

KIC 009957351

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})
009957351-01	OBS	3964.01	0.991103	131.893713	299261.3	1.881	1934.9	774.4	0.58	4769	34.55	592.10
009957351-02	OBS	No	0.991088	132.406930	278929.1	1.932	1643.1	725.5	0.58	4769	32.94	592.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009957351-01	OBS	FP	0.00	1	0	0	0	LPP_ALT
009957351-02	OBS	FP	0.00	1	0	0	0	LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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.

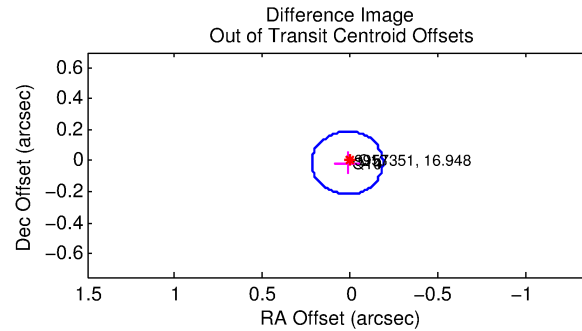
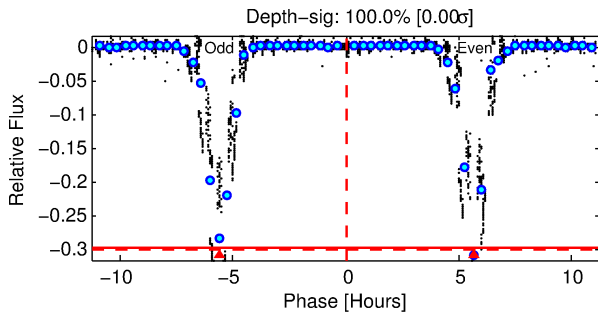
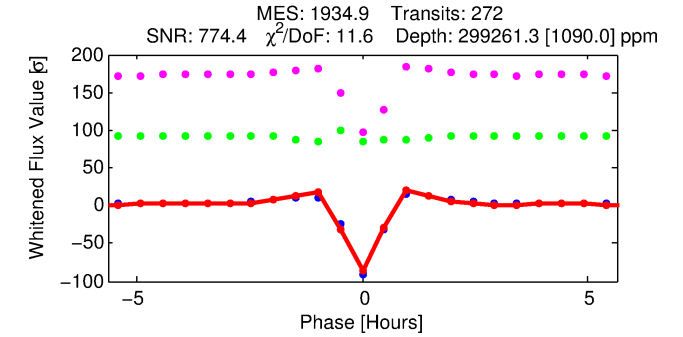
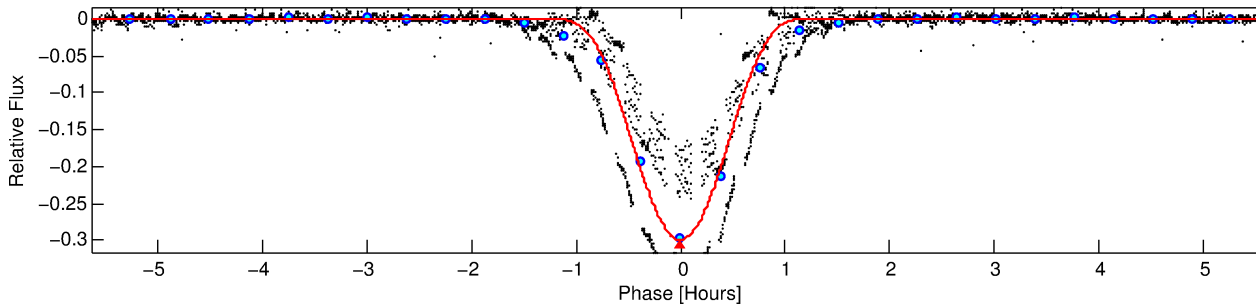
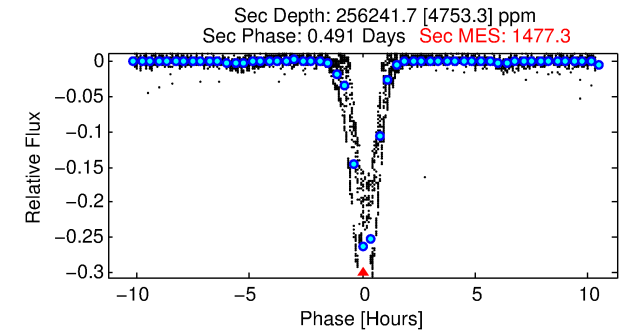
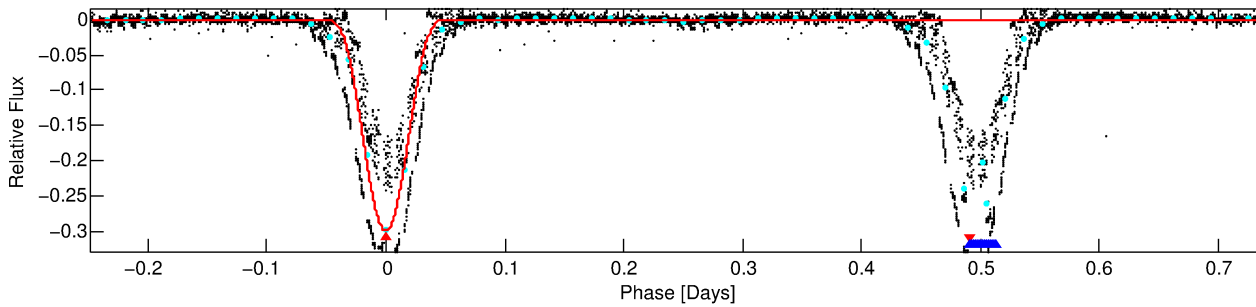
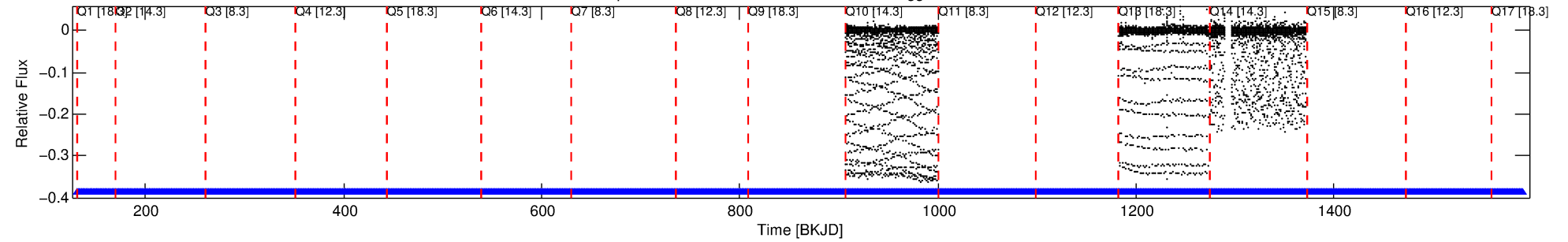
Ephemeris Match Information For 009957351-01

No Significant Match Found

DV One-Page Summary

KIC: 9957351 Candidate: 1 of 2 Period: 0.991 d
KOI: K03964.01 Corr: 0.914

Kp: 16.95 R*: 0.58 Rs Teff: 4769.0 K Logg: 4.67 Fe/H: -0.920



DV Fit Results:

Period = 0.99110 [0.00000] d
Epoch = 131.8937 [0.0000] BKJD
Rp/R* = 0.5478 [0.0161]
a/R* = 5.98 [0.01]
b = 0.50 [0.04]
Seff = 592.10 [102.14]
Teff = 1258 [54] K
Rp = 34.55 [2.93] Re
a = 0.0162 [0.0011] AU
Ag = 30.88 [3.52] [8.49σ]
Teffp = 4584 [179] K [17.79σ]

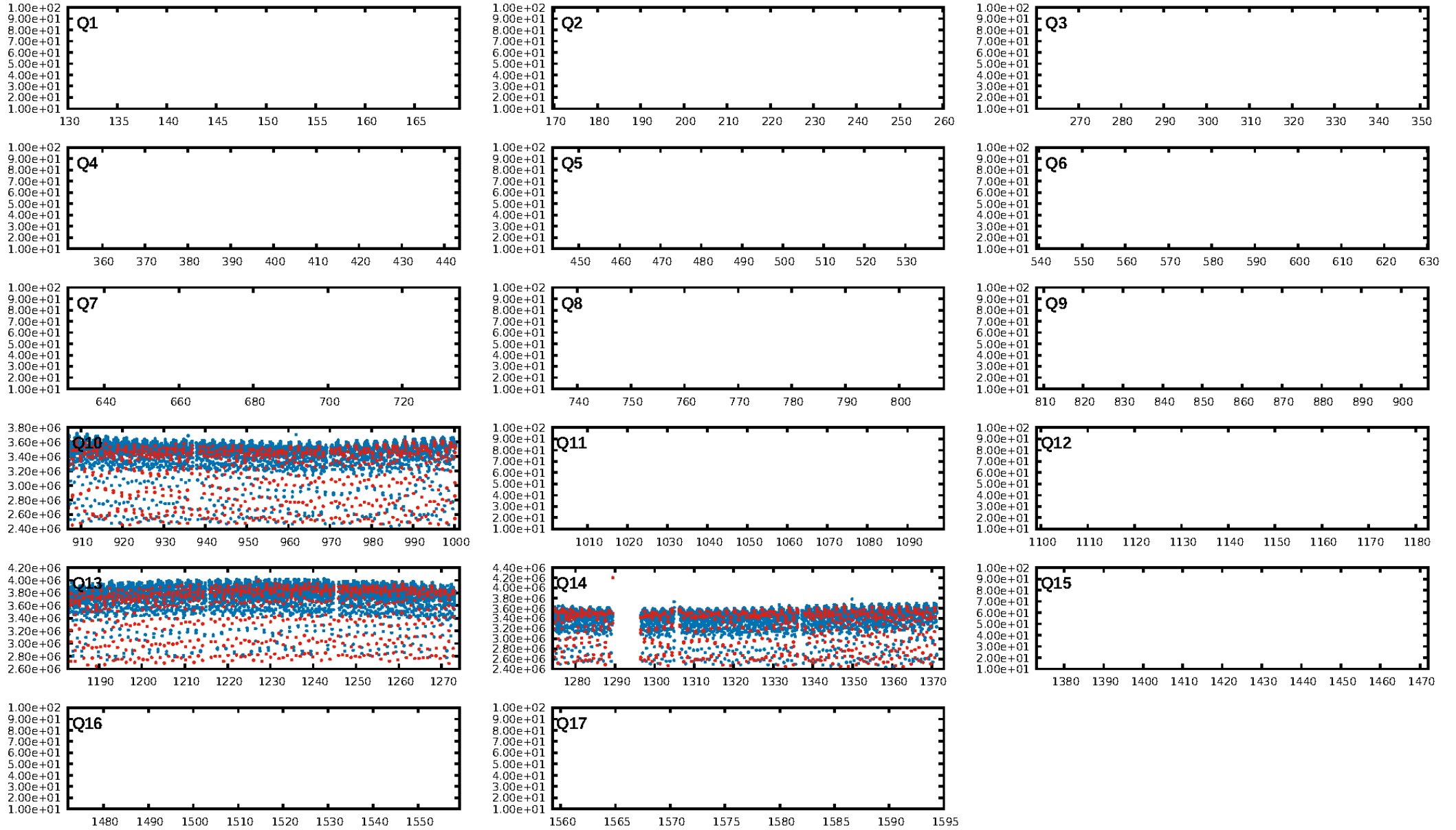
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [272/272]
GhostDiagnostic-chr: 0.9178
Centroid-sig: 4.5%
Centroid-so: 0.267 arcsec [70.59σ]
OotOffset-rm: 0.022 arcsec [0.32σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-rm: 0.203 arcsec [2.76σ]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

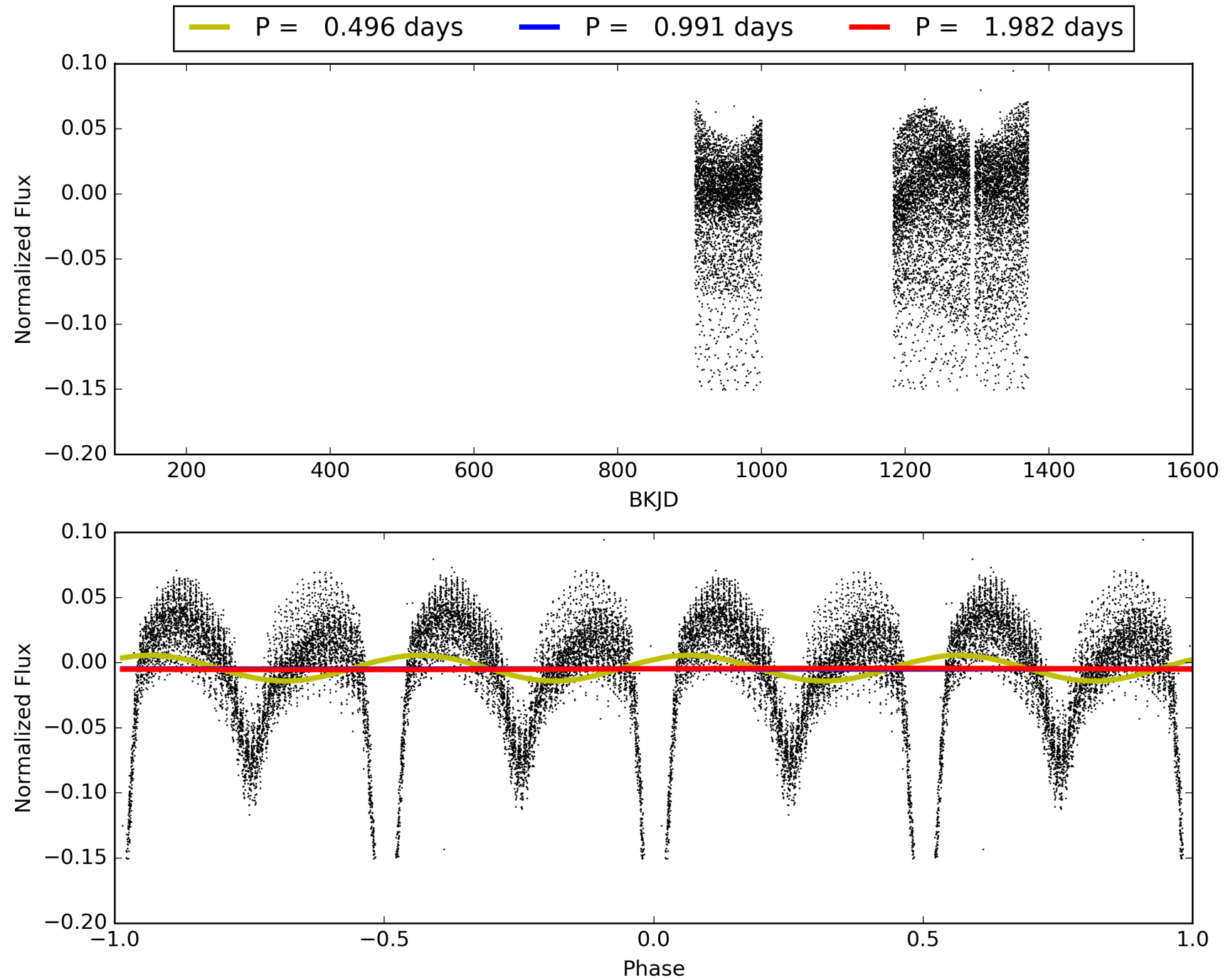
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:18:21 Z

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

TCE 009957351-01, PDC Light Curves

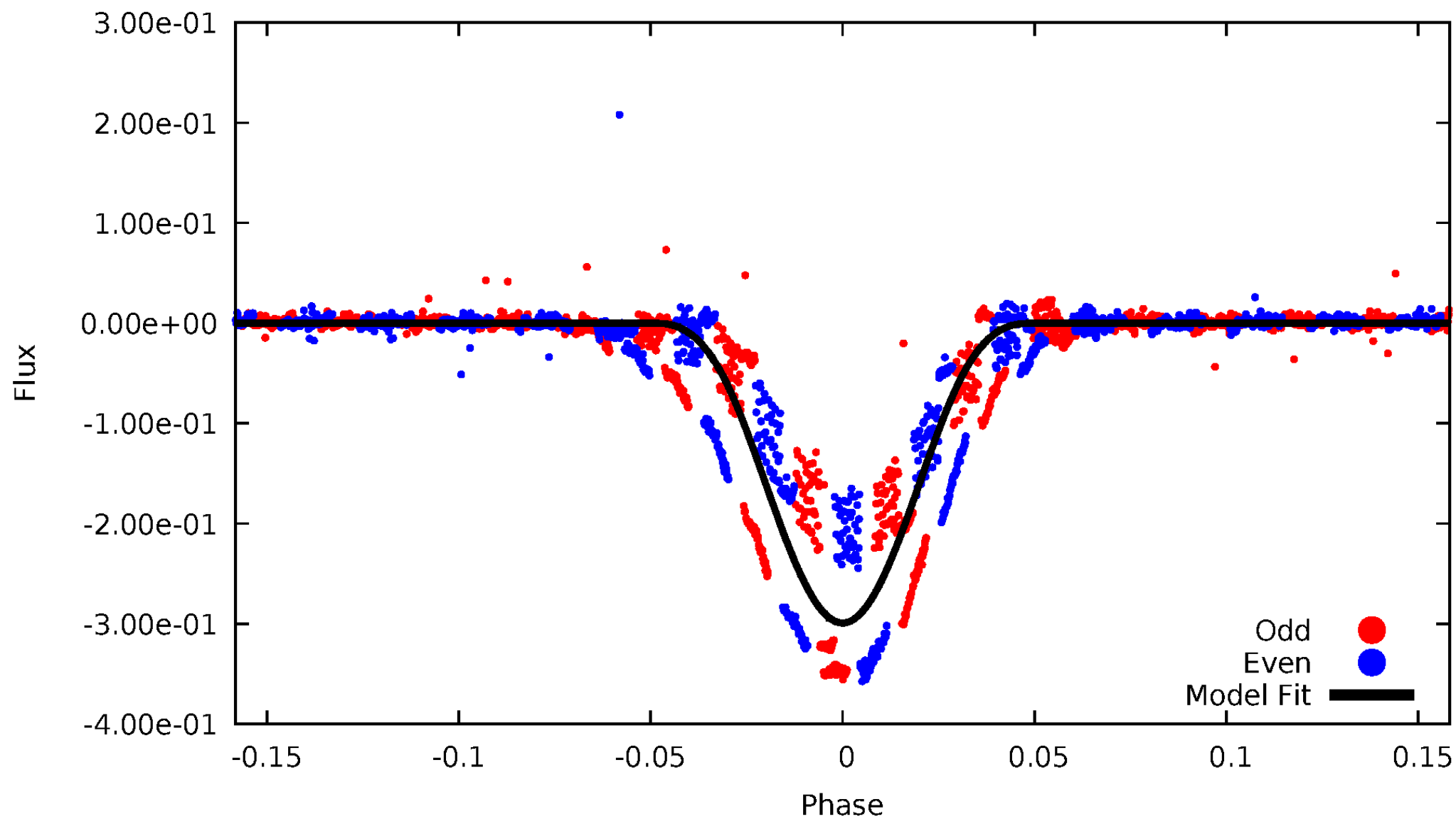


TCE 009957351-01



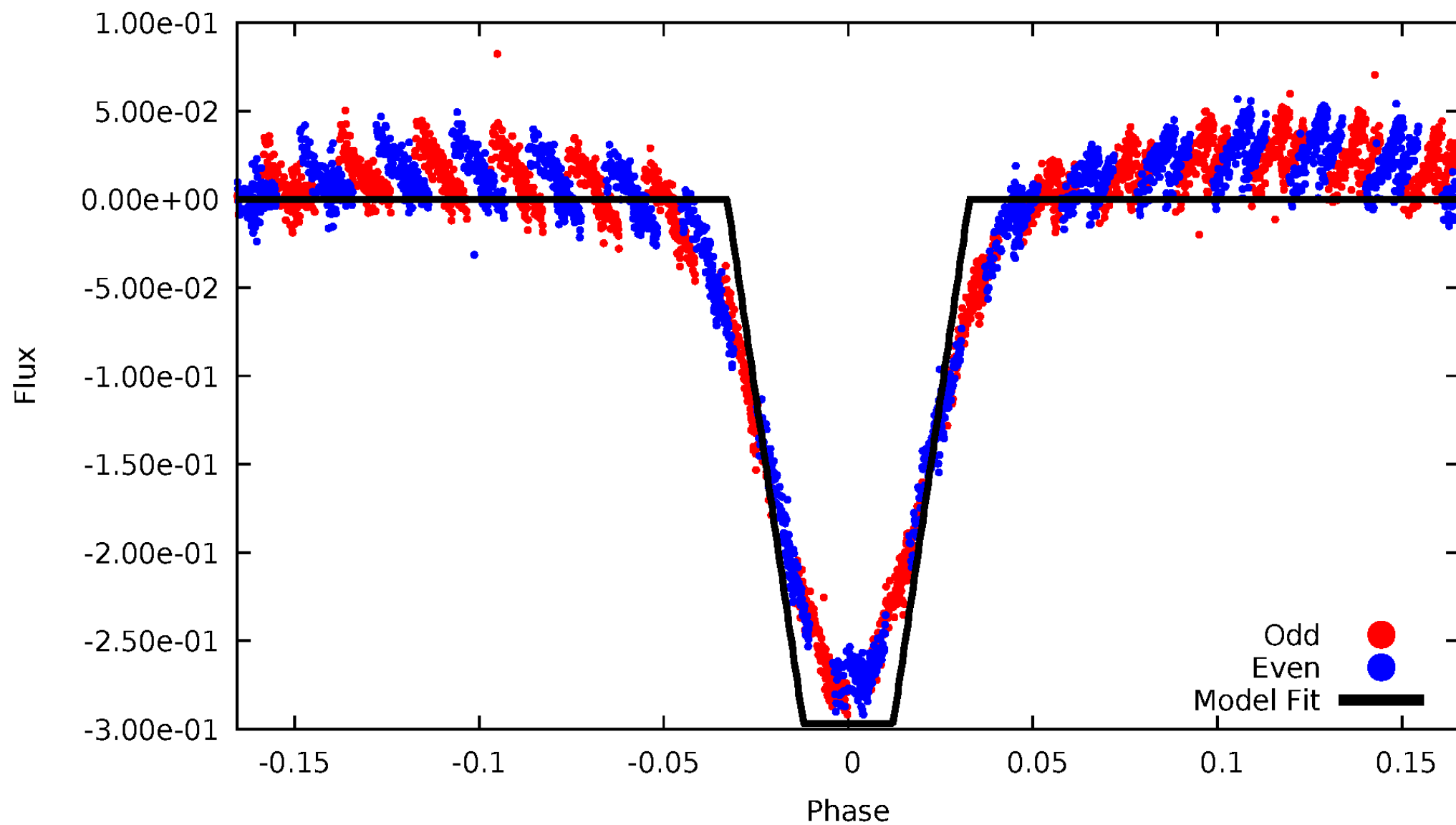
DV Odd/Even

TCE 009957351-01



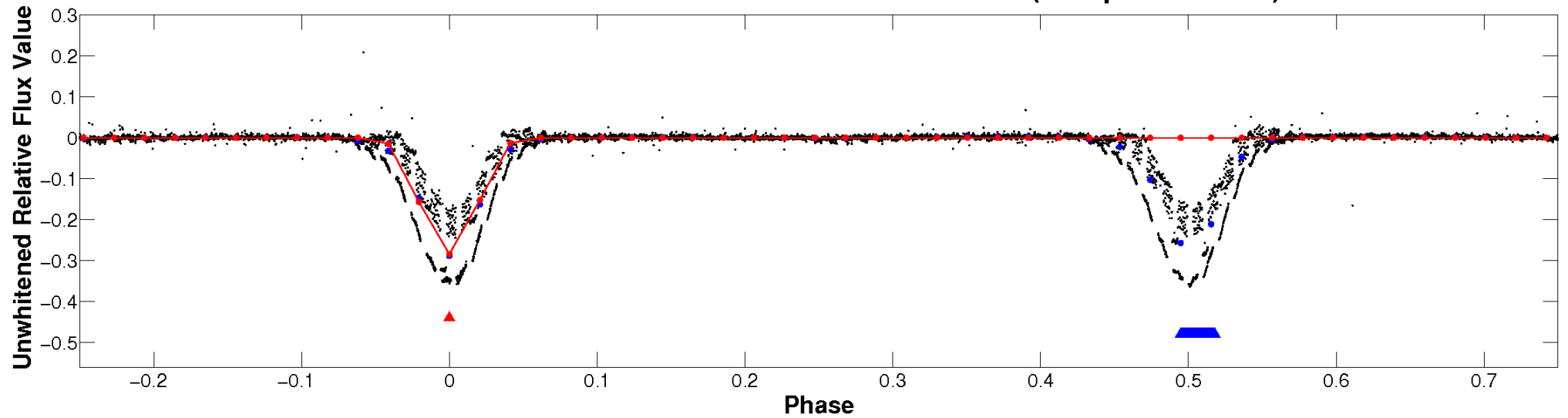
ALT Odd/Even

TCE 009957351-01

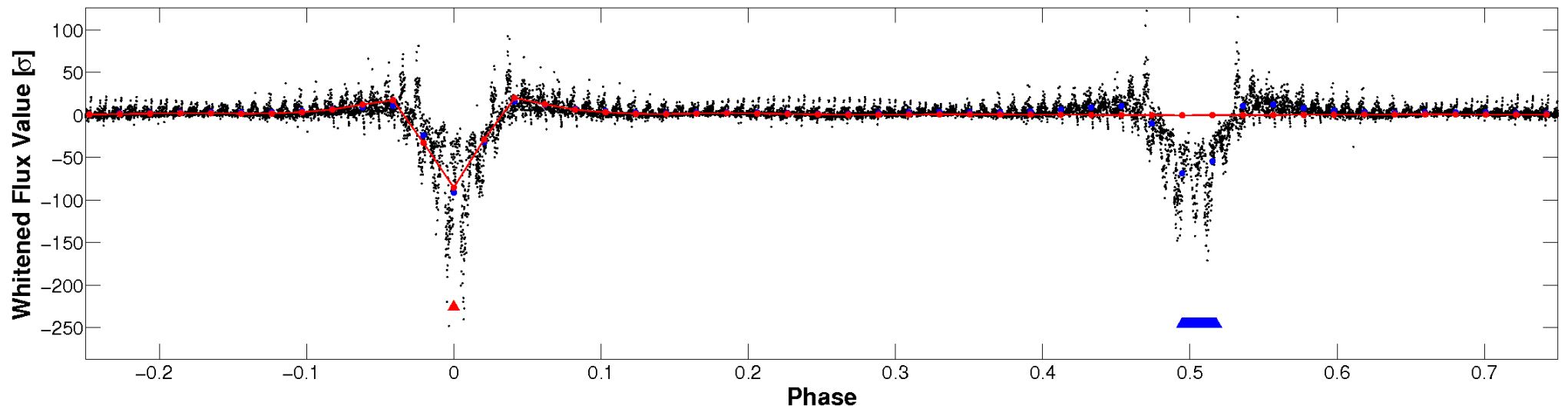


Non-Whitened Vs. Whitened Light Curve

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

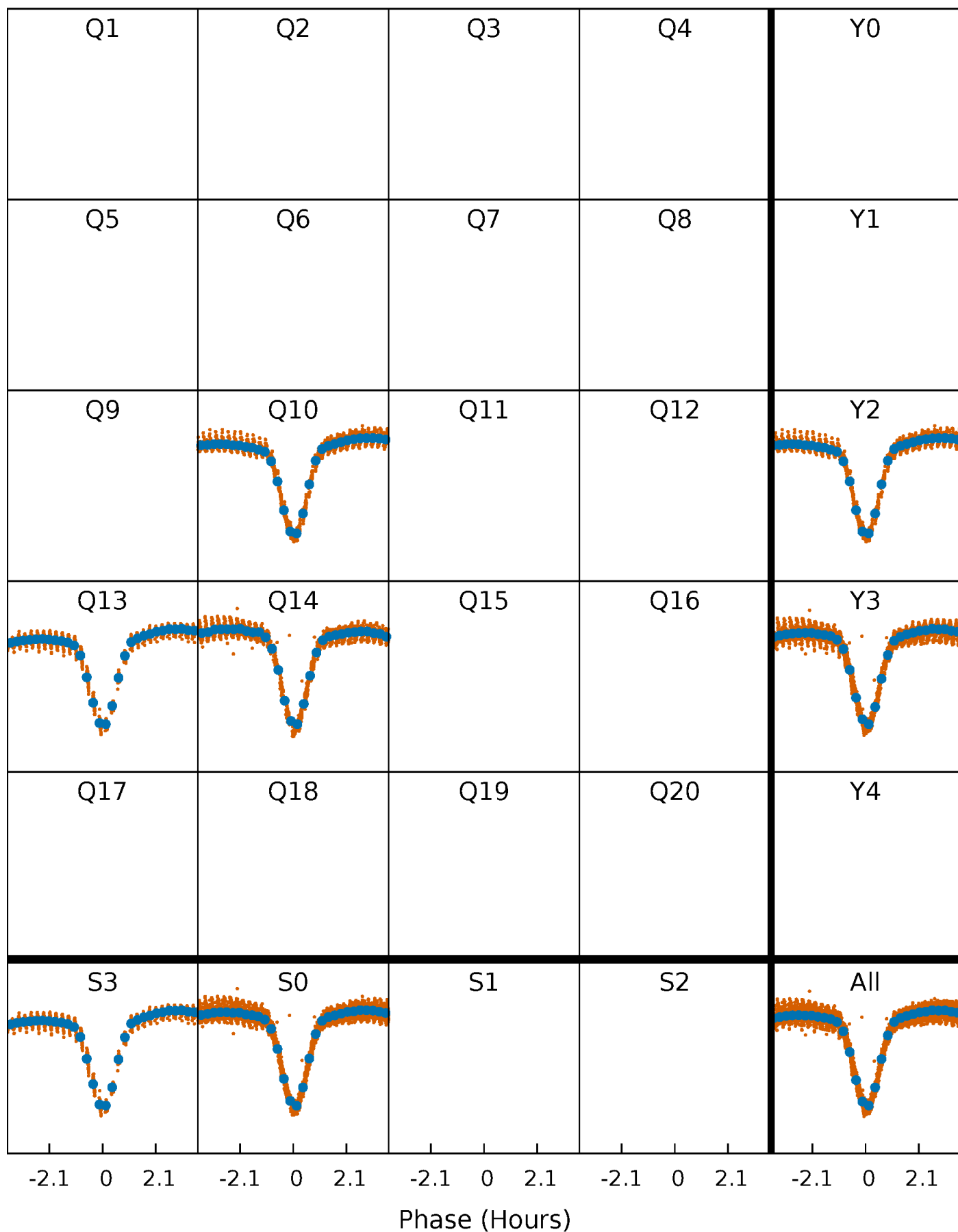


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



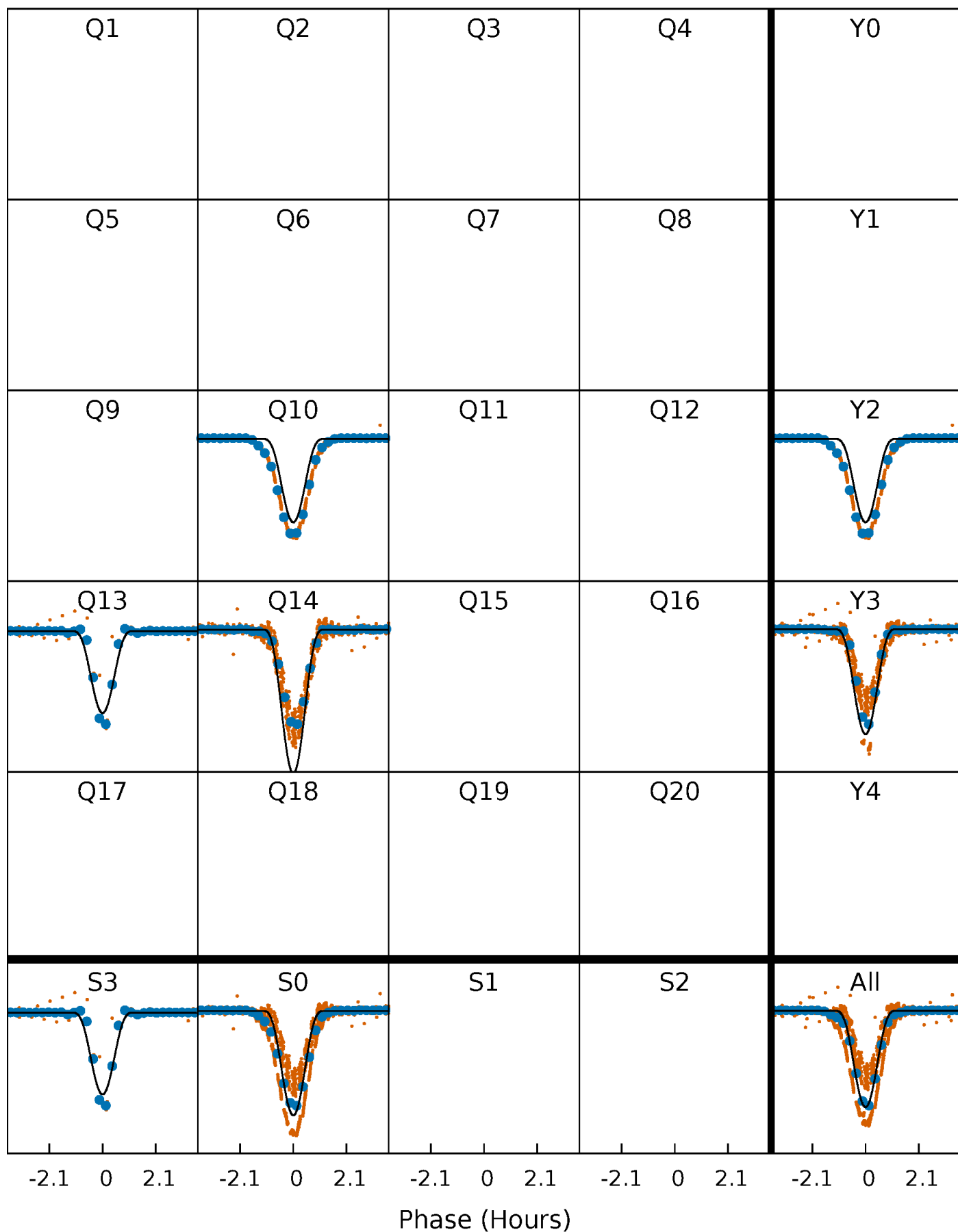
PDC Quarter-Phased Transit Curves

TCE 009957351-01 P= 0.991103 Days $T_0=131.893713$ (BKJD)



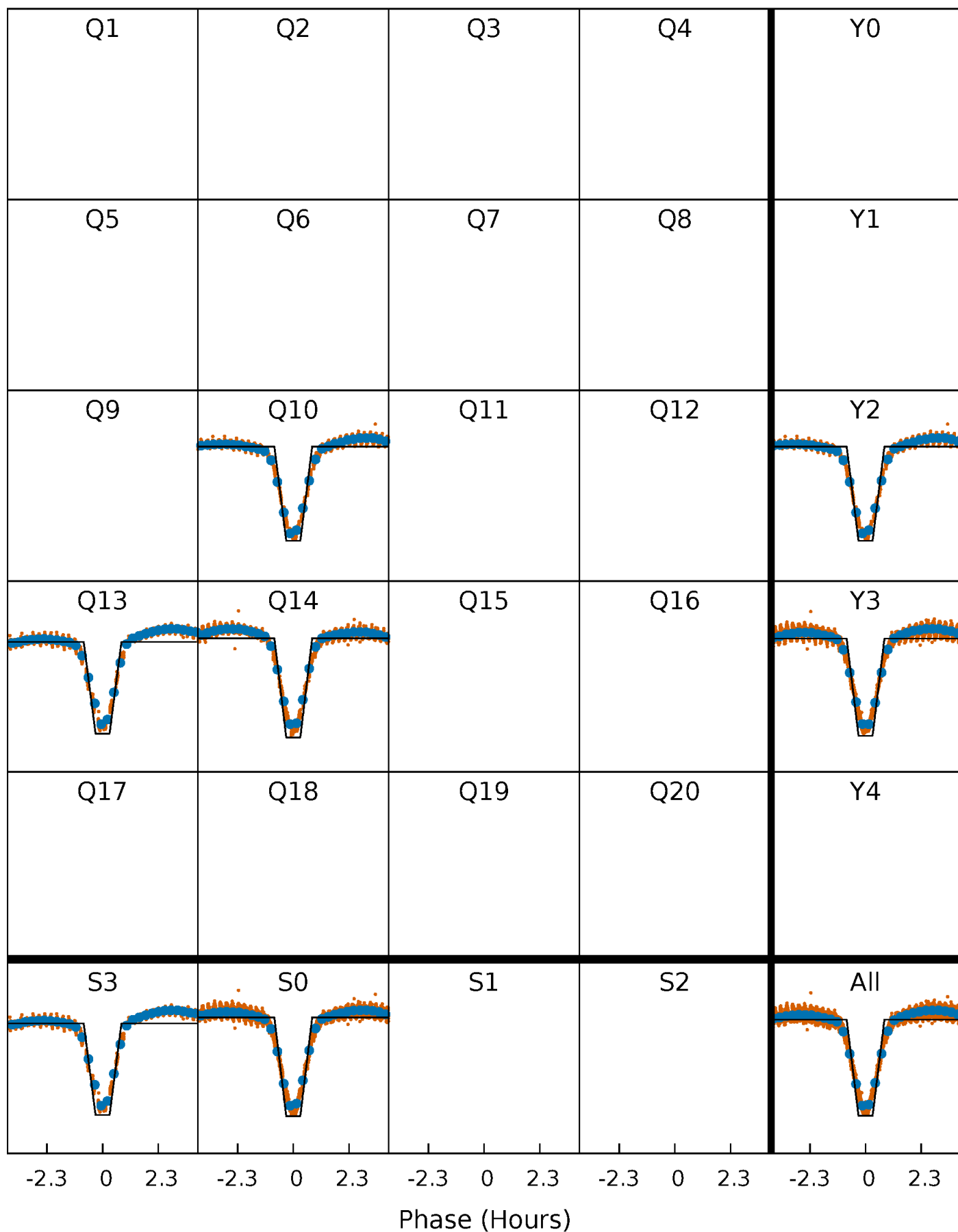
DV Quarter-Phased Transit Curves

TCE 009957351-01 P= 0.991103 Days $T_0=131.893713$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

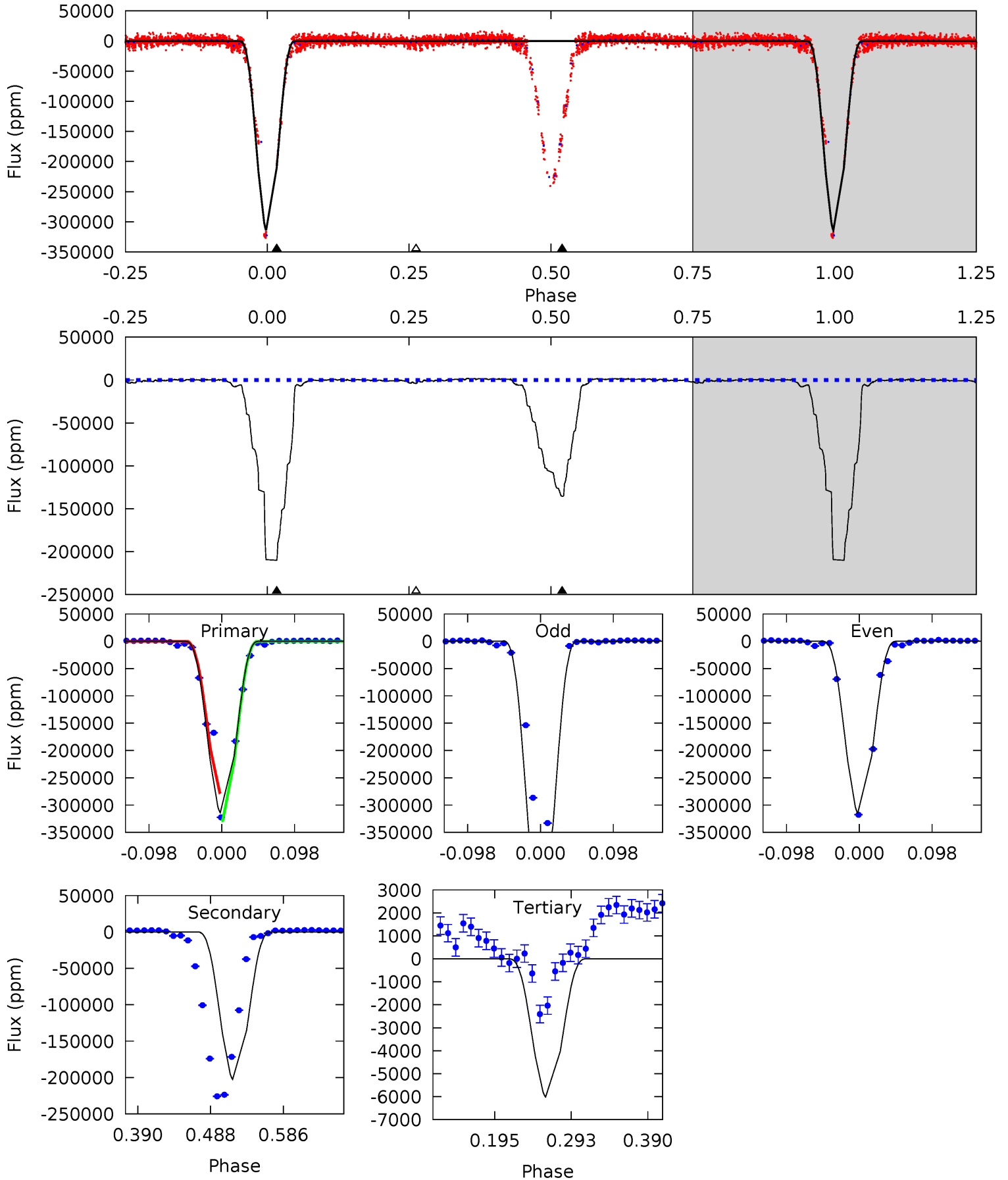
TCE 009957351-01 P= 0.991105 Days $T_0=131.893932$ (BKJD)



DV Model-Shift Uniqueness Test

009957351-01, P = 0.991103 Days, E = 131.893713 Days

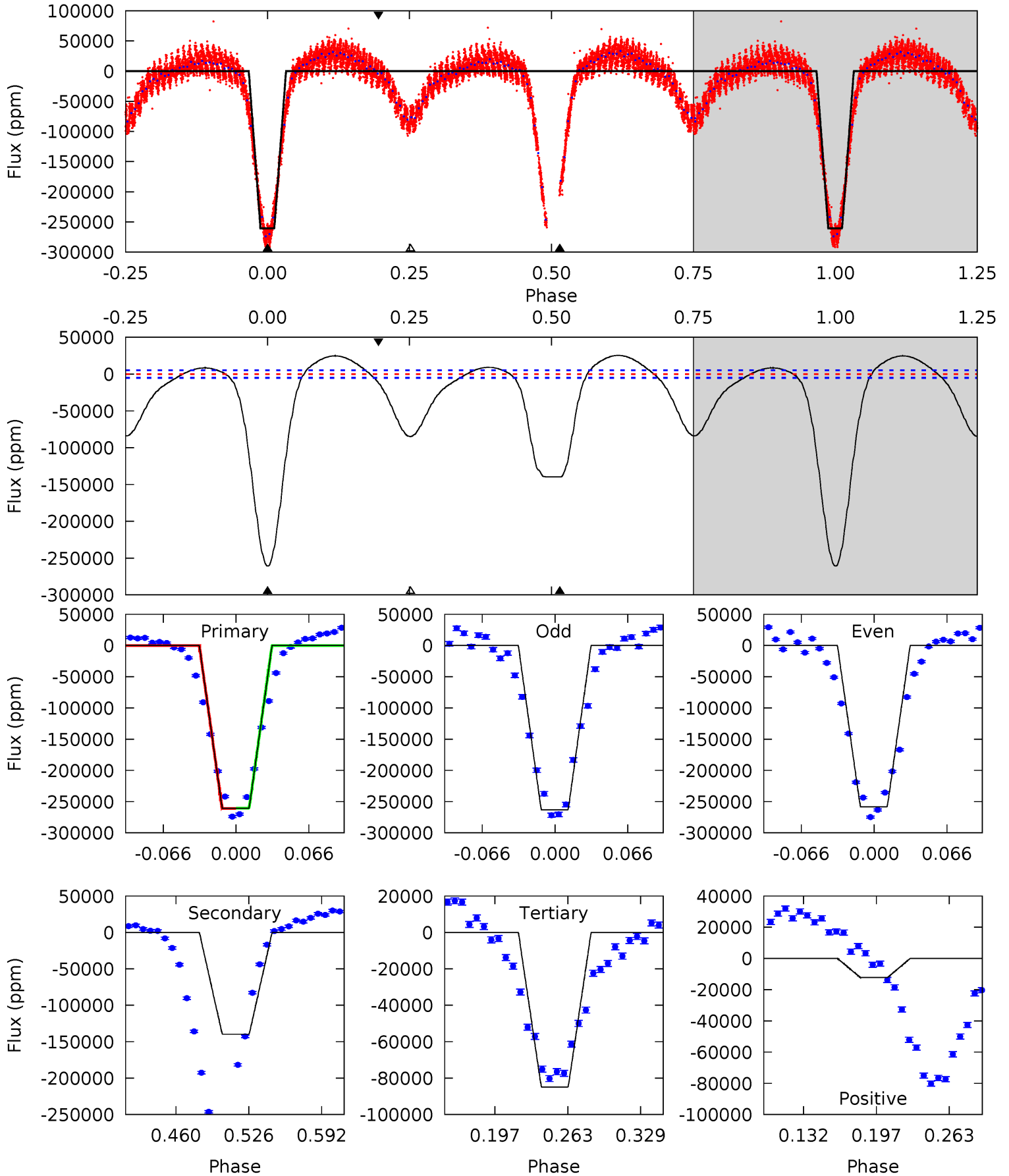
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
972.9	627.1	18.7	0	4.57	1.66	5.12	954.2	972.9	608.5	627.1	321.6	1.00	0.01	0



Alt Model-Shift Uniqueness Test

009957351-01, P = 0.991105 Days, E = 131.893932 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
233.3	125.0	75.9	-11.0	4.65	1.84	28.5	157.4	244.3	49.1	136.0	2.26	1.00	0.09	0.28



Stellar Parameters For KIC 009957351

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4769^{+171}_{-171}	$4.673^{+0.052}_{-0.032}$	$-0.920^{+0.300}_{-0.300}$	$0.578^{+0.046}_{-0.041}$	$0.574^{+0.053}_{-0.029}$	$4.185^{+0.893}_{-0.565}$
	+4%/-4%	+1%/-1%	+33%/-33%	+8%/-7%	+9%/-5%	+21%/-14%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009957351-01 / KOI 3964.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-135360 ± 216	$34.34^{+1.97}_{-1.69}$	1748^{+75}_{-65}	4197^{+143}_{-146}	19^{+2}_{-2}
Alt.	-139724 ± 1118	$34.29^{+1.88}_{-1.67}$	1749^{+69}_{-66}	4229^{+143}_{-147}	20^{+2}_{-2}

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

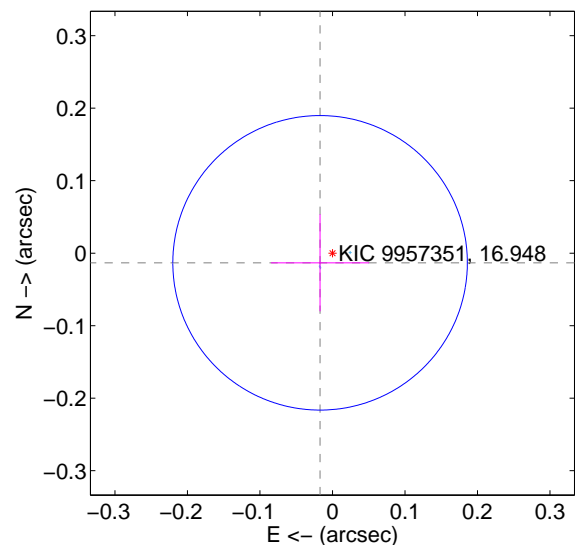
Supplemental centroid analysis for 009957351-01. Kepler magnitude: 16.95. Transit SNR 774.36

There are 3 quarters with good PRF difference image offsets

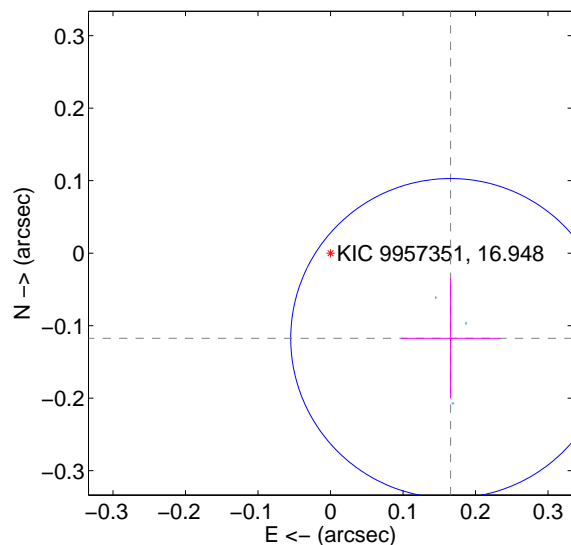
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.022 ± 0.068	0.32	0.017 ± 0.068	-0.013 ± 0.067
PRF-fit source offset from KIC position	0.203 ± 0.073	2.76	-0.166 ± 0.068	-0.117 ± 0.083
photometric centroid source offset	0.27 ± 0.00	70.59	-0.11 ± 0.00	-0.24 ± 0.00

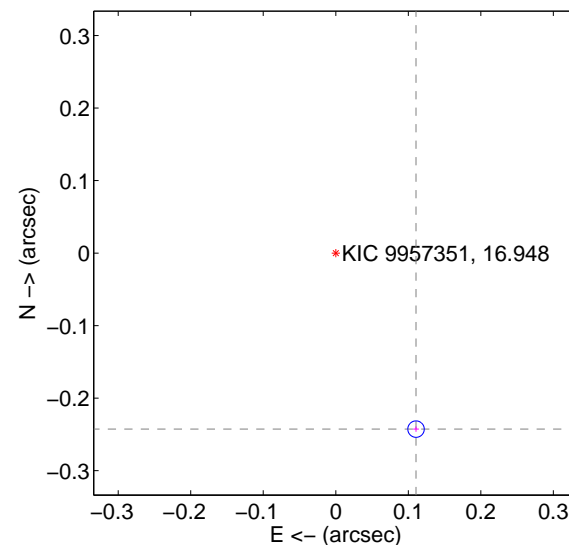
offset from difference PRF-fit to OOT PRF-fit



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

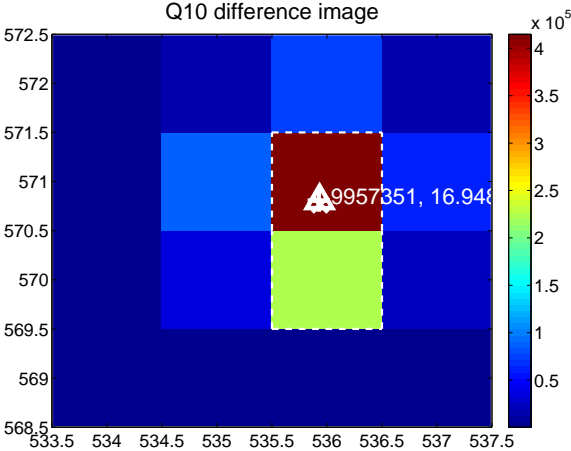
Q9 no difference image



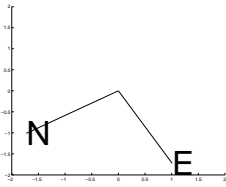
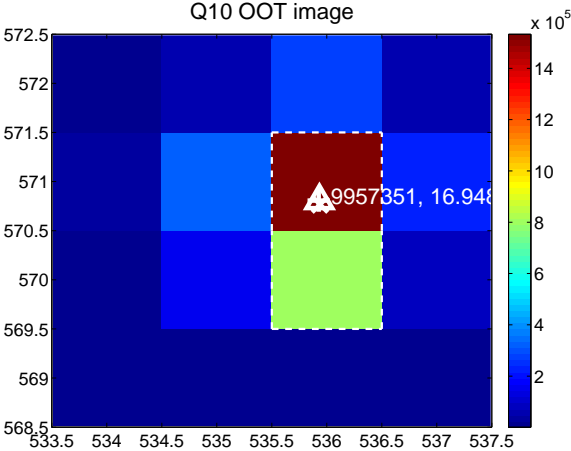
Q9 no OOT image



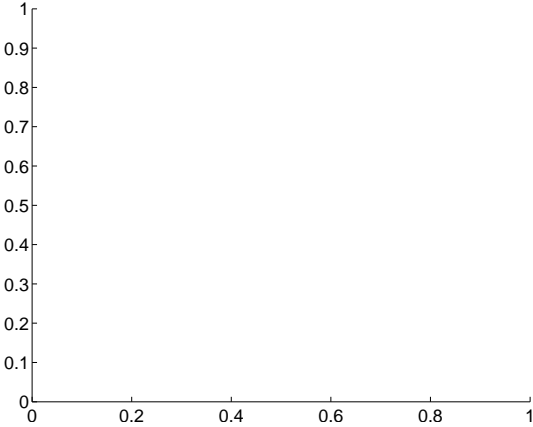
Q10 difference image



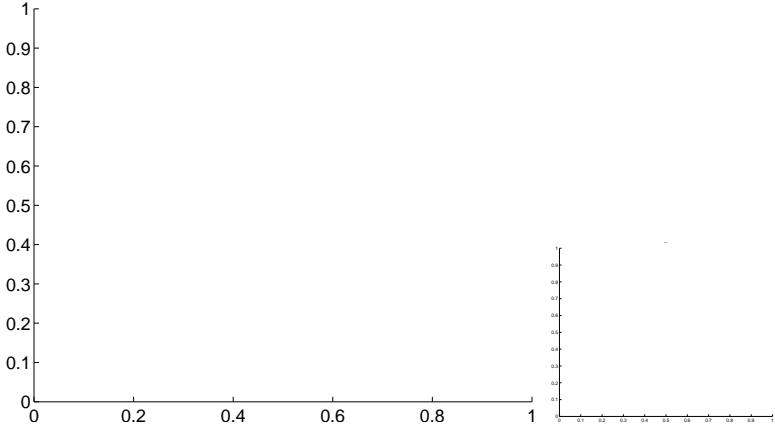
Q10 OOT image



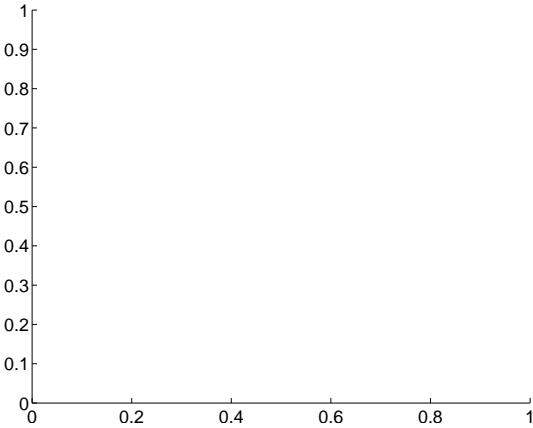
Q11 no difference image



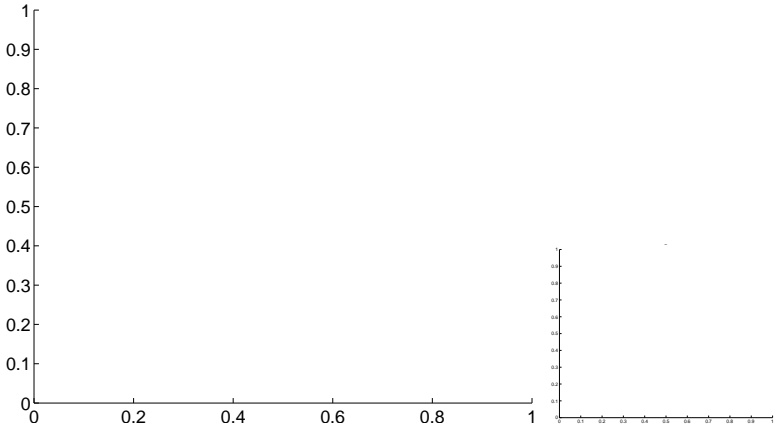
Q11 no OOT image



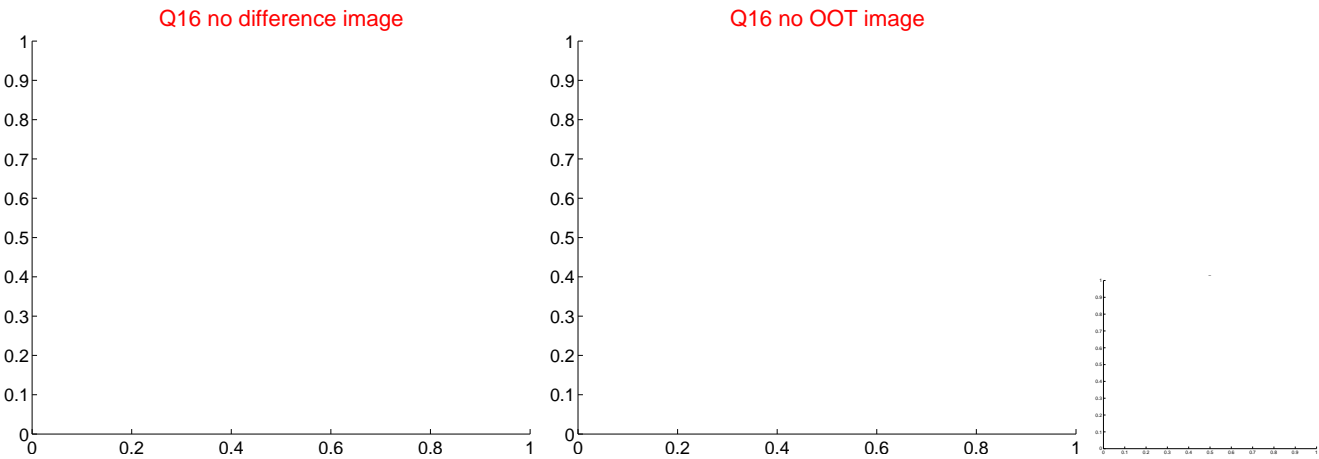
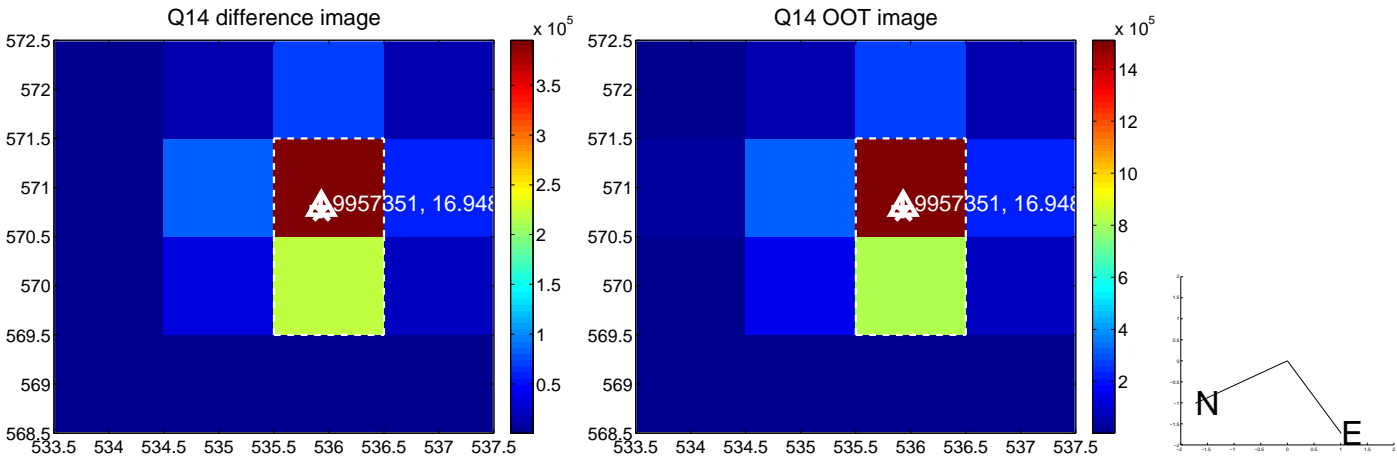
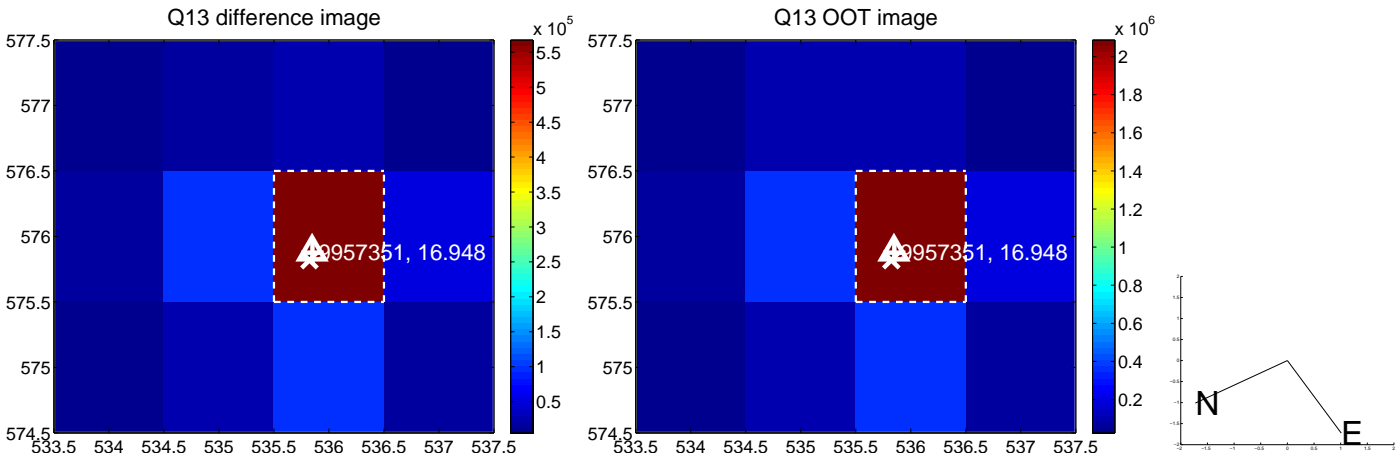
Q12 no difference image



Q12 no OOT image



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

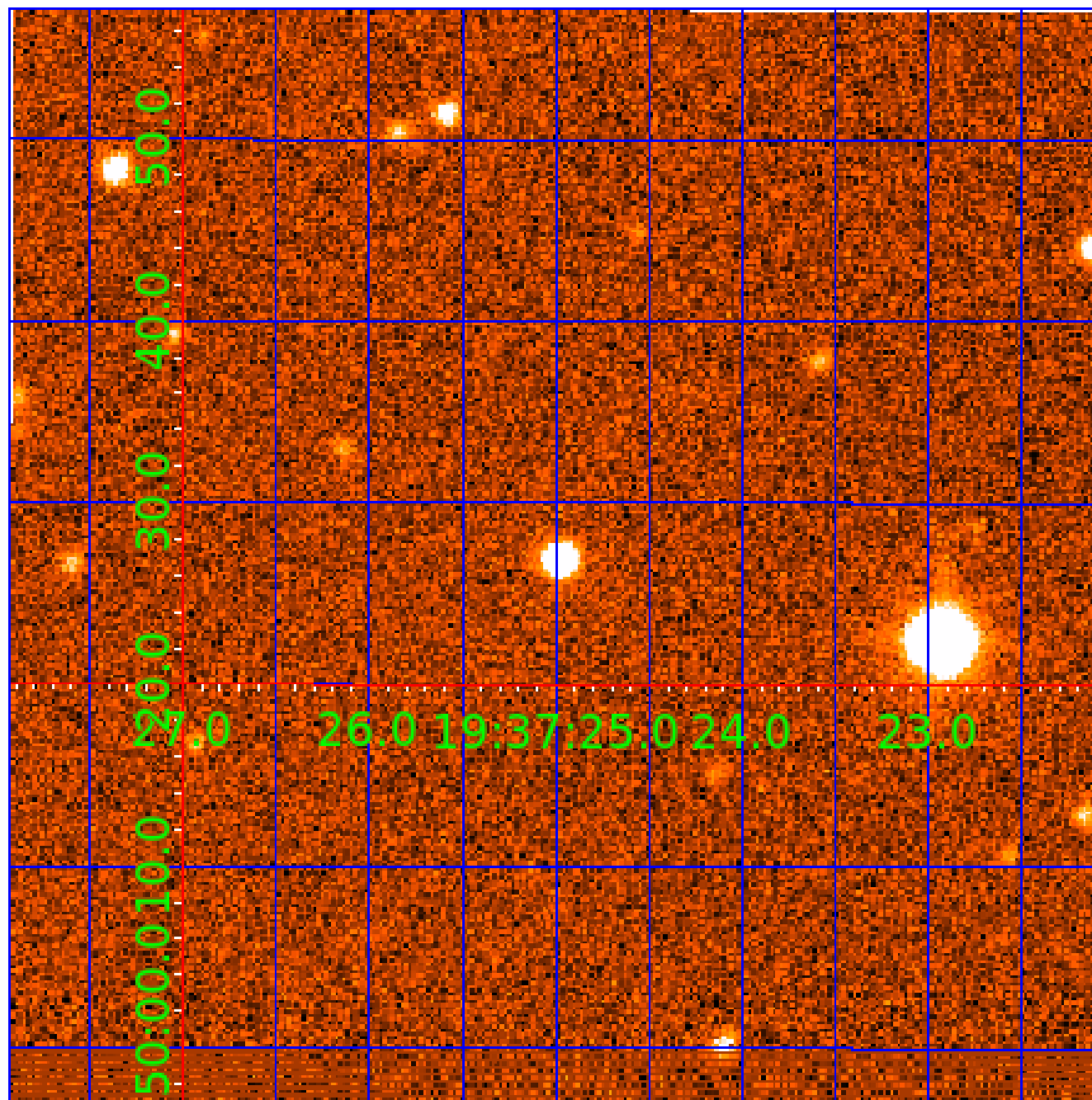


2



UKIRT Image

Declination



KIC 009957351

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})
009957351-01	OBS	3964.01	0.991103	131.893713	299261.3	1.881	1934.9	774.4	0.58	4769	34.55	592.10
009957351-02	OBS	No	0.991088	132.406930	278929.1	1.932	1643.1	725.5	0.58	4769	32.94	592.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009957351-01	OBS	FP	0.00	1	0	0	0	LPP_ALT
009957351-02	OBS	FP	0.00	1	0	0	0	LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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.

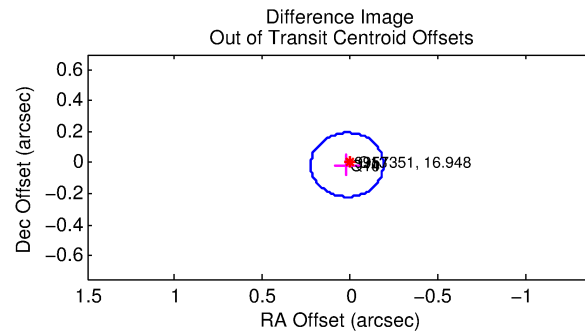
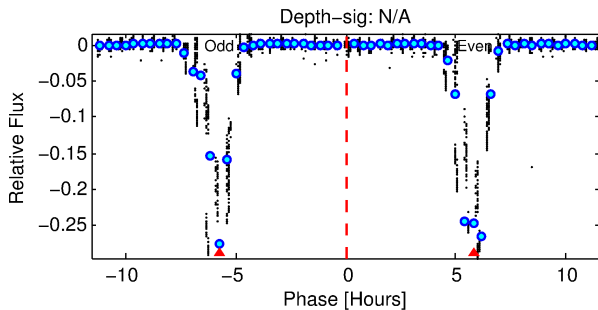
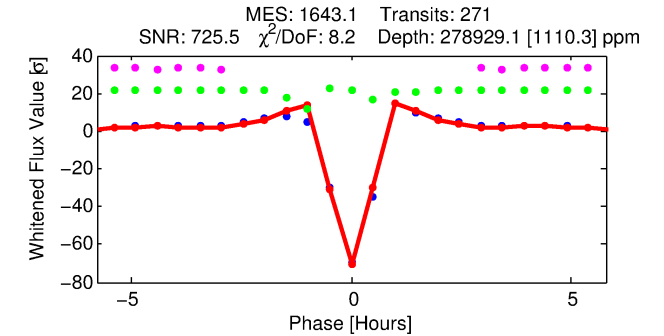
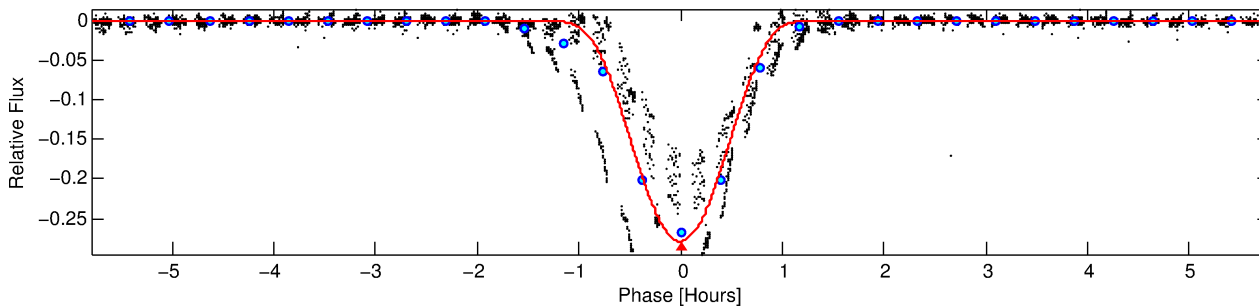
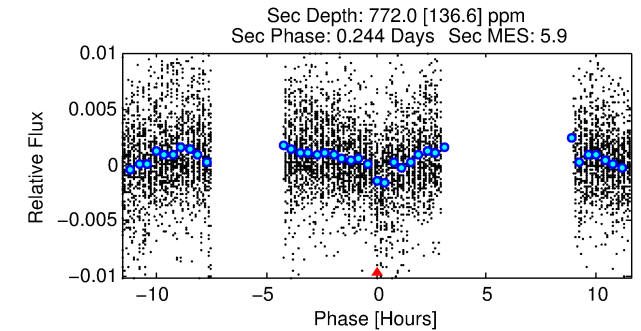
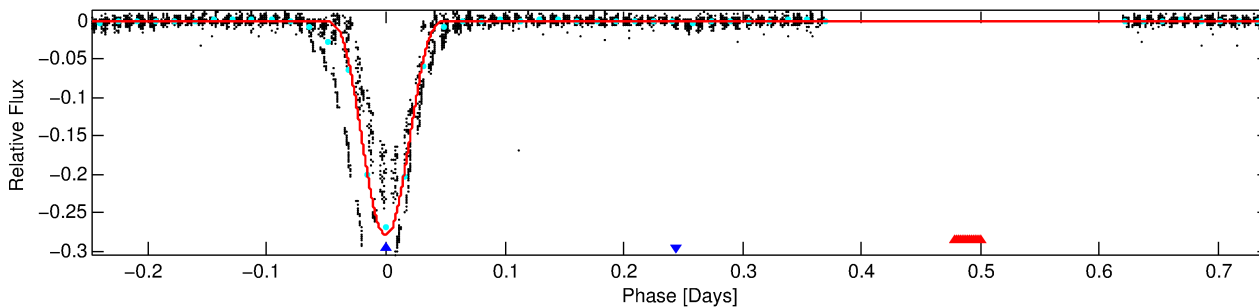
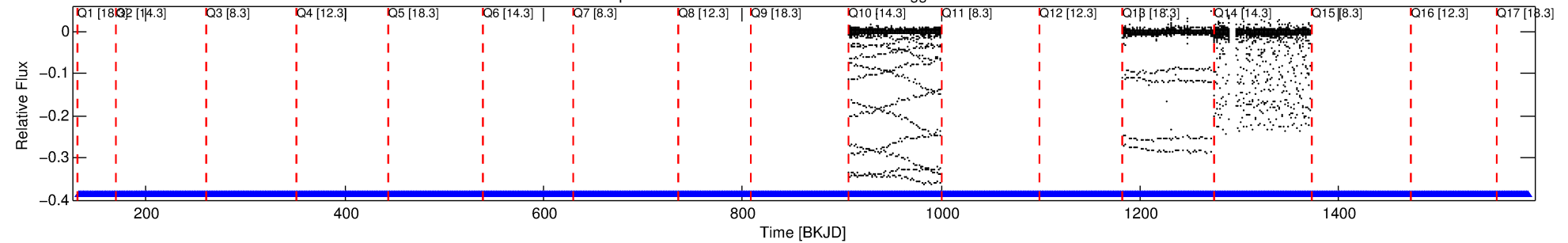
Ephemeris Match Information For 009957351-02

No Significant Match Found

DV One-Page Summary

KIC: 9957351 Candidate: 2 of 2 Period: 0.991 d
KOI: K03964 Corr: No Ephemeris Match

Kp: 16.95 R*: 0.58 Rs Teff: 4769.0 K Logg: 4.67 Fe/H: -0.920



DV Fit Results:

Period = 0.99109 [0.00000] d
Epoch = 132.4069 [0.0000] BKJD
Rp/R* = 0.5223 [0.0096]
a/R* = 5.72 [0.02]
b = 0.50 [0.03]
Seff = 592.12 [102.14]
Teq = 1258 [54] K
Rp = 32.94 [2.69] Re
a = 0.0162 [0.0011] AU
Ag = 0.10 [0.02] [-42.87σ]
Teffp = 1100 [63] K [-1.89σ]

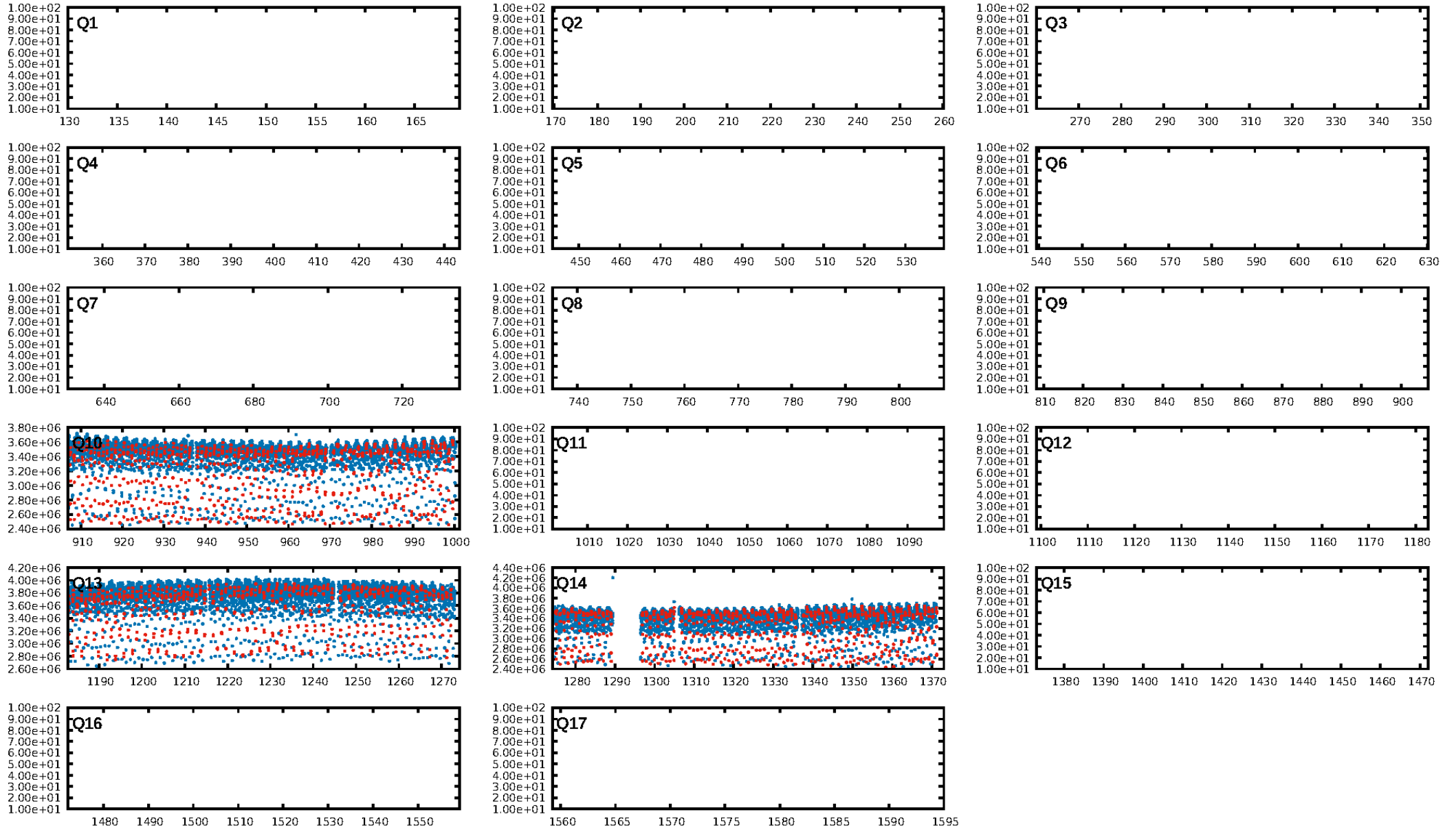
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [271/271]
GhostDiagnostic-chr: 0.9182
Centroid-sig: 2.3%
Centroid-so: 0.273 arcsec [68.91σ]
OotOffset-rm: 0.023 arcsec [0.34σ]
KicOffset-rm: 0.196 arcsec [2.65σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

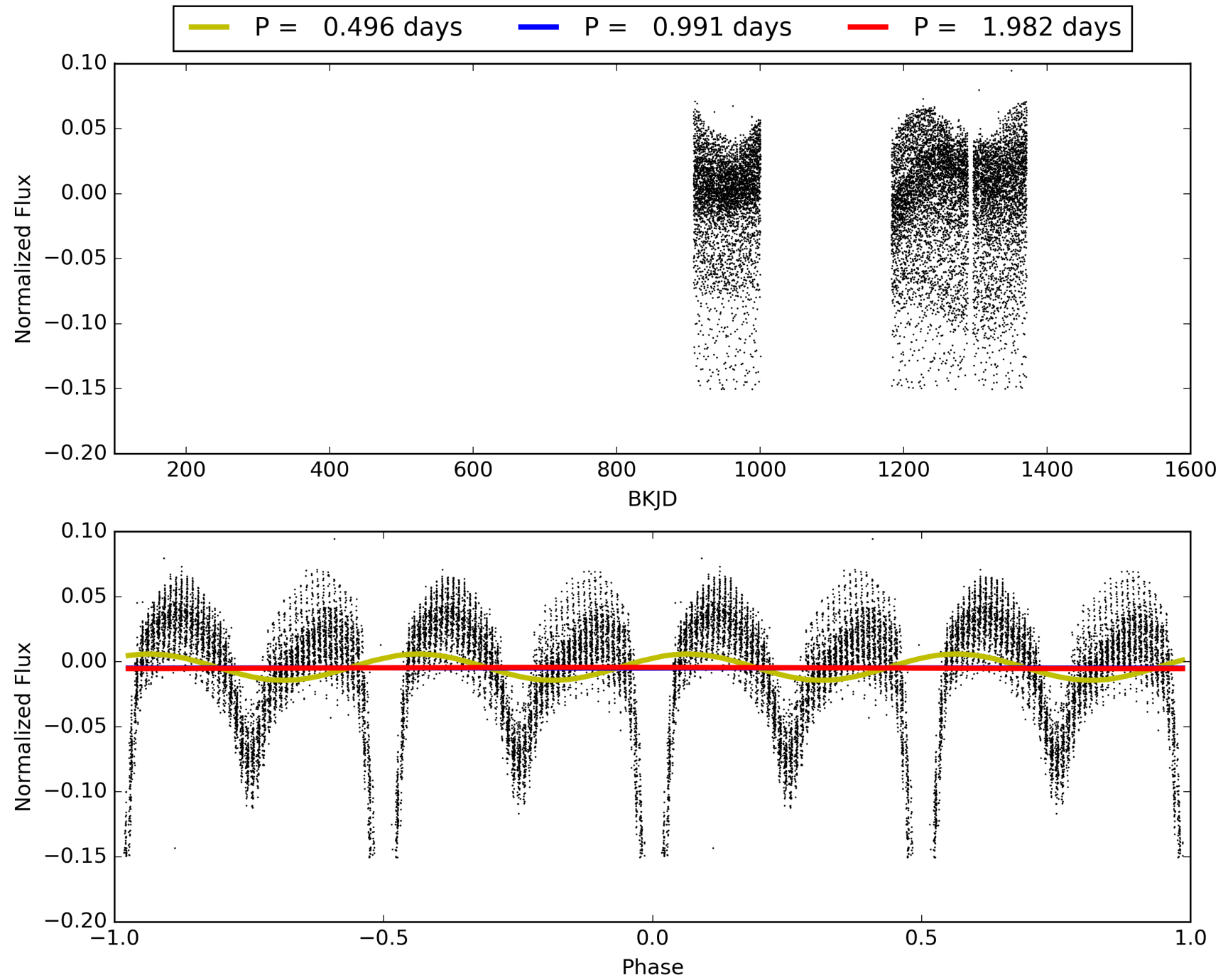
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:18:27 Z

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

TCE 009957351-02, PDC Light Curves

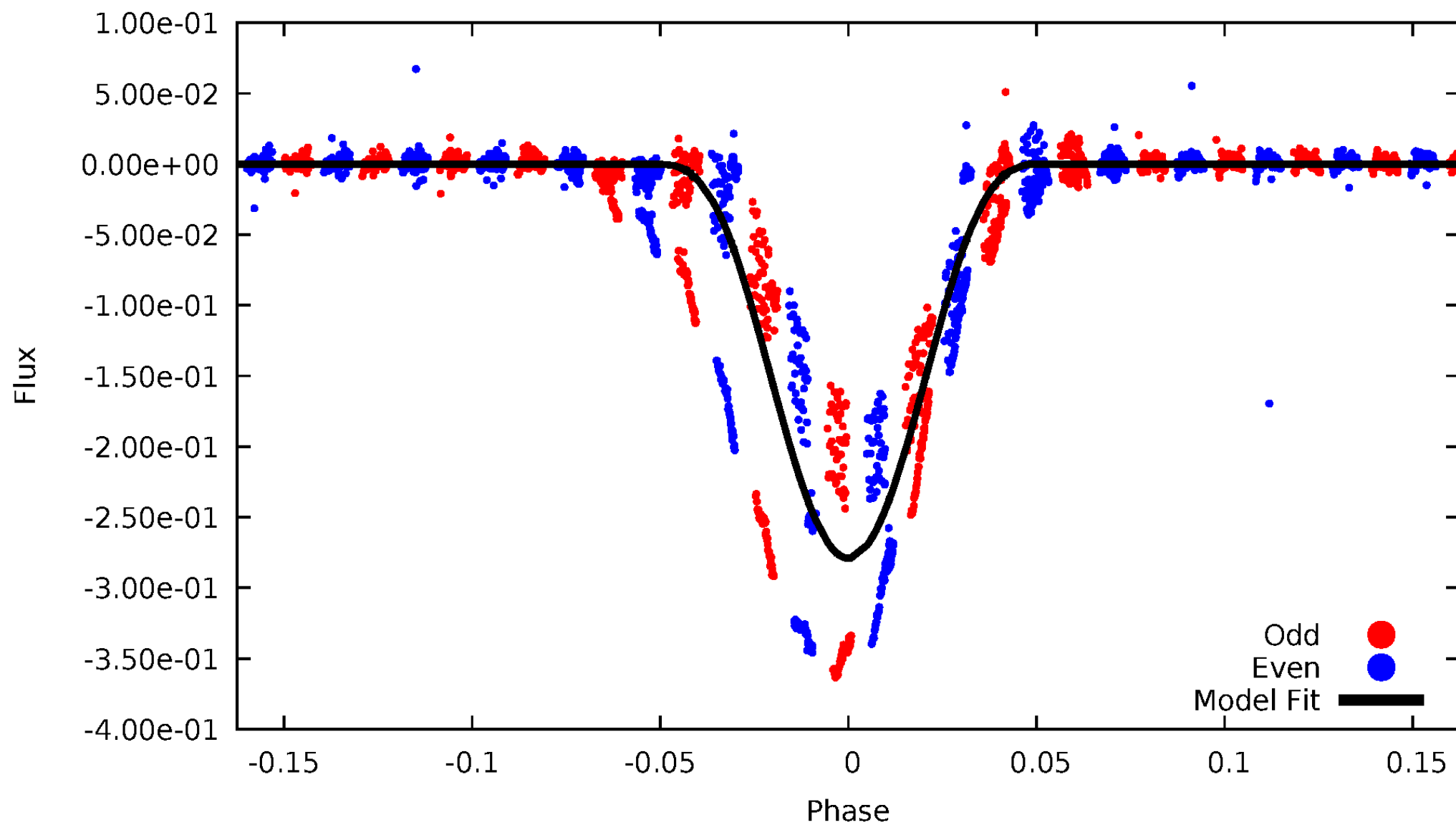


TCE 009957351-02



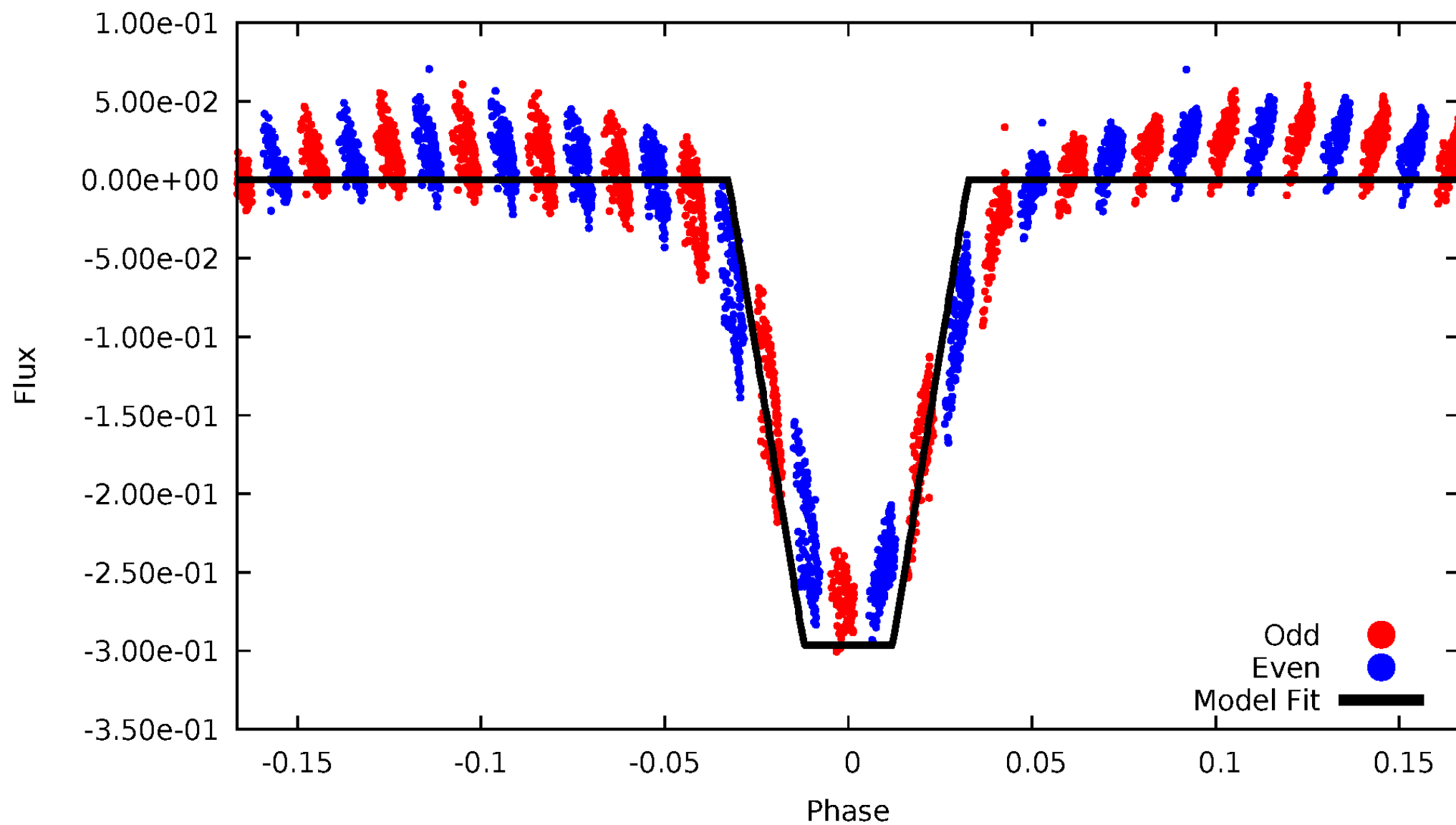
DV Odd/Even

TCE 009957351-02



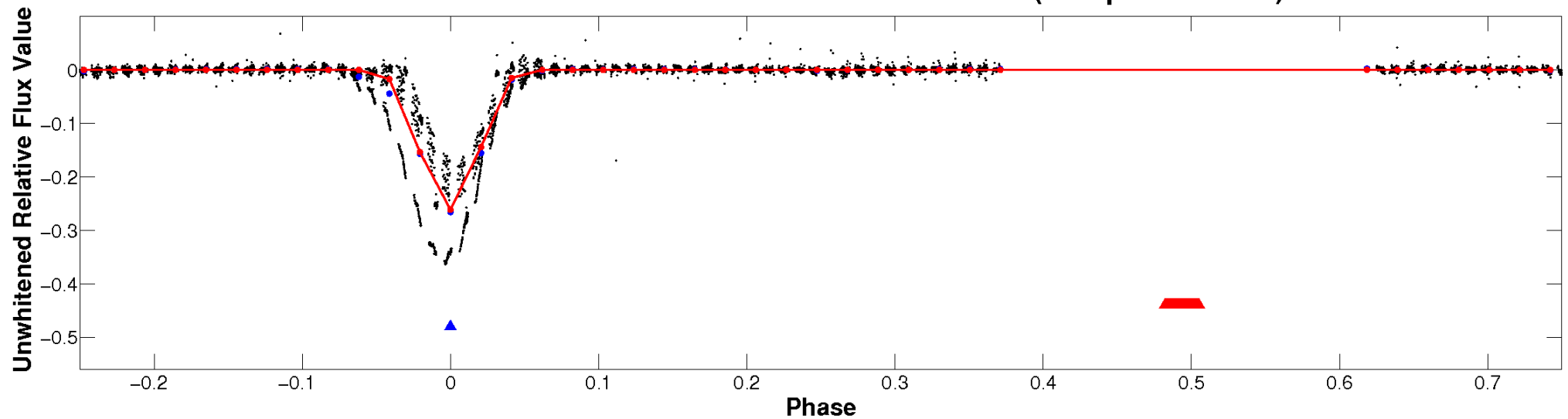
ALT Odd/Even

TCE 009957351-02

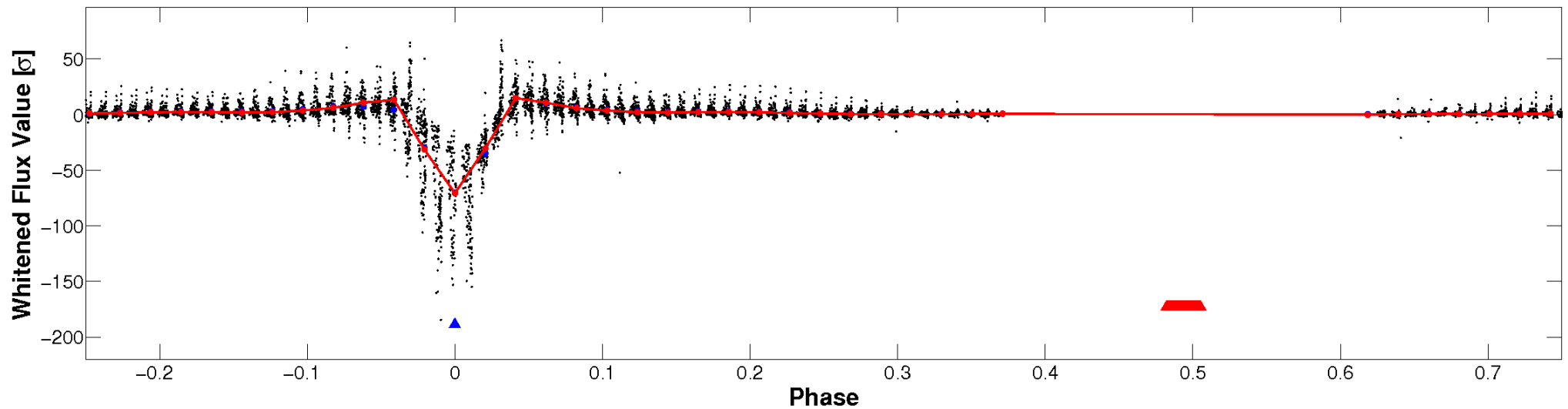


Non-Whitened Vs. Whitened Light Curve

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

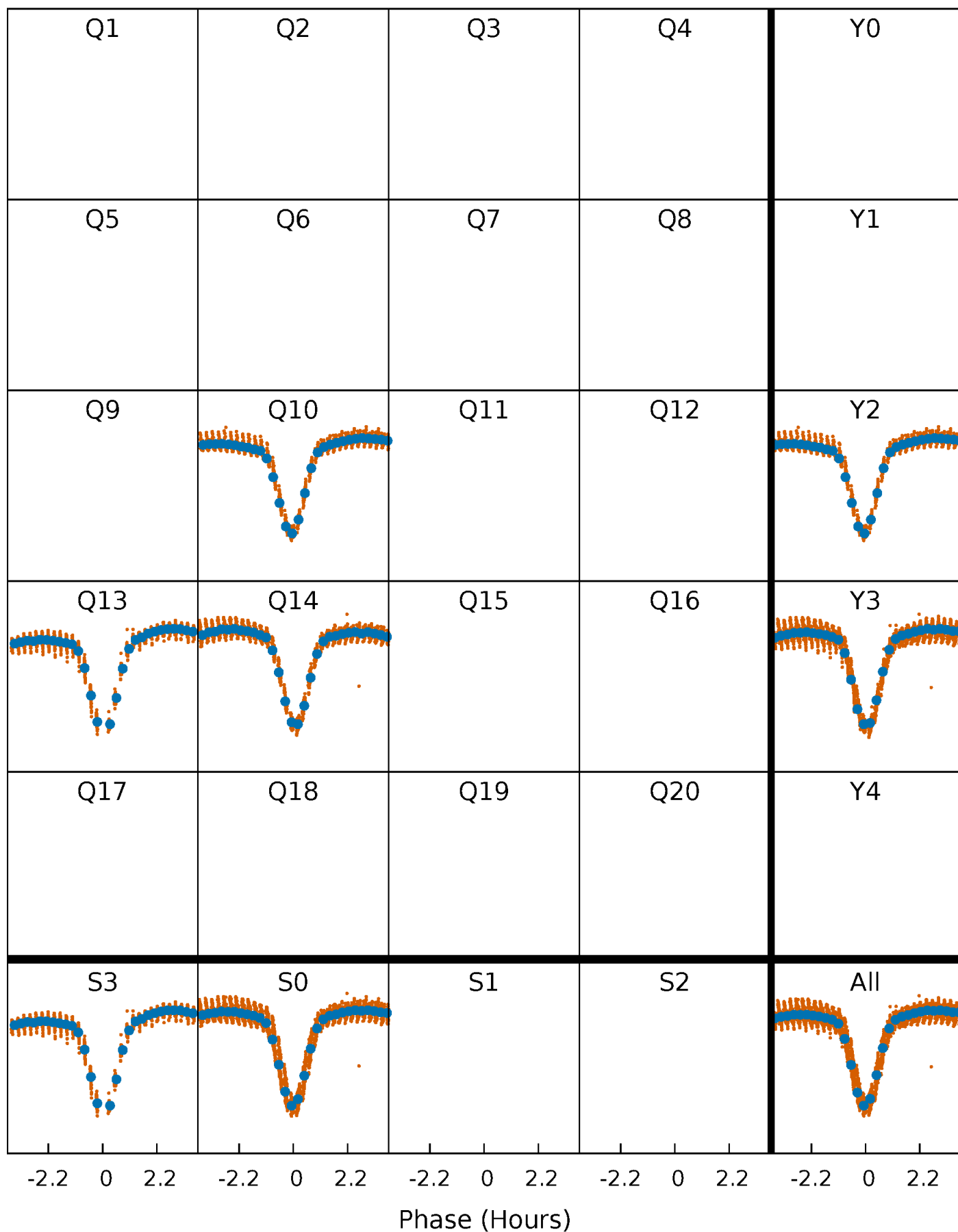


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



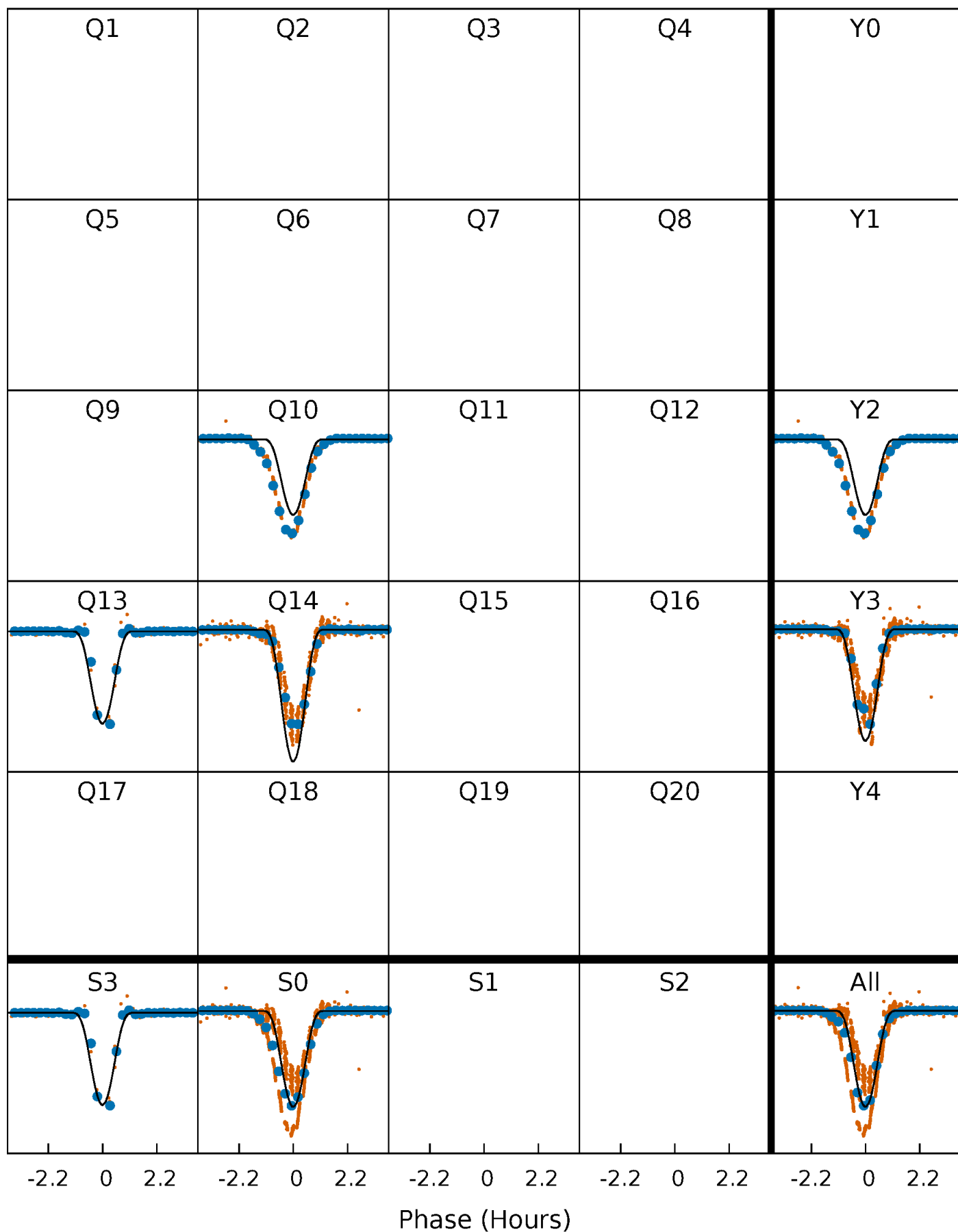
PDC Quarter-Phased Transit Curves

TCE 009957351-02 $P = 0.991088$ Days $T_0 = 132.406930$ (BKJD)



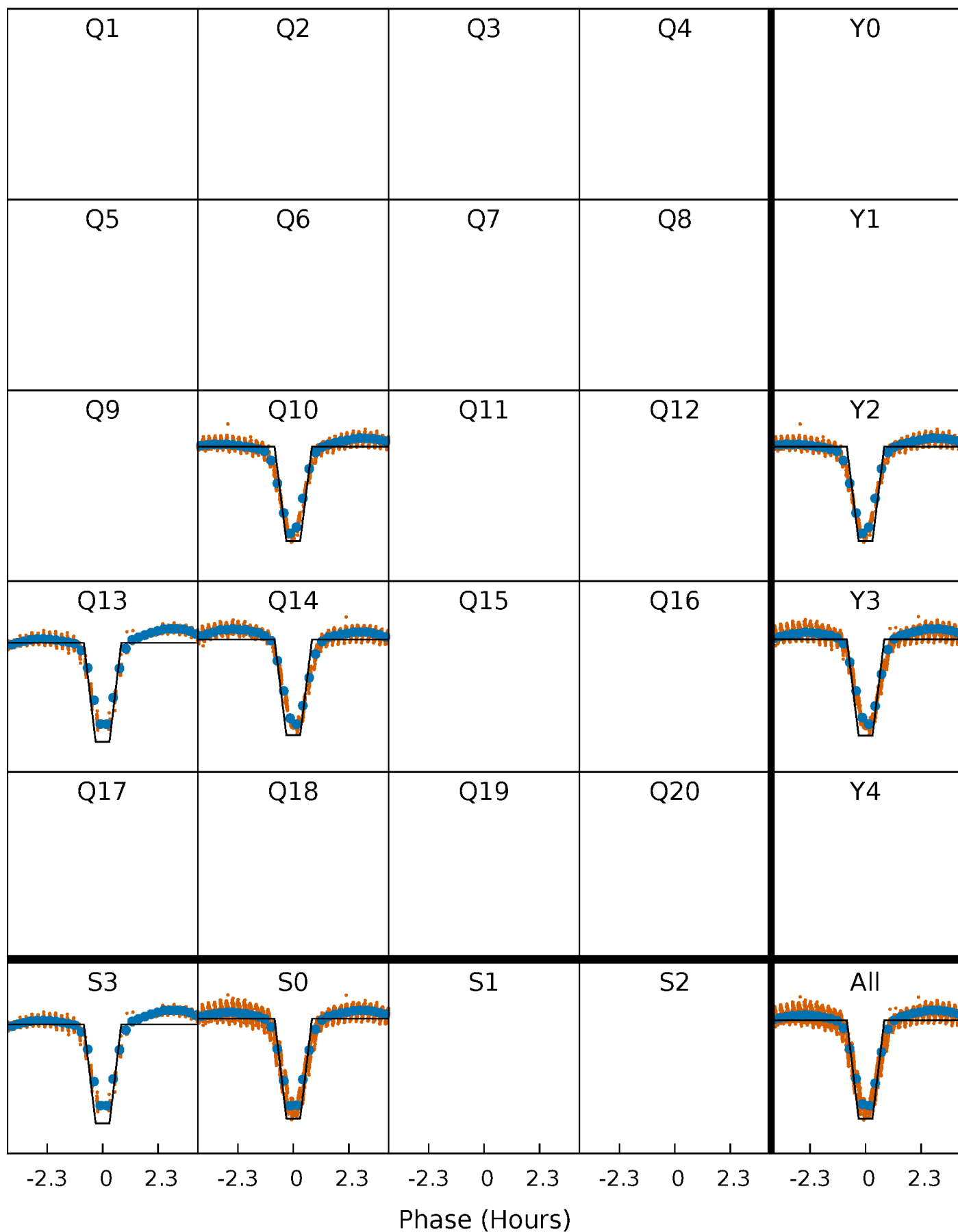
DV Quarter-Phased Transit Curves

TCE 009957351-02 P= 0.991088 Days $T_0=132.406930$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

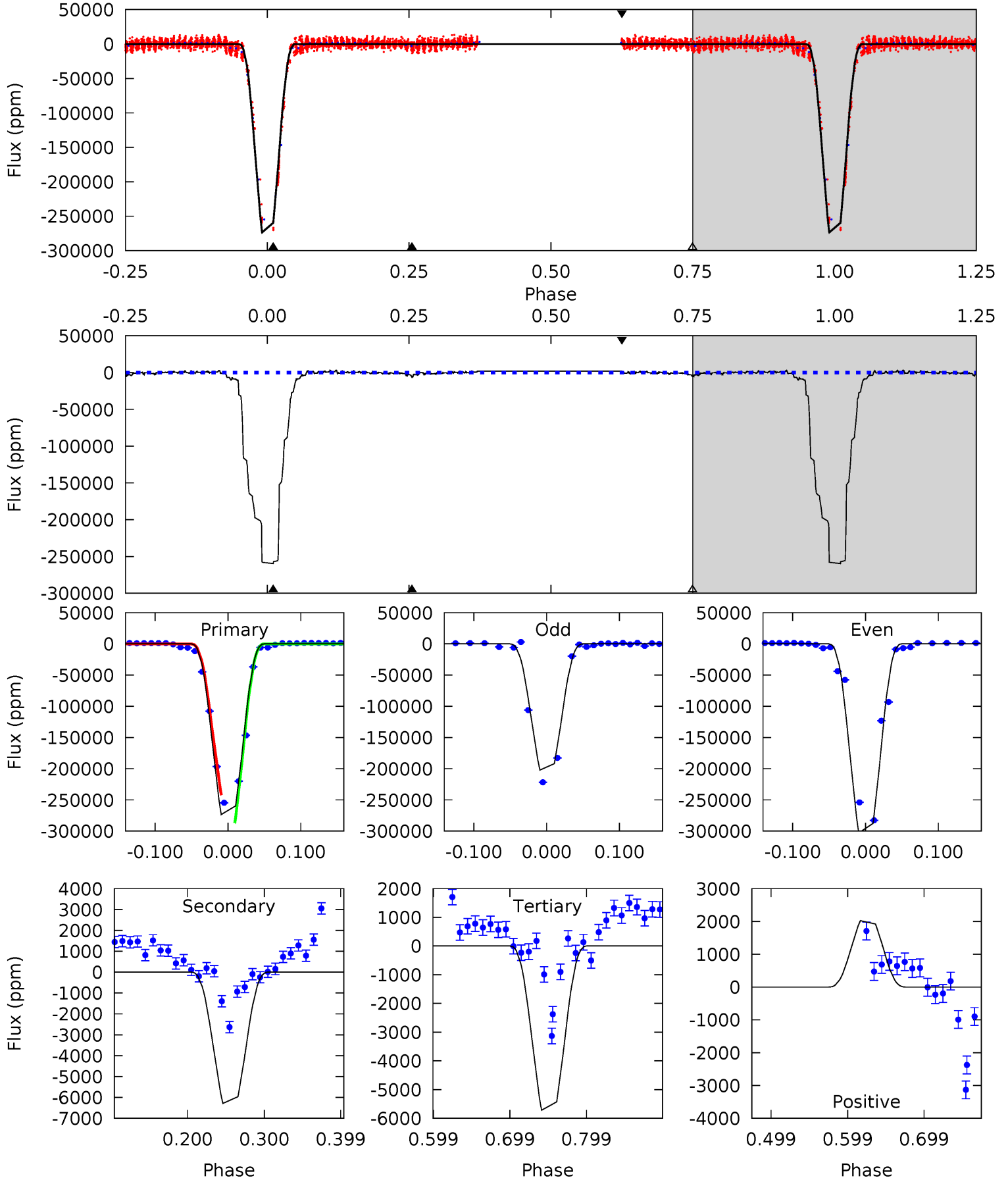
TCE 009957351-02 P= 0.991088 Days $T_0=132.406051$ (BKJD)



DV Model-Shift Uniqueness Test

009957351-02, P = 0.991088 Days, E = 132.406930 Days

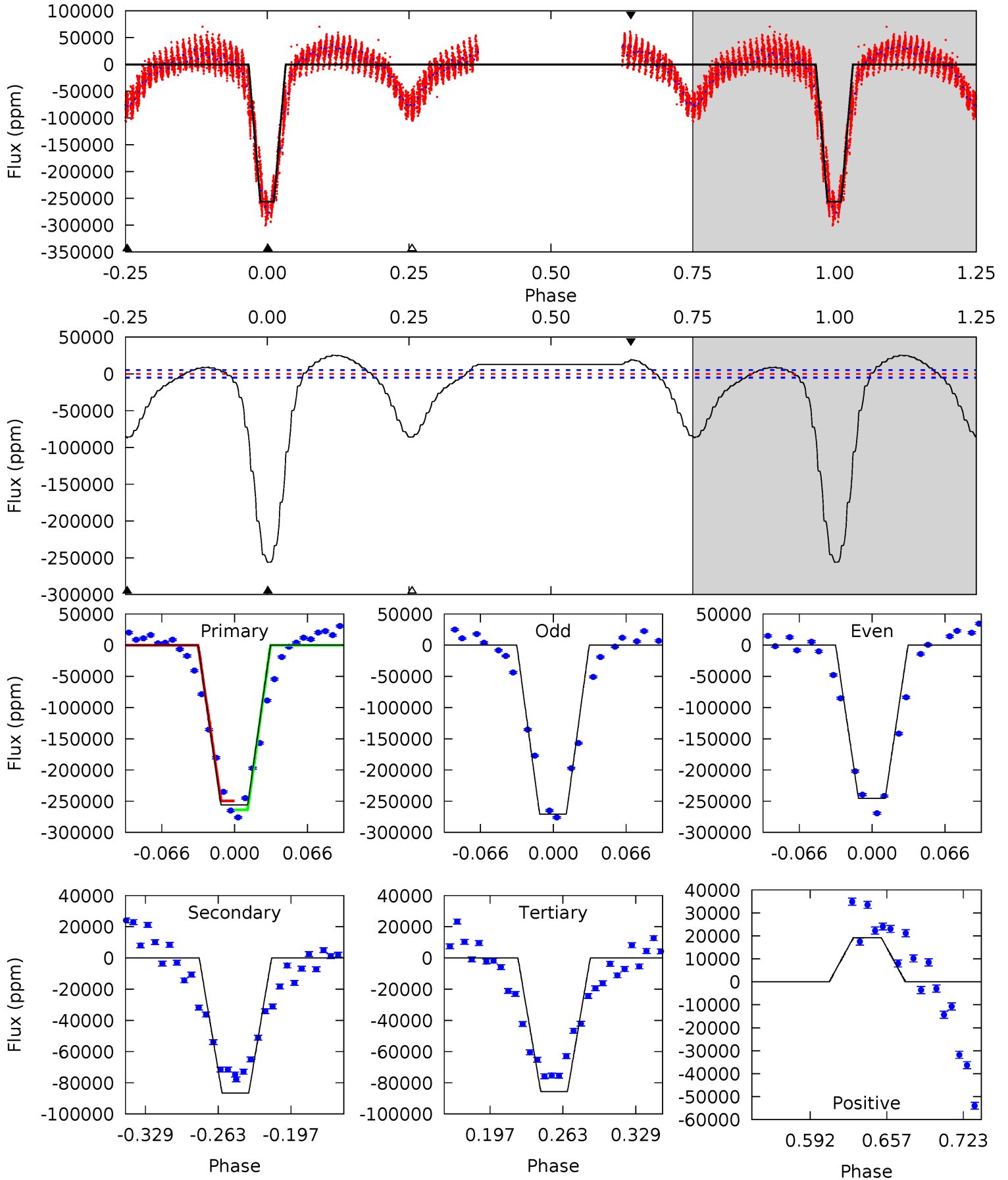
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
967.2	22.2	20.2	7.15	4.57	1.65	5.20	947.0	960.1	2.00	15.1	227.8	1.11	0.01	0



Alt Model-Shift Uniqueness Test

009957351-02, P = 0.991088 Days, E = 132.406051 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
230.1	77.9	77.0	17.2	4.65	1.84	27.9	153.1	212.9	0.84	60.7	11.1	1.02	0.09	5.58



Stellar Parameters For KIC 009957351

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4769^{+171}_{-171}	$4.673^{+0.052}_{-0.032}$	$-0.920^{+0.300}_{-0.300}$	$0.578^{+0.046}_{-0.041}$	$0.574^{+0.053}_{-0.029}$	$4.185^{+0.893}_{-0.565}$
	+4%/-4%	+1%/-1%	+33%/-33%	+8%/-7%	+9%/-5%	+21%/-14%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009957351-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5967 ± 268	$32.73^{+1.60}_{-1.49}$	1750^{+65}_{-71}	2461^{+59}_{-63}	$0.813^{+0.079}_{-0.068}$
Alt.	-86630 ± 1113	$34.22^{+1.57}_{-1.46}$	1749^{+71}_{-68}	3843^{+112}_{-127}	12^{+1}_{-1}

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 $A_{obs} \gg 1.0$

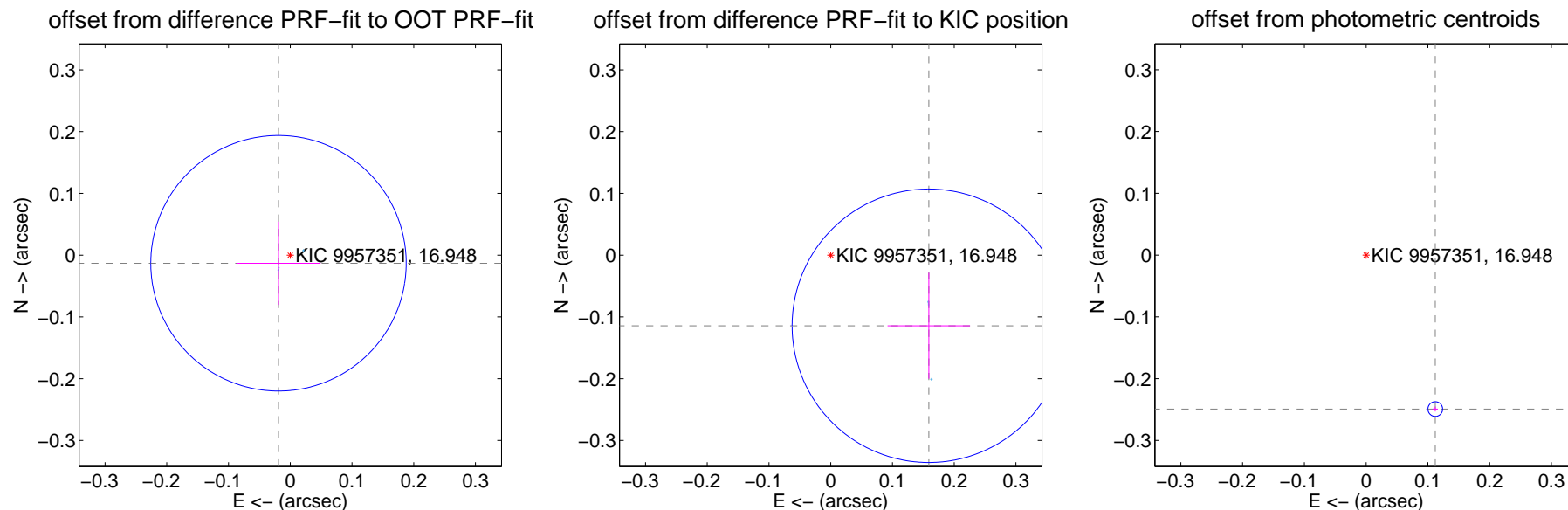
DV Centroid Data

Supplemental centroid analysis for 009957351-02. Kepler magnitude: 16.95. Transit SNR 725.49

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.023 ± 0.069	0.34	0.019 ± 0.068	-0.013 ± 0.067
PRF-fit source offset from KIC position	0.196 ± 0.074	2.65	-0.159 ± 0.067	-0.114 ± 0.086
photometric centroid source offset	0.27 ± 0.00	68.91	-0.11 ± 0.00	-0.25 ± 0.00



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

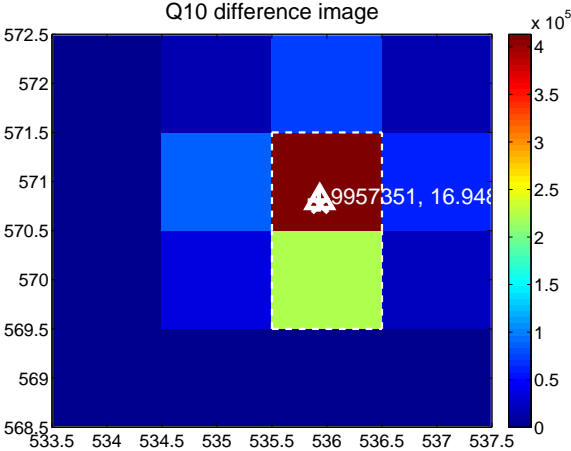
Q9 no difference image



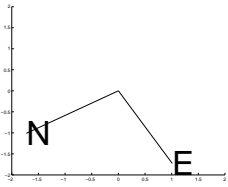
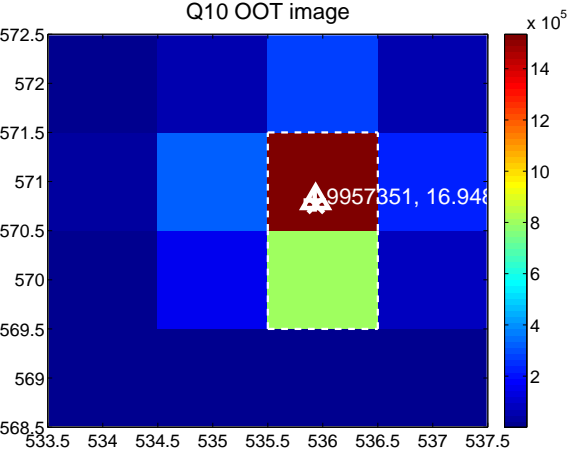
Q9 no OOT image



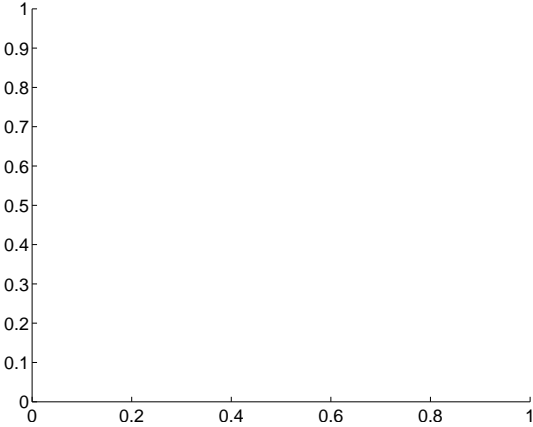
Q10 difference image



Q10 OOT image



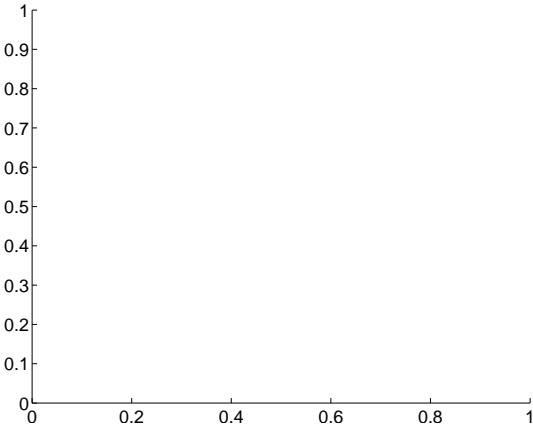
Q11 no difference image



Q11 no OOT image



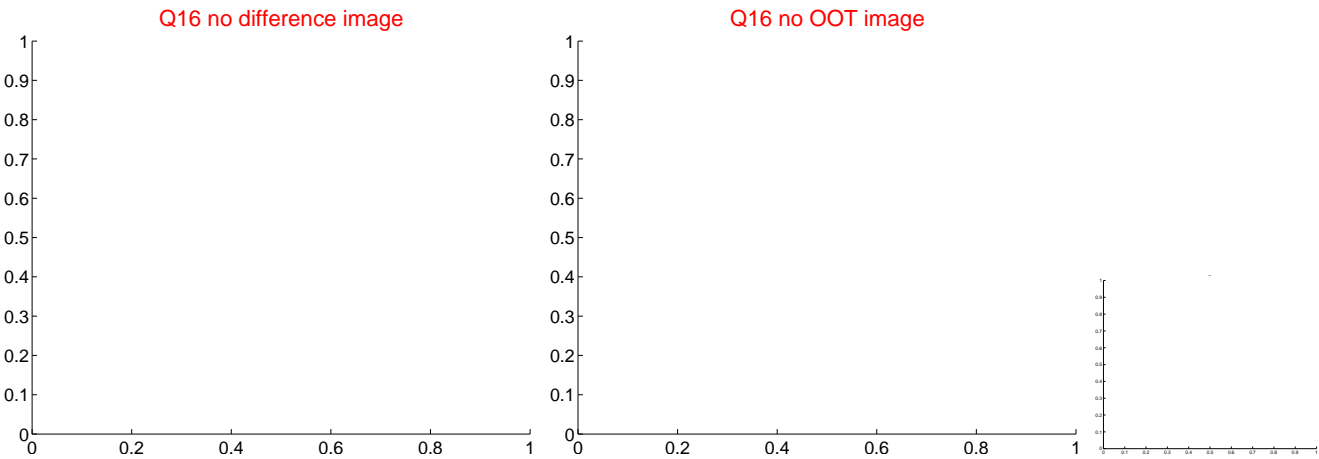
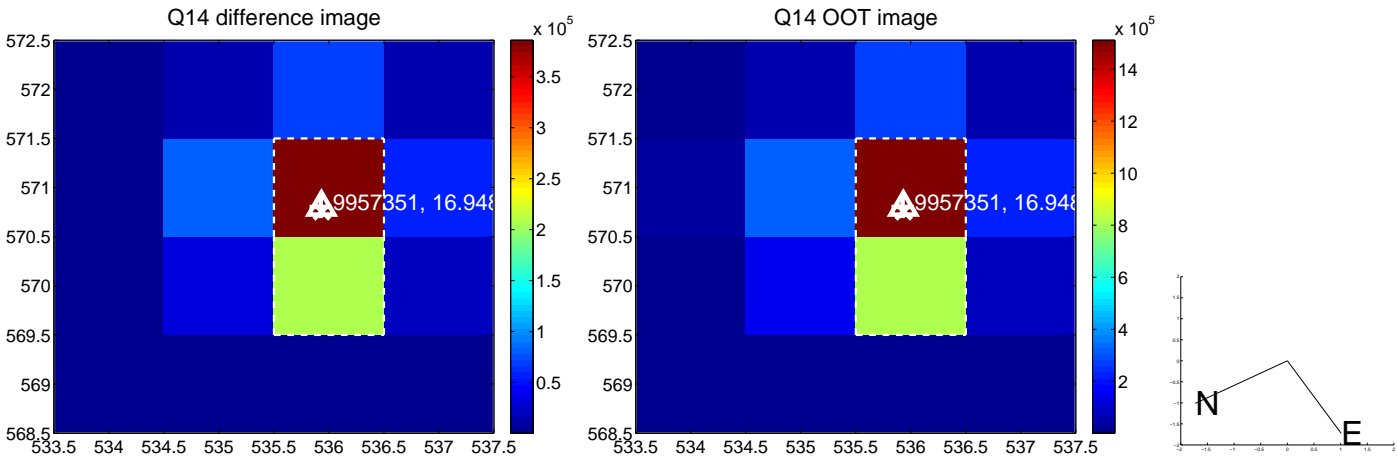
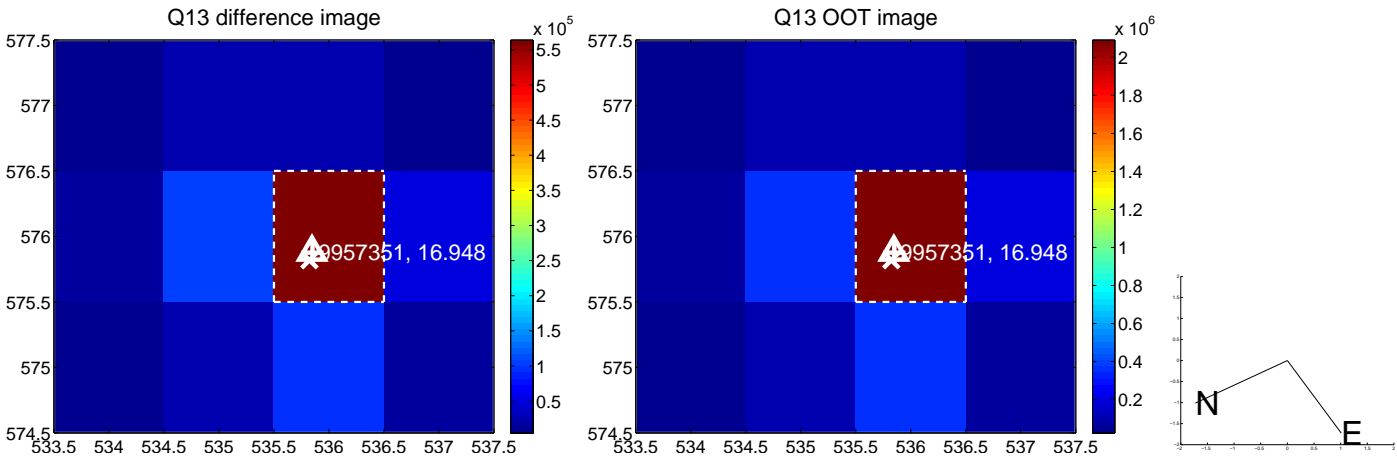
Q12 no difference image



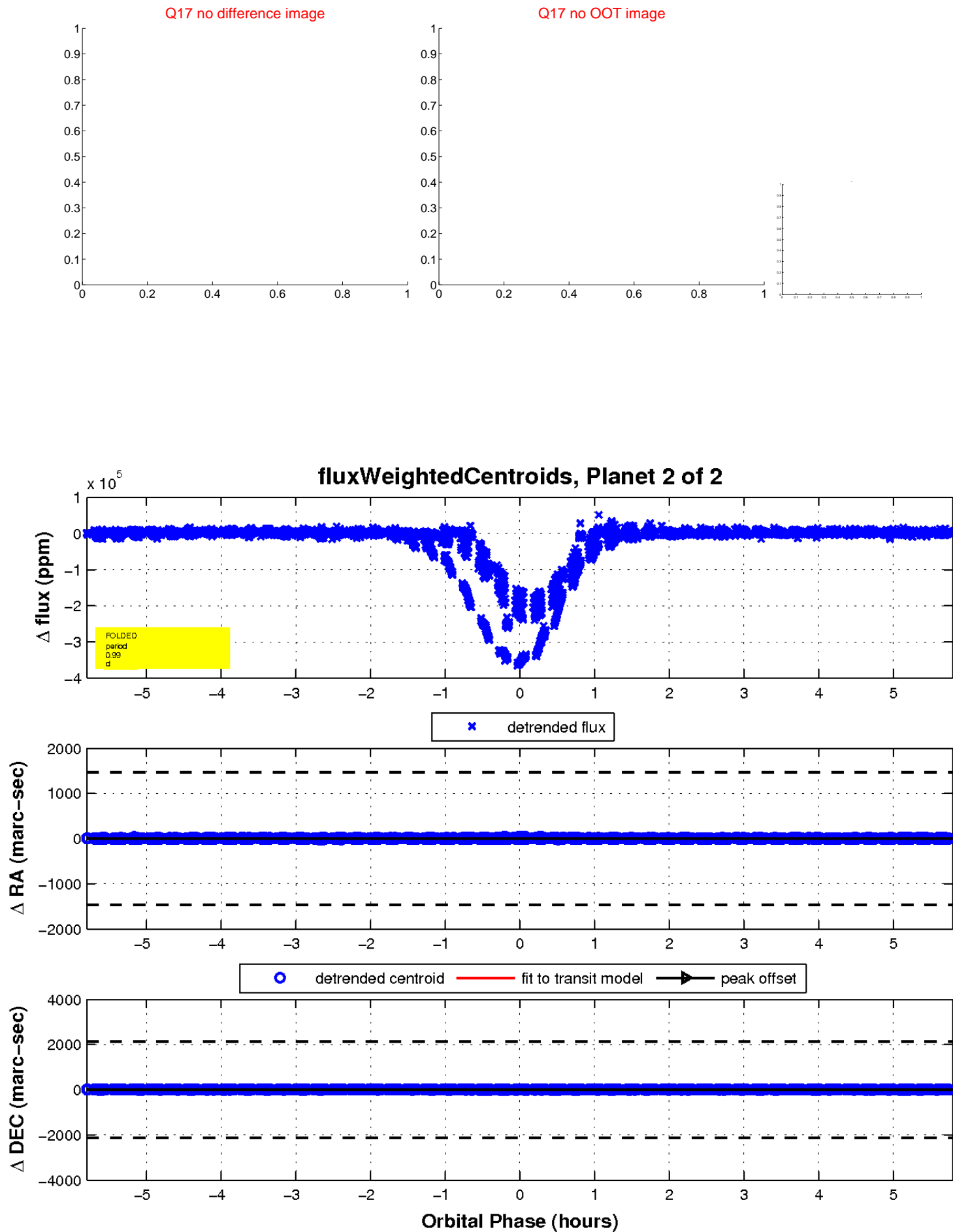
Q12 no OOT image



white \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

