

KIC 010422030

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})
010422030-01	OBS	No	338.256690	446.181942	738.3	3.151	14.0	5.9	0.54	4822	1.58	0.24
010422030-02	OBS	No	412.072734	140.862952	765.7	3.134	15.8	7.3	0.54	4822	1.58	0.18
010422030-03	OBS	No	280.987353	407.885611	916.0	2.958	11.4	8.3	0.54	4822	1.72	0.30
010422030-04	OBS	No	129.884630	253.576081	620.3	3.886	9.7	6.9	0.54	4822	1.43	0.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010422030-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010422030-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-04	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

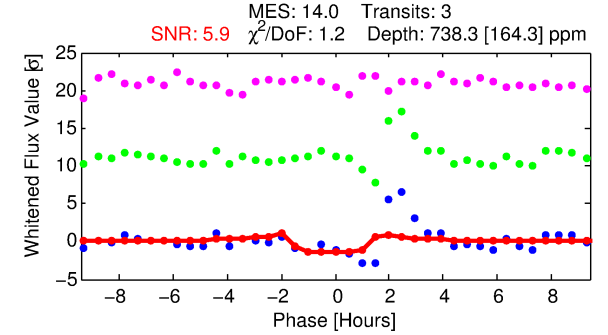
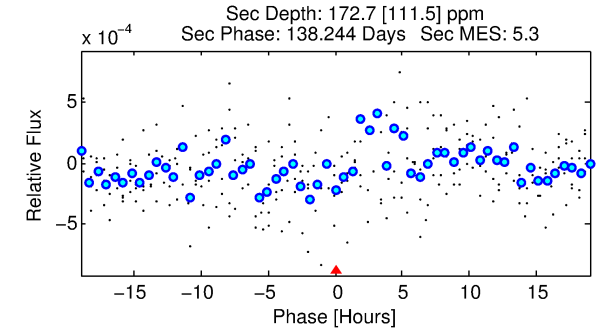
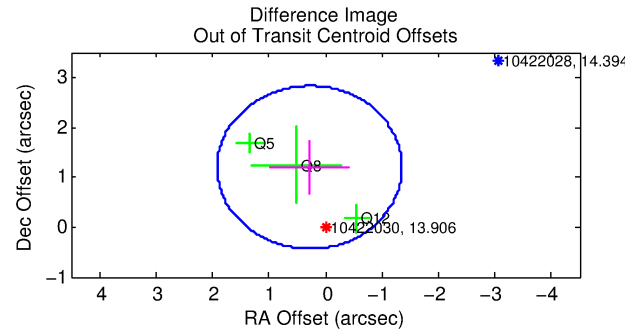
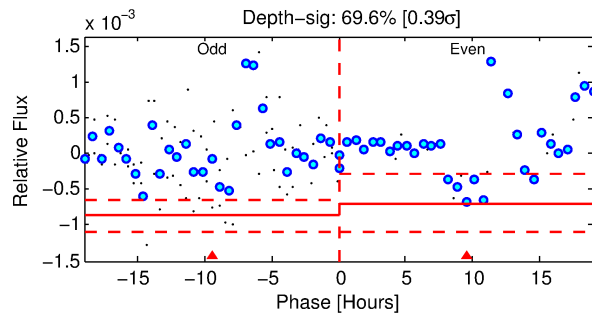
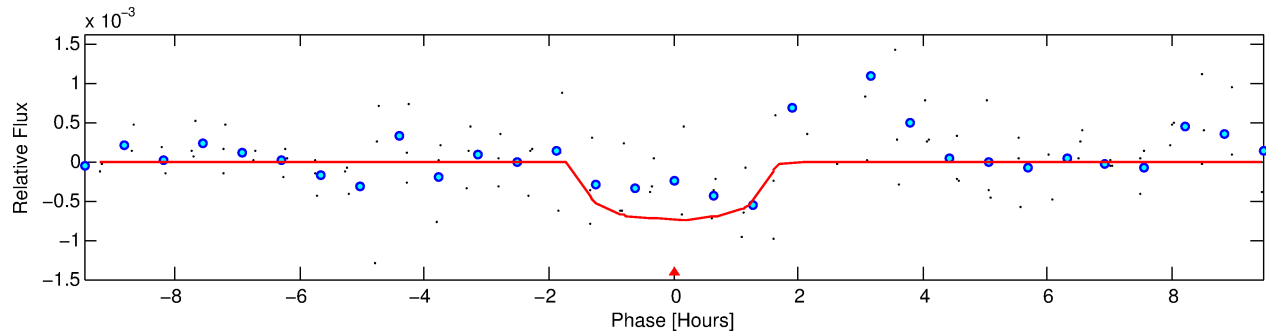
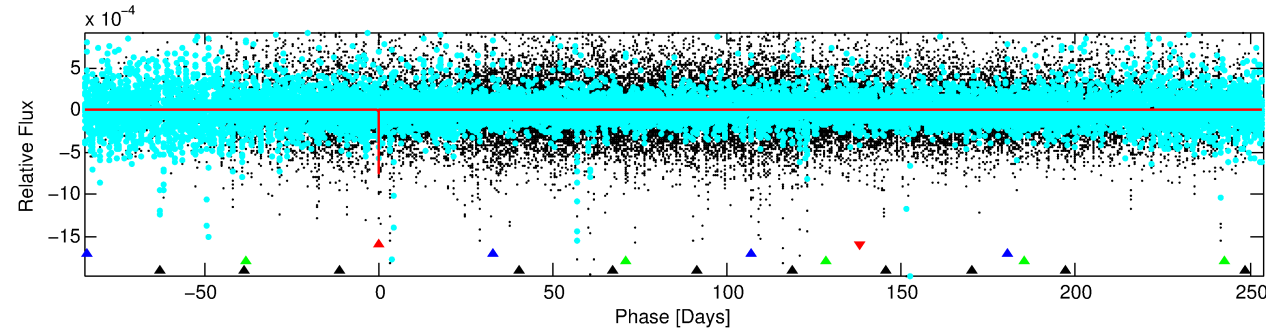
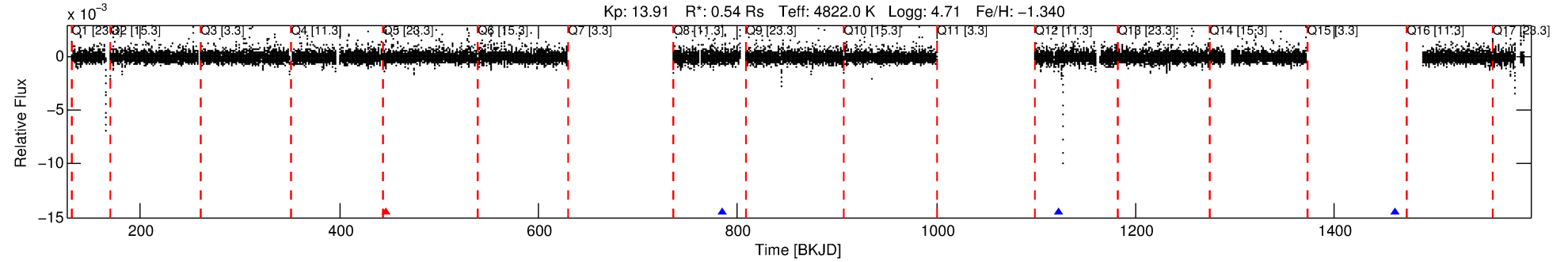
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010422030-01

No Significant Match Found

DV One-Page Summary

KIC: 10422030 Candidate: 1 of 4 Period: 338.257 d



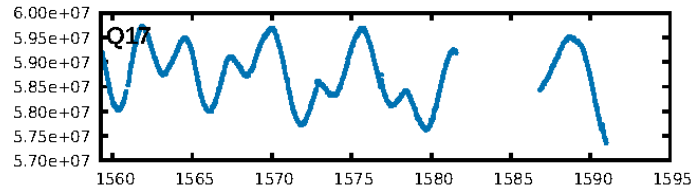
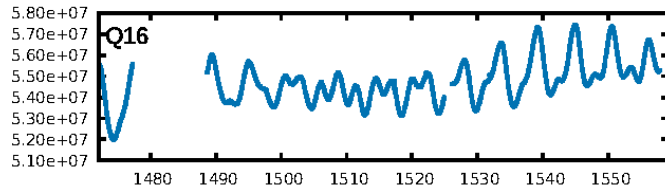
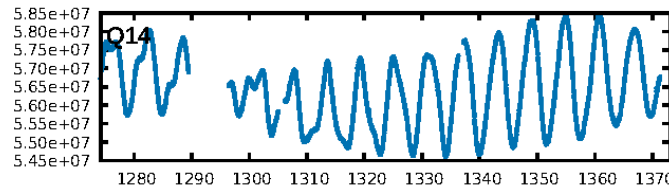
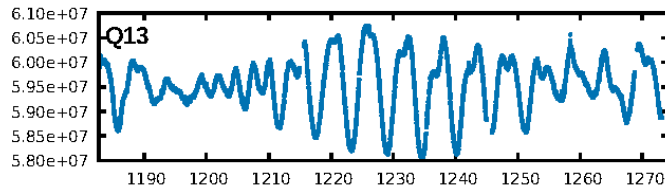
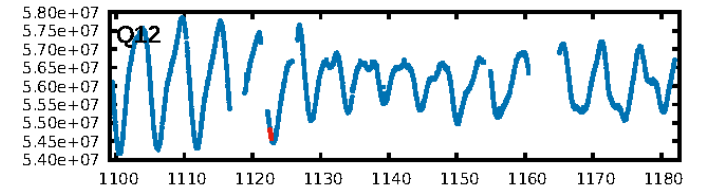
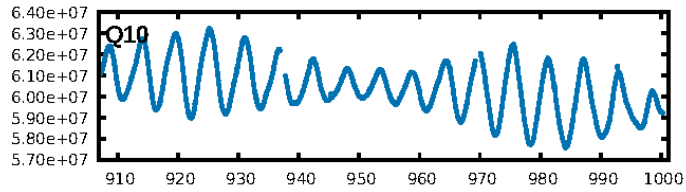
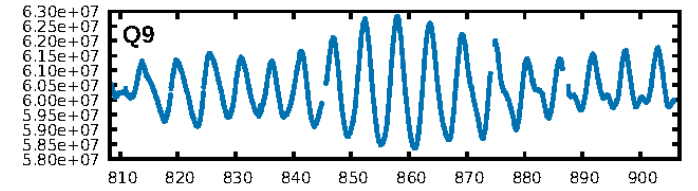
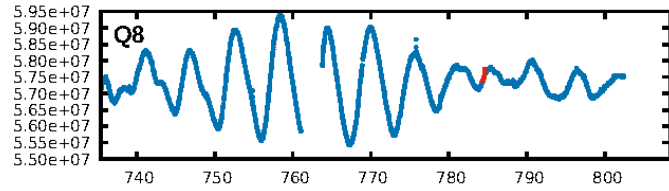
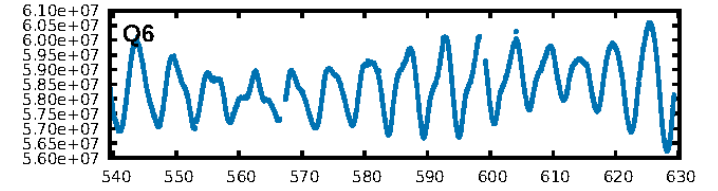
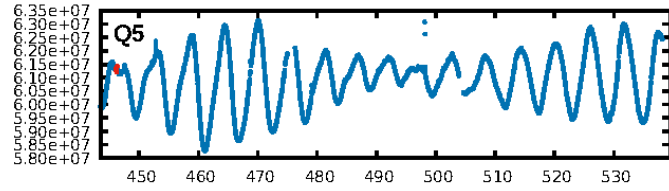
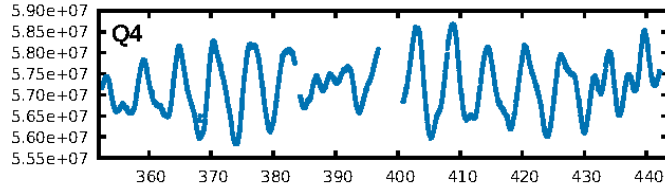
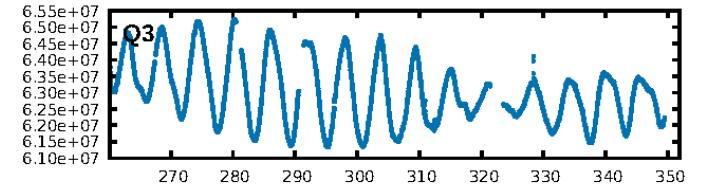
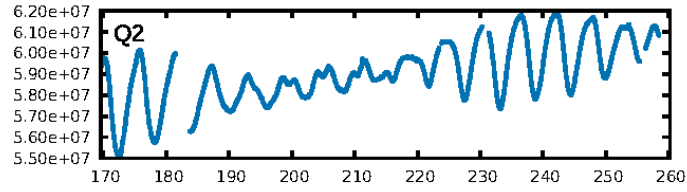
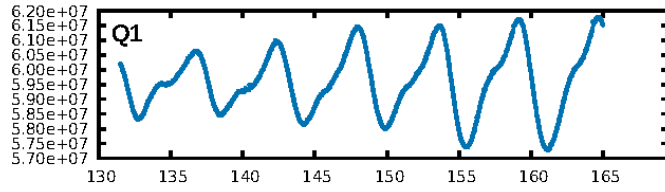
DV Fit Results:

Period = 338.25669 [0.00816] d
Epoch = 446.1819 [0.0076] BKJD
Rp/R* = 0.0267 [0.0915]
a/R* = 609.52 [8823.89]
b = 0.71 [10.31]
Seff = 0.24 [0.04]
Teq = 178 [7] K
Rp = 1.58 [5.42] Re
a = 0.7787 [0.0419] AU
Ag = 23078.80 [159144.56] [0.15 σ]
Teffp = 3385 [5836] K [0.55 σ]

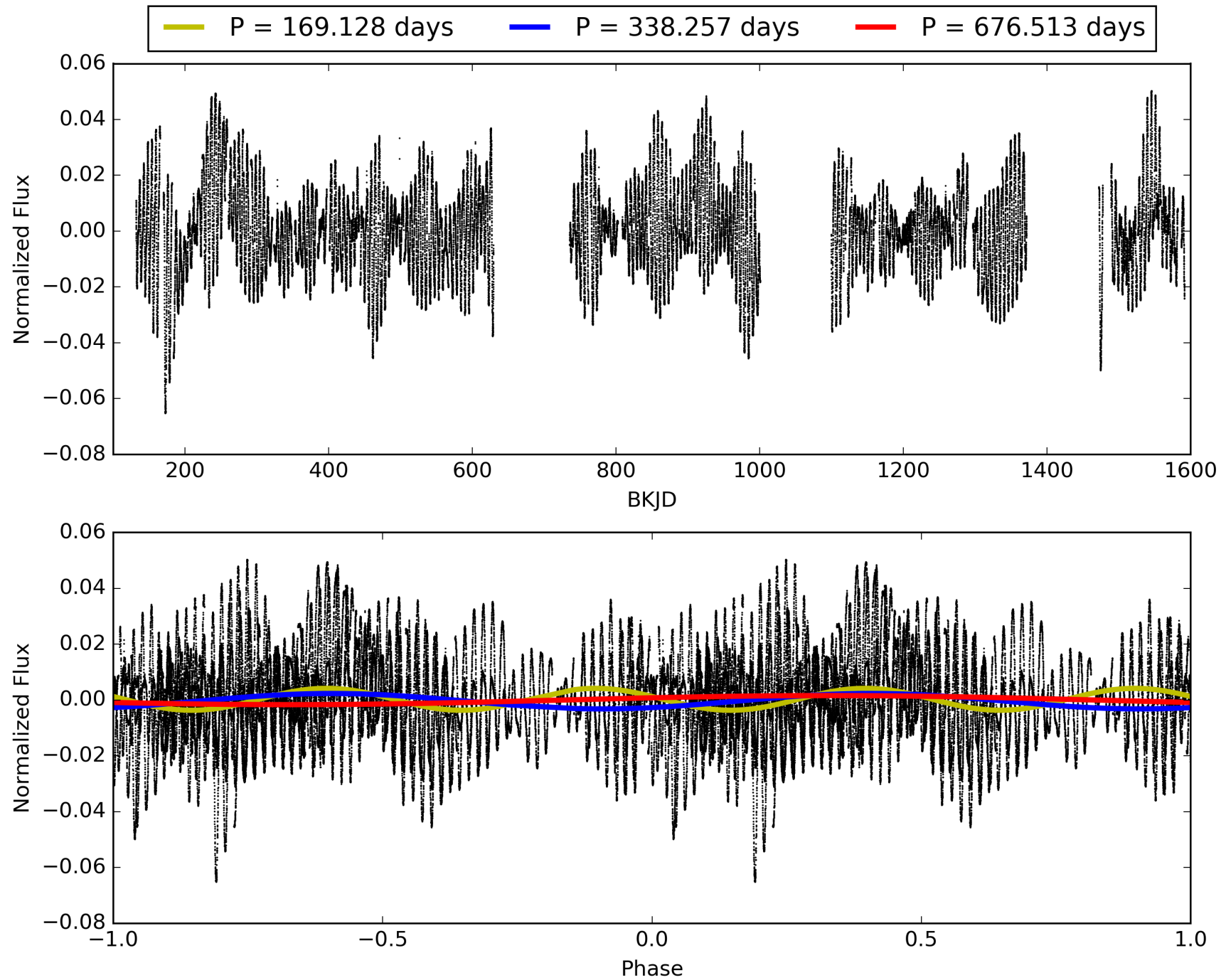
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [318.03 σ]
LongPeriod-sig: 100.0% [398.61 σ]
ModelChiSquare2-sig: 43.3%
ModelChiSquareGof-sig: 53.1%
Bootstrap-pfa: 3.10e-13
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 0.3698
Centroid-sig: 28.4%
Centroid-so: 0.930 arcsec [0.66 σ]
OotOffset-rm: 1.228 arcsec [2.26 σ]
KicOffset-rm: 1.237 arcsec [2.38 σ]
OotOffset-st: 0/0/2/1 [3]
KicOffset-st: 0/0/2/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010422030-01, PDC Light Curves

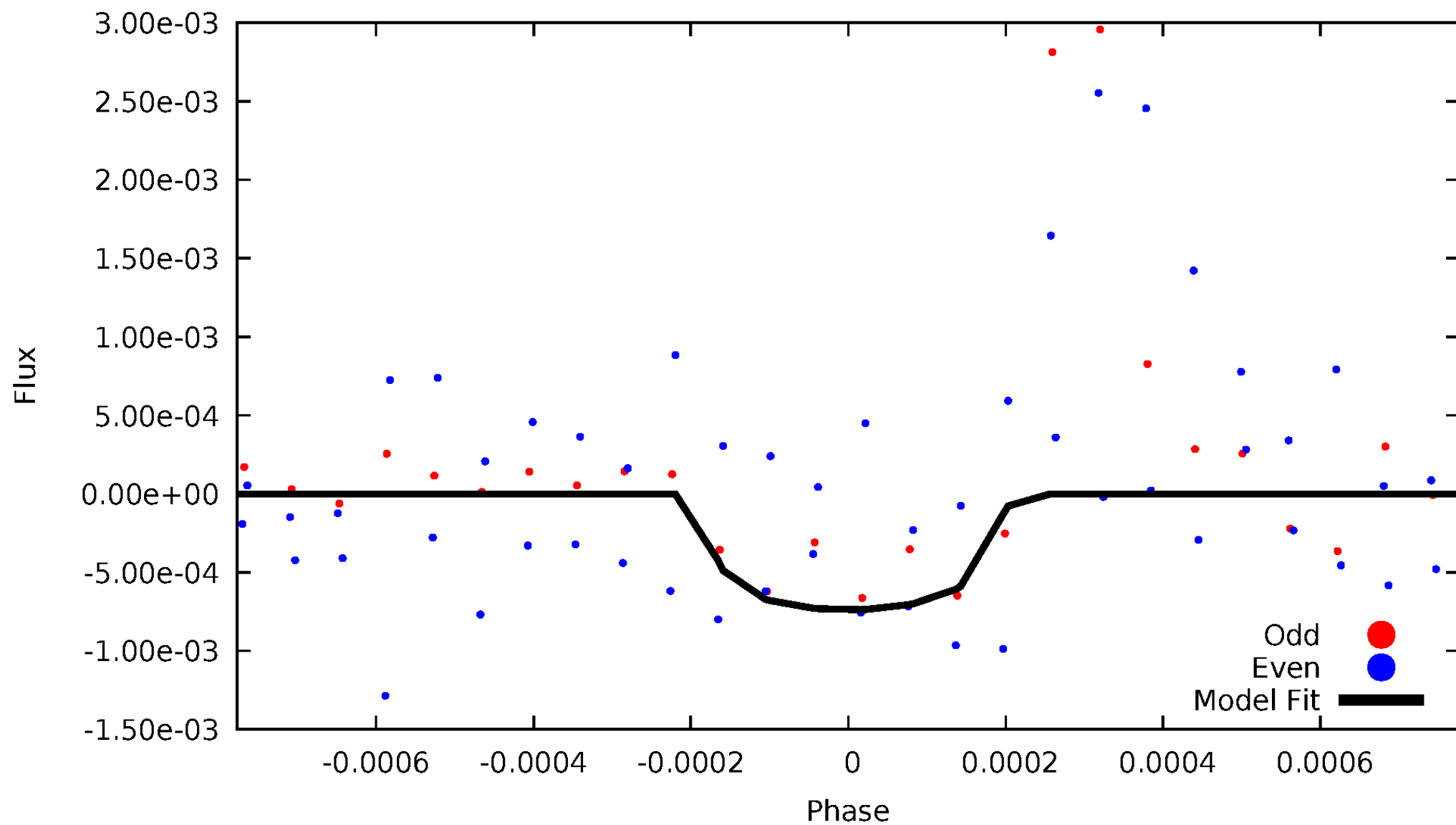


TCE 010422030-01



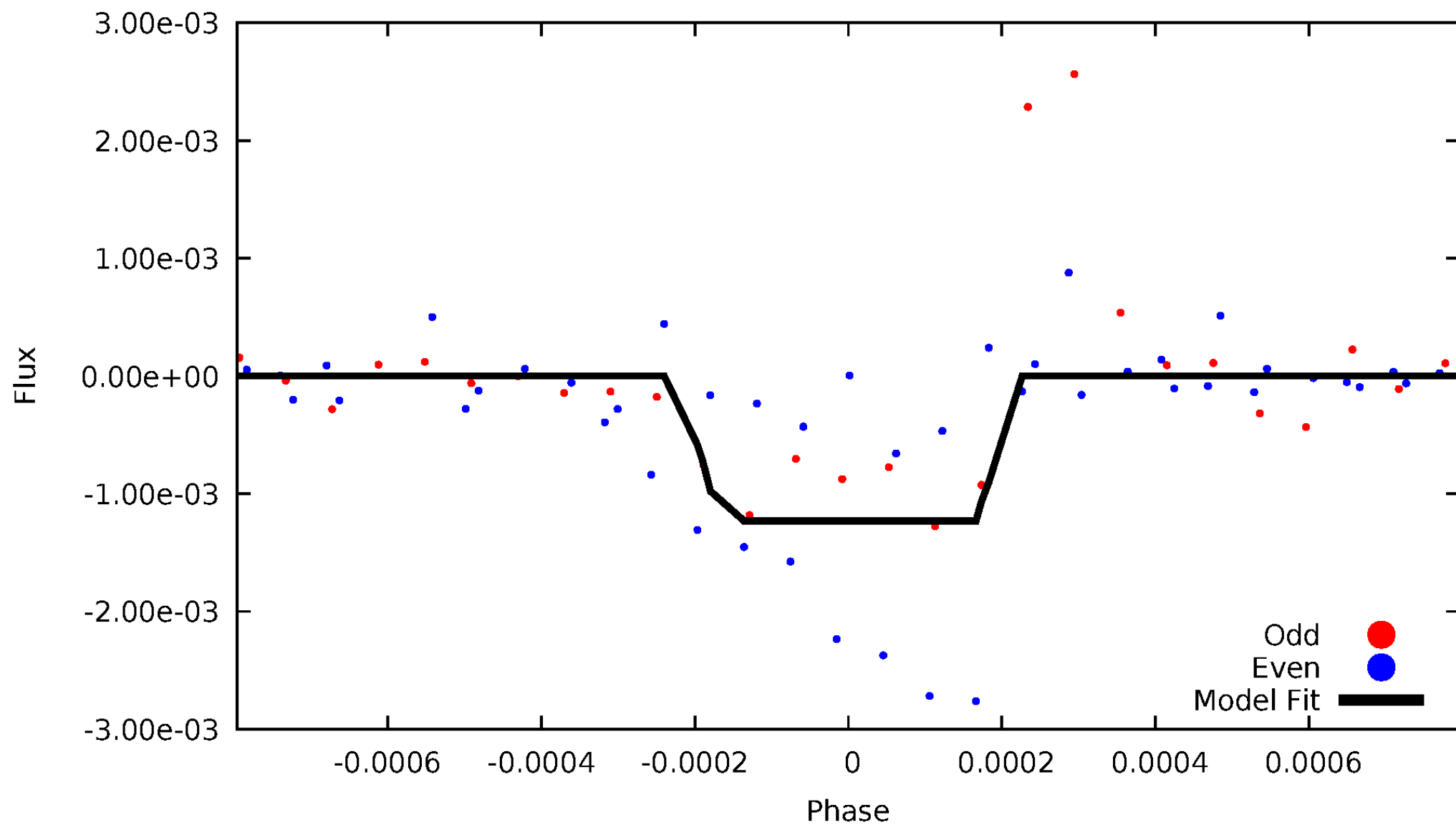
DV Odd/Even

TCE 010422030-01

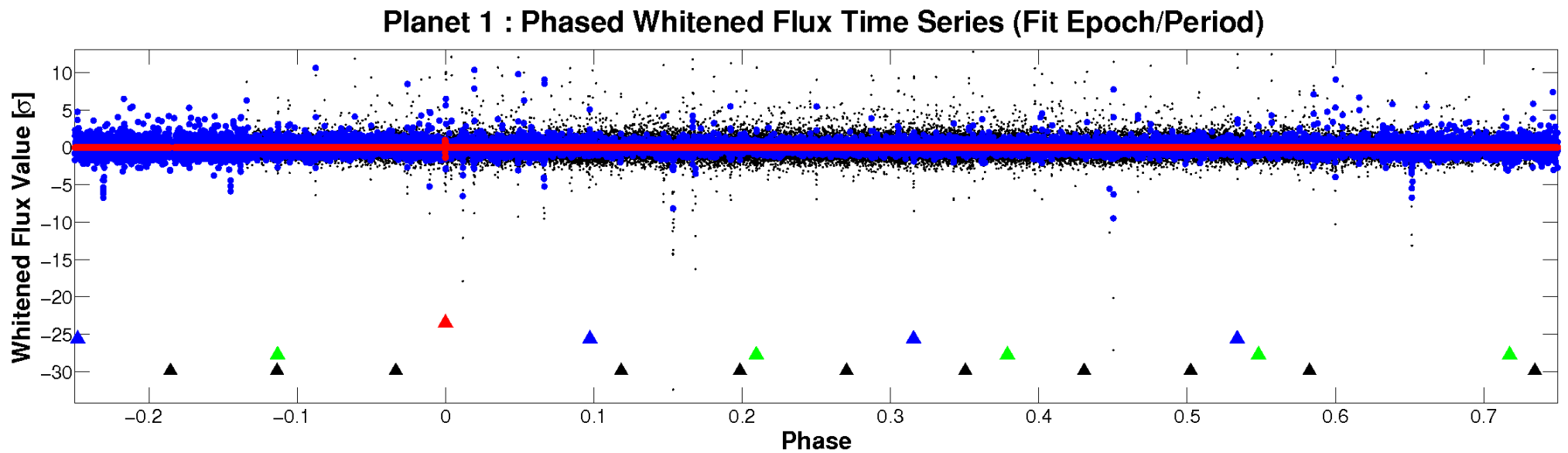
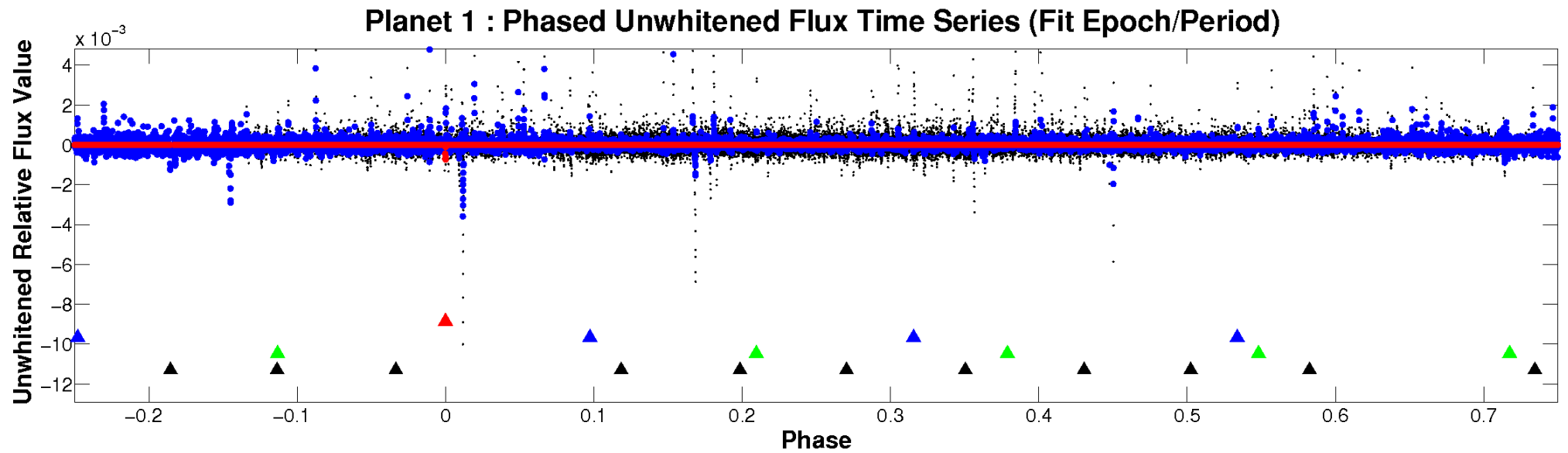


ALT Odd/Even

TCE 010422030-01

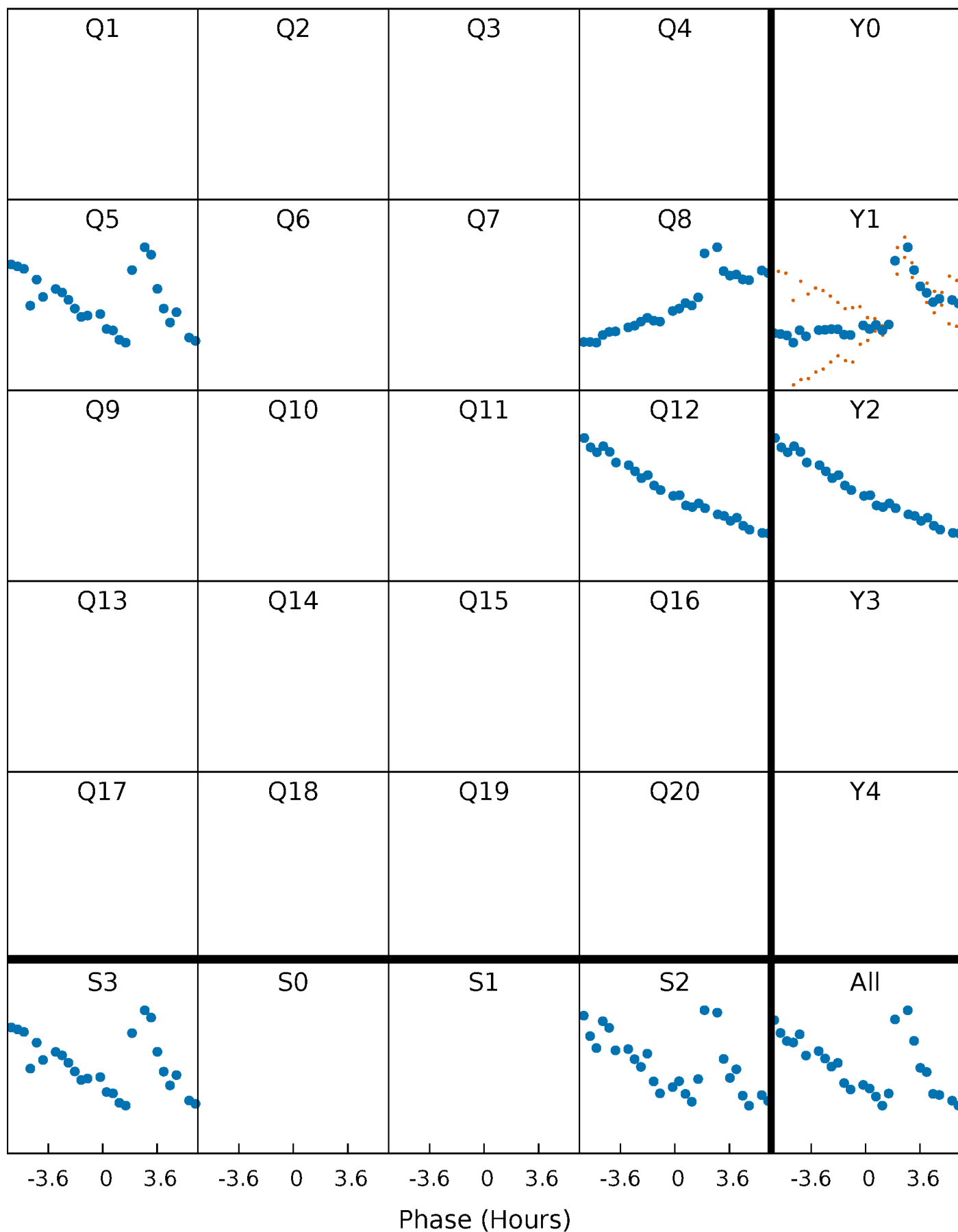


Non-Whitened Vs. Whitened Light Curve



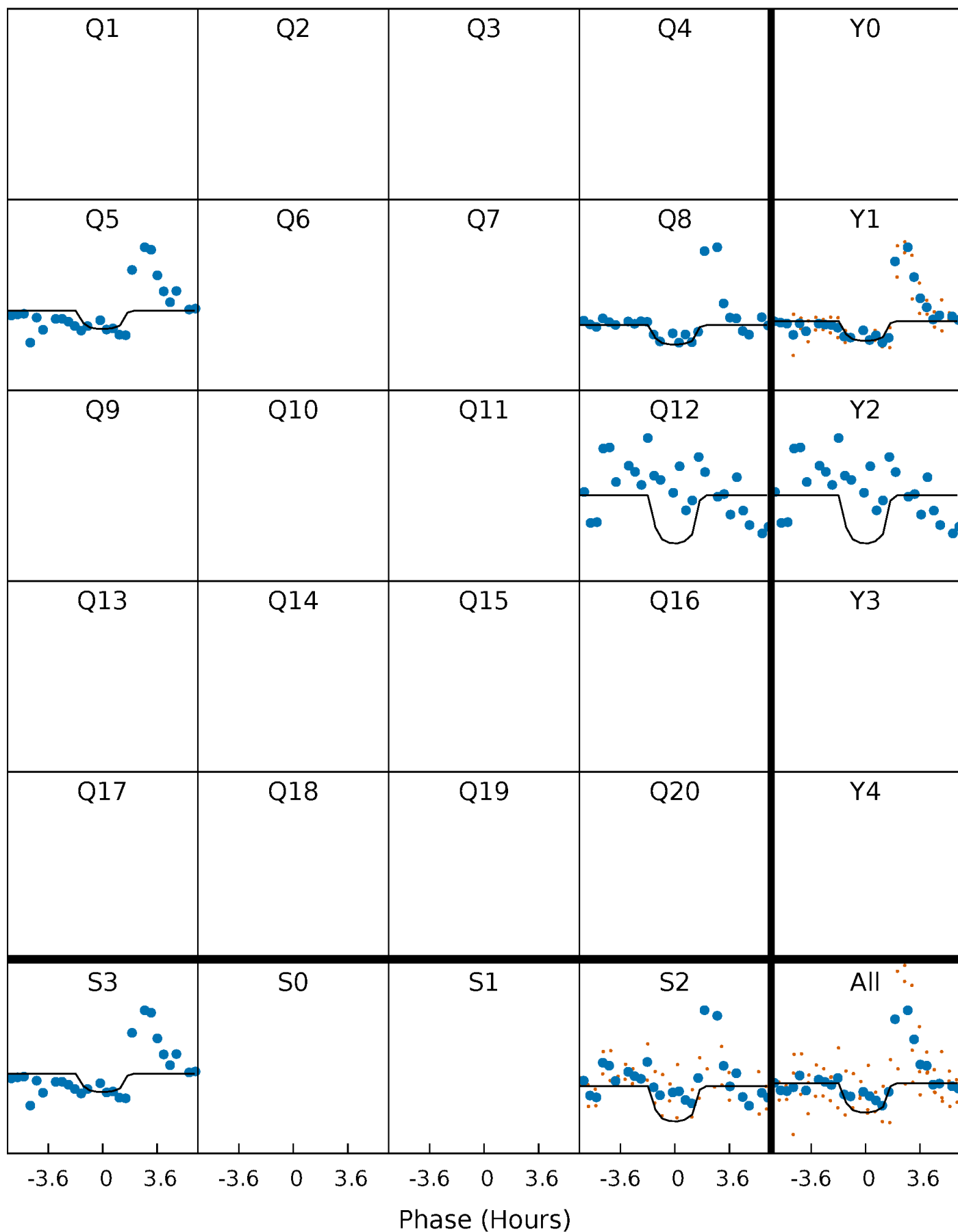
PDC Quarter-Phased Transit Curves

TCE 010422030-01 P=338.256690 Days $T_0=446.181942$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 010422030-01 $P=338.256690$ Days $T_0=446.181942$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

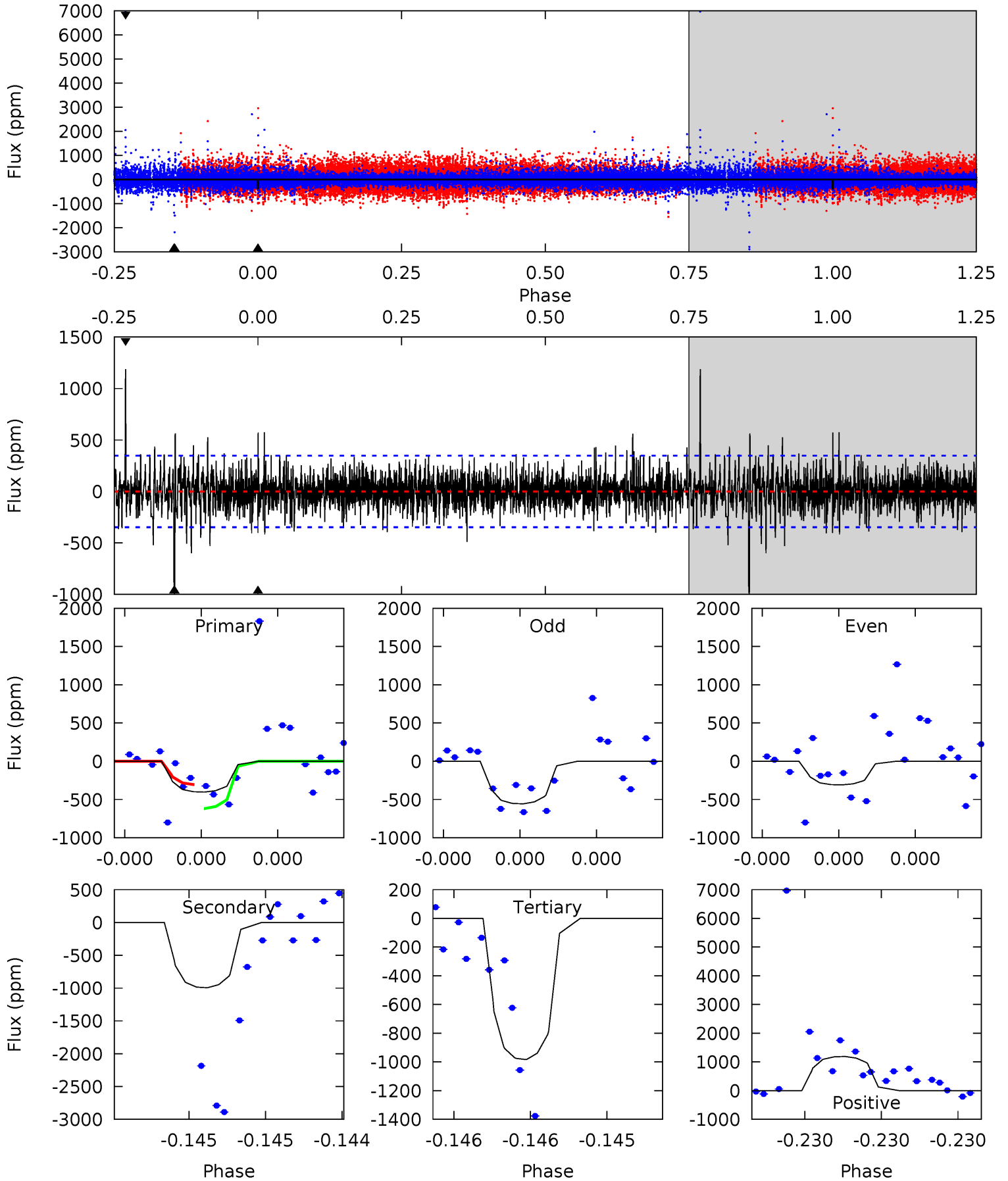
TCE 010422030-01 P=338.254907 Days $T_0=446.192355$ (BKJD)



DV Model-Shift Uniqueness Test

010422030-01, P = 338.256690 Days, E = 107.925252 Days

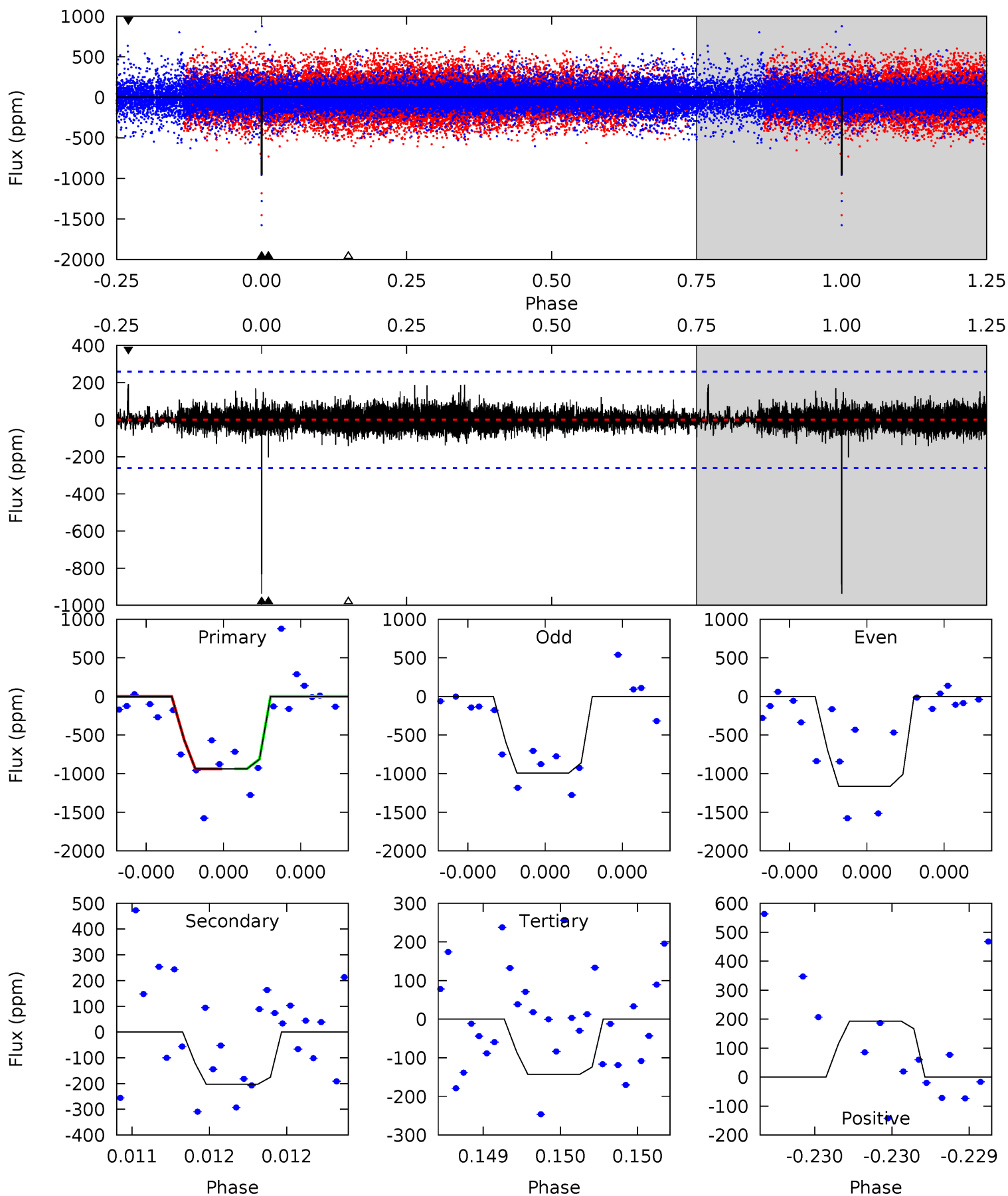
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.50	16.0	15.9	19.2	5.60	3.53	1.84	-9.39	-12.7	0.16	-3.12	1.75	0.73	0.54	2.44



Alt Model-Shift Uniqueness Test

010422030-01, P = 338.254907 Days, E = 107.937448 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.3	4.38	3.10	4.18	5.62	3.56	0.73	17.2	16.1	1.29	0.20	2.09	1.17	0.17	0.02



Stellar Parameters For KIC 010422030

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4822^{+144}_{-158}	$4.709^{+0.048}_{-0.024}$	$-1.340^{+0.300}_{-0.300}$	$0.543^{+0.029}_{-0.032}$	$0.550^{+0.036}_{-0.019}$	$4.830^{+0.943}_{-0.477}$
	+3%/-3%	+1%/-1%	+22%/-22%	+5%/-6%	+7%/-3%	+20%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010422030-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-994 ± 62	$4.13^{+4.22}_{-2.86}$	247^{+9}_{-9}	3594^{+2182}_{-682}	$20068^{+187952}_{-15244}$
Alt.	-202 ± 46	$4.49^{+4.89}_{-3.13}$	247^{+8}_{-9}	2755^{+1270}_{-432}	3174^{+34663}_{-2386}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

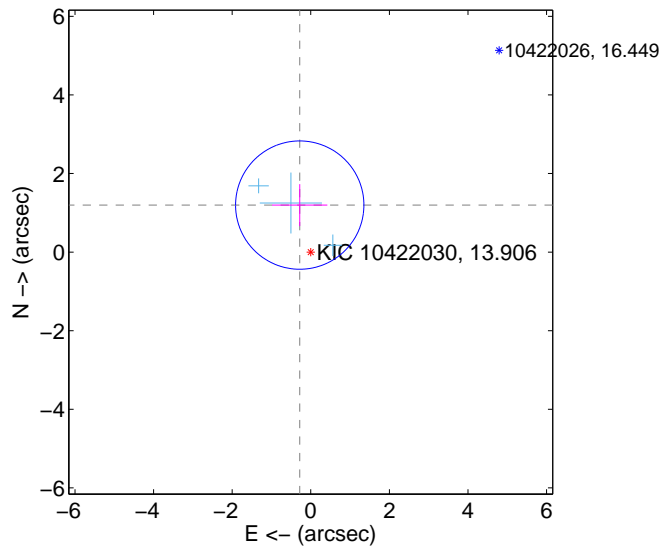
Supplemental centroid analysis for 010422030-01. Kepler magnitude: 13.91. Transit SNR 5.93

There are 3 quarters with good PRF difference image offsets

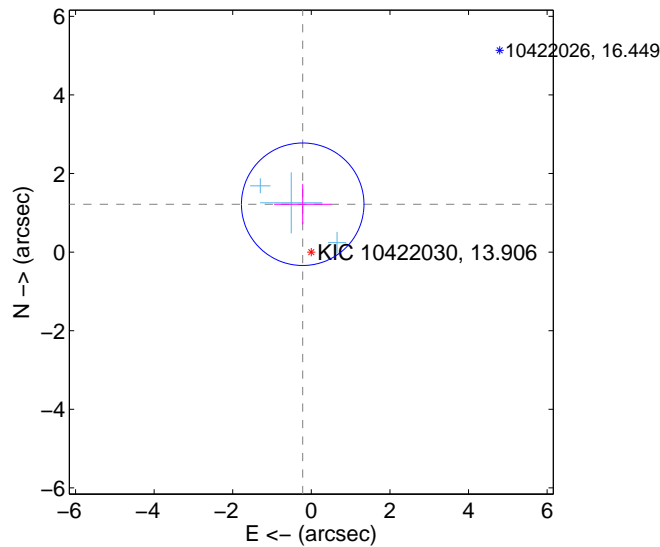
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.228 ± 0.544	2.26	0.281 ± 0.702	1.196 ± 0.534
PRF-fit source offset from KIC position	1.237 ± 0.520	2.38	0.220 ± 0.727	1.218 ± 0.511
photometric centroid source offset	0.93 ± 1.40	0.66	0.14 ± 1.50	-0.92 ± 1.40

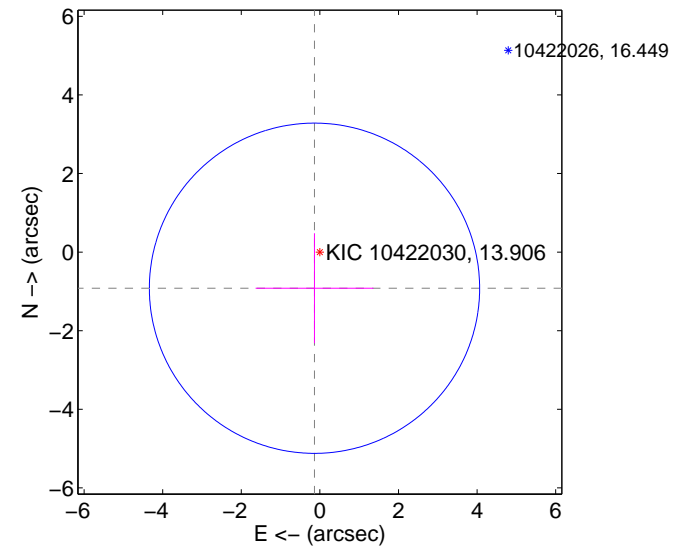
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

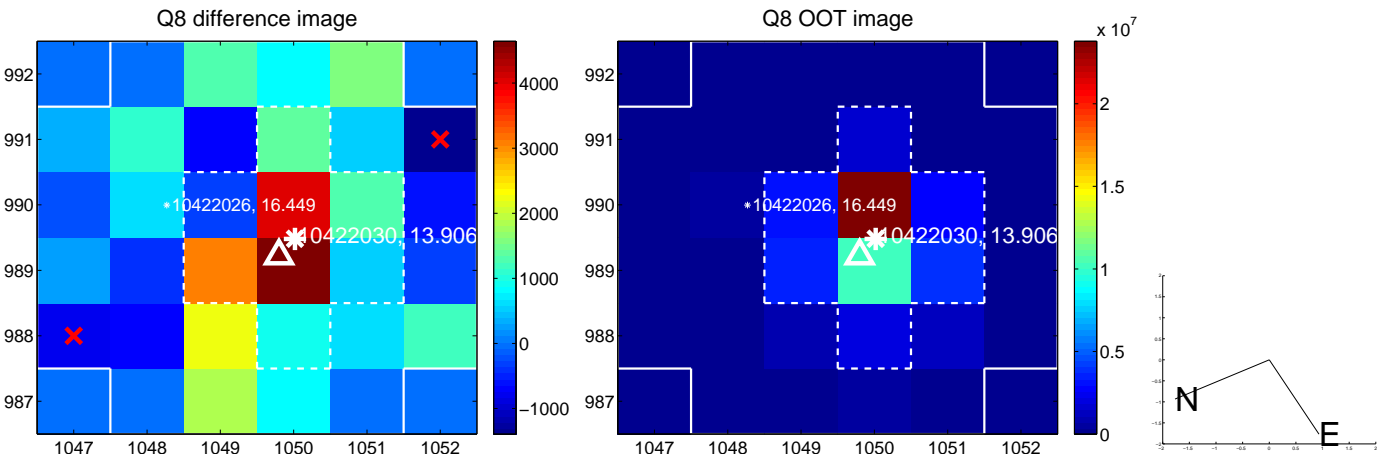
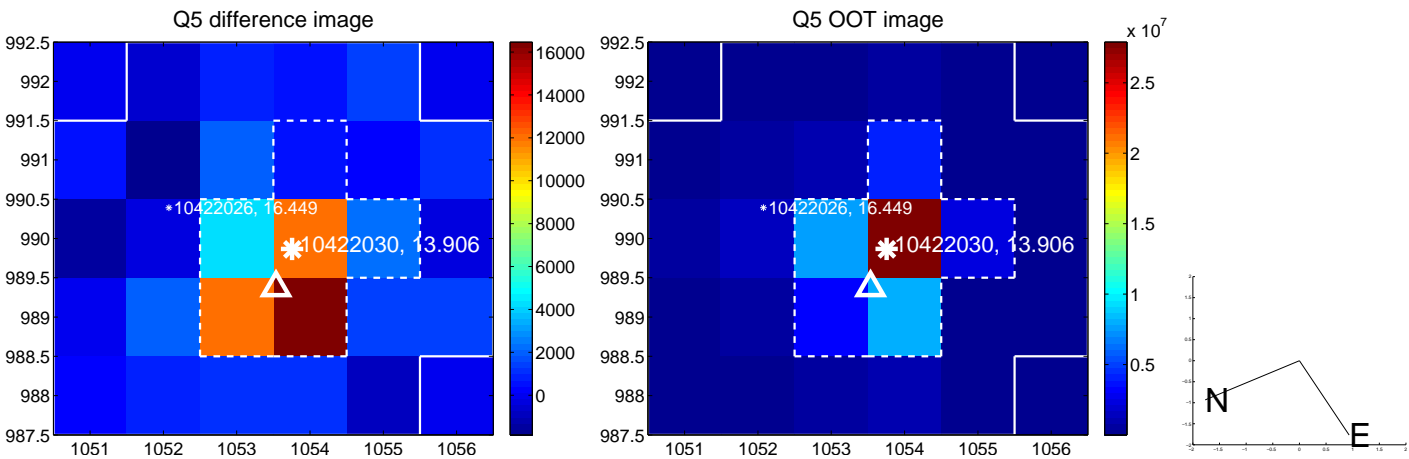


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

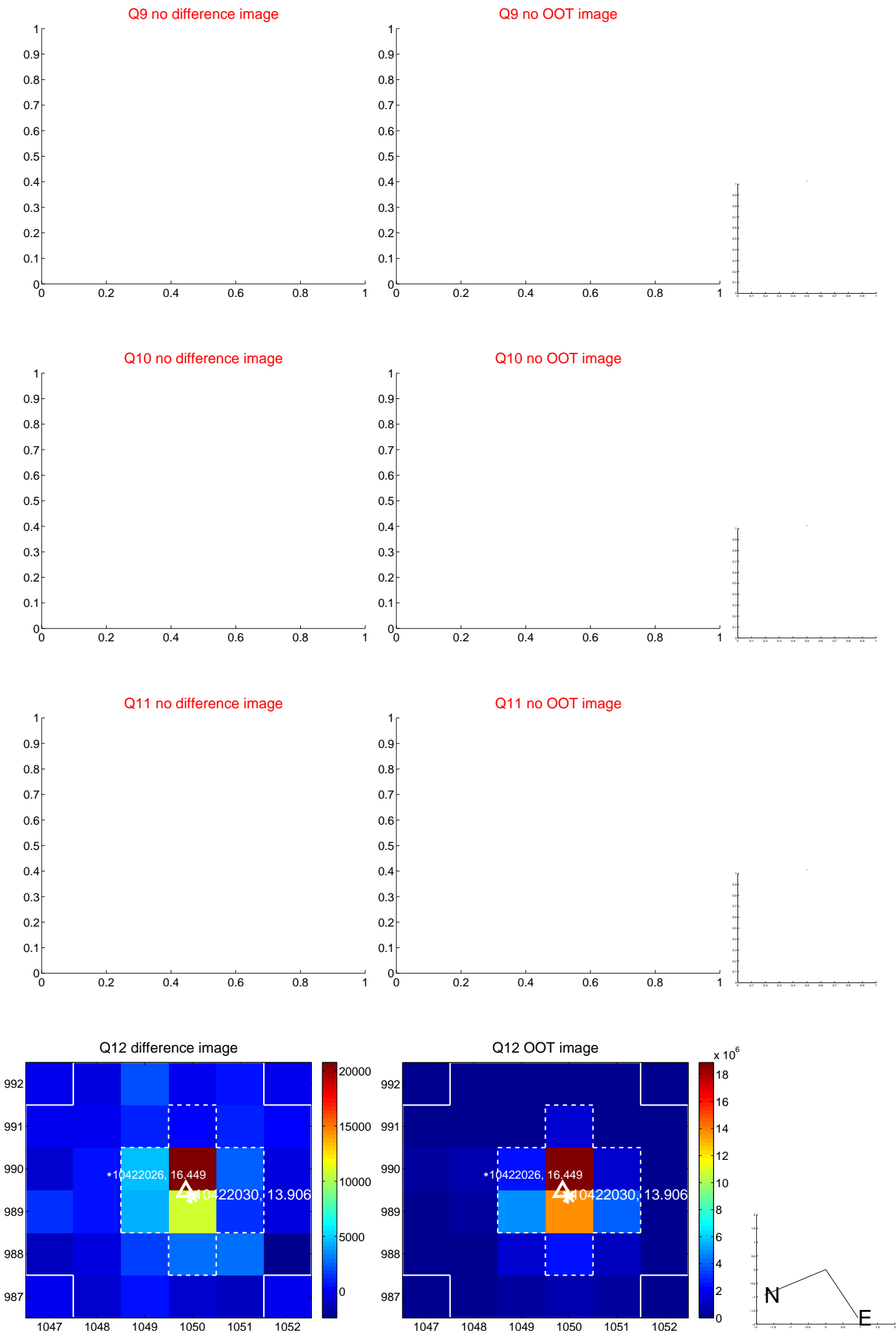
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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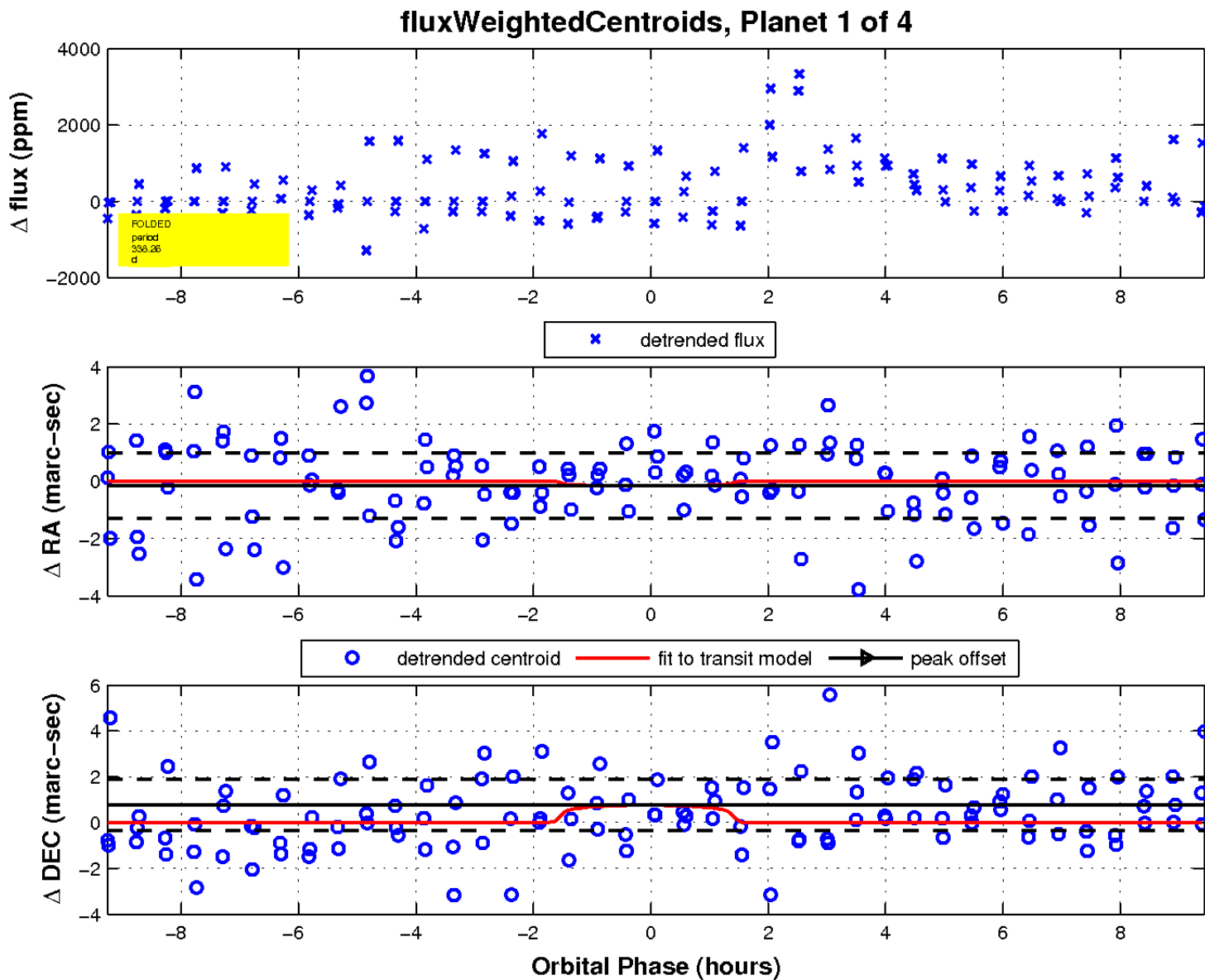
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

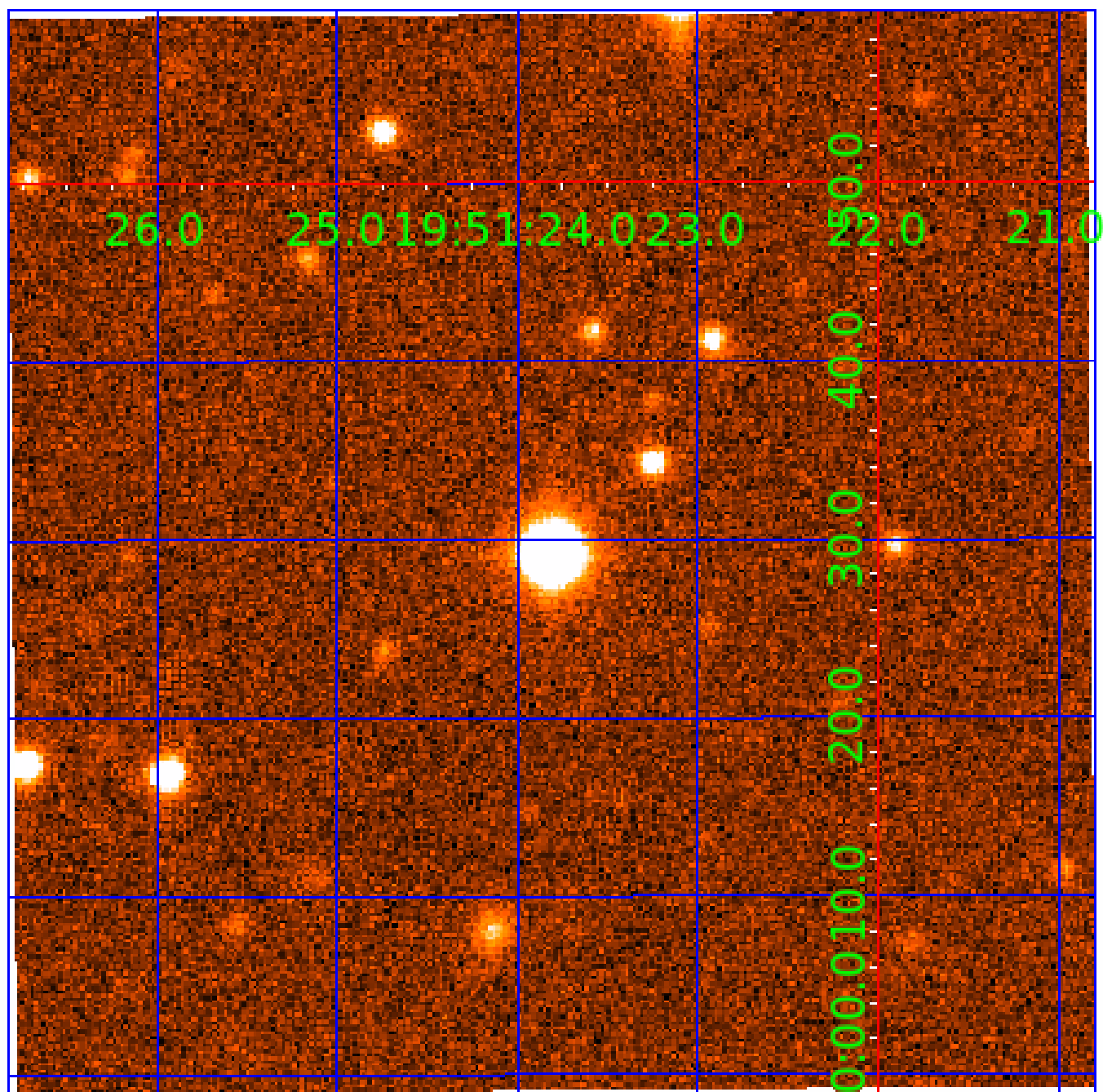


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010422030

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})
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Robovetter Results

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010422030-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-04	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

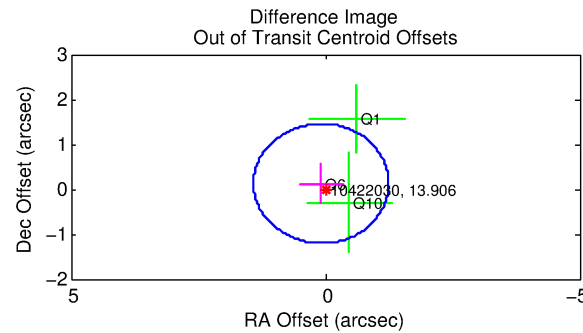
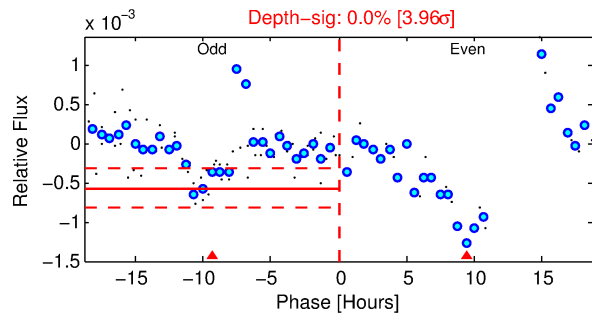
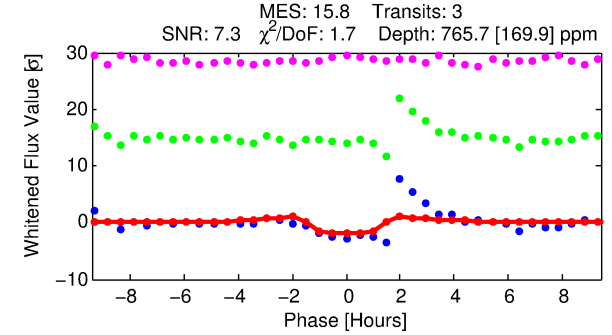
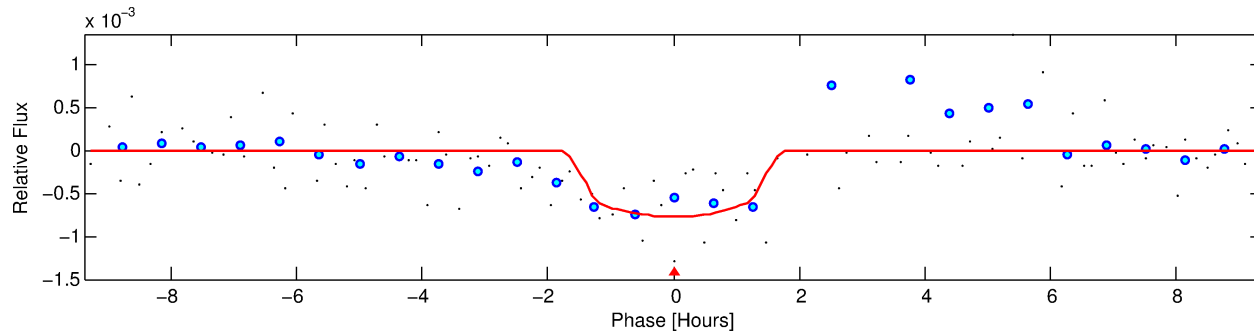
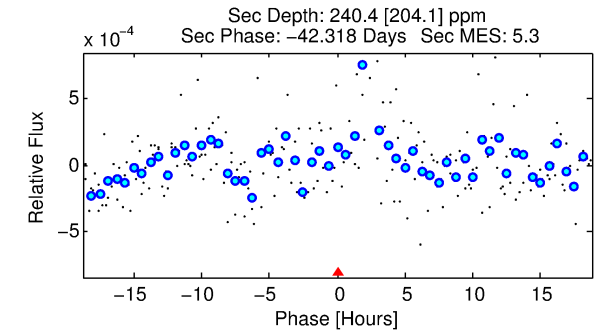
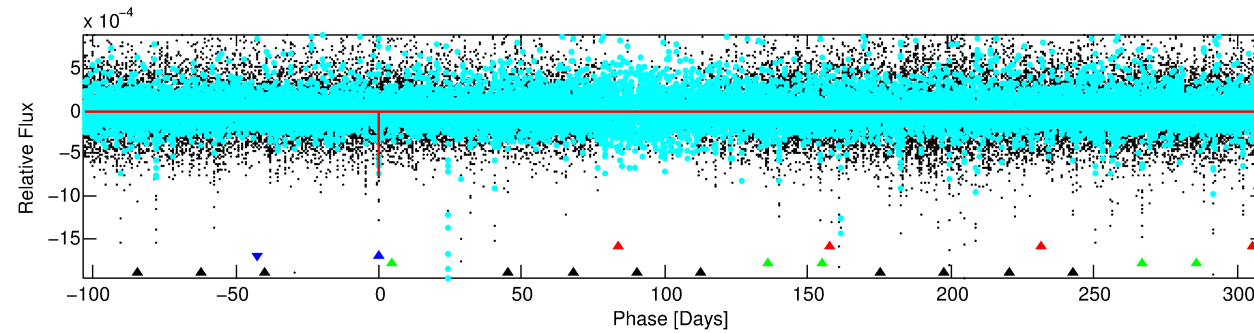
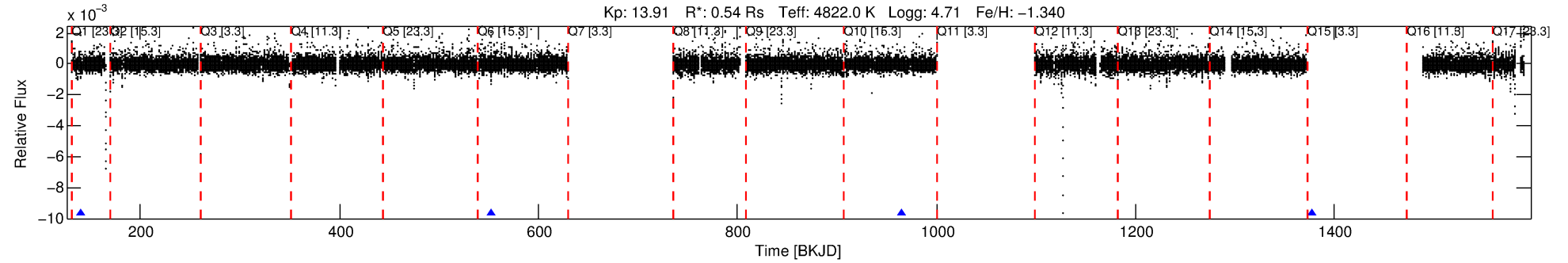
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010422030-02

No Significant Match Found

DV One-Page Summary

KIC: 10422030 Candidate: 2 of 4 Period: 412.073 d



DV Fit Results:

Period = 412.07273 [0.00668] d
Epoch = 140.8630 [0.0091] BKJD
Rp/R* = 0.0267 [0.0564]
a/R* = 793.42 [7043.05]
b = 0.66 [7.77]
Seff = 0.18 [0.03]
Teq = 166 [6] K
Rp = 1.58 [3.35] Re
a = 0.8883 [0.0478] AU
Ag = 41666.86 [179671.72] [0.23 σ]
Teffp = 3674 [3962] K [0.89 σ]

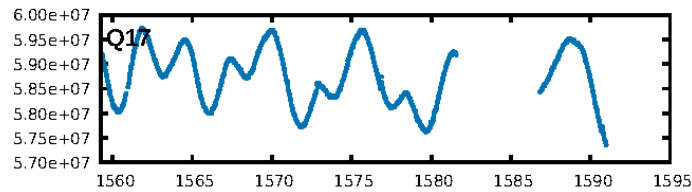
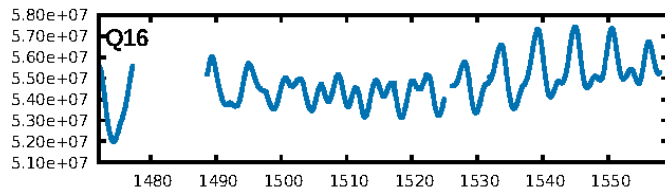
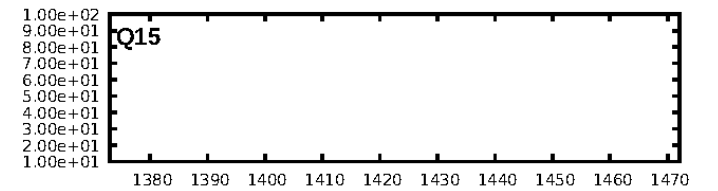
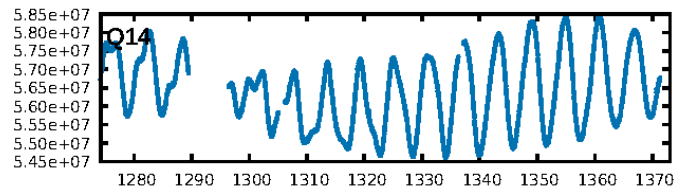
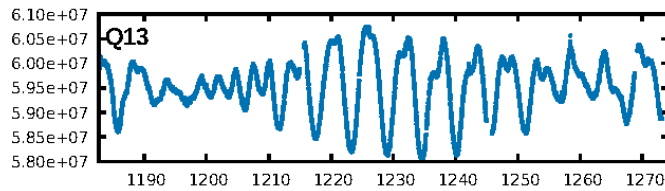
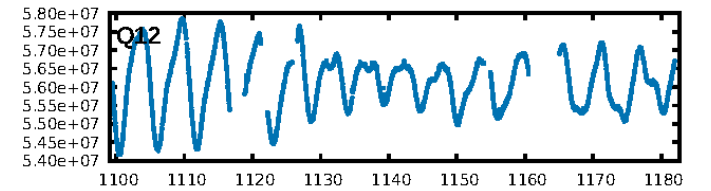
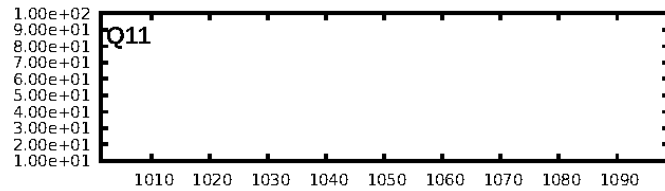
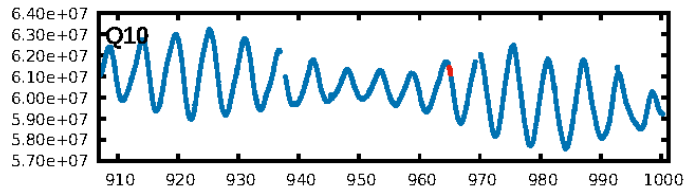
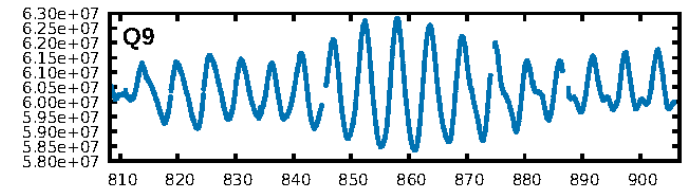
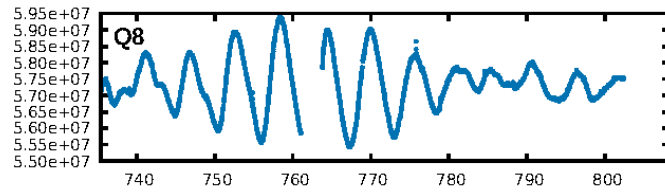
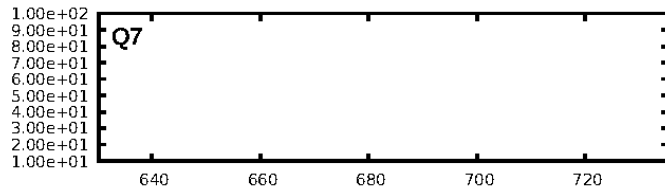
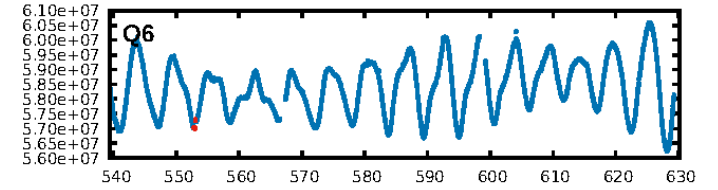
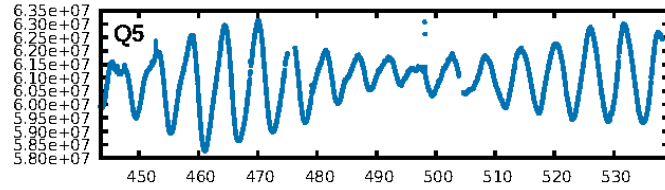
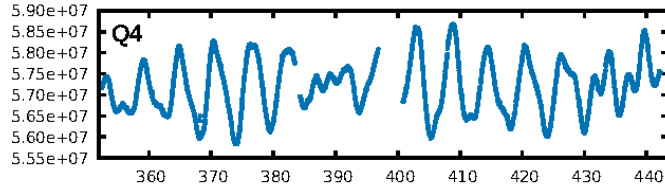
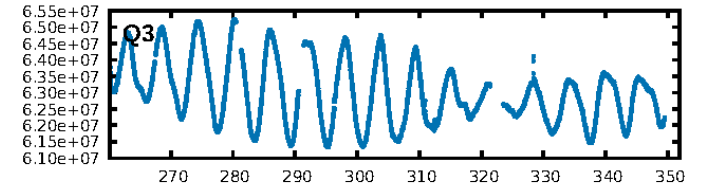
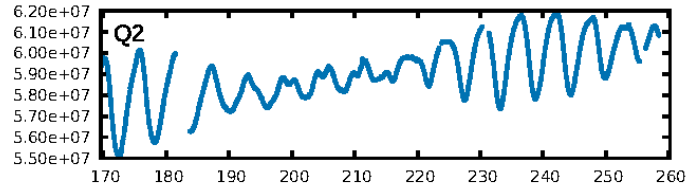
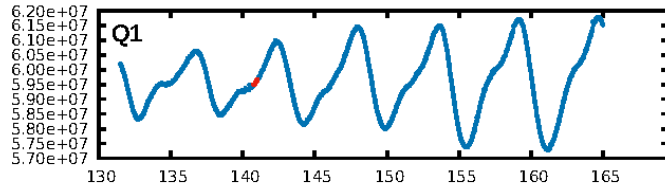
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [398.61 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 11.7%
Bootstrap-pfa: 5.09e-14
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.5895
Centroid-sig: 87.0%
Centroid-so: 0.490 arcsec [0.42 σ]
OotOffset-rm: 0.150 arcsec [0.34 σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-rm: 0.132 arcsec [0.31 σ]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

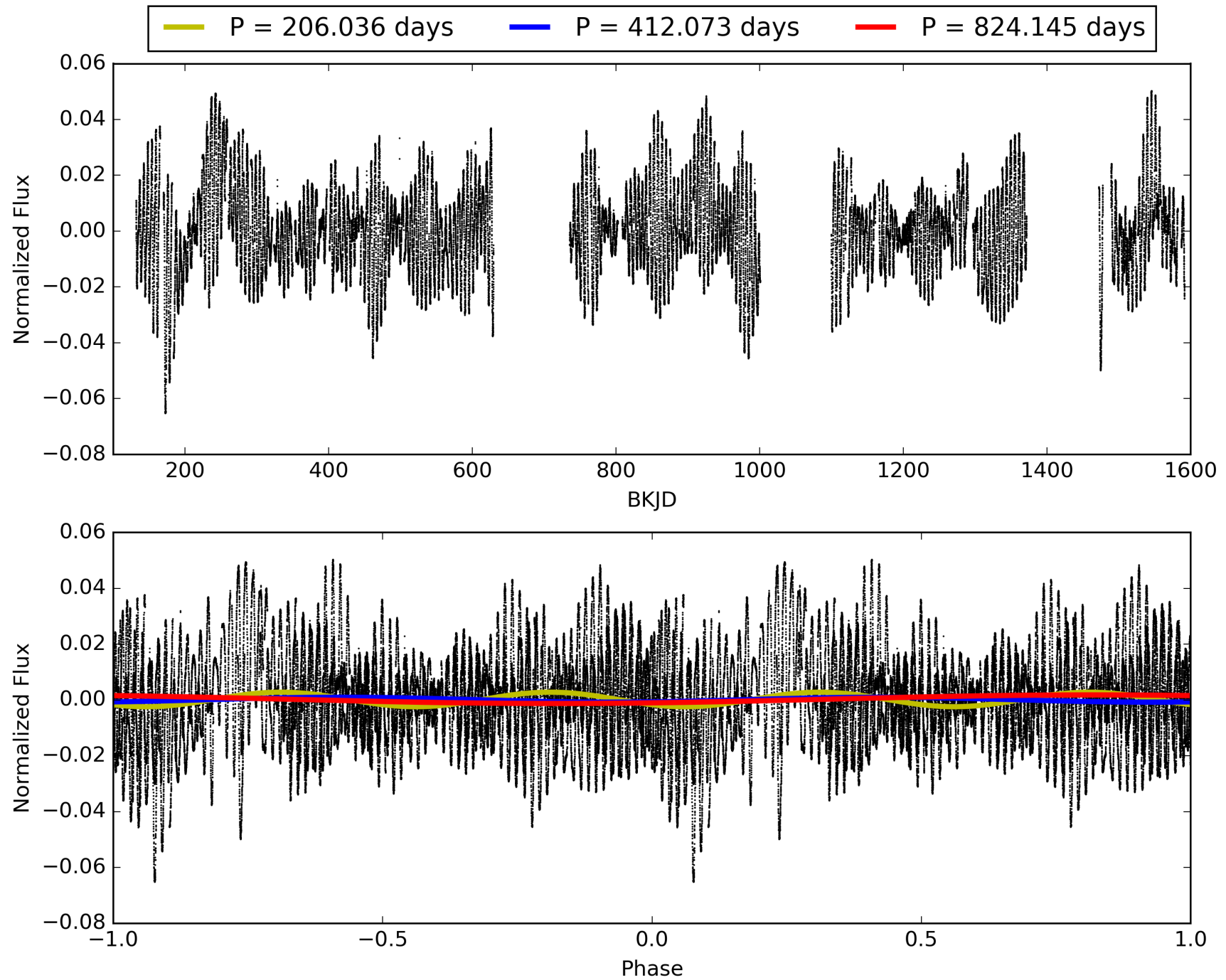
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:18:18 Z

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

TCE 010422030-02, PDC Light Curves

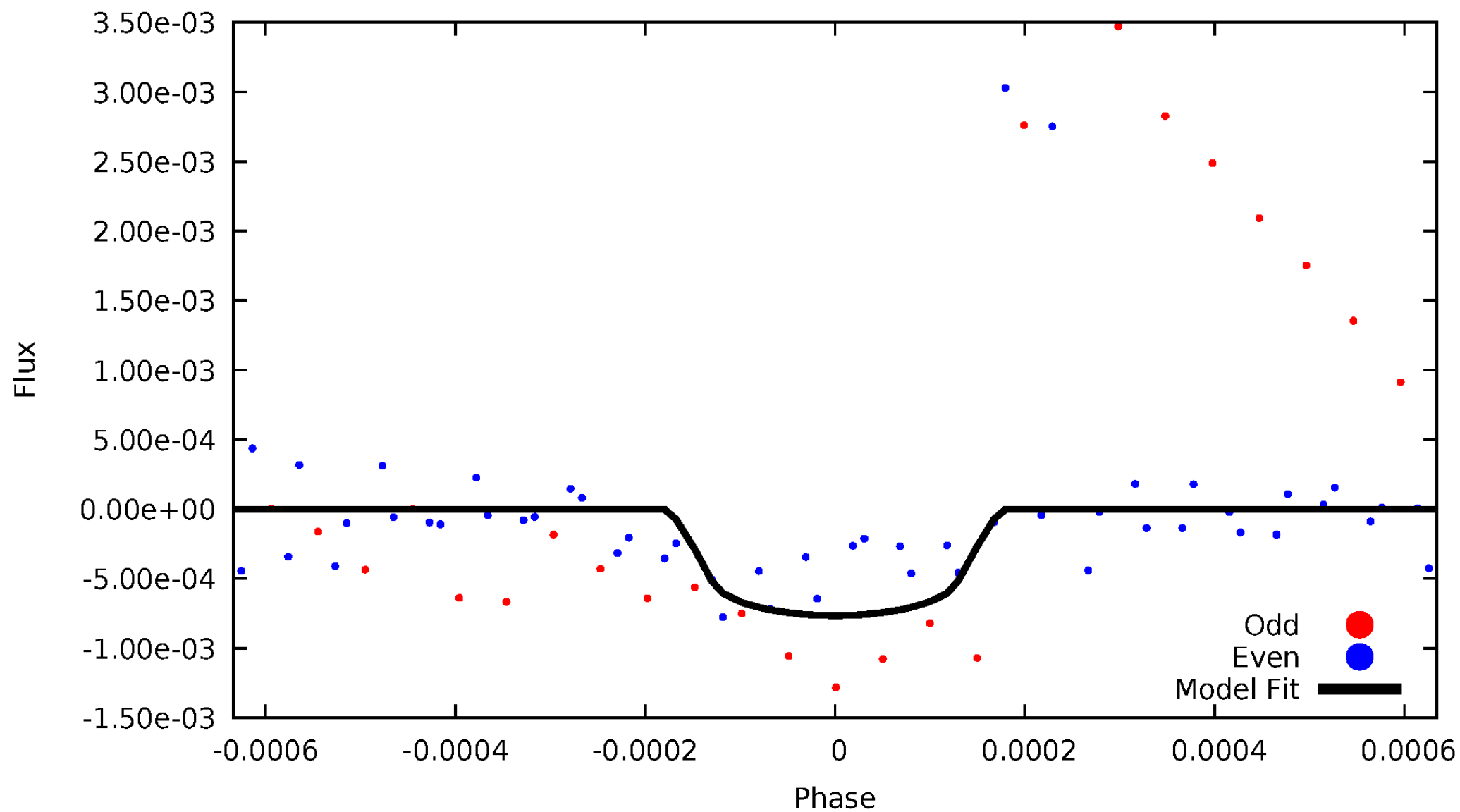


TCE 010422030-02



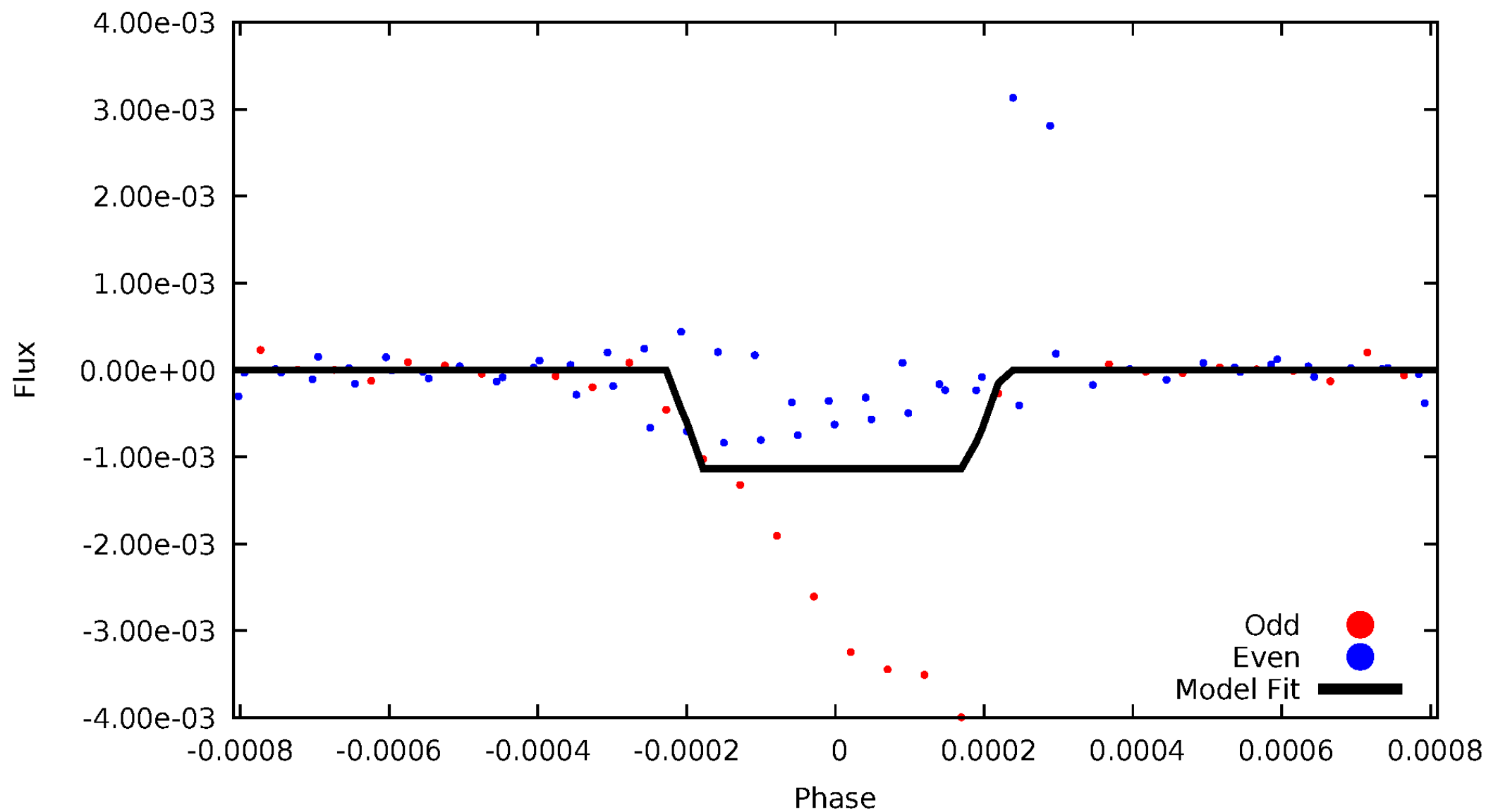
DV Odd/Even

TCE 010422030-02



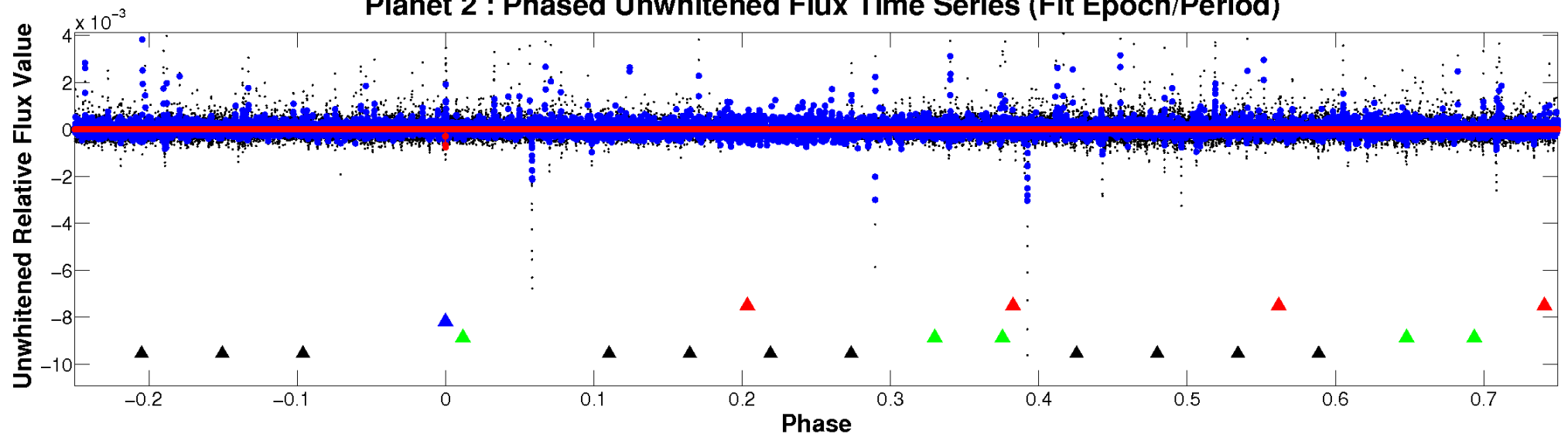
ALT Odd/Even

TCE 010422030-02

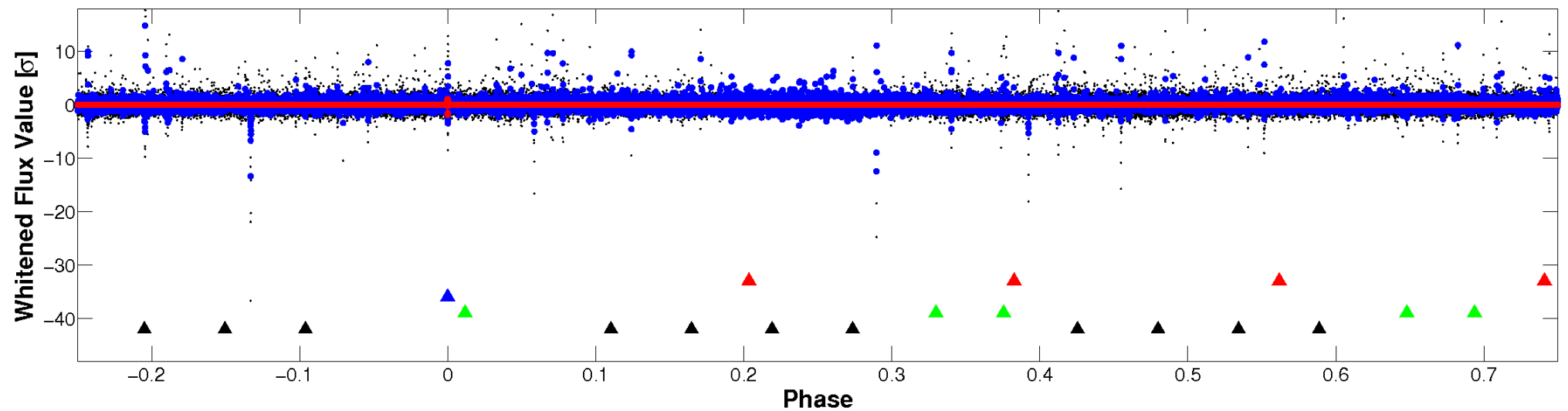


Non-Whitened Vs. Whitened Light Curve

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

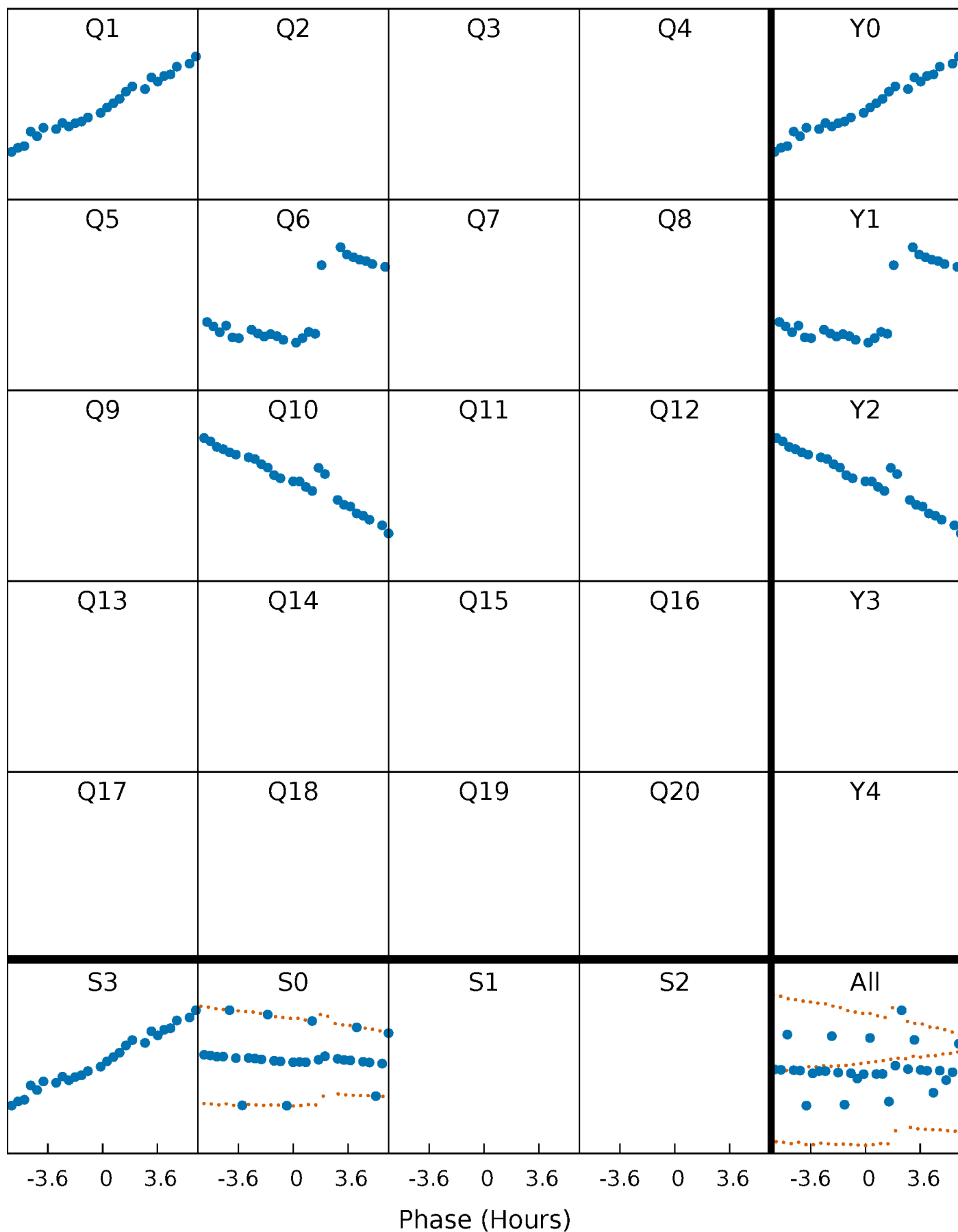


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



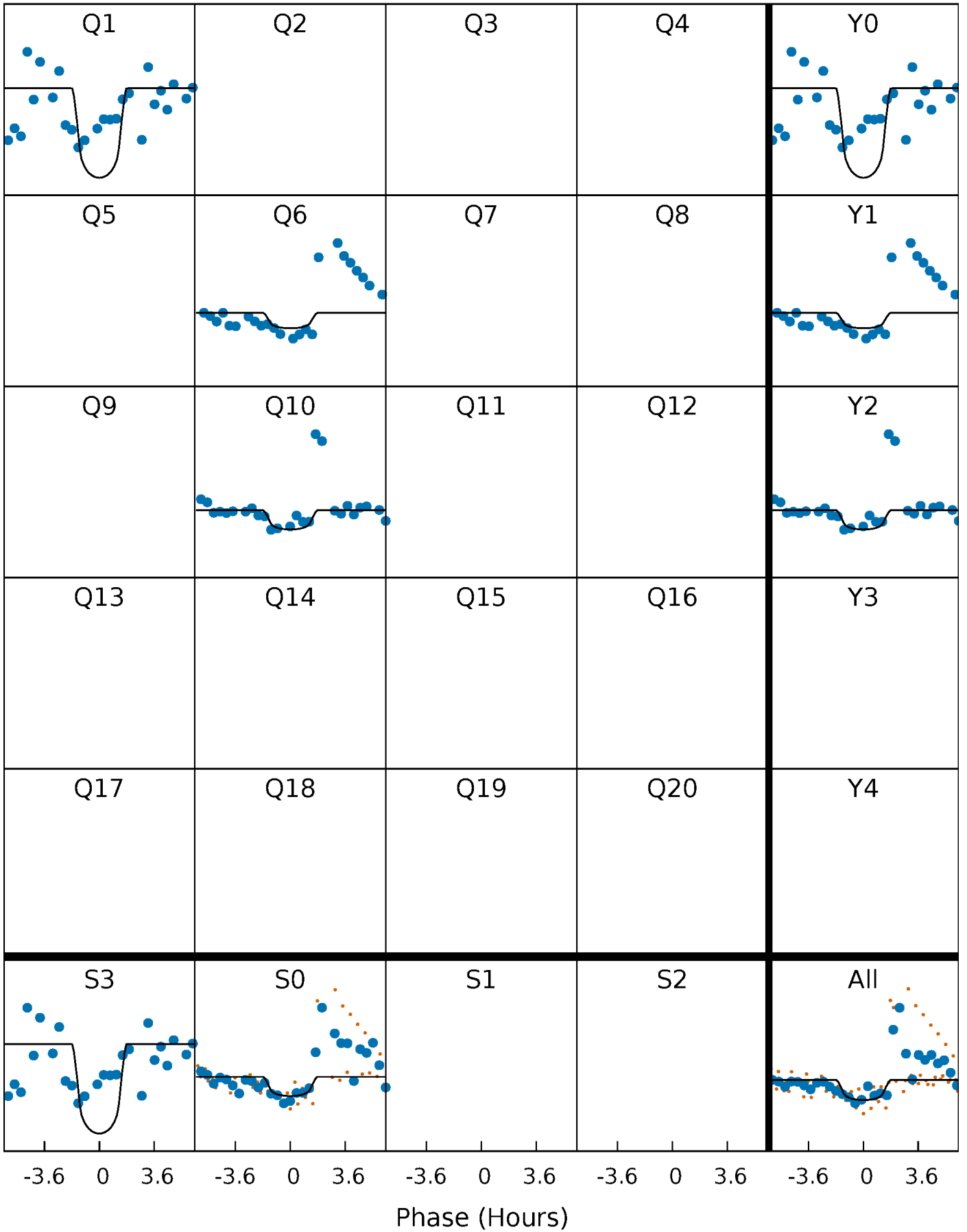
PDC Quarter-Phased Transit Curves

TCE 010422030-02 P=412.072734 Days $T_0=140.862952$ (BKJD)



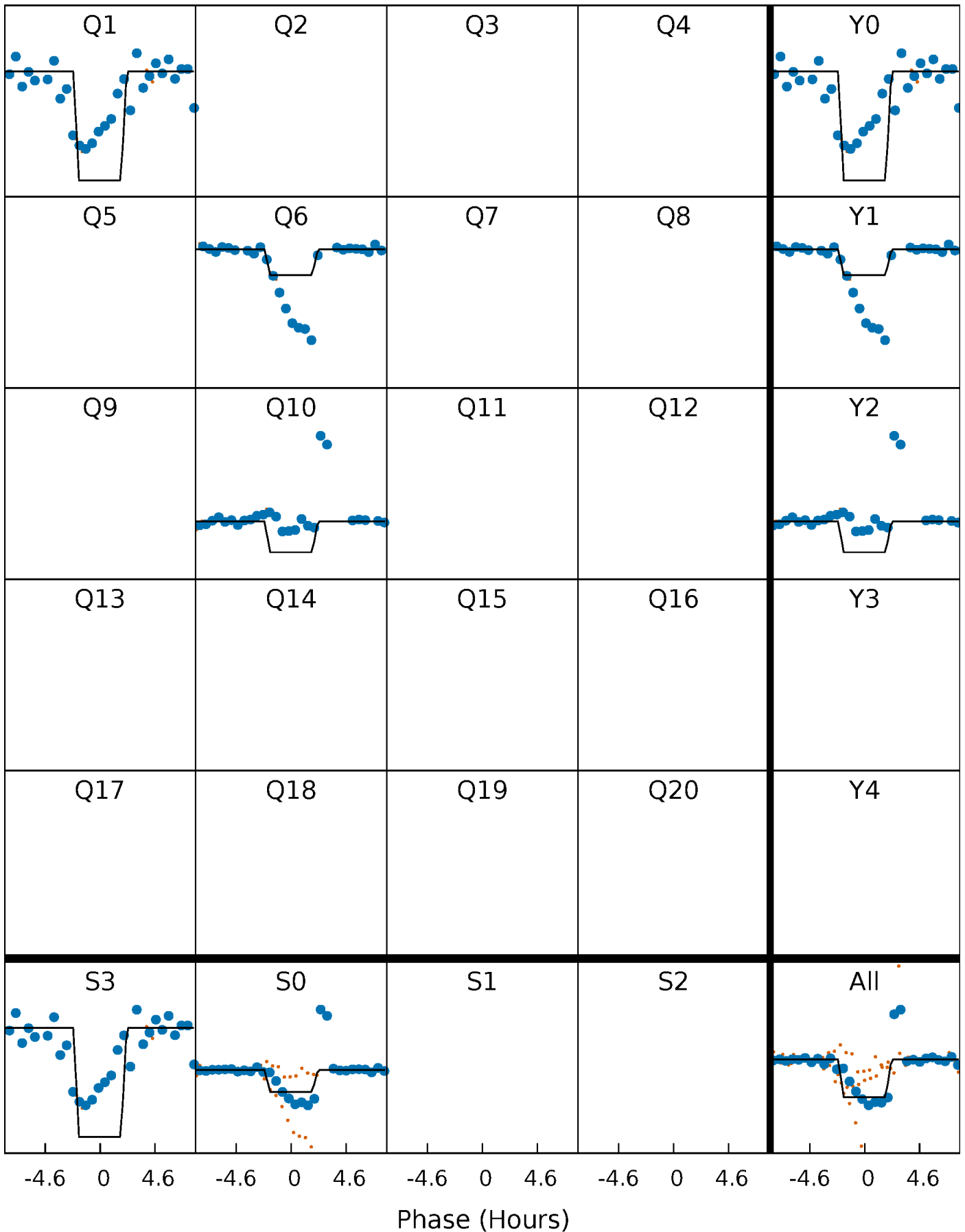
DV Quarter-Phased Transit Curves

TCE 010422030-02 $P=412.072734$ Days $T_0=140.862952$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

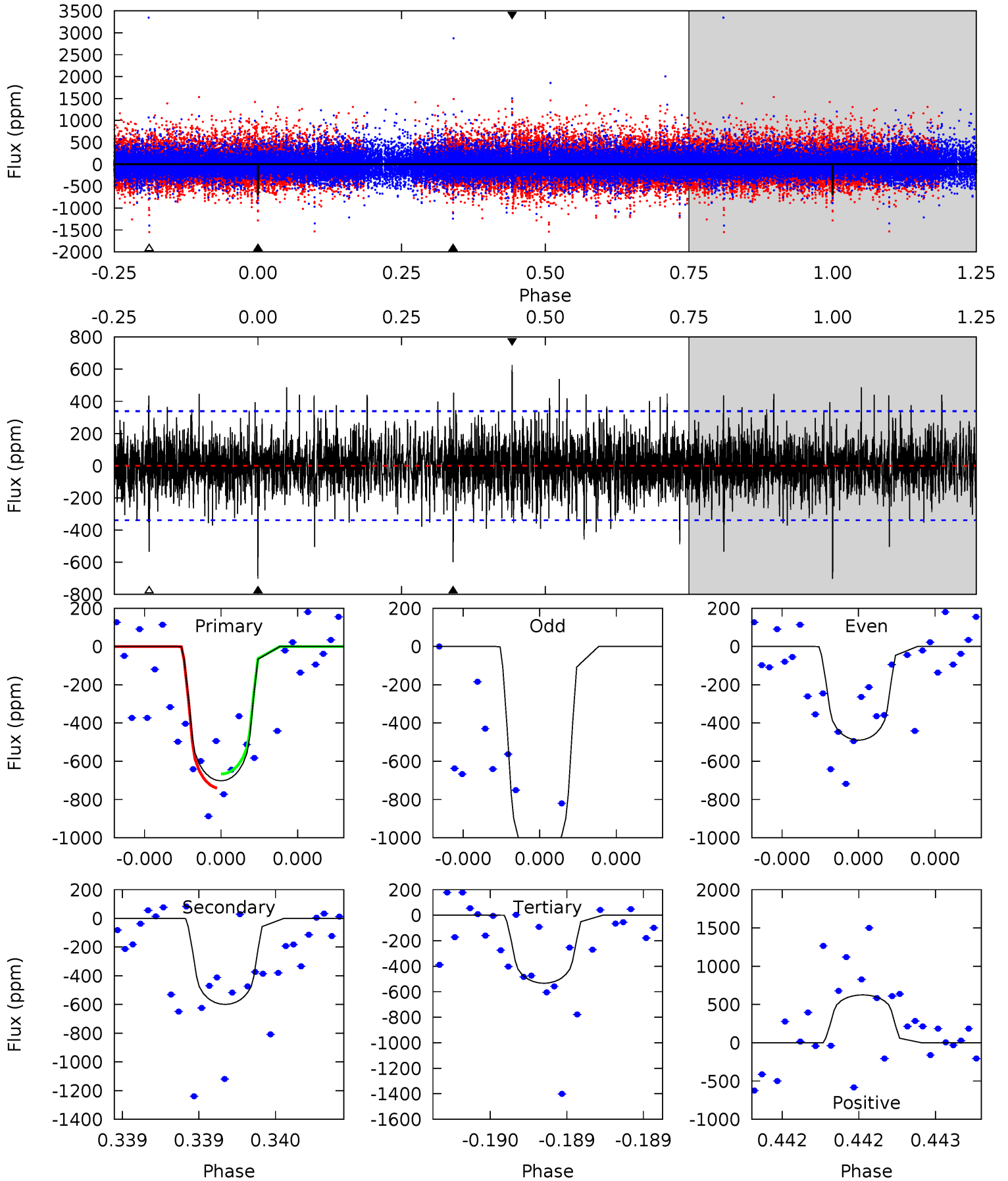
TCE 010422030-02 P=412.056360 Days $T_0=140.871179$ (BKJD)



DV Model-Shift Uniqueness Test

010422030-02, P = 412.072734 Days, E = 140.862952 Days

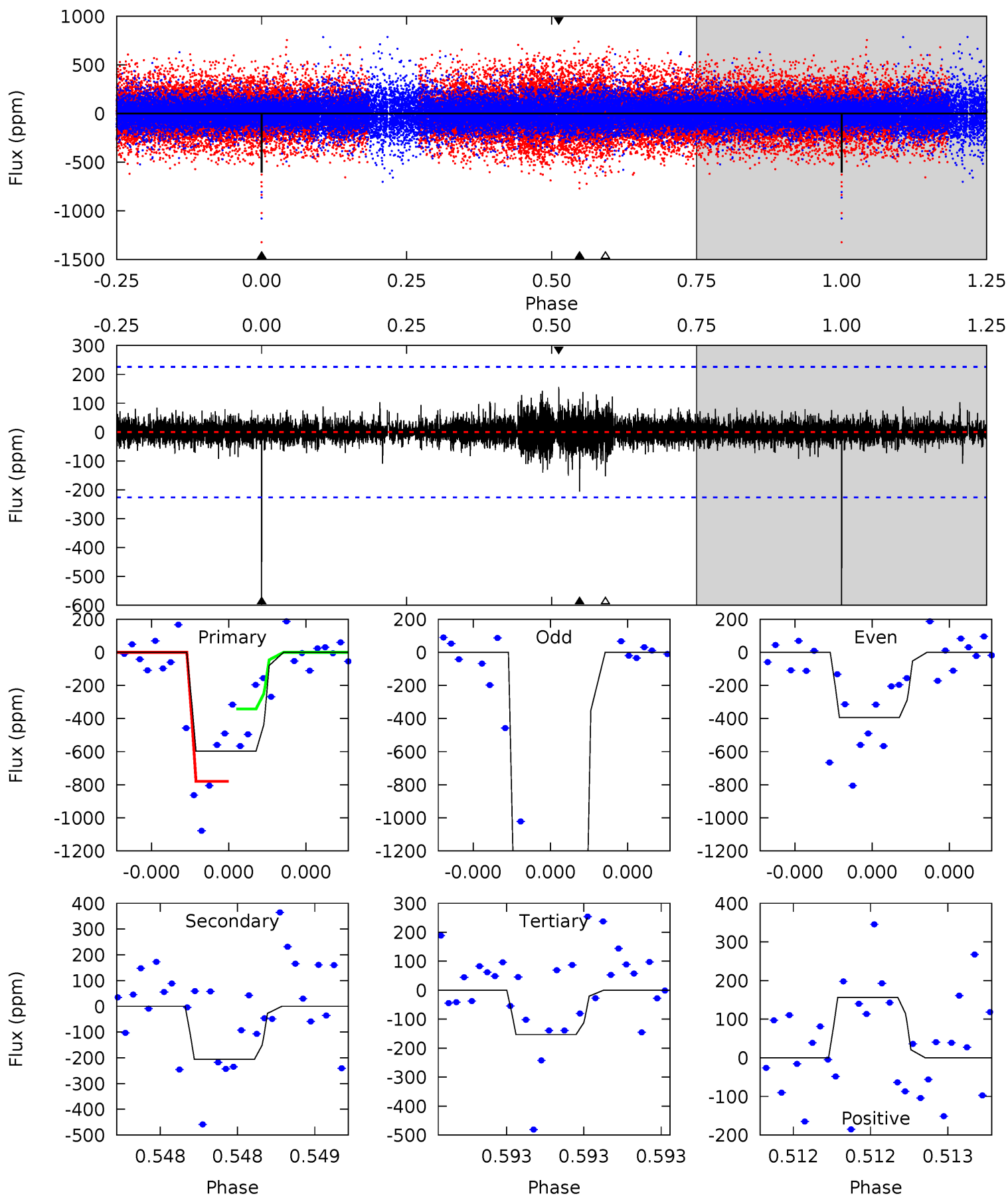
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	9.96	8.87	10.4	5.64	3.58	1.84	2.81	1.28	1.10	-0.43	4.63	1.17	0.47	0.61



Alt Model-Shift Uniqueness Test

010422030-02, P = 412.056360 Days, E = 140.871179 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	5.11	3.79	3.88	5.60	3.53	0.64	11.0	10.9	1.31	1.23	32.4	1.80	0.21	5.45



Stellar Parameters For KIC 010422030

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4822^{+144}_{-158}	$4.709^{+0.048}_{-0.024}$	$-1.340^{+0.300}_{-0.300}$	$0.543^{+0.029}_{-0.032}$	$0.550^{+0.036}_{-0.019}$	$4.830^{+0.943}_{-0.477}$
	+3%/-3%	+1%/-1%	+22%/-22%	+5%/-6%	+7%/-3%	+20%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010422030-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-599 ± 60	$2.87^{+2.86}_{-1.98}$	232^{+7}_{-9}	3737^{+2278}_{-716}	$32079^{+303926}_{-24156}$
Alt.	-206 ± 40	$3.10^{+2.65}_{-2.09}$	231^{+8}_{-8}	3102^{+1434}_{-518}	9350^{+79651}_{-6766}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

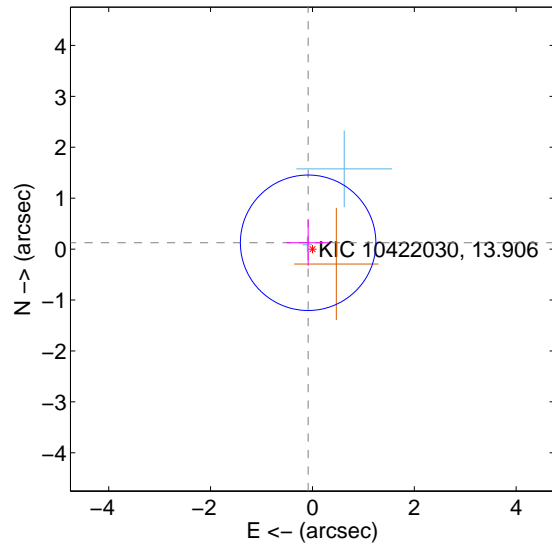
Supplemental centroid analysis for 010422030-02. Kepler magnitude: 13.91. Transit SNR 7.26

There are 2 quarters with good PRF difference image offsets

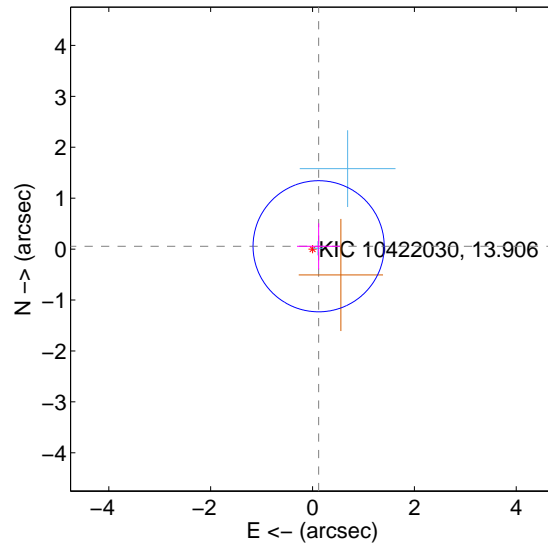
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.150 ± 0.443	0.34	0.085 ± 0.424	0.124 ± 0.452
PRF-fit source offset from KIC position	0.132 ± 0.429	0.31	-0.120 ± 0.424	0.056 ± 0.452
photometric centroid source offset	0.49 ± 1.16	0.42	-0.28 ± 1.01	0.40 ± 1.22

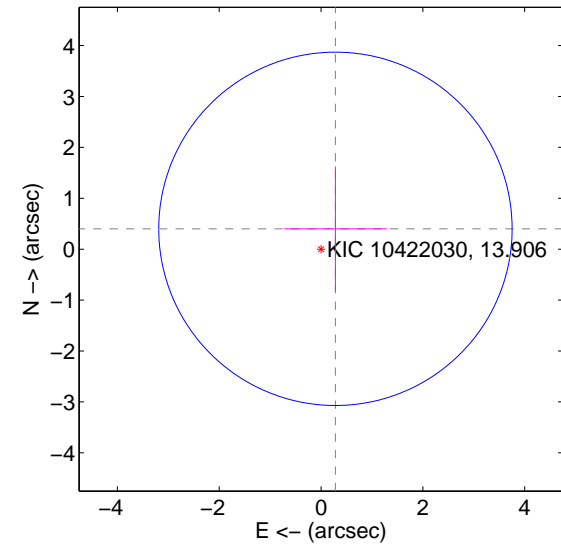
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

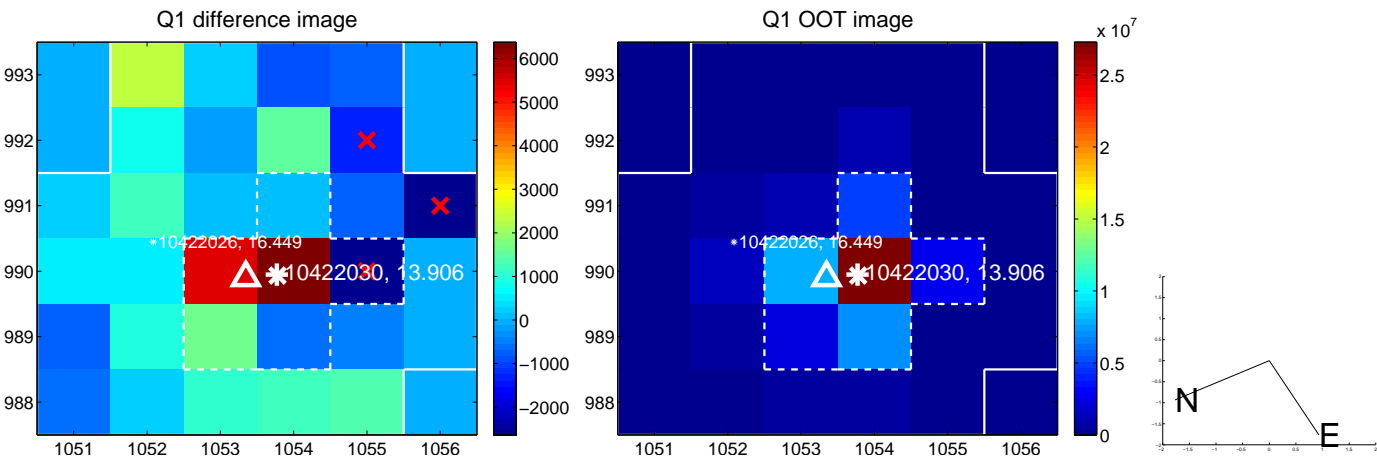


offset from photometric centroids

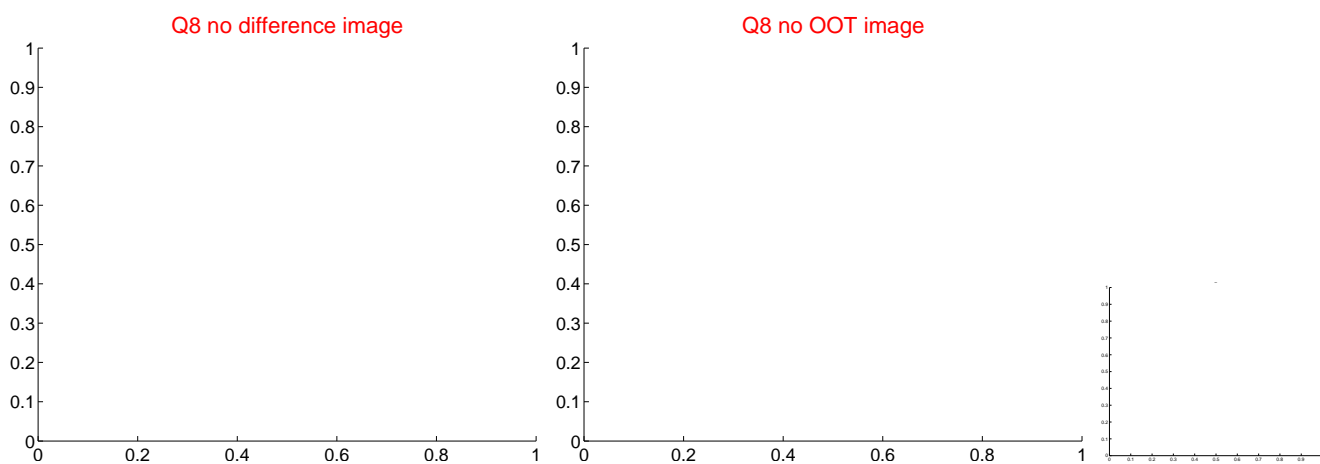
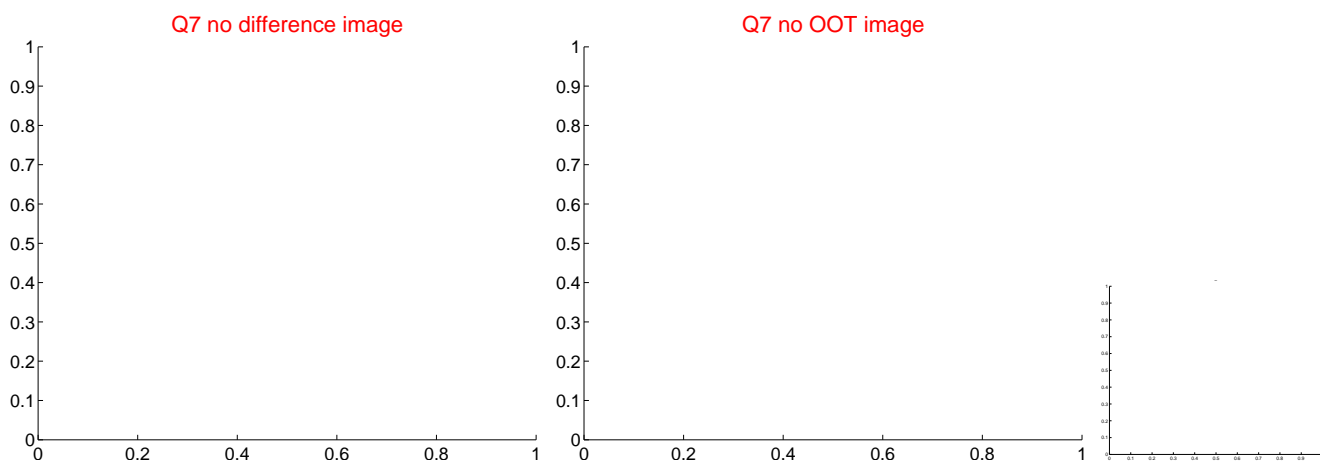
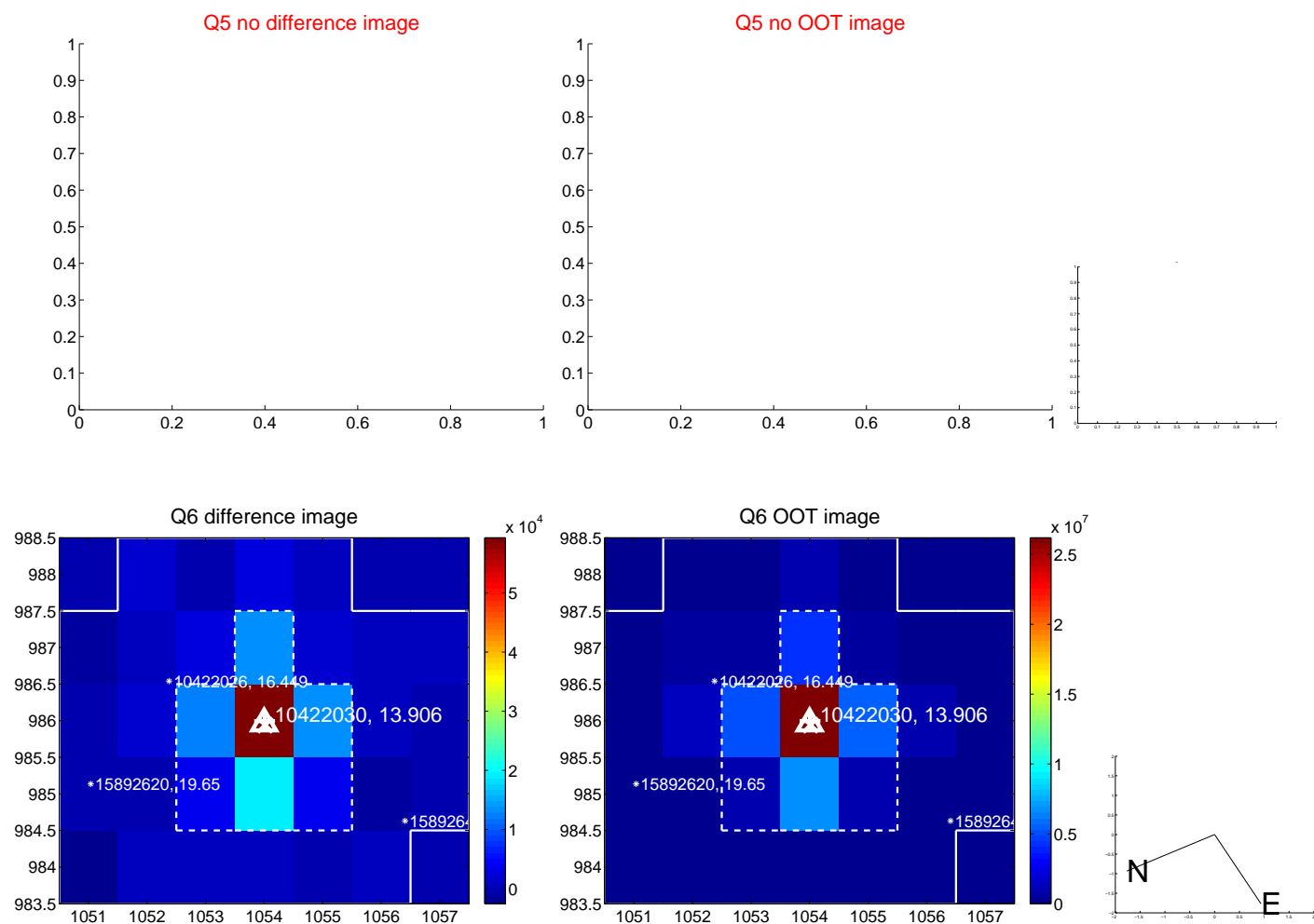


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

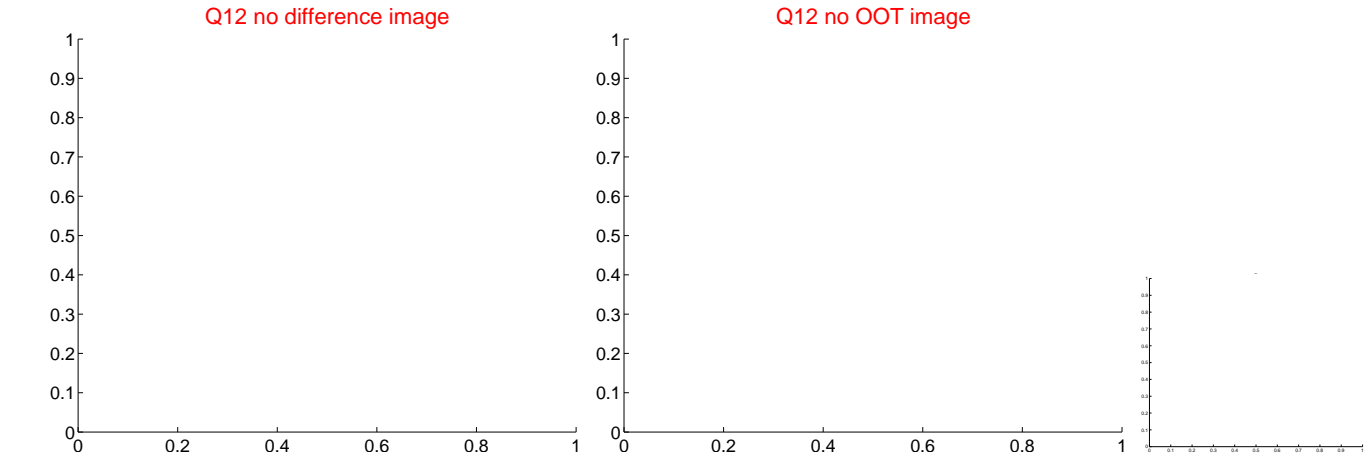
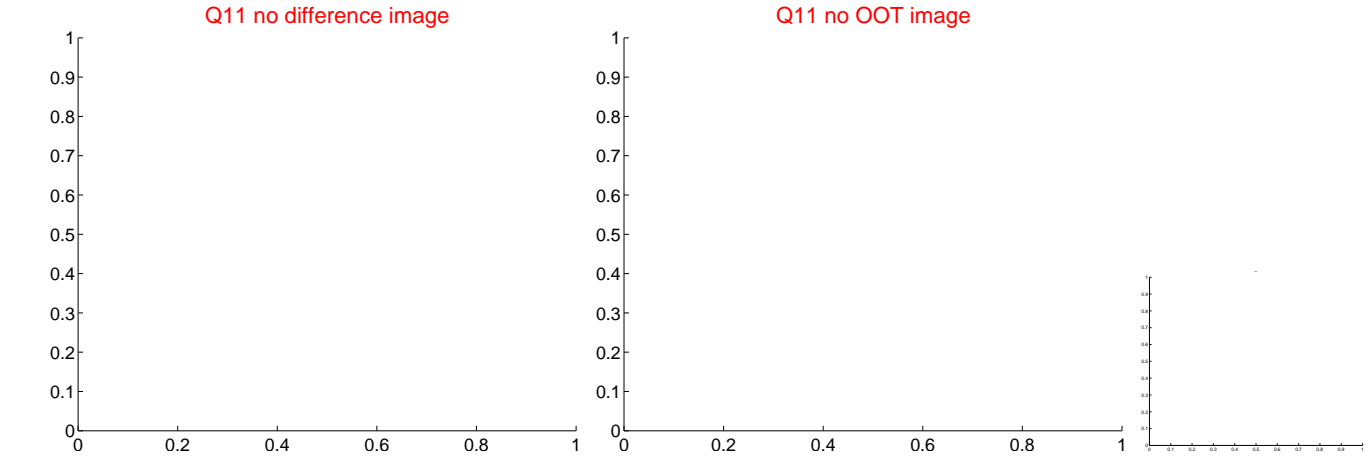
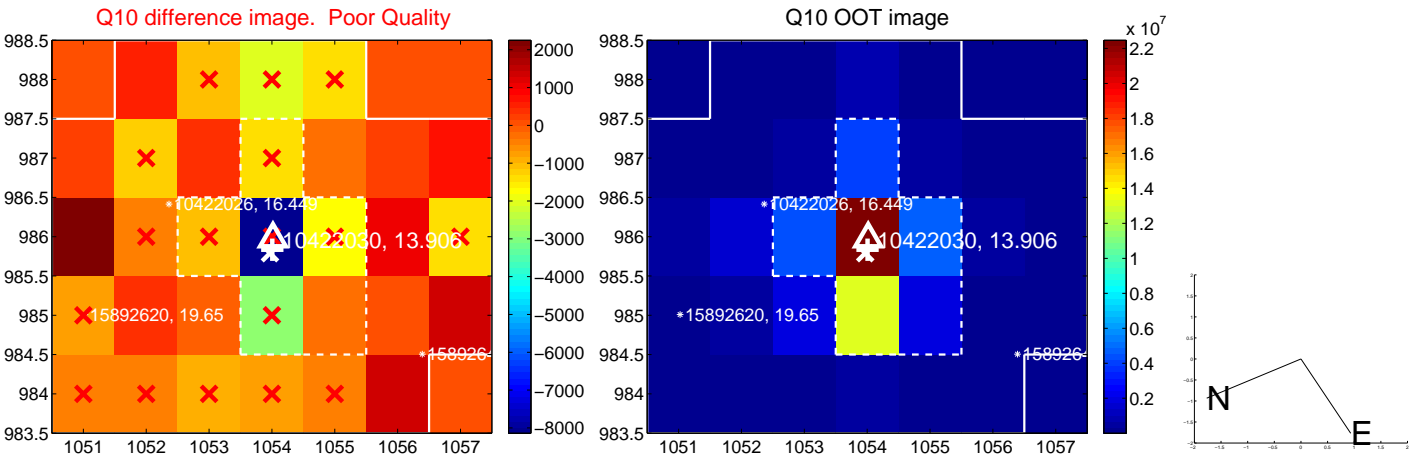
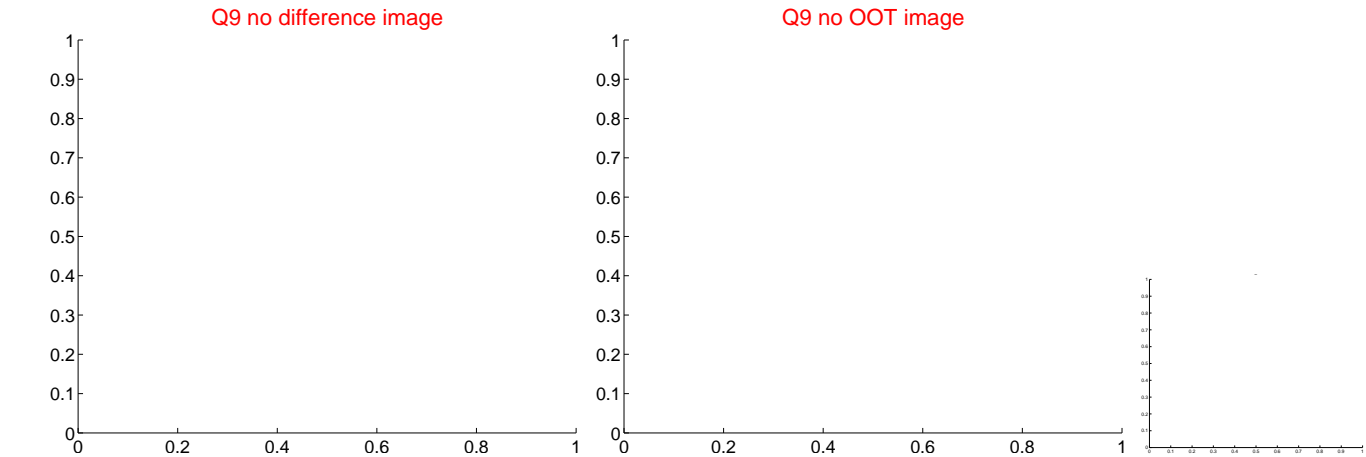
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



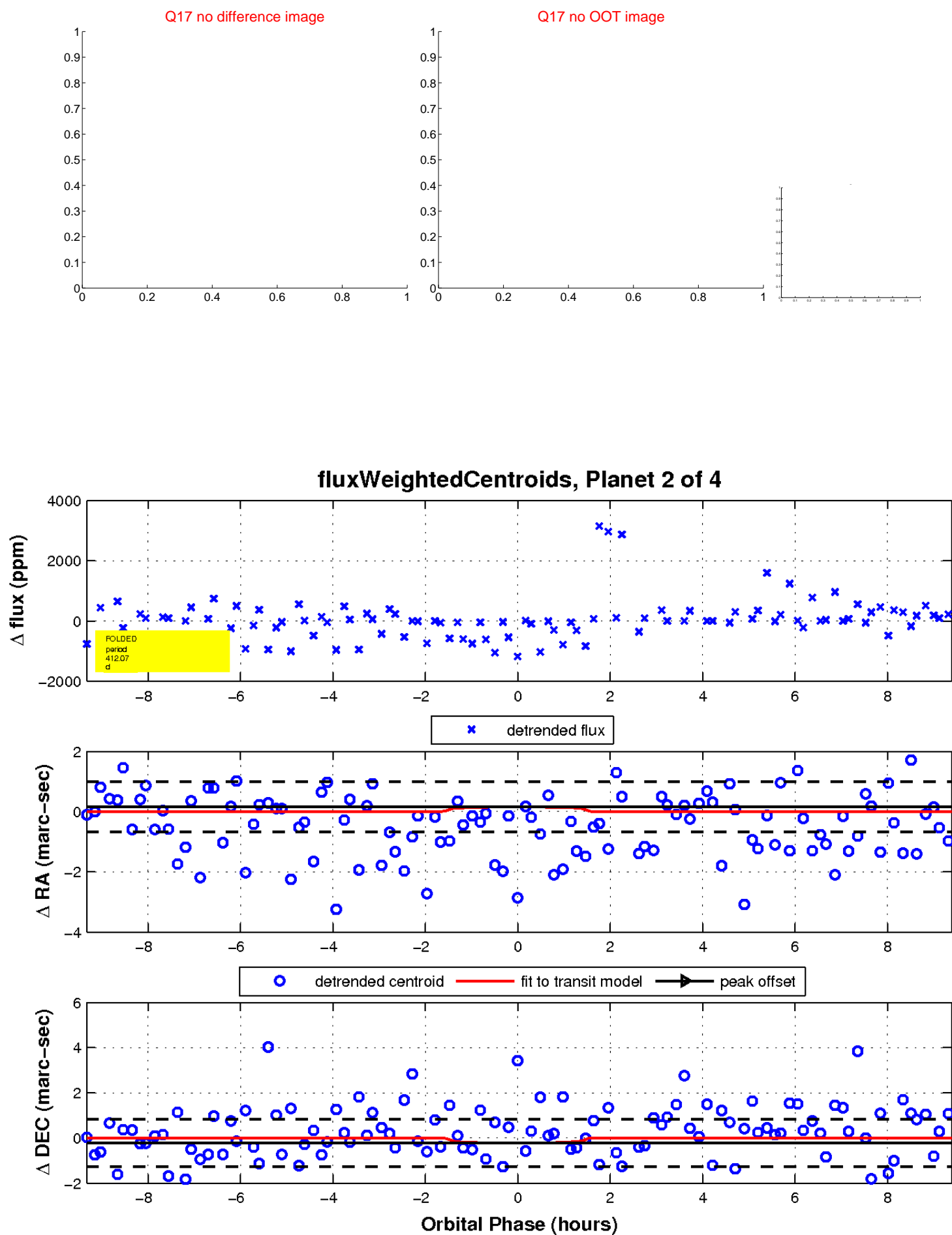
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

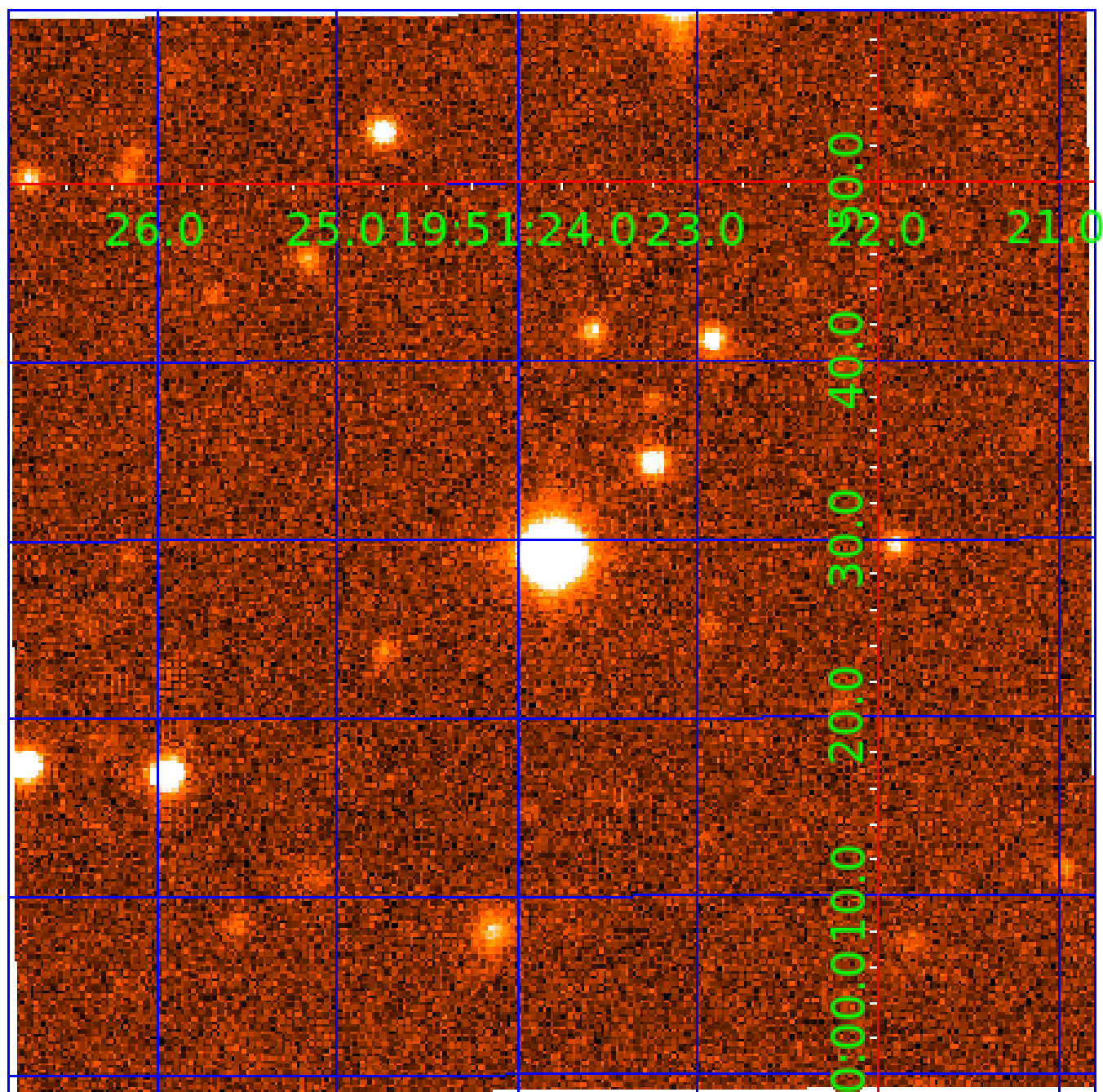


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010422030

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})
010422030-01	OBS	No	338.256690	446.181942	738.3	3.151	14.0	5.9	0.54	4822	1.58	0.24
010422030-02	OBS	No	412.072734	140.862952	765.7	3.134	15.8	7.3	0.54	4822	1.58	0.18
010422030-03	OBS	No	280.987353	407.885611	916.0	2.958	11.4	8.3	0.54	4822	1.72	0.30
010422030-04	OBS	No	129.884630	253.576081	620.3	3.886	9.7	6.9	0.54	4822	1.43	0.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010422030-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010422030-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-04	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

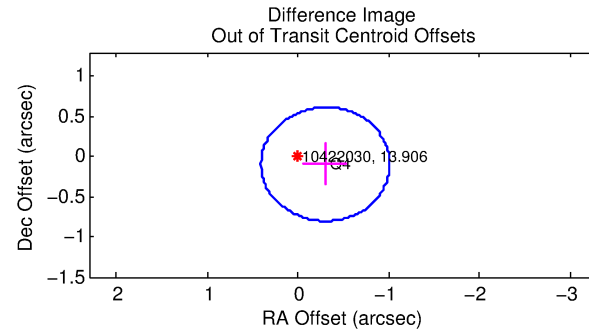
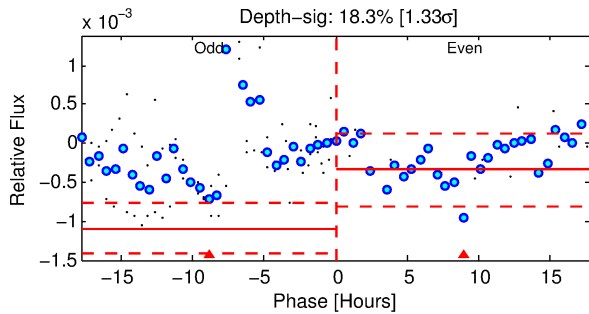
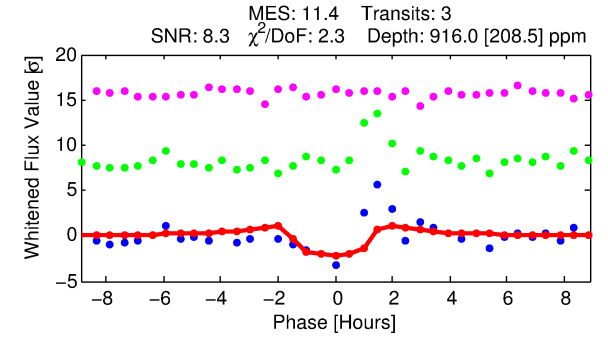
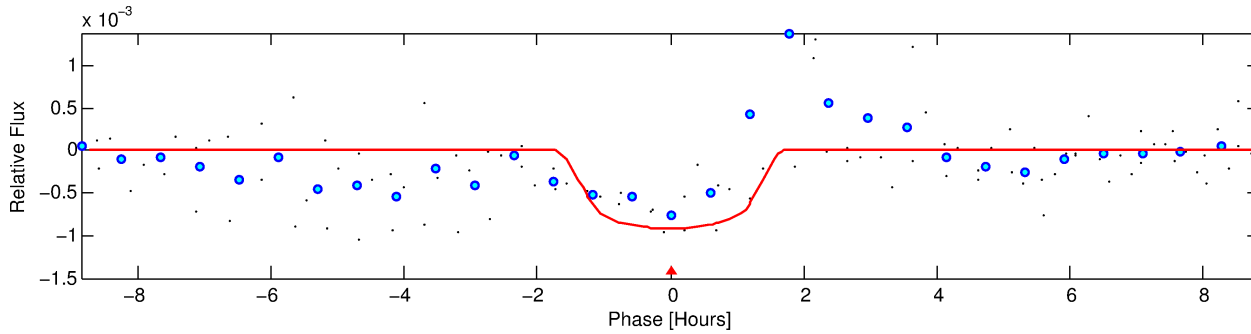
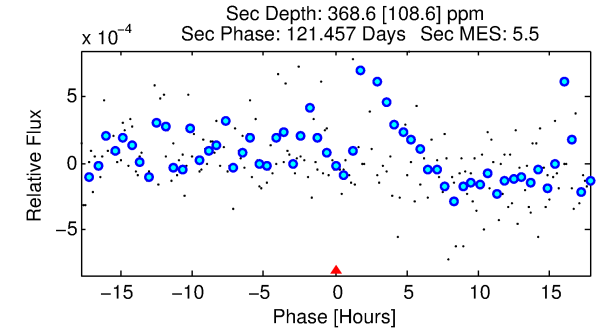
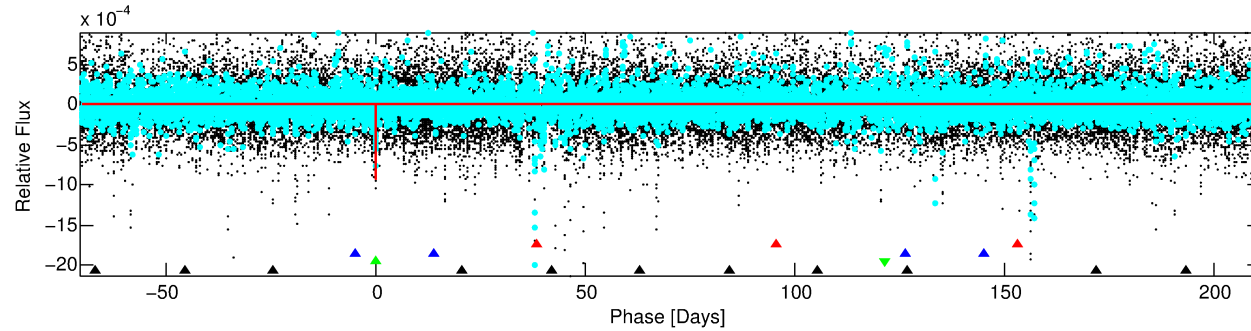
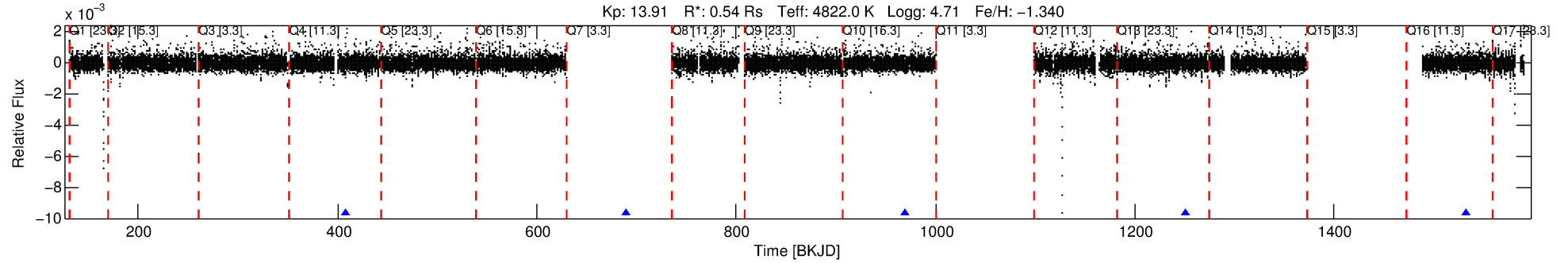
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010422030-03

No Significant Match Found

DV One-Page Summary

KIC: 10422030 Candidate: 3 of 4 Period: 280.987 d



DV Fit Results:

Period = 280.98735 [0.00331] d
Epoch = 407.8856 [0.0101] BKJD
Rp/R* = 0.0290 [0.0764]
a/R* = 590.54 [6435.00]
b = 0.63 [10.57]
Seff = 0.30 [0.05]
Teq = 189 [7] K
Rp = 1.72 [4.53] Re
a = 0.6882 [0.0371] AU
Ag = 32446.03 [170996.82] [0.19 σ]
Teffp = 3921 [5167] K [0.72 σ]

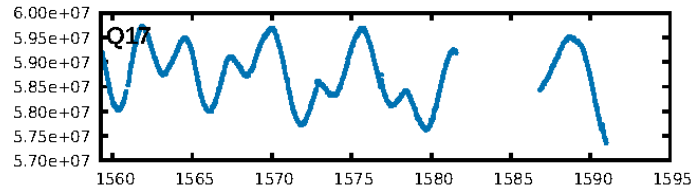
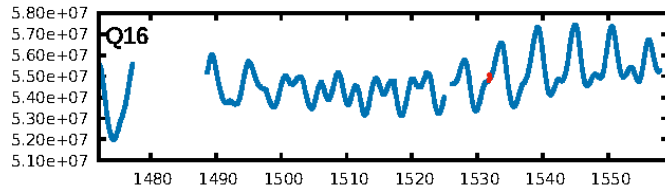
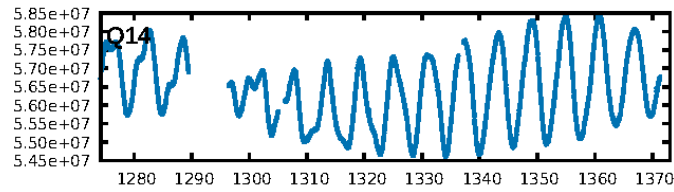
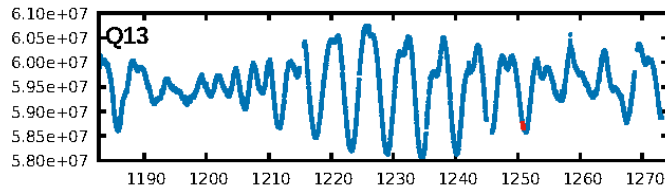
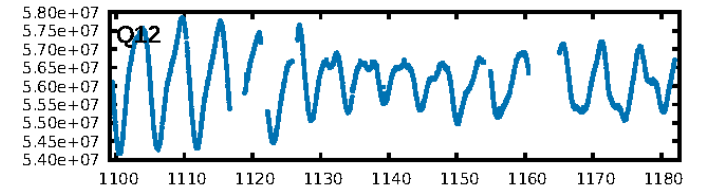
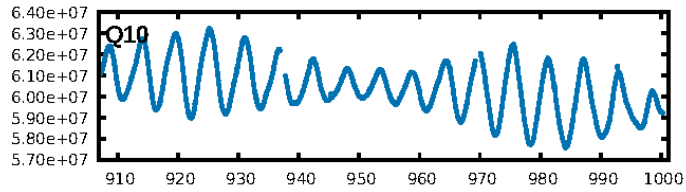
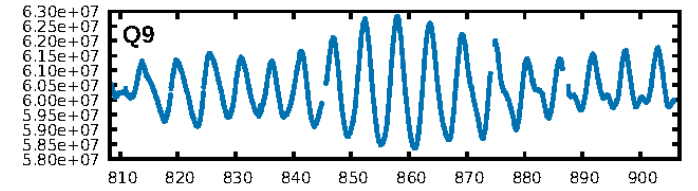
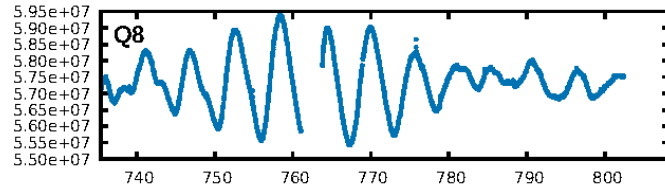
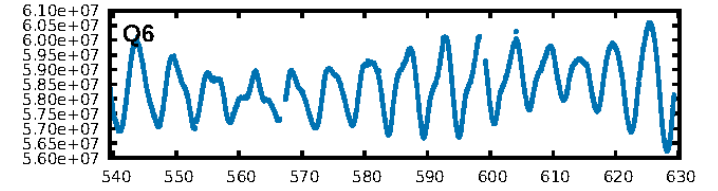
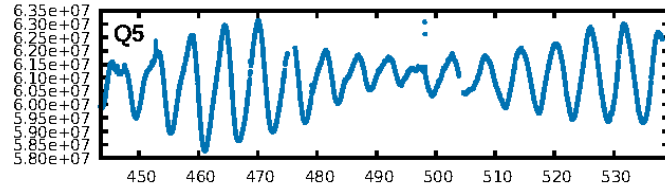
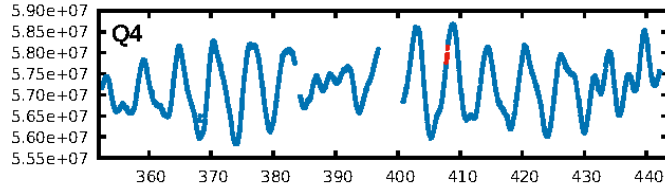
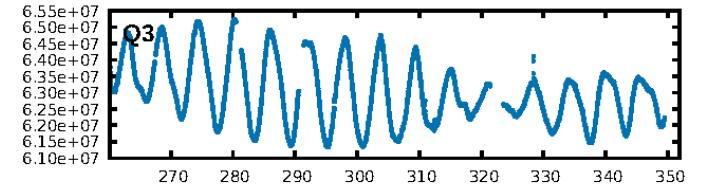
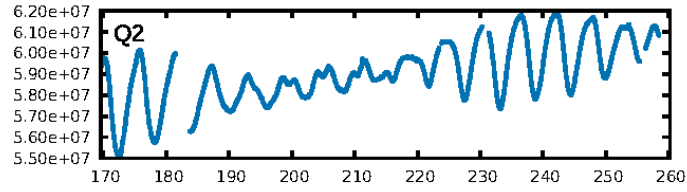
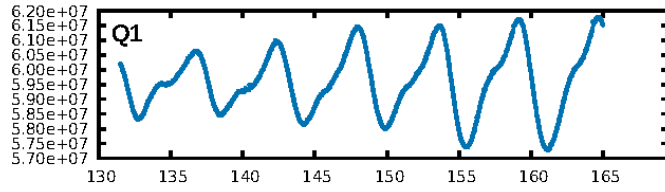
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [742.62 σ]
LongPeriod-sig: 100.0% [318.03 σ]
ModelChiSquare2-sig: 2.0%
ModelChiSquareGof-sig: 69.4%
Bootstrap-pfa: 1.49e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8302
Centroid-sig: 69.7%
Centroid-so: 0.561 arcsec [0.53 σ]
OotOffset-rm: 0.315 arcsec [1.34 σ]
KicOffset-rm: 0.329 arcsec [1.40 σ]
OotOffset-st: 0/0/1/0 [1]
KicOffset-st: 0/0/1/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

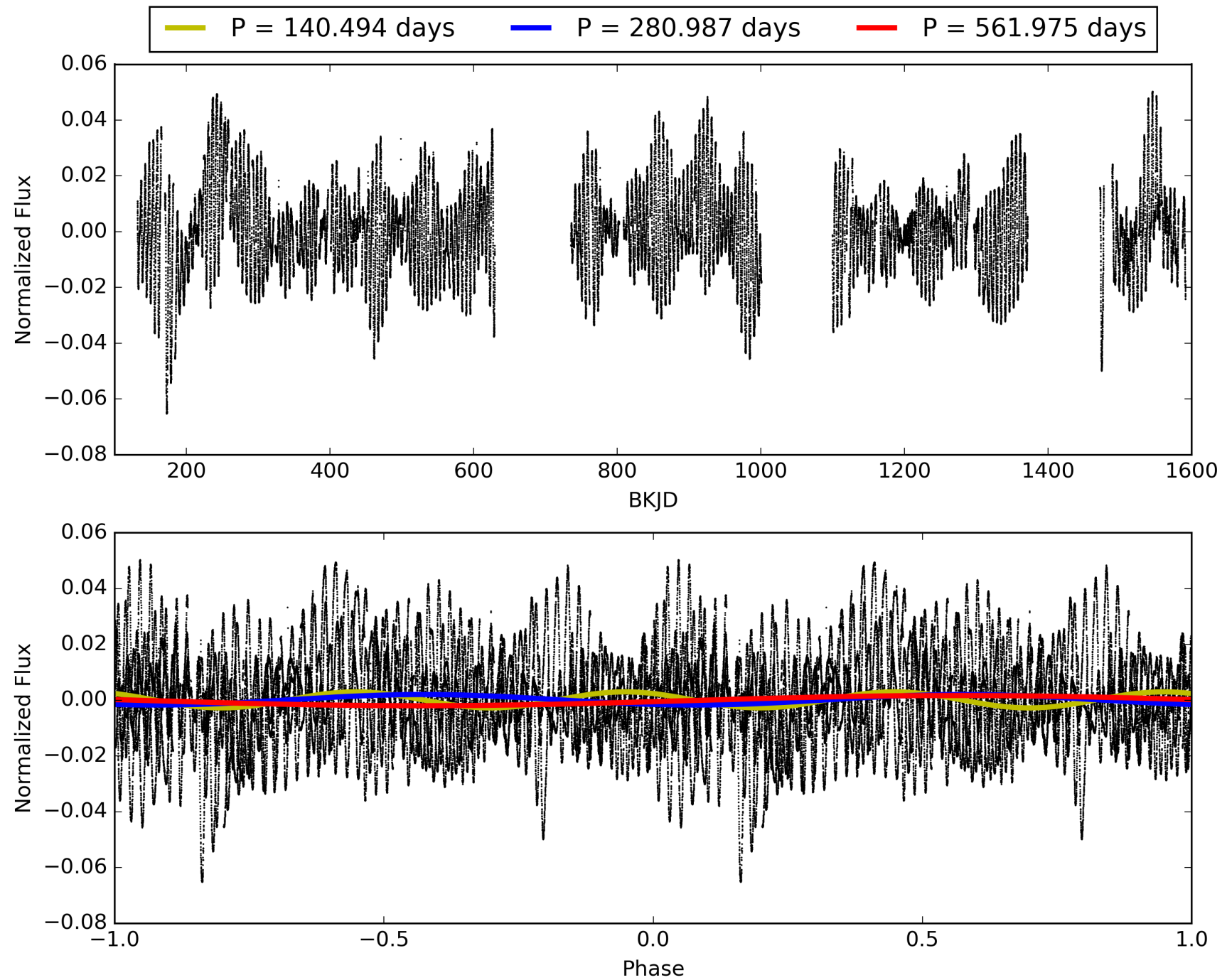
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:18:31 Z

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

TCE 010422030-03, PDC Light Curves

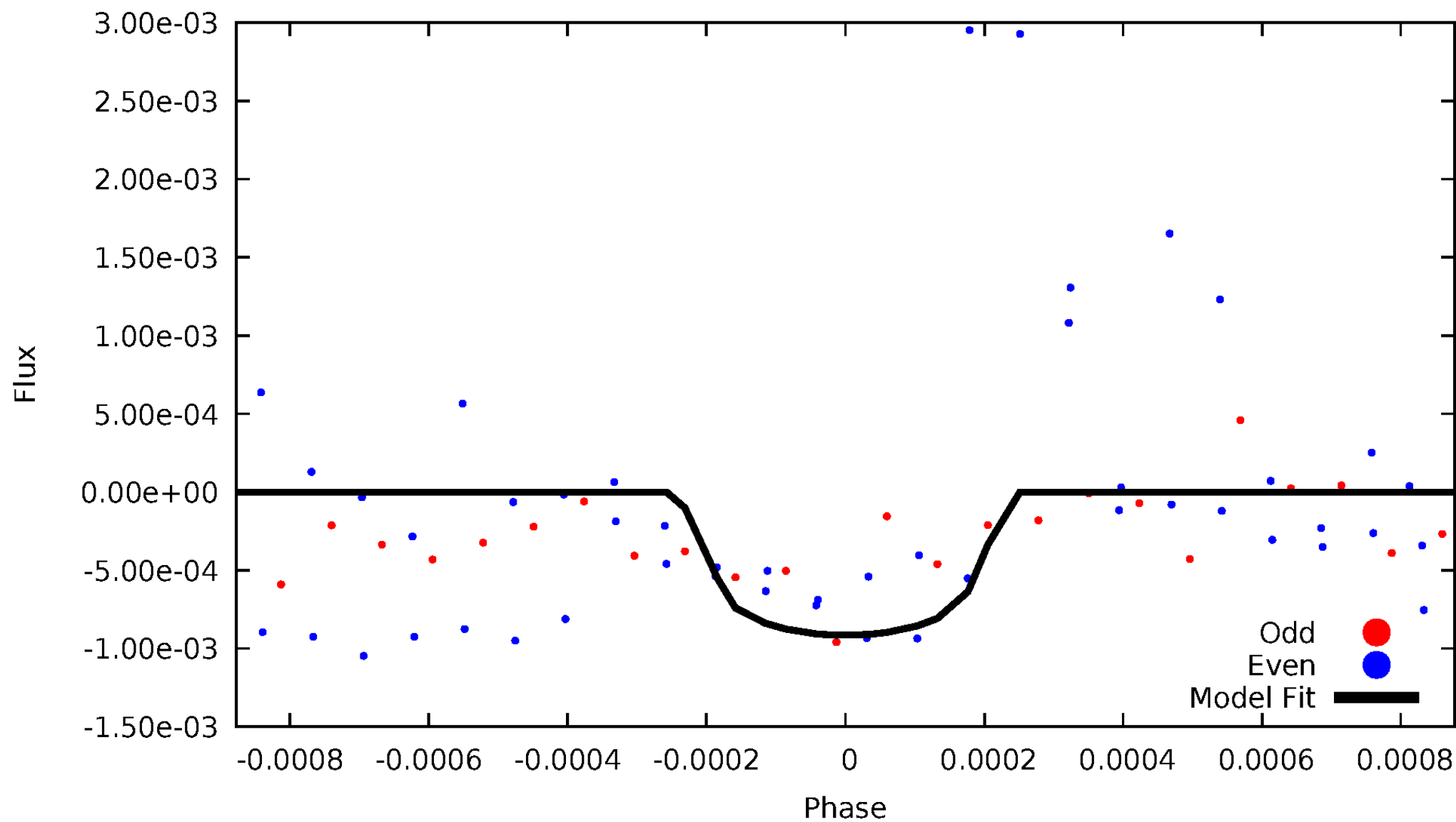


TCE 010422030-03



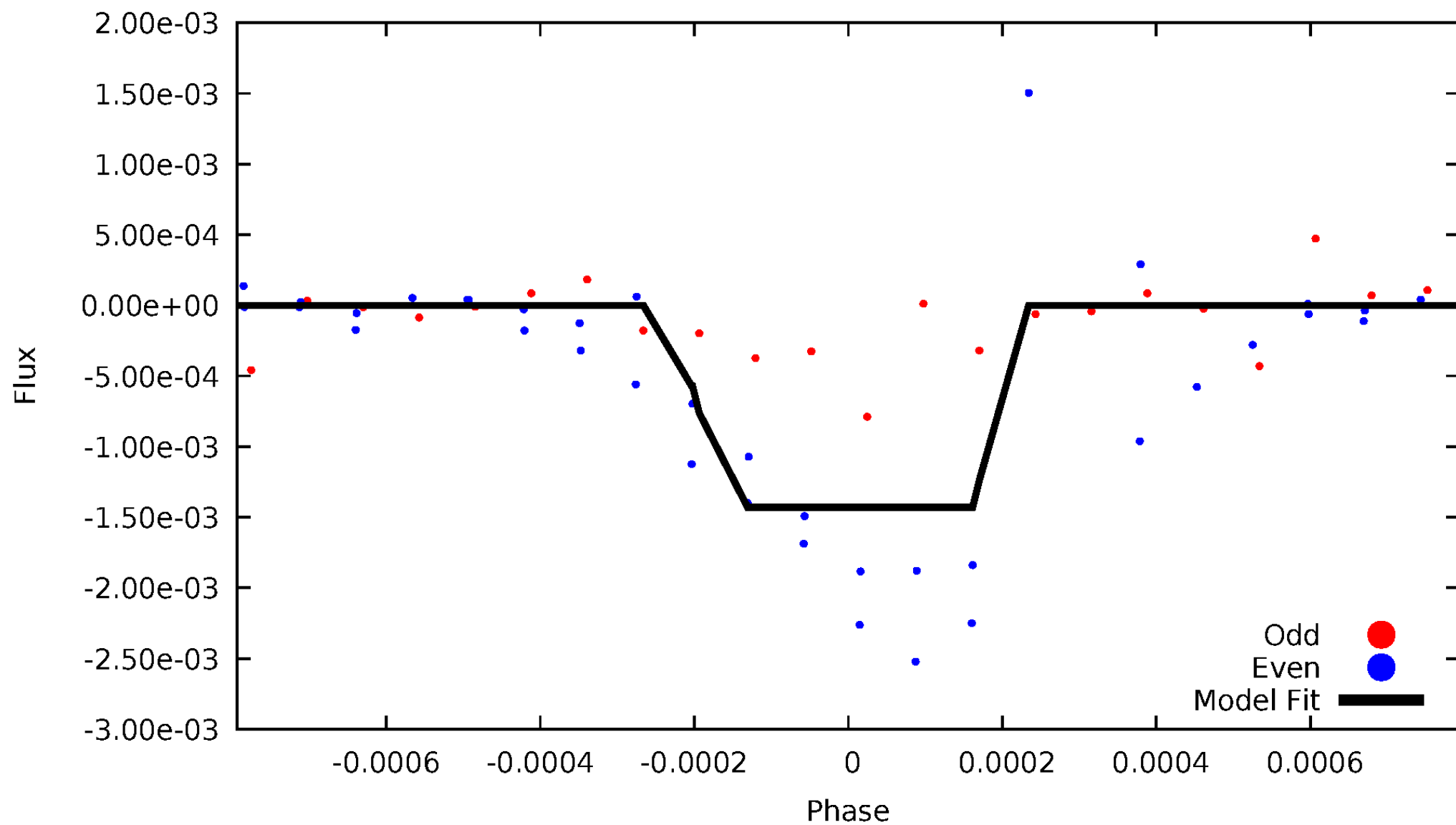
DV Odd/Even

TCE 010422030-03



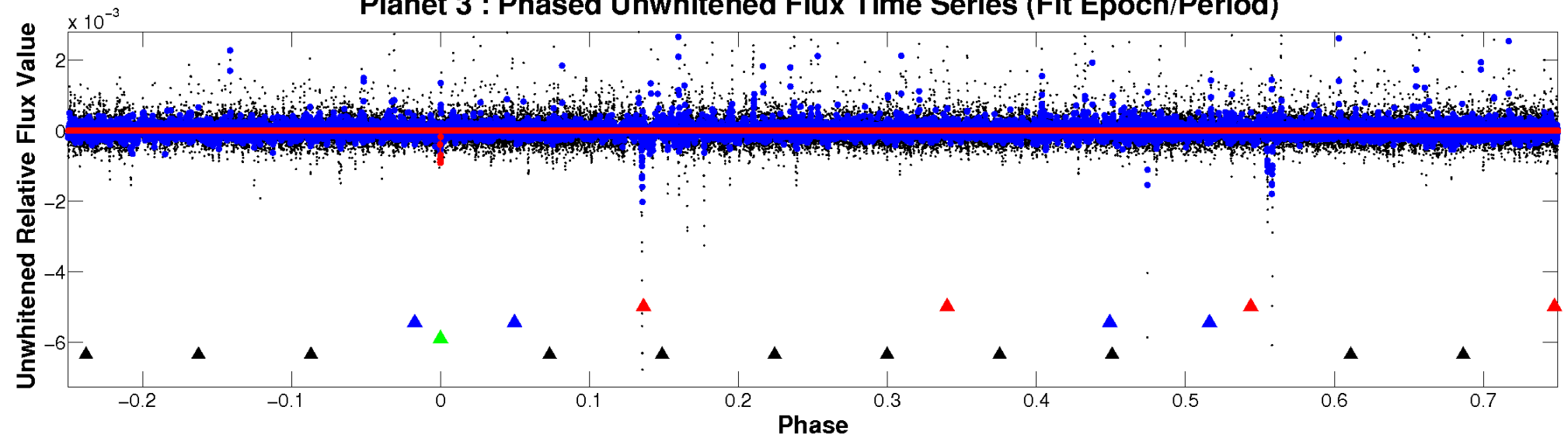
ALT Odd/Even

TCE 010422030-03

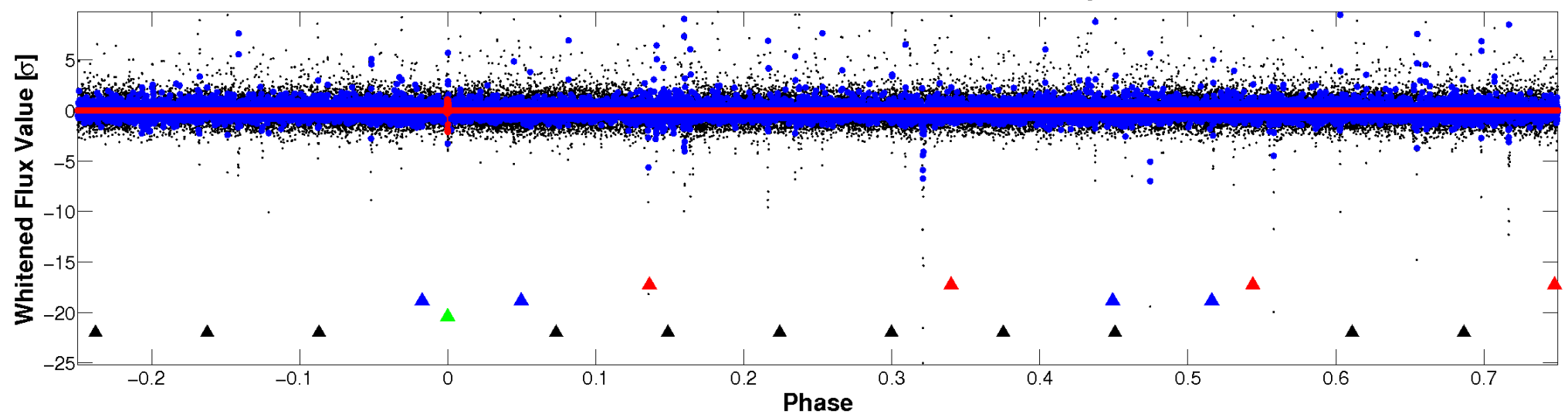


Non-Whitened Vs. Whitened Light Curve

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

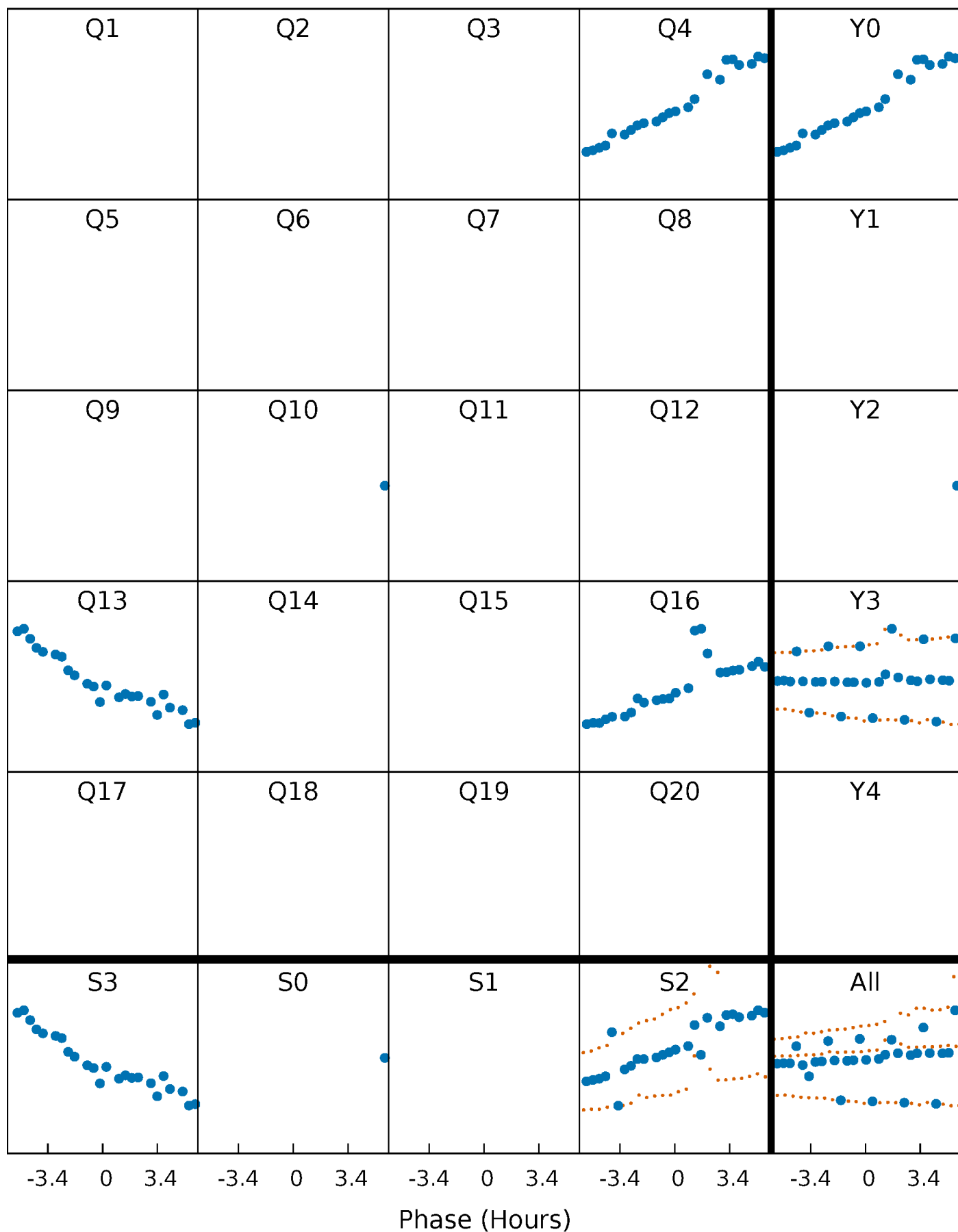


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



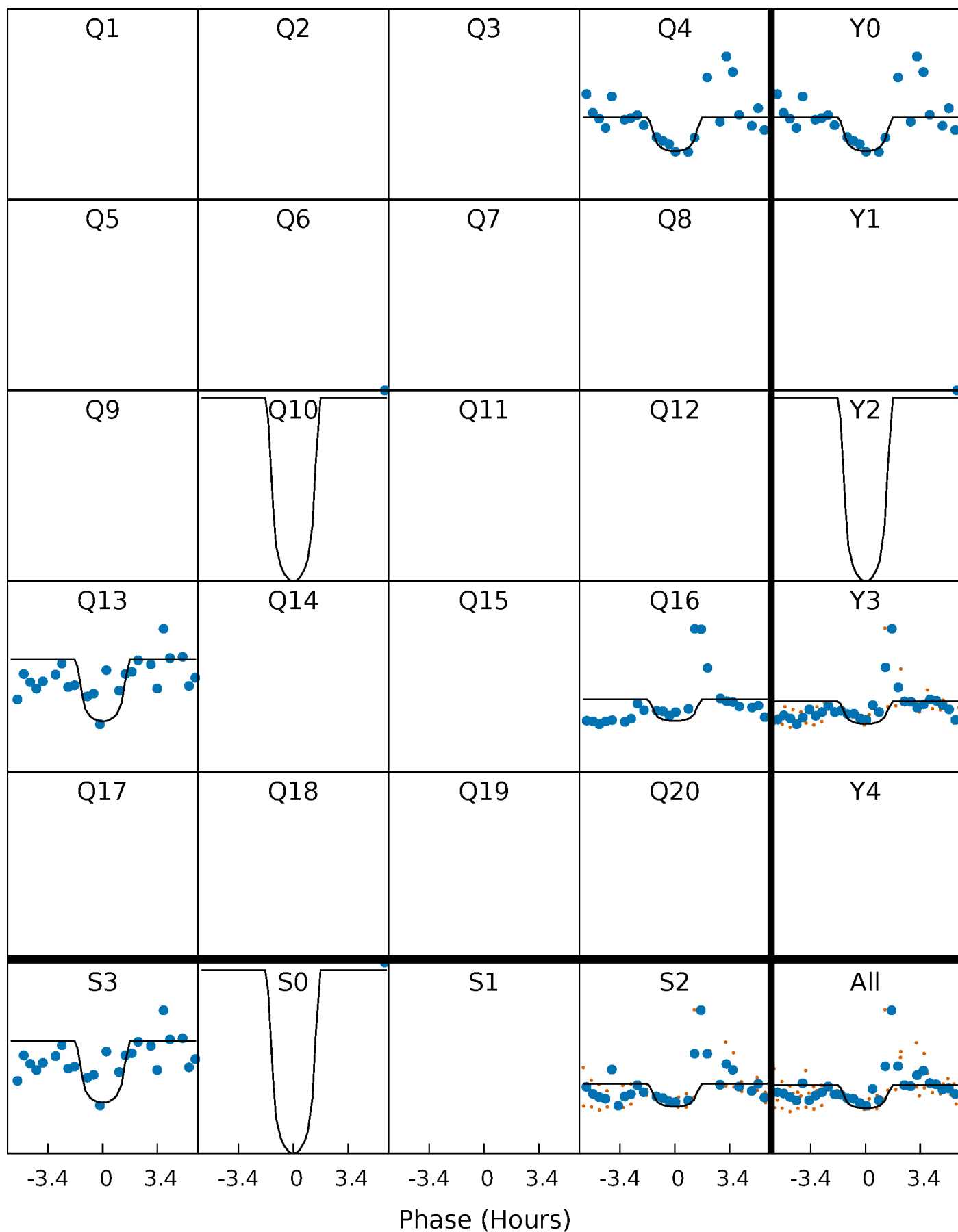
PDC Quarter-Phased Transit Curves

TCE 010422030-03 $P=280.987353$ Days $T_0=407.885611$ (BKJD)



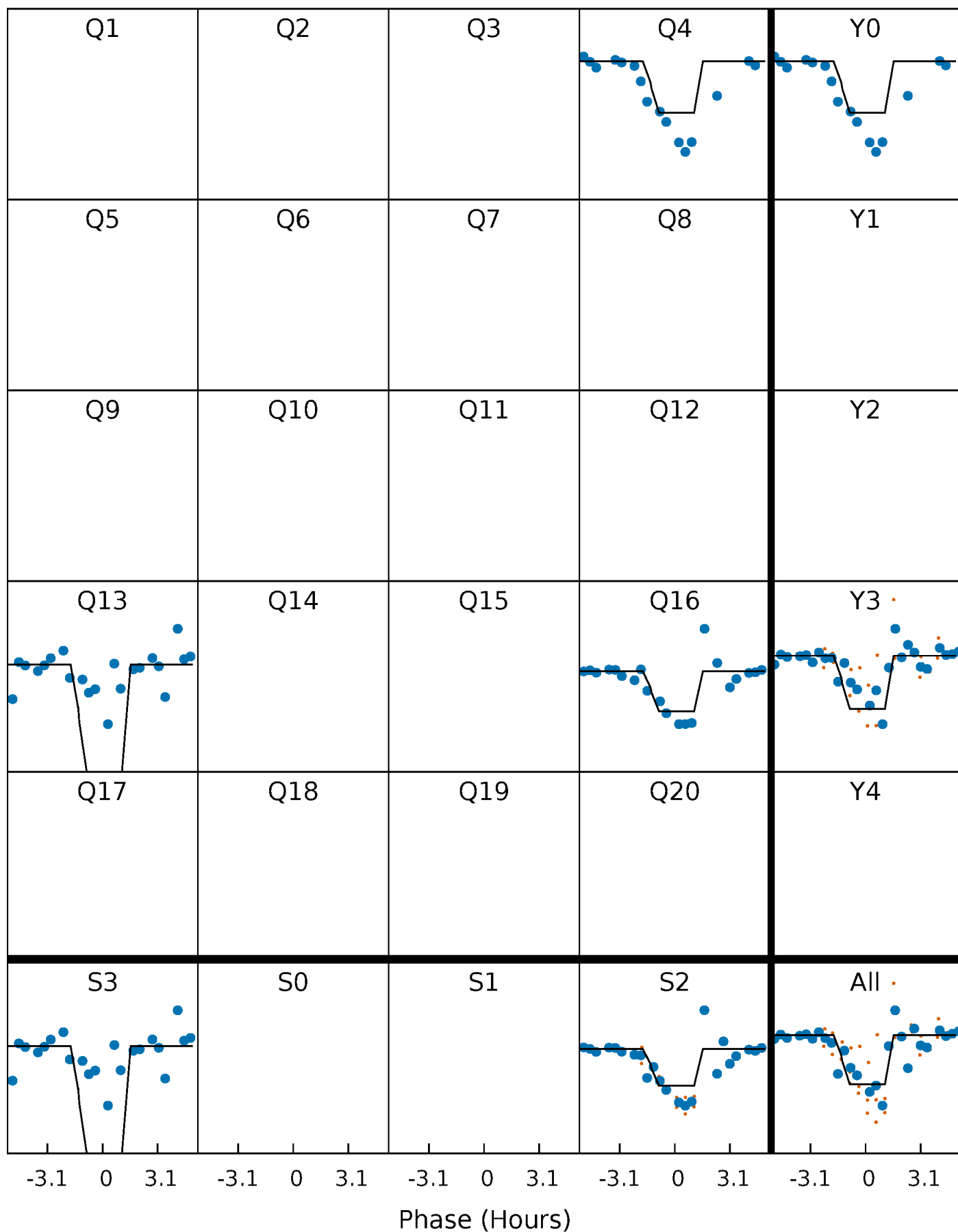
DV Quarter-Phased Transit Curves

TCE 010422030-03 $P=280.987353$ Days $T_0=407.885611$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

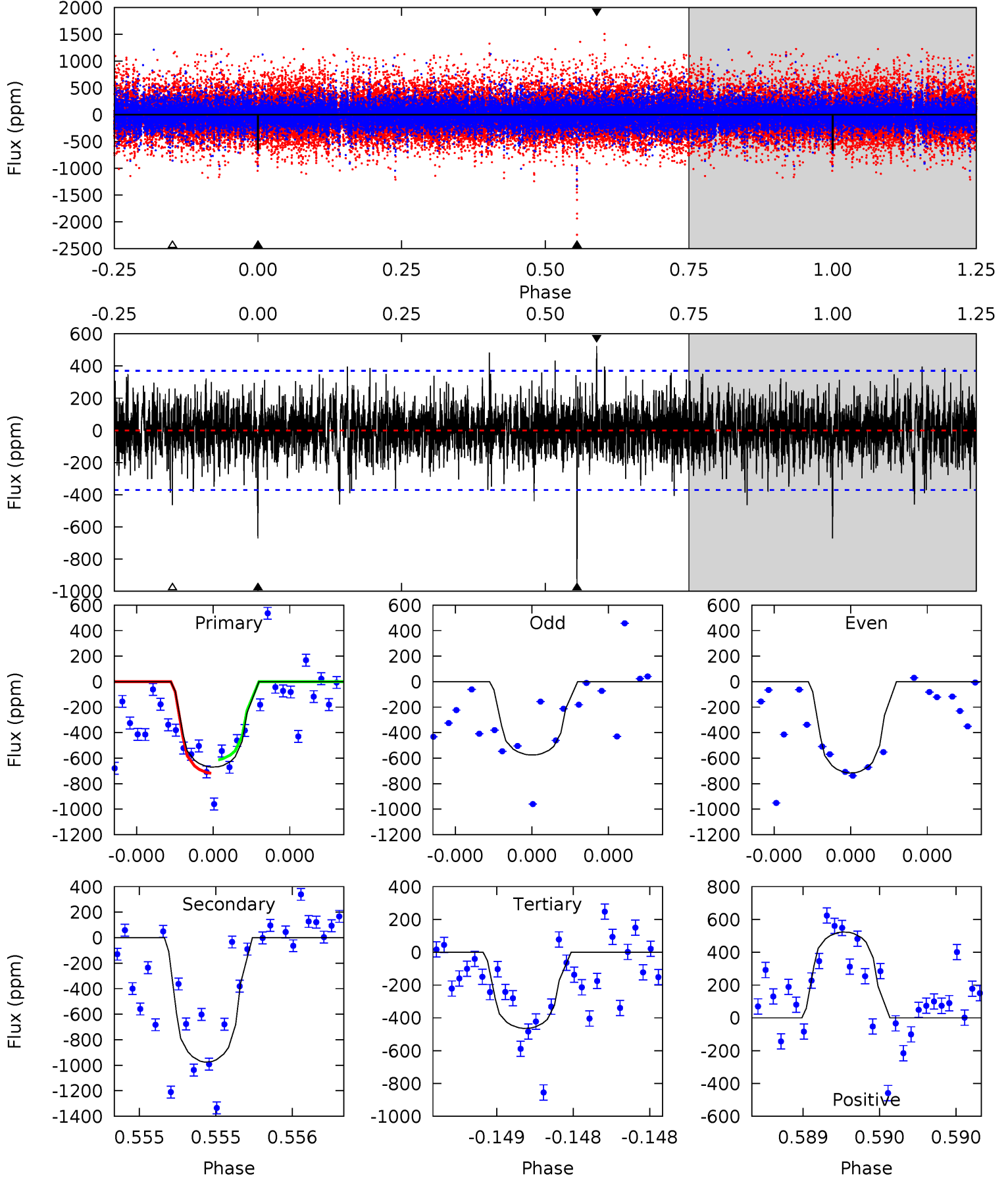
TCE 010422030-03 P=280.982333 Days $T_0=407.890103$ (BKJD)



DV Model-Shift Uniqueness Test

010422030-03, P = 280.987353 Days, E = 126.898258 Days

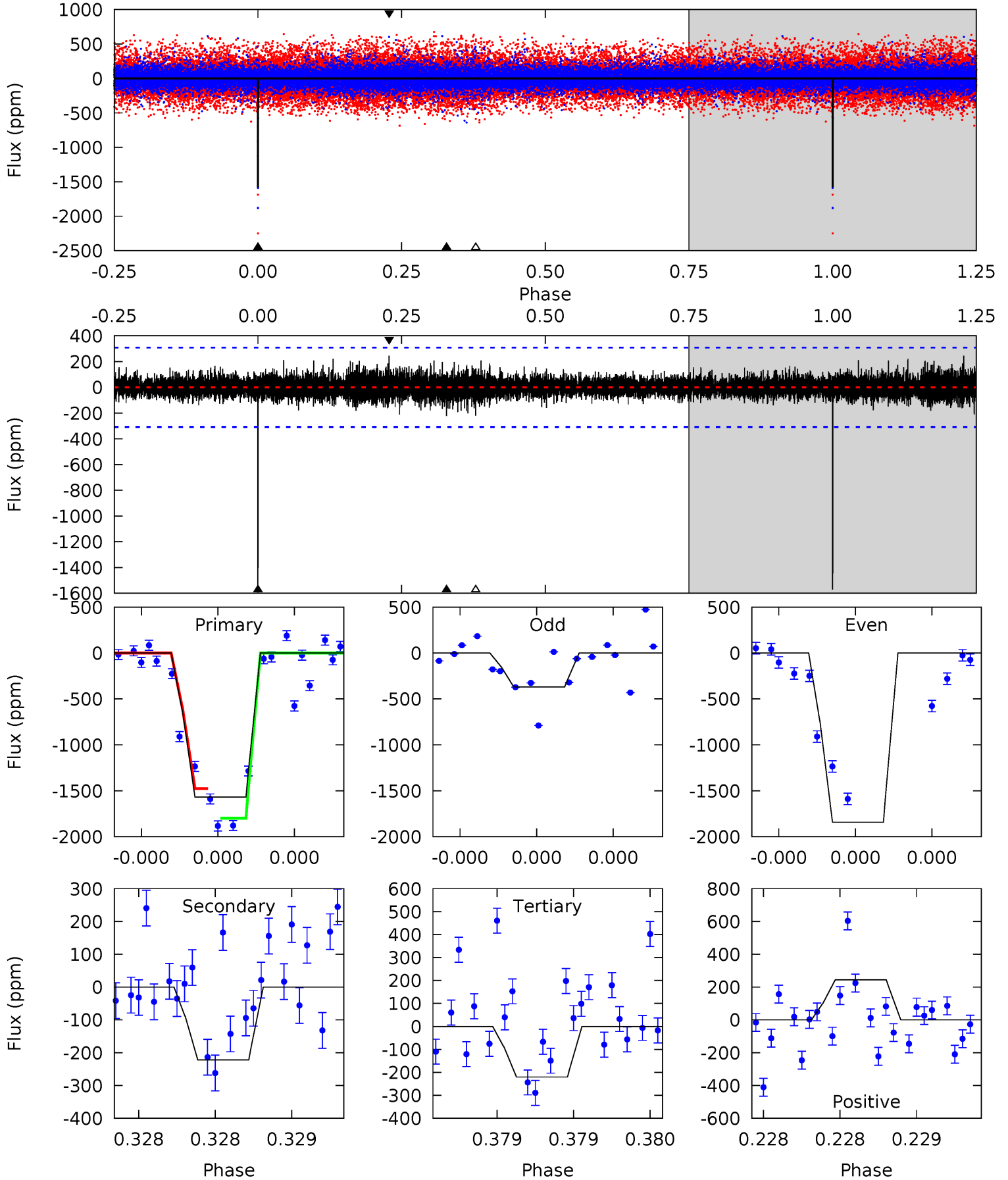
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.1	14.7	7.00	7.90	5.59	3.50	1.59	3.11	2.21	7.71	6.82	0.93	0.87	0.35	0.80



Alt Model-Shift Uniqueness Test

010422030-03, P = 280.982333 Days, E = 126.907770 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.5	4.03	4.00	4.44	5.60	3.52	0.83	24.5	24.1	0.03	-0.41	17.9	0.83	0.13	0



Stellar Parameters For KIC 010422030

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4822^{+144}_{-158}	$4.709^{+0.048}_{-0.024}$	$-1.340^{+0.300}_{-0.300}$	$0.543^{+0.029}_{-0.032}$	$0.550^{+0.036}_{-0.019}$	$4.830^{+0.943}_{-0.477}$
	+3%/-3%	+1%/-1%	+22%/-22%	+5%/-6%	+7%/-3%	+20%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010422030-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-975 ± 66	$3.87^{+3.99}_{-2.69}$	263^{+8}_{-9}	3669^{+2275}_{-715}	$17731^{+169771}_{-13553}$
Alt.	-222 ± 55	$4.09^{+3.76}_{-2.79}$	263^{+9}_{-9}	2859^{+1219}_{-437}	3342^{+27139}_{-2443}

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

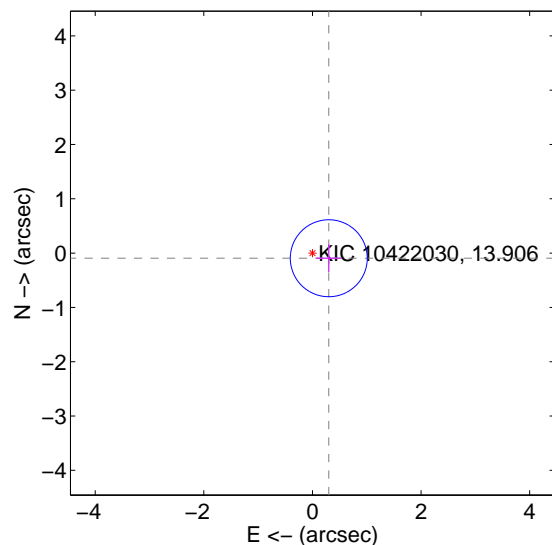
Supplemental centroid analysis for 010422030-03. Kepler magnitude: 13.91. Transit SNR 8.31

There are 1 quarters with good PRF difference image offsets

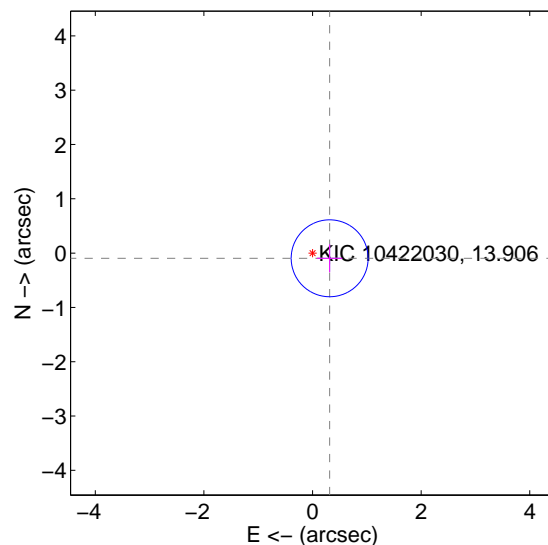
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.315 ± 0.236	1.34	-0.301 ± 0.234	-0.095 ± 0.257
PRF-fit source offset from KIC position	0.329 ± 0.236	1.40	-0.315 ± 0.234	-0.096 ± 0.257
photometric centroid source offset	0.56 ± 1.05	0.53	0.56 ± 1.05	-0.07 ± 1.07

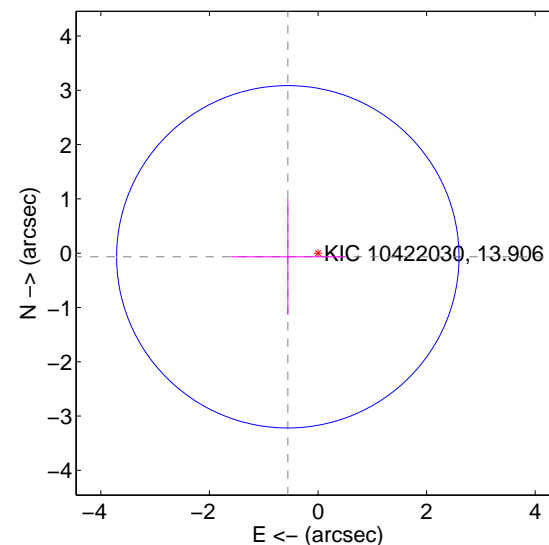
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

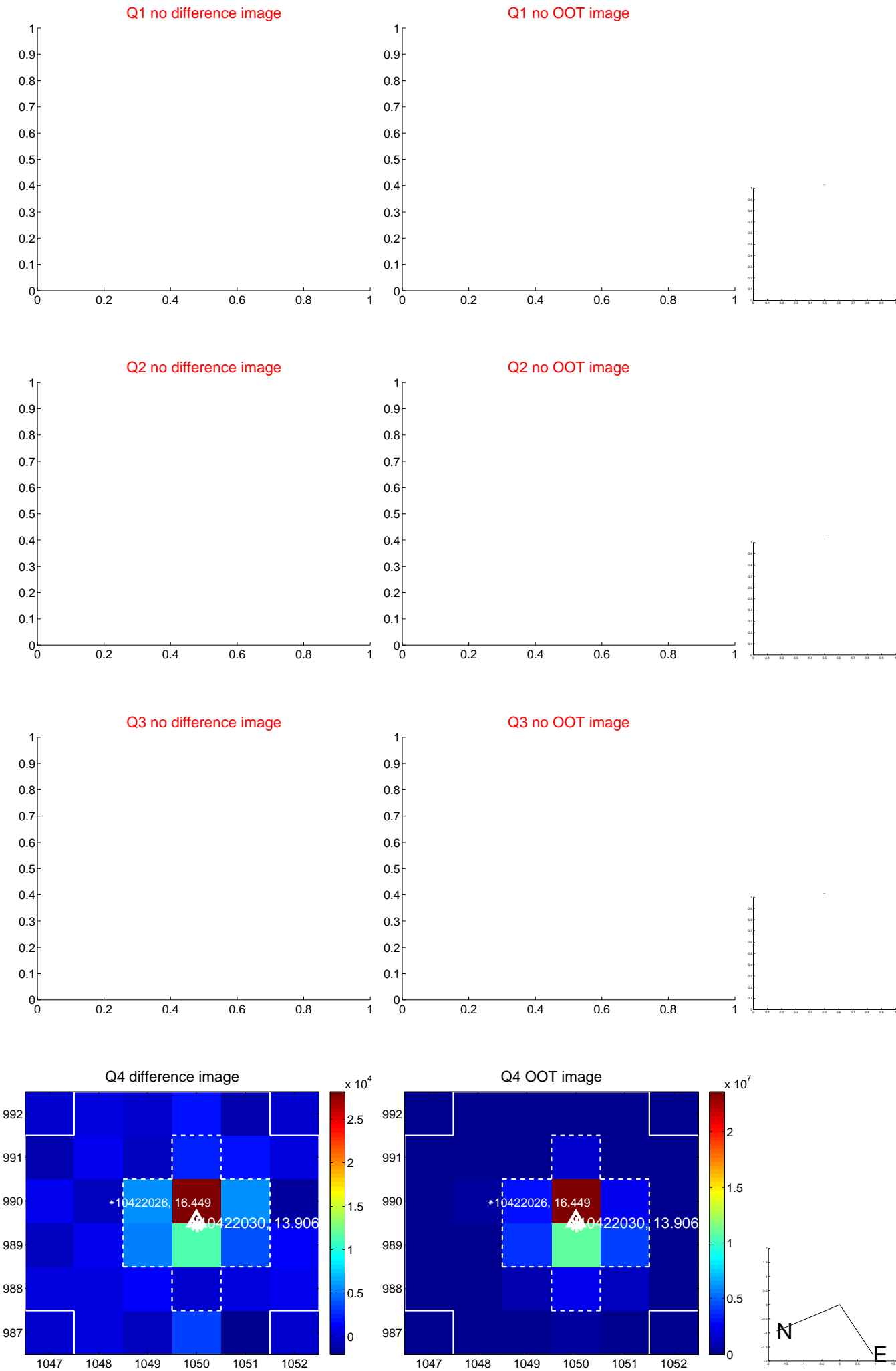


offset from photometric centroids



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.



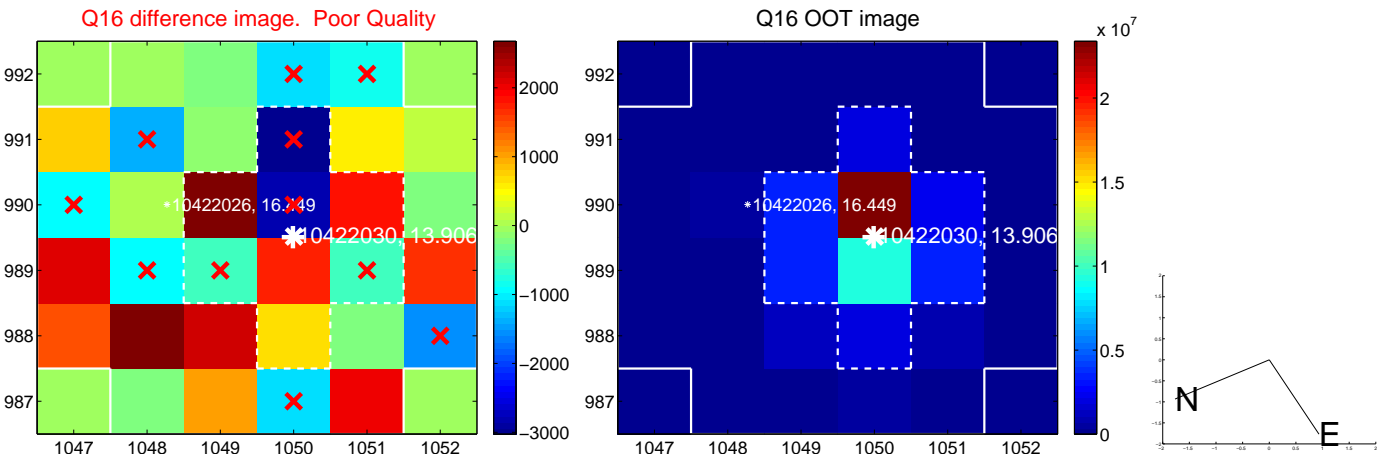
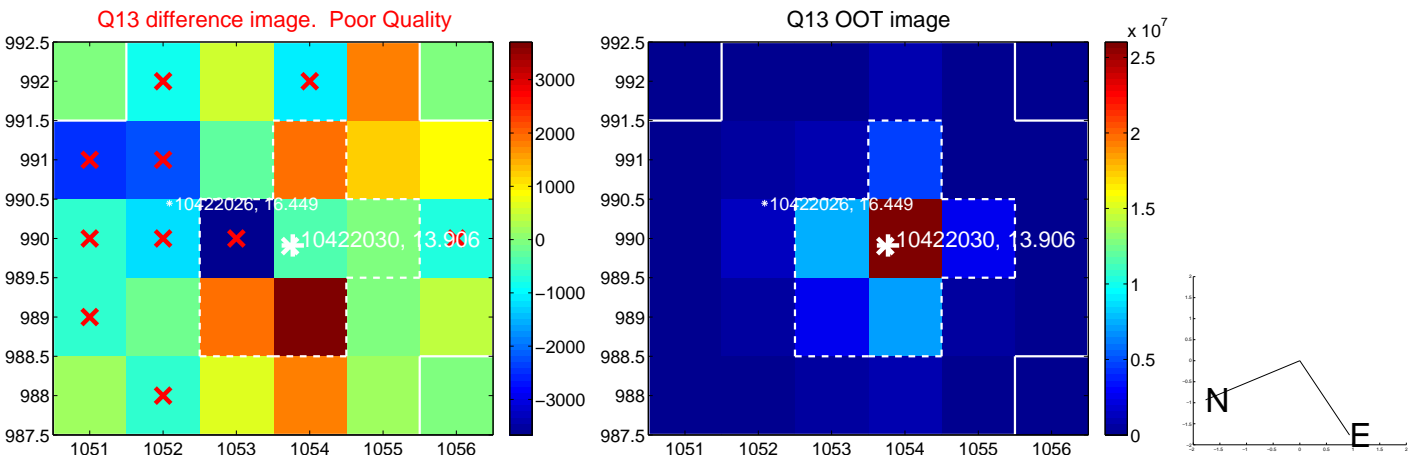
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



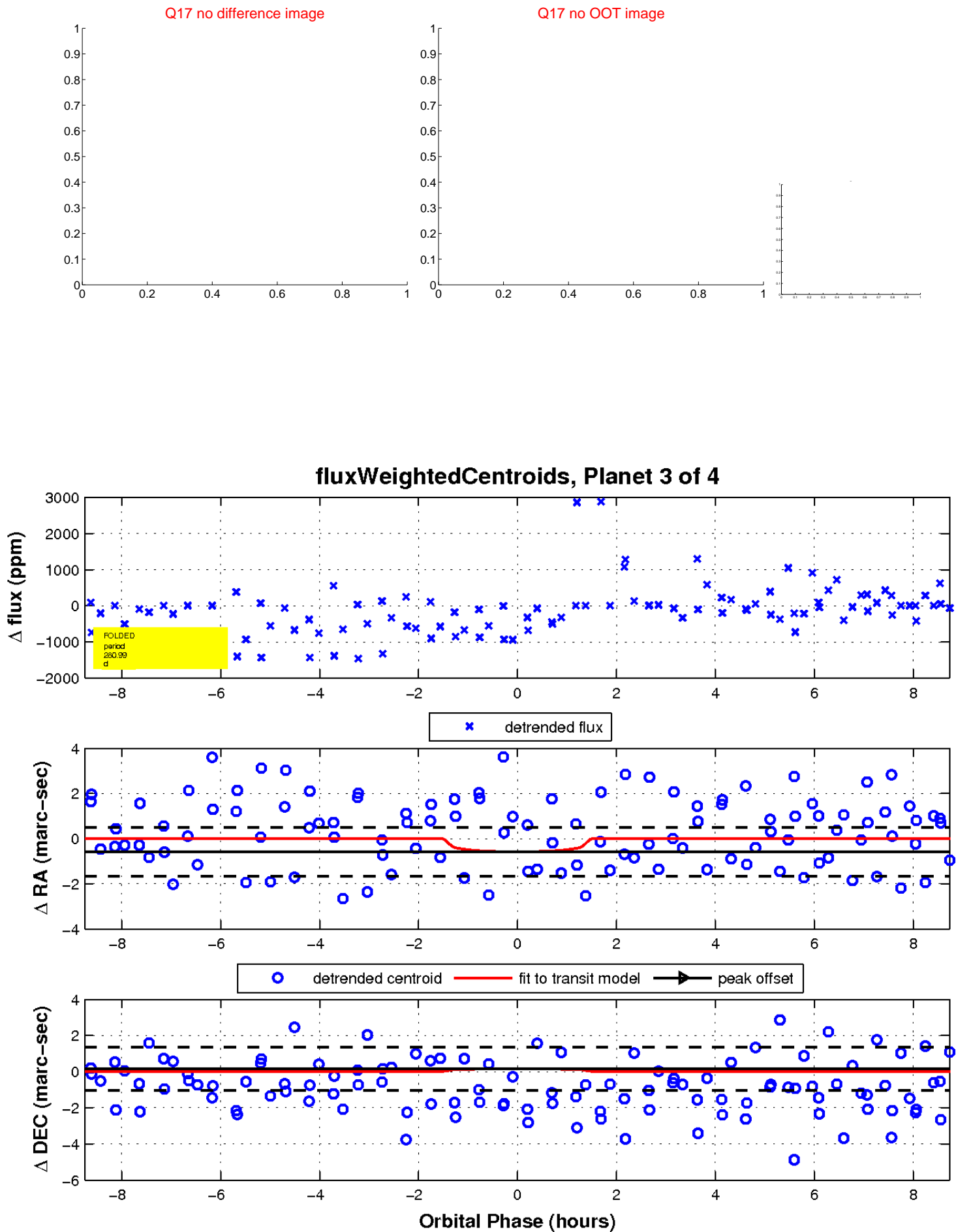
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

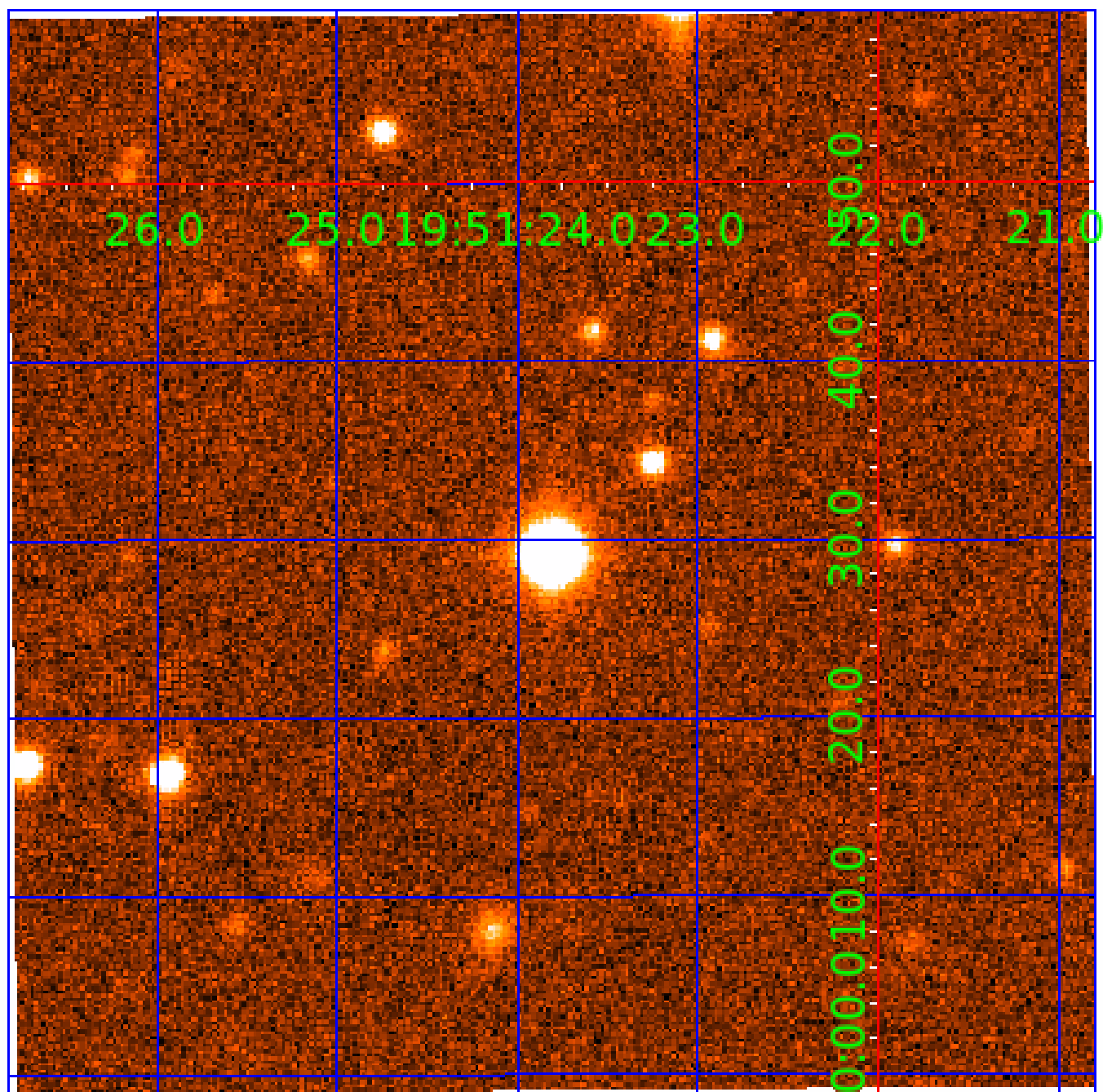


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010422030

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})
010422030-01	OBS	No	338.256690	446.181942	738.3	3.151	14.0	5.9	0.54	4822	1.58	0.24
010422030-02	OBS	No	412.072734	140.862952	765.7	3.134	15.8	7.3	0.54	4822	1.58	0.18
010422030-03	OBS	No	280.987353	407.885611	916.0	2.958	11.4	8.3	0.54	4822	1.72	0.30
010422030-04	OBS	No	129.884630	253.576081	620.3	3.886	9.7	6.9	0.54	4822	1.43	0.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010422030-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010422030-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010422030-04	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

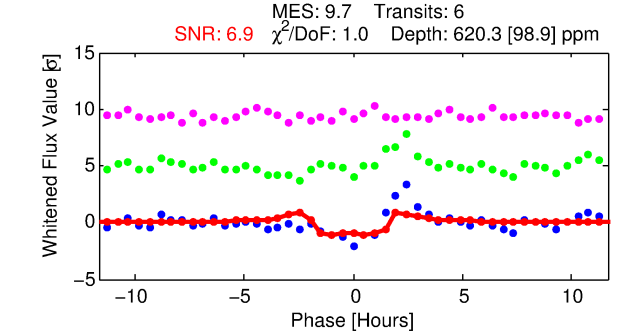
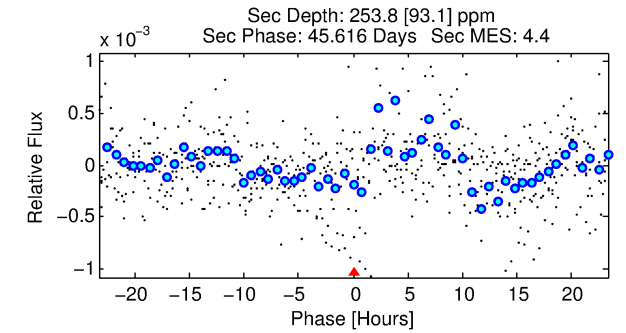
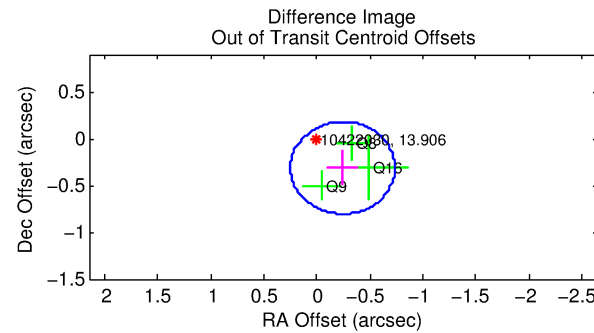
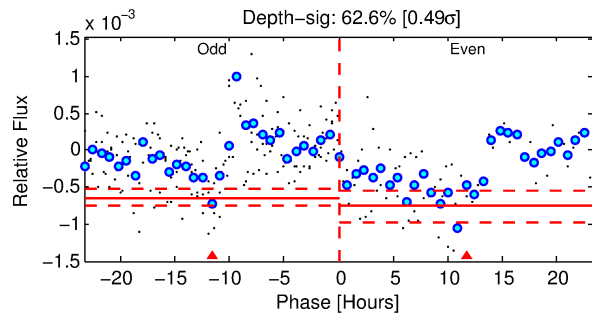
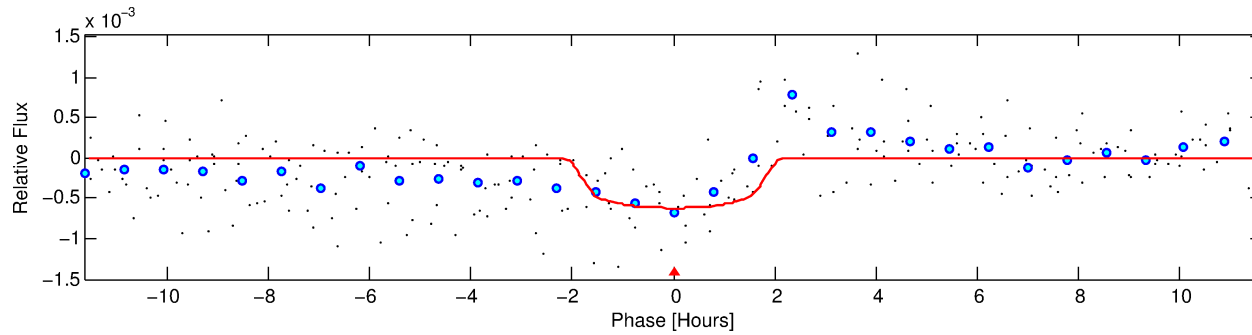
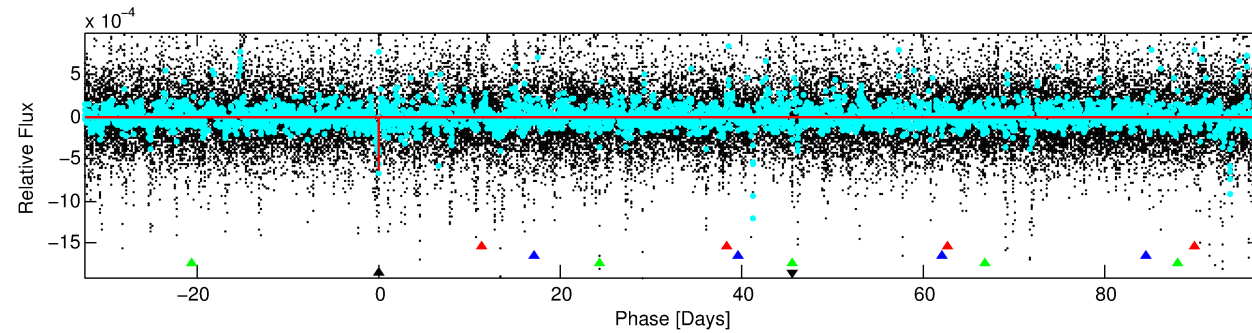
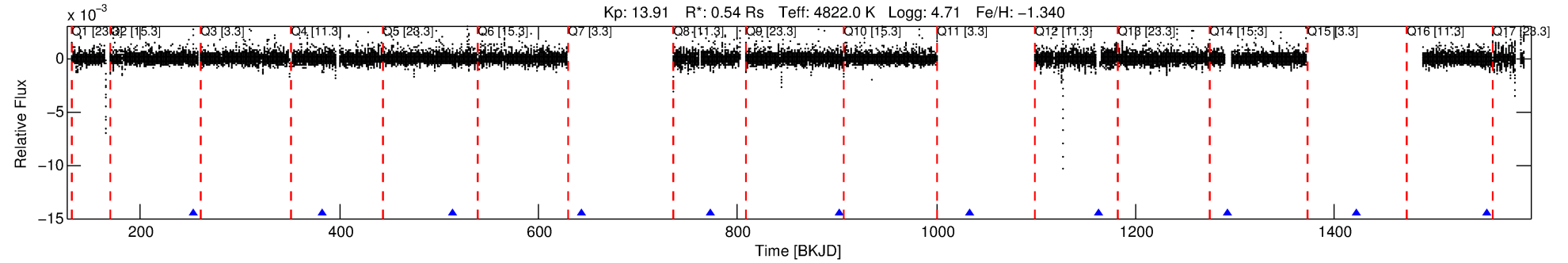
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010422030-04

No Significant Match Found

DV One-Page Summary

KIC: 10422030 Candidate: 4 of 4 Period: 129.885 d



DV Fit Results:

Period = 129.88463 [0.00135] d
Epoch = 253.5761 [0.0062] BKJD
Rp/R* = 0.0241 [0.0309]
a/R* = 200.08 [1066.48]
b = 0.66 [4.63]
Seff = 0.84 [0.13]
Teq = 244 [9] K
Rp = 1.43 [1.83] Re
a = 0.4114 [0.0222] AU
Ag = 11637.43 [30204.45] [0.39 σ]
Teffp = 3925 [2548] K [1.44 σ]

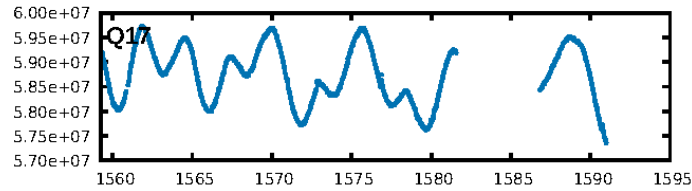
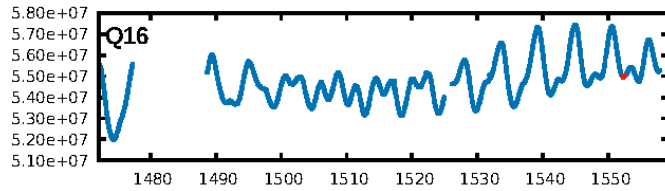
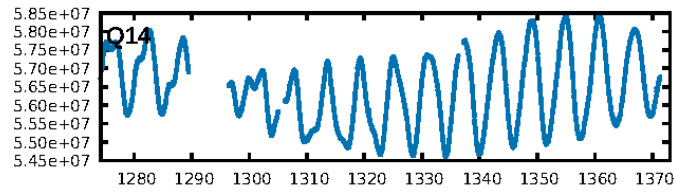
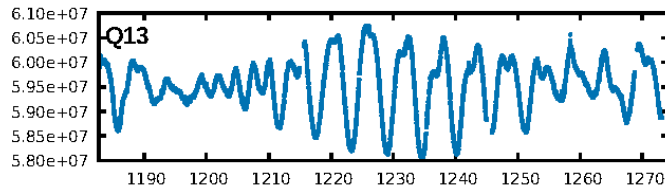
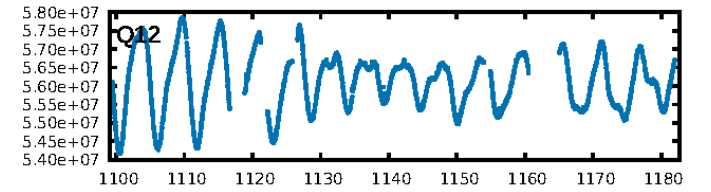
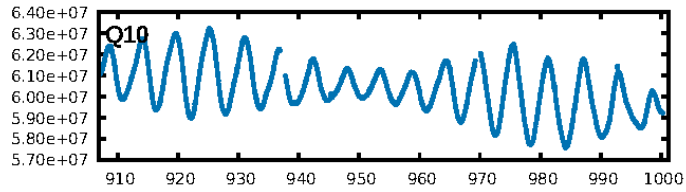
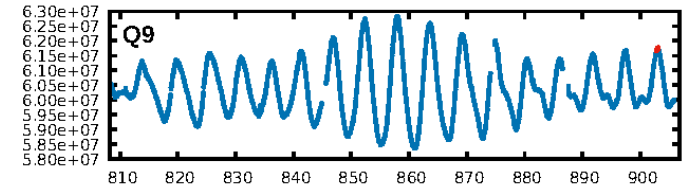
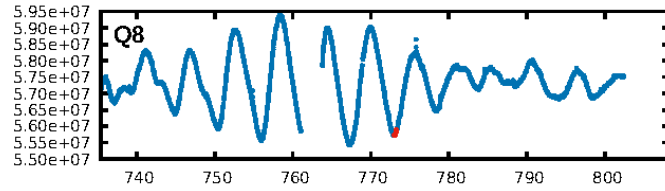
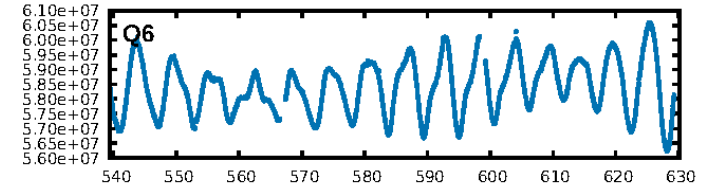
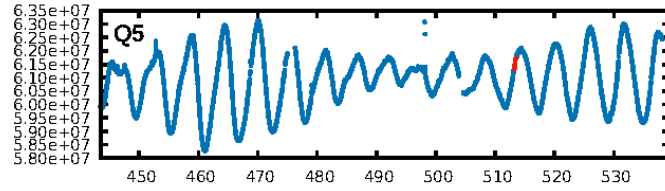
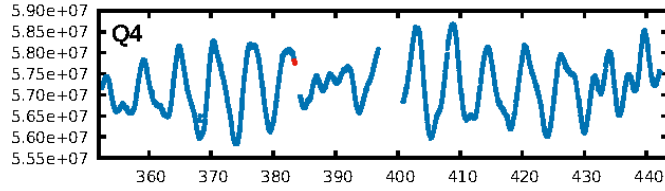
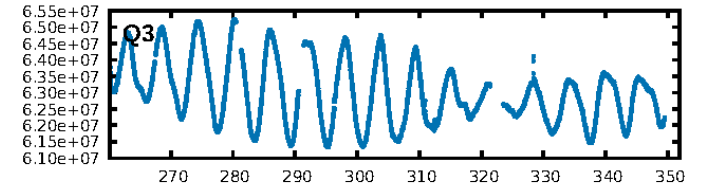
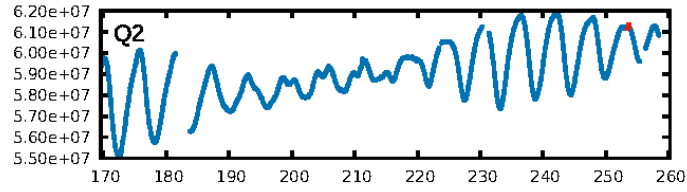
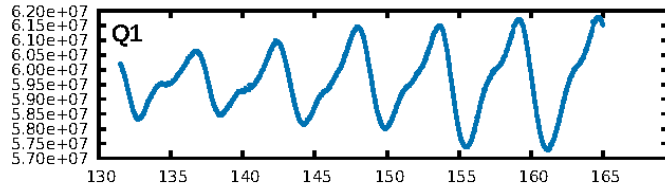
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [742.62 σ]
ModelChiSquare2-sig: 28.5%
ModelChiSquareGof-sig: 96.8%
Bootstrap-pfa: 1.22e-10
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -0.6721
Centroid-sig: 60.7%
Centroid-so: 0.752 arcsec [0.68 σ]
OotOffset-rm: 0.396 arcsec [2.41 σ]
KicOffset-rm: 0.337 arcsec [2.18 σ]
OotOffset-st: 0/0/2/1 [3]
KicOffset-st: 0/0/2/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [5/5]

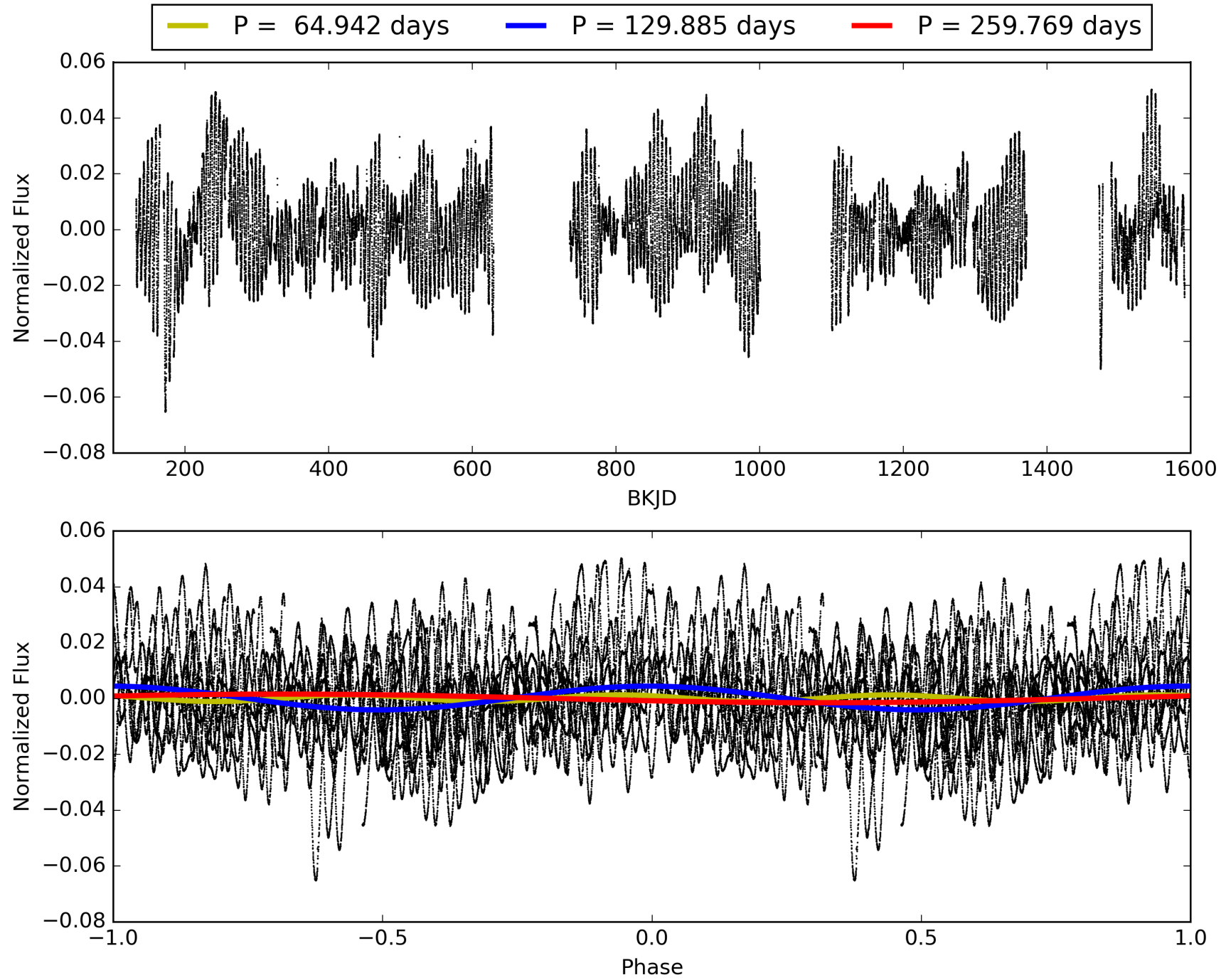
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:18:39 Z

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

TCE 010422030-04, PDC Light Curves

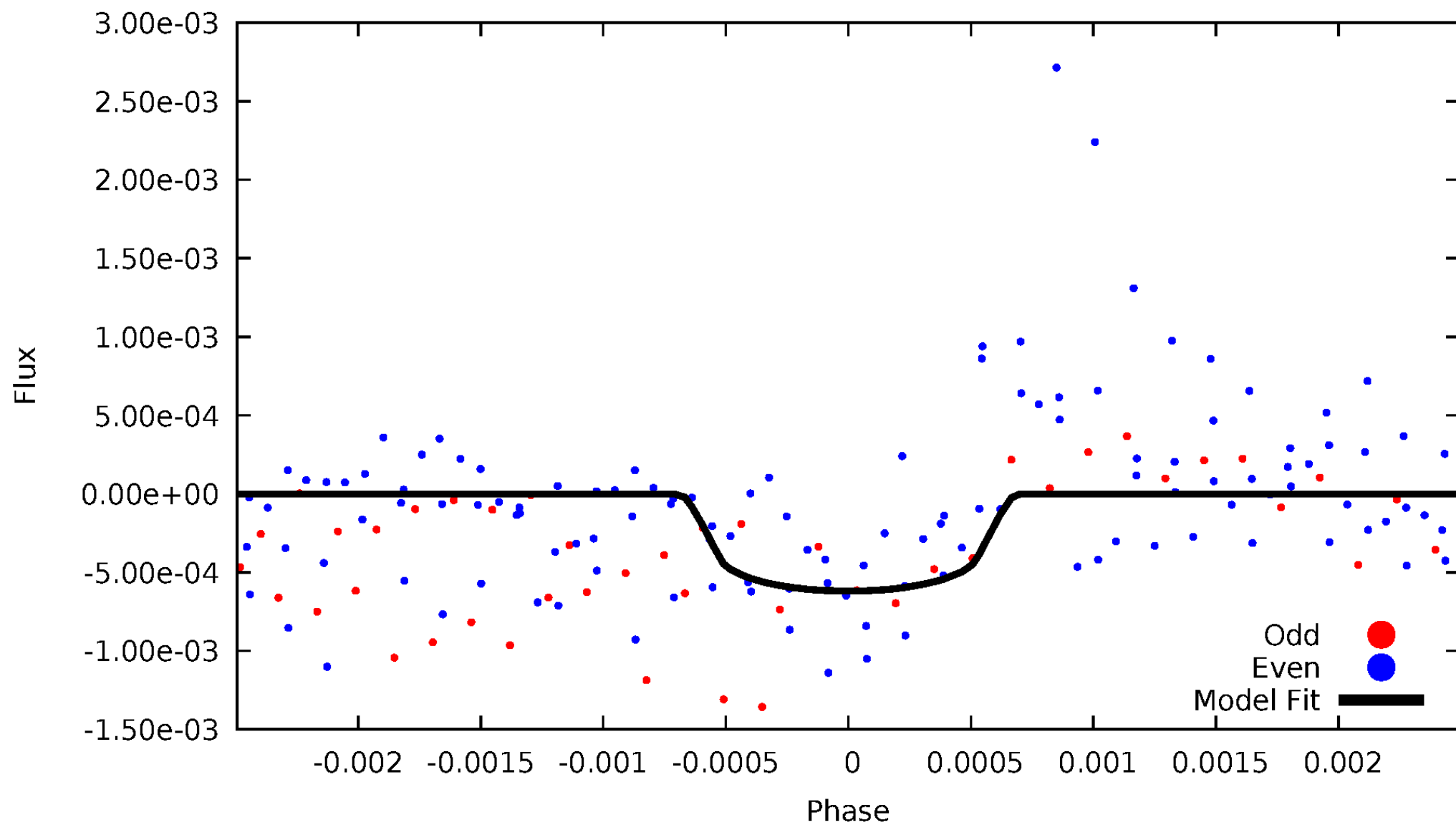


TCE 010422030-04



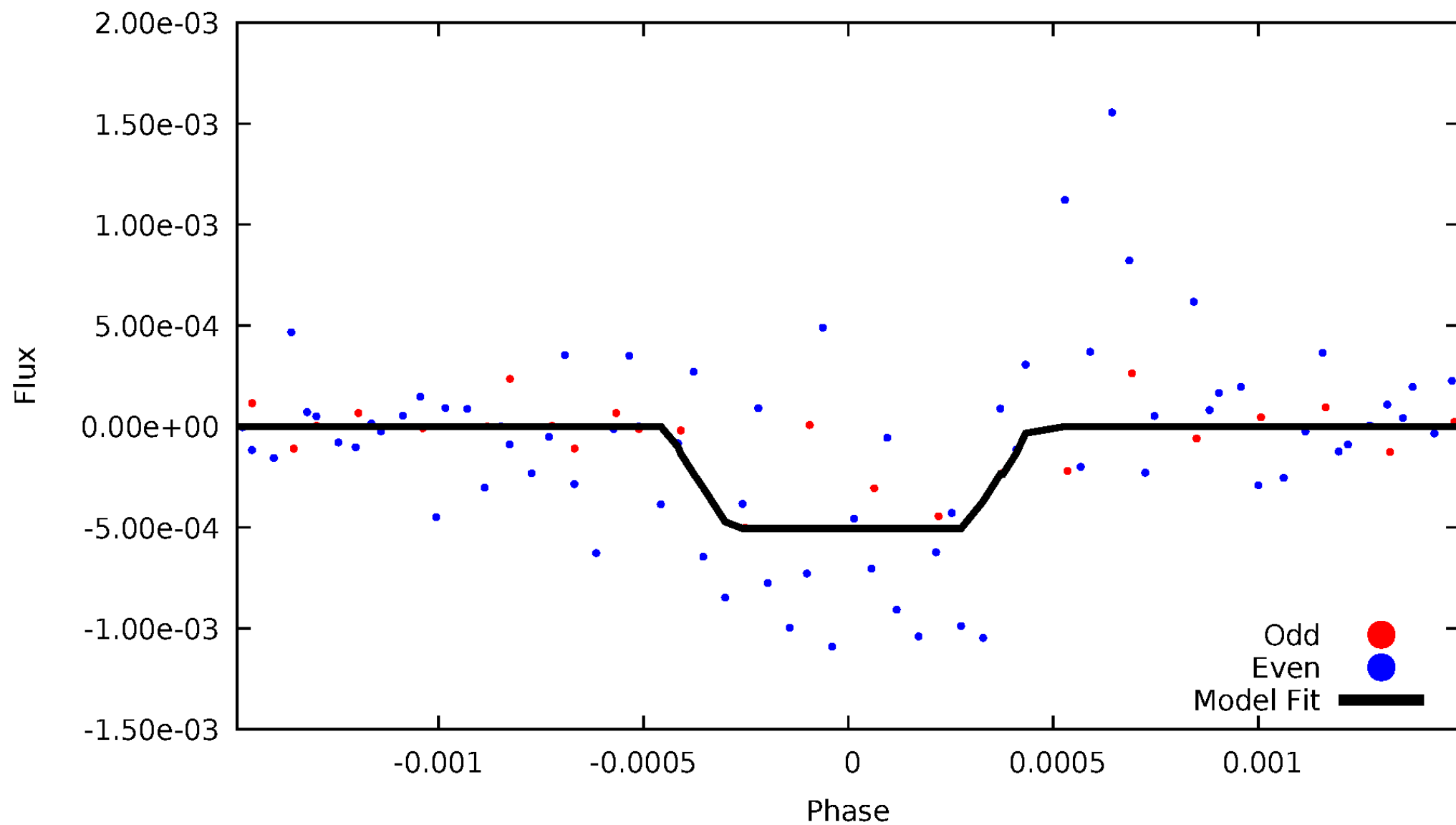
DV Odd/Even

TCE 010422030-04



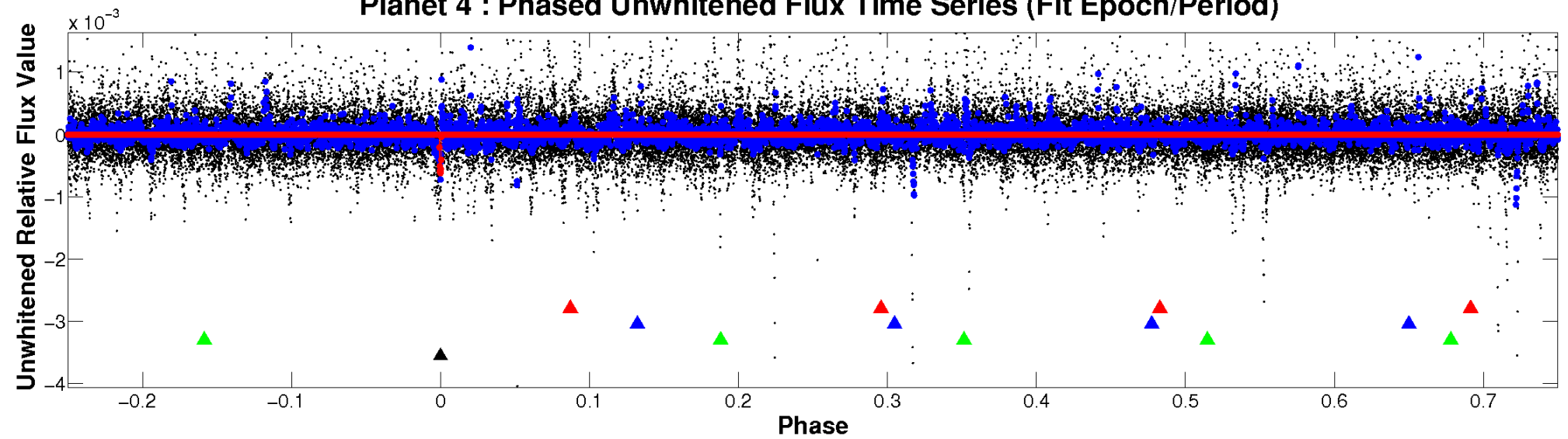
ALT Odd/Even

TCE 010422030-04

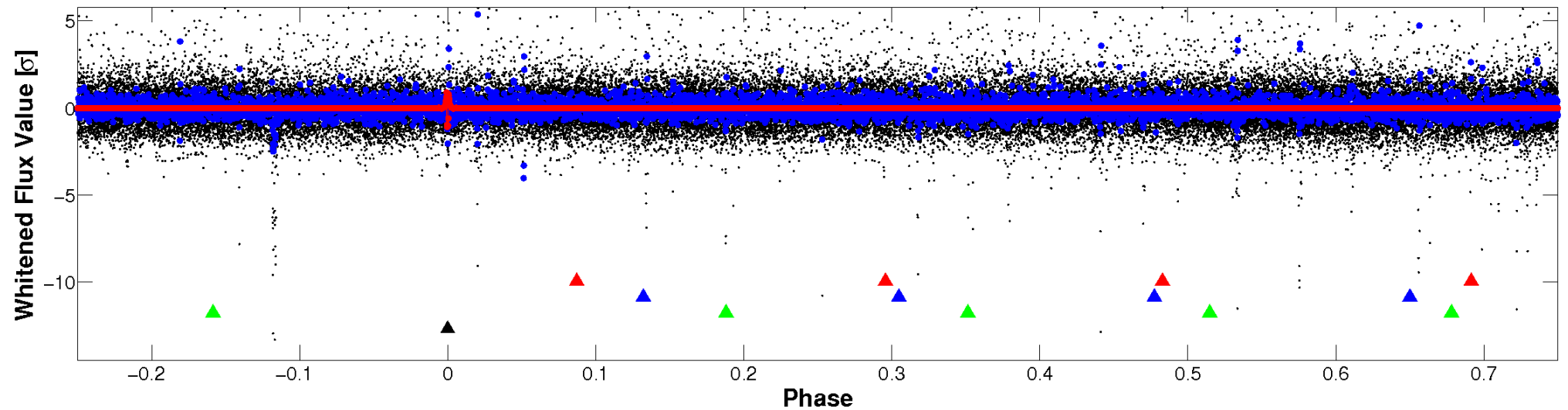


Non-Whitened Vs. Whitened Light Curve

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

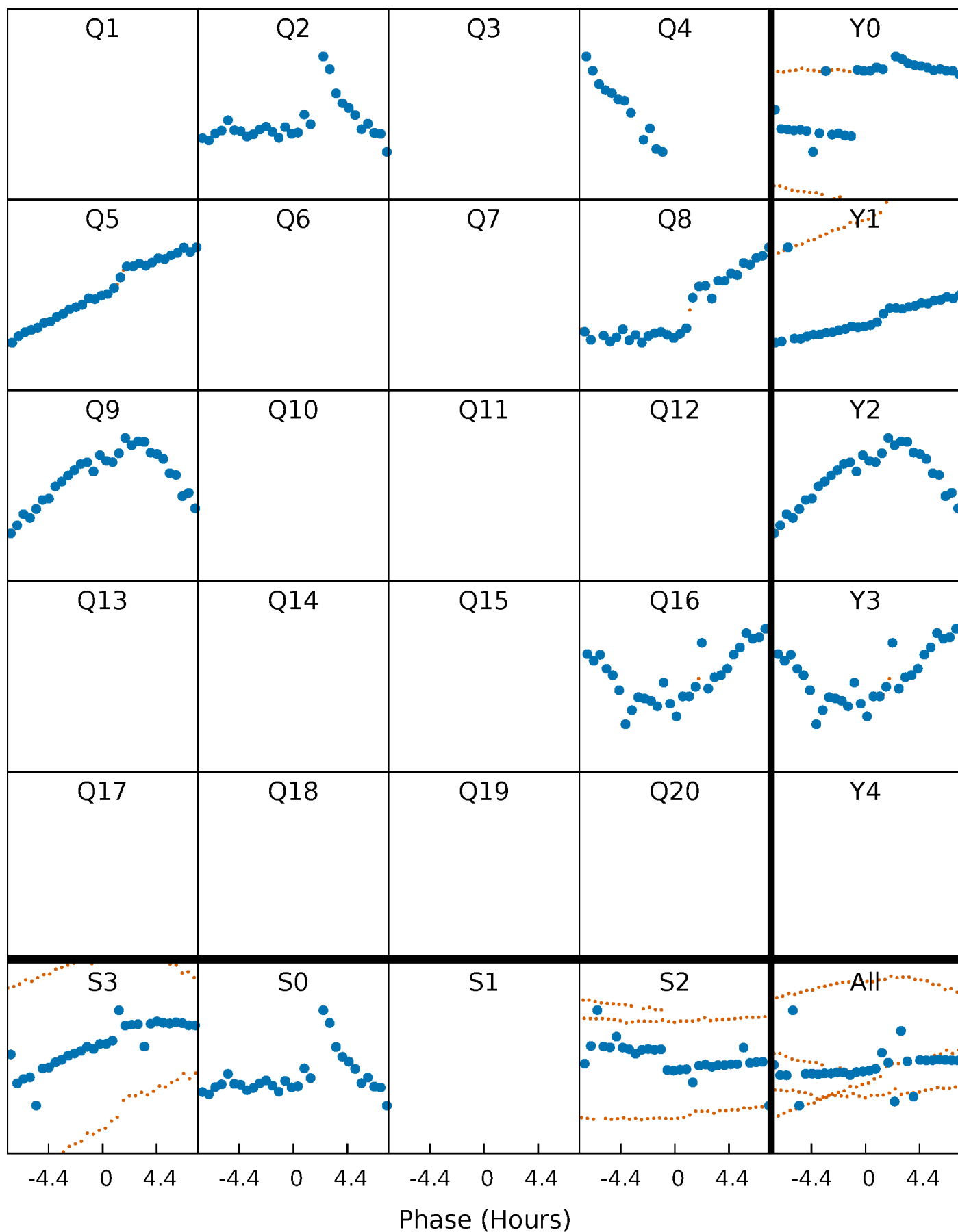


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



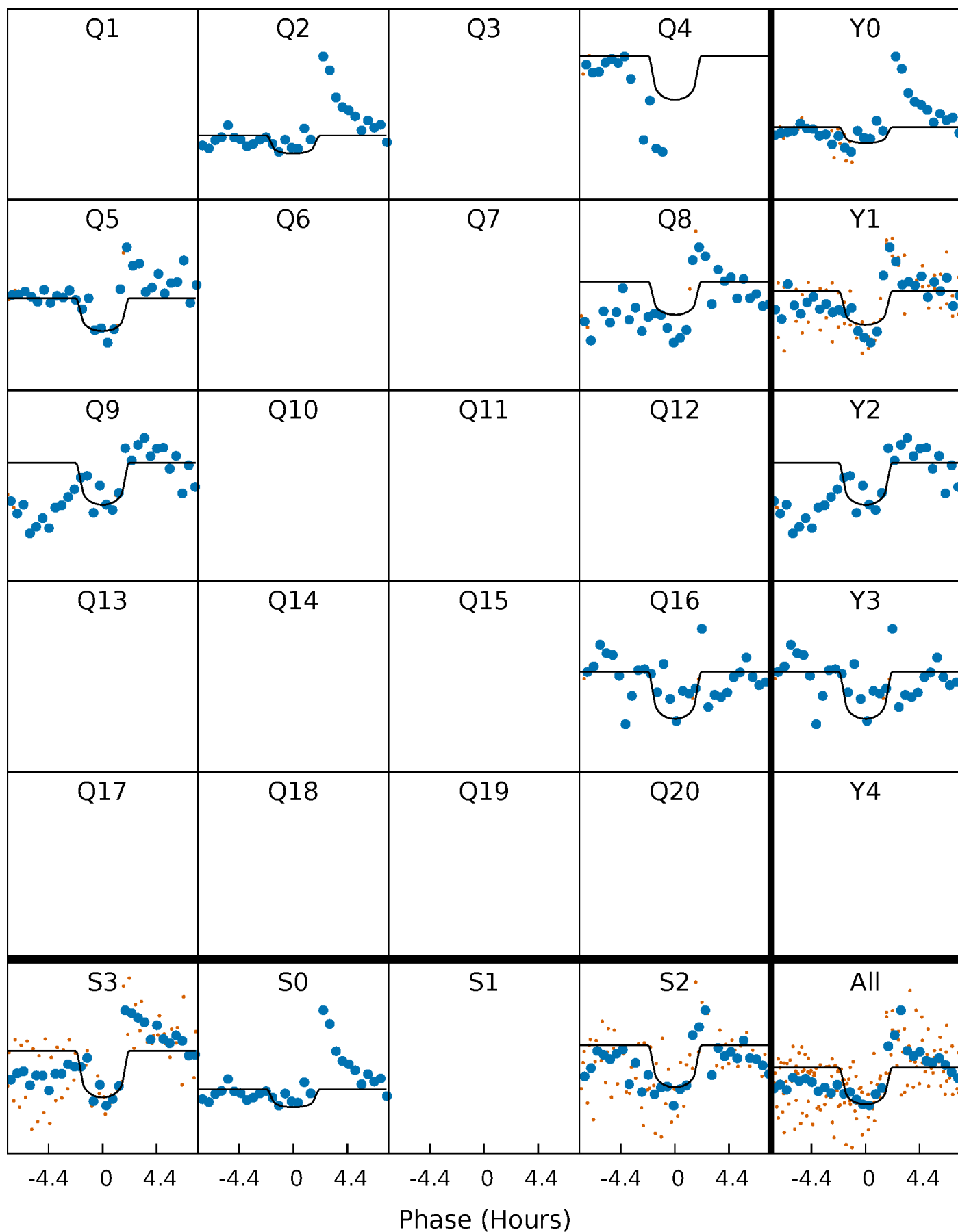
PDC Quarter-Phased Transit Curves

TCE 010422030-04 P=129.884630 Days $T_0=253.576081$ (BKJD)



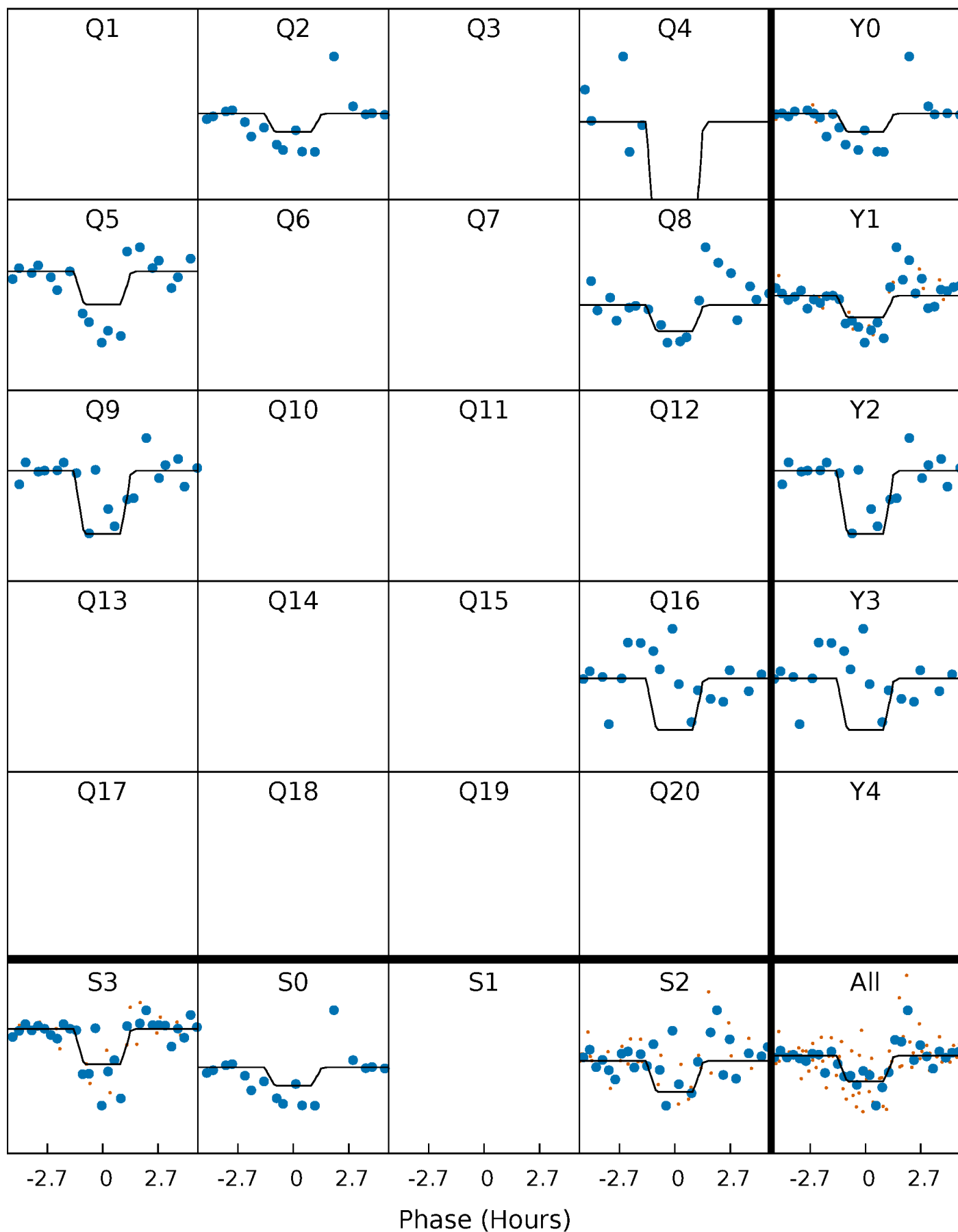
DV Quarter-Phased Transit Curves

TCE 010422030-04 $P=129.884630$ Days $T_0=253.576081$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

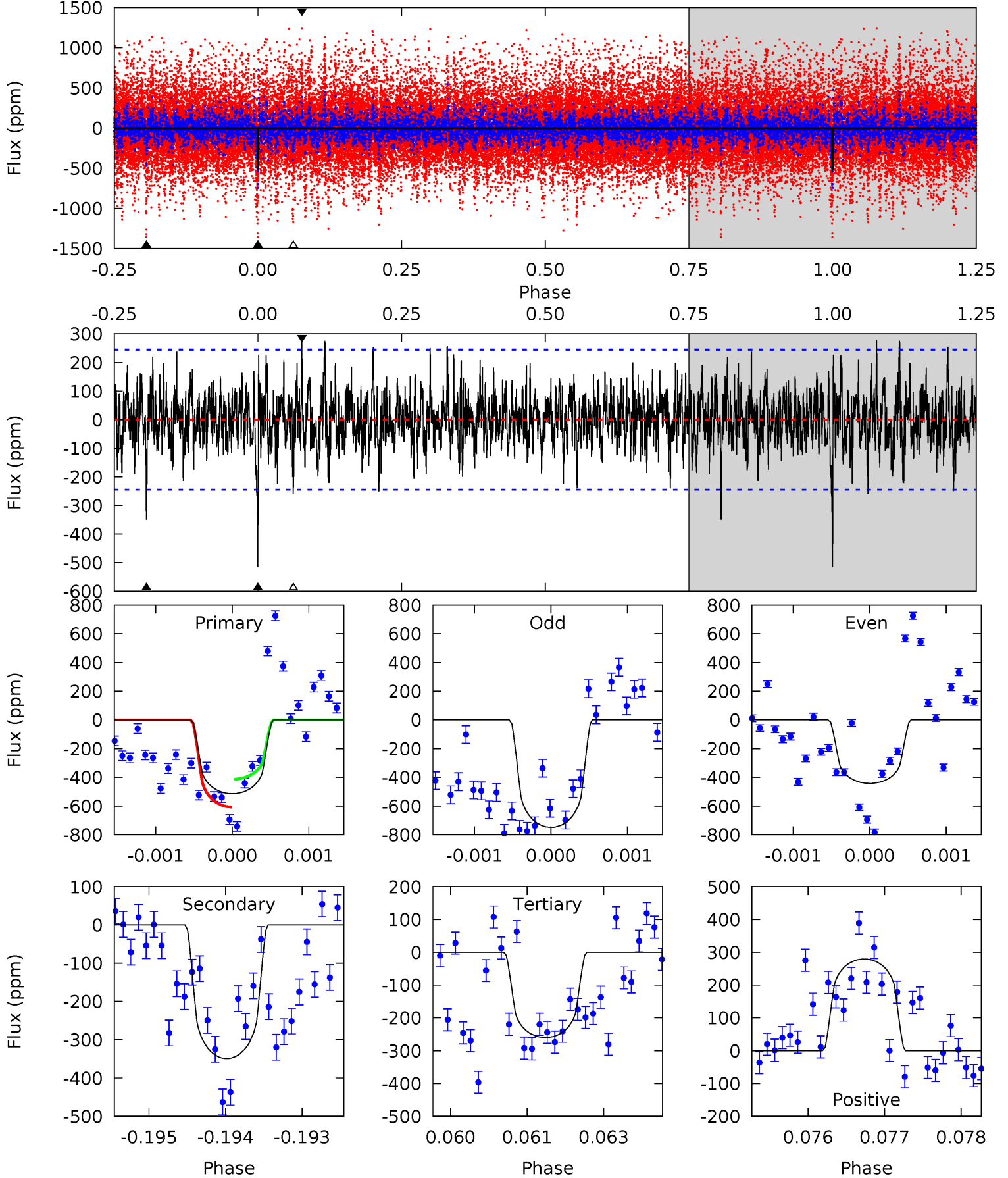
TCE 010422030-04 $P=129.878560$ Days $T_0=253.602839$ (BKJD)



DV Model-Shift Uniqueness Test

010422030-04, P = 129.884630 Days, E = 123.691451 Days

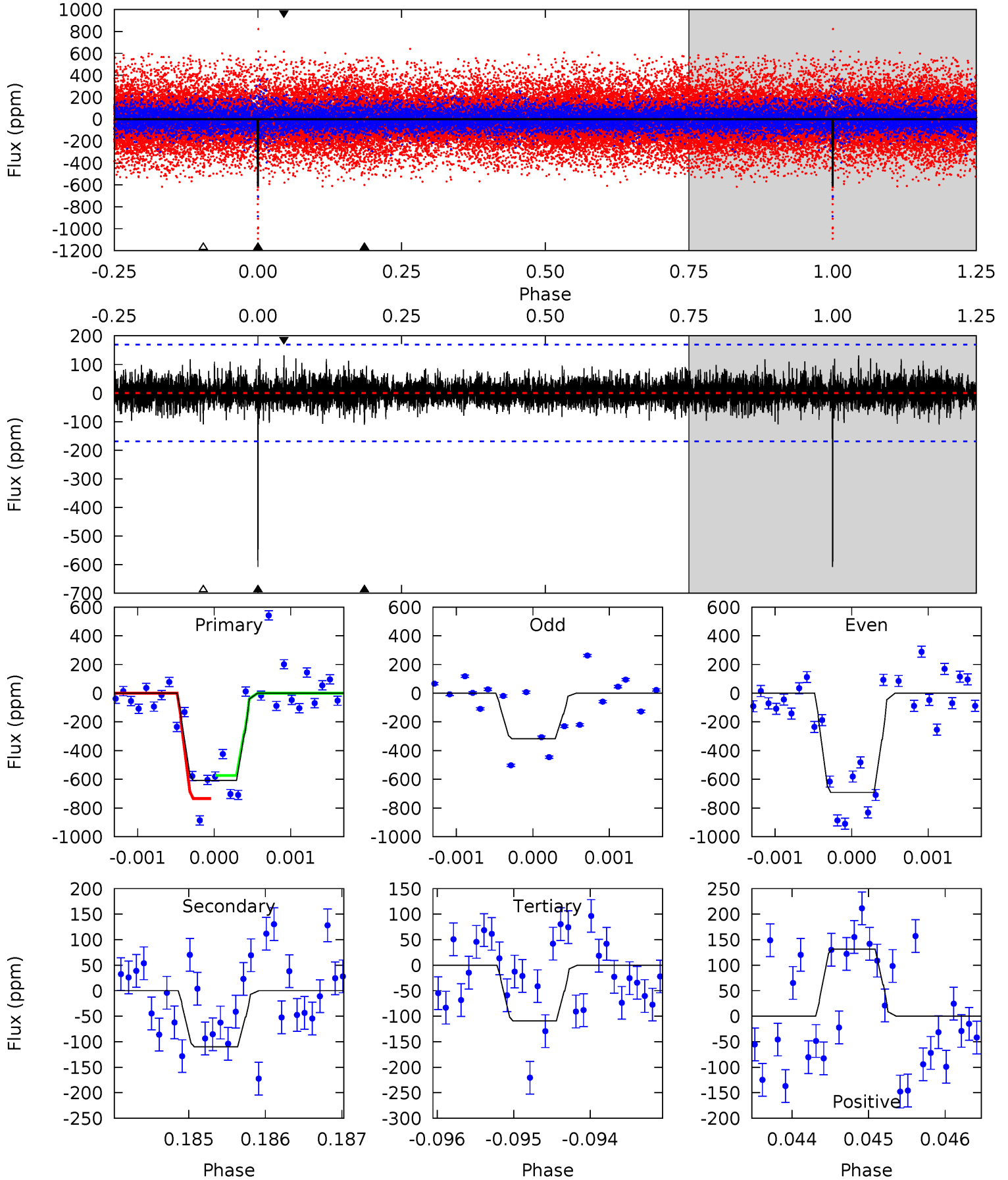
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	7.71	5.74	6.17	5.40	3.22	1.65	5.62	5.19	1.97	1.54	2.85	1.33	0.35	2.16



Alt Model-Shift Uniqueness Test

010422030-04, P = 129.878560 Days, E = 123.724279 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.6	3.55	3.53	4.25	5.46	3.31	0.93	16.1	15.4	0.02	-0.70	5.41	0.95	0.18	2.51



Stellar Parameters For KIC 010422030

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4822^{+144}_{-158}	$4.709^{+0.048}_{-0.024}$	$-1.340^{+0.300}_{-0.300}$	$0.543^{+0.029}_{-0.032}$	$0.550^{+0.036}_{-0.019}$	$4.830^{+0.943}_{-0.477}$
	+3%/-3%	+1%/-1%	+22%/-22%	+5%/-6%	+7%/-3%	+20%/-10%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010422030-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-349 ± 45	$1.82^{+1.52}_{-1.17}$	340^{+11}_{-13}	3965^{+2254}_{-717}	9696^{+74151}_{-6833}
Alt.	-110 ± 31	$1.86^{+1.54}_{-1.23}$	340^{+11}_{-13}	3266^{+1605}_{-536}	2880^{+24159}_{-2043}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

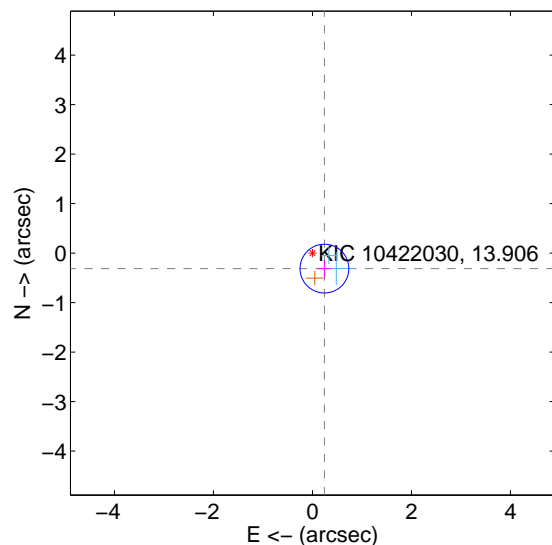
Supplemental centroid analysis for 010422030-04. Kepler magnitude: 13.91. Transit SNR 6.94

There are 2 quarters with good PRF difference image offsets

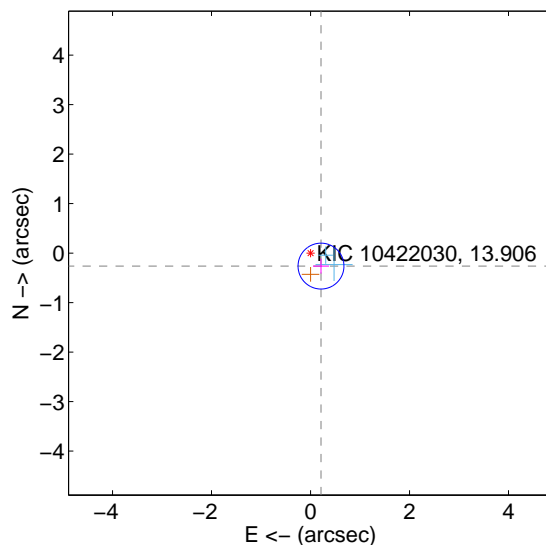
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.396 ± 0.164	2.41	-0.243 ± 0.144	-0.313 ± 0.175
PRF-fit source offset from KIC position	0.337 ± 0.155	2.18	-0.212 ± 0.161	-0.263 ± 0.150
photometric centroid source offset	0.75 ± 1.11	0.68	-0.46 ± 1.06	0.60 ± 1.13

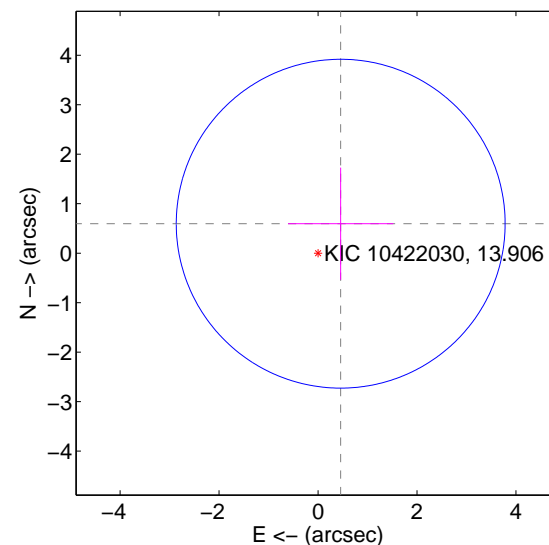
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

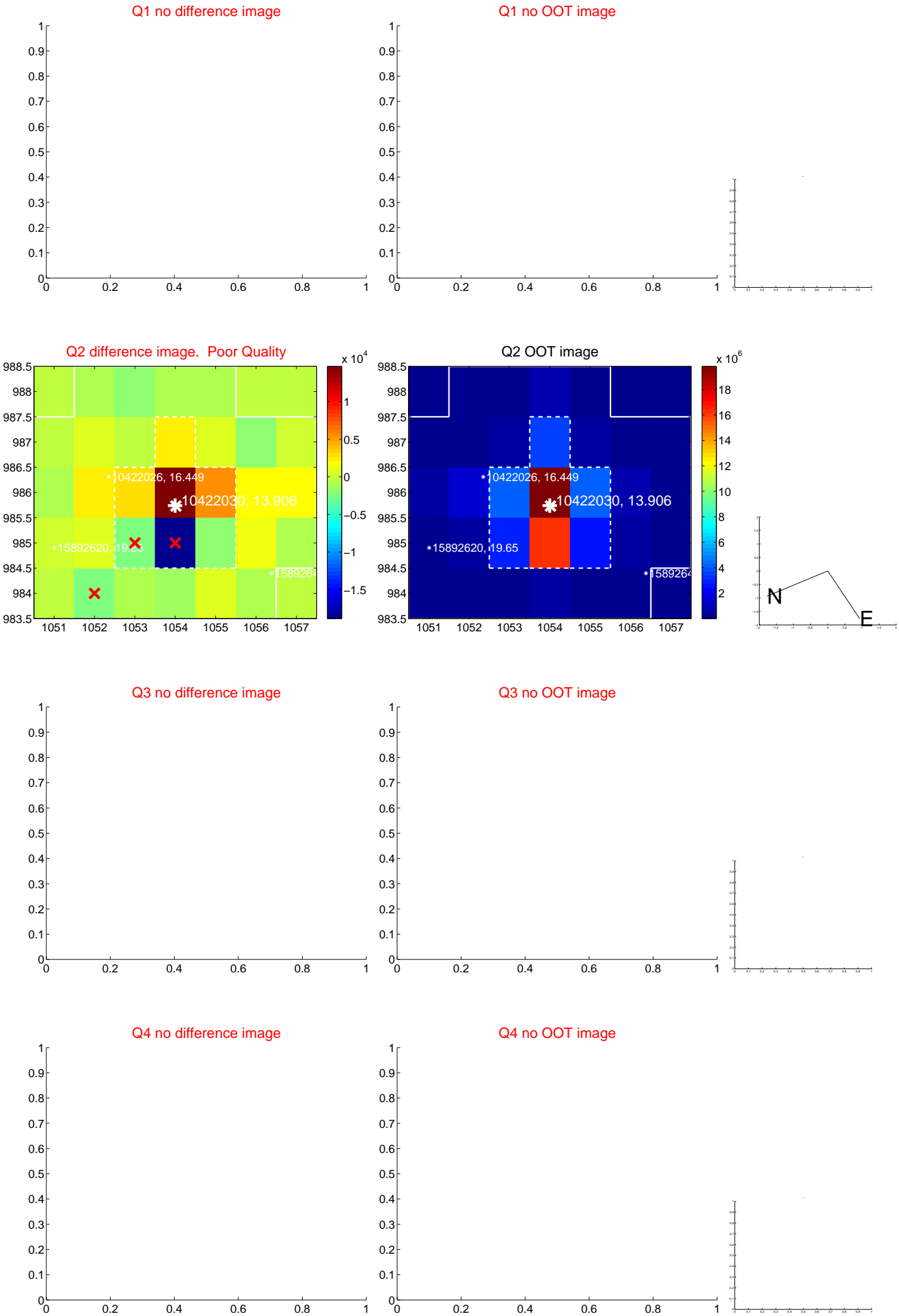


offset from photometric centroids

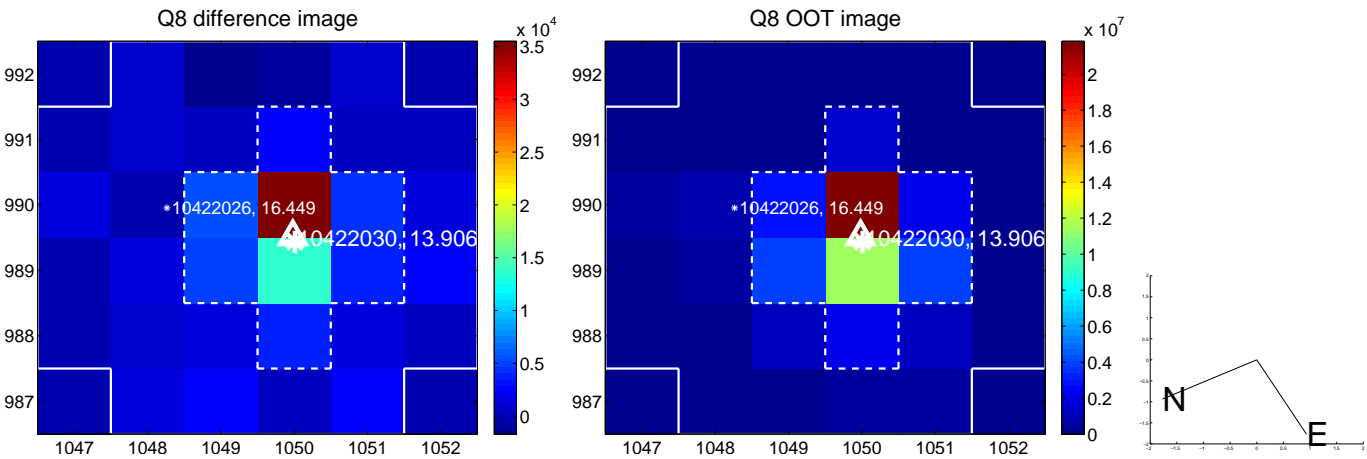
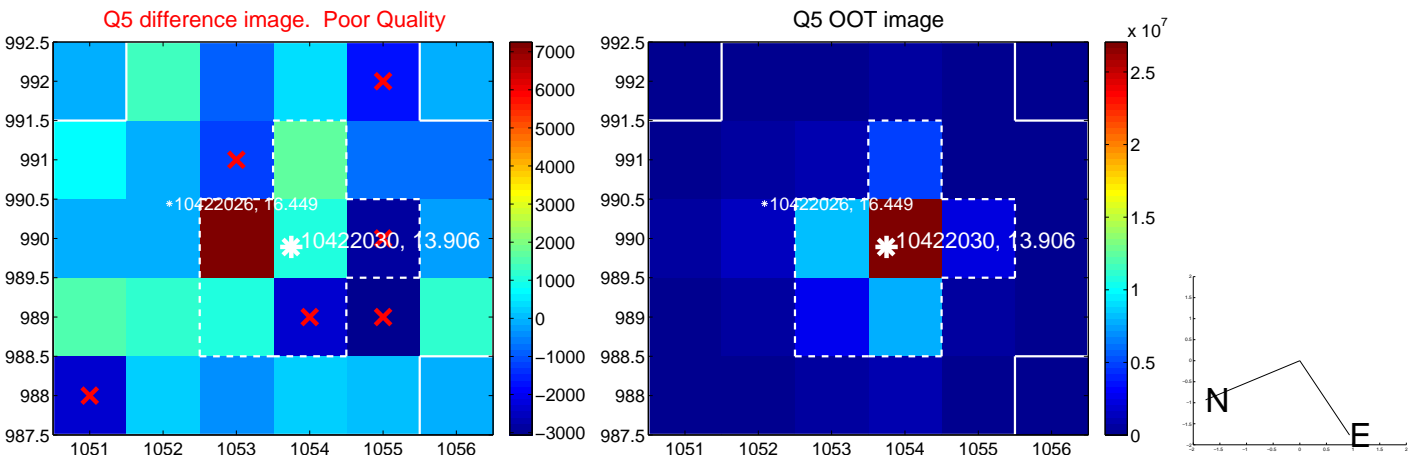


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

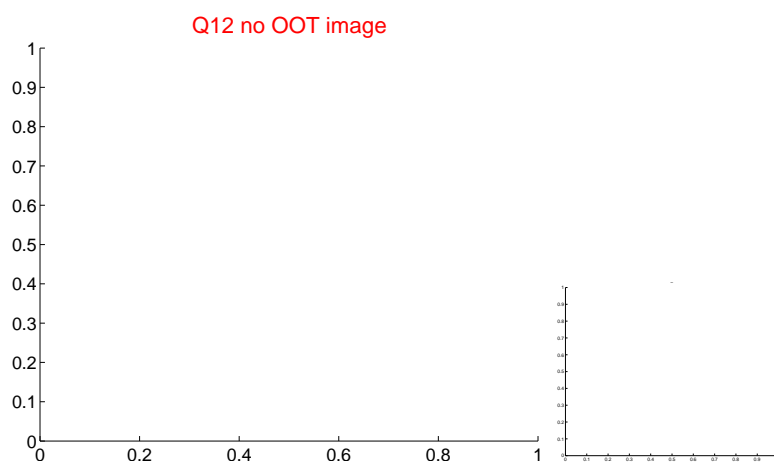
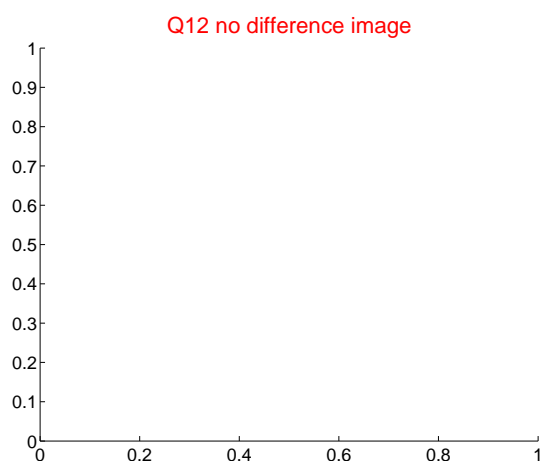
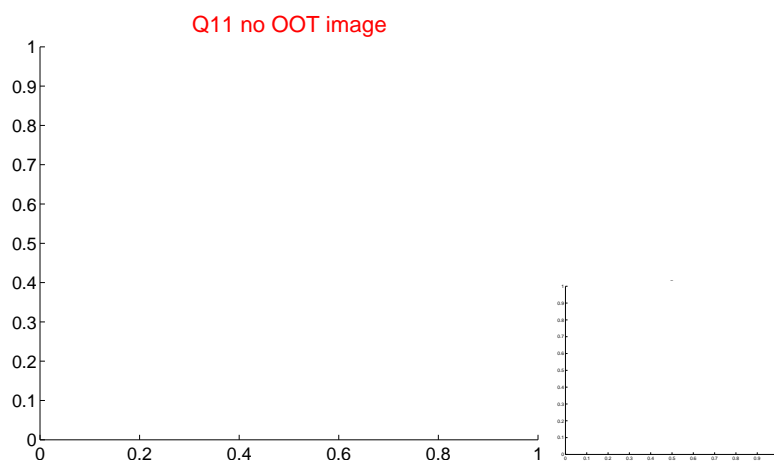
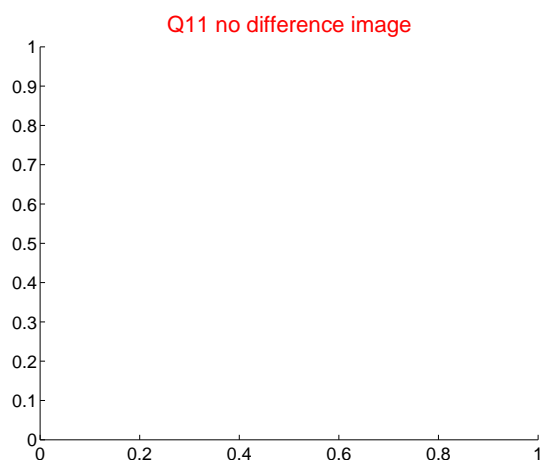
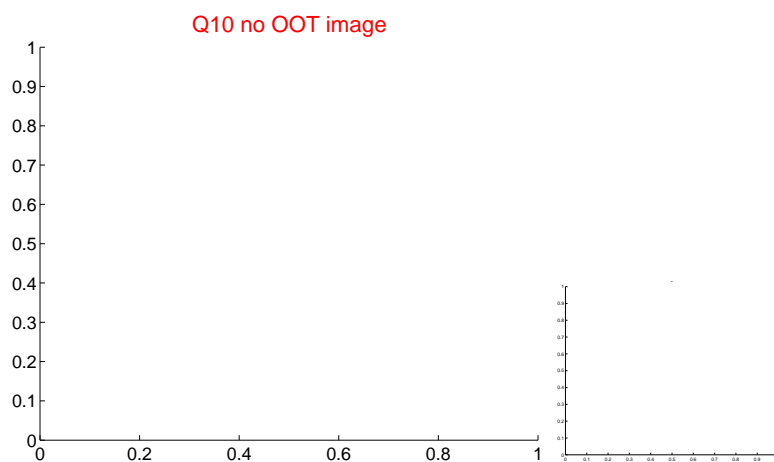
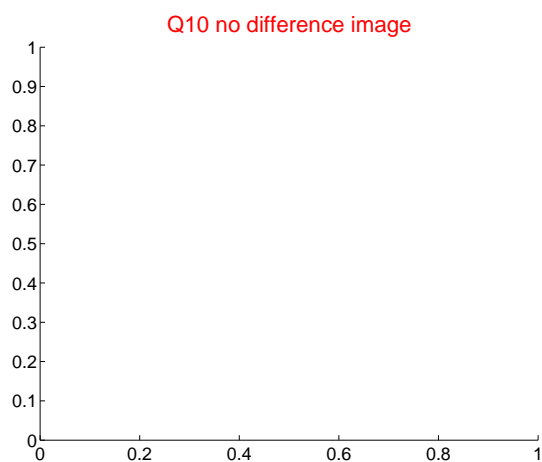
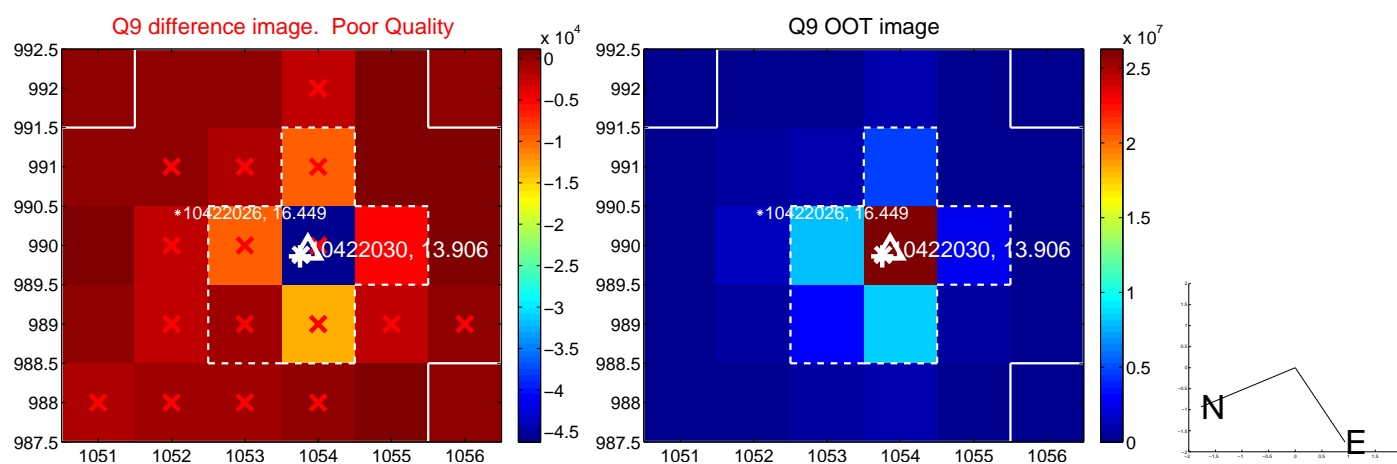
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



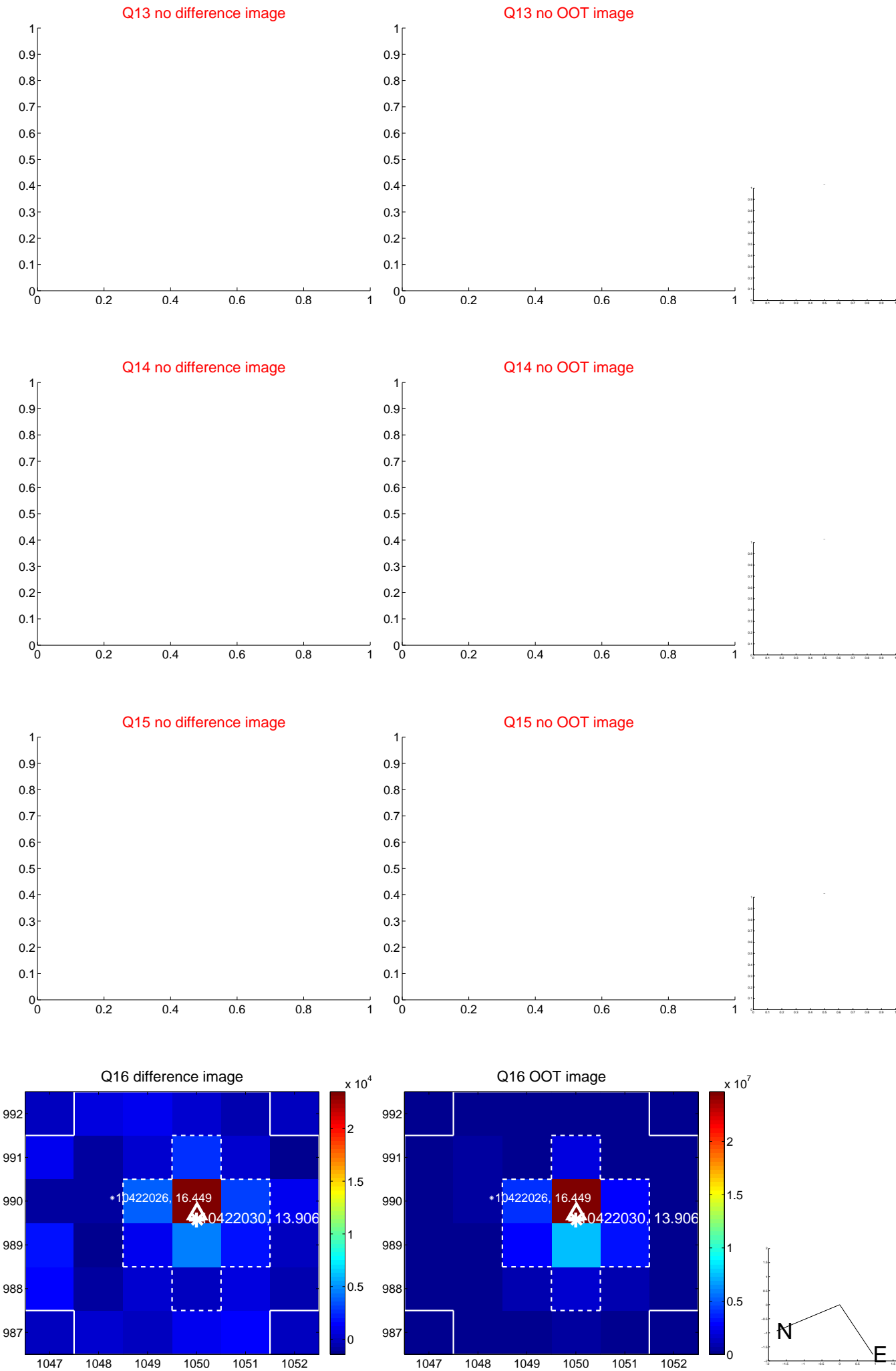
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



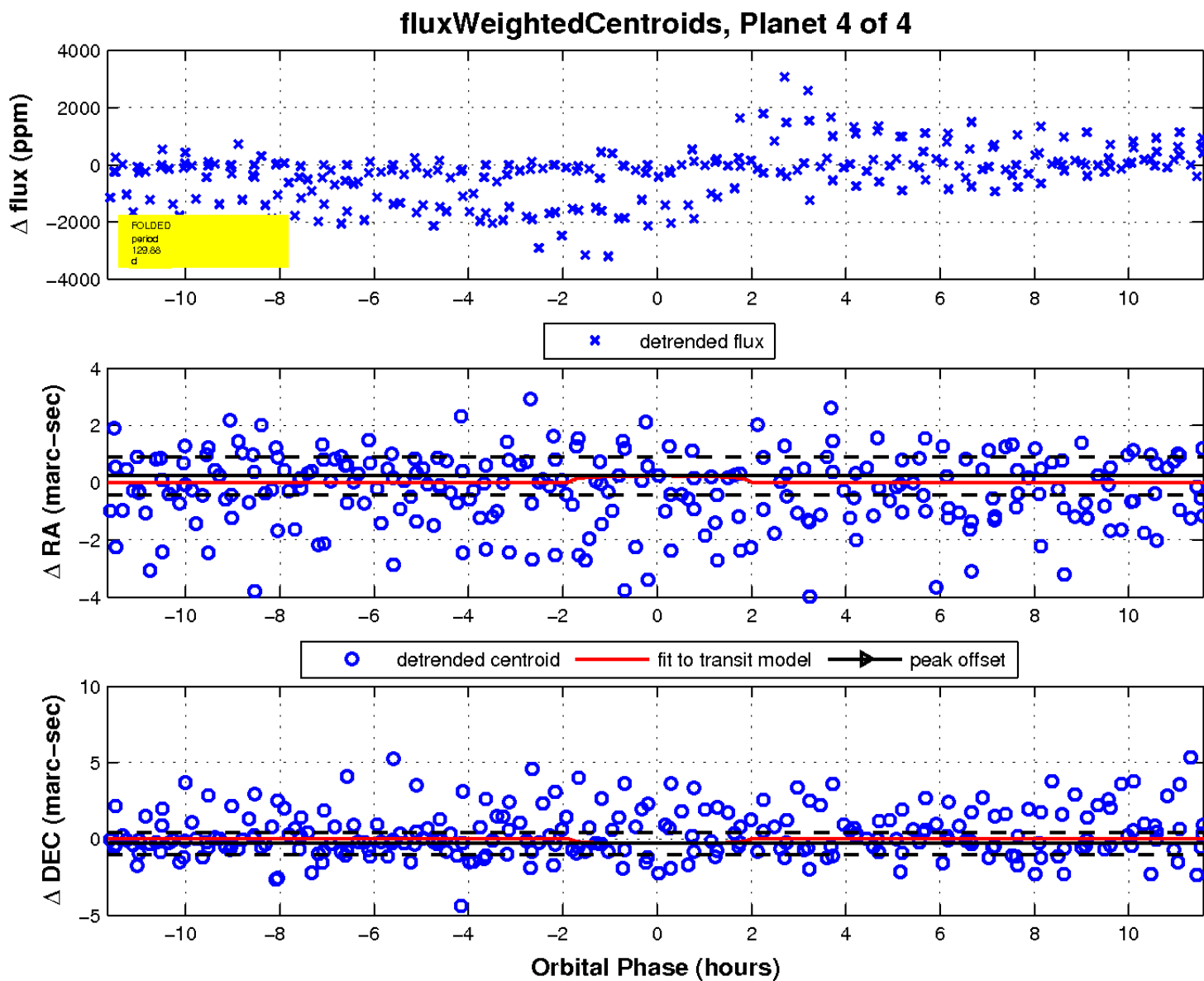
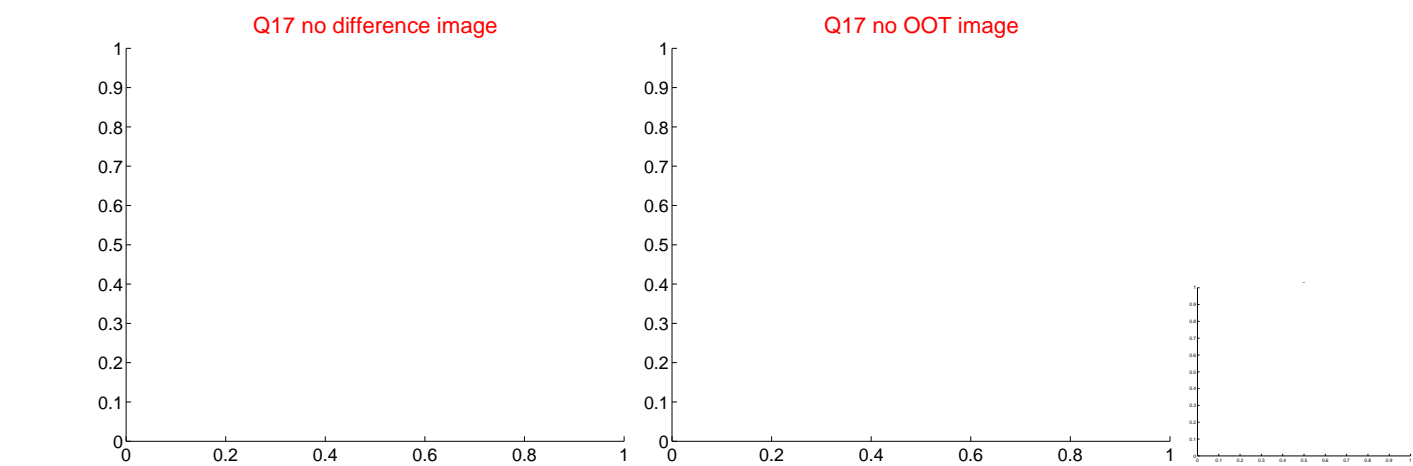
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

