

KIC 010073672

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})
010073672-01	OBS	2764.01	2.252990	132.235766	461.1	1.780	20.5	22.7	0.56	4039	1.44	94.46
010073672-02	OBS	No	359.629512	139.898442	2458.5	7.009	11.2	10.2	0.56	4039	3.46	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010073672-01	OBS	PC	0.93	0	0	0	0	CENT_KIC_POS
010073672-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

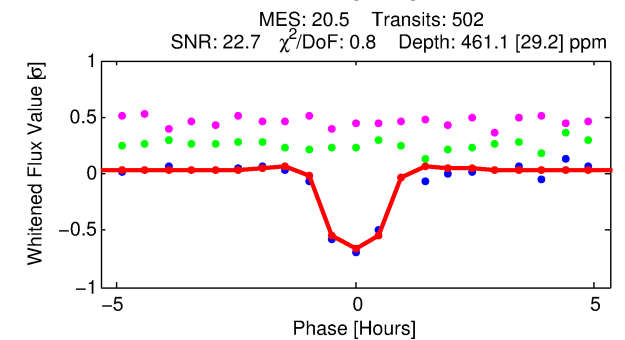
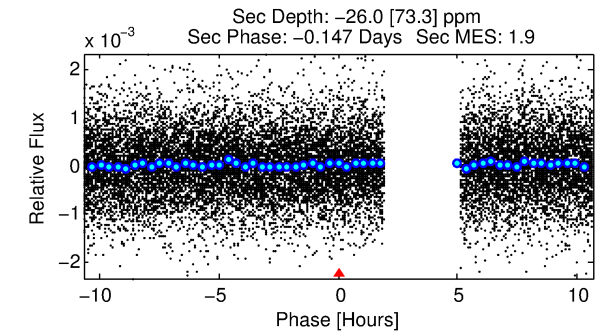
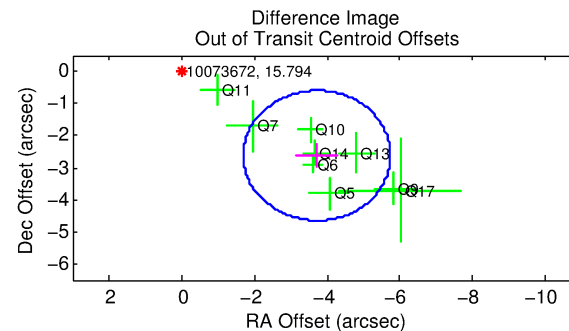
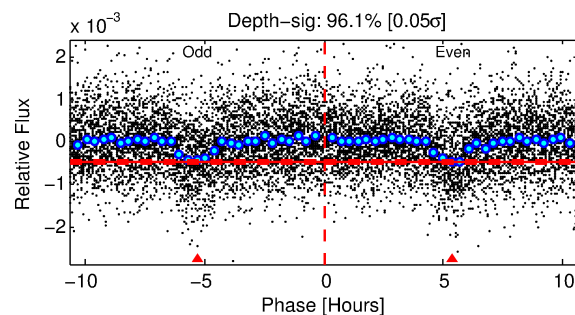
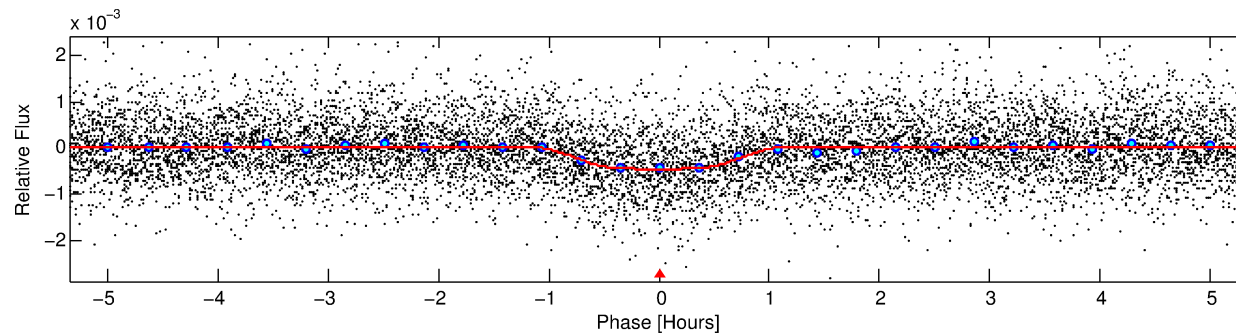
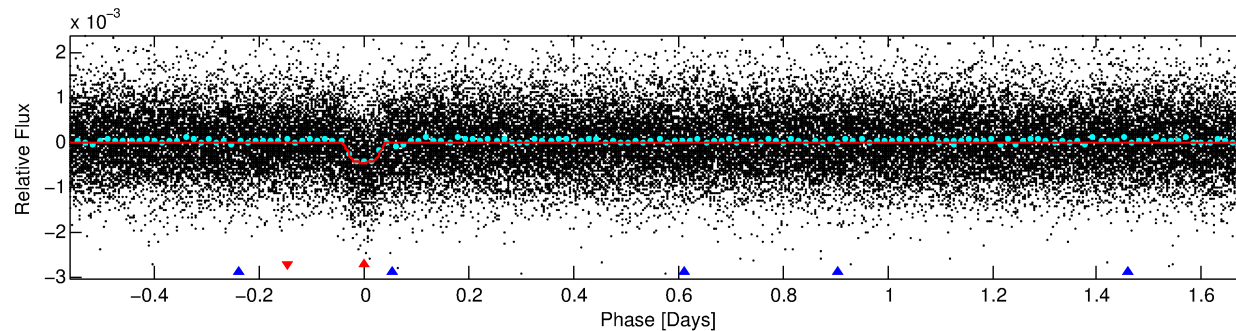
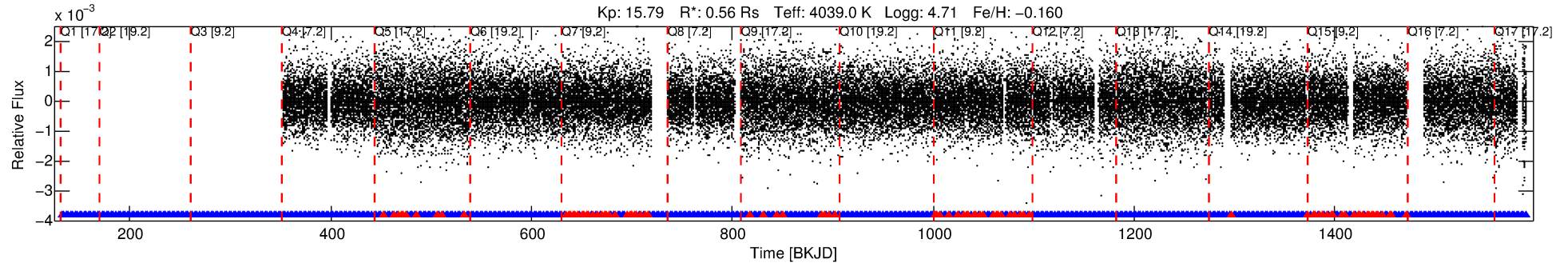
Ephemeris Match Information For 010073672-01

No Significant Match Found

DV One-Page Summary

KIC: 10073672 Candidate: 1 of 2 Period: 2.253 d
KOI: K02764.01 Corr: 0.949

Kp: 15.79 R*: 0.56 Rs Teff: 4039.0 K Logg: 4.71 Fe/H: -0.160



DV Fit Results:

Period = 2.25299 [0.00001] d
Epoch = 132.2358 [0.0012] BKJD
Rp/R* = 0.0236 [0.0057]
a/R* = 4.81 [4.78]
b = 0.90 [0.22]
Seff = 94.46 [9.33]
Teff = 795 [20] K
Rp = 1.44 [0.36] Re
a = 0.0281 [0.0012] AU
Ag = N/A
Teffp = N/A

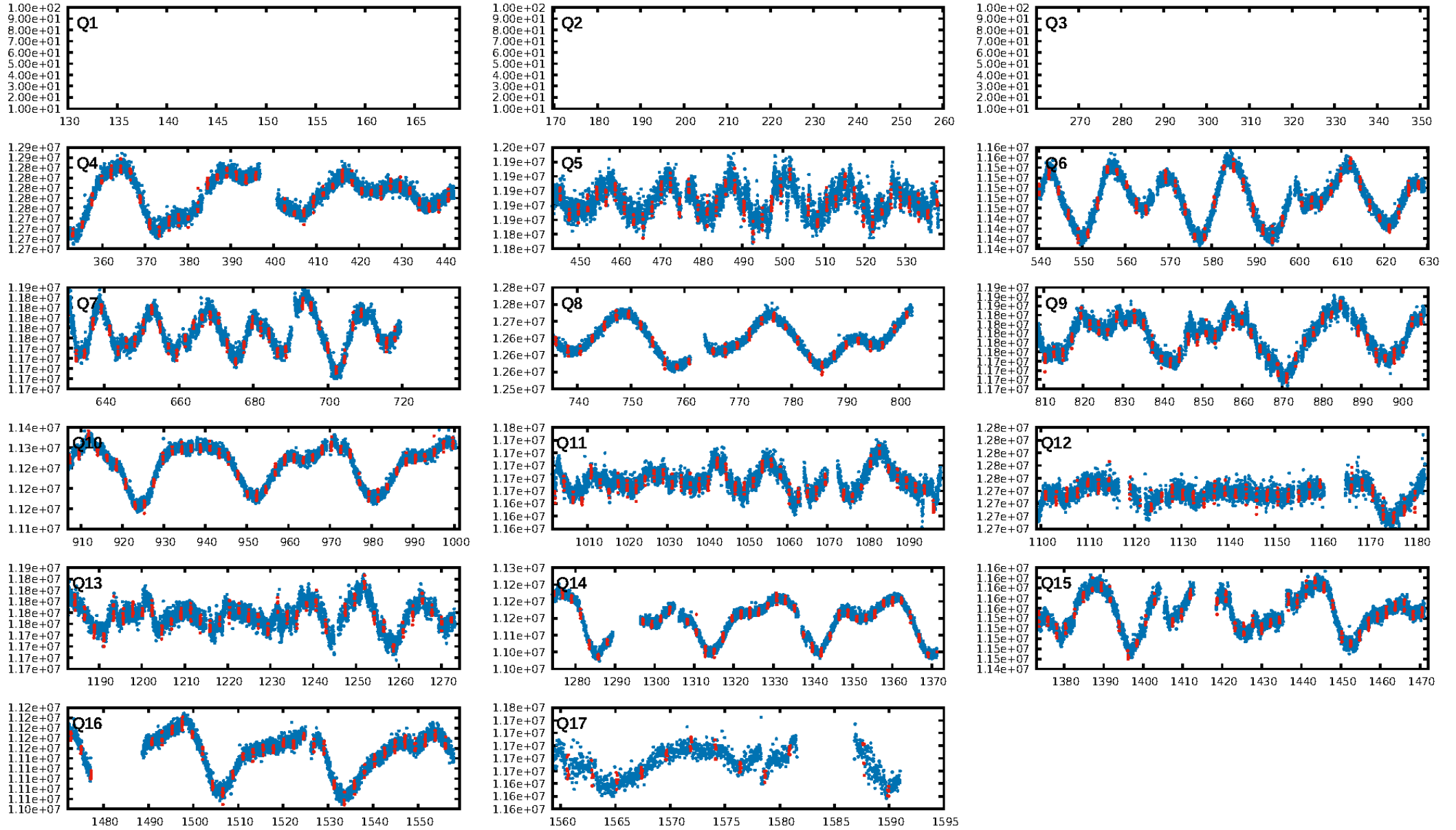
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1186.01σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.70e-88
RollingBand-fgt: 0.82 [401/490]
GhostDiagnostic-chr: 10.89
Centroid-sig: 0.0%
Centroid-so: 2.666 arcsec [8.05σ]
OotOffset-rm: 4.549 arcsec [6.74σ]
KicOffset-rm: 0.583 arcsec [2.87σ]
OotOffset-st: 3/2/0/4 [9]
KicOffset-st: 3/2/4/4 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 1.00 [14/14]

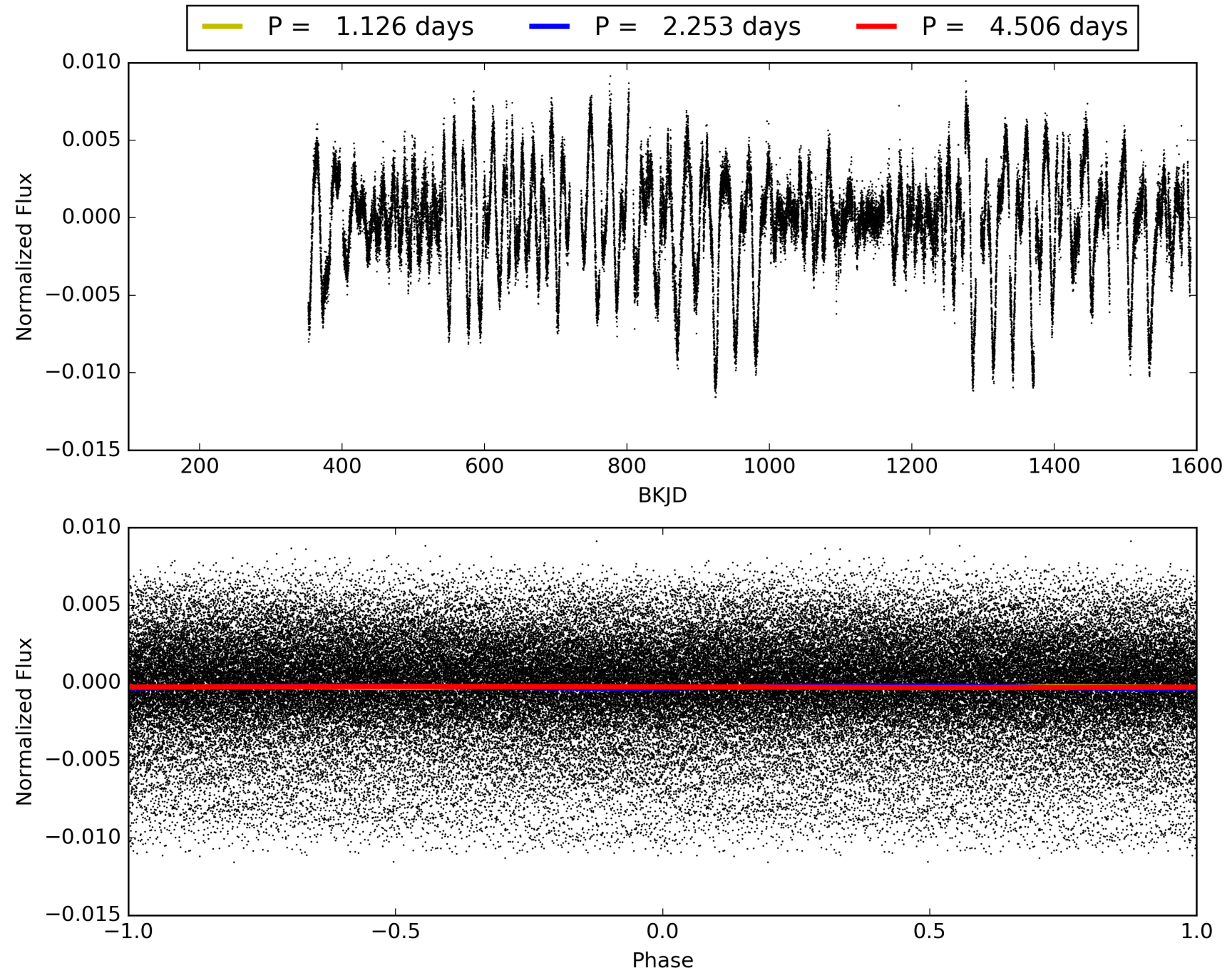
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:37:06 Z

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

TCE 010073672-01, PDC Light Curves

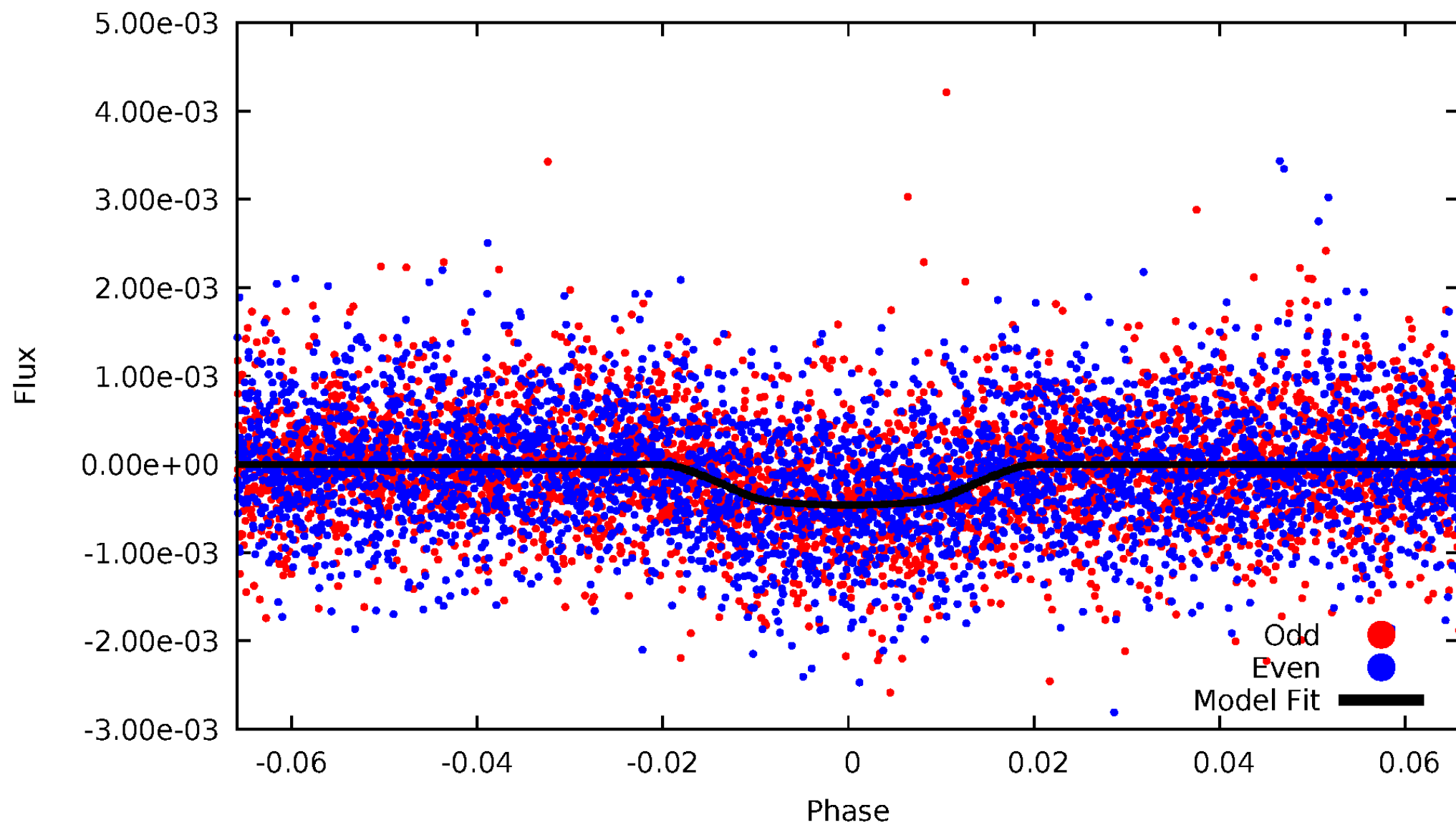


TCE 010073672-01



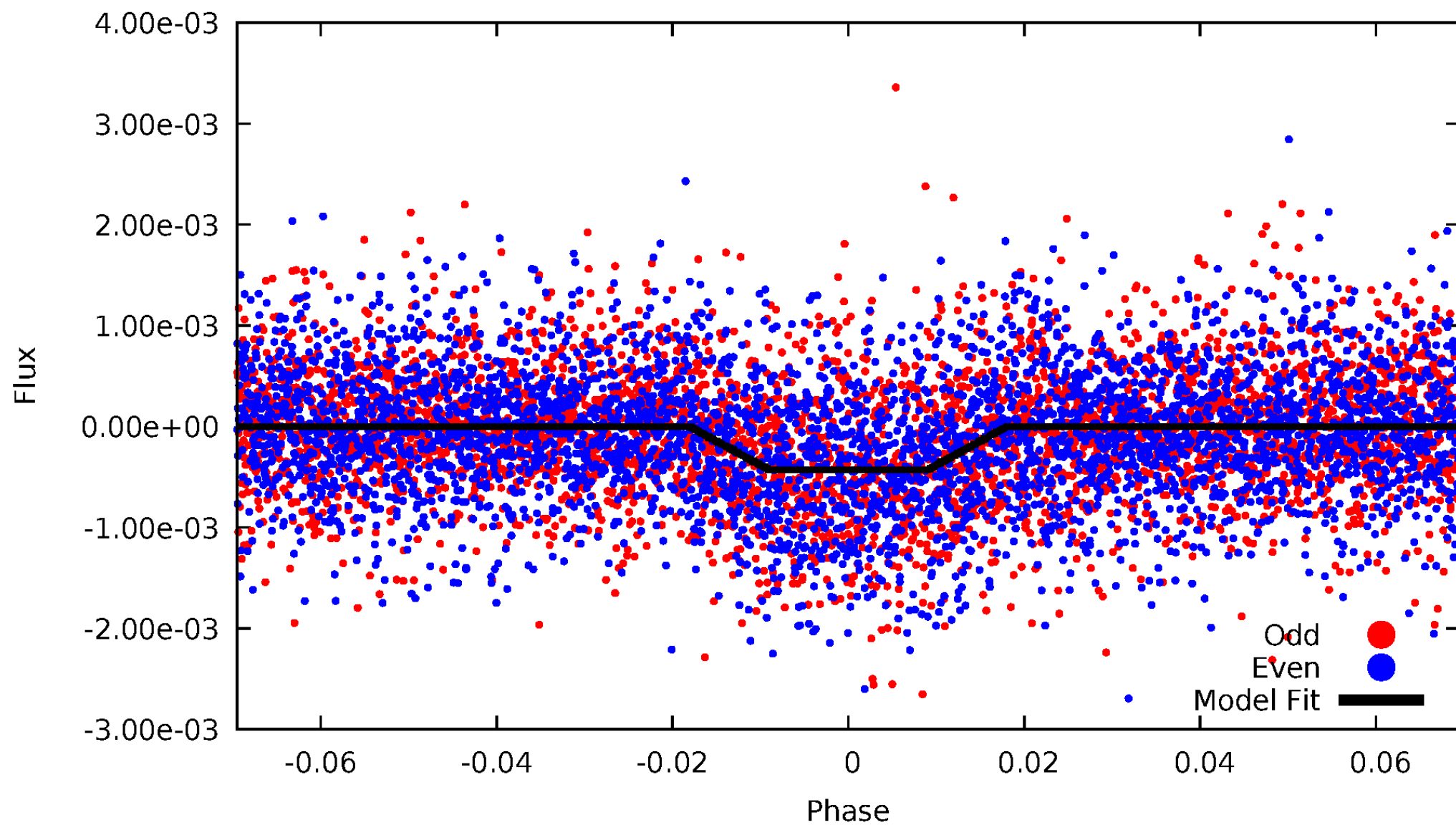
DV Odd/Even

TCE 010073672-01

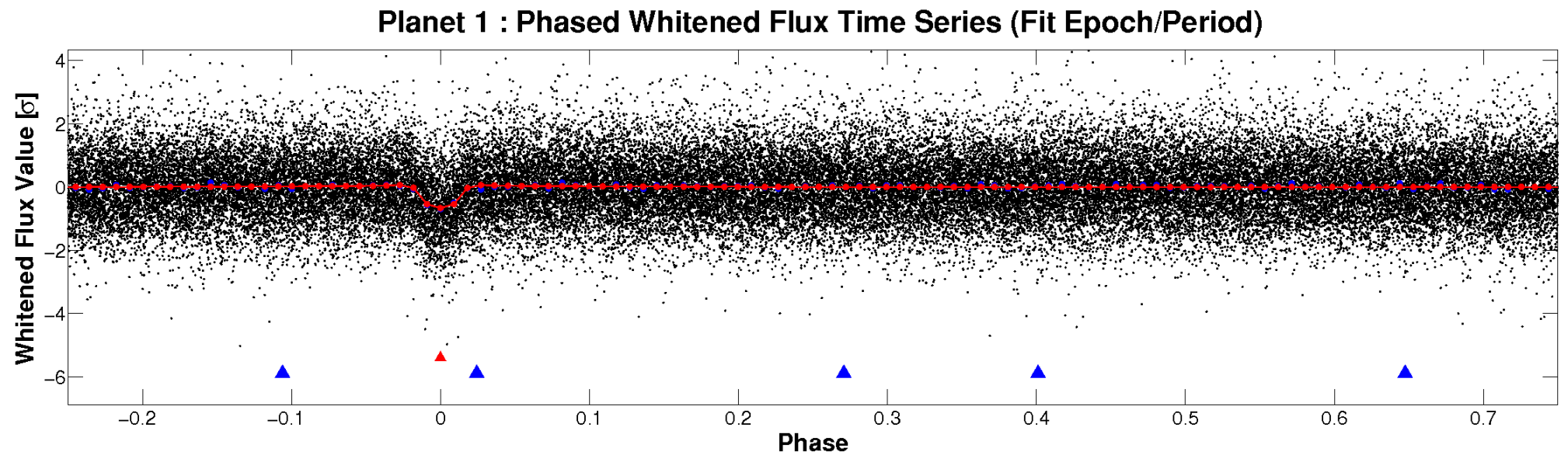
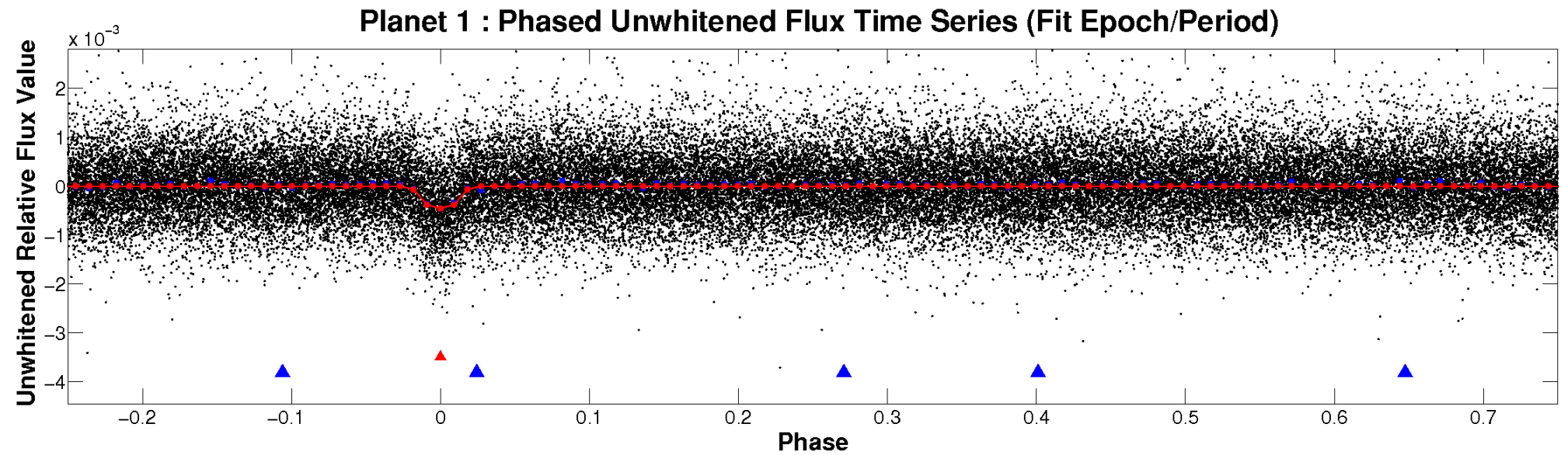


ALT Odd/Even

TCE 010073672-01

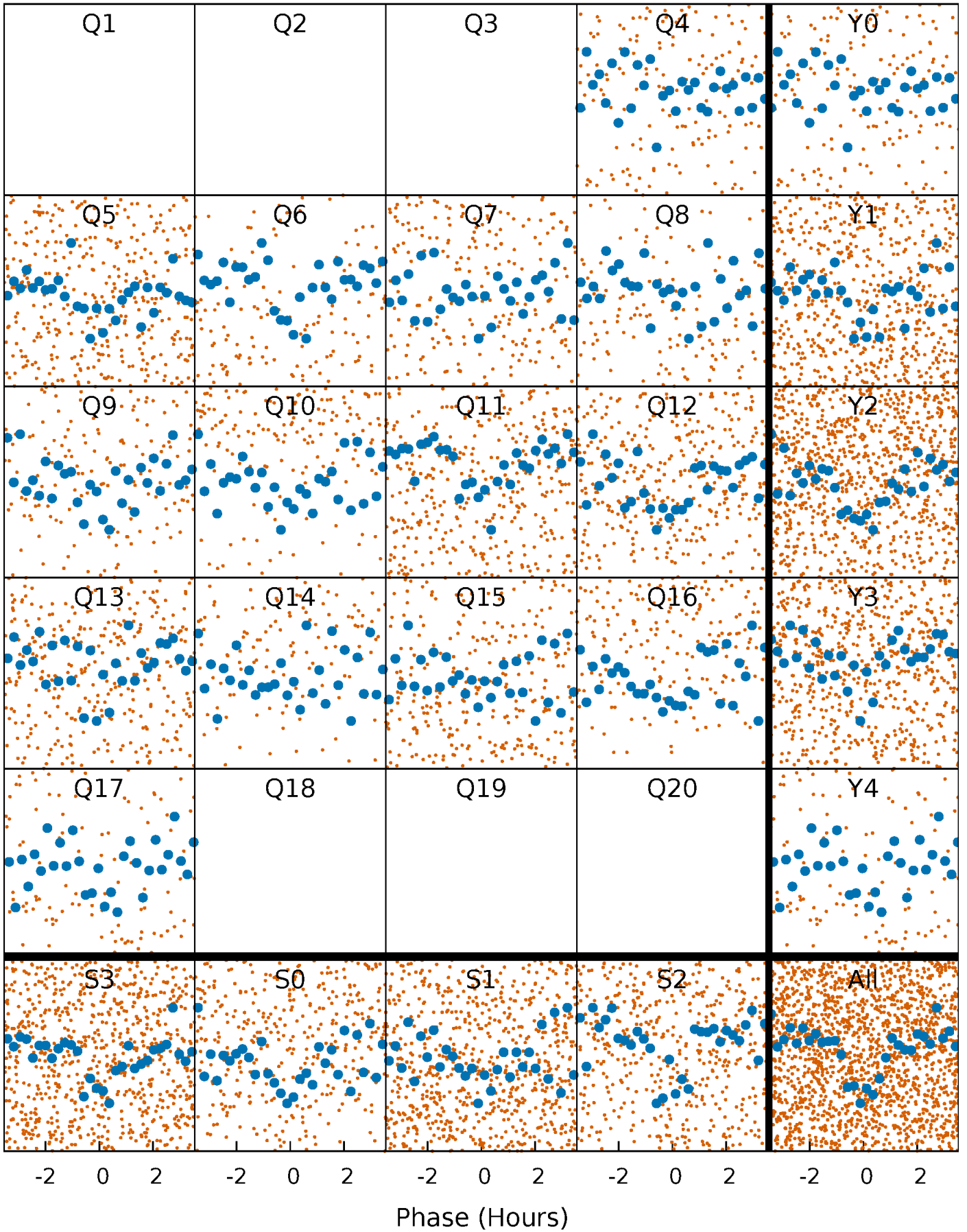


Non-Whitened Vs. Whitened Light Curve



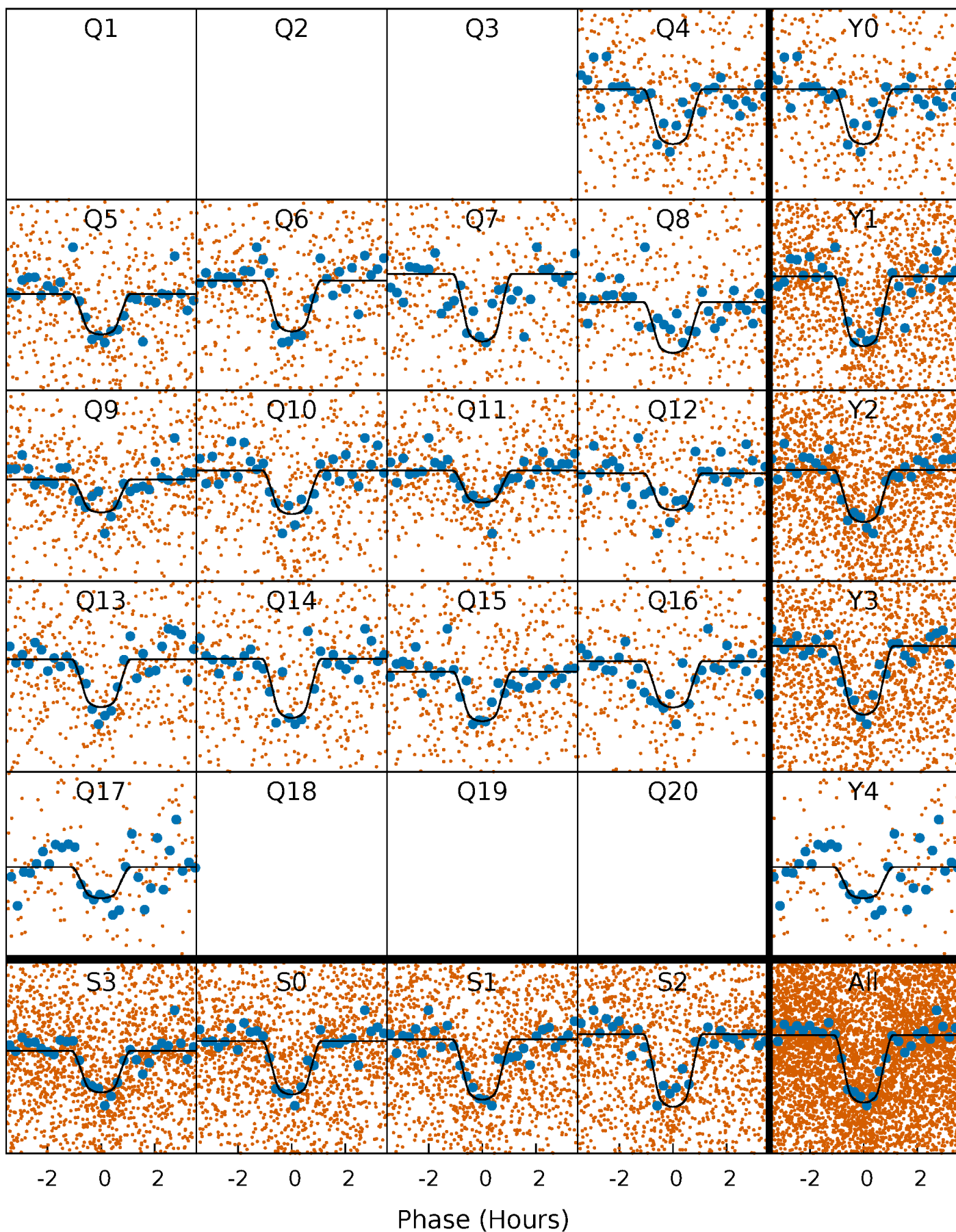
PDC Quarter-Phased Transit Curves

TCE 010073672-01 P= 2.252990 Days $T_0=132.235766$ (BKJD)



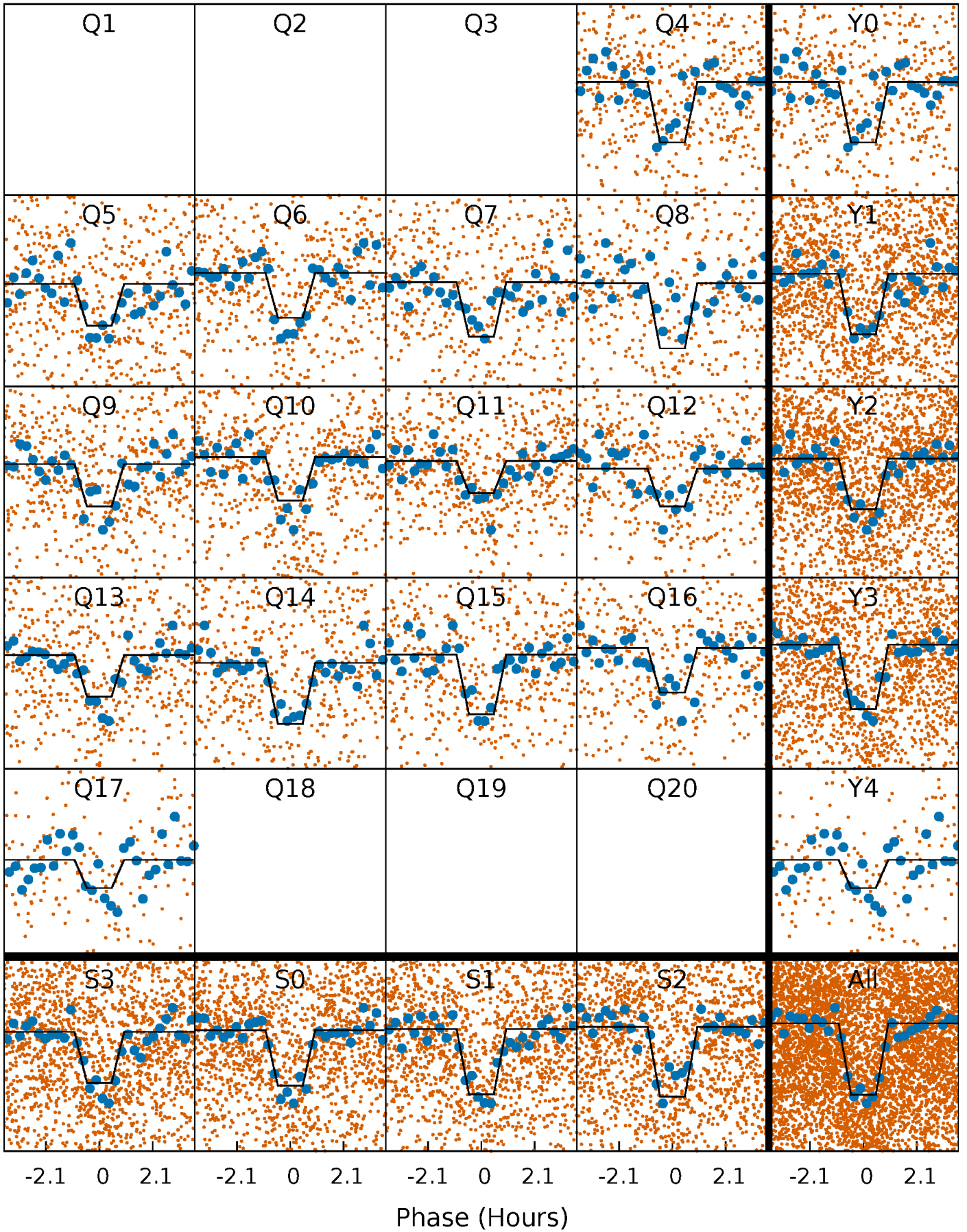
DV Quarter-Phased Transit Curves

TCE 010073672-01 P= 2.252990 Days $T_0=132.235766$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

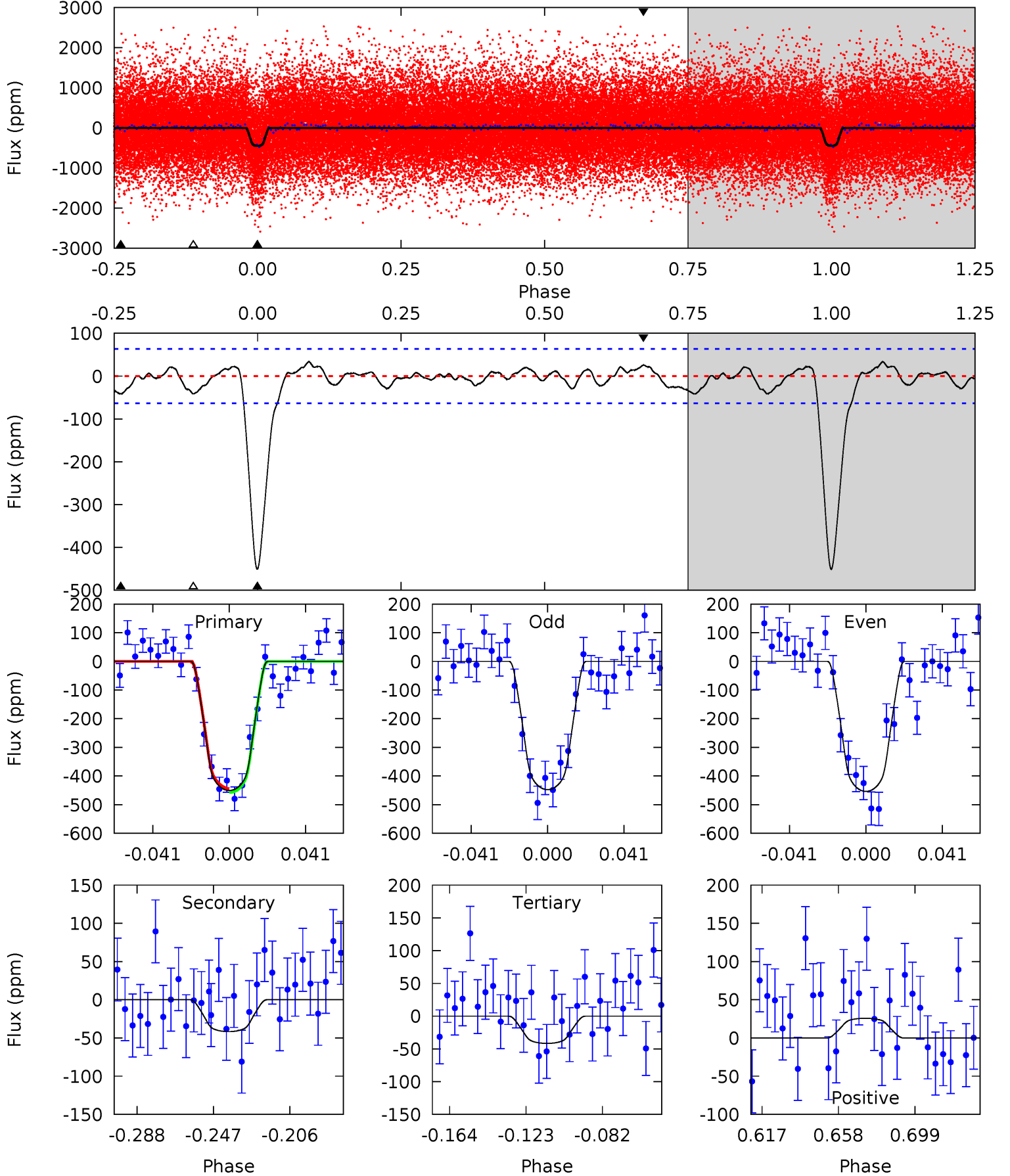
TCE 010073672-01 P= 2.252972 Days $T_0=132.239982$ (BKJD)



DV Model-Shift Uniqueness Test

010073672-01, P = 2.252990 Days, E = 132.235766 Days

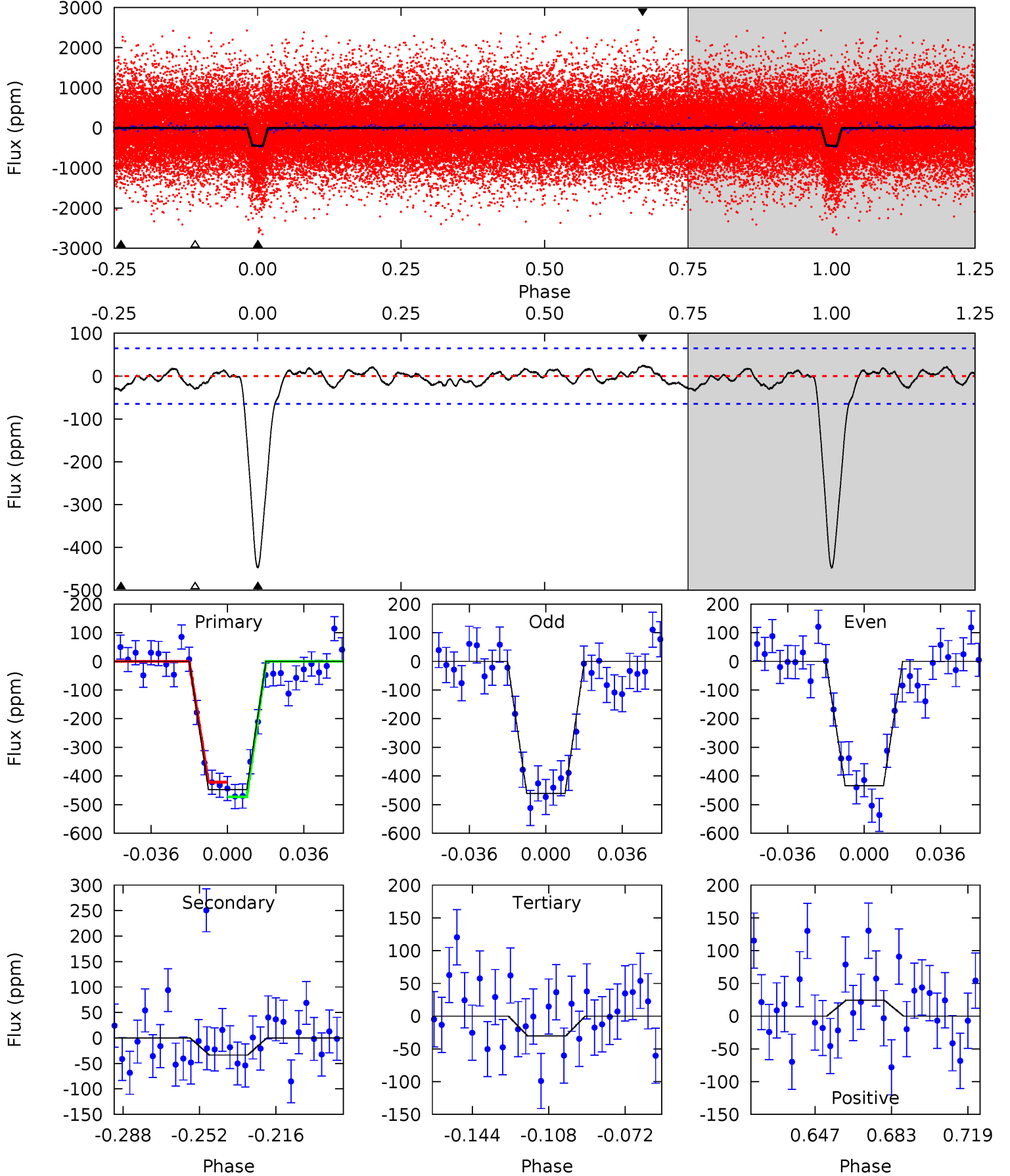
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.7	3.12	3.11	1.92	4.75	2.04	1.14	30.6	31.8	0.00	1.19	0.23	1.02	0.07	0.50



Alt Model-Shift Uniqueness Test

010073672-01, P = 2.252972 Days, E = 132.239982 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.0	2.47	2.23	1.79	4.77	2.10	0.95	30.8	31.2	0.25	0.69	0.98	1.04	0.05	1.89



Stellar Parameters For KIC 010073672

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4039^{+80}_{-80}	$4.708^{+0.023}_{-0.030}$	$-0.160^{+0.150}_{-0.150}$	$0.559^{+0.031}_{-0.031}$	$0.583^{+0.029}_{-0.038}$	$4.690^{+0.512}_{-0.558}$
	+2%/-2%	+0%/-1%	+94%/-94%	+6%/-6%	+5%/-7%	+11%/-12%
Source	SPE70	PHO2	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 010073672-01 / KOI 2764.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-42 ± 13	$1.44^{+0.40}_{-0.35}$	1114^{+25}_{-26}	2700^{+248}_{-203}	$8.307^{+7.334}_{-3.615}$
Alt.	-33 ± 14	$1.28^{+0.36}_{-0.34}$	1111^{+29}_{-24}	2697^{+305}_{-234}	$8.187^{+9.549}_{-3.999}$

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

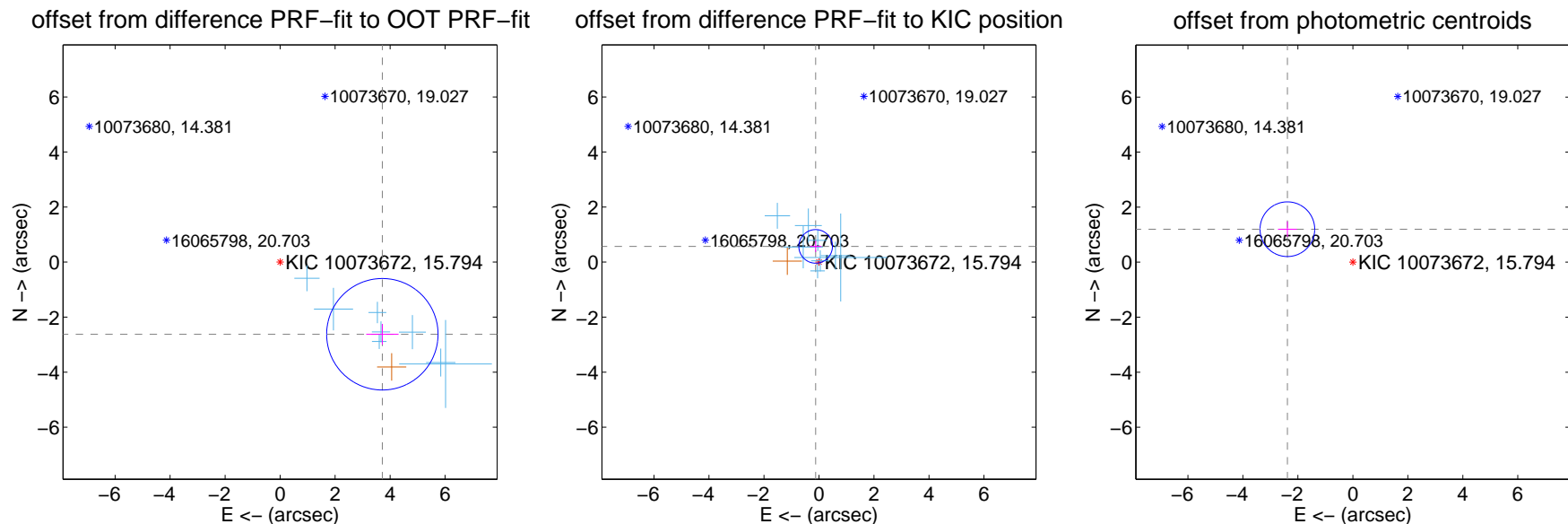
DV Centroid Data

Supplemental centroid analysis for 010073672-01. Kepler magnitude: 15.79. Transit SNR 22.69

There are 11 quarters with good PRF difference image offsets

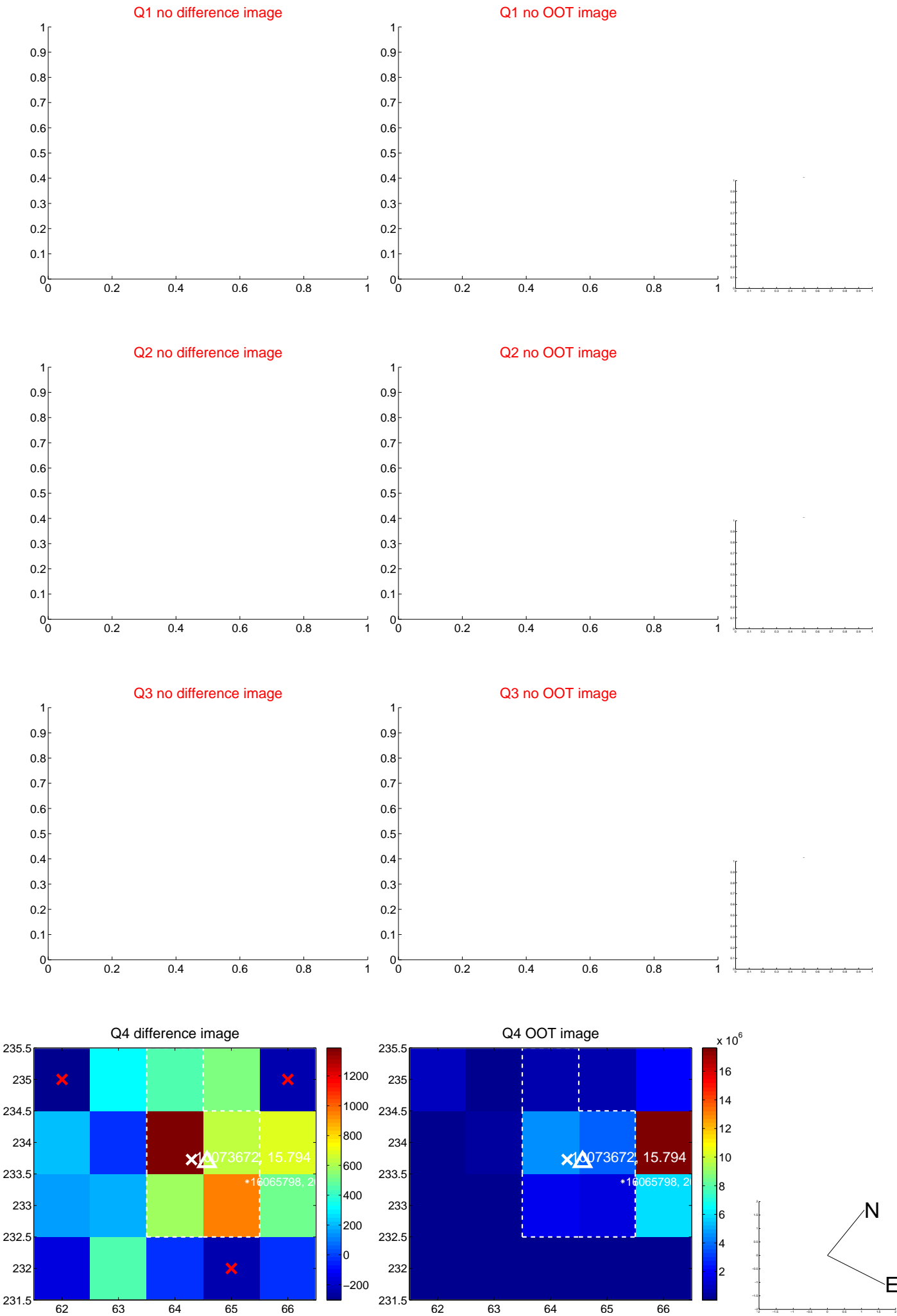
The OOT PRF centroid is offset from the target star catalog position by about 6.50 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.549 ± 0.675	6.74	-3.718 ± 0.588	-2.622 ± 0.374
PRF-fit source offset from KIC position	0.583 ± 0.204	2.87	0.122 ± 0.204	0.570 ± 0.204
photometric centroid source offset	2.67 ± 0.33	8.05	2.38 ± 0.34	1.20 ± 0.28

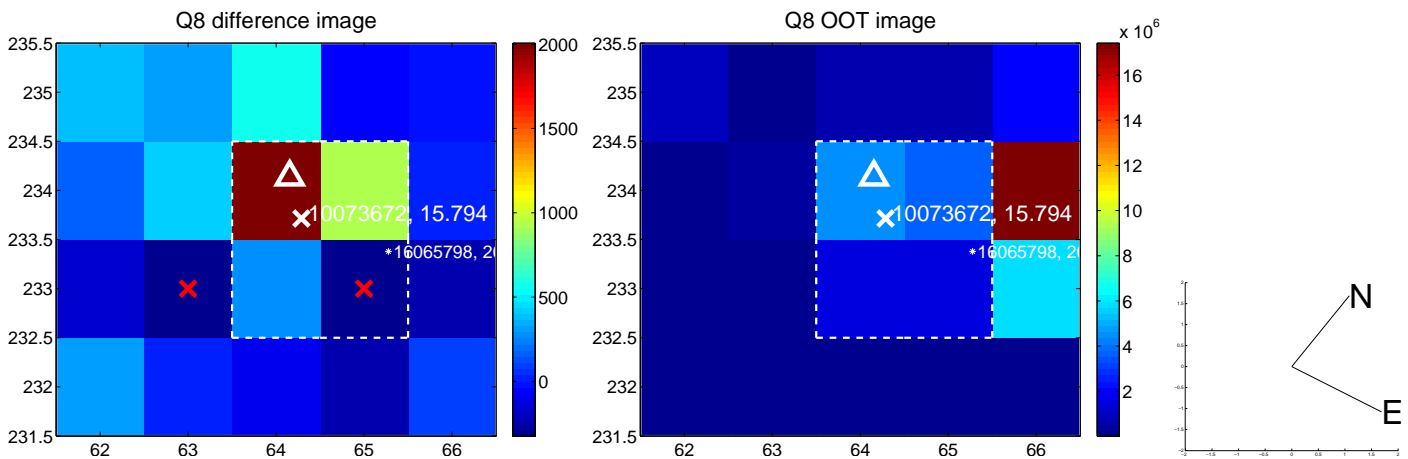
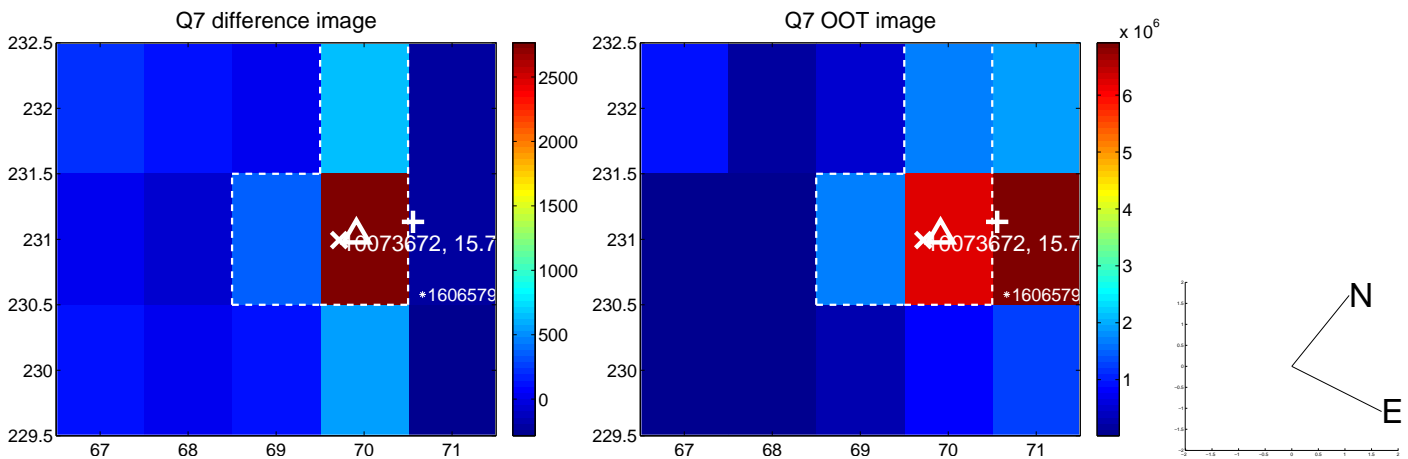
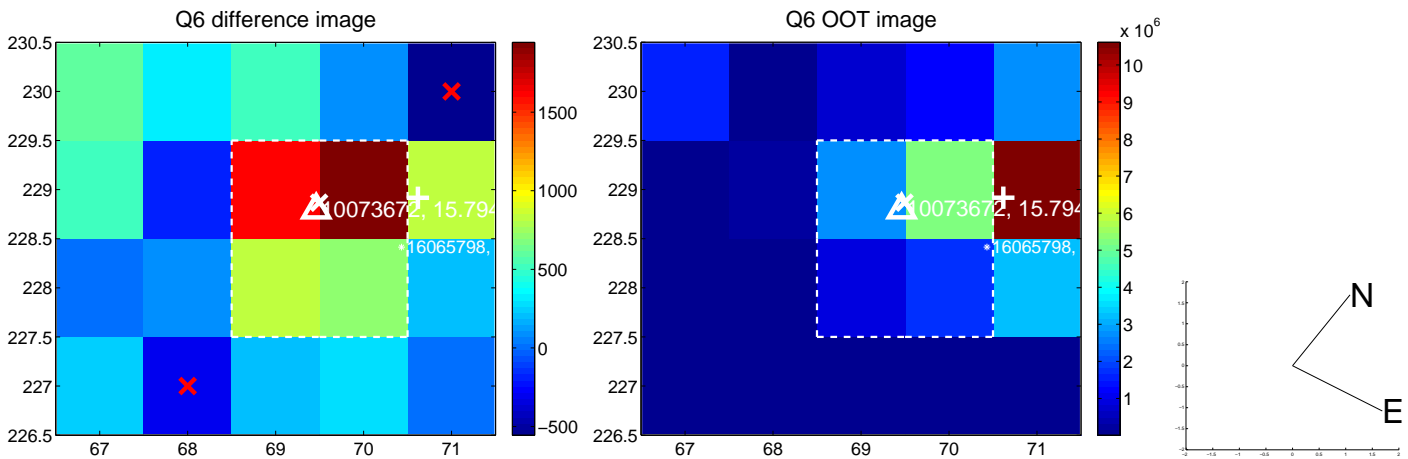
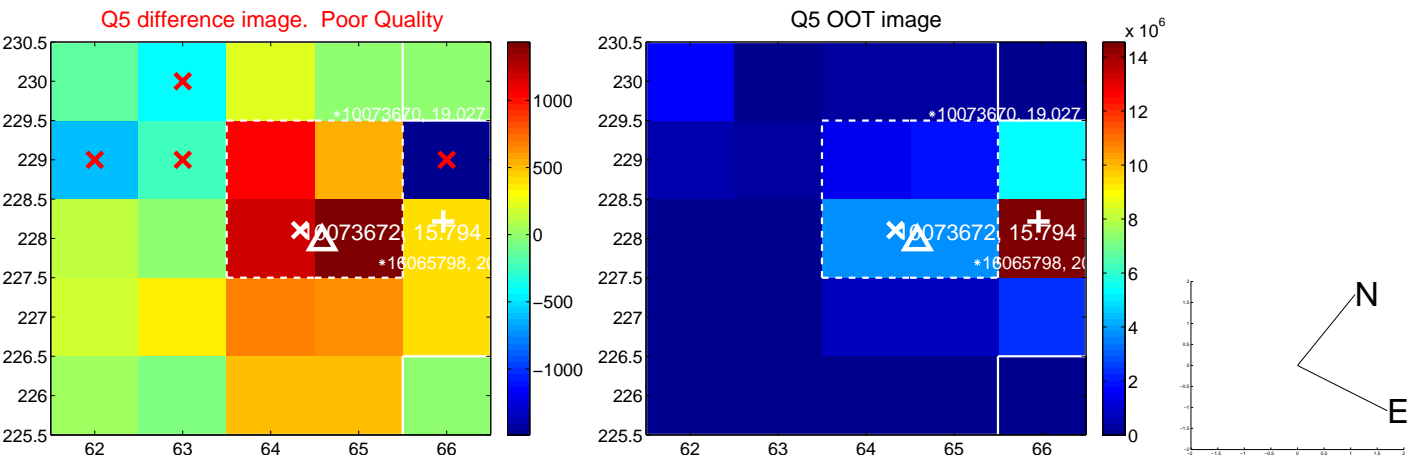


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

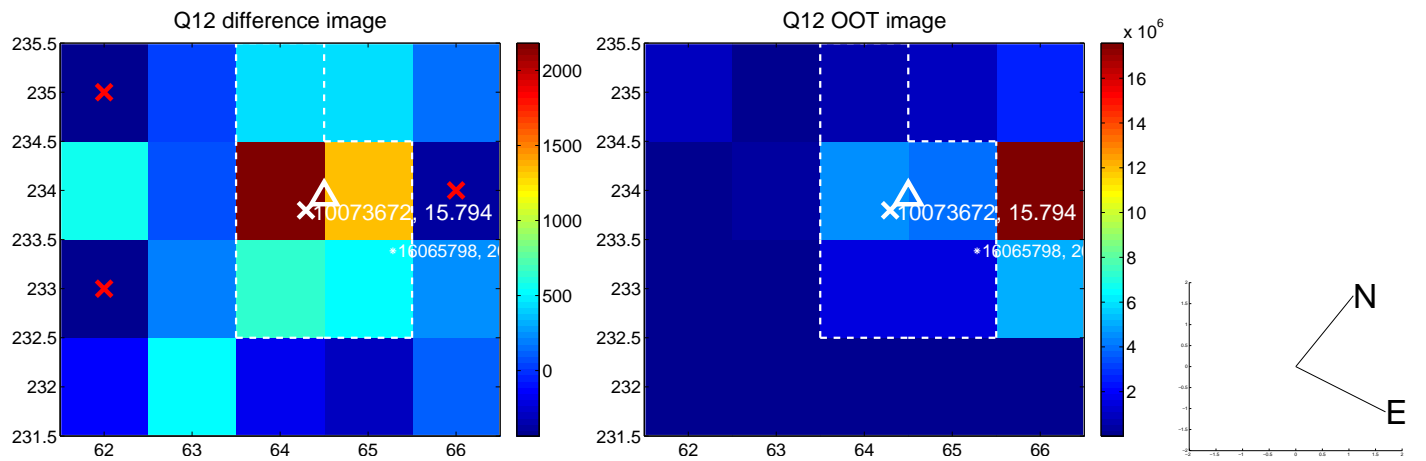
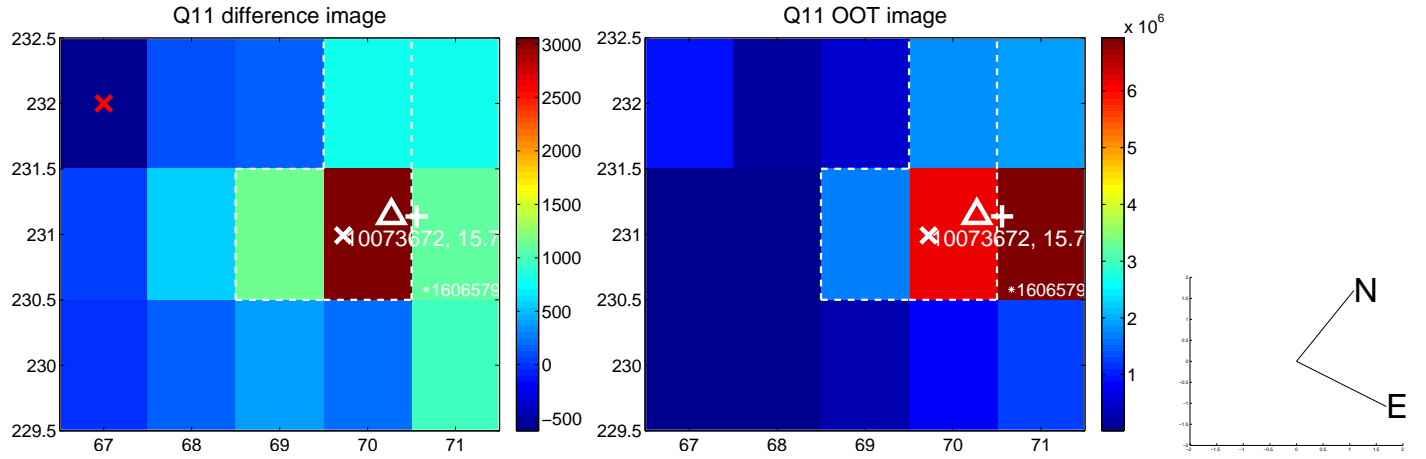
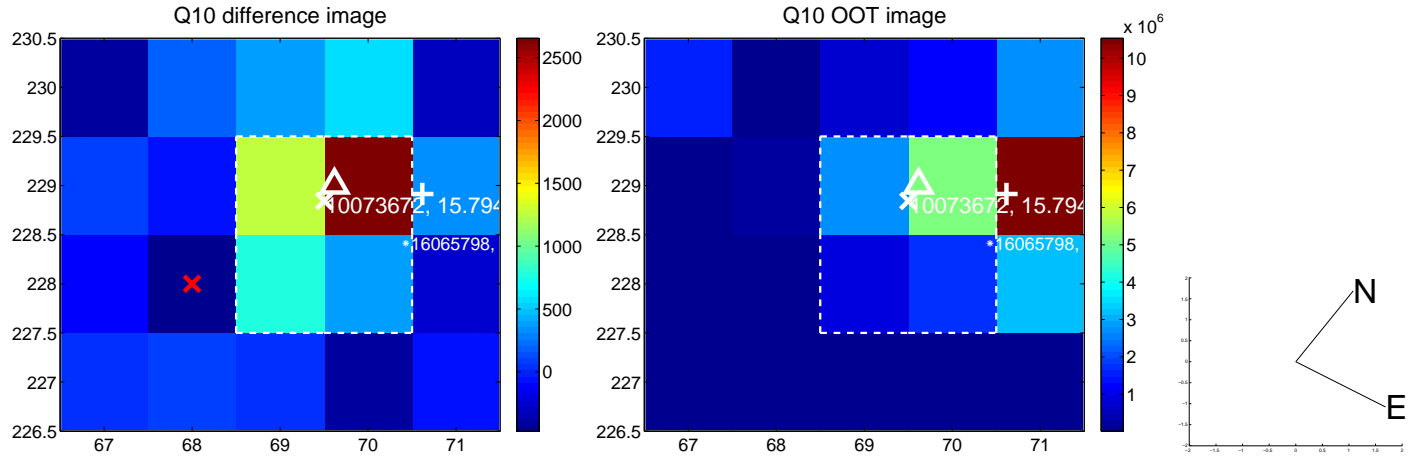
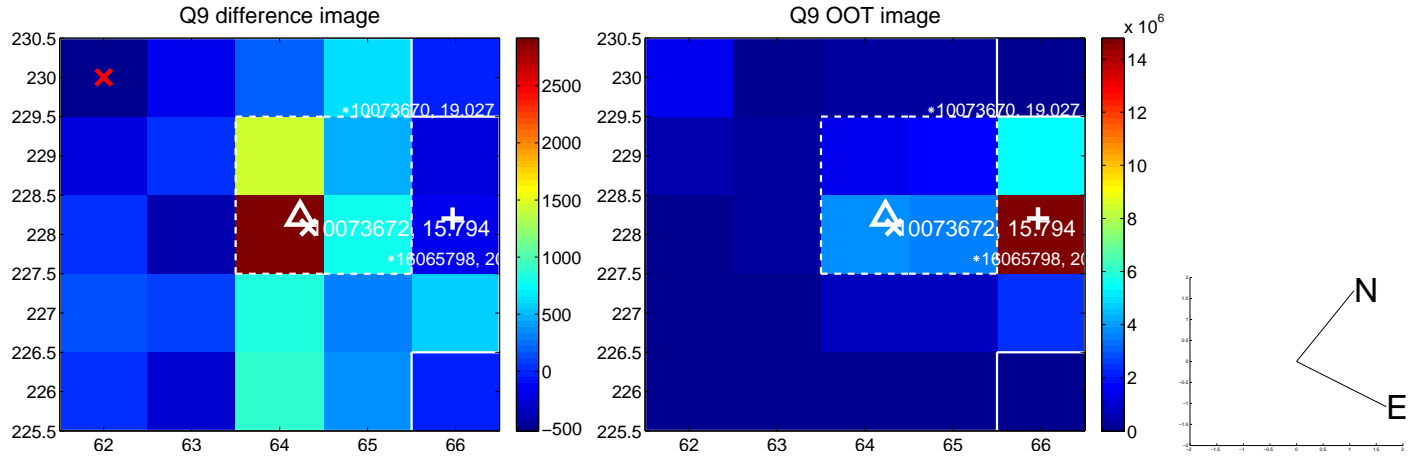
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



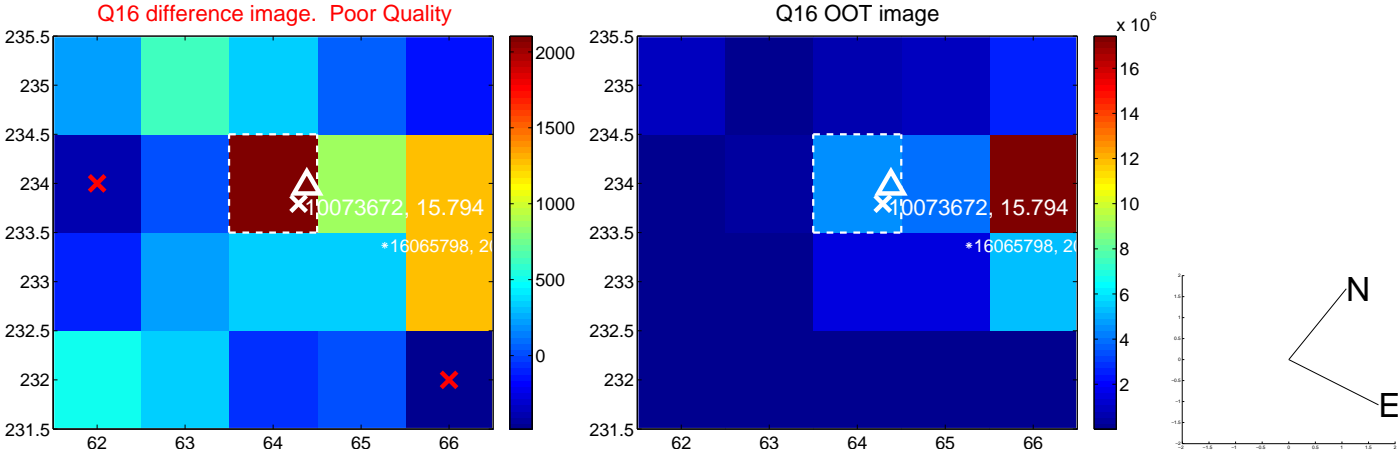
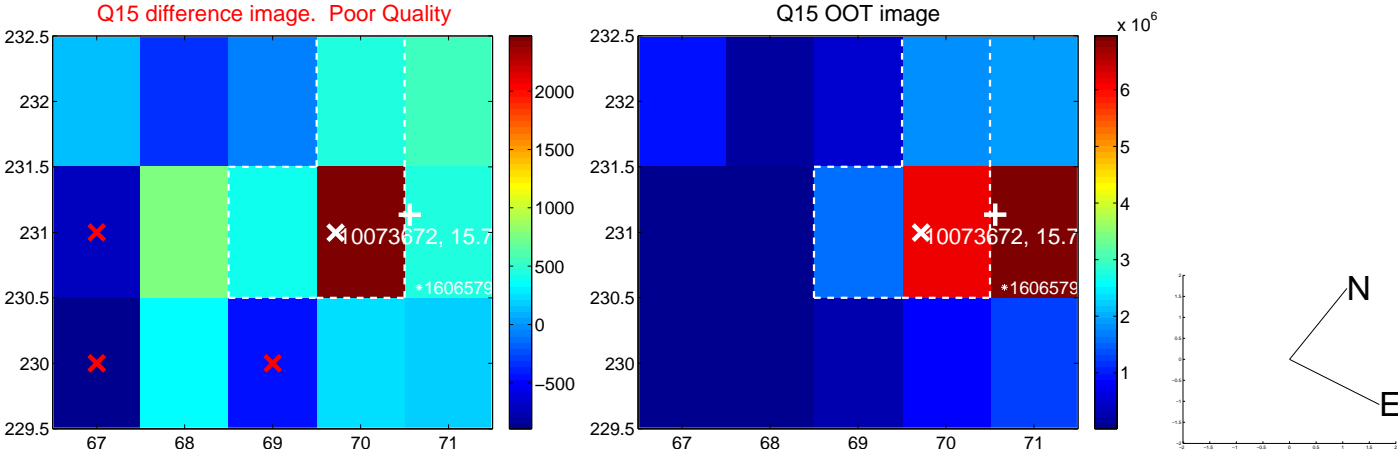
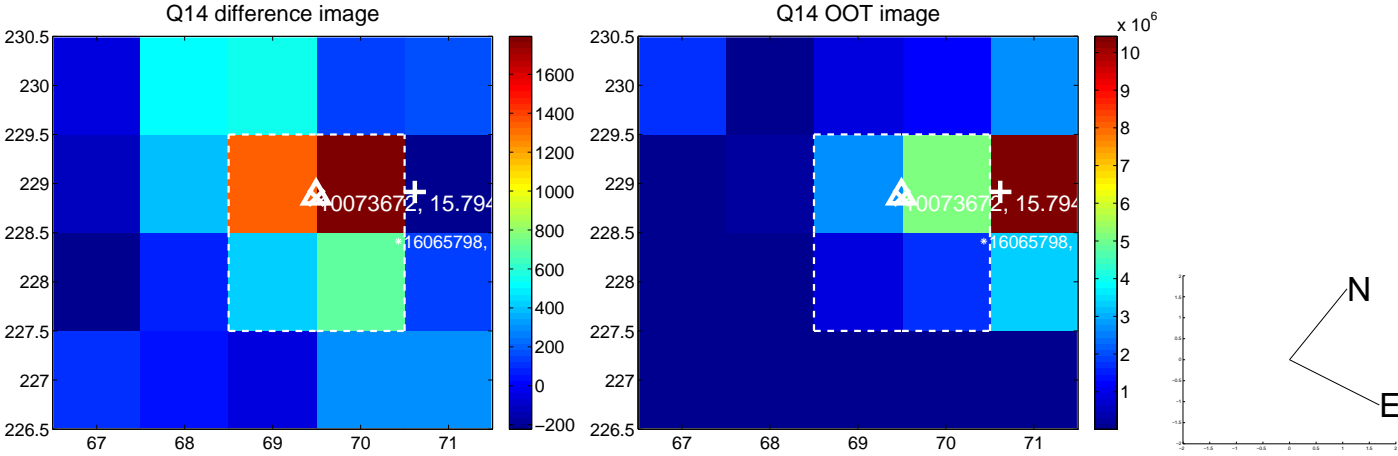
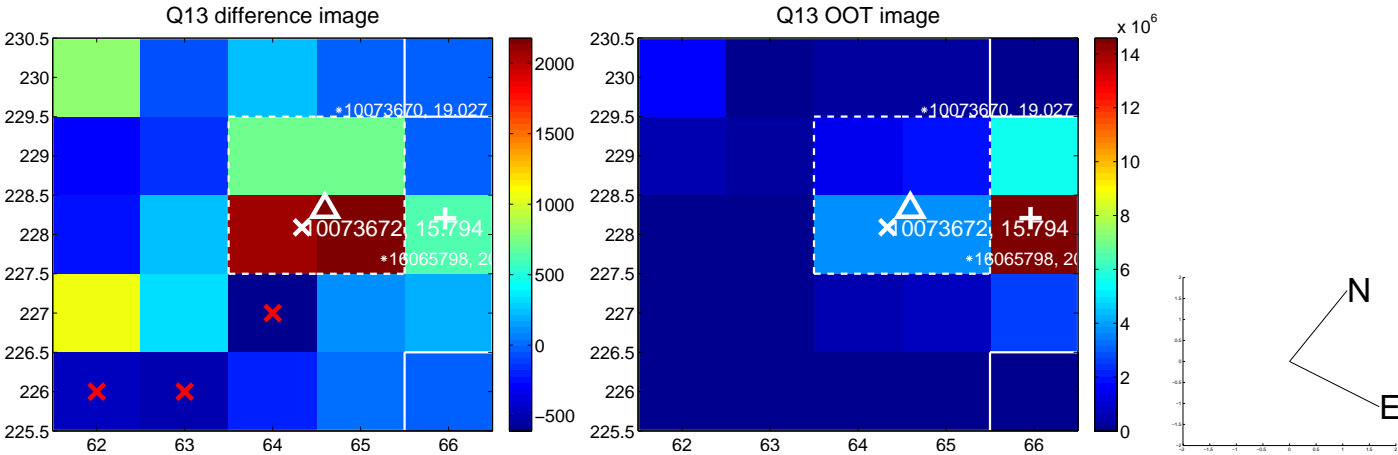
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



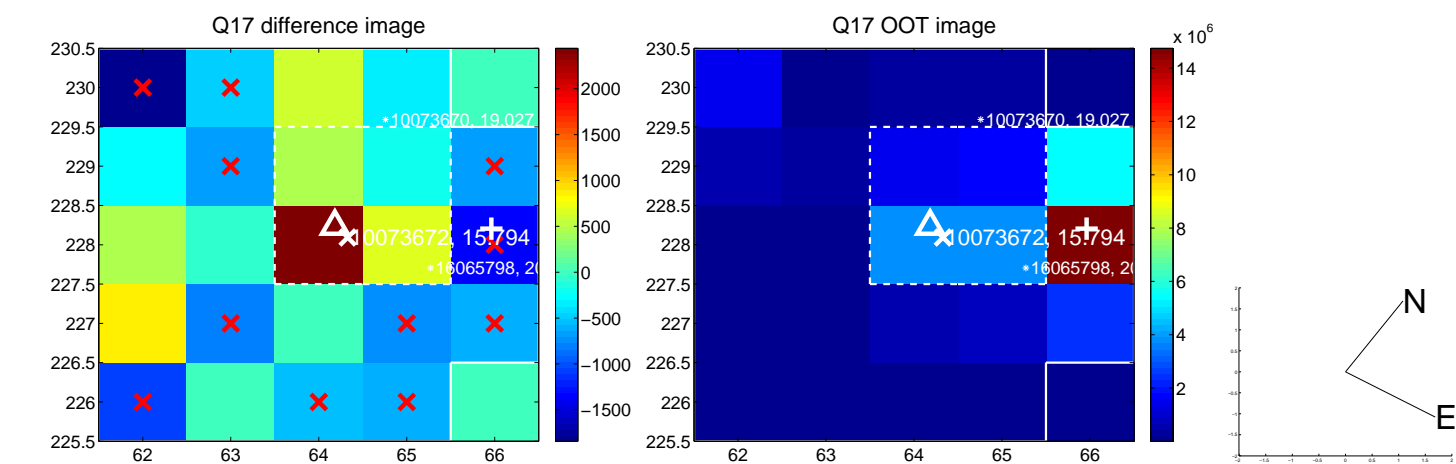
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



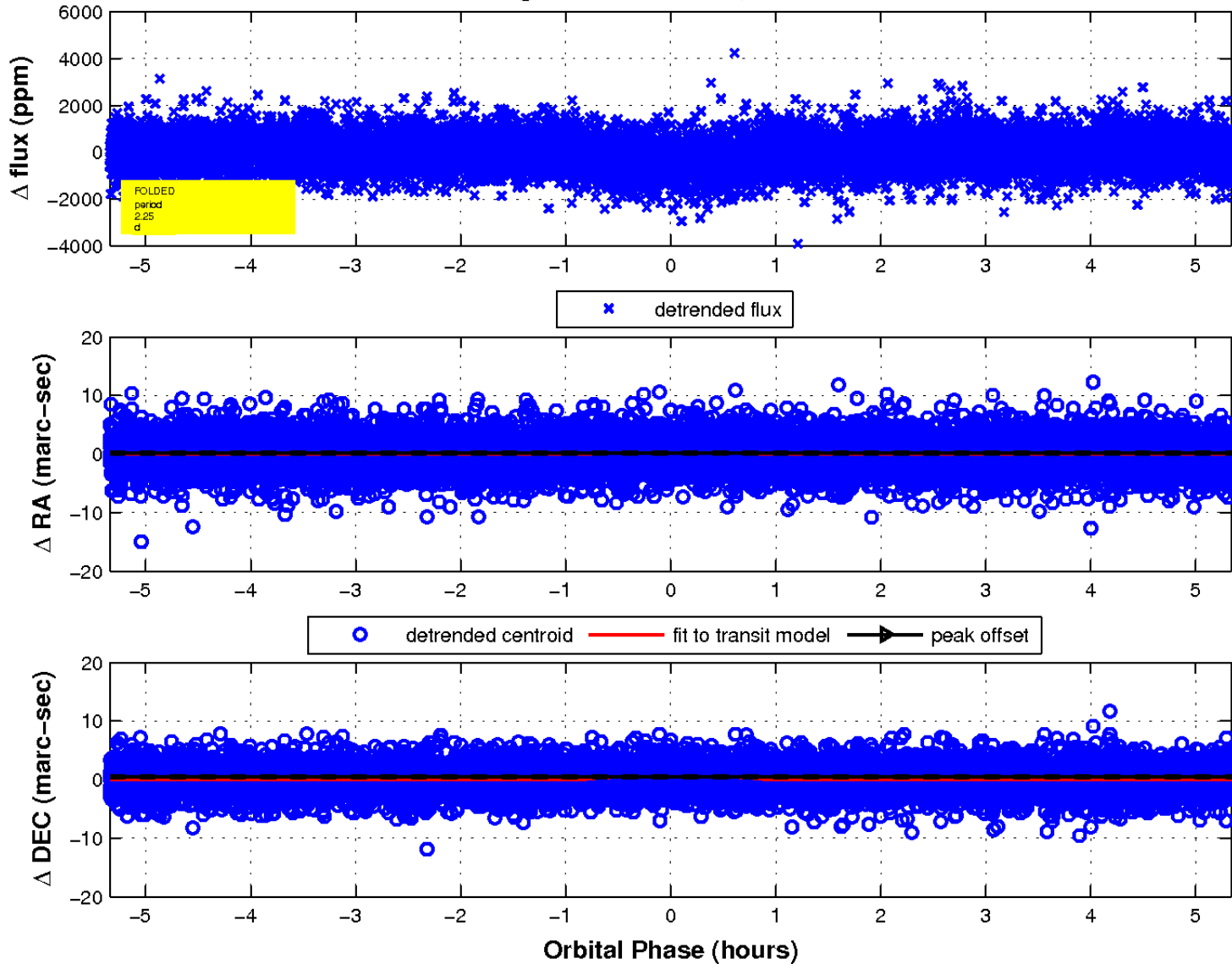
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

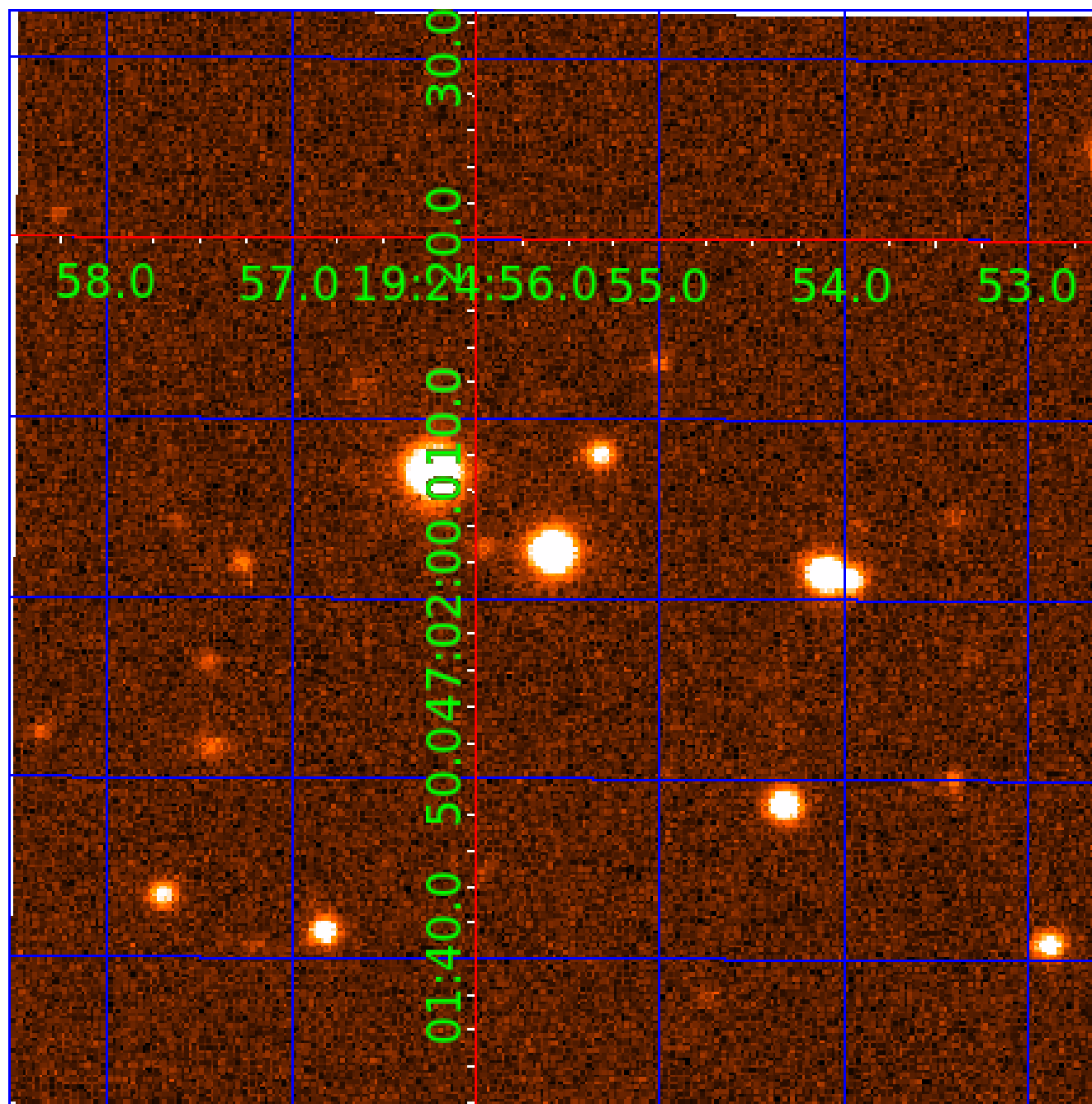


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010073672

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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010073672-02	OBS	No	359.629512	139.898442	2458.5	7.009	11.2	10.2	0.56	4039	3.46	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010073672-01	OBS	PC	0.93	0	0	0	0	CENT_KIC_POS
010073672-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—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 010073672-02

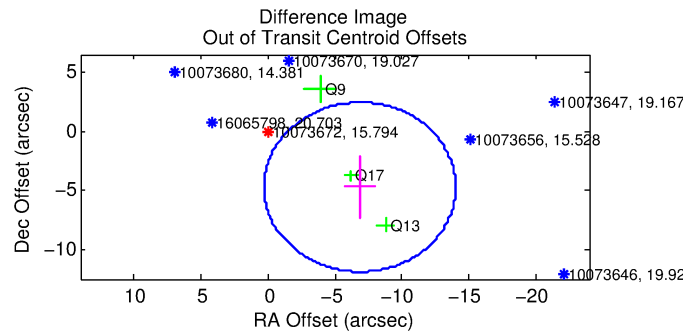
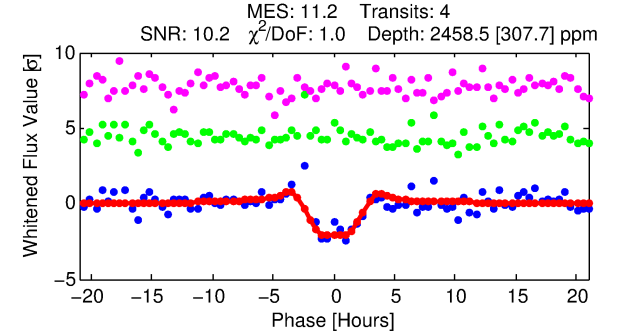
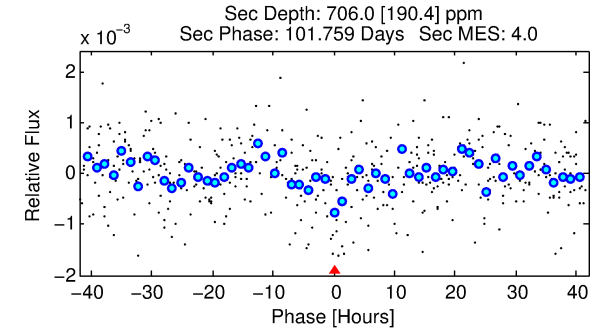
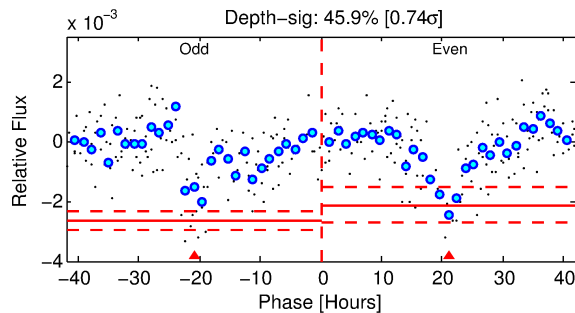
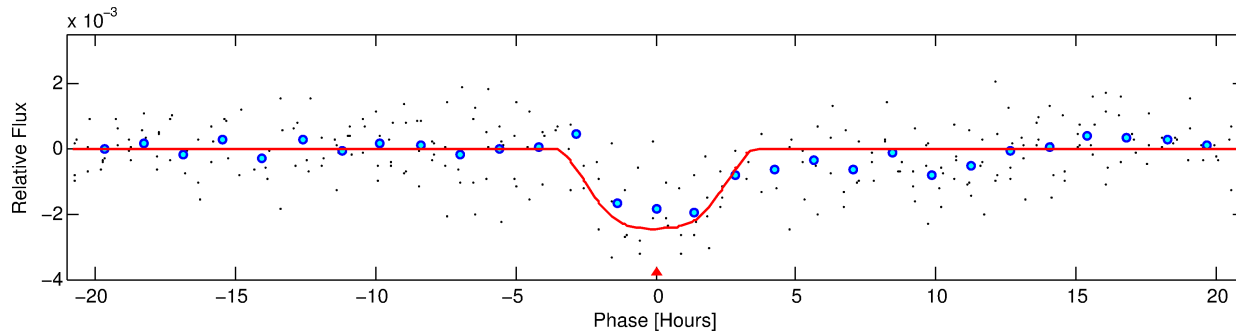
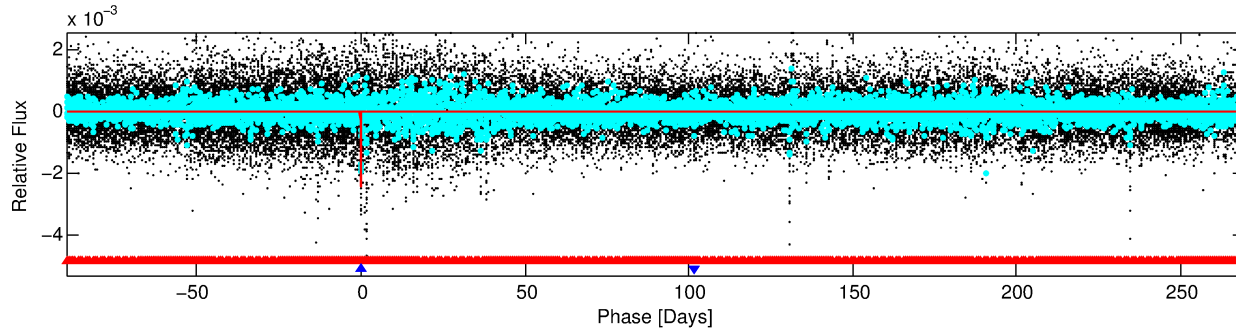
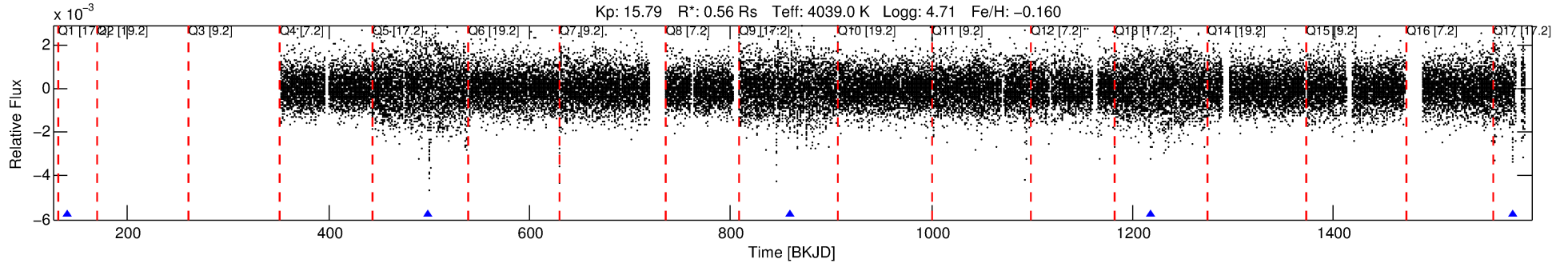
No Significant Match Found

DV One-Page Summary

KIC: 10073672 Candidate: 2 of 2 Period: 359.630 d

KOI: K02764 Corr: No Ephemeris Match

Kp: 15.79 R*: 0.56 Rs Teff: 4039.0 K Logg: 4.71 Fe/H: -0.160



DV Fit Results:

Period = 359.62951 [0.00715] d
Epoch = 139.8984 [0.0219] BKJD
Rp/R* = 0.0568 [0.0055]
a/R* = 197.78 [38.03]
b = 0.93 [0.03]
Seff = 0.11 [0.01]
Teq = 147 [4] K
Rp = 3.46 [0.39] Re
a = 0.8264 [0.0360] AU
Ag = 22124.39 [7456.72] [2.97σ]
Teff = 2763 [236] K [11.10σ]

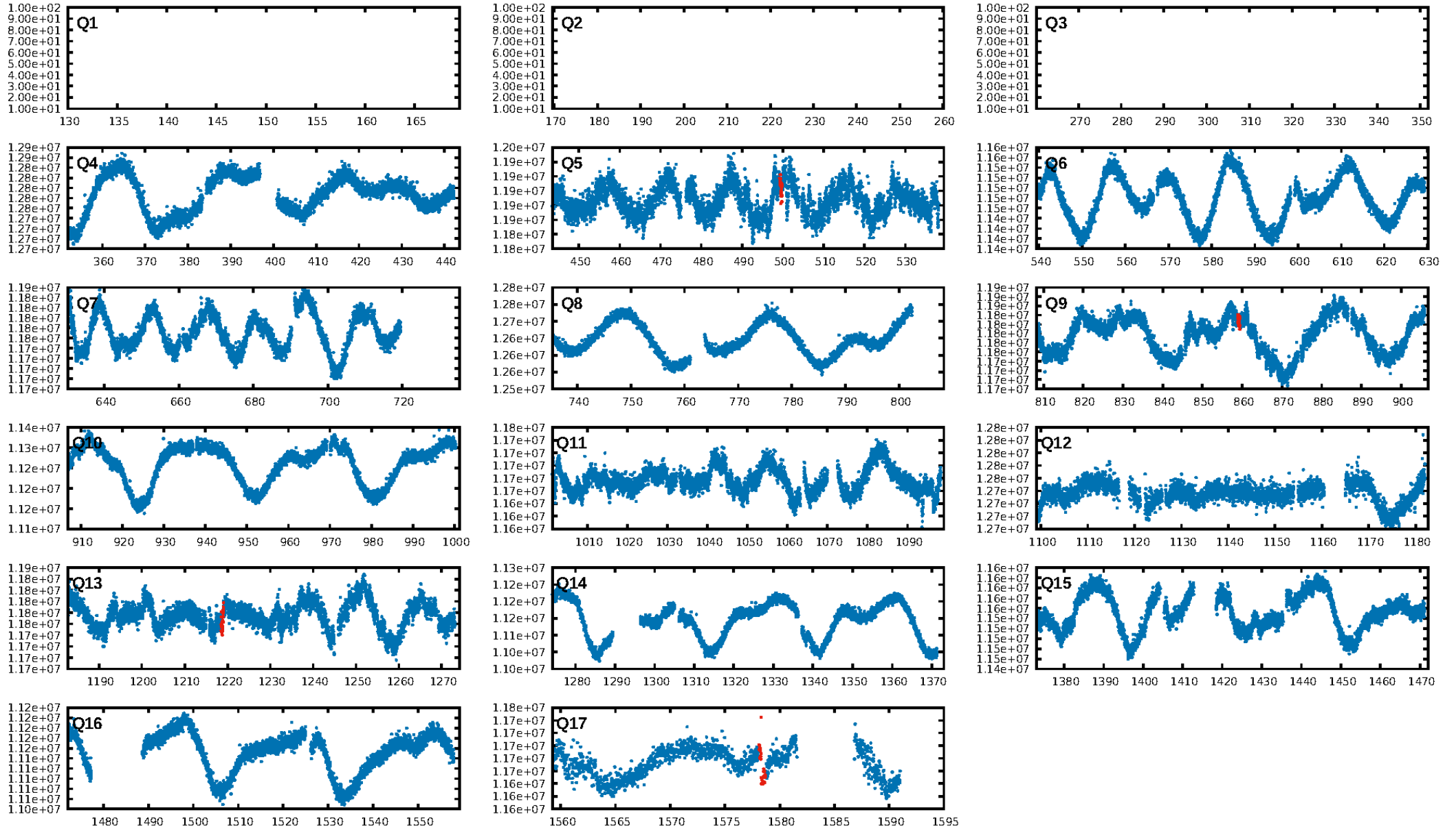
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1186.01σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.69e-17
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.393
Centroid-sig: 29.4%
Centroid-so: 3.348 arcsec [6.19σ]
OotOffset-rm: 8.334 arcsec [3.49σ]
KicOffset-rm: 1.820 arcsec [0.91σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.50 [2/4]

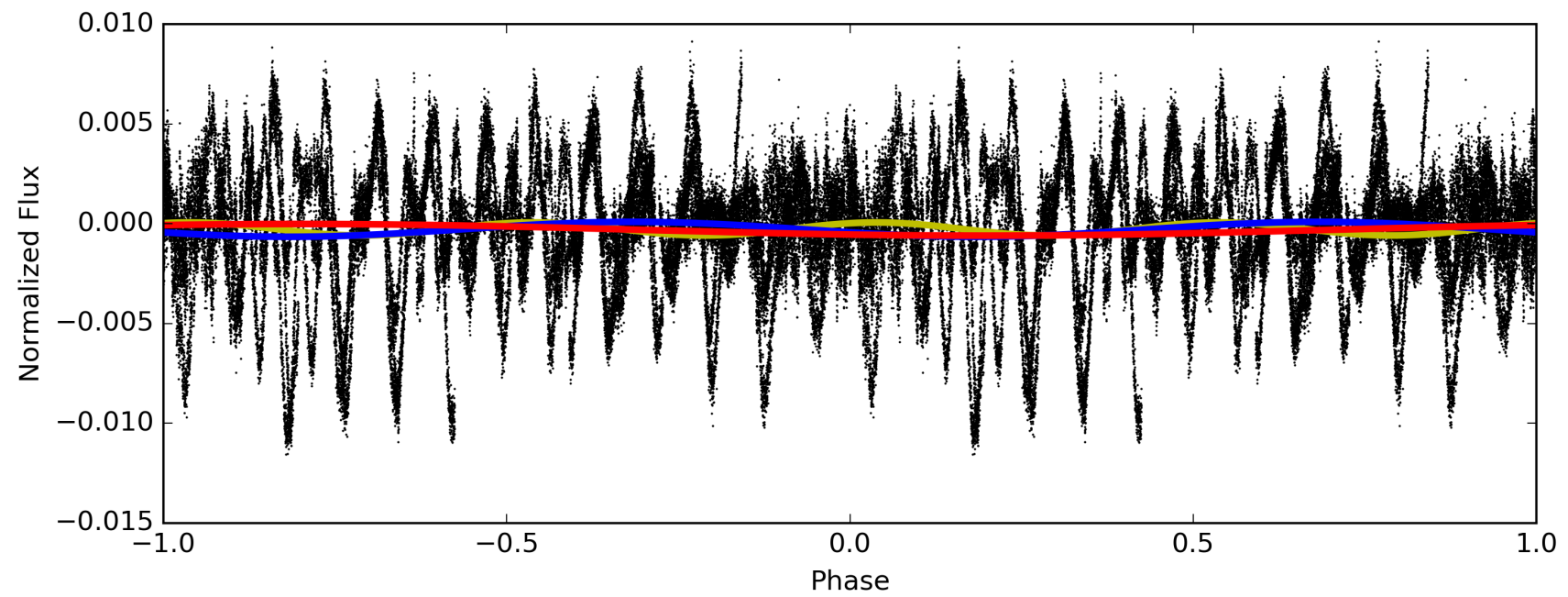
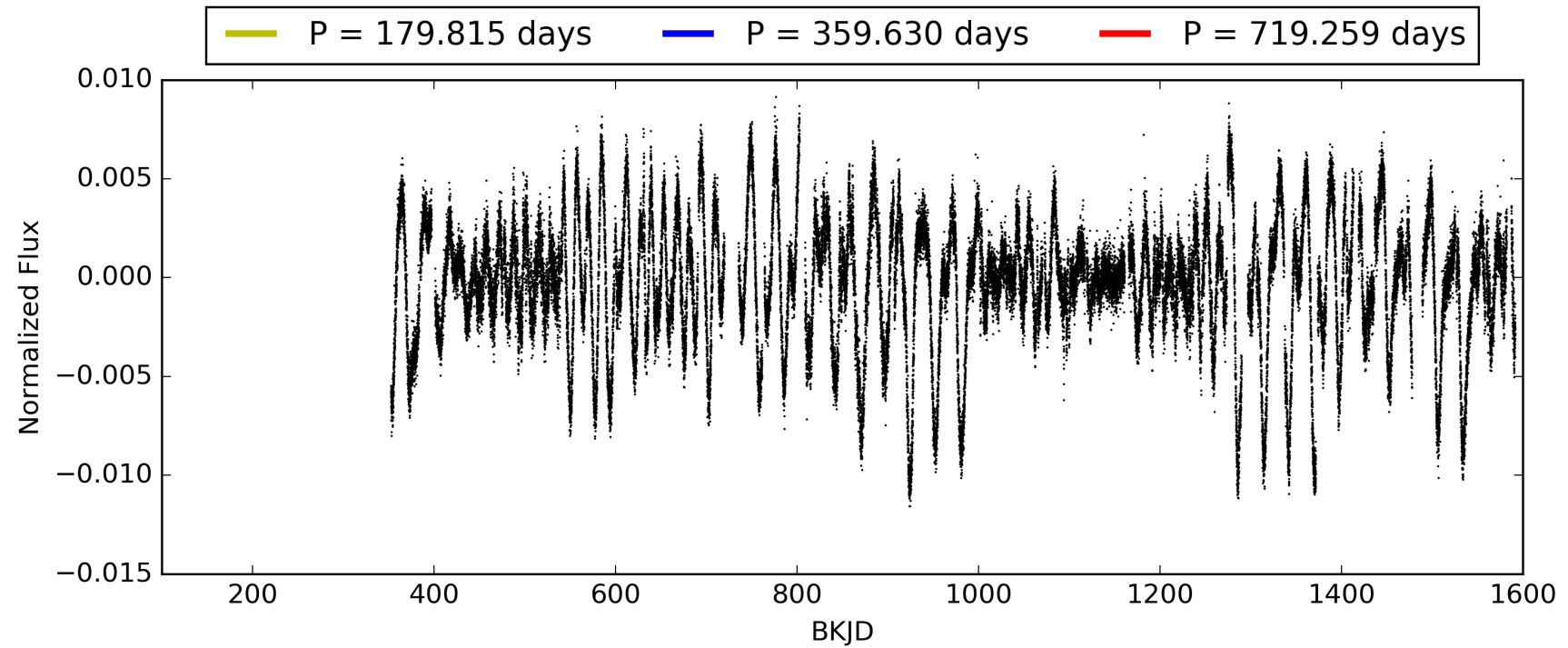
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010073672-02, PDC Light Curves

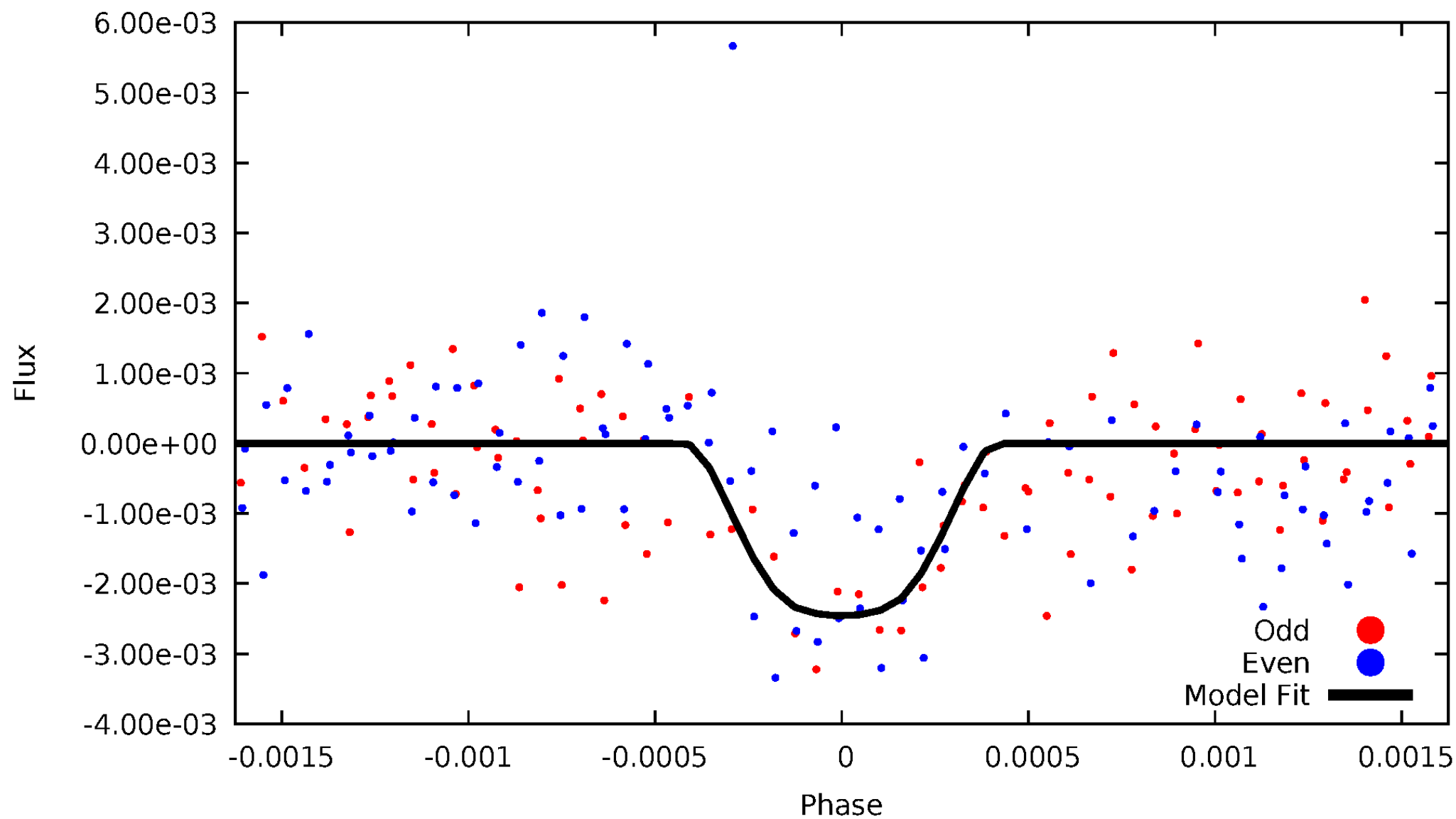


TCE 010073672-02



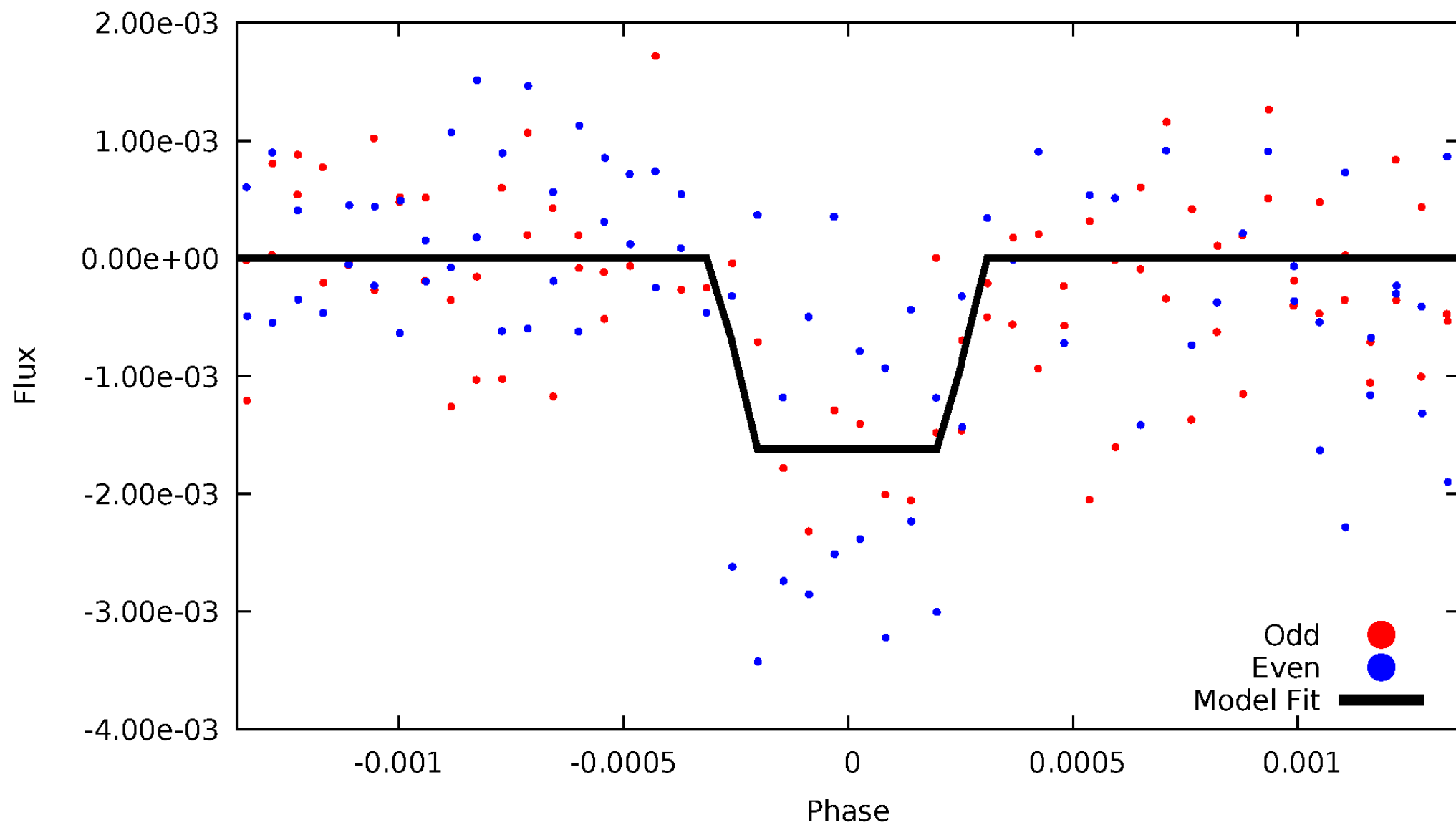
DV Odd/Even

TCE 010073672-02



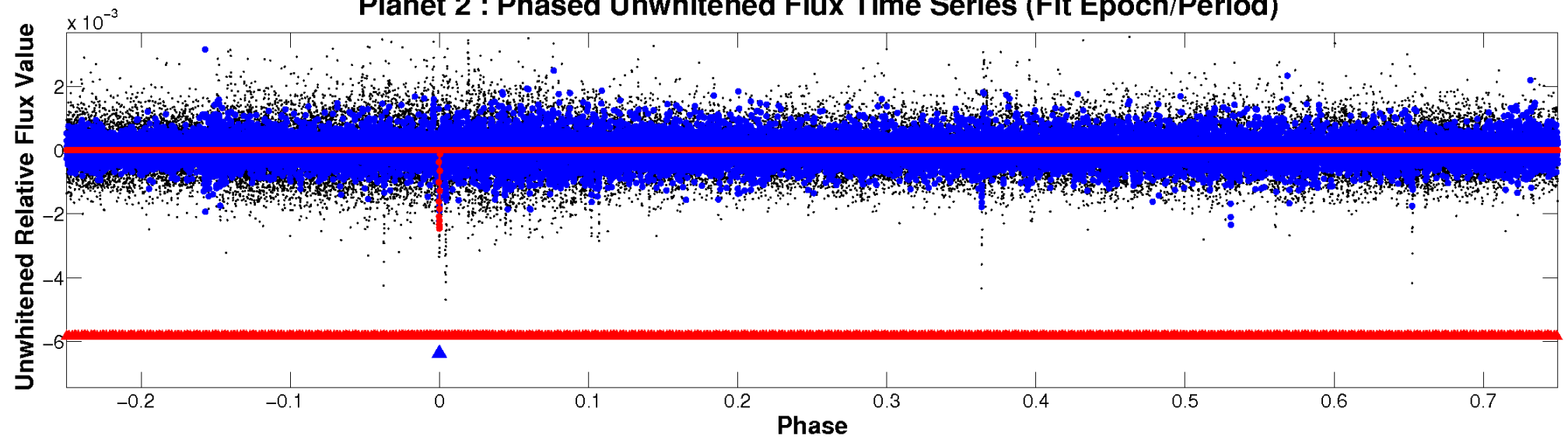
ALT Odd/Even

TCE 010073672-02

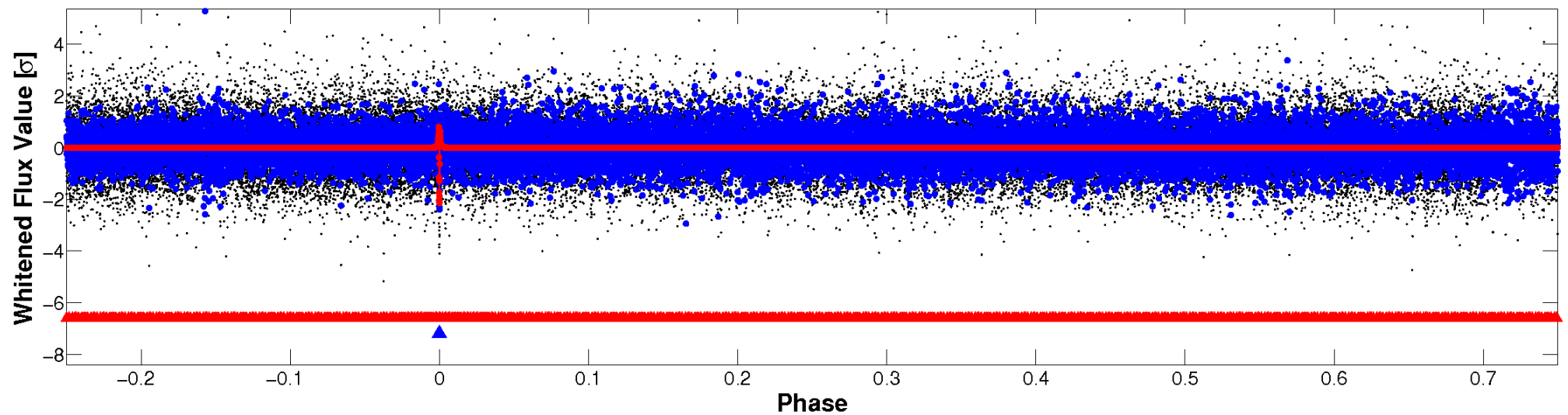


Non-Whitened Vs. Whitened Light Curve

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

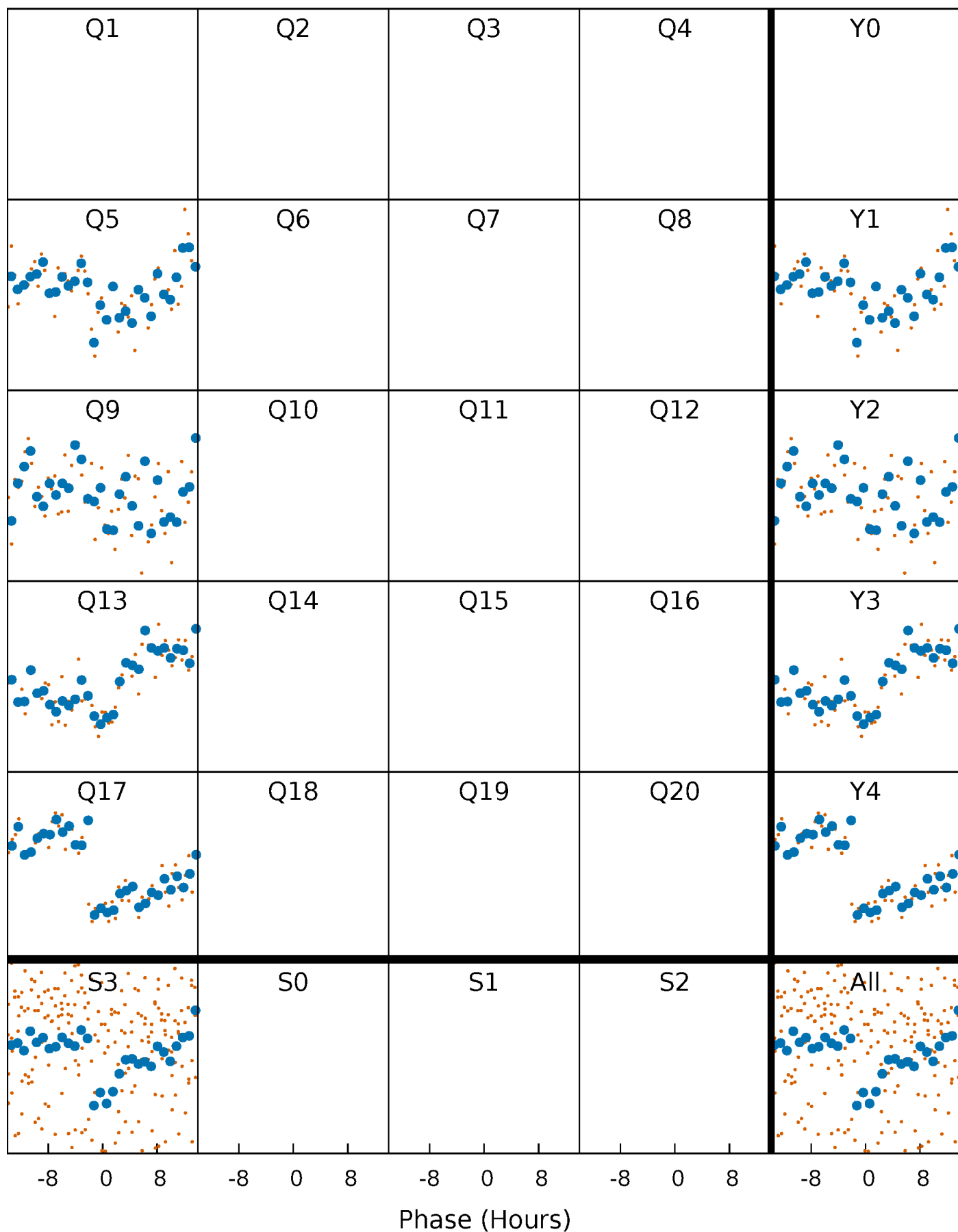


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



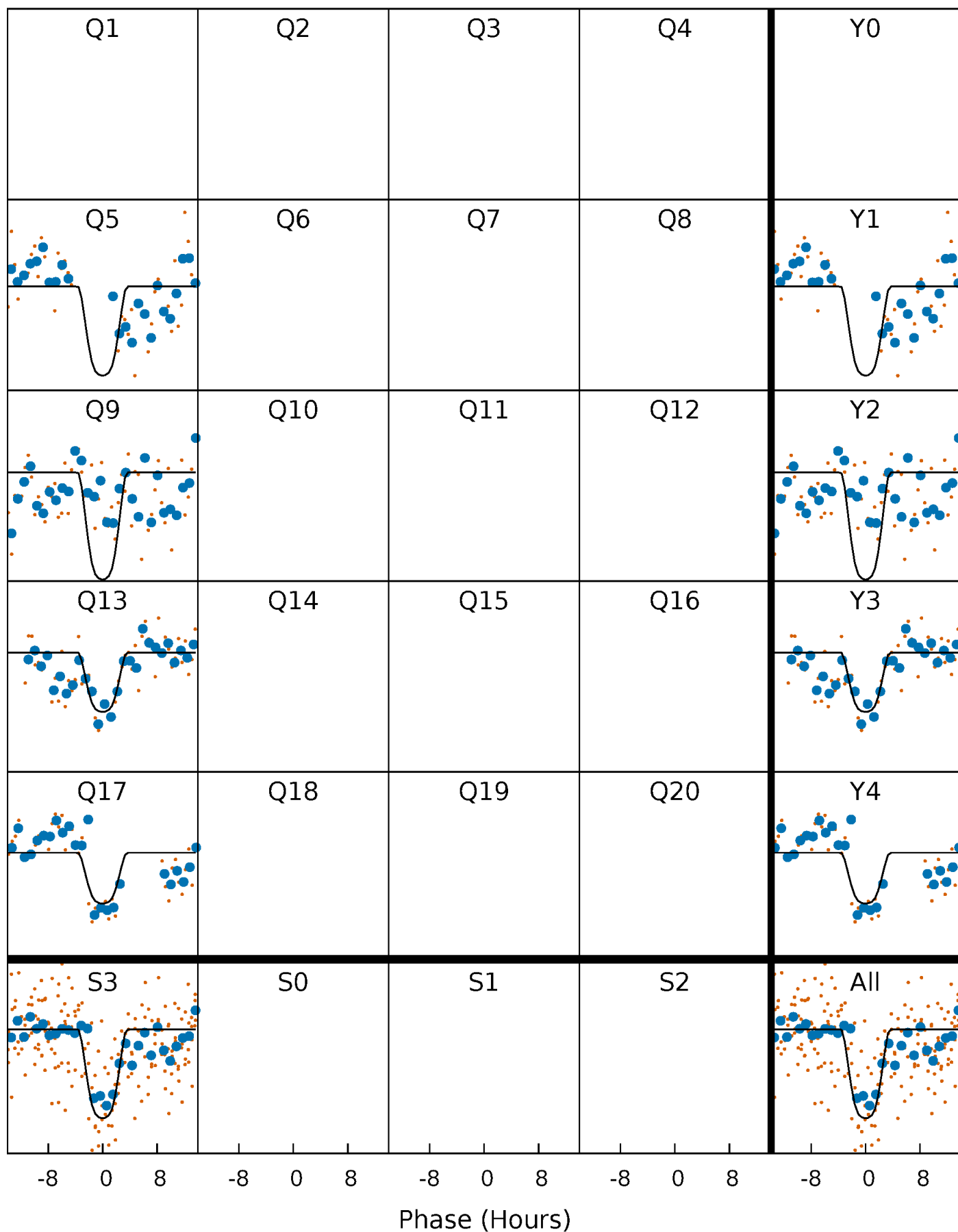
PDC Quarter-Phased Transit Curves

TCE 010073672-02 $P=359.629512$ Days $T_0=139.898442$ (BKJD)



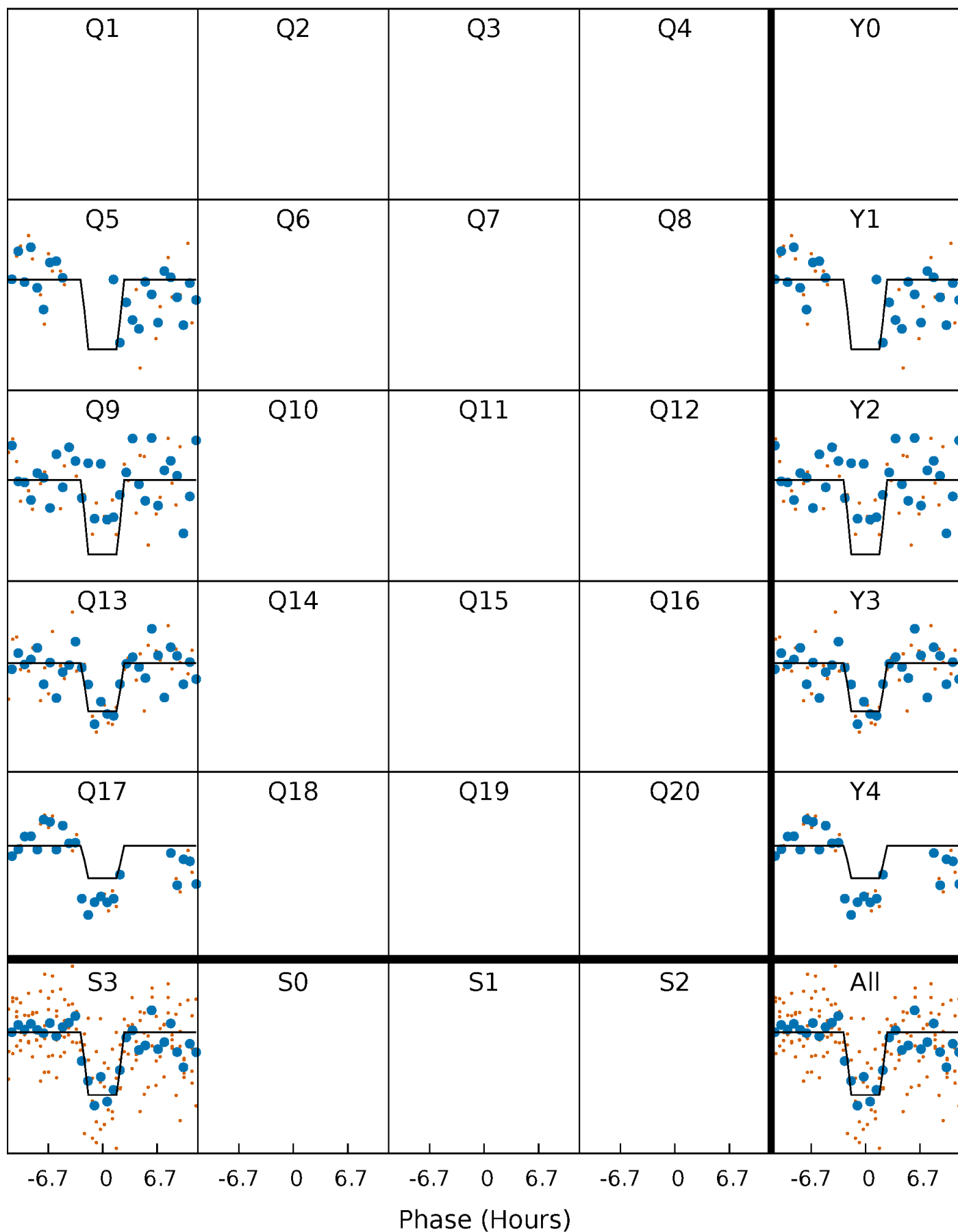
DV Quarter-Phased Transit Curves

TCE 010073672-02 $P=359.629512$ Days $T_0=139.898442$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

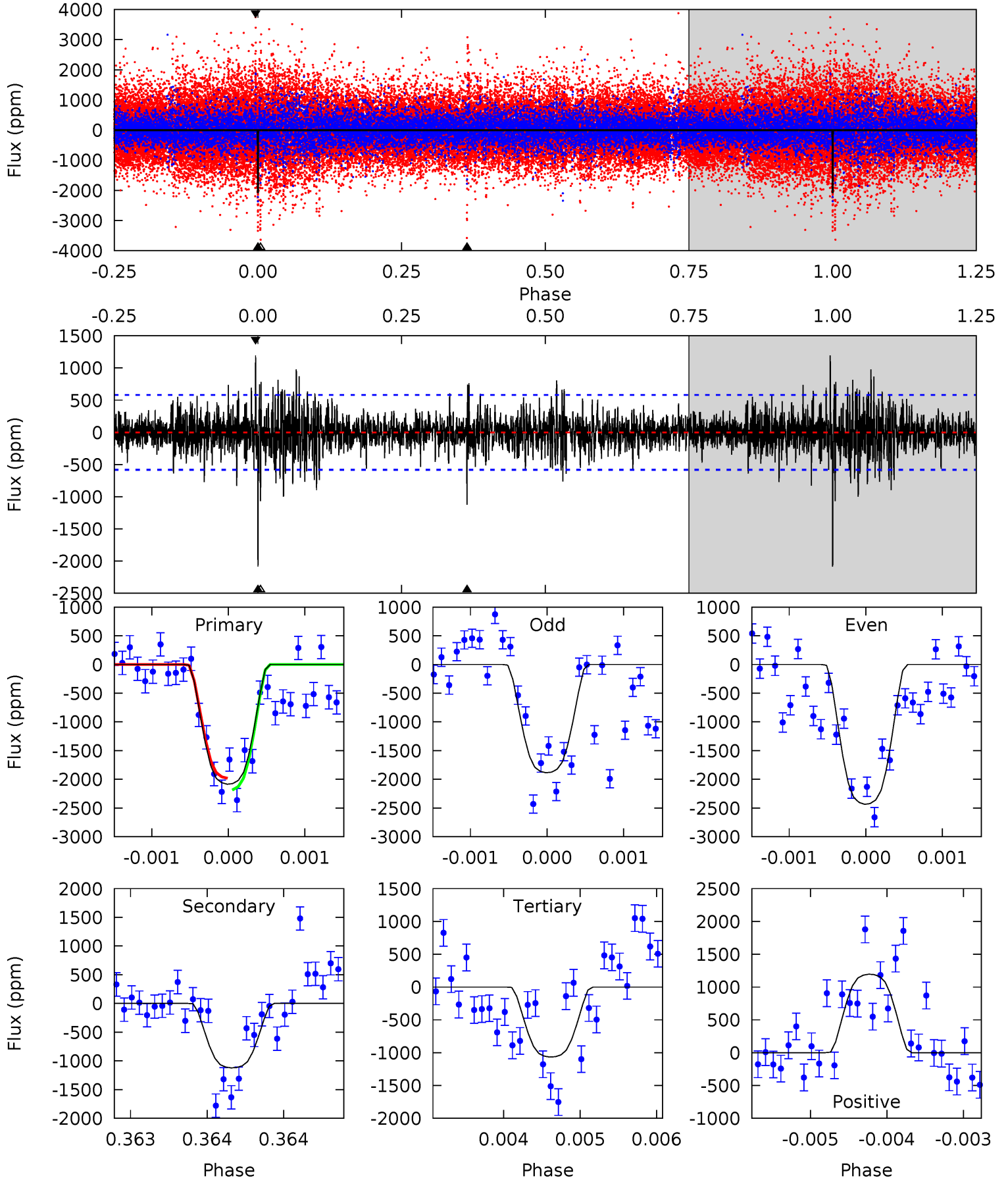
TCE 010073672-02 $P=359.630656$ Days $T_0=139.902162$ (BKJD)



DV Model-Shift Uniqueness Test

010073672-02, P = 359.629512 Days, E = 139.898442 Days

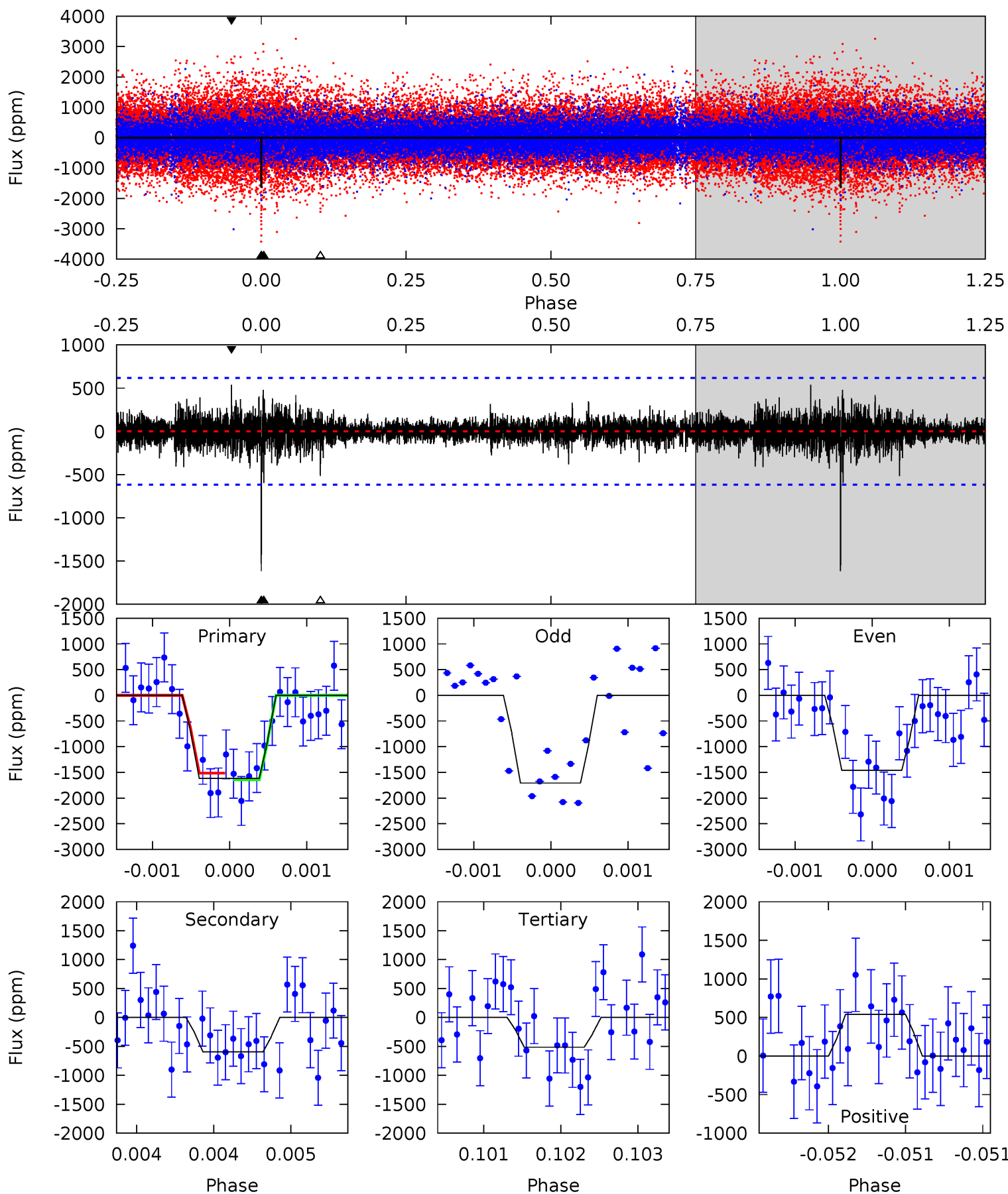
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	10.6	10.1	11.3	5.49	3.35	1.99	9.63	8.41	0.52	-0.70	2.53	0.92	0.36	0.97



Alt Model-Shift Uniqueness Test

010073672-02, P = 359.630656 Days, E = 139.902162 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.6	5.38	4.64	4.86	5.57	3.47	0.84	9.93	9.71	0.74	0.52	1.10	1.27	0.25	0.56



Stellar Parameters For KIC 010073672

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4039^{+80}_{-80}	$4.708^{+0.023}_{-0.030}$	$-0.160^{+0.150}_{-0.150}$	$0.559^{+0.031}_{-0.031}$	$0.583^{+0.029}_{-0.038}$	$4.690^{+0.512}_{-0.558}$
	+2%/-2%	+0%/-1%	+94%/-94%	+6%/-6%	+5%/-7%	+11%/-12%
Source	SPE70	PHO2	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 010073672-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1122 ± 106	$3.49^{+0.39}_{-0.35}$	205^{+5}_{-5}	3394^{+136}_{-144}	35035^{+8809}_{-7487}
Alt.	-596 ± 111	$2.46^{+0.35}_{-0.32}$	205^{+5}_{-5}	3421^{+194}_{-173}	36641^{+14207}_{-9818}

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 $A_{obs} \gg 1.0$

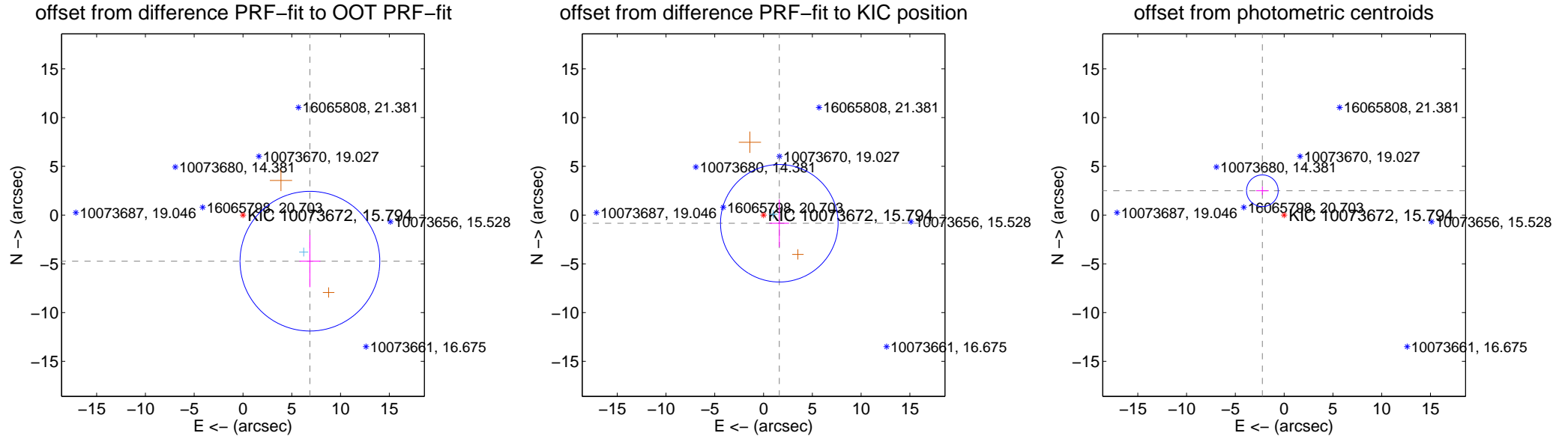
DV Centroid Data

Supplemental centroid analysis for 010073672-02. Kepler magnitude: 15.79. Transit SNR 10.23

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 6.51 arcsec so the offset from difference PRF-fit to OOT-PRF-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.334 ± 2.388	3.49	-6.863 ± 1.073	-4.728 ± 2.674
PRF-fit source offset from KIC position	1.820 ± 2.009	0.91	-1.616 ± 1.004	-0.838 ± 2.439
photometric centroid source offset	3.35 ± 0.54	6.19	2.23 ± 0.65	2.50 ± 0.43

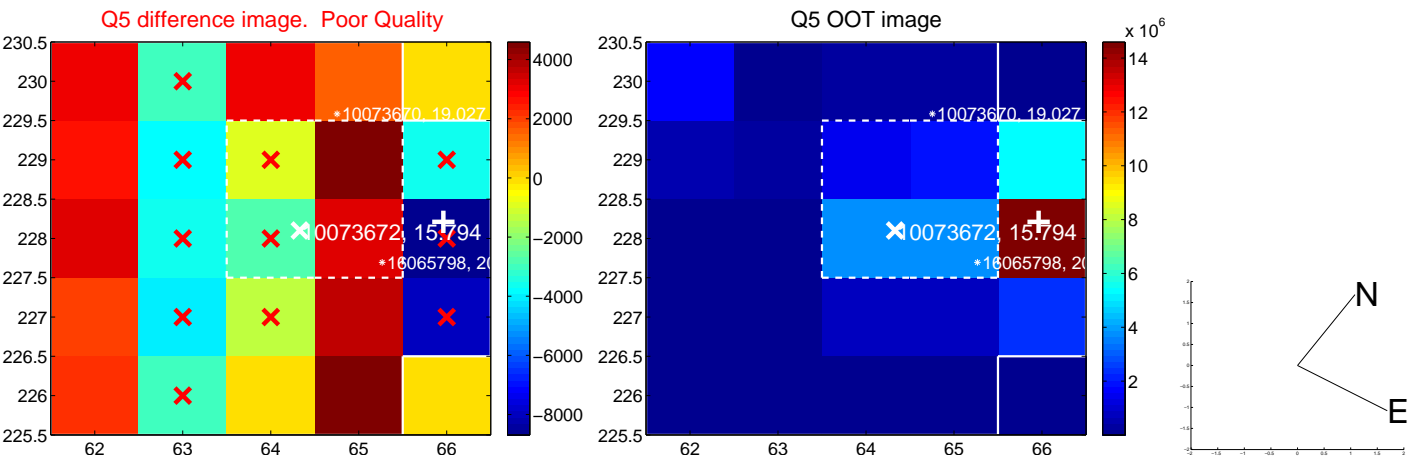


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

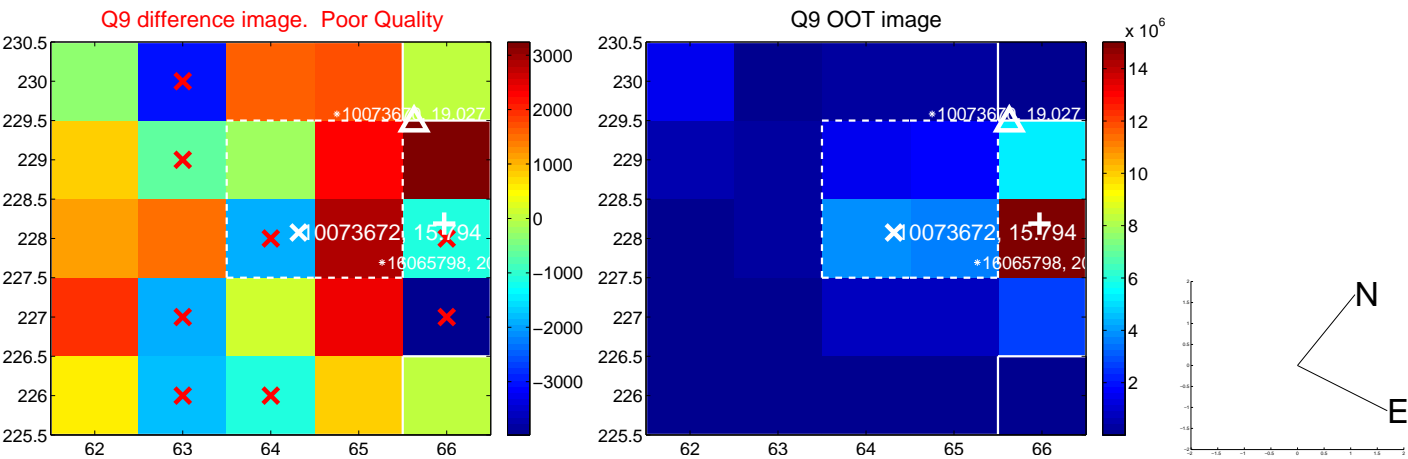
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



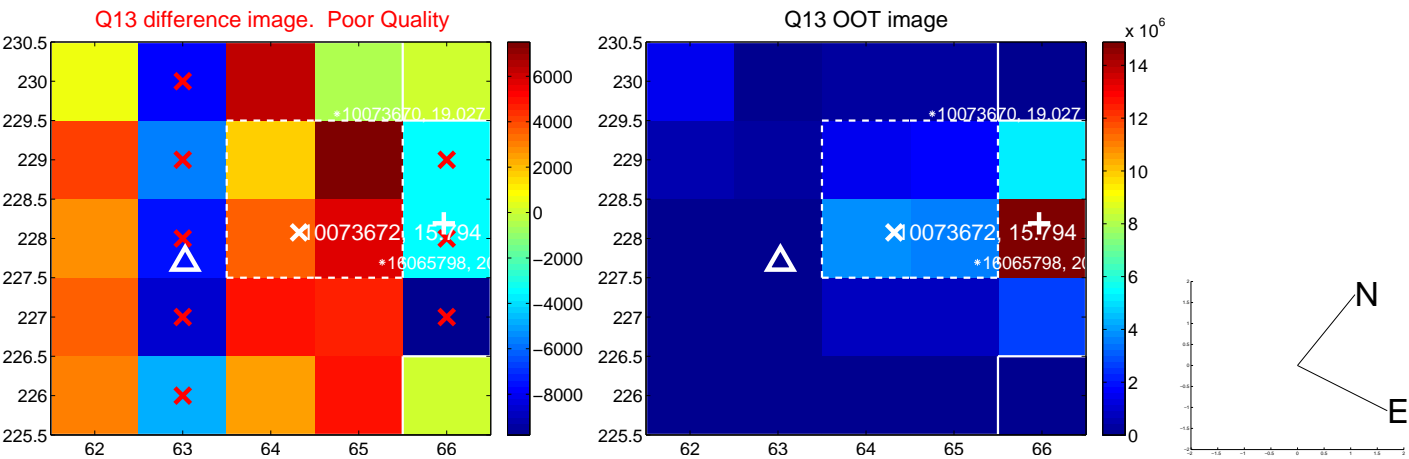
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



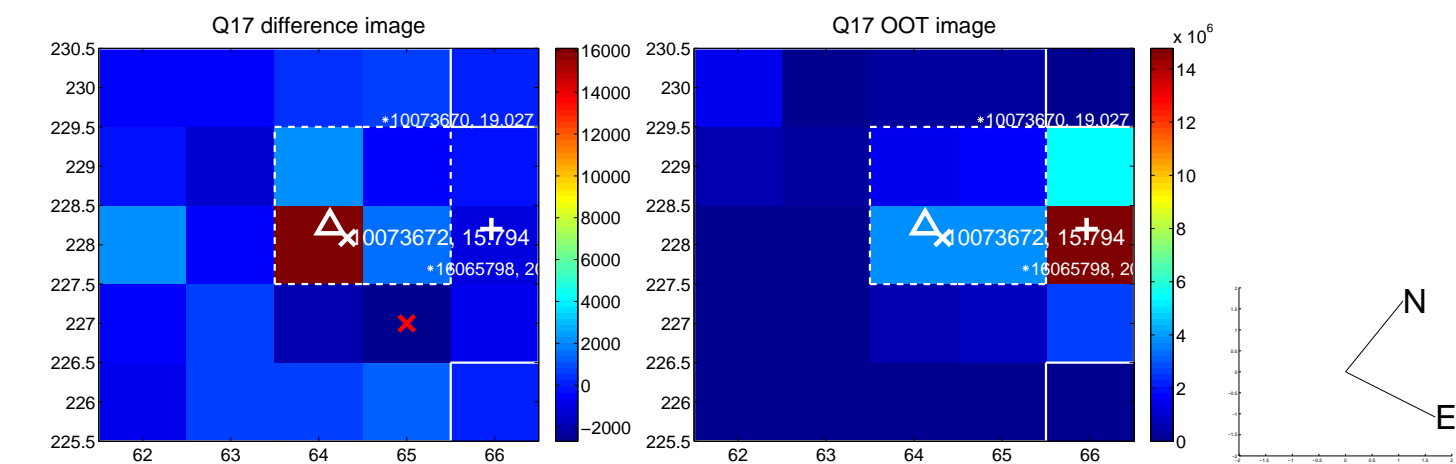
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



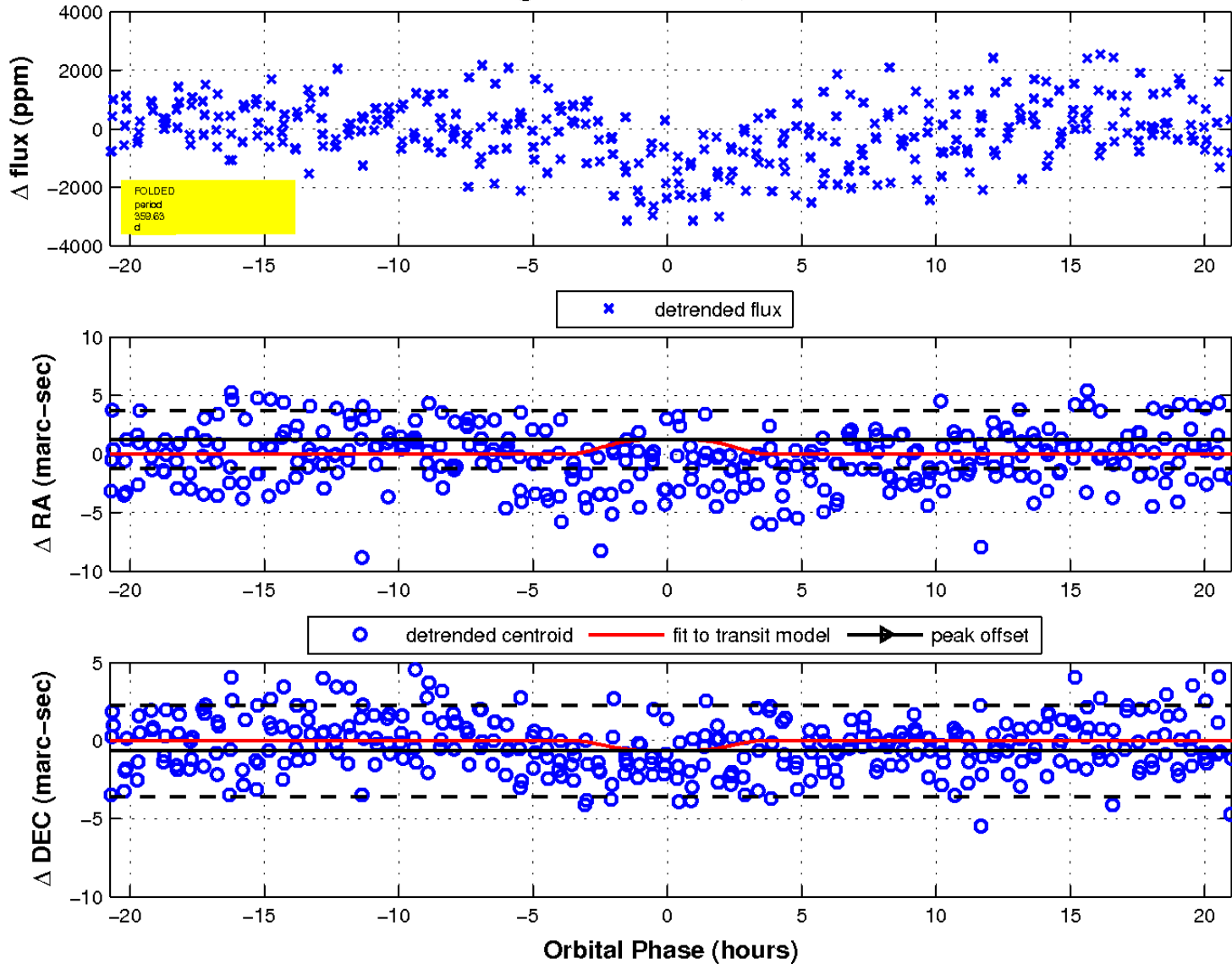
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

