

KIC 005112410

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})
005112410-01	OBS	No	0.549867	131.857736	72.8	2.523	8.0	9.5	0.84	5927	0.82	5256.48
005112410-02	OBS	No	413.485130	437.853038	1925.4	6.990	12.5	12.9	0.84	5927	4.26	0.77
005112410-03	OBS	No	46.479842	159.184333	86.1	22.576	10.2	2.1	0.84	5927	0.82	14.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005112410-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
005112410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005112410-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

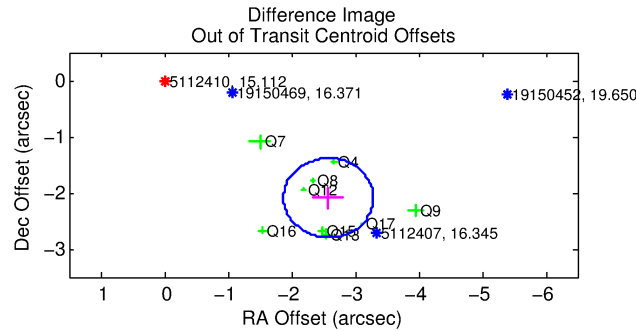
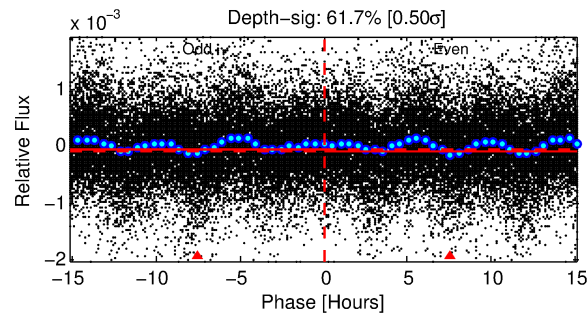
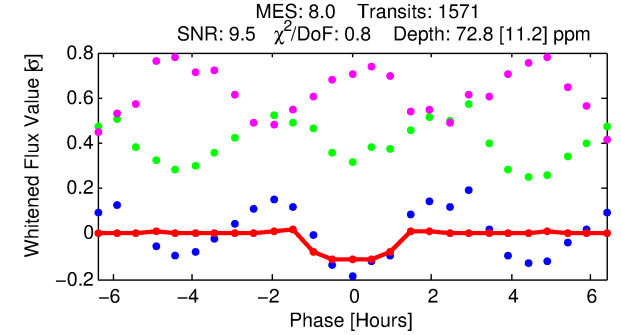
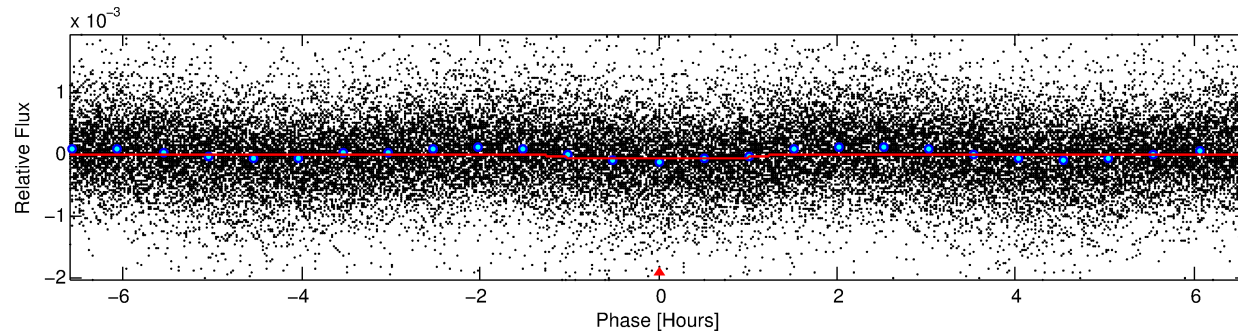
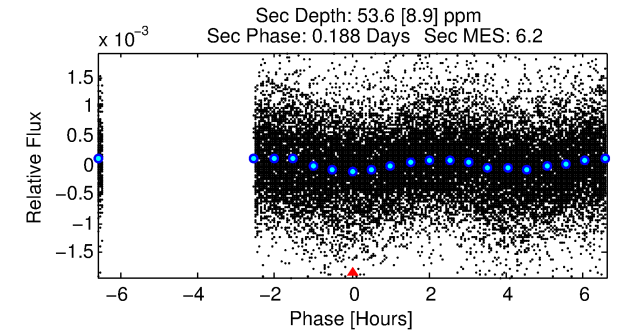
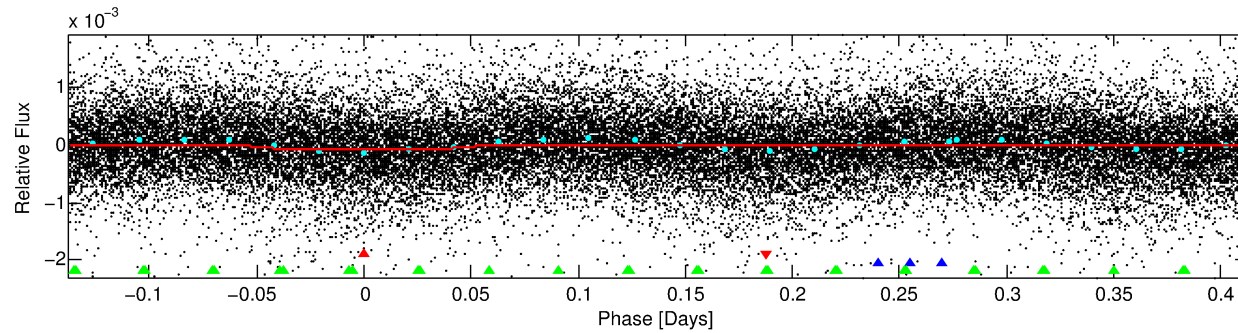
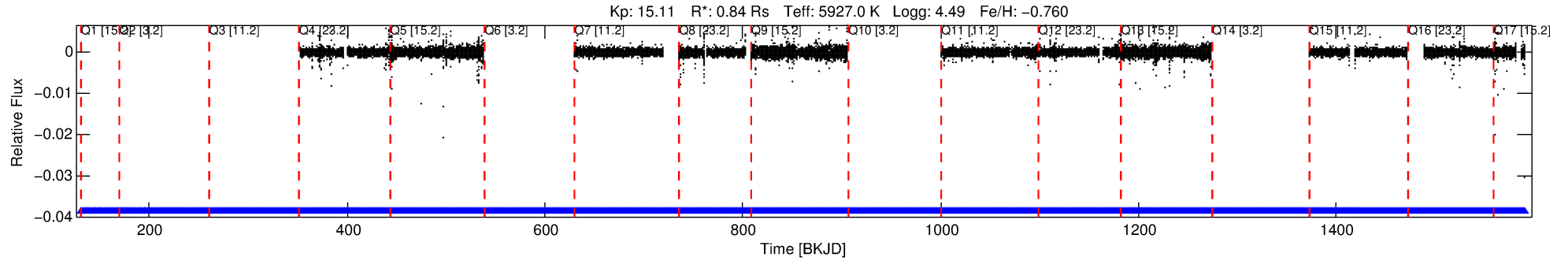
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005112410-01

No Significant Match Found

DV One-Page Summary

KIC: 5112410 Candidate: 1 of 3 Period: 0.550 d



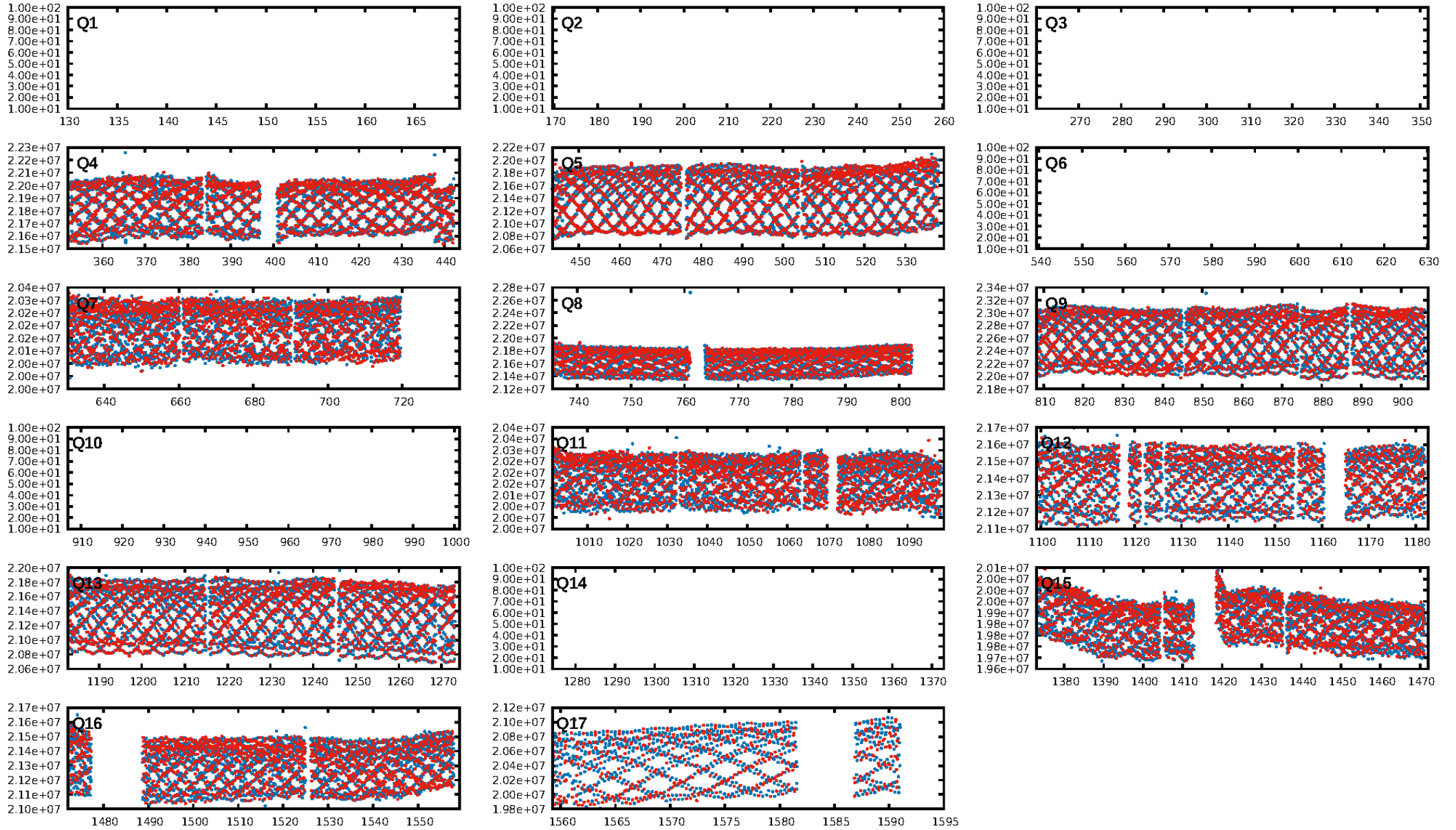
DV Fit Results:

Period = 0.54987 [0.00001] d
Epoch = 131.8577 [0.0028] BKJD
Rp/R* = 0.0090 [0.0062]
a/R* = 1.26 [1.74]
b = 0.87 [1.09]
Seff = 5256.48 [1633.33]
Teff = 2171 [169] K
Rp = 0.82 [0.60] Re
a = 0.0121 [0.0023] AU
Ag = 6.49 [9.25] [0.59σ]
Teffp = 5357 [1882] K [1.69σ]

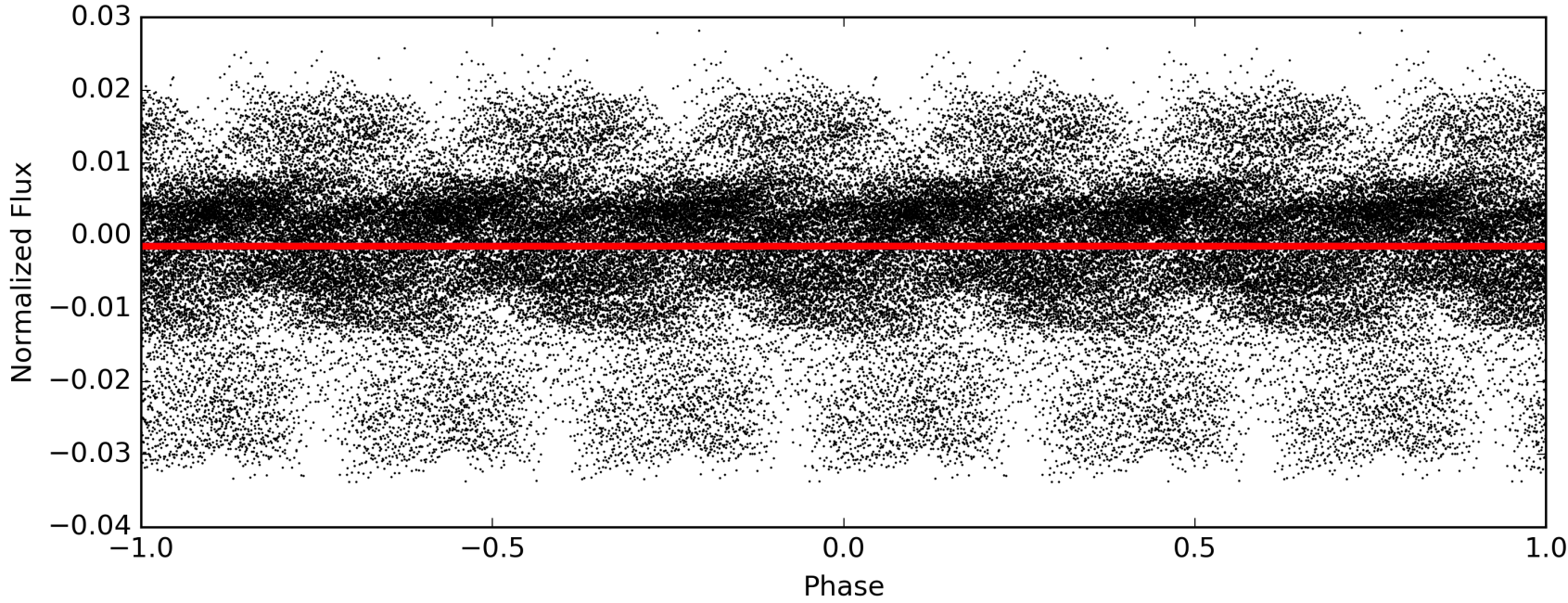
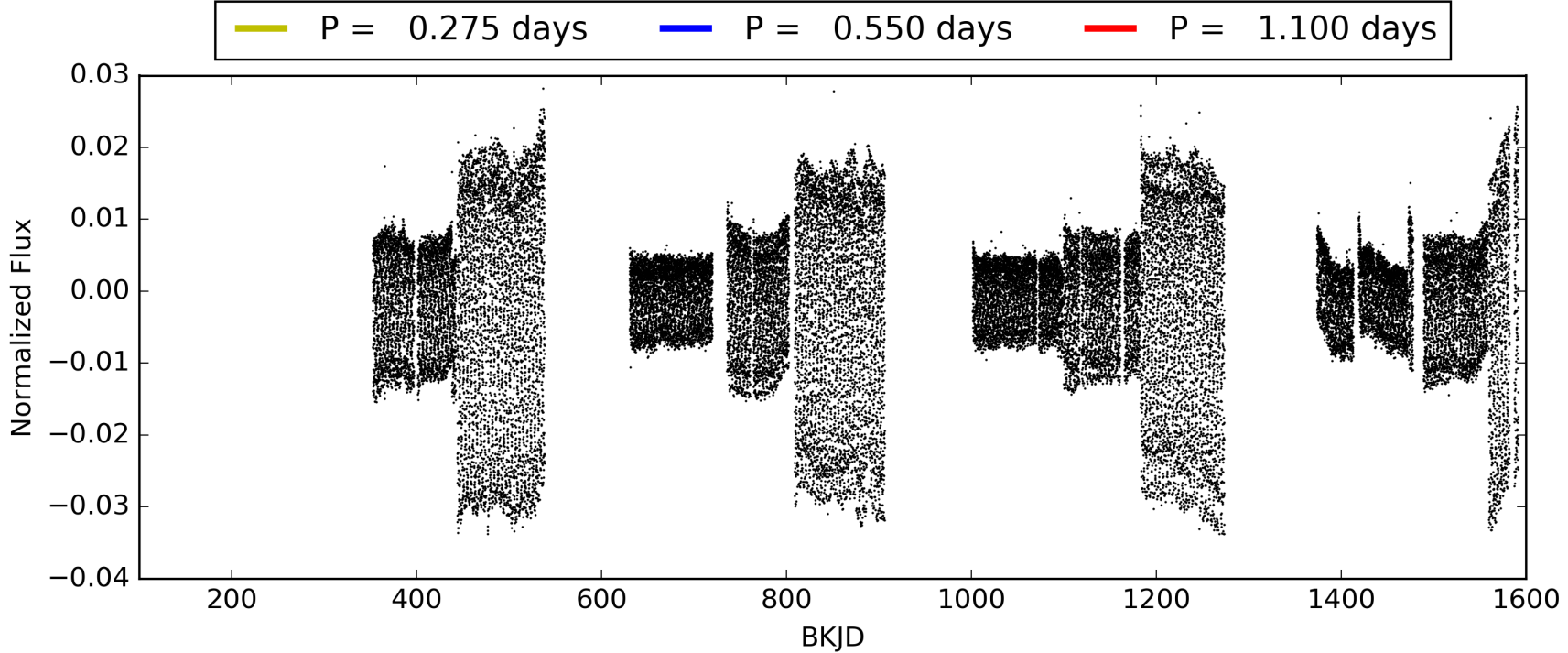
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [48.53σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.94e-11
RollingBand-fgt: 1.00 [1522/1522]
GhostDiagnostic-chr: 0.1522
Centroid-sig: 56.9%
Centroid-so: 0.863 arcsec [0.36σ]
OotOffset-rm: 3.322 arcsec [14.12σ]
KicOffset-rm: 4.474 arcsec [23.76σ]
OotOffset-st: 0/2/4/3 [9]
KicOffset-st: 0/2/4/3 [9]
DiffImageQuality-fgm: 0.67 [6/9]
DiffImageOverlap-fno: 1.00 [11/11]

TCE 005112410-01, PDC Light Curves

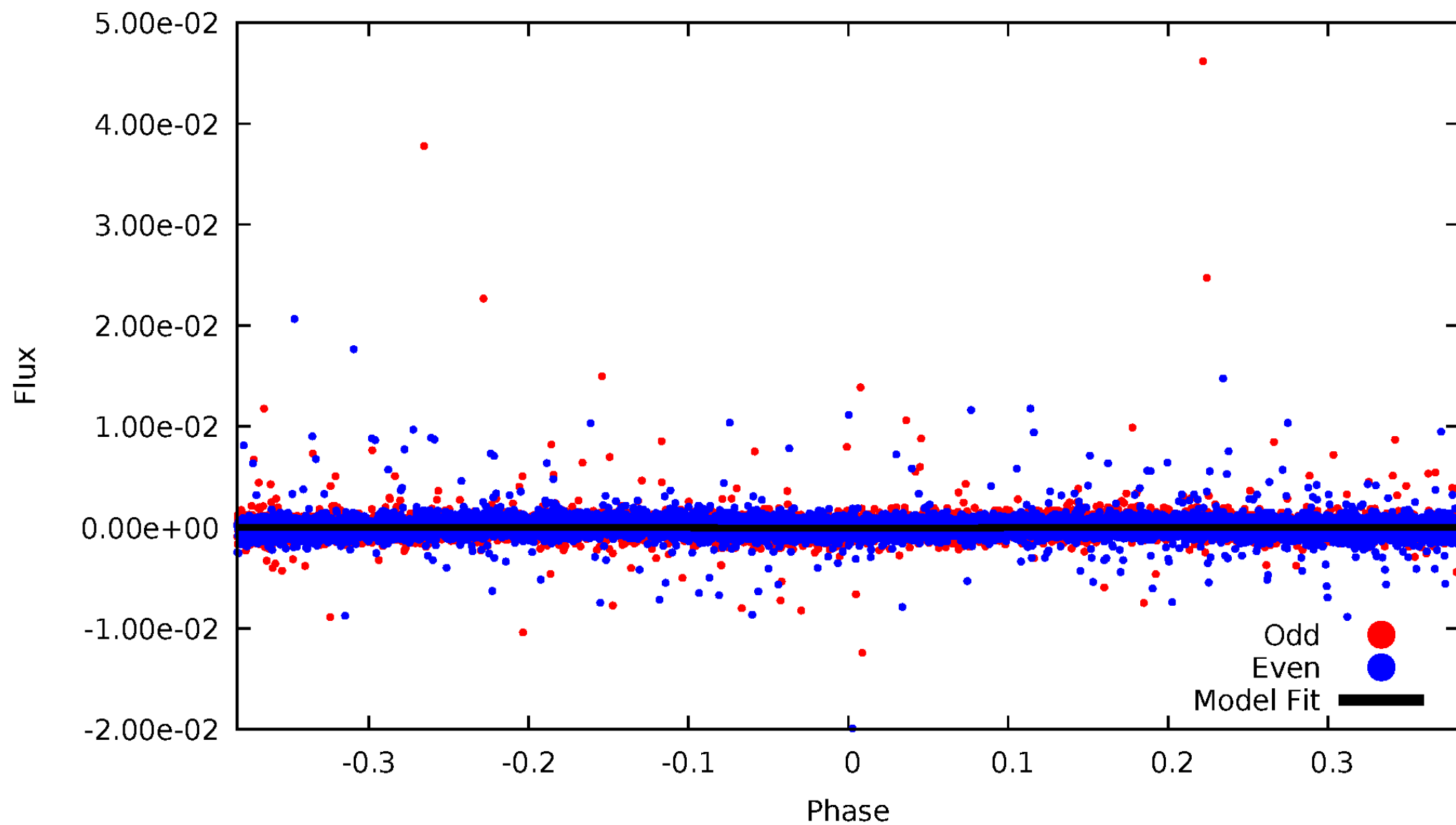


TCE 005112410-01



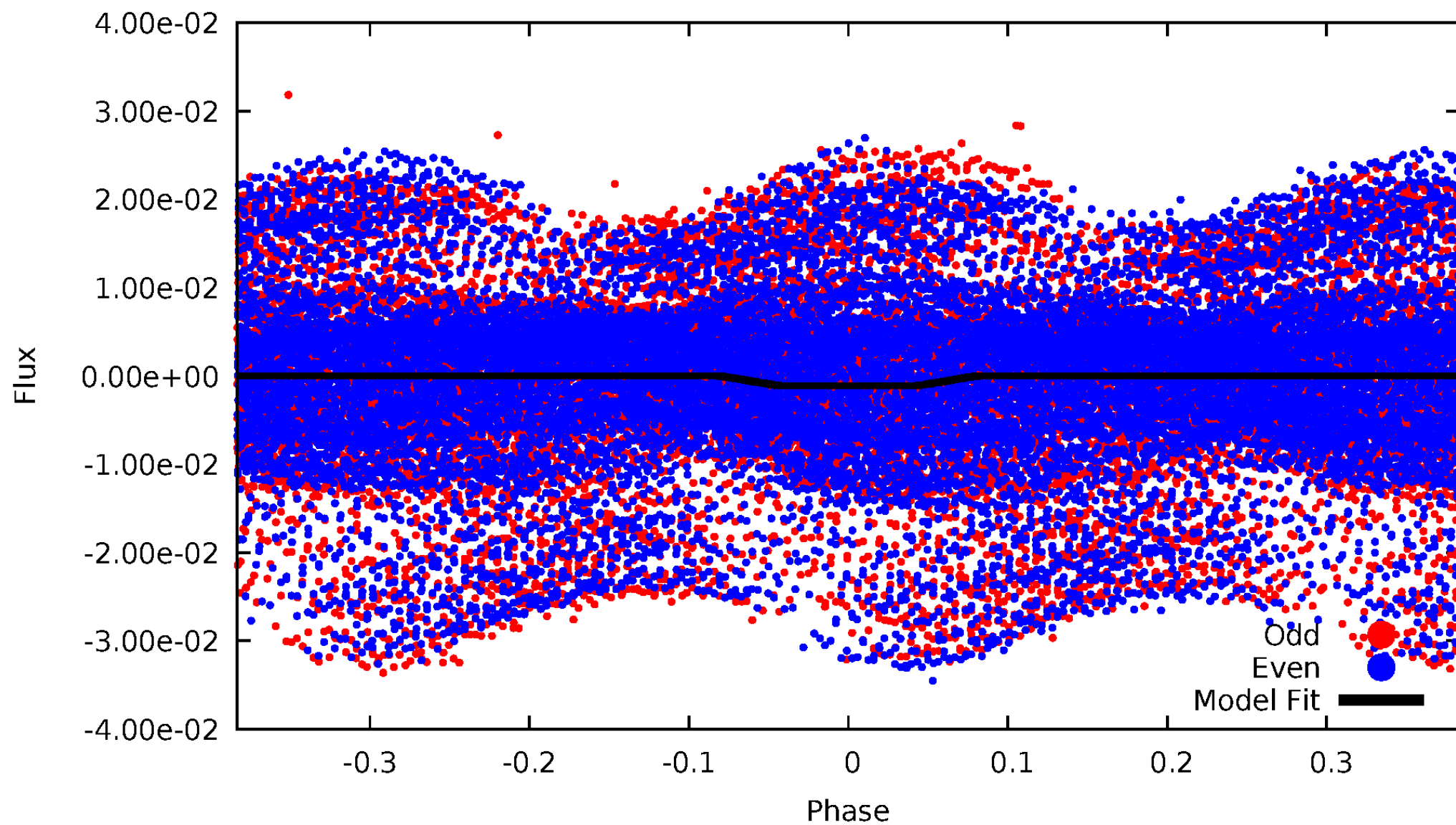
DV Odd/Even

TCE 005112410-01

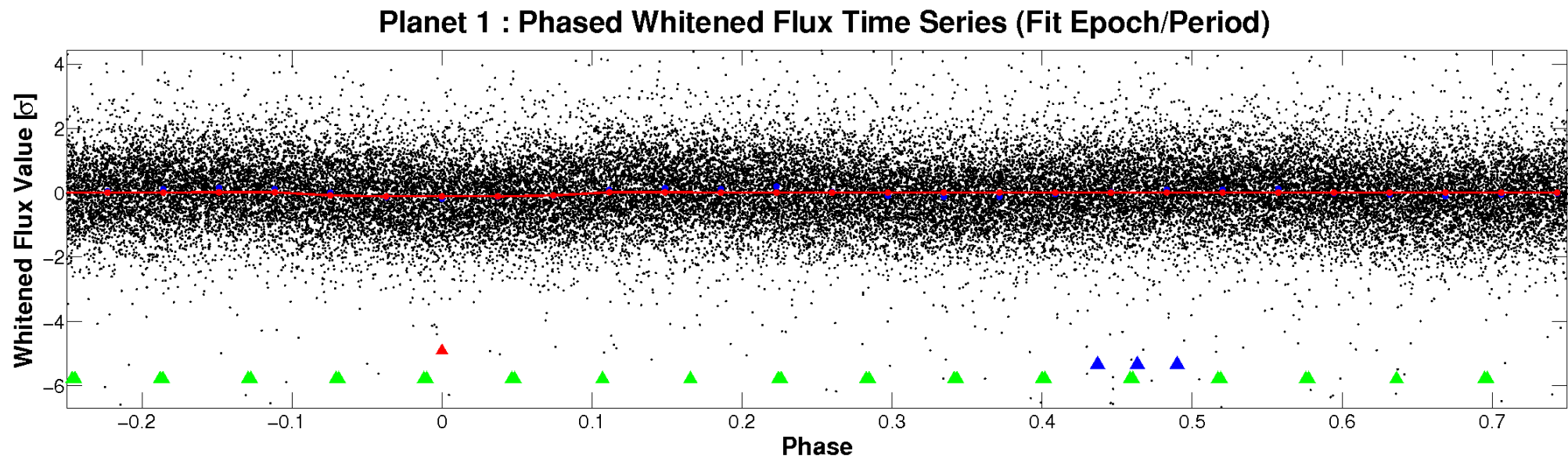
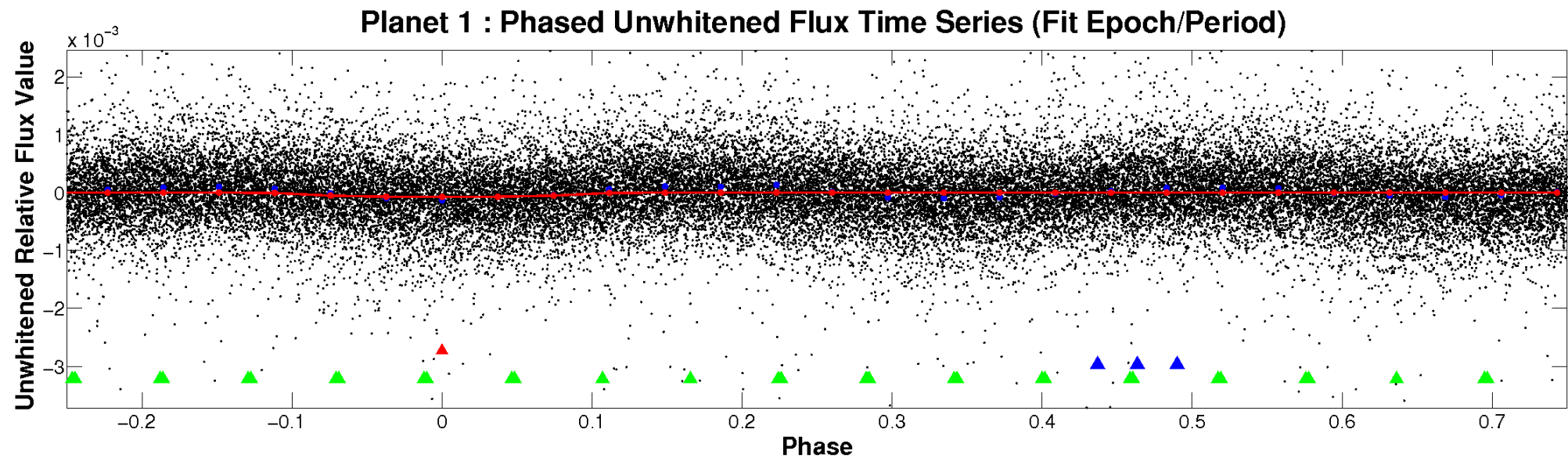


ALT Odd/Even

TCE 005112410-01

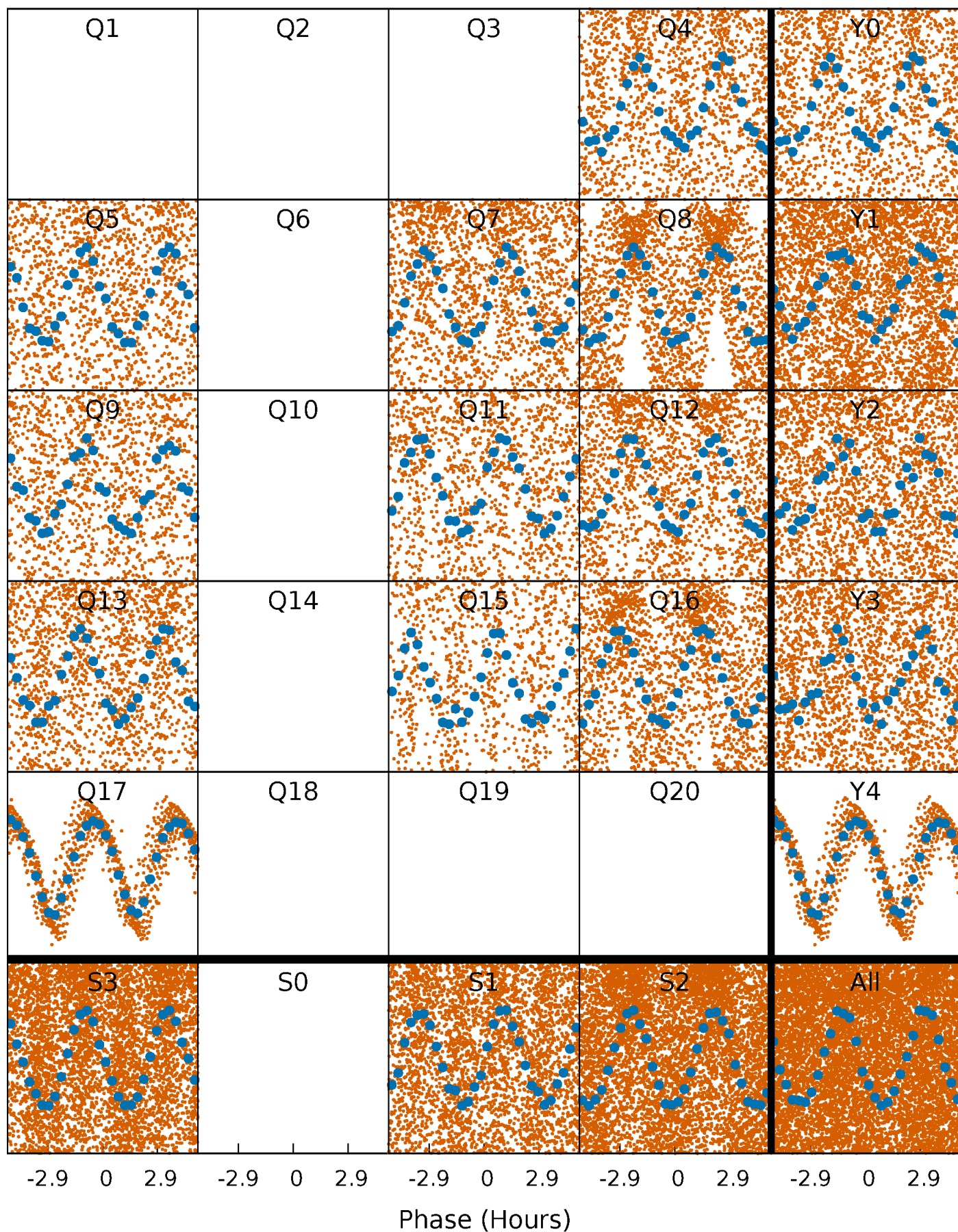


Non-Whitened Vs. Whitened Light Curve



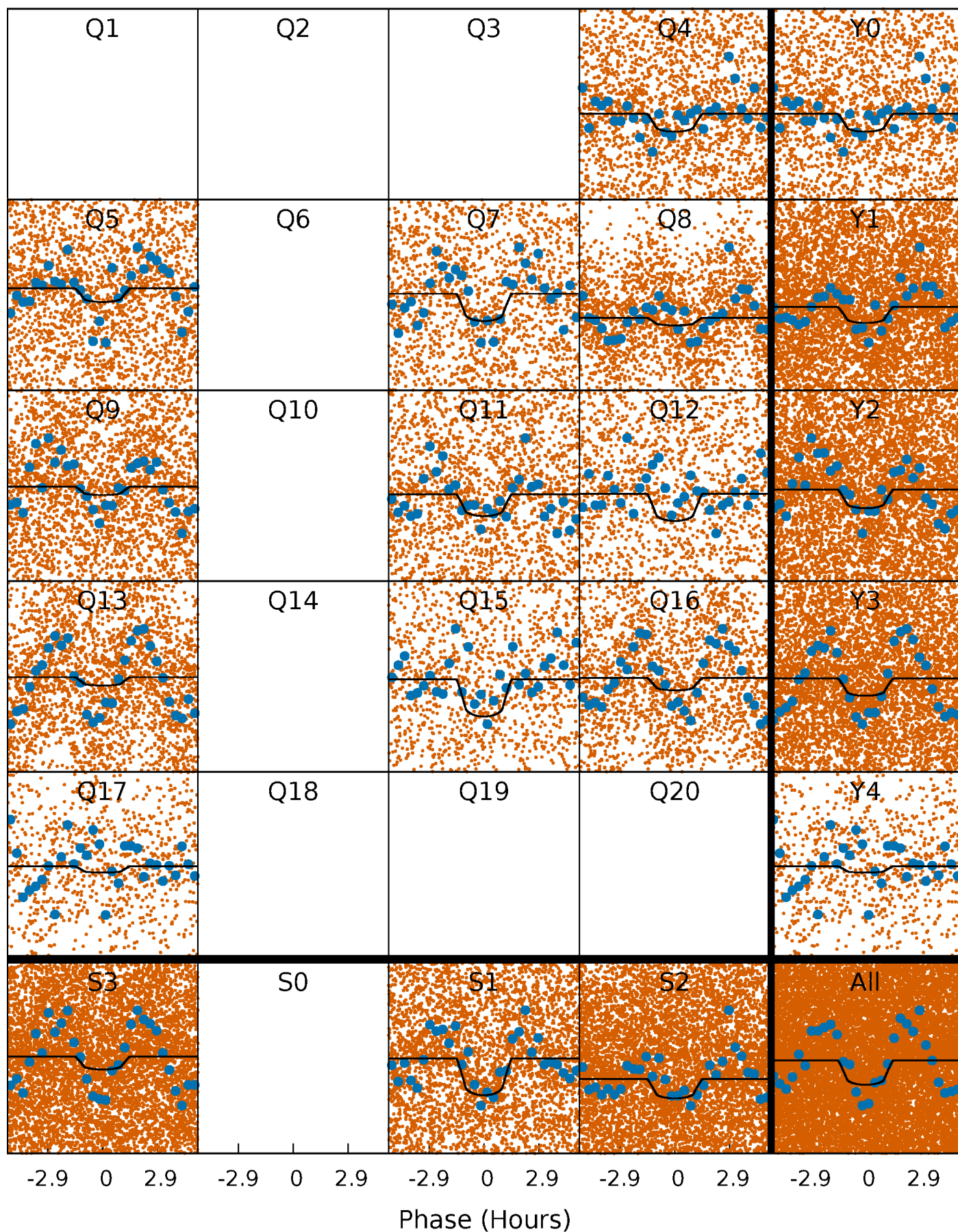
PDC Quarter-Phased Transit Curves

TCE 005112410-01 P= 0.549867 Days $T_0=131.857736$ (BKJD)



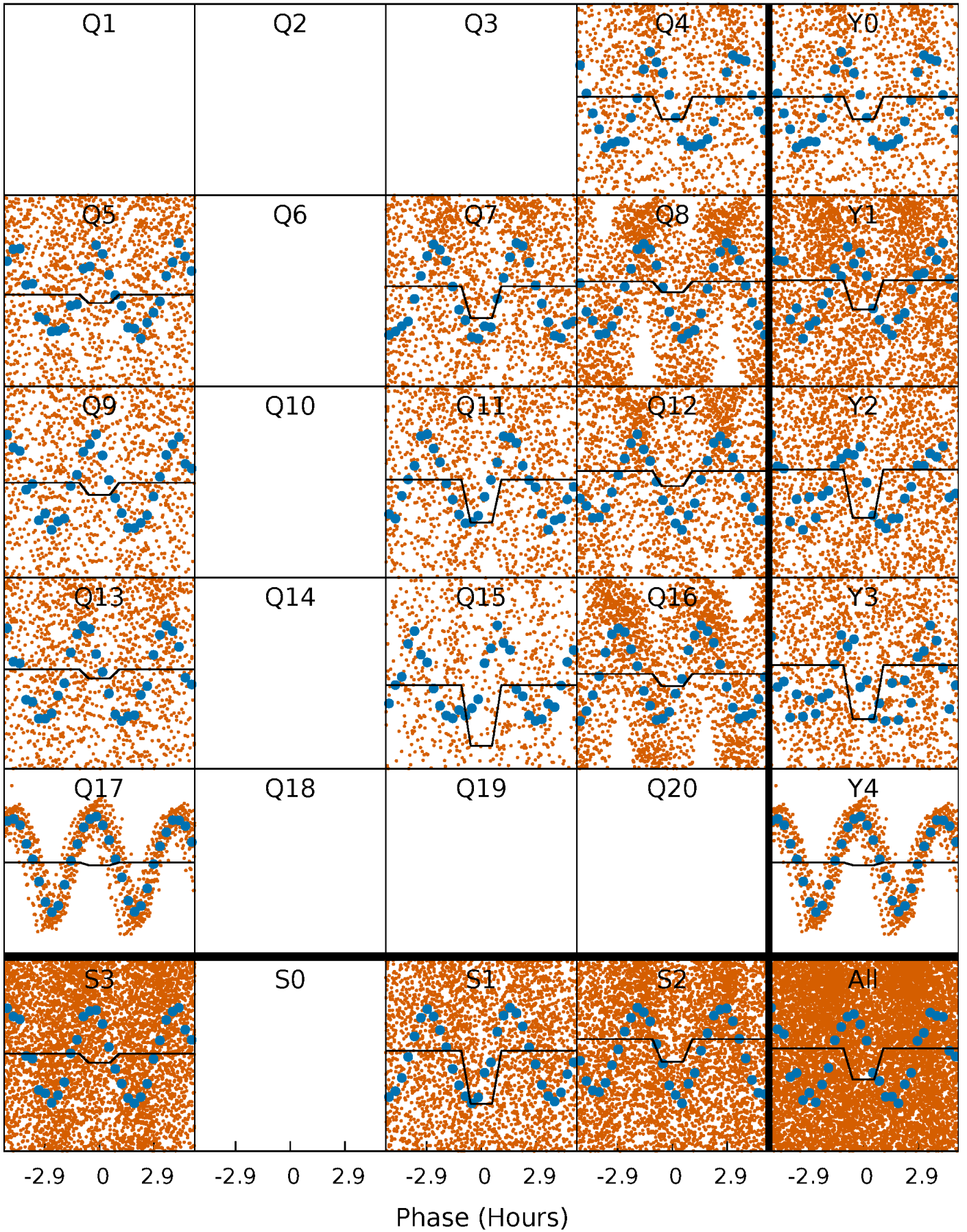
DV Quarter-Phased Transit Curves

TCE 005112410-01 P= 0.549867 Days $T_0=131.857736$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

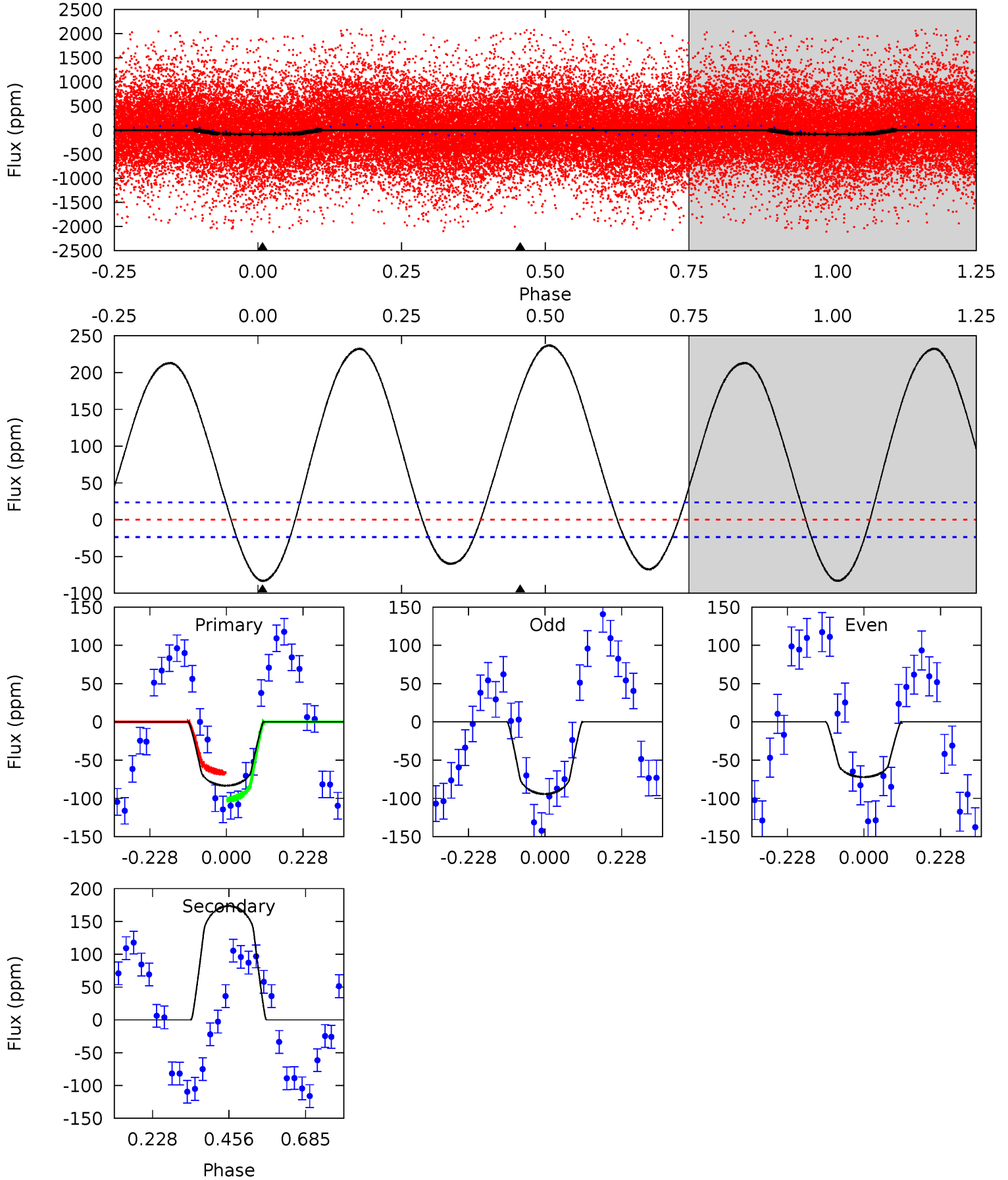
TCE 005112410-01 P= 0.549880 Days $T_0=131.815359$ (BKJD)



DV Model-Shift Uniqueness Test

005112410-01, P = 0.549867 Days, E = 131.857736 Days

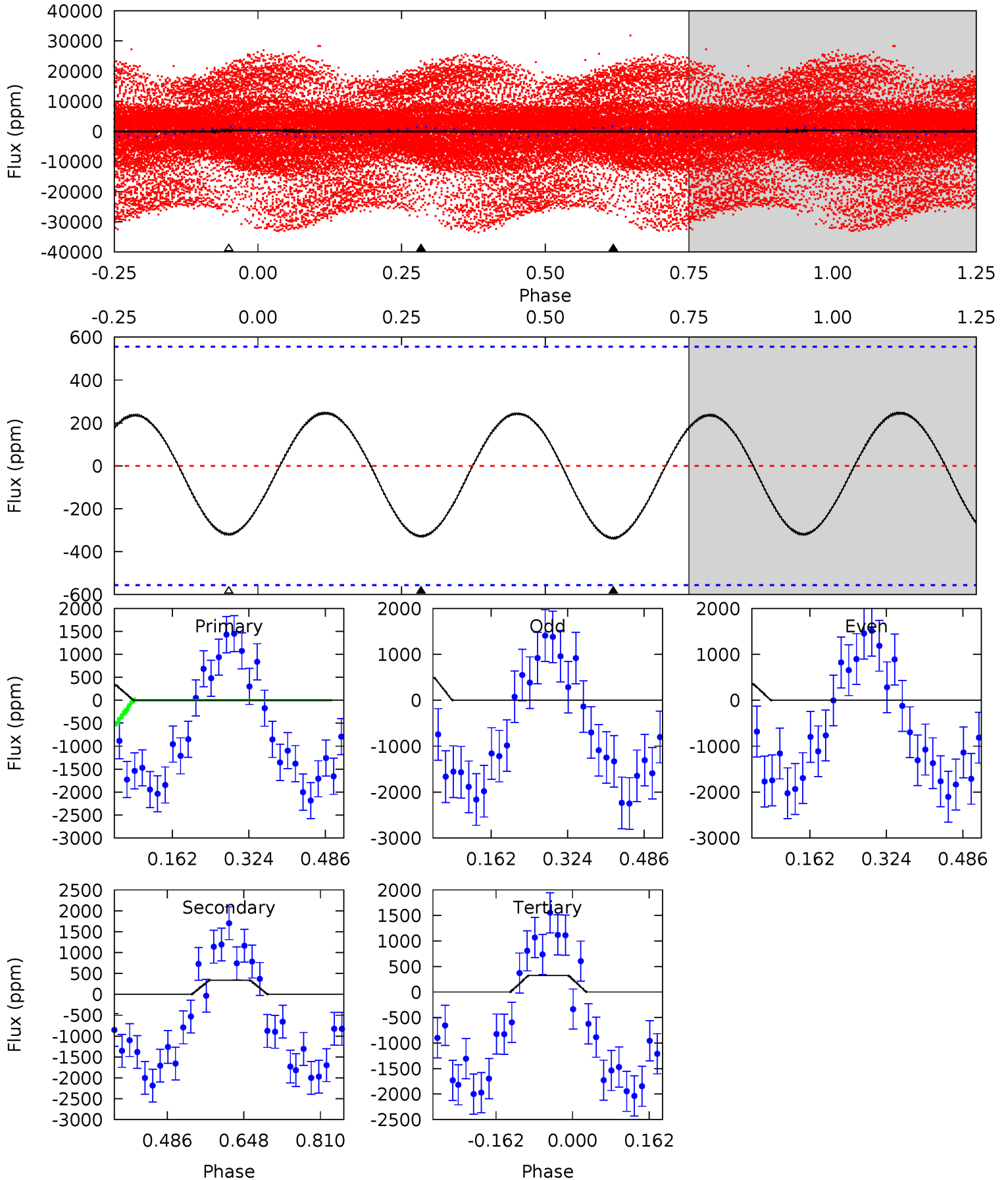
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	-32.4	0	0	4.39	1.21	11.5	15.5	15.5	-32.4	-32.4	2.03	1.14	0.74	3.15



Alt Model-Shift Uniqueness Test

005112410-01, P = 0.549880 Days, E = 131.815359 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.66	2.73	2.59	0	4.46	1.40	1.63	0.07	2.66	0.15	2.73	0.56	-14.9	0.42	3.15



Stellar Parameters For KIC 005112410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5927^{+197}_{-197}	$4.489^{+0.104}_{-0.156}$	$-0.760^{+0.300}_{-0.300}$	$0.836^{+0.184}_{-0.107}$	$0.784^{+0.091}_{-0.056}$	$1.893^{+0.861}_{-0.821}$
	+3%/-3%	+2%/-3%	+39%/-39%	+22%/-13%	+12%/-7%	+45%/-43%
Source	KIC0	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 005112410-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	173 ± 5	$0.86^{+0.53}_{-0.52}$	3043^{+186}_{-158}	-7116^{+1500}_{-6638}	$-19.120^{+11.862}_{-100.379}$
Alt.	-340 ± 125	$3.15^{+0.72}_{-0.64}$	3051^{+209}_{-164}	4433^{+566}_{-522}	$2.736^{+2.090}_{-1.228}$

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

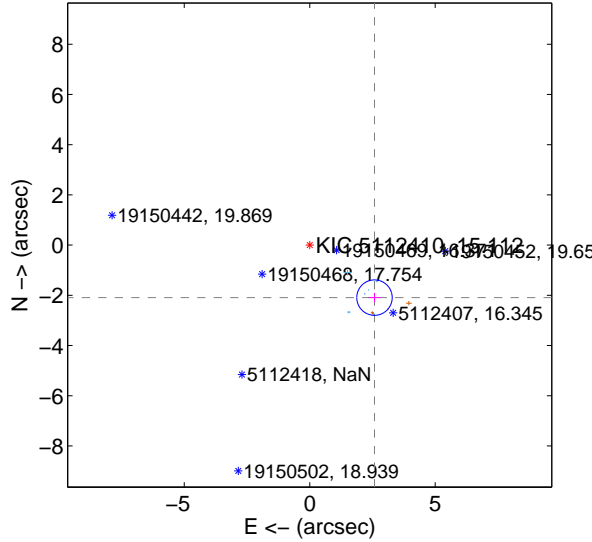
Supplemental centroid analysis for 005112410-01. Kepler magnitude: 15.11. Transit SNR 9.49

There are 6 quarters with good PRF difference image offsets

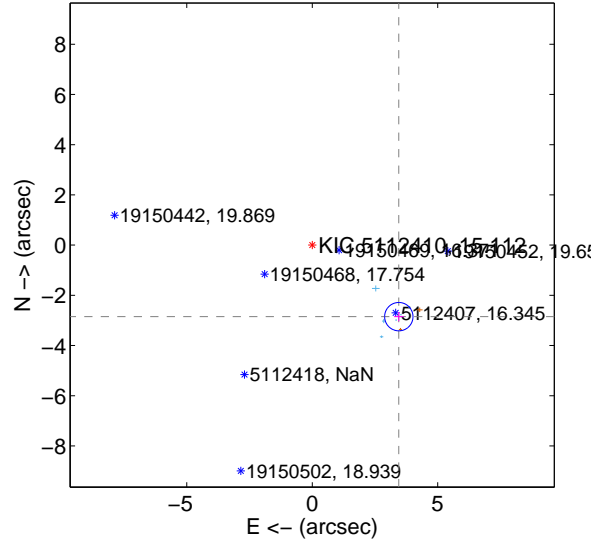
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.322 ± 0.235	14.12	-2.580 ± 0.236	-2.092 ± 0.187
PRF-fit source offset from KIC position	4.474 ± 0.188	23.76	-3.449 ± 0.189	-2.851 ± 0.185
photometric centroid source offset	0.86 ± 2.39	0.36	0.86 ± 2.39	-0.01 ± 1.70

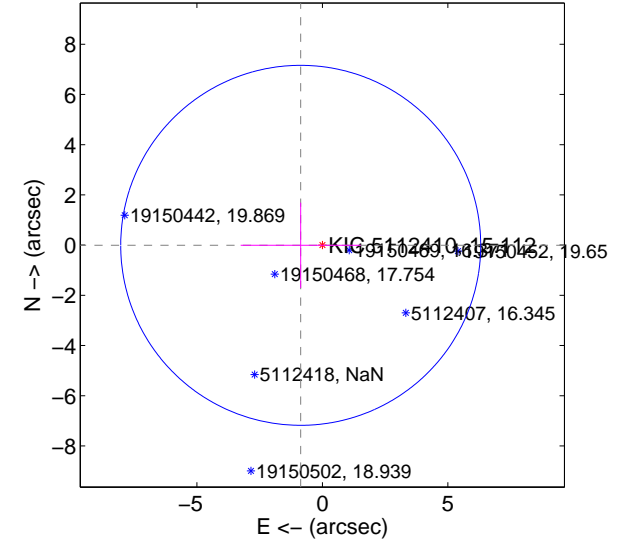
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

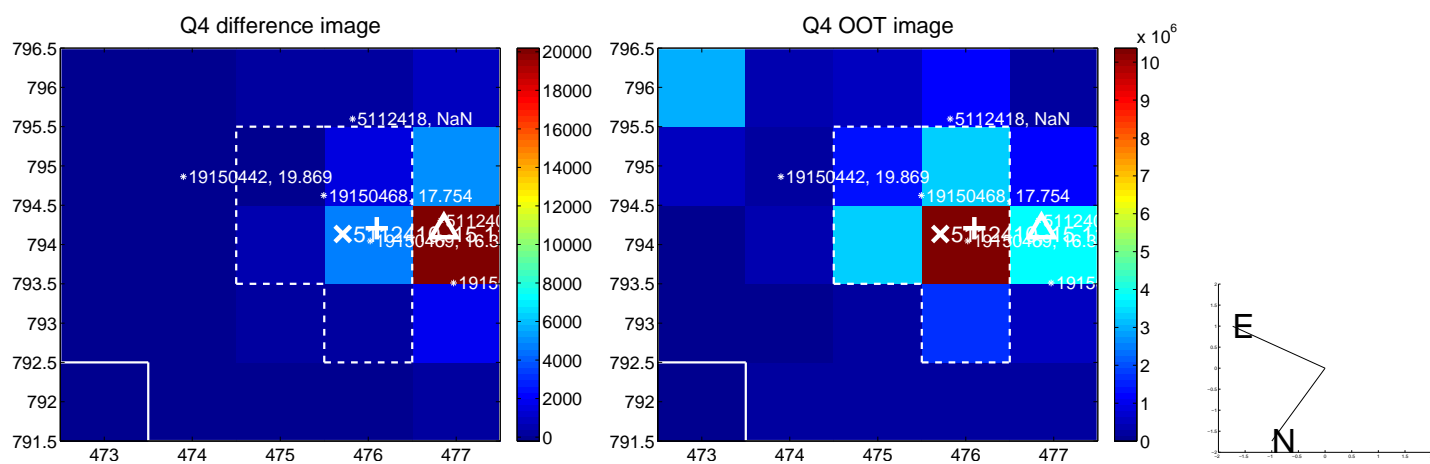
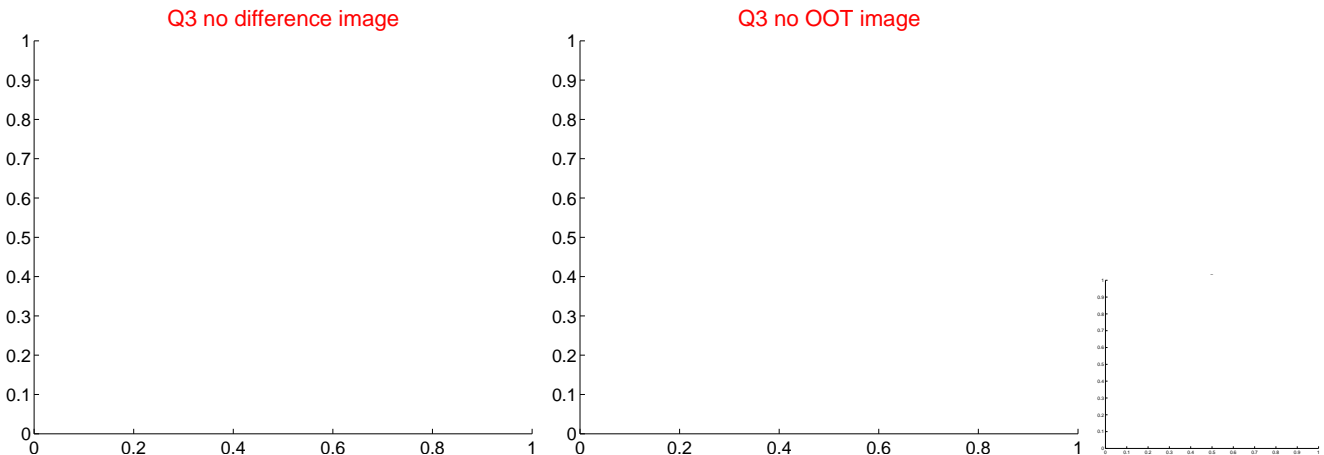
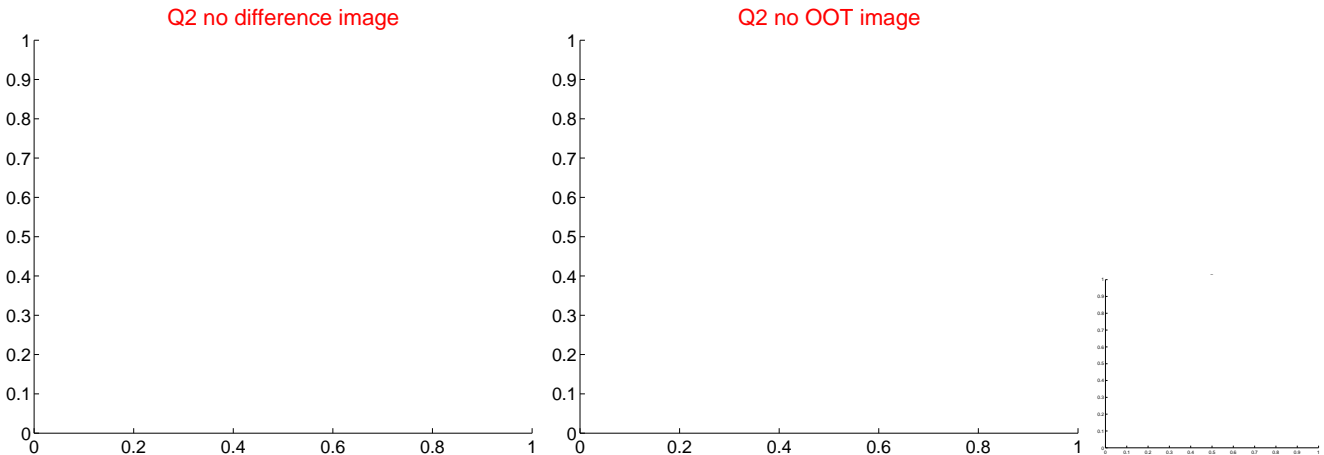
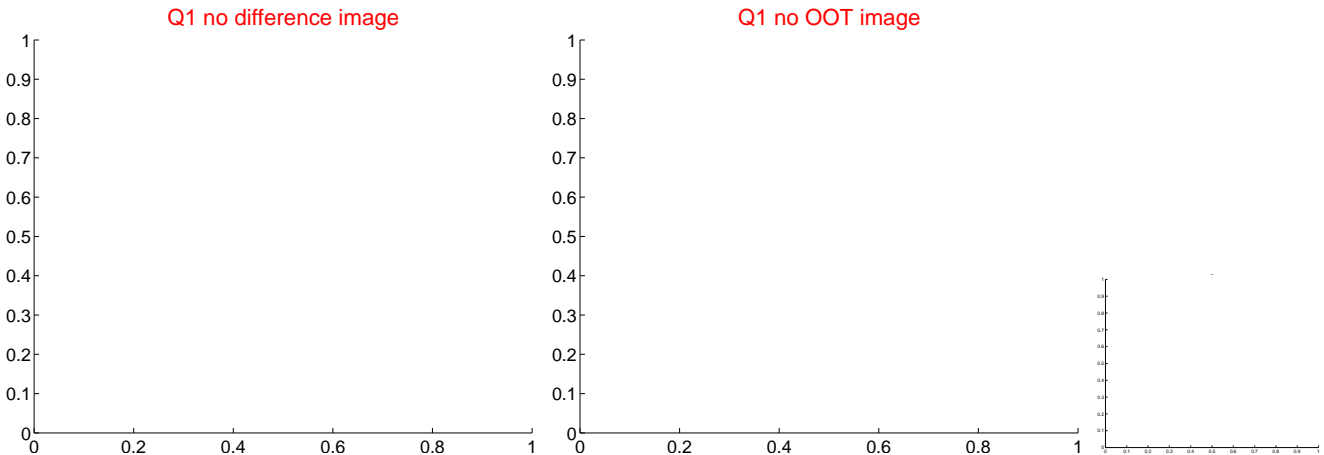


offset from photometric centroids

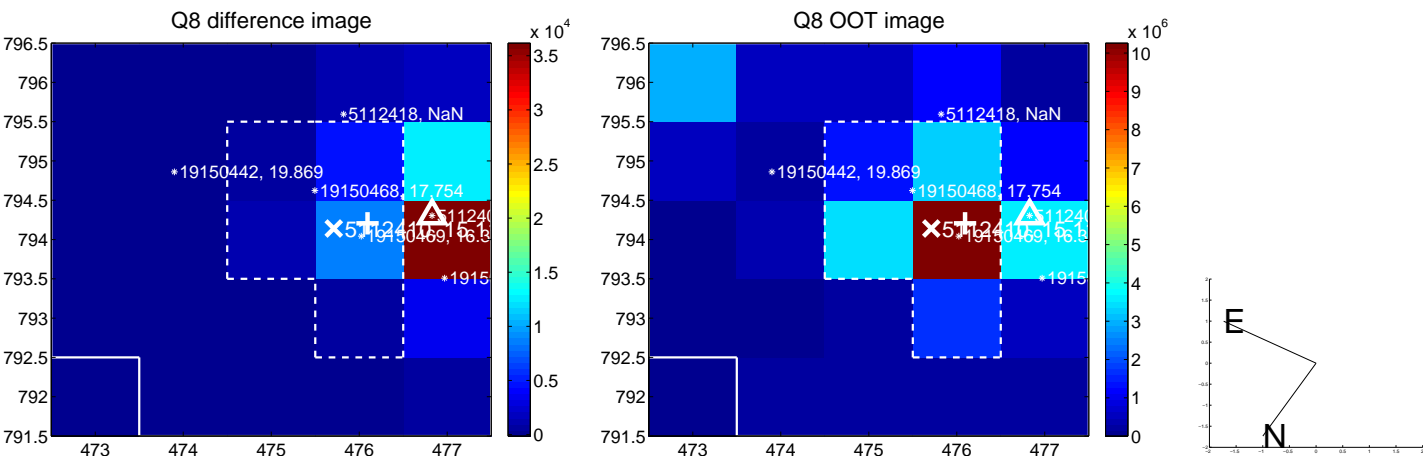
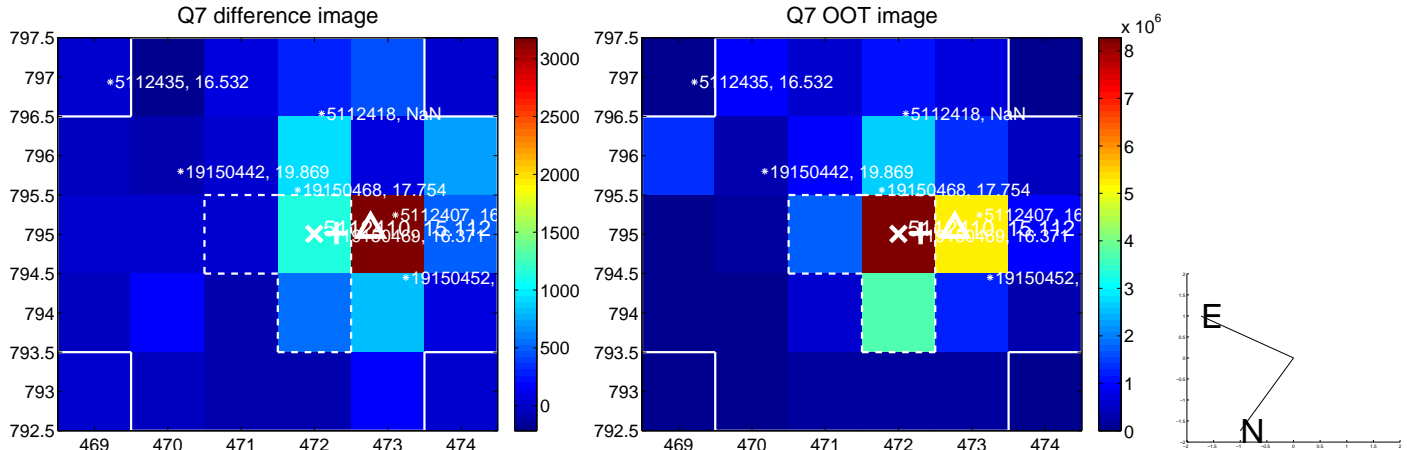
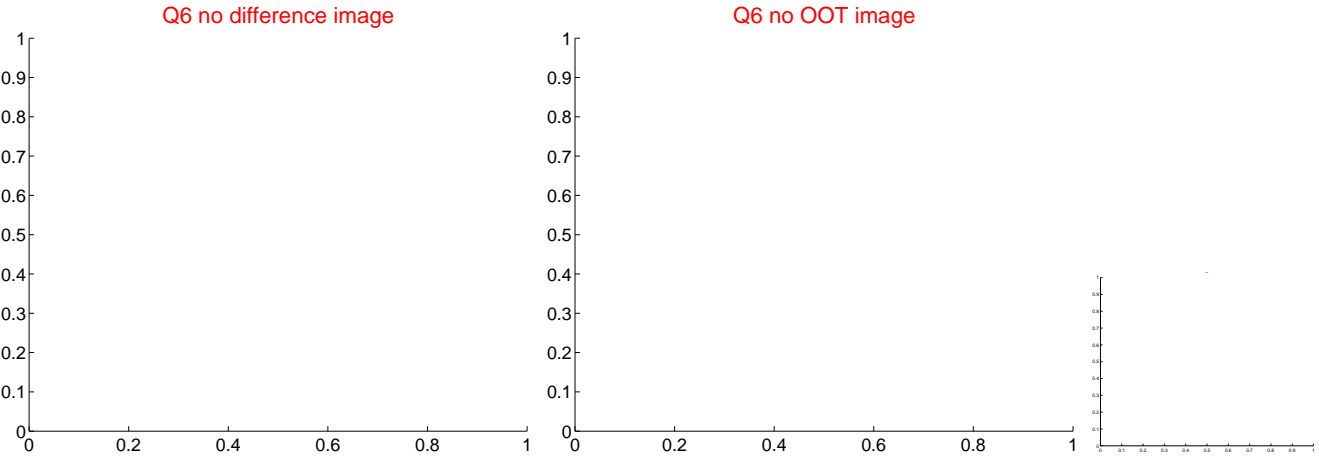
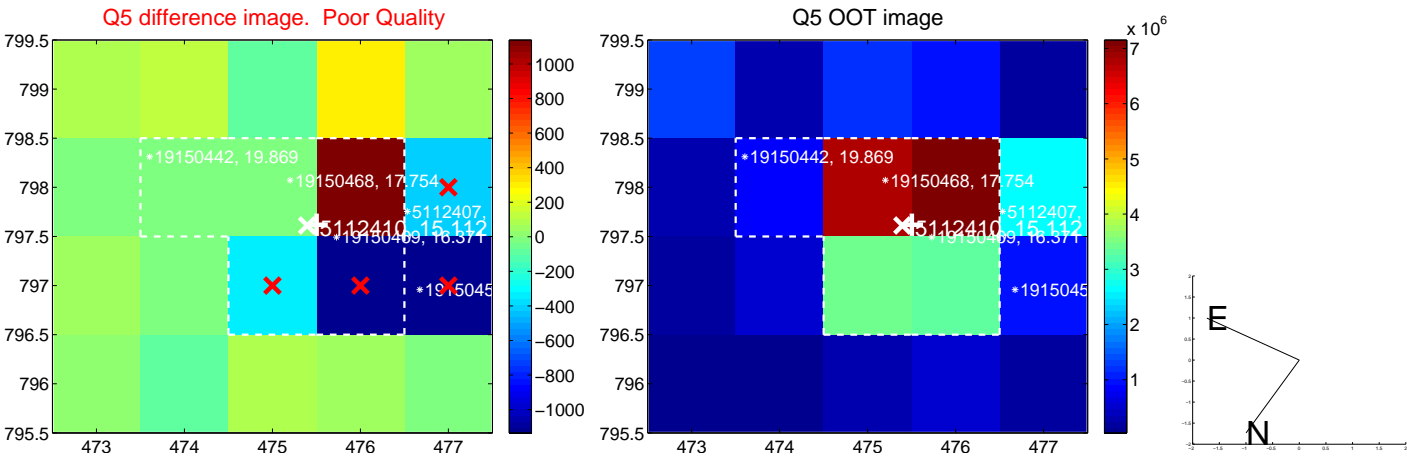


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

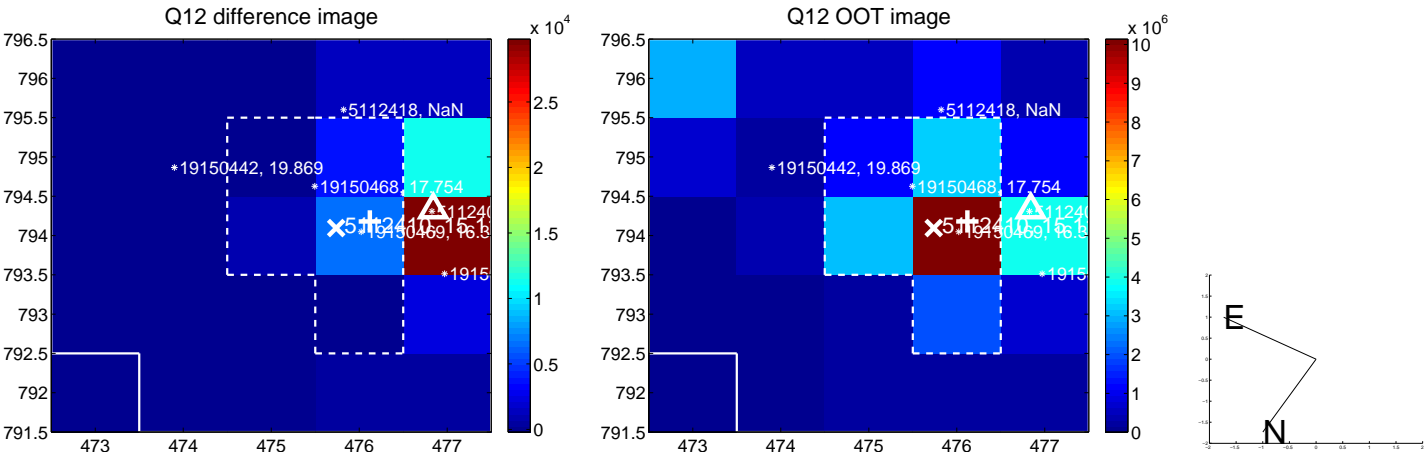
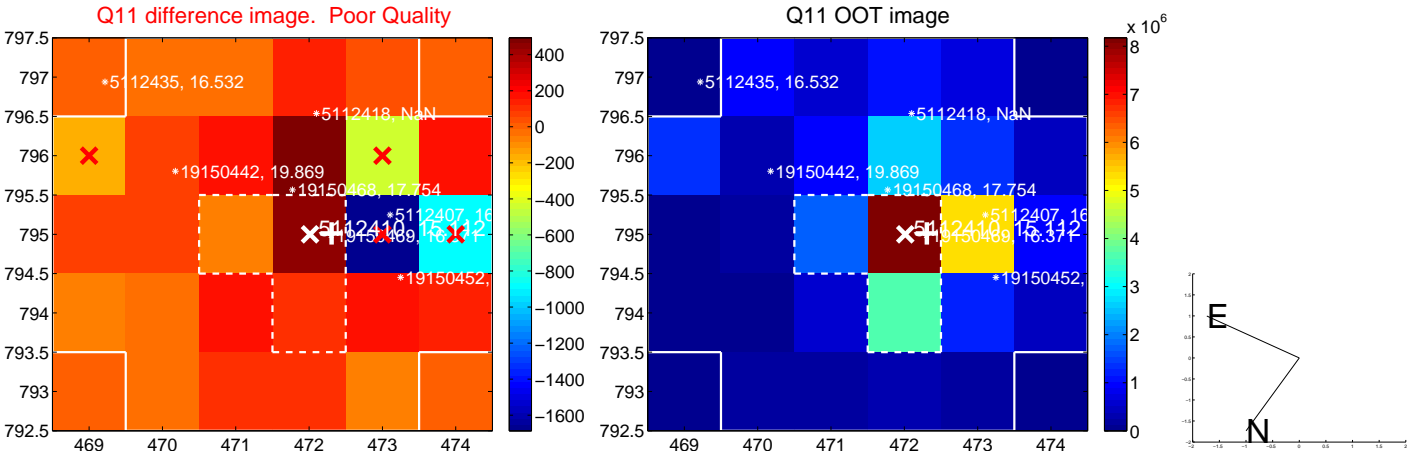
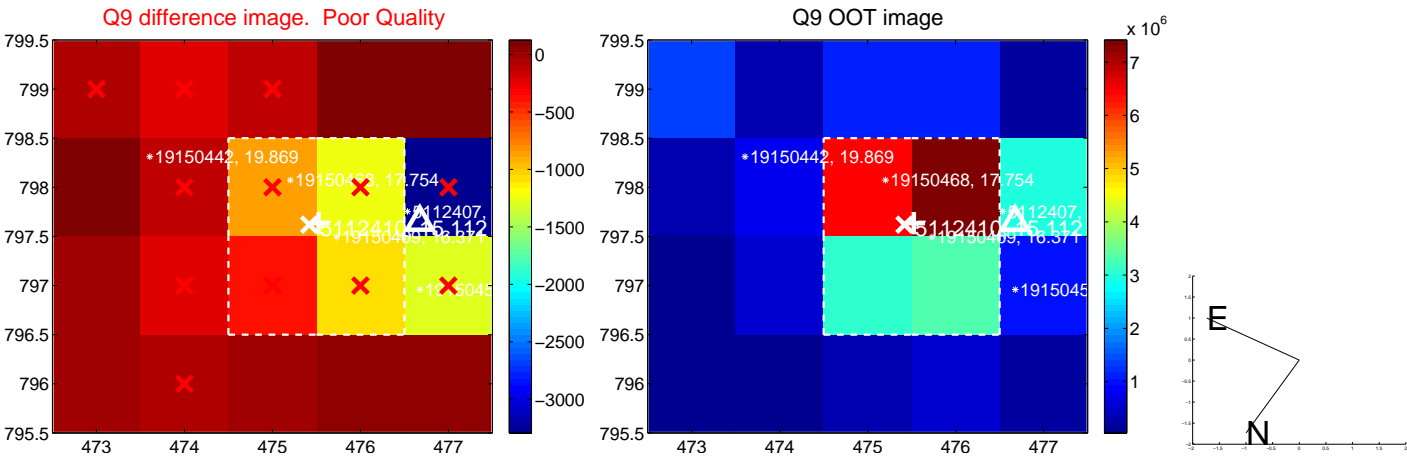
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



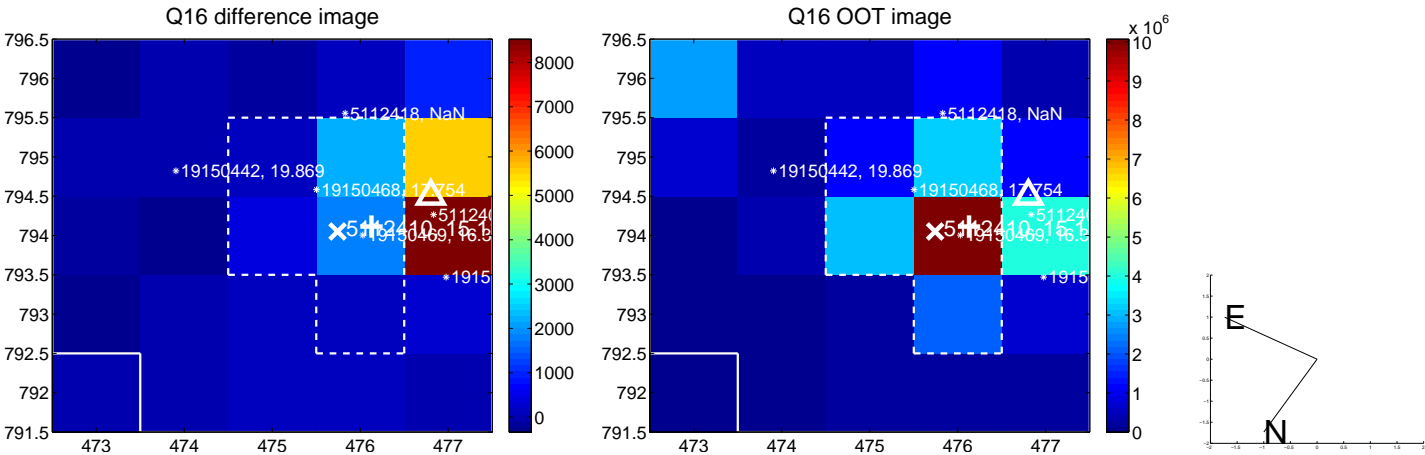
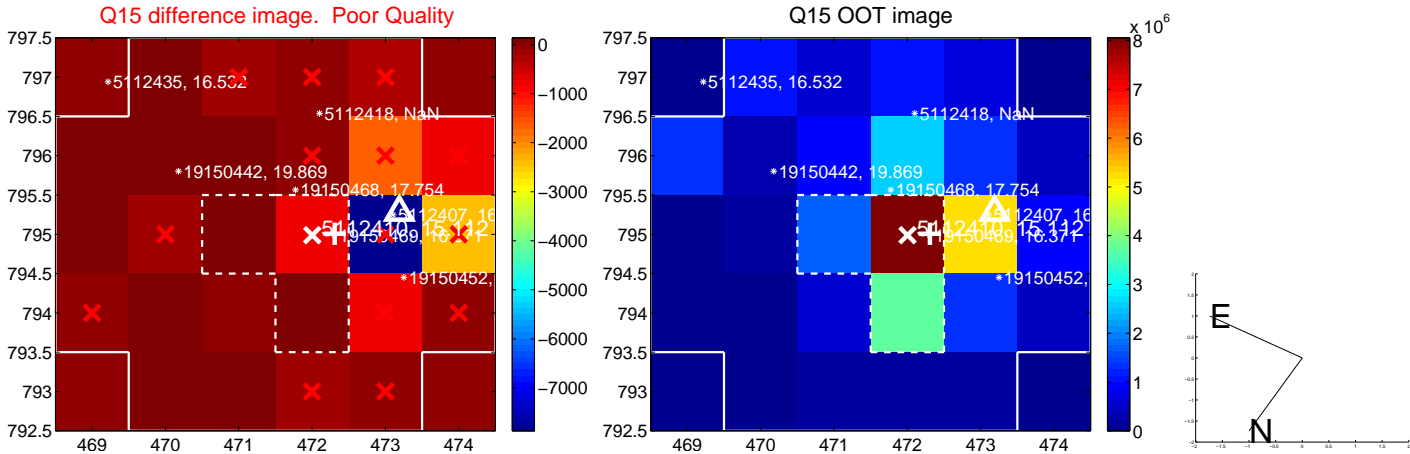
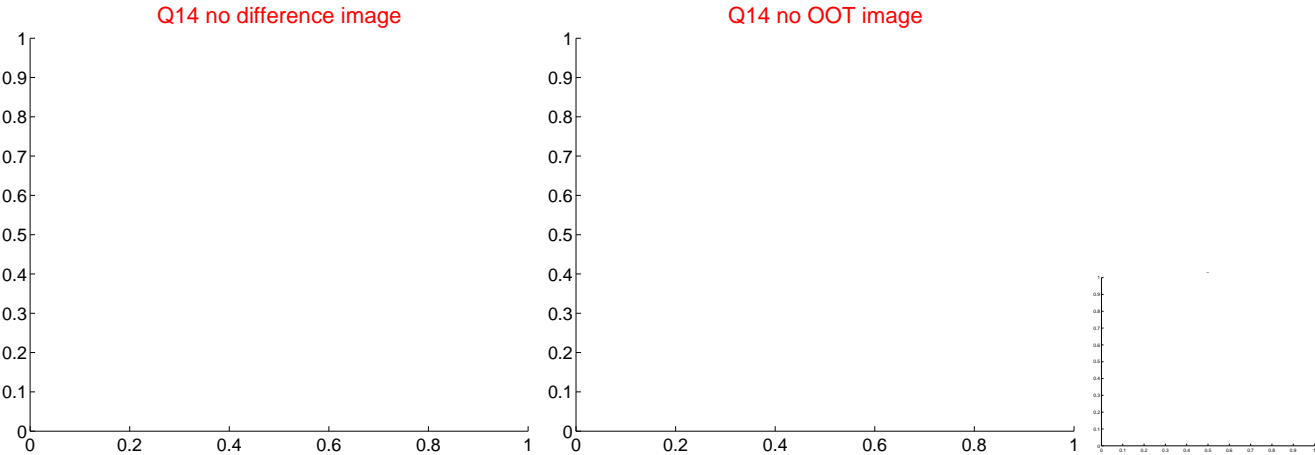
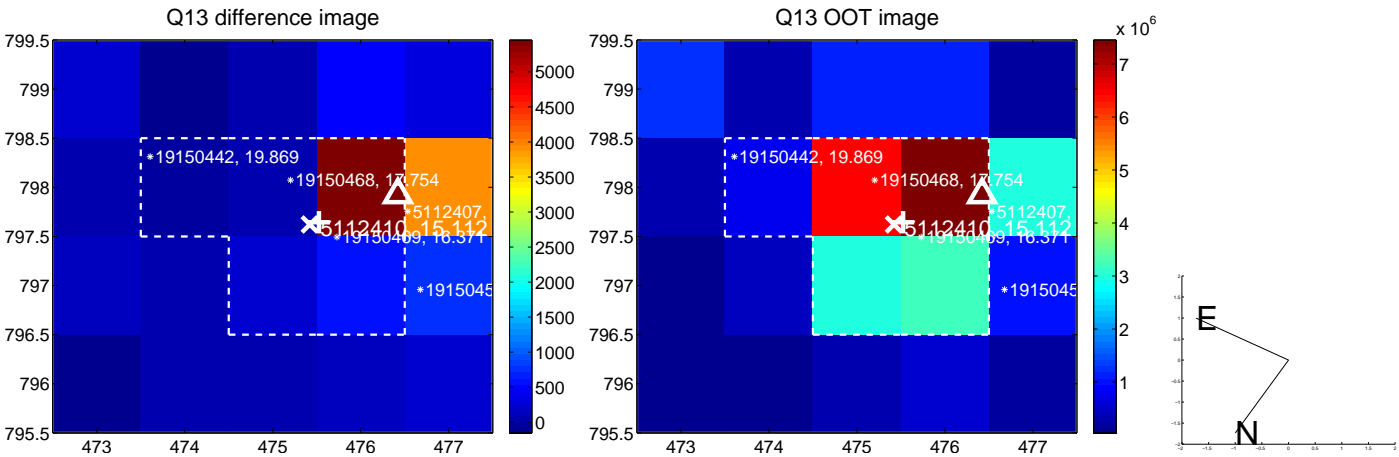
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



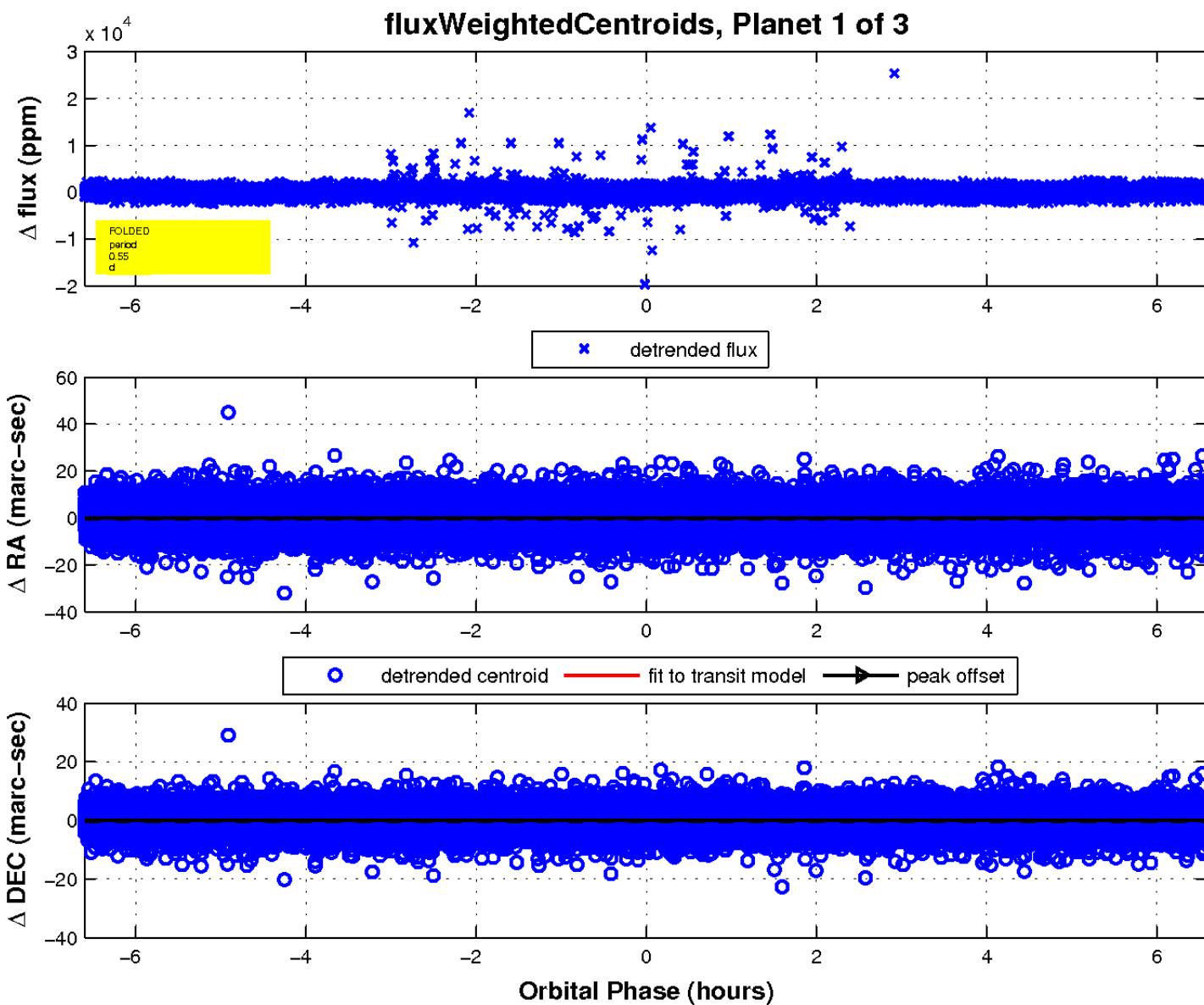
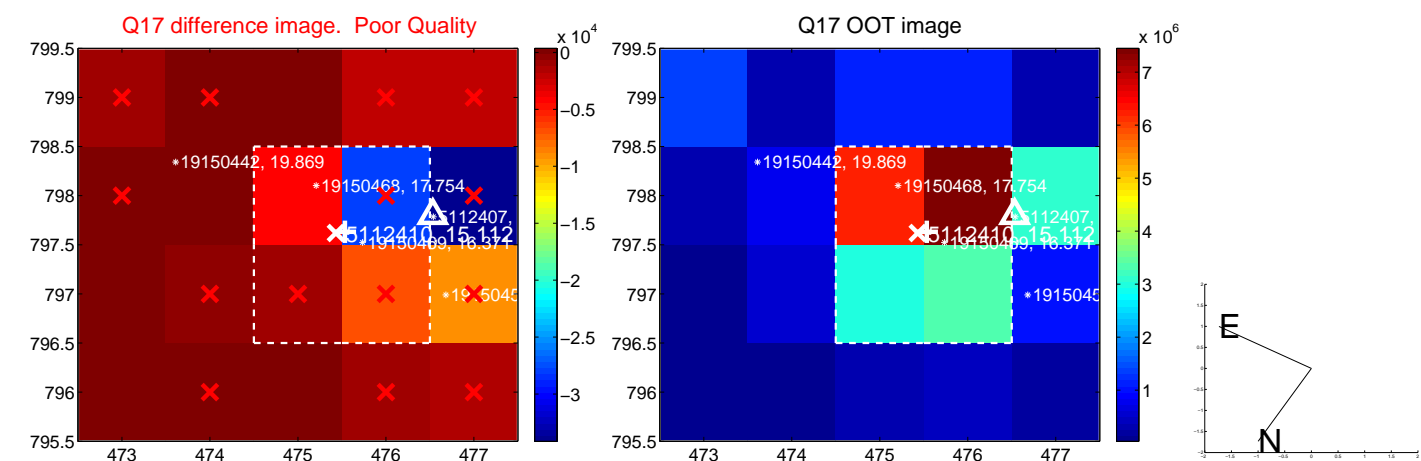
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



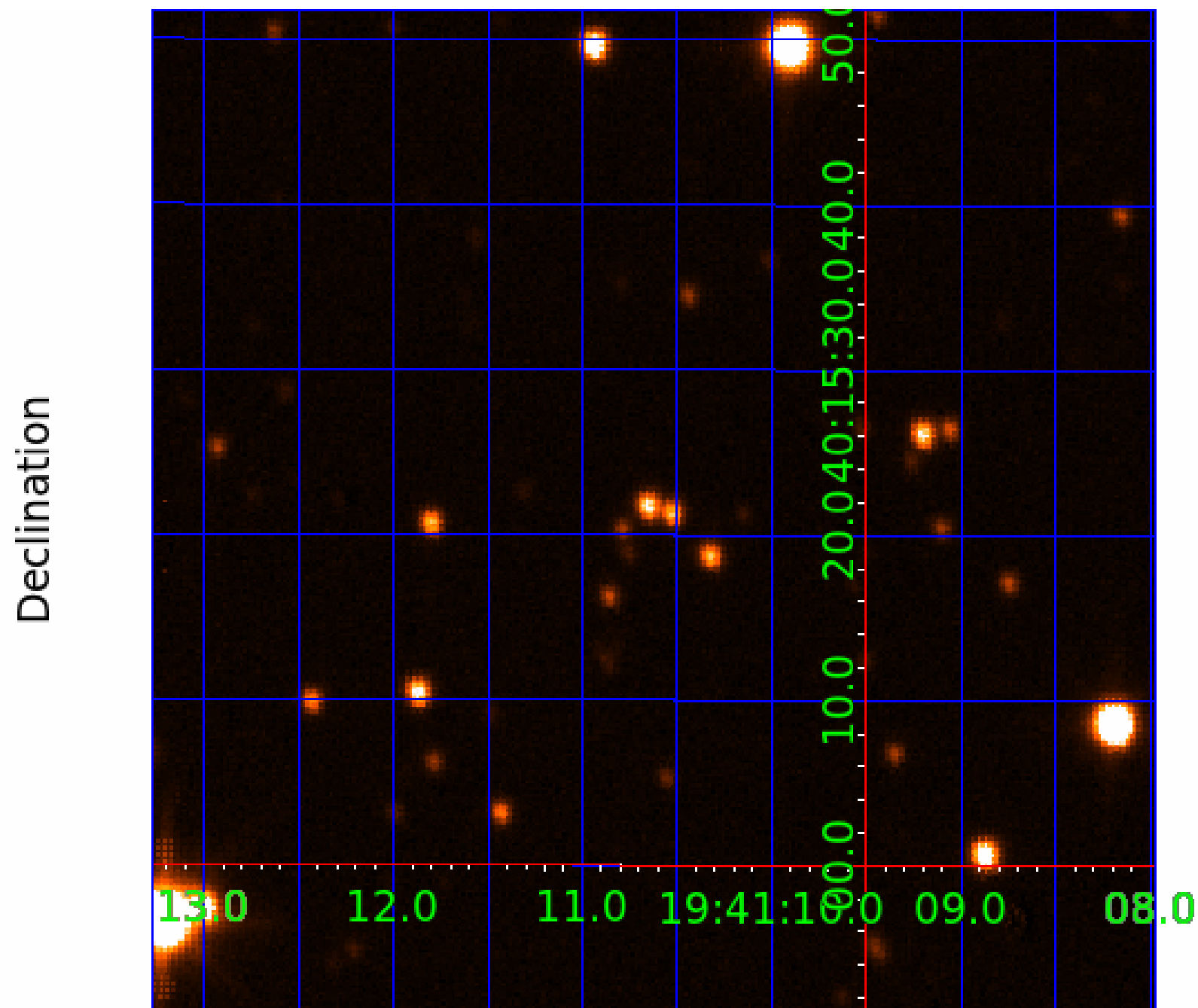
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



KIC 005112410

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})
005112410-01	OBS	No	0.549867	131.857736	72.8	2.523	8.0	9.5	0.84	5927	0.82	5256.48
005112410-02	OBS	No	413.485130	437.853038	1925.4	6.990	12.5	12.9	0.84	5927	4.26	0.77
005112410-03	OBS	No	46.479842	159.184333	86.1	22.576	10.2	2.1	0.84	5927	0.82	14.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005112410-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
005112410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005112410-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

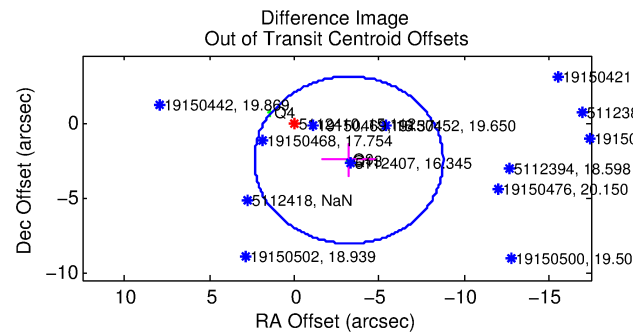
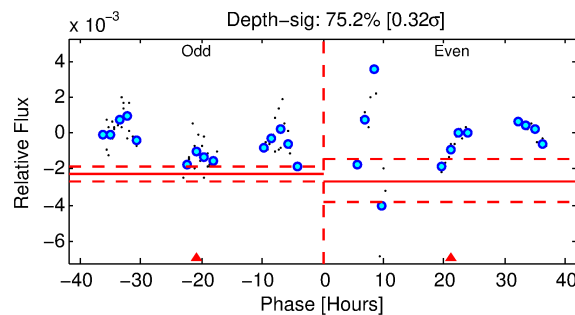
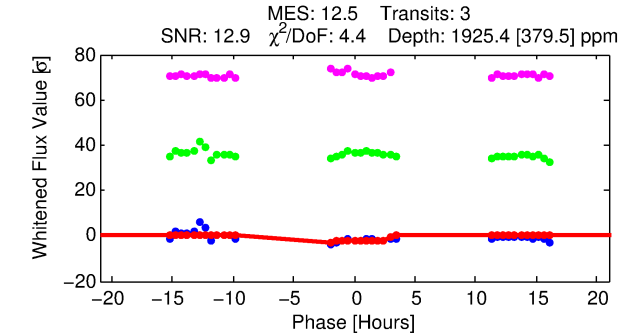
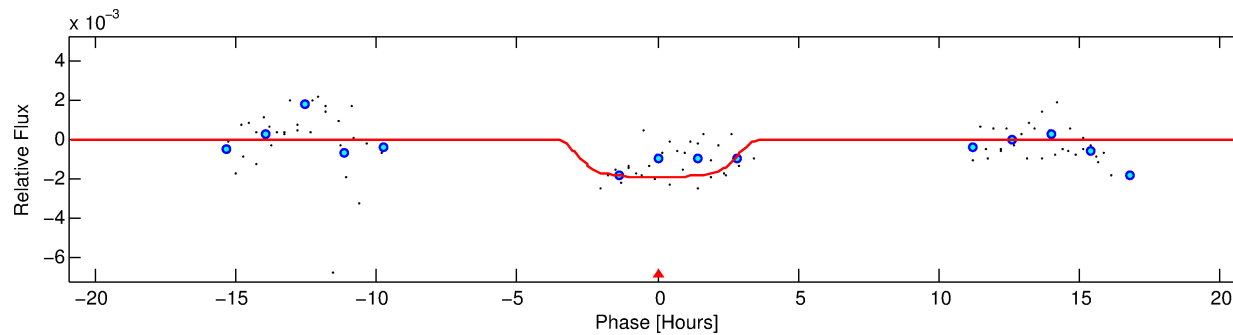
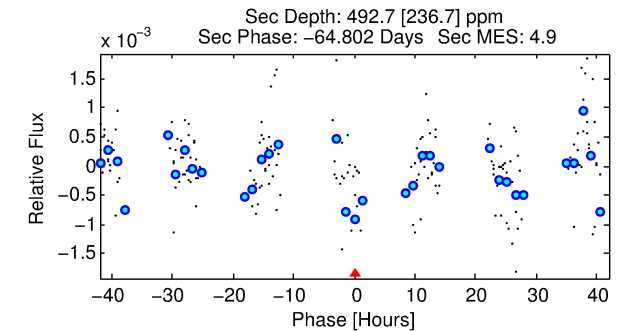
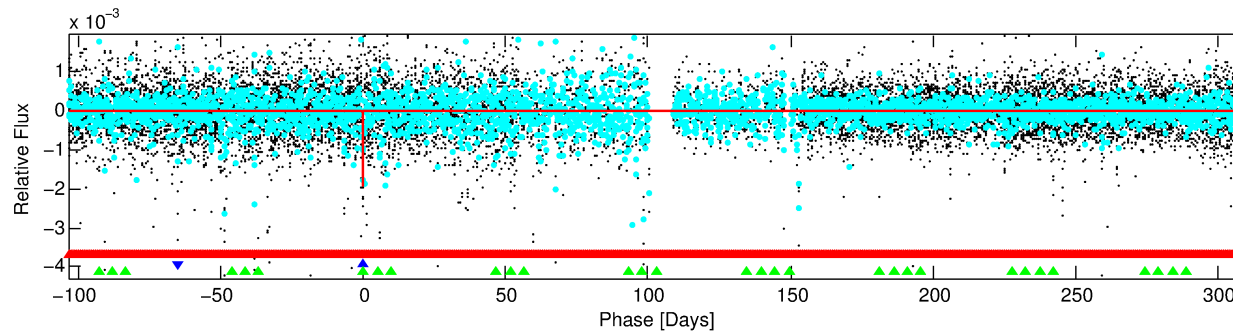
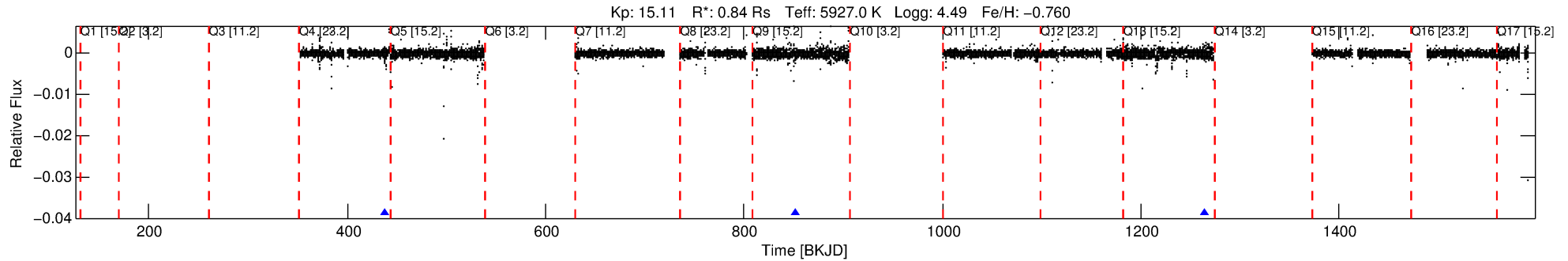
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005112410-02

No Significant Match Found

DV One-Page Summary

KIC: 5112410 Candidate: 2 of 3 Period: 413.485 d



DV Fit Results:

Period = 413.48513 [0.03621] d
Epoch = 437.8530 [0.0878] BKJD
Rp/R* = 0.0467 [0.0109]
R* = 251.38 [358.92]
b = 0.89 [0.26]
Seff = 0.77 [0.24]
Teq = 239 [19] K
Rp = 4.26 [1.37] Re
a = 1.0026 [0.1899] AU
Ag = 15004.72 [10897.67] [1.38σ]
Teffp = 4086 [697] K [5.51σ]

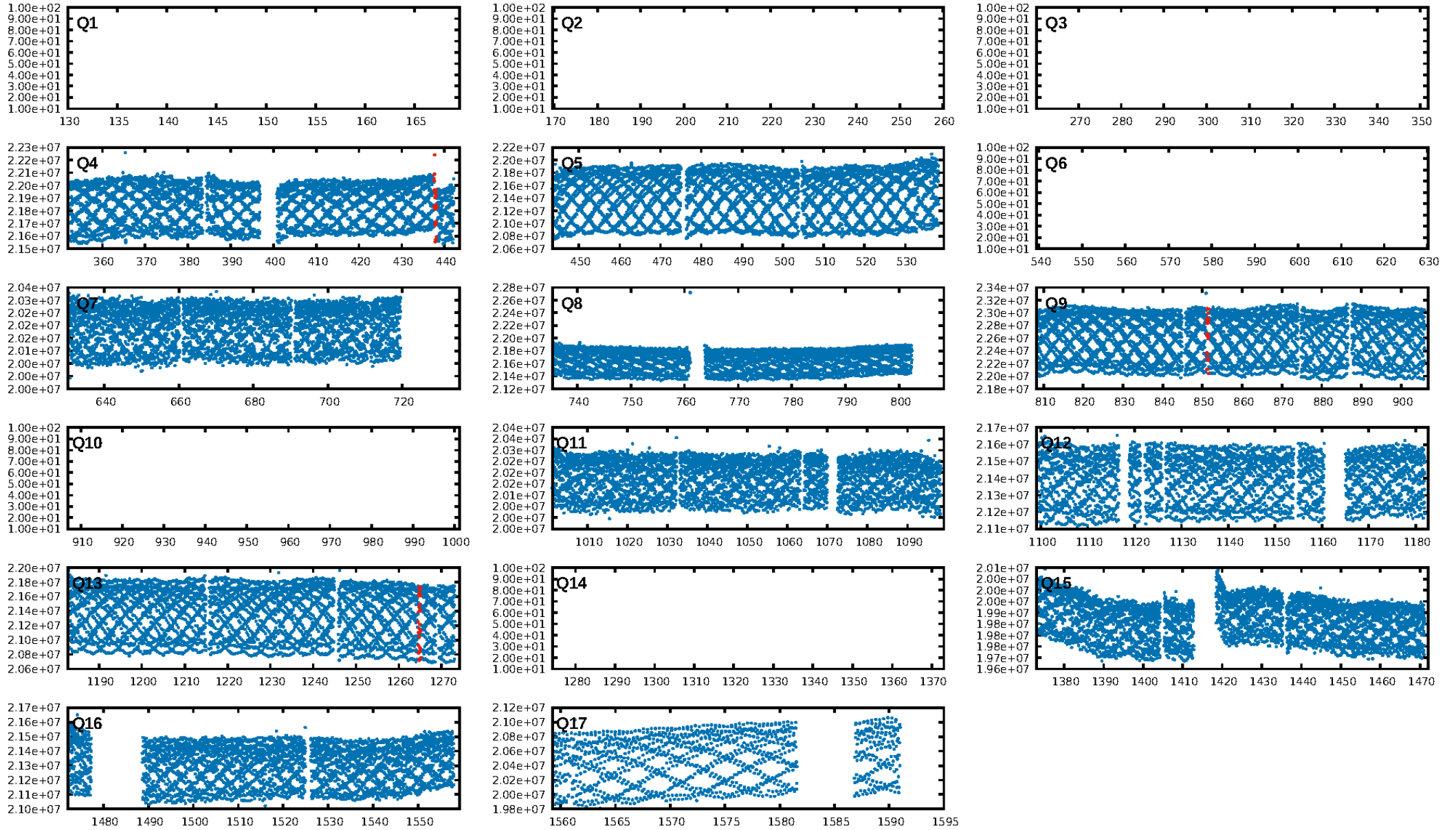
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [372.71σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.5%
Bootstrap-pfa: 2.68e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.239
Centroid-sig: 6.7%
Centroid-so: 1.626 arcsec [0.99σ]
OotOffset-rm: 4.073 arcsec [2.19σ]
OotOffset-st: 0/0/1/2 [3]
KicOffset-rm: 4.511 arcsec [4.55σ]
KicOffset-st: 0/0/1/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

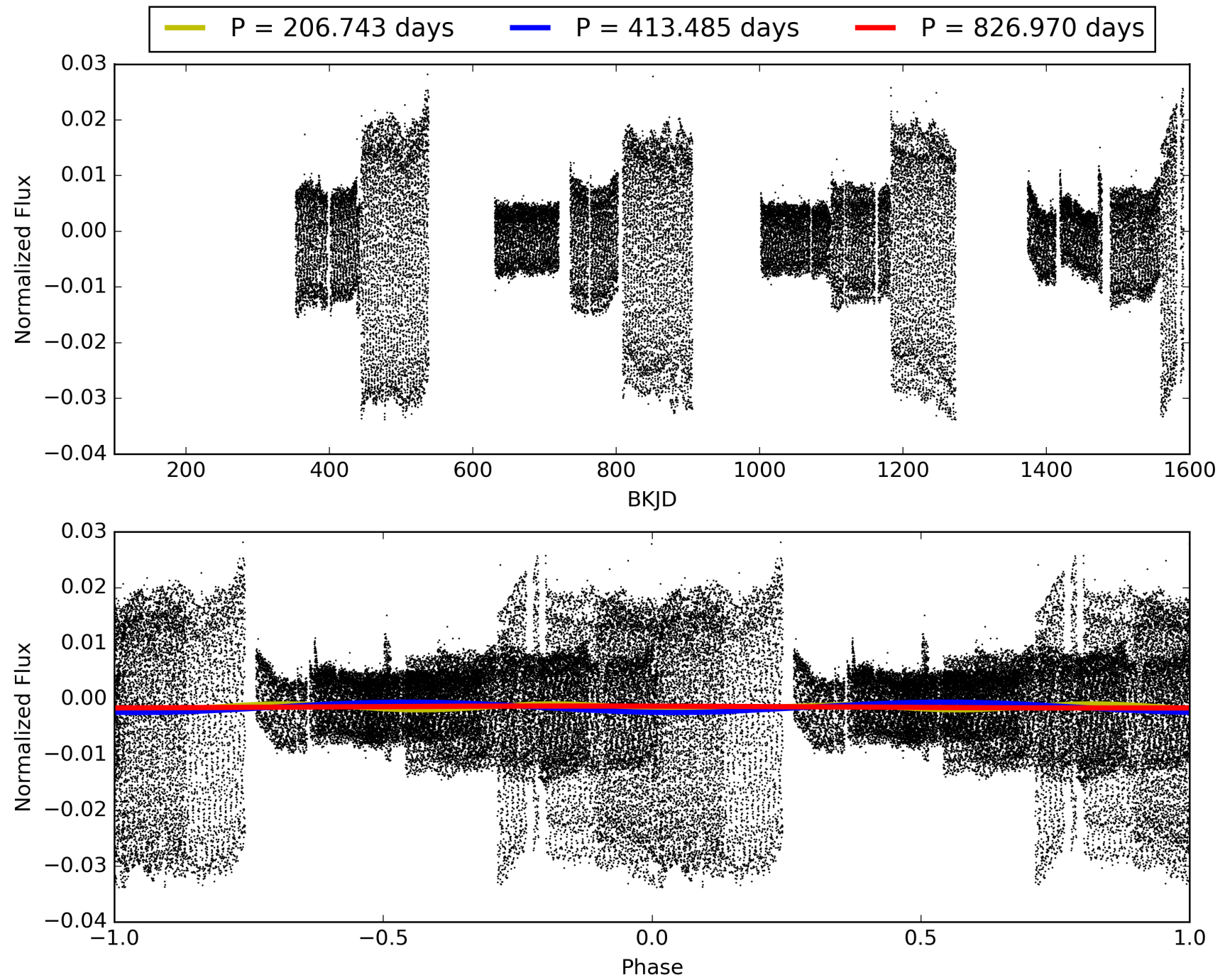
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:48:07 Z

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

TCE 005112410-02, PDC Light Curves

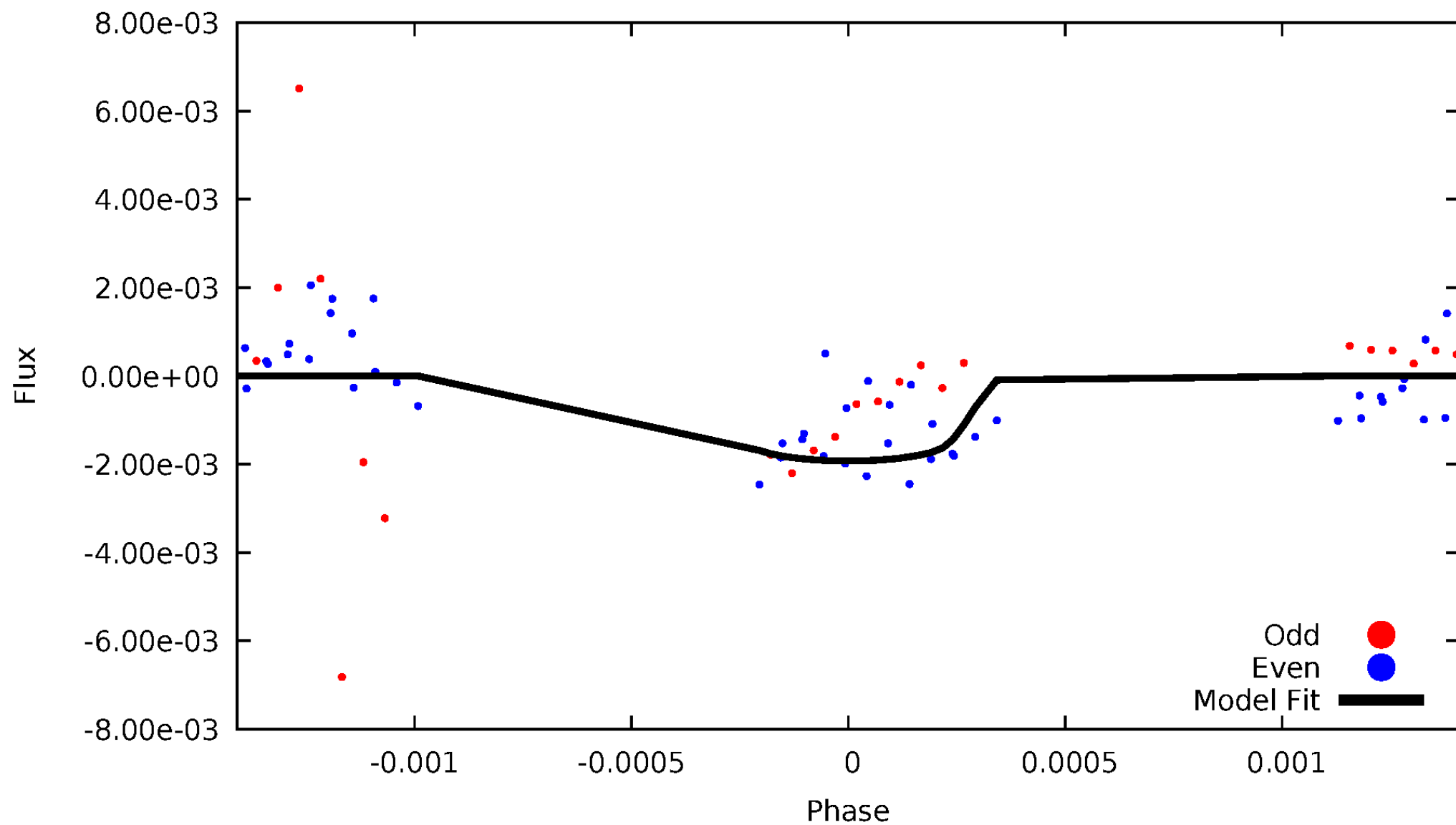


TCE 005112410-02



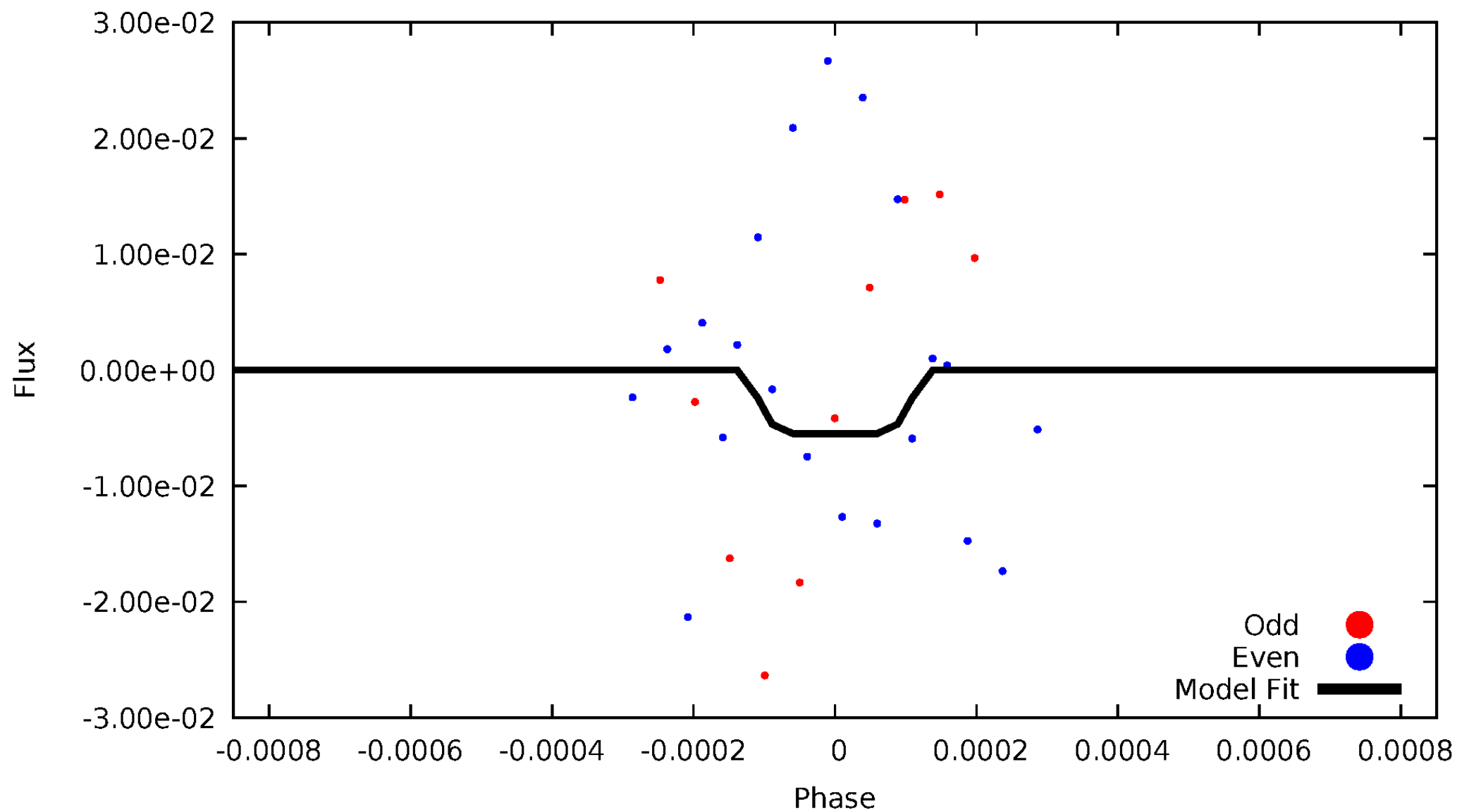
DV Odd/Even

TCE 005112410-02



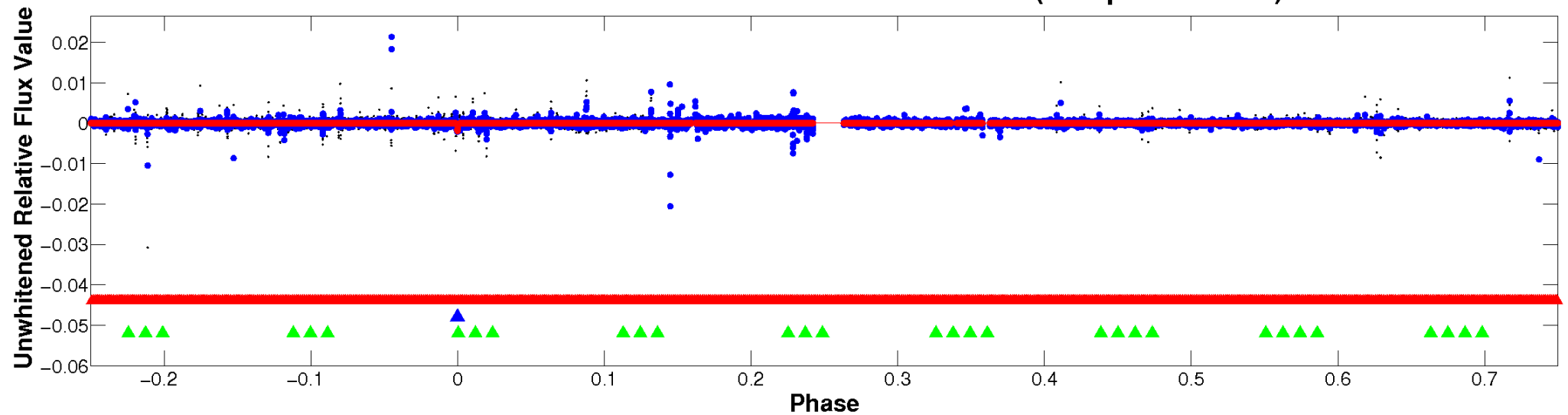
ALT Odd/Even

TCE 005112410-02

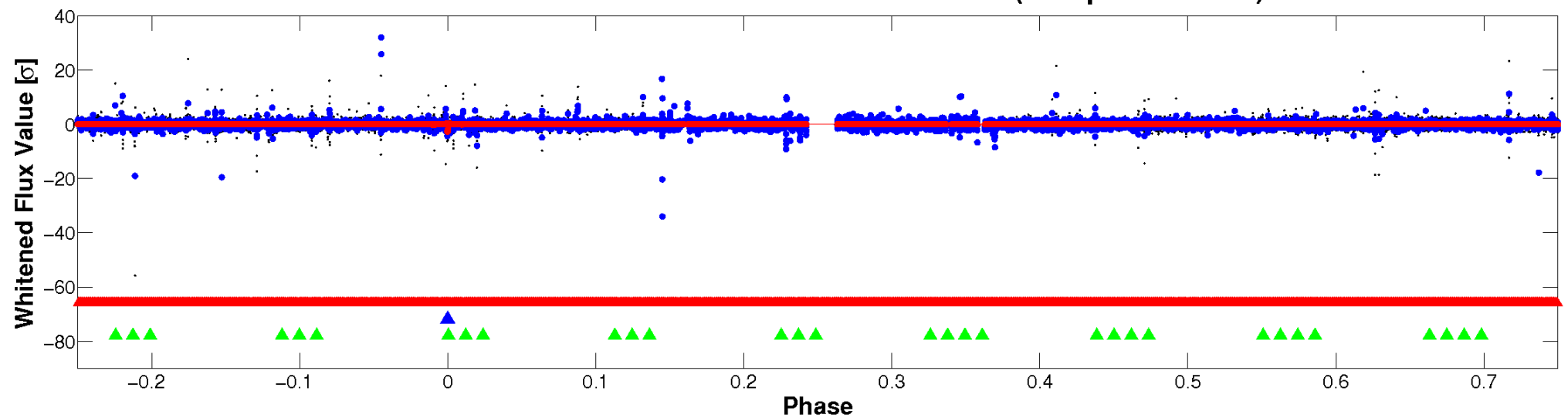


Non-Whitened Vs. Whitened Light Curve

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

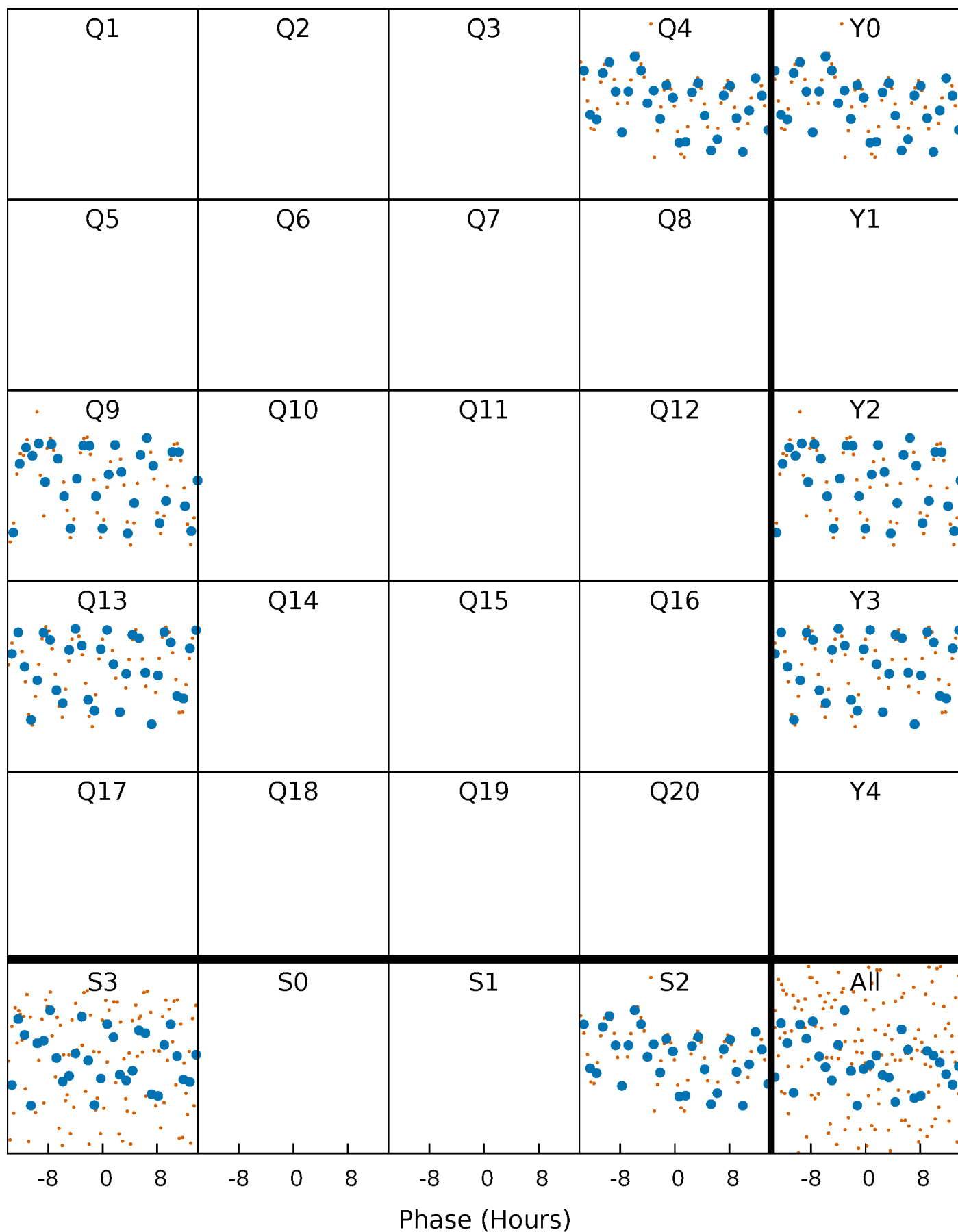


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



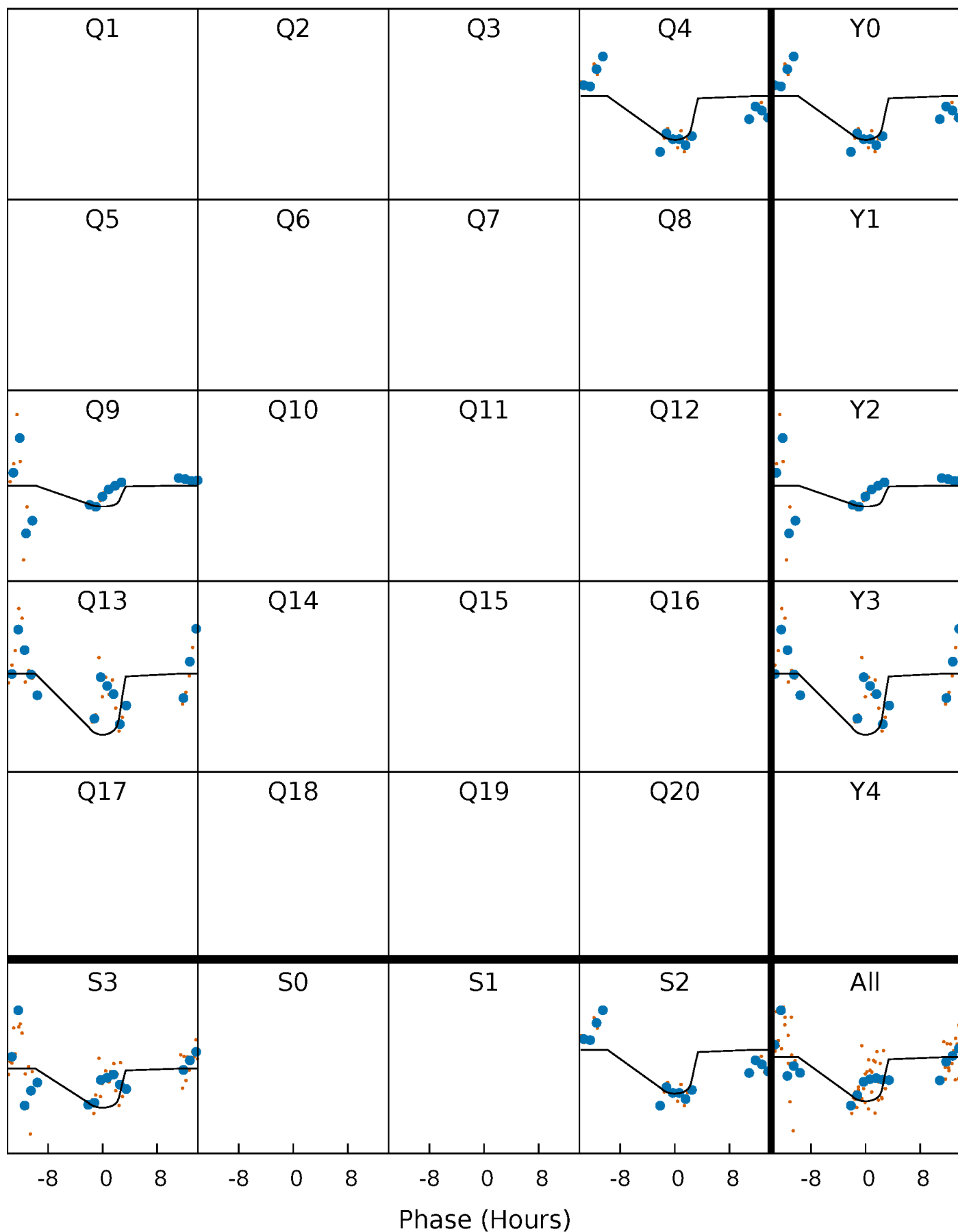
PDC Quarter-Phased Transit Curves

TCE 005112410-02 P=413.485130 Days $T_0=437.853038$ (BKJD)



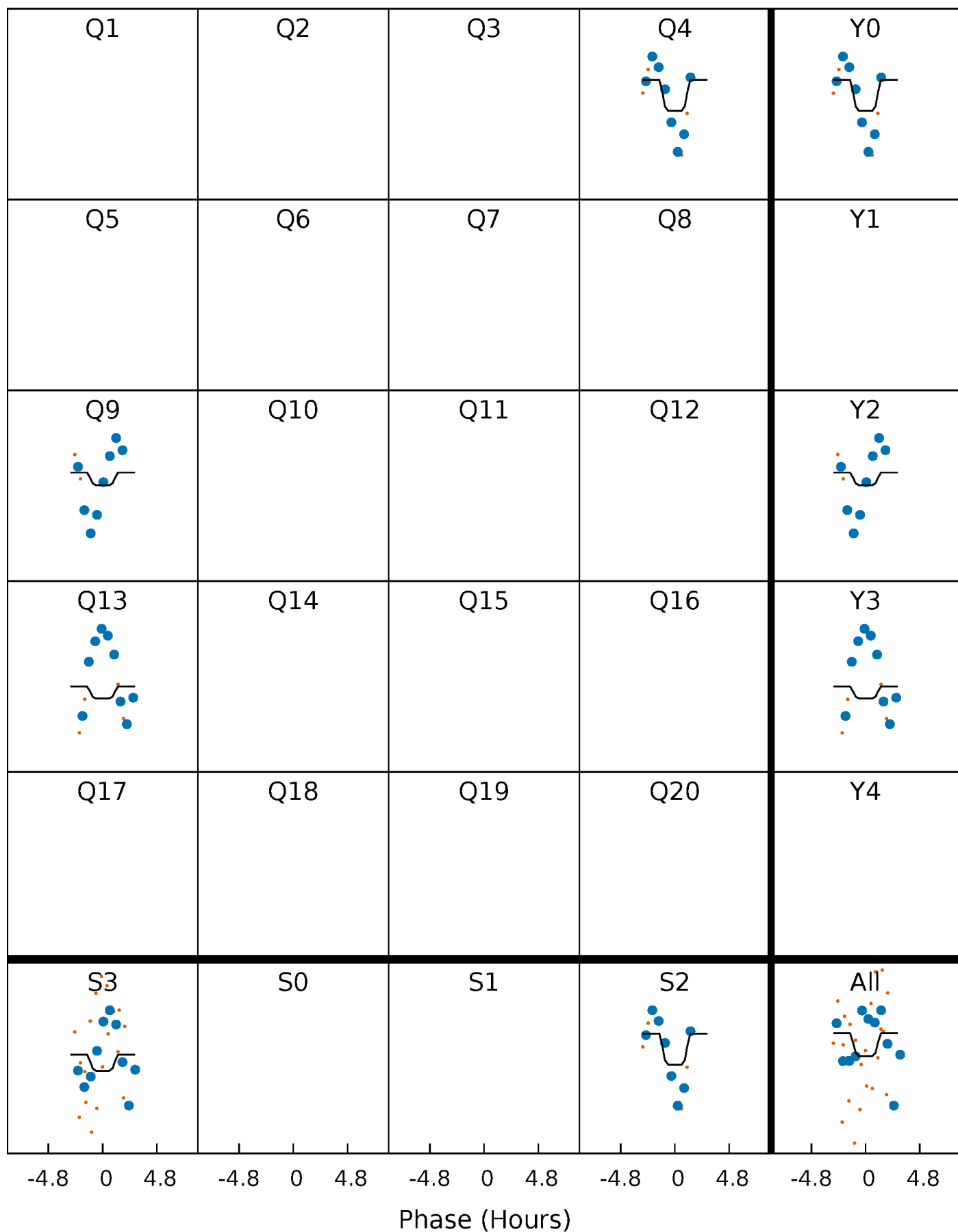
DV Quarter-Phased Transit Curves

TCE 005112410-02 P=413.485130 Days $T_0=437.853038$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

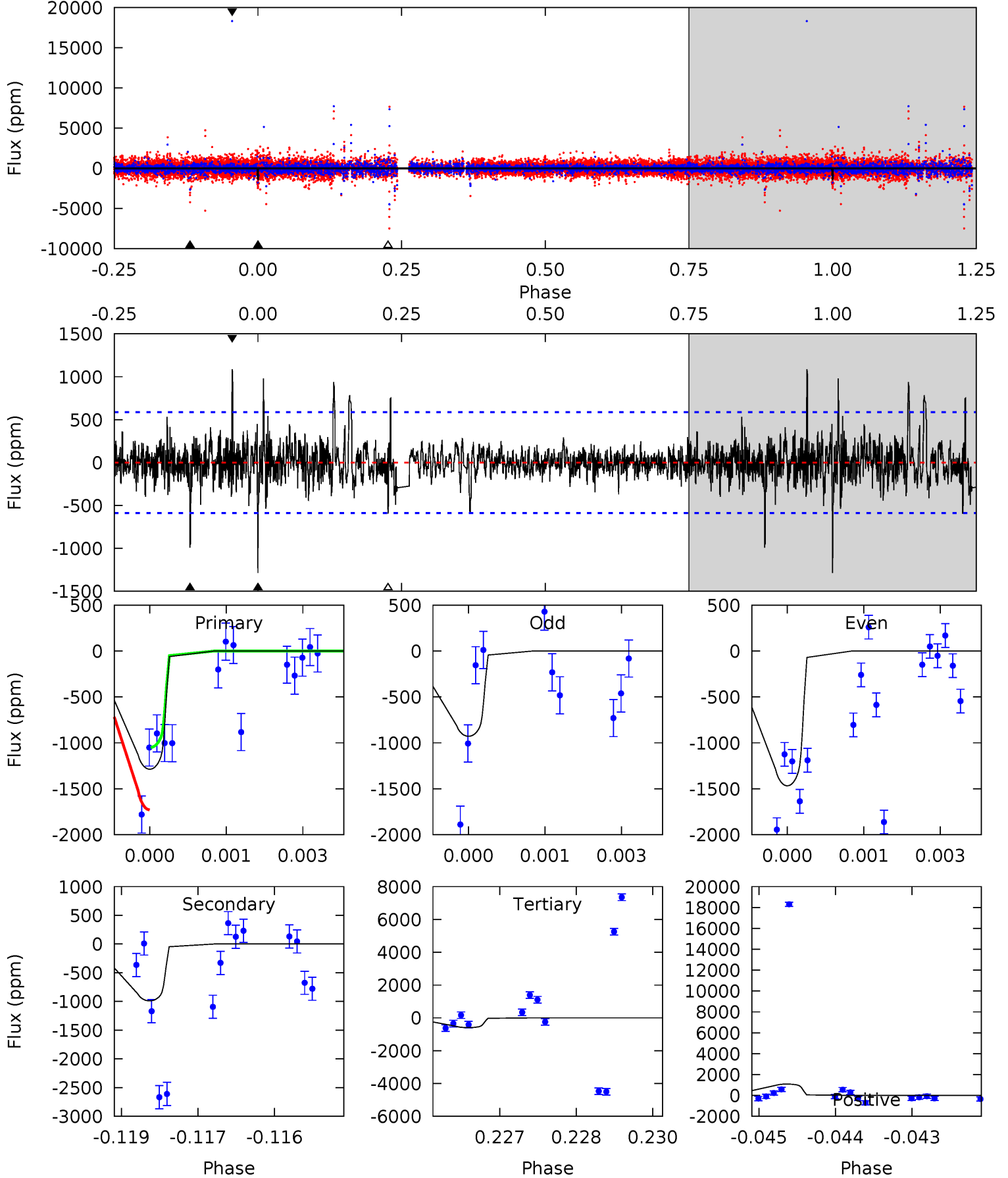
TCE 005112410-02 P=413.479898 Days $T_0=437.886609$ (BKJD)



DV Model-Shift Uniqueness Test

005112410-02, $P = 413.485130$ Days, $E = 24.367908$ Days

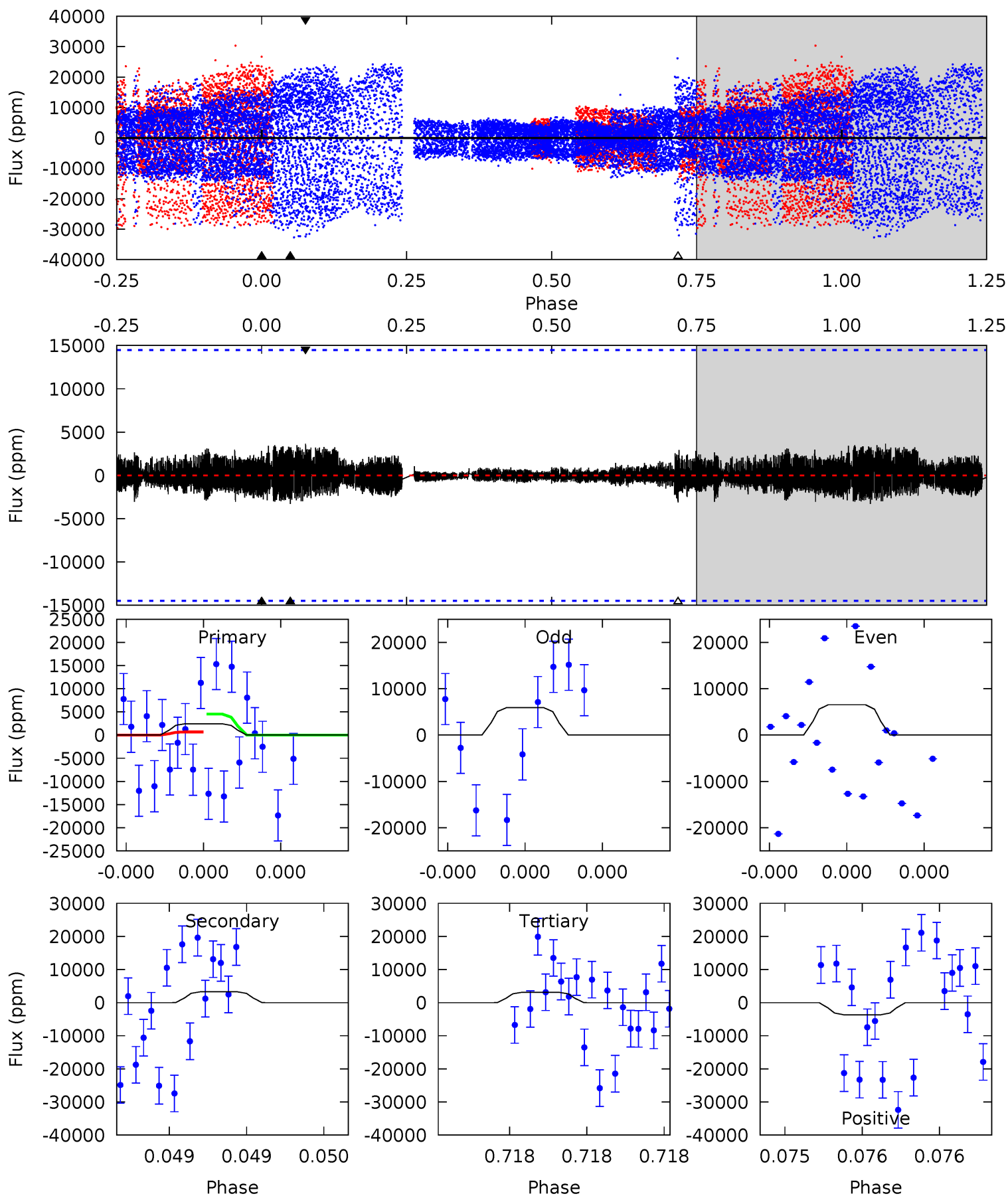
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	9.09	5.46	9.98	5.40	3.21	1.38	6.37	1.85	3.63	-0.88	2.24	1.37	0.46	2.98



Alt Model-Shift Uniqueness Test

005112410-02, P = 413.479898 Days, E = 24.406711 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.96	1.29	1.22	1.44	5.69	3.67	0.40	-0.26	-0.48	0.06	-0.15	0.12	-0.40	0.53	0.75



Stellar Parameters For KIC 005112410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5927^{+197}_{-197}	$4.489^{+0.104}_{-0.156}$	$-0.760^{+0.300}_{-0.300}$	$0.836^{+0.184}_{-0.107}$	$0.784^{+0.091}_{-0.056}$	$1.893^{+0.861}_{-0.821}$
	+3%/-3%	+2%/-3%	+39%/-39%	+22%/-13%	+12%/-7%	+45%/-43%
Source	KIC0	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 005112410-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-990 ± 109	$4.31^{+1.16}_{-1.05}$	336^{+20}_{-18}	4942^{+653}_{-417}	28955^{+22887}_{-10813}
Alt.	-3277 ± 2543	$6.78^{+1.39}_{-1.15}$	335^{+20}_{-17}	5199^{+988}_{-1176}	36351^{+42739}_{-26232}

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

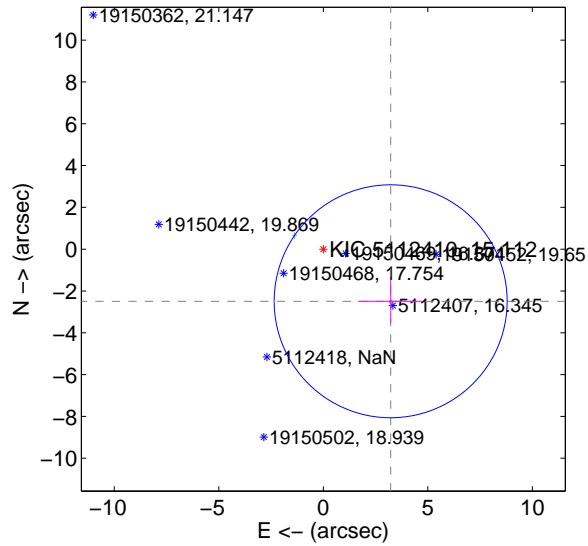
Supplemental centroid analysis for 005112410-02. Kepler magnitude: 15.11. Transit SNR 12.93

There are 2 quarters with good PRF difference image offsets

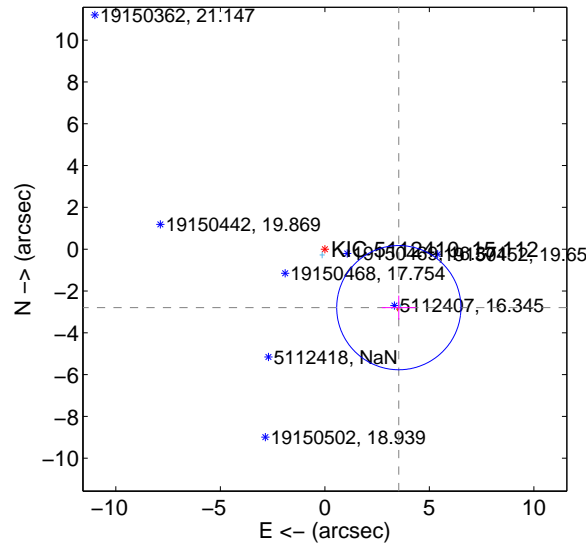
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.073 ± 1.857	2.19	-3.222 ± 1.540	-2.493 ± 1.047
PRF-fit source offset from KIC position	4.511 ± 0.990	4.55	-3.539 ± 0.813	-2.798 ± 0.575
photometric centroid source offset	1.63 ± 1.65	0.99	-1.58 ± 1.67	0.40 ± 1.13

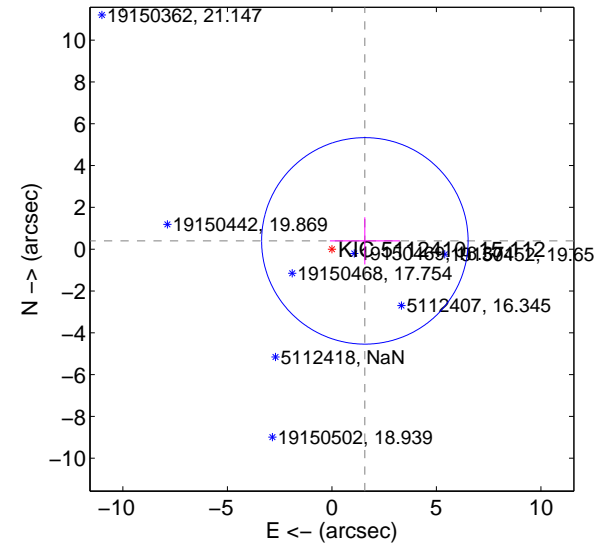
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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

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

Q1 no difference image



Q1 no OOT image



Q2 no difference image



Q2 no OOT image



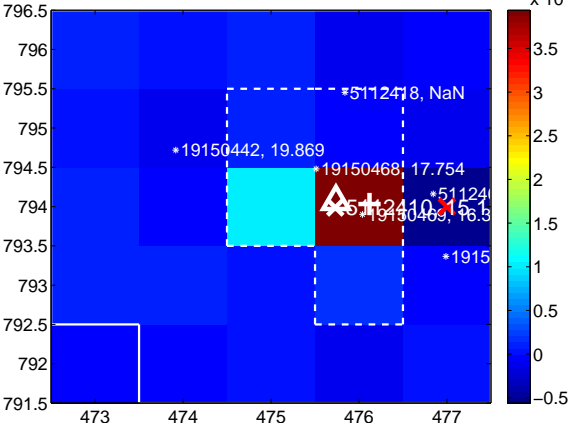
Q3 no difference image



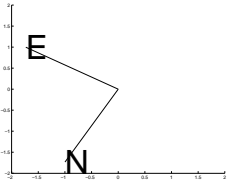
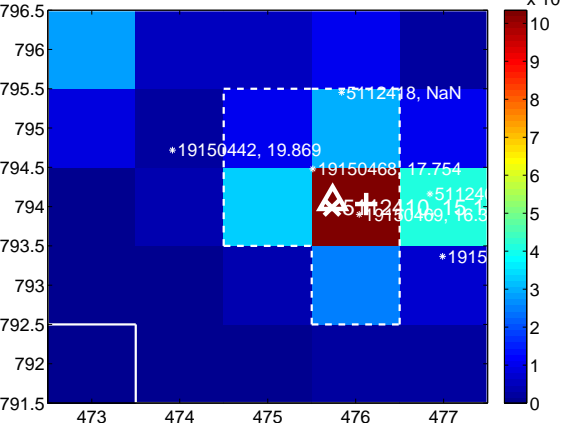
Q3 no OOT image



Q4 difference image



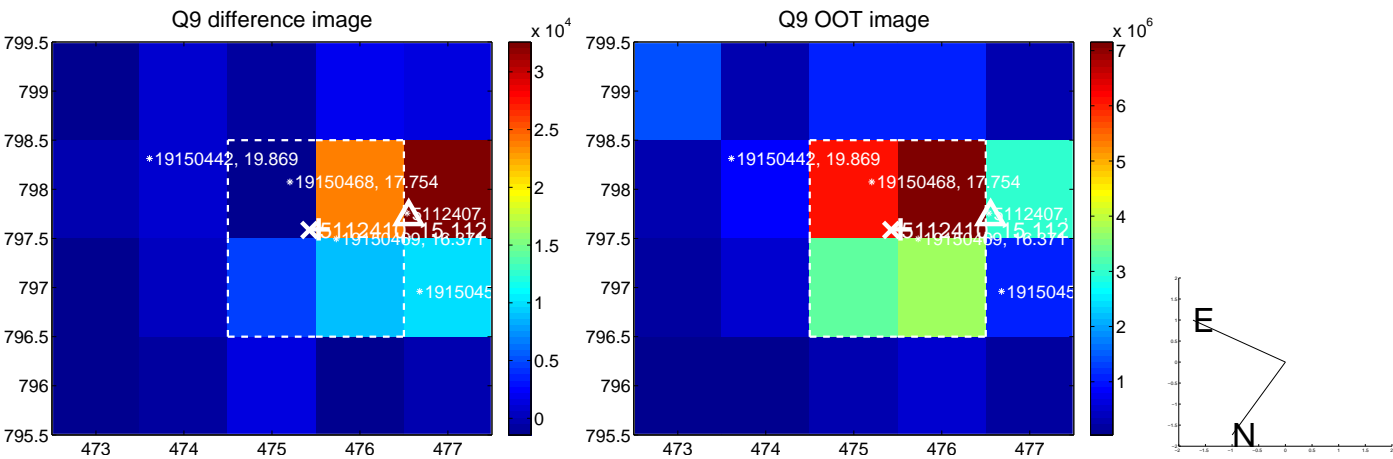
Q4 OOT image



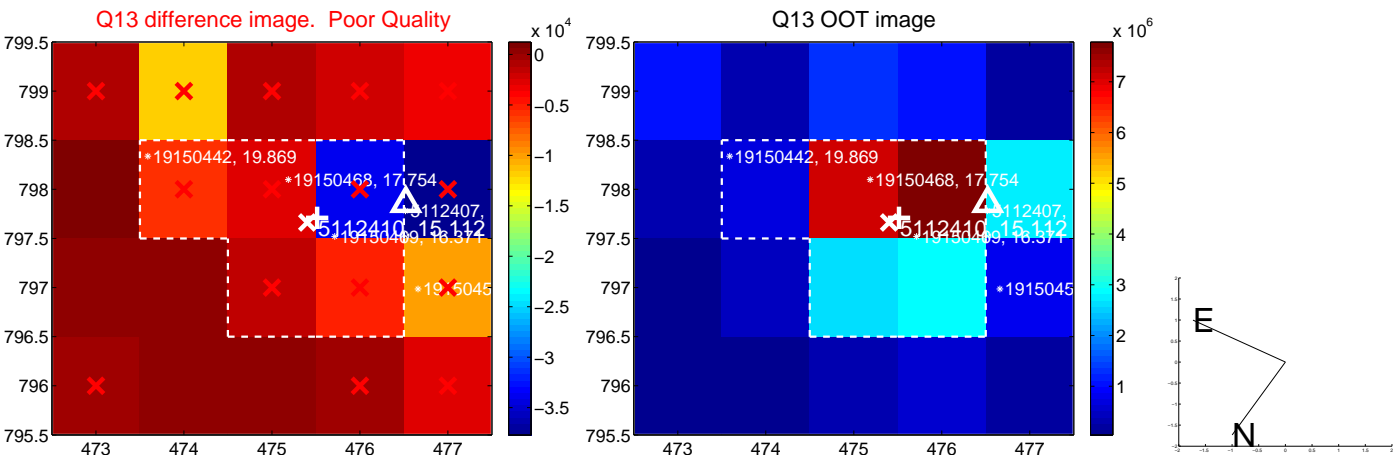
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



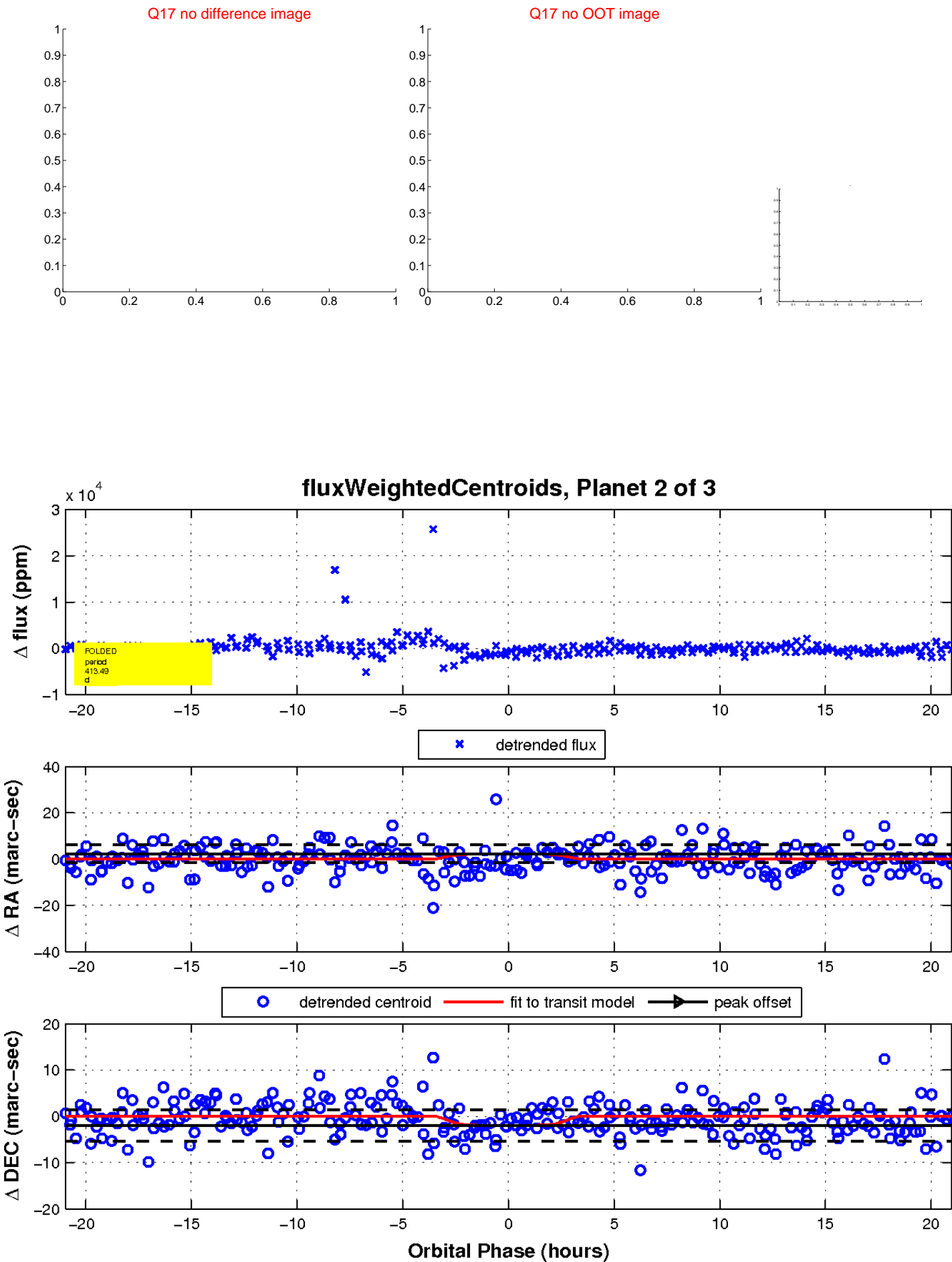
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

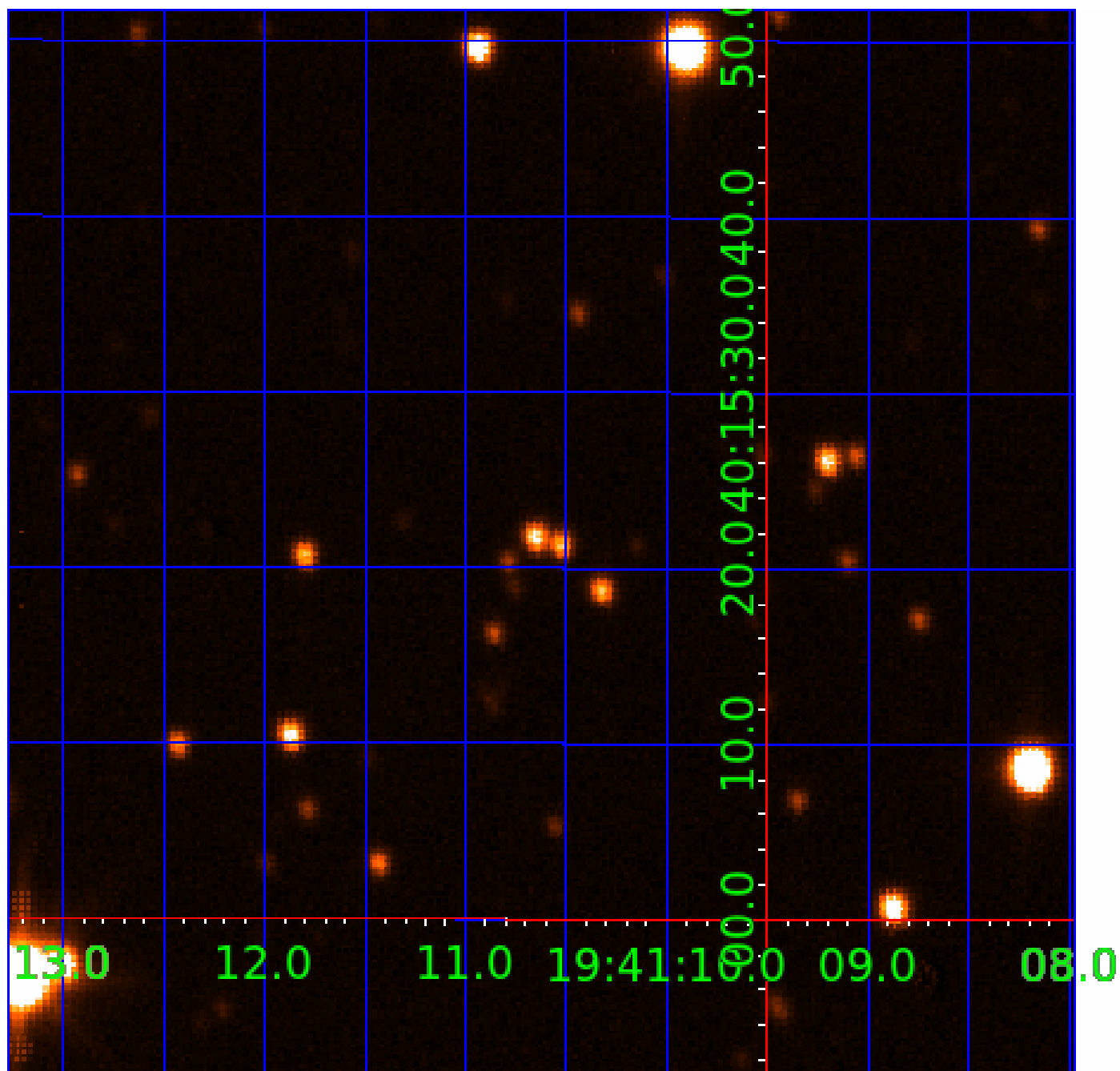


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005112410

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})
005112410-01	OBS	No	0.549867	131.857736	72.8	2.523	8.0	9.5	0.84	5927	0.82	5256.48
005112410-02	OBS	No	413.485130	437.853038	1925.4	6.990	12.5	12.9	0.84	5927	4.26	0.77
005112410-03	OBS	No	46.479842	159.184333	86.1	22.576	10.2	2.1	0.84	5927	0.82	14.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005112410-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
005112410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005112410-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

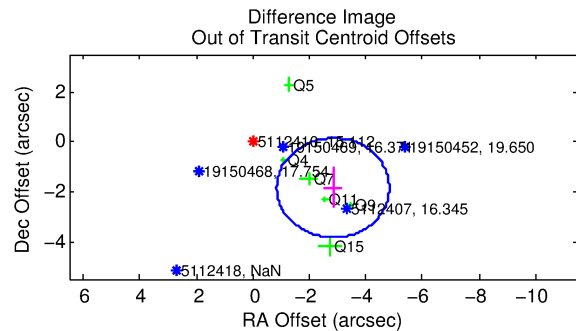
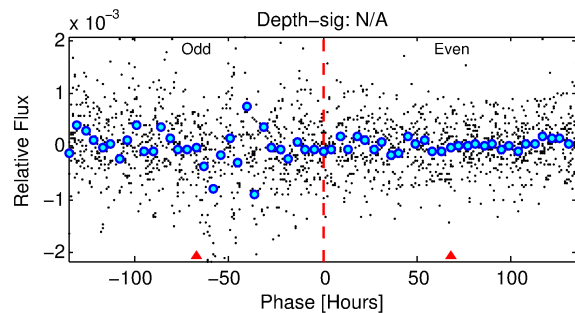
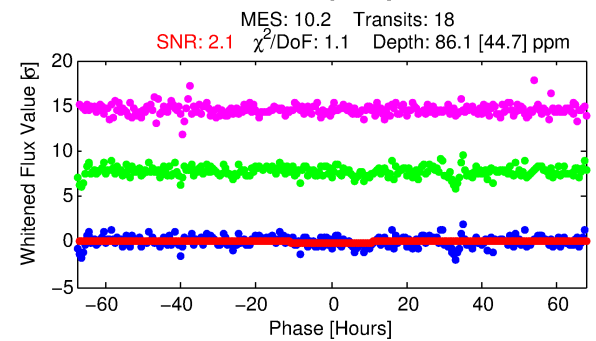
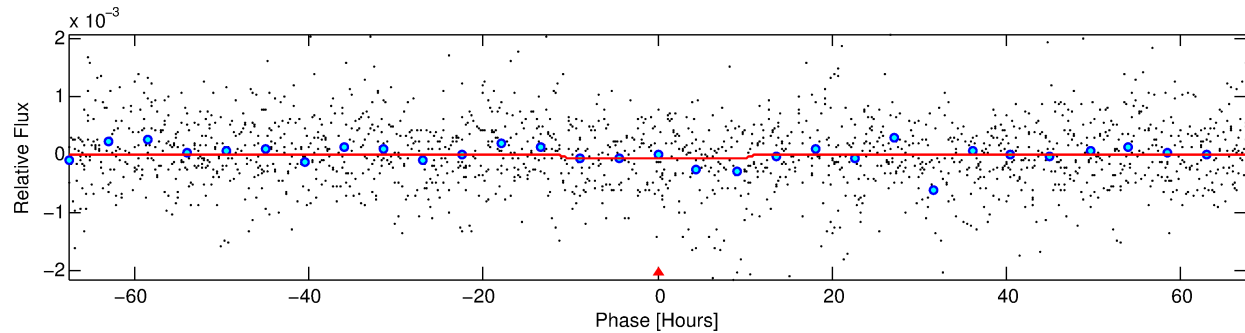
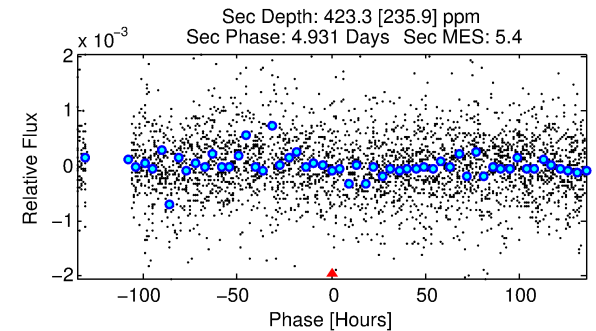
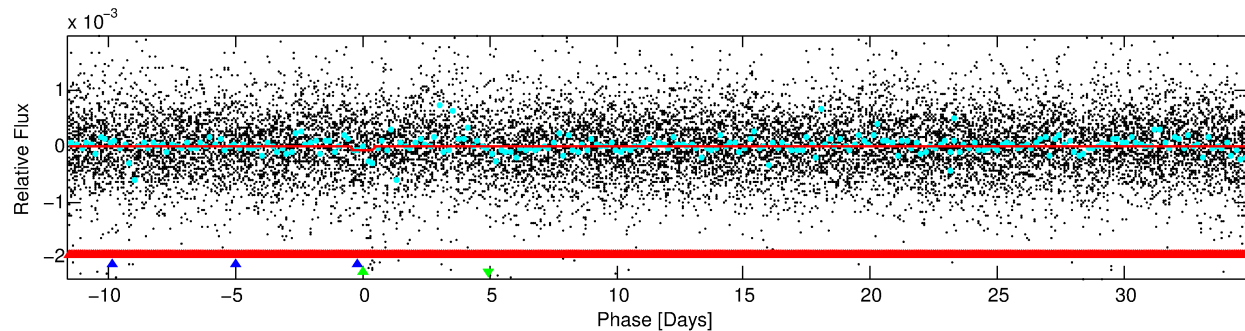
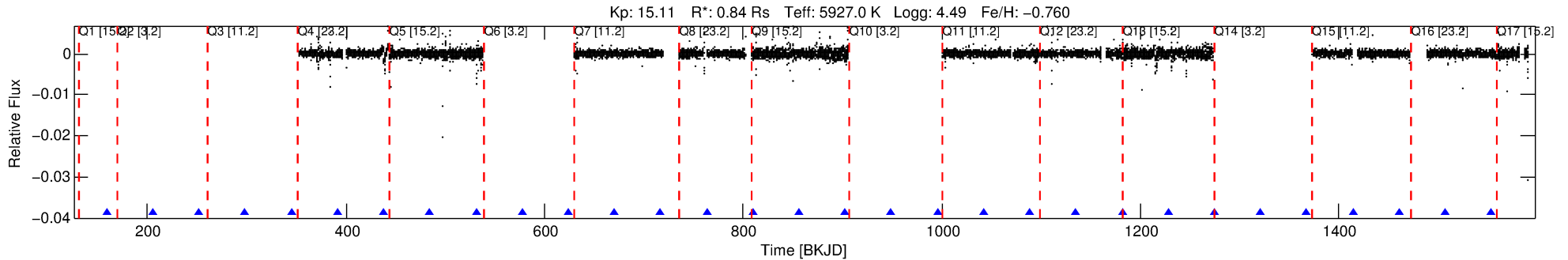
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005112410-03

No Significant Match Found

DV One-Page Summary

KIC: 5112410 Candidate: 3 of 3 Period: 46.480 d



DV Fit Results:

Period = 46.47984 [0.00775] d
Epoch = 159.1843 [0.1559] BKJD
Rp/R* = 0.0090 [0.0127]
a/R* = 11.81 [84.53]
b = 0.68 [5.81]
Seff = 14.17 [4.40]
Teq = 495 [38] K
Rp = 0.82 [1.17] Re
a = 0.2335 [0.0442] AU
Ag = 18681.48 [53859.51] [0.35σ]
Teffp = 8942 [6422] K [1.32σ]

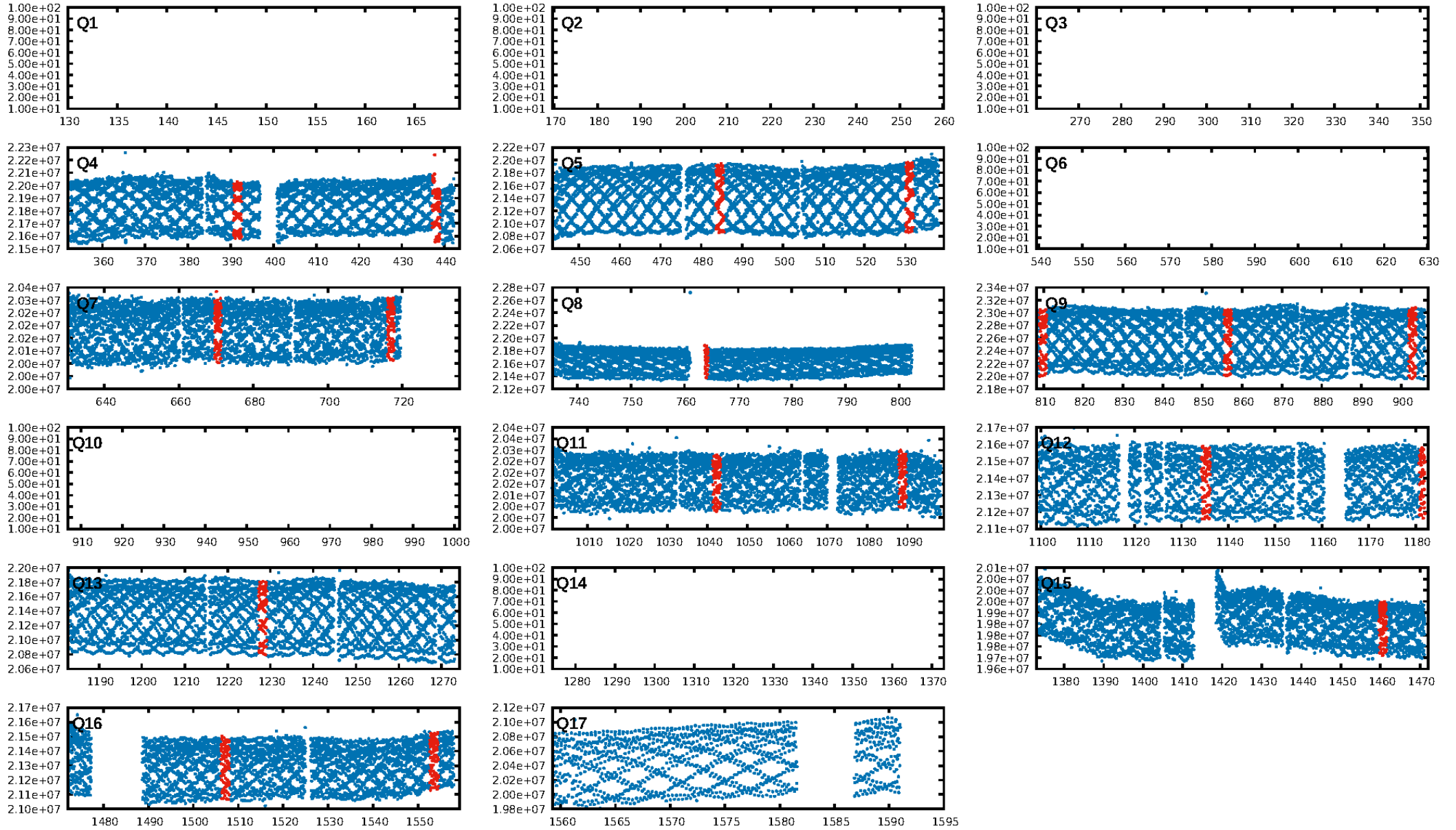
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [48.53σ]
LongPeriod-sig: 100.0% [372.71σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.63e-18
RollingBand-fgt: 1.00 [18/18]
GhostDiagnostic-chr: 0.2335
Centroid-sig: 96.2%
Centroid-so: 0.398 arcsec [0.06σ]
OotOffset-rm: 3.384 arcsec [5.09σ]
KicOffset-rm: 3.868 arcsec [6.23σ]
OotOffset-st: 0/3/1/2 [6]
KicOffset-st: 0/3/1/2 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.00 [0/7]

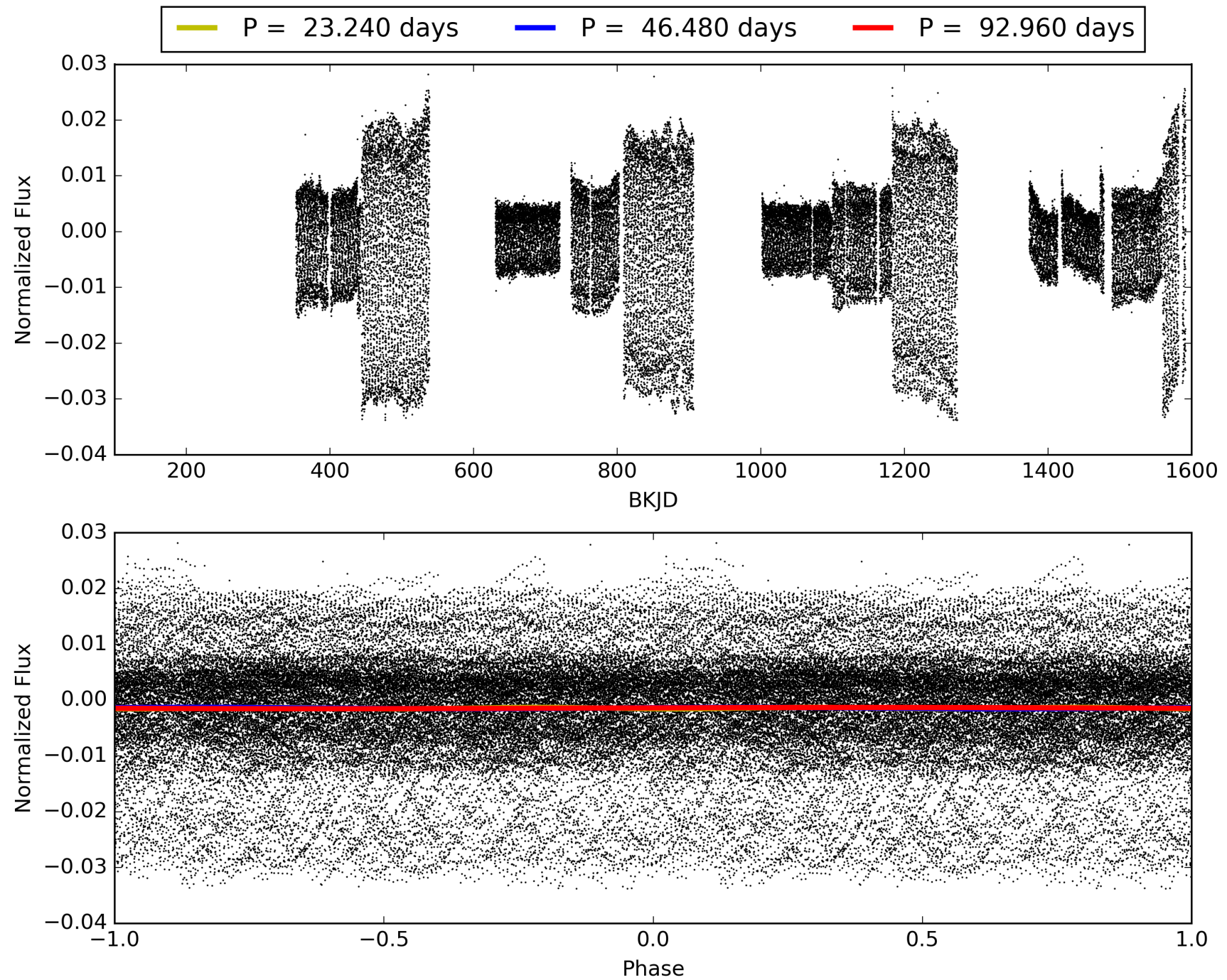
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:48:12 Z

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

TCE 005112410-03, PDC Light Curves

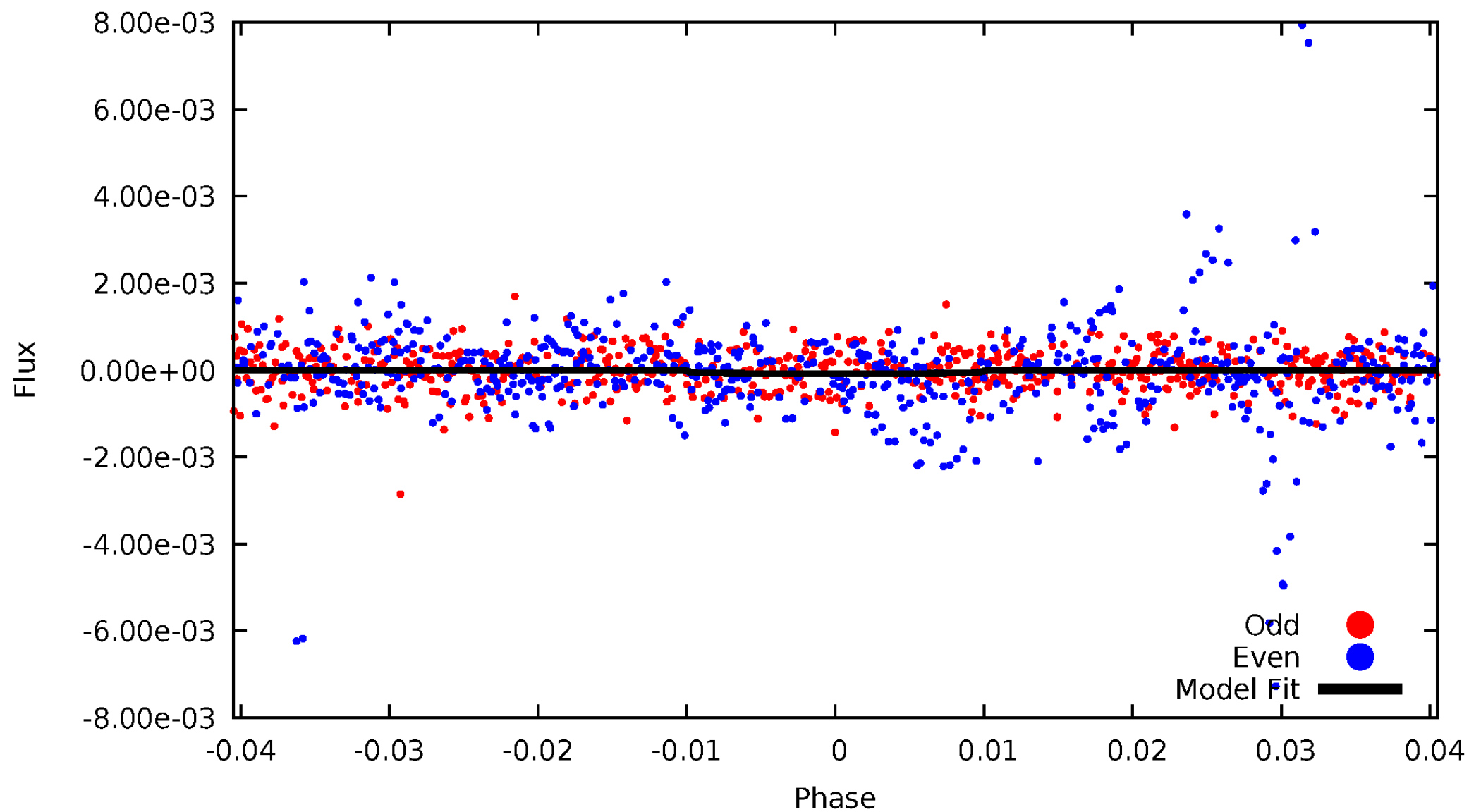


TCE 005112410-03



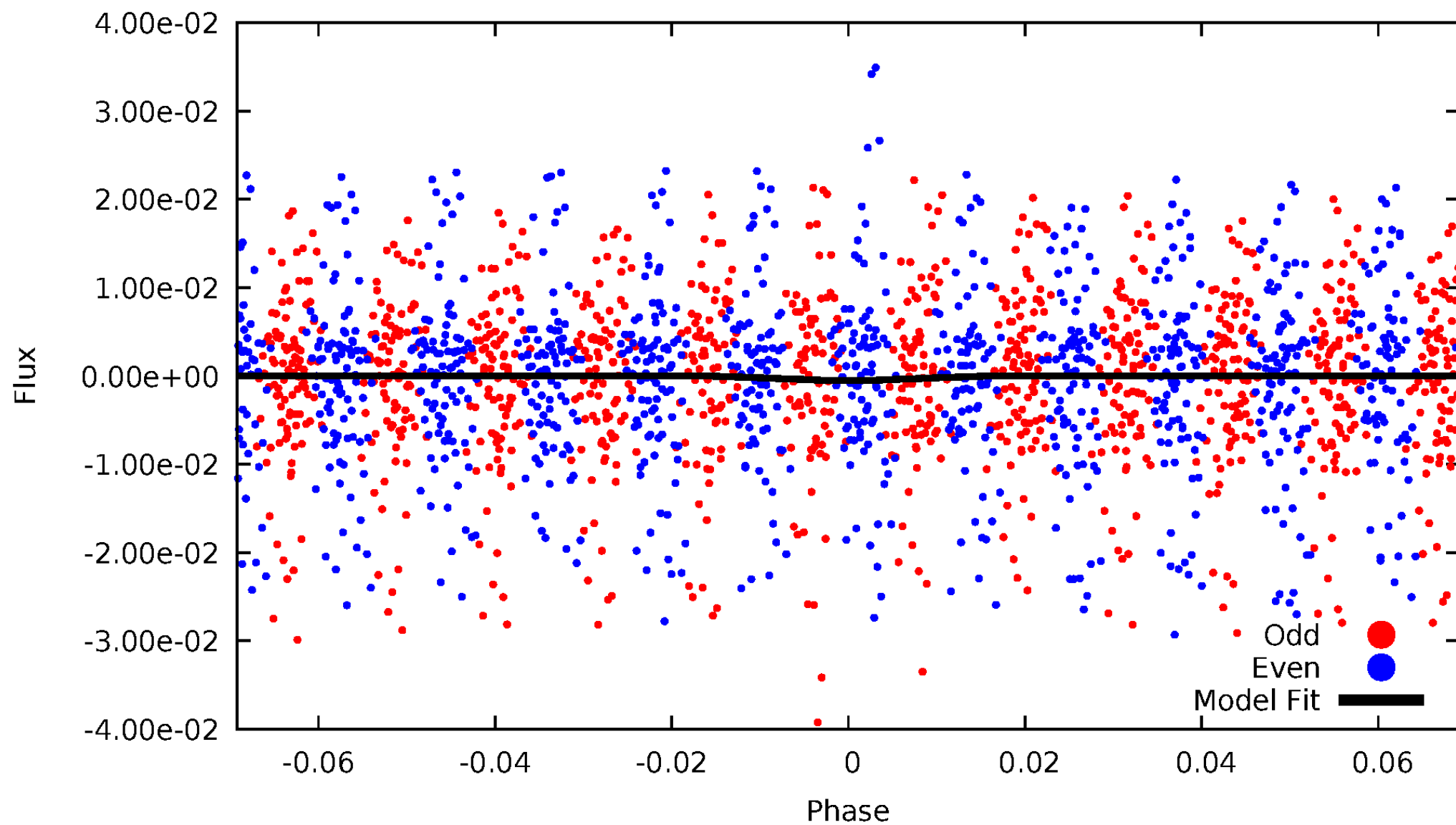
DV Odd/Even

TCE 005112410-03

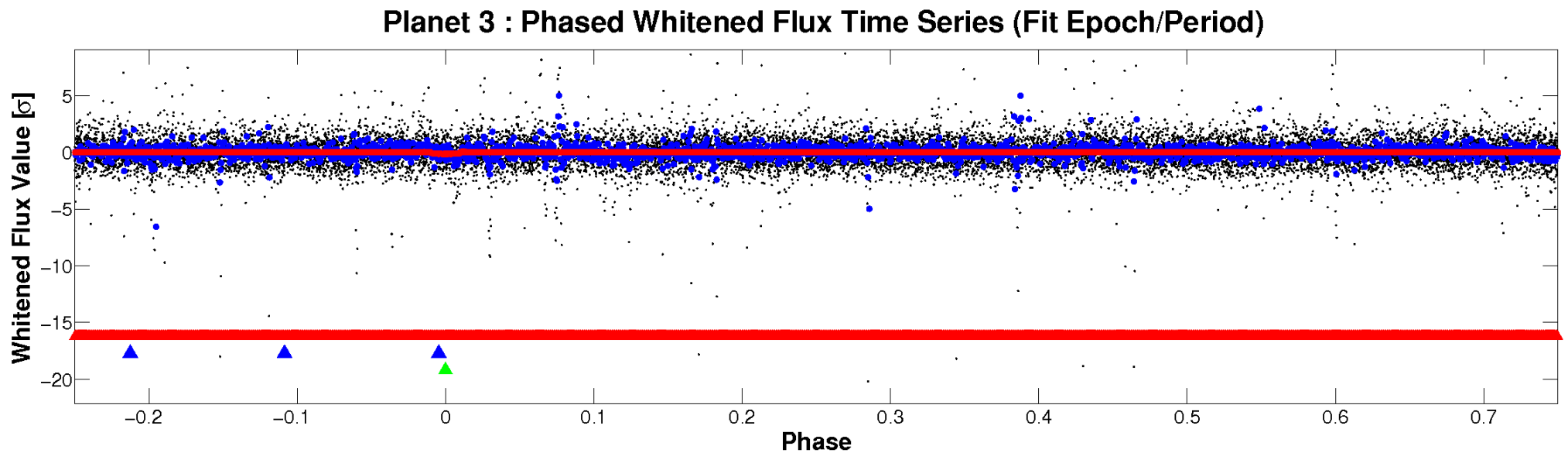
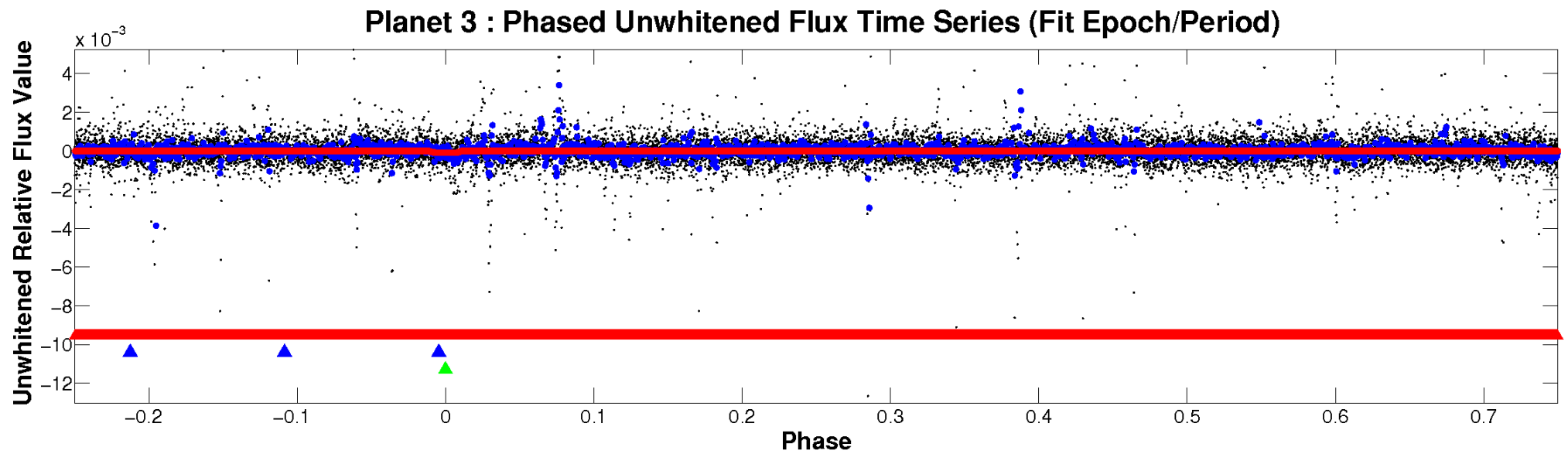


ALT Odd/Even

TCE 005112410-03

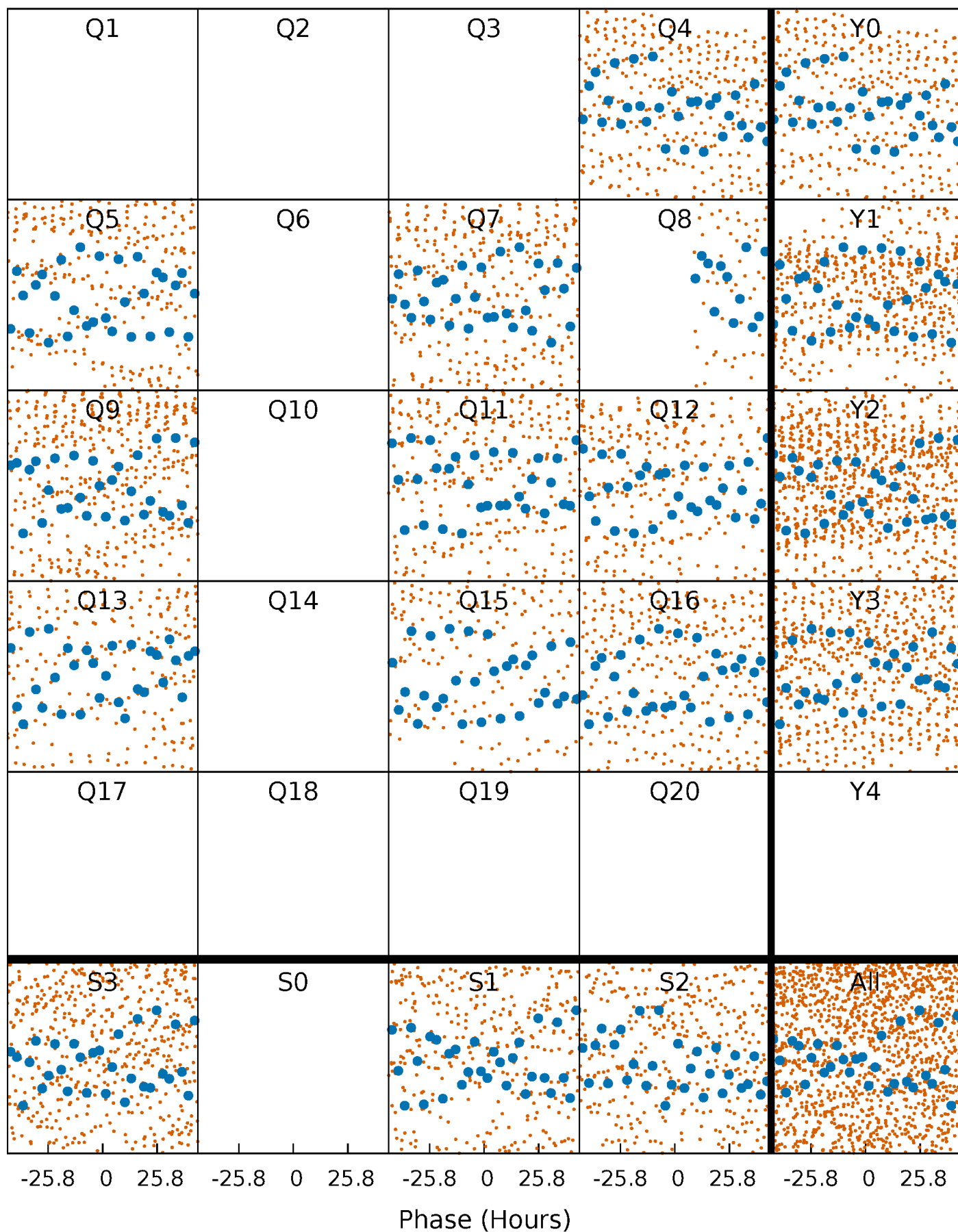


Non-Whitened Vs. Whitened Light Curve



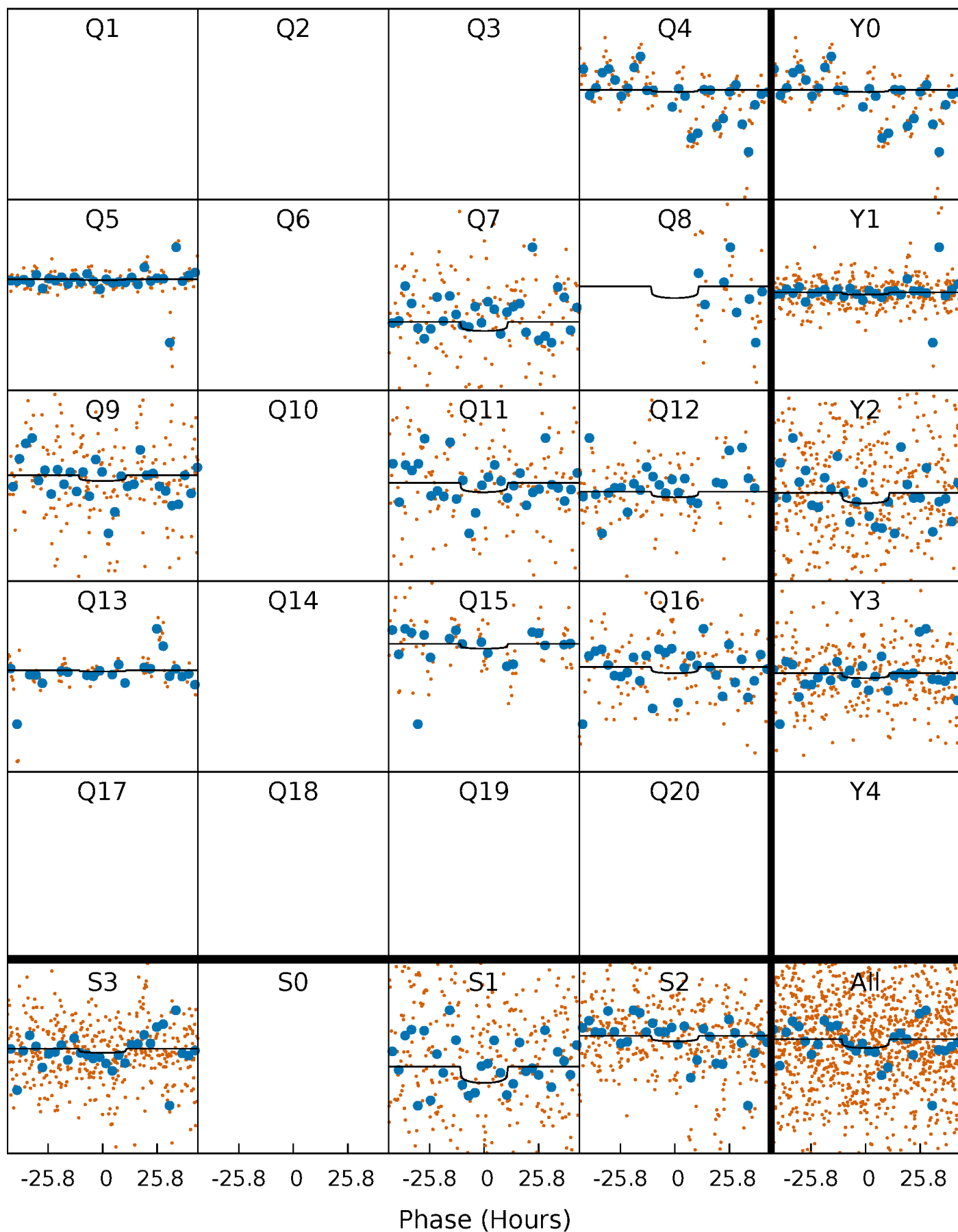
PDC Quarter-Phased Transit Curves

TCE 005112410-03 P= 46.479842 Days $T_0=159.184333$ (BKJD)



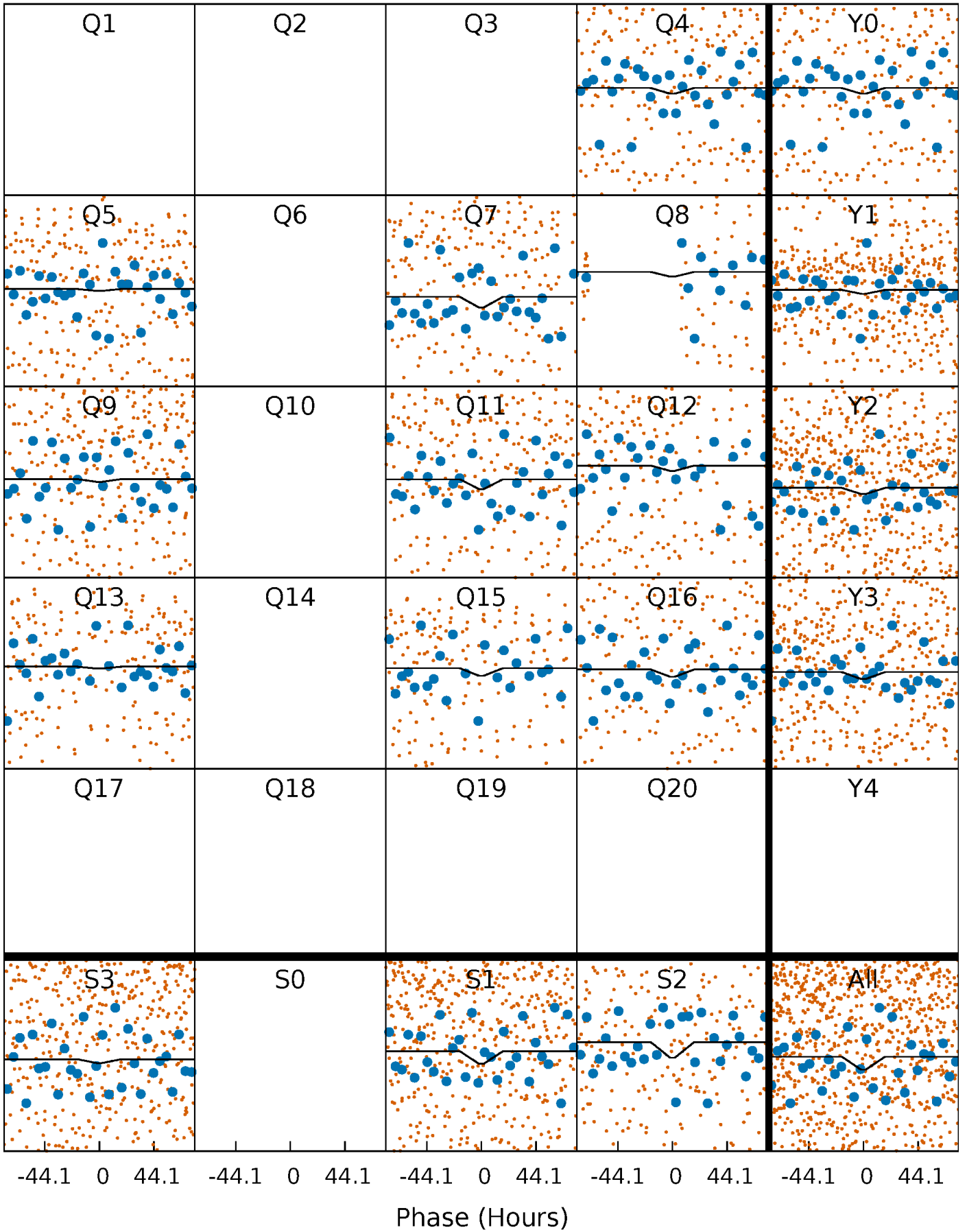
DV Quarter-Phased Transit Curves

TCE 005112410-03 P= 46.479842 Days $T_0=159.184333$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

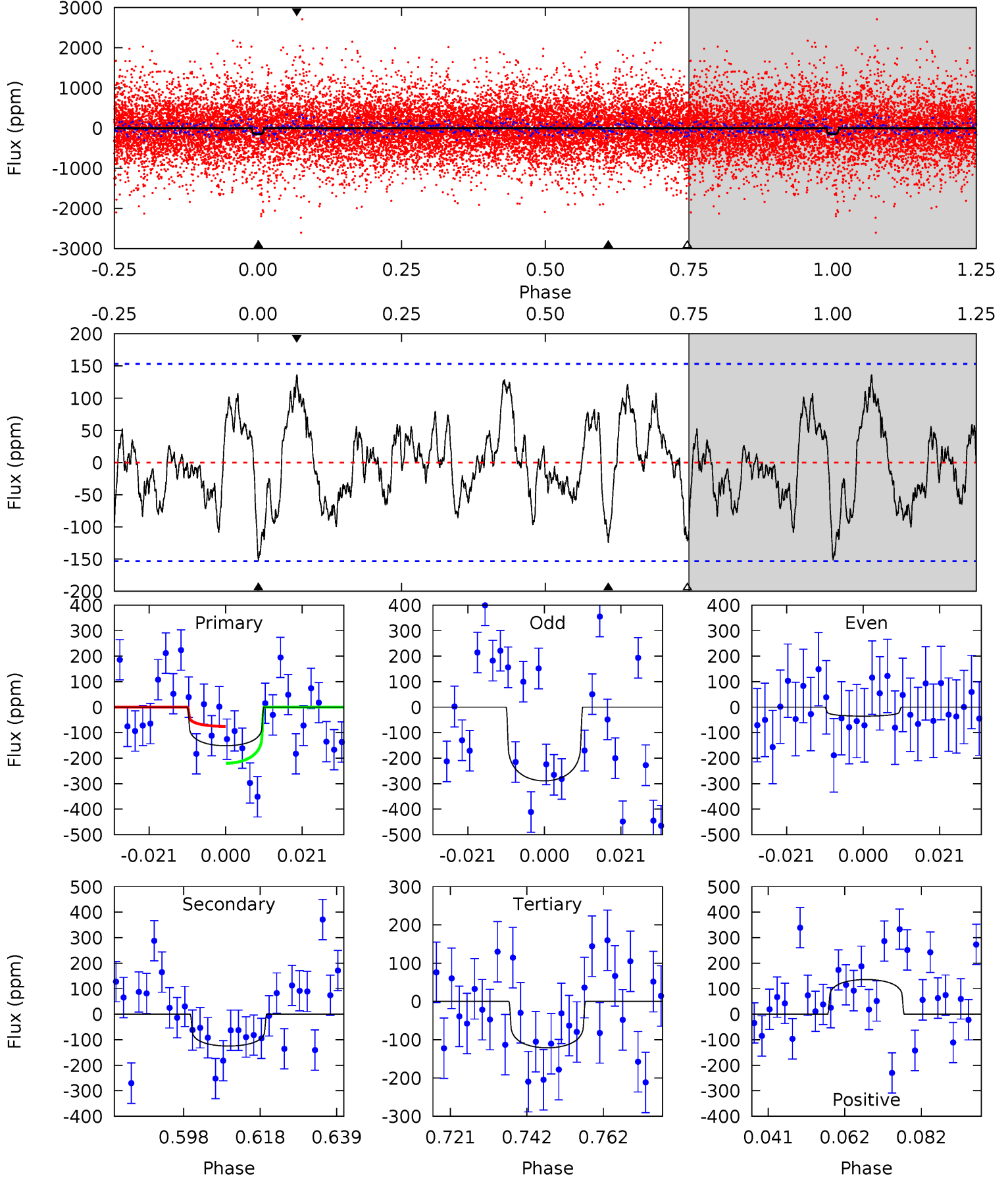
TCE 005112410-03 P= 46.470063 Days $T_0=159.433470$ (BKJD)



DV Model-Shift Uniqueness Test

005112410-03, P = 46.479842 Days, E = 159.184333 Days

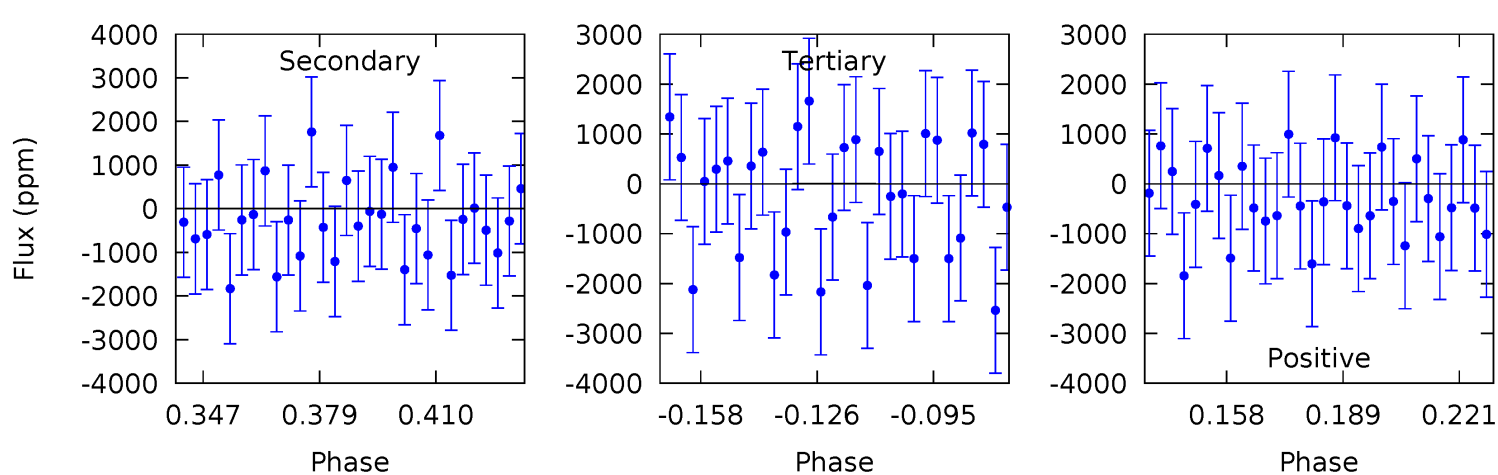
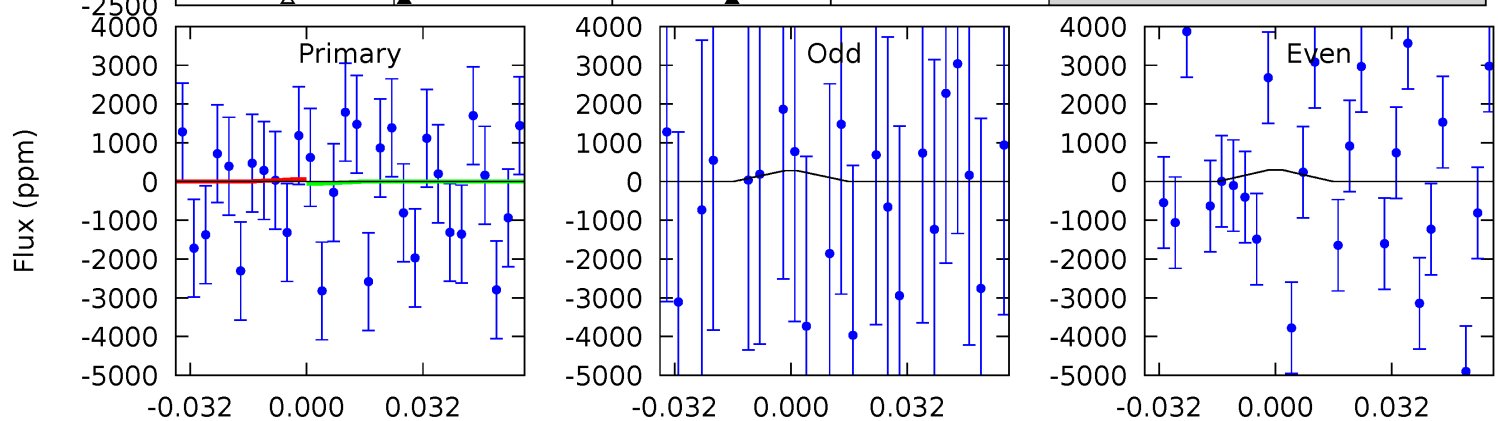
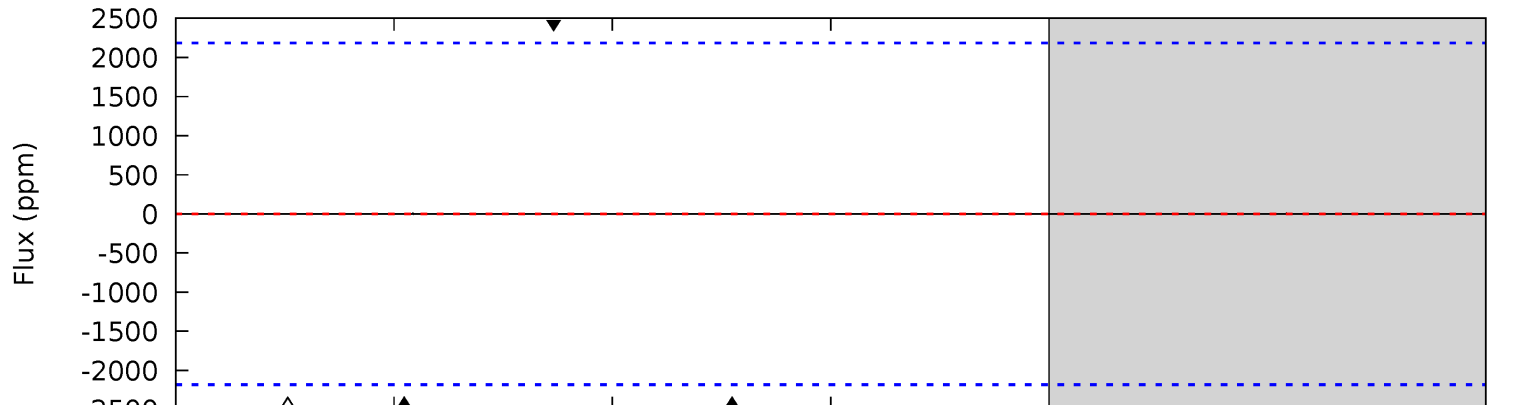
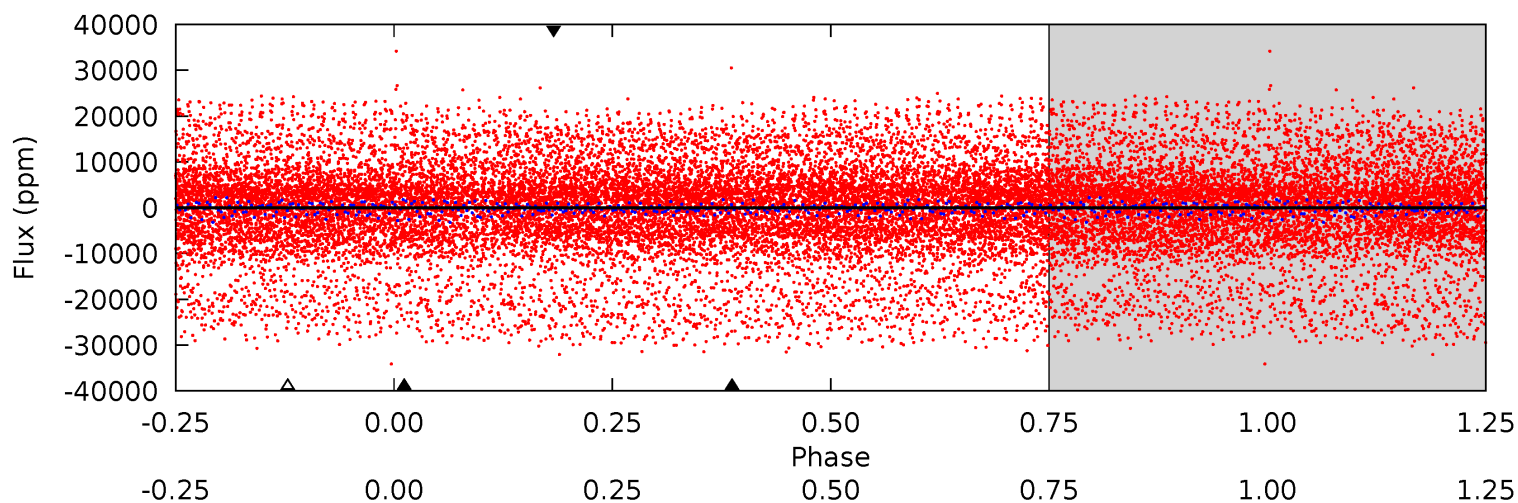
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.83	3.98	3.86	4.34	4.89	2.32	1.67	0.97	0.49	0.12	-0.36	4.04	4.33	0.47	2.31



Alt Model-Shift Uniqueness Test

005112410-03, P = 46.470063 Days, E = 159.433470 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	4.80	2.15	0.00	0	0	0	0	0.02	0.22	0.28	0.00



Stellar Parameters For KIC 005112410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5927^{+197}_{-197}	$4.489^{+0.104}_{-0.156}$	$-0.760^{+0.300}_{-0.300}$	$0.836^{+0.184}_{-0.107}$	$0.784^{+0.091}_{-0.056}$	$1.893^{+0.861}_{-0.821}$
	+3%/-3%	+2%/-3%	+39%/-39%	+22%/-13%	+12%/-7%	+45%/-43%
Source	KIC0	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 005112410-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-125 ± 31	$1.20^{+0.93}_{-0.79}$	698^{+40}_{-38}	5483^{+4844}_{-1185}	2553^{+19599}_{-1830}
Alt.	-1 ± 455	$2.18^{+1.18}_{-1.09}$	694^{+42}_{-36}	-3281^{+9071}_{-2824}	$-169.905^{+3304.336}_{-3971.069}$

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

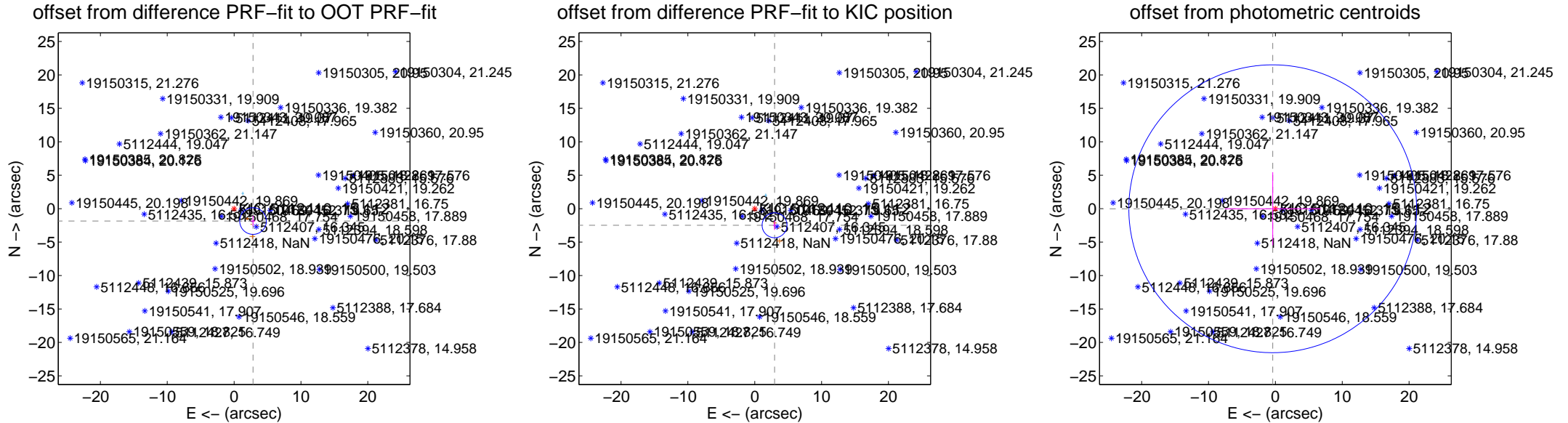
DV Centroid Data

Supplemental centroid analysis for 005112410-03. Kepler magnitude: 15.11. Transit SNR 2.14

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.384 ± 0.664	5.09	-2.833 ± 0.327	-1.851 ± 0.784
PRF-fit source offset from KIC position	3.868 ± 0.621	6.23	-2.966 ± 0.240	-2.482 ± 0.716
photometric centroid source offset	0.40 ± 7.17	0.06	0.40 ± 7.18	-0.02 ± 5.47



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

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

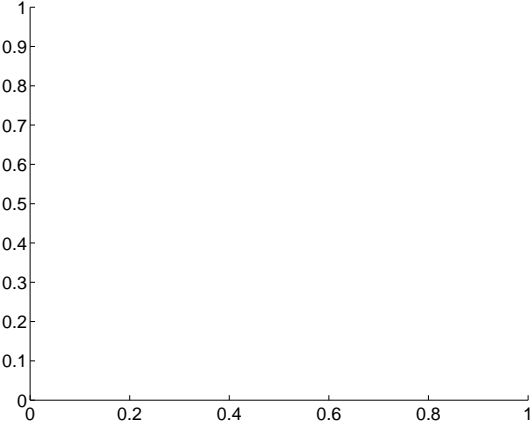
Q1 no difference image



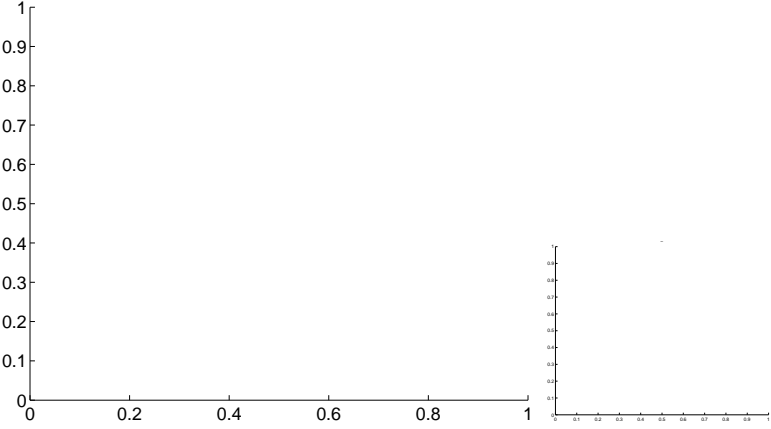
Q1 no OOT image



Q2 no difference image



Q2 no OOT image



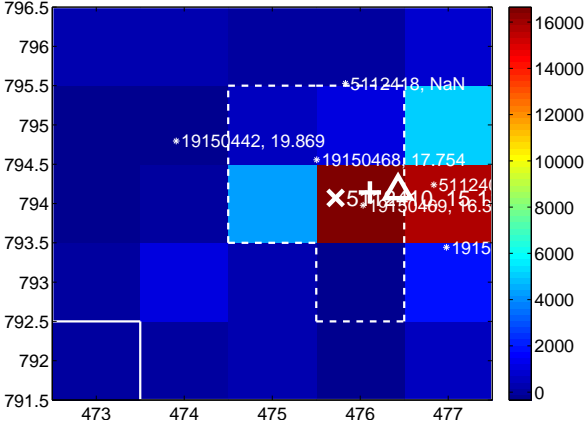
Q3 no difference image



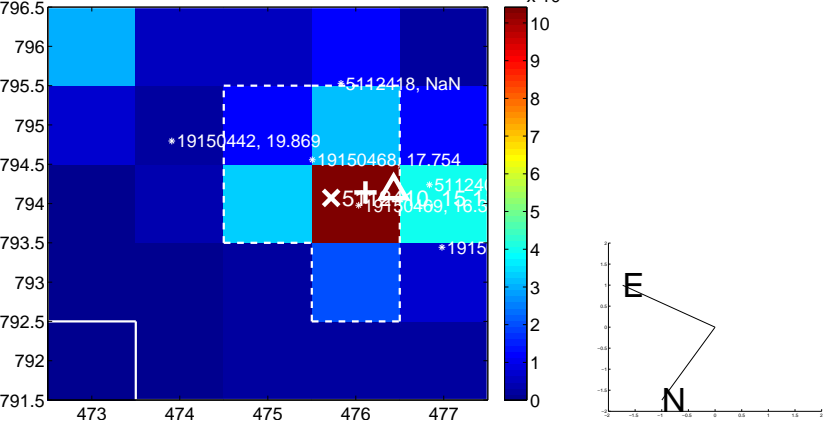
Q3 no OOT image



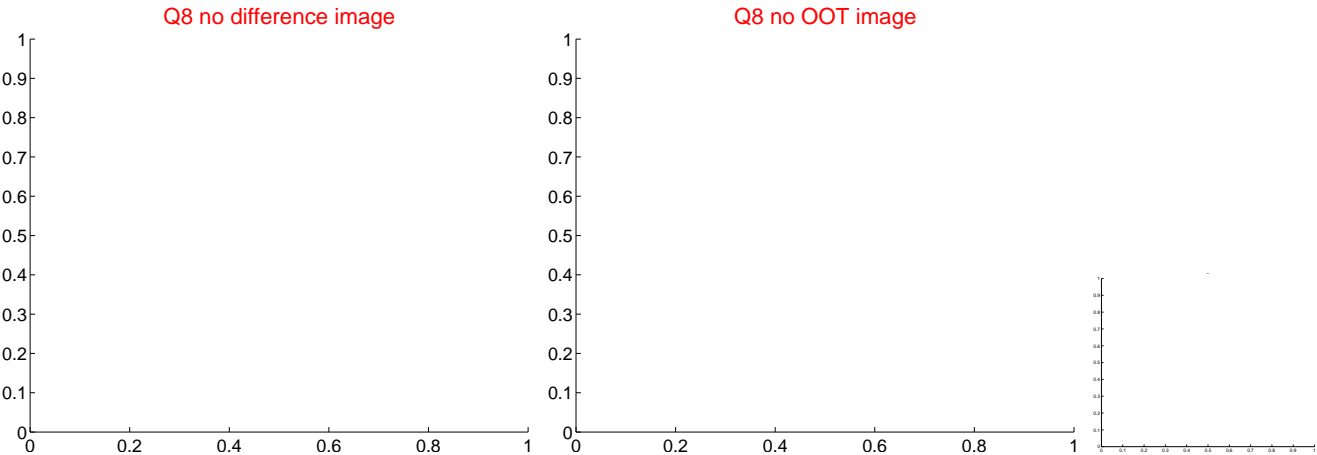
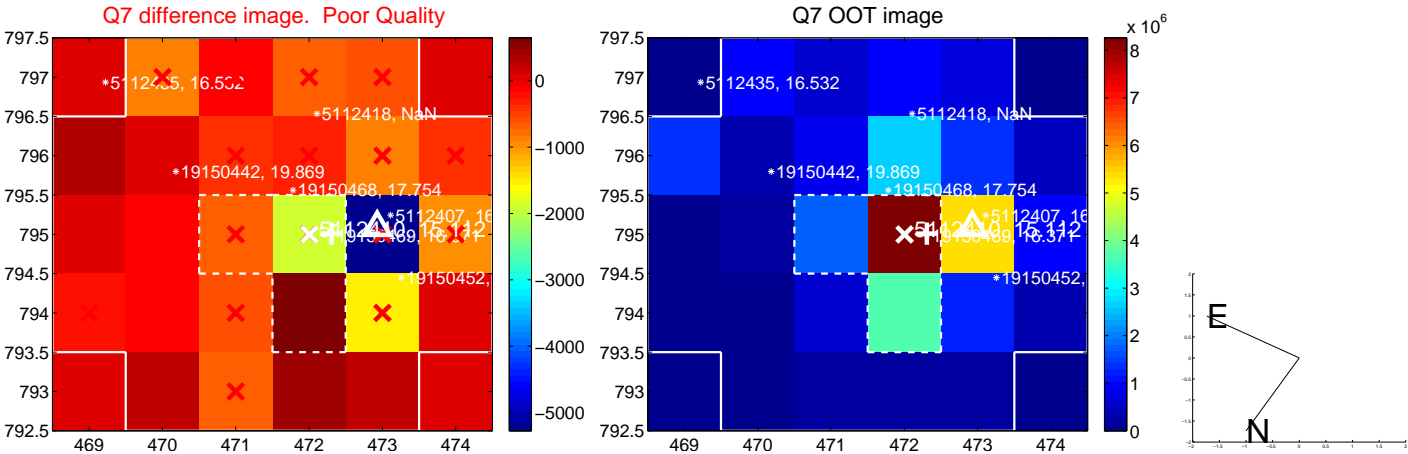
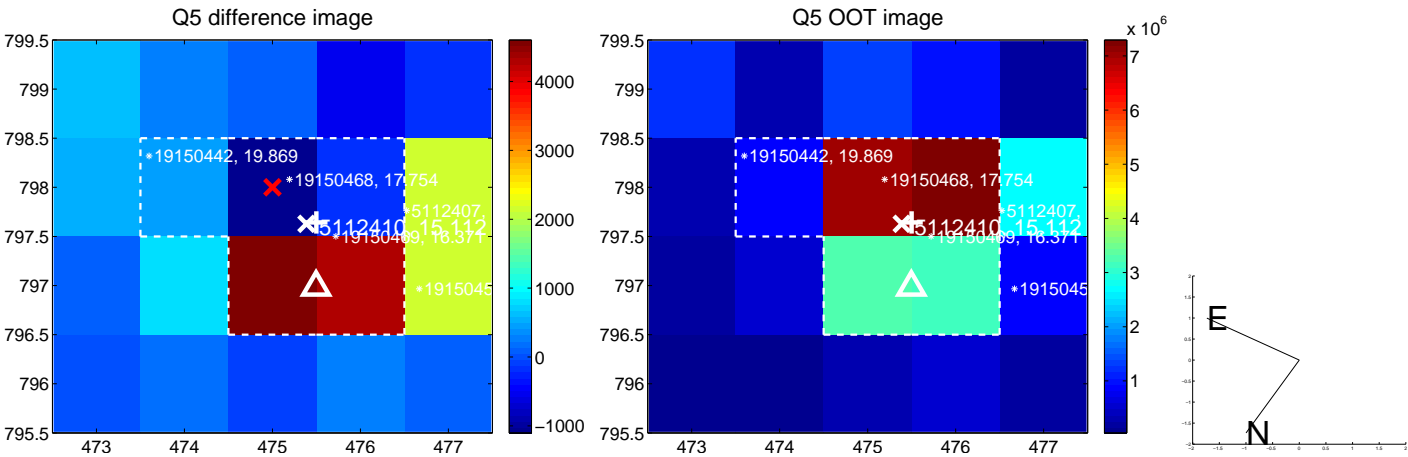
Q4 difference image



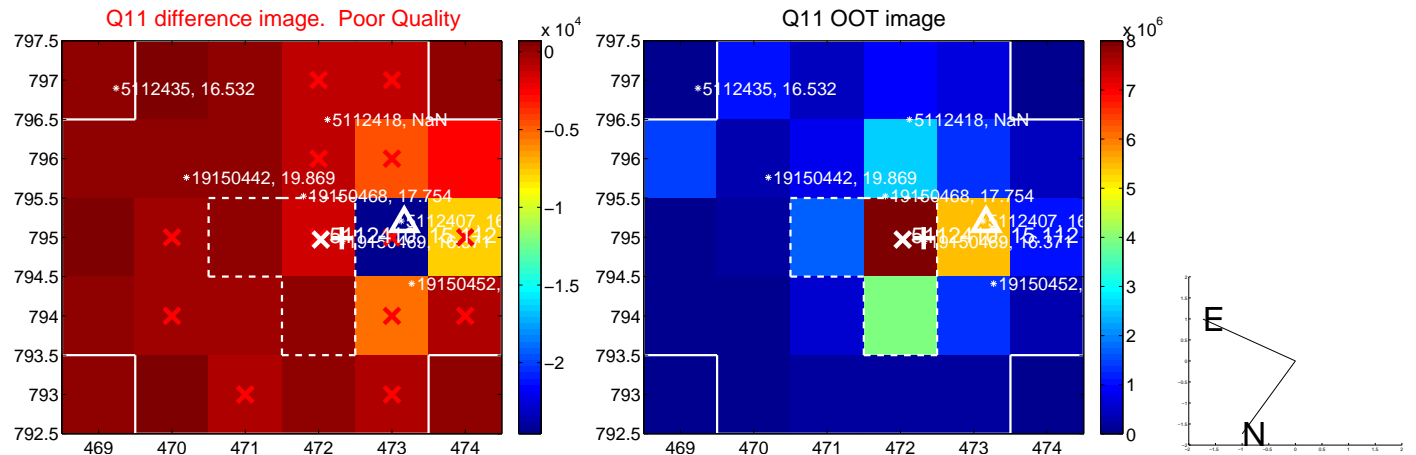
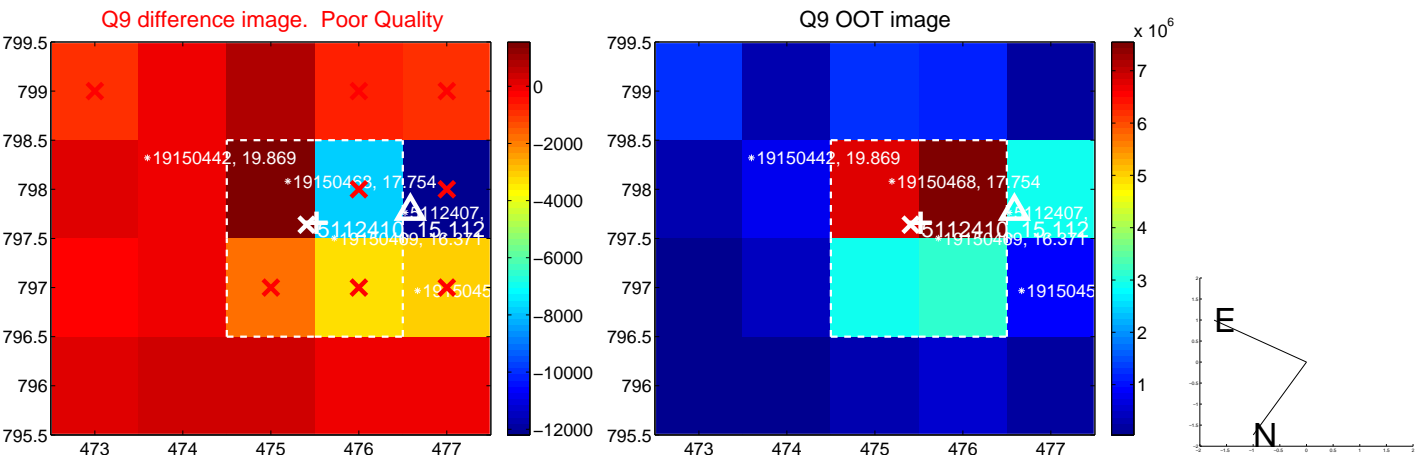
Q4 OOT image



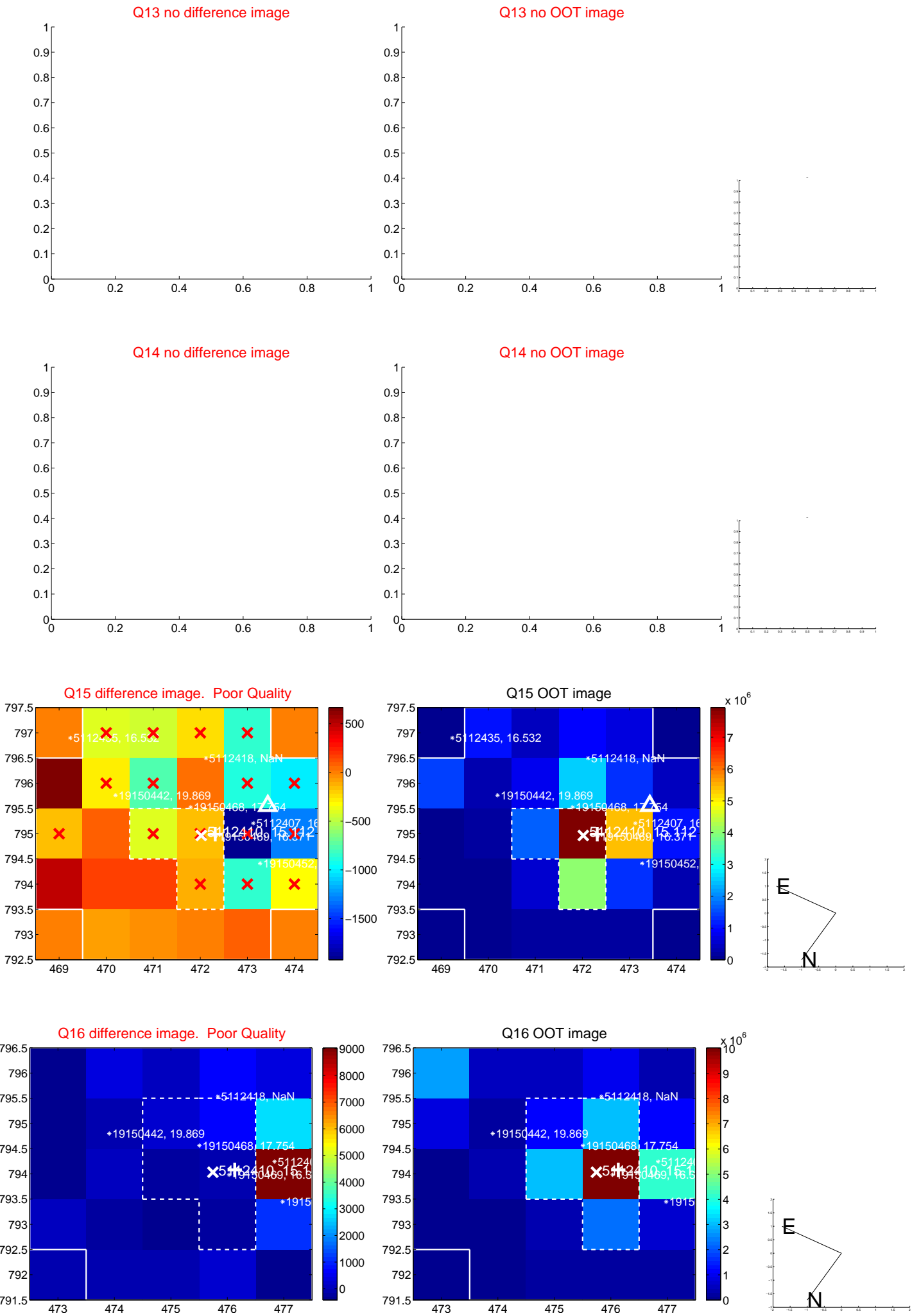
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



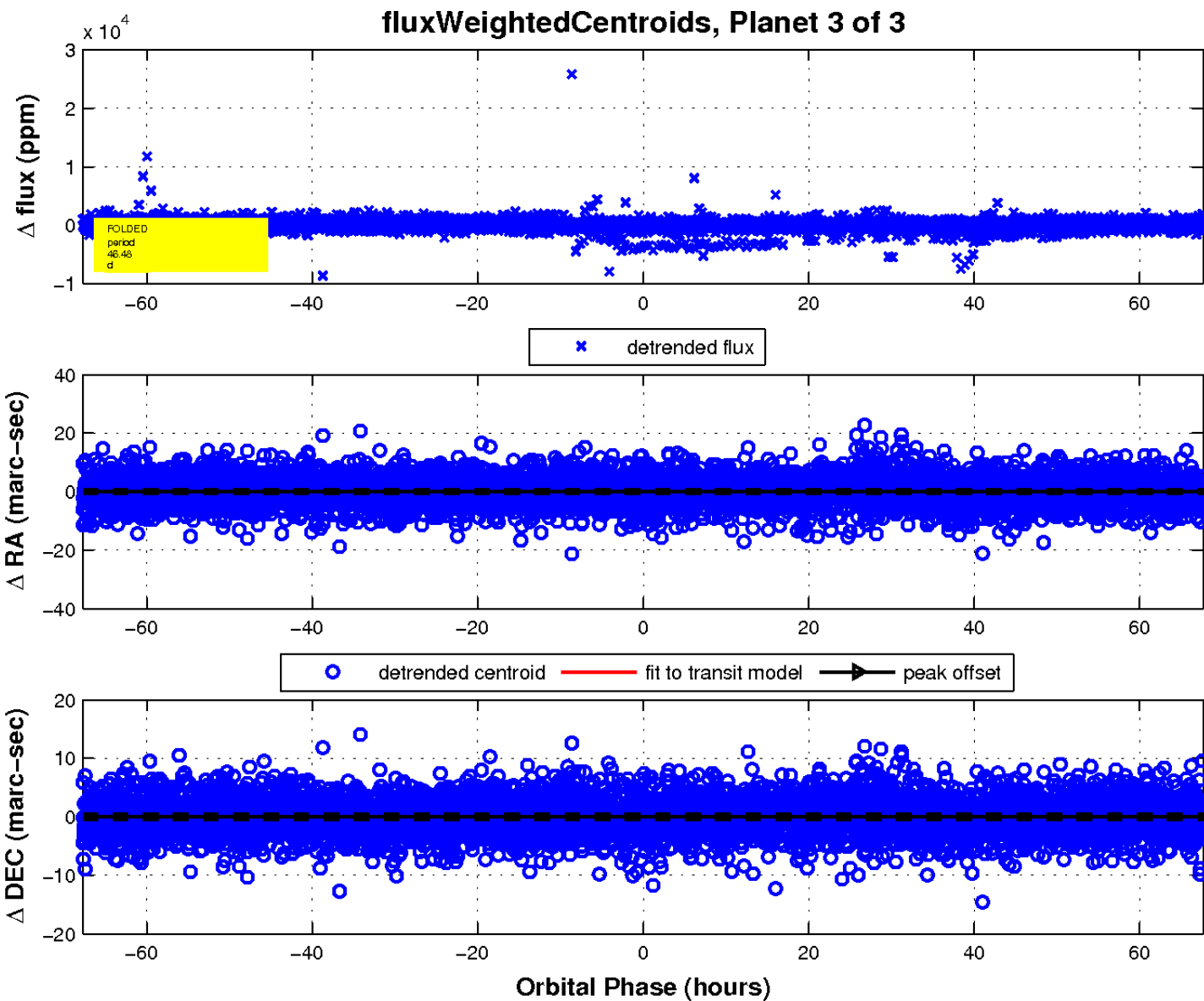
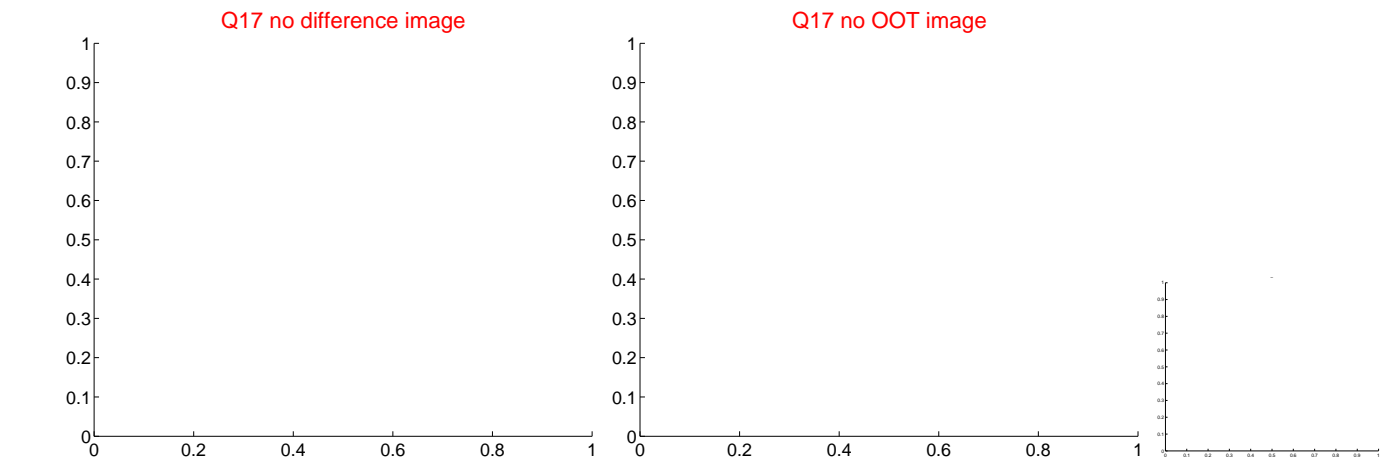
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



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



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