

KIC 004991436

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})
004991436-01	OBS	No	356.260409	323.011854	1538.5	3.162	10.8	6.7	0.70	5257	3.03	0.41
004991436-02	OBS	No	200.540360	256.121816	1346.9	2.321	9.3	6.4	0.70	5257	2.65	0.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004991436-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004991436-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—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.

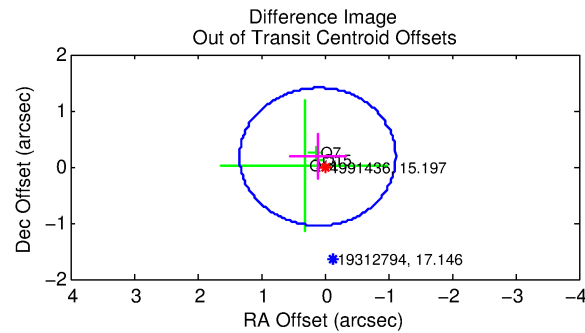
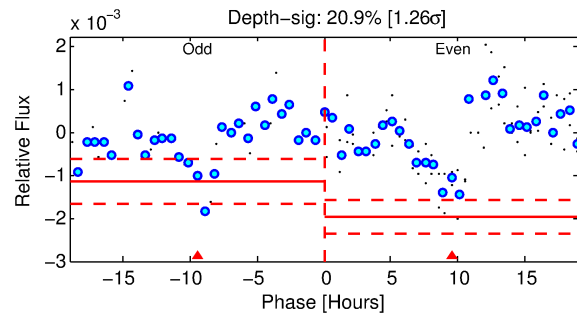
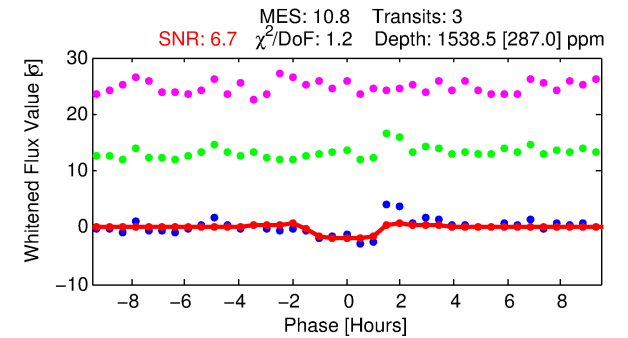
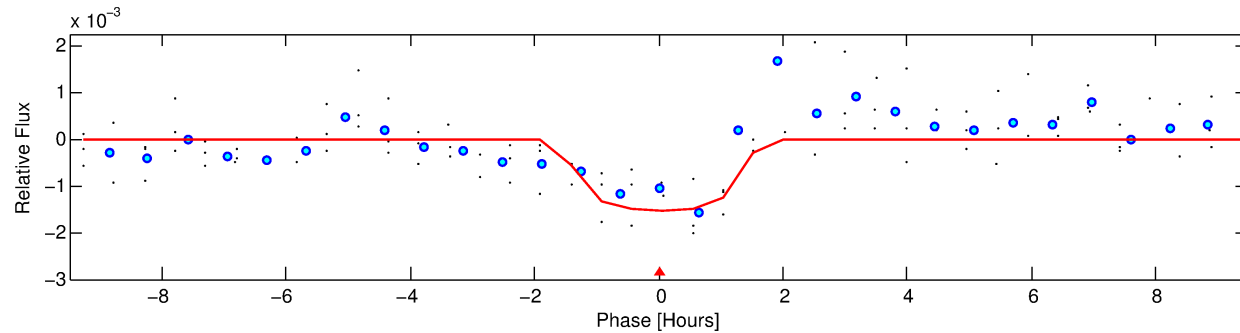
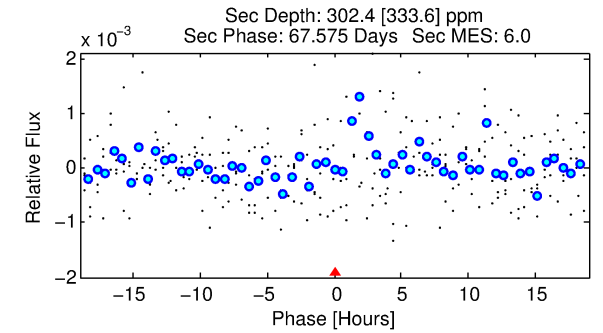
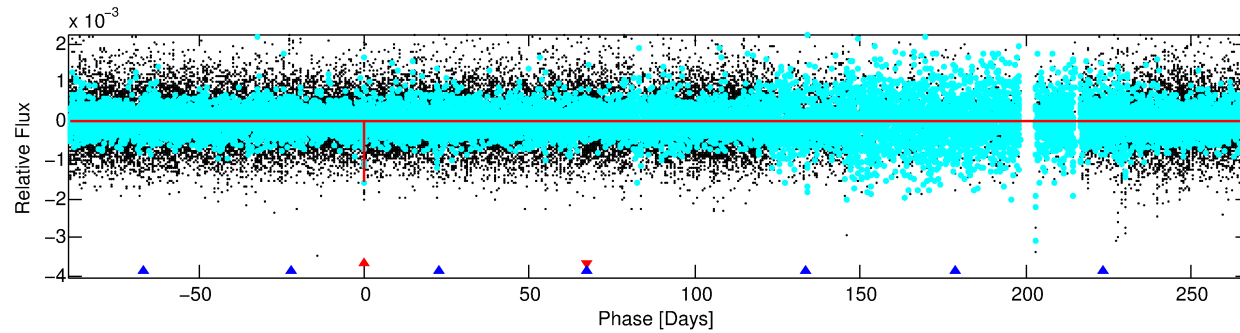
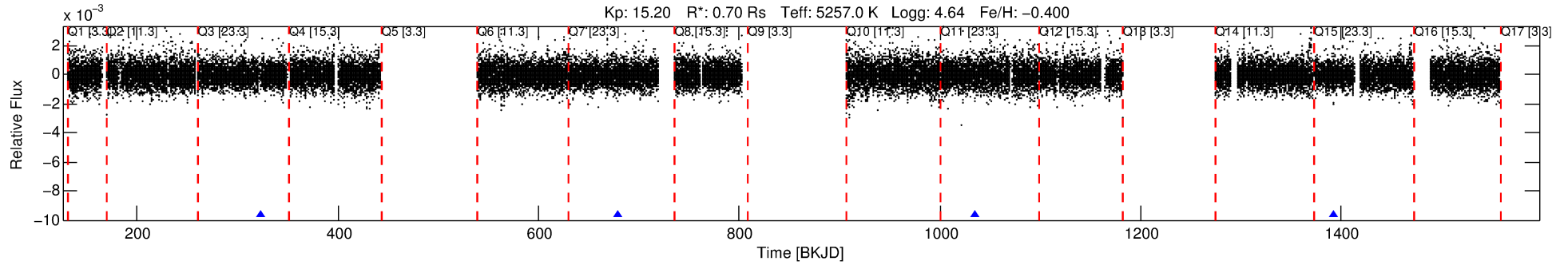
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004991436-01

No Significant Match Found

DV One-Page Summary

KIC: 4991436 Candidate: 1 of 2 Period: 356.260 d



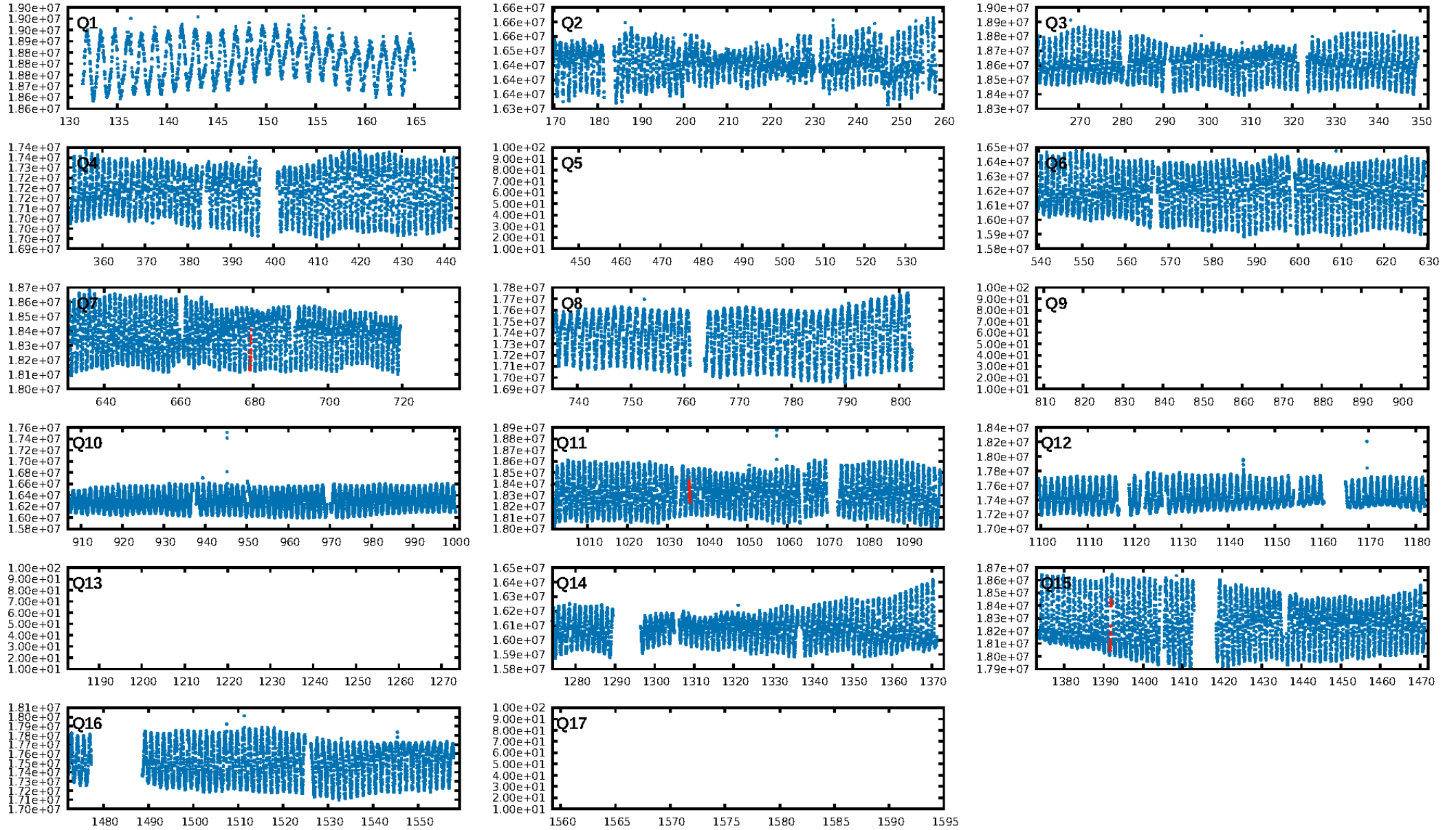
DV Fit Results:

Period = 356.26041 [0.00540] d
Epoch = 323.0119 [0.0122] BKJD
Rp/R* = 0.0400 [0.1724]
a/R* = 578.09 [9967.98]
b = 0.79 [8.23]
Seff = 0.41 [0.08]
Teq = 204 [10] K
Rp = 3.03 [13.10] Re
a = 0.9008 [0.1029] AU
Ag = 14659.56 [127573.98] [0.11 σ]
Teffp = 3468 [7545] K [0.43 σ]

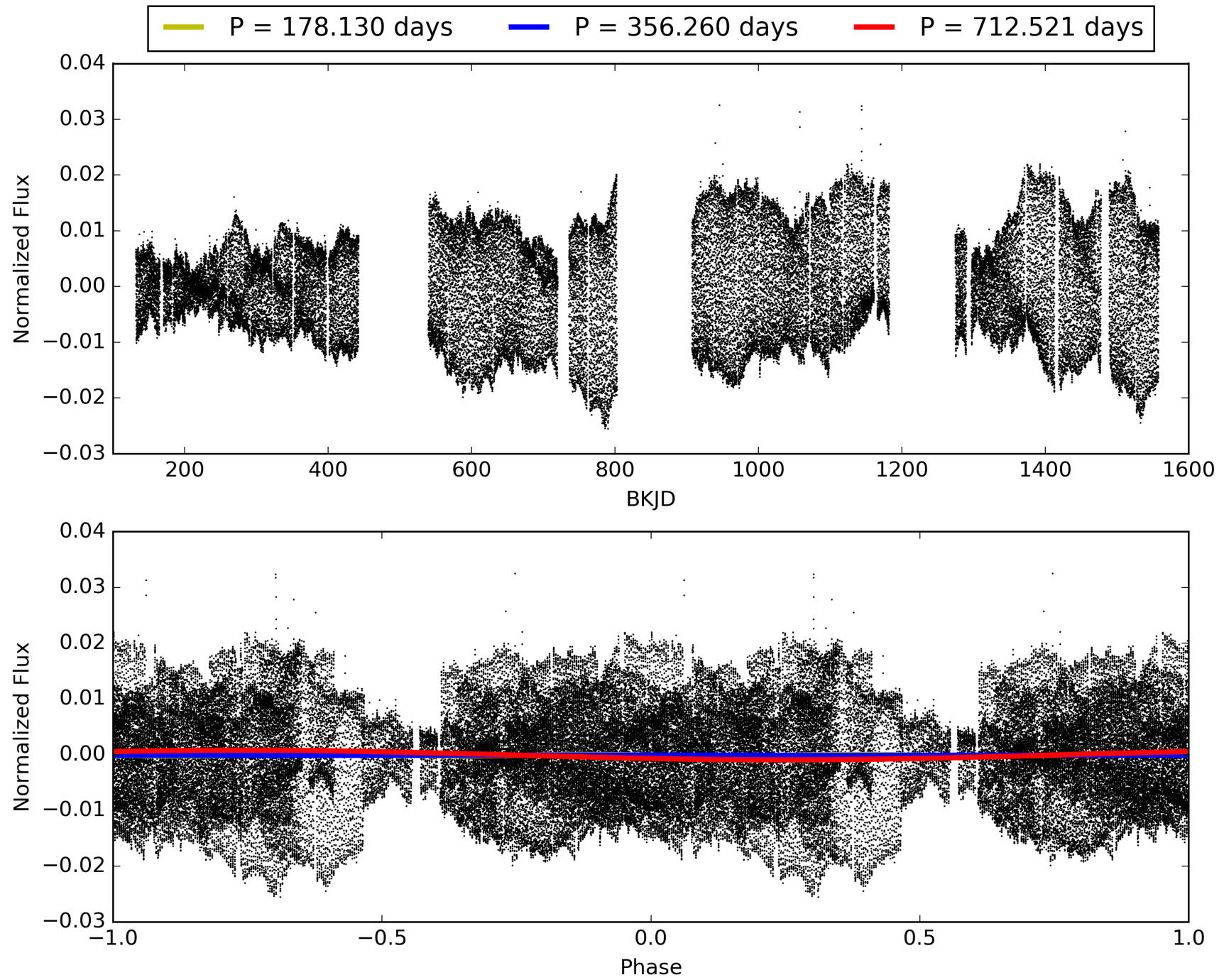
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [952.83 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 5.9%
ModelChiSquareGof-sig: 75.6%
Bootstrap-pfa: 1.60e-14
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.589
Centroid-sig: 99.4%
Centroid-so: 0.276 arcsec [0.19 σ]
OotOffset-rm: 0.207 arcsec [0.51 σ]
OotOffset-st: 0/3/0/0 [3]
KicOffset-rm: 0.297 arcsec [0.74 σ]
KicOffset-st: 0/3/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 004991436-01, PDC Light Curves

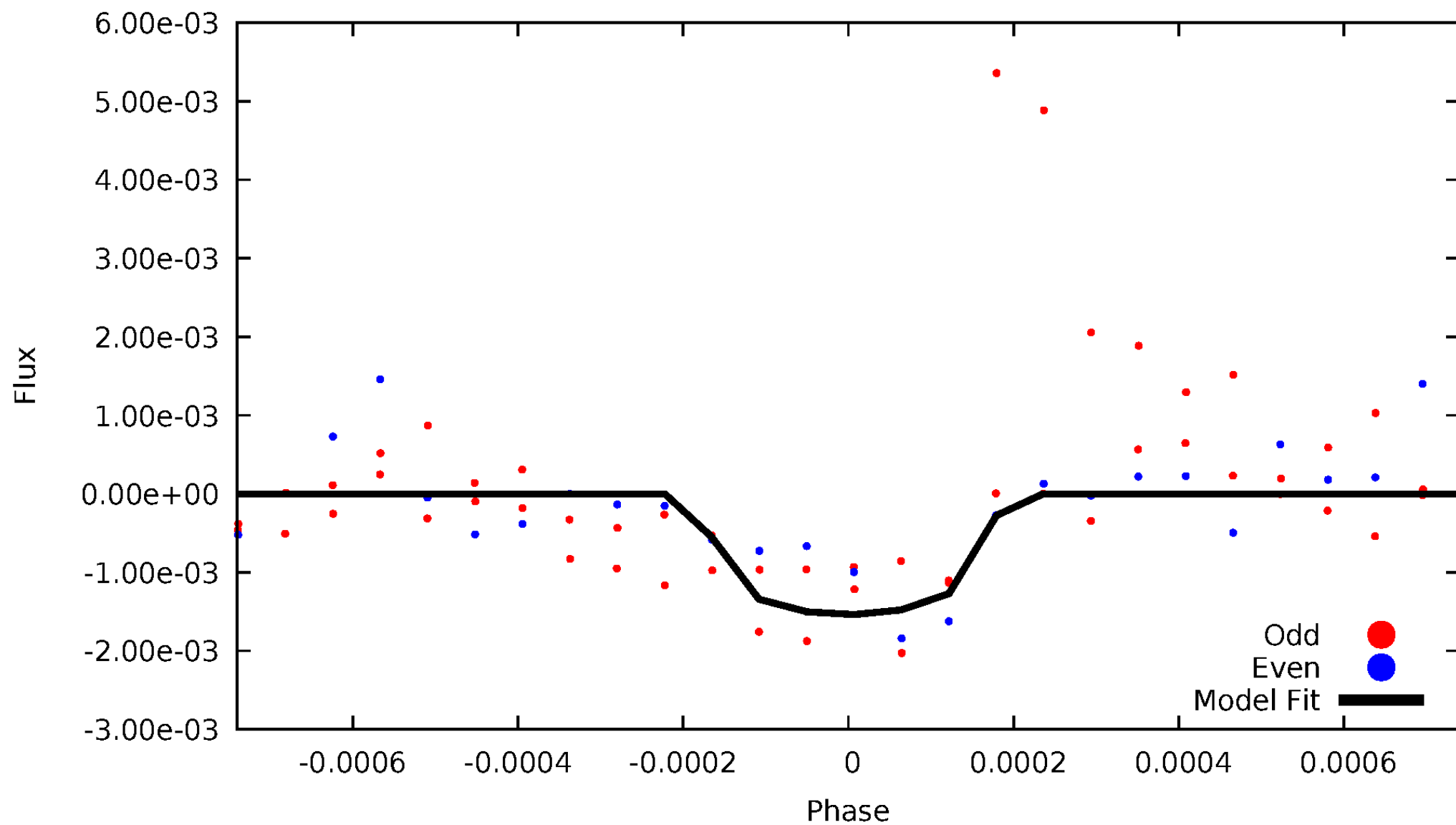


TCE 004991436-01



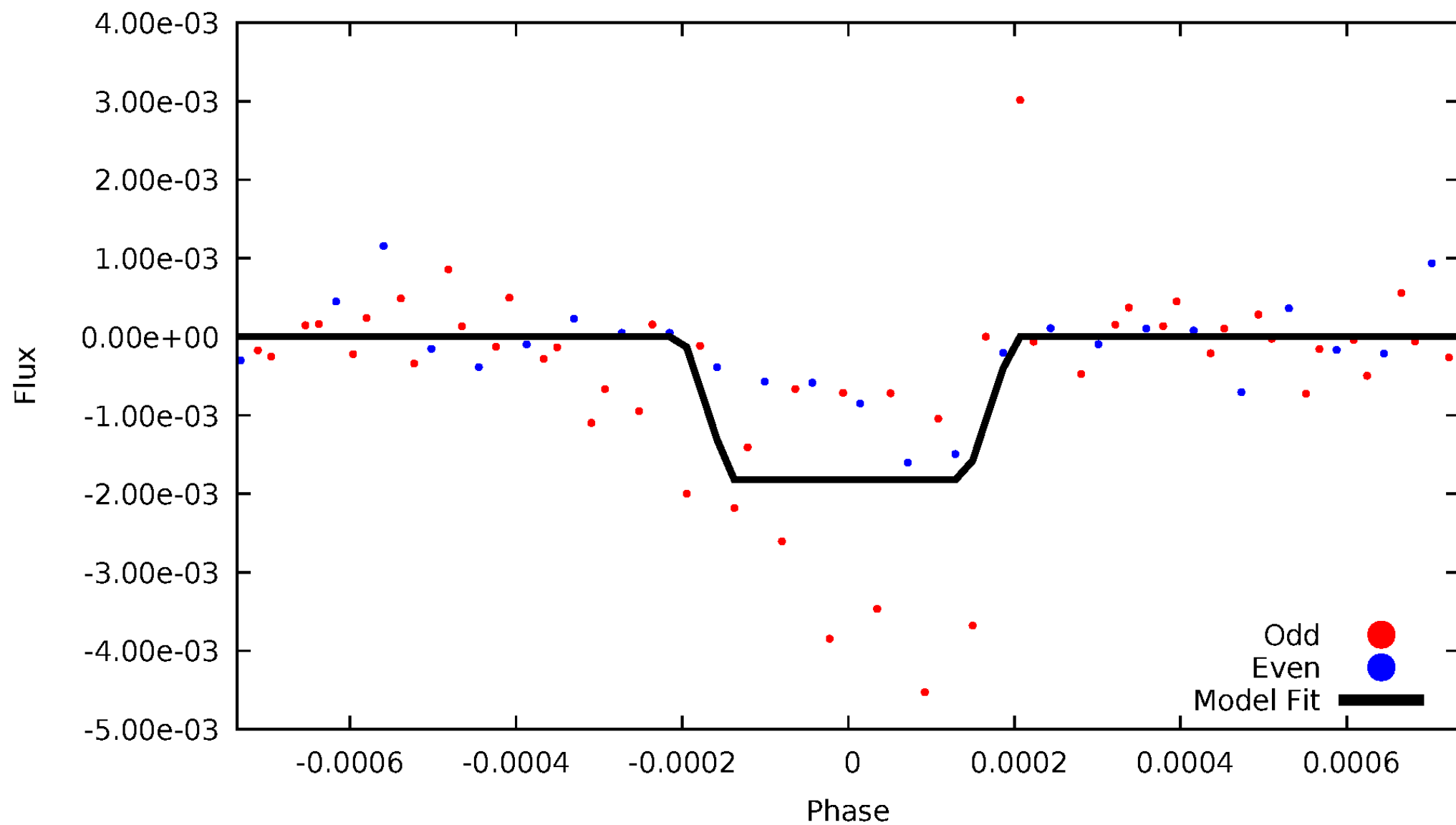
DV Odd/Even

TCE 004991436-01

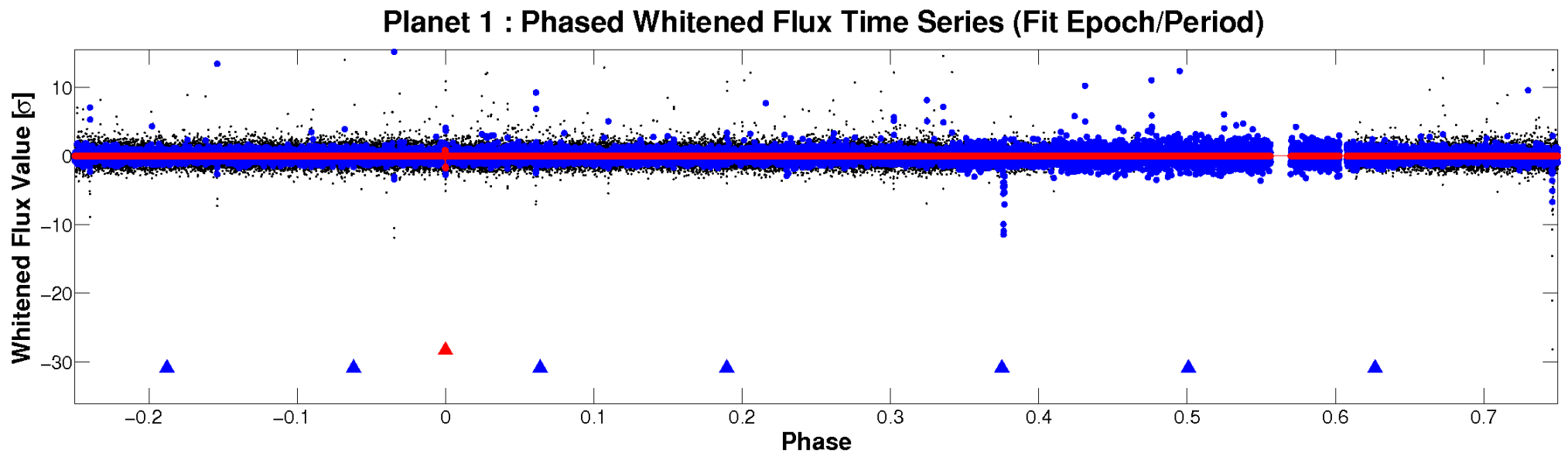
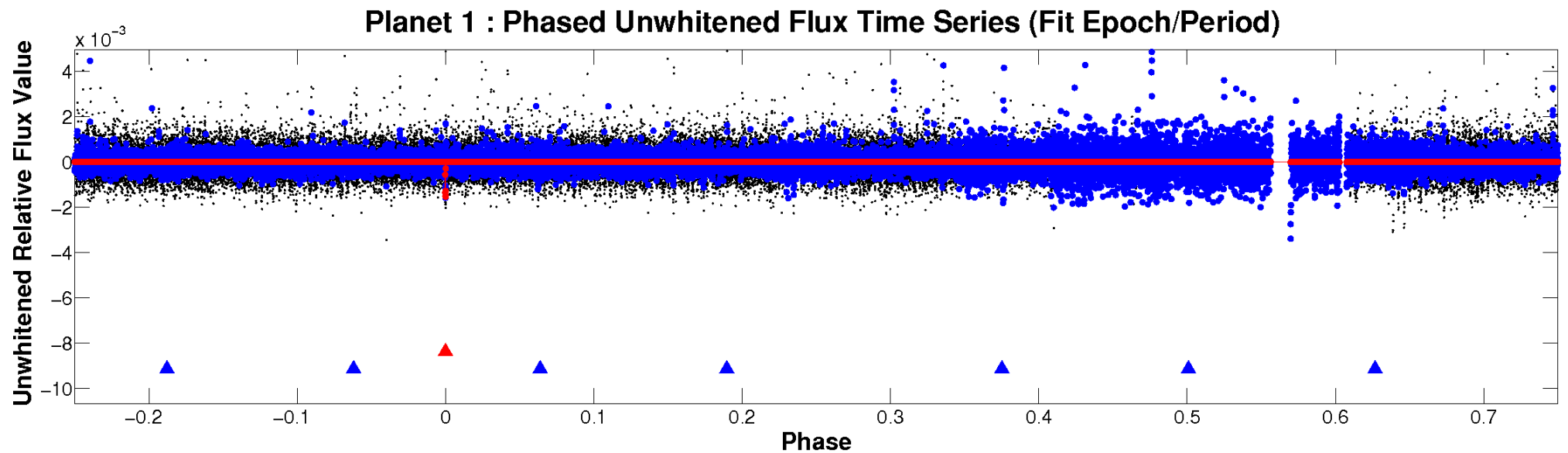


ALT Odd/Even

TCE 004991436-01

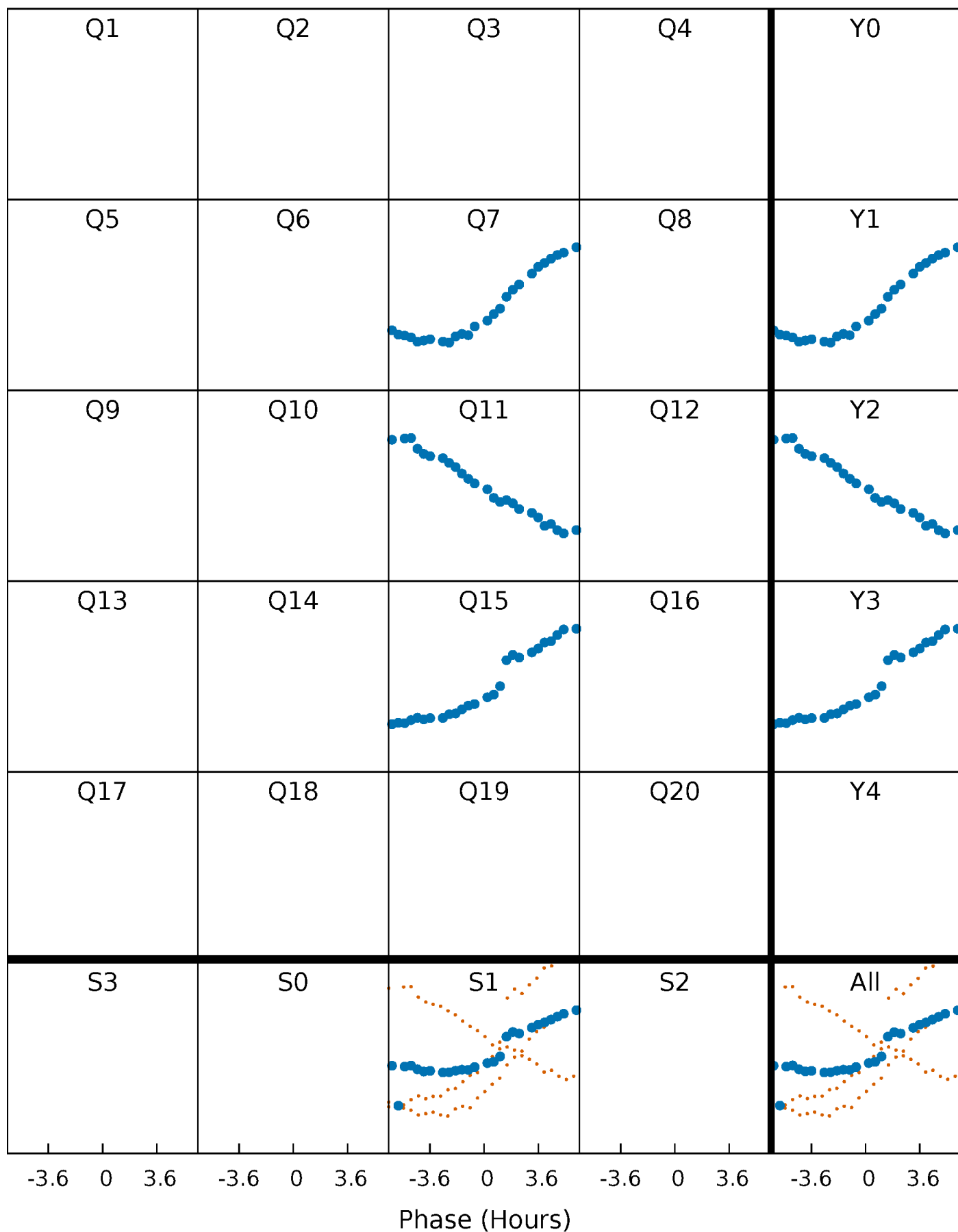


Non-Whitened Vs. Whitened Light Curve



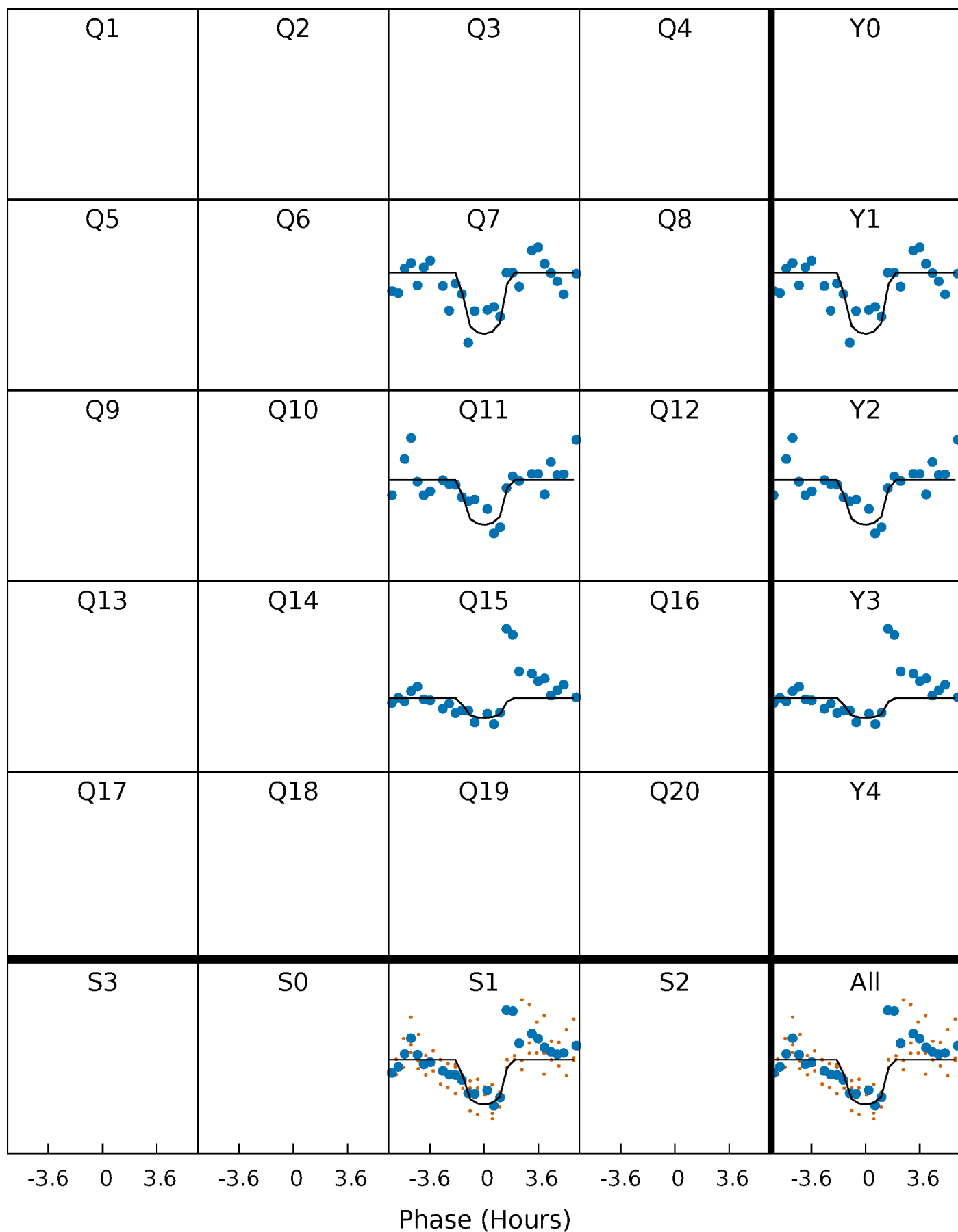
PDC Quarter-Phased Transit Curves

TCE 004991436-01 P=356.260409 Days $T_0=323.011854$ (BKJD)



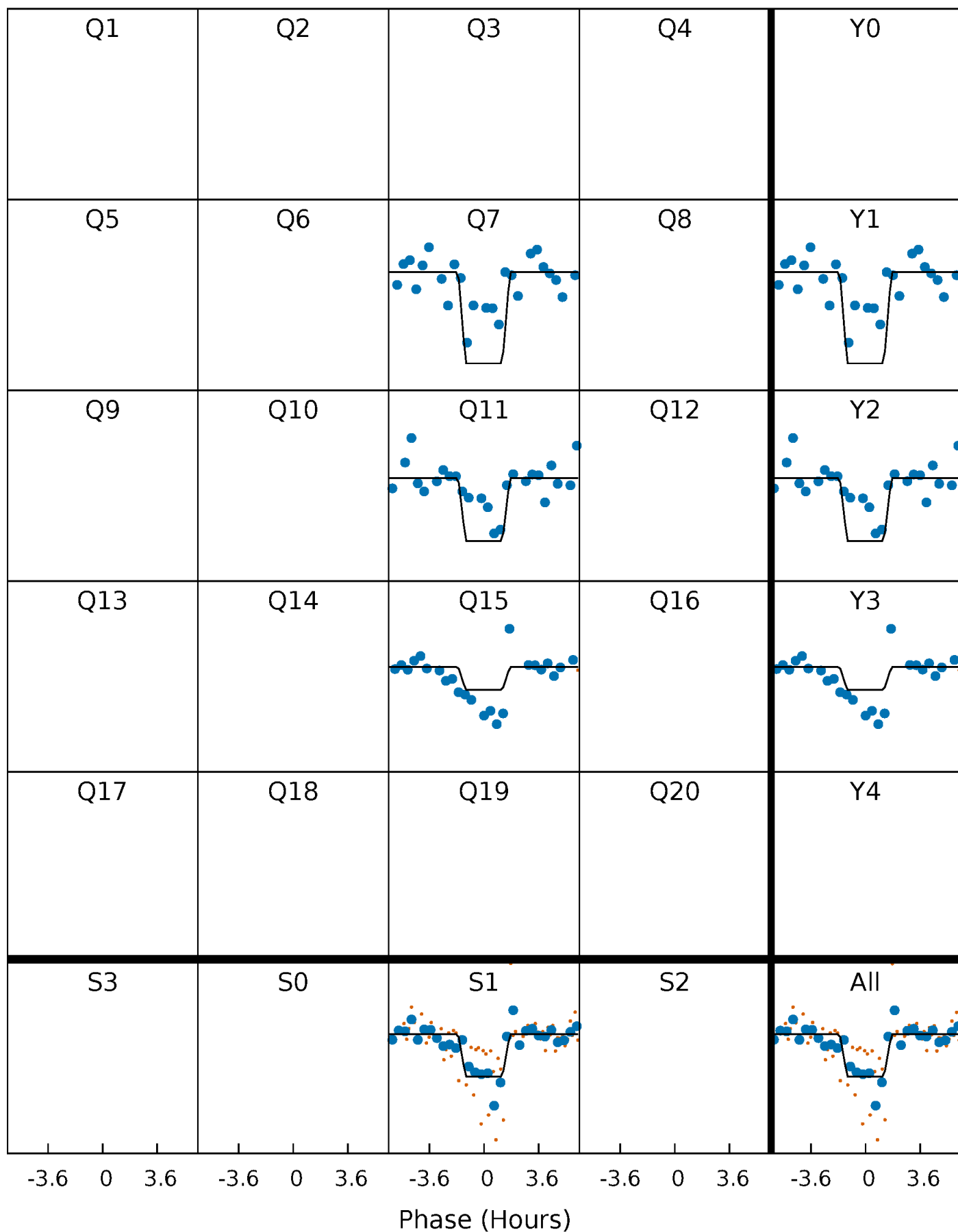
DV Quarter-Phased Transit Curves

TCE 004991436-01 $P=356.260409$ Days $T_0=323.011854$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

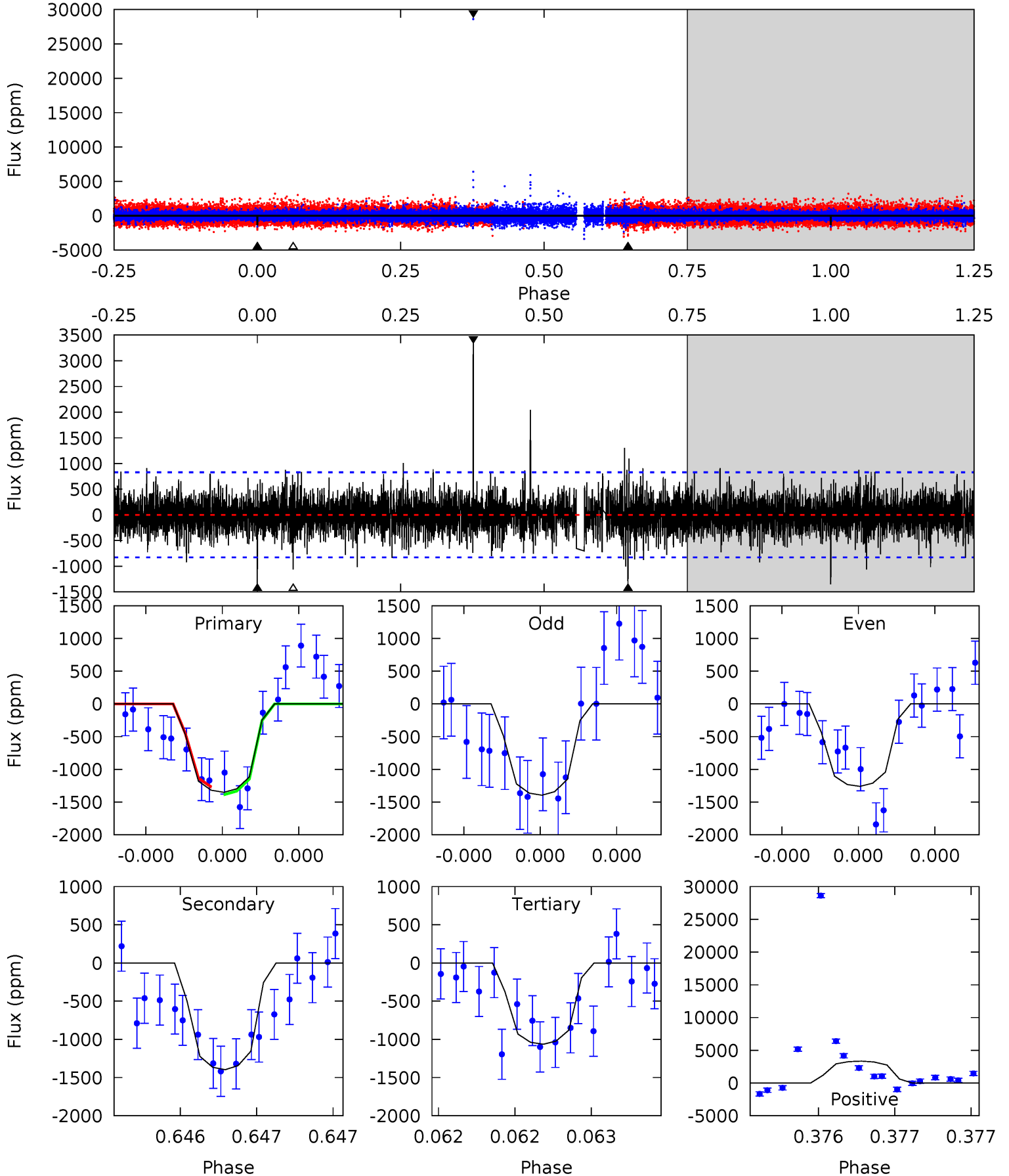
TCE 004991436-01 P=356.253185 Days $T_0=323.023739$ (BKJD)



DV Model-Shift Uniqueness Test

004991436-01, P = 356.260409 Days, E = 323.011854 Days

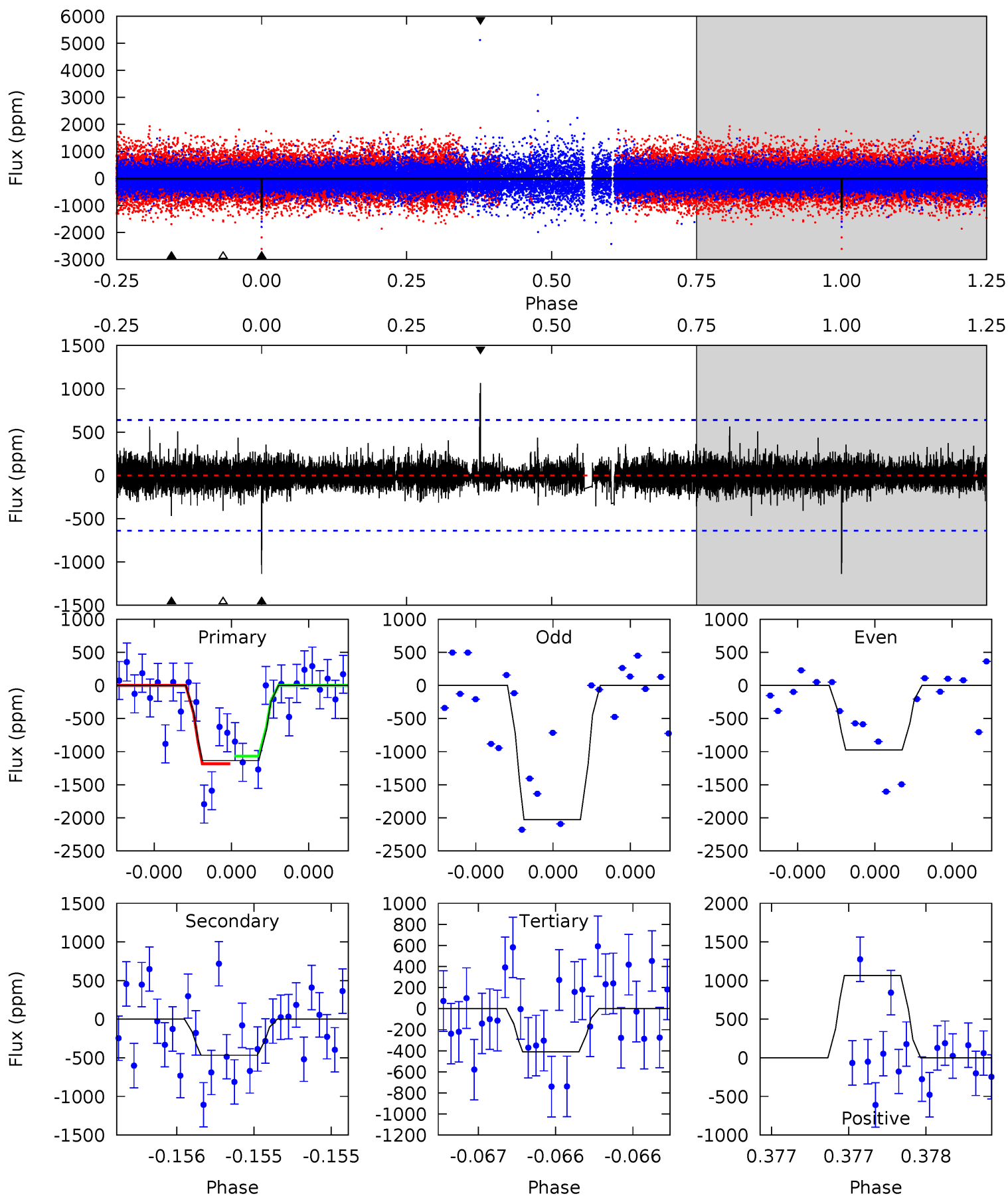
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.19	9.51	7.24	22.7	5.64	3.58	1.71	1.95	-13.5	2.27	-13.2	0.42	1.01	0.71	0.39



Alt Model-Shift Uniqueness Test

004991436-01, P = 356.253185 Days, E = 323.023739 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	4.11	3.61	9.39	5.63	3.56	0.81	6.41	0.62	0.50	-5.29	5.07	1.81	0.48	0.51



Stellar Parameters For KIC 004991436

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5257^{+141}_{-157}	$4.638^{+0.030}_{-0.090}$	$-0.400^{+0.300}_{-0.300}$	$0.696^{+0.095}_{-0.055}$	$0.776^{+0.075}_{-0.083}$	$3.238^{+0.510}_{-0.938}$
	+3%/-3%	+1%/-2%	+75%/-75%	+14%/-8%	+10%/-11%	+16%/-29%
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 004991436-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1397 ± 147	$10.28^{+11.15}_{-6.98}$	288^{+11}_{-11}	3335^{+1629}_{-632}	6050^{+50359}_{-4685}
Alt.	-466 ± 113	$10.30^{+11.08}_{-7.37}$	288^{+11}_{-11}	2832^{+1316}_{-476}	1932^{+21139}_{-1495}

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 $A_{obs} \gg 1.0$

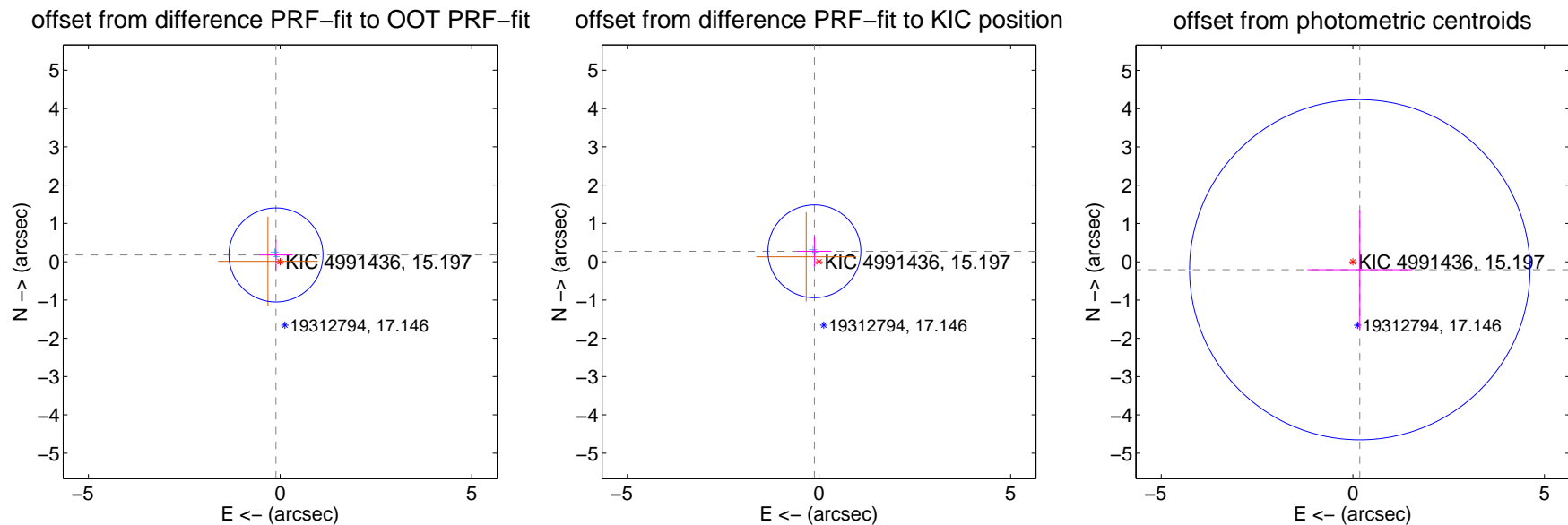
DV Centroid Data

Supplemental centroid analysis for 004991436-01. Kepler magnitude: 15.20. Transit SNR 6.74

There are 2 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.207 ± 0.409	0.51	0.108 ± 0.441	0.176 ± 0.396
PRF-fit source offset from KIC position	0.297 ± 0.404	0.74	0.120 ± 0.441	0.272 ± 0.396
photometric centroid source offset	0.28 ± 1.48	0.19	-0.18 ± 1.37	-0.21 ± 1.56

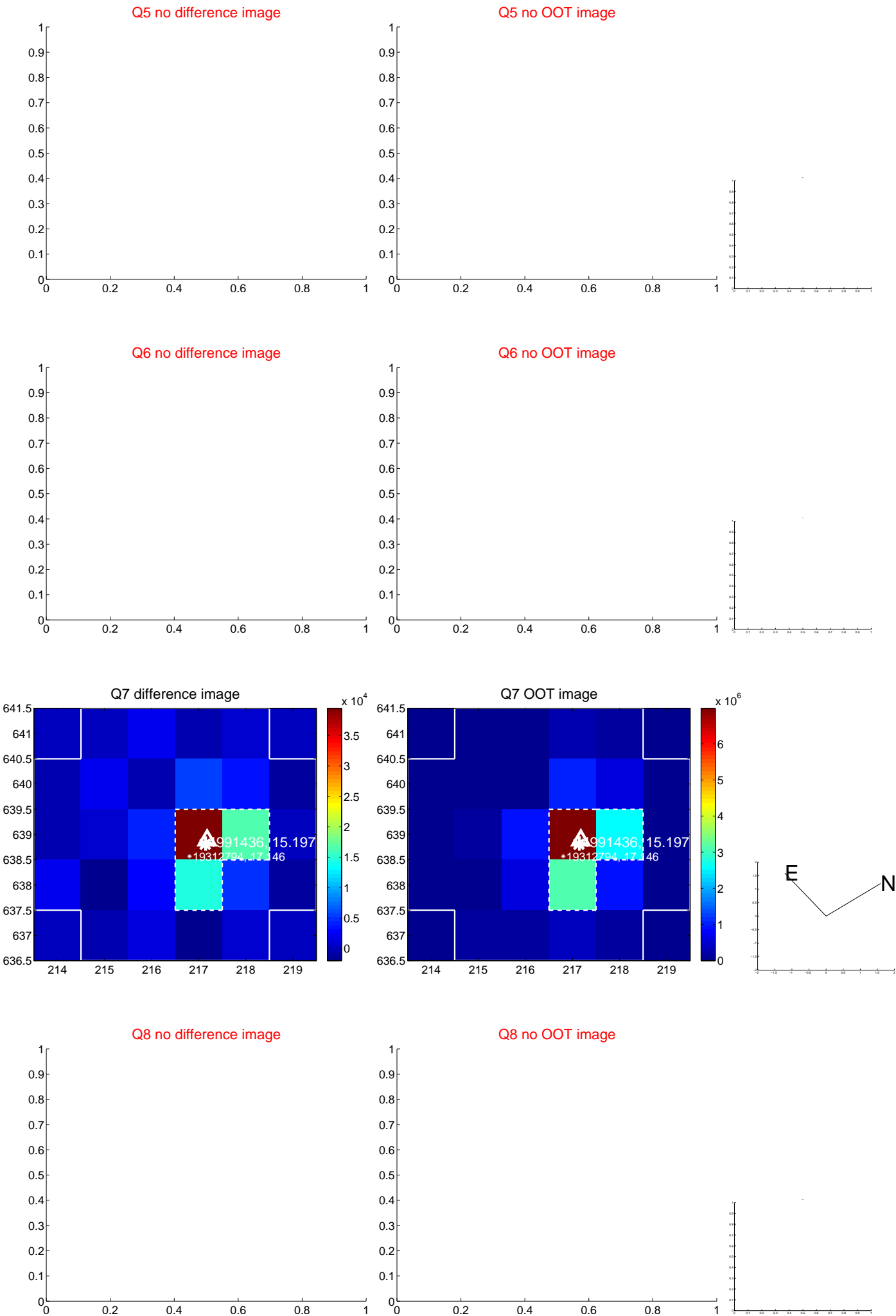


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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



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



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

Q9 no difference image



Q9 no OOT image



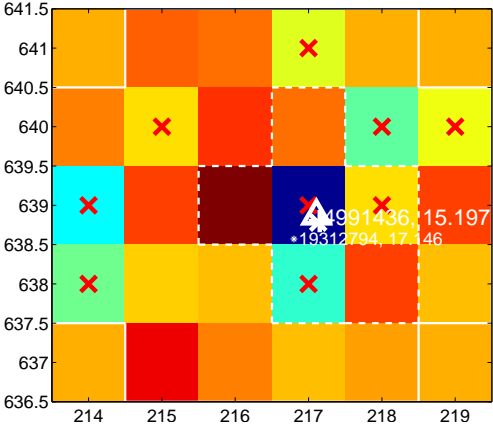
Q10 no difference image



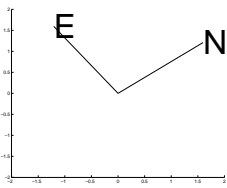
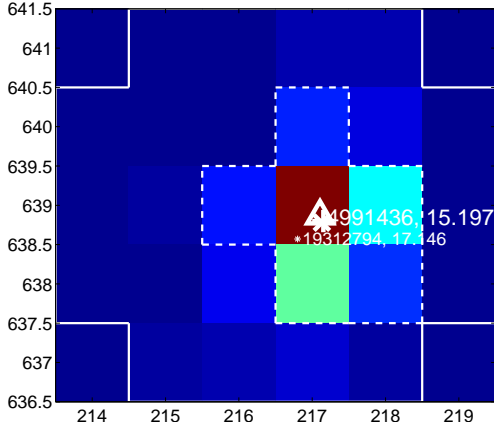
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



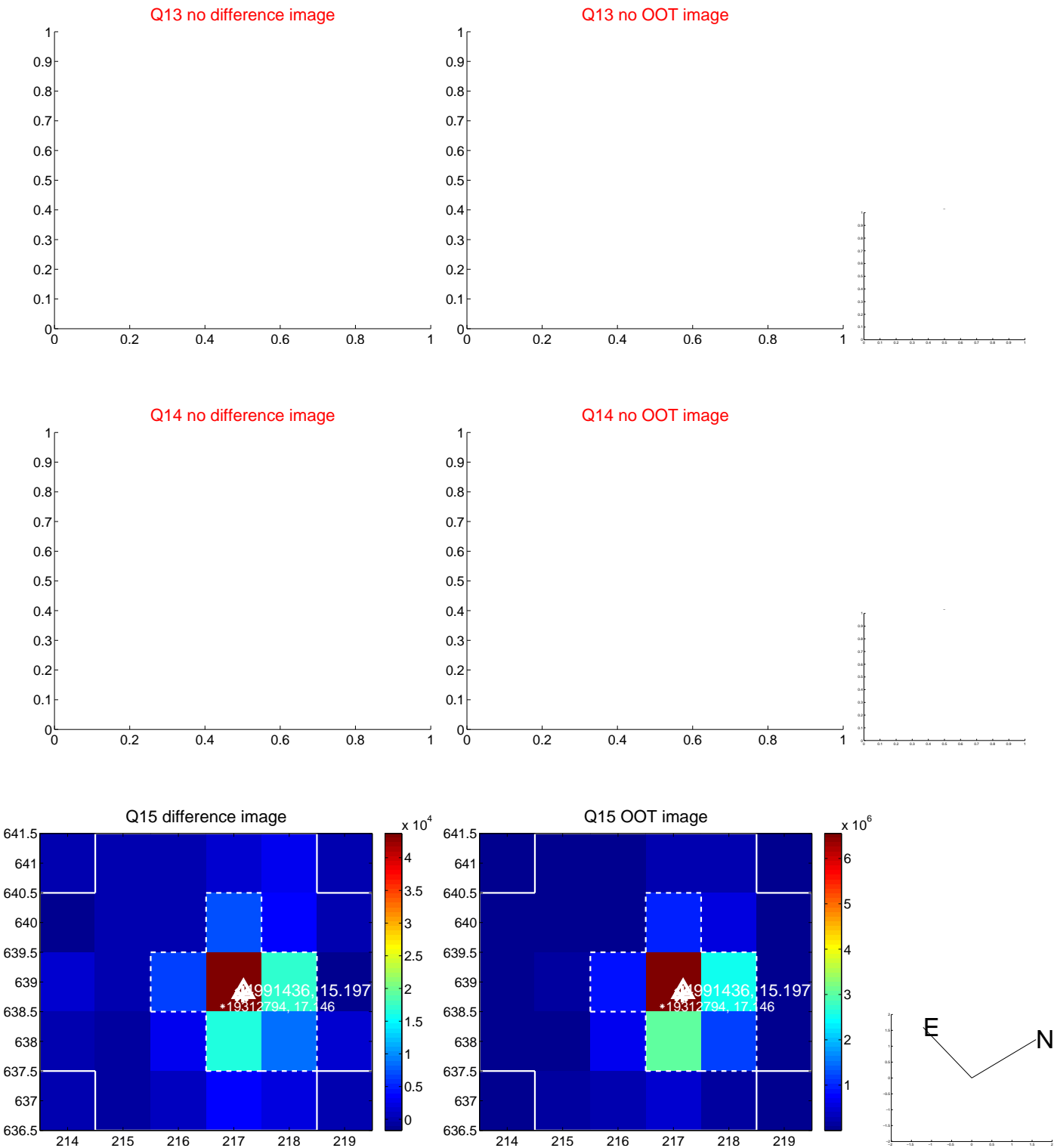
Q12 no difference image



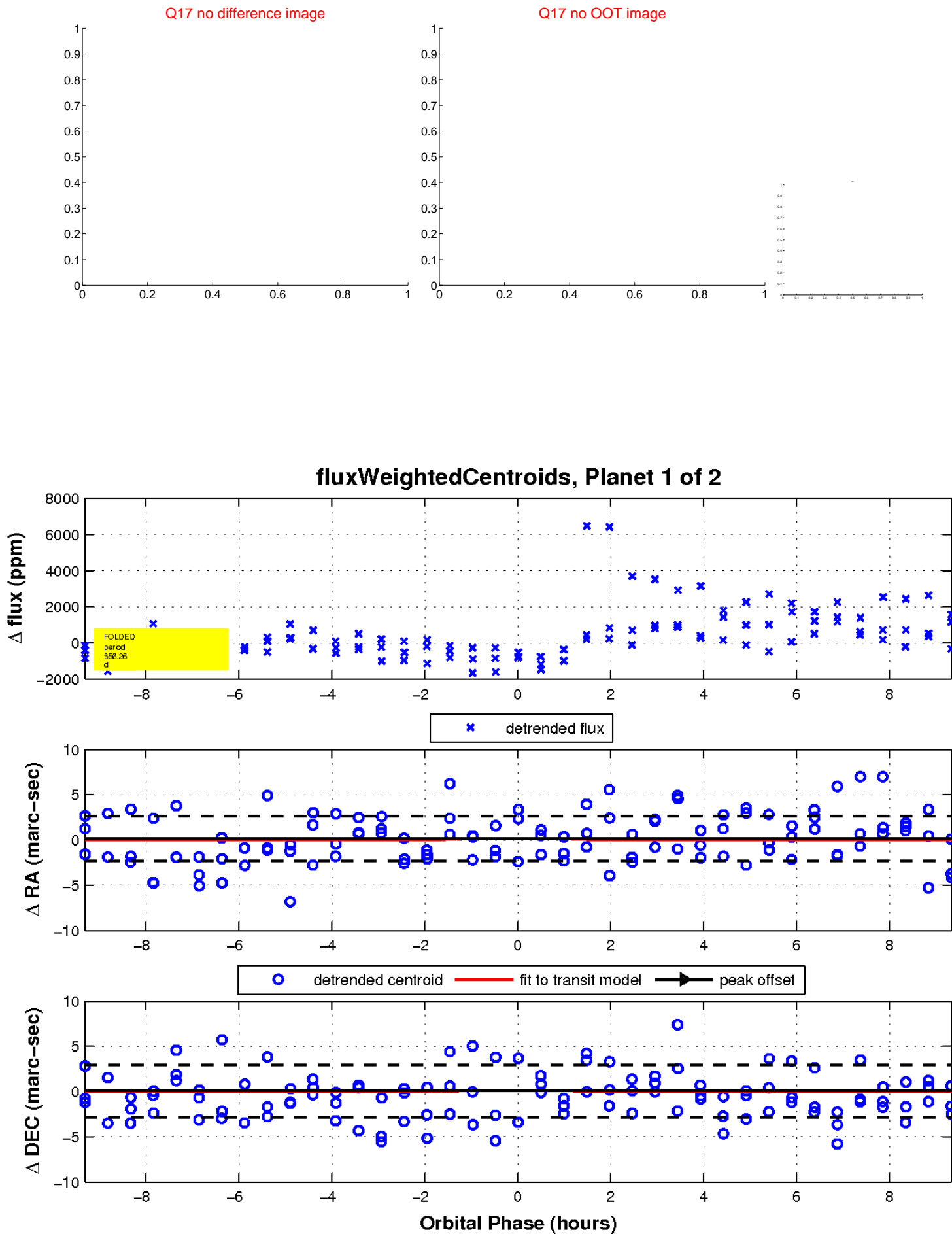
Q12 no OOT image



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

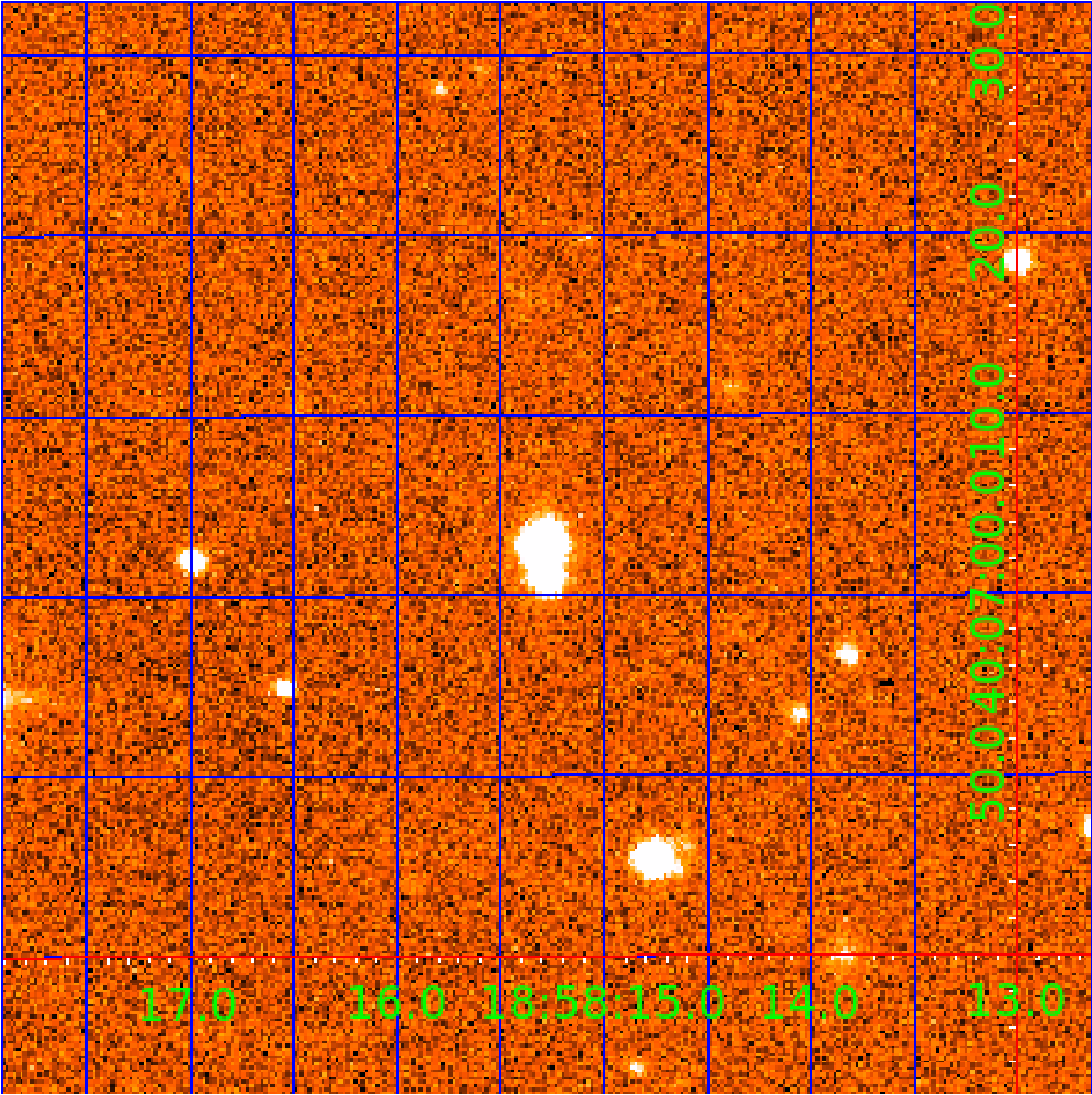


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004991436

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})
004991436-01	OBS	No	356.260409	323.011854	1538.5	3.162	10.8	6.7	0.70	5257	3.03	0.41
004991436-02	OBS	No	200.540360	256.121816	1346.9	2.321	9.3	6.4	0.70	5257	2.65	0.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004991436-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004991436-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—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.

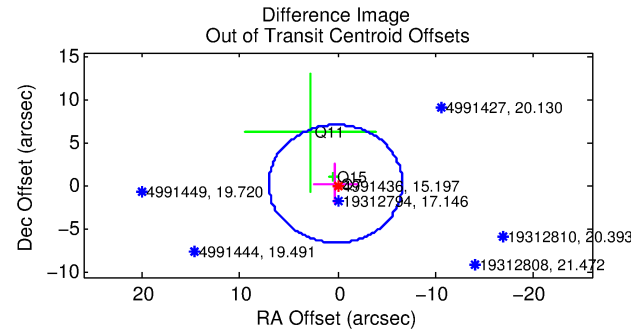
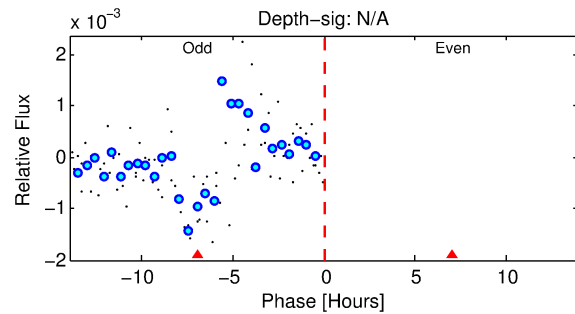
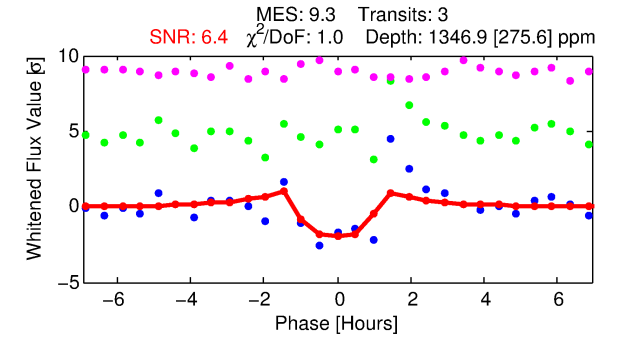
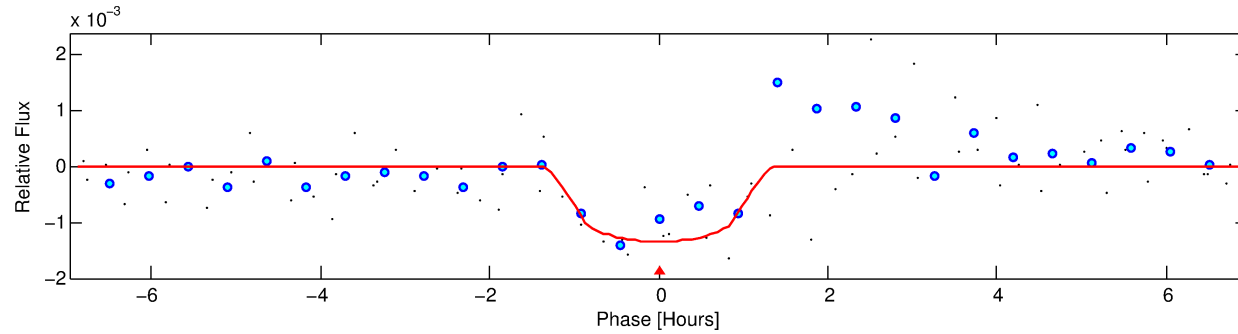
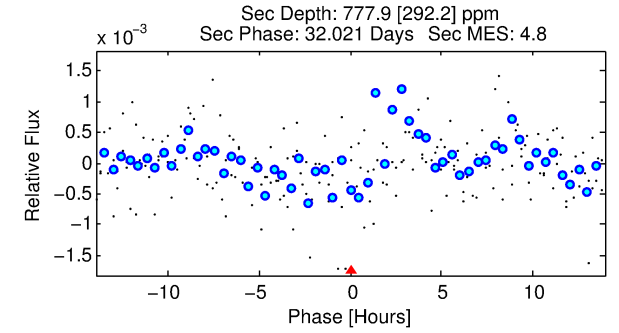
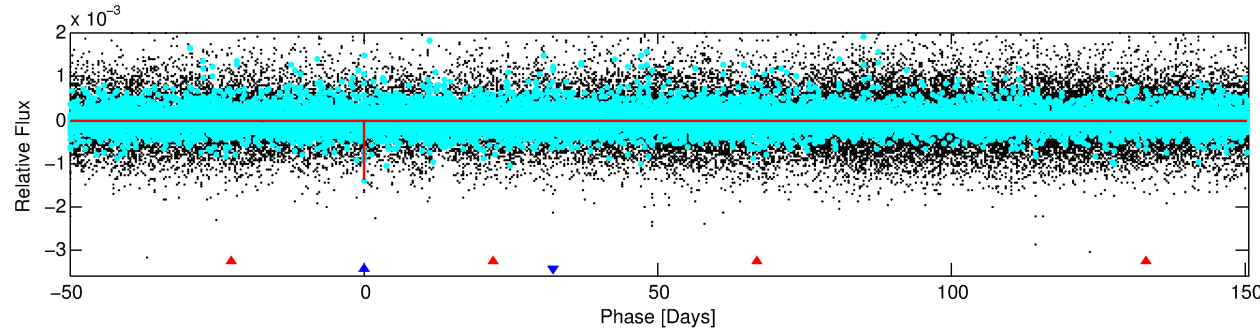
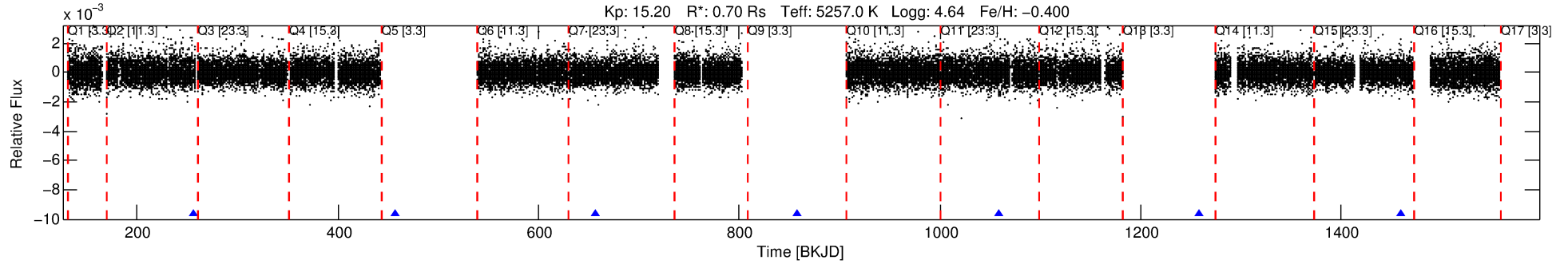
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004991436-02

No Significant Match Found

DV One-Page Summary

KIC: 4991436 Candidate: 2 of 2 Period: 200.540 d



DV Fit Results:

Period = 200.54036 [0.00253] d
Epoch = 256.1218 [0.0125] BKJD
Rp/R* = 0.0350 [0.0865]
a/R* = 554.78 [5341.83]
b = 0.60 [10.24]
Seff = 0.88 [0.18]
Teq = 247 [13] K
Rp = 2.66 [6.58] Re
a = 0.6141 [0.0702] AU
Ag = 22894.57 [113635.03] [0.20σ]
Teffp = 4696 [5825] K [0.76σ]

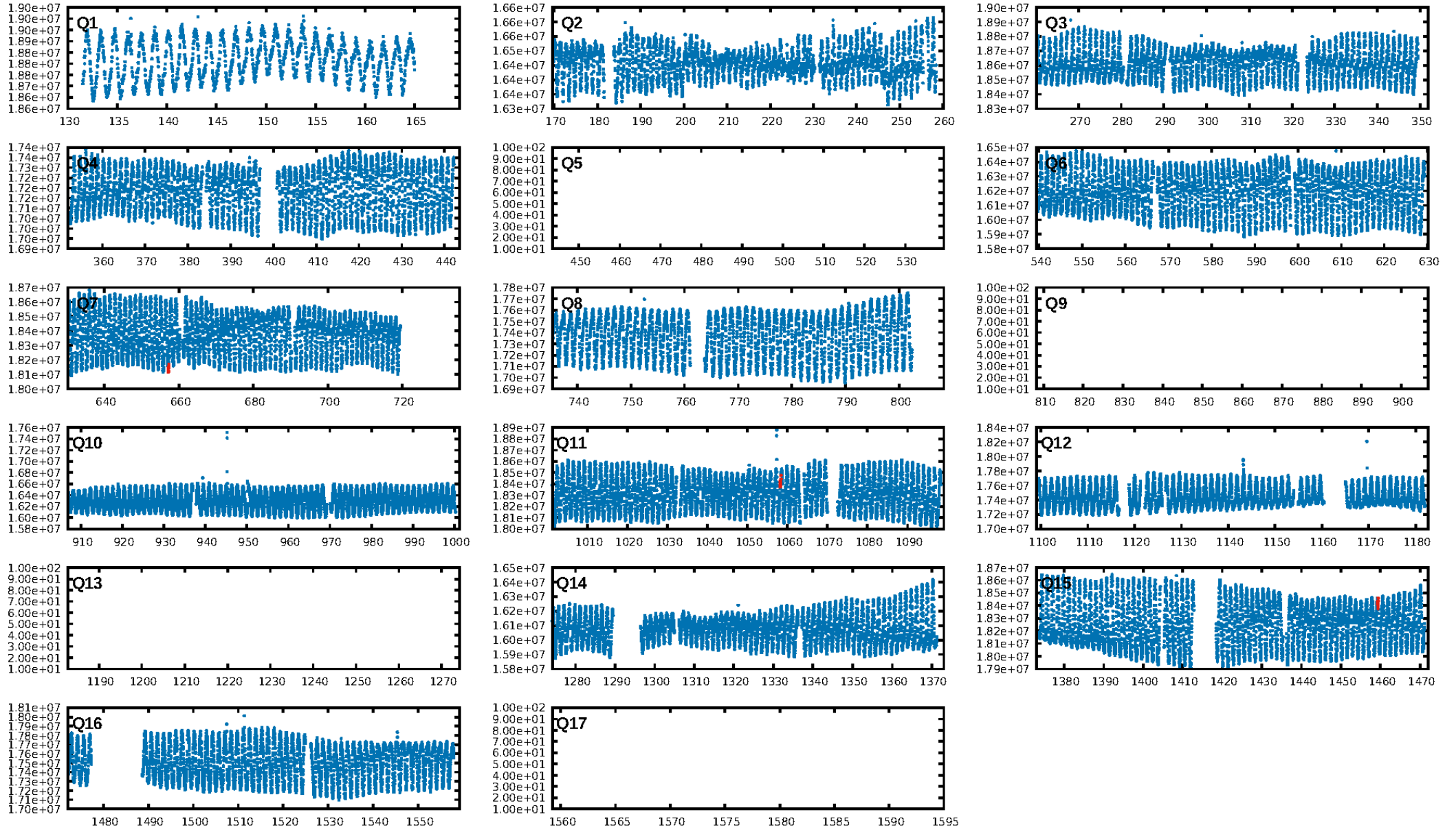
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [952.83σ]
ModelChiSquare2-sig: 11.0%
ModelChiSquareGof-sig: 70.7%
Bootstrap-pfa: 2.57e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.619
Centroid-sig: 12.1%
Centroid-so: 2.020 arcsec [1.36σ]
OotOffset-rm: 0.352 arcsec [0.15σ]
OotOffset-st: 0/3/0/0 [3]
KicOffset-rm: 0.431 arcsec [0.19σ]
KicOffset-st: 0/3/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

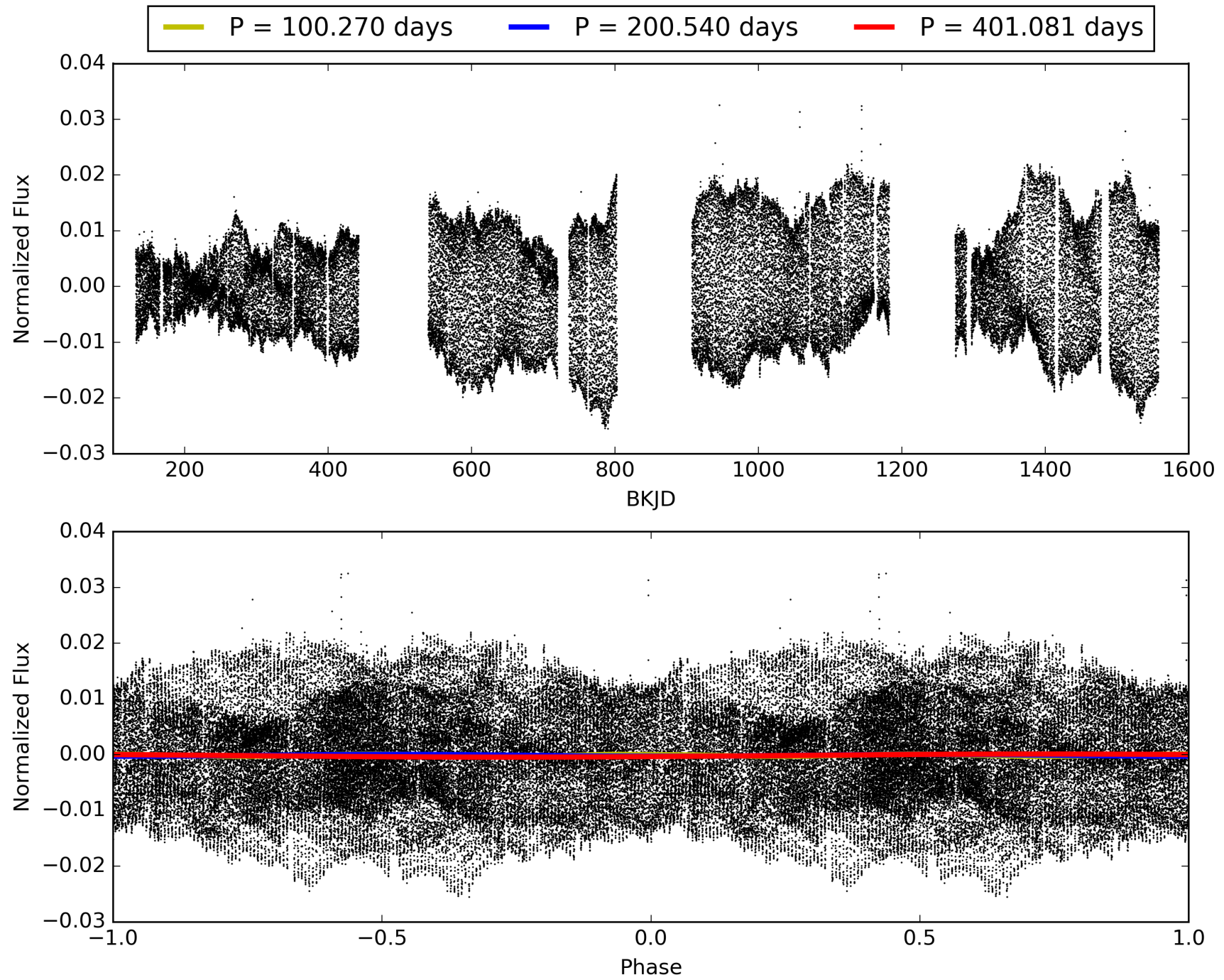
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:29:30 Z

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

TCE 004991436-02, PDC Light Curves

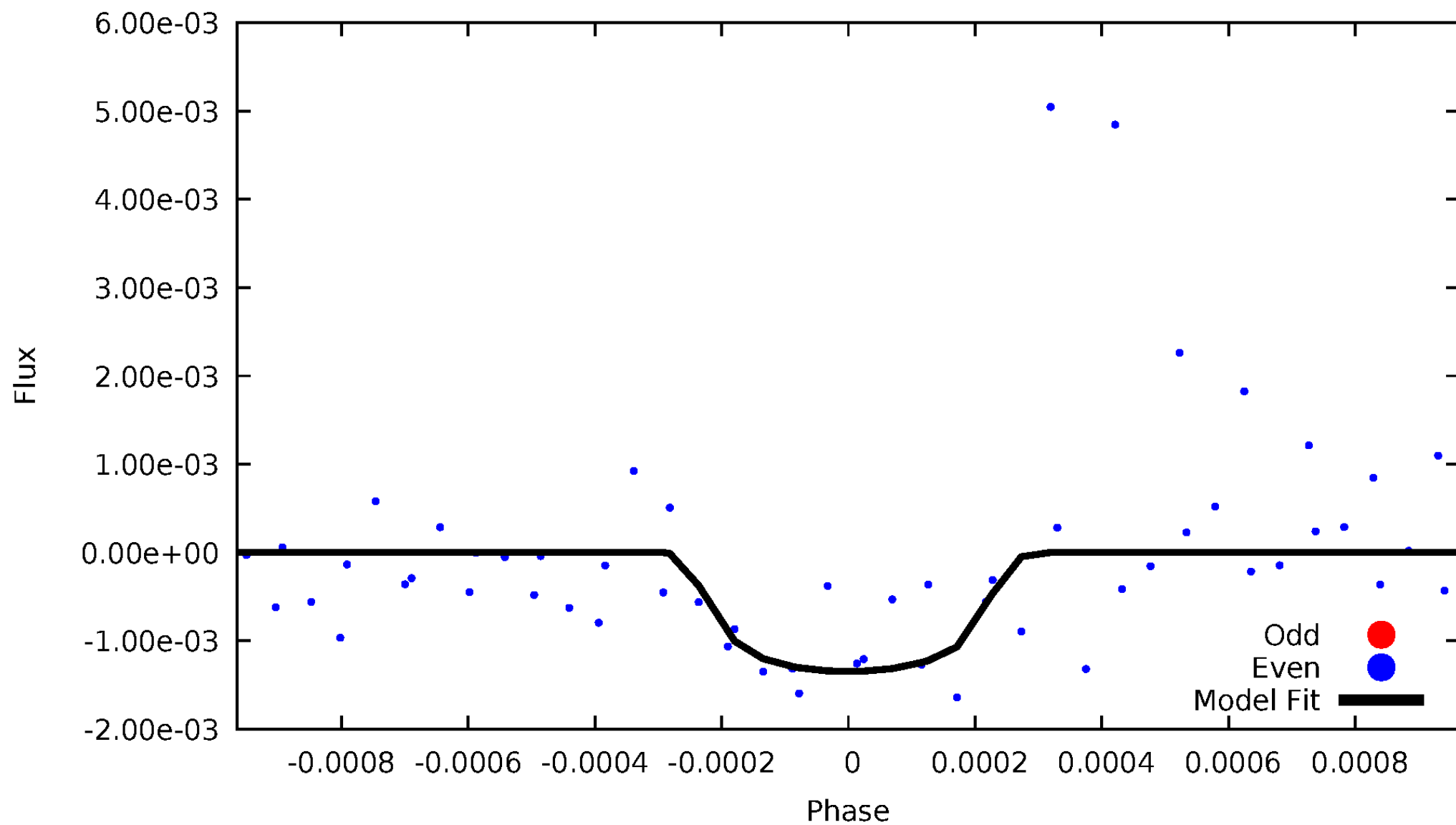


TCE 004991436-02



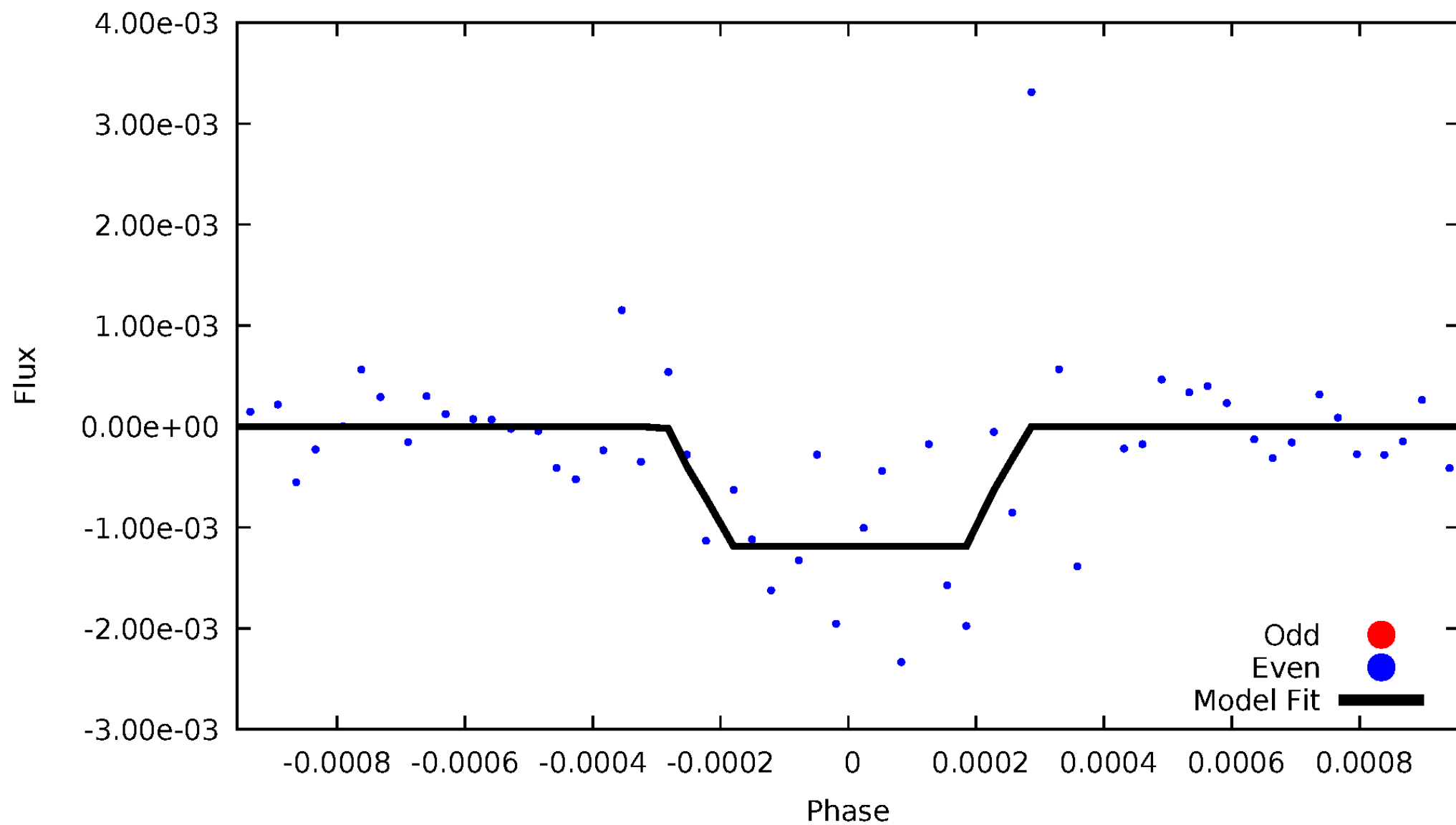
DV Odd/Even

TCE 004991436-02



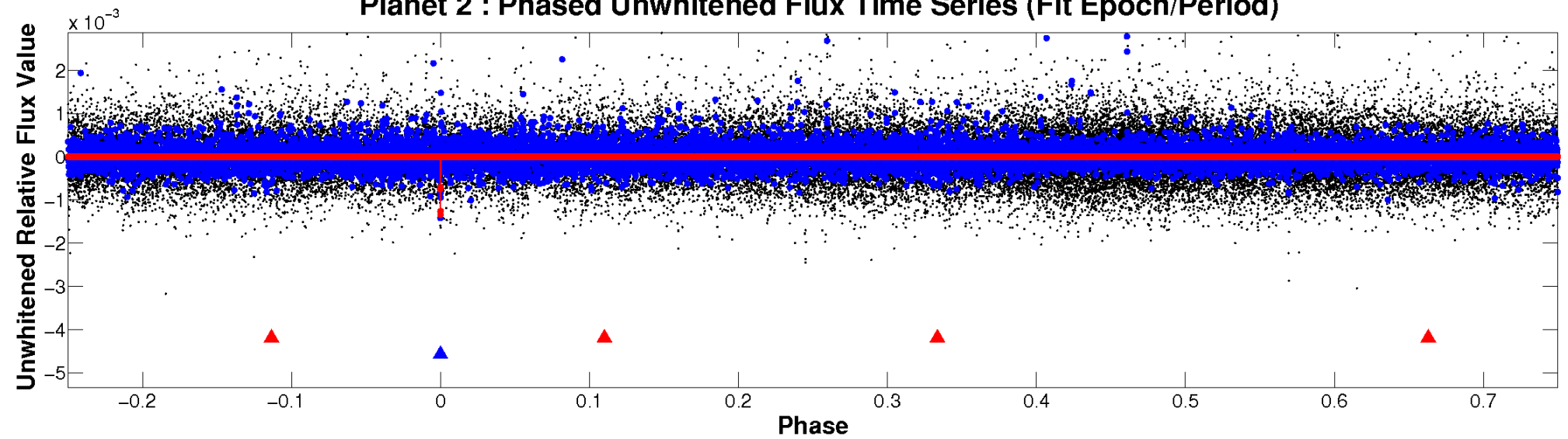
ALT Odd/Even

TCE 004991436-02

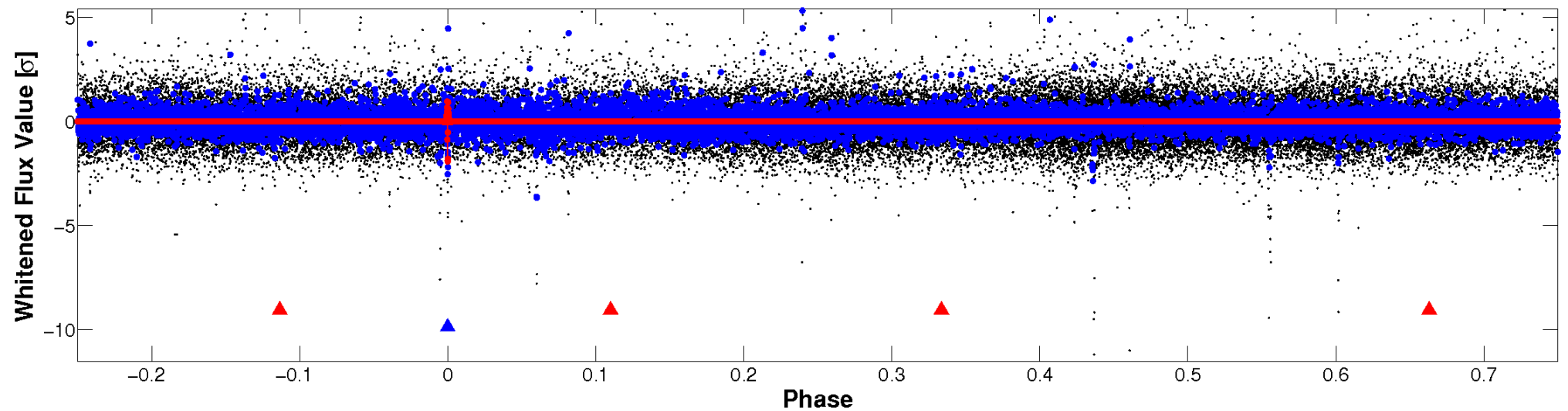


Non-Whitened Vs. Whitened Light Curve

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

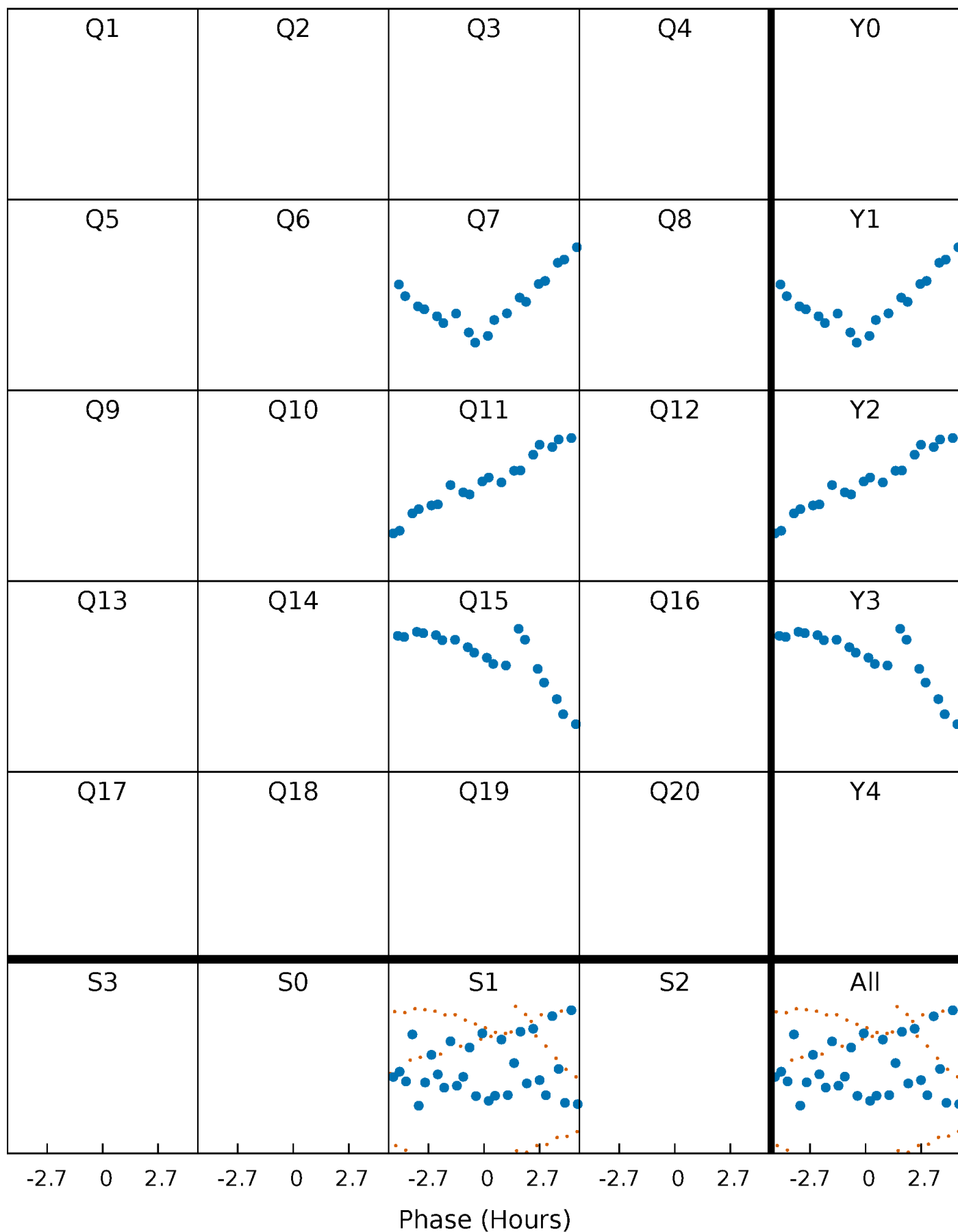


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



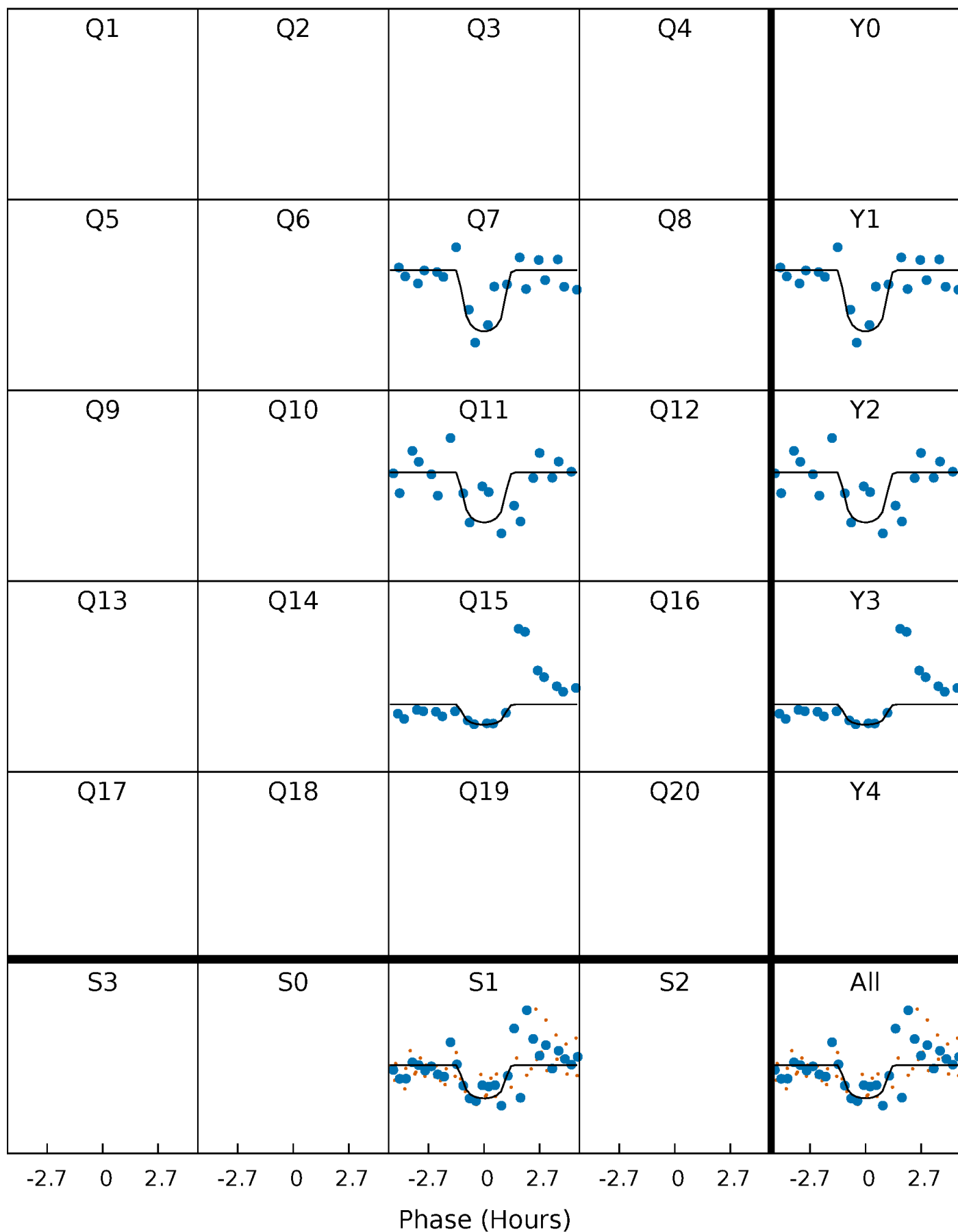
PDC Quarter-Phased Transit Curves

TCE 004991436-02 P=200.540359 Days $T_0=256.121816$ (BKJD)



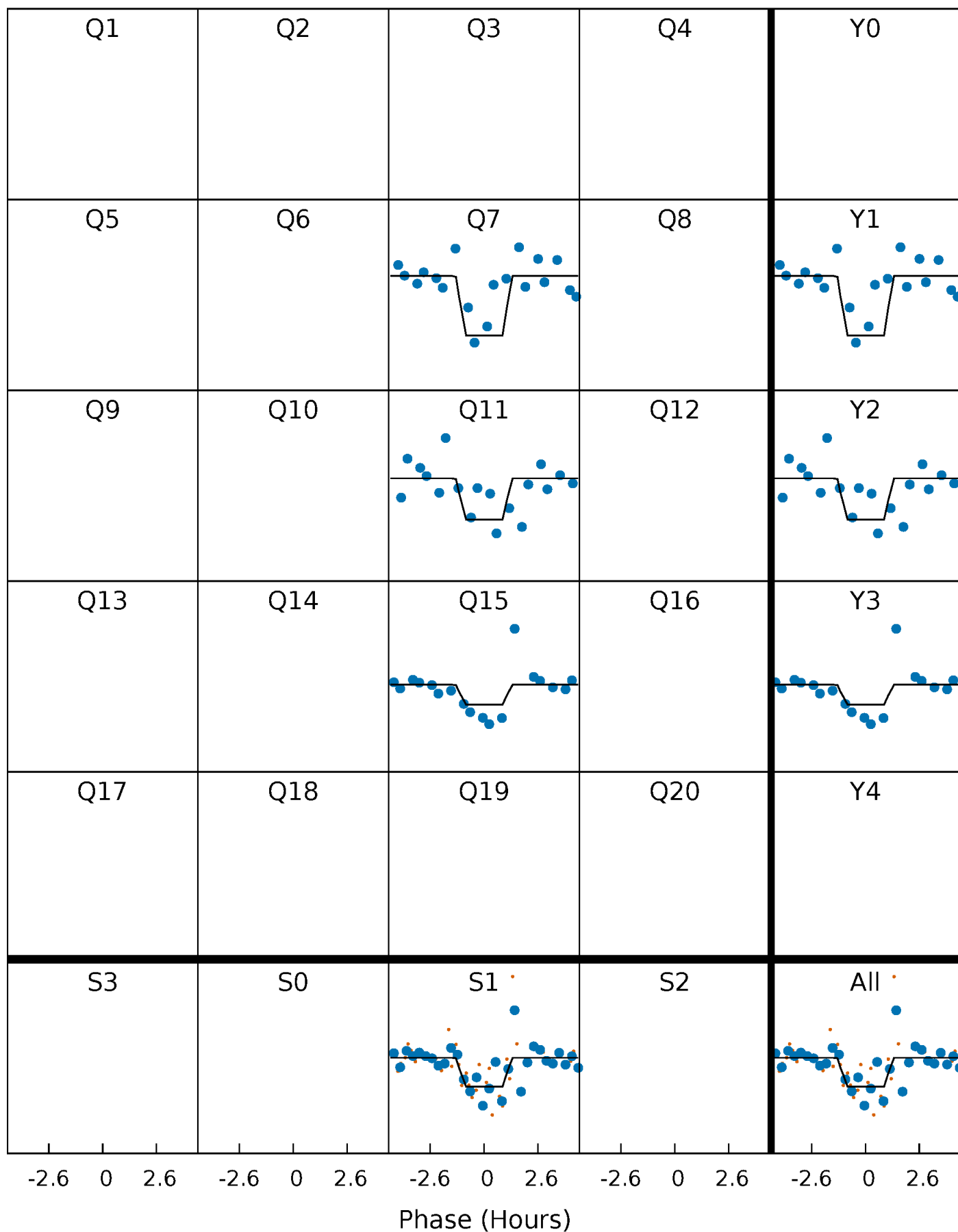
DV Quarter-Phased Transit Curves

TCE 004991436-02 $P=200.540359$ Days $T_0=256.121816$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

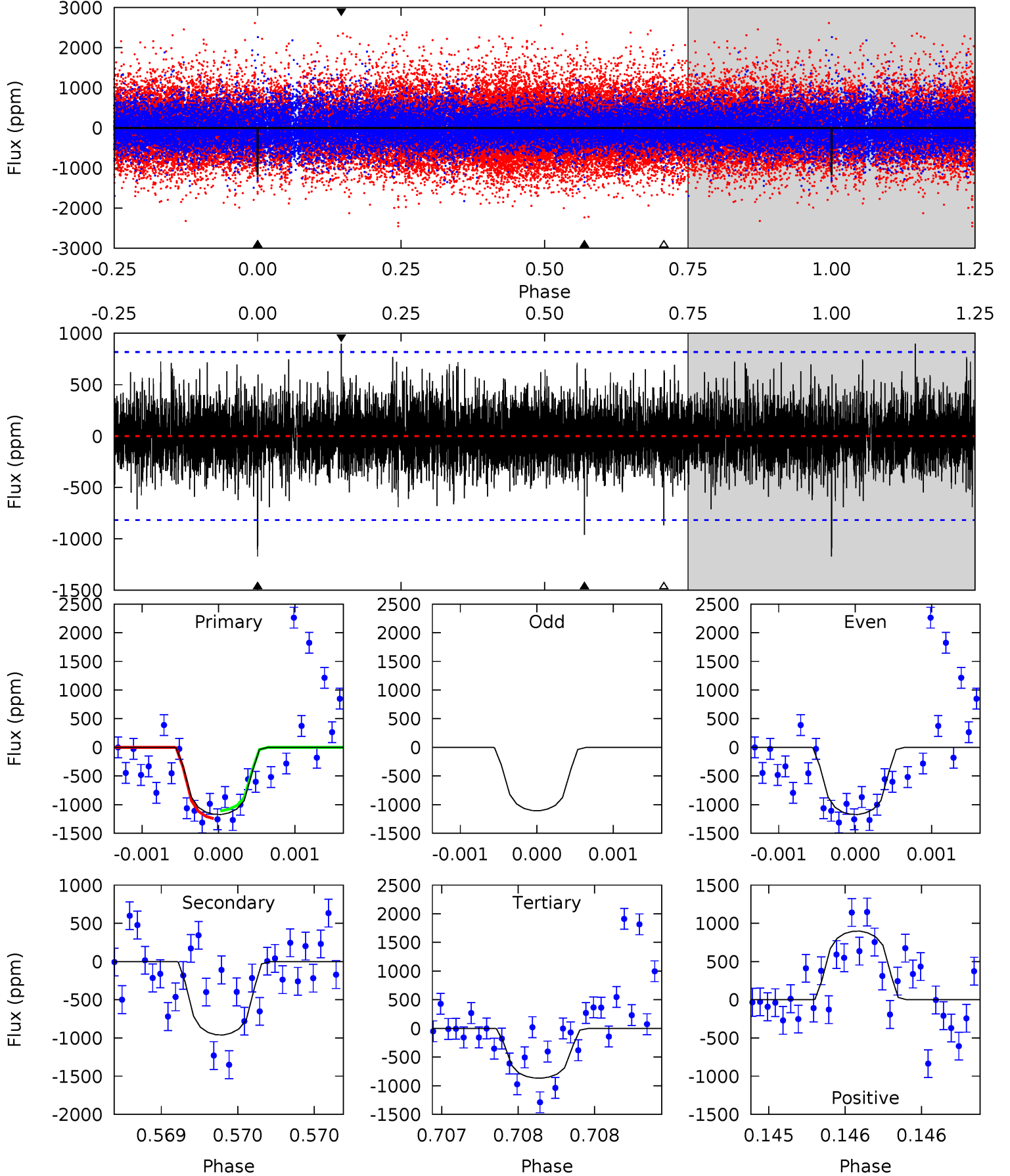
TCE 004991436-02 P=200.541992 Days $T_0=256.118558$ (BKJD)



DV Model-Shift Uniqueness Test

004991436-02, P = 200.540359 Days, E = 55.581457 Days

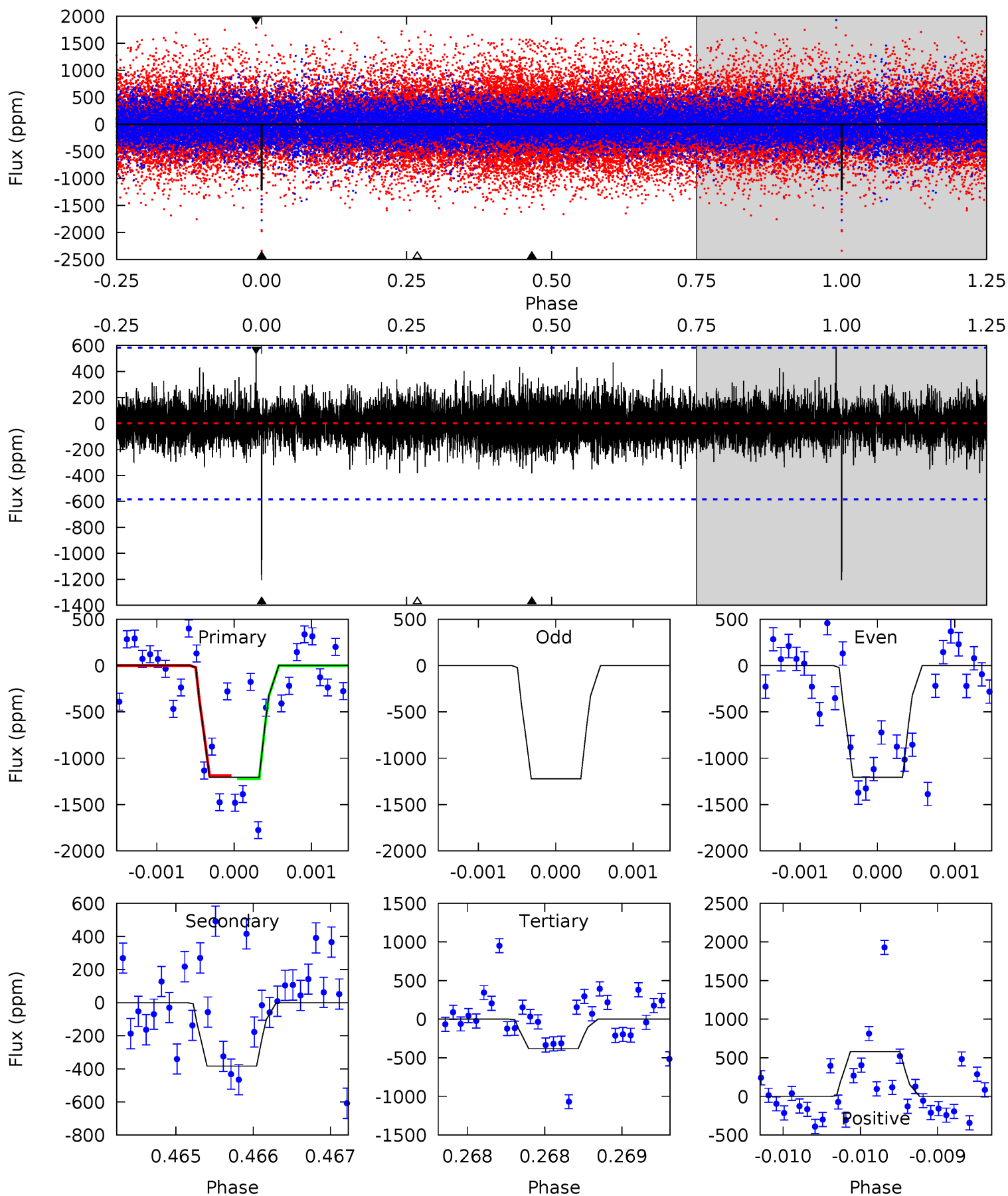
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.99	6.55	5.91	6.12	5.57	3.48	1.37	2.07	1.87	0.63	0.43	0.27	1.05	0.43	0.46



Alt Model-Shift Uniqueness Test

004991436-02, P = 200.541992 Days, E = 55.576566 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	3.64	3.62	5.51	5.55	3.45	0.98	7.84	5.95	0.02	-1.87	0.09	1.34	0.32	0.15



Stellar Parameters For KIC 004991436

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5257^{+141}_{-157}	$4.638^{+0.030}_{-0.090}$	$-0.400^{+0.300}_{-0.300}$	$0.696^{+0.095}_{-0.055}$	$0.776^{+0.075}_{-0.083}$	$3.238^{+0.510}_{-0.938}$
	+3%/-3%	+1%/-2%	+75%/-75%	+14%/-8%	+10%/-11%	+16%/-29%
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 004991436-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-961 ± 147	$5.78^{+5.55}_{-3.77}$	349^{+14}_{-11}	3764^{+1947}_{-705}	6052^{+43722}_{-4509}
Alt.	-383 ± 105	$5.42^{+6.28}_{-3.73}$	349^{+13}_{-13}	3281^{+1698}_{-631}	2533^{+24427}_{-1991}

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

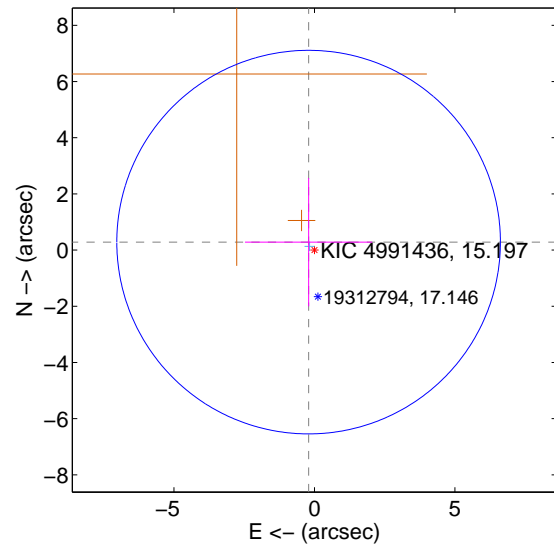
Supplemental centroid analysis for 004991436-02. Kepler magnitude: 15.20. Transit SNR 6.39

There are 1 quarters with good PRF difference image offsets

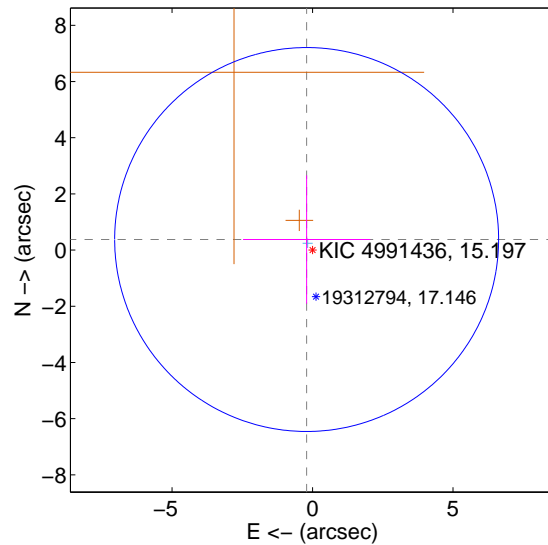
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.352 ± 2.275	0.15	0.208 ± 2.263	0.284 ± 2.282
PRF-fit source offset from KIC position	0.431 ± 2.277	0.19	0.209 ± 2.263	0.376 ± 2.282
photometric centroid source offset	2.02 ± 1.48	1.36	2.00 ± 1.46	0.30 ± 2.13

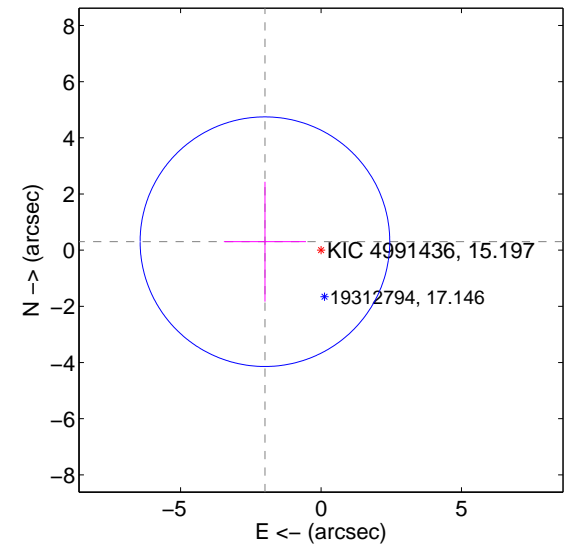
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

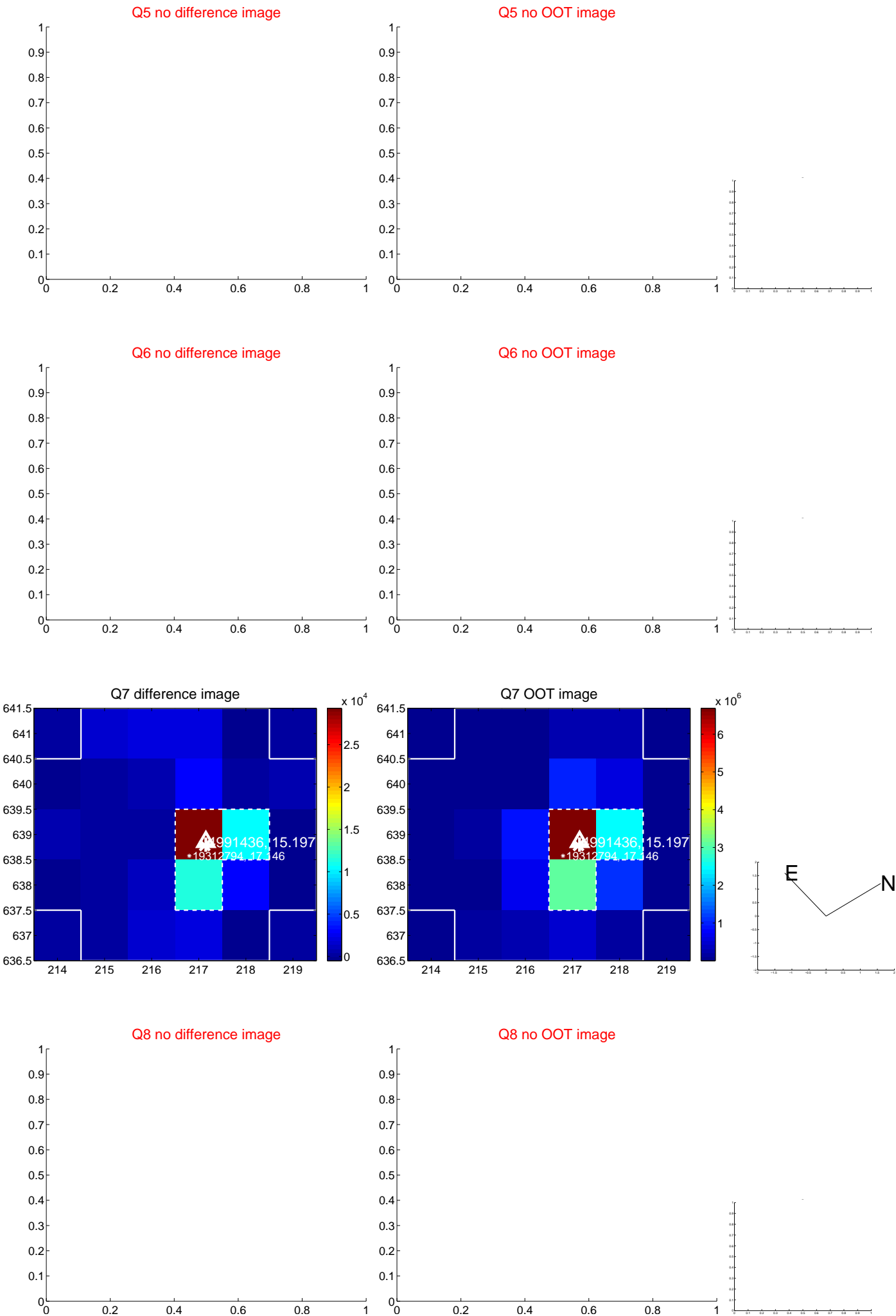


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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



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



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

Q9 no difference image



Q9 no OOT image



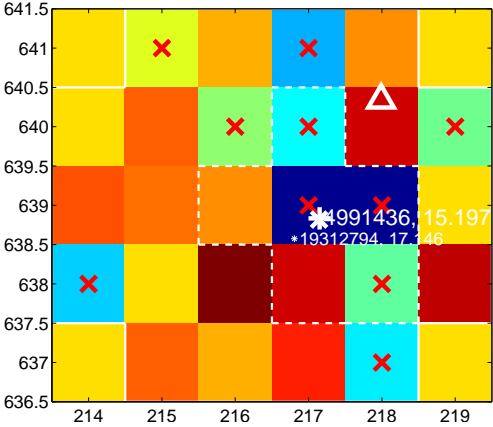
Q10 no difference image



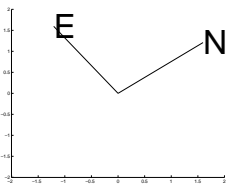
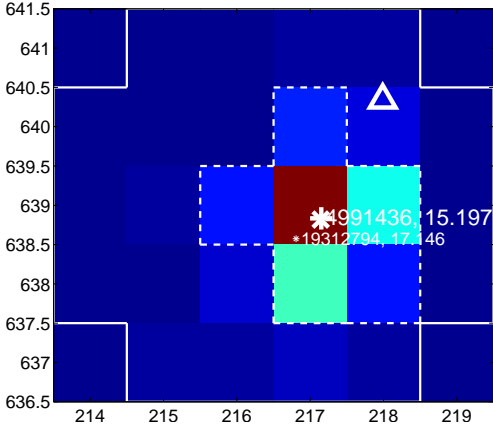
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



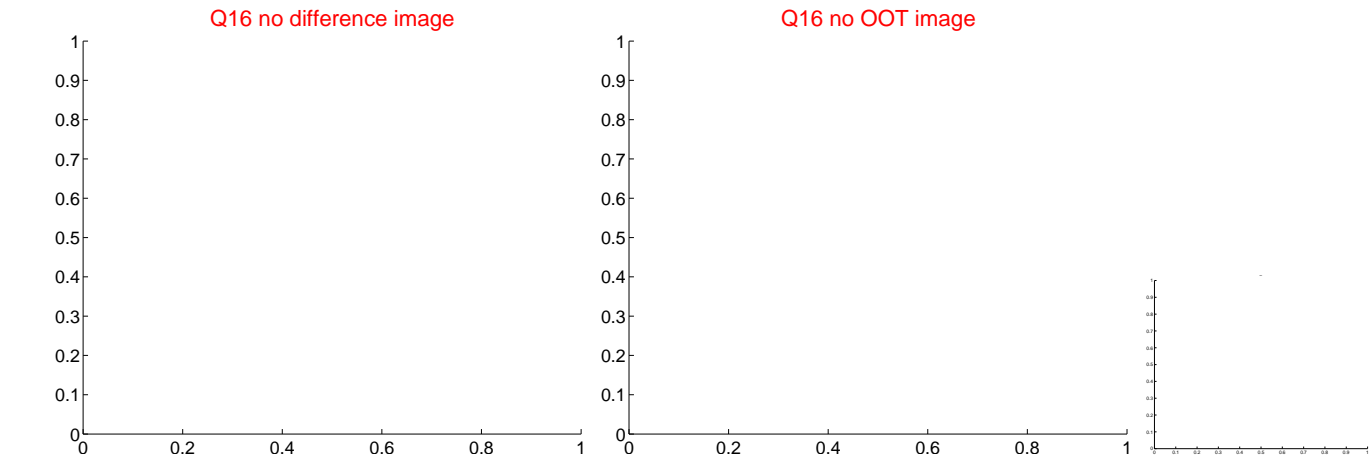
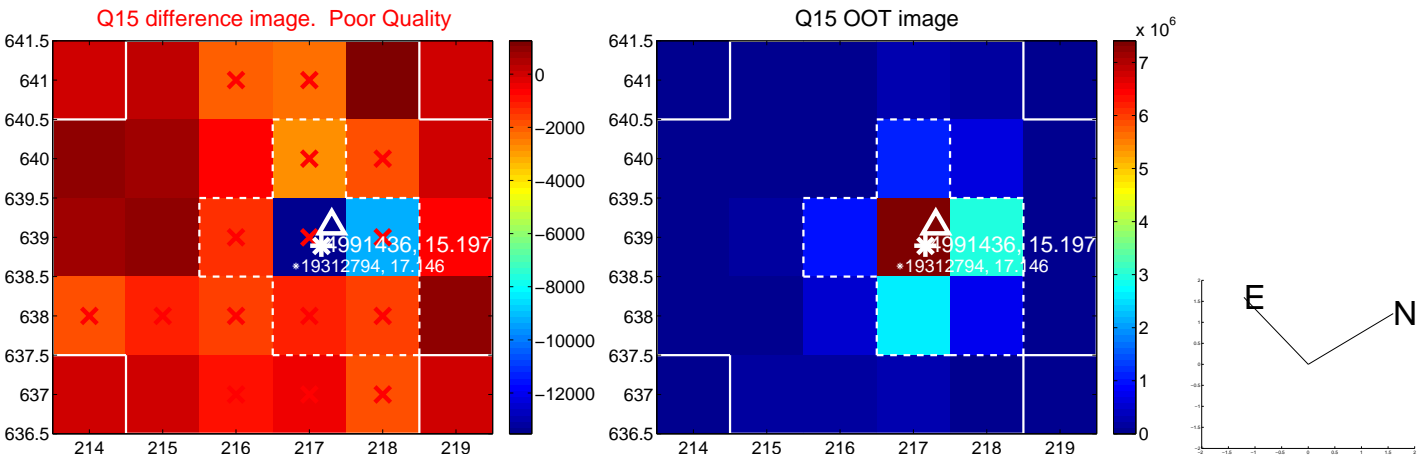
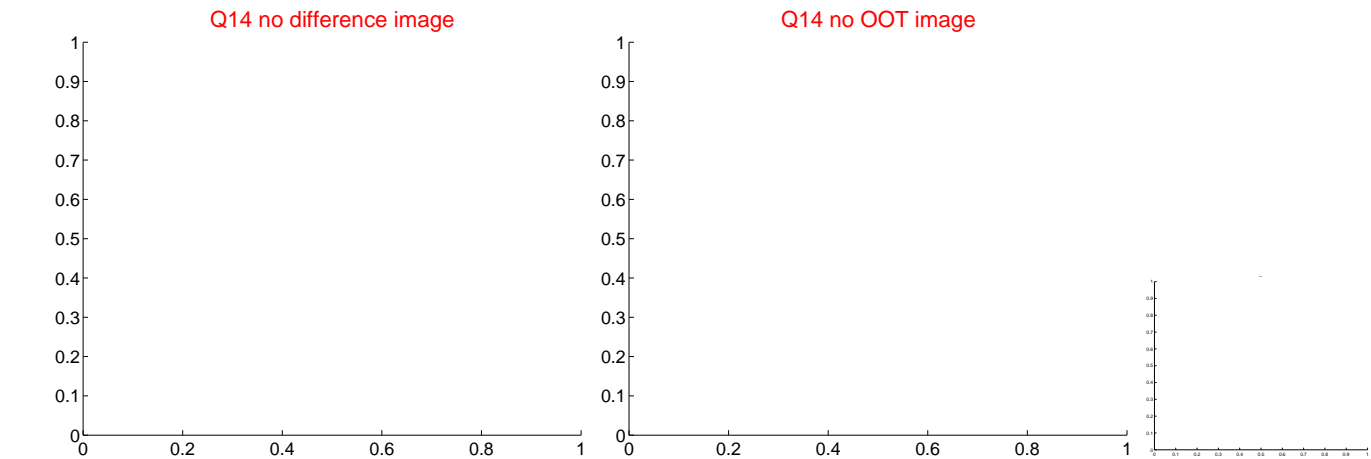
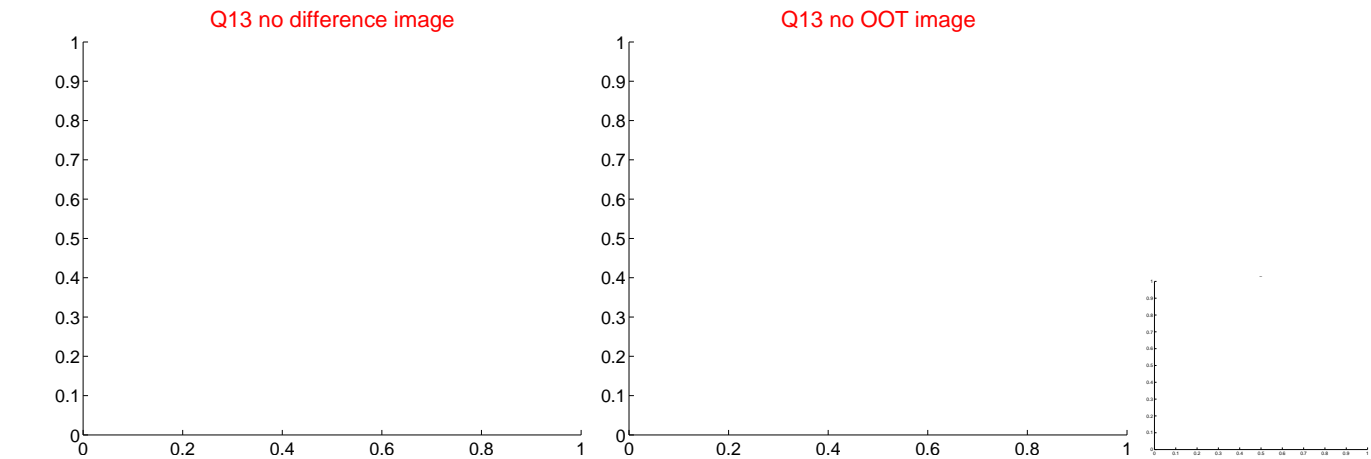
Q12 no difference image



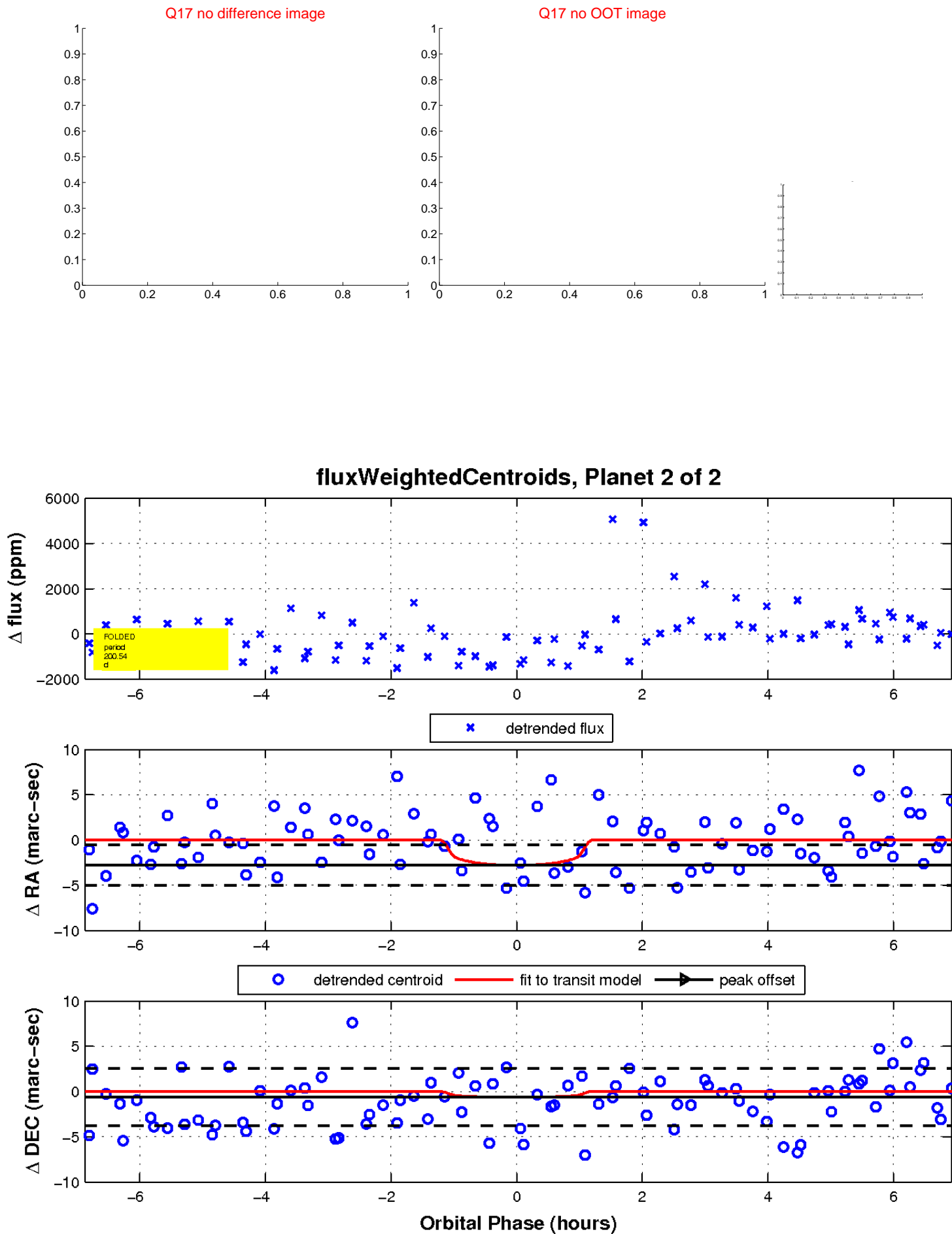
Q12 no OOT image



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



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



UKIRT Image

Declination

