

KIC 009040536

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})
009040536-01	OBS	No	363.978139	140.080369	339.8	5.114	8.4	6.9	0.81	5875	1.63	0.76
009040536-02	OBS	No	367.681795	179.825340	333.0	16.153	8.5	8.9	0.81	5875	1.57	0.75

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009040536-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—CENT_FEW_DIFFS
009040536-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—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.

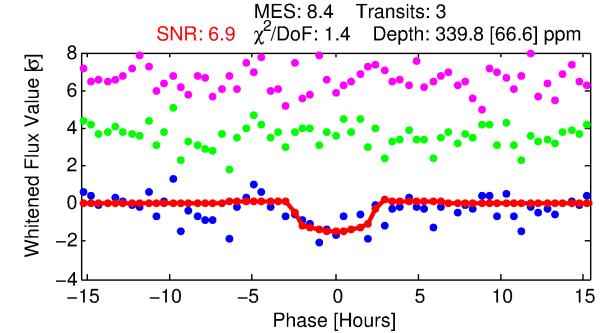
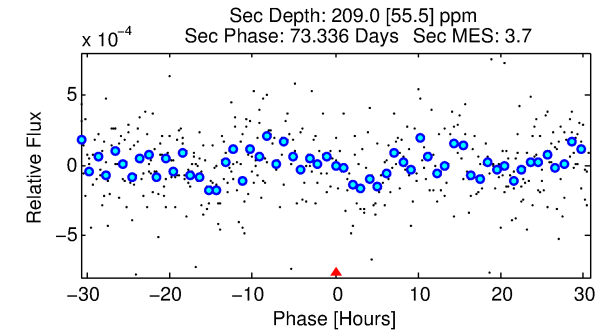
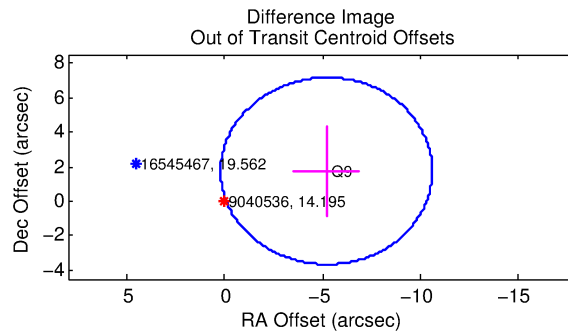
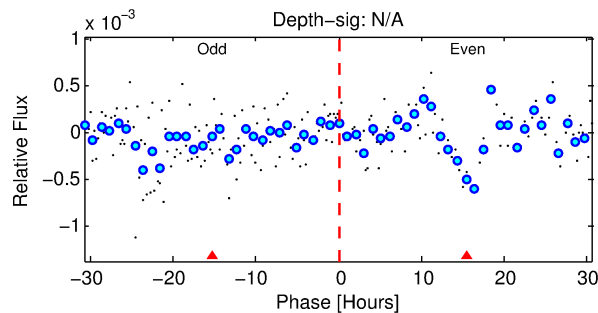
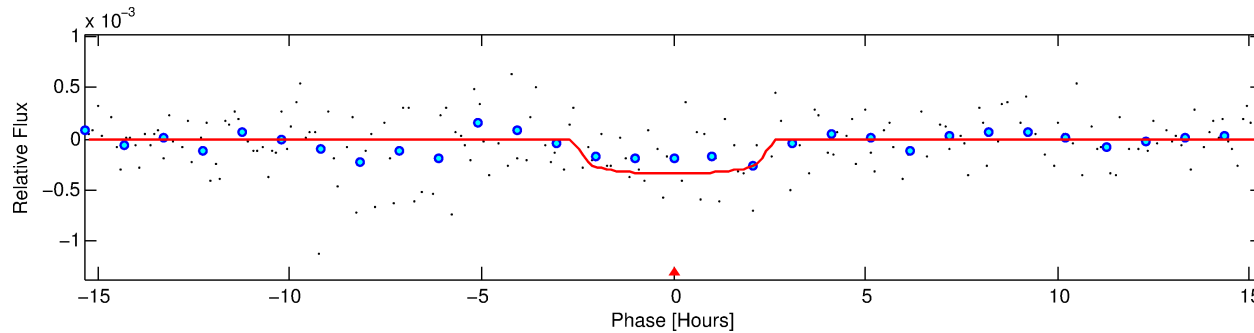
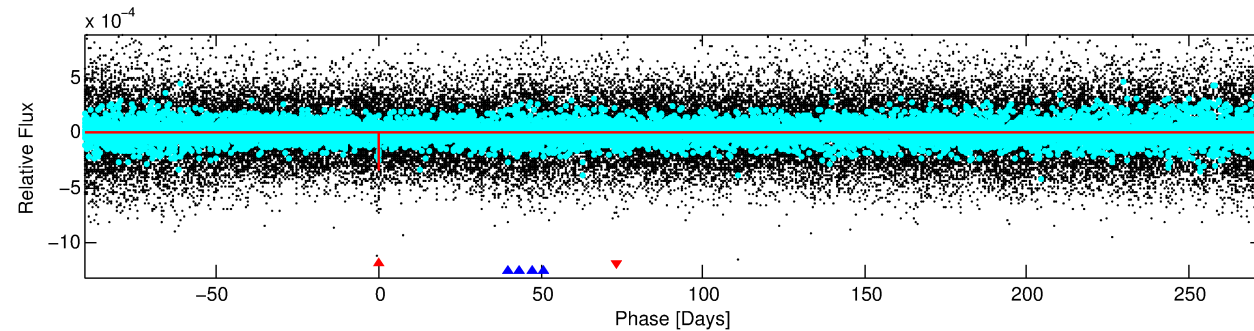
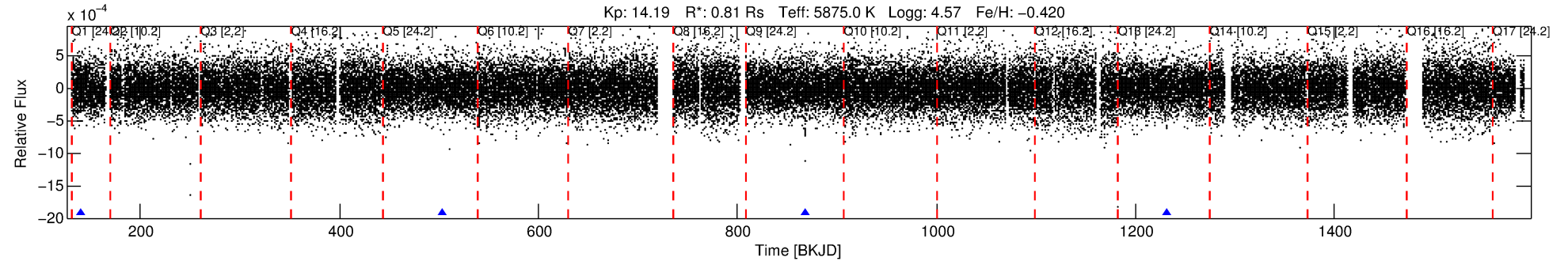
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009040536-01

No Significant Match Found

DV One-Page Summary

KIC: 9040536 Candidate: 1 of 2 Period: 363.978 d



DV Fit Results:

Period = 363.97814 [0.00931] d
Epoch = 140.0804 [0.0195] BKJD
Rp/R* = 0.0185 [0.0292]
a/R* = 359.80 [2770.50]
b = 0.77 [4.04]
Seff = 0.76 [0.26]
Teff = 238 [21] K
Rp = 1.63 [2.61] Re
a = 0.9602 [0.2151] AU
Ag = 39731.60 [126458.31] [0.31σ]
Teffp = 5193 [4112] K [1.21σ]

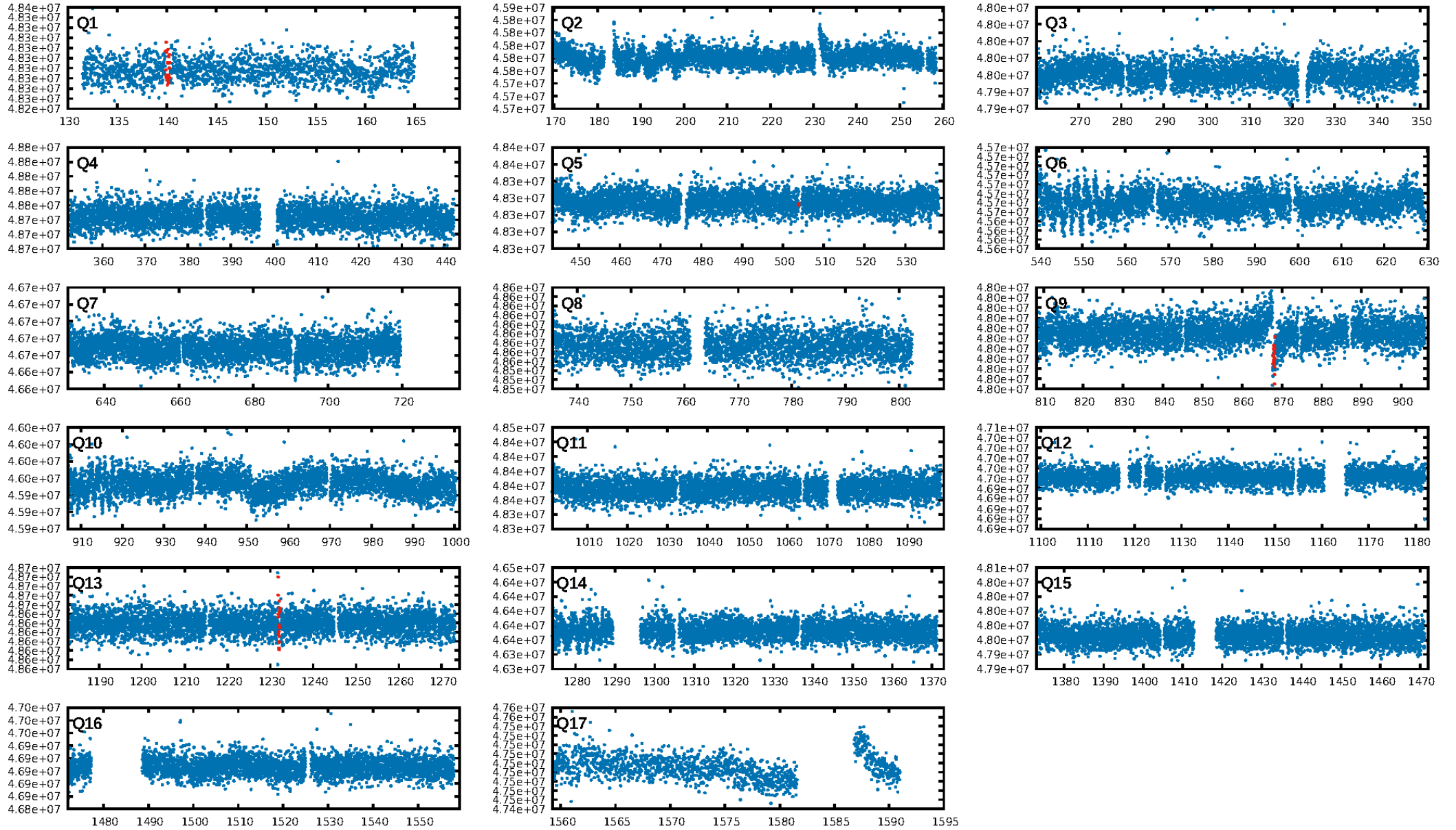
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [5.25σ]
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 70.5%
Bootstrap-pfa: 1.46e-17
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 42.48
Centroid-sig: 1.9%
Centroid-so: 3.639 arcsec [1.78σ]
OotOffset-rm: 5.493 arcsec [3.05σ]
KicOffset-rm: 5.570 arcsec [3.15σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

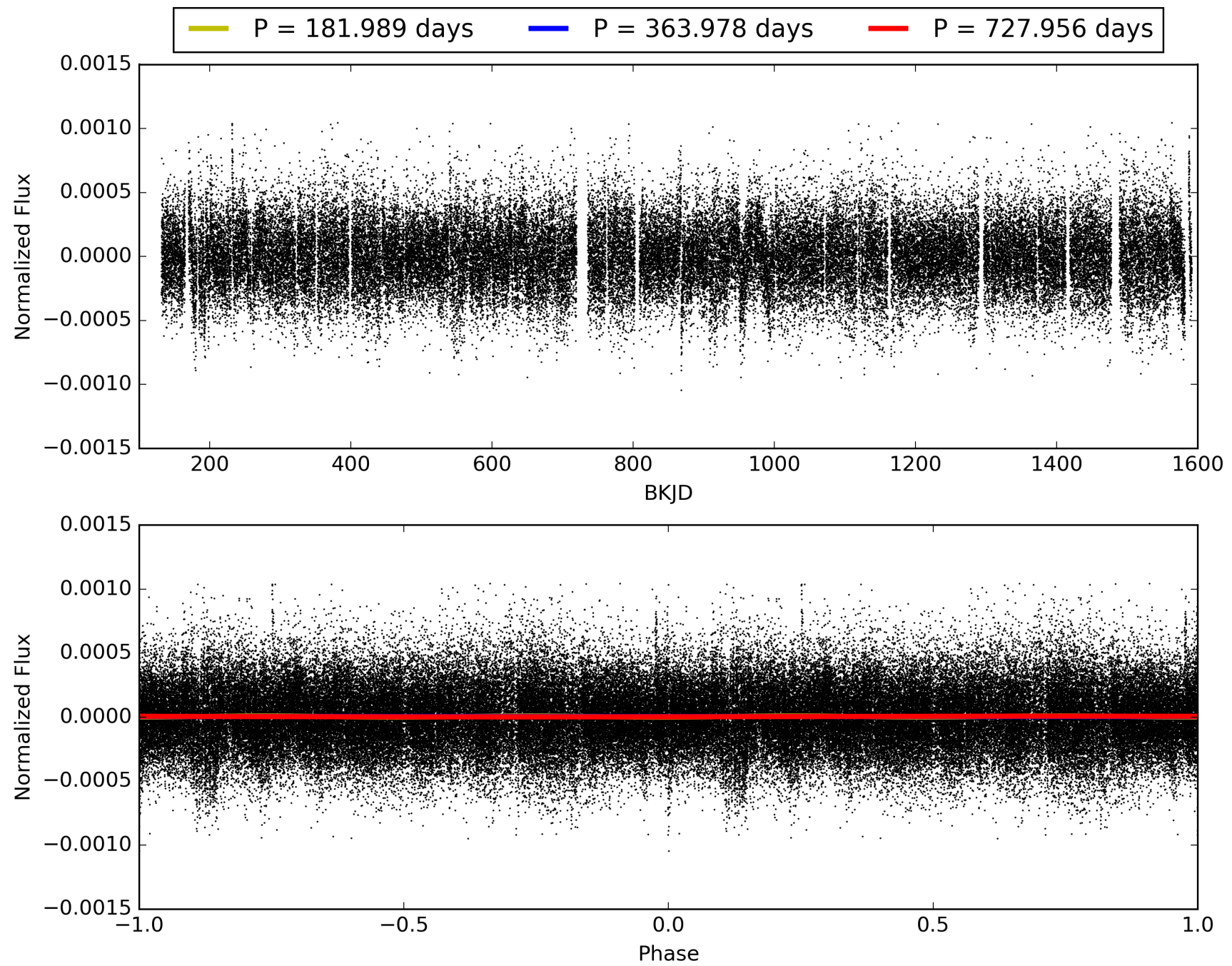
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:10:21 Z

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

TCE 009040536-01, PDC Light Curves

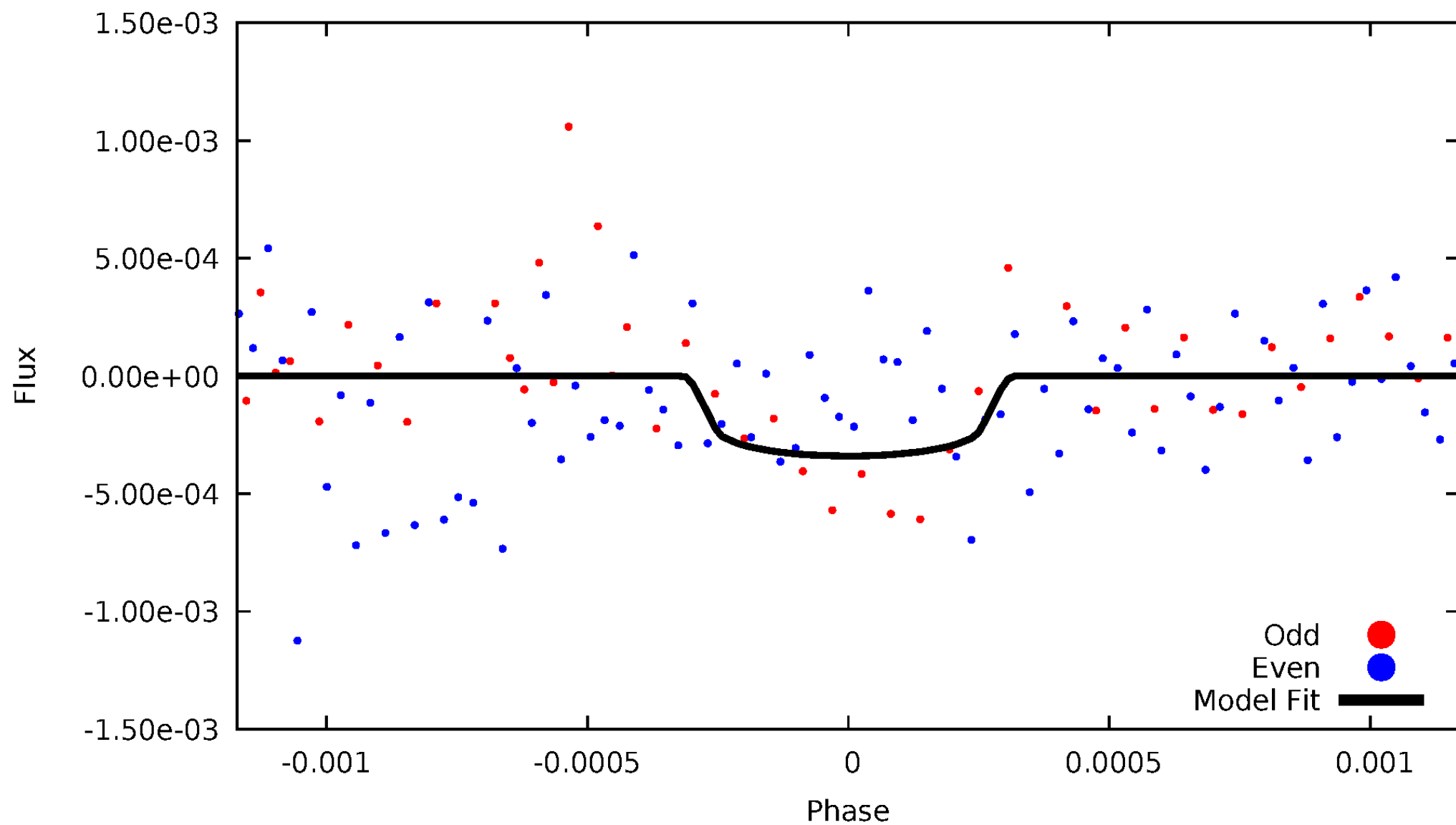


TCE 009040536-01



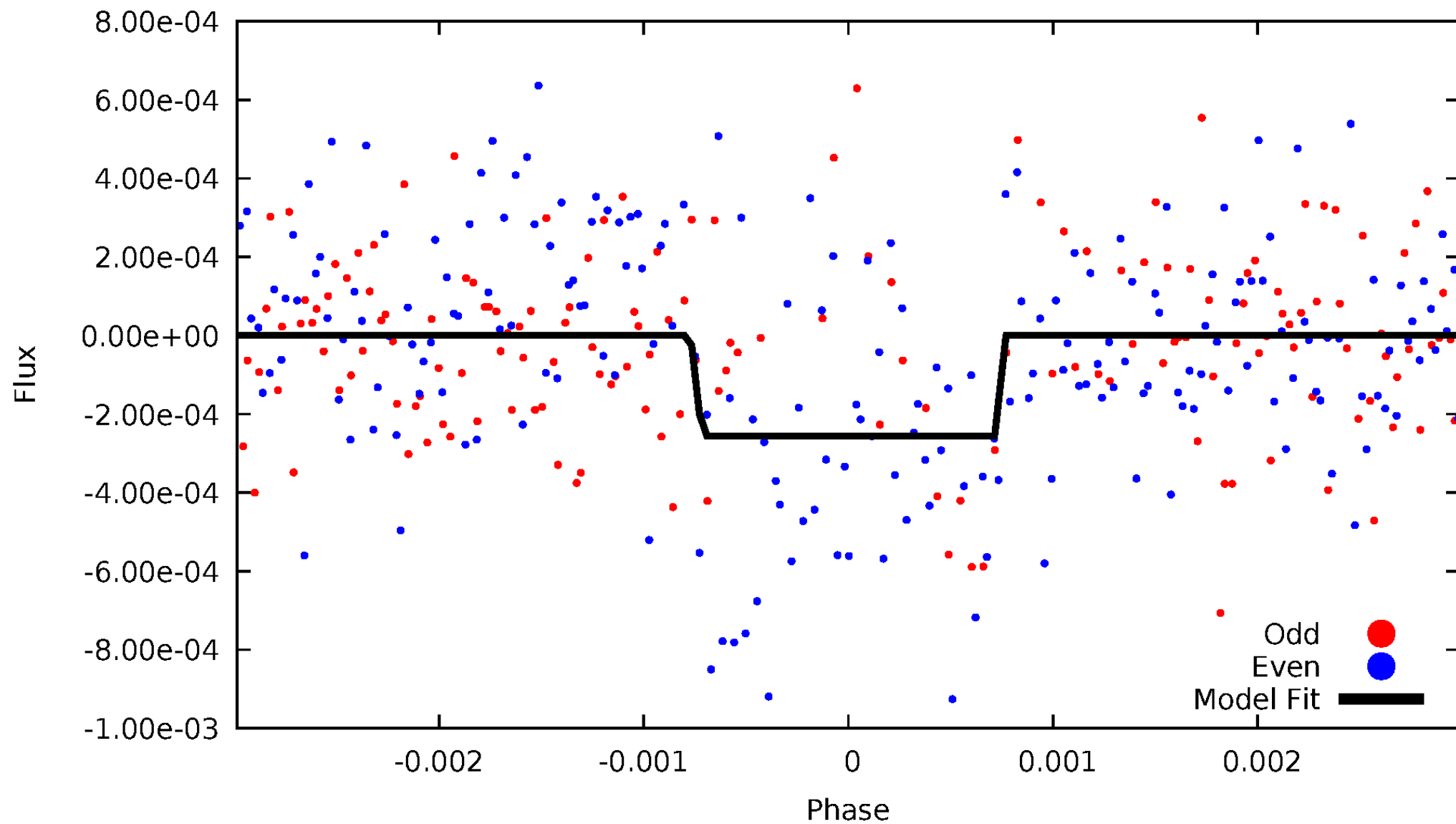
DV Odd/Even

TCE 009040536-01



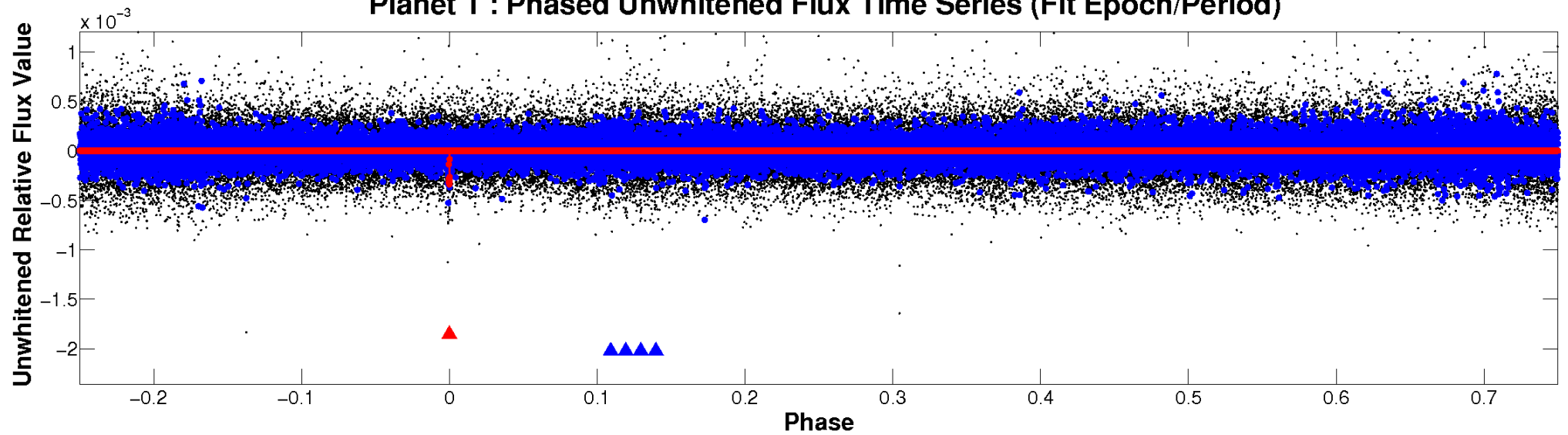
ALT Odd/Even

TCE 009040536-01

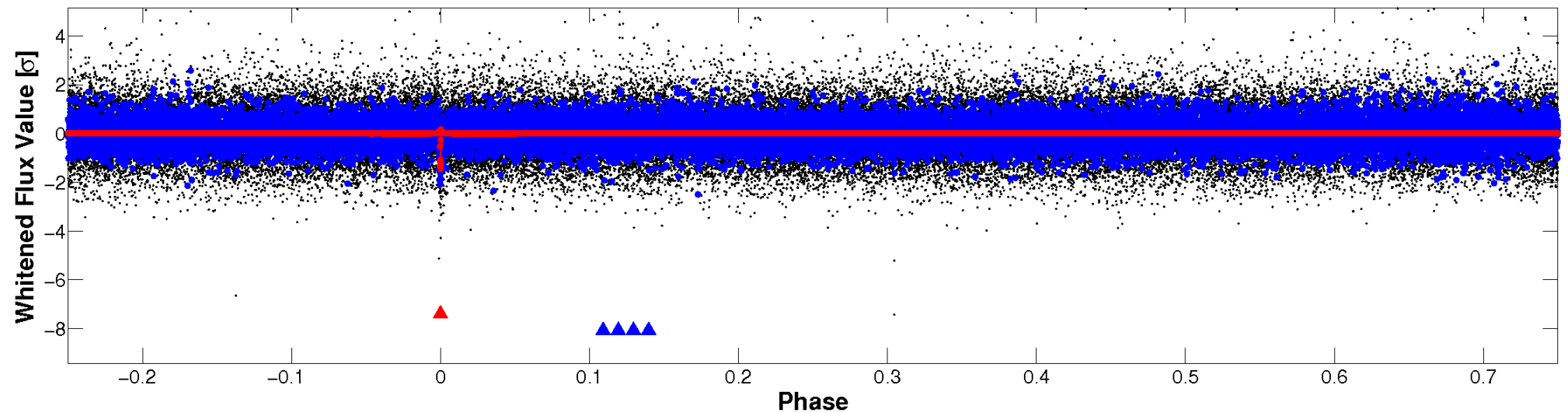


Non-Whitened Vs. Whitened Light Curve

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

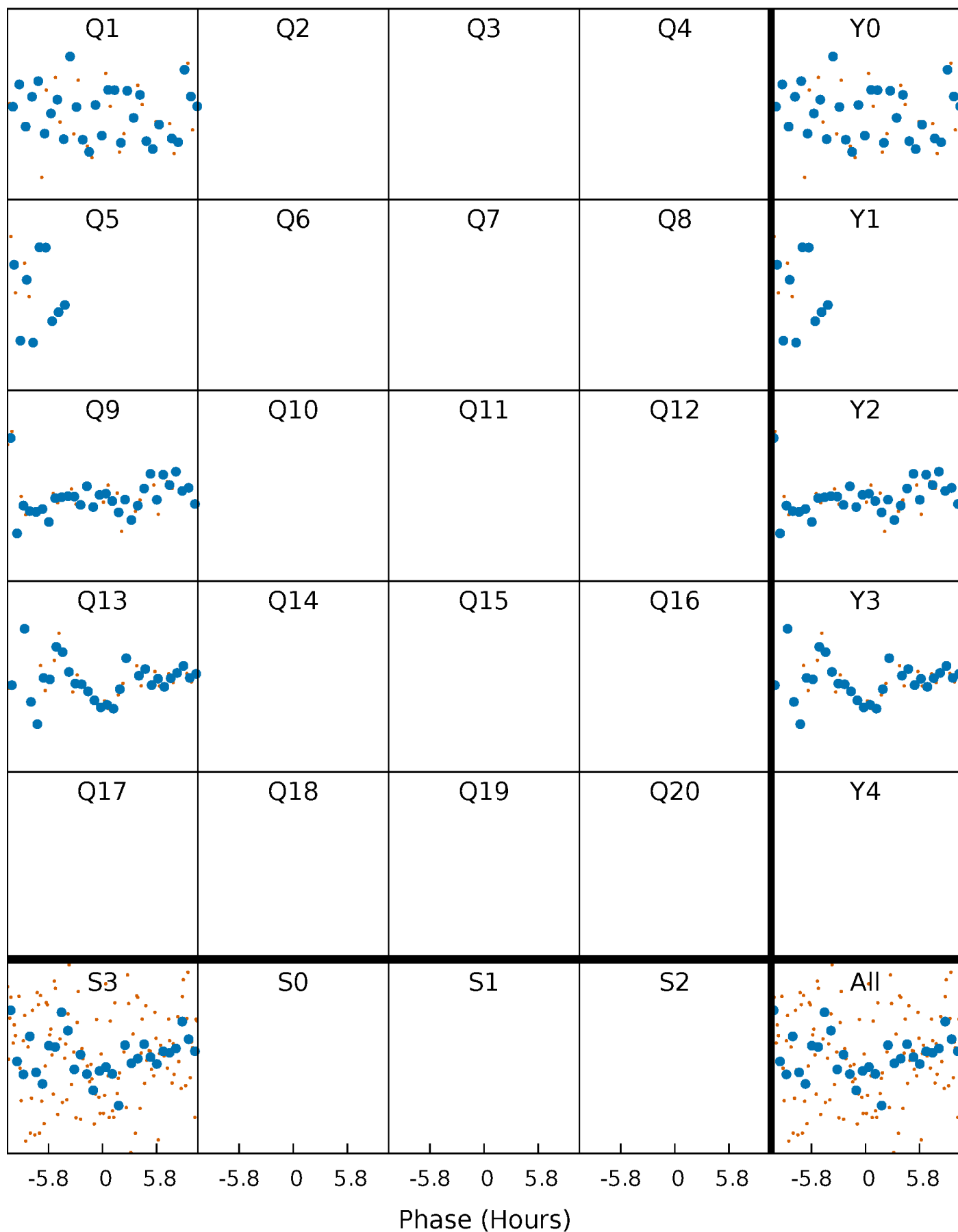


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



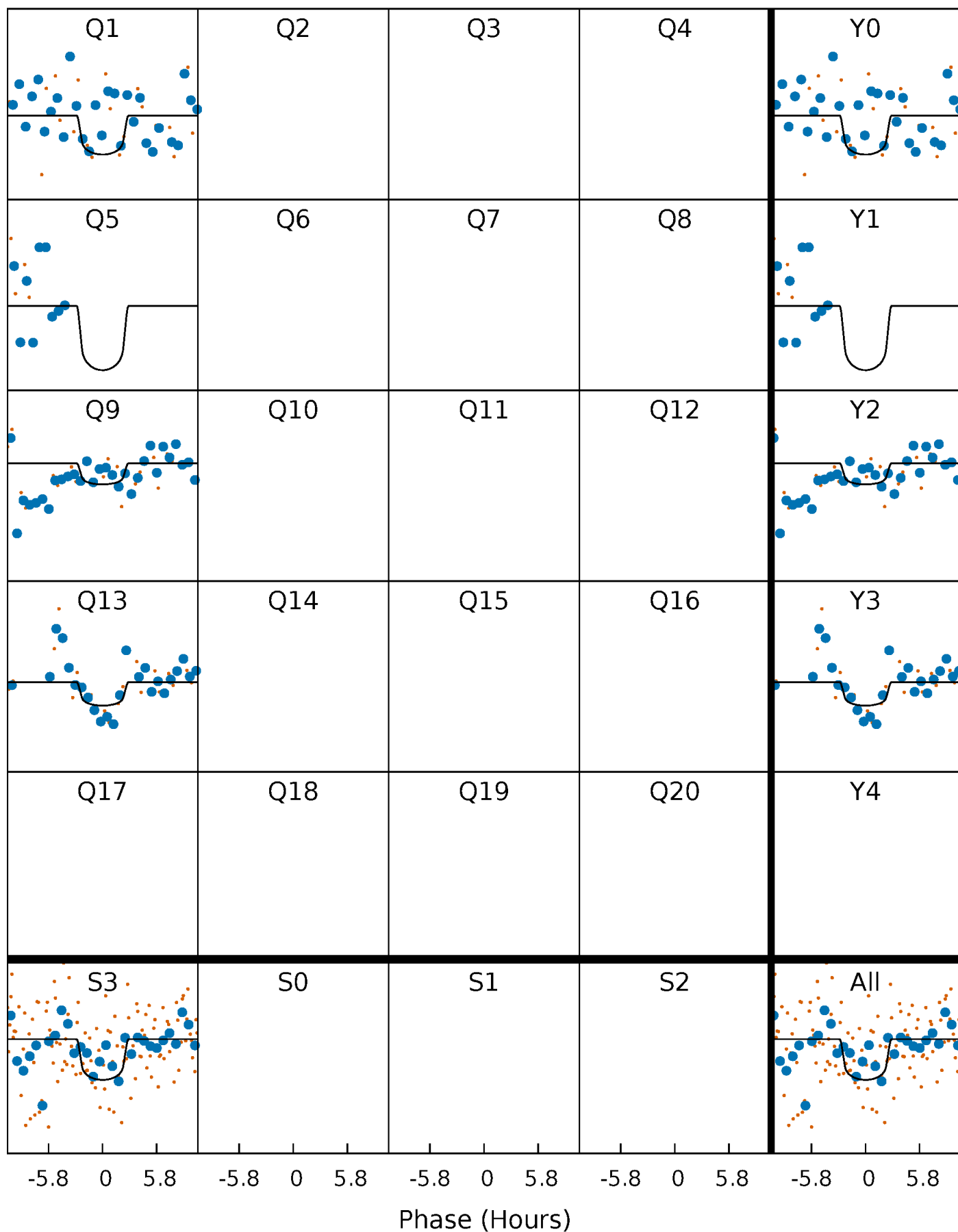
PDC Quarter-Phased Transit Curves

TCE 009040536-01 P=363.978139 Days $T_0=140.080369$ (BKJD)



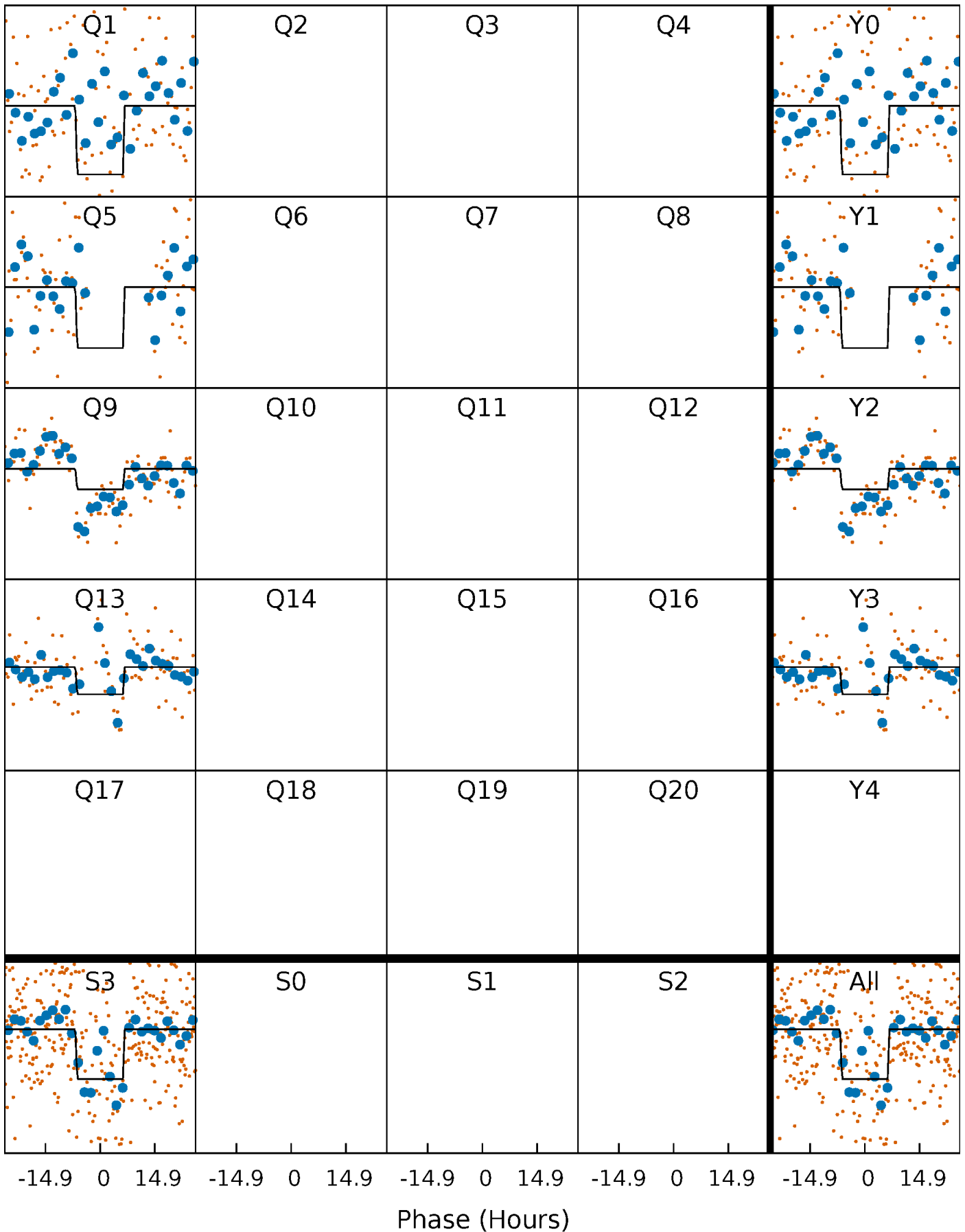
DV Quarter-Phased Transit Curves

TCE 009040536-01 P=363.978139 Days $T_0=140.080369$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

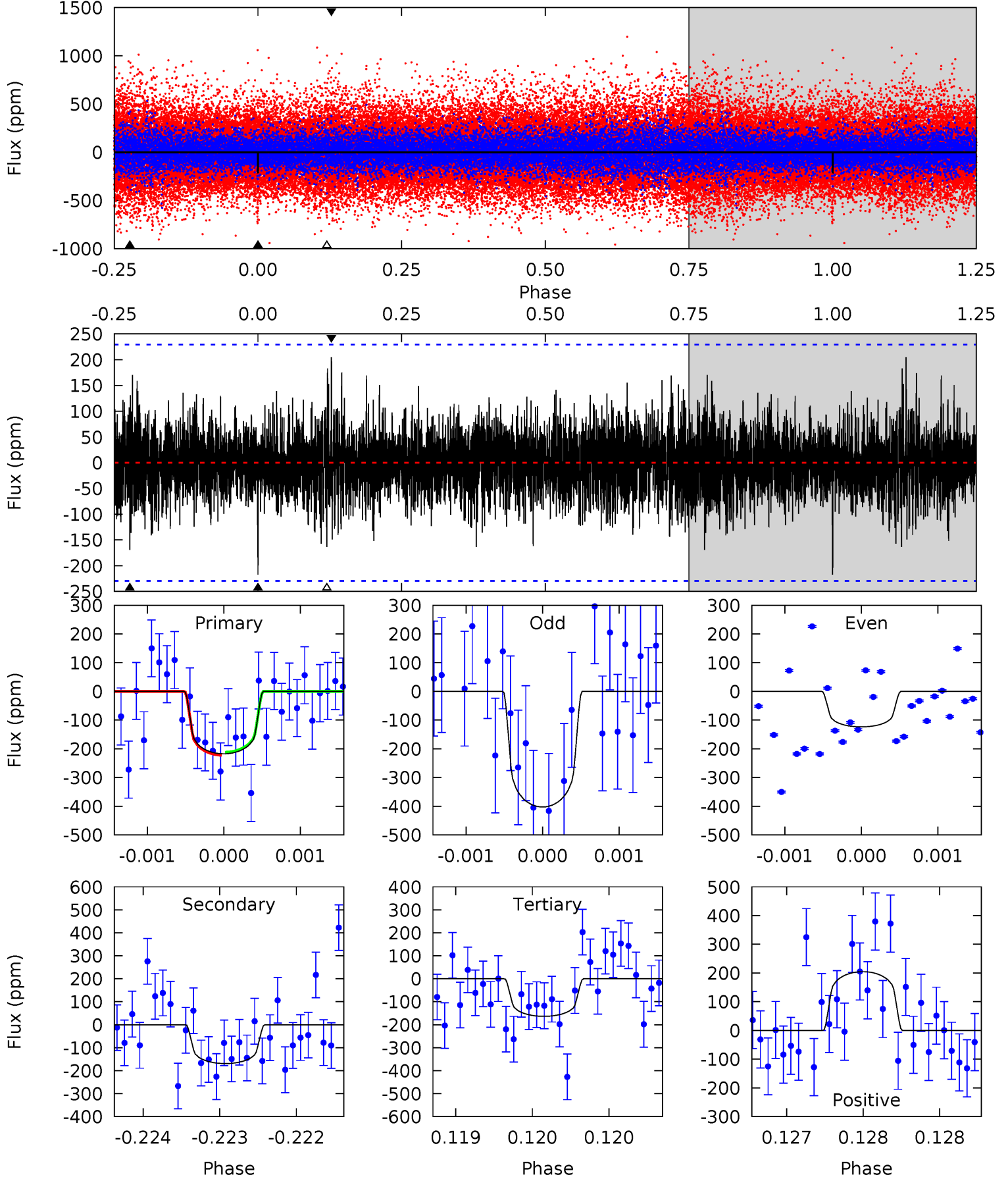
TCE 009040536-01 P=363.887648 Days $T_0=140.161997$ (BKJD)



DV Model-Shift Uniqueness Test

009040536-01, P = 363.978139 Days, E = 140.080369 Days

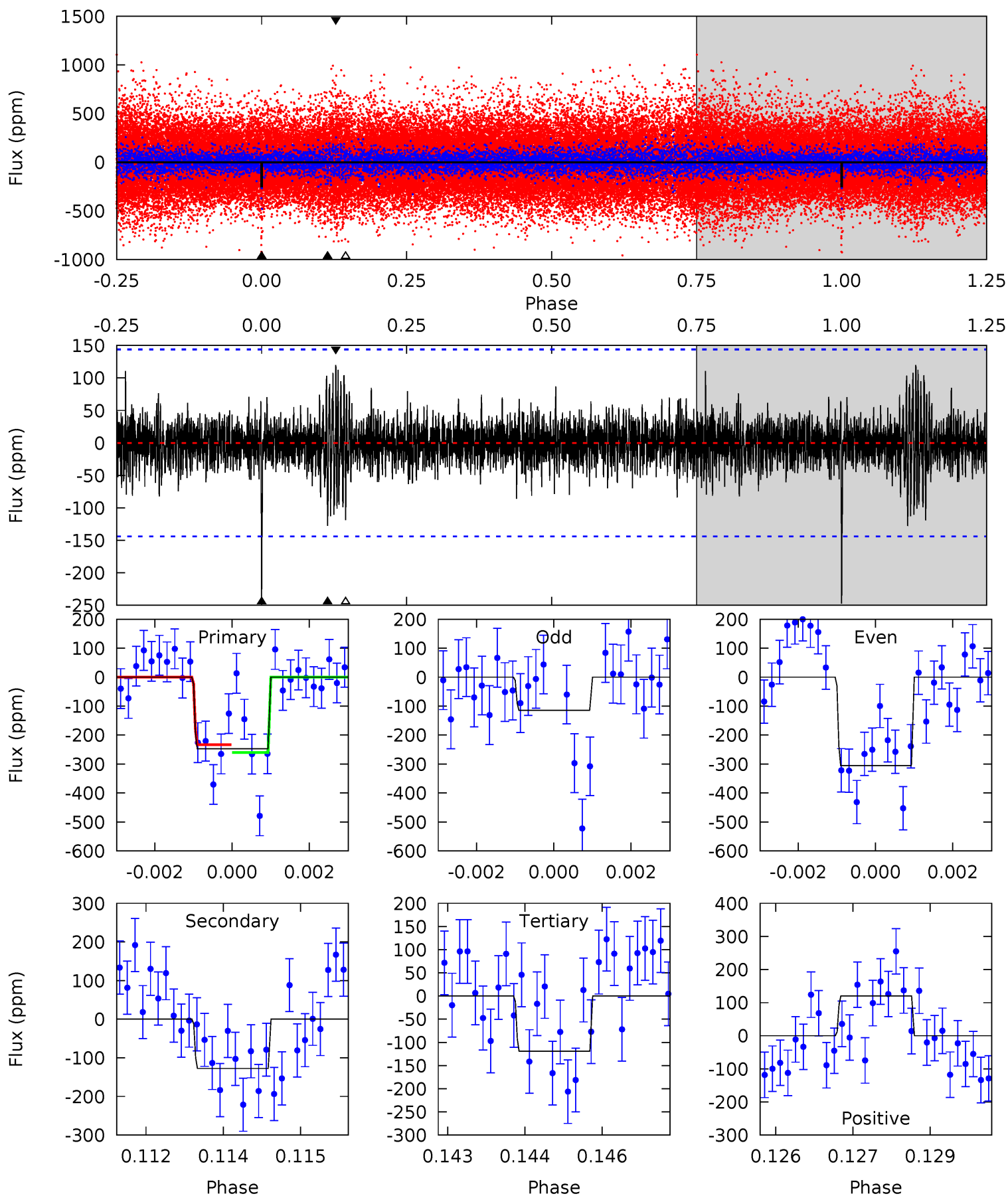
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.24	4.08	3.94	4.94	5.54	3.42	1.11	1.30	0.31	0.14	-0.86	3.25	1.24	0.48	0.13



Alt Model-Shift Uniqueness Test

009040536-01, P = 363.887648 Days, E = 140.161997 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.24	4.77	4.44	4.48	5.37	3.17	0.95	4.79	4.75	0.33	0.29	3.27	1.70	0.33	0.49



Stellar Parameters For KIC 009040536

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5875^{+146}_{-161}	$4.572^{+0.035}_{-0.184}$	$-0.420^{+0.300}_{-0.300}$	$0.809^{+0.211}_{-0.070}$	$0.895^{+0.090}_{-0.099}$	$2.376^{+0.435}_{-1.171}$
	+2%/-3%	+1%/-4%	+71%/-71%	+26%/-9%	+10%/-11%	+18%/-49%
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 009040536-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-169 ± 41	$2.76^{+2.40}_{-1.86}$	340^{+21}_{-14}	4155^{+2486}_{-771}	10778^{+86081}_{-7586}
Alt.	-128 ± 27	$2.47^{+2.36}_{-1.69}$	340^{+20}_{-15}	4144^{+2677}_{-858}	10469^{+92009}_{-7738}

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

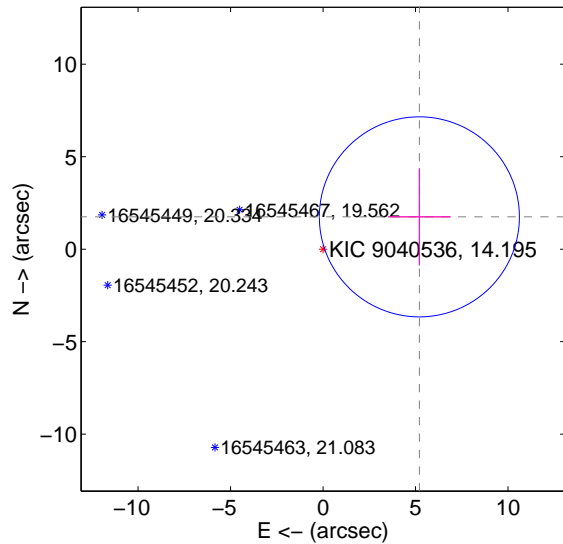
Supplemental centroid analysis for 009040536-01. Kepler magnitude: 14.20. Transit SNR 6.89

There are 0 quarters with good PRF difference image offsets

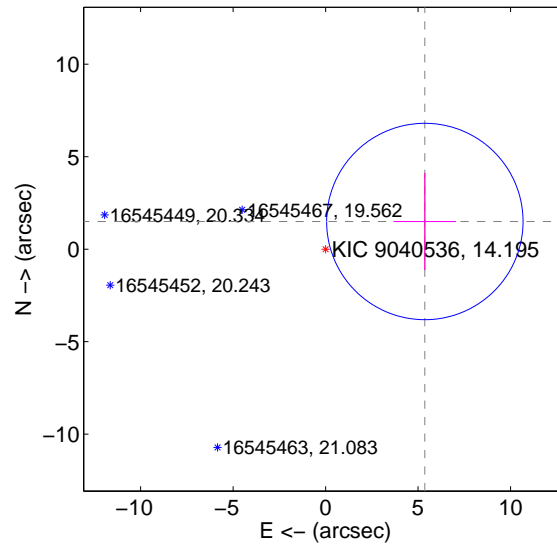
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.493 ± 1.802	3.05	-5.208 ± 1.685	1.747 ± 2.621
PRF-fit source offset from KIC position	5.570 ± 1.770	3.15	-5.366 ± 1.685	1.496 ± 2.621
photometric centroid source offset	3.64 ± 2.04	1.78	-2.02 ± 1.75	-3.02 ± 2.16

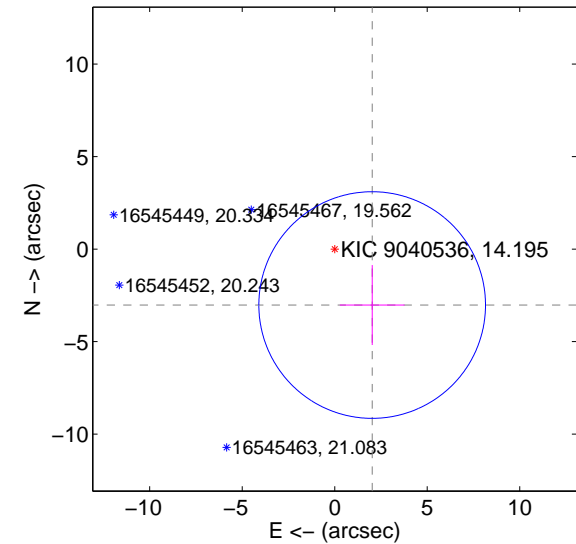
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

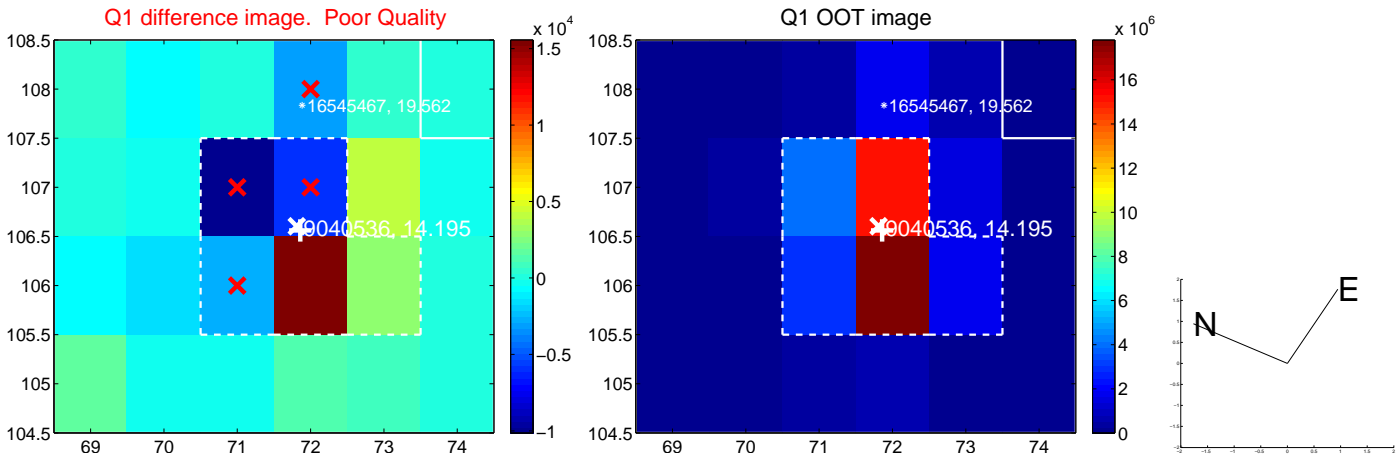


offset from photometric centroids



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.

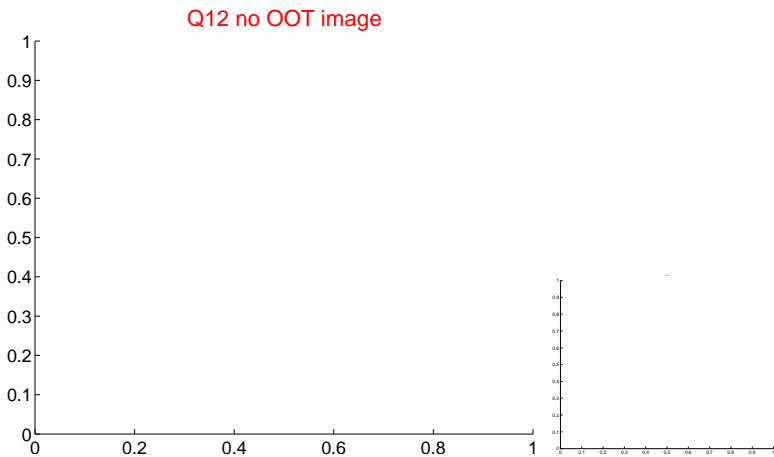
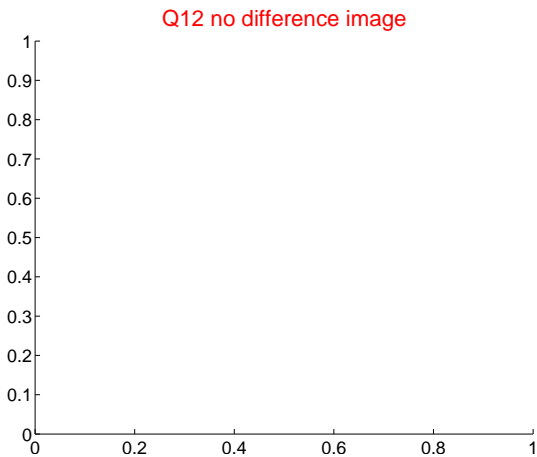
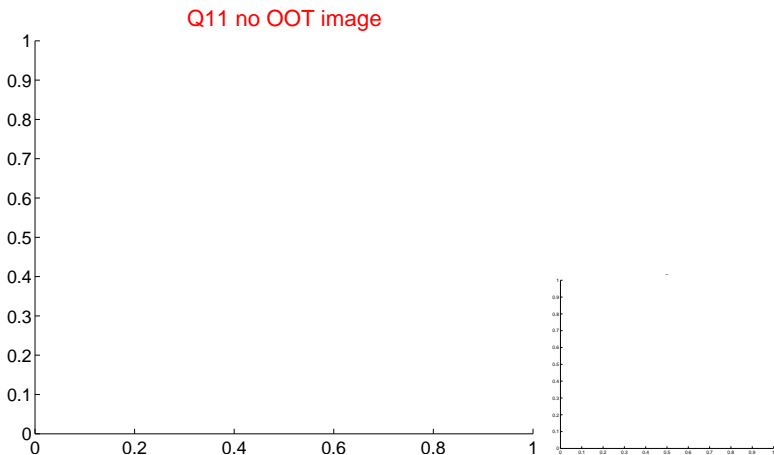
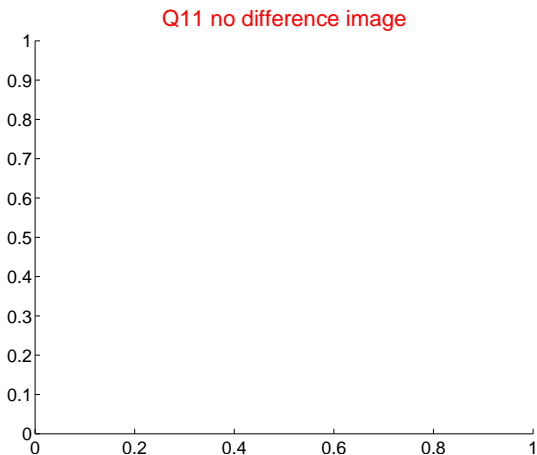
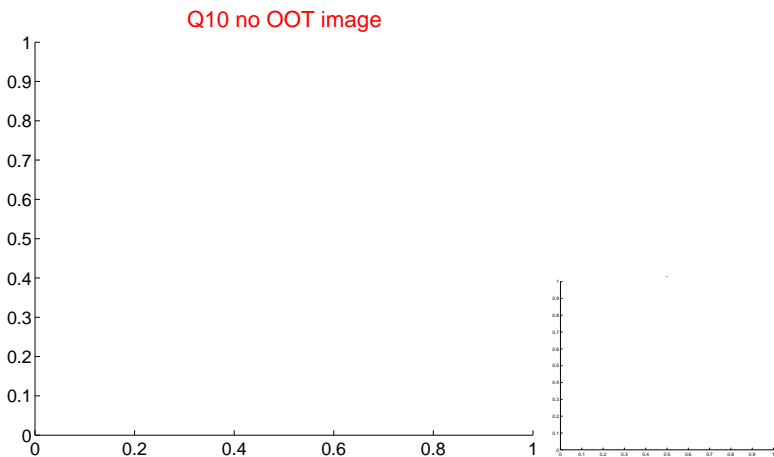
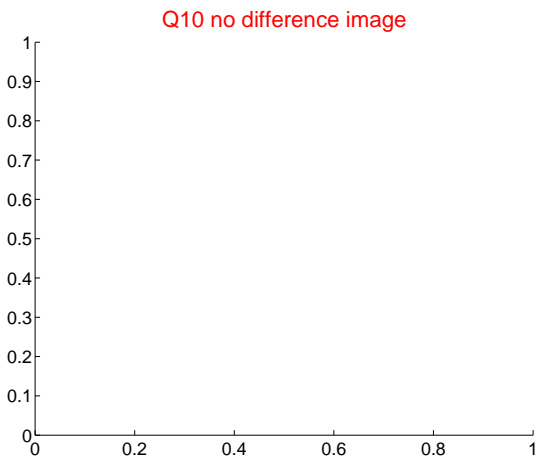
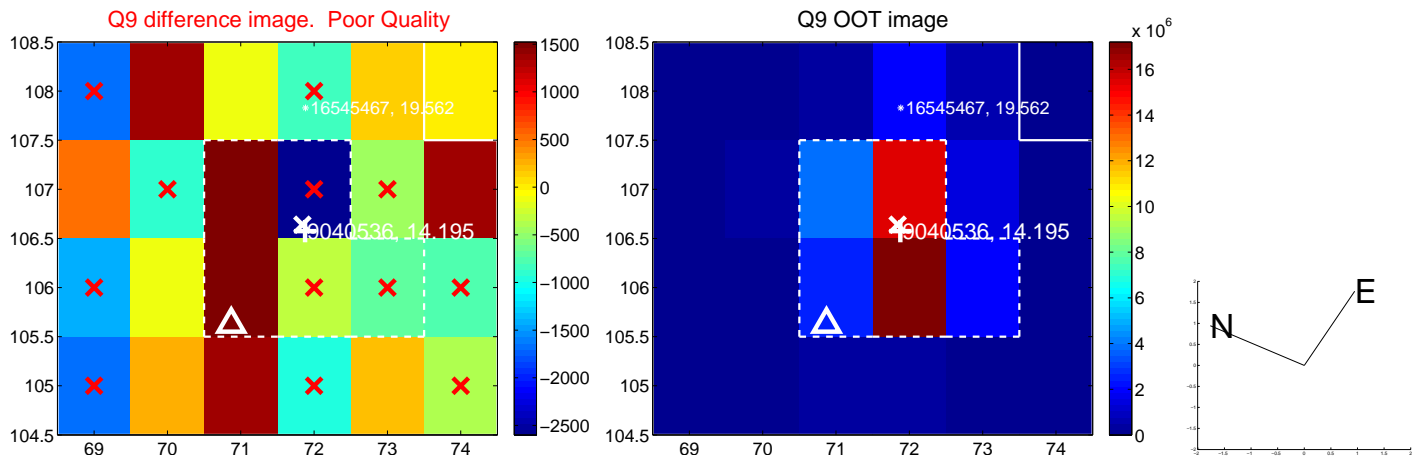
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



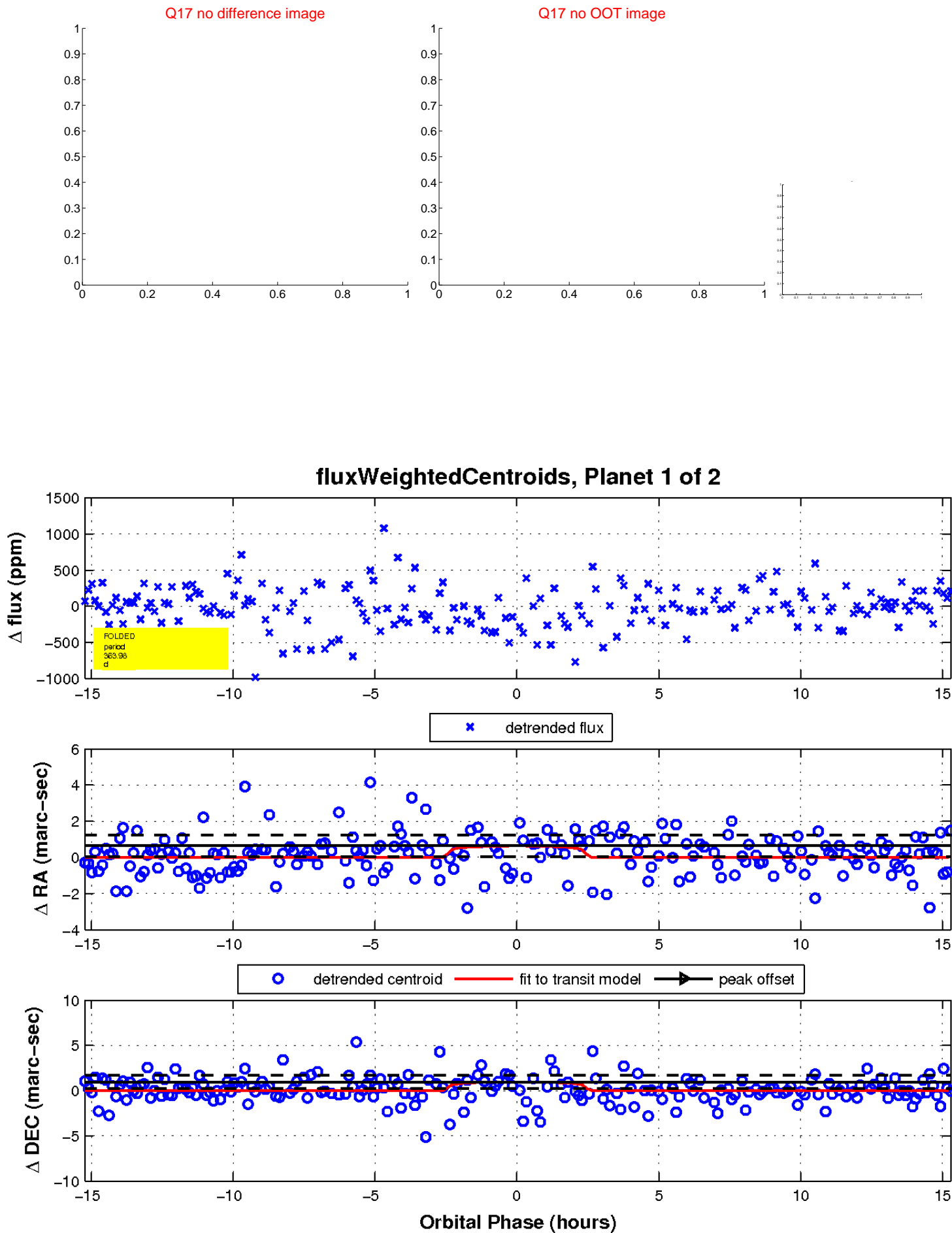
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

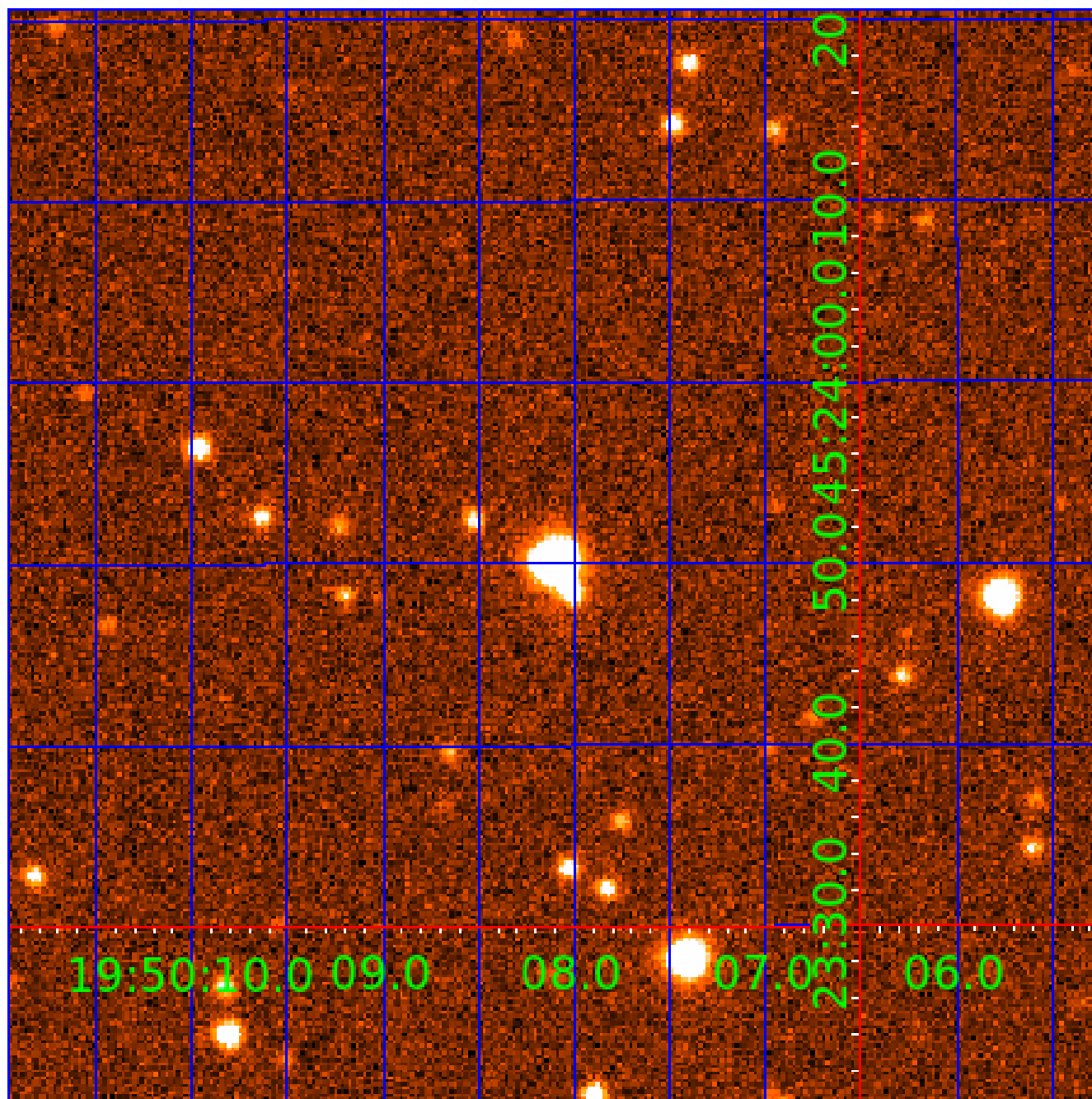


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009040536

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})
009040536-01	OBS	No	363.978139	140.080369	339.8	5.114	8.4	6.9	0.81	5875	1.63	0.76
009040536-02	OBS	No	367.681795	179.825340	333.0	16.153	8.5	8.9	0.81	5875	1.57	0.75

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009040536-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—CENT_FEW_DIFFS
009040536-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—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.

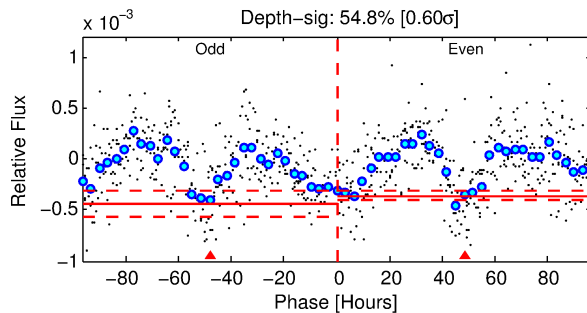
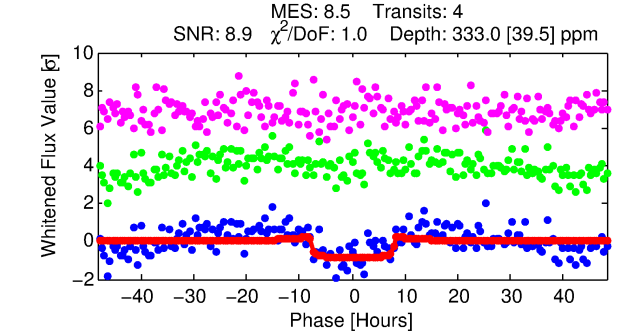
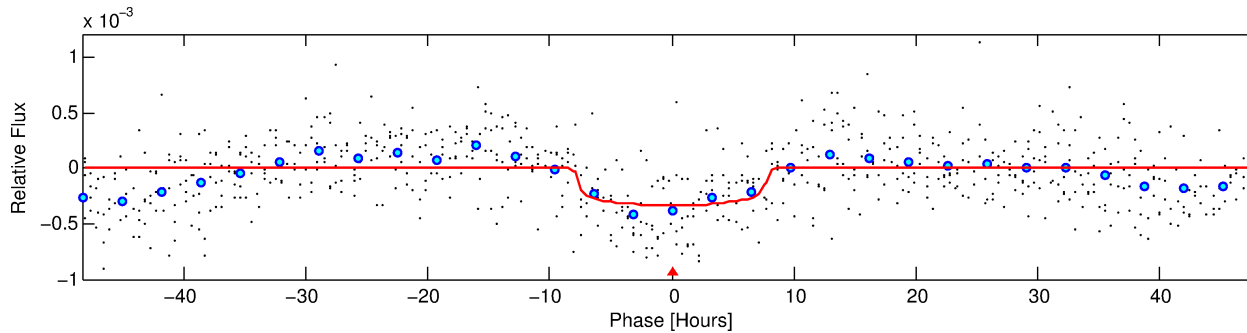
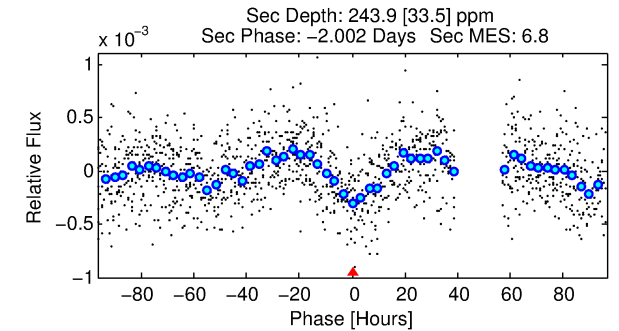
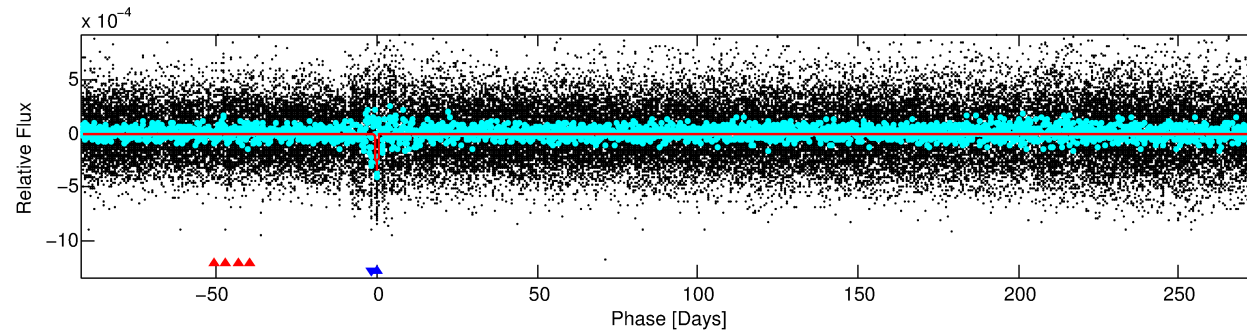
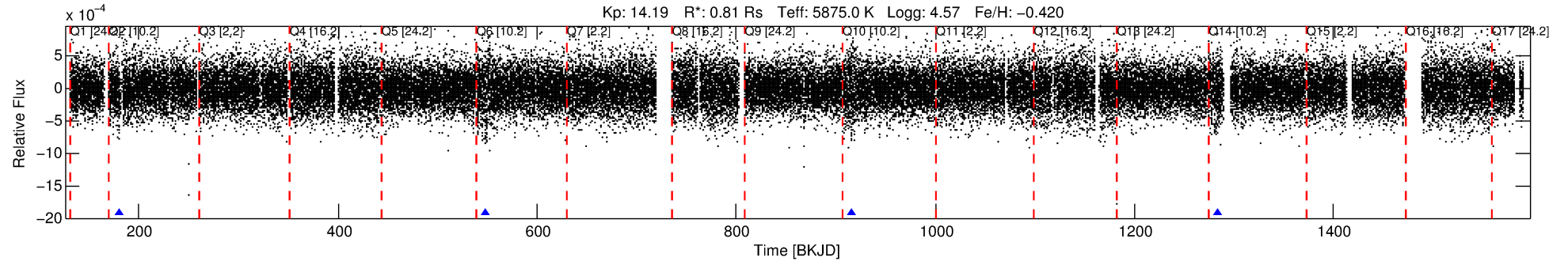
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009040536-02

No Significant Match Found

DV One-Page Summary

KIC: 9040536 Candidate: 2 of 2 Period: 367.682 d



DV Fit Results:

Period = 367.68180 [0.00981] d
Epoch = 179.8253 [0.0188] BKJD
Rp/R* = 0.0178 [0.0049]
a/R* = 129.49 [169.63]
b = 0.69 [0.98]
Seff = 0.75 [0.26]
Teq = 237 [21] K
Rp = 1.57 [0.60] Re
a = 0.9667 [0.2166] AU
Ag = 50591.38 [33378.61] [1.52σ]
Teffp = 5498 [798] K [6.59σ]

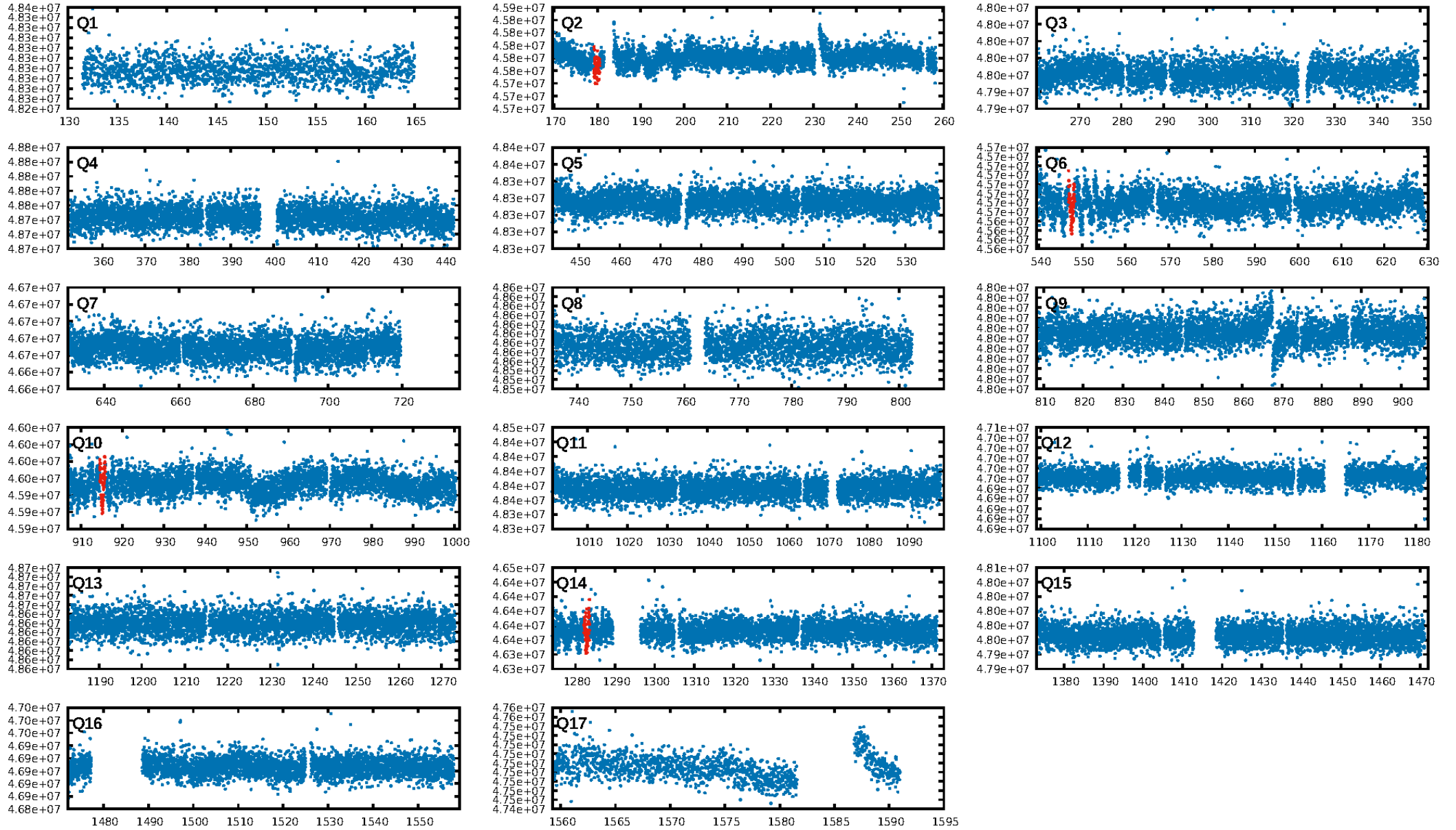
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.25σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 6.8%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 2.88e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 4.251
Centroid-sig: 0.3%
Centroid-so: 3.174 arcsec [2.06σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 1.00 [3/3]

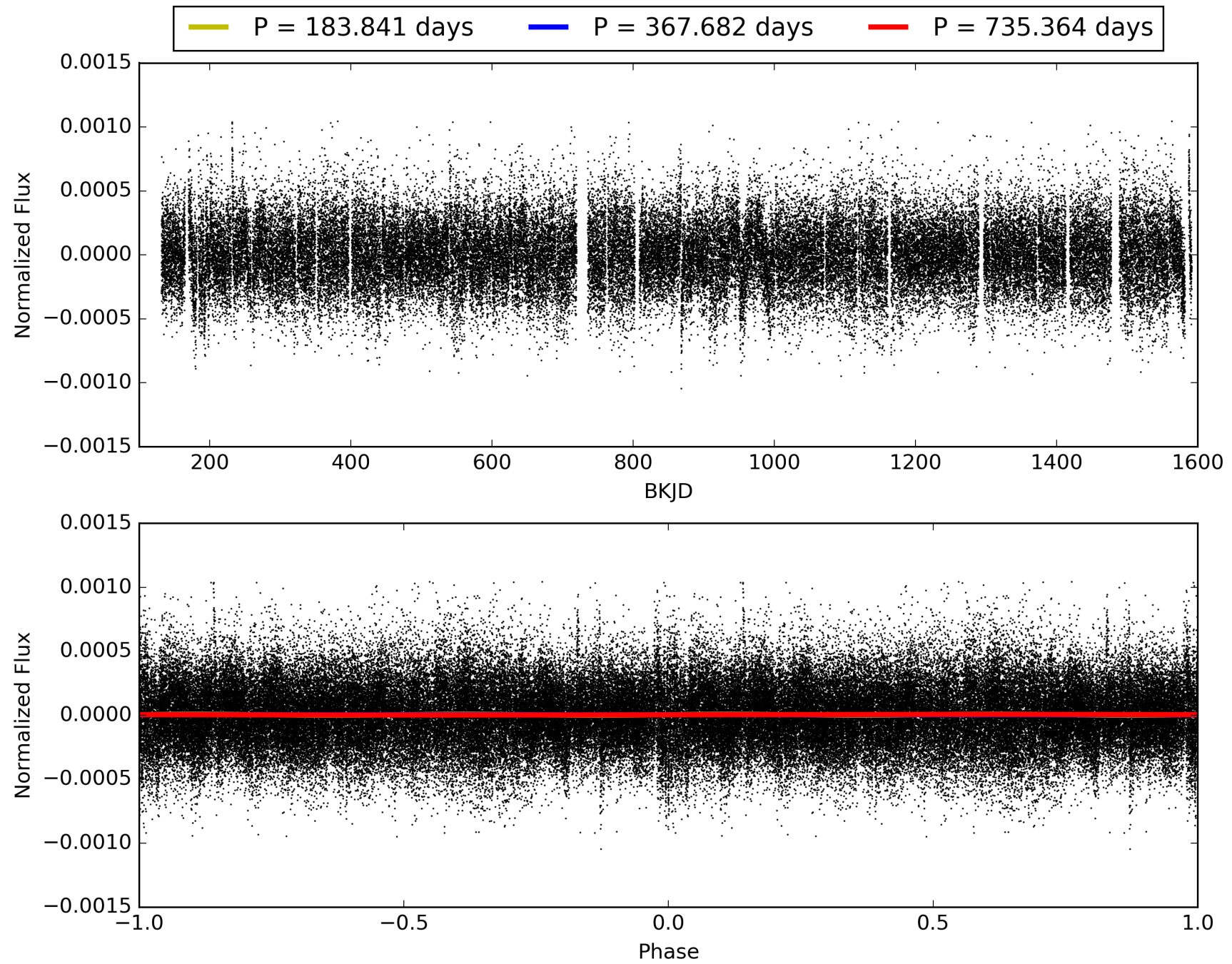
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:10:29 Z

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

TCE 009040536-02, PDC Light Curves

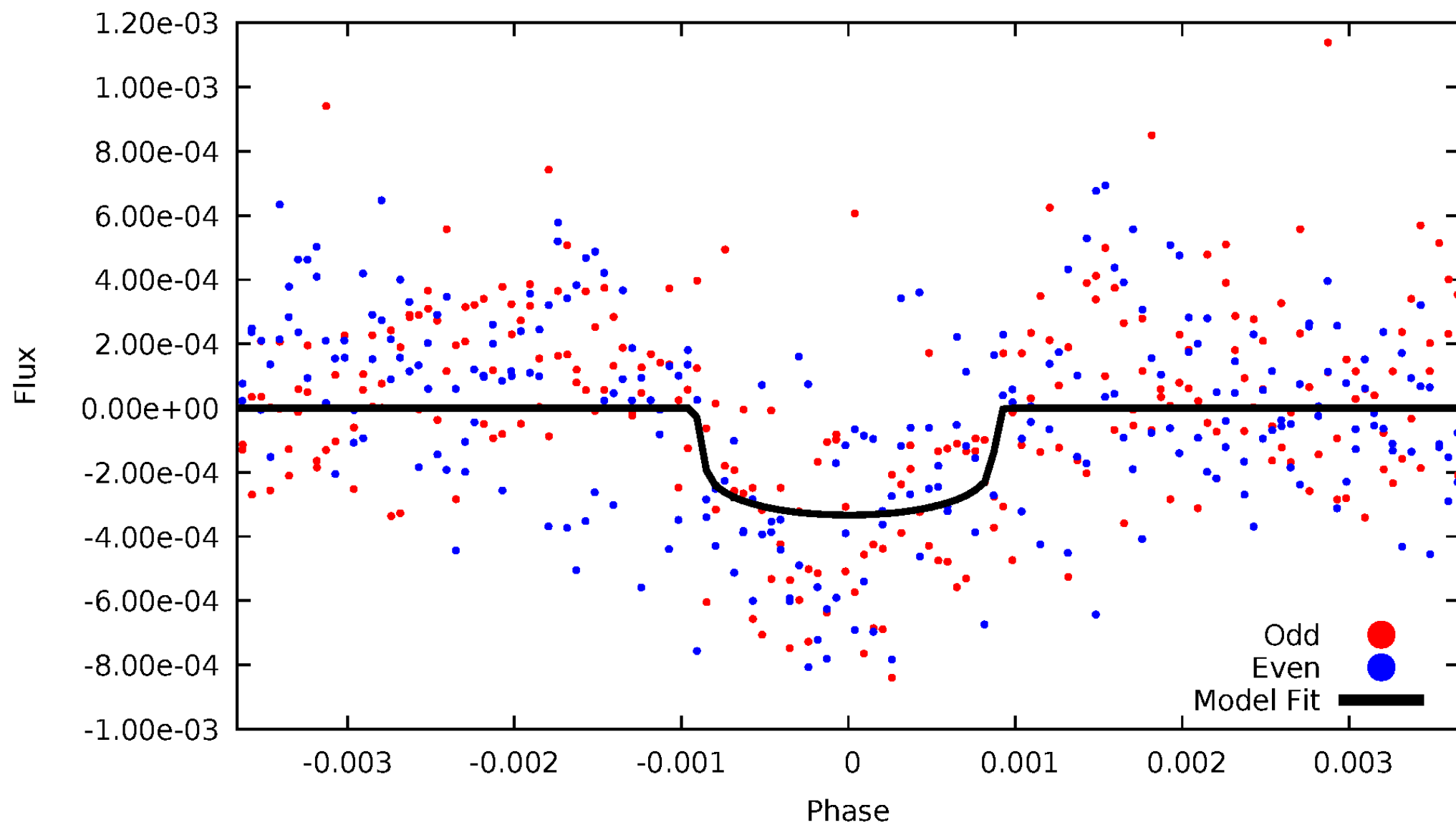


TCE 009040536-02



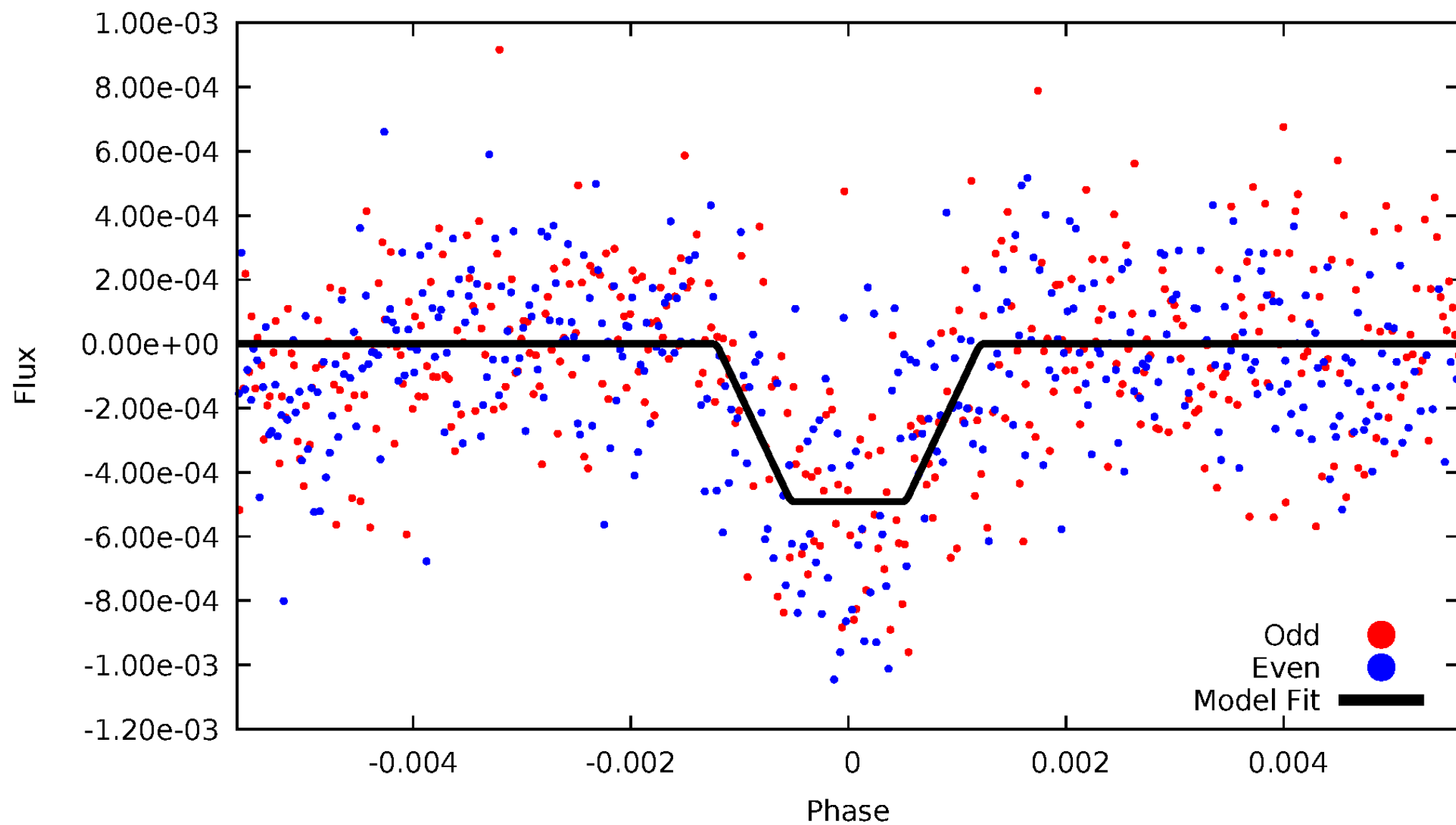
DV Odd/Even

TCE 009040536-02



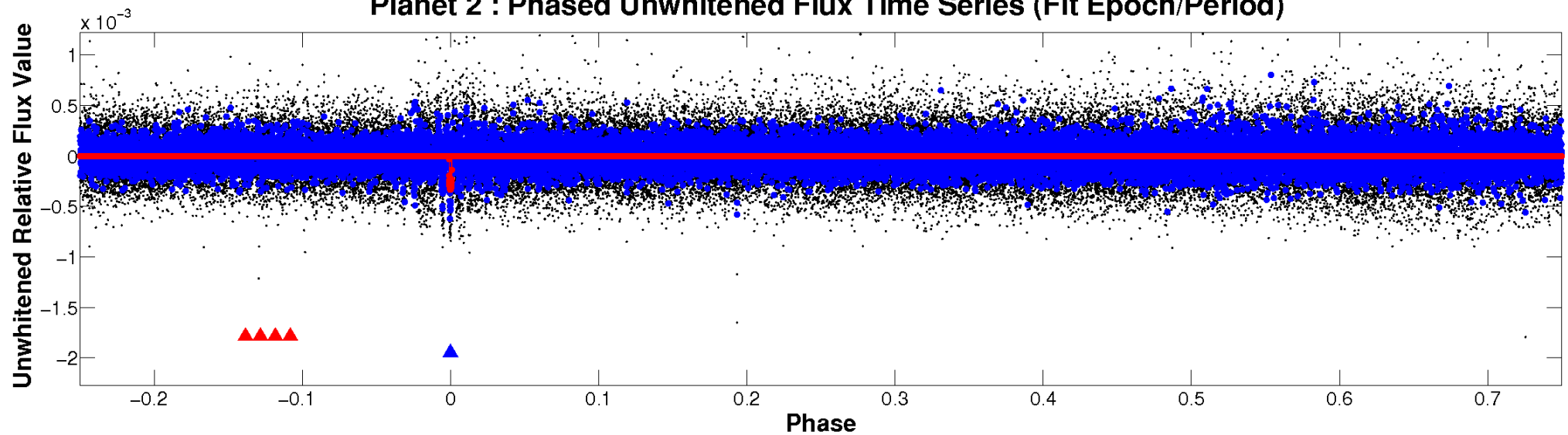
ALT Odd/Even

TCE 009040536-02

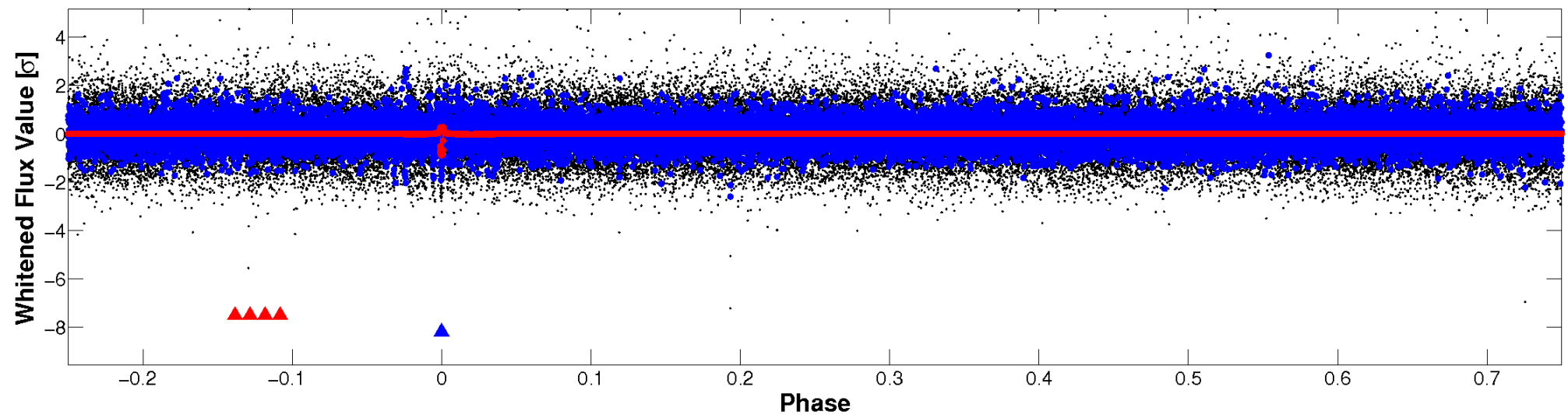


Non-Whitened Vs. Whitened Light Curve

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

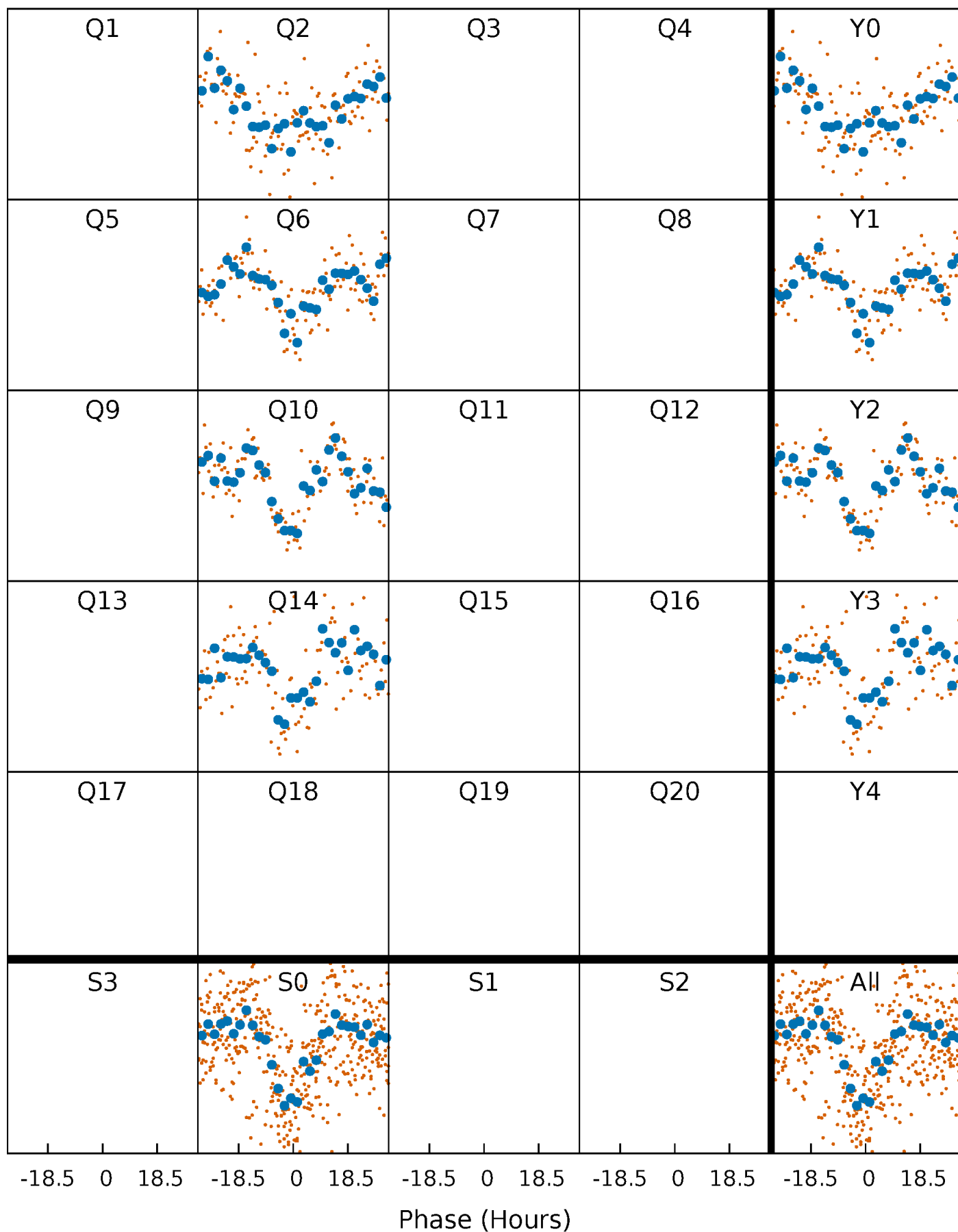


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



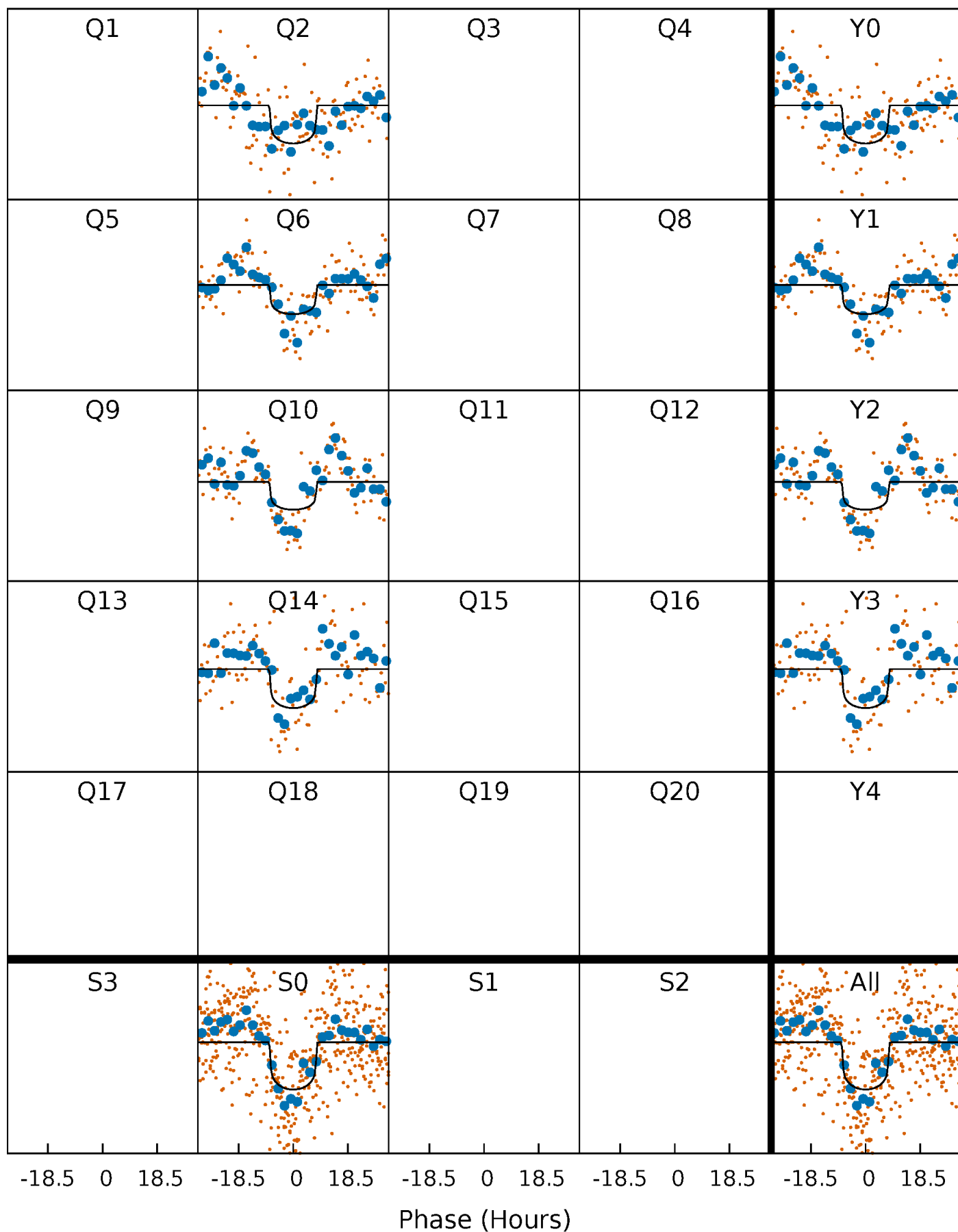
PDC Quarter-Phased Transit Curves

TCE 009040536-02 P=367.681795 Days $T_0=179.825340$ (BKJD)



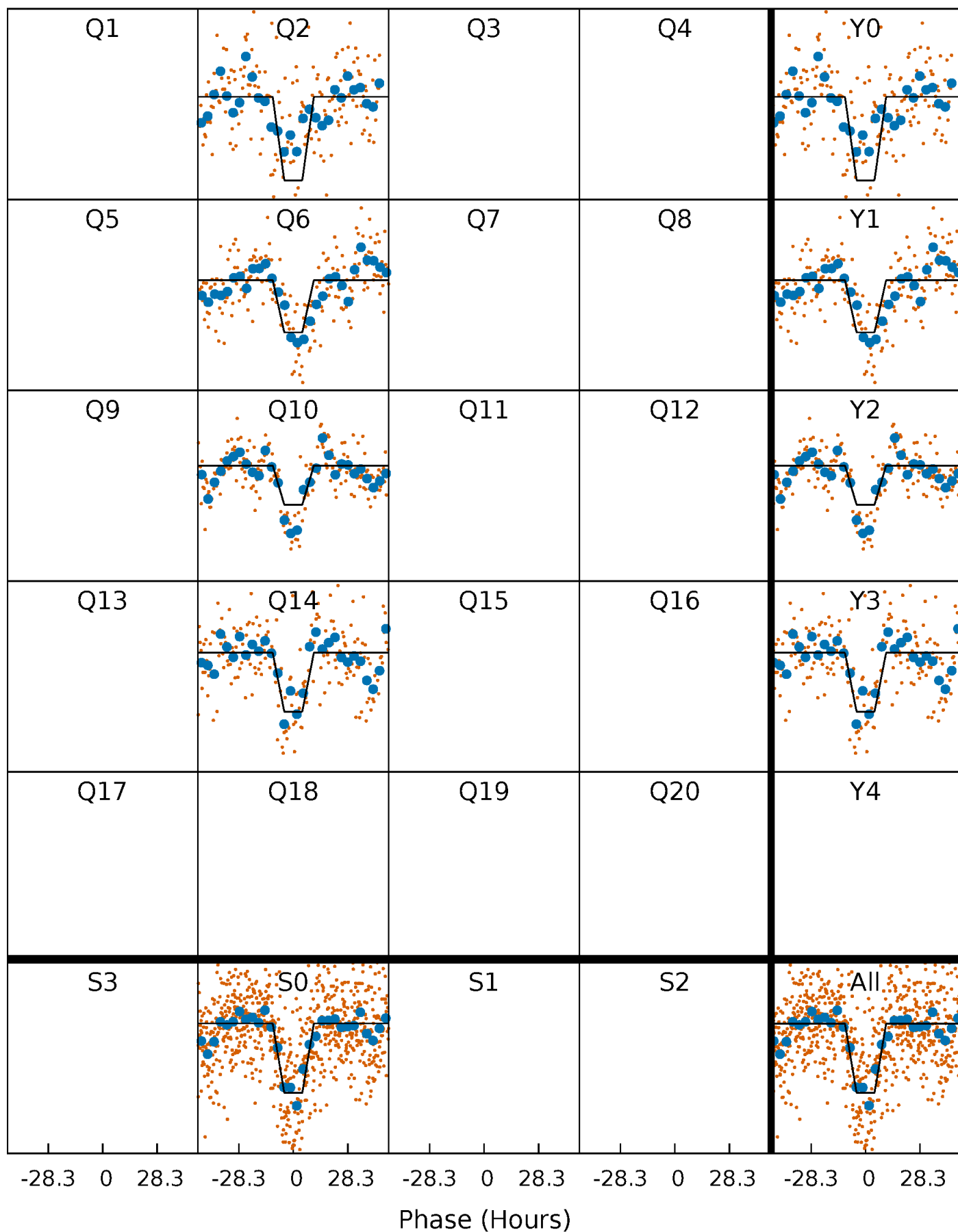
DV Quarter-Phased Transit Curves

TCE 009040536-02 P=367.681795 Days $T_0=179.825340$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

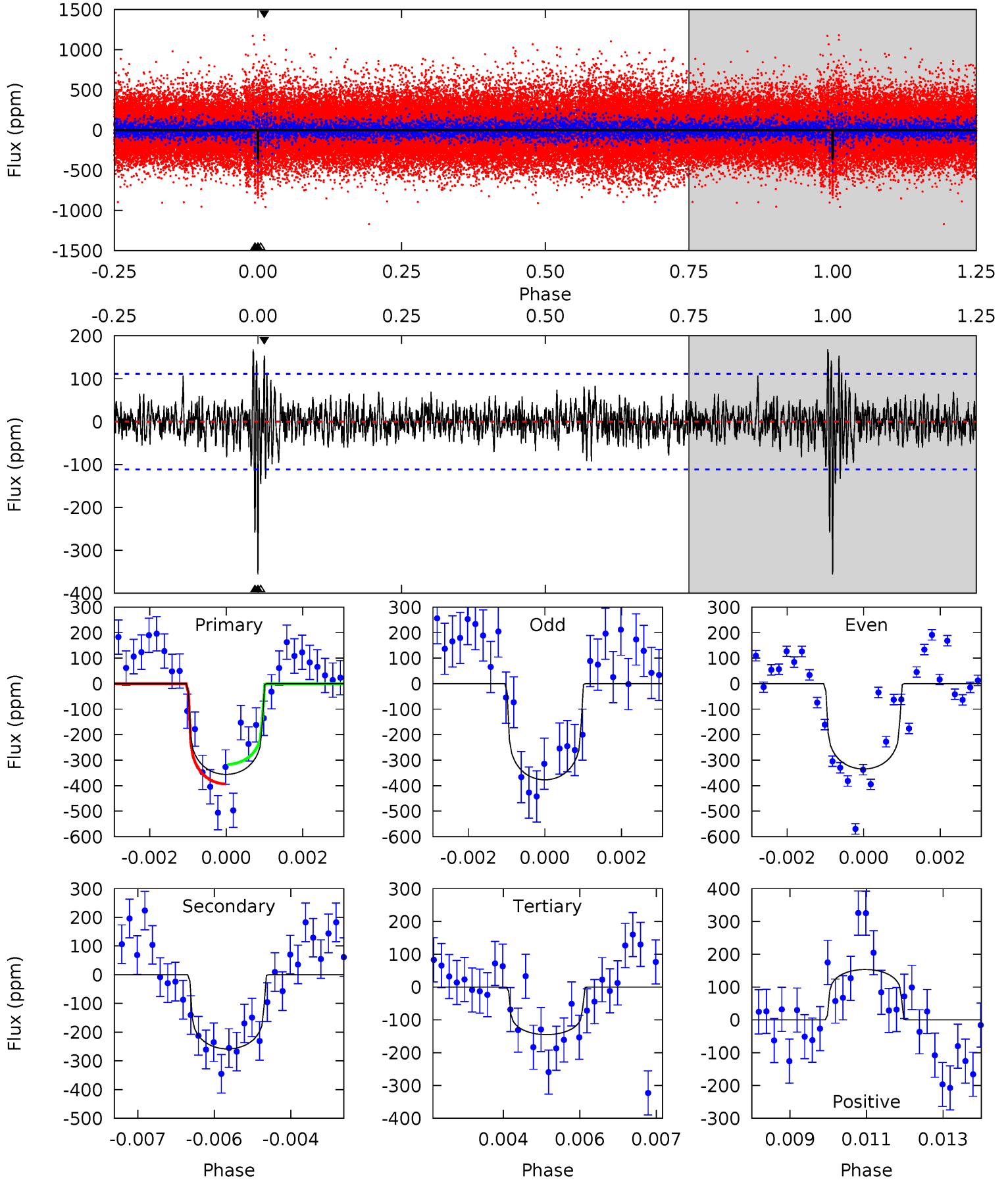
TCE 009040536-02 P=367.749591 Days $T_0=179.650196$ (BKJD)



DV Model-Shift Uniqueness Test

009040536-02, P = 367.681795 Days, E = 179.825340 Days

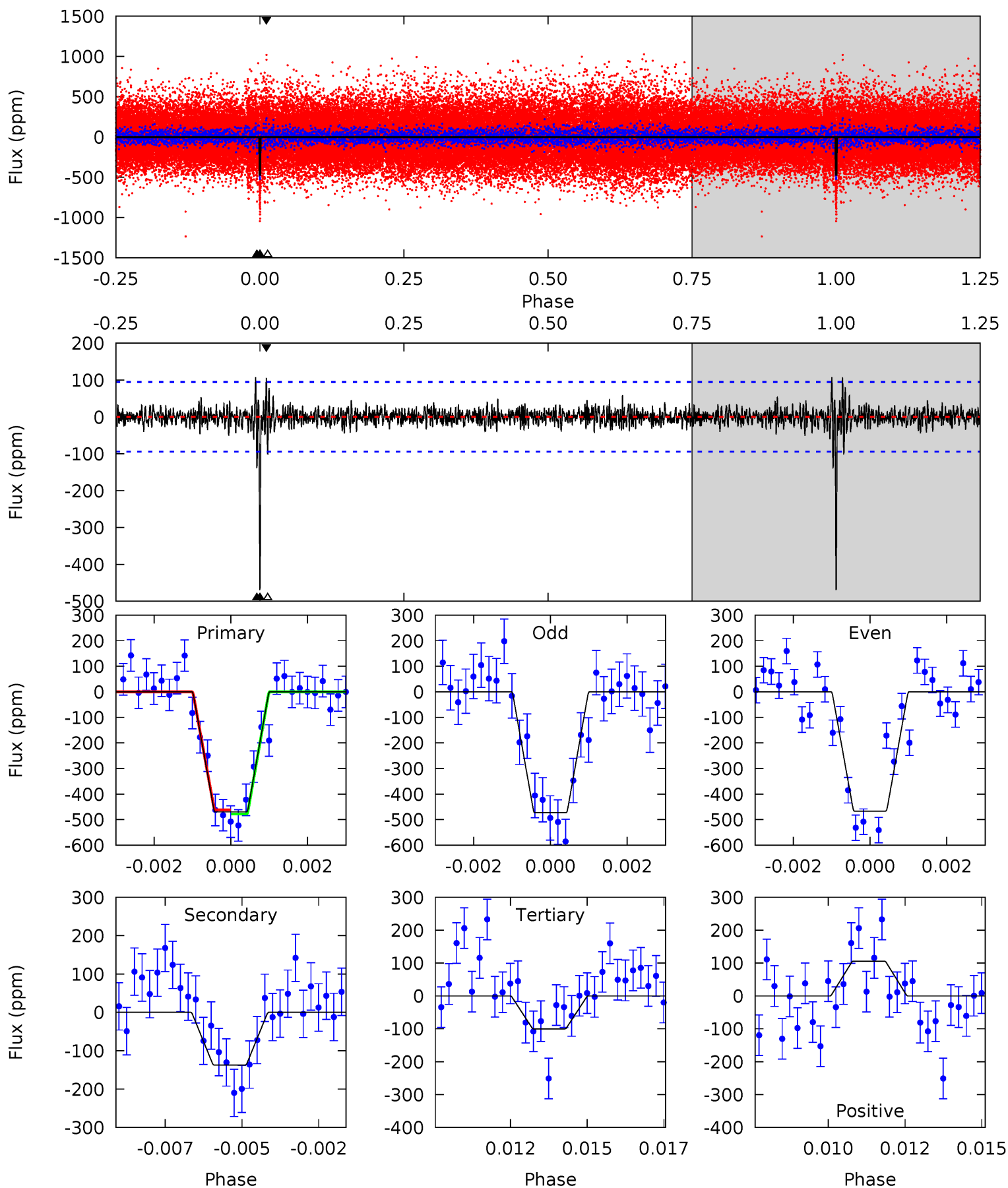
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	12.4	6.97	7.38	5.34	3.12	1.41	10.1	9.73	5.45	5.04	1.02	0.97	0.32	1.84



Alt Model-Shift Uniqueness Test

009040536-02, P = 367.749591 Days, E = 179.650196 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.3	7.68	5.60	5.90	5.29	3.03	0.94	20.7	20.4	2.08	1.78	0.18	0.99	0.19	0.46



Stellar Parameters For KIC 009040536

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5875^{+146}_{-161}	$4.572^{+0.035}_{-0.184}$	$-0.420^{+0.300}_{-0.300}$	$0.809^{+0.211}_{-0.070}$	$0.895^{+0.090}_{-0.099}$	$2.376^{+0.435}_{-1.171}$
	+2%/-3%	+1%/-4%	+71%/-71%	+26%/-9%	+10%/-11%	+18%/-49%
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 009040536-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-258 ± 21	$1.67^{+0.53}_{-0.45}$	339^{+21}_{-14}	5579^{+907}_{-593}	46623^{+42188}_{-18878}
Alt.	-137 ± 18	$2.06^{+0.54}_{-0.52}$	339^{+21}_{-15}	4459^{+562}_{-358}	16395^{+13164}_{-6175}

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

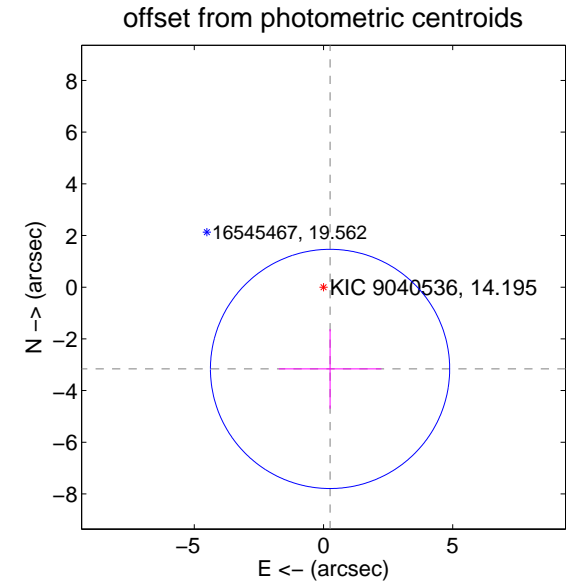
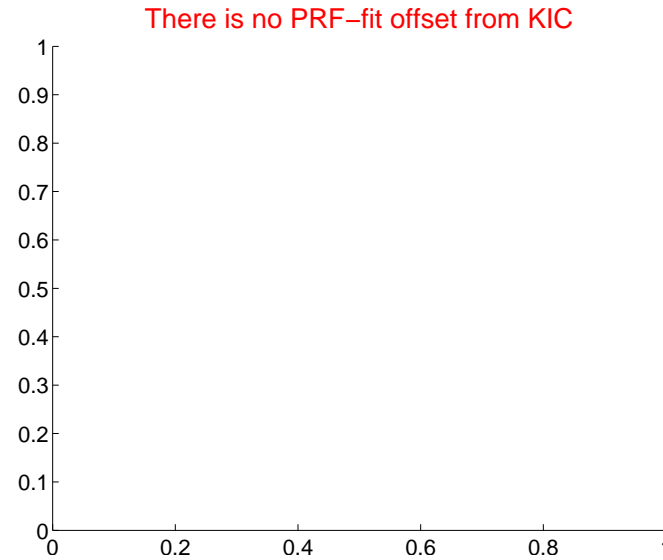
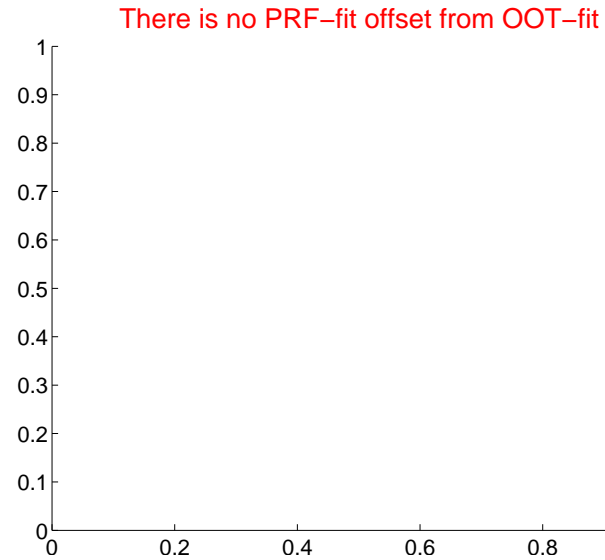
DV Centroid Data

Supplemental centroid analysis for 009040536-02. Kepler magnitude: 14.20. Transit SNR 8.95

There are 0 quarters with good PRF difference image offsets

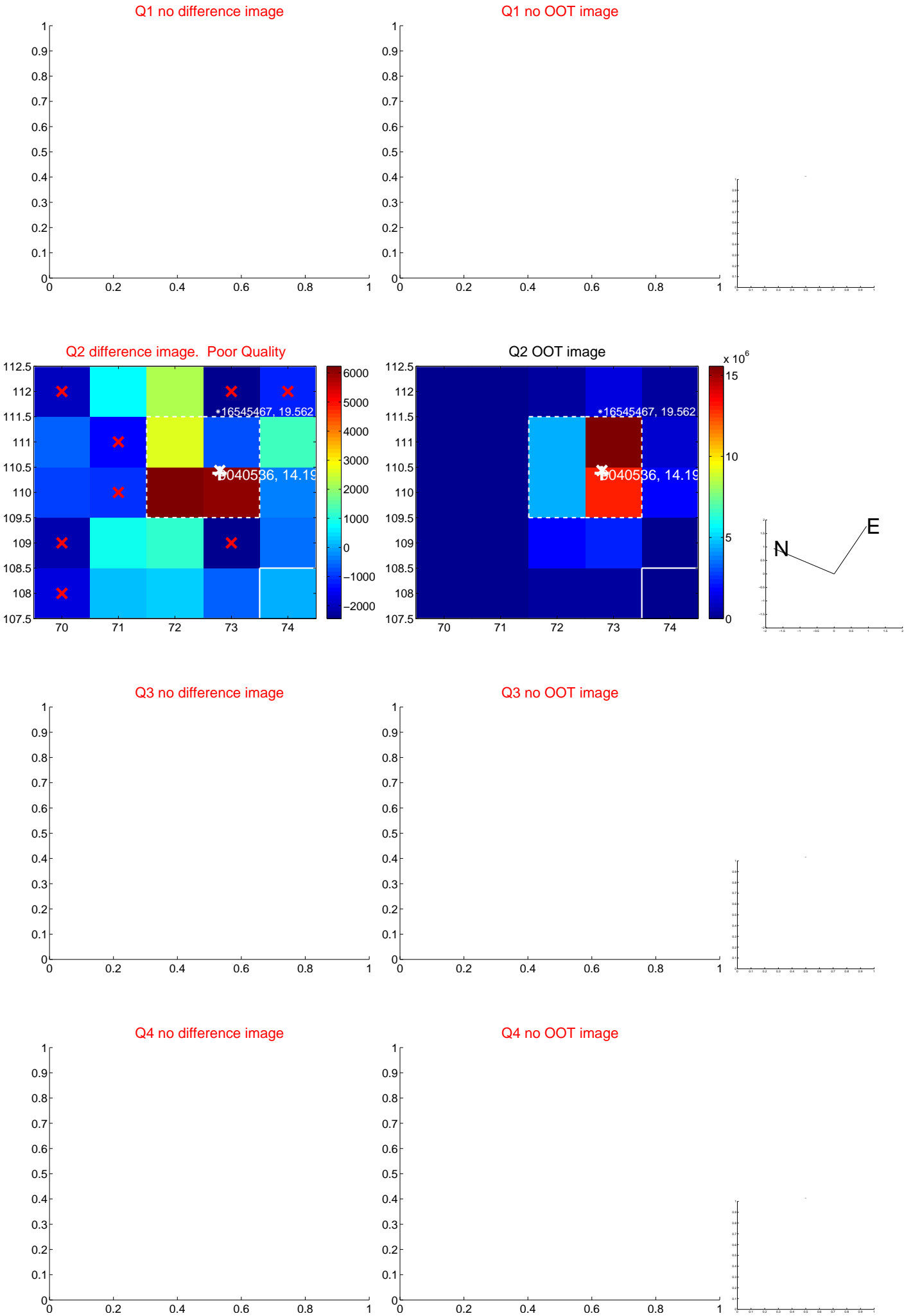
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	3.17 ± 1.54	2.06	-0.25 ± 1.99	-3.16 ± 1.54

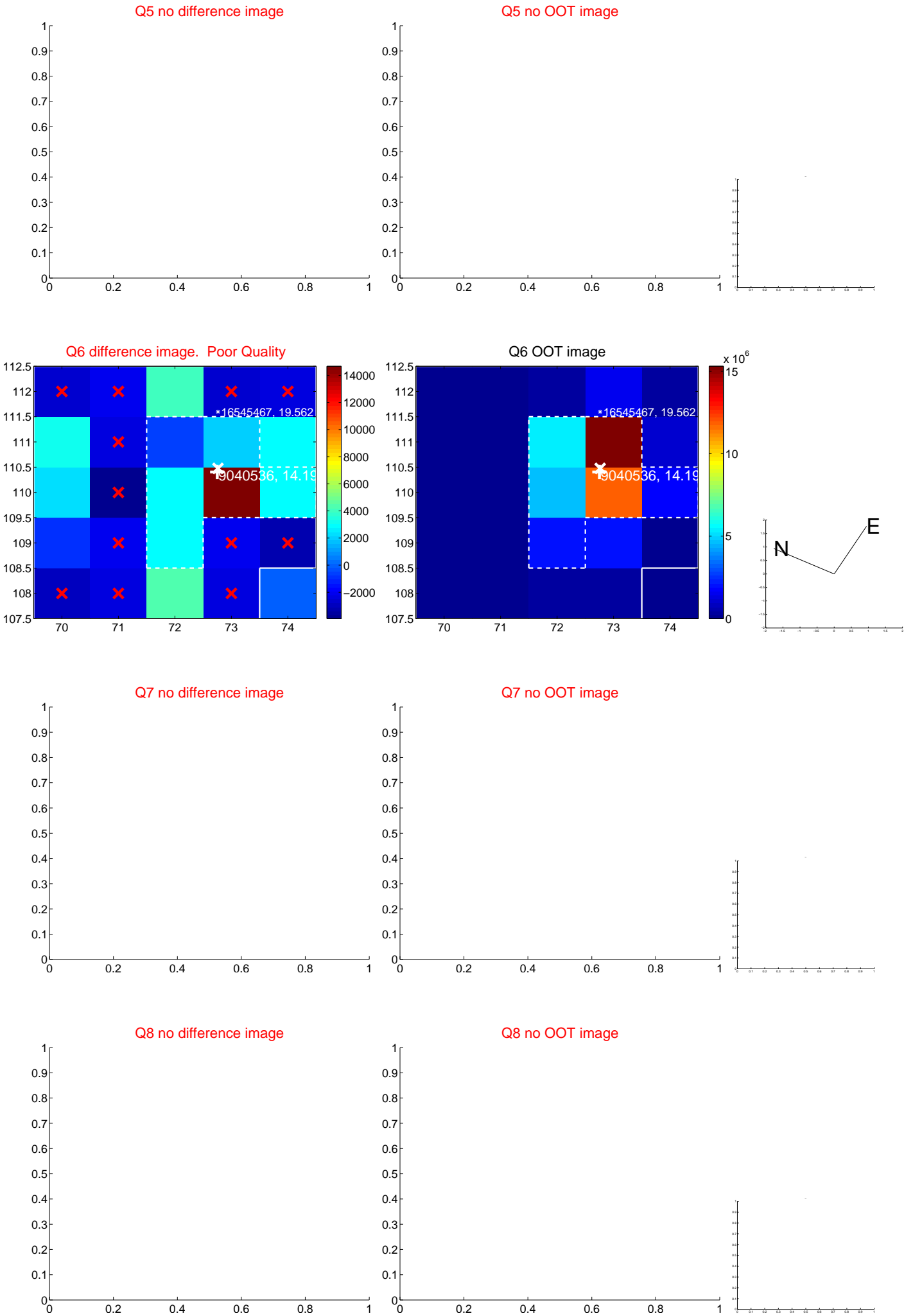


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

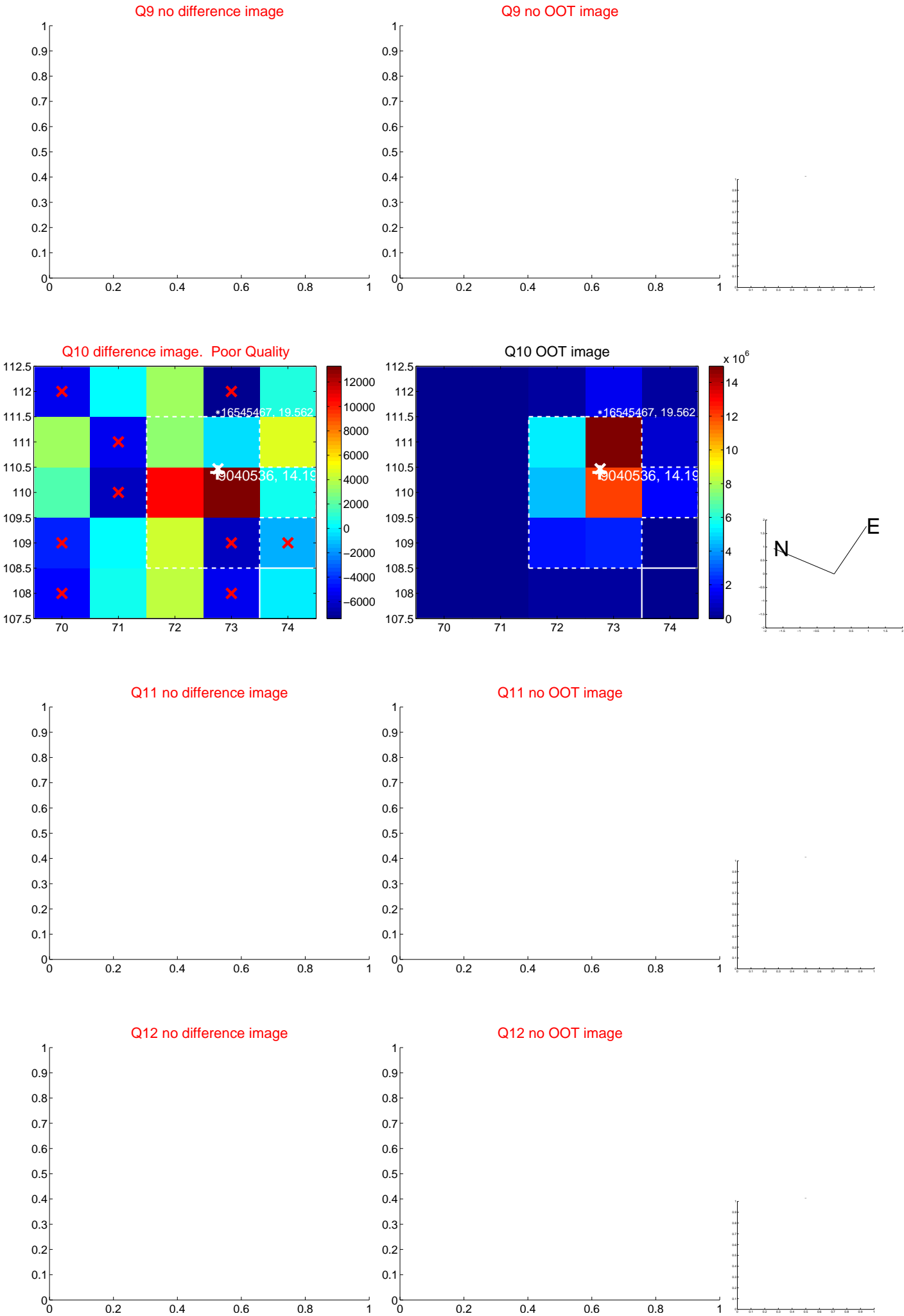
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



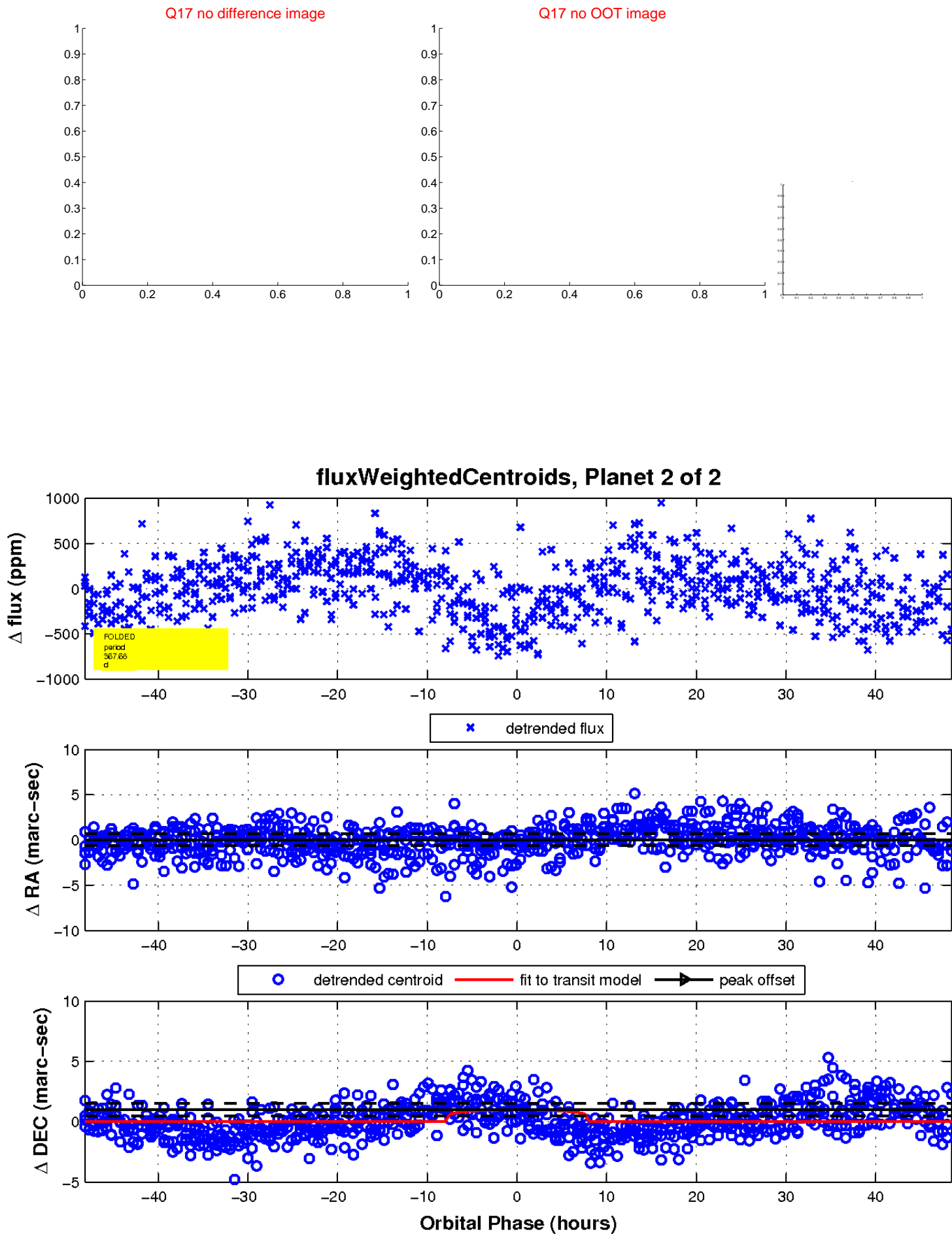
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



UKIRT Image

Declination

