

KIC 012102573

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})
012102573-01	OBS	No	445.804484	204.108481	1668.5	4.662	18.8	9.6	0.74	4474	2.96	0.19
012102573-03	OBS	No	255.673121	272.159199	390.3	7.647	16.4	2.3	0.74	4474	1.62	0.39
012102573-04	OBS	No	554.948142	270.562533	261.1	1.271	13.6	1.9	0.74	4474	1.61	0.14
012102573-05	OBS	No	377.372121	147.853988	883.3	5.400	12.7	6.0	0.74	4474	2.24	0.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012102573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
012102573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012102573-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
012102573-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

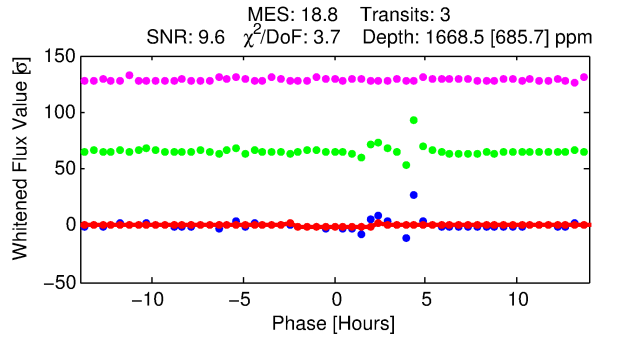
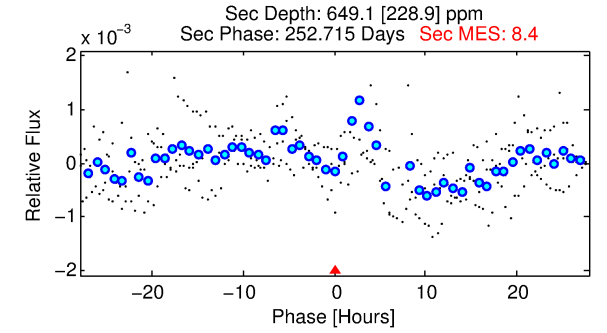
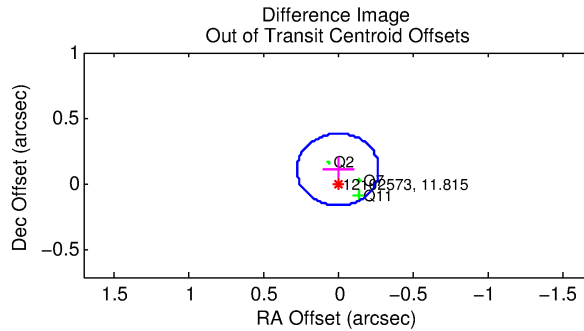
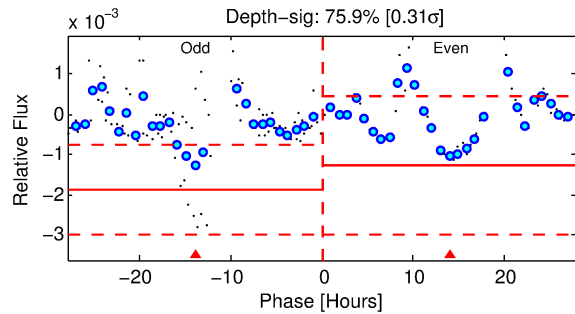
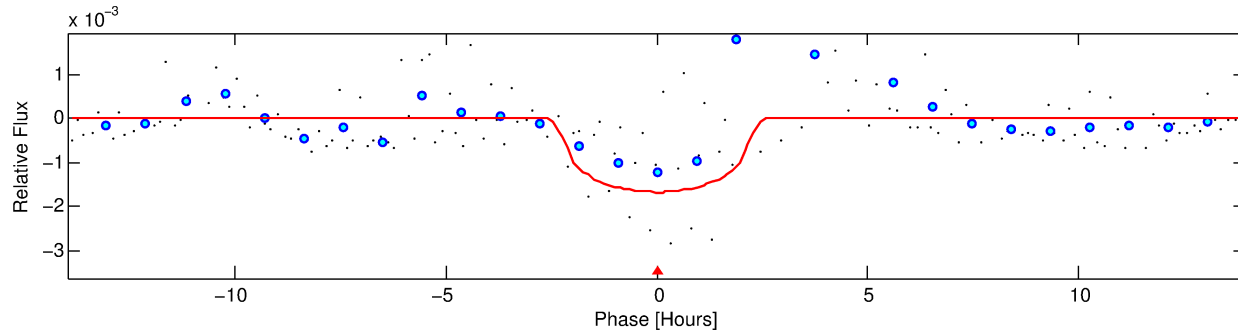
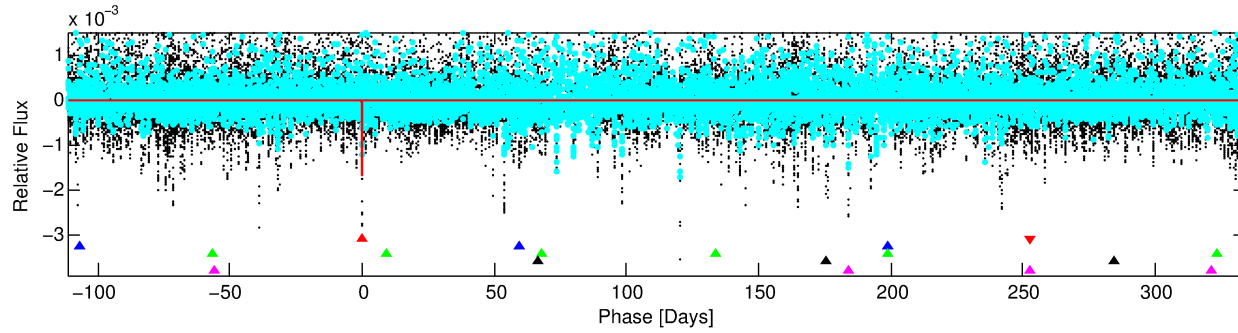
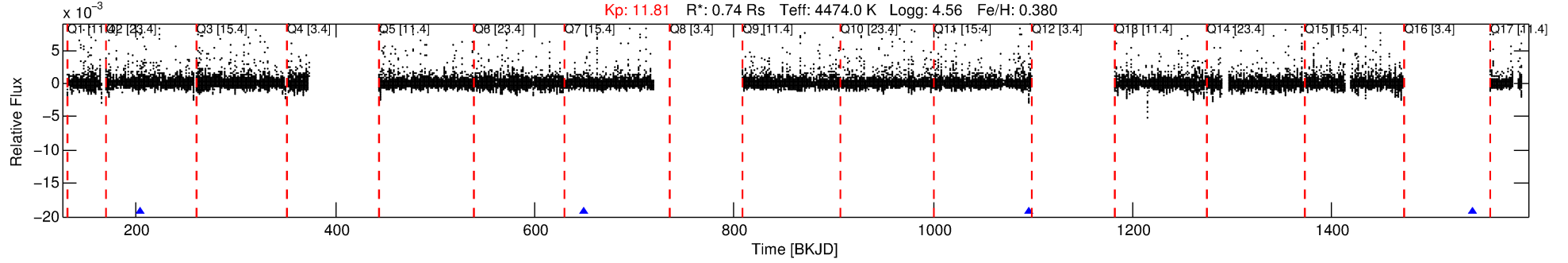
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012102573-01

No Significant Match Found

DV One-Page Summary

KIC: 12102573 Candidate: 1 of 5 Period: 445.804 d



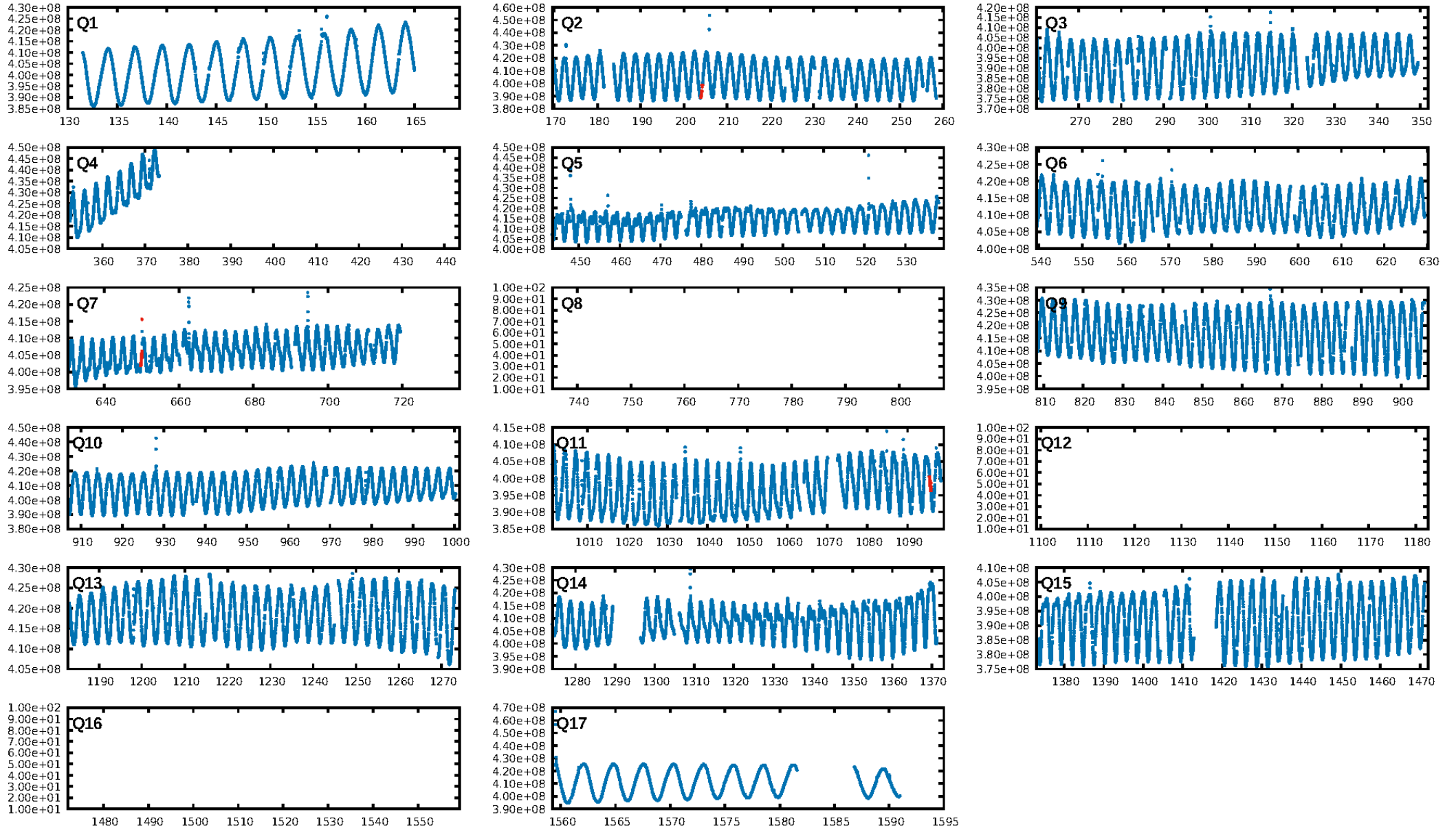
DV Fit Results:

Period = 445.80448 [0.01144] d
Epoch = 204.1085 [0.0145] BKJD
Rp/R* = 0.0364 [0.0883]
a/R* = 712.26 [4836.32]
b = 0.35 [17.37]
Seff = 0.19 [0.03]
Teq = 168 [7] K
Rp = 2.96 [7.18] Re
a = 1.0317 [0.0741] AU
Ag = 43446.59 [211391.39] [0.21σ]
Teffp = 3744 [4555] K [0.79σ]

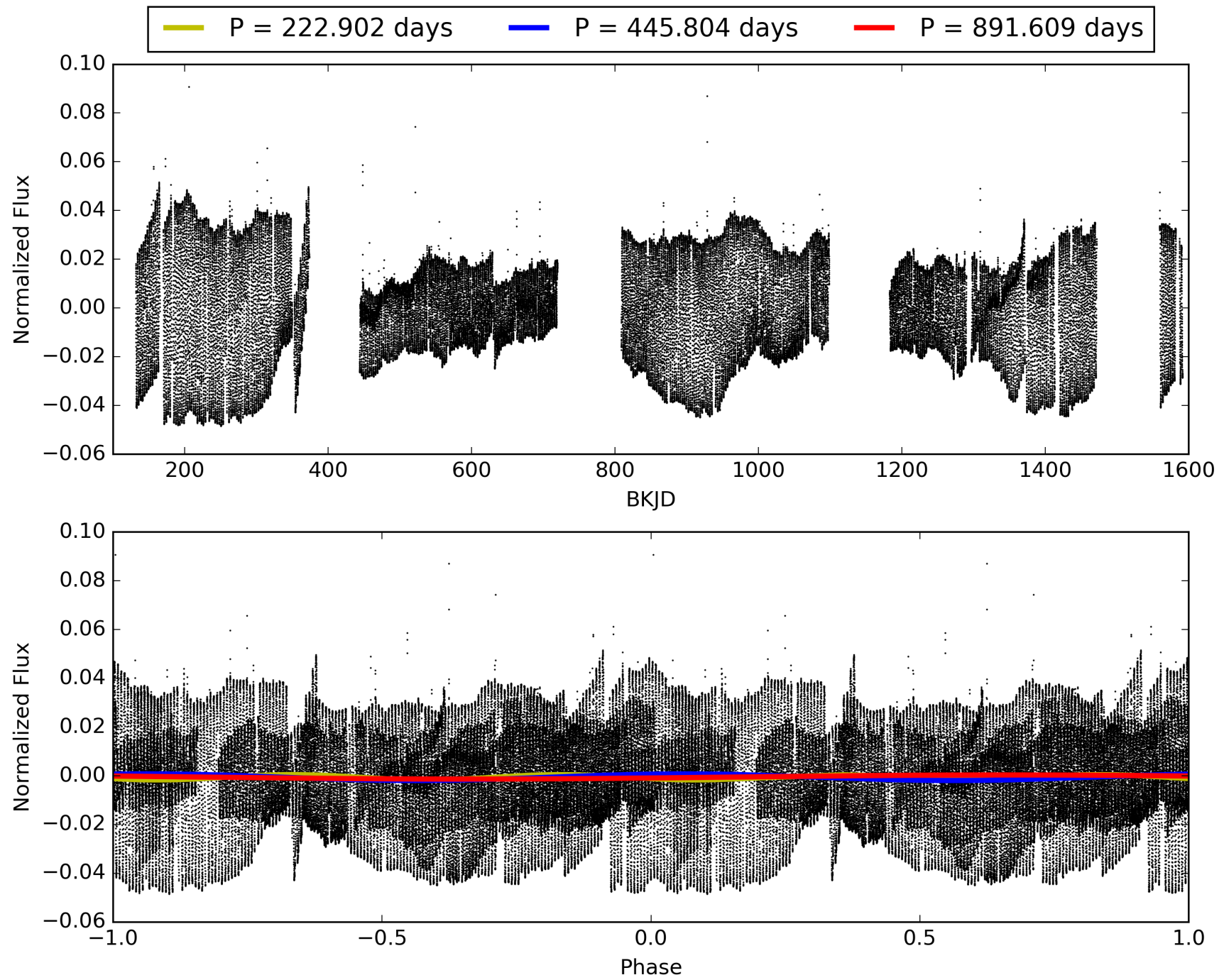
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [230.23σ]
LongPeriod-sig: 100.0% [542.15σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.754
Centroid-sig: 86.1%
Centroid-so: 0.517 arcsec [2.23σ]
OotOffset-rm: 0.112 arcsec [1.23σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-rm: 0.558 arcsec [5.48σ]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 012102573-01, PDC Light Curves

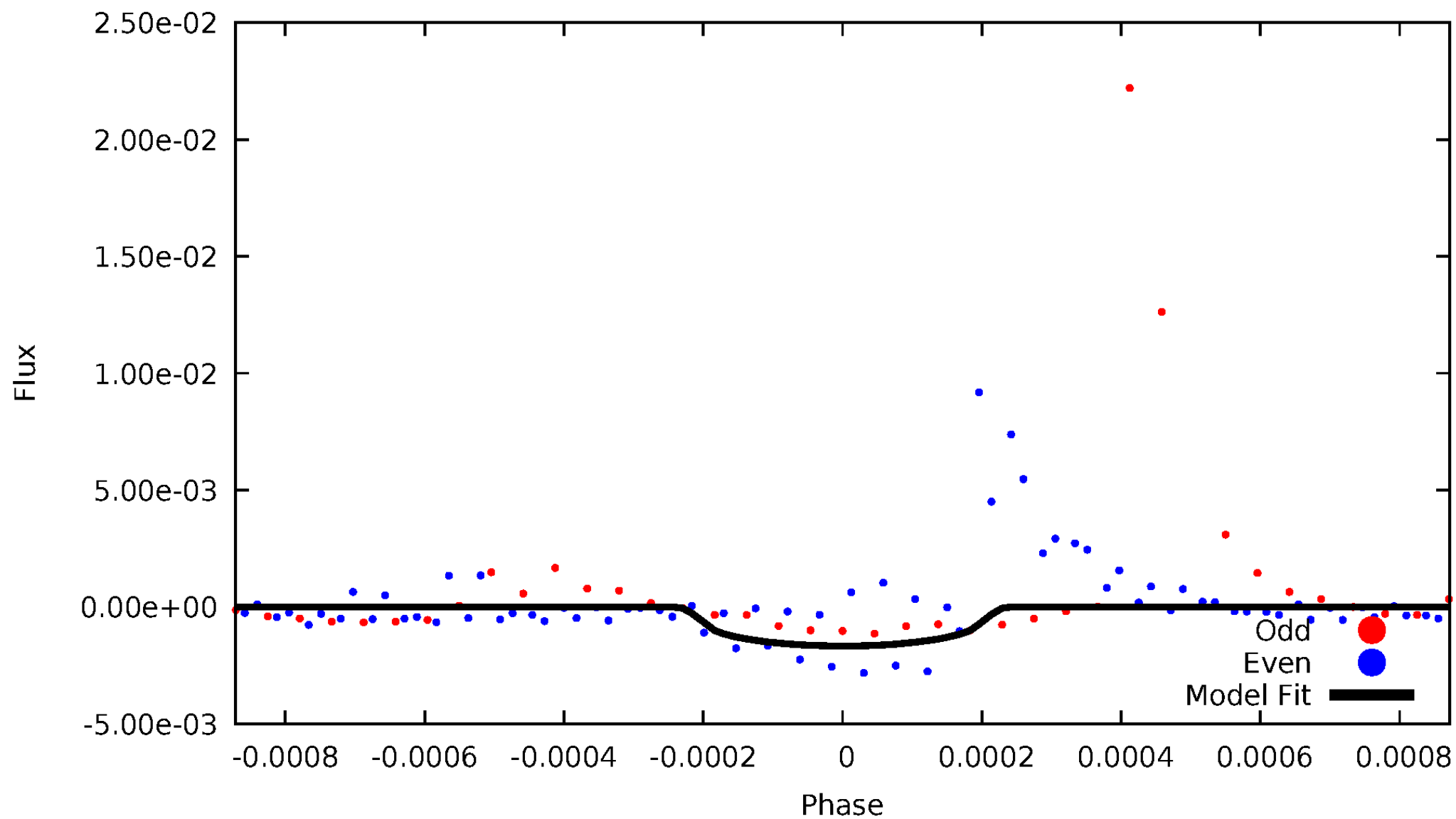


TCE 012102573-01



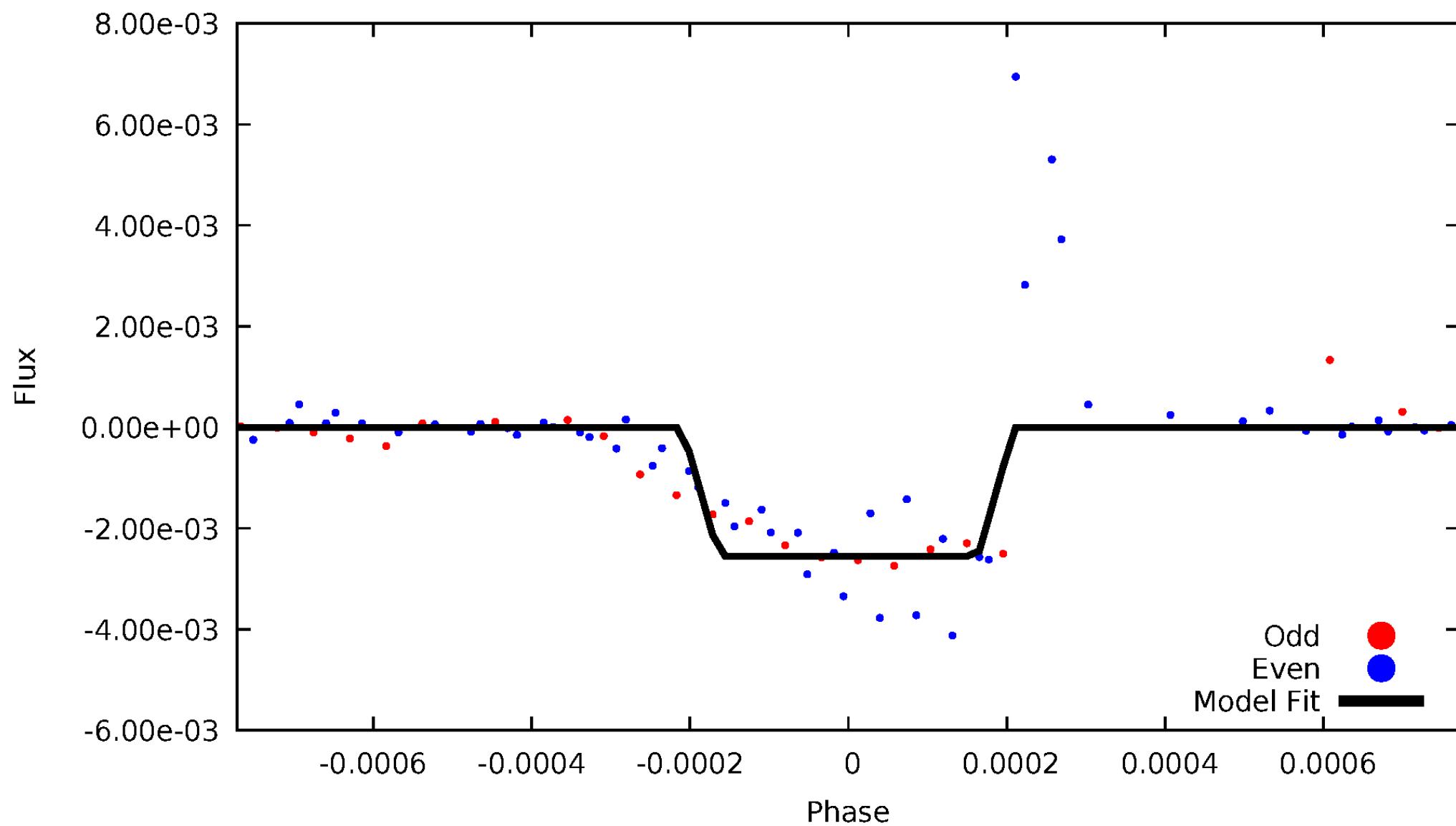
DV Odd/Even

TCE 012102573-01



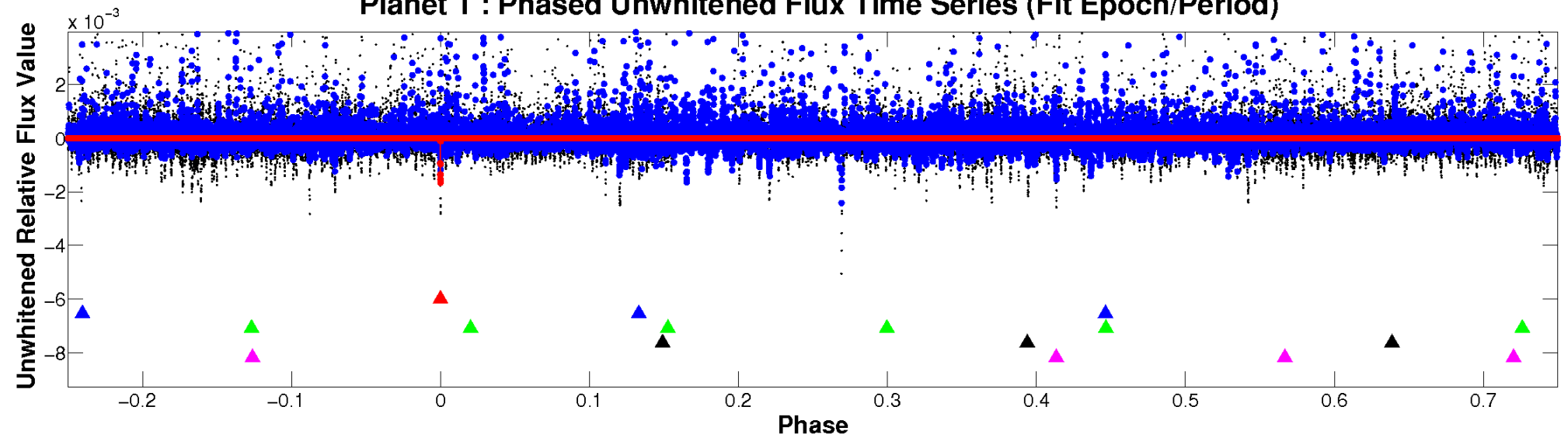
ALT Odd/Even

TCE 012102573-01

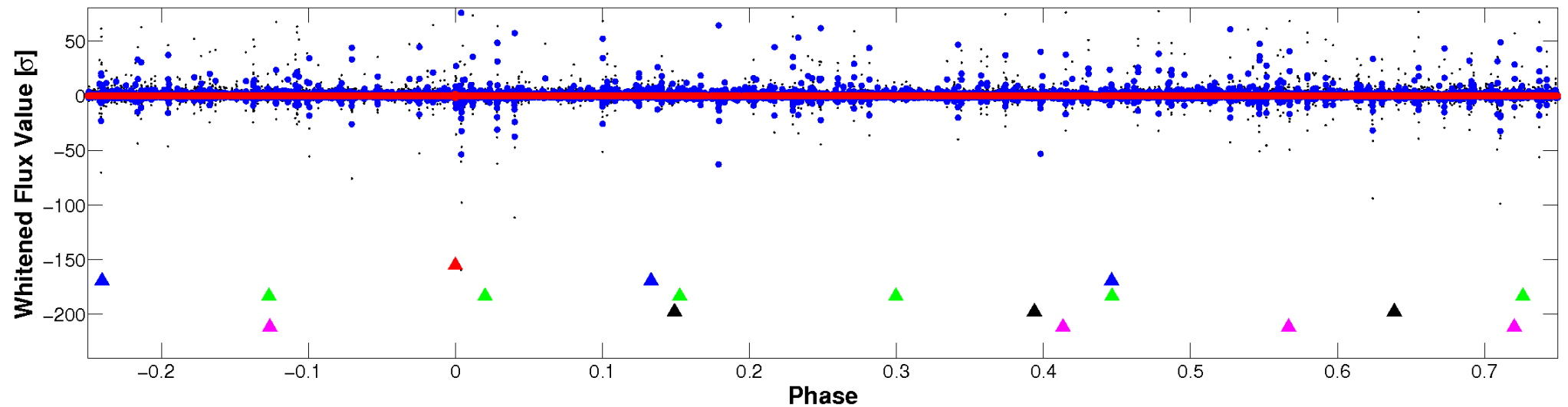


Non-Whitened Vs. Whitened Light Curve

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

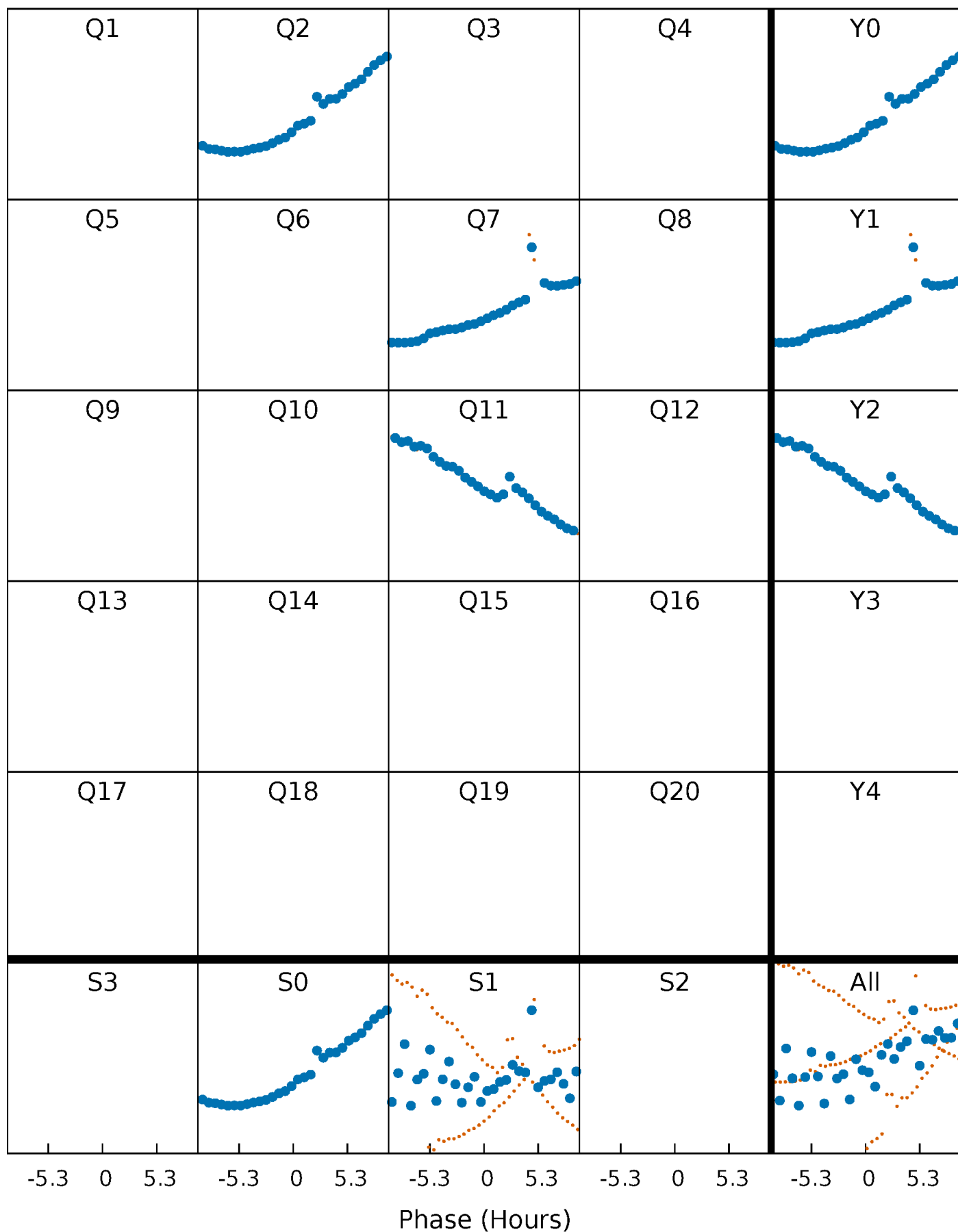


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



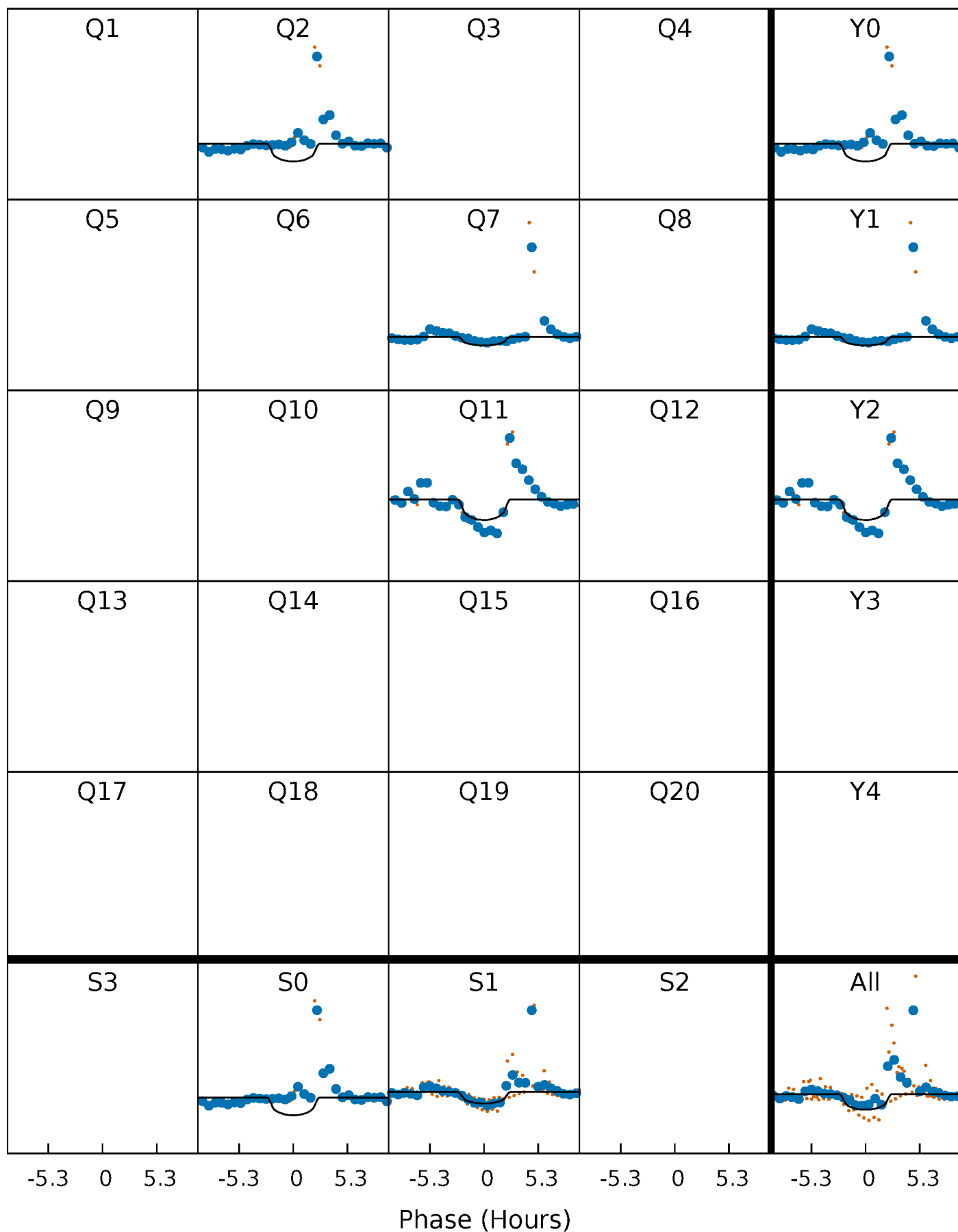
PDC Quarter-Phased Transit Curves

TCE 012102573-01 P=445.804484 Days $T_0=204.108481$ (BKJD)



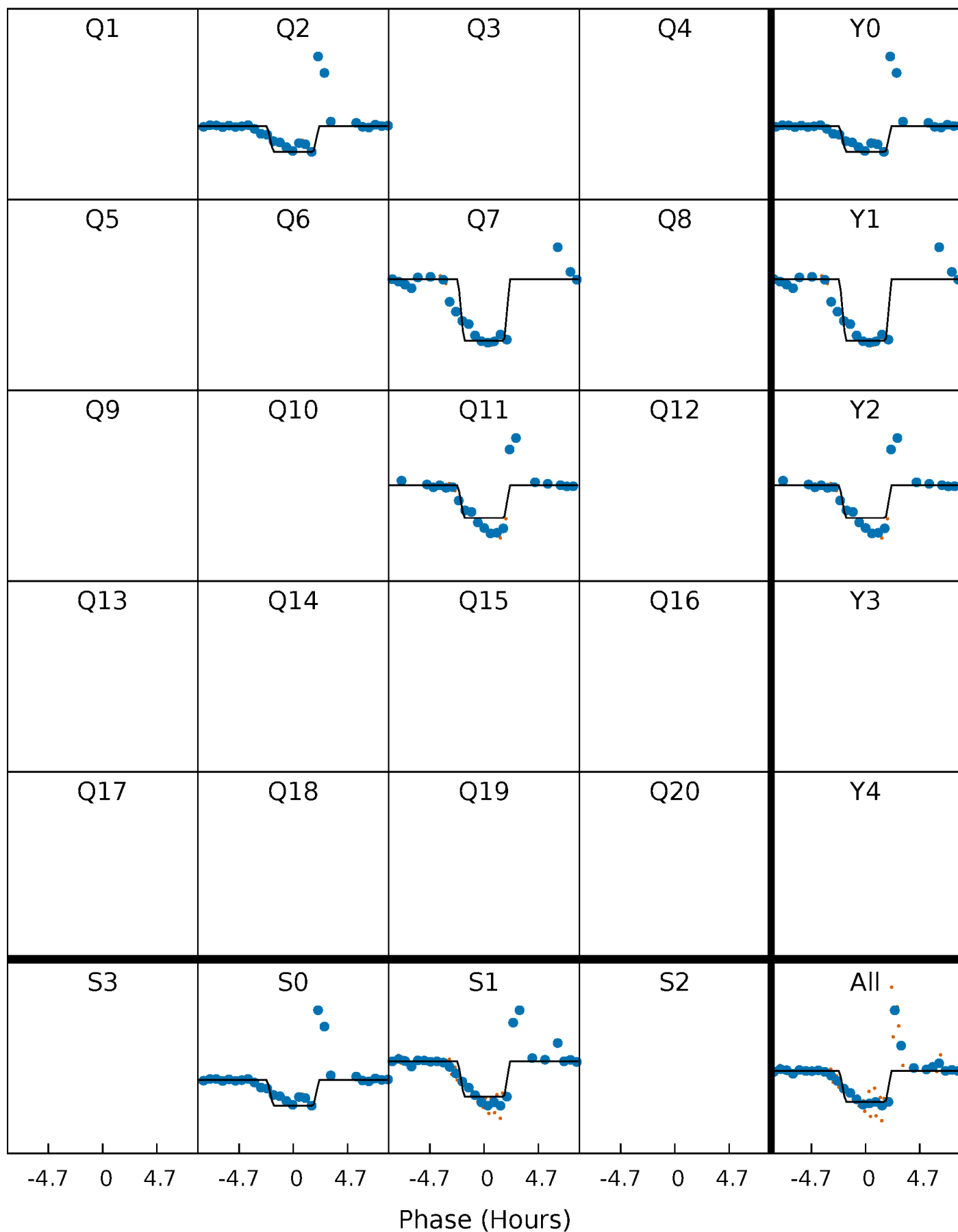
DV Quarter-Phased Transit Curves

TCE 012102573-01 P=445.804484 Days $T_0=204.108481$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

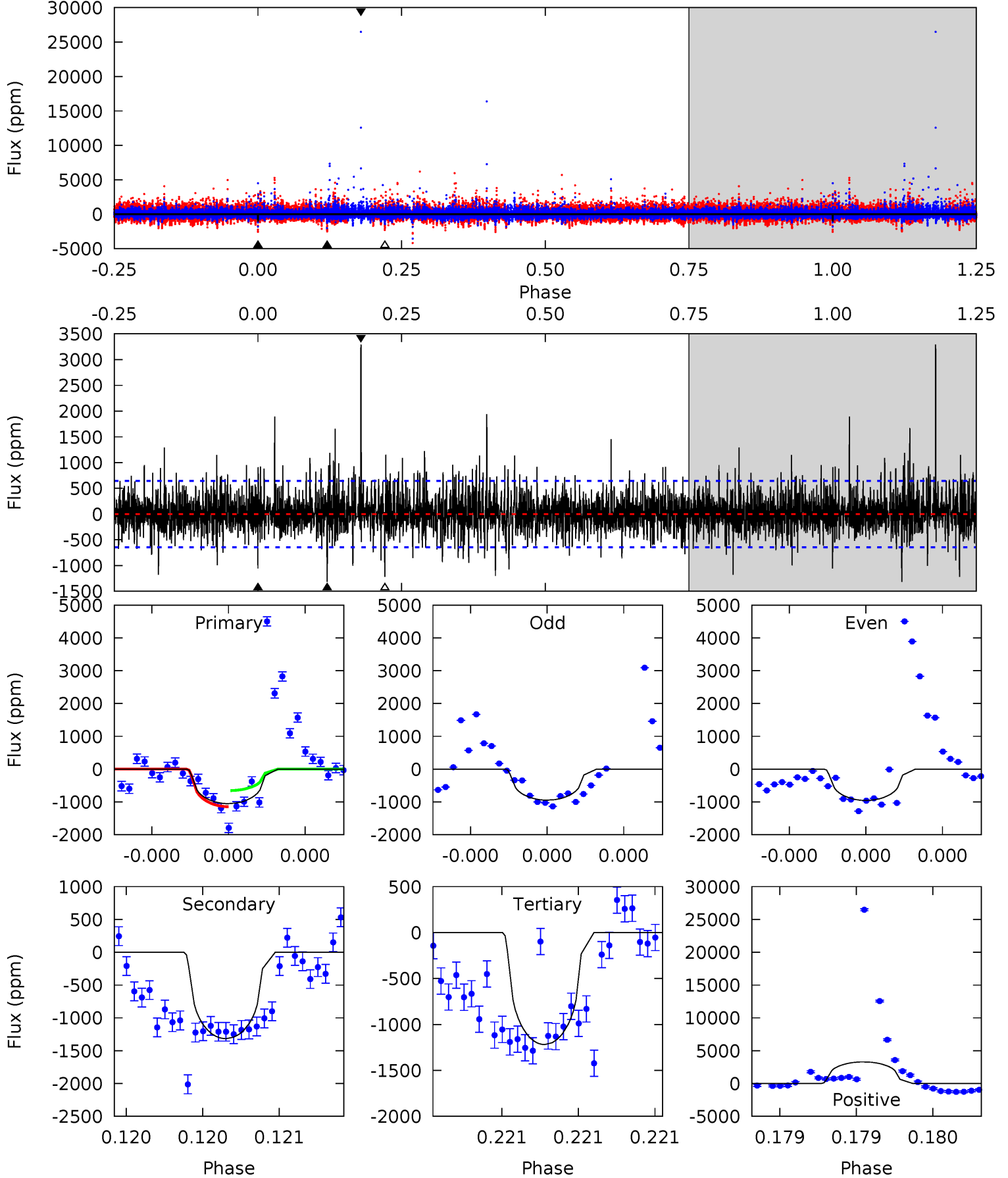
TCE 012102573-01 P=445.805790 Days $T_0=204.101725$ (BKJD)



DV Model-Shift Uniqueness Test

012102573-01, P = 445.804484 Days, E = 204.108481 Days

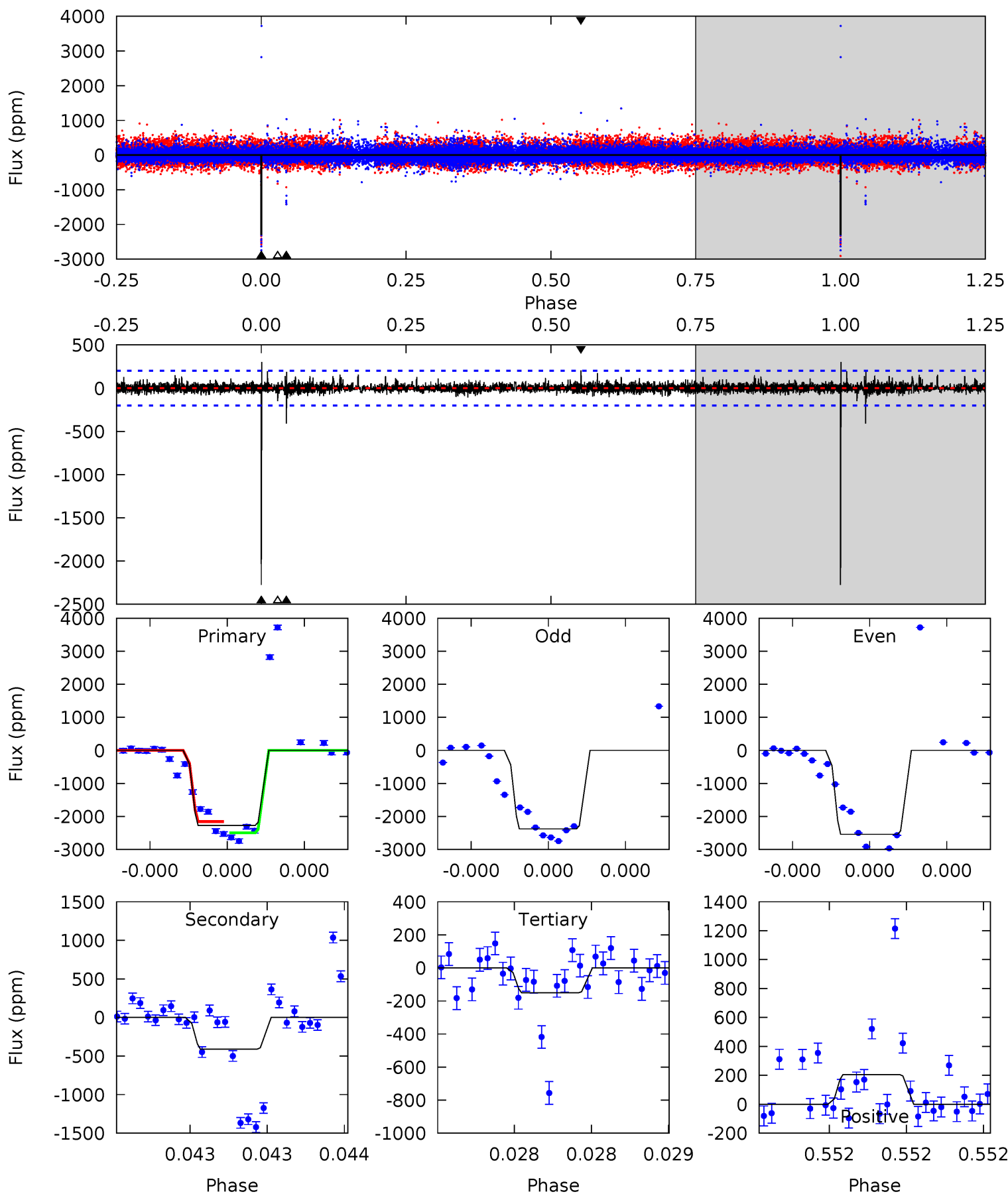
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.15	11.5	10.6	28.6	5.59	3.51	2.51	-1.44	-19.4	0.85	-17.2	0.03	0.88	0.71	2.08



Alt Model-Shift Uniqueness Test

012102573-01, P = 445.805790 Days, E = 204.101725 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
63.4	11.4	4.19	5.69	5.61	3.53	0.77	59.2	57.7	7.21	5.71	1.87	1.03	0.12	0



Stellar Parameters For KIC 012102573

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4474^{+145}_{-145}	$4.561^{+0.058}_{-0.018}$	$0.380^{+0.050}_{-0.300}$	$0.745^{+0.024}_{-0.063}$	$0.736^{+0.041}_{-0.046}$	$2.509^{+0.636}_{-0.182}$
	+3%/-3%	+1%/-0%	+13%/-79%	+3%/-8%	+6%/-6%	+25%/-7%
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 012102573-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1318 ± 115	$5.72^{+5.81}_{-3.71}$	233^{+8}_{-8}	3538^{+1733}_{-670}	$23746^{+170926}_{-18019}$
Alt.	-409 ± 36	$6.42^{+6.22}_{-4.32}$	233^{+8}_{-8}	2872^{+1223}_{-446}	5872^{+49807}_{-4335}

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

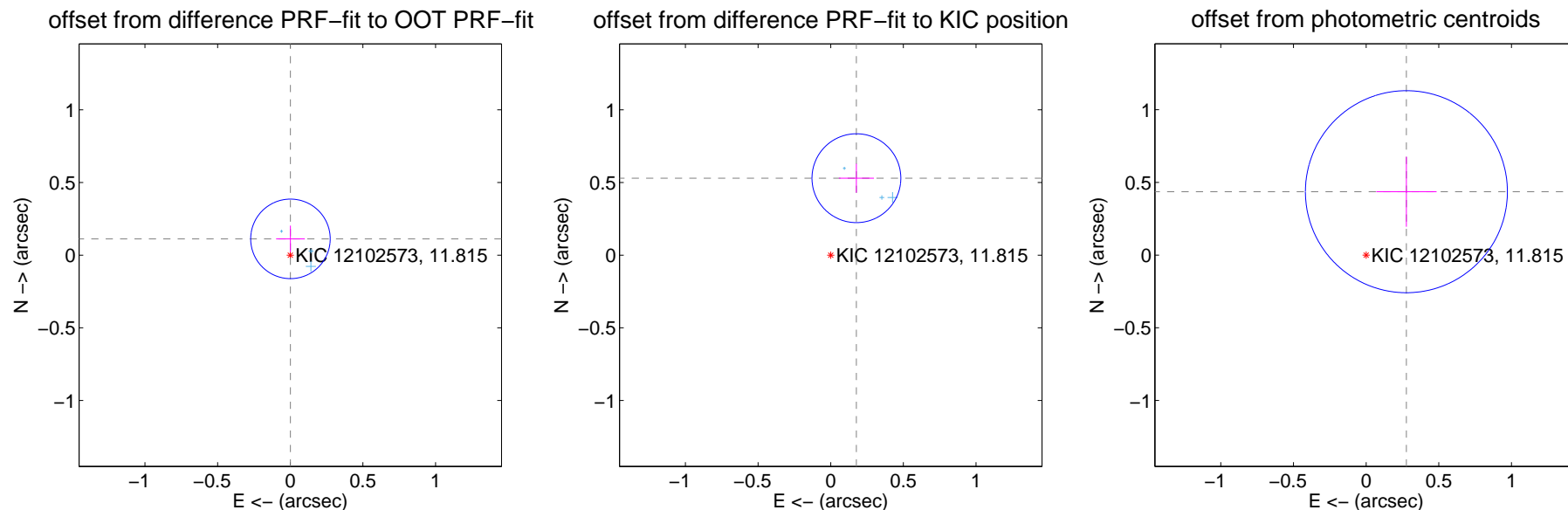
DV Centroid Data

Supplemental centroid analysis for 012102573-01. **Kepler magnitude: 11.81.** Transit SNR 9.61

There are 3 quarters with good PRF difference image offsets

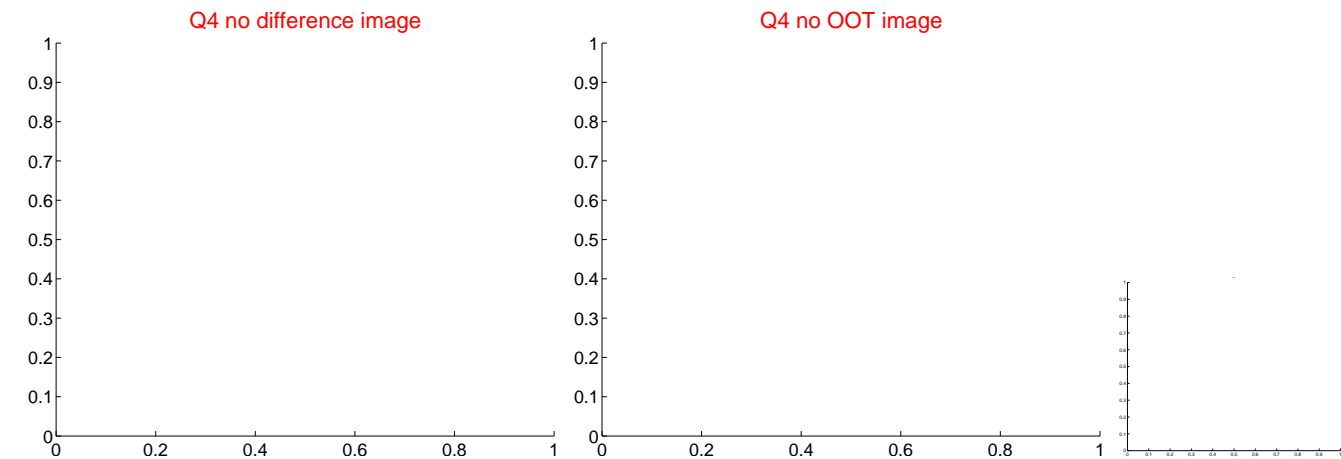
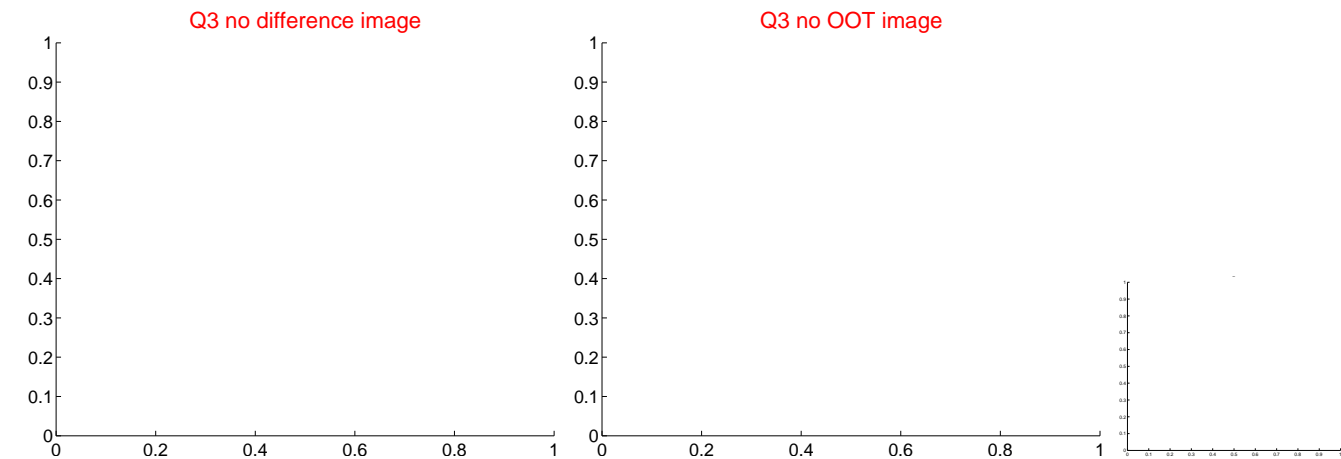
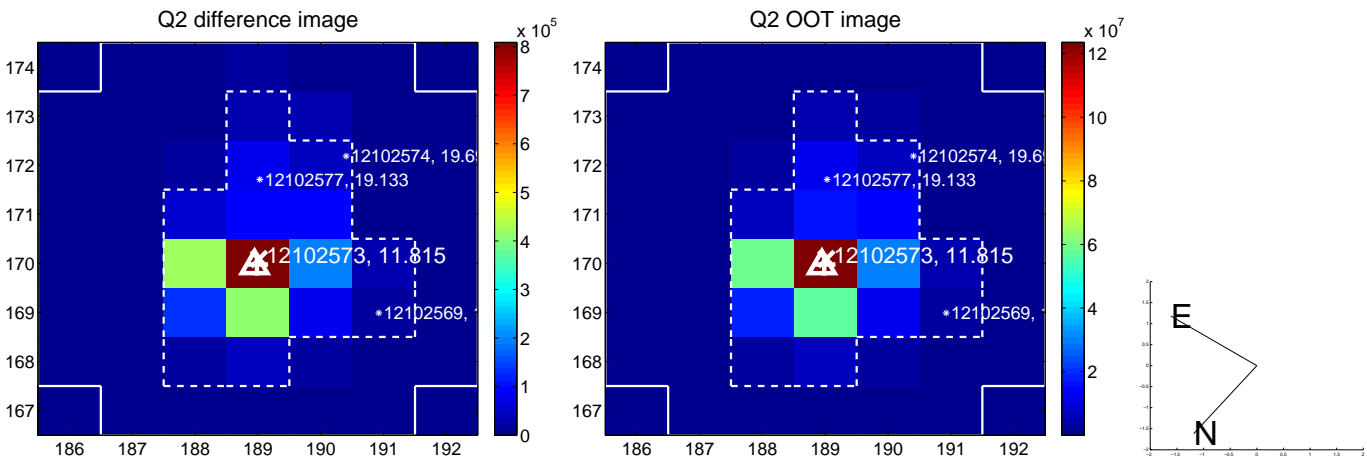
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.112 ± 0.091	1.23	-0.001 ± 0.099	0.112 ± 0.091
PRF-fit source offset from KIC position	0.558 ± 0.102	5.48	-0.177 ± 0.121	0.530 ± 0.100
photometric centroid source offset	0.52 ± 0.23	2.23	-0.28 ± 0.21	0.44 ± 0.24

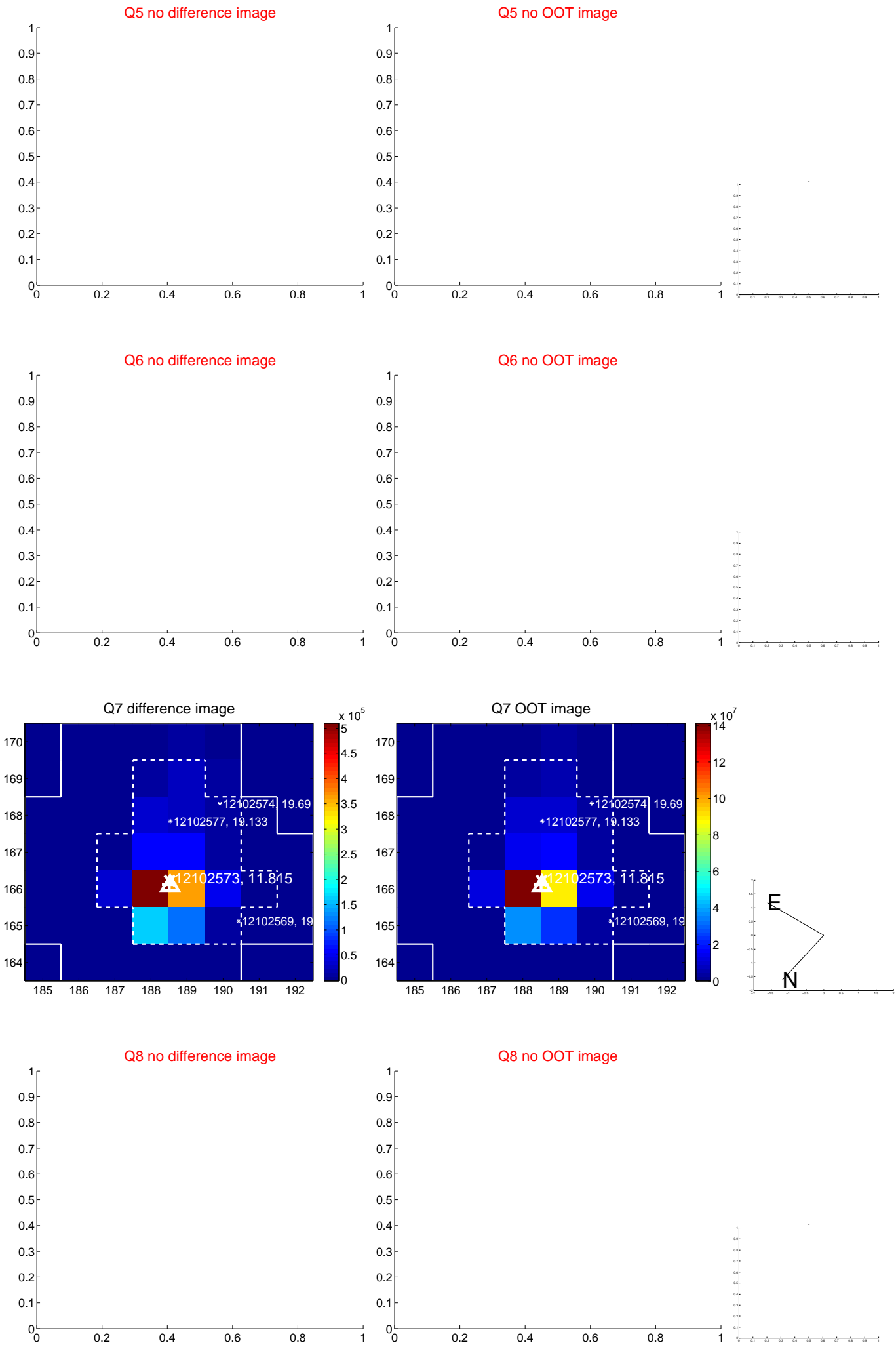


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

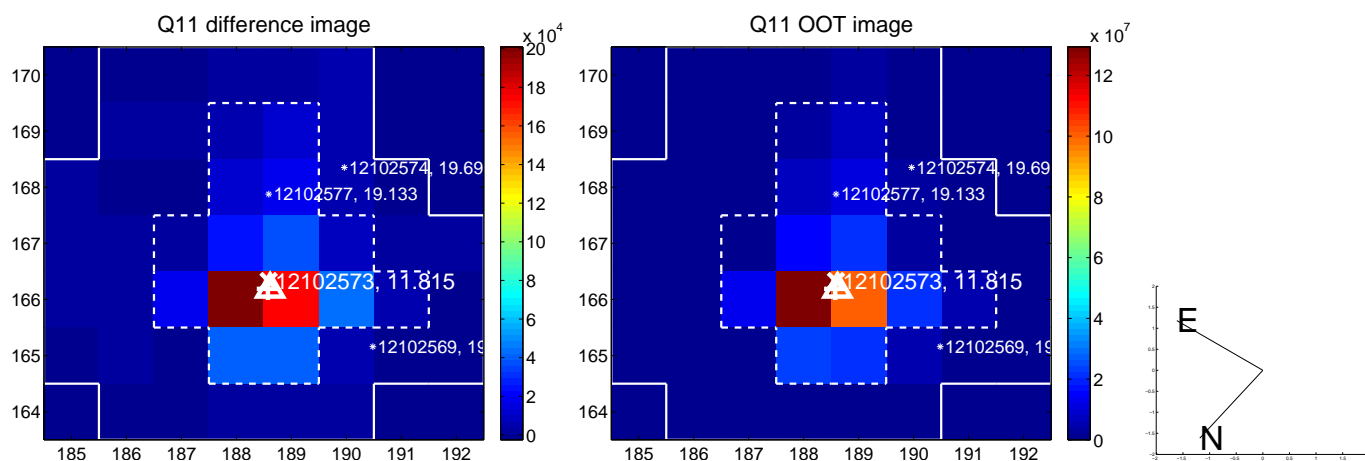
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



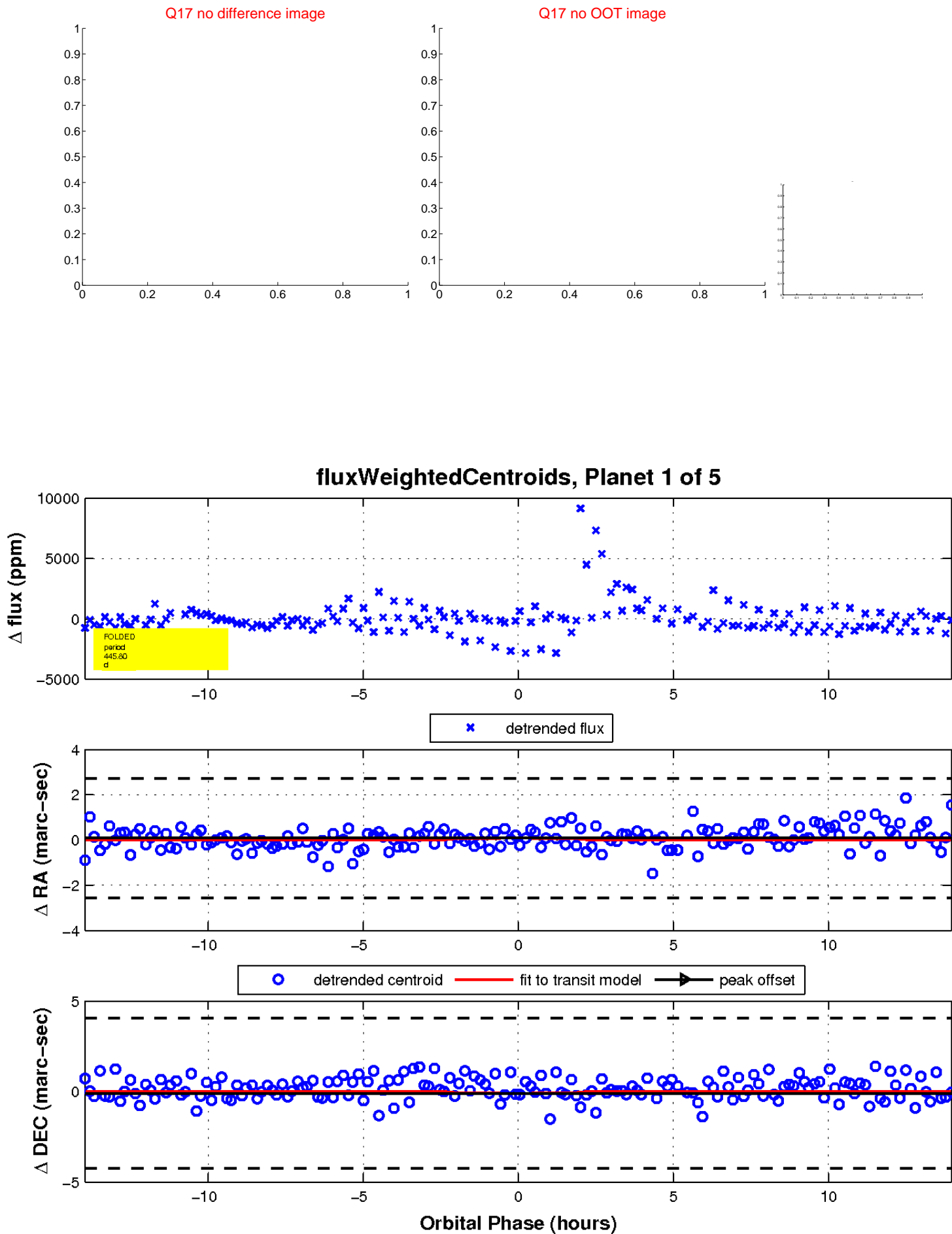
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

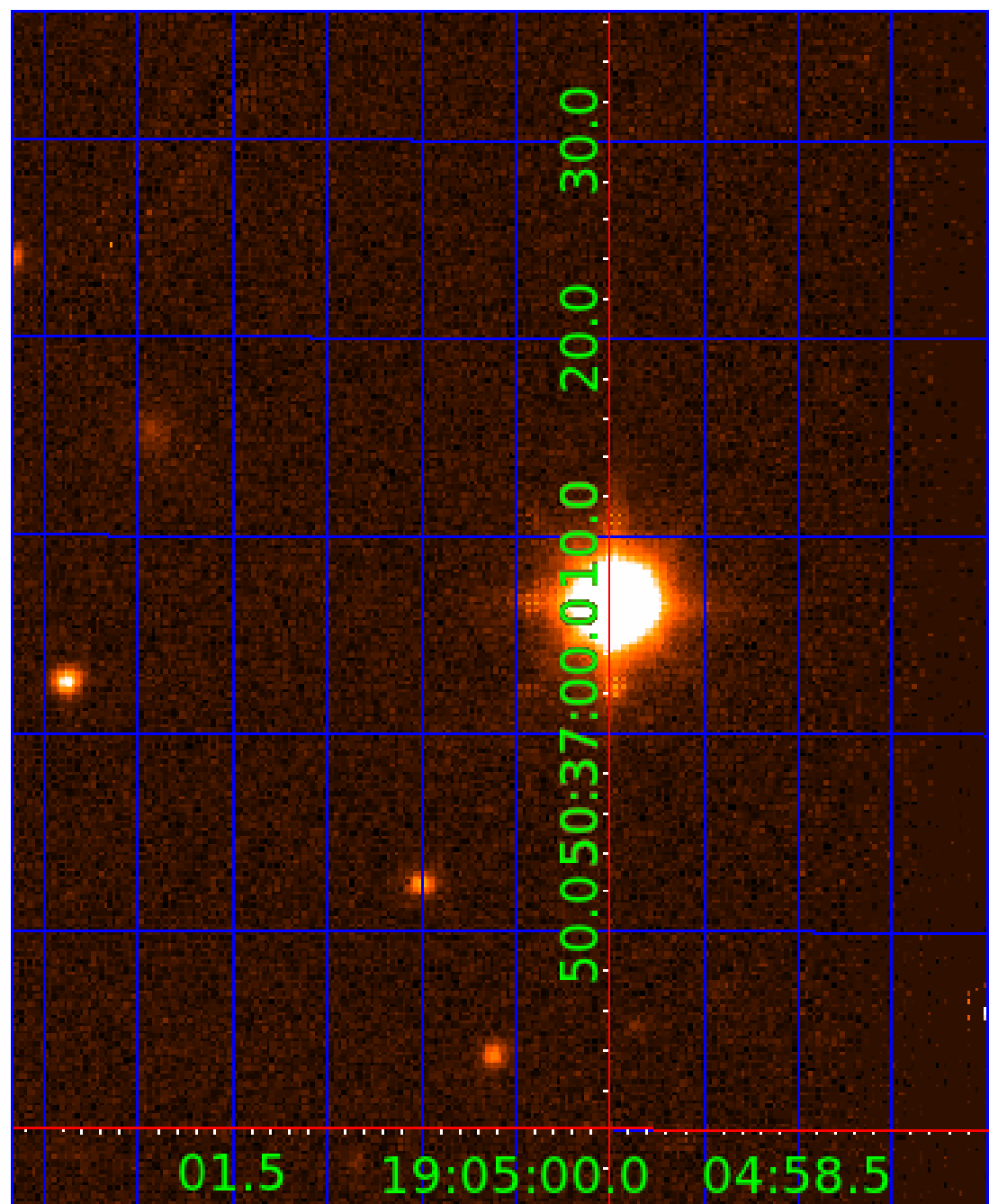


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012102573

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})
012102573-01	OBS	No	445.804484	204.108481	1668.5	4.662	18.8	9.6	0.74	4474	2.96	0.19
012102573-03	OBS	No	255.673121	272.159199	390.3	7.647	16.4	2.3	0.74	4474	1.62	0.39
012102573-04	OBS	No	554.948142	270.562533	261.1	1.271	13.6	1.9	0.74	4474	1.61	0.14
012102573-05	OBS	No	377.372121	147.853988	883.3	5.400	12.7	6.0	0.74	4474	2.24	0.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012102573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
012102573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012102573-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
012102573-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

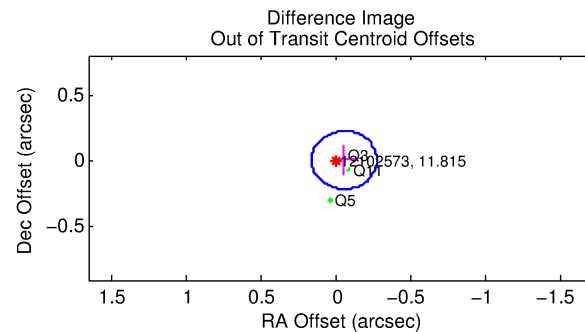
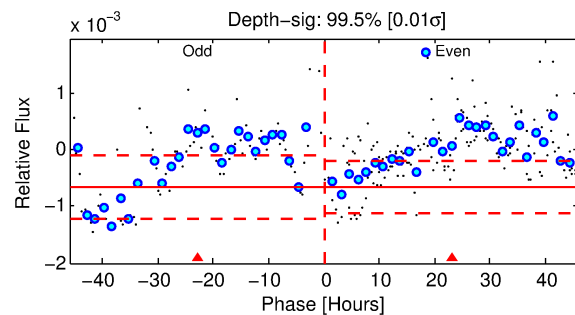
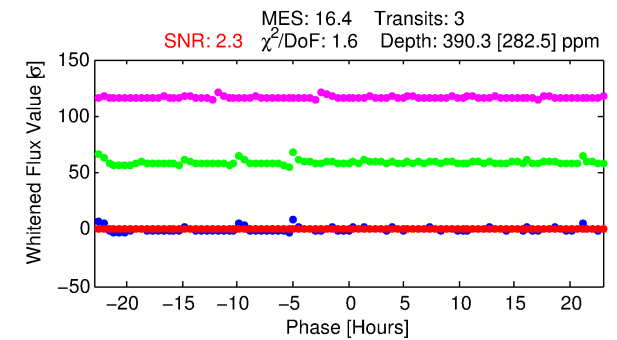
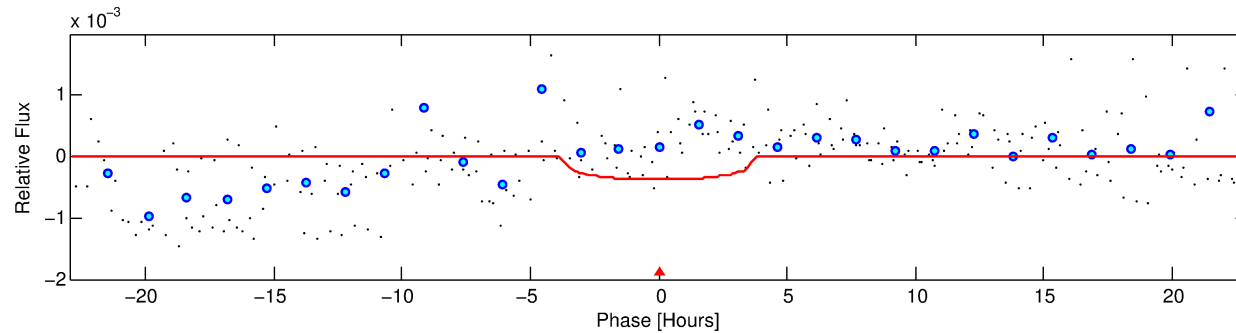
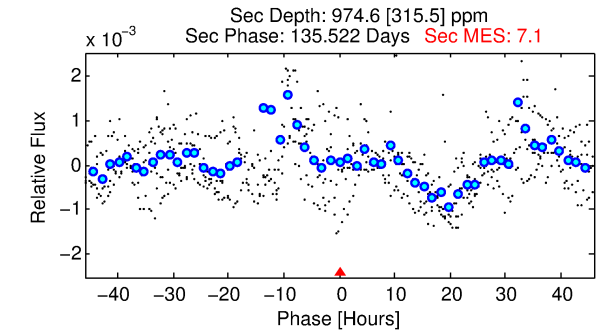
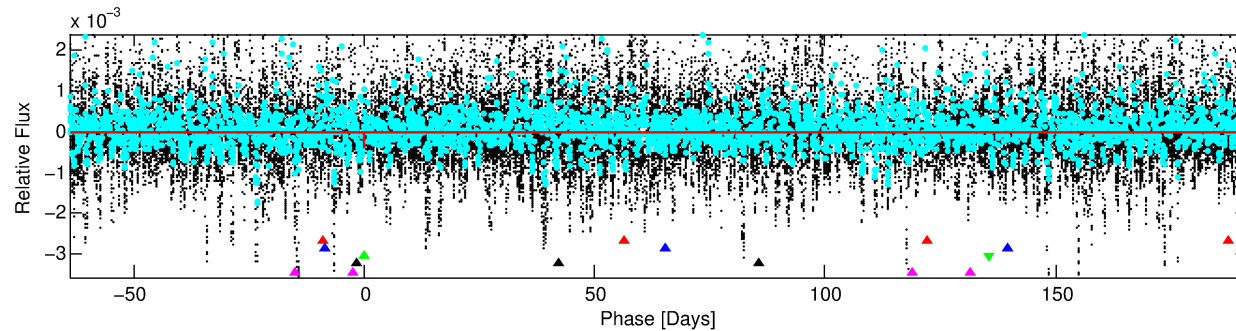
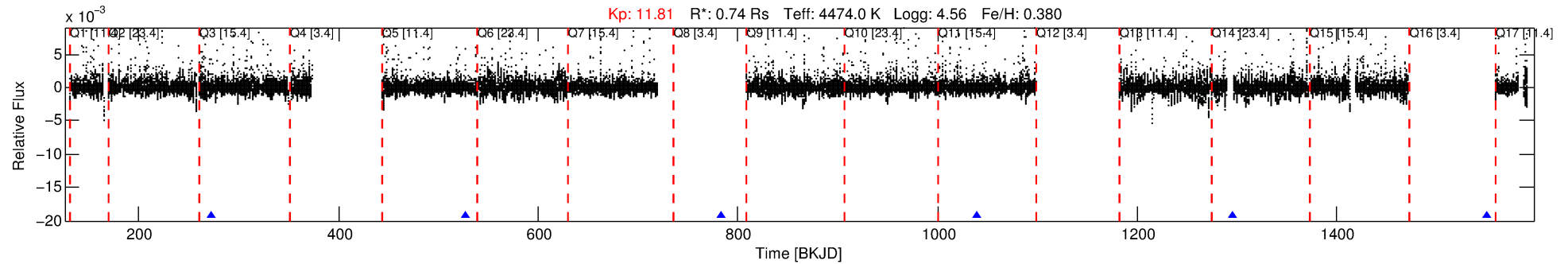
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012102573-03

No Significant Match Found

DV One-Page Summary

KIC: 12102573 Candidate: 3 of 5 Period: 255.673 d



DV Fit Results:

Period = 255.67312 [0.01129] d
Epoch = 272.1592 [0.0234] BKJD
Rp/R* = 0.0200 [0.0278]
a/R* = 172.98 [752.86]
b = 0.76 [2.43]
Seff = 0.39 [0.07]
Teq = 202 [8] K
Rp = 1.62 [2.26] Re
a = 0.7122 [0.0512] AU
Ag = 103358.68 [290176.21] [0.36 σ]
Teffp = 5596 [3929] K [1.37 σ]

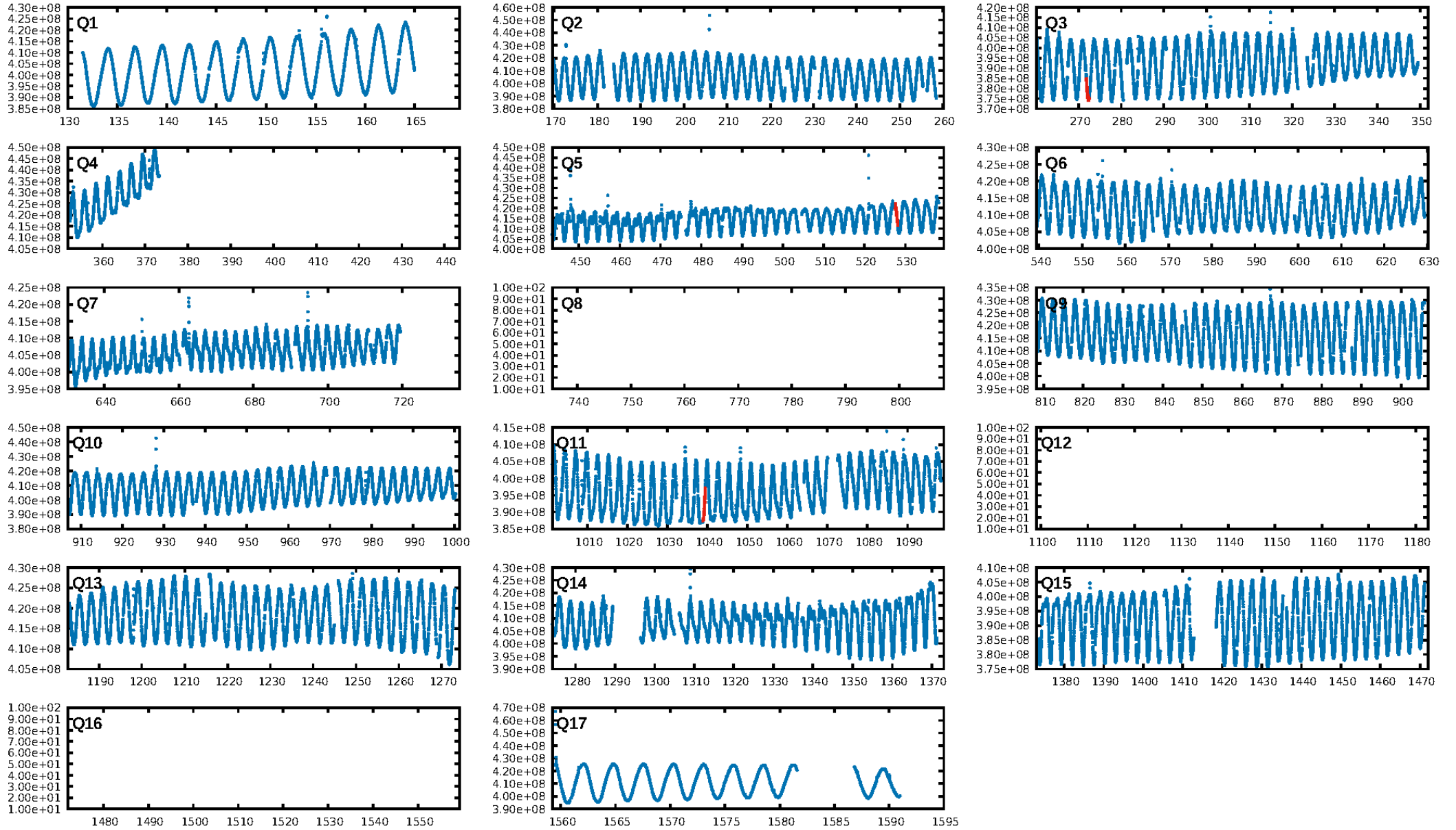
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [312.00 σ]
ModelChiSquare2-sig: 94.5%
ModelChiSquareGof-sig: 77.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.6329
Centroid-sig: 82.9%
Centroid-so: 0.396 arcsec [0.52 σ]
OotOffset-rm: 0.060 arcsec [0.82 σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-rm: 0.427 arcsec [5.89 σ]
KicOffset-st: 0/2/0/1 [3]
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DiffImageOverlap-fno: 1.00 [3/3]

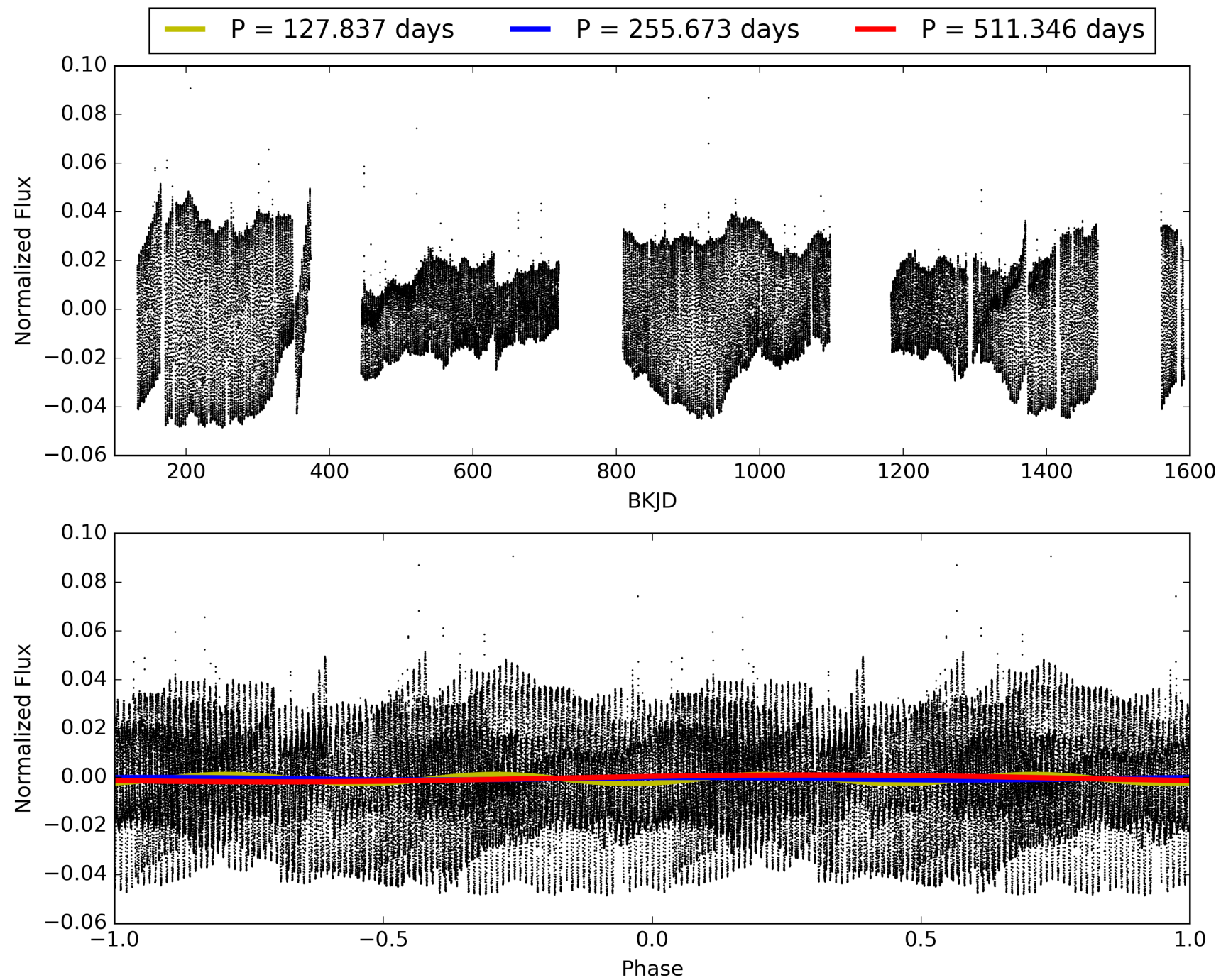
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:16:42 Z

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

TCE 012102573-03, PDC Light Curves

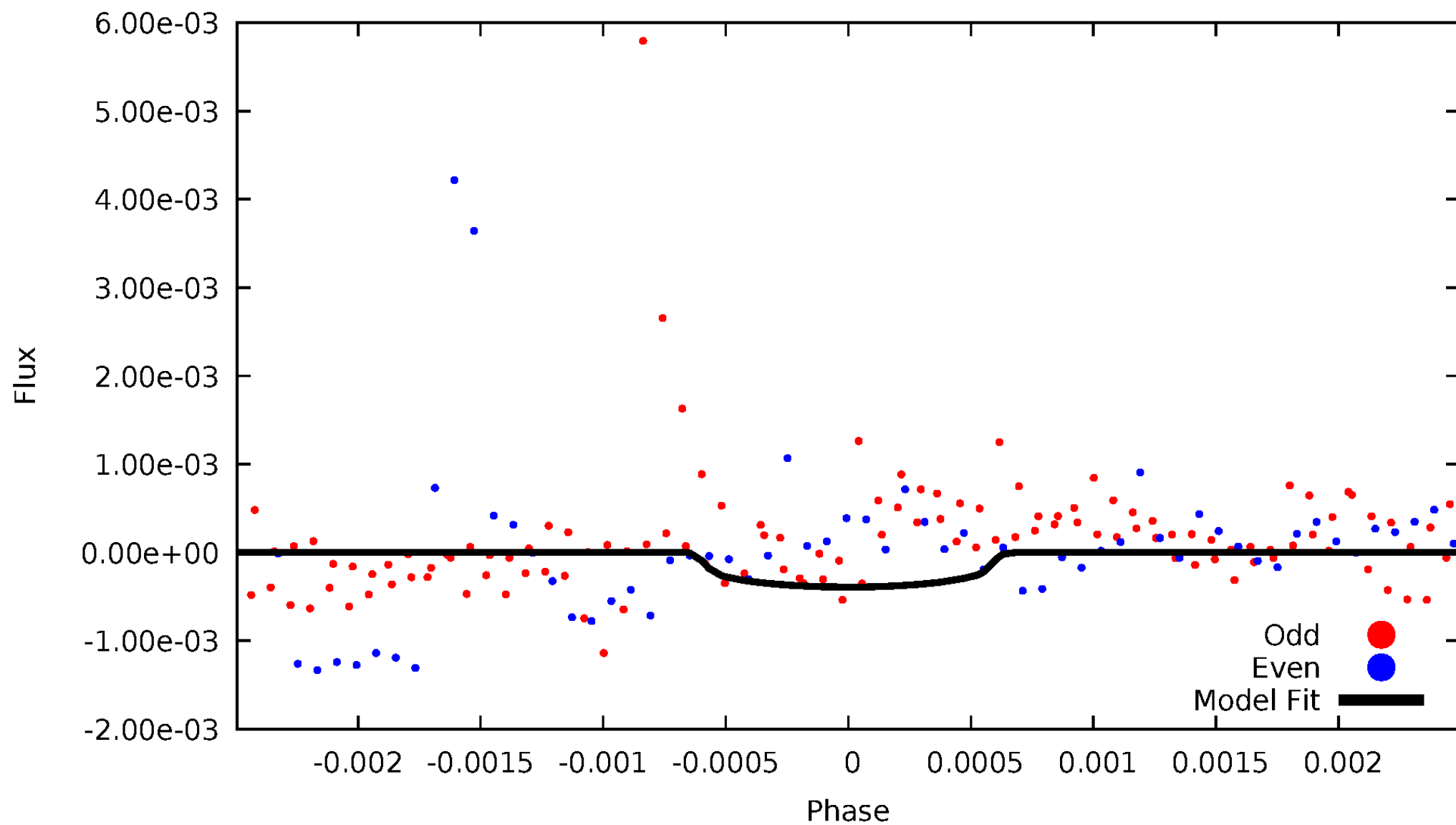


TCE 012102573-03



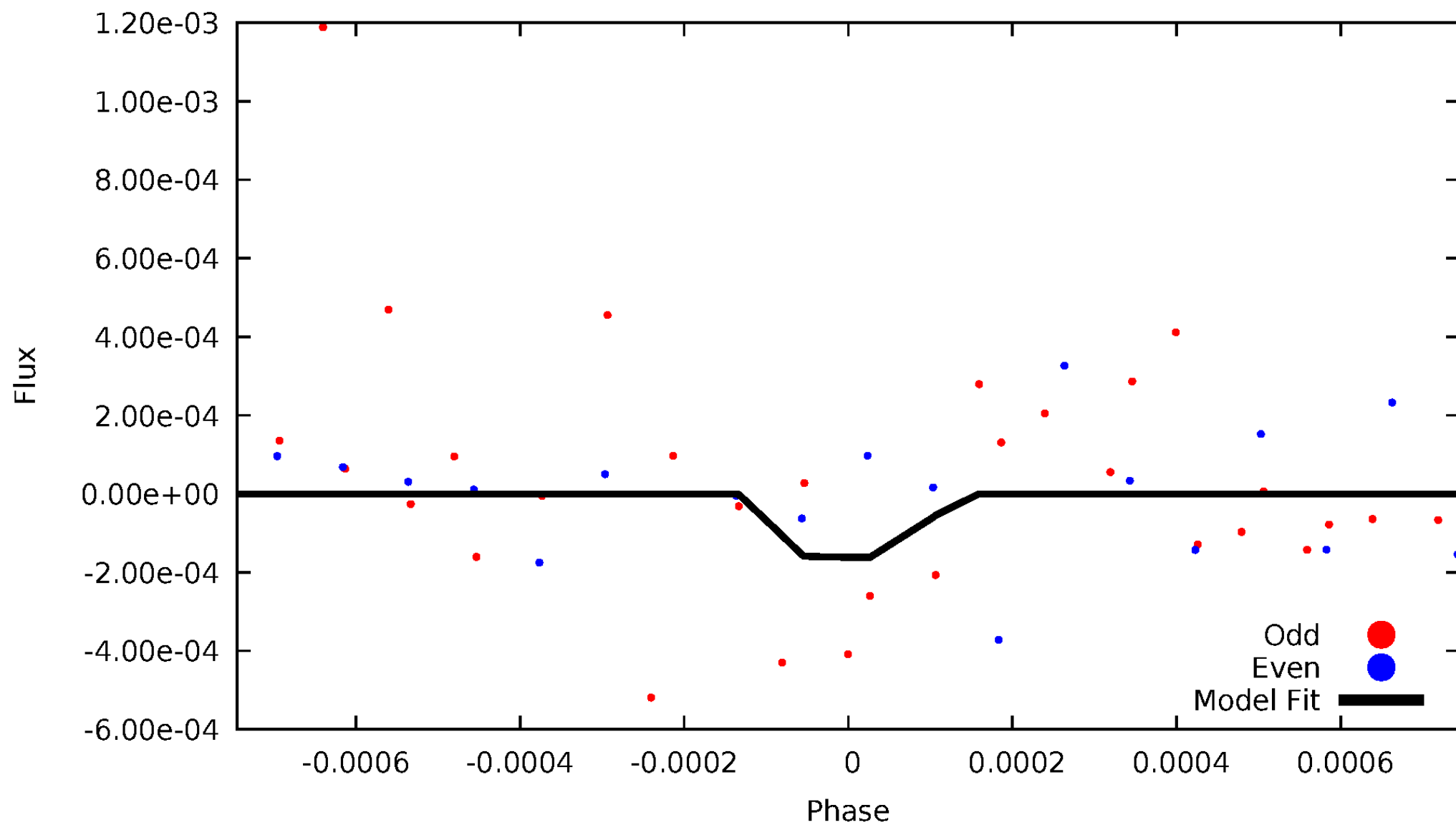
DV Odd/Even

TCE 012102573-03



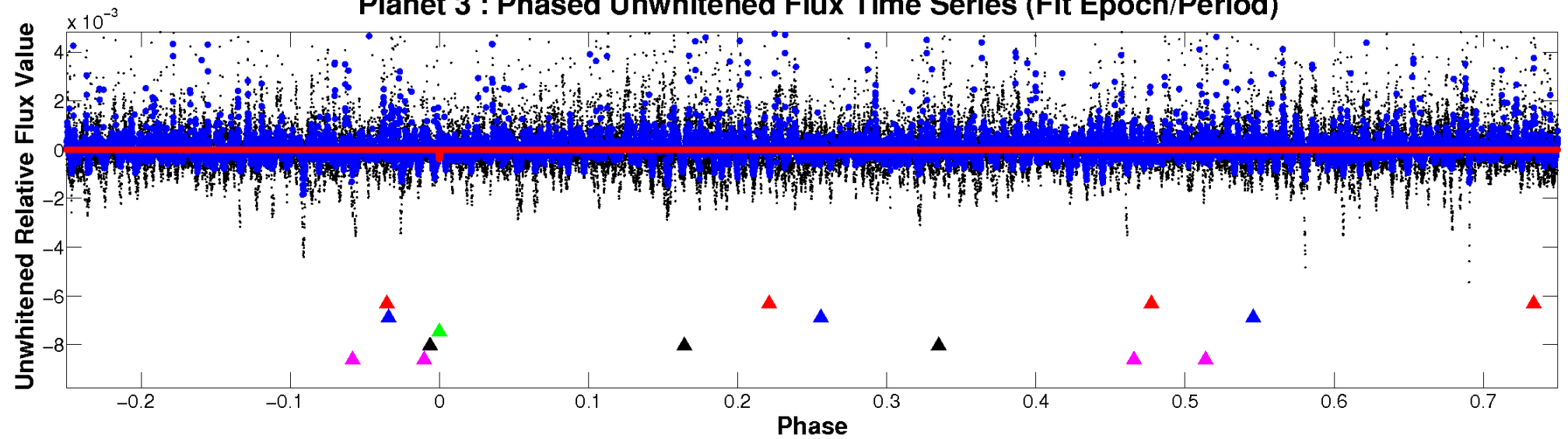
ALT Odd/Even

TCE 012102573-03

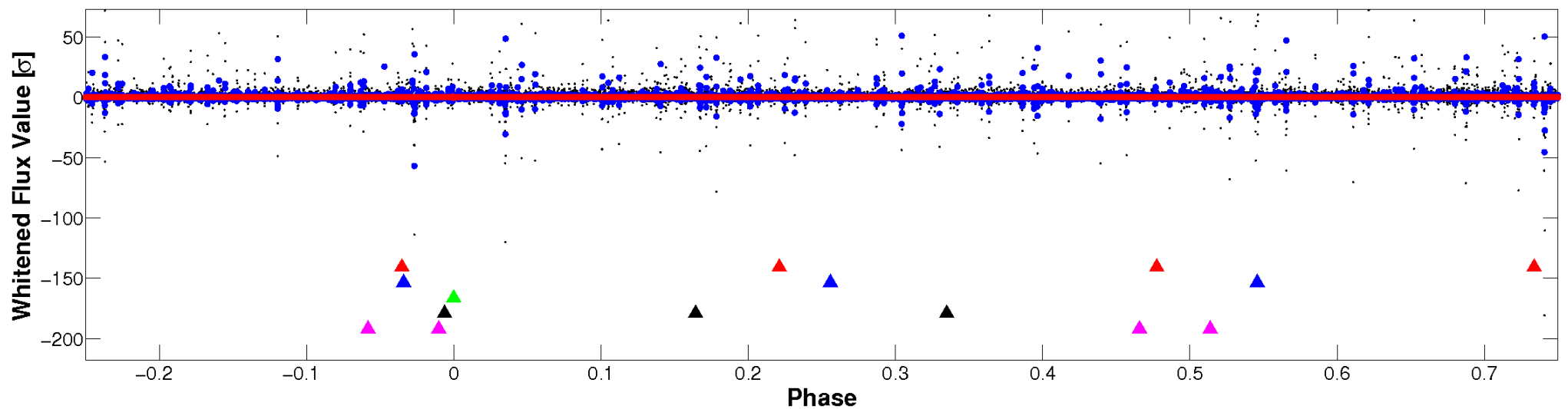


Non-Whitened Vs. Whitened Light Curve

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

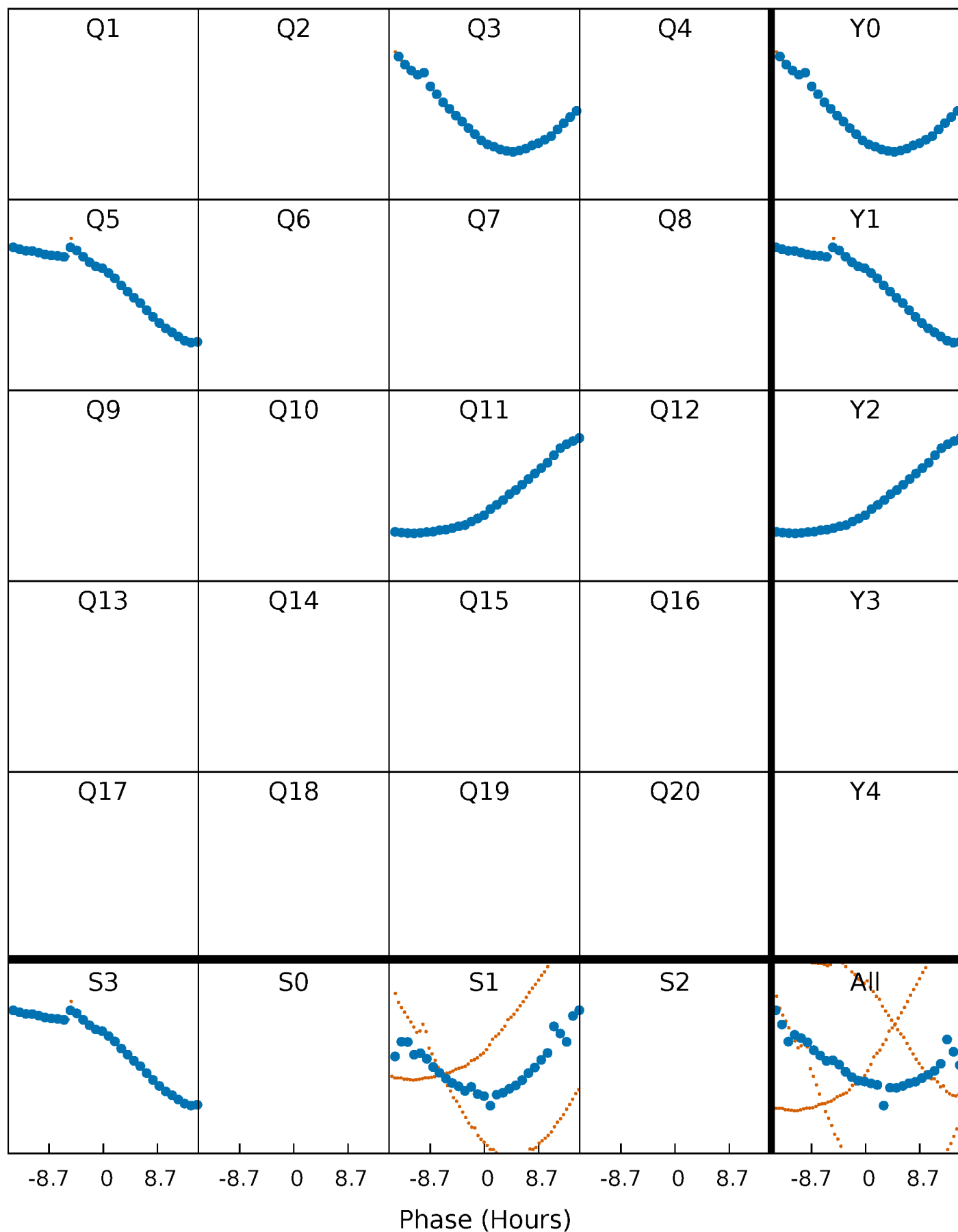


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



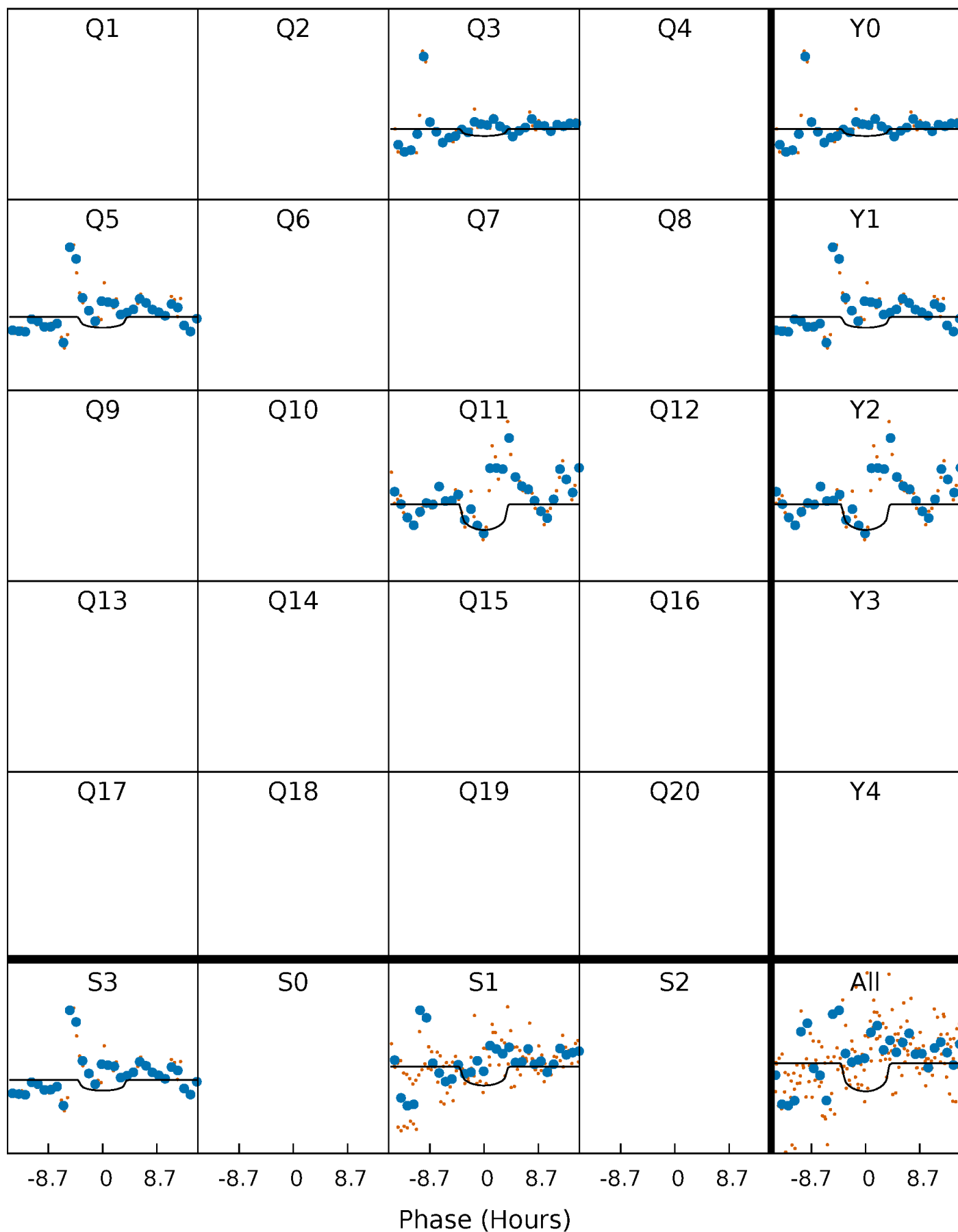
PDC Quarter-Phased Transit Curves

TCE 012102573-03 P=255.673121 Days $T_0=272.159199$ (BKJD)



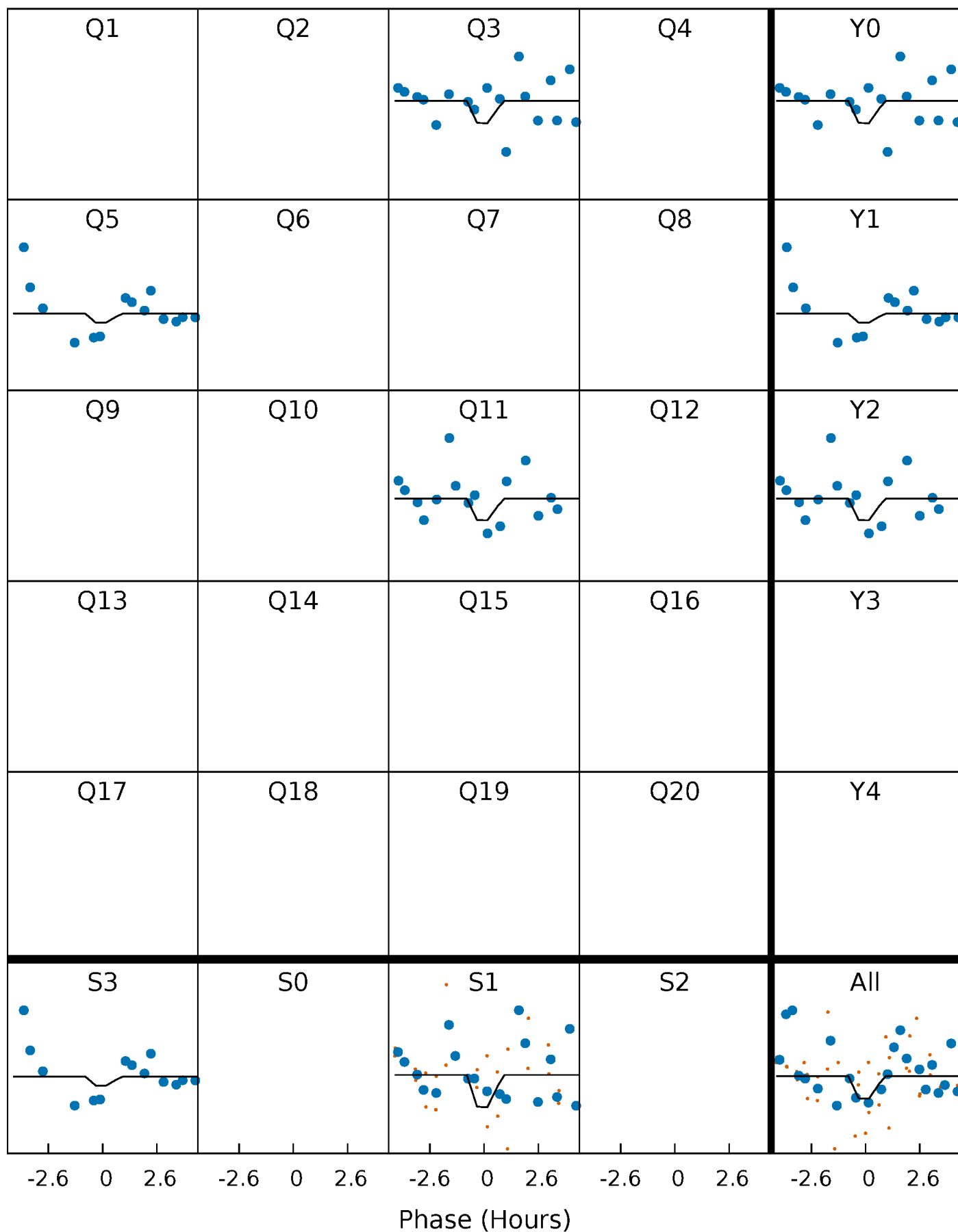
DV Quarter-Phased Transit Curves

TCE 012102573-03 P=255.673121 Days $T_0=272.159199$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

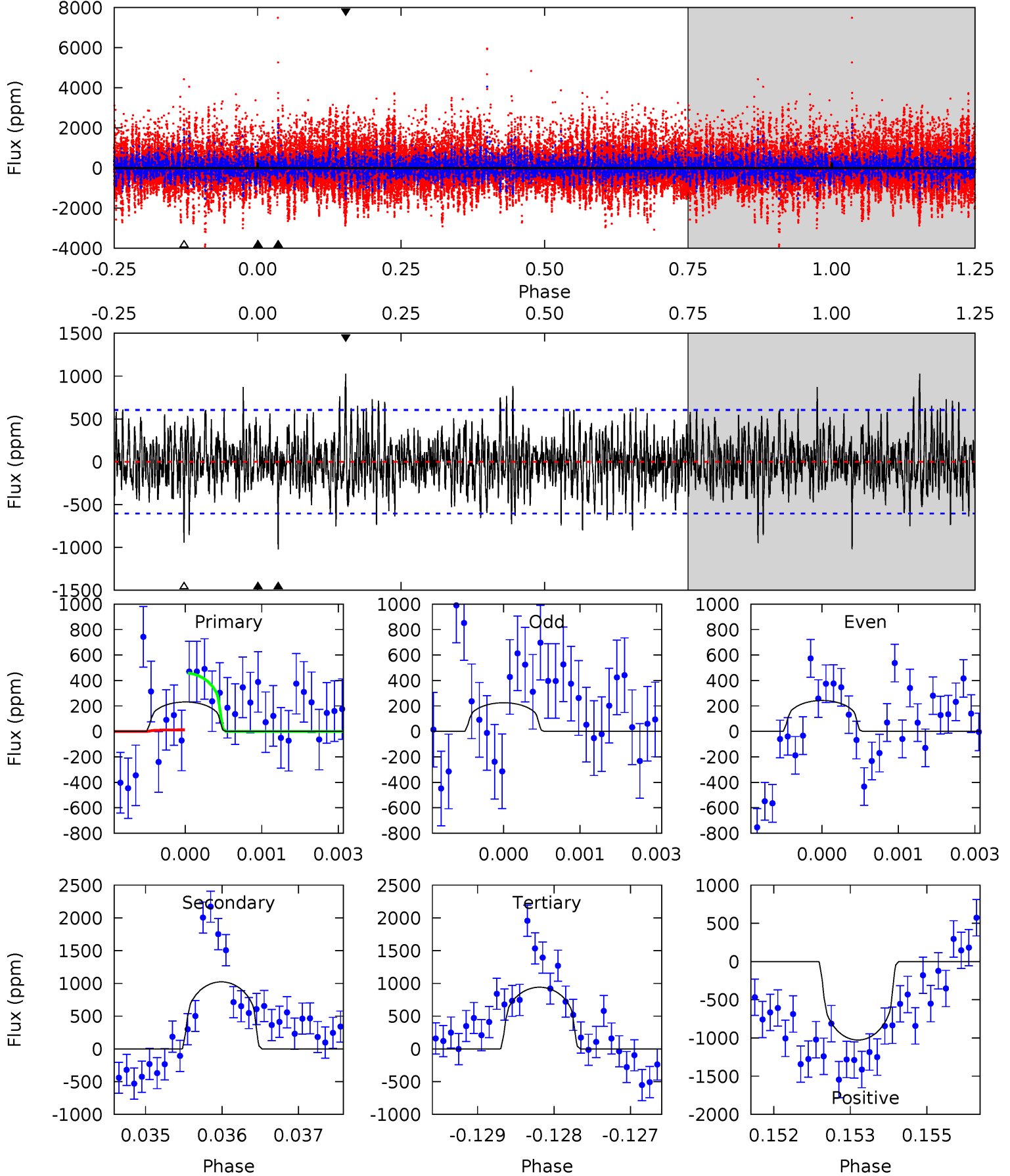
TCE 012102573-03 P=255.671514 Days $T_0=272.151203$ (BKJD)



DV Model-Shift Uniqueness Test

012102573-03, P = 255.673121 Days, E = 16.486078 Days

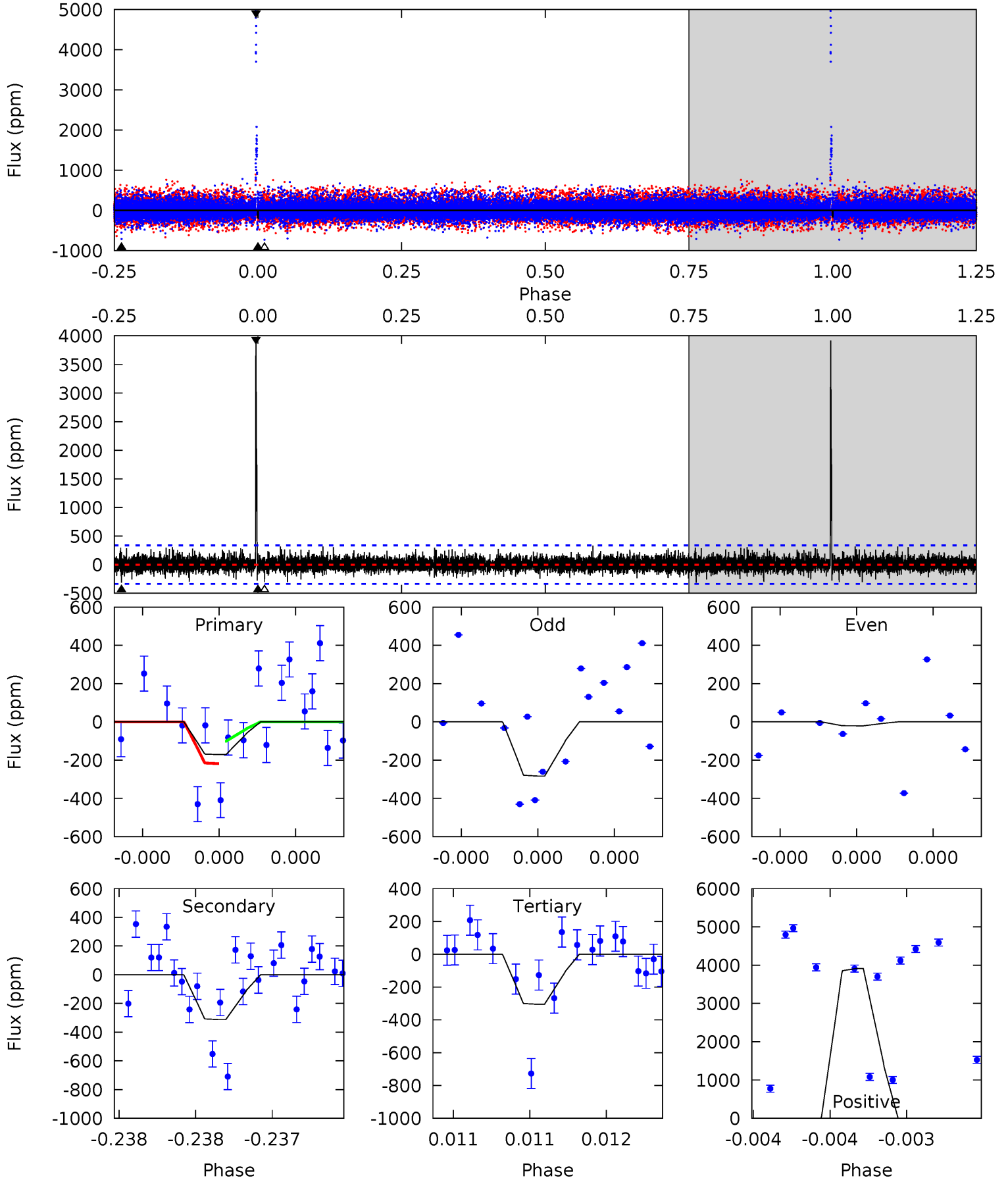
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.07	9.16	8.42	9.19	5.41	3.22	2.19	-6.35	-7.12	0.73	-0.03	0.07	0.96	0.50	2.01



Alt Model-Shift Uniqueness Test

012102573-03, P = 255.671514 Days, E = 16.479689 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.88	5.25	5.13	65.8	5.67	3.62	1.58	-2.25	-62.9	0.12	-60.6	1.96	1.39	0.93	1.00



Stellar Parameters For KIC 012102573

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4474^{+145}_{-145}	$4.561^{+0.058}_{-0.018}$	$0.380^{+0.050}_{-0.300}$	$0.745^{+0.024}_{-0.063}$	$0.736^{+0.041}_{-0.046}$	$2.509^{+0.636}_{-0.182}$
	+3%/-3%	+1%/-0%	+13%/-79%	+3%/-8%	+6%/-6%	+25%/-7%
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 012102573-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1023 ± 112	$2.28^{+1.72}_{-1.56}$	280^{+10}_{-11}	4680^{+3958}_{-890}	$55180^{+490064}_{-37371}$
Alt.	-312 ± 59	$1.94^{+1.91}_{-1.39}$	279^{+10}_{-9}	4004^{+2780}_{-815}	$23702^{+255272}_{-17556}$

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

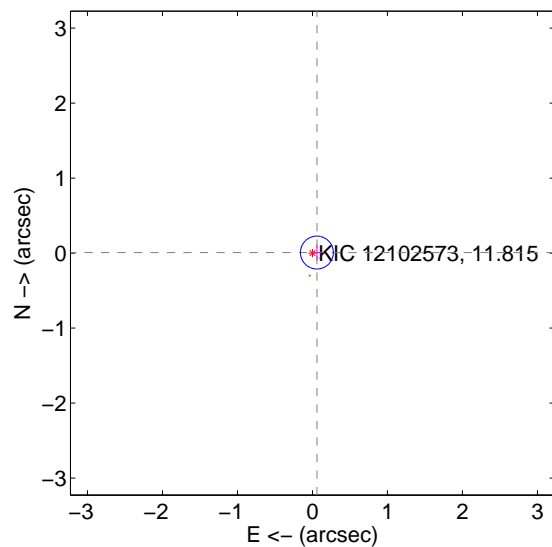
Supplemental centroid analysis for 012102573-03. **Kepler magnitude: 11.81.** Transit SNR 2.25

There are 2 quarters with good PRF difference image offsets

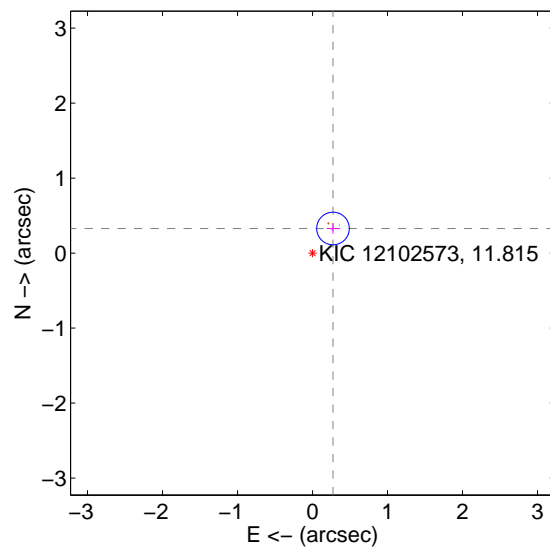
The direct PRF centroid is offset from the target star catalog position by about 0.52 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.060 ± 0.073	0.82	-0.060 ± 0.070	0.007 ± 0.105
PRF-fit source offset from KIC position	0.427 ± 0.072	5.89	-0.273 ± 0.082	0.328 ± 0.070
photometric centroid source offset	0.40 ± 0.76	0.52	-0.37 ± 0.75	0.13 ± 0.88

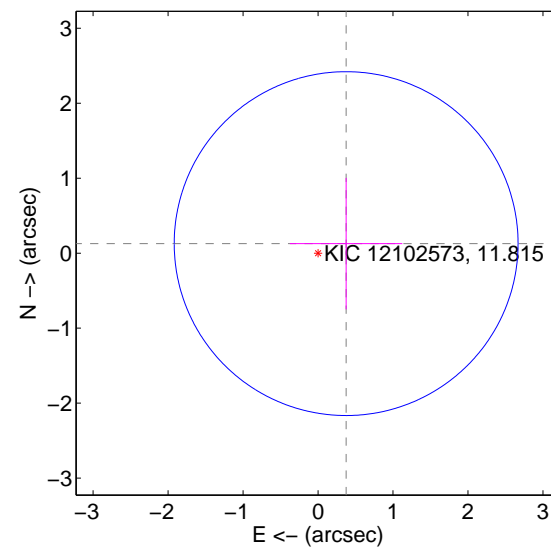
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

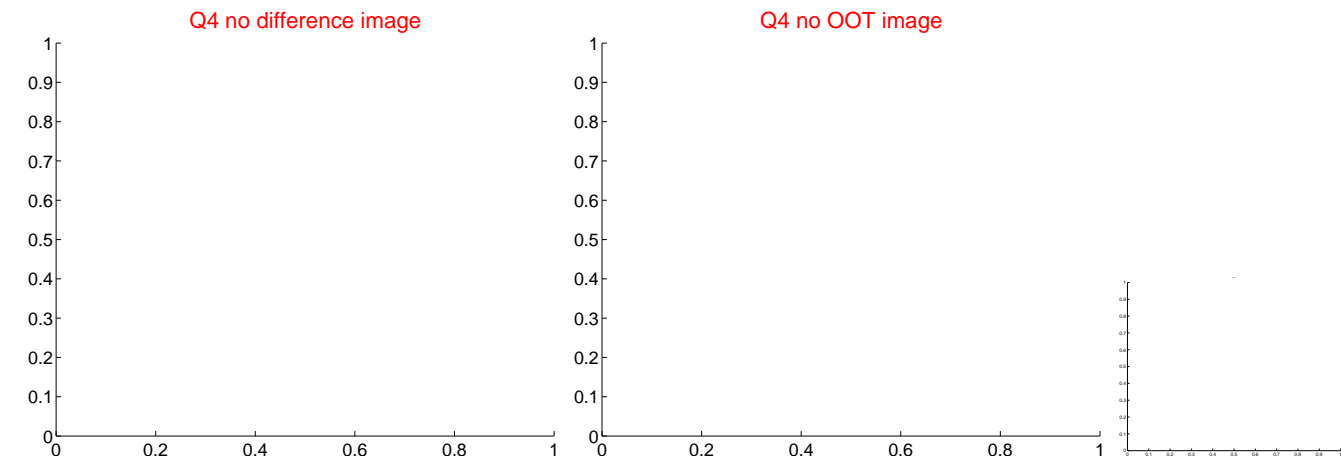
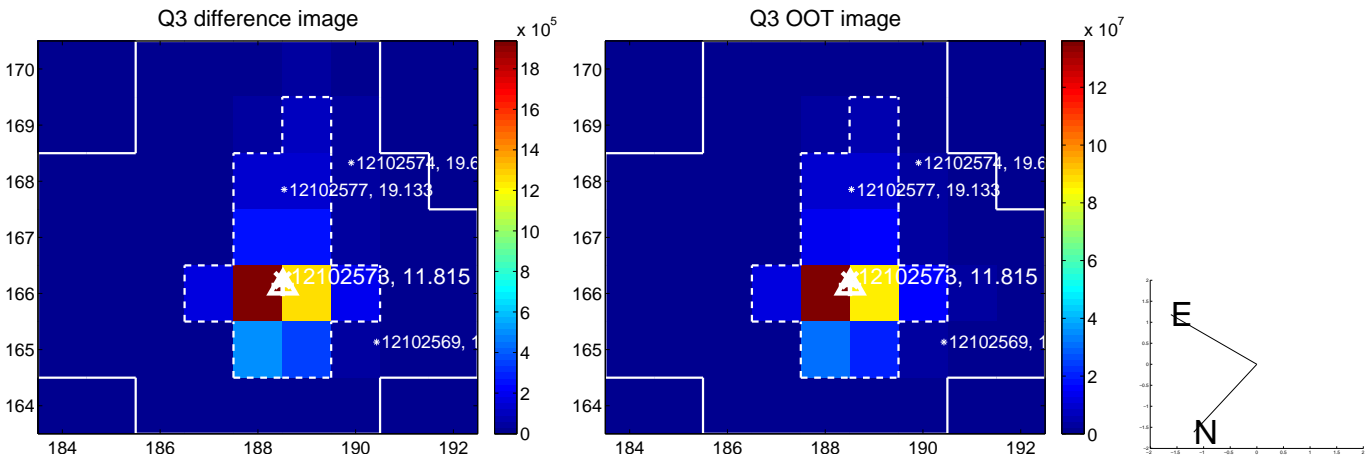


offset from photometric centroids

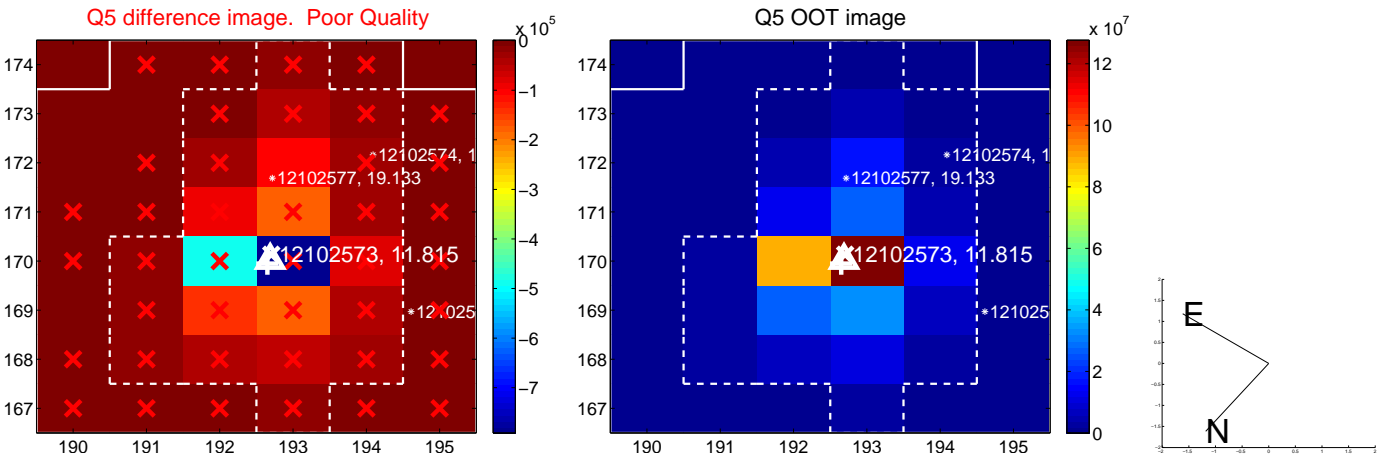


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

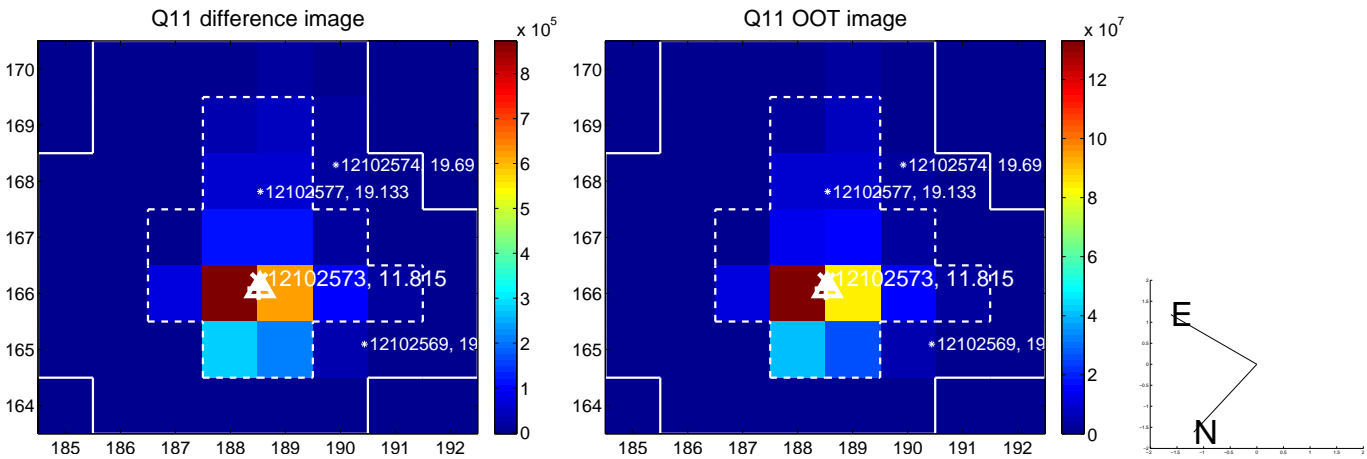
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



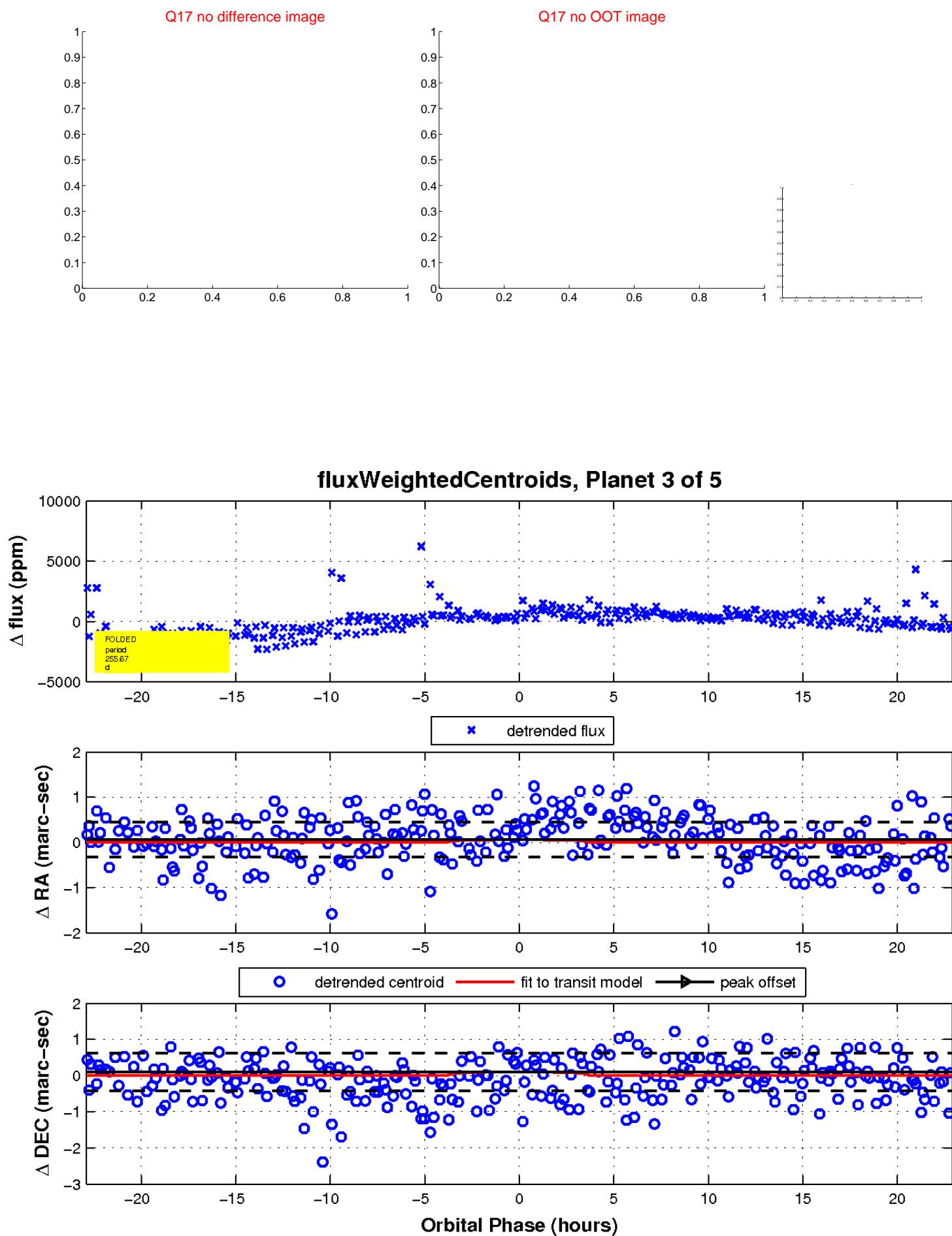
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

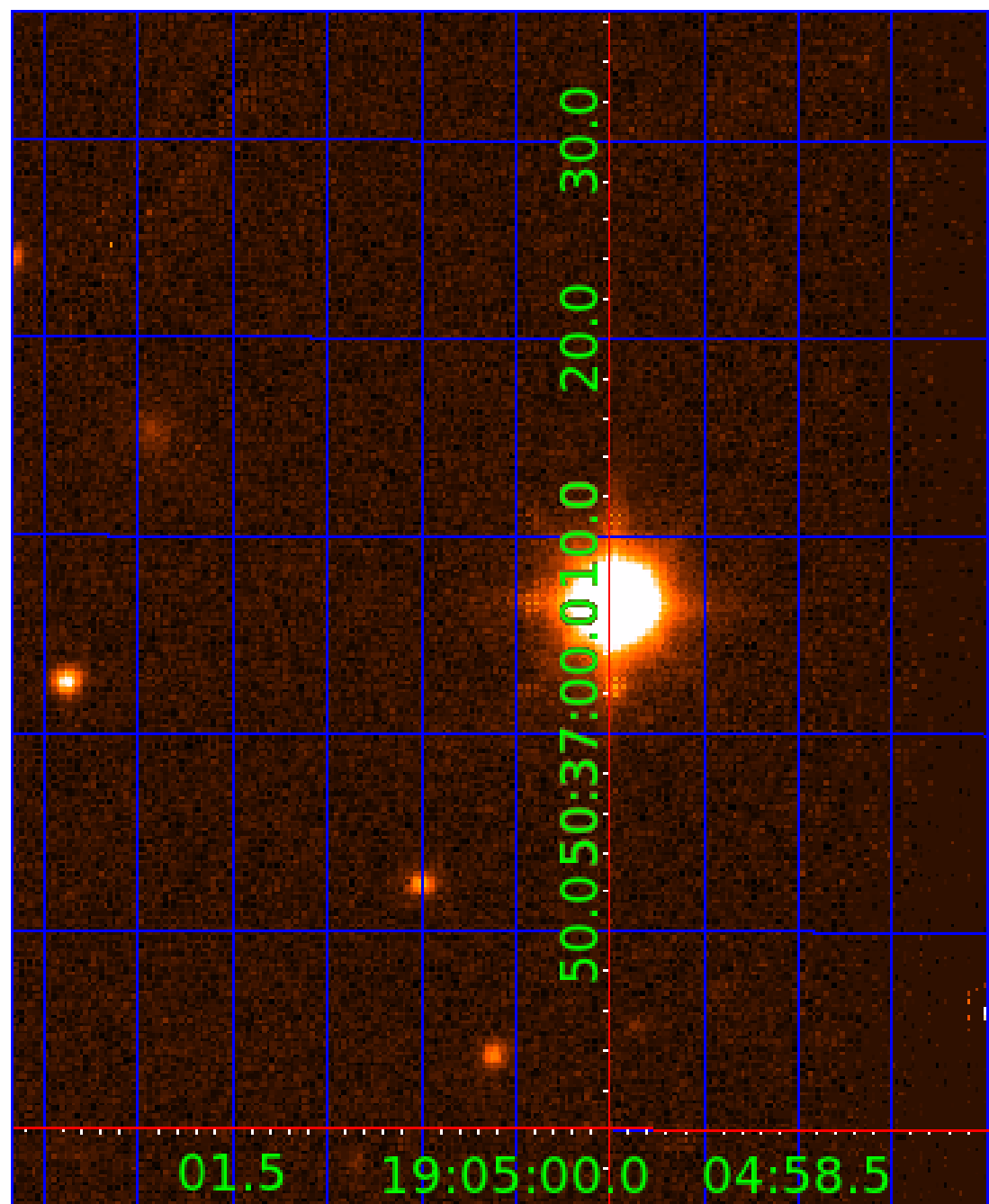


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012102573

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})
012102573-01	OBS	No	445.804484	204.108481	1668.5	4.662	18.8	9.6	0.74	4474	2.96	0.19
012102573-03	OBS	No	255.673121	272.159199	390.3	7.647	16.4	2.3	0.74	4474	1.62	0.39
012102573-04	OBS	No	554.948142	270.562533	261.1	1.271	13.6	1.9	0.74	4474	1.61	0.14
012102573-05	OBS	No	377.372121	147.853988	883.3	5.400	12.7	6.0	0.74	4474	2.24	0.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012102573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
012102573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012102573-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
012102573-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

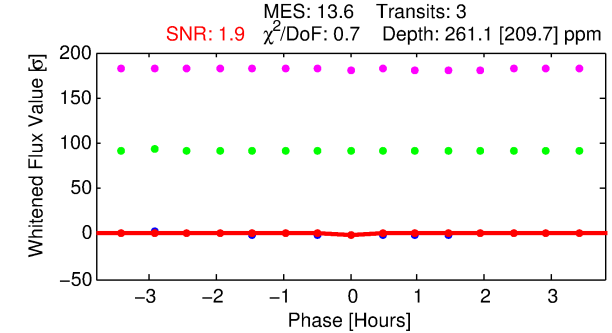
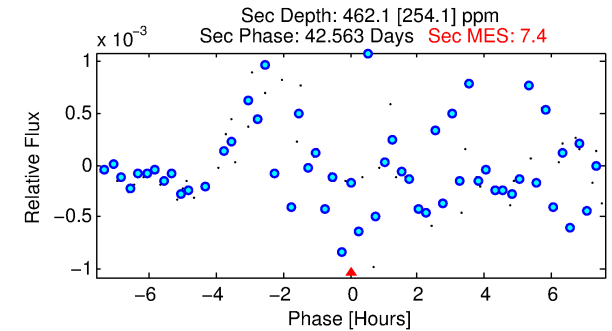
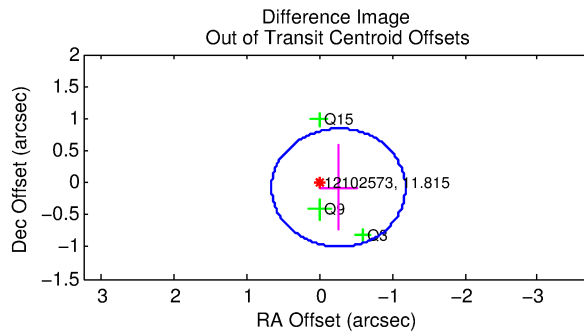
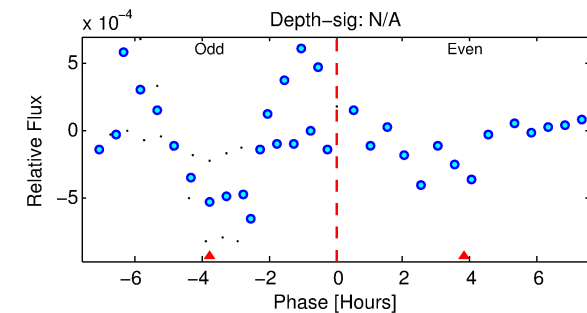
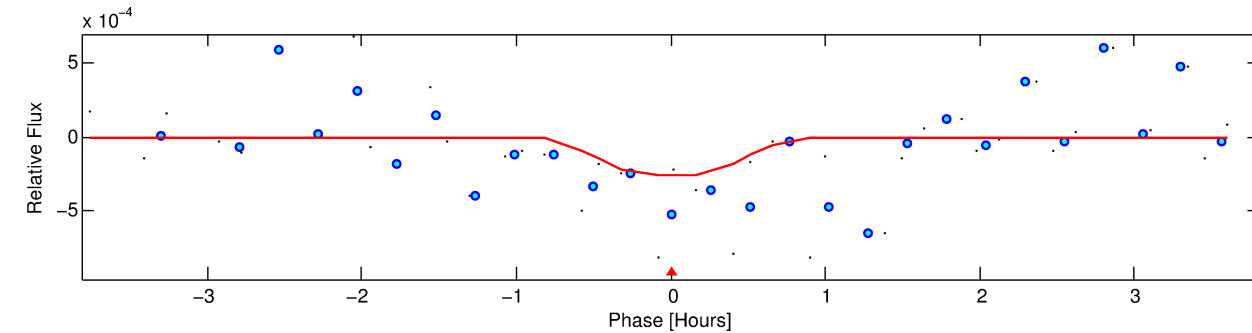
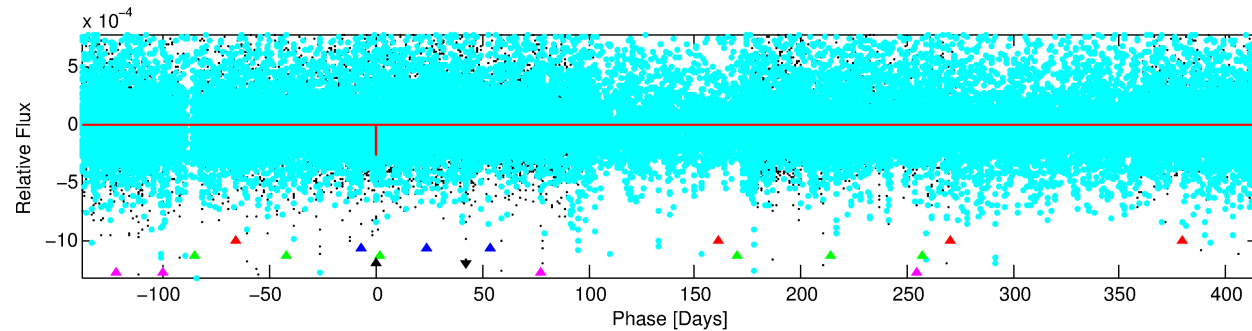
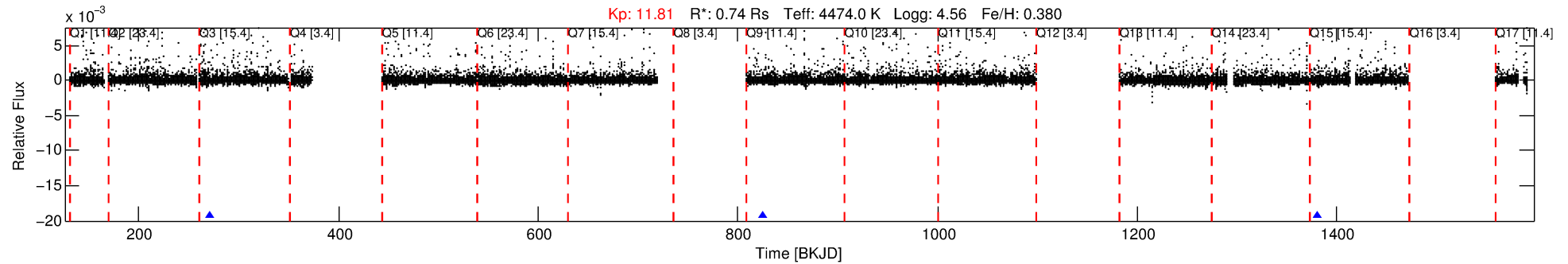
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012102573-04

No Significant Match Found

DV One-Page Summary

KIC: 12102573 Candidate: 4 of 5 Period: 554.948 d



DV Fit Results:

Period = 554.94814 [0.00820] d
Epoch = 270.5625 [0.0113] BKJD
Rp/R* = 0.0199 [0.0710]
a/R* = 1293.73 [17890.59]
b = 0.94 [1.67]
Seff = 0.14 [0.02]
Teq = 156 [7] K
Rp = 1.61 [5.77] Re
a = 1.1939 [0.0858] AU
Ag = 138951.20 [996312.56] [0.14] σ
Teffp = 4654 [8343] K [0.54] σ

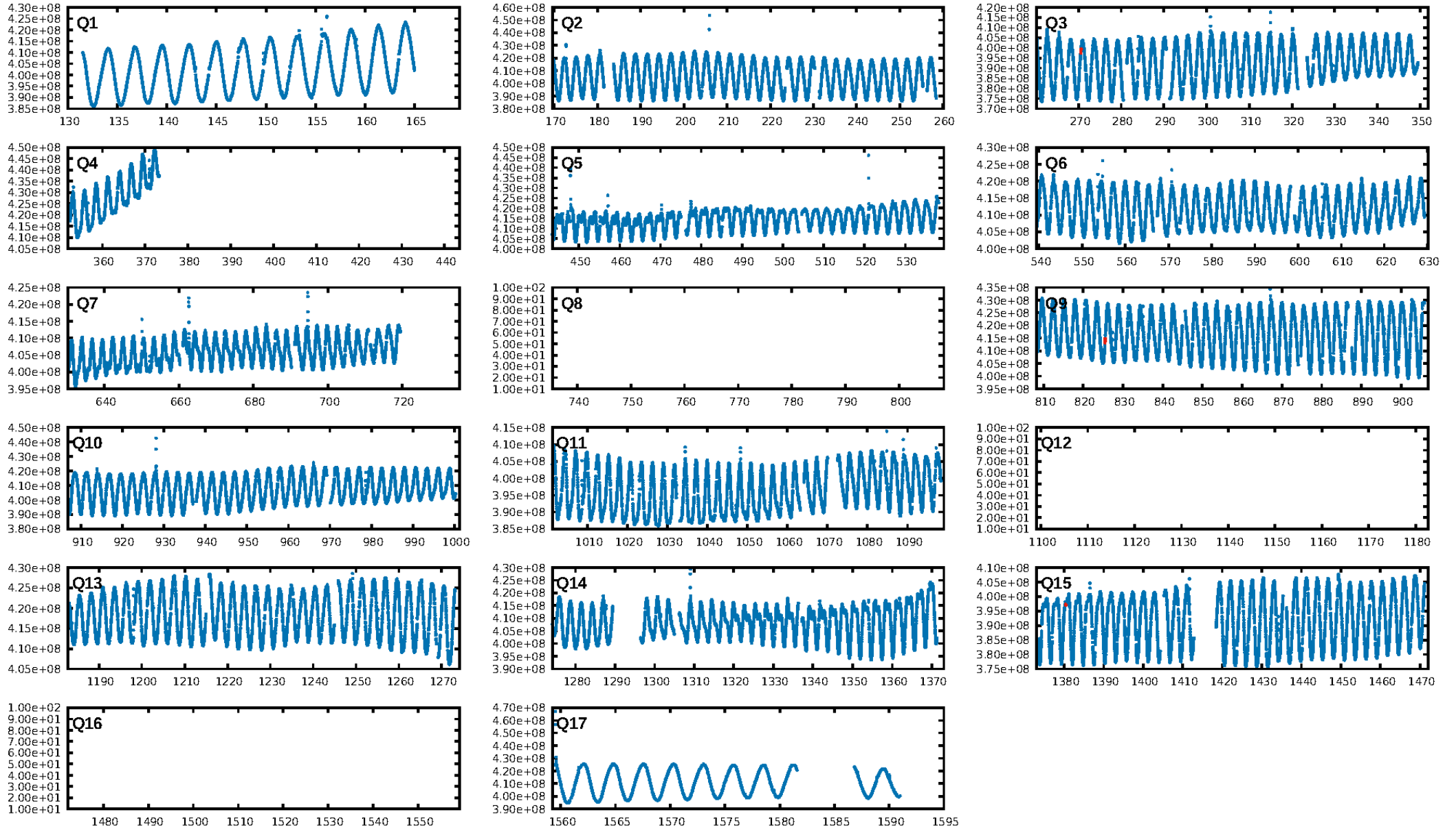
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [542.15] σ
LongPeriod-sig: 100.0% [222.19] σ
ModelChiSquare2-sig: 71.3%
ModelChiSquareGof-sig: 94.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5701
Centroid-sig: 11.9%
Centroid-so: 2.142 arcsec [0.90] σ
OotOffset-rm: 0.273 arcsec [0.89] σ
OotOffset-st: 0/2/0/1 [3]
KicOffset-rm: 0.586 arcsec [1.47] σ
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

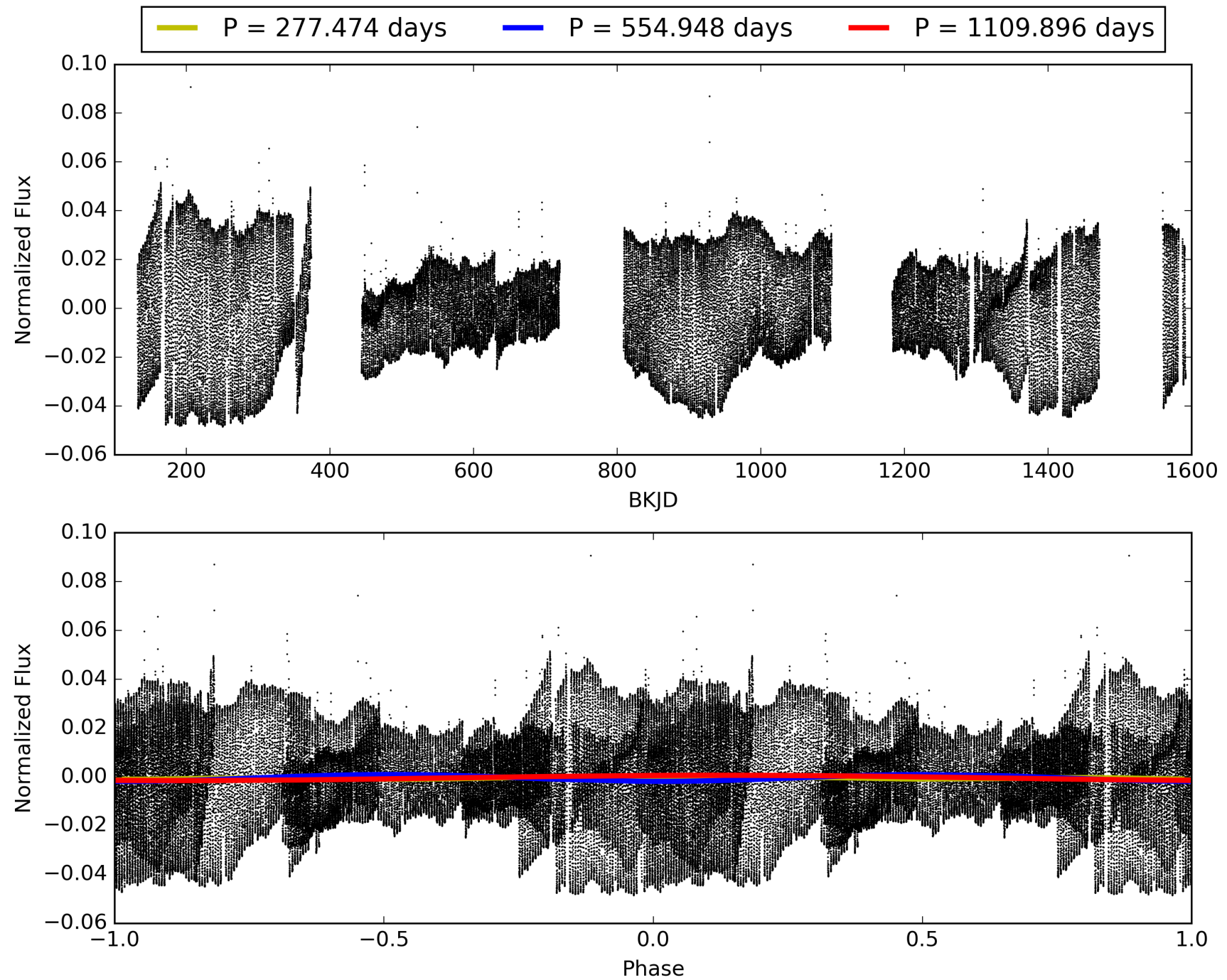
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:17:22 Z

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

TCE 012102573-04, PDC Light Curves

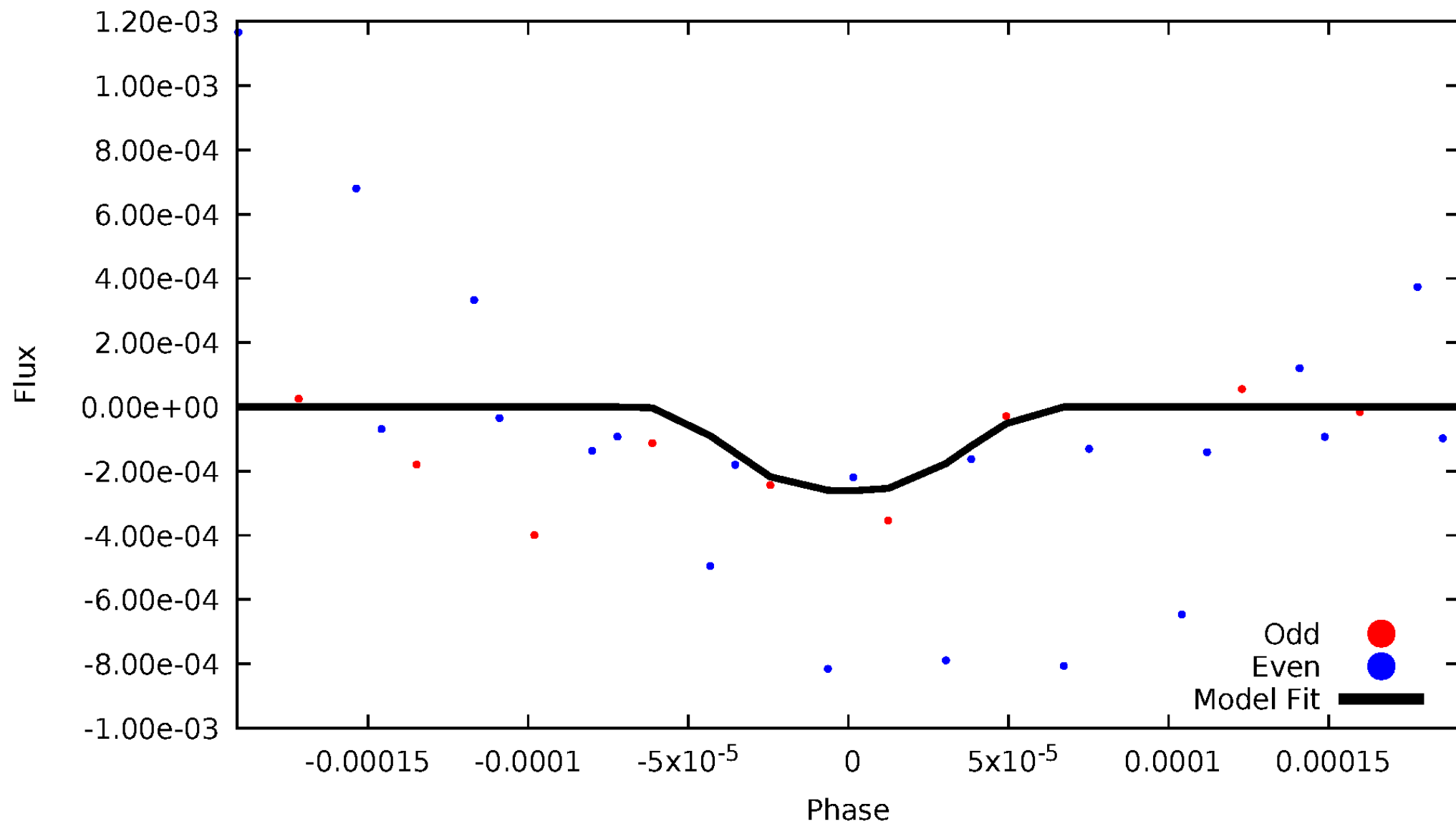


TCE 012102573-04



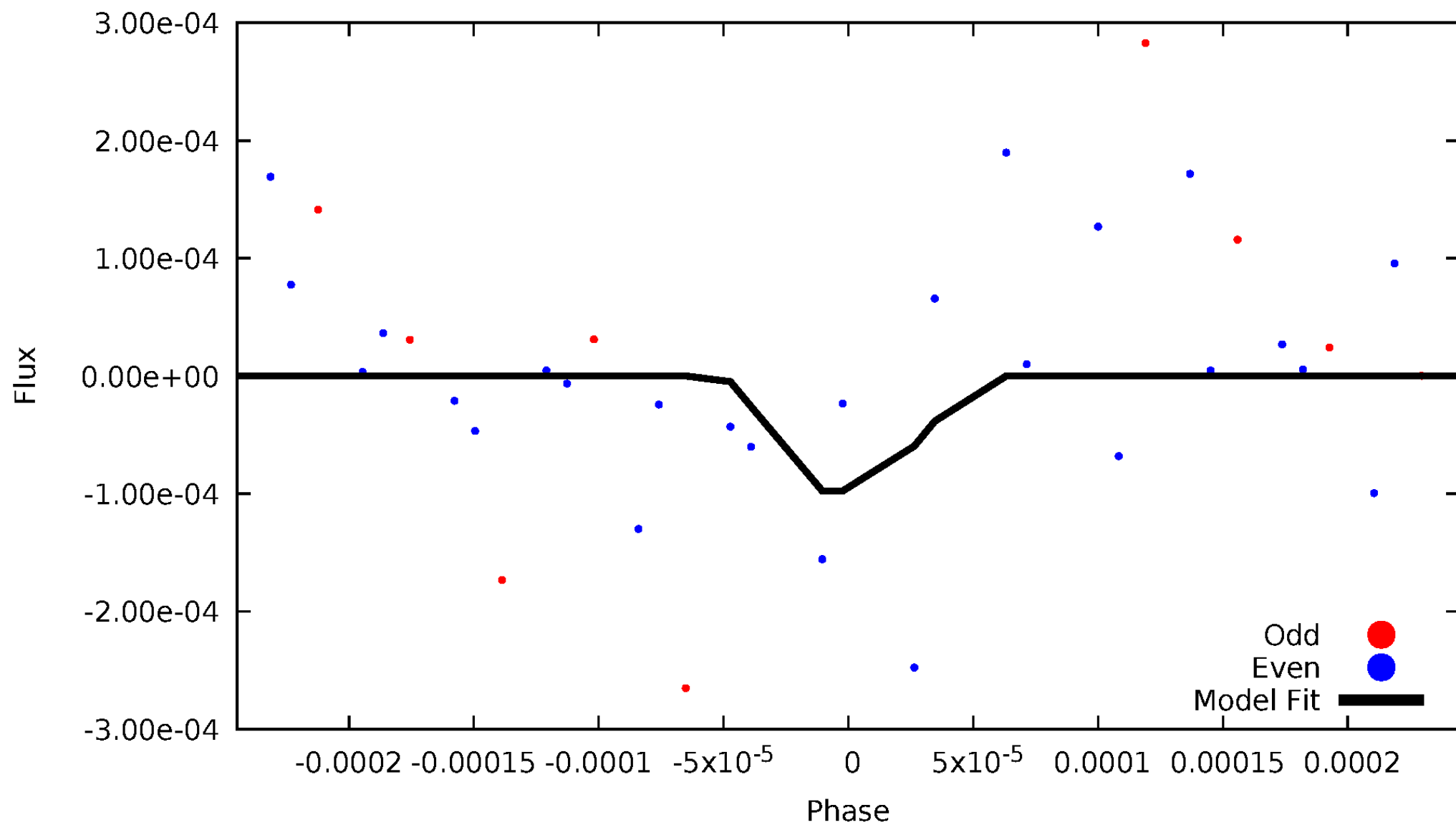
DV Odd/Even

TCE 012102573-04



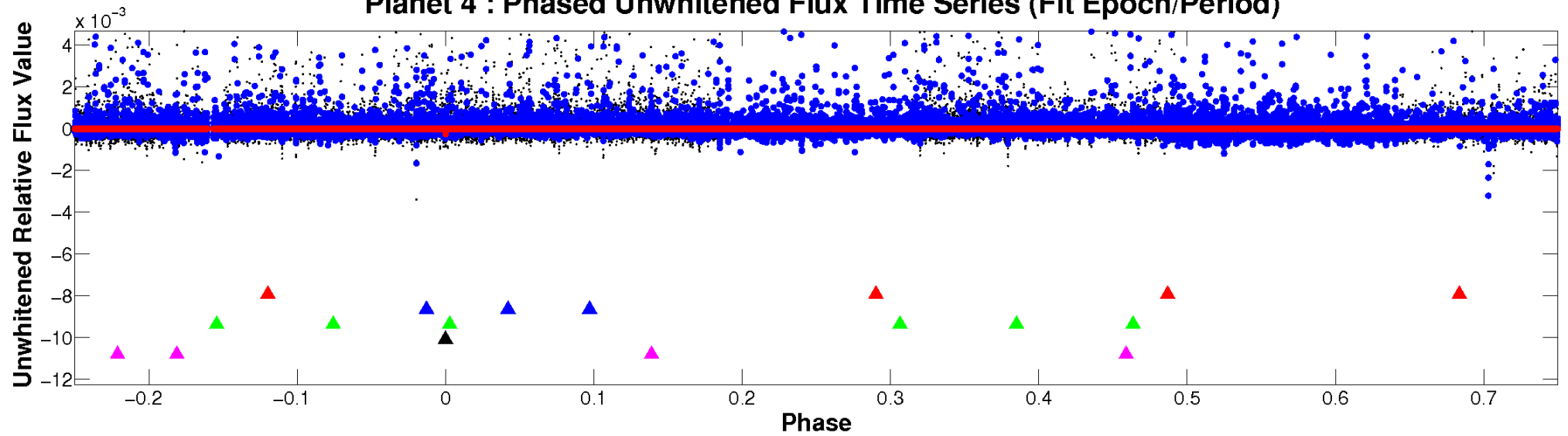
ALT Odd/Even

TCE 012102573-04

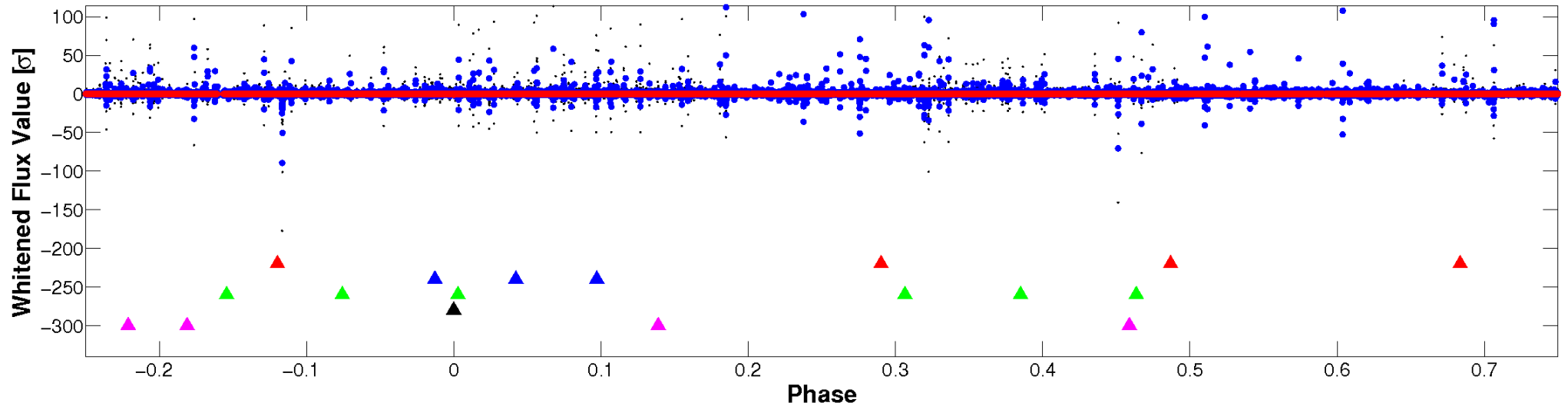


Non-Whitened Vs. Whitened Light Curve

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

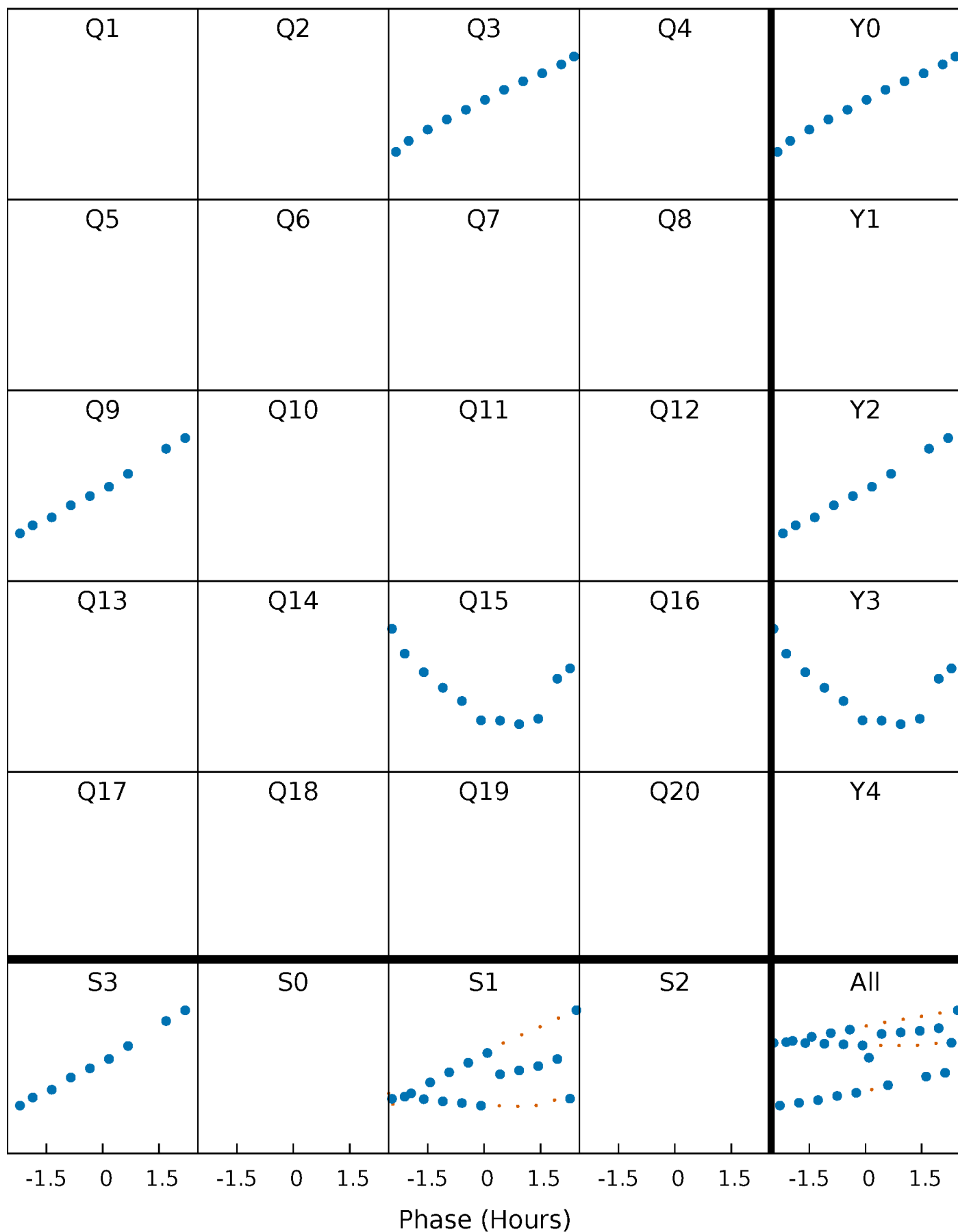


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



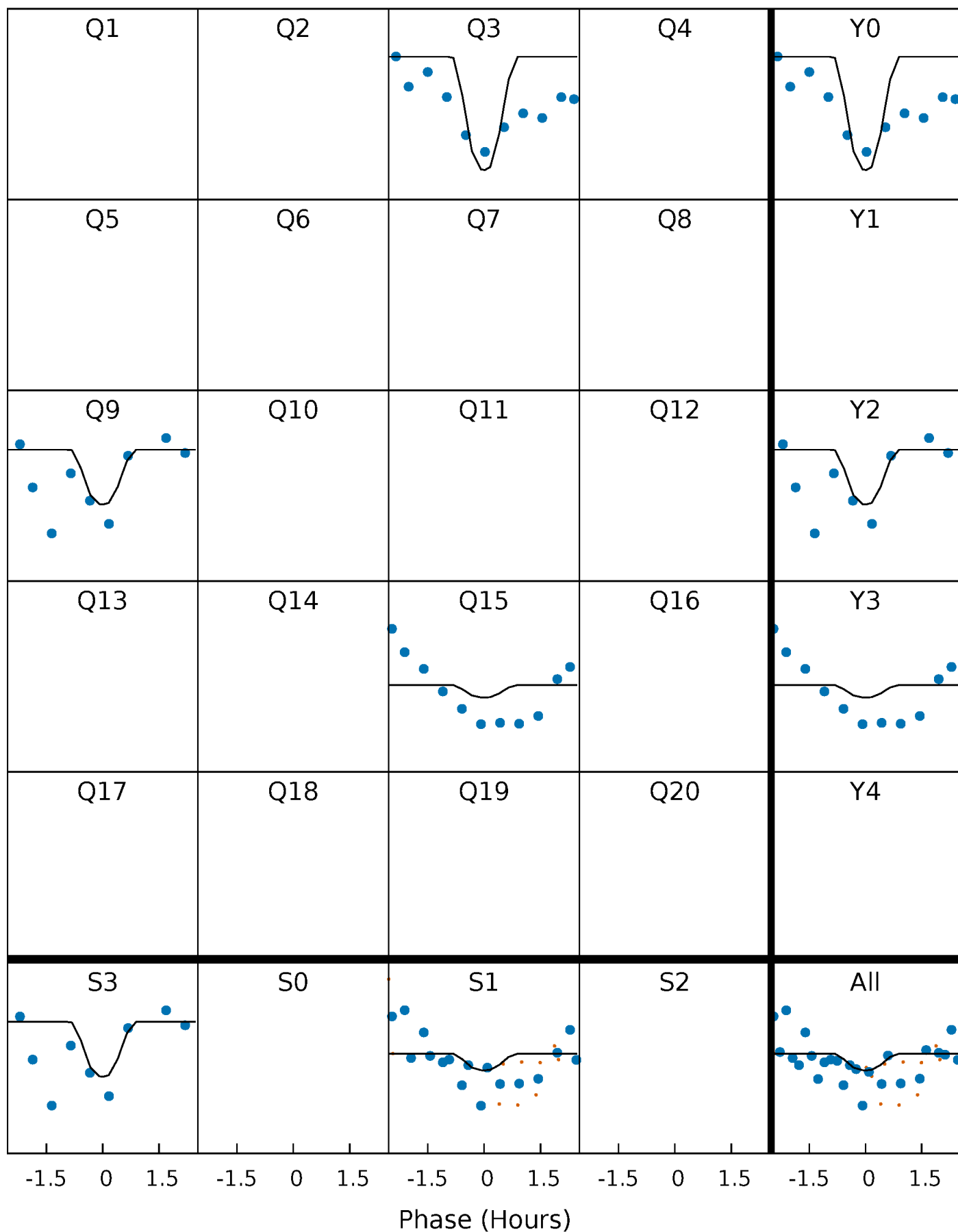
PDC Quarter-Phased Transit Curves

TCE 012102573-04 $P=554.948142$ Days $T_0=270.562533$ (BKJD)



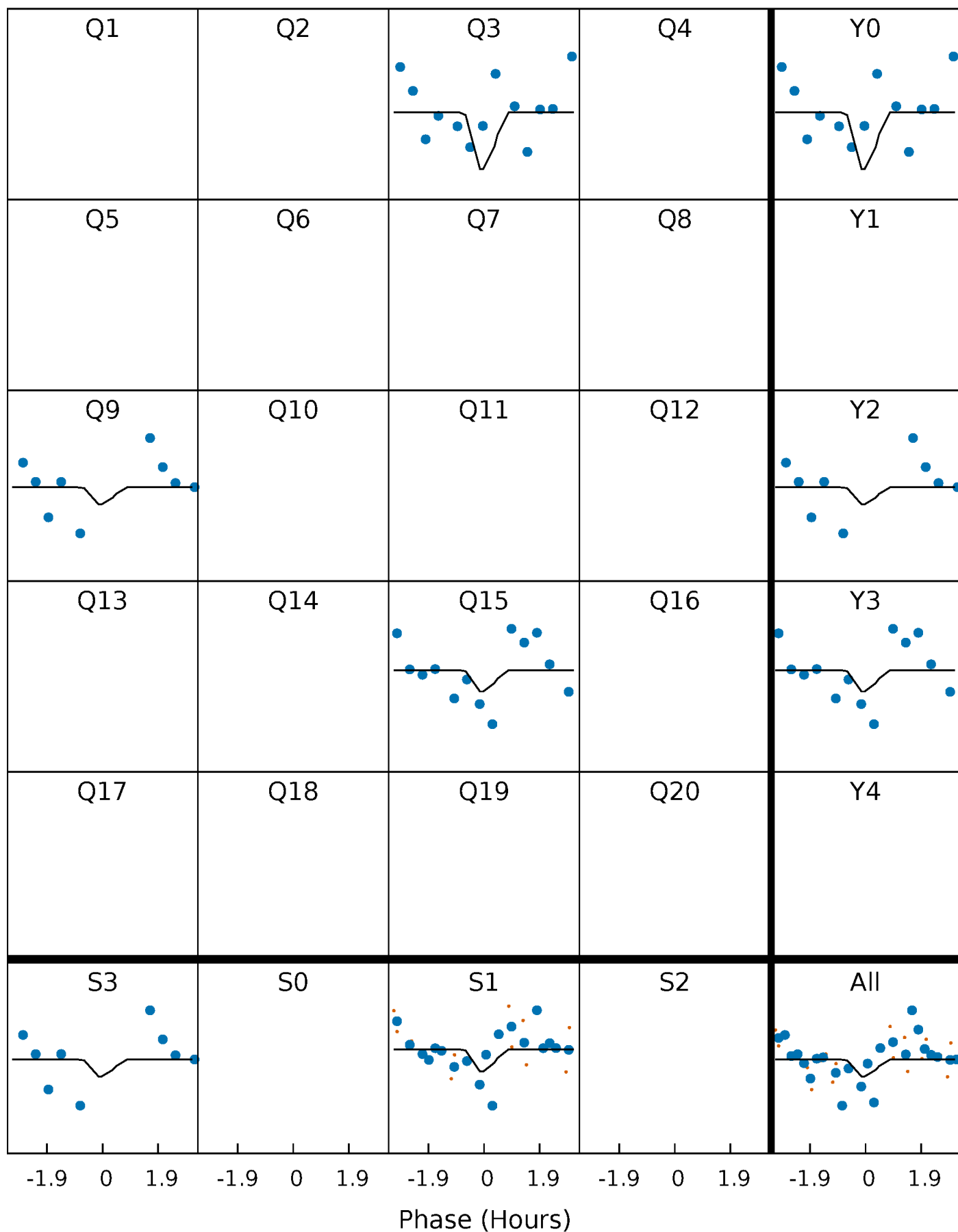
DV Quarter-Phased Transit Curves

TCE 012102573-04 P=554.948142 Days $T_0=270.562533$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

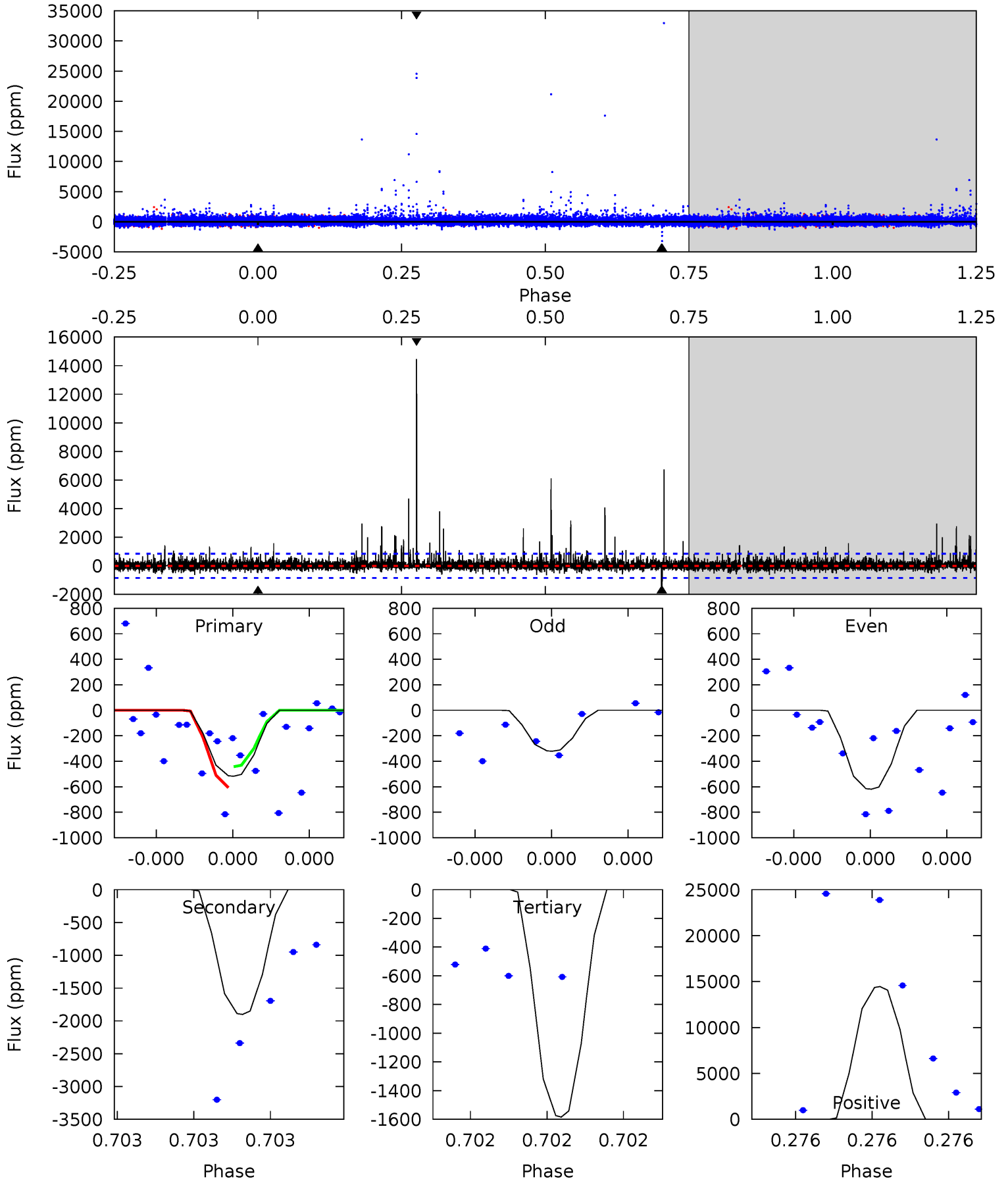
TCE 012102573-04 P=554.968678 Days $T_0=270.564588$ (BKJD)



DV Model-Shift Uniqueness Test

012102573-04, P = 554.948142 Days, E = 270.562533 Days

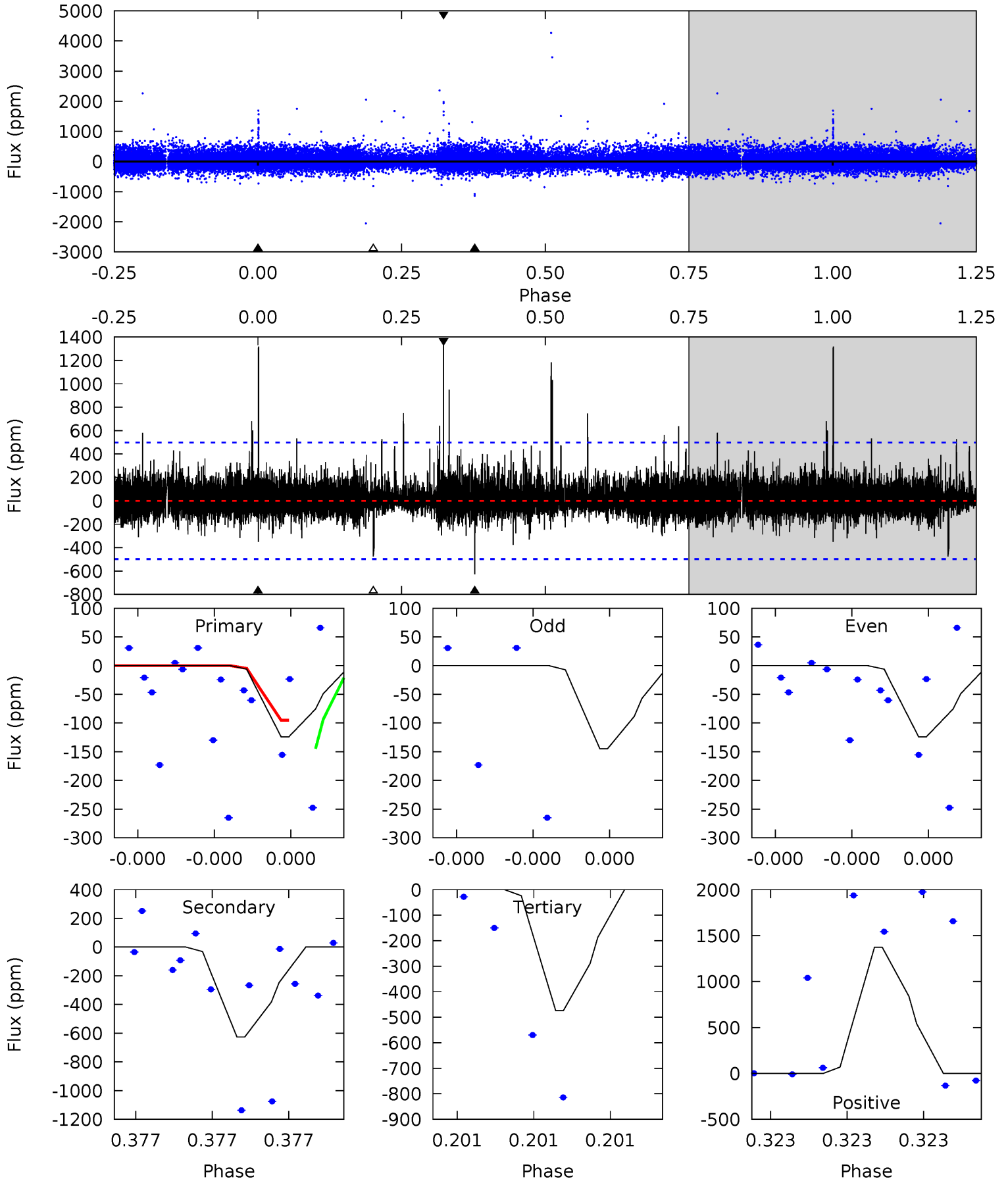
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.55	13.0	10.9	99.1	5.83	3.87	1.81	-7.32	-95.6	2.17	-86.1	0.47	1.58	0.88	0.56



Alt Model-Shift Uniqueness Test

012102573-04, P = 554.968678 Days, E = 270.564588 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.46	7.39	5.59	16.2	5.88	3.94	0.99	-4.13	-14.7	1.80	-8.81	0.11	1.00	0.69	0.26



Stellar Parameters For KIC 012102573

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4474^{+145}_{-145}	$4.561^{+0.058}_{-0.018}$	$0.380^{+0.050}_{-0.300}$	$0.745^{+0.024}_{-0.063}$	$0.736^{+0.041}_{-0.046}$	$2.509^{+0.636}_{-0.182}$
	+3%/-3%	+1%/-0%	+13%/-79%	+3%/-8%	+6%/-6%	+25%/-7%
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 012102573-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1901 ± 146	$4.60^{+4.42}_{-3.27}$	216^{+8}_{-8}	4023^{+3048}_{-802}	$68959^{+770170}_{-50546}$
Alt.	-627 ± 85	$4.29^{+4.10}_{-2.87}$	216^{+7}_{-8}	3432^{+1779}_{-629}	$26318^{+212109}_{-19416}$

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

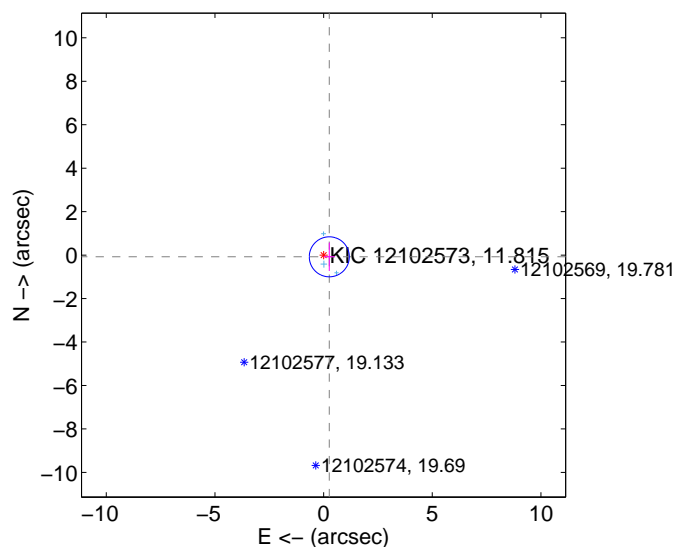
Supplemental centroid analysis for 012102573-04. **Kepler magnitude: 11.81.** Transit SNR 1.90

There are 3 quarters with good PRF difference image offsets

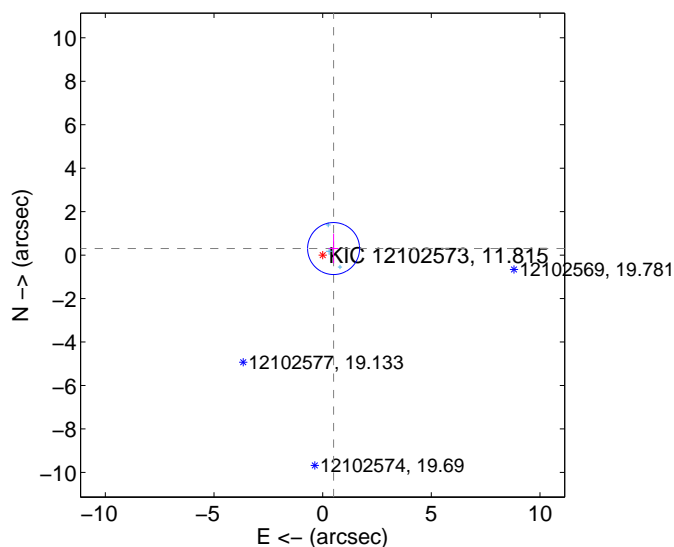
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.273 ± 0.307	0.89	-0.262 ± 0.254	-0.079 ± 0.650
PRF-fit source offset from KIC position	0.586 ± 0.399	1.47	-0.503 ± 0.224	0.301 ± 0.680
photometric centroid source offset	2.14 ± 2.38	0.90	-0.29 ± 2.01	-2.12 ± 2.39

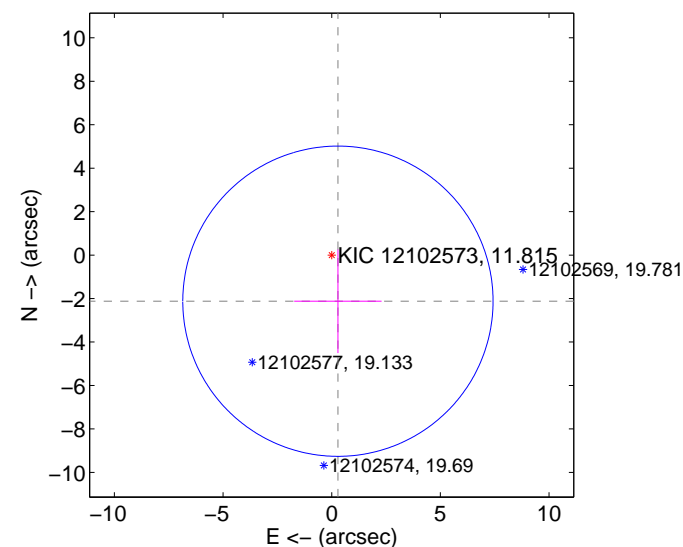
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

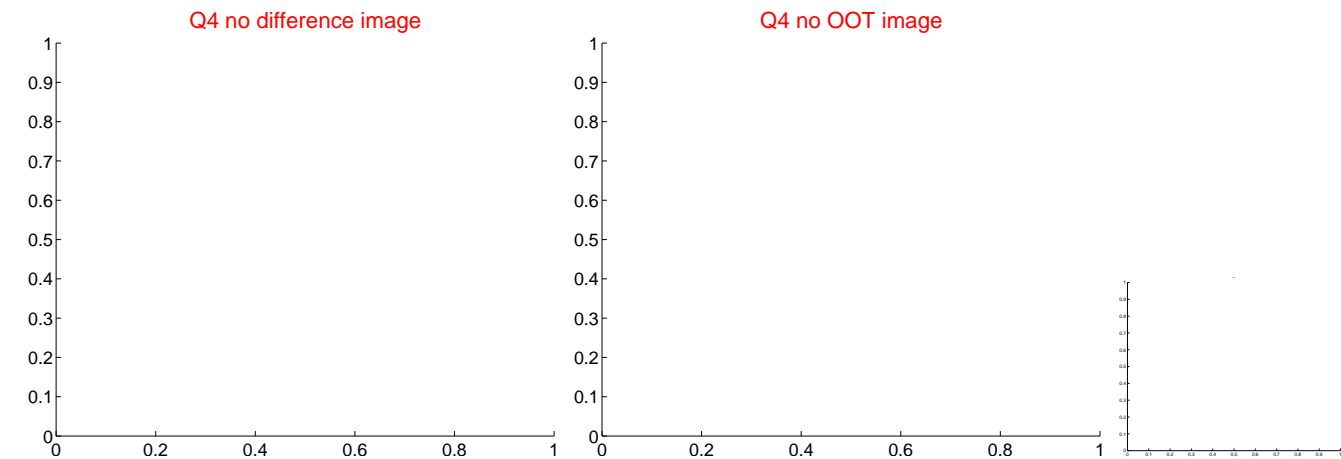
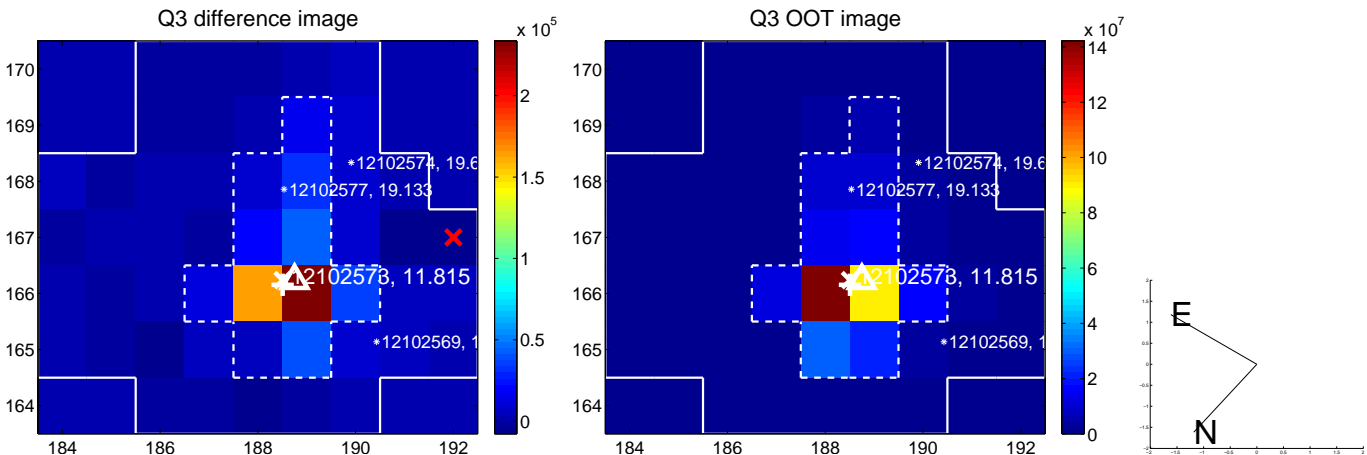


offset from photometric centroids



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.

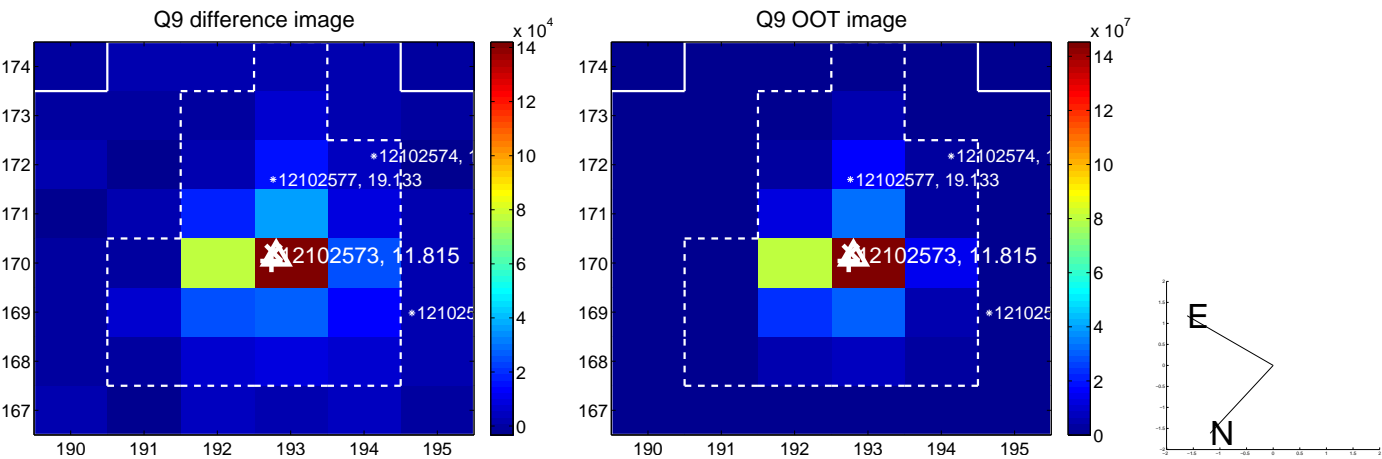
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



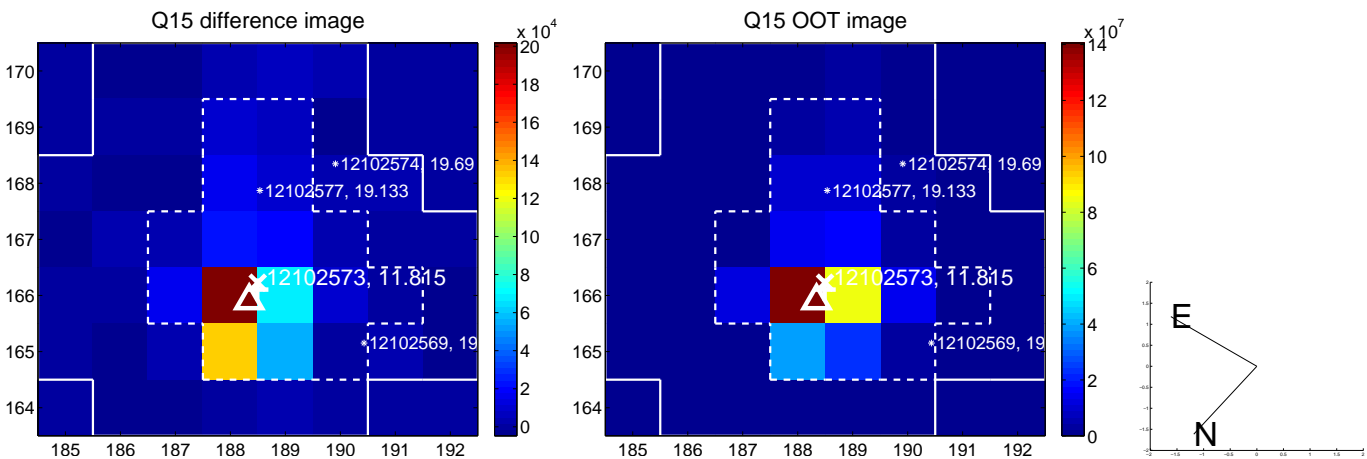
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



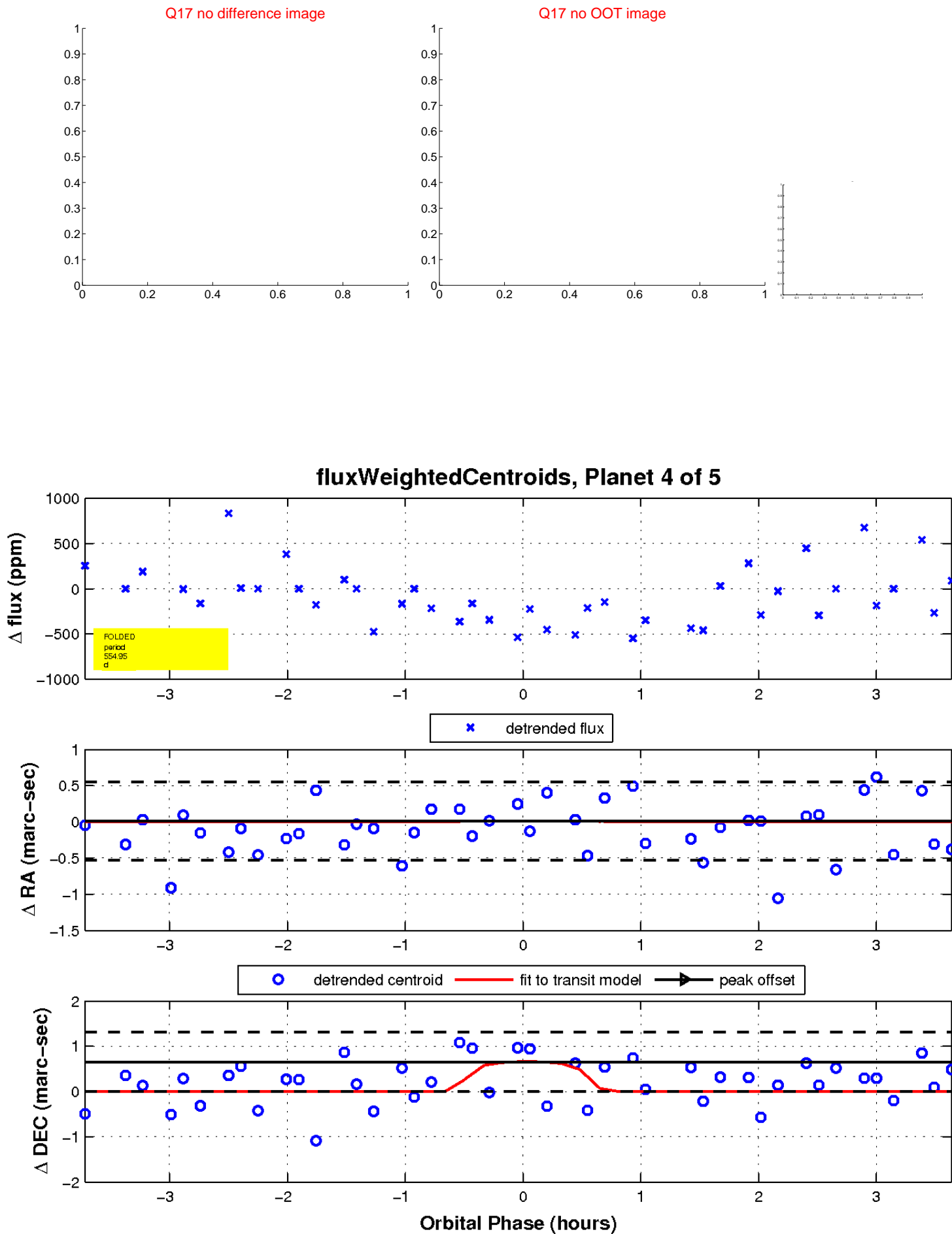
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

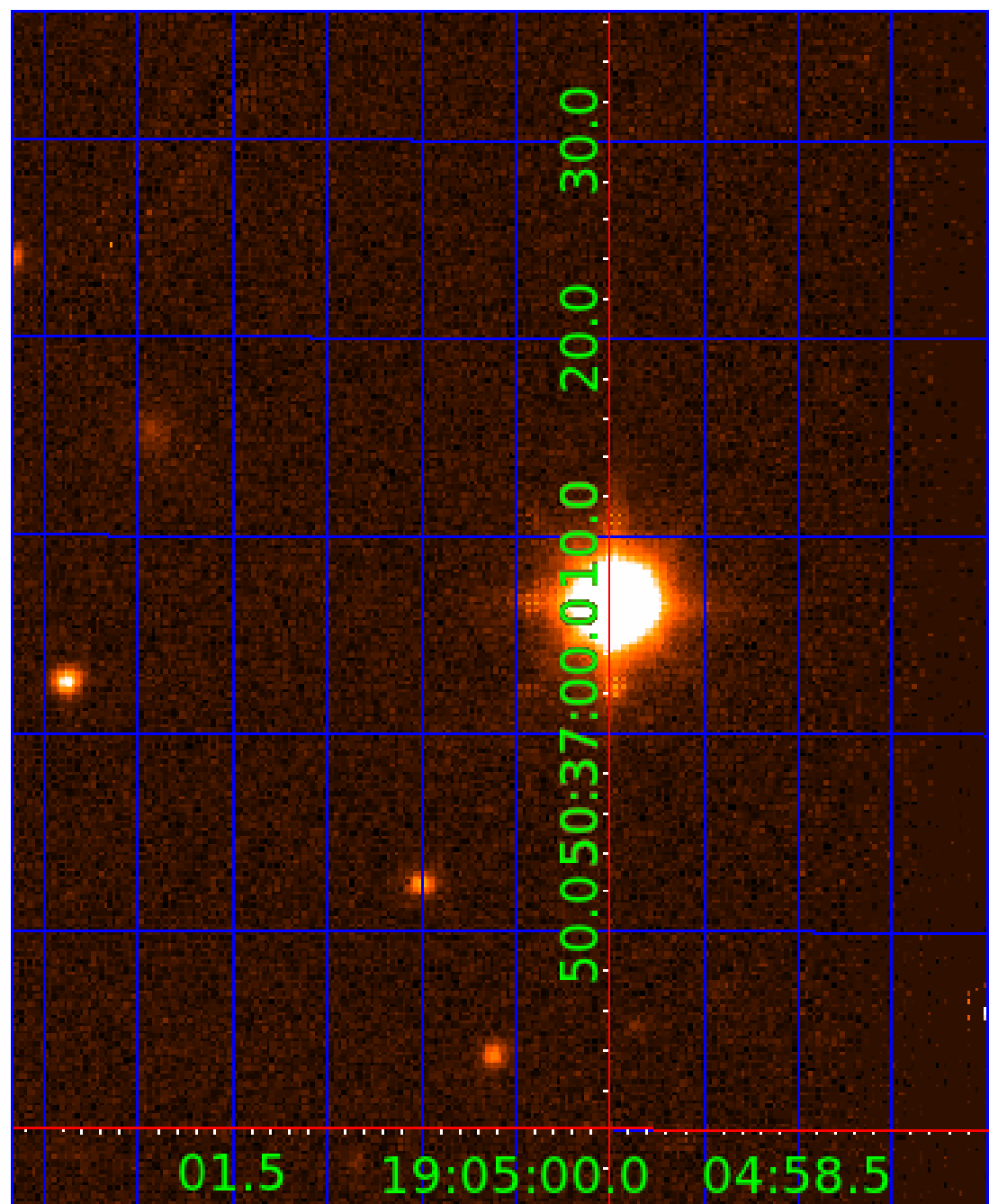


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012102573

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})
012102573-01	OBS	No	445.804484	204.108481	1668.5	4.662	18.8	9.6	0.74	4474	2.96	0.19
012102573-03	OBS	No	255.673121	272.159199	390.3	7.647	16.4	2.3	0.74	4474	1.62	0.39
012102573-04	OBS	No	554.948142	270.562533	261.1	1.271	13.6	1.9	0.74	4474	1.61	0.14
012102573-05	OBS	No	377.372121	147.853988	883.3	5.400	12.7	6.0	0.74	4474	2.24	0.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012102573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
012102573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012102573-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
012102573-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

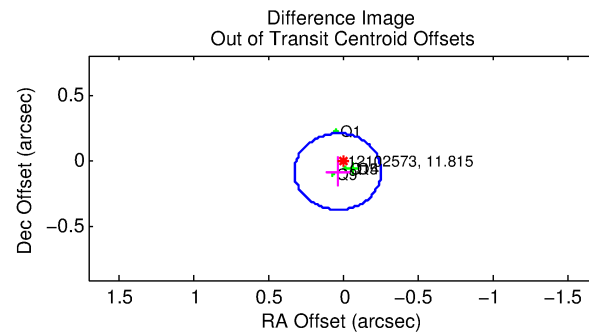
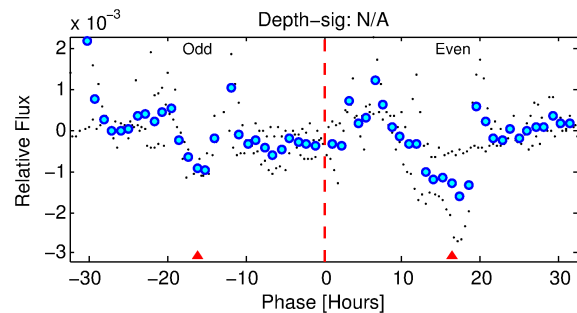
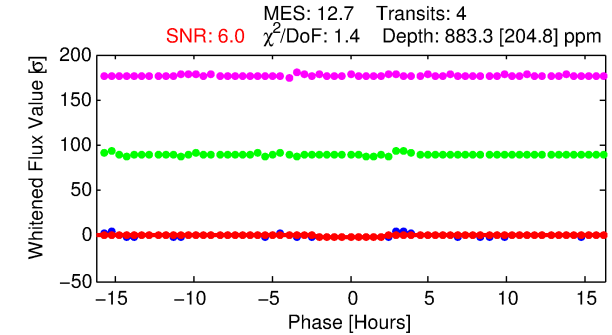
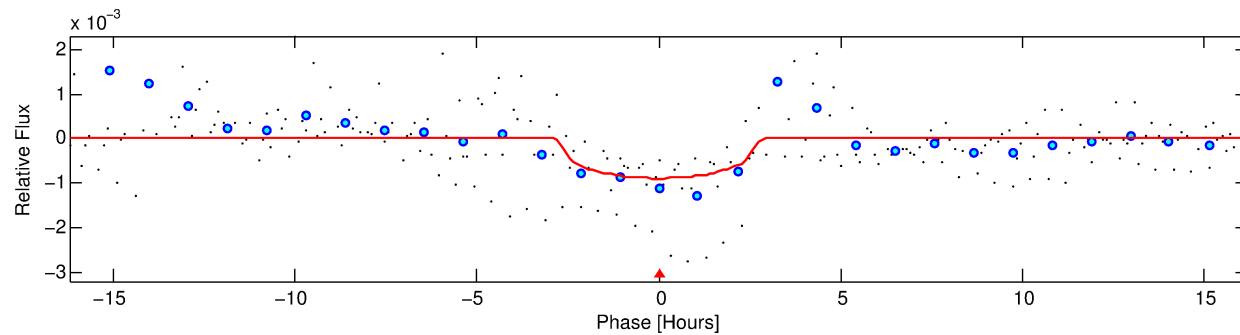
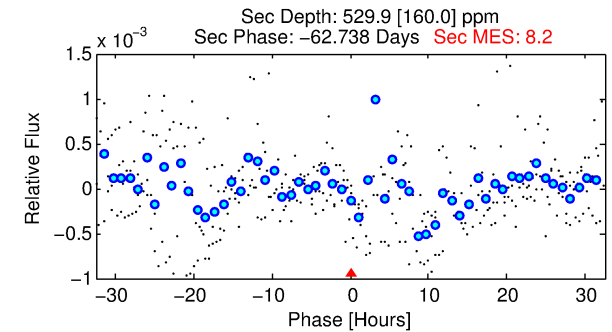
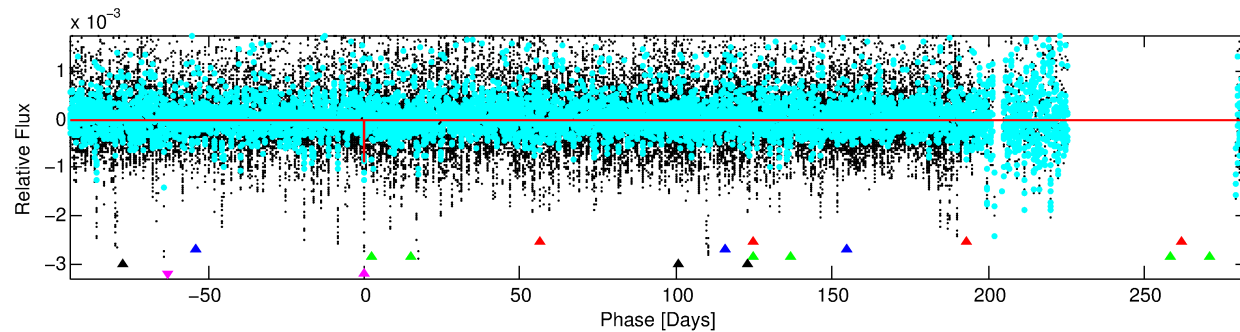
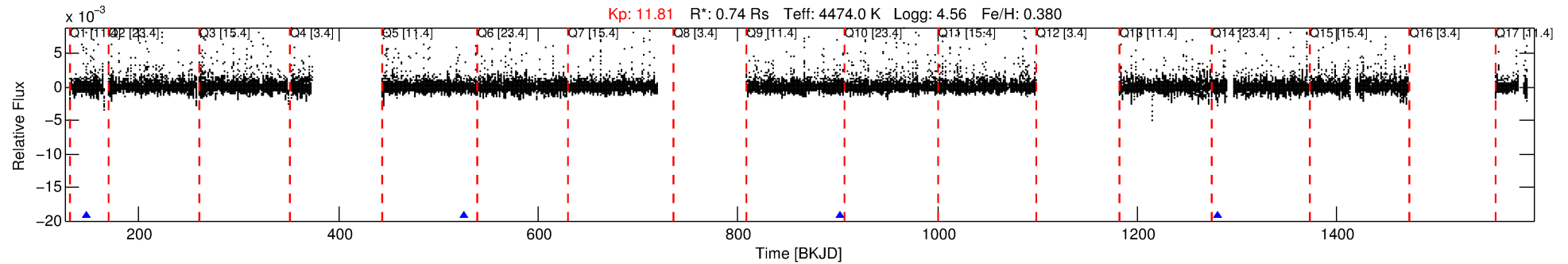
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012102573-05

No Significant Match Found

DV One-Page Summary

KIC: 12102573 Candidate: 5 of 5 Period: 377.372 d



DV Fit Results:

Period = 377.37212 [0.00515] d
Epoch = 147.8540 [0.0085] BKJD
Rp/R* = 0.0276 [0.0255]
a/R* = 463.40 [1247.99]
b = 0.55 [3.49]
Seff = 0.23 [0.04]
Teq = 177 [7] K
Rp = 2.24 [2.08] Re
a = 0.9232 [0.0663] AU
Ag = 49519.28 [92908.23] [0.53] σ
Teffp = 4089 [1920] K [2.04] σ

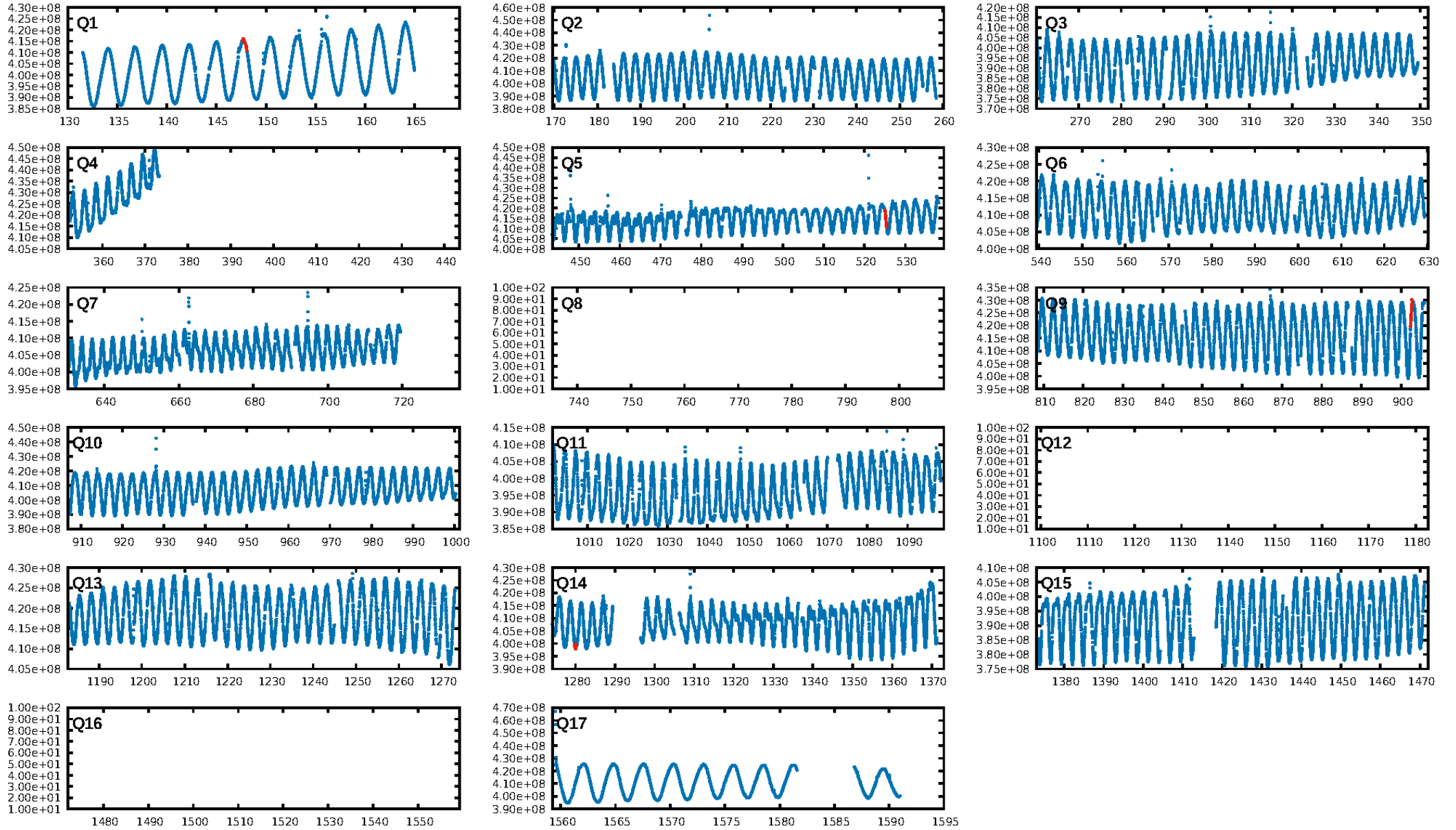
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [312.00] σ
LongPeriod-sig: 100.0% [230.23] σ
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 78.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.9
Centroid-sig: 89.5%
Centroid-so: 0.435 arcsec [1.20] σ
OotOffset-rm: 0.086 arcsec [0.89] σ
OotOffset-st: 1/0/0/3 [4]
KicOffset-rm: 0.668 arcsec [5.81] σ
KicOffset-st: 1/0/0/3 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [4/4]

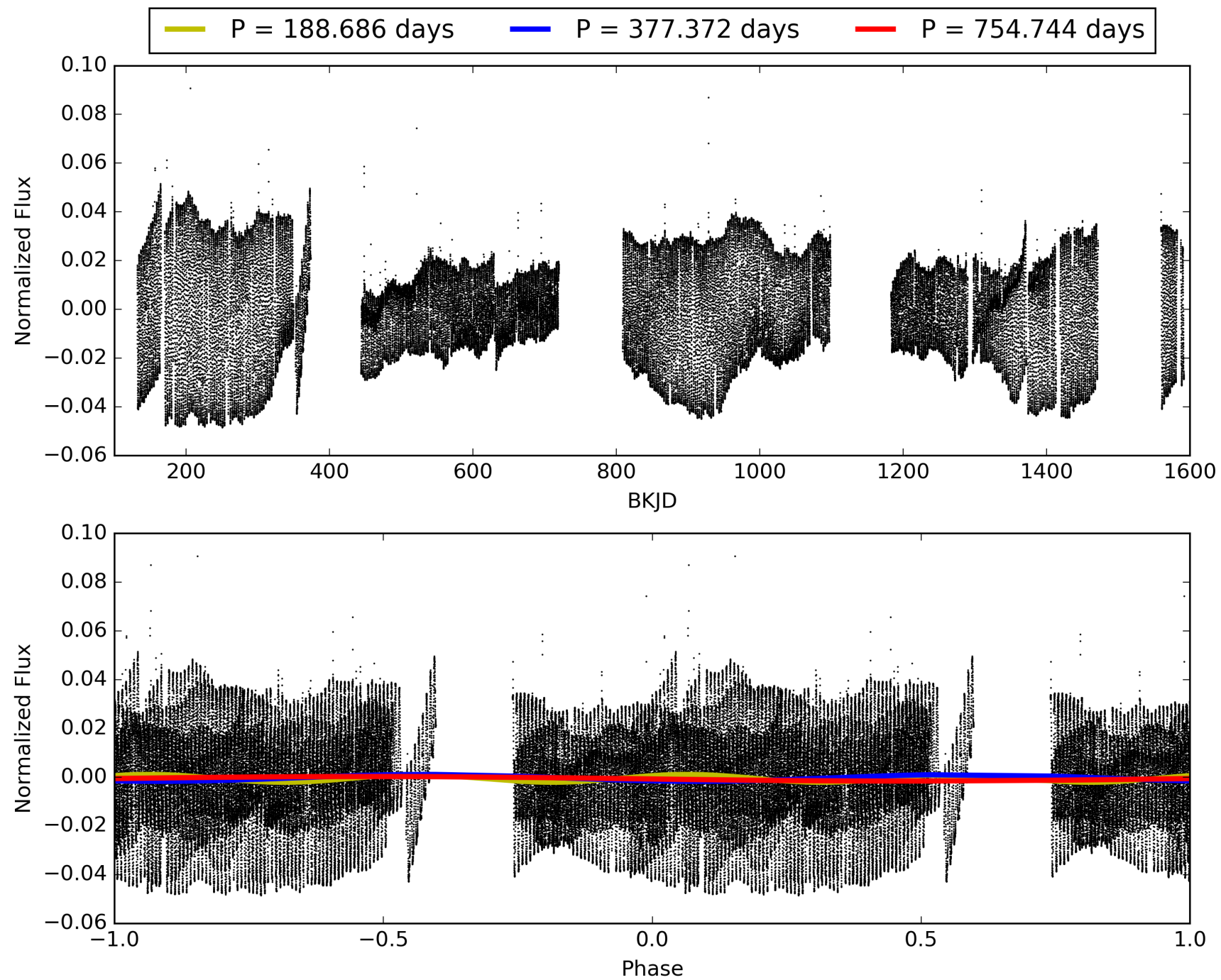
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:17:34 Z

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

TCE 012102573-05, PDC Light Curves

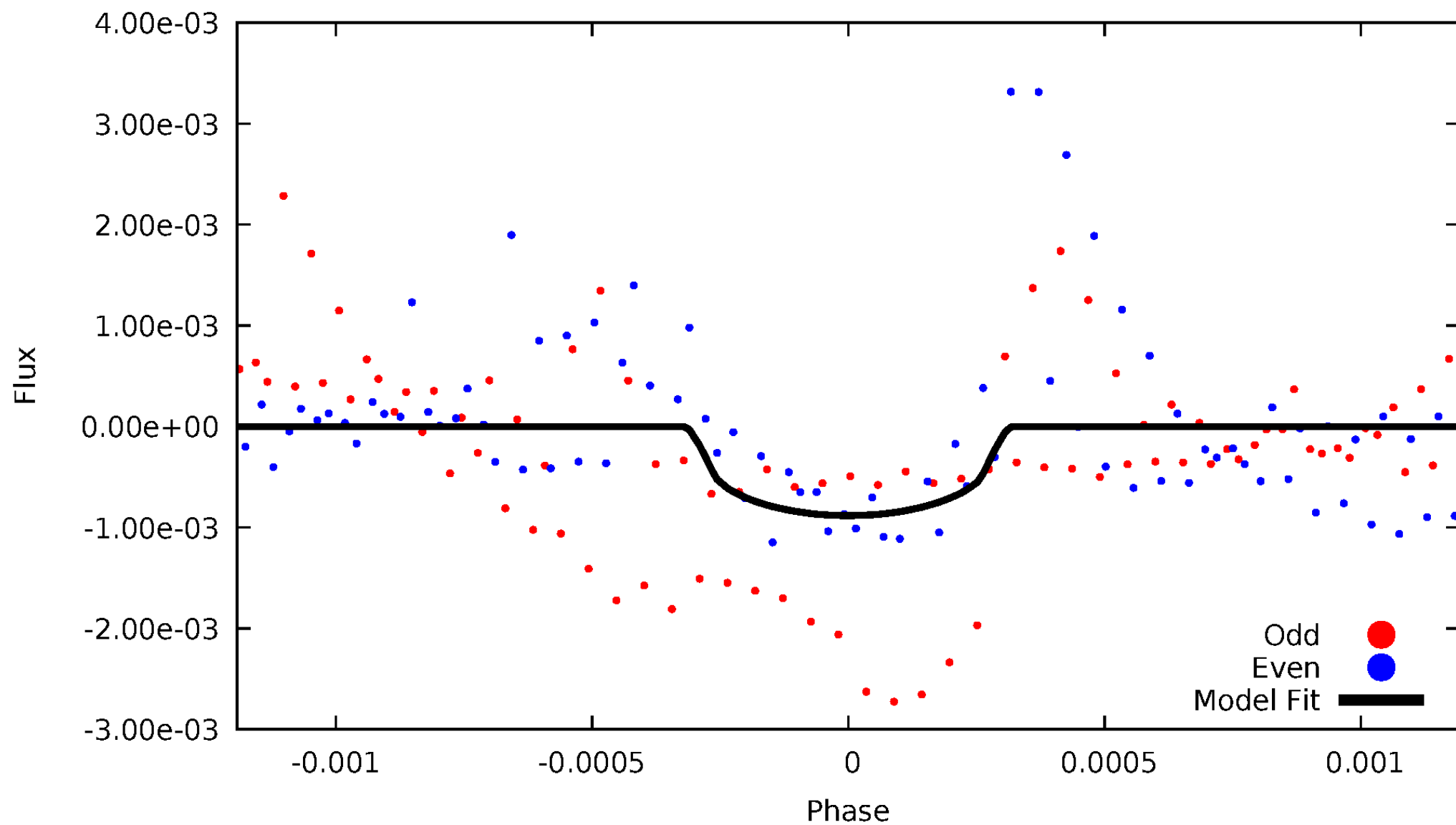


TCE 012102573-05



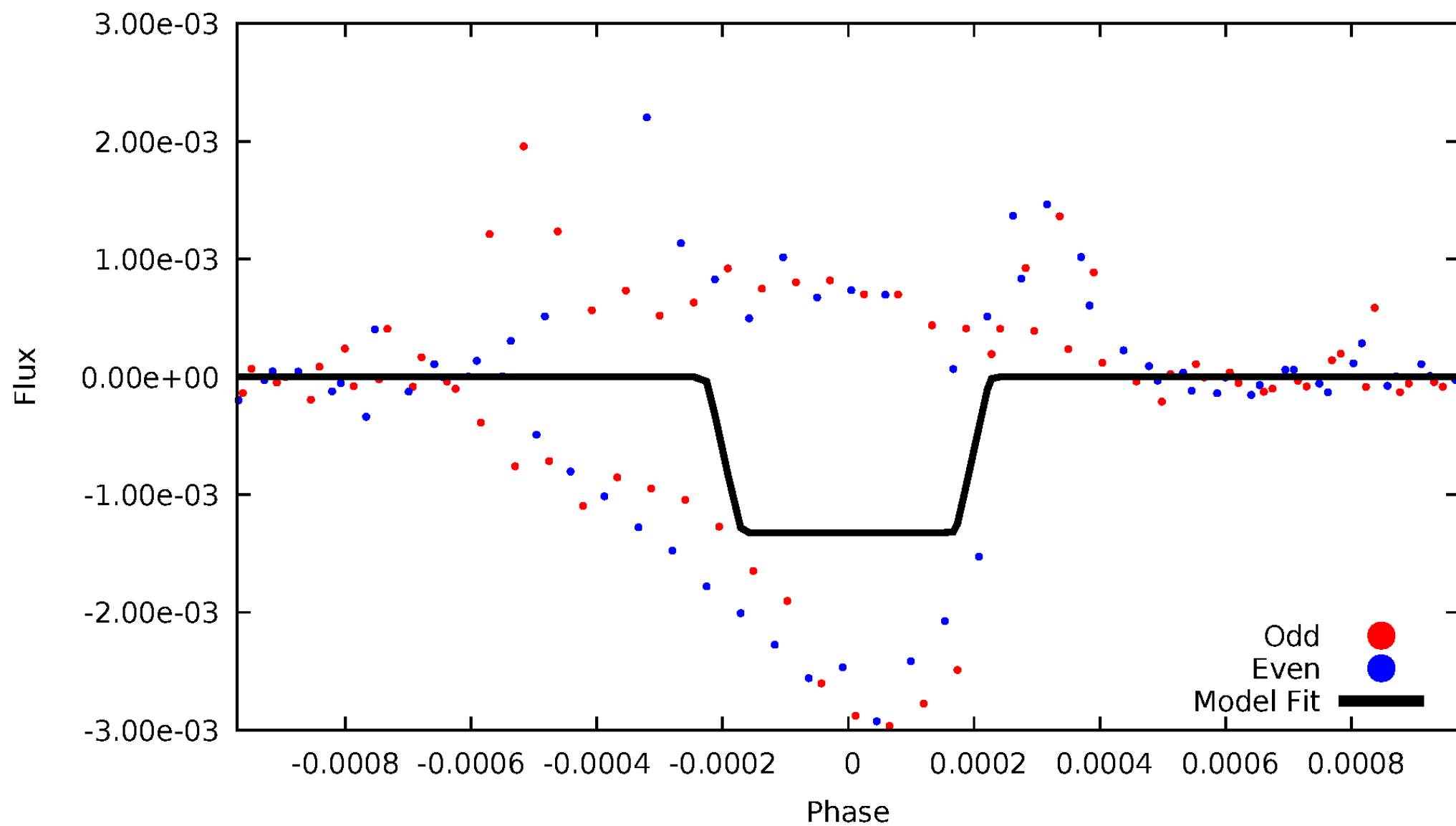
DV Odd/Even

TCE 012102573-05



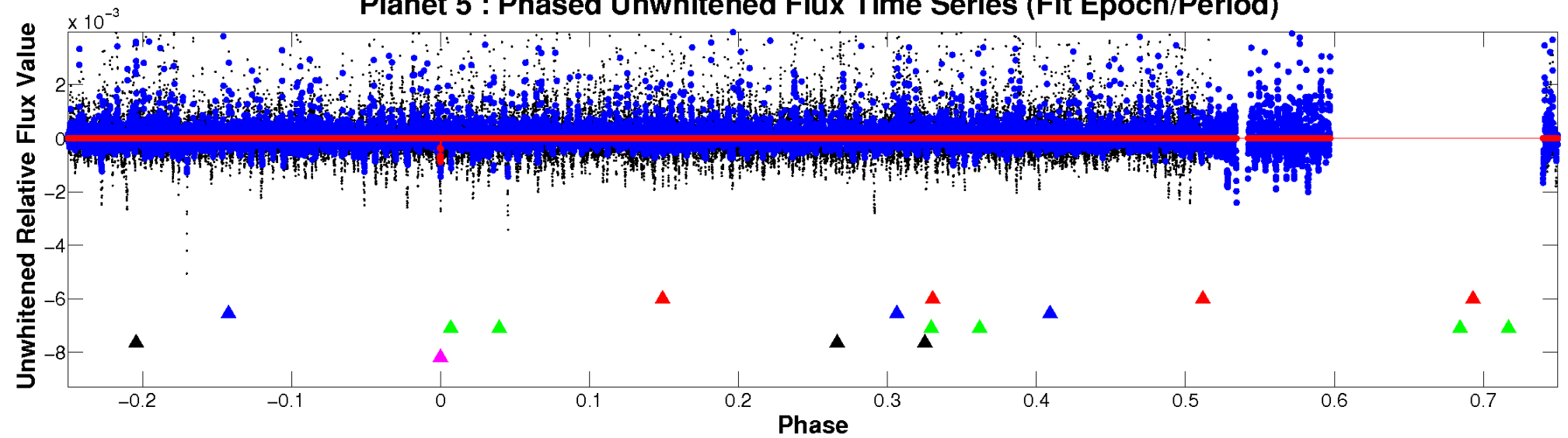
ALT Odd/Even

TCE 012102573-05

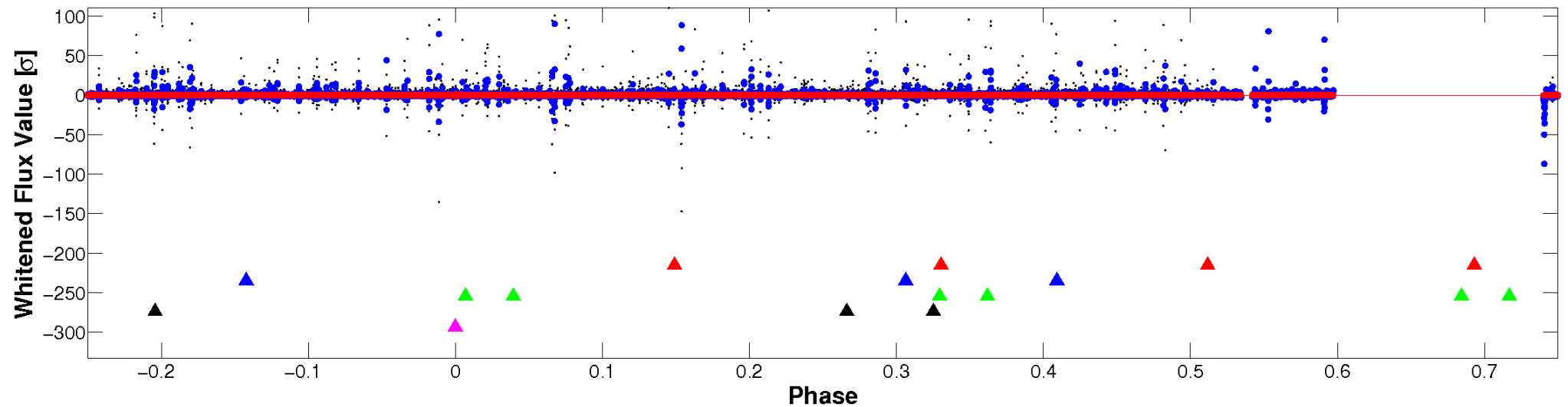


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

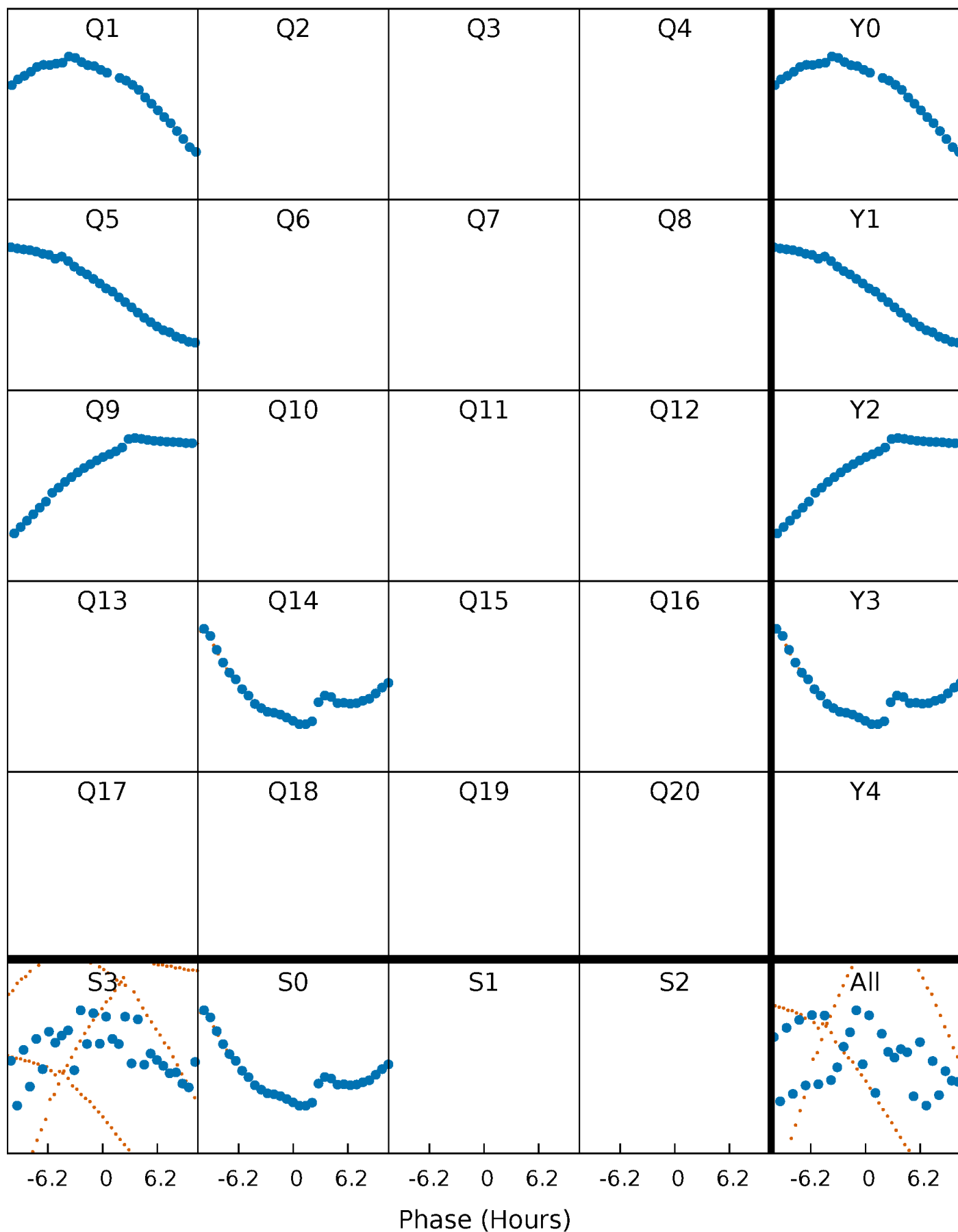


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



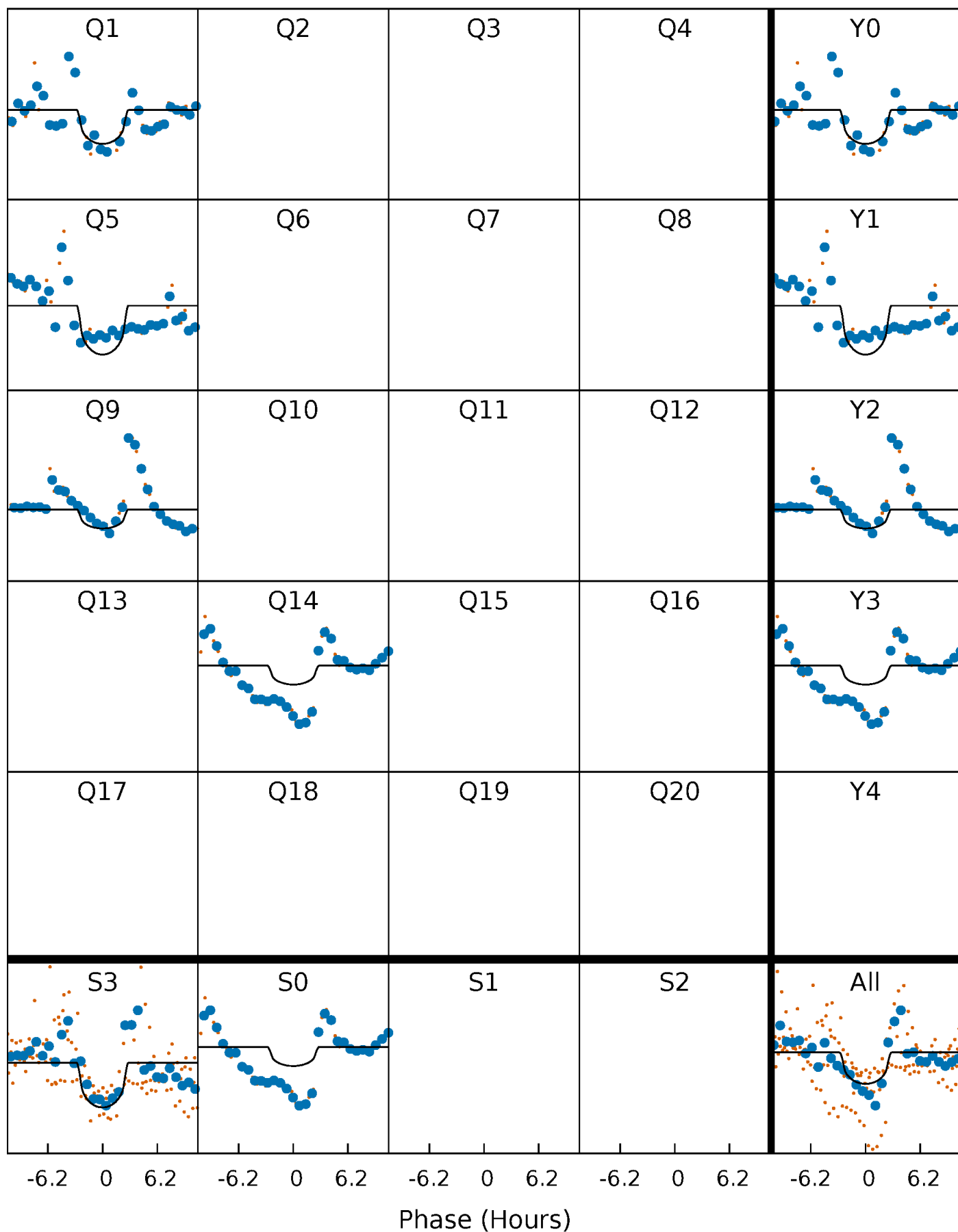
PDC Quarter-Phased Transit Curves

TCE 012102573-05 $P=377.372121$ Days $T_0=147.853988$ (BKJD)



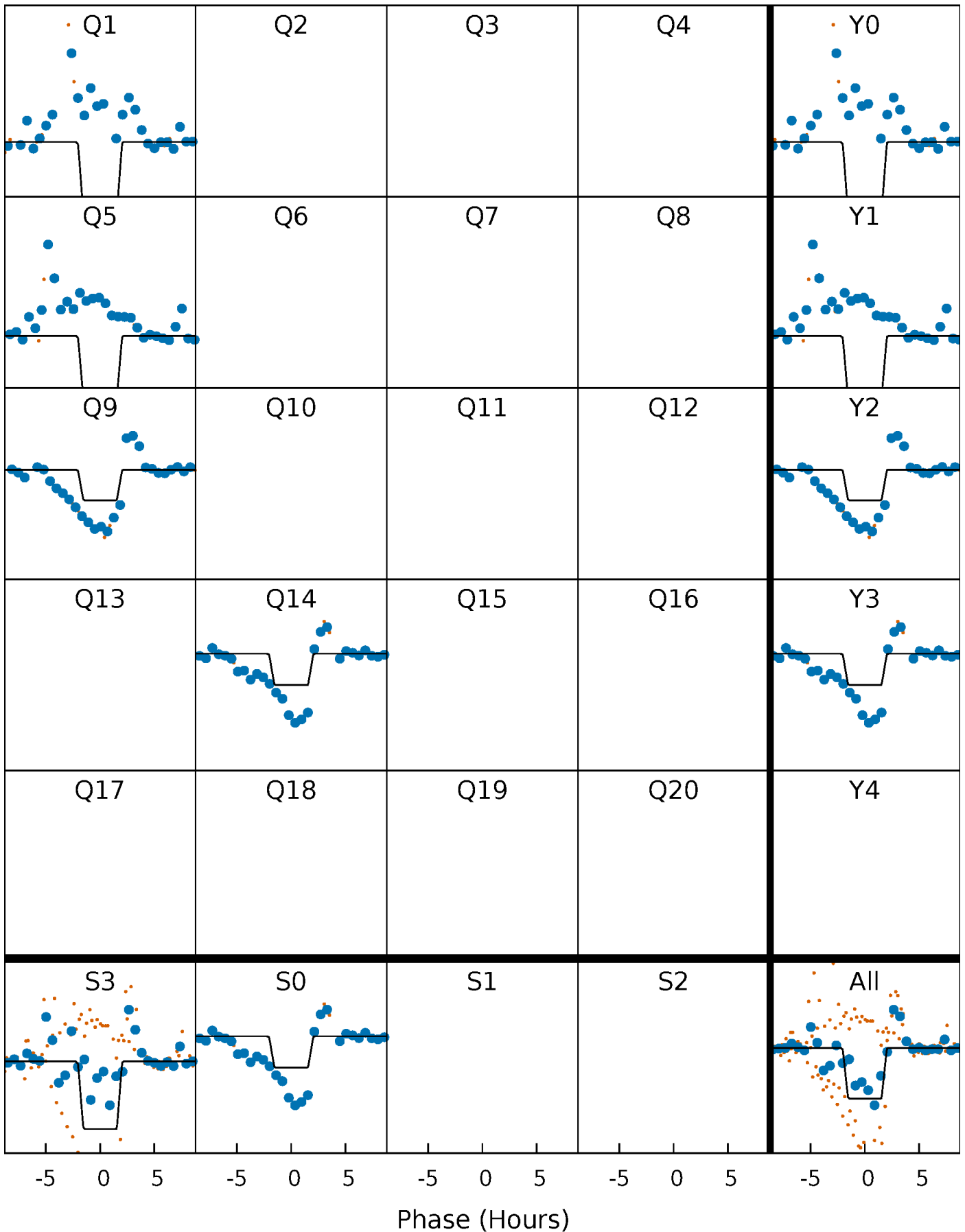
DV Quarter-Phased Transit Curves

TCE 012102573-05 $P=377.372121$ Days $T_0=147.853988$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

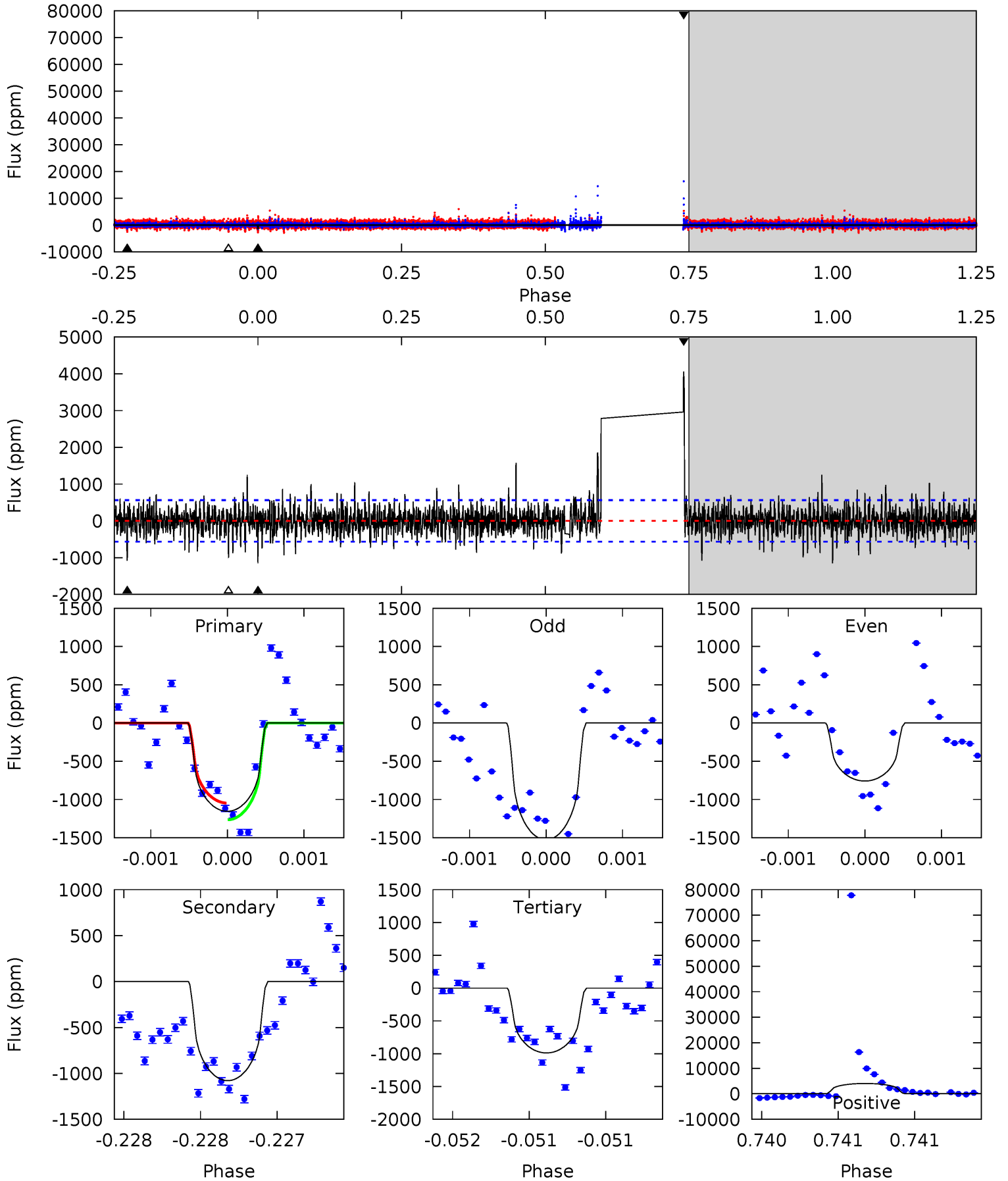
TCE 012102573-05 $P=377.380608$ Days $T_0=147.857855$ (BKJD)



DV Model-Shift Uniqueness Test

012102573-05, P = 377.372121 Days, E = 147.853988 Days

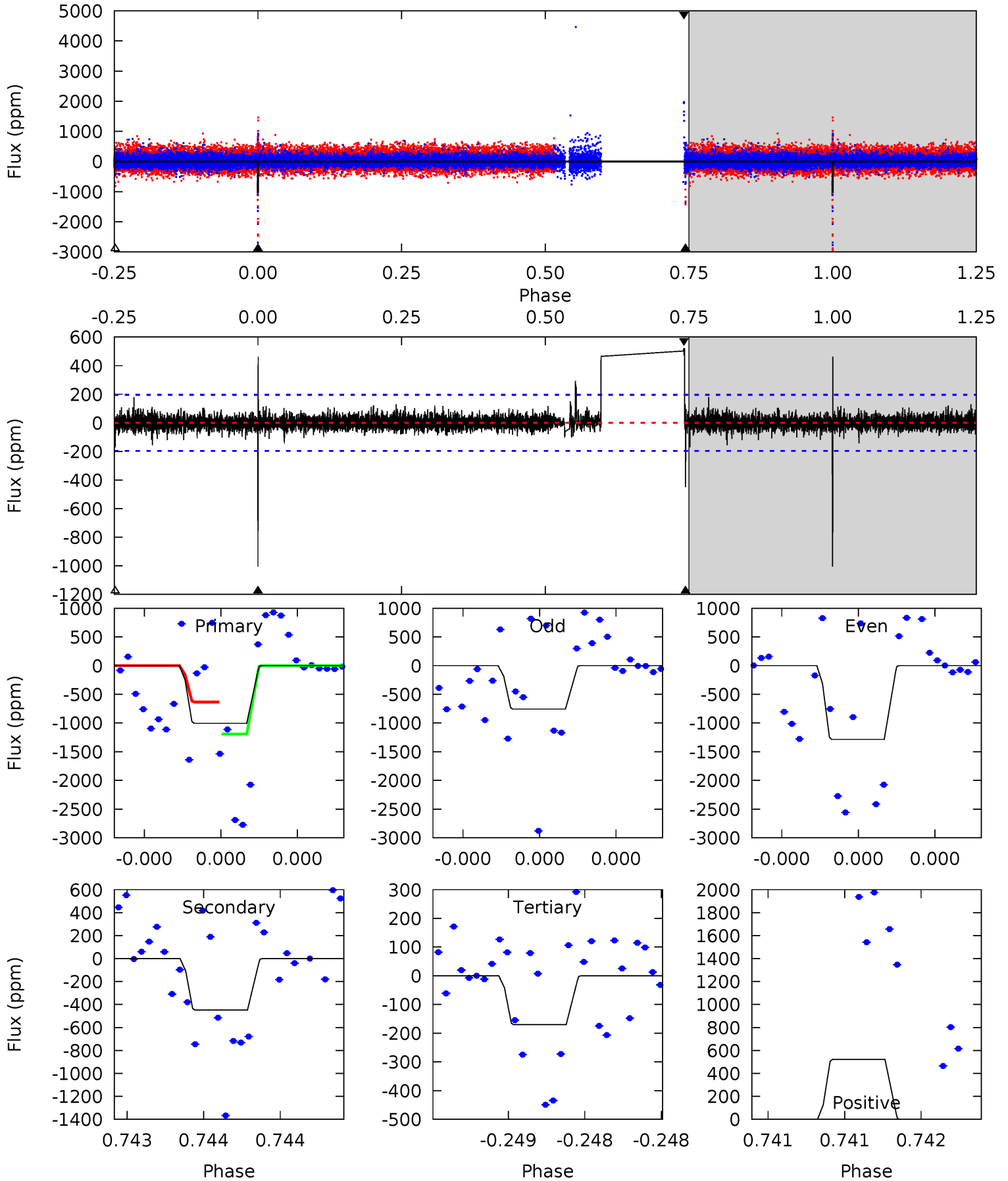
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	10.6	9.67	39.7	5.53	3.42	2.80	1.62	-28.4	0.89	-29.1	3.07	1.43	0.78	1.00



Alt Model-Shift Uniqueness Test

012102573-05, P = 377.380608 Days, E = 147.857855 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.6	12.8	4.84	14.8	5.59	3.51	0.91	23.7	13.7	7.91	-2.08	7.52	0.99	0.34	6.78



Stellar Parameters For KIC 012102573

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4474^{+145}_{-145}	$4.561^{+0.058}_{-0.018}$	$0.380^{+0.050}_{-0.300}$	$0.745^{+0.024}_{-0.063}$	$0.736^{+0.041}_{-0.046}$	$2.509^{+0.636}_{-0.182}$
	+3%/-3%	+1%/-0%	+13%/-79%	+3%/-8%	+6%/-6%	+25%/-7%
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 012102573-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1079 ± 102	$2.57^{+1.91}_{-1.52}$	246^{+8}_{-9}	4559^{+2285}_{-864}	$75815^{+388562}_{-50168}$
Alt.	-449 ± 35	$3.15^{+1.96}_{-1.73}$	246^{+9}_{-8}	3587^{+1263}_{-493}	21137^{+84163}_{-13003}

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

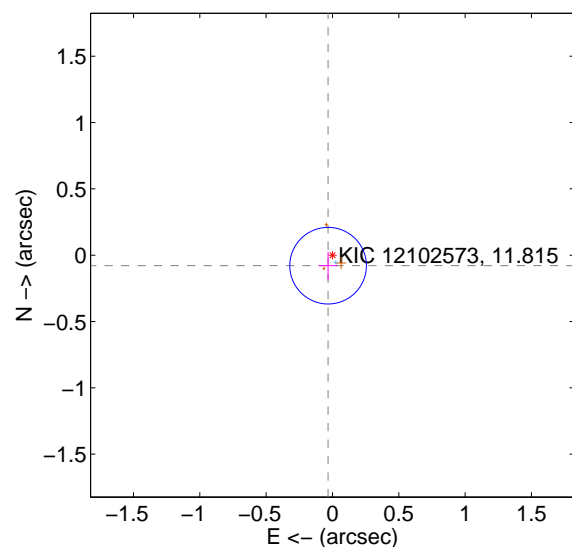
Supplemental centroid analysis for 012102573-05. **Kepler magnitude: 11.81.** Transit SNR 6.04

There are 1 quarters with good PRF difference image offsets

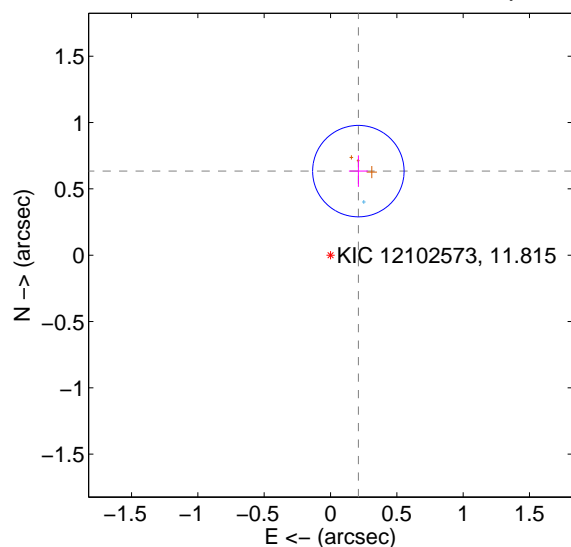
The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.086 ± 0.096	0.89	0.033 ± 0.072	-0.079 ± 0.104
PRF-fit source offset from KIC position	0.668 ± 0.115	5.81	-0.210 ± 0.071	0.634 ± 0.119
photometric centroid source offset	0.43 ± 0.36	1.20	-0.31 ± 0.31	0.30 ± 0.41

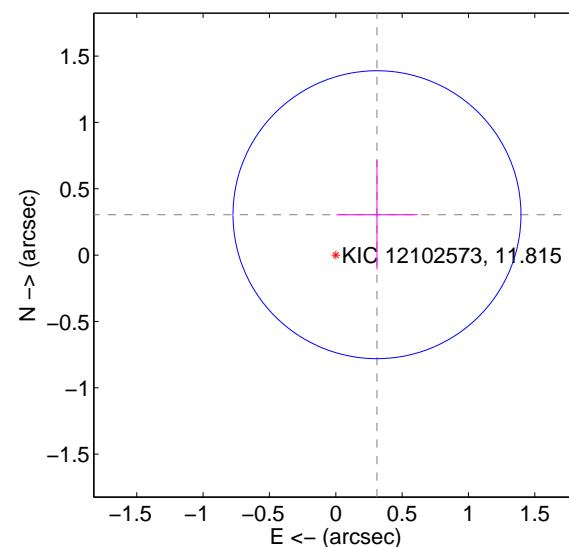
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

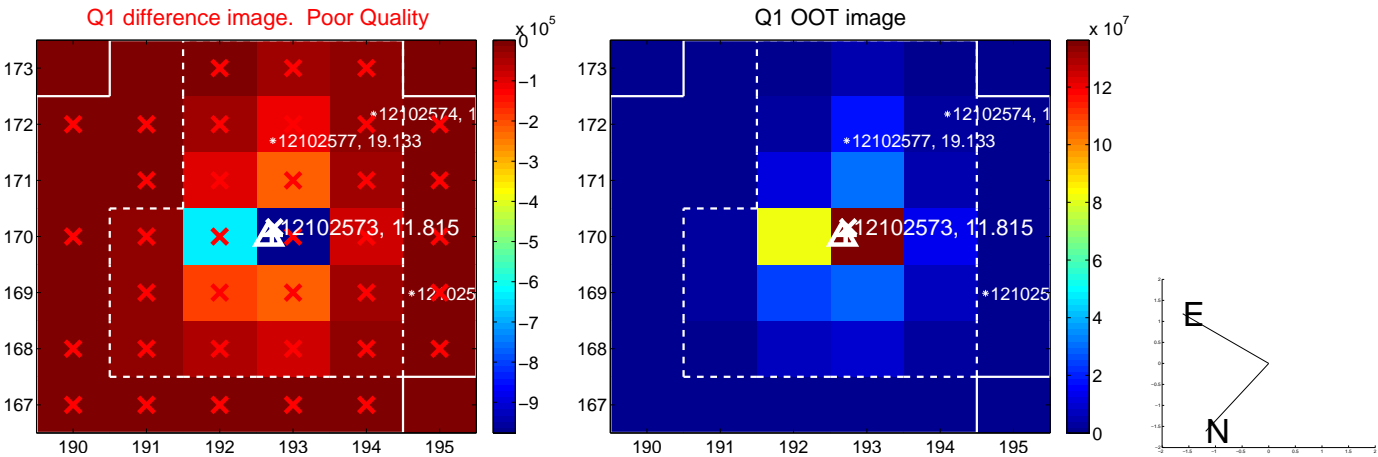


offset from photometric centroids

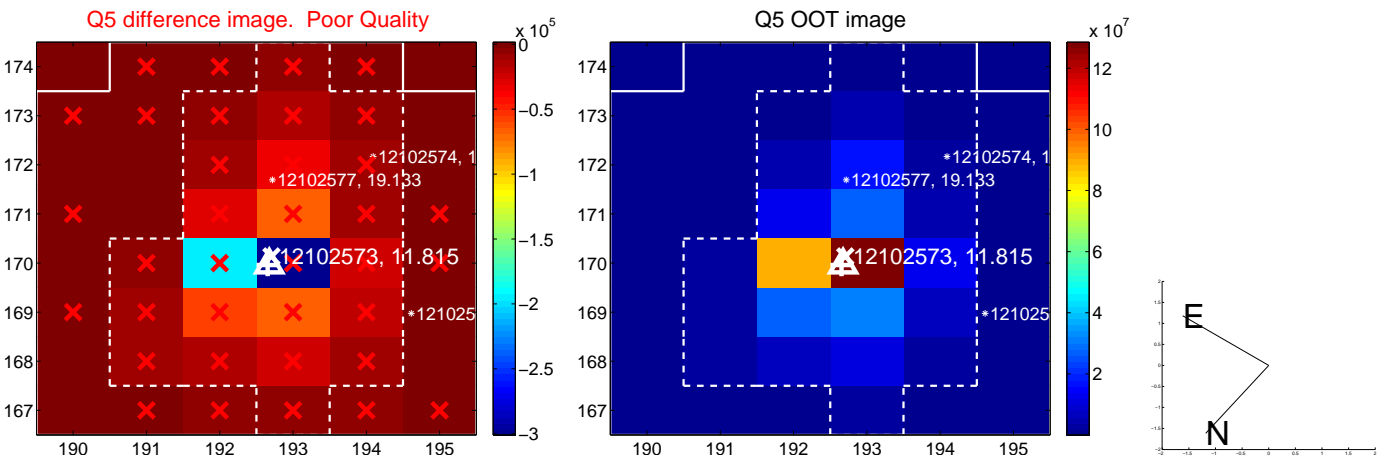


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

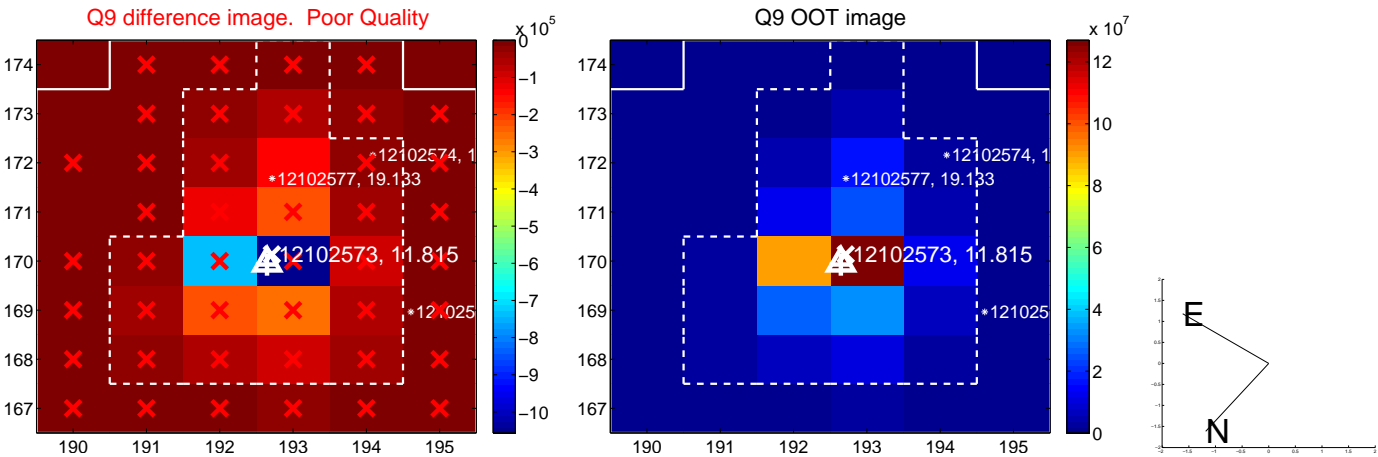
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



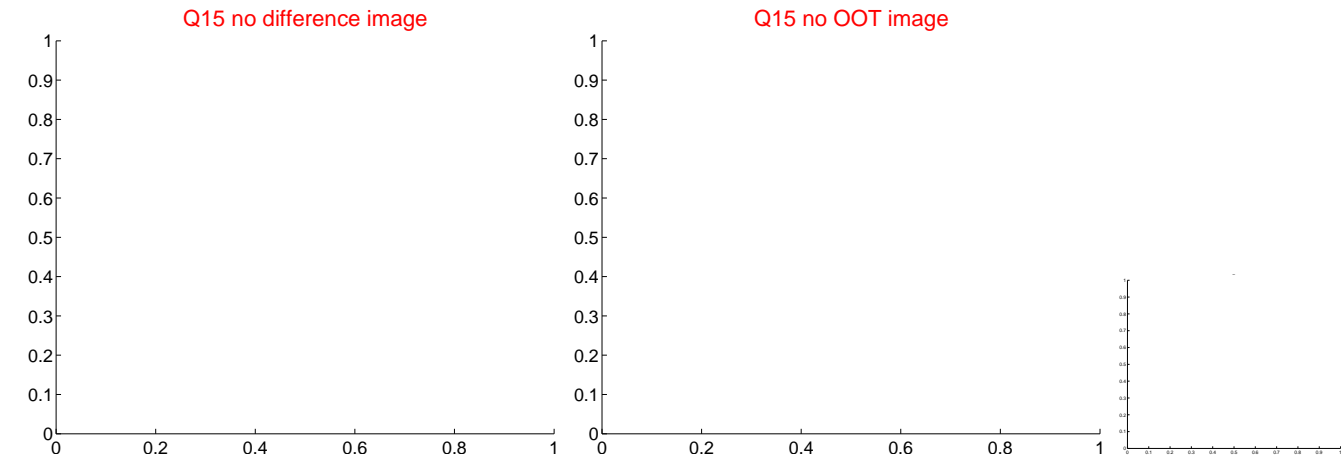
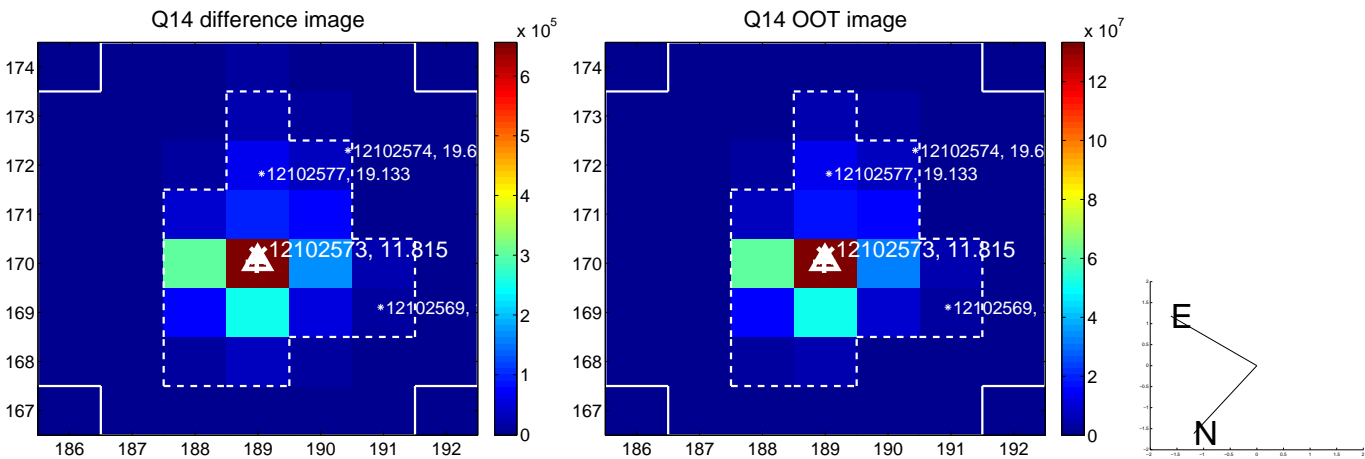
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



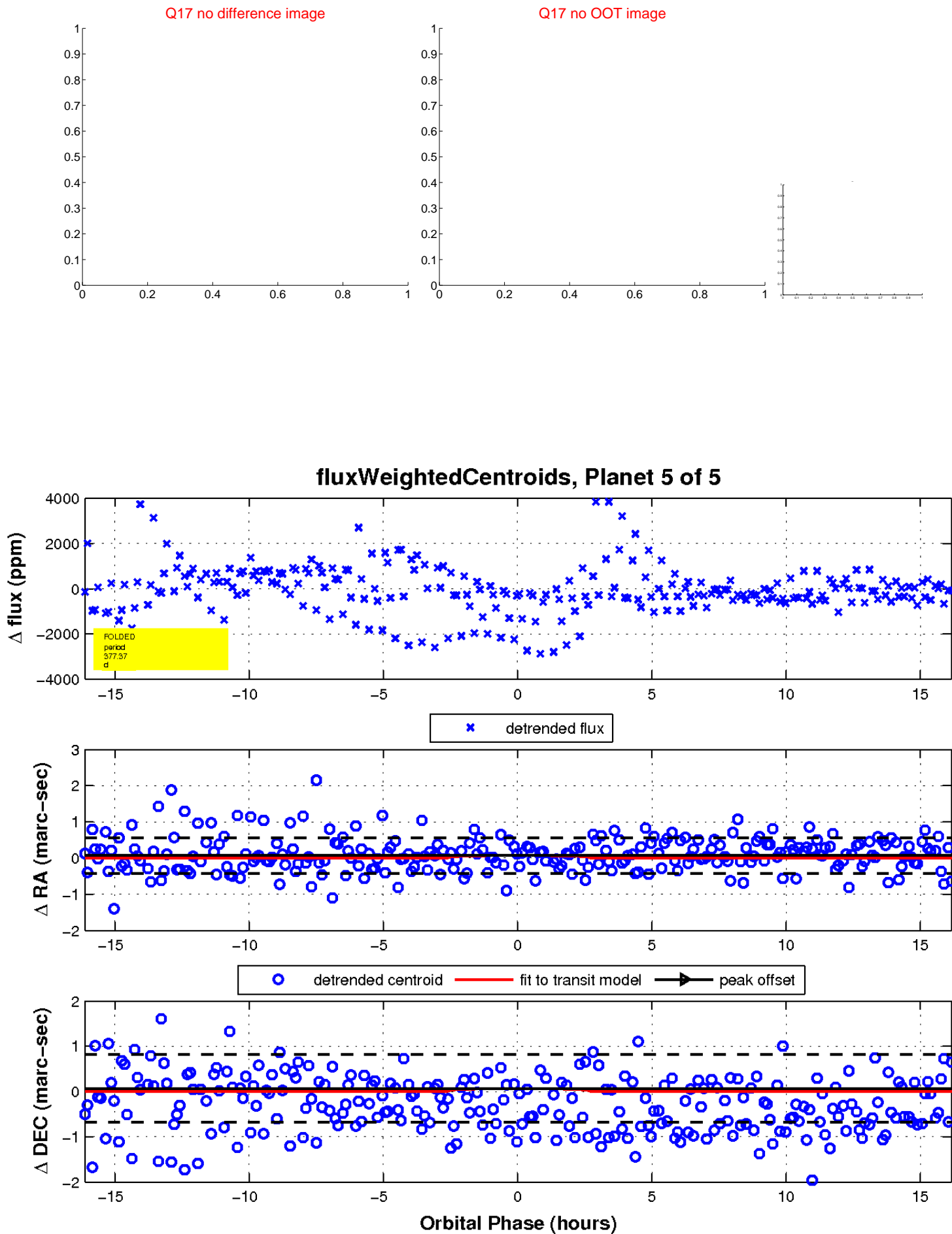
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

