

KIC 010472112

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})
010472112-01	OBS	No	372.799047	497.003335	1165.3	23.240	8.5	9.0	0.72	5092	3.17	0.38
010472112-02	OBS	No	415.108100	484.942714	732.9	12.750	8.4	7.9	0.72	5092	2.10	0.33

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010472112-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
010472112-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—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.

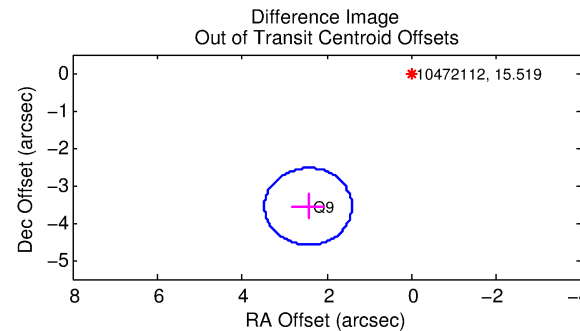
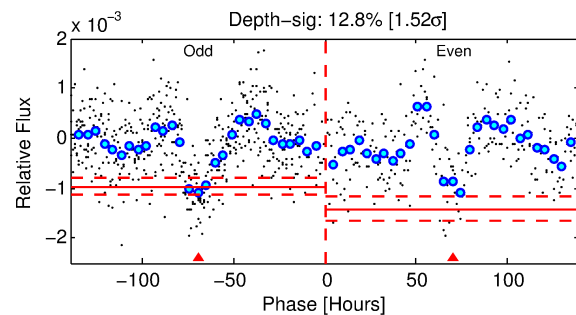
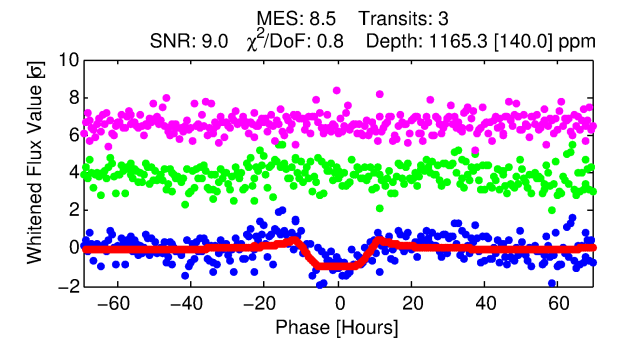
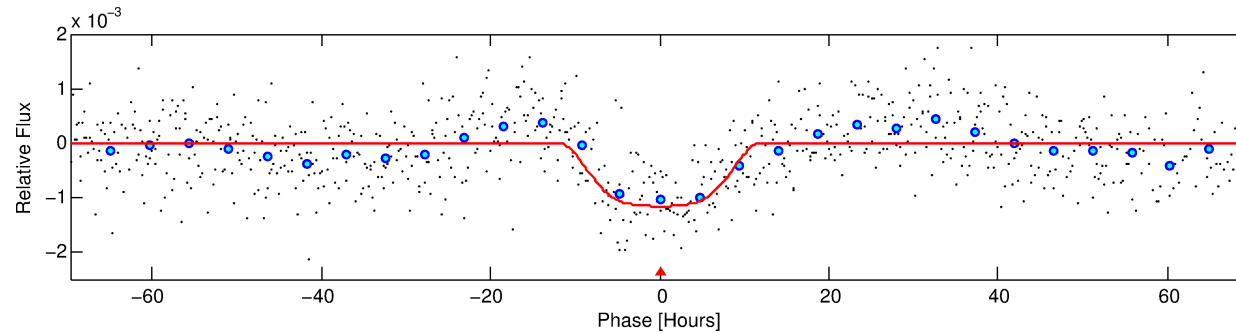
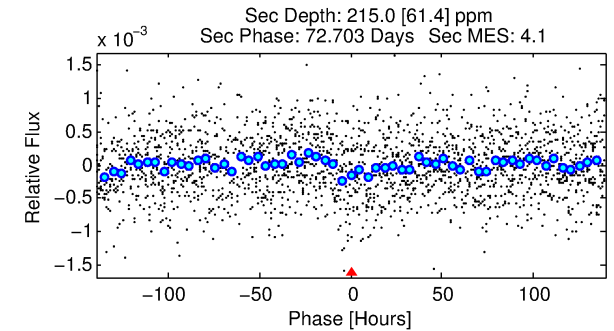
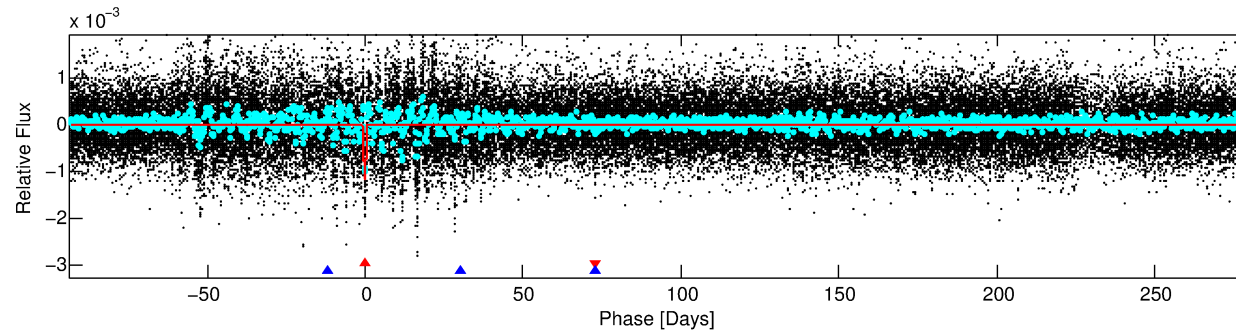
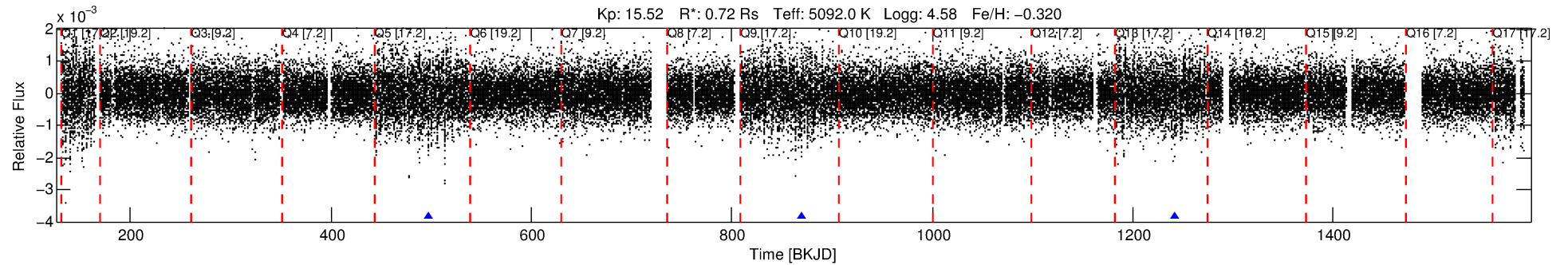
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010472112-01

No Significant Match Found

DV One-Page Summary

KIC: 10472112 Candidate: 1 of 2 Period: 372.799 d



DV Fit Results:

Period = 372.79905 [0.02566] d
Epoch = 497.0033 [0.0331] BKJD
Rp/R* = 0.0403 [0.0032]
a/R* = 53.95 [8.07]
b = 0.94 [0.02]
Seff = 0.38 [0.06]
Teq = 200 [8] K
Rp = 3.17 [0.43] Re
a = 0.9090 [0.0768] AU
Ag = 9735.83 [3366.41] [2.89σ]
Teff = 3070 [267] K [10.74σ]

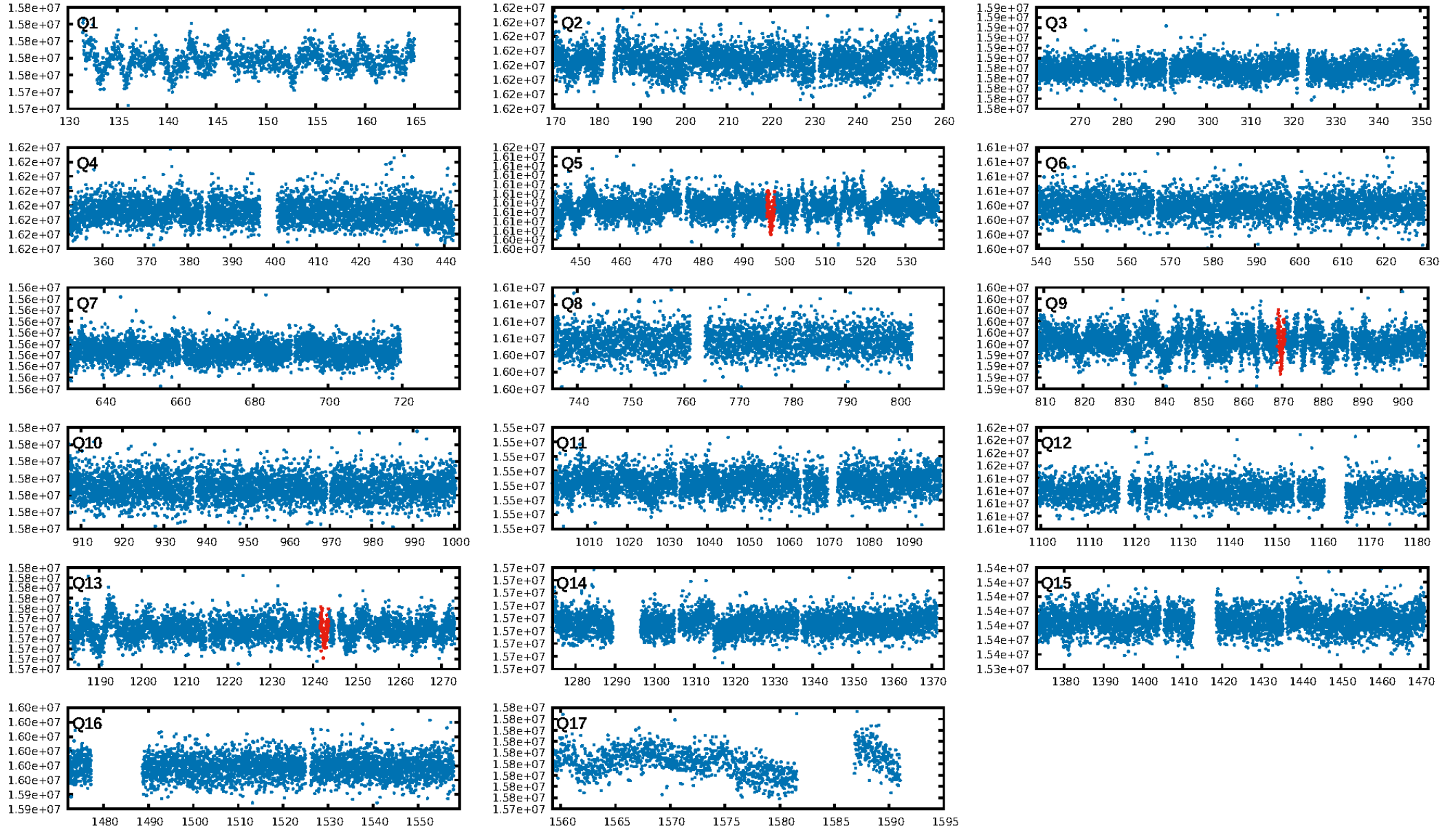
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [38.31σ]
ModelChiSquare2-sig: 81.6%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 2.58e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.364
Centroid-sig: 86.3%
Centroid-so: 0.549 arcsec [0.38σ]
OotOffset-rm: 4.321 arcsec [12.59σ]
KicOffset-rm: 4.125 arcsec [11.93σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

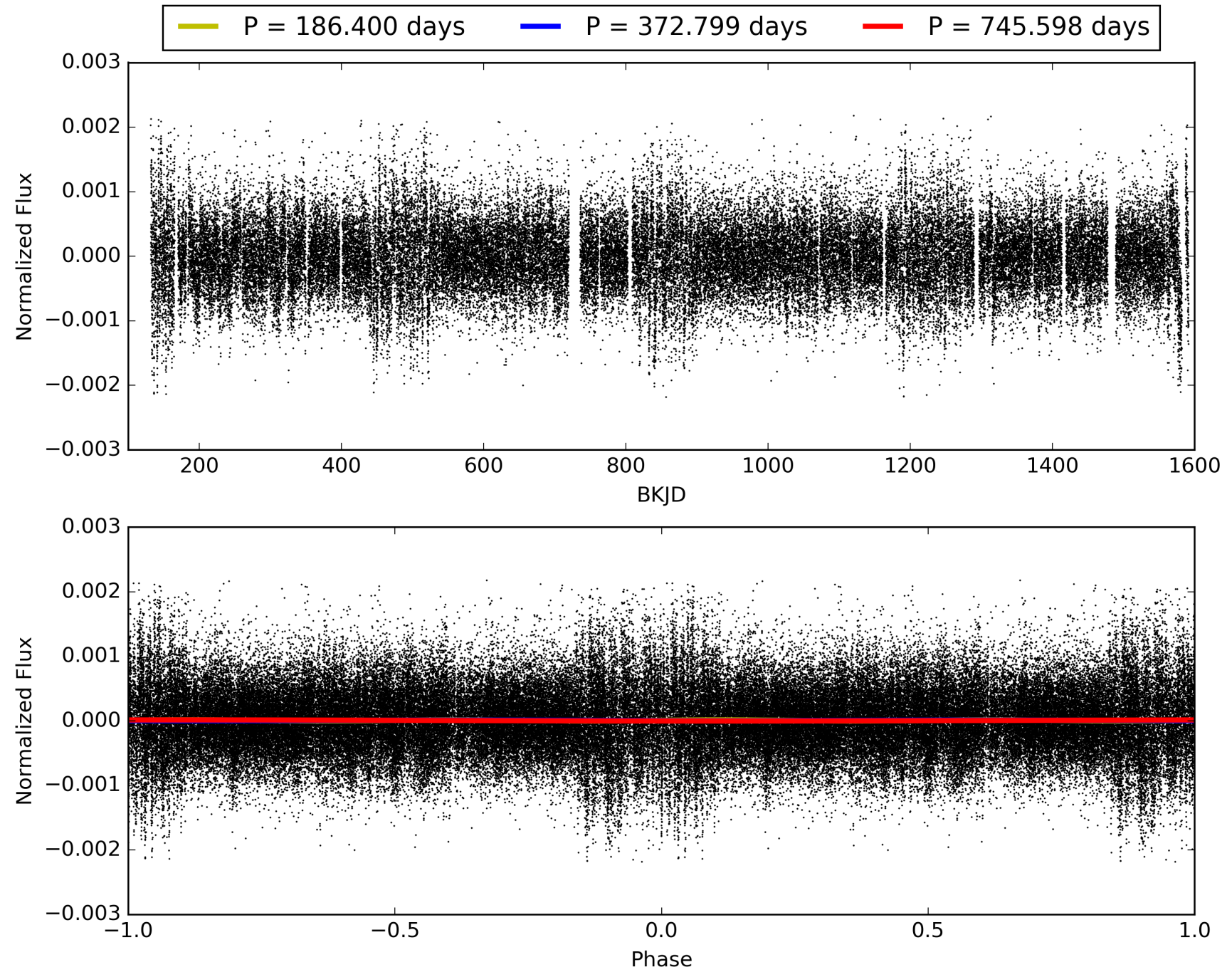
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:58:11 Z

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

TCE 010472112-01, PDC Light Curves

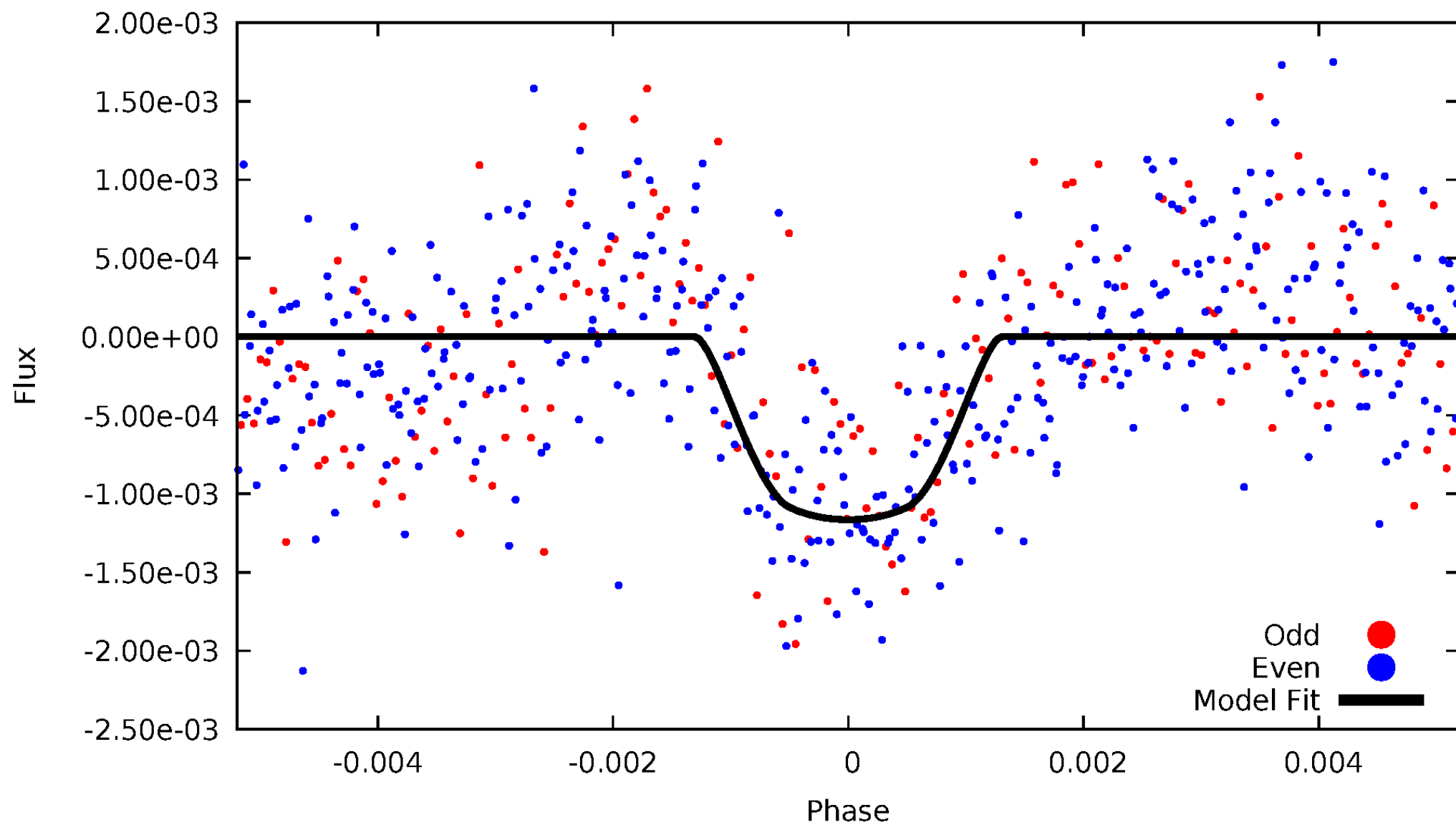


TCE 010472112-01



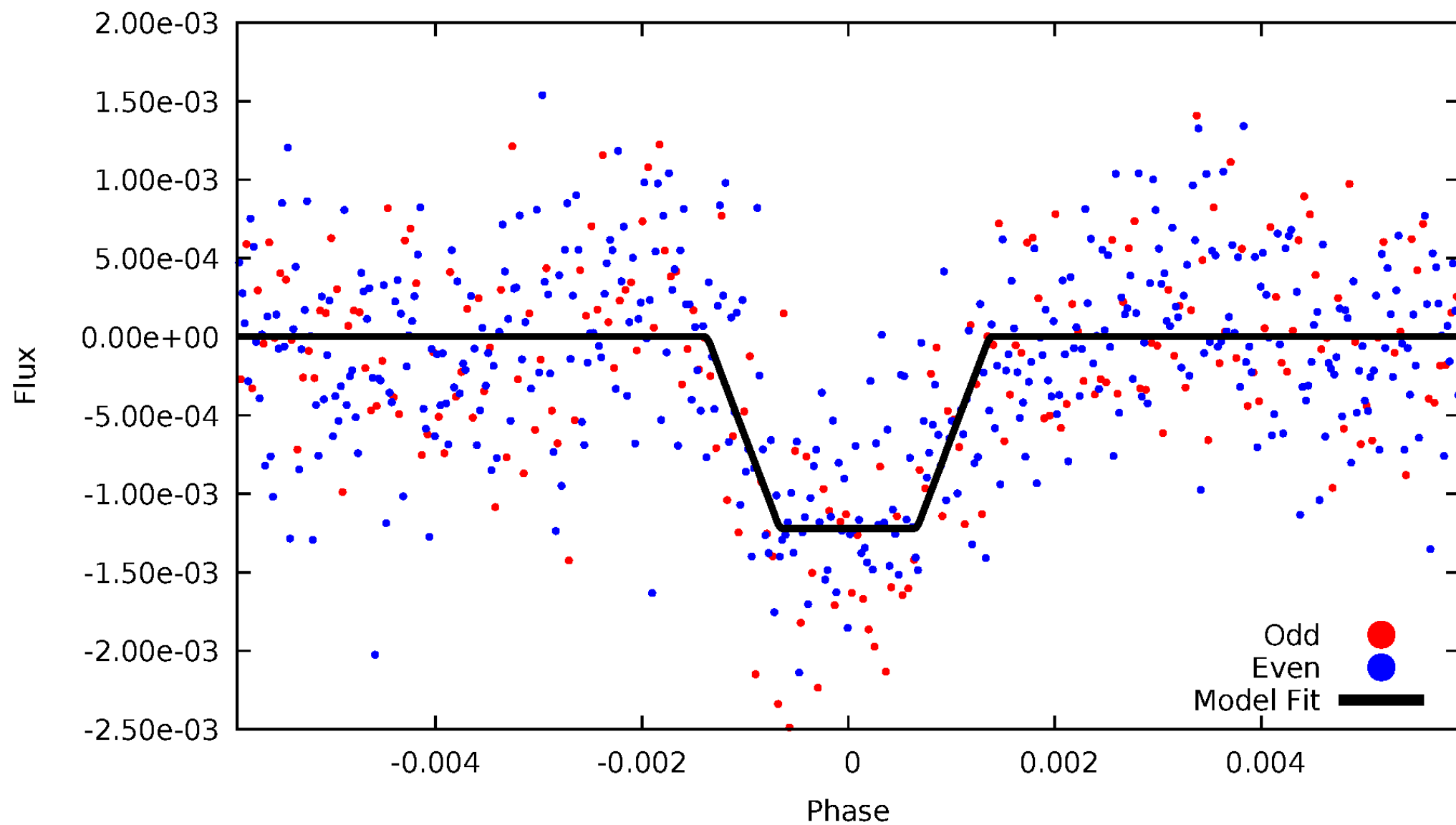
DV Odd/Even

TCE 010472112-01



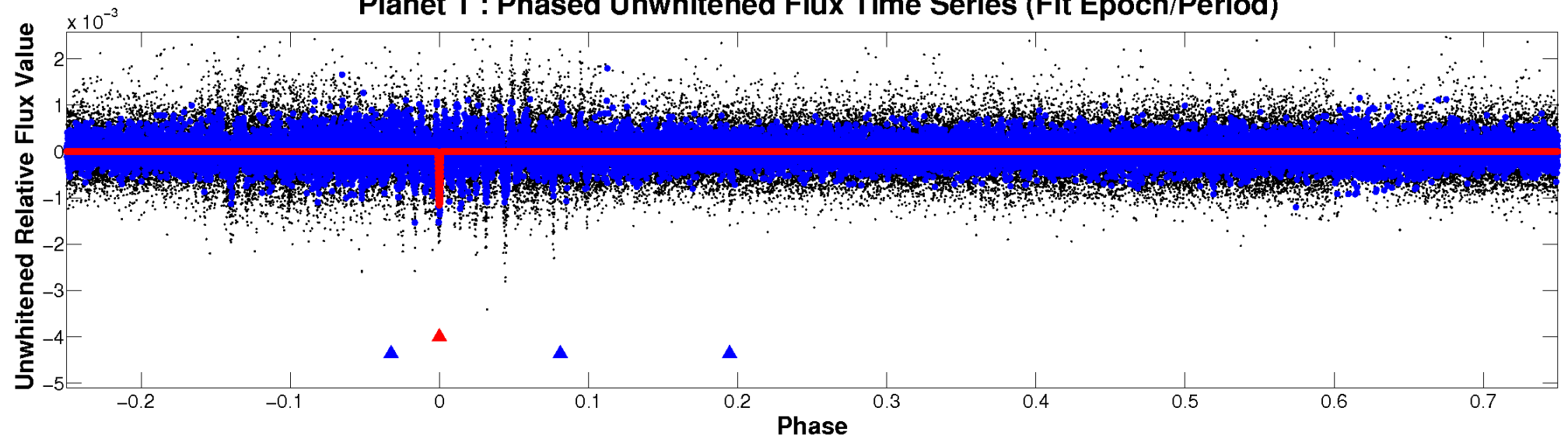
ALT Odd/Even

TCE 010472112-01

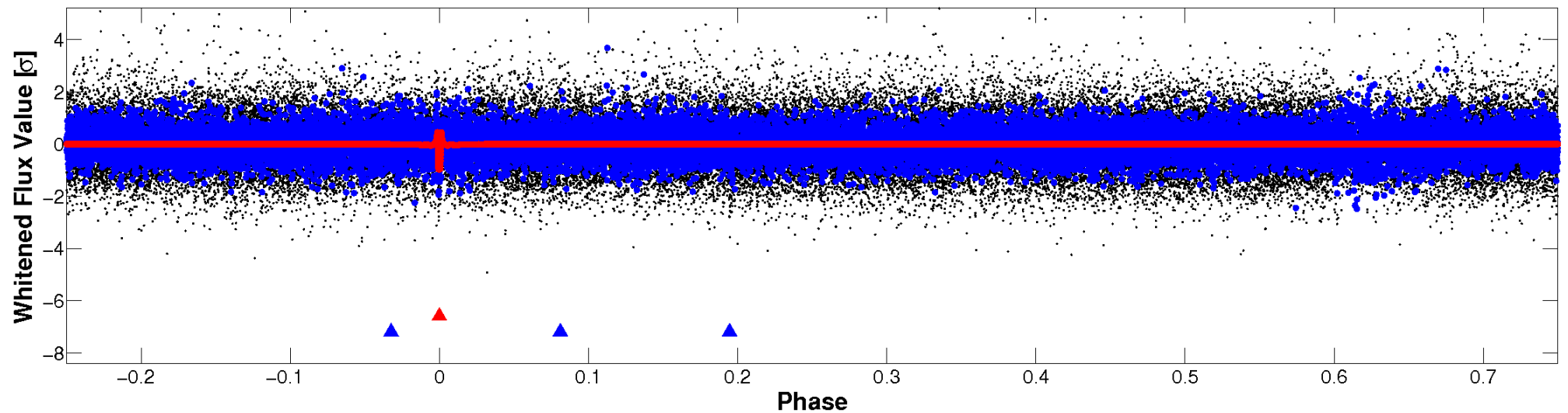


Non-Whitened Vs. Whitened Light Curve

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

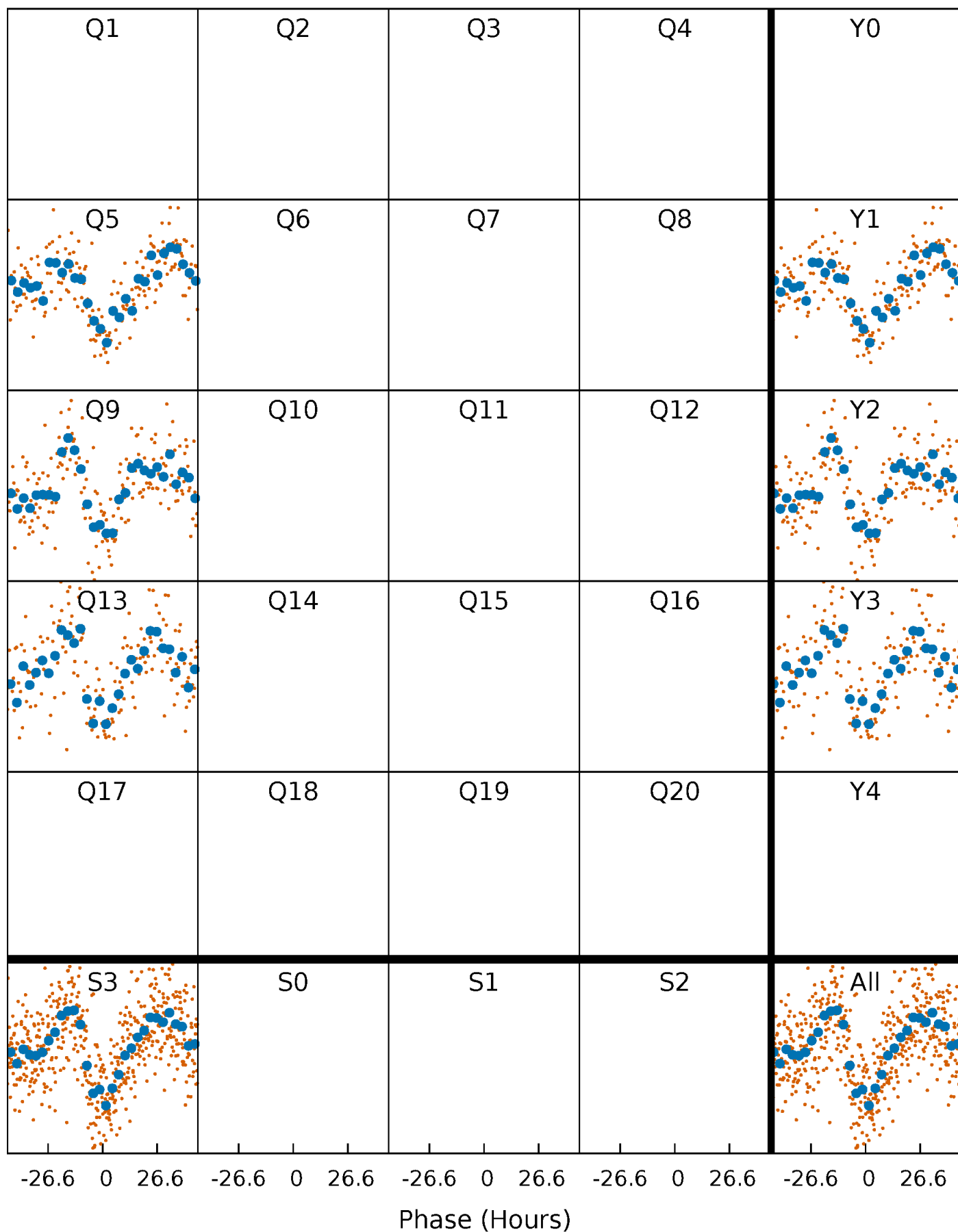


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



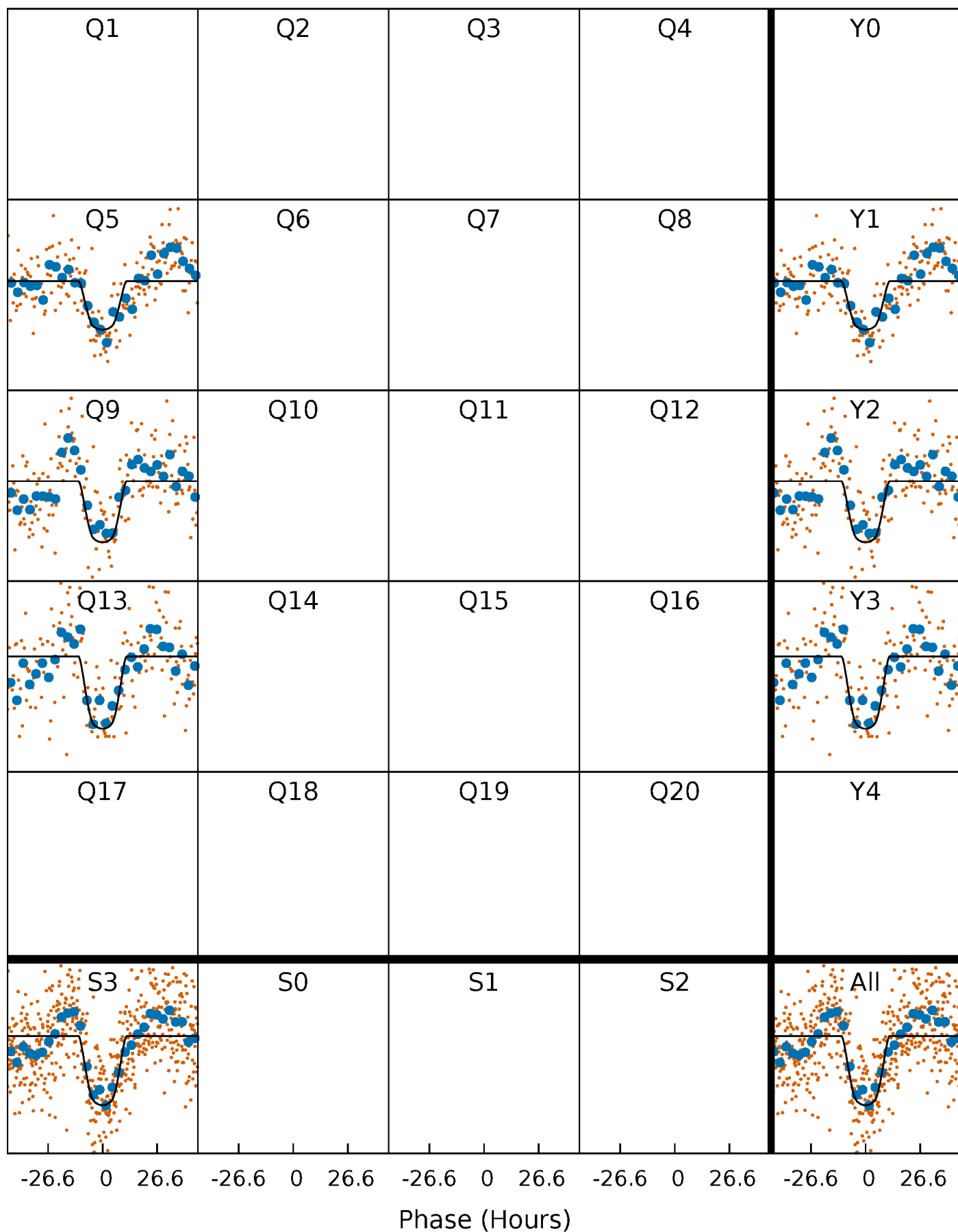
PDC Quarter-Phased Transit Curves

TCE 010472112-01 P=372.799047 Days $T_0=497.003335$ (BKJD)



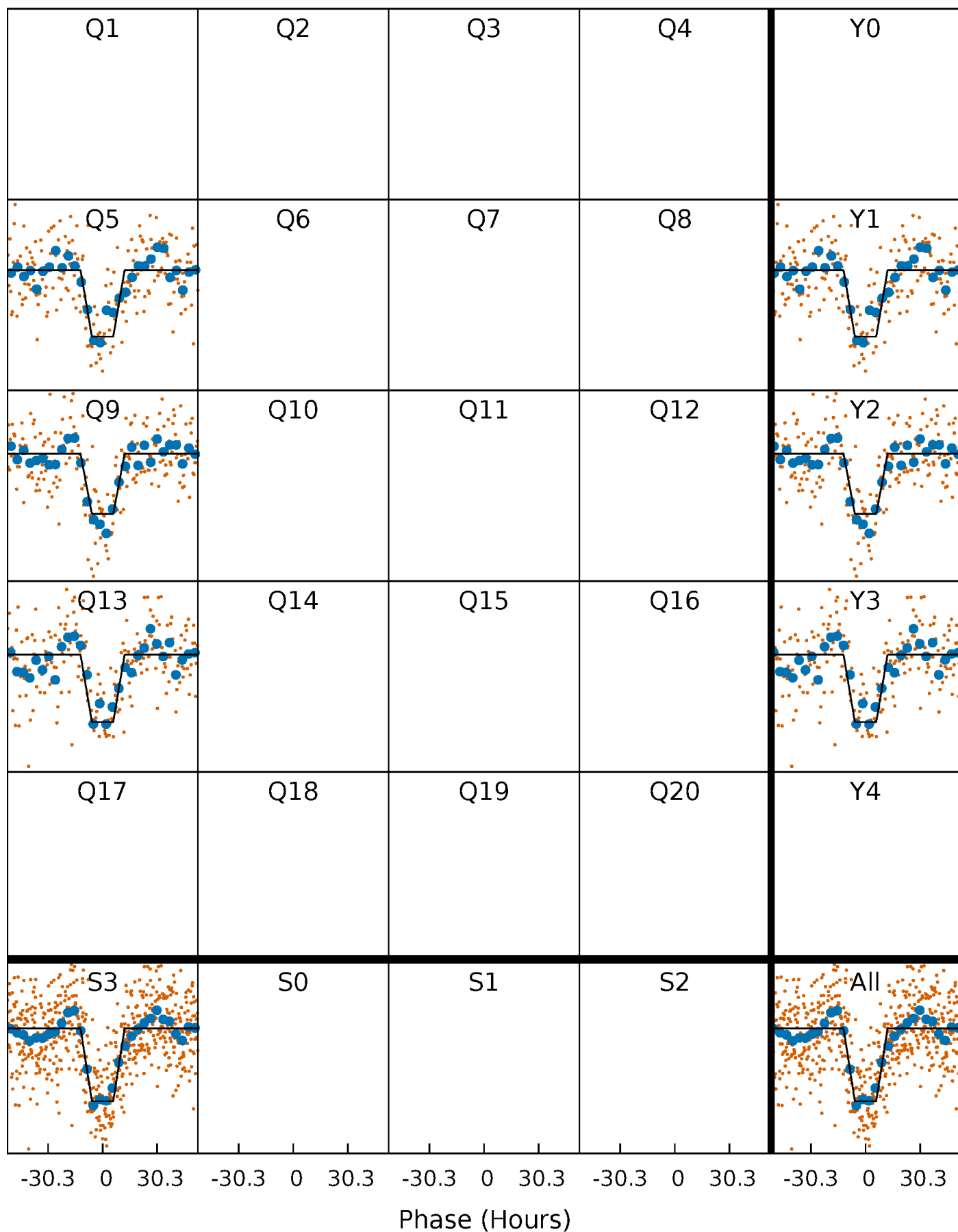
DV Quarter-Phased Transit Curves

TCE 010472112-01 P=372.799047 Days $T_0=497.003335$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

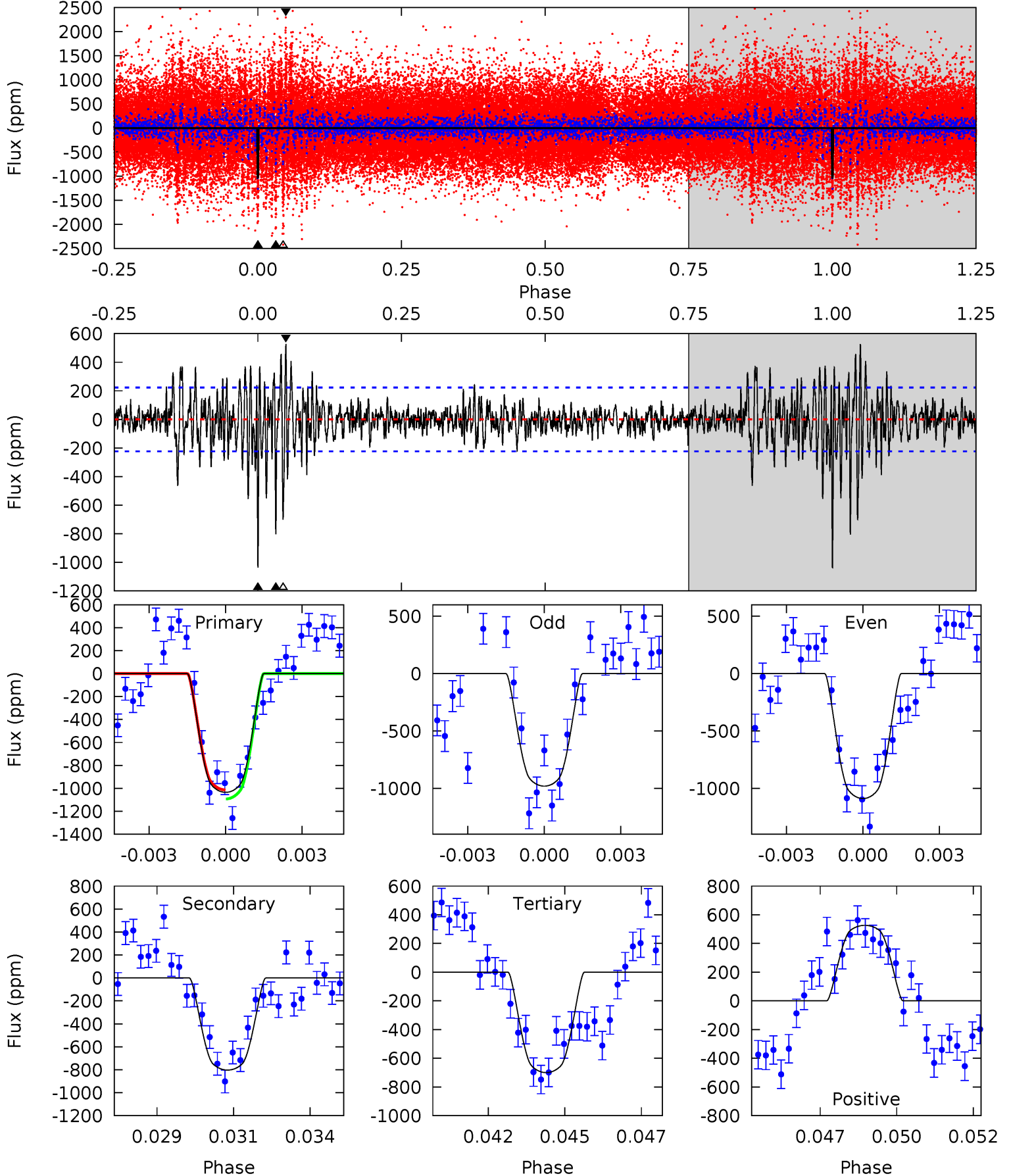
TCE 010472112-01 P=372.735379 Days $T_0=497.111926$ (BKJD)



DV Model-Shift Uniqueness Test

010472112-01, P = 372.799047 Days, E = 124.204288 Days

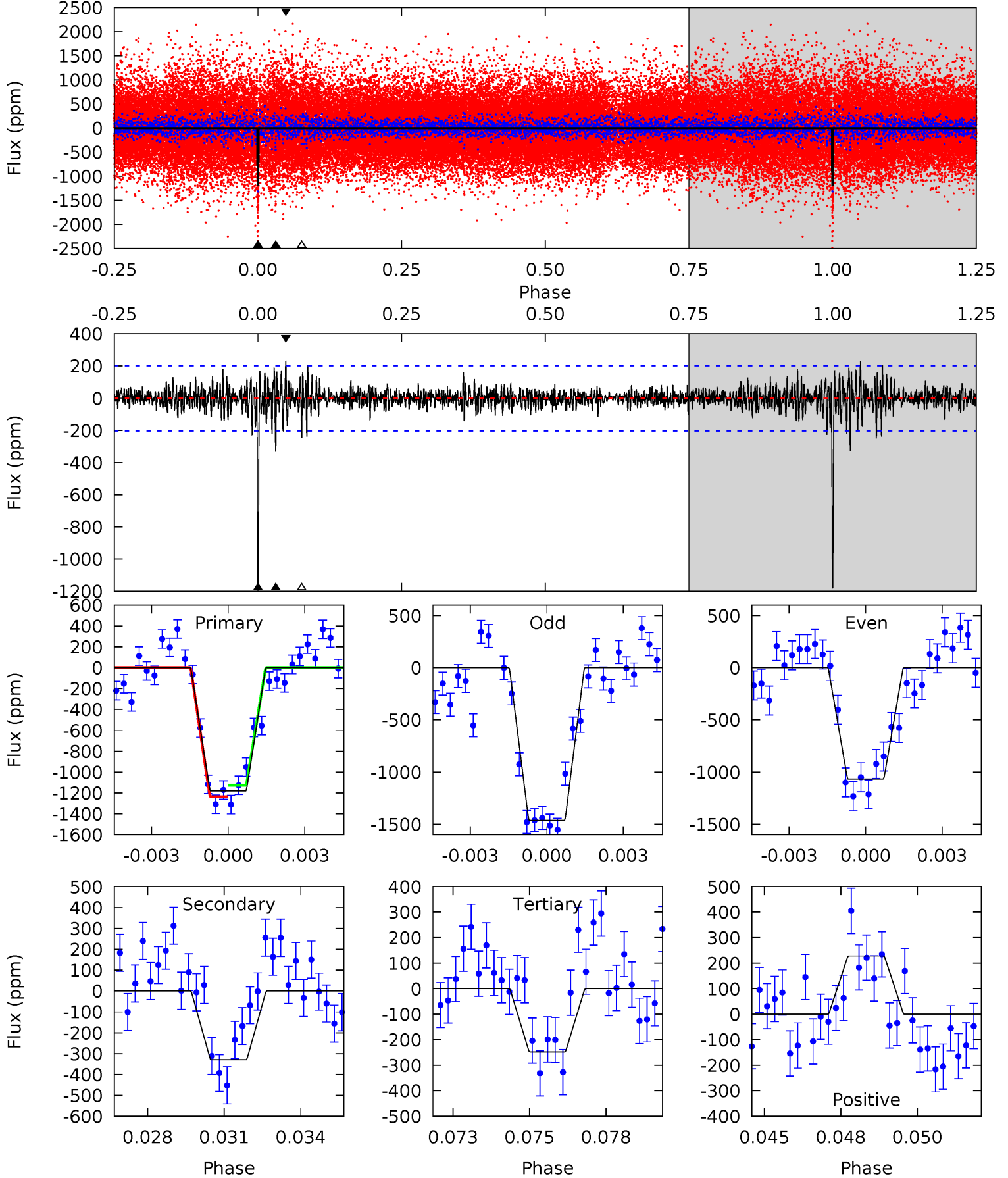
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.5	19.0	16.6	12.5	5.28	3.01	2.69	7.93	12.0	2.44	6.55	1.20	1.06	0.34	0.93



Alt Model-Shift Uniqueness Test

010472112-01, P = 372.735379 Days, E = 124.376547 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.6	8.54	6.42	5.92	5.27	2.99	1.22	24.2	24.7	2.12	2.63	4.81	1.10	0.16	1.42



Stellar Parameters For KIC 010472112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5092^{+151}_{-151}	$4.581^{+0.055}_{-0.055}$	$-0.320^{+0.300}_{-0.300}$	$0.720^{+0.079}_{-0.071}$	$0.721^{+0.087}_{-0.055}$	$2.719^{+0.706}_{-0.561}$
	+3%/-3%	+1%/-1%	+94%/-94%	+11%/-10%	+12%/-8%	+26%/-21%
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 010472112-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-803 ± 42	$3.20^{+0.33}_{-0.32}$	279^{+12}_{-10}	4405^{+210}_{-174}	35872^{+8451}_{-5854}
Alt.	-329 ± 39	$2.75^{+0.31}_{-0.29}$	279^{+10}_{-10}	3952^{+190}_{-179}	19804^{+5497}_{-4219}

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

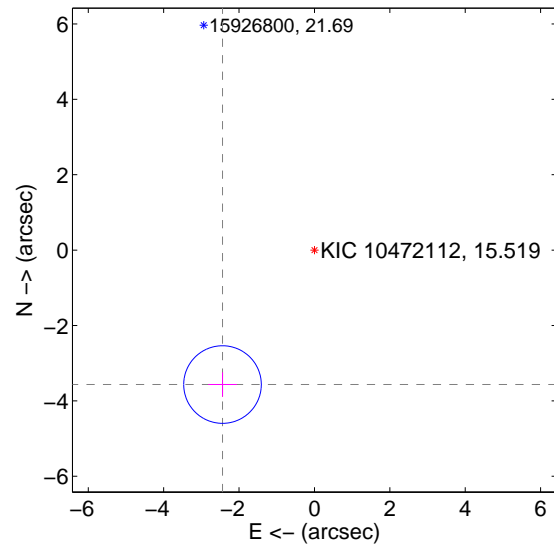
Supplemental centroid analysis for 010472112-01. Kepler magnitude: 15.52. Transit SNR 8.96

There are 0 quarters with good PRF difference image offsets

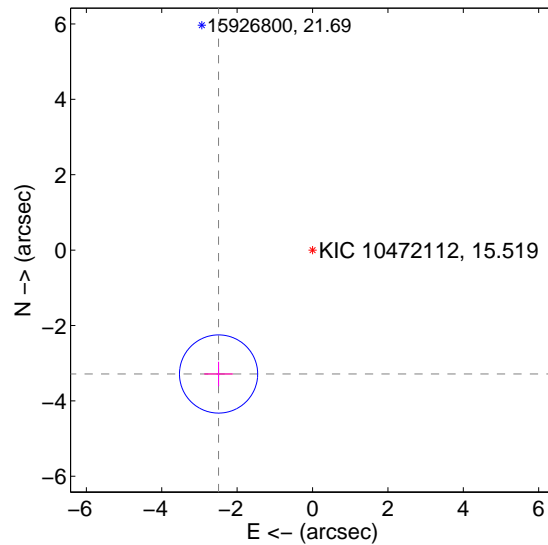
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.321 ± 0.343	12.59	2.439 ± 0.380	-3.567 ± 0.325
PRF-fit source offset from KIC position	4.125 ± 0.346	11.93	2.492 ± 0.380	-3.287 ± 0.325
photometric centroid source offset	0.55 ± 1.45	0.38	0.40 ± 1.42	0.37 ± 1.48

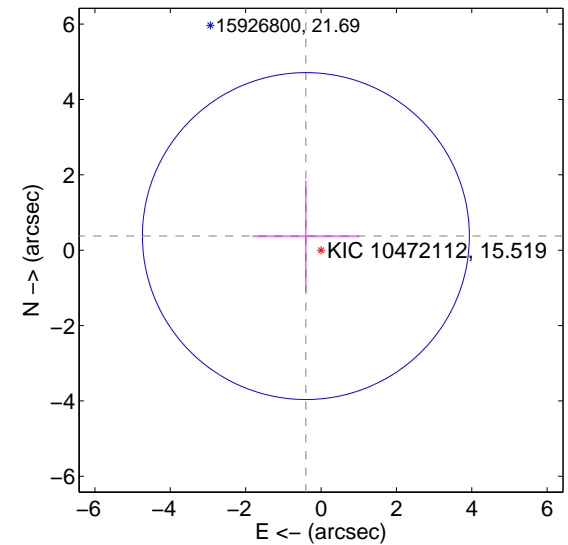
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

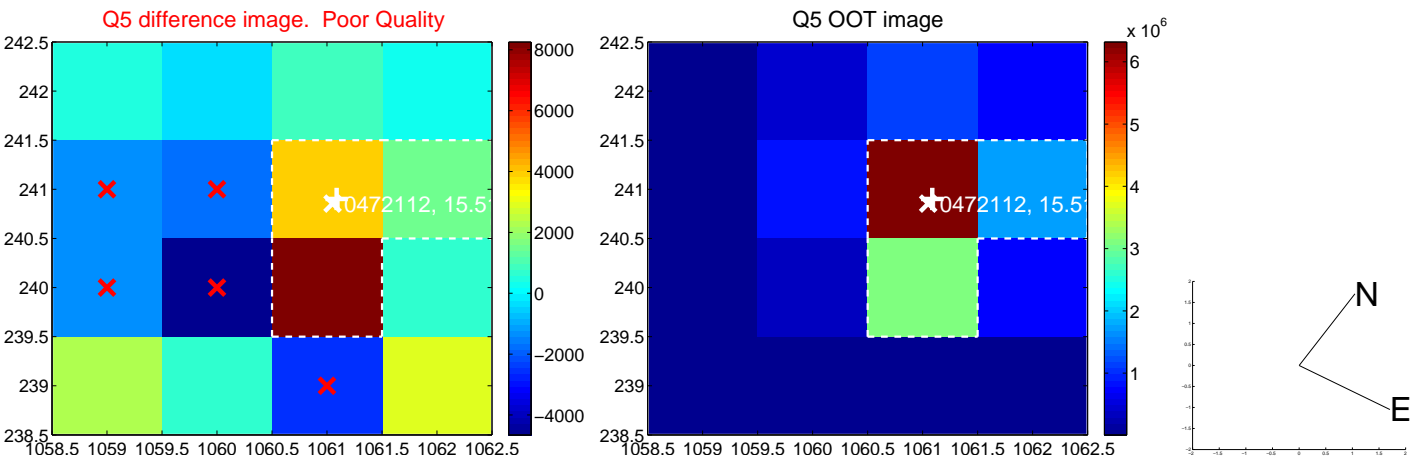


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

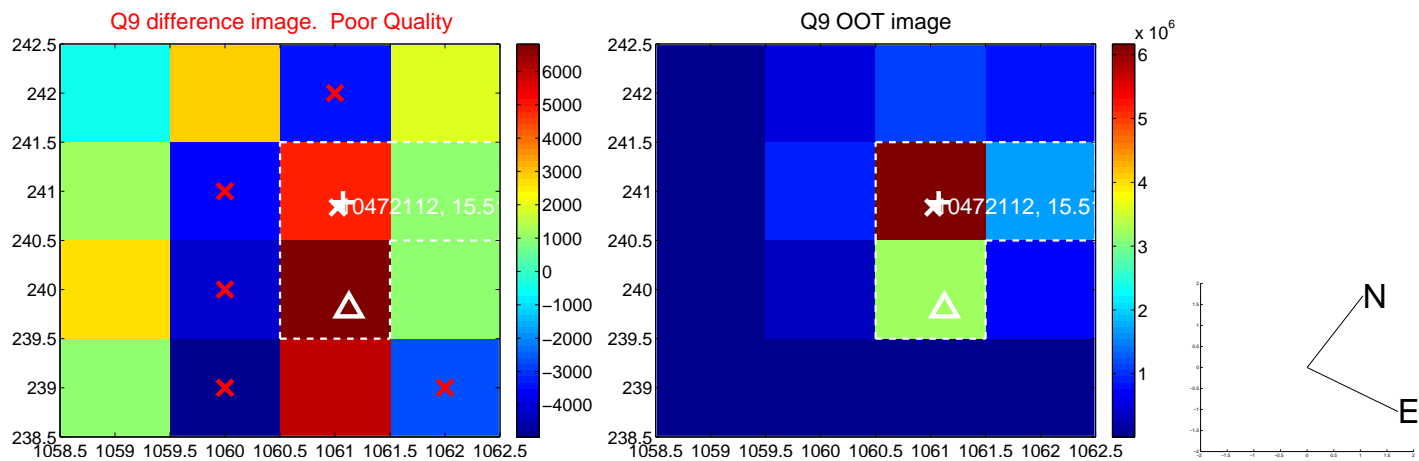
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



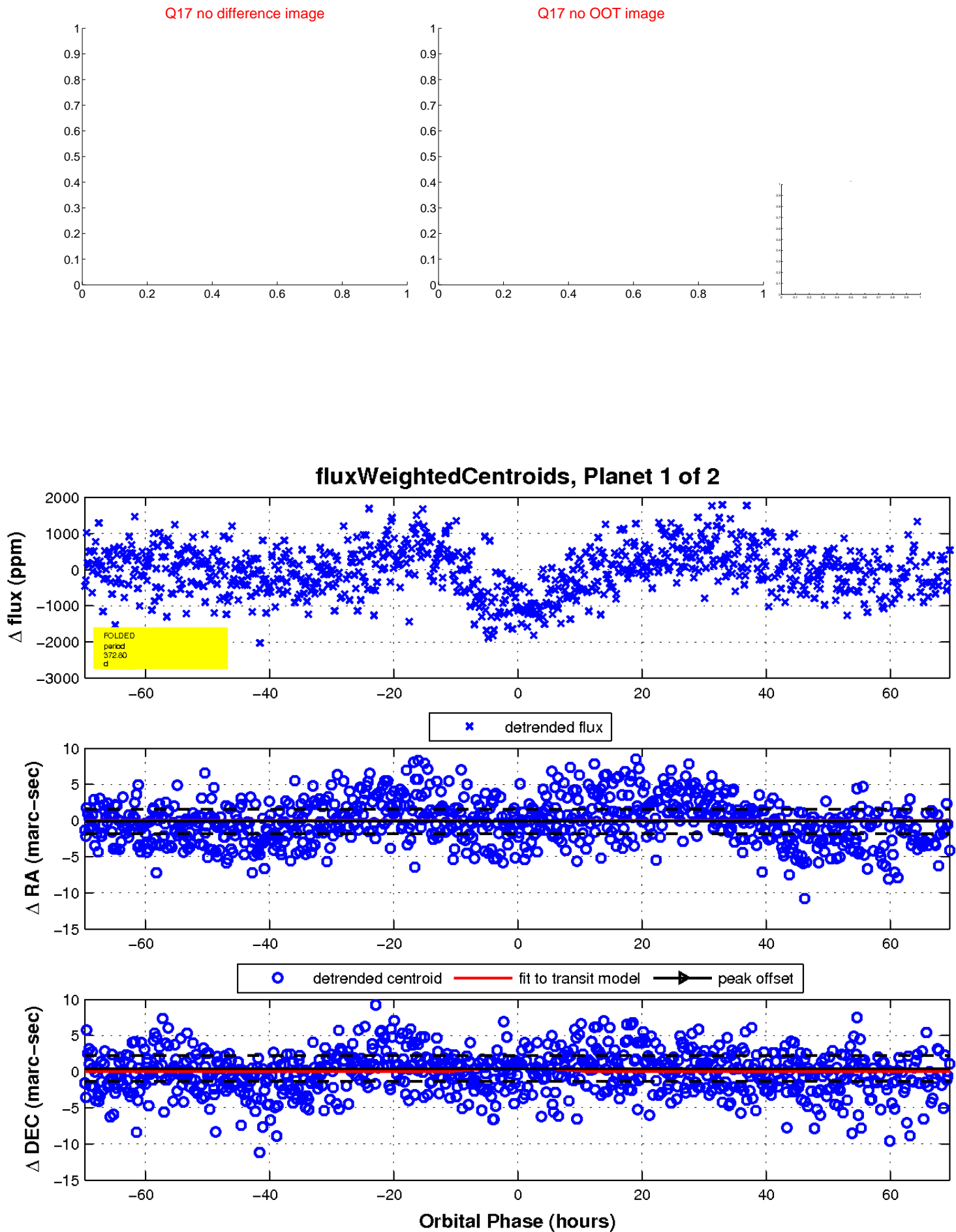
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

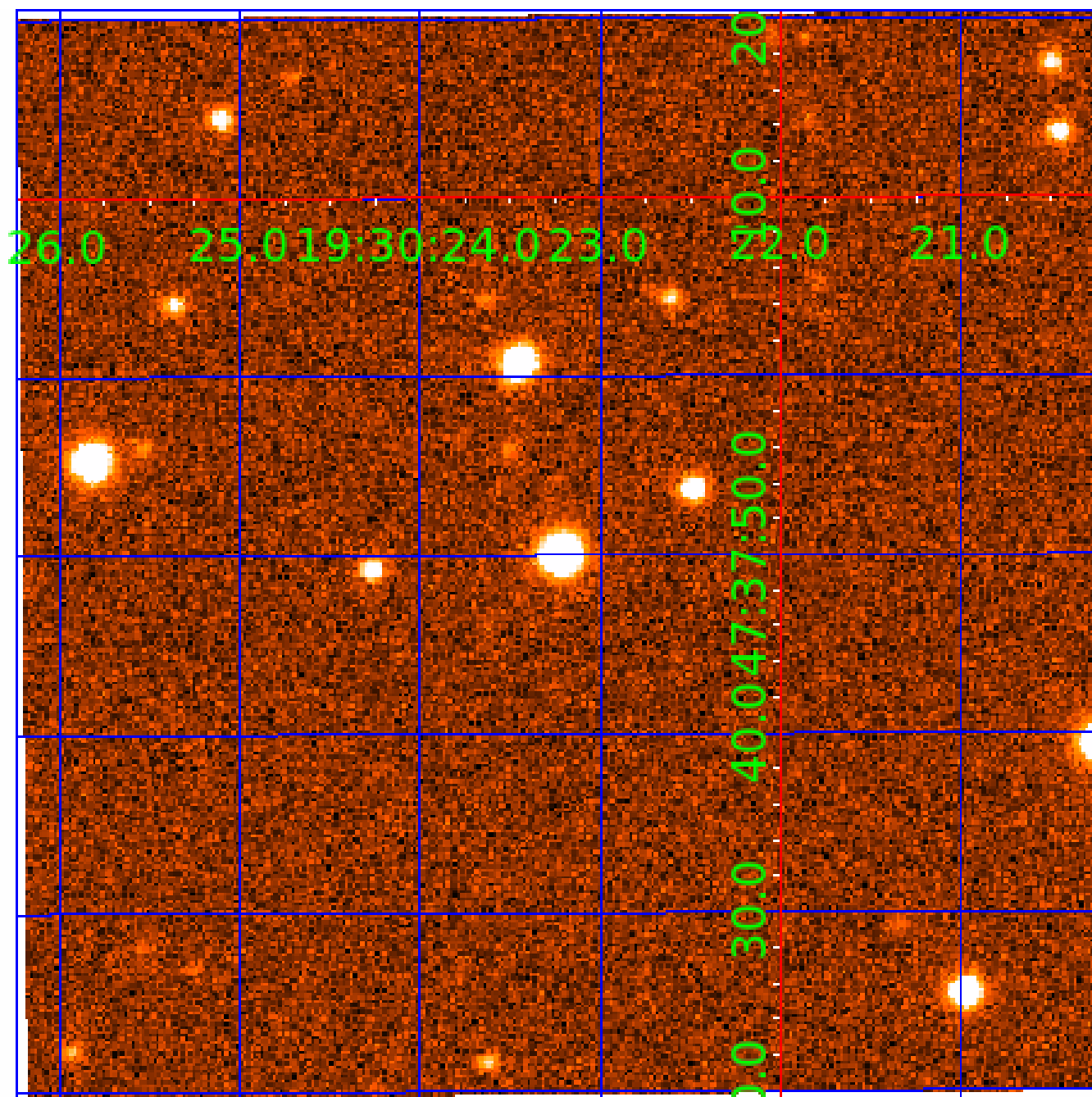


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010472112

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})
010472112-01	OBS	No	372.799047	497.003335	1165.3	23.240	8.5	9.0	0.72	5092	3.17	0.38
010472112-02	OBS	No	415.108100	484.942714	732.9	12.750	8.4	7.9	0.72	5092	2.10	0.33

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010472112-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
010472112-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—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.

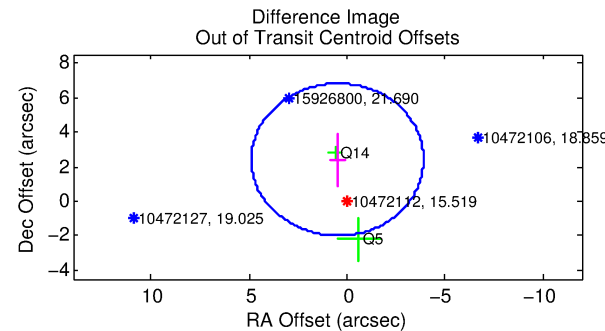
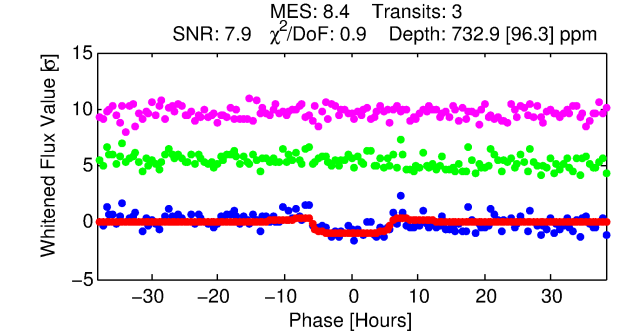
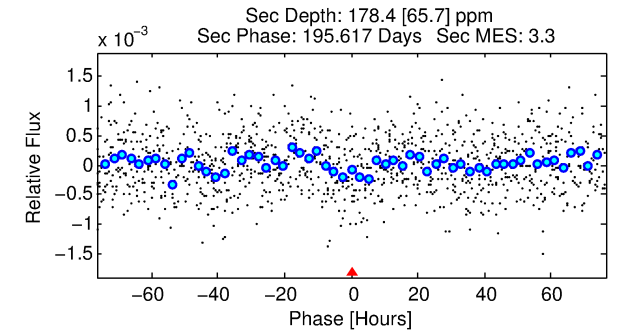
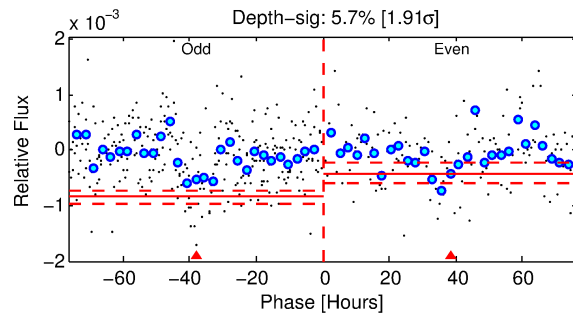
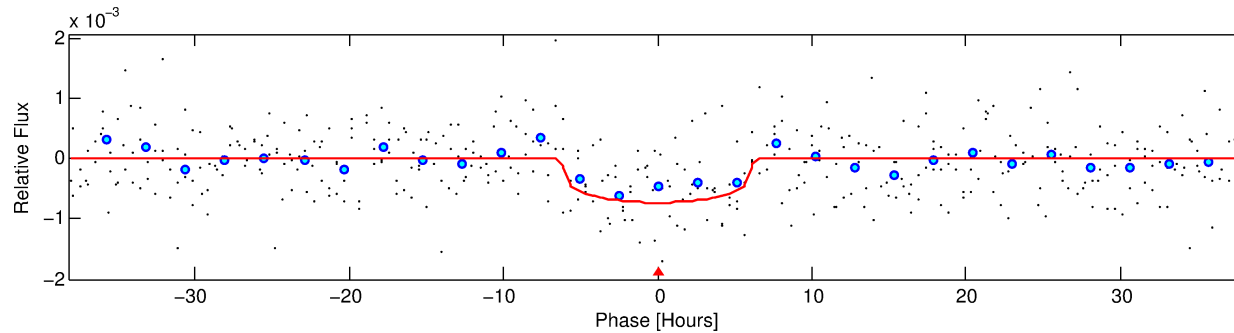
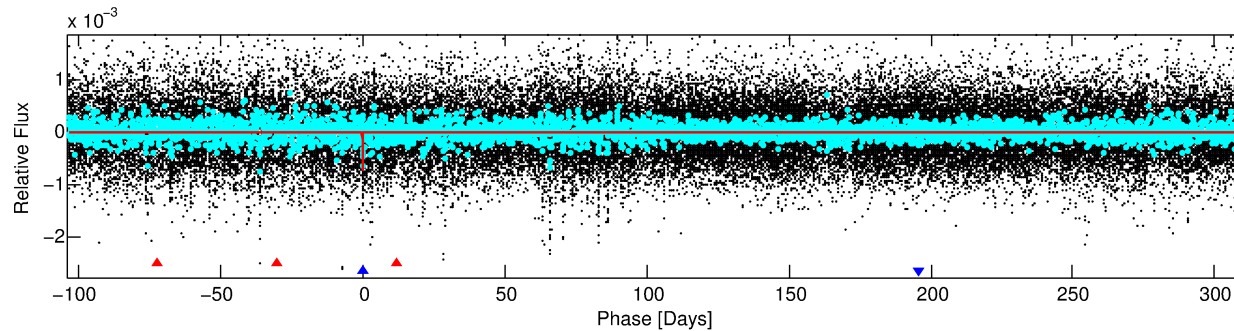
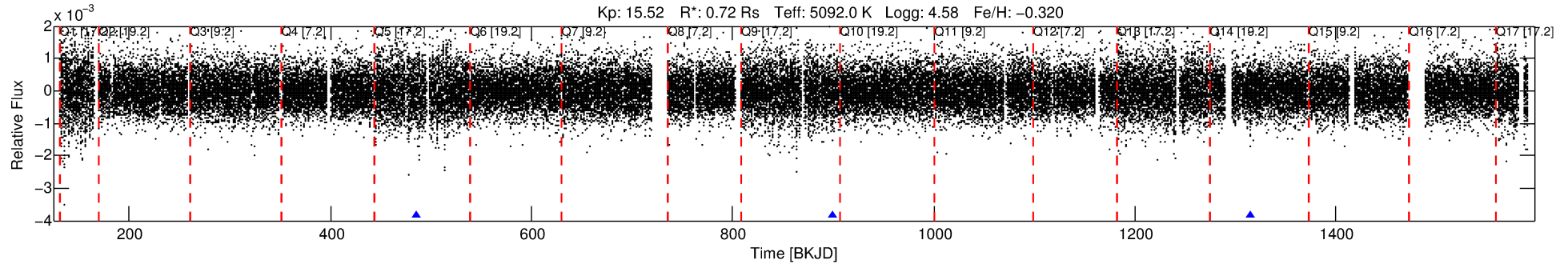
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010472112-02

No Significant Match Found

DV One-Page Summary

KIC: 10472112 Candidate: 2 of 2 Period: 415.108 d



DV Fit Results:

Period = 415.10810 [0.01481] d
Epoch = 484.9427 [0.0217] BKJD
Rp/R* = 0.0267 [0.0127]
a/R* = 181.35 [313.34]
b = 0.72 [1.17]
Seff = 0.33 [0.05]
Teq = 193 [8] K
Rp = 2.10 [1.03] Re
a = 0.9765 [0.0825] AU
Ag = 21292.56 [21880.57] [0.97 σ]
Teffp = 3602 [926] K [3.68 σ]

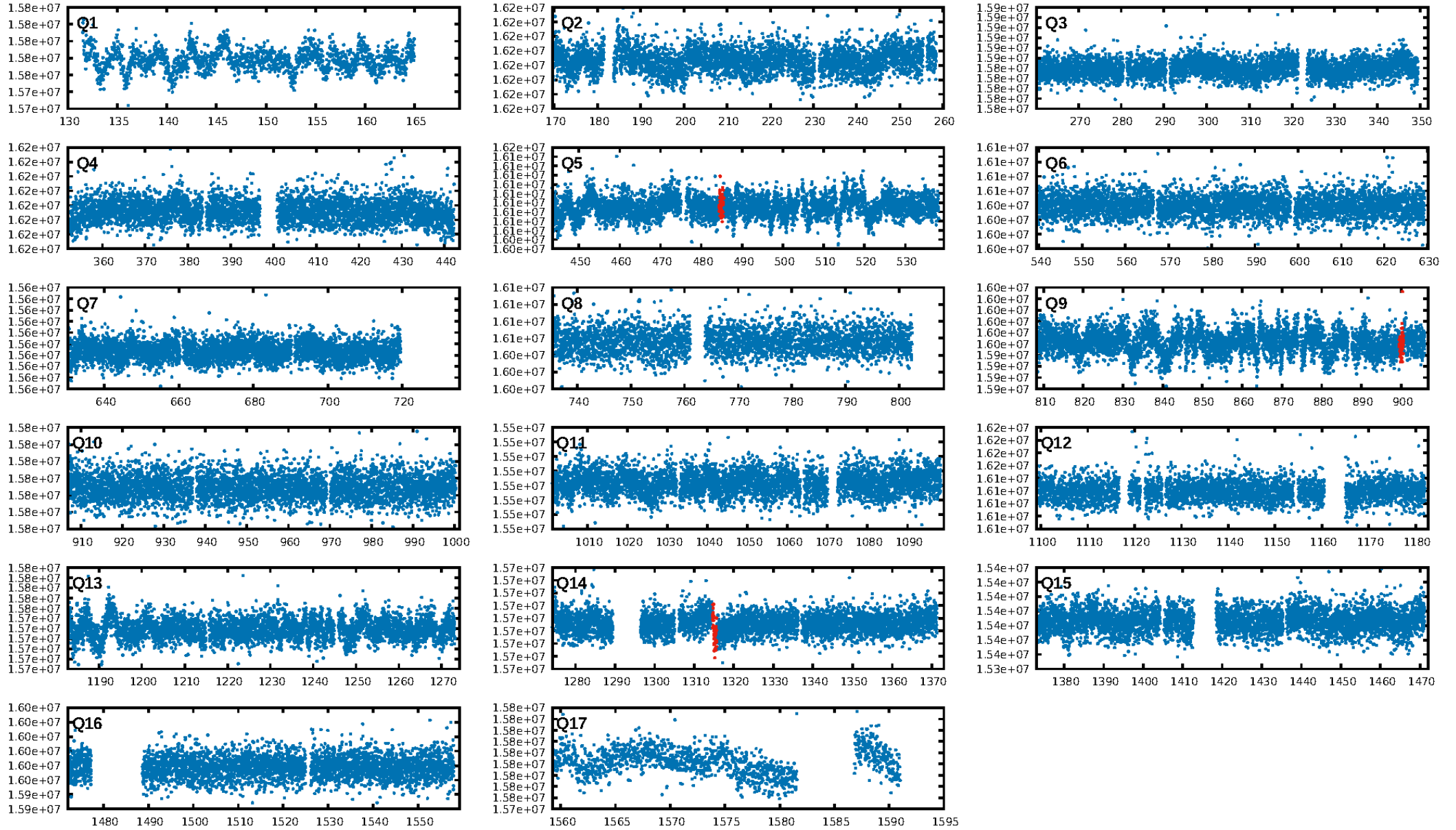
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [38.31 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.1%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 5.40e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -7.143
Centroid-sig: 46.1%
Centroid-so: 1.554 arcsec [0.94 σ]
OotOffset-rm: 2.458 arcsec [1.67 σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-rm: 2.779 arcsec [1.31 σ]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

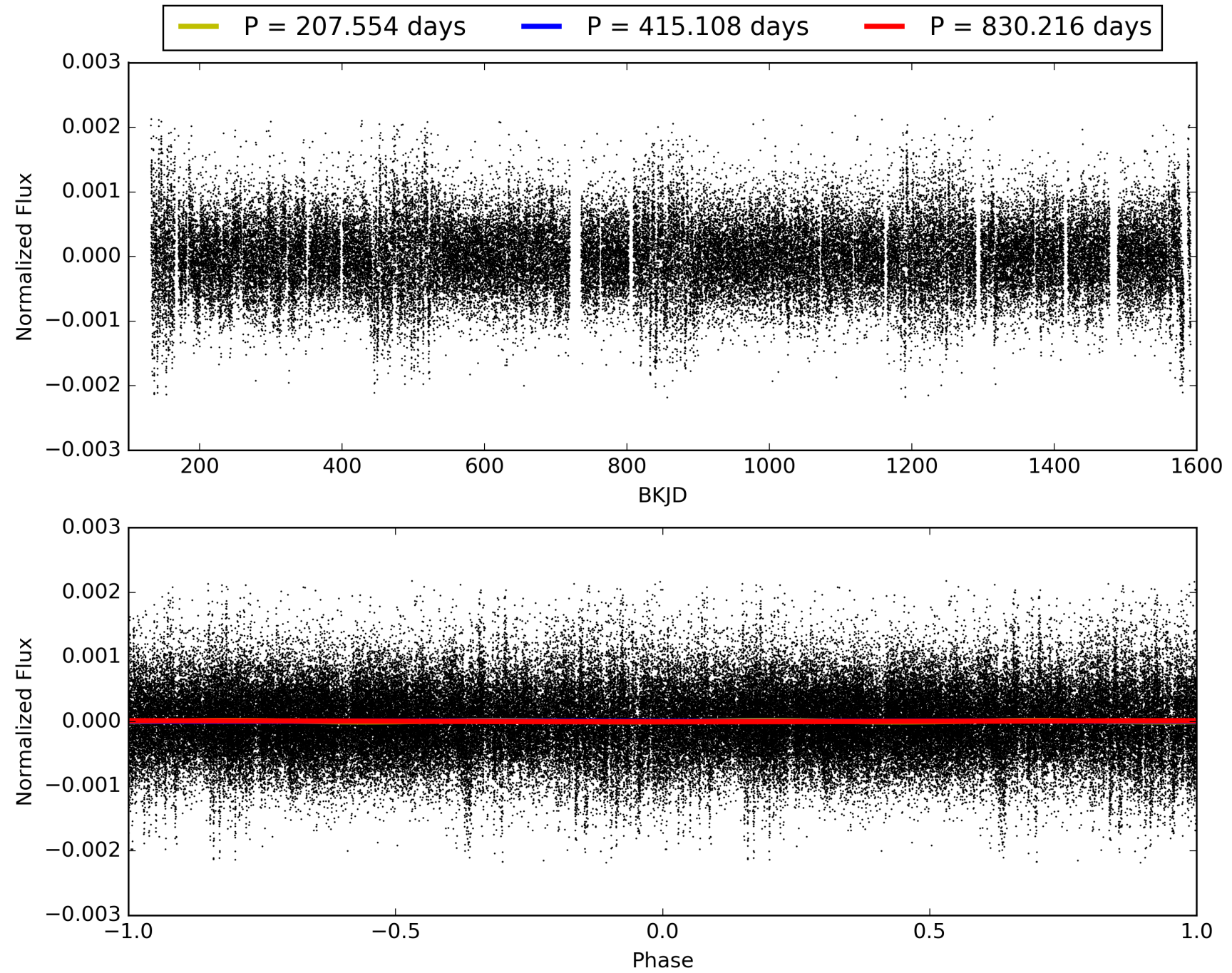
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:58:29 Z

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

TCE 010472112-02, PDC Light Curves

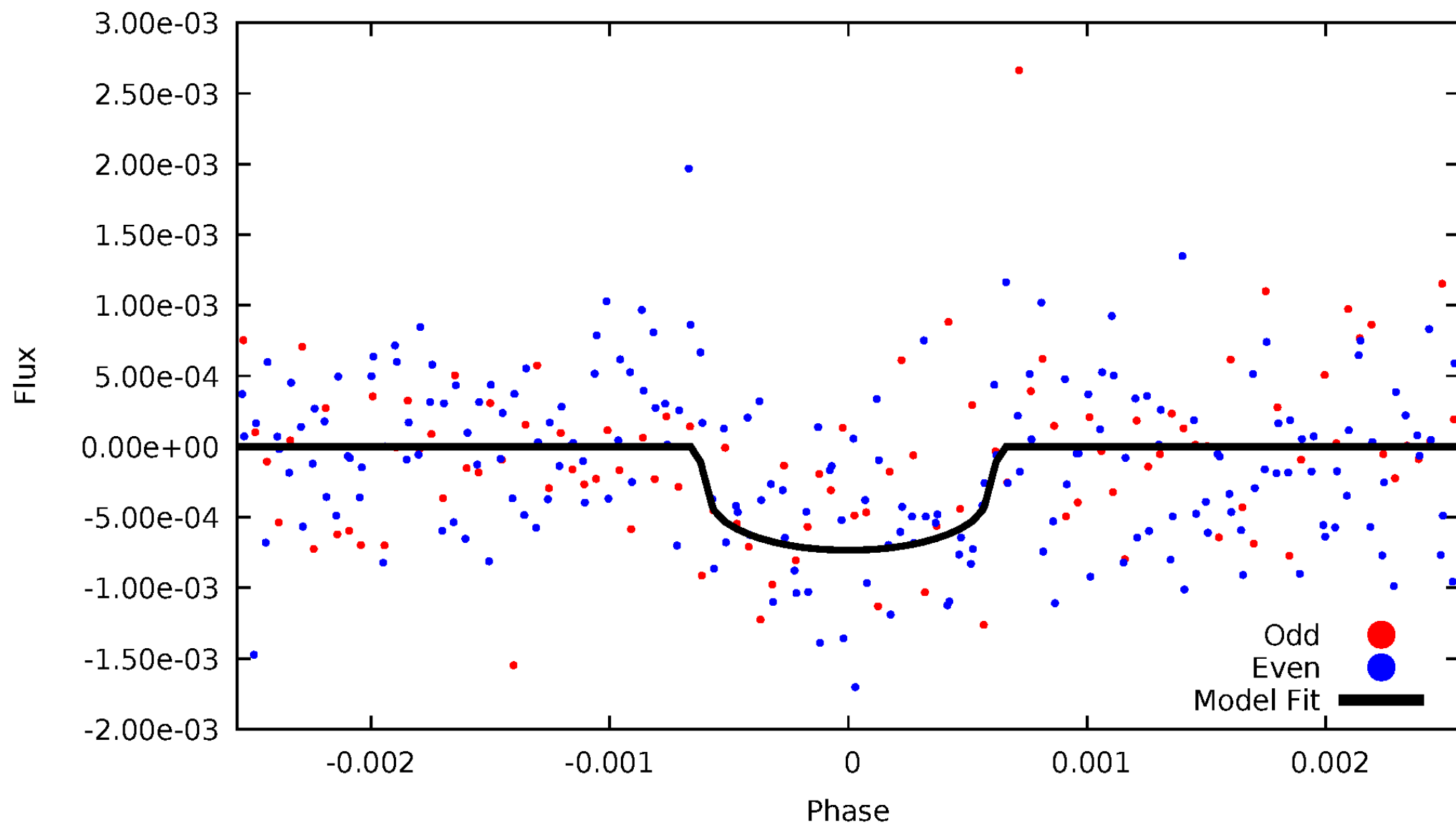


TCE 010472112-02



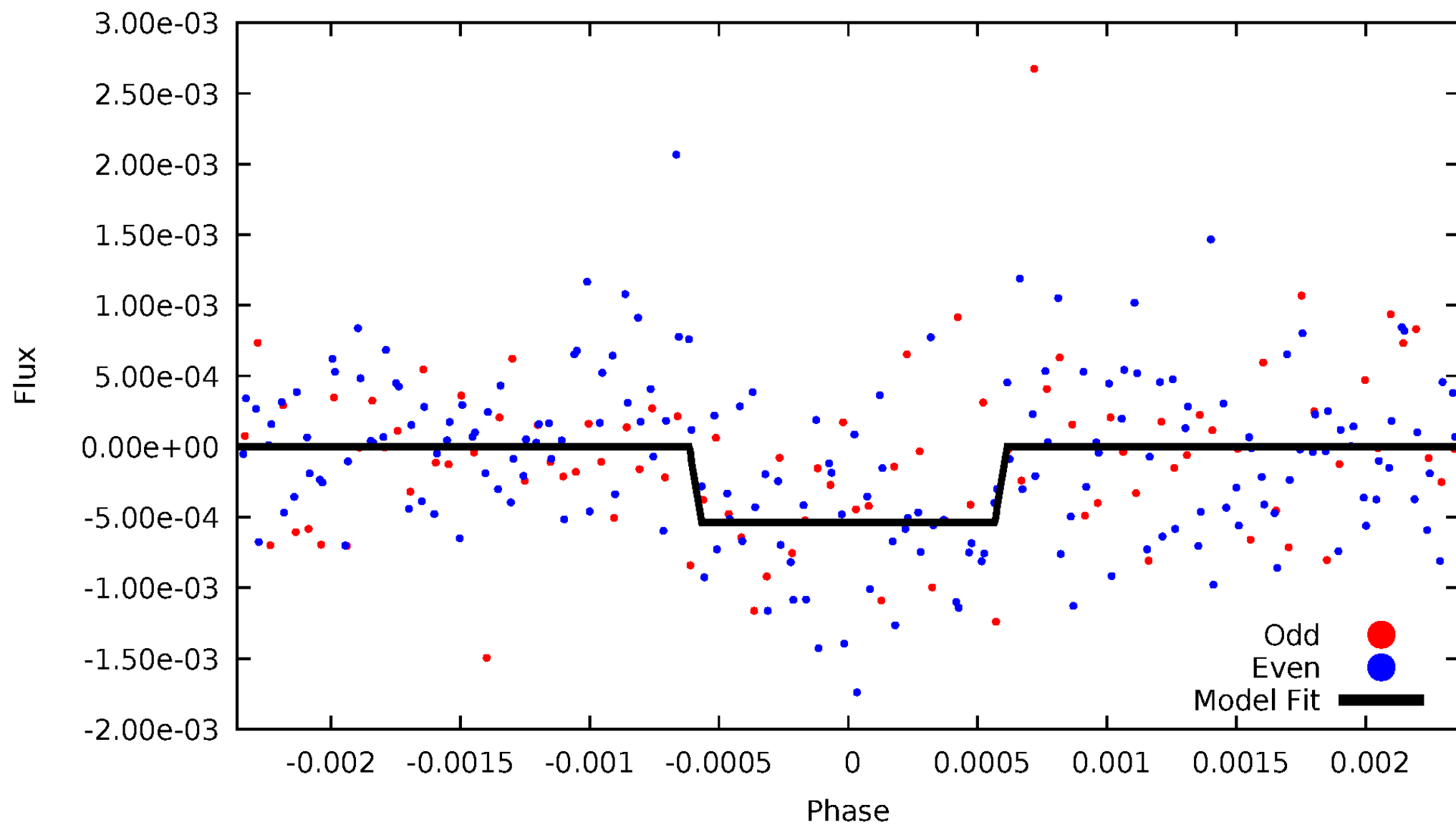
DV Odd/Even

TCE 010472112-02



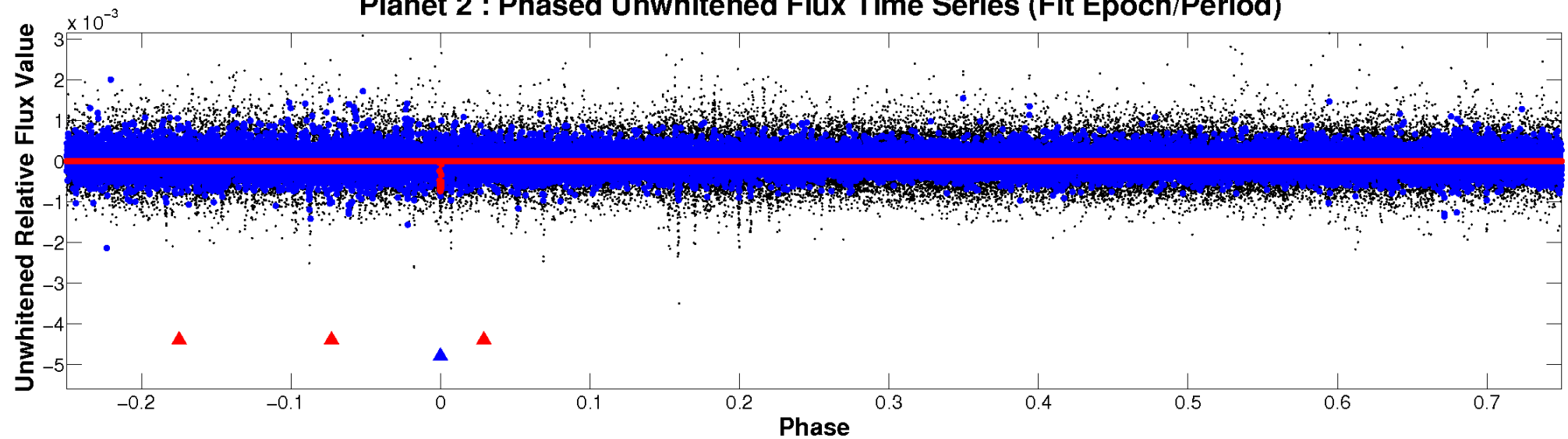
ALT Odd/Even

TCE 010472112-02

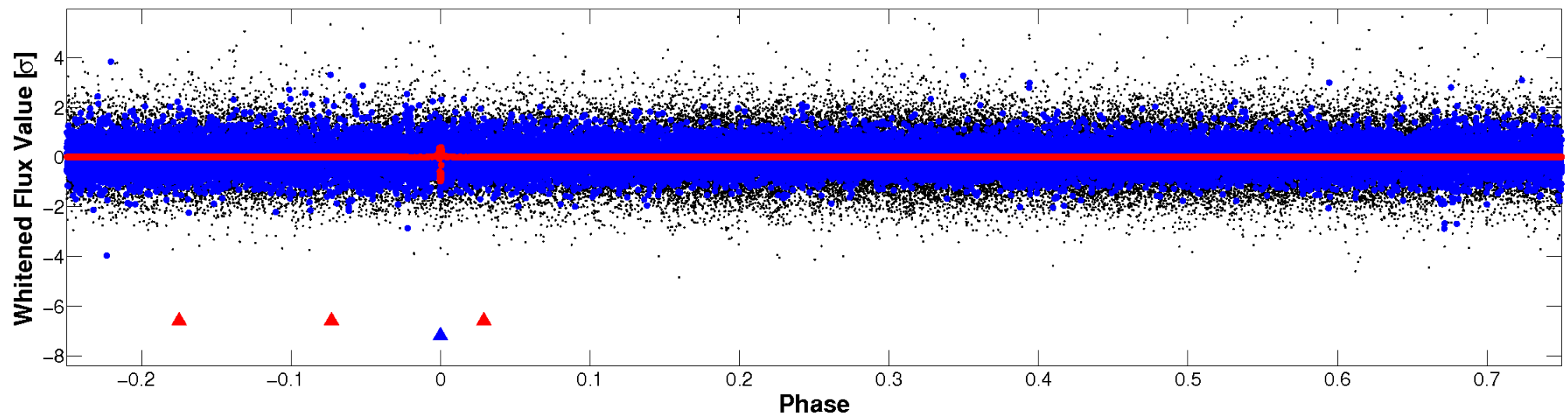


Non-Whitened Vs. Whitened Light Curve

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

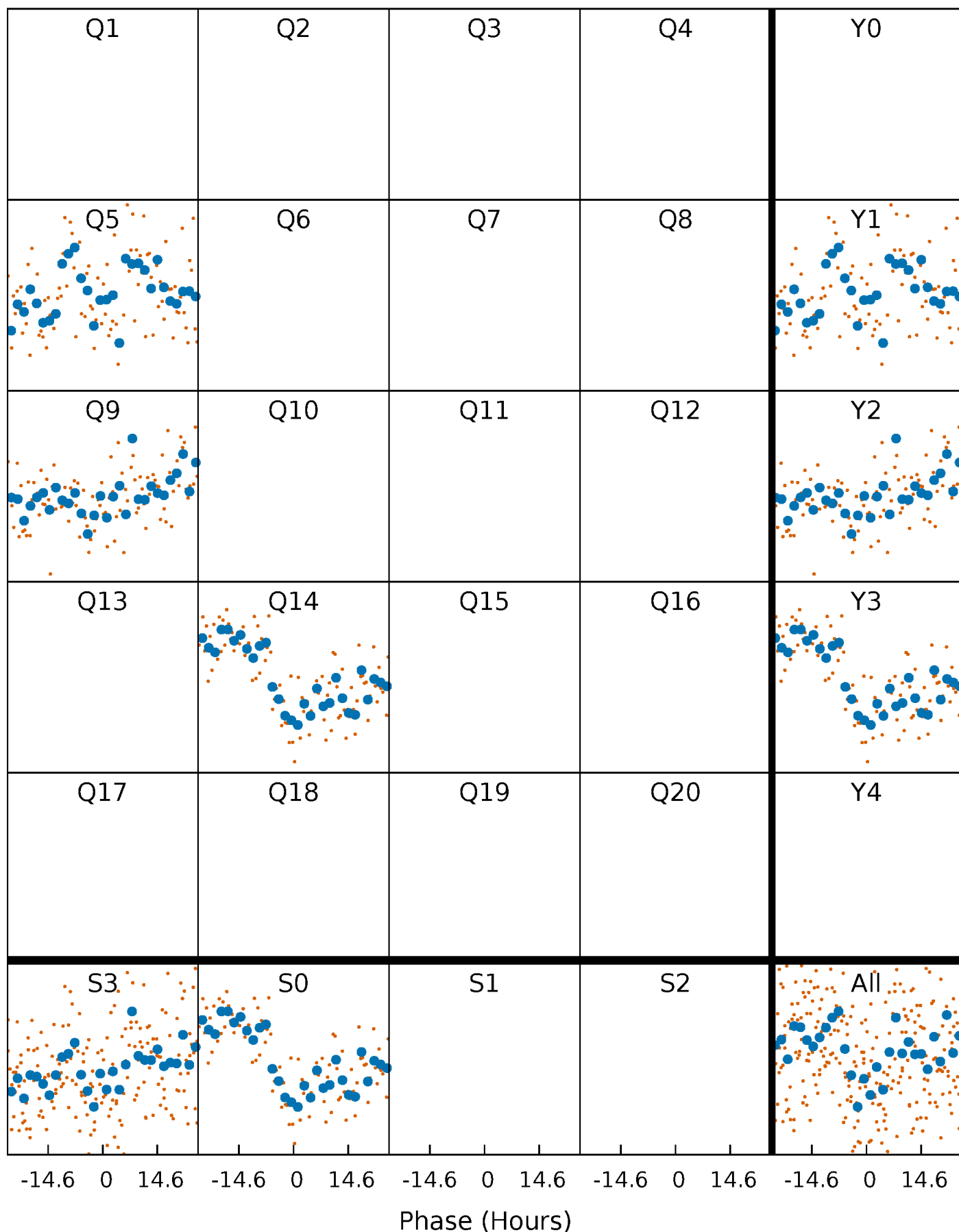


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



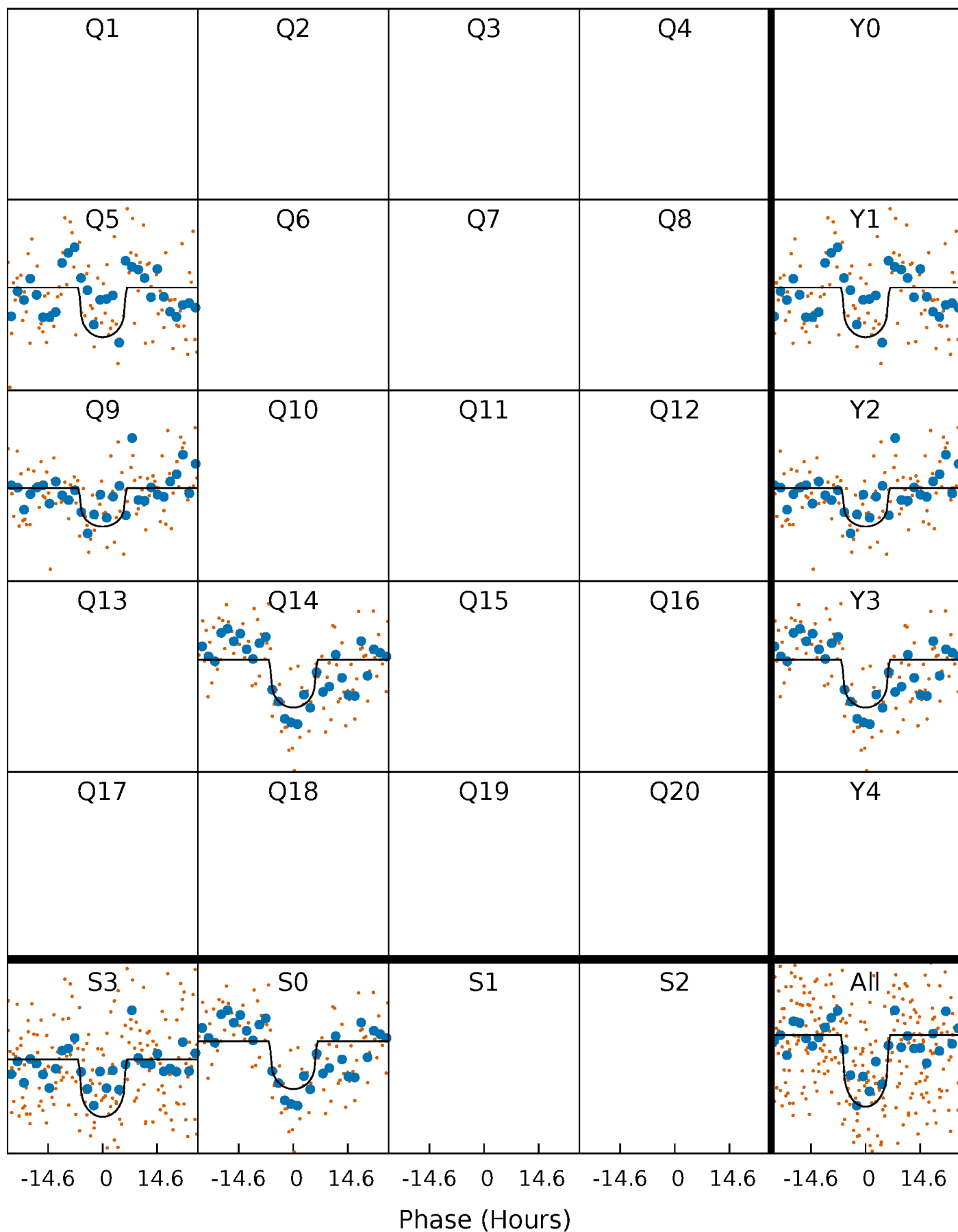
PDC Quarter-Phased Transit Curves

TCE 010472112-02 P=415.108099 Days $T_0=484.942714$ (BKJD)



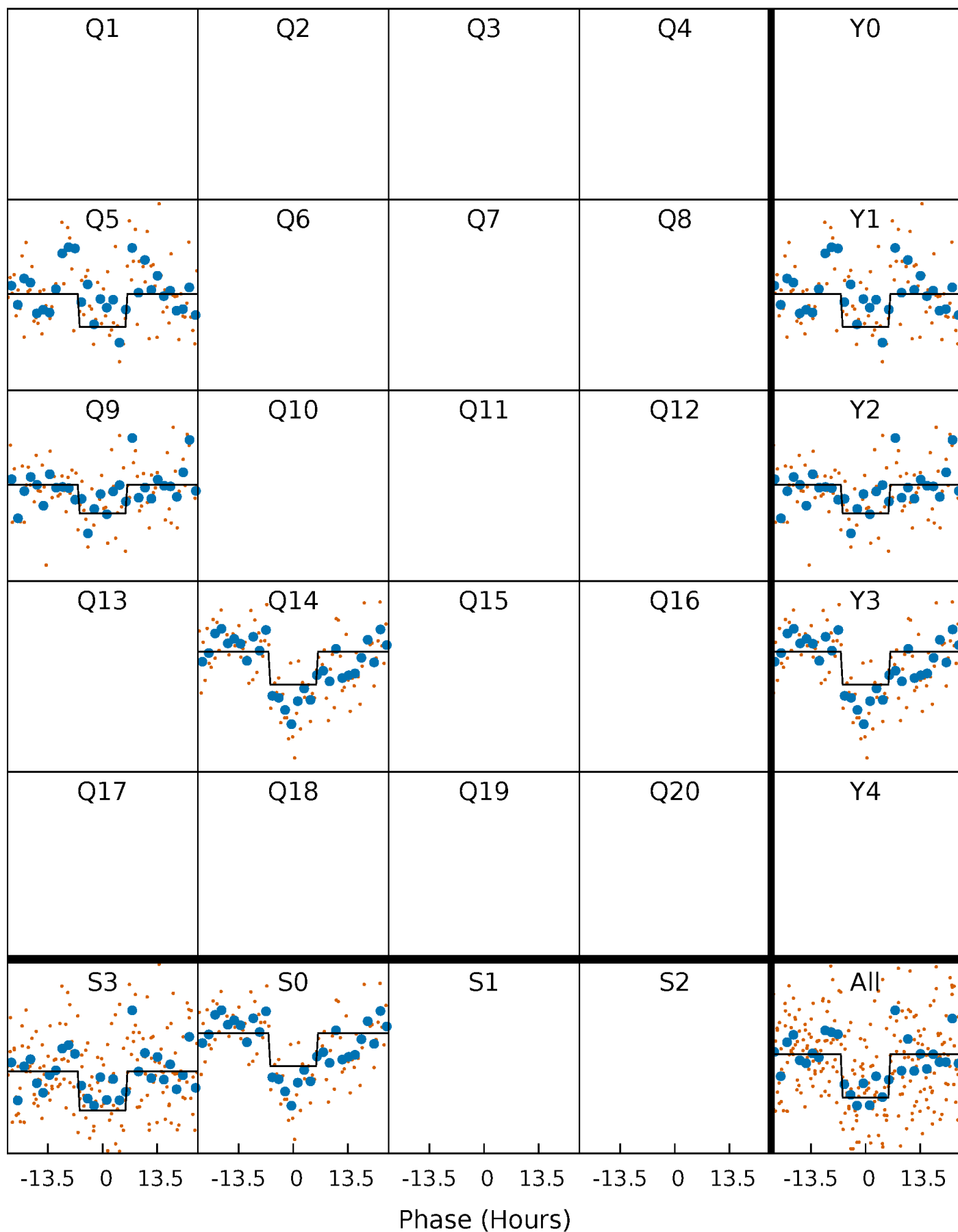
DV Quarter-Phased Transit Curves

TCE 010472112-02 $P=415.108099$ Days $T_0=484.942714$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

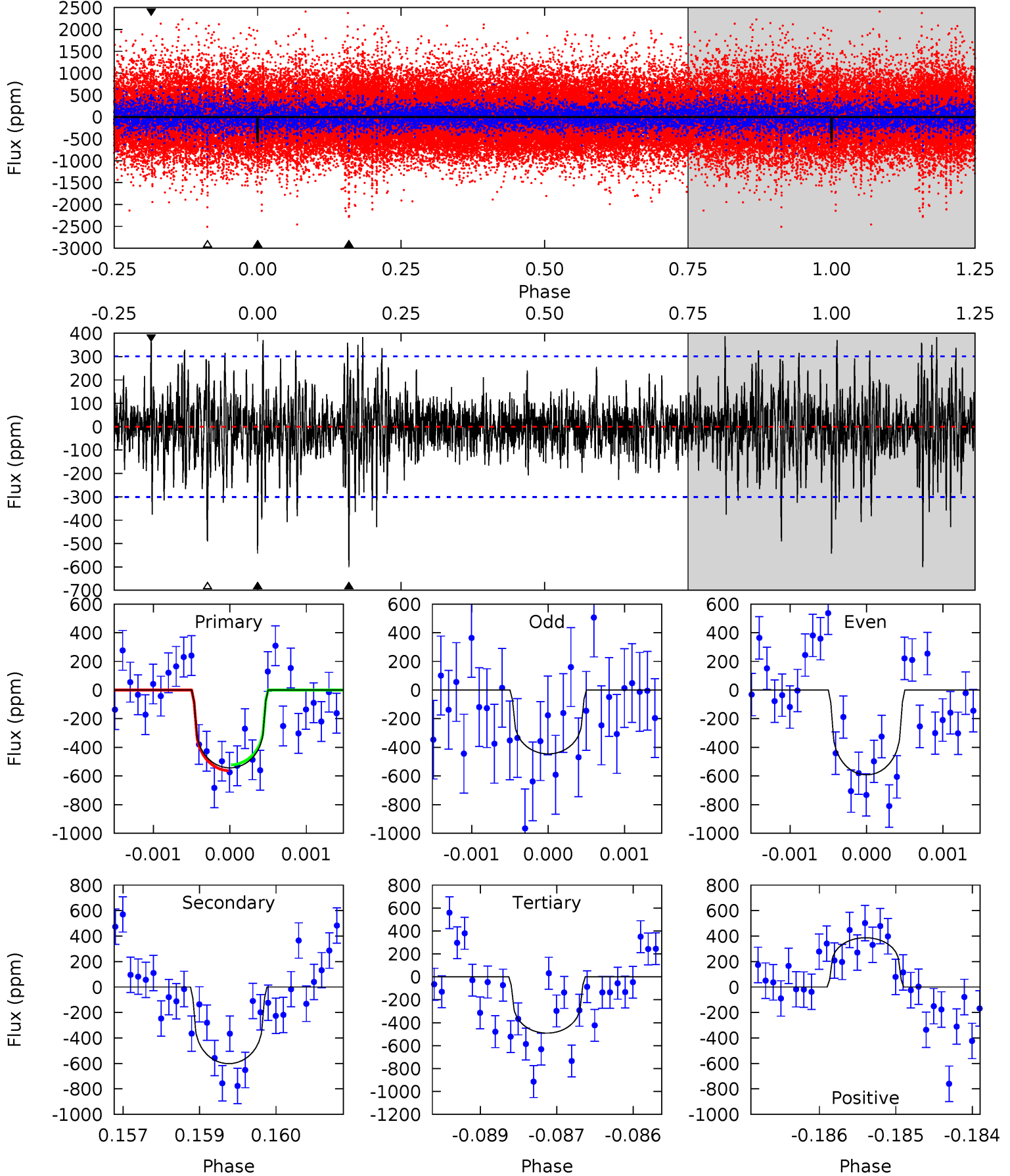
TCE 010472112-02 P=415.107771 Days $T_0=484.941547$ (BKJD)



DV Model-Shift Uniqueness Test

010472112-02, $P = 415.108099$ Days, $E = 69.834615$ Days

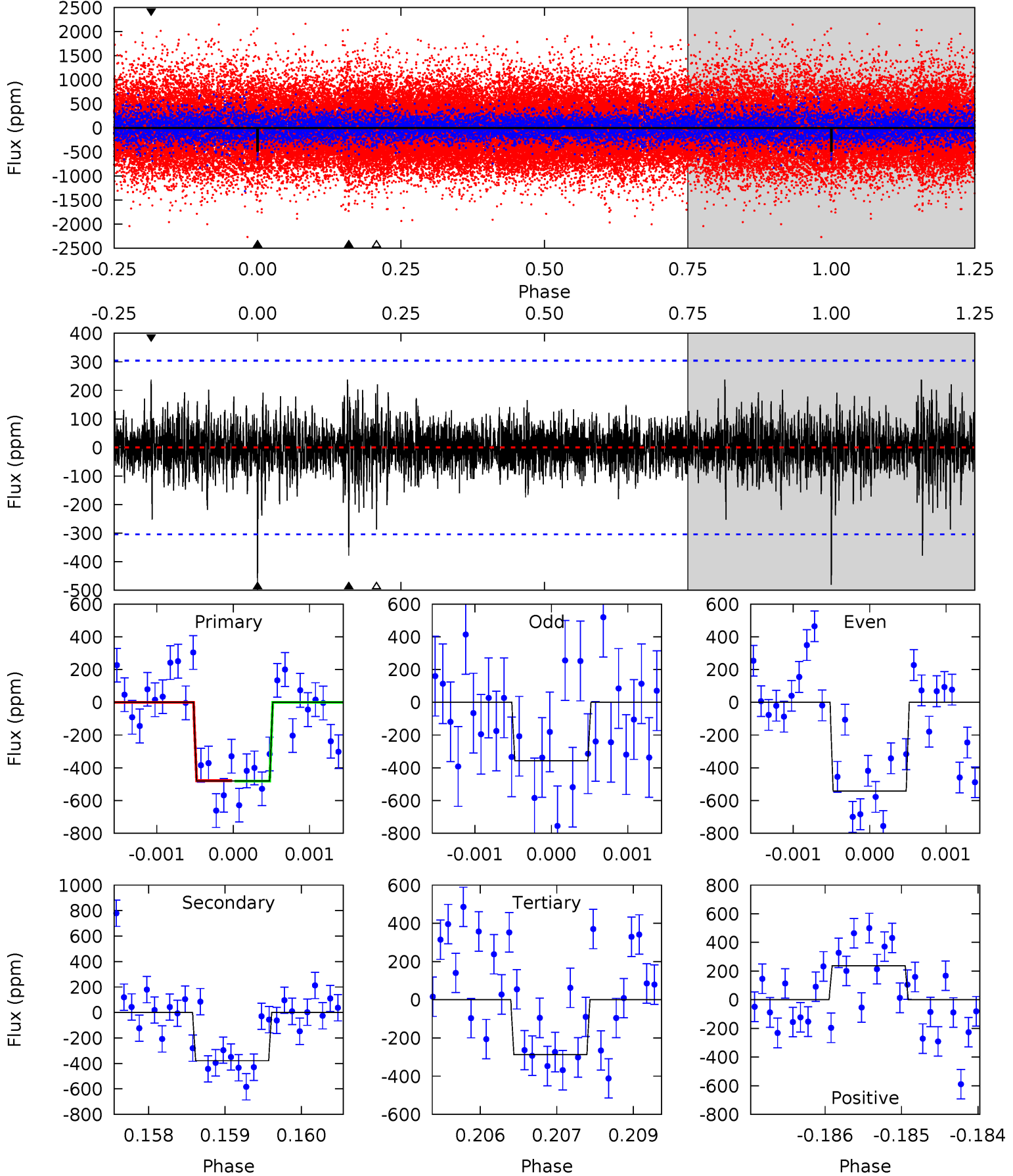
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.74	10.8	8.80	6.94	5.40	3.21	1.73	0.94	2.80	1.98	3.85	1.23	1.22	0.39	0.36



Alt Model-Shift Uniqueness Test

010472112-02, $P = 415.107771$ Days, $E = 69.833776$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.56	6.75	5.11	4.23	5.42	3.24	1.03	3.45	4.33	1.63	2.52	1.56	1.35	0.33	0.03



Stellar Parameters For KIC 010472112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5092^{+151}_{-151}	$4.581^{+0.055}_{-0.055}$	$-0.320^{+0.300}_{-0.300}$	$0.720^{+0.079}_{-0.071}$	$0.721^{+0.087}_{-0.055}$	$2.719^{+0.706}_{-0.561}$
	+3%/-3%	+1%/-1%	+94%/-94%	+11%/-10%	+12%/-8%	+26%/-21%
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 010472112-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-601 ± 56	$2.11^{+1.06}_{-0.97}$	270^{+11}_{-10}	4922^{+1617}_{-736}	$70920^{+170665}_{-39532}$
Alt.	-378 ± 56	$1.91^{+0.97}_{-0.98}$	270^{+9}_{-10}	4657^{+1797}_{-689}	$54858^{+164524}_{-31370}$

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

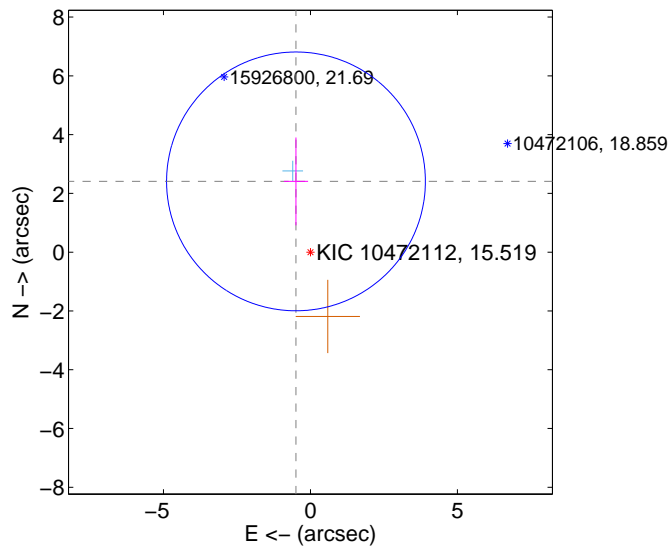
Supplemental centroid analysis for 010472112-02. Kepler magnitude: 15.52. Transit SNR 7.90

There are 1 quarters with good PRF difference image offsets

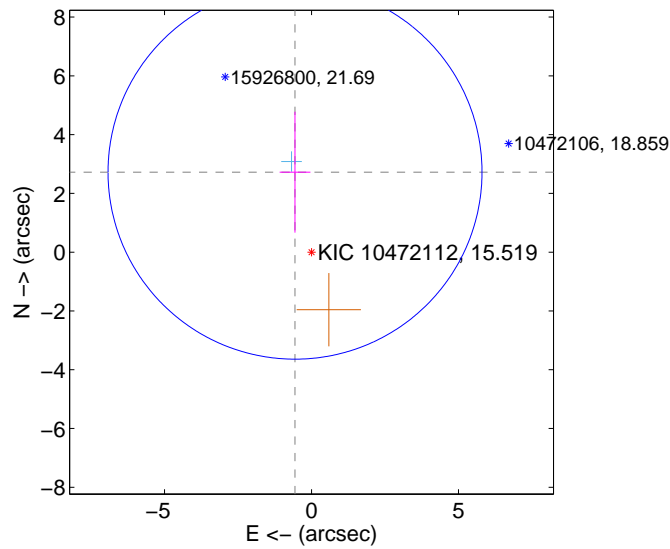
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.458 ± 1.468	1.67	0.492 ± 0.411	2.409 ± 1.496
PRF-fit source offset from KIC position	2.779 ± 2.121	1.31	0.561 ± 0.523	2.722 ± 2.059
photometric centroid source offset	1.55 ± 1.65	0.94	-1.40 ± 1.61	0.67 ± 1.82

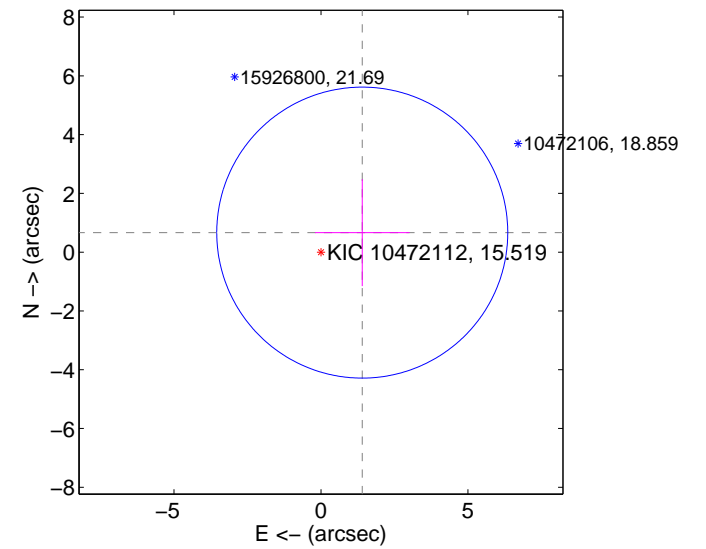
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

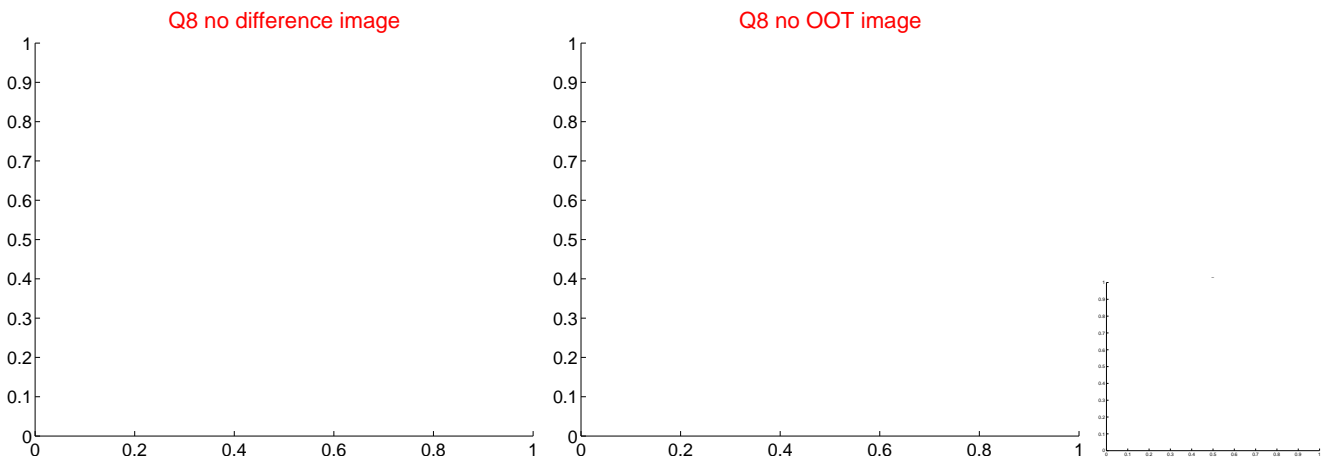
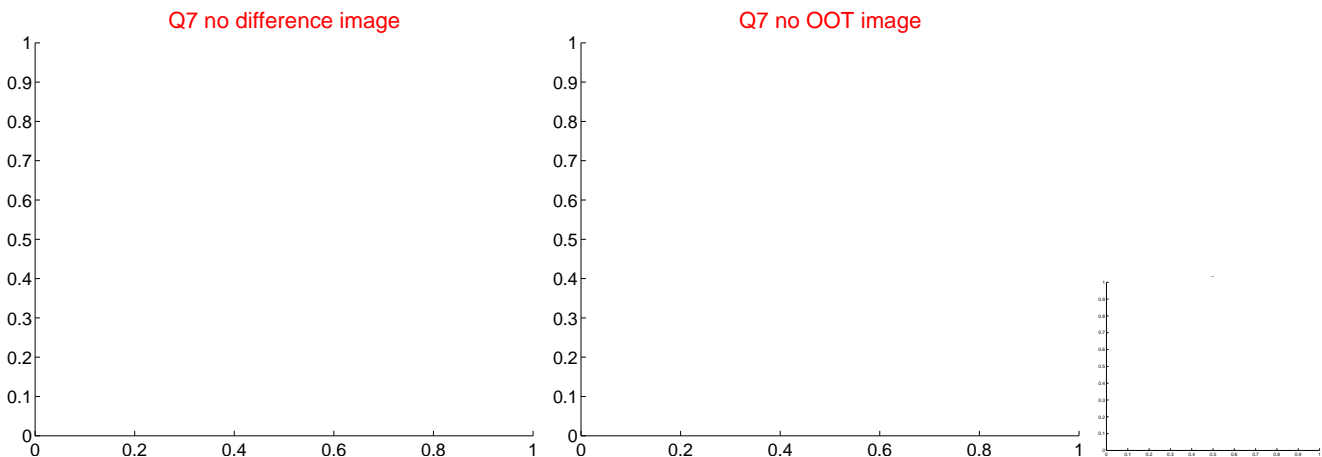
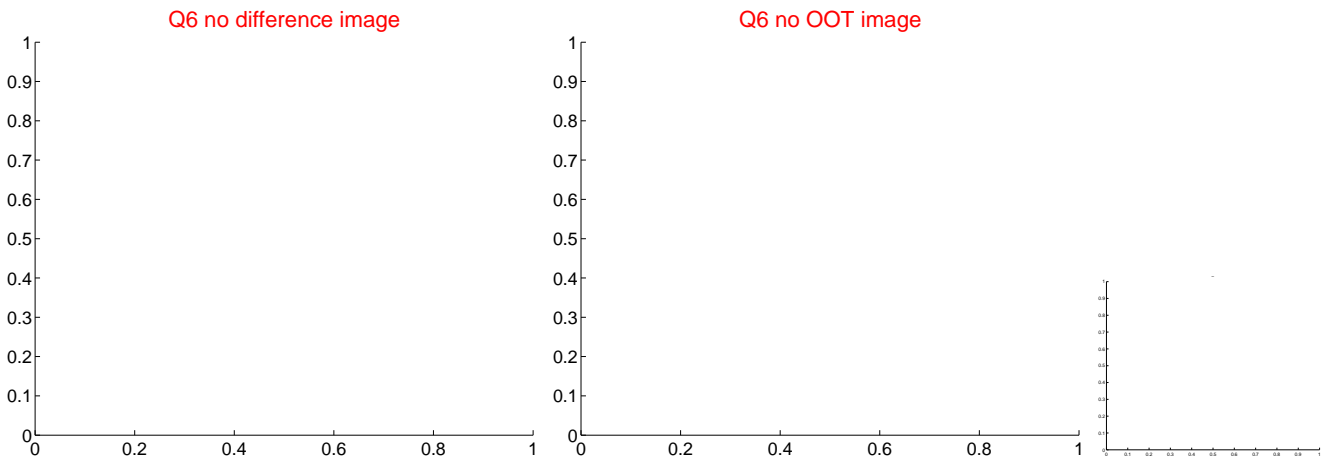
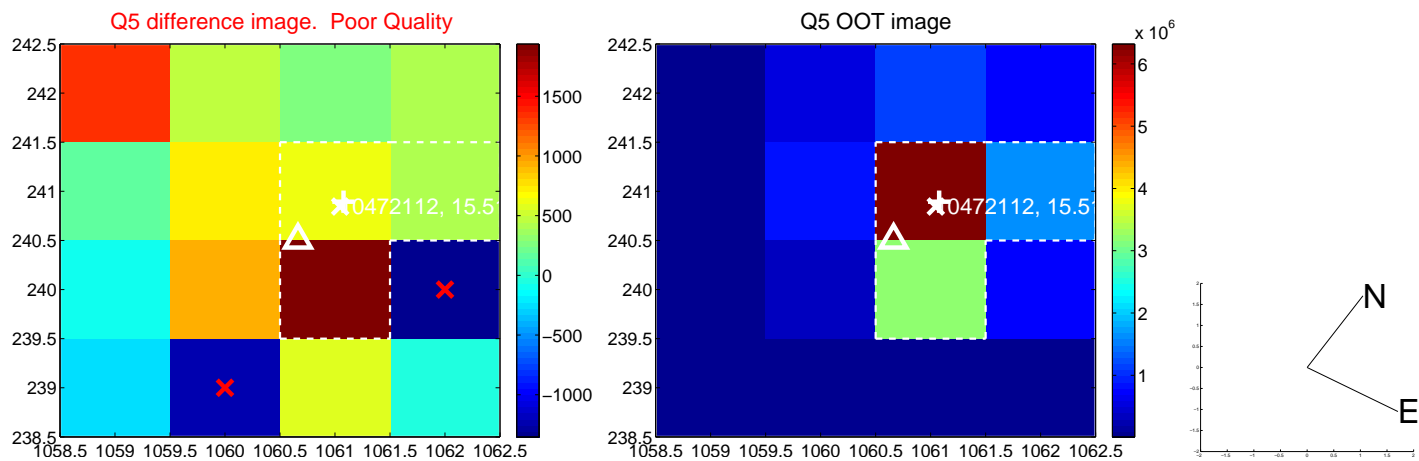


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

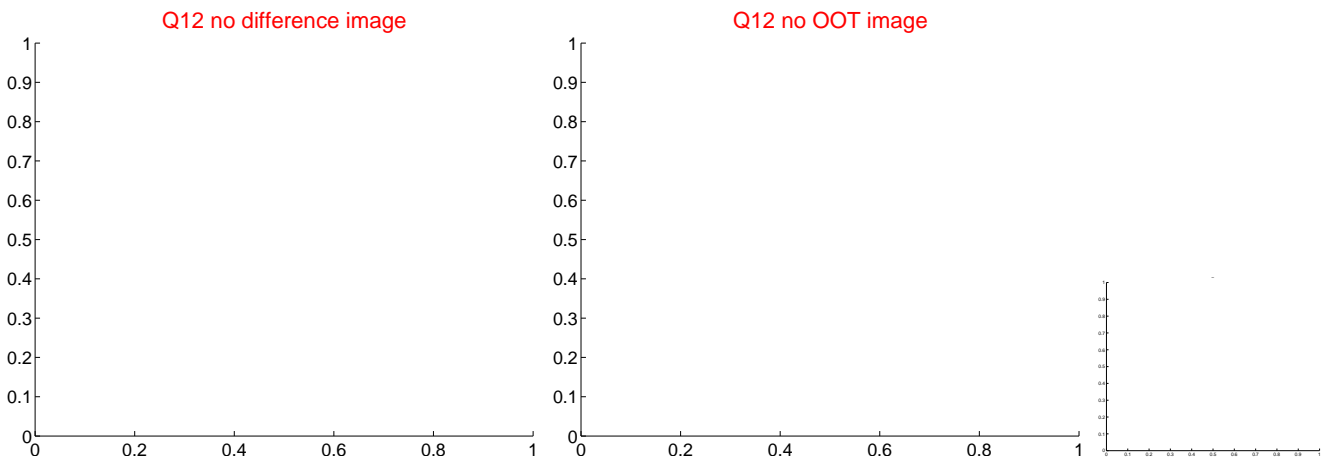
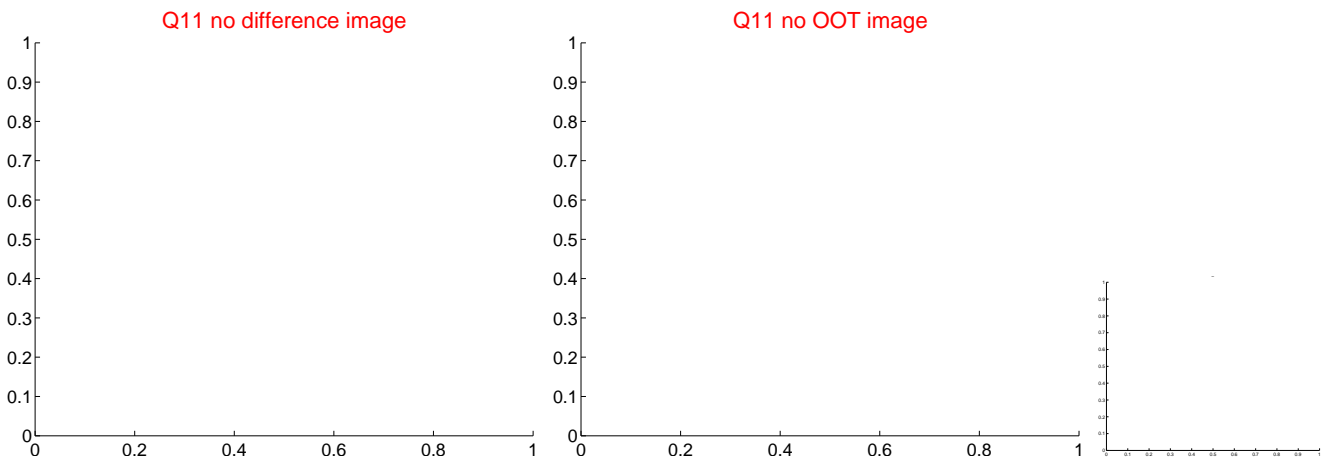
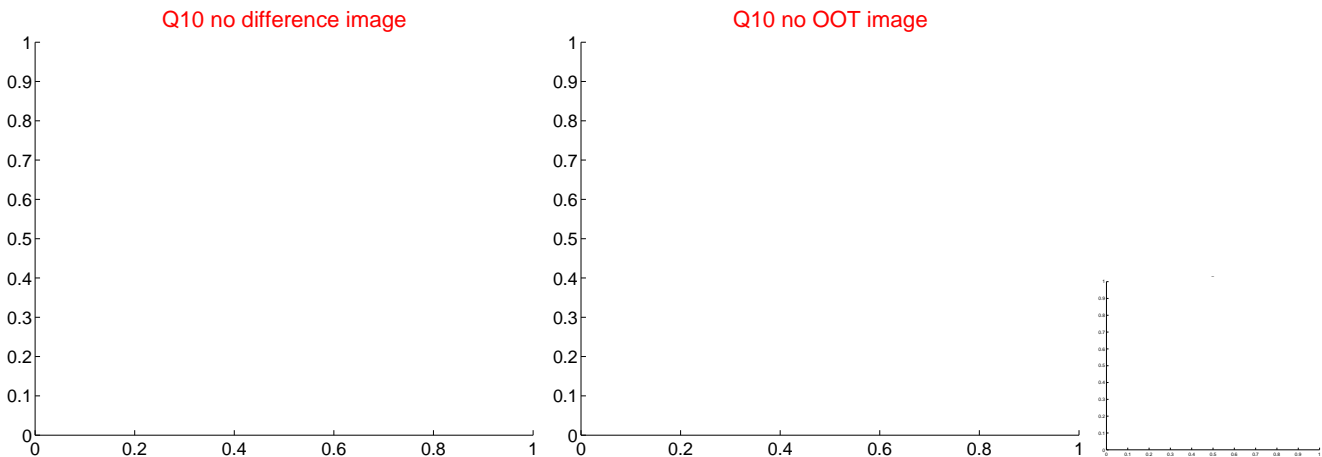
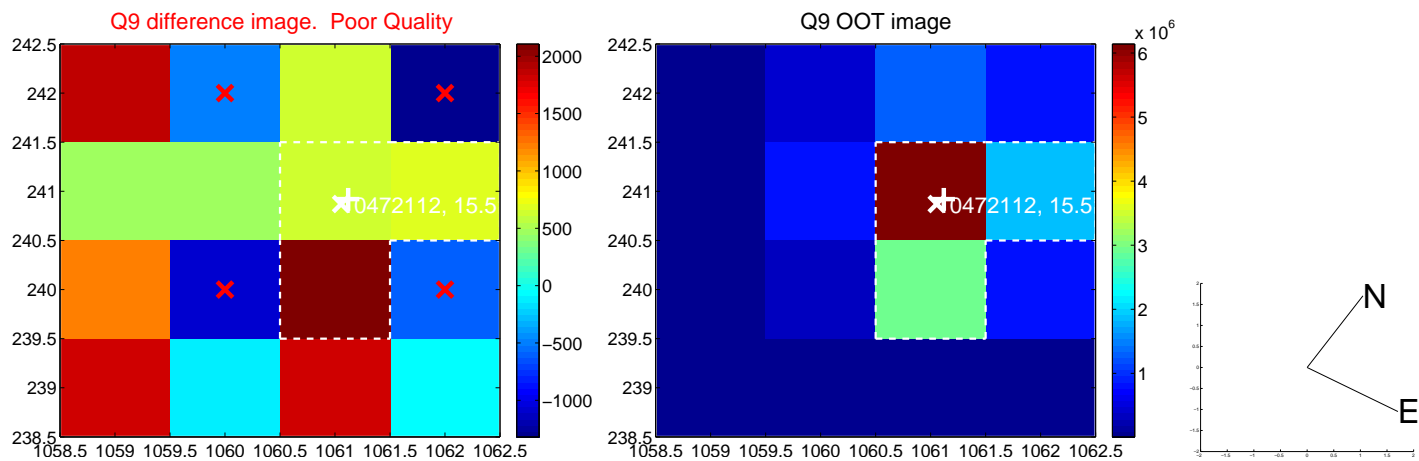
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

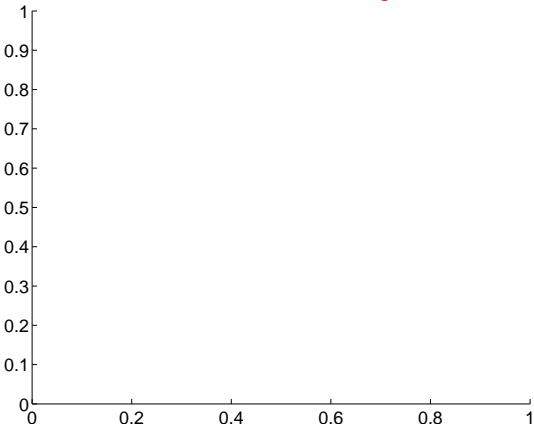


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

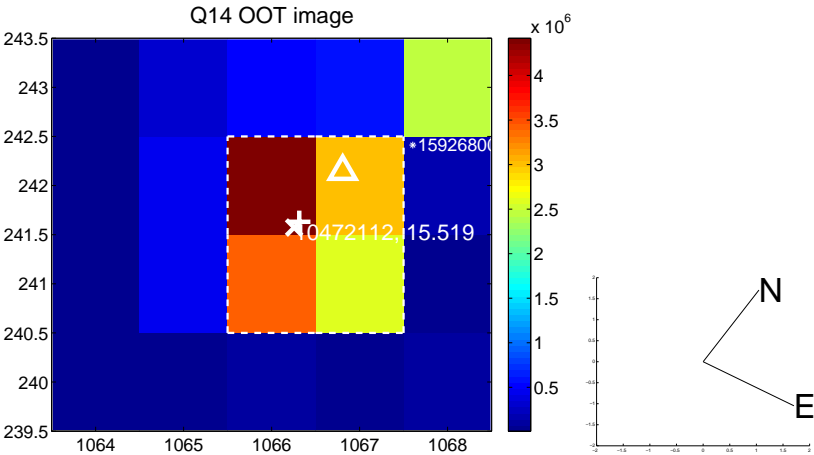
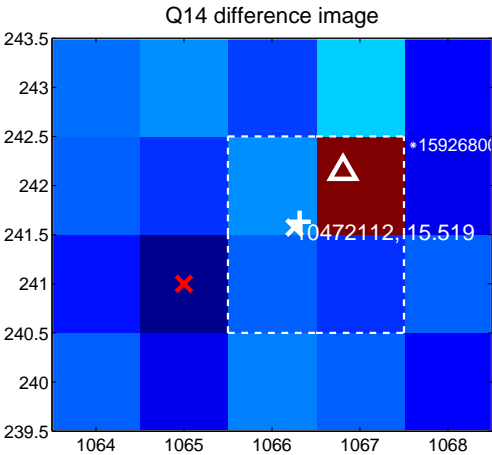
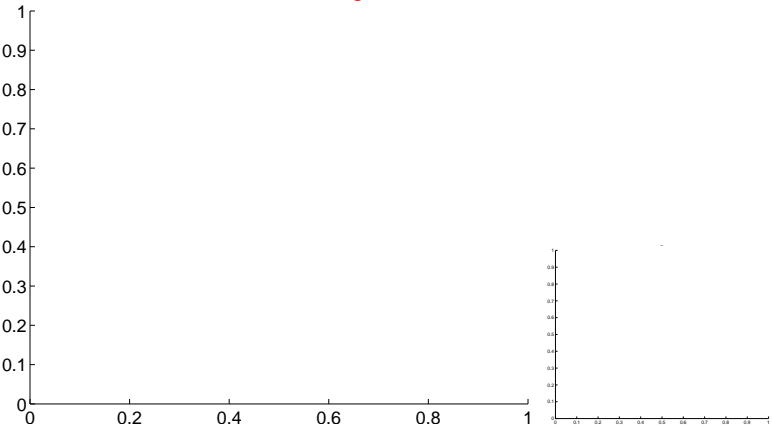


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

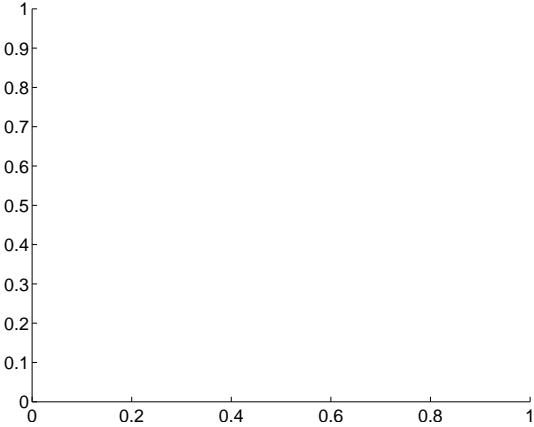
Q13 no difference image



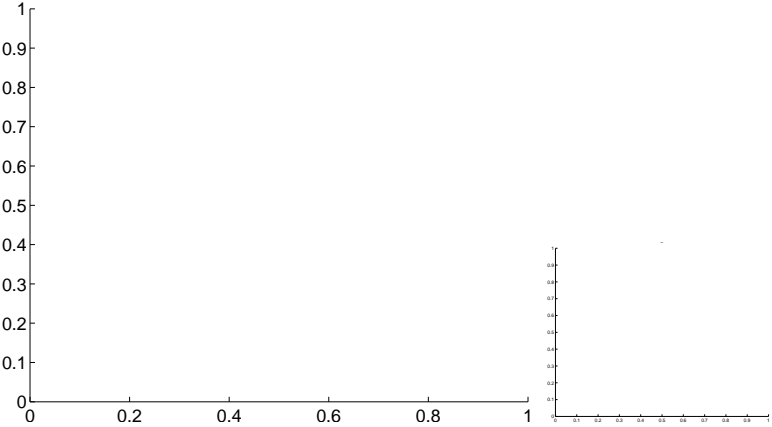
Q13 no OOT image



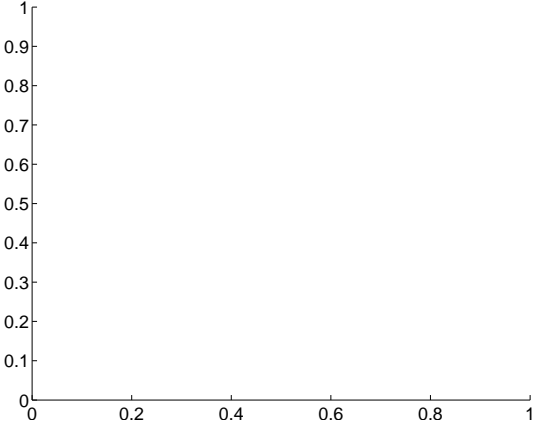
Q15 no difference image



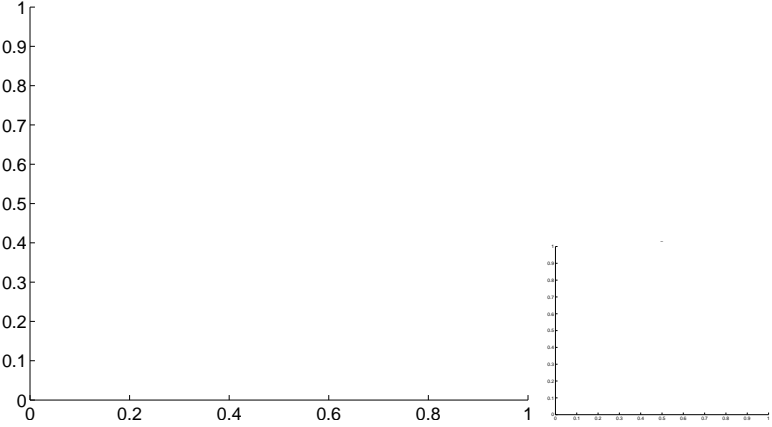
Q15 no OOT image



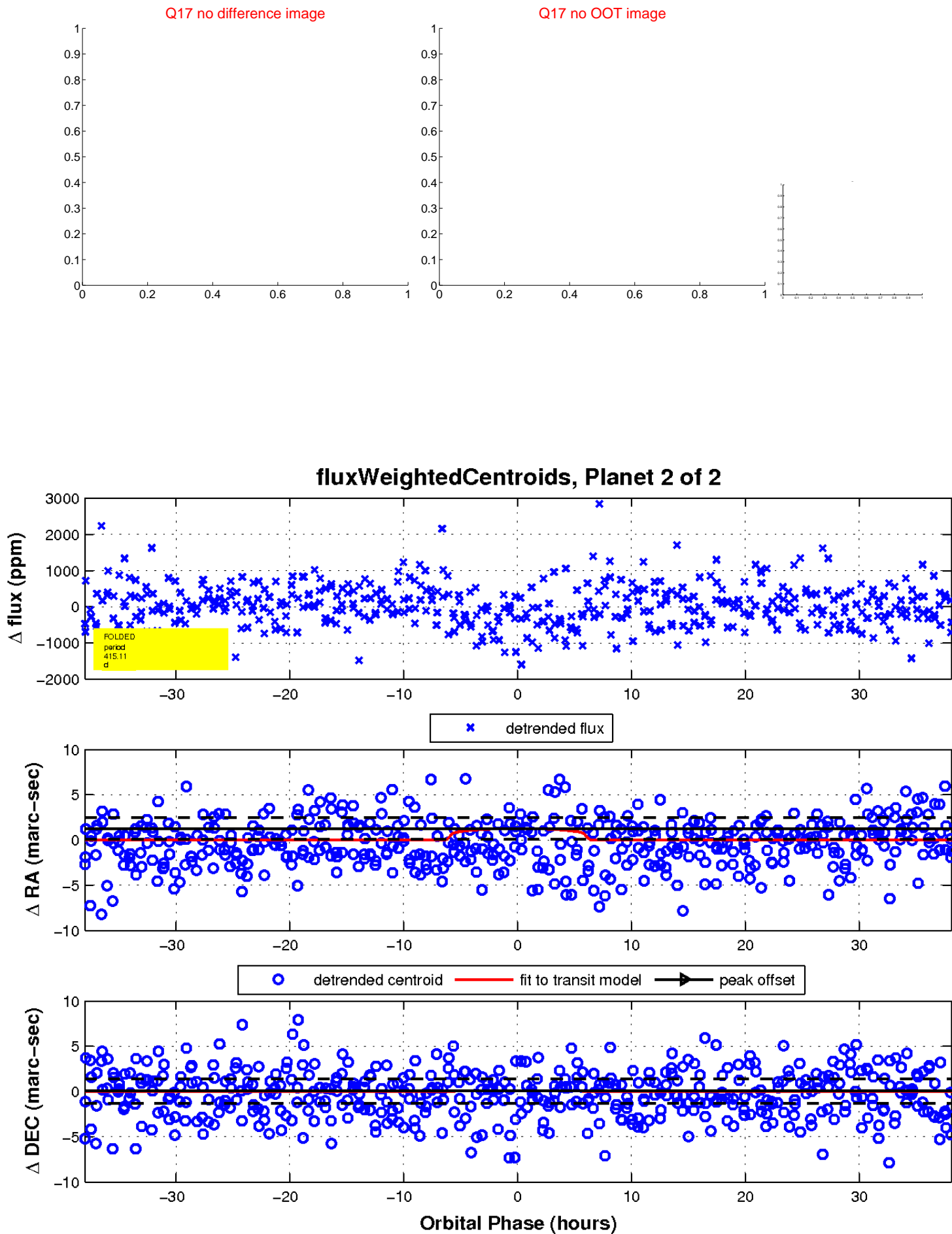
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

