

KIC 009453011

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})
009453011-01	OBS	No	554.676636	300.725456	1435.9	8.204	17.9	9.2	0.45	3760	2.19	0.04
009453011-03	OBS	No	595.624318	274.153650	1114.3	5.491	19.8	7.5	0.45	3760	1.97	0.03
009453011-04	OBS	No	554.249661	220.742929	483.5	6.457	13.7	3.9	0.45	3760	1.07	0.04
009453011-05	OBS	No	414.910833	487.156787	430.9	3.047	13.8	3.8	0.45	3760	1.05	0.05
009453011-06	OBS	No	489.459841	413.308931	674.3	4.387	13.9	5.1	0.45	3760	1.18	0.04
009453011-07	OBS	No	529.140659	452.726557	200.3	12.500	12.9	-1.0	0.45	3760	0.64	0.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009453011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009453011-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

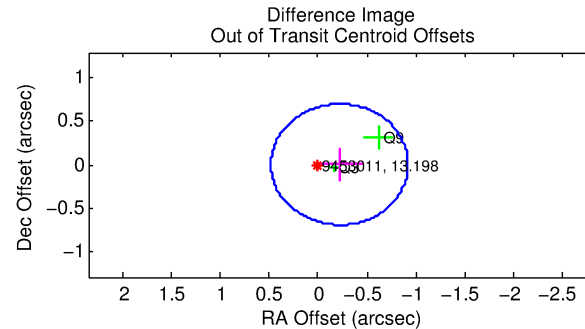
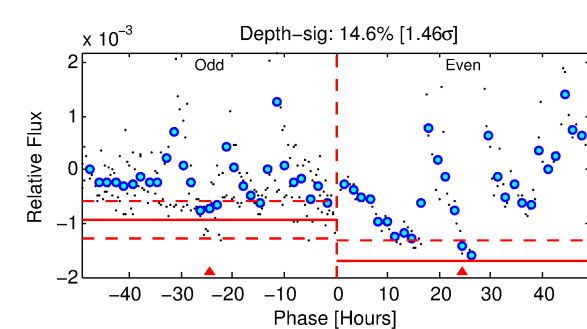
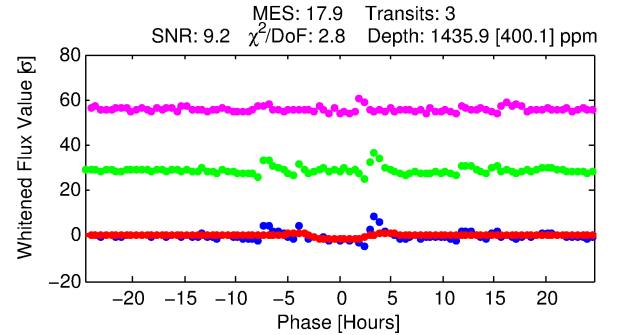
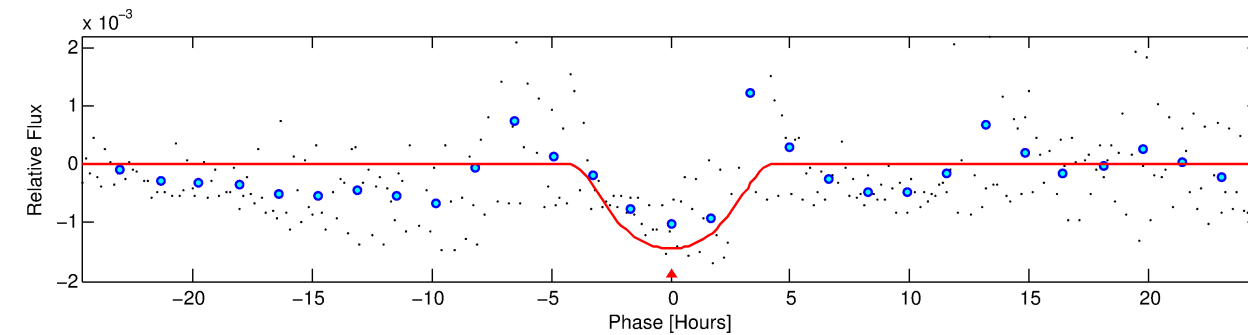
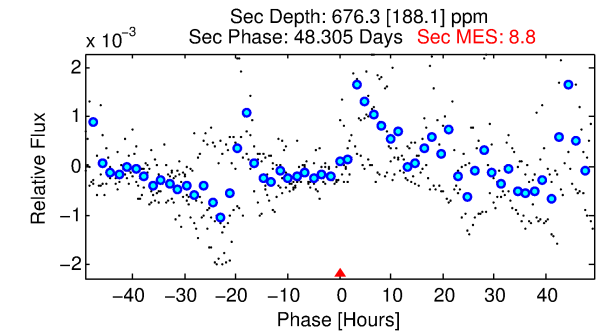
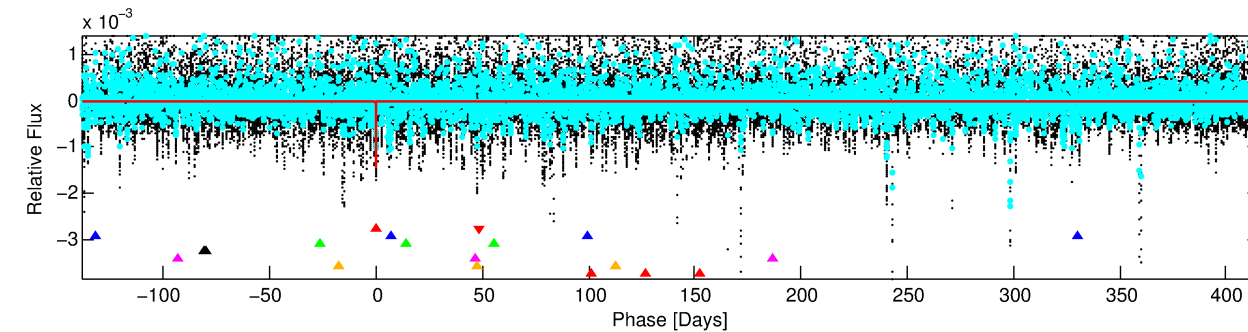
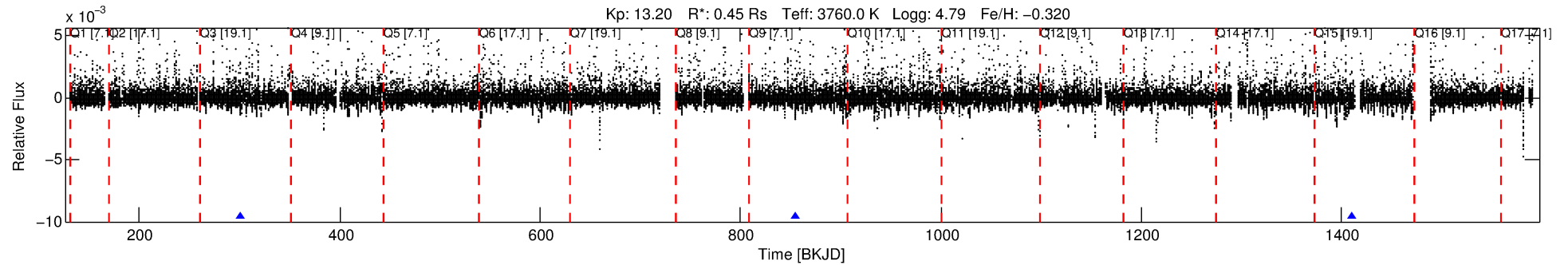
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009453011-01

No Significant Match Found

DV One-Page Summary

KIC: 9453011 Candidate: 1 of 7 Period: 554.677 d



DV Fit Results:

Period = 554.67664 [0.01749] d
Epoch = 300.7255 [0.0208] BKJD
Rp/R* = 0.0446 [0.0090]
a/R* = 218.19 [44.07]
b = 0.96 [0.03]
Seff = 0.04 [0.01]
Teq = 110 [8] K
Rp = 2.19 [0.67] Re
a = 1.0190 [0.1825] AU
Ag = 80244.36 [43977.59] [1.82 σ]
Teffp = 2872 [368] K [7.49 σ]

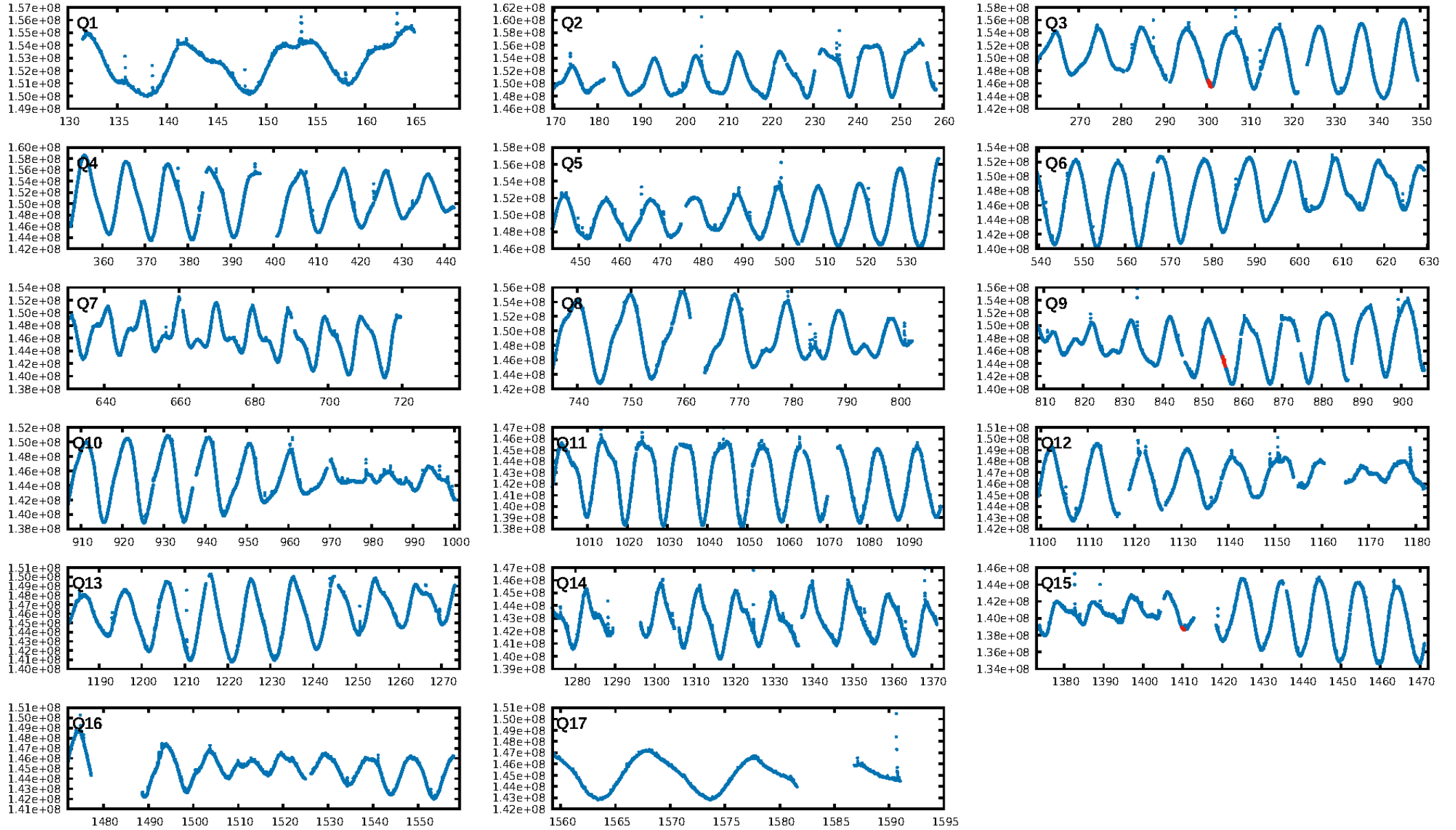
DV Diagnostic Results:

ShortPeriod-sig: 67.4% [0.98 σ]
LongPeriod-sig: 100.0% [99.55 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.242
Centroid-sig: 93.8%
Centroid-so: 0.366 arcsec [1.59 σ]
OotOffset-rm: 0.218 arcsec [0.93 σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-rm: 0.312 arcsec [1.03 σ]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

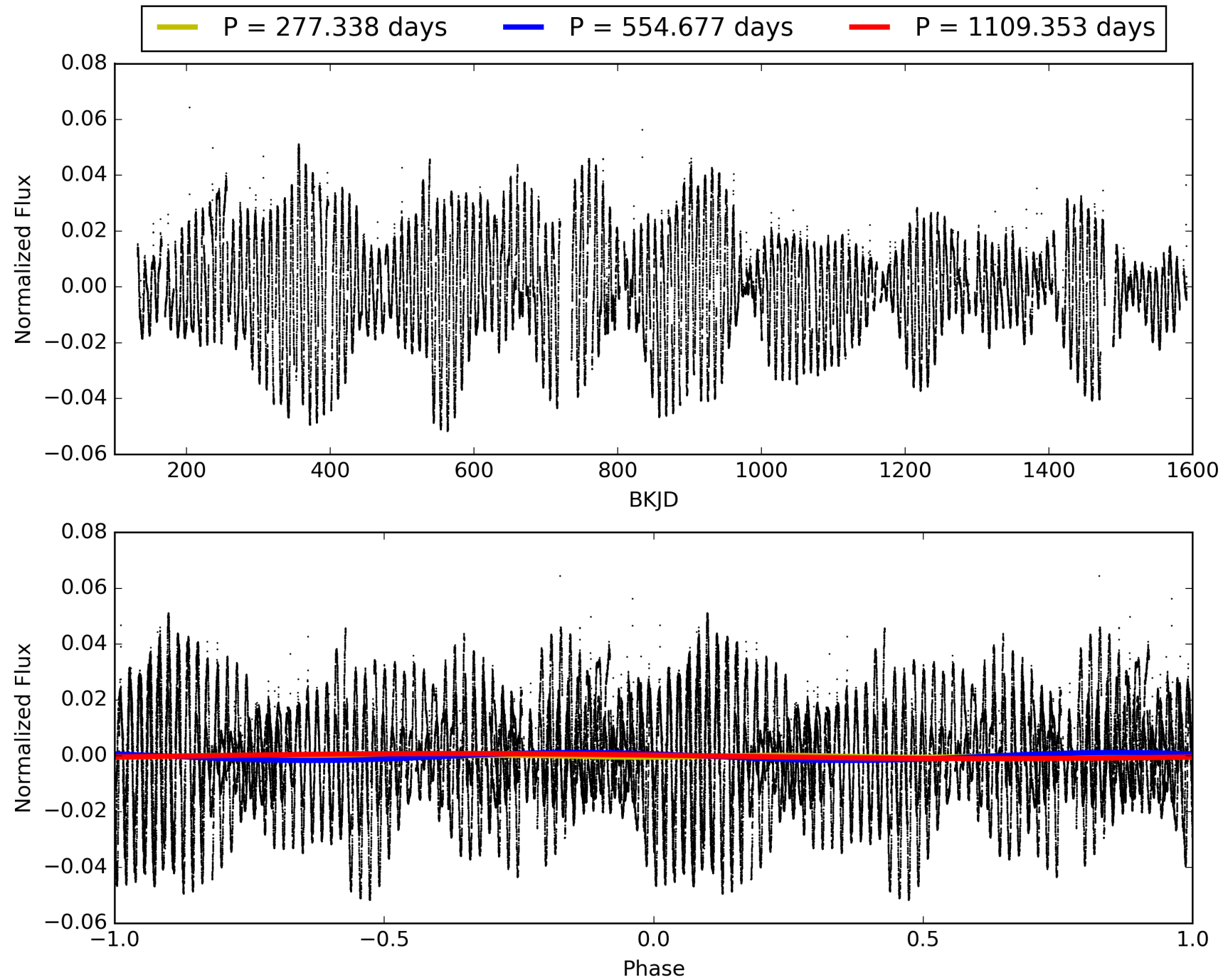
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:35:45 Z

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

TCE 009453011-01, PDC Light Curves

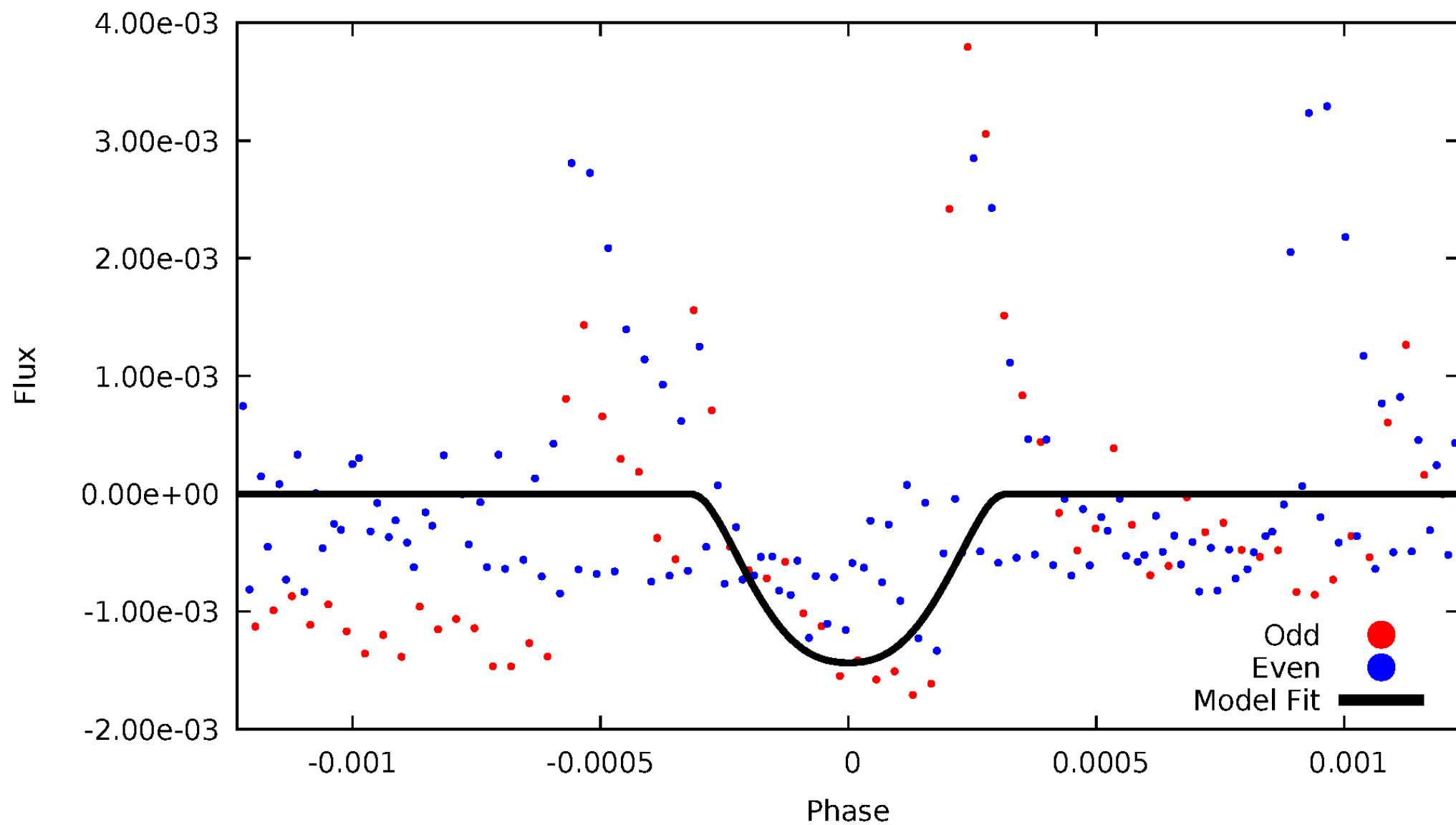


TCE 009453011-01



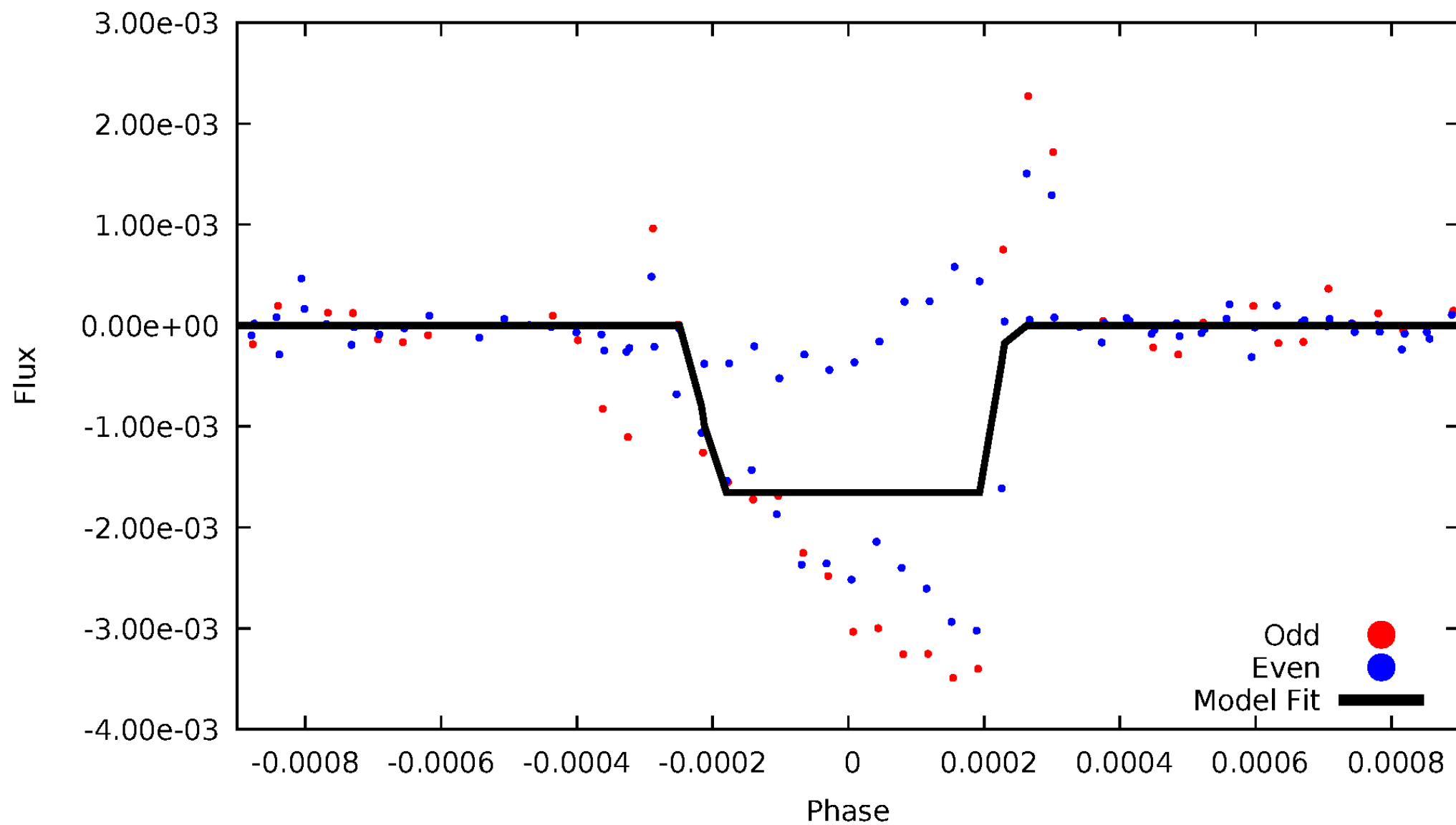
DV Odd/Even

TCE 009453011-01



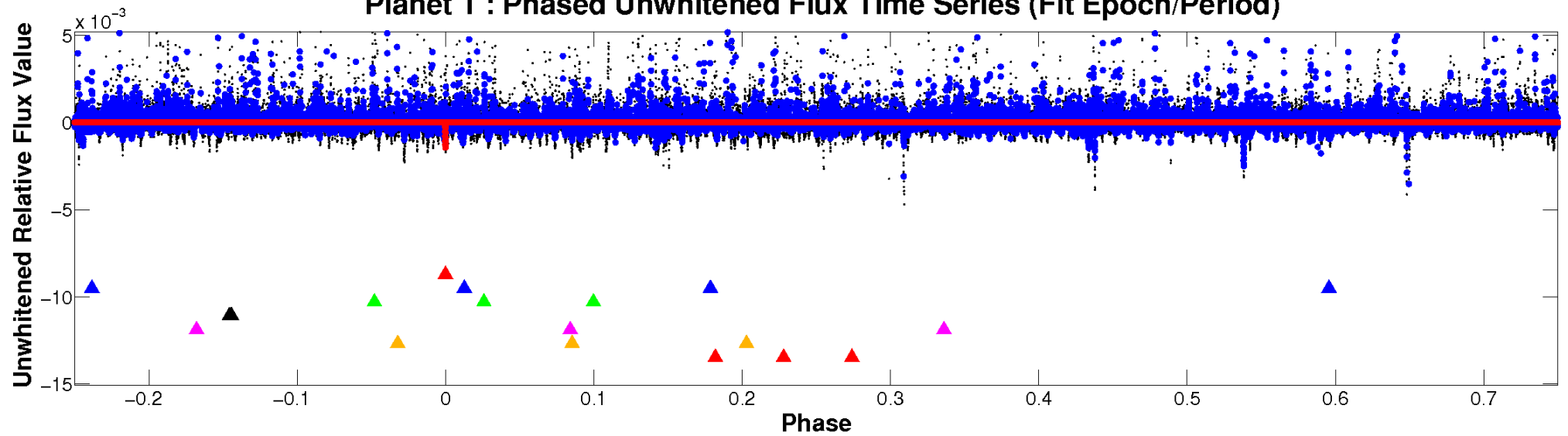
ALT Odd/Even

TCE 009453011-01

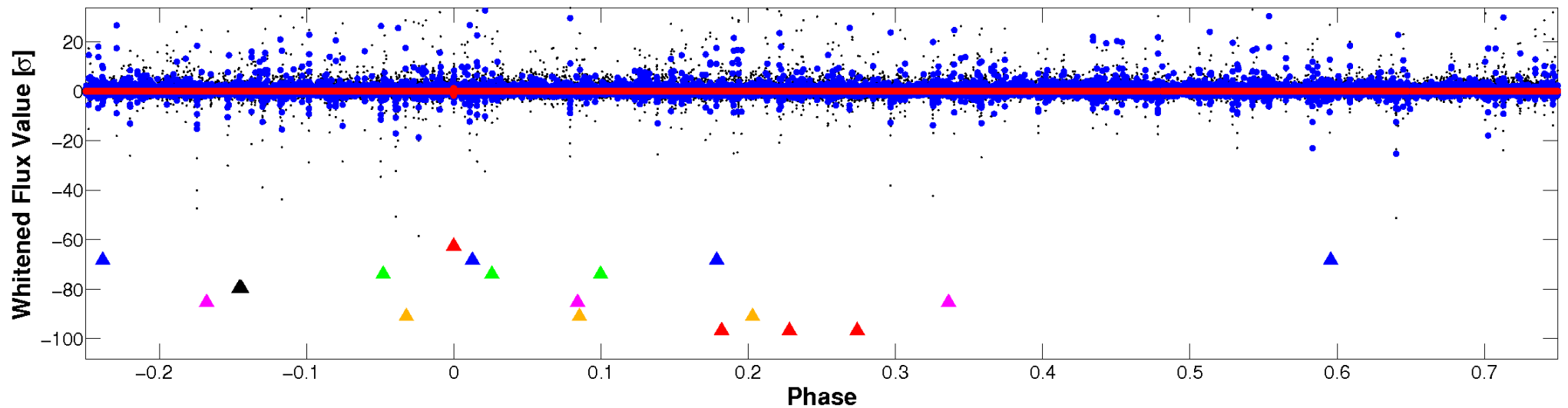


Non-Whitened Vs. Whitened Light Curve

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

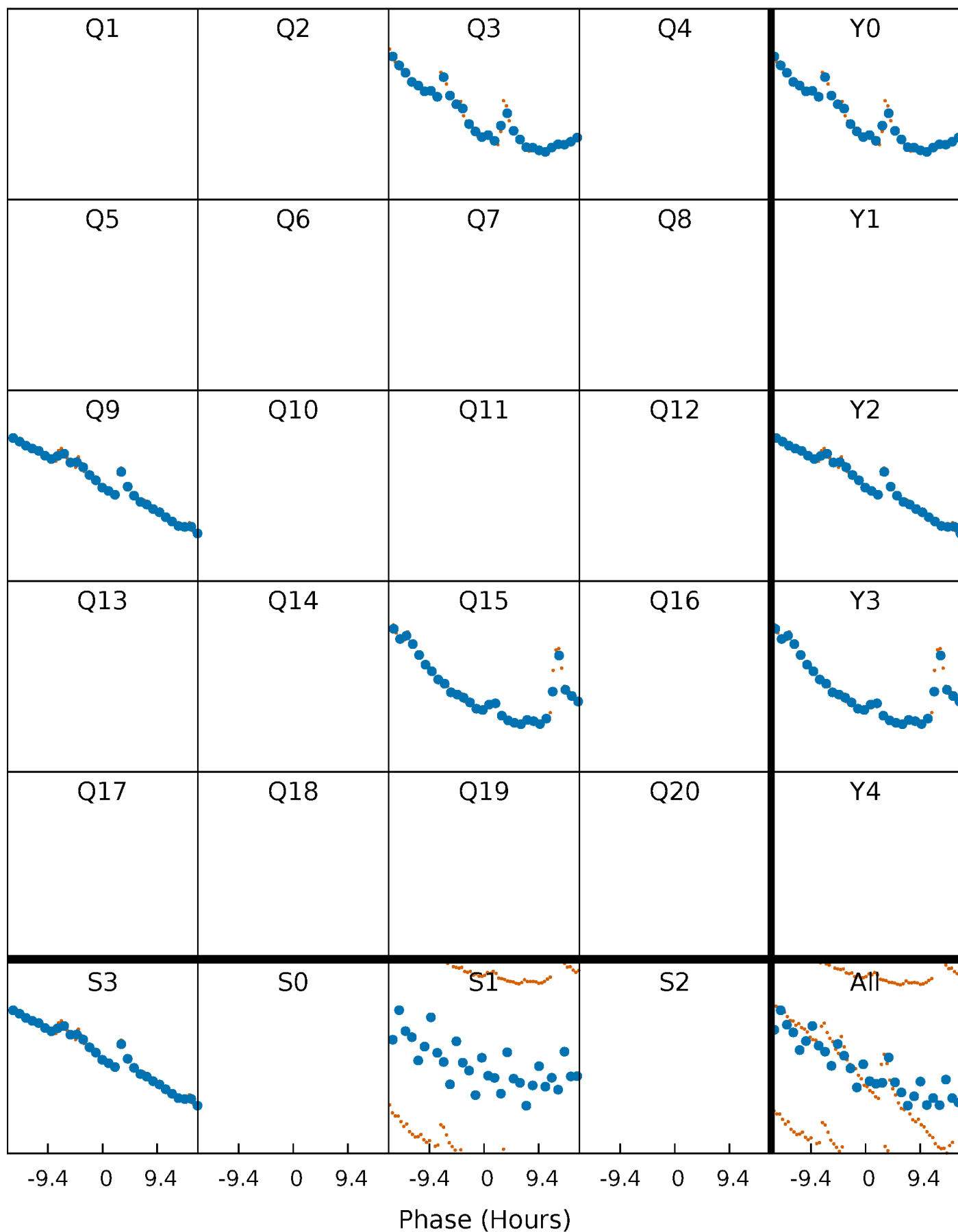


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



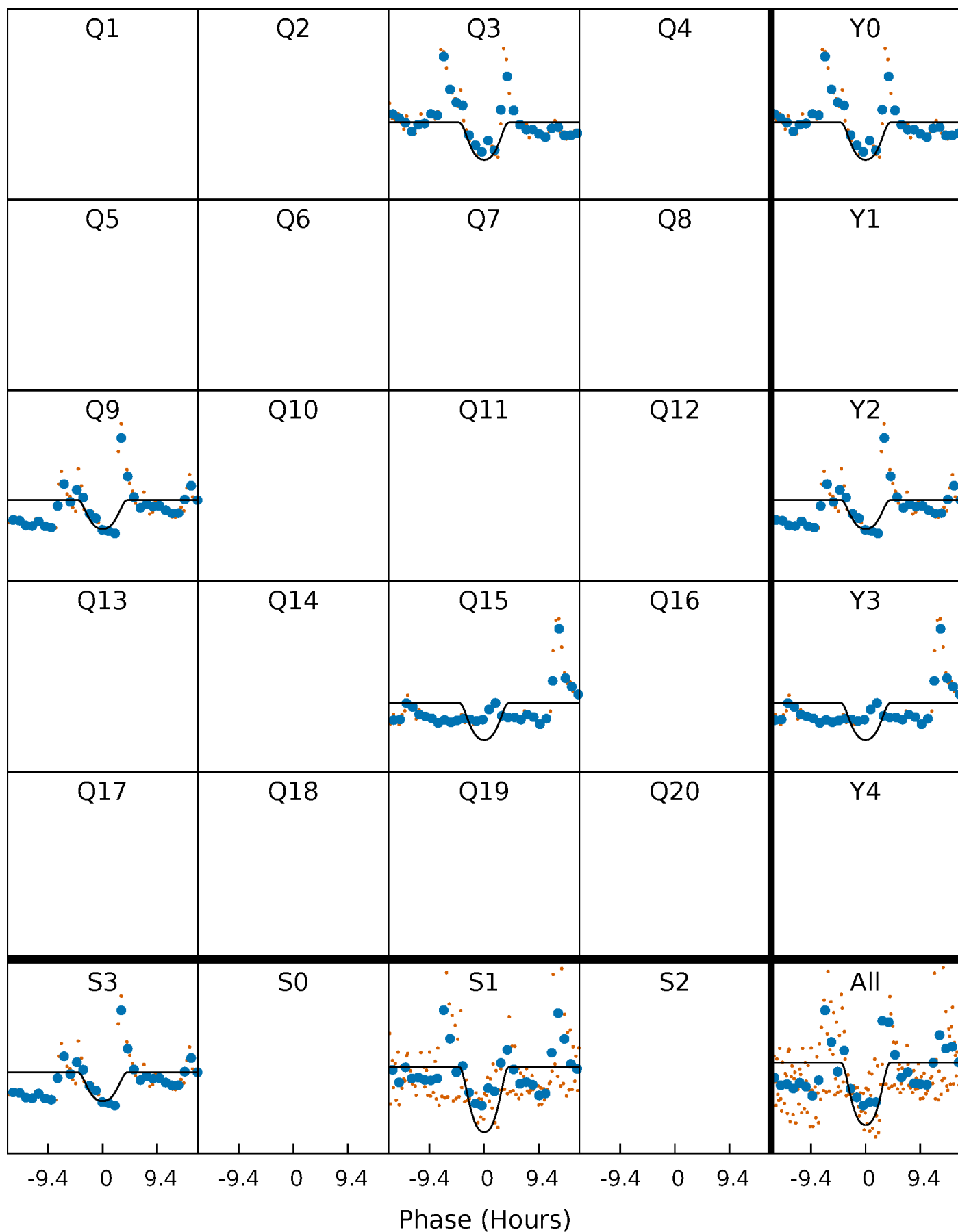
PDC Quarter-Phased Transit Curves

TCE 009453011-01 P=554.676636 Days $T_0=300.725456$ (BKJD)



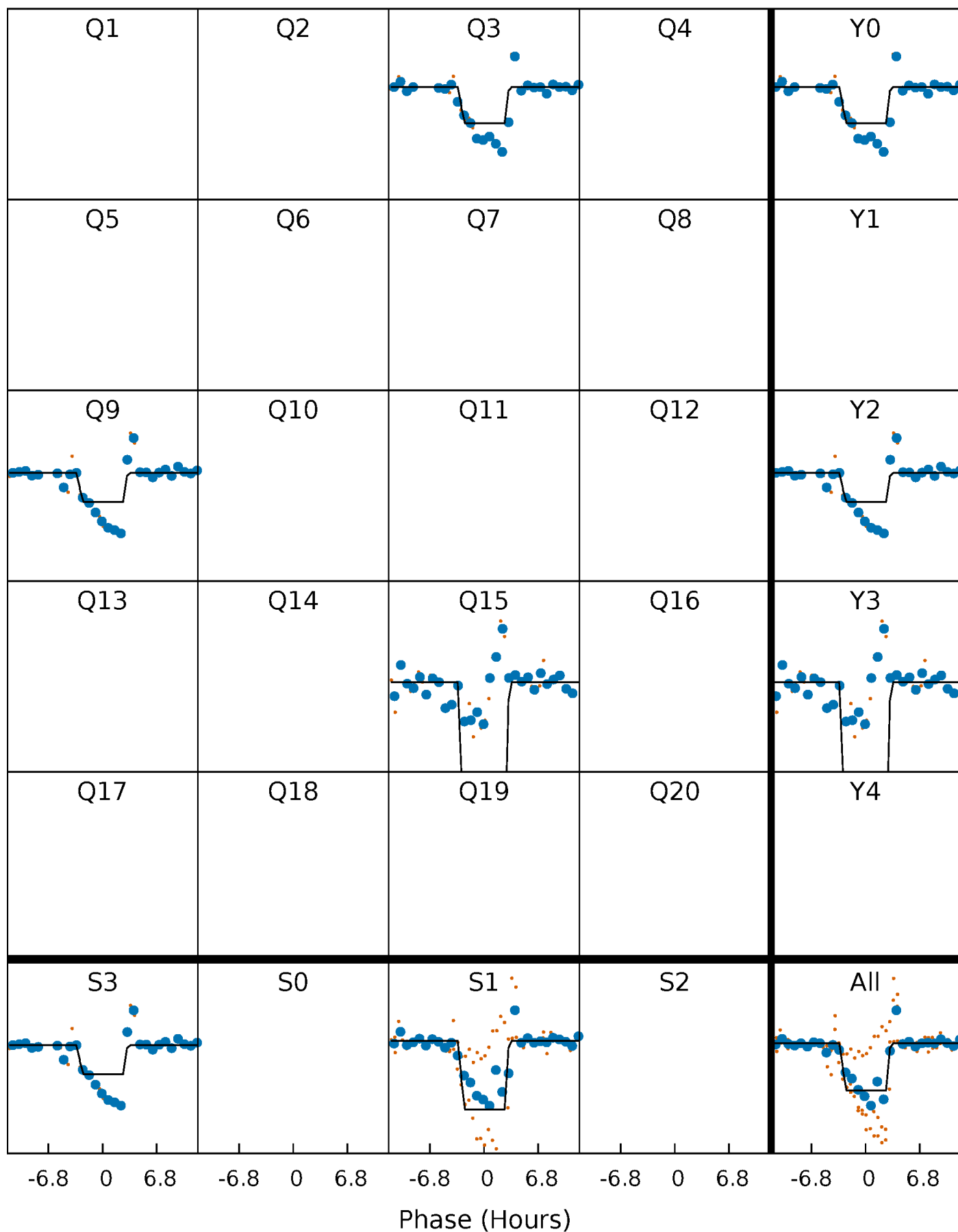
DV Quarter-Phased Transit Curves

TCE 009453011-01 P=554.676636 Days $T_0=300.725456$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

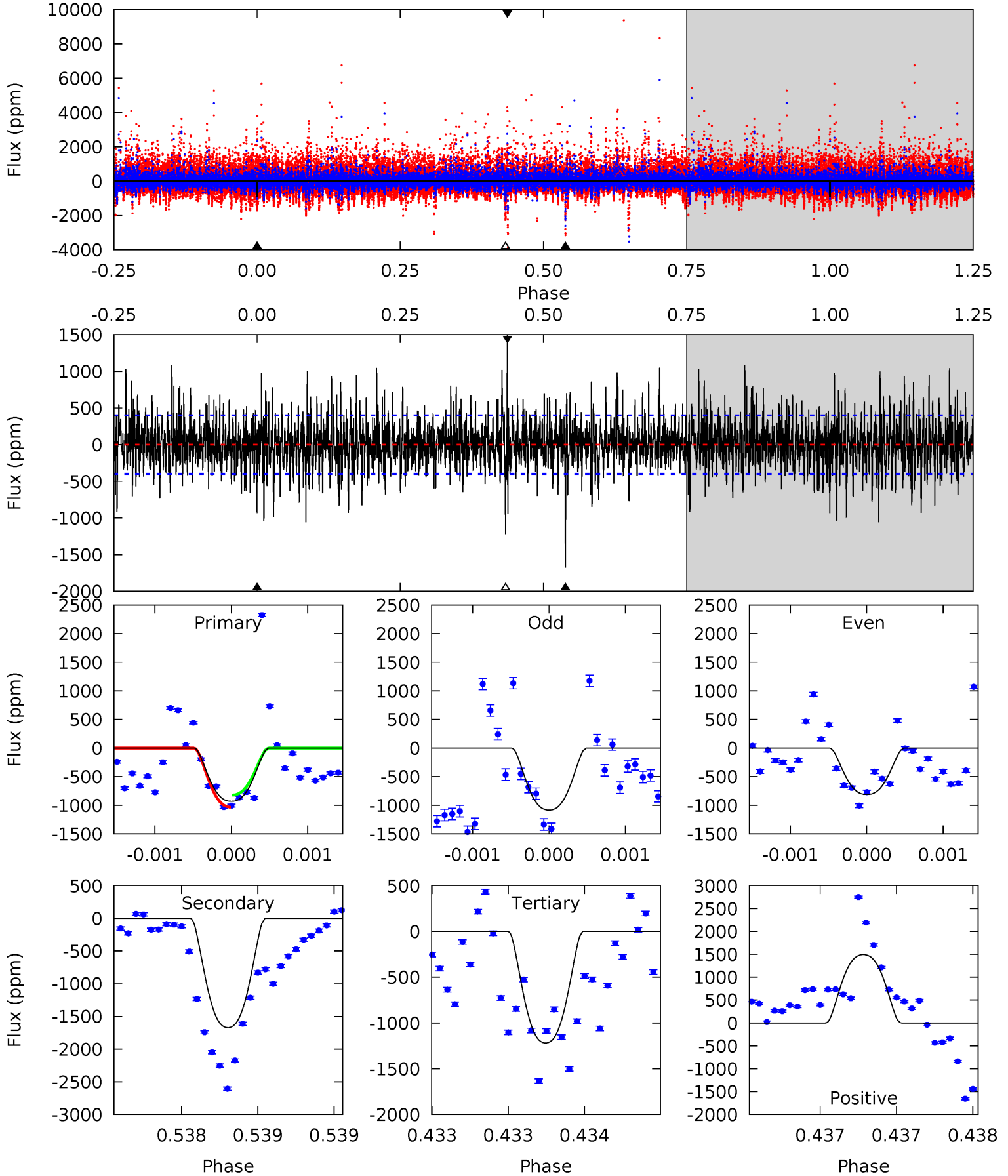
TCE 009453011-01 P=554.668986 Days $T_0=300.719690$ (BKJD)



DV Model-Shift Uniqueness Test

009453011-01, P = 554.676636 Days, E = 300.725456 Days

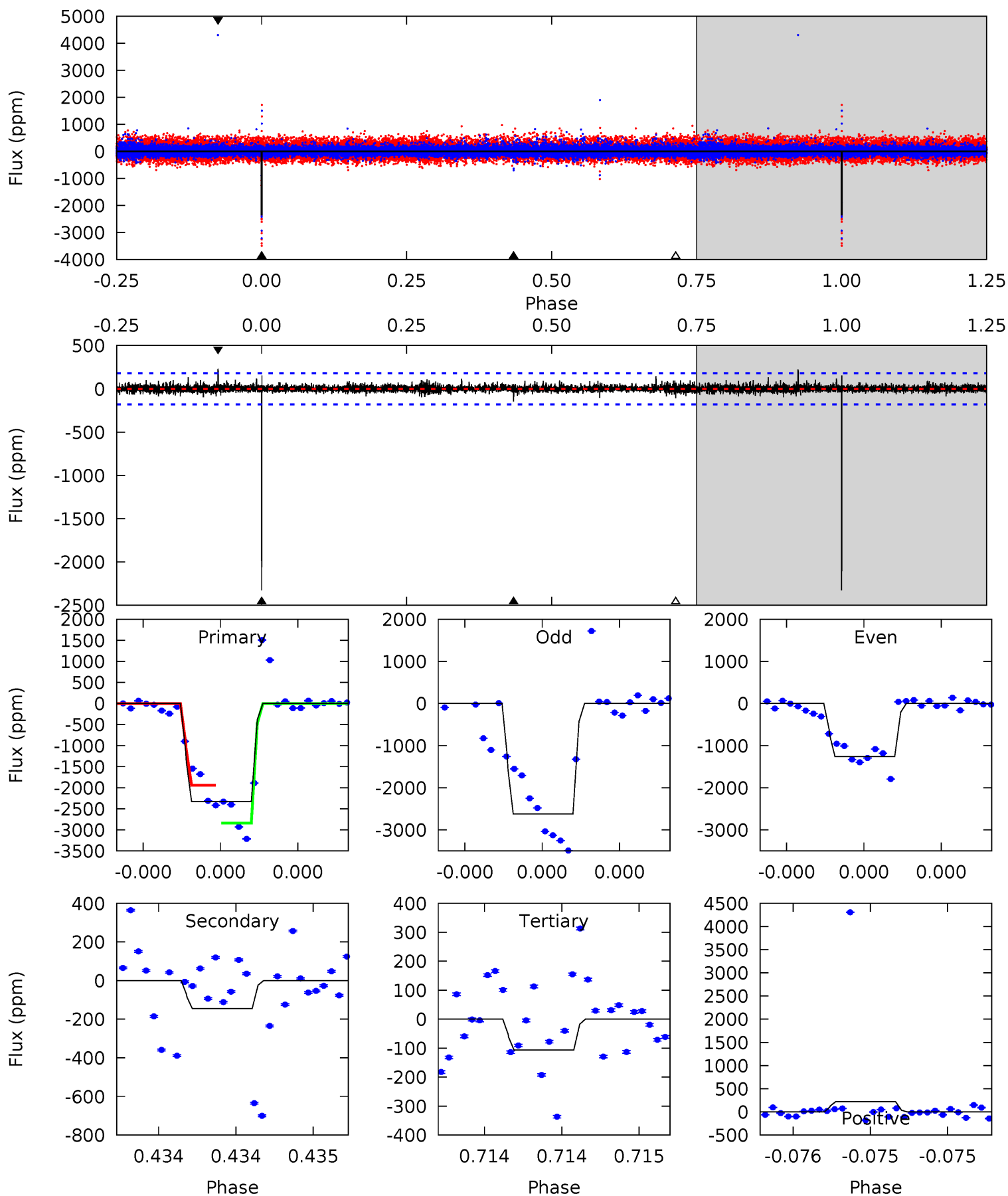
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	23.1	16.8	20.6	5.53	3.41	3.66	-3.97	-7.75	6.27	2.49	1.30	0.91	0.47	1.48



Alt Model-Shift Uniqueness Test

009453011-01, P = 554.668986 Days, E = 300.719690 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
71.6	4.49	3.26	6.82	5.58	3.49	0.67	68.4	64.8	1.23	-2.34	24.5	0.73	0.09	0



Stellar Parameters For KIC 009453011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3760^{+117}_{-143}	$4.791^{+0.126}_{-0.054}$	$-0.320^{+0.300}_{-0.350}$	$0.451^{+0.068}_{-0.102}$	$0.459^{+0.069}_{-0.103}$	$7.044^{+4.959}_{-1.529}$
	+3%/-4%	+3%/-1%	+94%/-109%	+15%/-23%	+15%/-22%	+70%/-22%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009453011-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1672 ± 72	$2.13^{+0.50}_{-0.44}$	152^{+7}_{-8}	3632^{+312}_{-220}	$213292^{+119695}_{-71184}$
Alt.	-146 ± 32	$1.90^{+0.51}_{-0.42}$	152^{+8}_{-8}	2637^{+219}_{-173}	22239^{+16651}_{-8458}

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

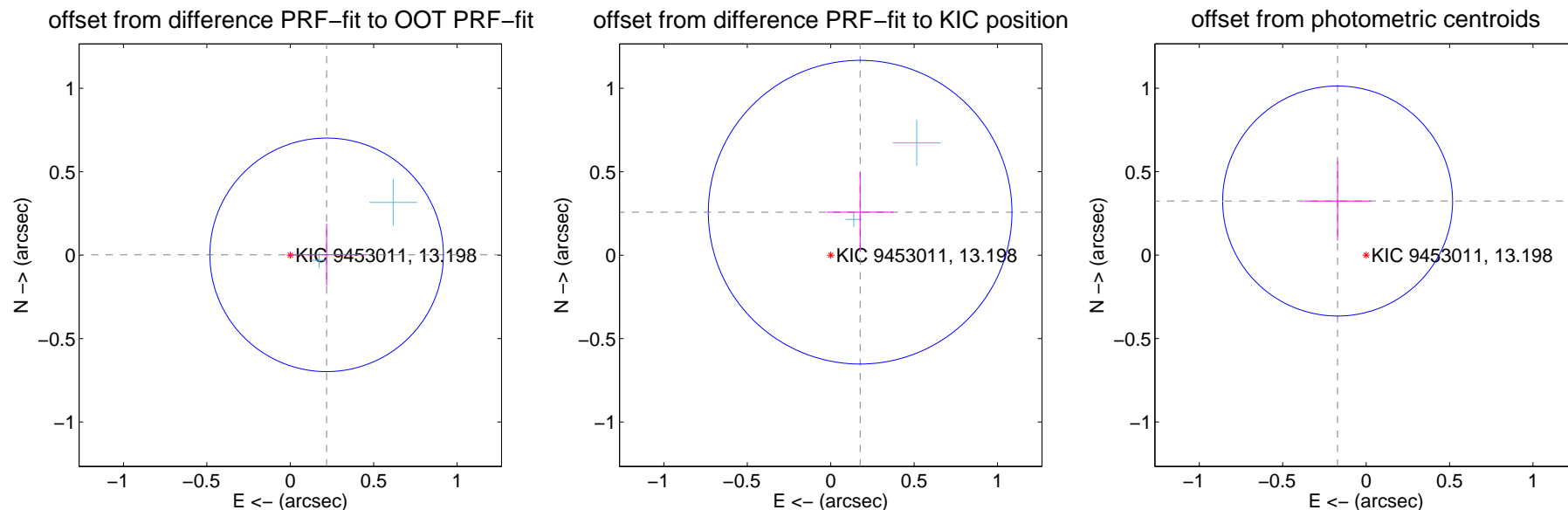
DV Centroid Data

Supplemental centroid analysis for 009453011-01. Kepler magnitude: 13.20. Transit SNR 9.23

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.218 ± 0.233	0.93	-0.218 ± 0.232	0.002 ± 0.186
PRF-fit source offset from KIC position	0.312 ± 0.303	1.03	-0.176 ± 0.200	0.257 ± 0.239
photometric centroid source offset	0.37 ± 0.23	1.59	0.17 ± 0.20	0.32 ± 0.24



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



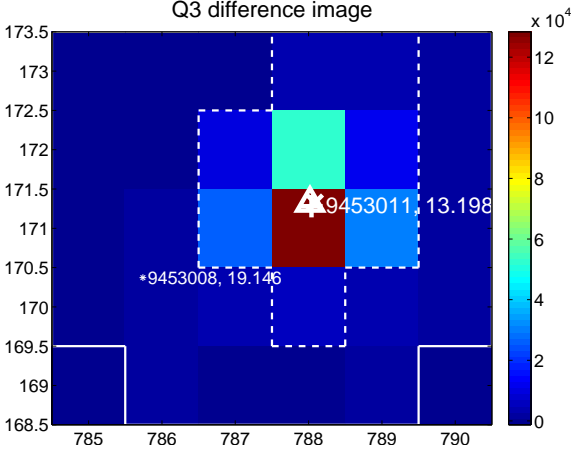
Q2 no difference image



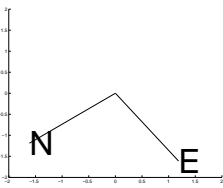
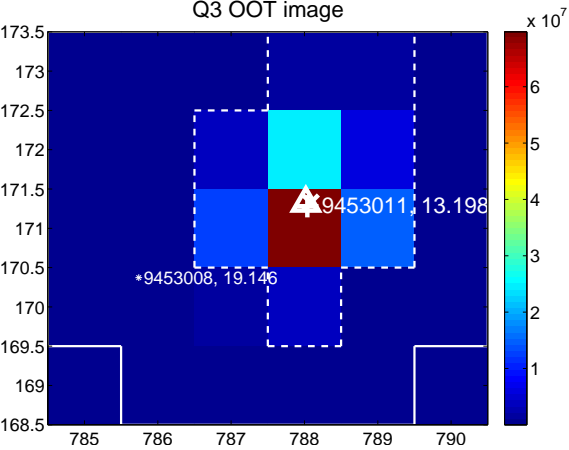
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



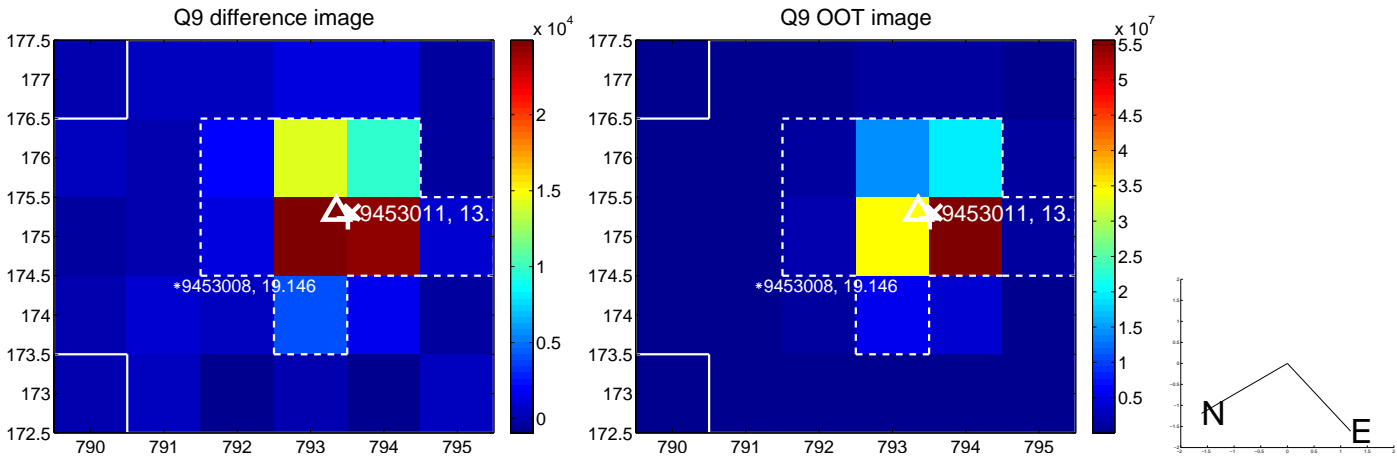
Q4 no OOT image



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



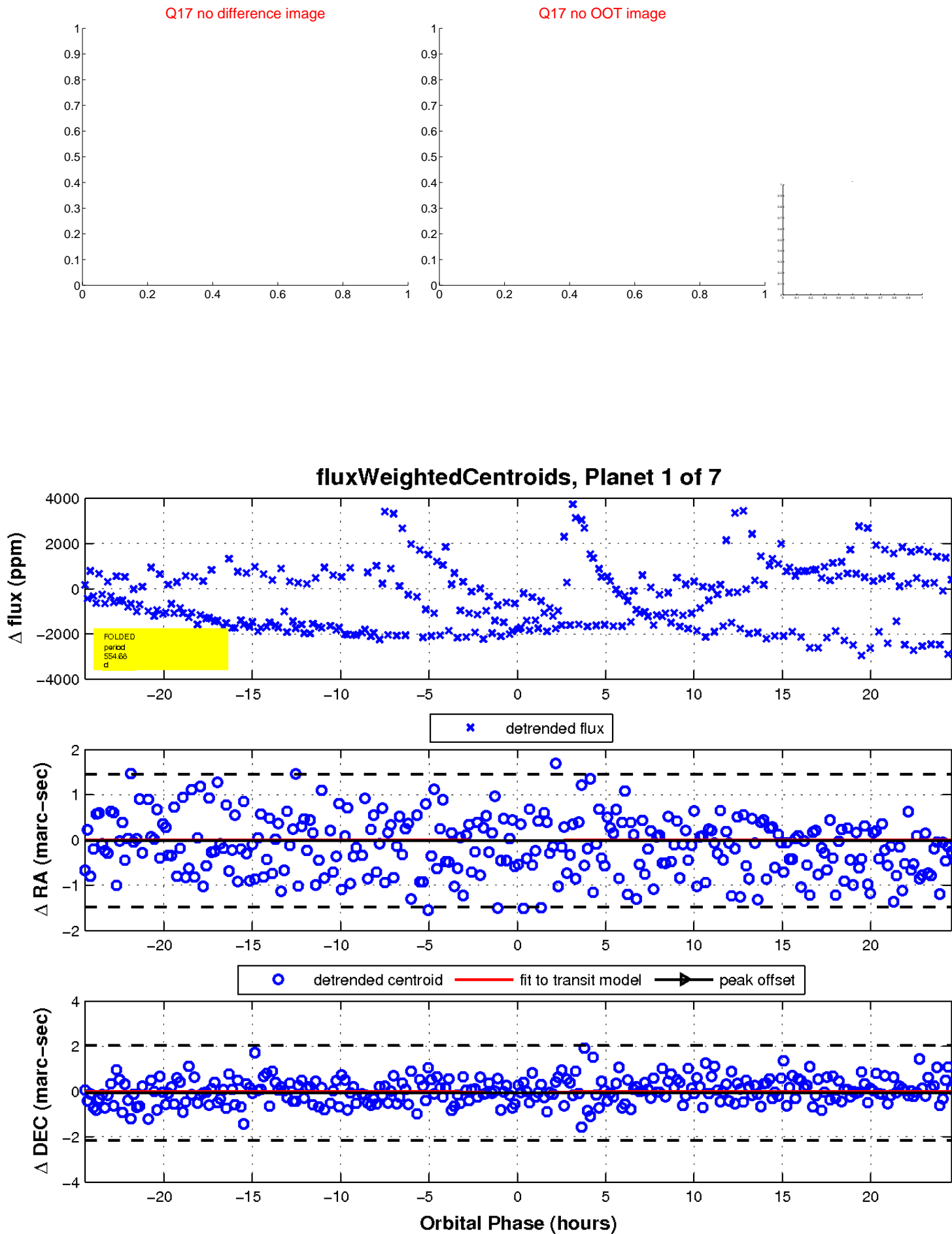
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

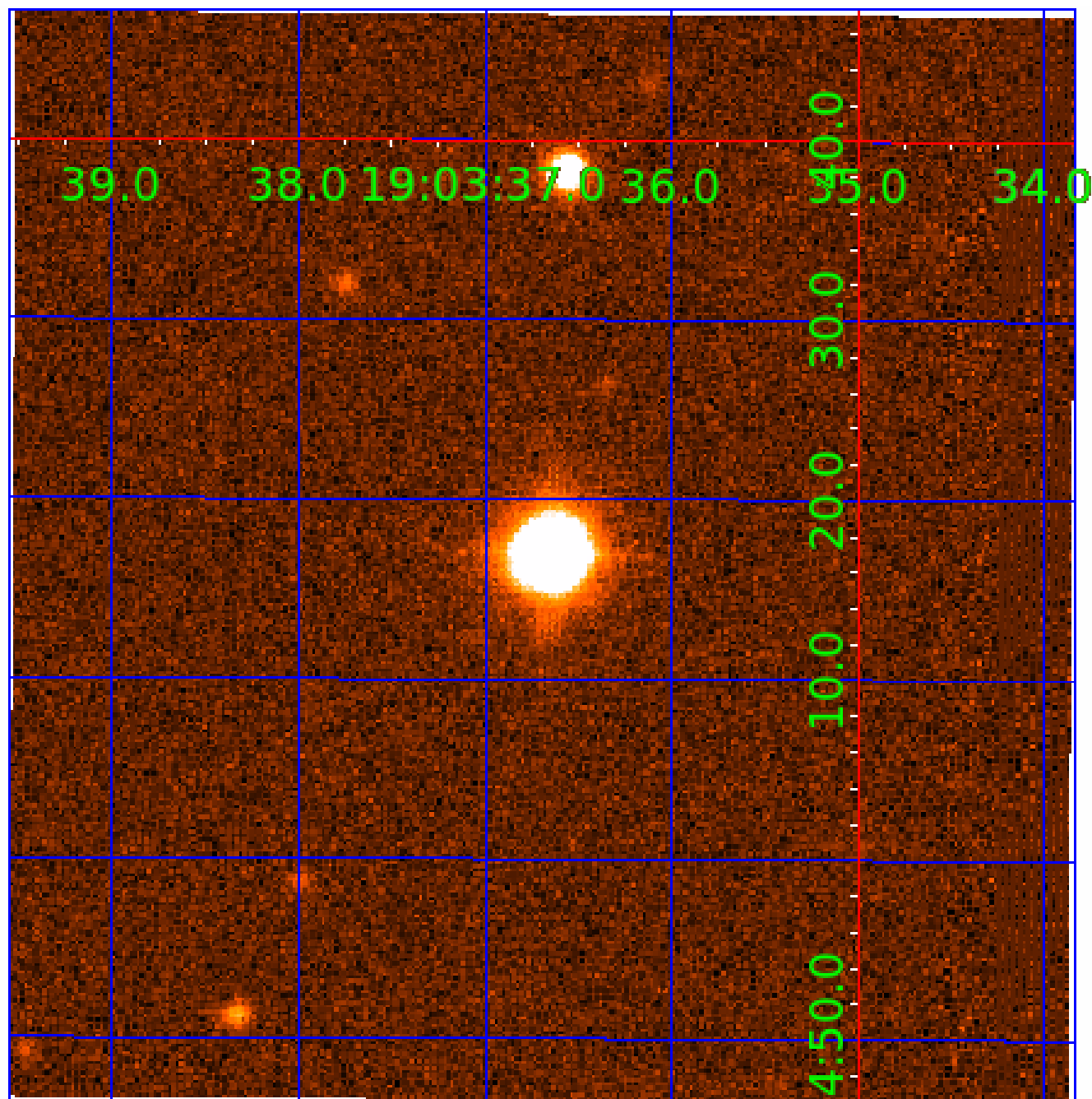


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009453011

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})
009453011-01	OBS	No	554.676636	300.725456	1435.9	8.204	17.9	9.2	0.45	3760	2.19	0.04
009453011-03	OBS	No	595.624318	274.153650	1114.3	5.491	19.8	7.5	0.45	3760	1.97	0.03
009453011-04	OBS	No	554.249661	220.742929	483.5	6.457	13.7	3.9	0.45	3760	1.07	0.04
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009453011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009453011-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

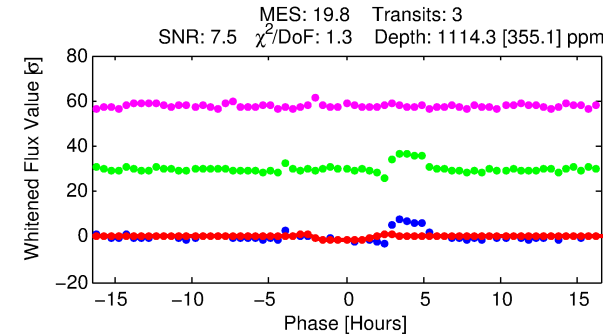
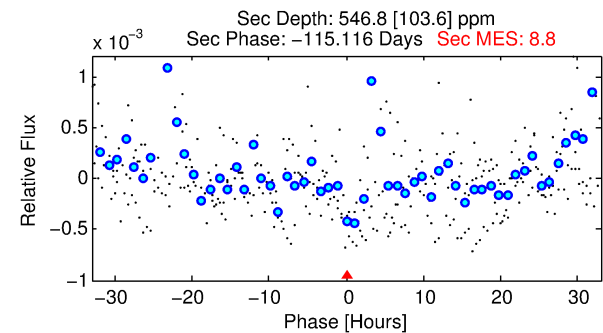
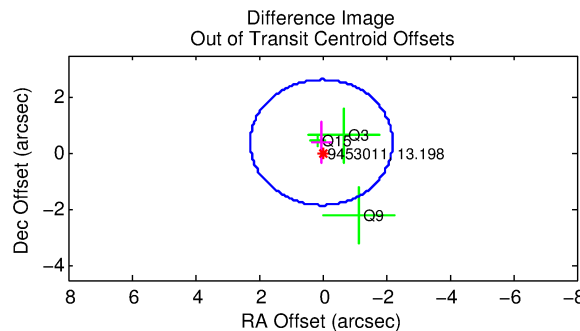
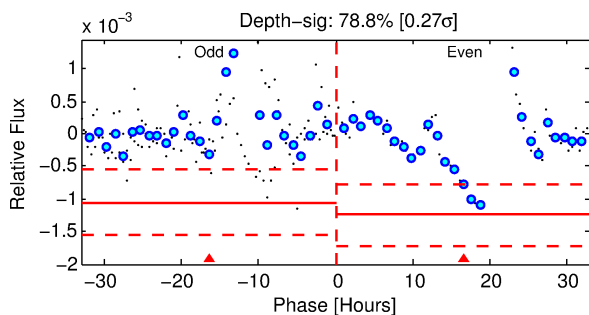
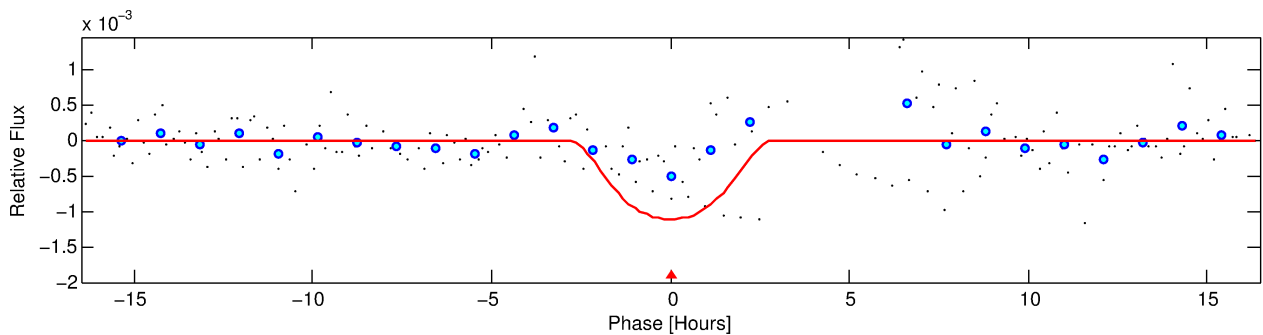
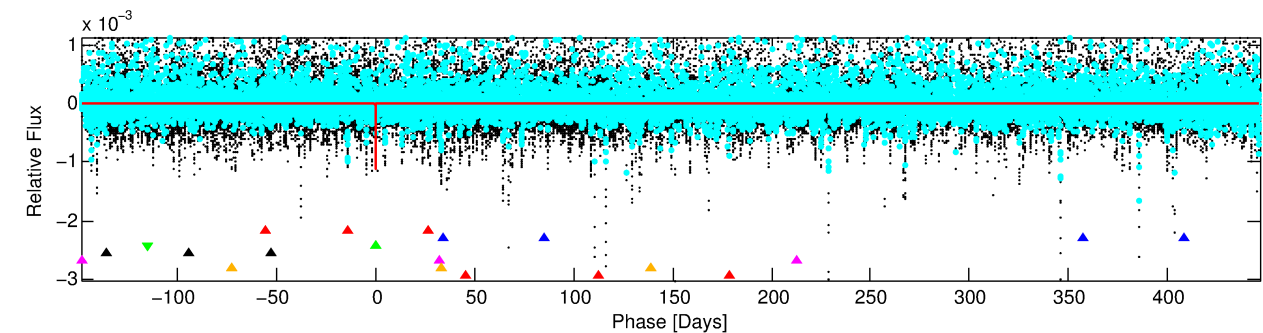
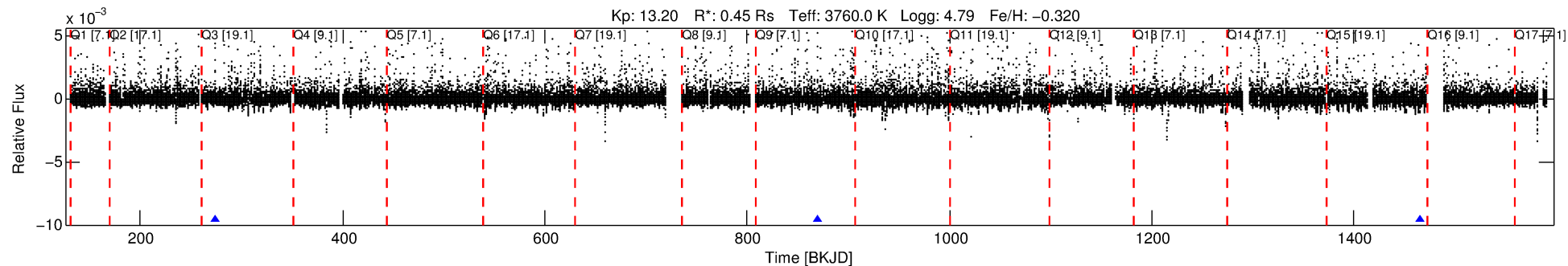
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009453011-03

No Significant Match Found

DV One-Page Summary

KIC: 9453011 Candidate: 3 of 7 Period: 595.624 d



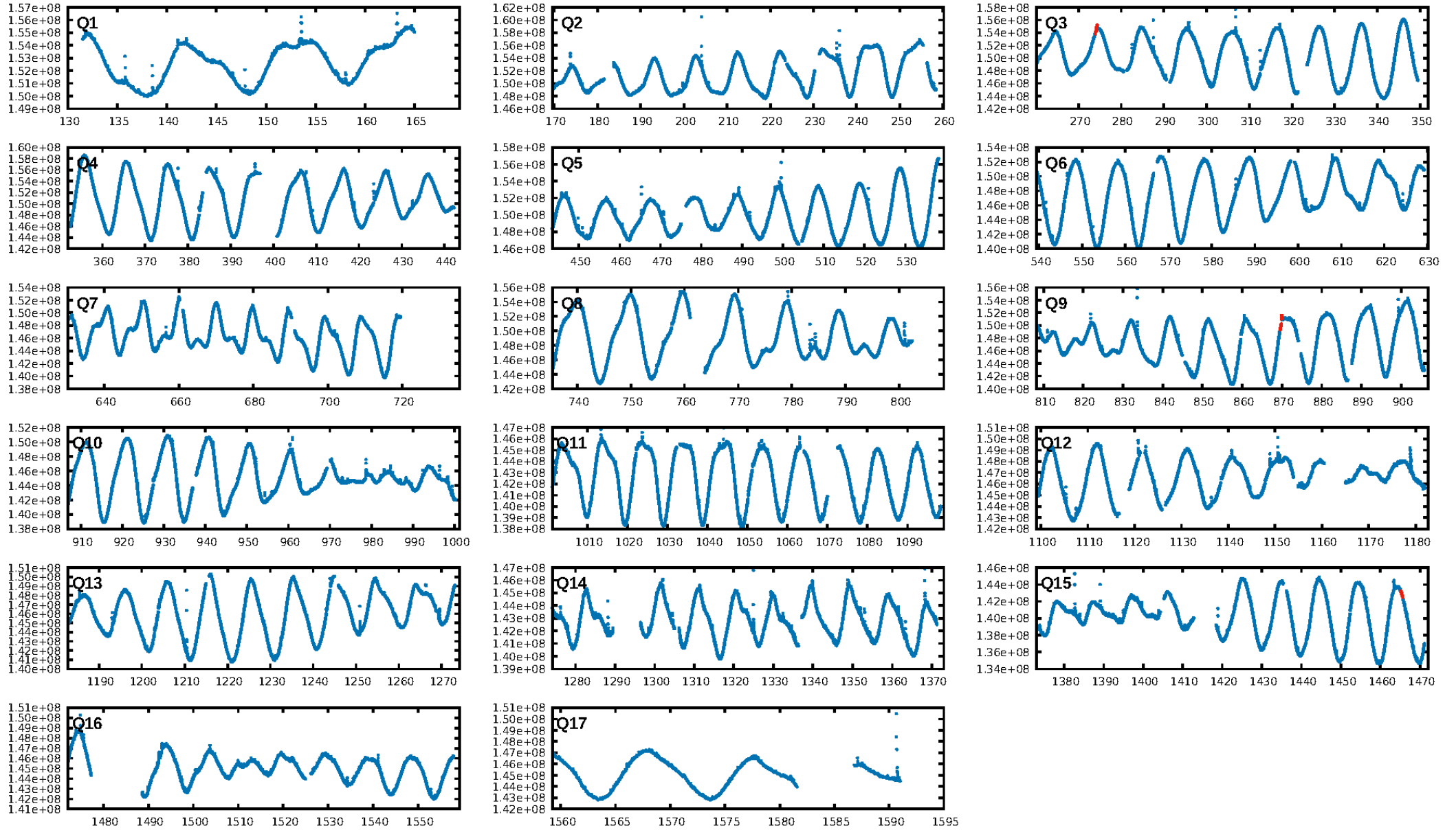
DV Fit Results:

Period = 595.62432 [0.01208] d
Epoch = 274.1536 [0.0122] BKJD
Rp/R* = 0.0400 [0.0114]
a/R* = 327.86 [81.33]
b = 0.96 [0.04]
Seff = 0.03 [0.01]
Teq = 108 [8] K
Rp = 1.97 [0.72] Re
a = 1.0686 [0.1914] AU
Ag = 88547.83 [57453.89] [1.54 σ]
Teffp = 2874 [445] K [6.21 σ]

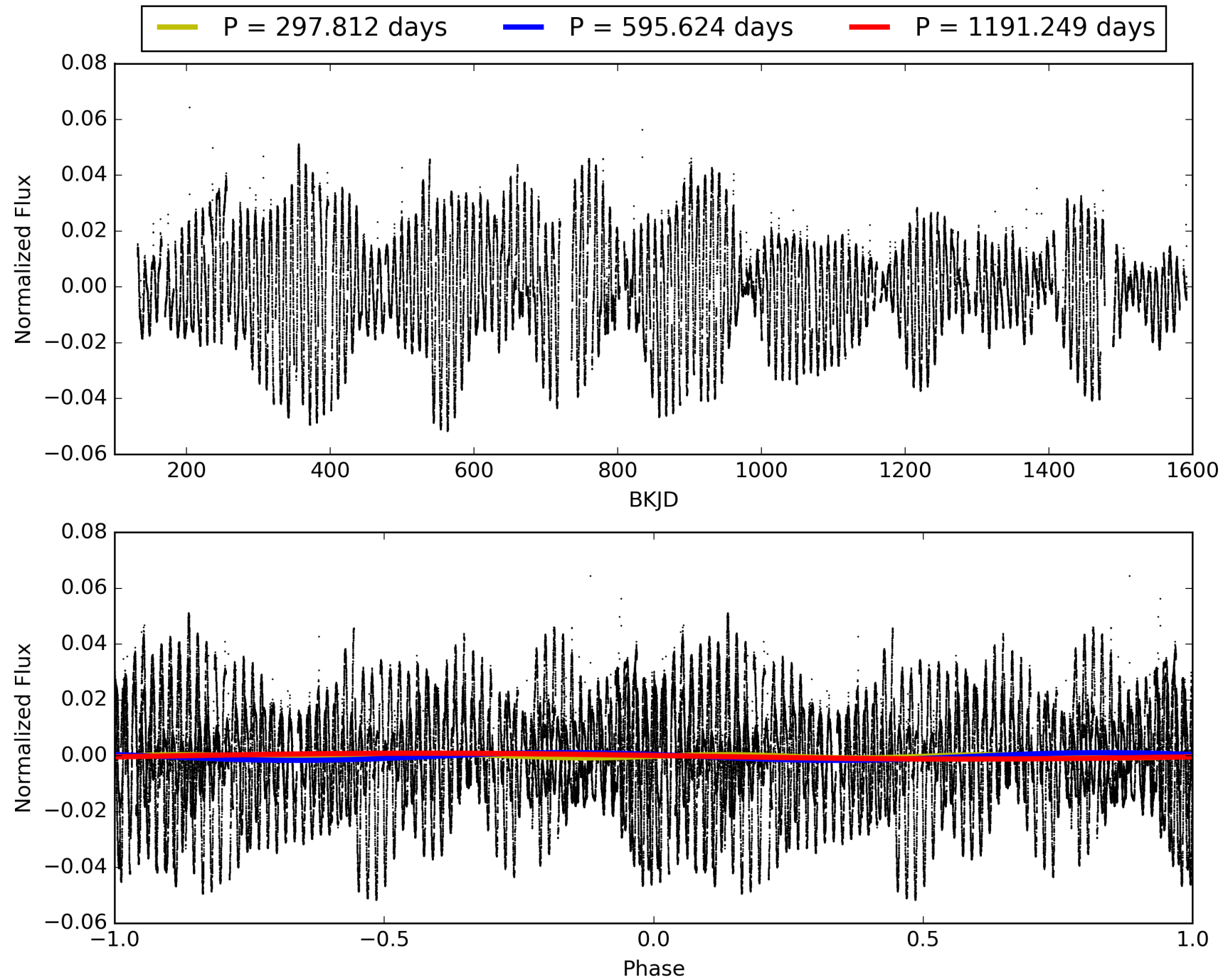
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [99.55 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 32.5%
ModelChiSquareGof-sig: 88.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.117
Centroid-sig: 14.1%
Centroid-so: 0.401 arcsec [1.36 σ]
OotOffset-rm: 0.400 arcsec [0.54 σ]
OotOffset-st: 0.2/0/1 [3]
KicOffset-rm: 0.766 arcsec [1.41 σ]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 009453011-03, PDC Light Curves

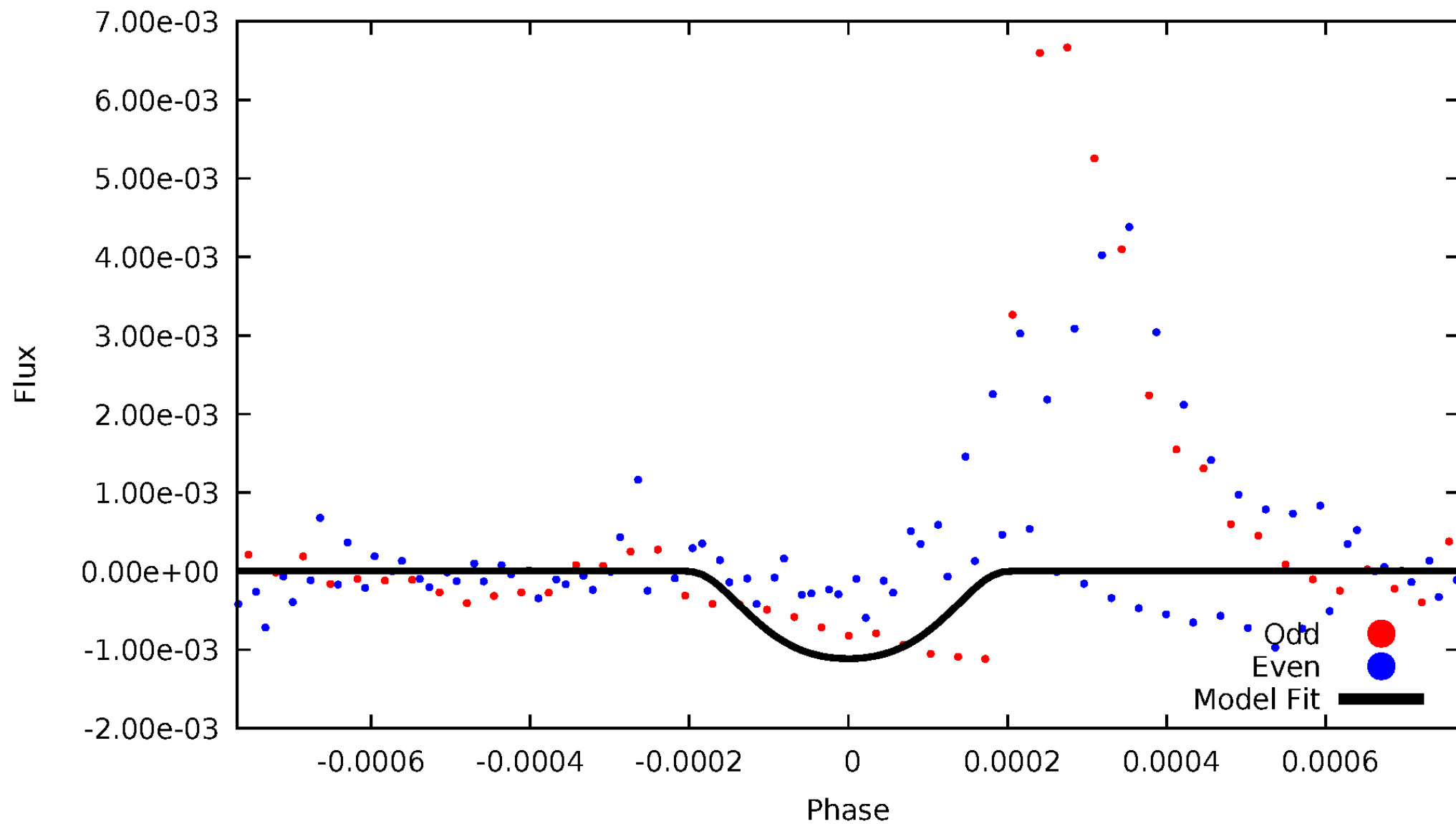


TCE 009453011-03



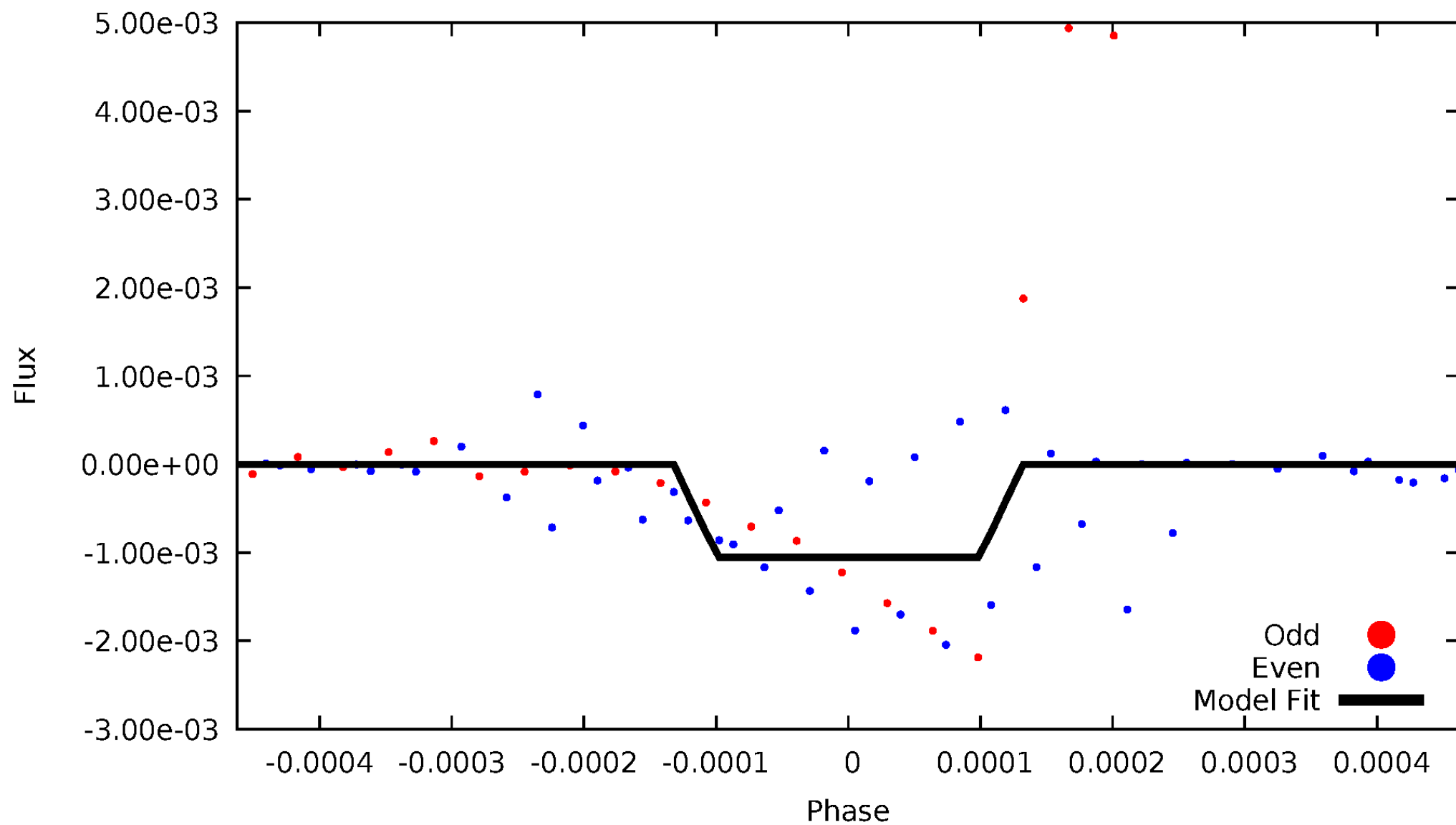
DV Odd/Even

TCE 009453011-03



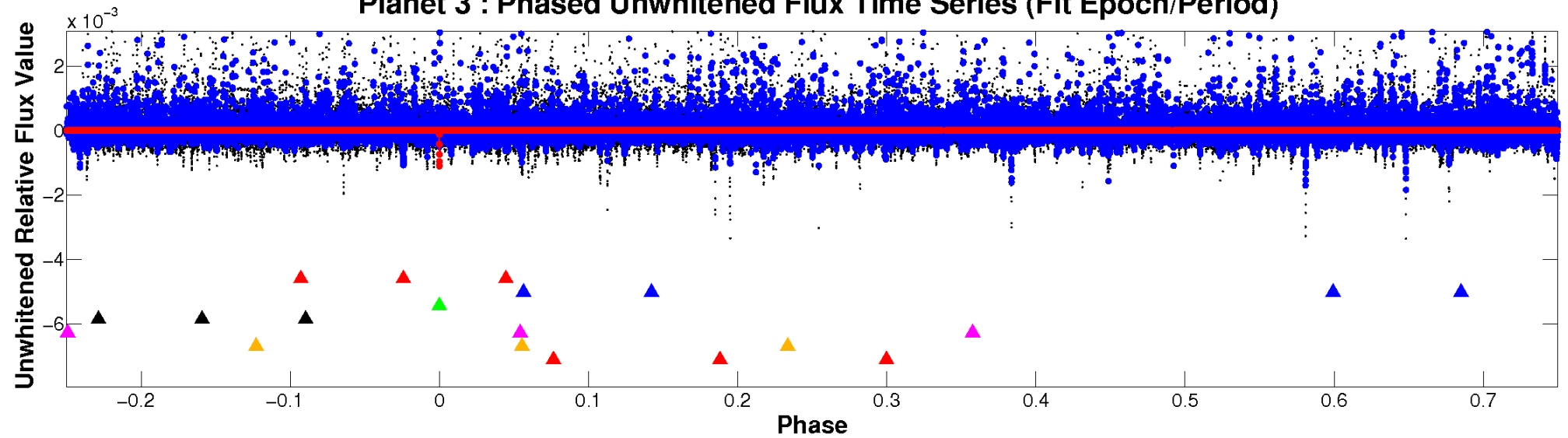
ALT Odd/Even

TCE 009453011-03

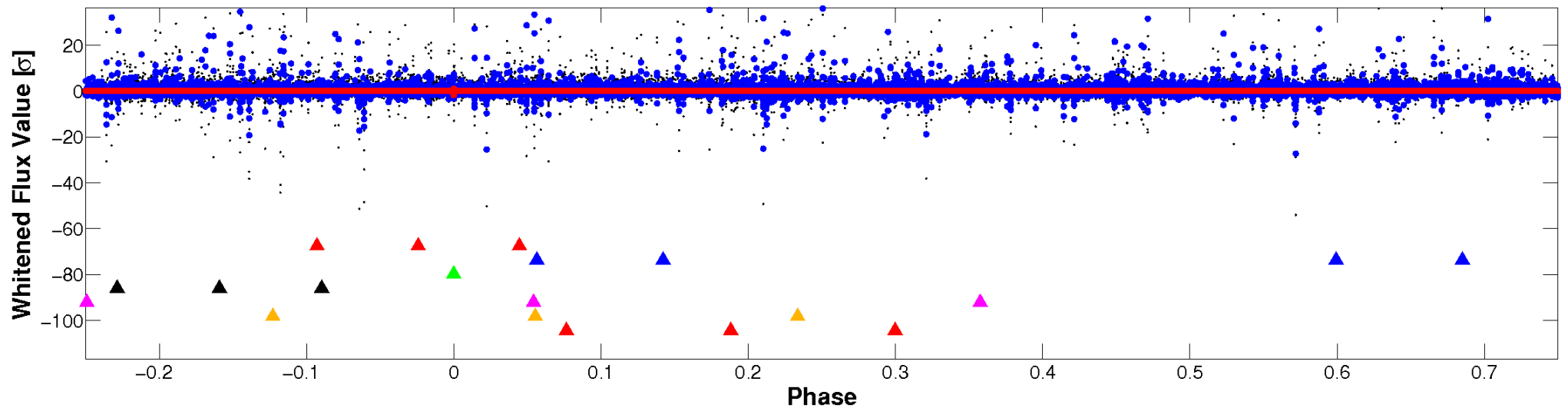


Non-Whitened Vs. Whitened Light Curve

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

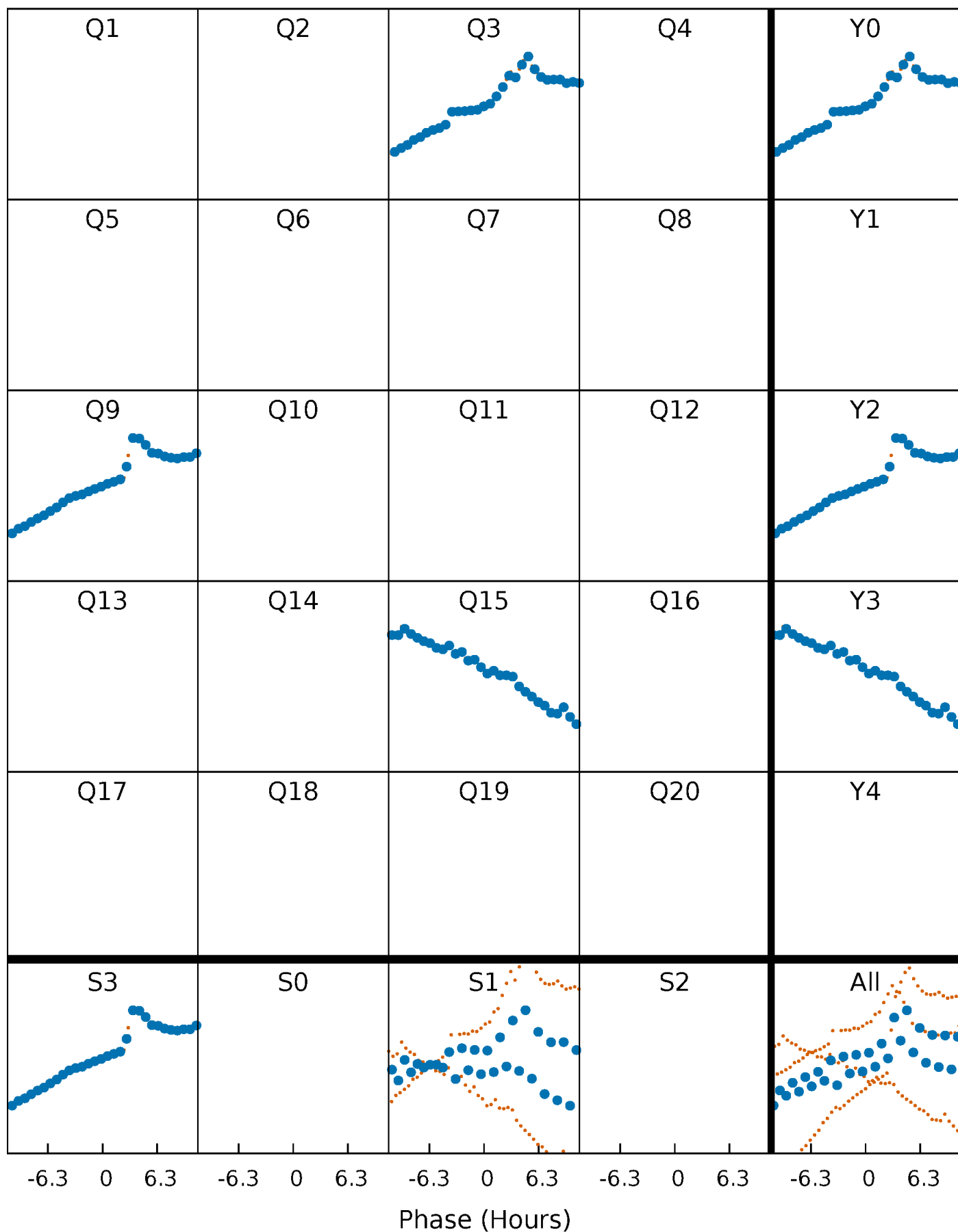


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



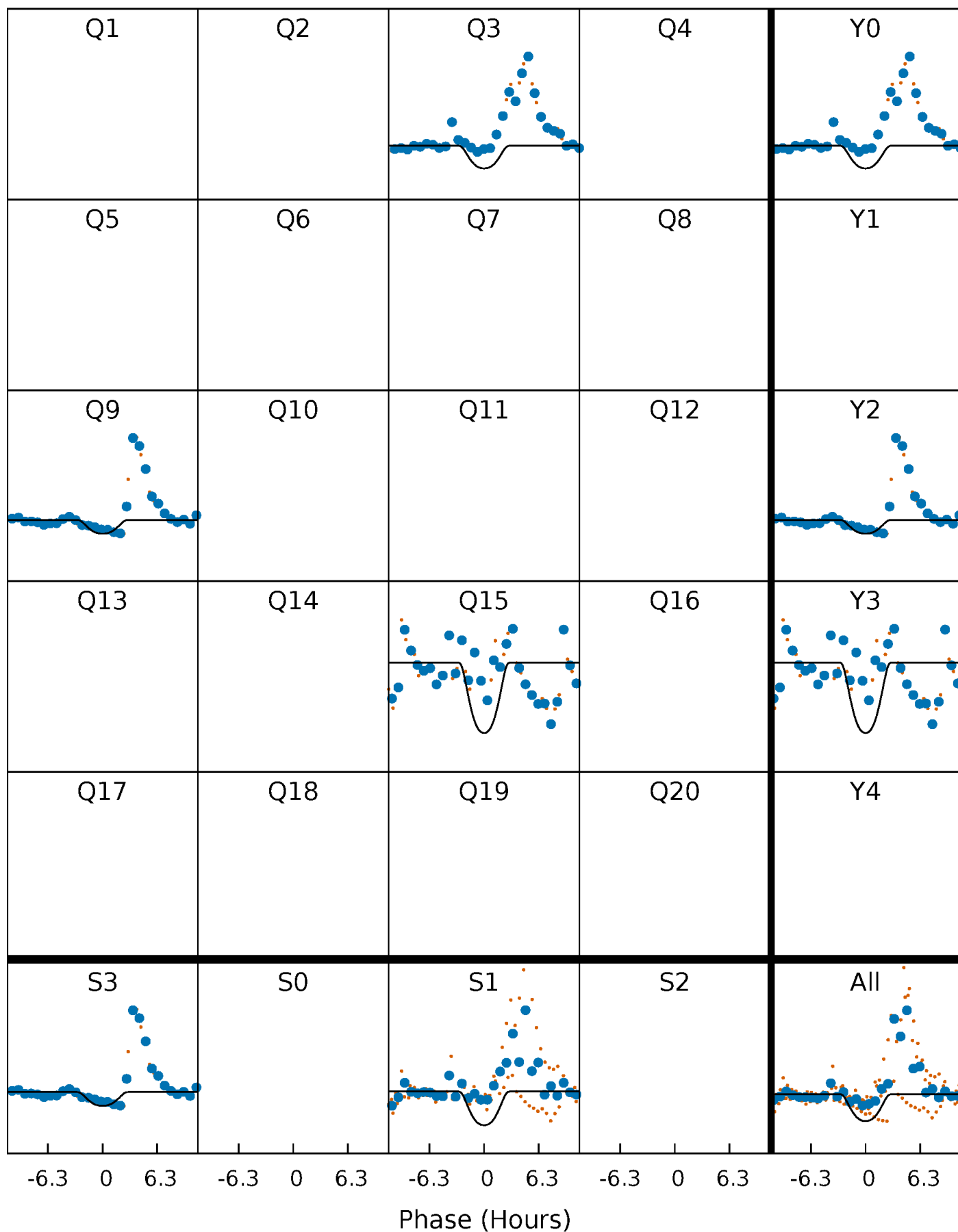
PDC Quarter-Phased Transit Curves

TCE 009453011-03 P=595.624318 Days $T_0=274.153650$ (BKJD)



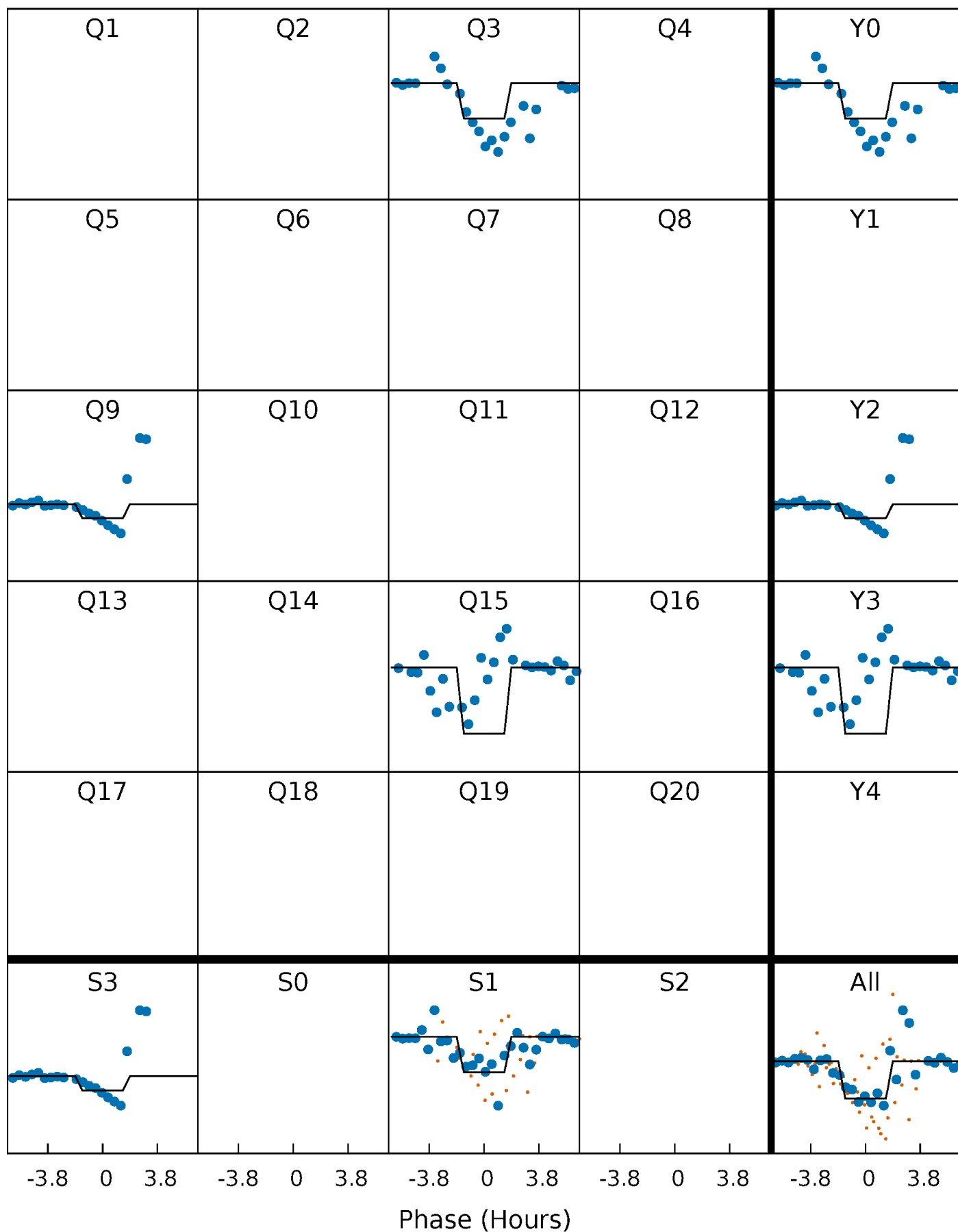
DV Quarter-Phased Transit Curves

TCE 009453011-03 $P=595.624318$ Days $T_0=274.153650$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

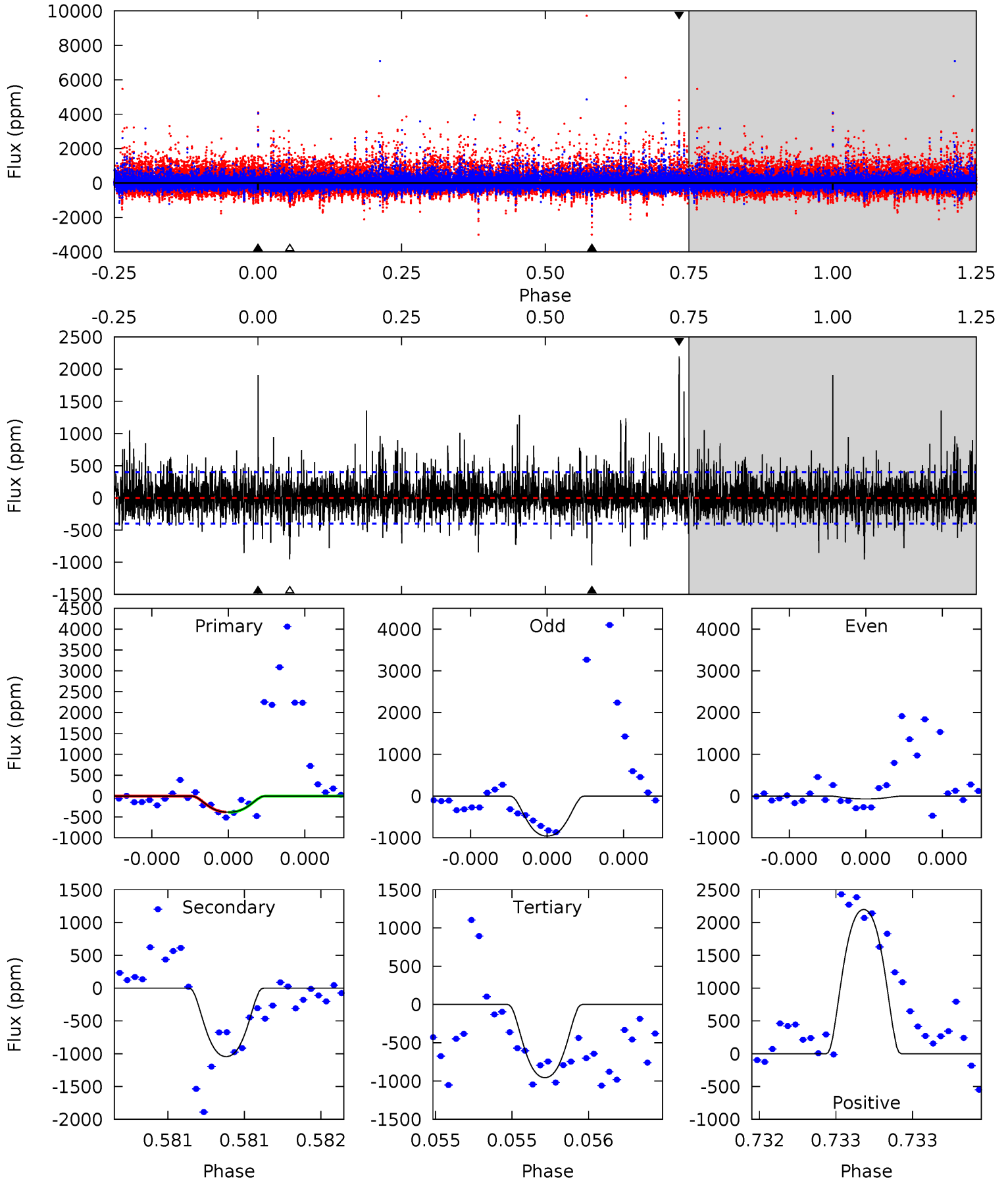
TCE 009453011-03 P=595.645085 Days $T_0=274.177006$ (BKJD)



DV Model-Shift Uniqueness Test

009453011-03, P = 595.624318 Days, E = 274.153650 Days

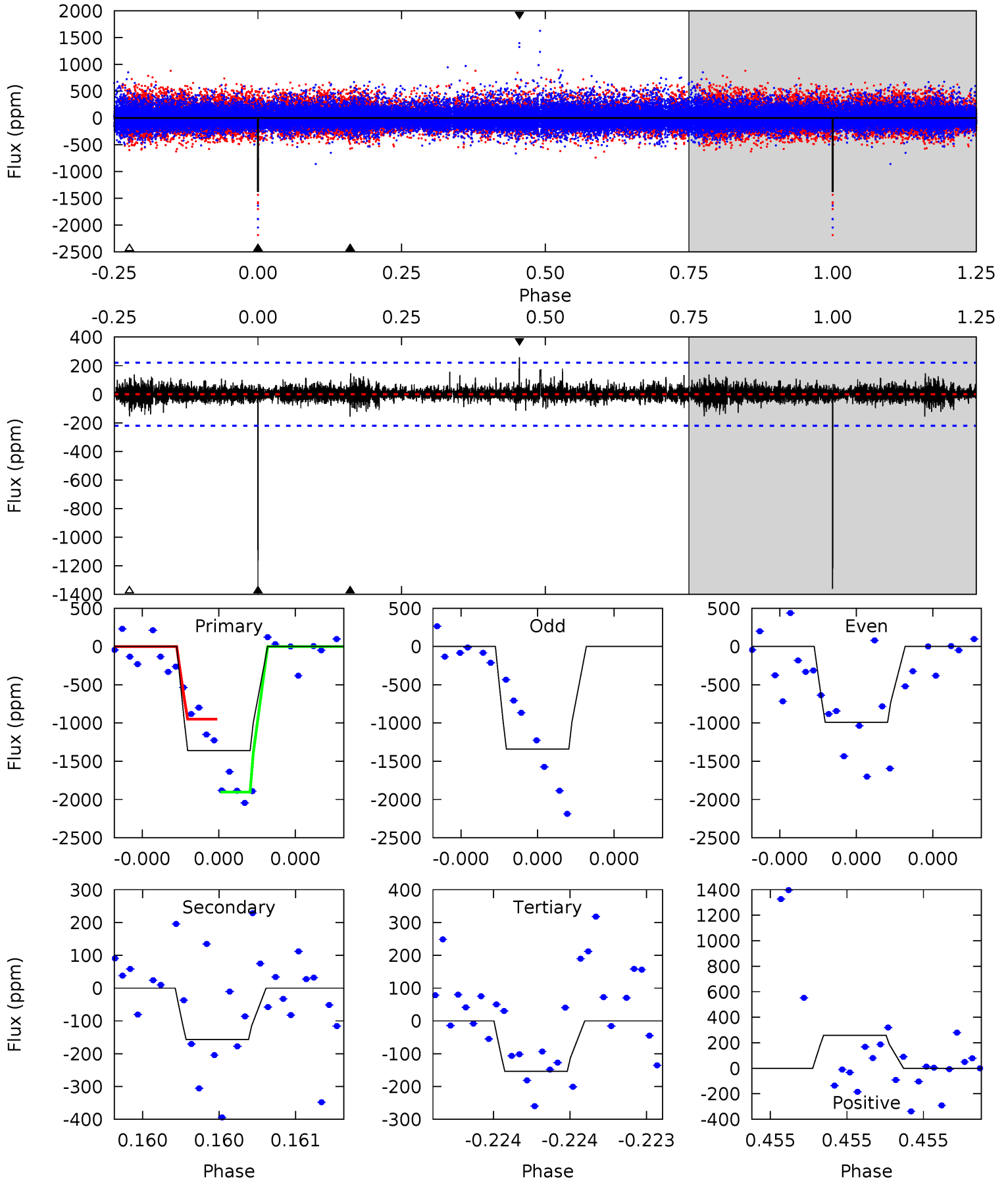
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.44	14.7	13.4	30.8	5.60	3.53	3.01	-7.97	-25.4	1.25	-16.2	3.81	1.60	0.68	0.03



Alt Model-Shift Uniqueness Test

009453011-03, P = 595.645085 Days, E = 274.177006 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.1	4.04	3.97	6.67	5.70	3.67	0.70	31.1	28.4	0.07	-2.64	4.46	0.76	0.16	12.4



Stellar Parameters For KIC 009453011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3760^{+117}_{-143}	$4.791^{+0.126}_{-0.054}$	$-0.320^{+0.300}_{-0.350}$	$0.451^{+0.068}_{-0.102}$	$0.459^{+0.069}_{-0.103}$	$7.044^{+4.959}_{-1.529}$
	+3%/-4%	+3%/-1%	+94%/-109%	+15%/-23%	+15%/-22%	+70%/-22%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009453011-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1045 ± 71	$1.94^{+0.61}_{-0.57}$	148^{+8}_{-8}	3506^{+382}_{-300}	$175924^{+165800}_{-72816}$
Alt.	-157 ± 39	$1.53^{+0.62}_{-0.56}$	149^{+7}_{-8}	2826^{+391}_{-246}	41201^{+65451}_{-20251}

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

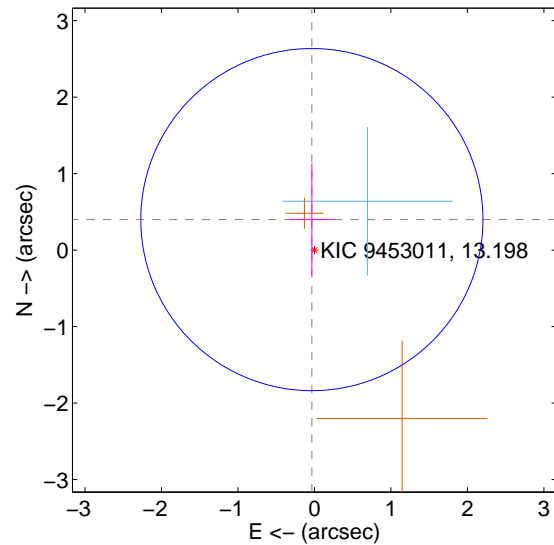
Supplemental centroid analysis for 009453011-03. Kepler magnitude: 13.20. Transit SNR 7.53

There are 1 quarters with good PRF difference image offsets

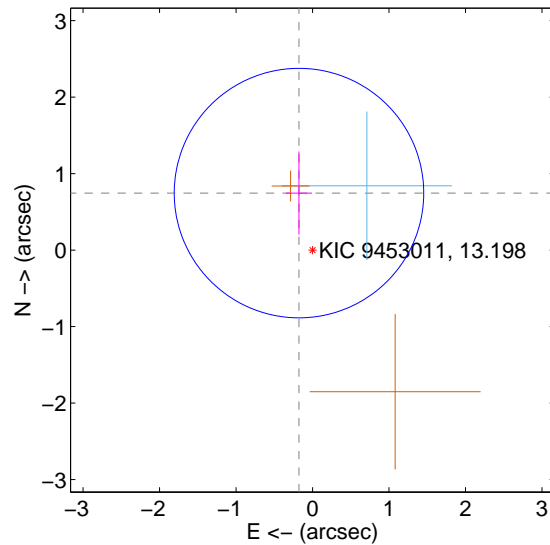
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.400 ± 0.745	0.54	0.033 ± 0.292	0.399 ± 0.735
PRF-fit source offset from KIC position	0.766 ± 0.543	1.41	0.177 ± 0.171	0.745 ± 0.543
photometric centroid source offset	0.40 ± 0.30	1.36	0.40 ± 0.30	0.00 ± 0.34

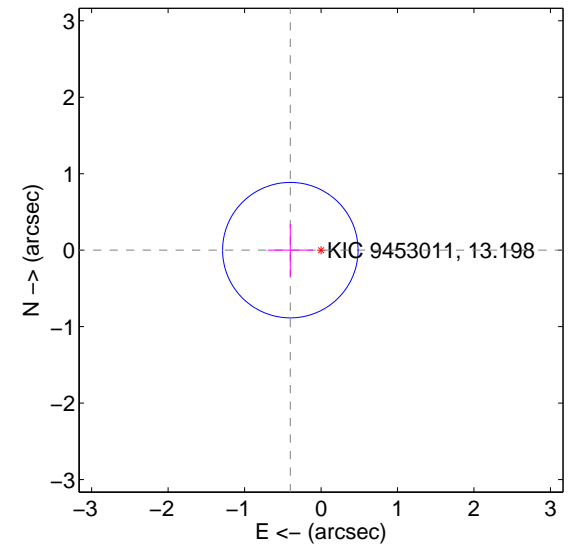
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

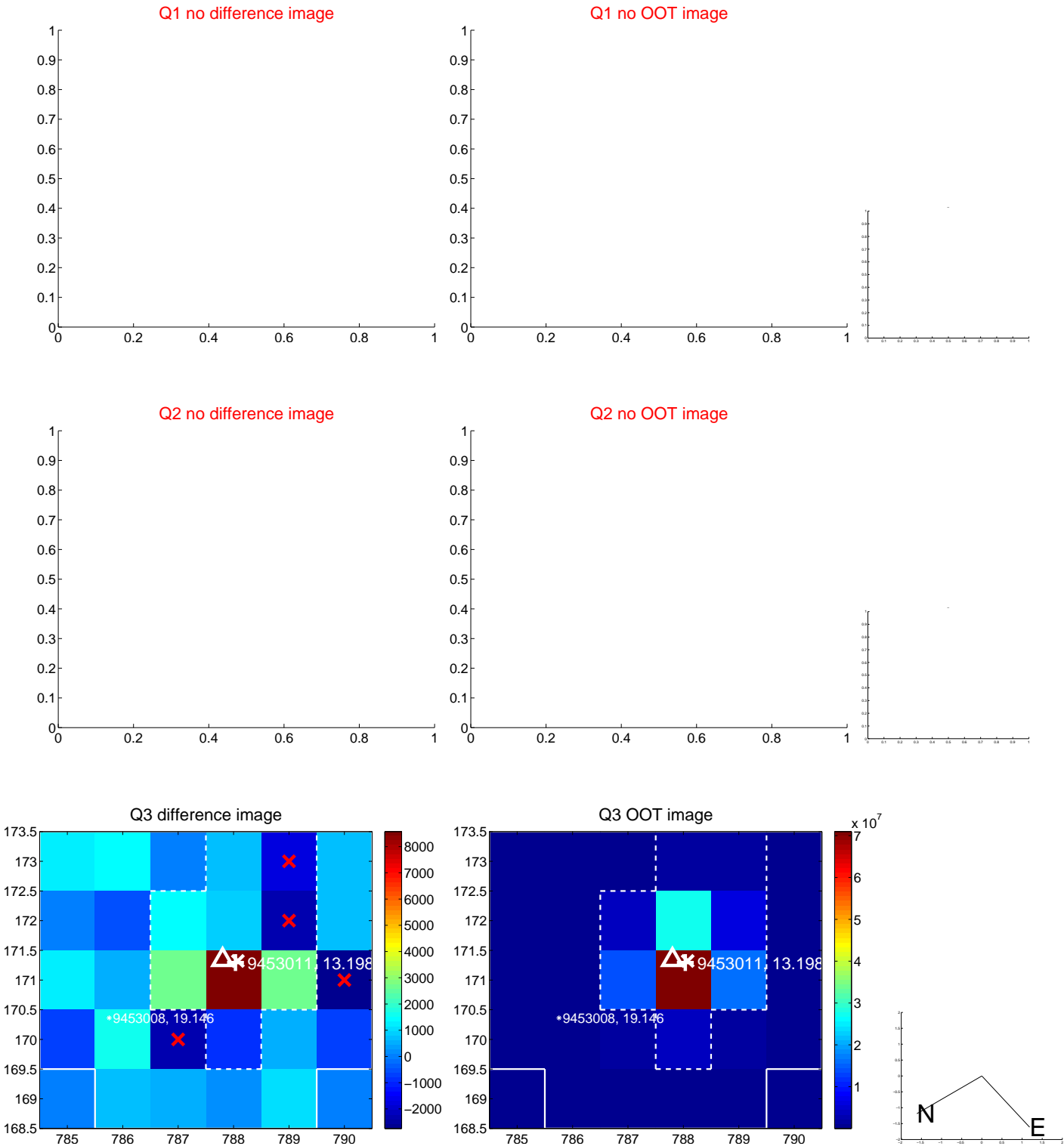


offset from photometric centroids



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.

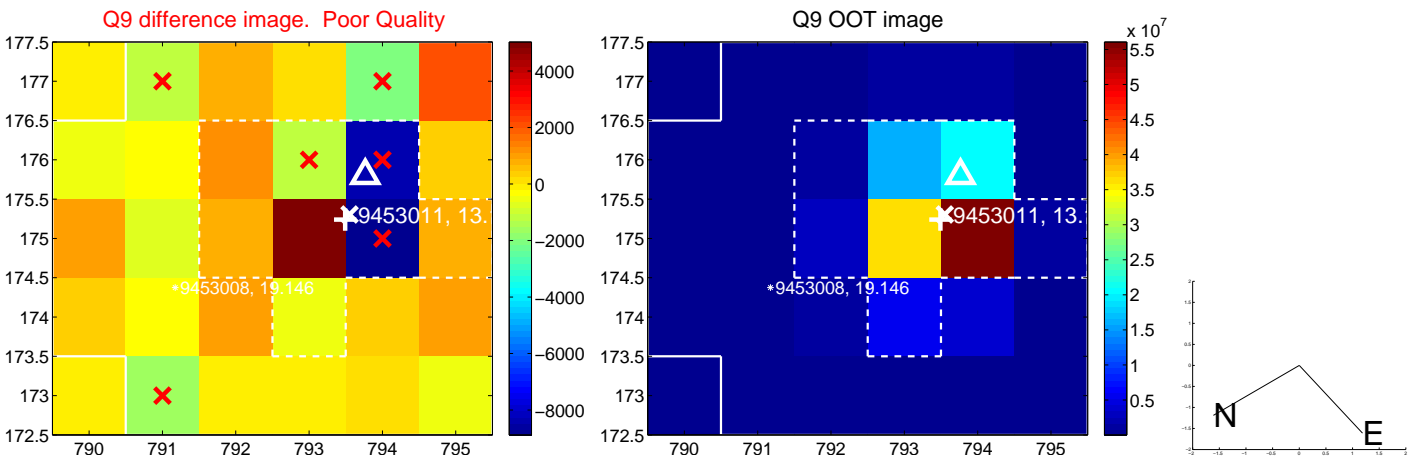
white \times : KIC target position; $+$: OOT centroid; Δ : difference centroid. red \times : large negative pixel value.



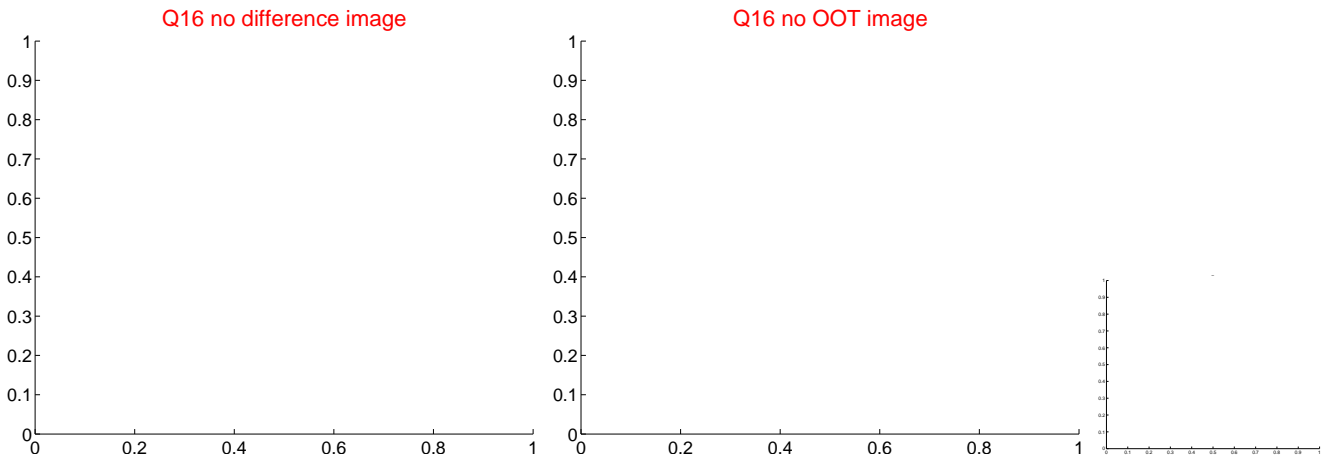
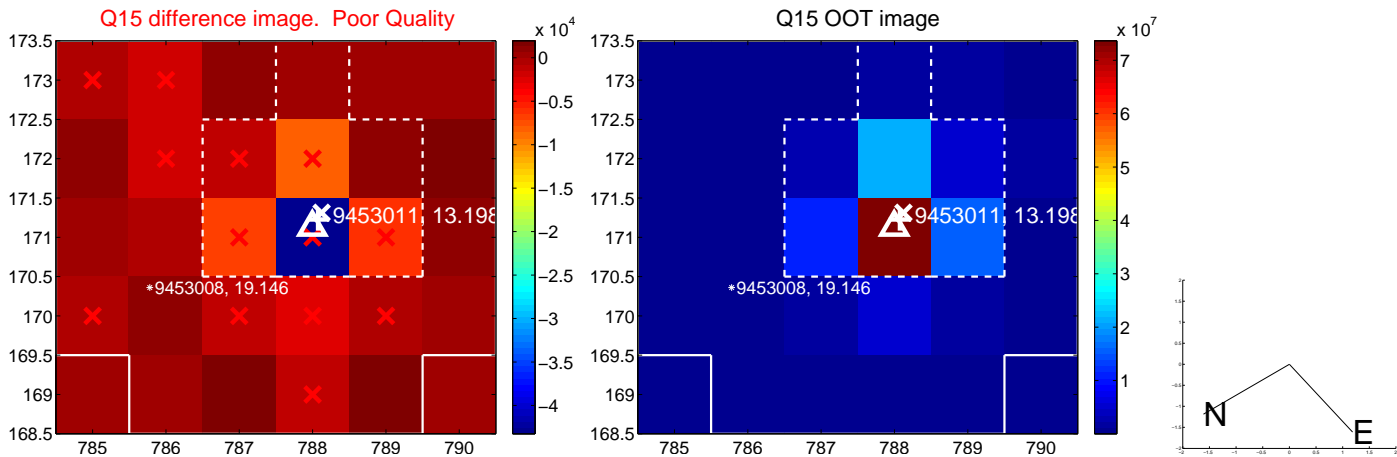
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



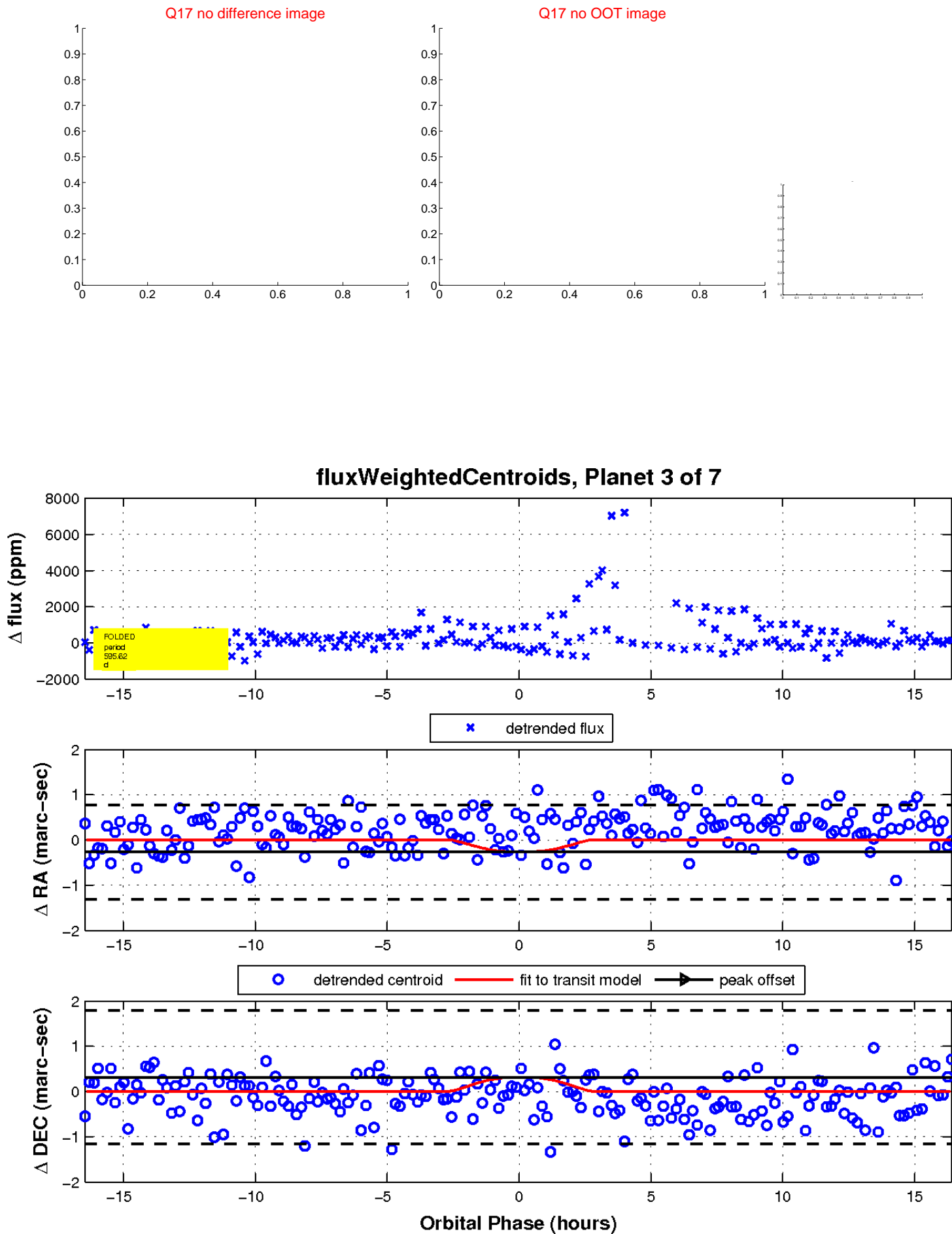
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

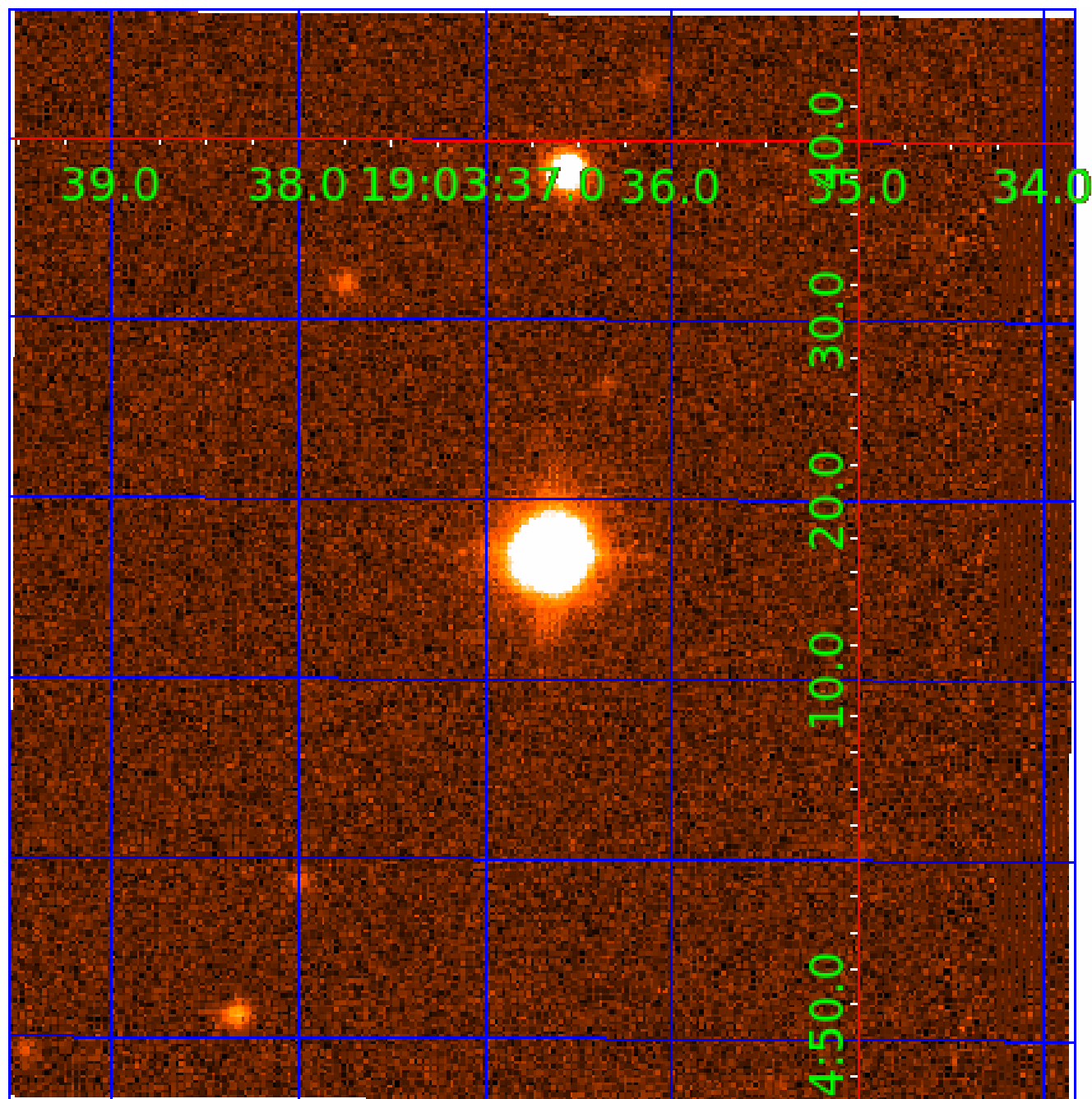


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009453011

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})
009453011-01	OBS	No	554.676636	300.725456	1435.9	8.204	17.9	9.2	0.45	3760	2.19	0.04
009453011-03	OBS	No	595.624318	274.153650	1114.3	5.491	19.8	7.5	0.45	3760	1.97	0.03
009453011-04	OBS	No	554.249661	220.742929	483.5	6.457	13.7	3.9	0.45	3760	1.07	0.04
009453011-05	OBS	No	414.910833	487.156787	430.9	3.047	13.8	3.8	0.45	3760	1.05	0.05
009453011-06	OBS	No	489.459841	413.308931	674.3	4.387	13.9	5.1	0.45	3760	1.18	0.04
009453011-07	OBS	No	529.140659	452.726557	200.3	12.500	12.9	-1.0	0.45	3760	0.64	0.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009453011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009453011-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

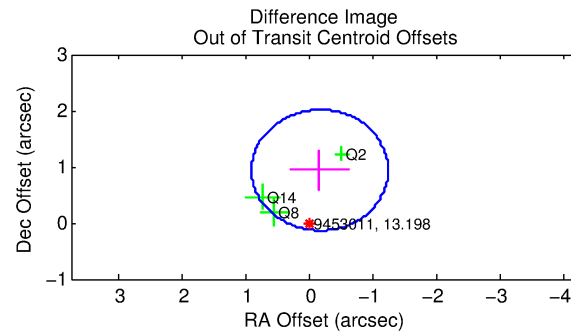
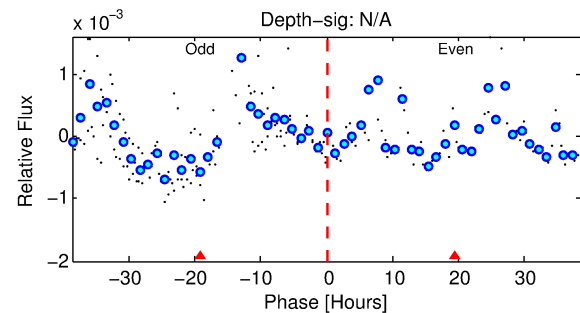
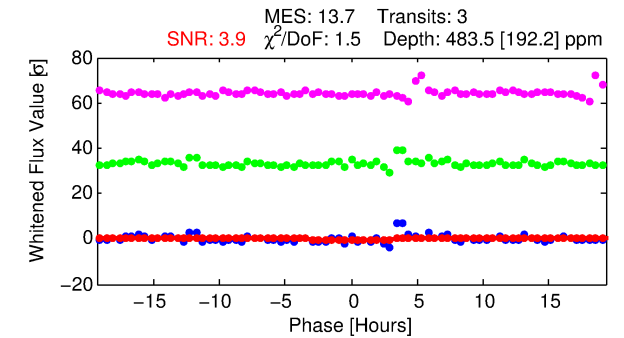
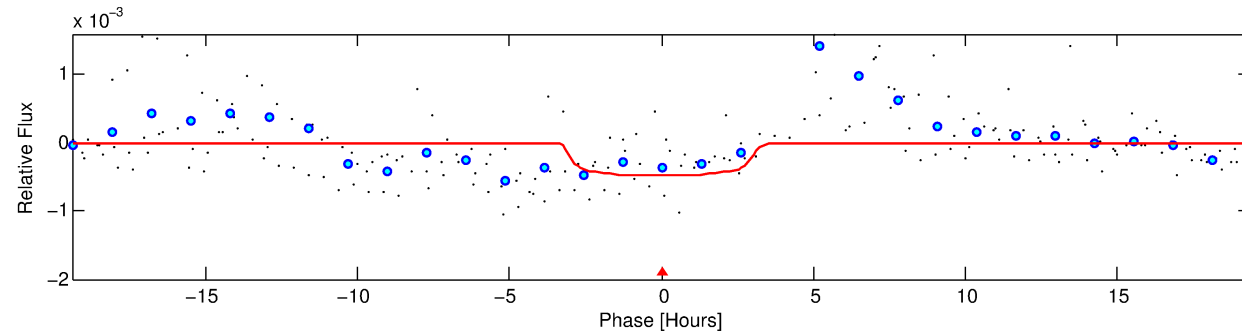
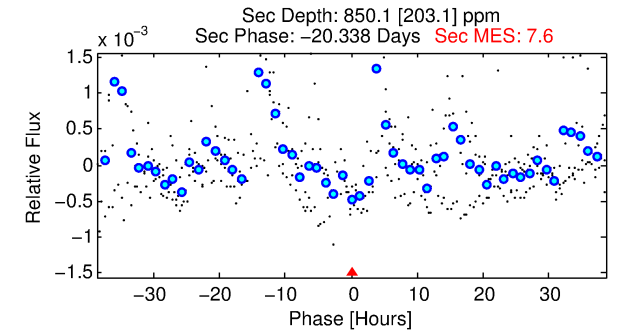
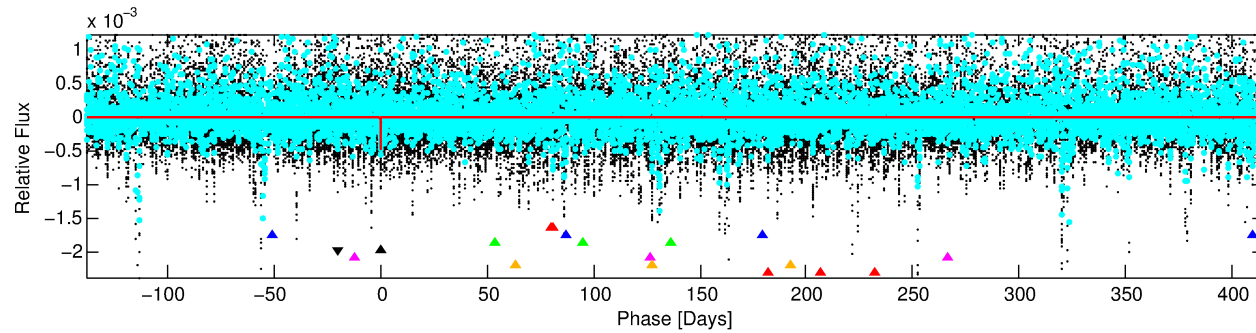
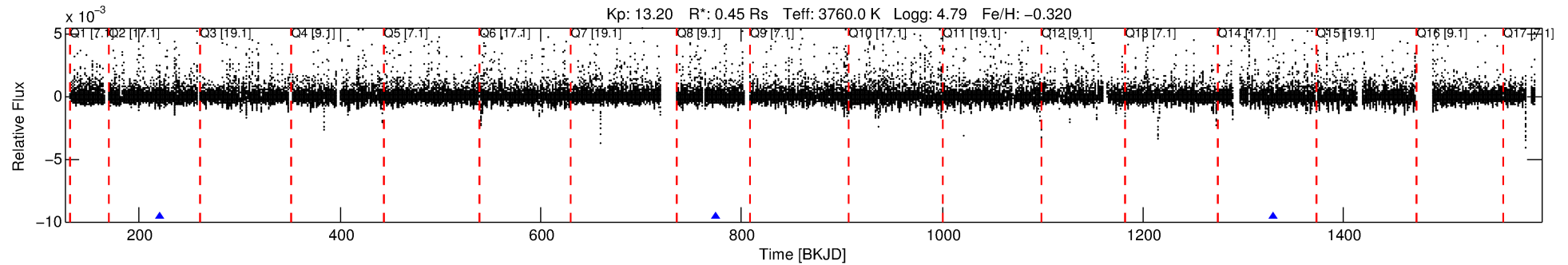
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009453011-04

No Significant Match Found

DV One-Page Summary

KIC: 9453011 Candidate: 4 of 7 Period: 554.250 d



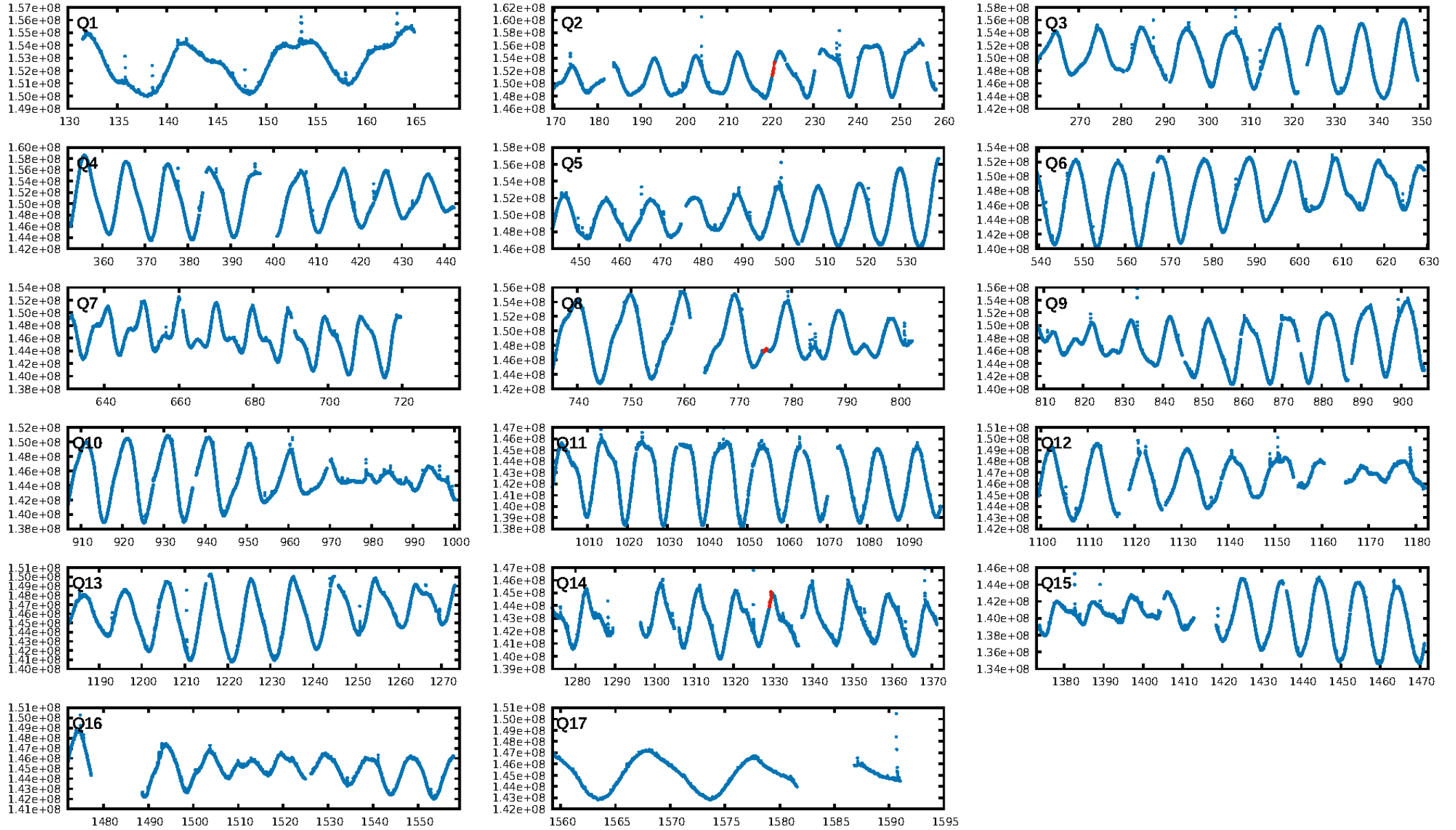
DV Fit Results:

Period = 554.24966 [0.01845] d
Epoch = 220.7429 [0.0277] BKJD
Rp/R* = 0.0218 [0.0181]
a/R* = 455.22 [1738.85]
b = 0.75 [2.25]
Seff = 0.04 [0.01]
Teq = 110 [8] K
Rp = 1.07 [0.92] Re
a = 1.0185 [0.1824] AU
Ag = 420492.70 [712577.67] [0.59σ]
Teffp = 4346 [1829] K [2.32σ]

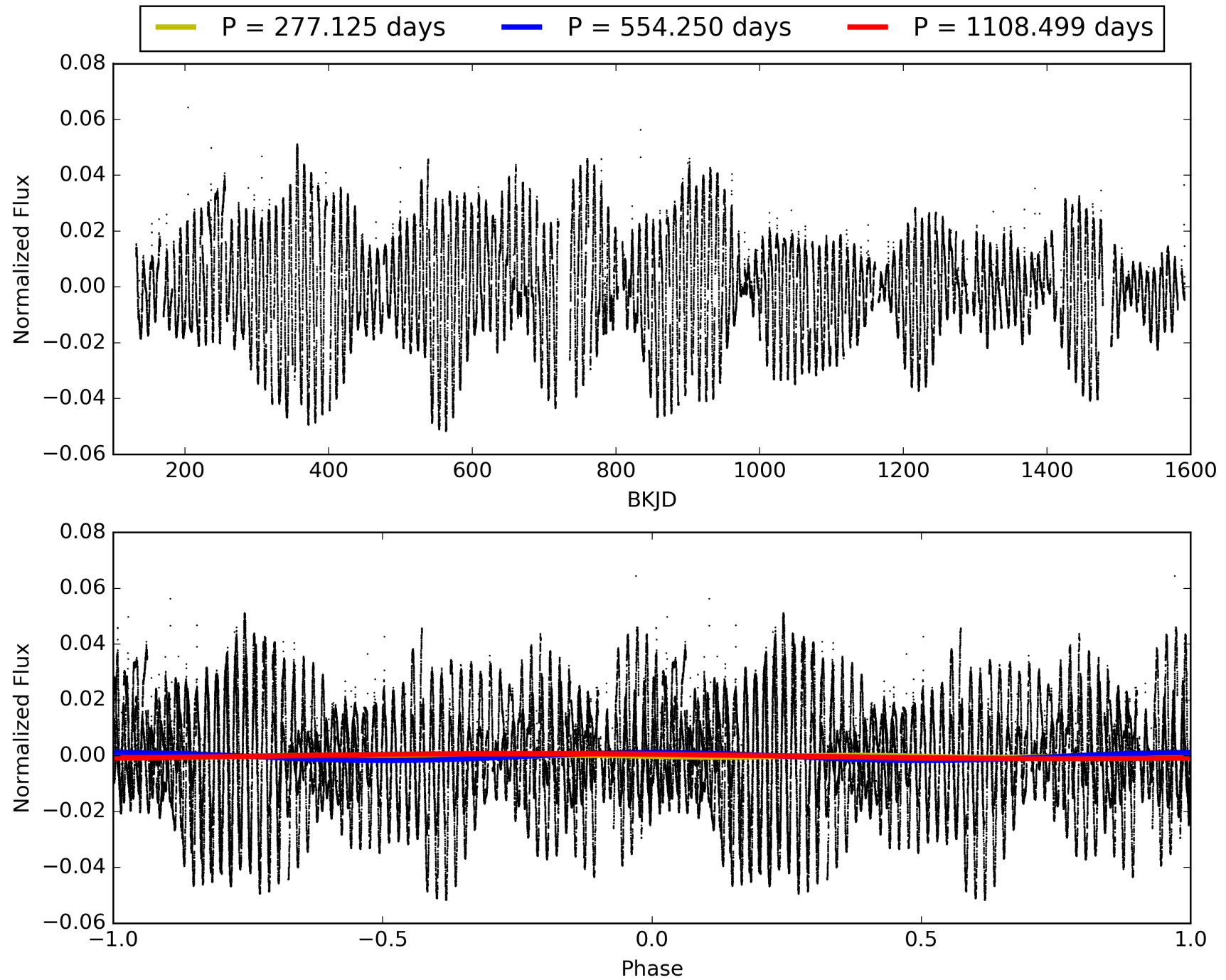
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [42.83σ]
LongPeriod-sig: 67.4% [0.98σ]
ModelChiSquare2-sig: 18.8%
ModelChiSquareGof-sig: 75.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 9.587
Centroid-sig: 59.7%
Centroid-so: 0.016 arcsec [0.03σ]
OotOffset-rm: 0.949 arcsec [2.65σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-rm: 1.172 arcsec [3.40σ]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 009453011-04, PDC Light Curves

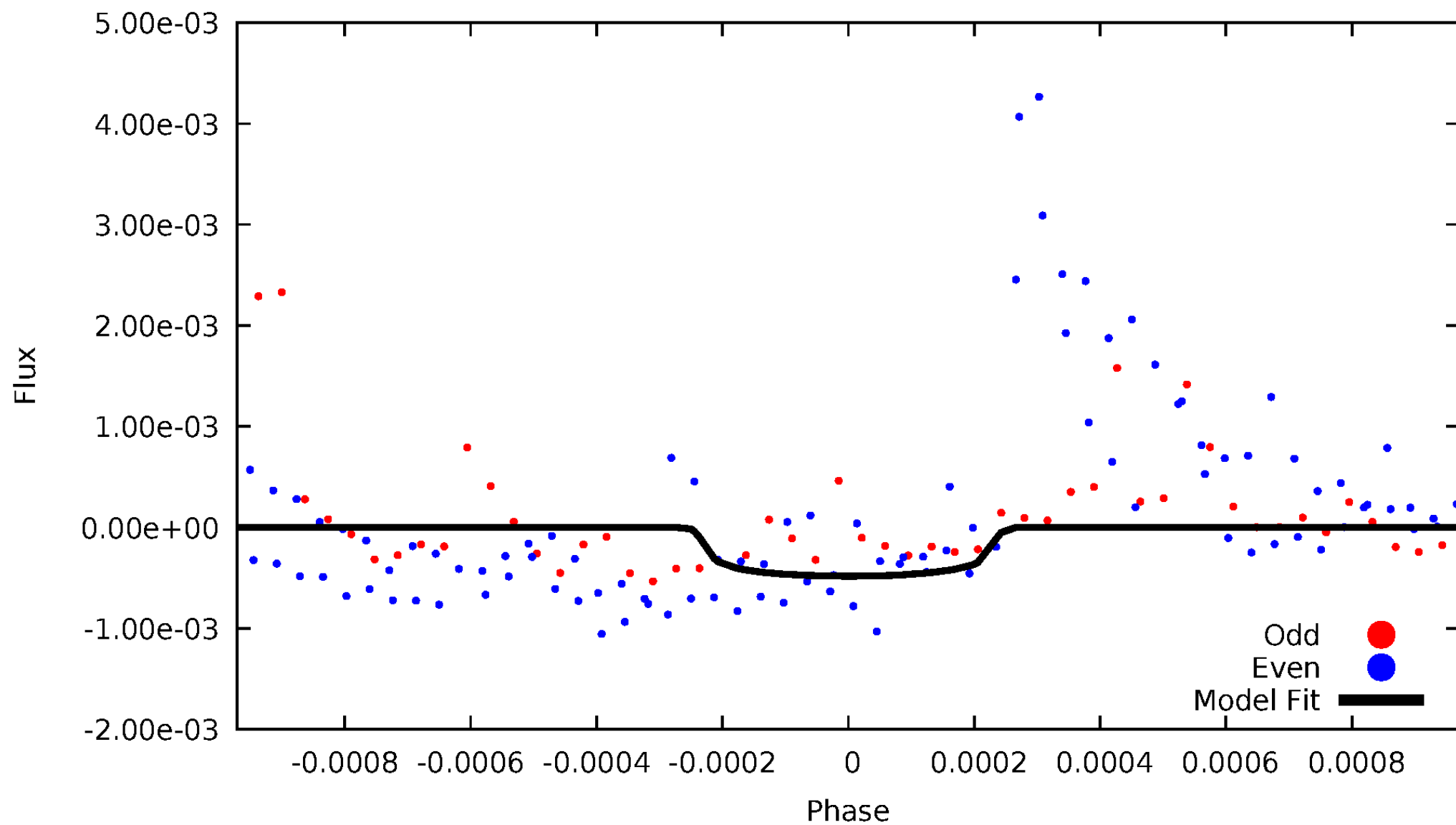


TCE 009453011-04



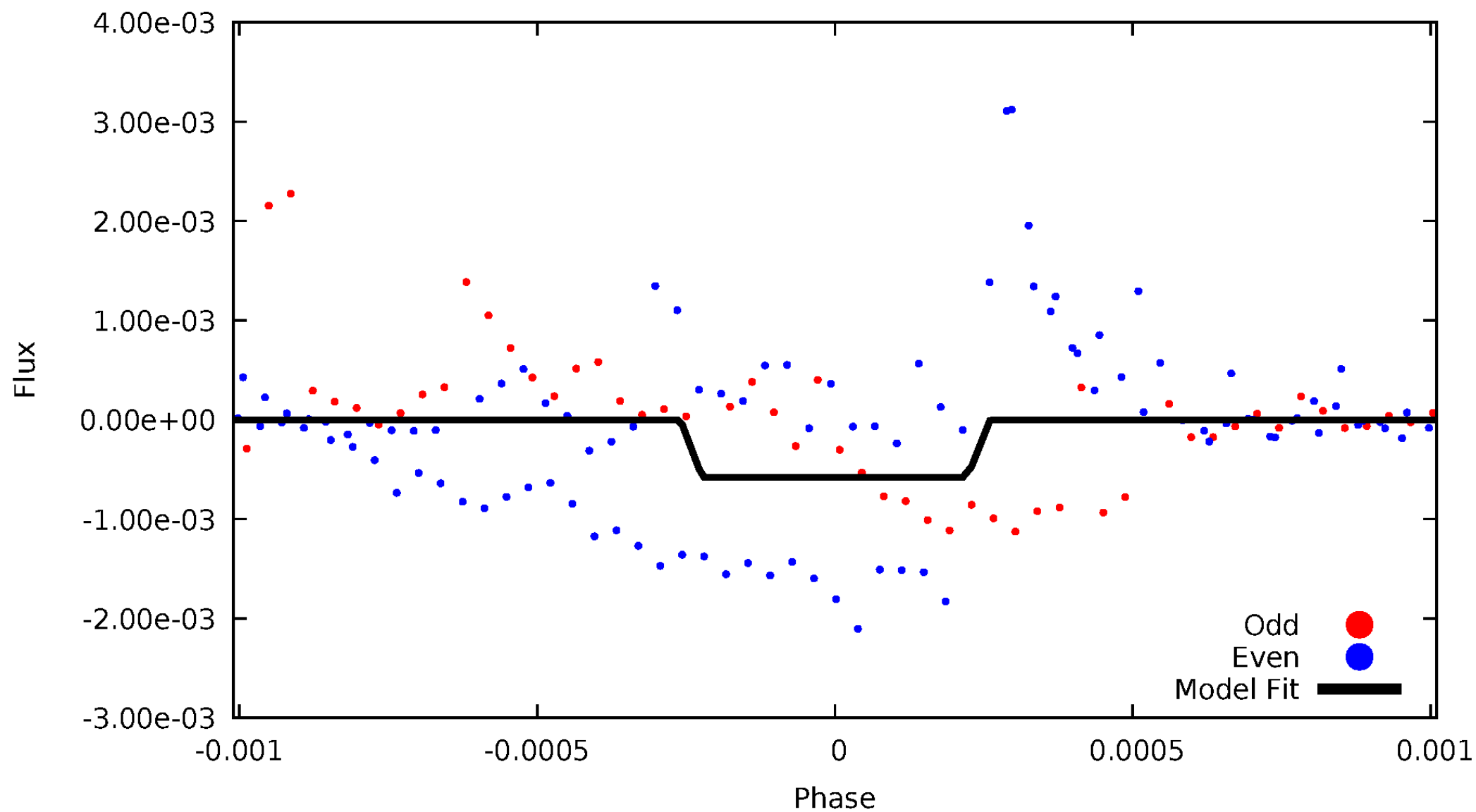
DV Odd/Even

TCE 009453011-04



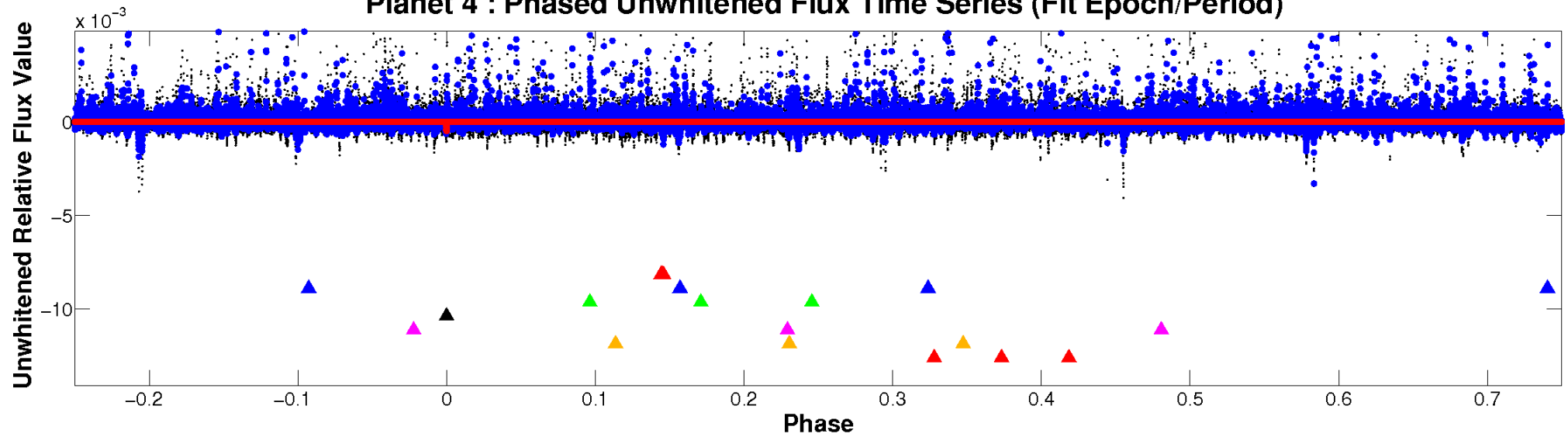
ALT Odd/Even

TCE 009453011-04

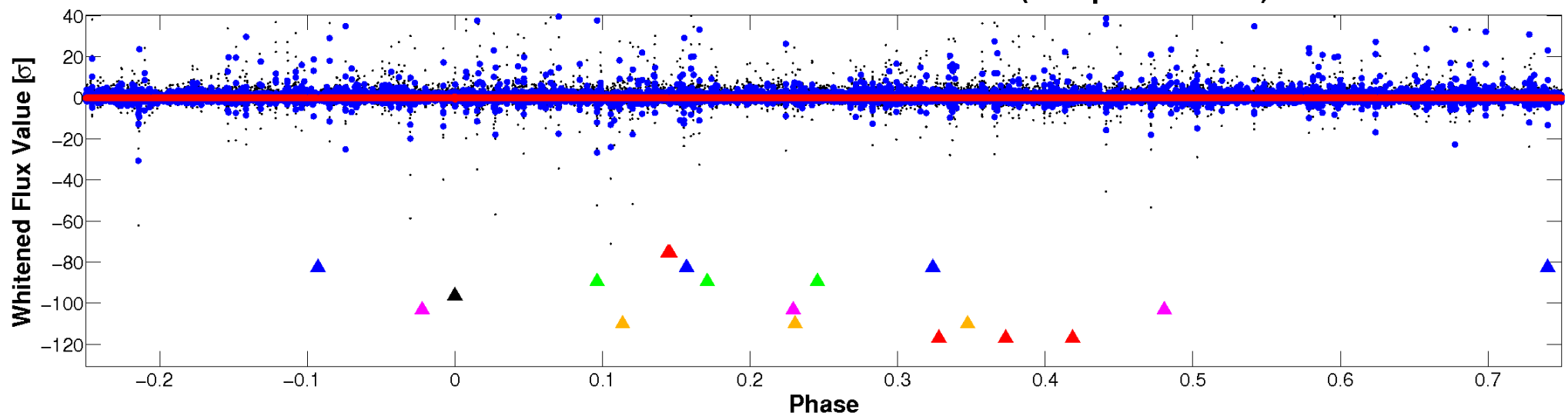


Non-Whitened Vs. Whitened Light Curve

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

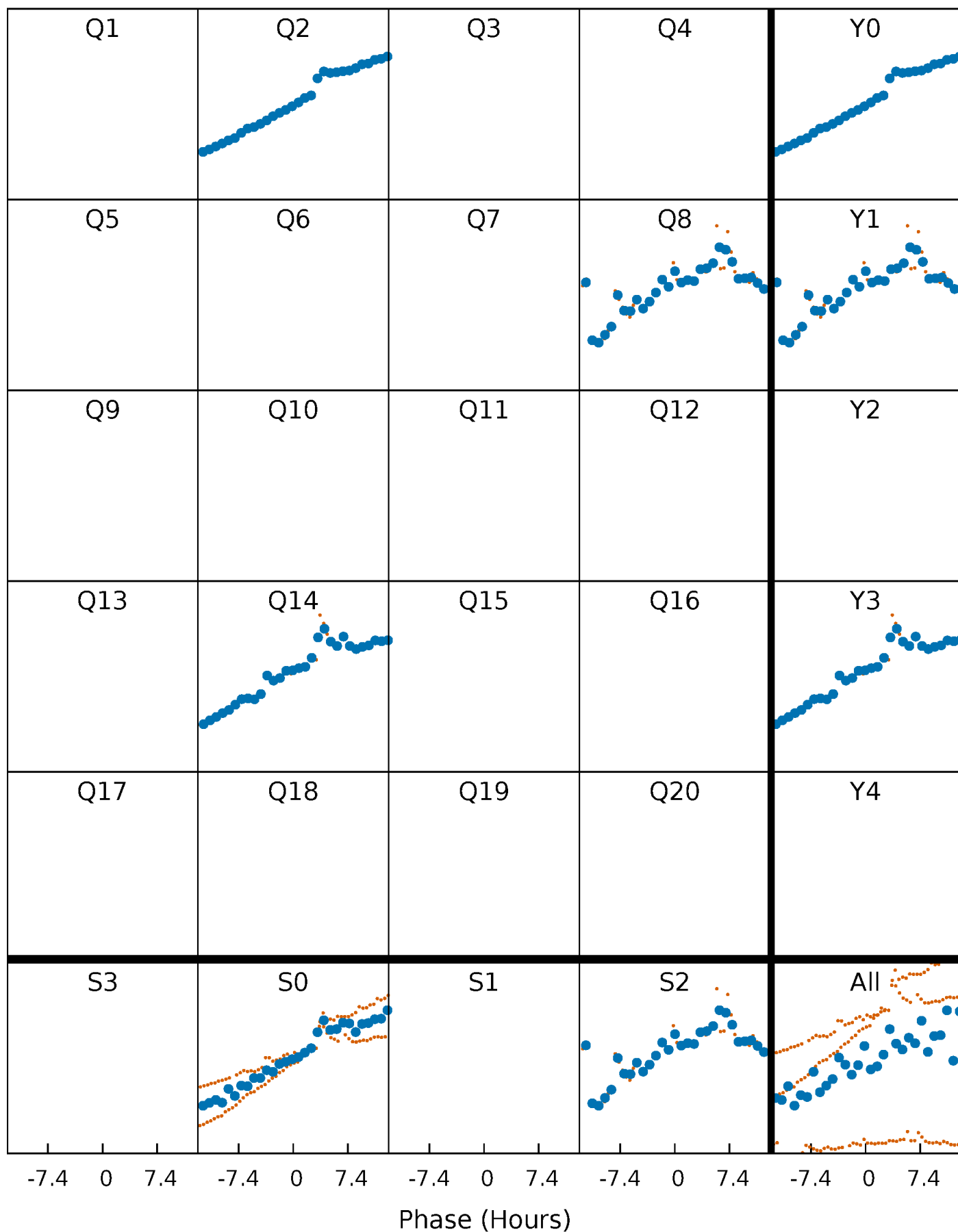


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



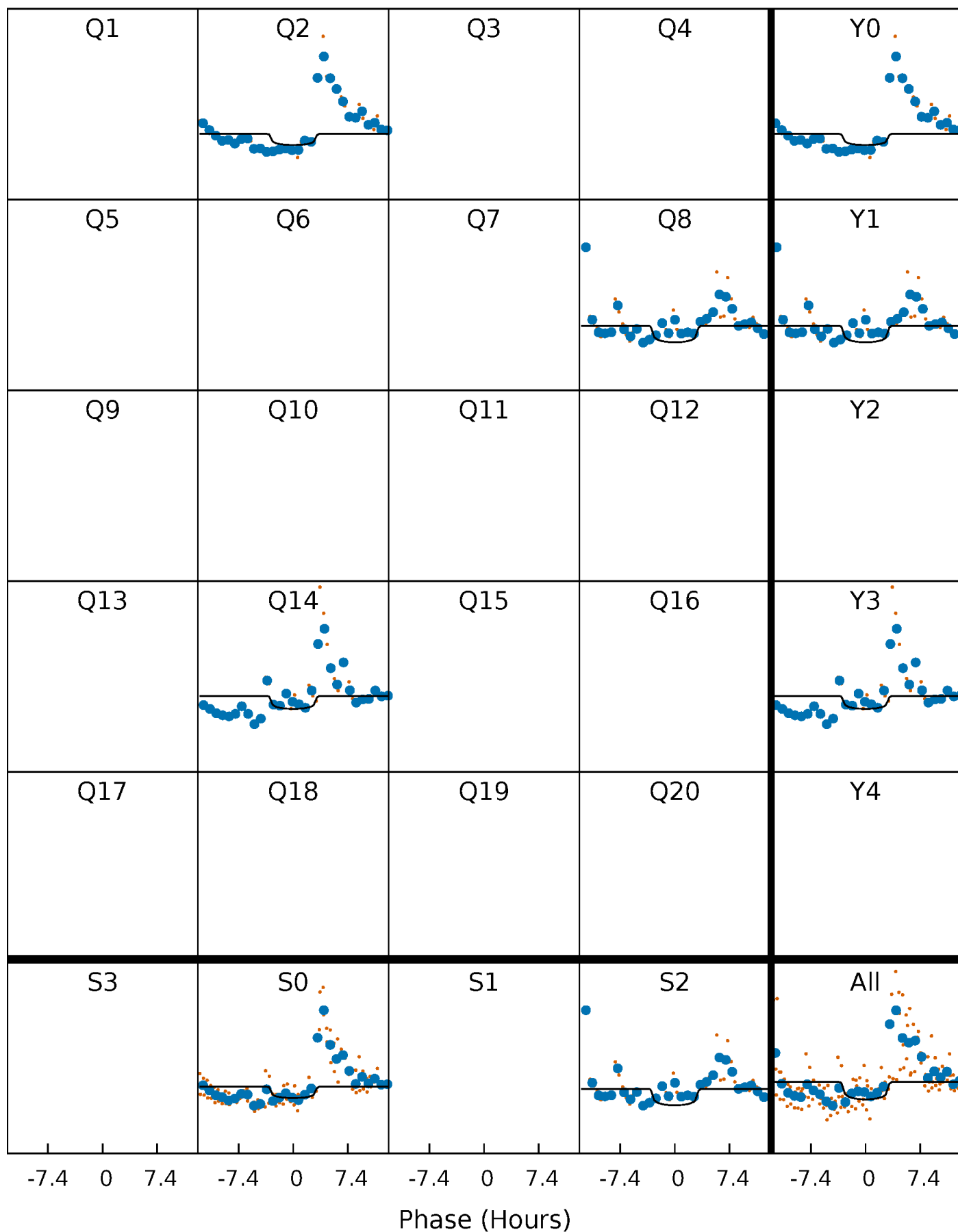
PDC Quarter-Phased Transit Curves

TCE 009453011-04 P=554.249661 Days $T_0=220.742929$ (BKJD)



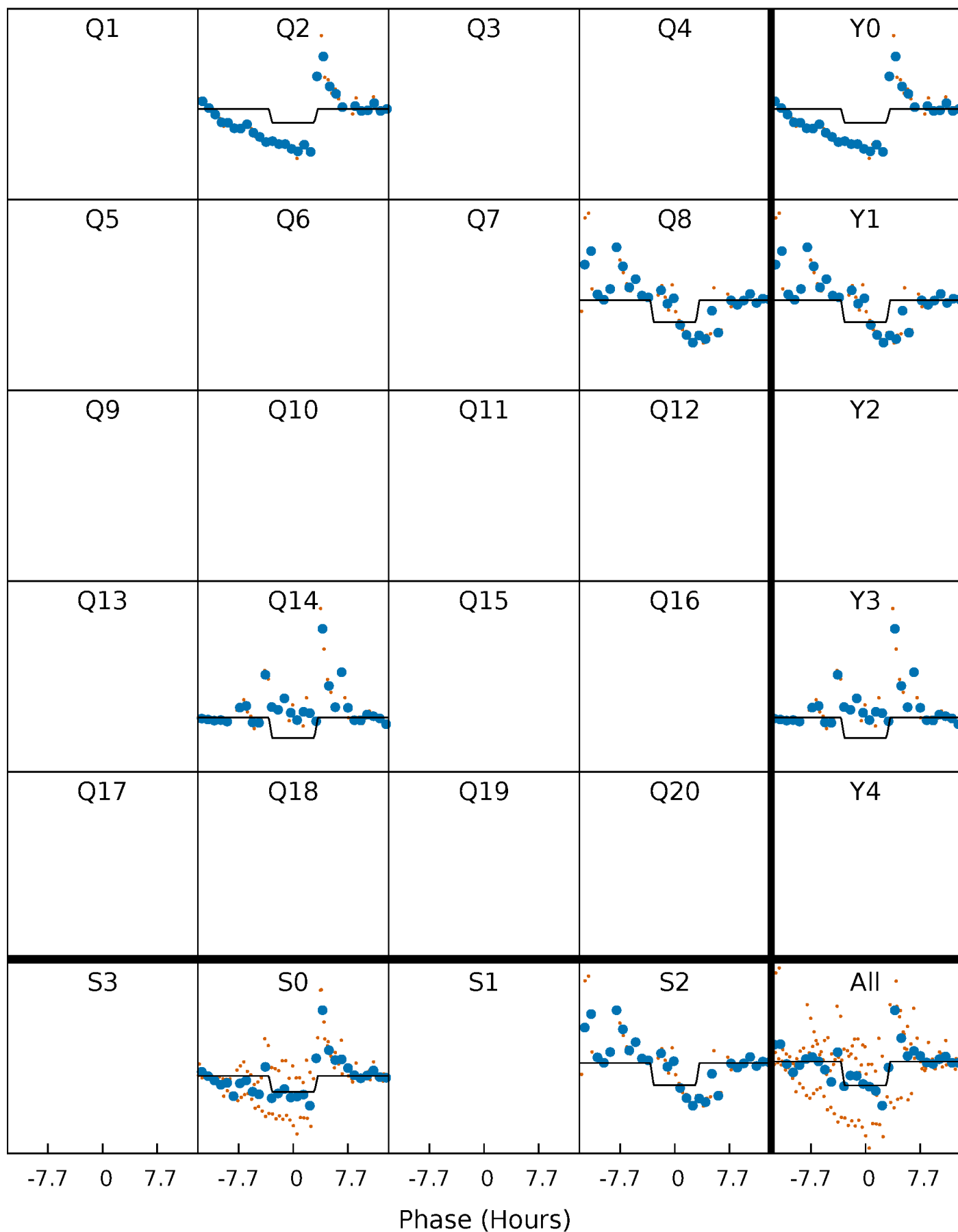
DV Quarter-Phased Transit Curves

TCE 009453011-04 P=554.249661 Days $T_0=220.742929$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

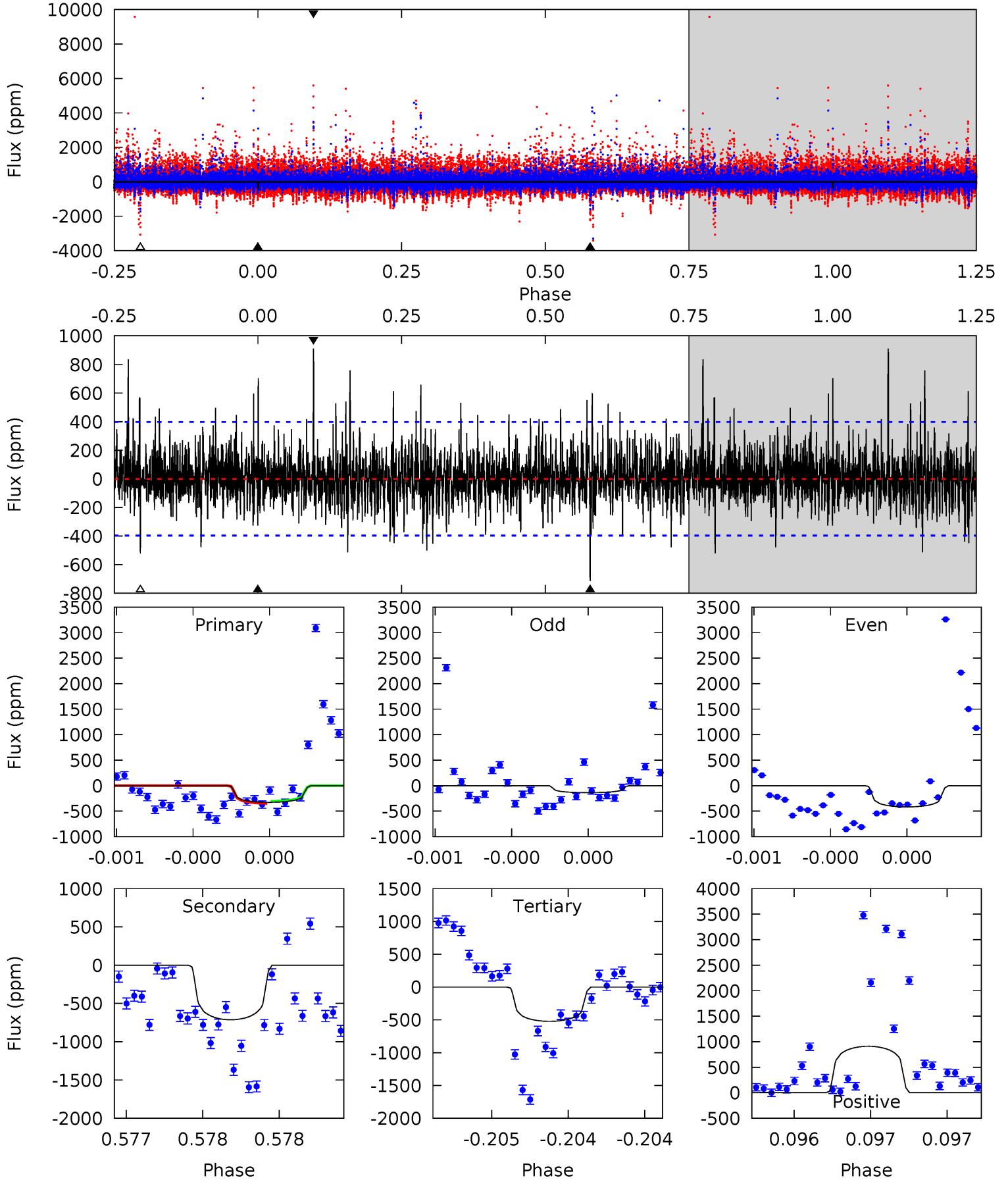
TCE 009453011-04 P=554.253504 Days $T_0=220.746506$ (BKJD)



DV Model-Shift Uniqueness Test

009453011-04, P = 554.249661 Days, E = 220.742929 Days

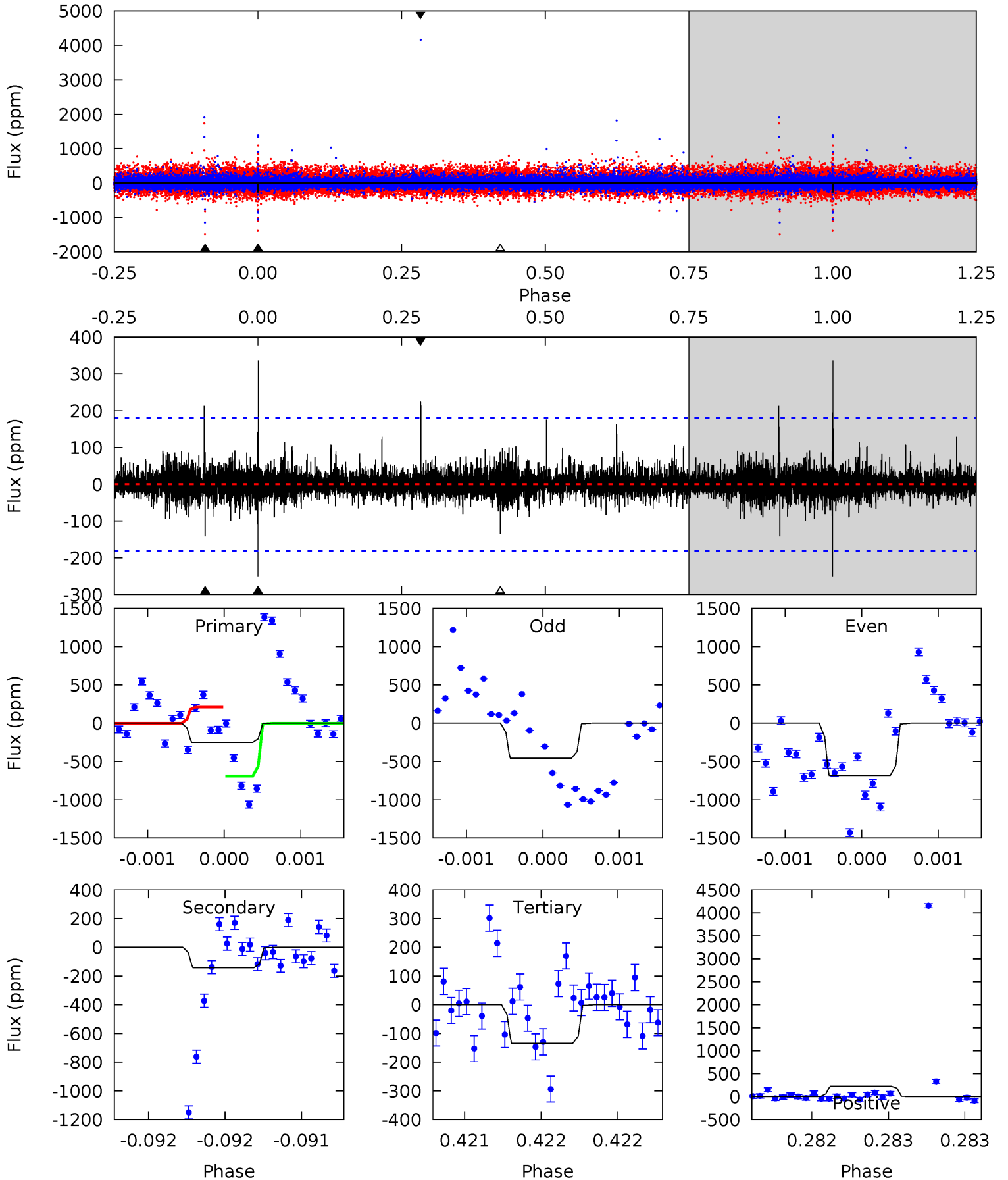
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.59	10.0	7.33	12.8	5.58	3.48	1.90	-2.74	-8.19	2.68	-2.77	1.19	1.83	0.56	0.27



Alt Model-Shift Uniqueness Test

009453011-04, P = 554.253504 Days, E = 220.746506 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.72	4.37	4.16	6.98	5.57	3.47	0.69	3.57	0.75	0.21	-2.61	3.84	1.57	0.57	7.27



Stellar Parameters For KIC 009453011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3760^{+117}_{-143}	$4.791^{+0.126}_{-0.054}$	$-0.320^{+0.300}_{-0.350}$	$0.451^{+0.068}_{-0.102}$	$0.459^{+0.069}_{-0.103}$	$7.044^{+4.959}_{-1.529}$
	+3%/-4%	+3%/-1%	+94%/-109%	+15%/-23%	+15%/-22%	+70%/-22%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009453011-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-713 ± 71	$1.17^{+0.83}_{-0.74}$	152^{+8}_{-9}	3852^{+1889}_{-611}	$313340^{+1916979}_{-209550}$
Alt.	-141 ± 32	$1.25^{+0.81}_{-0.69}$	152^{+7}_{-9}	2960^{+878}_{-394}	$50511^{+218424}_{-31868}$

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 $A_{obs} \gg 1.0$

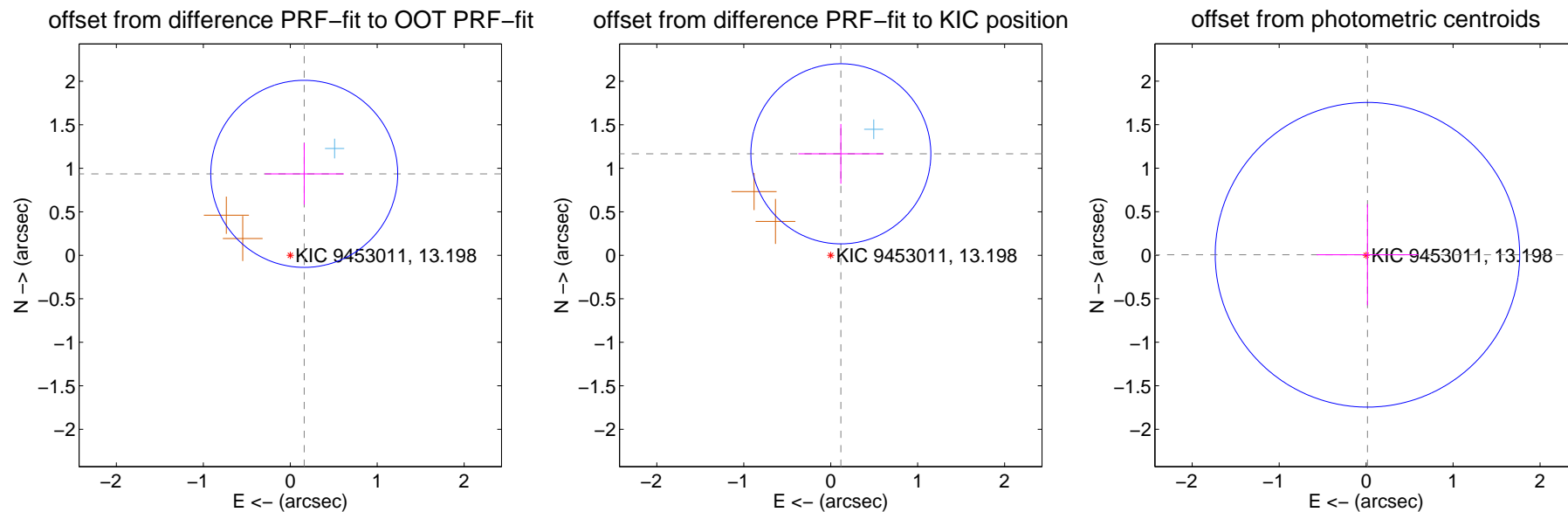
DV Centroid Data

Supplemental centroid analysis for 009453011-04. Kepler magnitude: 13.20. Transit SNR 3.87

There are 1 quarters with good PRF difference image offsets

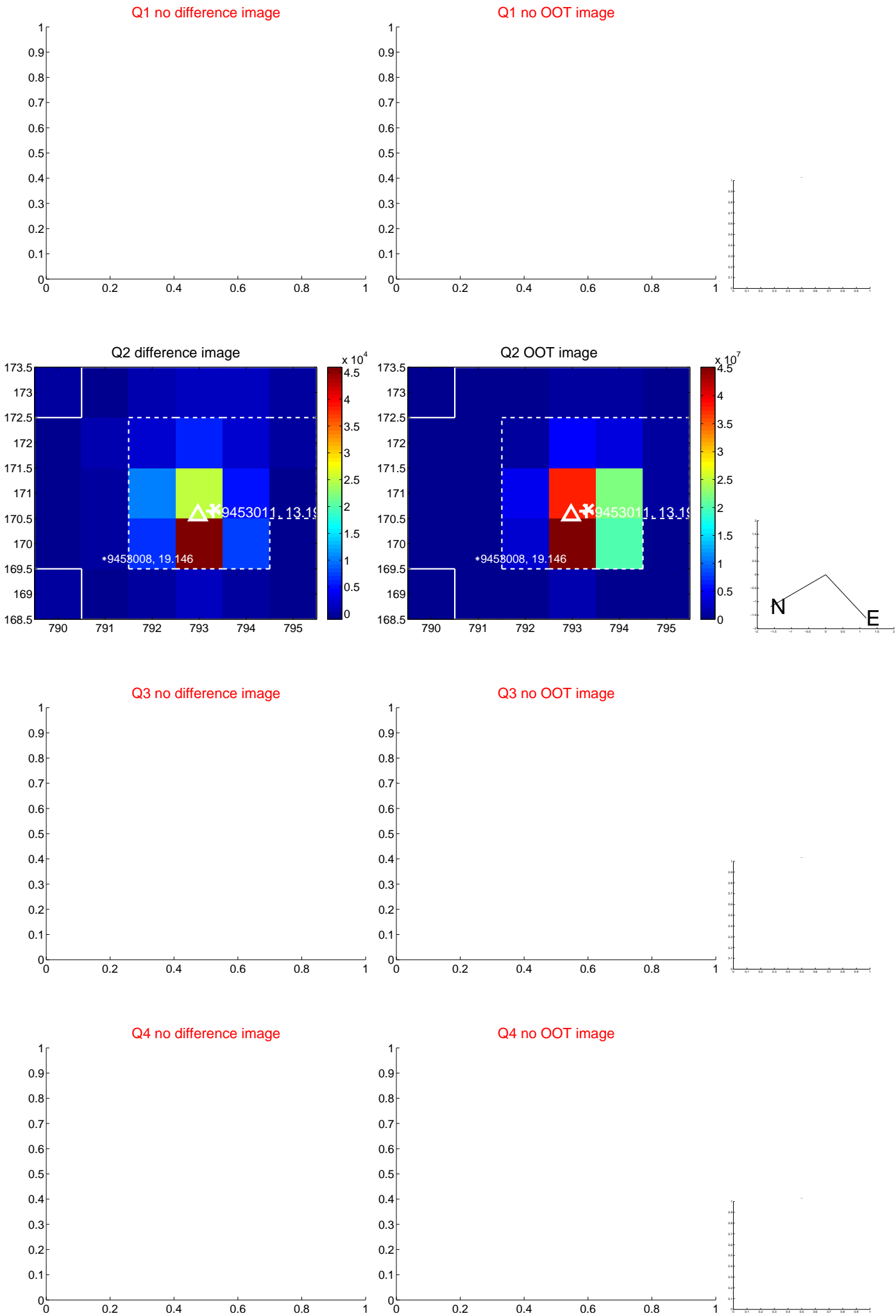
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.949 ± 0.358	2.65	-0.161 ± 0.455	0.936 ± 0.355
PRF-fit source offset from KIC position	1.172 ± 0.345	3.40	-0.117 ± 0.489	1.166 ± 0.343
photometric centroid source offset	0.02 ± 0.58	0.03	-0.02 ± 0.58	0.01 ± 0.58

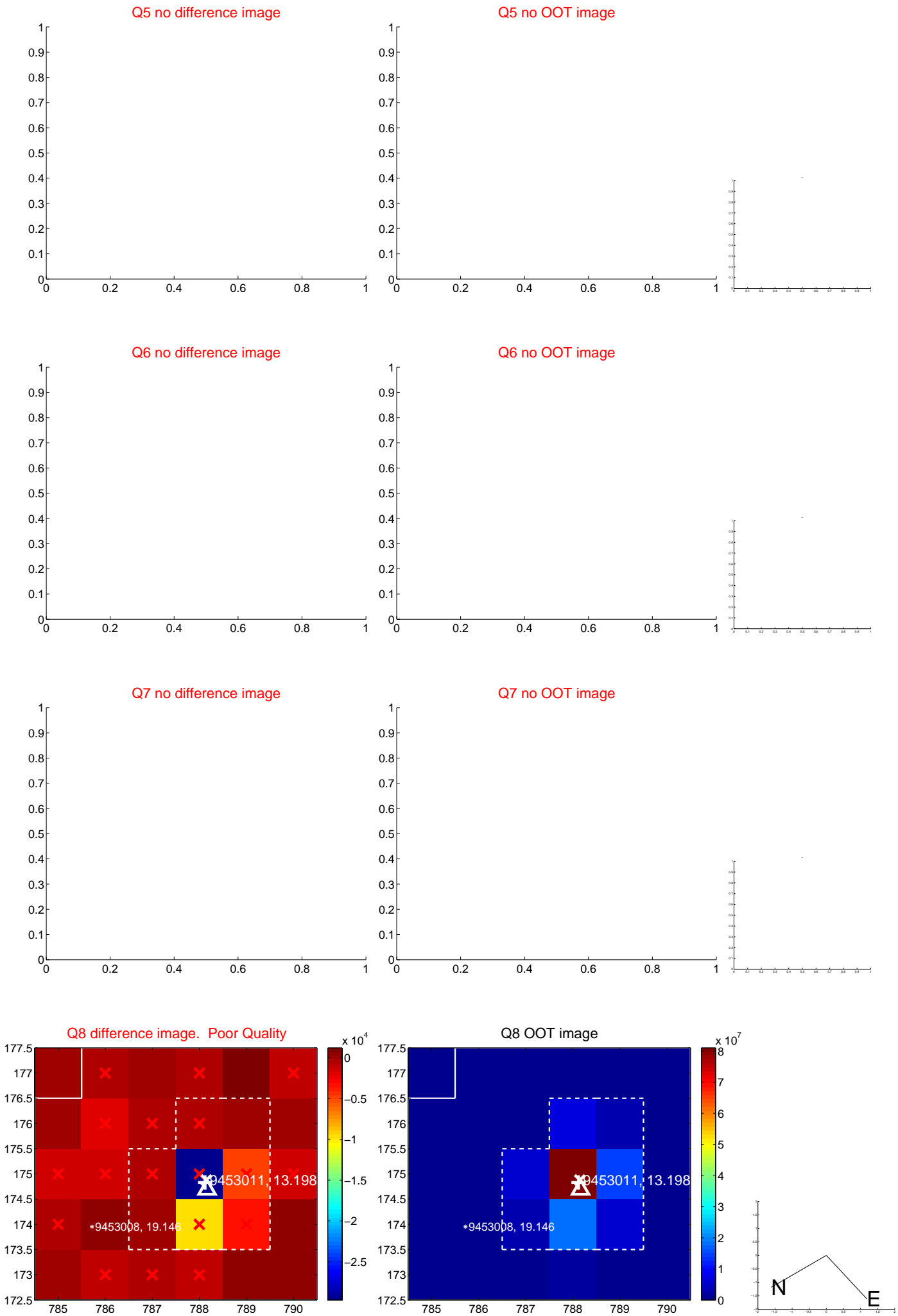


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



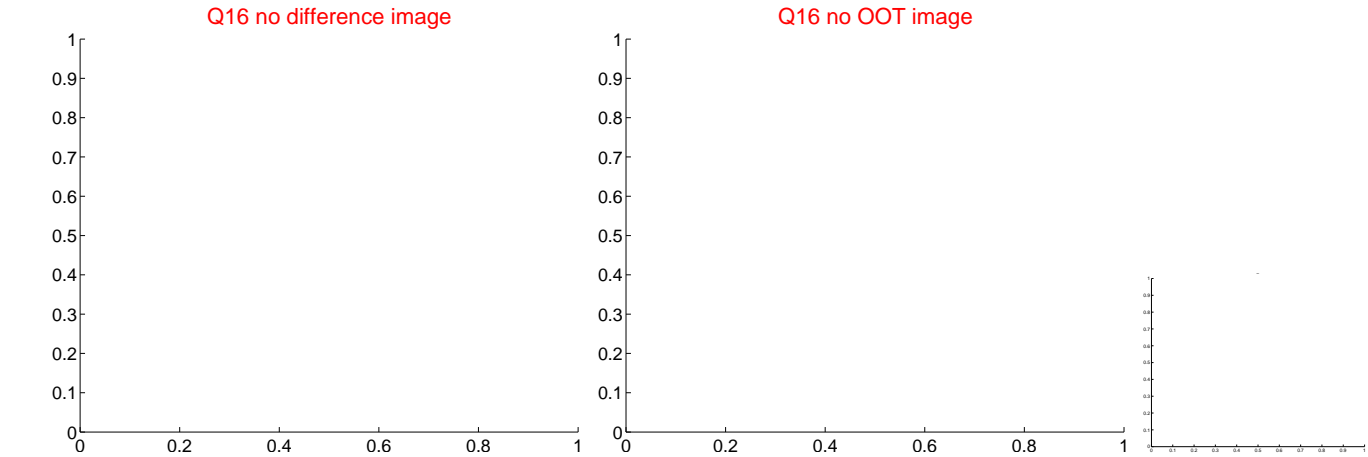
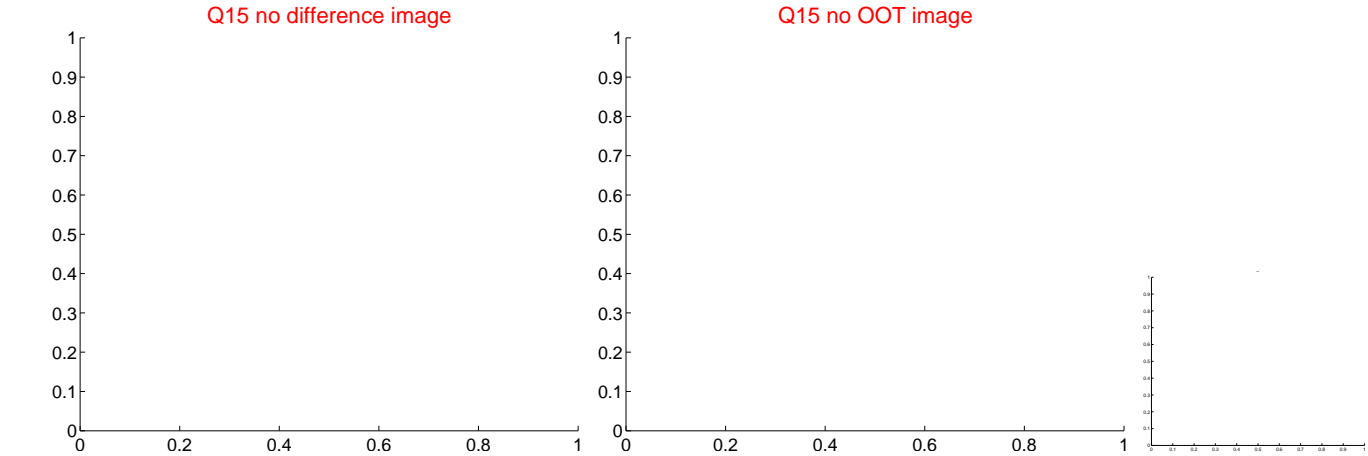
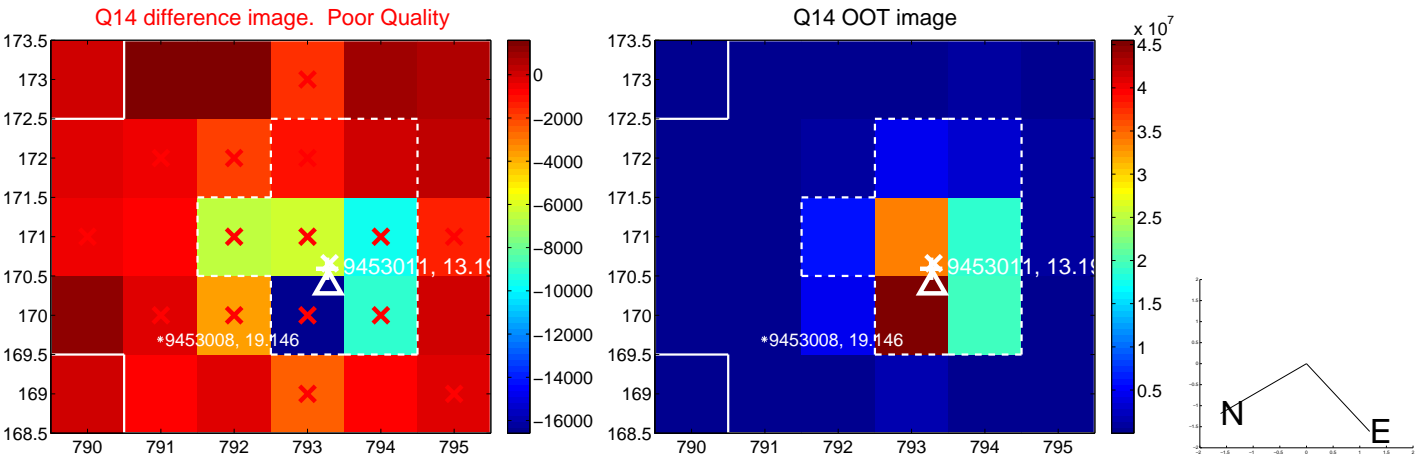
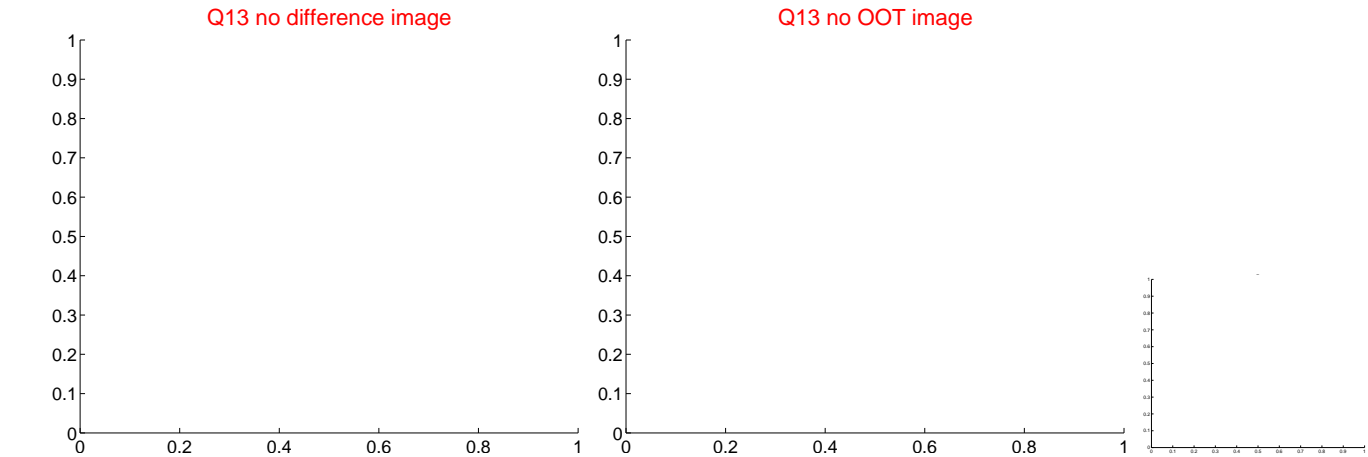
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



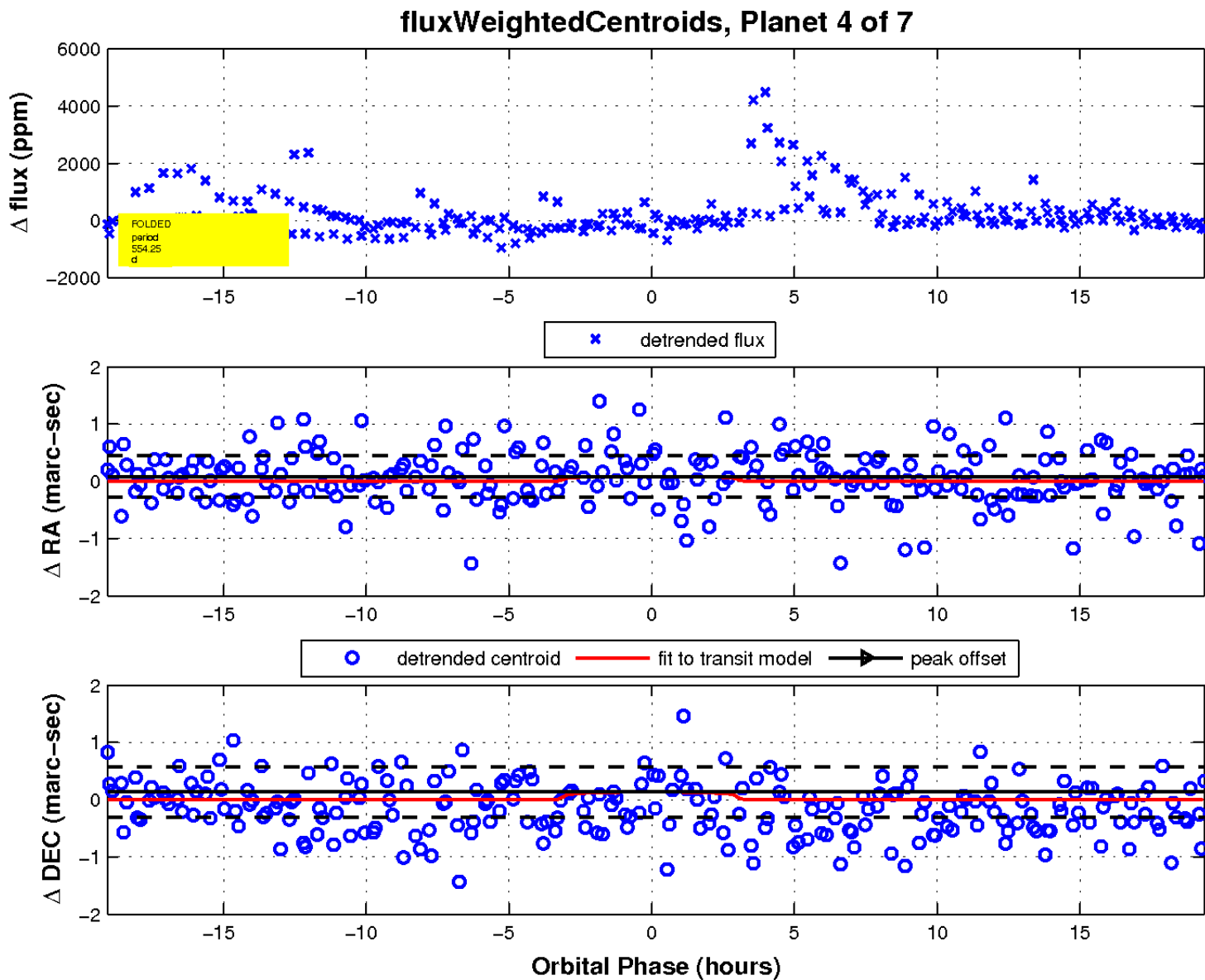
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

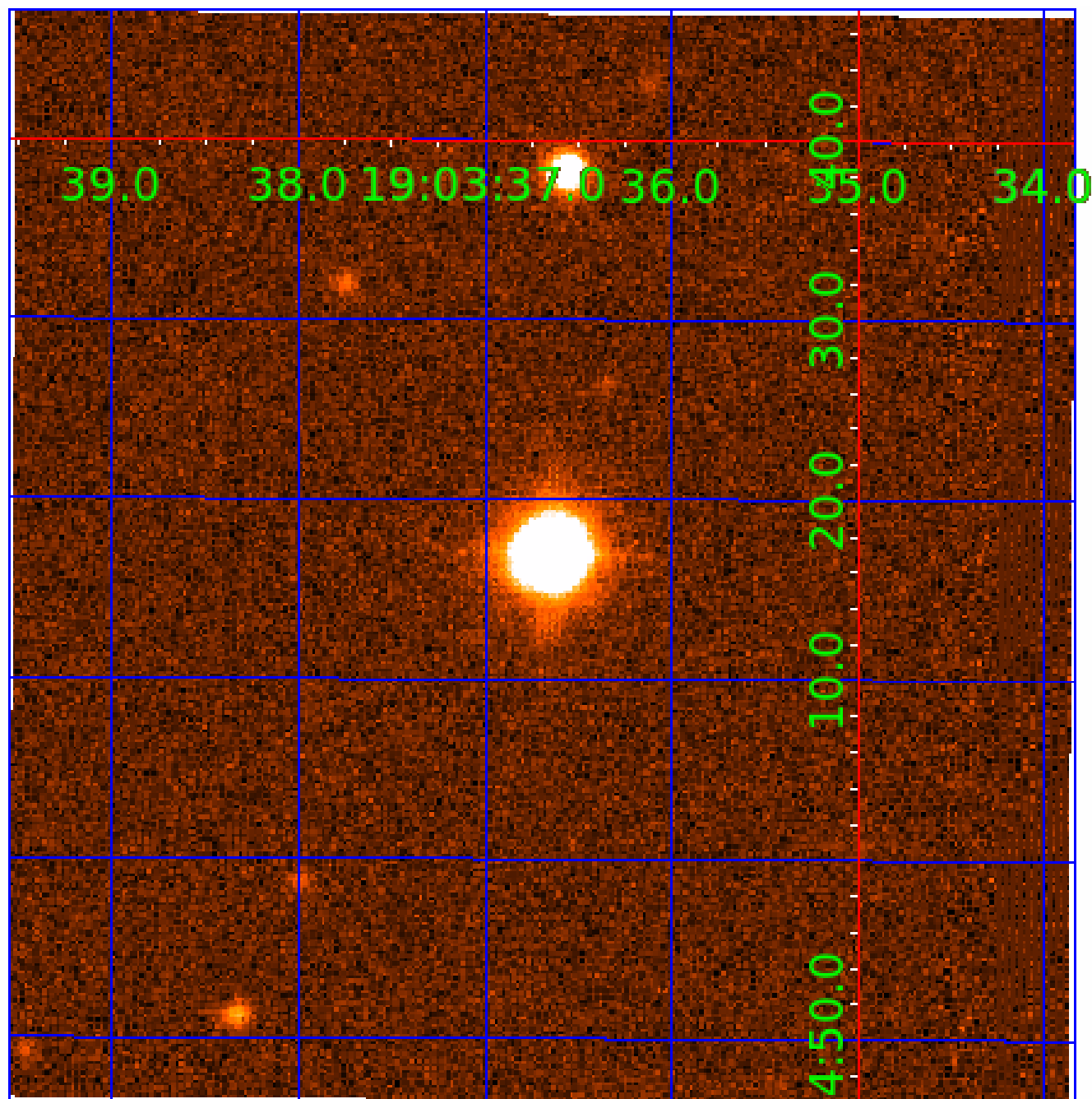


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009453011

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})
009453011-01	OBS	No	554.676636	300.725456	1435.9	8.204	17.9	9.2	0.45	3760	2.19	0.04
009453011-03	OBS	No	595.624318	274.153650	1114.3	5.491	19.8	7.5	0.45	3760	1.97	0.03
009453011-04	OBS	No	554.249661	220.742929	483.5	6.457	13.7	3.9	0.45	3760	1.07	0.04
009453011-05	OBS	No	414.910833	487.156787	430.9	3.047	13.8	3.8	0.45	3760	1.05	0.05
009453011-06	OBS	No	489.459841	413.308931	674.3	4.387	13.9	5.1	0.45	3760	1.18	0.04
009453011-07	OBS	No	529.140659	452.726557	200.3	12.500	12.9	-1.0	0.45	3760	0.64	0.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009453011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009453011-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

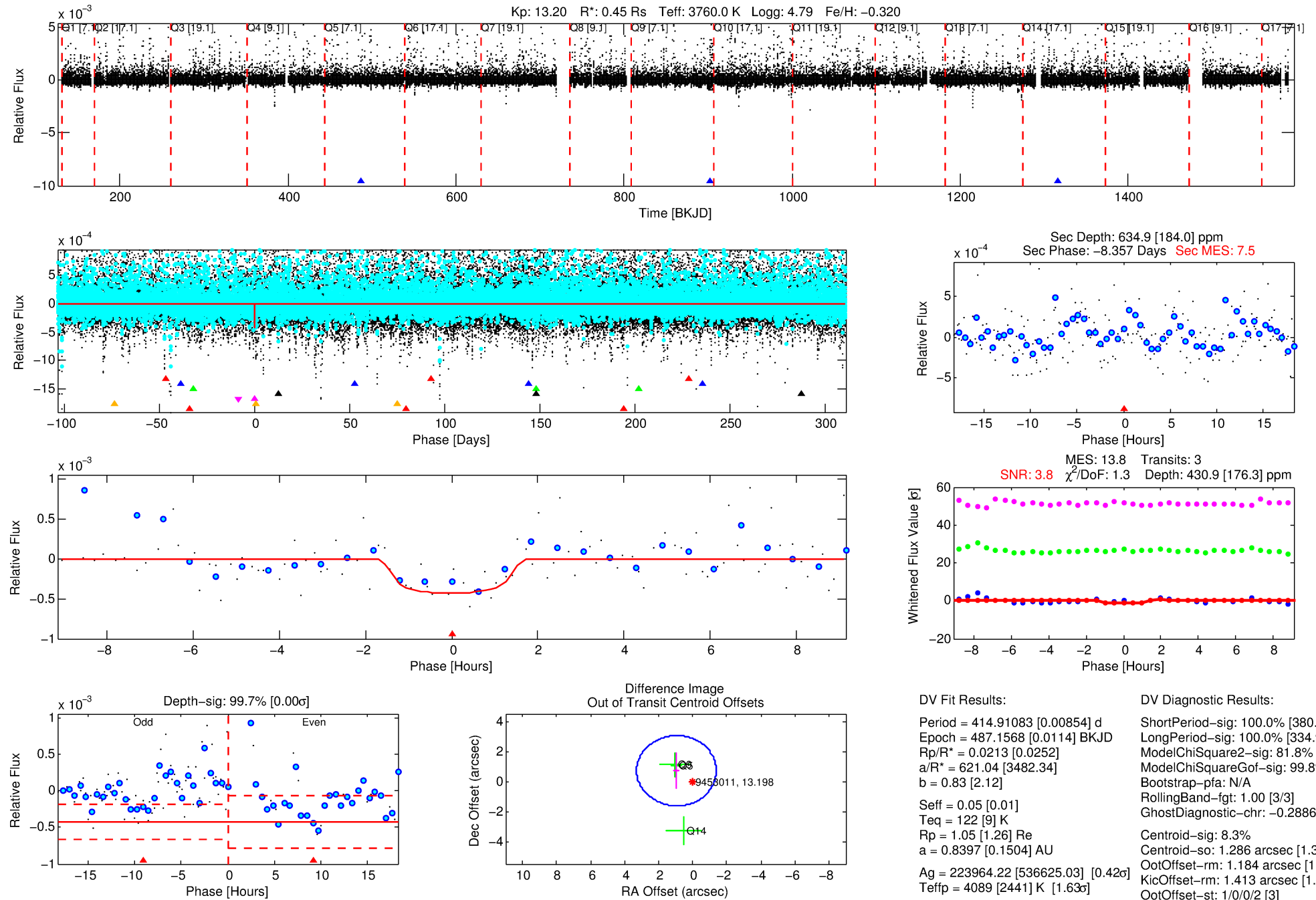
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009453011-05

No Significant Match Found

DV One-Page Summary

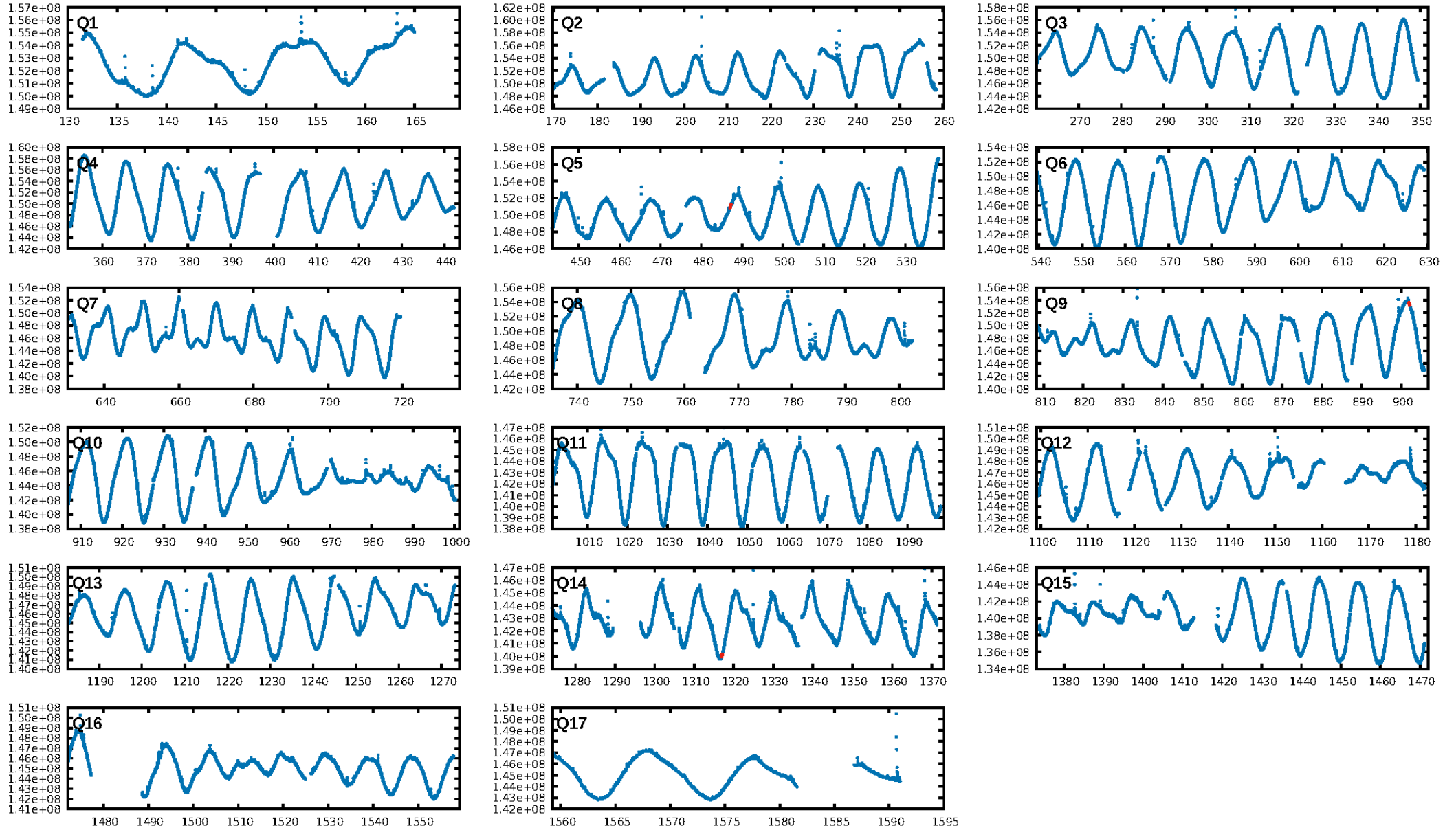
KIC: 9453011 Candidate: 5 of 7 Period: 414.911 d



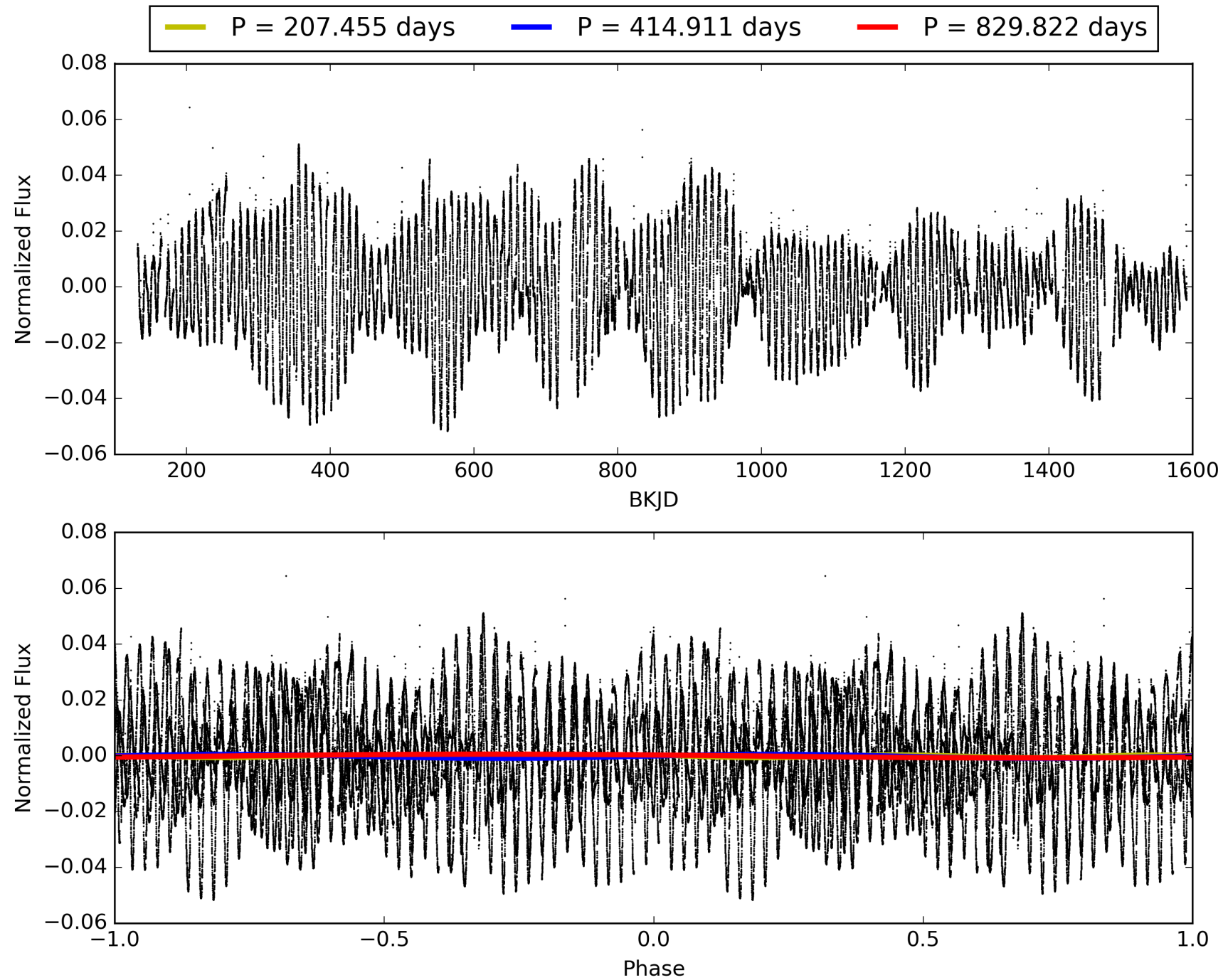
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:36:49 Z

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

TCE 009453011-05, PDC Light Curves

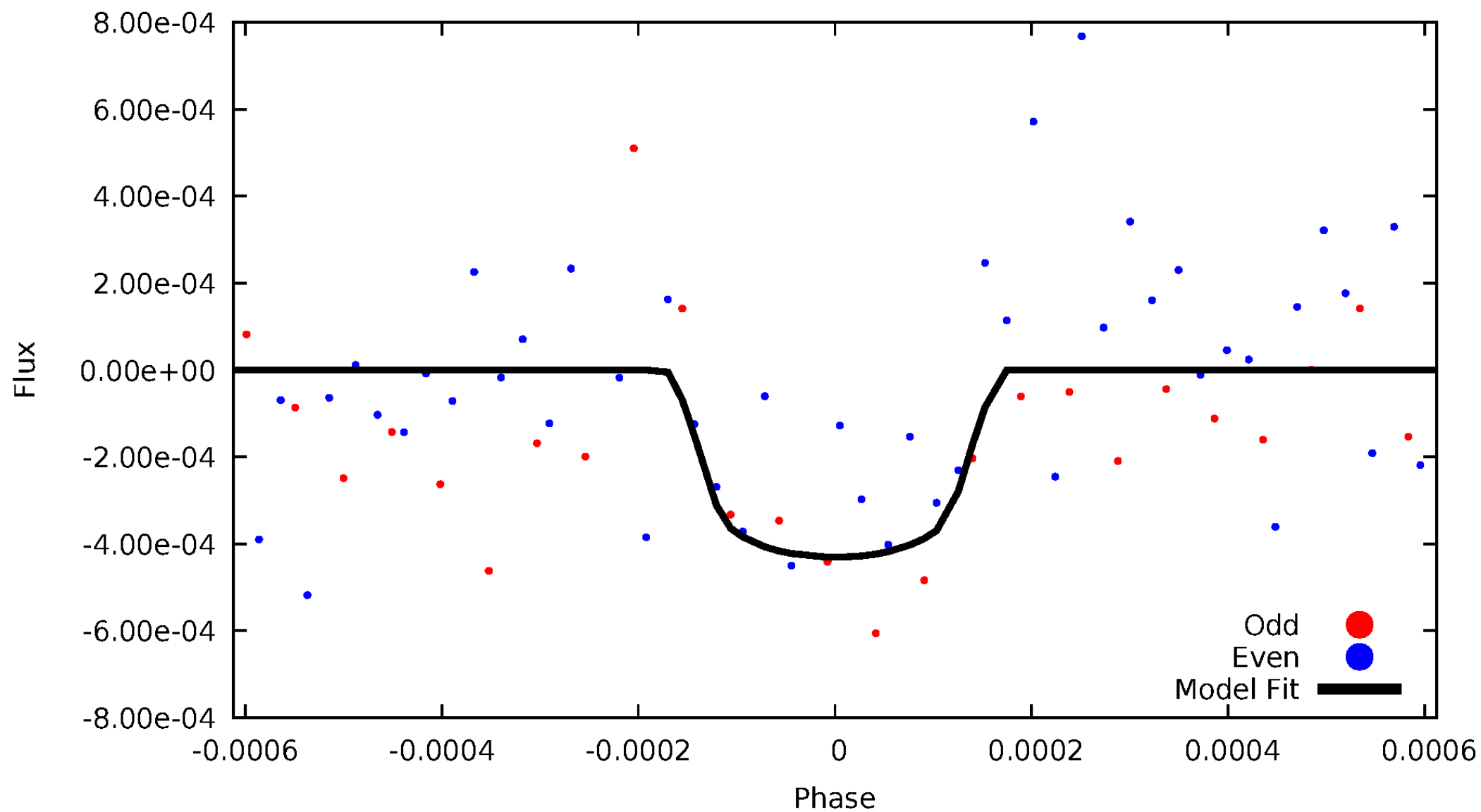


TCE 009453011-05



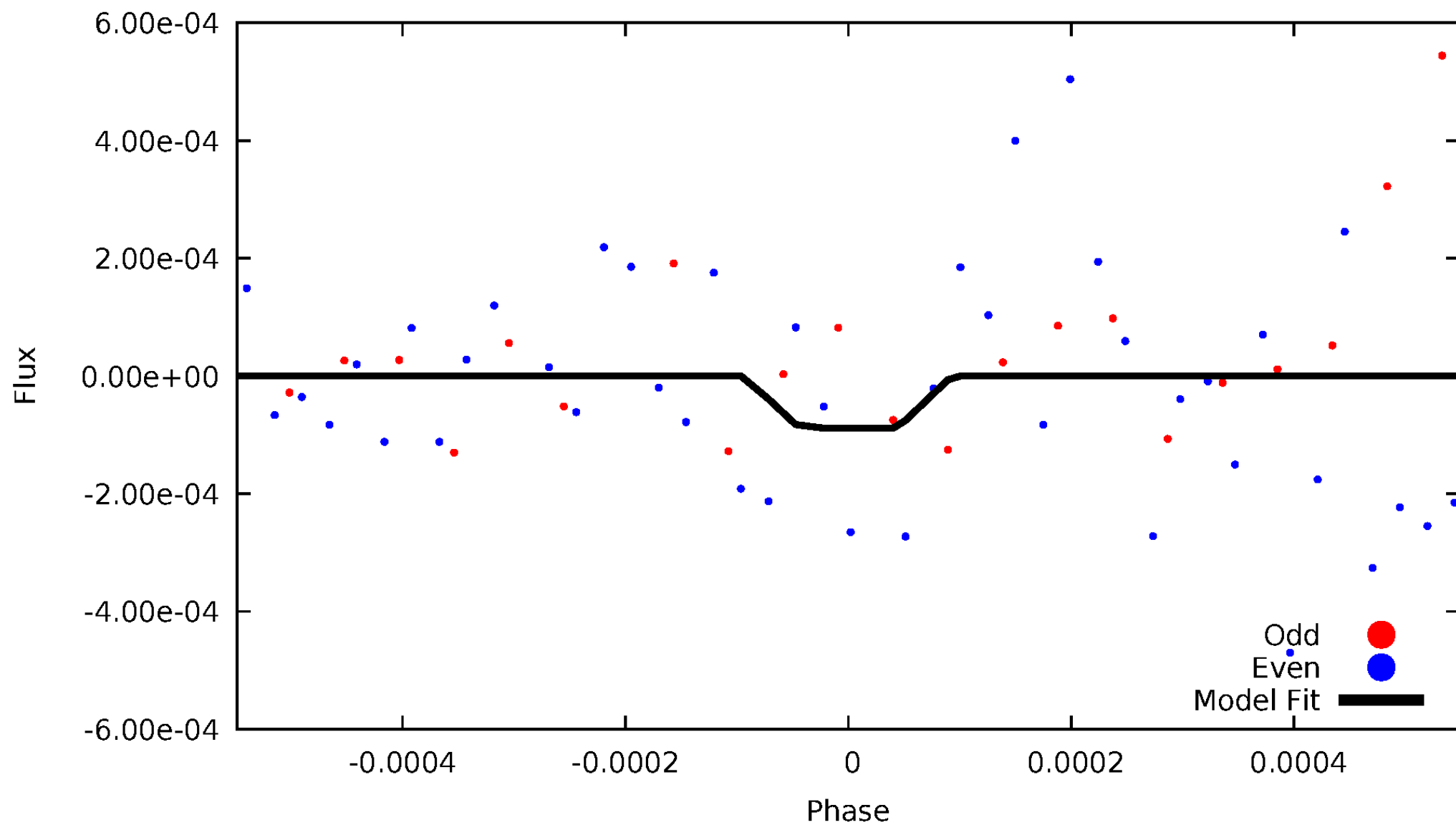
DV Odd/Even

TCE 009453011-05



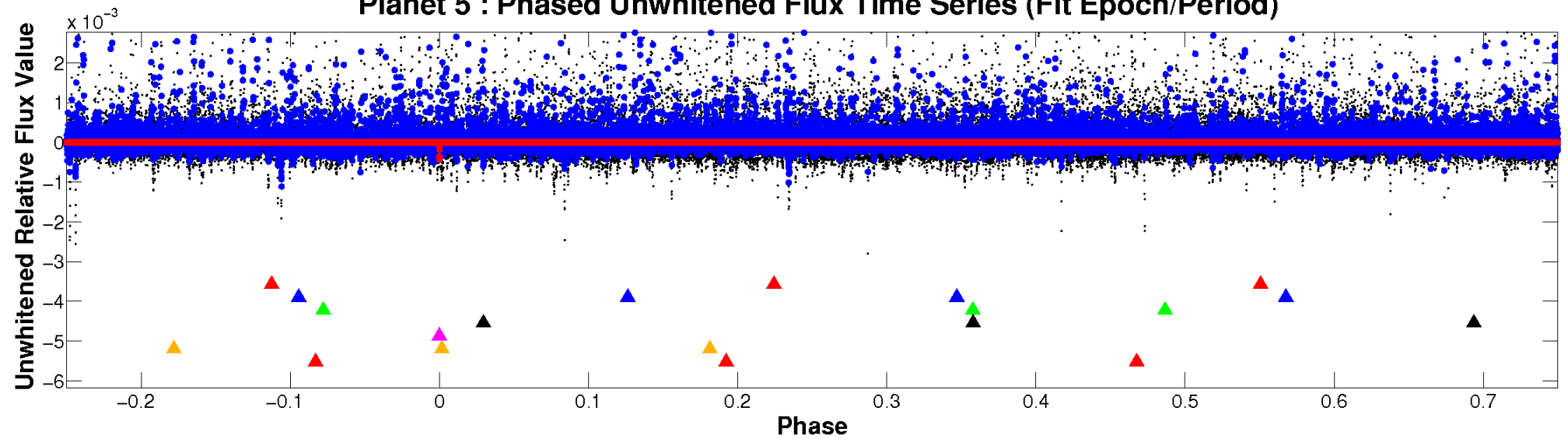
ALT Odd/Even

TCE 009453011-05

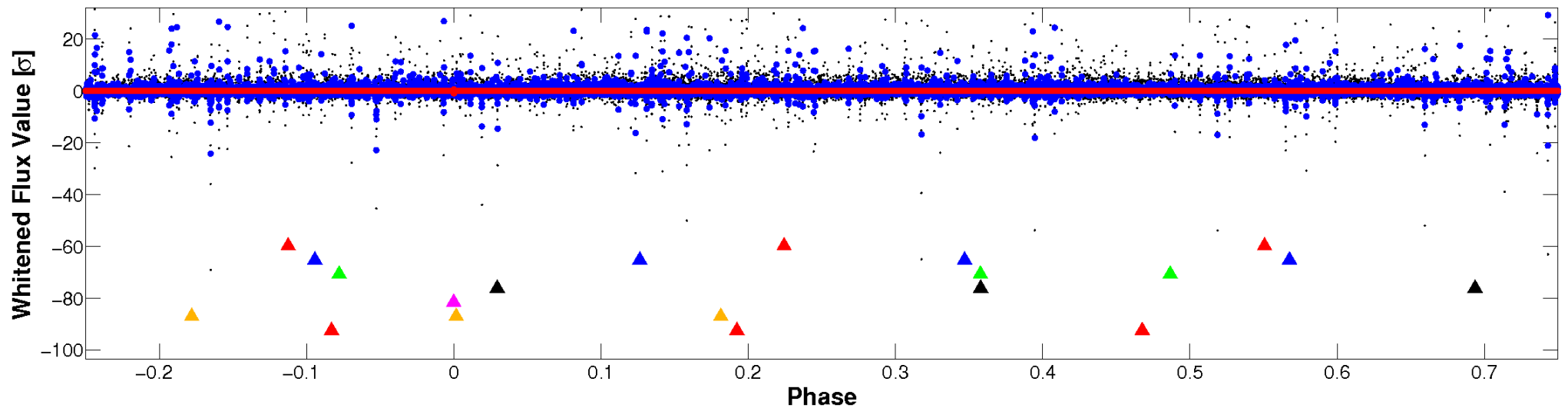


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

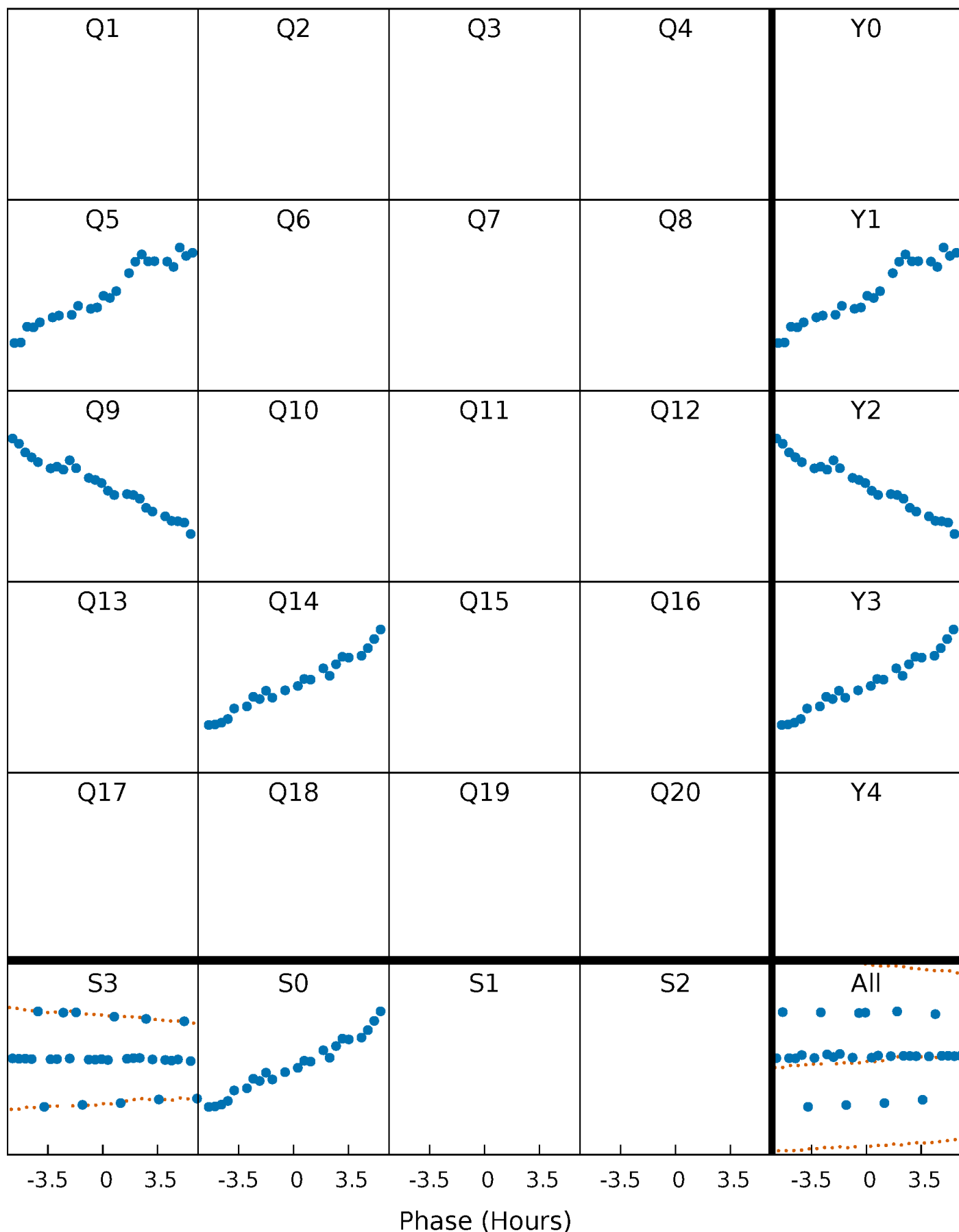


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



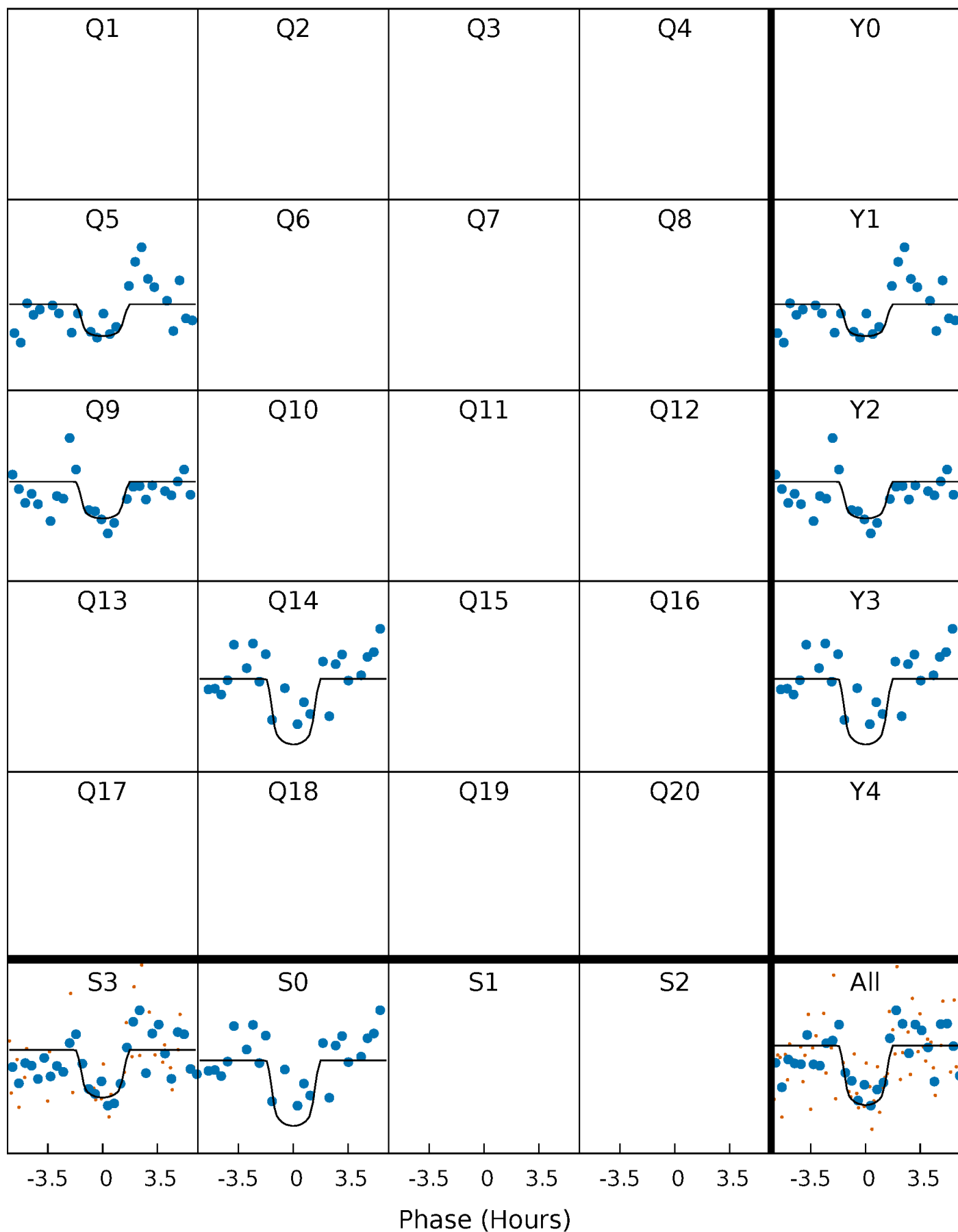
PDC Quarter-Phased Transit Curves

TCE 009453011-05 $P=414.910833$ Days $T_0=487.156787$ (BKJD)



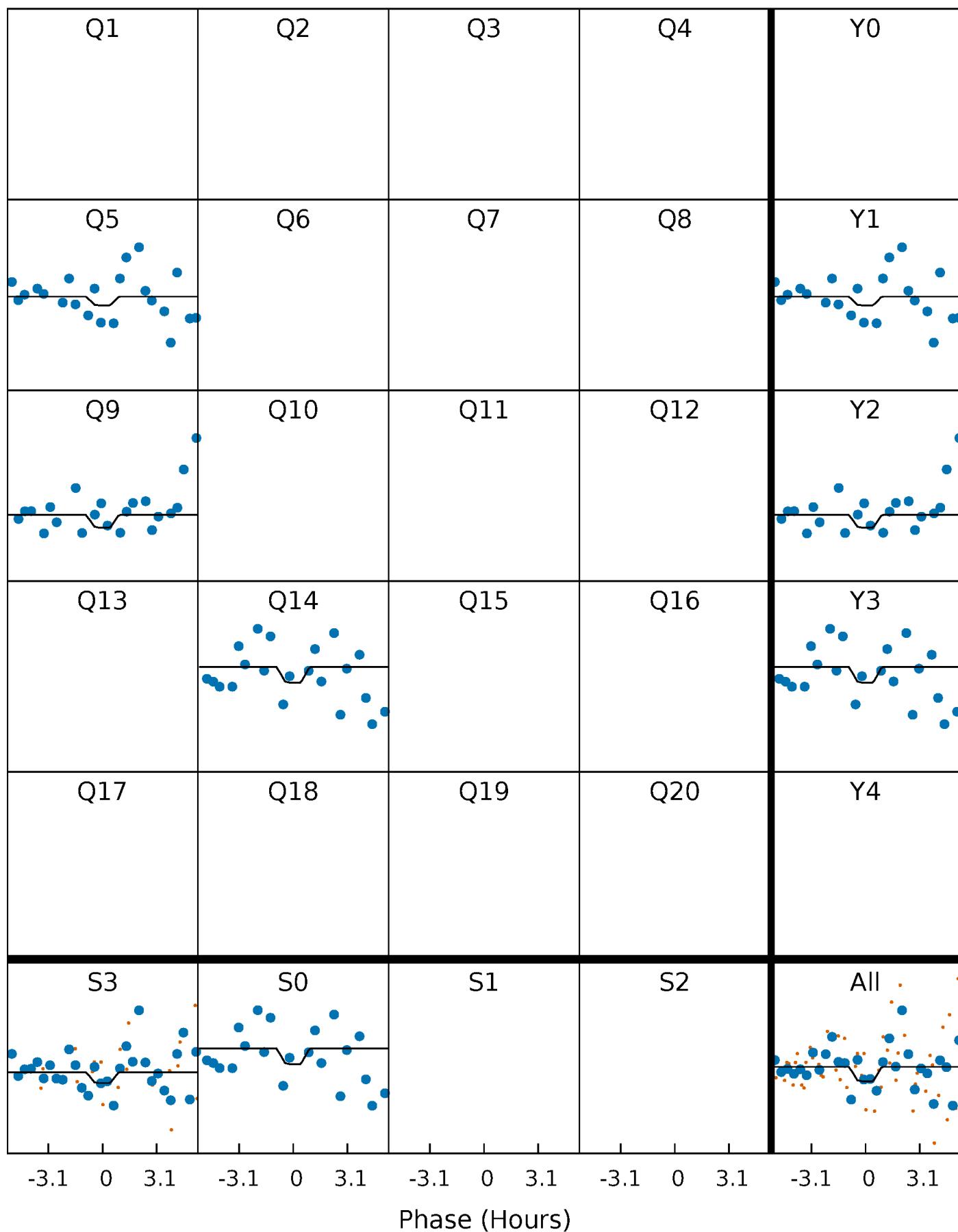
DV Quarter-Phased Transit Curves

TCE 009453011-05 $P=414.910833$ Days $T_0=487.156787$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

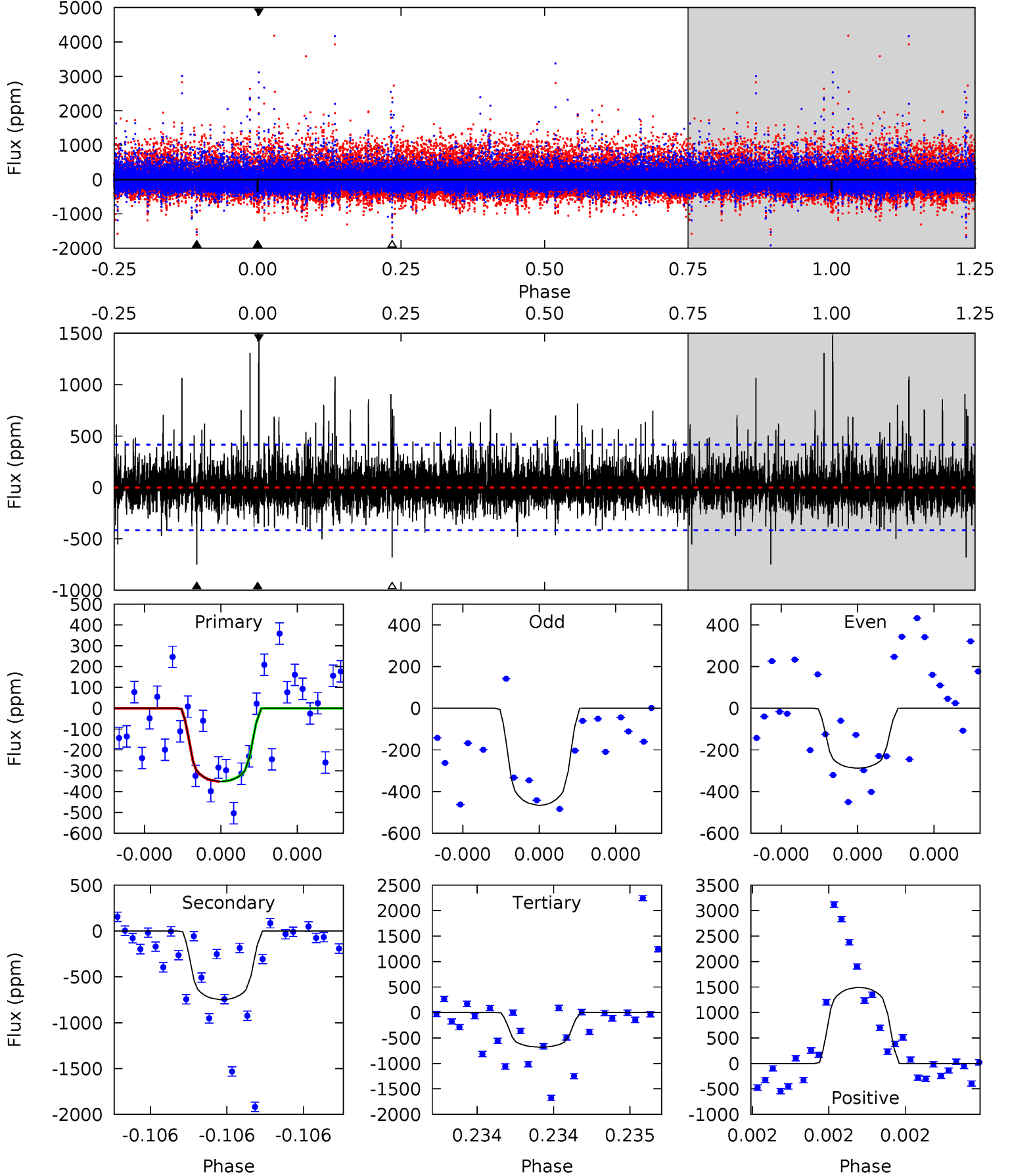
TCE 009453011-05 $P=414.889813$ Days $T_0=487.178362$ (BKJD)



DV Model-Shift Uniqueness Test

009453011-05, P = 414.910833 Days, E = 72.245954 Days

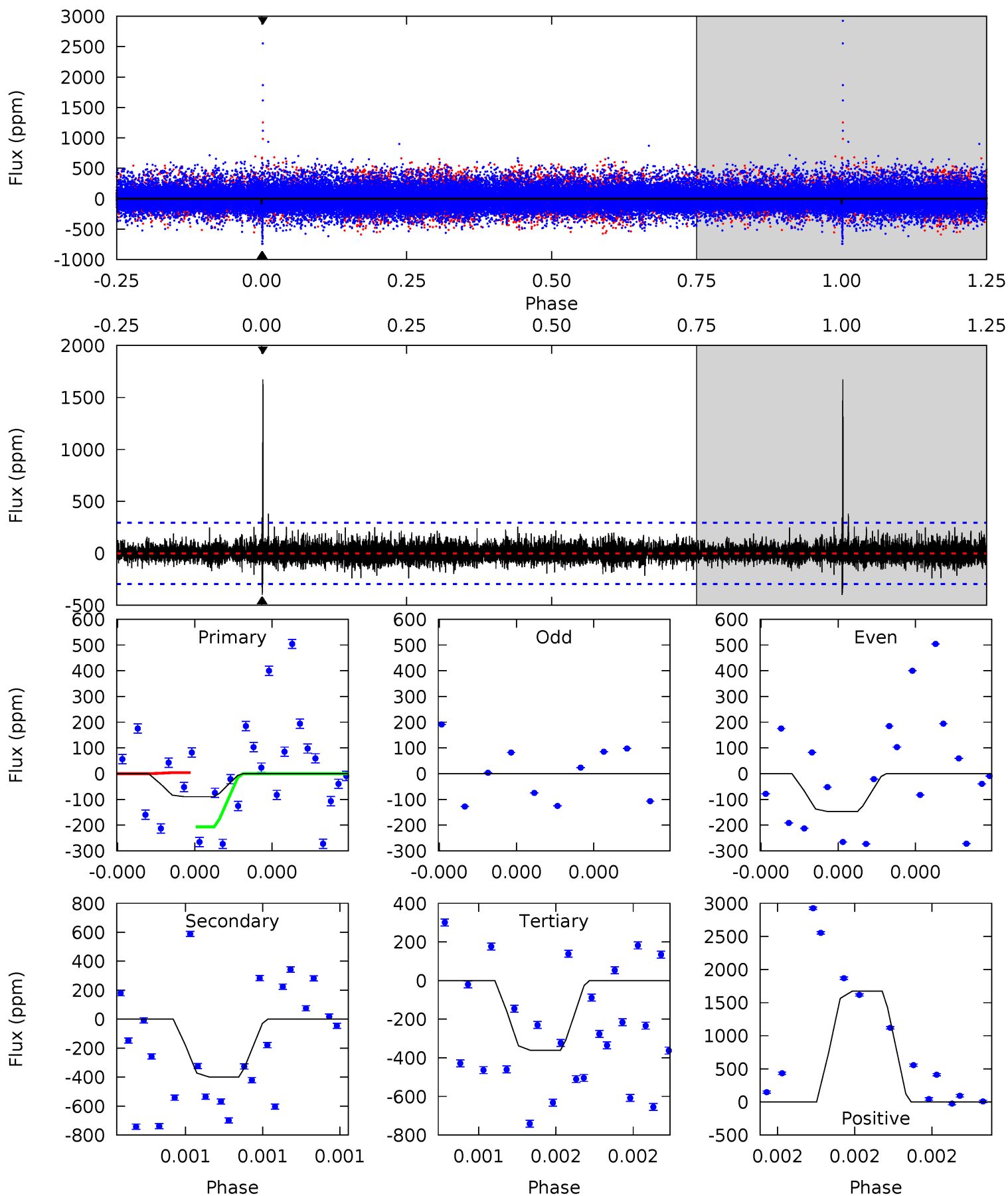
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.77	10.2	9.23	20.3	5.65	3.59	1.93	-4.46	-15.5	0.94	-10.1	0.67	1.02	0.67	0.01



Alt Model-Shift Uniqueness Test

009453011-05, P = 414.889813 Days, E = 72.288549 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.75	7.79	7.07	32.7	5.77	3.77	1.06	-5.33	-31.0	0.72	-24.9	1.33	0.79	0.81	2.01



Stellar Parameters For KIC 009453011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3760^{+117}_{-143}	$4.791^{+0.126}_{-0.054}$	$-0.320^{+0.300}_{-0.350}$	$0.451^{+0.068}_{-0.102}$	$0.459^{+0.069}_{-0.103}$	$7.044^{+4.959}_{-1.529}$
	+3%/-4%	+3%/-1%	+94%/-109%	+15%/-23%	+15%/-22%	+70%/-22%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009453011-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-749 ± 74	$1.32^{+1.03}_{-0.82}$	167^{+8}_{-9}	3760^{+1627}_{-643}	$168079^{+945392}_{-115775}$
Alt.	-398 ± 51	$1.01^{+1.07}_{-0.67}$	167^{+9}_{-9}	3654^{+2086}_{-704}	$152713^{+1247206}_{-117295}$

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 $A_{obs} \gg 1.0$

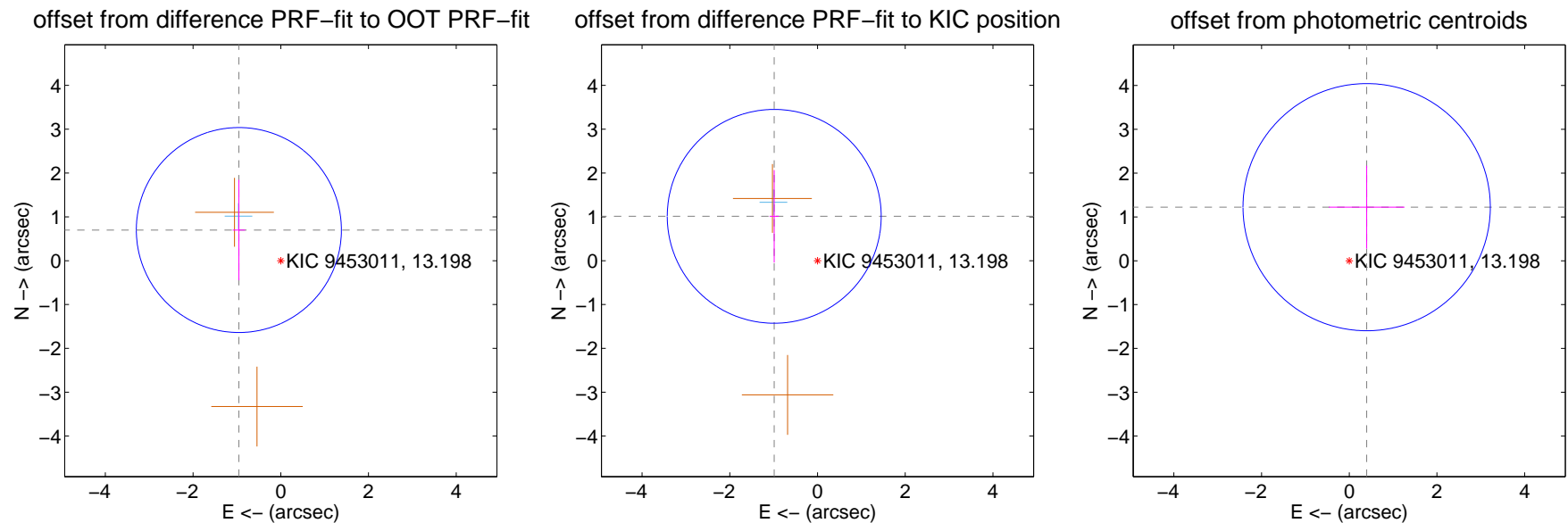
DV Centroid Data

Supplemental centroid analysis for 009453011-05. Kepler magnitude: 13.20. Transit SNR 3.81

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.184 ± 0.779	1.52	0.955 ± 0.142	0.699 ± 1.147
PRF-fit source offset from KIC position	1.413 ± 0.813	1.74	0.987 ± 0.105	1.012 ± 1.055
photometric centroid source offset	1.29 ± 0.94	1.37	-0.40 ± 0.86	1.22 ± 0.95

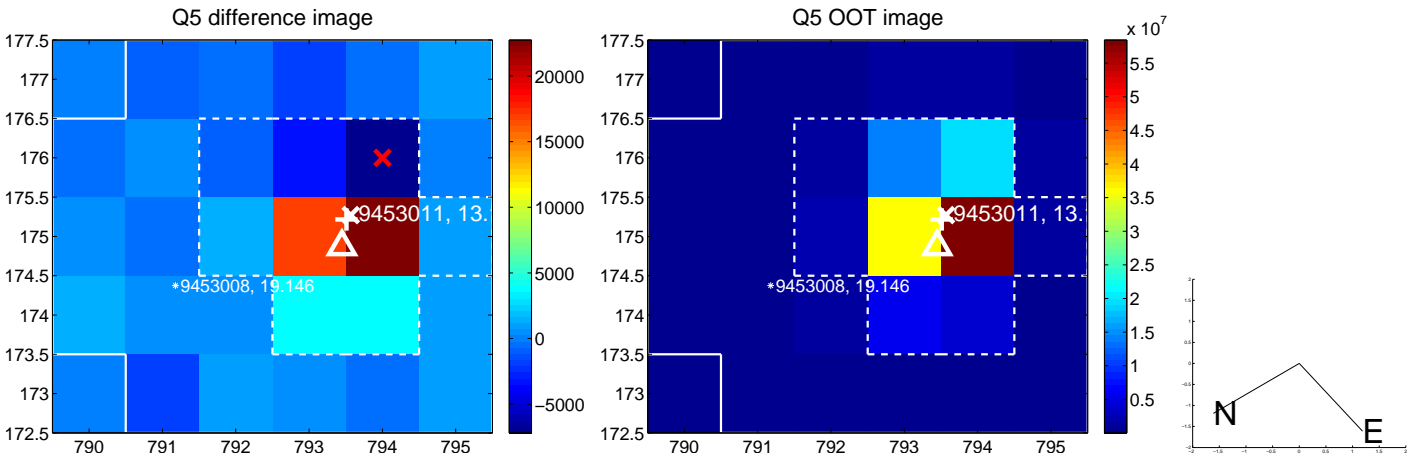


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

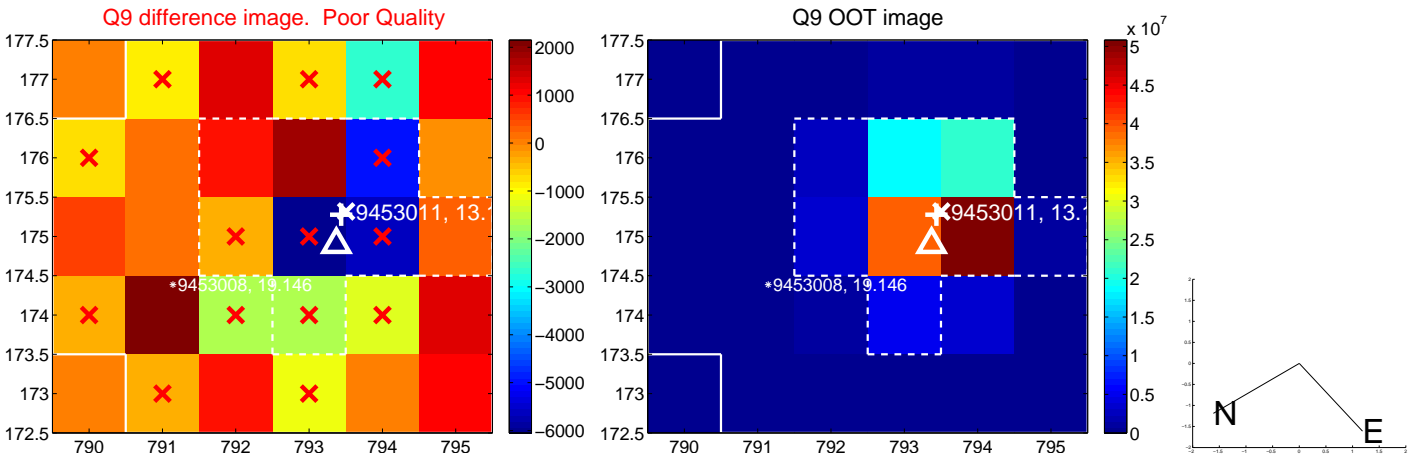
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



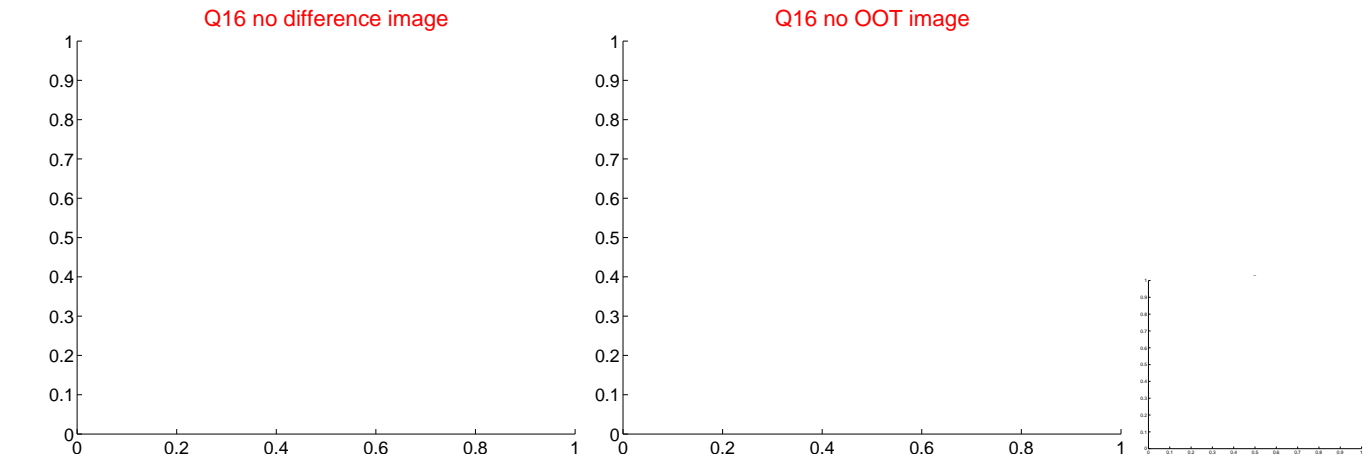
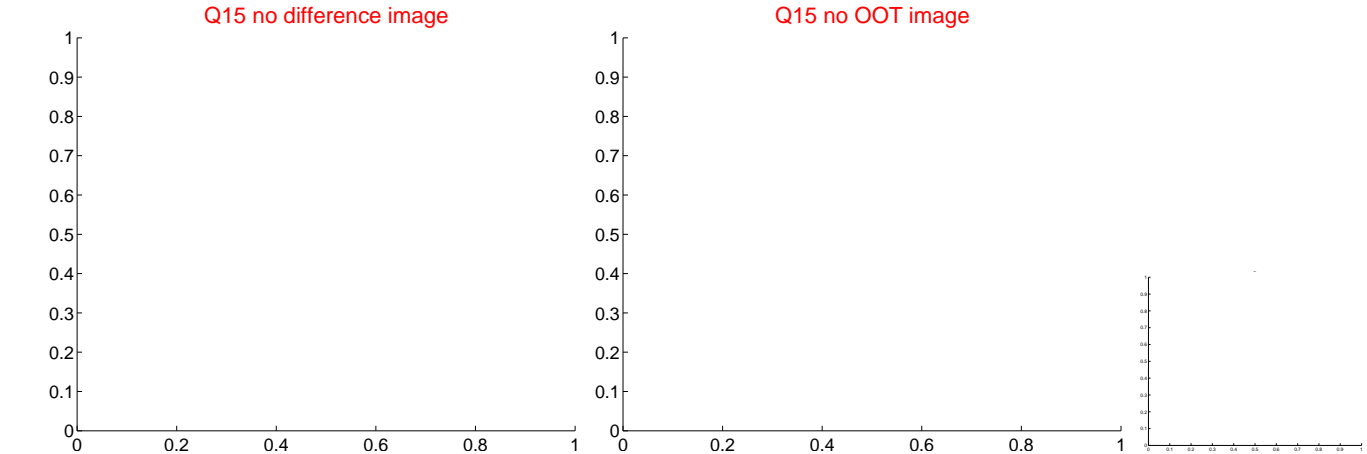
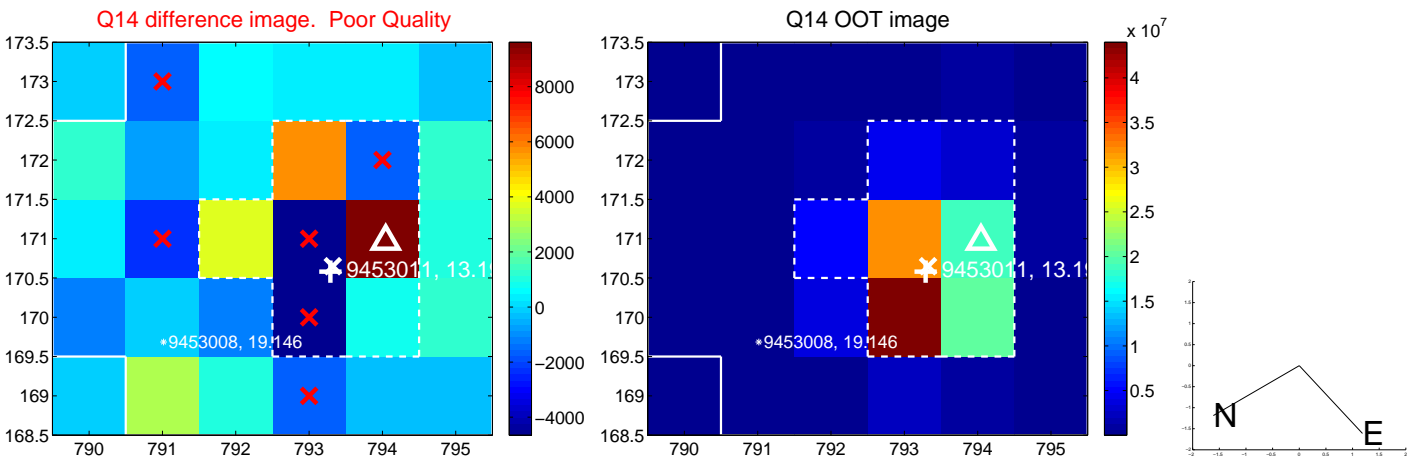
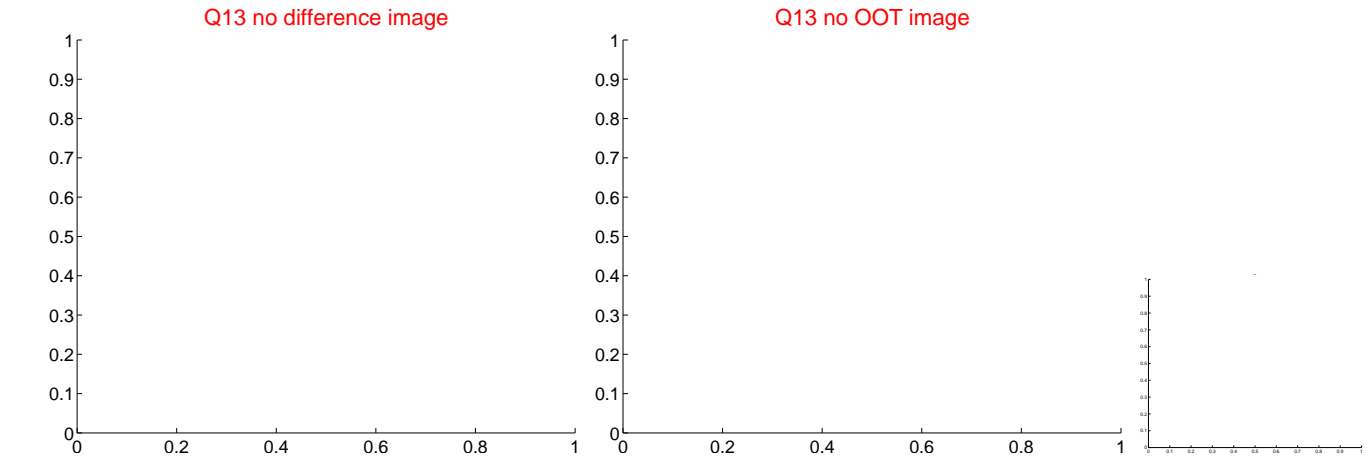
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



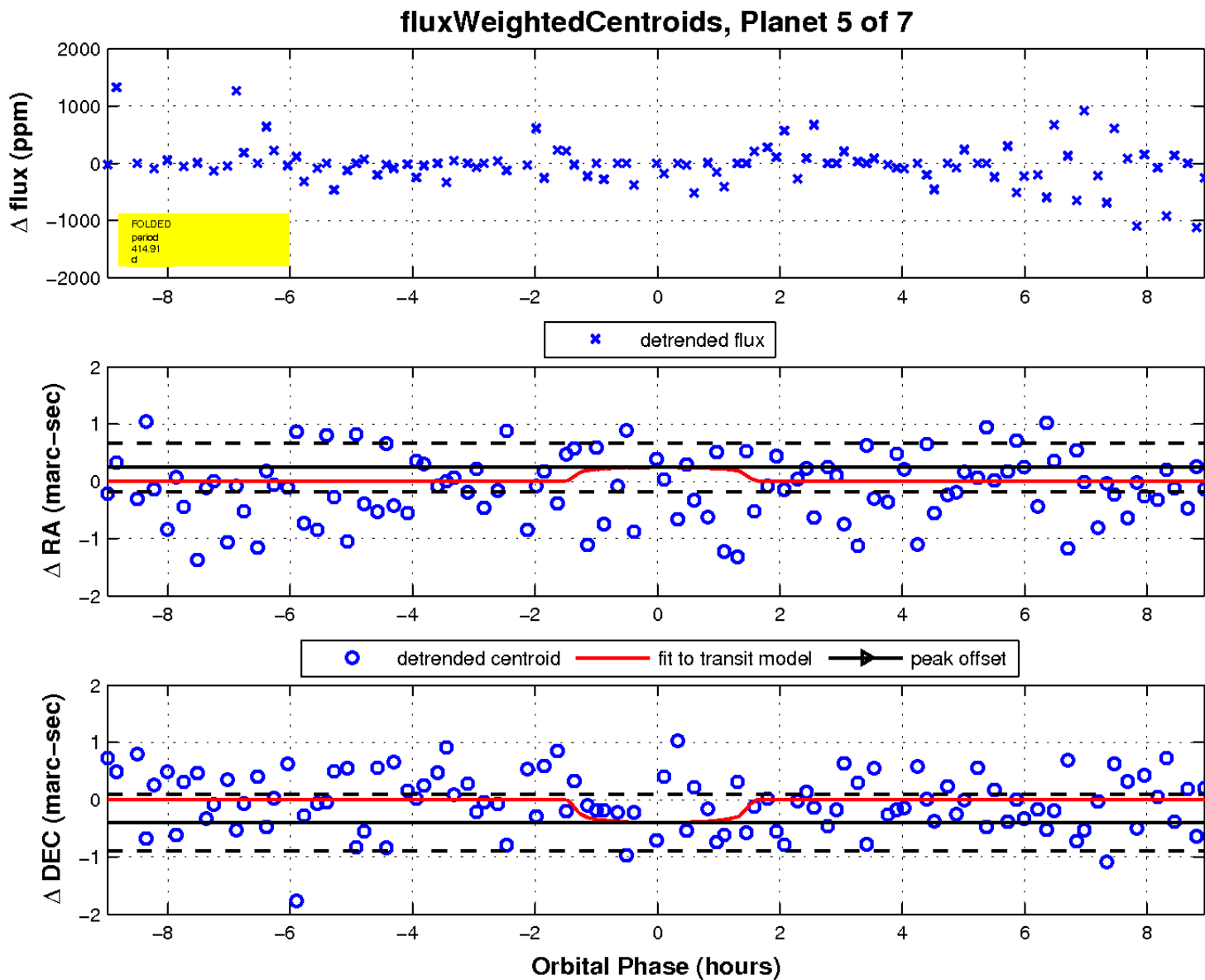
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

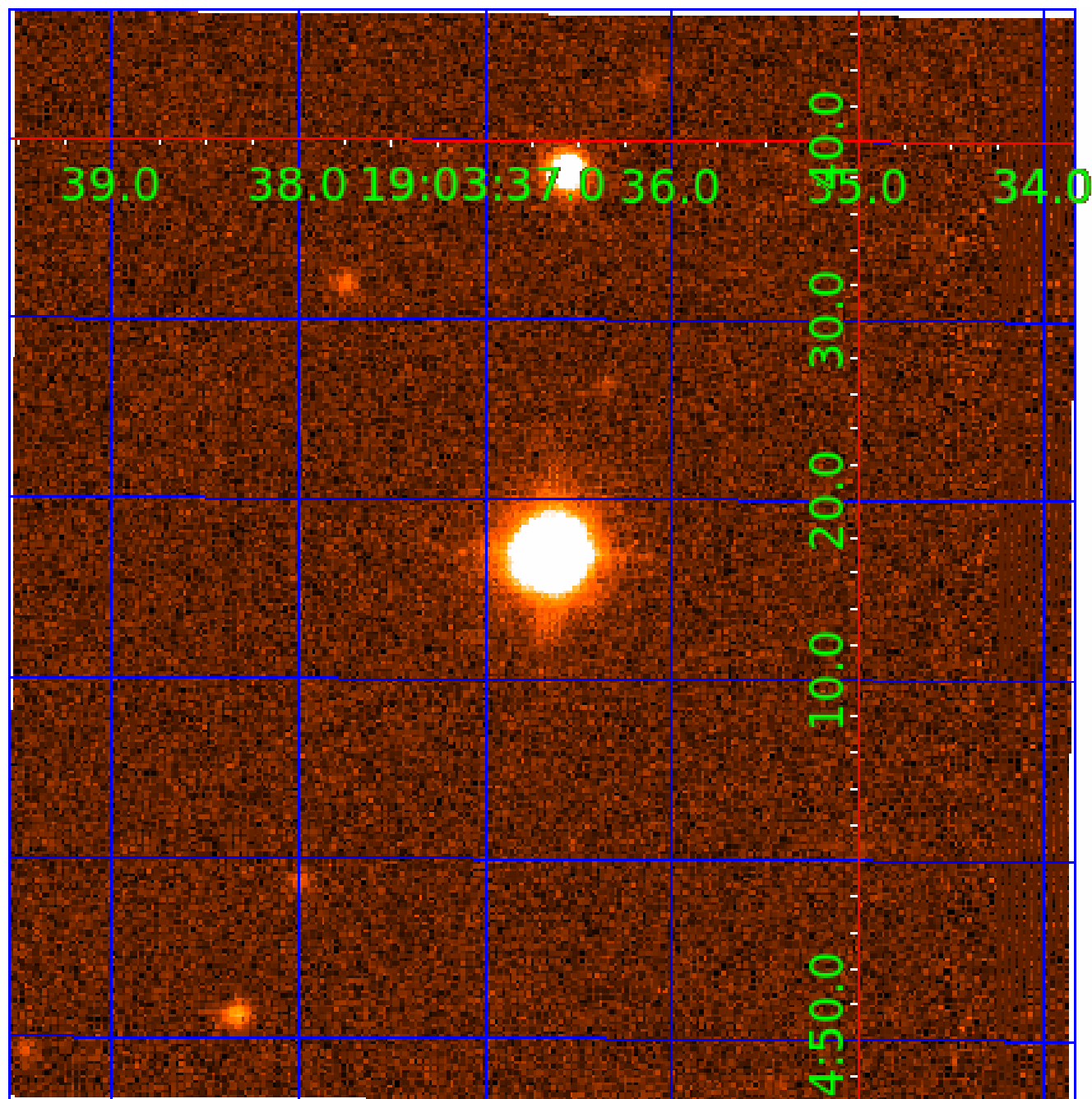


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009453011

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})
009453011-01	OBS	No	554.676636	300.725456	1435.9	8.204	17.9	9.2	0.45	3760	2.19	0.04
009453011-03	OBS	No	595.624318	274.153650	1114.3	5.491	19.8	7.5	0.45	3760	1.97	0.03
009453011-04	OBS	No	554.249661	220.742929	483.5	6.457	13.7	3.9	0.45	3760	1.07	0.04
009453011-05	OBS	No	414.910833	487.156787	430.9	3.047	13.8	3.8	0.45	3760	1.05	0.05
009453011-06	OBS	No	489.459841	413.308931	674.3	4.387	13.9	5.1	0.45	3760	1.18	0.04
009453011-07	OBS	No	529.140659	452.726557	200.3	12.500	12.9	-1.0	0.45	3760	0.64	0.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009453011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009453011-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

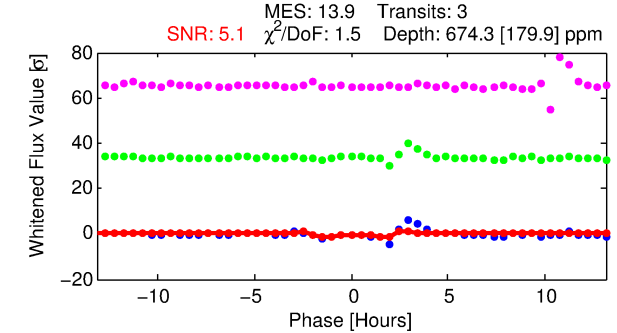
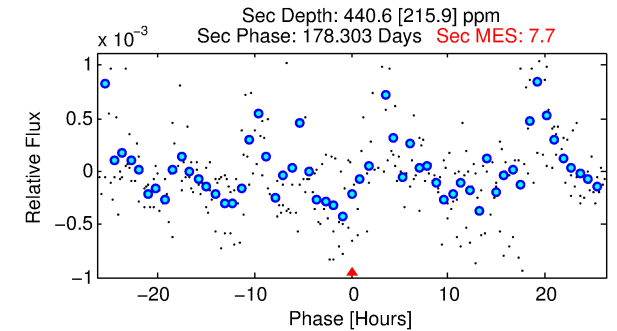
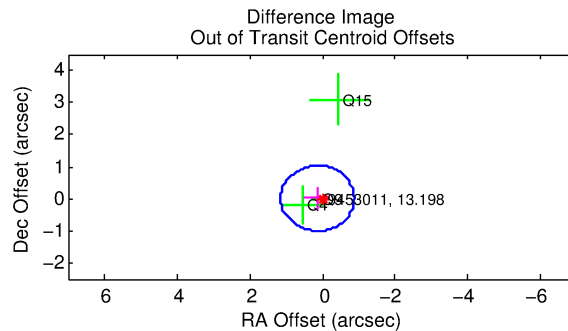
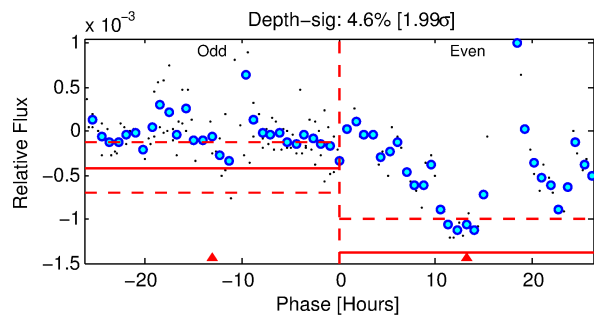
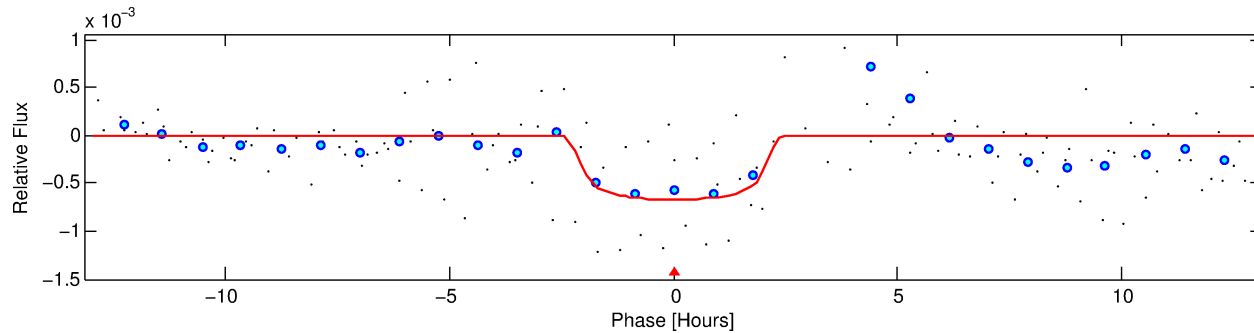
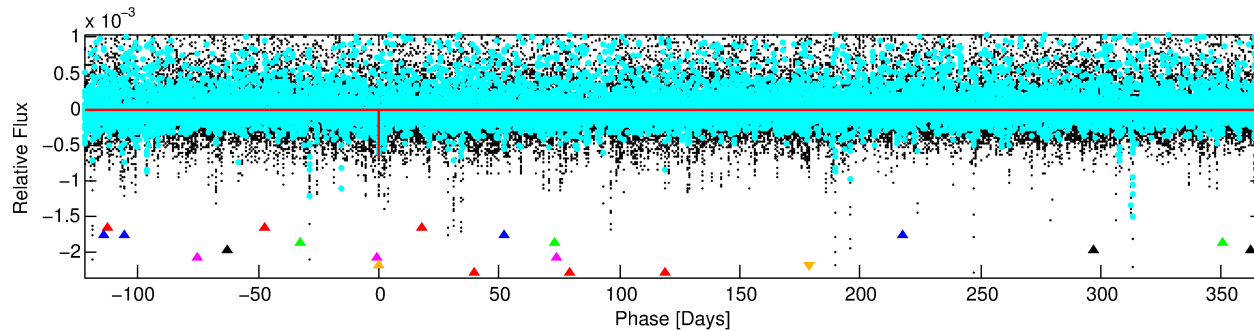
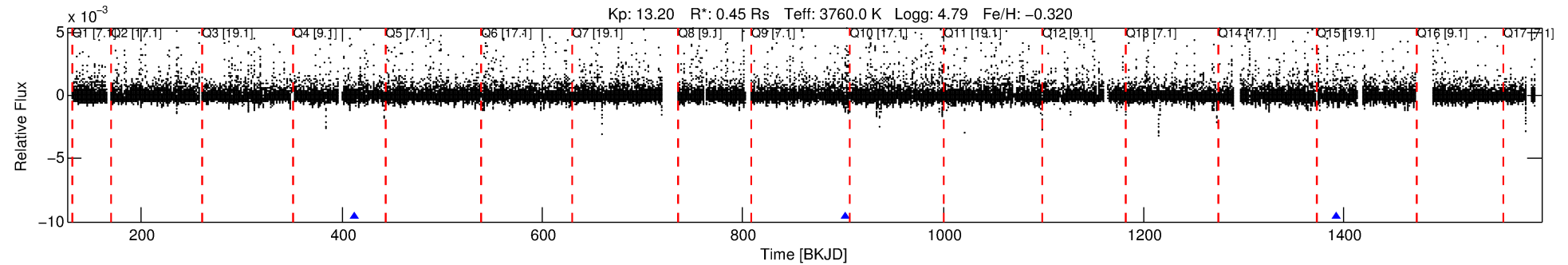
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009453011-06

No Significant Match Found

DV One-Page Summary

KIC: 9453011 Candidate: 6 of 7 Period: 489.460 d



DV Fit Results:

Period = 489.45984 [0.00567] d
Epoch = 413.3089 [0.0062] BKJD
 $R_p/R^* = 0.0240$ [0.0368]
 $a/R^* = 833.45$ [6316.37]
 $b = 0.30$ [22.66]
 $\text{Seff} = 0.04$ [0.01]
 $T_{\text{eq}} = 115$ [8] K
 $R_p = 1.18$ [1.83] R_{e}
 $a = 0.9375$ [0.1679] AU
 $A_g = 152860.02$ [476904.43] [0.32 σ]
 $T_{\text{eff}} = 3517$ [2738] K [1.24 σ]

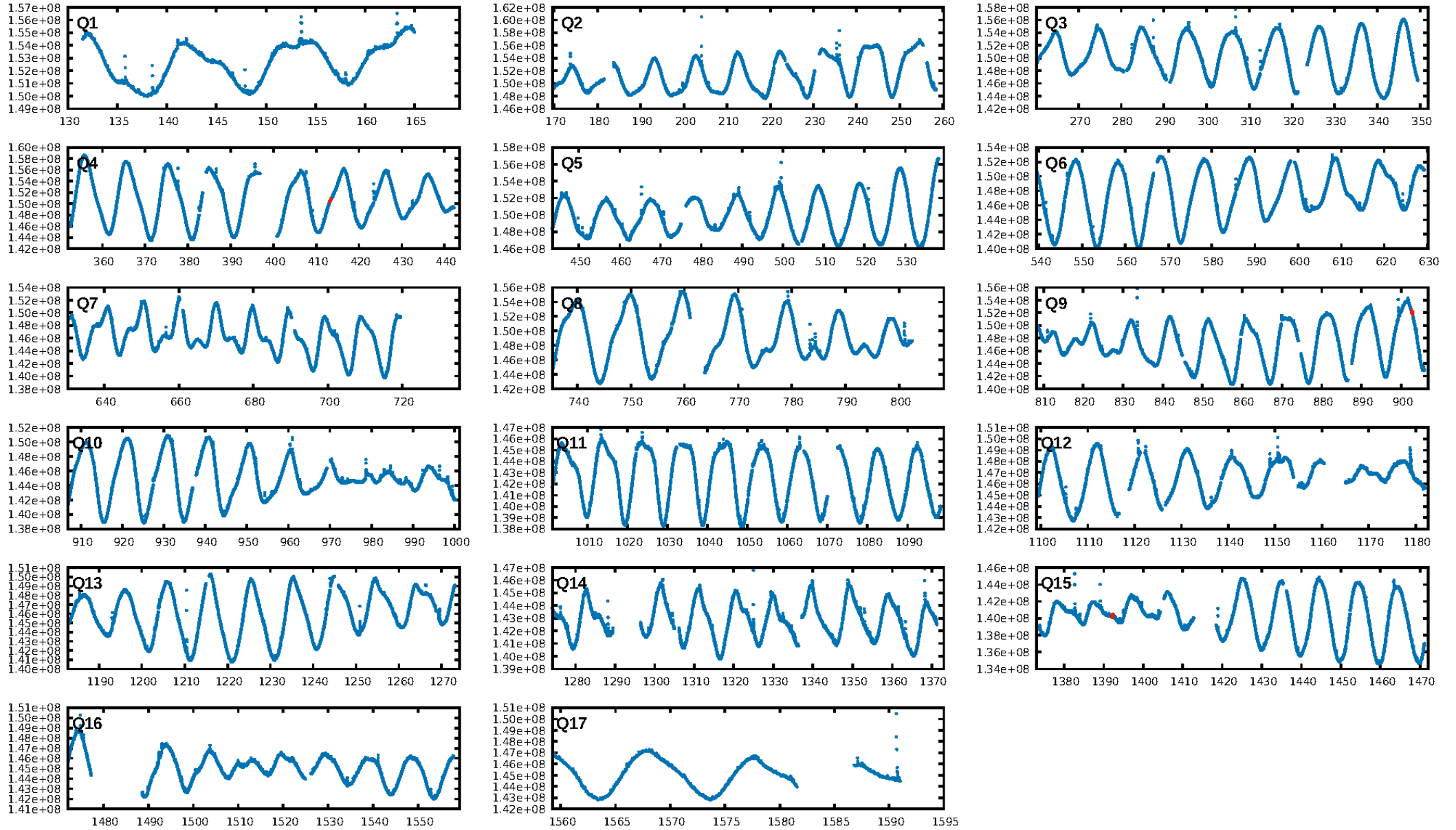
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [334.96 σ]
LongPeriod-sig: 100.0% [71.89 σ]
ModelChiSquare2-sig: 3.4%
ModelChiSquareGof-sig: 78.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.137
Centroid-sig: 88.3%
Centroid-so: 0.459 arcsec [0.89 σ]
OotOffset-rm: 0.139 arcsec [0.41 σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 0.281 arcsec [0.32 σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

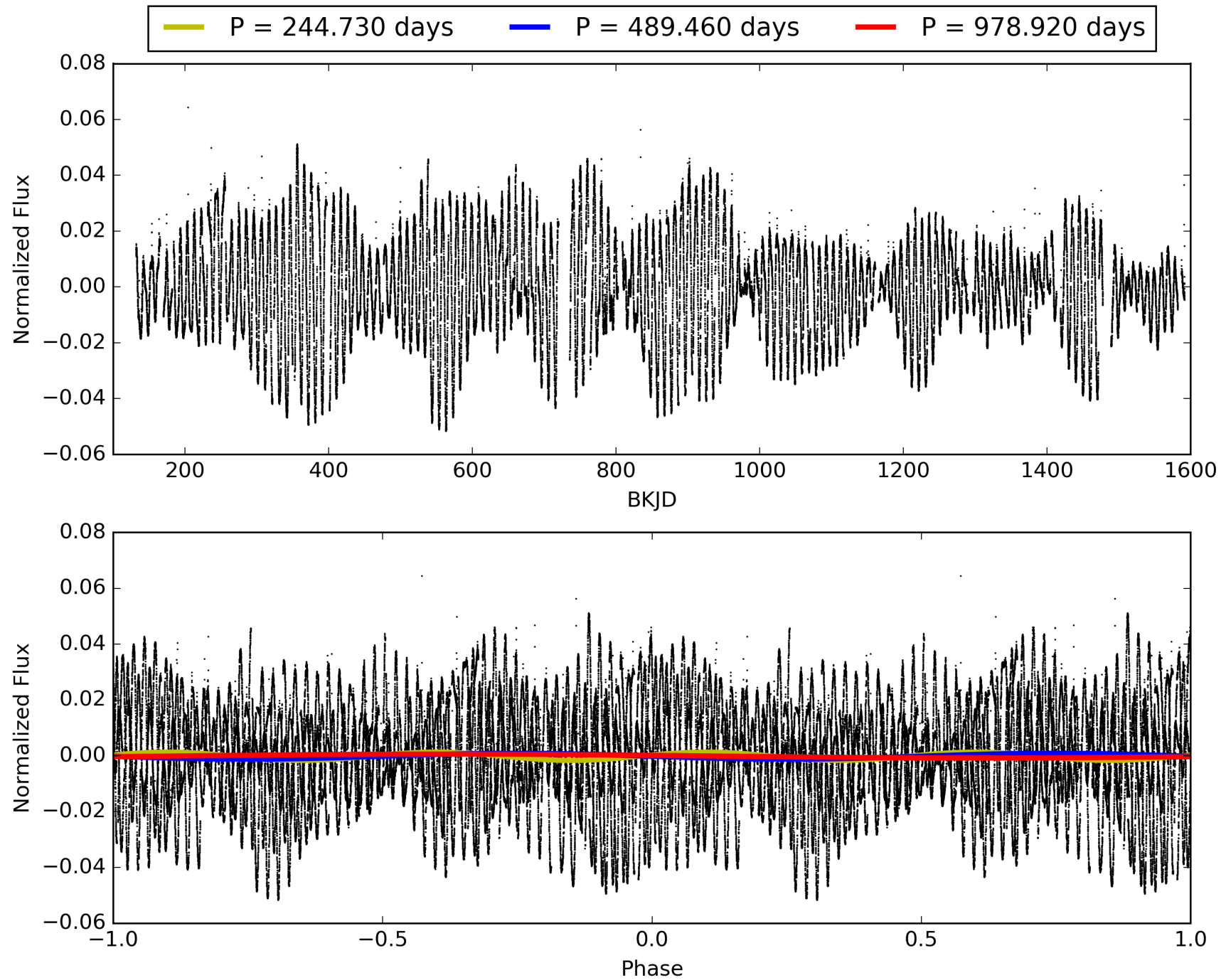
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:37:06 Z

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

TCE 009453011-06, PDC Light Curves

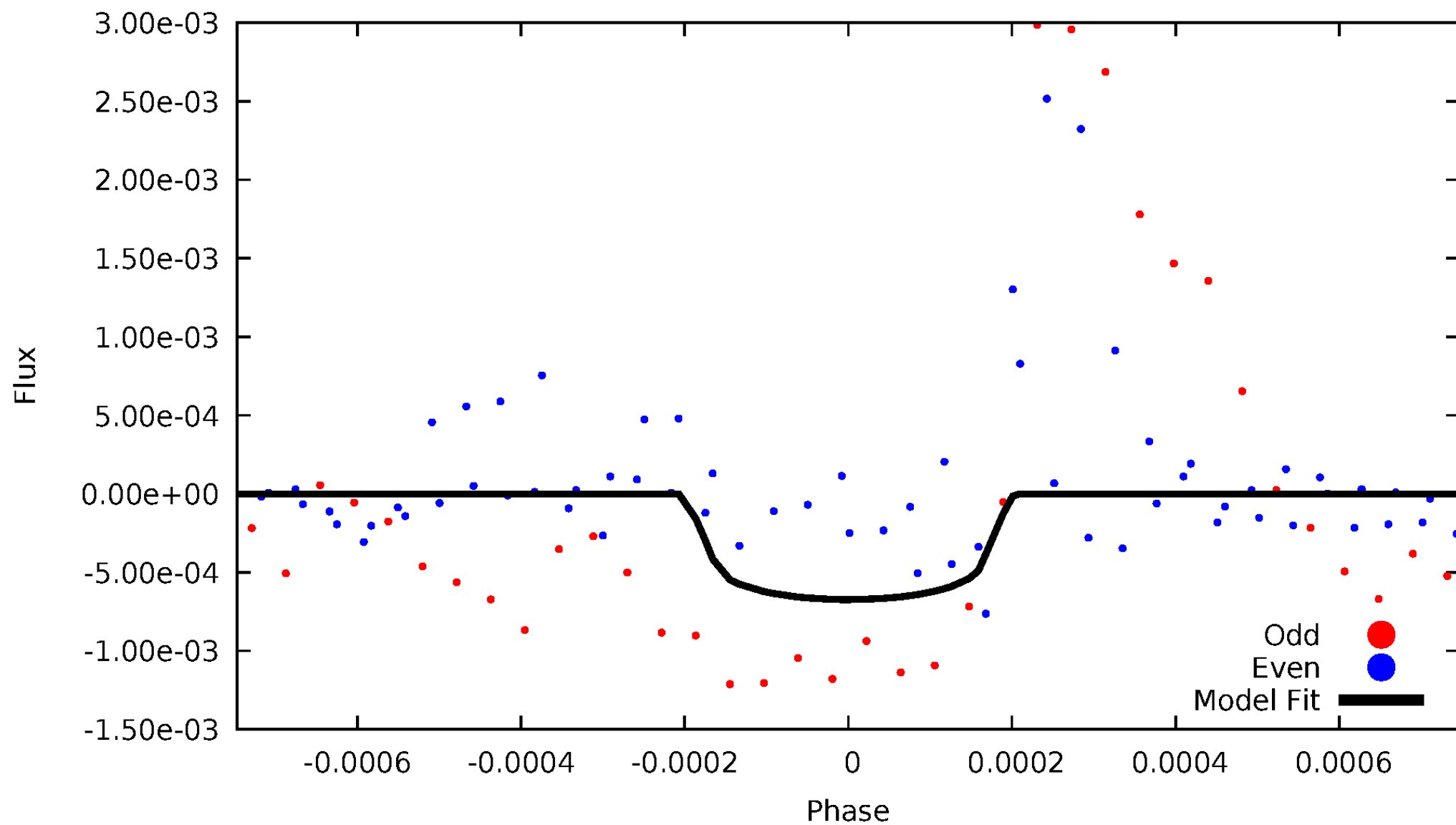


TCE 009453011-06



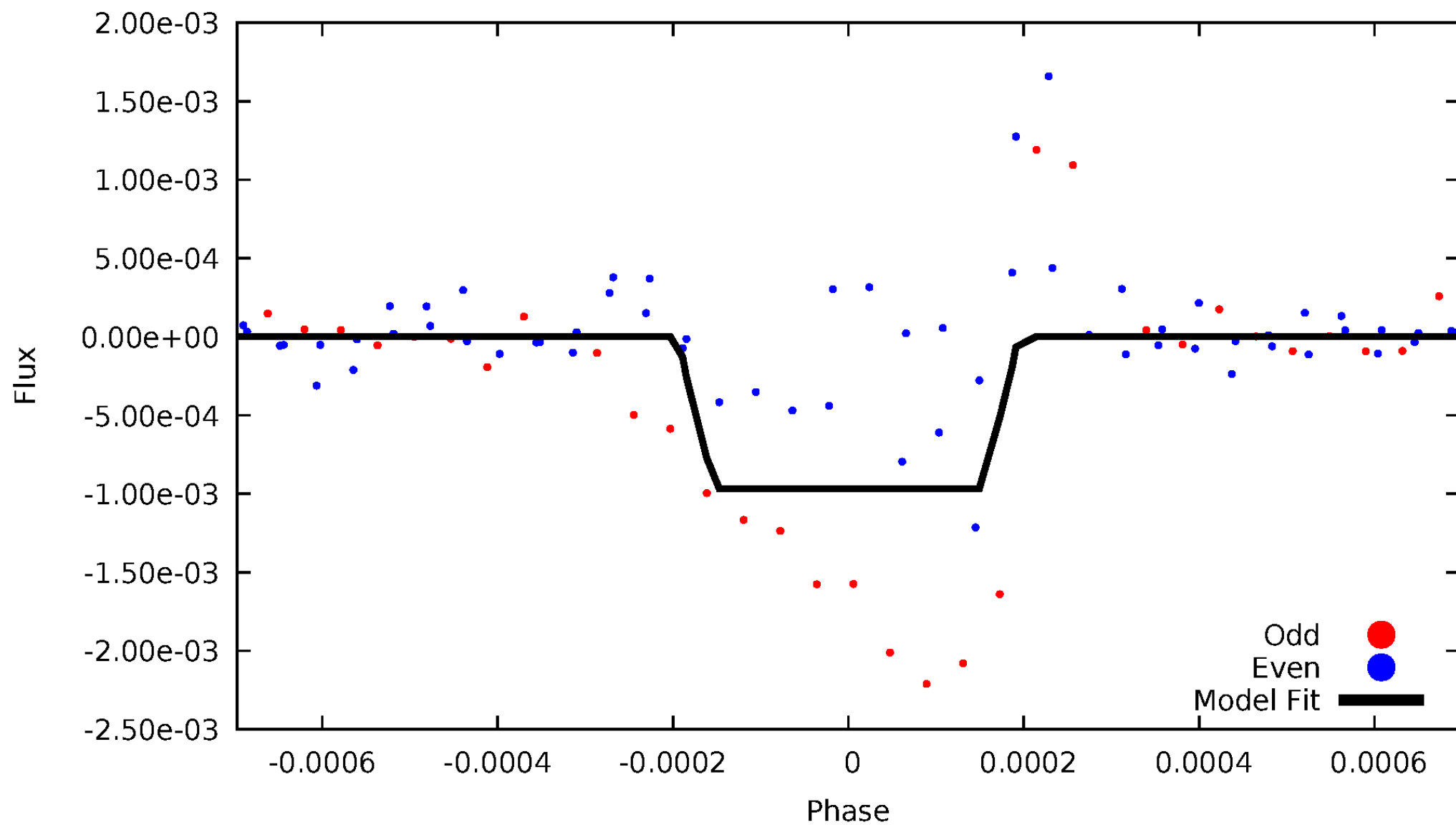
DV Odd/Even

TCE 009453011-06



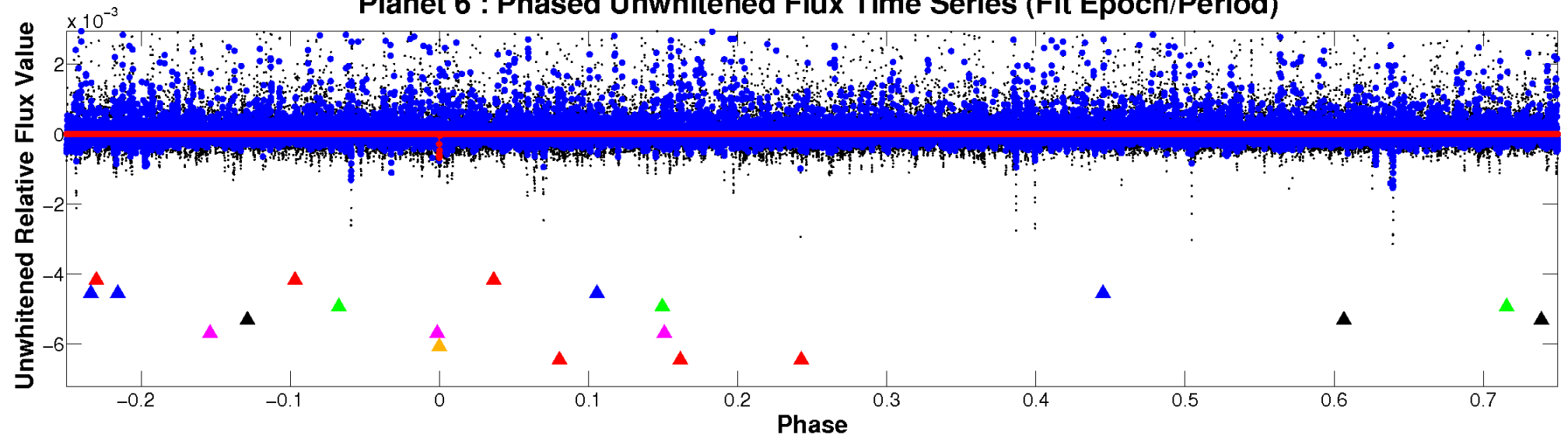
ALT Odd/Even

TCE 009453011-06

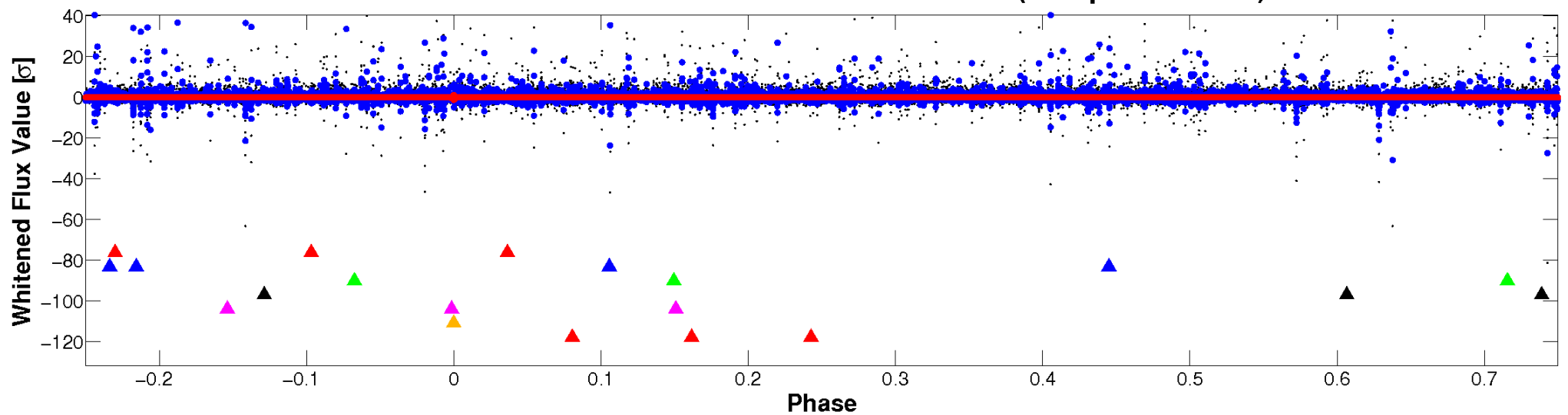


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

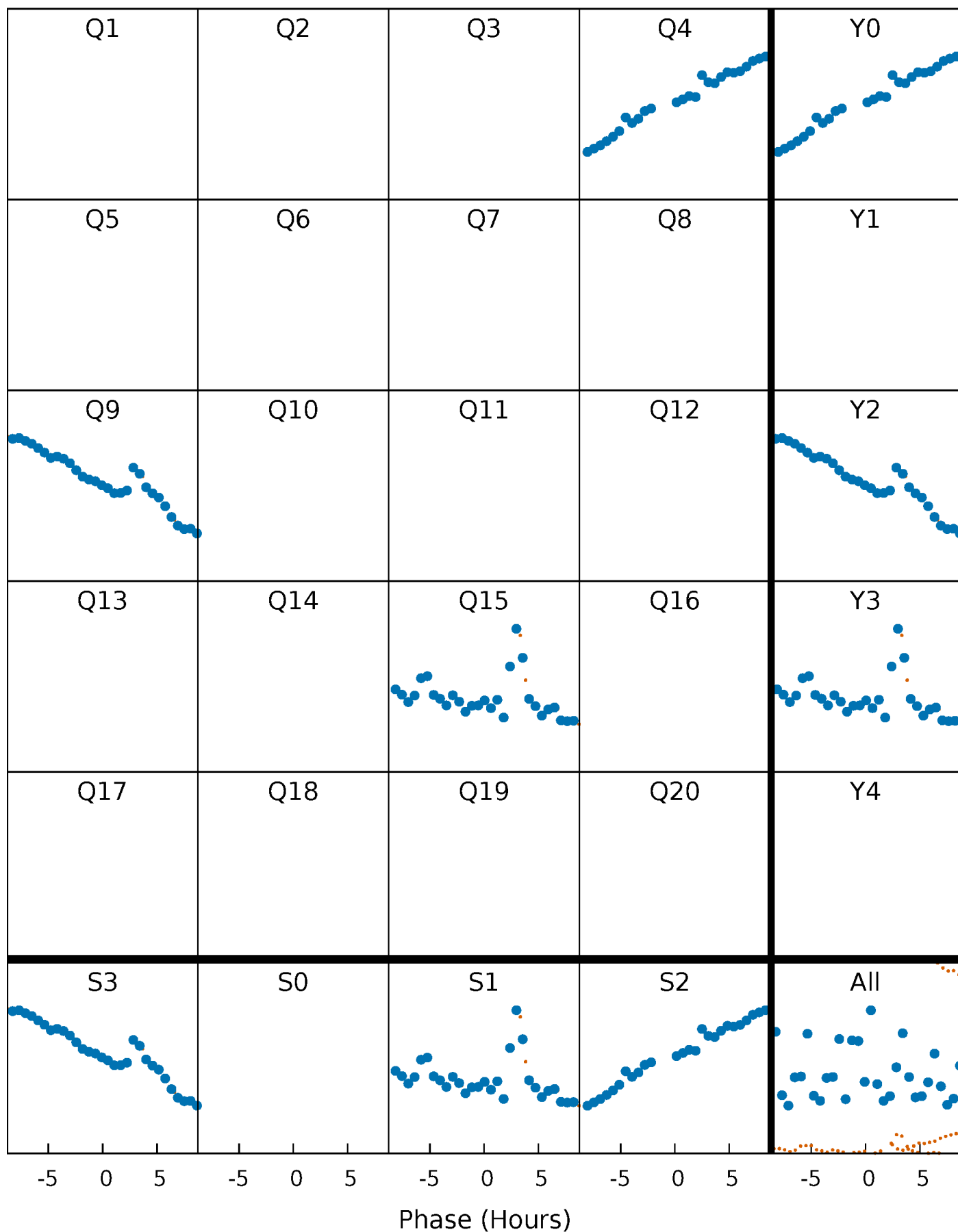


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



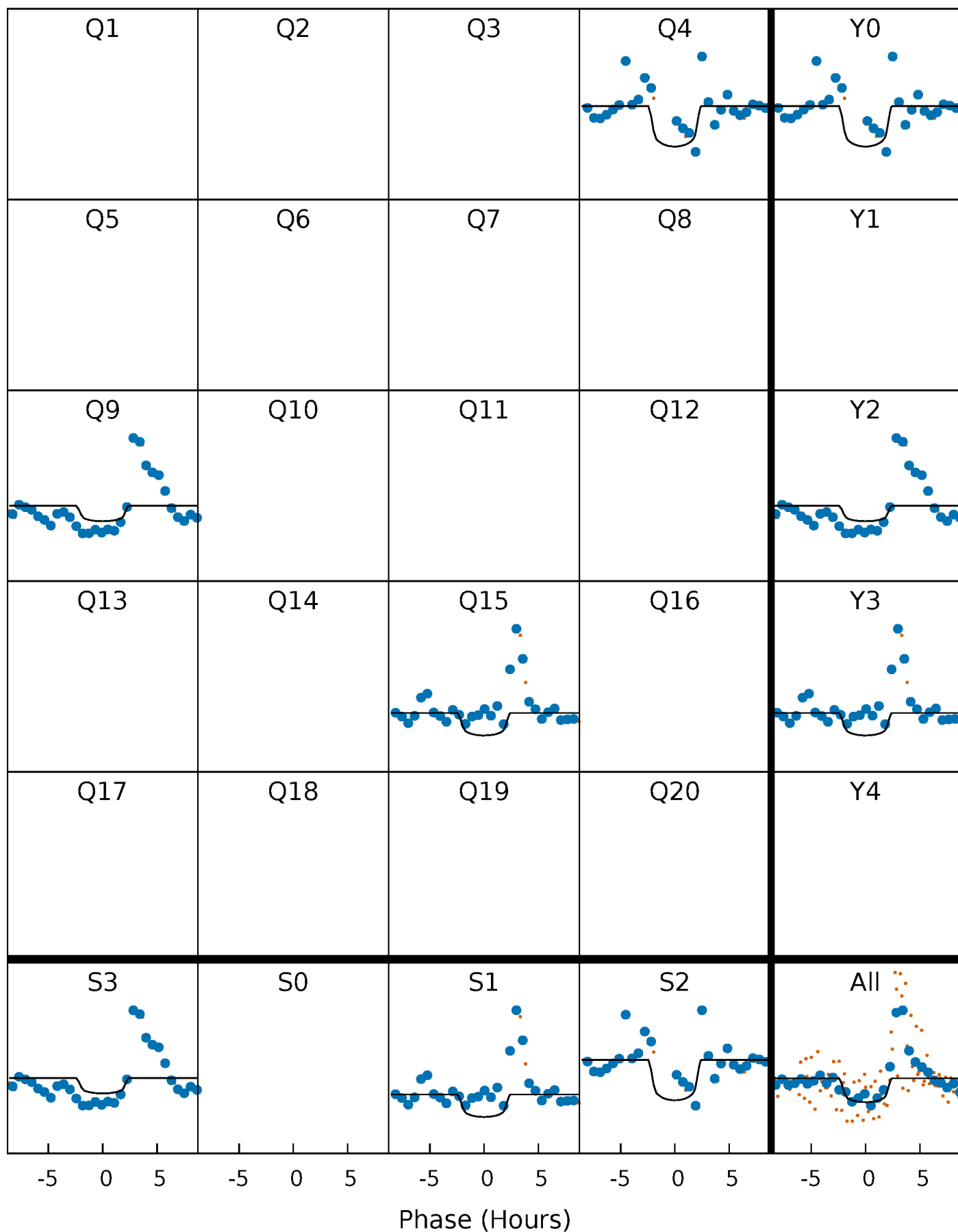
PDC Quarter-Phased Transit Curves

TCE 009453011-06 P=489.459841 Days $T_0=413.308931$ (BKJD)



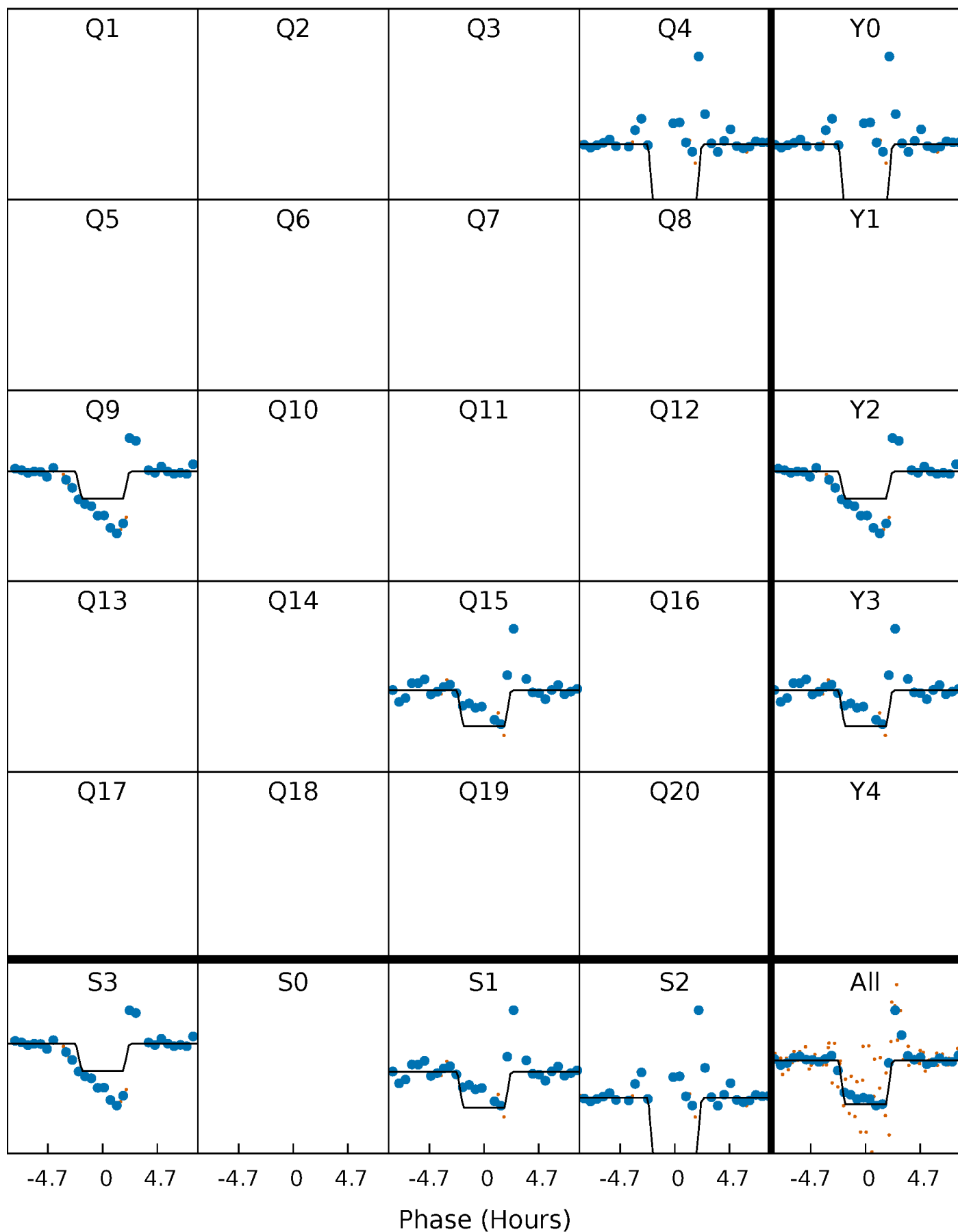
DV Quarter-Phased Transit Curves

TCE 009453011-06 P=489.459841 Days $T_0=413.308931$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

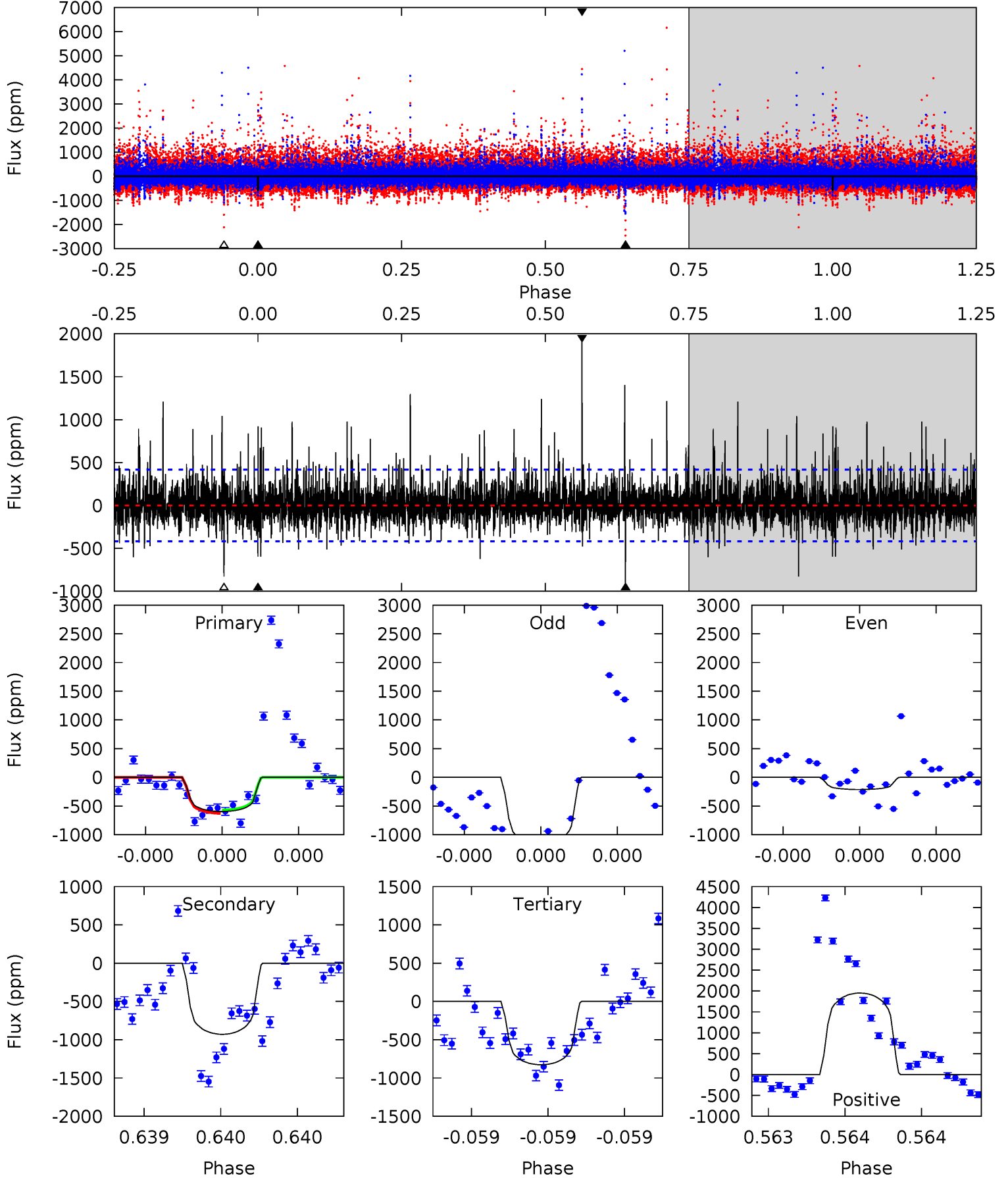
TCE 009453011-06 P=489.458685 Days $T_0=413.318163$ (BKJD)



DV Model-Shift Uniqueness Test

009453011-06, P = 489.459841 Days, E = 413.308931 Days

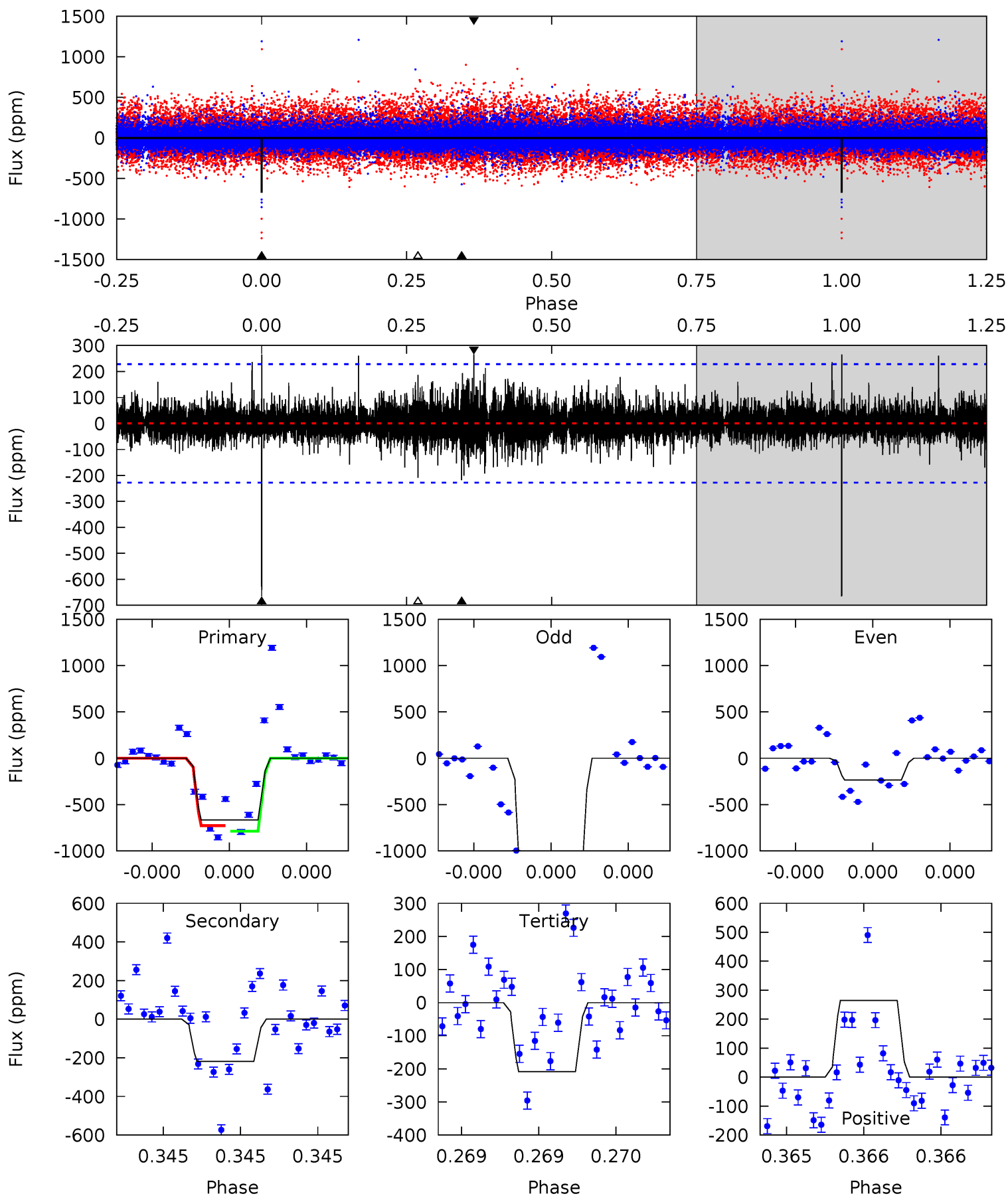
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.00	12.5	11.1	26.2	5.61	3.54	2.24	-3.10	-18.2	1.37	-13.7	3.77	1.40	0.68	0.38



Alt Model-Shift Uniqueness Test

009453011-06, P = 489.458685 Days, E = 413.318163 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	5.37	5.12	6.52	5.61	3.54	0.93	11.2	9.85	0.25	-1.15	23.7	1.23	0.28	0



Stellar Parameters For KIC 009453011

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3760^{+117}_{-143}	$4.791^{+0.126}_{-0.054}$	$-0.320^{+0.300}_{-0.350}$	$0.451^{+0.068}_{-0.102}$	$0.459^{+0.069}_{-0.103}$	$7.044^{+4.959}_{-1.529}$
	+3%/-4%	+3%/-1%	+94%/-109%	+15%/-23%	+15%/-22%	+70%/-22%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009453011-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-929 ± 75	$1.78^{+1.56}_{-1.16}$	158^{+8}_{-8}	3519^{+1650}_{-594}	$140774^{+1090974}_{-97536}$
Alt.	-218 ± 41	$1.95^{+1.48}_{-1.18}$	158^{+8}_{-9}	2765^{+847}_{-375}	$26956^{+147212}_{-18231}$

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

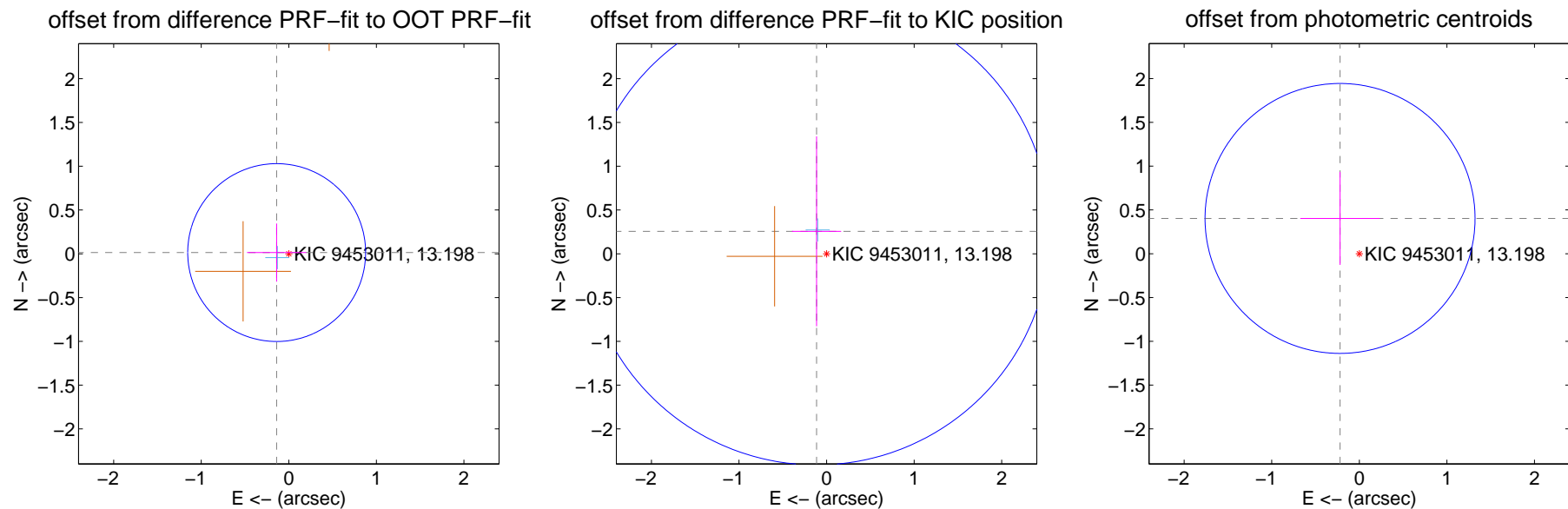
DV Centroid Data

Supplemental centroid analysis for 009453011-06. Kepler magnitude: 13.20. Transit SNR 5.06

There are 1 quarters with good PRF difference image offsets

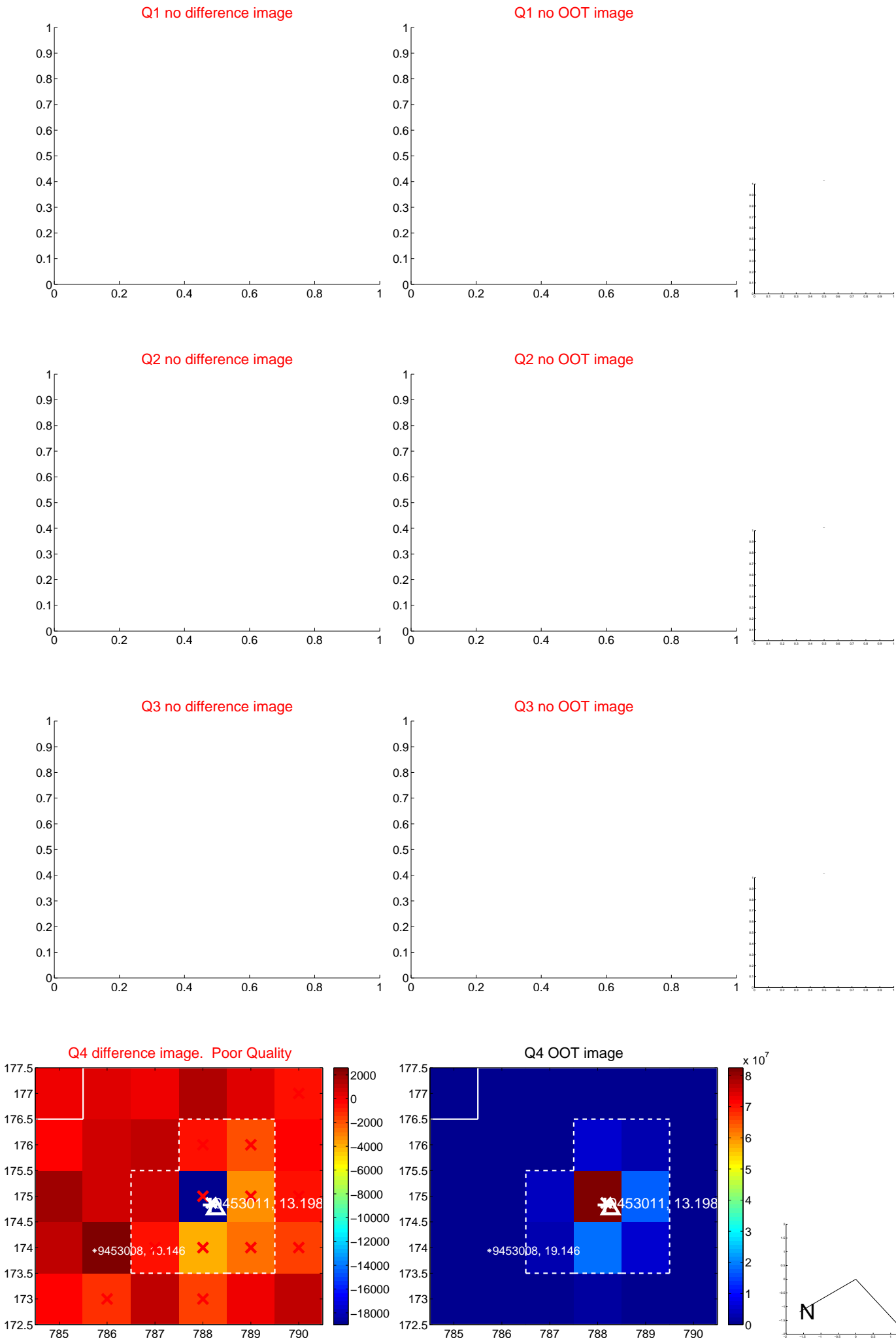
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.139 ± 0.339	0.41	0.139 ± 0.339	0.014 ± 0.333
PRF-fit source offset from KIC position	0.281 ± 0.889	0.32	0.115 ± 0.281	0.257 ± 1.084
photometric centroid source offset	0.46 ± 0.51	0.89	0.22 ± 0.45	0.40 ± 0.53



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.

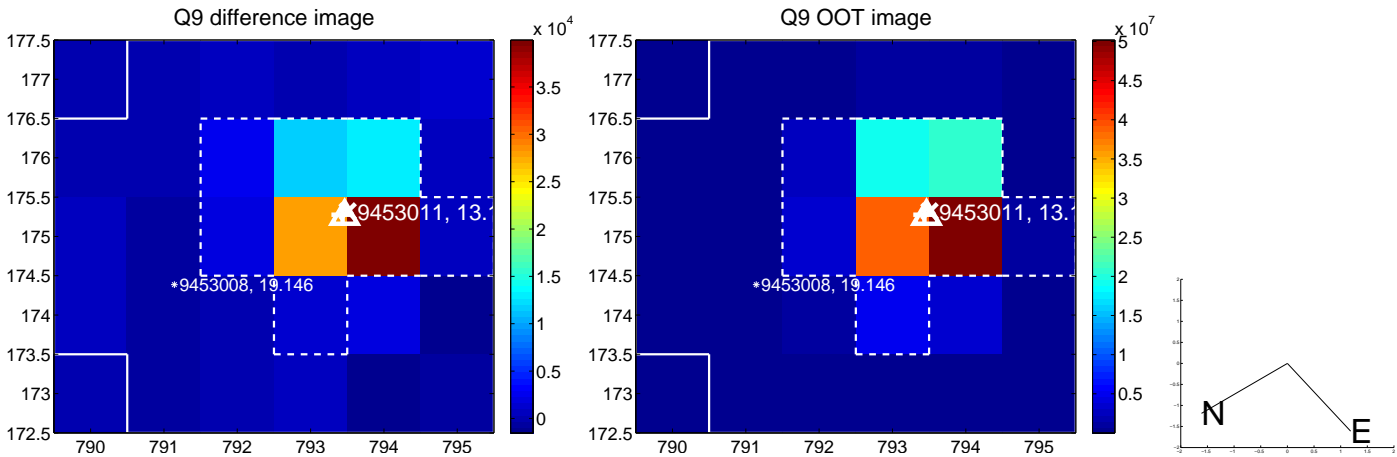
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



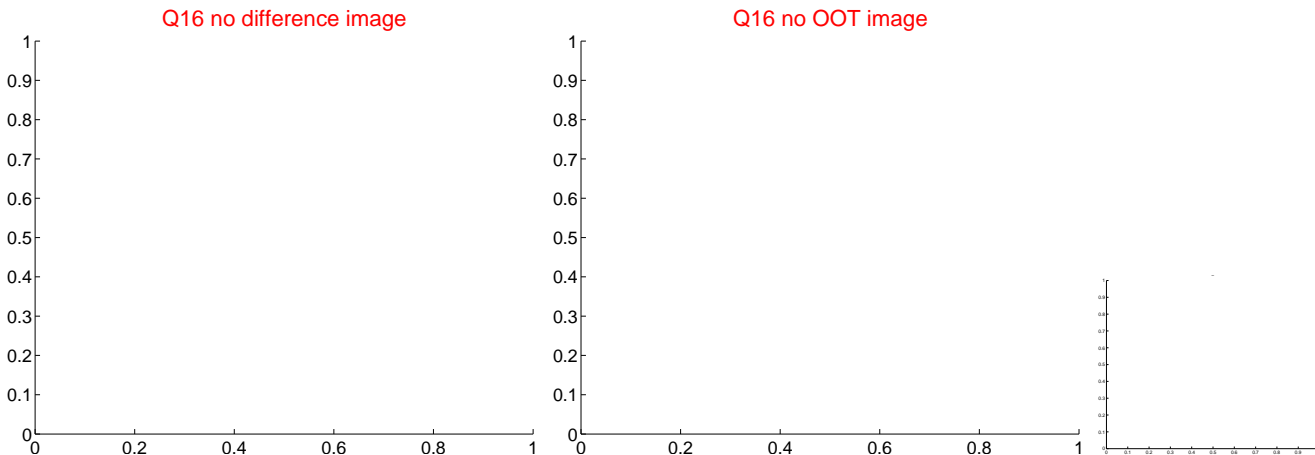
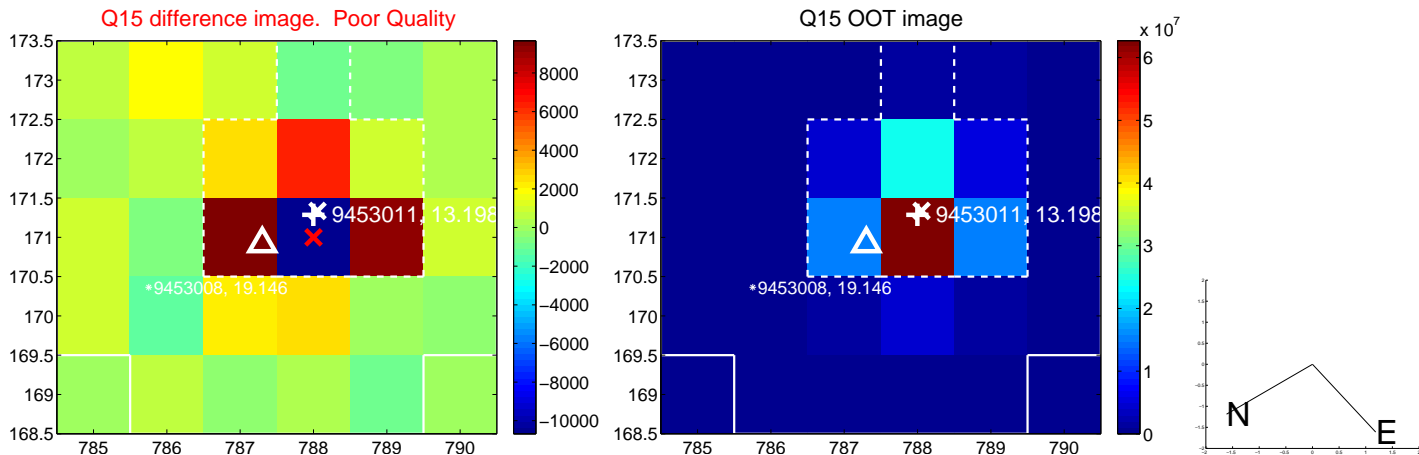
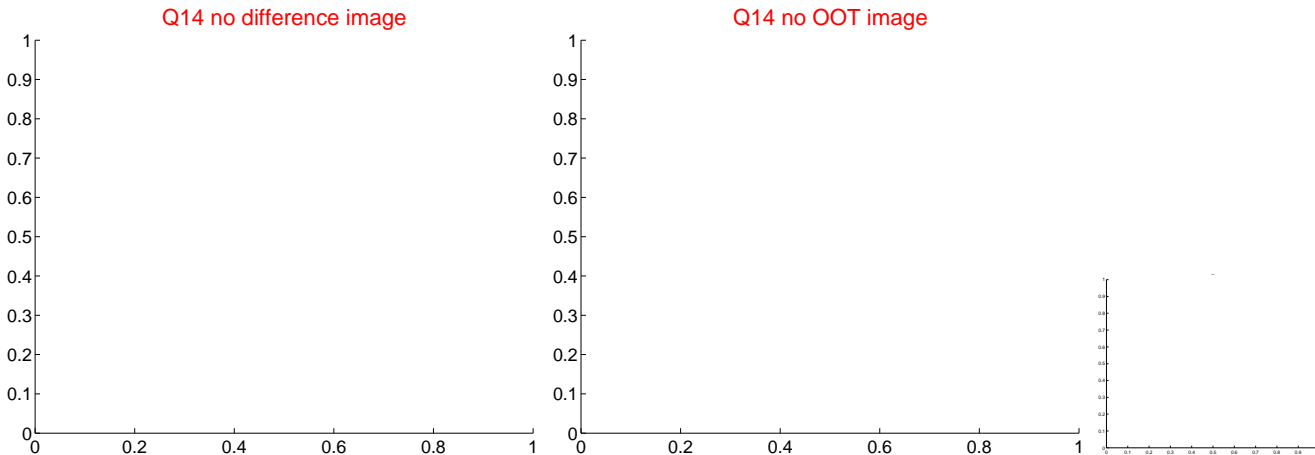
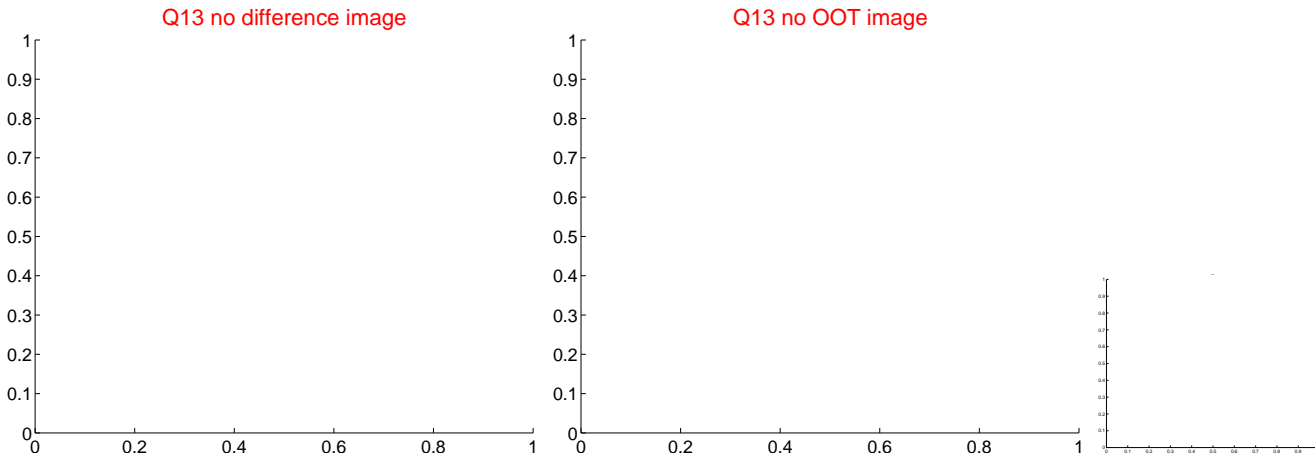
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



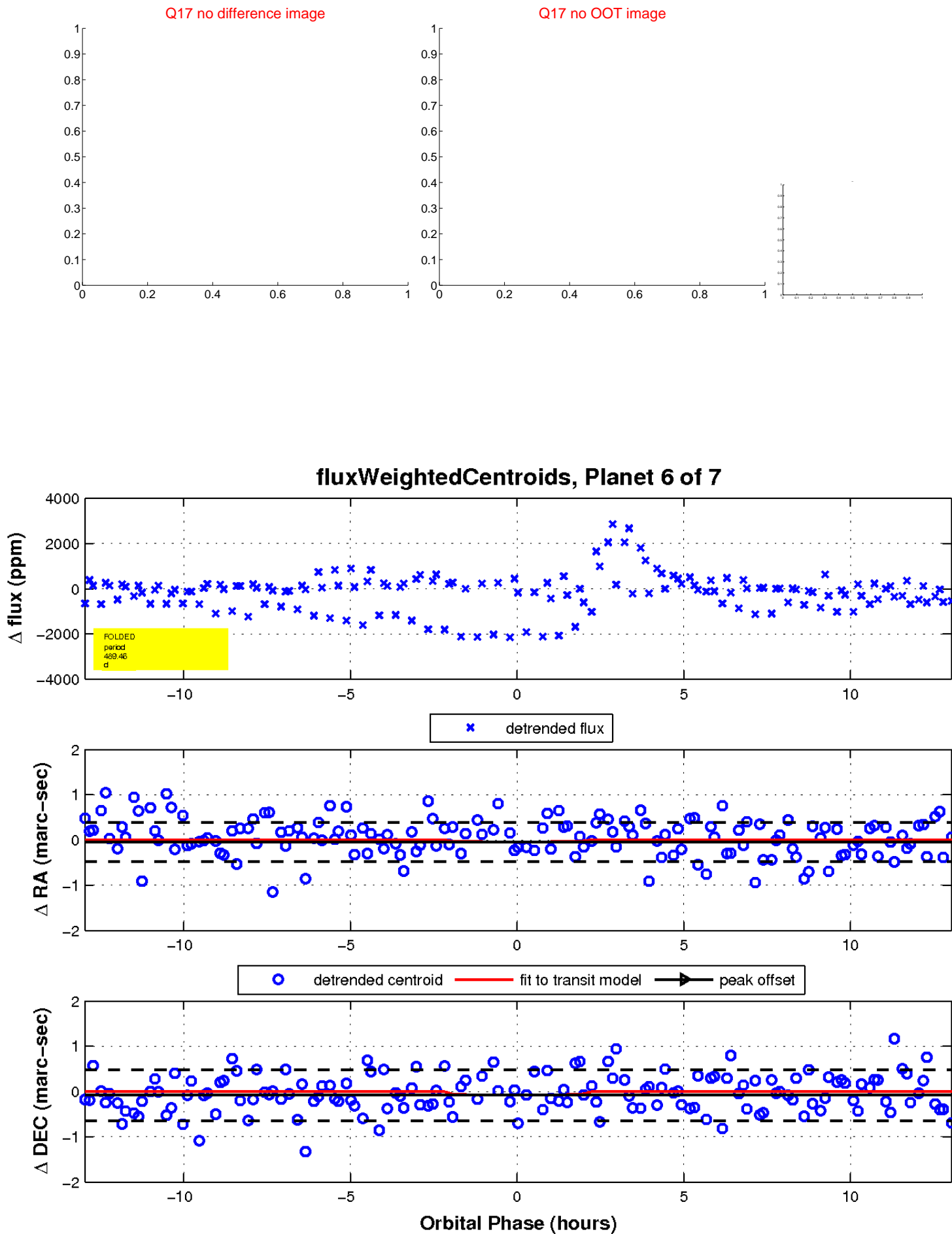
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

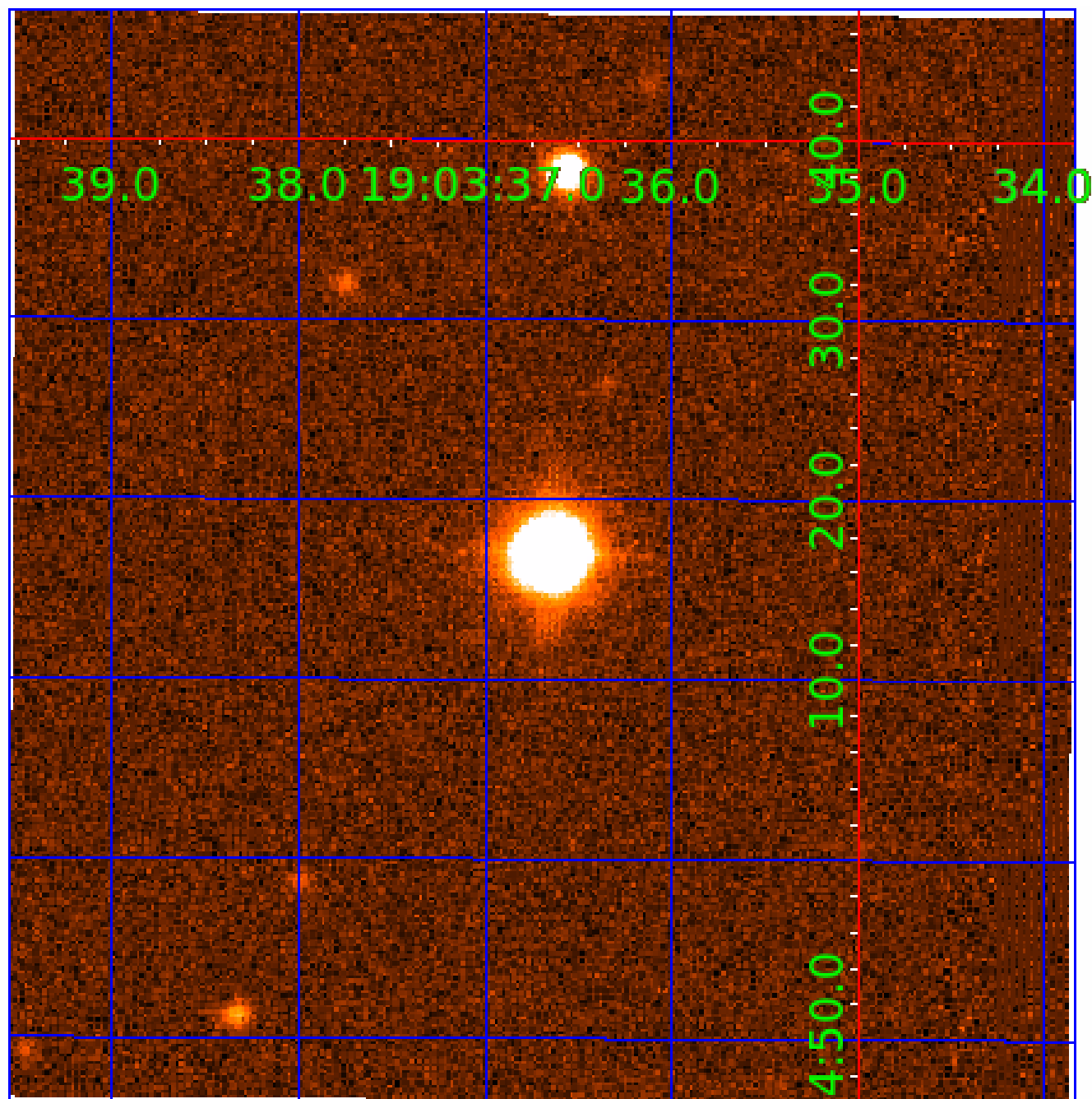


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009453011

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})
009453011-01	OBS	No	554.676636	300.725456	1435.9	8.204	17.9	9.2	0.45	3760	2.19	0.04
009453011-03	OBS	No	595.624318	274.153650	1114.3	5.491	19.8	7.5	0.45	3760	1.97	0.03
009453011-04	OBS	No	554.249661	220.742929	483.5	6.457	13.7	3.9	0.45	3760	1.07	0.04
009453011-05	OBS	No	414.910833	487.156787	430.9	3.047	13.8	3.8	0.45	3760	1.05	0.05
009453011-06	OBS	No	489.459841	413.308931	674.3	4.387	13.9	5.1	0.45	3760	1.18	0.04
009453011-07	OBS	No	529.140659	452.726557	200.3	12.500	12.9	-1.0	0.45	3760	0.64	0.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009453011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009453011-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009453011-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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

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

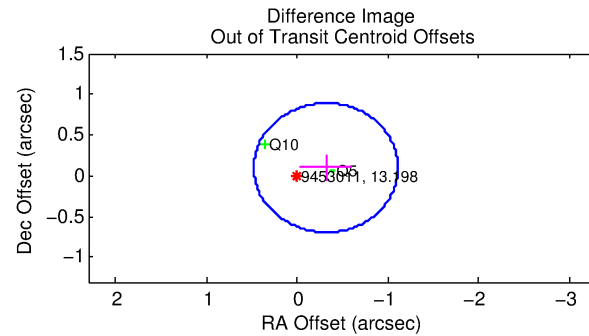
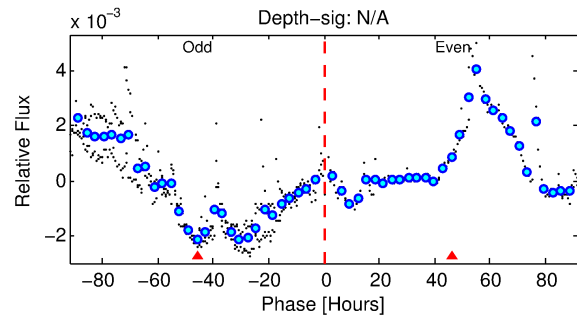
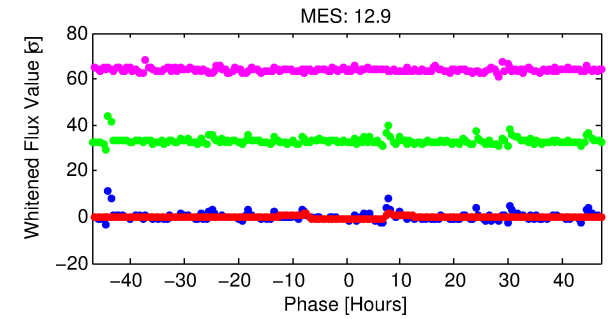
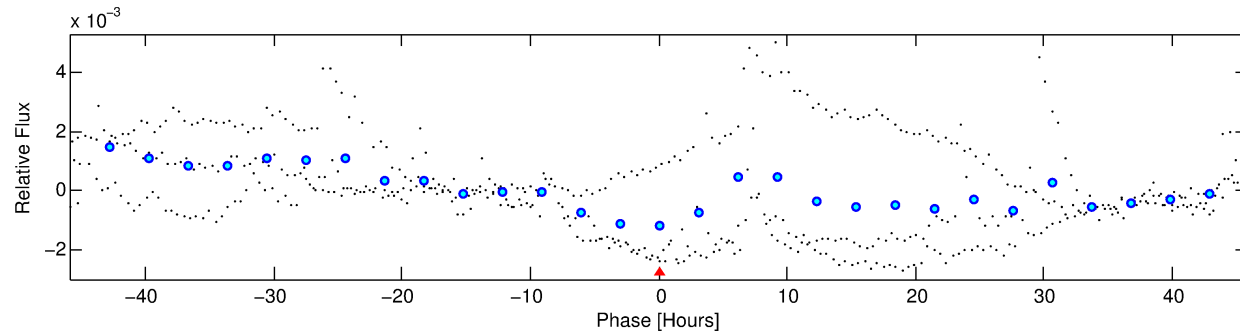
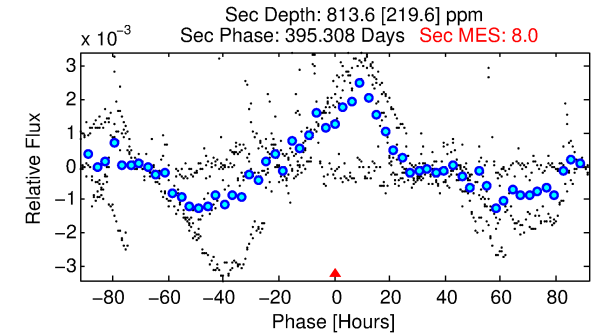
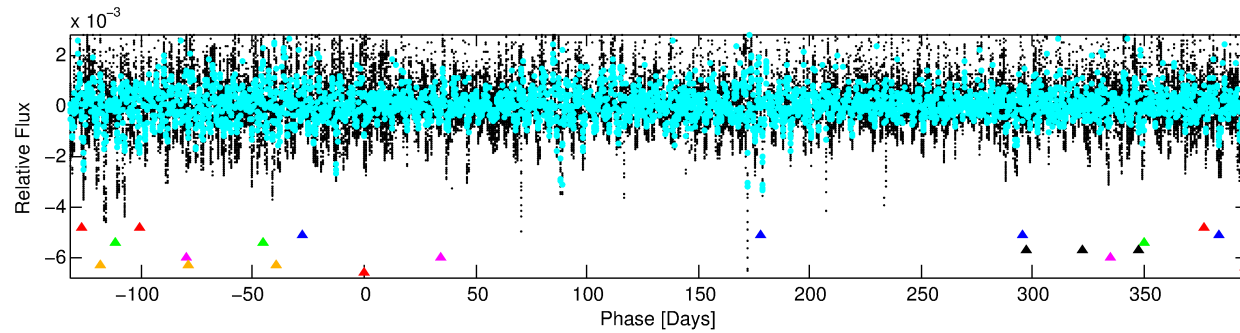
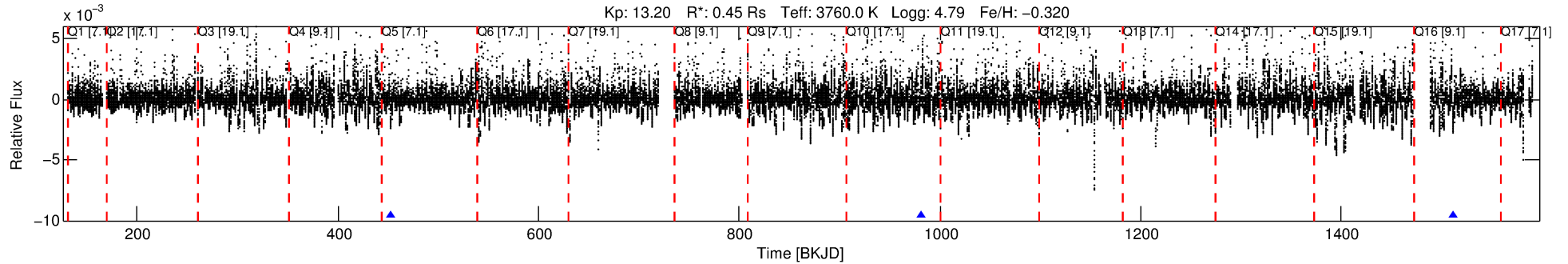
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009453011-07

No Significant Match Found

DV One-Page Summary

KIC: 9453011 Candidate: 7 of 7 Period: 529.141 d



TPS TCE Results:

Period = 529.14066 d
Epoch = 452.7266 BKJD

DV fit results are unavailable

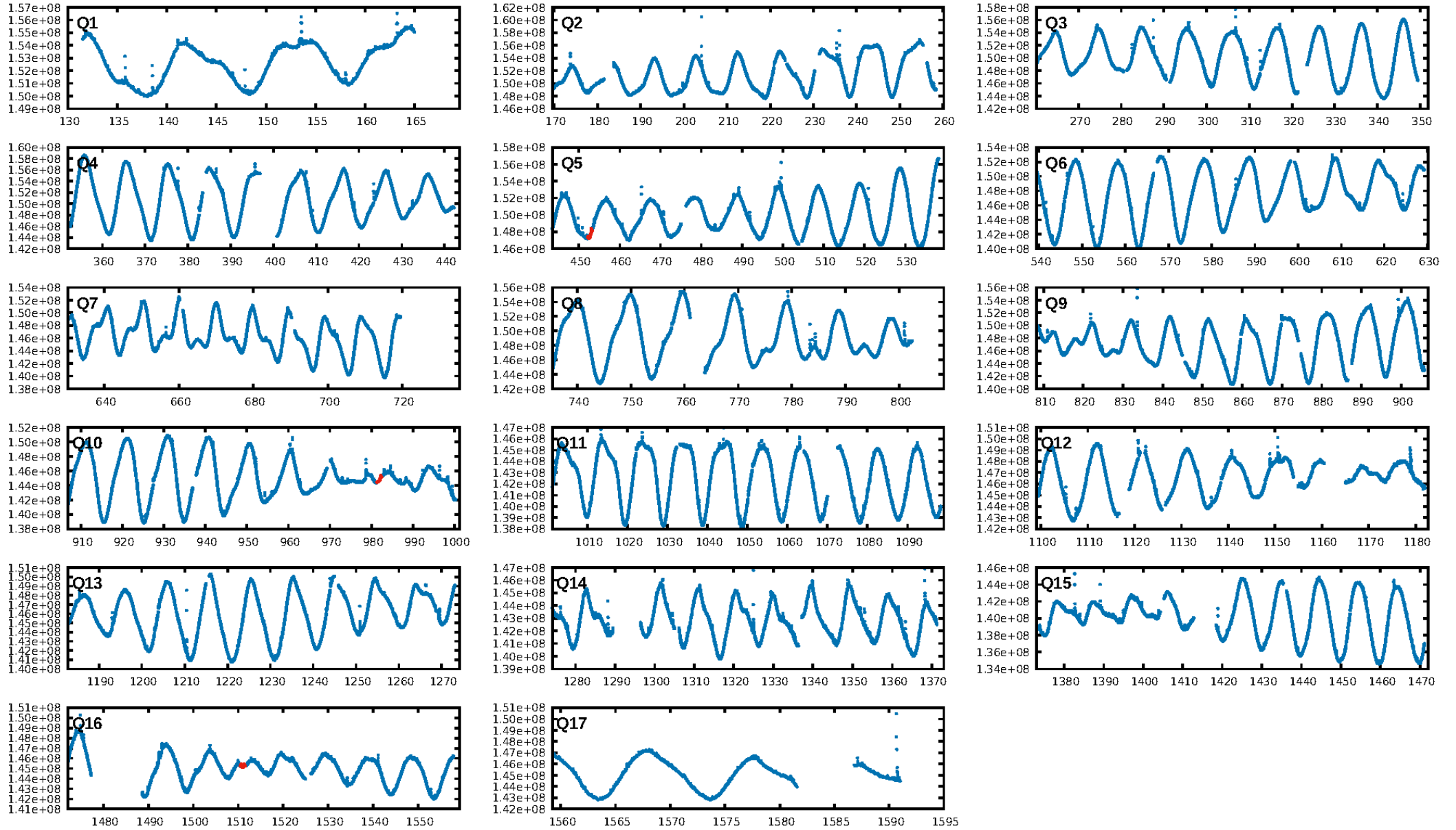
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [71.89σ]
LongPeriod-sig: 100.0% [42.83σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5195
Centroid-sig: 12.4%
Centroid-so: 0.358 arcsec [3.42σ]
OotOffset-rm: 0.330 arcsec [1.25σ]
KicOffset-rm: 0.481 arcsec [2.43σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

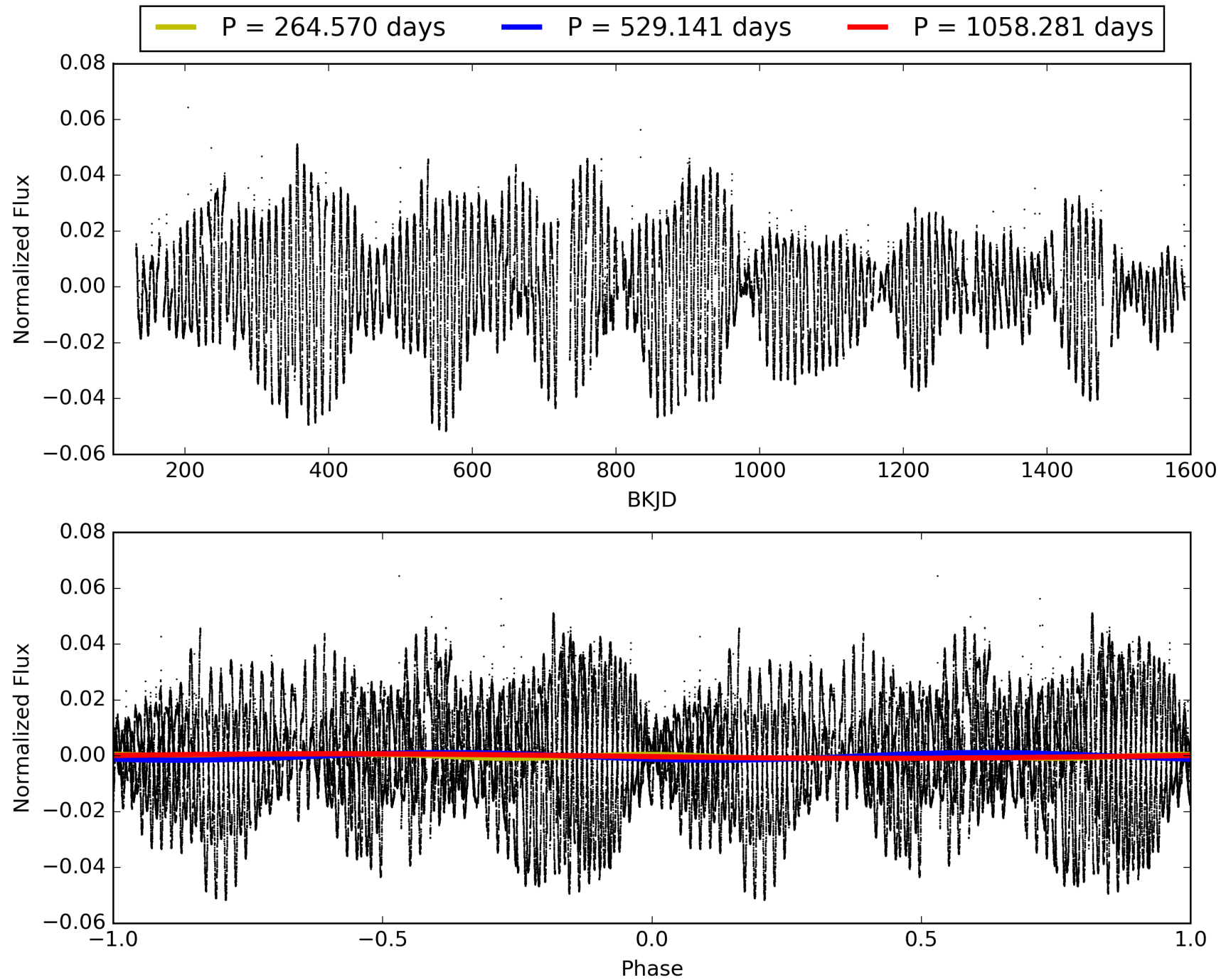
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:37:16 Z

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

TCE 009453011-07, PDC Light Curves

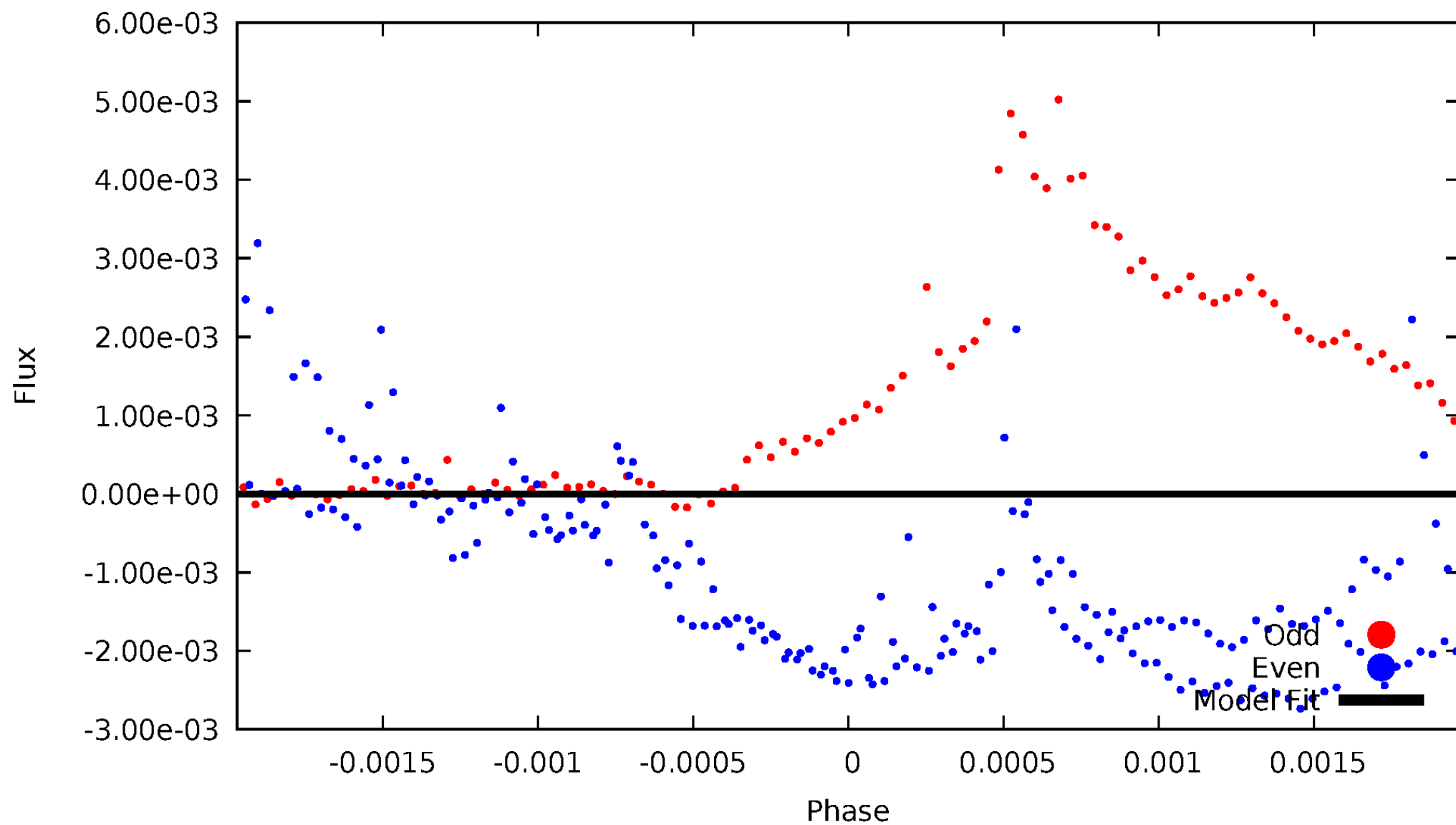


TCE 009453011-07



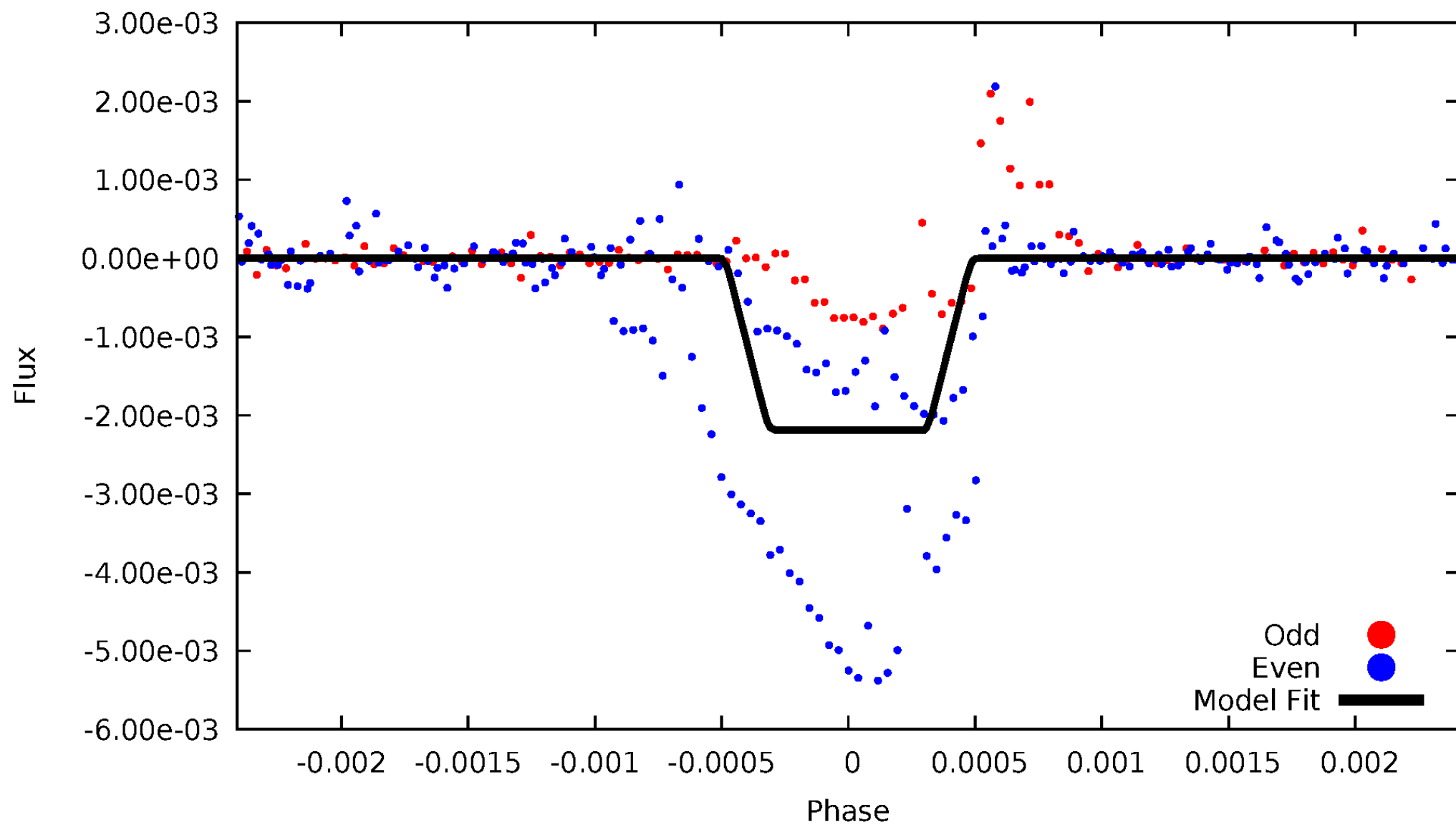
DV Odd/Even

TCE 009453011-07

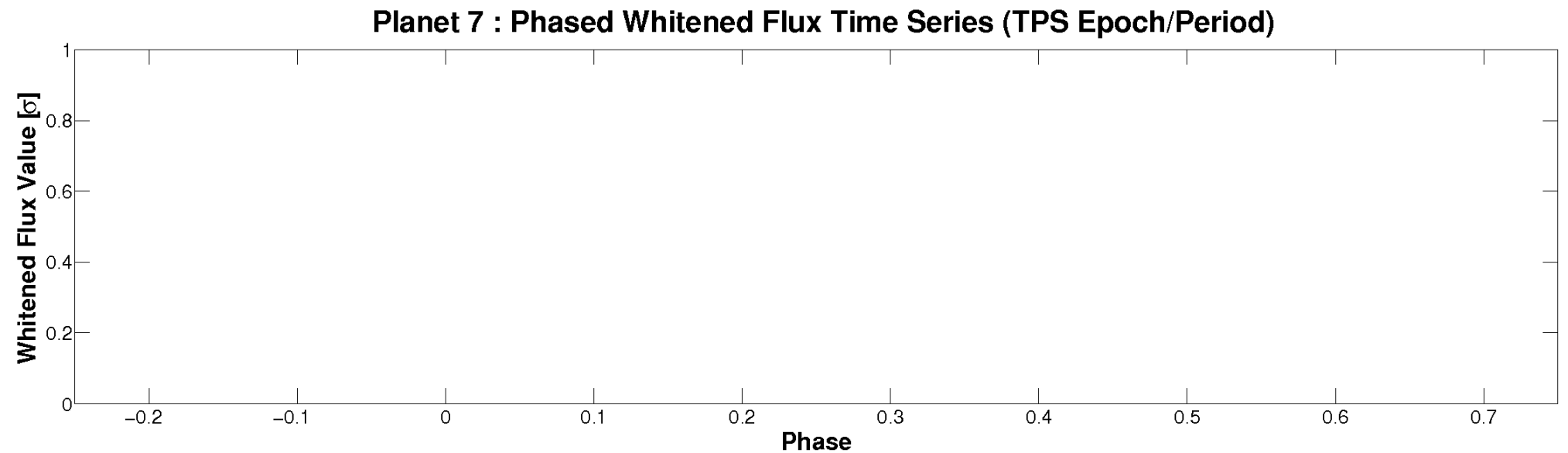
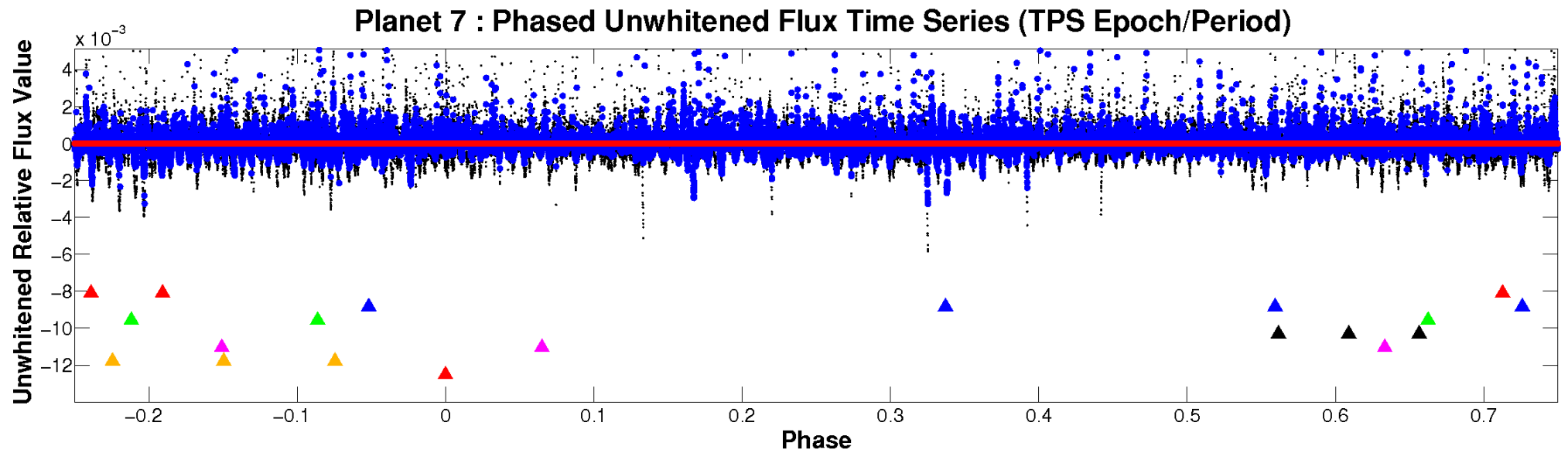


ALT Odd/Even

TCE 009453011-07

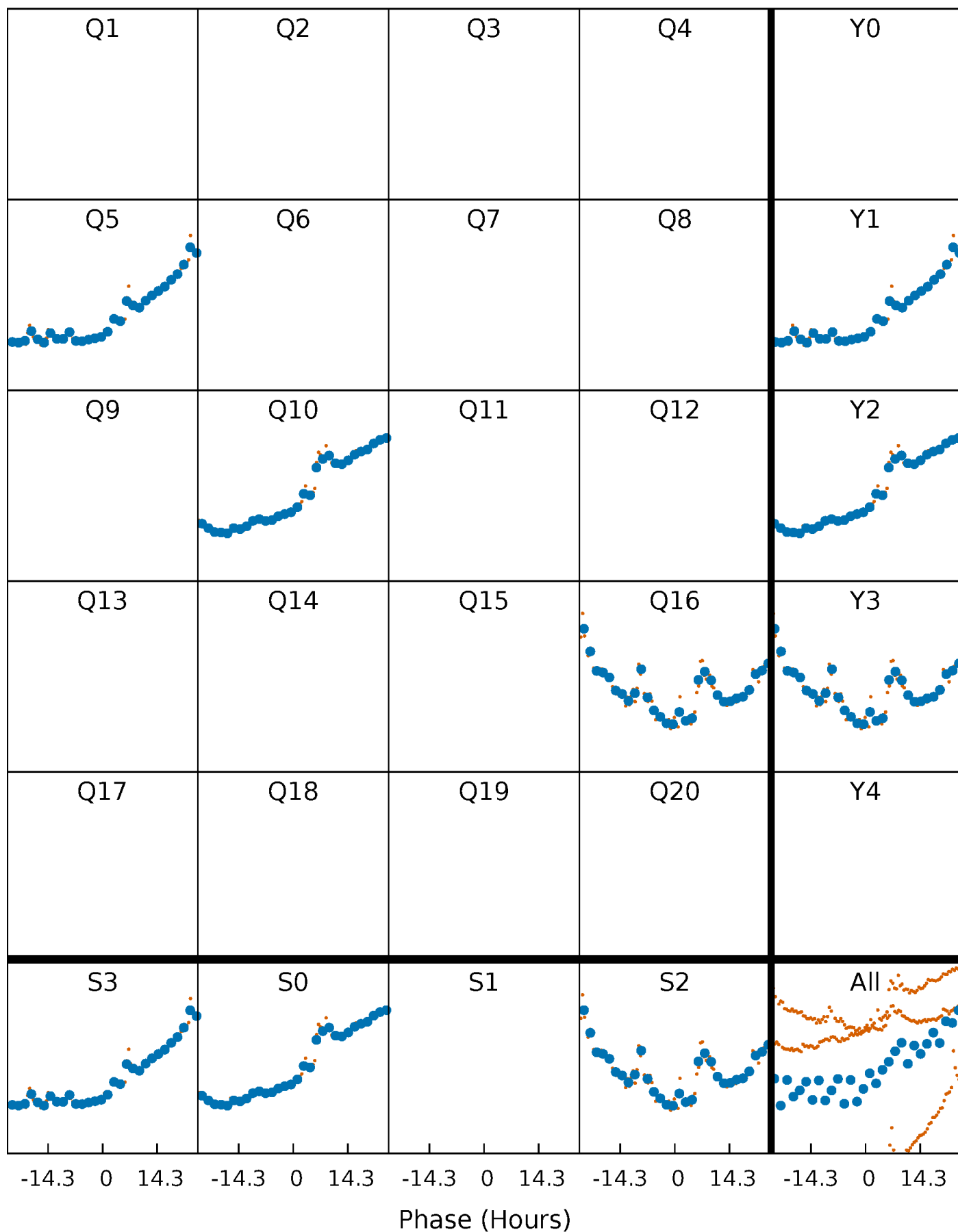


Non-Whitened Vs. Whitened Light Curve



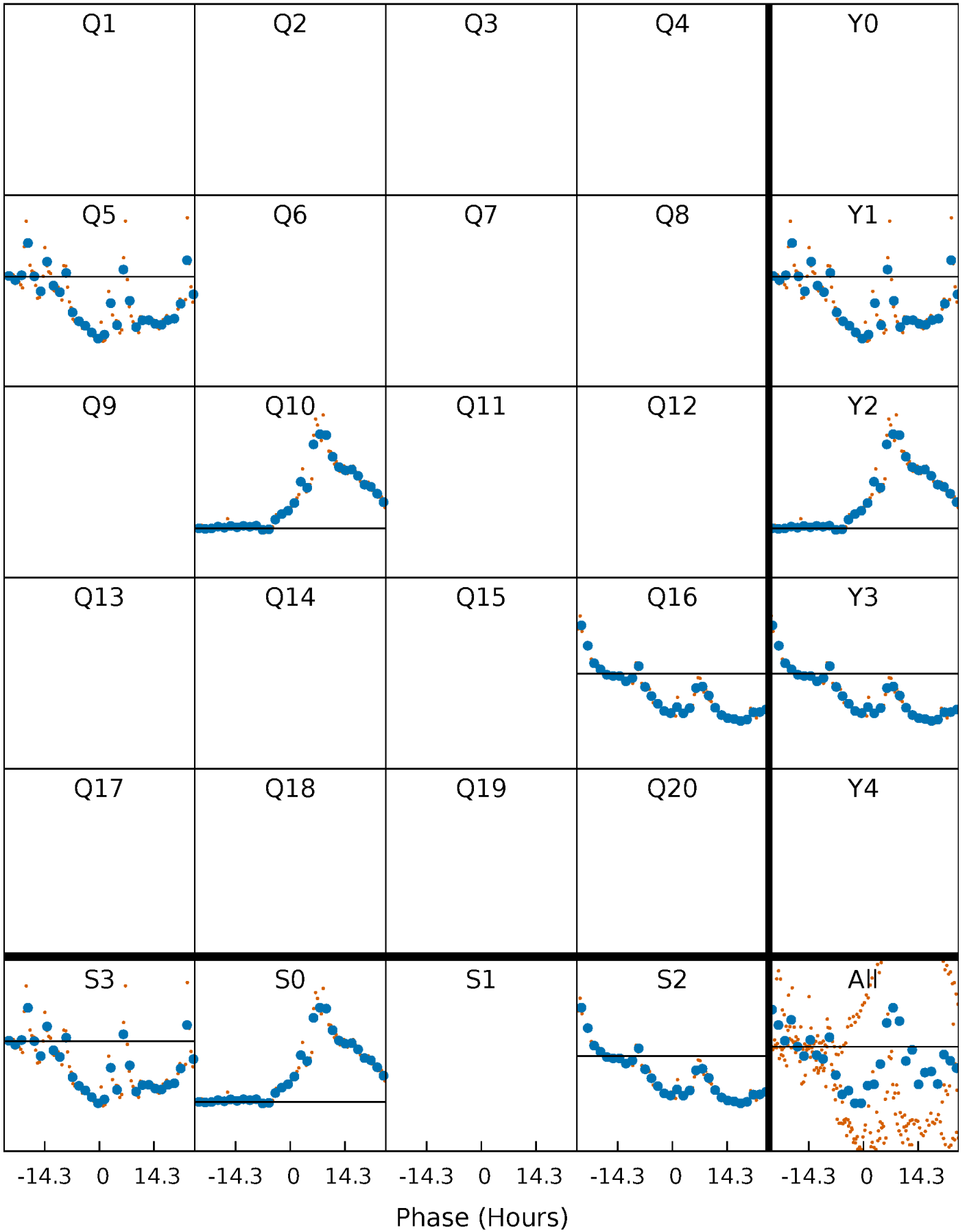
PDC Quarter-Phased Transit Curves

TCE 009453011-07 $P=529.140659$ Days $T_0=452.726557$ (BKJD)



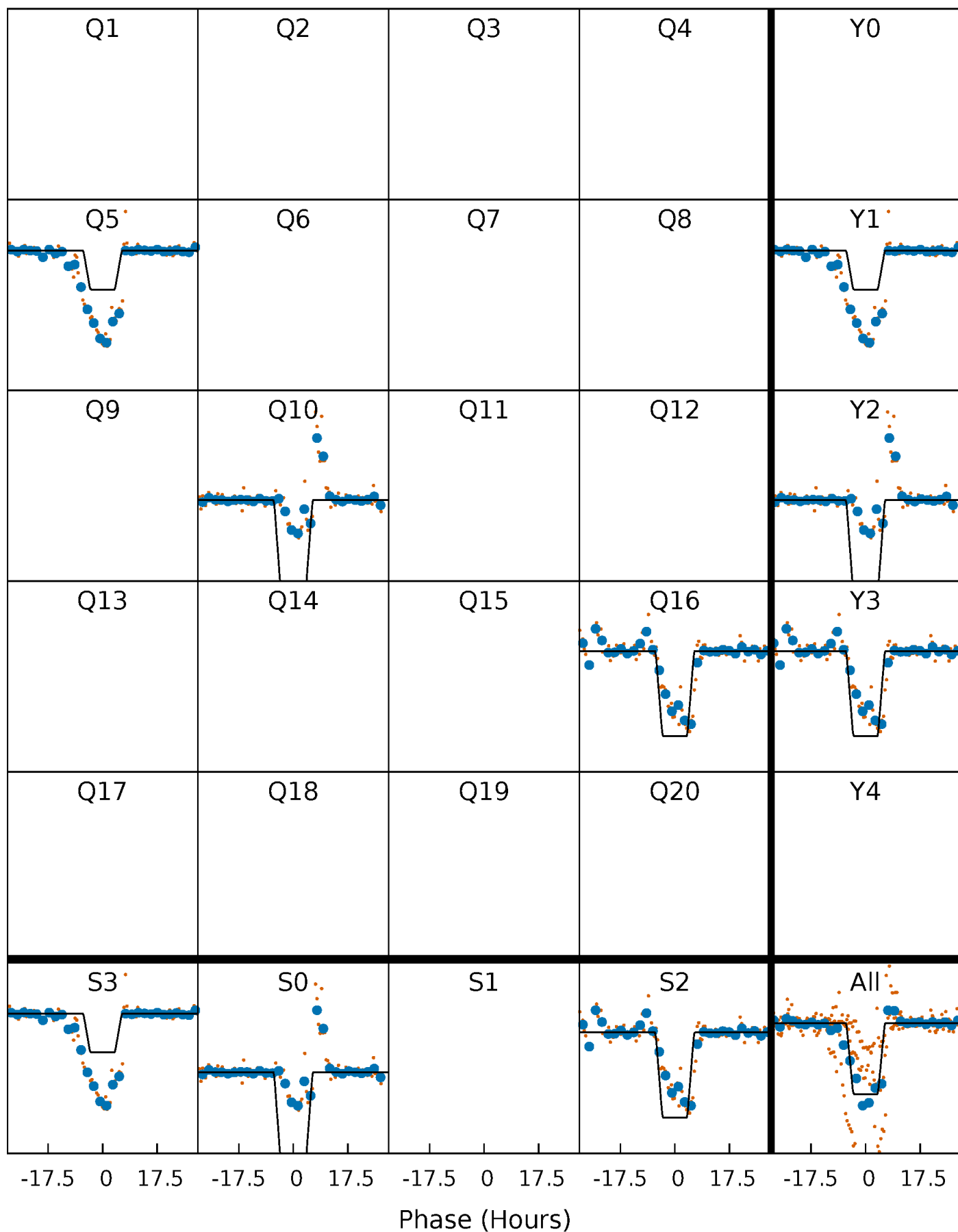
DV Quarter-Phased Transit Curves

TCE 009453011-07 $P=529.140659$ Days $T_0=452.726557$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

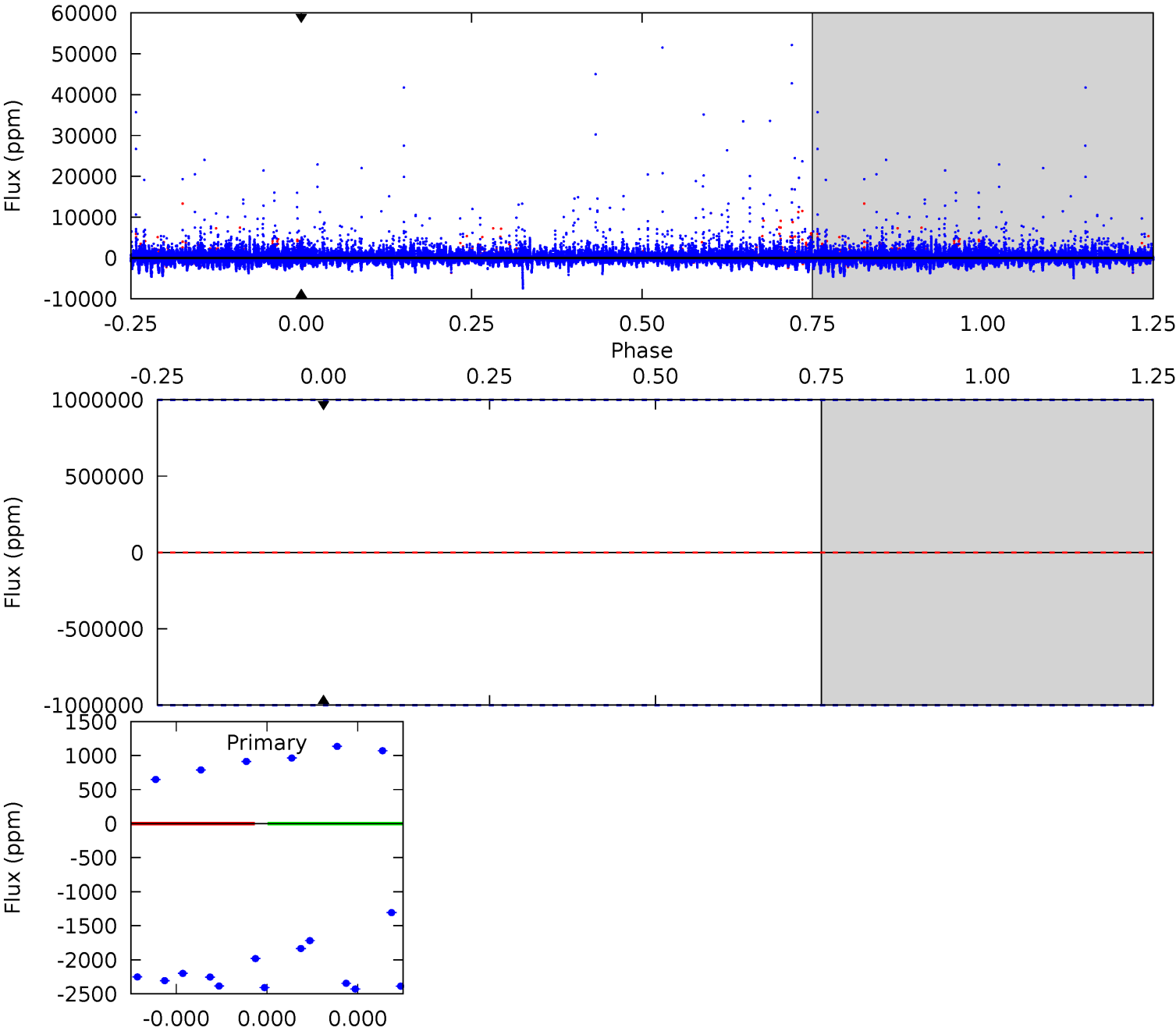
TCE 009453011-07 $P=529.140659$ Days $T_0=452.706100$ (BKJD)



DV Model-Shift Uniqueness Test

009453011-07, P = 529.140659 Days, E = 452.726557 Days

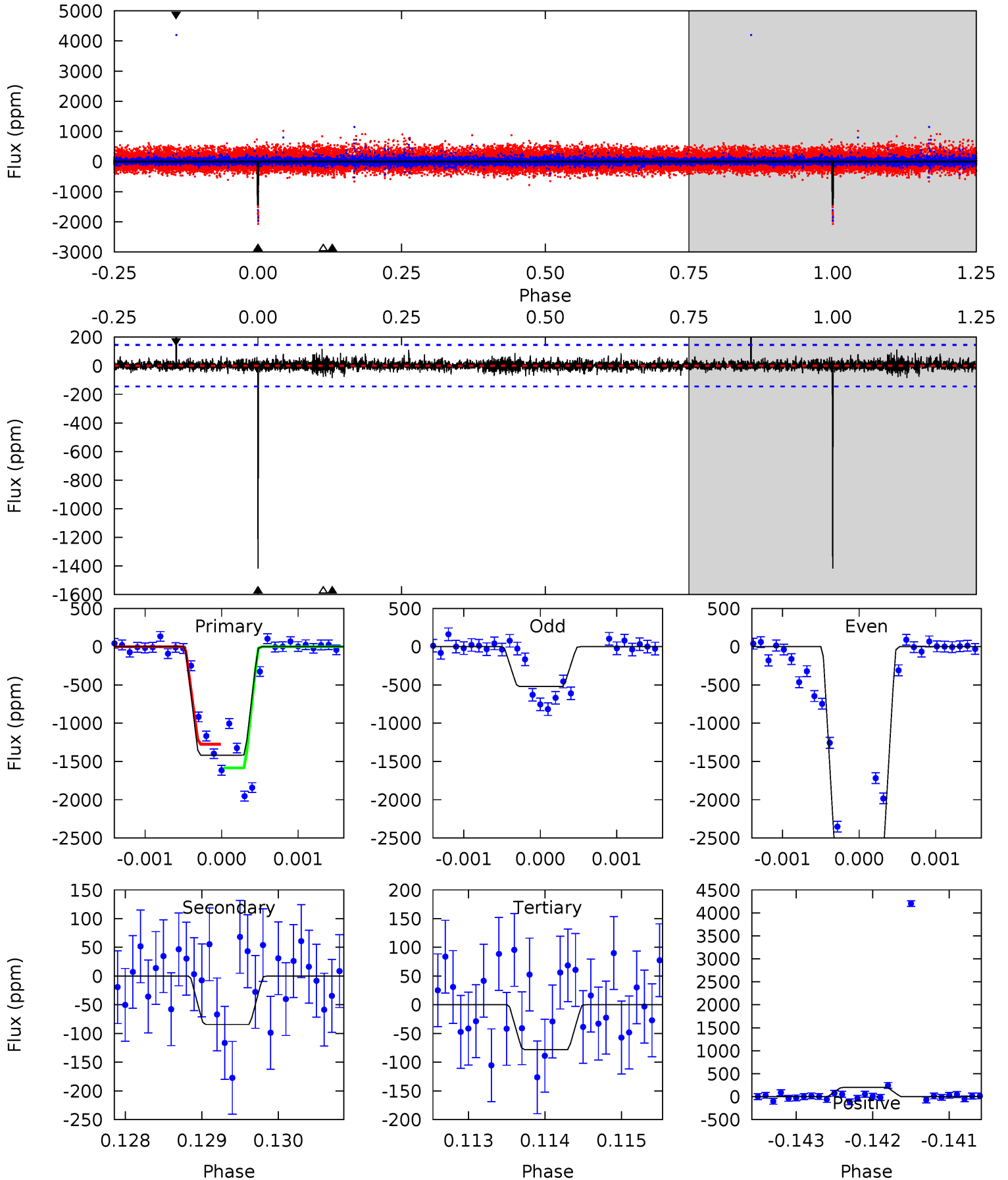
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009453011-07, P = 529.140659 Days, E = 452.706100 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.2	3.17	2.93	7.49	5.45	3.28	0.67	50.3	45.7	0.24	-4.32	61.0	1.46	0.12	5.76



Stellar Parameters For KIC 009453011

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3760^{+117}_{-143}	$4.791^{+0.126}_{-0.054}$	$-0.320^{+0.300}_{-0.350}$	$0.451^{+0.068}_{-0.102}$	$0.459^{+0.069}_{-0.103}$	$7.044^{+4.959}_{-1.529}$
	+3%/-4%	+3%/-1%	+94%/-109%	+15%/-23%	+15%/-22%	+70%/-22%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009453011-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$3.17^{+4.22}_{-2.26}$	154^{+7}_{-8}	3314^{+6284}_{-12197}	$103050^{+13519109}_{-8740643}$
Alt.	-84 ± 27	$4.11^{+3.77}_{-2.79}$	154^{+8}_{-8}	2064^{+653}_{-255}	2495^{+22710}_{-1818}

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

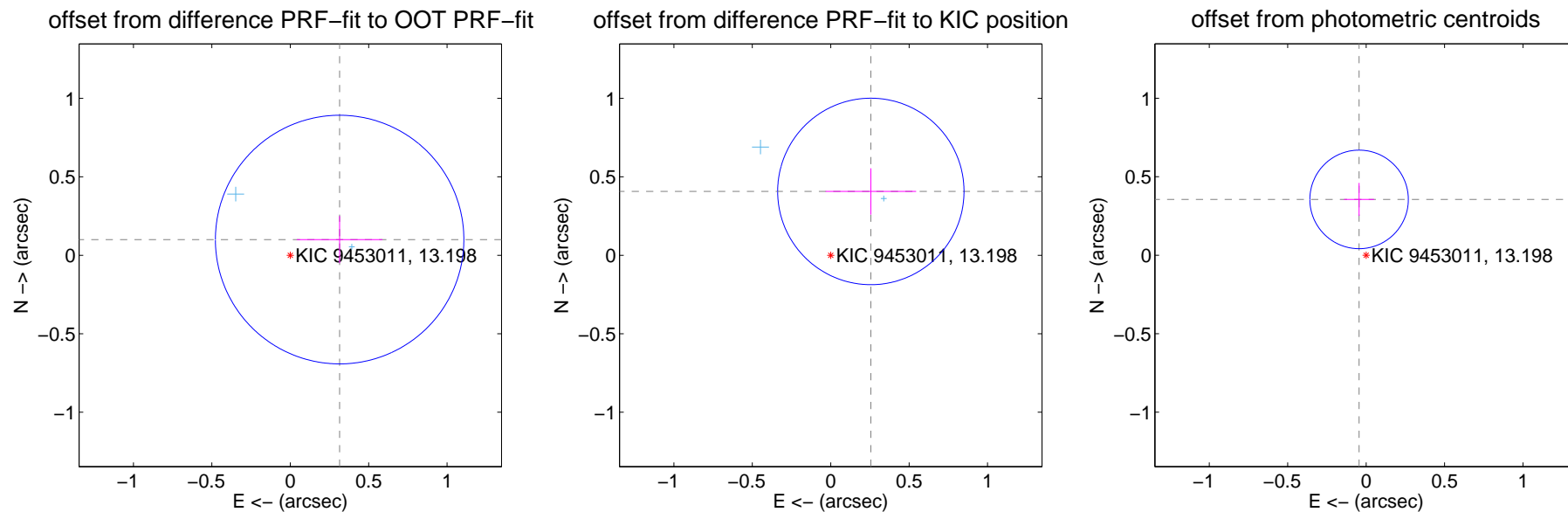
DV Centroid Data

Supplemental centroid analysis for 009453011-07. Kepler magnitude: 13.20. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.330 ± 0.264	1.25	-0.315 ± 0.273	0.100 ± 0.150
PRF-fit source offset from KIC position	0.481 ± 0.198	2.43	-0.256 ± 0.289	0.407 ± 0.148
photometric centroid source offset	0.36 ± 0.10	3.42	0.04 ± 0.10	0.36 ± 0.10

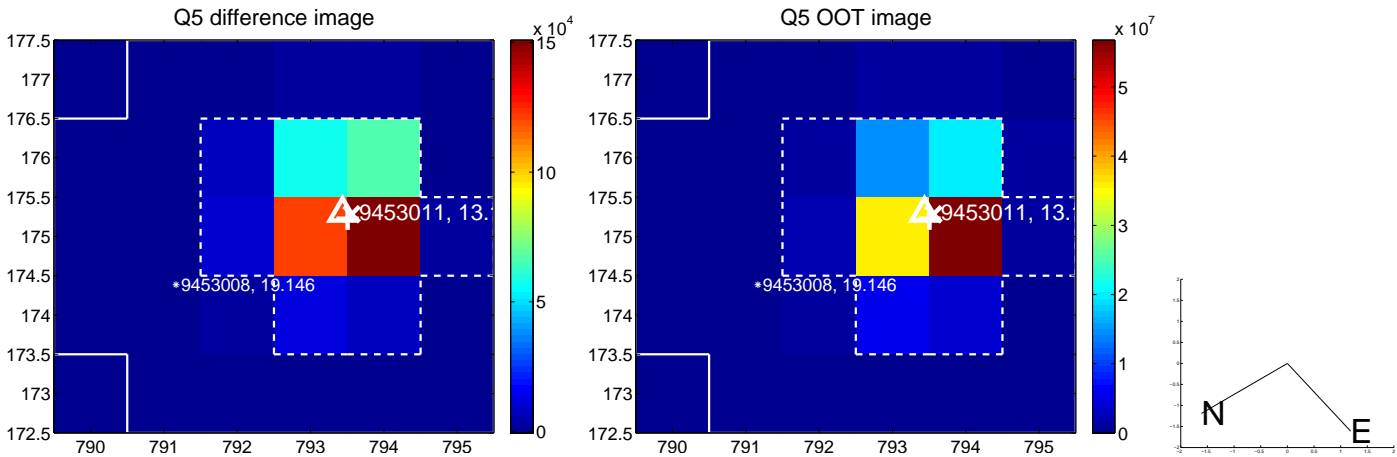


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

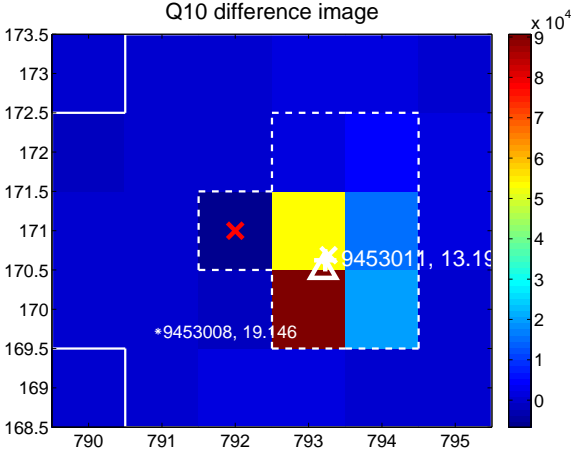
Q9 no difference image



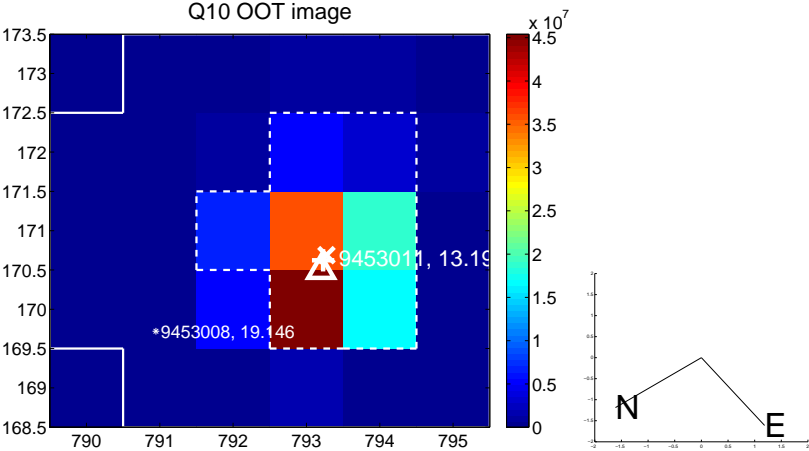
Q9 no OOT image



Q10 difference image



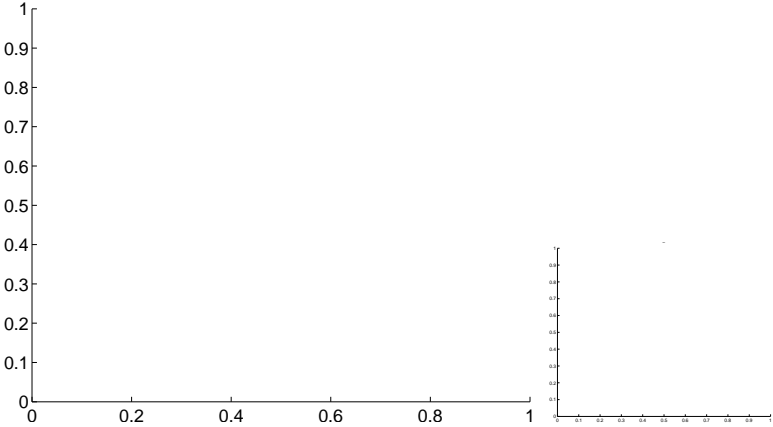
Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



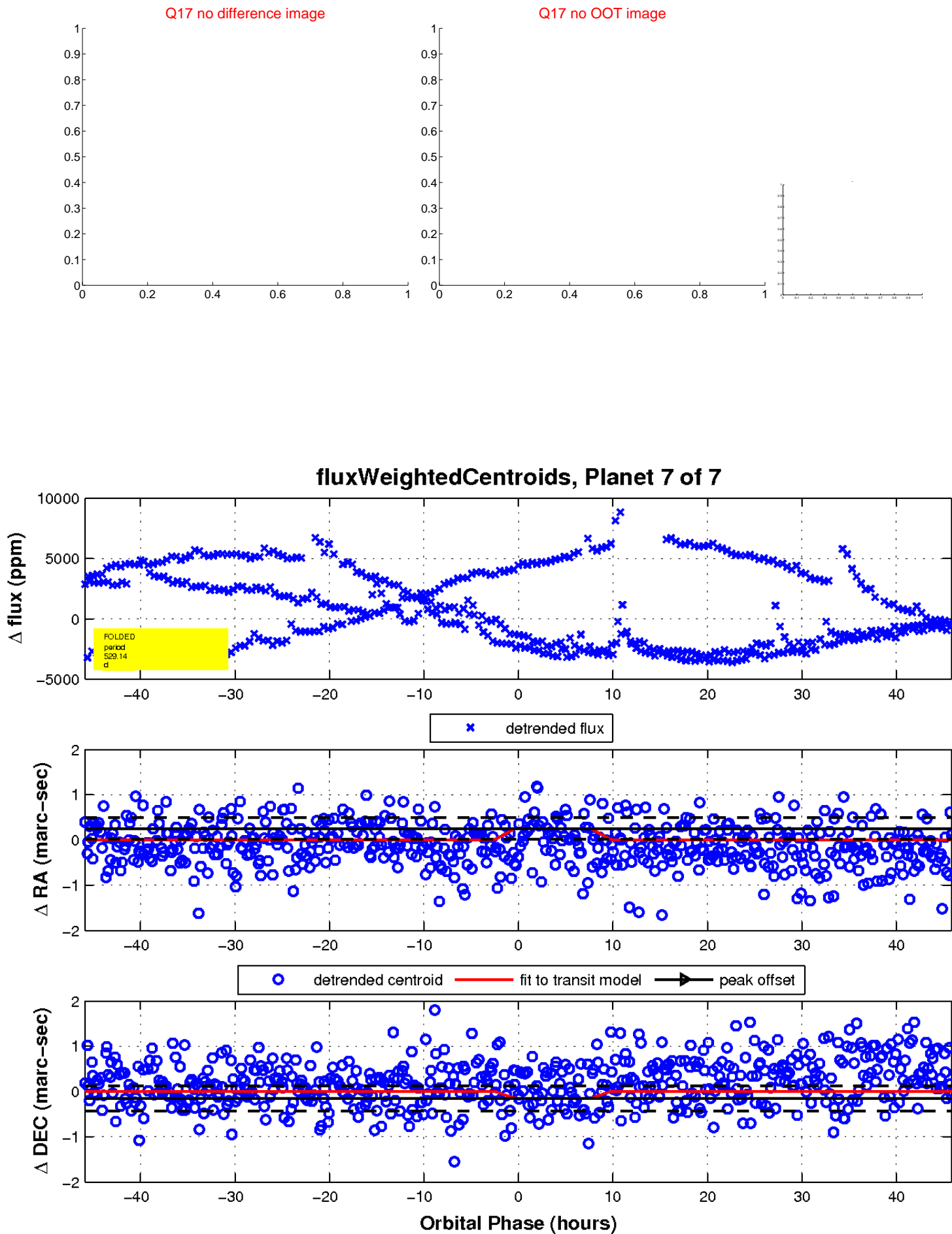
Q12 no OOT image



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

