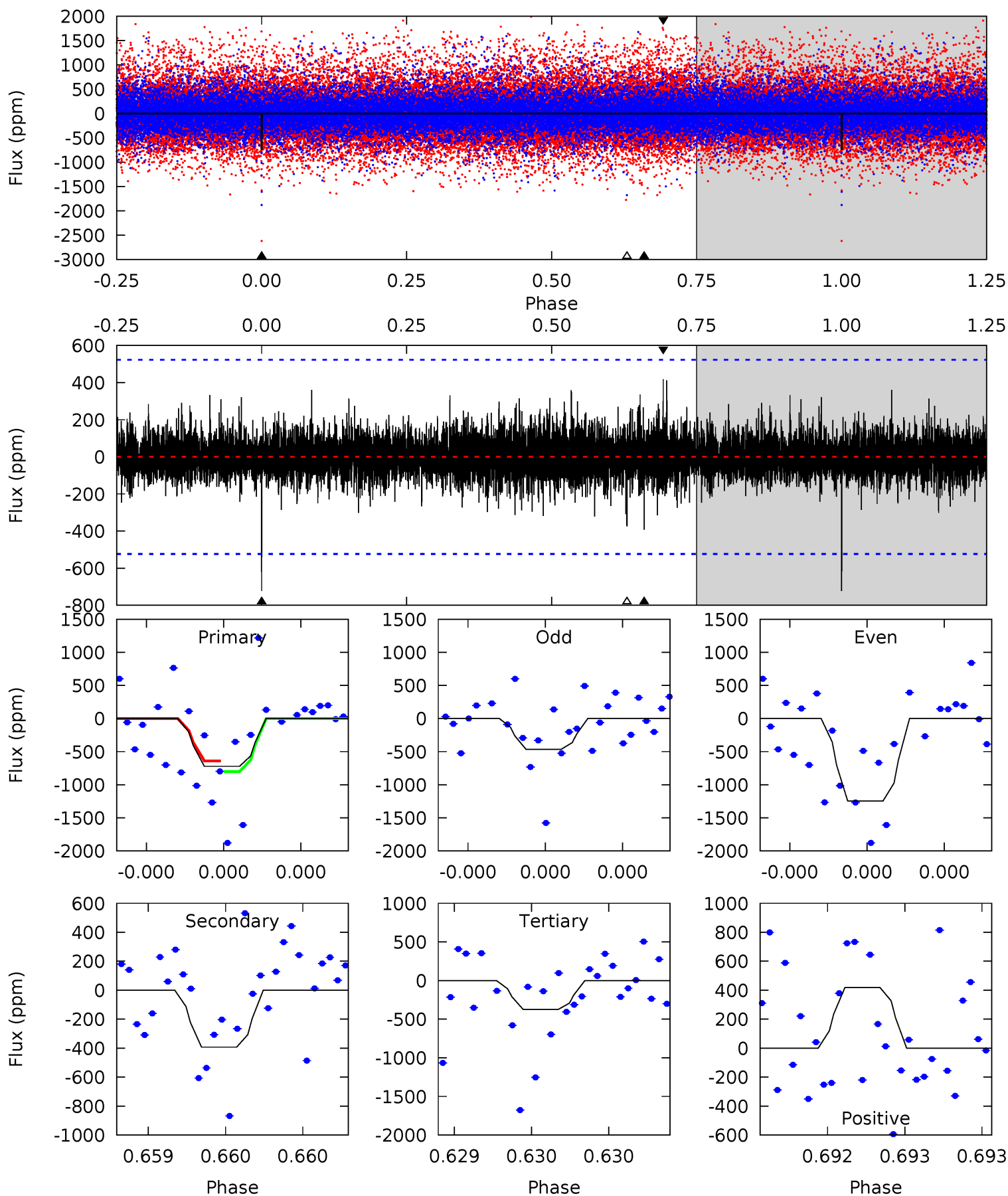
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.67	7.46	7.37	9.31	5.55	3.44	1.81	1.30	-0.64	0.08	-1.85	1.40	0.97	0.52	0.96



Alt Model-Shift Uniqueness Test

004774574-04, P = 215.800552 Days, E = 344.366750 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.71	4.19	3.99	4.46	5.58	3.50	0.88	3.72	3.24	0.20	-0.27	3.97	1.58	0.37	0.87



Stellar Parameters For KIC 004774574

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4508^{+143}_{-179}	$4.684^{+0.059}_{-0.027}$	$-0.820^{+0.300}_{-0.300}$	$0.559^{+0.044}_{-0.049}$	$0.551^{+0.053}_{-0.035}$	$4.436^{+1.119}_{-0.574}$
	+3%/-4%	+1%/-1%	+37%/-37%	+8%/-9%	+10%/-6%	+25%/-13%
Source	KIC0	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 004774574-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-854 ± 115	$2.41^{+0.92}_{-0.92}$	272^{+10}_{-11}	4008^{+804}_{-417}	27328^{+42447}_{-13274}
Alt.	-393 ± 94	$2.15^{+0.96}_{-0.83}$	271^{+10}_{-12}	3641^{+717}_{-425}	15438^{+28391}_{-8299}

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

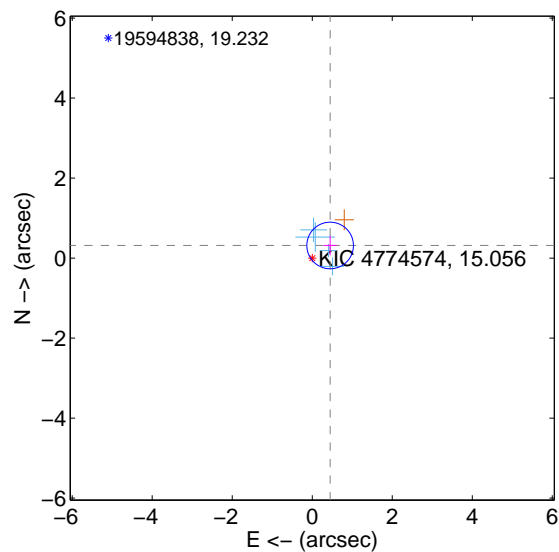
Supplemental centroid analysis for 004774574-04. Kepler magnitude: 15.06. Transit SNR 6.62

There are 4 quarters with good PRF difference image offsets

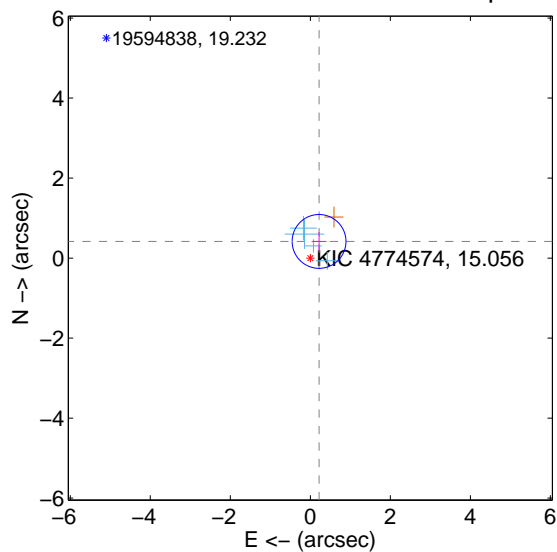
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.547 ± 0.194	2.82	-0.447 ± 0.163	0.315 ± 0.245
PRF-fit source offset from KIC position	0.470 ± 0.224	2.10	-0.218 ± 0.185	0.417 ± 0.234
photometric centroid source offset	0.71 ± 1.44	0.49	0.44 ± 1.49	0.55 ± 1.41

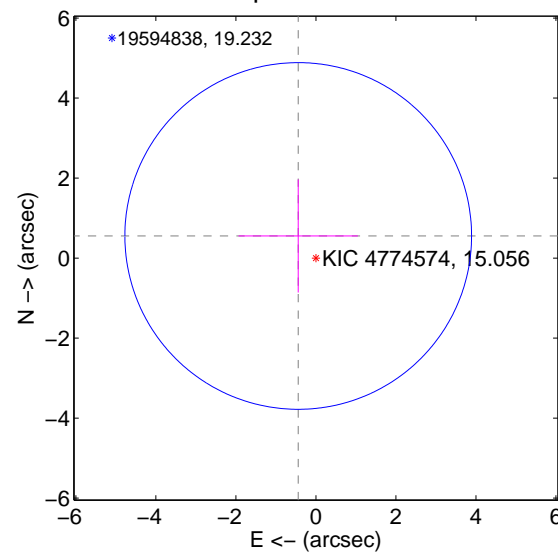
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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



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

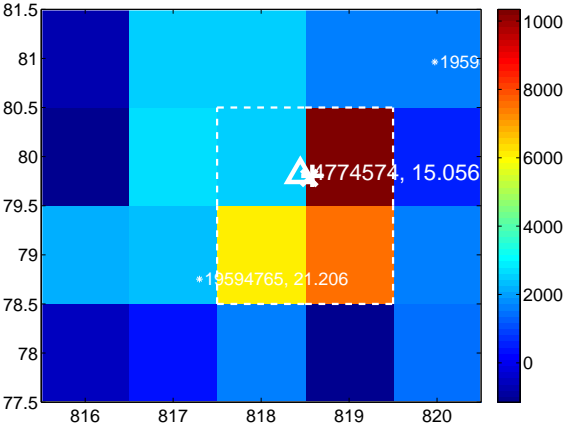
Q5 no difference image



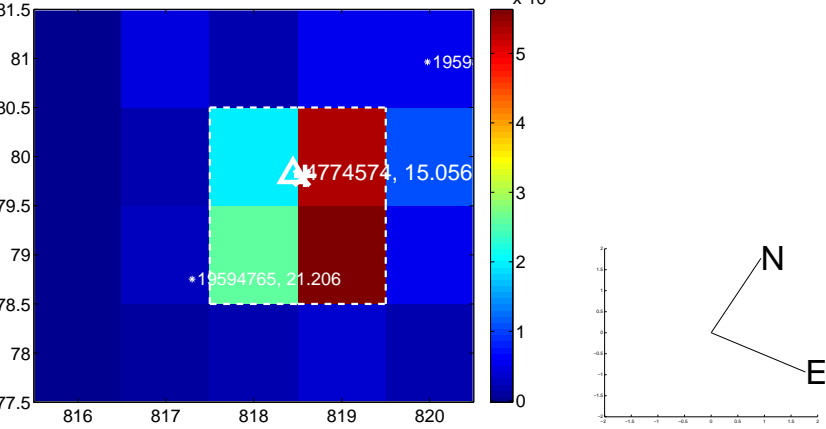
Q5 no OOT image



Q6 difference image



Q6 OOT image



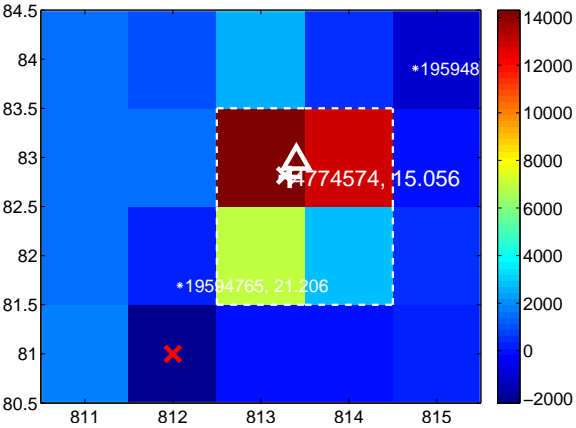
Q7 no difference image



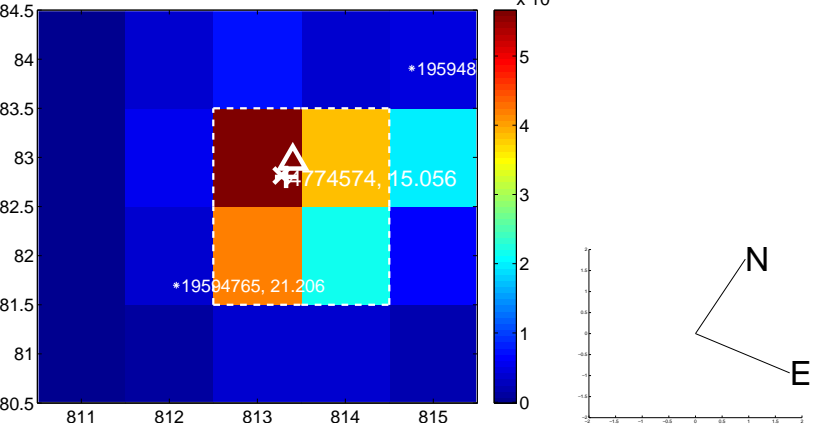
Q7 no OOT image



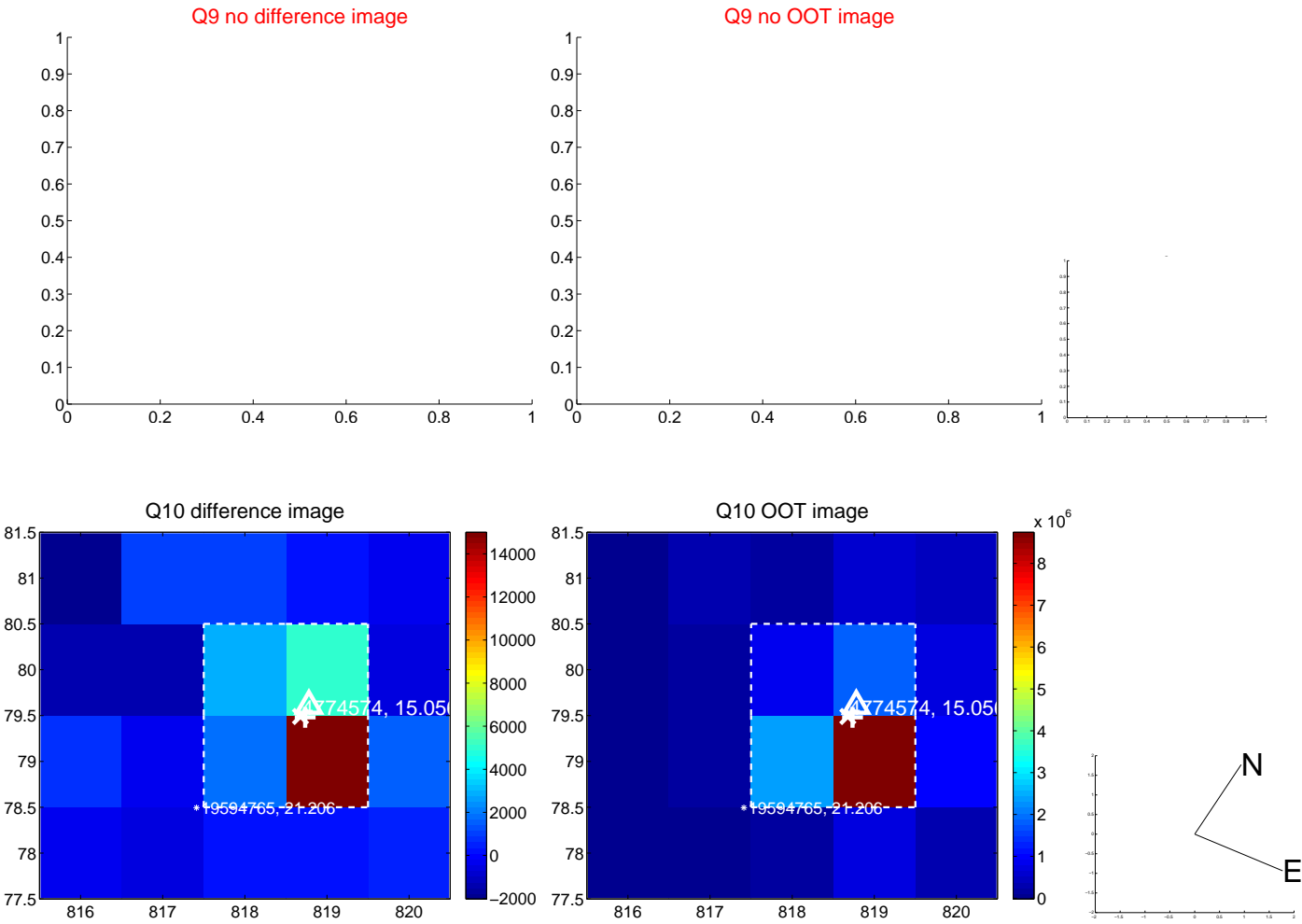
Q8 difference image



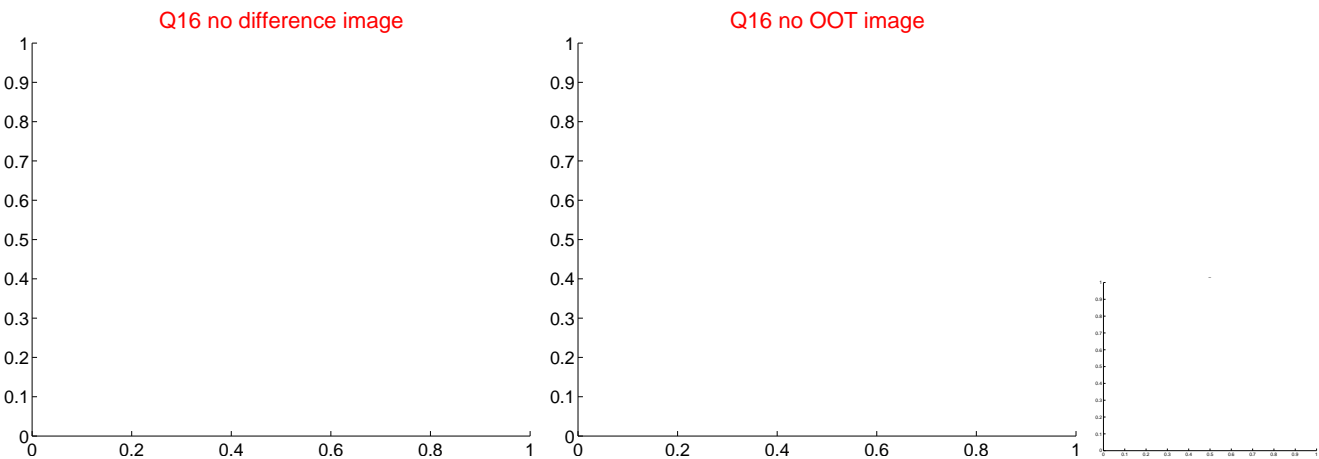
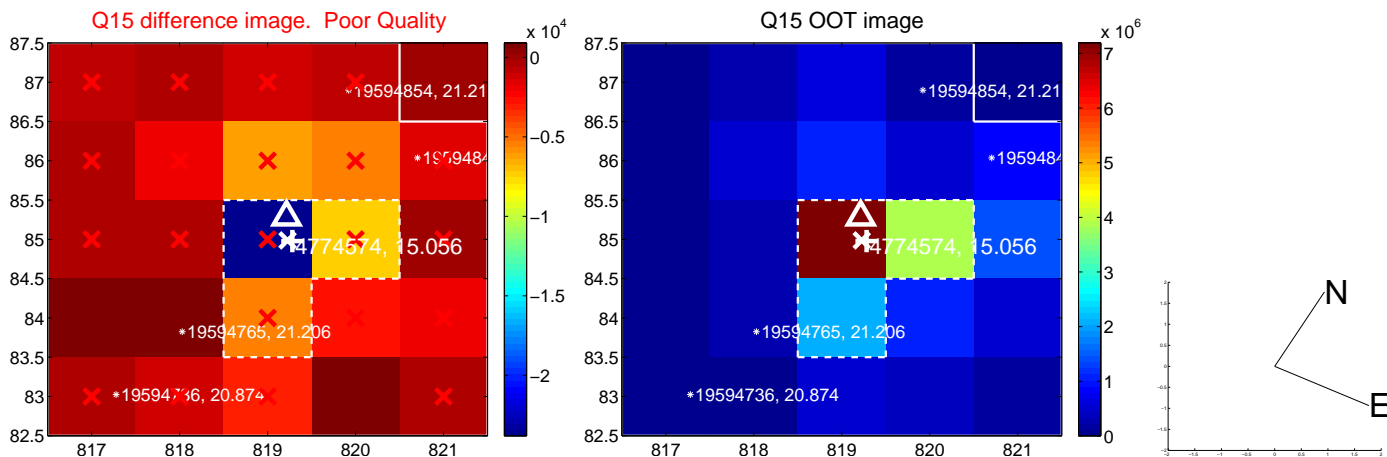
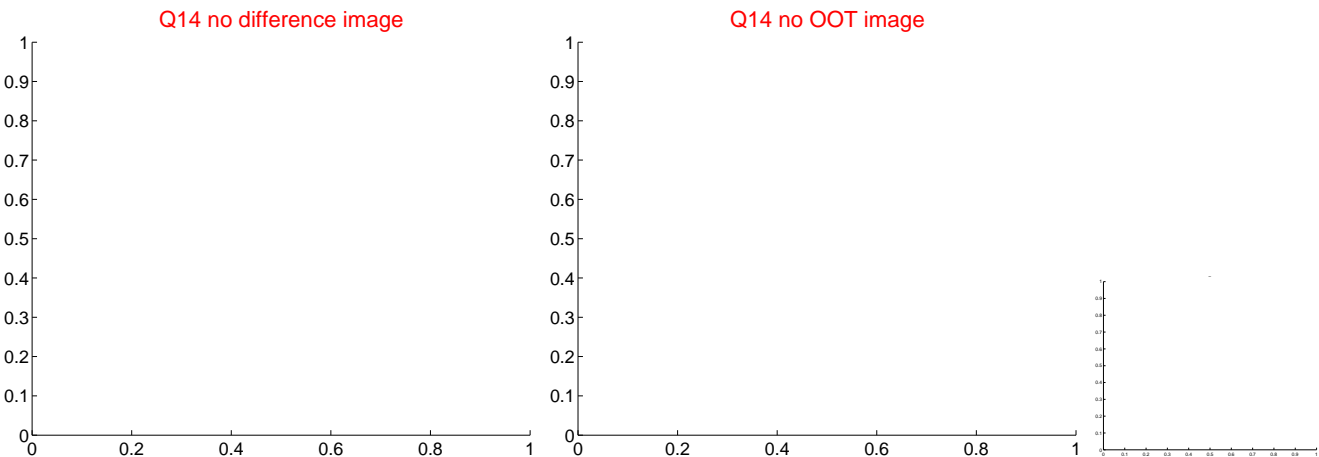
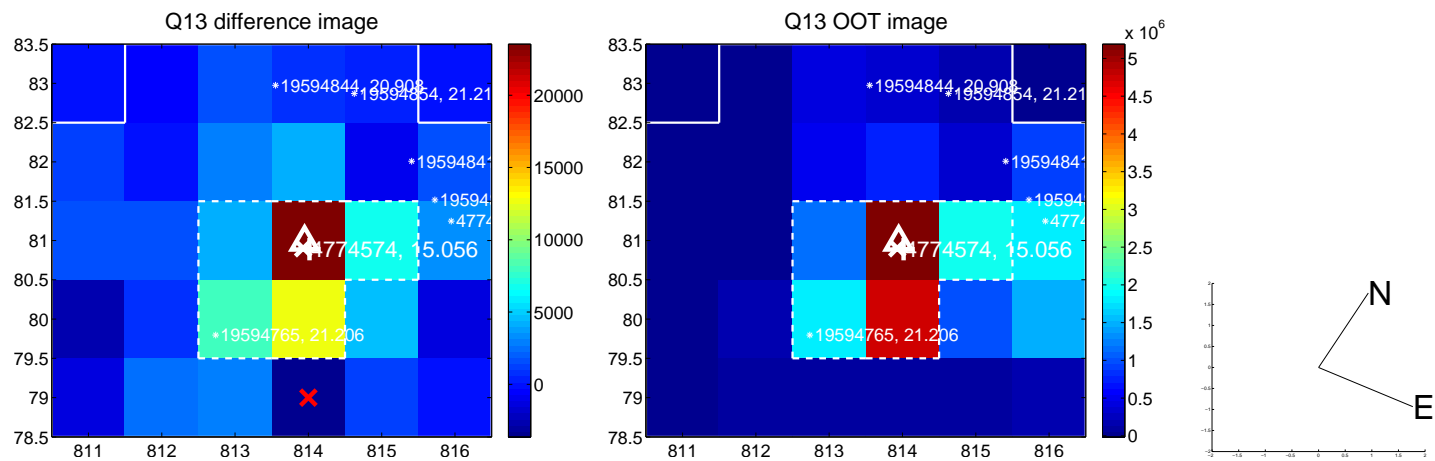
Q8 OOT image



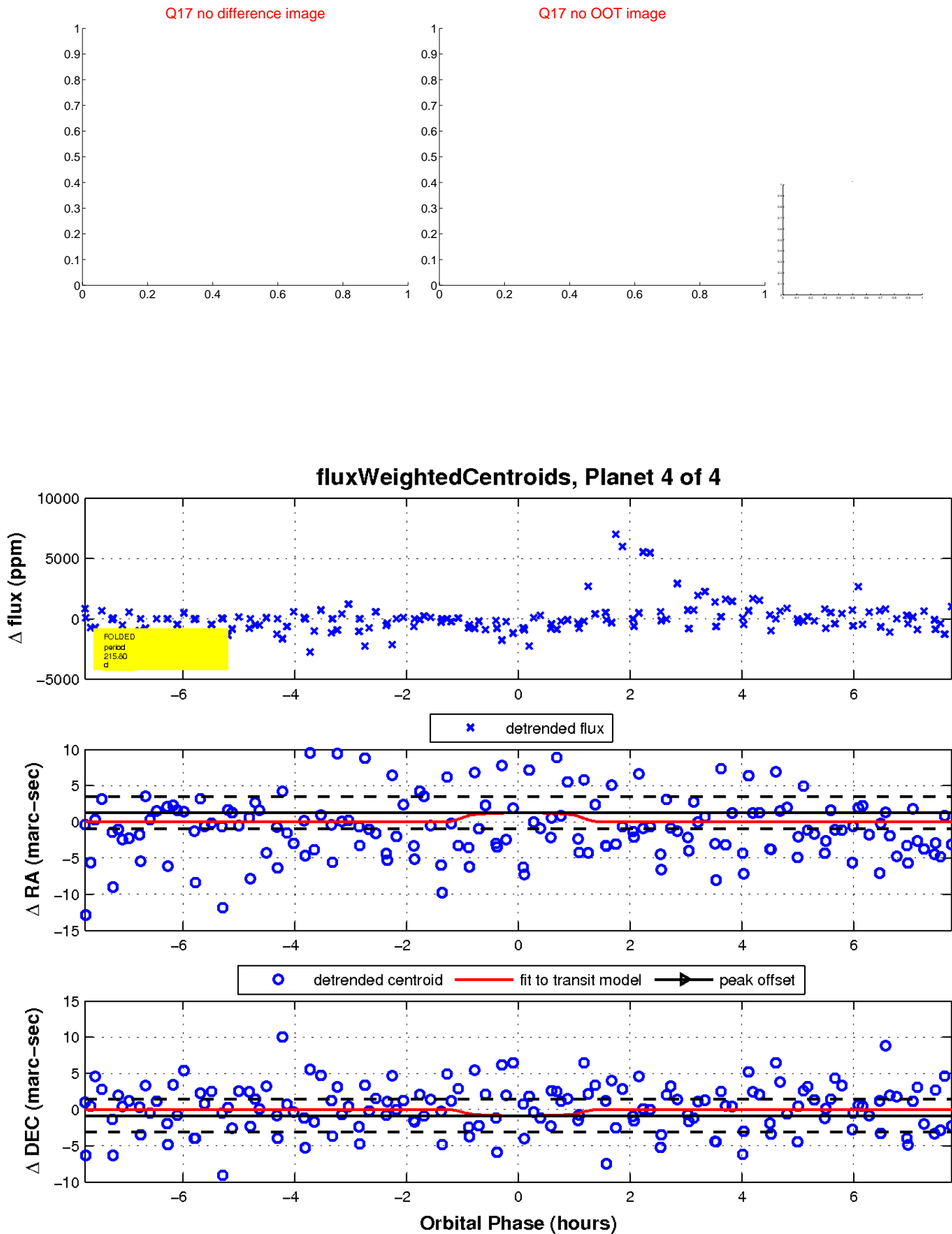
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

