

KIC 002159486

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})
002159486-01	OBS	No	274.566329	397.109481	994.8	10.365	12.6	4.6	0.73	4879	2.46	0.50
002159486-02	OBS	No	284.208354	314.805520	1322.7	4.561	9.9	5.5	0.73	4879	2.69	0.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002159486-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002159486-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

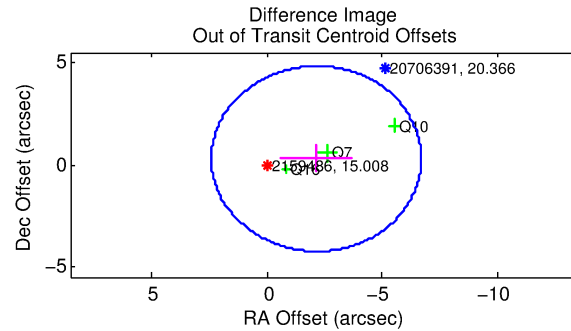
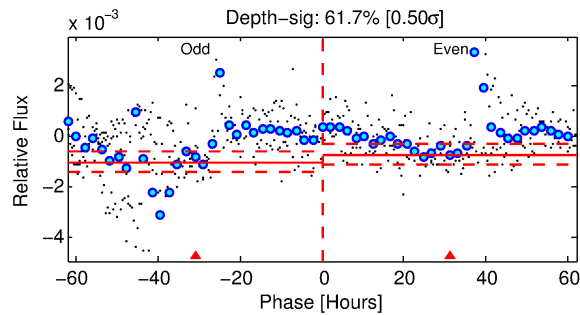
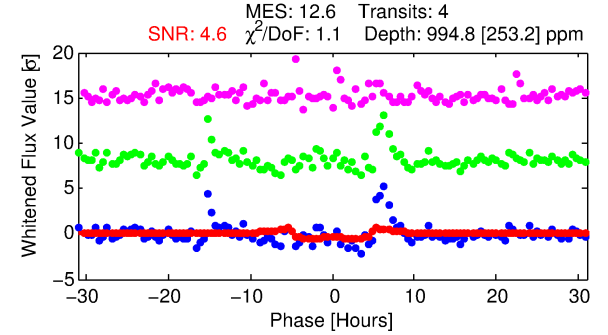
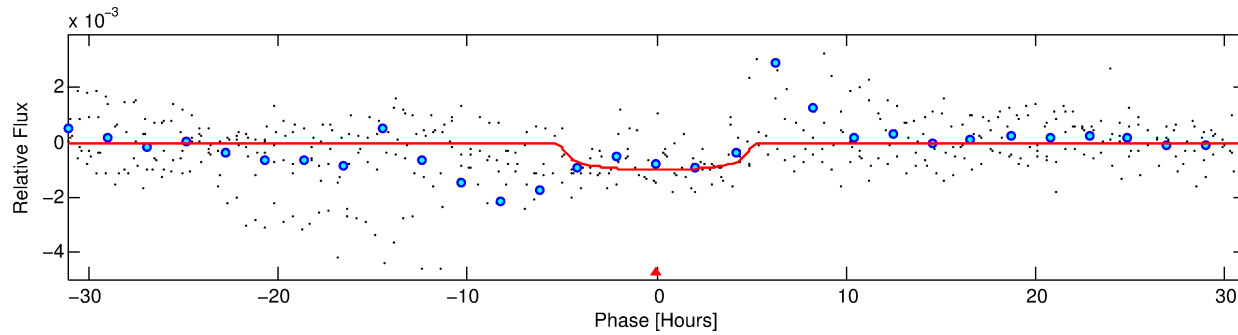
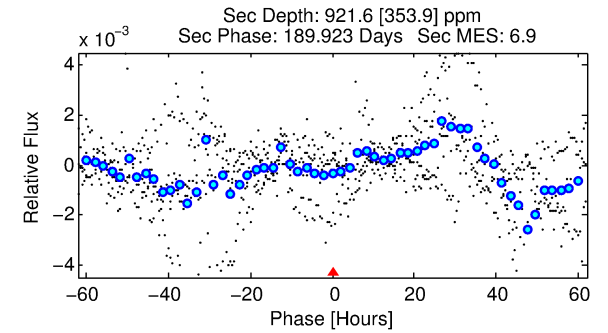
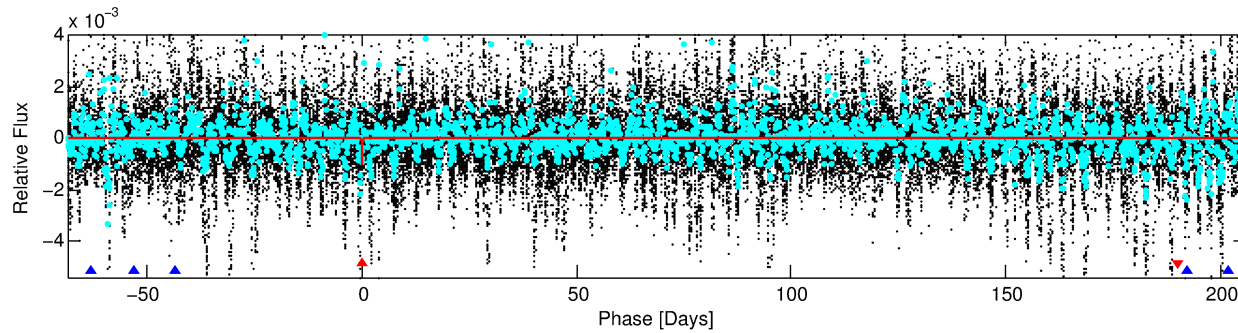
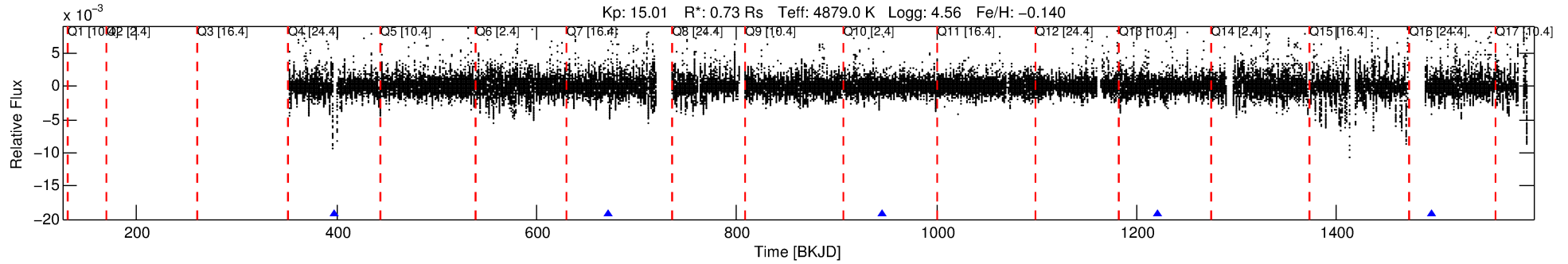
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002159486-01

No Significant Match Found

DV One-Page Summary

KIC: 2159486 Candidate: 1 of 2 Period: 274.566 d



DV Fit Results:

Period = 274.56633 [0.00938] d
Epoch = 397.1095 [0.0257] BKJD
Rp/R* = 0.0307 [0.0228]
a/R* = 155.04 [383.33]
b = 0.69 [1.92]
Seff = 0.50 [0.06]
Teq = 215 [6] K
Rp = 2.46 [1.83] Re
a = 0.7384 [0.0417] AU
Ag = 45635.51 [70097.99] [0.65σ]
Teffp = 4853 [1862] K [2.49σ]

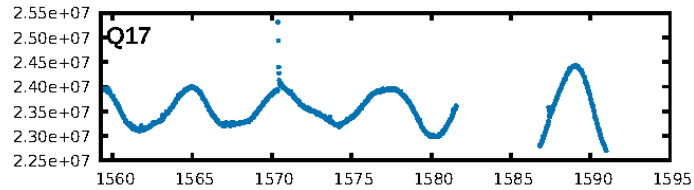
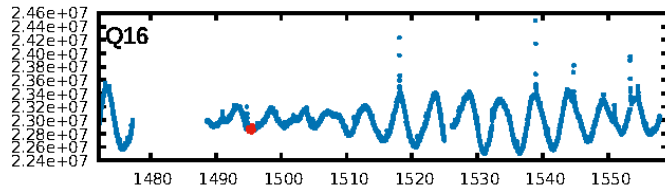
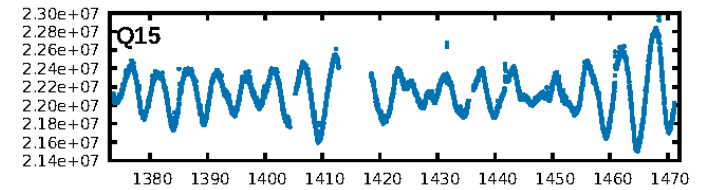
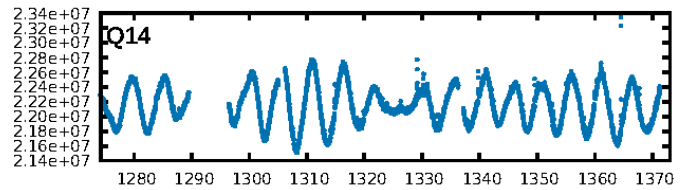
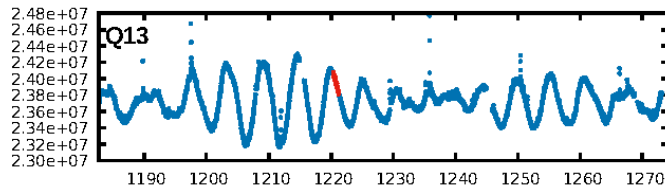
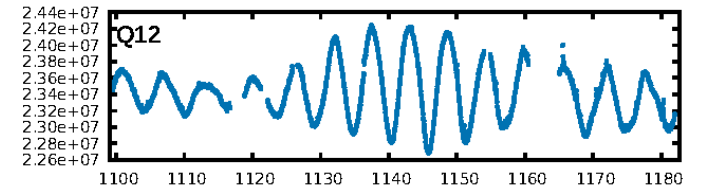
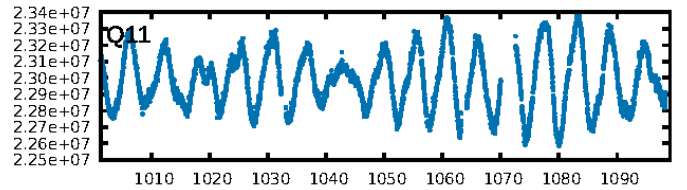
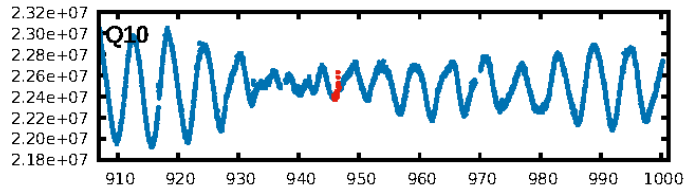
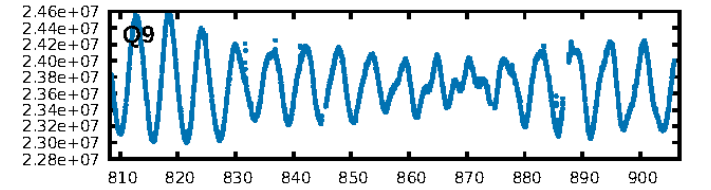
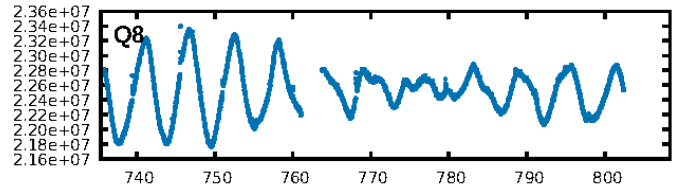
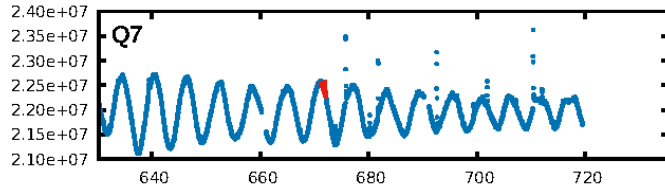
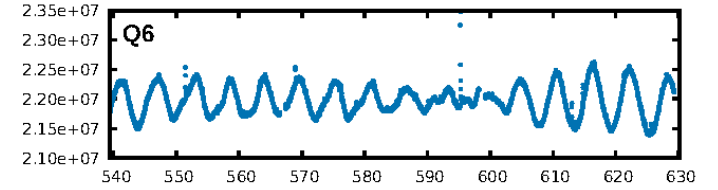
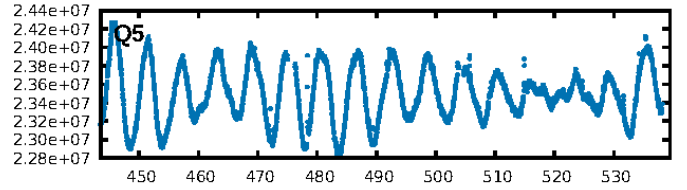
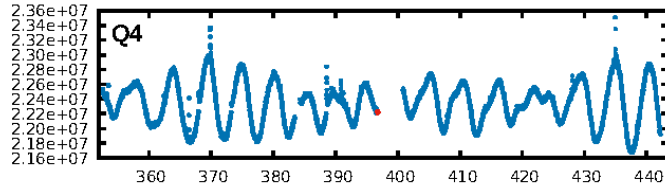
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [20.43σ]
ModelChiSquare2-sig: 14.0%
ModelChiSquareGof-sig: 98.3%
Bootstrap-pfa: 2.49e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.17
Centroid-sig: 19.2%
Centroid-so: 3.676 arcsec [2.14σ]
OotOffset-rm: 2.161 arcsec [1.43σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.236 arcsec [0.89σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

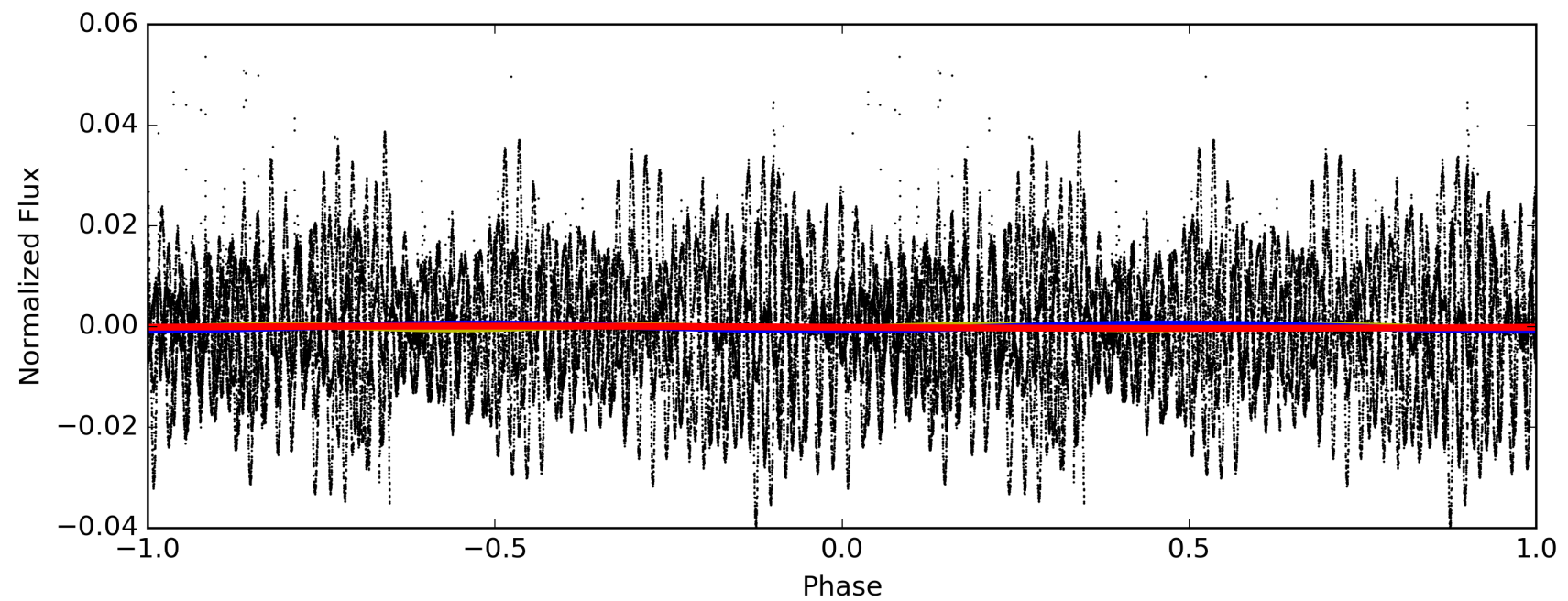
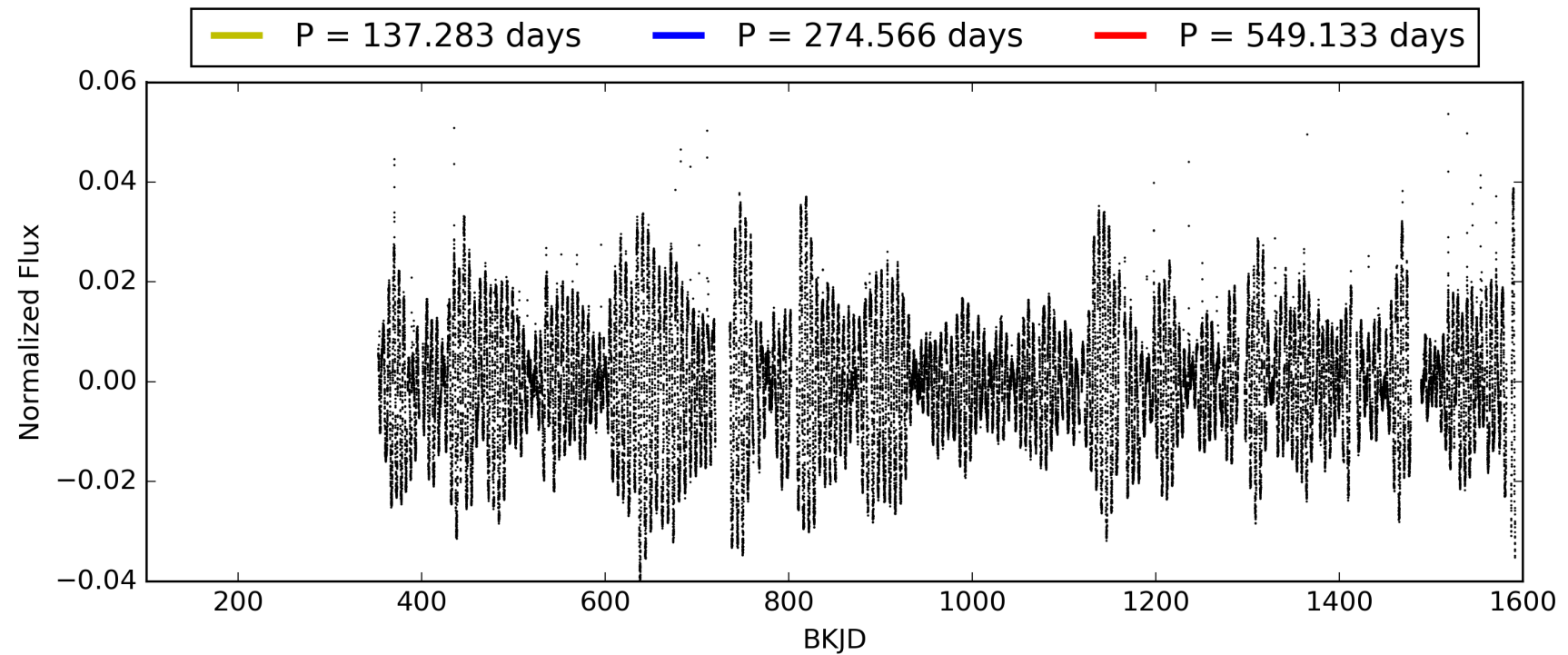
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 002159486-01, PDC Light Curves

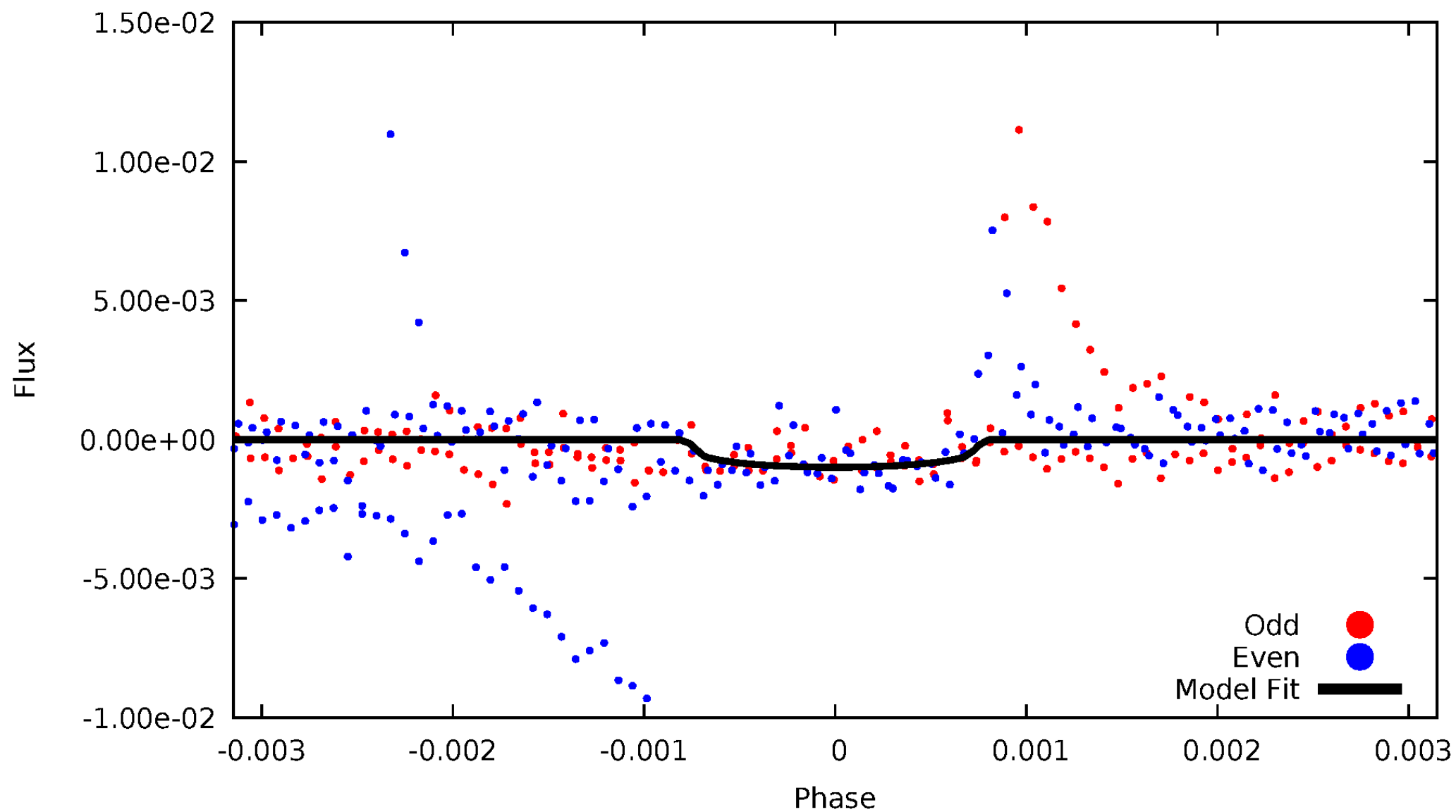


TCE 002159486-01



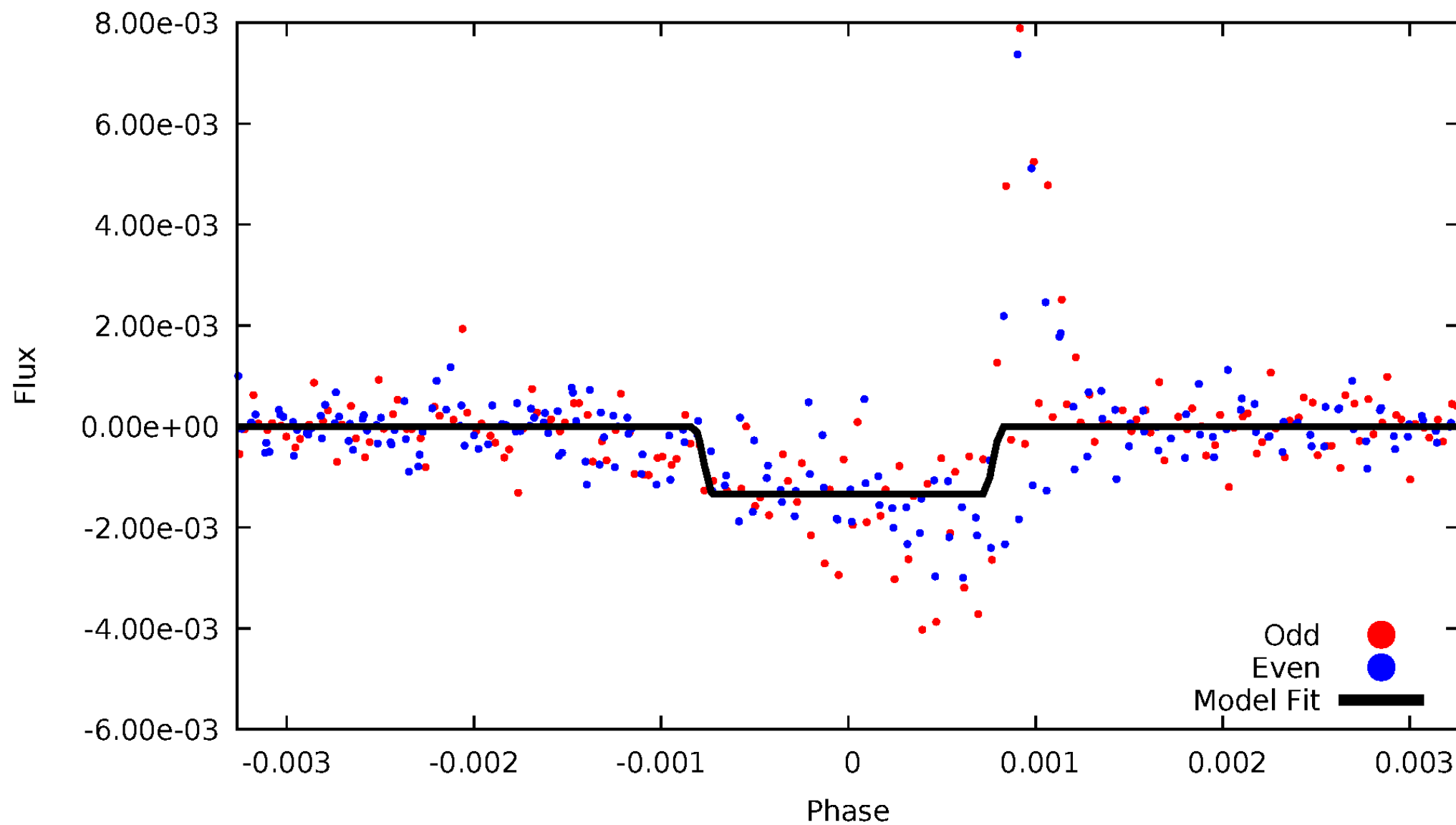
DV Odd/Even

TCE 002159486-01



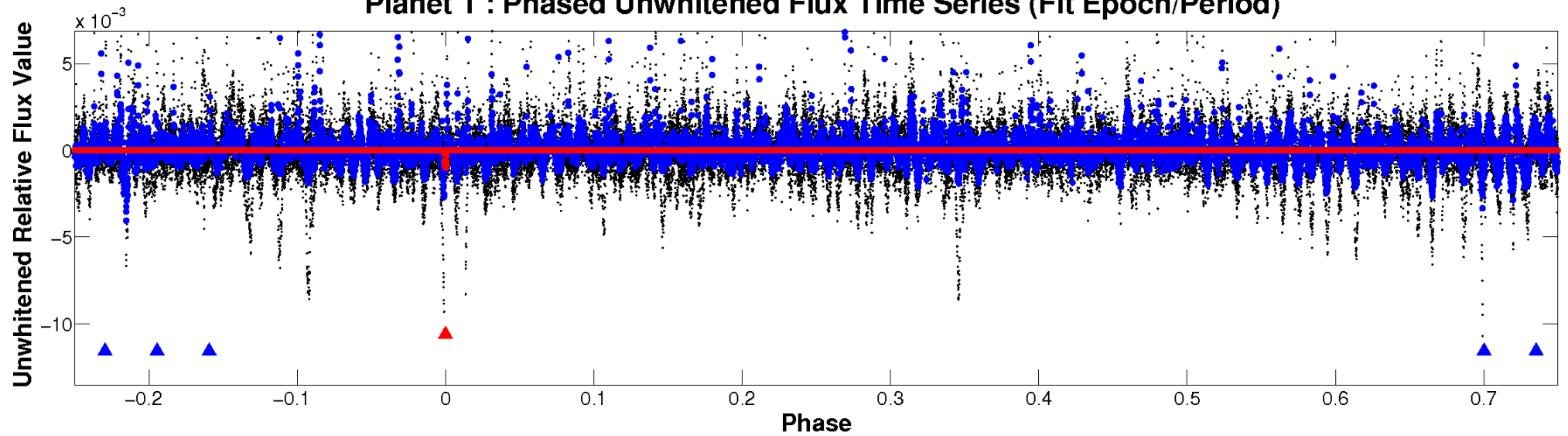
ALT Odd/Even

TCE 002159486-01

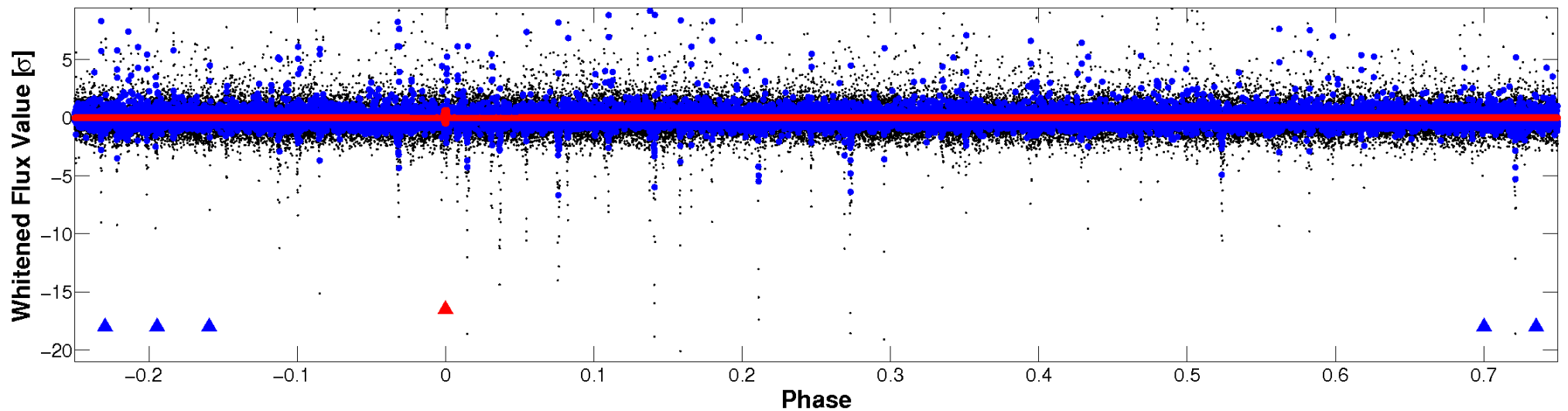


Non-Whitened Vs. Whitened Light Curve

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

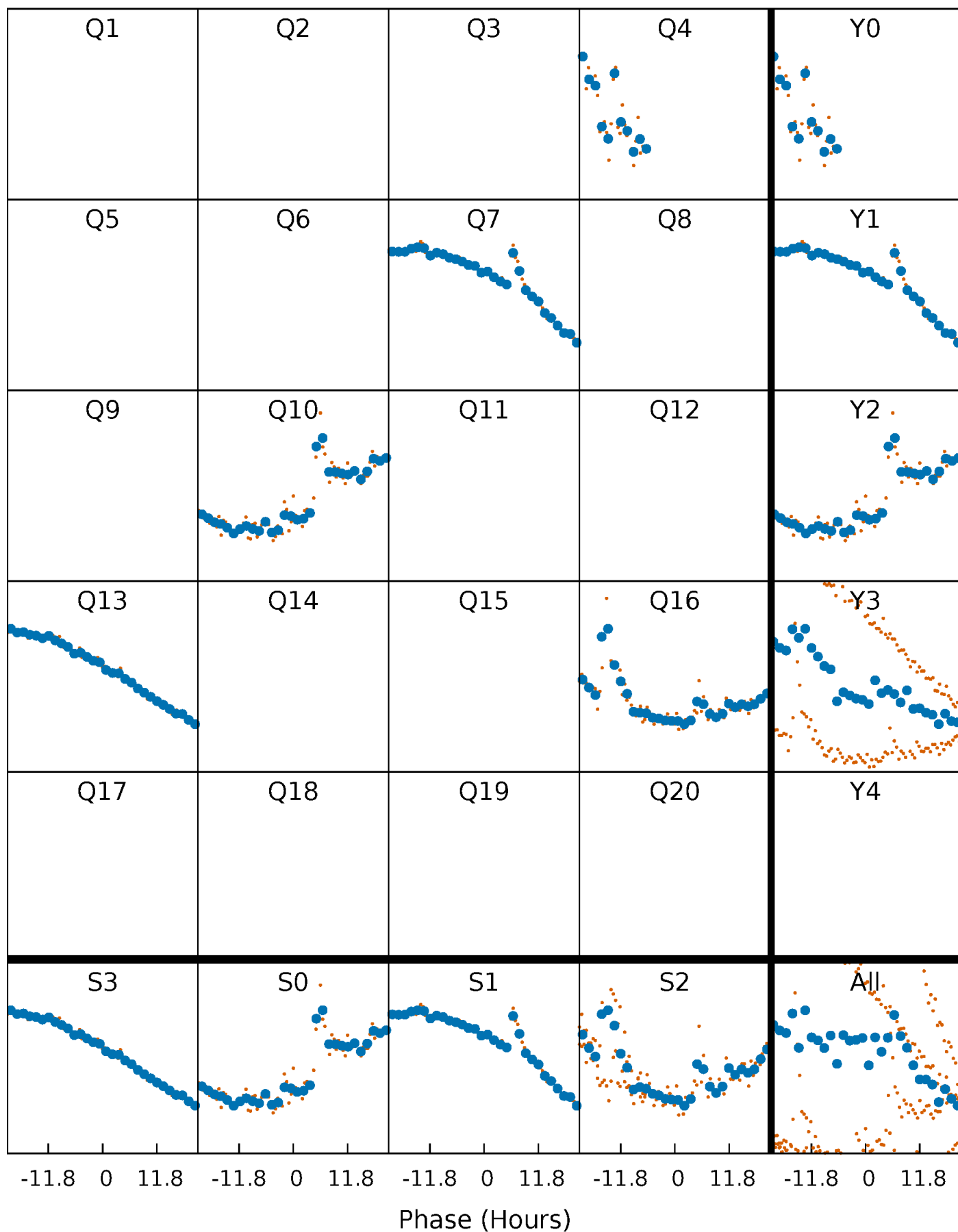


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



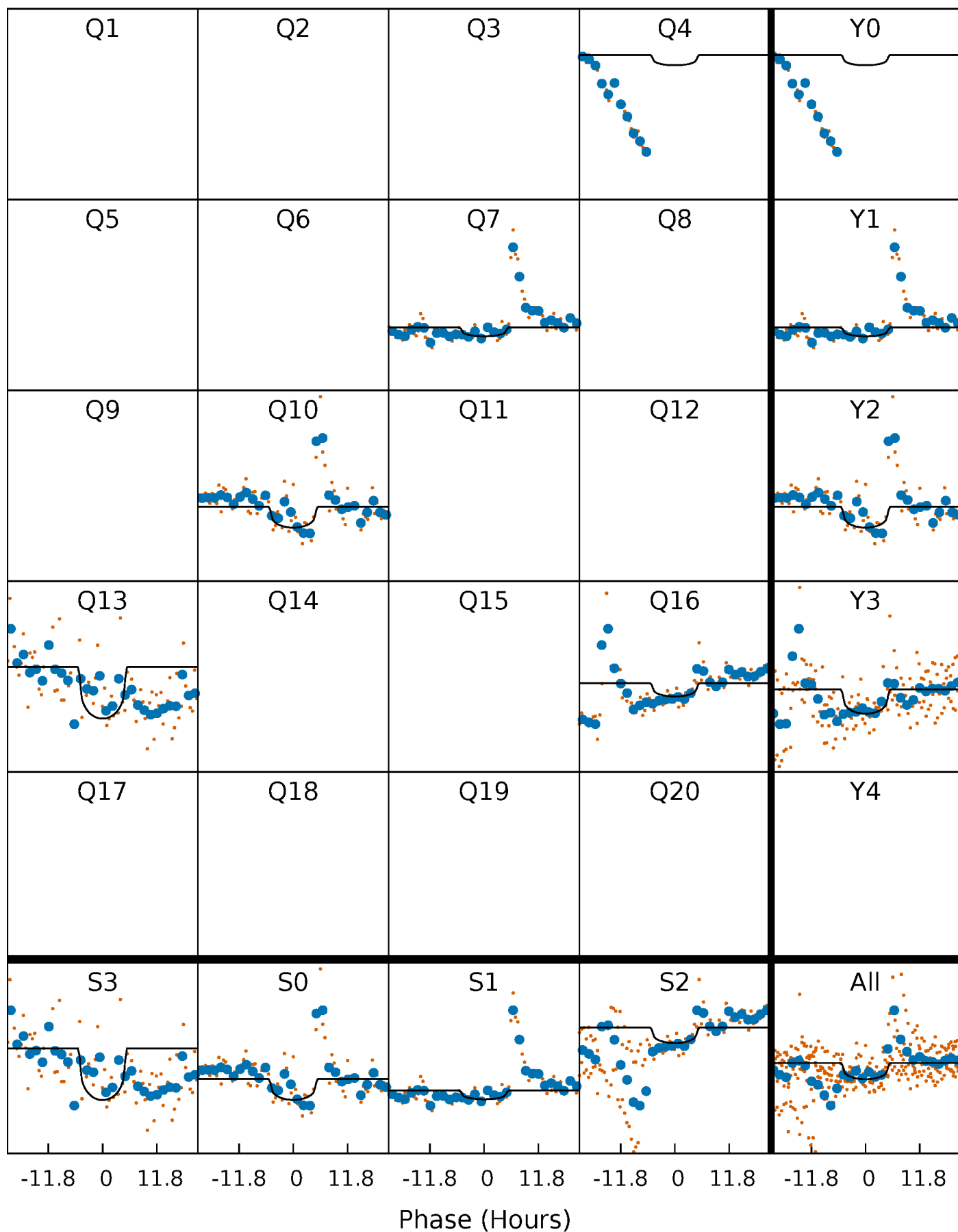
PDC Quarter-Phased Transit Curves

TCE 002159486-01 P=274.566329 Days $T_0=397.109481$ (BKJD)



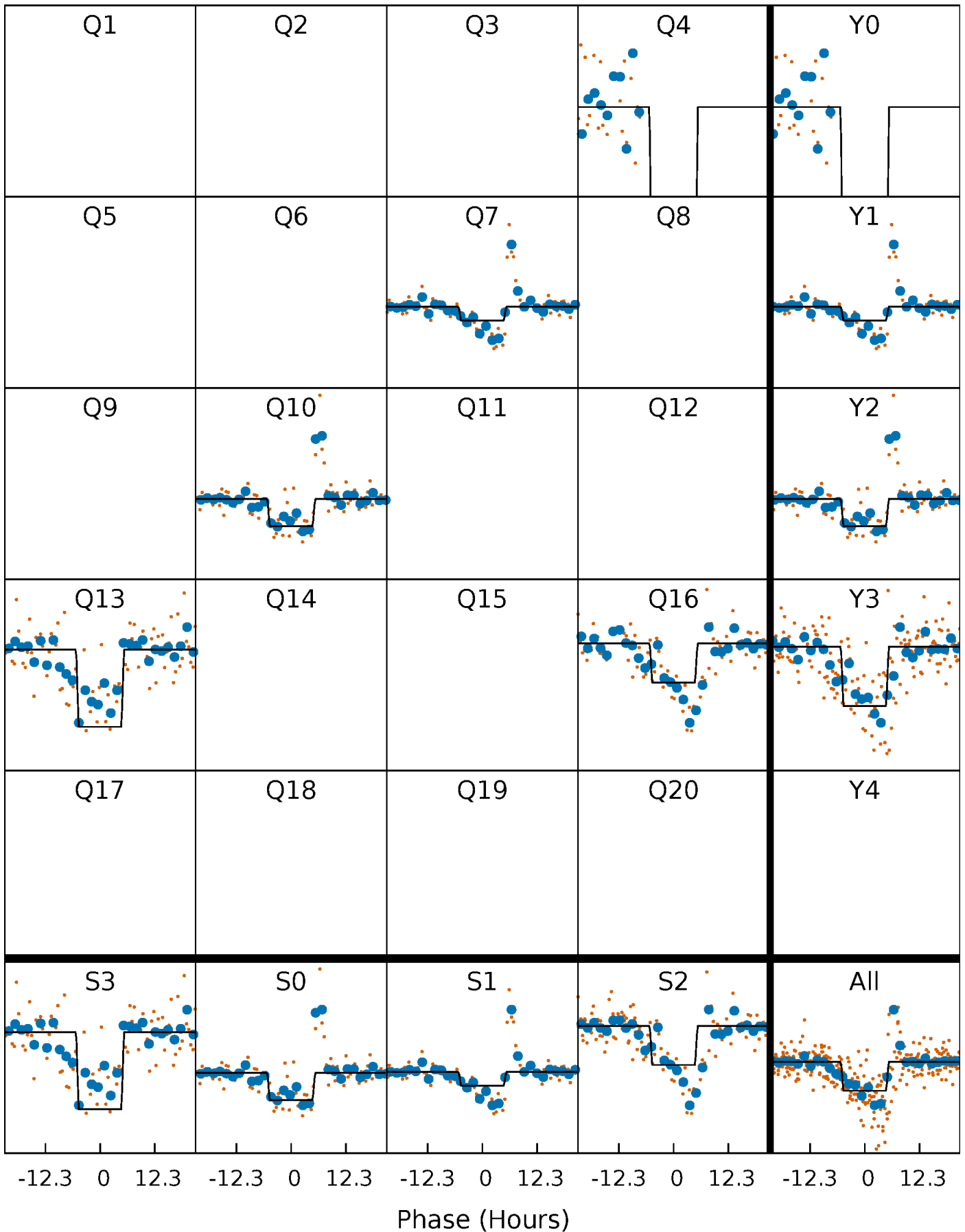
DV Quarter-Phased Transit Curves

TCE 002159486-01 P=274.566329 Days $T_0=397.109481$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

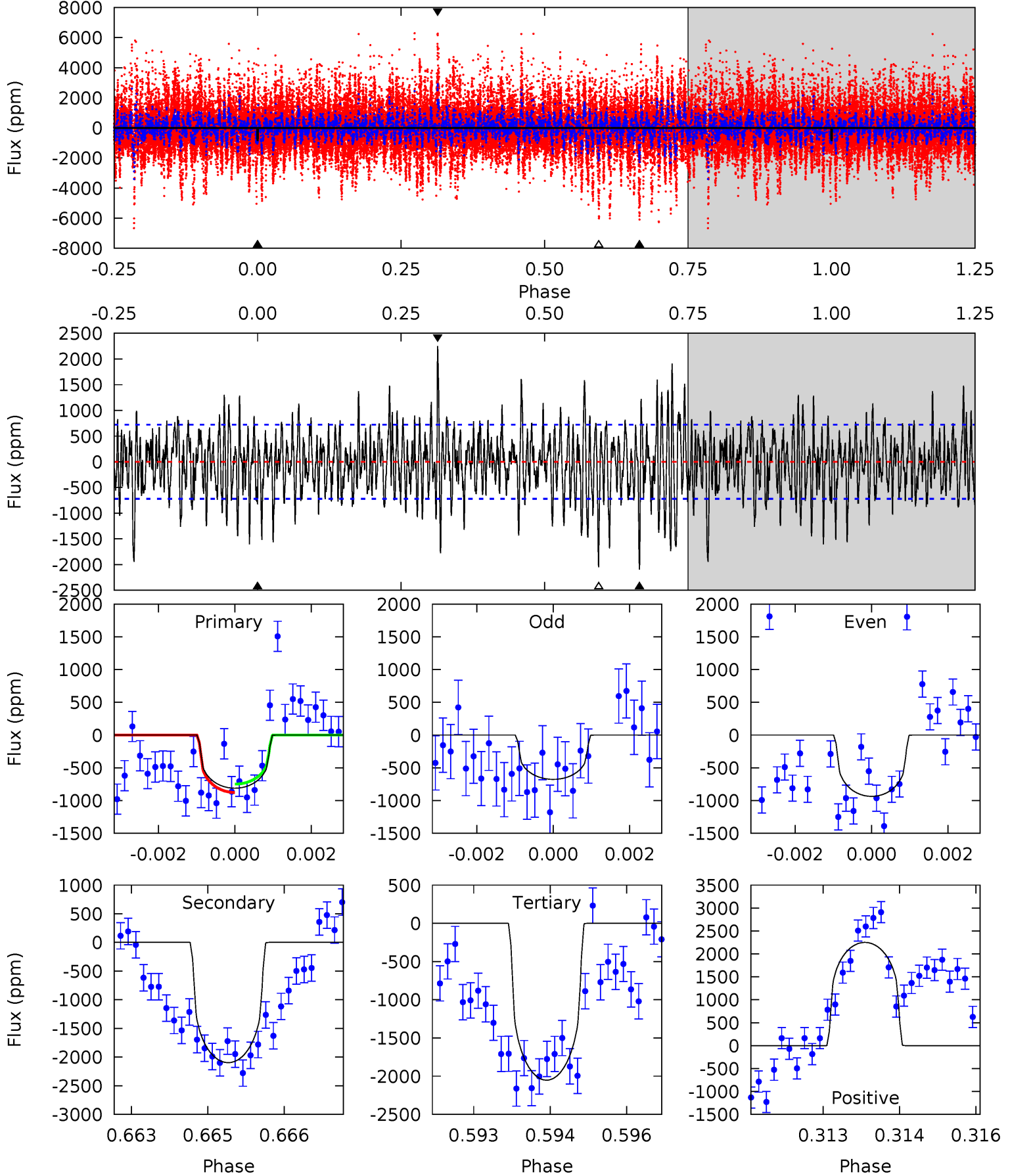
TCE 002159486-01 P=274.531690 Days $T_0=397.156478$ (BKJD)



DV Model-Shift Uniqueness Test

002159486-01, P = 274.566329 Days, E = 122.543152 Days

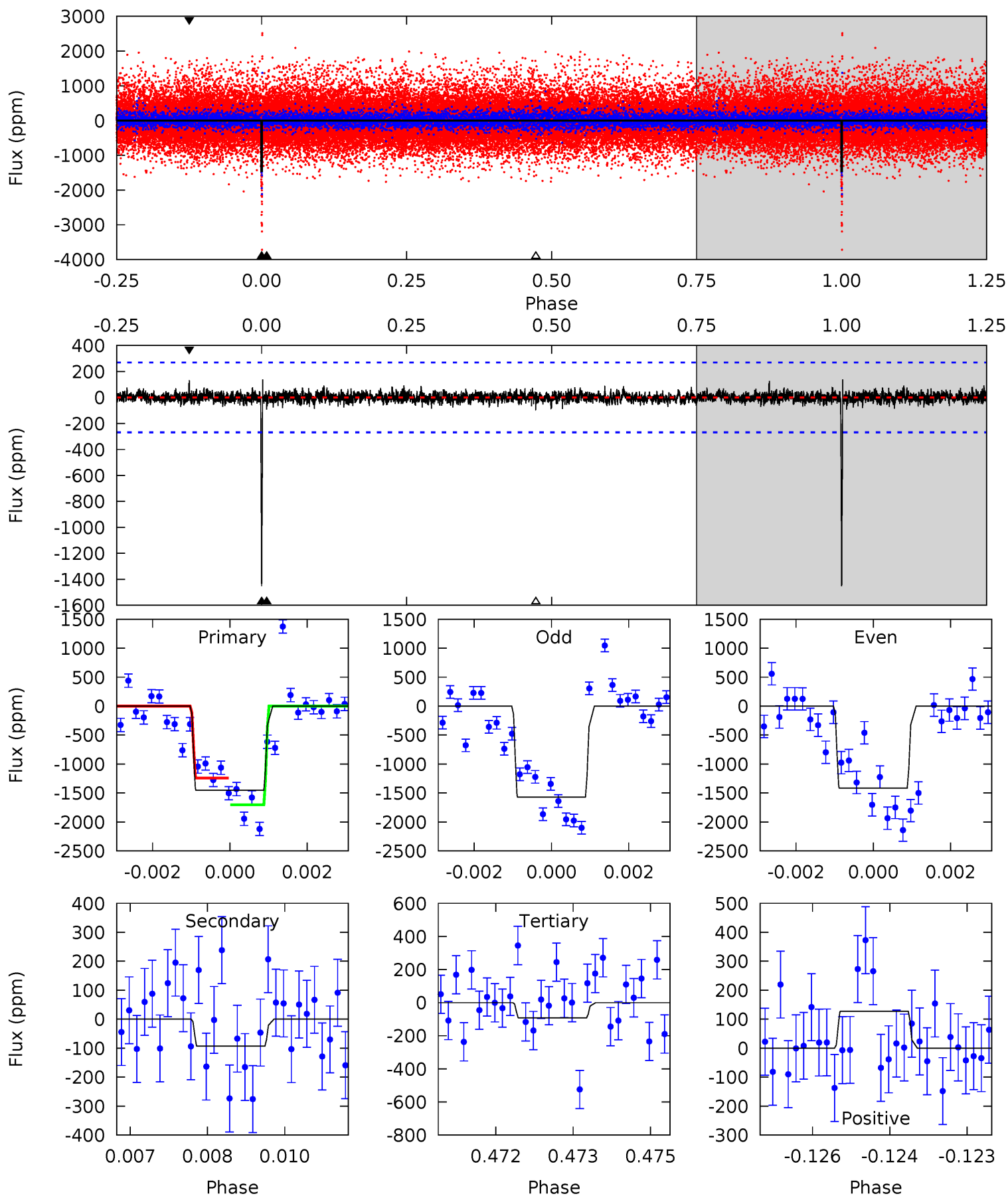
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.04	15.6	15.3	16.7	5.36	3.15	4.12	-9.22	-10.7	0.33	-1.14	0.90	1.14	0.52	0.47



Alt Model-Shift Uniqueness Test

002159486-01, P = 274.531690 Days, E = 122.624788 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.0	1.86	1.84	2.53	5.36	3.15	0.47	27.2	26.5	0.02	-0.67	1.52	1.07	0.09	4.61



Stellar Parameters For KIC 002159486

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4879^{+88}_{-78}	$4.558^{+0.052}_{-0.021}$	$-0.140^{+0.150}_{-0.150}$	$0.735^{+0.033}_{-0.044}$	$0.712^{+0.047}_{-0.030}$	$2.530^{+0.496}_{-0.200}$
	+2%/-2%	+1%/-0%	+107%/-107%	+4%/-6%	+7%/-4%	+20%/-8%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002159486-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2097 ± 135	$2.48^{+1.70}_{-1.43}$	299^{+6}_{-7}	5811^{+3851}_{-1200}	$102561^{+484633}_{-67106}$
Alt.	-93 ± 50	$3.15^{+1.56}_{-1.73}$	299^{+7}_{-6}	2997^{+839}_{-432}	2683^{+10360}_{-1849}

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

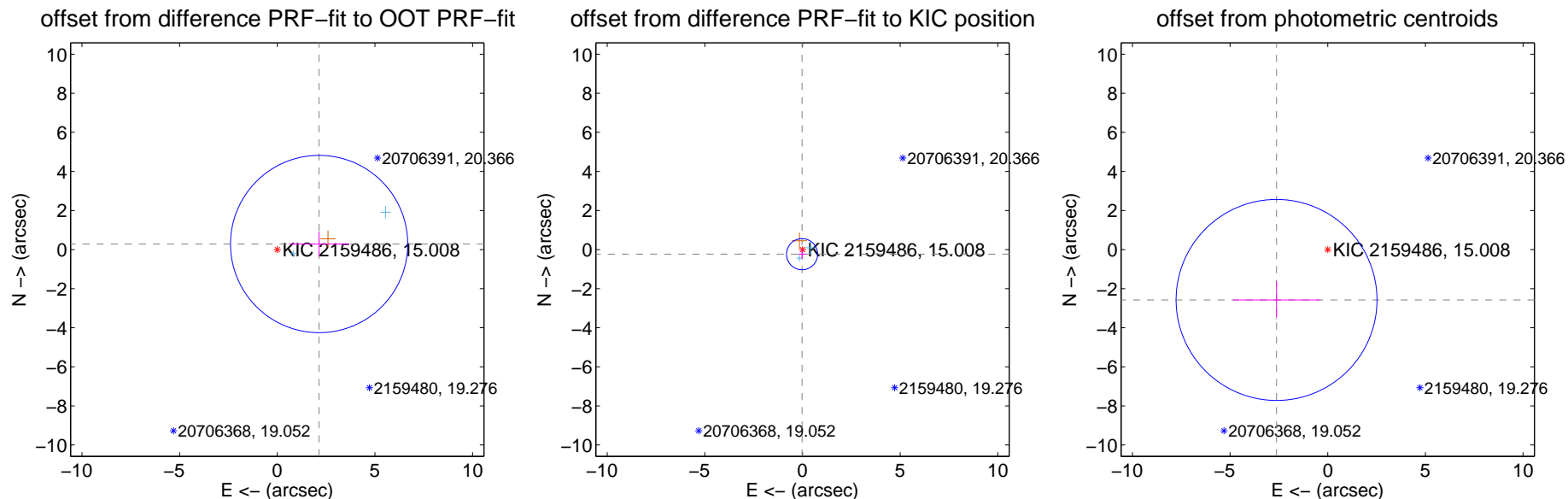
DV Centroid Data

Supplemental centroid analysis for 002159486-01. Kepler magnitude: 15.01. Transit SNR 4.57

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.00 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.161 ± 1.512	1.43	-2.143 ± 1.523	0.284 ± 0.640
PRF-fit source offset from KIC position	0.236 ± 0.265	0.89	0.023 ± 0.201	-0.235 ± 0.266
photometric centroid source offset	3.68 ± 1.71	2.14	2.62 ± 2.22	-2.58 ± 0.93

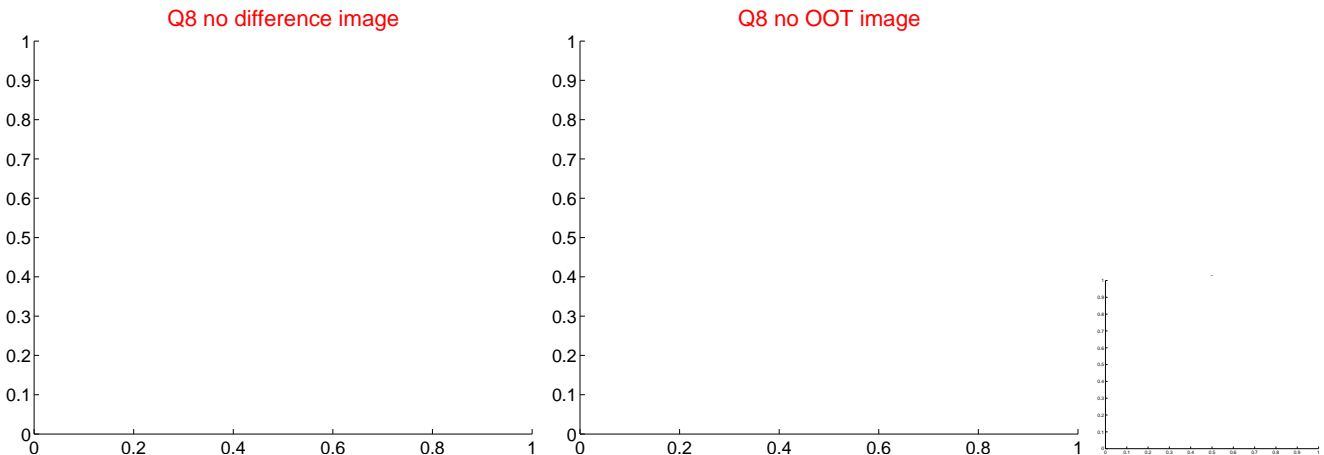
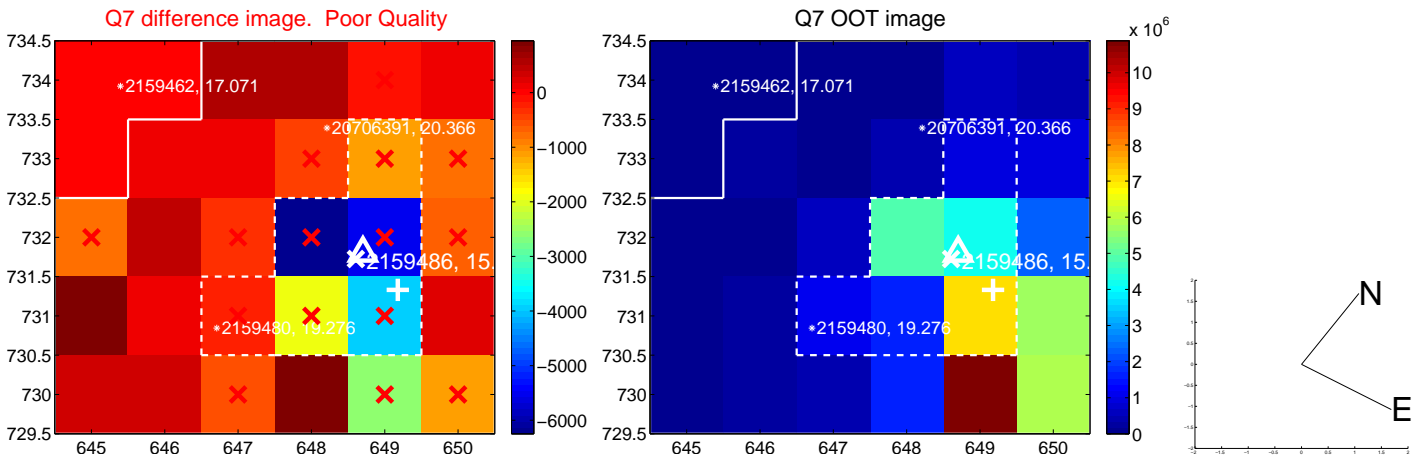
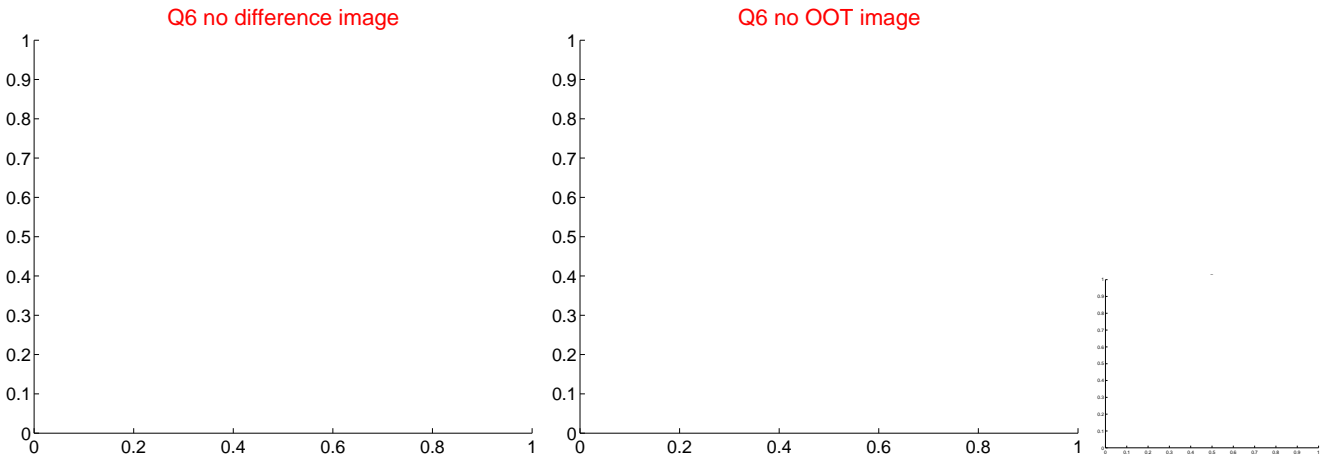
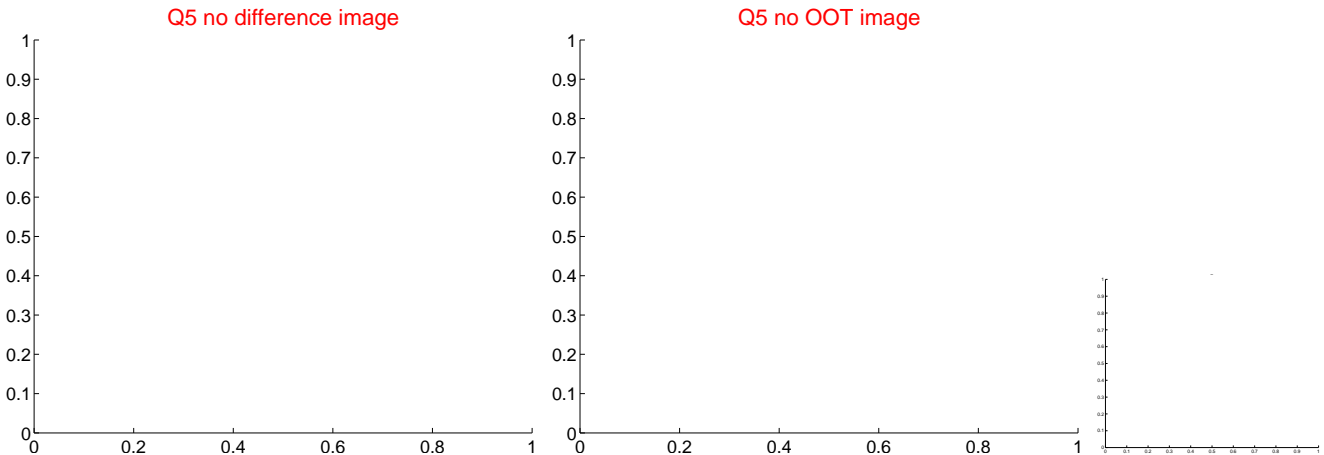


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

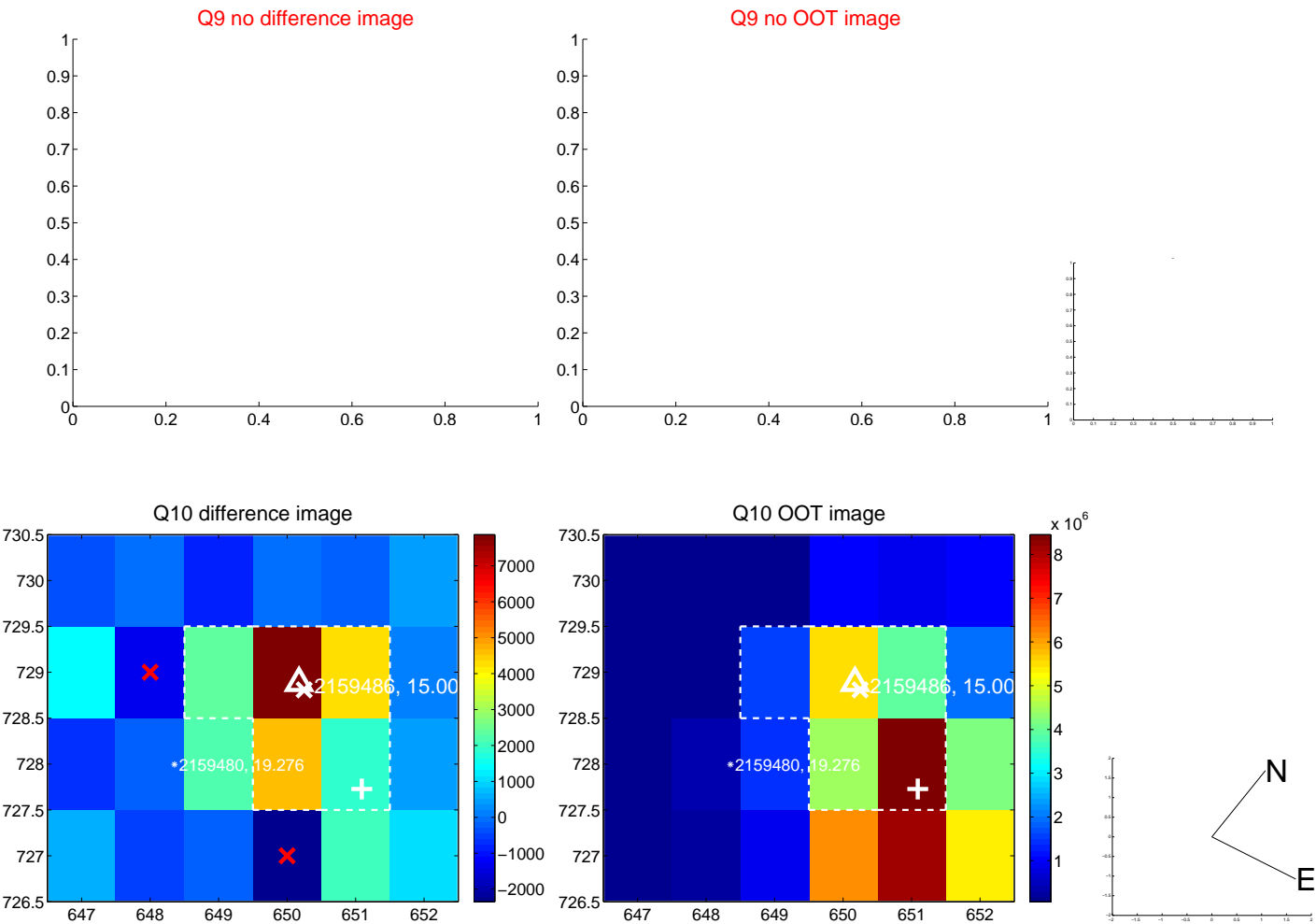
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



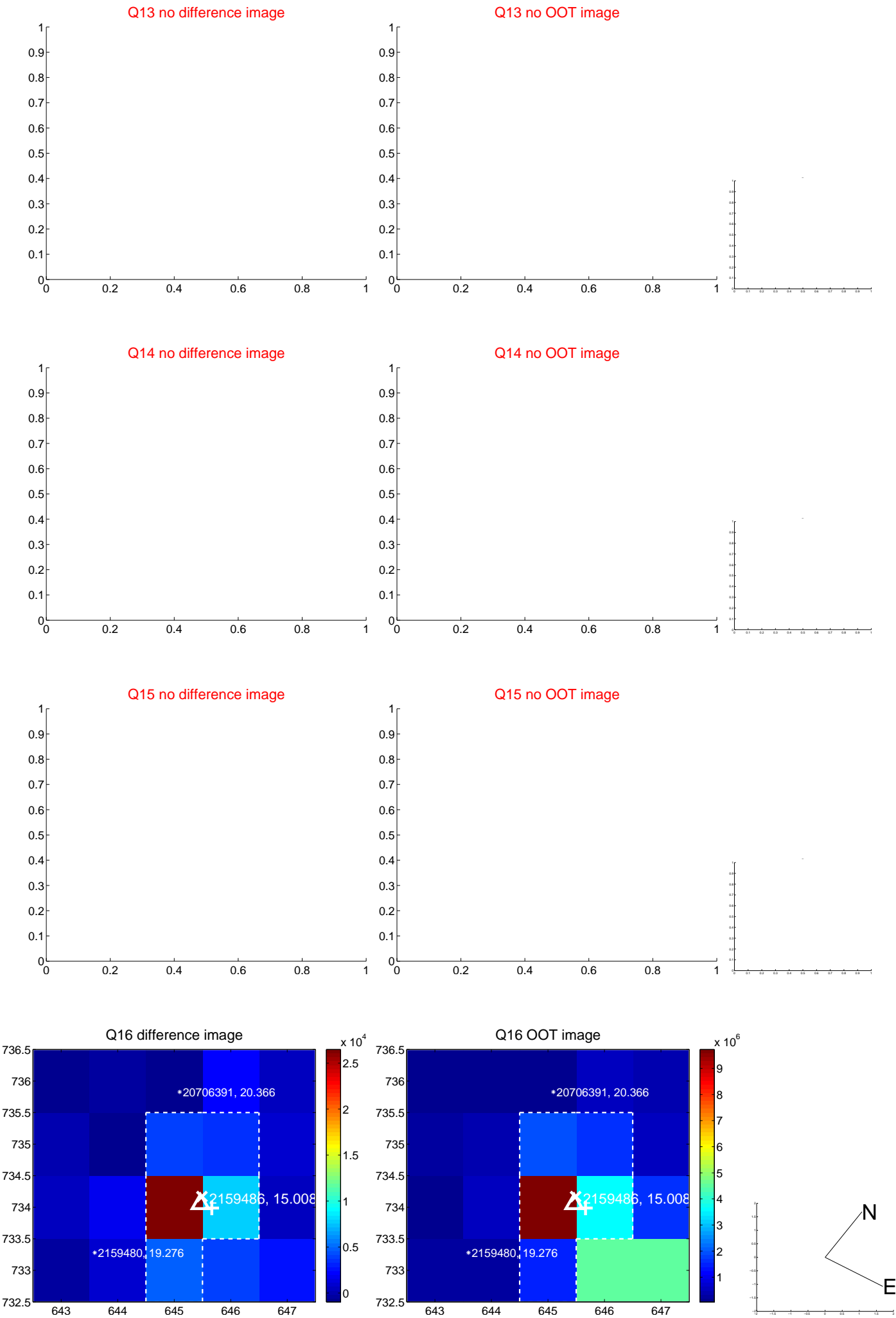
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



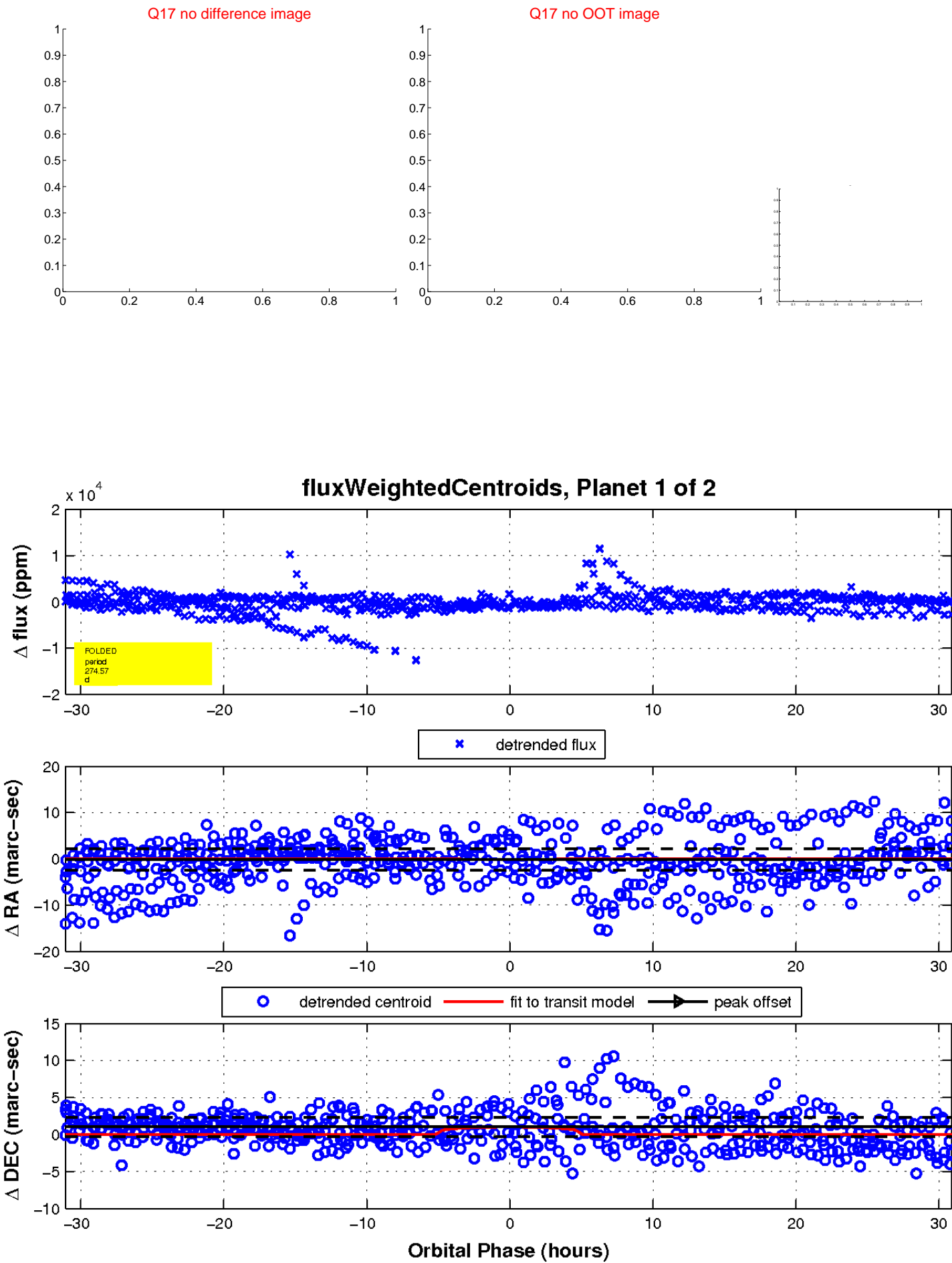
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

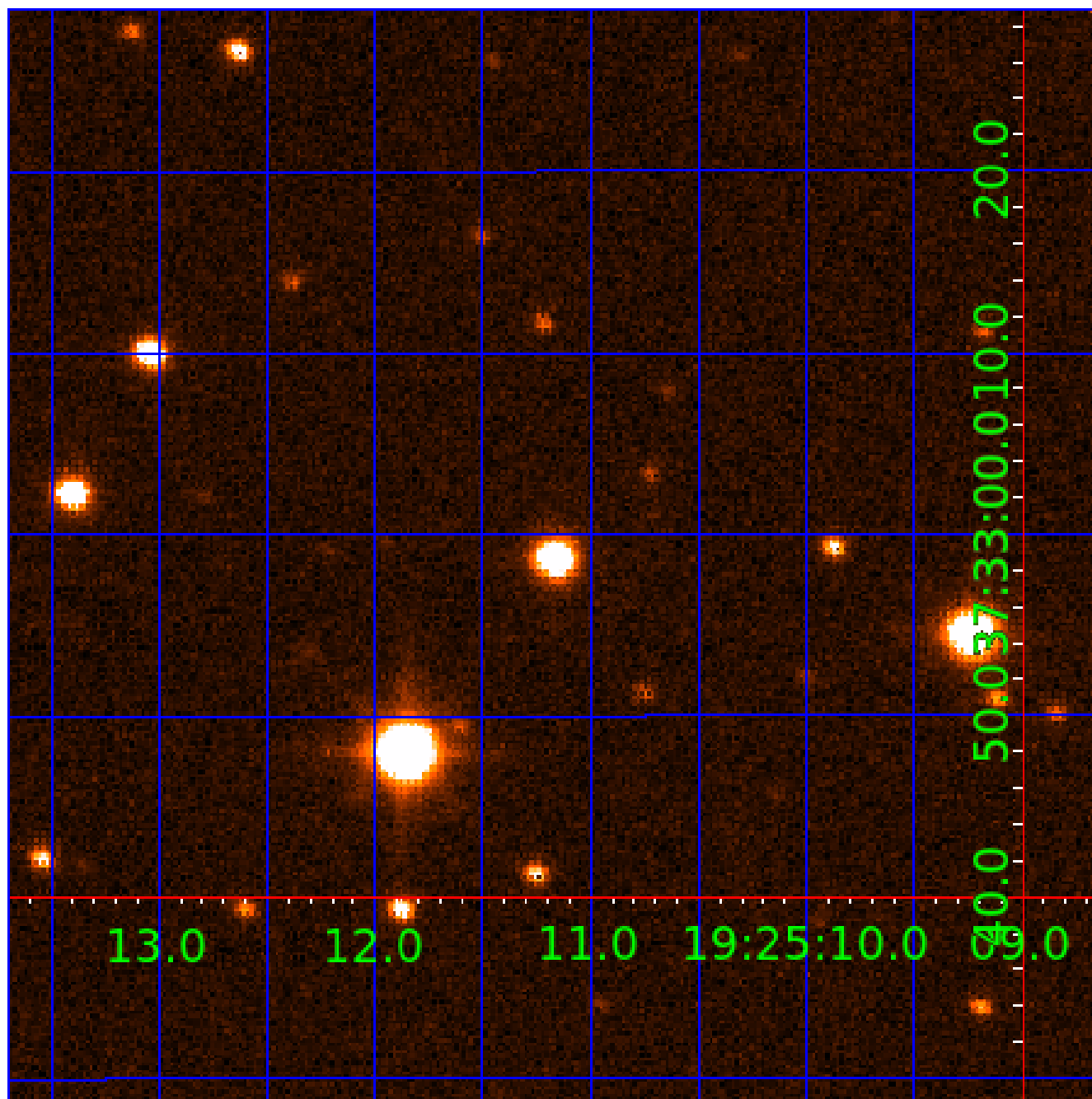


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002159486

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})
002159486-01	OBS	No	274.566329	397.109481	994.8	10.365	12.6	4.6	0.73	4879	2.46	0.50
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Robovetter Results

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002159486-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

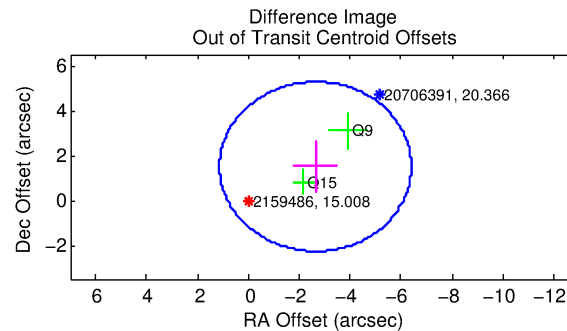
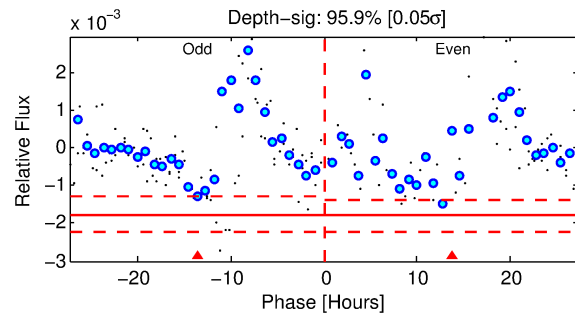
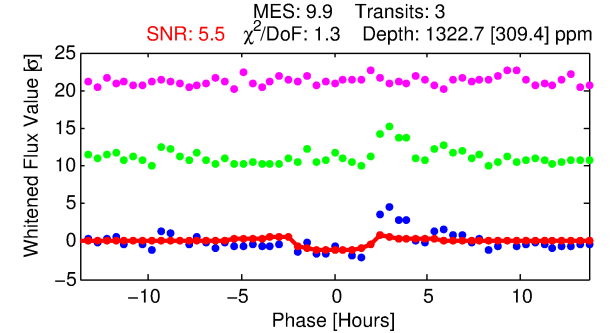
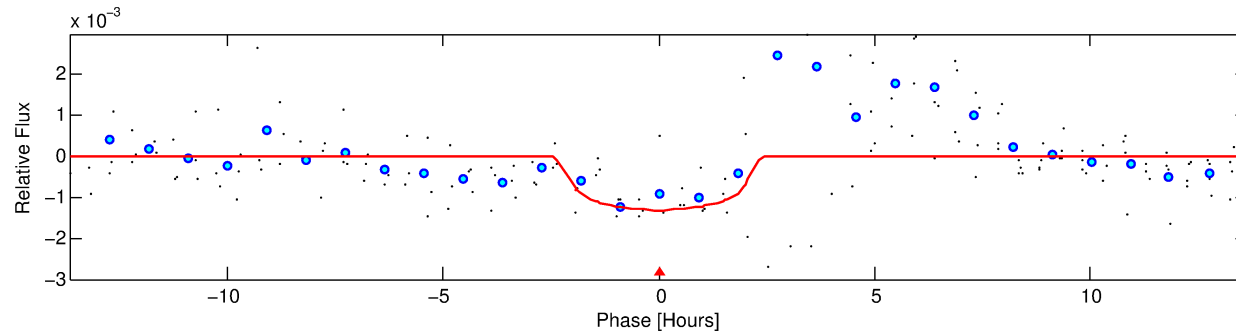
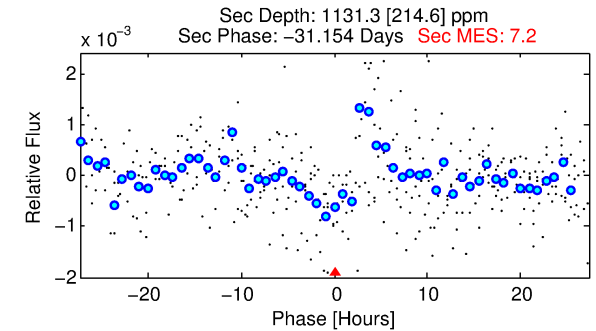
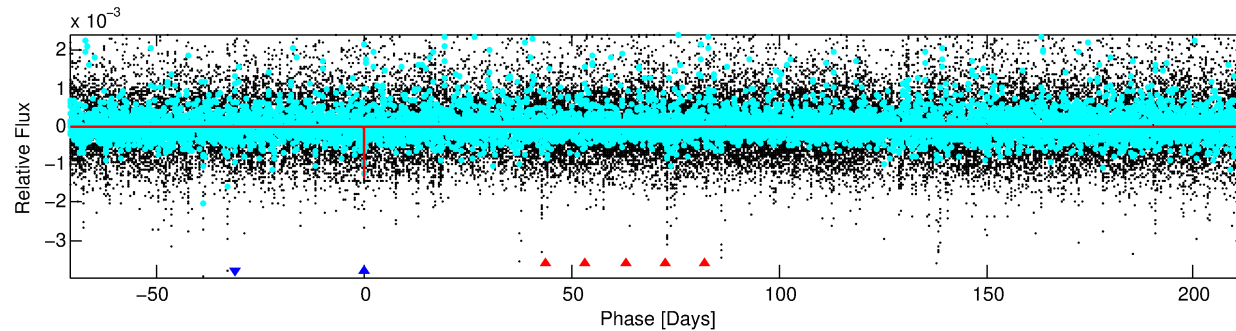
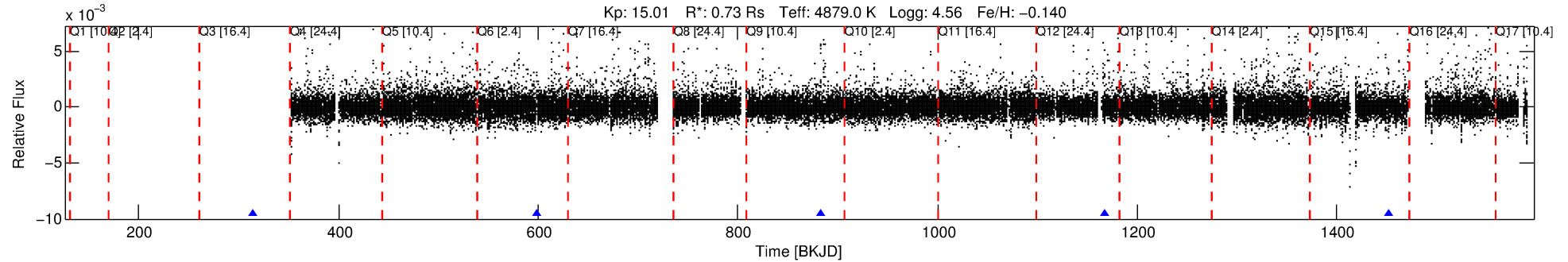
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002159486-02

No Significant Match Found

DV One-Page Summary

KIC: 2159486 Candidate: 2 of 2 Period: 284.208 d



DV Fit Results:

Period = 284.20835 [0.00823] d
Epoch = 314.8055 [0.0249] BKJD
Rp/R* = 0.0335 [0.0827]
a/R* = 431.87 [3492.13]
b = 0.50 [12.58]
Seff = 0.48 [0.06]
Teq = 212 [6] K
Rp = 2.69 [6.64] Re
a = 0.7556 [0.0426] AU
Ag = 49088.24 [242321.10] [0.20σ]
Teffp = 4885 [6029] K [0.78σ]

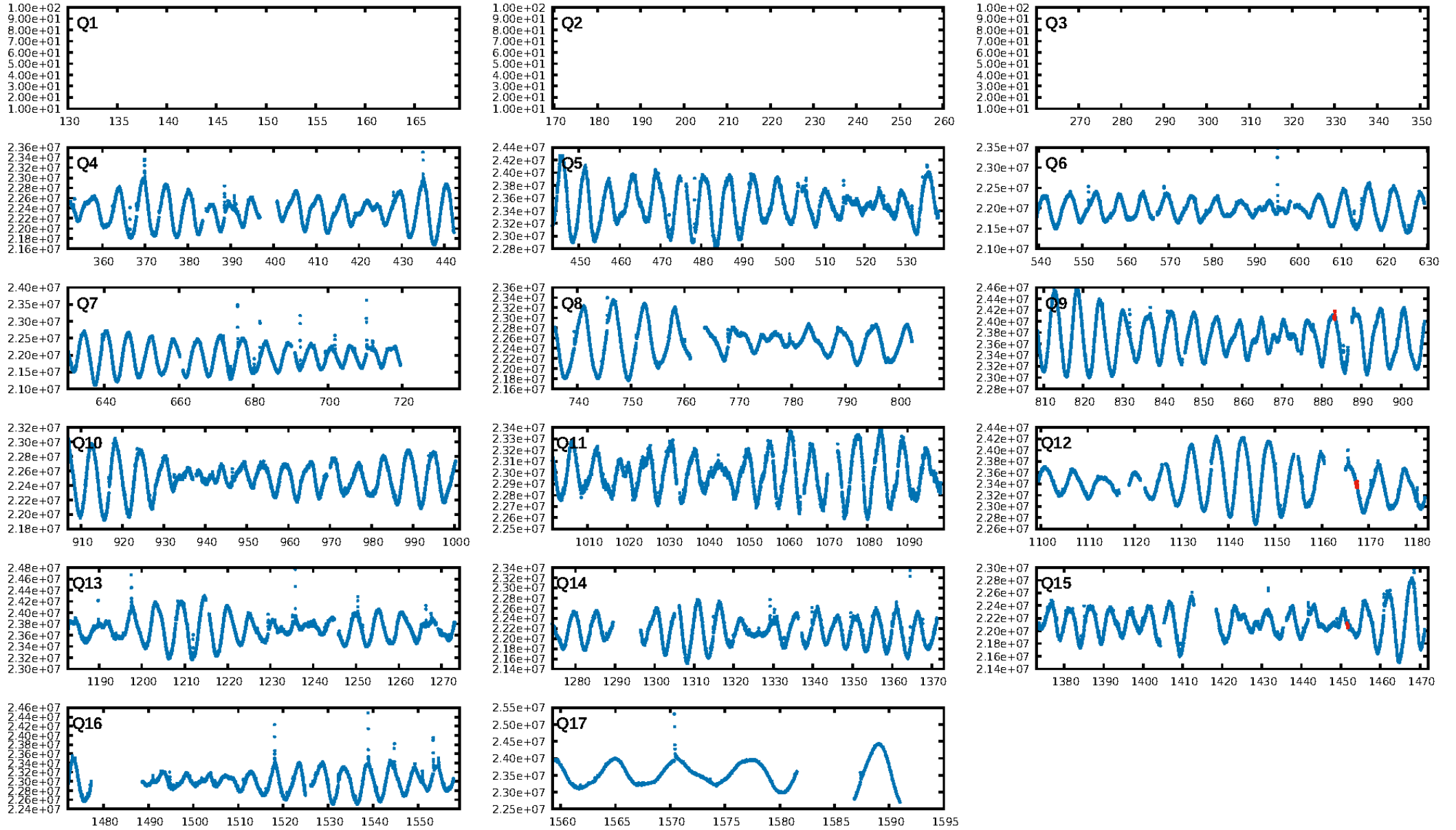
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.43σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.9%
ModelChiSquareGof-sig: 77.7%
Bootstrap-pfa: 4.29e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.01328
Centroid-sig: 60.9%
Centroid-so: 2.676 arcsec [1.73σ]
OotOffset-rm: 3.035 arcsec [2.41σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-rm: 0.562 arcsec [1.25σ]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

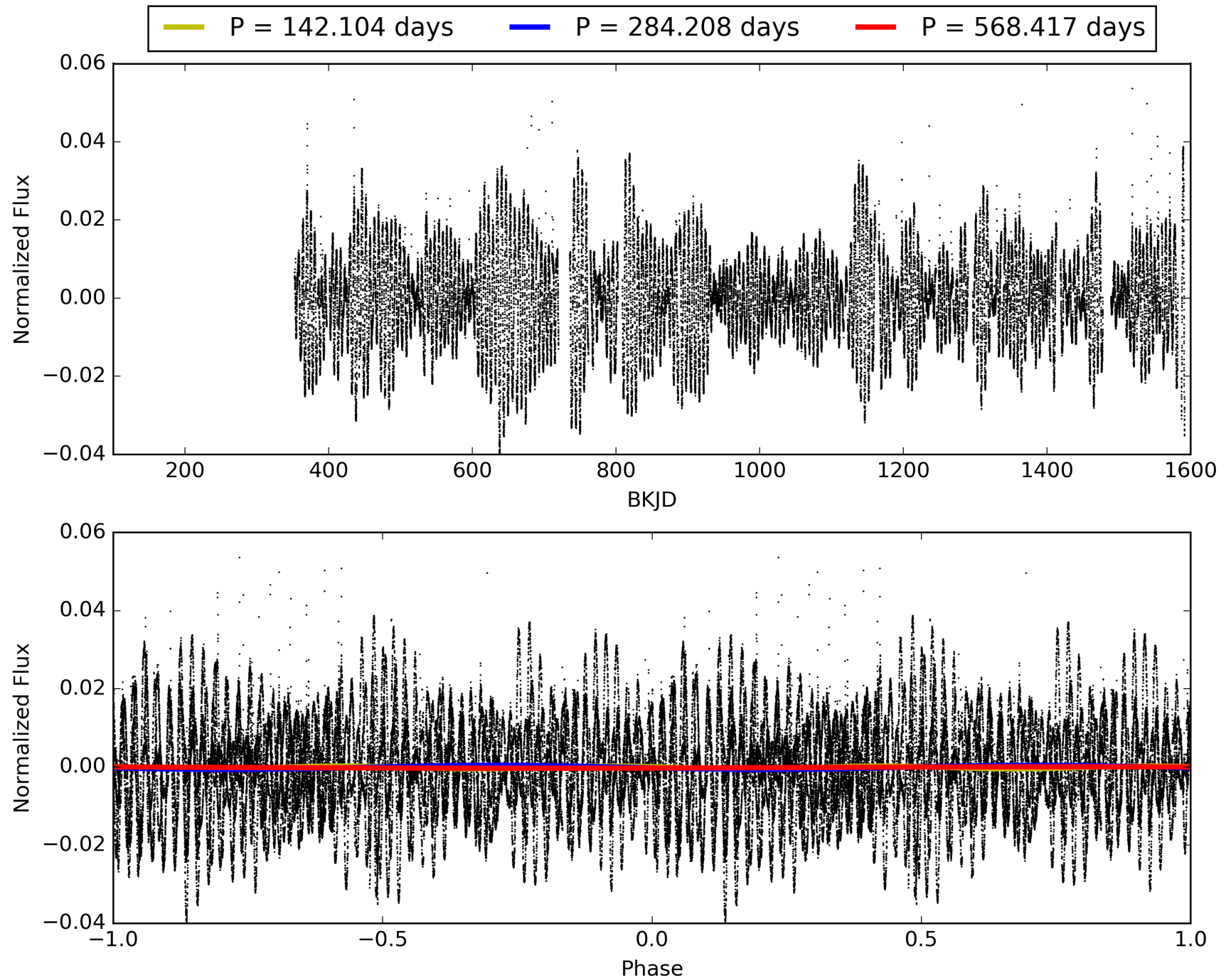
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:12:22 Z

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

TCE 002159486-02, PDC Light Curves

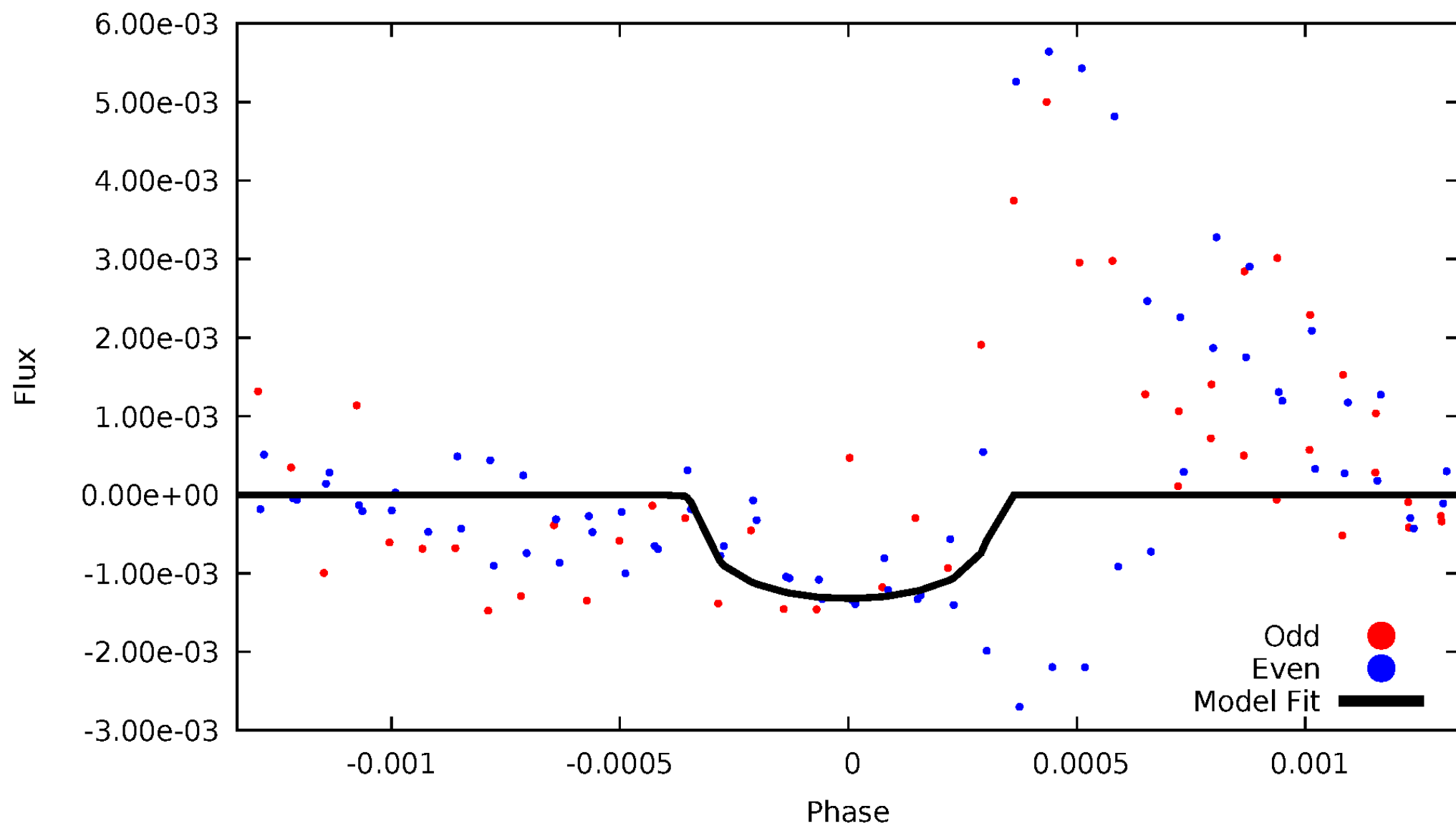


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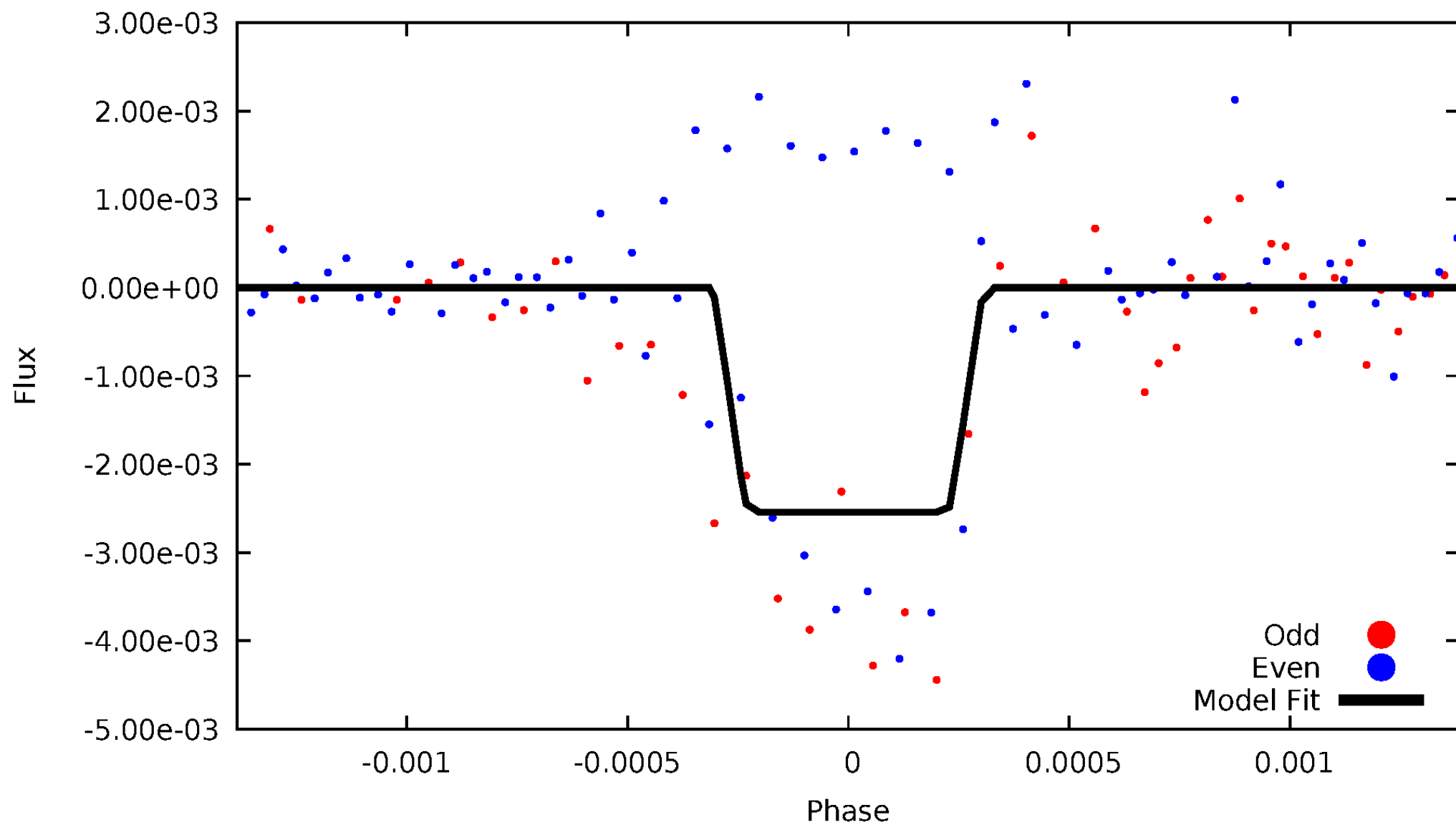
DV Odd/Even

TCE 002159486-02



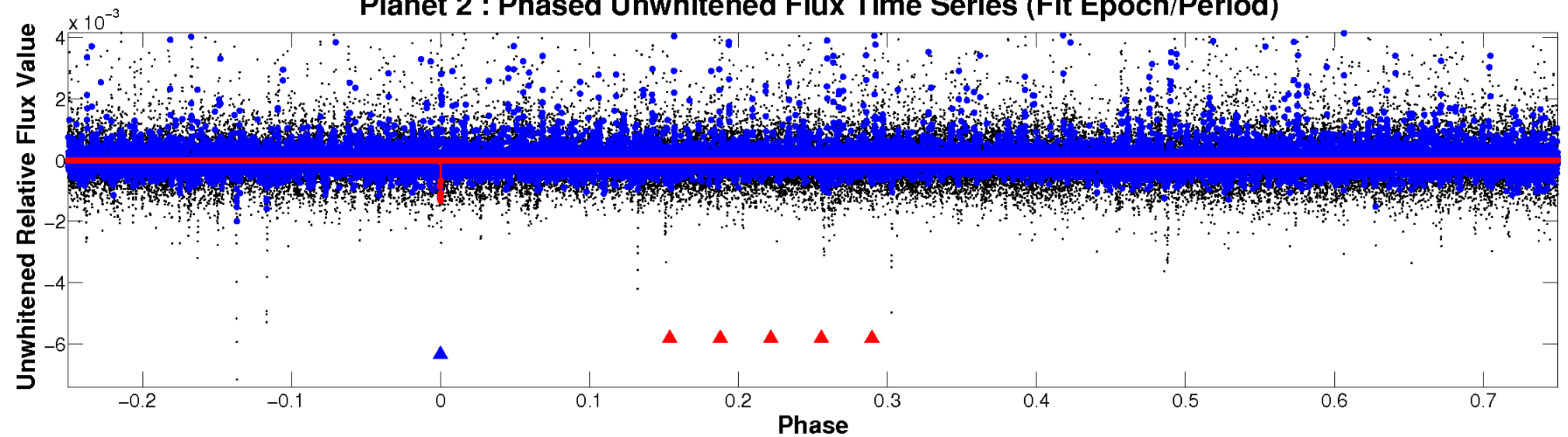
ALT Odd/Even

TCE 002159486-02

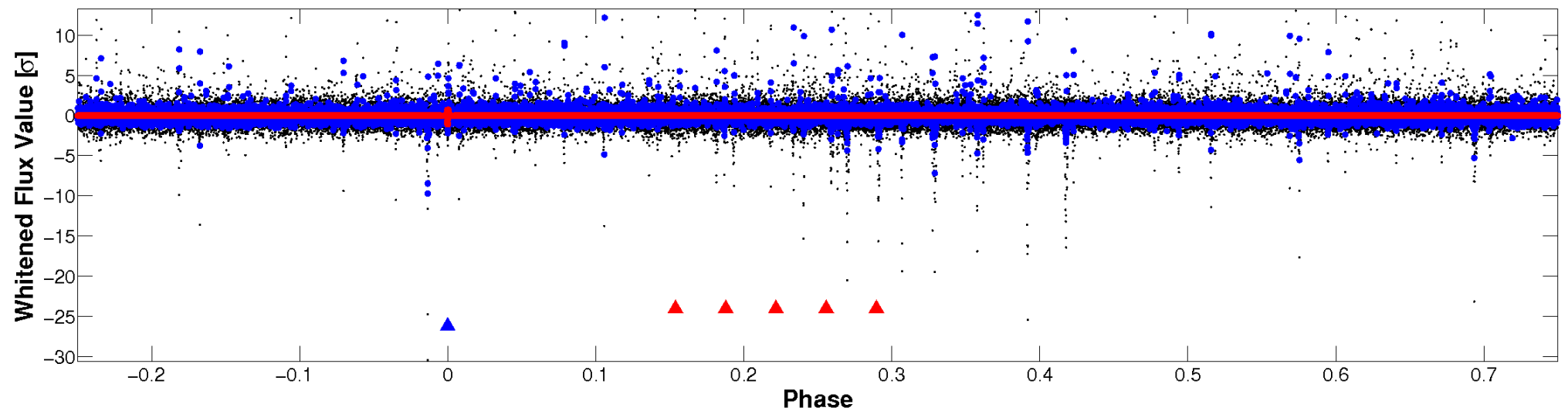


Non-Whitened Vs. Whitened Light Curve

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

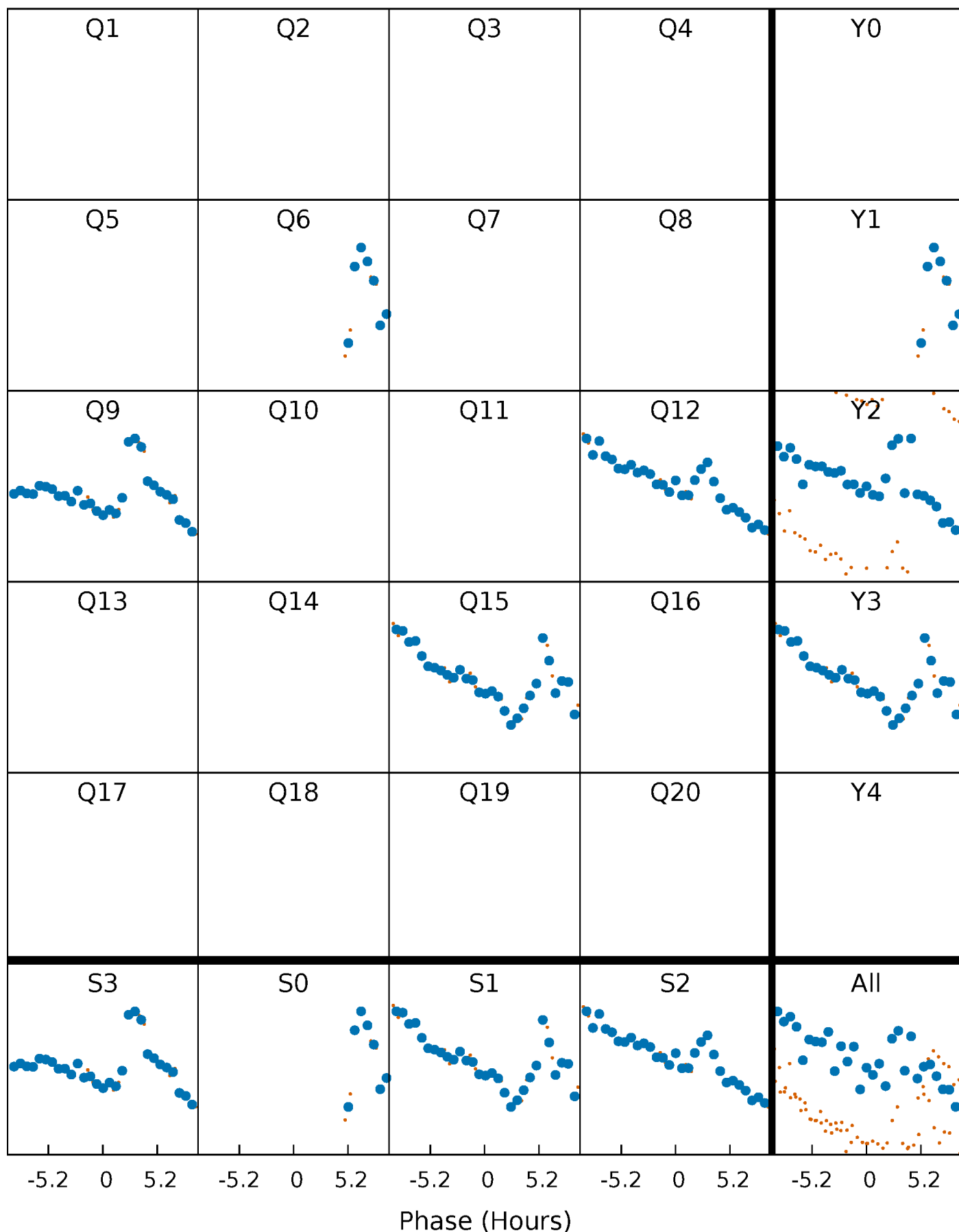


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



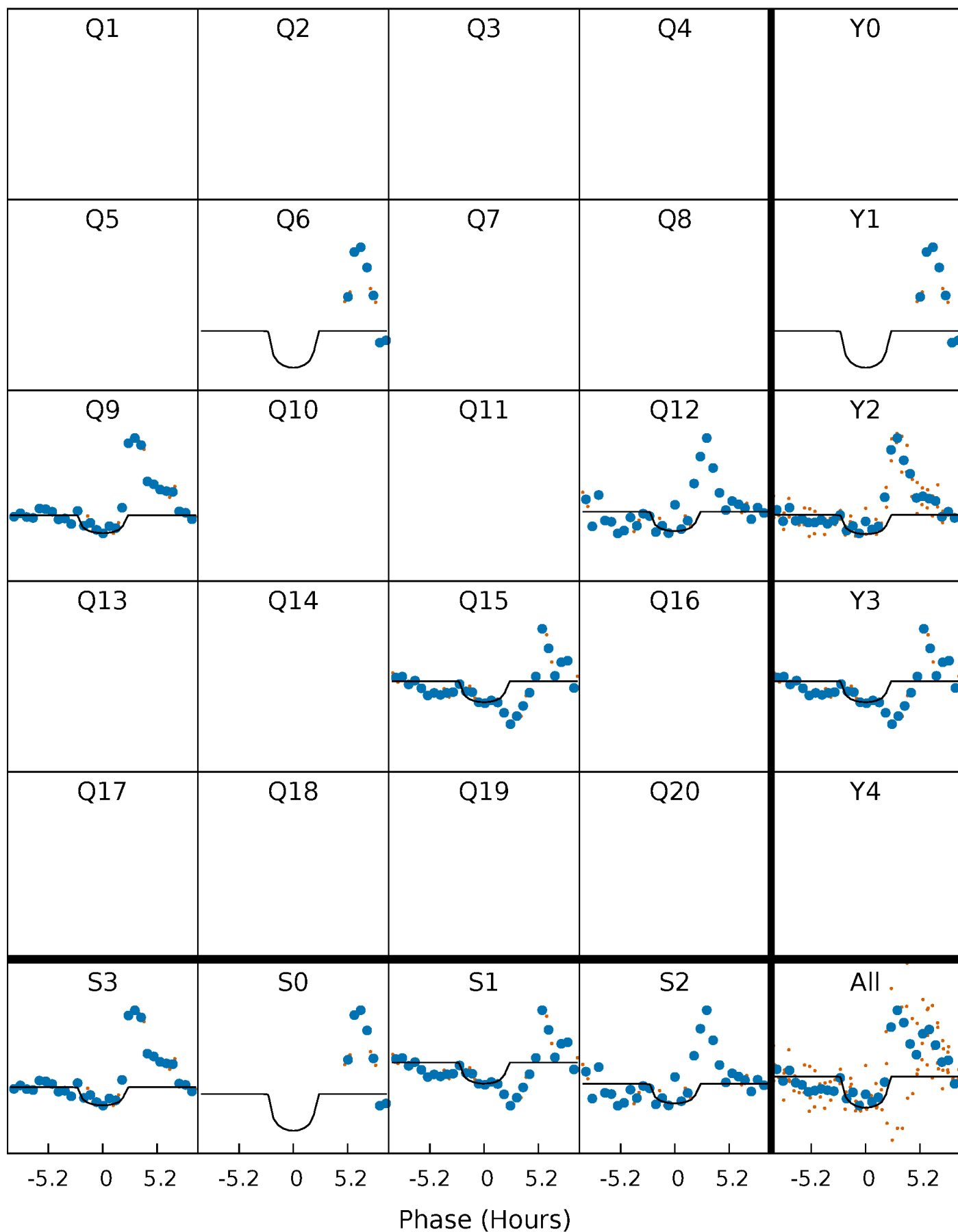
PDC Quarter-Phased Transit Curves

TCE 002159486-02 P=284.208354 Days $T_0=314.805520$ (BKJD)



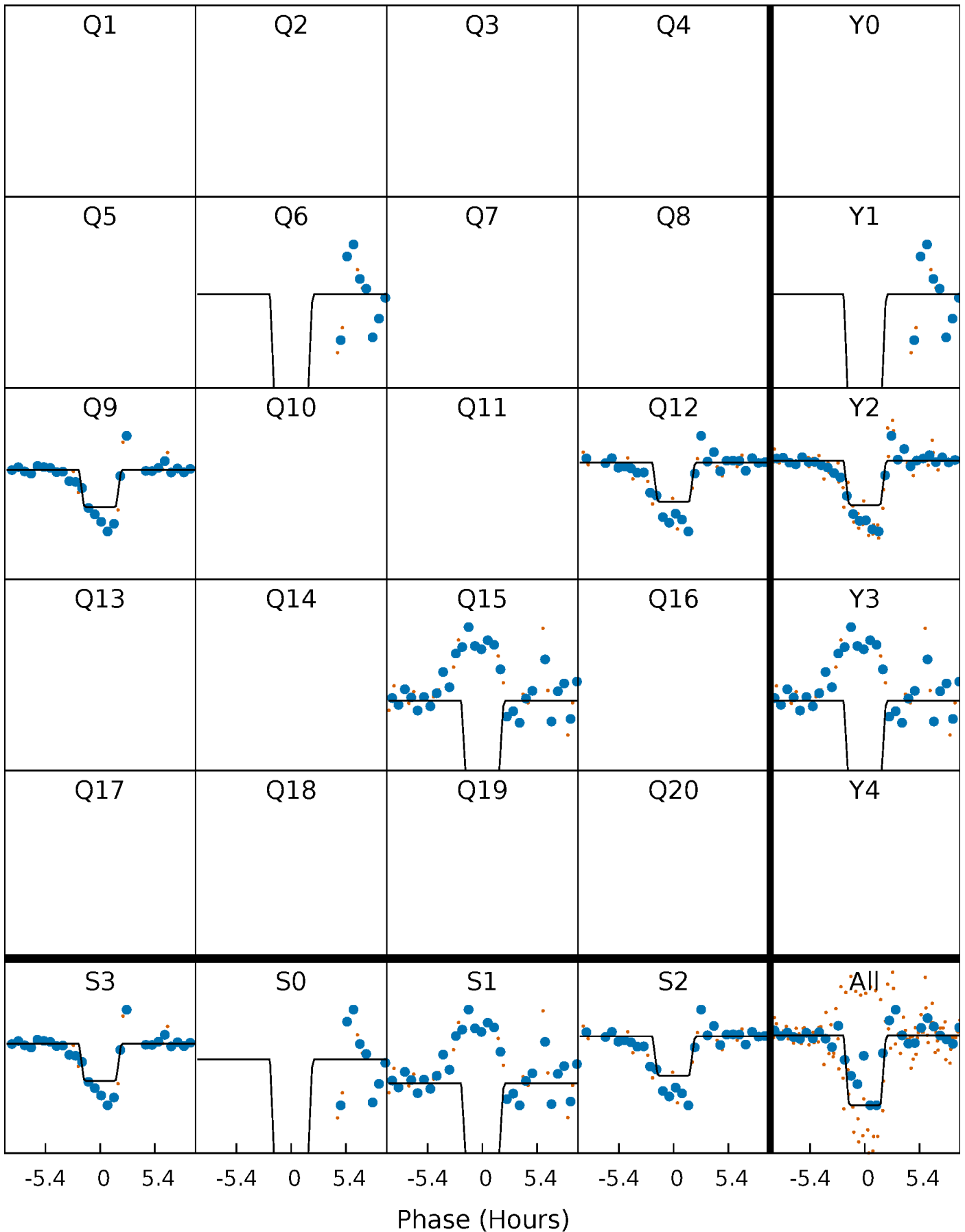
DV Quarter-Phased Transit Curves

TCE 002159486-02 $P=284.208354$ Days $T_0=314.805520$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

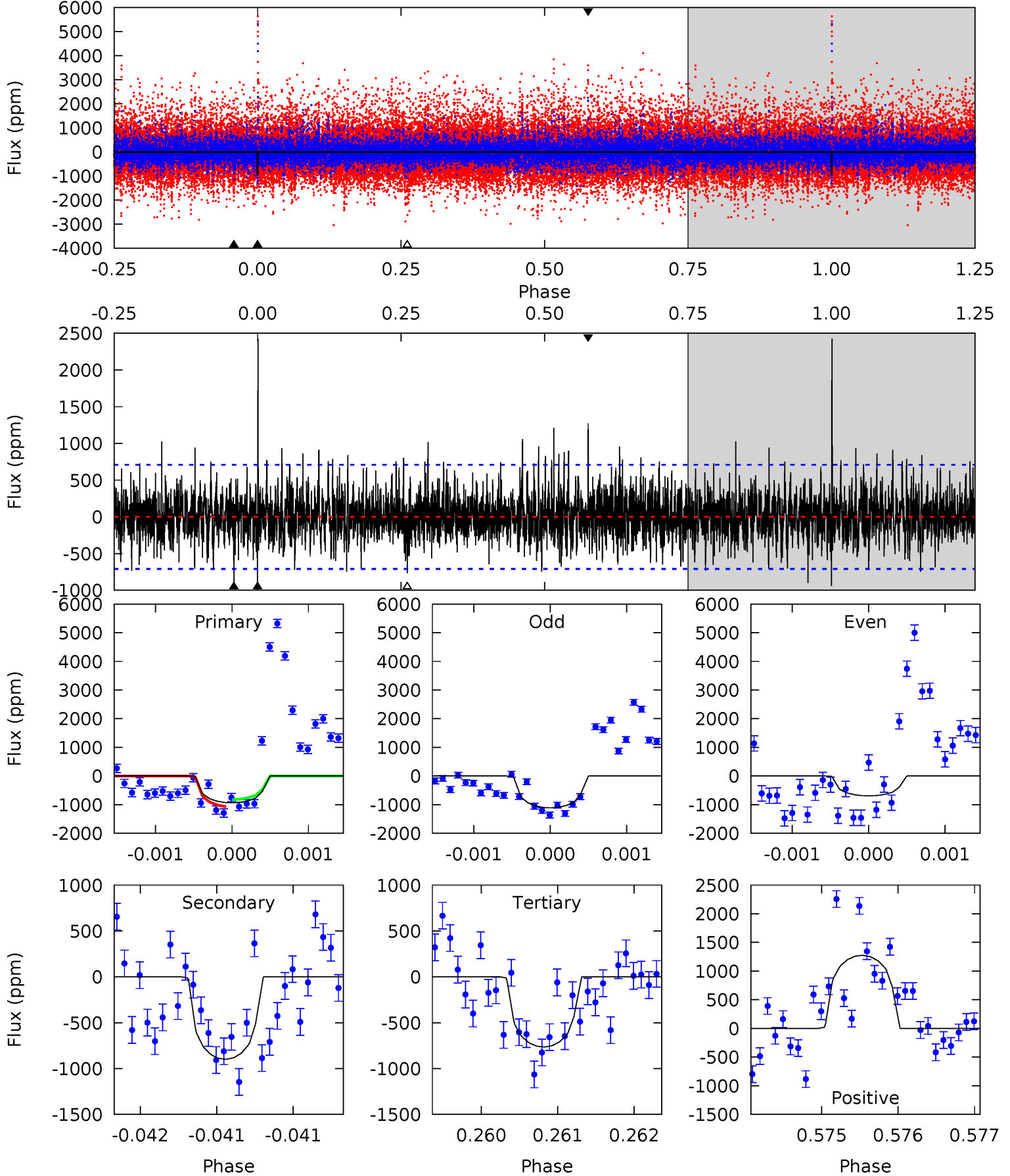
TCE 002159486-02 P=284.203575 Days $T_0=314.825112$ (BKJD)



DV Model-Shift Uniqueness Test

002159486-02, P = 284.208354 Days, E = 314.805520 Days

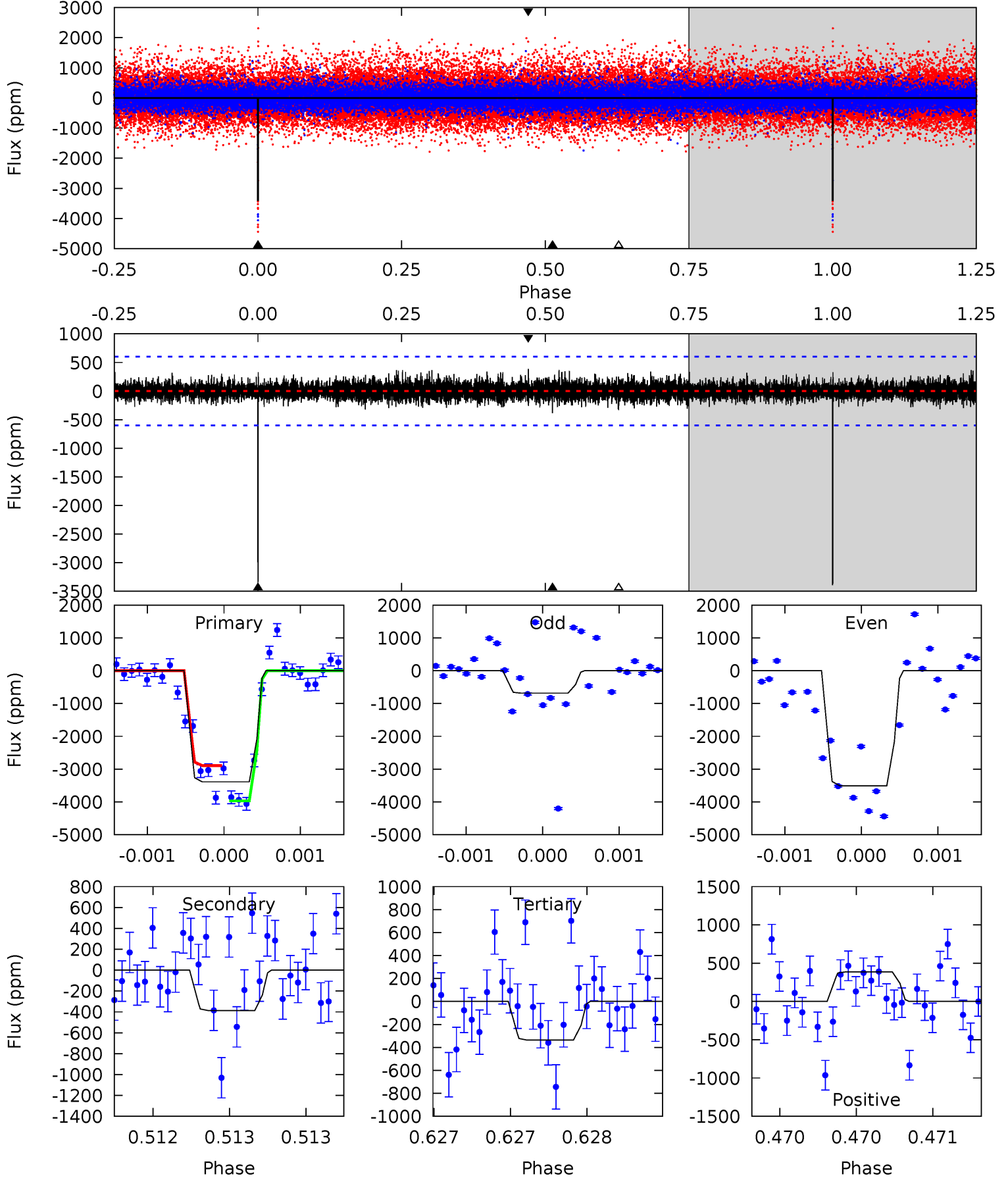
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.28	6.98	5.94	9.90	5.51	3.38	1.87	1.34	-2.61	1.04	-2.92	1.28	1.07	0.72	0.94



Alt Model-Shift Uniqueness Test

002159486-02, P = 284.203575 Days, E = 314.825112 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.2	3.56	3.09	3.55	5.54	3.43	0.80	28.1	27.7	0.47	0.01	14.6	0.52	0.10	4.97



Stellar Parameters For KIC 002159486

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4879^{+88}_{-78}	$4.558^{+0.052}_{-0.021}$	$-0.140^{+0.150}_{-0.150}$	$0.735^{+0.033}_{-0.044}$	$0.712^{+0.047}_{-0.030}$	$2.530^{+0.496}_{-0.200}$
	+2%/-2%	+1%/-0%	+107%/-107%	+4%/-6%	+7%/-4%	+20%/-8%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002159486-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-899 ± 129	$5.58^{+4.82}_{-3.75}$	295^{+7}_{-6}	3562^{+1966}_{-628}	9079^{+77701}_{-6592}
Alt.	-386 ± 109	$6.09^{+5.34}_{-4.00}$	295^{+6}_{-7}	3055^{+1310}_{-479}	3288^{+24639}_{-2389}

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 $A_{obs} \gg 1.0$

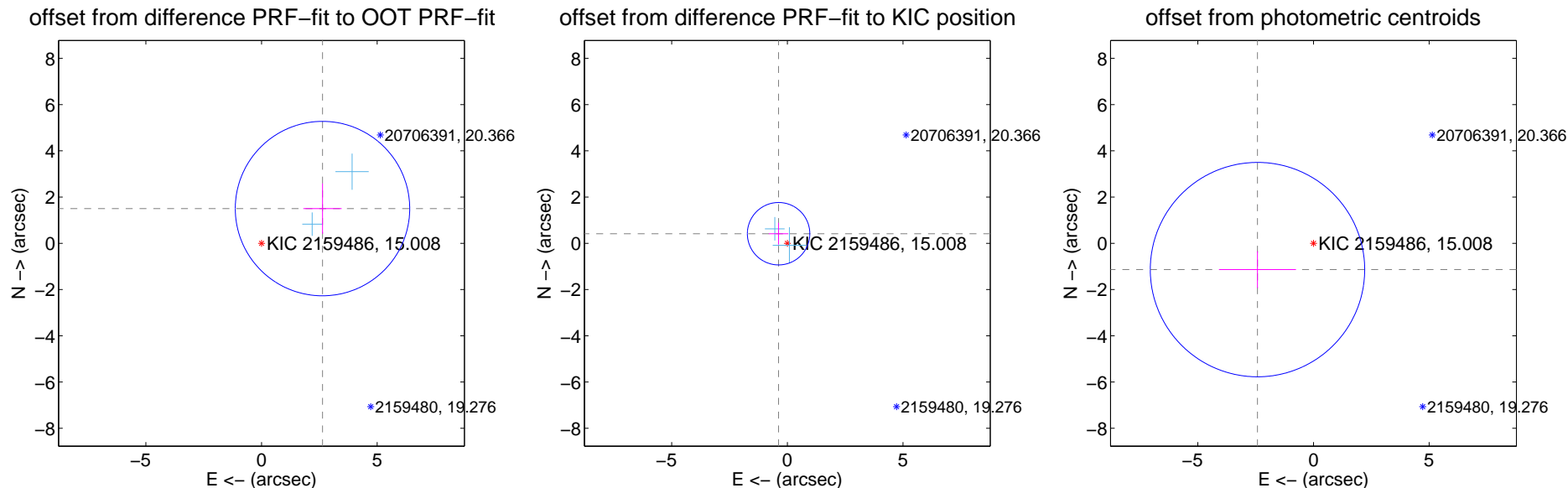
DV Centroid Data

Supplemental centroid analysis for 002159486-02. Kepler magnitude: 15.01. Transit SNR 5.48

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 2.74 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.035 ± 1.257	2.41	-2.637 ± 0.829	1.502 ± 1.089
PRF-fit source offset from KIC position	0.562 ± 0.450	1.25	0.379 ± 0.424	0.415 ± 0.470
photometric centroid source offset	2.68 ± 1.55	1.73	2.42 ± 1.67	-1.14 ± 0.80



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.

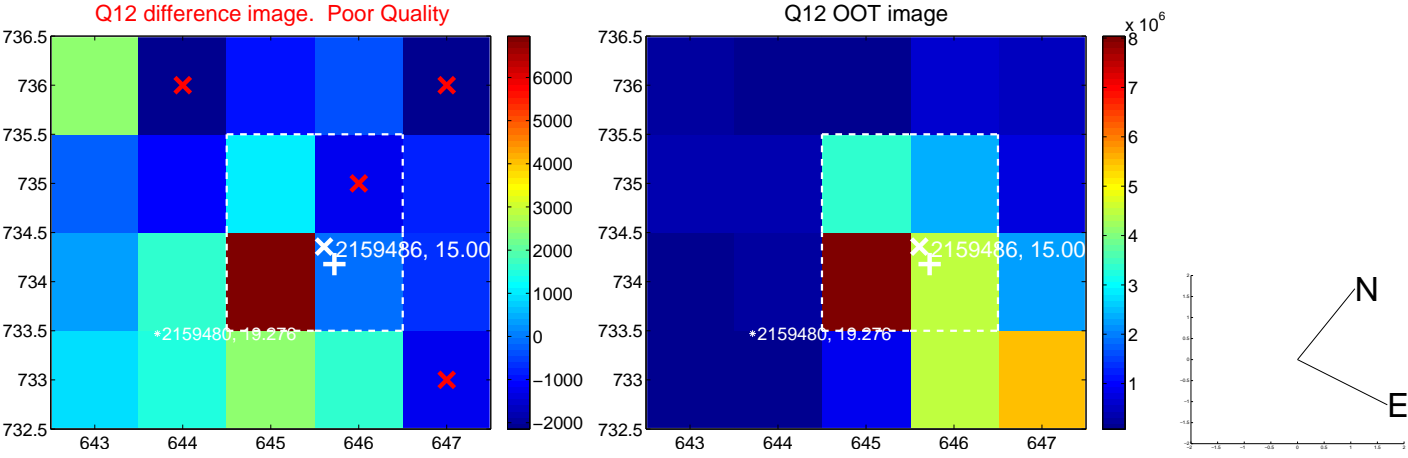
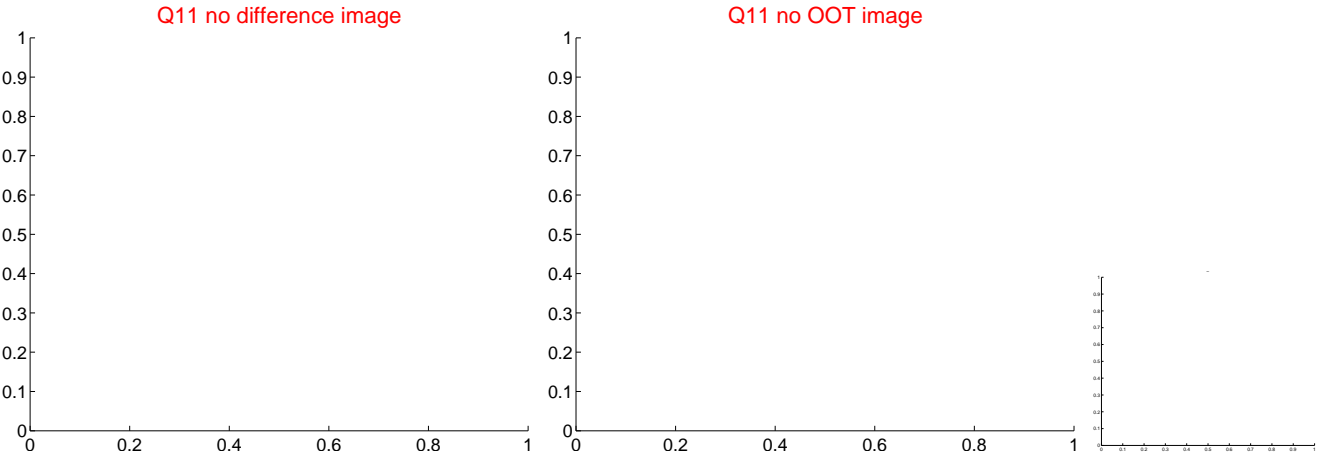
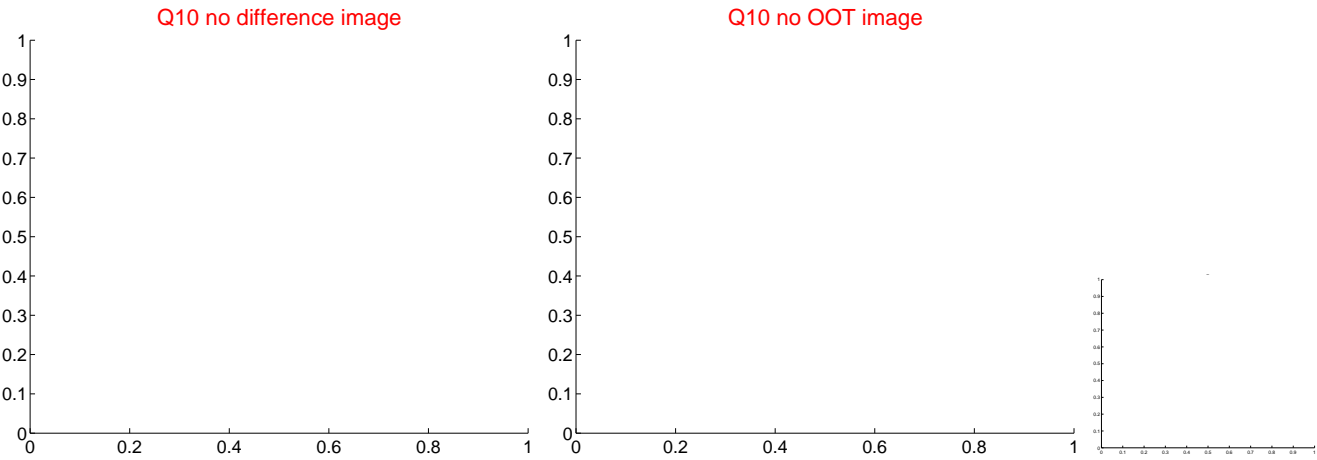
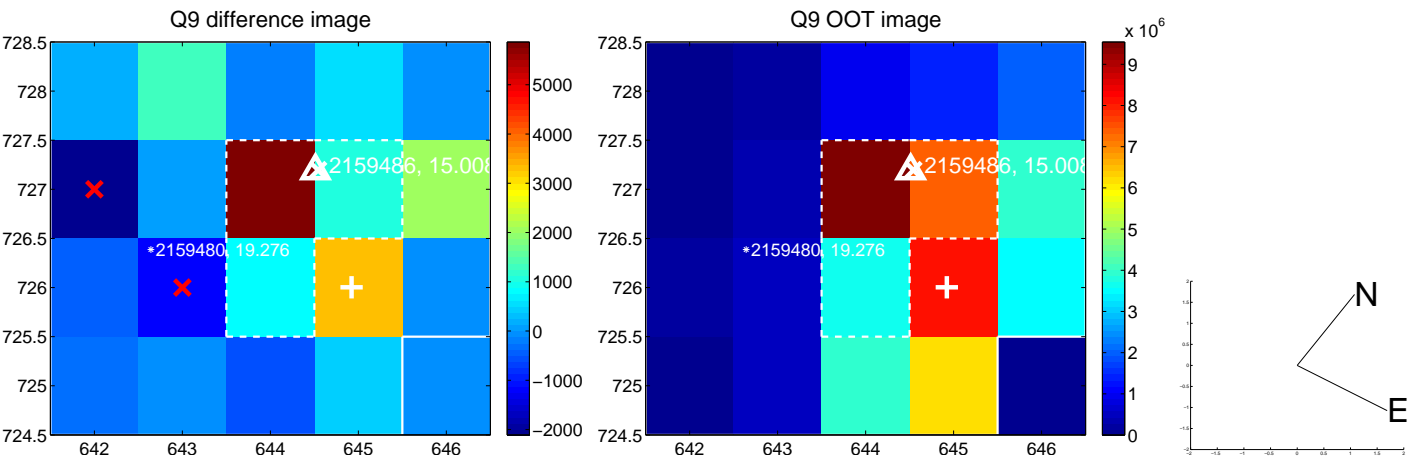
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



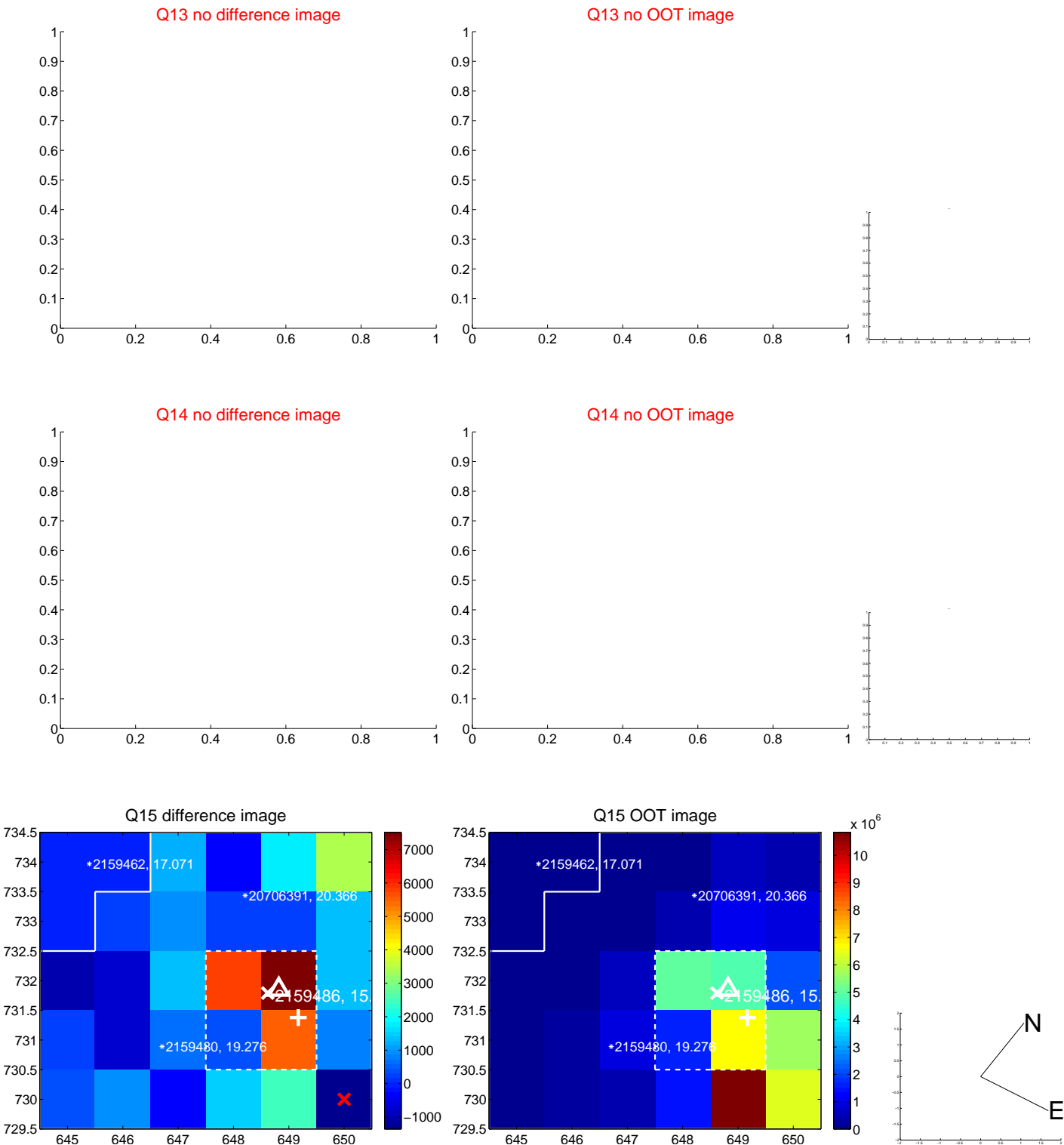
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



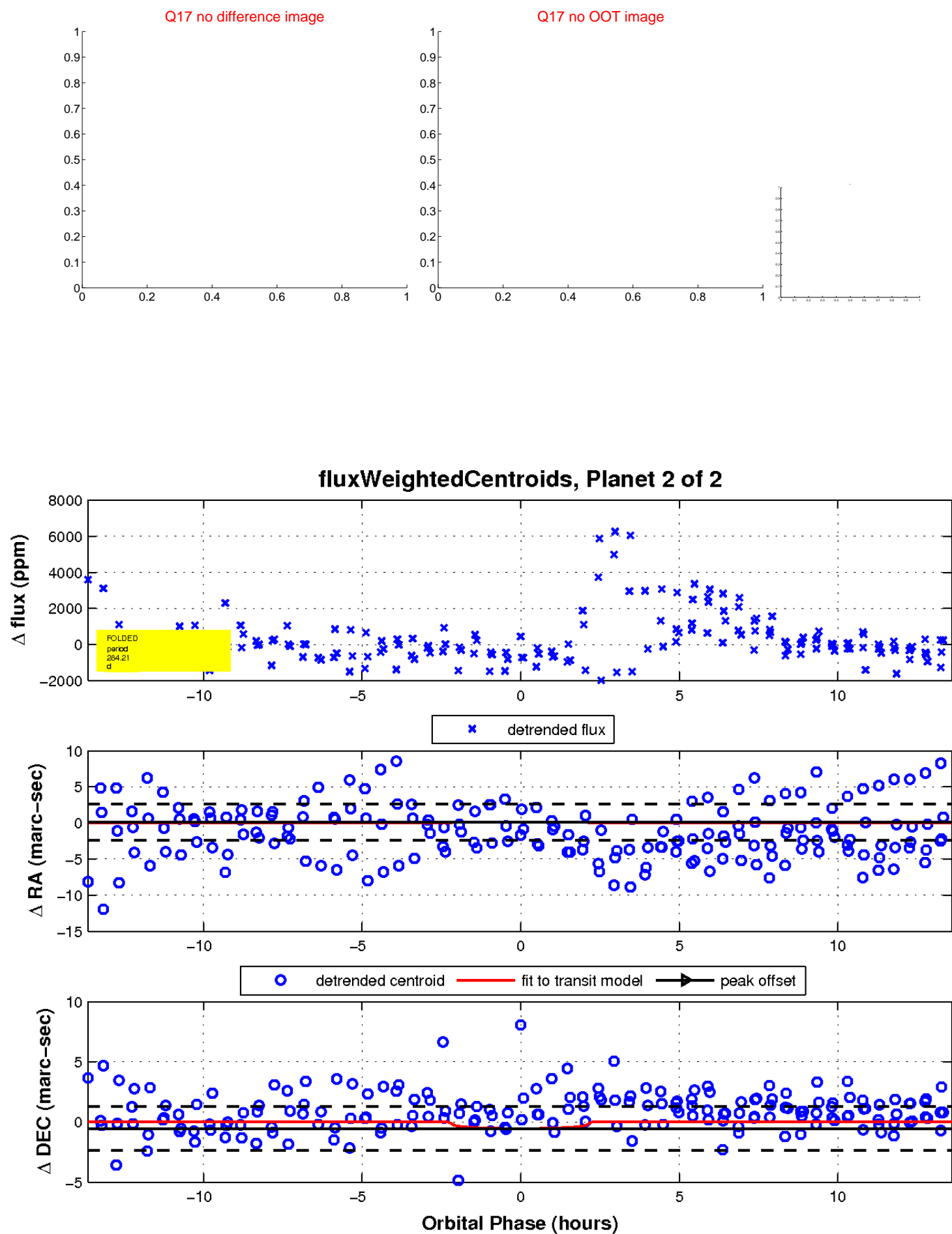
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

