

KIC 009466312

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})
009466312-01	OBS	No	492.813975	515.409669	835.3	5.354	15.7	5.7	0.72	5229	2.12	0.30
009466312-02	OBS	No	481.397767	304.858313	1809.4	17.078	14.1	7.3	0.72	5229	3.02	0.31
009466312-03	OBS	No	275.863765	244.910372	663.4	0.740	12.6	5.3	0.72	5229	1.87	0.65
009466312-04	OBS	No	532.724498	389.445988	1059.6	5.372	11.7	7.1	0.72	5229	2.31	0.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009466312-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009466312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

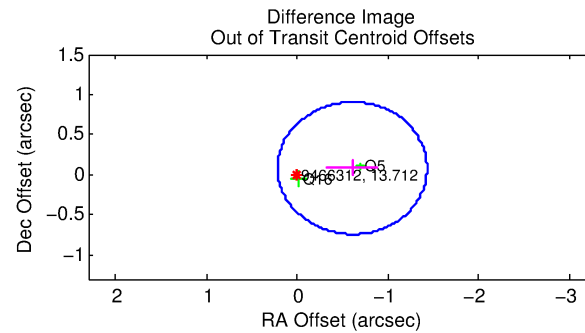
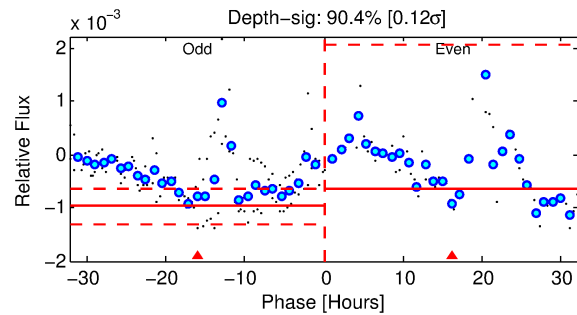
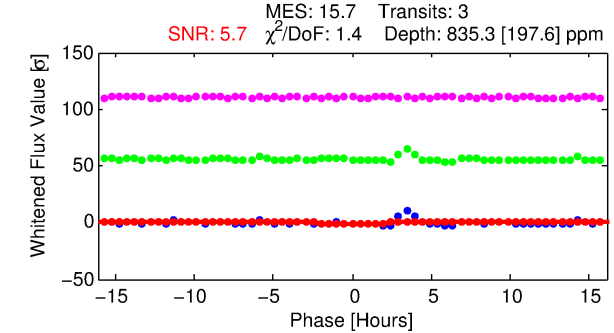
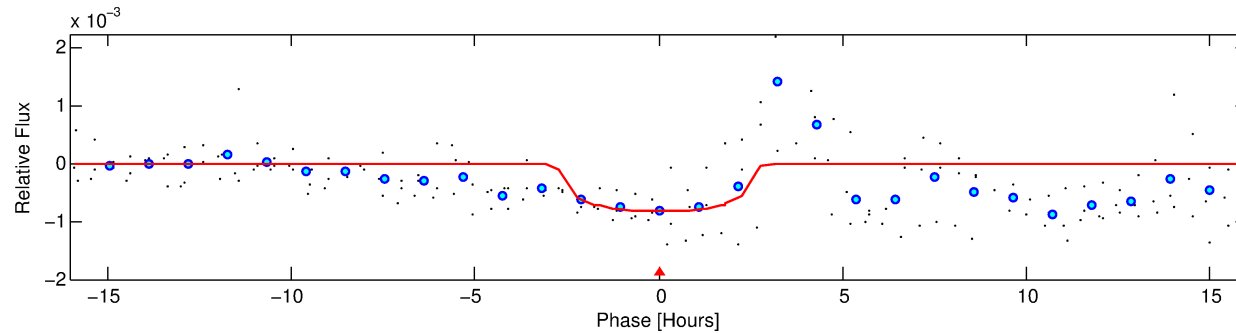
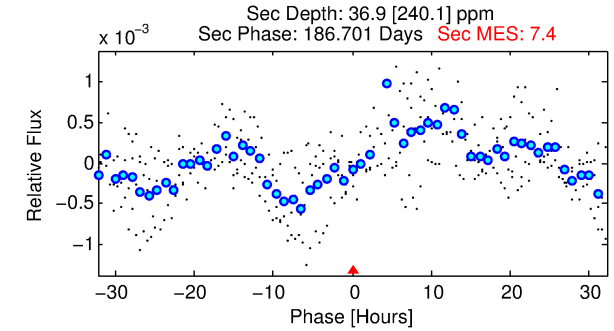
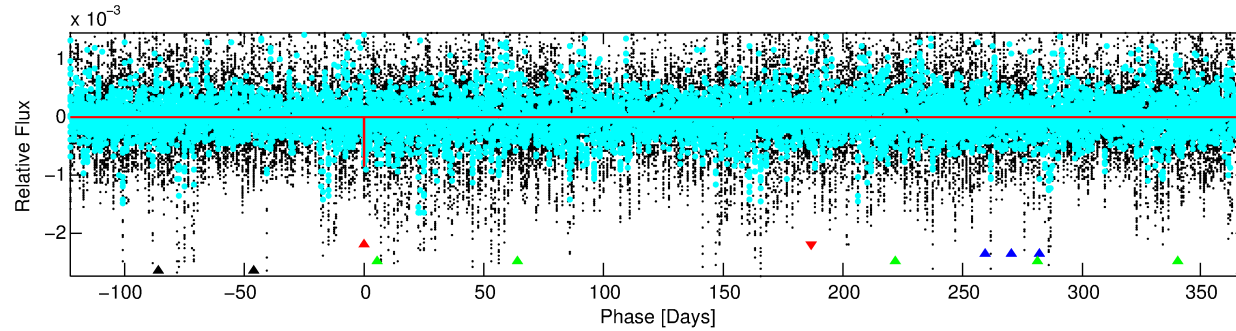
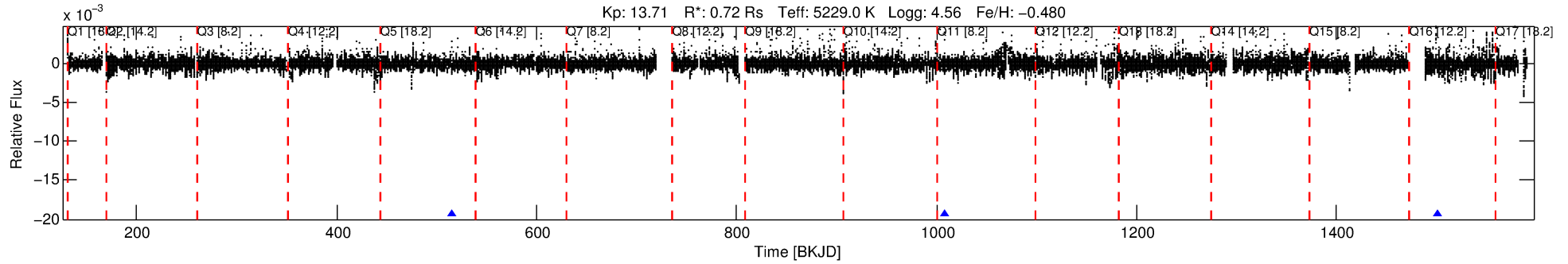
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009466312-01

No Significant Match Found

DV One-Page Summary

KIC: 9466312 Candidate: 1 of 4 Period: 492.814 d



DV Fit Results:

Period = 492.81397 [0.00735] d
Epoch = 515.4097 [0.0081] BKJD
Rp/R* = 0.0268 [0.0428]
a/R* = 638.47 [4008.86]
b = 0.48 [10.21]
Seff = 0.30 [0.05]
Teq = 188 [8] K
Rp = 2.12 [3.39] Re
a = 1.0847 [0.1005] AU
Ag = 5306.29 [38498.00] [0.14 σ]
Teffp = 2487 [4511] K [0.51 σ]

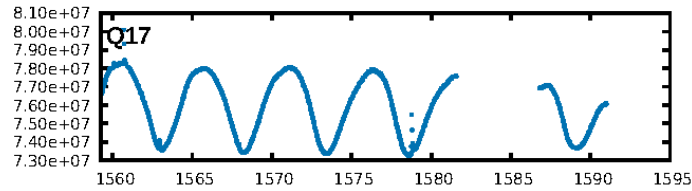
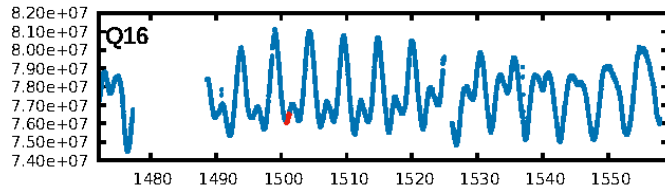
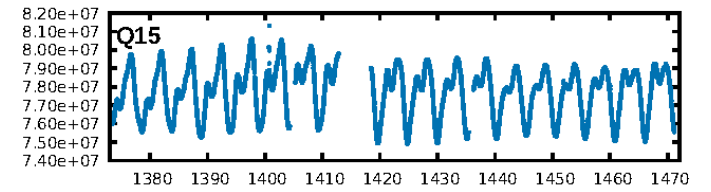
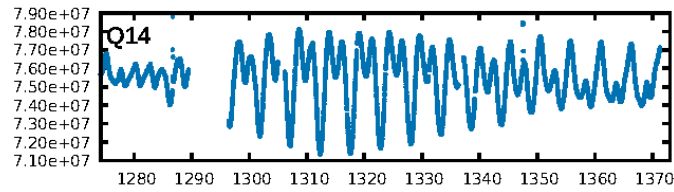
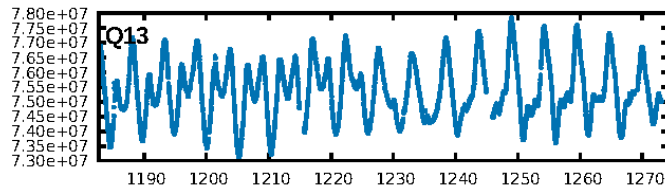
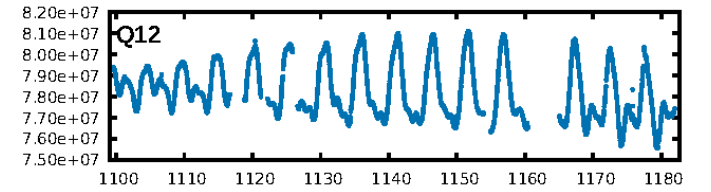
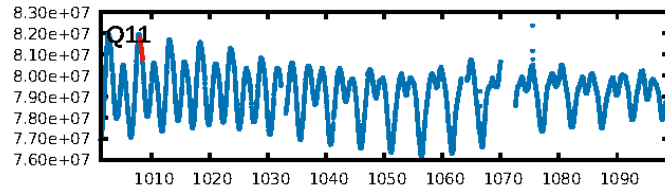
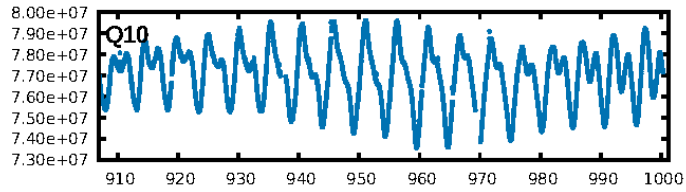
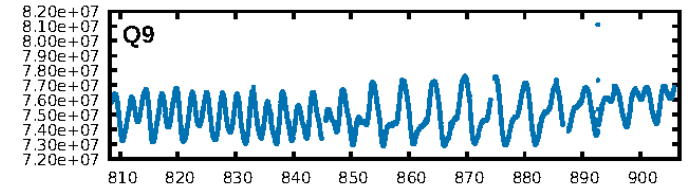
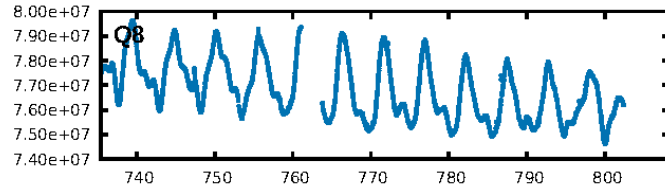
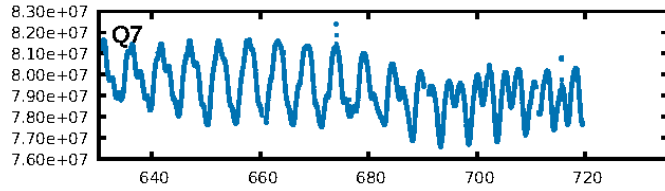
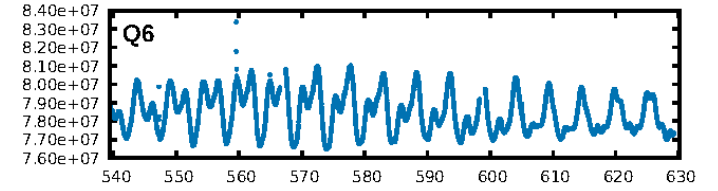
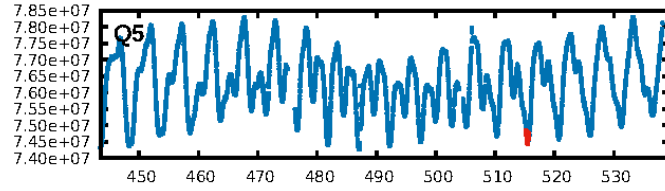
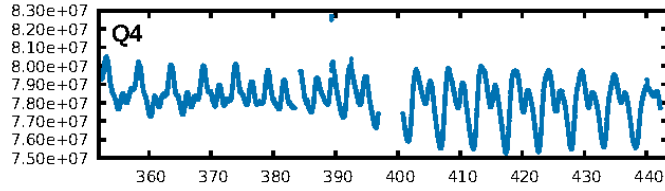
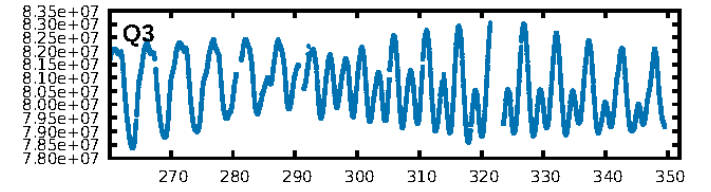
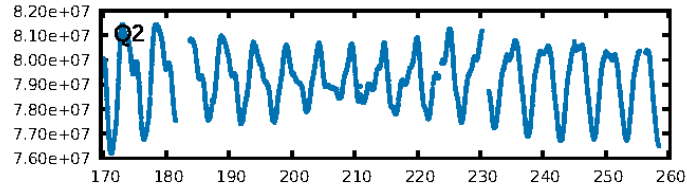
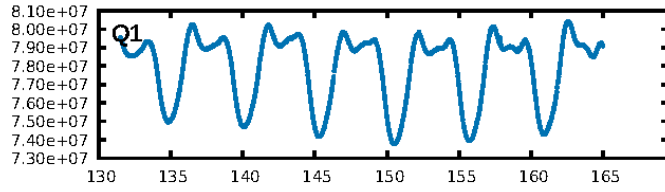
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [15.31 σ]
LongPeriod-sig: 100.0% [126.29 σ]
ModelChiSquare2-sig: 28.8%
ModelChiSquareGof-sig: 46.5%
Bootstrap-pfa: 1.38e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.913
Centroid-sig: 4.1%
Centroid-so: 1.796 arcsec [1.79 σ]
OotOffset-rm: 0.612 arcsec [2.23 σ]
OotOffset-st: 0/0/1/1 [2]
KicOffset-rm: 0.672 arcsec [2.32 σ]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

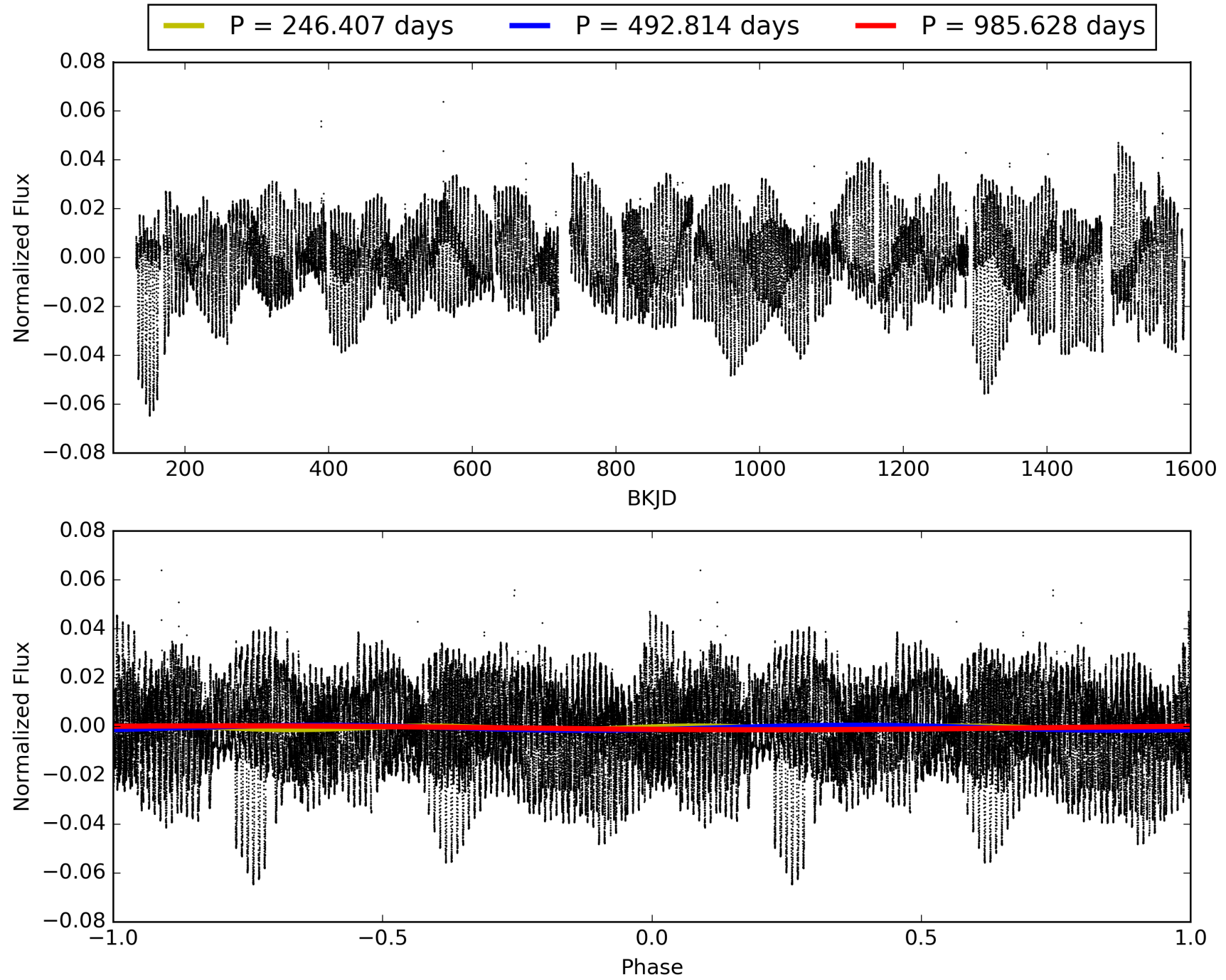
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:34:50 Z

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

TCE 009466312-01, PDC Light Curves

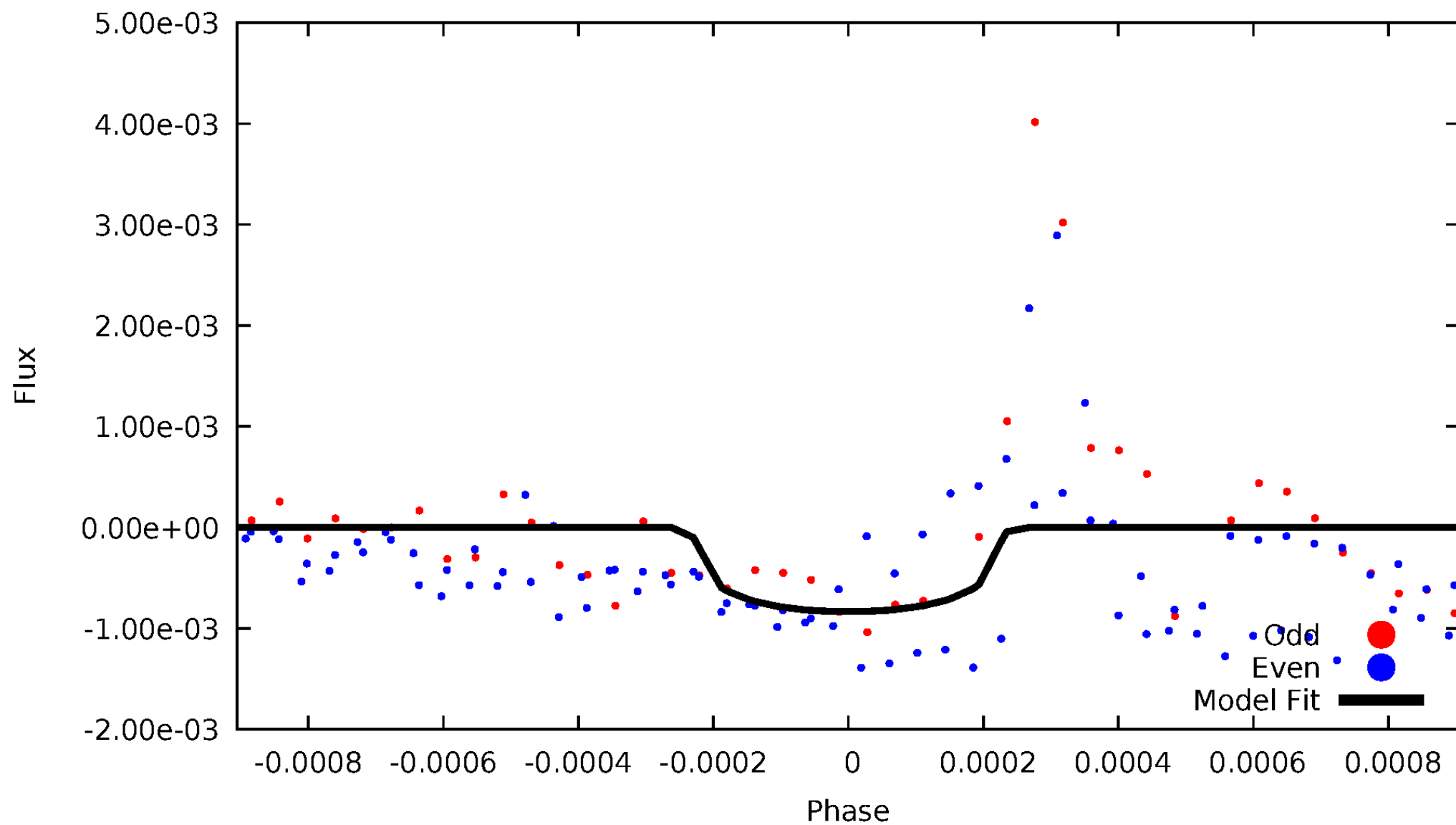


TCE 009466312-01



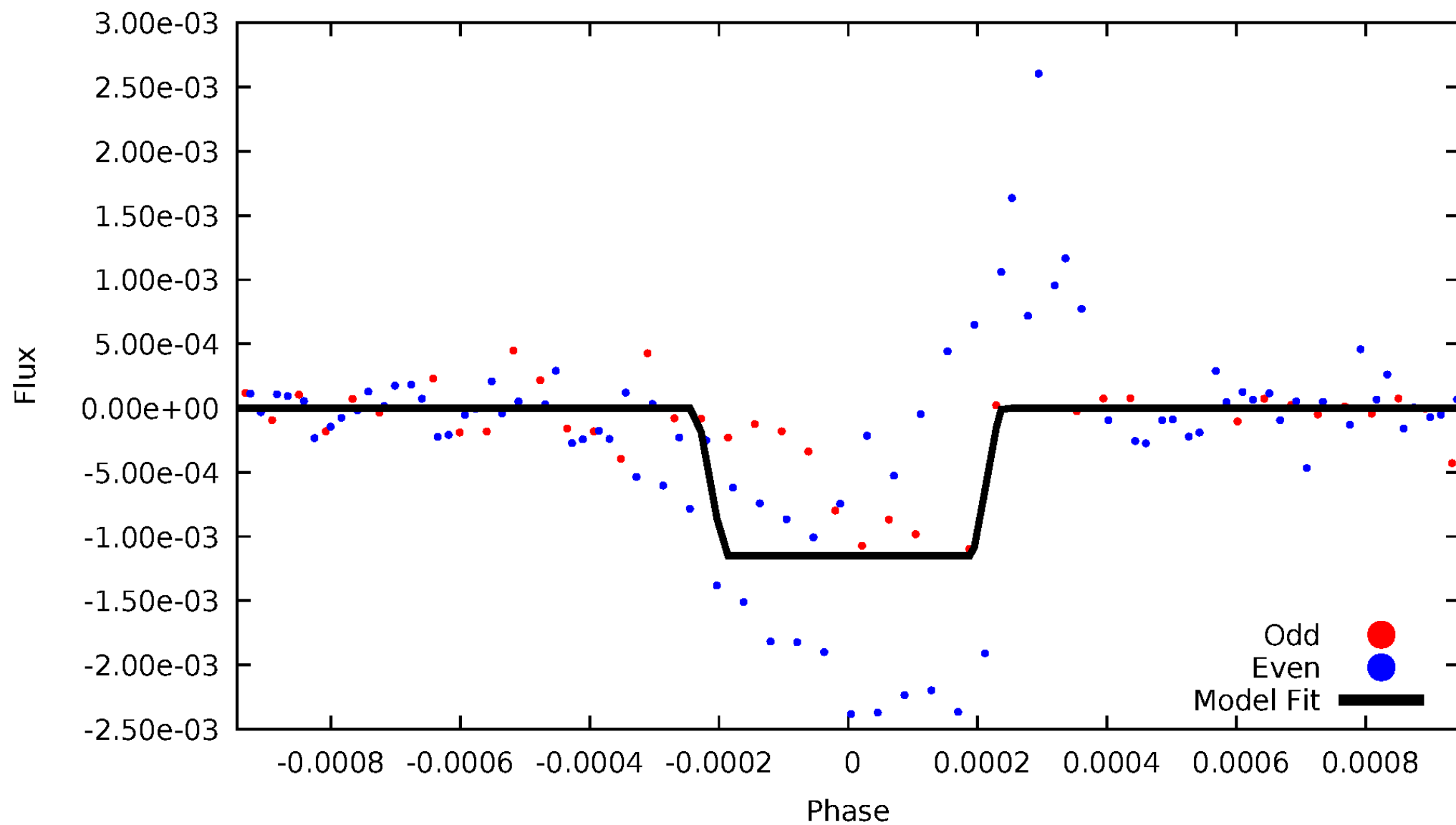
DV Odd/Even

TCE 009466312-01



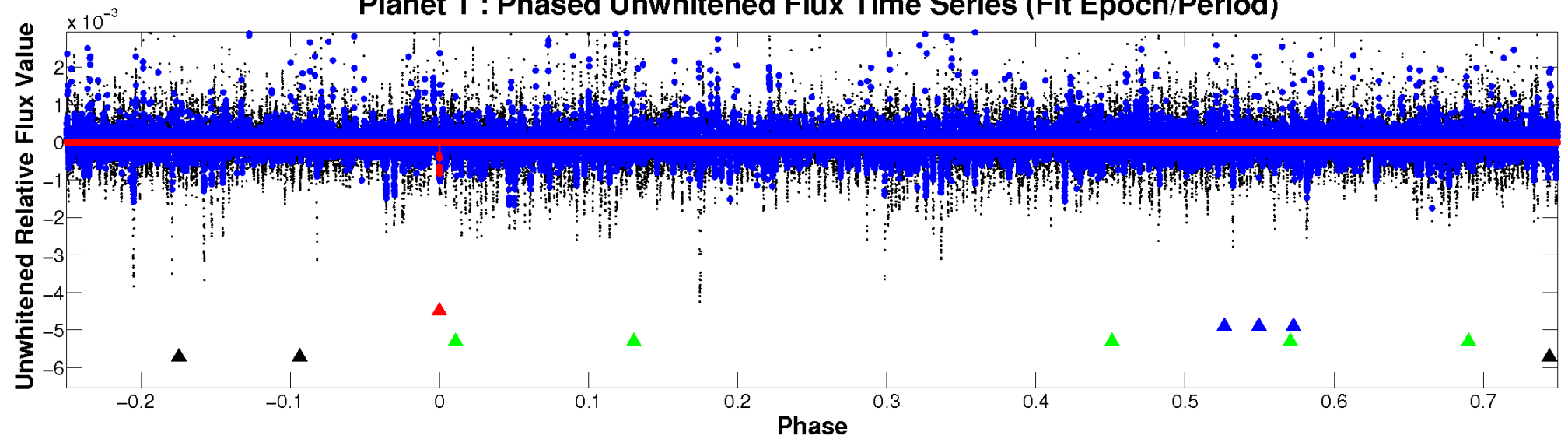
ALT Odd/Even

TCE 009466312-01

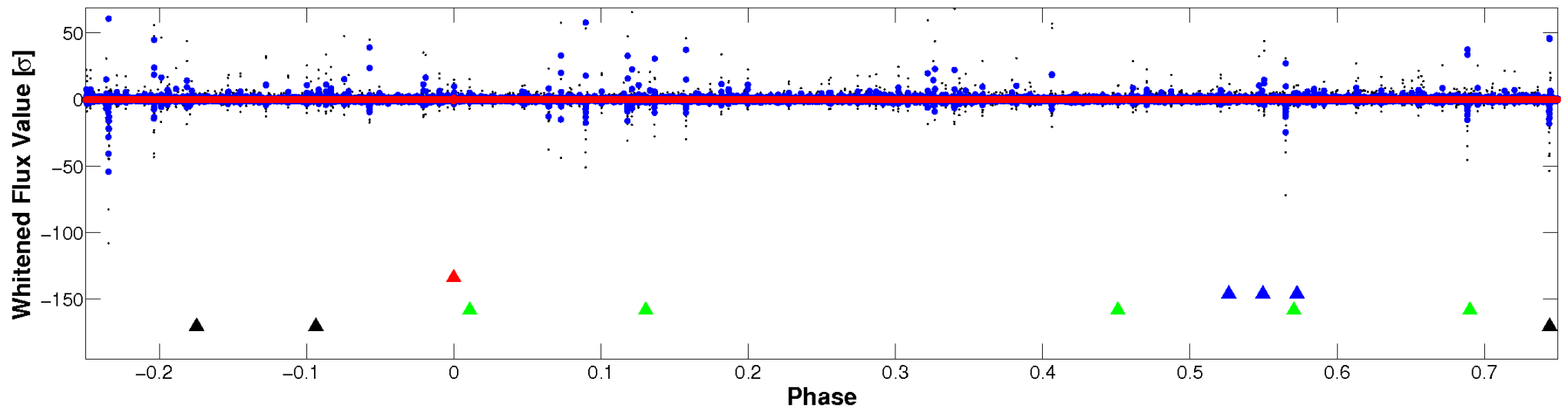


Non-Whitened Vs. Whitened Light Curve

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

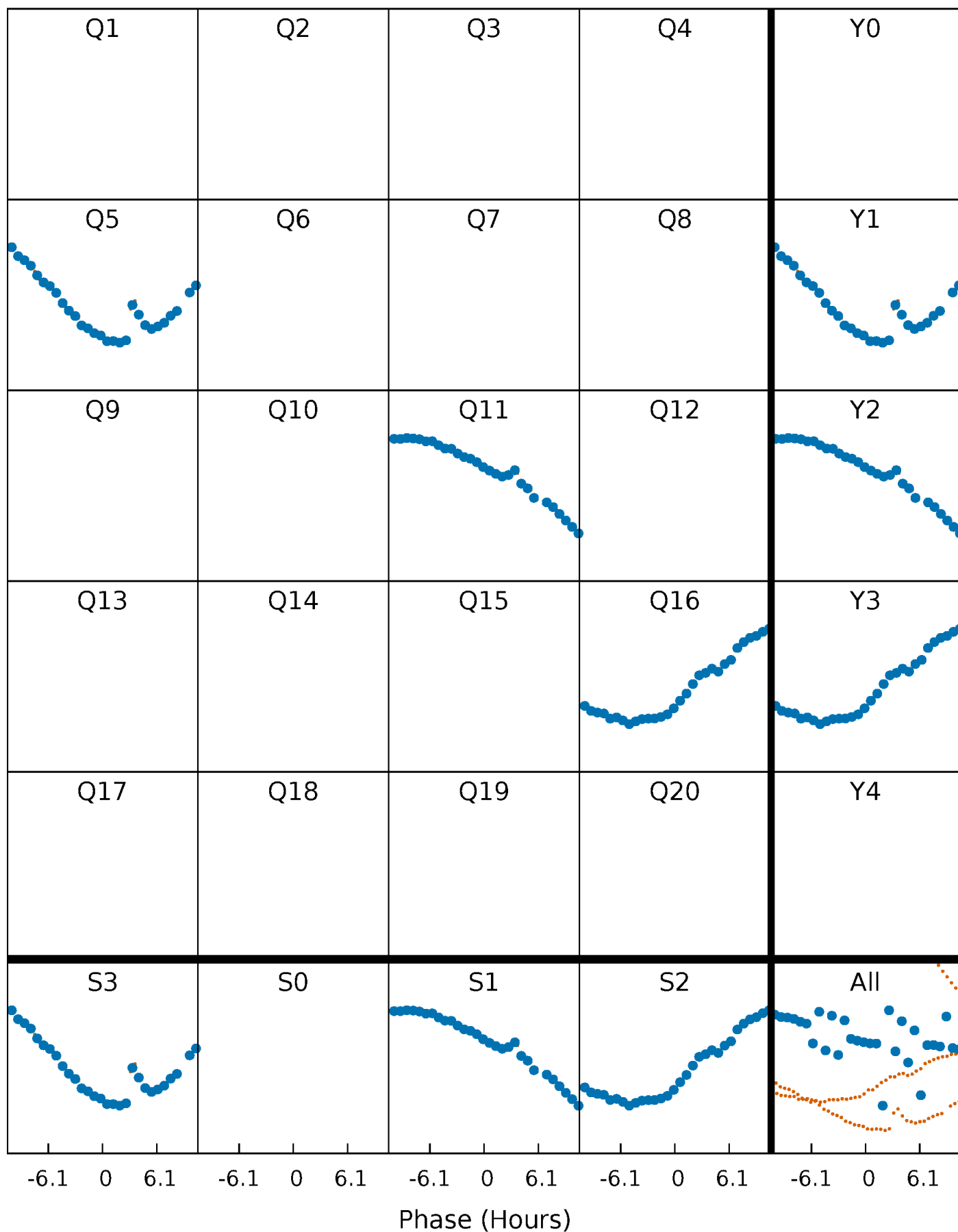


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



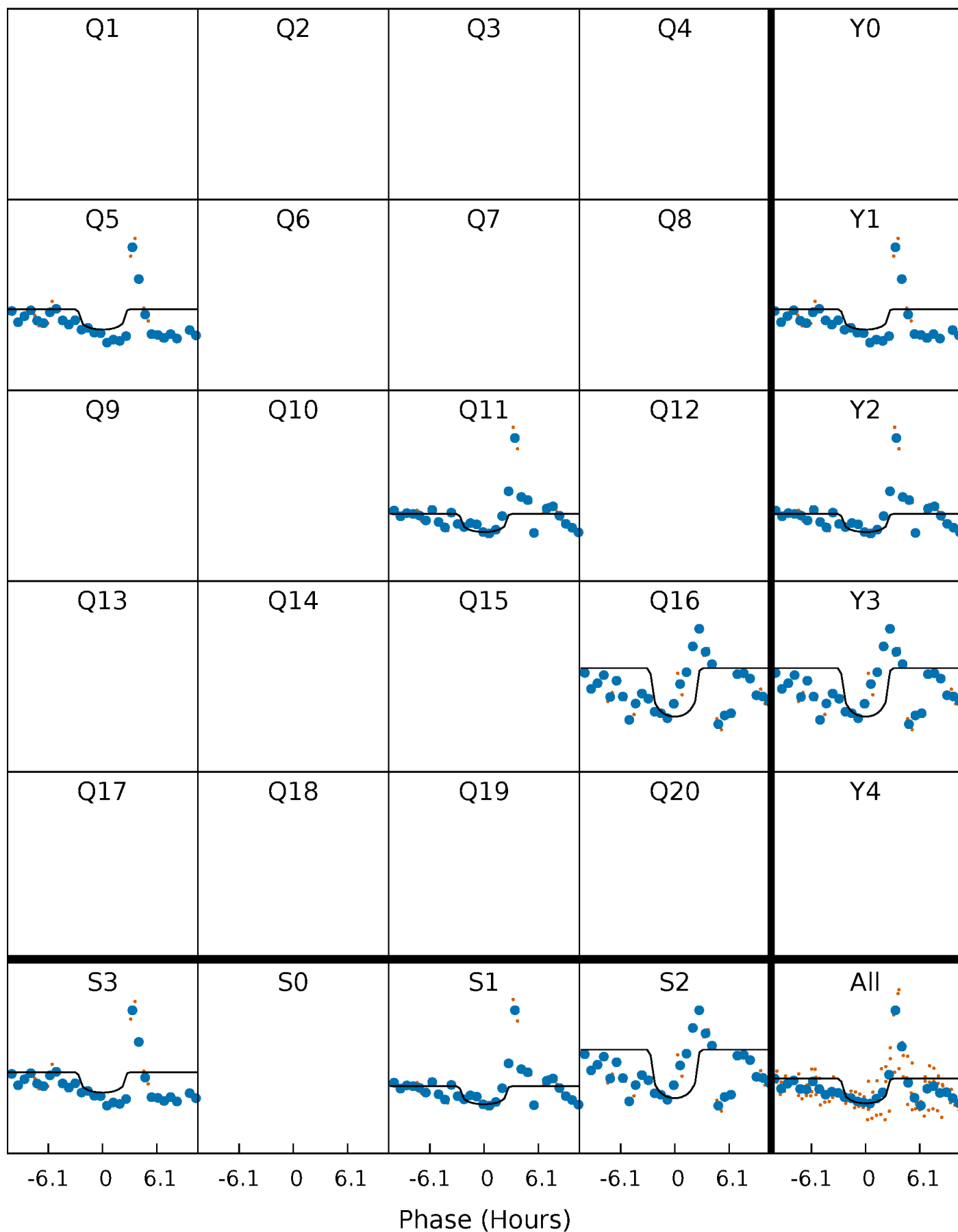
PDC Quarter-Phased Transit Curves

TCE 009466312-01 P=492.813975 Days $T_0=515.409669$ (BKJD)



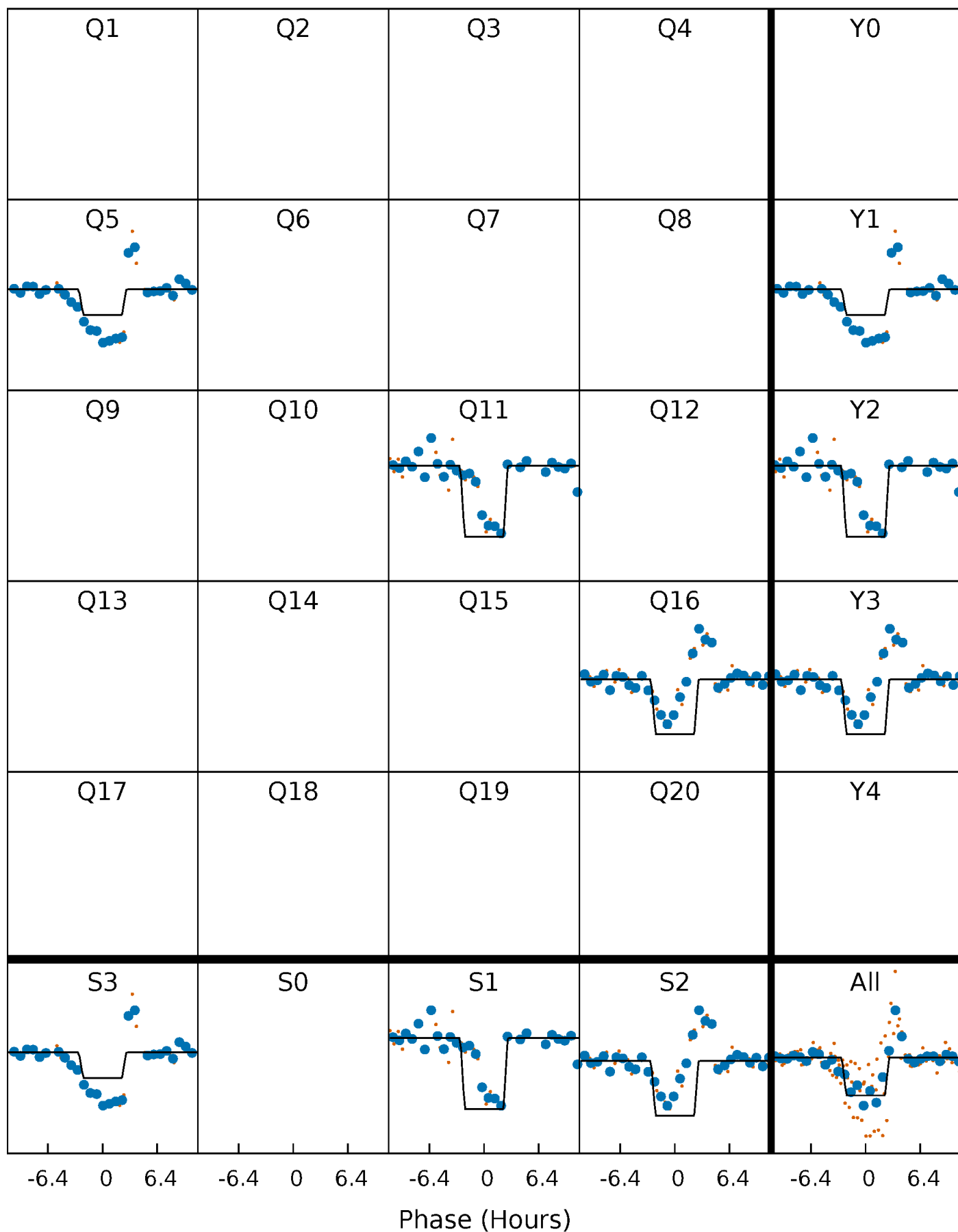
DV Quarter-Phased Transit Curves

TCE 009466312-01 $P=492.813975$ Days $T_0=515.409669$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

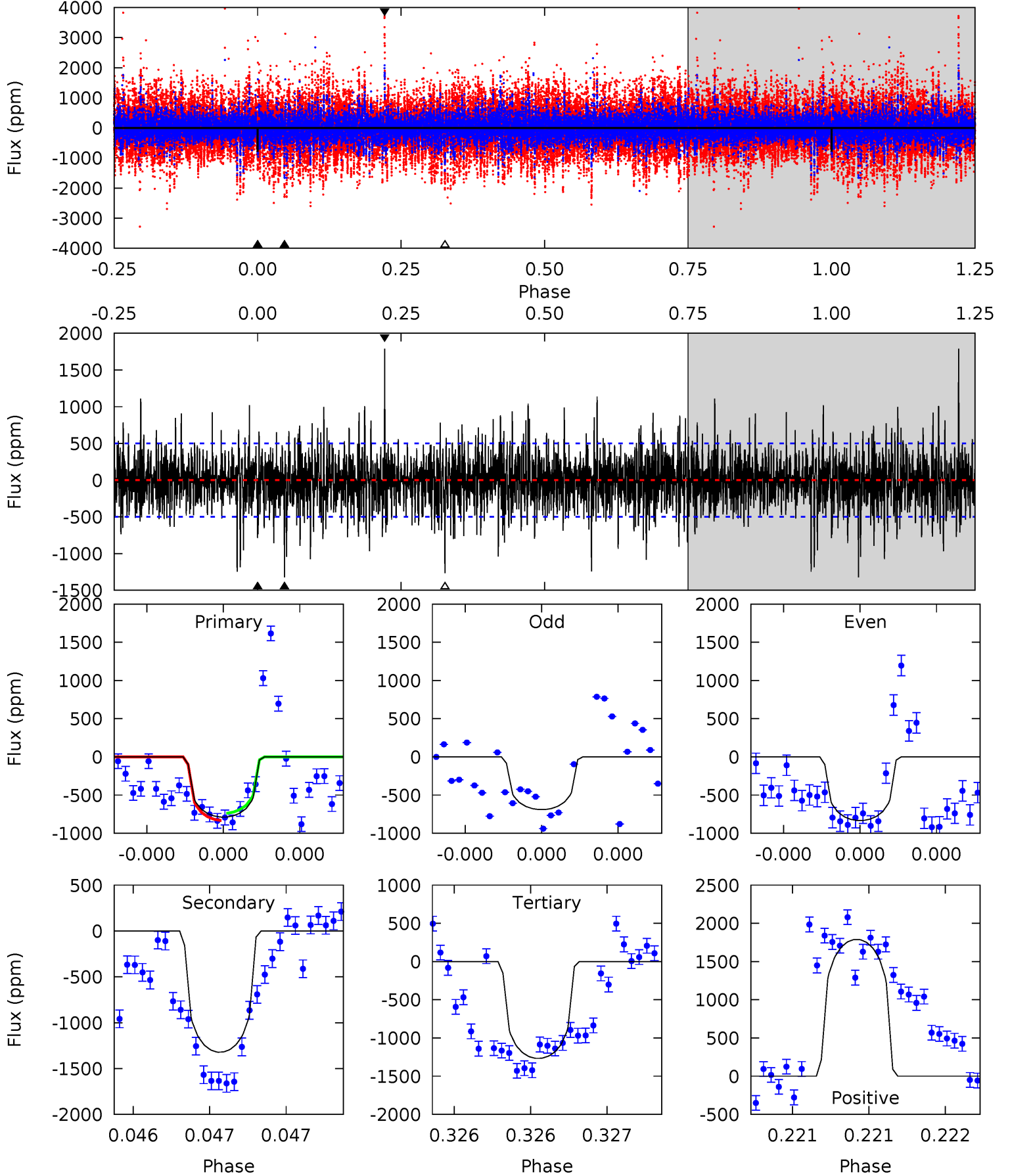
TCE 009466312-01 P=492.809789 Days $T_0=515.417141$ (BKJD)



DV Model-Shift Uniqueness Test

009466312-01, P = 492.813975 Days, E = 22.595694 Days

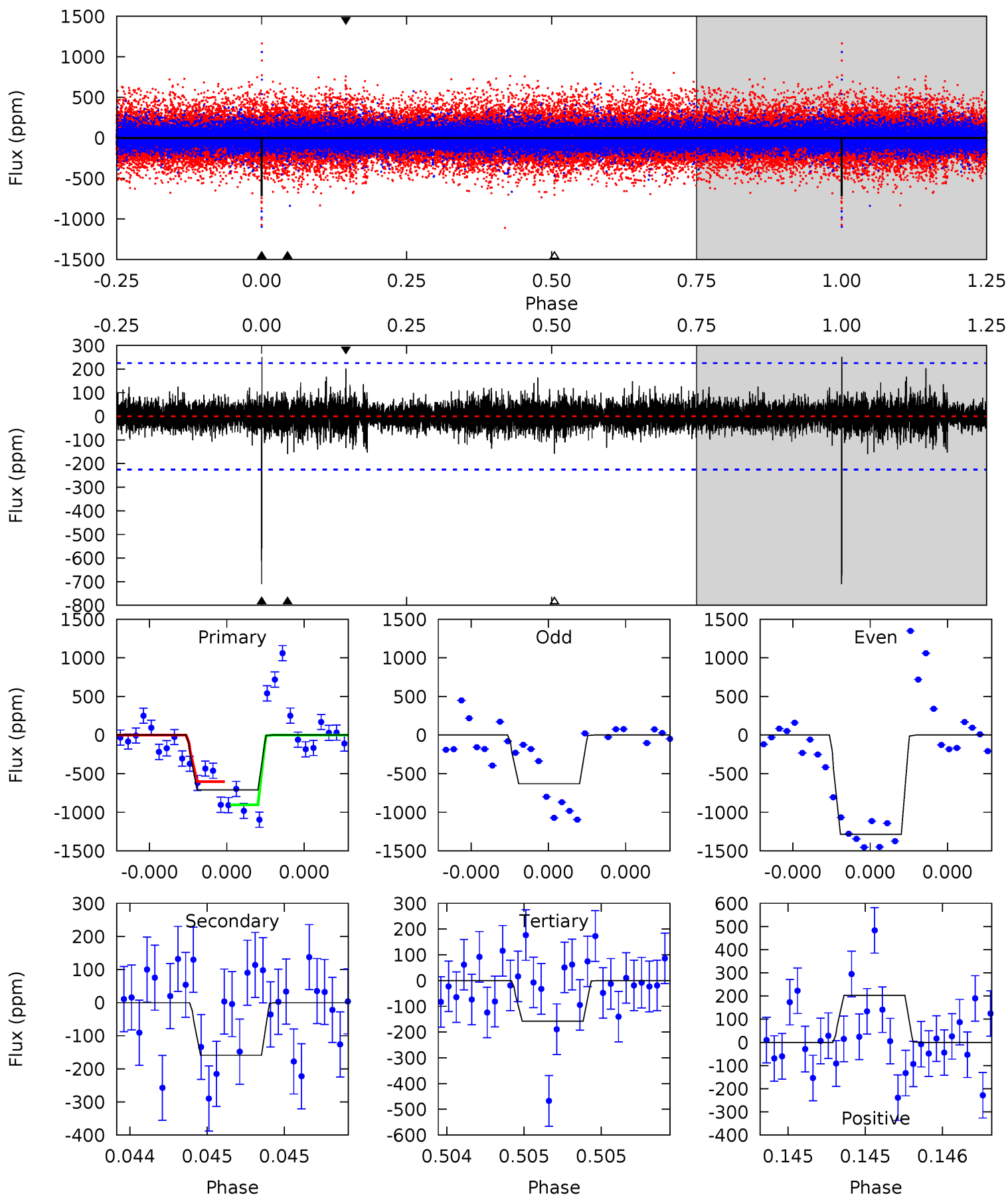
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.79	14.7	14.1	20.0	5.57	3.48	3.15	-5.34	-11.2	0.61	-5.21	0.59	1.15	0.58	0.53



Alt Model-Shift Uniqueness Test

009466312-01, $P = 492.809789$ Days, $E = 22.607352$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	3.93	3.90	5.02	5.59	3.50	0.77	13.7	12.6	0.03	-1.09	10.1	1.64	0.26	3.60



Stellar Parameters For KIC 009466312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5229^{+156}_{-140}	$4.564^{+0.070}_{-0.056}$	$-0.480^{+0.300}_{-0.300}$	$0.724^{+0.082}_{-0.074}$	$0.700^{+0.093}_{-0.043}$	$2.597^{+0.833}_{-0.528}$
	+3%/-3%	+2%/-1%	+62%/-62%	+11%/-10%	+13%/-6%	+32%/-20%
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 009466312-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1321 ± 90	$3.24^{+2.91}_{-2.16}$	262^{+10}_{-9}	4960^{+4028}_{-1085}	$80150^{+654263}_{-57111}$
Alt.	-159 ± 40	$3.56^{+2.90}_{-2.37}$	263^{+10}_{-9}	3295^{+1515}_{-550}	8220^{+66029}_{-5958}

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 $A_{obs} \gg 1.0$

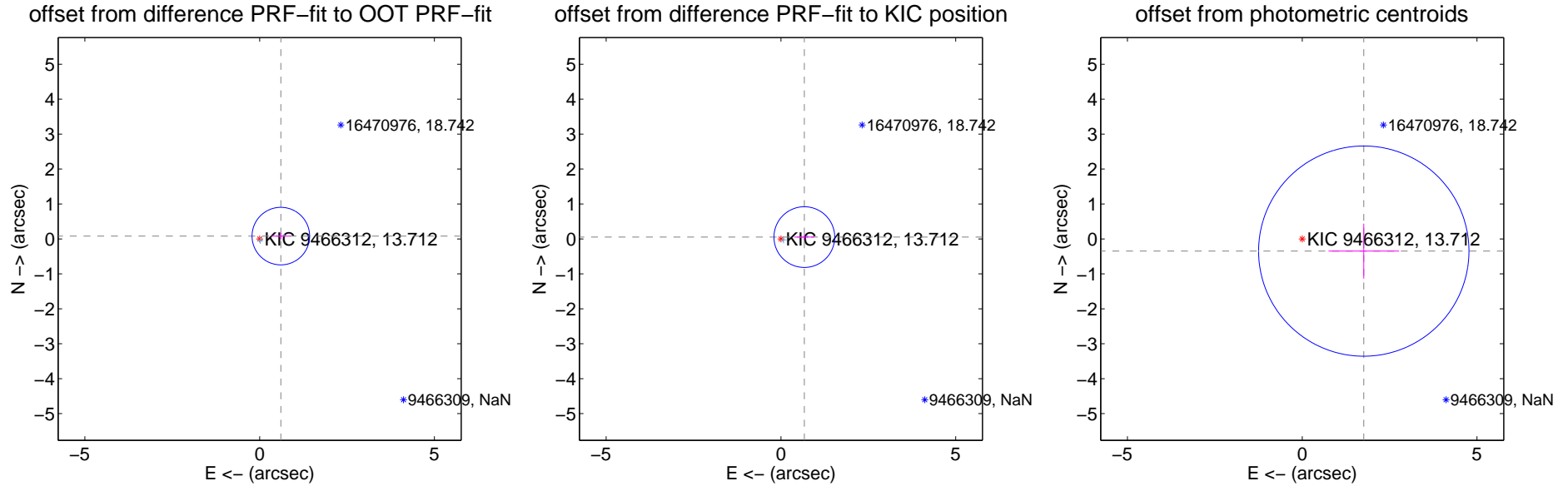
DV Centroid Data

Supplemental centroid analysis for 009466312-01. Kepler magnitude: 13.71. Transit SNR 5.70

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.612 ± 0.275	2.23	-0.606 ± 0.277	0.081 ± 0.090
PRF-fit source offset from KIC position	0.672 ± 0.290	2.32	-0.670 ± 0.288	0.053 ± 0.077
photometric centroid source offset	1.80 ± 1.00	1.79	-1.76 ± 1.01	-0.35 ± 0.79

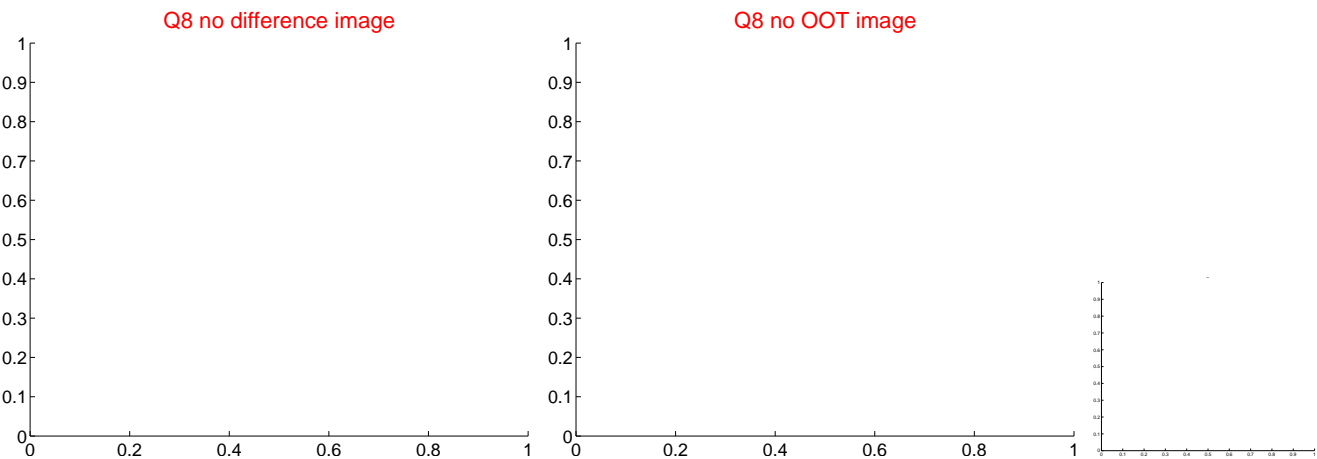
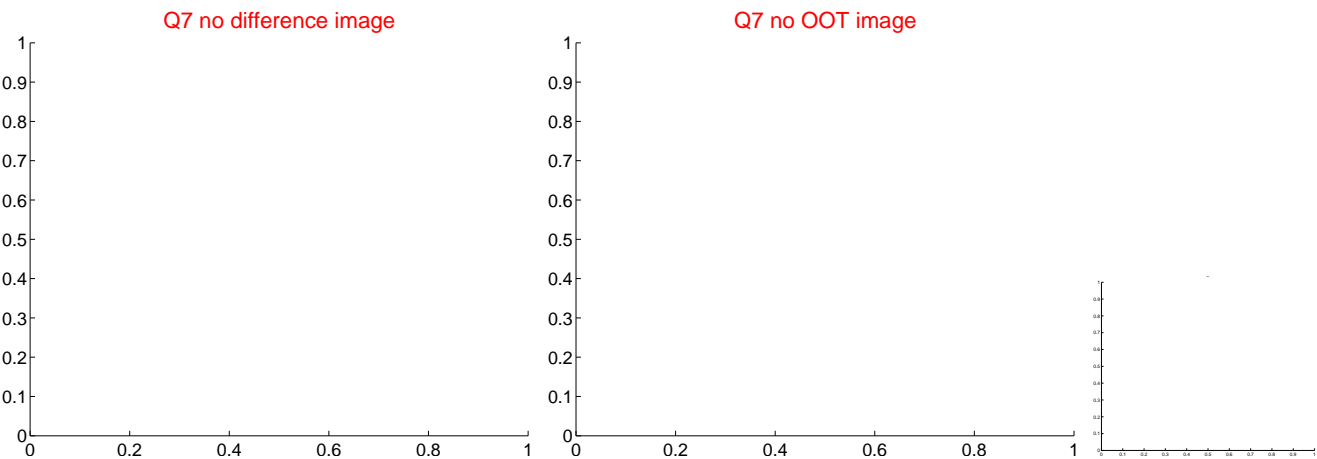
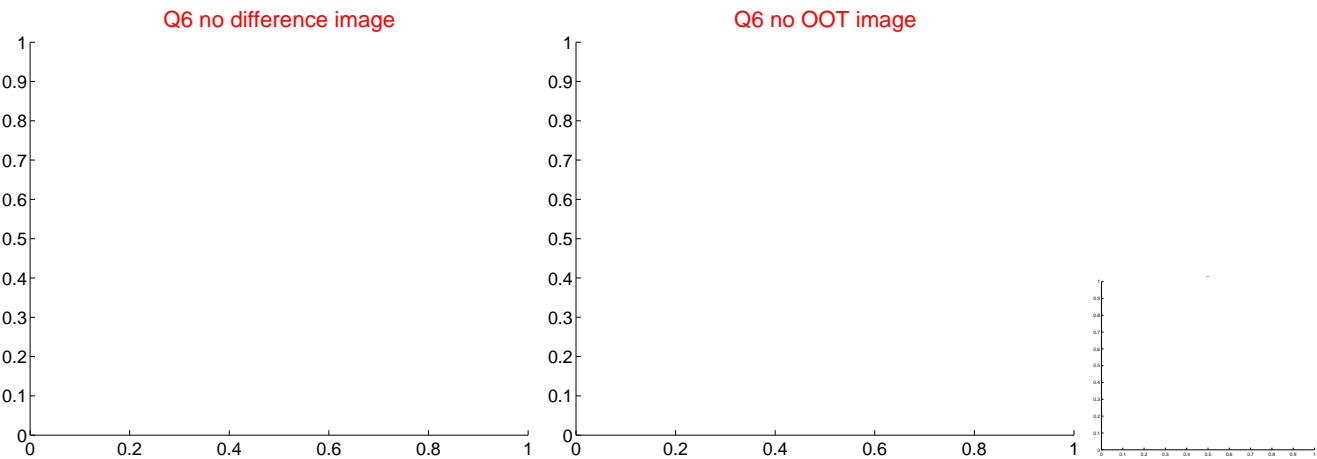
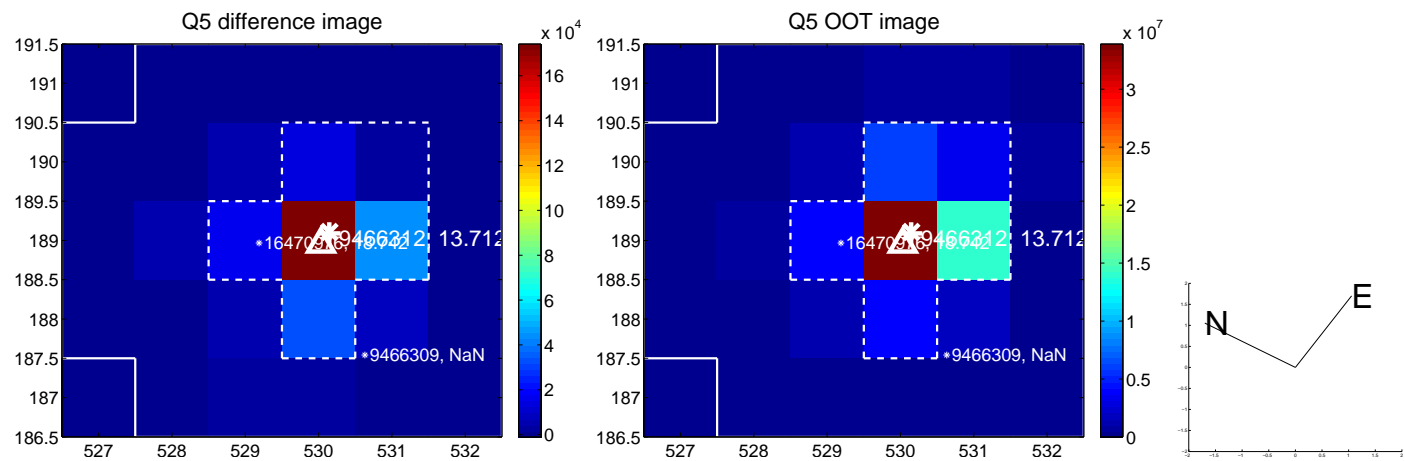


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



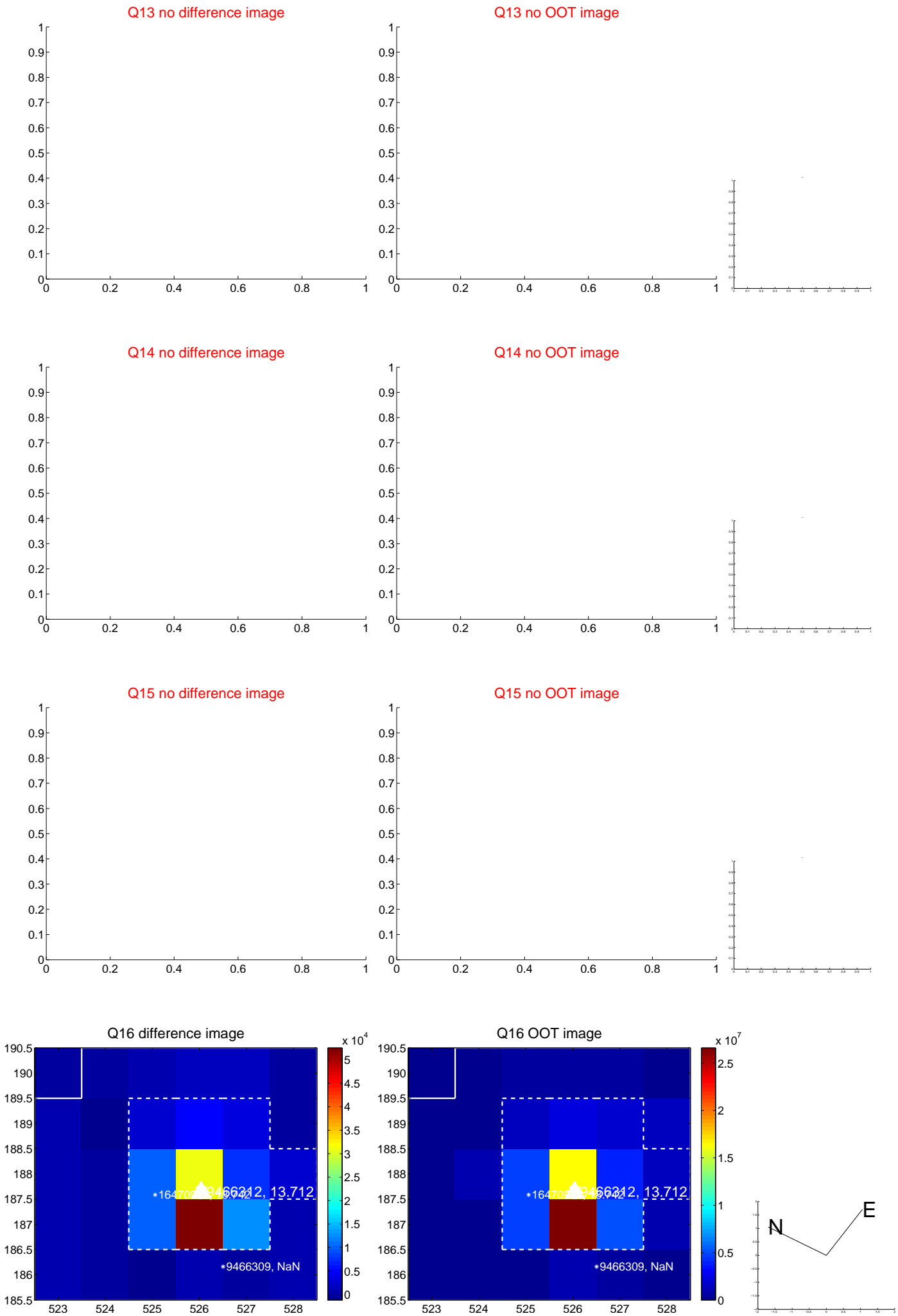
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



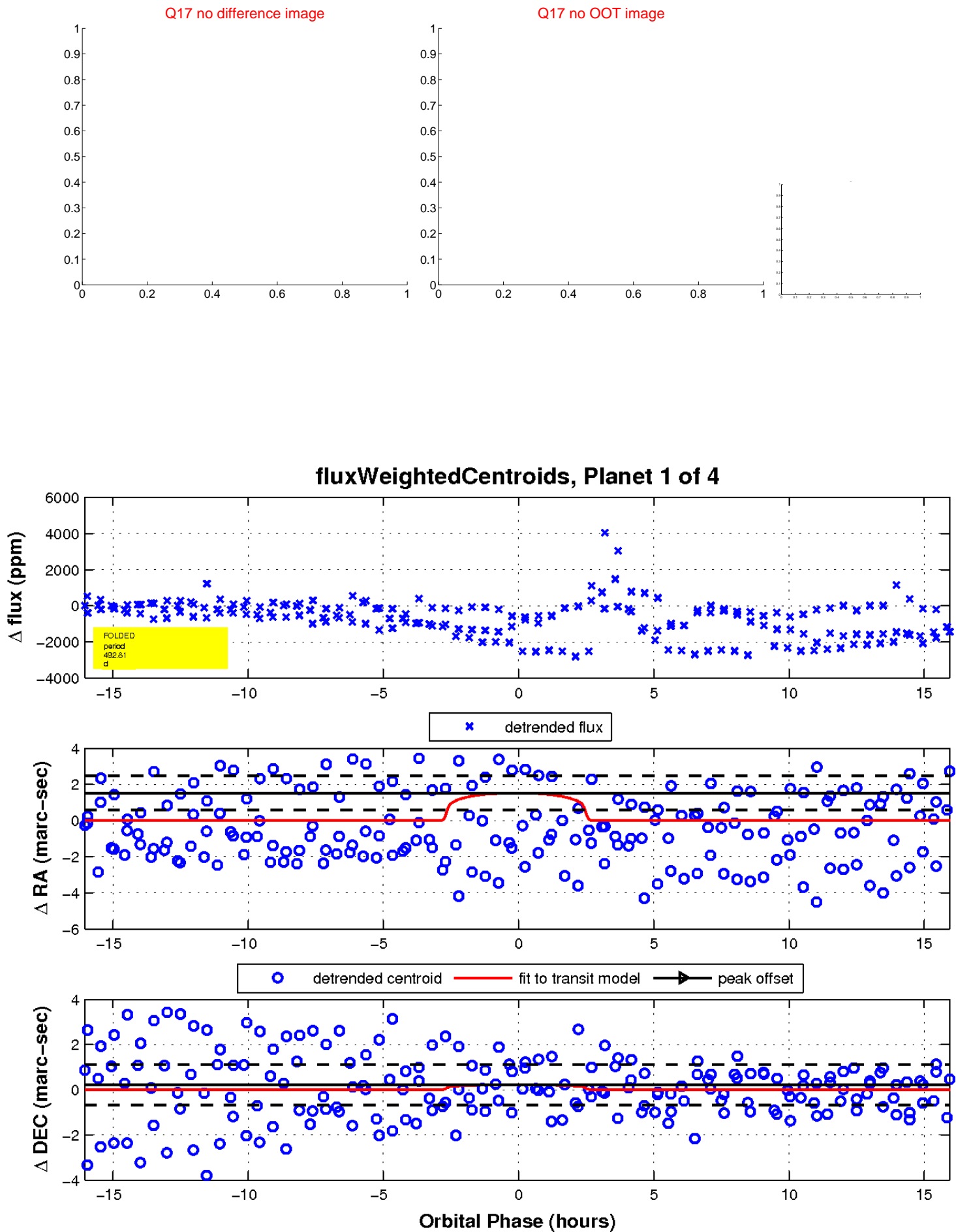
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

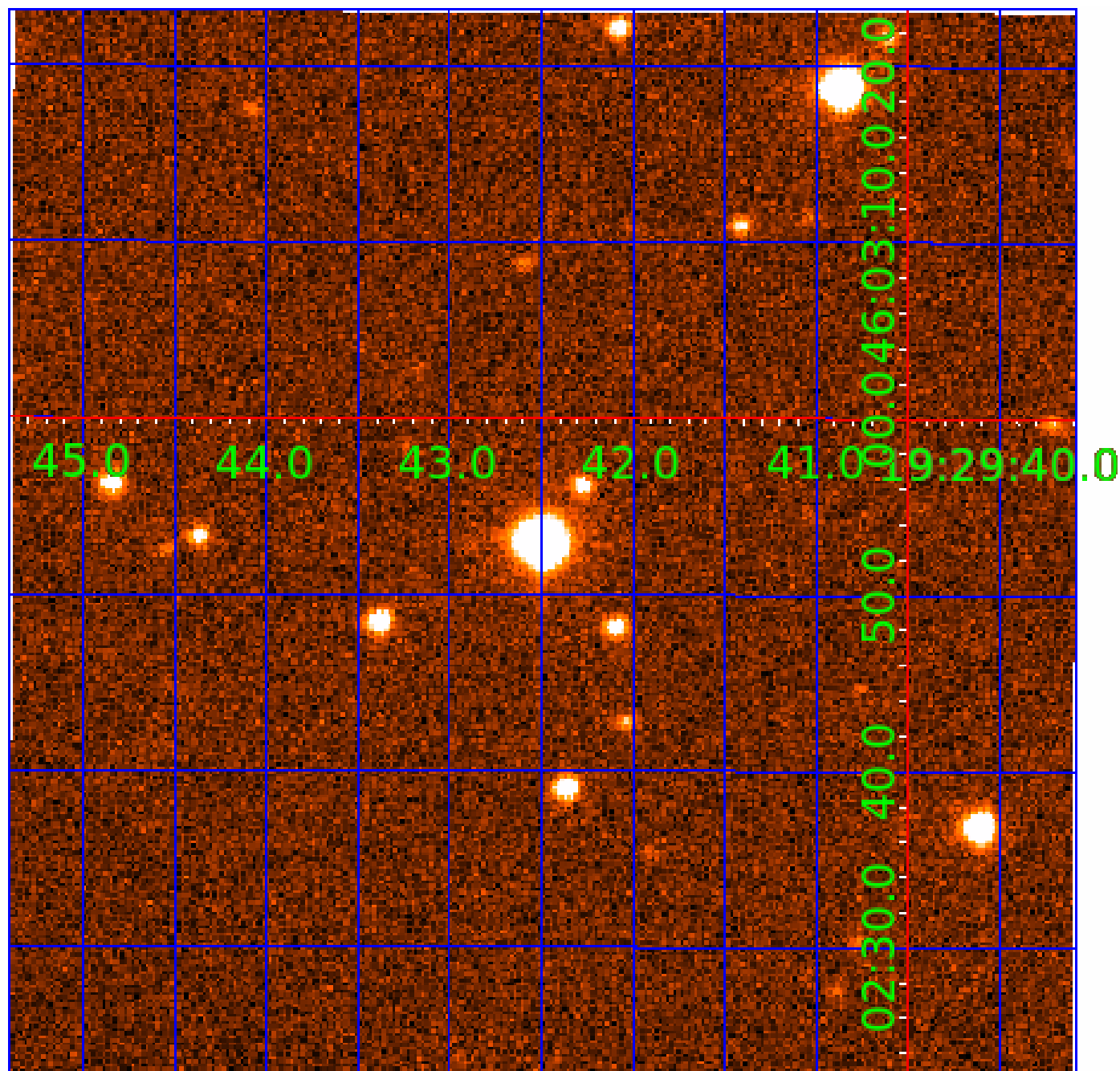


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009466312

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})
009466312-01	OBS	No	492.813975	515.409669	835.3	5.354	15.7	5.7	0.72	5229	2.12	0.30
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009466312-04	OBS	No	532.724498	389.445988	1059.6	5.372	11.7	7.1	0.72	5229	2.31	0.27

Robovetter Results

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009466312-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009466312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

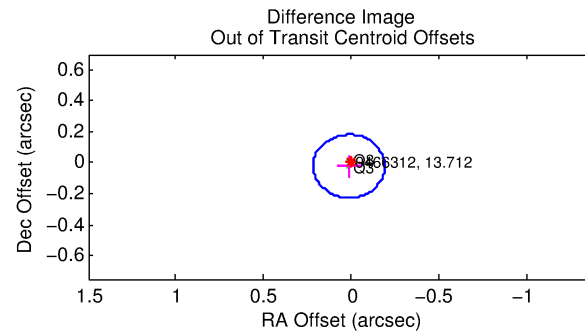
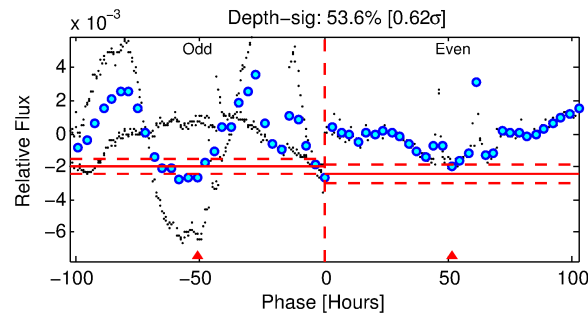
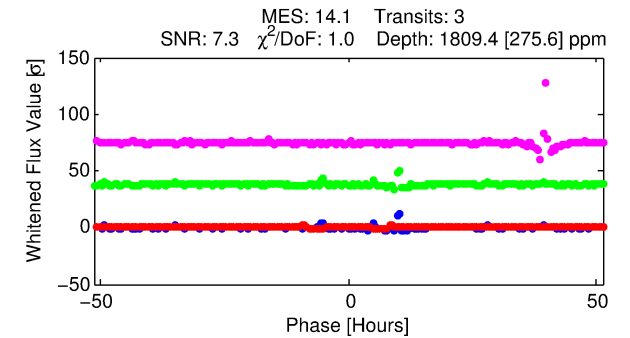
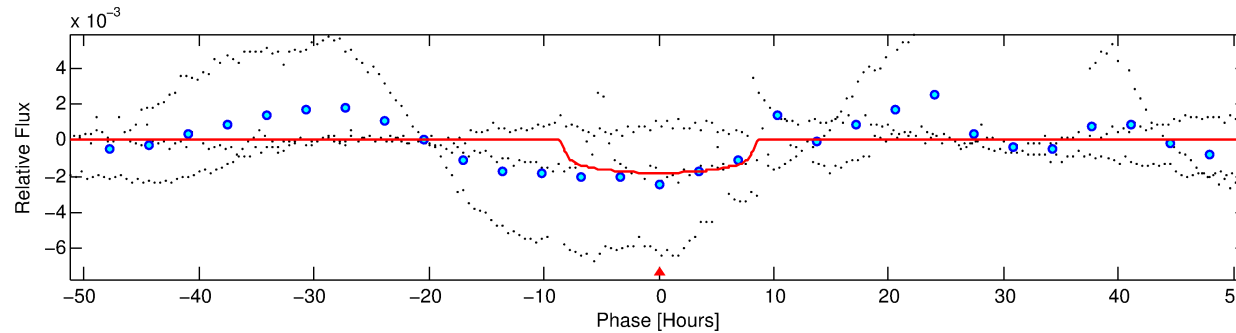
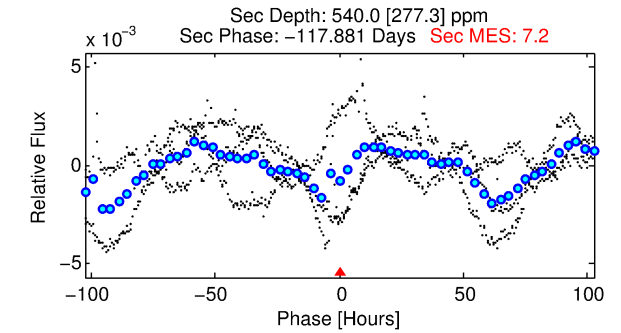
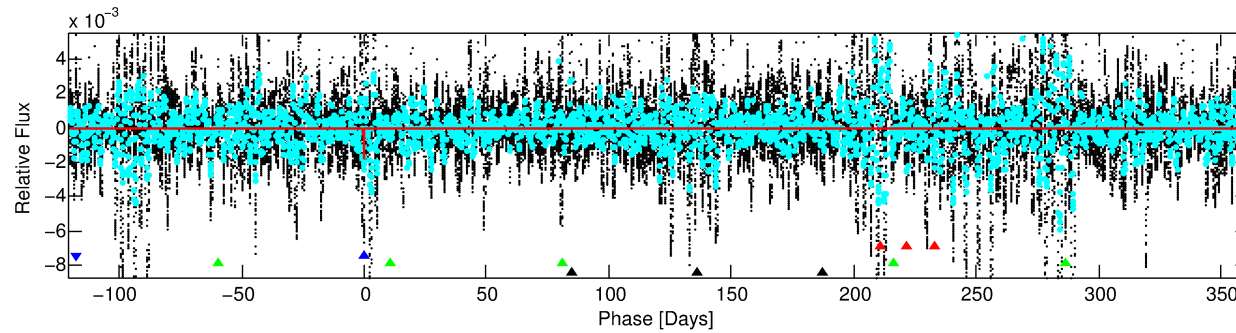
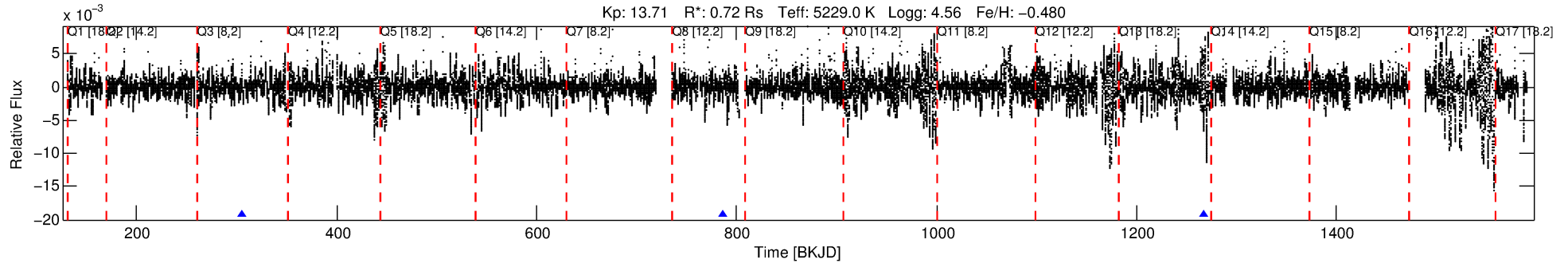
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009466312-02

No Significant Match Found

DV One-Page Summary

KIC: 9466312 Candidate: 2 of 4 Period: 481.398 d



DV Fit Results:

Period = 481.39777 [0.00411] d
Epoch = 304.8583 [0.0045] BKJD
Rp/R* = 0.0382 [0.0065]
a/R* = 222.83 [116.88]
b = 0.09 [6.09]
Seff = 0.31 [0.05]
Teq = 190 [8] K
Rp = 3.02 [0.61] Re
a = 1.0679 [0.0990] AU
Ag = 37099.90 [23316.03] [1.59 σ]
Teffp = 4076 [638] K [6.09 σ]

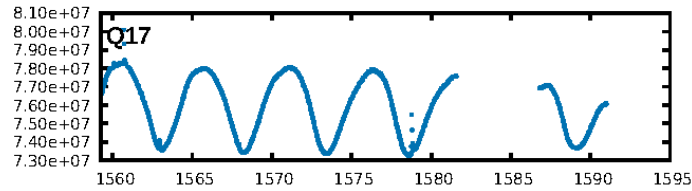
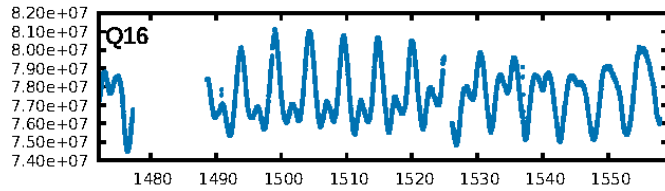
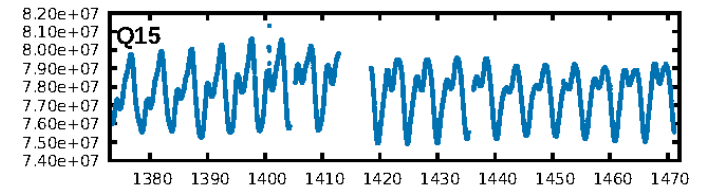
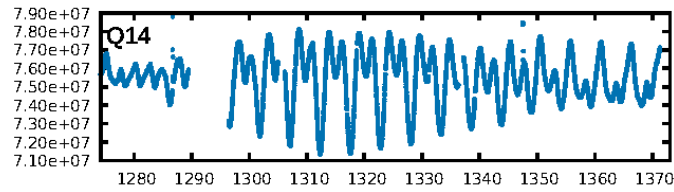
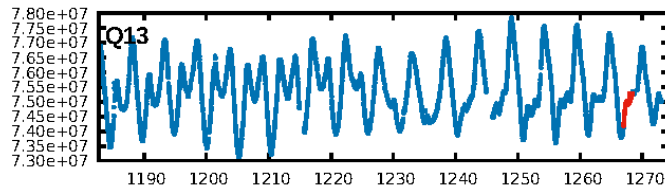
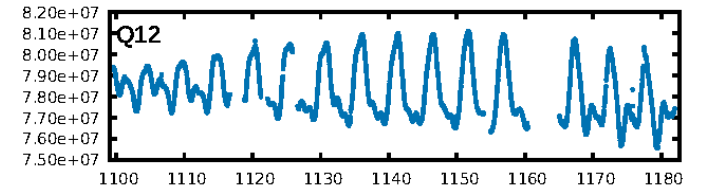
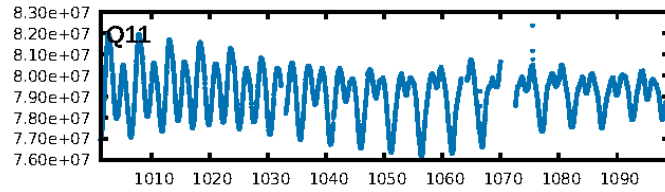
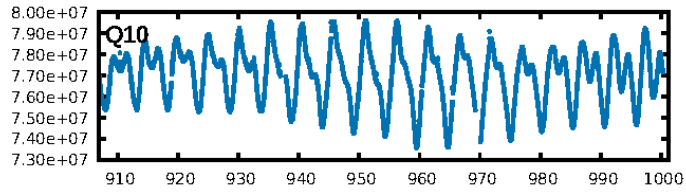
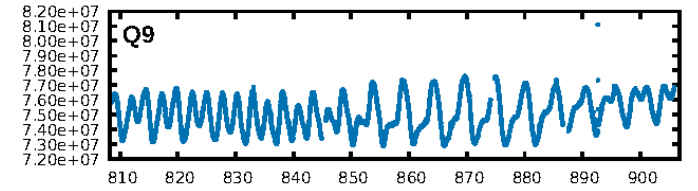
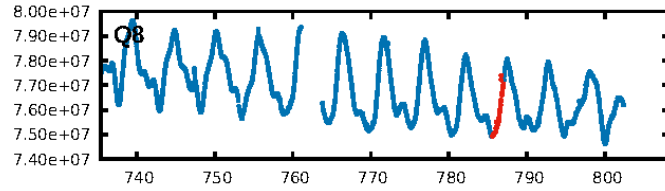
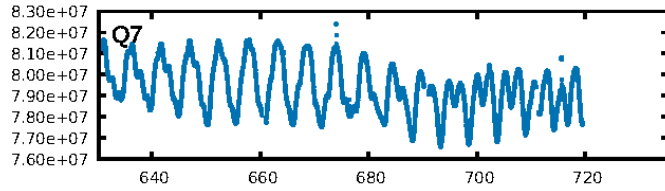
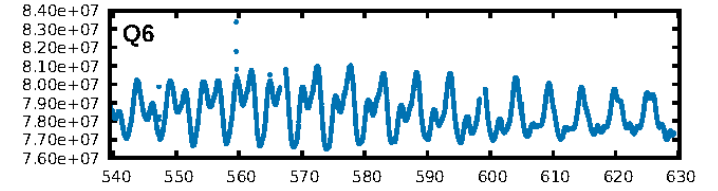
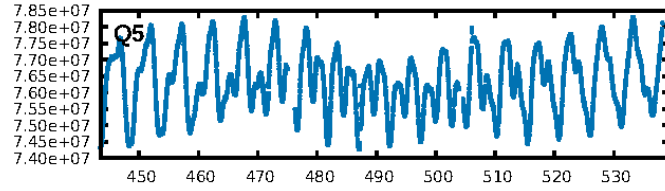
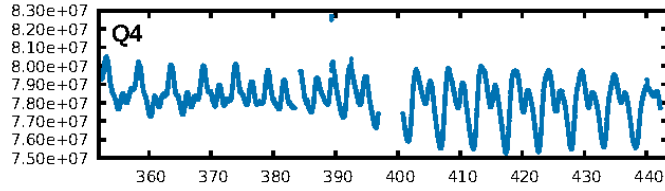
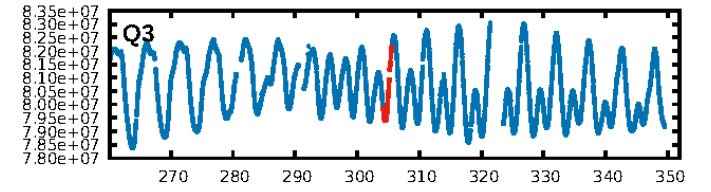
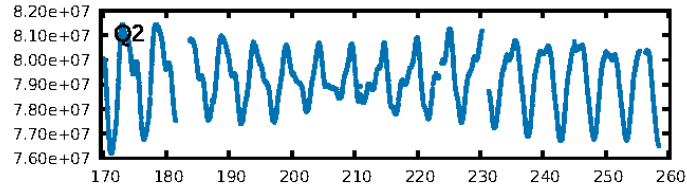
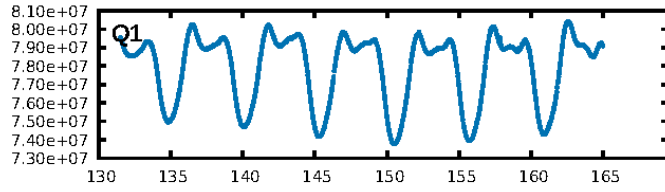
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [288.57 σ]
LongPeriod-sig: 100.0% [15.31 σ]
ModelChiSquare2-sig: 47.0%
ModelChiSquareGof-sig: 92.4%
Bootstrap-pfa: 7.71e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.1215
Centroid-sig: 12.3%
Centroid-so: 0.740 arcsec [1.64 σ]
OotOffset-rm: 0.027 arcsec [0.40 σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-rm: 0.049 arcsec [0.60 σ]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

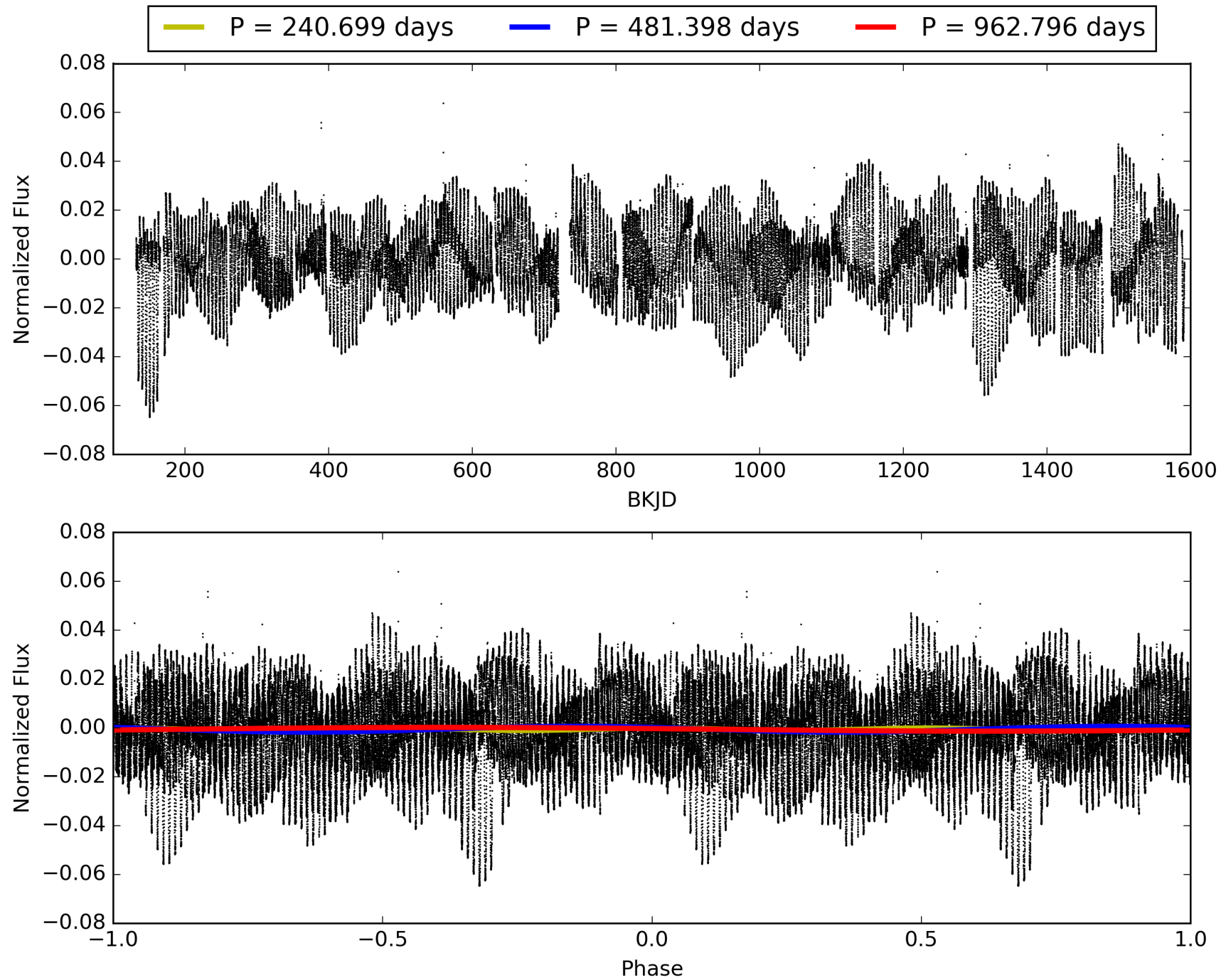
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:34:59 Z

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

TCE 009466312-02, PDC Light Curves

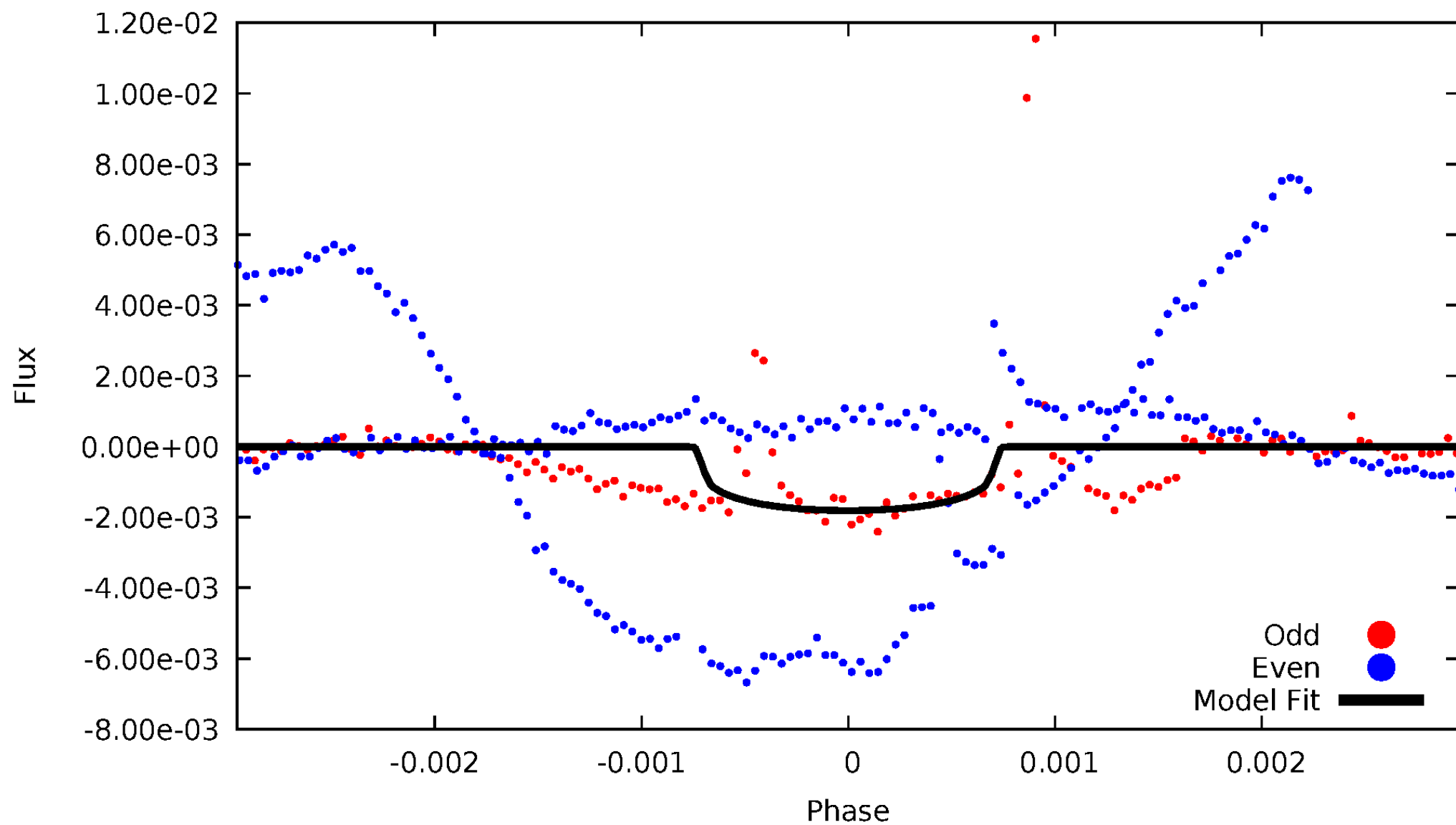


TCE 009466312-02



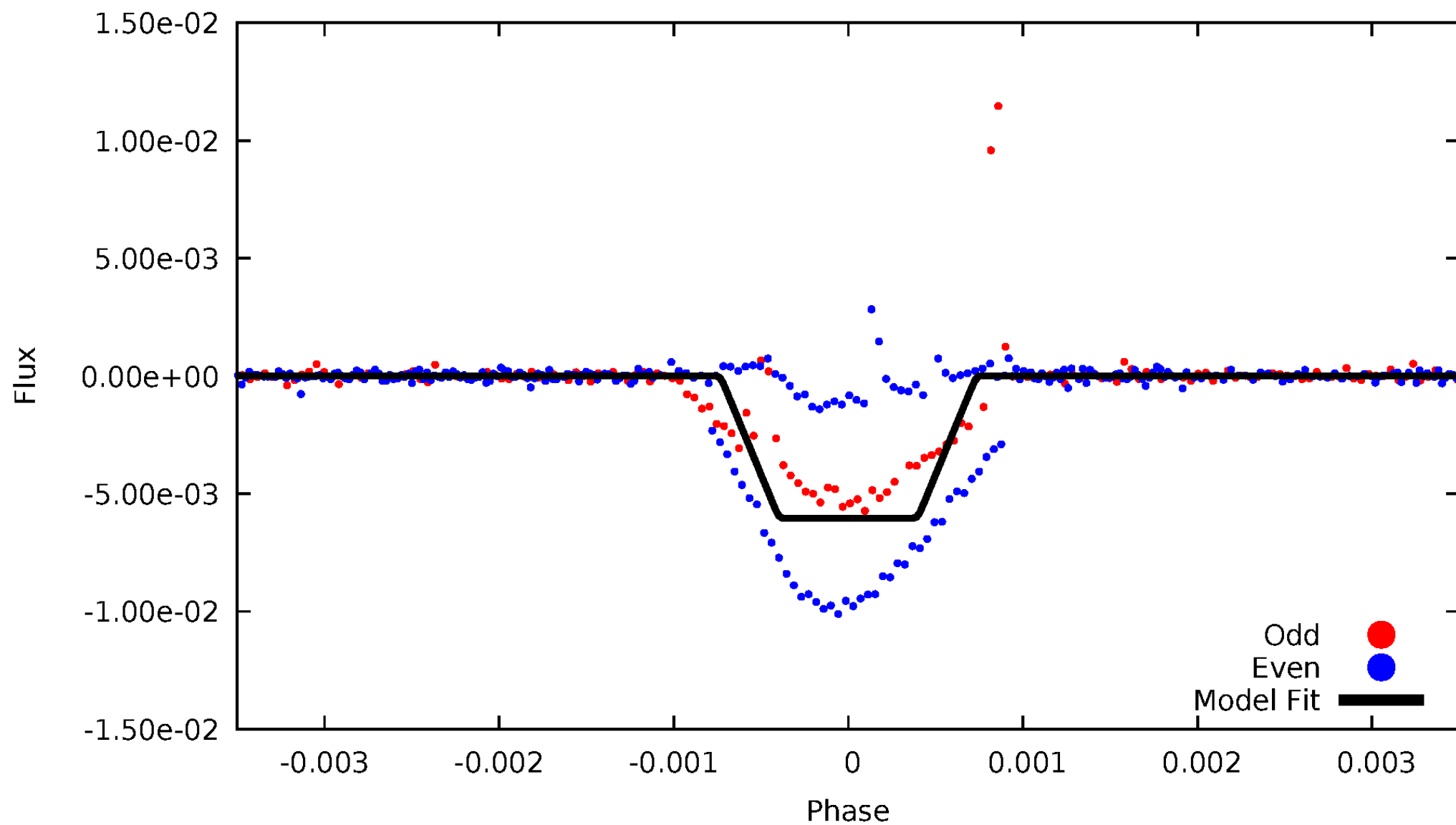
DV Odd/Even

TCE 009466312-02



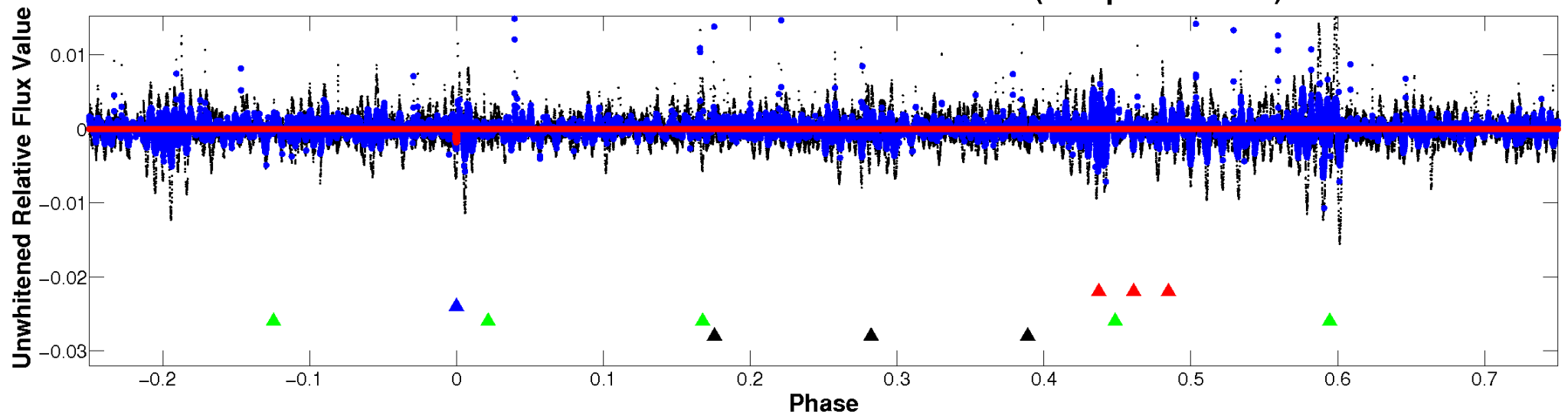
ALT Odd/Even

TCE 009466312-02

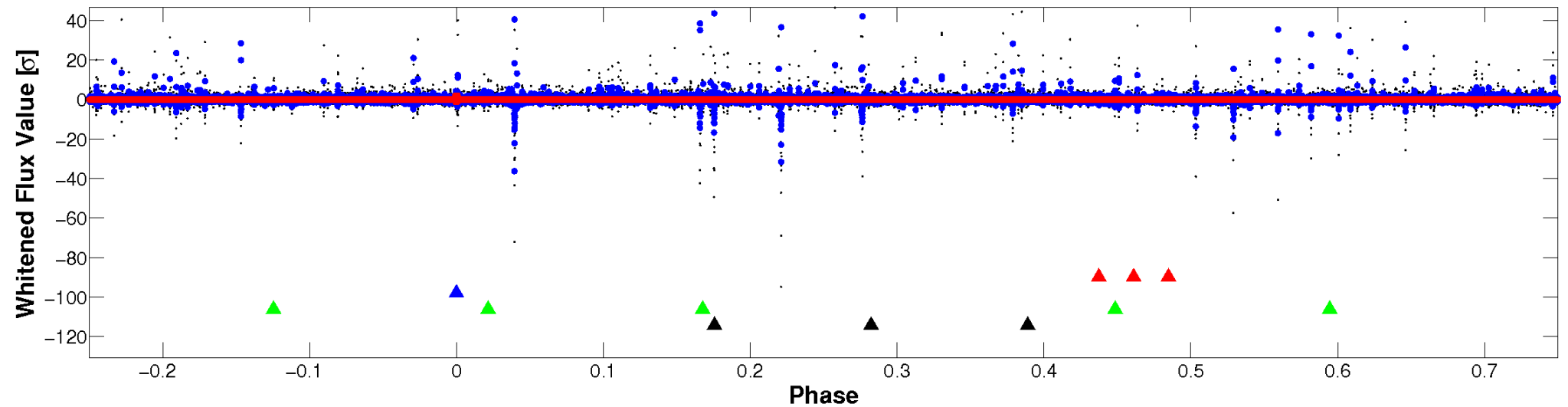


Non-Whitened Vs. Whitened Light Curve

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

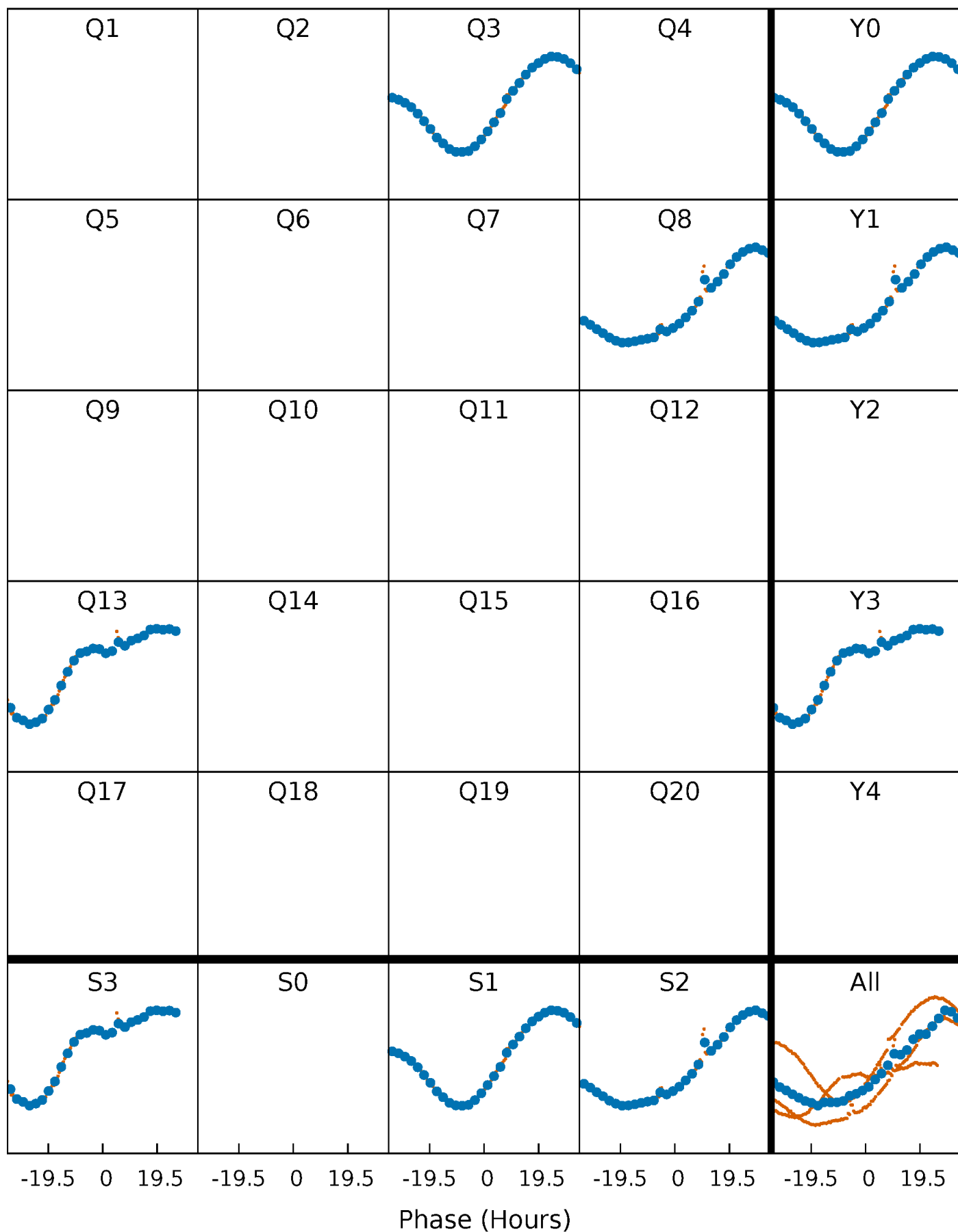


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



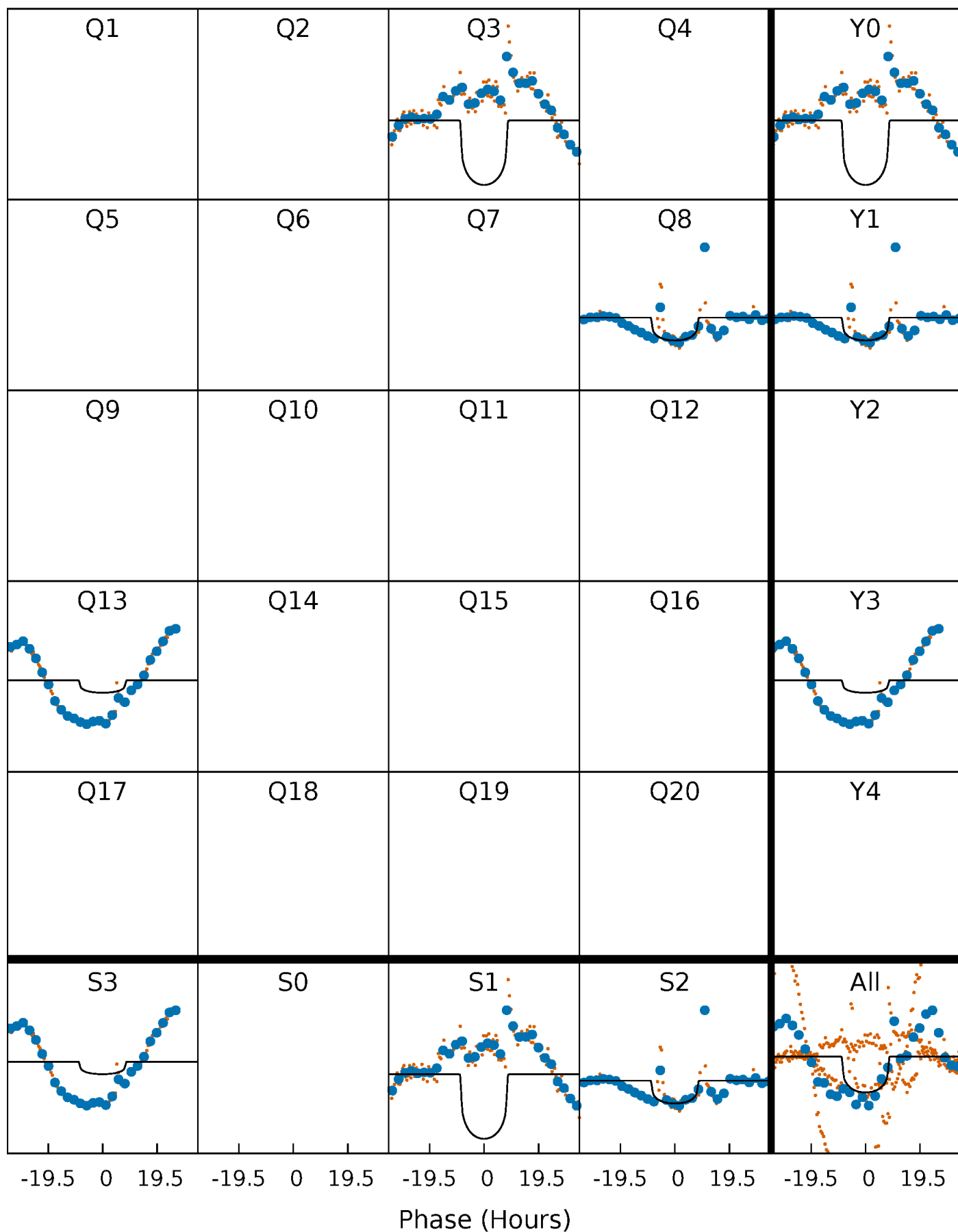
PDC Quarter-Phased Transit Curves

TCE 009466312-02 $P=481.397767$ Days $T_0=304.858313$ (BKJD)



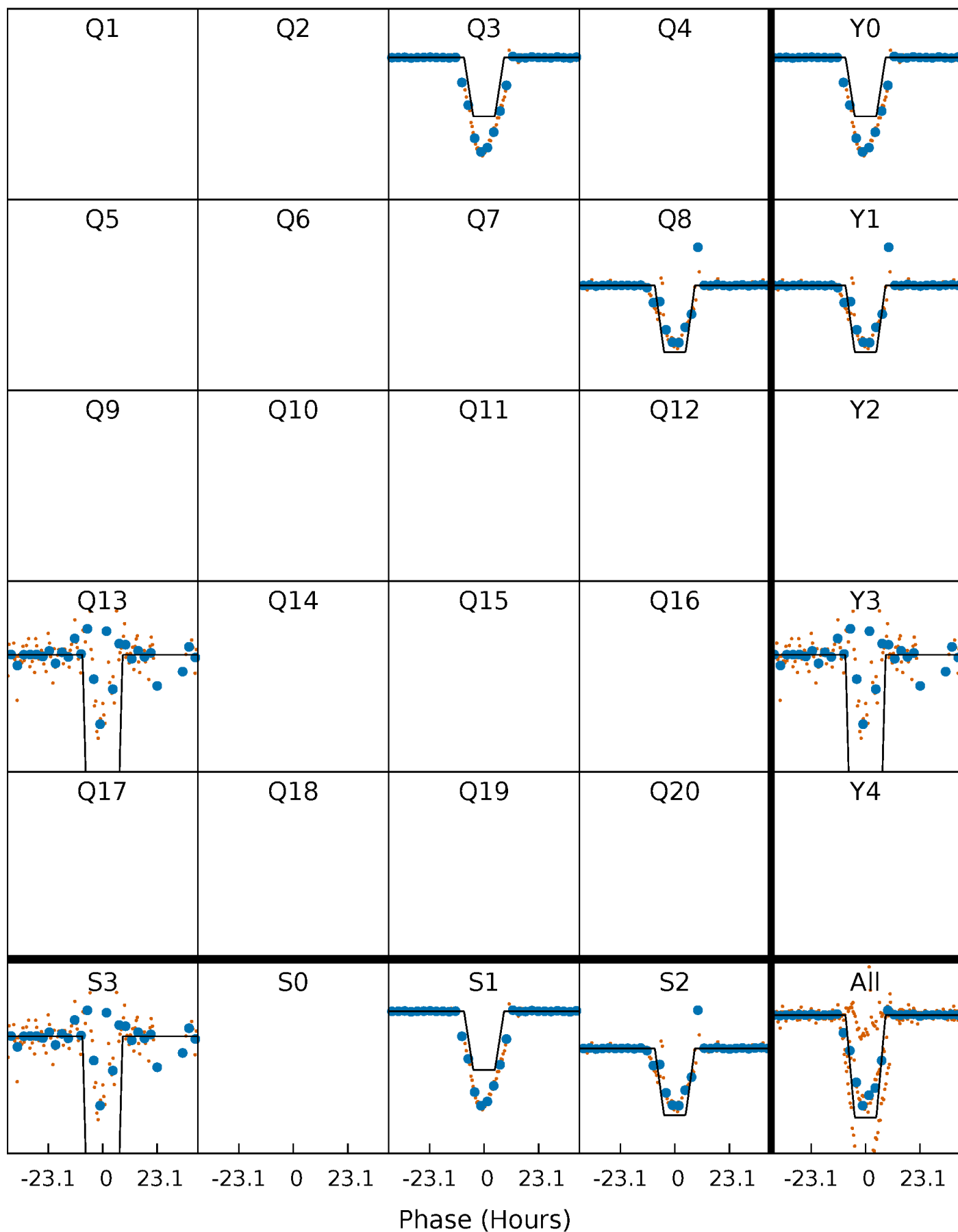
DV Quarter-Phased Transit Curves

TCE 009466312-02 $P=481.397767$ Days $T_0=304.858313$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

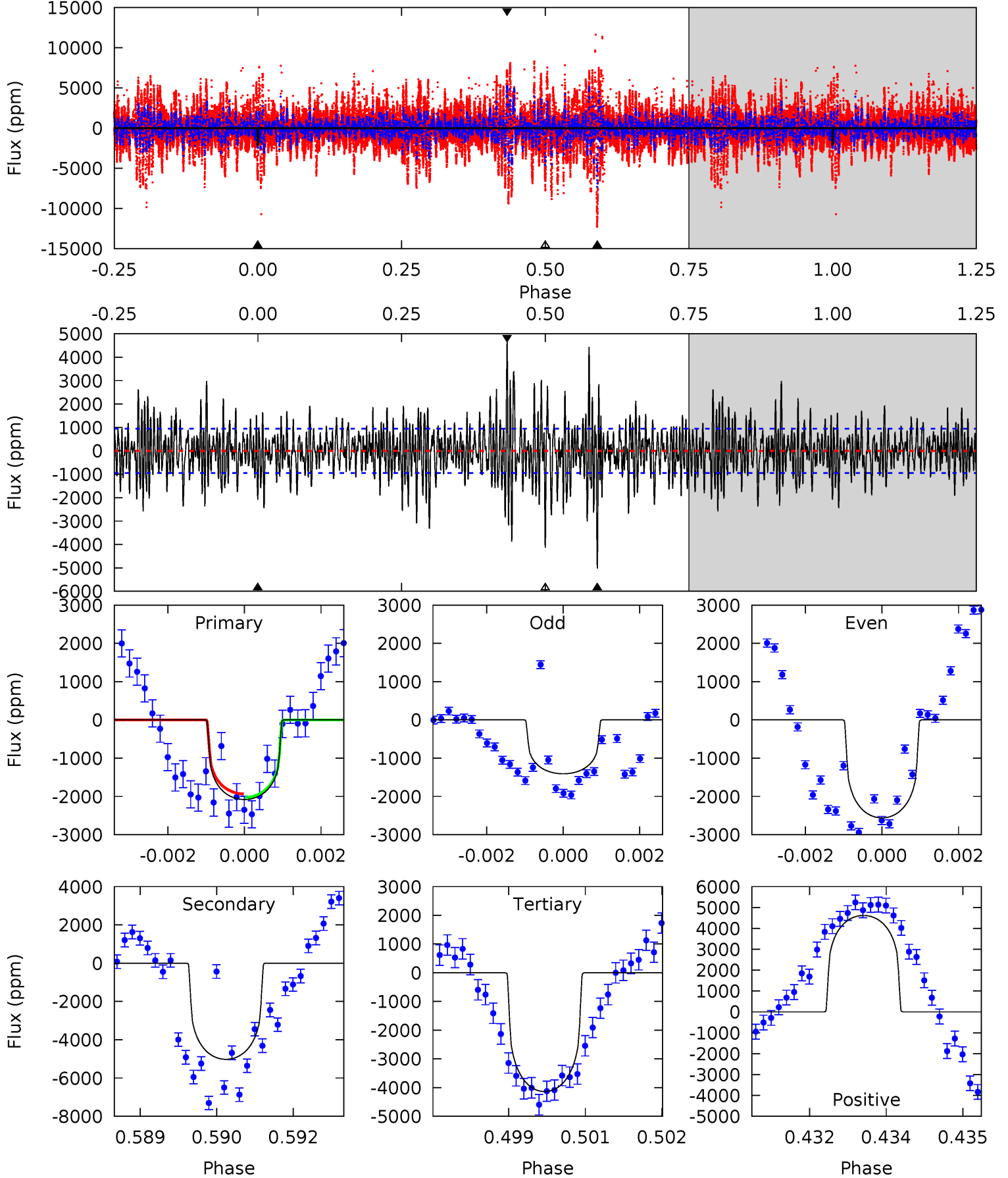
TCE 009466312-02 $P=481.523653$ Days $T_0=304.755243$ (BKJD)



DV Model-Shift Uniqueness Test

009466312-02, P = 481.397767 Days, E = 304.858313 Days

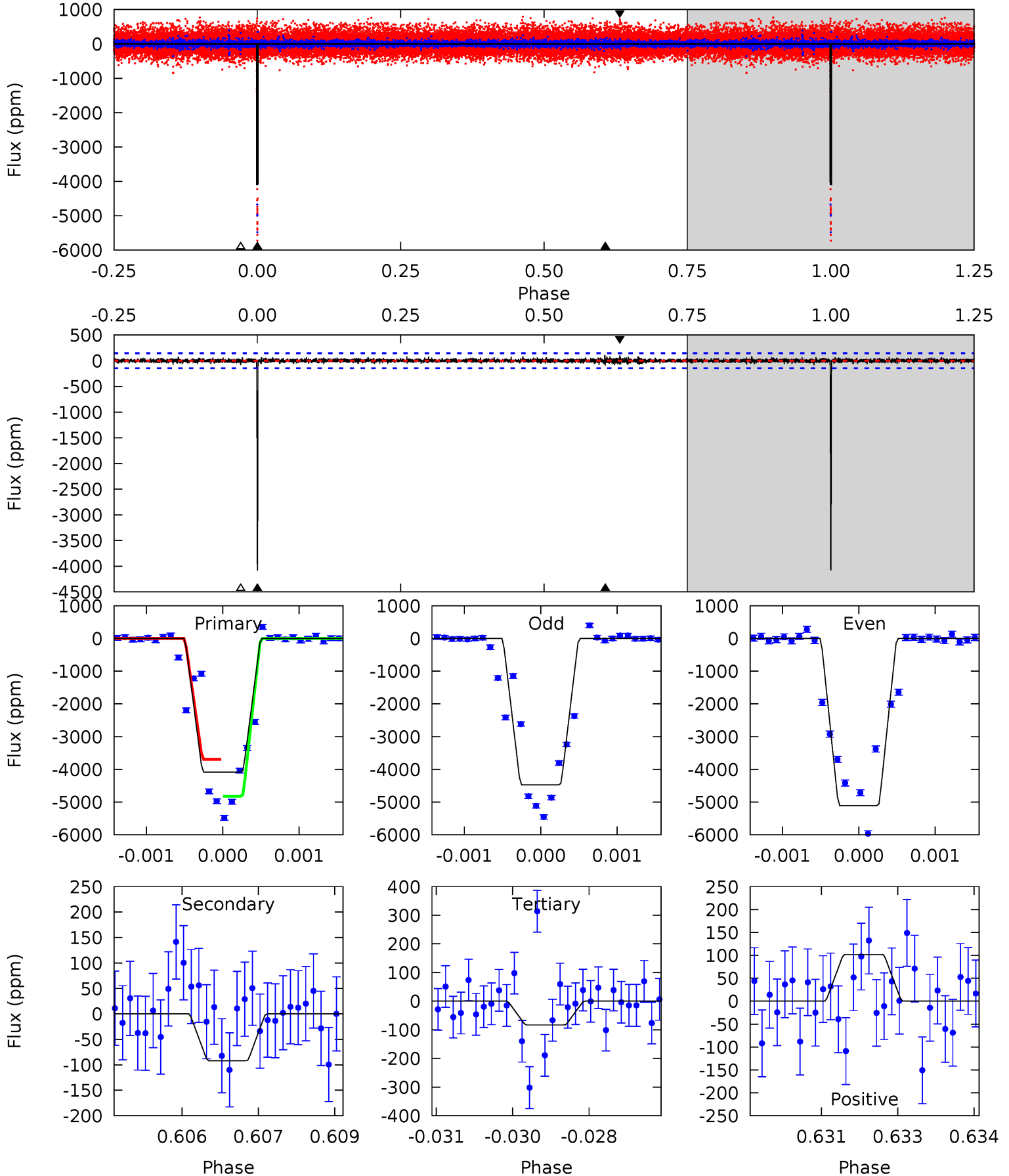
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	28.5	23.5	26.2	5.38	3.17	5.49	-11.7	-14.4	5.02	2.29	2.61	1.55	0.48	0.26



Alt Model-Shift Uniqueness Test

009466312-02, P = 481.523653 Days, E = 304.755243 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
151.6	3.42	3.08	3.77	5.38	3.18	0.62	148.5	147.8	0.33	-0.36	16.2	1.03	0.03	0



Stellar Parameters For KIC 009466312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5229^{+156}_{-140}	$4.564^{+0.070}_{-0.056}$	$-0.480^{+0.300}_{-0.300}$	$0.724^{+0.082}_{-0.074}$	$0.700^{+0.093}_{-0.043}$	$2.597^{+0.833}_{-0.528}$
	+3%/-3%	+2%/-1%	+62%/-62%	+11%/-10%	+13%/-6%	+32%/-20%
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 009466312-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5024 ± 176	$3.01^{+0.57}_{-0.52}$	265^{+10}_{-10}	7103^{+903}_{-586}	$350983^{+164870}_{-101627}$
Alt.	-92 ± 27	$6.16^{+0.61}_{-0.61}$	264^{+11}_{-9}	2630^{+108}_{-126}	1563^{+550}_{-516}

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

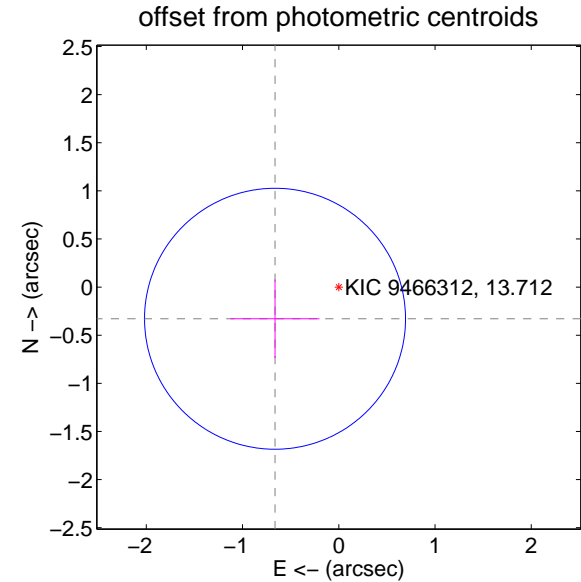
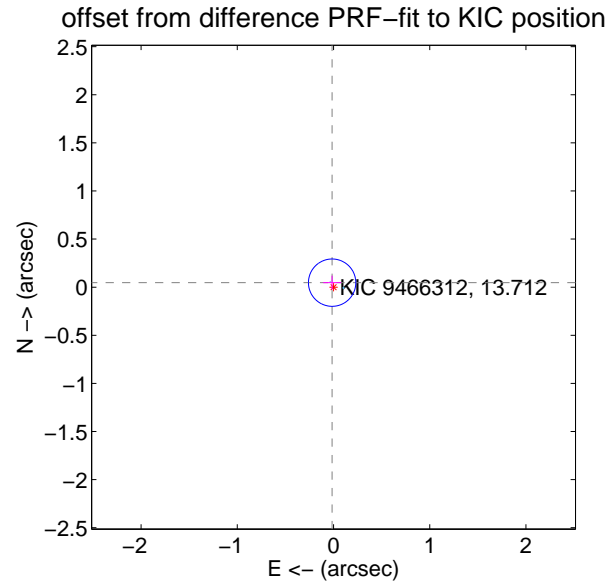
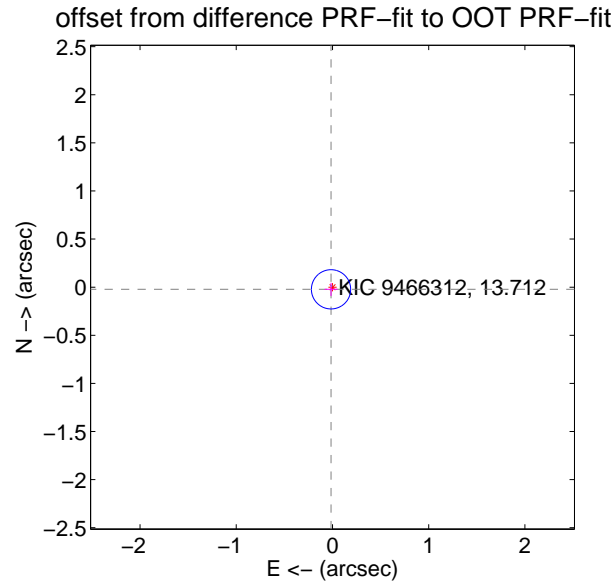
DV Centroid Data

Supplemental centroid analysis for 009466312-02. Kepler magnitude: 13.71. Transit SNR 7.29

There are 2 quarters with good PRF difference image offsets

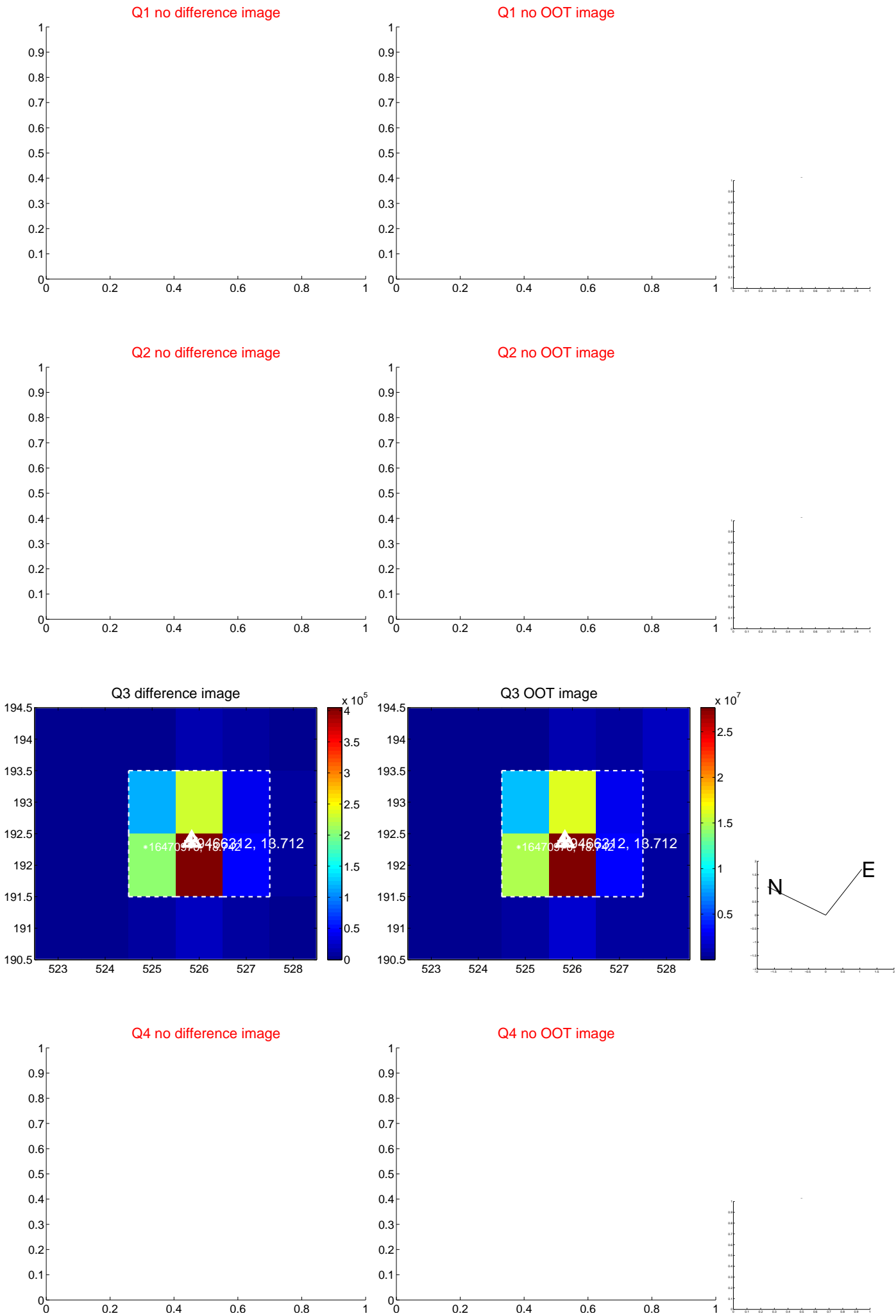
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.027 ± 0.068	0.40	0.015 ± 0.067	-0.022 ± 0.069
PRF-fit source offset from KIC position	0.049 ± 0.082	0.60	0.014 ± 0.094	0.047 ± 0.073
photometric centroid source offset	0.74 ± 0.45	1.64	0.66 ± 0.46	-0.33 ± 0.41

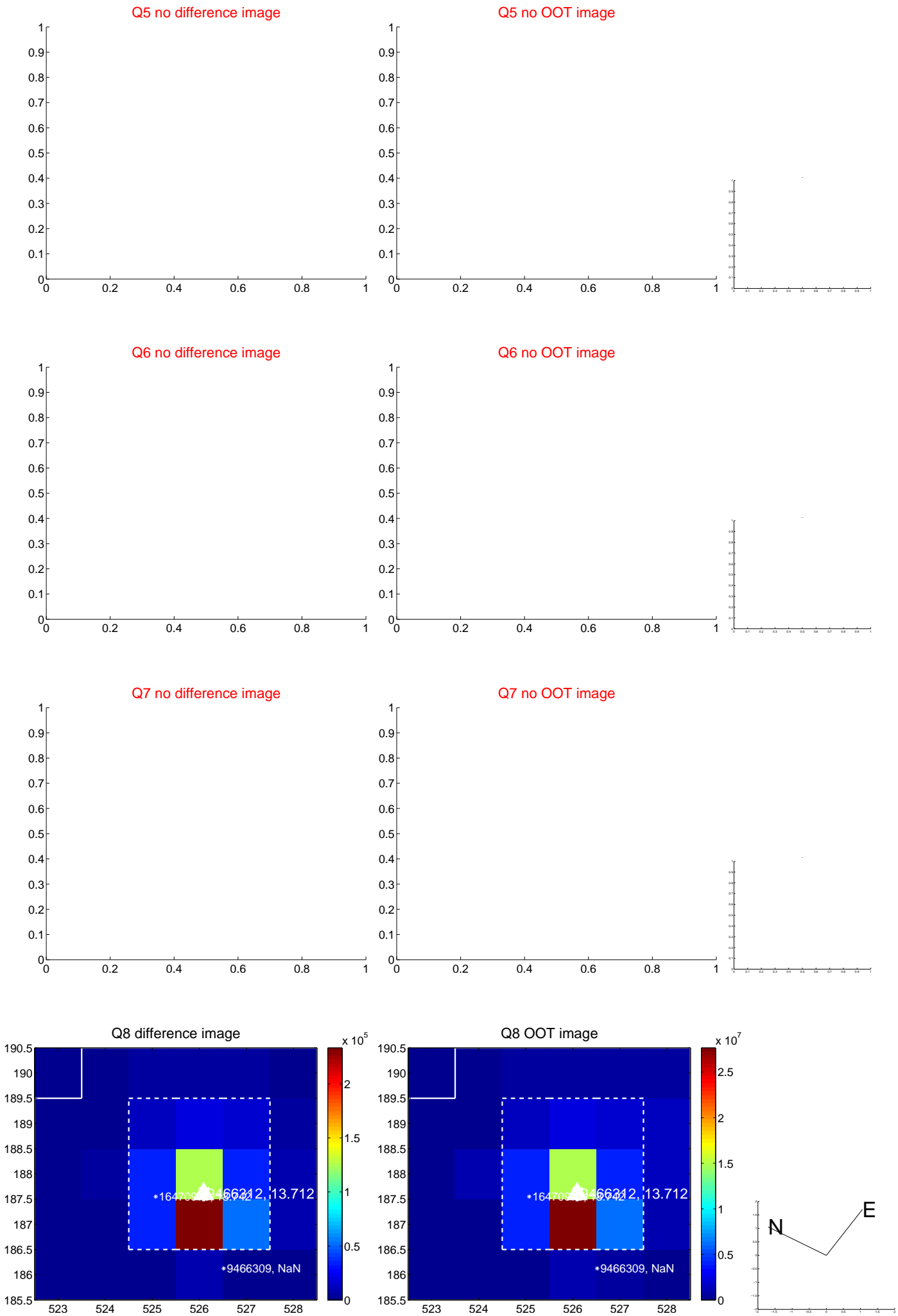


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



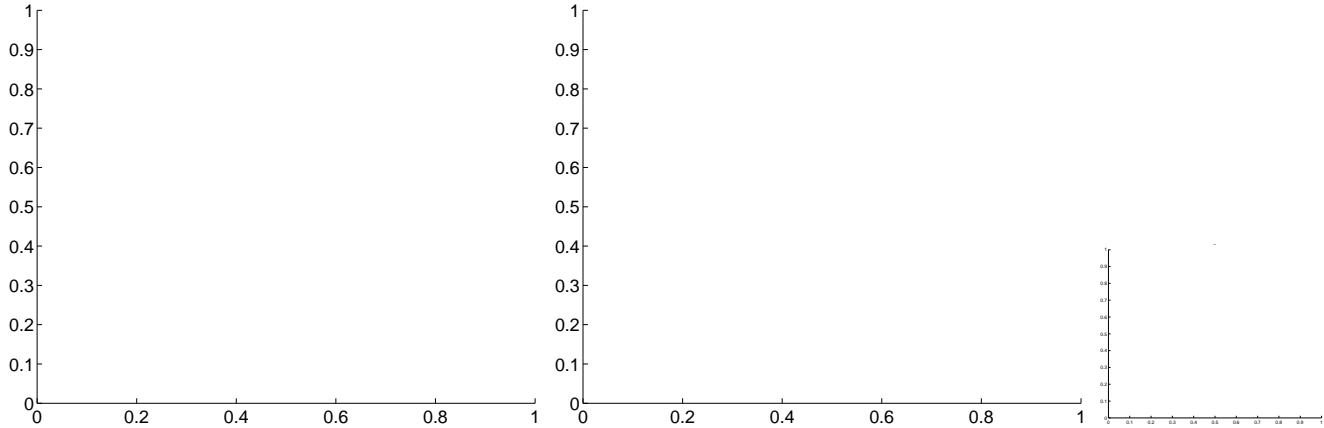
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



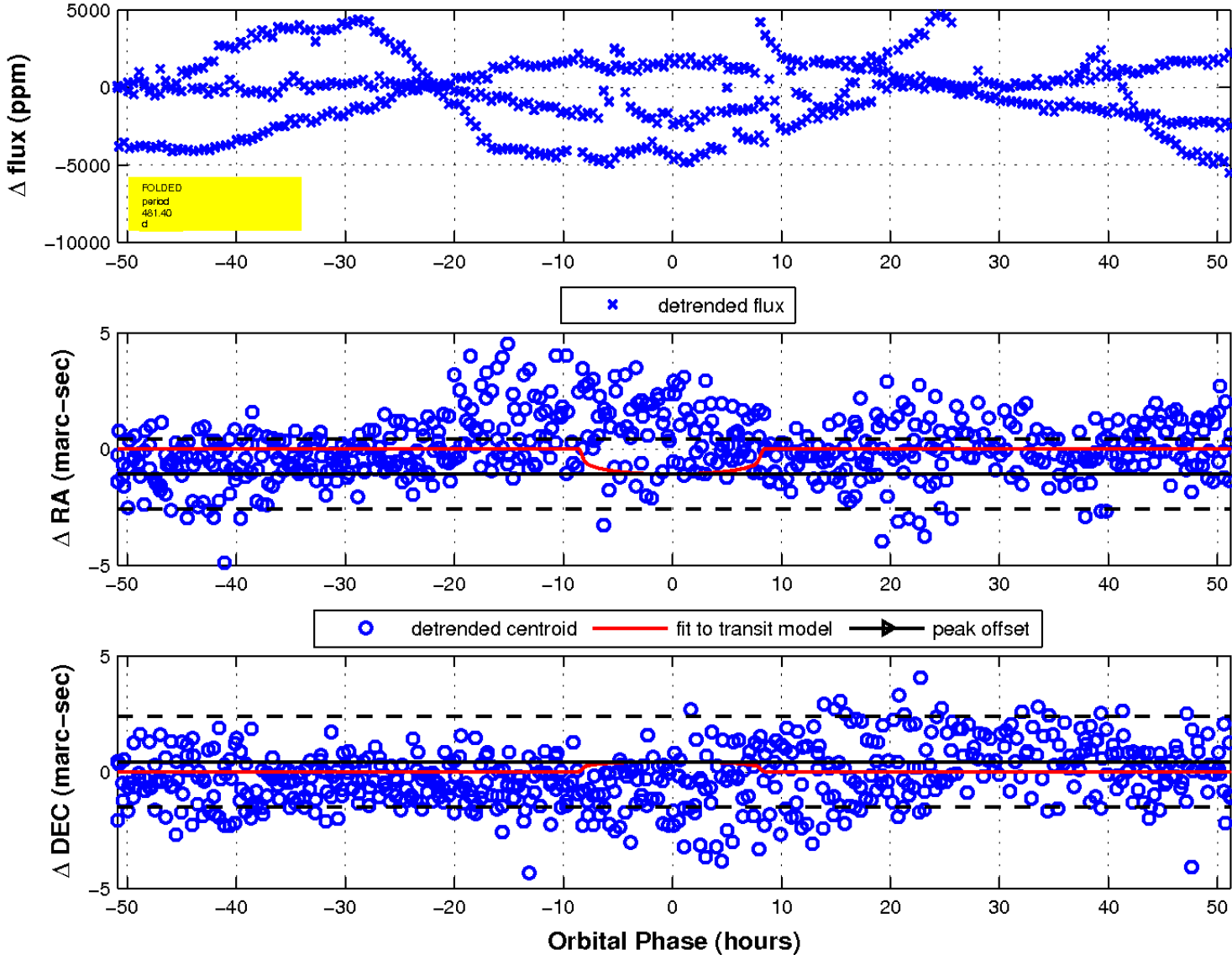
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image

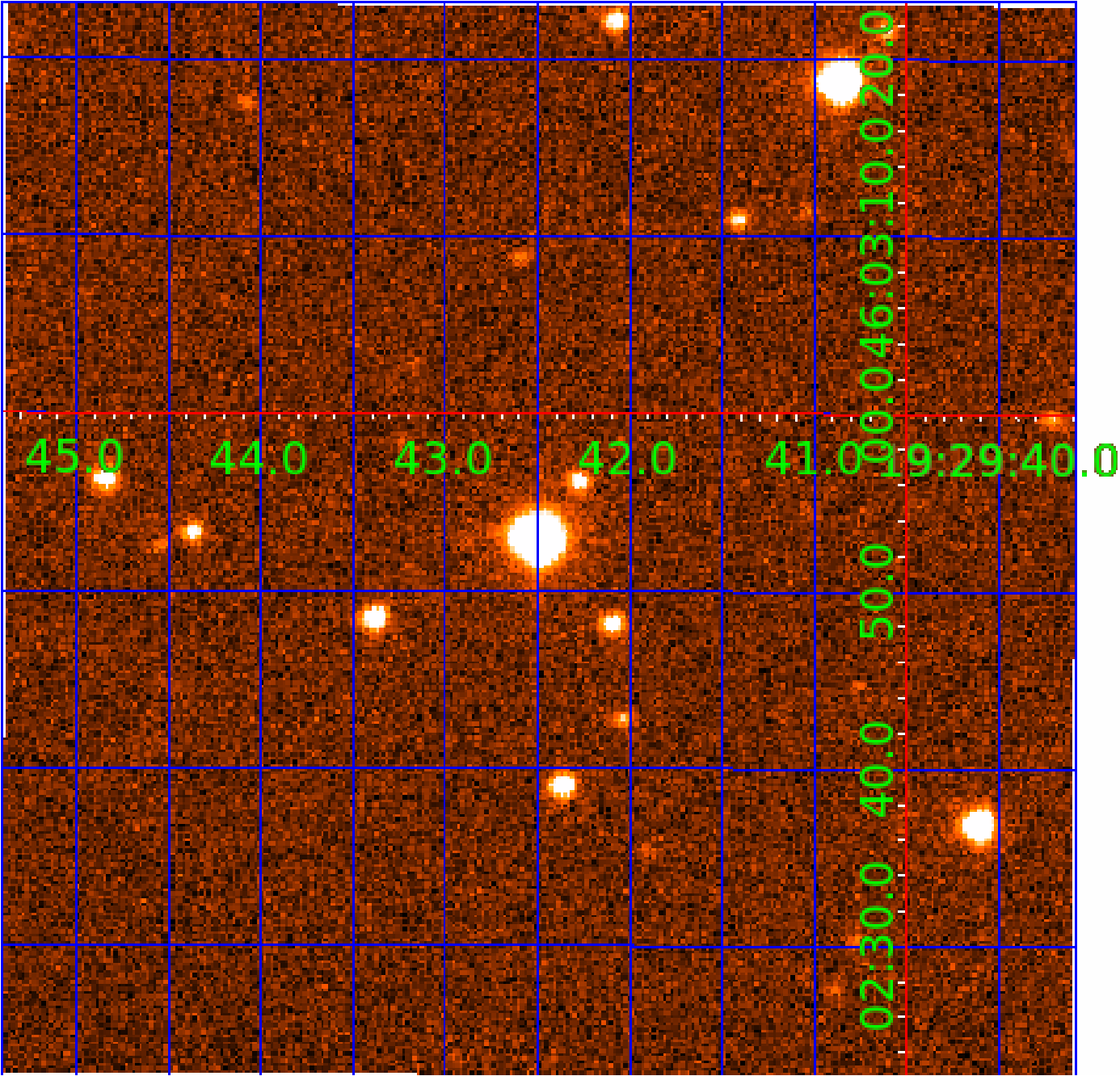


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 009466312

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})
009466312-01	OBS	No	492.813975	515.409669	835.3	5.354	15.7	5.7	0.72	5229	2.12	0.30
009466312-02	OBS	No	481.397767	304.858313	1809.4	17.078	14.1	7.3	0.72	5229	3.02	0.31
009466312-03	OBS	No	275.863765	244.910372	663.4	0.740	12.6	5.3	0.72	5229	1.87	0.65
009466312-04	OBS	No	532.724498	389.445988	1059.6	5.372	11.7	7.1	0.72	5229	2.31	0.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009466312-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009466312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

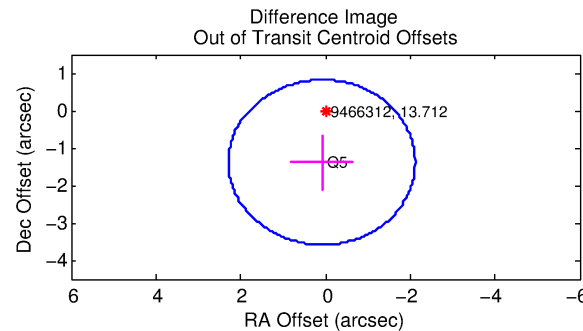
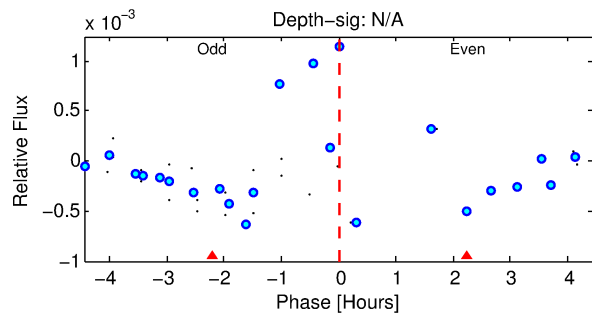
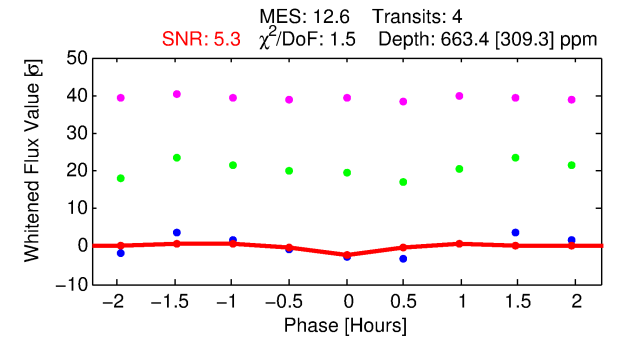
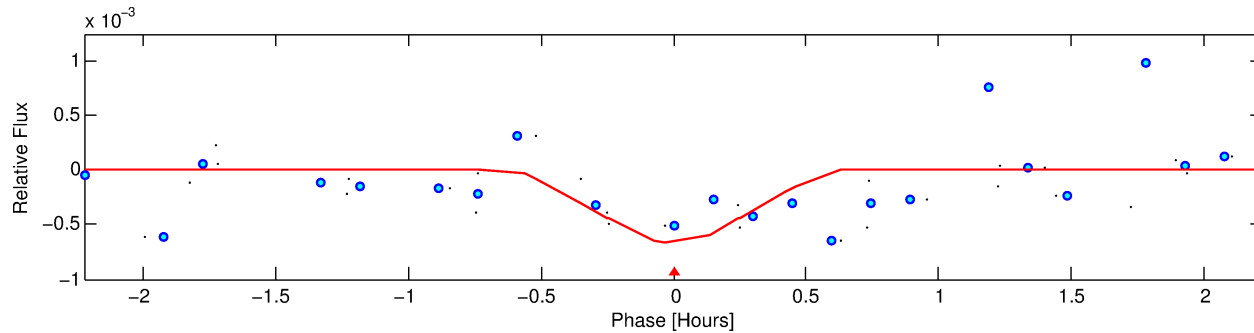
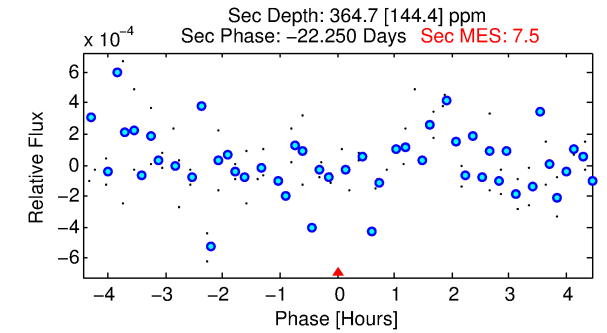
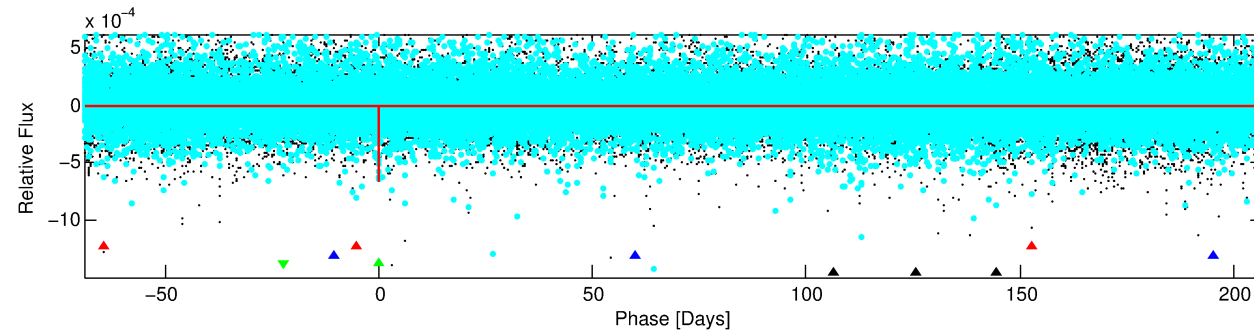
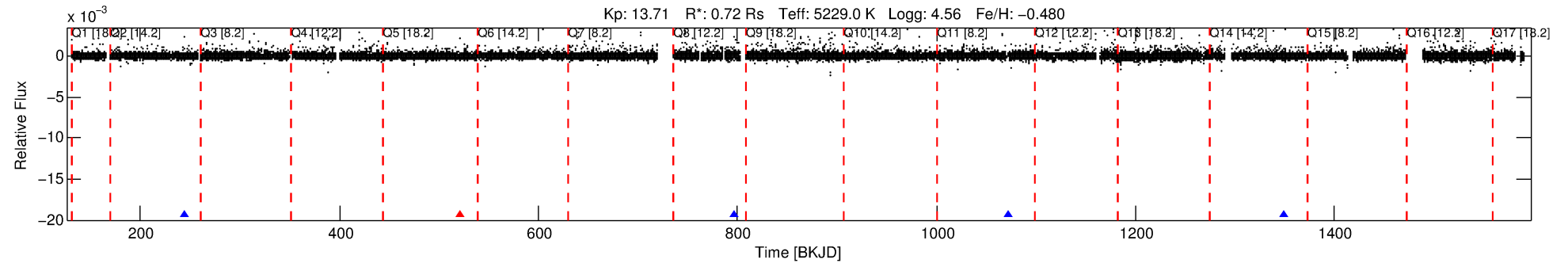
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009466312-03

No Significant Match Found

DV One-Page Summary

KIC: 9466312 Candidate: 3 of 4 Period: 275.864 d



DV Fit Results:

Period = 275.86376 [0.00326] d
Epoch = 244.9104 [0.0056] BKJD
Rp/R* = 0.0237 [1.0937]
a/R* = 2916.99 [534708.60]
b = 0.02 [10274.29]
Seff = 0.65 [0.11]
Teq = 229 [10] K
Rp = 1.87 [86.41] Re
a = 0.7367 [0.0683] AU
Ag = 31114.57 [2874005.36] [0.01σ]
Teffp = 4696 [108436] K [0.04σ]

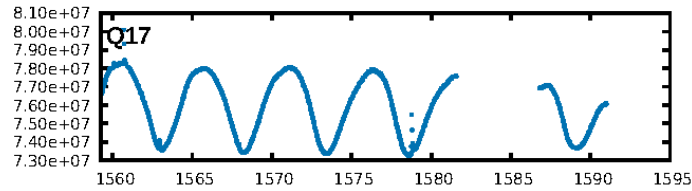
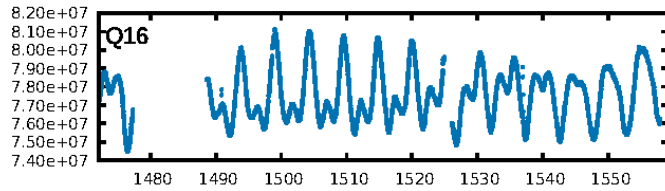
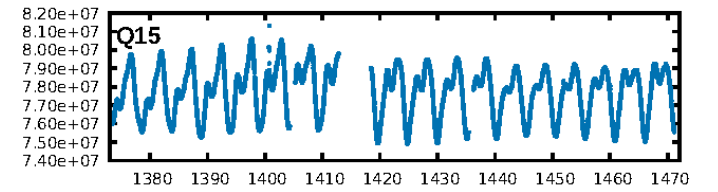
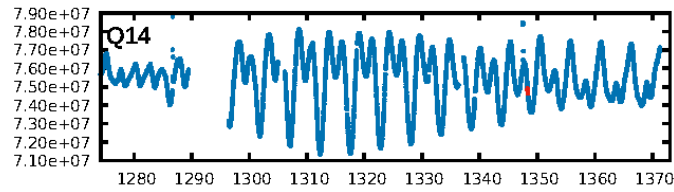
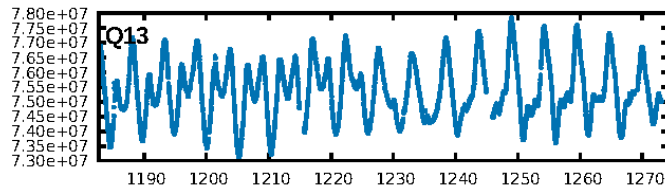
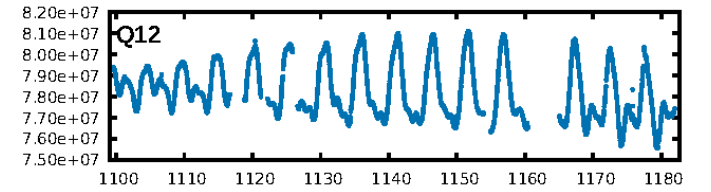
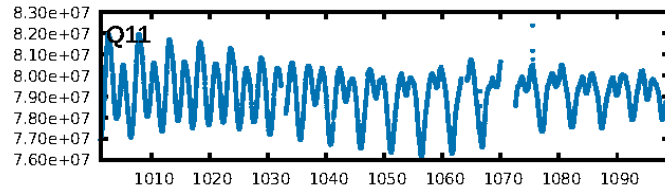
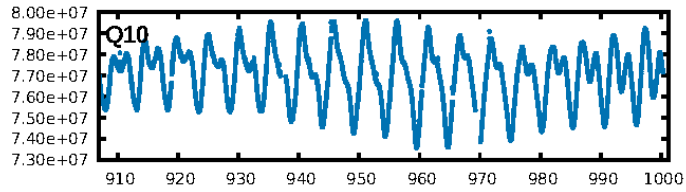
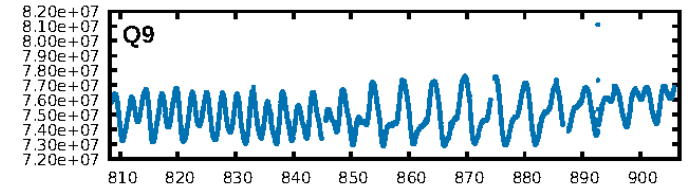
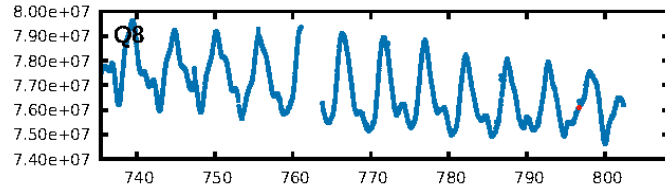
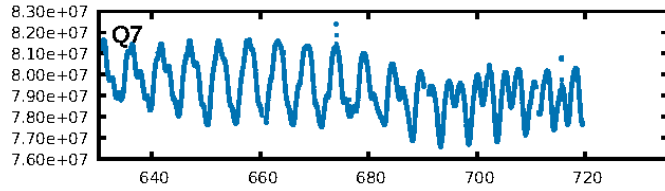
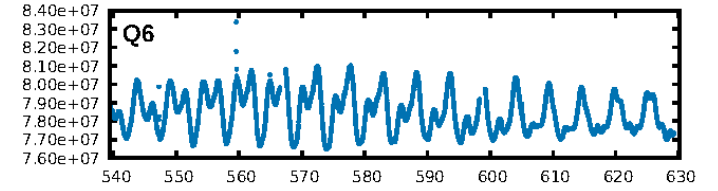
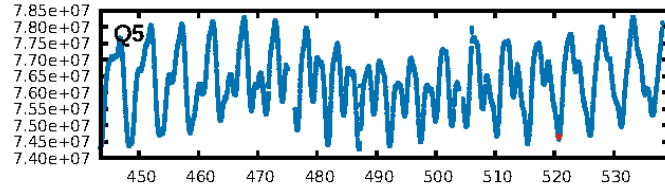
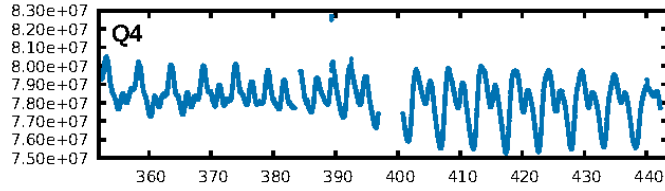
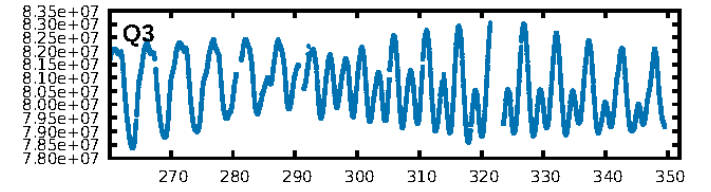
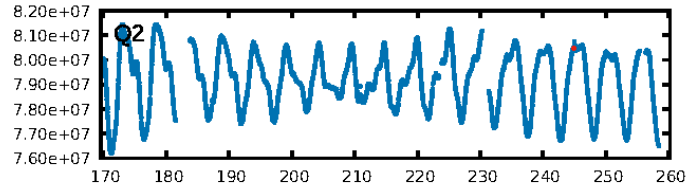
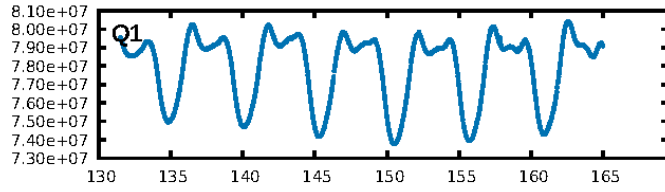
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [288.57σ]
ModelChiSquare2-sig: 64.2%
ModelChiSquareGof-sig: 98.5%
Bootstrap-pfa: 6.57e-11
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: 1.598
Centroid-sig: 7.7%
Centroid-so: 1.619 arcsec [1.05σ]
OotOffset-rm: 1.388 arcsec [1.89σ]
KicOffset-rm: 1.424 arcsec [1.94σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [2/2]

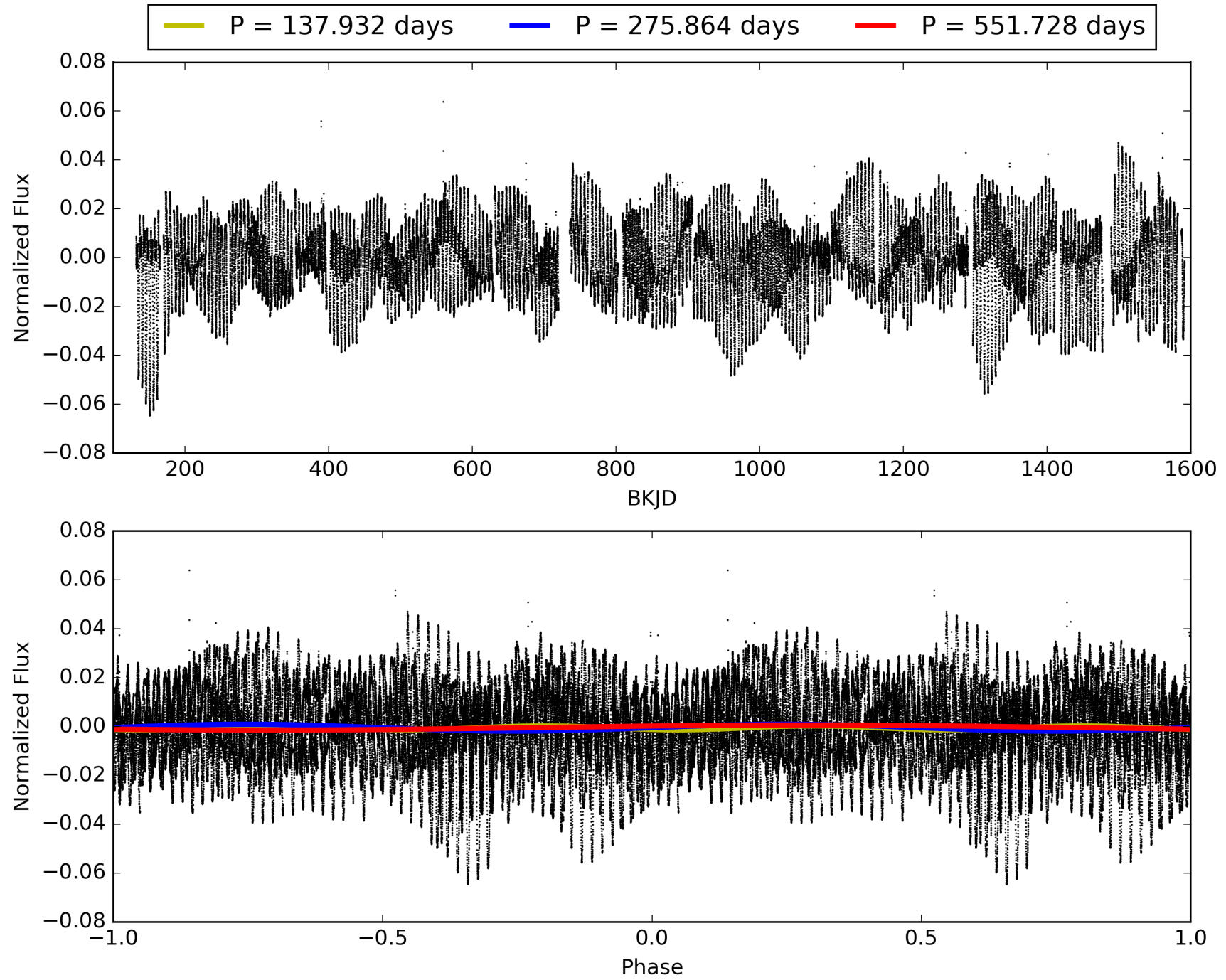
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:35:43 Z

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

TCE 009466312-03, PDC Light Curves

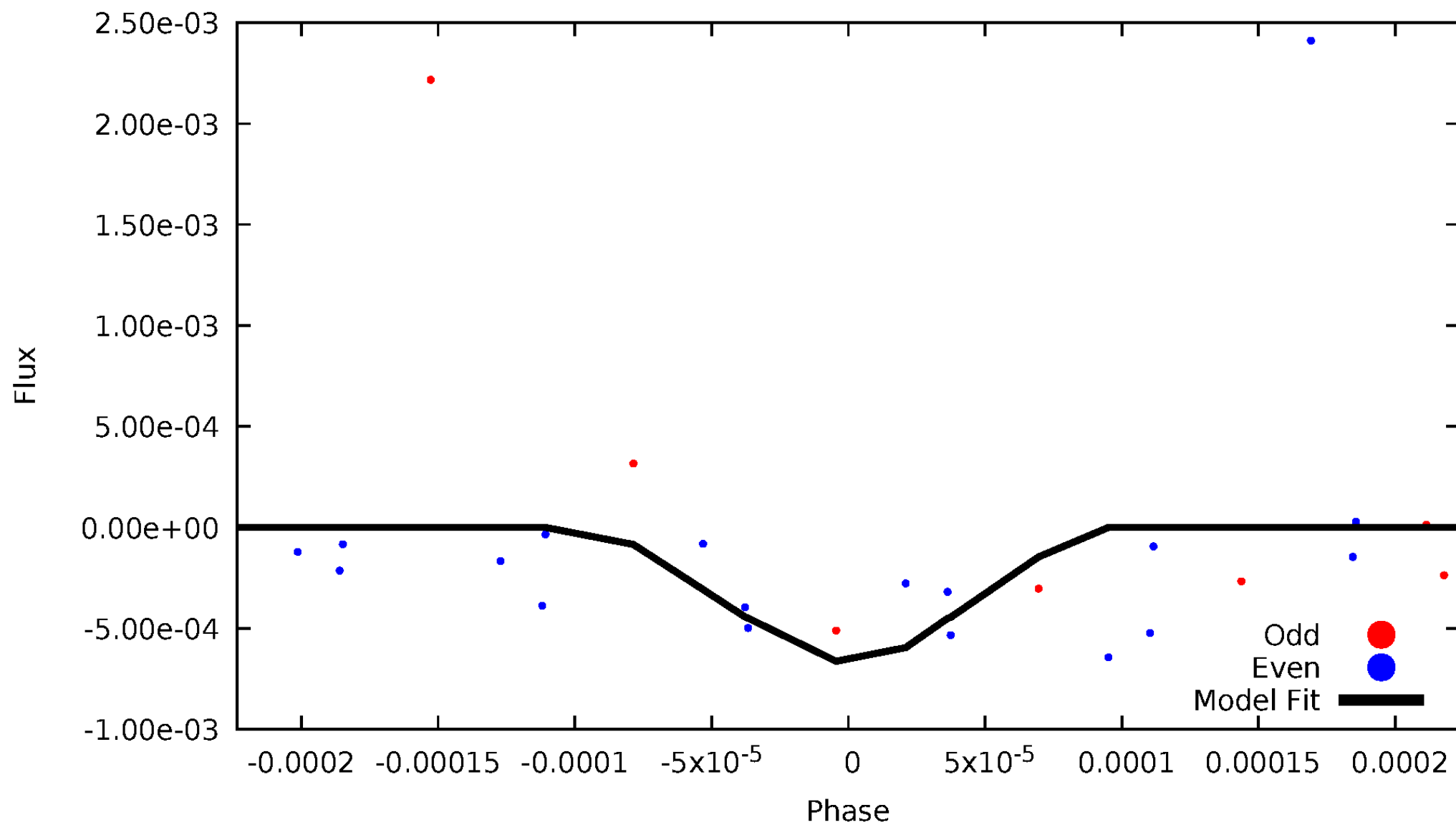


TCE 009466312-03



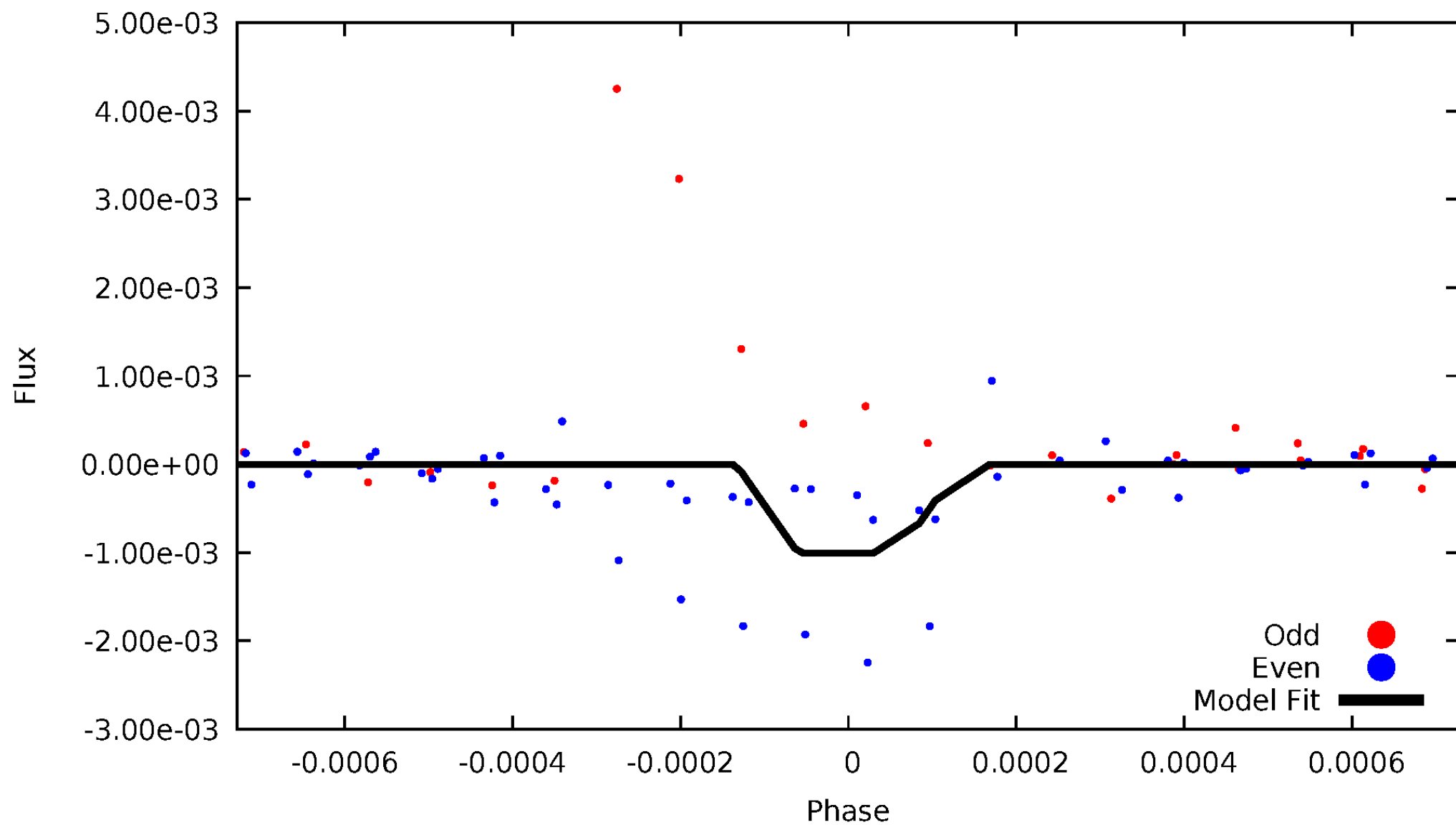
DV Odd/Even

TCE 009466312-03

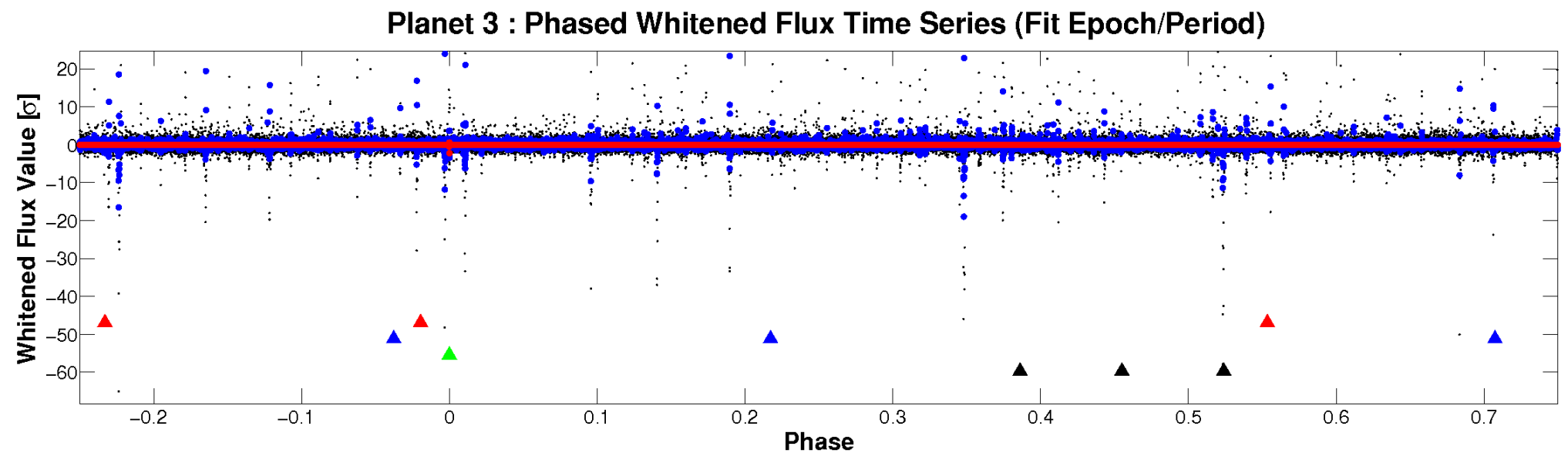
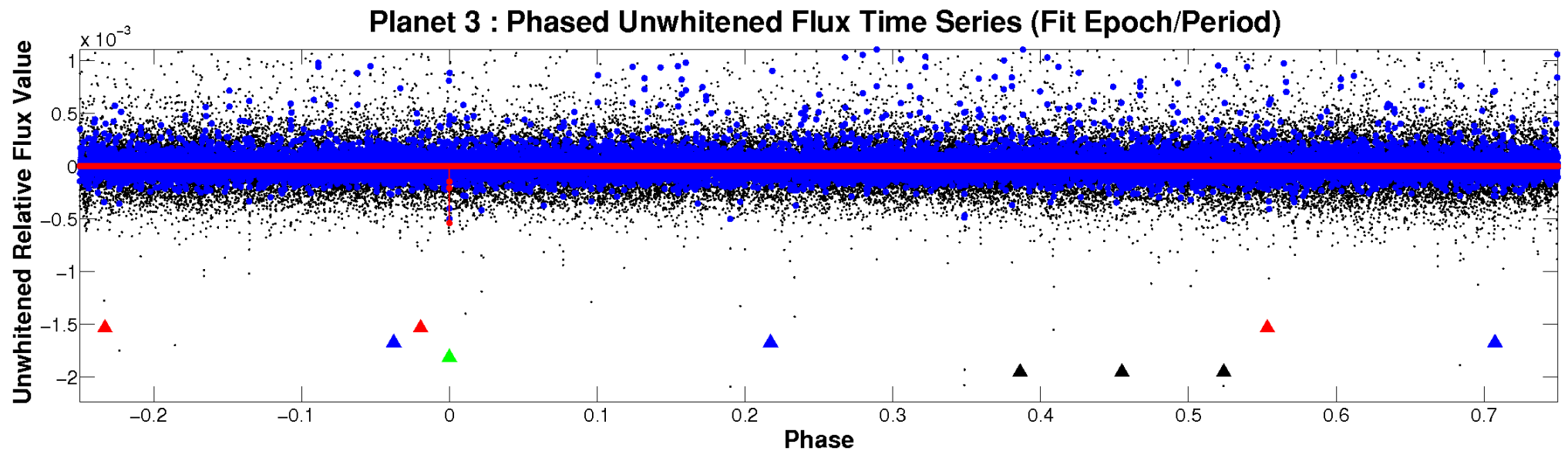


ALT Odd/Even

TCE 009466312-03

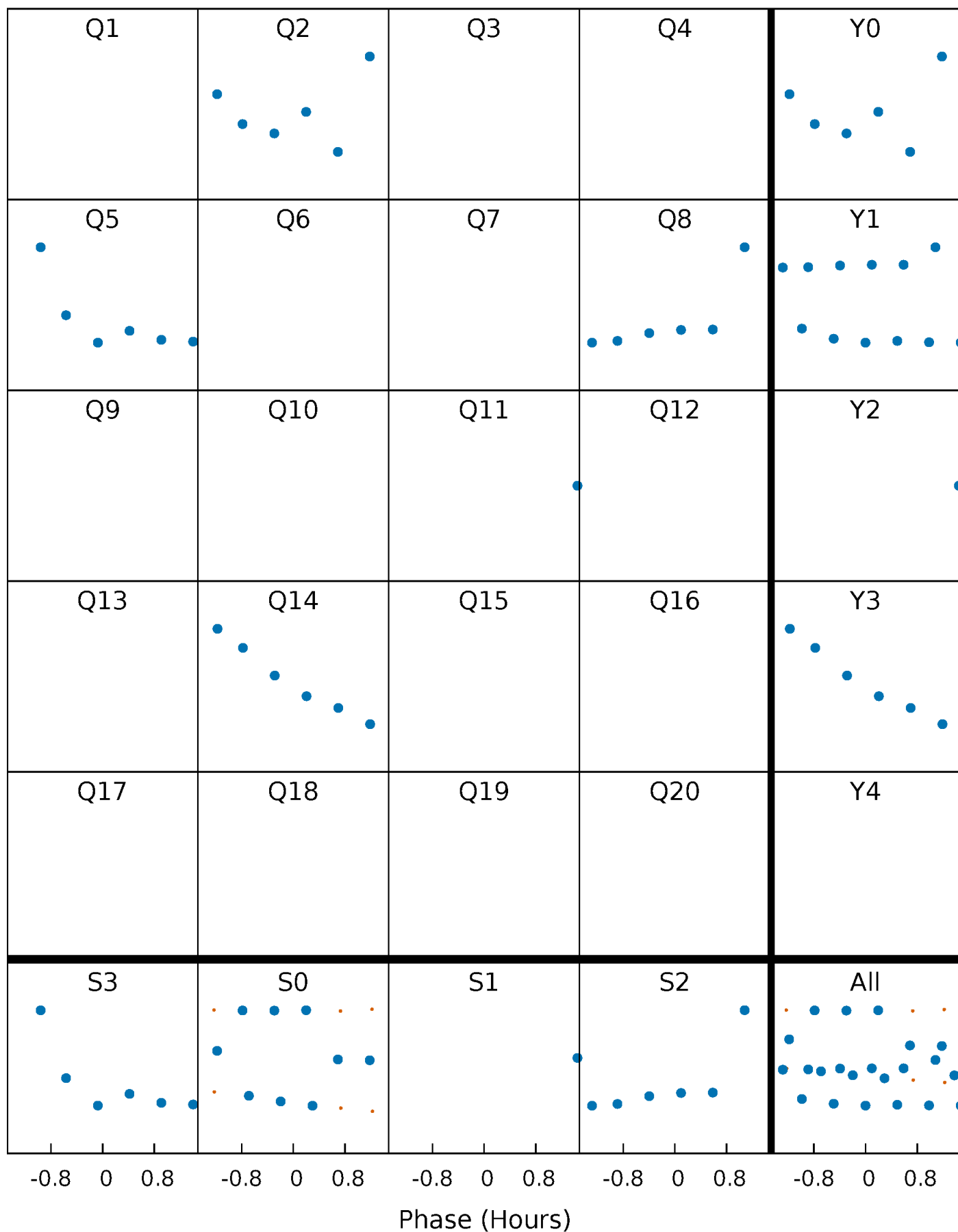


Non-Whitened Vs. Whitened Light Curve



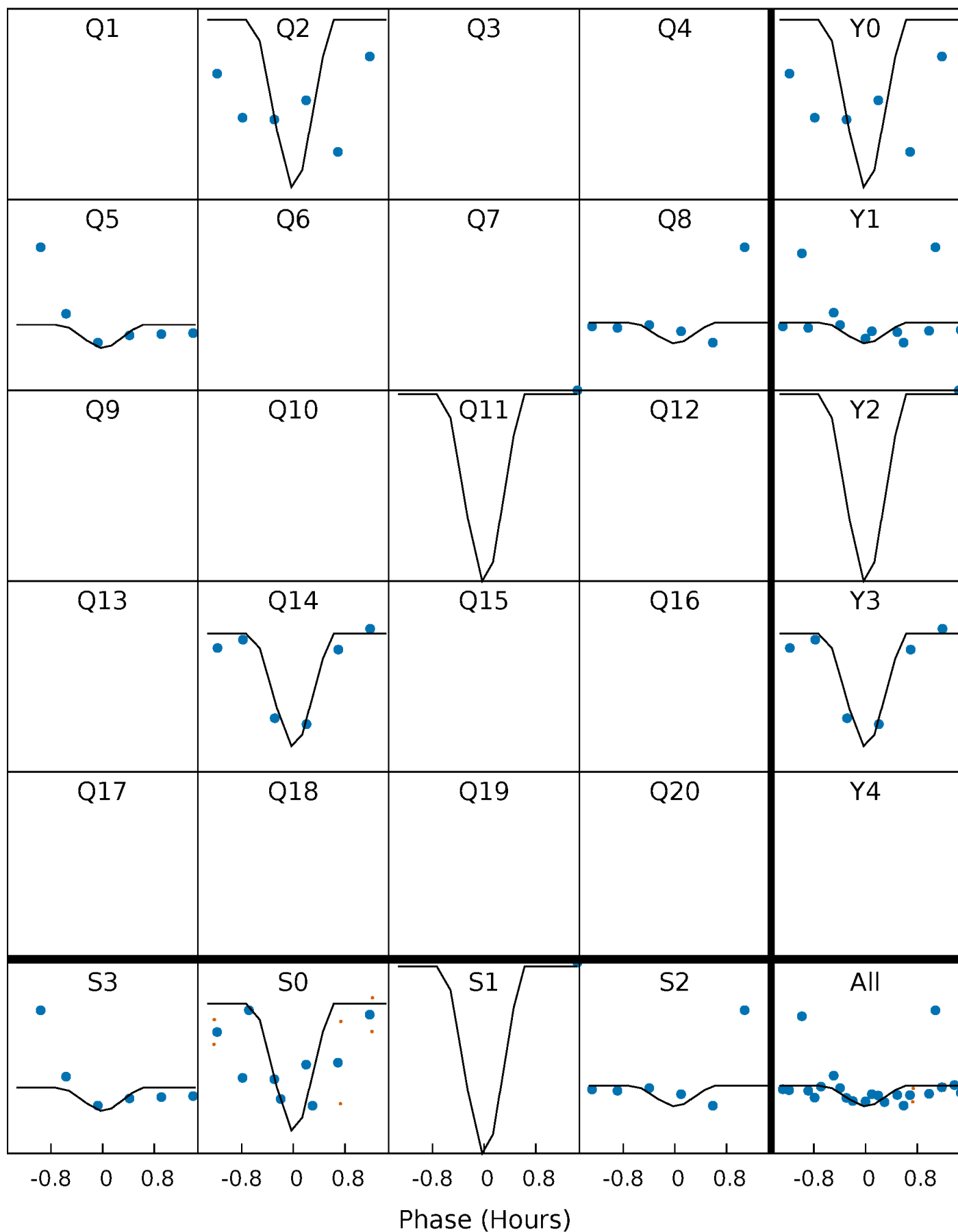
PDC Quarter-Phased Transit Curves

TCE 009466312-03 P=275.863765 Days $T_0=244.910372$ (BKJD)



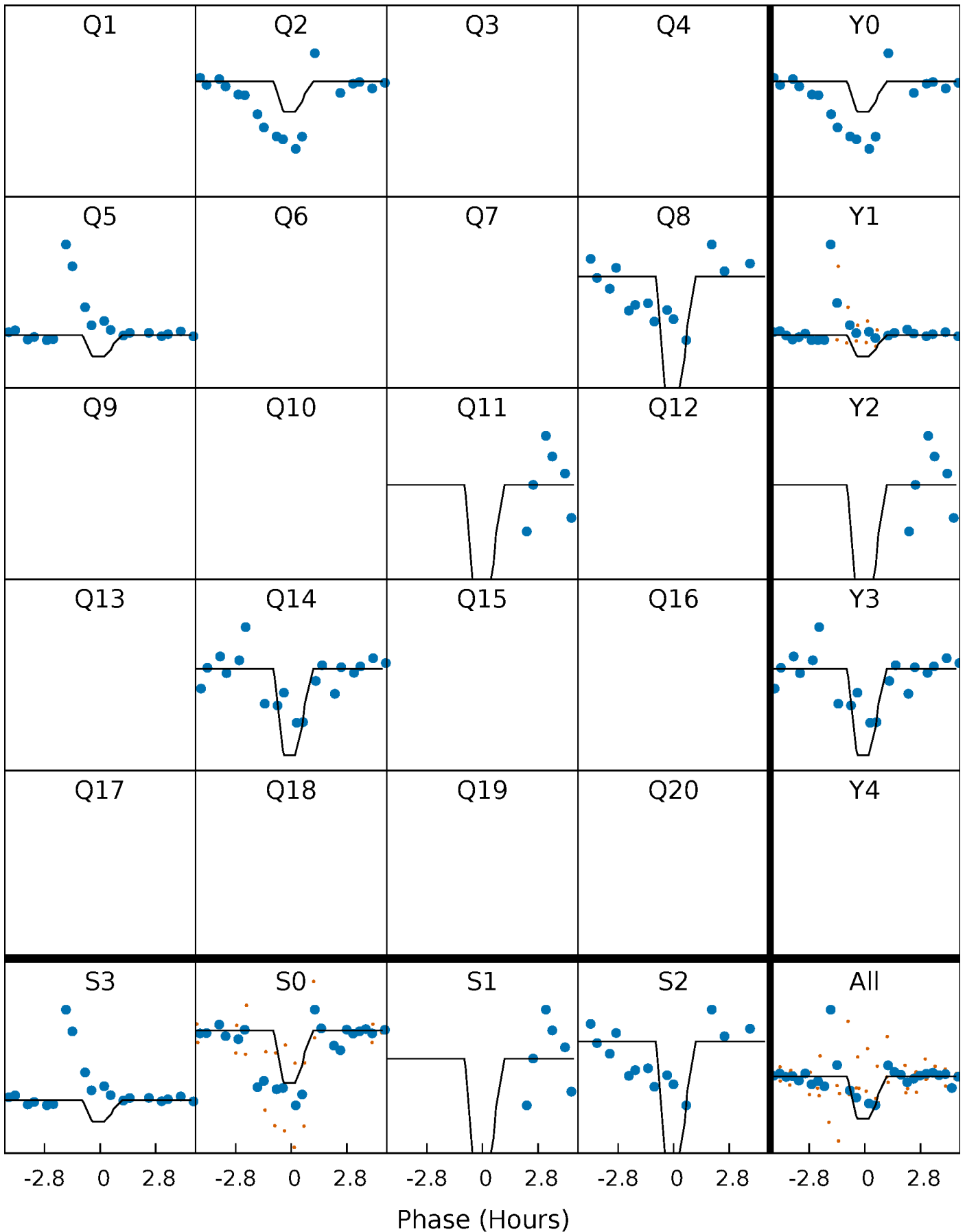
DV Quarter-Phased Transit Curves

TCE 009466312-03 $P=275.863765$ Days $T_0=244.910372$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

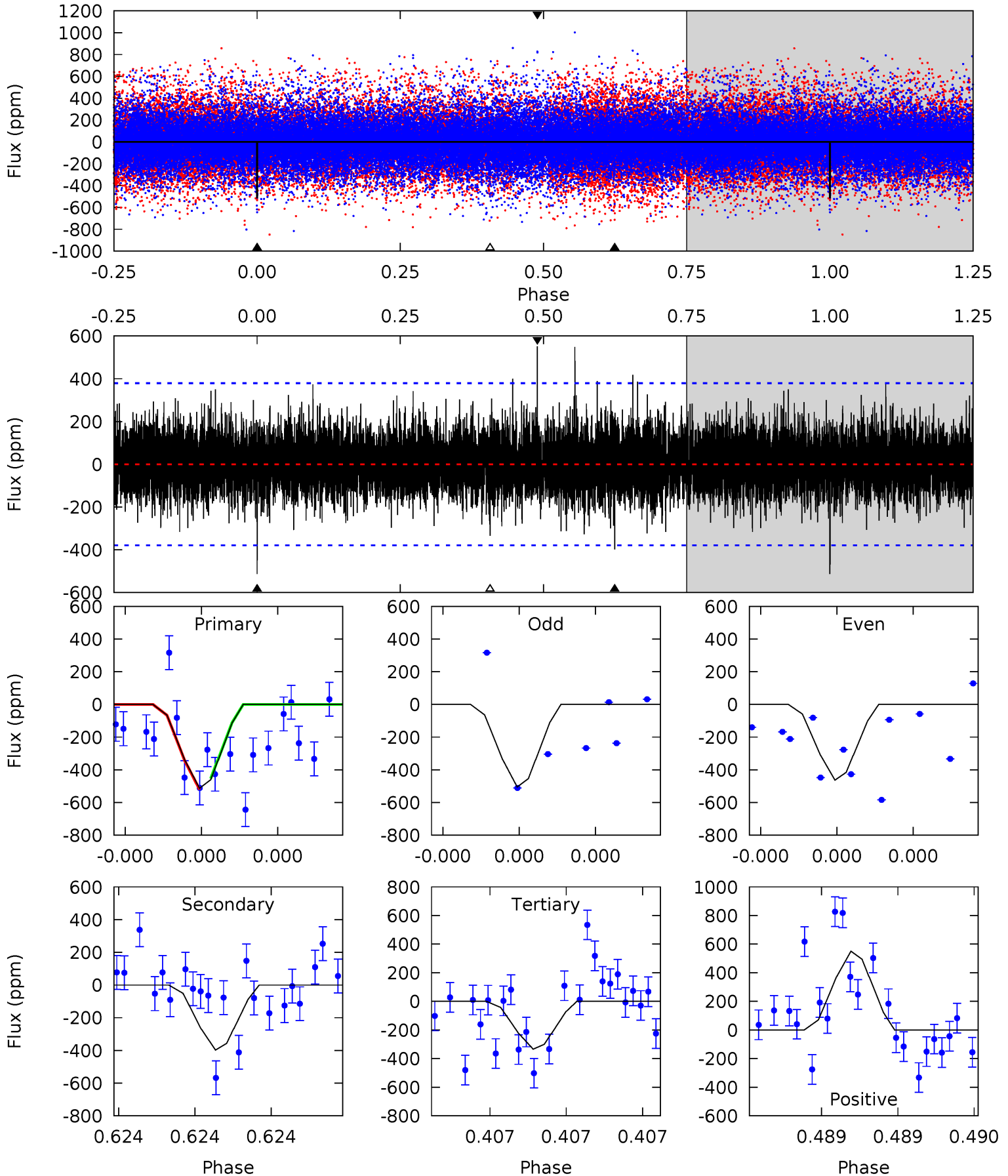
TCE 009466312-03 P=275.853166 Days $T_0=244.934515$ (BKJD)



DV Model-Shift Uniqueness Test

009466312-03, P = 275.863765 Days, E = 244.910372 Days

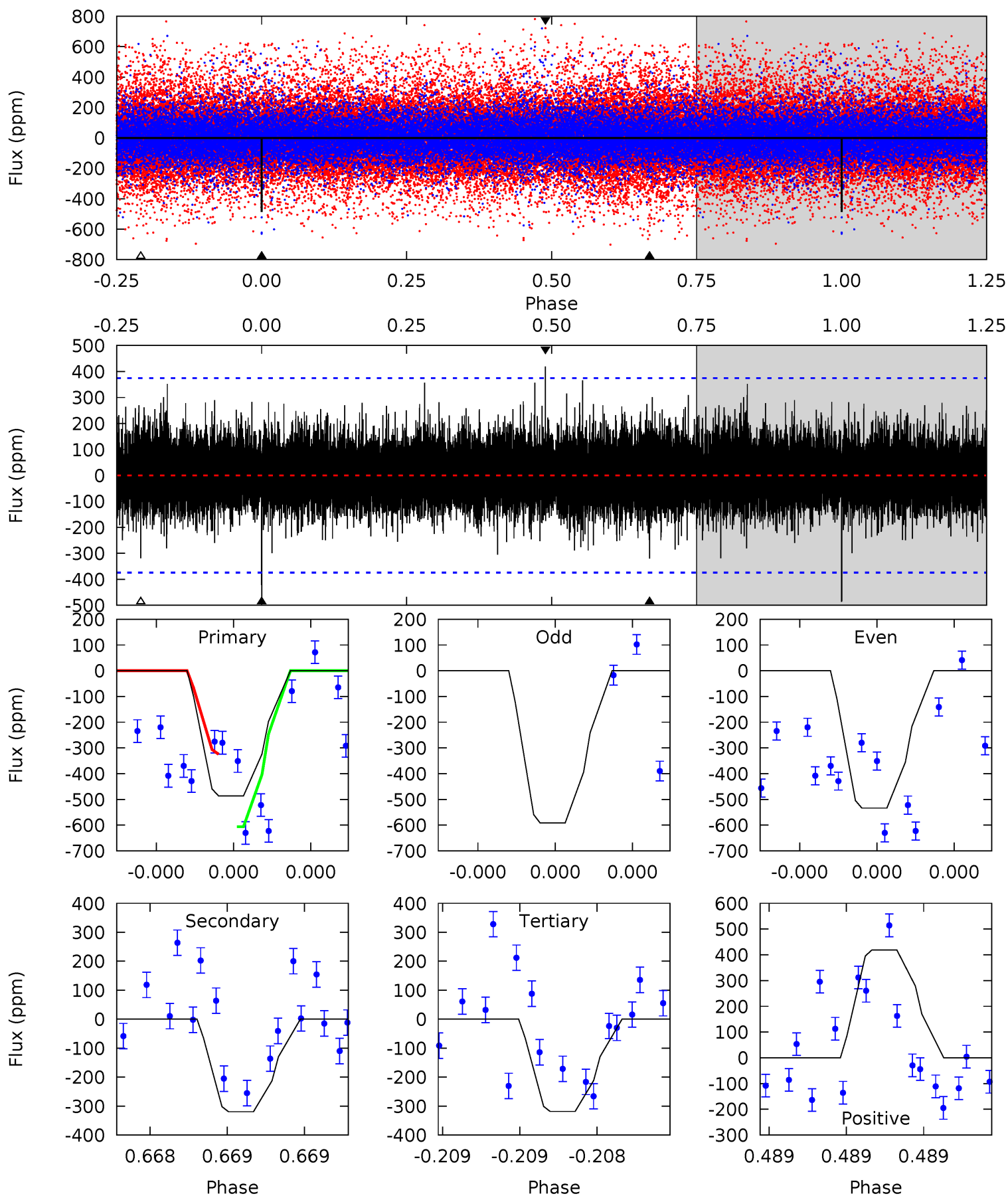
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.79	6.04	5.07	8.37	5.75	3.75	1.29	2.72	-0.58	0.97	-2.33	0.23	1.01	0.52	0.52



Alt Model-Shift Uniqueness Test

009466312-03, P = 275.853166 Days, E = 244.934515 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.41	4.87	4.85	6.38	5.71	3.68	1.12	2.56	1.03	0.01	-1.51	0.49	1.39	0.46	2.17



Stellar Parameters For KIC 009466312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5229^{+156}_{-140}	$4.564^{+0.070}_{-0.056}$	$-0.480^{+0.300}_{-0.300}$	$0.724^{+0.082}_{-0.074}$	$0.700^{+0.093}_{-0.043}$	$2.597^{+0.833}_{-0.528}$
	+3%/-3%	+2%/-1%	+62%/-62%	+11%/-10%	+13%/-6%	+32%/-20%
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 009466312-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-398 ± 66	$57.69^{+67.00}_{-39.37}$	319^{+12}_{-12}	1874^{+554}_{-244}	35^{+316}_{-28}
Alt.	-319 ± 66	$55.06^{+70.69}_{-39.67}$	318^{+14}_{-12}	1849^{+594}_{-255}	31^{+367}_{-24}

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

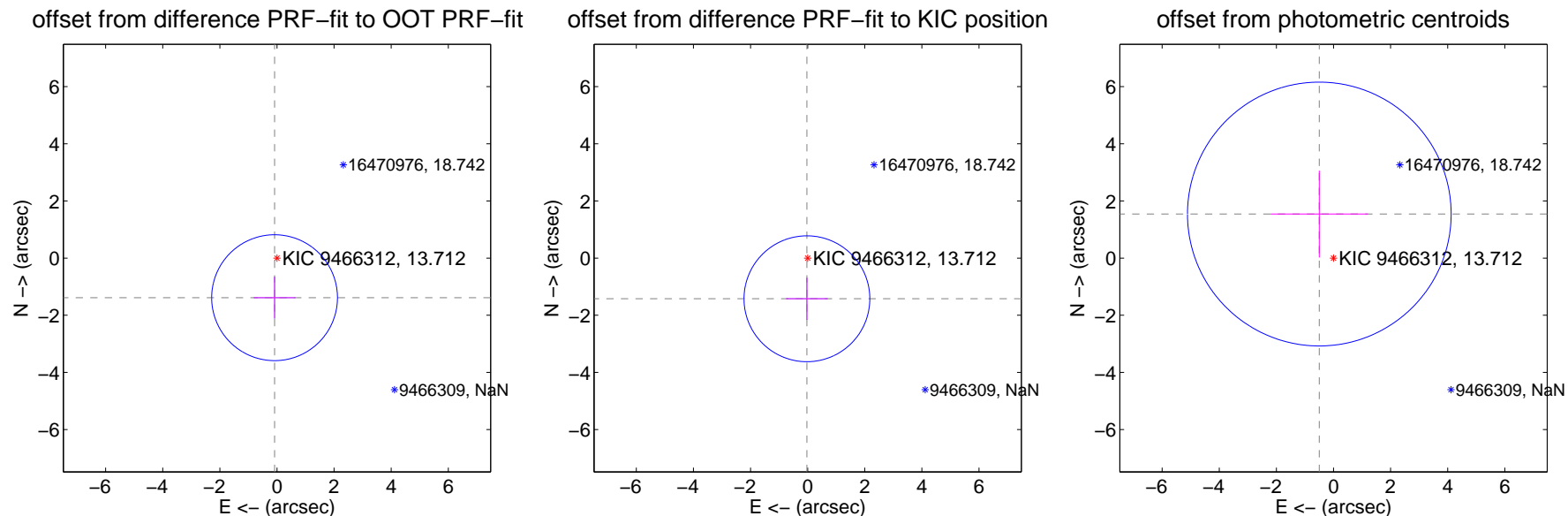
DV Centroid Data

Supplemental centroid analysis for 009466312-03. Kepler magnitude: 13.71. Transit SNR 5.32

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.388 ± 0.734	1.89	0.084 ± 0.729	-1.386 ± 0.734
PRF-fit source offset from KIC position	1.424 ± 0.734	1.94	0.026 ± 0.729	-1.424 ± 0.734
photometric centroid source offset	1.62 ± 1.54	1.05	0.50 ± 1.70	1.54 ± 1.52

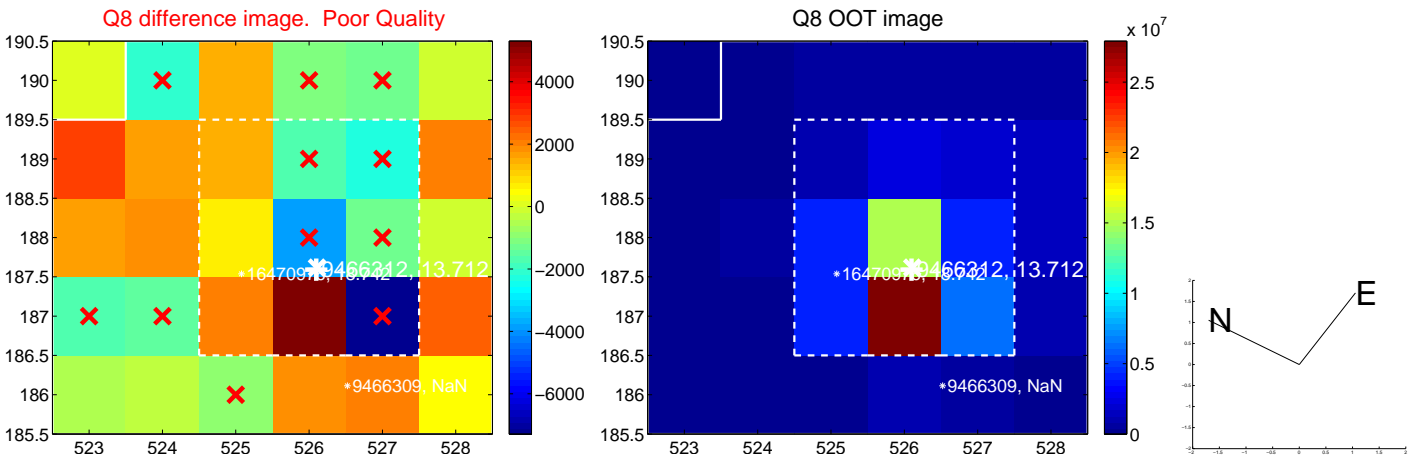
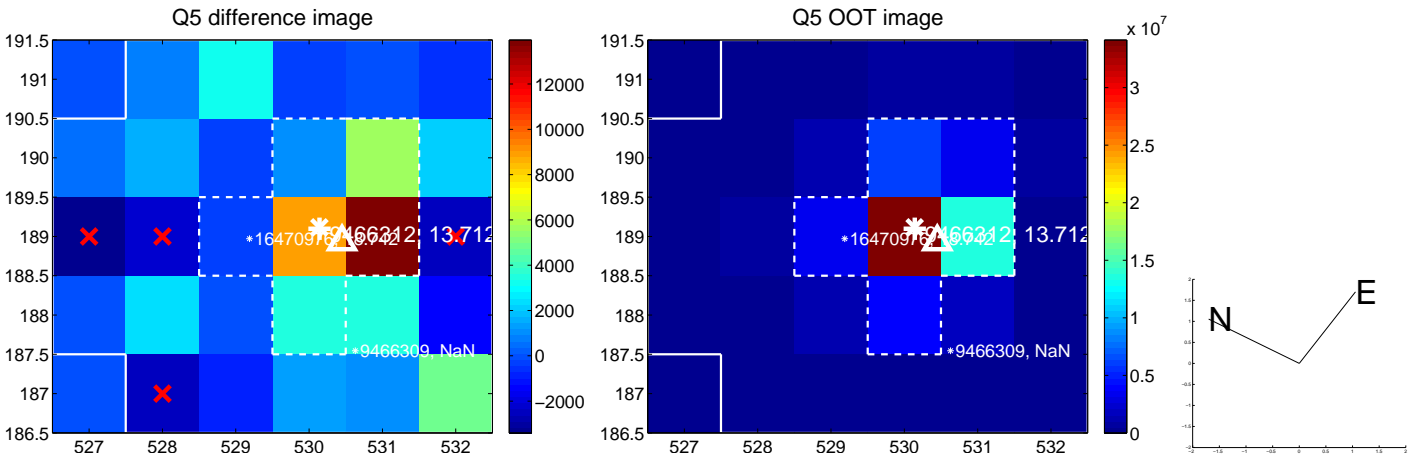


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



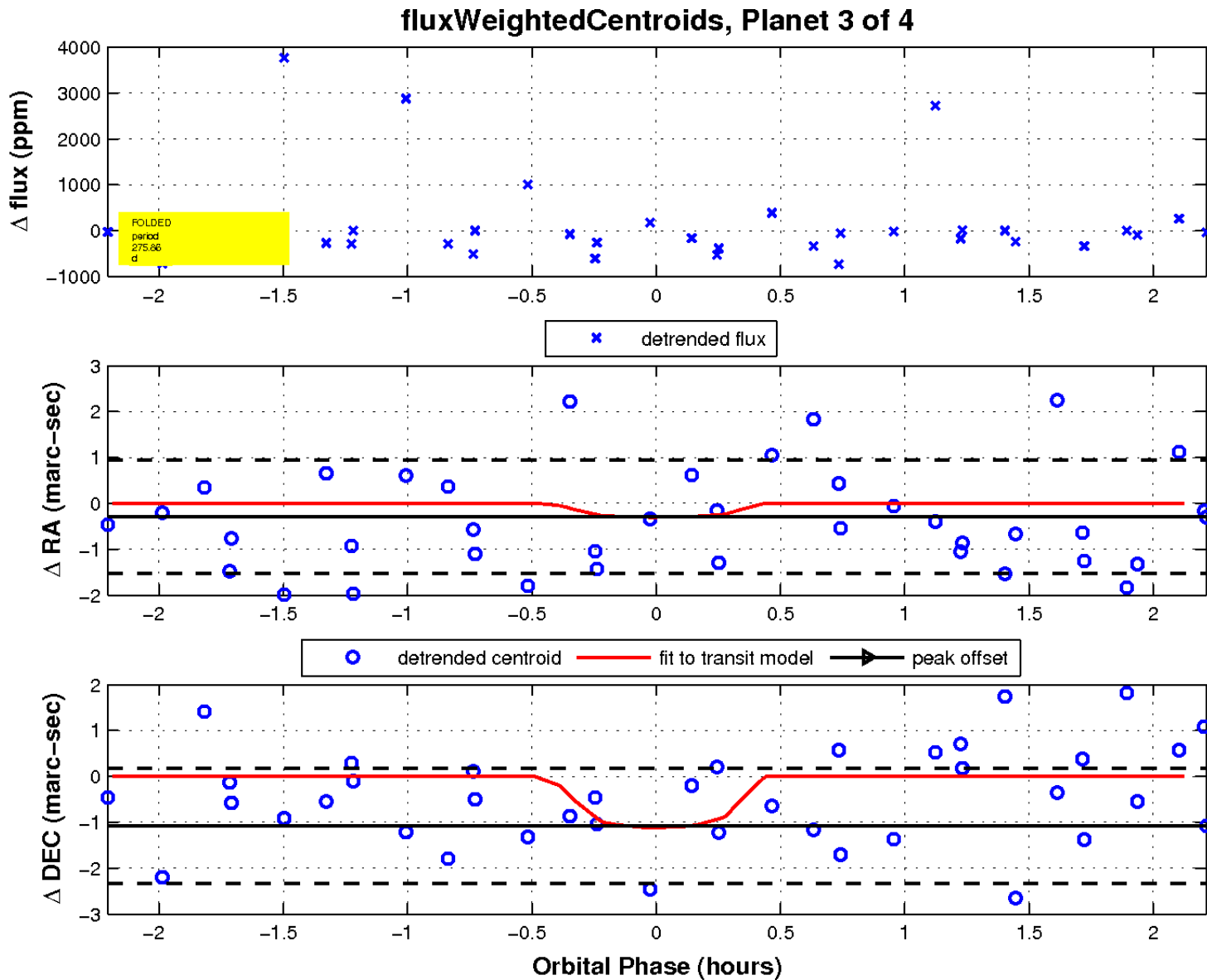
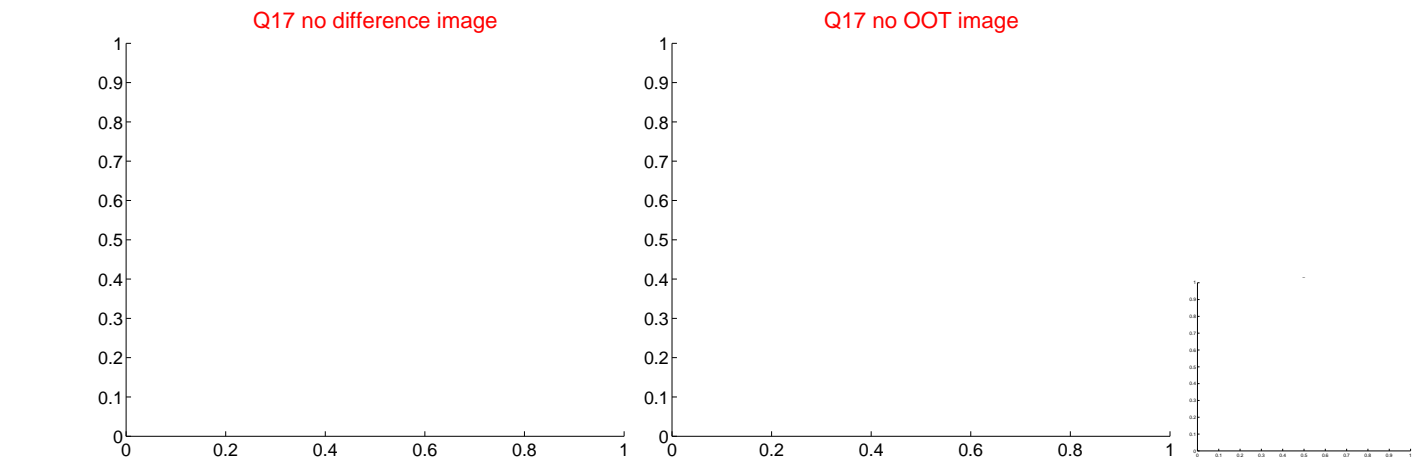
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

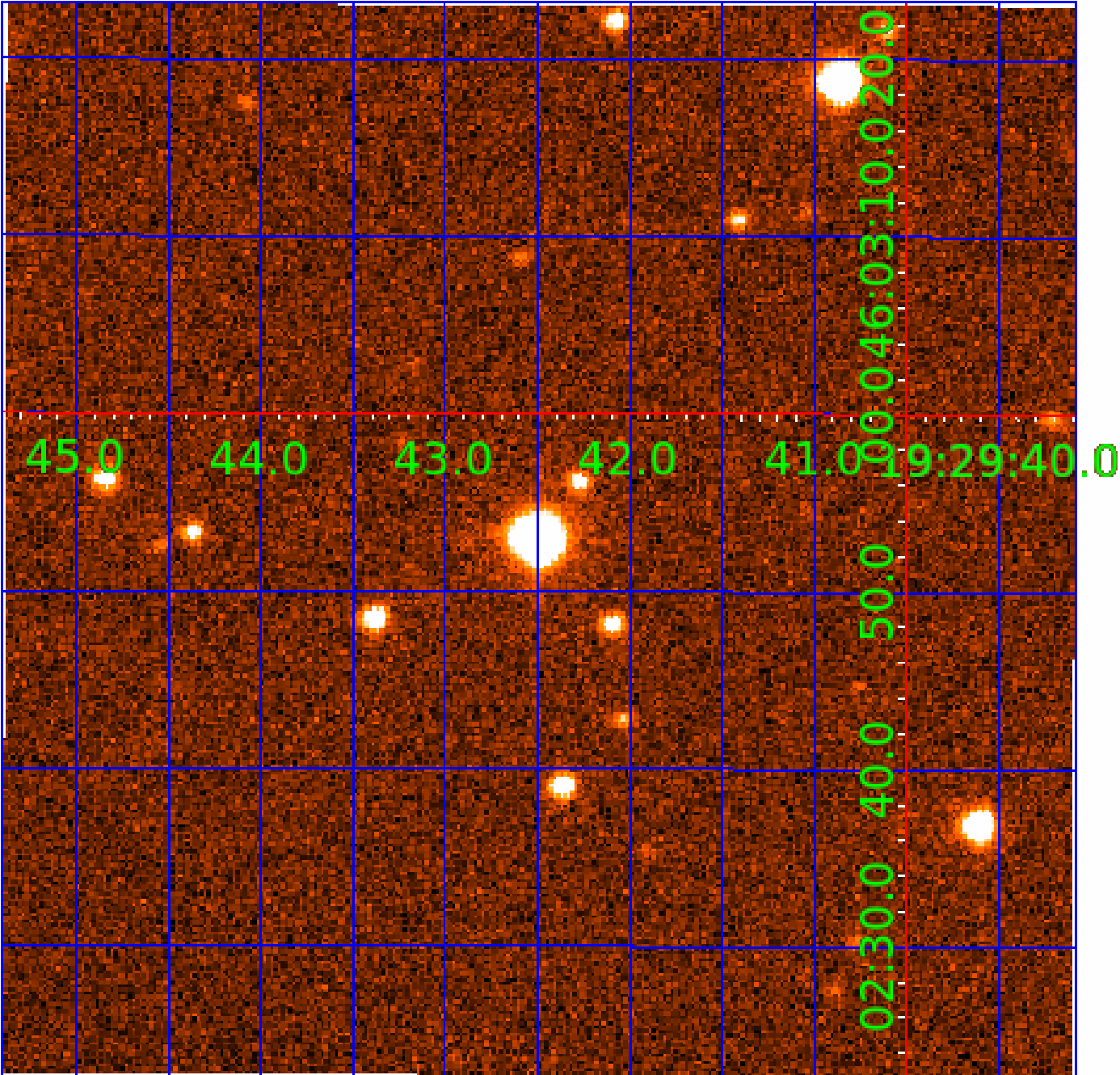


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009466312

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})
009466312-01	OBS	No	492.813975	515.409669	835.3	5.354	15.7	5.7	0.72	5229	2.12	0.30
009466312-02	OBS	No	481.397767	304.858313	1809.4	17.078	14.1	7.3	0.72	5229	3.02	0.31
009466312-03	OBS	No	275.863765	244.910372	663.4	0.740	12.6	5.3	0.72	5229	1.87	0.65
009466312-04	OBS	No	532.724498	389.445988	1059.6	5.372	11.7	7.1	0.72	5229	2.31	0.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009466312-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009466312-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009466312-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

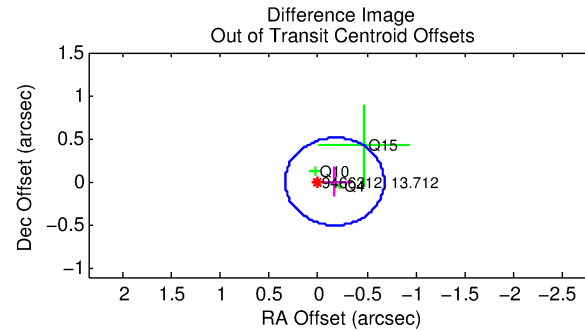
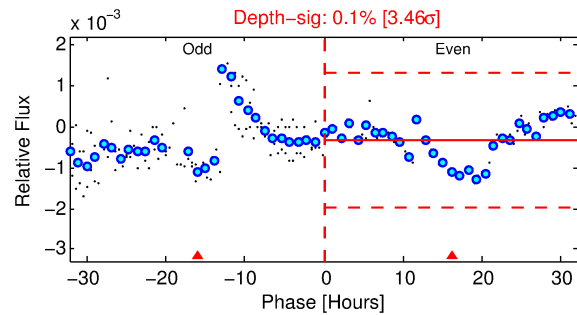
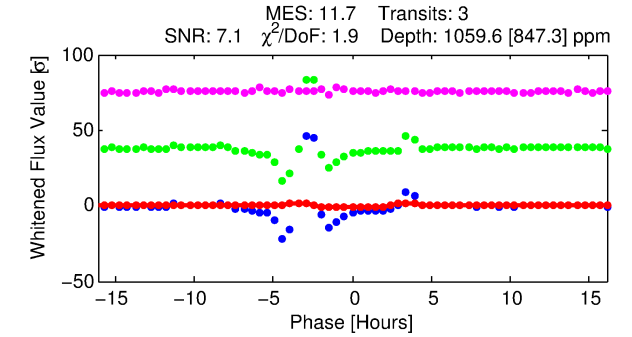
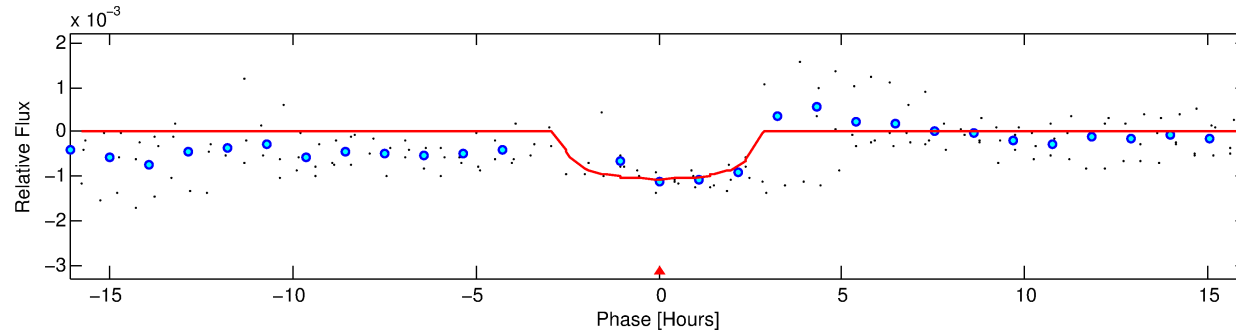
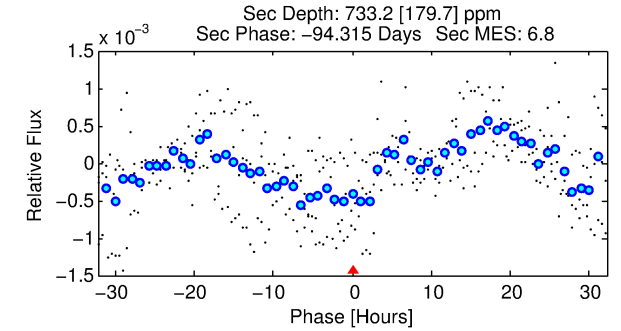
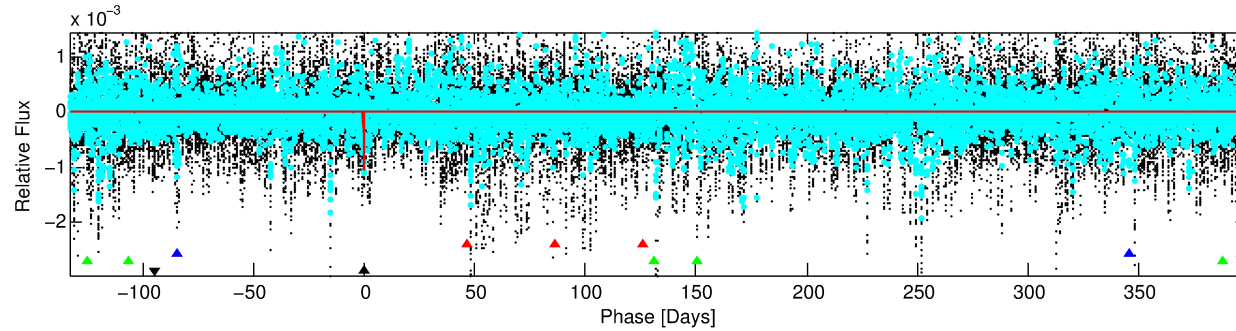
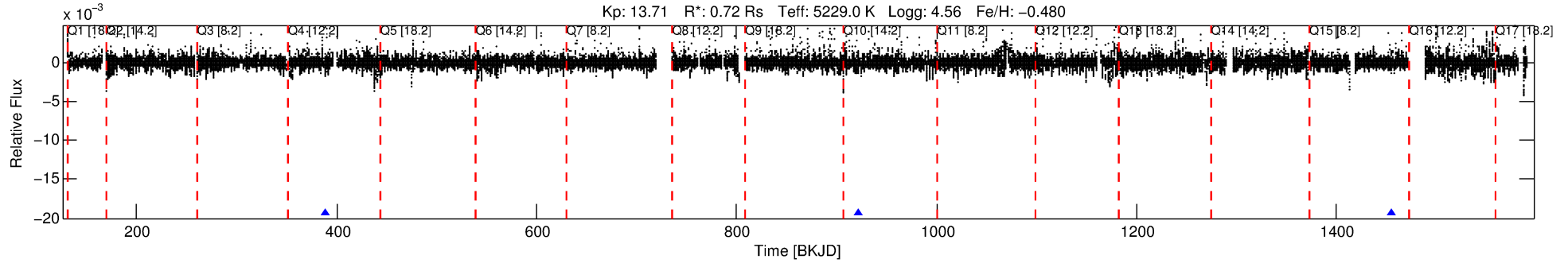
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009466312-04

No Significant Match Found

DV One-Page Summary

KIC: 9466312 Candidate: 4 of 4 Period: 532.724 d



DV Fit Results:

Period = 532.72450 [0.02188] d
Epoch = 389.4460 [0.0296] BKJD
Rp/R* = 0.0293 [0.2227]
a/R* = 779.59 [23219.24]
b = 0.02 [1495.61]
Seff = 0.27 [0.05]
Teq = 184 [8] K
Rp = 2.31 [17.59] Re
a = 1.1425 [0.1059] AU
Ag = 98580.80 [1501040.09] [0.07]
Teffp = 5031 [19151] K [0.25 σ]

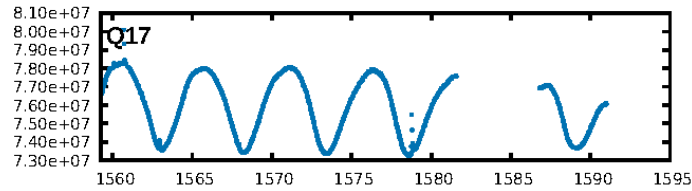
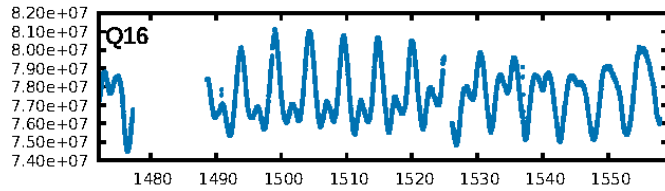
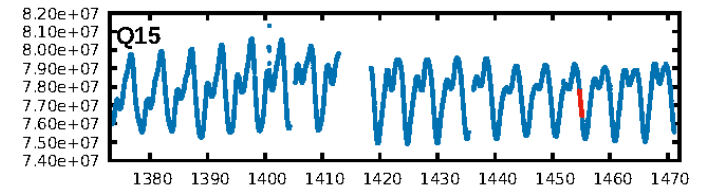
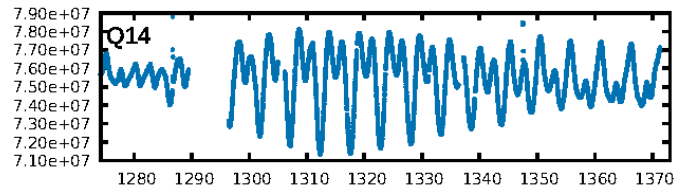
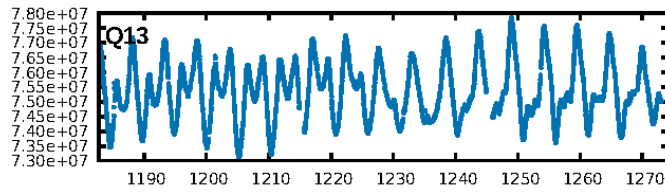
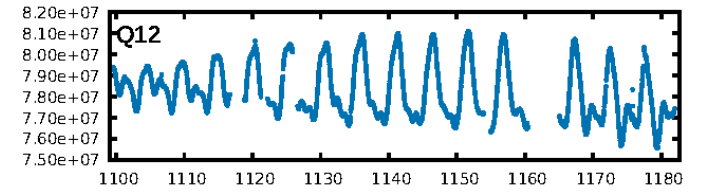
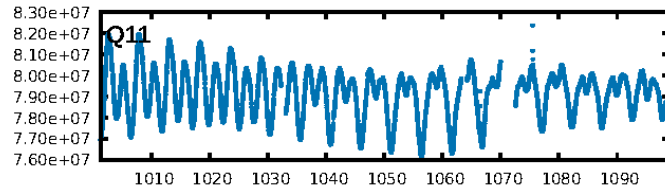
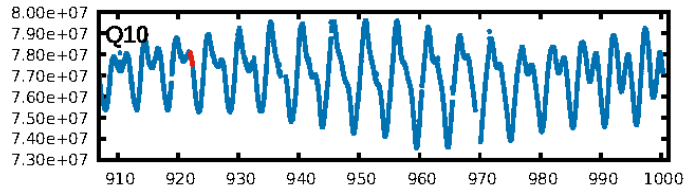
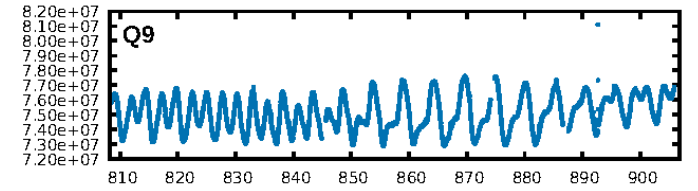
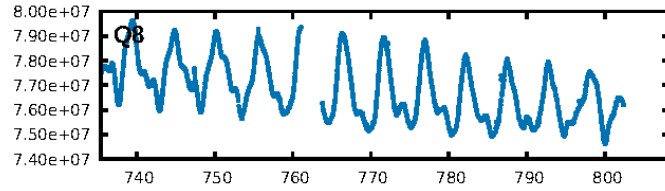
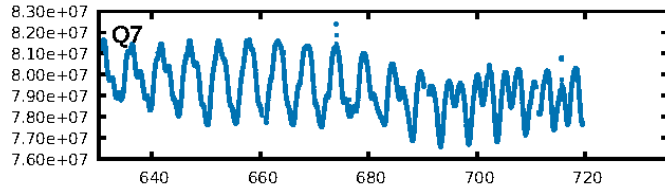
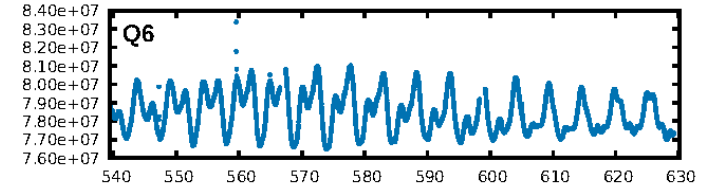
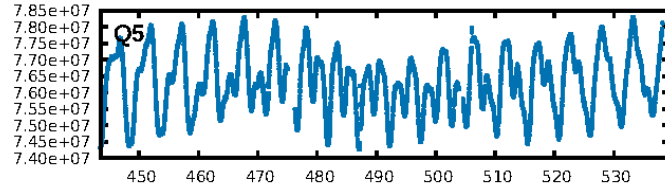
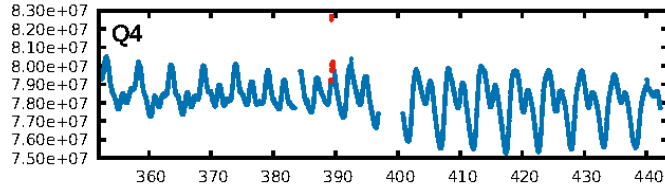
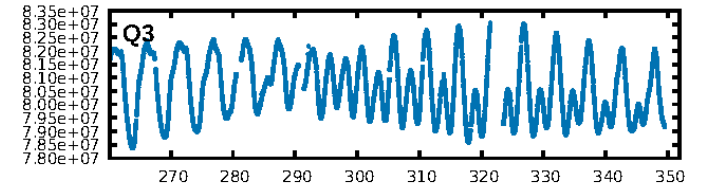
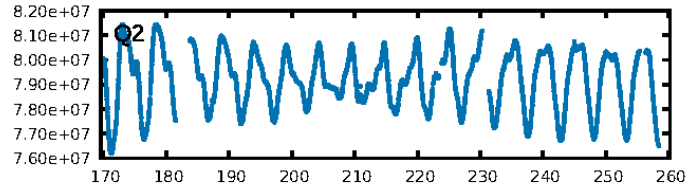
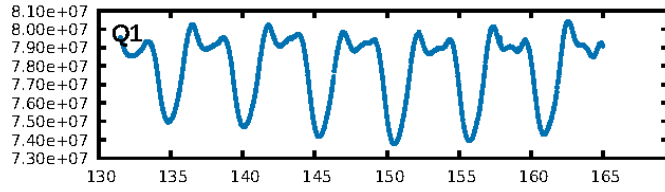
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [126.29 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 82.5%
Bootstrap-pfa: 2.64e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.3703
Centroid-sig: 82.9%
Centroid-so: 0.209 arcsec [0.31 σ]
OotOffset-rm: 0.168 arcsec [1.00 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.186 arcsec [1.08 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

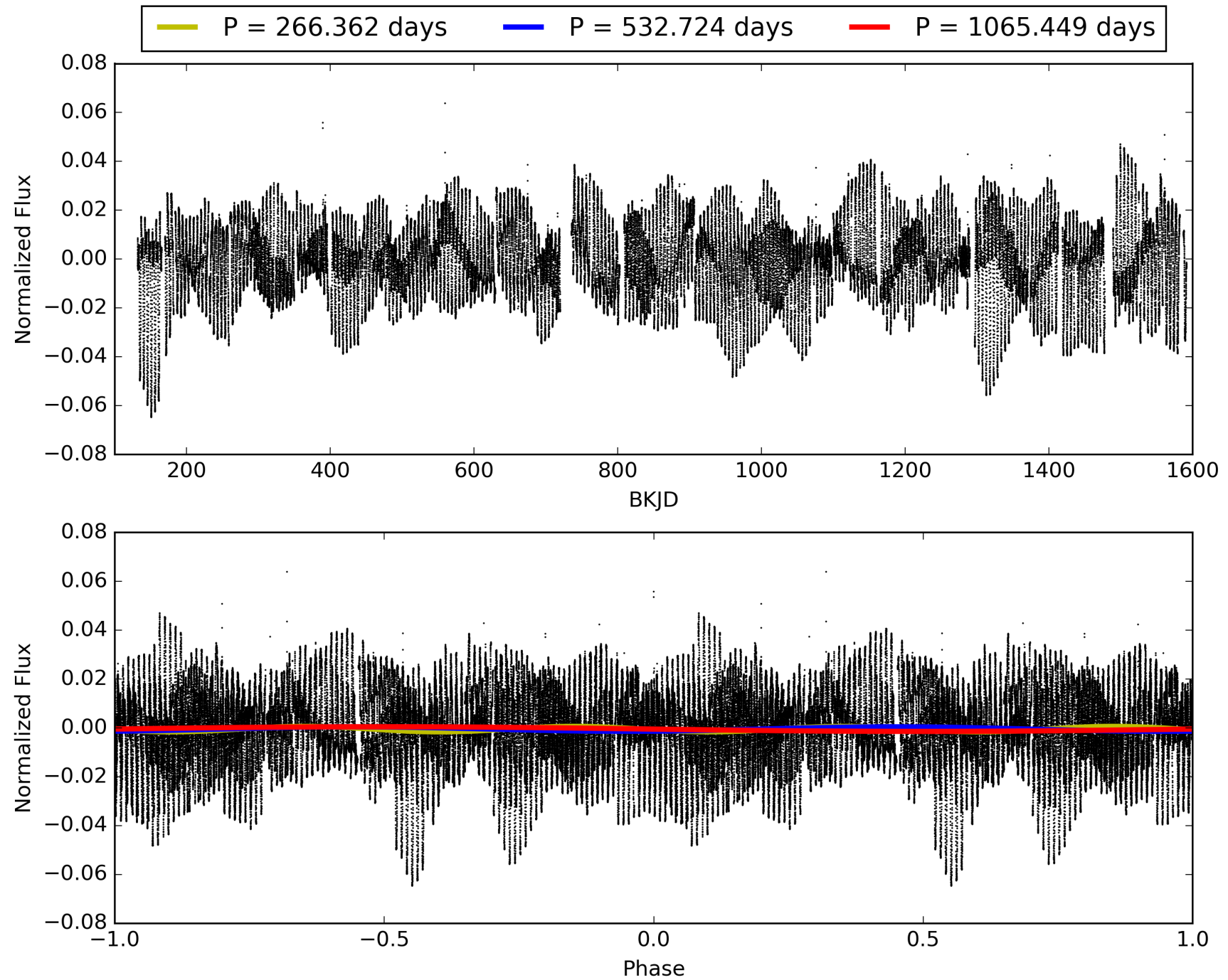
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:35:59 Z

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

TCE 009466312-04, PDC Light Curves

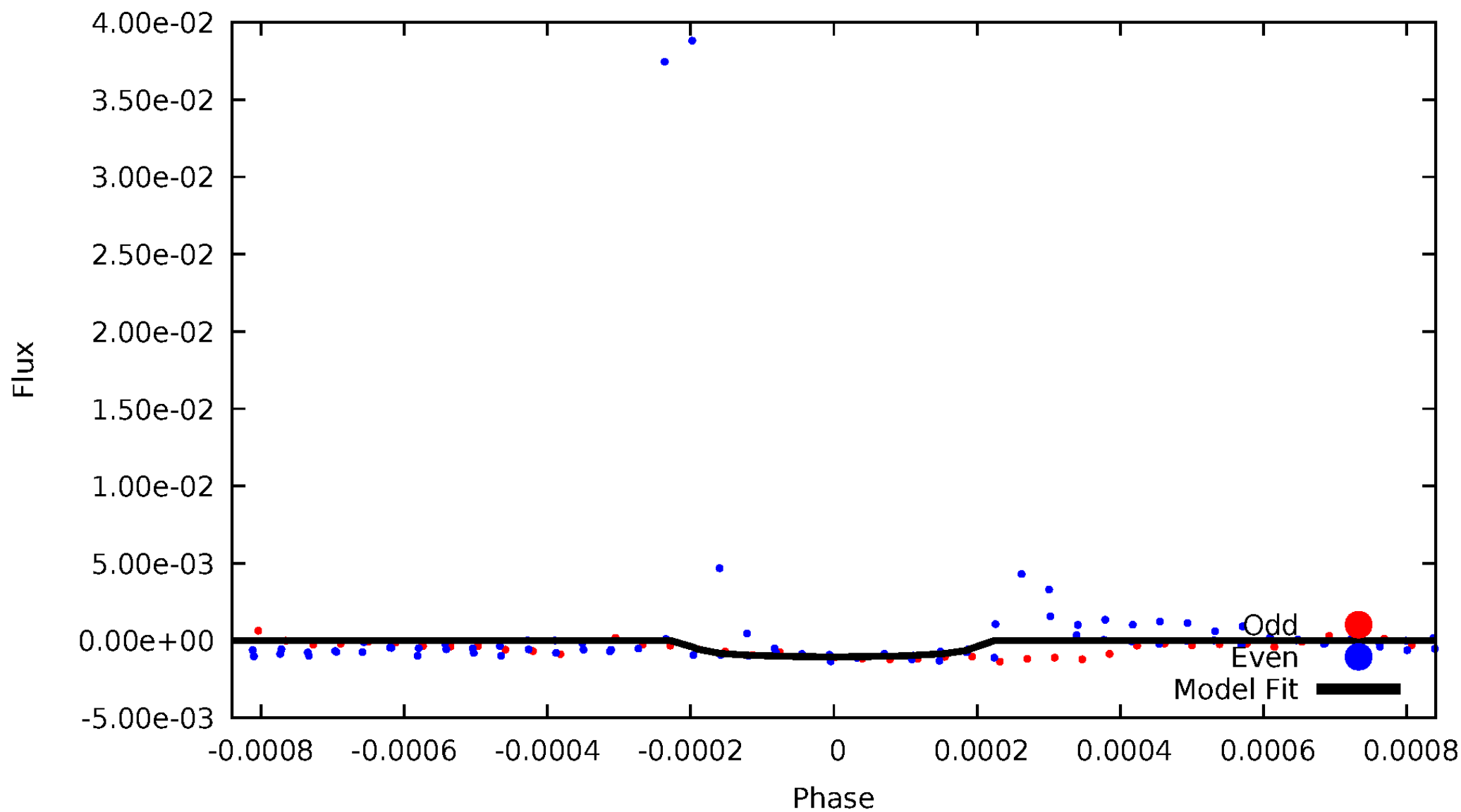


TCE 009466312-04



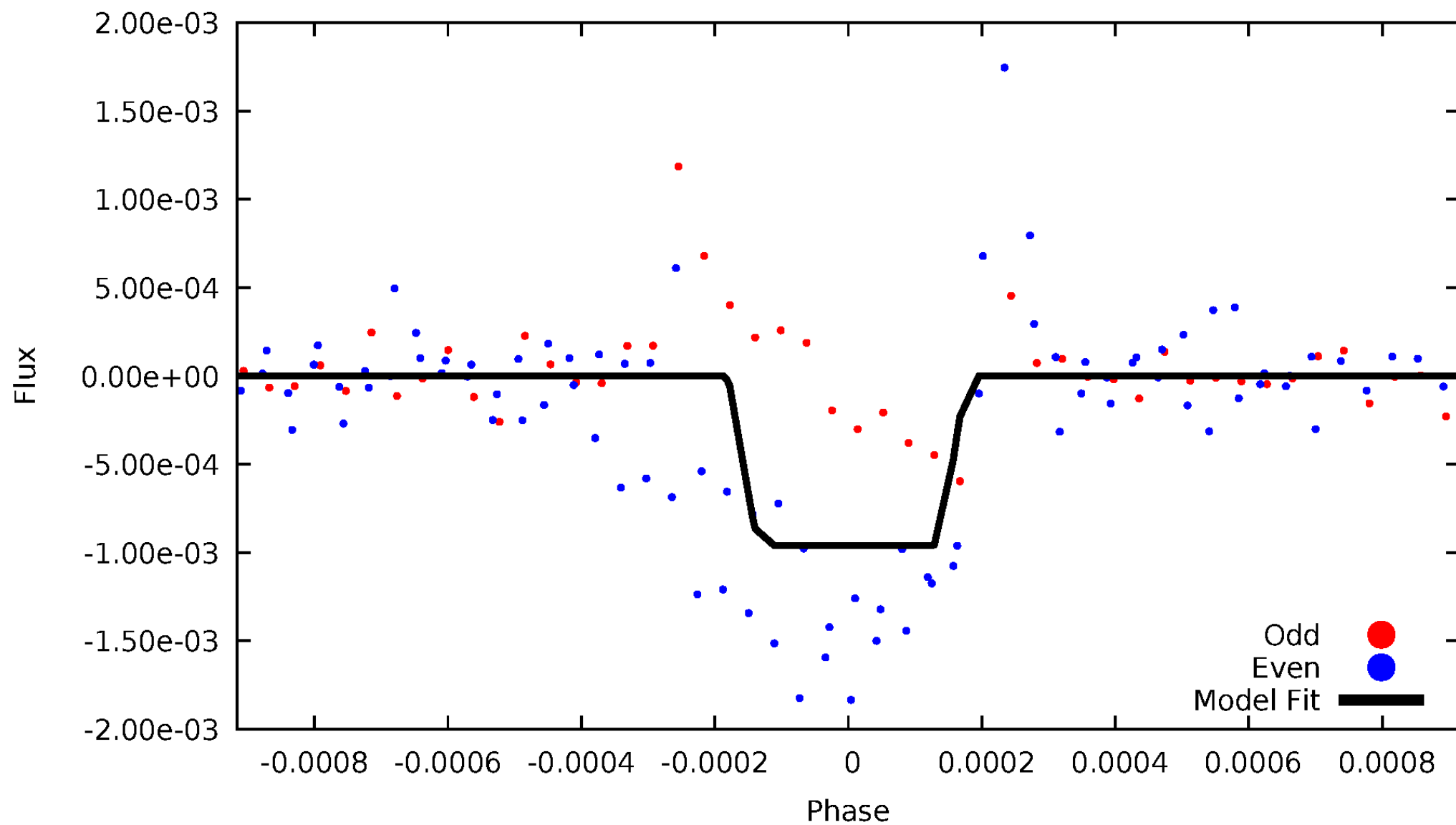
DV Odd/Even

TCE 009466312-04



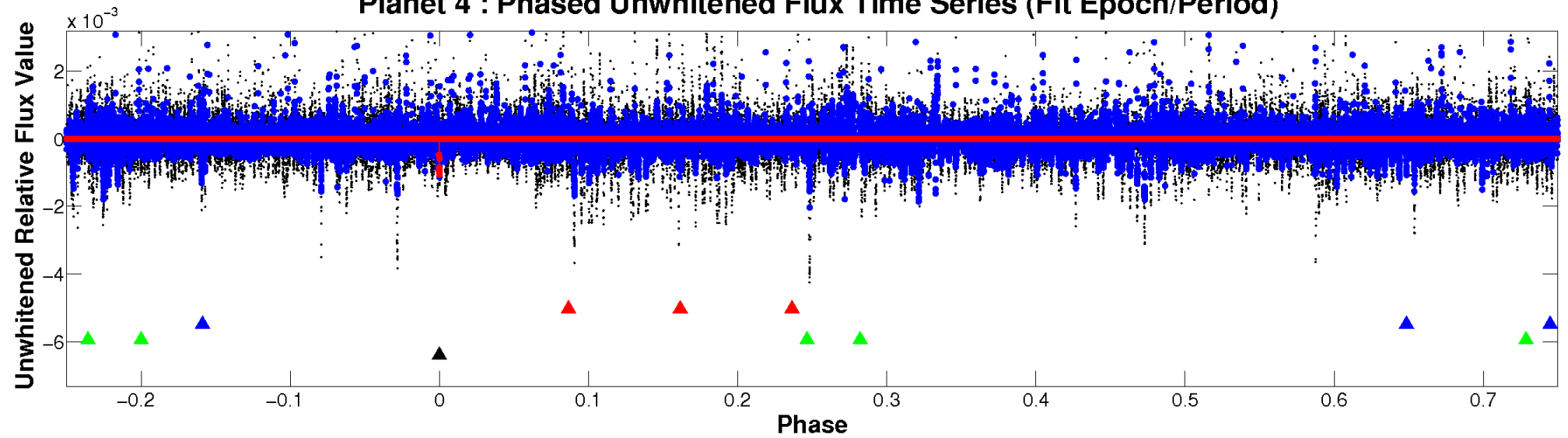
ALT Odd/Even

TCE 009466312-04

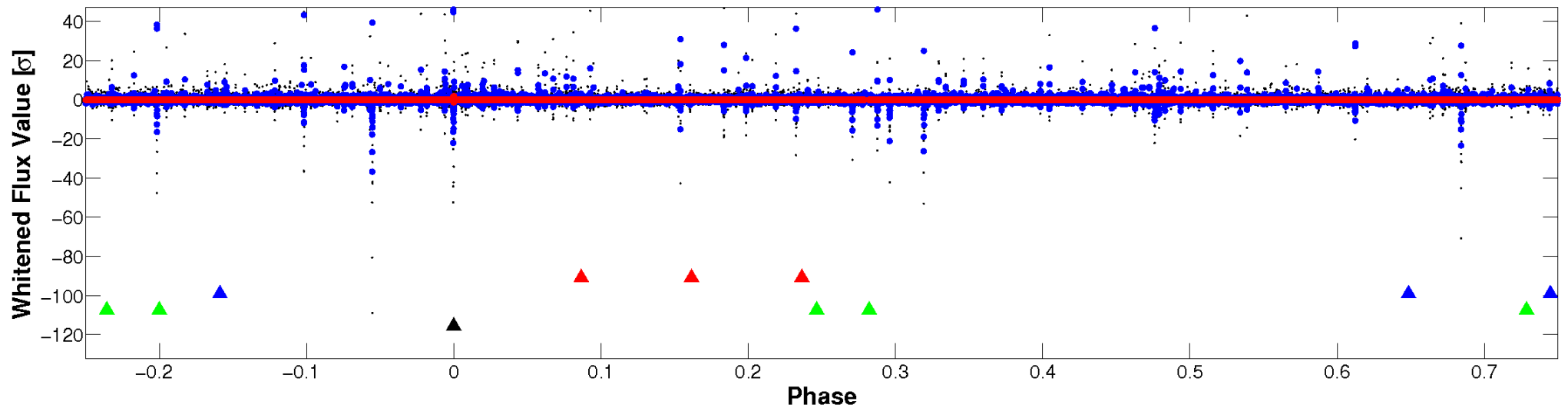


Non-Whitened Vs. Whitened Light Curve

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

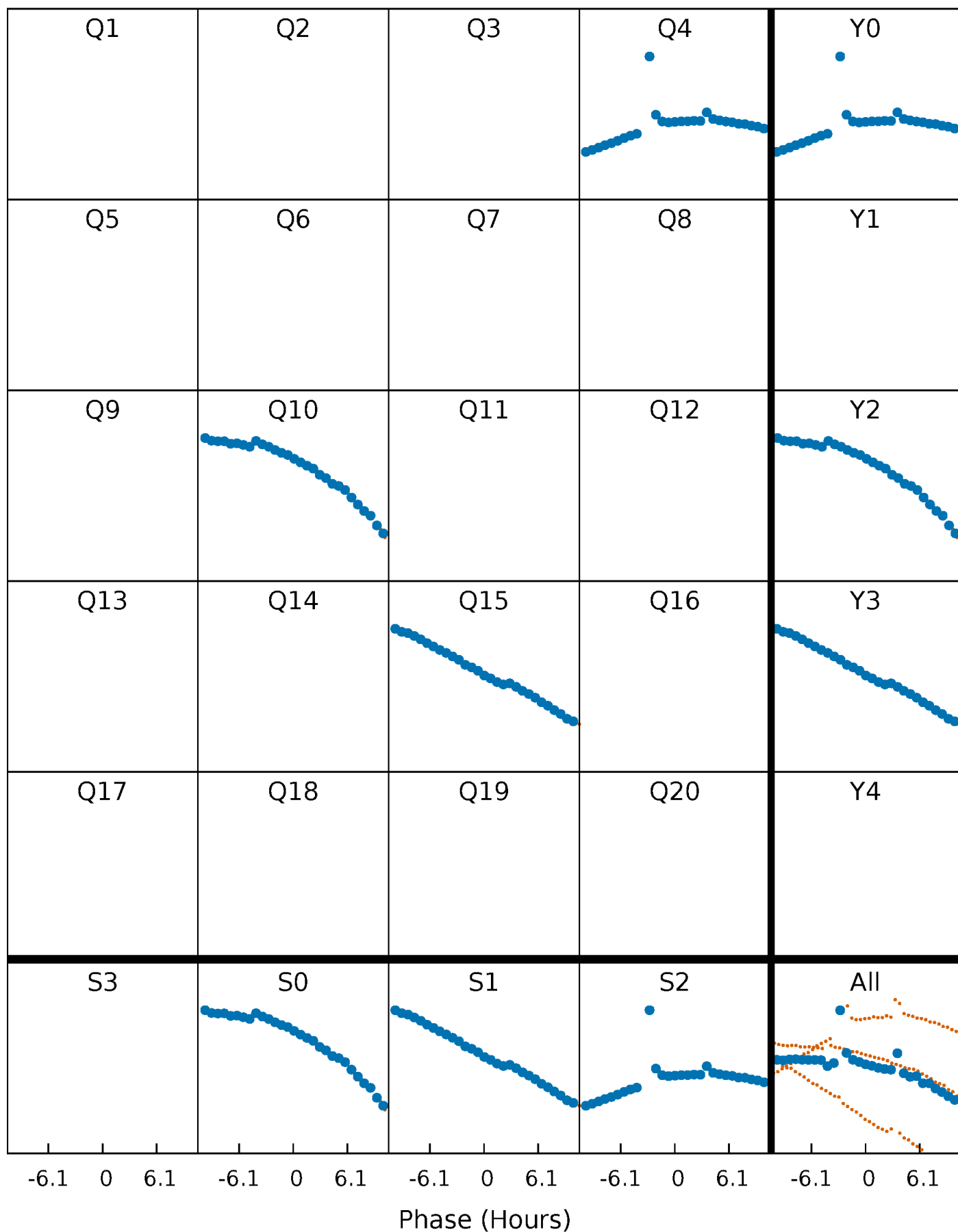


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



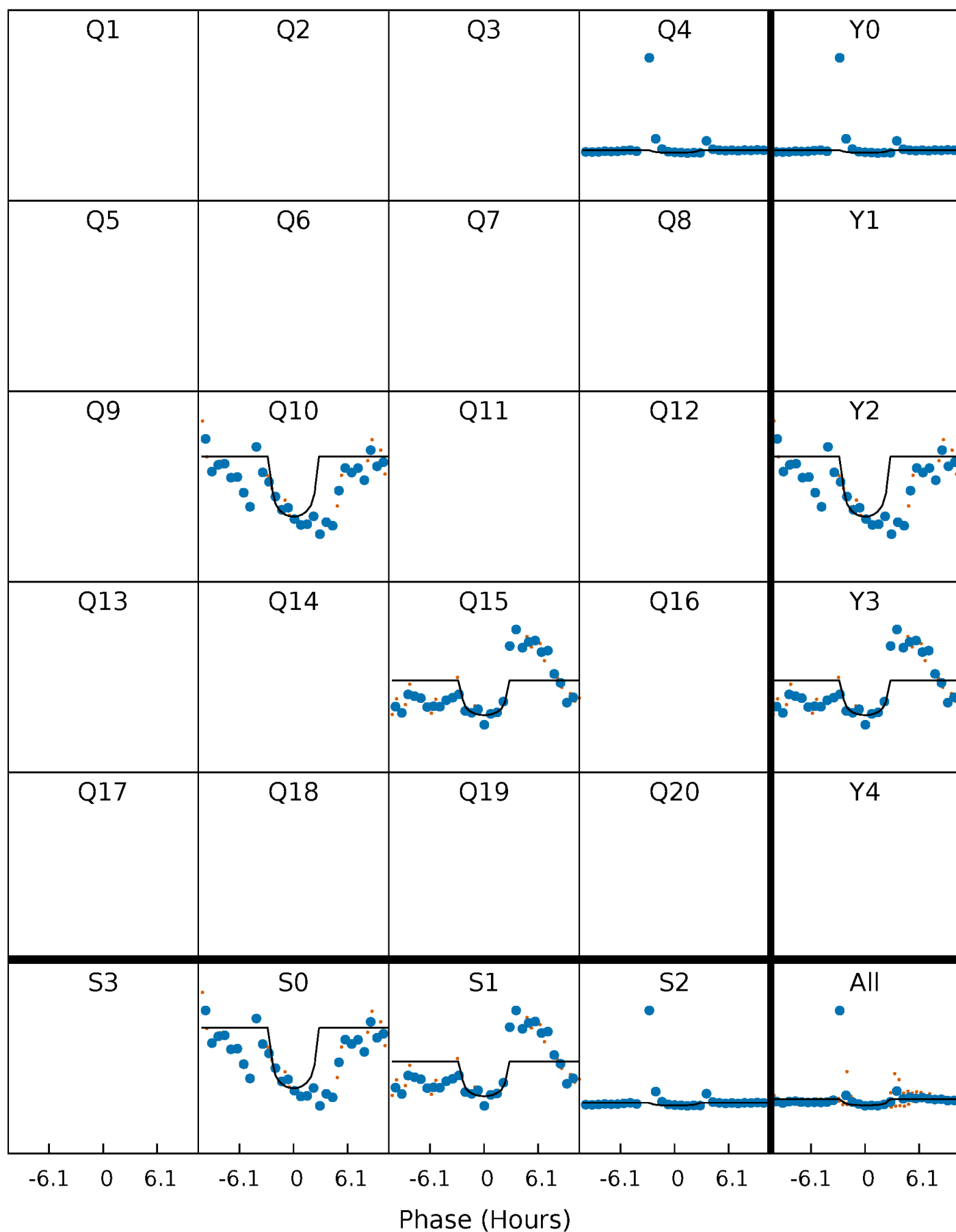
PDC Quarter-Phased Transit Curves

TCE 009466312-04 P=532.724498 Days $T_0=389.445988$ (BKJD)



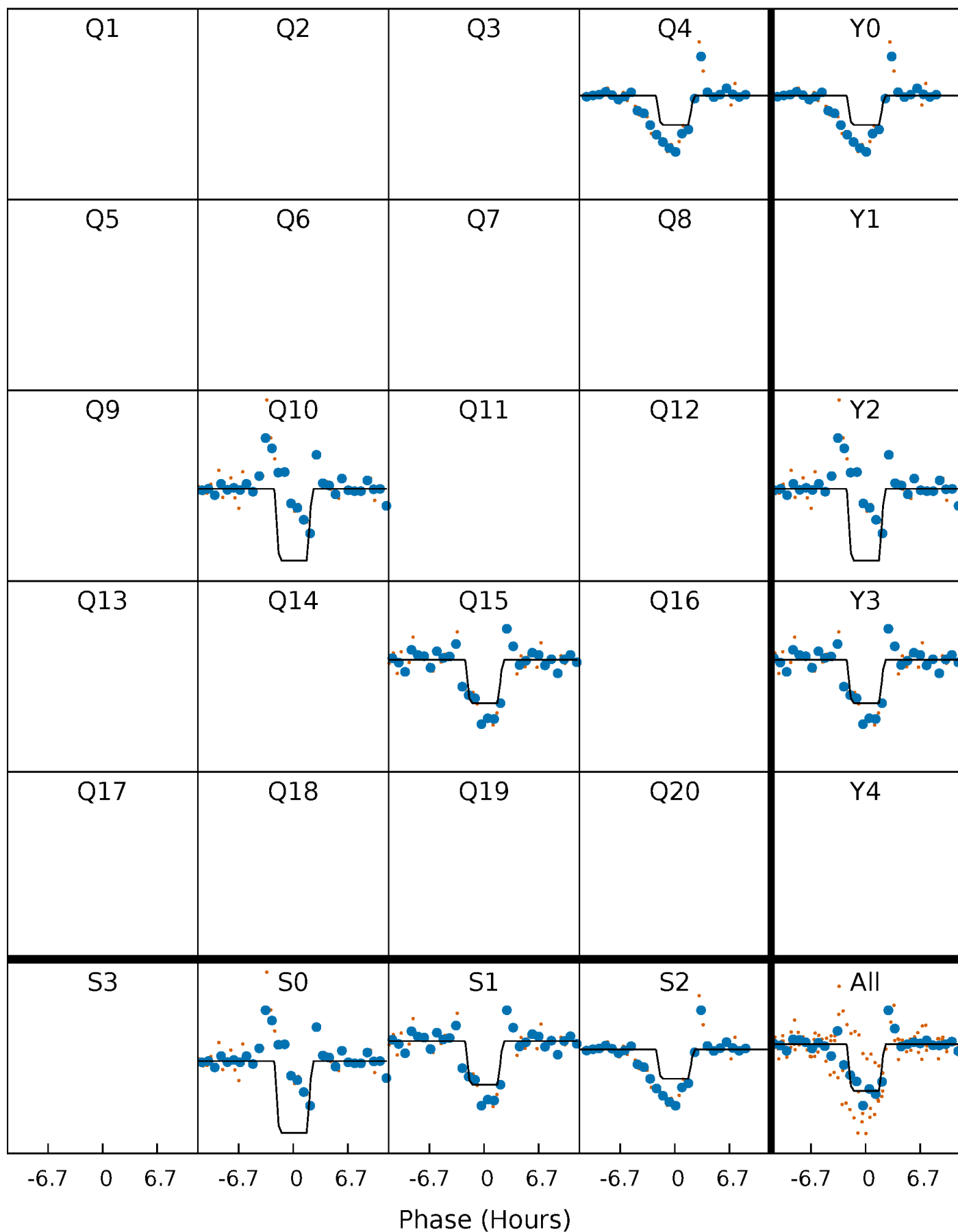
DV Quarter-Phased Transit Curves

TCE 009466312-04 P=532.724498 Days $T_0=389.445988$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

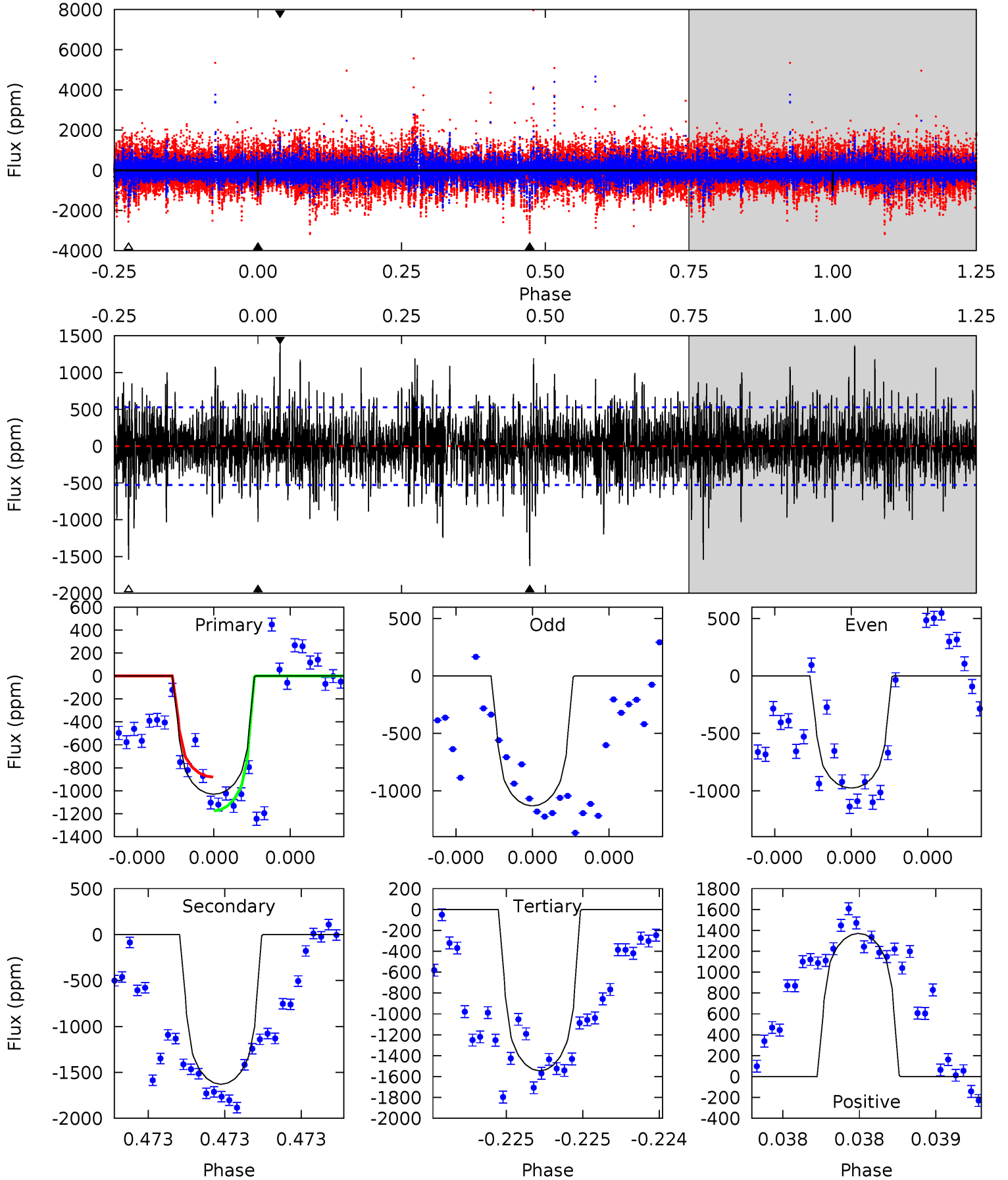
TCE 009466312-04 P=533.029846 Days $T_0=388.848041$ (BKJD)



DV Model-Shift Uniqueness Test

009466312-04, P = 532.724498 Days, E = 389.445988 Days

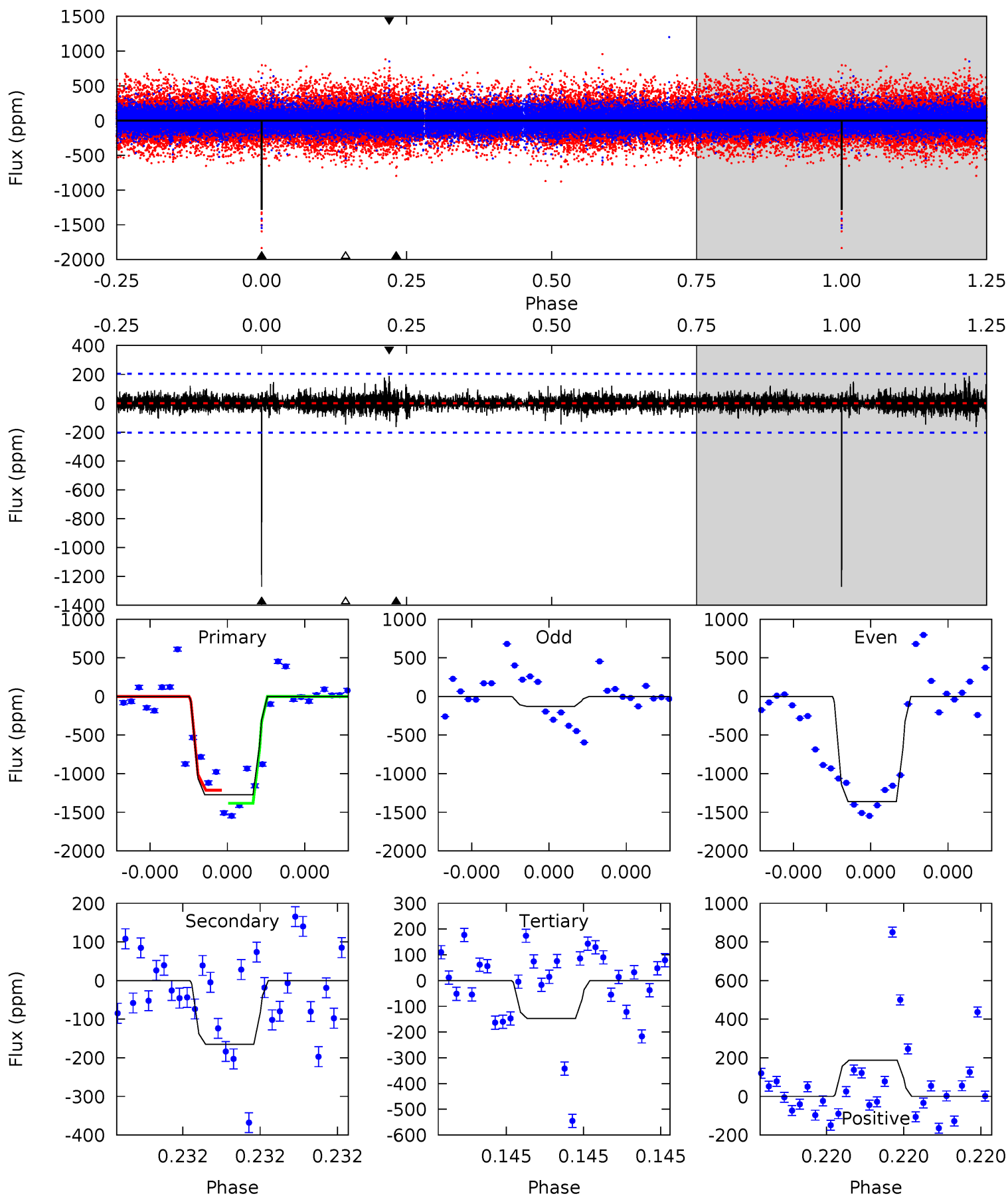
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	17.3	16.4	14.5	5.60	3.53	3.11	-5.45	-3.61	0.90	2.74	0.61	0.23	0.46	1.57



Alt Model-Shift Uniqueness Test

009466312-04, P = 533.029846 Days, E = 388.848041 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.2	4.56	4.08	5.18	5.62	3.56	0.74	31.1	30.0	0.48	-0.62	18.8	0.80	0.13	0



Stellar Parameters For KIC 009466312

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5229^{+156}_{-140}	$4.564^{+0.070}_{-0.056}$	$-0.480^{+0.300}_{-0.300}$	$0.724^{+0.082}_{-0.074}$	$0.700^{+0.093}_{-0.043}$	$2.597^{+0.833}_{-0.528}$
	+3%/-3%	+2%/-1%	+62%/-62%	+11%/-10%	+13%/-6%	+32%/-20%
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 009466312-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1629 ± 94	$12.93^{+13.80}_{-9.26}$	256^{+10}_{-9}	3173^{+1783}_{-576}	7060^{+79755}_{-5384}
Alt.	-165 ± 36	$12.55^{+13.41}_{-8.73}$	256^{+10}_{-9}	2357^{+874}_{-341}	762^{+7509}_{-592}

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

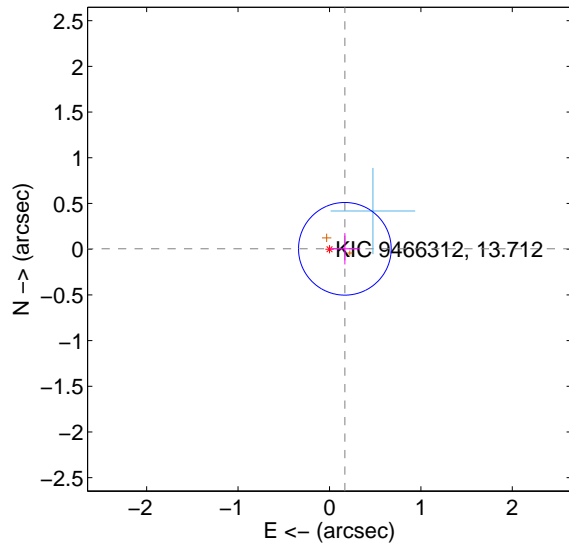
Supplemental centroid analysis for 009466312-04. Kepler magnitude: 13.71. Transit SNR 7.11

There are 1 quarters with good PRF difference image offsets

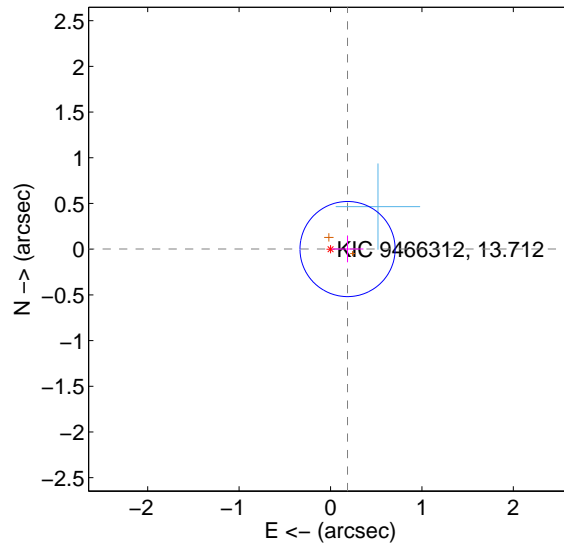
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.168 ± 0.169	1.00	-0.168 ± 0.169	0.004 ± 0.172
PRF-fit source offset from KIC position	0.186 ± 0.173	1.08	-0.186 ± 0.173	0.001 ± 0.144
photometric centroid source offset	0.21 ± 0.67	0.31	0.20 ± 0.68	0.07 ± 0.53

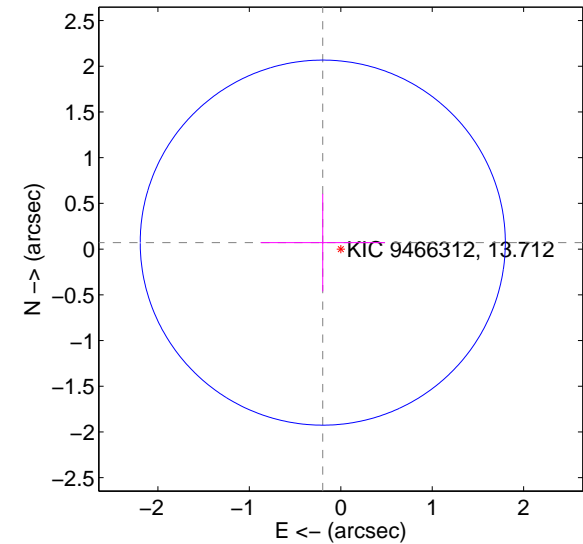
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

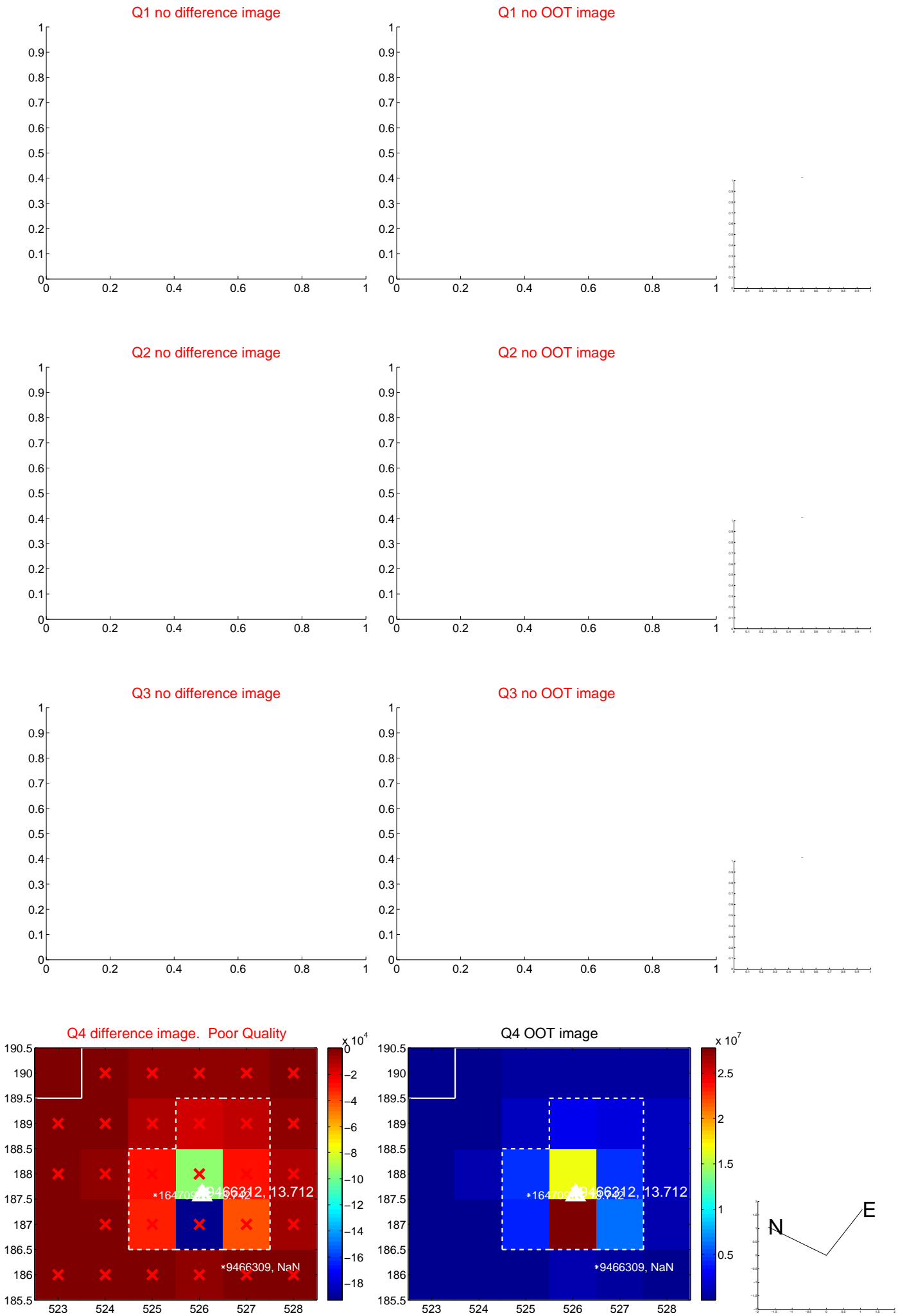


offset from photometric centroids



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.

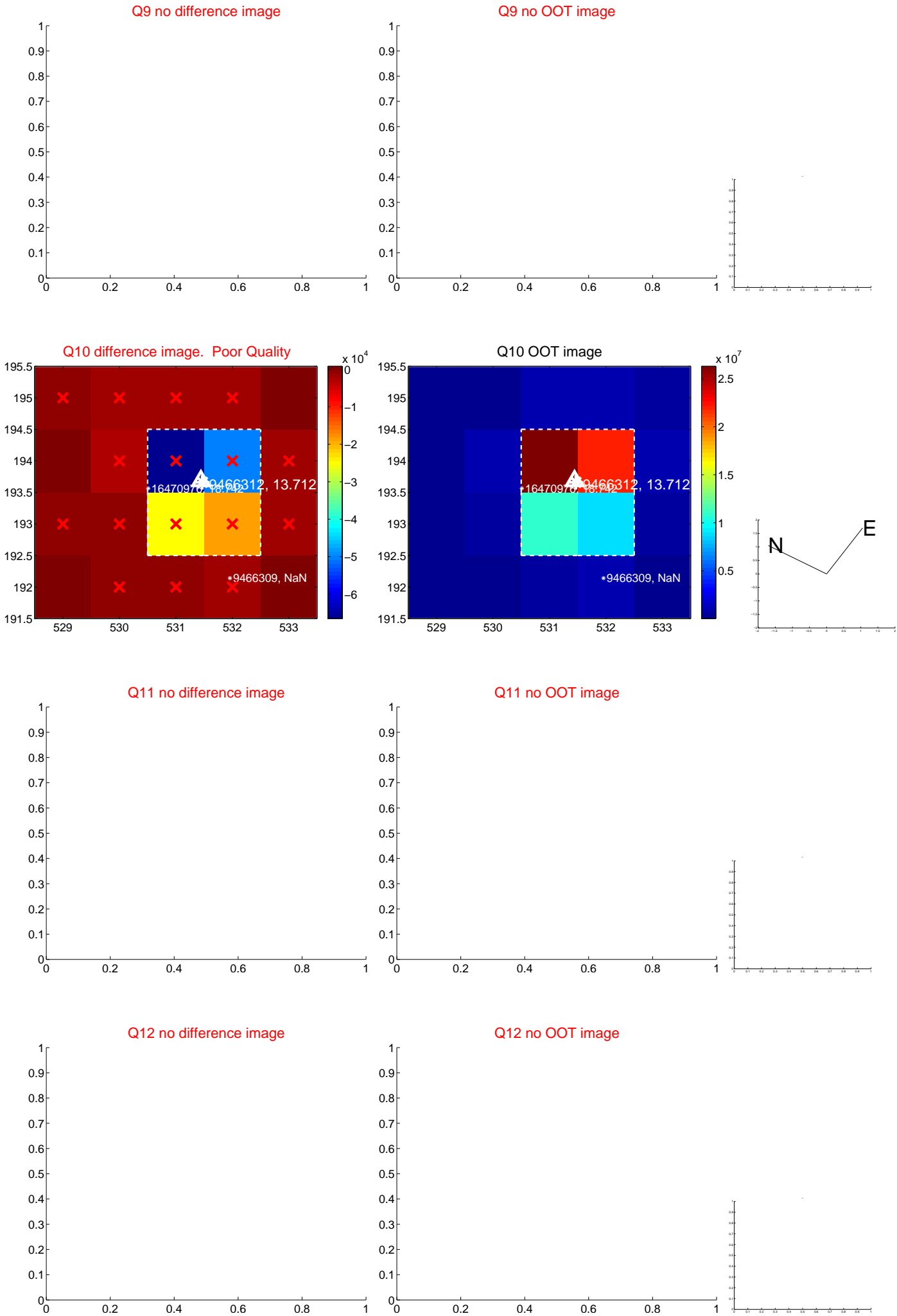
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



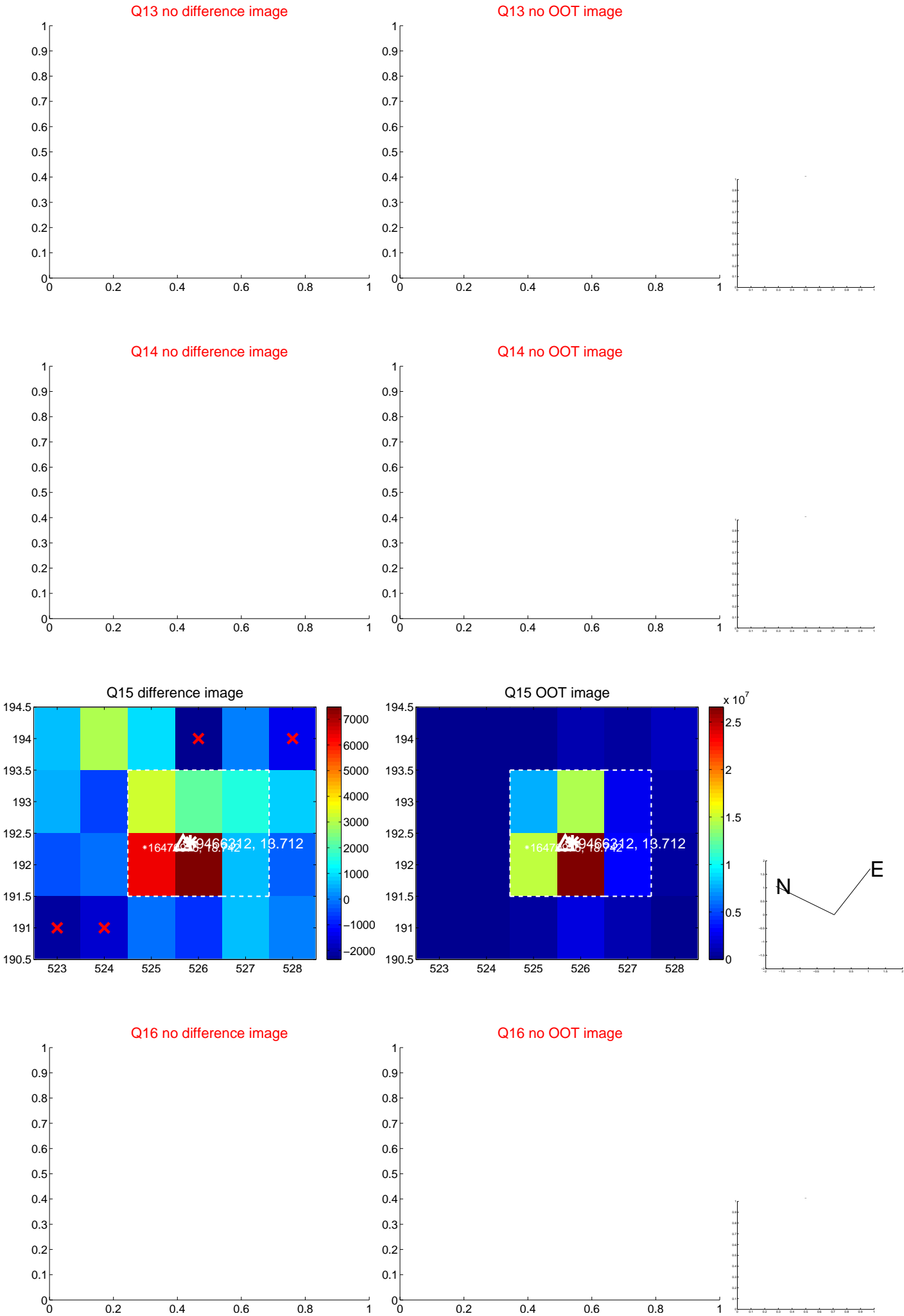
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



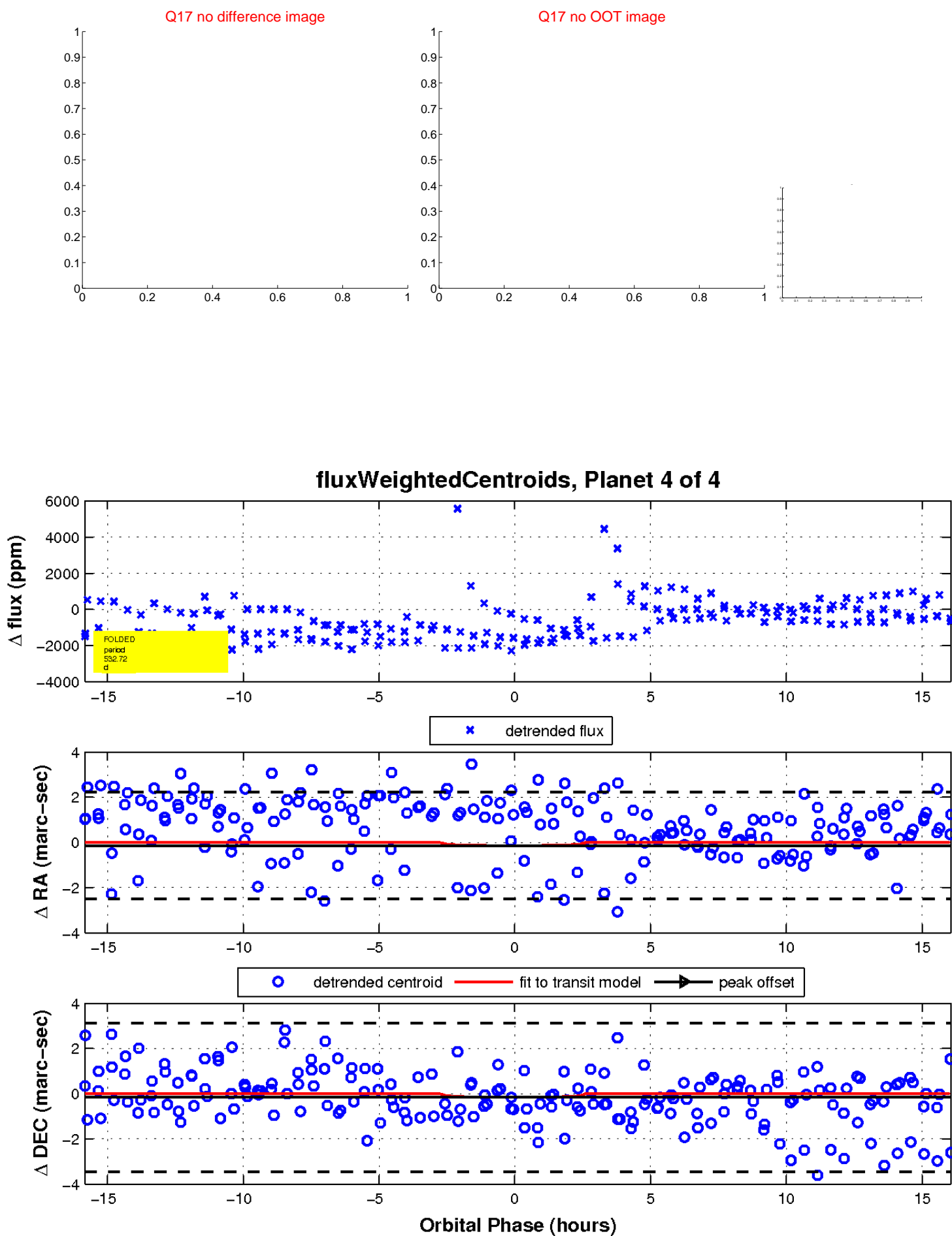
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

