

KIC 005614003

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})
005614003-01	OBS	No	558.942557	432.693350	2260.1	3.558	11.5	9.8	0.56	5059	2.72	0.14
005614003-02	OBS	No	628.885035	249.401819	1654.7	3.860	11.3	6.7	0.56	5059	2.84	0.12
005614003-03	OBS	No	229.772915	325.876708	1349.3	3.775	9.5	6.4	0.56	5059	2.05	0.47
005614003-04	OBS	No	463.518437	277.187953	1607.4	4.063	11.6	6.7	0.56	5059	2.22	0.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005614003-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
005614003-02	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
005614003-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005614003-04	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

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

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

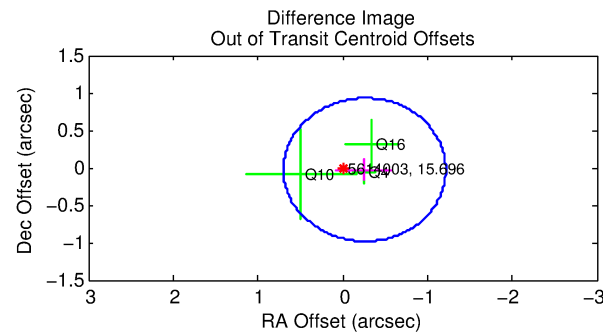
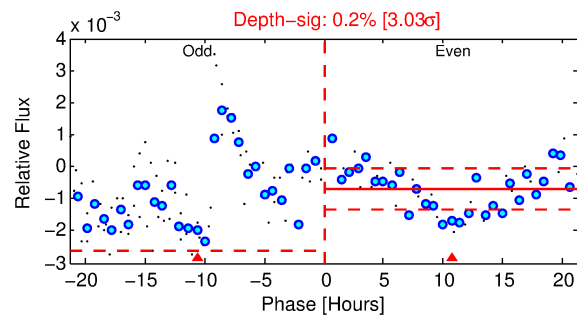
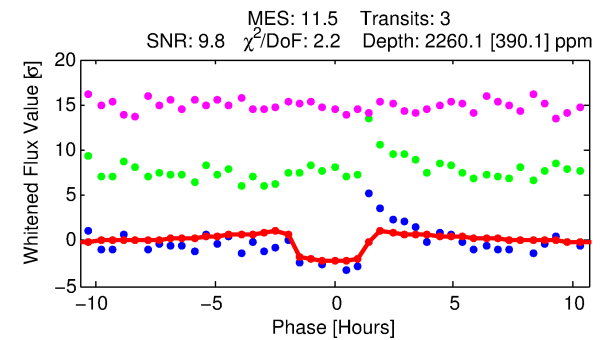
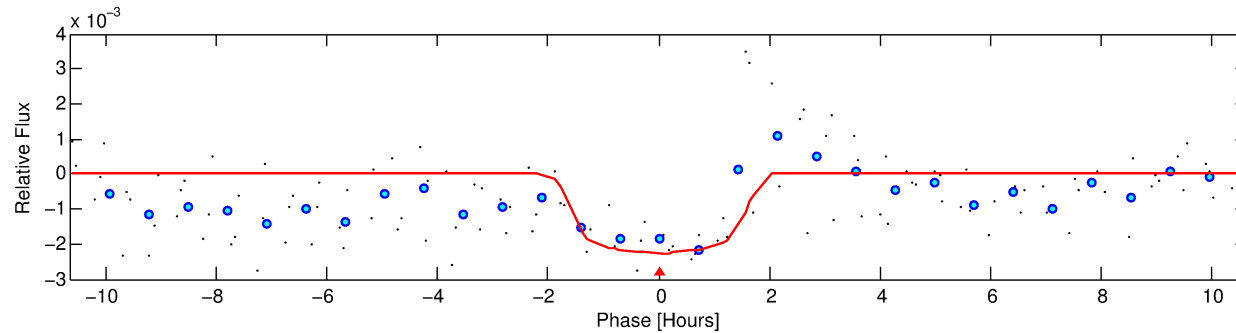
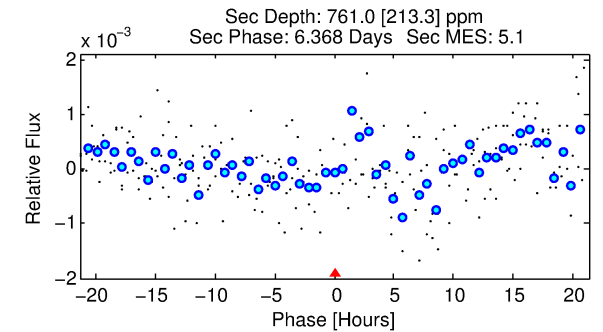
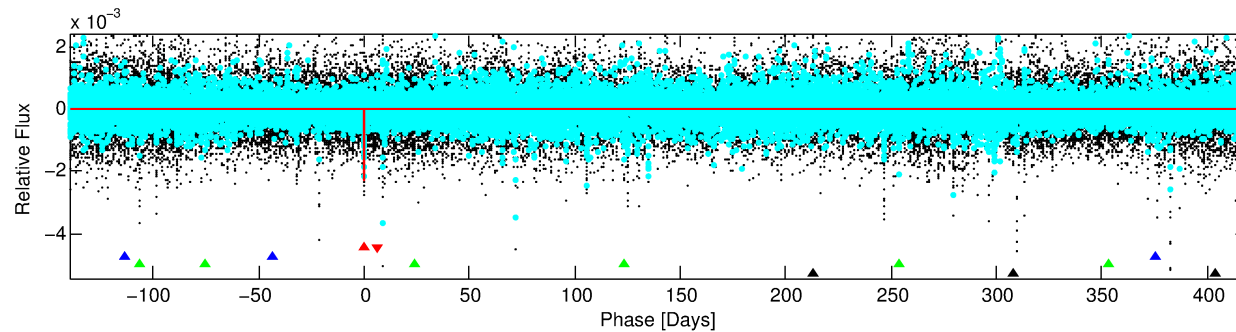
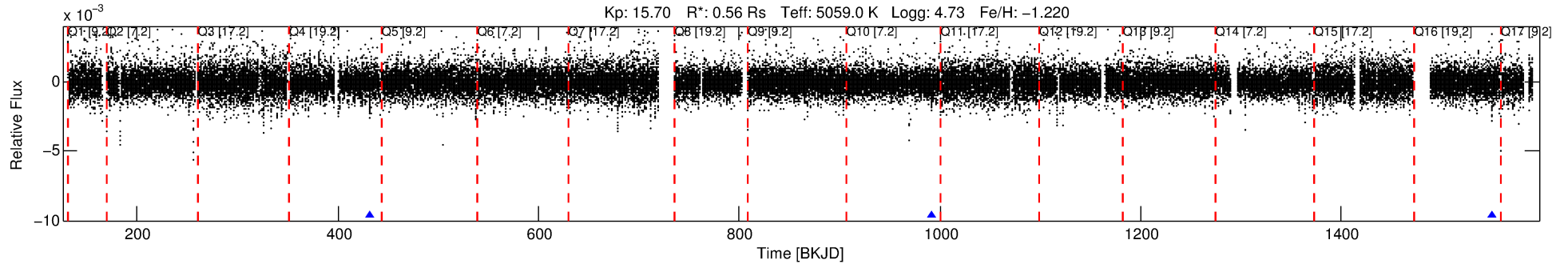
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005614003-01

No Significant Match Found

DV One-Page Summary

KIC: 5614003 Candidate: 1 of 4 Period: 558.943 d



DV Fit Results:

Period = 558.94256 [0.00587] d
Epoch = 432.6933 [0.0077] BKJD
Rp/R* = 0.0447 [0.0696]
a/R* = 1083.20 [7286.54]
b = 0.53 [9.33]
Seff = 0.14 [0.02]
Teq = 157 [6] K
Rp = 2.72 [4.24] Re
a = 1.1299 [0.0719] AU
Ag = 72104.07 [225476.17] [0.32σ]
Teffp = 3974 [3107] K [1.23σ]

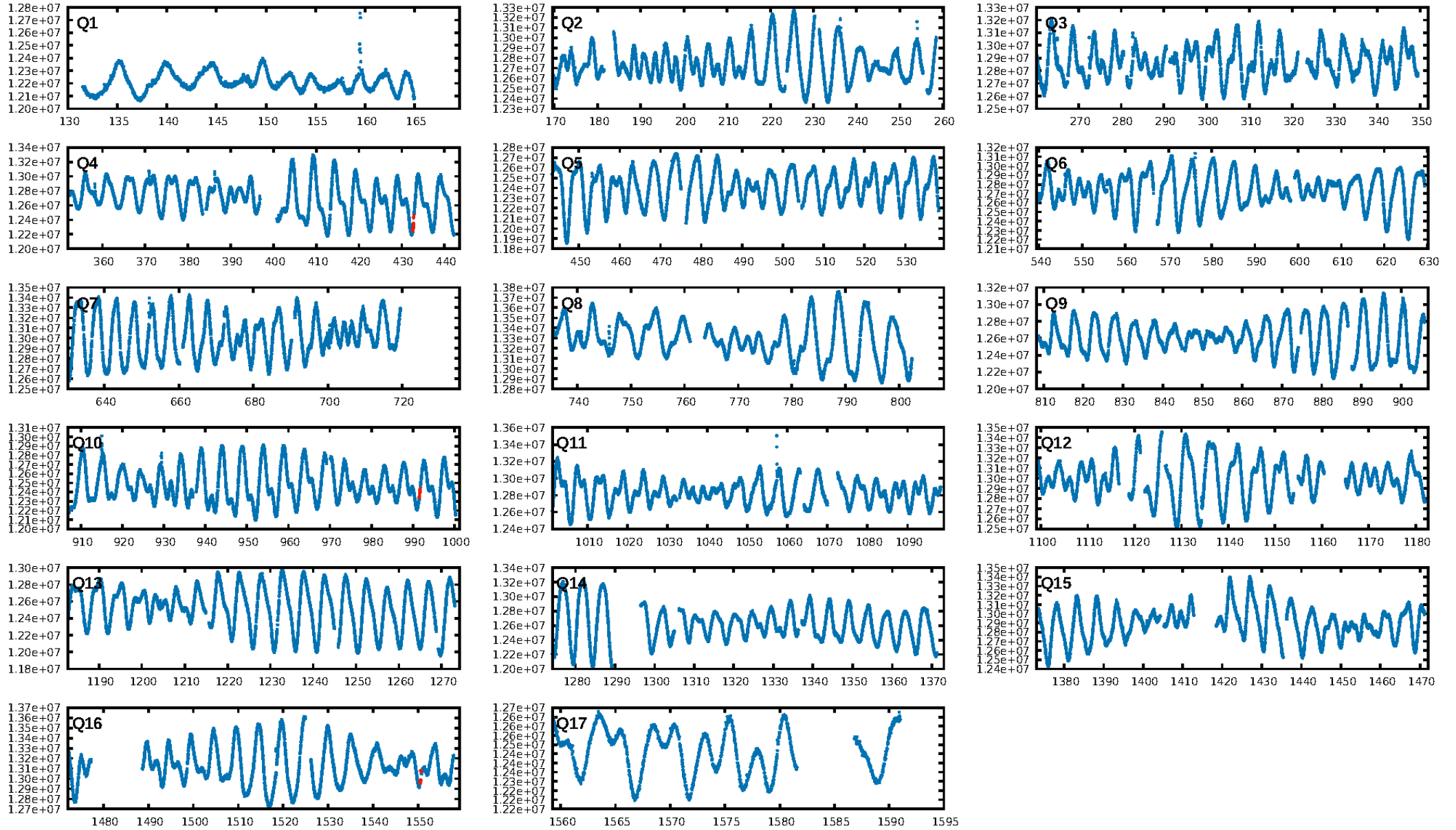
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [424.06σ]
LongPeriod-sig: 100.0% [319.79σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 22.0%
Bootstrap-pfa: 2.04e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.338
Centroid-sig: 38.0%
Centroid-so: 0.440 arcsec [0.62σ]
OotOffset-rm: 0.261 arcsec [0.82σ]
OotOffset-st: 1/0/2/0 [3]
KicOffset-rm: 0.341 arcsec [1.34σ]
KicOffset-st: 1/0/2/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

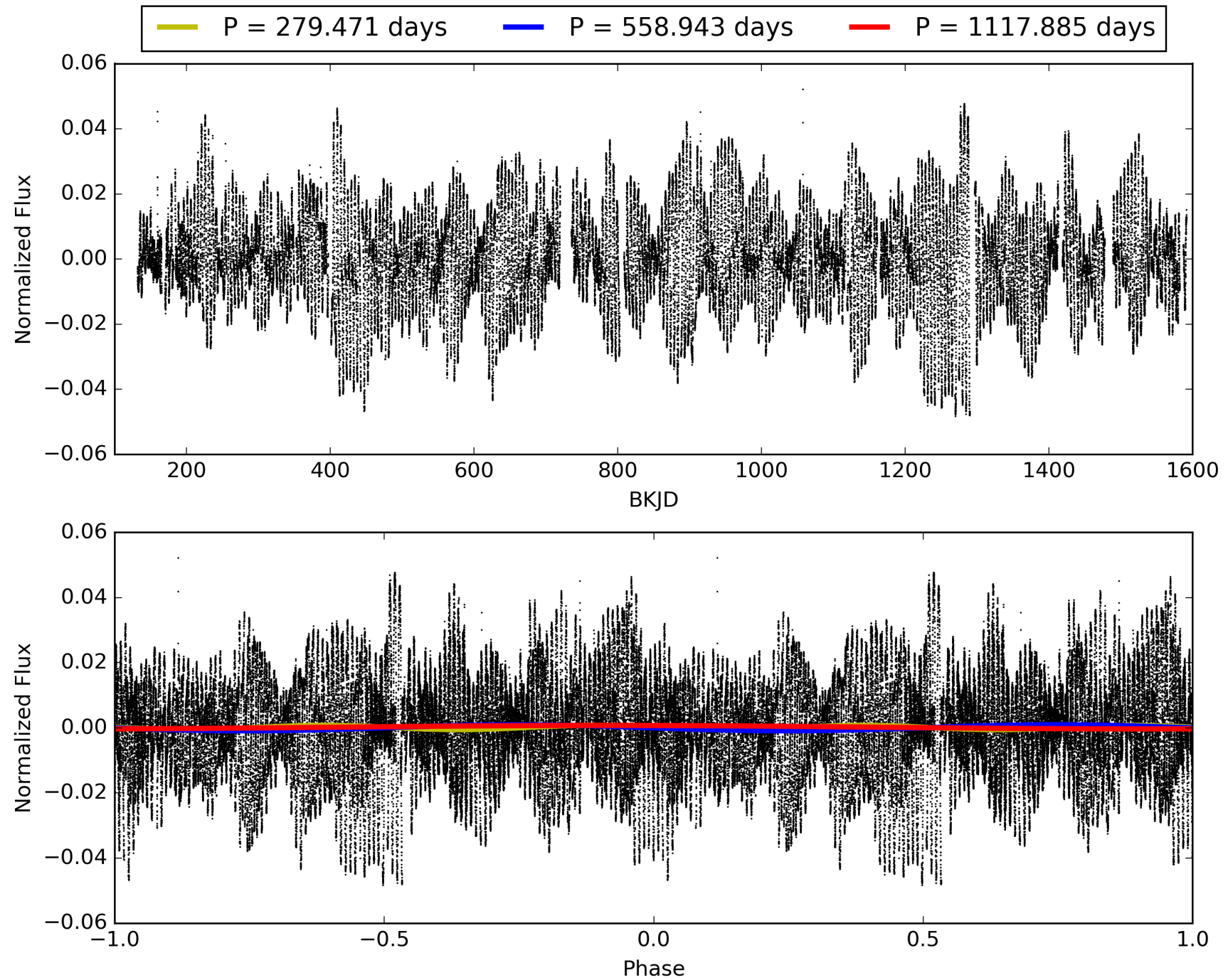
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:03:18 Z

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

TCE 005614003-01, PDC Light Curves

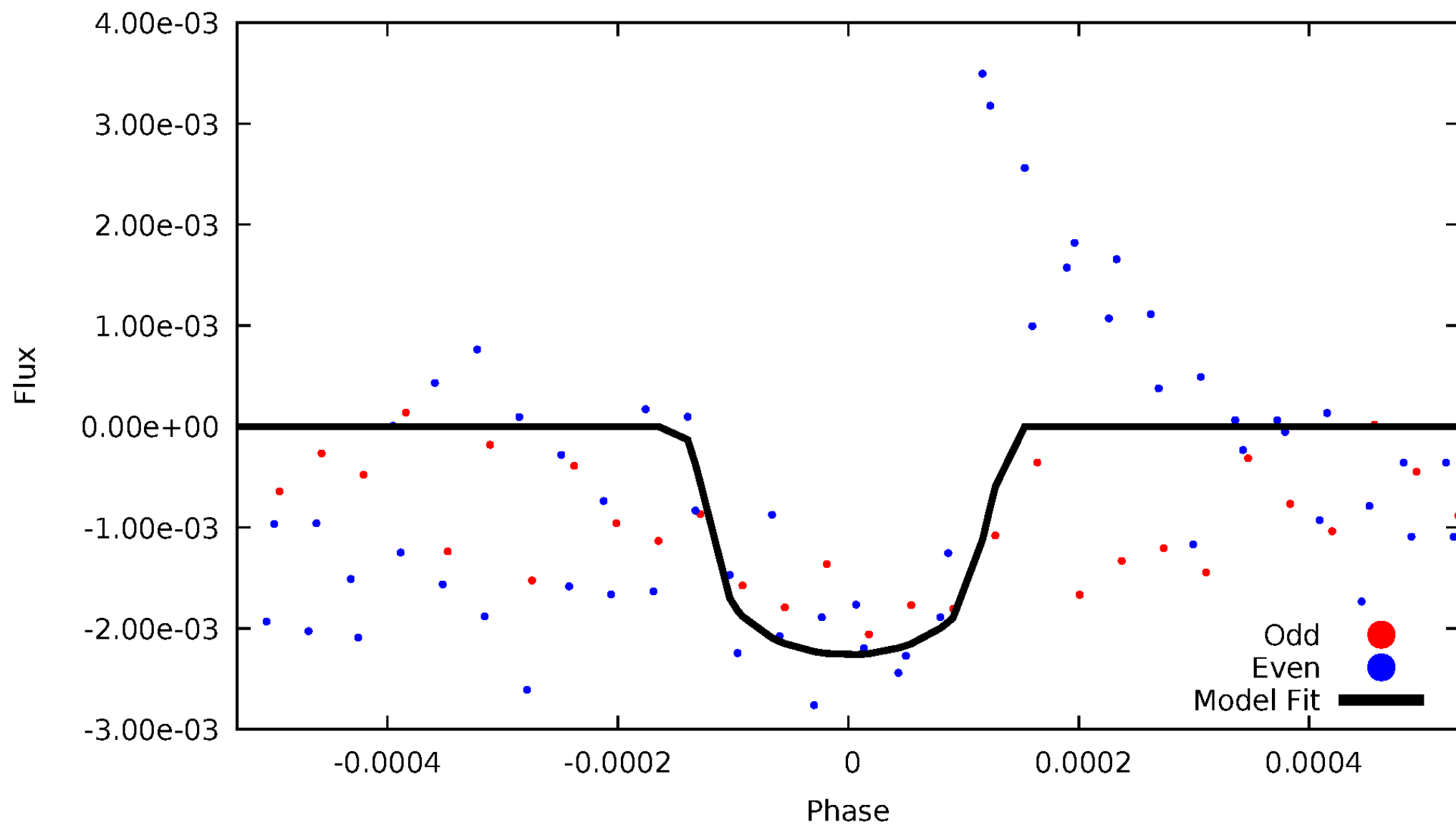


TCE 005614003-01



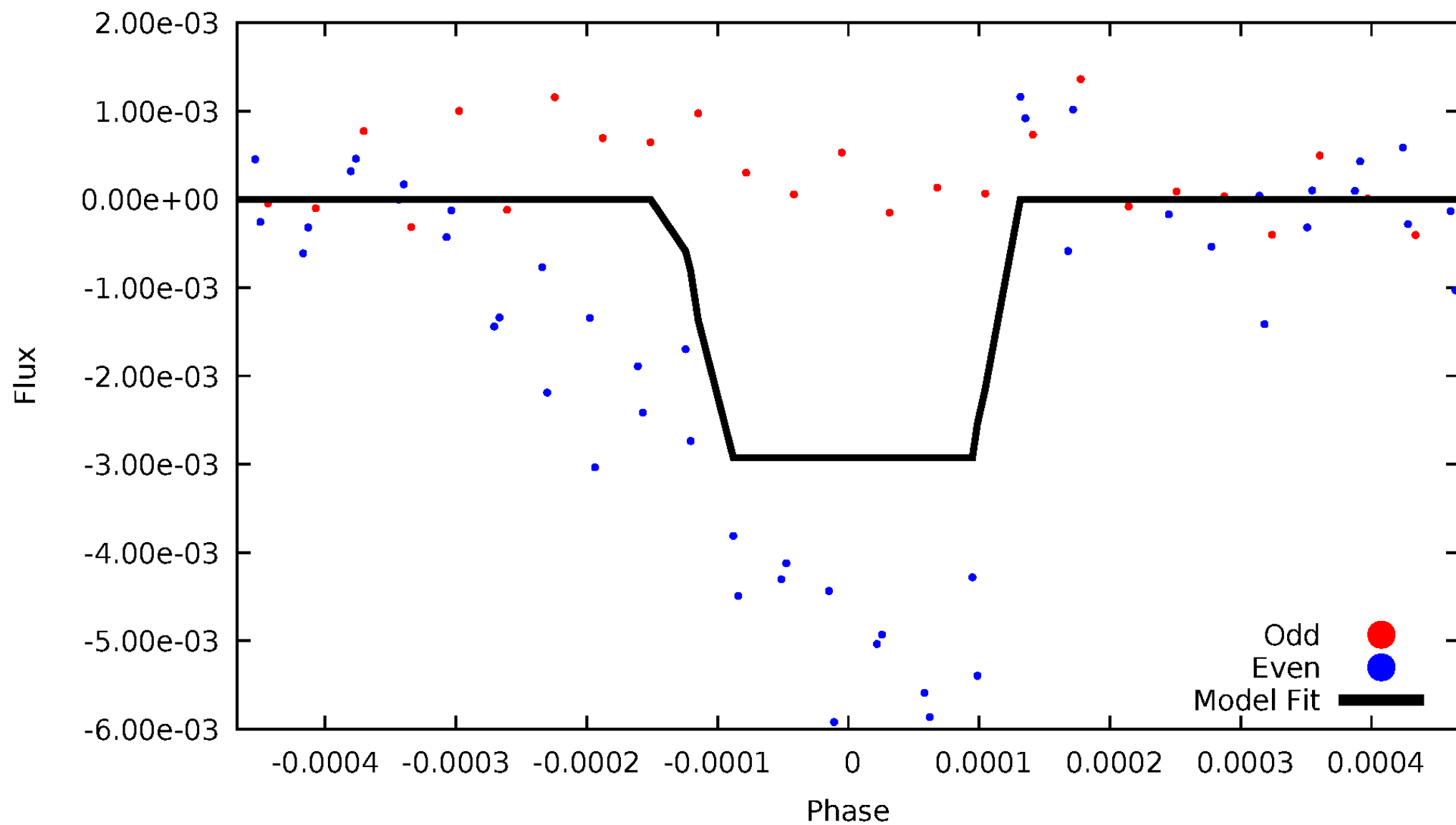
DV Odd/Even

TCE 005614003-01

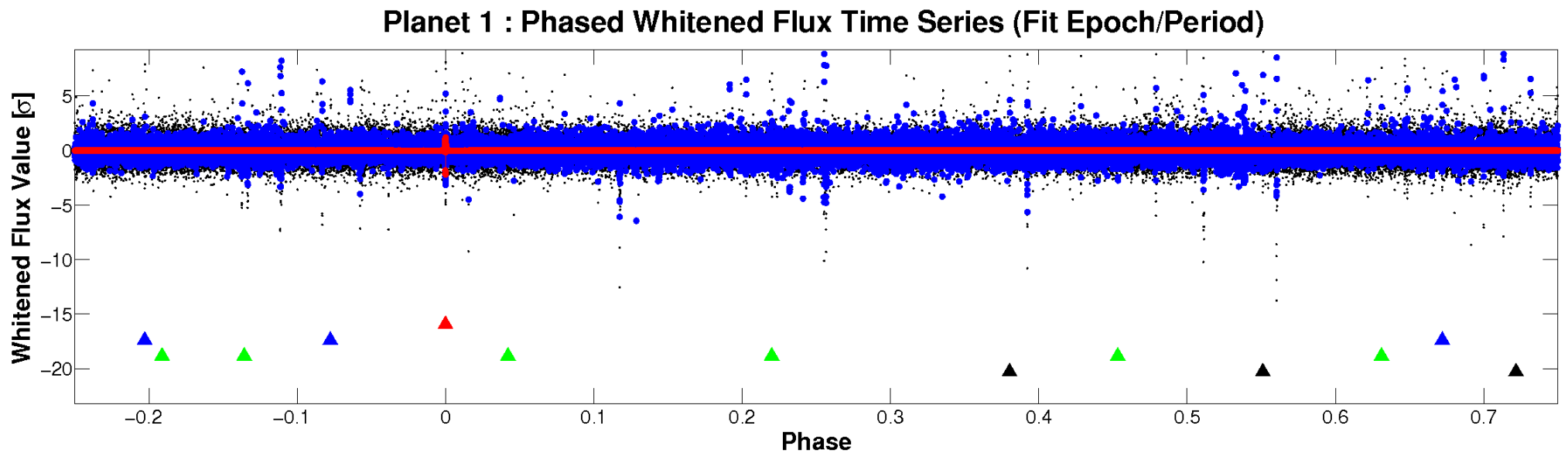
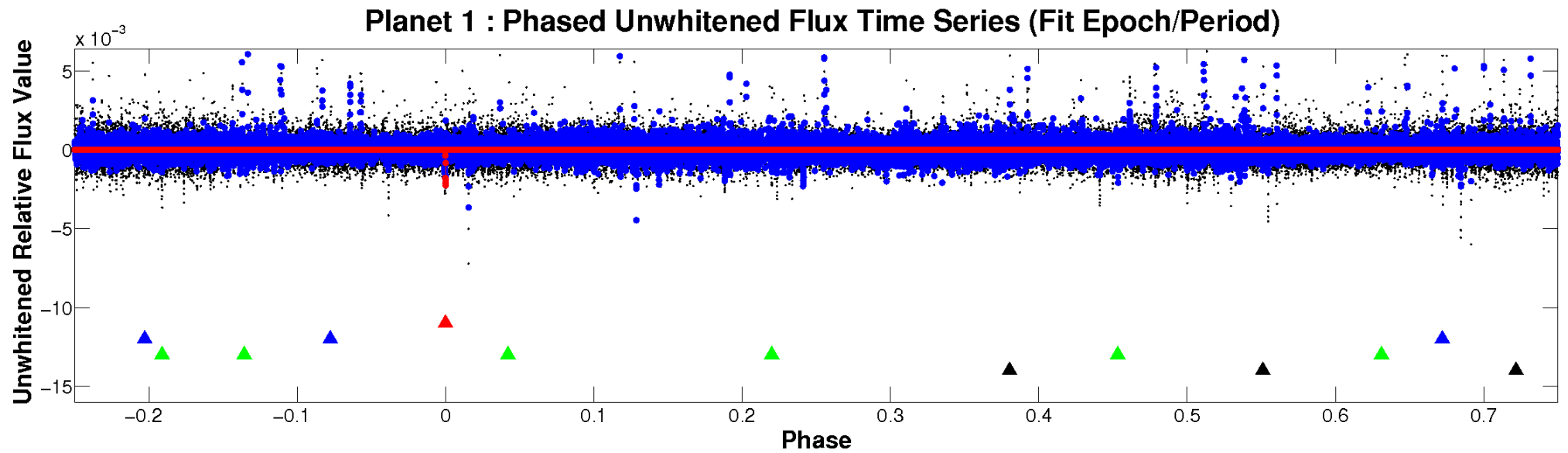


ALT Odd/Even

TCE 005614003-01

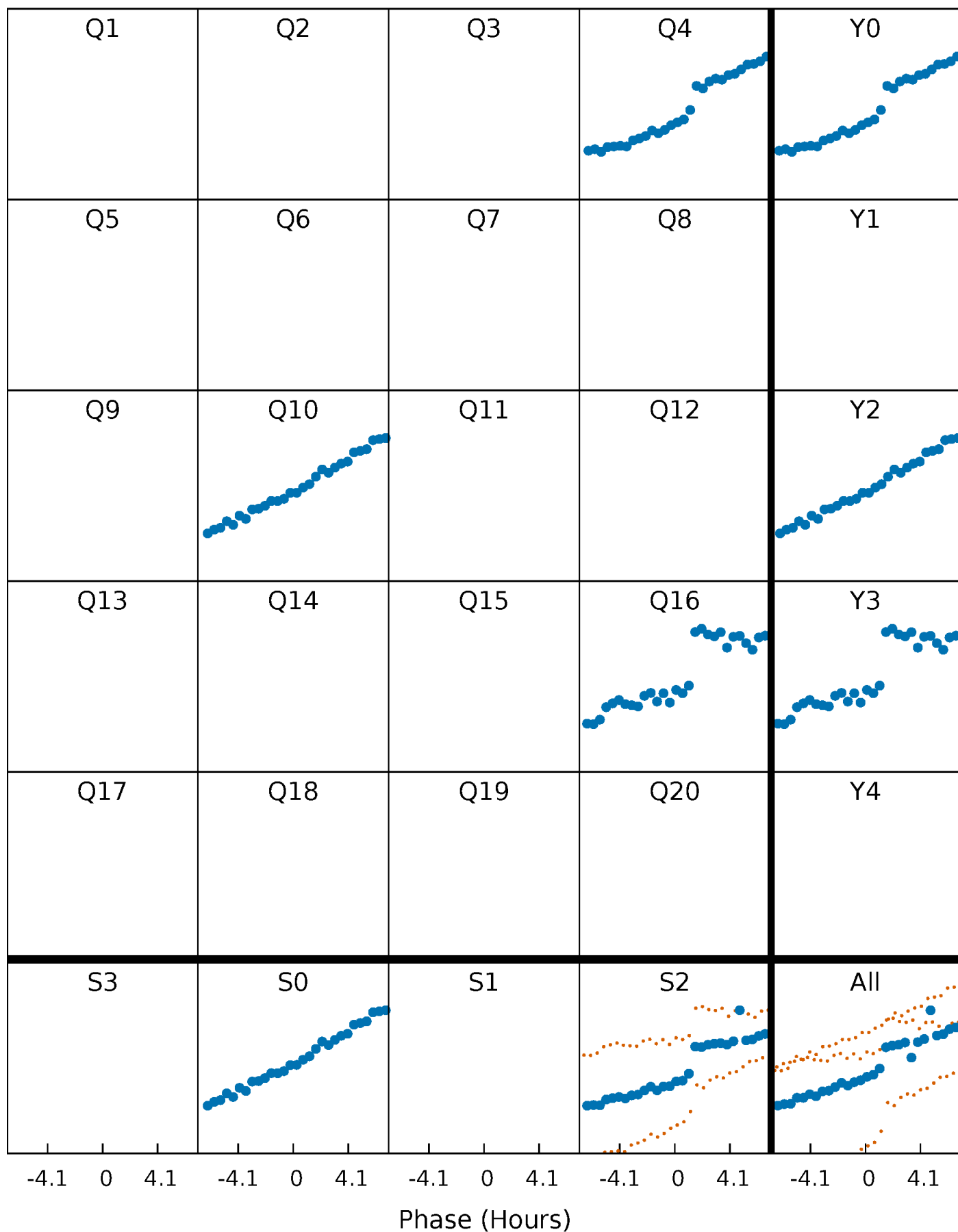


Non-Whitened Vs. Whitened Light Curve



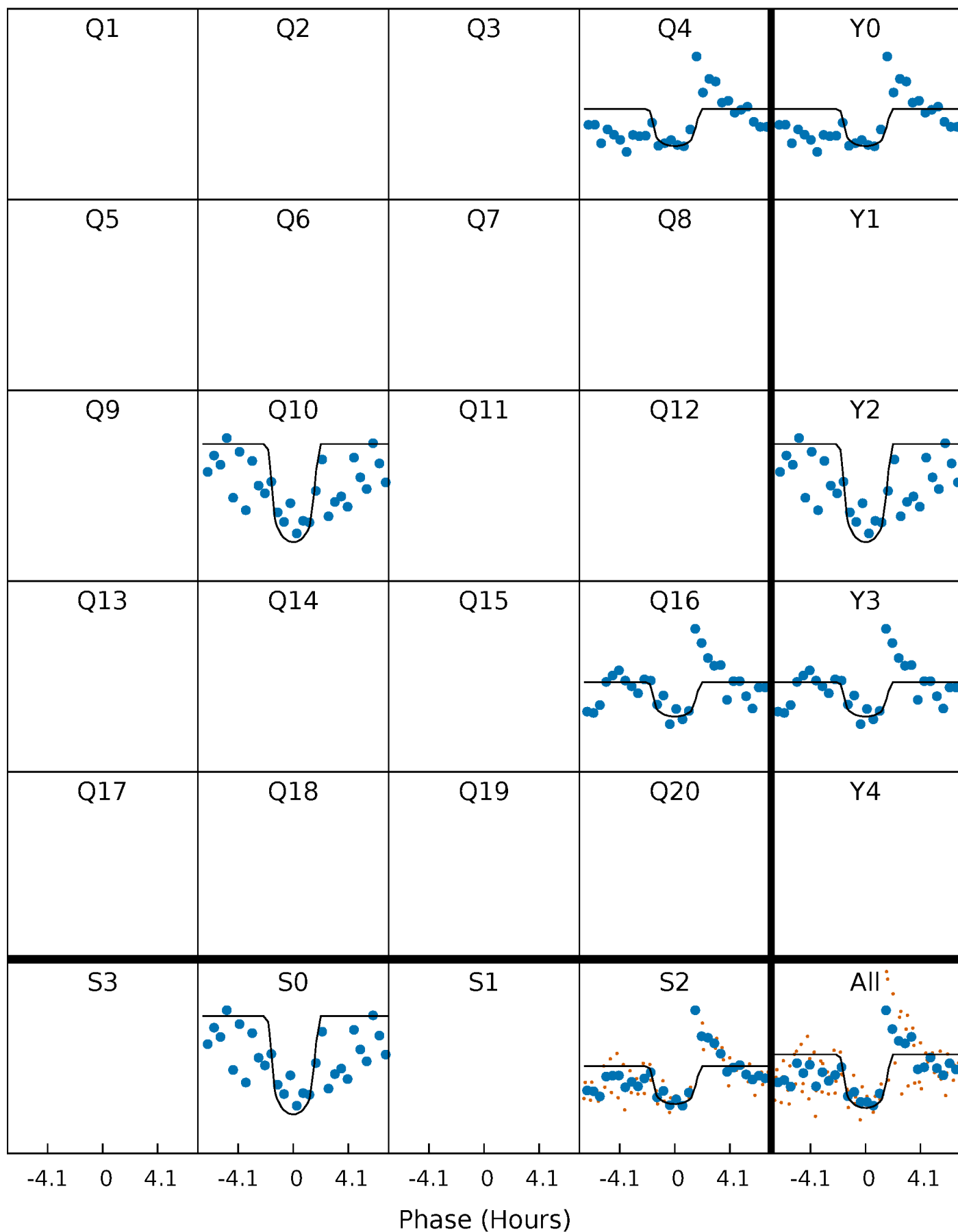
PDC Quarter-Phased Transit Curves

TCE 005614003-01 P=558.942557 Days $T_0=432.693350$ (BKJD)



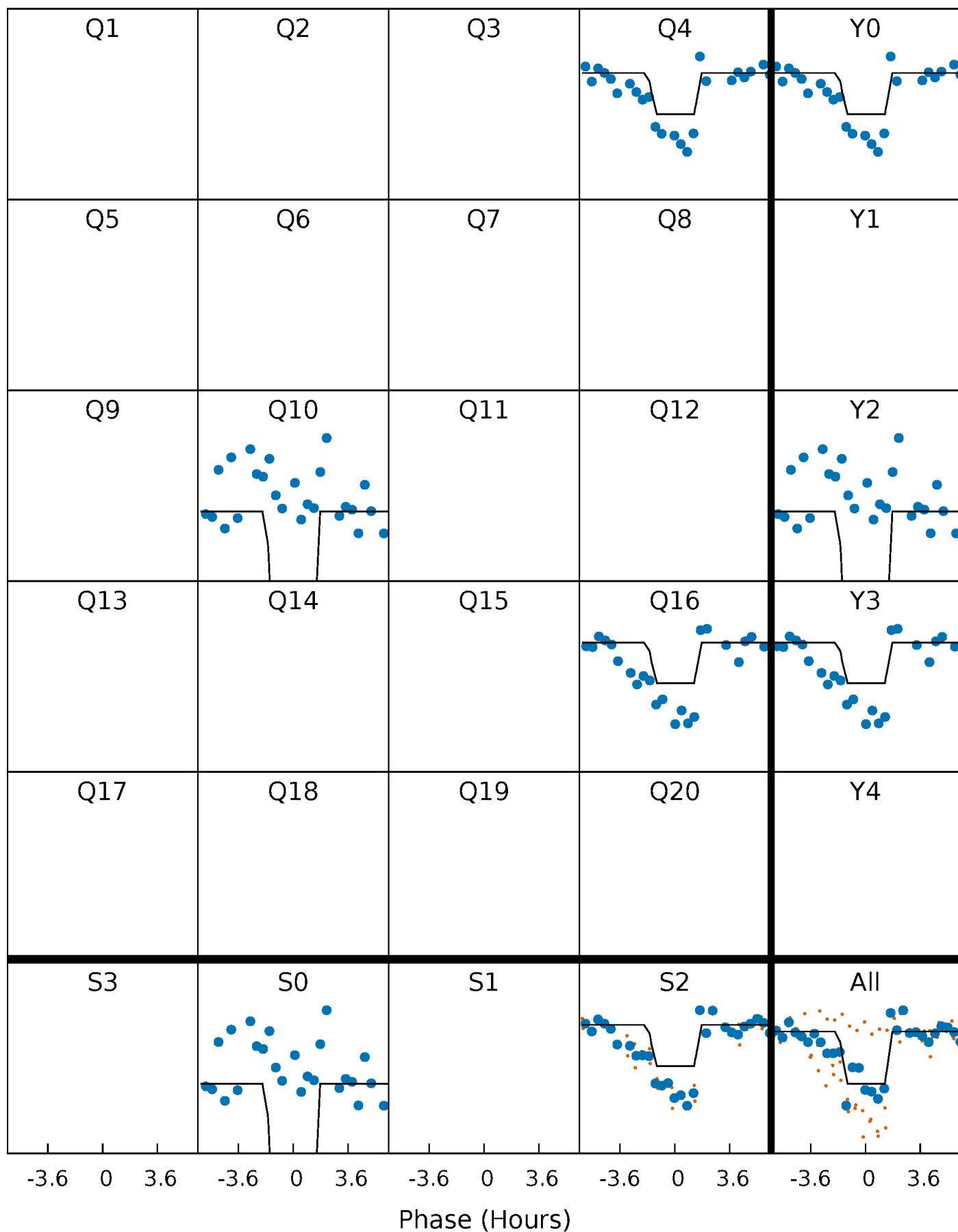
DV Quarter-Phased Transit Curves

TCE 005614003-01 P=558.942557 Days $T_0=432.693350$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

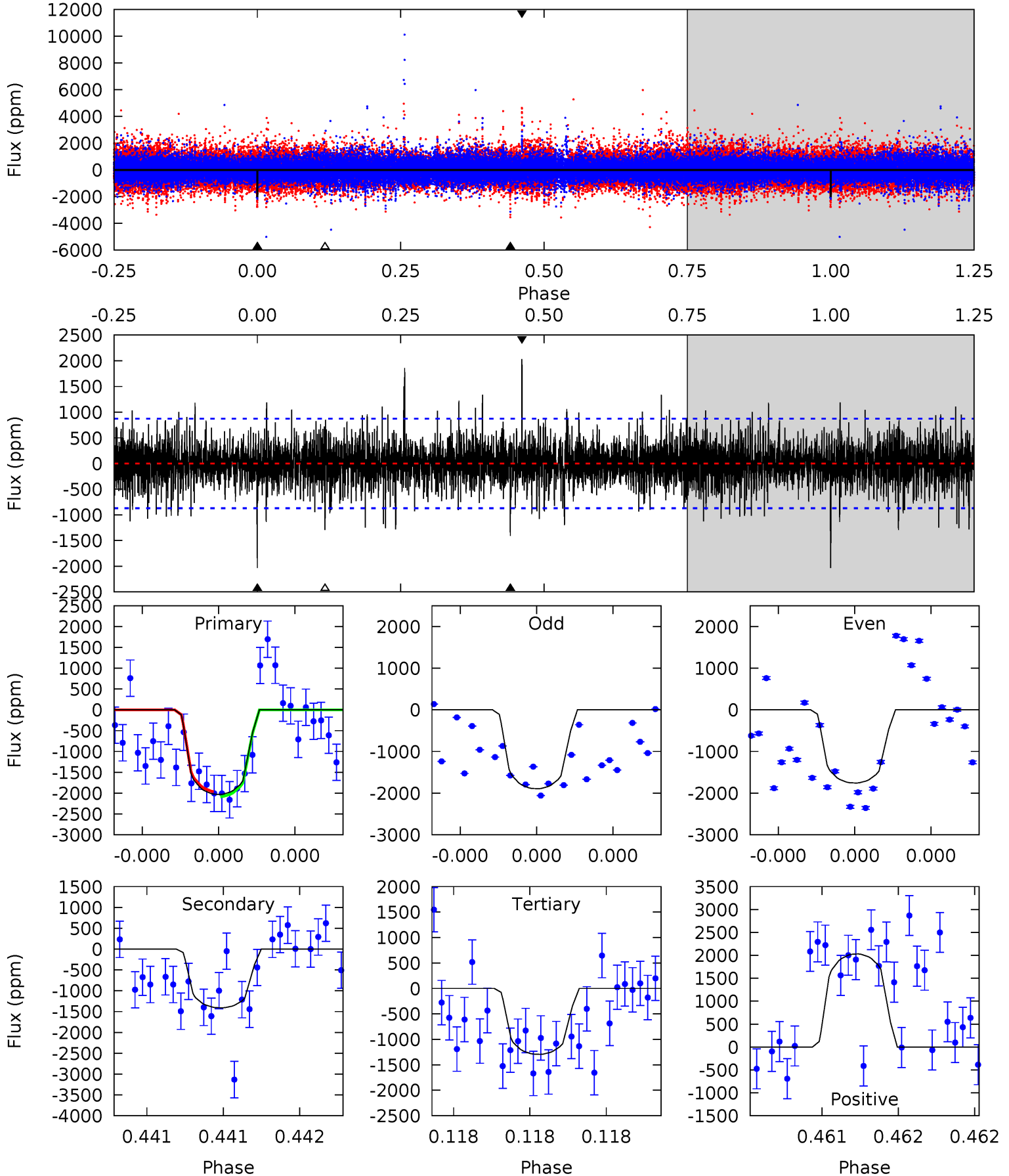
TCE 005614003-01 P=558.939600 Days $T_0=432.688728$ (BKJD)



DV Model-Shift Uniqueness Test

005614003-01, P = 558.942557 Days, E = 432.693350 Days

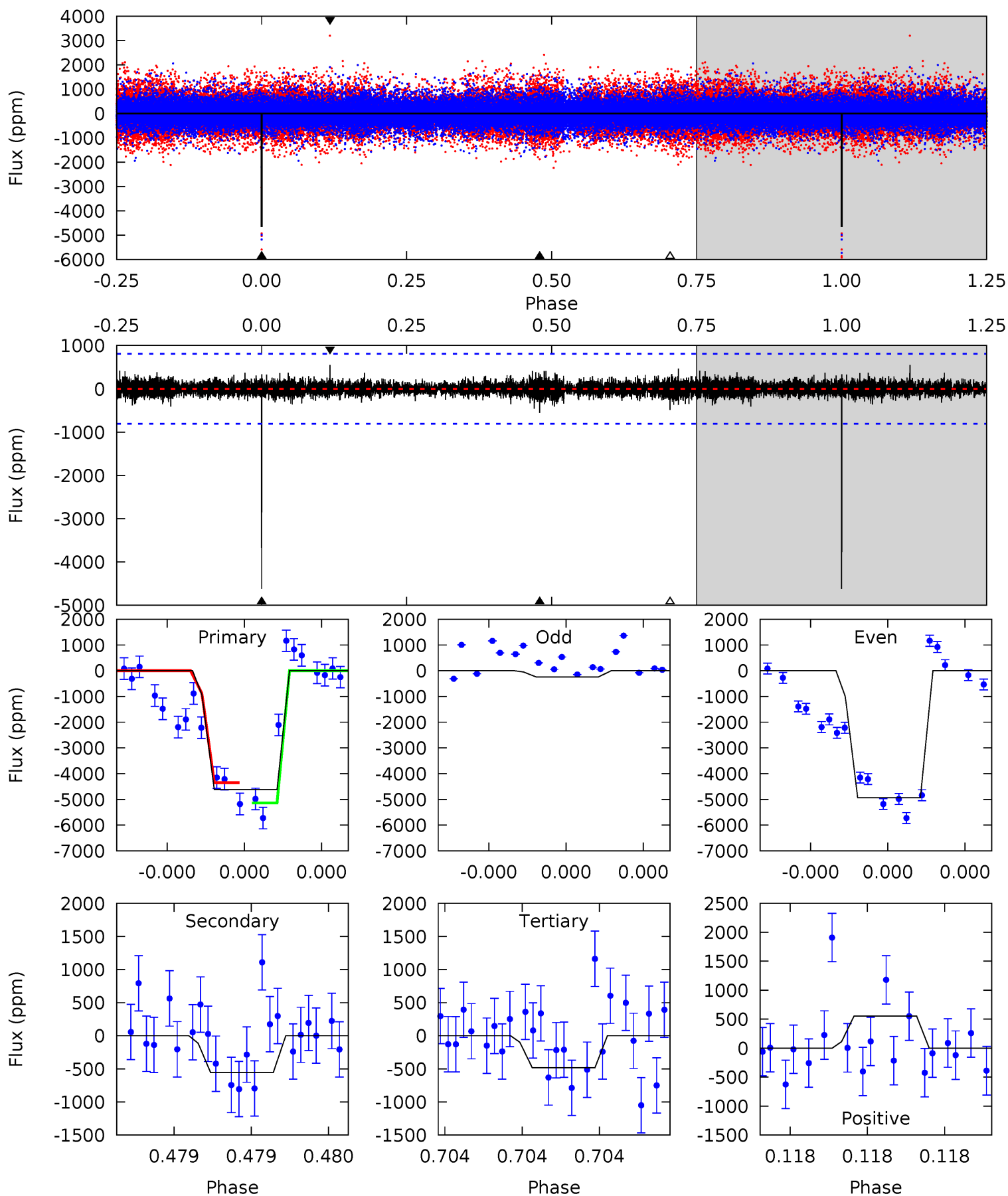
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	9.17	8.42	13.2	5.67	3.63	1.83	4.79	0.01	0.75	-4.04	0.41	0.95	0.50	0.39



Alt Model-Shift Uniqueness Test

005614003-01, P = 558.939600 Days, E = 432.688728 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.7	3.94	3.42	3.90	5.71	3.69	0.60	29.3	28.8	0.52	0.04	20.4	0.70	0.11	0



Stellar Parameters For KIC 005614003

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5059^{+150}_{-150}	$4.734^{+0.021}_{-0.053}$	$-1.220^{+0.300}_{-0.300}$	$0.558^{+0.041}_{-0.024}$	$0.615^{+0.032}_{-0.032}$	$4.990^{+0.433}_{-0.882}$
	+3%/-3%	+0%/-1%	+25%/-25%	+7%/-4%	+5%/-5%	+9%/-18%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005614003-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1410 ± 154	$4.22^{+3.76}_{-2.82}$	220^{+8}_{-7}	4002^{+2455}_{-761}	$56848^{+444286}_{-41738}$
Alt.	-557 ± 141	$4.48^{+3.93}_{-2.65}$	221^{+7}_{-7}	3359^{+1208}_{-562}	19416^{+89432}_{-14132}

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

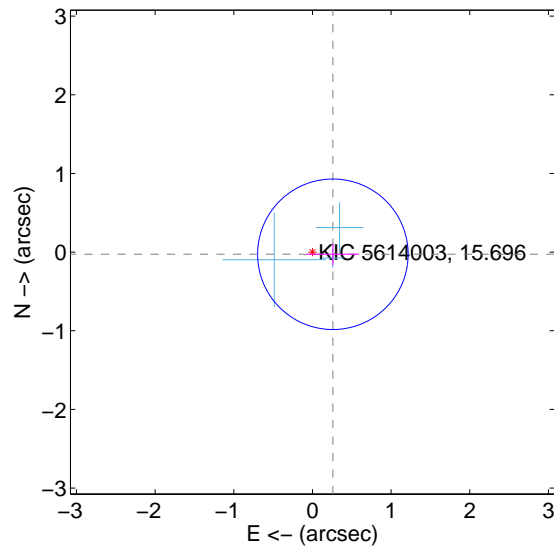
Supplemental centroid analysis for 005614003-01. Kepler magnitude: 15.70. Transit SNR 9.78

There are 3 quarters with good PRF difference image offsets

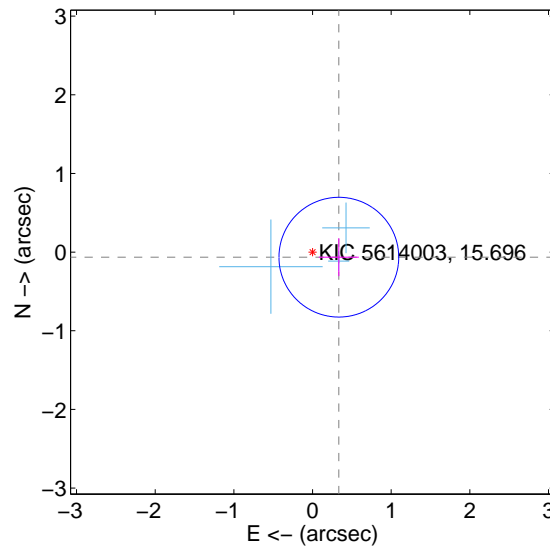
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.261 ± 0.319	0.82	-0.260 ± 0.331	-0.028 ± 0.137
PRF-fit source offset from KIC position	0.341 ± 0.254	1.34	-0.335 ± 0.254	-0.065 ± 0.240
photometric centroid source offset	0.44 ± 0.71	0.62	0.04 ± 0.76	-0.44 ± 0.71

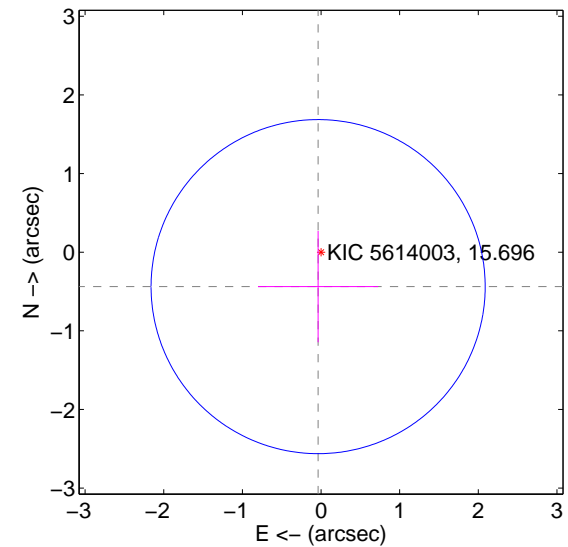
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

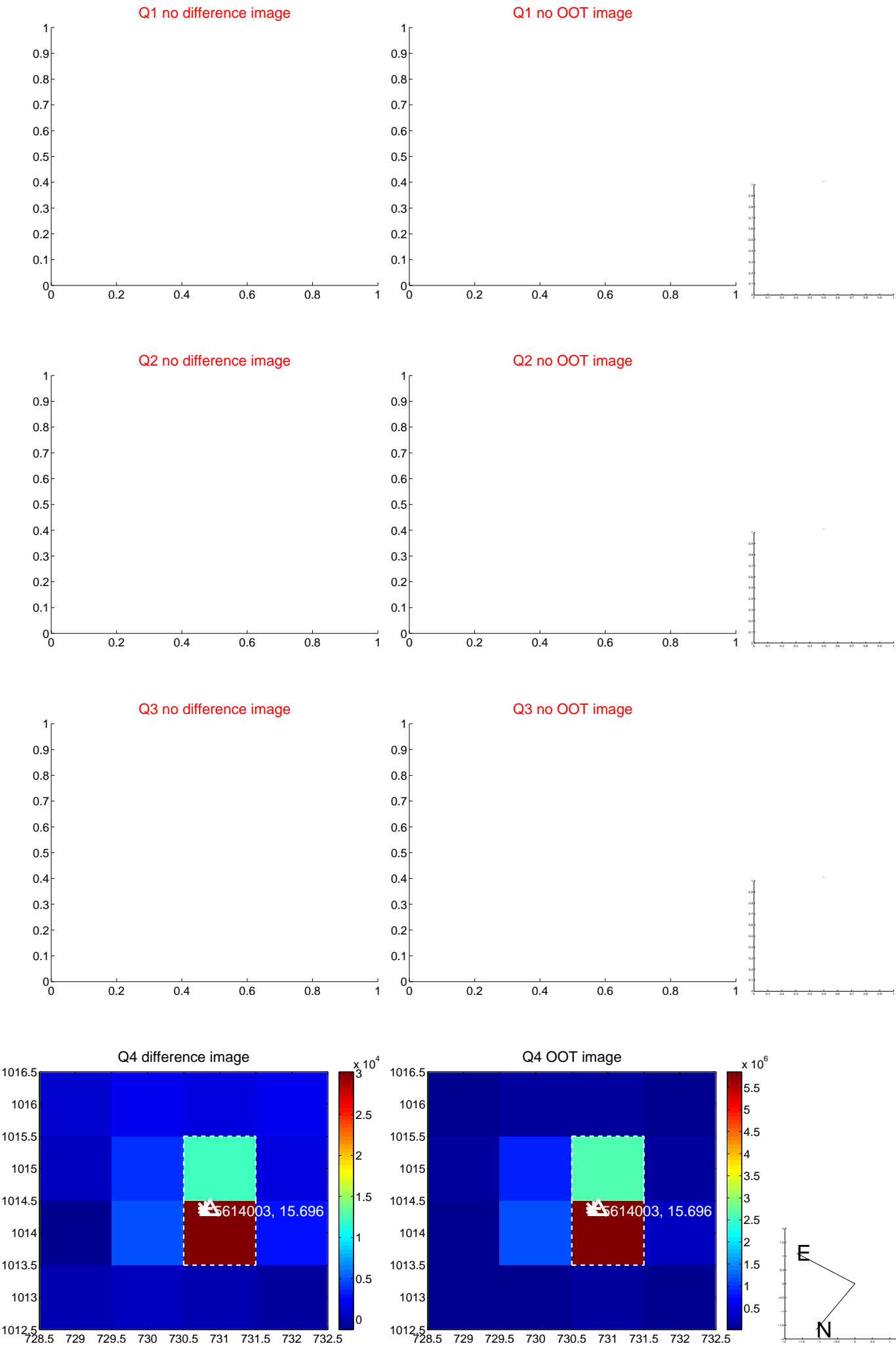


offset from photometric centroids



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.

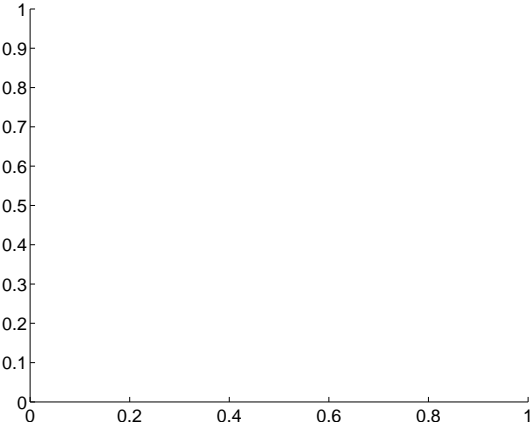


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

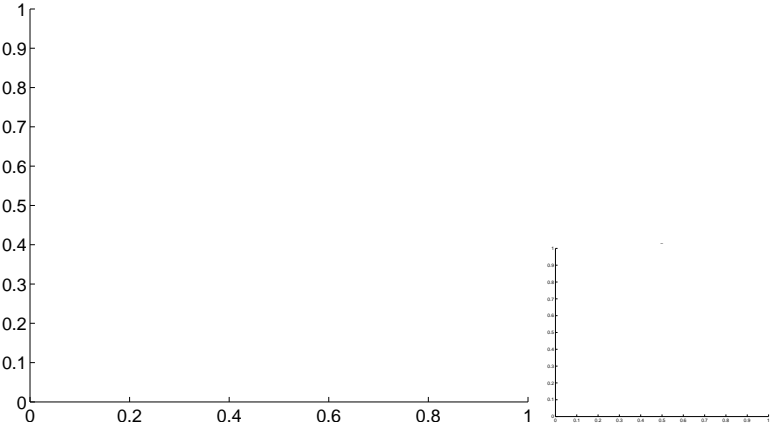


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

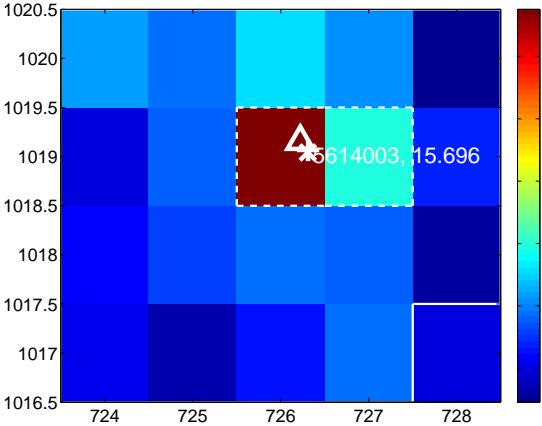
Q9 no difference image



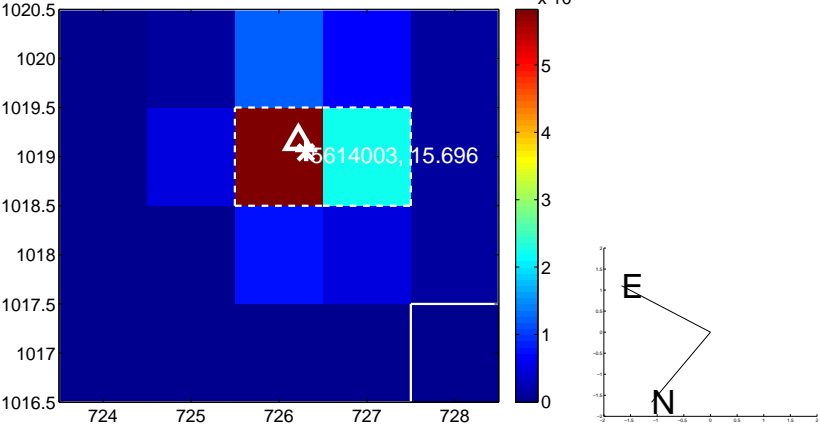
Q9 no OOT image



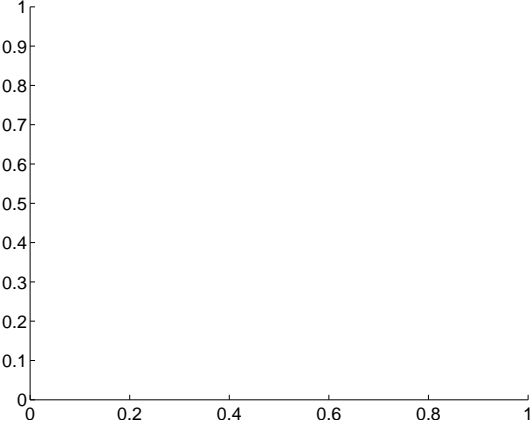
Q10 difference image



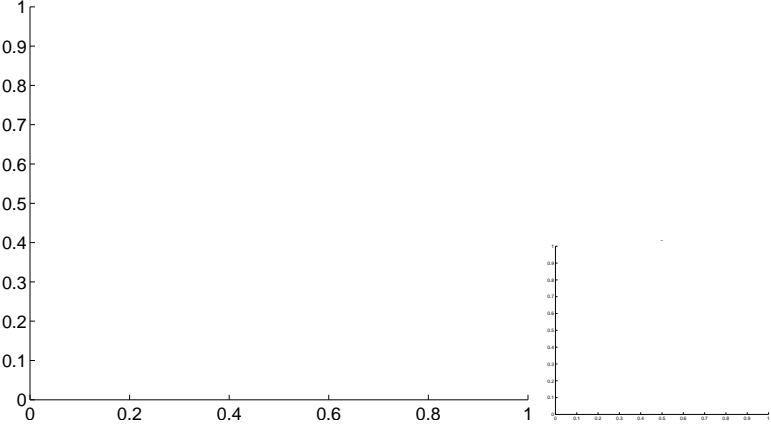
Q10 OOT image



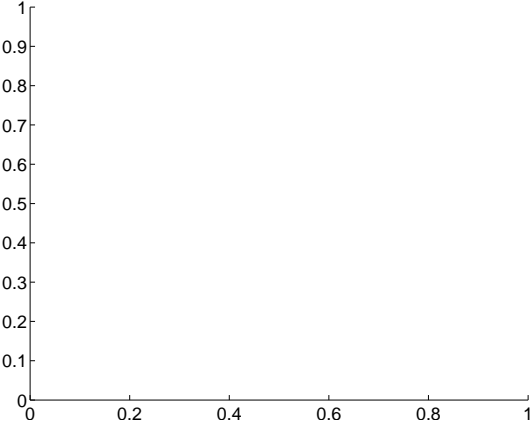
Q11 no difference image



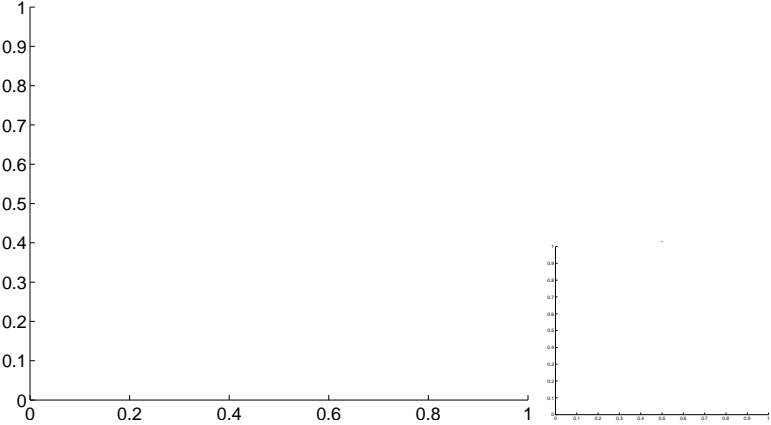
Q11 no OOT image



Q12 no difference image



Q12 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

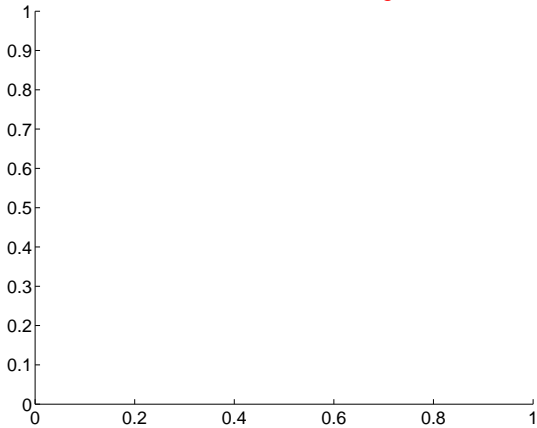
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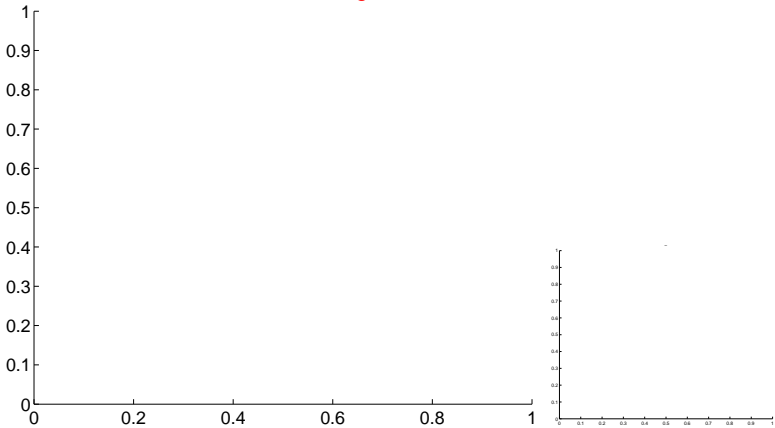
Q13 no OOT image



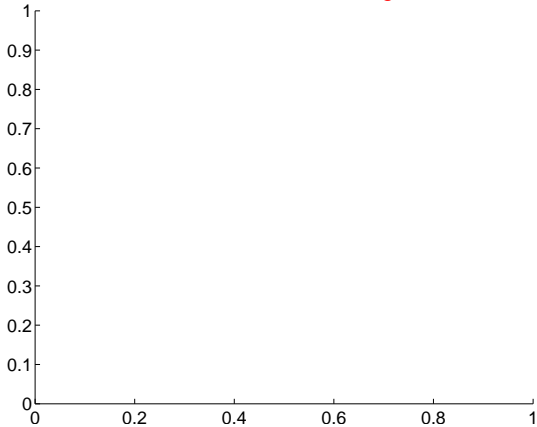
Q14 no difference image



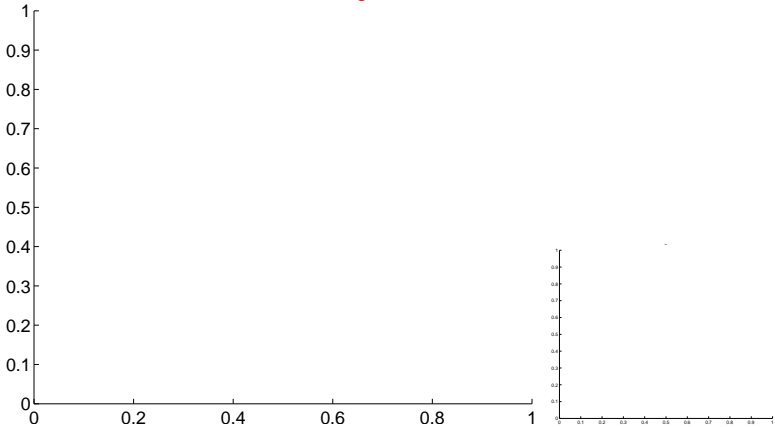
Q14 no OOT image



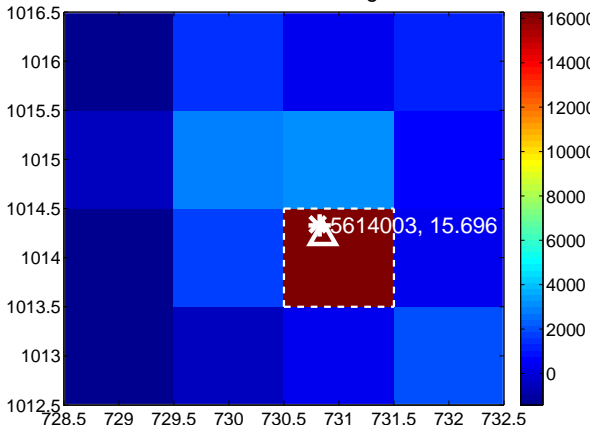
Q15 no difference image



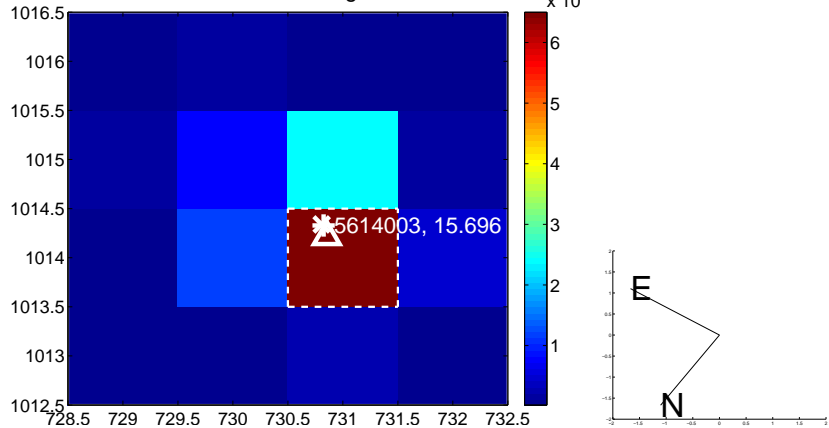
Q15 no OOT image



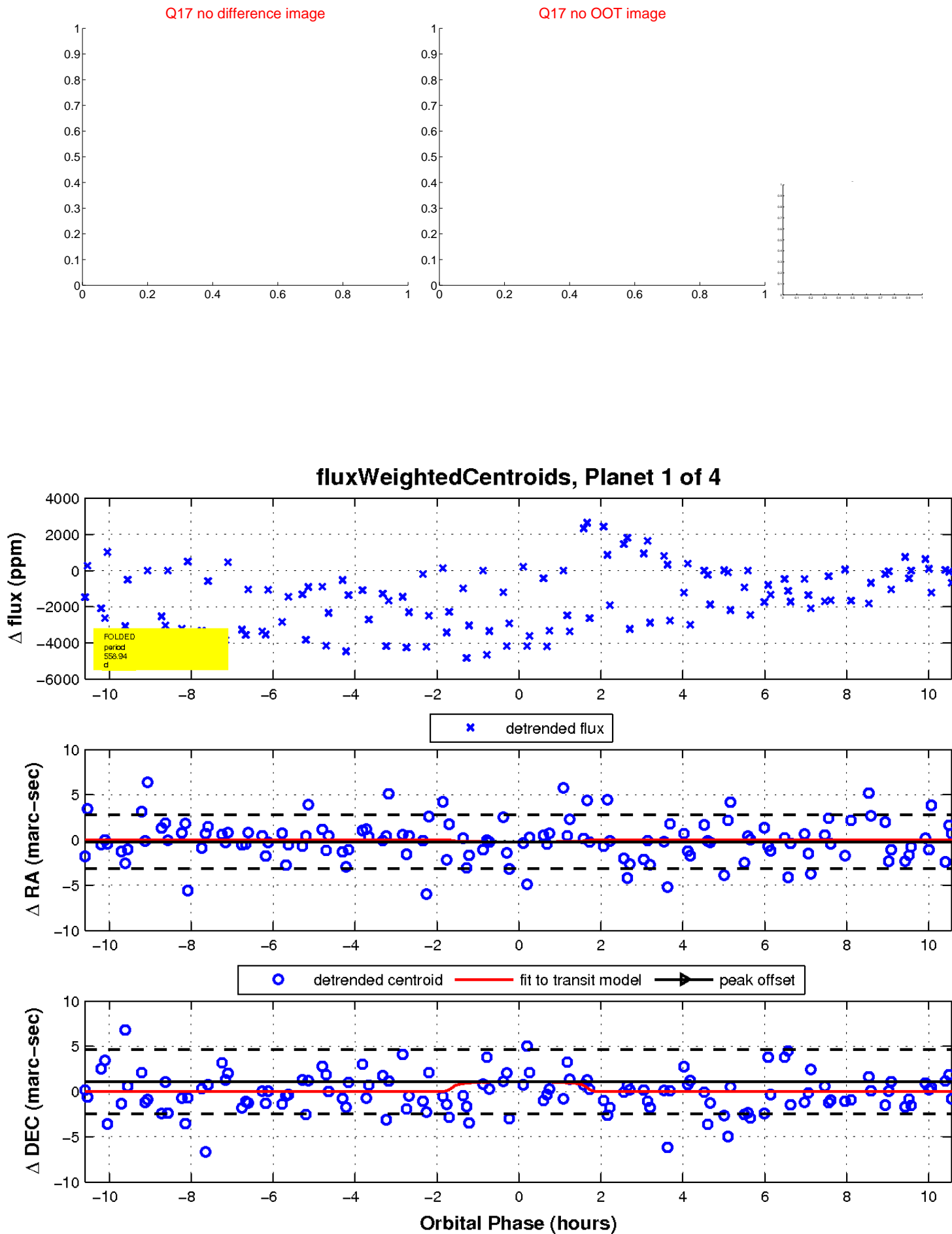
Q16 difference image



Q16 OOT image

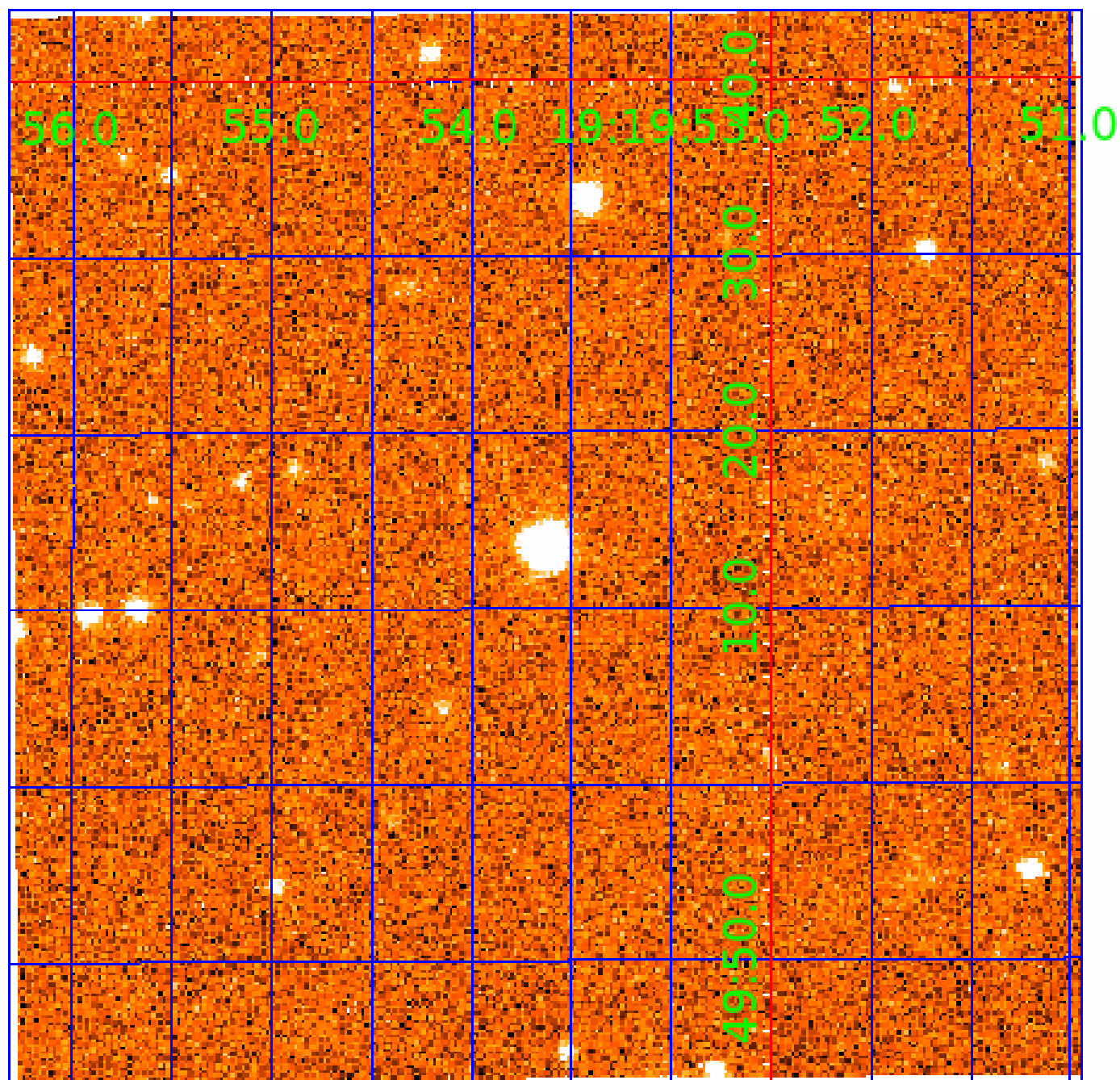


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005614003

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})
005614003-01	OBS	No	558.942557	432.693350	2260.1	3.558	11.5	9.8	0.56	5059	2.72	0.14
005614003-02	OBS	No	628.885035	249.401819	1654.7	3.860	11.3	6.7	0.56	5059	2.84	0.12
005614003-03	OBS	No	229.772915	325.876708	1349.3	3.775	9.5	6.4	0.56	5059	2.05	0.47
005614003-04	OBS	No	463.518437	277.187953	1607.4	4.063	11.6	6.7	0.56	5059	2.22	0.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005614003-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
005614003-02	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
005614003-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005614003-04	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

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

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

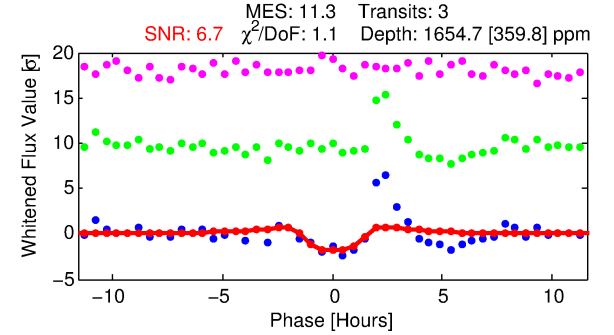
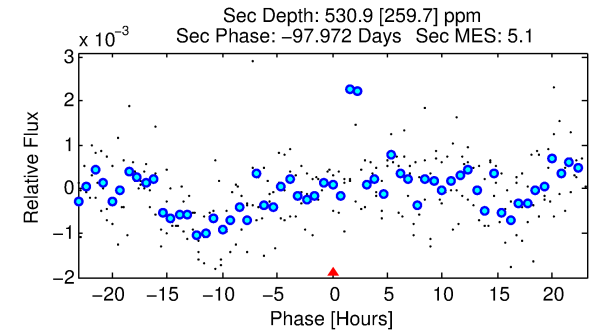
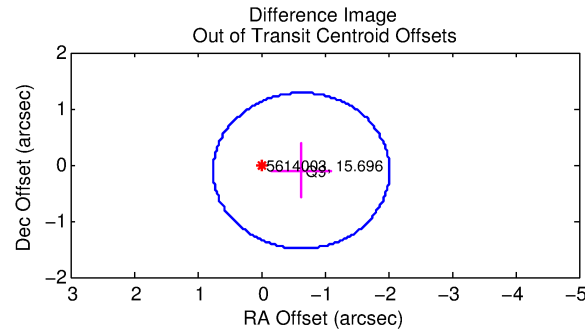
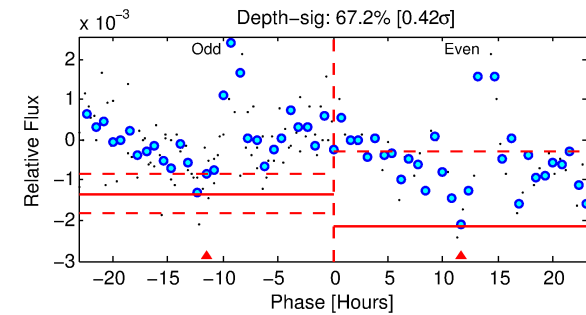
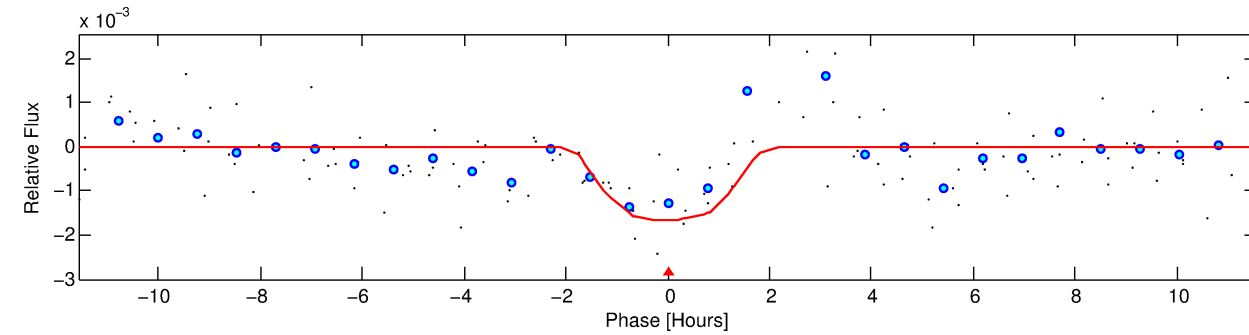
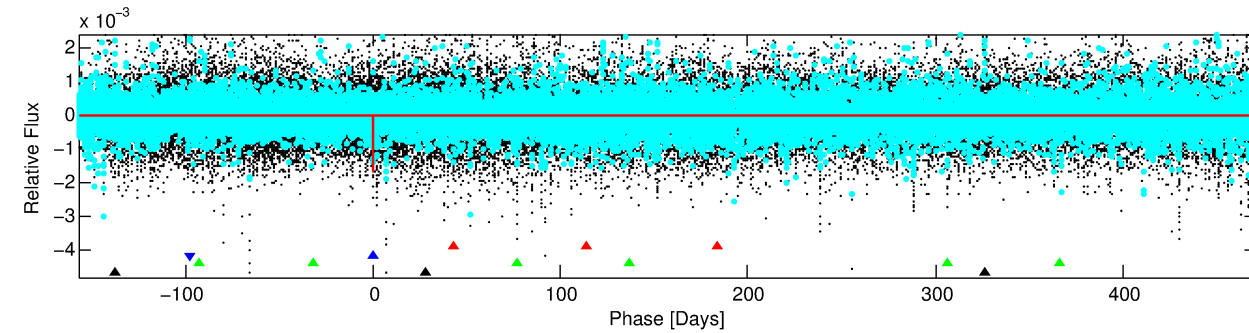
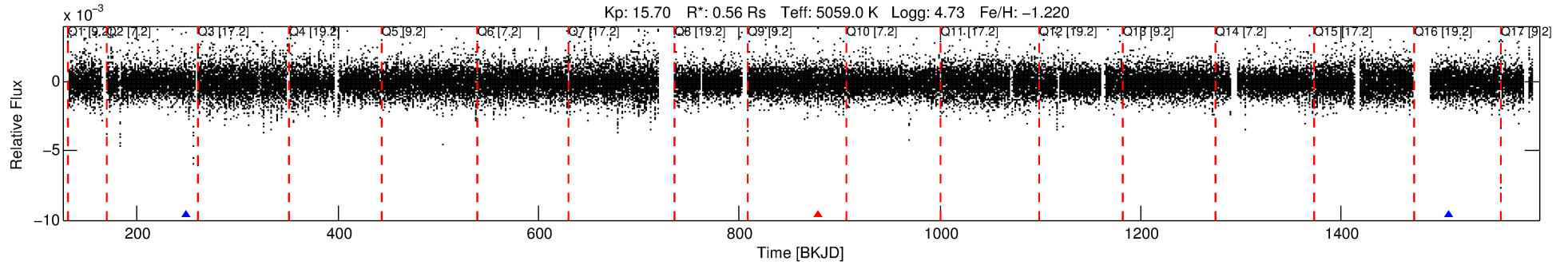
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005614003-02

No Significant Match Found

DV One-Page Summary

KIC: 5614003 Candidate: 2 of 4 Period: 628.885 d



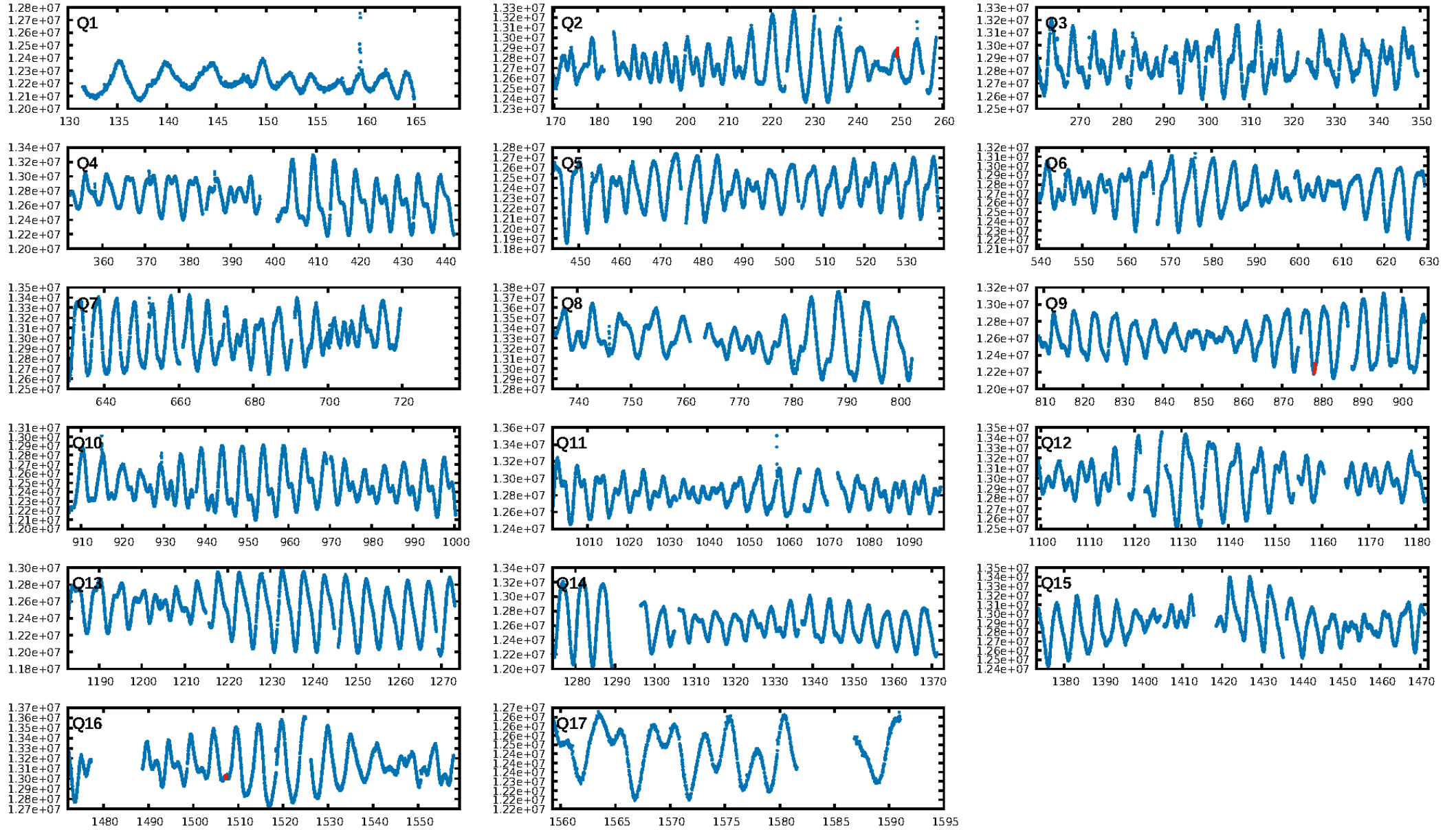
DV Fit Results:

Period = 628.88503 [0.00870] d
Epoch = 249.4018 [0.0098] BKJD
Rp/R* = 0.0466 [0.0086]
a/R* = 585.84 [260.09]
b = 0.93 [0.07]
Seff = 0.12 [0.02]
Teq = 151 [6] K
Rp = 2.84 [0.56] Re
a = 1.2223 [0.0778] AU
Ag = 54175.55 [33592.61] [1.61 σ]
Teffp = 3557 [555] K [6.14 σ]

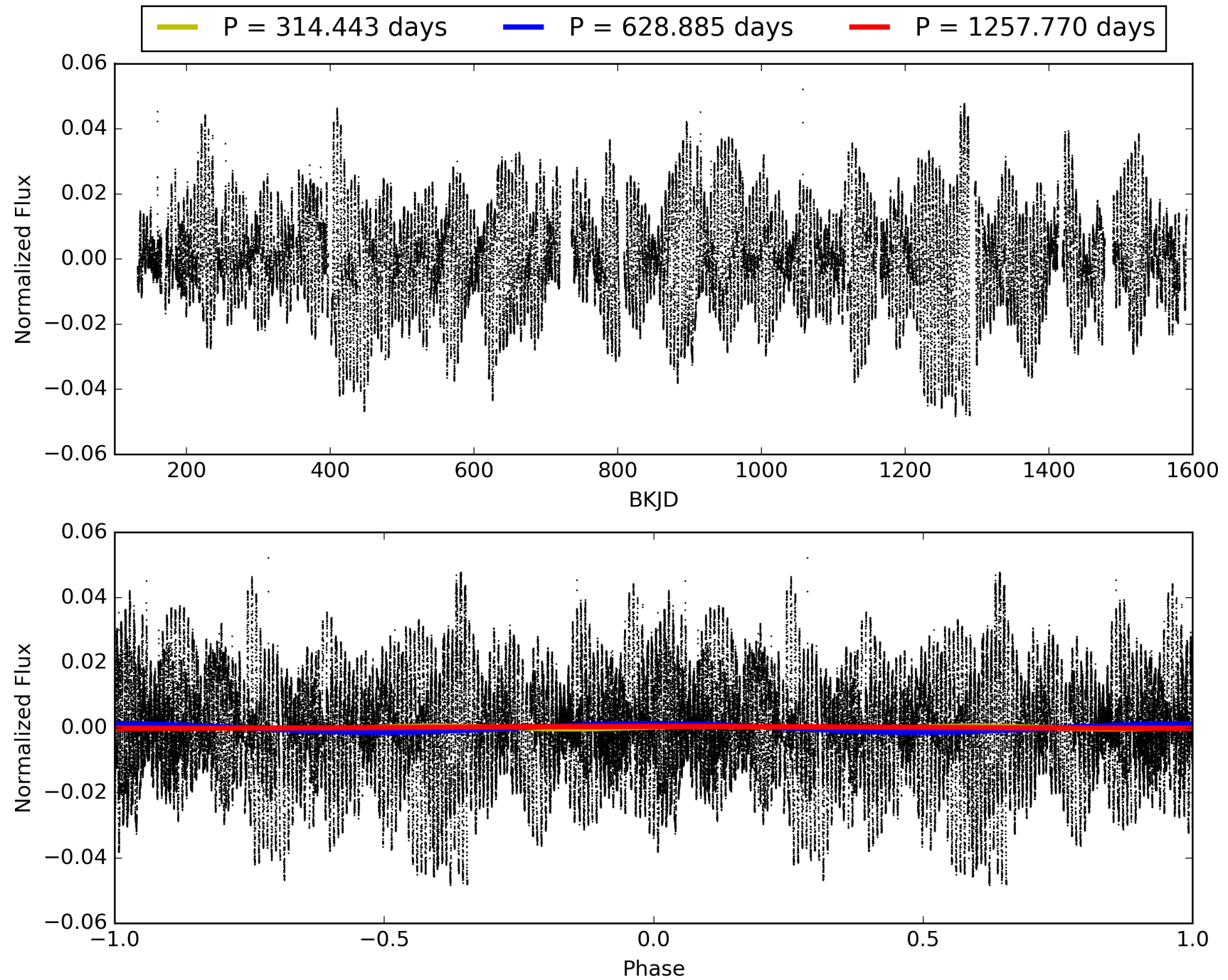
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [319.79 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.8%
ModelChiSquareGof-sig: 91.6%
Bootstrap-pfa: 1.11e-10
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 1.79
Centroid-sig: 15.2%
Centroid-so: 1.151 arcsec [0.86 σ]
OotOffset-rm: 0.642 arcsec [1.39 σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-rm: 0.552 arcsec [1.19 σ]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 005614003-02, PDC Light Curves

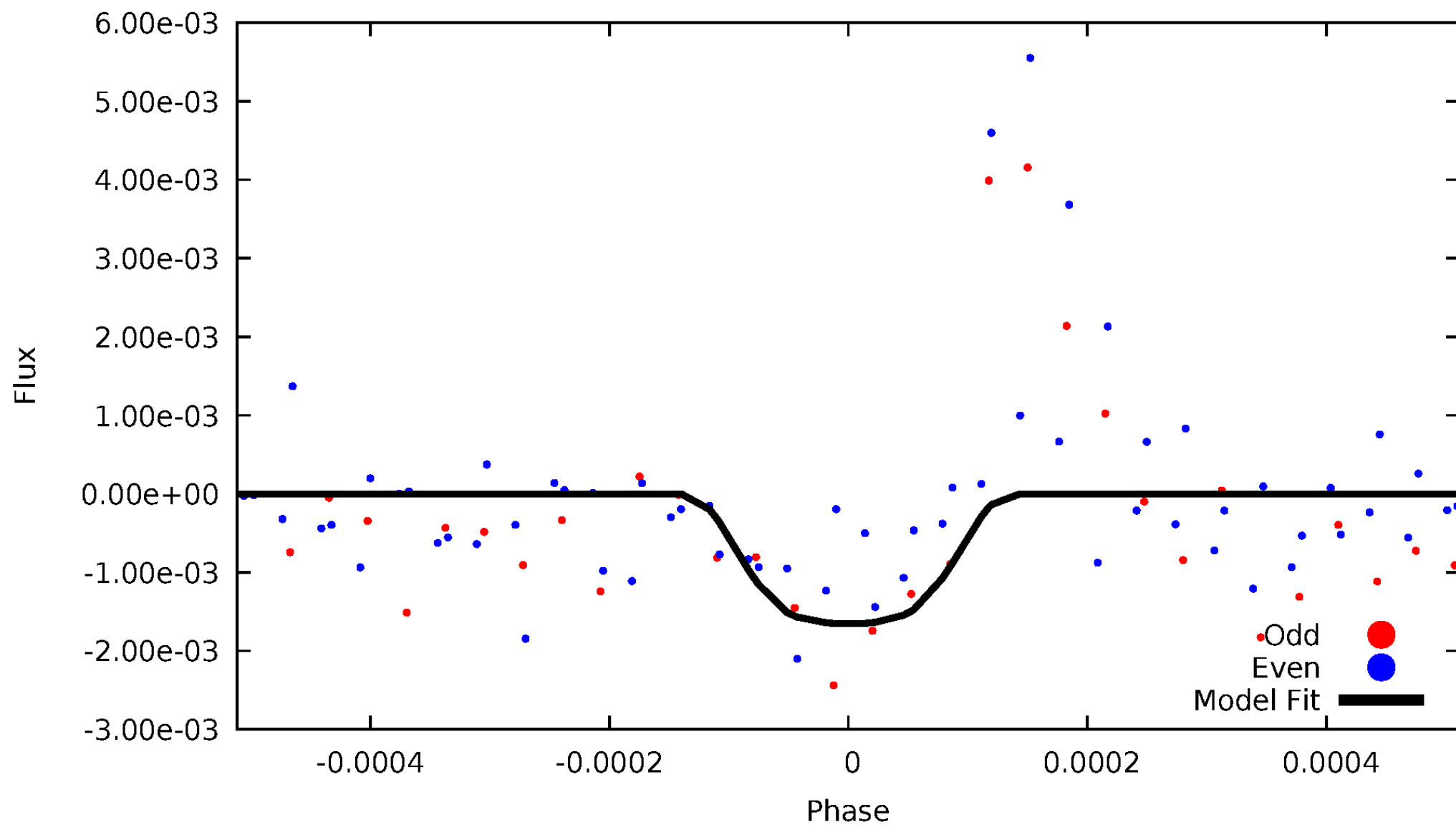


TCE 005614003-02



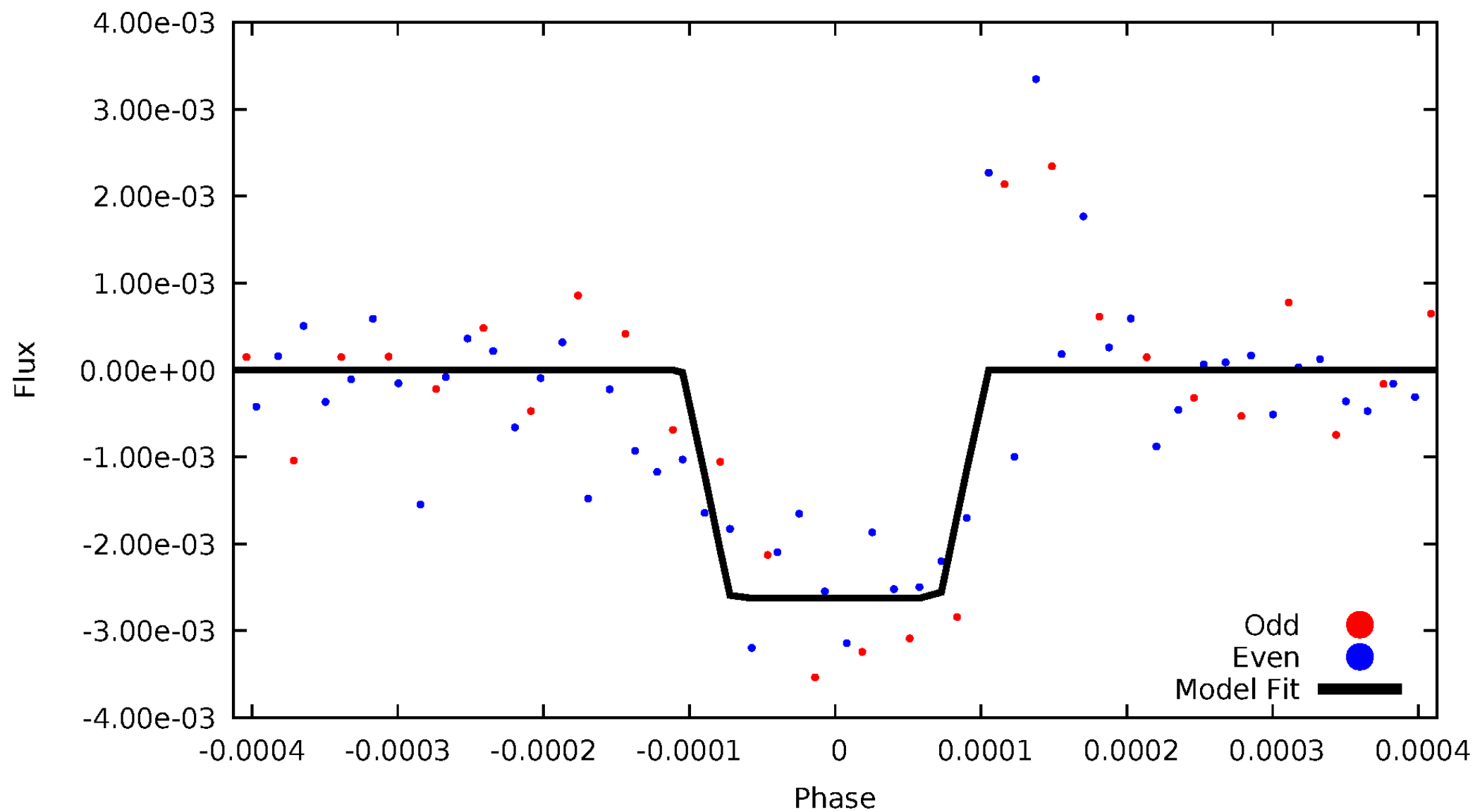
DV Odd/Even

TCE 005614003-02



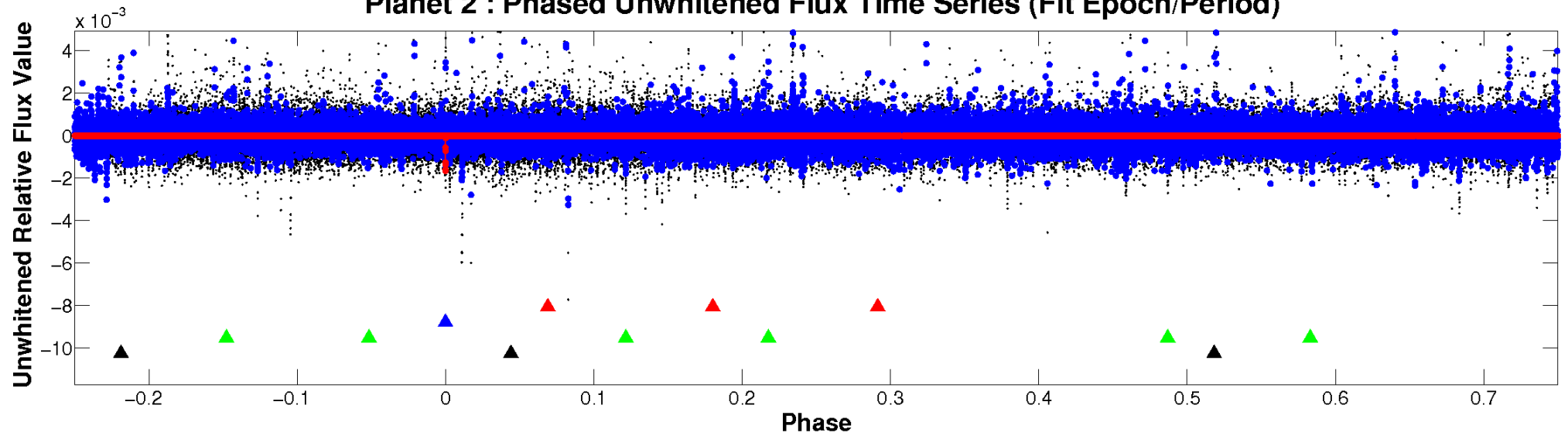
ALT Odd/Even

TCE 005614003-02

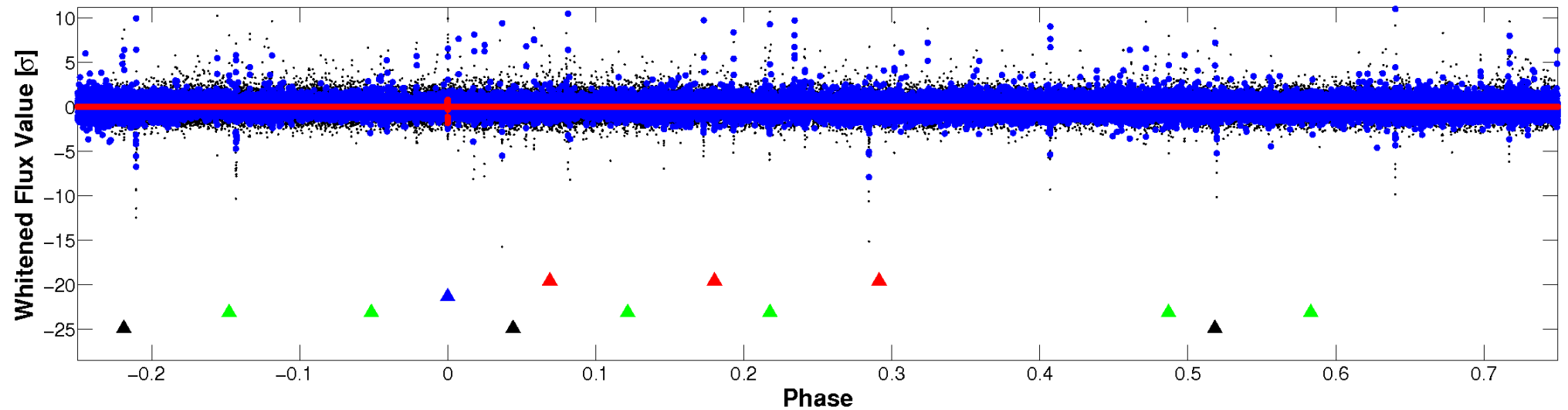


Non-Whitened Vs. Whitened Light Curve

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

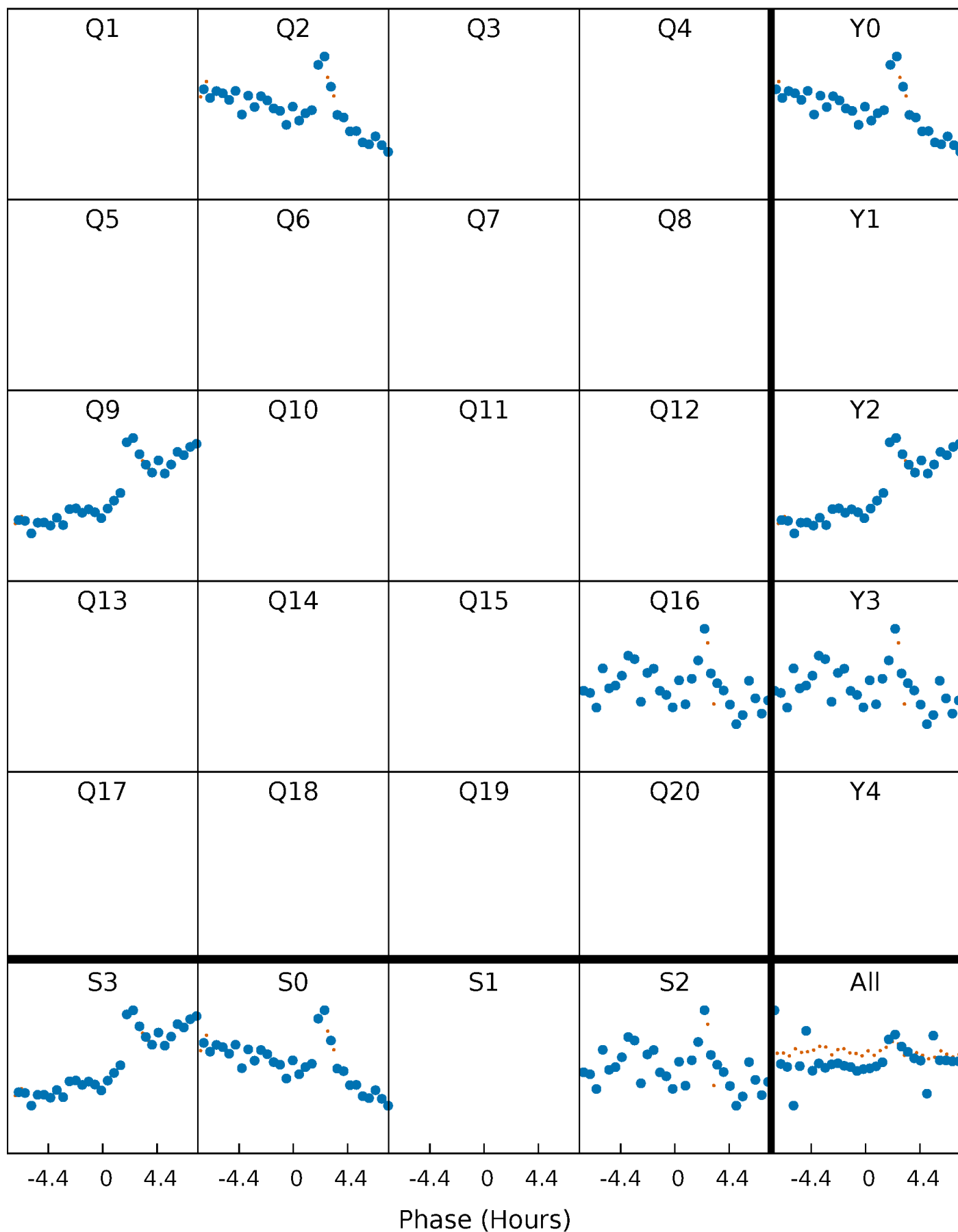


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



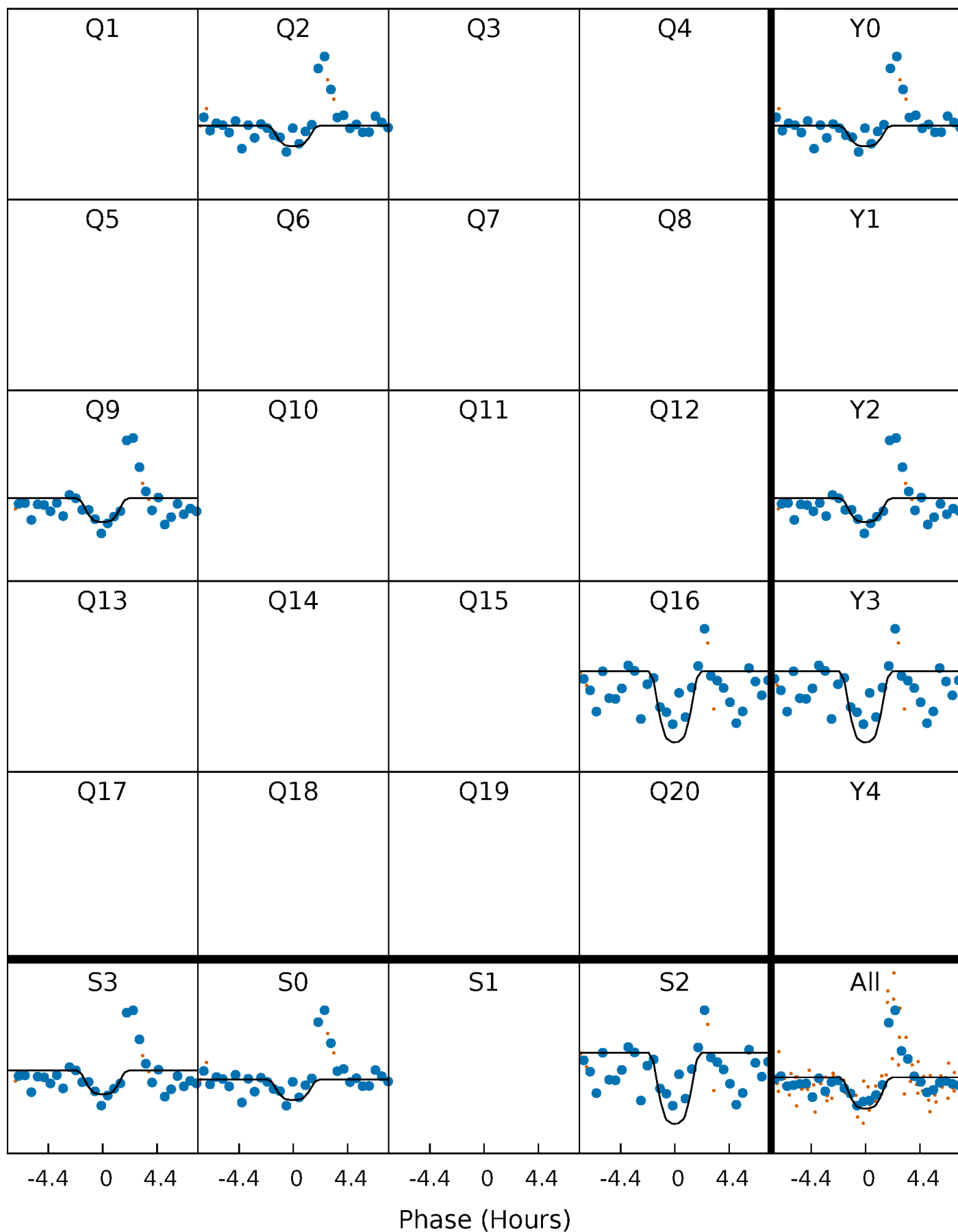
PDC Quarter-Phased Transit Curves

TCE 005614003-02 P=628.885035 Days $T_0=249.401819$ (BKJD)



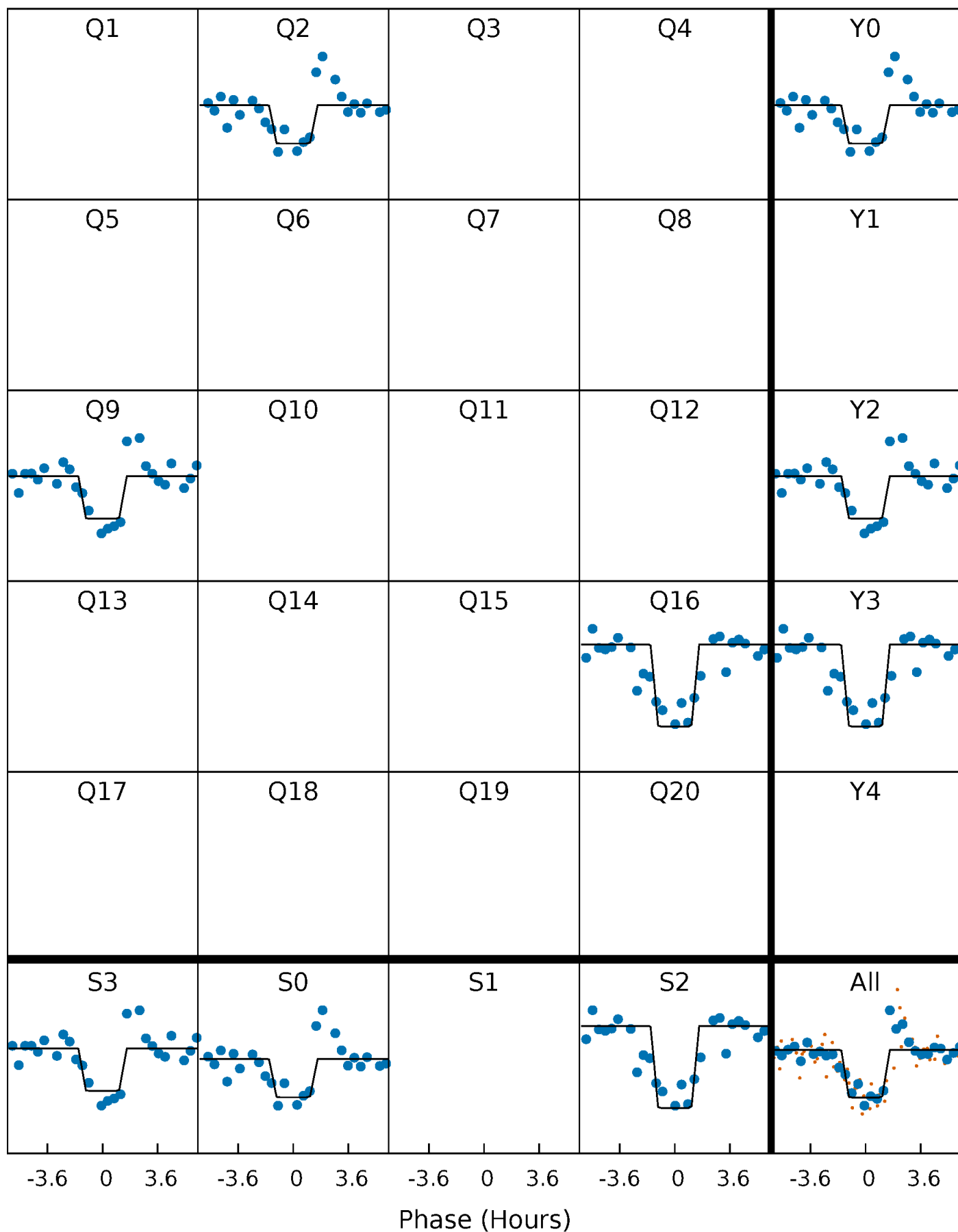
DV Quarter-Phased Transit Curves

TCE 005614003-02 P=628.885035 Days $T_0=249.401819$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

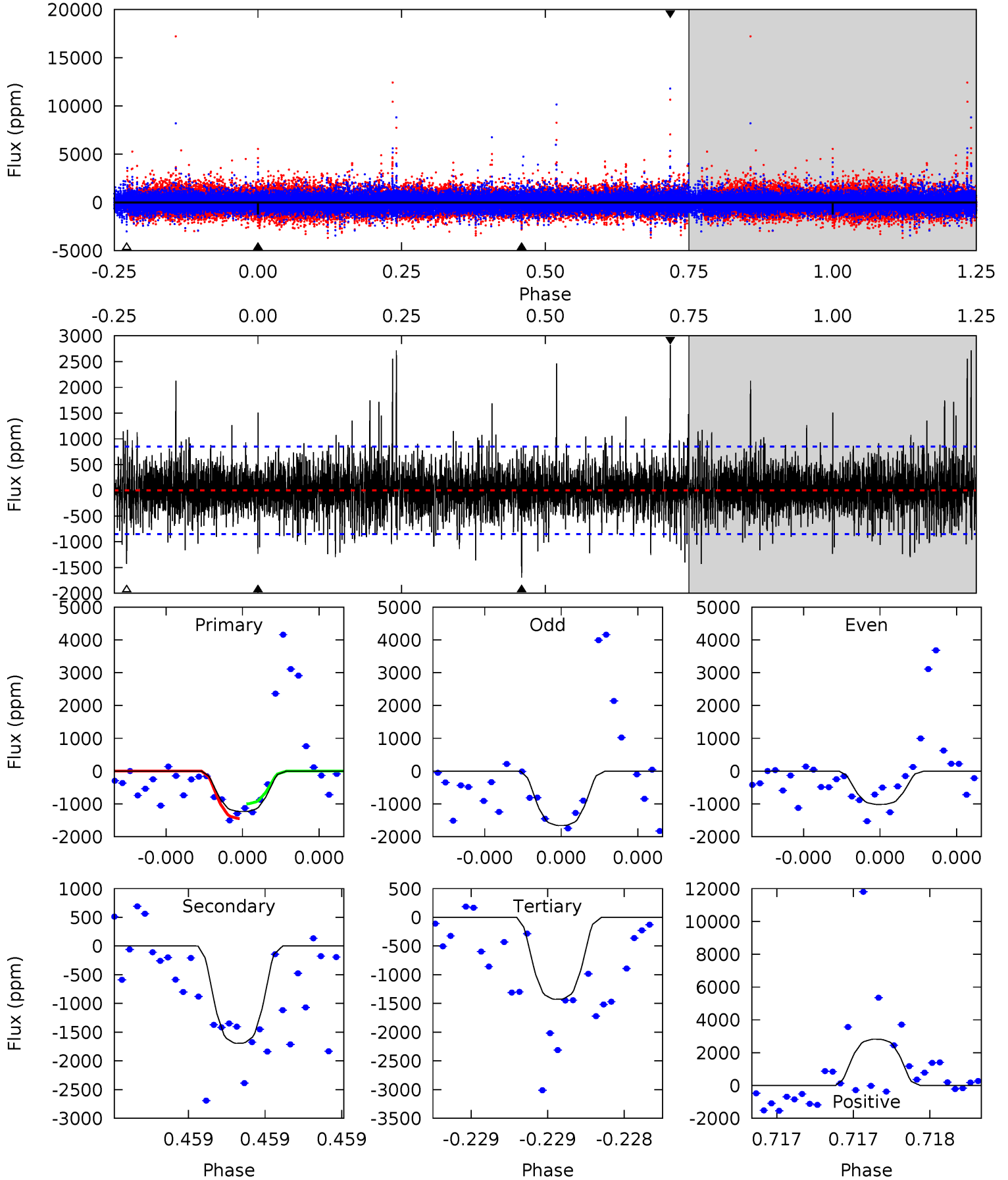
TCE 005614003-02 P=628.876865 Days $T_0=249.410926$ (BKJD)



DV Model-Shift Uniqueness Test

005614003-02, P = 628.885035 Days, E = 249.401819 Days

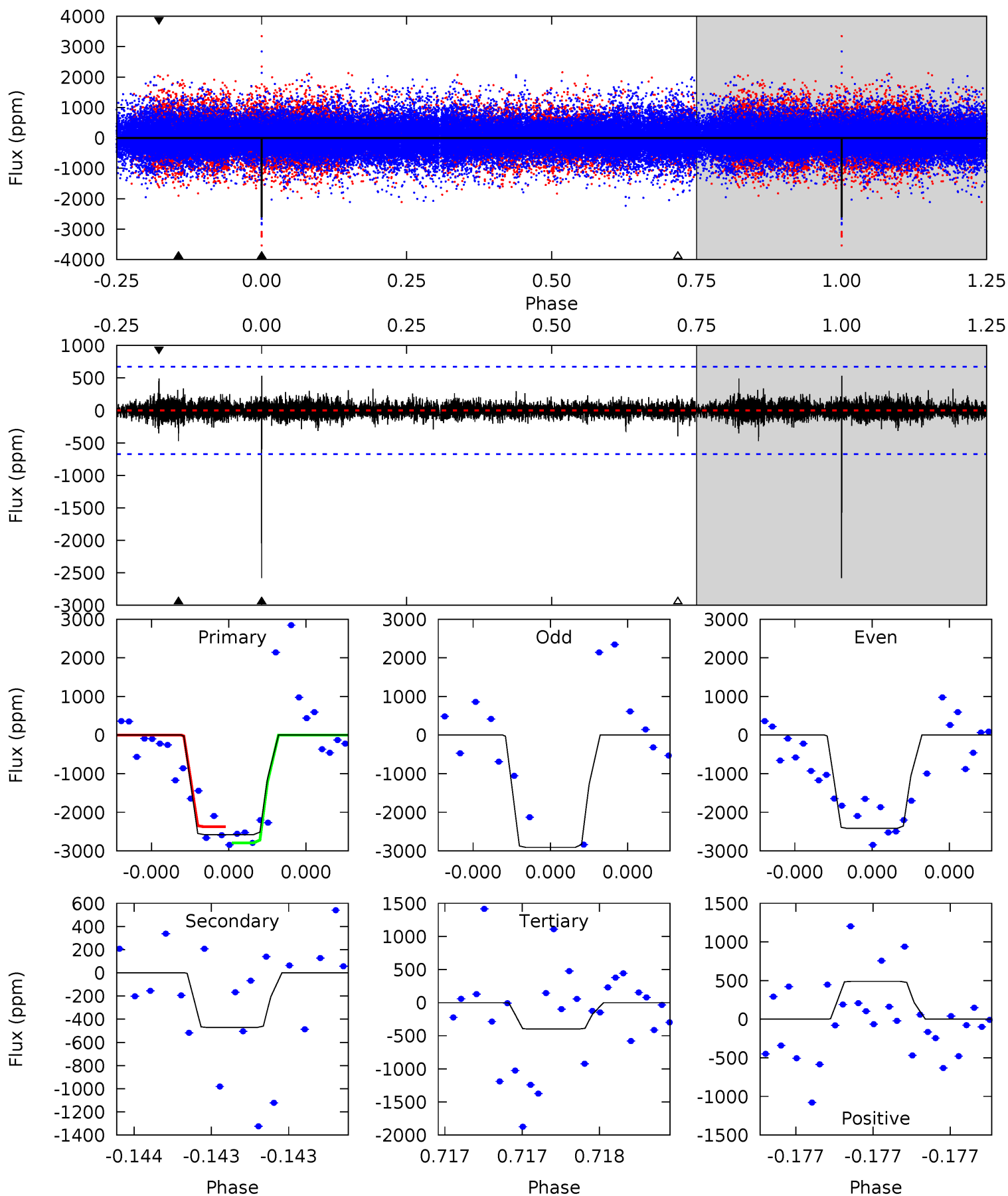
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.25	11.3	9.55	18.9	5.68	3.65	2.17	-1.30	-10.6	1.78	-7.53	1.85	1.22	0.62	1.49



Alt Model-Shift Uniqueness Test

005614003-02, P = 628.876865 Days, E = 249.410926 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.1	4.03	3.41	4.18	5.75	3.75	0.55	18.6	17.9	0.62	-0.15	2.03	0.99	0.17	1.78



Stellar Parameters For KIC 005614003

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5059^{+150}_{-150}	$4.734^{+0.021}_{-0.053}$	$-1.220^{+0.300}_{-0.300}$	$0.558^{+0.041}_{-0.024}$	$0.615^{+0.032}_{-0.032}$	$4.990^{+0.433}_{-0.882}$
	+3%/-3%	+0%/-1%	+25%/-25%	+7%/-4%	+5%/-5%	+9%/-18%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005614003-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1695 ± 150	$2.83^{+0.58}_{-0.49}$	212^{+7}_{-7}	4829^{+471}_{-374}	172962^{+85087}_{-53011}
Alt.	-472 ± 117	$3.12^{+0.60}_{-0.46}$	212^{+7}_{-7}	3669^{+275}_{-242}	38611^{+20092}_{-13606}

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

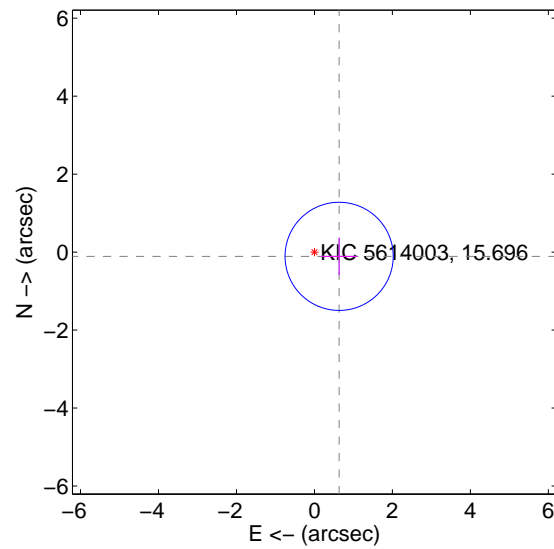
Supplemental centroid analysis for 005614003-02. Kepler magnitude: 15.70. Transit SNR 6.74

There are 1 quarters with good PRF difference image offsets

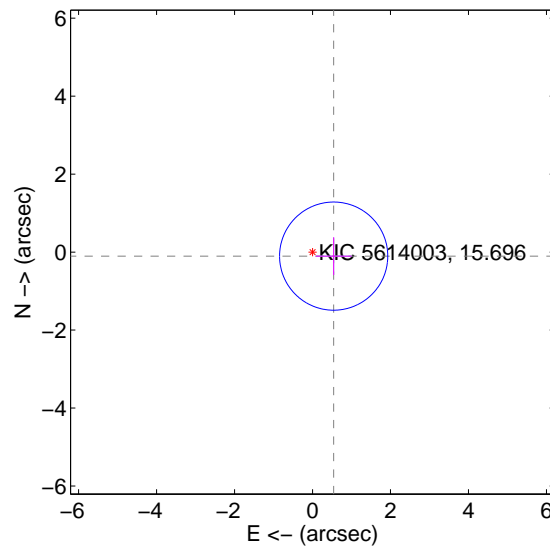
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.642 ± 0.462	1.39	-0.633 ± 0.462	-0.109 ± 0.483
PRF-fit source offset from KIC position	0.552 ± 0.462	1.19	-0.542 ± 0.462	-0.103 ± 0.483
photometric centroid source offset	1.15 ± 1.34	0.86	-0.39 ± 1.38	1.08 ± 1.34

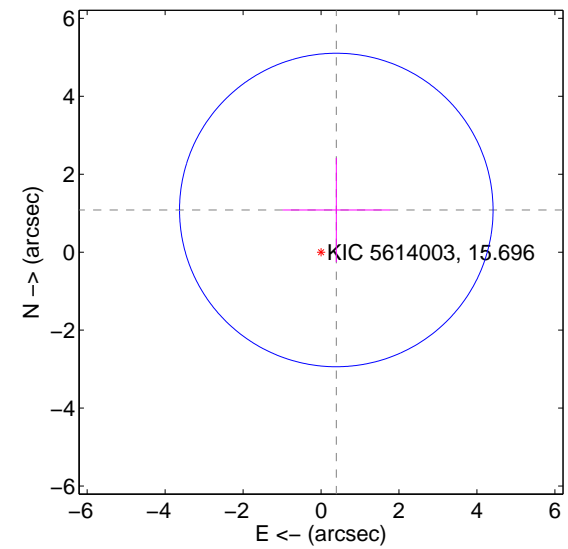
offset from difference PRF-fit to OOT PRF-fit



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

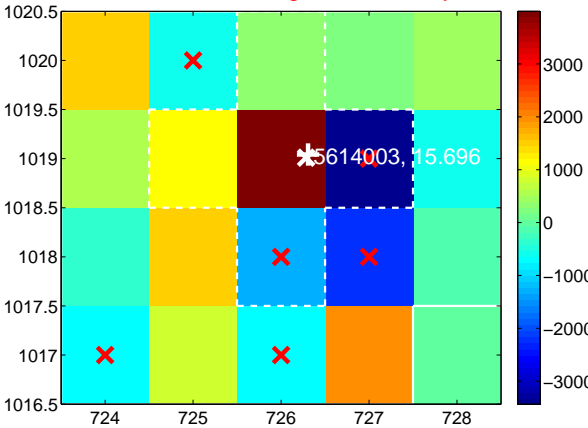
Q1 no difference image



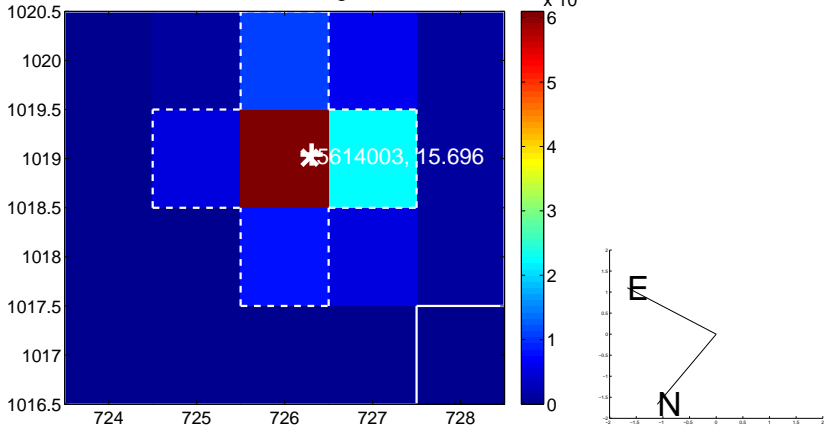
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



Q3 no difference image



Q3 no OOT image



Q4 no difference image



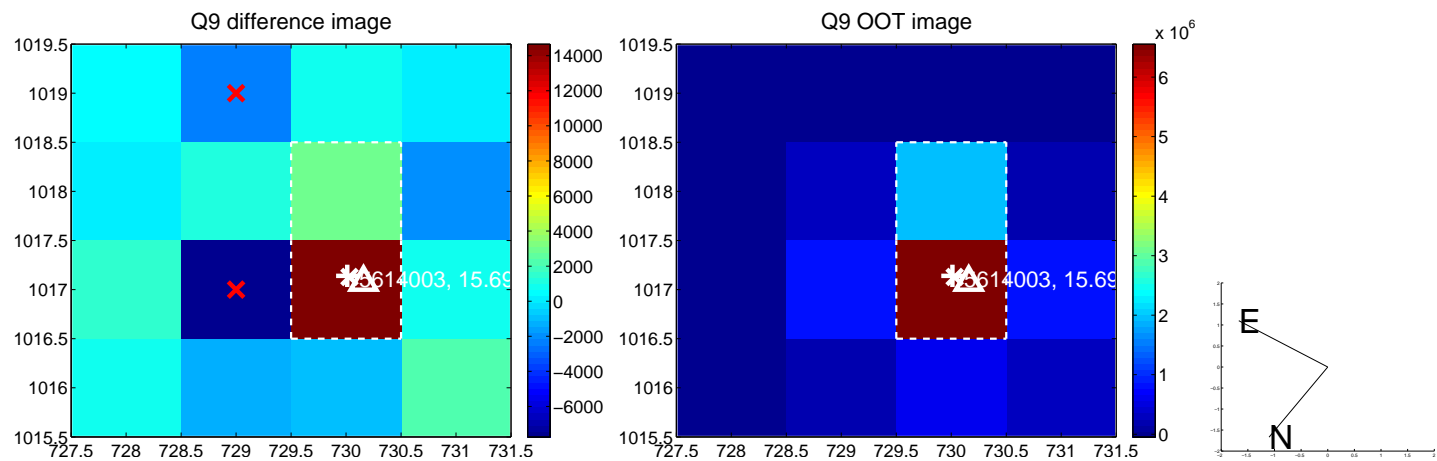
Q4 no OOT image



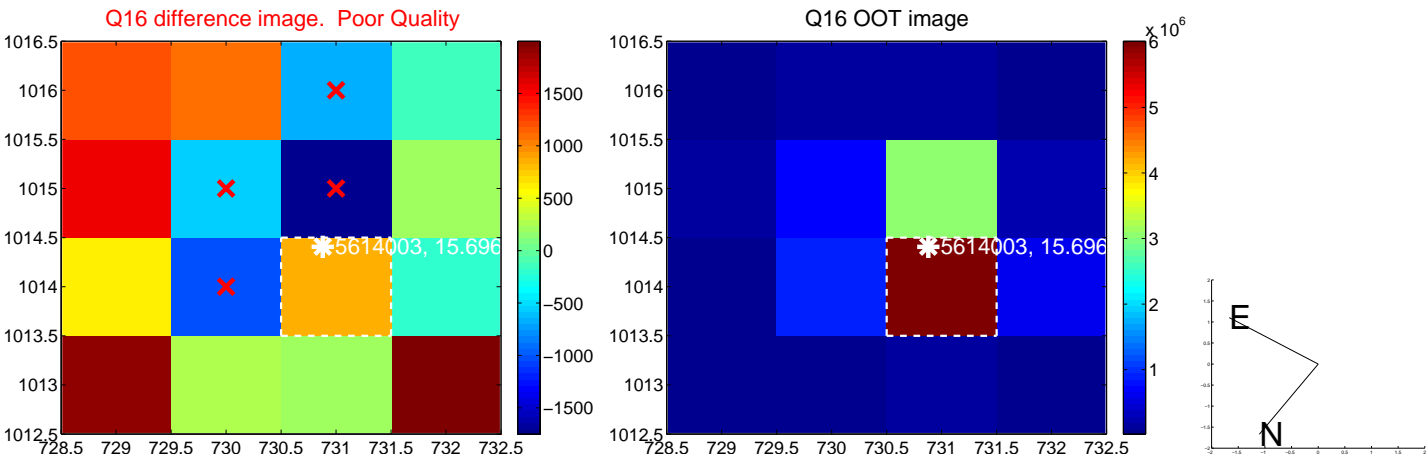
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



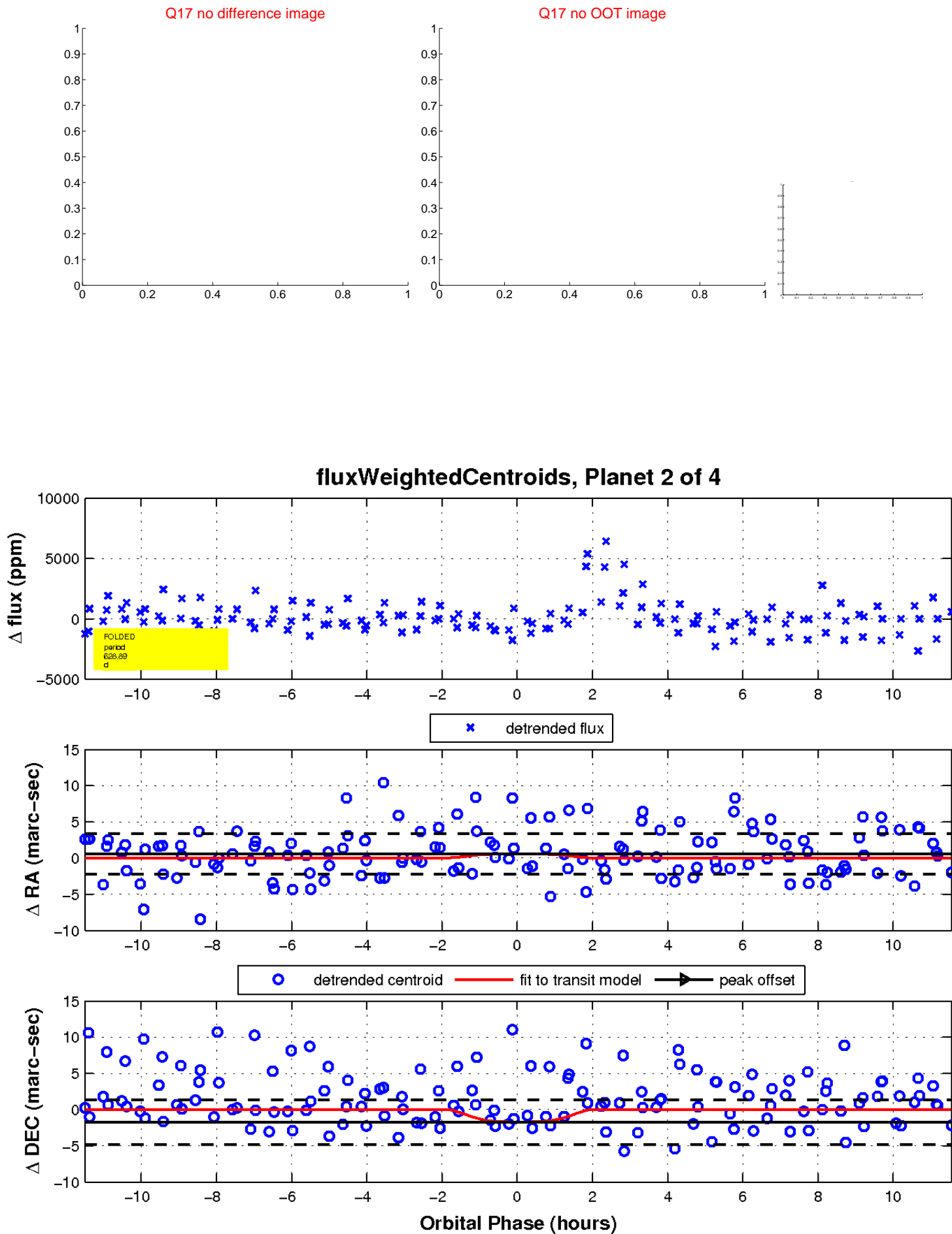
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

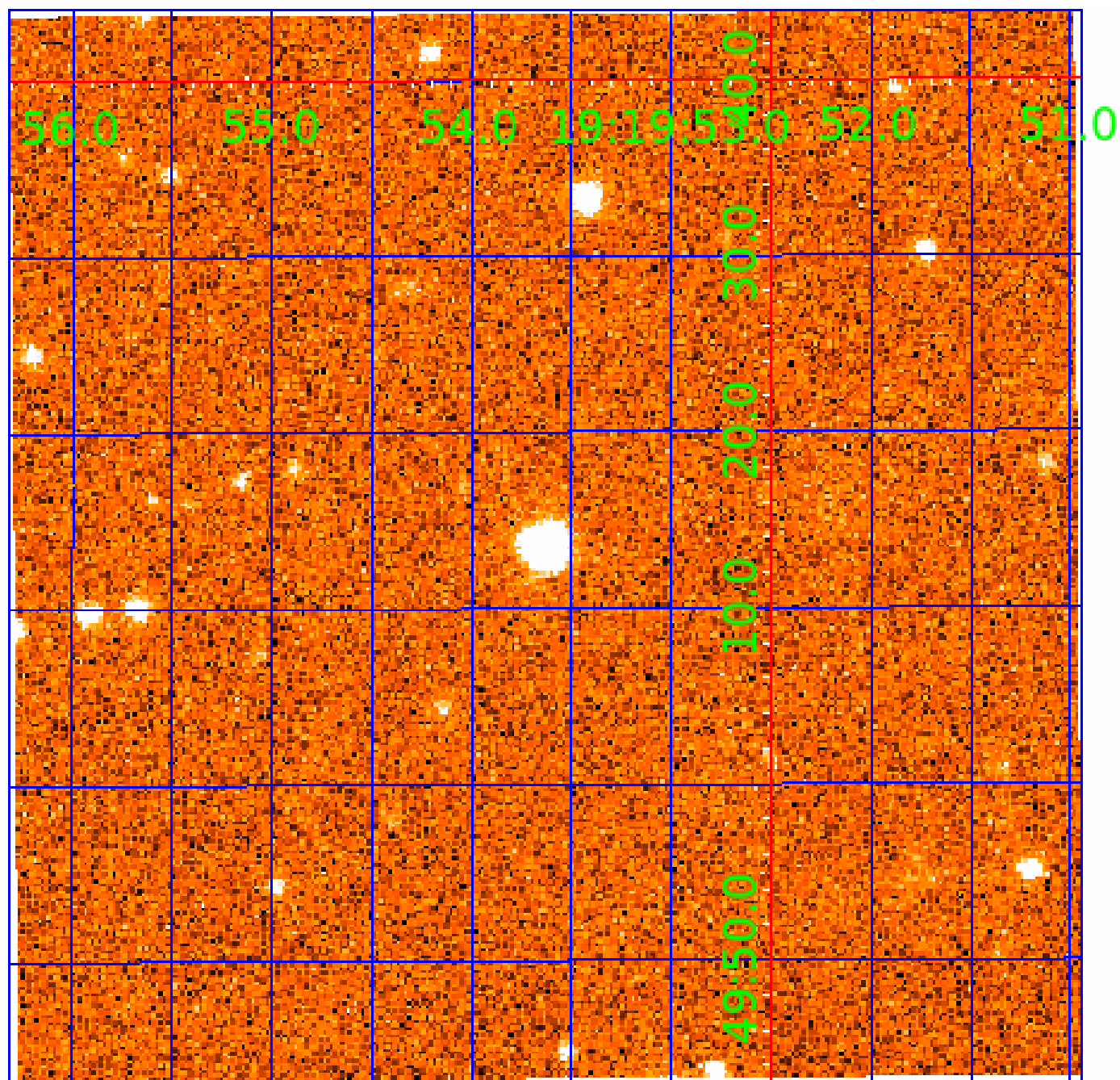


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005614003

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})
005614003-01	OBS	No	558.942557	432.693350	2260.1	3.558	11.5	9.8	0.56	5059	2.72	0.14
005614003-02	OBS	No	628.885035	249.401819	1654.7	3.860	11.3	6.7	0.56	5059	2.84	0.12
005614003-03	OBS	No	229.772915	325.876708	1349.3	3.775	9.5	6.4	0.56	5059	2.05	0.47
005614003-04	OBS	No	463.518437	277.187953	1607.4	4.063	11.6	6.7	0.56	5059	2.22	0.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005614003-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
005614003-02	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
005614003-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005614003-04	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

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

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

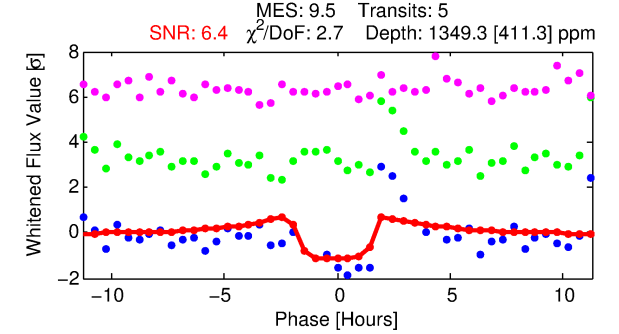
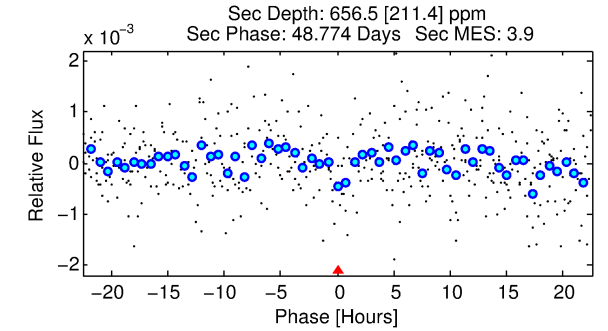
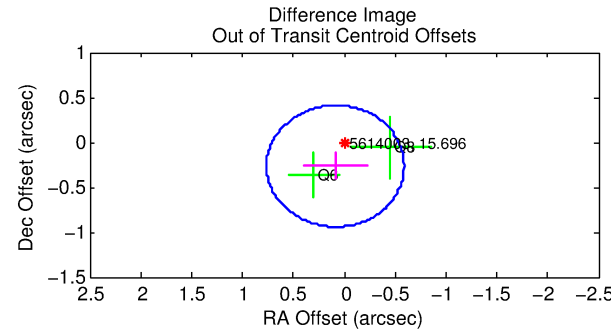
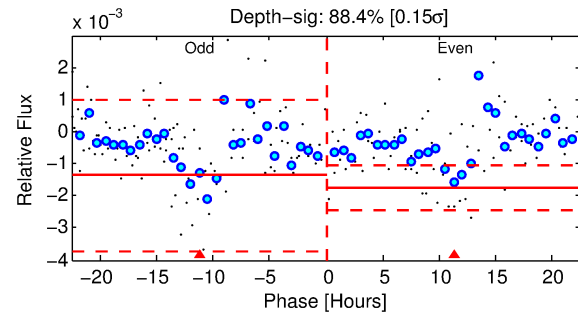
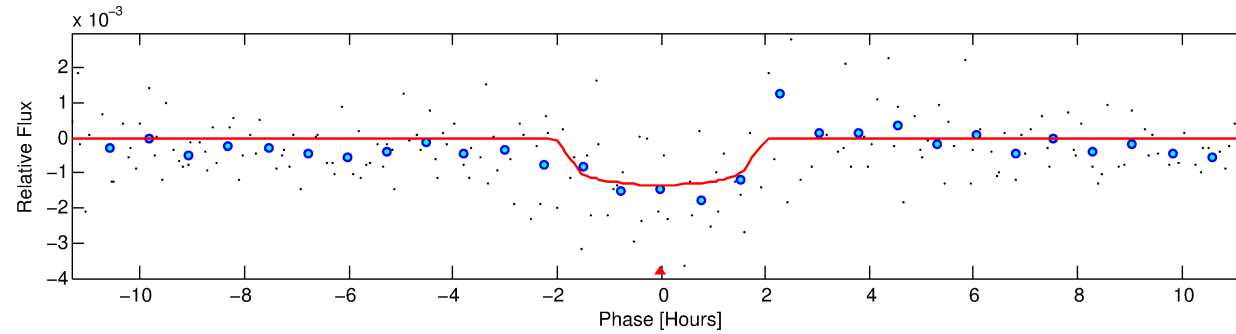
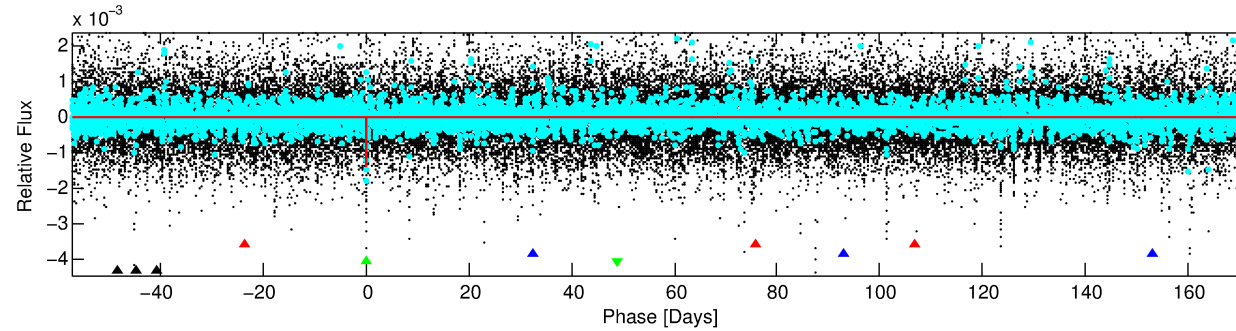
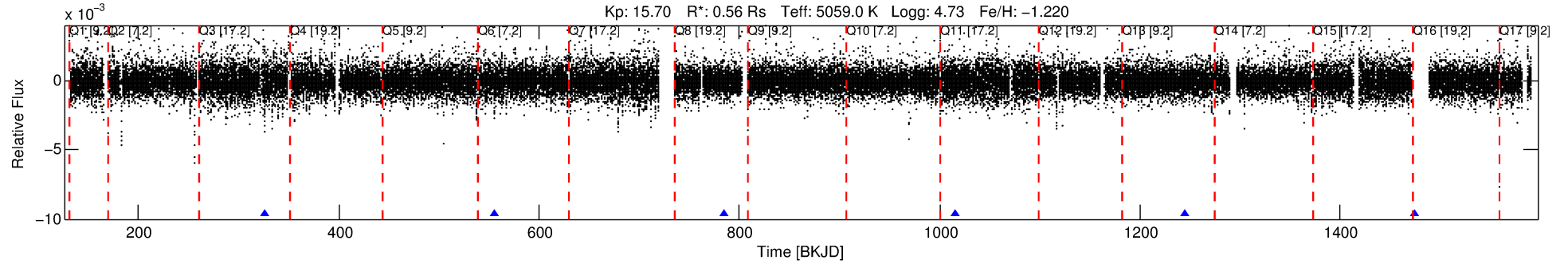
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005614003-03

No Significant Match Found

DV One-Page Summary

KIC: 5614003 Candidate: 3 of 4 Period: 229.773 d



DV Fit Results:

Period = 229.77291 [0.00686] d
Epoch = 325.8767 [0.0171] BKJD
Rp/R* = 0.0336 [0.1110]
a/R* = 460.14 [6658.53]
b = 0.30 [44.31]
Seff = 0.47 [0.07]
Teq = 211 [8] K
Rp = 2.05 [6.76] Re
a = 0.6247 [0.0398] AU
Ag = 33574.57 [221798.46] [0.15 σ]
Teffp = 4415 [7291] K [0.58 σ]

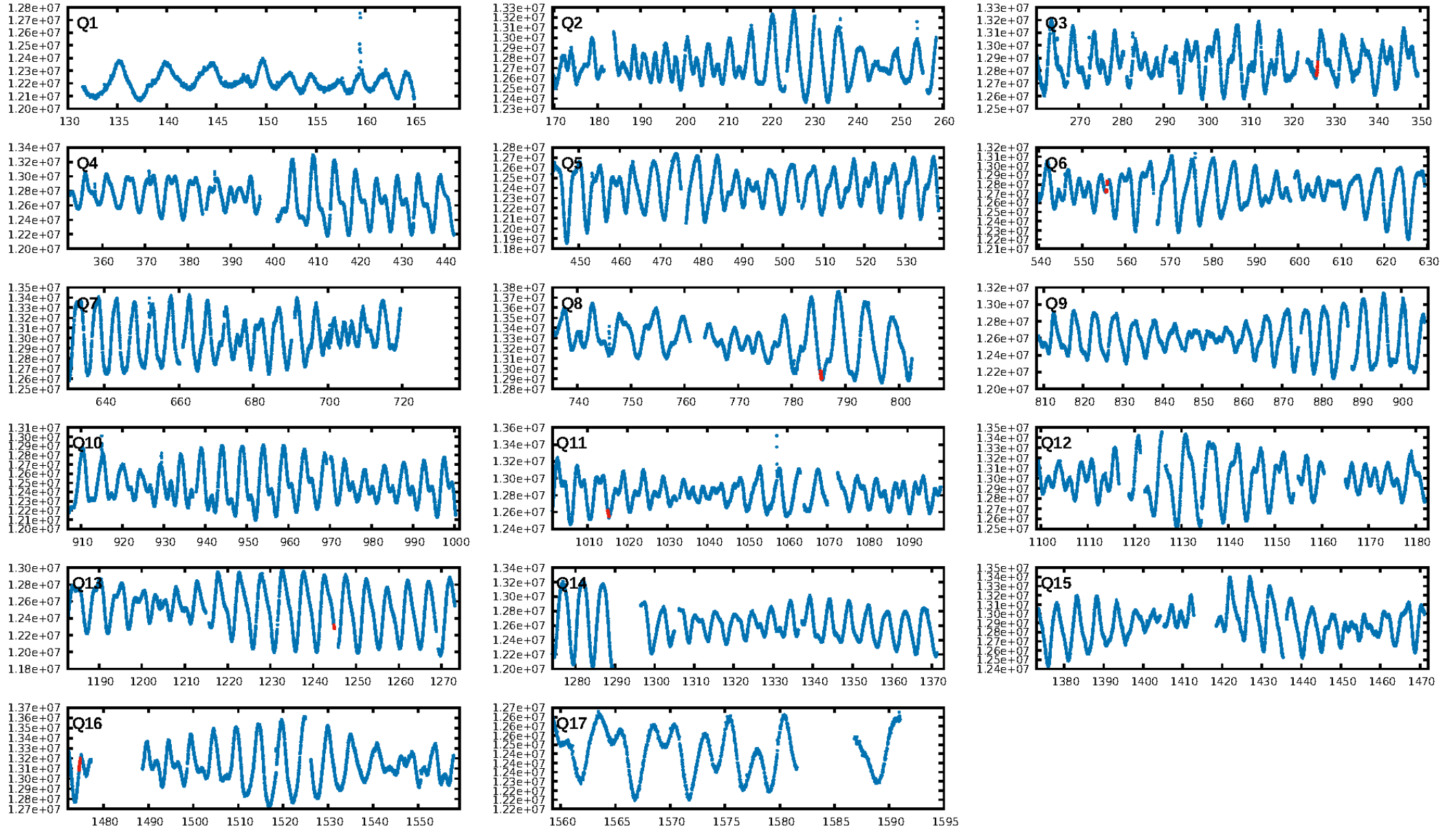
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1011.46 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 8.7%
Bootstrap-pfa: 3.14e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.7171
Centroid-sig: 3.0%
Centroid-so: 2.025 arcsec [1.33 σ]
OotOffset-rm: 0.280 arcsec [1.24 σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-rm: 0.324 arcsec [1.46 σ]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [4/4]

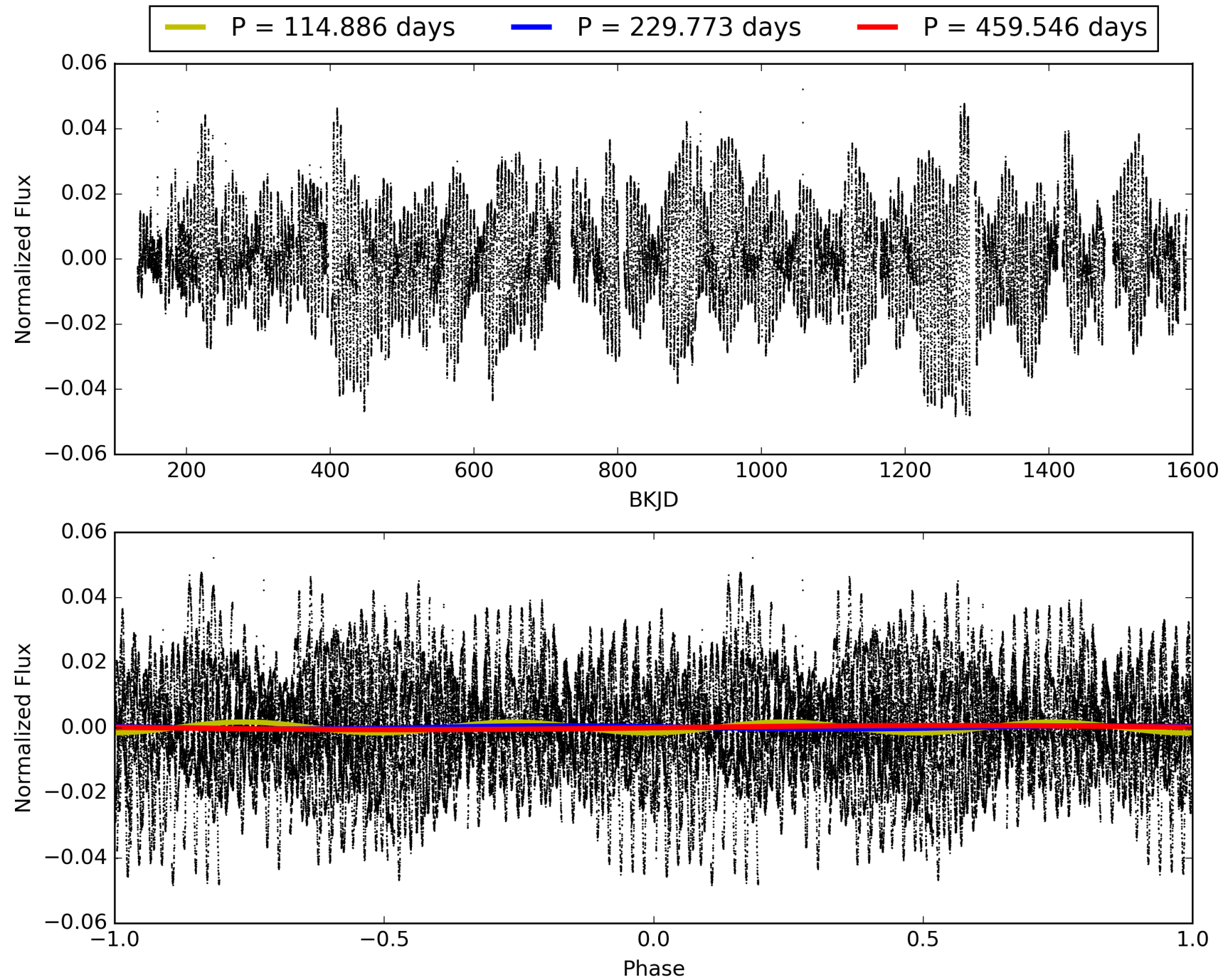
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:03:53 Z

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

TCE 005614003-03, PDC Light Curves

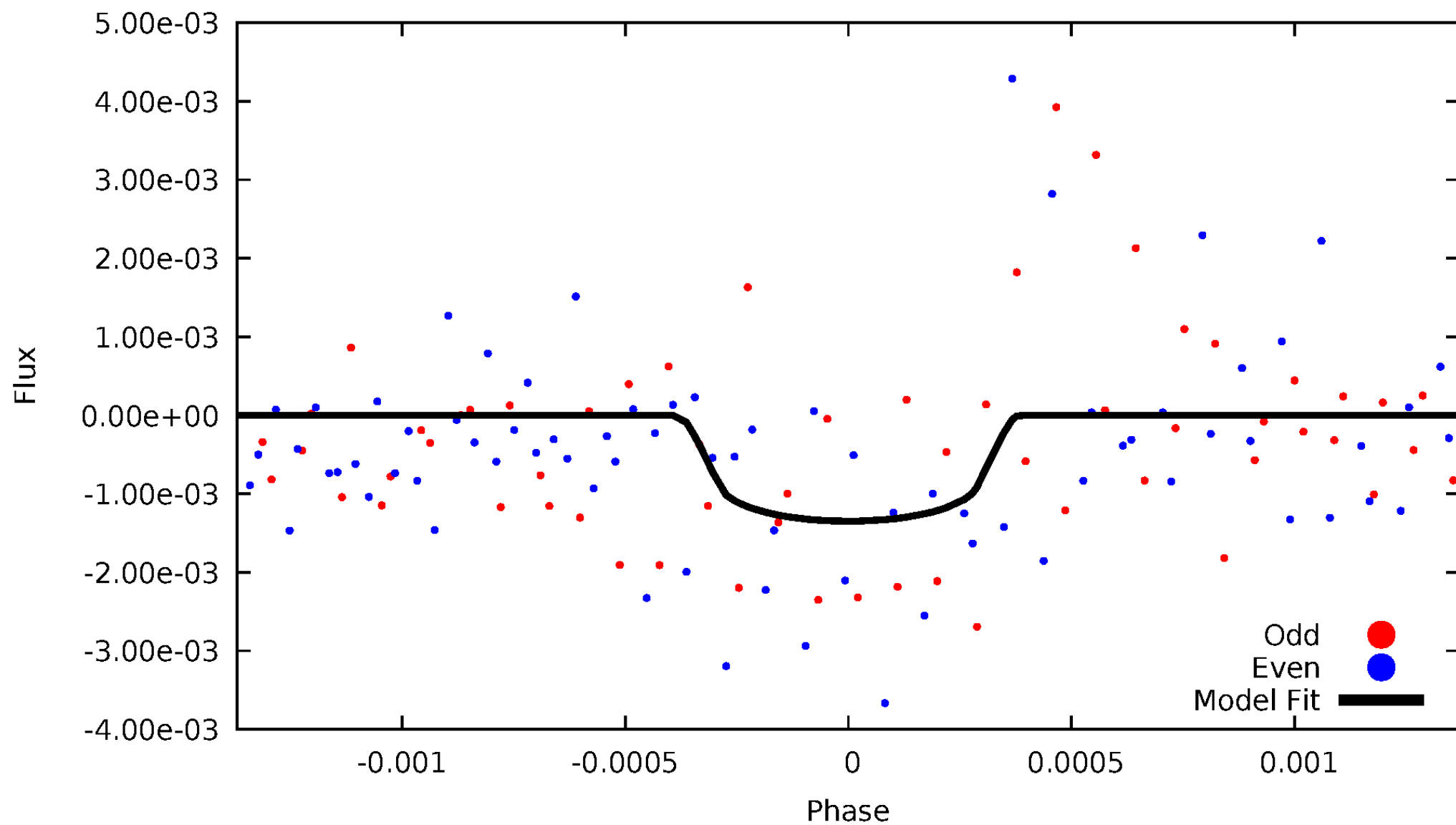


TCE 005614003-03



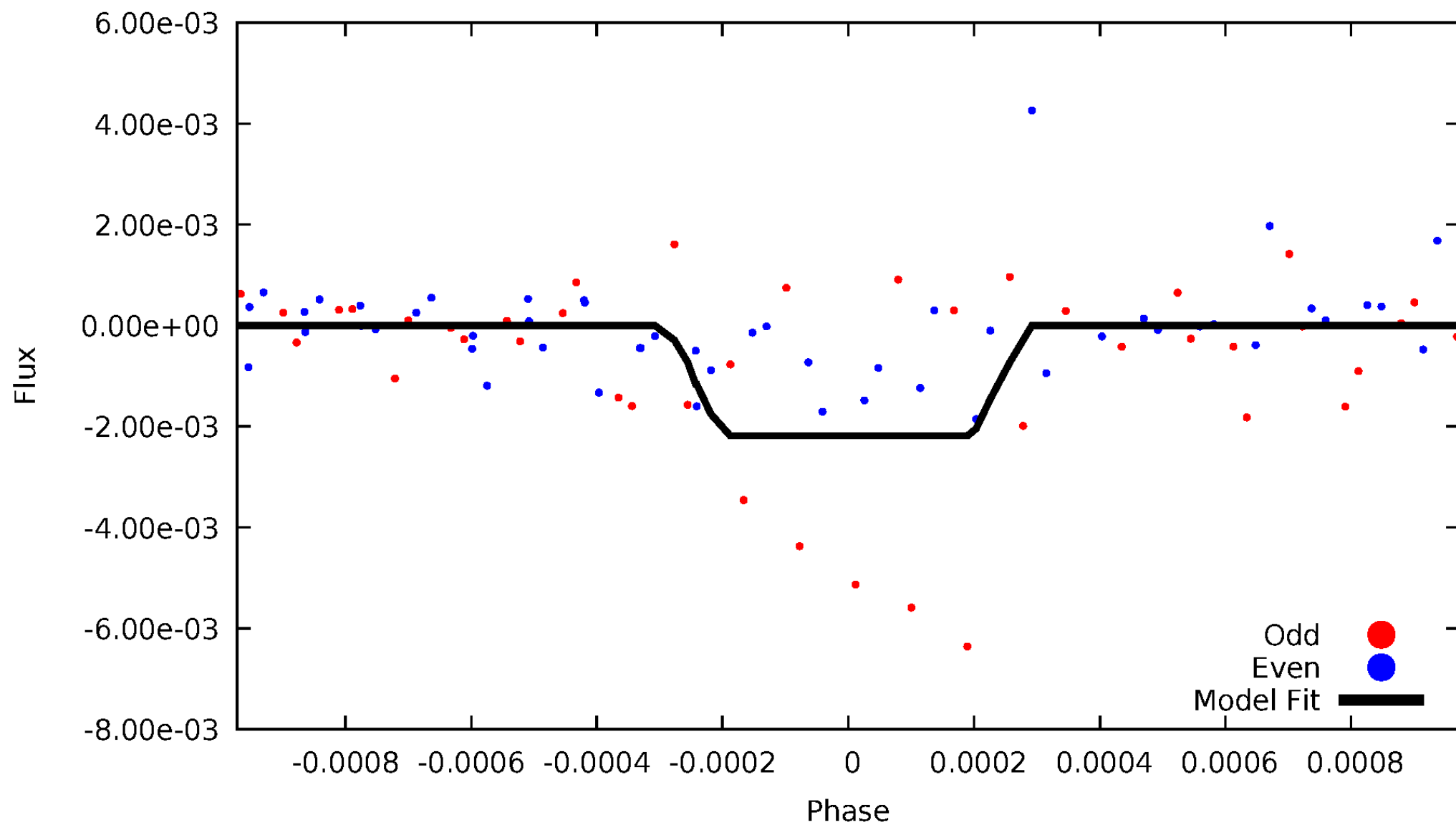
DV Odd/Even

TCE 005614003-03



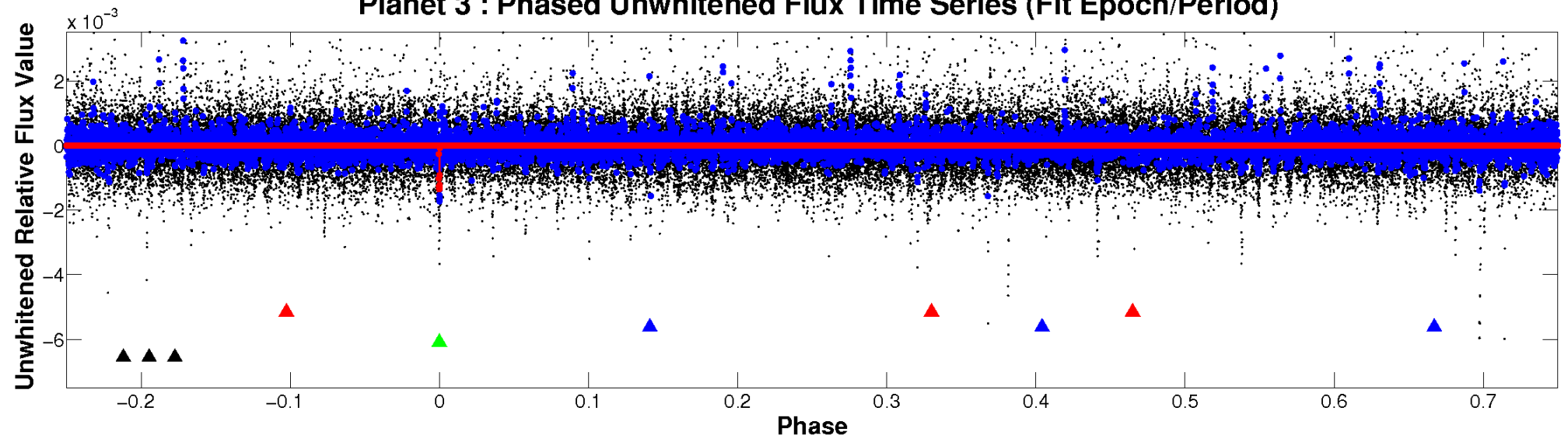
ALT Odd/Even

TCE 005614003-03

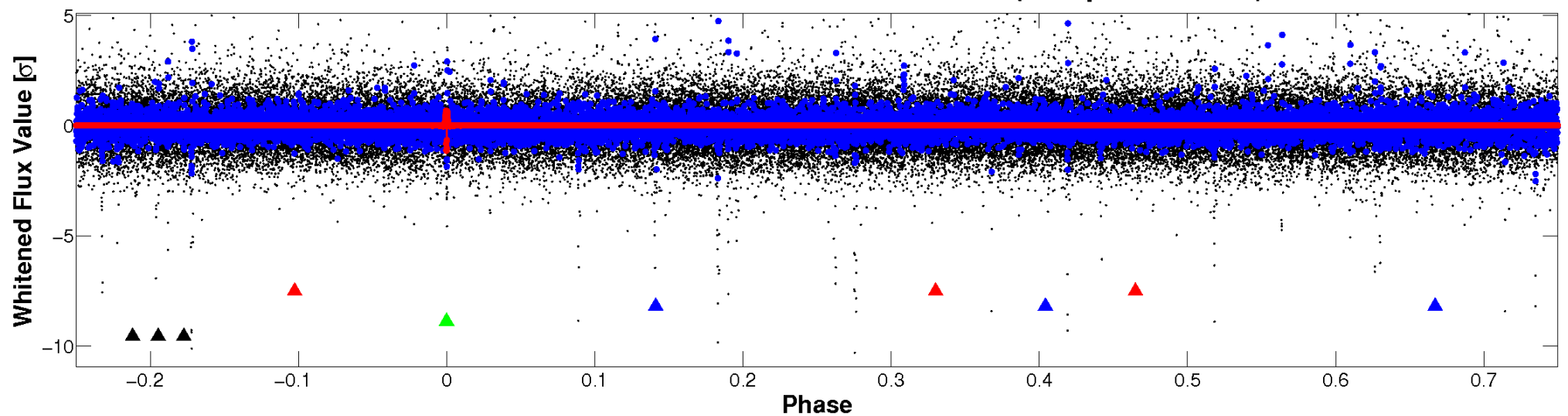


Non-Whitened Vs. Whitened Light Curve

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

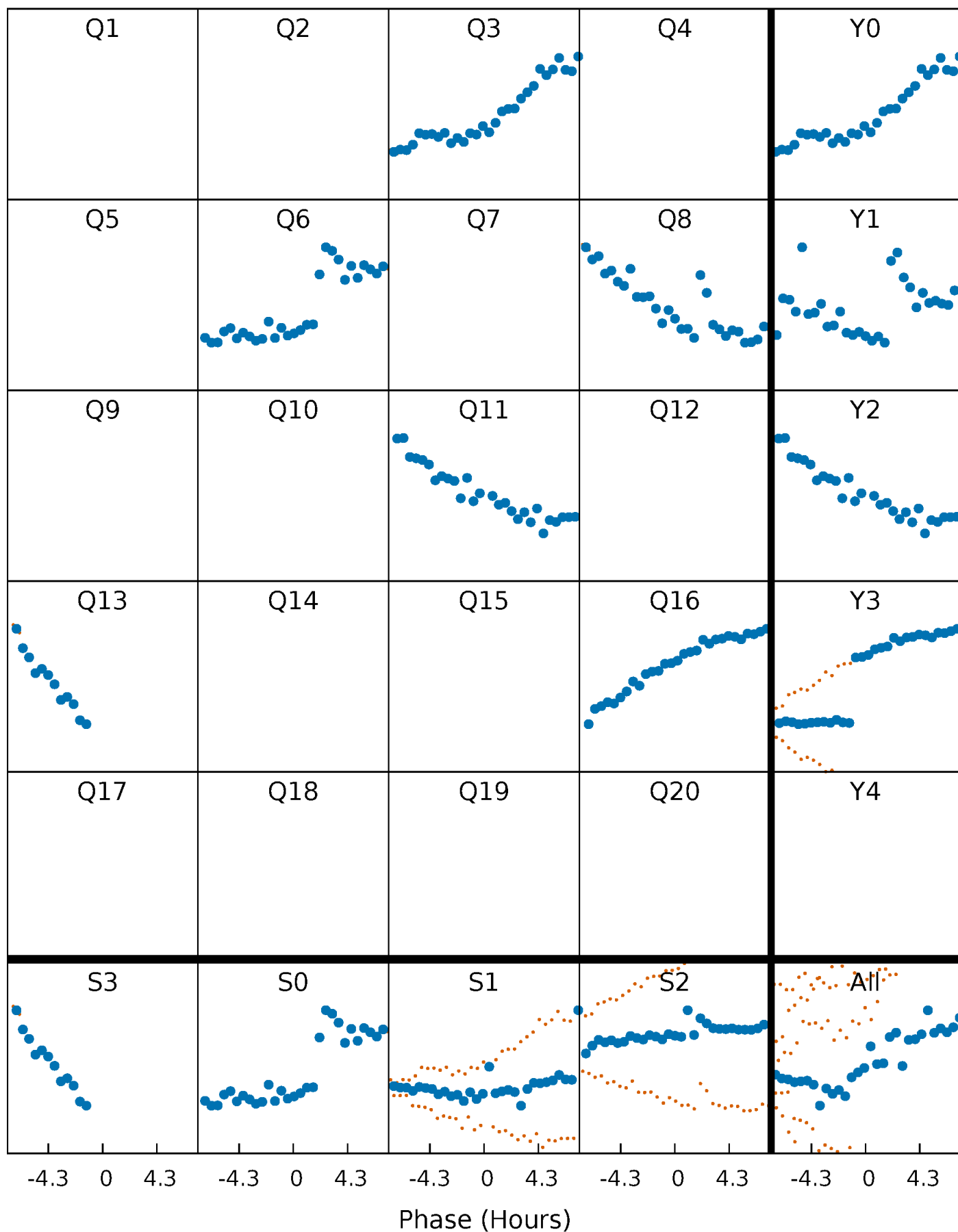


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



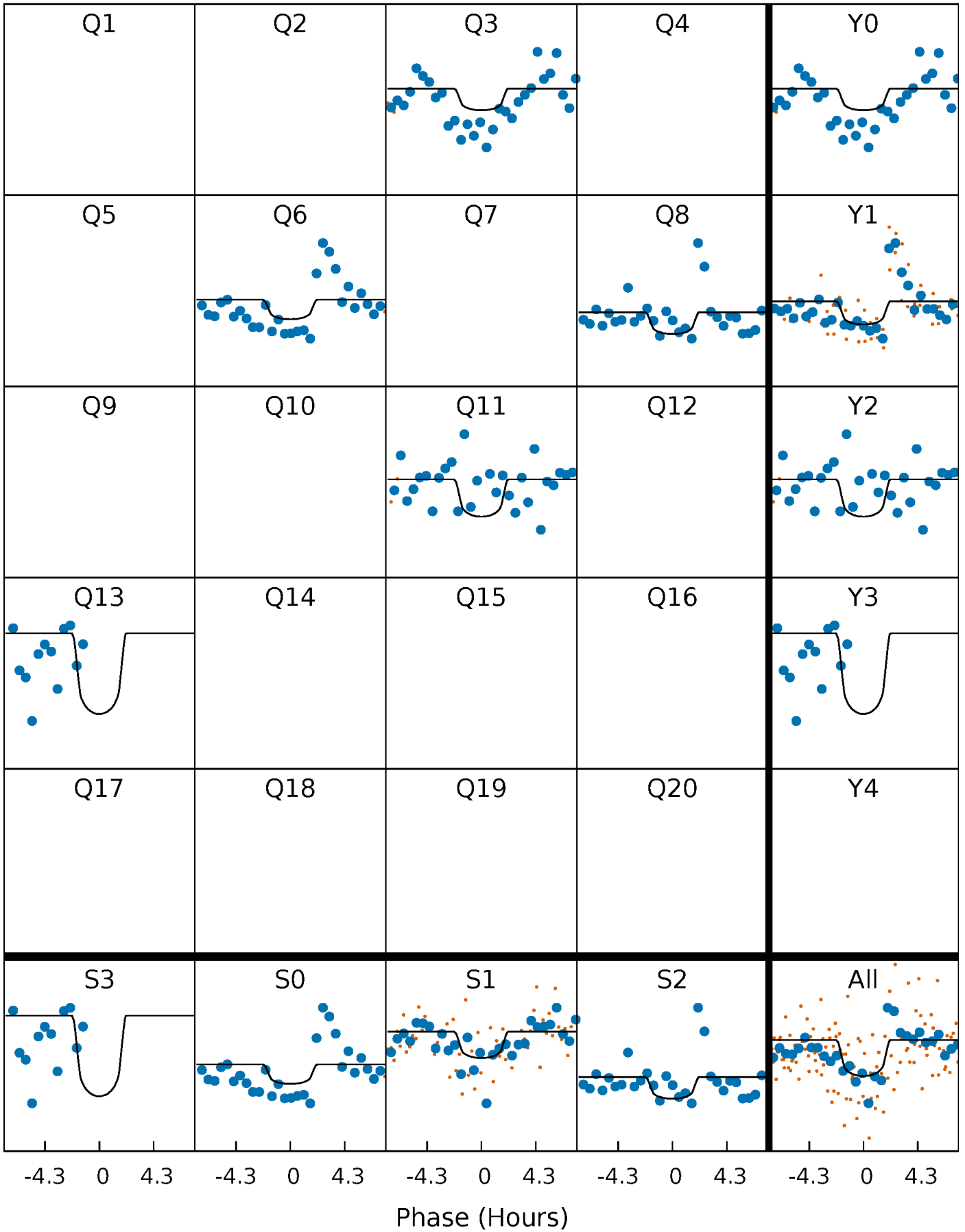
PDC Quarter-Phased Transit Curves

TCE 005614003-03 $P=229.772915$ Days $T_0=325.876709$ (BKJD)



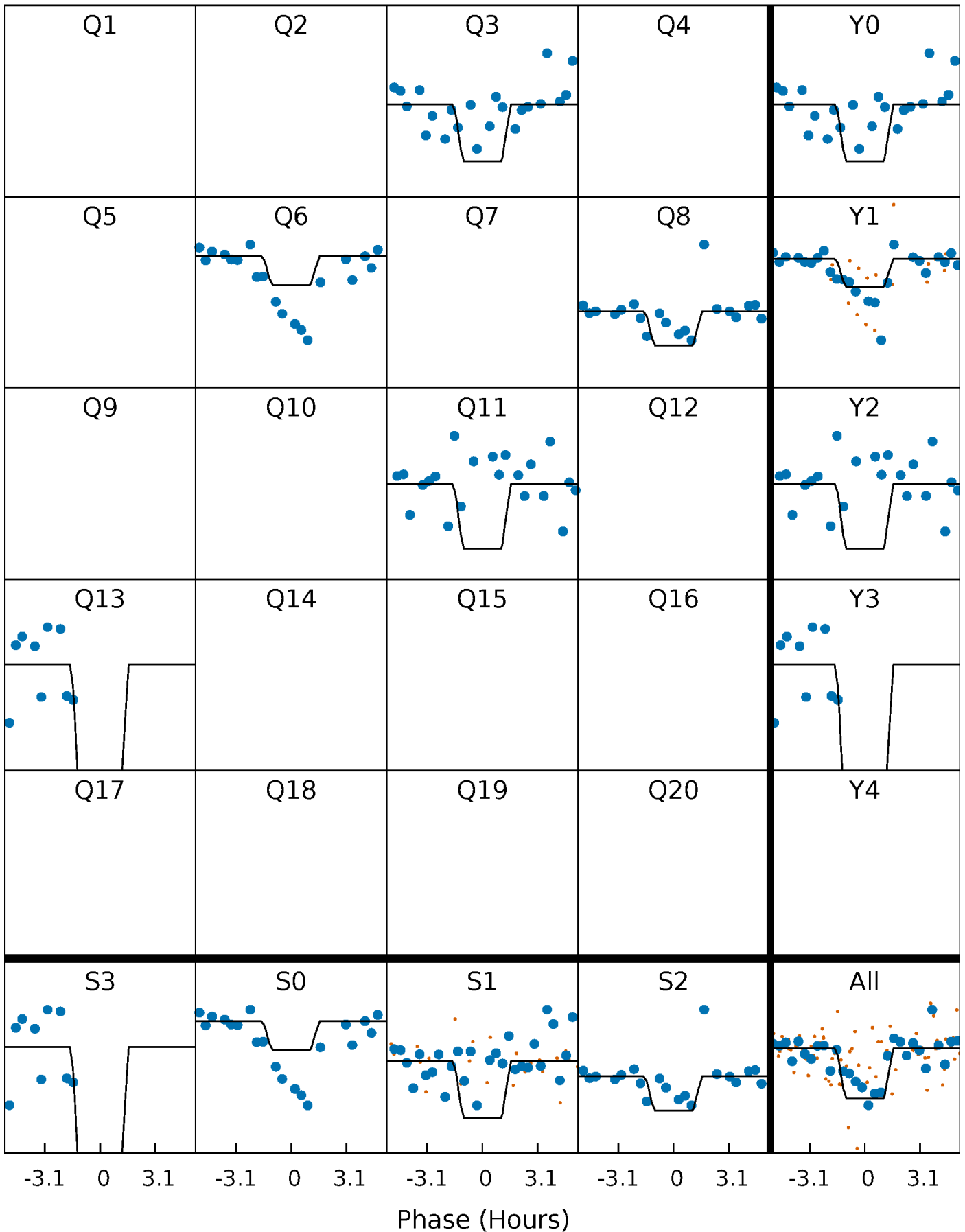
DV Quarter-Phased Transit Curves

TCE 005614003-03 $P=229.772915$ Days $T_0=325.876709$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

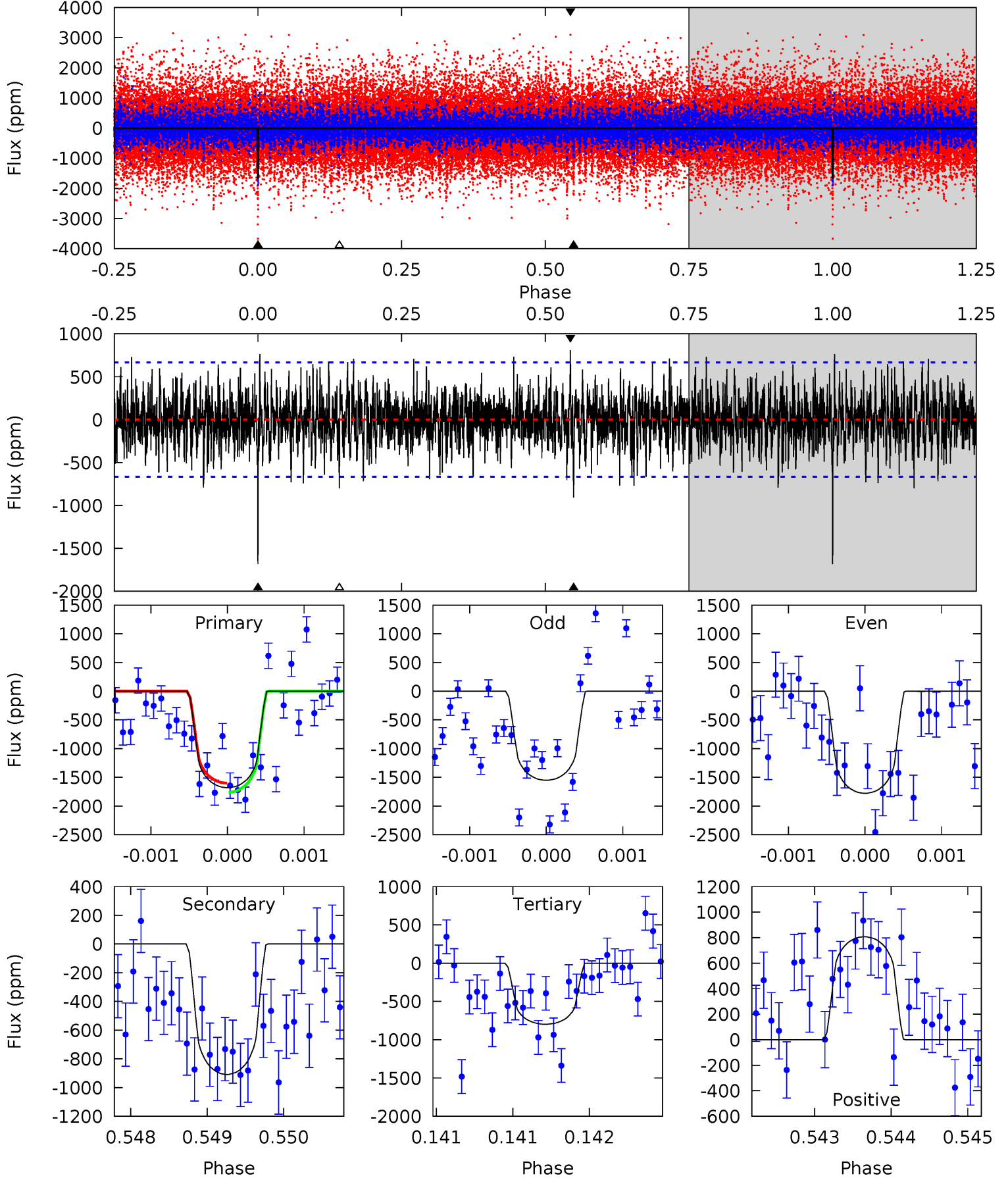
TCE 005614003-03 P=229.767440 Days $T_0=325.904942$ (BKJD)



DV Model-Shift Uniqueness Test

005614003-03, P = 229.772915 Days, E = 96.103794 Days

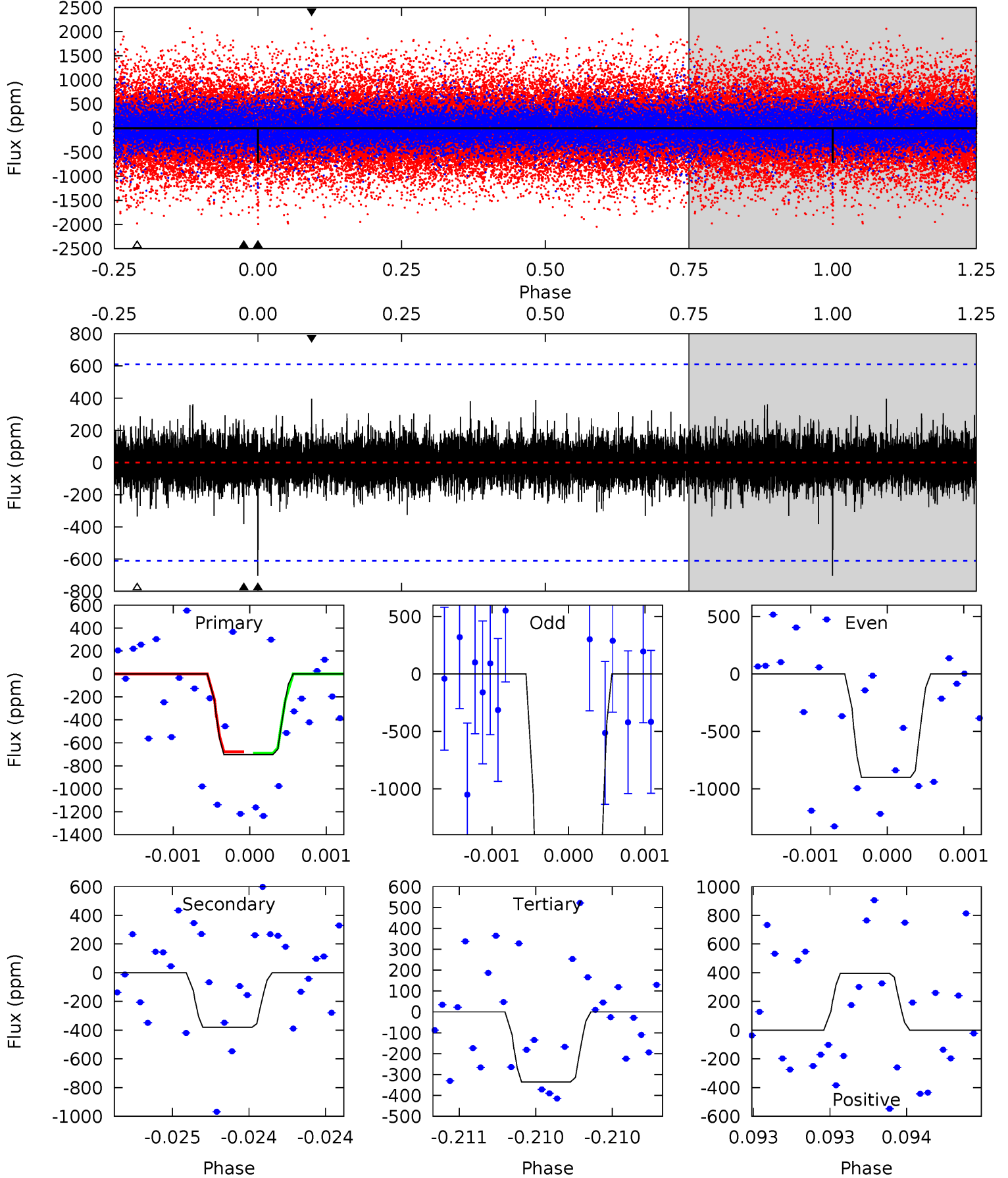
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	7.52	6.60	6.68	5.50	3.37	1.77	7.31	7.23	0.91	0.84	0.94	1.44	0.32	0.67



Alt Model-Shift Uniqueness Test

005614003-03, P = 229.767440 Days, E = 96.137502 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.39	3.46	3.05	3.60	5.56	3.45	0.74	3.34	2.79	0.41	-0.14	10.6	1.78	0.36	0.05



Stellar Parameters For KIC 005614003

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5059^{+150}_{-150}	$4.734^{+0.021}_{-0.053}$	$-1.220^{+0.300}_{-0.300}$	$0.558^{+0.041}_{-0.024}$	$0.615^{+0.032}_{-0.032}$	$4.990^{+0.433}_{-0.882}$
	+3%/-3%	+0%/-1%	+25%/-25%	+7%/-4%	+5%/-5%	+9%/-18%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005614003-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-909 ± 121	$5.45^{+5.93}_{-3.56}$	296^{+9}_{-10}	3415^{+1647}_{-651}	6396^{+53815}_{-4921}
Alt.	-380 ± 110	$6.01^{+5.68}_{-4.15}$	297^{+10}_{-9}	2915^{+1324}_{-475}	2251^{+21561}_{-1696}

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

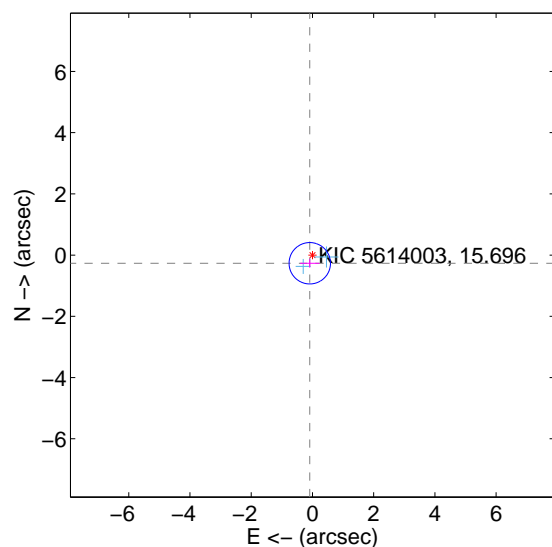
Supplemental centroid analysis for 005614003-03. Kepler magnitude: 15.70. Transit SNR 6.39

There are 2 quarters with good PRF difference image offsets

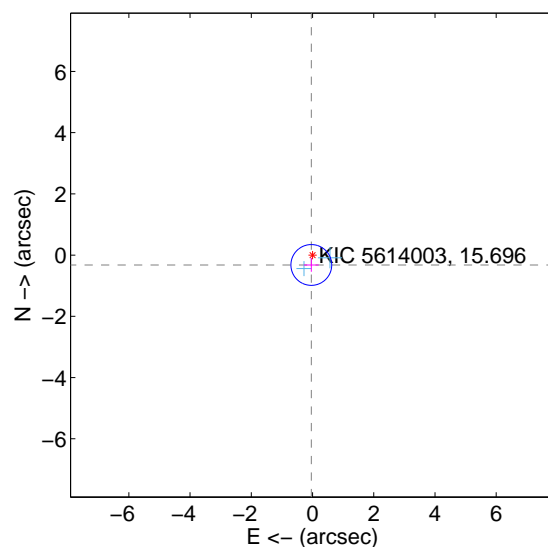
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.280 ± 0.225	1.24	0.087 ± 0.316	-0.267 ± 0.142
PRF-fit source offset from KIC position	0.324 ± 0.222	1.46	0.039 ± 0.242	-0.322 ± 0.222
photometric centroid source offset	2.02 ± 1.52	1.33	-0.59 ± 1.50	-1.94 ± 1.52

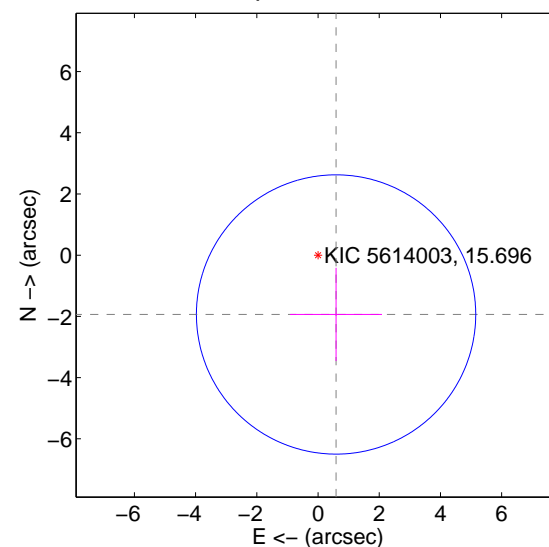
offset from difference PRF-fit to OOT PRF-fit



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.

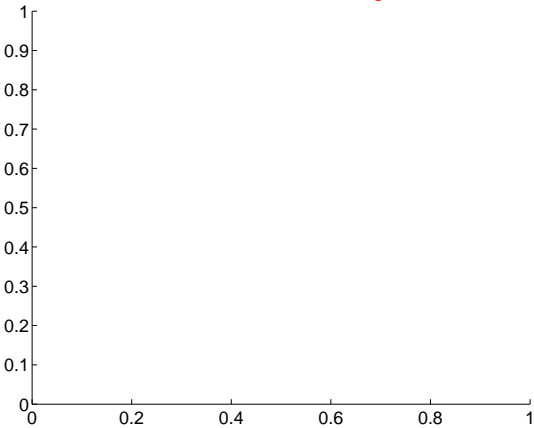
Q1 no difference image



Q1 no OOT image



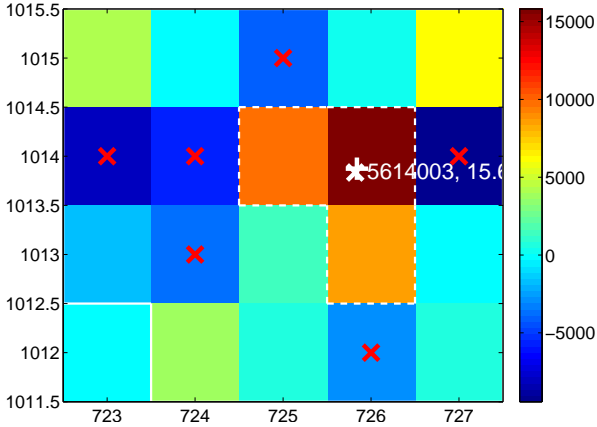
Q2 no difference image



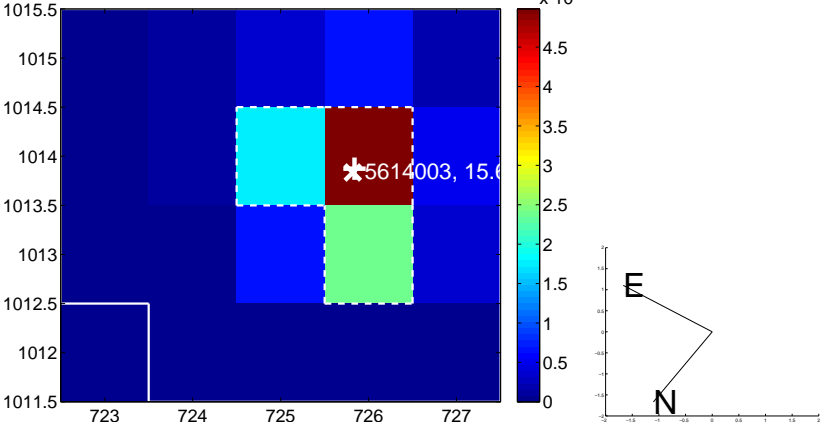
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



Q4 no OOT image



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

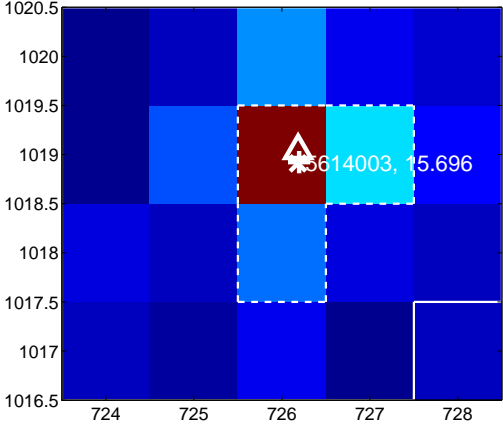
Q5 no difference image



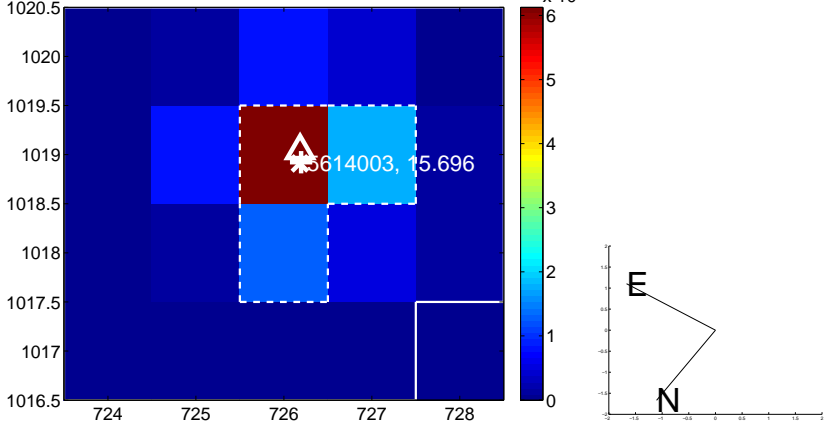
Q5 no OOT image



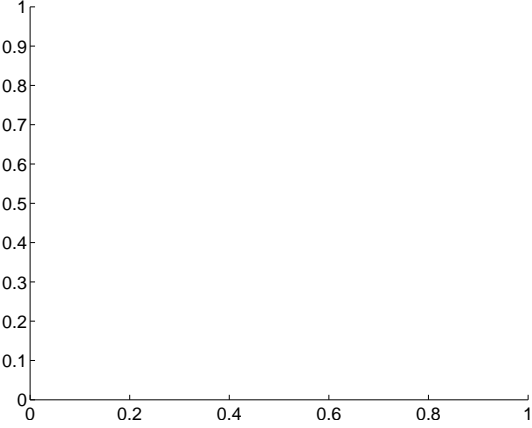
Q6 difference image



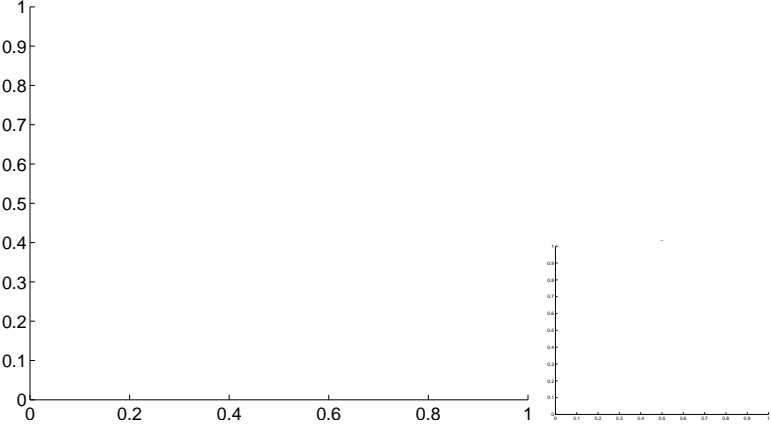
Q6 OOT image



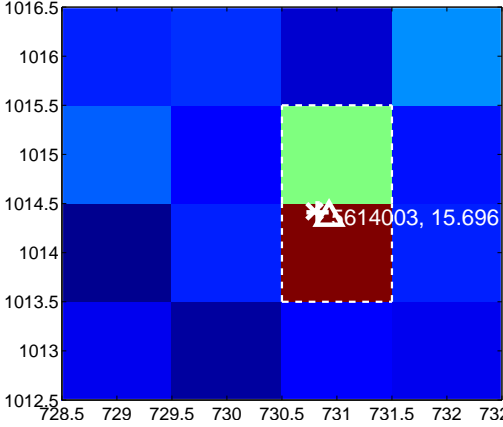
Q7 no difference image



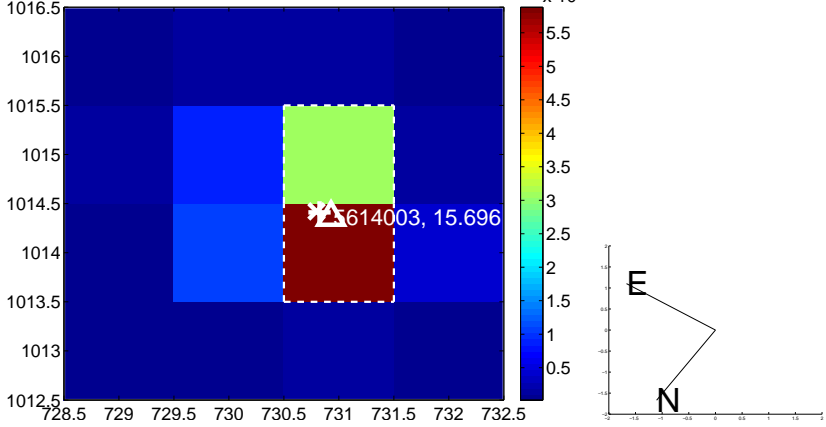
Q7 no OOT image



Q8 difference image



Q8 OOT image



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

Q9 no difference image



Q9 no OOT image



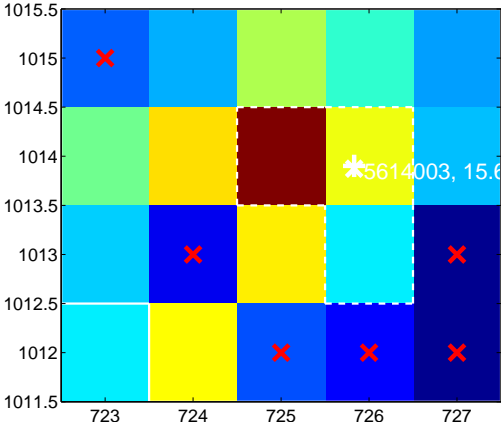
Q10 no difference image



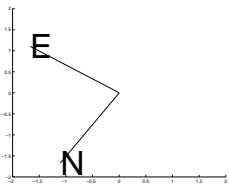
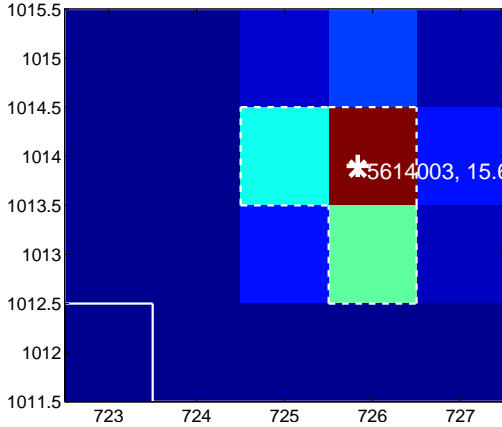
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



Q12 no difference image



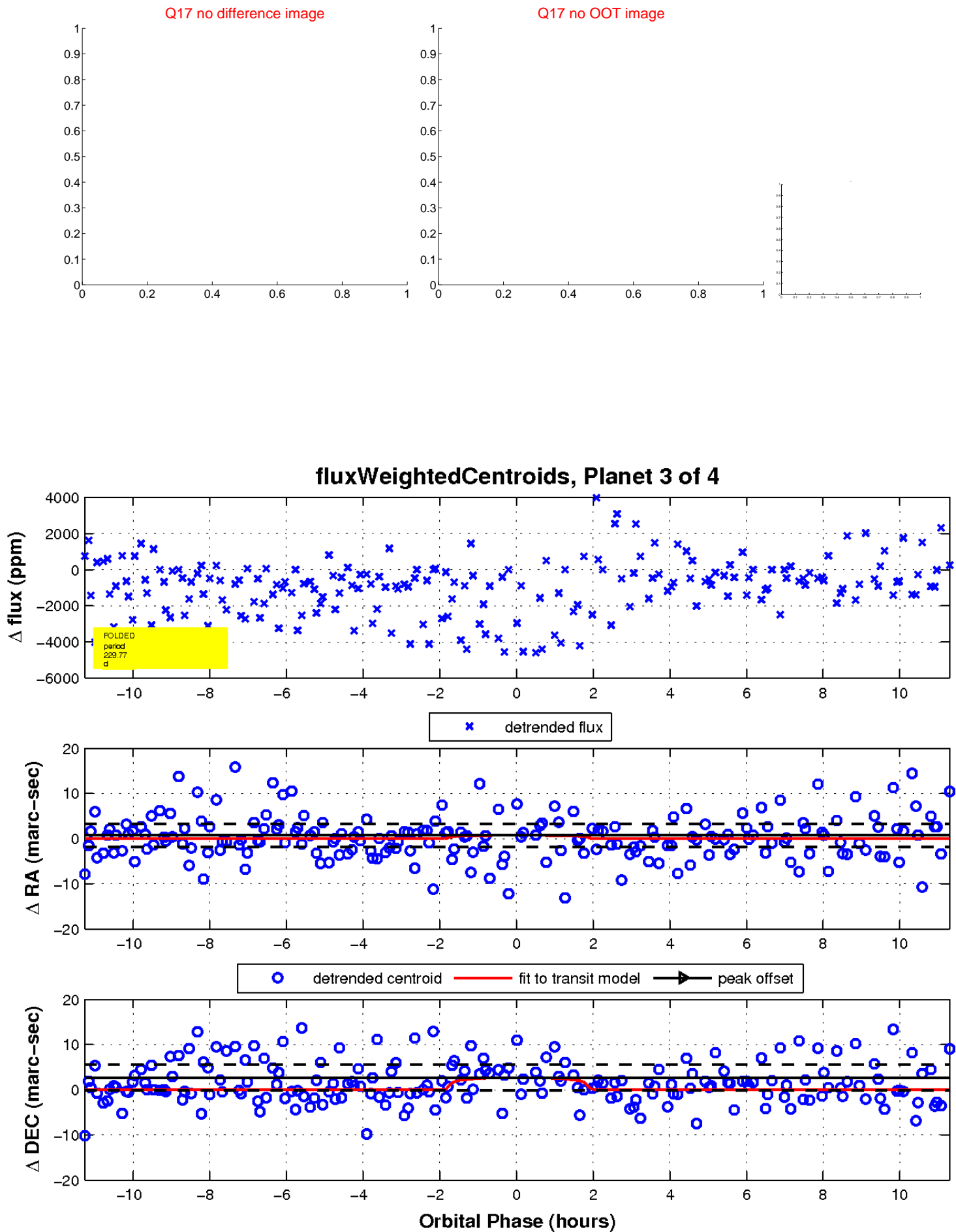
Q12 no OOT image



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

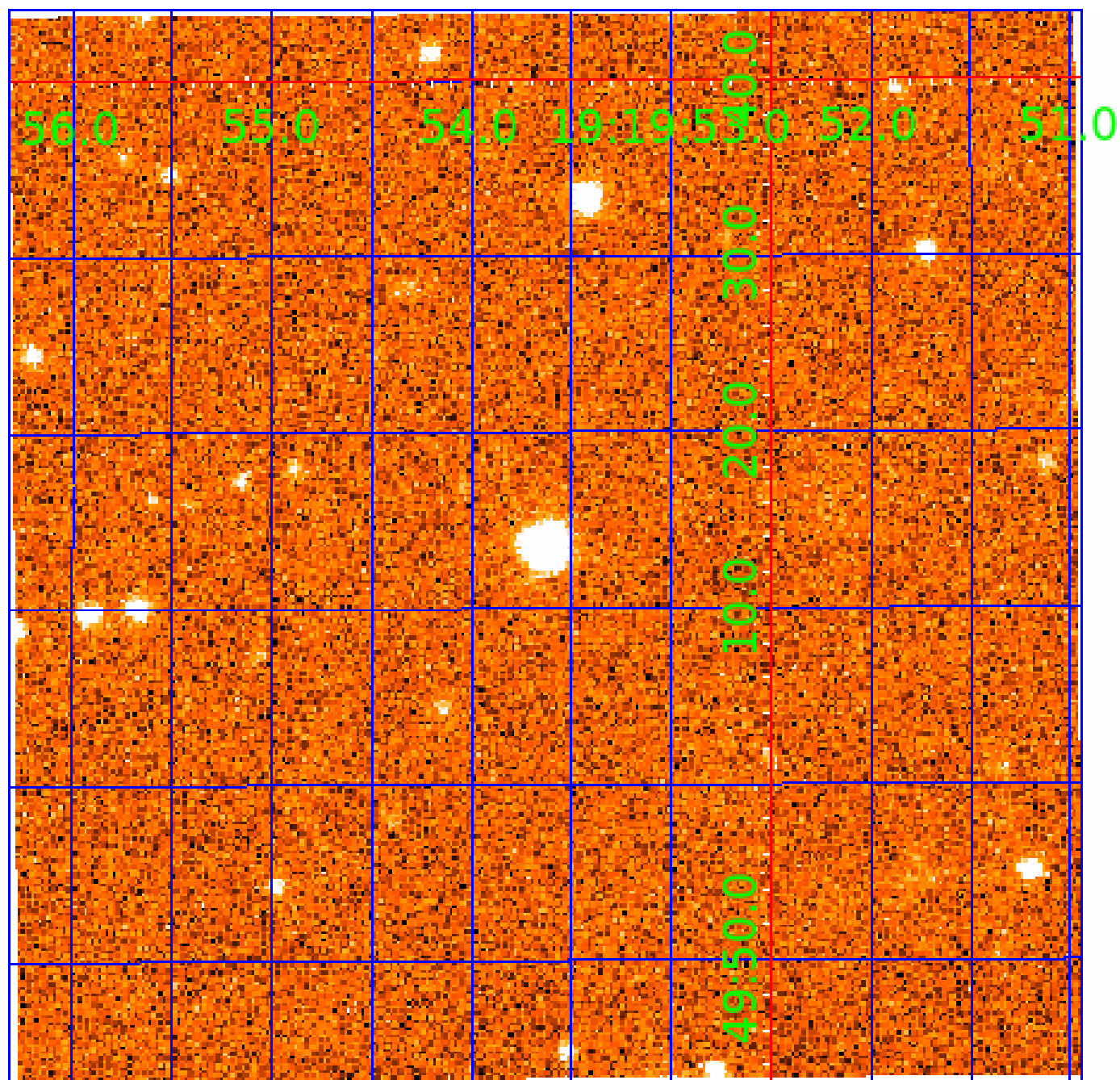


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005614003

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})
005614003-01	OBS	No	558.942557	432.693350	2260.1	3.558	11.5	9.8	0.56	5059	2.72	0.14
005614003-02	OBS	No	628.885035	249.401819	1654.7	3.860	11.3	6.7	0.56	5059	2.84	0.12
005614003-03	OBS	No	229.772915	325.876708	1349.3	3.775	9.5	6.4	0.56	5059	2.05	0.47
005614003-04	OBS	No	463.518437	277.187953	1607.4	4.063	11.6	6.7	0.56	5059	2.22	0.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005614003-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
005614003-02	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
005614003-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005614003-04	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

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

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

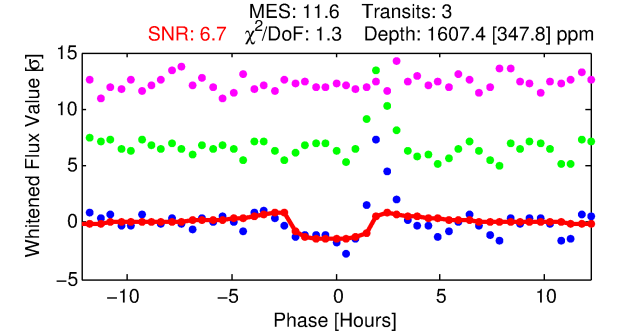
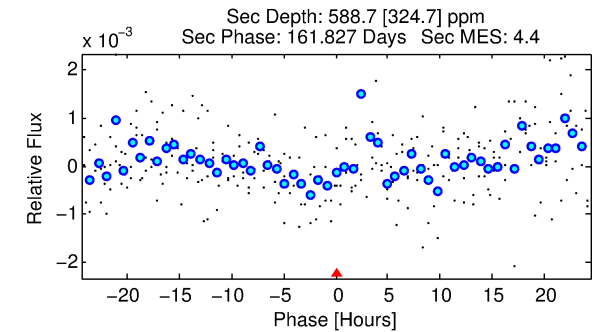
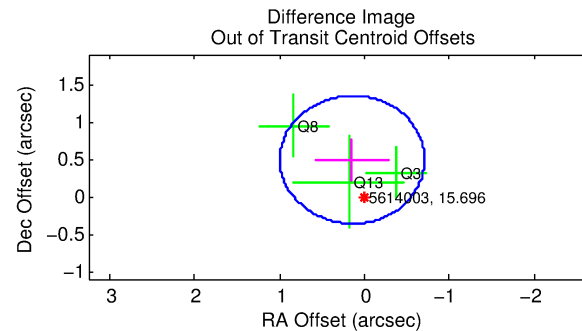
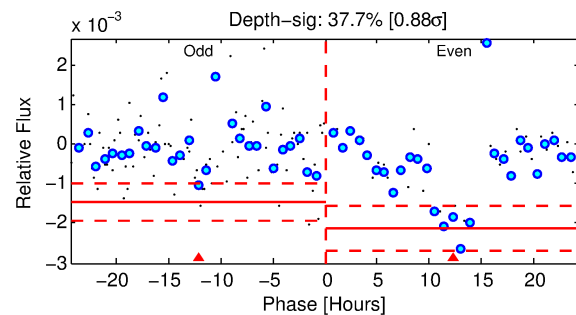
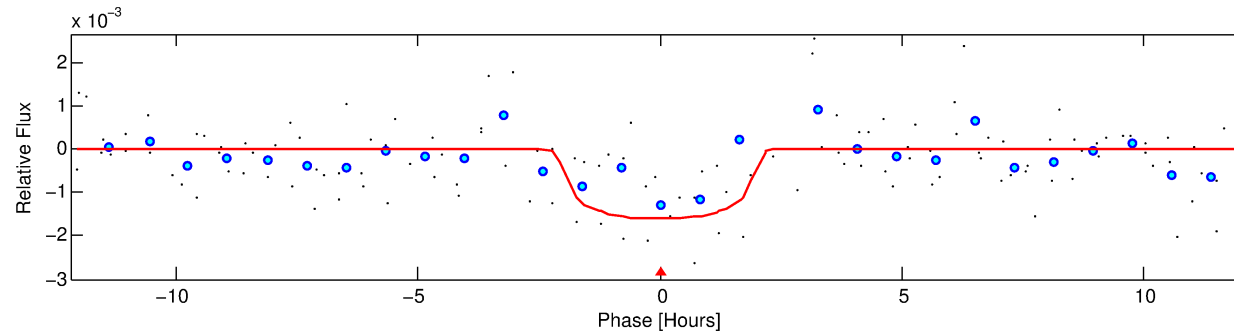
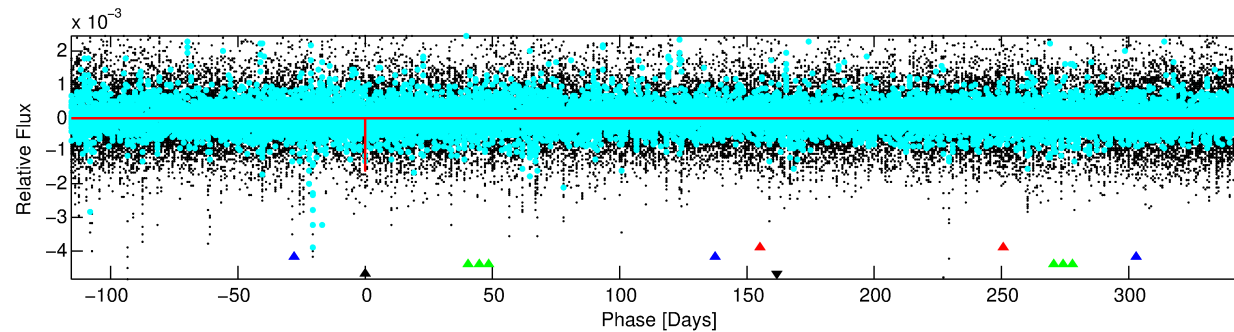
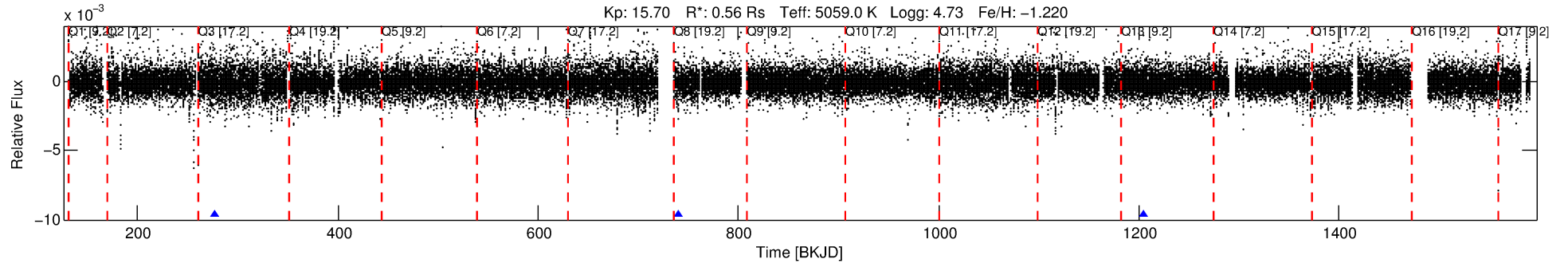
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005614003-04

No Significant Match Found

DV One-Page Summary

KIC: 5614003 Candidate: 4 of 4 Period: 463.518 d



DV Fit Results:

Period = 463.51844 [0.01109] d
Epoch = 277.1880 [0.0146] BKJD
Rp/R* = 0.0364 [0.0627]
a/R* = 898.81 [6797.55]
b = 0.10 [73.12]
Seff = 0.18 [0.03]
Teq = 167 [6] K
Rp = 2.22 [3.82] Re
a = 0.9973 [0.0635] AU
Ag = 65606.26 [228890.82] [0.29 σ]
Teffp = 4131 [3604] K [1.10 σ]

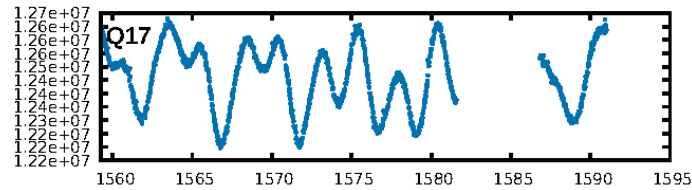
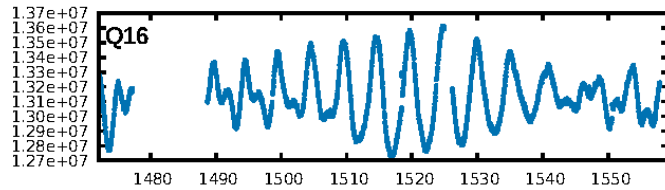
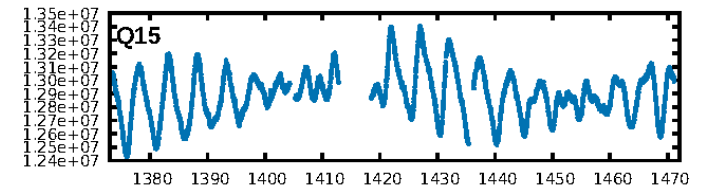
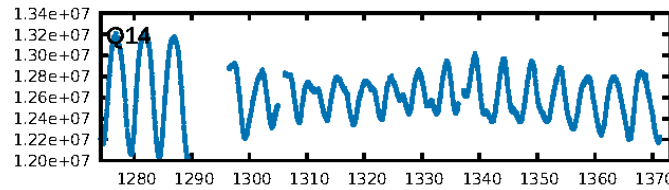
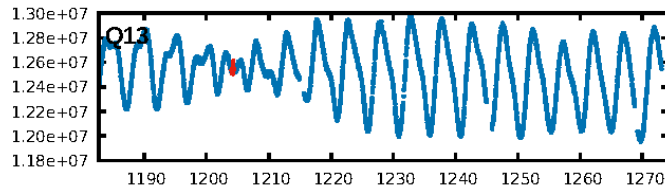
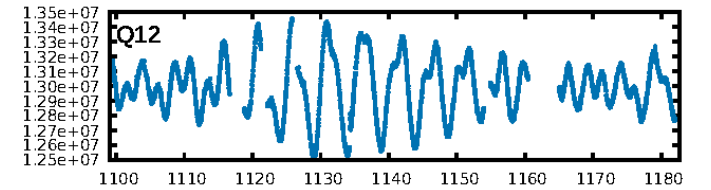
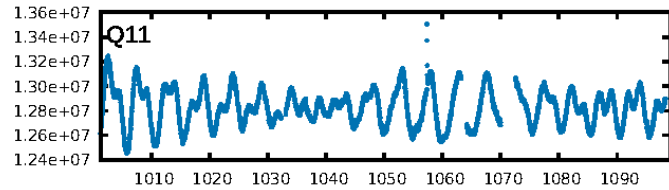
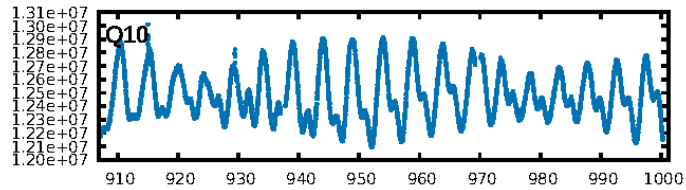
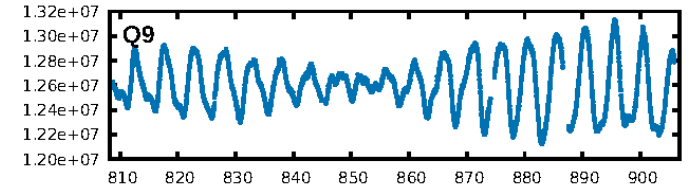
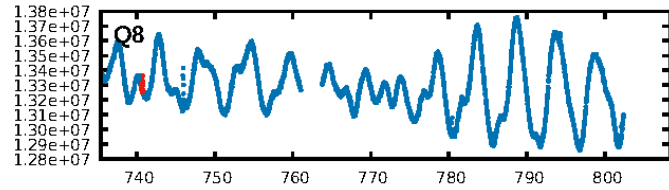
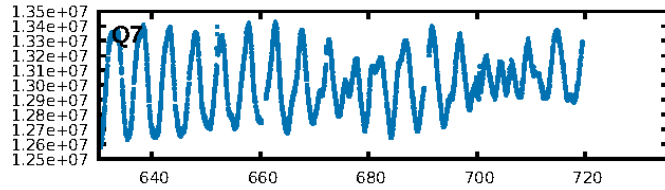
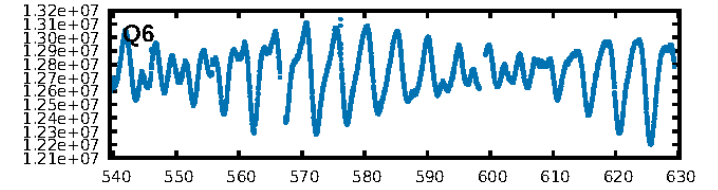
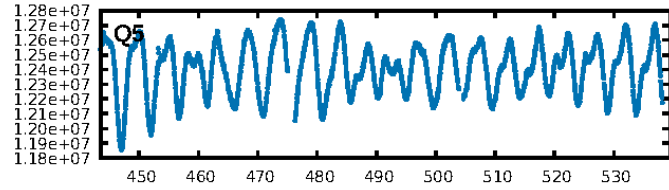
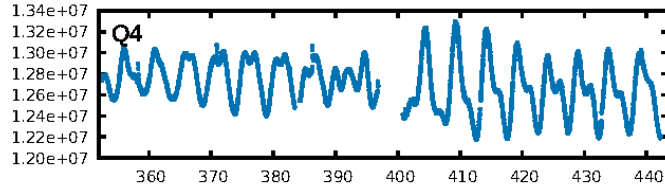
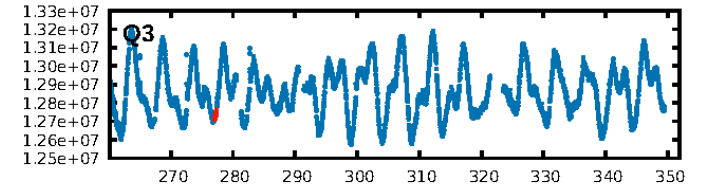
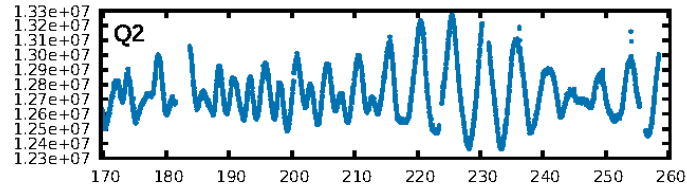
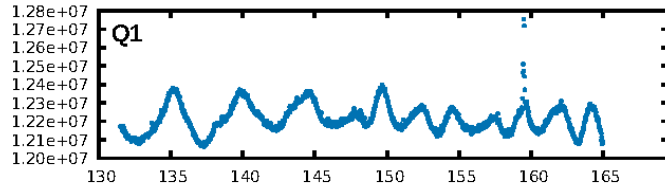
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1011.46 σ]
LongPeriod-sig: 100.0% [424.06 σ]
ModelChiSquare2-sig: 1.5%
ModelChiSquareGof-sig: 86.5%
Bootstrap-pfa: 1.92e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.317
Centroid-sig: 32.5%
Centroid-so: 1.362 arcsec [0.93 σ]
OotOffset-rm: 0.511 arcsec [1.80 σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 0.419 arcsec [1.34 σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

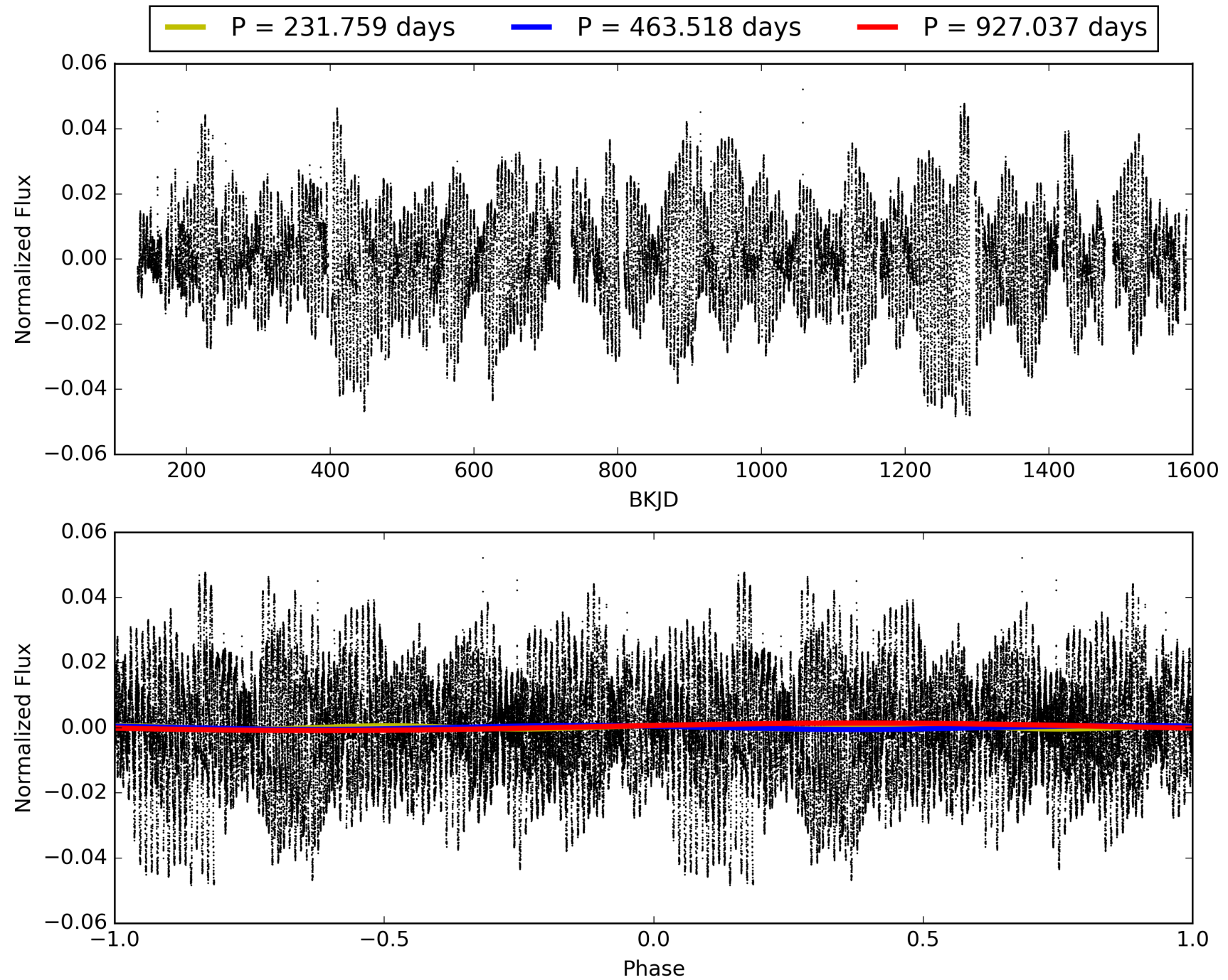
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:04:11 Z

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

TCE 005614003-04, PDC Light Curves

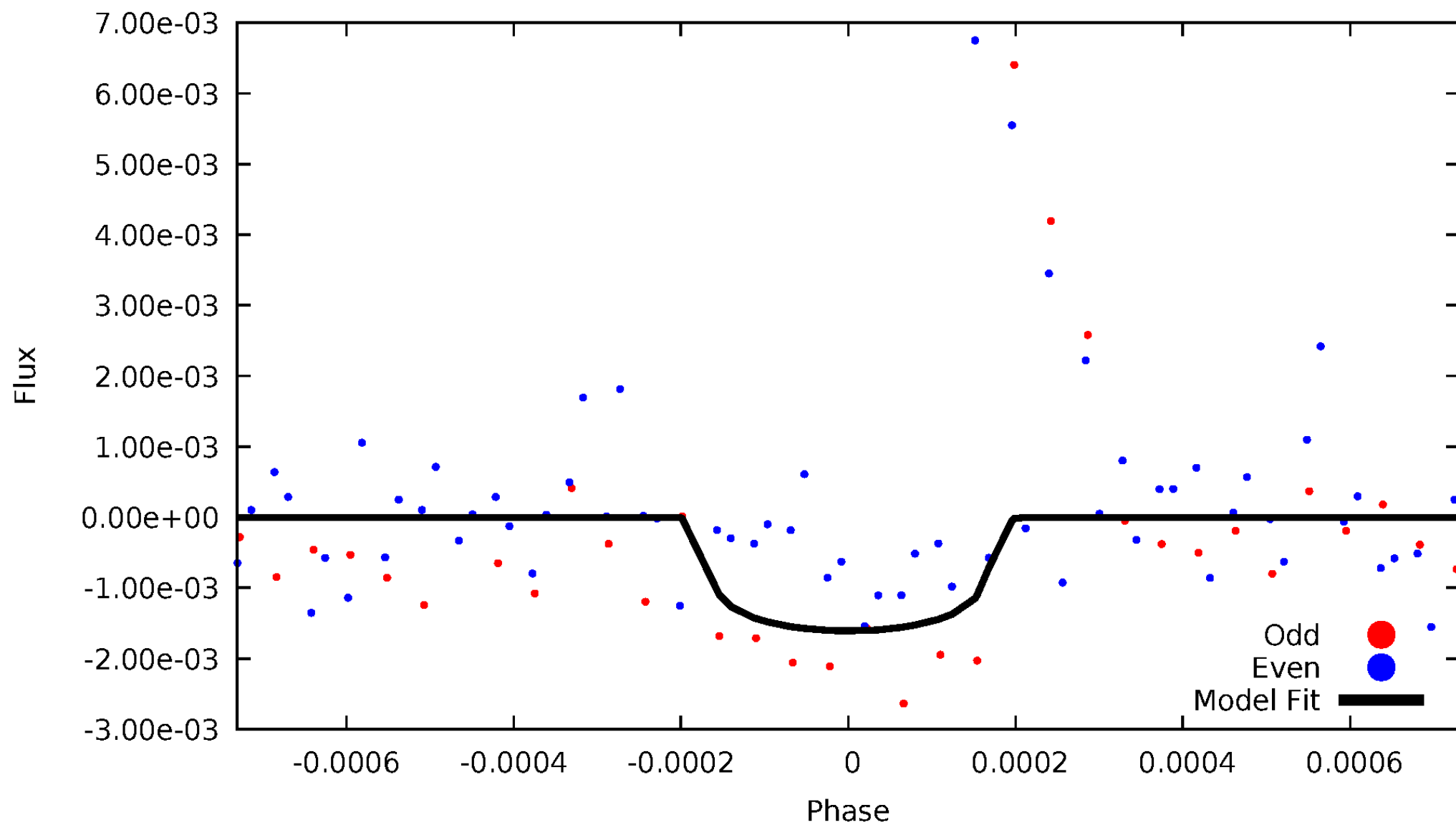


TCE 005614003-04



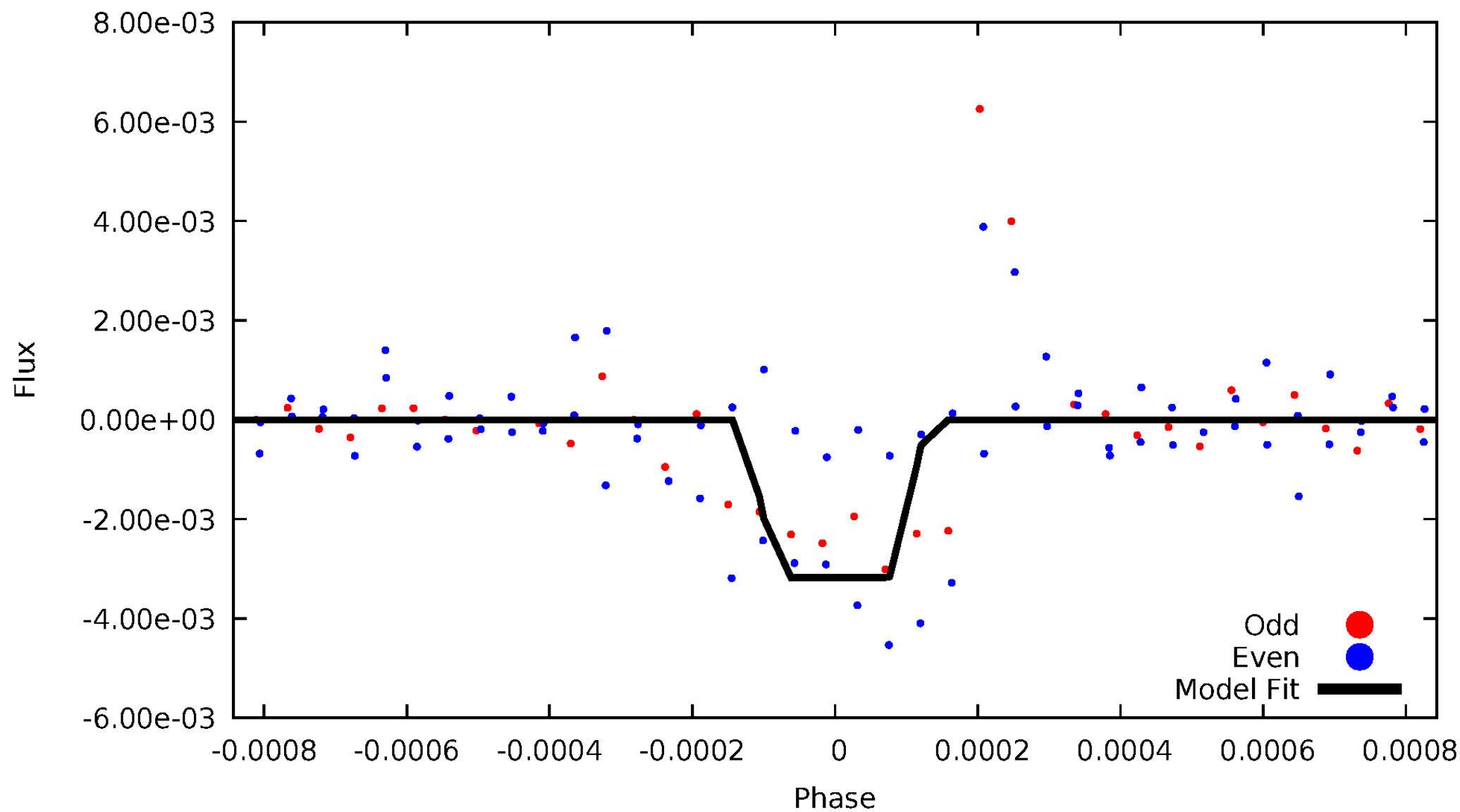
DV Odd/Even

TCE 005614003-04



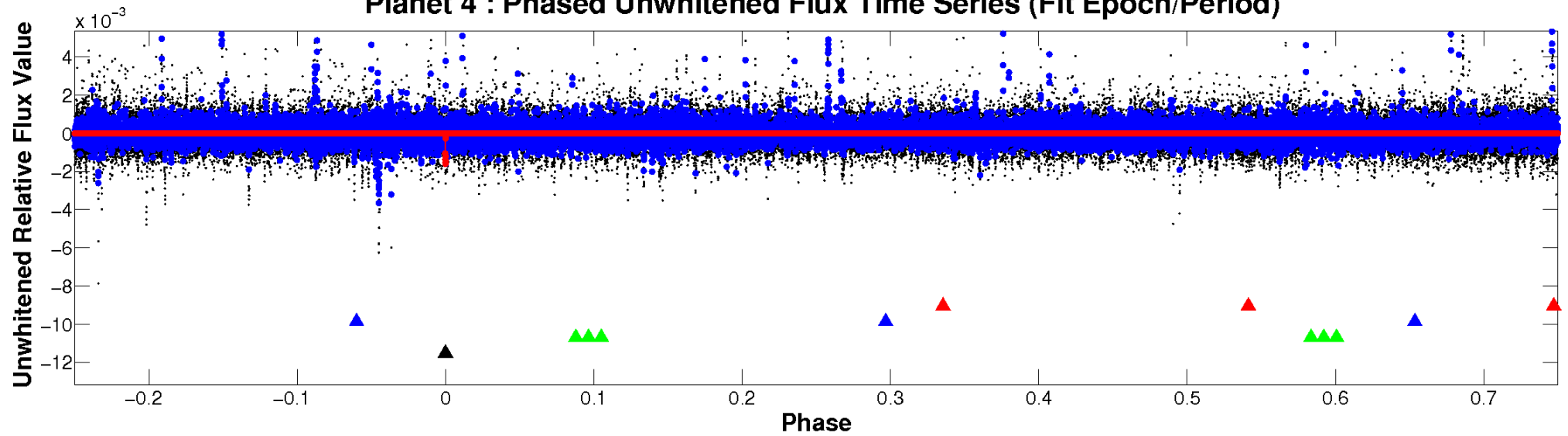
ALT Odd/Even

TCE 005614003-04

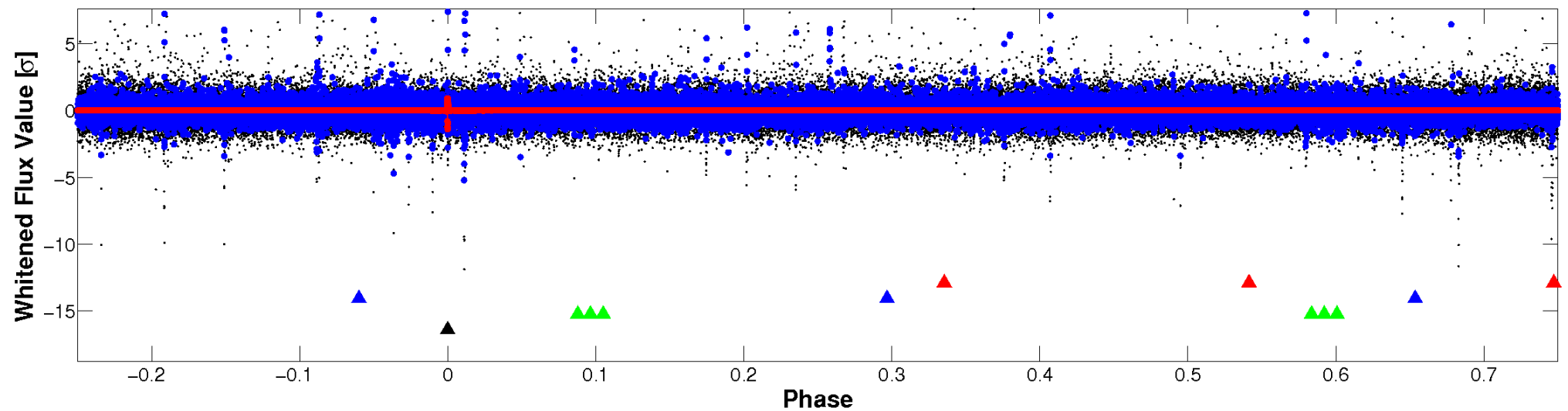


Non-Whitened Vs. Whitened Light Curve

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

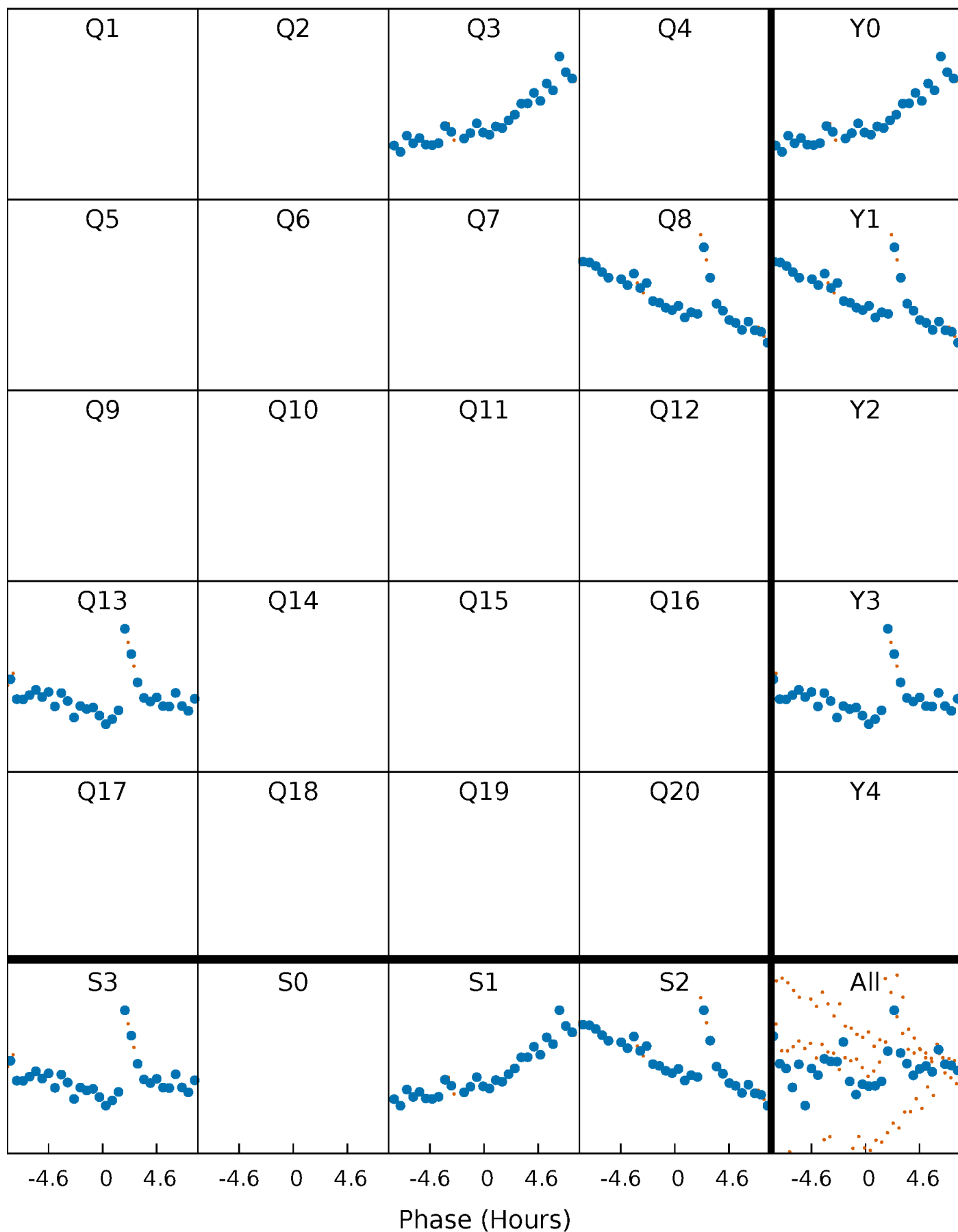


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



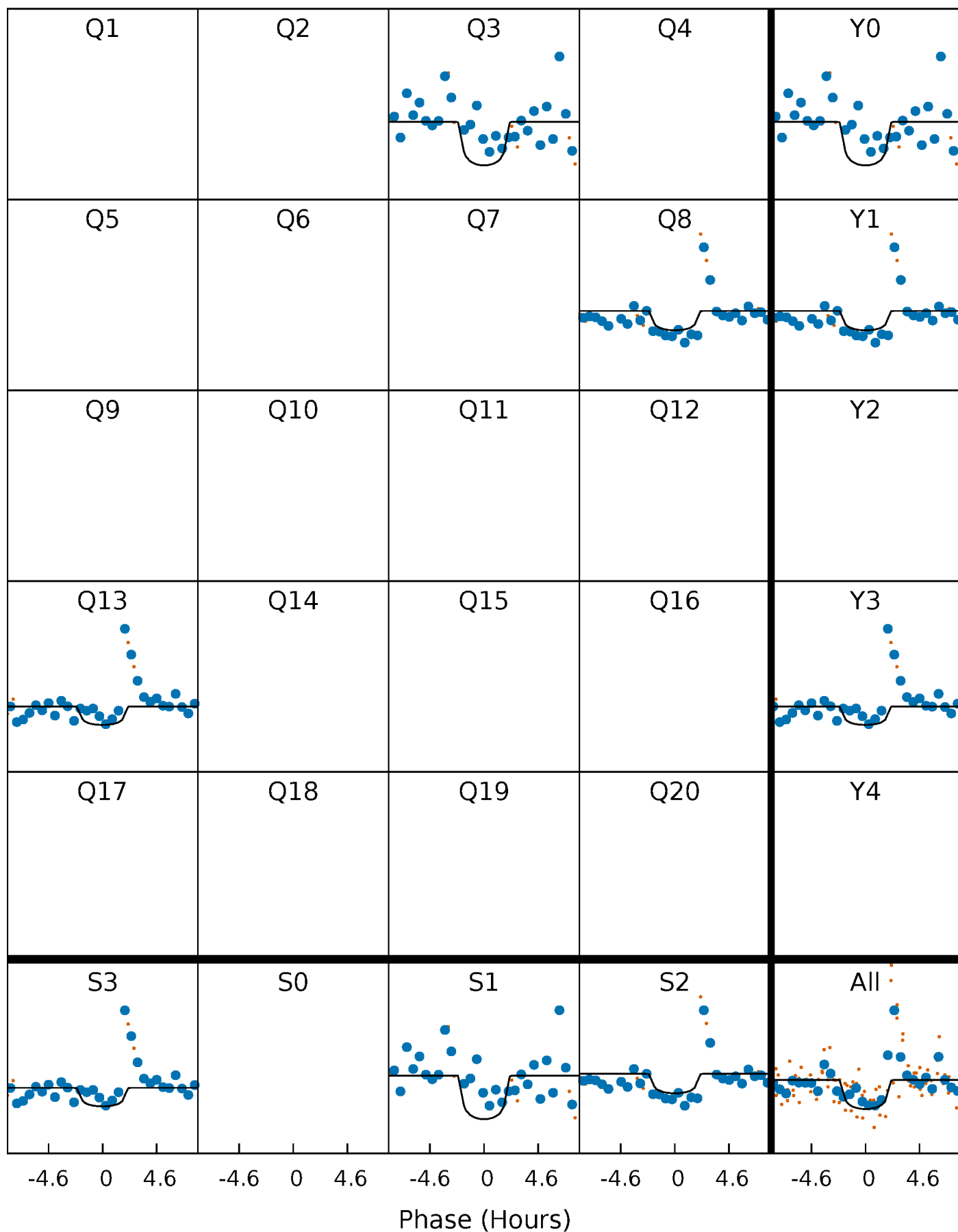
PDC Quarter-Phased Transit Curves

TCE 005614003-04 P=463.518437 Days $T_0=277.187953$ (BKJD)



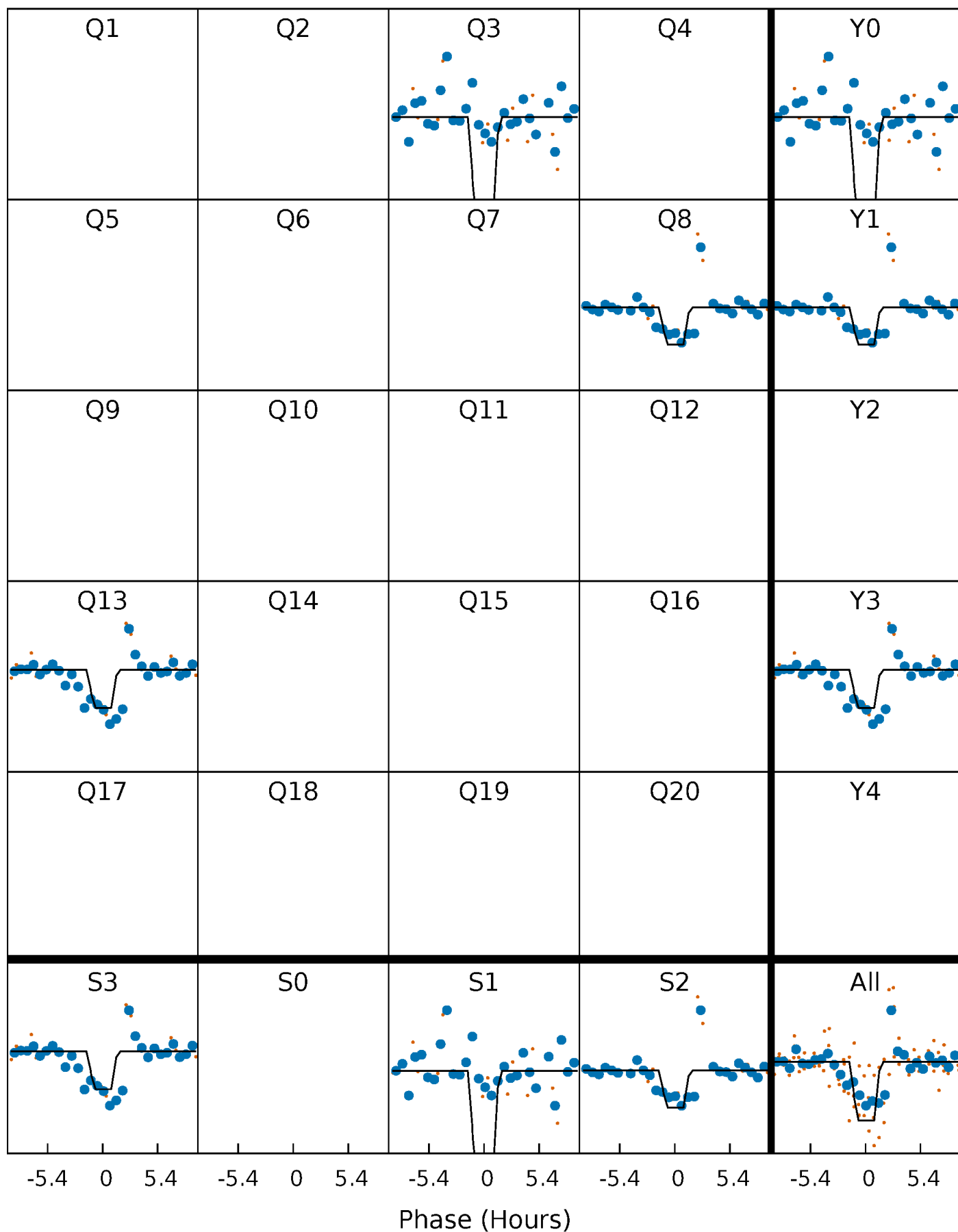
DV Quarter-Phased Transit Curves

TCE 005614003-04 P=463.518437 Days $T_0=277.187953$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

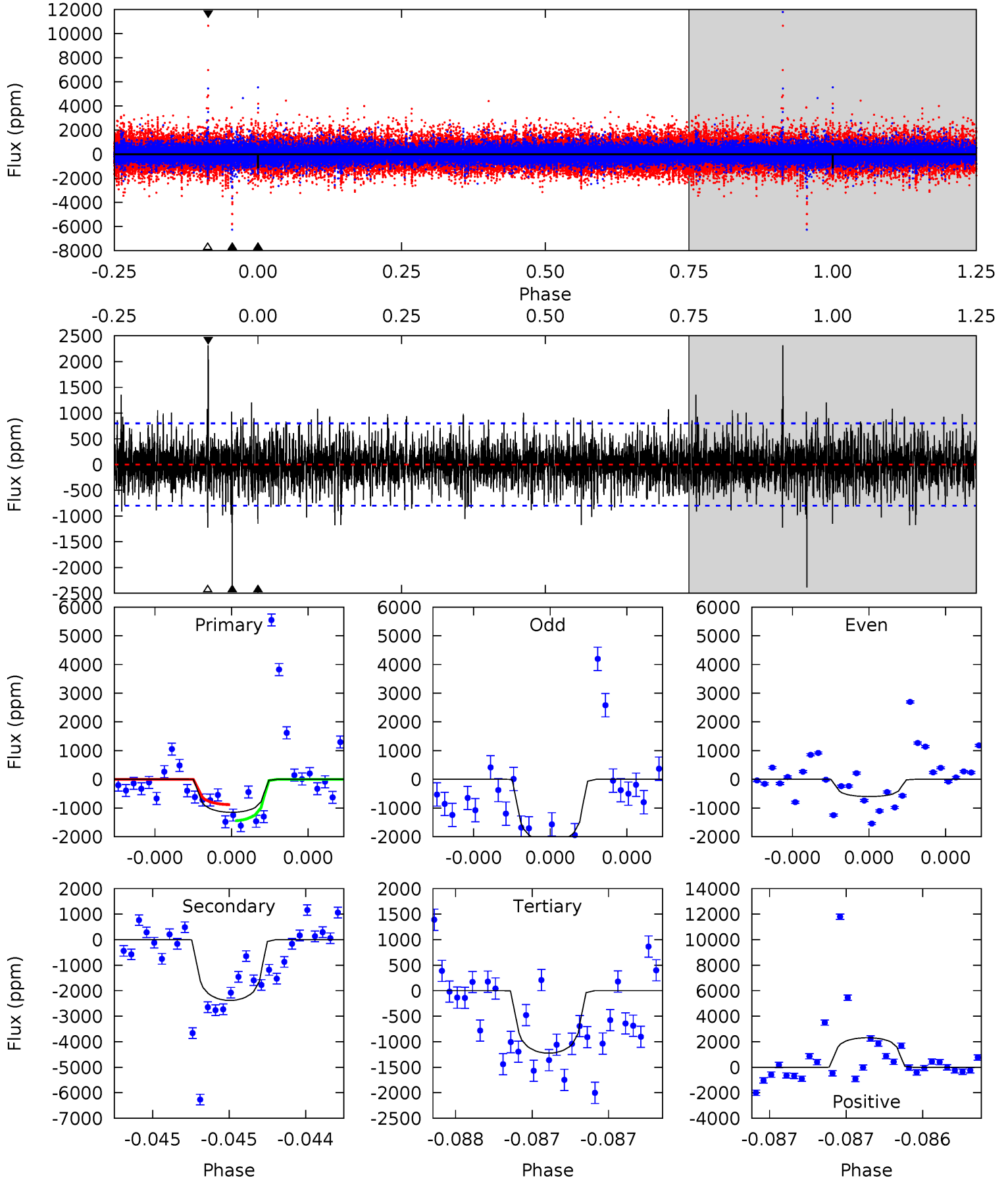
TCE 005614003-04 P=463.494441 Days $T_0=277.209884$ (BKJD)



DV Model-Shift Uniqueness Test

005614003-04, P = 463.518437 Days, E = 277.187953 Days

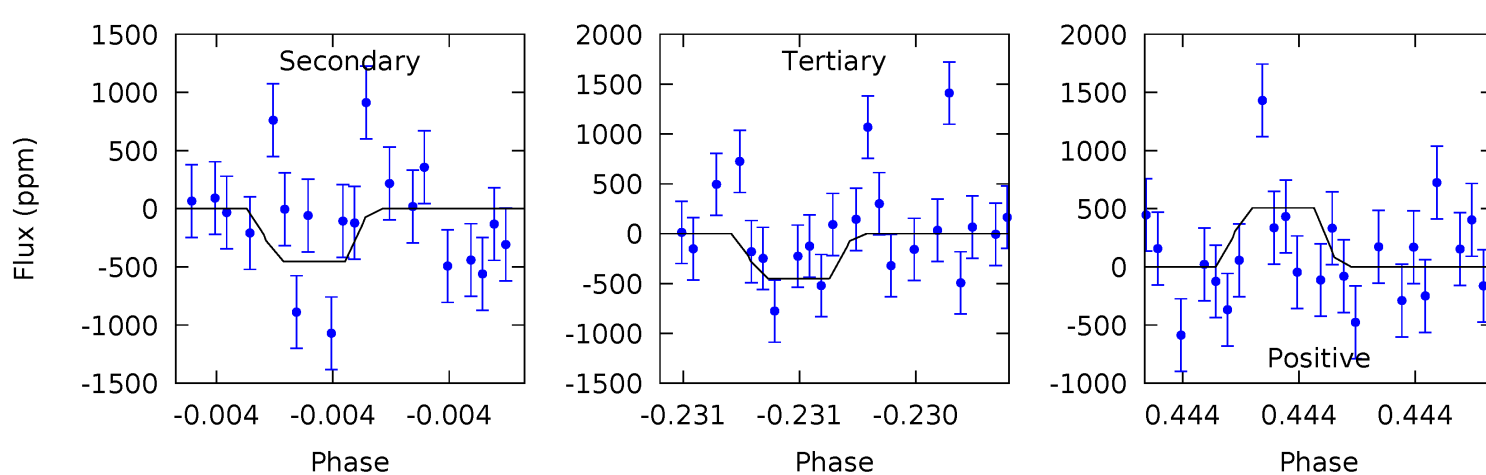
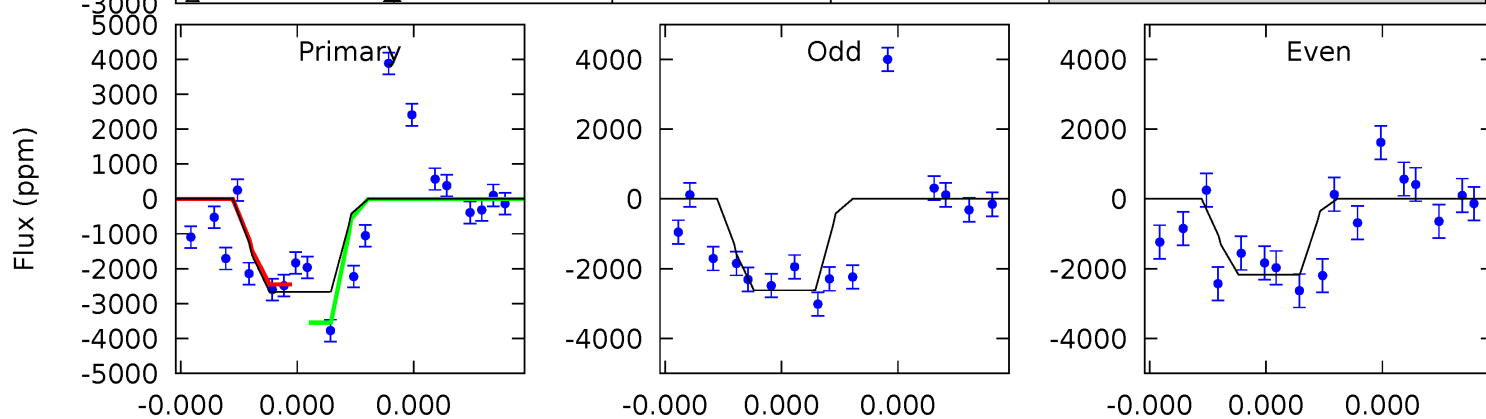
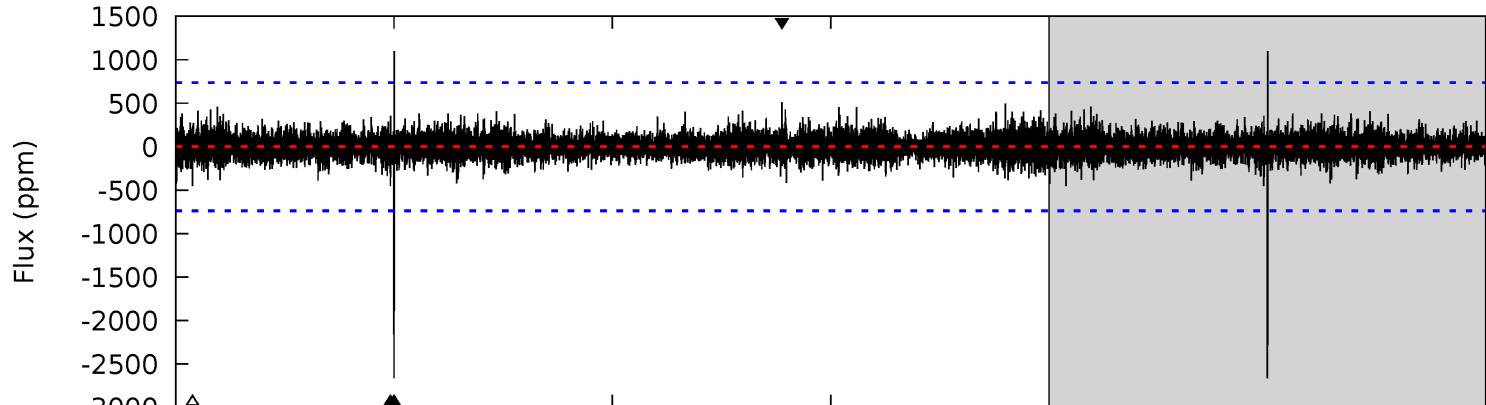
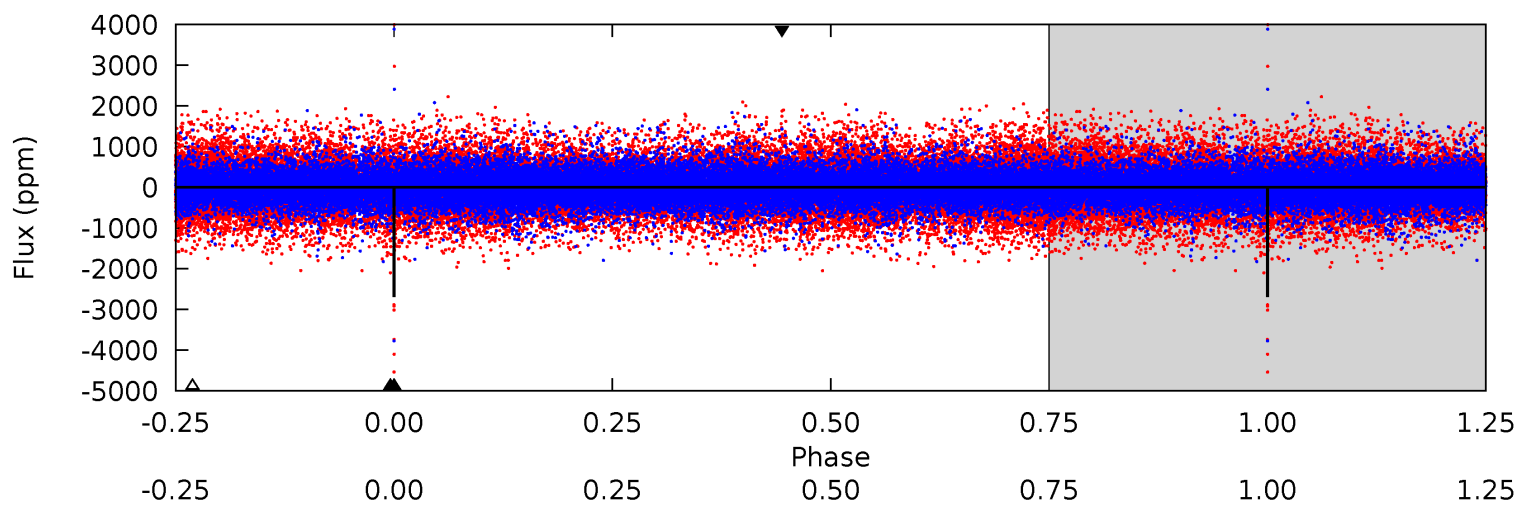
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.10	16.8	8.61	16.3	5.61	3.54	1.99	-0.51	-8.18	8.15	0.48	4.93	1.77	0.49	2.00



Alt Model-Shift Uniqueness Test

005614003-04, P = 463.494441 Days, E = 277.209884 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.6	3.51	3.48	3.92	5.69	3.65	0.72	17.1	16.6	0.03	-0.42	1.80	0.84	0.29	4.02



Stellar Parameters For KIC 005614003

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5059^{+150}_{-150}	$4.734^{+0.021}_{-0.053}$	$-1.220^{+0.300}_{-0.300}$	$0.558^{+0.041}_{-0.024}$	$0.615^{+0.032}_{-0.032}$	$4.990^{+0.433}_{-0.882}$
	+3%/-3%	+0%/-1%	+25%/-25%	+7%/-4%	+5%/-5%	+9%/-18%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005614003-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2383 ± 142	$3.65^{+3.27}_{-2.54}$	235^{+8}_{-7}	4665^{+3819}_{-957}	$96169^{+904794}_{-68489}$
Alt.	-454 ± 129	$4.49^{+3.25}_{-2.88}$	235^{+8}_{-8}	3259^{+1315}_{-508}	11719^{+75442}_{-7905}

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

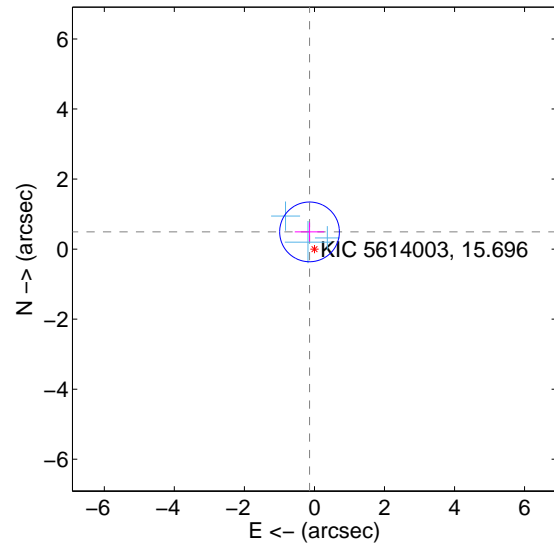
Supplemental centroid analysis for 005614003-04. Kepler magnitude: 15.70. Transit SNR 6.67

There are 3 quarters with good PRF difference image offsets

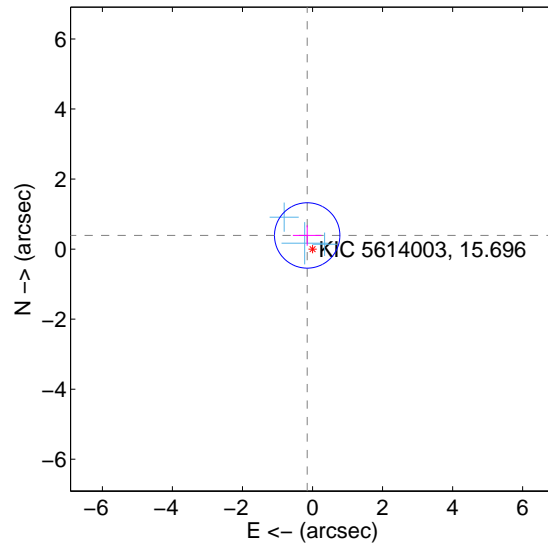
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.511 ± 0.284	1.80	0.140 ± 0.421	0.492 ± 0.270
PRF-fit source offset from KIC position	0.419 ± 0.311	1.34	0.153 ± 0.407	0.390 ± 0.294
photometric centroid source offset	1.36 ± 1.47	0.93	1.20 ± 1.45	0.65 ± 1.52

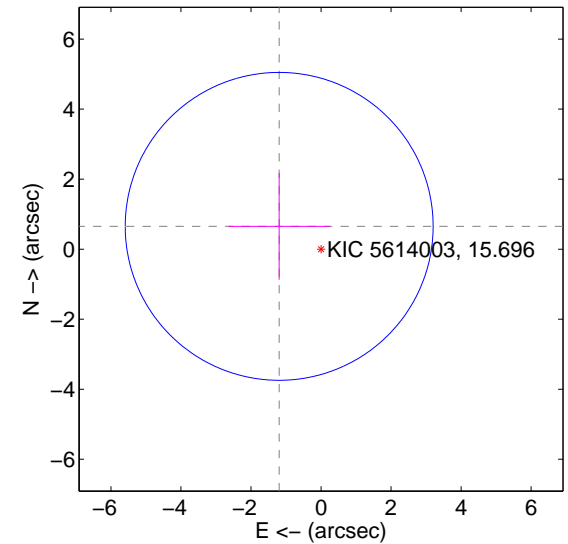
offset from difference PRF-fit to OOT PRF-fit



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.

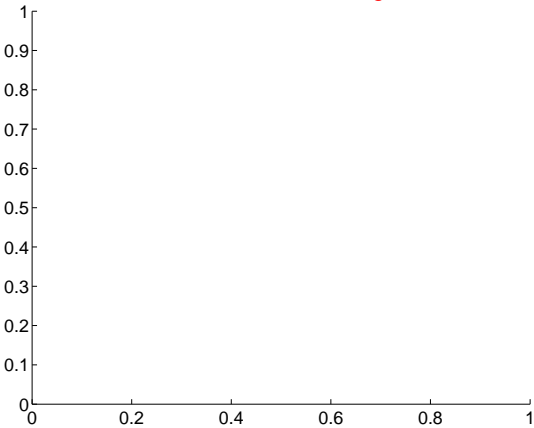
Q1 no difference image



Q1 no OOT image



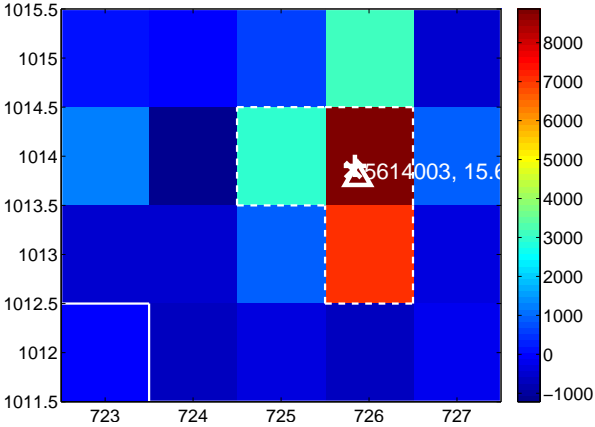
Q2 no difference image



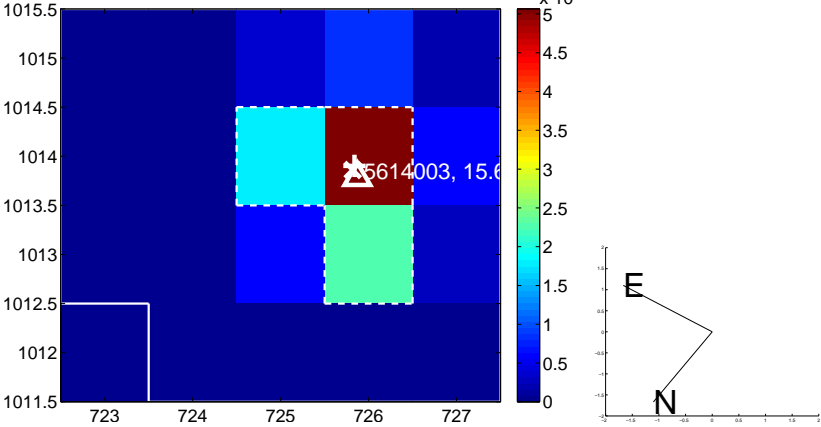
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



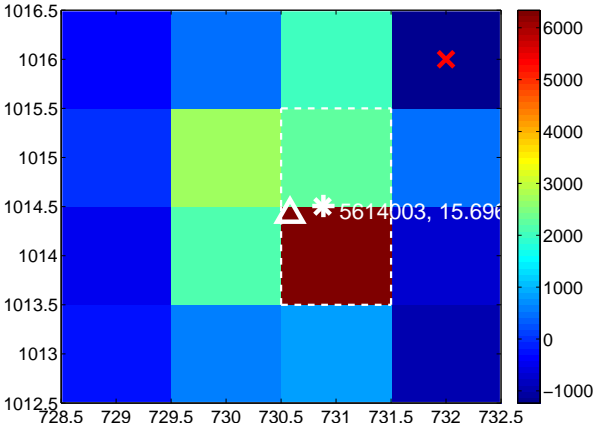
Q7 no difference image



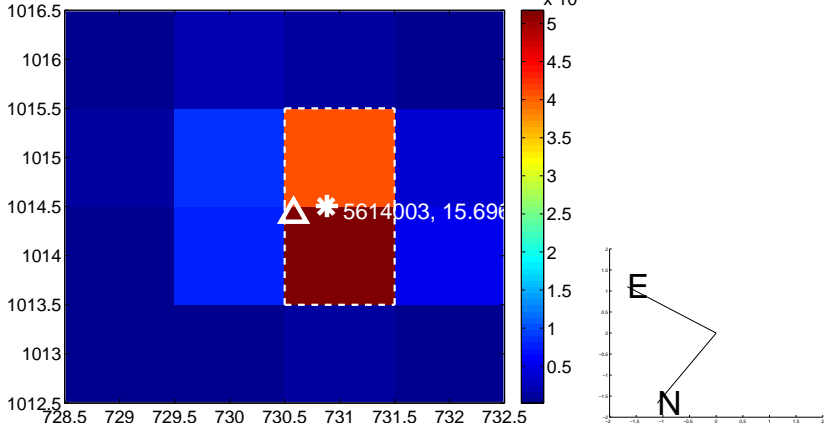
Q7 no OOT image



Q8 difference image



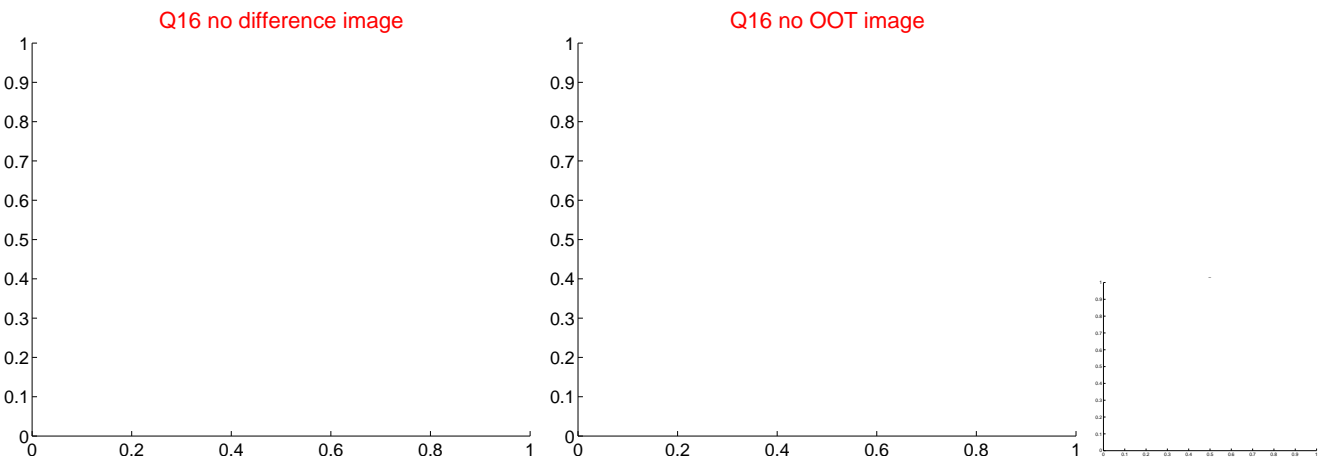
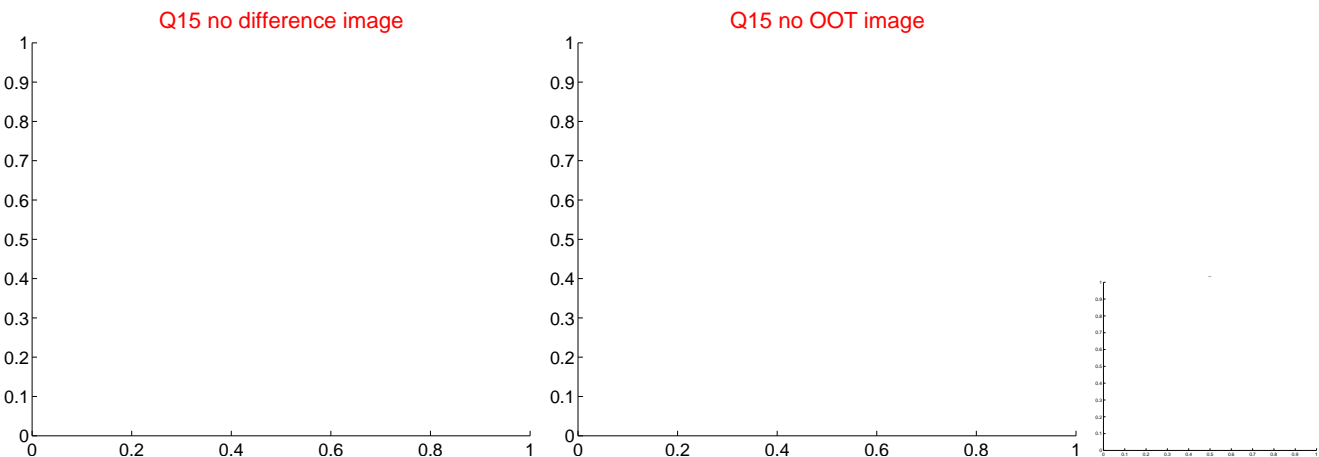
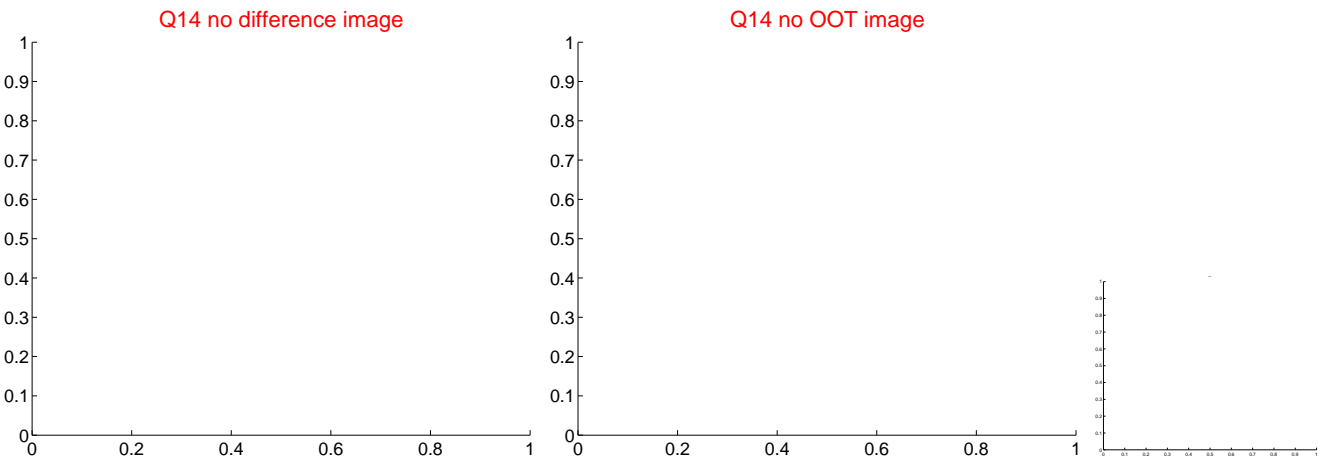
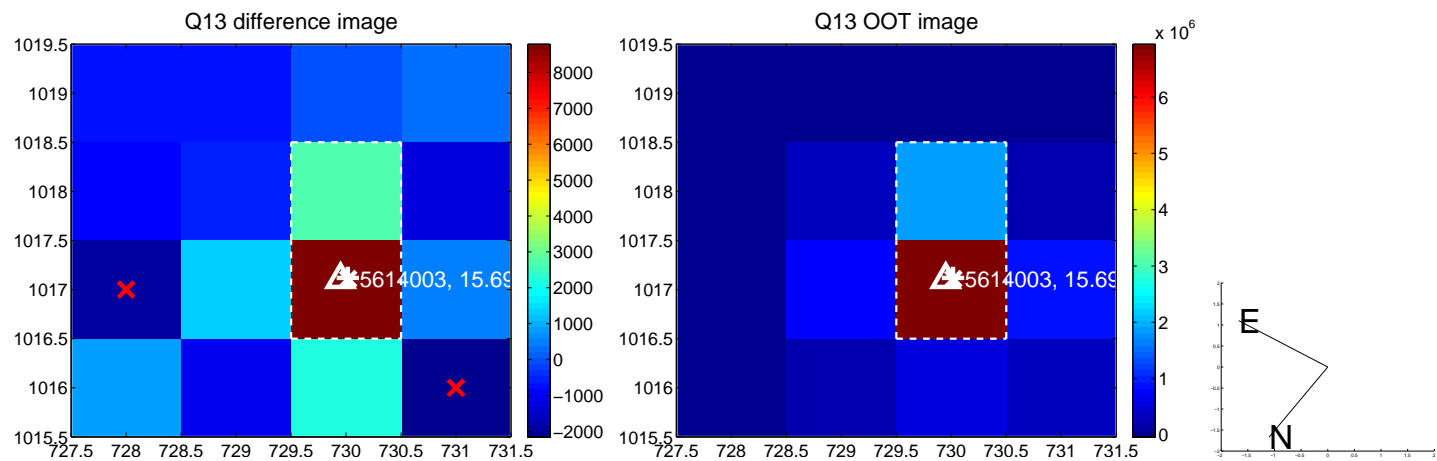
Q8 OOT image



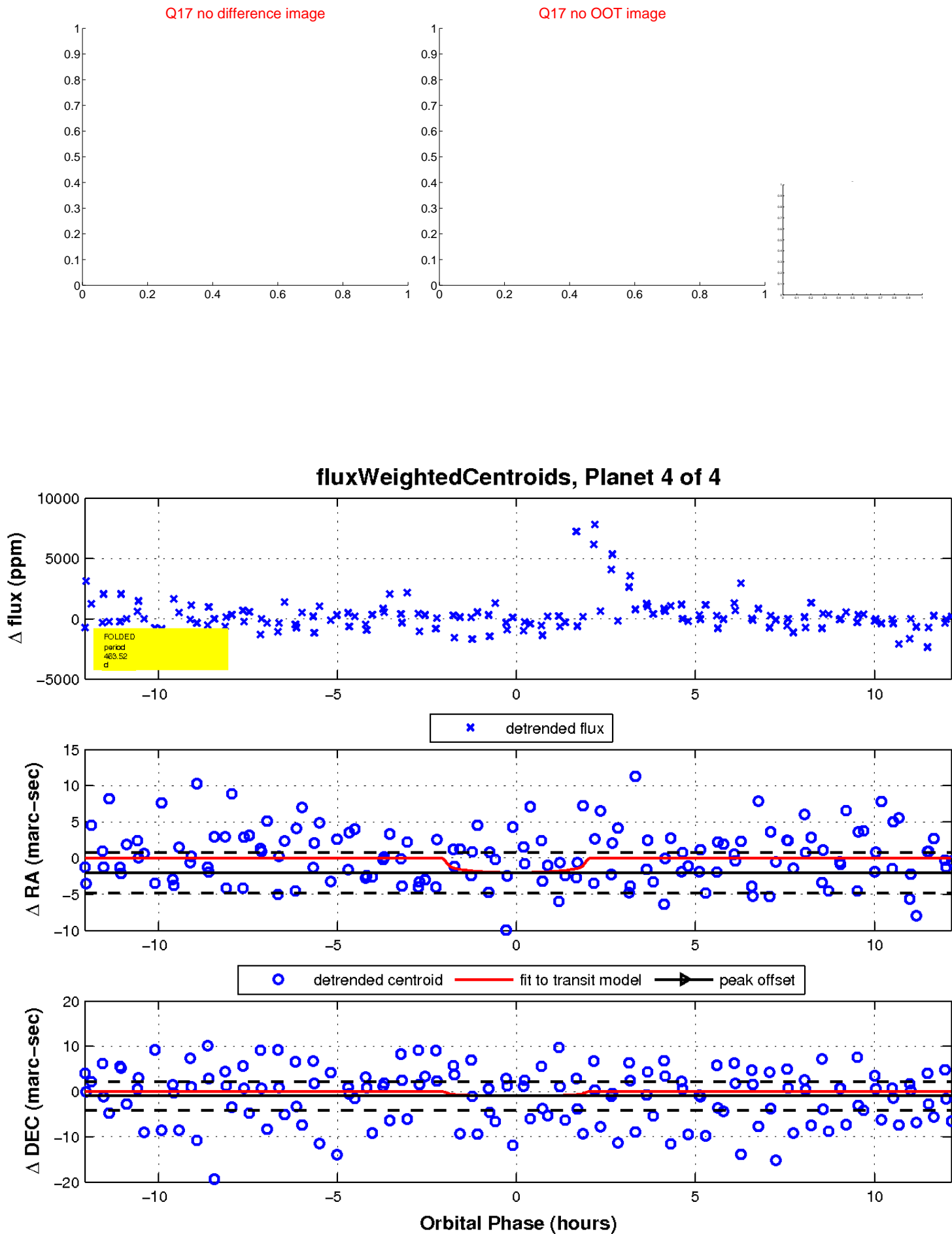
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

