

KIC 009172506

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})
009172506-01	OBS	7141.01	50.440289	149.908313	85559.1	12.166	3130.3	2451.0	1.65	6225	51.69	48.46
009172506-02	OBS	No	50.440330	145.864498	7643.7	5.625	352.5	290.9	1.65	6225	15.89	48.46
009172506-03	OBS	No	637.757228	225.750458	368.3	8.378	26.8	4.5	1.65	6225	3.19	1.65
009172506-04	OBS	No	50.442473	146.167457	849.7	24.445	11.2	16.1	1.65	6225	9.14	48.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009172506-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_KIC_POS
009172506-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009172506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009172506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—SAME_NTL_PERIOD

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

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

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

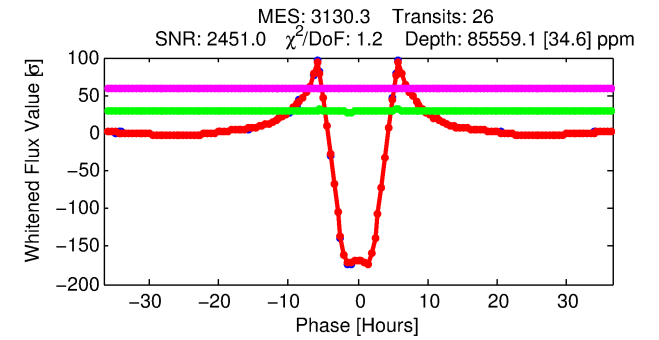
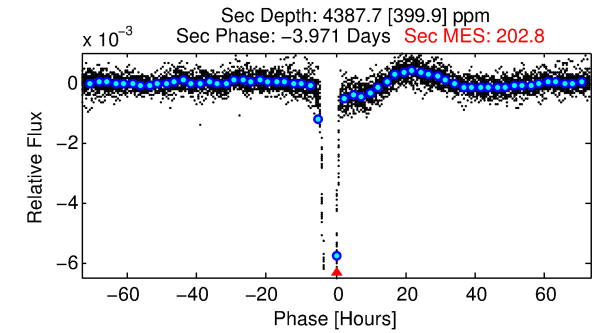
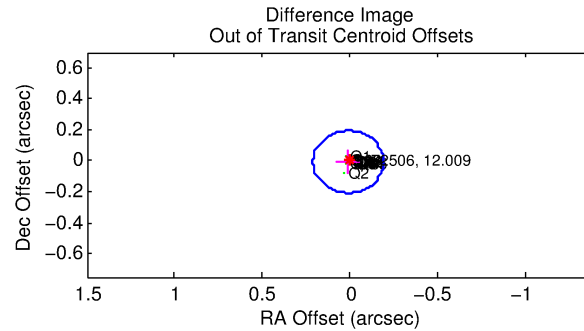
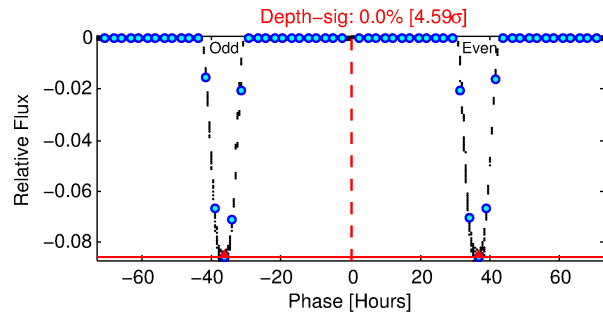
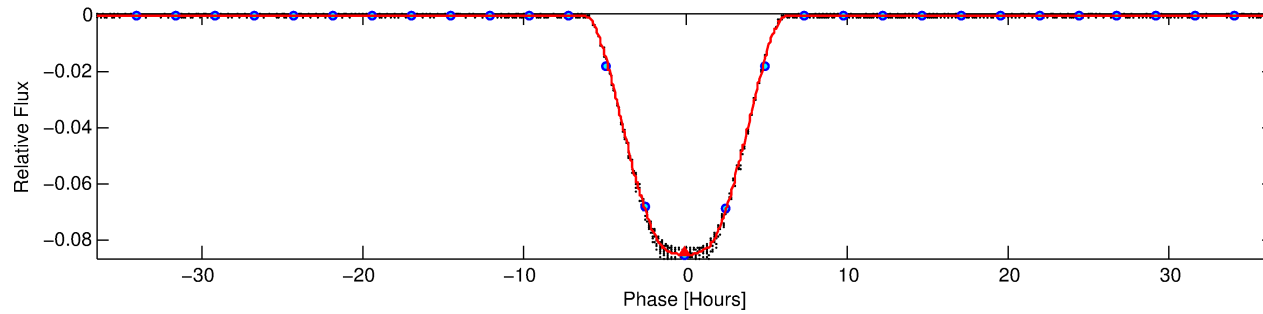
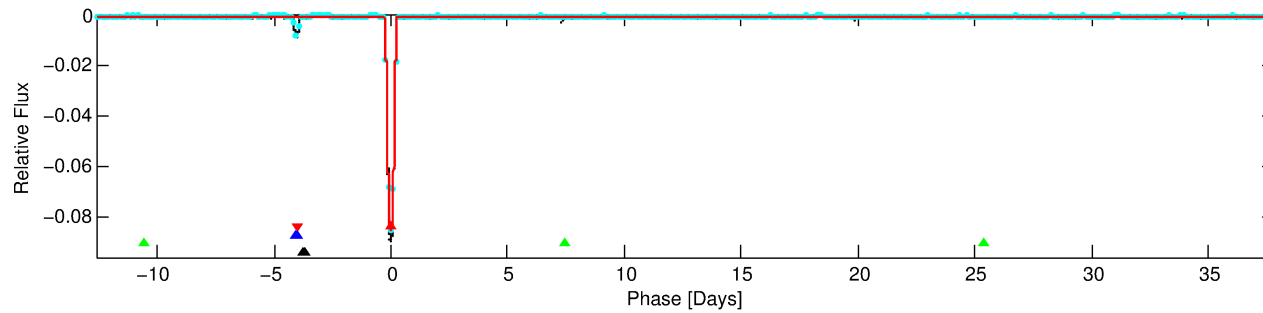
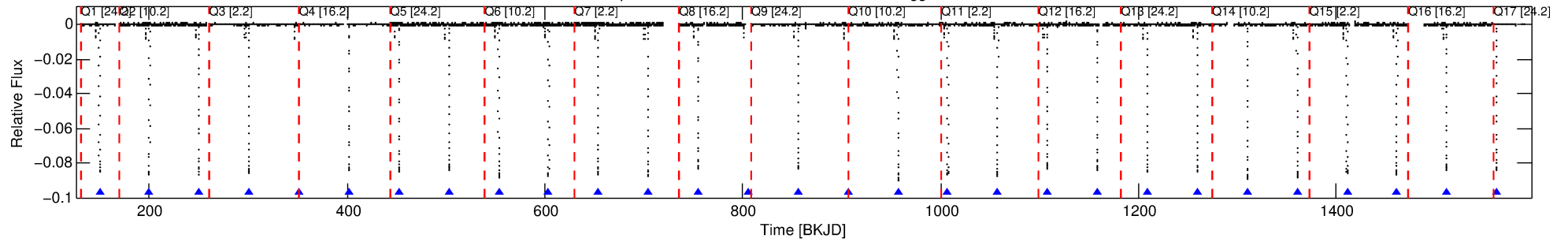
Ephemeris Match Information For 009172506-01

No Significant Match Found

DV One-Page Summary

KIC: 9172506 Candidate: 1 of 4 Period: 50.440 d
KOI: K07141.01 Corr: 1.000

Kp: 12.01 R*: 1.65 Rs Teff: 6225.0 K Logg: 4.04 Fe/H: -0.280



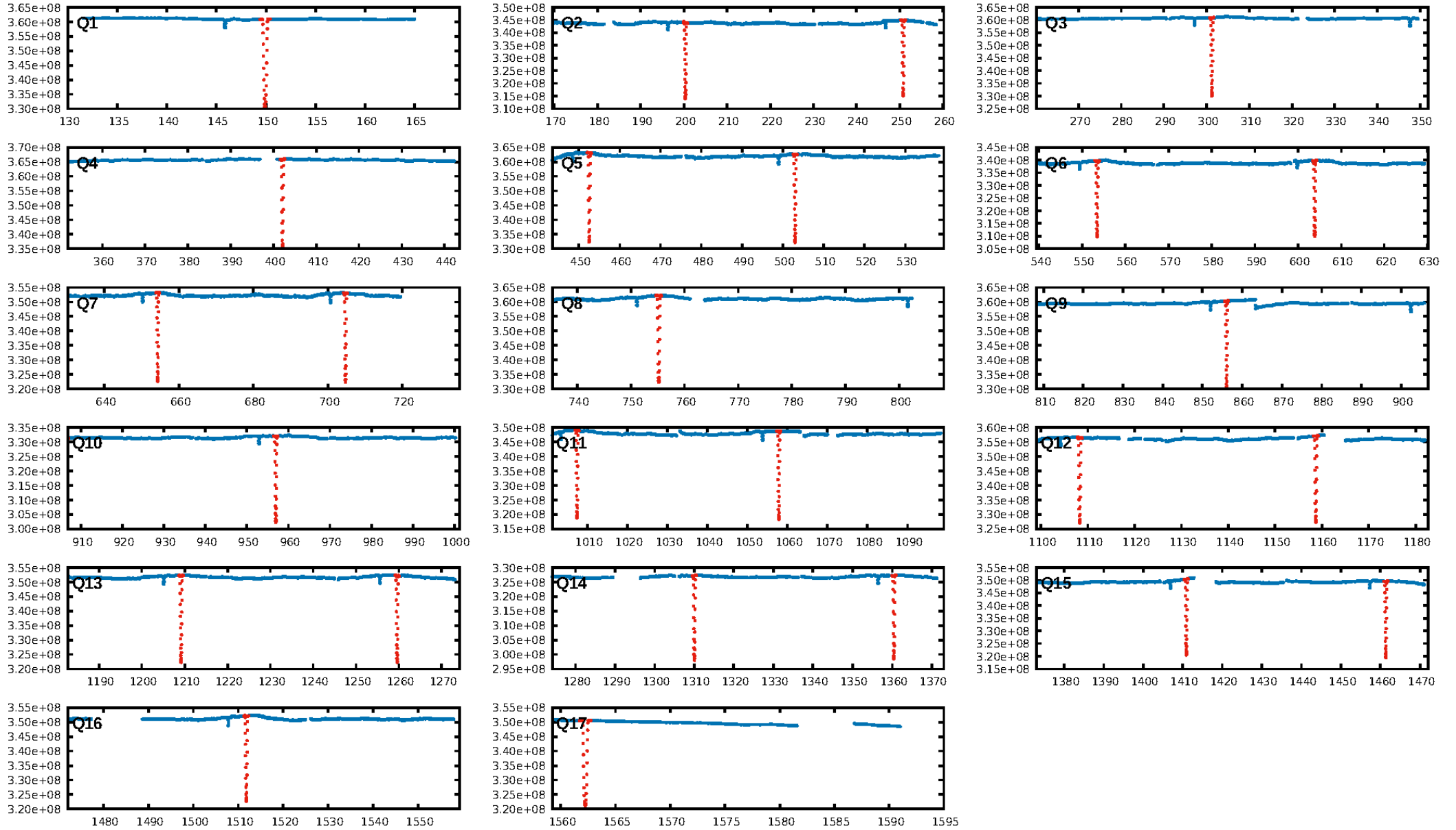
DV Fit Results:

Period = 50.44029 [0.00000] d
Epoch = 149.9083 [0.0001] BKJD
Rp/R* = 0.2878 [0.0001]
a/R* = 35.01 [0.01]
b = 0.66 [0.00]
Seff = 48.46 [22.39]
Teff = 673 [78] K
Rp = 51.69 [14.48] Re
a = 0.2743 [0.0759] AU
Ag = 67.95 [31.13] [2.15σ]
Teffp = 2986 [106] K [17.58σ]

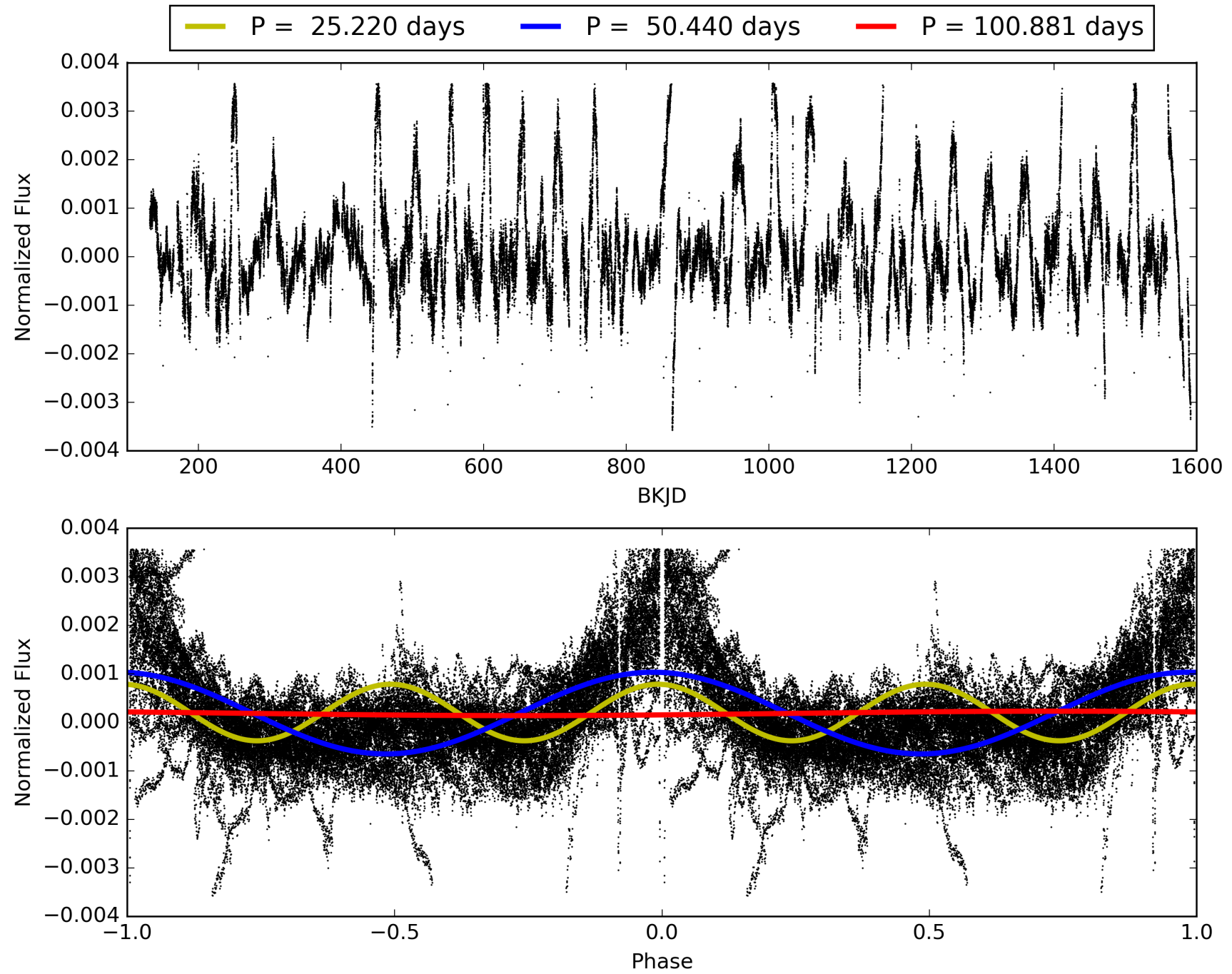
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [24/24]
GhostDiagnostic-chr: 5.886
Centroid-sig: 0.0%
Centroid-so: 0.394 arcsec [480.83σ]
OotOffset-rm: 0.013 arcsec [0.19σ]
KicOffset-rm: 0.344 arcsec [4.91σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 009172506-01, PDC Light Curves

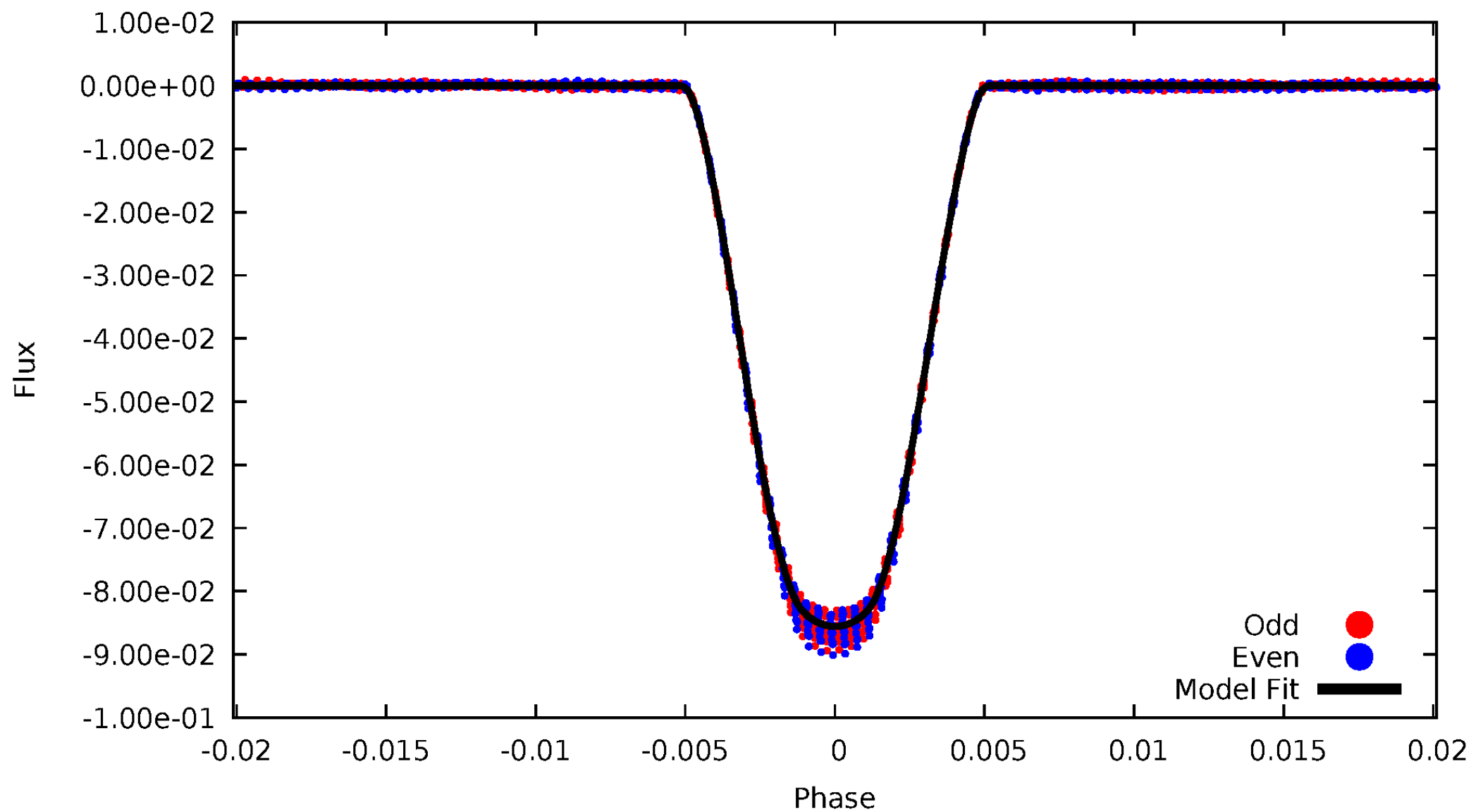


TCE 009172506-01



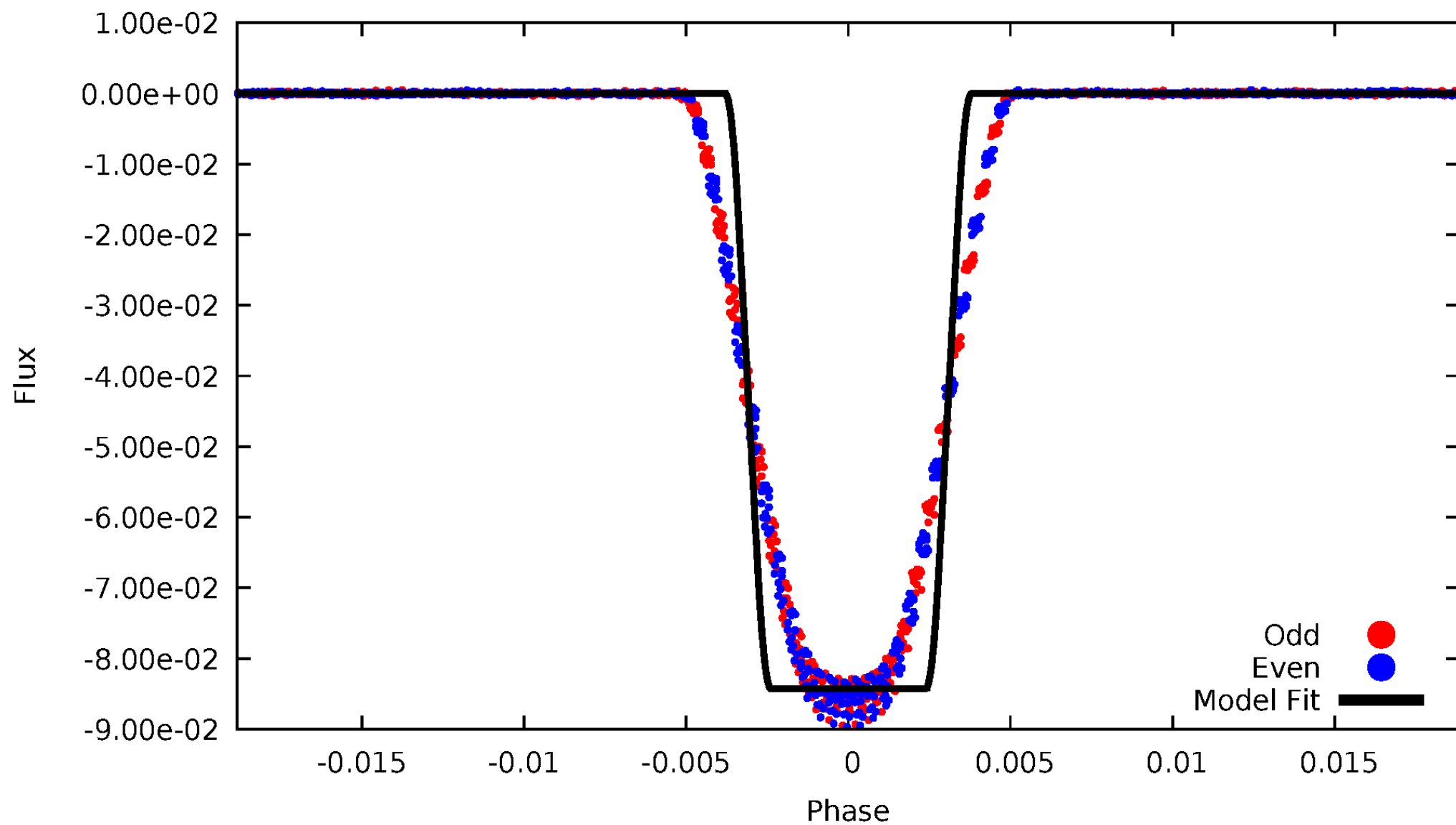
DV Odd/Even

TCE 009172506-01



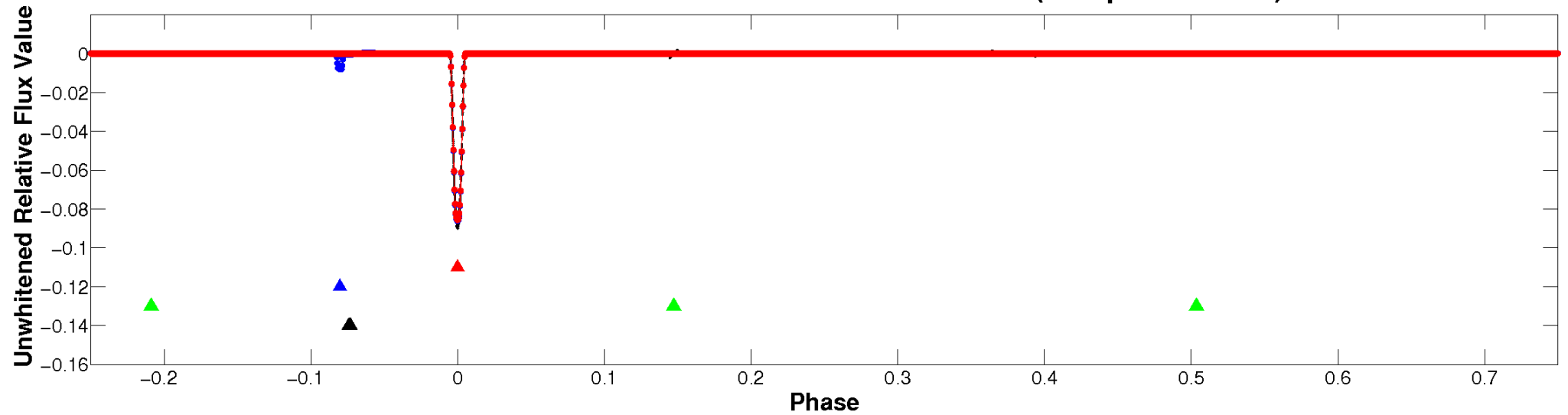
ALT Odd/Even

TCE 009172506-01

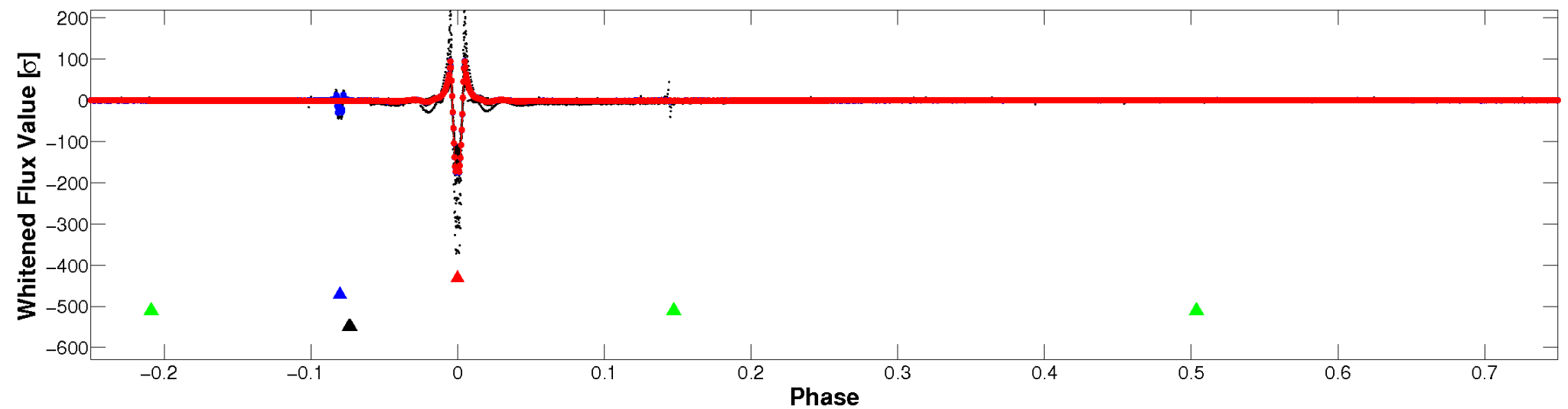


Non-Whitened Vs. Whitened Light Curve

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

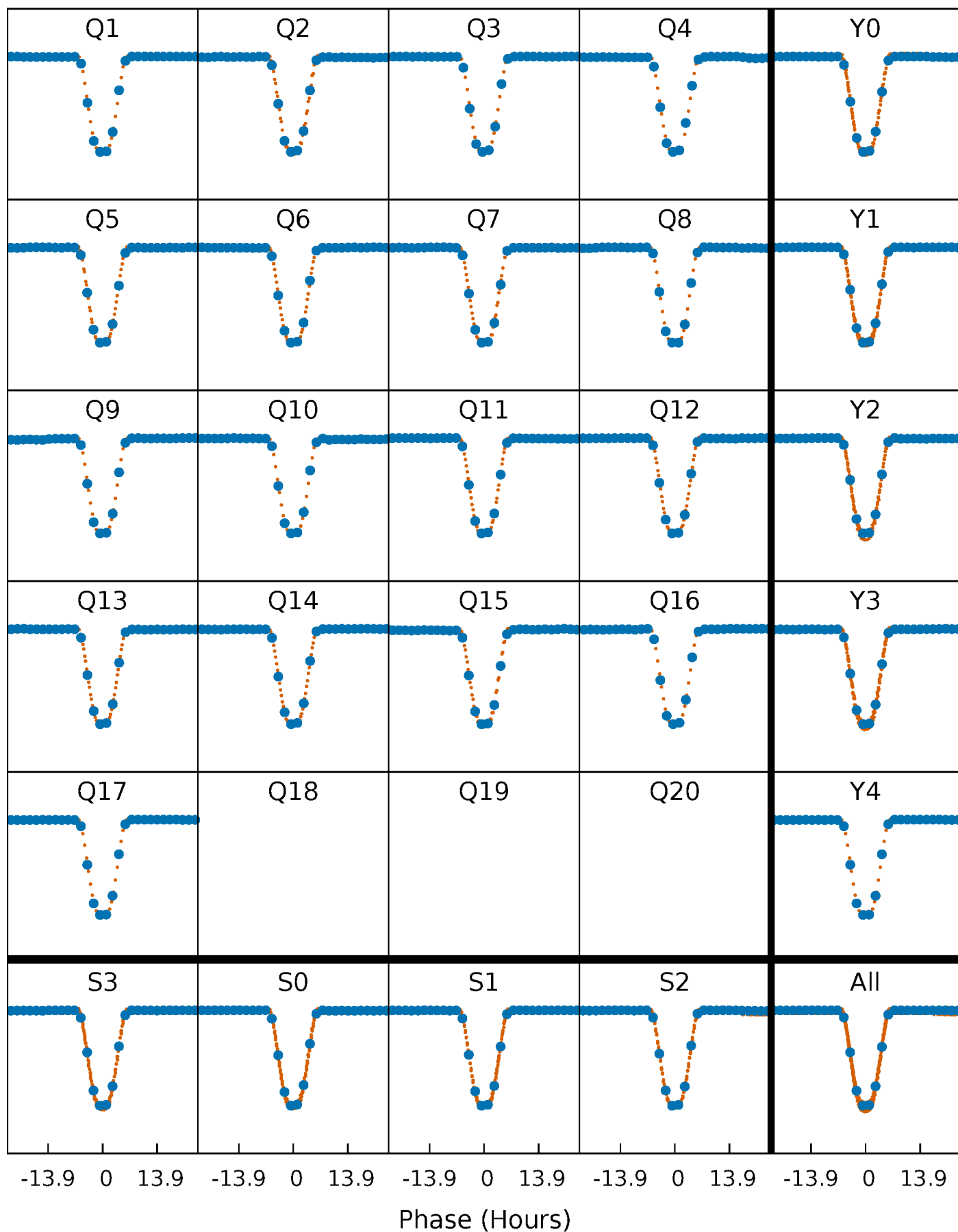


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



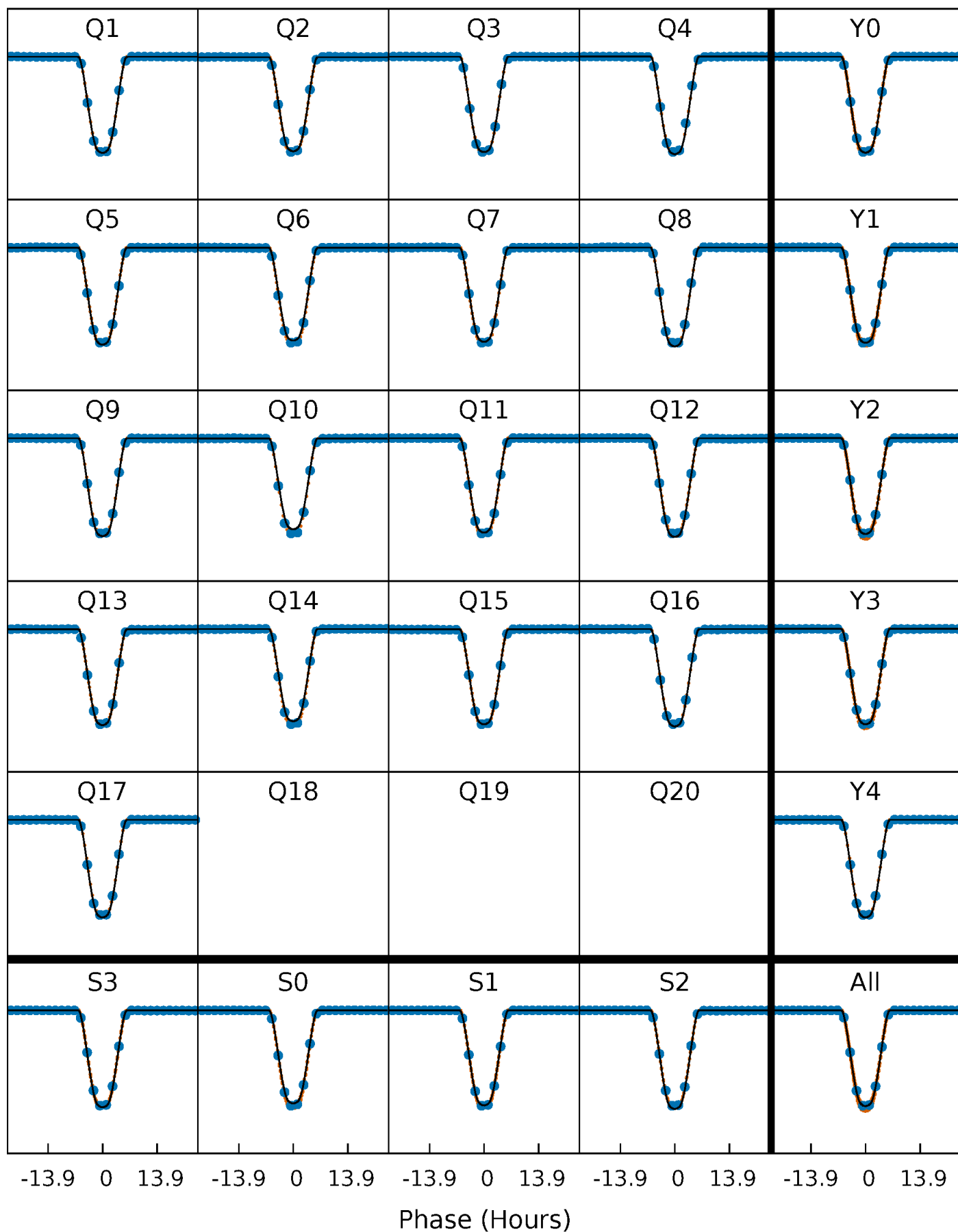
PDC Quarter-Phased Transit Curves

TCE 009172506-01 P= 50.440289 Days $T_0=149.908313$ (BKJD)



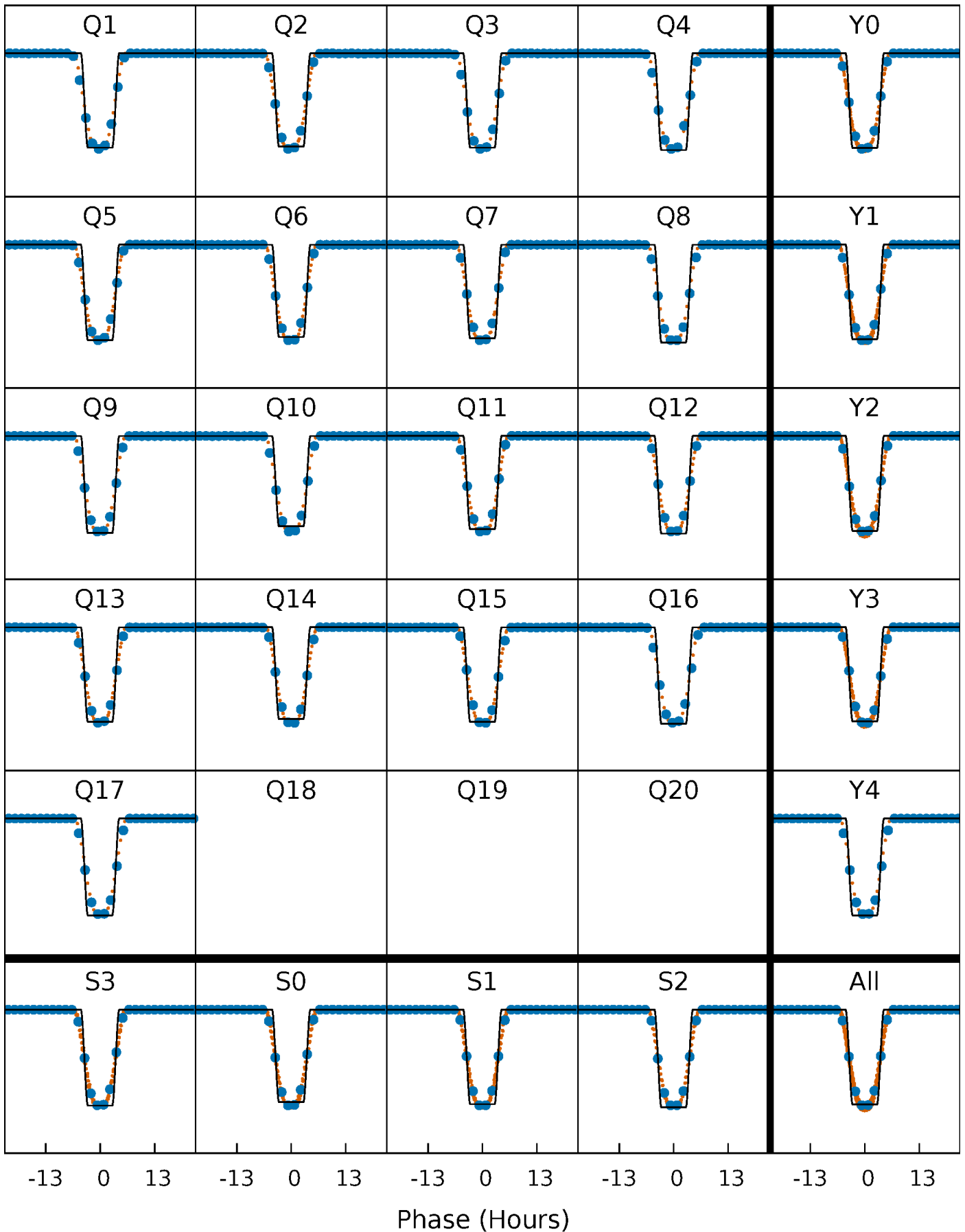
DV Quarter-Phased Transit Curves

TCE 009172506-01 P= 50.440289 Days $T_0=149.908313$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

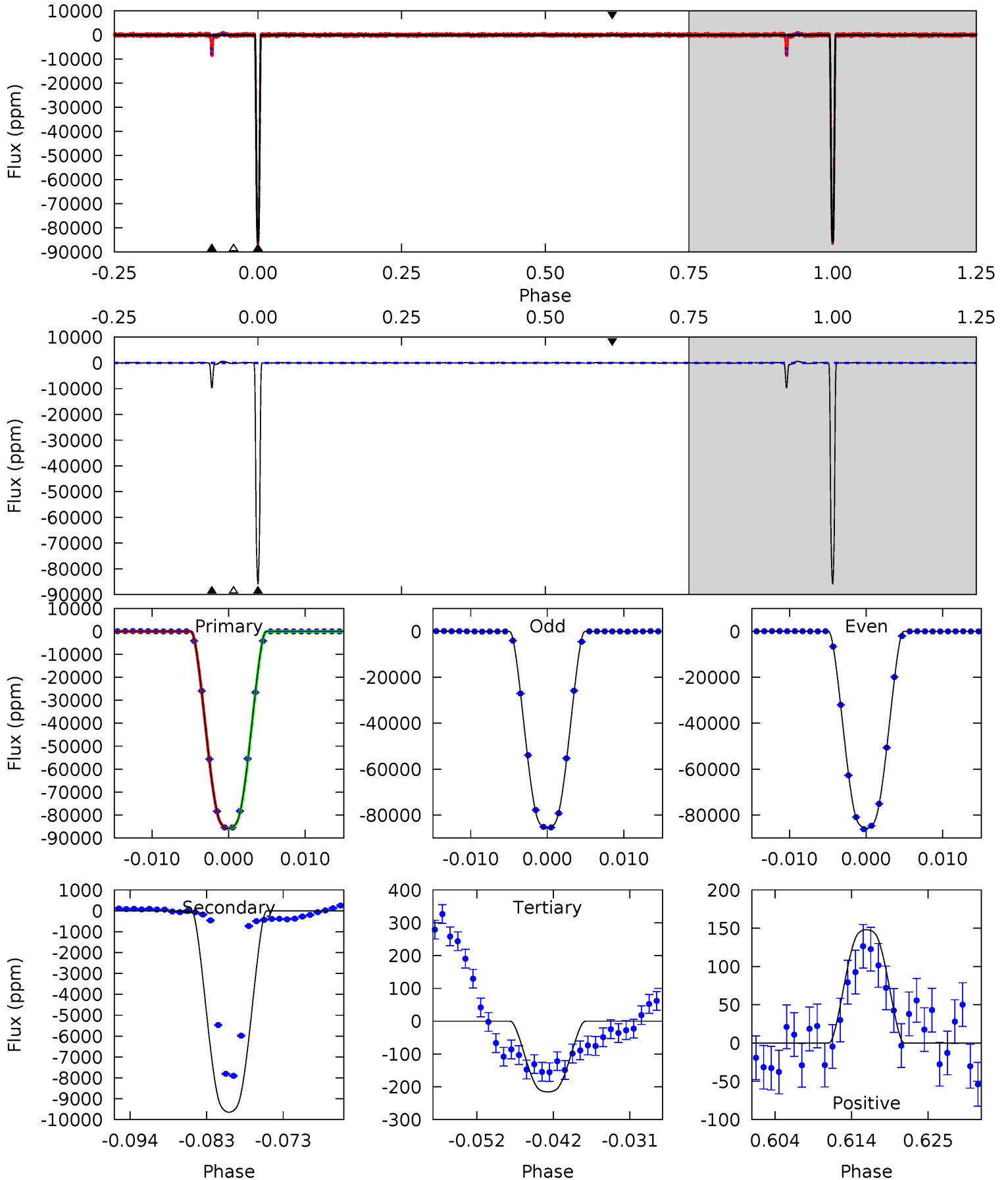
TCE 009172506-01 P= 50.439809 Days $T_0=149.915368$ (BKJD)



DV Model-Shift Uniqueness Test

009172506-01, P = 50.440289 Days, E = 99.468024 Days

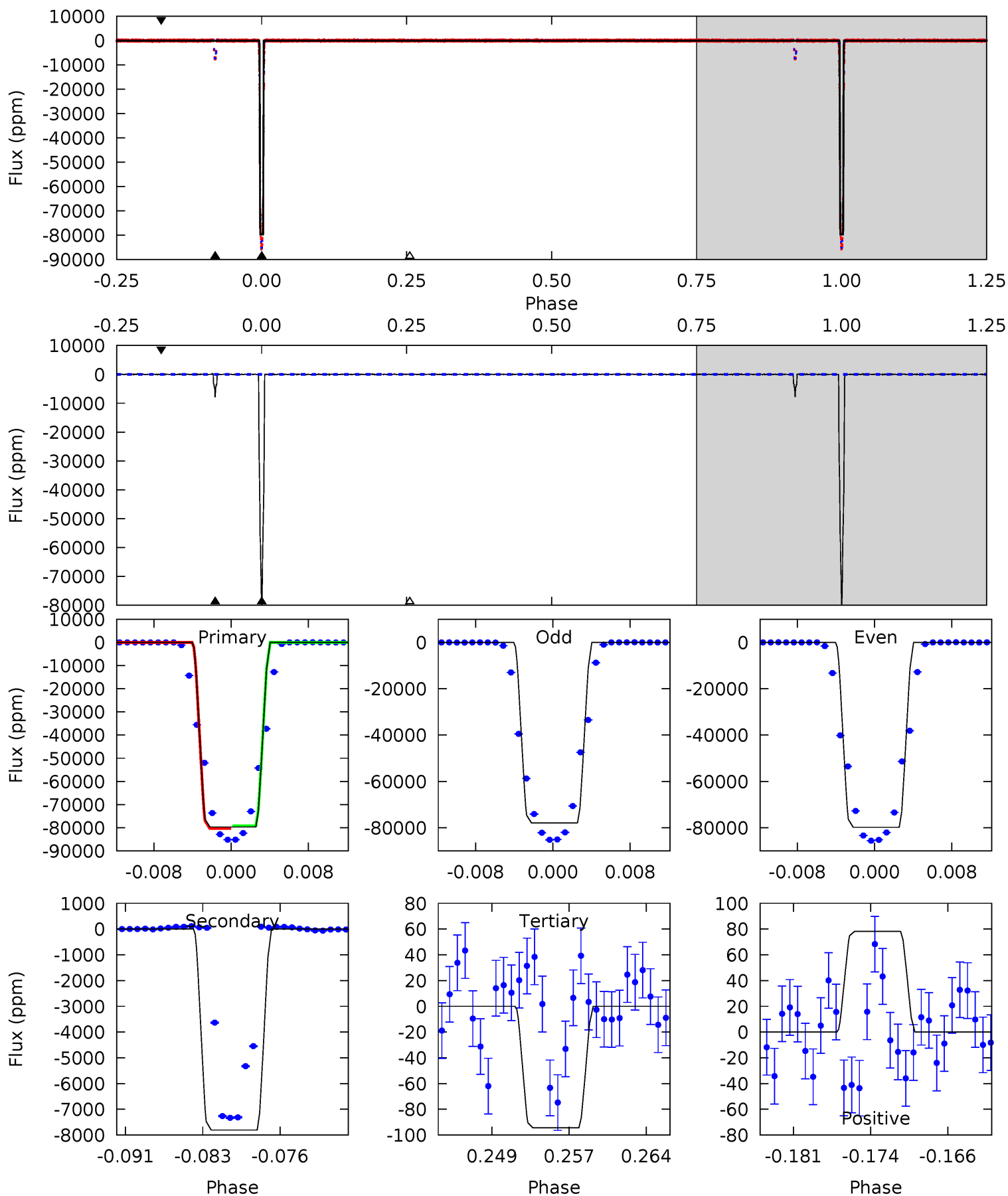
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7770	872.8	19.5	13.4	5.02	2.56	6.79	7750	7756	853.3	859.4	2.93	1.00	0.01	0



Alt Model-Shift Uniqueness Test

009172506-01, P = 50.439809 Days, E = 99.475559 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5504	539.2	6.52	5.40	5.08	2.67	1.62	5498	5499	532.7	533.8	80.2	1.00	0.00	0



Stellar Parameters For KIC 009172506

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6225^{+170}_{-170}	$4.039^{+0.266}_{-0.114}$	$-0.280^{+0.300}_{-0.300}$	$1.646^{+0.335}_{-0.461}$	$1.080^{+0.192}_{-0.157}$	$0.341^{+0.483}_{-0.129}$
	+3%/-3%	+7%/-3%	+107%/-107%	+20%/-28%	+18%/-15%	+142%/-38%
Source	PHO1	FLK73	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 009172506-01 / KOI 7141.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-9646 ± 11	$51.02^{+6.42}_{-7.60}$	929^{+55}_{-67}	3981^{+73}_{-73}	157^{+56}_{-28}
Alt.	-7805 ± 14	$51.38^{+6.34}_{-7.97}$	929^{+59}_{-70}	3817^{+77}_{-68}	124^{+45}_{-23}

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

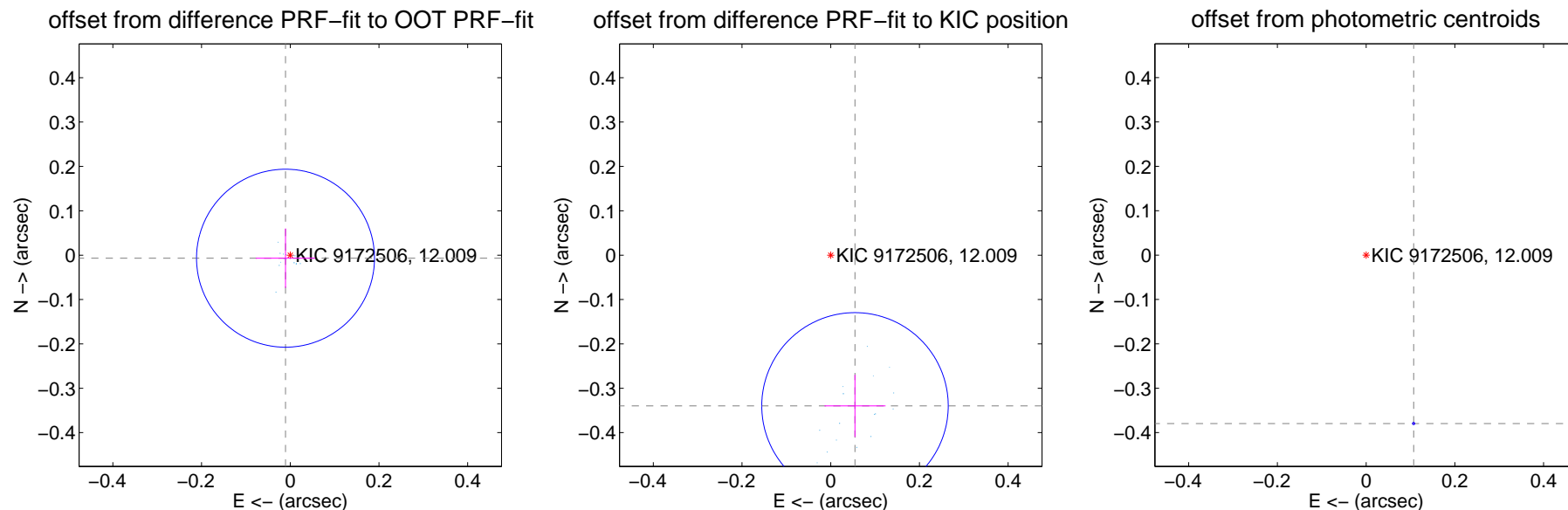
DV Centroid Data

Supplemental centroid analysis for 009172506-01. Kepler magnitude: 12.01. Transit SNR 2451.00

There are 16 quarters with good PRF difference image offsets

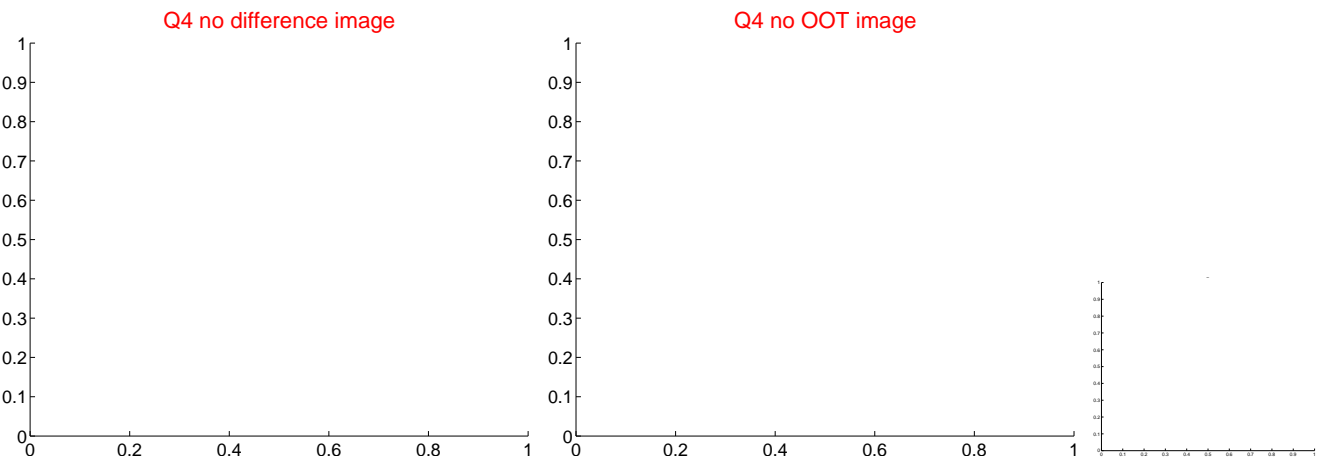
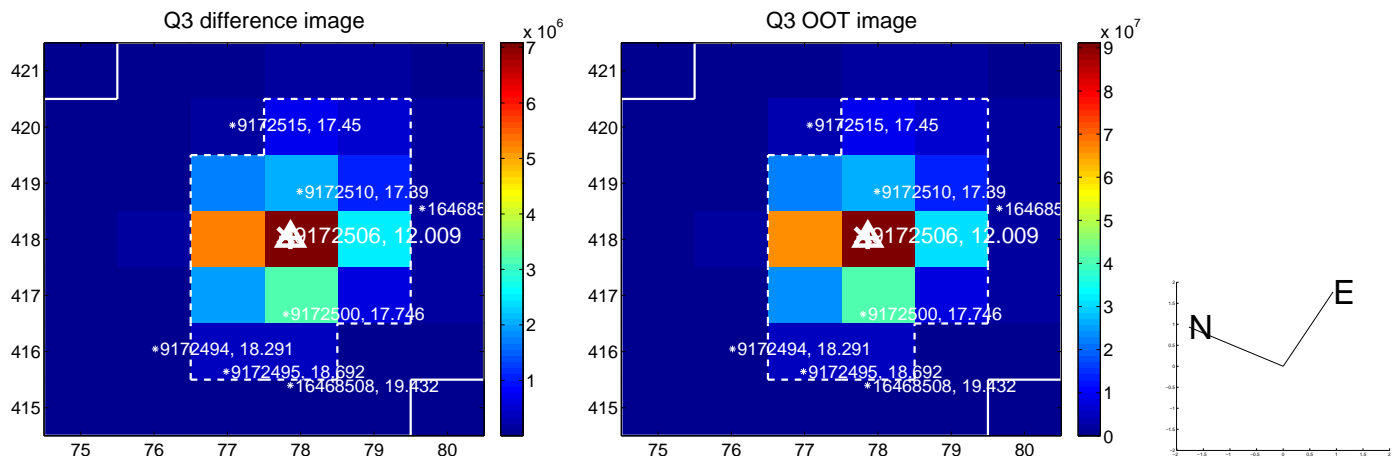
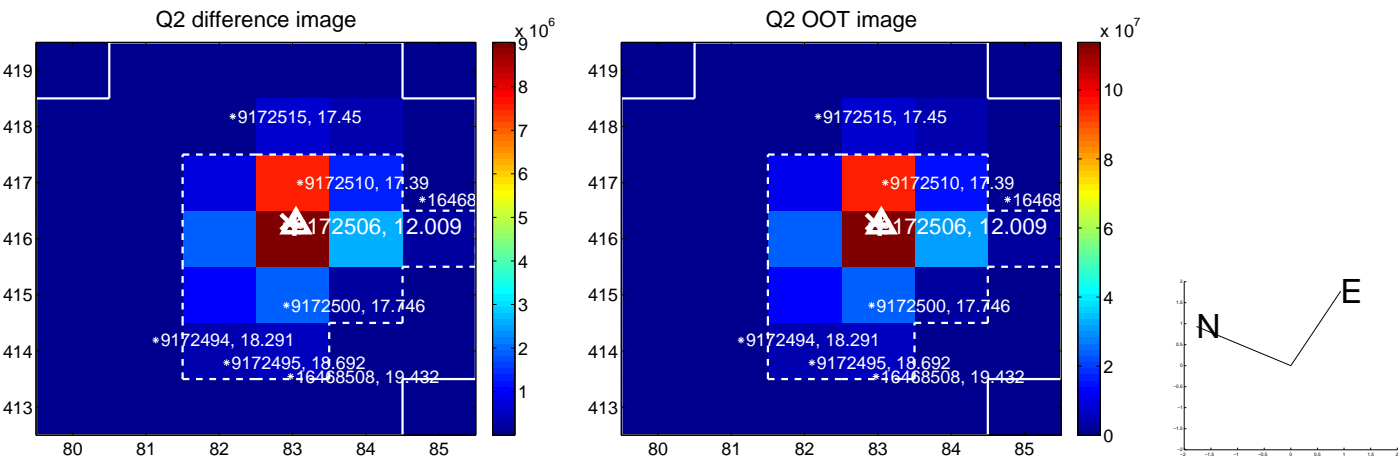
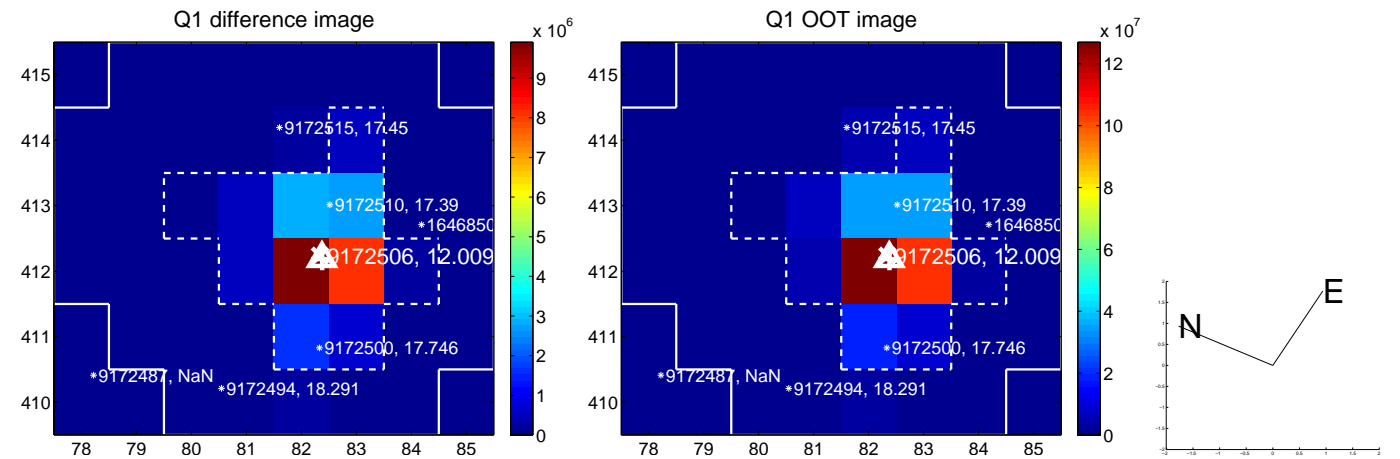
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.013 ± 0.067	0.19	0.011 ± 0.067	-0.007 ± 0.067
PRF-fit source offset from KIC position	0.344 ± 0.070	4.91	-0.055 ± 0.069	-0.340 ± 0.070
photometric centroid source offset	0.39 ± 0.00	480.83	-0.11 ± 0.00	-0.38 ± 0.00

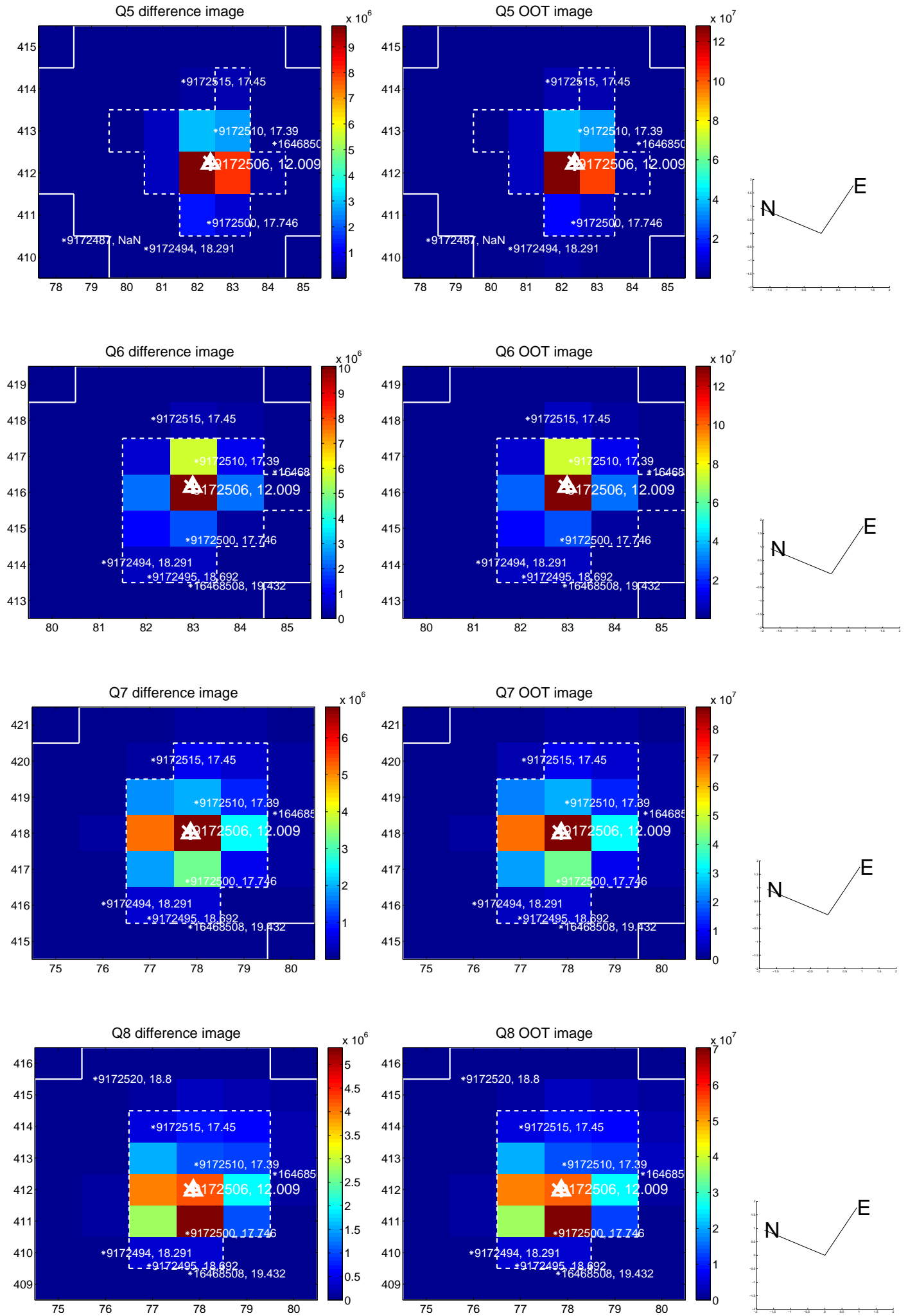


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

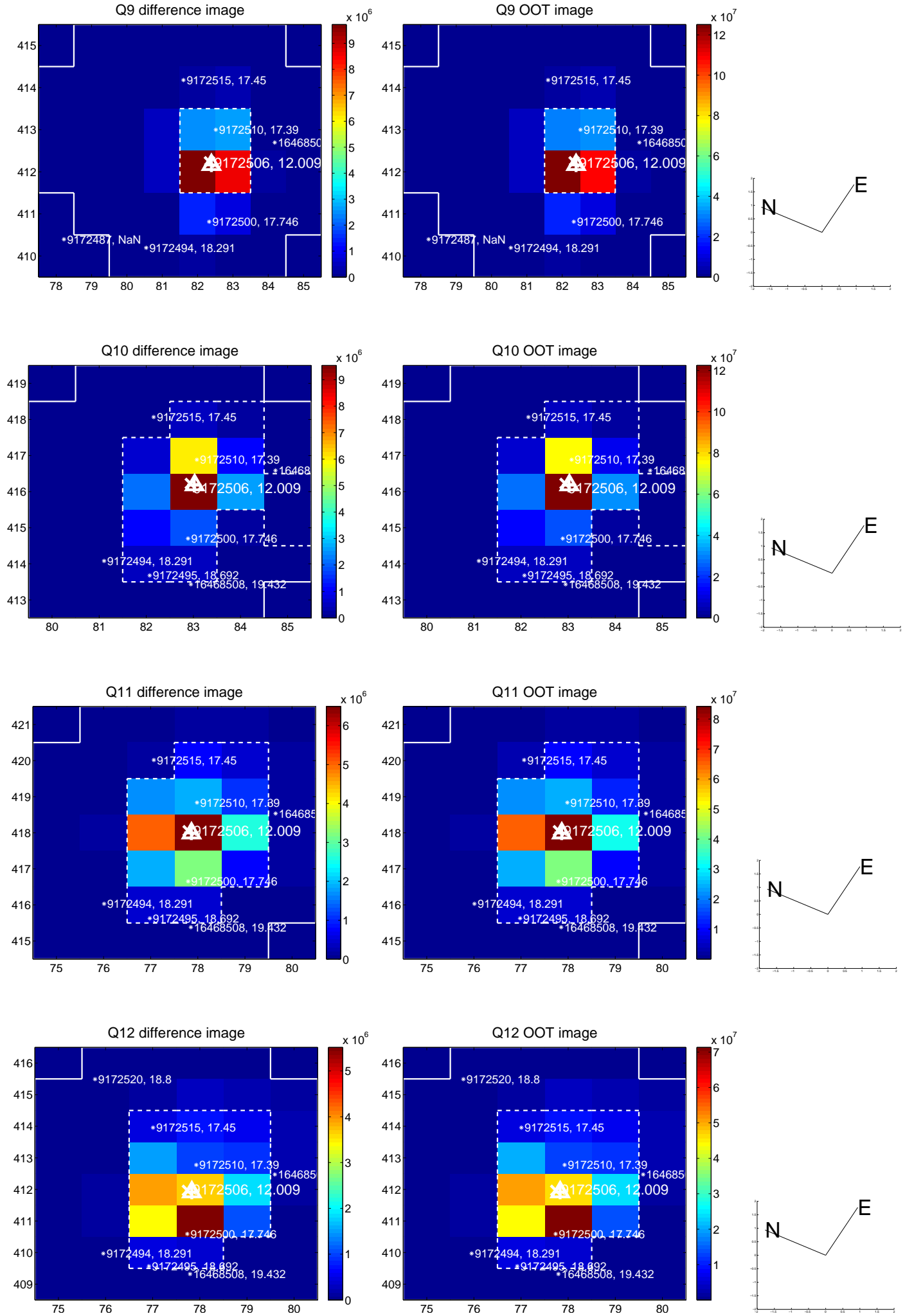
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



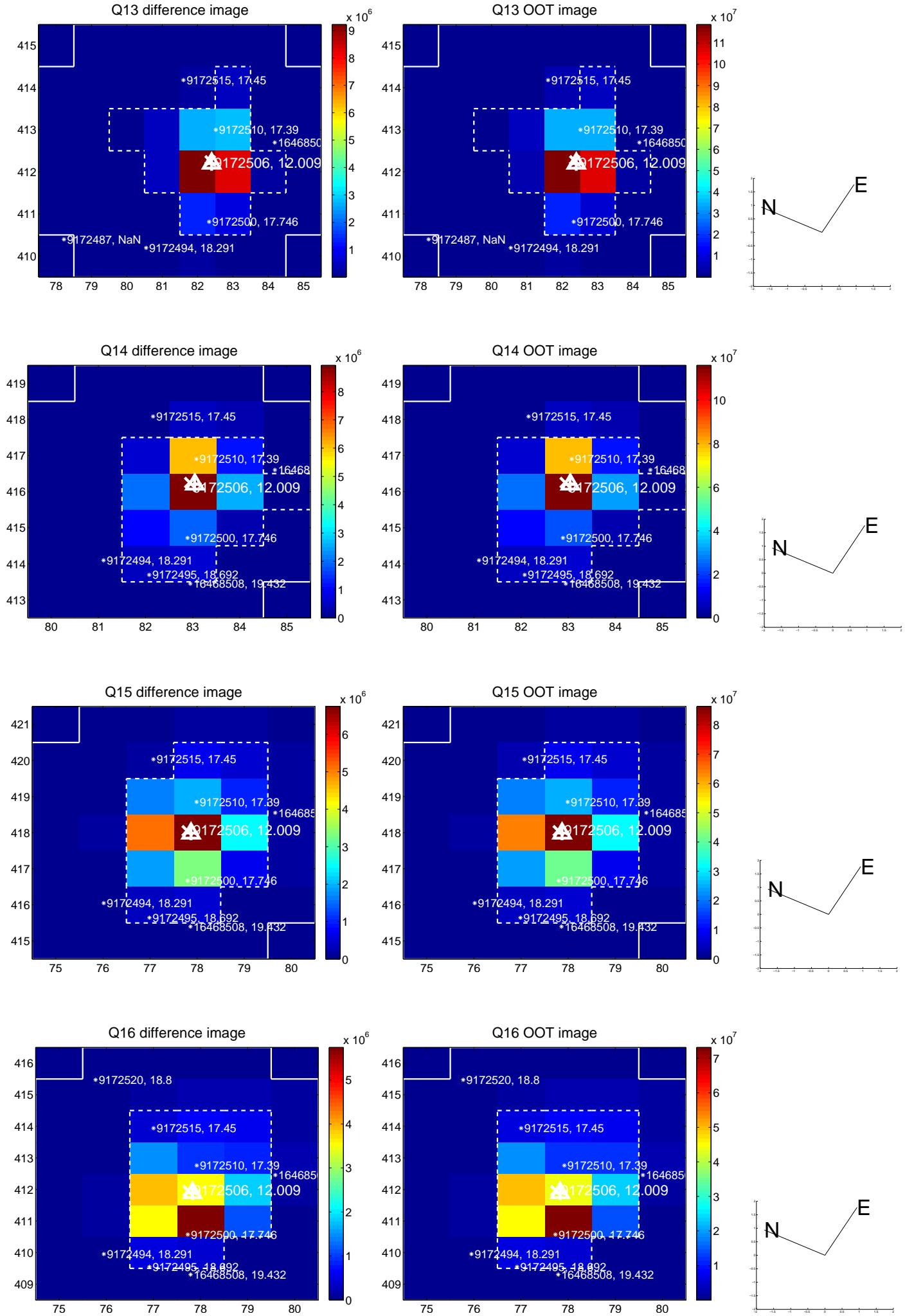
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



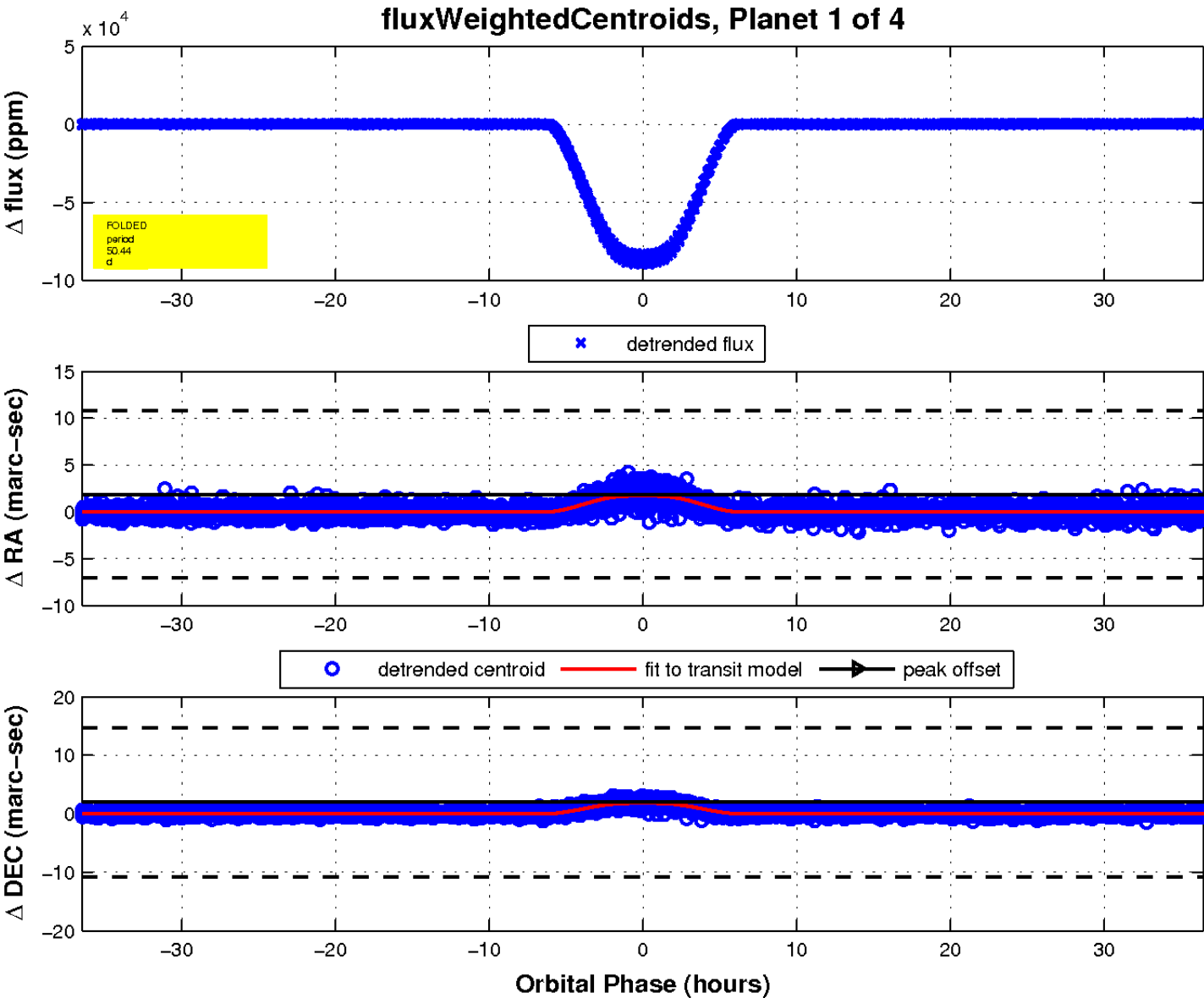
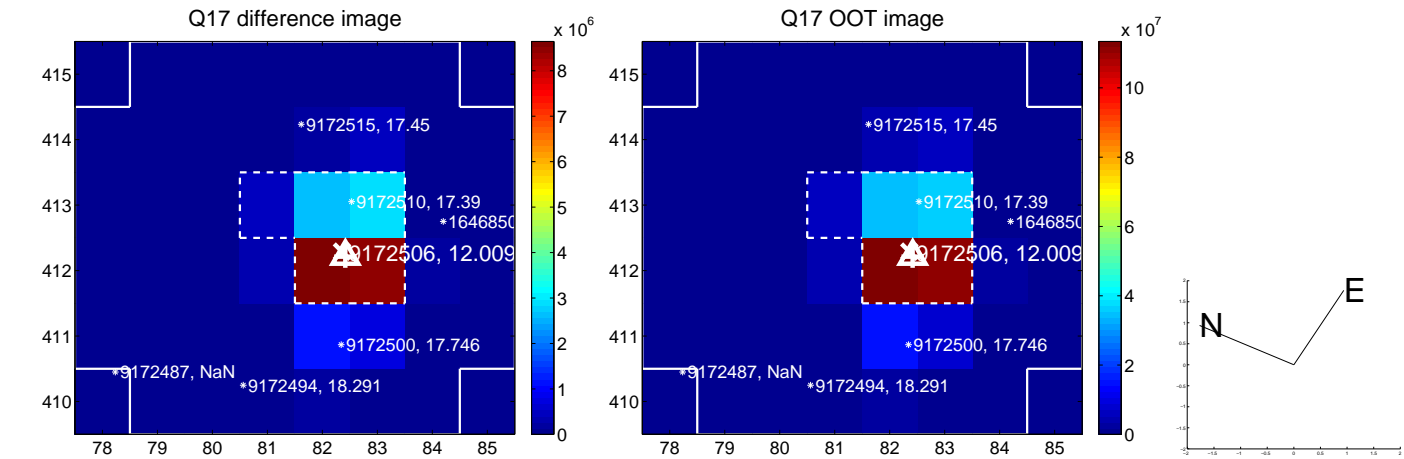
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

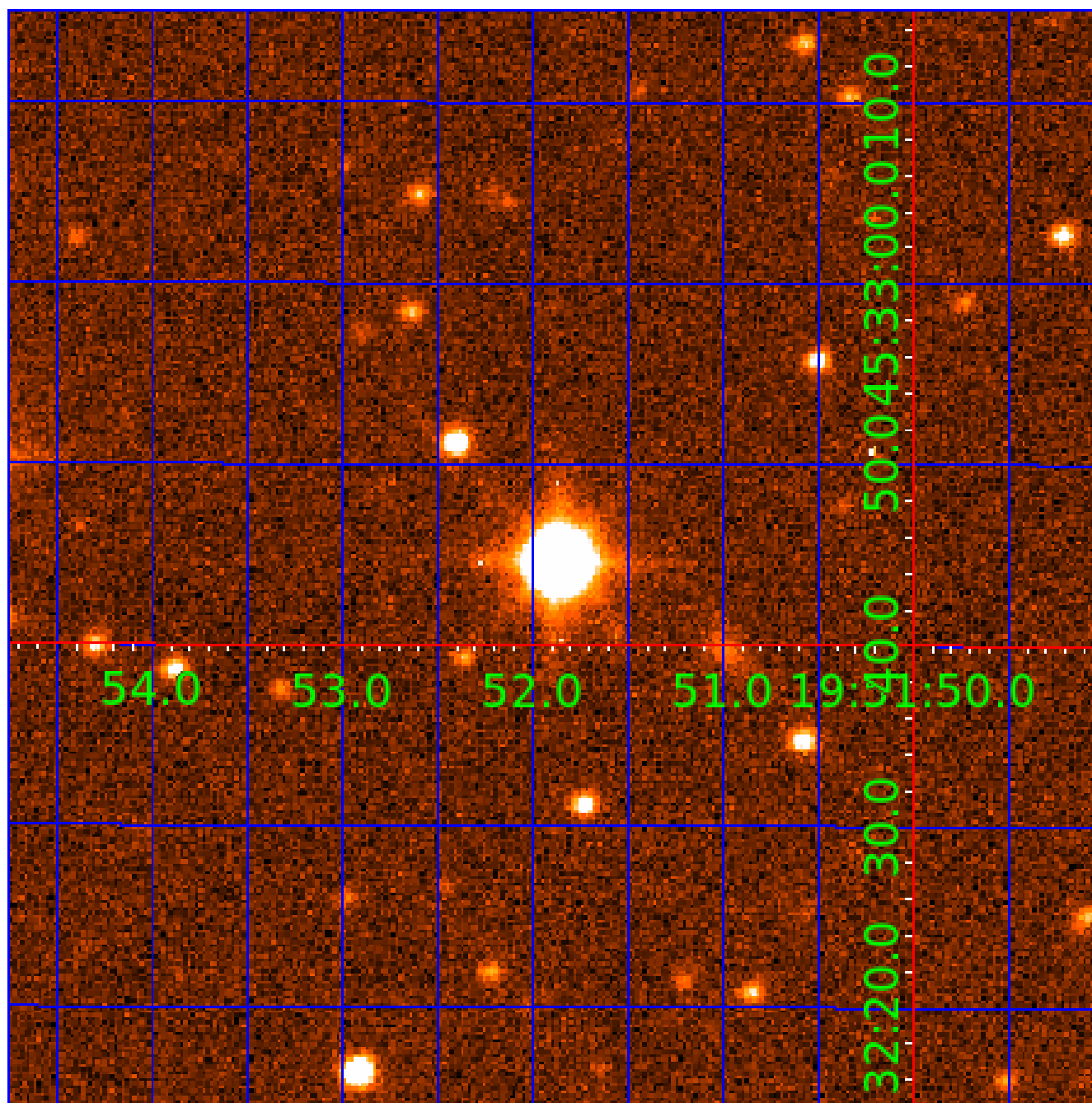


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009172506

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})
009172506-01	OBS	7141.01	50.440289	149.908313	85559.1	12.166	3130.3	2451.0	1.65	6225	51.69	48.46
009172506-02	OBS	No	50.440330	145.864498	7643.7	5.625	352.5	290.9	1.65	6225	15.89	48.46
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009172506-04	OBS	No	50.442473	146.167457	849.7	24.445	11.2	16.1	1.65	6225	9.14	48.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009172506-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_KIC_POS
009172506-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009172506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009172506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—SAME_NTL_PERIOD

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

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

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

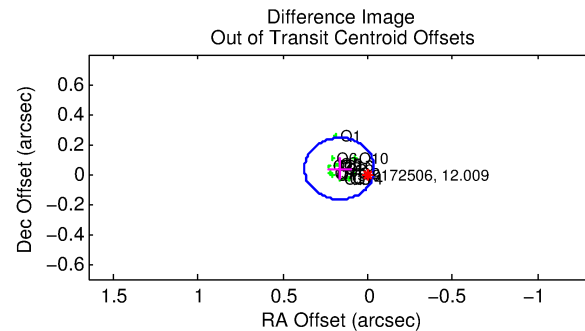
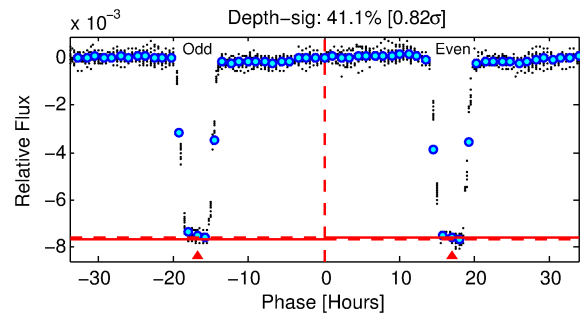
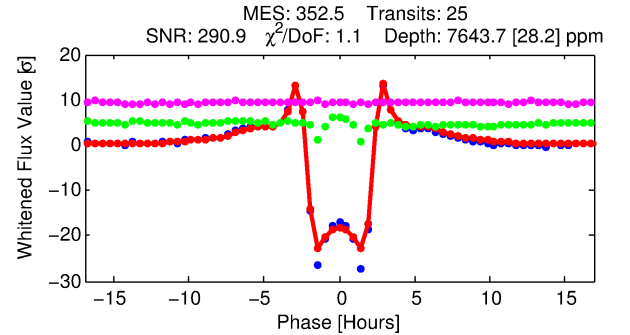
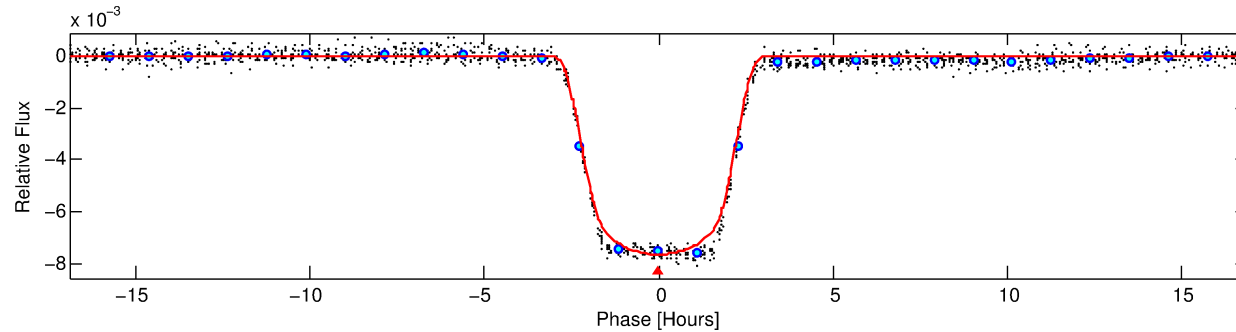
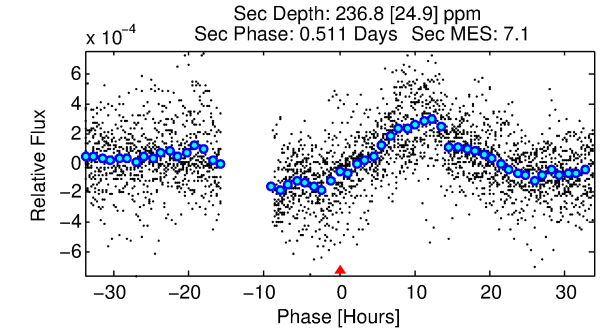
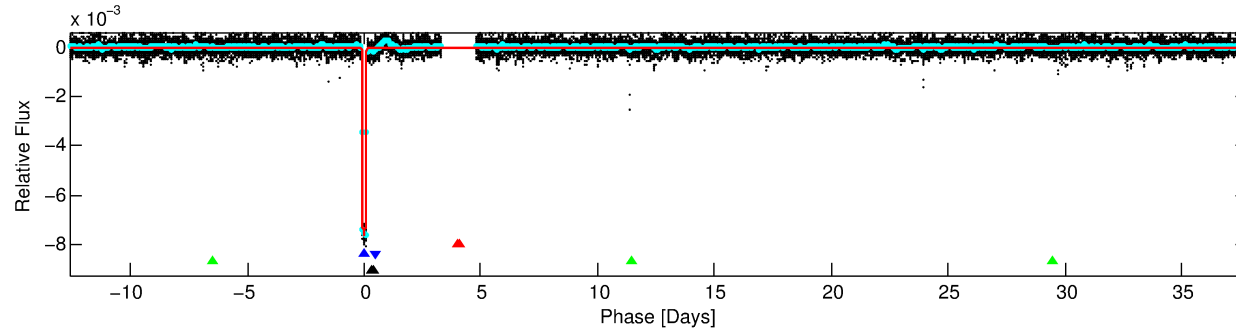
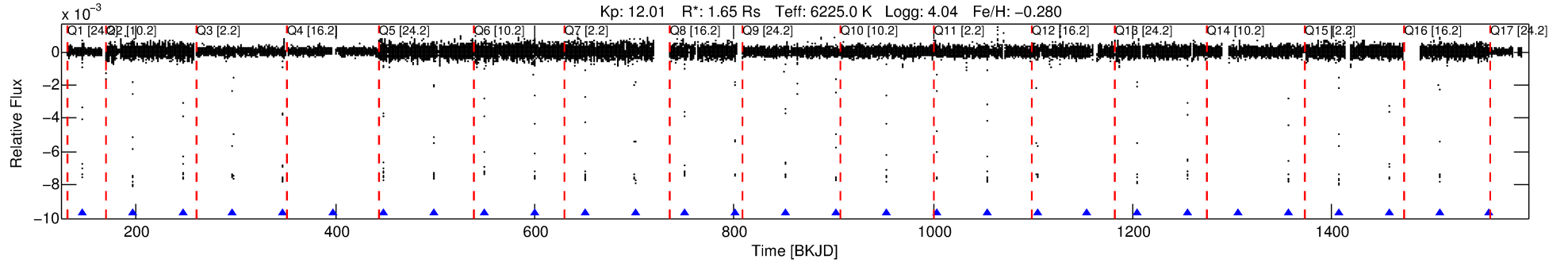
Ephemeris Match Information For 009172506-02

No Significant Match Found

DV One-Page Summary

KIC: 9172506 Candidate: 2 of 4 Period: 50.440 d

KOI: K07141 Corr: No Ephemeris Match



DV Fit Results:

Period = 50.44033 [0.00001] d
Epoch = 145.8645 [0.0002] BKJD
Rp/R* = 0.0885 [0.0002]
a/R* = 51.21 [0.26]
b = 0.79 [0.00]
Seff = 48.46 [22.39]
Teff = 673 [78] K
Rp = 15.89 [4.45] Re
a = 0.2743 [0.0759] AU
Ag = 38.81 [17.90] [2.11σ]
Teffp = 2596 [98] K [15.34σ]

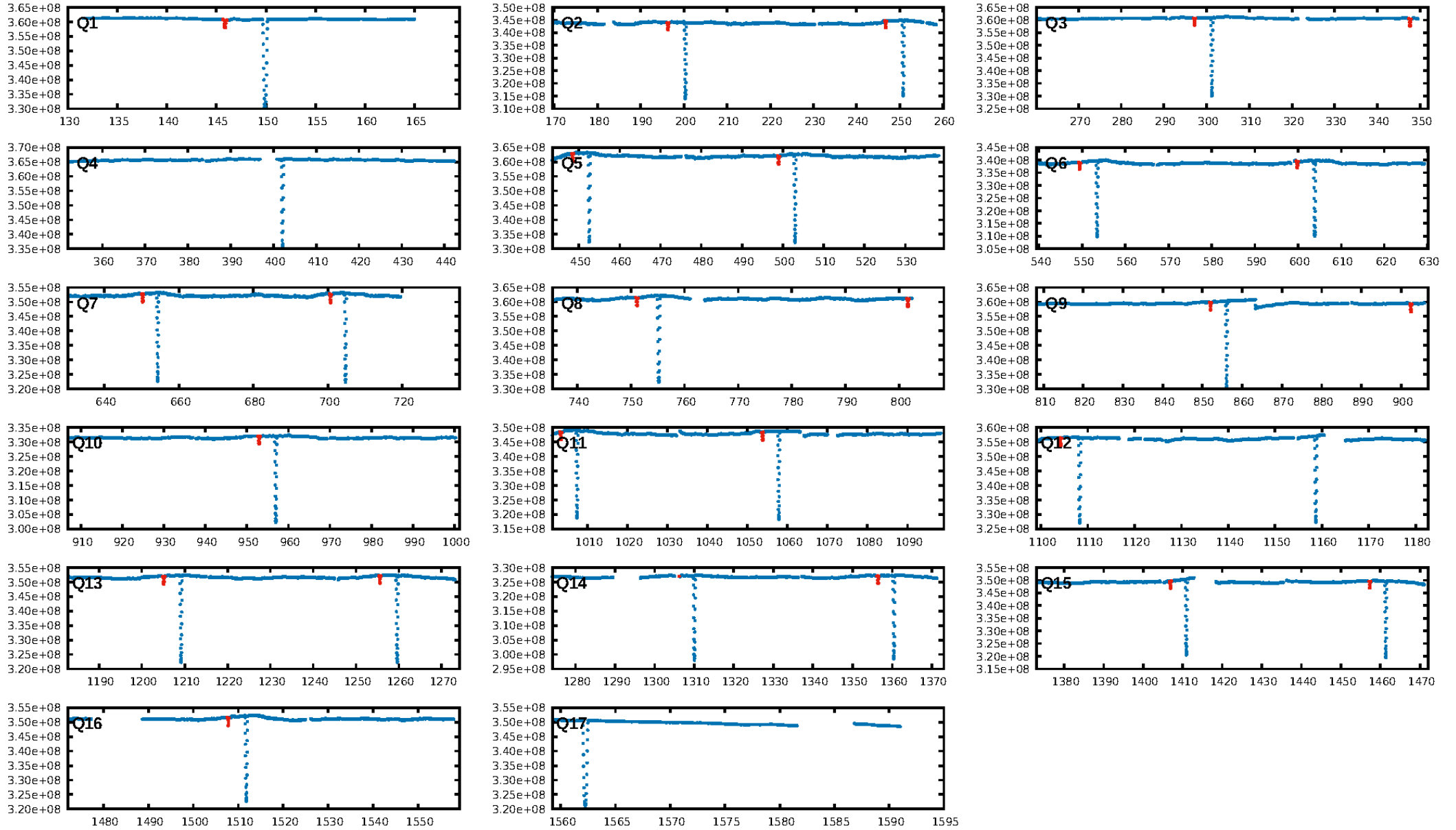
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 0.2% [0.00σ]
ModelChiSquare2-sig: 91.7%
ModelChiSquareGof-sig: 81.2%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [24/24]
GhostDiagnostic-chr: 5.538
Centroid-sig: 0.0%
Centroid-so: 0.353 arcsec [35.15σ]
OotOffset-rm: 0.173 arcsec [2.54σ]
OotOffset-st: 4/4/2/4 [14]
KicOffset-rm: 0.277 arcsec [3.67σ]
KicOffset-st: 4/4/2/4 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.00 [0/14]

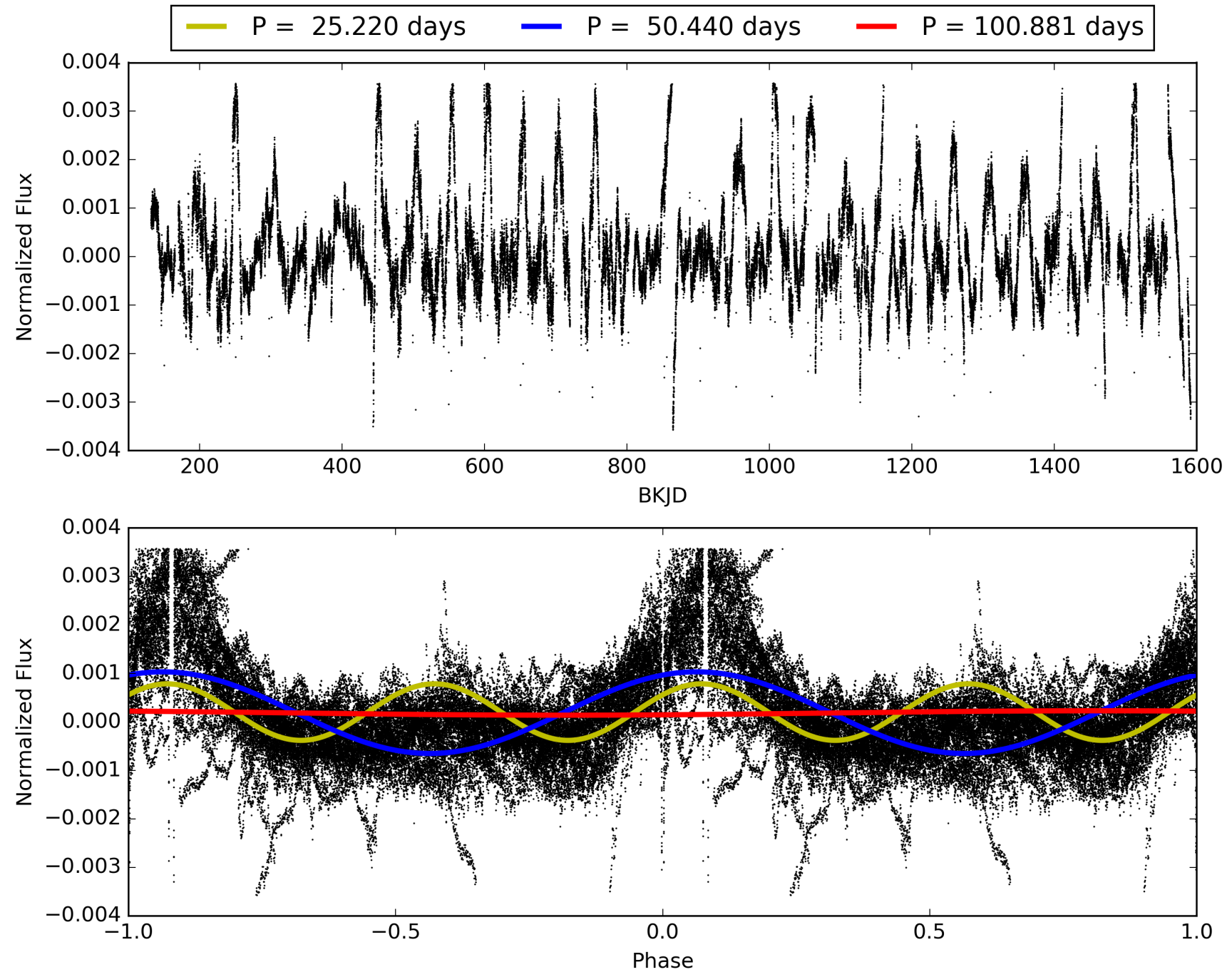
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:23:54 Z

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

TCE 009172506-02, PDC Light Curves

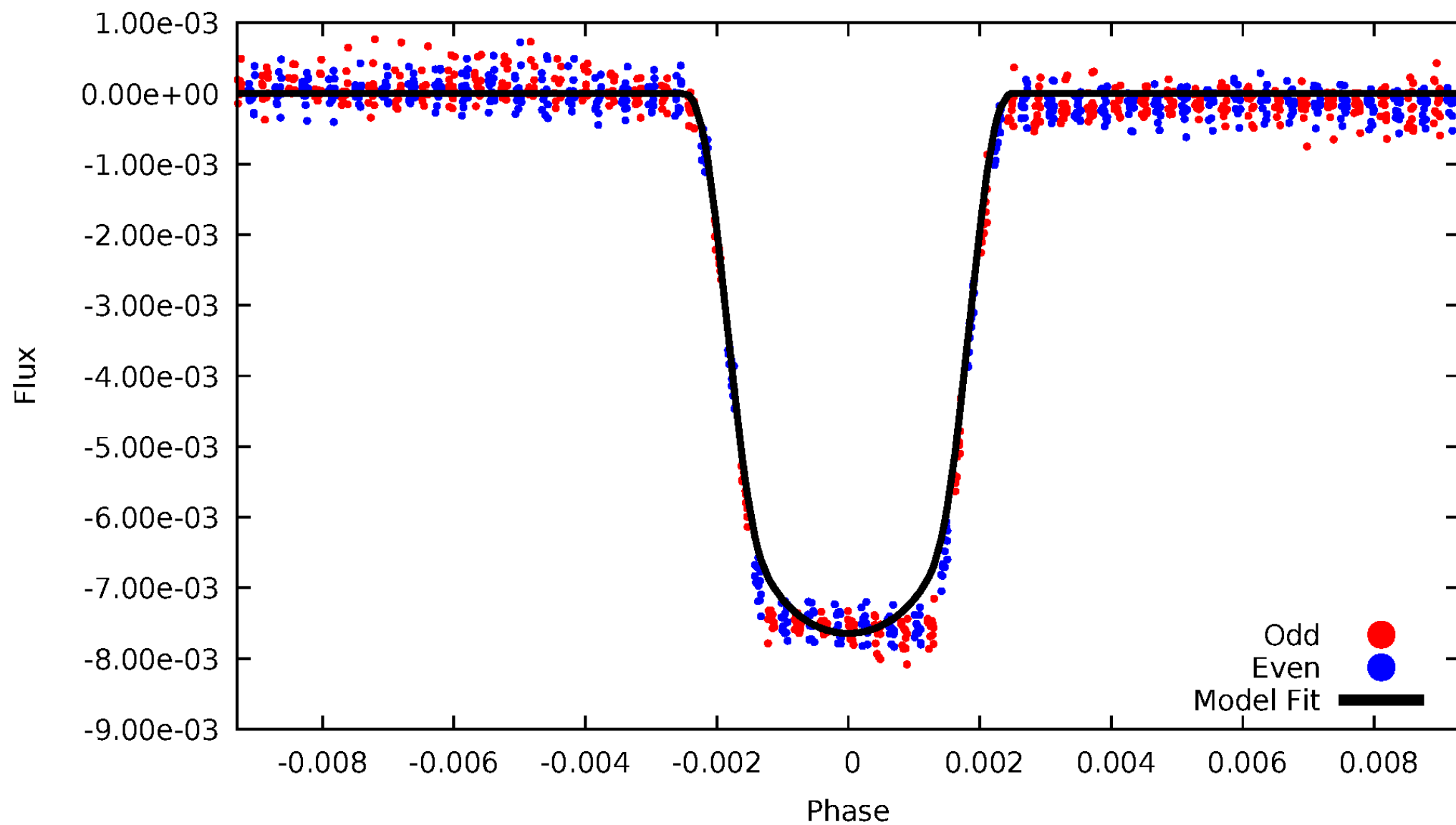


TCE 009172506-02



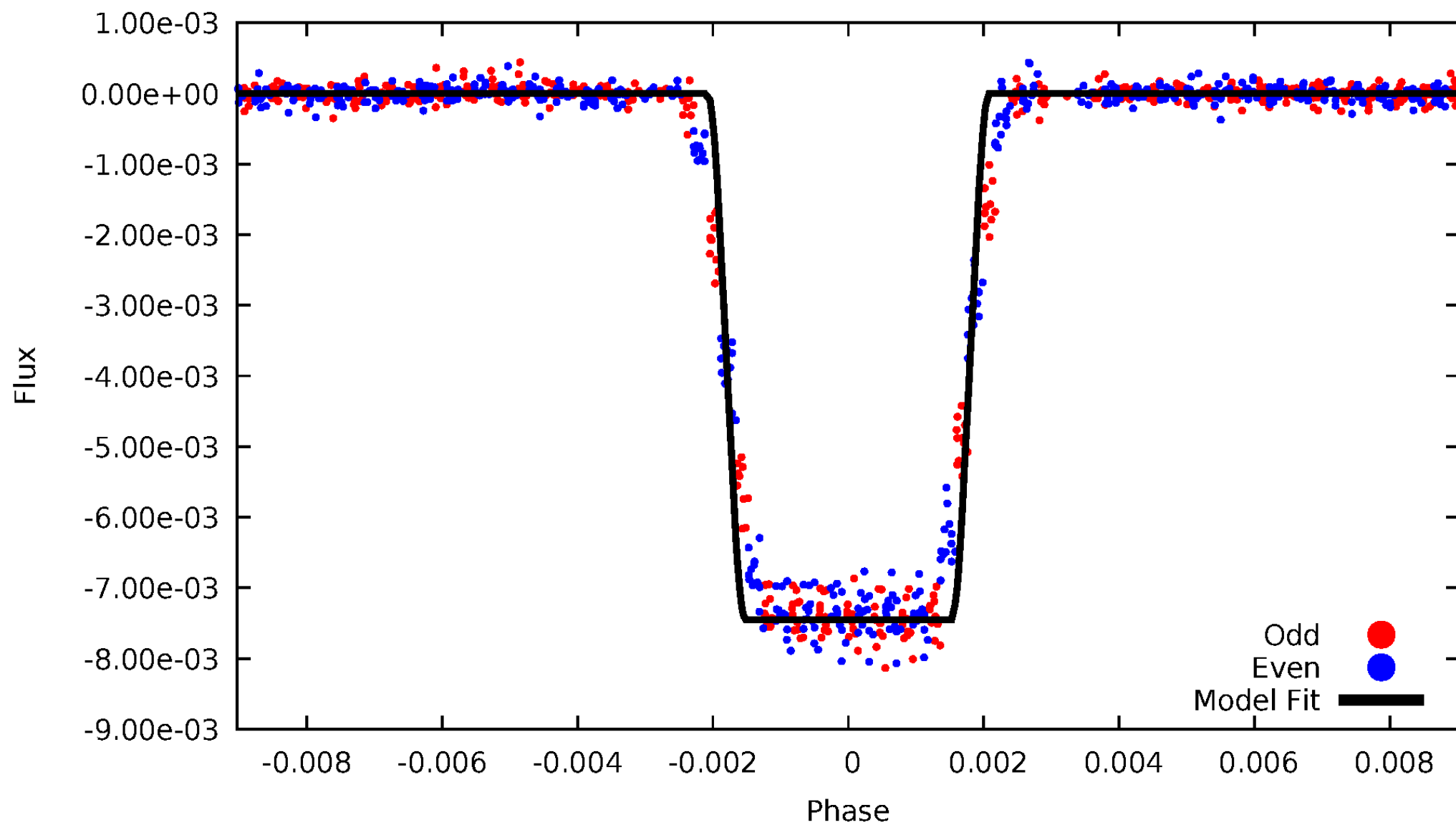
DV Odd/Even

TCE 009172506-02



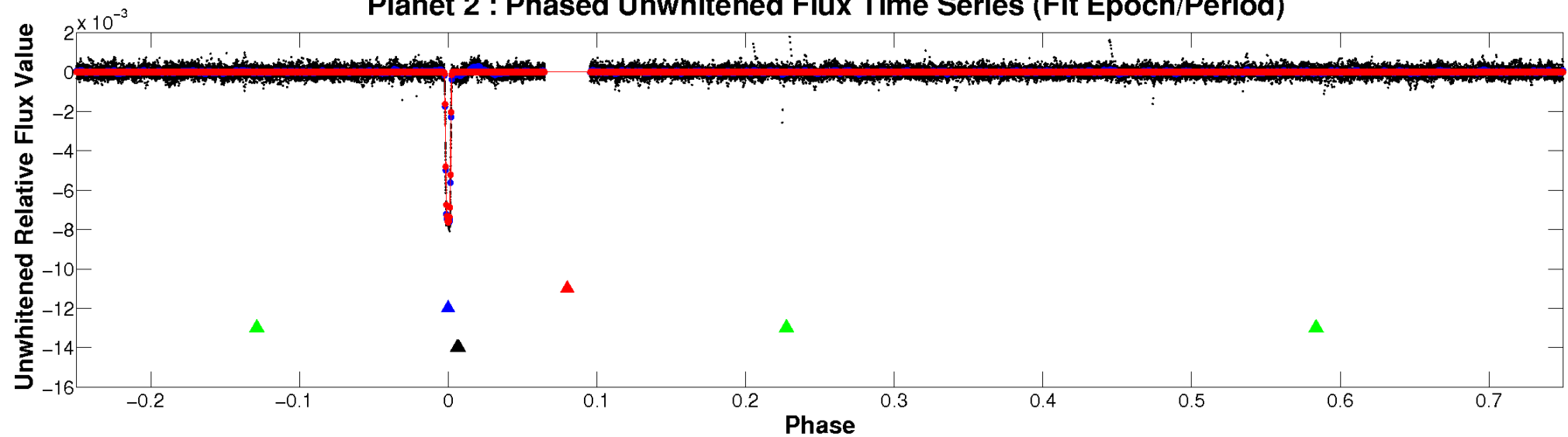
ALT Odd/Even

TCE 009172506-02

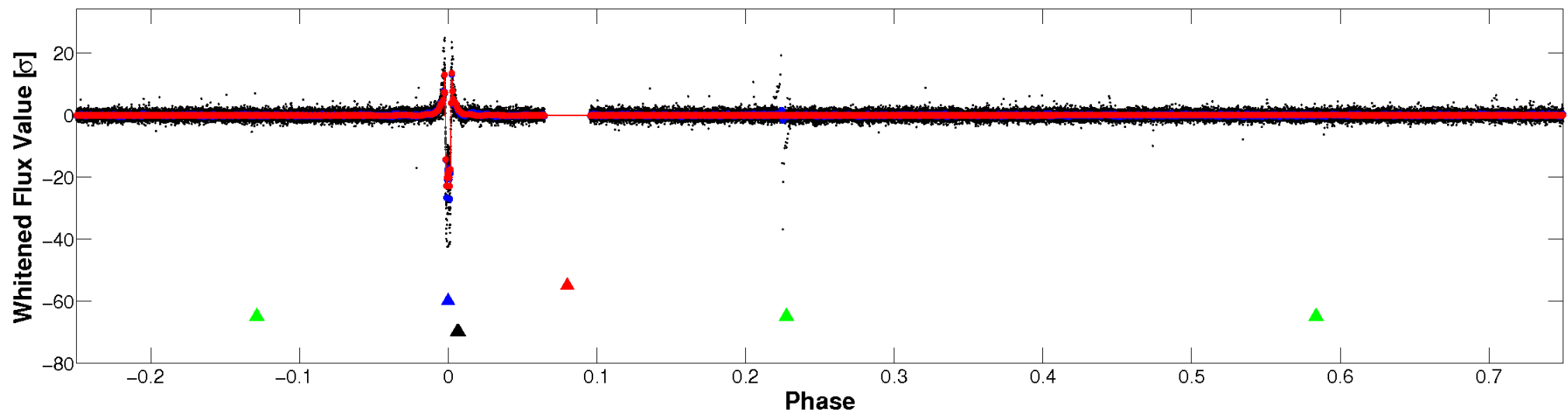


Non-Whitened Vs. Whitened Light Curve

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

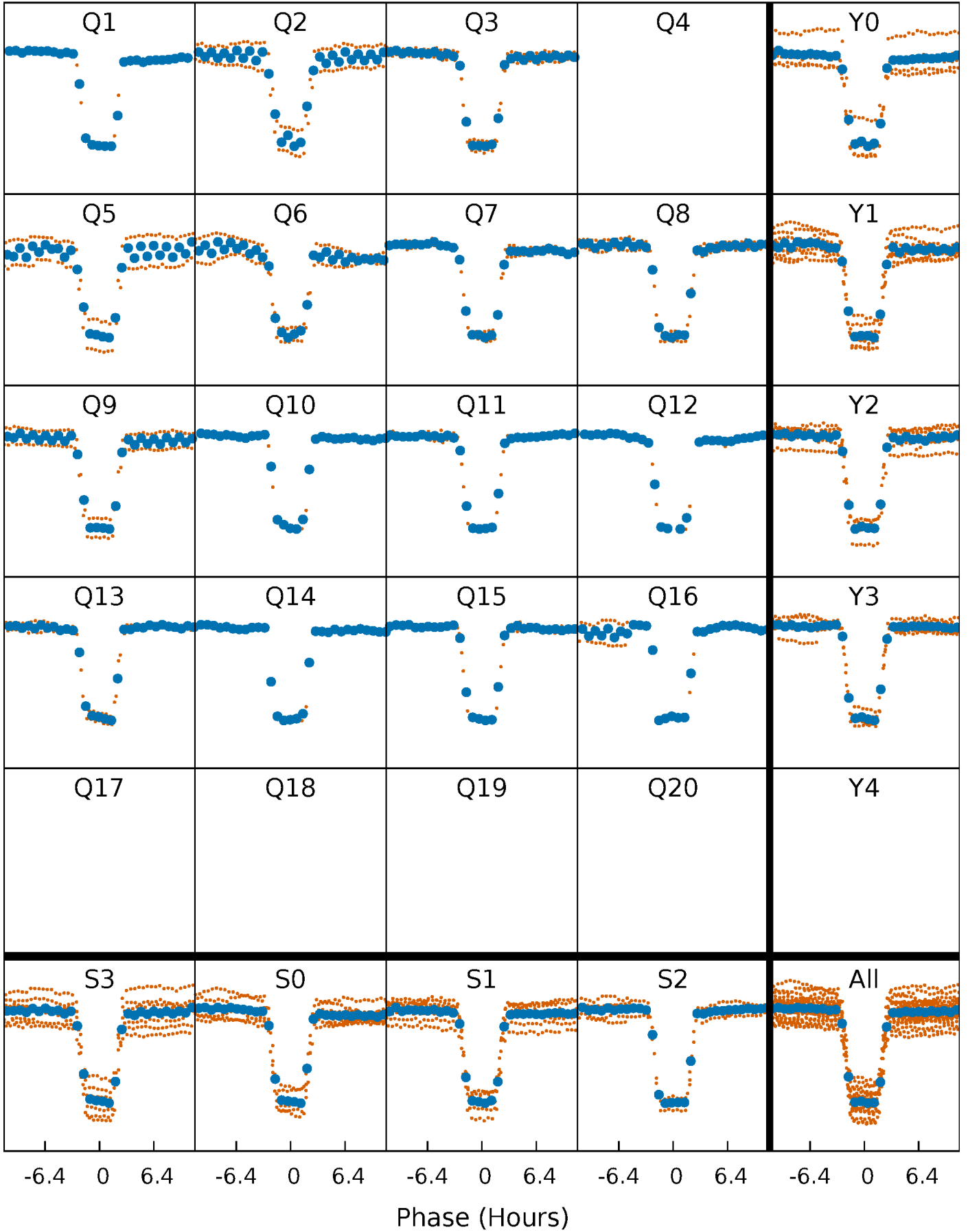


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



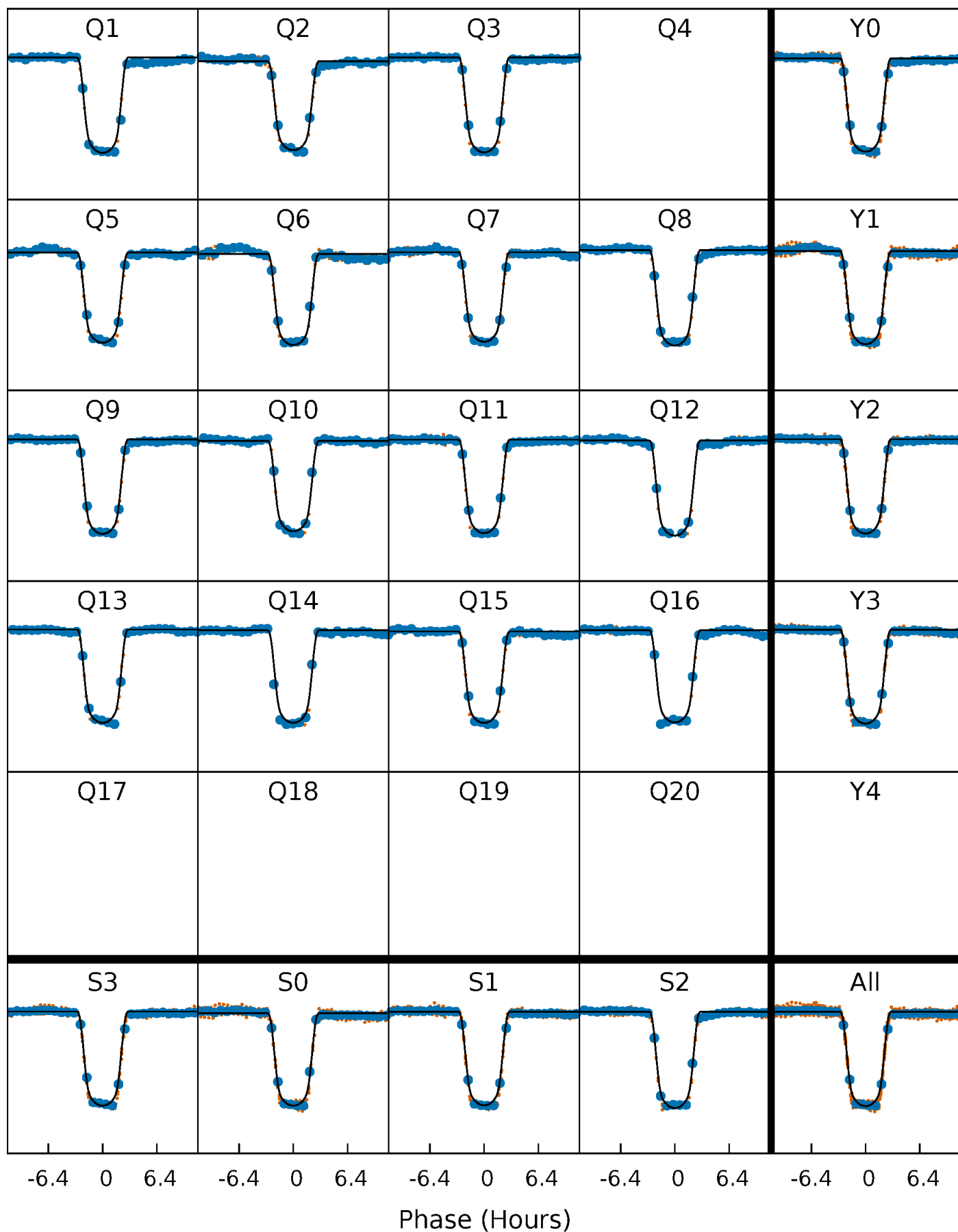
PDC Quarter-Phased Transit Curves

TCE 009172506-02 P= 50.440330 Days $T_0=145.864498$ (BKJD)



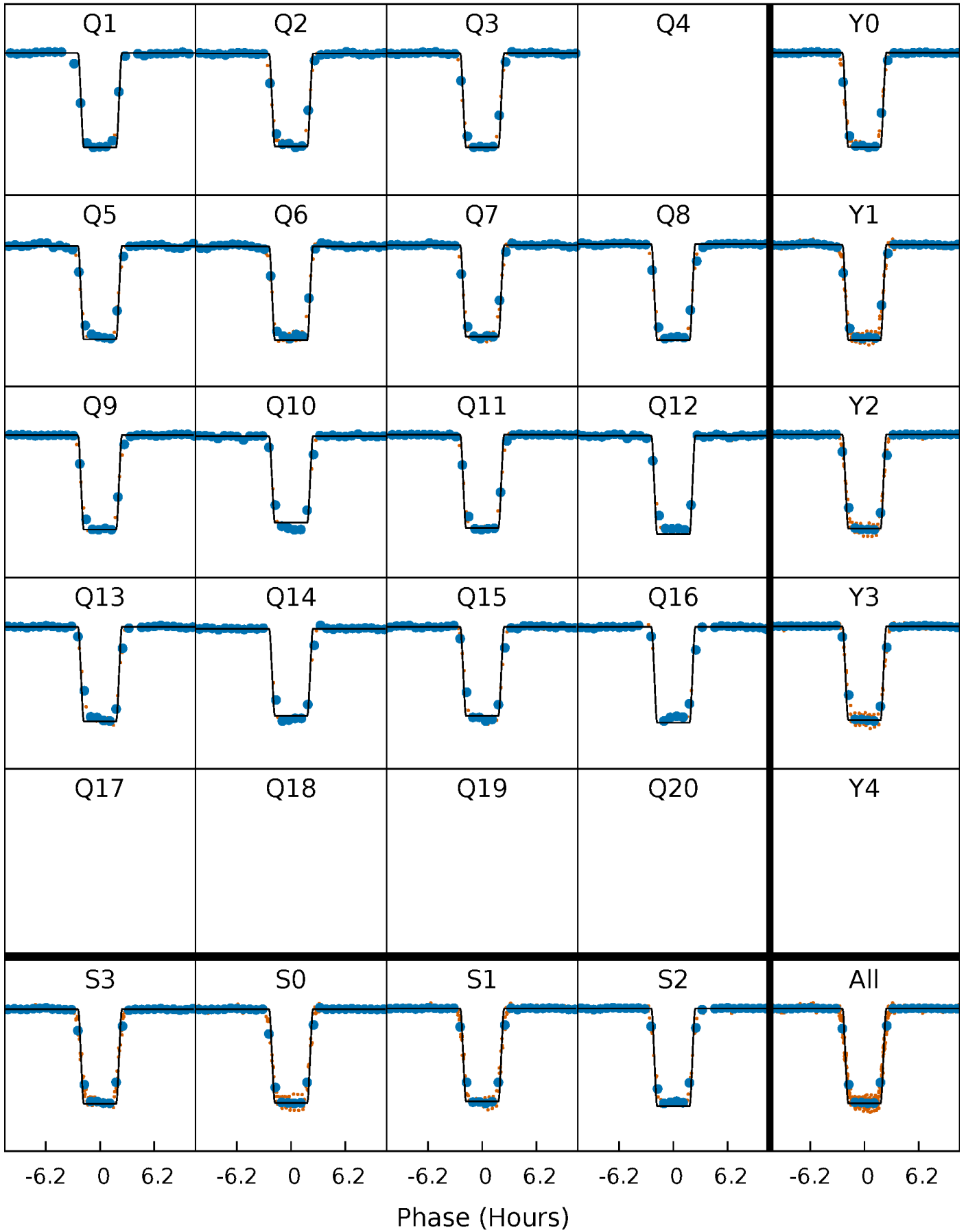
DV Quarter-Phased Transit Curves

TCE 009172506-02 P= 50.440330 Days $T_0=145.864498$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

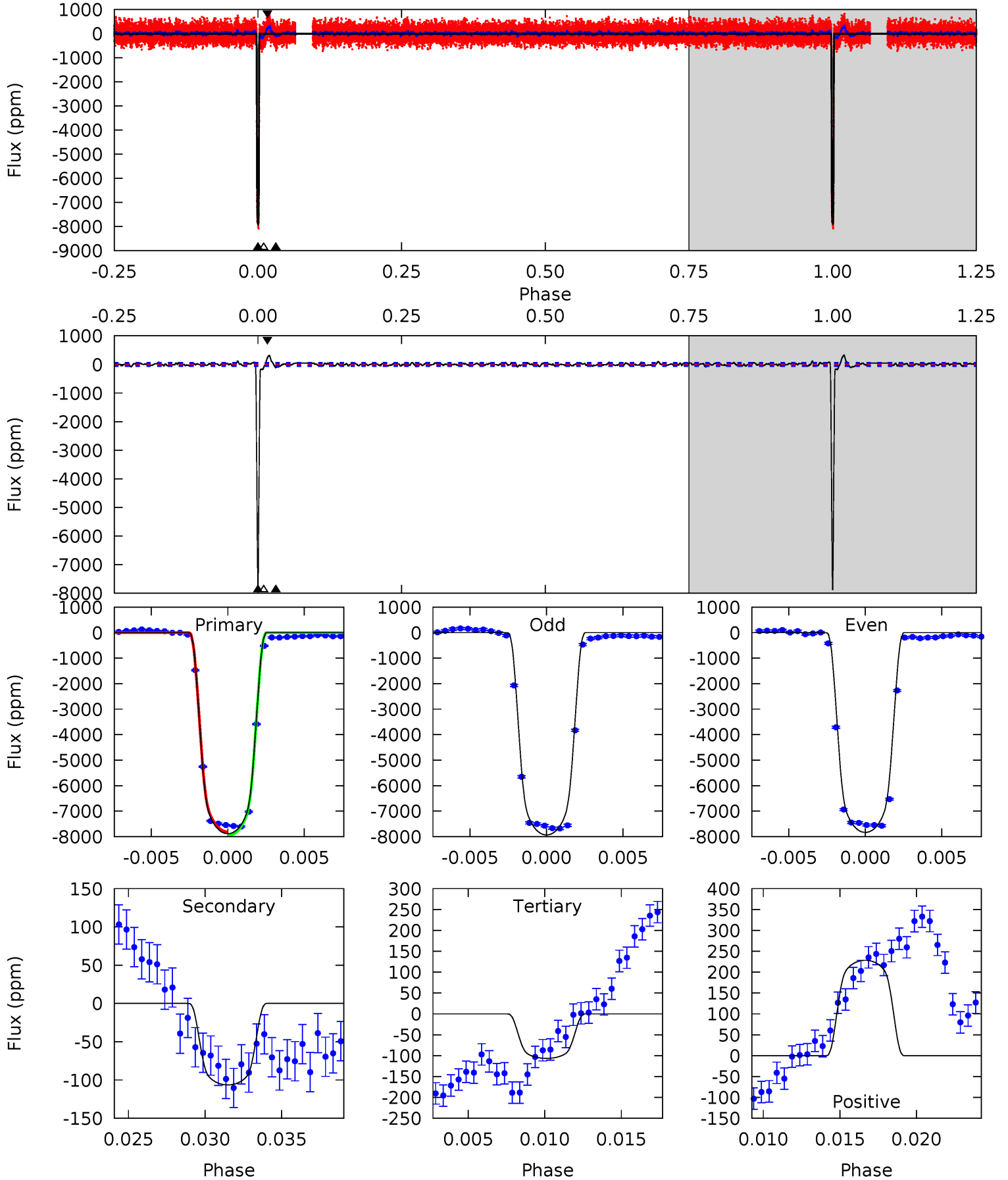
TCE 009172506-02 P= 50.439976 Days $T_0=145.869362$ (BKJD)



DV Model-Shift Uniqueness Test

009172506-02, P = 50.440330 Days, E = 95.424168 Days

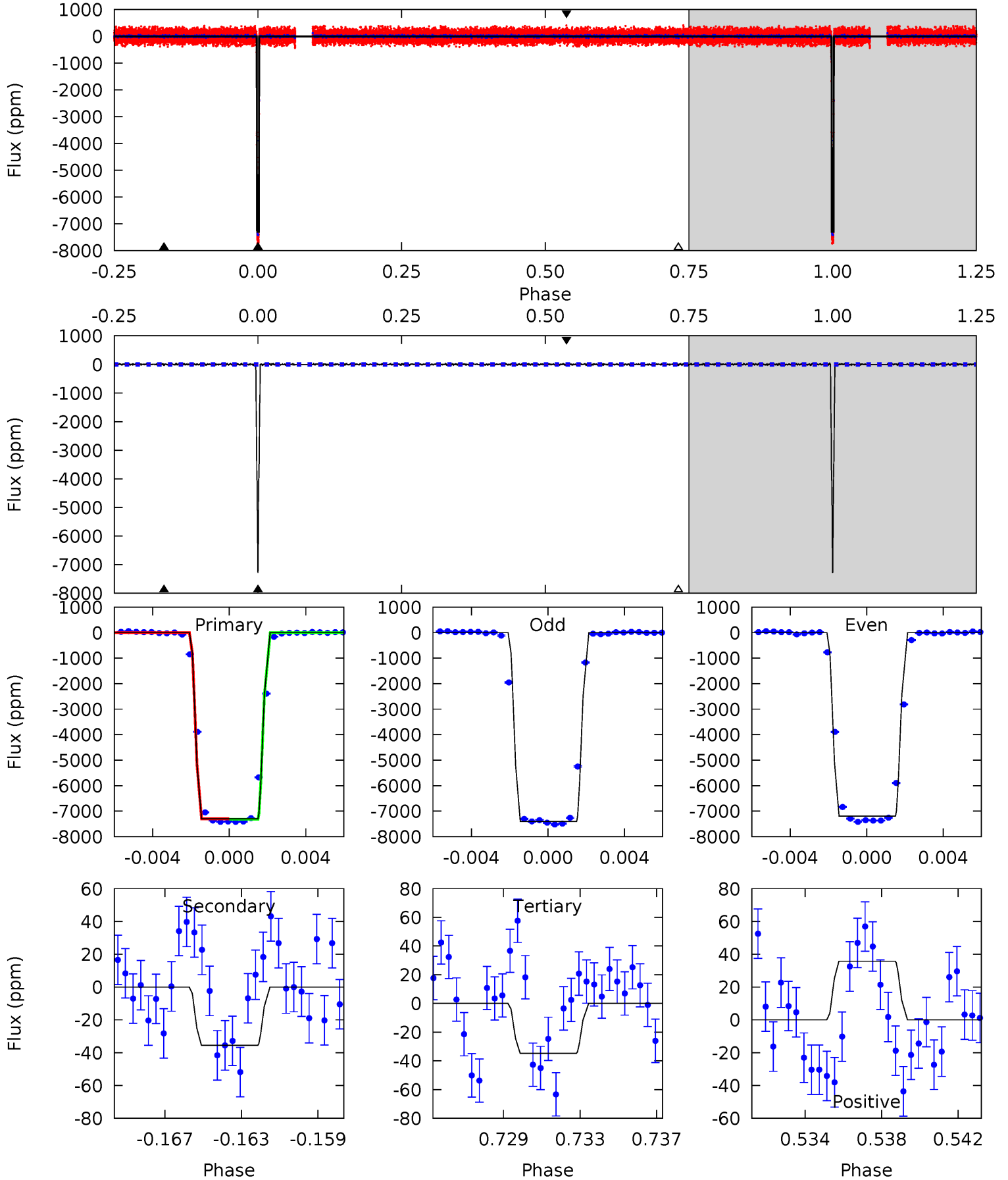
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
775.3	10.5	10.5	22.5	5.16	2.81	3.89	764.8	752.8	-0.01	-12.0	4.93	1.00	0.04	7.10



Alt Model-Shift Uniqueness Test

009172506-02, P = 50.439976 Days, E = 95.429386 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
927.0	4.52	4.41	4.54	5.20	2.87	1.27	922.6	922.5	0.11	-0.03	13.0	1.00	0.00	0.98



Stellar Parameters For KIC 009172506

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6225^{+170}_{-170}	$4.039^{+0.266}_{-0.114}$	$-0.280^{+0.300}_{-0.300}$	$1.646^{+0.335}_{-0.461}$	$1.080^{+0.192}_{-0.157}$	$0.341^{+0.483}_{-0.129}$
	+3%/-3%	+7%/-3%	+107%/-107%	+20%/-28%	+18%/-15%	+142%/-38%
Source	PHO1	FLK73	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 009172506-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-106 ± 10	$15.54^{+1.94}_{-2.30}$	926^{+59}_{-74}	2847^{+57}_{-60}	18^{+7}_{-4}
Alt.	-36 ± 8	$15.11^{+2.02}_{-2.27}$	924^{+61}_{-72}	2477^{+72}_{-76}	$6.532^{+2.798}_{-1.777}$

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

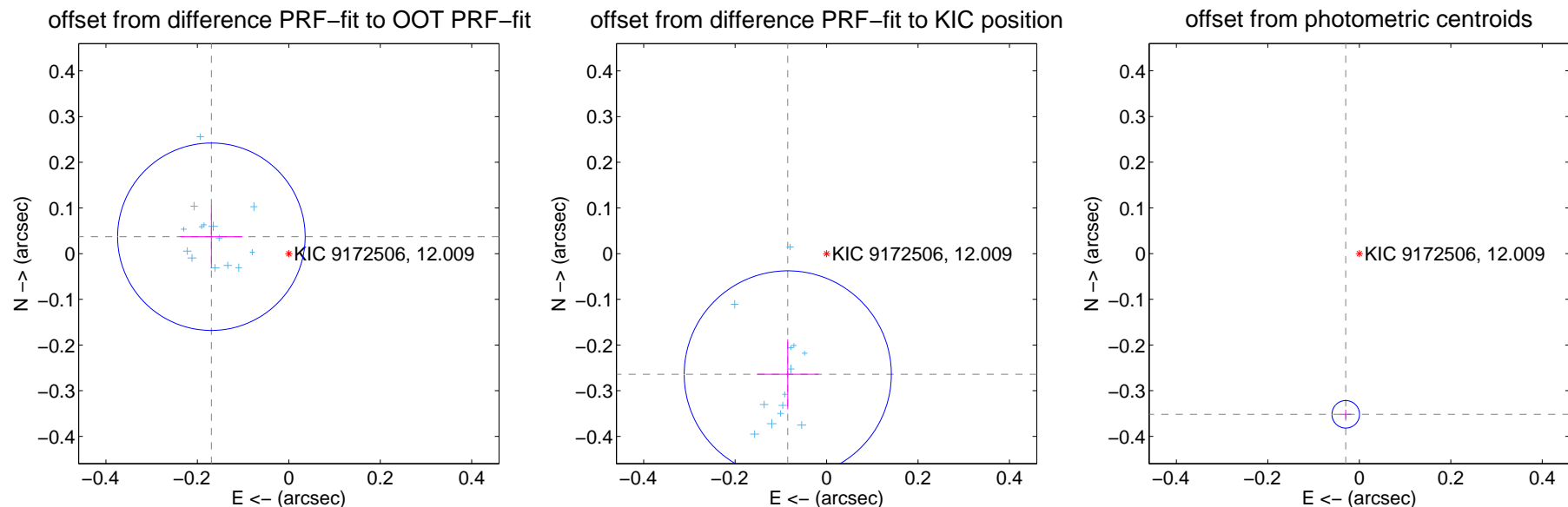
DV Centroid Data

Supplemental centroid analysis for 009172506-02. Kepler magnitude: 12.01. Transit SNR 290.94

There are 14 quarters with good PRF difference image offsets

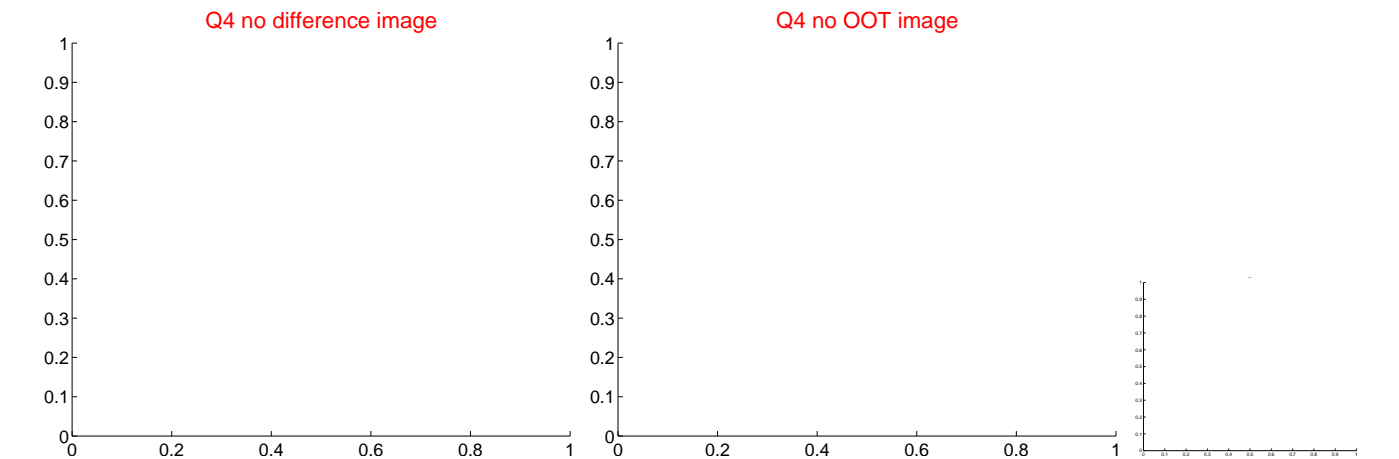
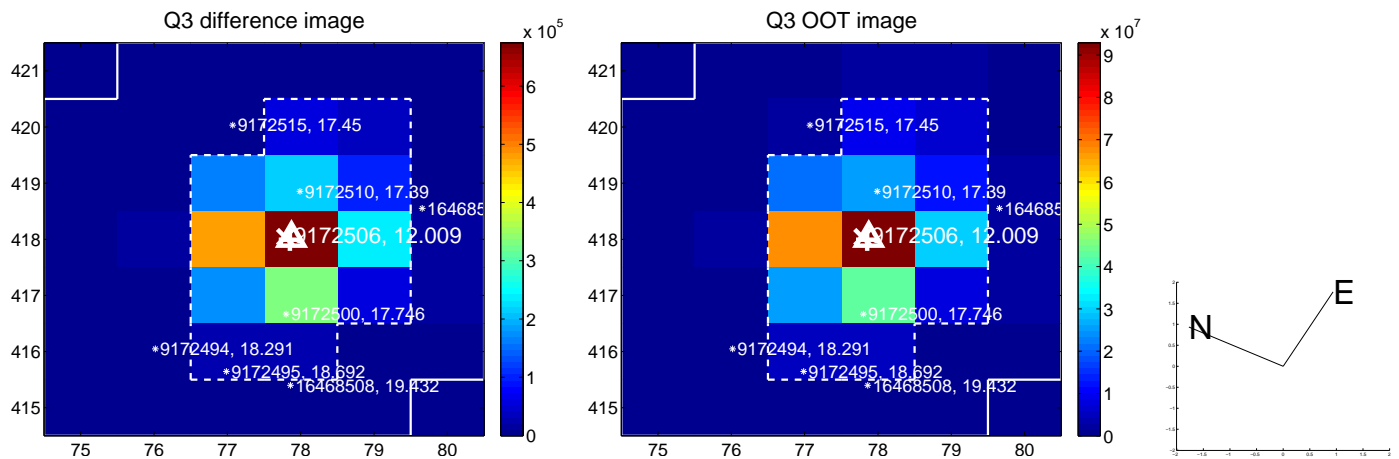
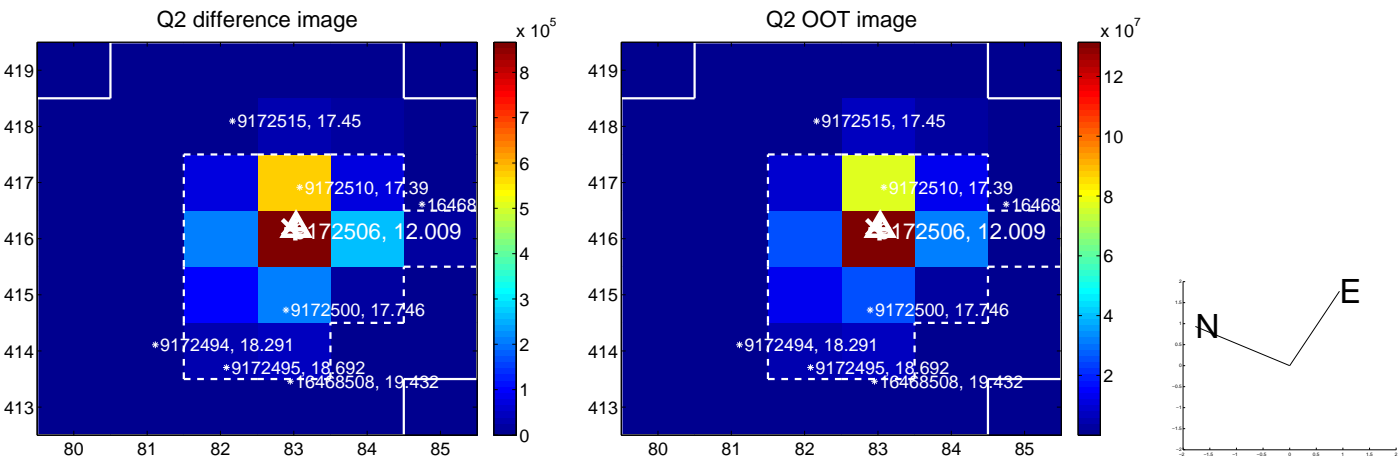
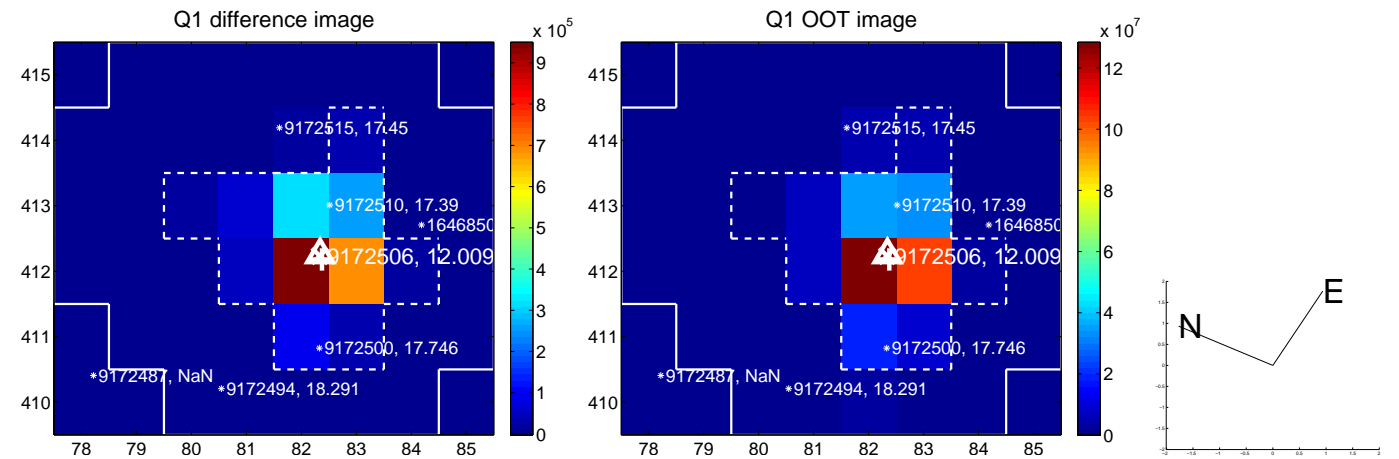
The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.173 ± 0.068	2.54	0.169 ± 0.068	0.037 ± 0.068
PRF-fit source offset from KIC position	0.277 ± 0.076	3.67	0.085 ± 0.068	-0.264 ± 0.076
photometric centroid source offset	0.35 ± 0.01	35.15	0.03 ± 0.01	-0.35 ± 0.01

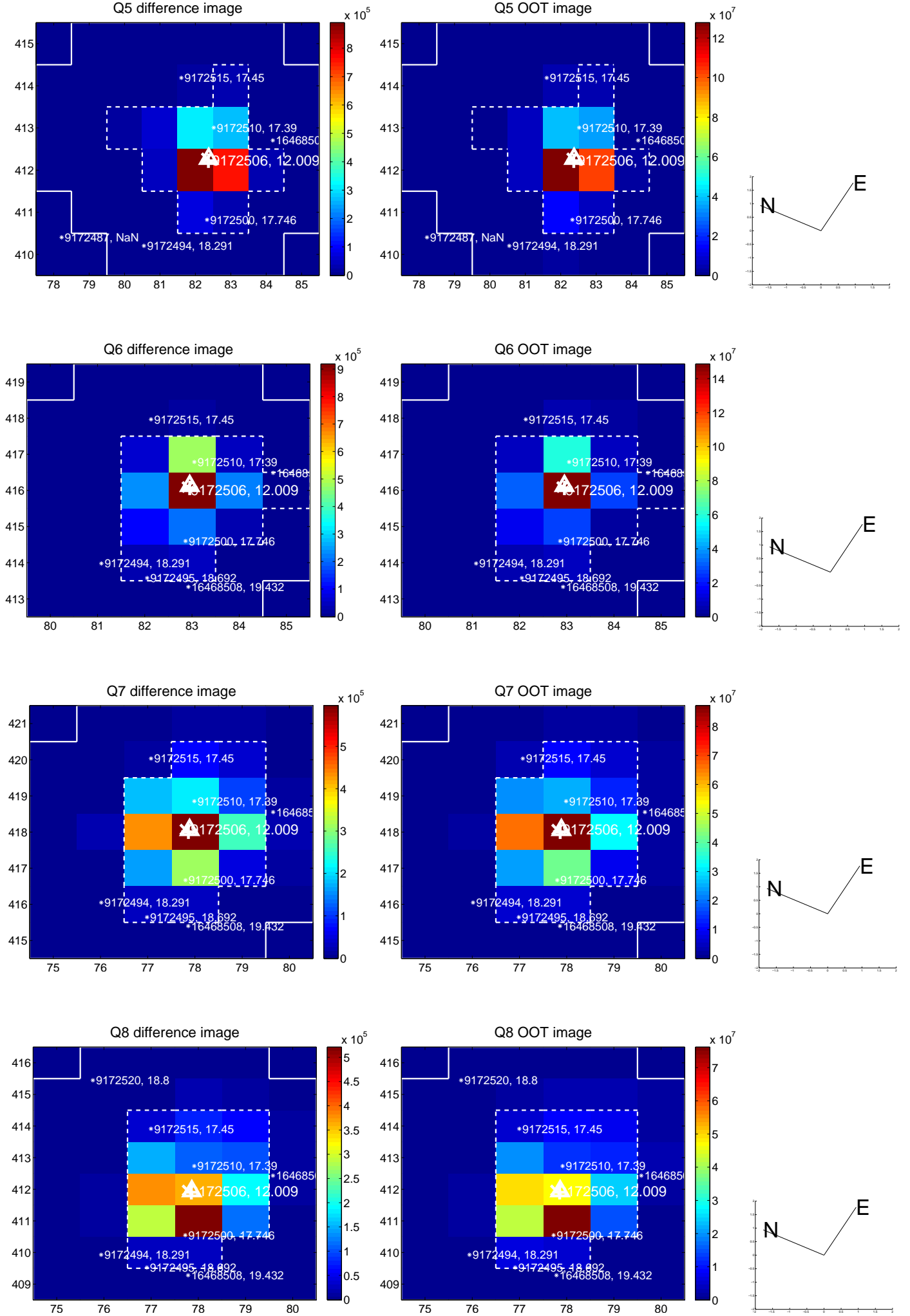


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

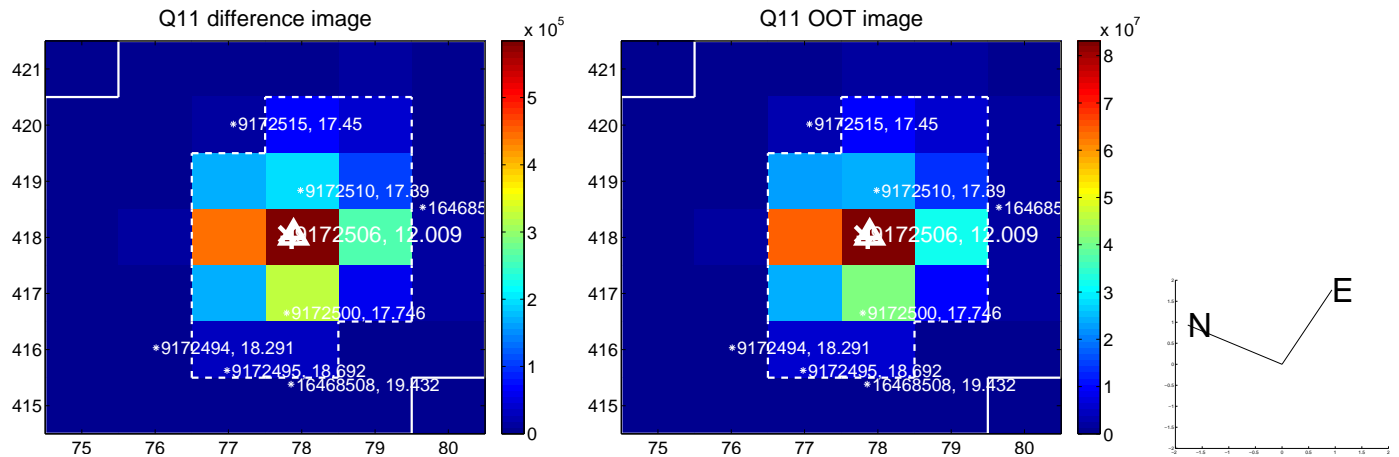
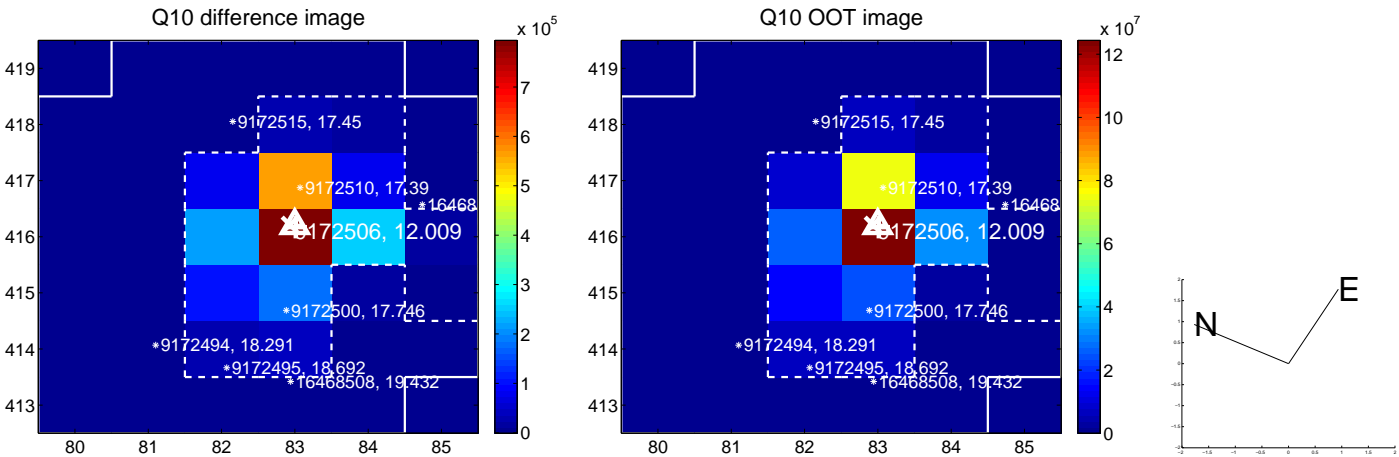
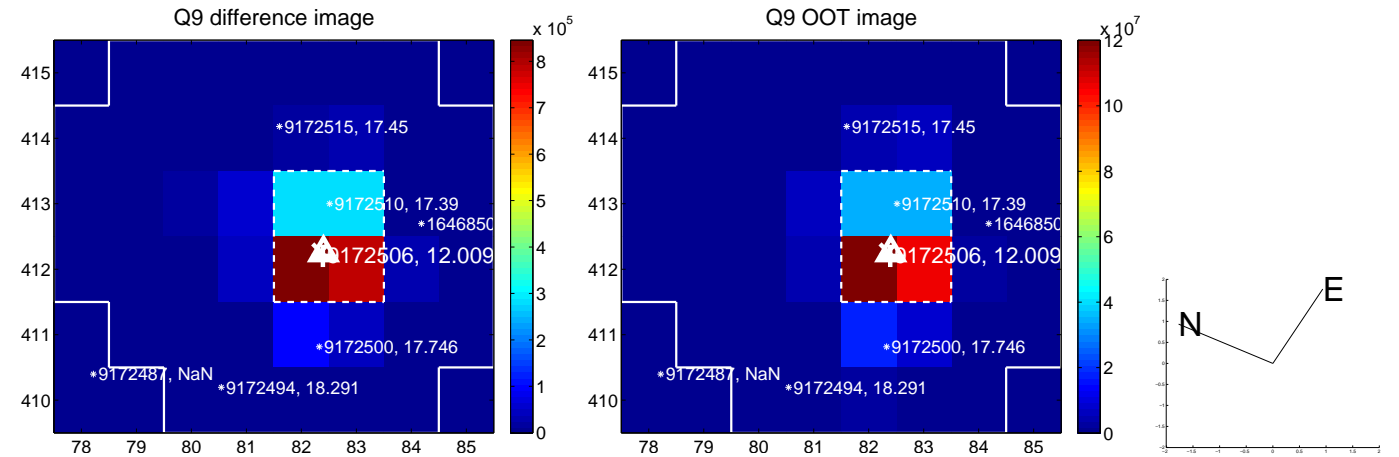
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



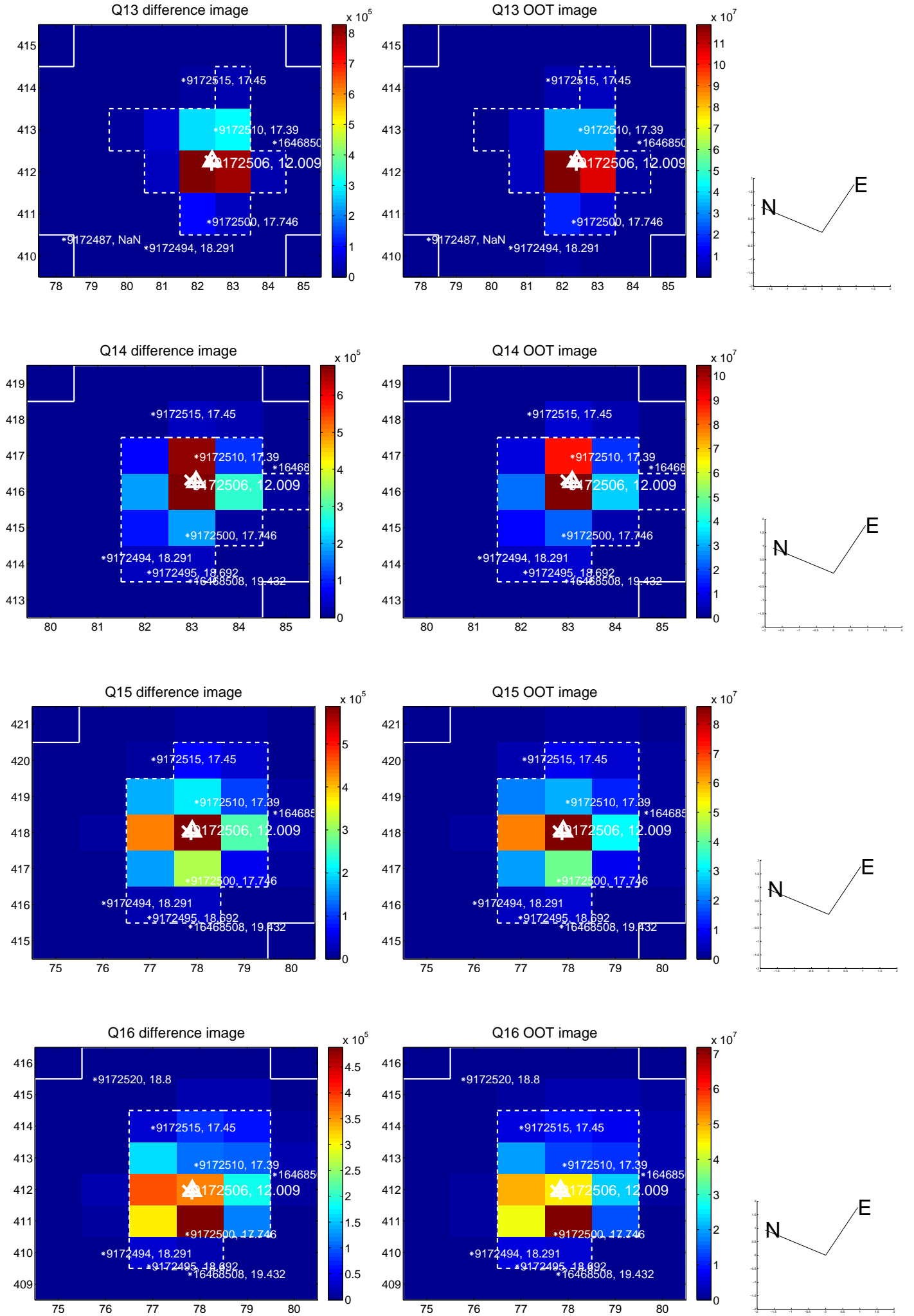
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



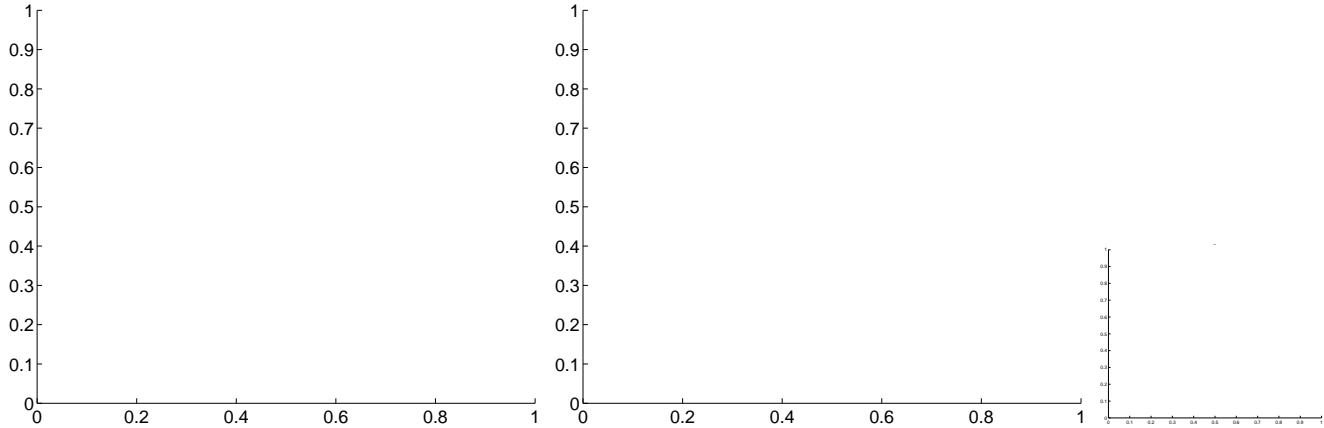
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



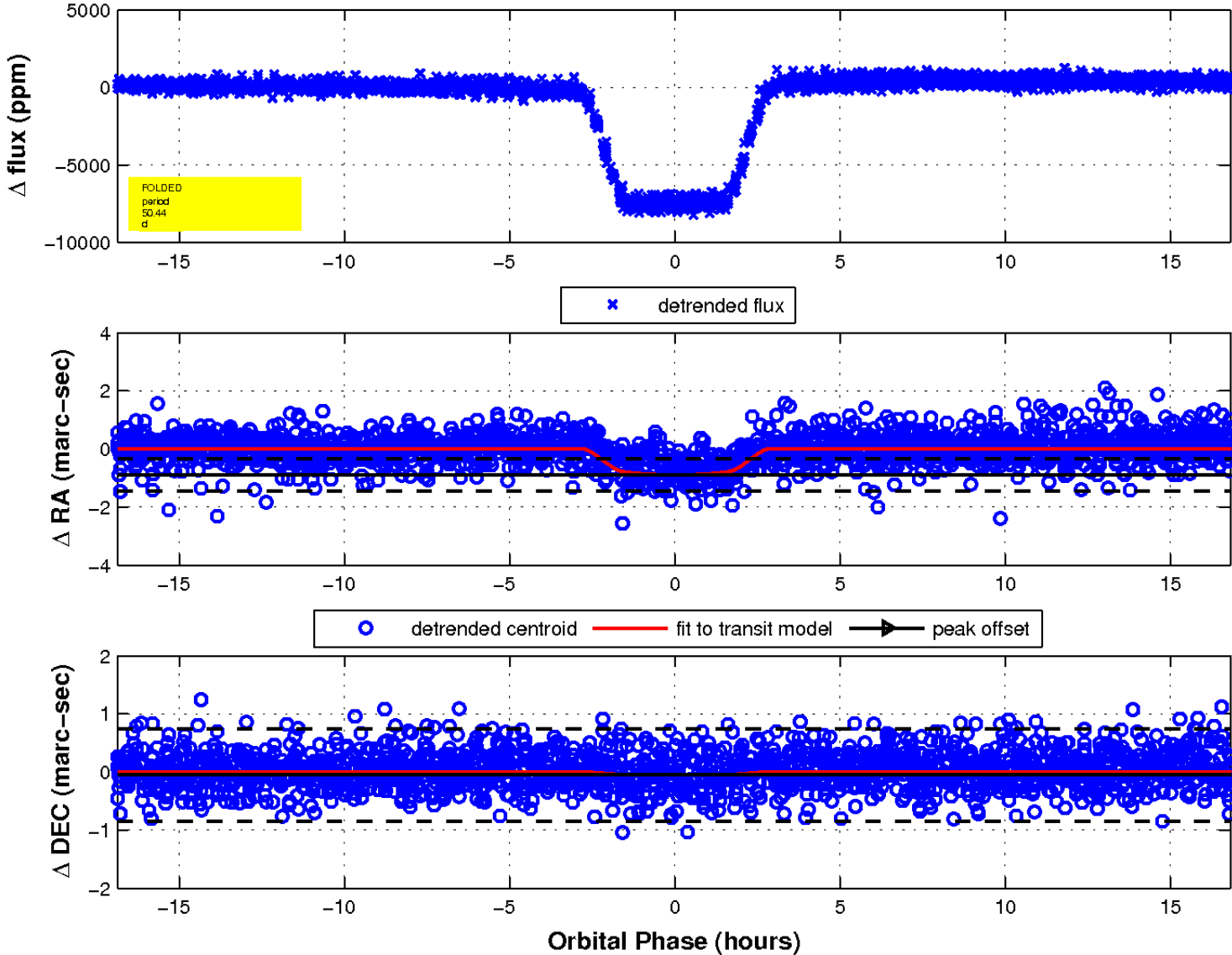
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image

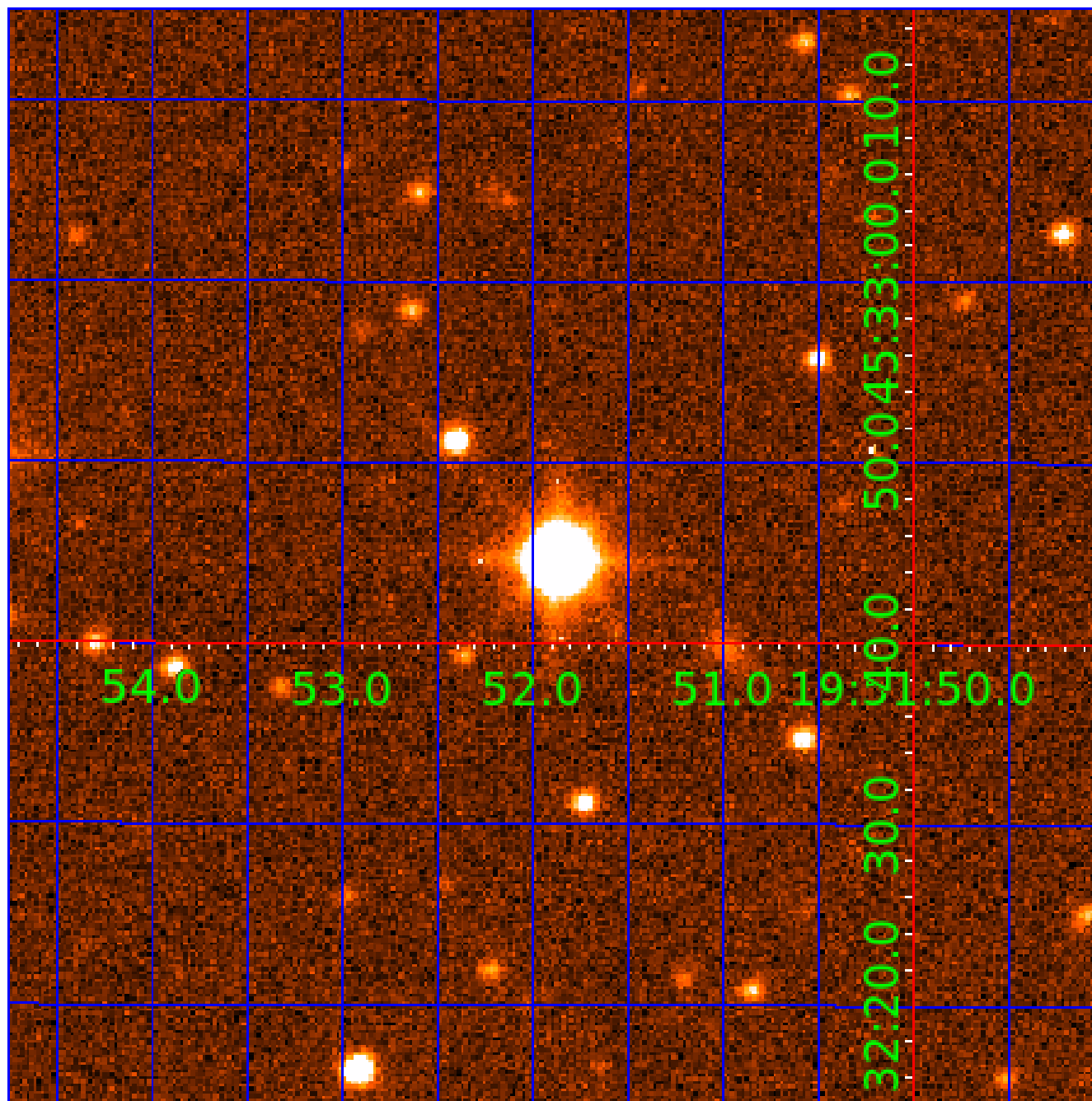


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 009172506

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})
009172506-01	OBS	7141.01	50.440289	149.908313	85559.1	12.166	3130.3	2451.0	1.65	6225	51.69	48.46
009172506-02	OBS	No	50.440330	145.864498	7643.7	5.625	352.5	290.9	1.65	6225	15.89	48.46
009172506-03	OBS	No	637.757228	225.750458	368.3	8.378	26.8	4.5	1.65	6225	3.19	1.65
009172506-04	OBS	No	50.442473	146.167457	849.7	24.445	11.2	16.1	1.65	6225	9.14	48.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009172506-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_KIC_POS
009172506-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009172506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009172506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—SAME_NTL_PERIOD

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

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

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

Ephemeris Match Information For 009172506-03

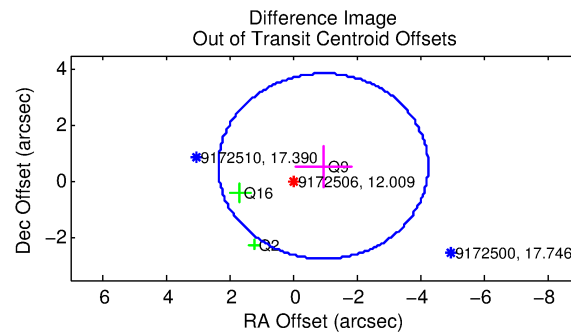
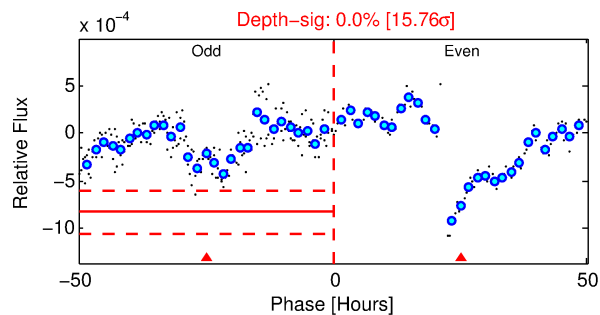
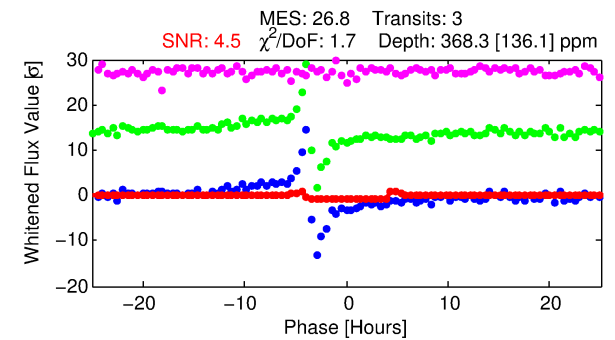
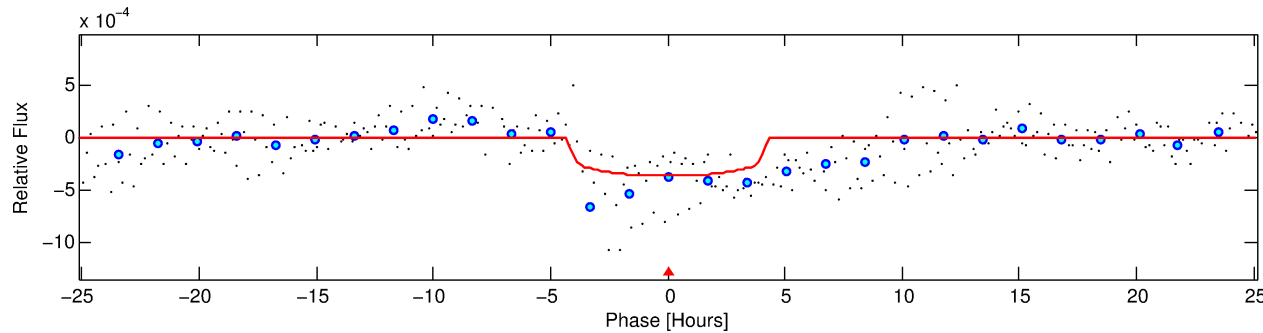
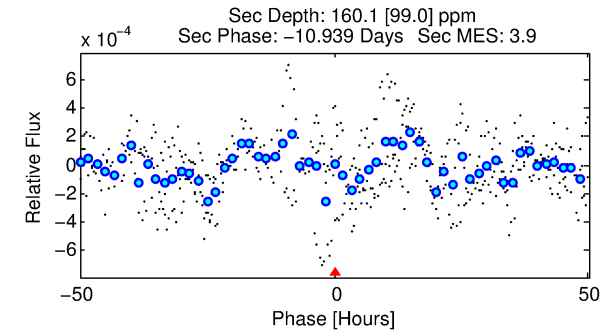
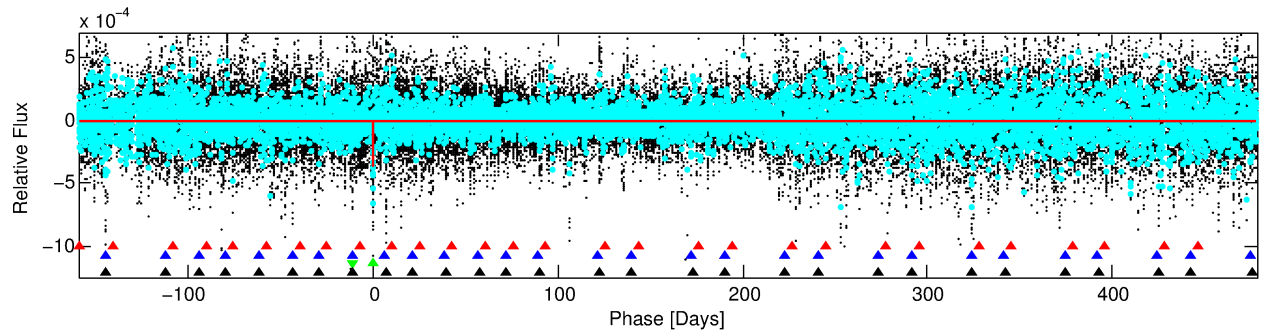
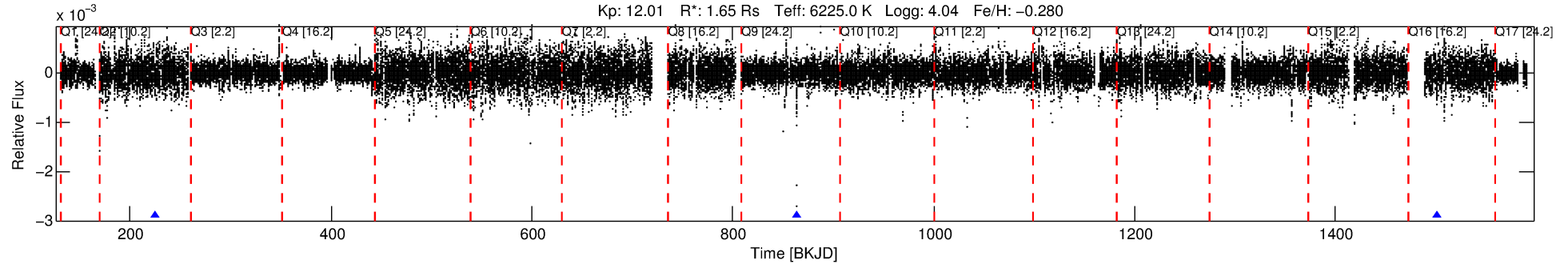
No Significant Match Found

DV One-Page Summary

KIC: 9172506 Candidate: 3 of 4 Period: 637.757 d

KOI: K07141 Corr: No Ephemeris Match

Kp: 12.01 R*: 1.65 Rs Teff: 6225.0 K Logg: 4.04 Fe/H: -0.280



DV Fit Results:

Period = 637.75723 [0.01096] d
Epoch = 225.7505 [0.0136] BKJD
Rp/R* = 0.0177 [0.0382]
a/R* = 571.84 [6308.25]
b = 0.26 [39.31]
Seff = 1.65 [0.76]
Teq = 289 [33] K
Rp = 3.19 [6.92] Re
a = 1.4885 [0.4118] AU
Ag = 19222.89 [84152.81] [0.23 σ]
Teffp = 5257 [5725] K [0.87 σ]

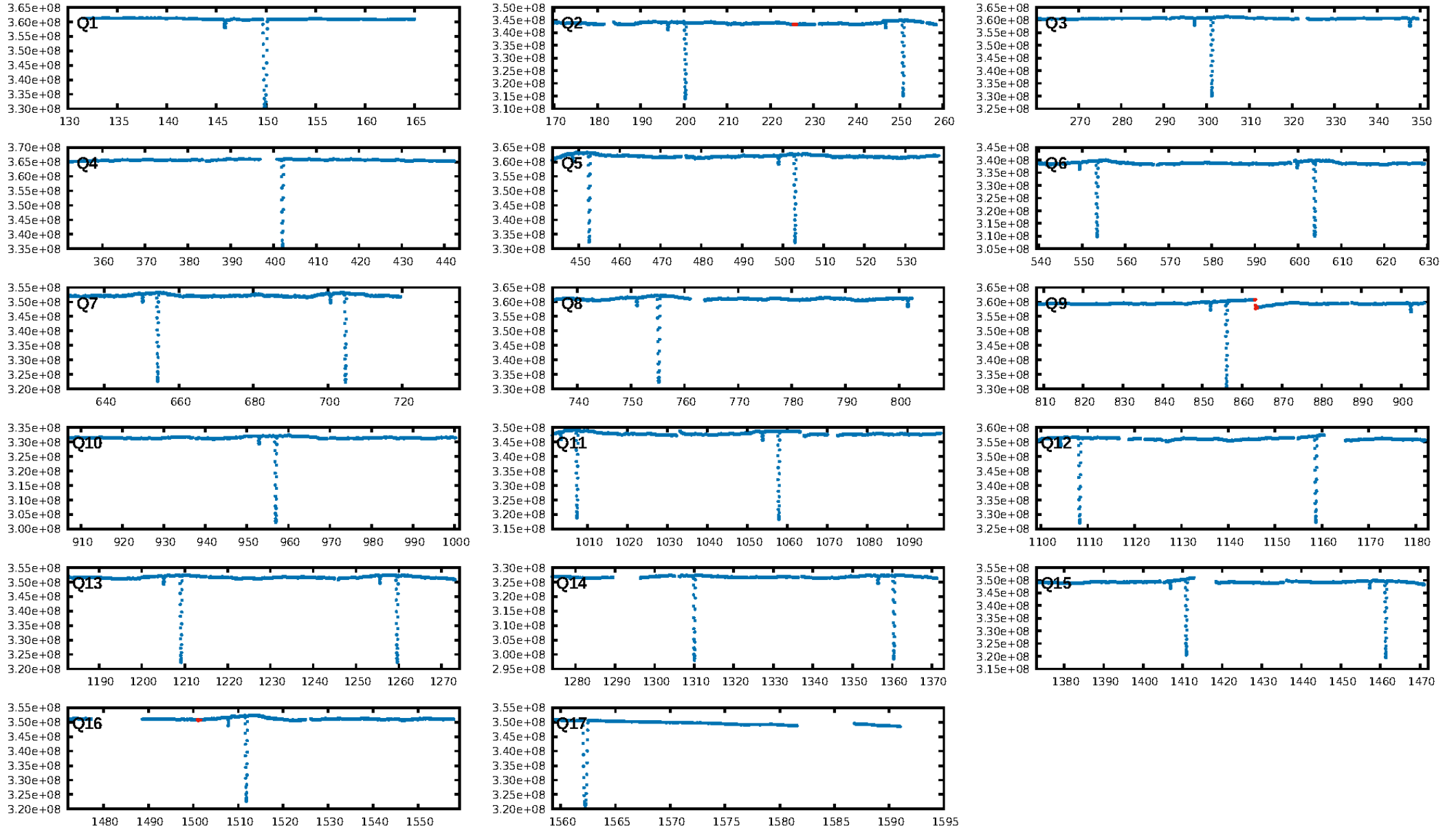
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [545.48 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 92.4%
Bootstrap-pfa: 5.18e-107
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8984
Centroid-sig: 0.0%
Centroid-so: 2.782 arcsec [4.37 σ]
OotOffset-rm: 1.103 arcsec [1.00 σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 1.128 arcsec [1.74 σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

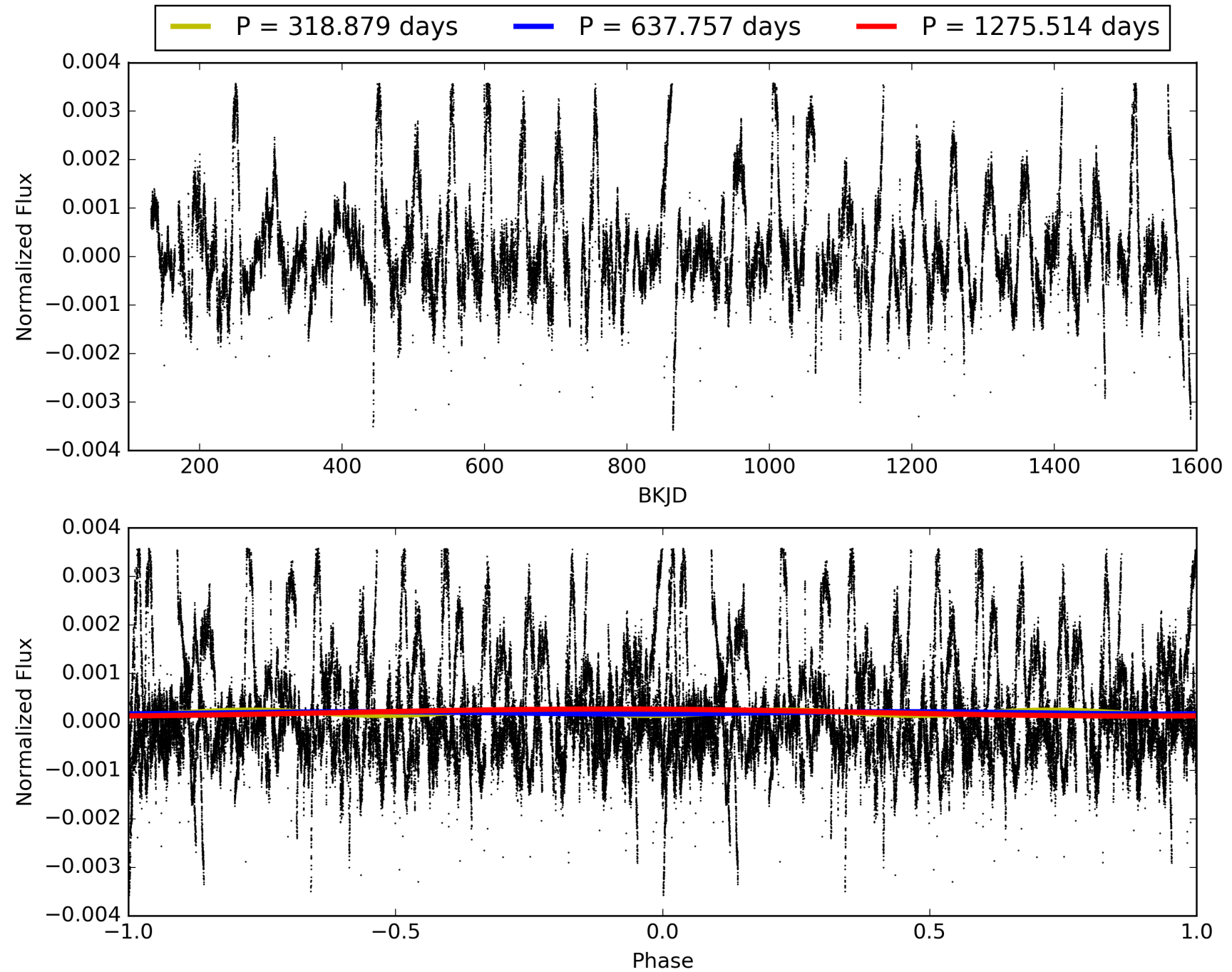
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:24:06 Z

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

TCE 009172506-03, PDC Light Curves

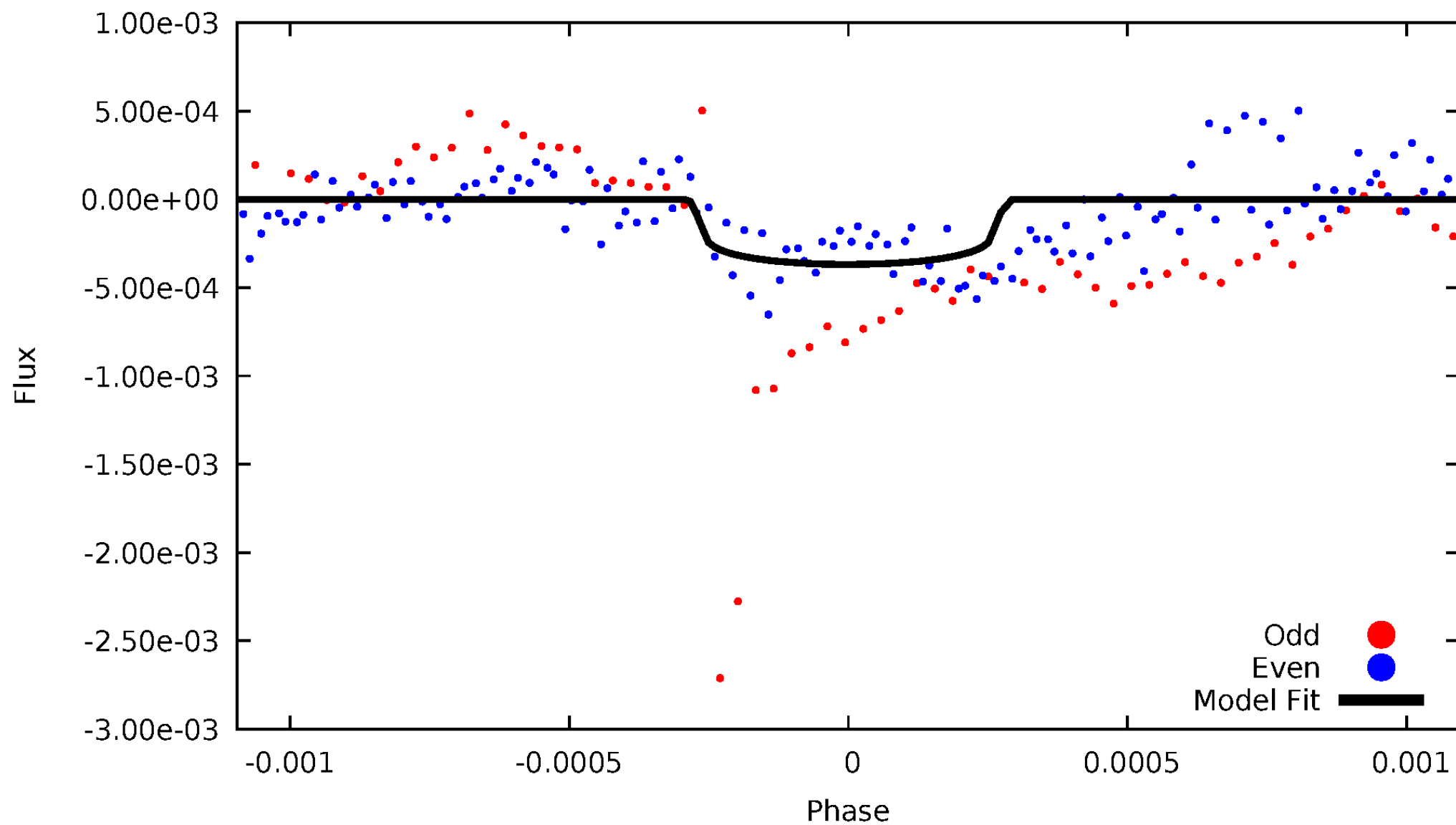


TCE 009172506-03



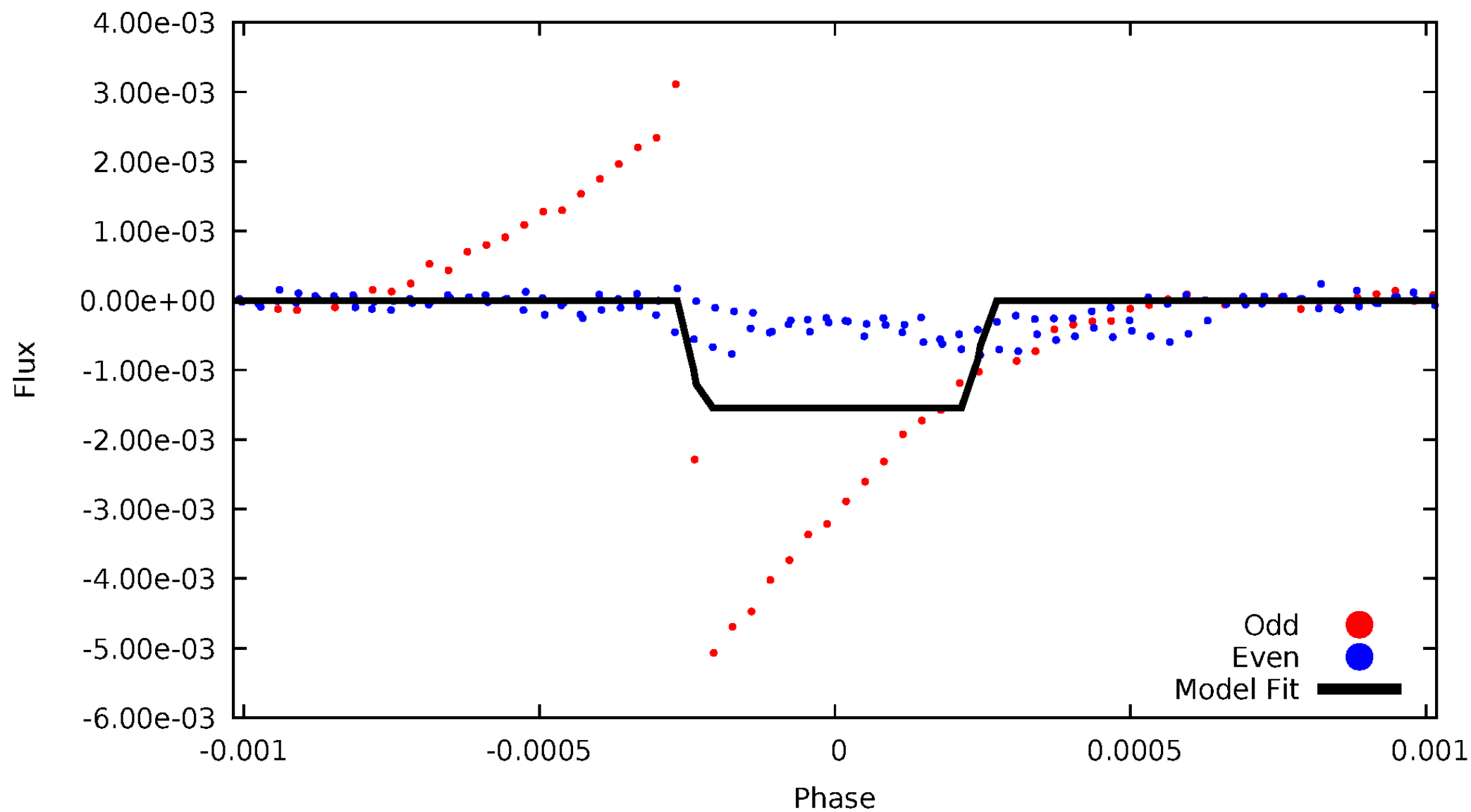
DV Odd/Even

TCE 009172506-03



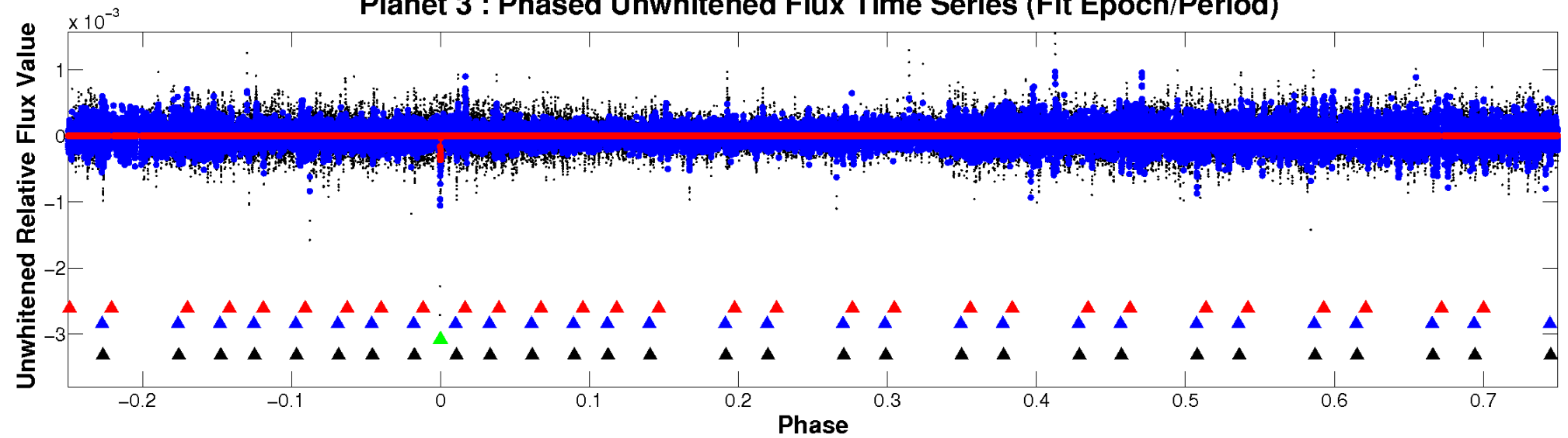
ALT Odd/Even

TCE 009172506-03

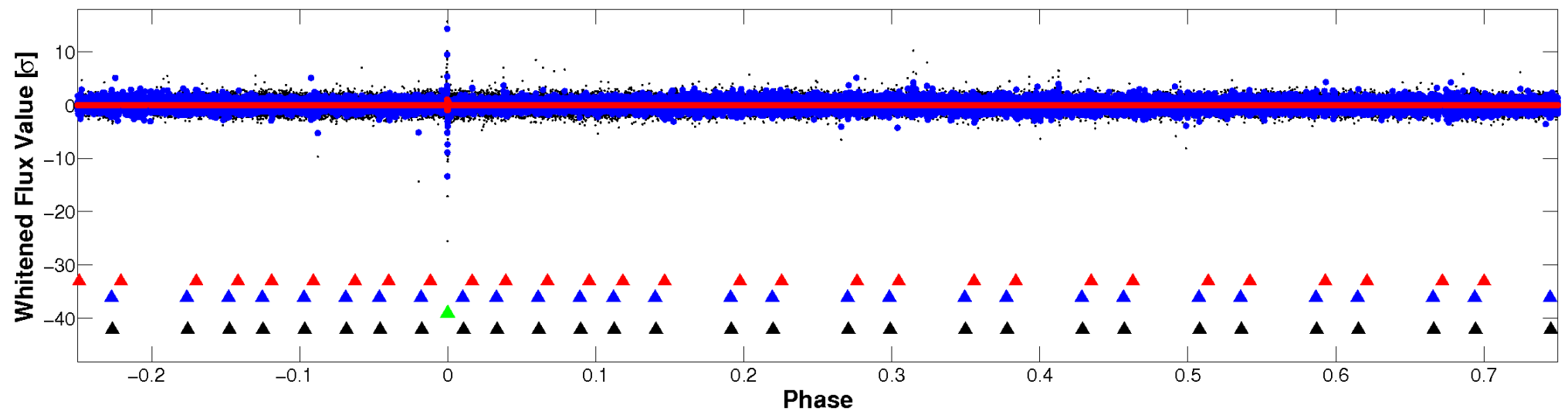


Non-Whitened Vs. Whitened Light Curve

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

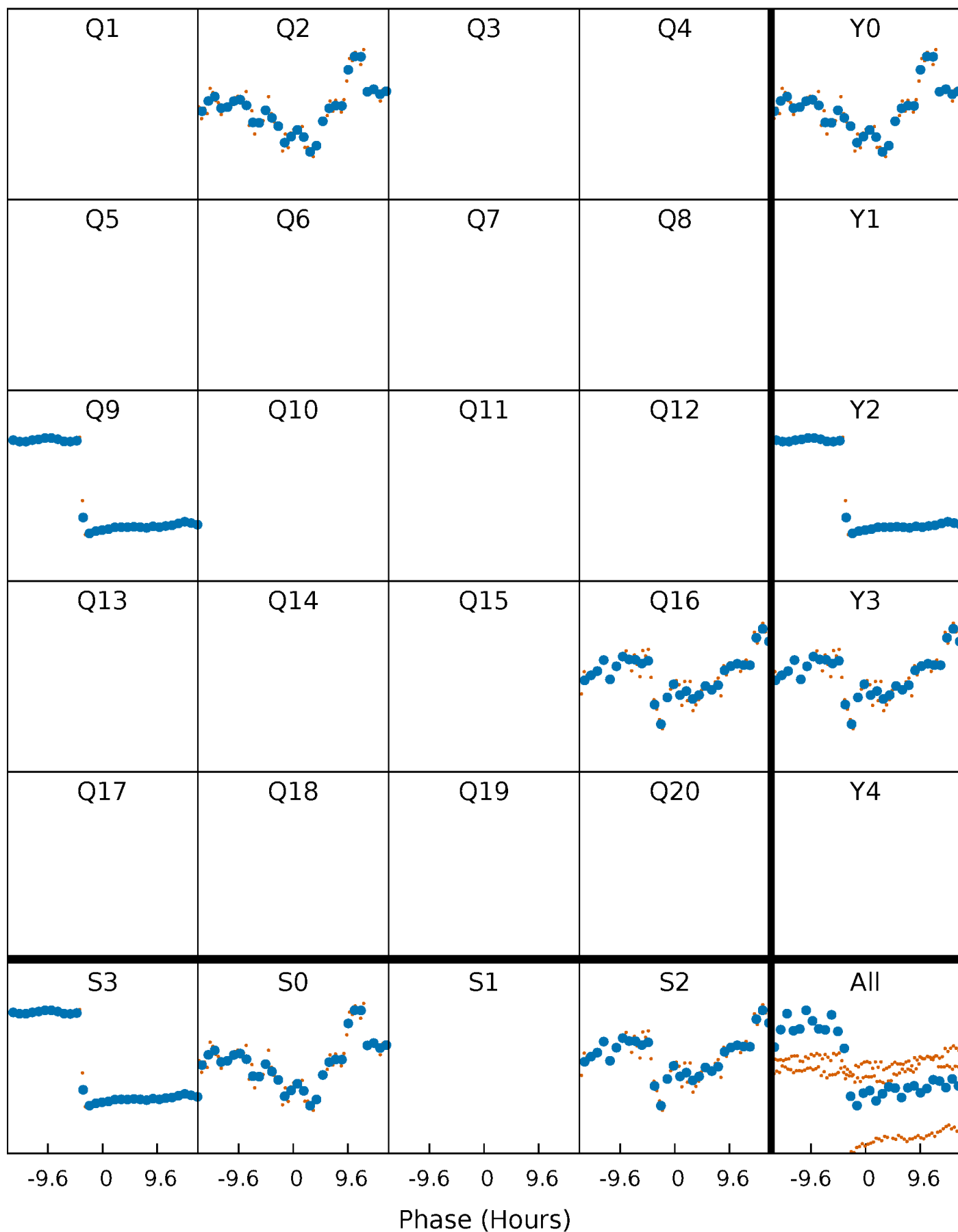


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



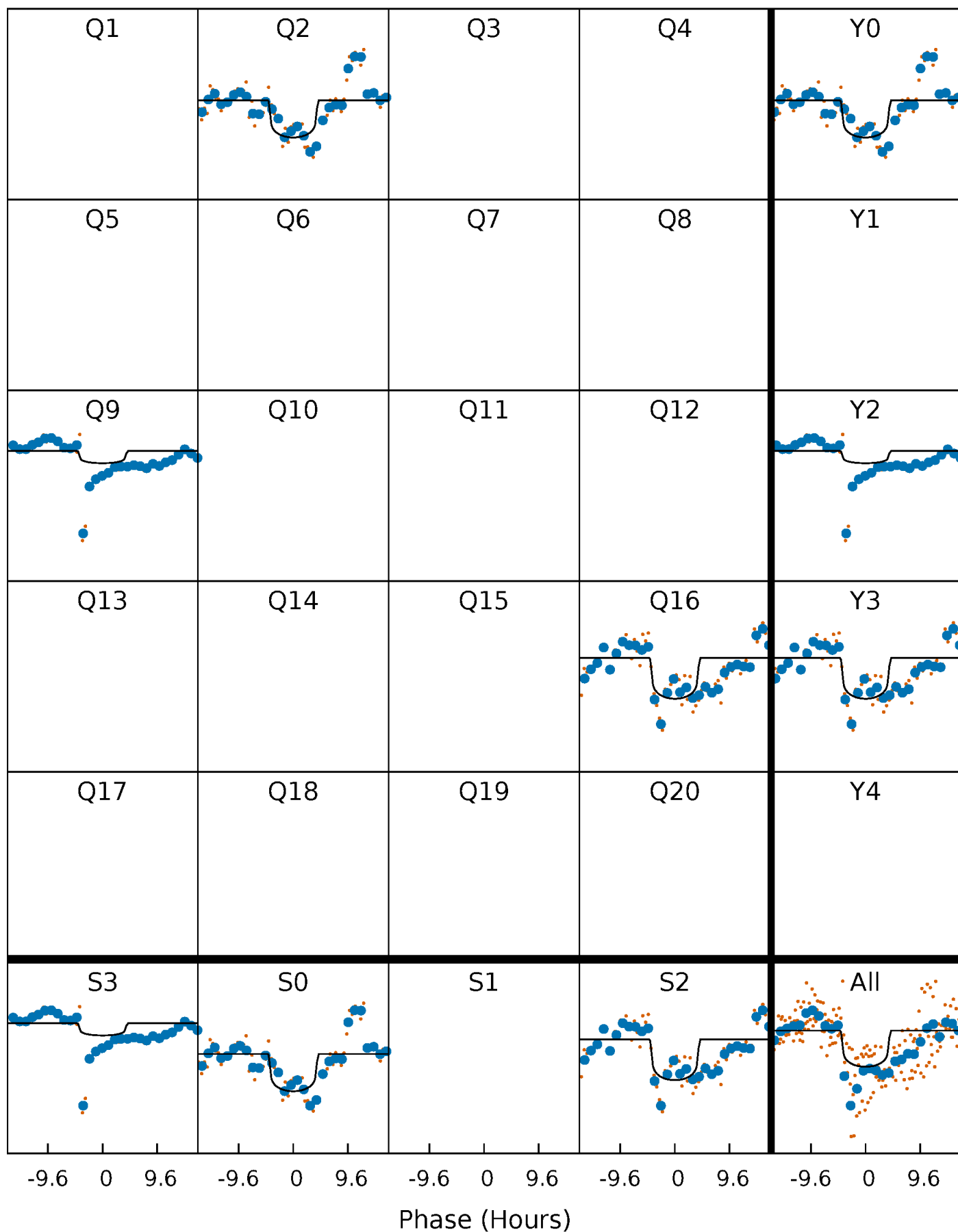
PDC Quarter-Phased Transit Curves

TCE 009172506-03 P=637.757228 Days $T_0=225.750458$ (BKJD)



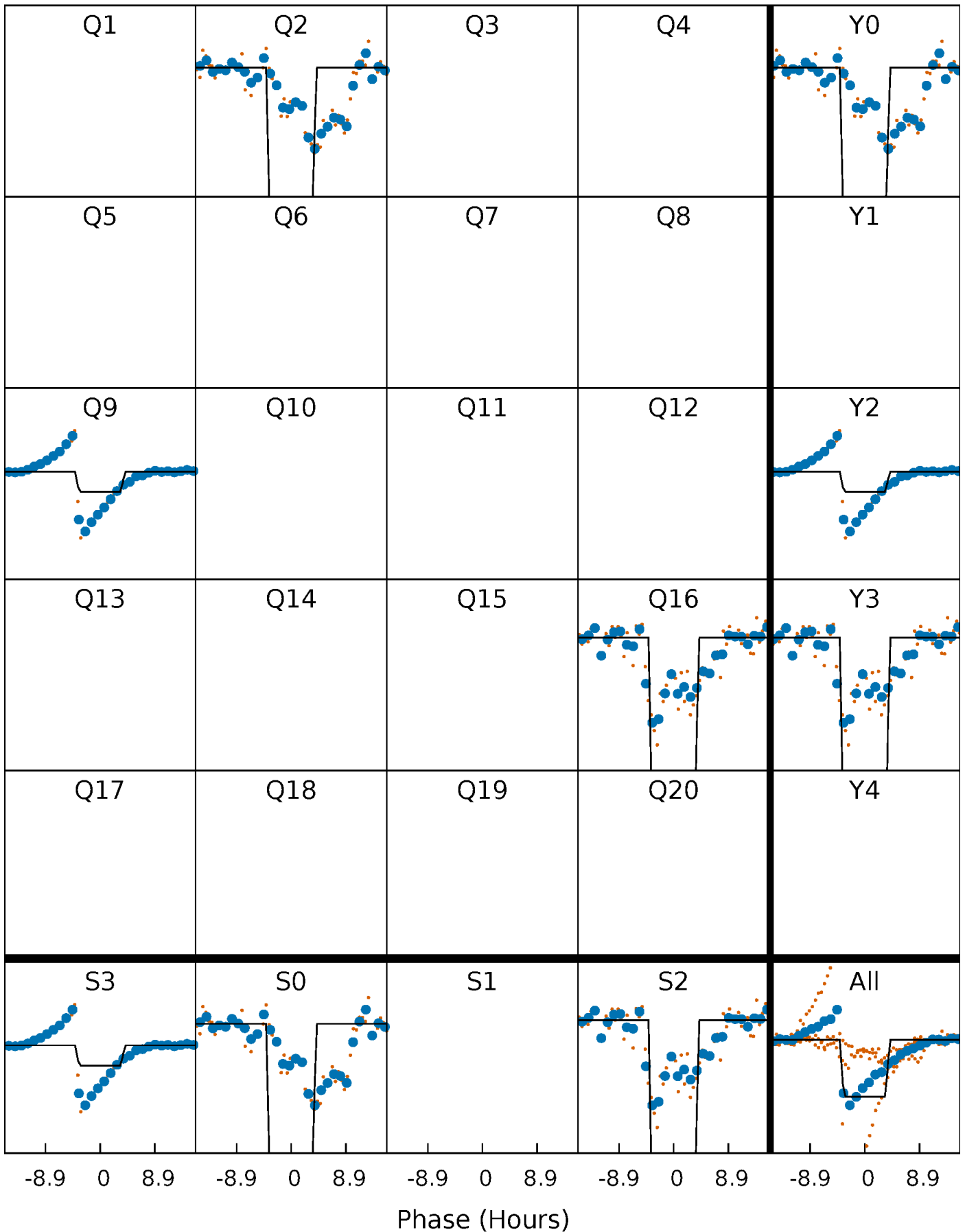
DV Quarter-Phased Transit Curves

TCE 009172506-03 P=637.757228 Days $T_0=225.750458$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

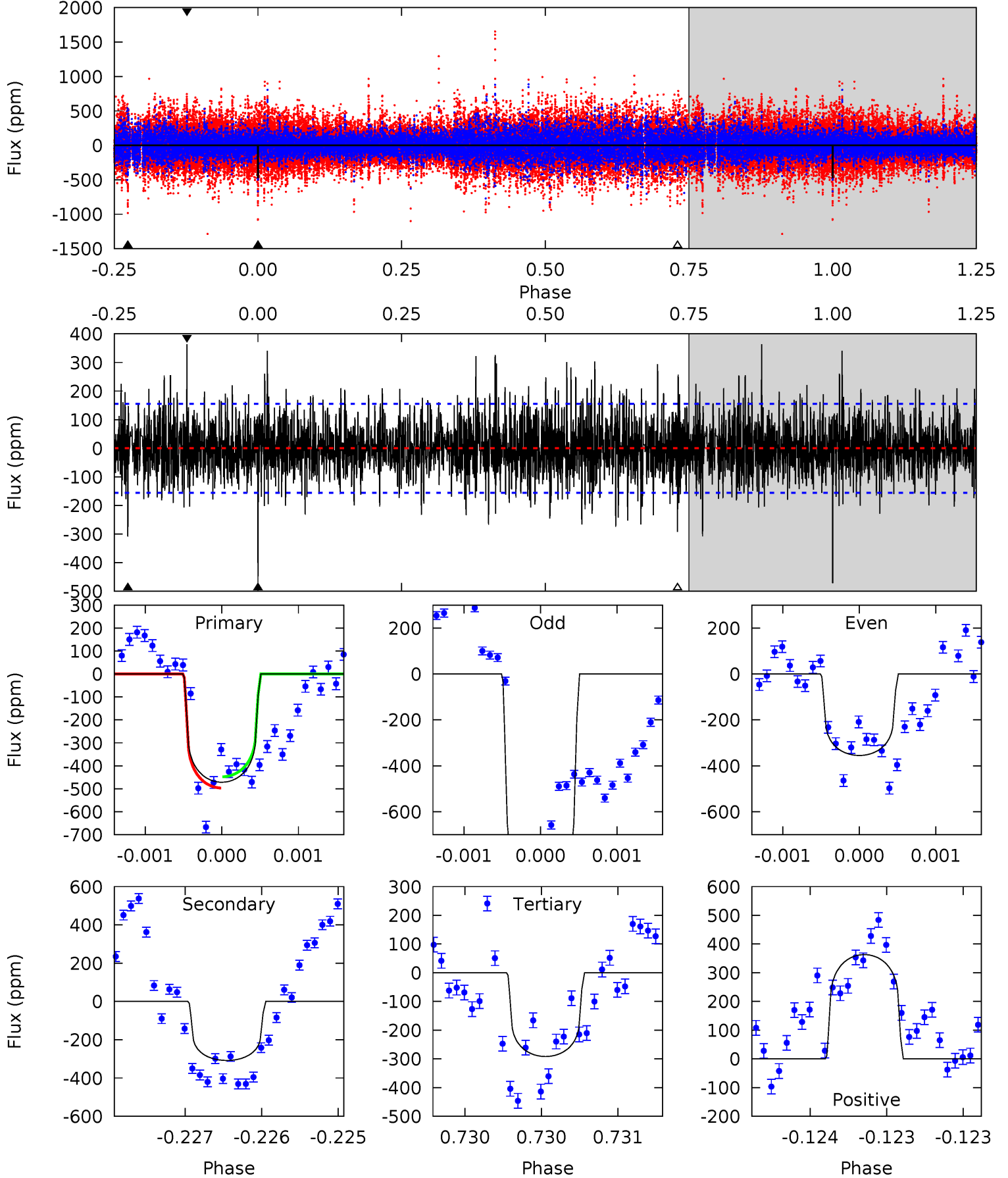
TCE 009172506-03 P=637.772275 Days $T_0=225.740210$ (BKJD)



DV Model-Shift Uniqueness Test

009172506-03, P = 637.757228 Days, E = 225.750458 Days

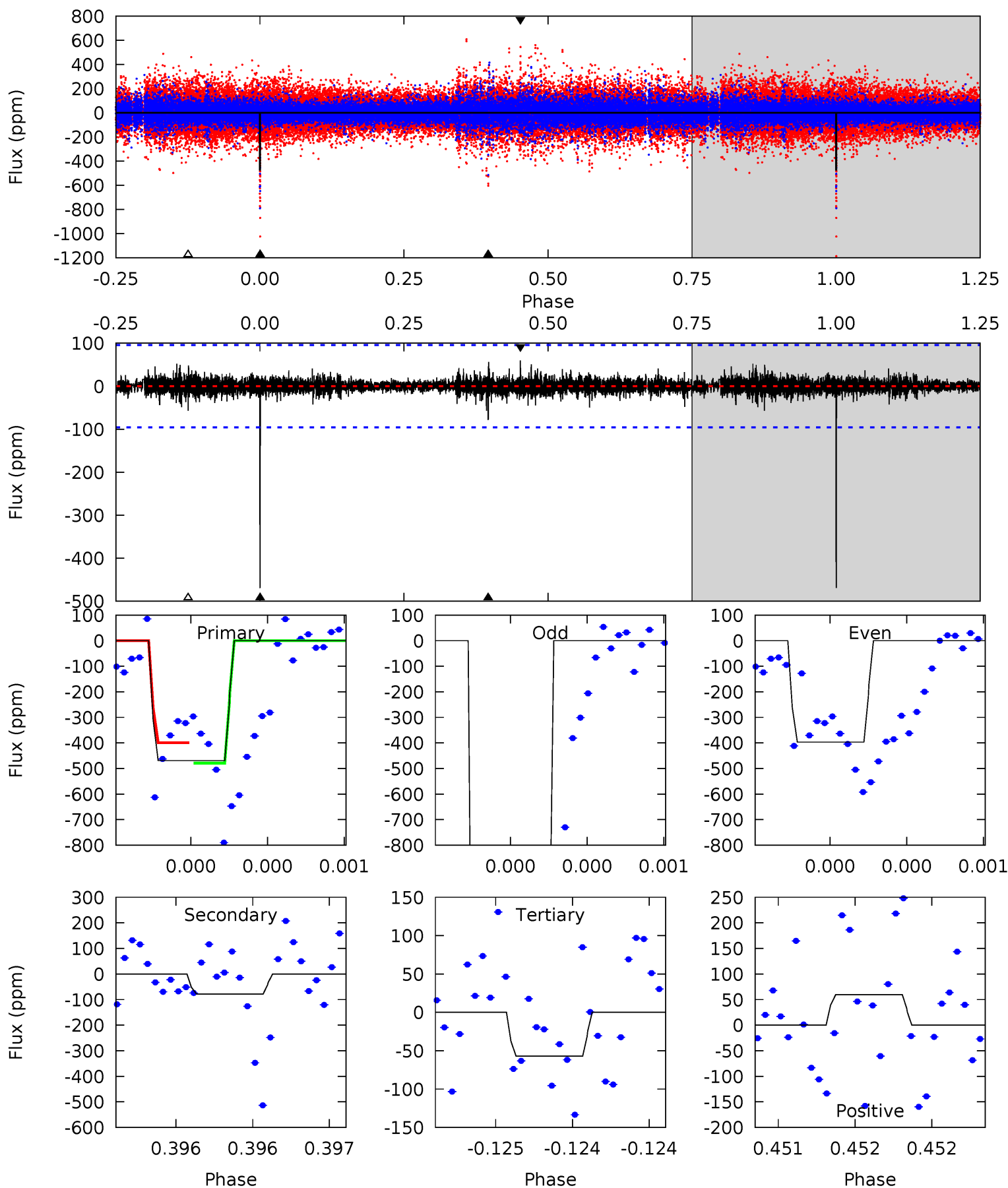
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.8	11.0	10.4	13.0	5.55	3.44	2.83	6.42	3.87	0.59	-1.96	10.4	1.53	0.44	0.87



Alt Model-Shift Uniqueness Test

009172506-03, P = 637.772275 Days, E = 225.740210 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.4	4.57	3.33	3.48	5.58	3.49	0.60	24.0	23.9	1.24	1.09	85.0	2.89	0.11	2.22



Stellar Parameters For KIC 009172506

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6225^{+170}_{-170}	$4.039^{+0.266}_{-0.114}$	$-0.280^{+0.300}_{-0.300}$	$1.646^{+0.335}_{-0.461}$	$1.080^{+0.192}_{-0.157}$	$0.341^{+0.483}_{-0.129}$
	+3%/-3%	+7%/-3%	+107%/-107%	+20%/-28%	+18%/-15%	+142%/-38%
Source	PHO1	FLK73	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 009172506-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-308 ± 28	$5.93^{+5.55}_{-3.95}$	400^{+24}_{-32}	4642^{+3101}_{-971}	10665^{+82282}_{-7748}
Alt.	-78 ± 17	$7.98^{+6.54}_{-4.77}$	399^{+23}_{-32}	3290^{+1123}_{-515}	1478^{+7431}_{-1037}

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

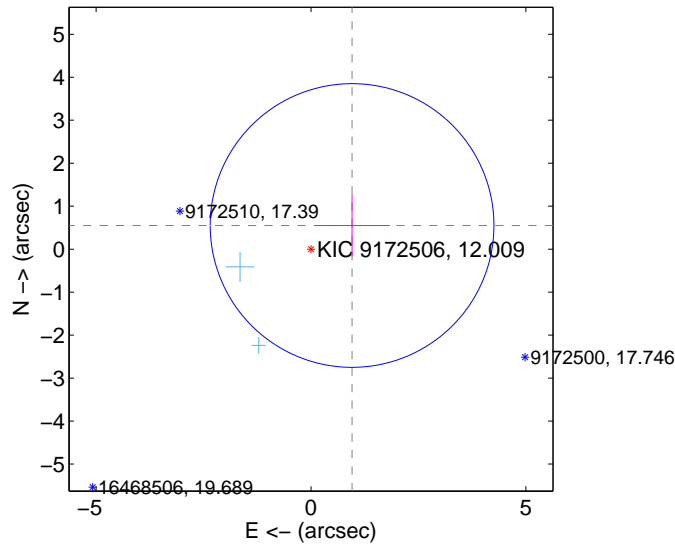
Supplemental centroid analysis for 009172506-03. Kepler magnitude: 12.01. Transit SNR 4.52

There are 3 quarters with good PRF difference image offsets

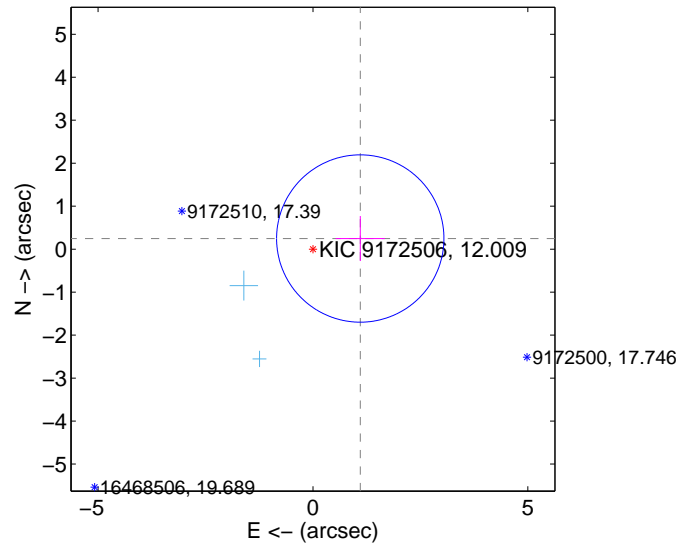
The direct PRF centroid is offset from the target star catalog position by about 0.44 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.103 ± 1.100	1.00	-0.956 ± 0.882	0.551 ± 0.721
PRF-fit source offset from KIC position	1.128 ± 0.649	1.74	-1.101 ± 0.571	0.248 ± 0.524
photometric centroid source offset	2.78 ± 0.64	4.37	-2.29 ± 0.70	1.58 ± 0.46

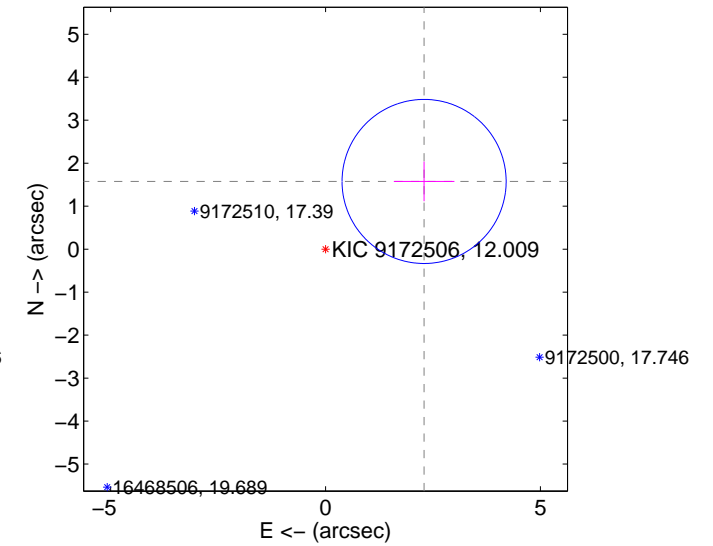
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

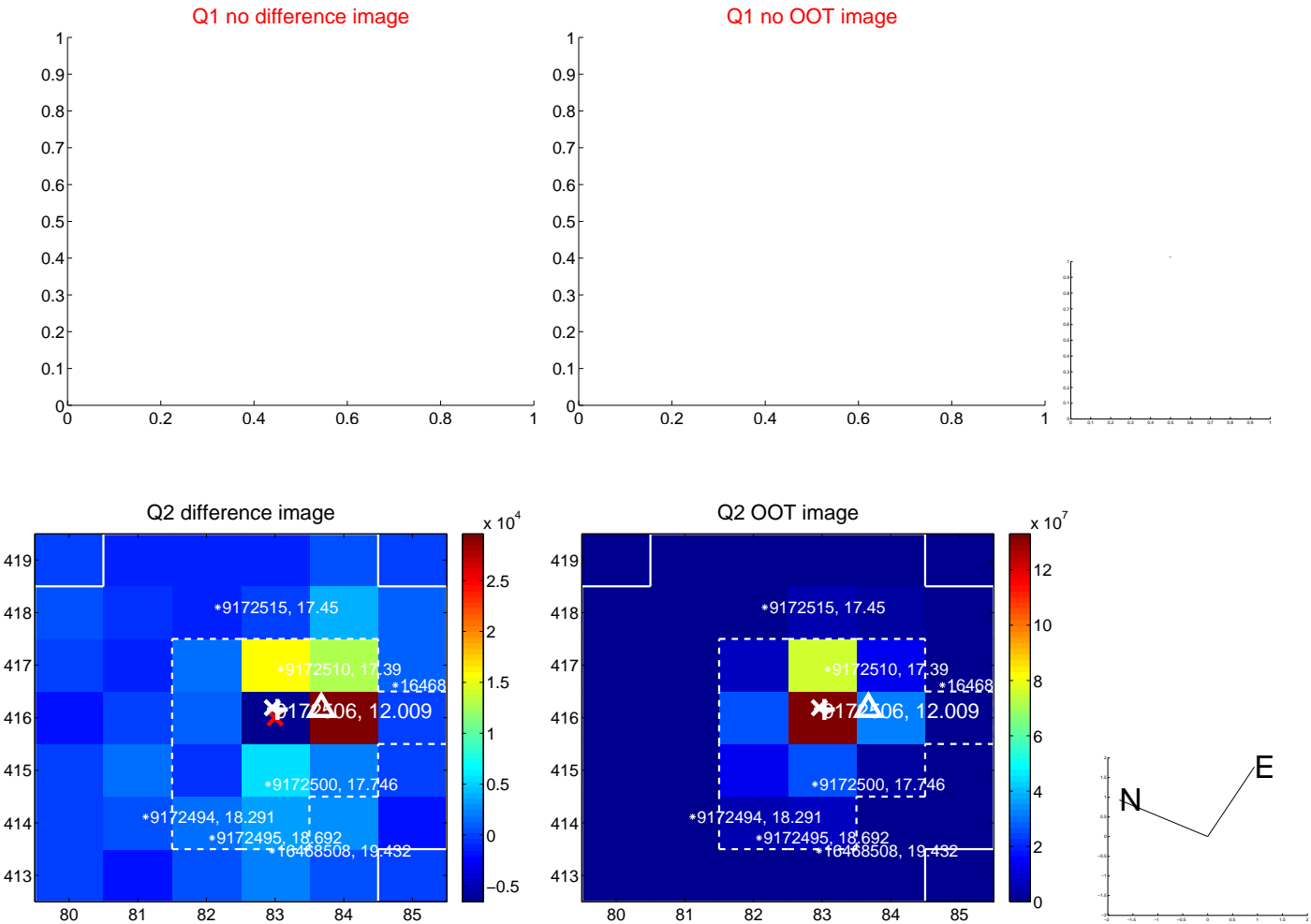


offset from photometric centroids



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

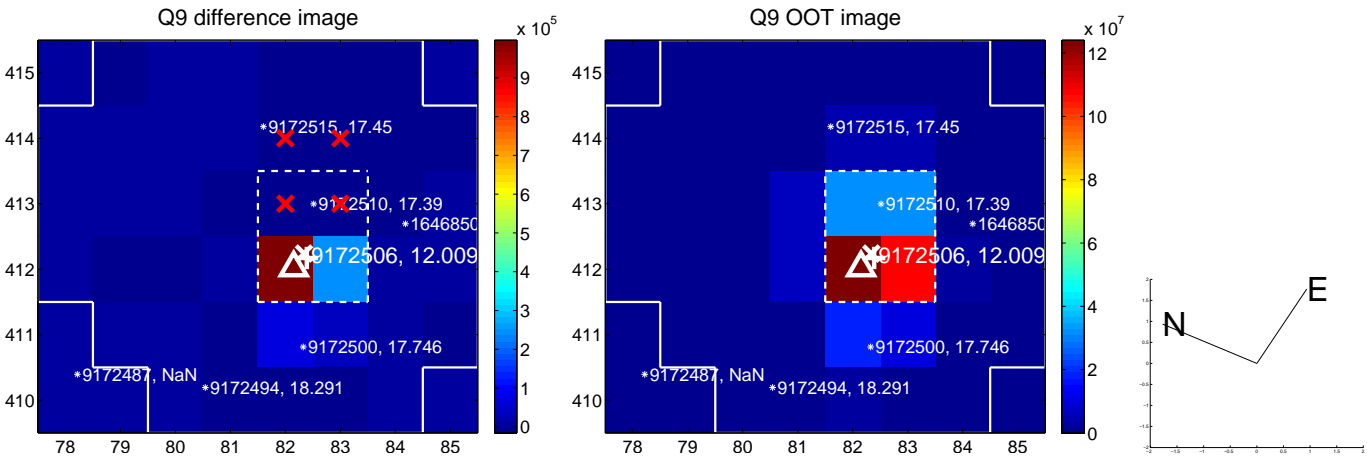
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



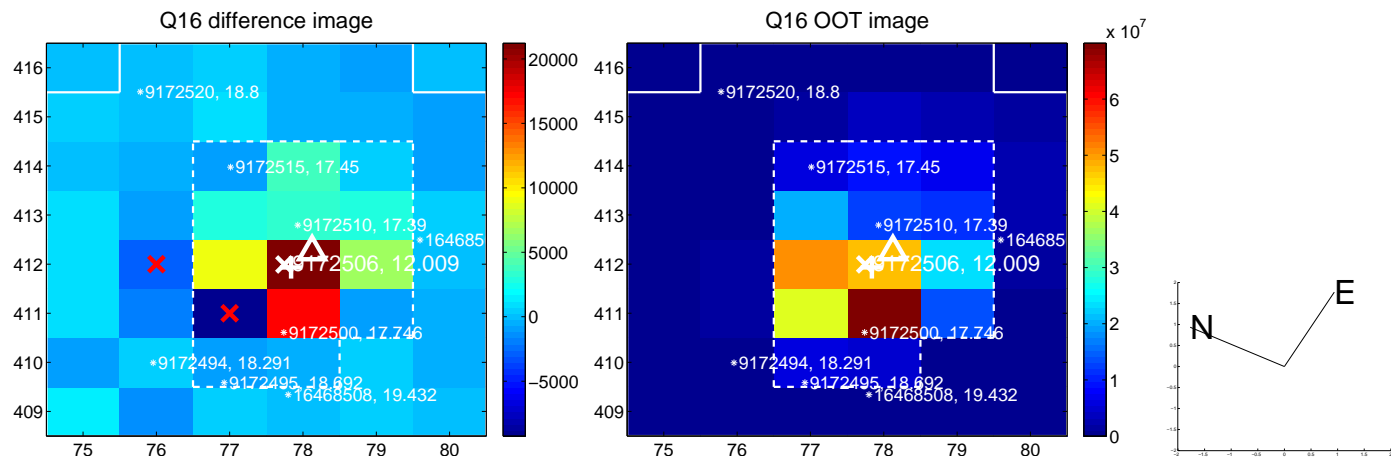
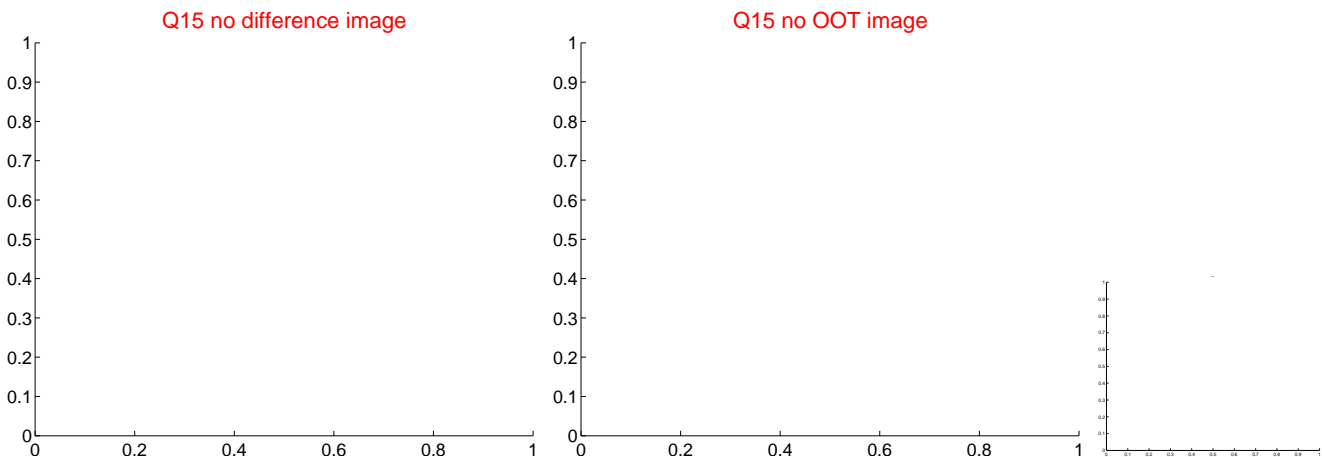
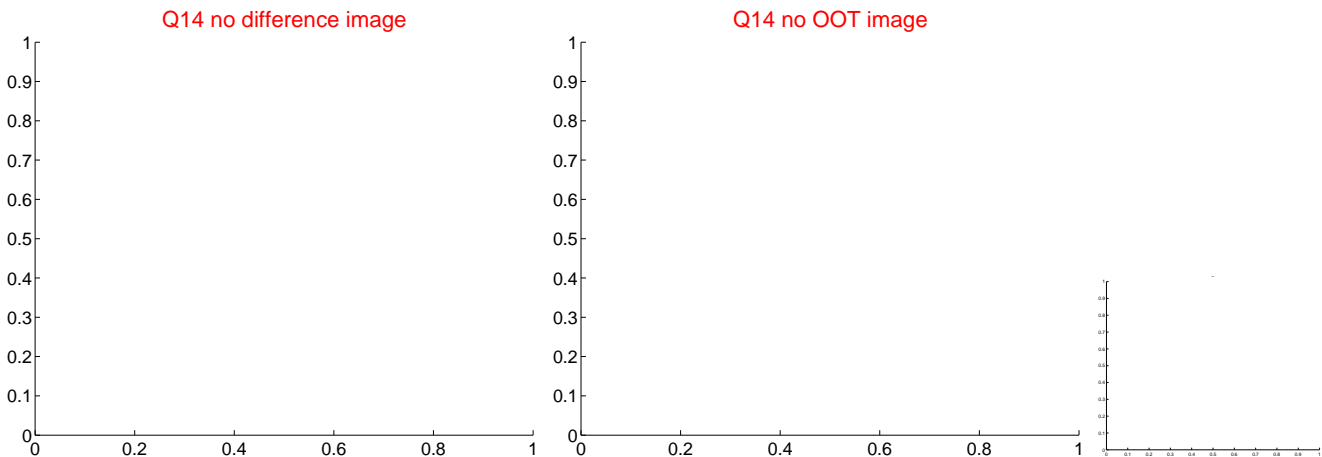
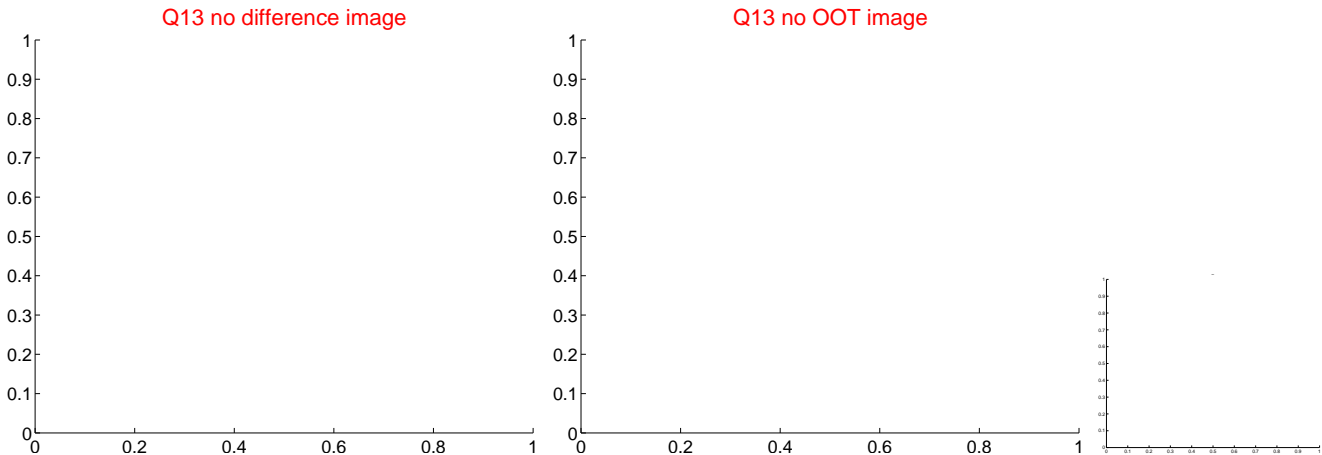
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



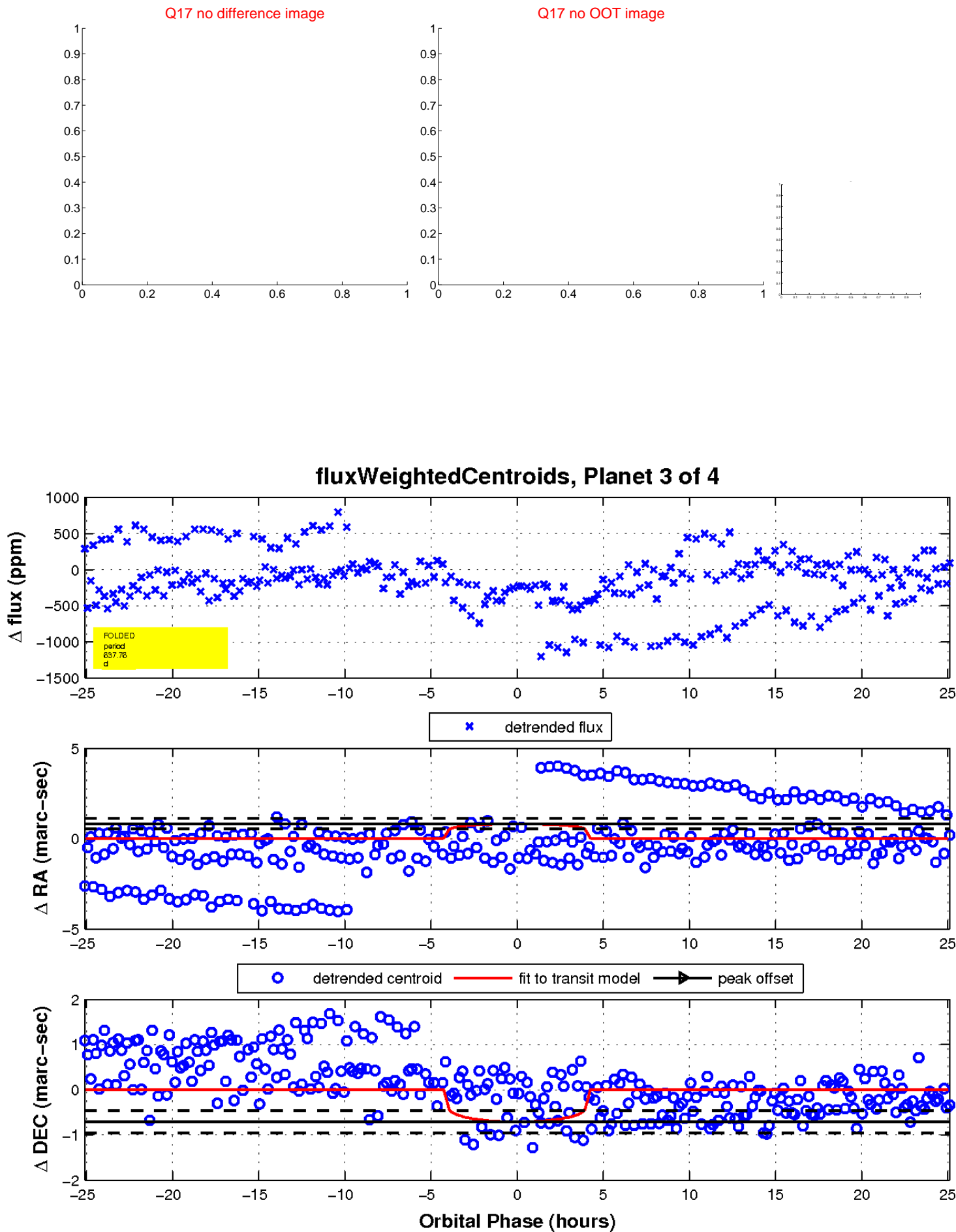
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

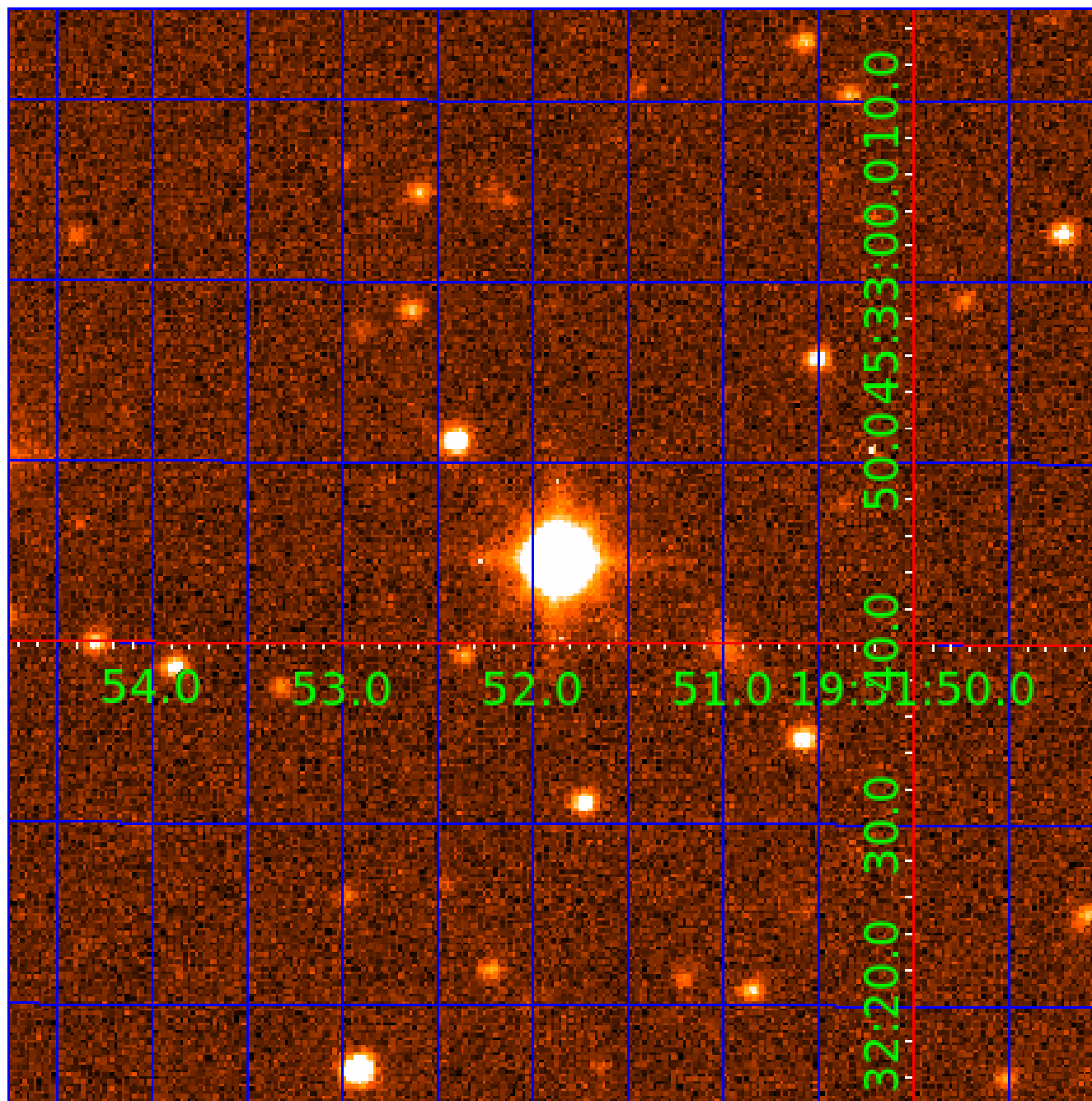


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009172506

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})
009172506-01	OBS	7141.01	50.440289	149.908313	85559.1	12.166	3130.3	2451.0	1.65	6225	51.69	48.46
009172506-02	OBS	No	50.440330	145.864498	7643.7	5.625	352.5	290.9	1.65	6225	15.89	48.46
009172506-03	OBS	No	637.757228	225.750458	368.3	8.378	26.8	4.5	1.65	6225	3.19	1.65
009172506-04	OBS	No	50.442473	146.167457	849.7	24.445	11.2	16.1	1.65	6225	9.14	48.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009172506-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_KIC_POS
009172506-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009172506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009172506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—SAME_NTL_PERIOD

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

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

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

Ephemeris Match Information For 009172506-04

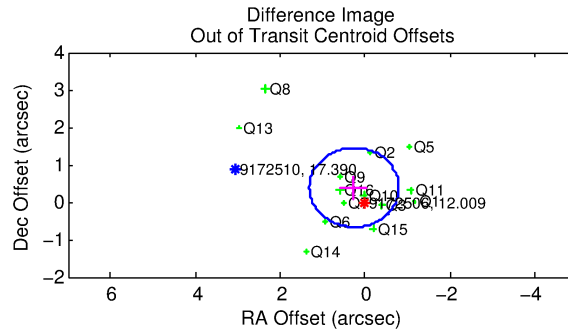
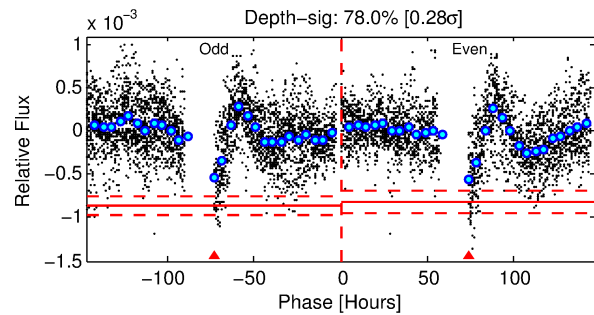
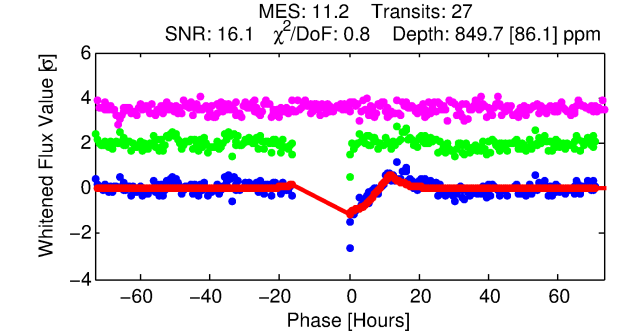
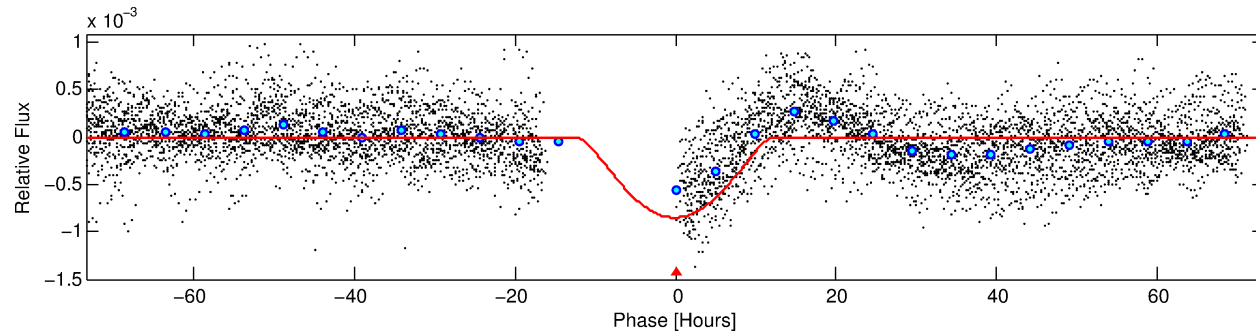
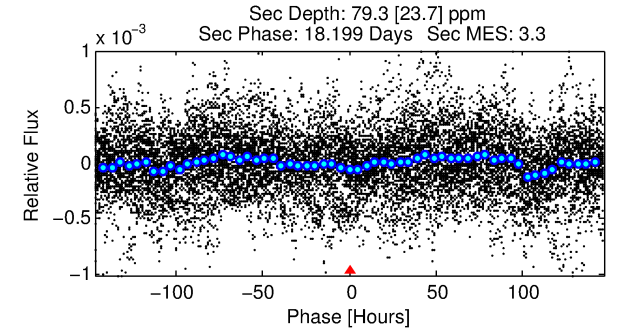
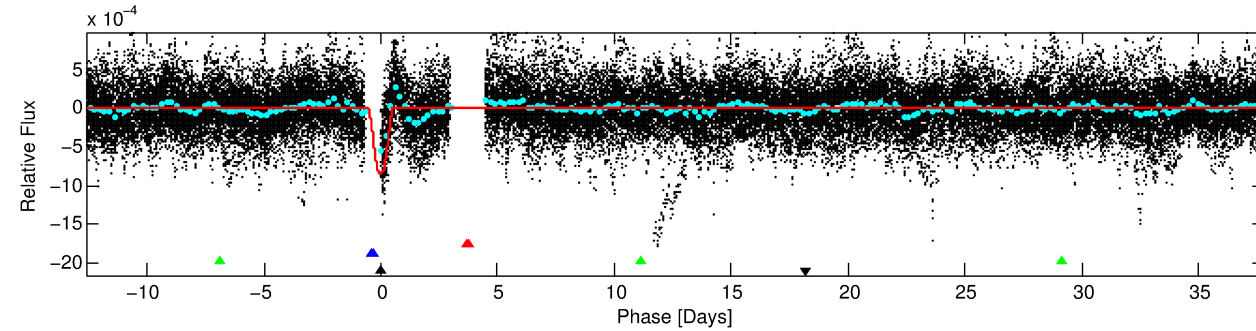
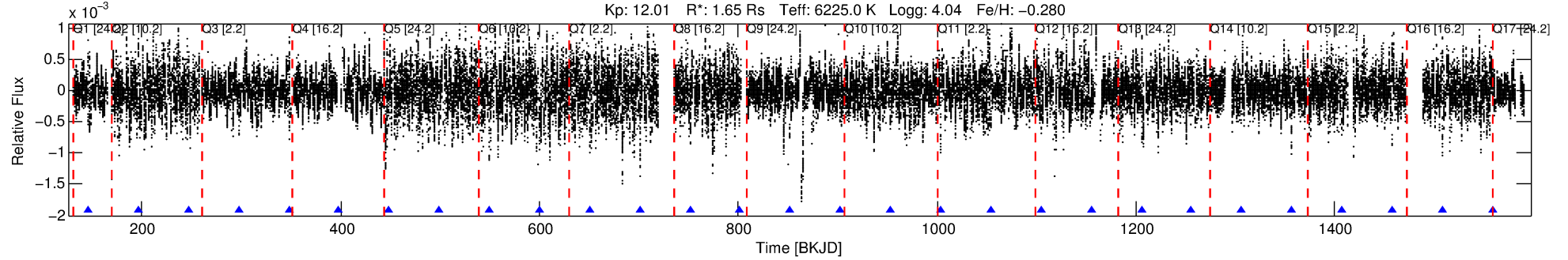
No Significant Match Found

DV One-Page Summary

KIC: 9172506 Candidate: 4 of 4 Period: 50.442 d

KOI: K07141 Corr: No Ephemeris Match

Kp: 12.01 R*: 1.65 Rs Teff: 6225.0 K Logg: 4.04 Fe/H: -0.280



DV Fit Results:

Period = 50.44247 [0.00110] d
Epoch = 146.1675 [0.0315] BKJD
Rp/R* = 0.0509 [0.0387]
a/R* = 5.20 [0.84]
b = 1.00 [0.05]
Seff = 48.46 [22.39]
Teq = 673 [78] K
Rp = 9.14 [7.41] Re
a = 0.2743 [0.0759] AU
Ag = 39.25 [63.37] [0.60σ]
Teffp = 2603 [1012] K [1.90σ]

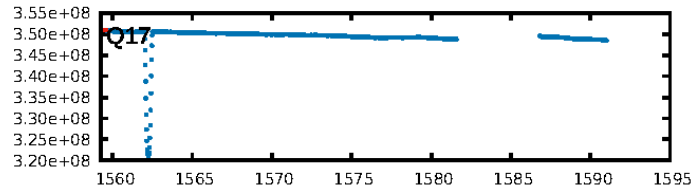
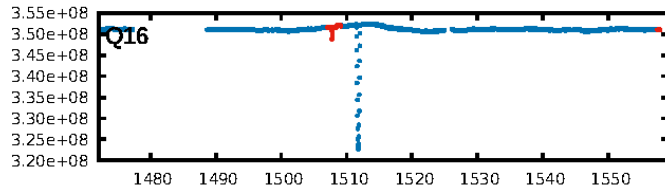
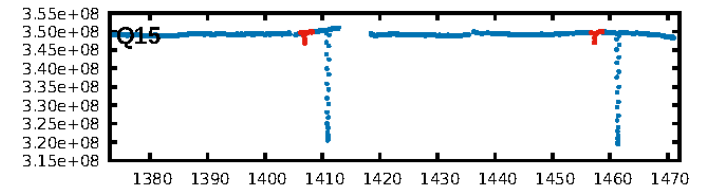
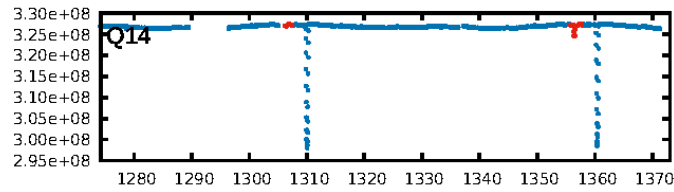
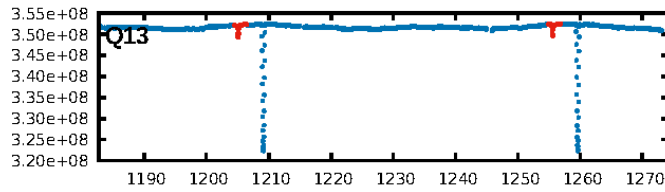
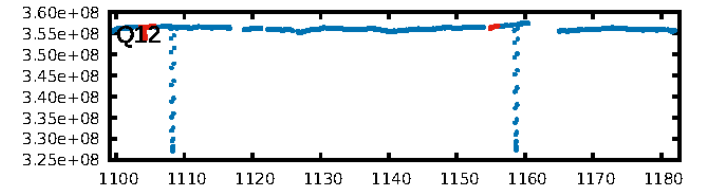
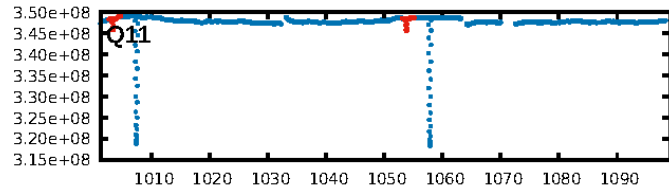
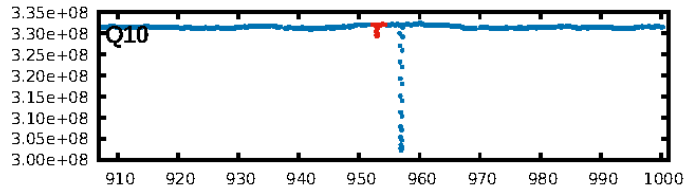
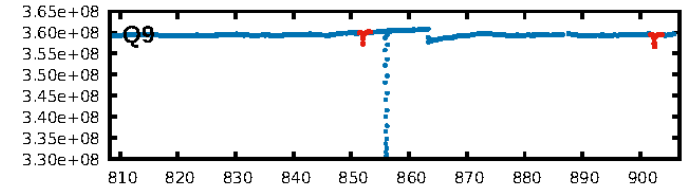
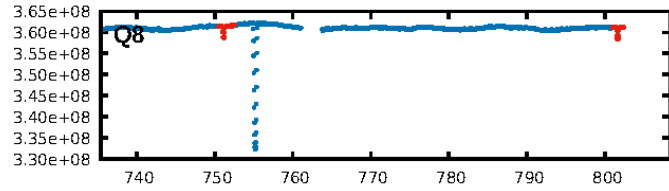
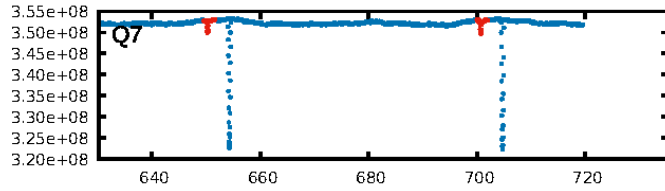
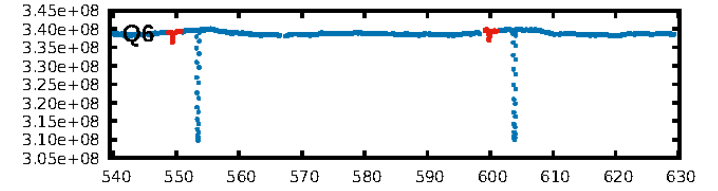
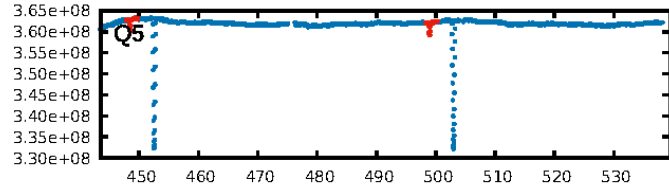
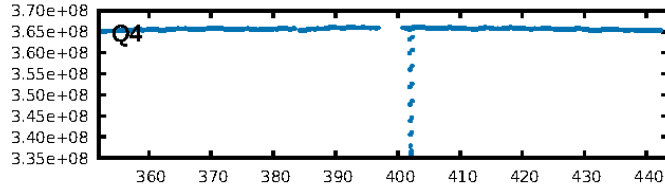
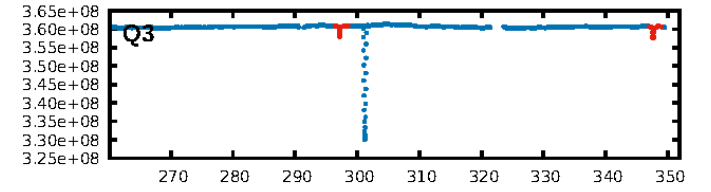
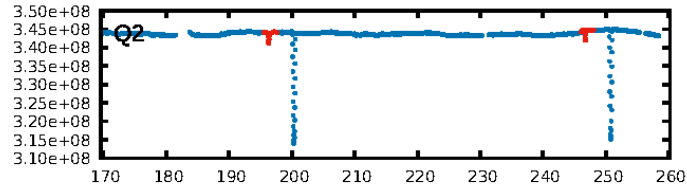
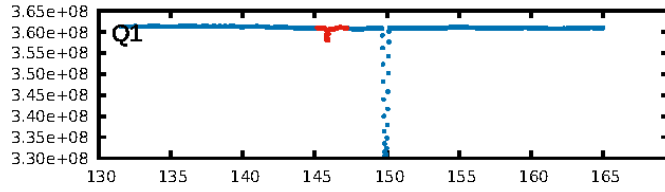
DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]
LongPeriod-sig: 100.0% [545.48σ]
ModelChiSquare2-sig: 2.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.71e-26
RollingBand-fgt: 1.00 [26/26]
GhostDiagnostic-chr: 1.363
Centroid-sig: 9.9%
Centroid-so: 0.393 arcsec [4.79σ]
OotOffset-rm: 0.465 arcsec [1.32σ]
KicOffset-rm: 0.245 arcsec [0.67σ]
OotOffset-st: 4/4/2/4 [14]
KicOffset-st: 4/4/2/4 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 0.00 [0/14]

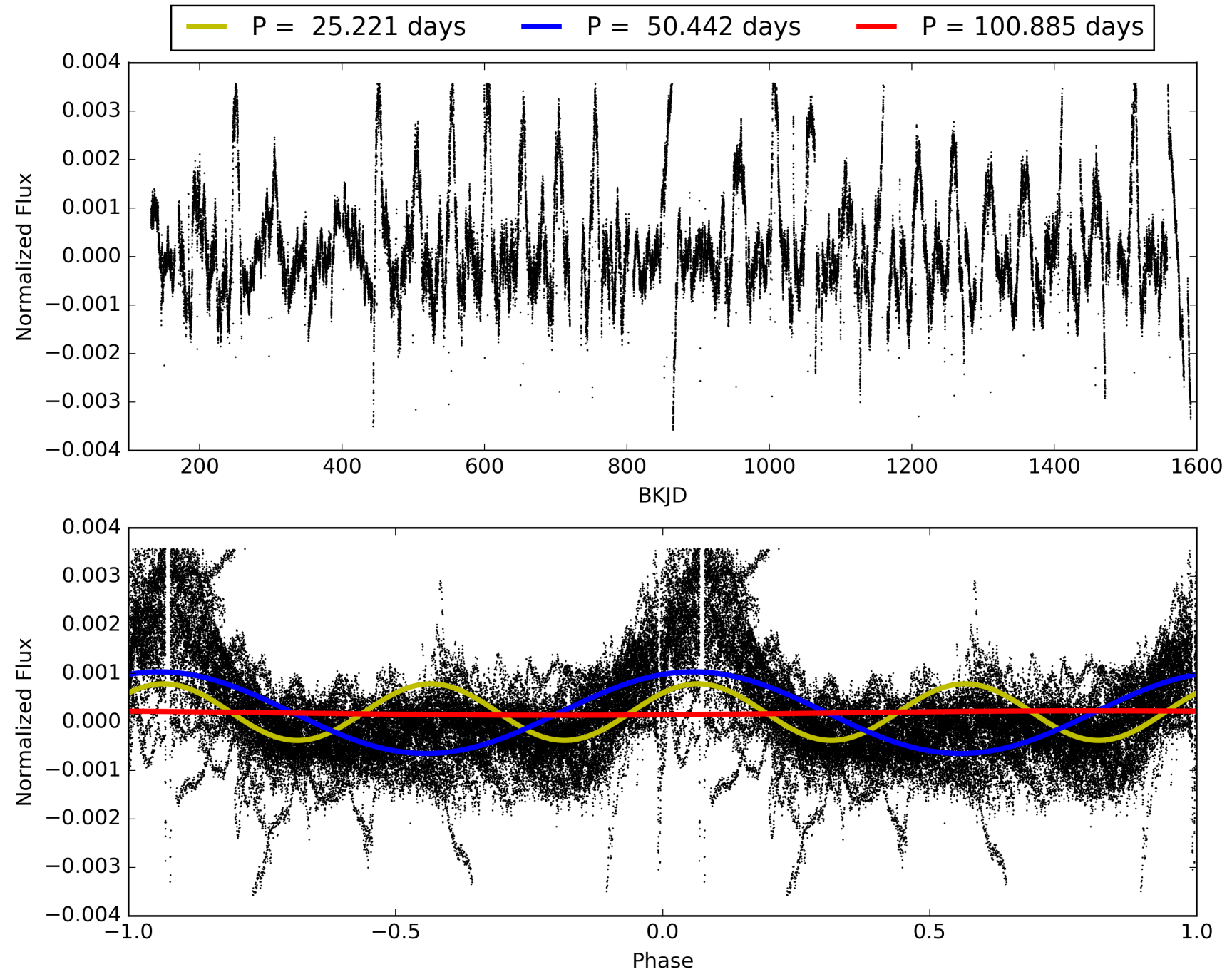
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:24:13 Z

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

TCE 009172506-04, PDC Light Curves

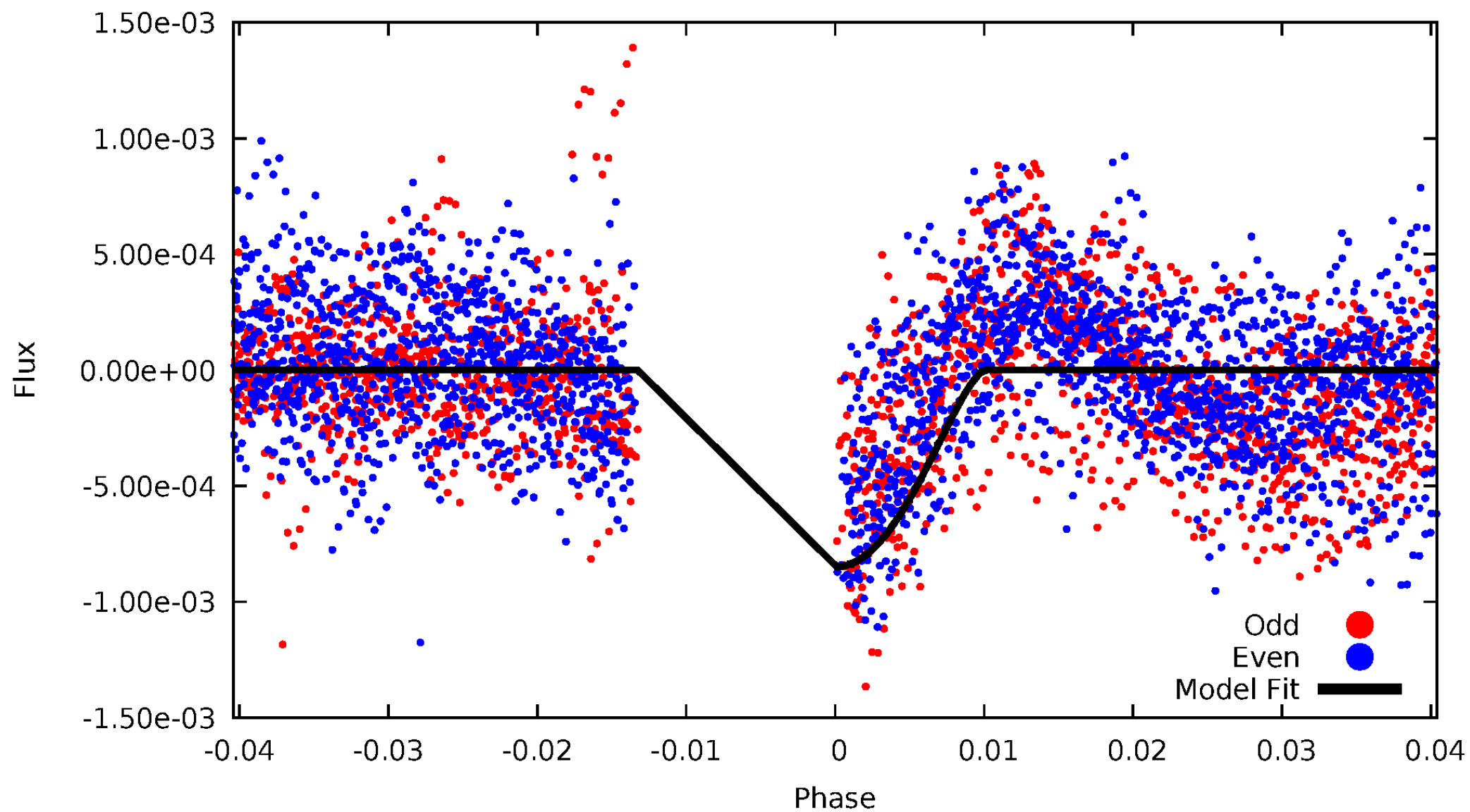


TCE 009172506-04



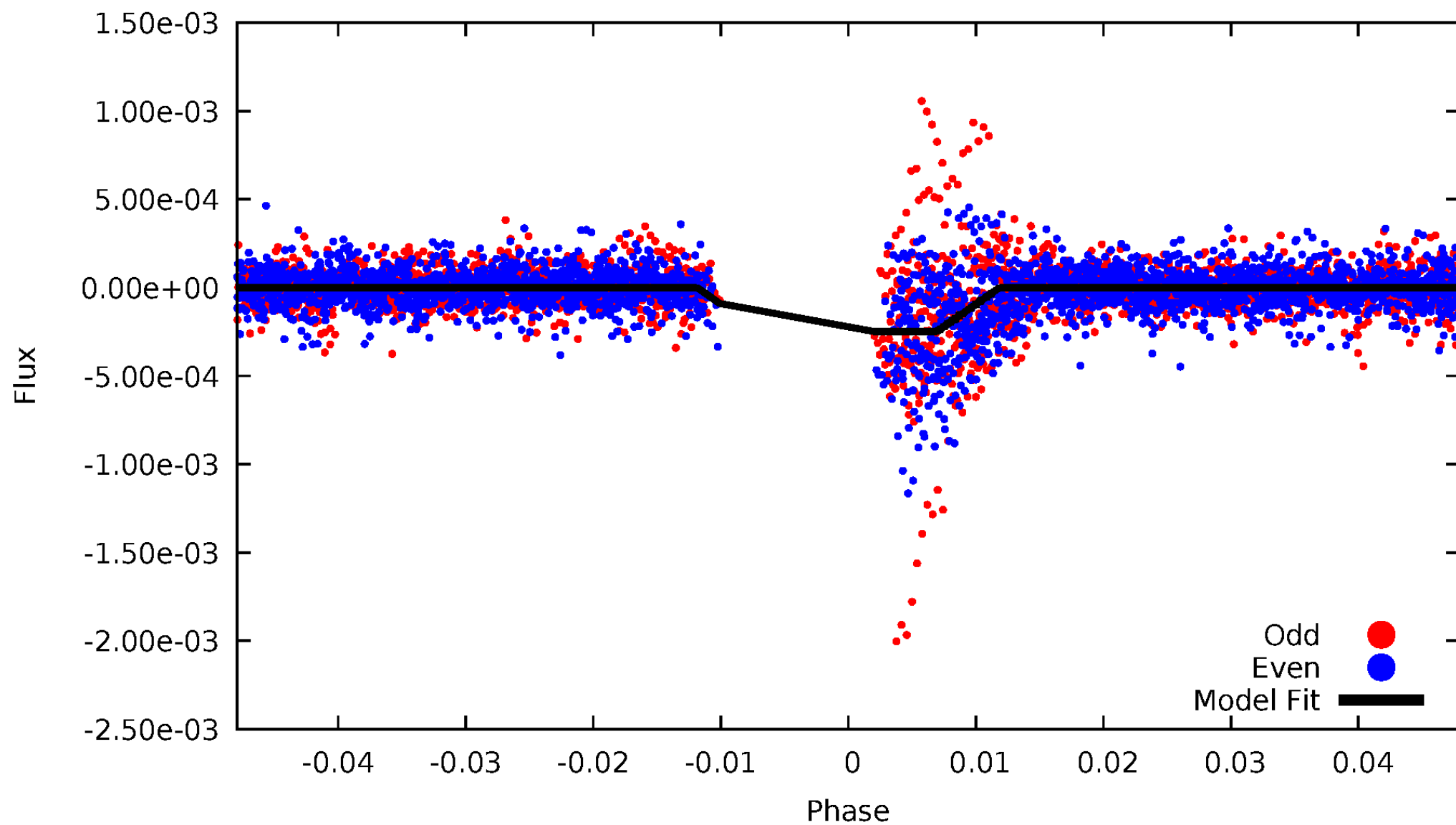
DV Odd/Even

TCE 009172506-04



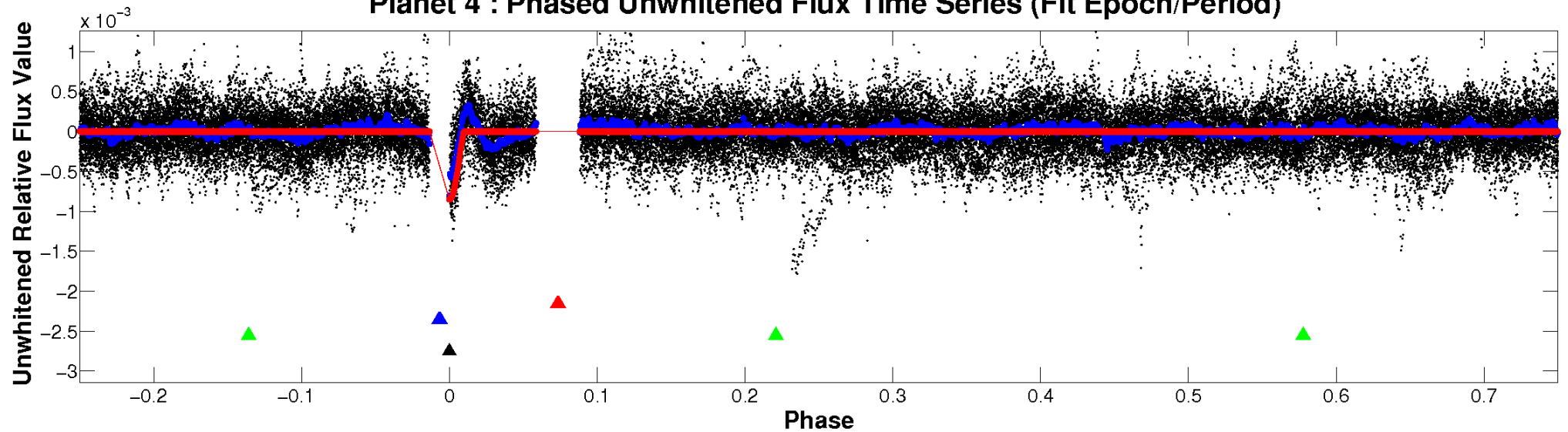
ALT Odd/Even

TCE 009172506-04

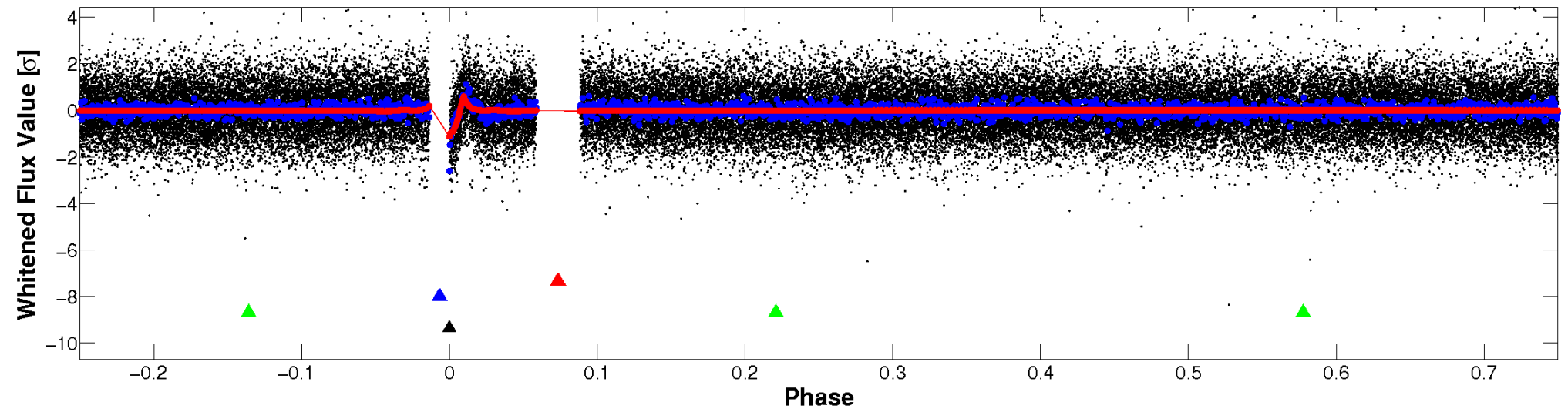


Non-Whitened Vs. Whitened Light Curve

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

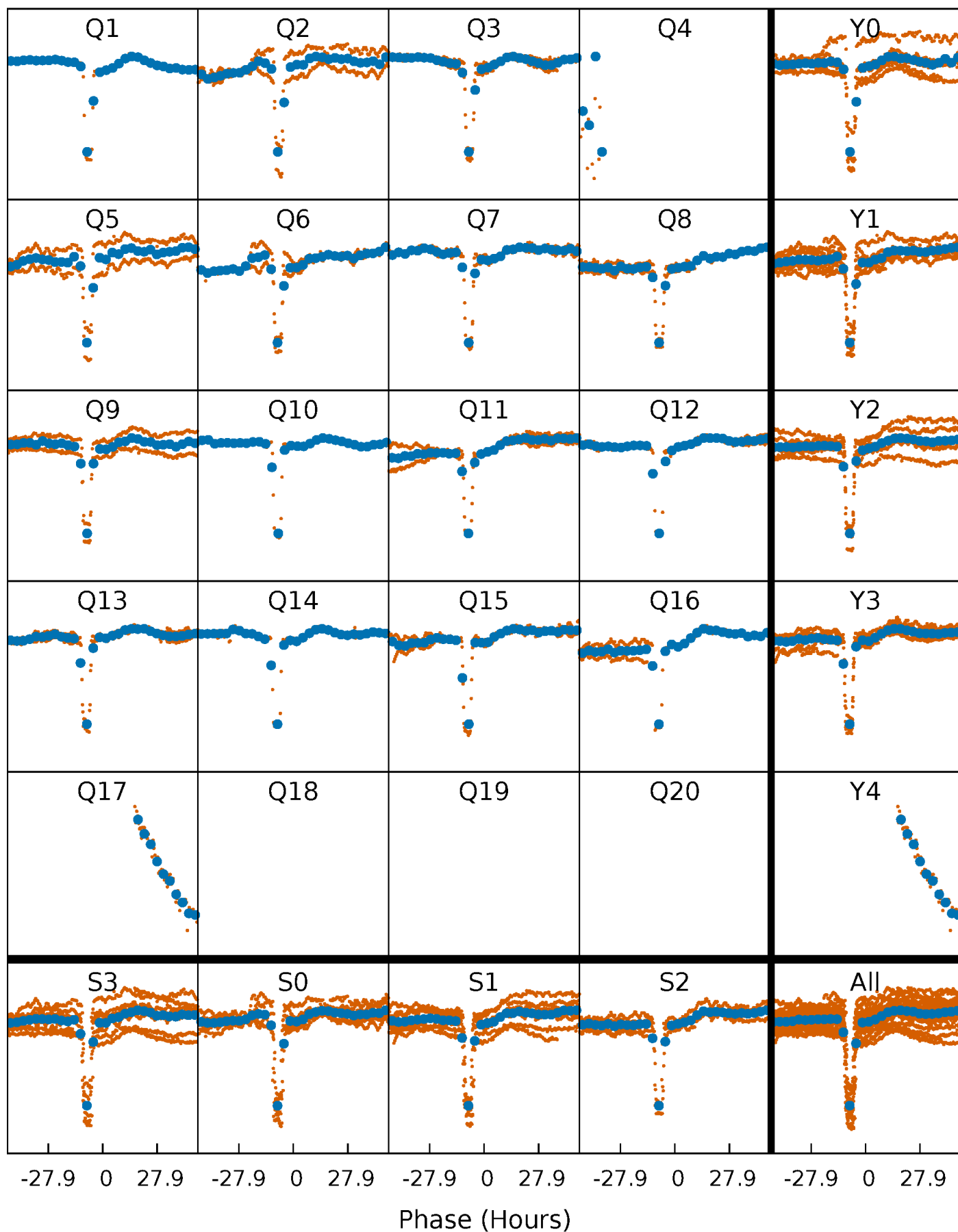


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



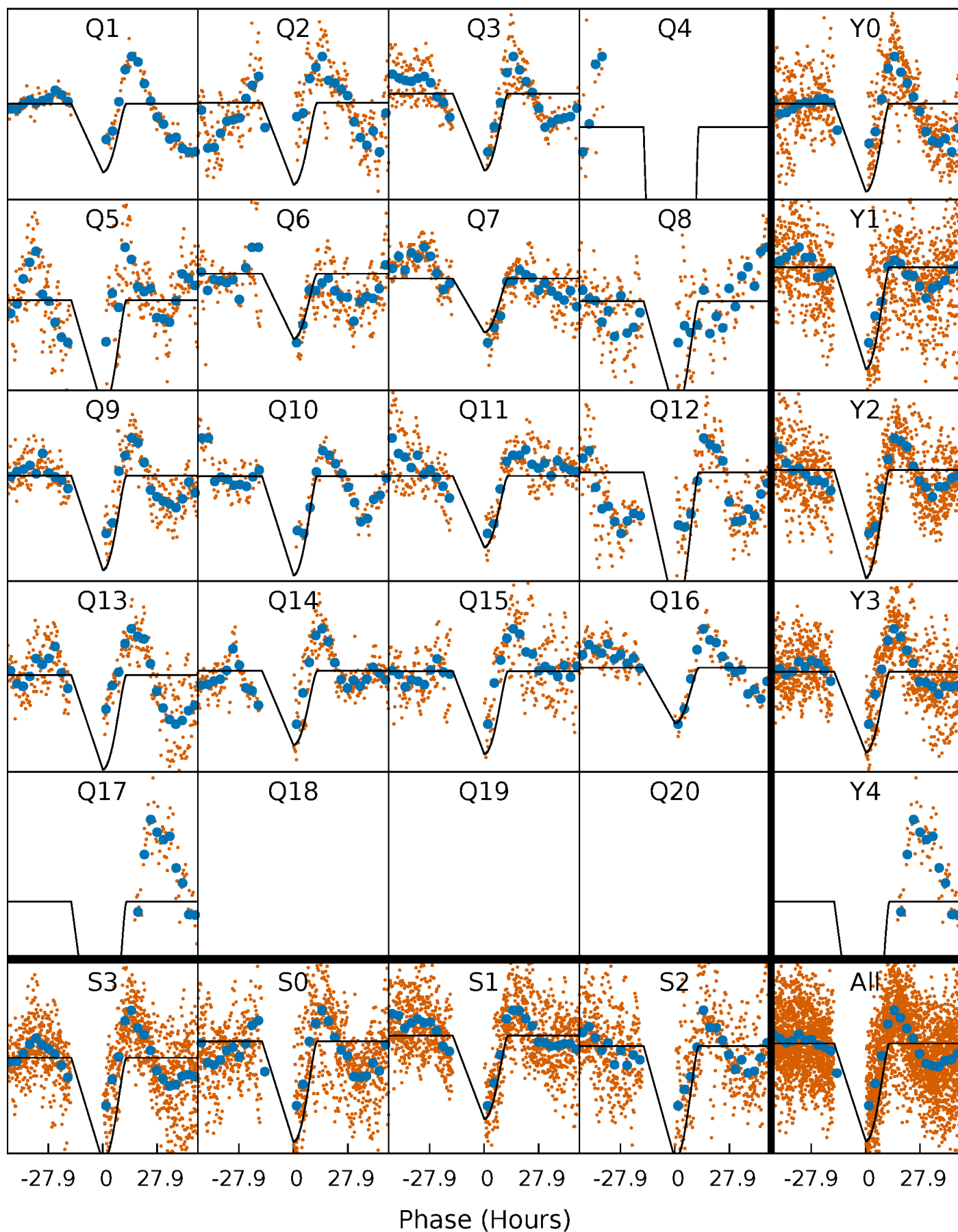
PDC Quarter-Phased Transit Curves

TCE 009172506-04 $P = 50.442473$ Days $T_0 = 146.167456$ (BKJD)



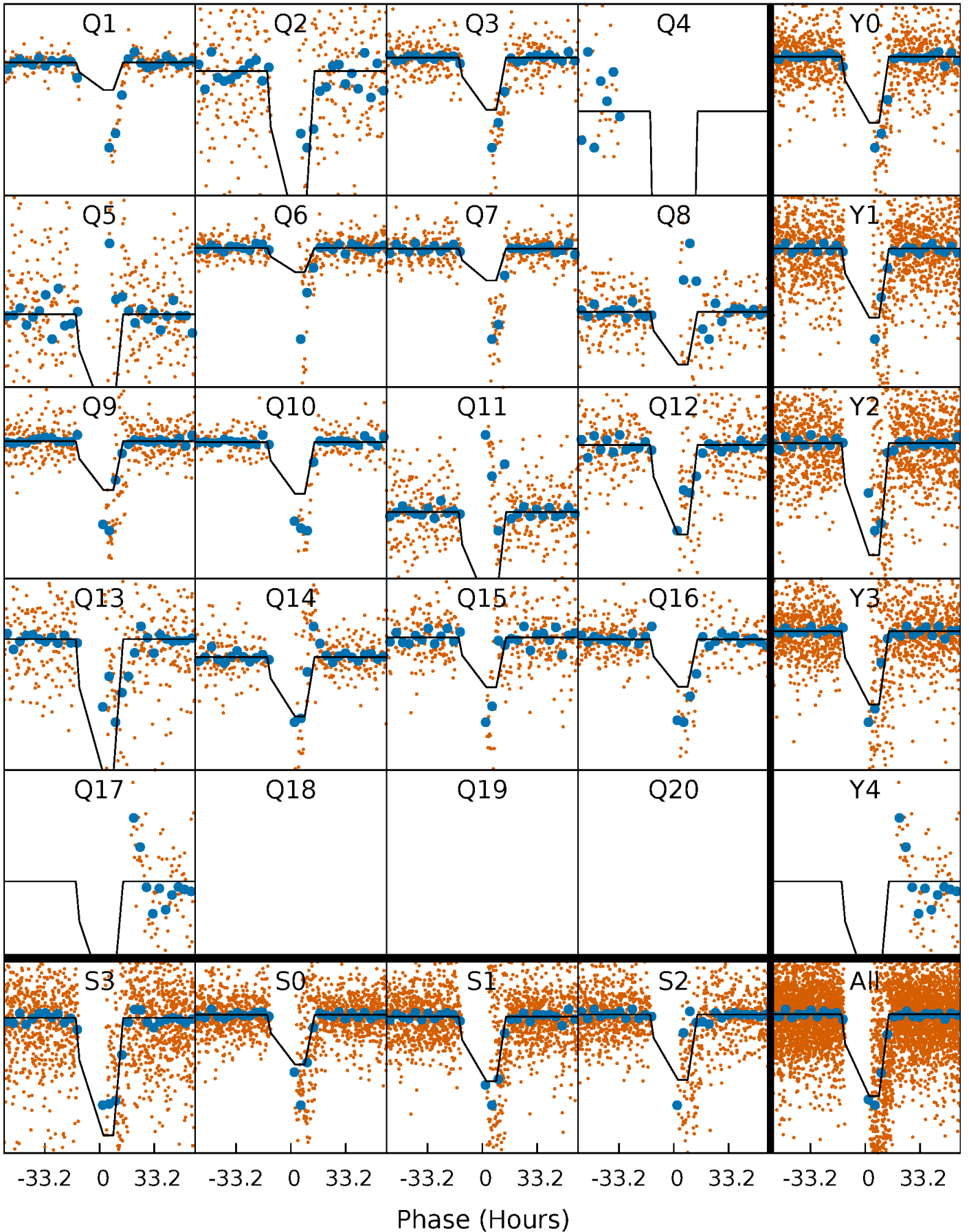
DV Quarter-Phased Transit Curves

TCE 009172506-04 P= 50.442473 Days $T_0=146.167456$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

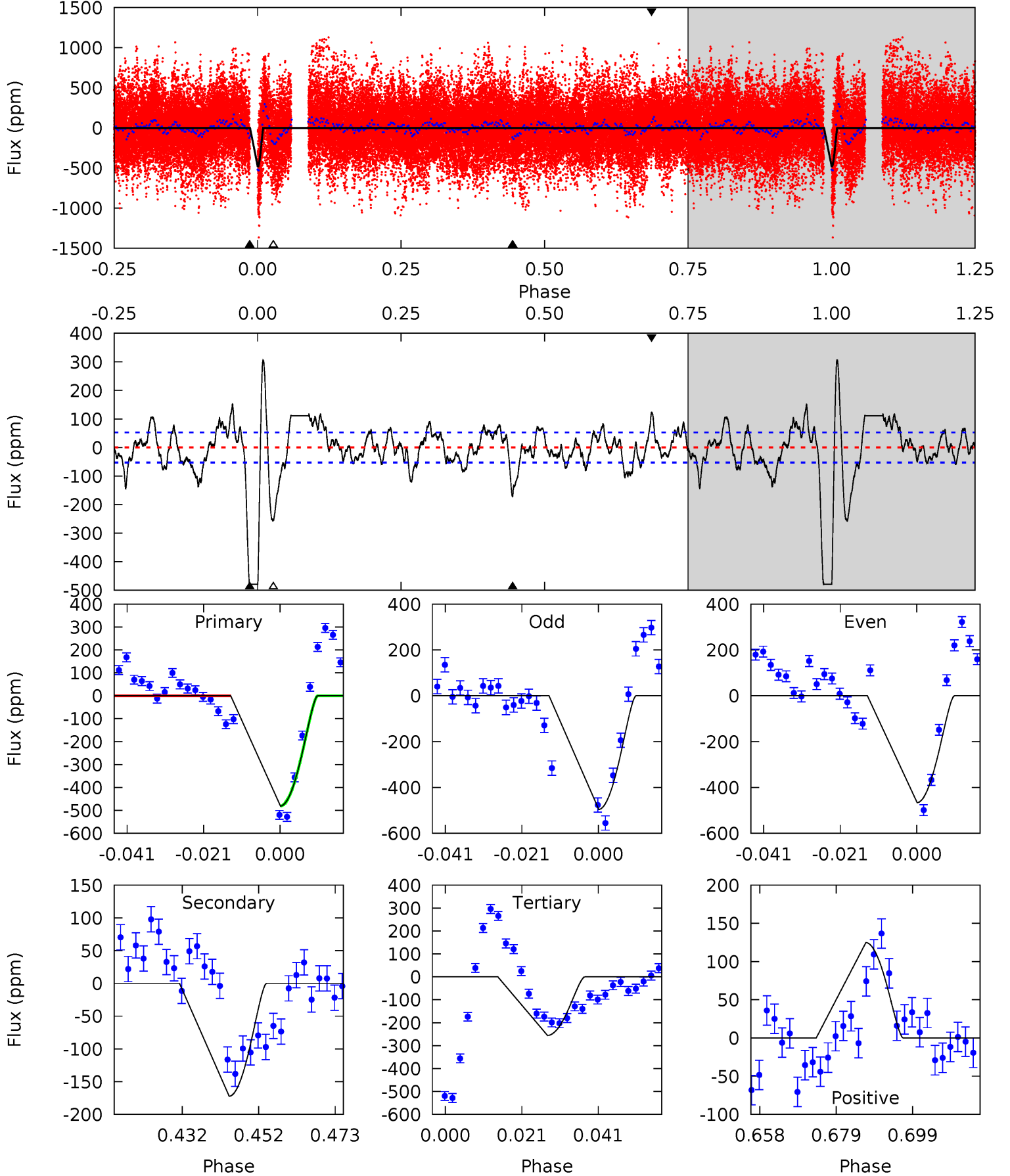
TCE 009172506-04 P= 50.444894 Days $T_0=146.005244$ (BKJD)



DV Model-Shift Uniqueness Test

009172506-04, P = 50.442473 Days, E = 95.724983 Days

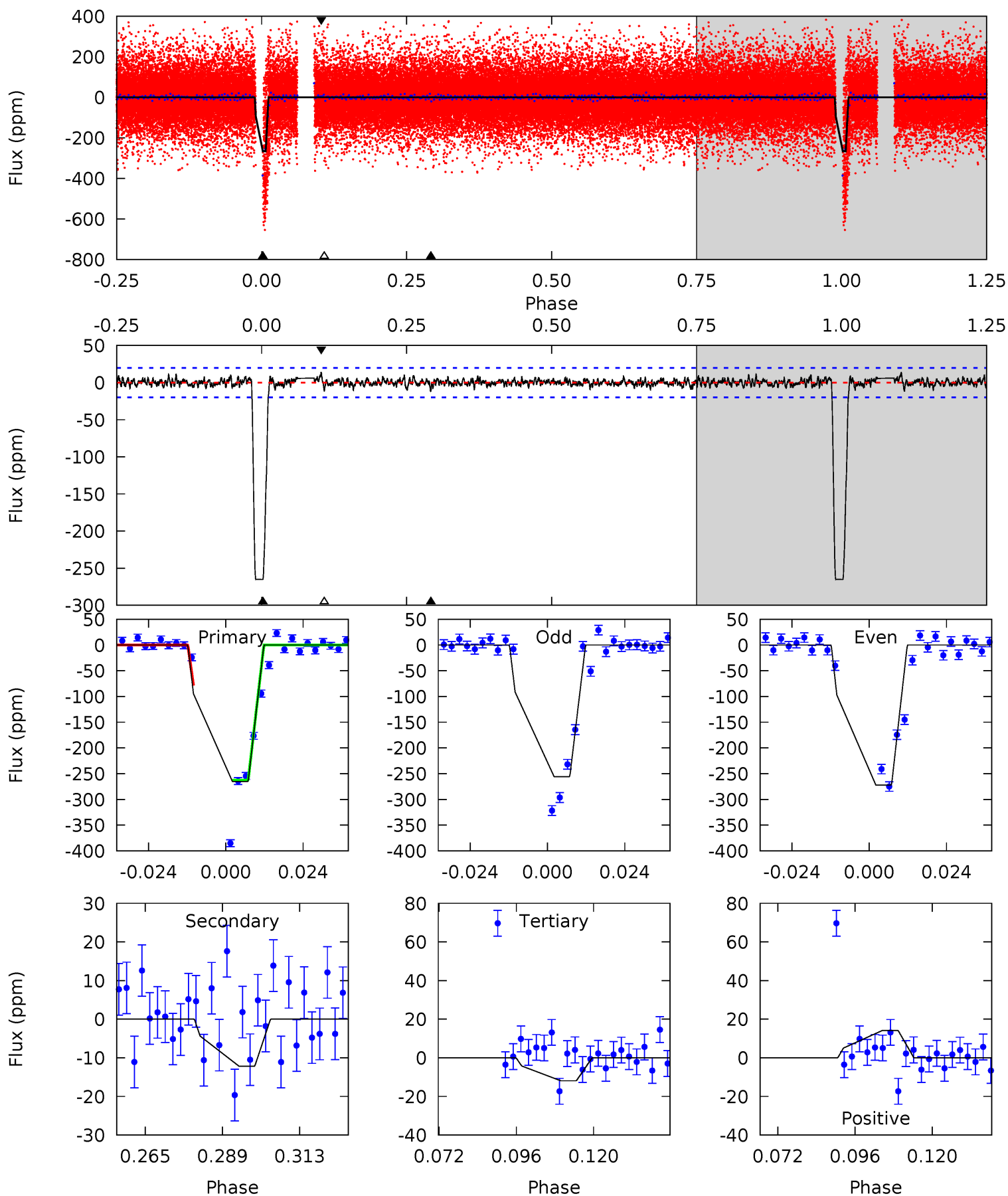
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
44.4	15.9	23.6	11.5	4.89	2.32	5.98	20.8	32.8	-7.69	4.38	1.37	1.02	0.39	0



Alt Model-Shift Uniqueness Test

009172506-04, P = 50.444894 Days, E = 95.560350 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
64.8	2.98	2.90	3.46	4.86	2.26	0.83	61.9	61.4	0.07	-0.48	2.01	1.05	0.05	14.3



Stellar Parameters For KIC 009172506

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6225^{+170}_{-170}	$4.039^{+0.266}_{-0.114}$	$-0.280^{+0.300}_{-0.300}$	$1.646^{+0.335}_{-0.461}$	$1.080^{+0.192}_{-0.157}$	$0.341^{+0.483}_{-0.129}$
	+3%/-3%	+7%/-3%	+107%/-107%	+20%/-28%	+18%/-15%	+142%/-38%
Source	PHO1	FLK73	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 009172506-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-172 ± 11	$9.10^{+7.54}_{-5.21}$	925^{+59}_{-71}	3529^{+1284}_{-522}	87^{+392}_{-60}
Alt.	-12 ± 4	$5.91^{+5.14}_{-4.01}$	927^{+58}_{-70}	2734^{+1108}_{-436}	15^{+131}_{-11}

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

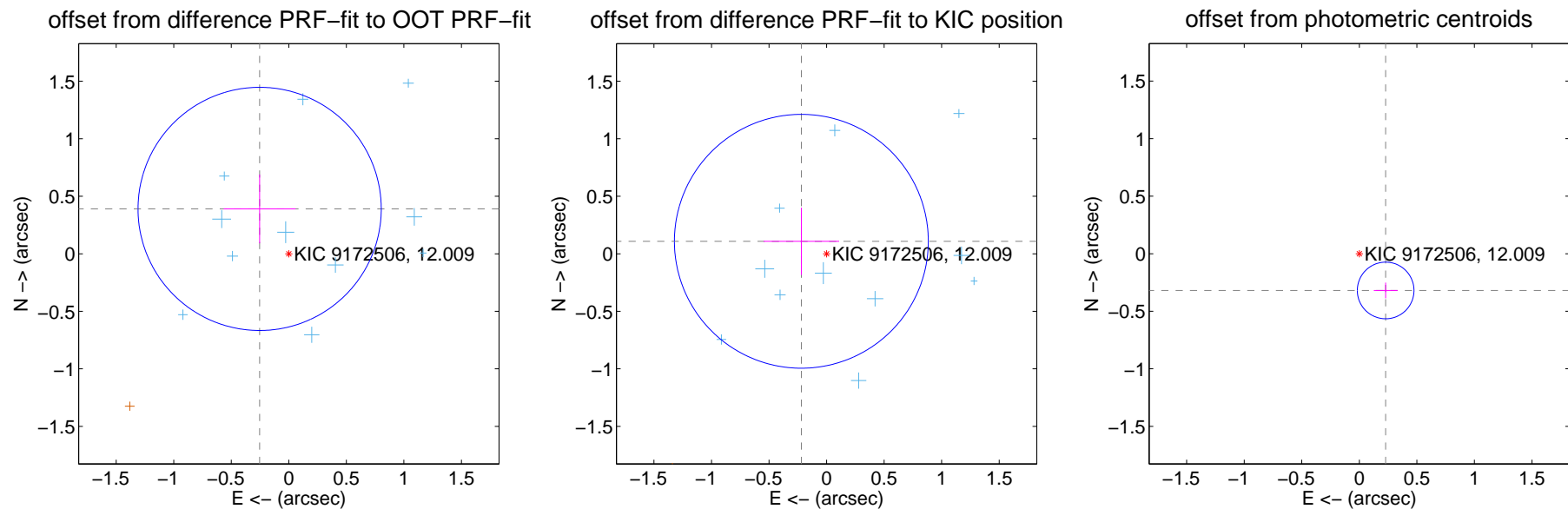
DV Centroid Data

Supplemental centroid analysis for 009172506-04. Kepler magnitude: 12.01. Transit SNR 16.06

There are 12 quarters with good PRF difference image offsets

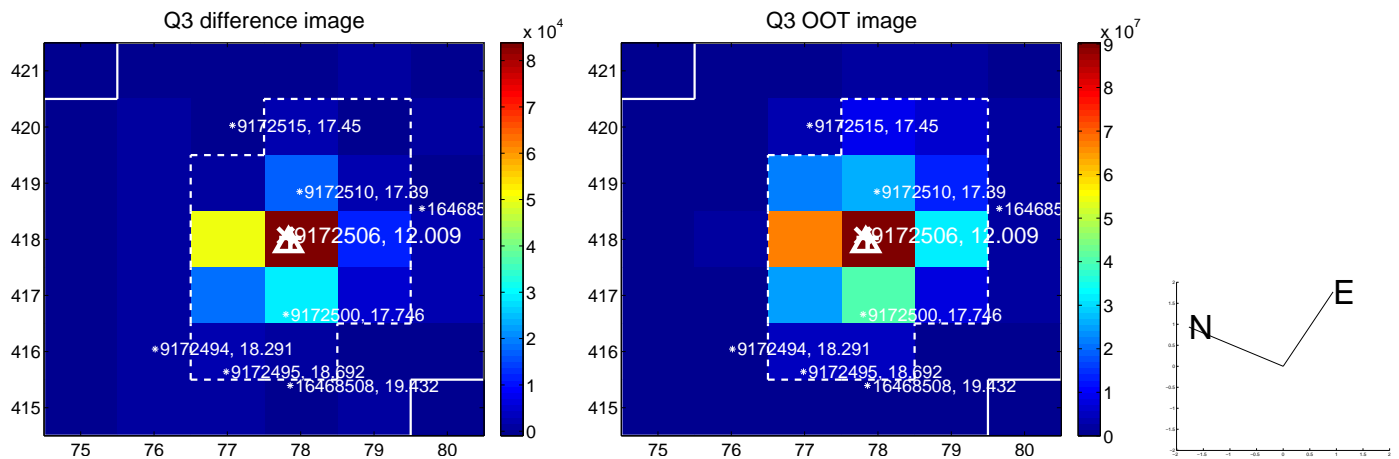
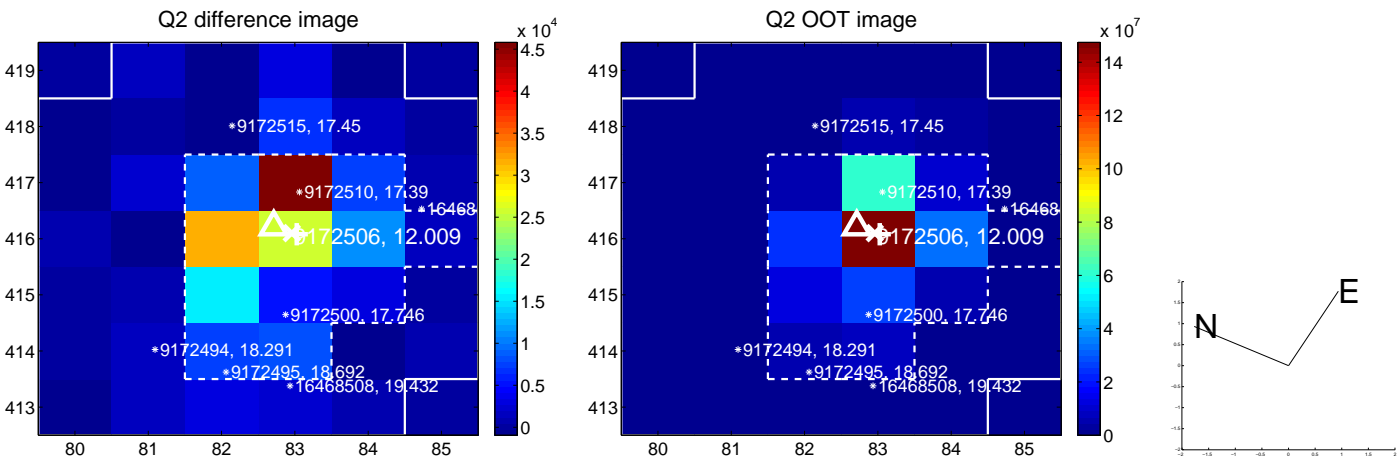
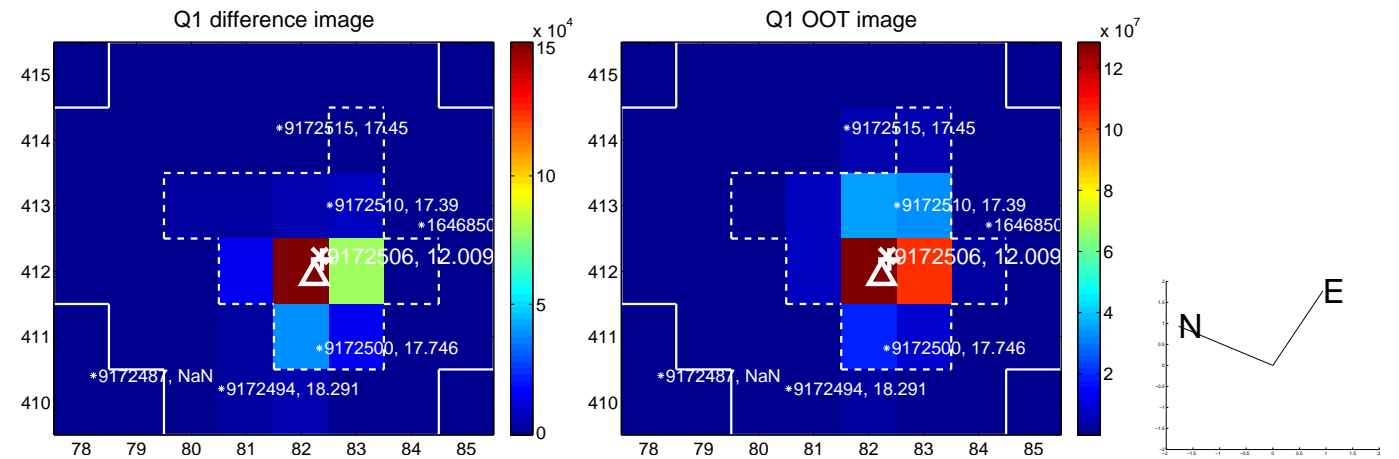
The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.465 ± 0.352	1.32	0.254 ± 0.312	0.390 ± 0.299
PRF-fit source offset from KIC position	0.245 ± 0.368	0.67	0.219 ± 0.329	0.109 ± 0.292
photometric centroid source offset	0.39 ± 0.08	4.79	-0.23 ± 0.10	-0.32 ± 0.07

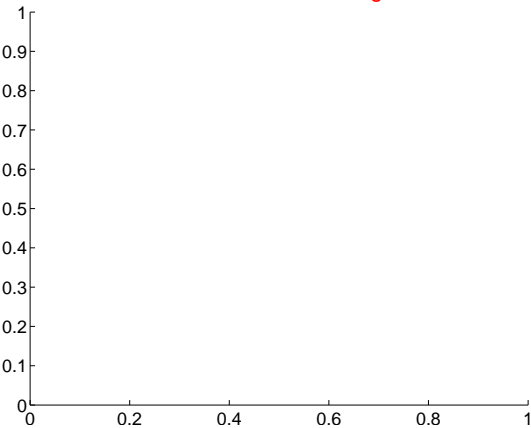


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

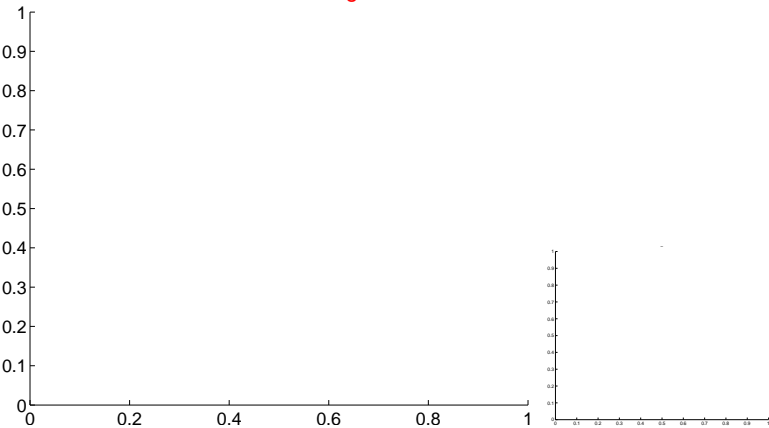
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



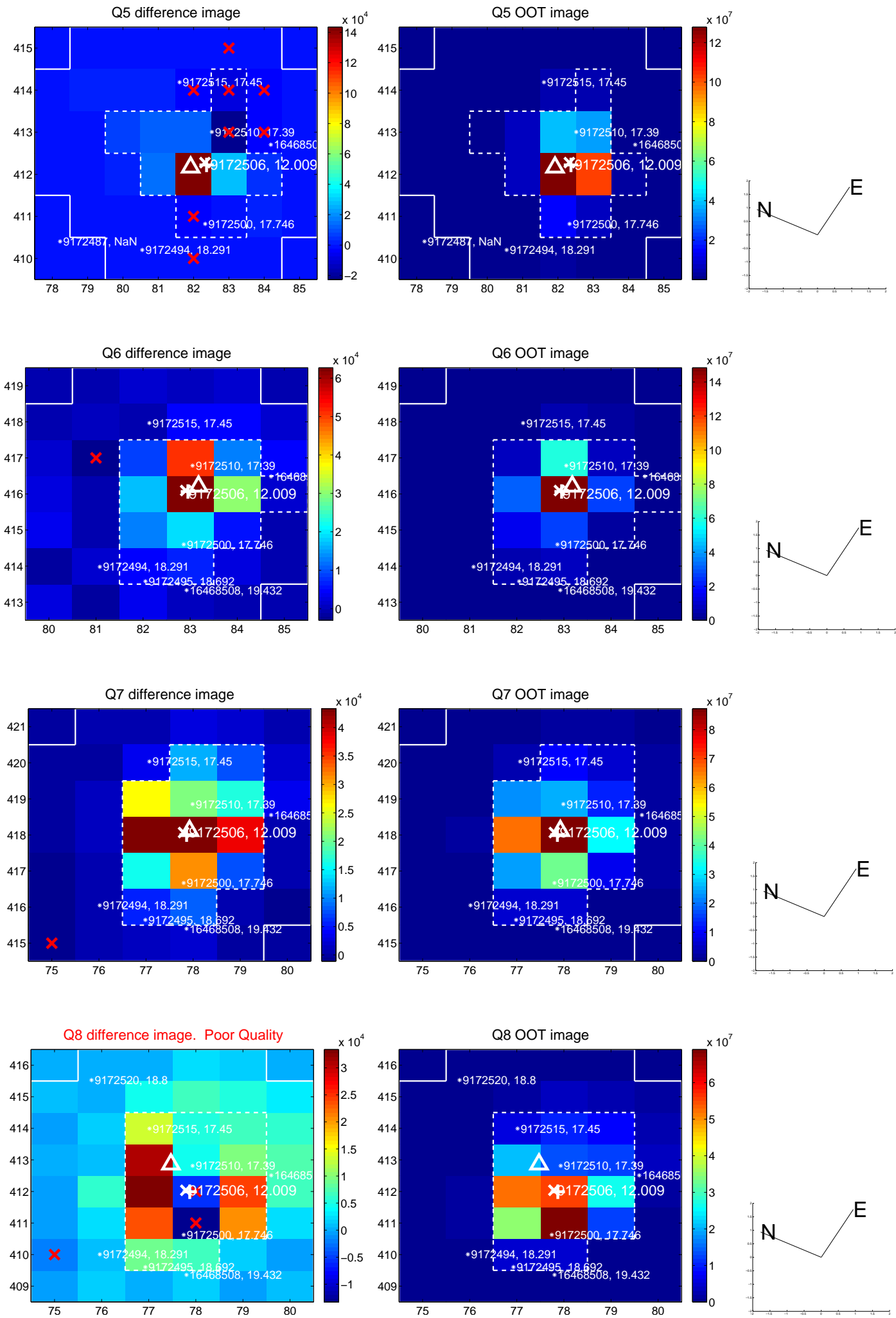
Q4 no difference image



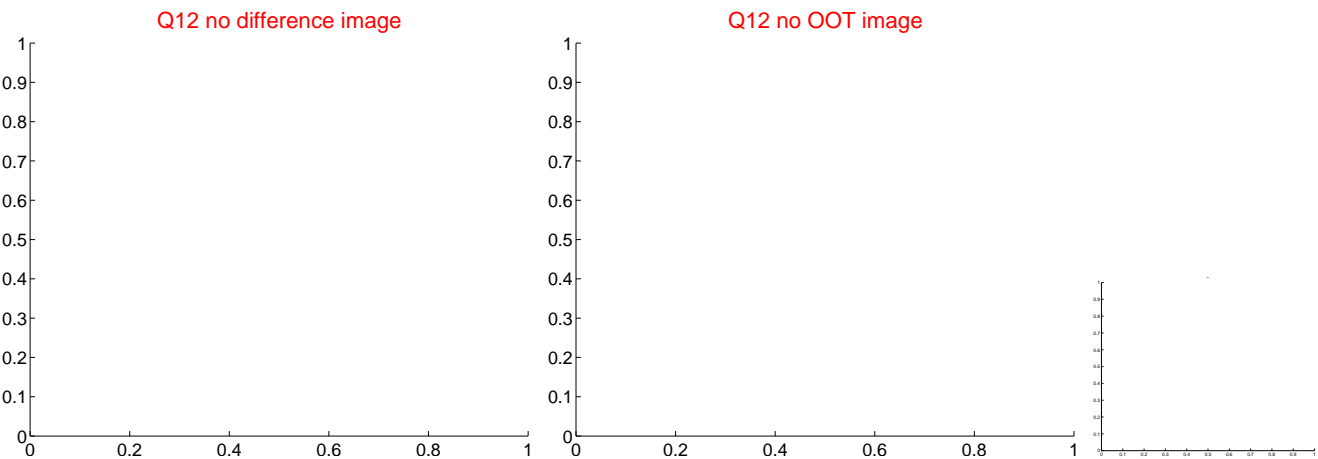
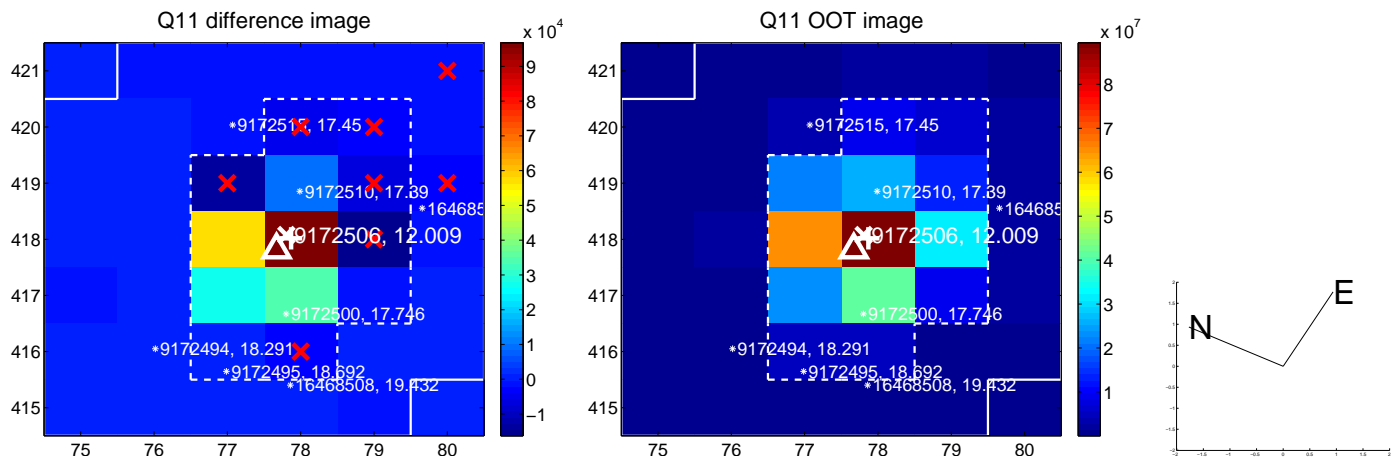
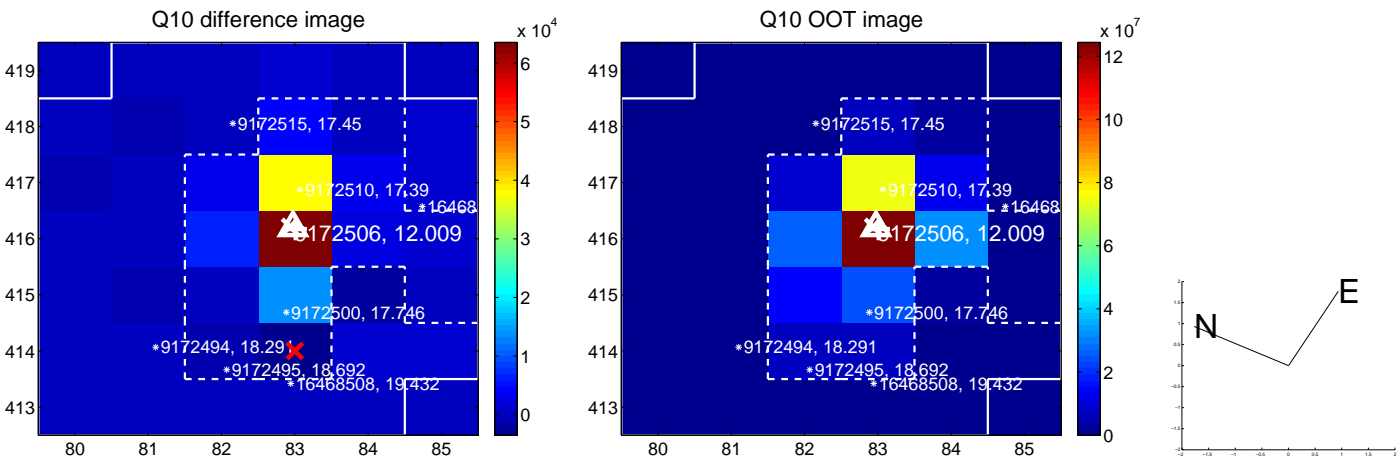
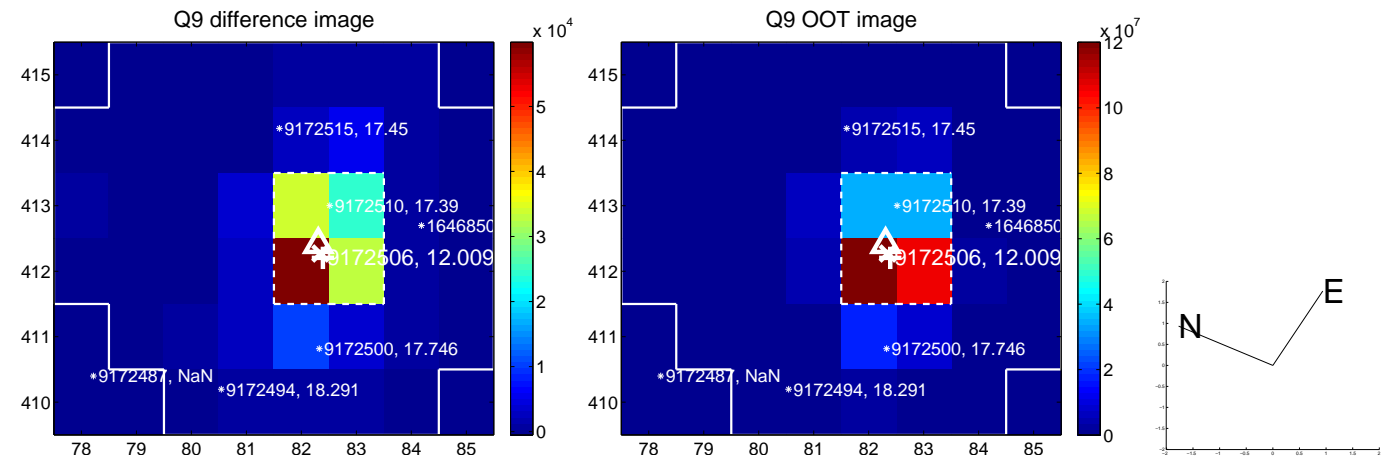
Q4 no OOT image



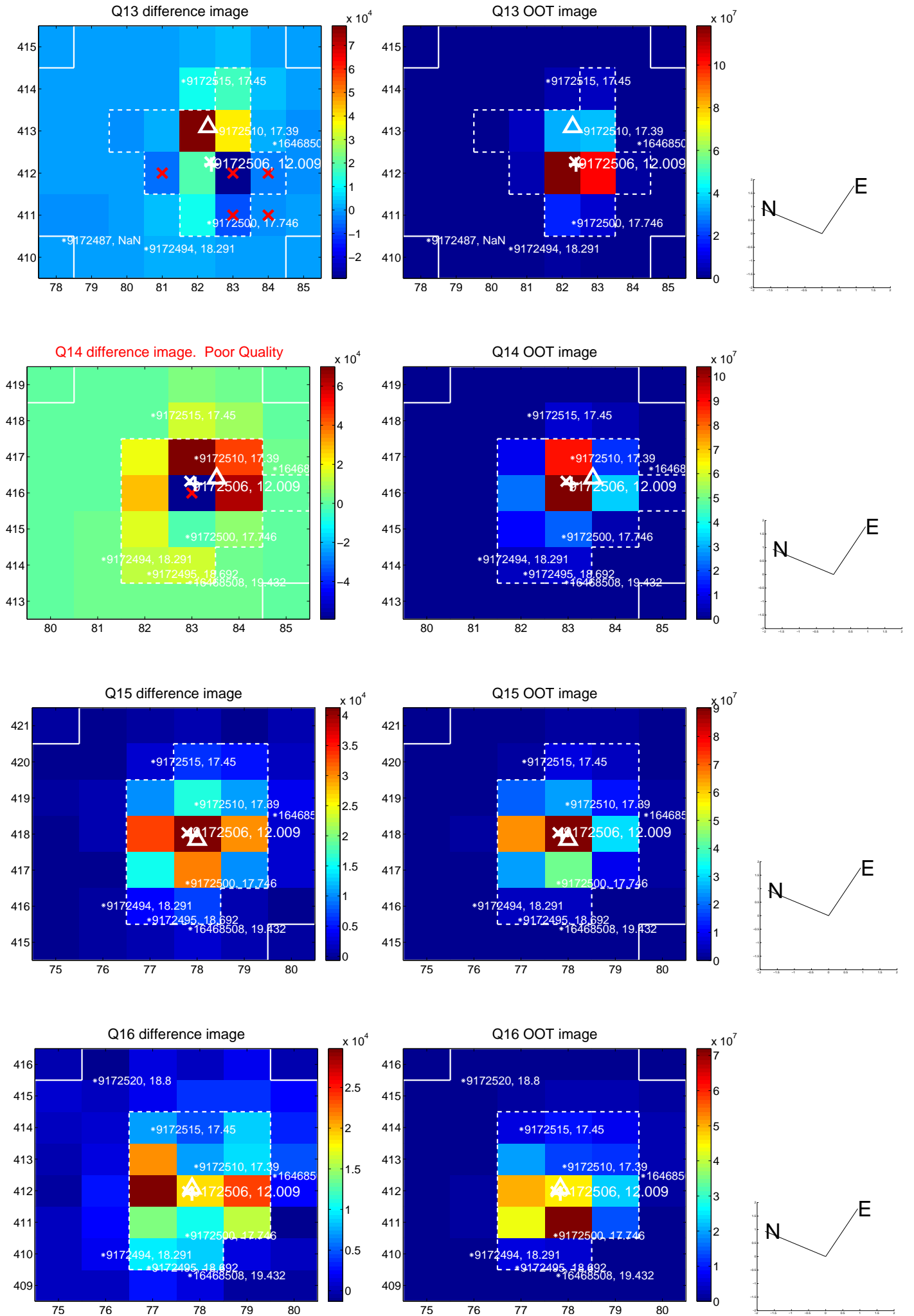
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



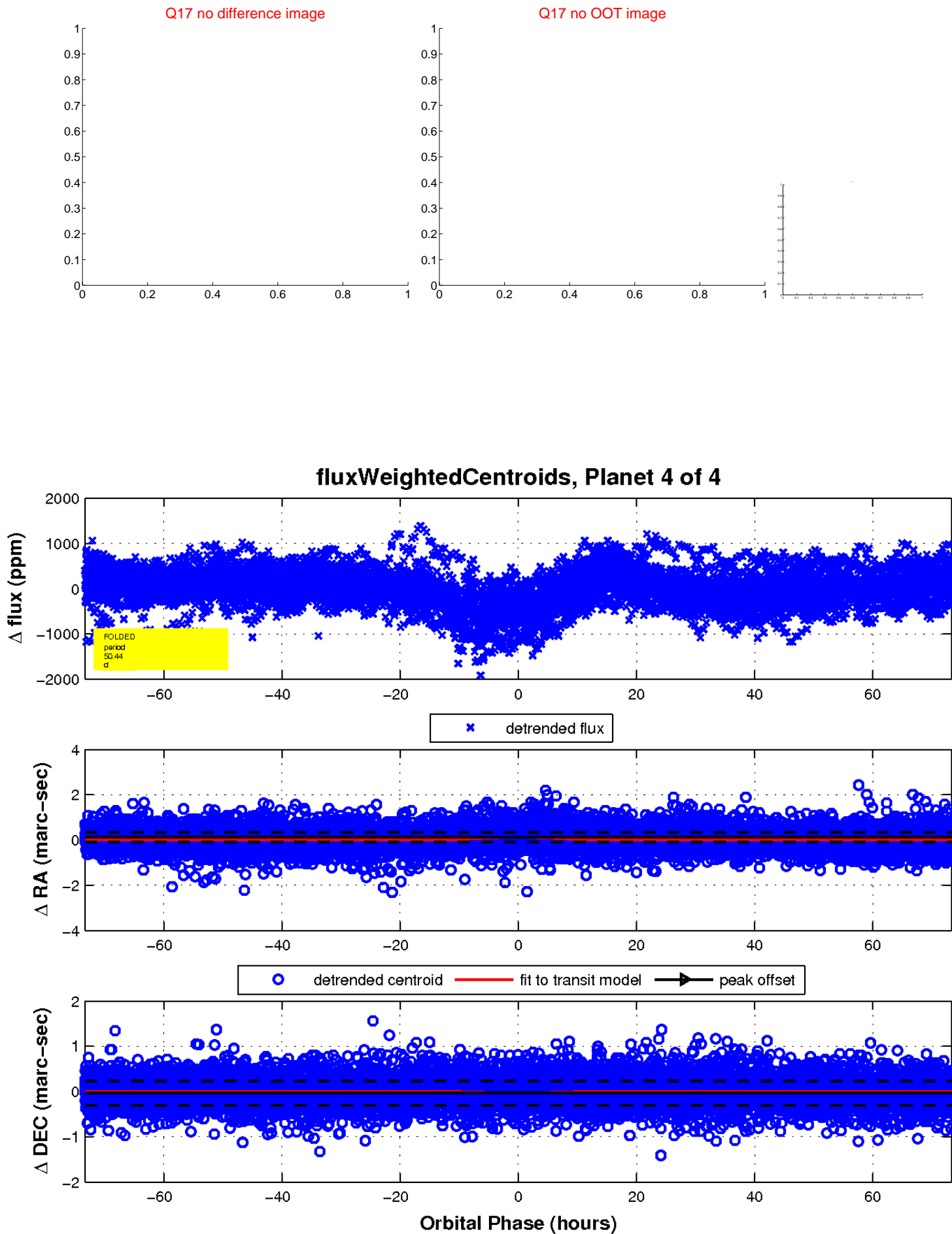
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

