

KIC 009897464

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})
009897464-01	OBS	No	639.260434	255.018020	1259.2	12.290	14.3	5.6	0.94	5771	3.41	0.46
009897464-02	OBS	No	448.522569	405.726830	1530.0	5.415	12.0	8.4	0.94	5771	3.69	0.73
009897464-03	OBS	No	480.757165	235.563006	1213.3	3.650	11.4	7.0	0.94	5771	3.35	0.67
009897464-04	OBS	No	376.748350	300.934472	729.7	3.243	11.5	5.4	0.94	5771	3.21	0.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009897464-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009897464-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
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009897464-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

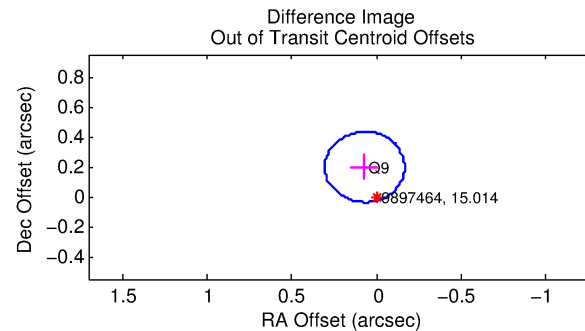
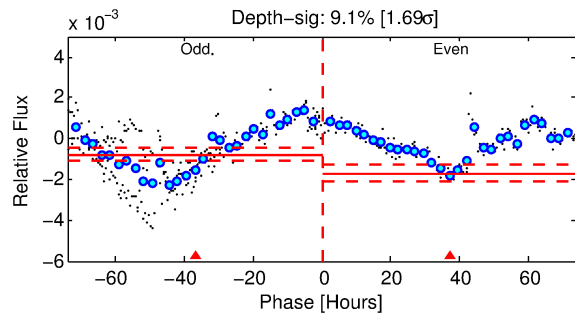
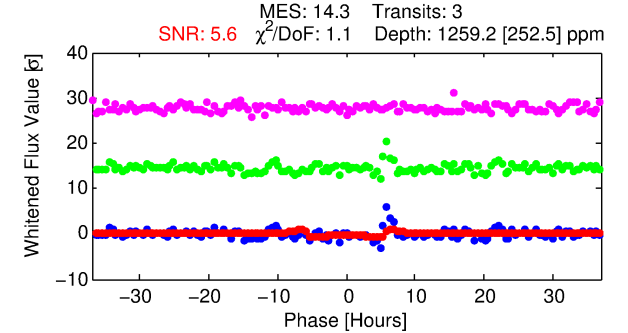
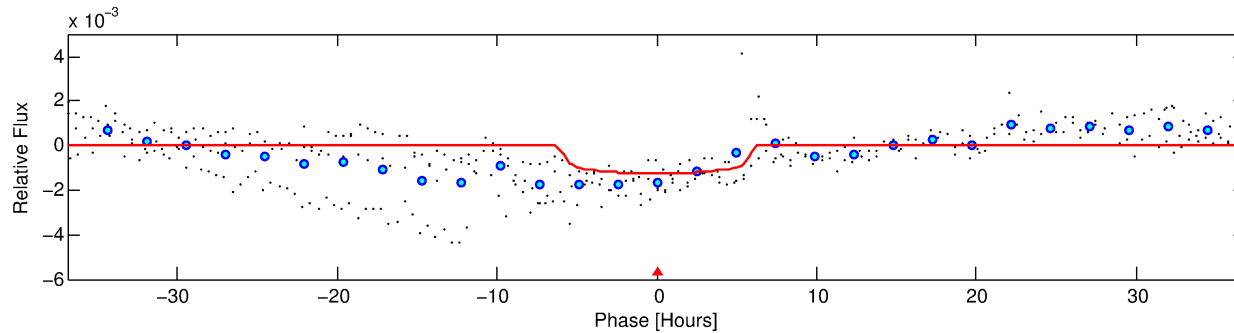
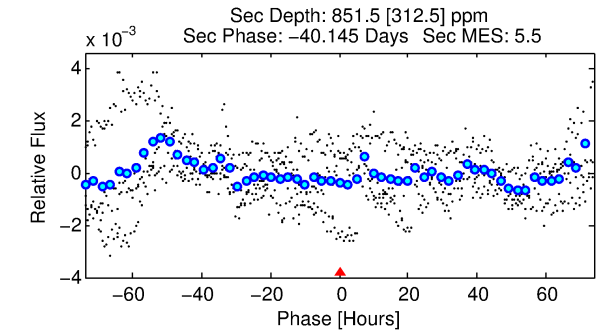
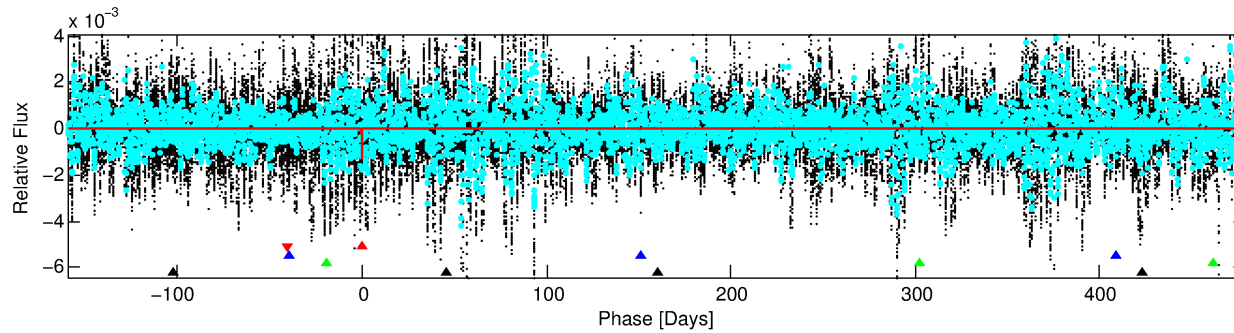
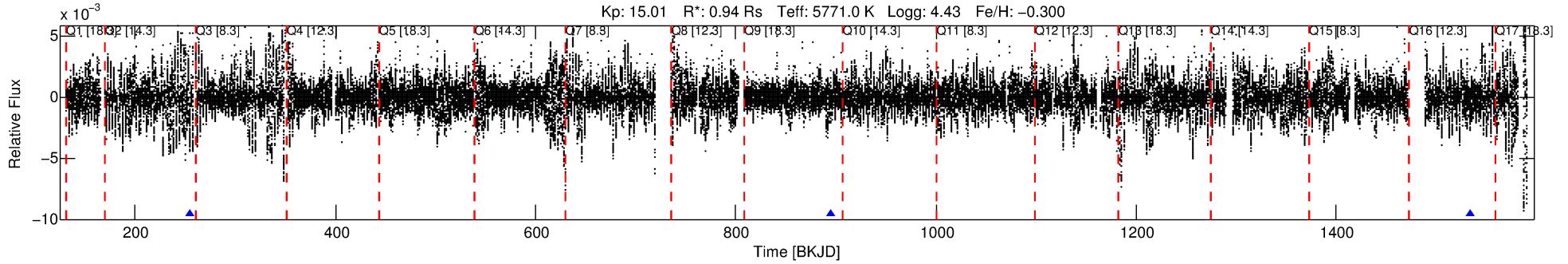
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009897464-01

No Significant Match Found

DV One-Page Summary

KIC: 9897464 Candidate: 1 of 4 Period: 639.260 d



DV Fit Results:

Period = 639.26043 [0.00942] d
Epoch = 255.0180 [0.0114] BKJD
Rp/R* = 0.0333 [0.0190]
a/R* = 358.48 [891.01]
b = 0.50 [3.72]
Seff = 0.46 [0.16]
Teq = 210 [19] K
Rp = 3.41 [2.15] Re
a = 1.3823 [0.3149] AU
Ag = 76925.14 [95833.33] [0.80] σ
Teffp = 5400 [1627] K [3.19] σ

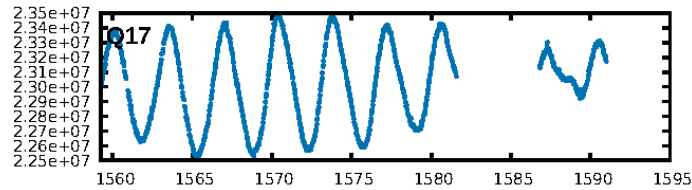
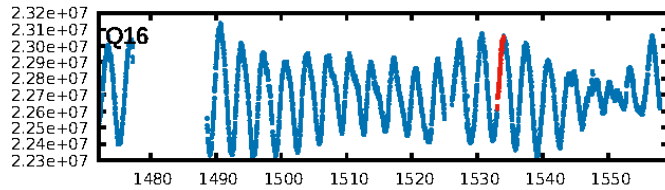
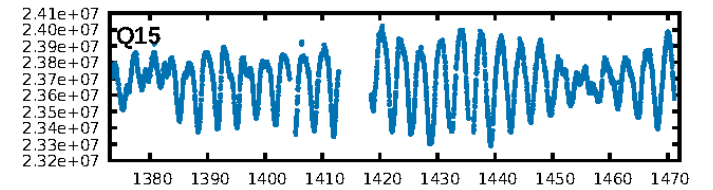
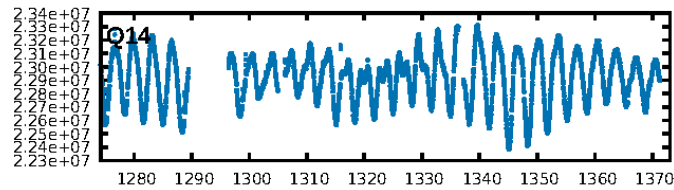
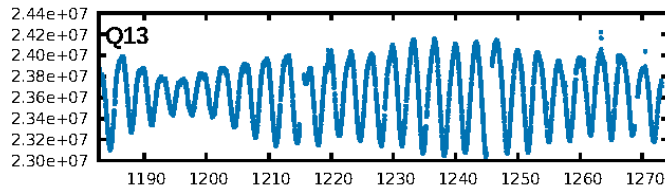
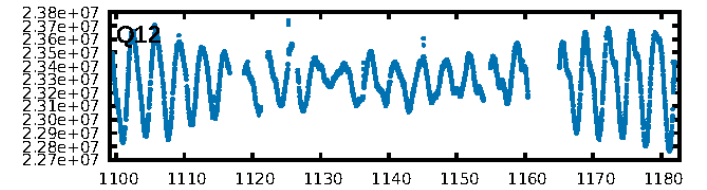
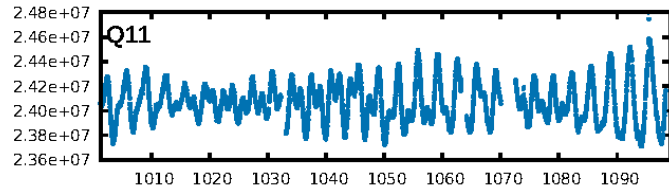
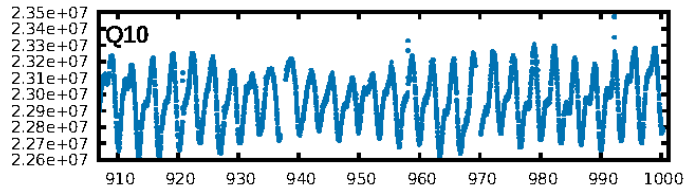
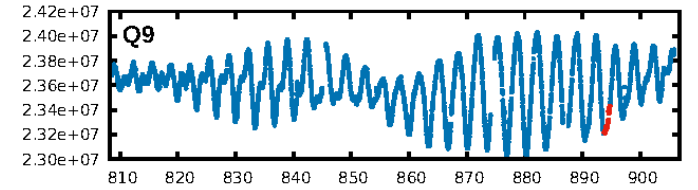
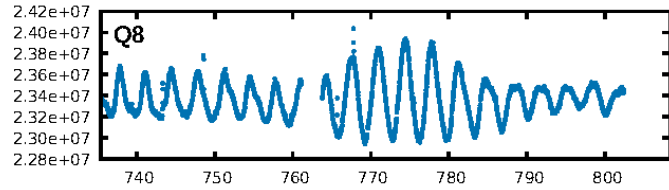
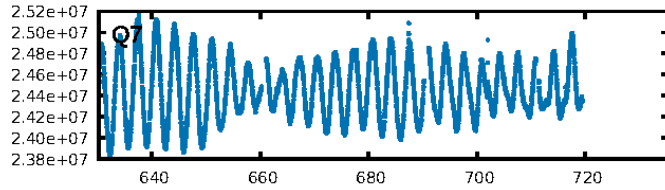
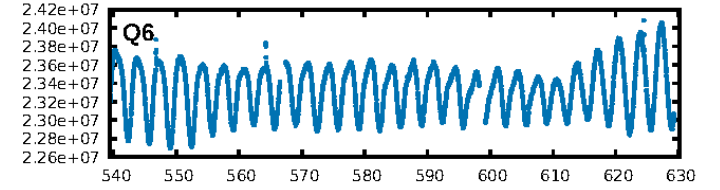
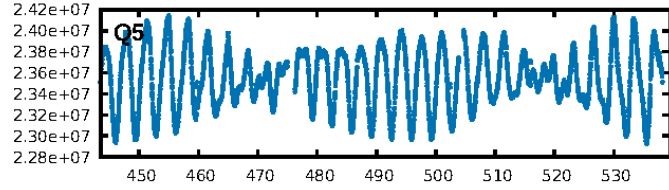
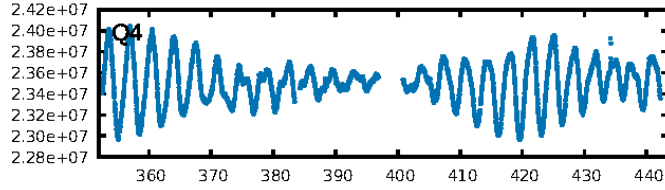
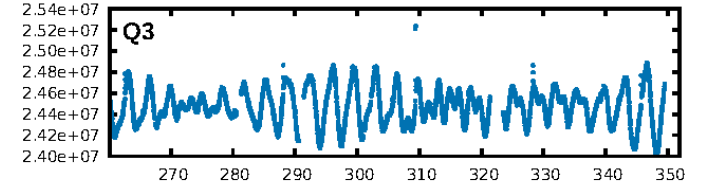
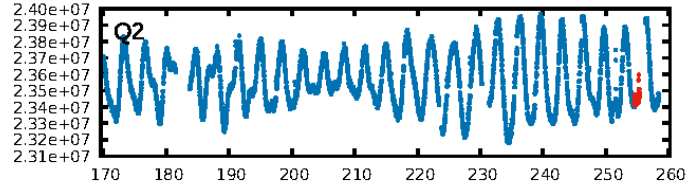
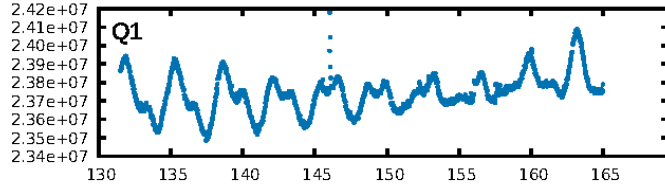
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [296.71 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 13.3%
ModelChiSquareGof-sig: 97.2%
Bootstrap-pfa: 1.67e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5009
Centroid-sig: 13.6%
Centroid-so: 0.535 arcsec [1.12 σ]
OotOffset-rm: 0.209 arcsec [2.67 σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-rm: 0.227 arcsec [2.89 σ]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [1/1]

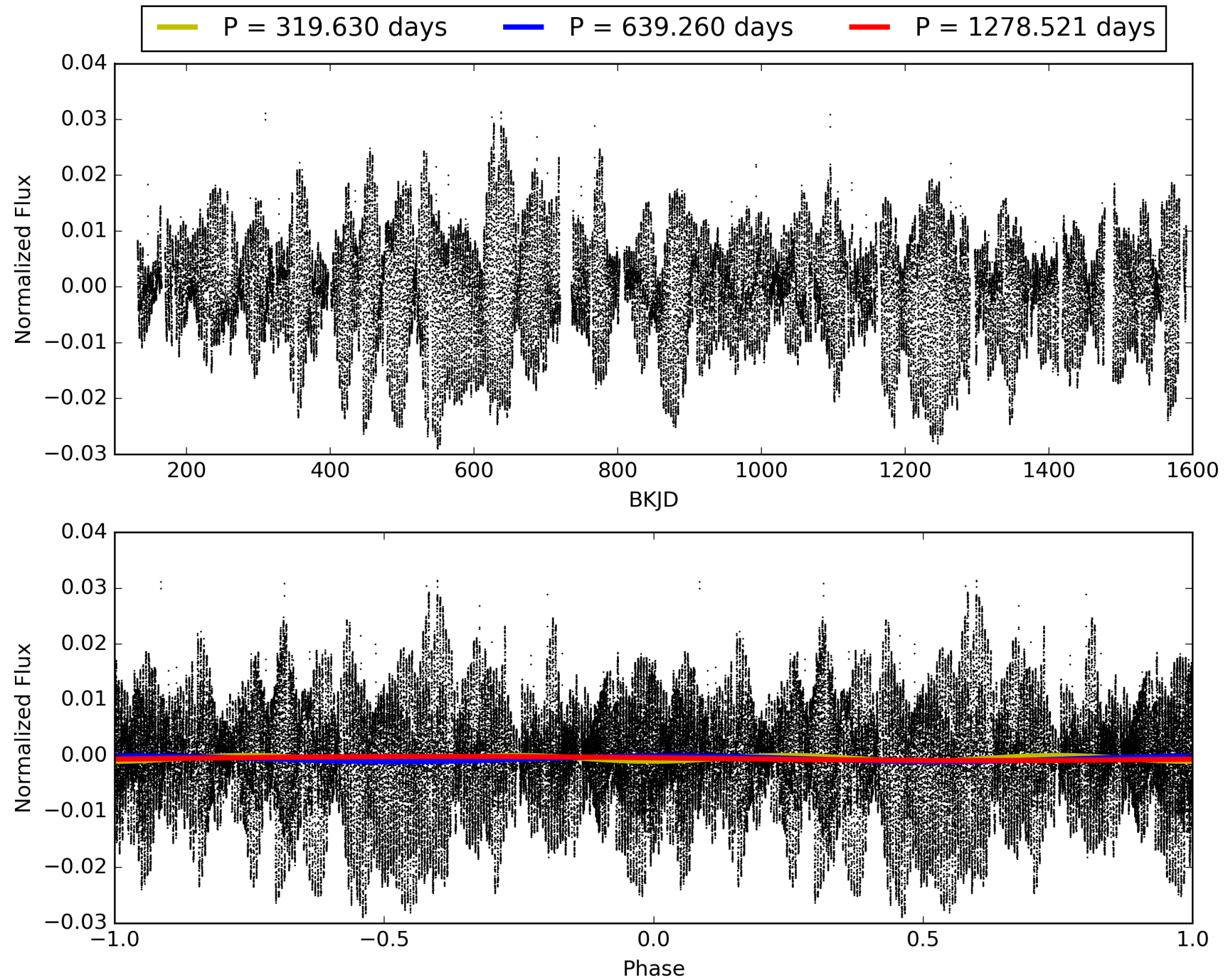
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009897464-01, PDC Light Curves

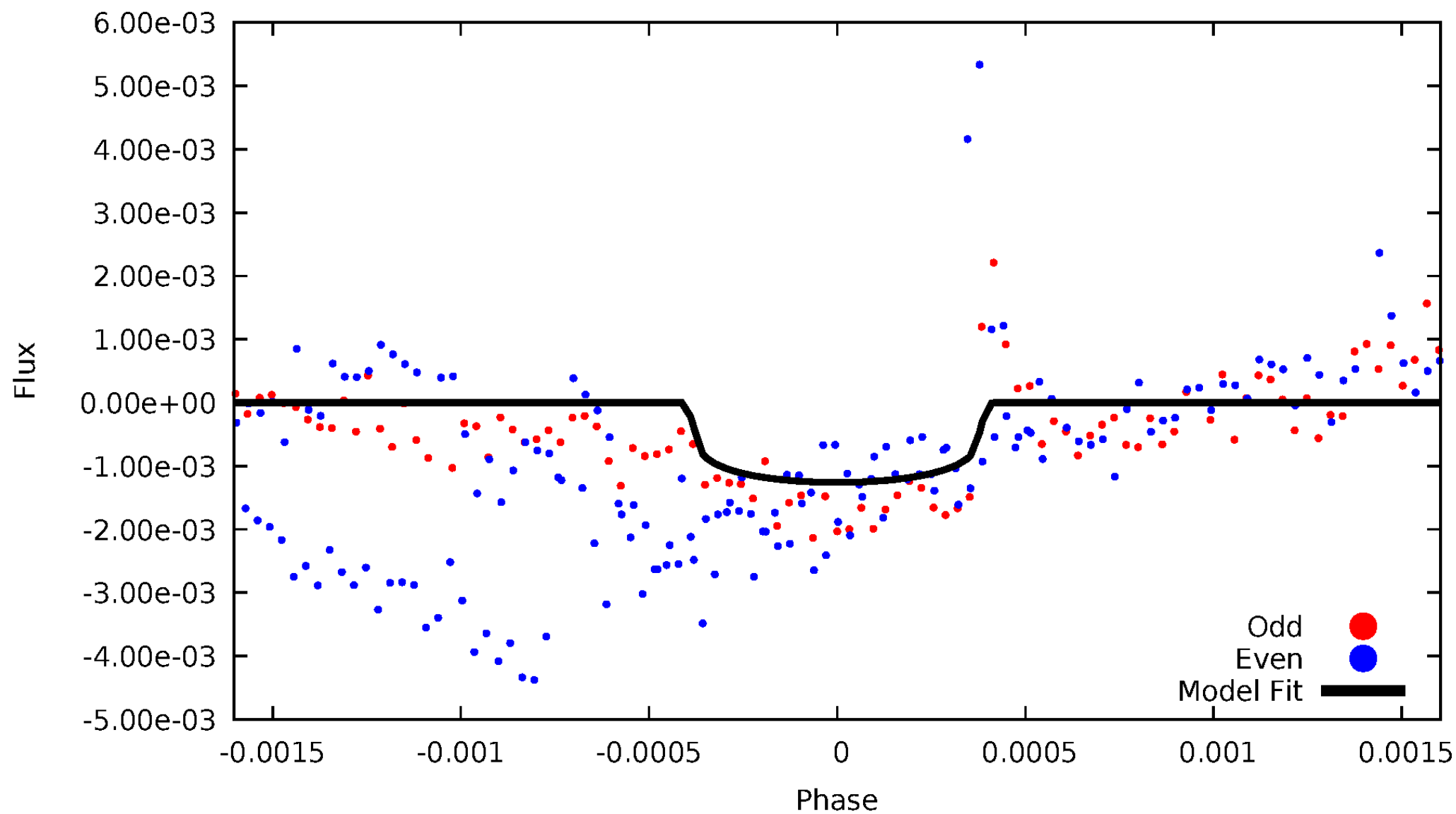


TCE 009897464-01



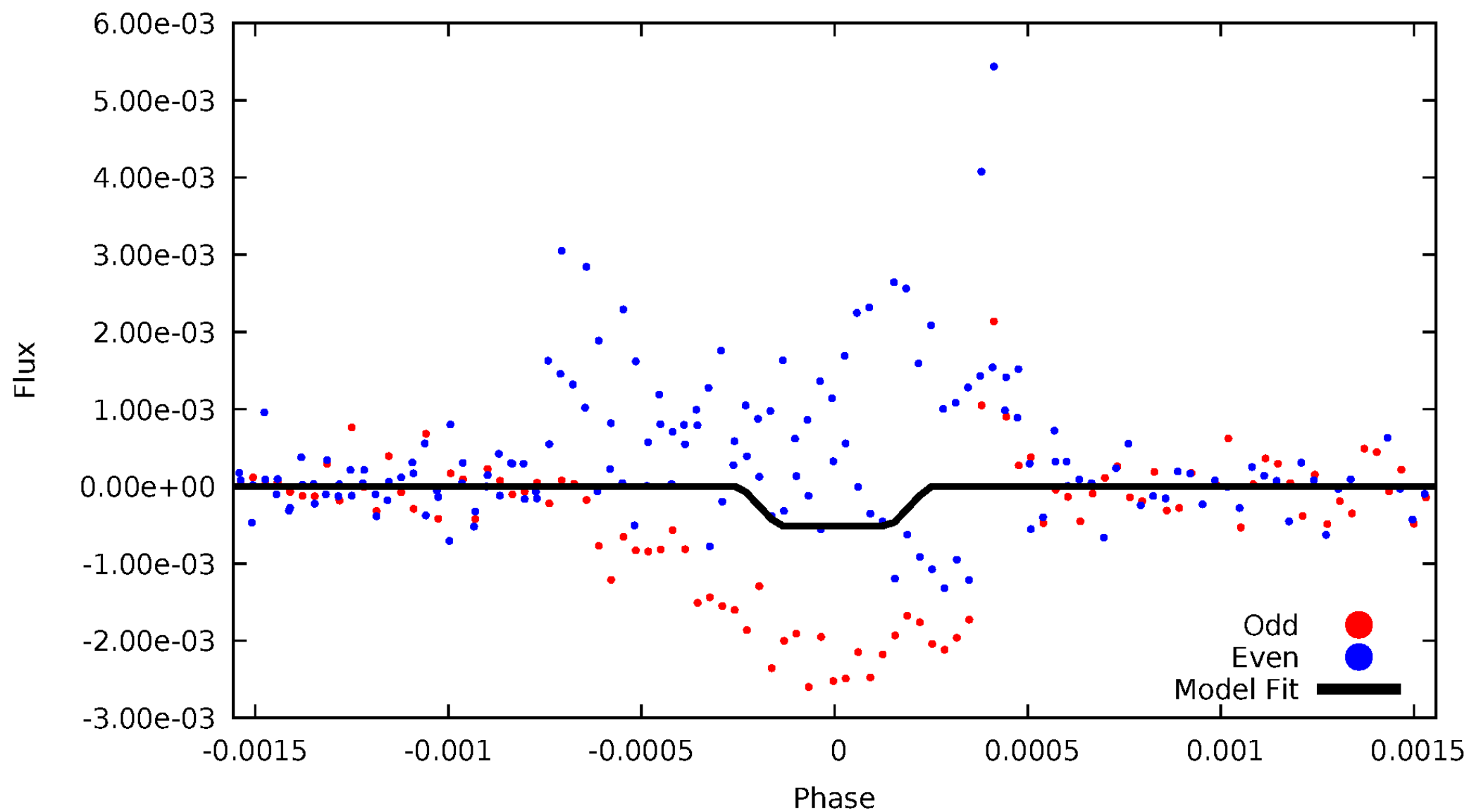
DV Odd/Even

TCE 009897464-01



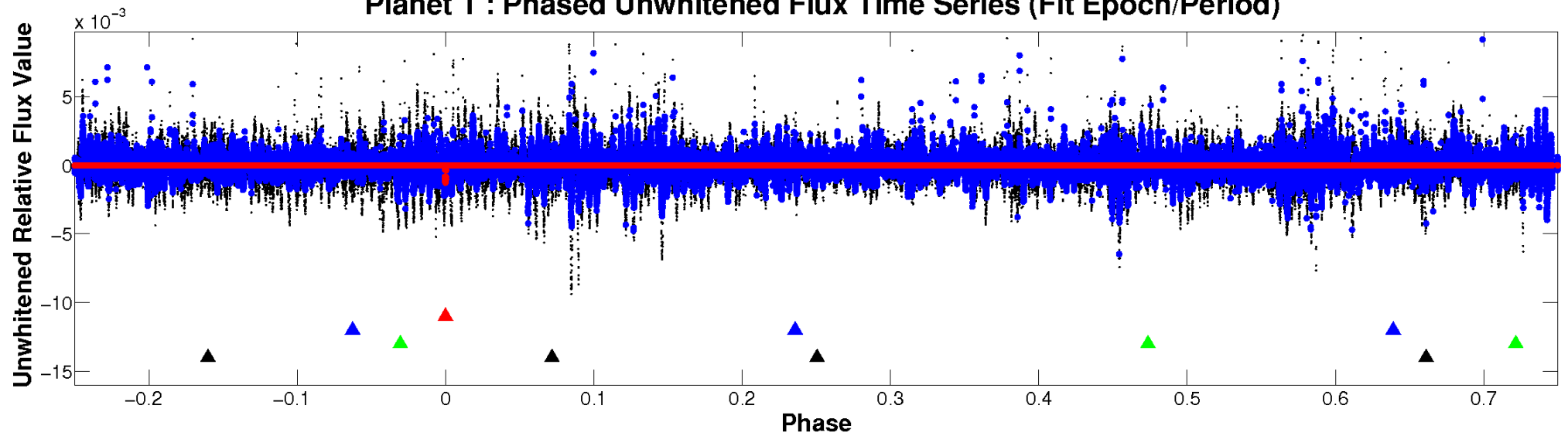
ALT Odd/Even

TCE 009897464-01

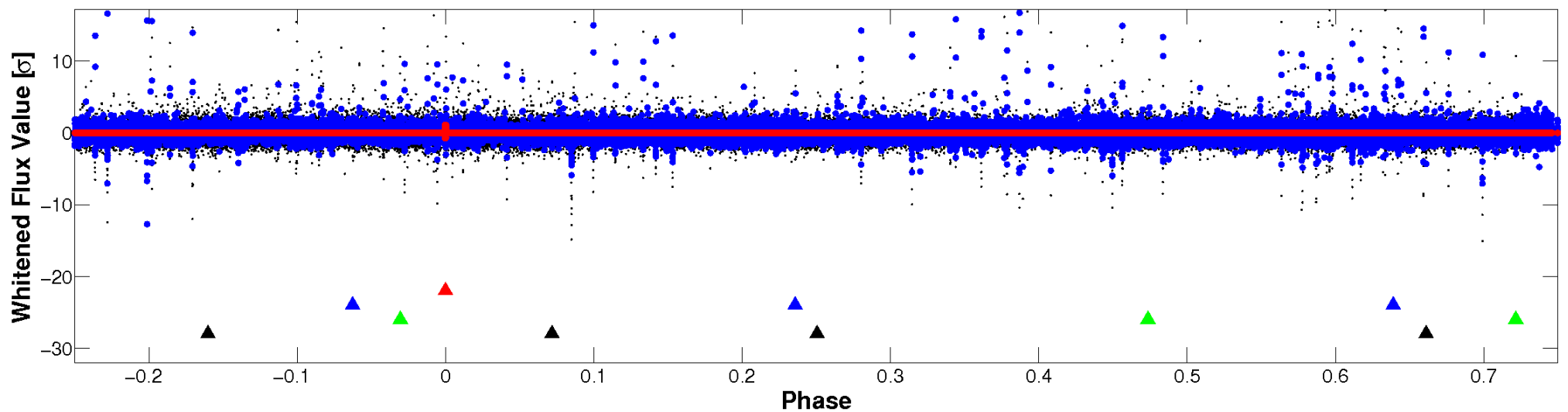


Non-Whitened Vs. Whitened Light Curve

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

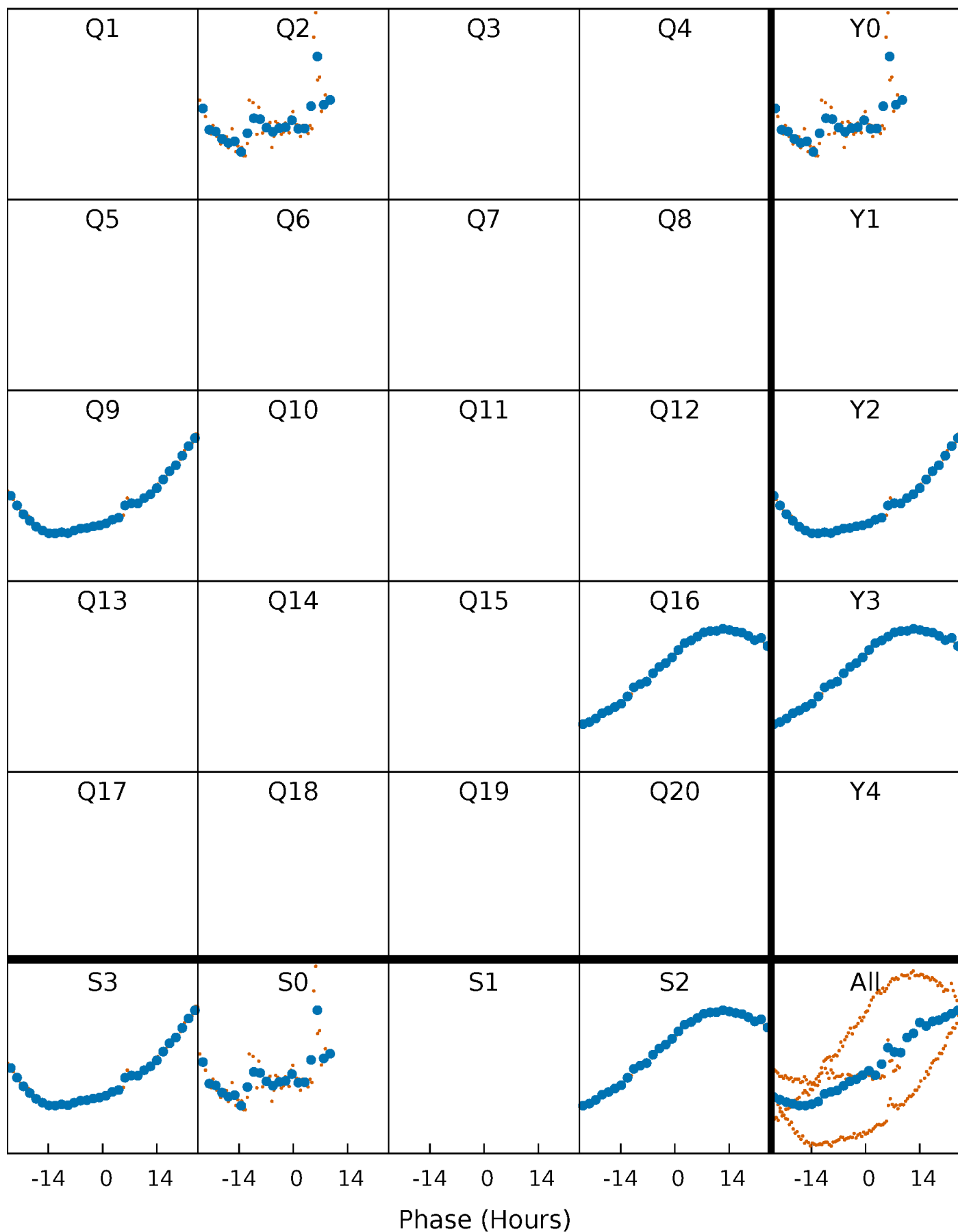


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



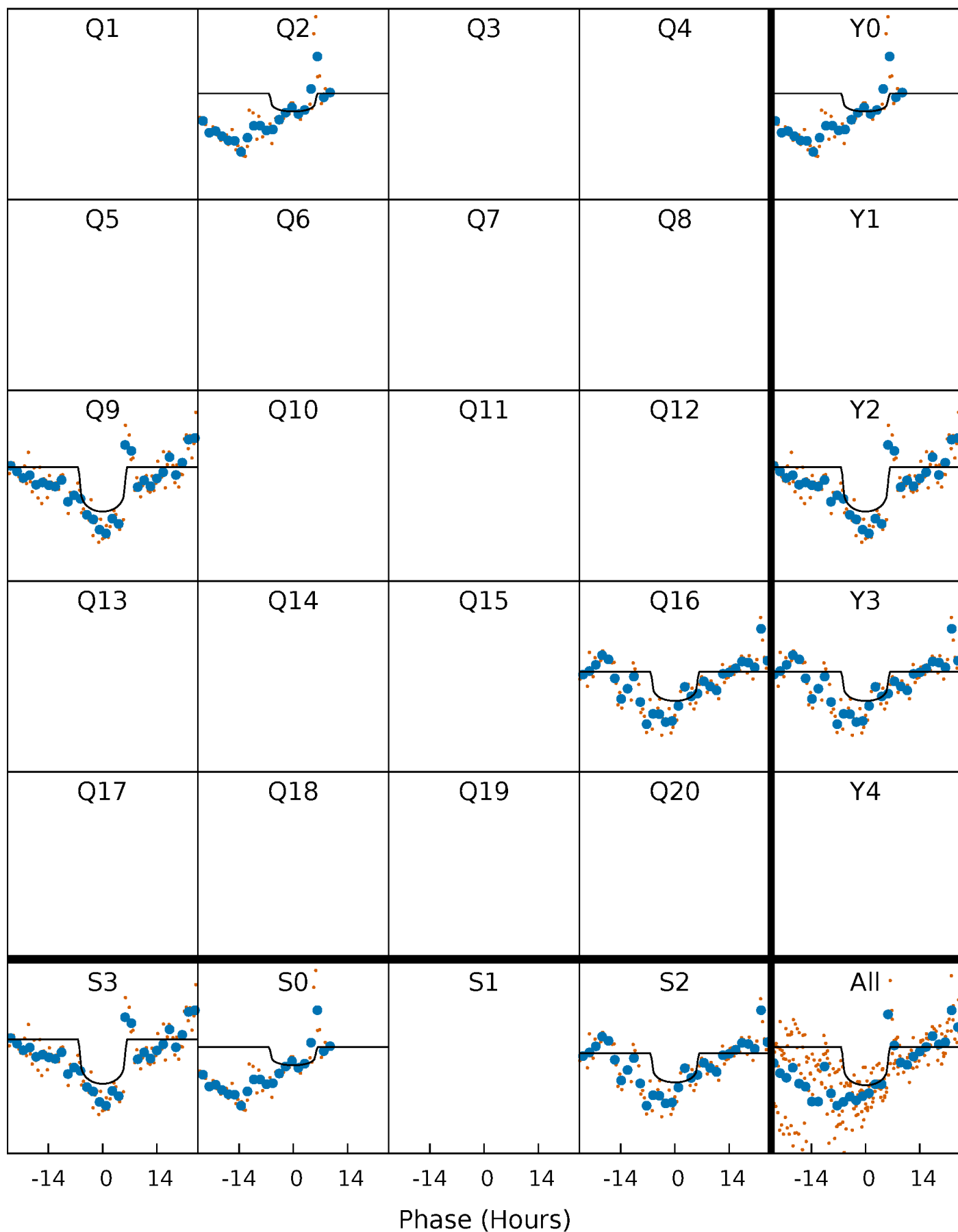
PDC Quarter-Phased Transit Curves

TCE 009897464-01 P=639.260434 Days $T_0=255.018020$ (BKJD)



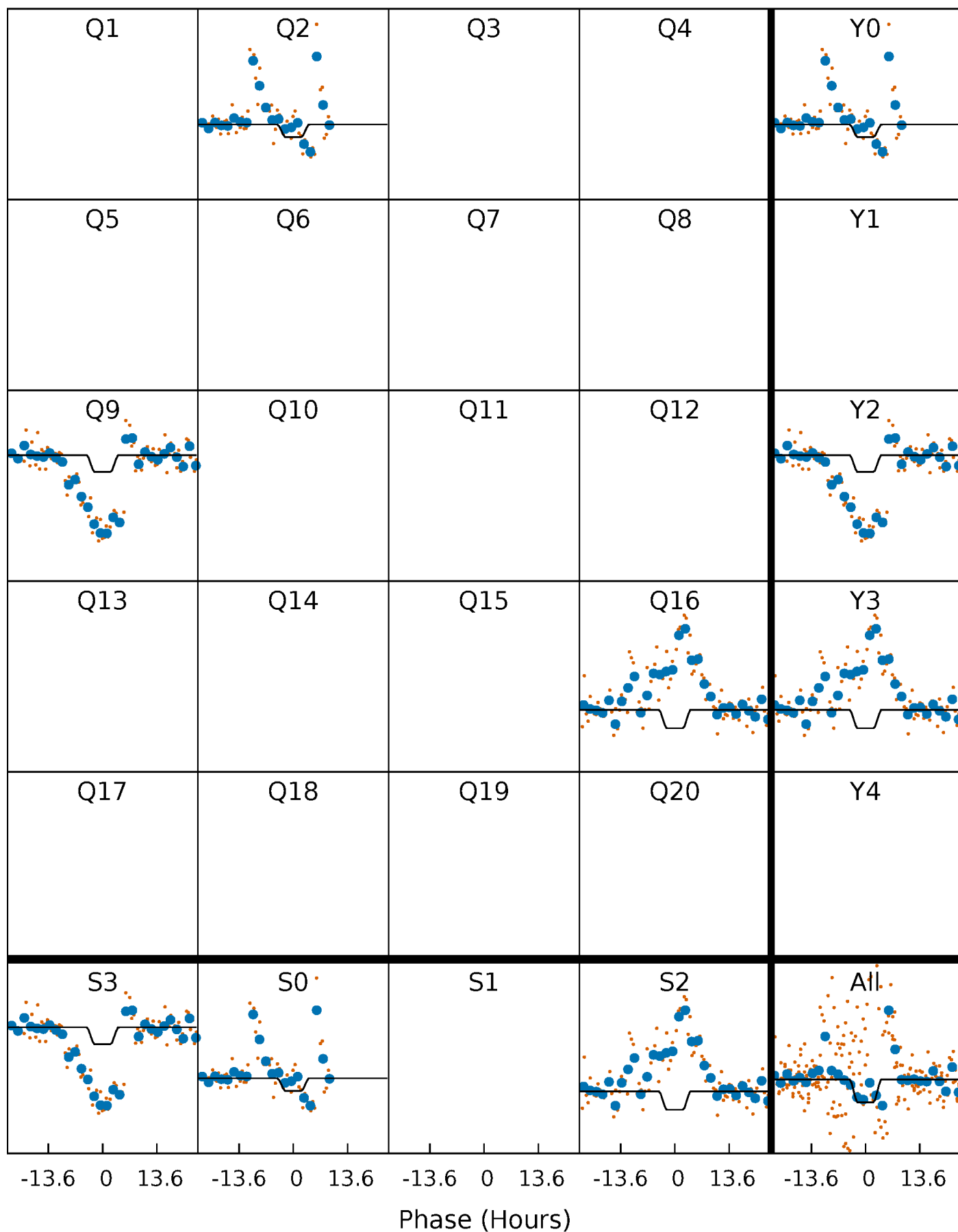
DV Quarter-Phased Transit Curves

TCE 009897464-01 P=639.260434 Days $T_0=255.018020$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

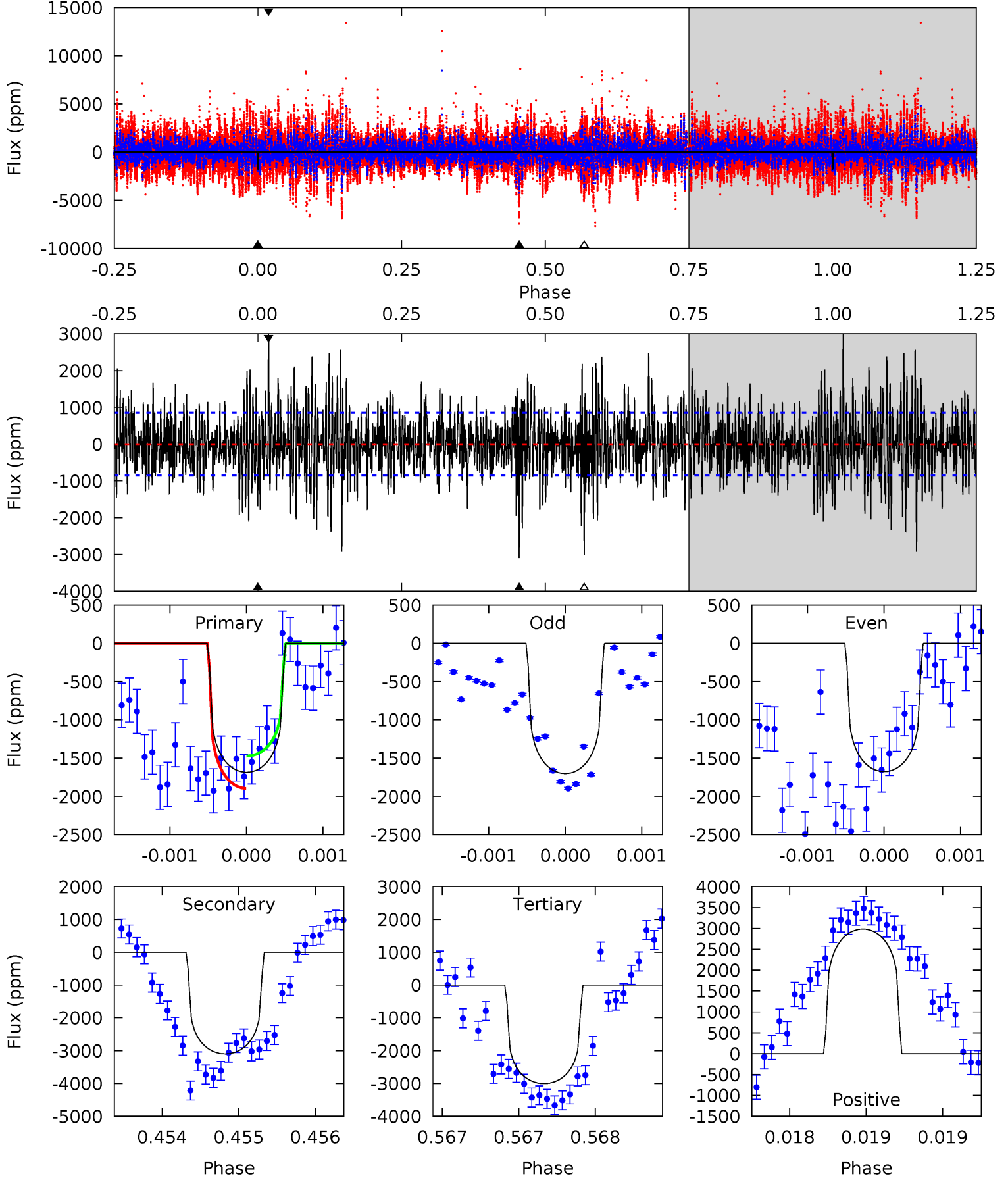
TCE 009897464-01 P=639.284358 Days $T_0=254.996159$ (BKJD)



DV Model-Shift Uniqueness Test

009897464-01, P = 639.260434 Days, E = 255.018020 Days

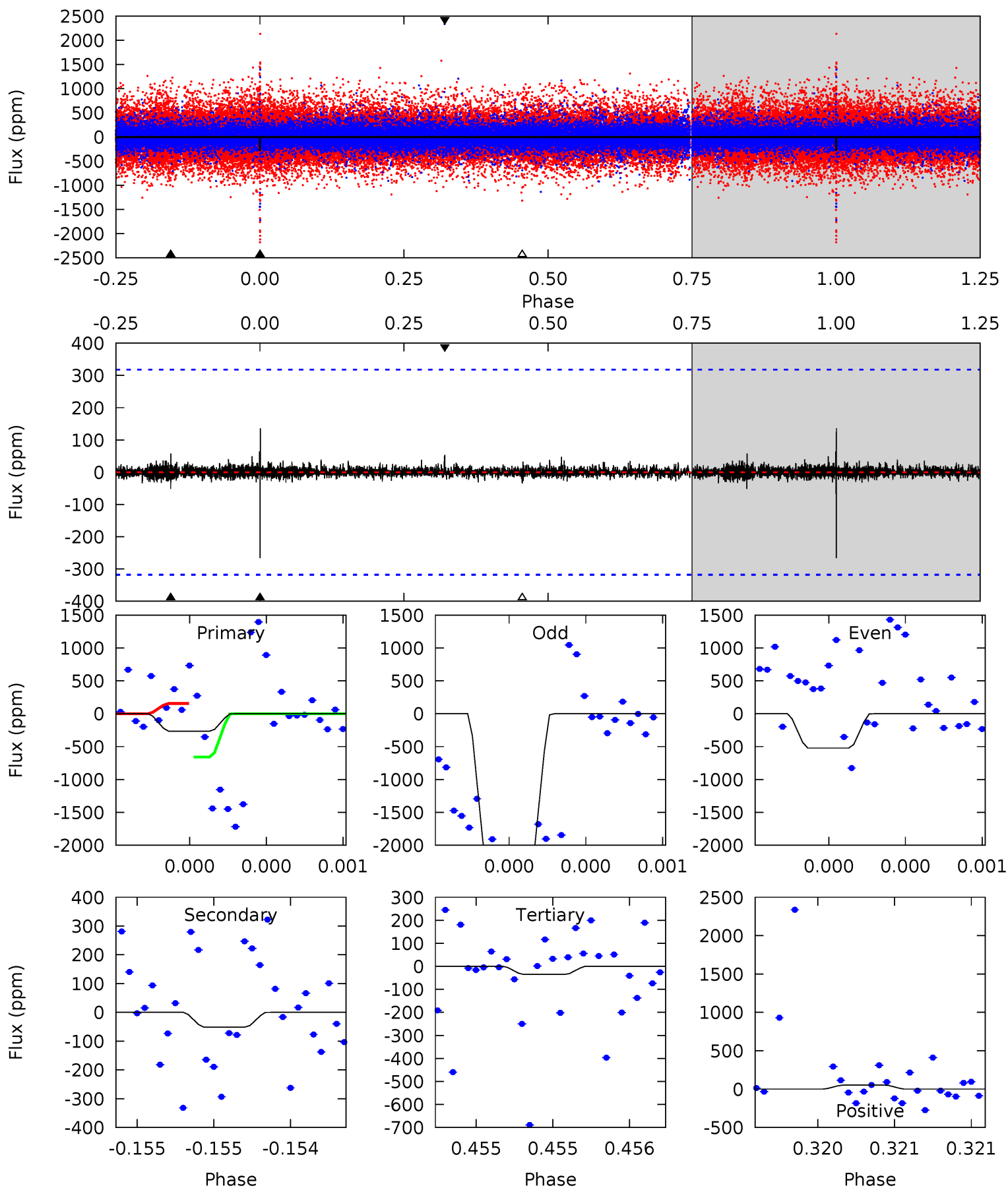
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	19.9	19.3	19.2	5.49	3.35	4.60	-8.47	-8.35	0.60	0.73	0.08	0.93	0.49	1.37



Alt Model-Shift Uniqueness Test

009897464-01, P = 639.284358 Days, E = 254.996159 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.67	0.90	0.62	0.90	5.58	3.49	0.14	4.05	3.77	0.28	-0.00	19.6	1.20	0.34	0



Stellar Parameters For KIC 009897464

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5771^{+155}_{-172}	$4.429^{+0.116}_{-0.188}$	$-0.300^{+0.300}_{-0.300}$	$0.938^{+0.248}_{-0.134}$	$0.861^{+0.118}_{-0.082}$	$1.470^{+0.776}_{-0.684}$
	+3%/-3%	+3%/-4%	+100%/-100%	+26%/-14%	+14%/-10%	+53%/-47%
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 009897464-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-3099 ± 156	$3.68^{+1.87}_{-1.73}$	297^{+20}_{-17}	7421^{+3847}_{-1470}	$243965^{+647213}_{-136893}$
Alt.	-51 ± 57	$2.76^{+1.90}_{-1.59}$	295^{+22}_{-16}	3341^{+1278}_{-6122}	5157^{+29164}_{-6680}

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

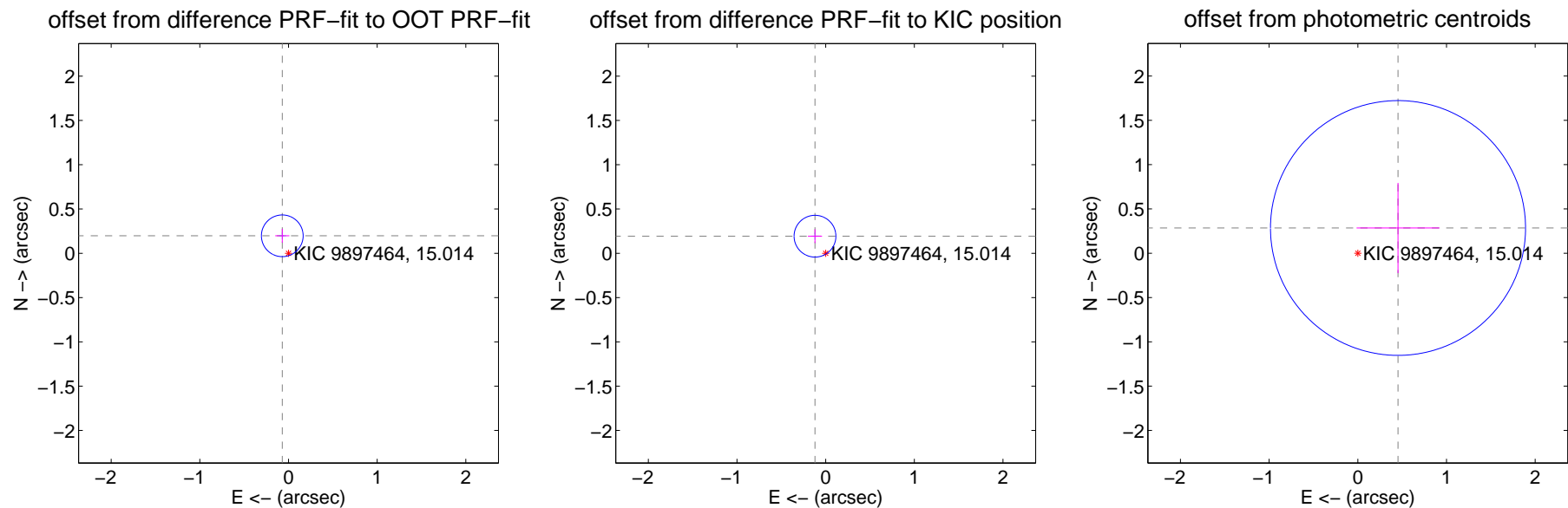
DV Centroid Data

Supplemental centroid analysis for 009897464-01. Kepler magnitude: 15.01. Transit SNR 5.56

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.209 ± 0.078	2.67	0.070 ± 0.079	0.197 ± 0.078
PRF-fit source offset from KIC position	0.227 ± 0.079	2.89	0.120 ± 0.079	0.193 ± 0.078
photometric centroid source offset	0.54 ± 0.48	1.12	-0.45 ± 0.47	0.28 ± 0.51



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.

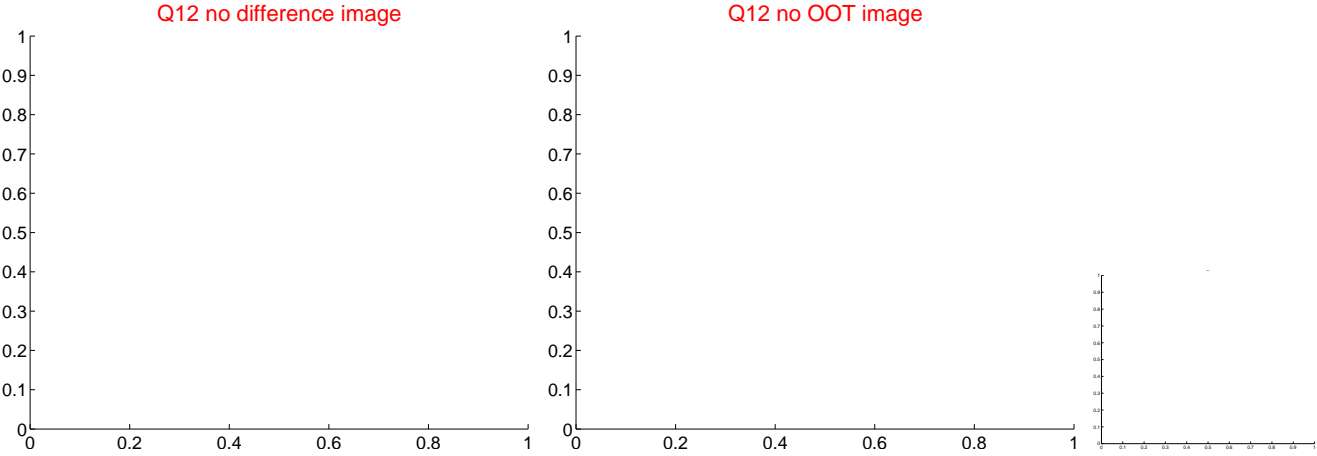
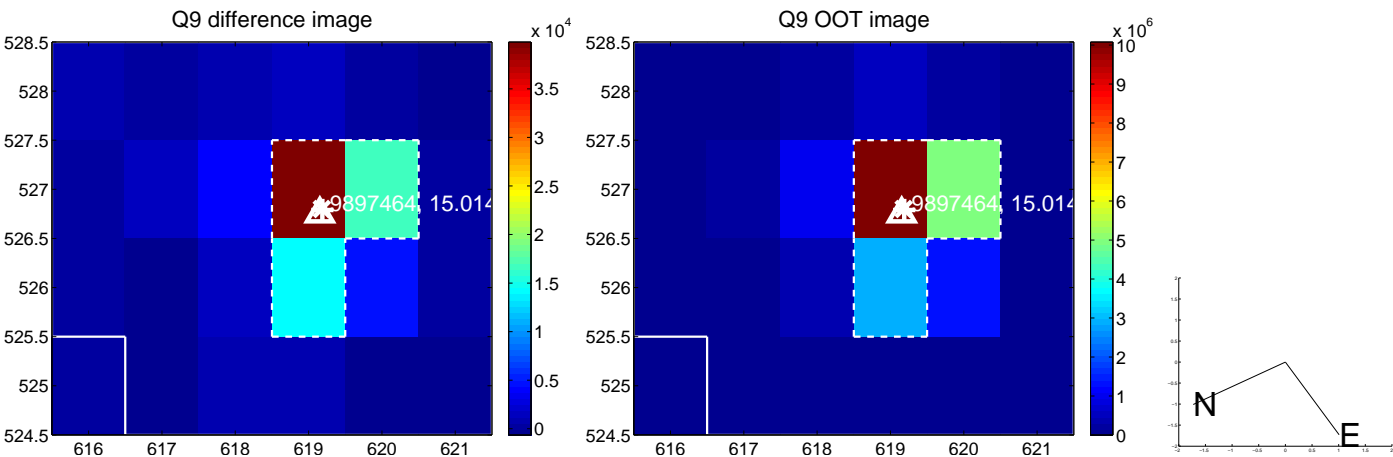
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



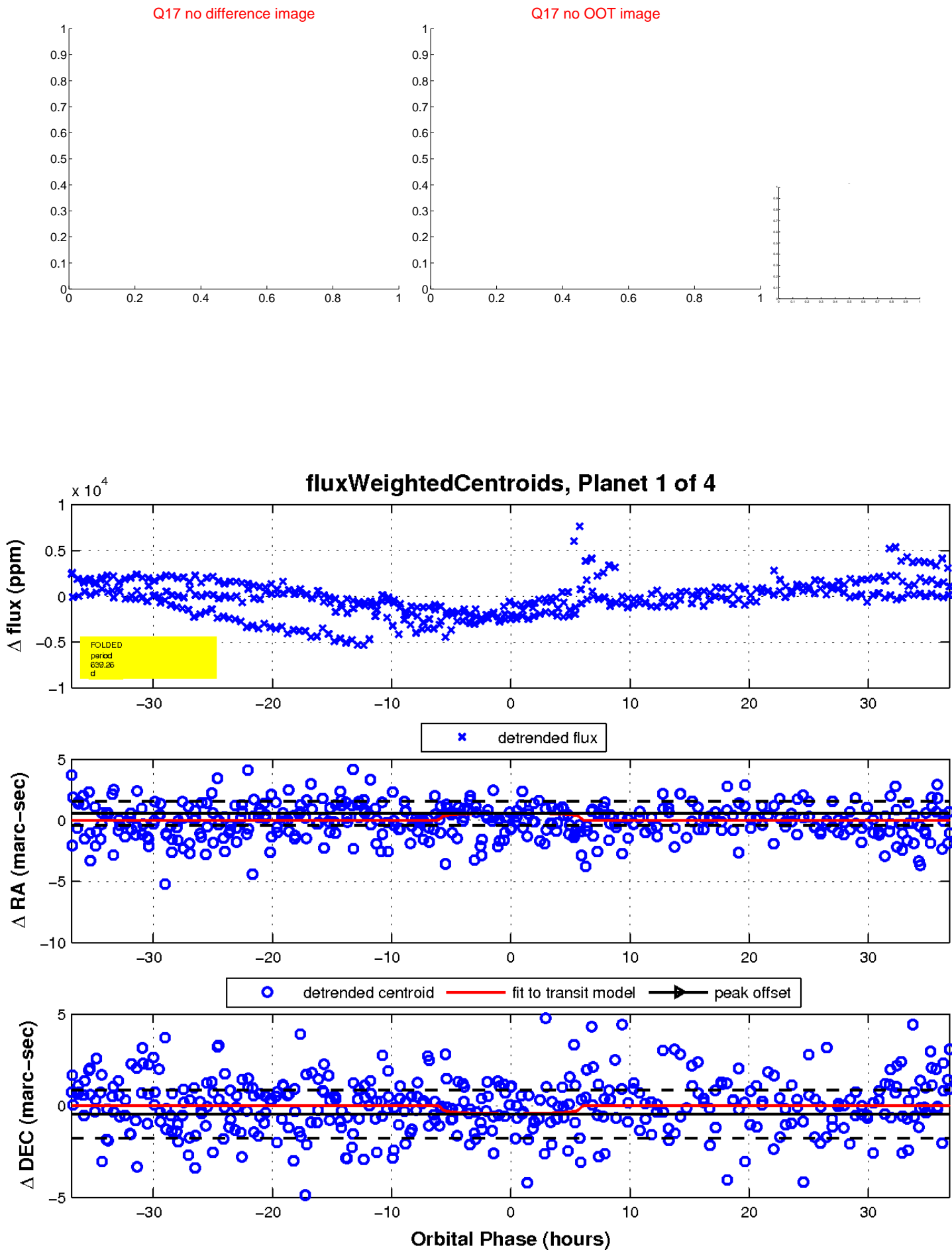
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

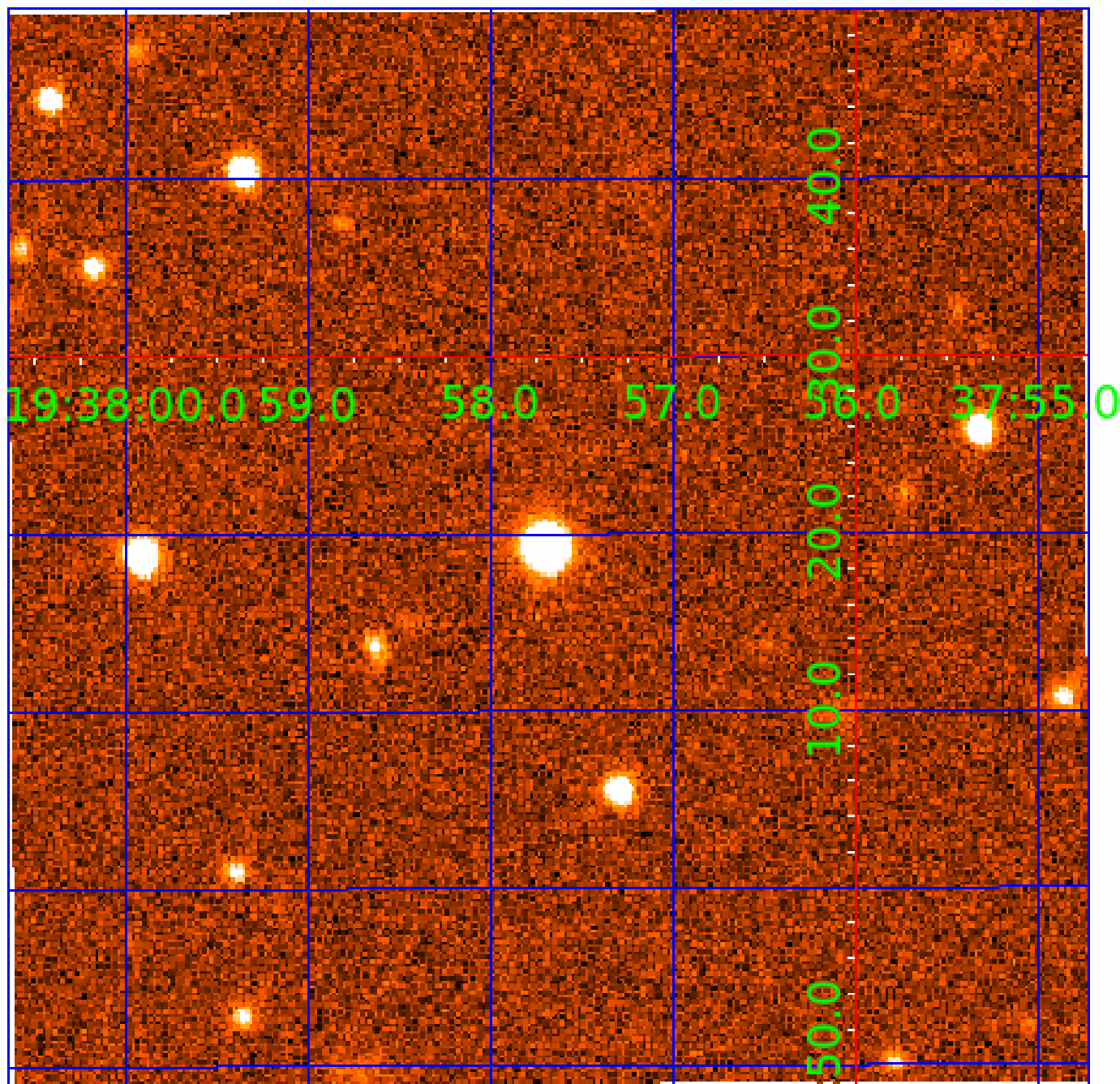


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009897464

Q1-17 DR25 TCE Parameters

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009897464-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

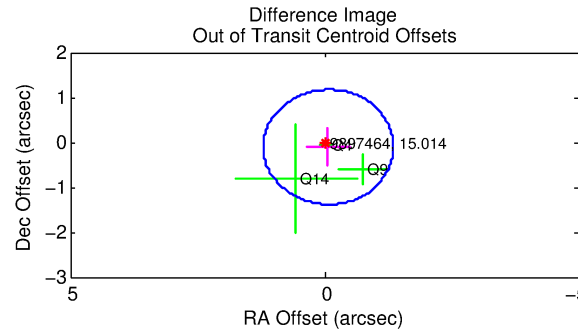
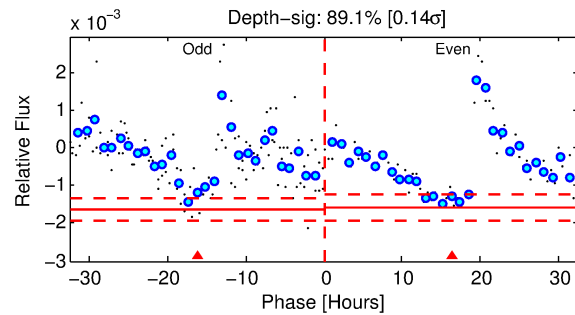
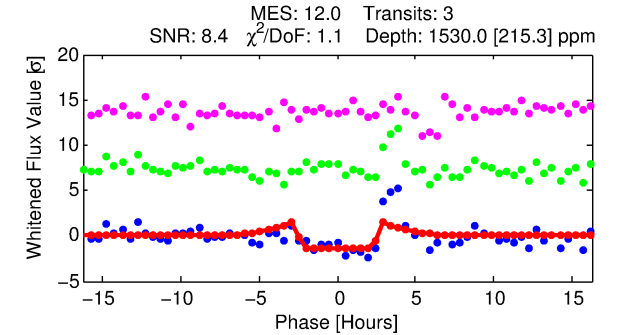
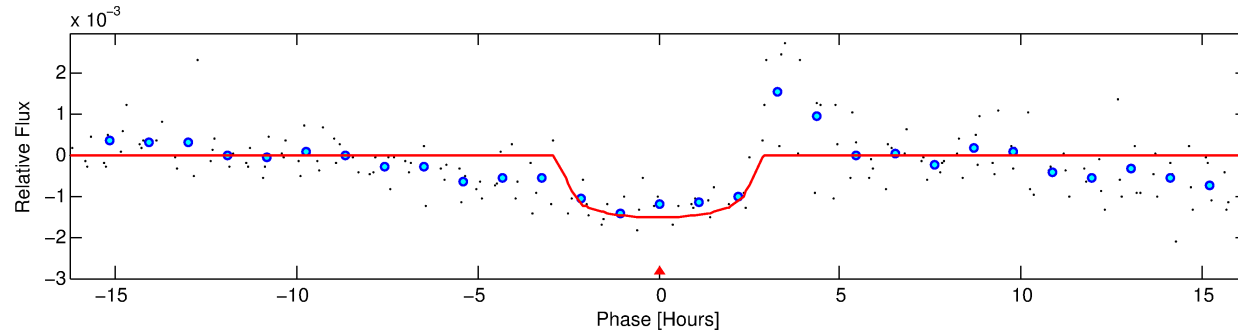
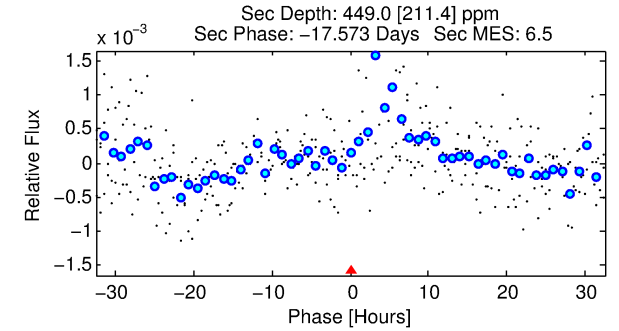
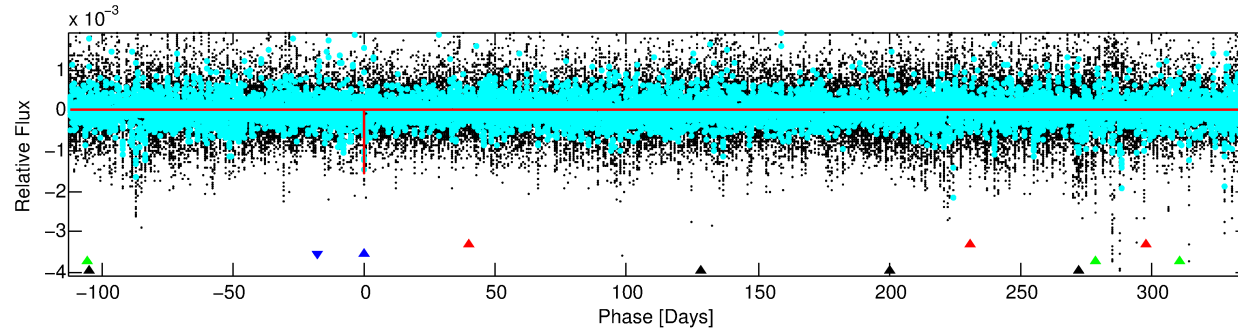
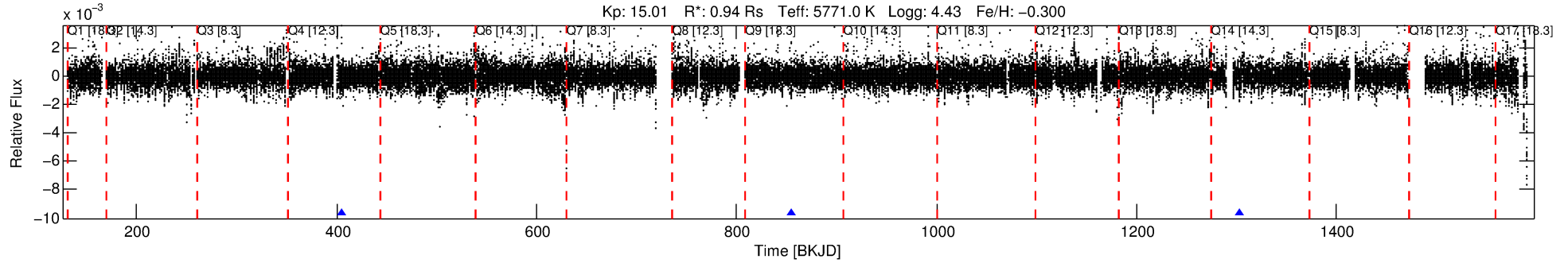
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009897464-02

No Significant Match Found

DV One-Page Summary

KIC: 9897464 Candidate: 2 of 4 Period: 448.523 d



DV Fit Results:

Period = 448.52257 [0.00554] d
Epoch = 405.7268 [0.0065] BKJD
Rp/R* = 0.0360 [0.0341]
a/R* = 621.59 [2646.87]
b = 0.33 [11.59]
Seff = 0.73 [0.26]
Teq = 236 [21] K
Rp = 3.69 [3.62] Re
a = 1.0915 [0.2486] AU
Ag = 21619.90 [42780.39] [0.51σ]
Teffp = 4425 [2161] K [1.94σ]

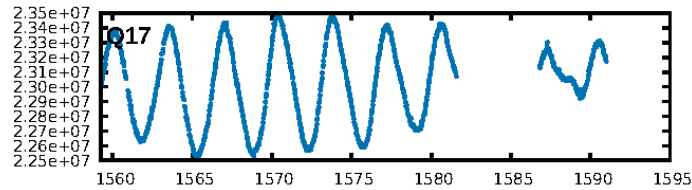
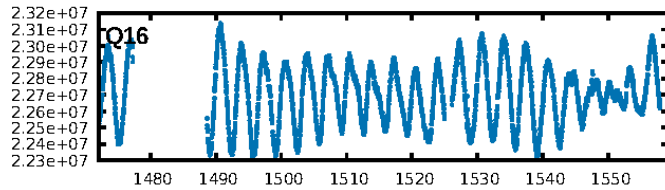
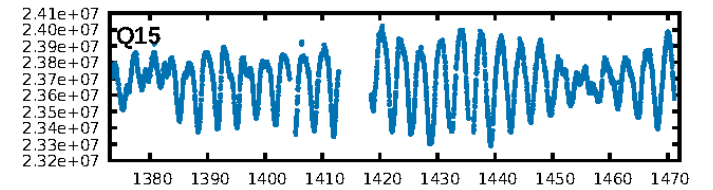
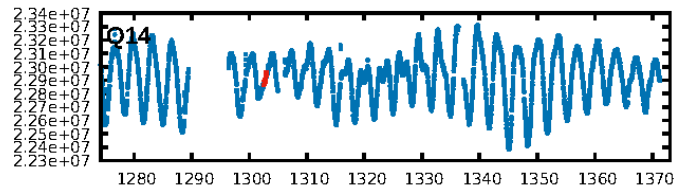
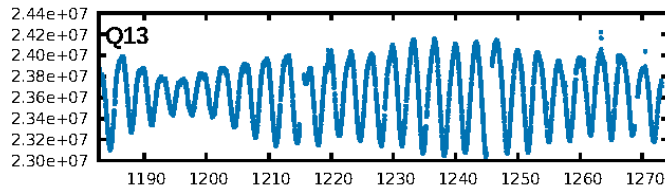
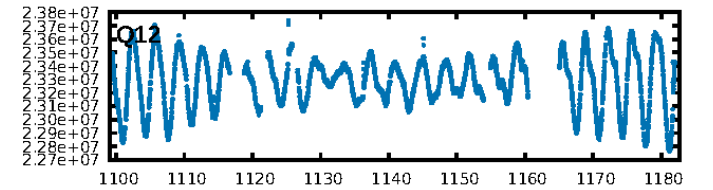
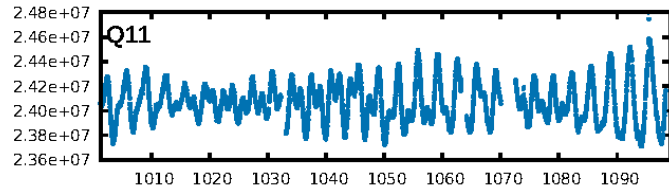
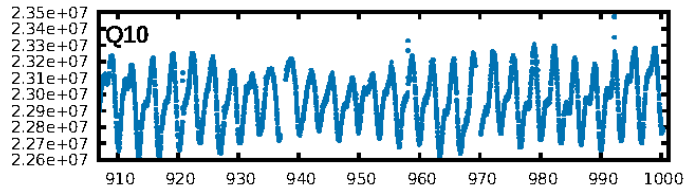
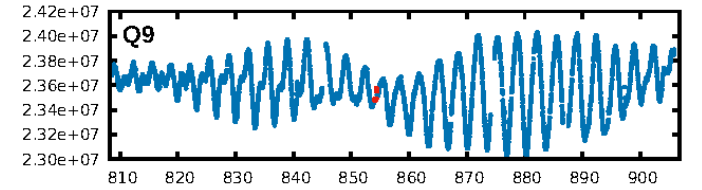
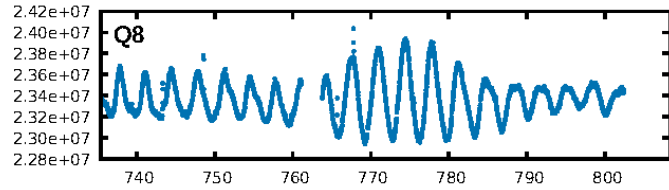
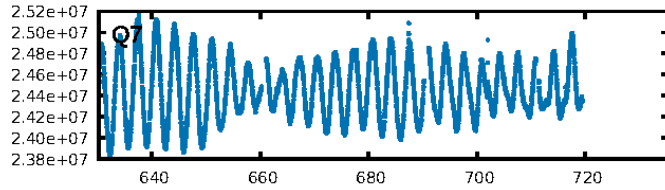
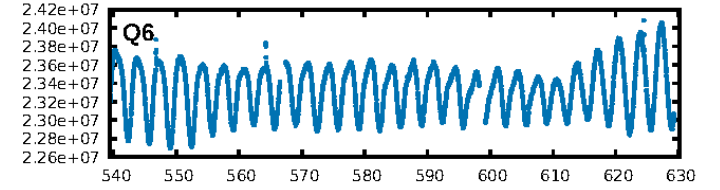
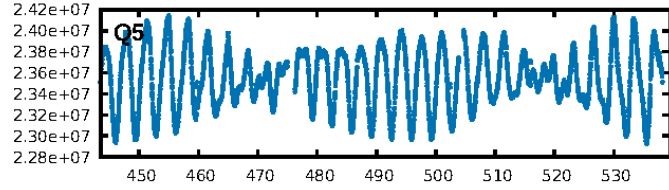
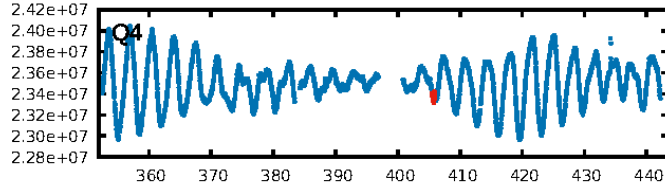
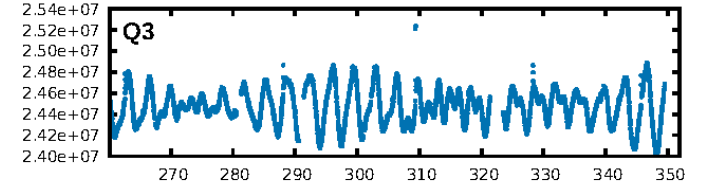
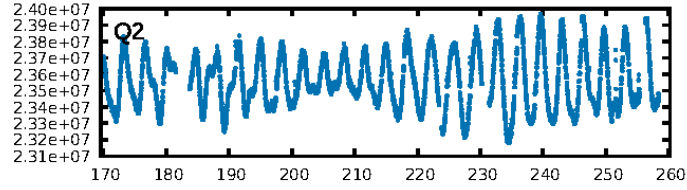
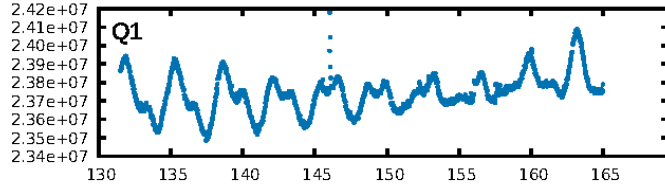
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [272.92σ]
LongPeriod-sig: 100.0% [118.47σ]
ModelChiSquare2-sig: 86.9%
ModelChiSquareGof-sig: 97.9%
Bootstrap-pfa: 2.38e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.927
Centroid-sig: 8.1%
Centroid-so: 0.835 arcsec [1.27σ]
OotOffset-rm: 0.130 arcsec [0.31σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 0.132 arcsec [0.31σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

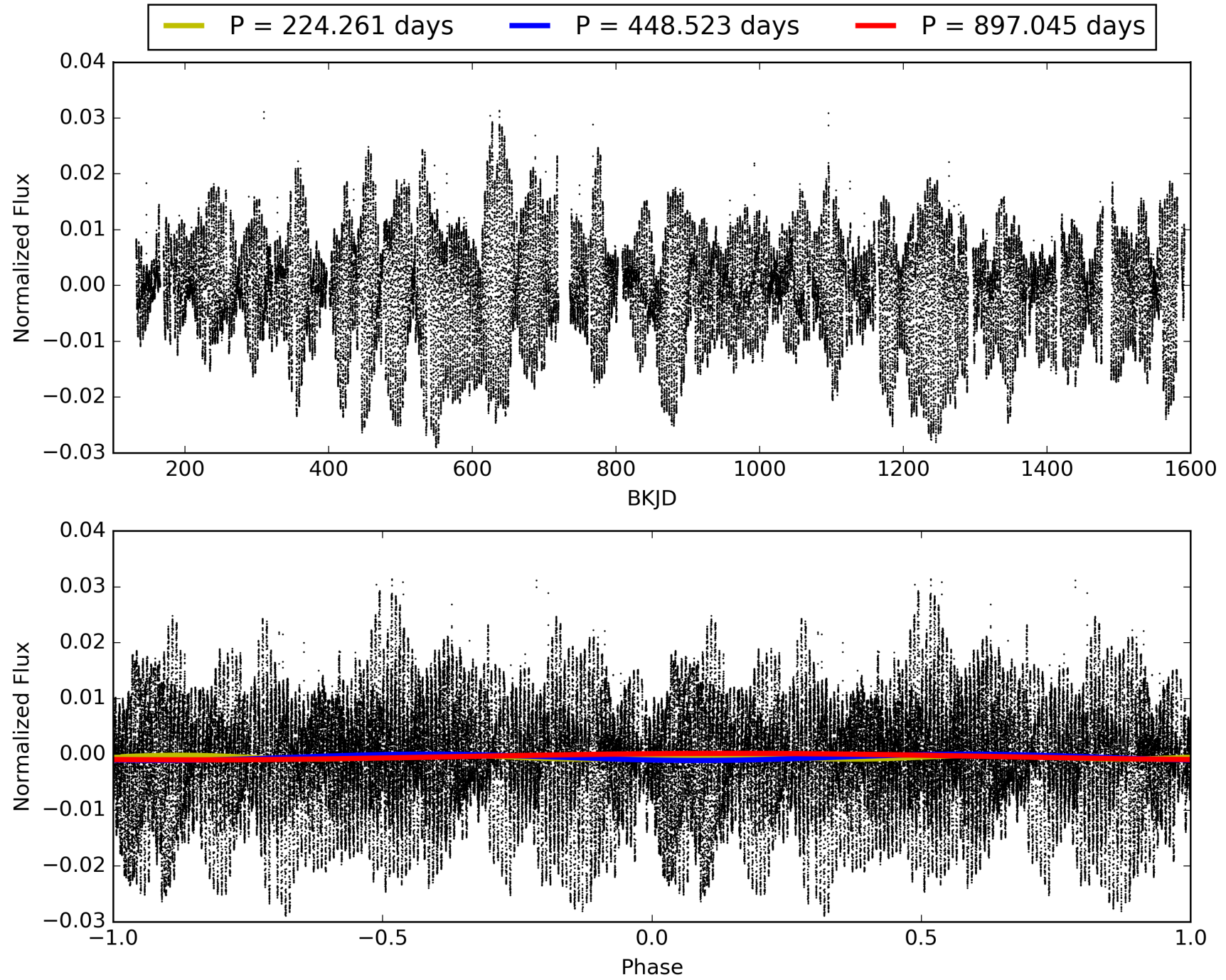
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:39:21 Z

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

TCE 009897464-02, PDC Light Curves

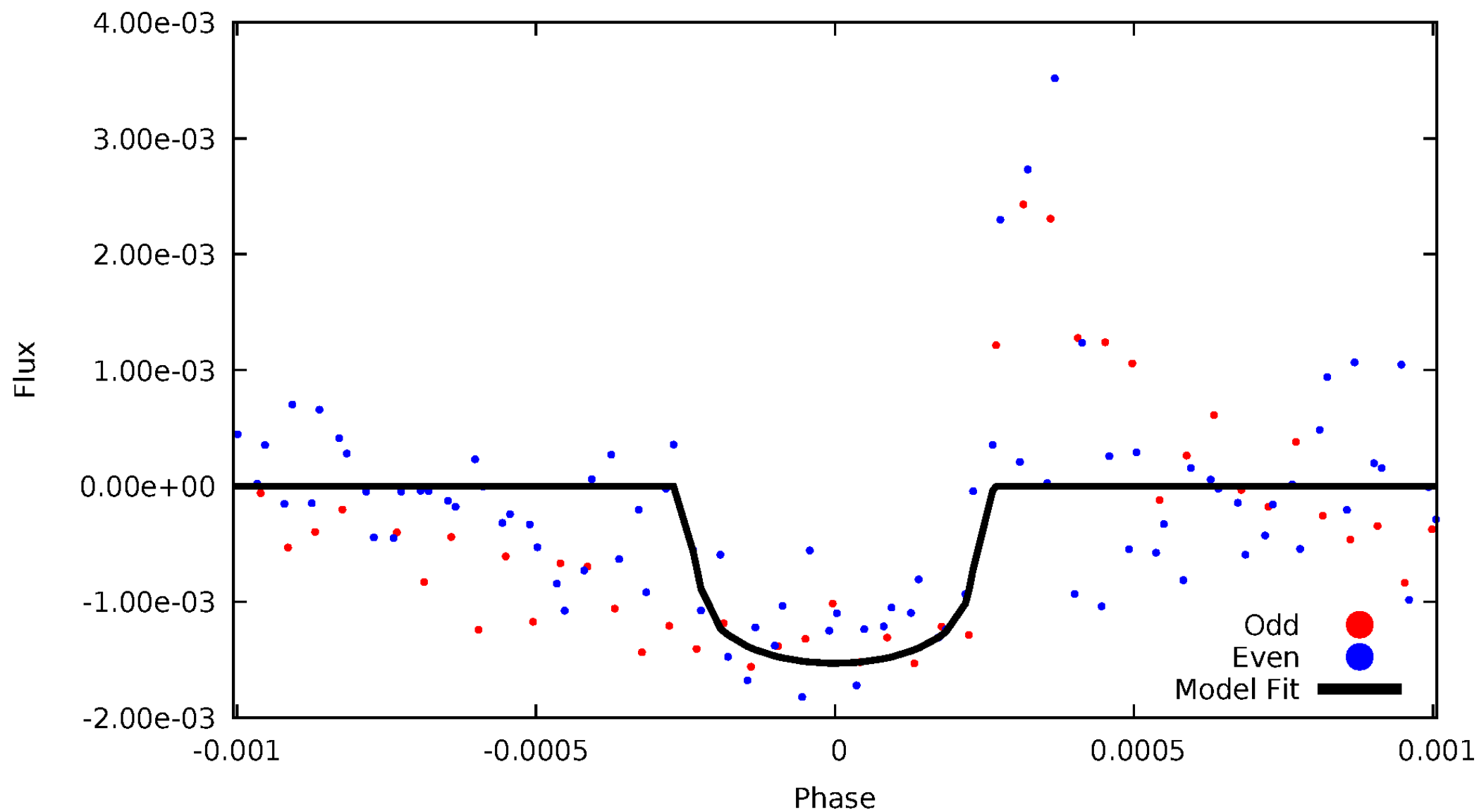


TCE 009897464-02



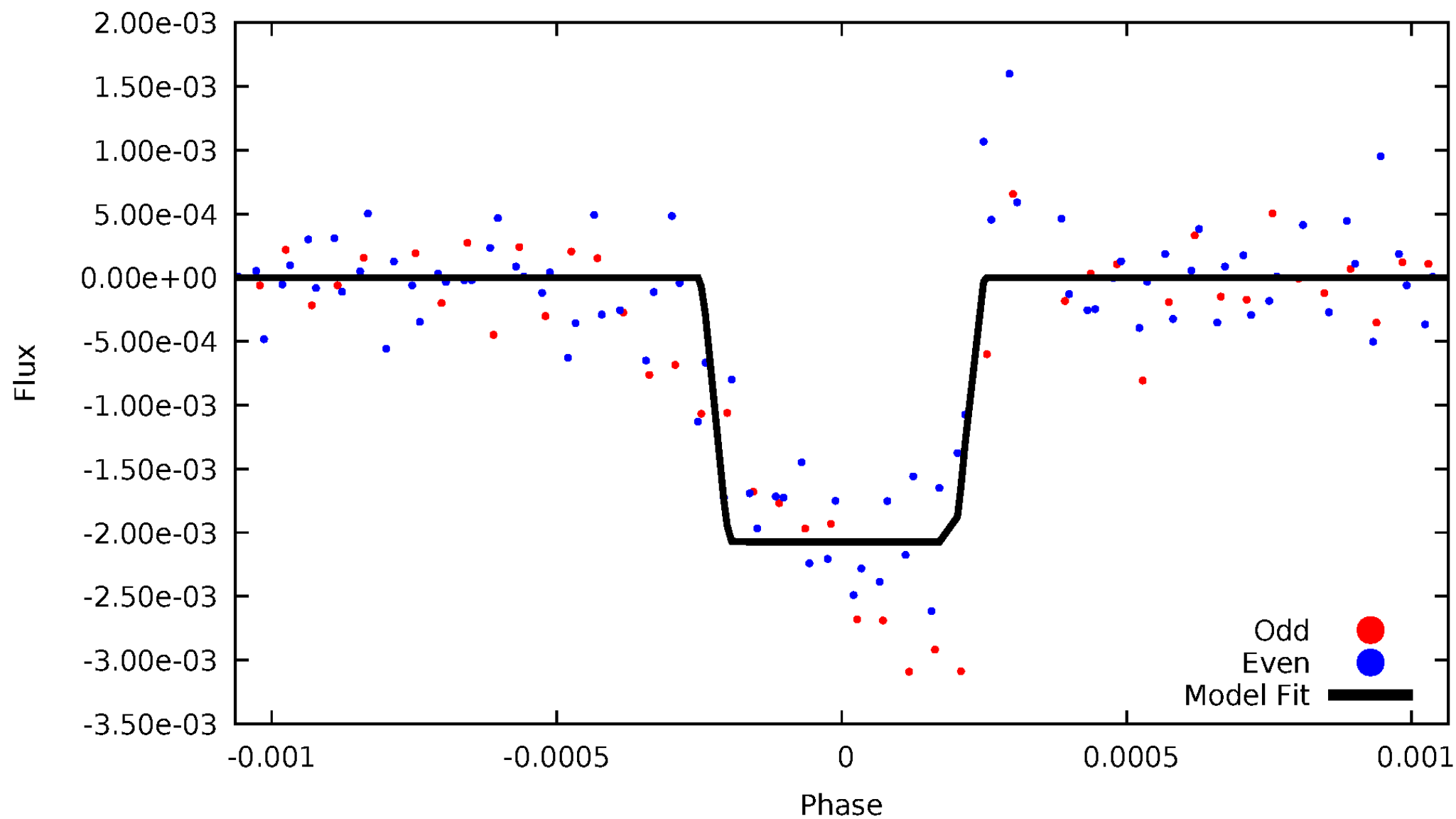
DV Odd/Even

TCE 009897464-02



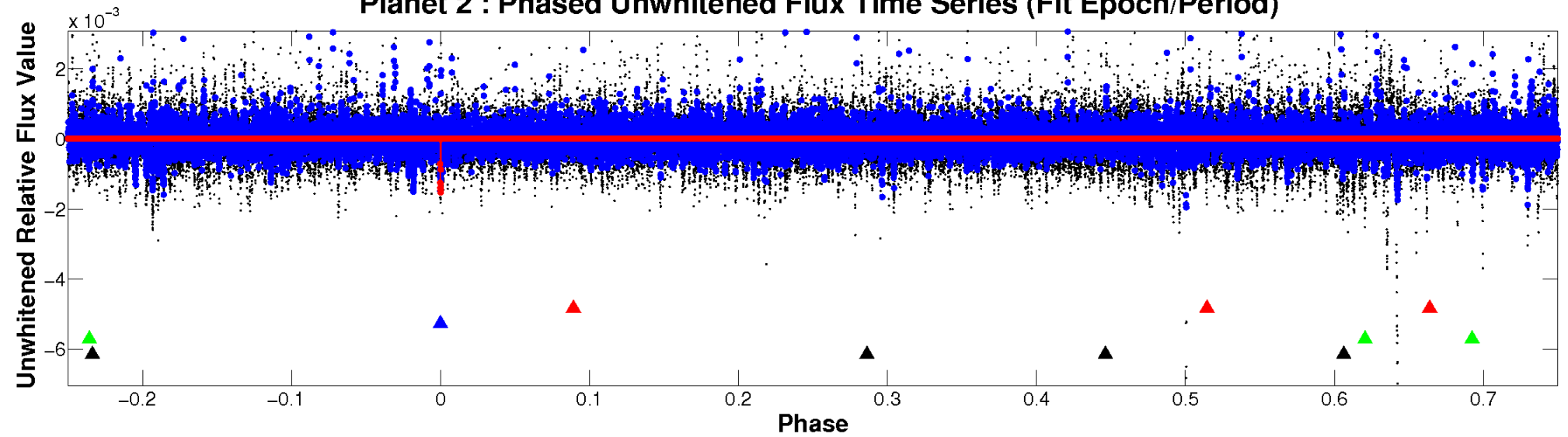
ALT Odd/Even

TCE 009897464-02

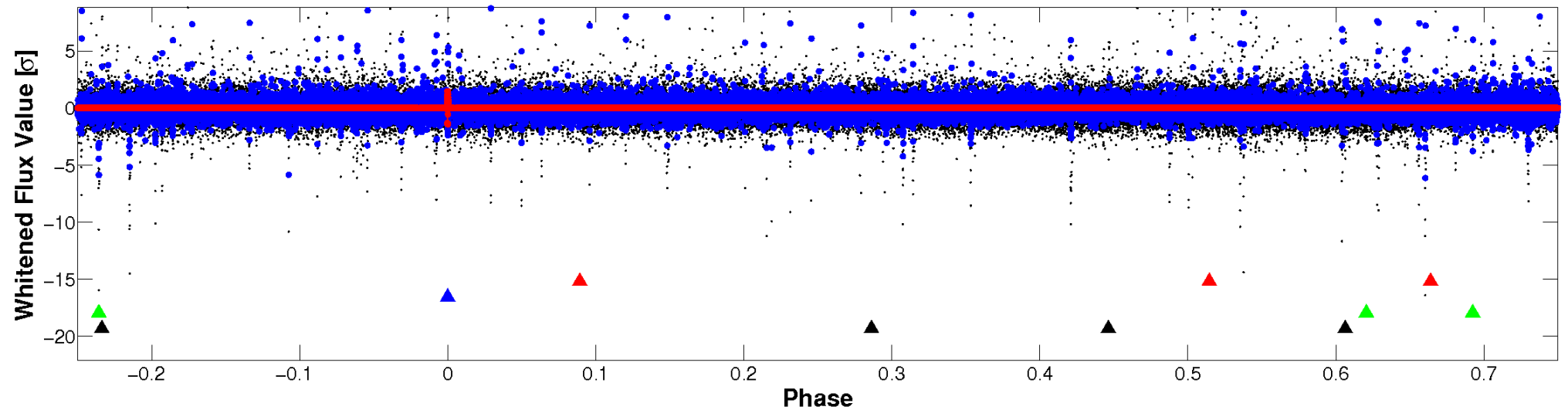


Non-Whitened Vs. Whitened Light Curve

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

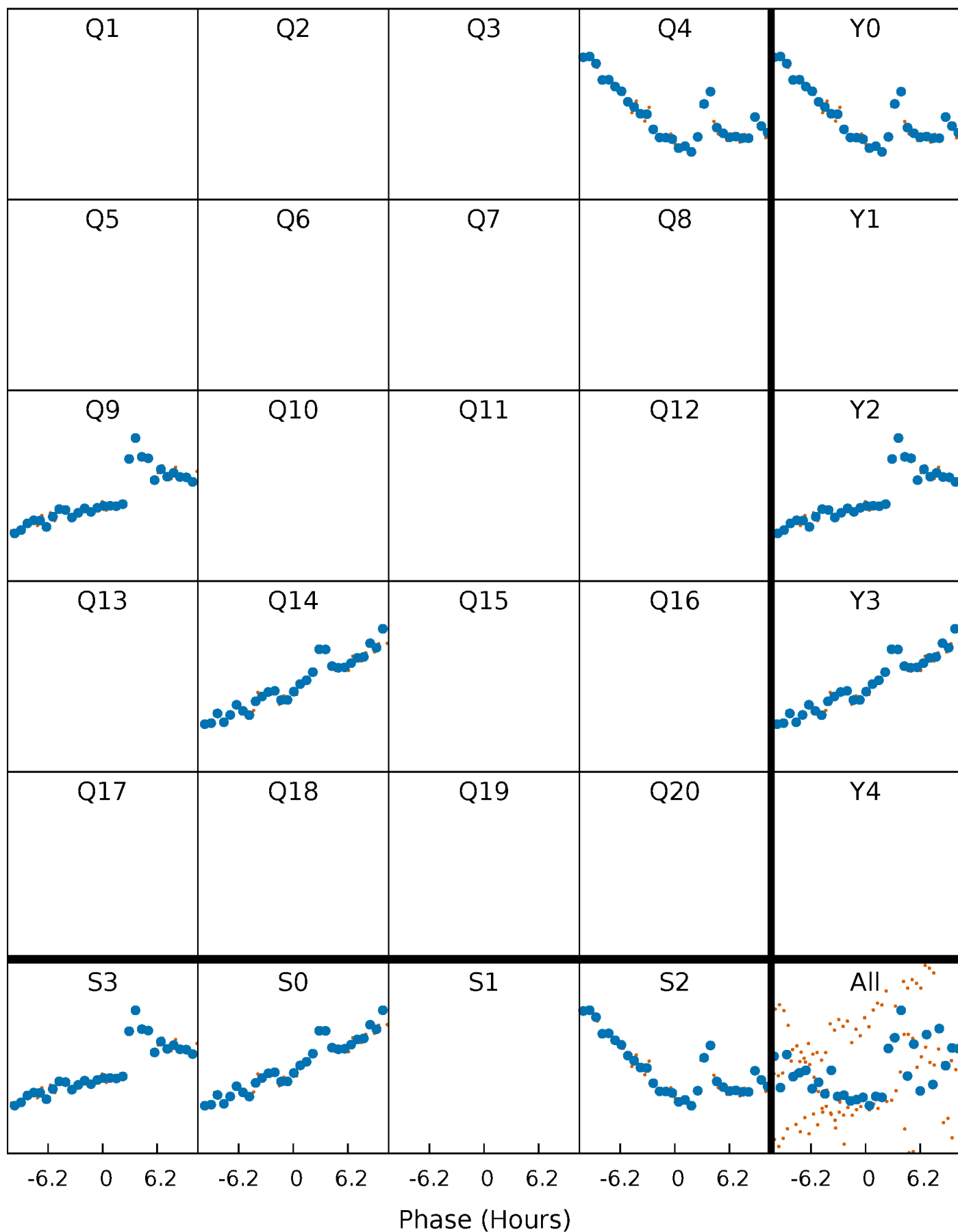


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 009897464-02 $P=448.522569$ Days $T_0=405.726830$ (BKJD)



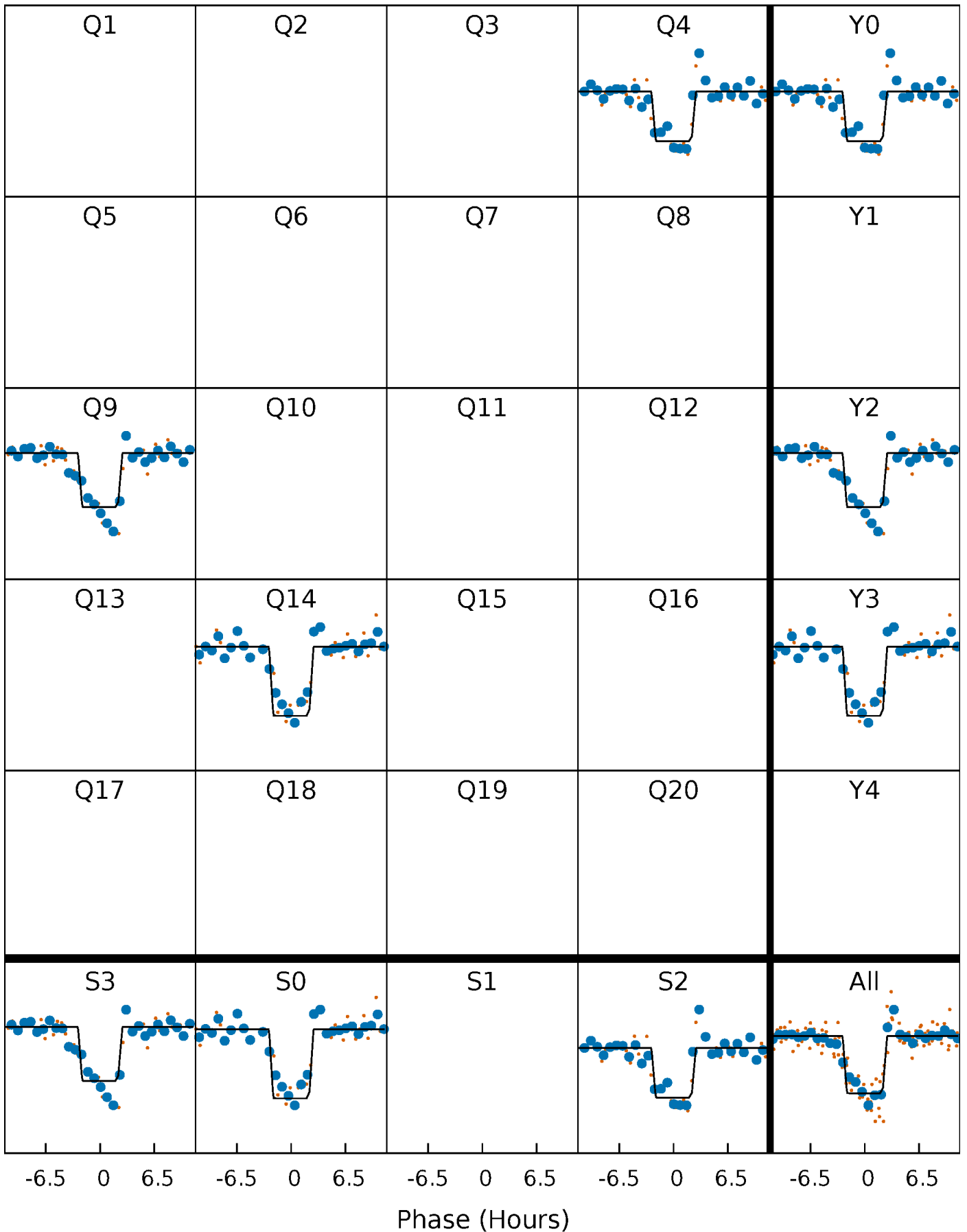
DV Quarter-Phased Transit Curves

TCE 009897464-02 $P=448.522569$ Days $T_0=405.726830$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

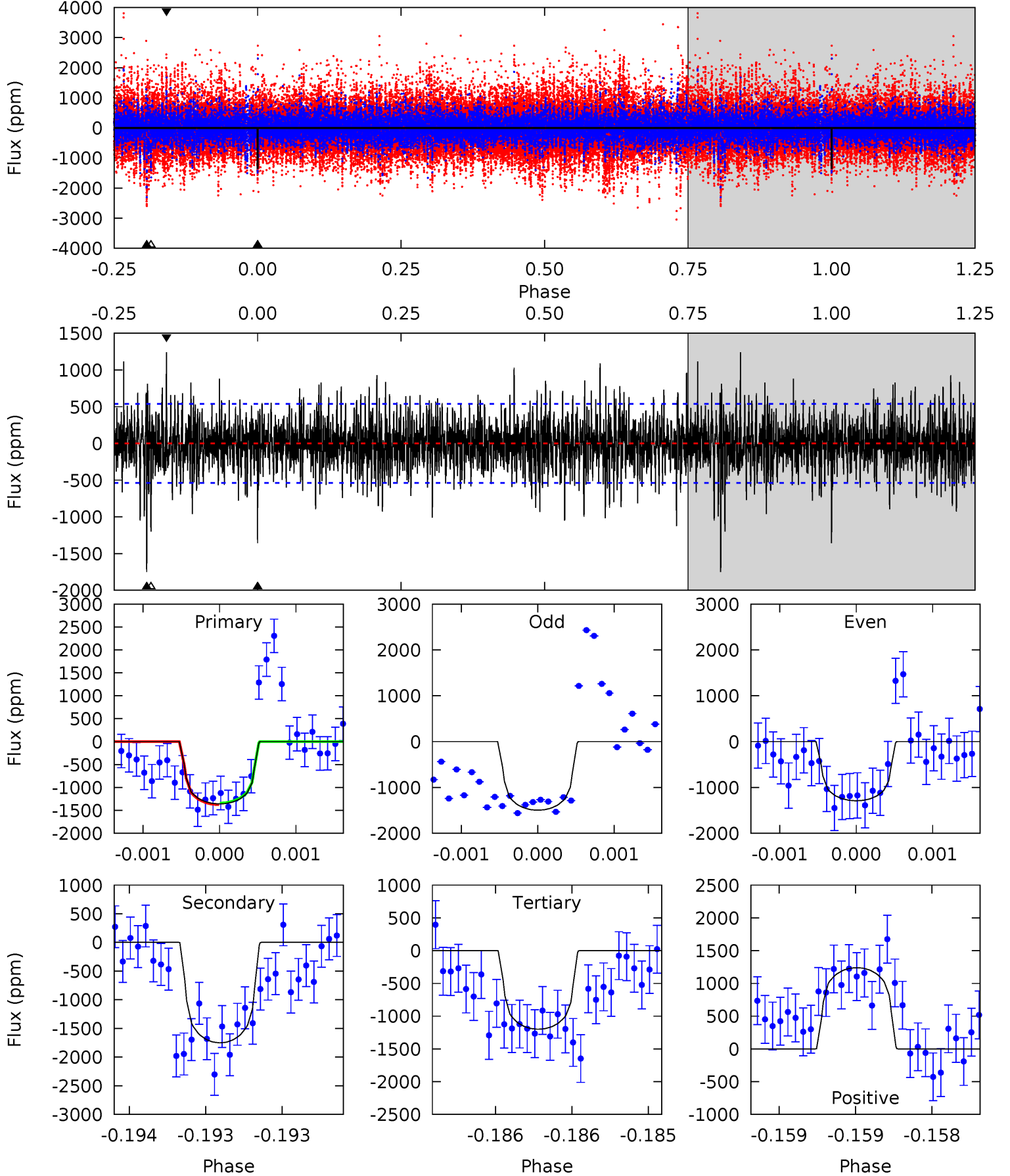
TCE 009897464-02 P=448.516642 Days $T_0=405.739313$ (BKJD)



DV Model-Shift Uniqueness Test

009897464-02, P = 448.522569 Days, E = 405.726830 Days

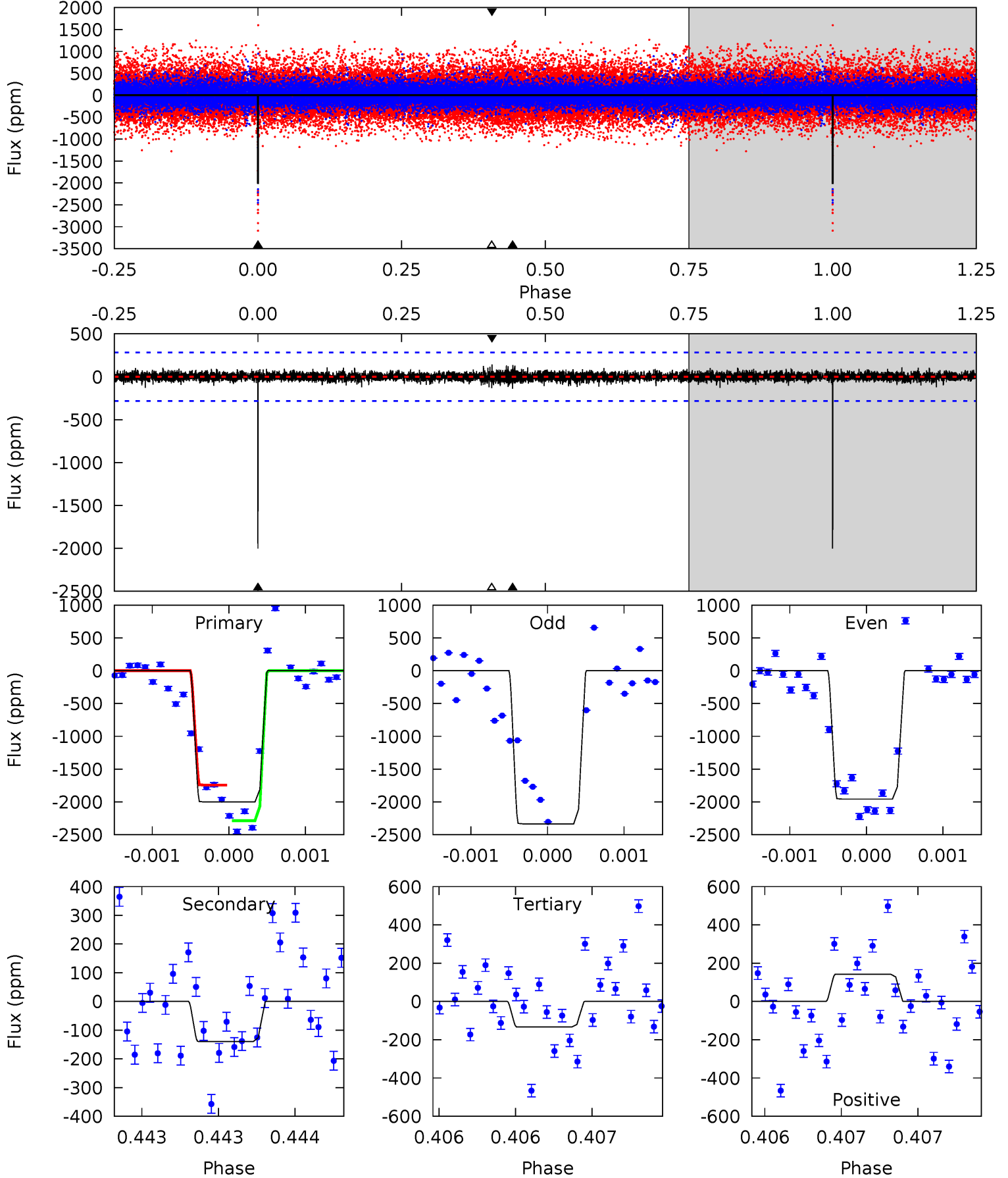
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	18.1	12.4	12.8	5.57	3.47	2.89	1.65	1.24	5.69	5.28	0.92	0.94	0.41	0.17



Alt Model-Shift Uniqueness Test

009897464-02, P = 448.516642 Days, E = 405.739313 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.4	2.75	2.62	2.80	5.57	3.48	0.54	36.8	36.6	0.13	-0.05	3.40	1.00	0.07	5.35



Stellar Parameters For KIC 009897464

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5771^{+155}_{-172}	$4.429^{+0.116}_{-0.188}$	$-0.300^{+0.300}_{-0.300}$	$0.938^{+0.248}_{-0.134}$	$0.861^{+0.118}_{-0.082}$	$1.470^{+0.776}_{-0.684}$
	+3%/-3%	+3%/-4%	+100%/-100%	+26%/-14%	+14%/-10%	+53%/-47%
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 009897464-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1751 ± 97	$4.55^{+3.64}_{-2.85}$	332^{+23}_{-19}	5613^{+4336}_{-1152}	$54958^{+340283}_{-37442}$
Alt.	-140 ± 51	$5.31^{+3.63}_{-2.96}$	331^{+24}_{-18}	3279^{+974}_{-464}	2995^{+12672}_{-2037}

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 $A_{obs} \gg 1.0$

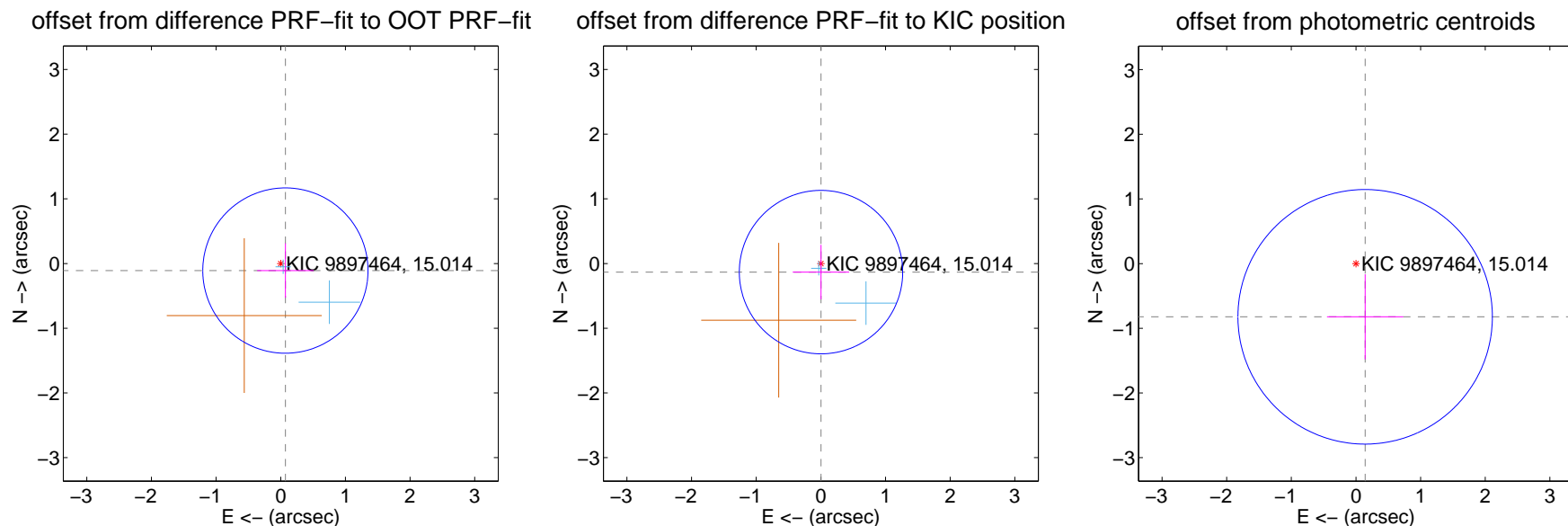
DV Centroid Data

Supplemental centroid analysis for 009897464-02. Kepler magnitude: 15.01. Transit SNR 8.41

There are 2 quarters with good PRF difference image offsets

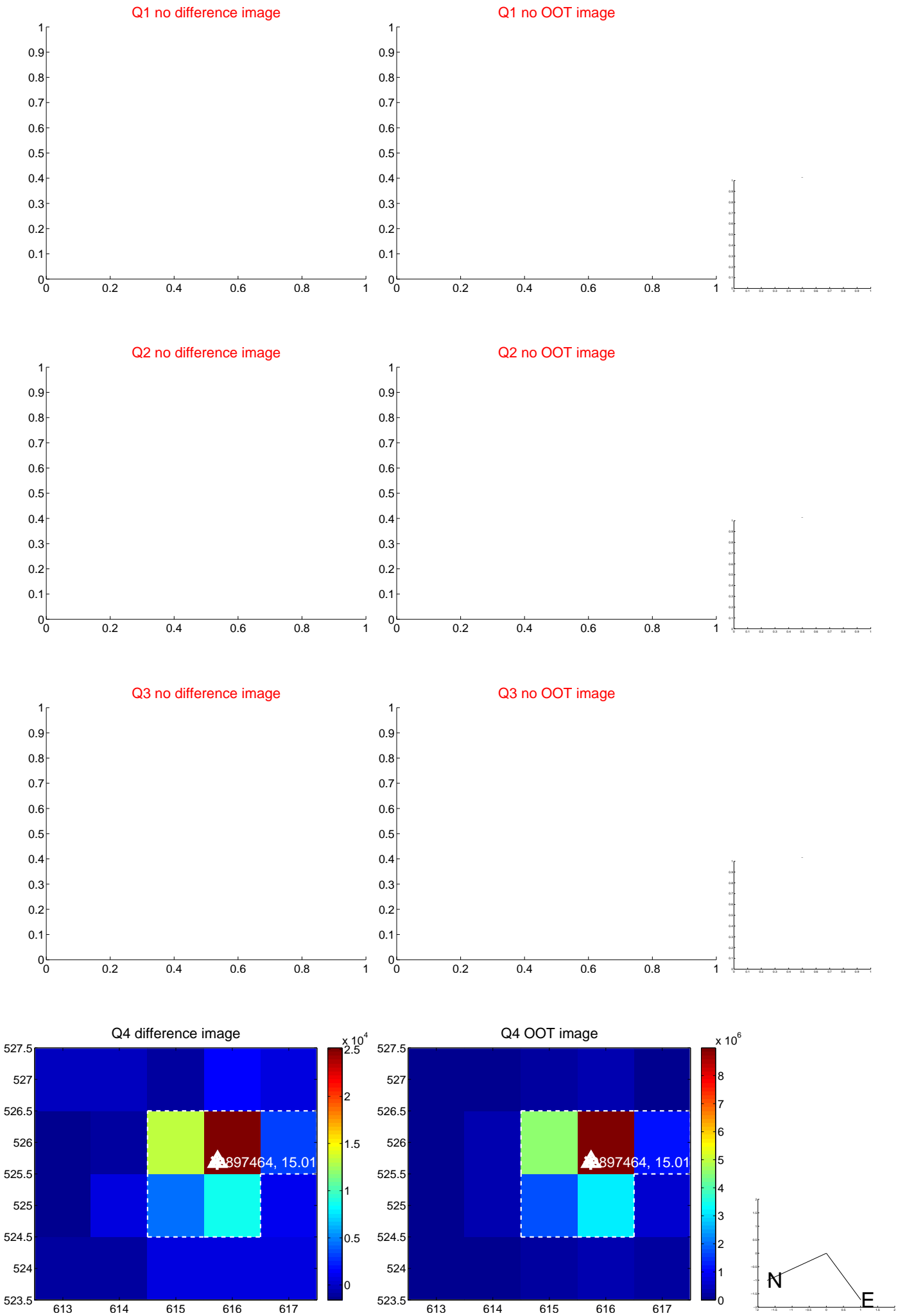
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.130 ± 0.426	0.31	-0.072 ± 0.437	-0.109 ± 0.421
PRF-fit source offset from KIC position	0.132 ± 0.421	0.31	-0.002 ± 0.437	-0.132 ± 0.421
photometric centroid source offset	0.83 ± 0.66	1.27	-0.14 ± 0.59	-0.82 ± 0.66



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.

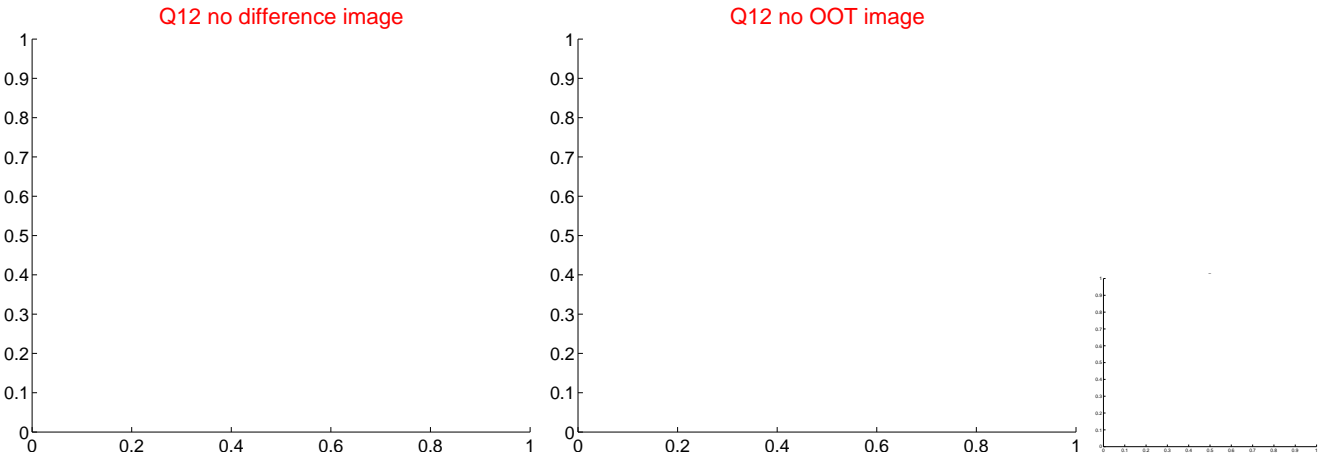
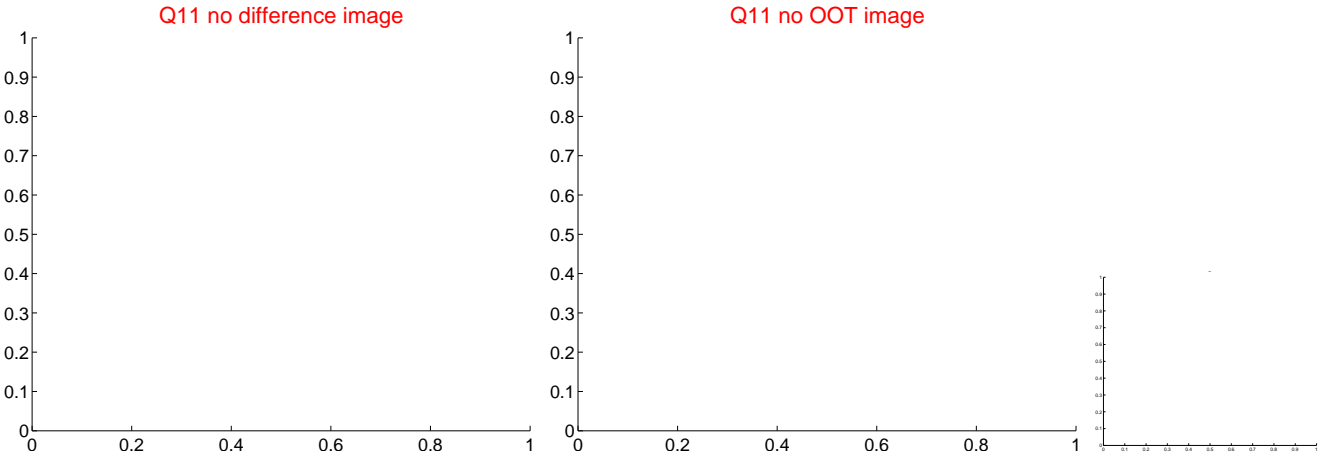
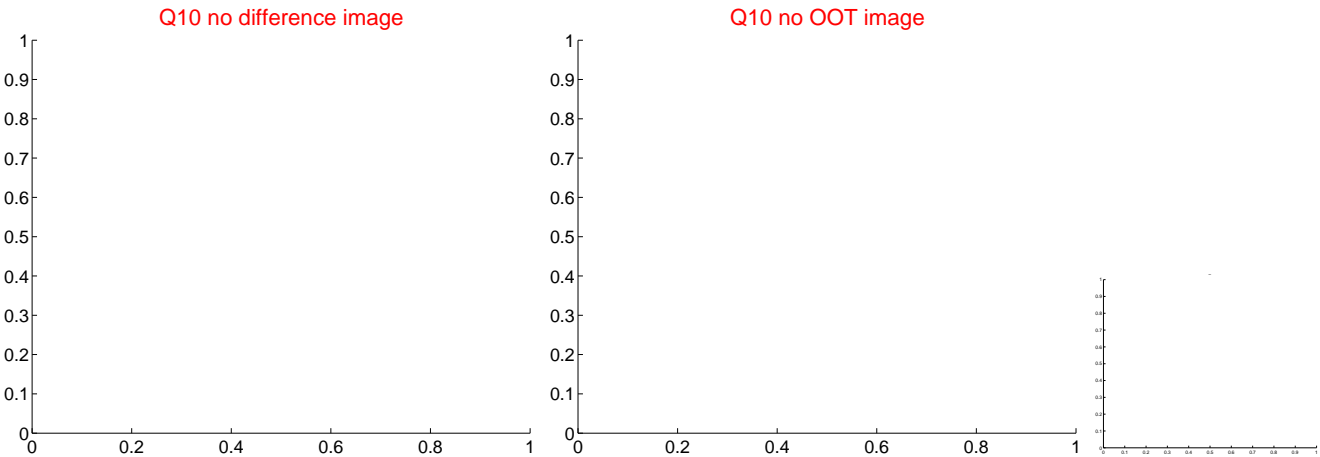
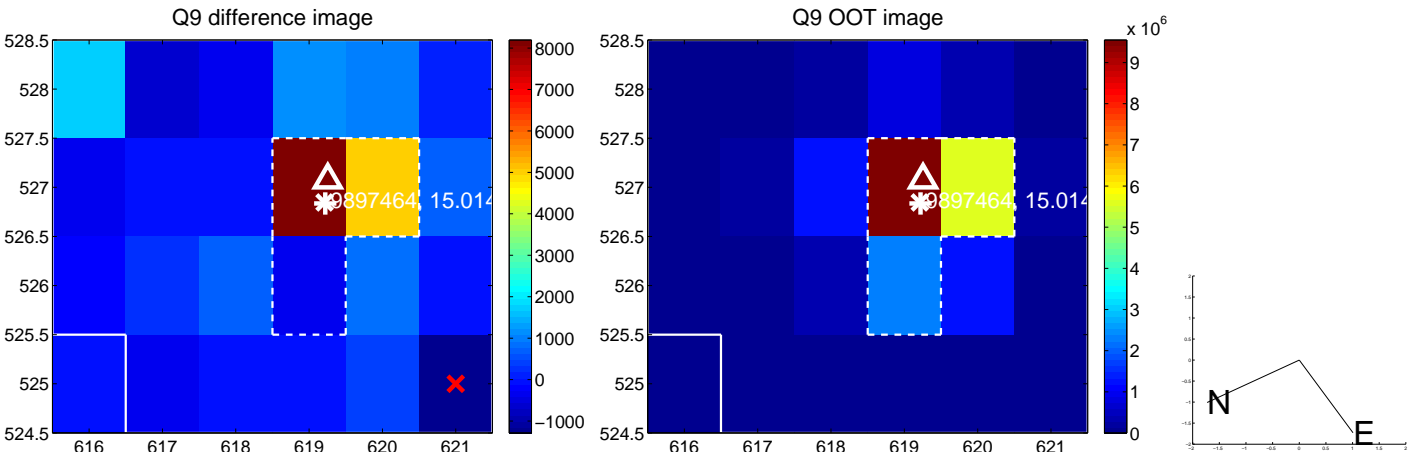
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



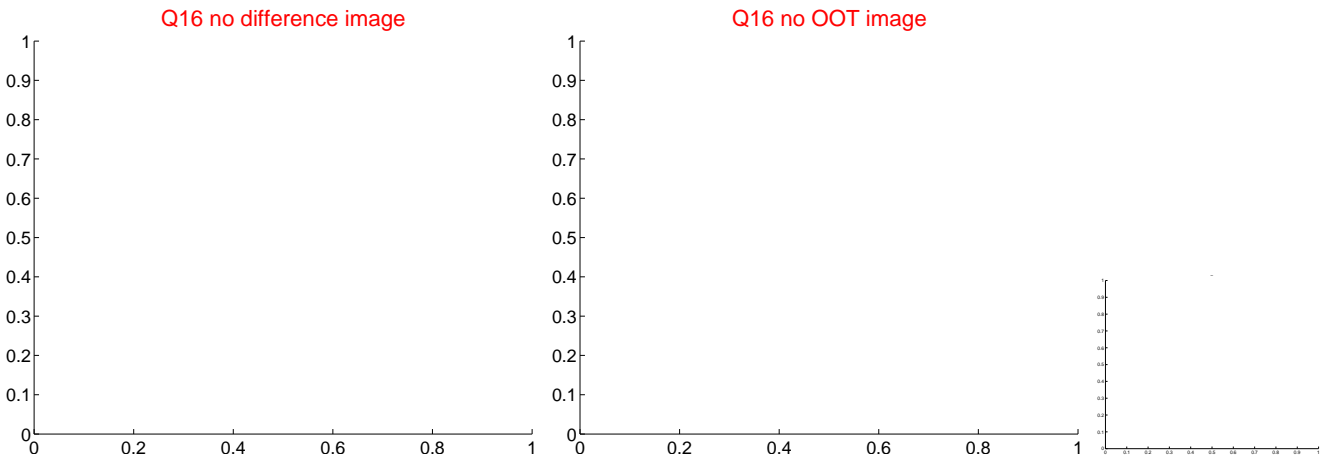
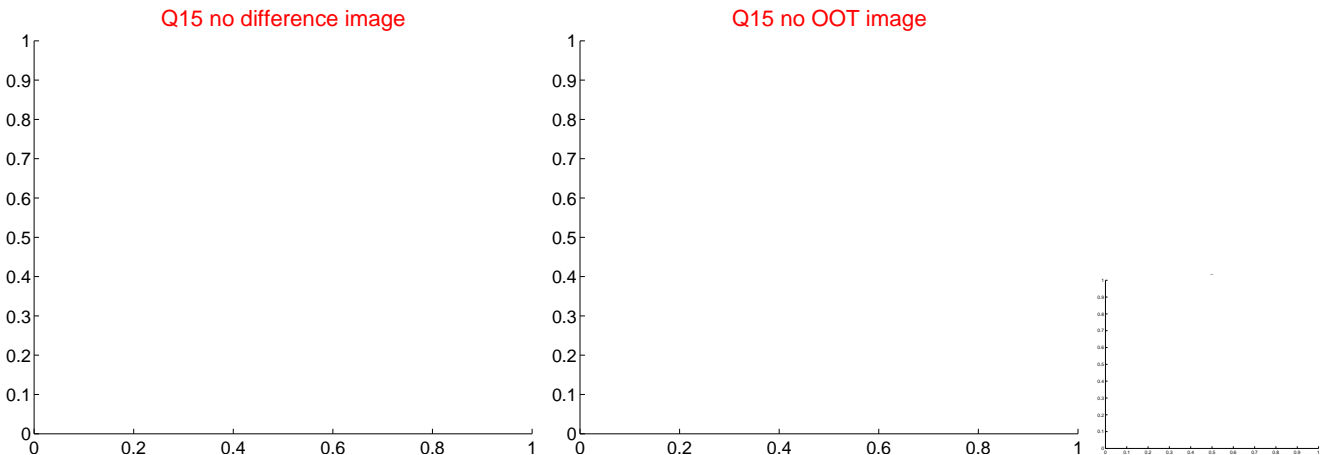
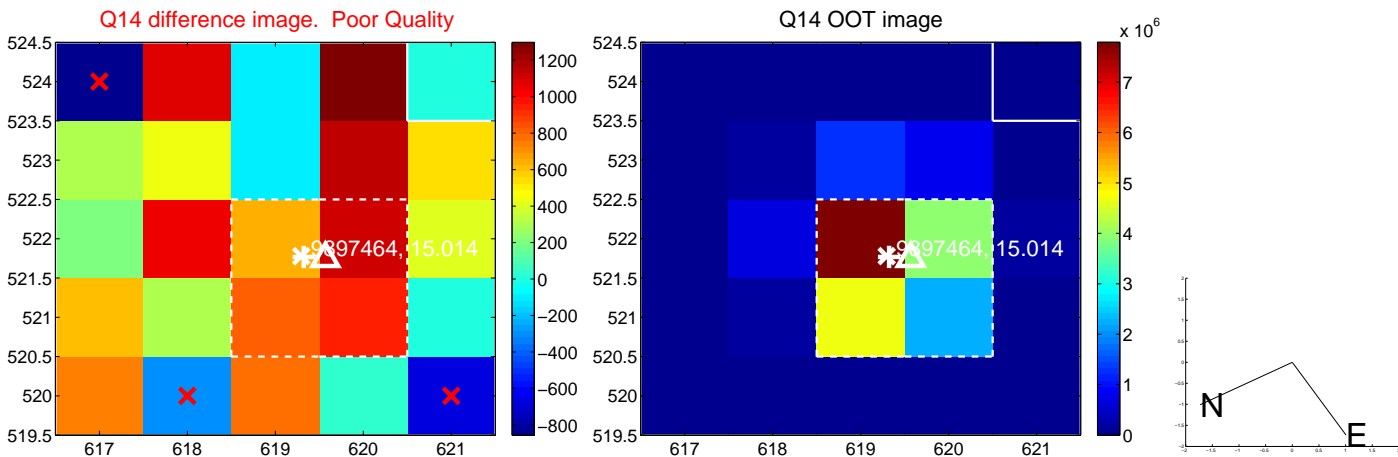
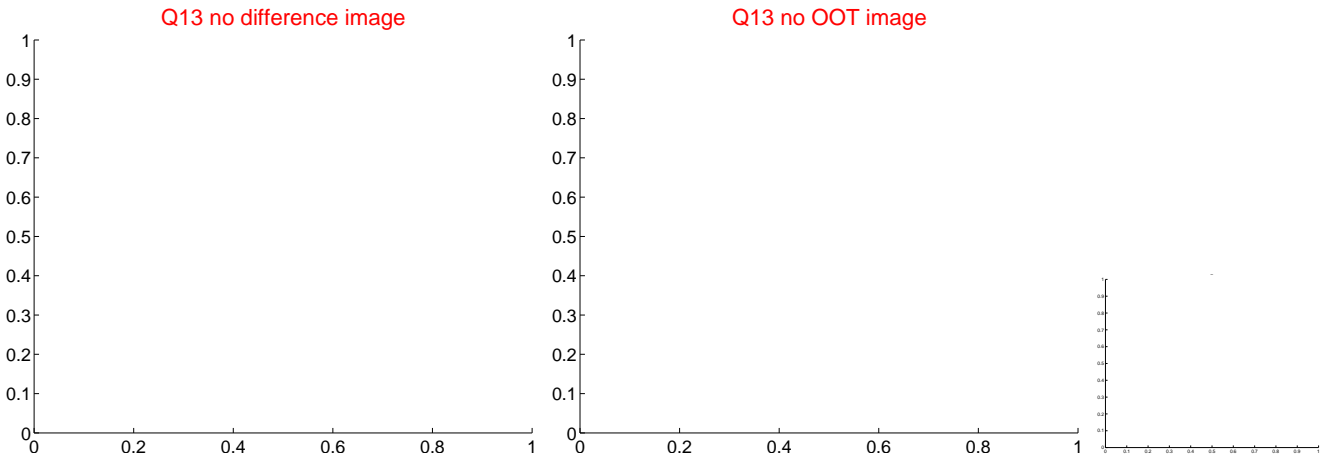
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



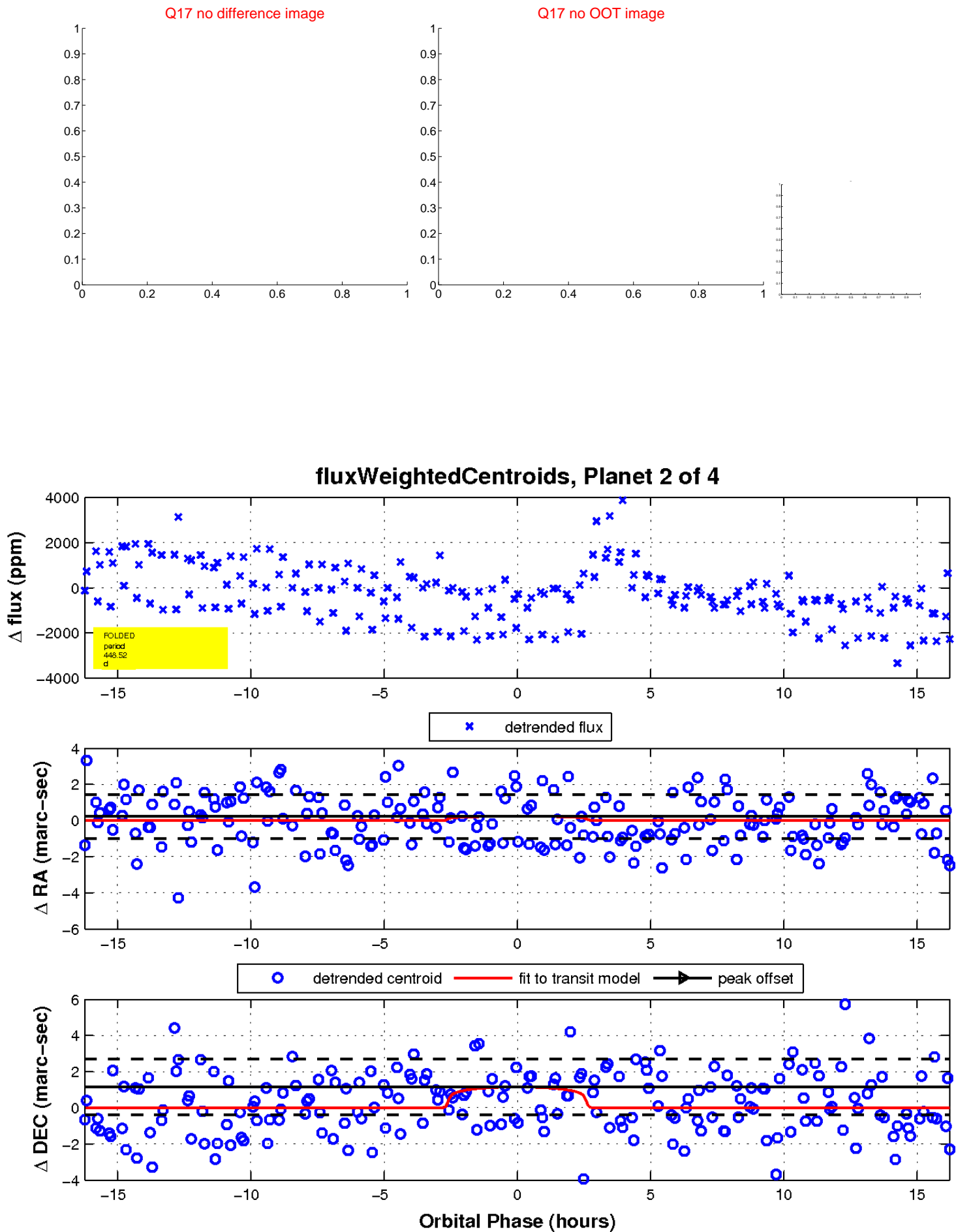
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

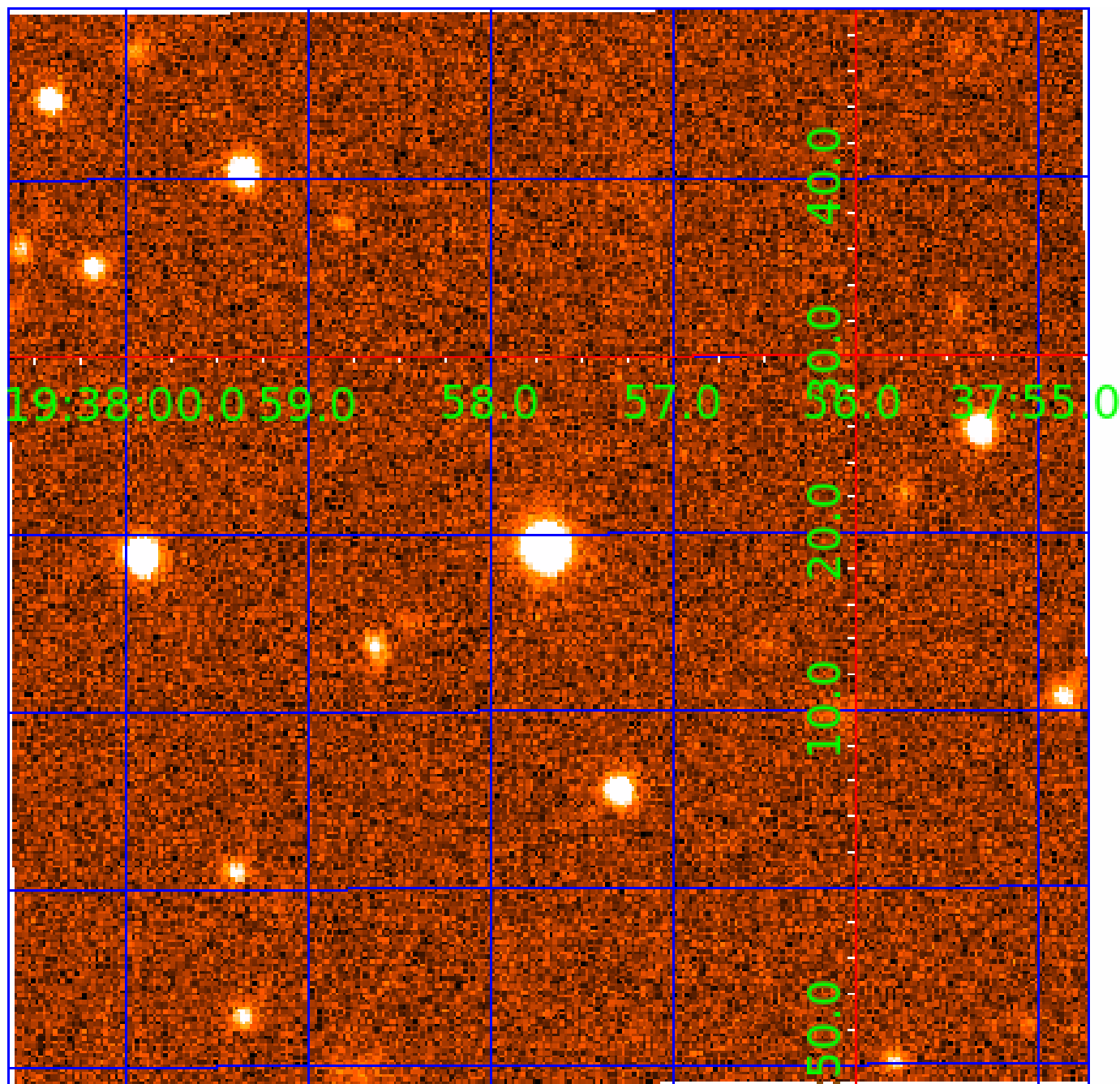


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009897464

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})
009897464-01	OBS	No	639.260434	255.018020	1259.2	12.290	14.3	5.6	0.94	5771	3.41	0.46
009897464-02	OBS	No	448.522569	405.726830	1530.0	5.415	12.0	8.4	0.94	5771	3.69	0.73
009897464-03	OBS	No	480.757165	235.563006	1213.3	3.650	11.4	7.0	0.94	5771	3.35	0.67
009897464-04	OBS	No	376.748350	300.934472	729.7	3.243	11.5	5.4	0.94	5771	3.21	0.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009897464-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009897464-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
009897464-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009897464-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

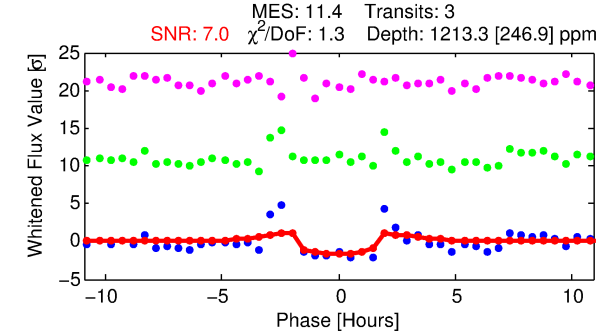
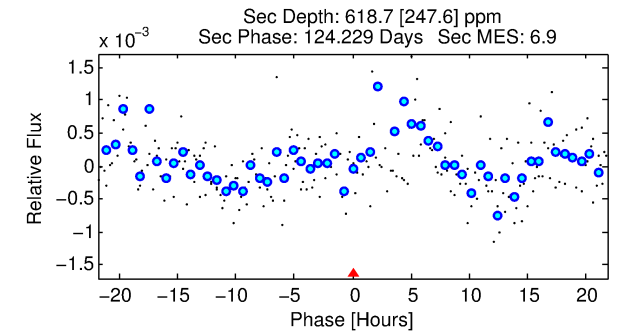
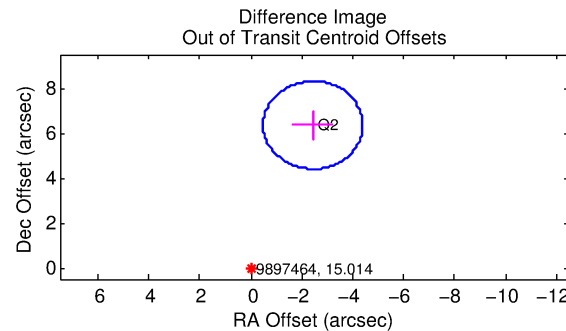
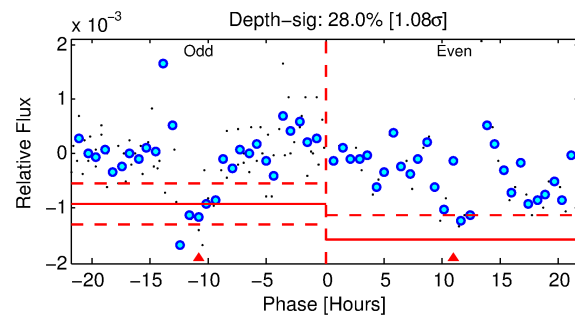
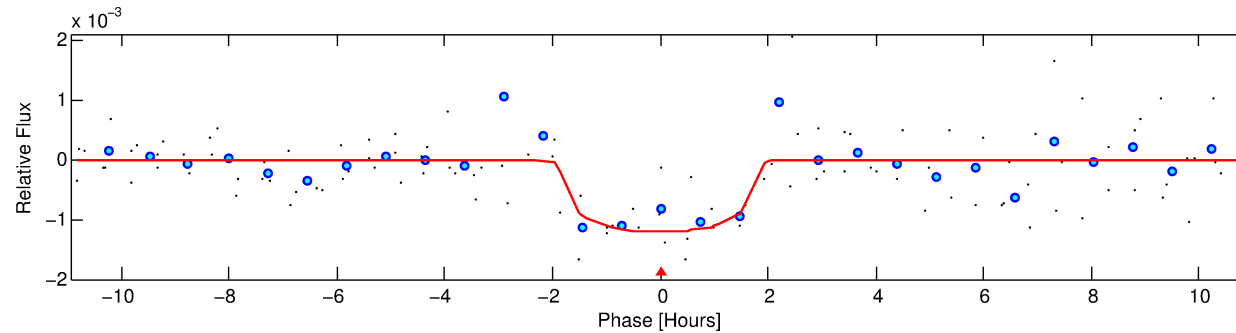
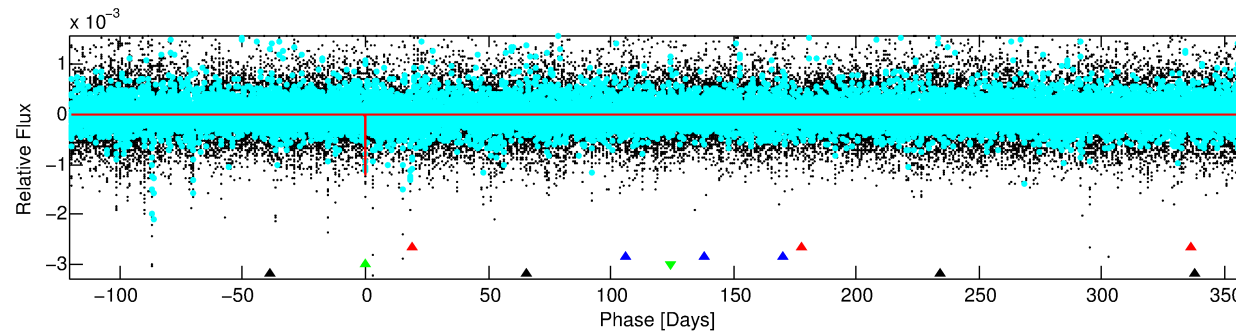
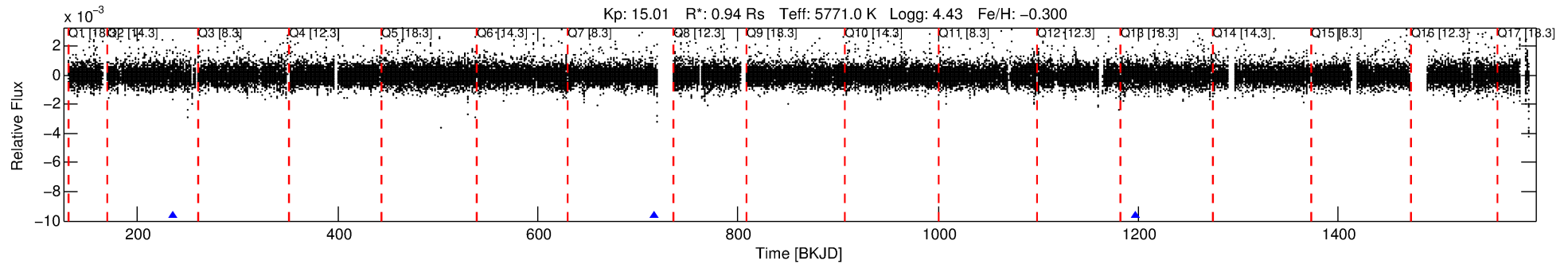
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009897464-03

No Significant Match Found

DV One-Page Summary

KIC: 9897464 Candidate: 3 of 4 Period: 480.757 d



DV Fit Results:

Period = 480.75716 [0.00682] d
Epoch = 235.5630 [0.0099] BKJD
Rp/R* = 0.0327 [0.0477]
a/R* = 911.36 [5959.23]
b = 0.50 [10.02]
Seff = 0.67 [0.24]
Teq = 231 [21] K
Rp = 3.35 [4.96] Re
a = 1.1432 [0.2604] AU
Ag = 39710.62 [117676.28] [0.34 σ]
Teffp = 5033 [3708] K [1.30 σ]

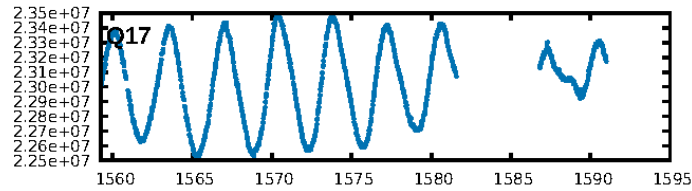
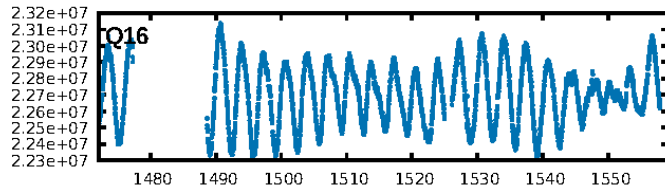
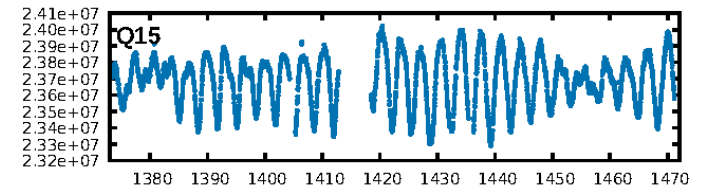
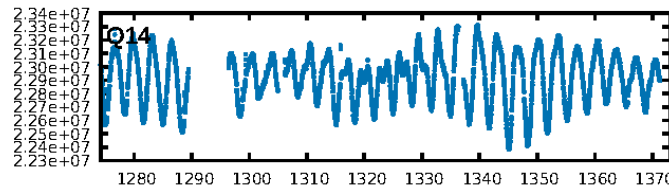
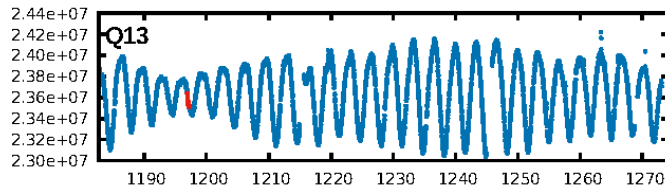
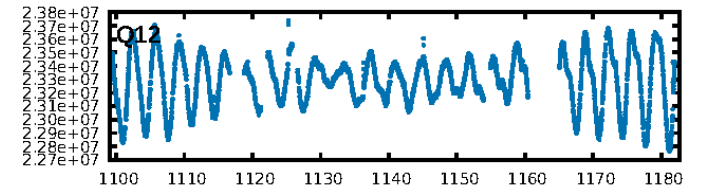
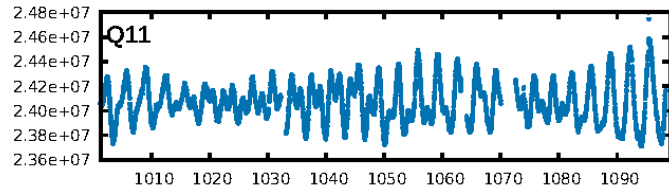
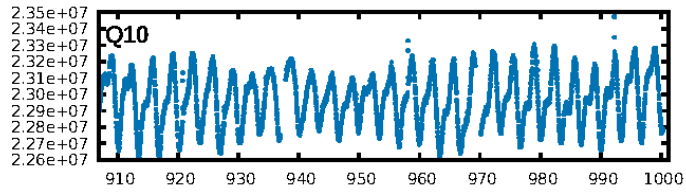
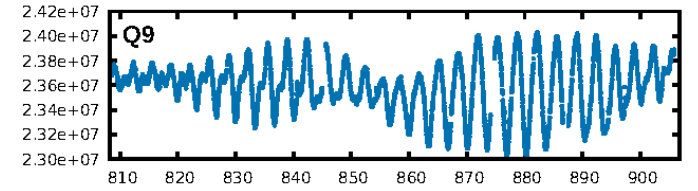
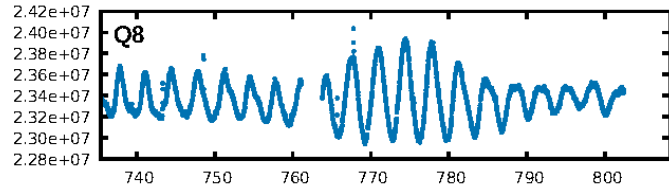
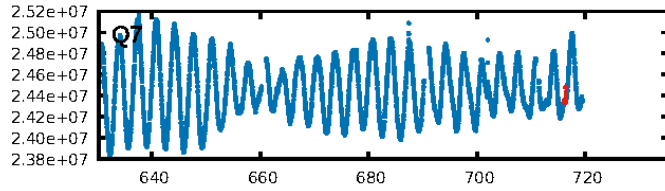
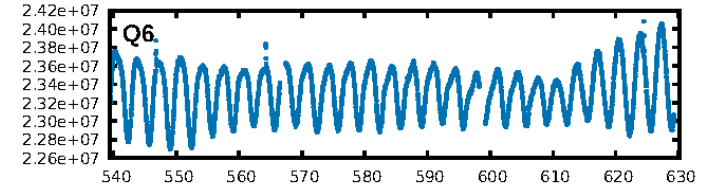
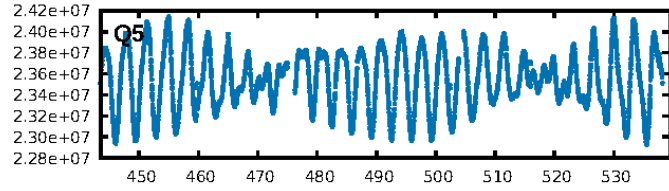
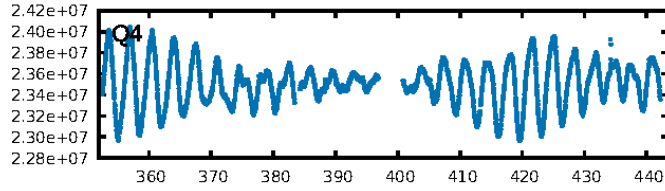
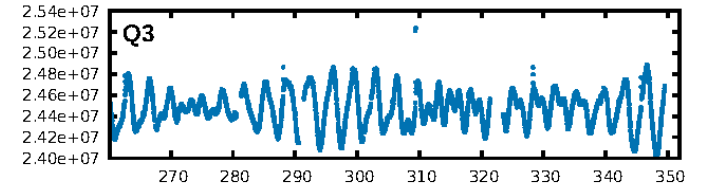
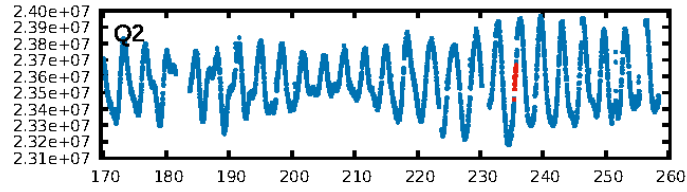
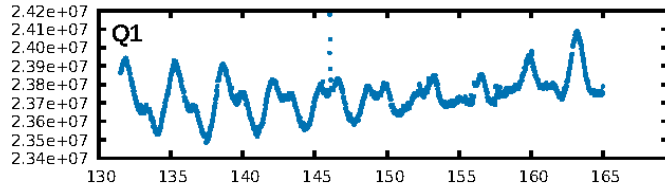
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [118.47 σ]
LongPeriod-sig: 100.0% [296.71 σ]
ModelChiSquare2-sig: 65.1%
ModelChiSquareGof-sig: 94.2%
Bootstrap-pfa: 4.33e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.7177
Centroid-sig: 14.3%
Centroid-so: 1.196 arcsec [1.06 σ]
OotOffset-rm: 6.802 arcsec [10.44 σ]
KicOffset-rm: 6.716 arcsec [10.32 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
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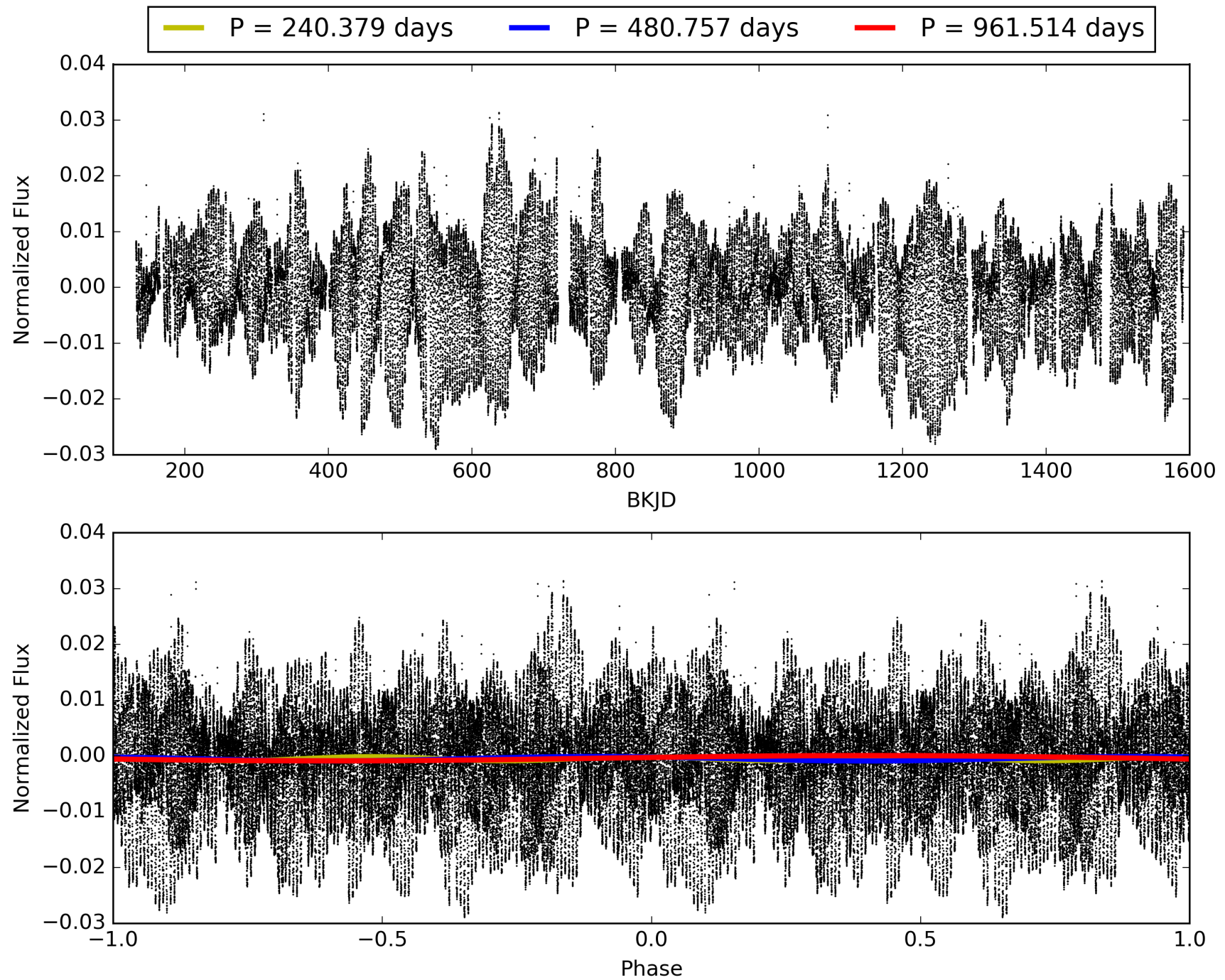
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:39:40 Z

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

TCE 009897464-03, PDC Light Curves

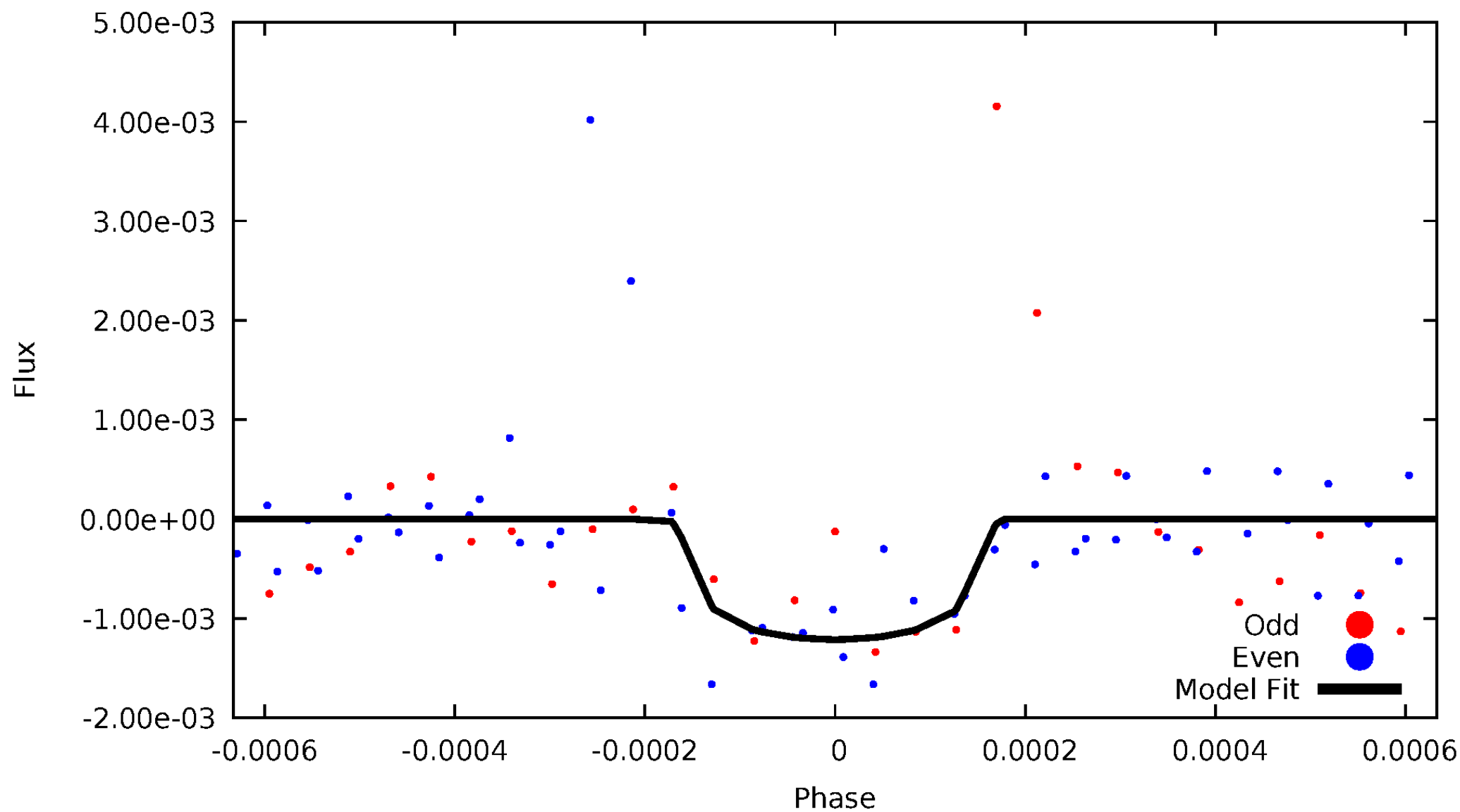


TCE 009897464-03



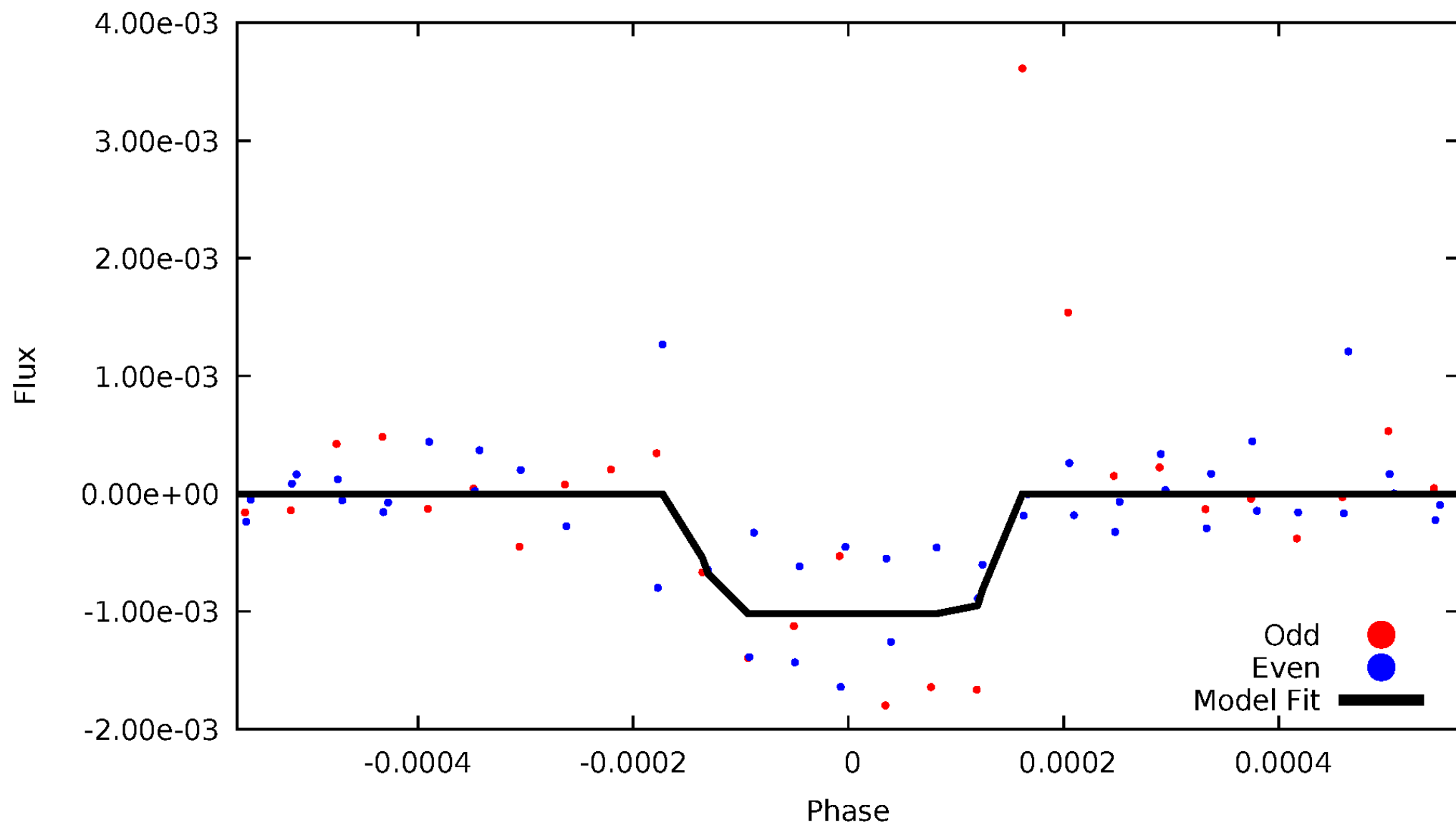
DV Odd/Even

TCE 009897464-03



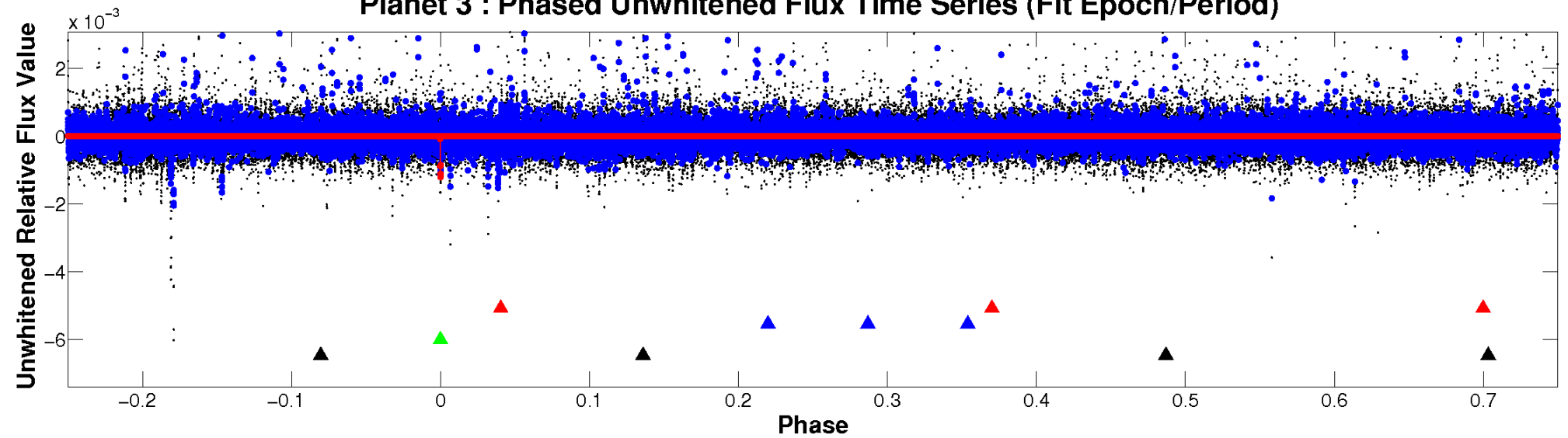
ALT Odd/Even

TCE 009897464-03

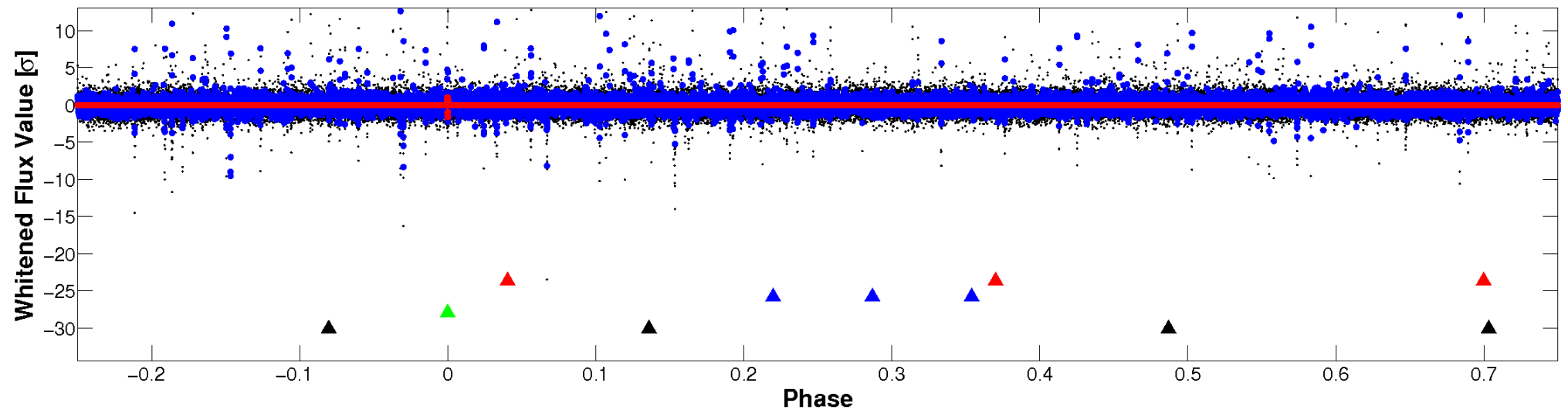


Non-Whitened Vs. Whitened Light Curve

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

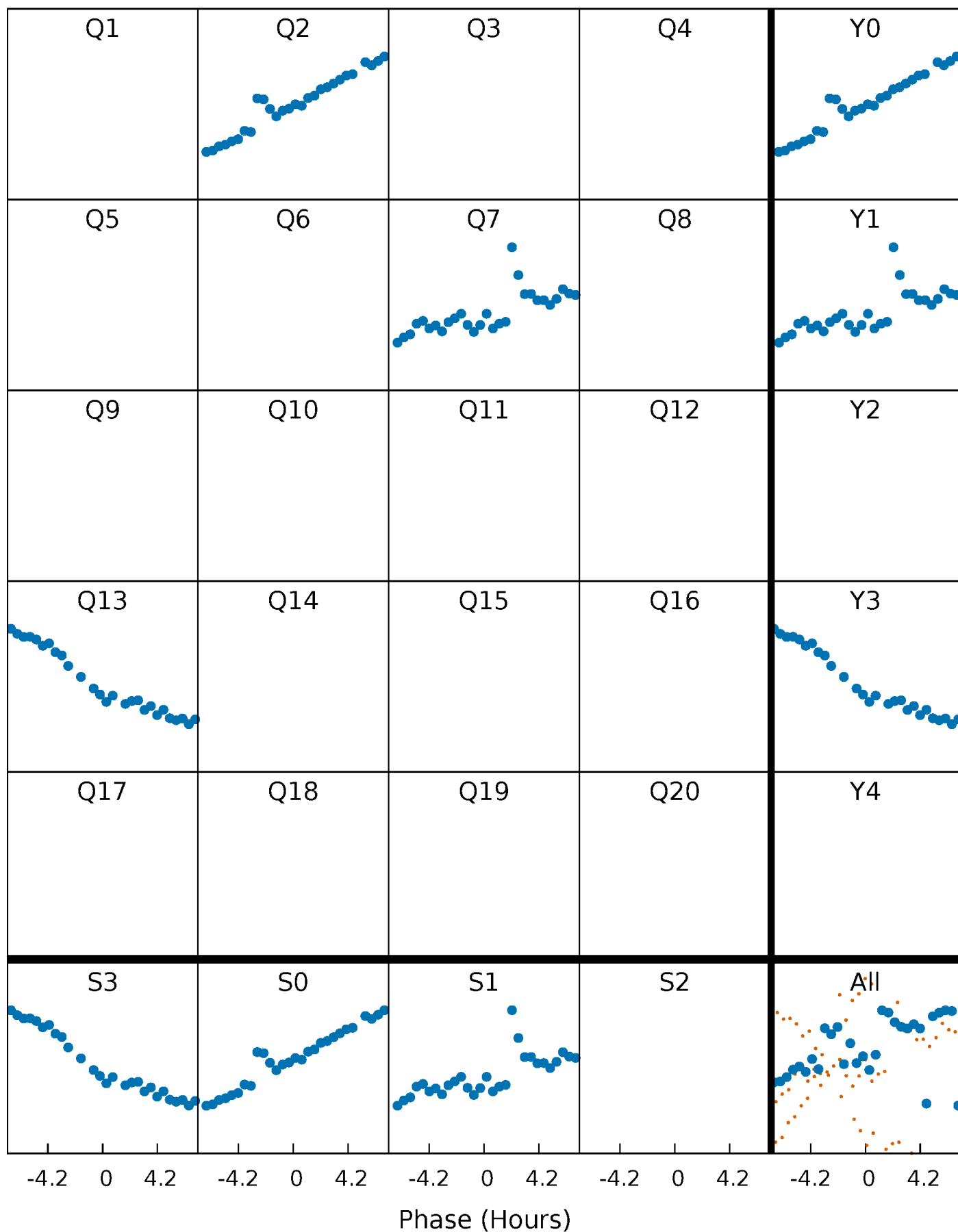


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



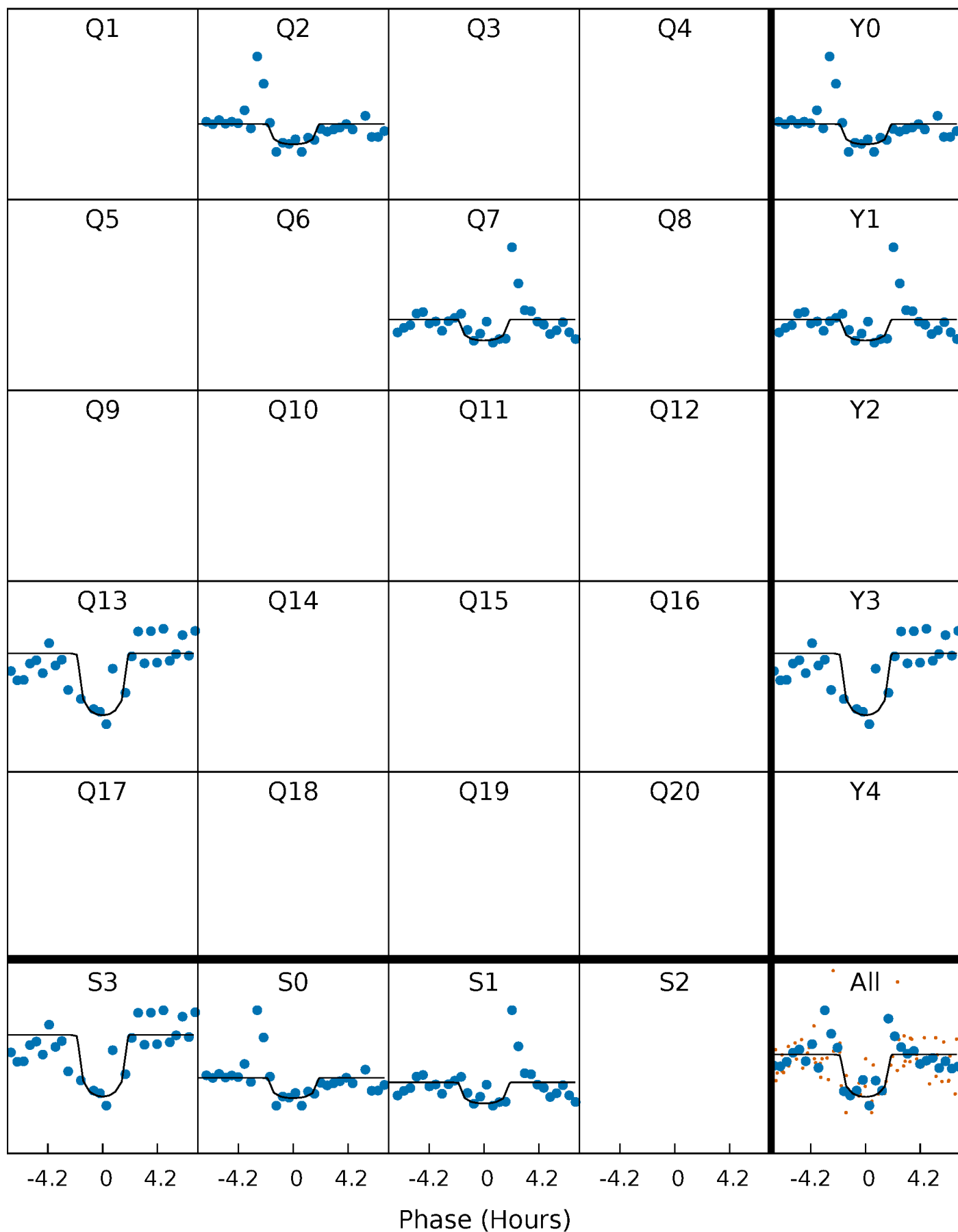
PDC Quarter-Phased Transit Curves

TCE 009897464-03 P=480.757165 Days $T_0=235.563006$ (BKJD)



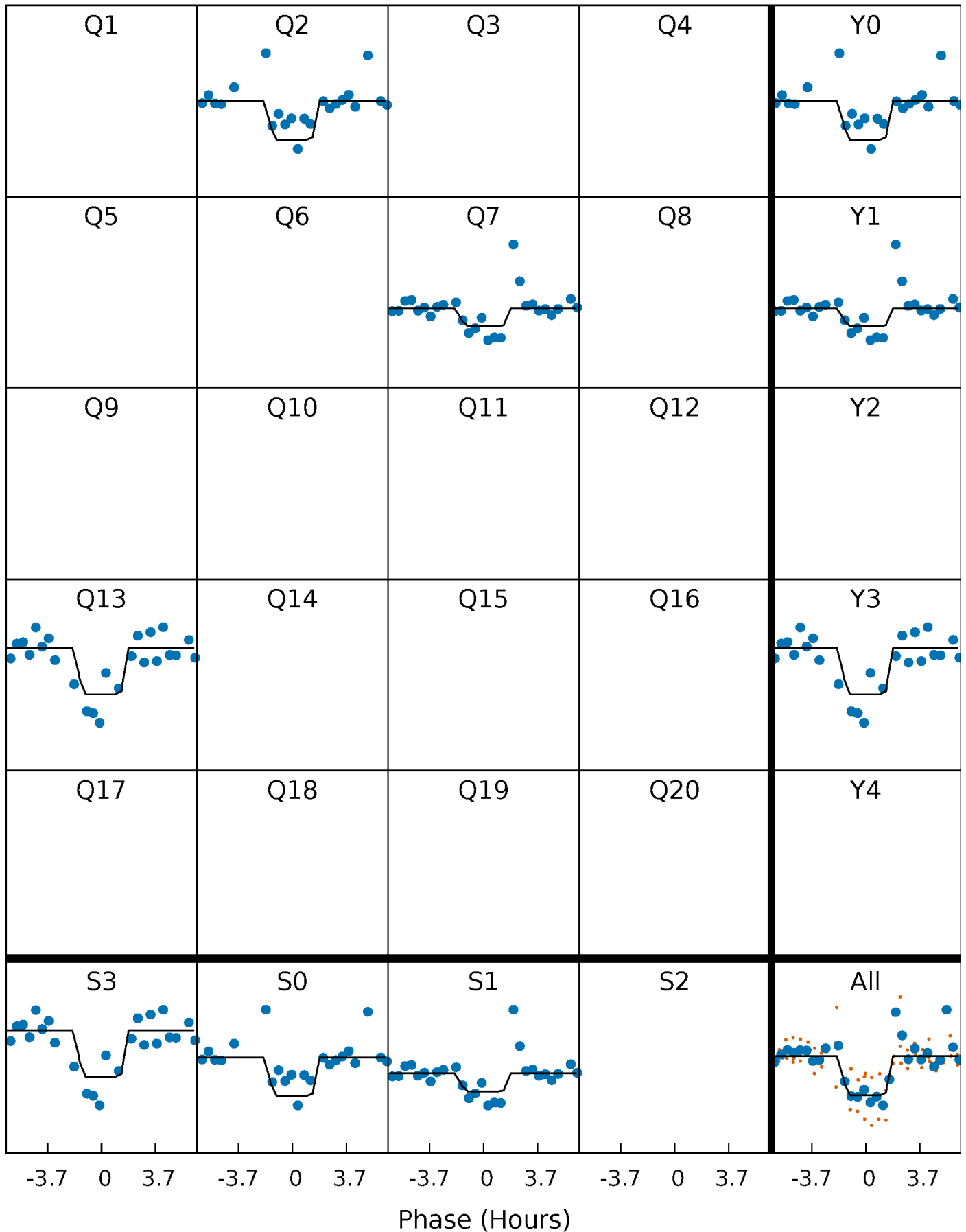
DV Quarter-Phased Transit Curves

TCE 009897464-03 $P=480.757165$ Days $T_0=235.563006$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

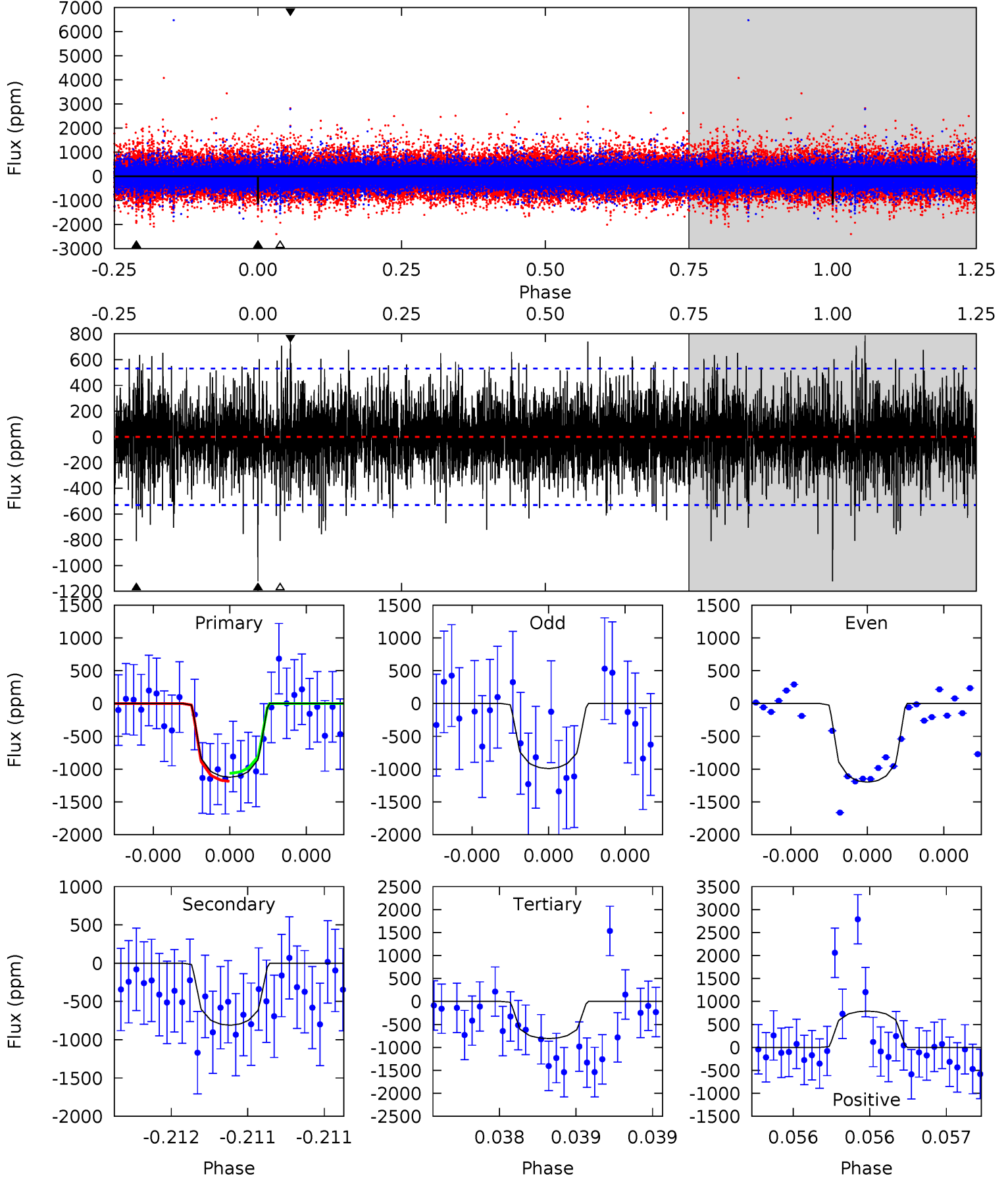
TCE 009897464-03 P=480.760800 Days $T_0=235.563305$ (BKJD)



DV Model-Shift Uniqueness Test

009897464-03, P = 480.757165 Days, E = 235.563006 Days

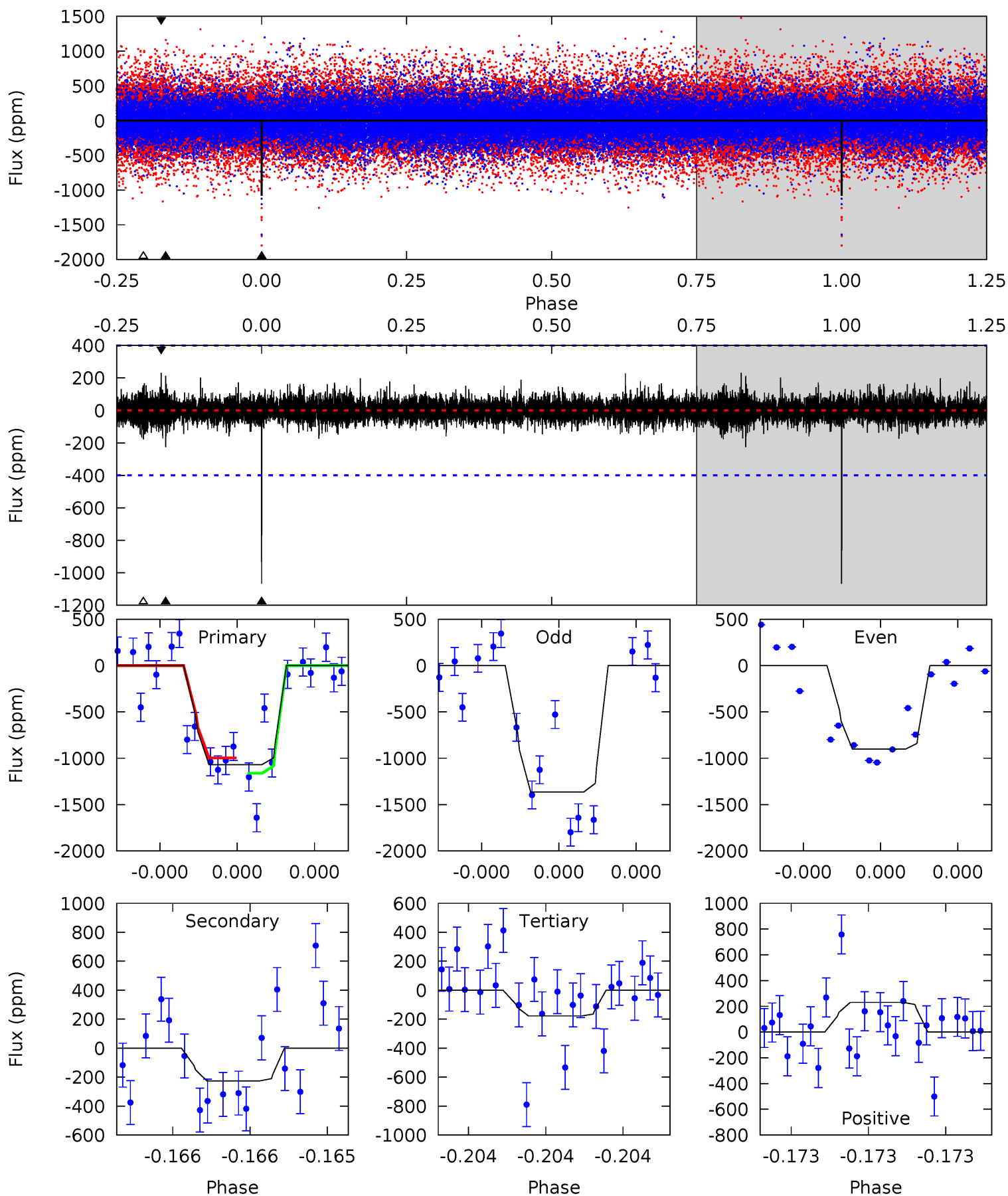
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	8.60	8.58	8.39	5.64	3.58	1.97	3.36	3.55	0.03	0.21	0.91	1.04	0.41	0.65



Alt Model-Shift Uniqueness Test

009897464-03, P = 480.760800 Days, E = 235.563305 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	3.21	2.53	3.28	5.69	3.66	0.57	12.7	11.9	0.68	-0.07	3.17	0.90	0.18	1.17



Stellar Parameters For KIC 009897464

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5771^{+155}_{-172}	$4.429^{+0.116}_{-0.188}$	$-0.300^{+0.300}_{-0.300}$	$0.938^{+0.248}_{-0.134}$	$0.861^{+0.118}_{-0.082}$	$1.470^{+0.776}_{-0.684}$
	+3%/-3%	+3%/-4%	+100%/-100%	+26%/-14%	+14%/-10%	+53%/-47%
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 009897464-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-809 ± 94	$4.96^{+4.49}_{-3.33}$	324^{+23}_{-18}	4616^{+3411}_{-934}	$23982^{+196082}_{-17449}$
Alt.	-225 ± 70	$5.12^{+4.63}_{-3.41}$	325^{+22}_{-18}	3613^{+1740}_{-669}	6101^{+43974}_{-4528}

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

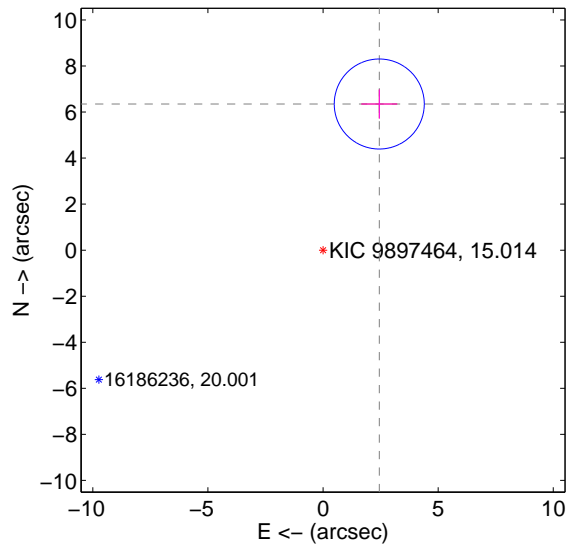
Supplemental centroid analysis for 009897464-03. Kepler magnitude: 15.01. Transit SNR 7.04

There are 0 quarters with good PRF difference image offsets

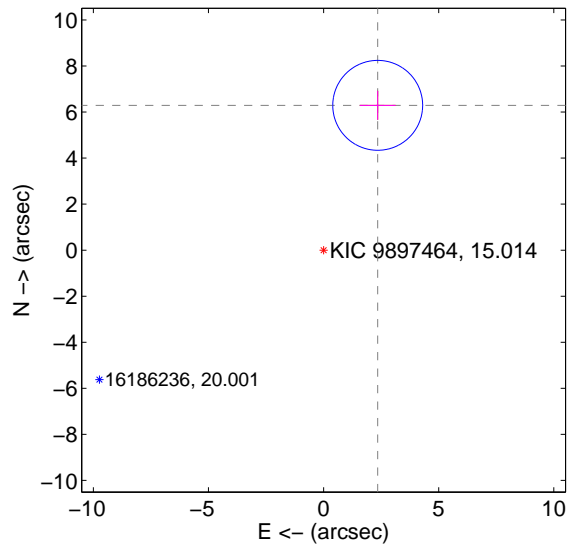
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.802 ± 0.652	10.44	-2.442 ± 0.779	6.348 ± 0.631
PRF-fit source offset from KIC position	6.716 ± 0.651	10.32	-2.351 ± 0.779	6.291 ± 0.631
photometric centroid source offset	1.20 ± 1.13	1.06	-0.02 ± 1.10	-1.20 ± 1.13

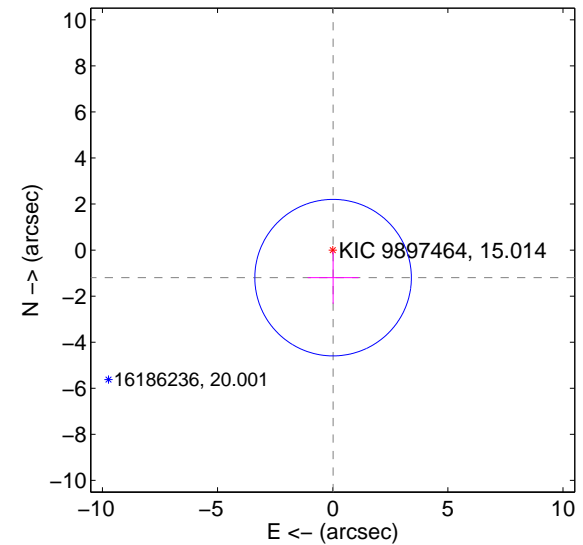
offset from difference PRF-fit to OOT PRF-fit



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.

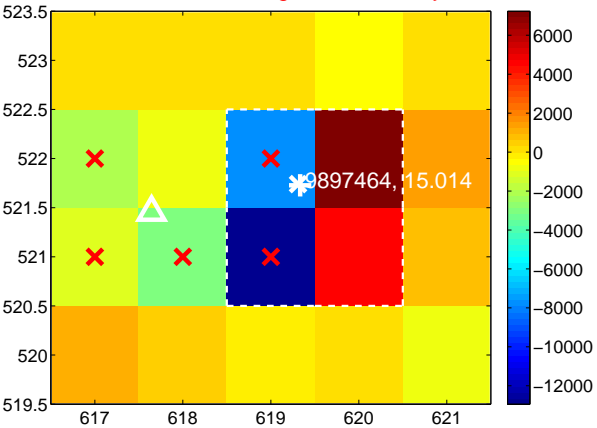
Q1 no difference image



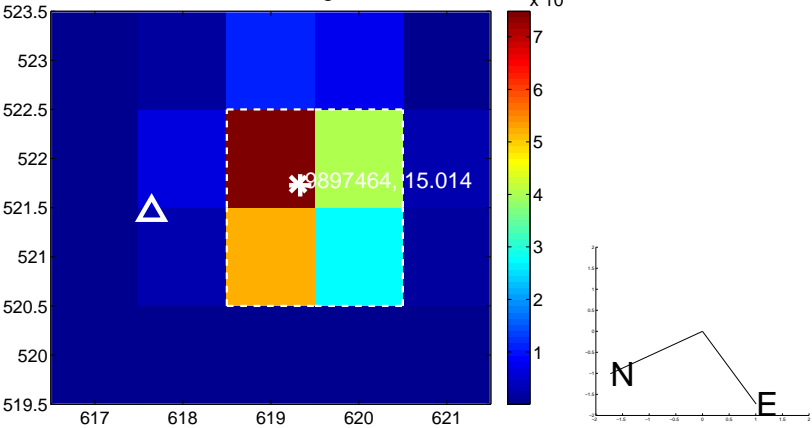
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



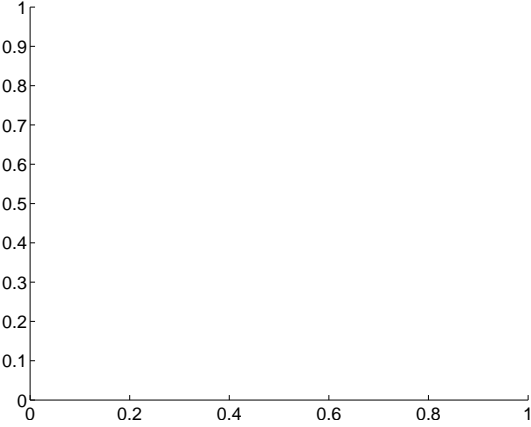
Q3 no difference image



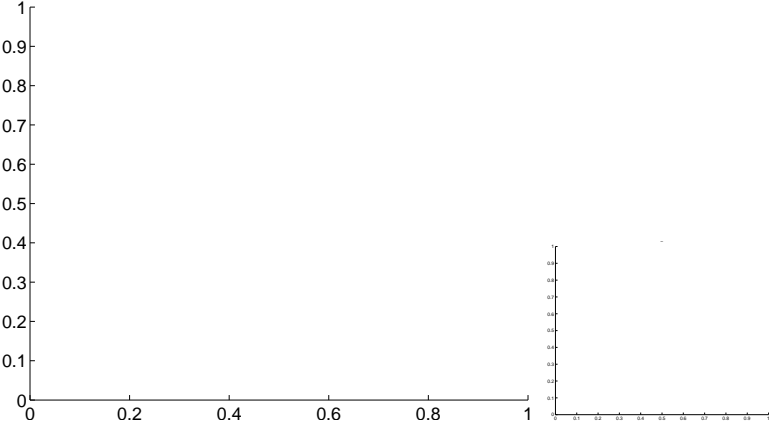
Q3 no OOT image



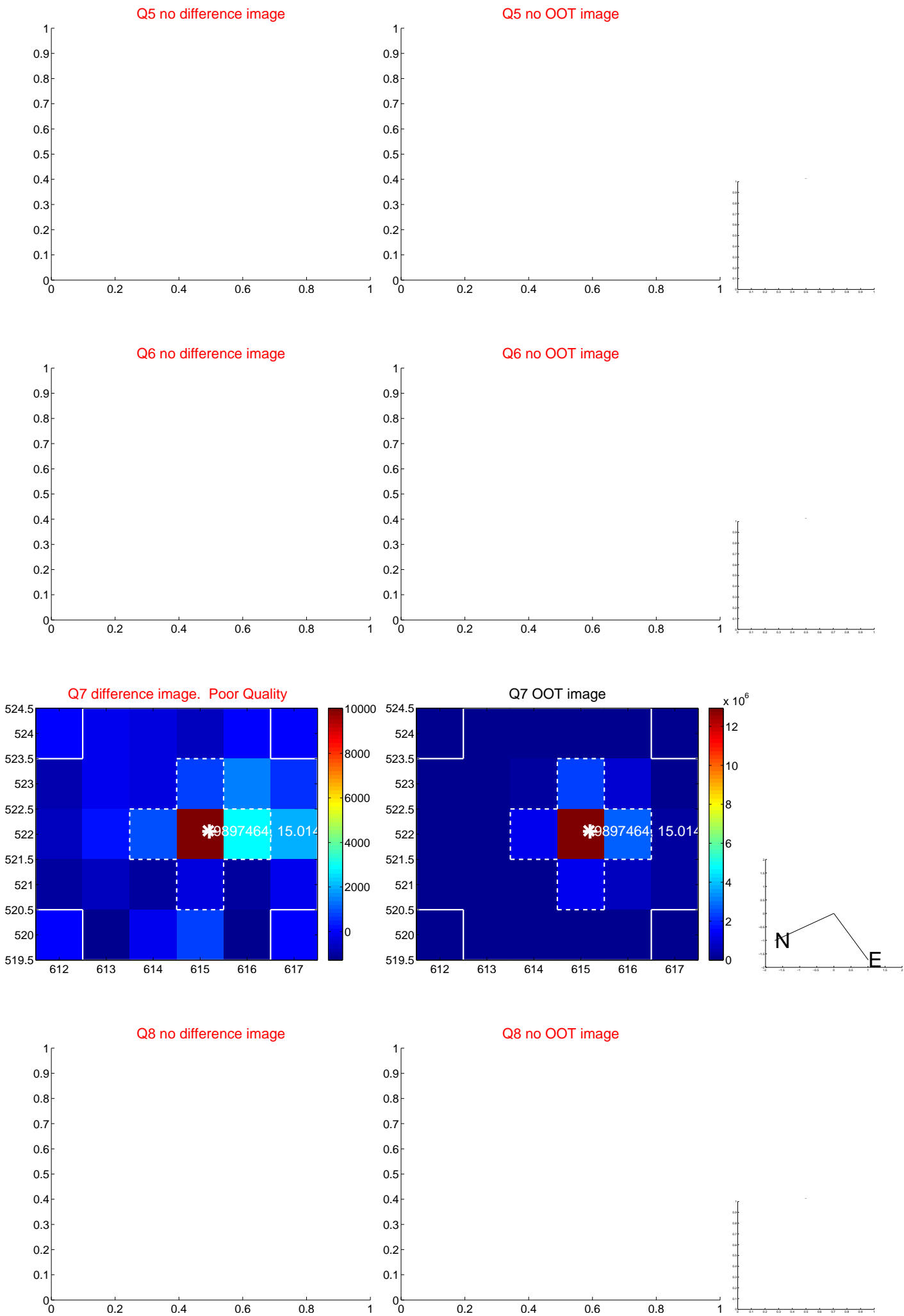
Q4 no difference image



Q4 no OOT image



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



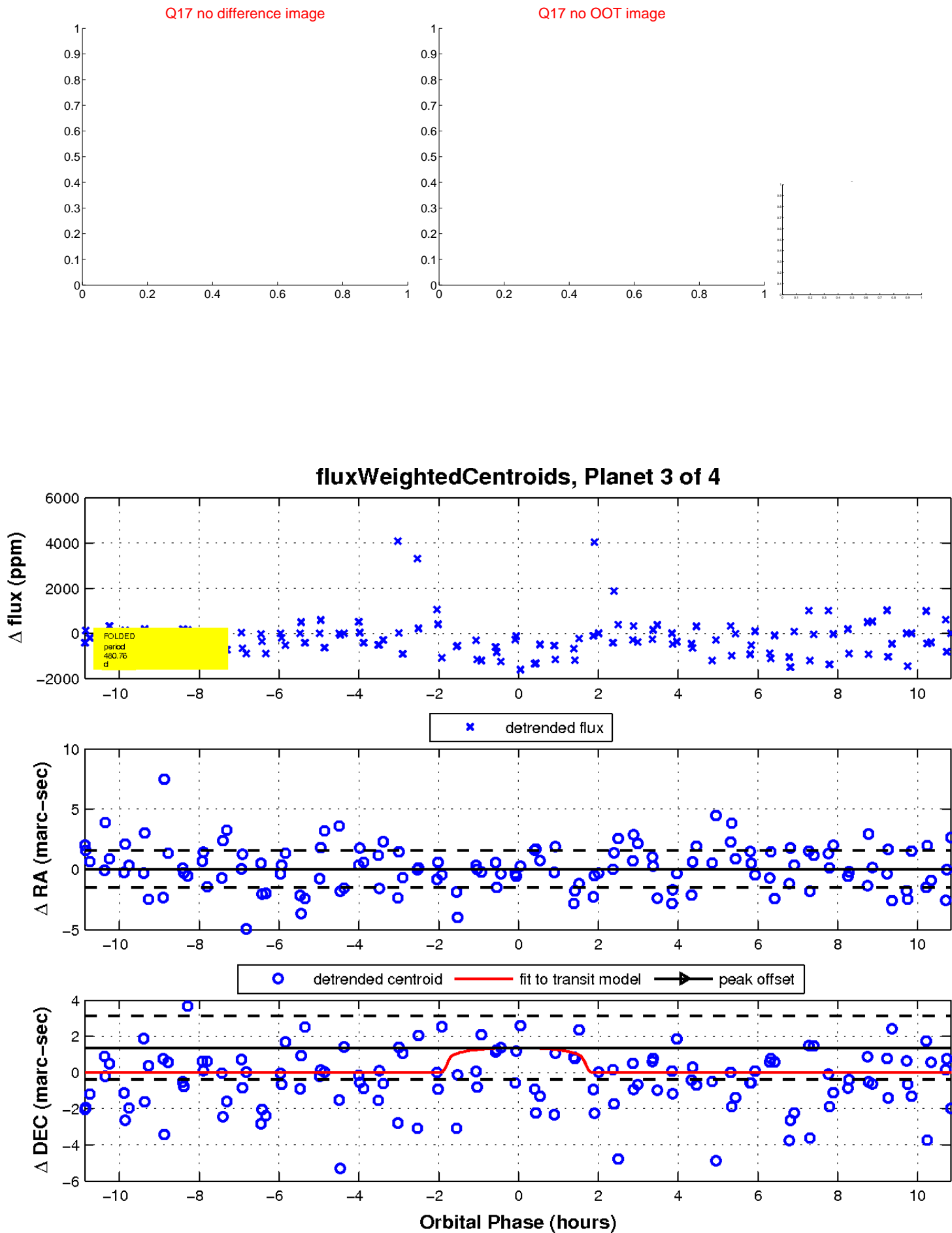
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

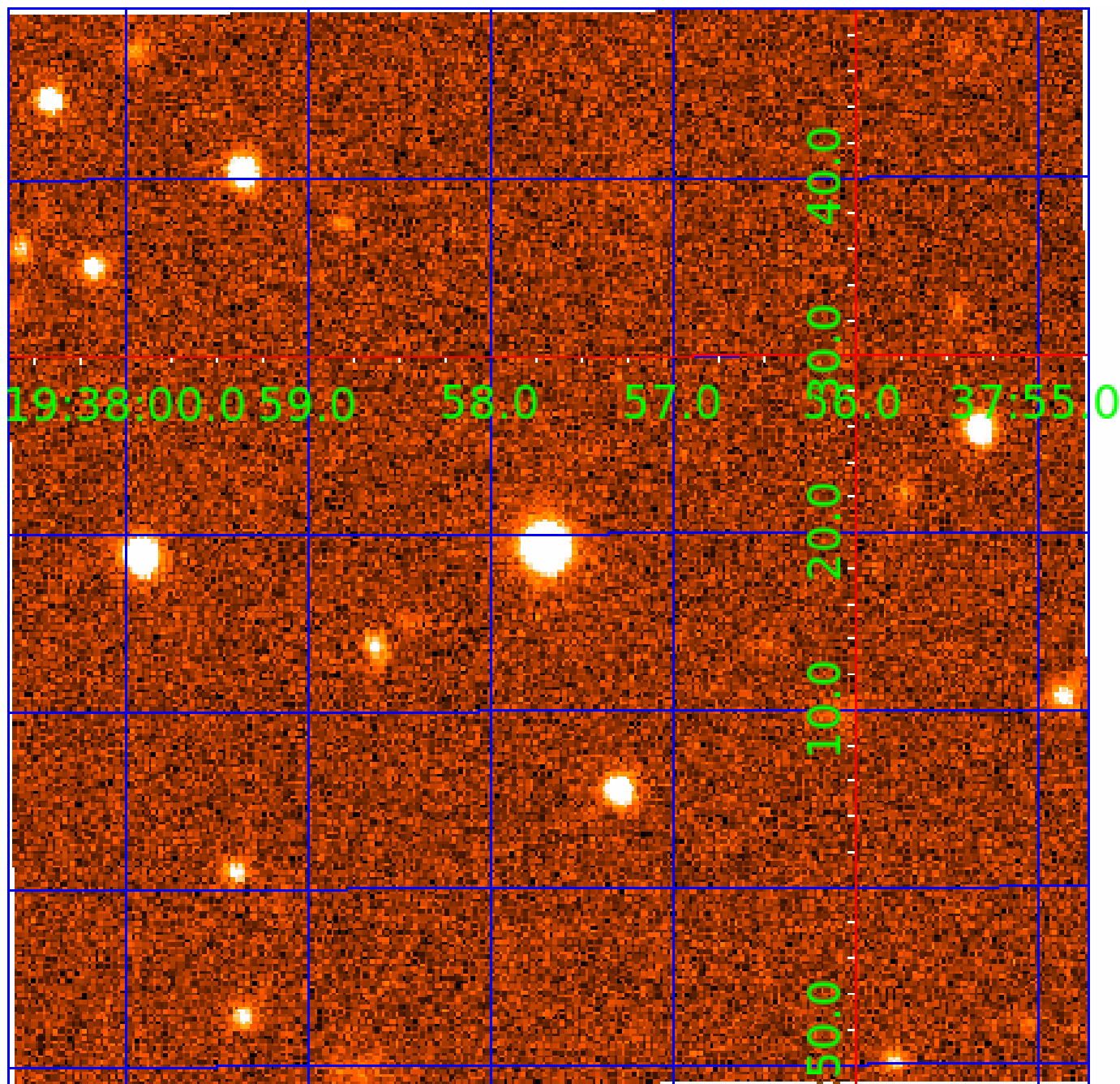


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009897464

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})
009897464-01	OBS	No	639.260434	255.018020	1259.2	12.290	14.3	5.6	0.94	5771	3.41	0.46
009897464-02	OBS	No	448.522569	405.726830	1530.0	5.415	12.0	8.4	0.94	5771	3.69	0.73
009897464-03	OBS	No	480.757165	235.563006	1213.3	3.650	11.4	7.0	0.94	5771	3.35	0.67
009897464-04	OBS	No	376.748350	300.934472	729.7	3.243	11.5	5.4	0.94	5771	3.21	0.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009897464-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009897464-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
009897464-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009897464-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

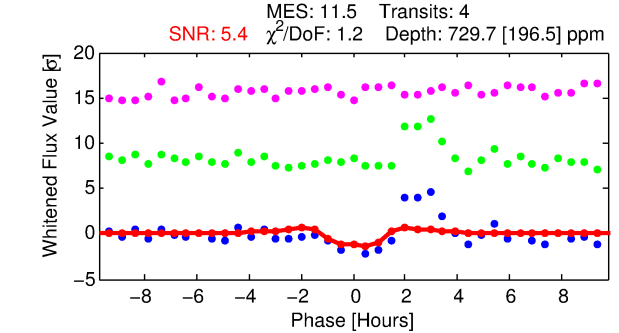
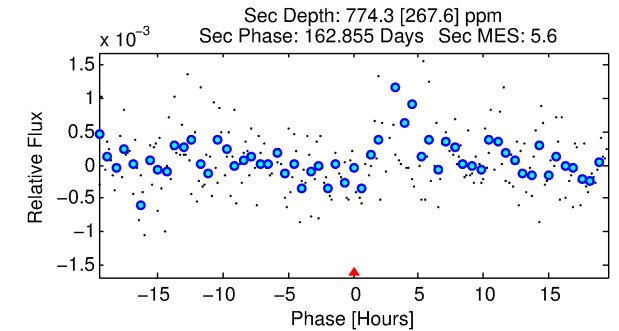
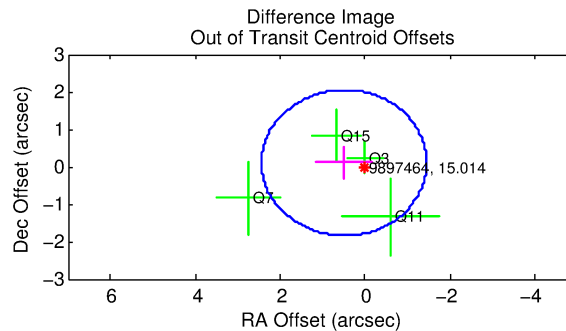
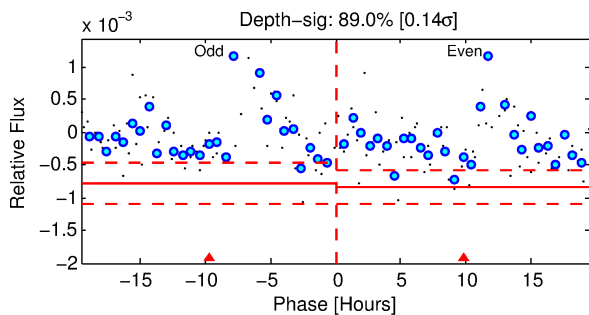
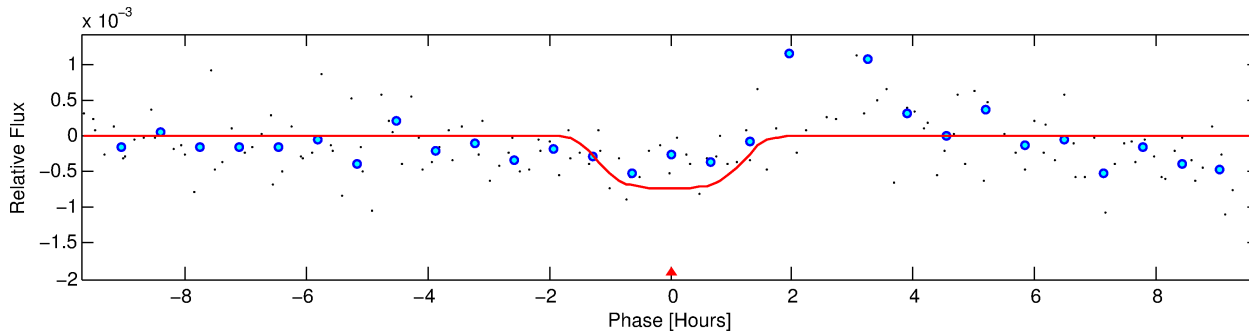
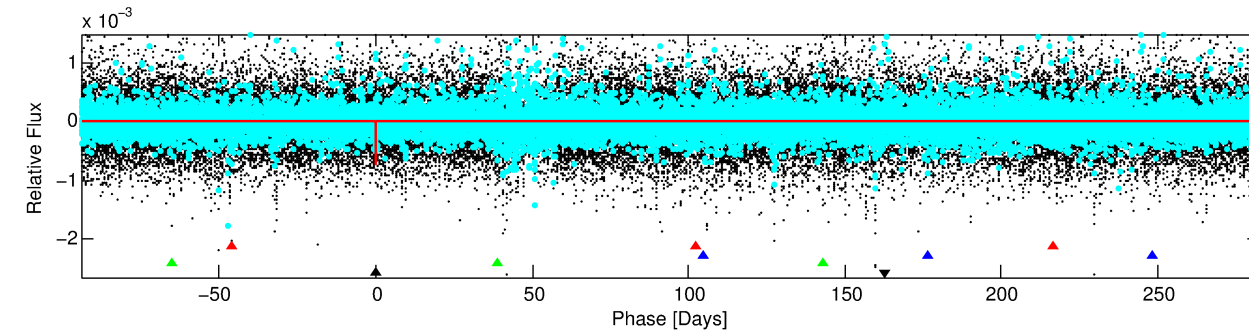
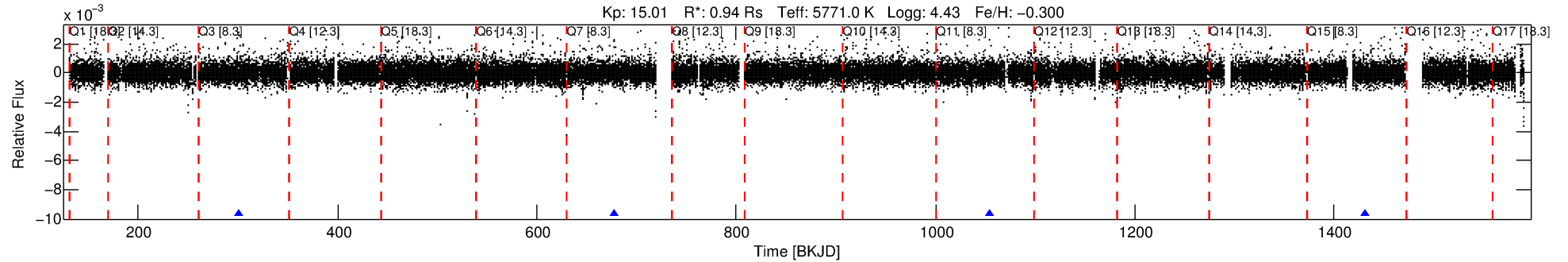
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009897464-04

No Significant Match Found

DV One-Page Summary

KIC: 9897464 Candidate: 4 of 4 Period: 376.748 d



DV Fit Results:

Period = 376.74835 [0.00570] d
Epoch = 300.9345 [0.0118] BKJD
Rp/R* = 0.0313 [0.0068]
a/R* = 356.94 [218.86]
b = 0.95 [0.07]
Seff = 0.93 [0.33]
Teff = 250 [22] K
Rp = 3.21 [1.09] Re
a = 0.9717 [0.2213] AU
Ag = 39134.21 [25380.41] [1.54 σ]
Teffp = 5440 [770] K [6.74 σ]

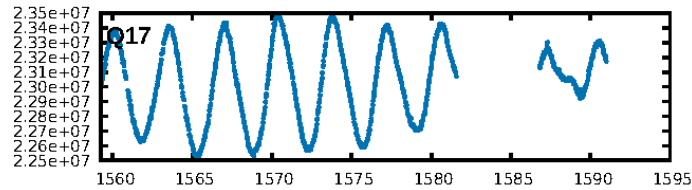
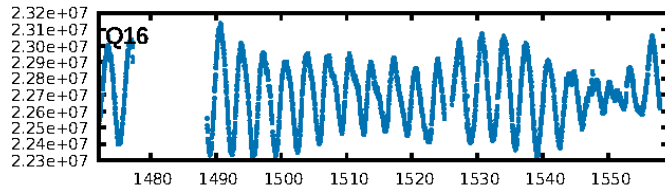
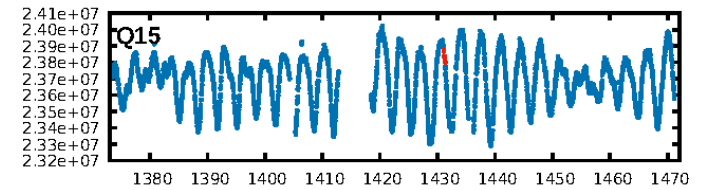
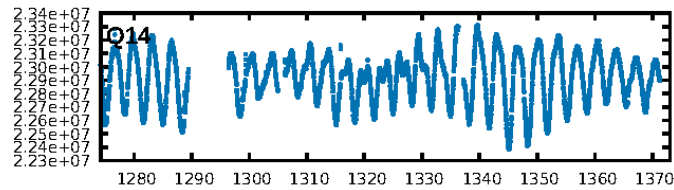
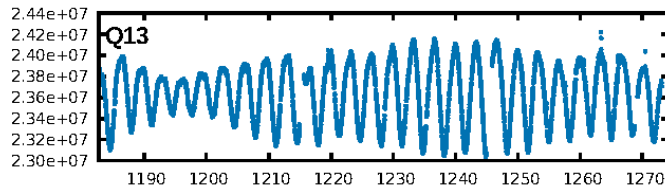
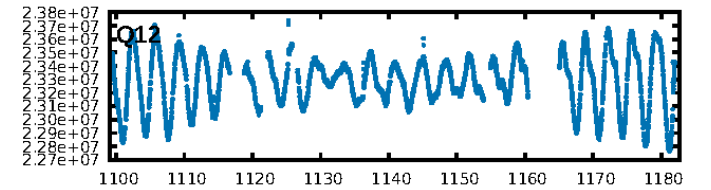
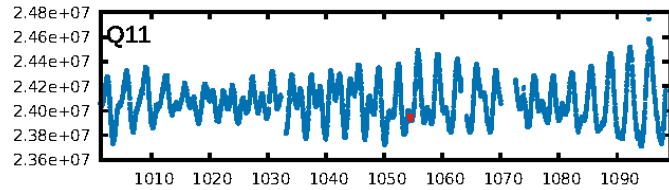
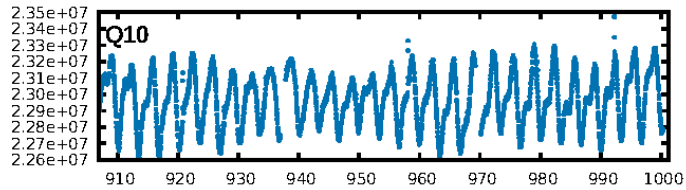
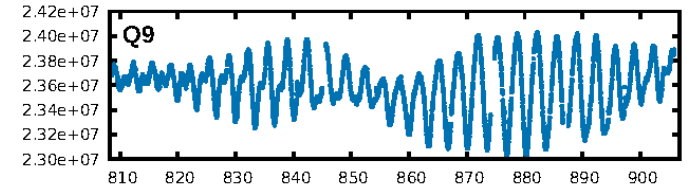
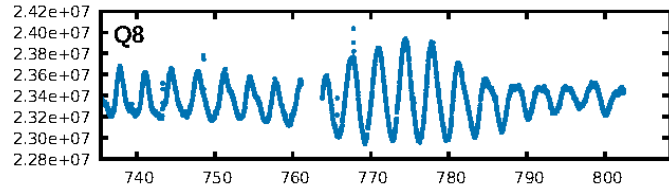
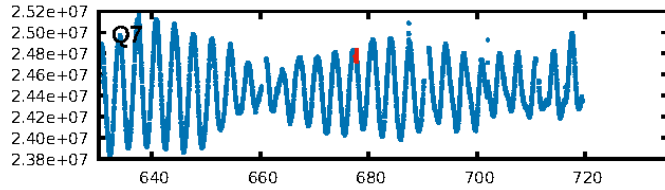
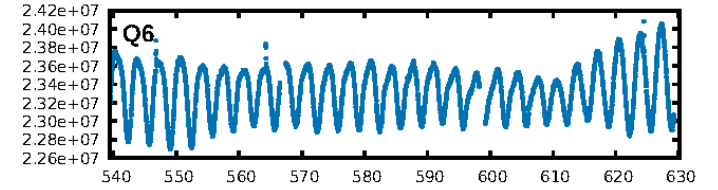
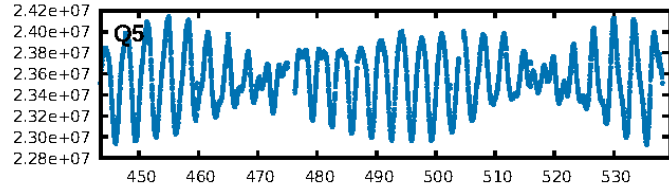
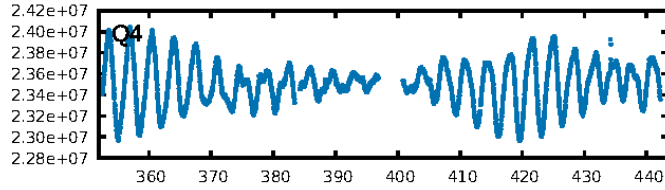
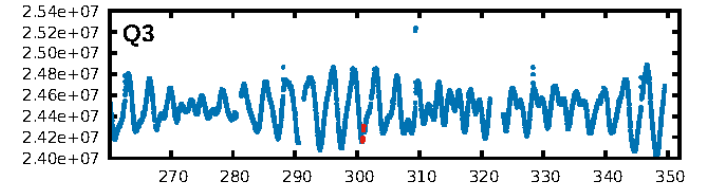
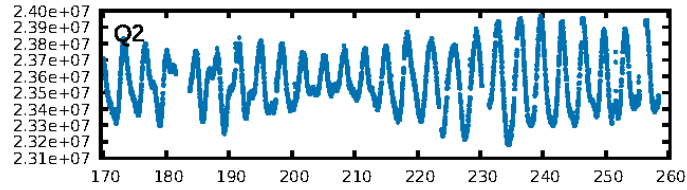
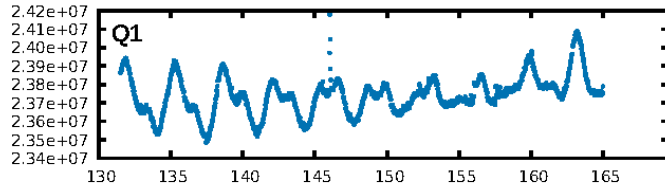
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [272.92 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 54.7%
Bootstrap-pfa: 4.11e-12
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -3.34
Centroid-sig: 46.5%
Centroid-so: 1.806 arcsec [0.88 σ]
OotOffset-rm: 0.501 arcsec [0.77 σ]
KicOffset-rm: 0.567 arcsec [0.86 σ]
OotOffset-st: 0/4/0/0 [4]
KicOffset-st: 0/4/0/0 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [4/4]

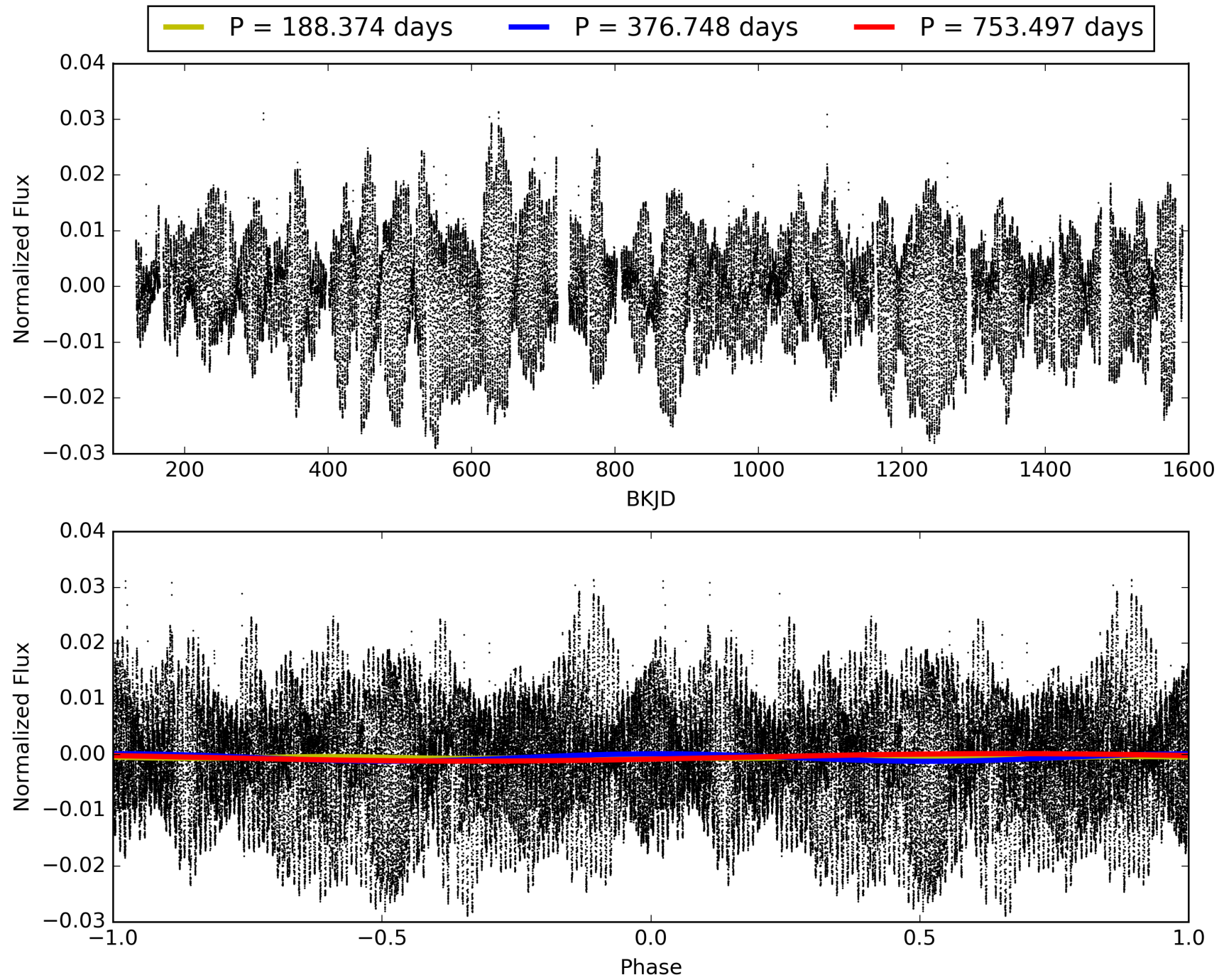
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:39:58 Z

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

TCE 009897464-04, PDC Light Curves

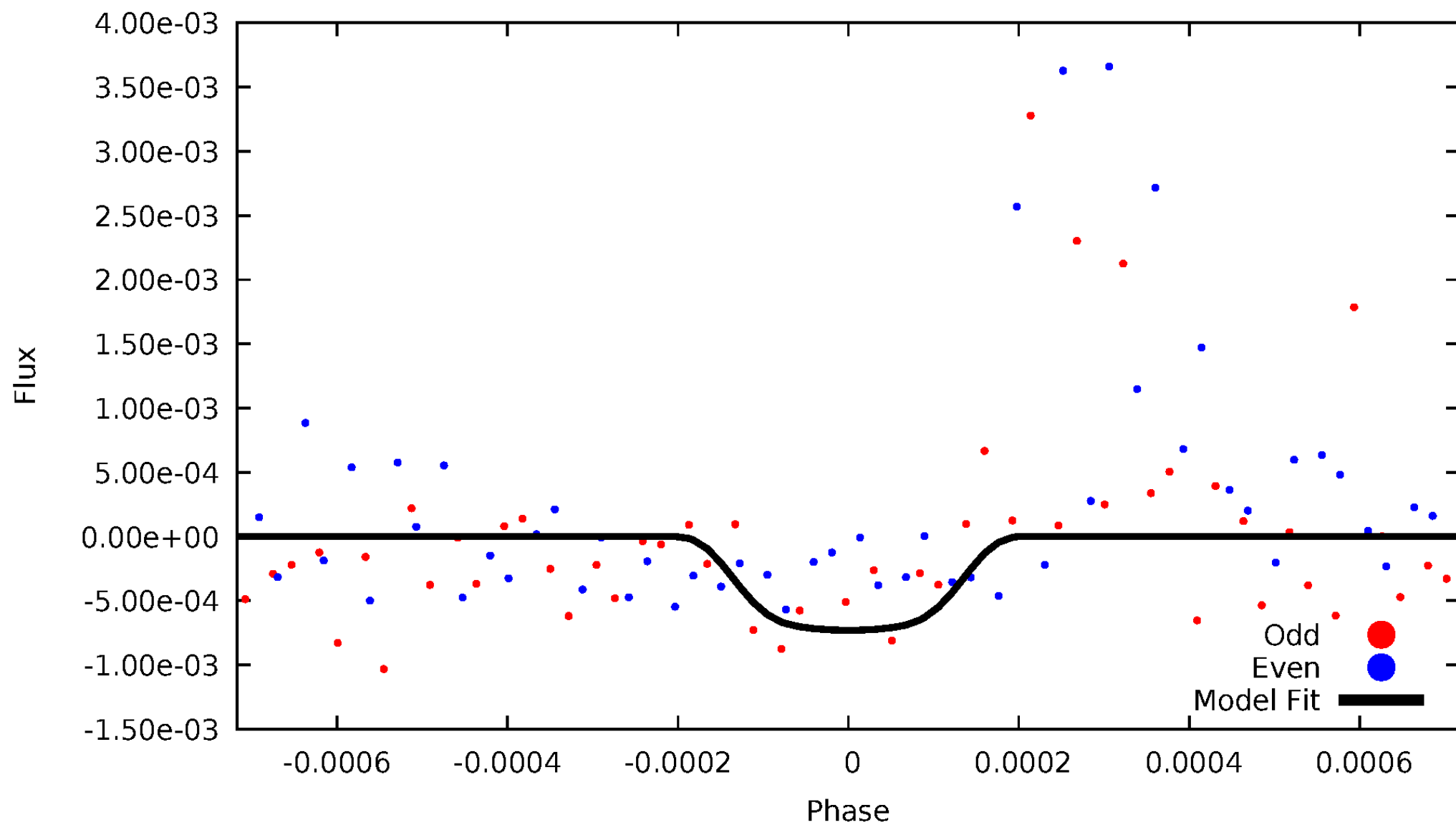


TCE 009897464-04



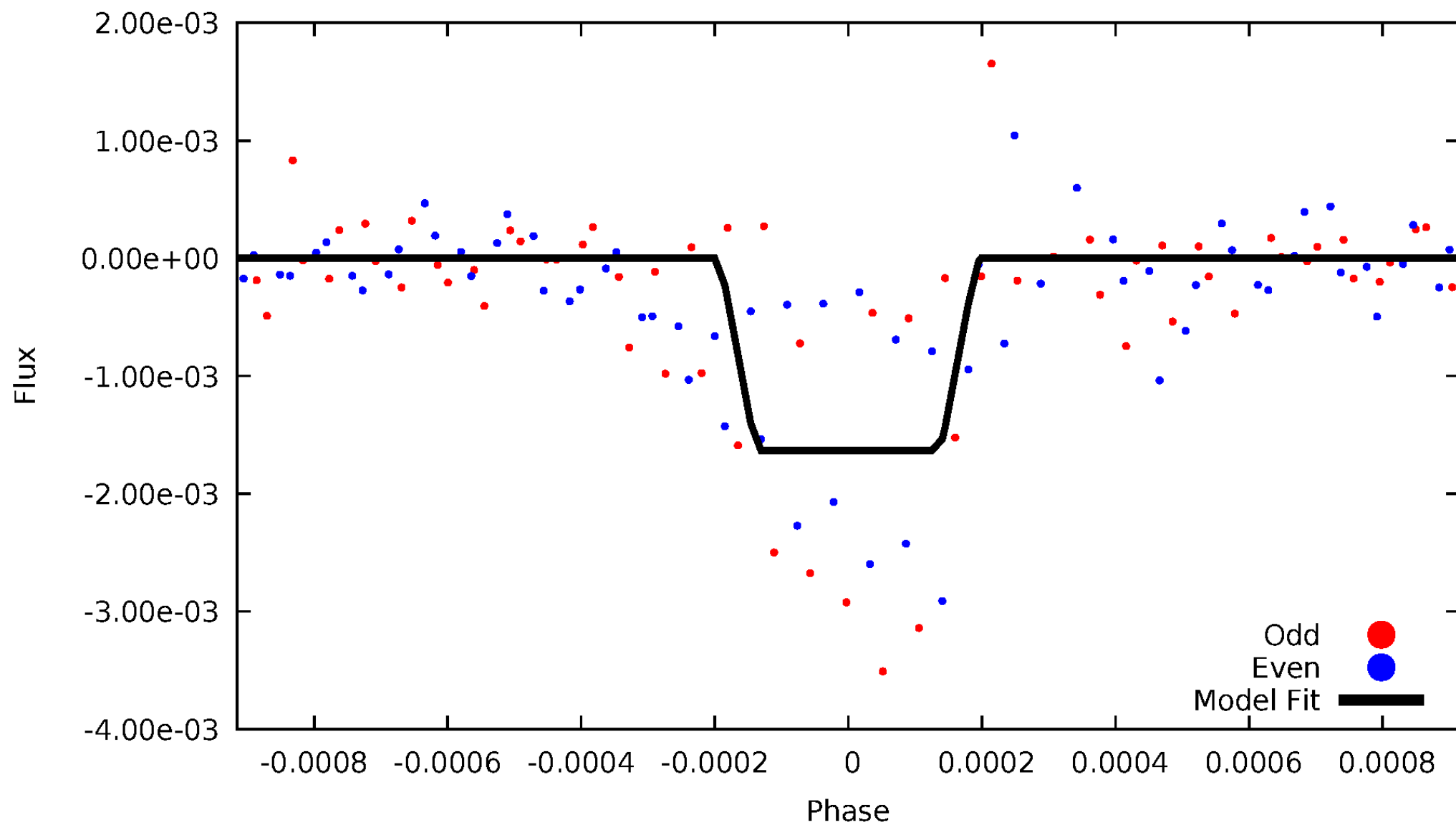
DV Odd/Even

TCE 009897464-04



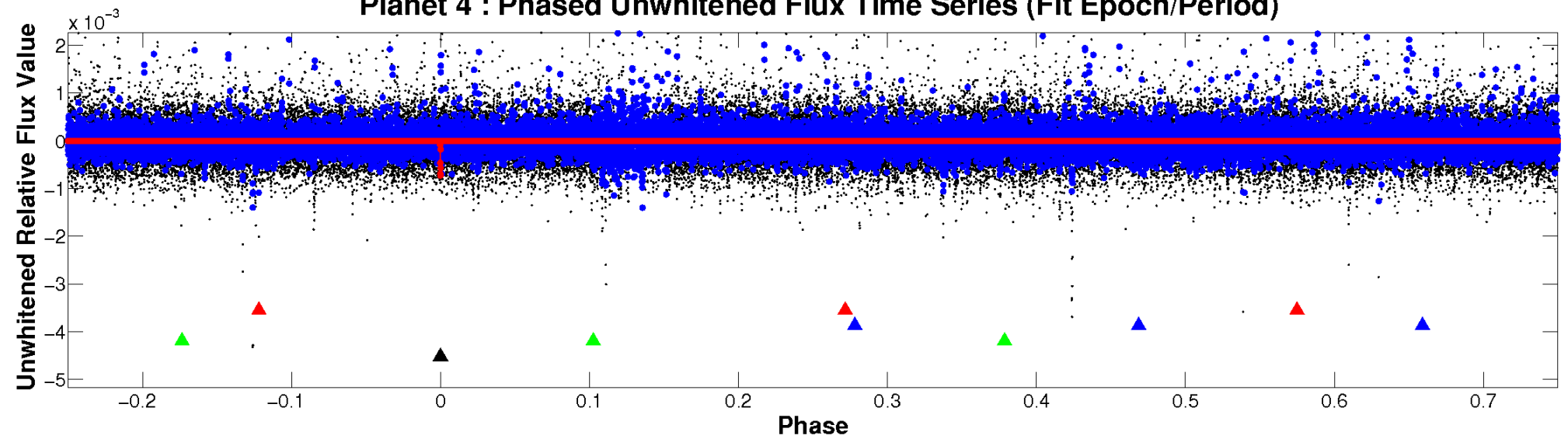
ALT Odd/Even

TCE 009897464-04

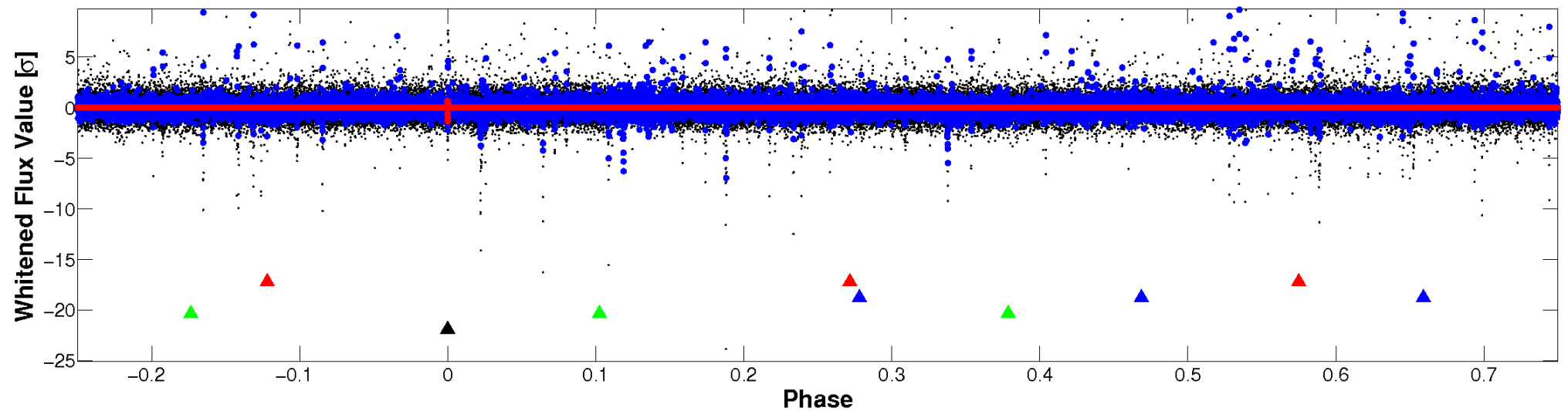


Non-Whitened Vs. Whitened Light Curve

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

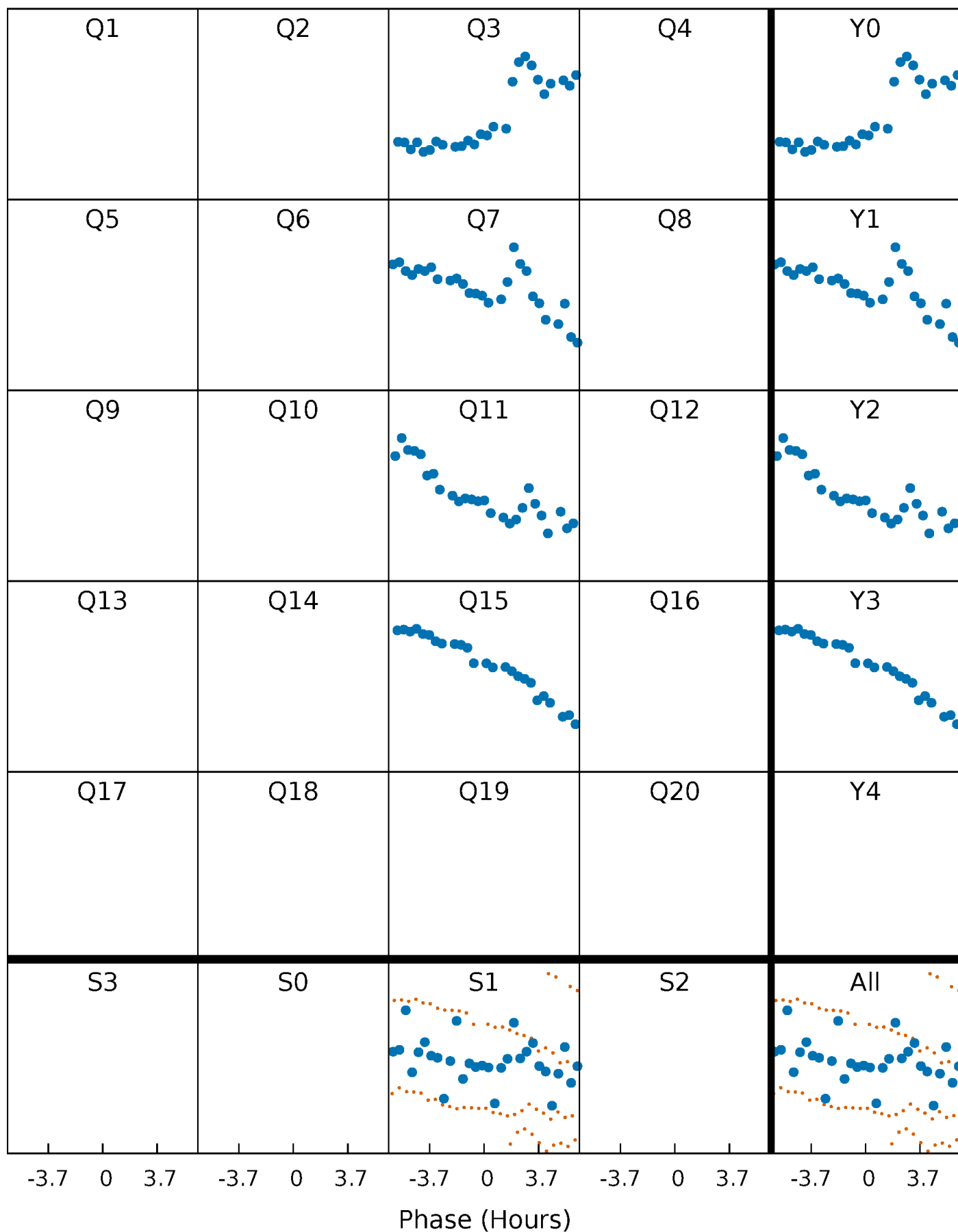


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



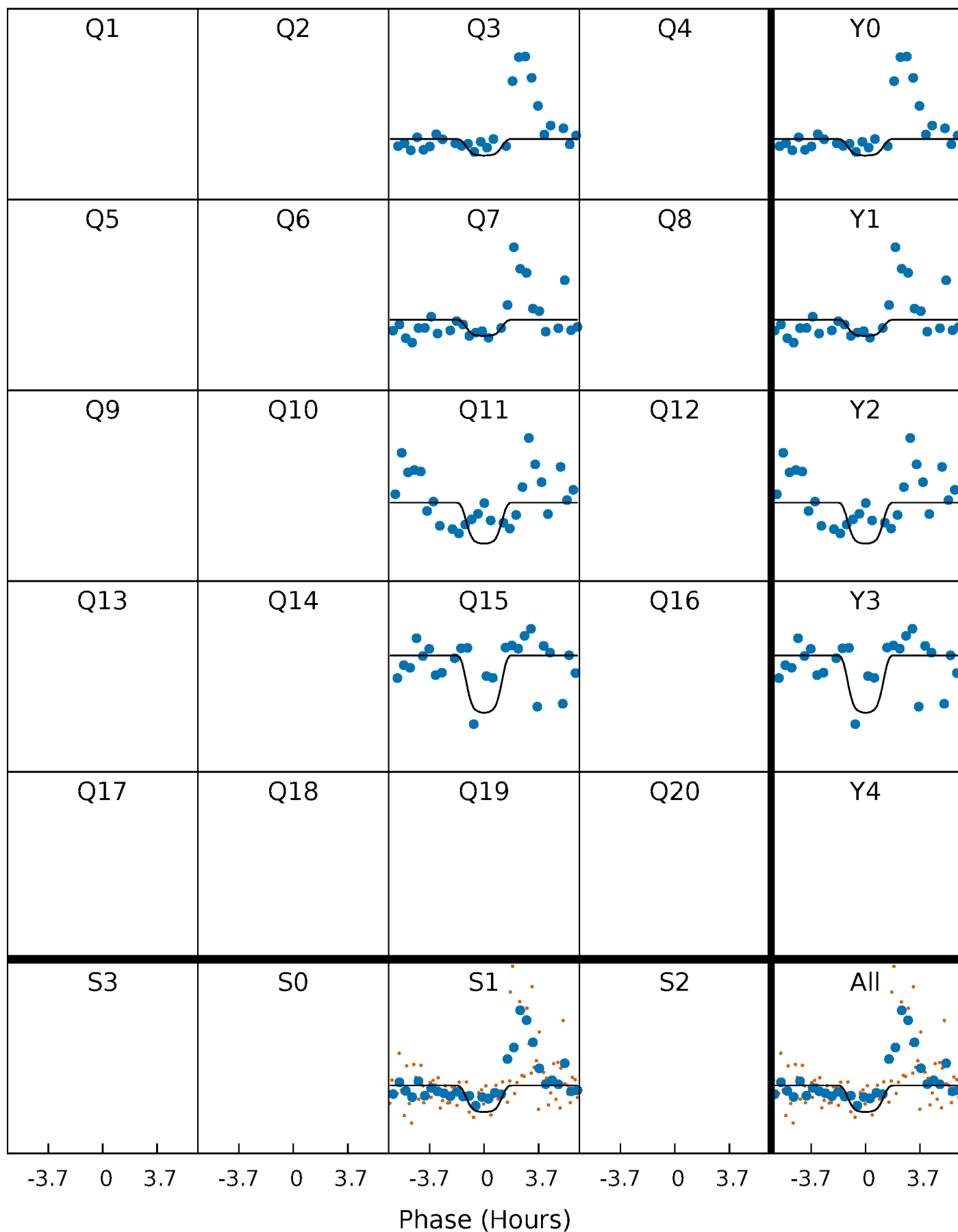
PDC Quarter-Phased Transit Curves

TCE 009897464-04 $P=376.748350$ Days $T_0=300.934472$ (BKJD)



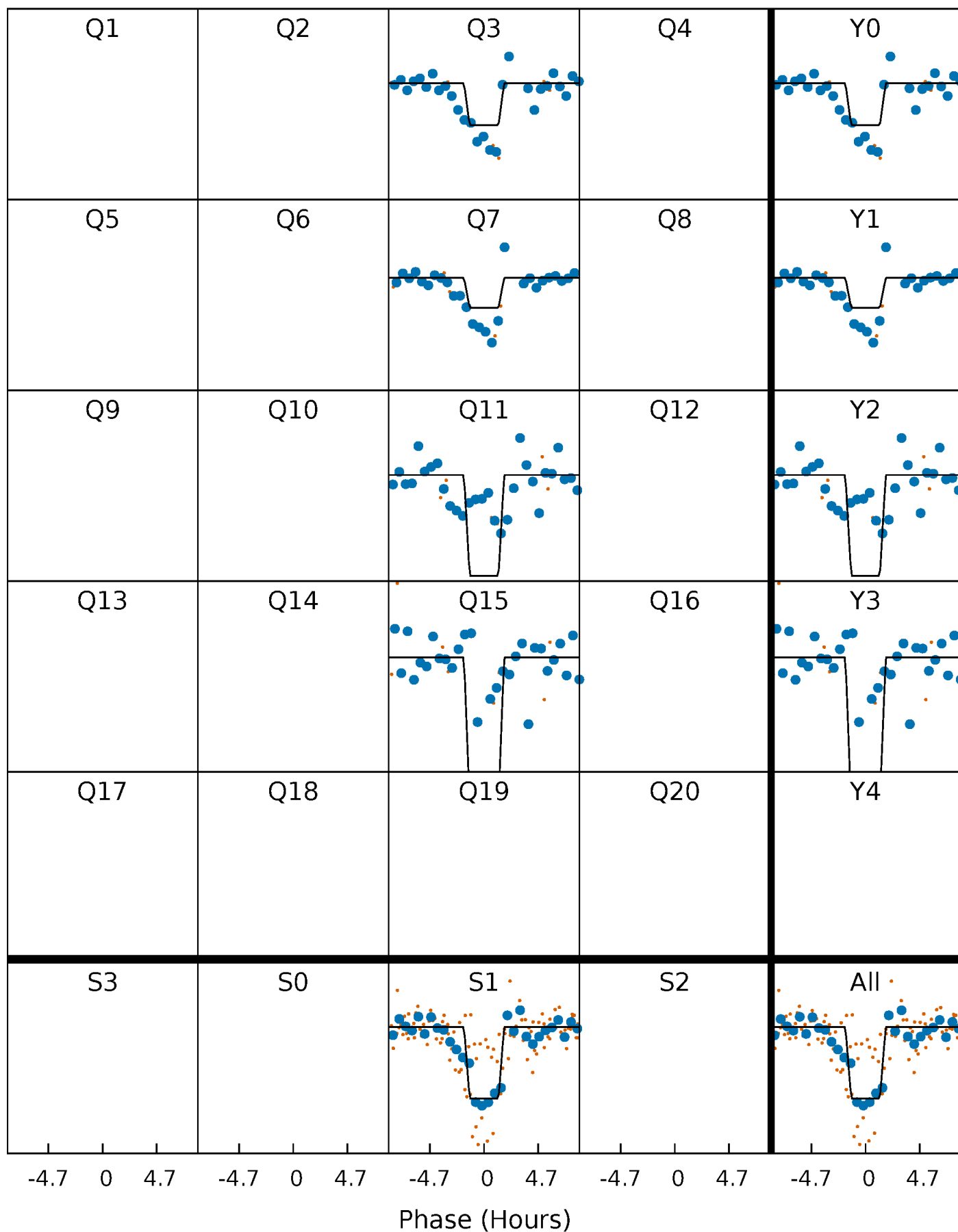
DV Quarter-Phased Transit Curves

TCE 009897464-04 P=376.748350 Days $T_0=300.934472$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

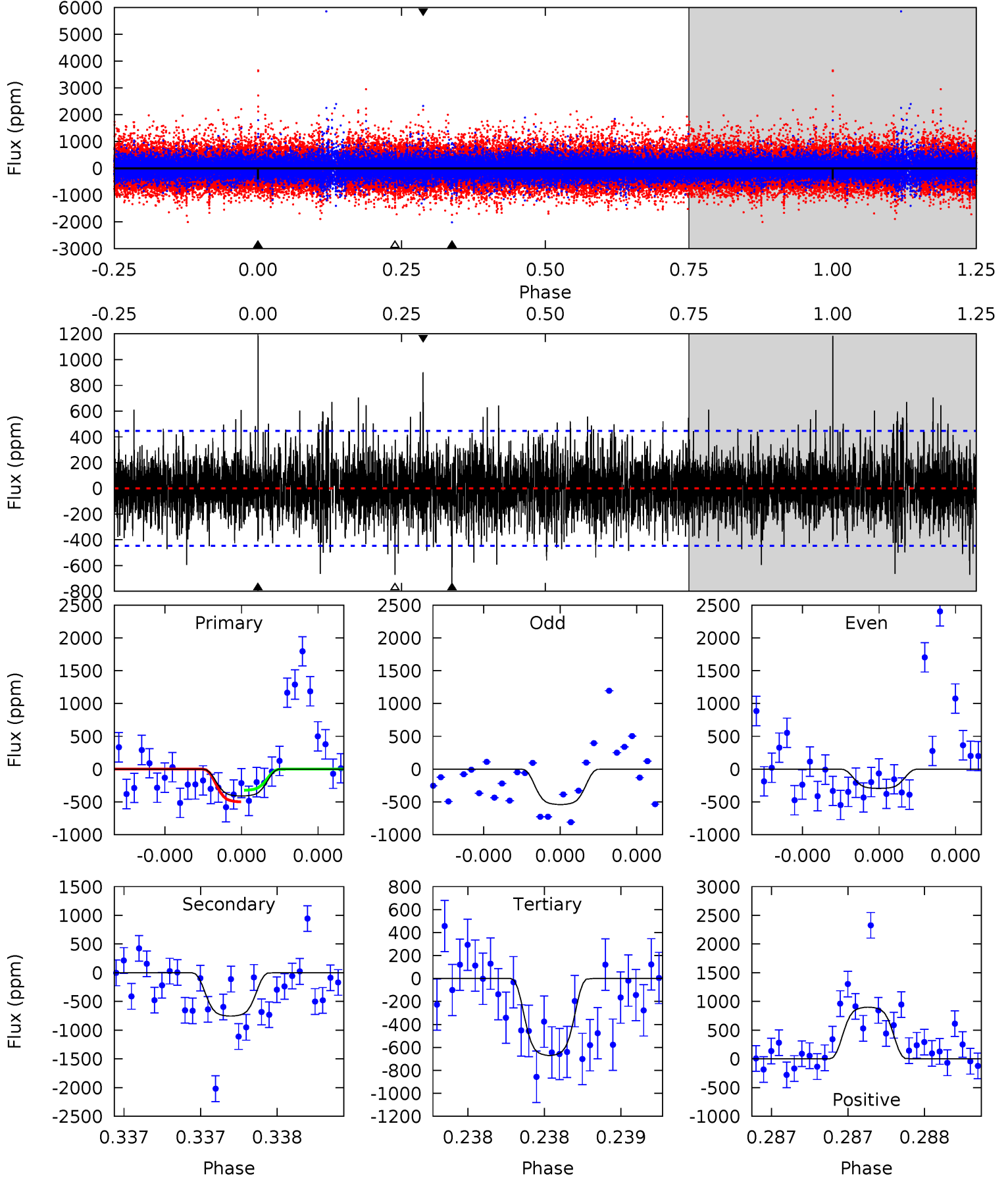
TCE 009897464-04 $P=376.747168$ Days $T_0=300.935596$ (BKJD)



DV Model-Shift Uniqueness Test

009897464-04, P = 376.748350 Days, E = 300.934472 Days

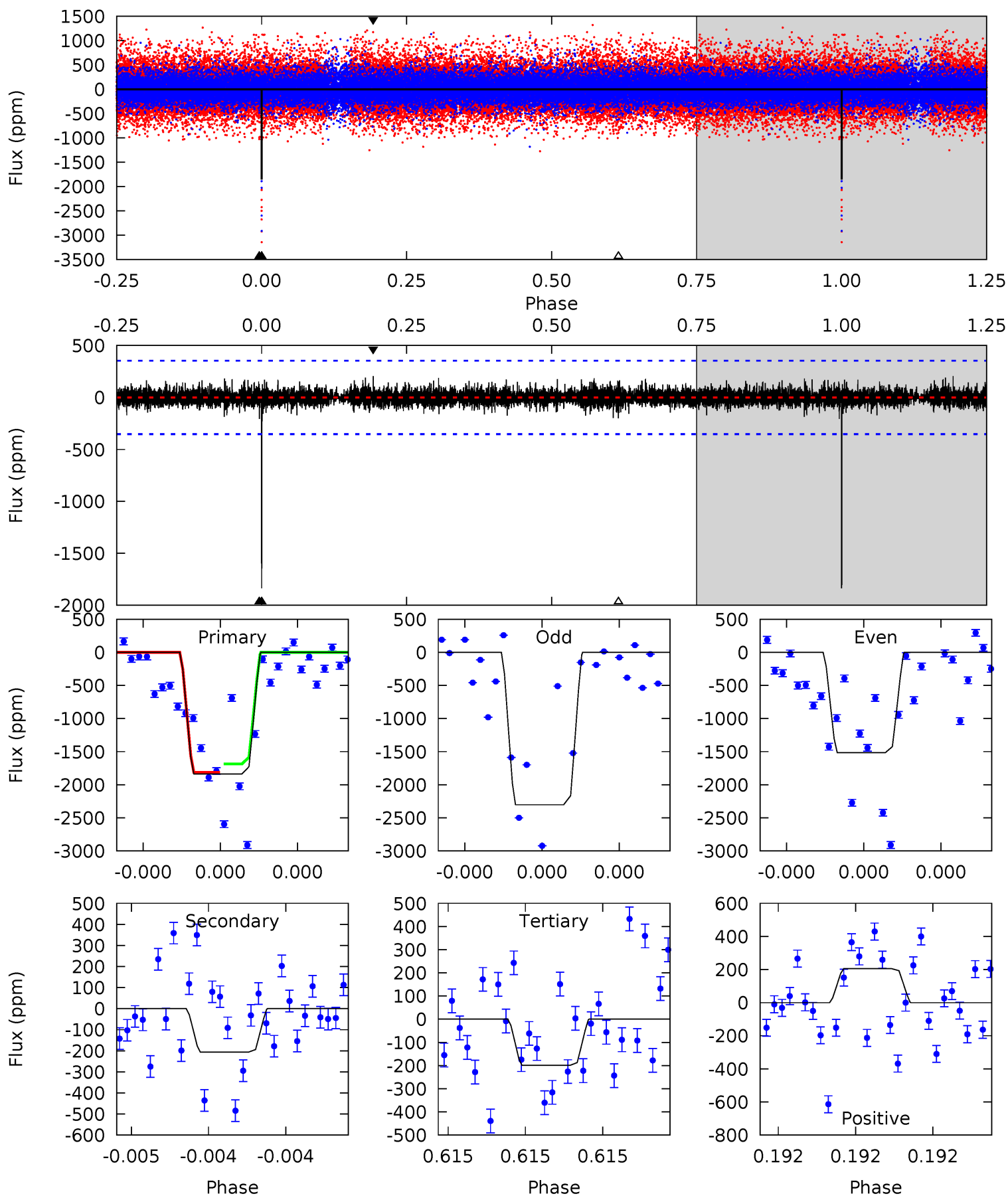
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.16	9.50	8.44	11.3	5.61	3.54	2.00	-3.28	-6.18	1.06	-1.84	1.47	1.14	0.61	1.11



Alt Model-Shift Uniqueness Test

009897464-04, P = 376.747168 Days, E = 300.935596 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.3	3.29	3.17	3.27	5.62	3.55	0.69	26.1	26.0	0.11	0.02	6.48	1.06	0.10	1.04



Stellar Parameters For KIC 009897464

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5771^{+155}_{-172}	$4.429^{+0.116}_{-0.188}$	$-0.300^{+0.300}_{-0.300}$	$0.938^{+0.248}_{-0.134}$	$0.861^{+0.118}_{-0.082}$	$1.470^{+0.776}_{-0.684}$
	+3%/-3%	+3%/-4%	+100%/-100%	+26%/-14%	+14%/-10%	+53%/-47%
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 009897464-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-755 ± 79	$3.30^{+0.84}_{-0.79}$	352^{+24}_{-18}	5413^{+696}_{-474}	36285^{+26374}_{-13581}
Alt.	-206 ± 63	$4.26^{+0.94}_{-0.84}$	352^{+23}_{-19}	3787^{+317}_{-307}	5641^{+3731}_{-2429}

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

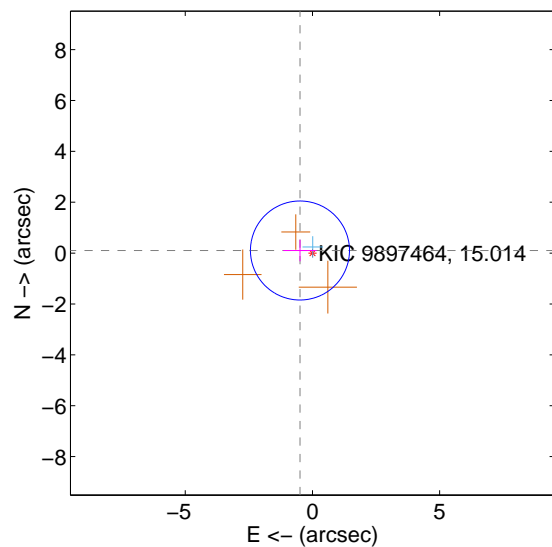
Supplemental centroid analysis for 009897464-04. Kepler magnitude: 15.01. Transit SNR 5.40

There are 1 quarters with good PRF difference image offsets

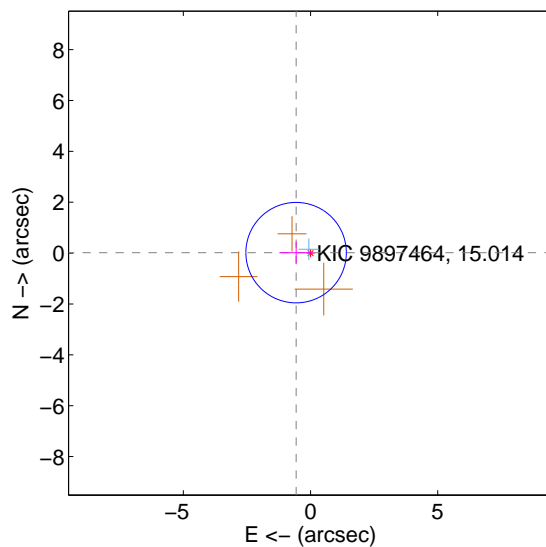
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.501 ± 0.649	0.77	0.490 ± 0.657	0.102 ± 0.423
PRF-fit source offset from KIC position	0.567 ± 0.658	0.86	0.567 ± 0.658	0.018 ± 0.422
photometric centroid source offset	1.81 ± 2.04	0.88	1.69 ± 2.04	0.65 ± 2.03

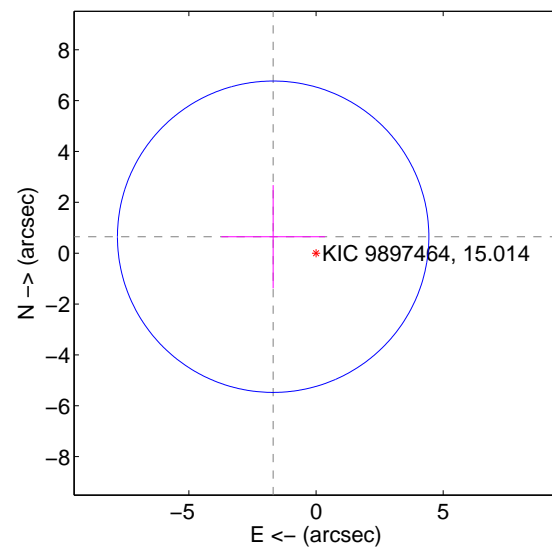
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

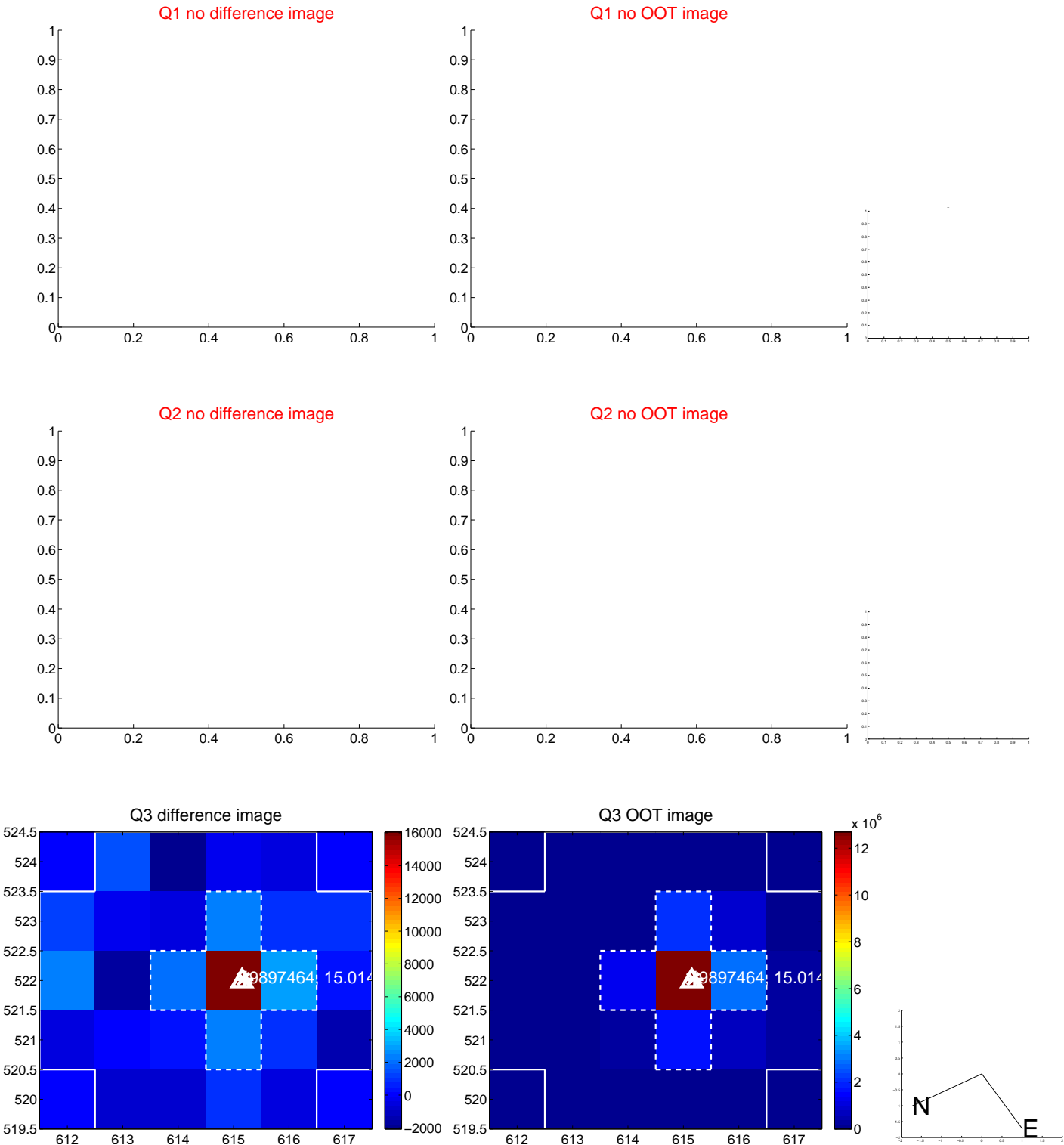


offset from photometric centroids

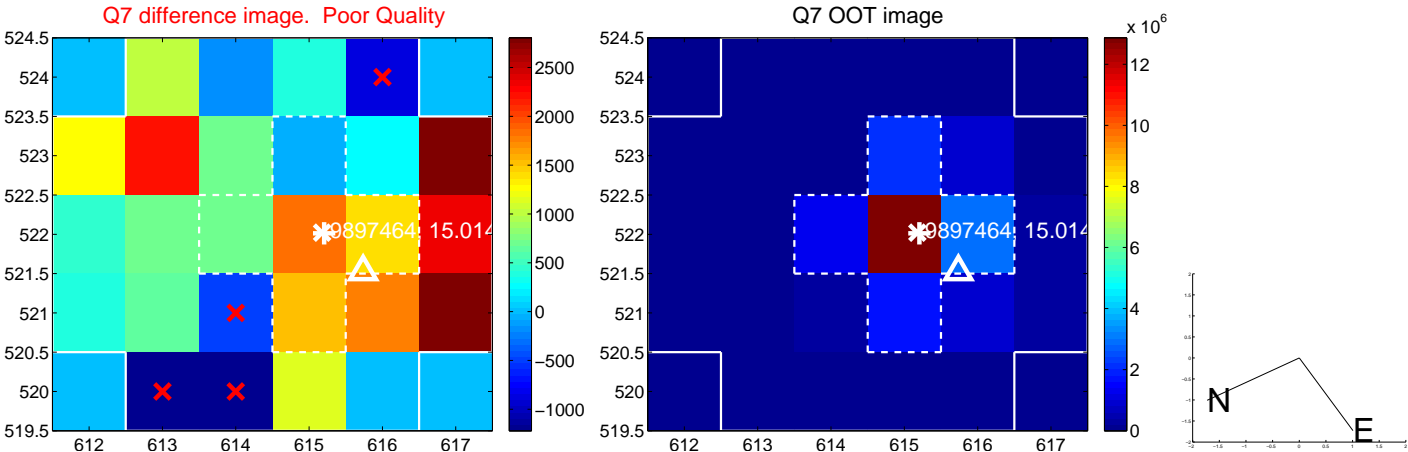


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

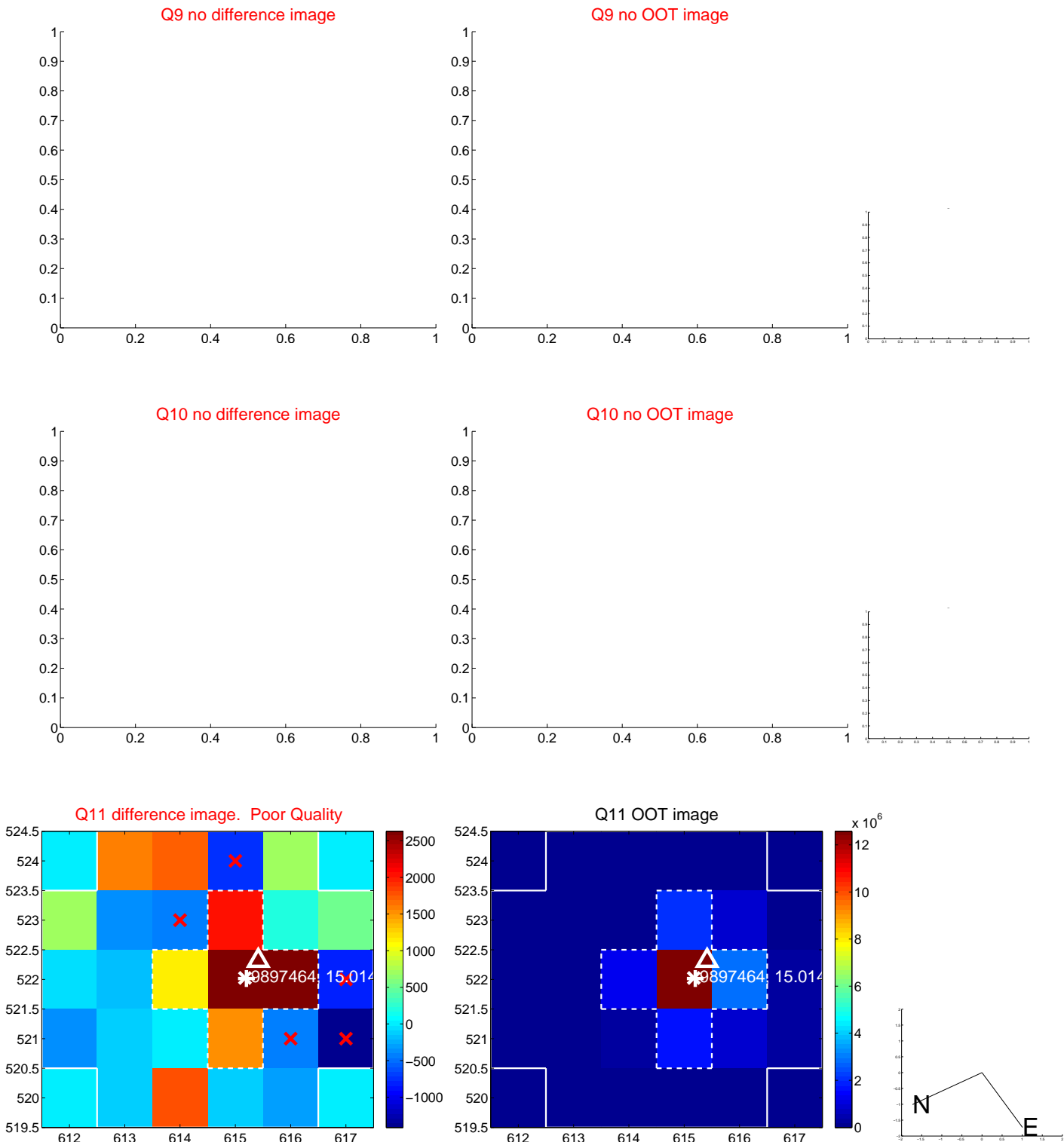
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



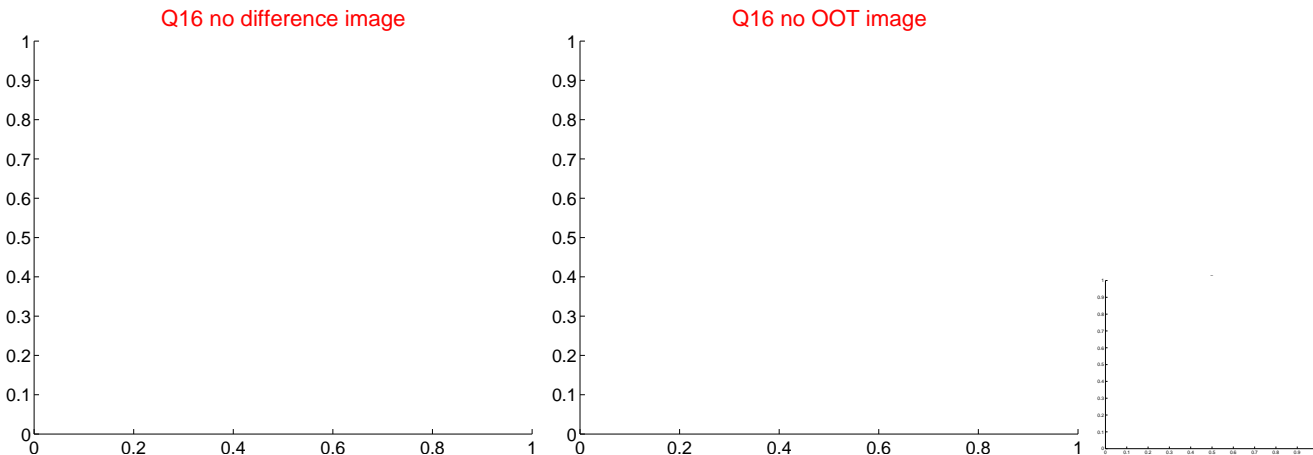
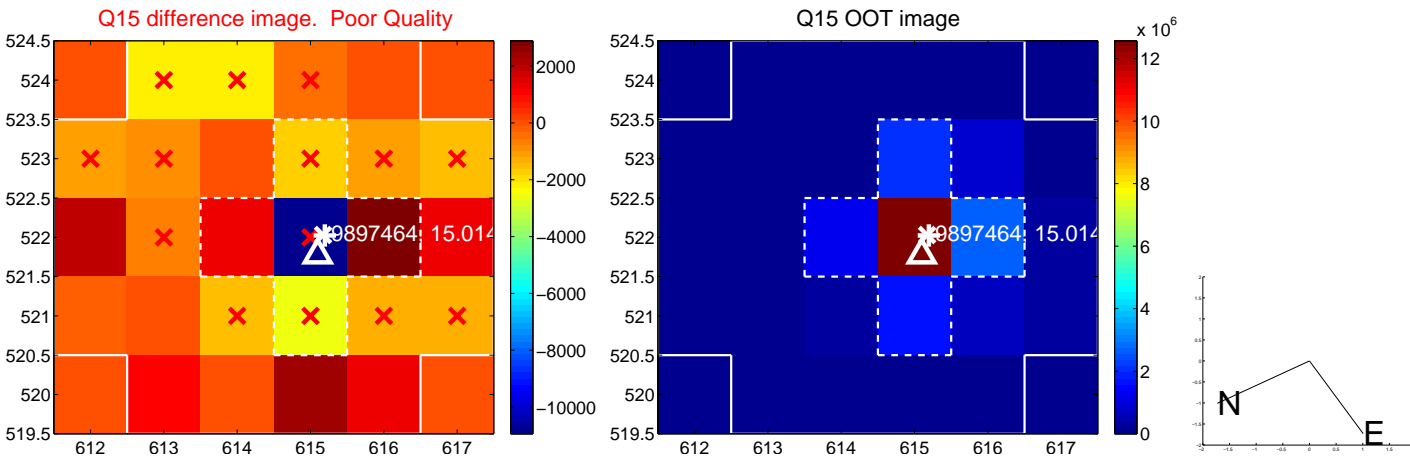
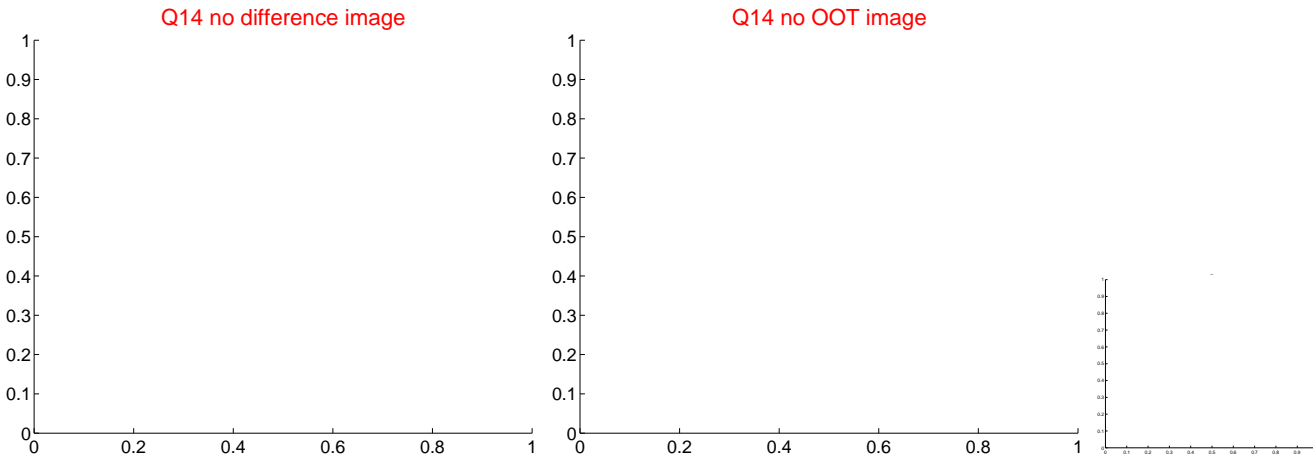
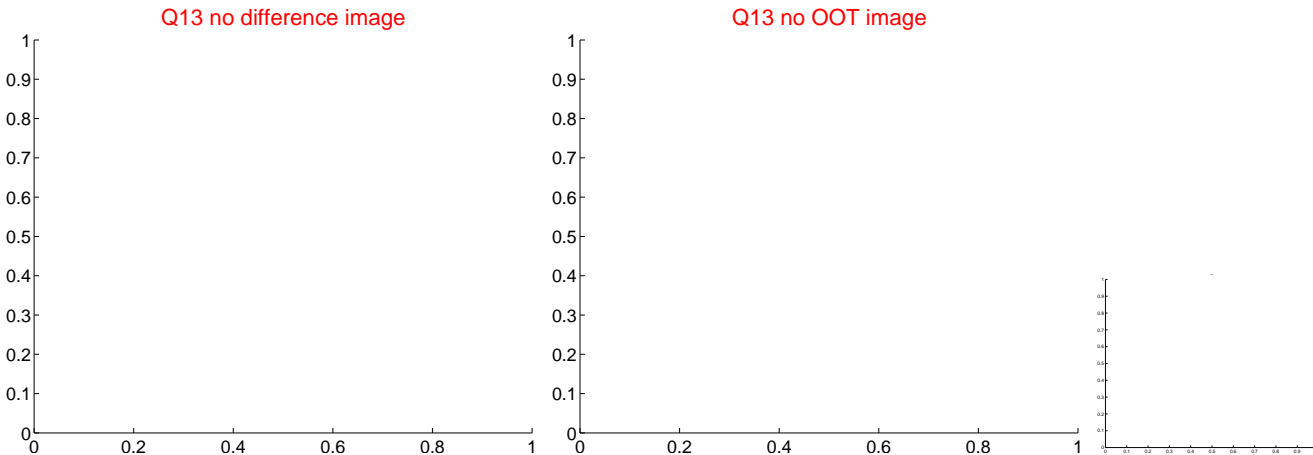
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



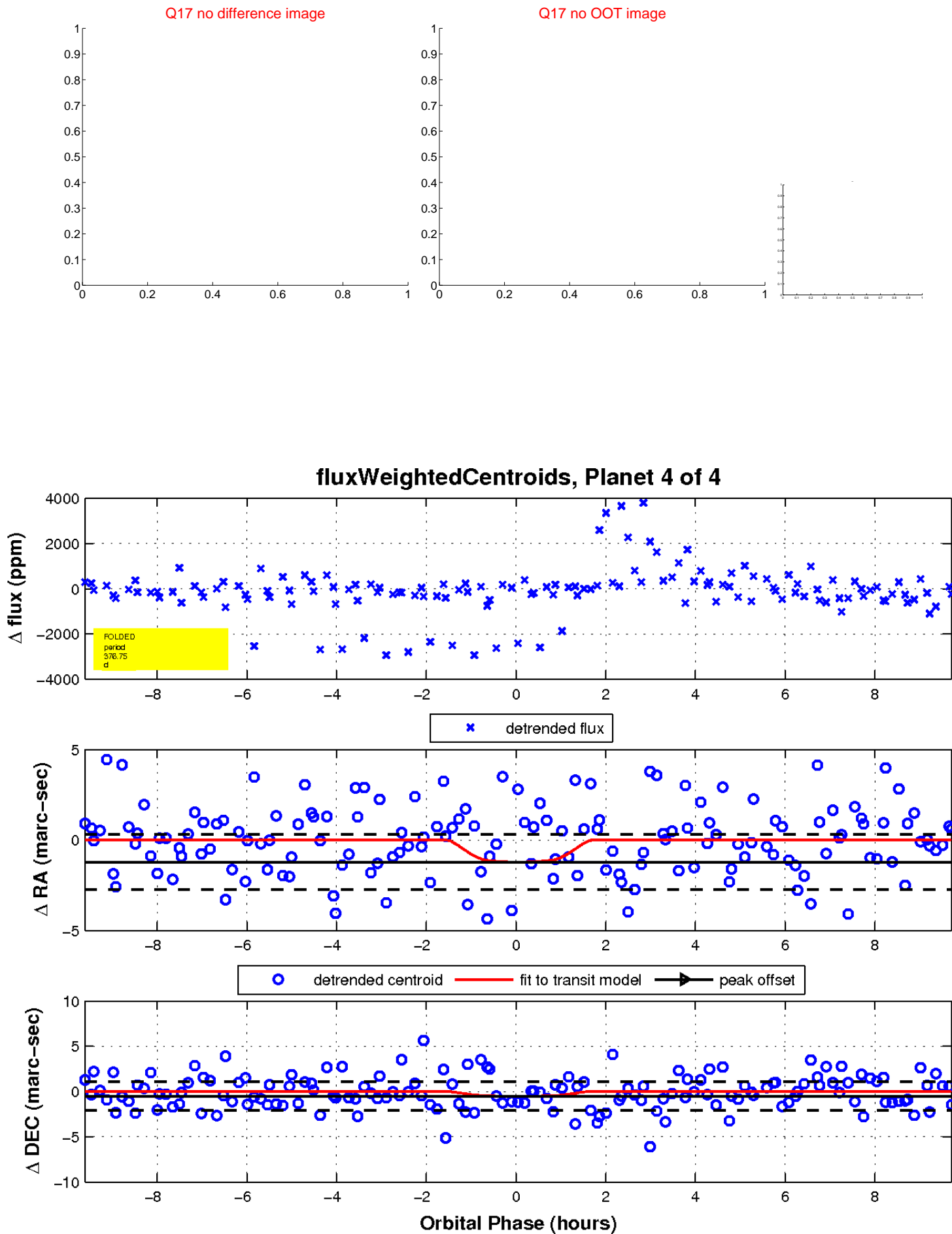
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

