

# KIC 004139673

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004139673-01	OBS	No	0.990748	132.290169	4586.5	1.508	9.8	13.3	1.13	6127	10.94	4231.55
004139673-02	OBS	No	31.052391	152.802653	12041.9	2.865	10.4	4.4	1.13	6127	12.52	42.82
004139673-03	OBS	No	24.591023	133.464815	18507.4	5.041	8.3	9.4	1.13	6127	21.16	58.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004139673-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS
004139673-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004139673-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

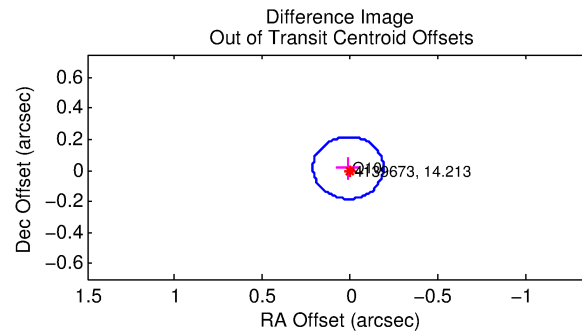
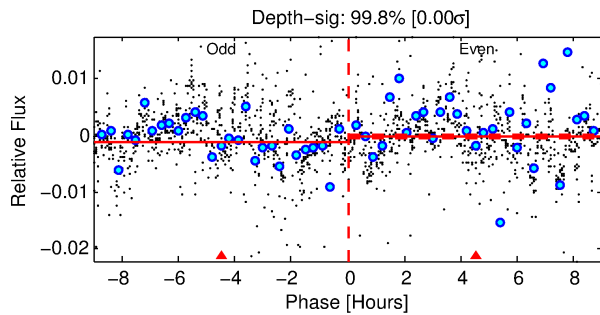
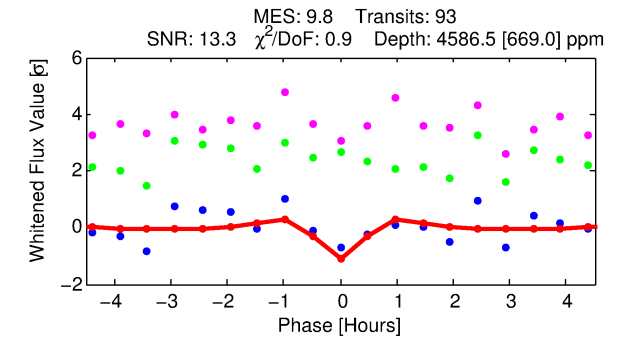
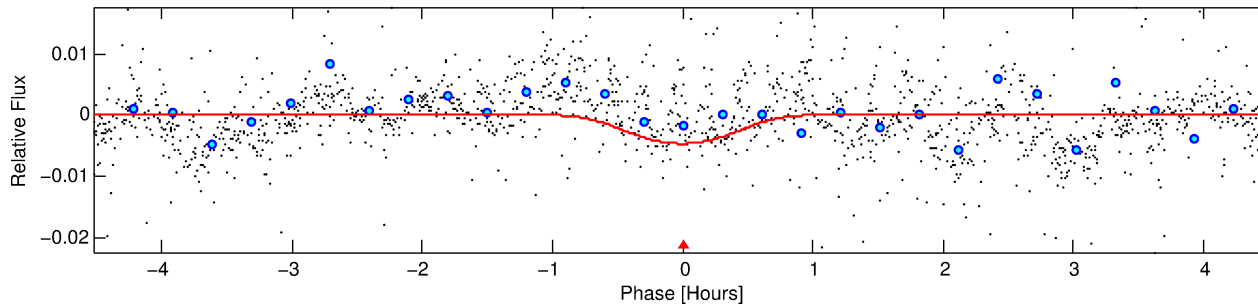
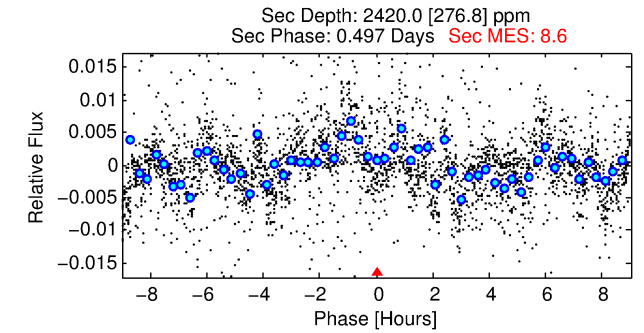
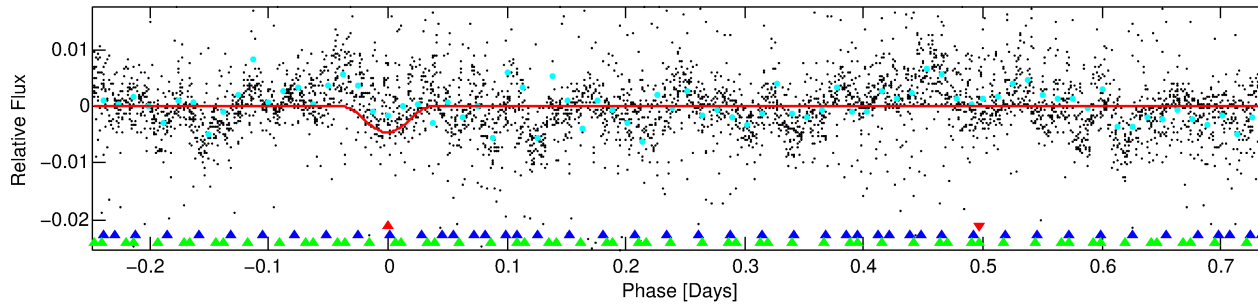
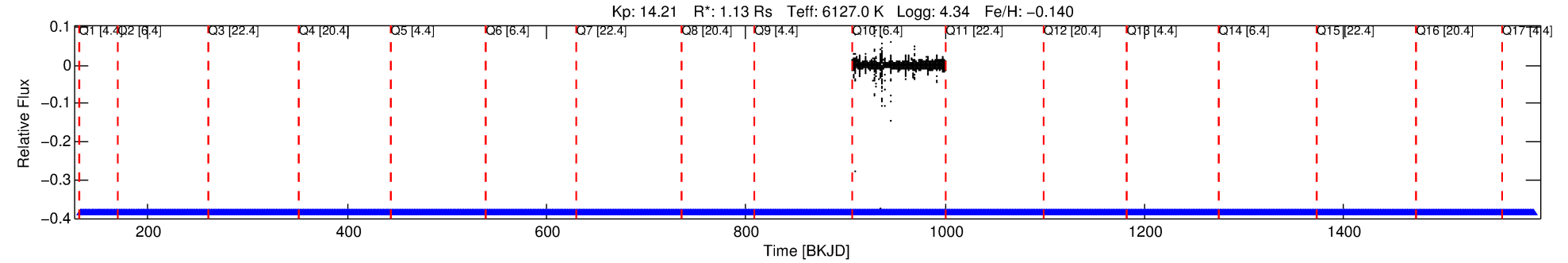
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004139673-01

No Significant Match Found

# DV One-Page Summary

KIC: 4139673 Candidate: 1 of 3 Period: 0.991 d



## DV Fit Results:

Period = 0.99075 [0.00001] d  
Epoch = 132.2902 [0.0013] BKJD  
Rp/R\* = 0.0886 [0.1615]  
a/R\* = 2.81 [1.62]  
b = 0.95 [0.32]  
Seff = 4231.55 [1691.71]  
Teq = 2057 [206] K  
Rp = 10.94 [20.25] Re  
a = 0.0196 [0.0051] AU  
Ag = 4.25 [15.61] [0.21σ]  
Teffp = 4567 [4171] K [0.60σ]

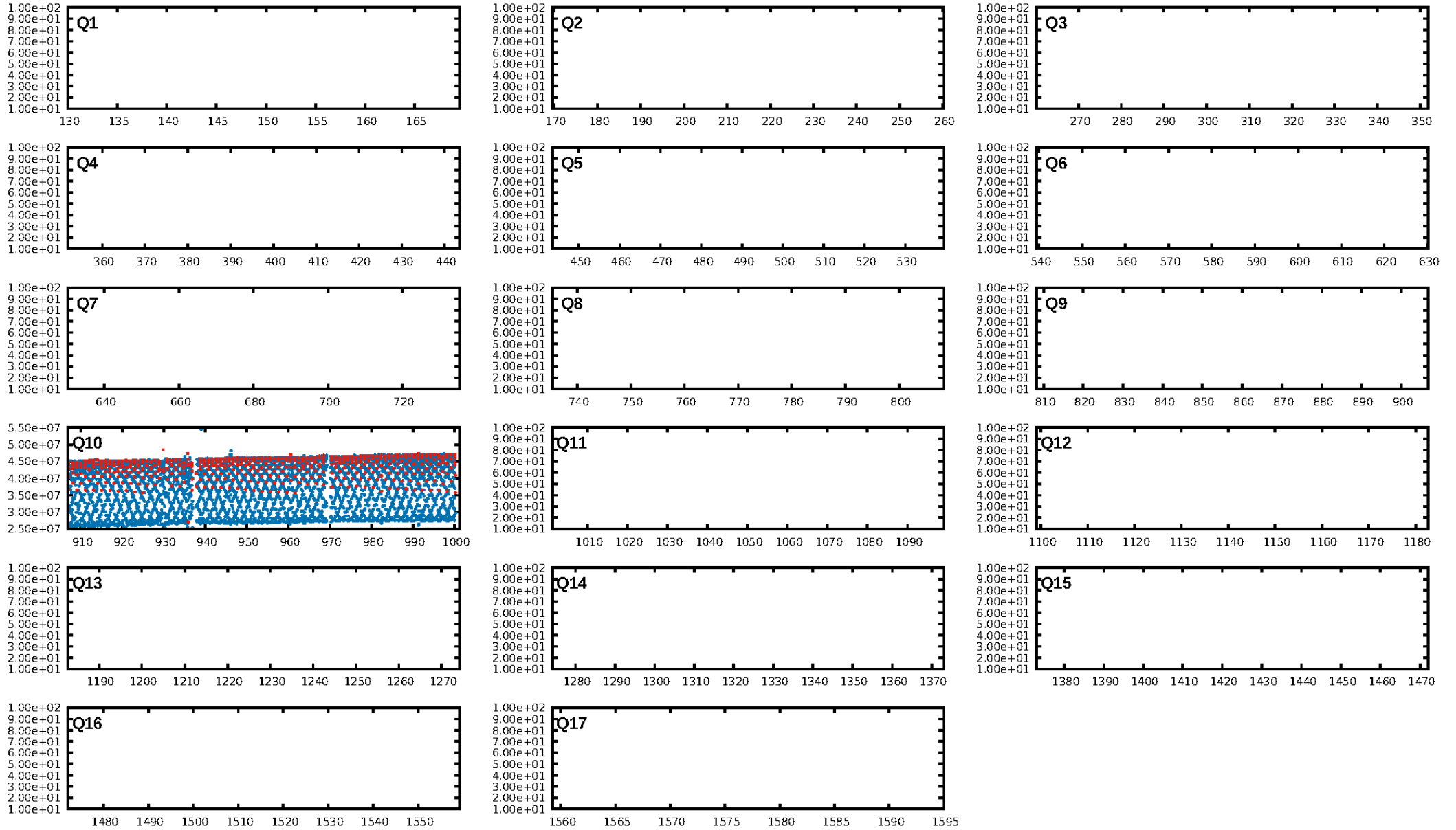
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [107.64σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.93e-20  
RollingBand-fgt: 1.00 [93/93]  
**GhostDiagnostic-chr: 0.7286**  
Centroid-sig: N/A  
Centroid-so: 0.143 arcsec [1.79σ]  
OotOffset-rm: 0.021 arcsec [0.32σ]  
**KicOffset-rm: 0.307 arcsec [4.60σ]**  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

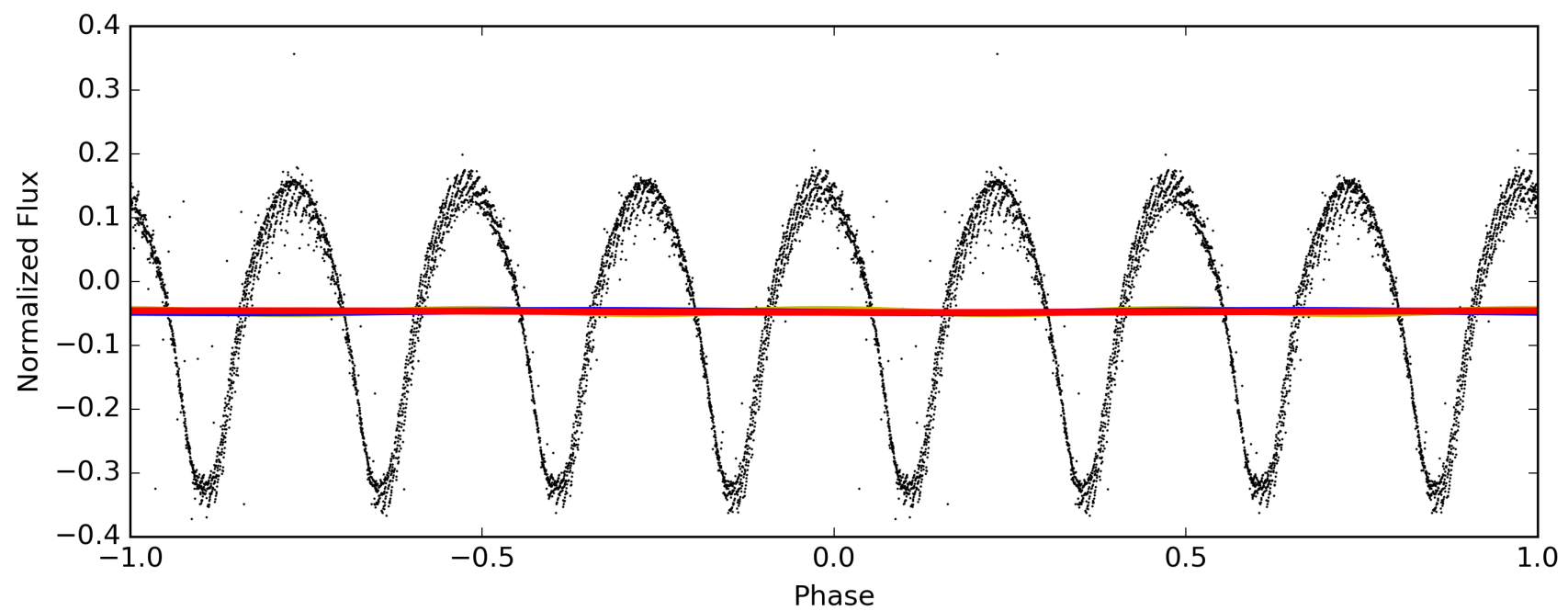
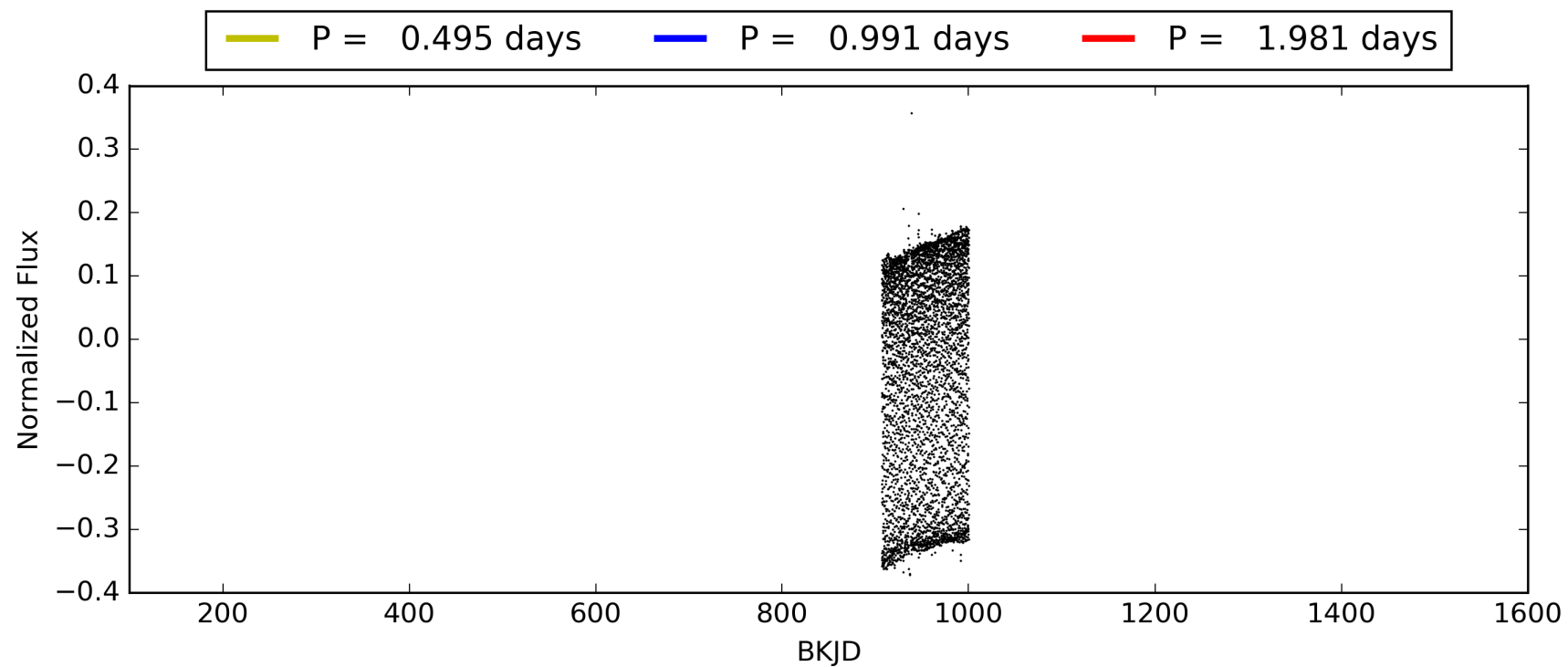
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 11:38:27 Z

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

# TCE 004139673-01, PDC Light Curves

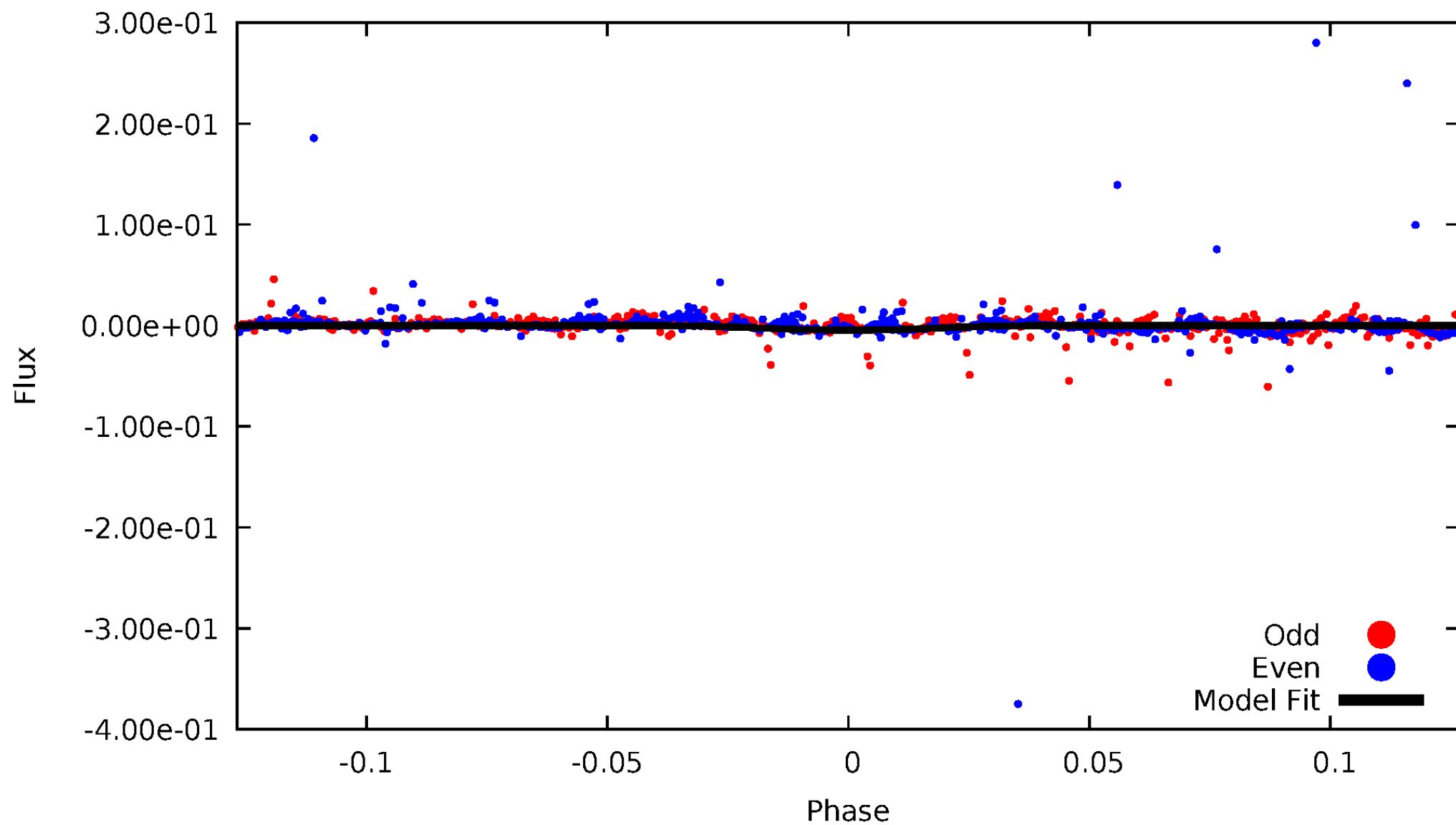


TCE 004139673-01



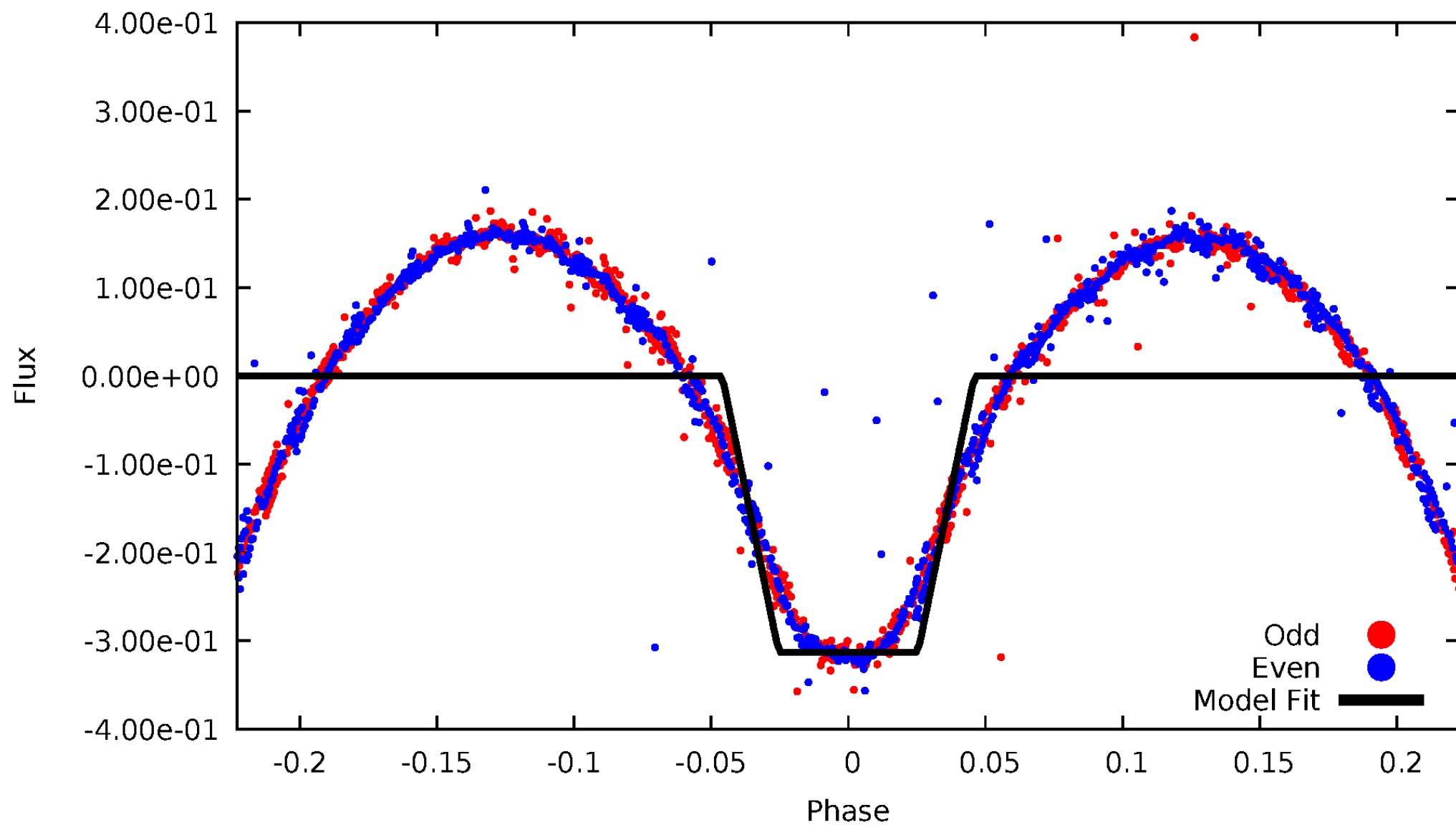
# DV Odd/Even

TCE 004139673-01



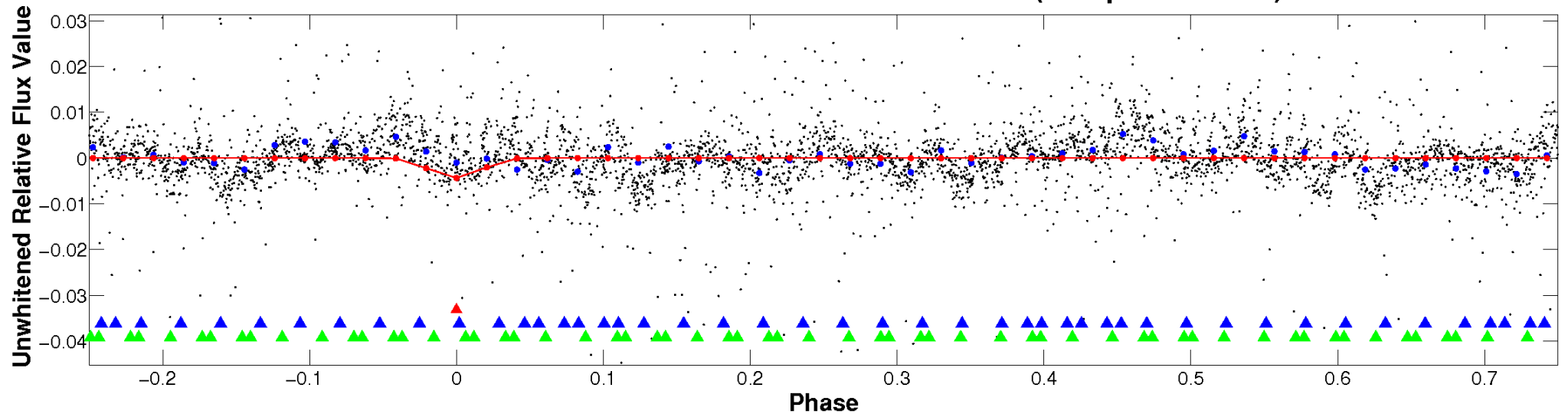
# ALT Odd/Even

TCE 004139673-01

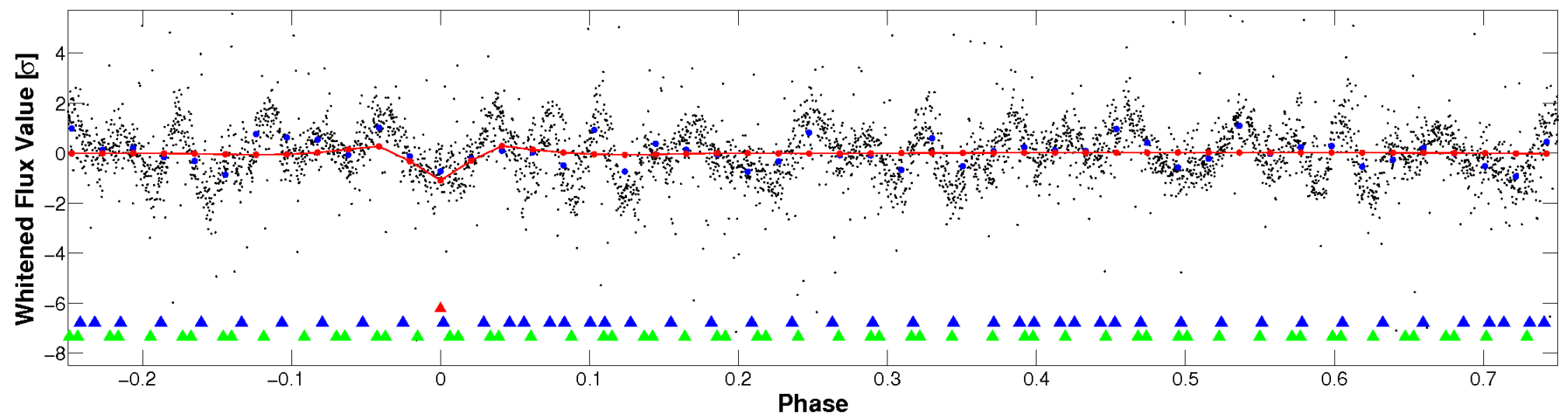


# Non-Whitened Vs. Whitened Light Curve

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

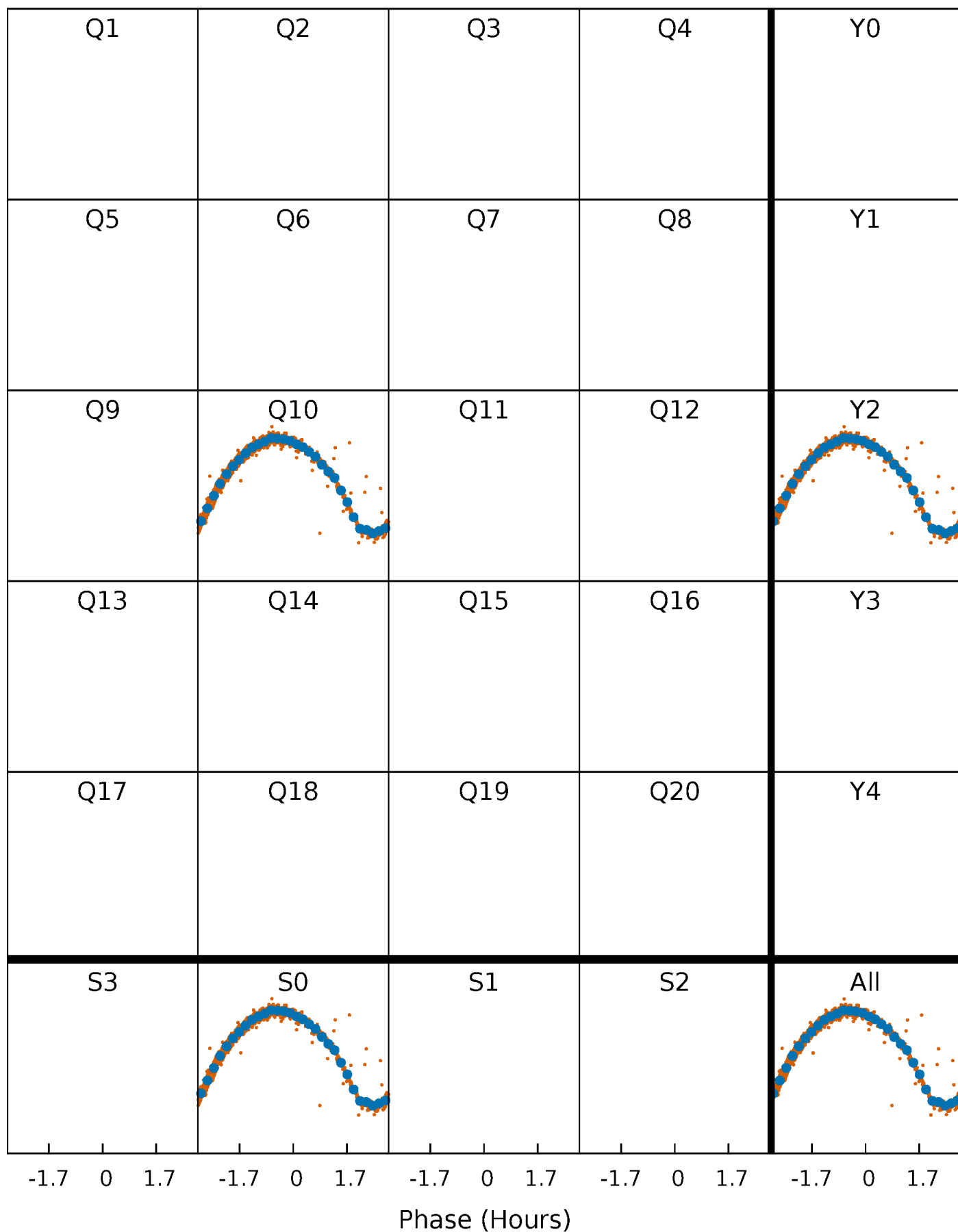


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

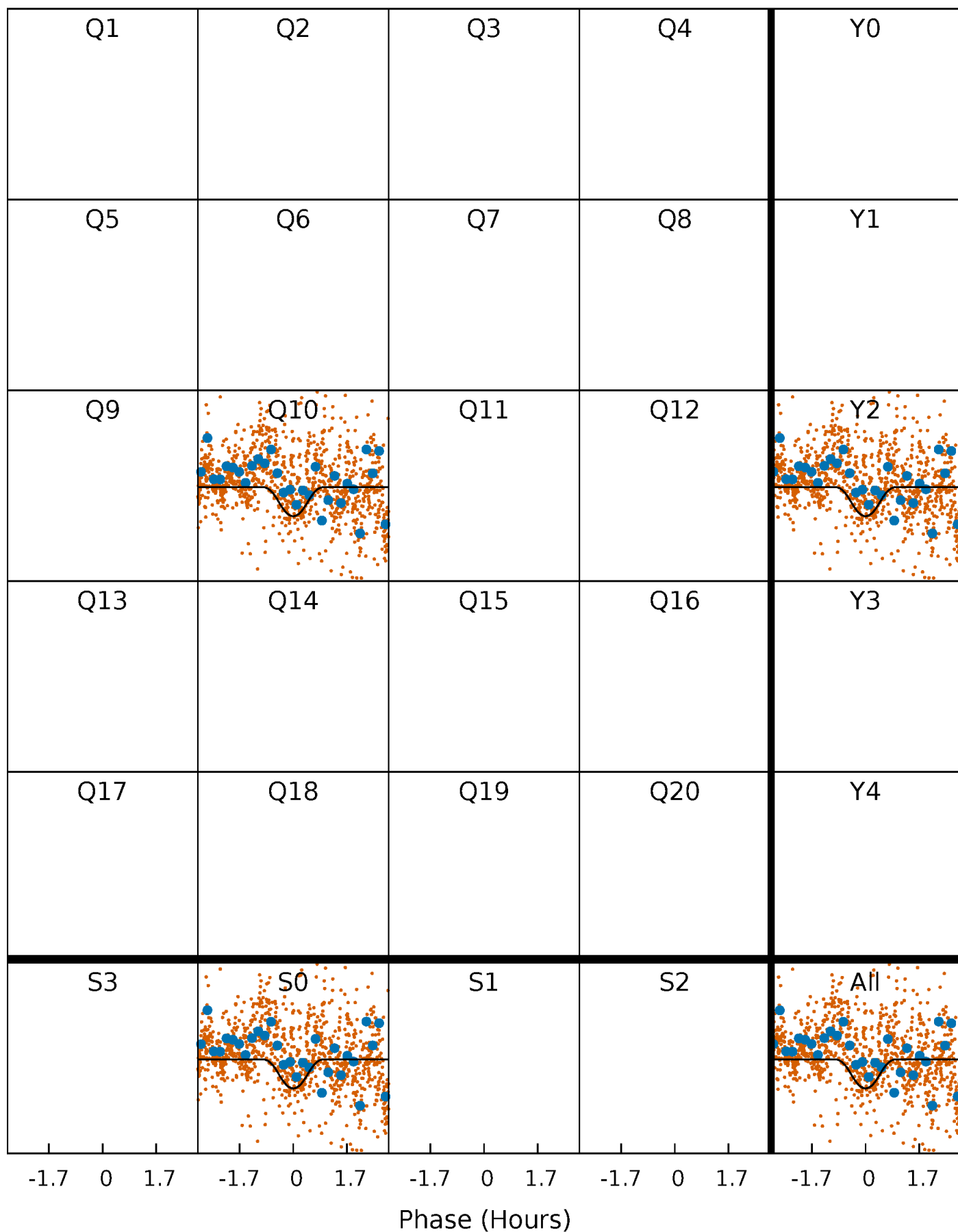
TCE 004139673-01 P= 0.990748 Days  $T_0=132.290169$  (BKJD)





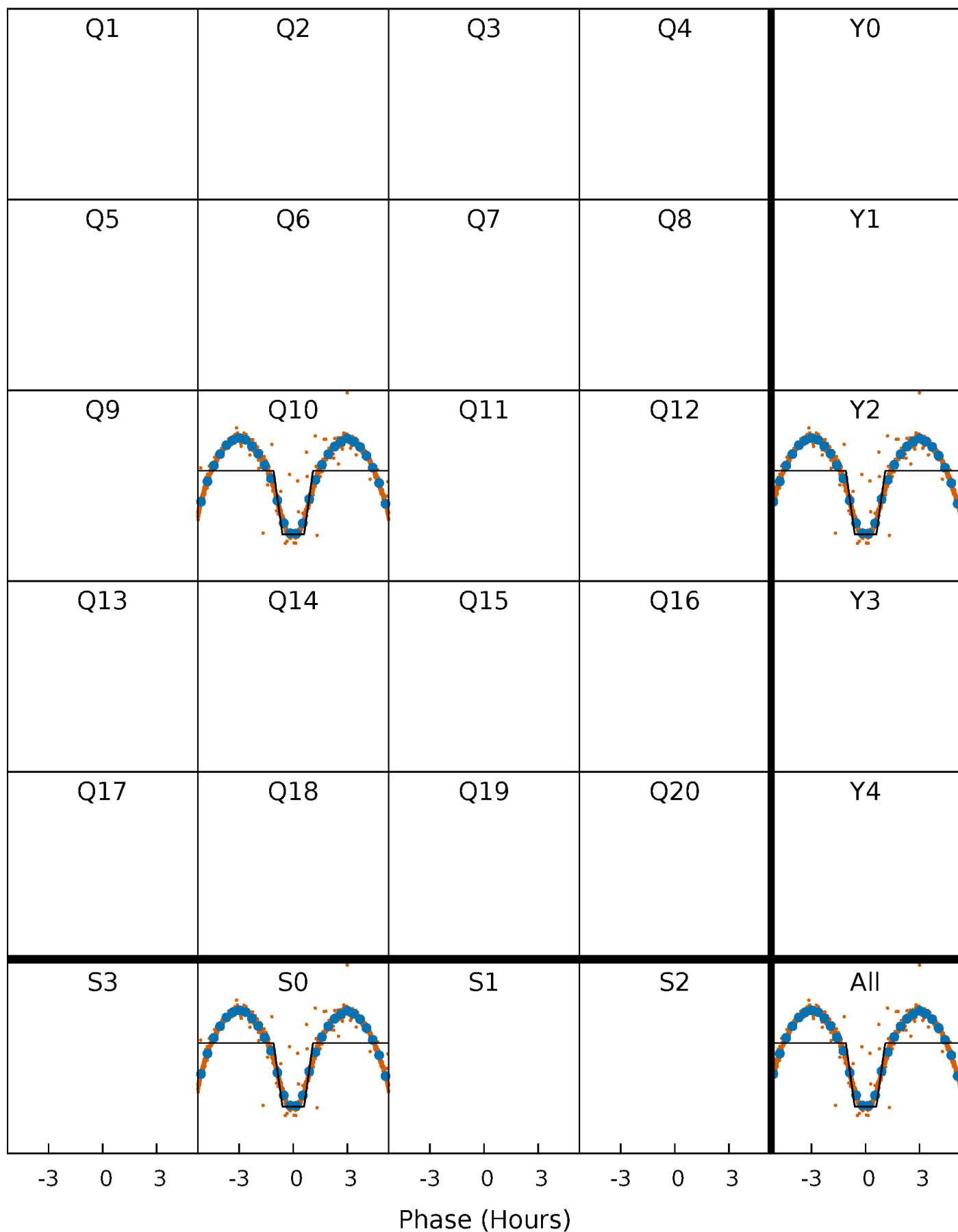
# DV Quarter-Phased Transit Curves

TCE 004139673-01   P= 0.990748 Days    $T_0=132.290169$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

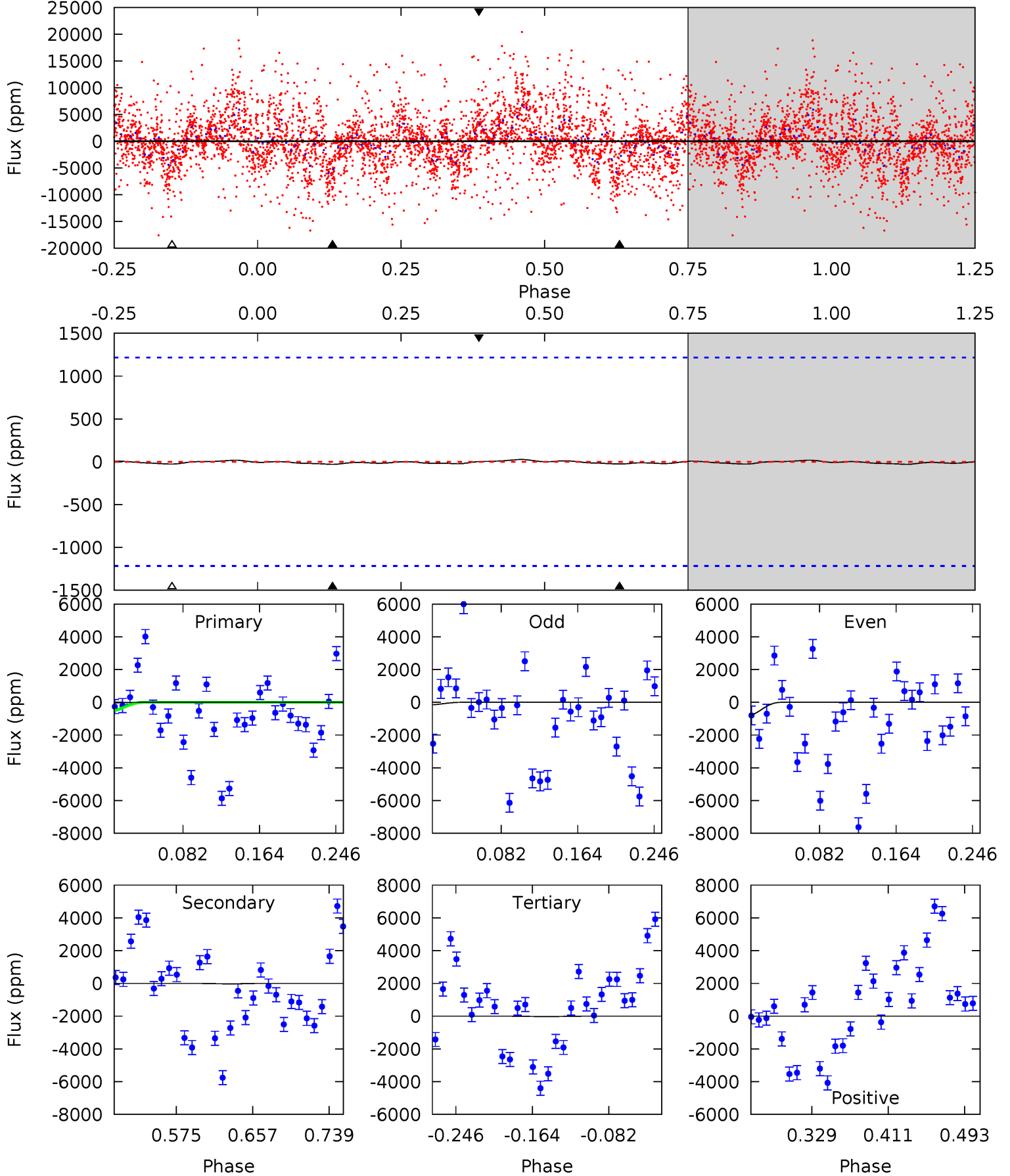
TCE 004139673-01 P= 0.990757 Days  $T_0=132.387990$  (BKJD)



# DV Model-Shift Uniqueness Test

004139673-01, P = 0.990748 Days, E = 132.290169 Days

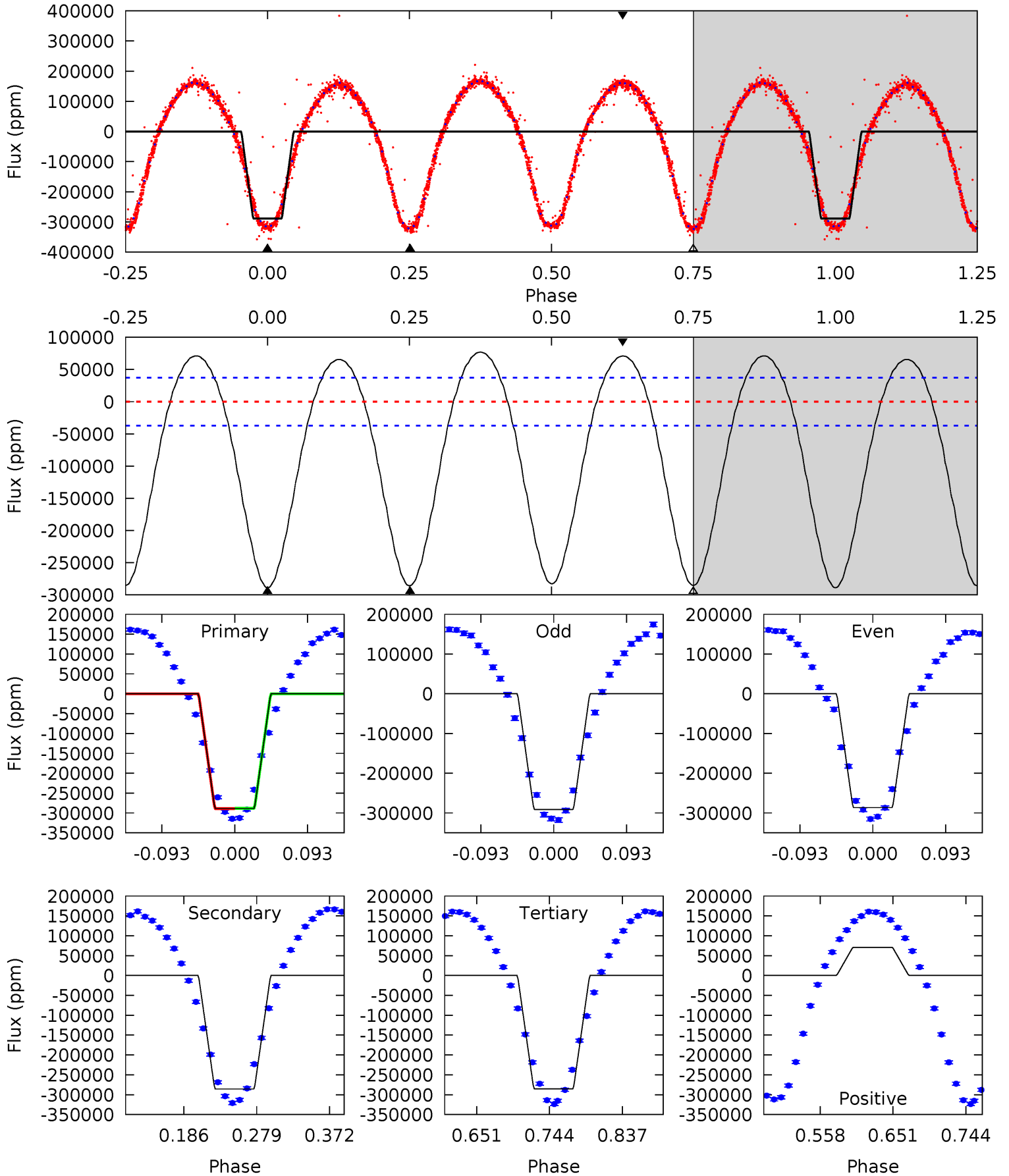
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.11	0.10	0.10	0	4.61	1.74	0.05	0.01	0.11	-0.00	0.10	1.38	0.46	0.47	0.19



# Alt Model-Shift Uniqueness Test

004139673-01, P = 0.990757 Days, E = 132.387990 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.6	35.2	35.2	8.75	4.58	1.68	15.5	0.43	26.9	0.05	26.5	0.29	0.99	0.21	0.05



### Stellar Parameters For KIC 004139673

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6127^{+193}_{-236}$	$4.337^{+0.132}_{-0.198}$	$-0.140^{+0.250}_{-0.300}$	$1.132^{+0.355}_{-0.191}$	$1.014^{+0.167}_{-0.111}$	$0.984^{+0.598}_{-0.499}$
	+3%/-4%	+3%/-5%	+179%/-214%	+31%/-17%	+16%/-11%	+61%/-51%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004139673-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-26 \pm 264$	$18.23^{+16.44}_{-12.13}$	$2874^{+236}_{-167}$	$-3006^{+5240}_{-345}$	$0.006^{+0.318}_{-0.223}$
Alt.	$-285647 \pm 8108$	$69.82^{+25.79}_{-21.62}$	$2892^{+219}_{-177}$	$6469^{+1592}_{-806}$	$17^{+19}_{-7}$

$T_{max}$  = 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

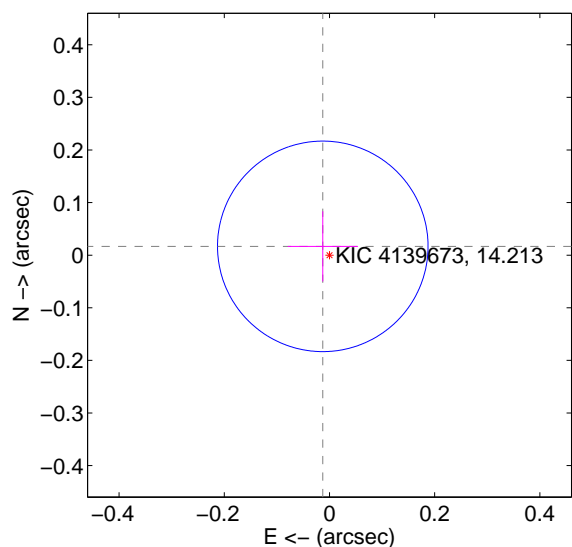
Supplemental centroid analysis for 004139673-01. Kepler magnitude: 14.21. Transit SNR 13.28

There are 0 quarters with good PRF difference image offsets

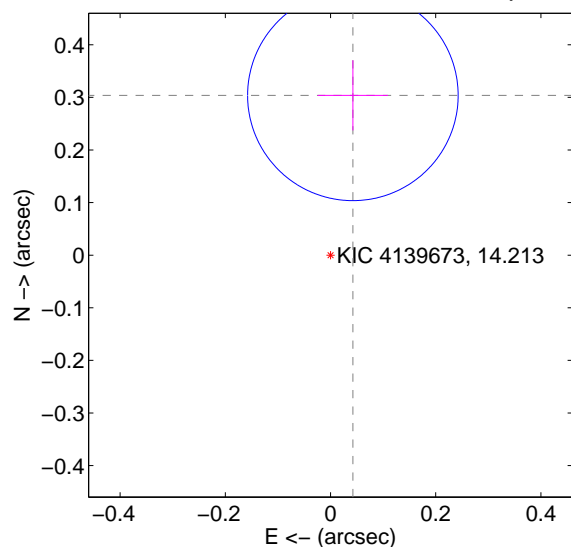
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.021 \pm 0.067$	0.32	$0.013 \pm 0.067$	$0.017 \pm 0.067$
PRF-fit source offset from KIC position	<b><math>0.307 \pm 0.067</math></b>	<b>4.60</b>	$-0.043 \pm 0.067$	$0.304 \pm 0.067$
photometric centroid source offset	$0.14 \pm 0.08$	1.79	$-0.14 \pm 0.08$	$-0.05 \pm 0.06$

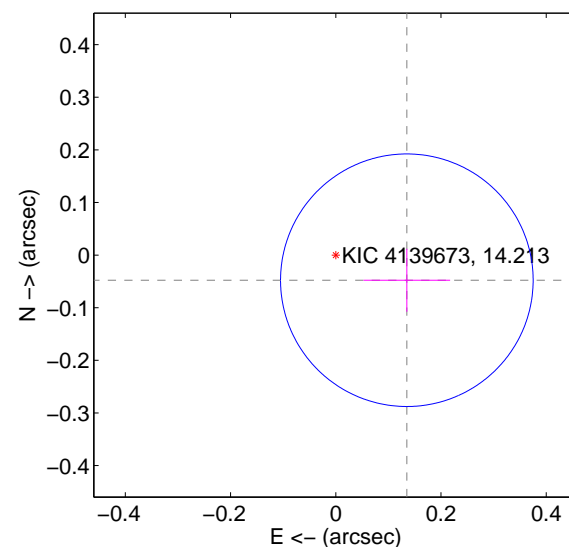
offset from difference PRF-fit to OOT PRF-fit



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

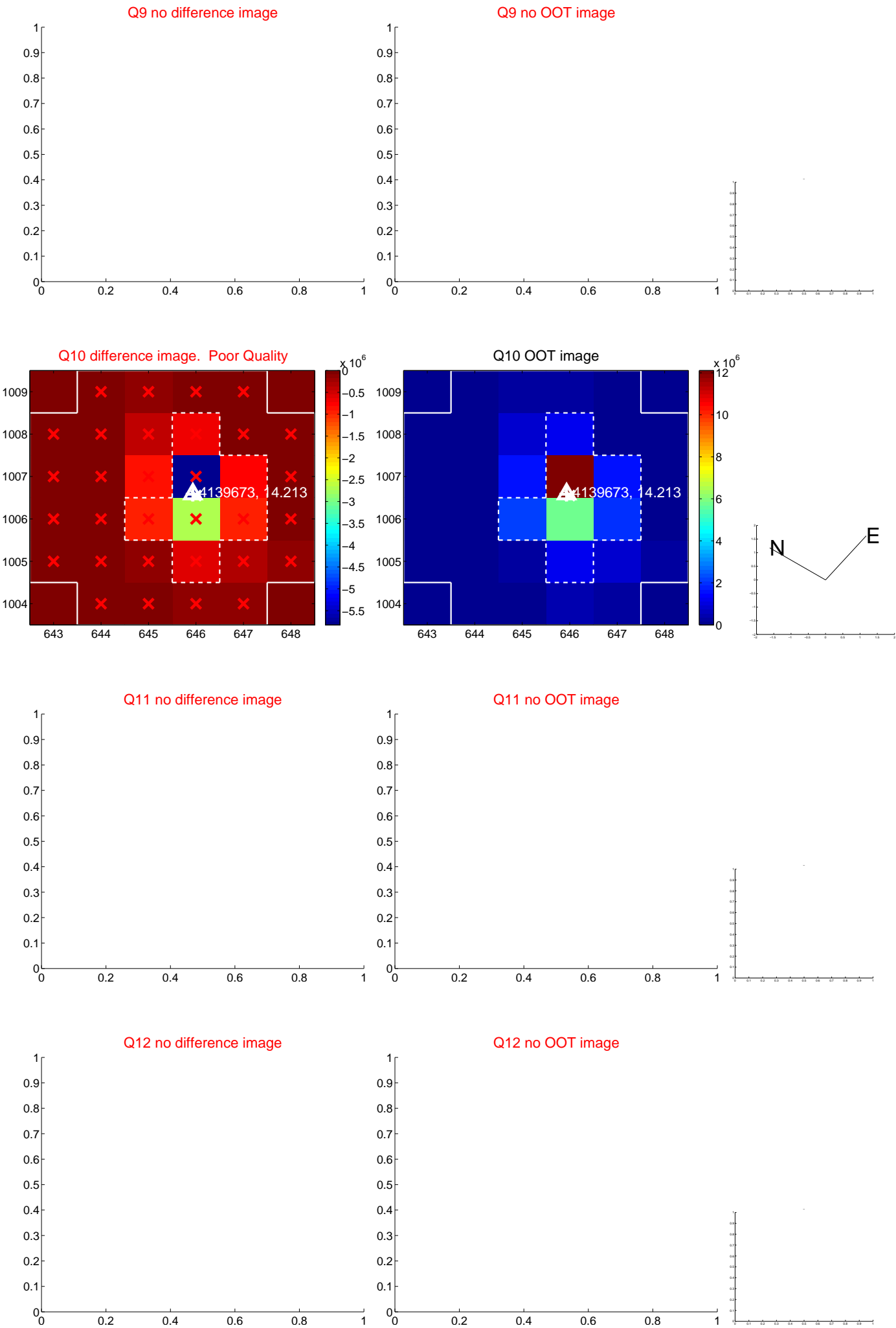


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





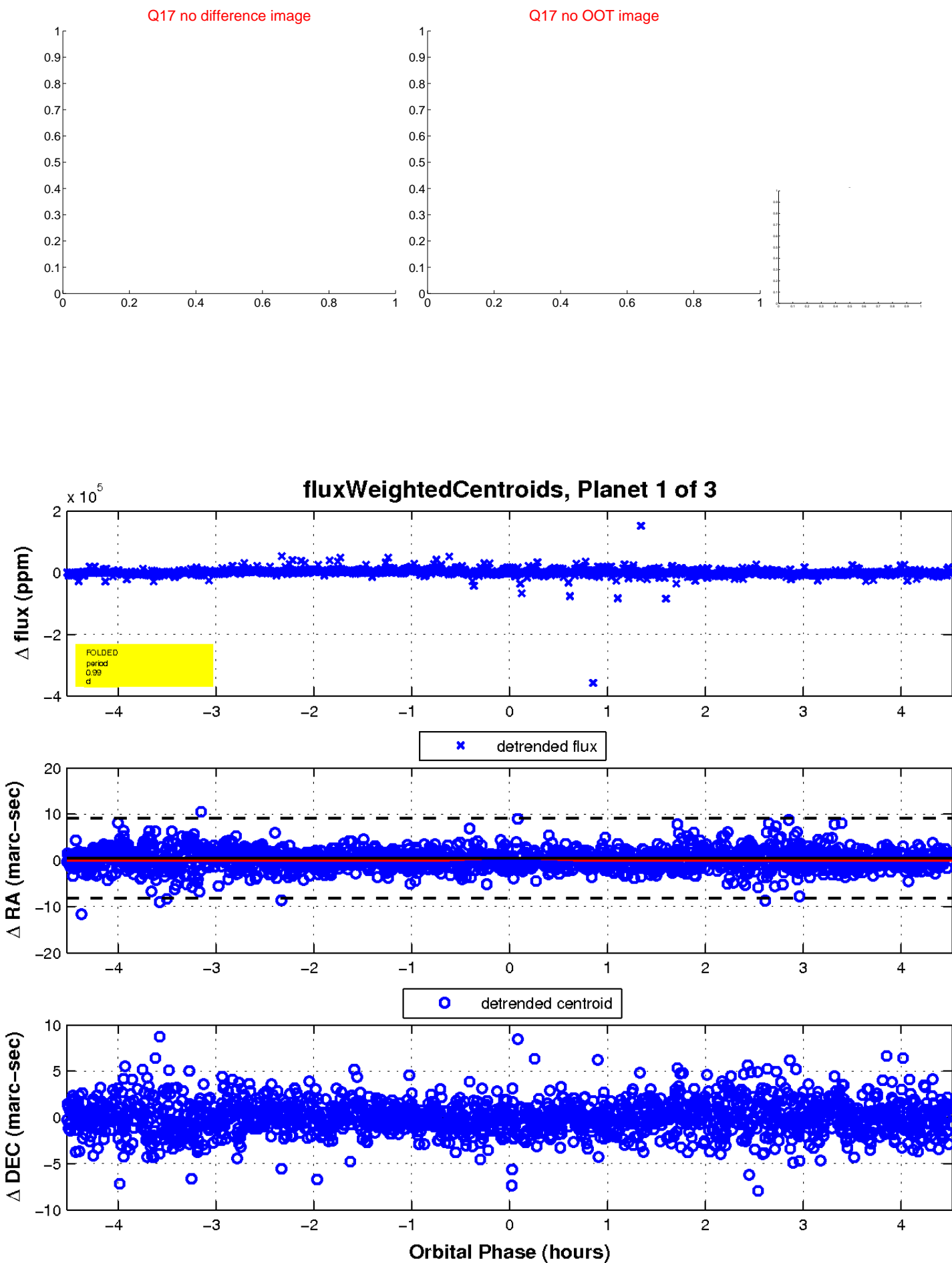
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

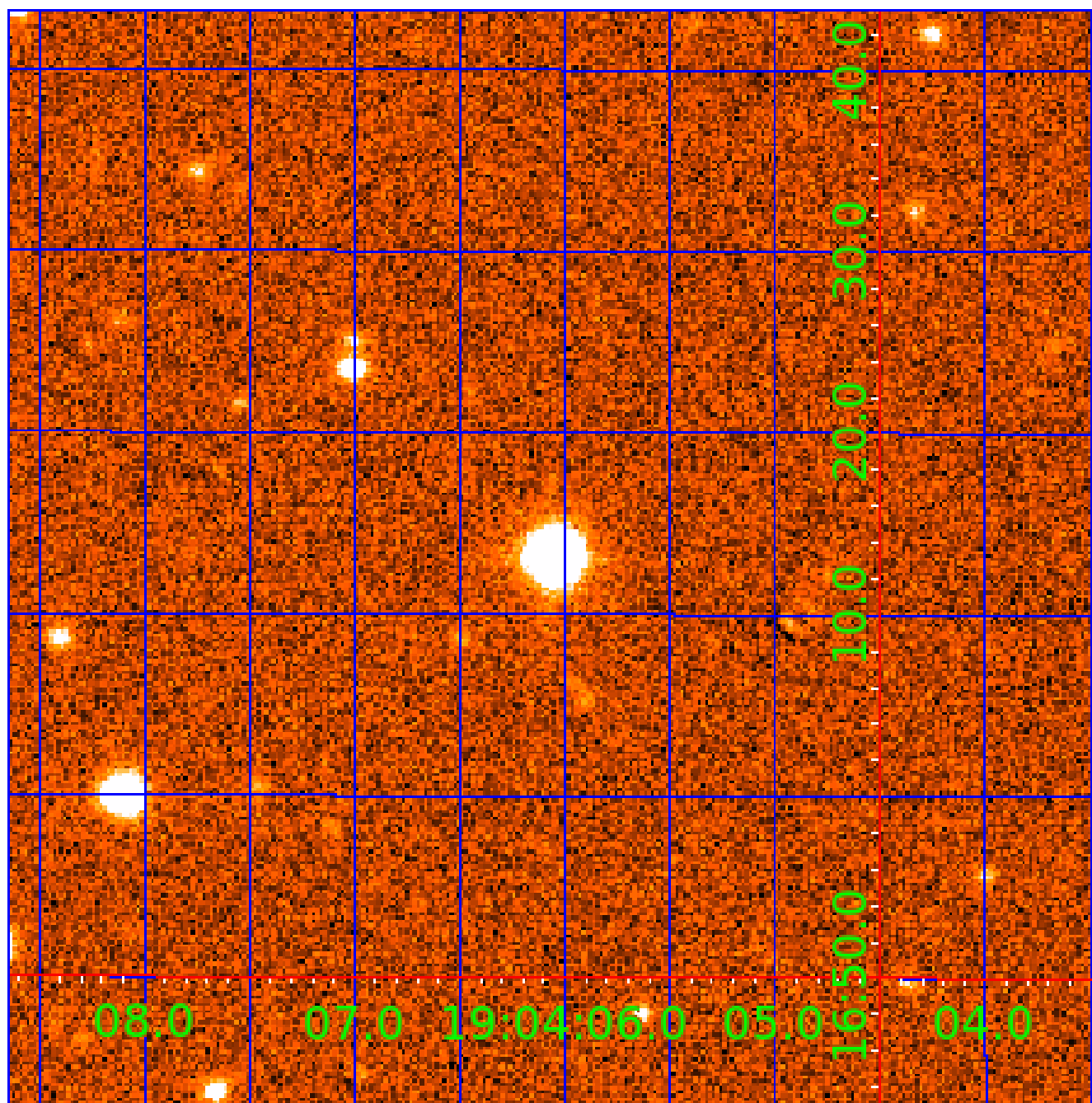


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 004139673

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004139673-01	OBS	No	0.990748	132.290169	4586.5	1.508	9.8	13.3	1.13	6127	10.94	4231.55
004139673-02	OBS	No	31.052391	152.802653	12041.9	2.865	10.4	4.4	1.13	6127	12.52	42.82
004139673-03	OBS	No	24.591023	133.464815	18507.4	5.041	8.3	9.4	1.13	6127	21.16	58.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004139673-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS
004139673-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004139673-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

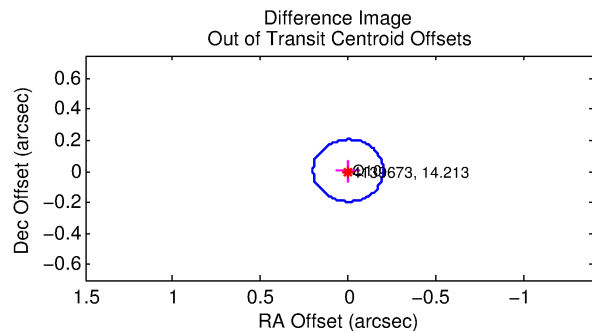
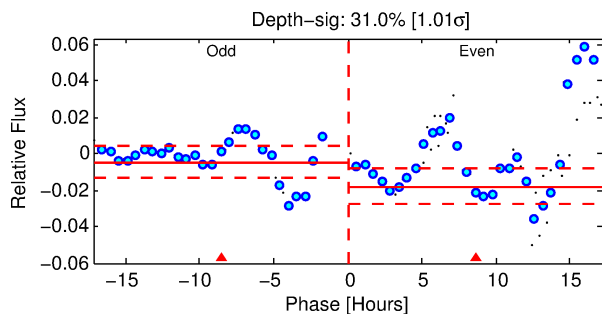
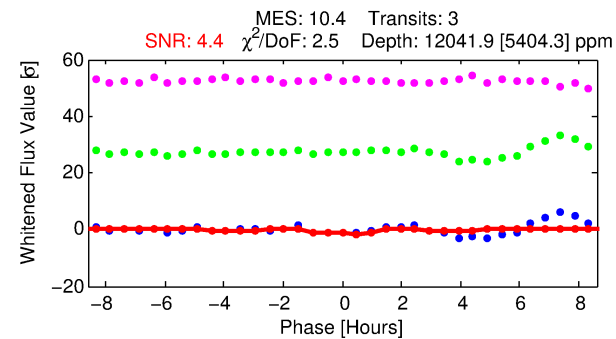
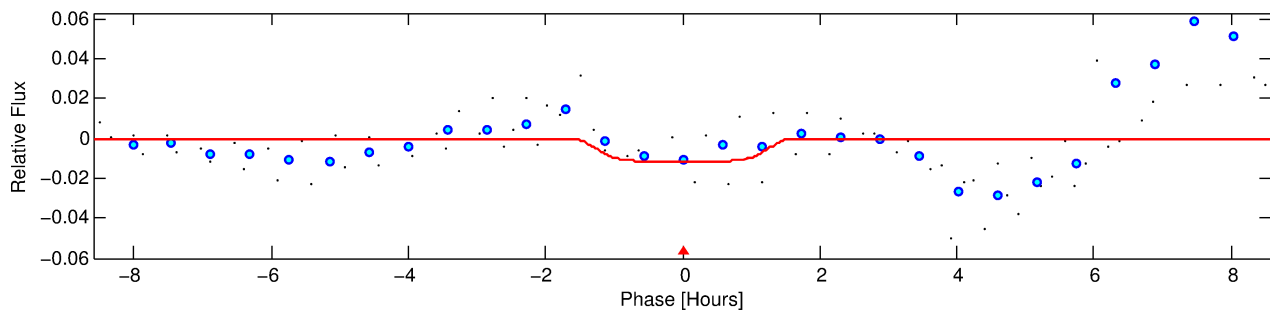
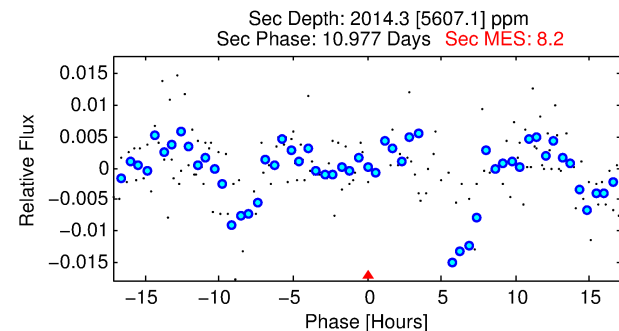
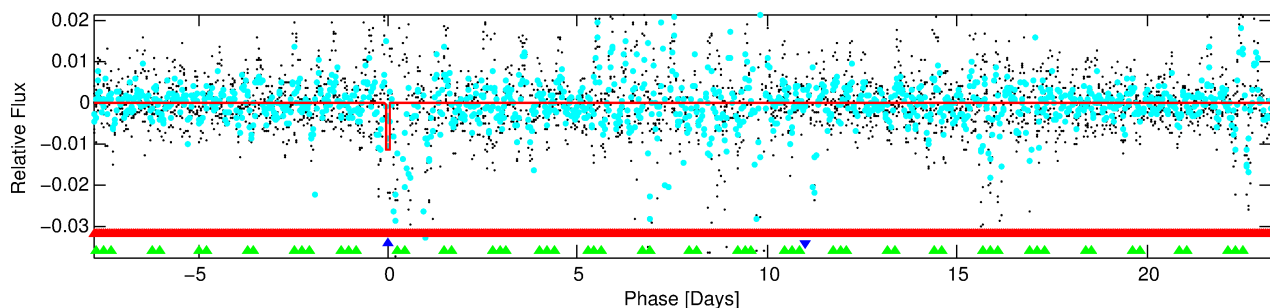
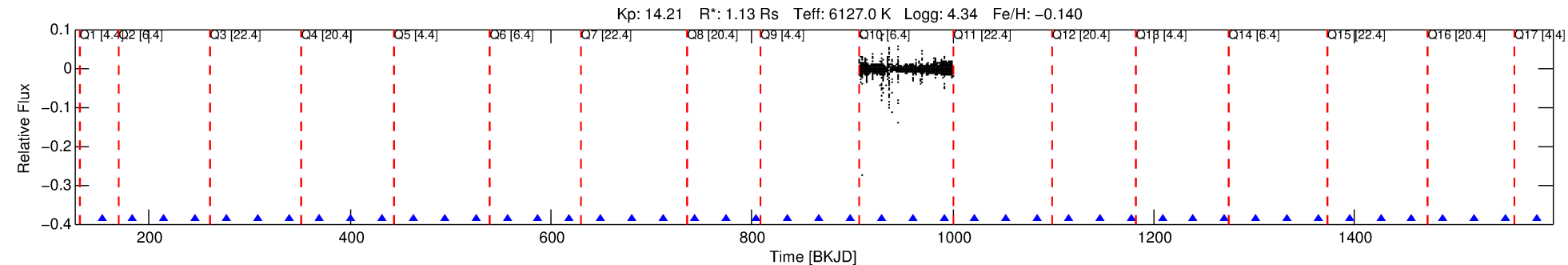
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004139673-02

No Significant Match Found

# DV One-Page Summary

KIC: 4139673 Candidate: 2 of 3 Period: 31.052 d



## DV Fit Results:

Period = 31.05239 [0.01294] d  
Epoch = 152.8027 [0.3397] BKJD  
Rp/R\* = 0.1013 [0.2841]  
a/R\* = 88.51 [1194.06]  
b = 0.27 [47.52]  
Seff = 42.82 [17.12]  
Teff = 652 [65] K  
Rp = 12.52 [35.31] Re  
a = 0.1944 [0.0502] AU  
Ag = 267.22 [1675.52] [0.16σ]  
Teffp = 4078 [6383] K [0.54σ]

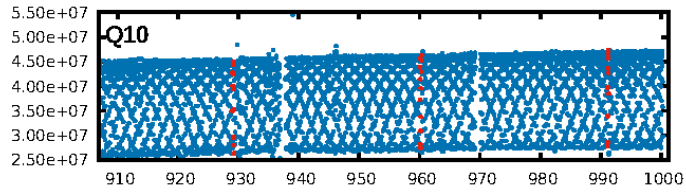
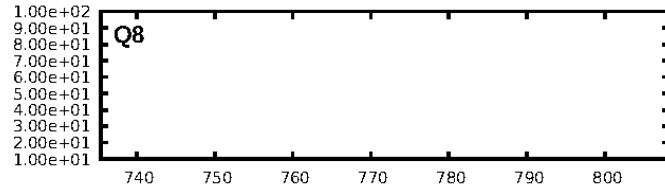
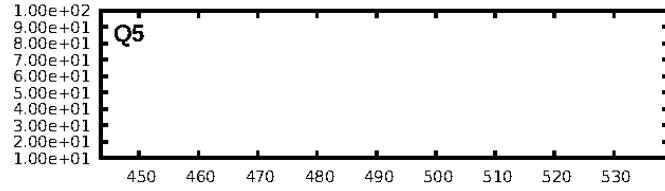
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [26.74σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 84.4%  
**Bootstrap-pfa: 1.20e-12**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.14  
Centroid-sig: N/A  
Centroid-so: 0.065 arcsec [0.62σ]  
OotOffset-rm: 0.007 arcsec [0.10σ]  
**KicOffset-rm: 0.333 arcsec [4.99σ]**  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [1/1]

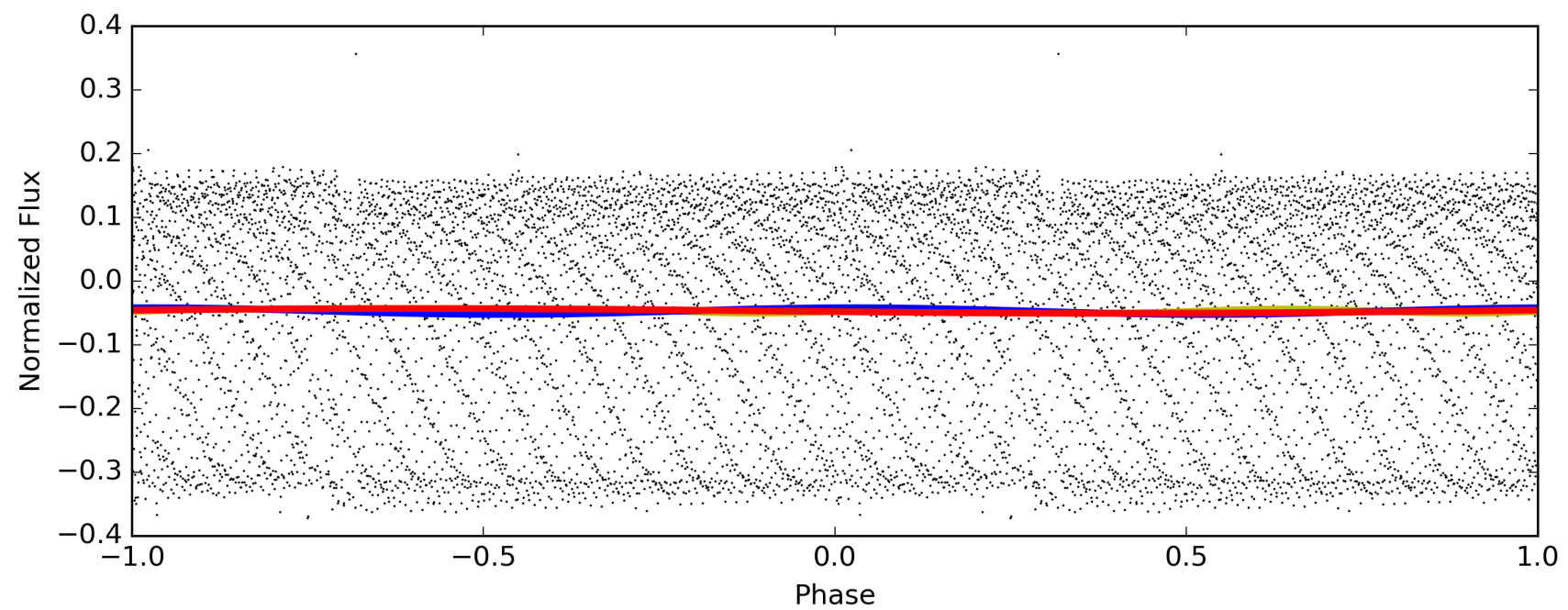
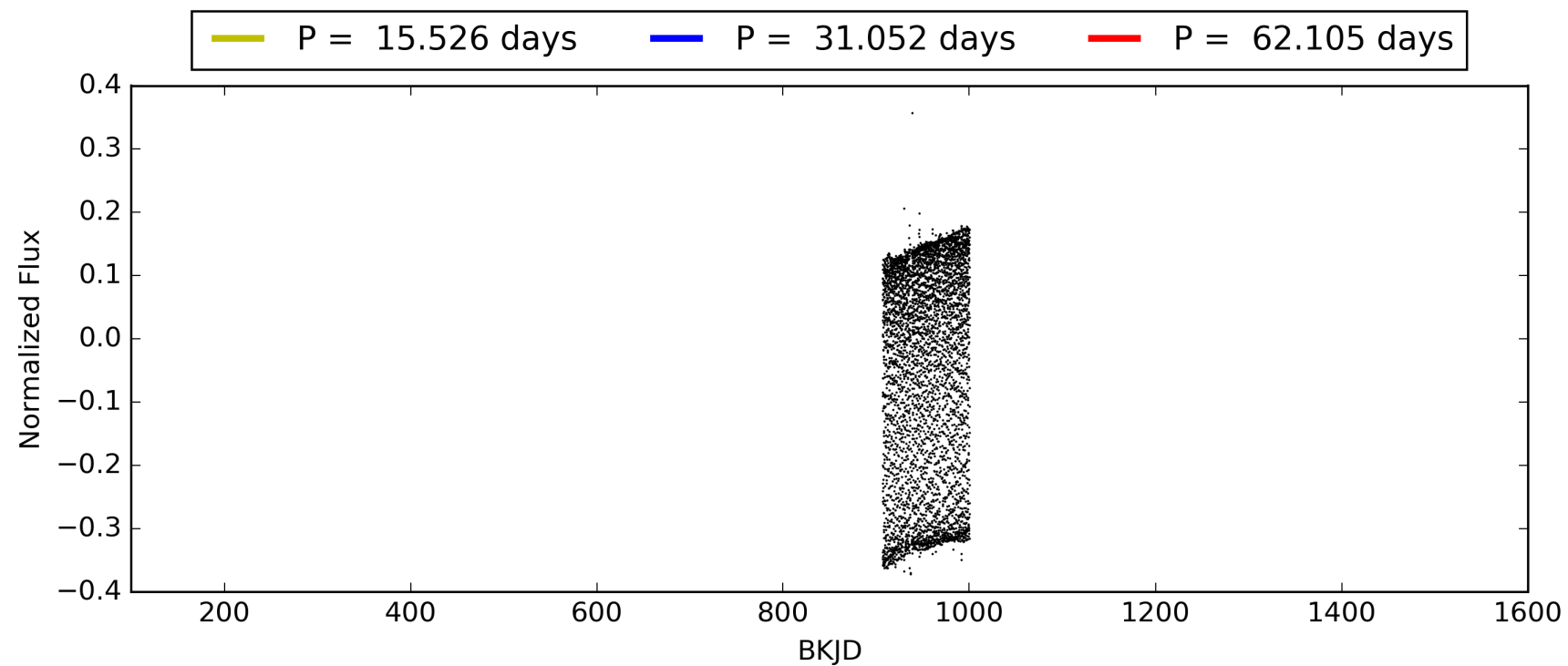
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 11:38:30 Z

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

# TCE 004139673-02, PDC Light Curves



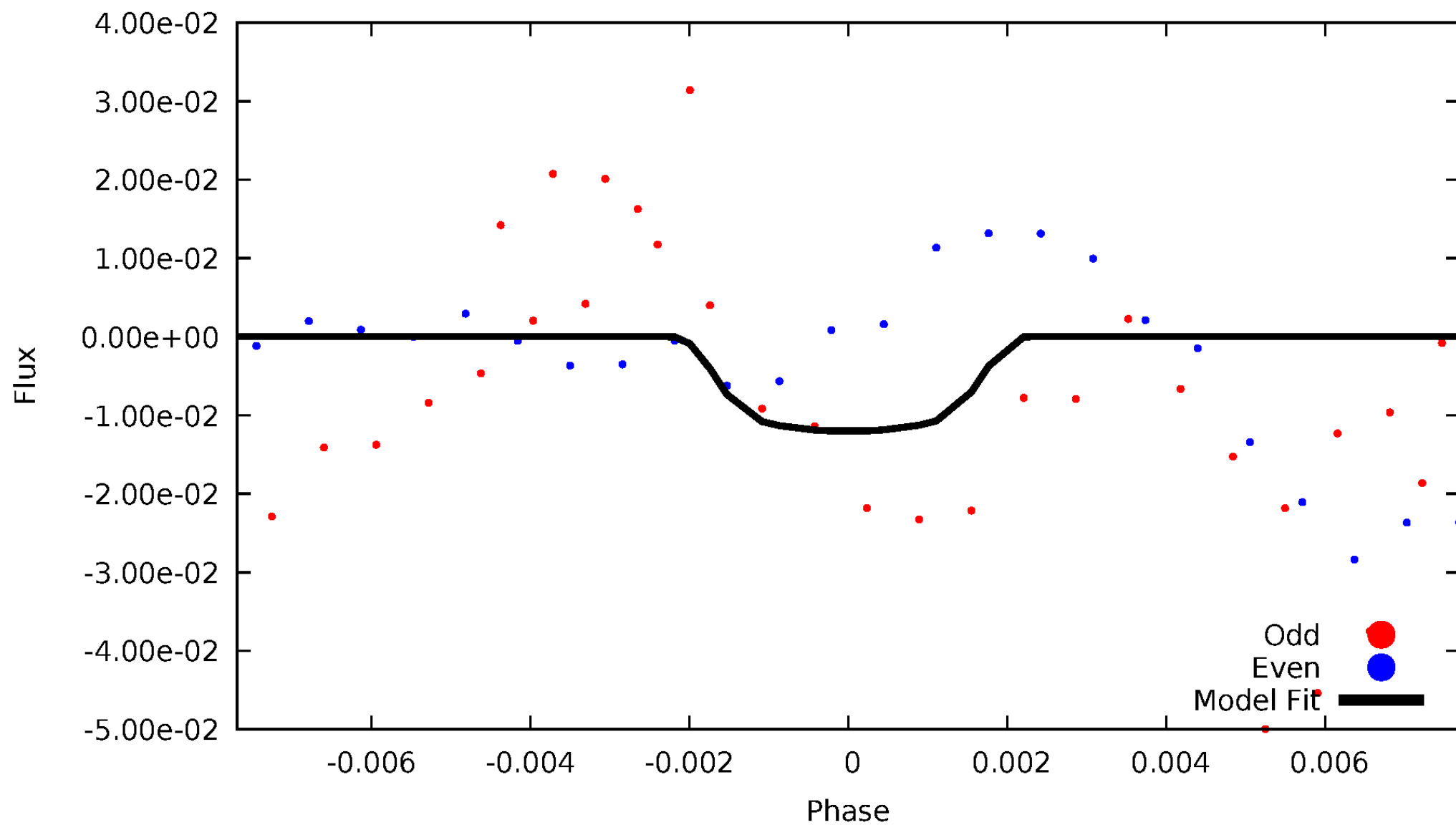
TCE 004139673-02





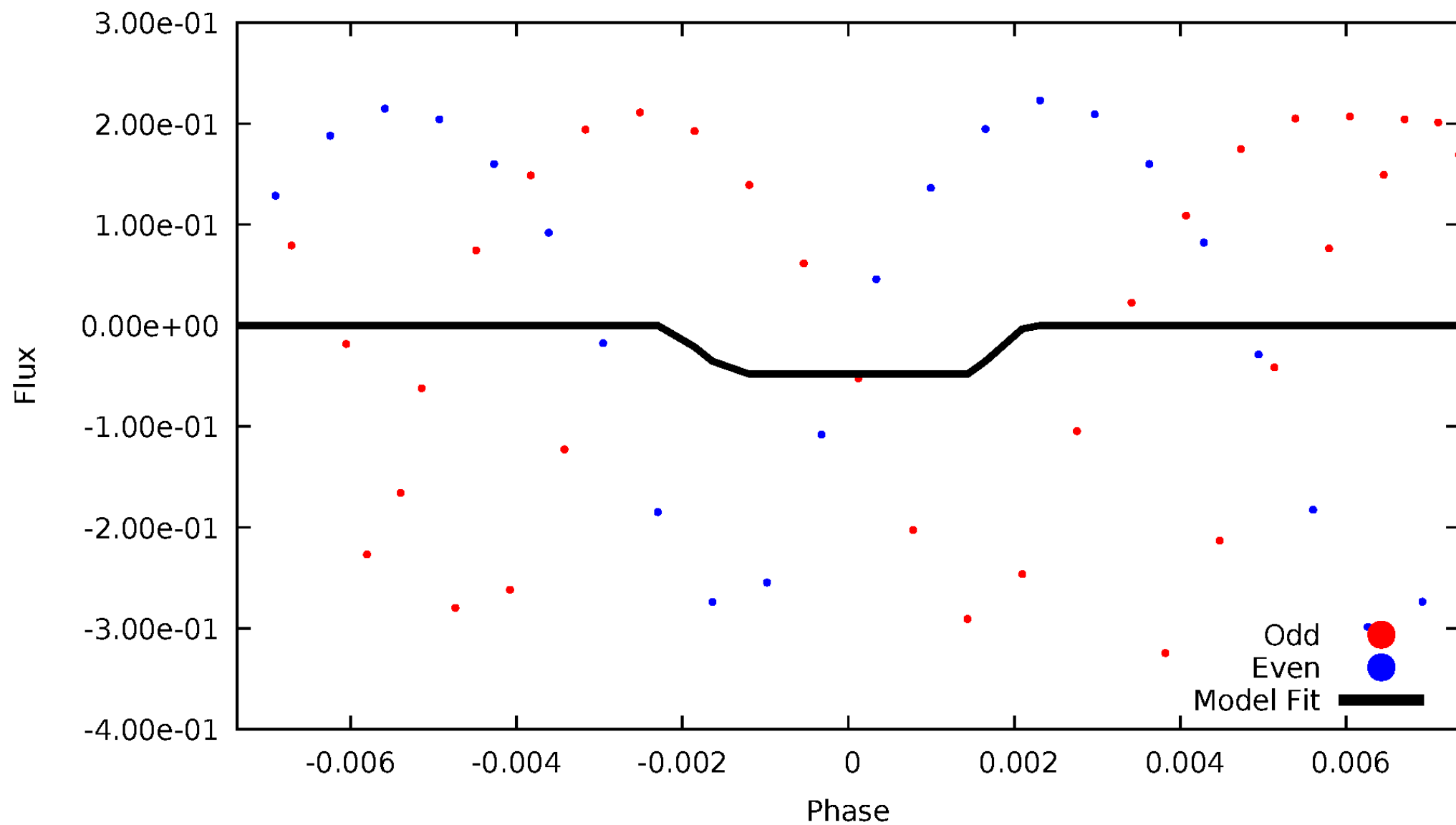
# DV Odd/Even

TCE 004139673-02



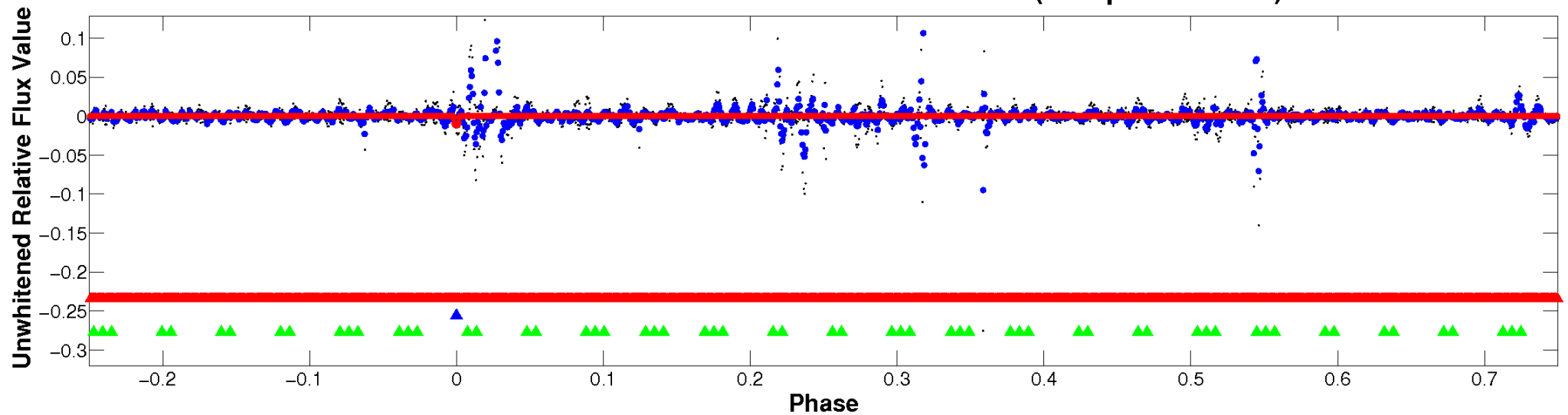
# ALT Odd/Even

TCE 004139673-02

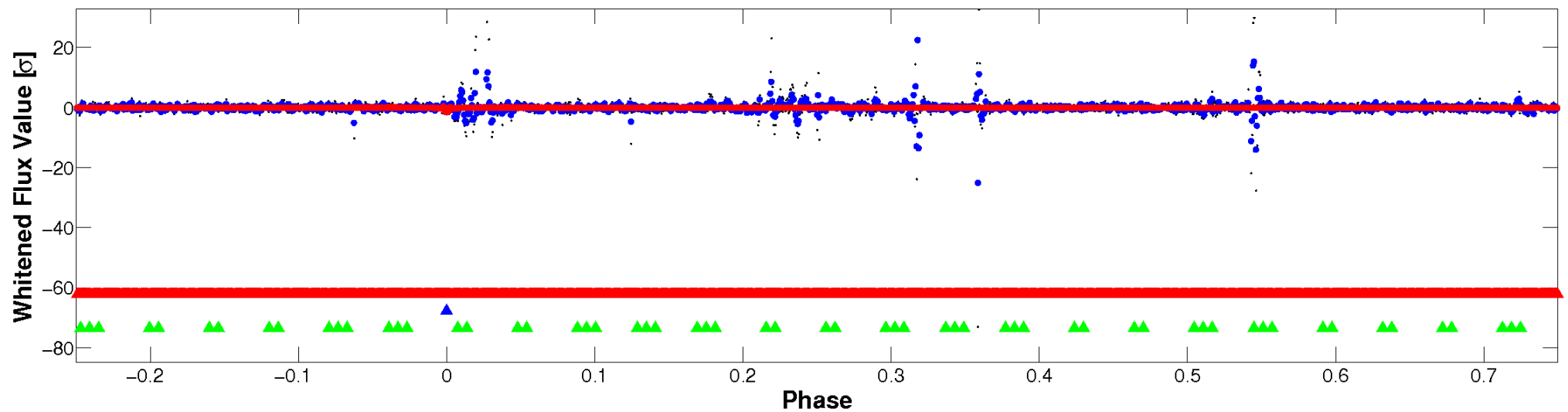


# Non-Whitened Vs. Whitened Light Curve

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



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



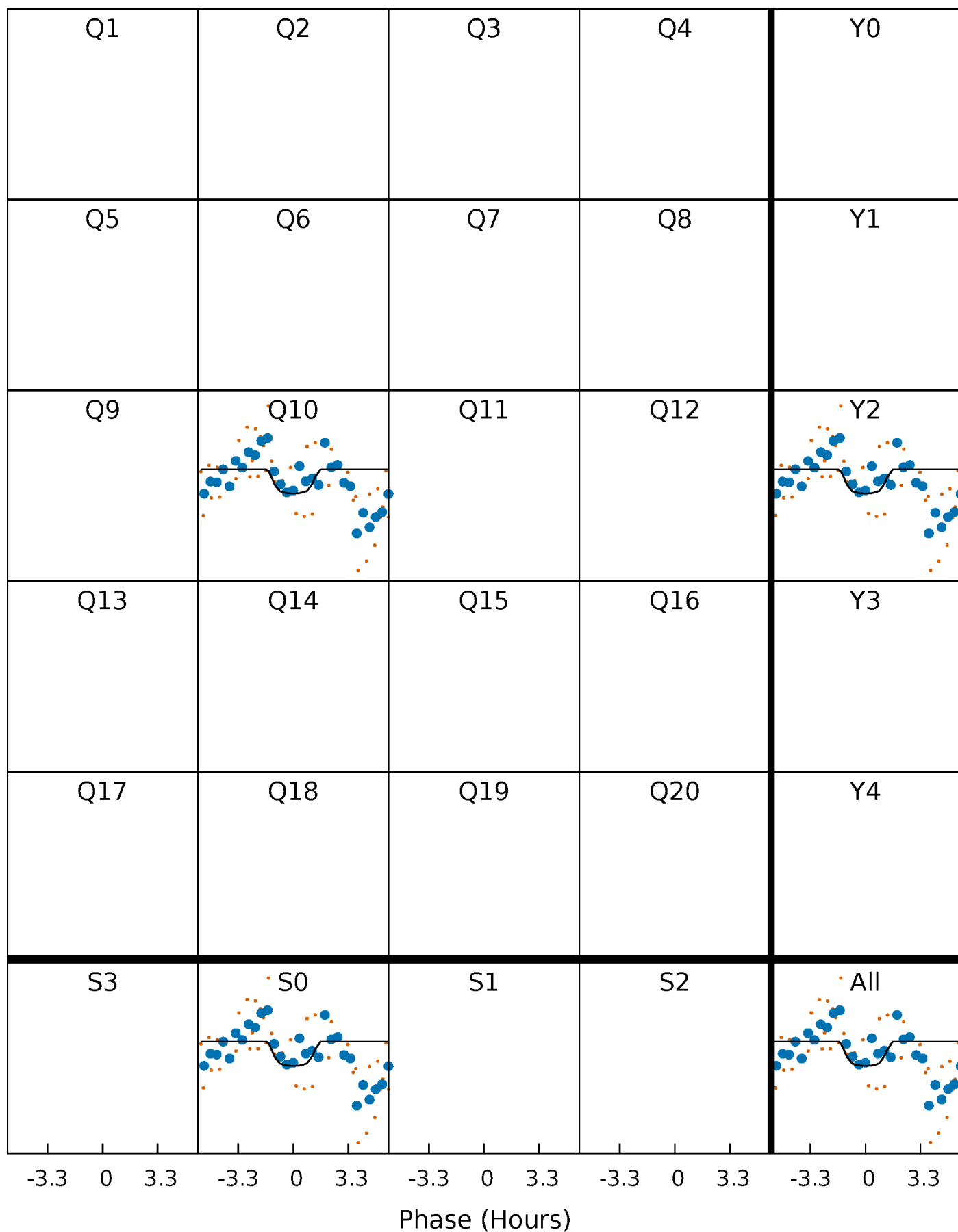
# PDC Quarter-Phased Transit Curves

TCE 004139673-02 P= 31.052391 Days  $T_0=152.802653$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 004139673-02     $P = 31.052391$  Days     $T_0 = 152.802653$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

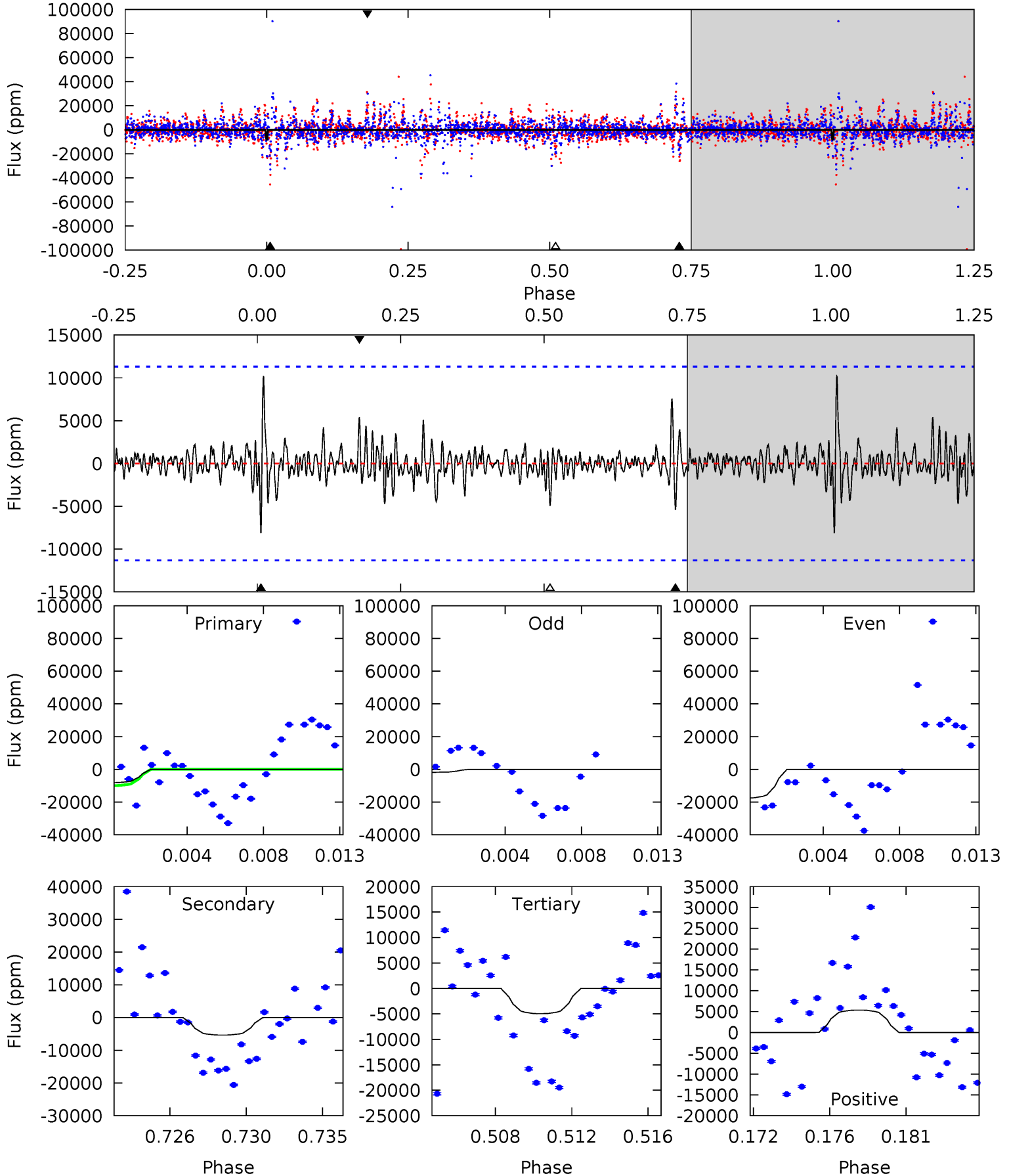
TCE 004139673-02 P= 31.052424 Days  $T_0=152.846111$  (BKJD)



# DV Model-Shift Uniqueness Test

004139673-02, P = 31.052391 Days, E = 152.802653 Days

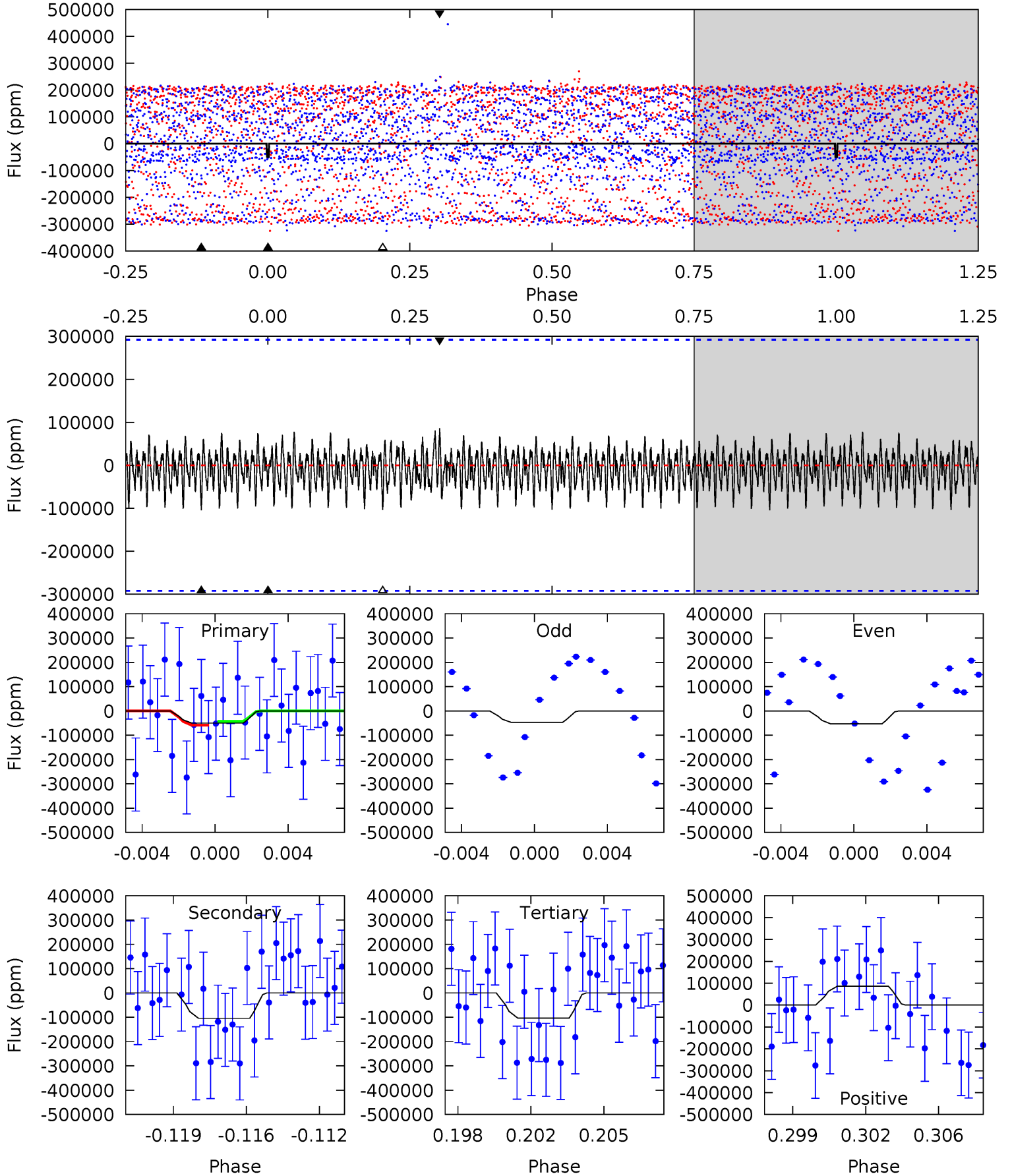
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.73	2.45	2.27	2.46	5.19	2.86	0.63	1.46	1.28	0.18	-0.01	3.40	1.00	0.56	0.82



# Alt Model-Shift Uniqueness Test

004139673-02, P = 31.052424 Days, E = 152.846111 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.89	1.86	1.85	1.53	5.21	2.90	0.63	-0.95	-0.64	0.01	0.33	0.06	1.00	0.45	0.14





### Stellar Parameters For KIC 004139673

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6127^{+193}_{-236}$	$4.337^{+0.132}_{-0.198}$	$-0.140^{+0.250}_{-0.300}$	$1.132^{+0.355}_{-0.191}$	$1.014^{+0.167}_{-0.111}$	$0.984^{+0.598}_{-0.499}$
	+3%/-4%	+3%/-5%	+179%/-214%	+31%/-17%	+16%/-11%	+61%/-51%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004139673-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-5348 \pm 2180$	$30.16^{+30.97}_{-20.93}$	$919^{+69}_{-62}$	$3755^{+2265}_{-809}$	$118^{+1026}_{-94}$
Alt.	$-104215 \pm 56075$	$36.35^{+32.18}_{-23.31}$	$915^{+72}_{-57}$	$6377^{+6906}_{-1895}$	$1579^{+12191}_{-1283}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

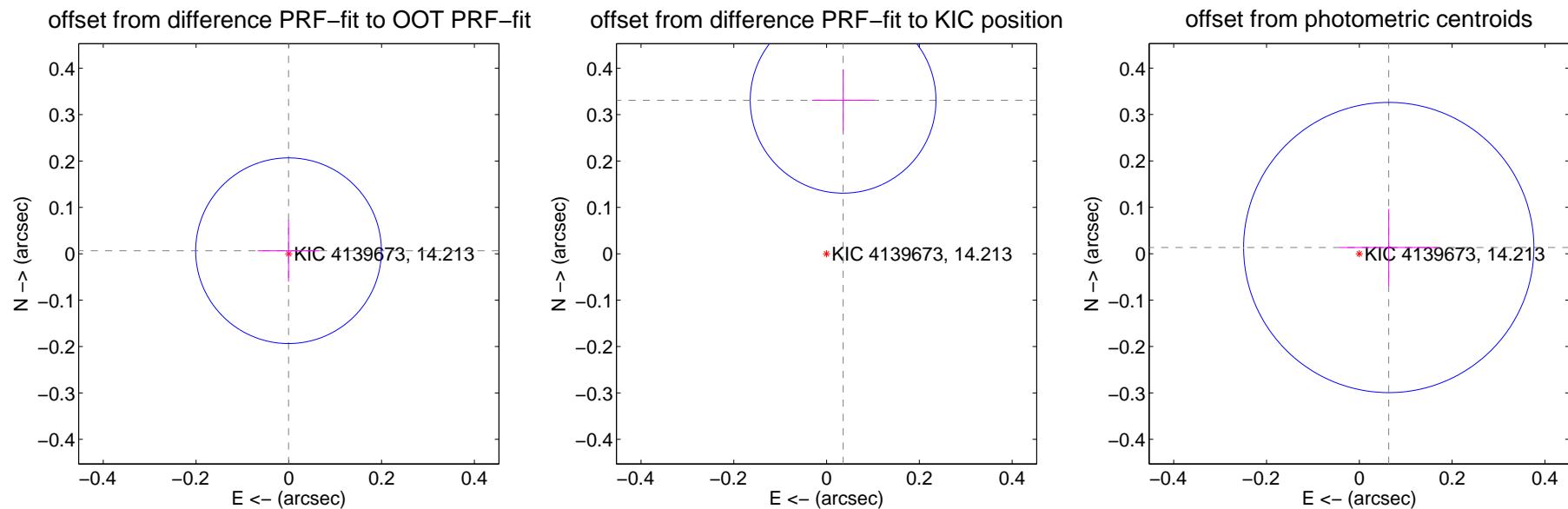
## DV Centroid Data

Supplemental centroid analysis for 004139673-02. Kepler magnitude: 14.21. Transit SNR 4.38

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 / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.007 \pm 0.067$	0.10	$0.001 \pm 0.067$	$0.007 \pm 0.067$
PRF-fit source offset from KIC position	$0.333 \pm 0.067$	4.99	$-0.036 \pm 0.067$	$0.331 \pm 0.067$
photometric centroid source offset	$0.06 \pm 0.10$	0.62	$-0.06 \pm 0.11$	$0.01 \pm 0.08$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

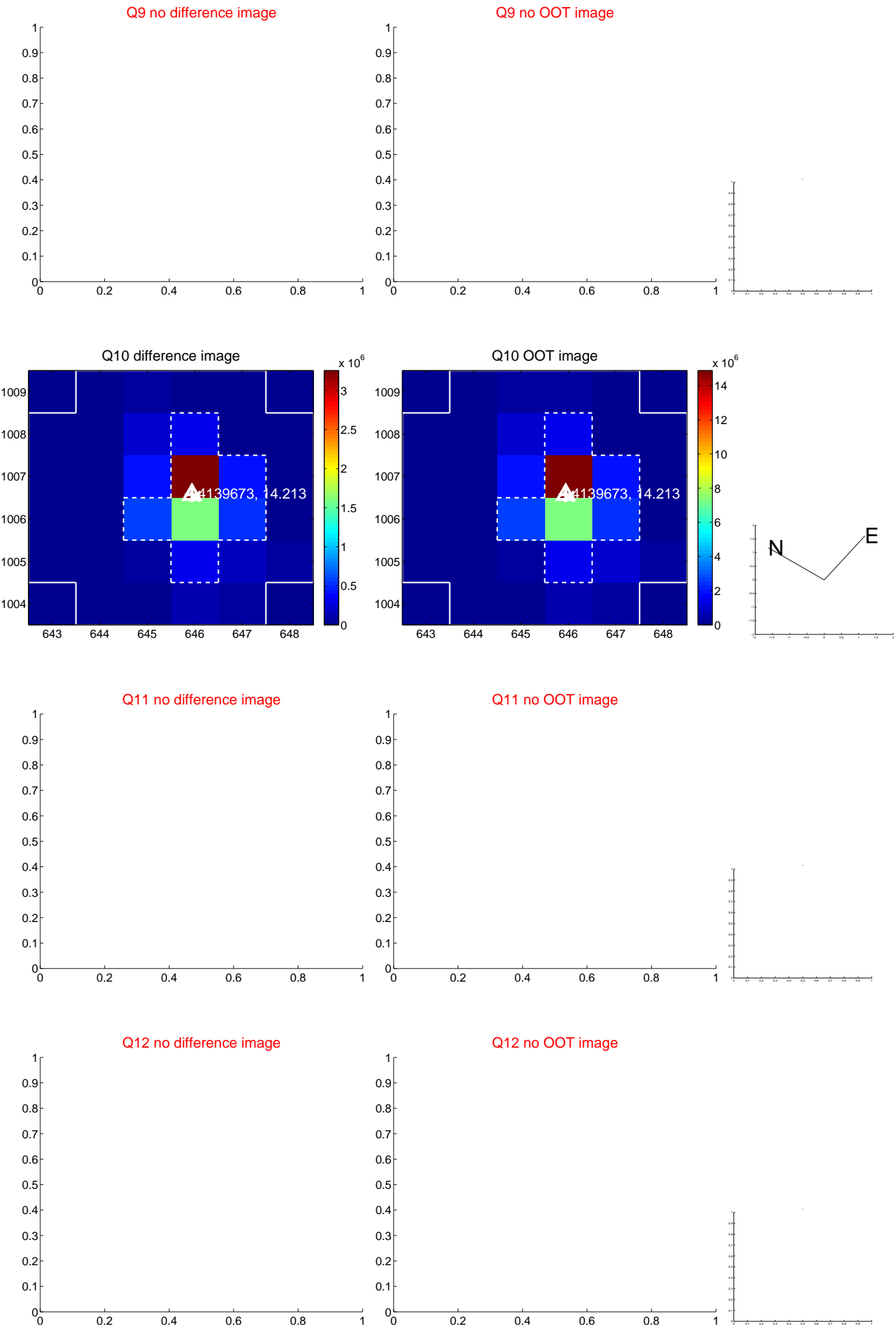
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



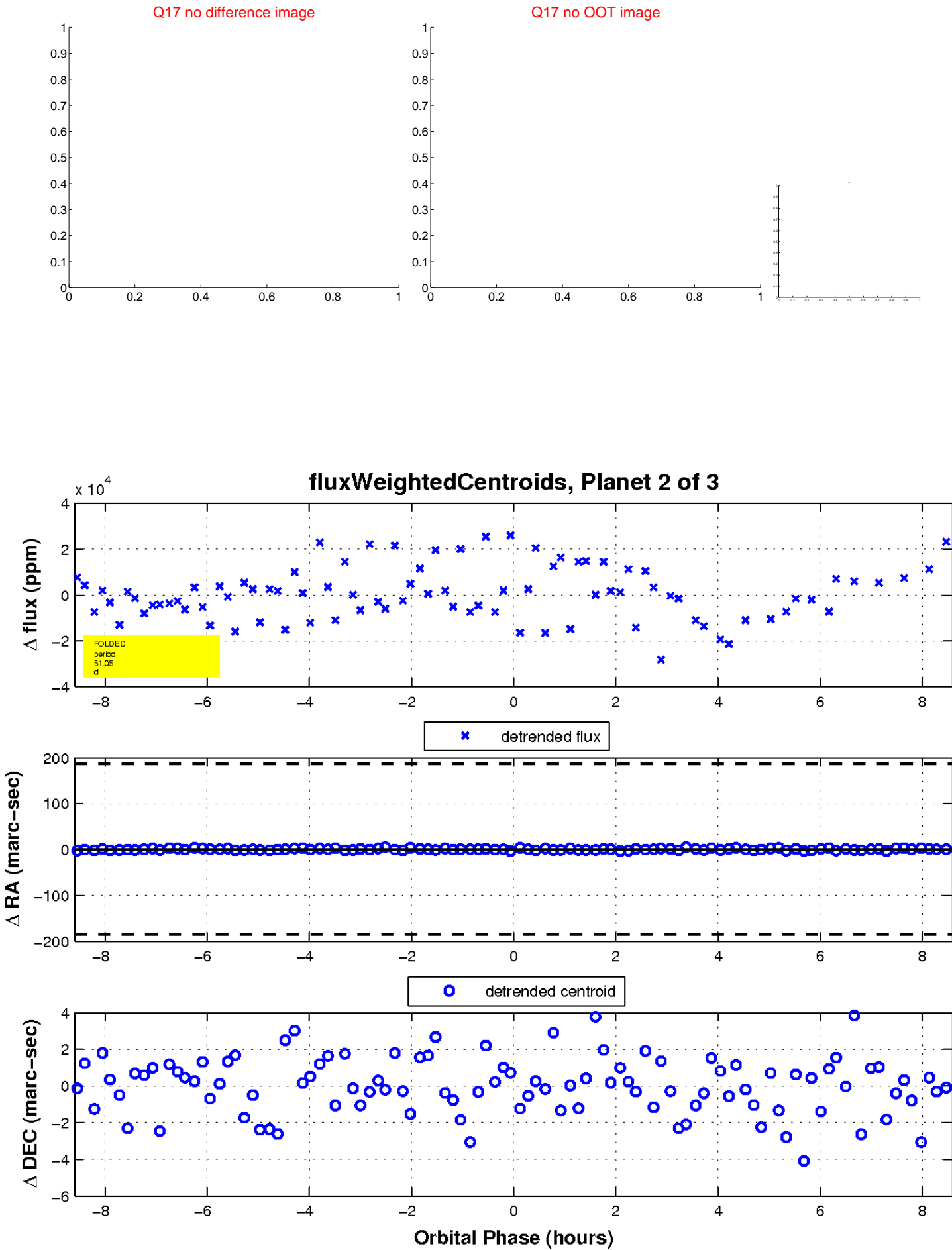
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

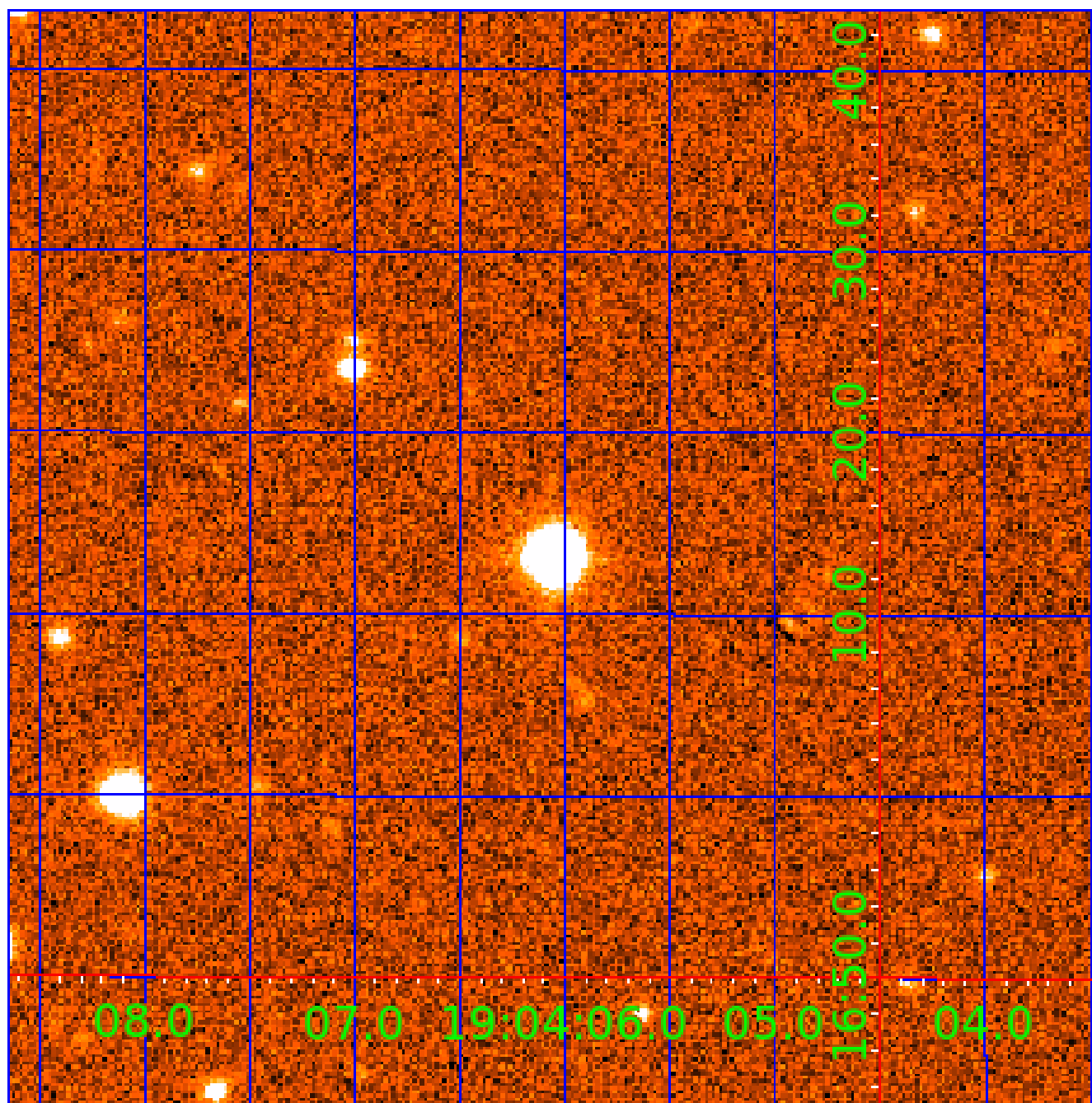


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 004139673

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004139673-01	OBS	No	0.990748	132.290169	4586.5	1.508	9.8	13.3	1.13	6127	10.94	4231.55
004139673-02	OBS	No	31.052391	152.802653	12041.9	2.865	10.4	4.4	1.13	6127	12.52	42.82
004139673-03	OBS	No	24.591023	133.464815	18507.4	5.041	8.3	9.4	1.13	6127	21.16	58.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004139673-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_FEW_DIFFS
004139673-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004139673-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

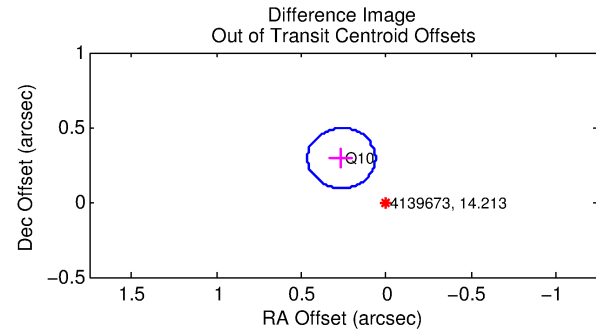
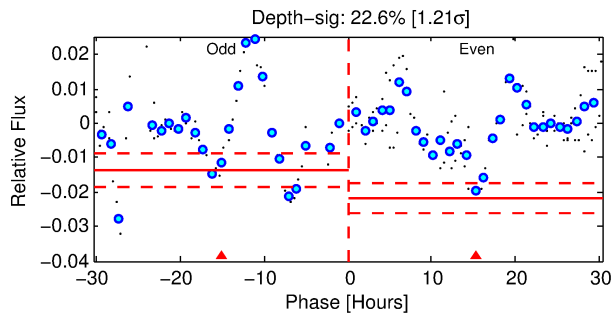
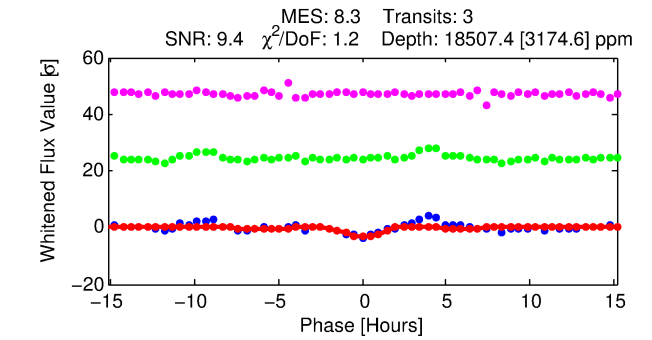
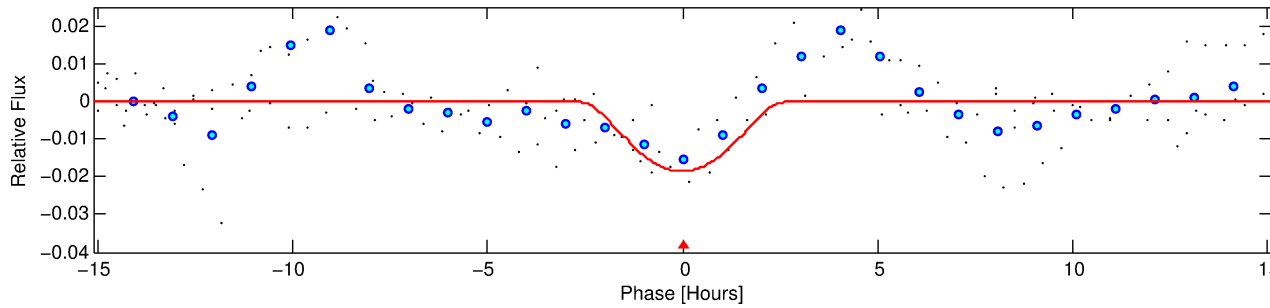
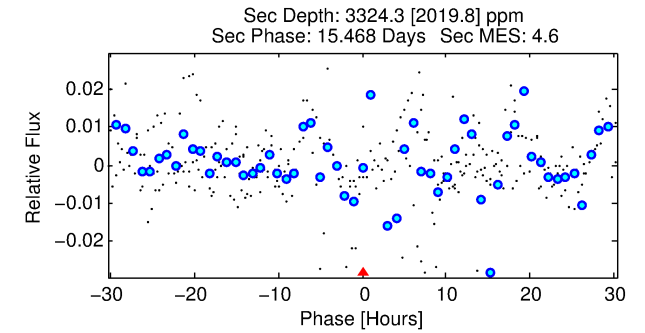
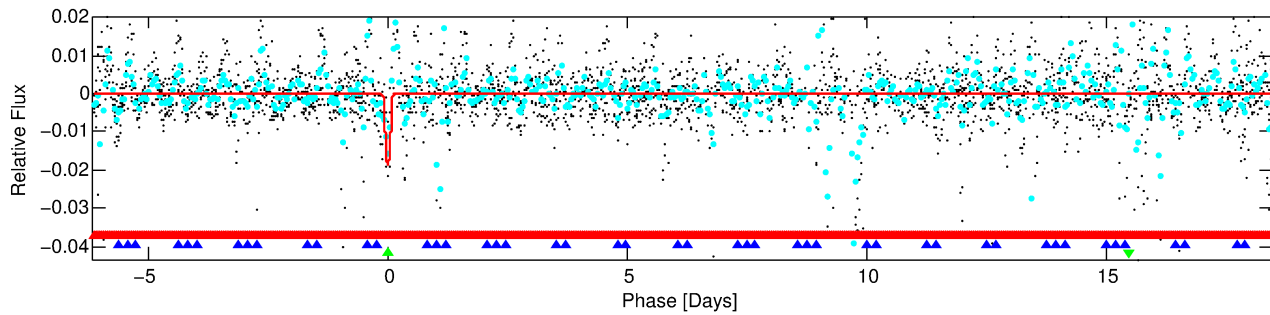
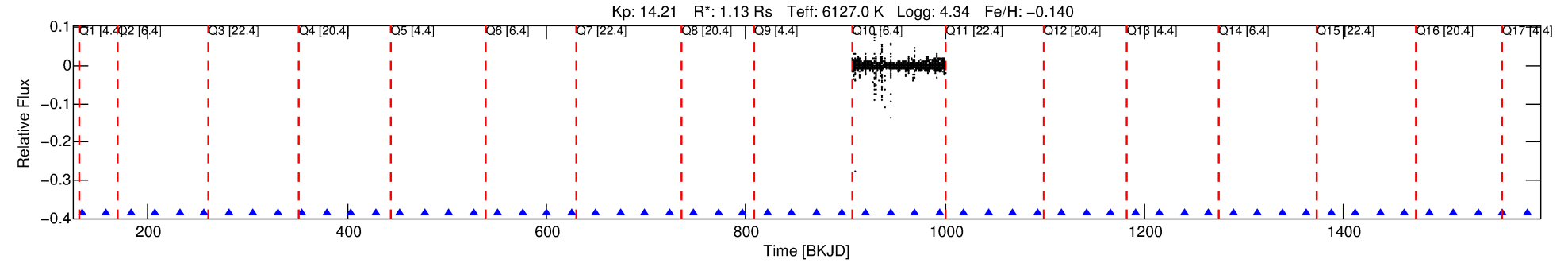
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004139673-03

No Significant Match Found

# DV One-Page Summary

KIC: 4139673 Candidate: 3 of 3 Period: 24.591 d



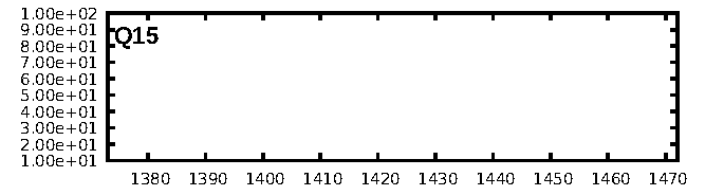
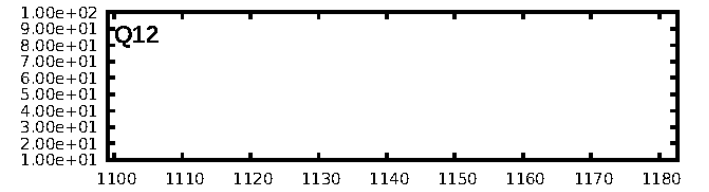
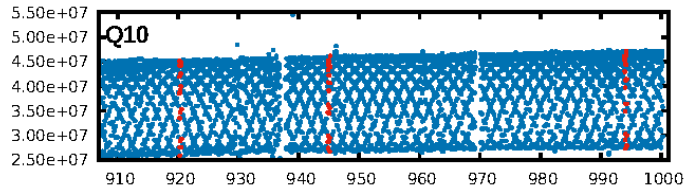
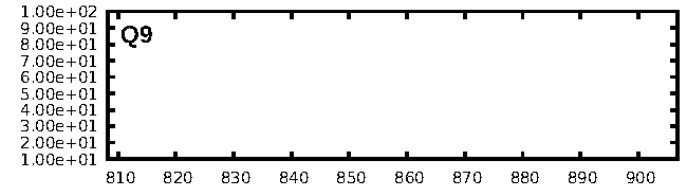
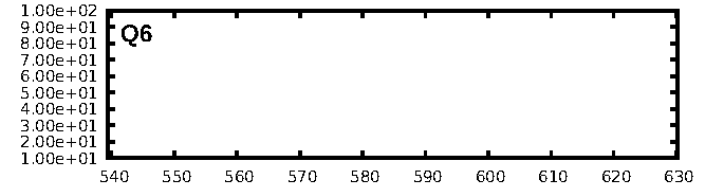
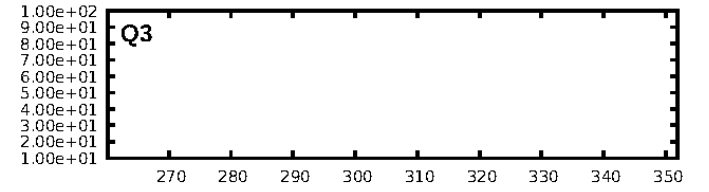
## DV Fit Results:

Period = 24.59102 [0.00865] d  
Epoch = 133.4648 [0.2826] BKJD  
Rp/R\* = 0.1713 [0.2937]  
a/R\* = 26.77 [11.87]  
b = 0.93 [0.53]  
Seff = 58.45 [23.37]  
Teq = 705 [70] K  
Rp = 21.16 [36.88] Re  
a = 0.1664 [0.0430] AU  
Ag = 113.10 [396.14] [0.28σ]  
Teffp = 3555 [3099] K [0.92σ]

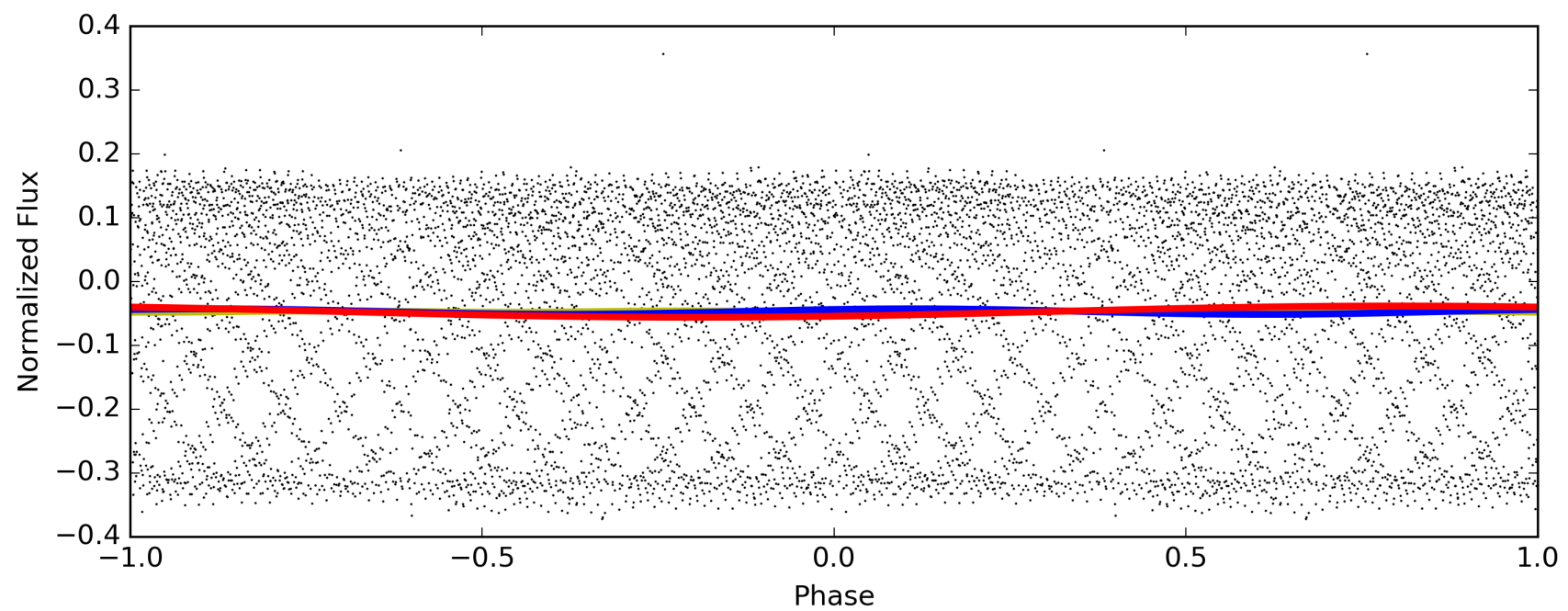
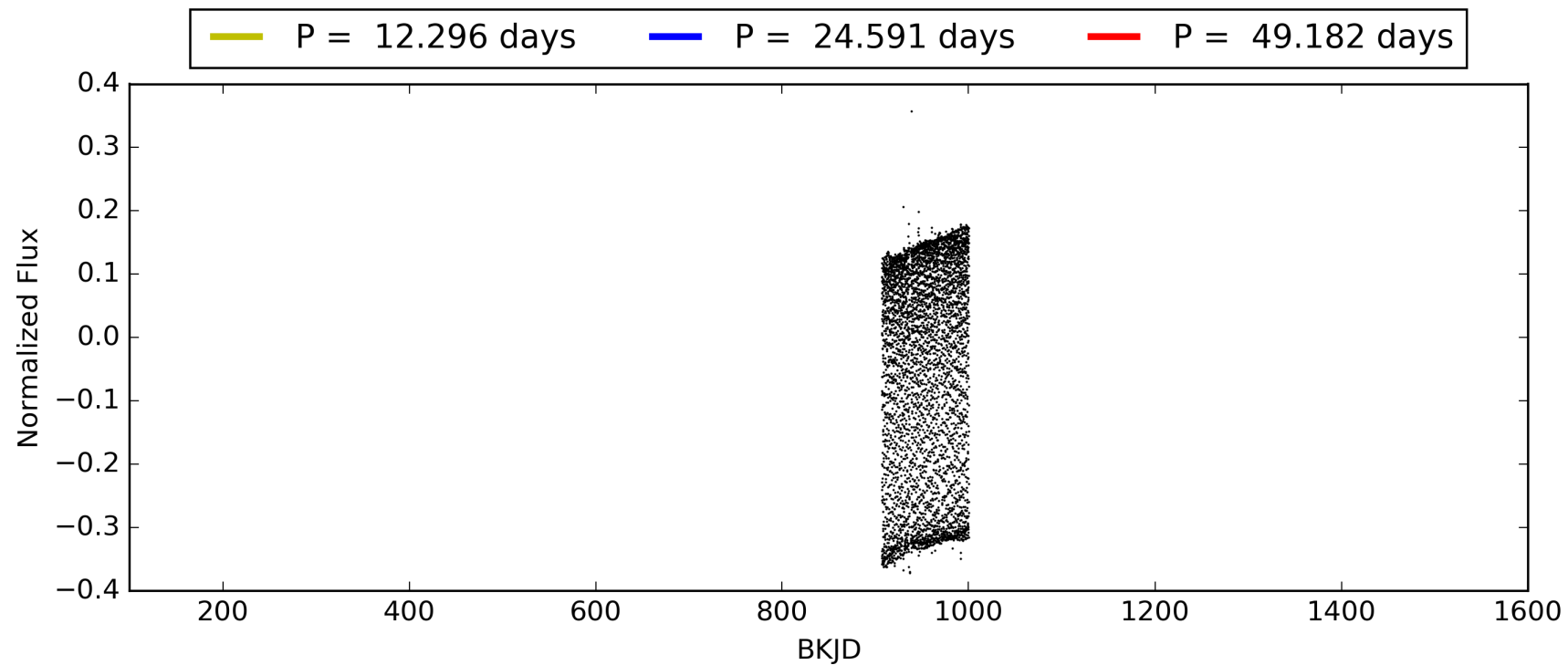
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [107.64σ]  
LongPeriod-sig: 100.0% [26.74σ]  
ModelChiSquare2-sig: 18.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.50e-11  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.877  
Centroid-sig: N/A  
Centroid-so: 0.087 arcsec [1.30σ]  
OotOffset-rm: 0.393 arcsec [5.89σ]  
KicOffset-rm: 0.617 arcsec [9.24σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/1]

# TCE 004139673-03, PDC Light Curves

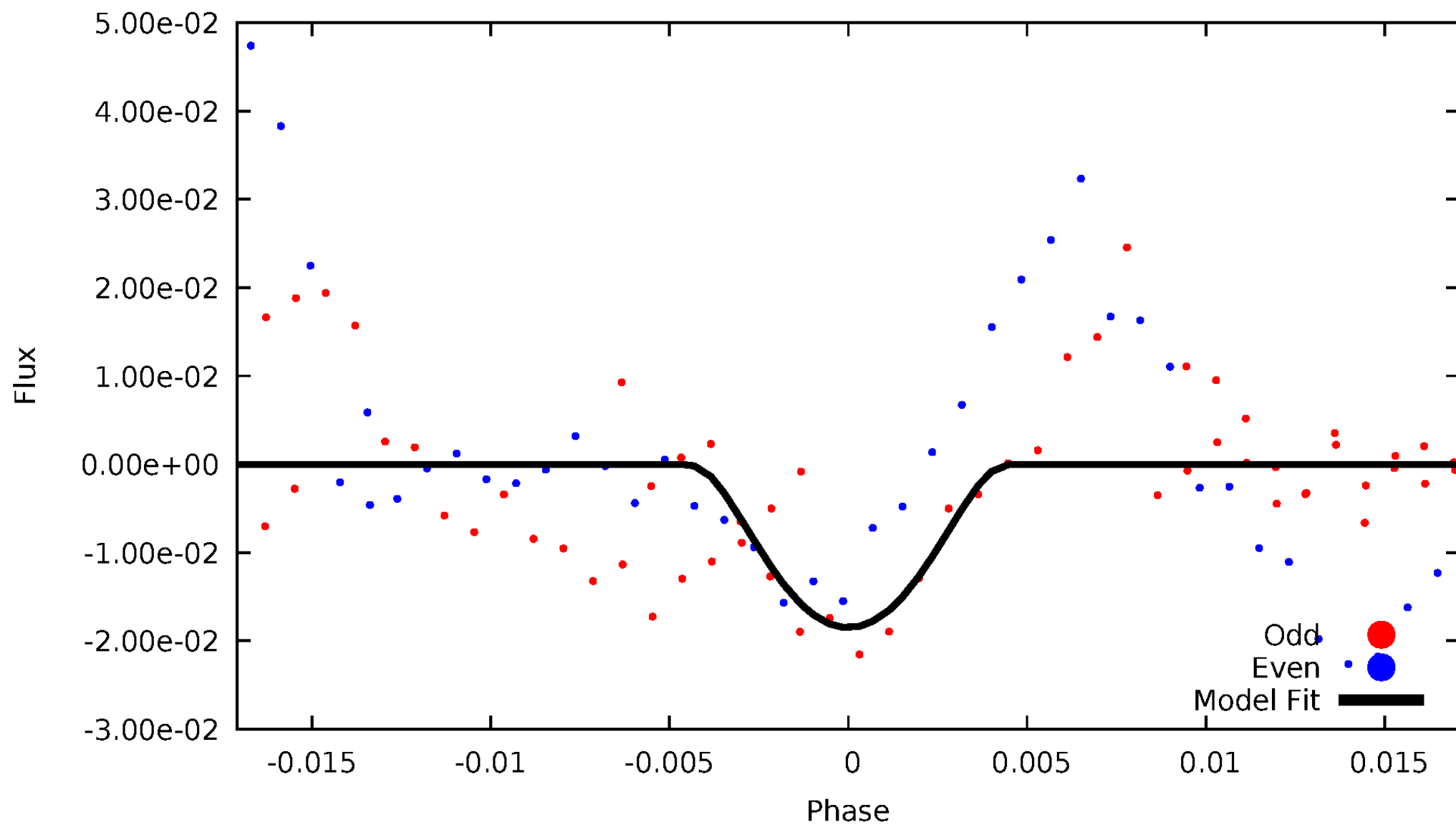


TCE 004139673-03



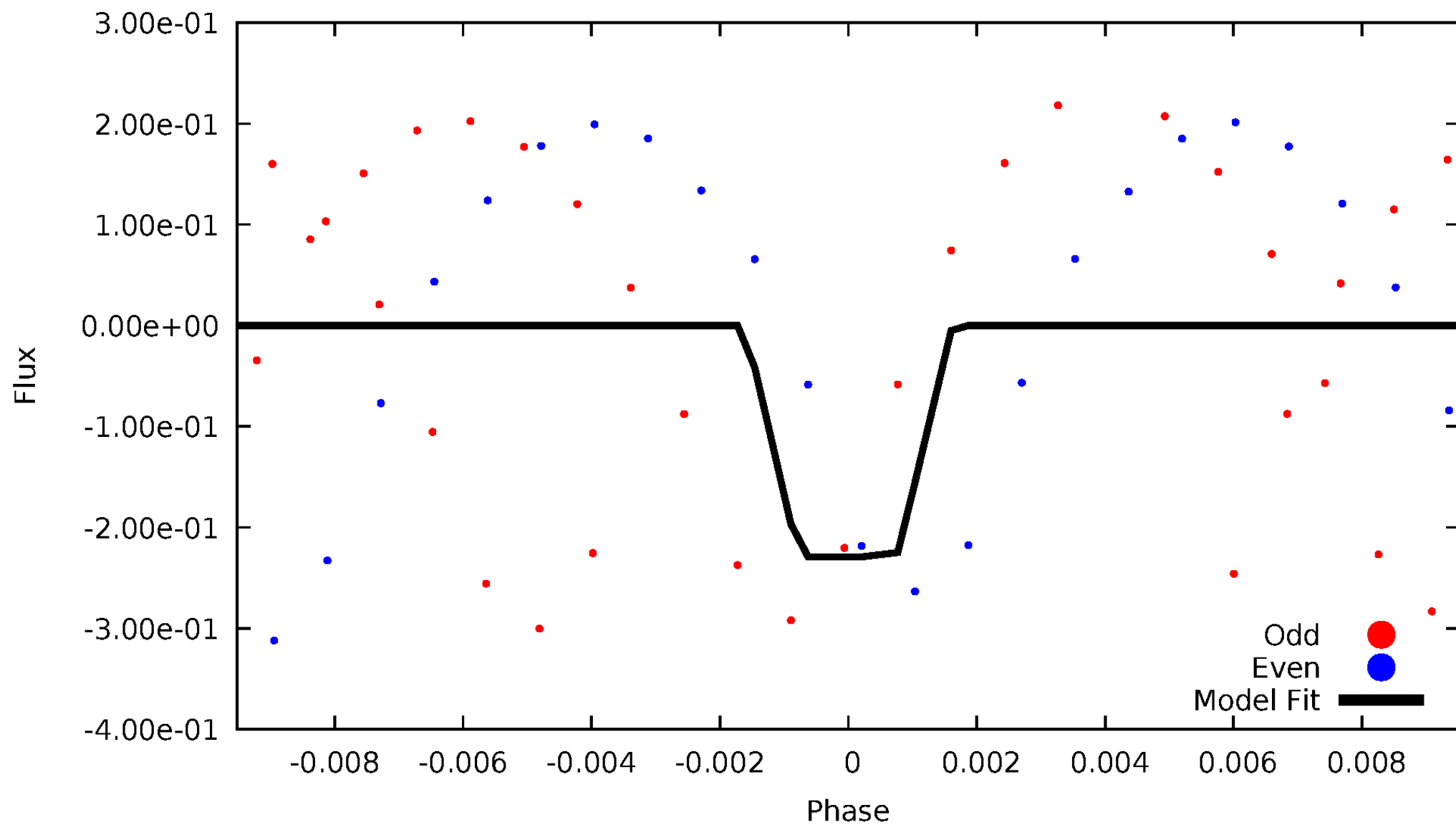
# DV Odd/Even

TCE 004139673-03



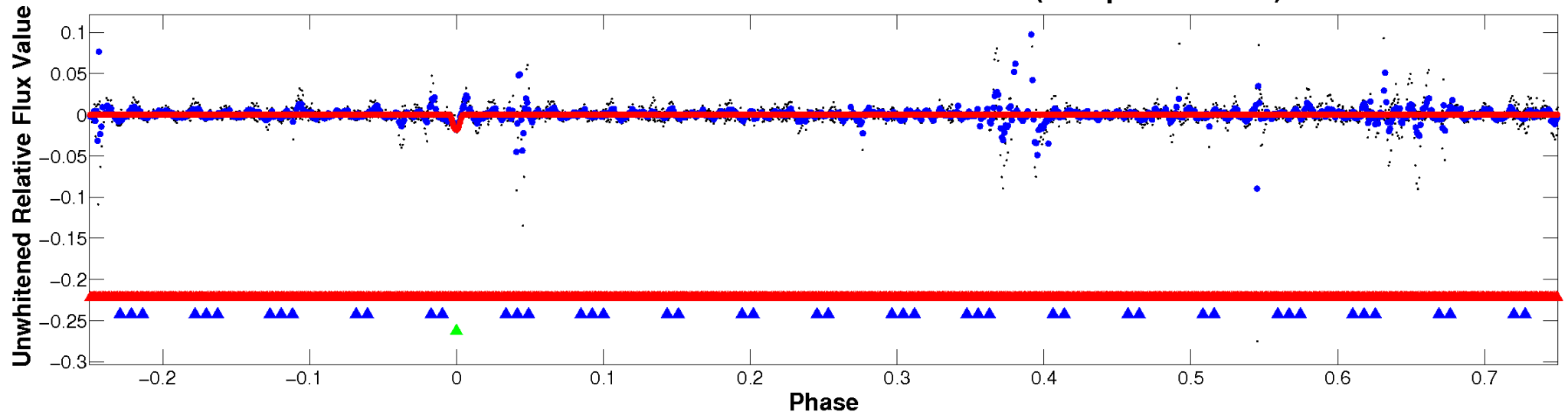
# ALT Odd/Even

TCE 004139673-03

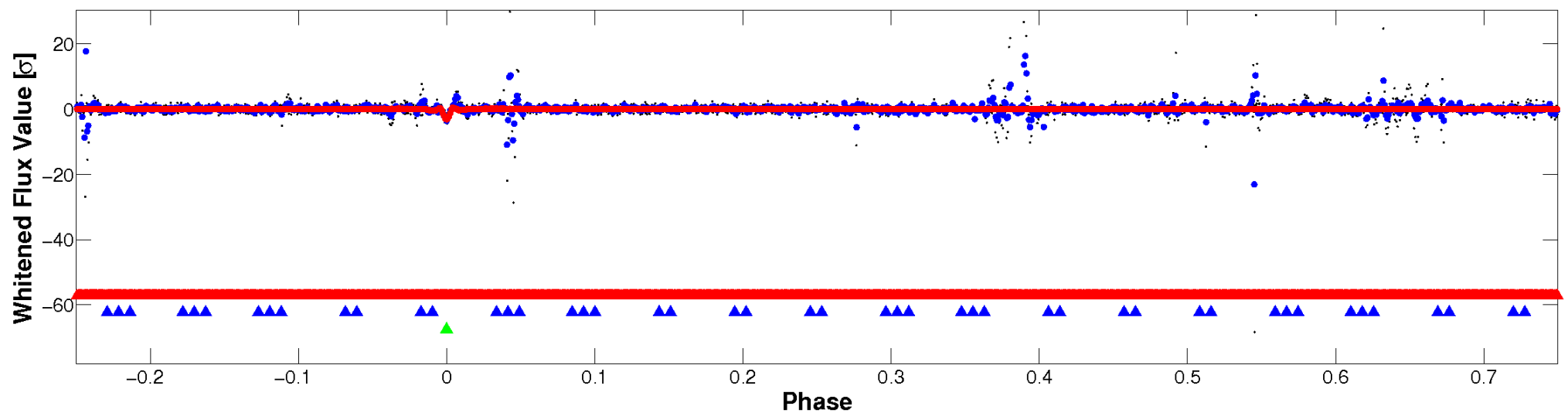


# Non-Whitened Vs. Whitened Light Curve

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

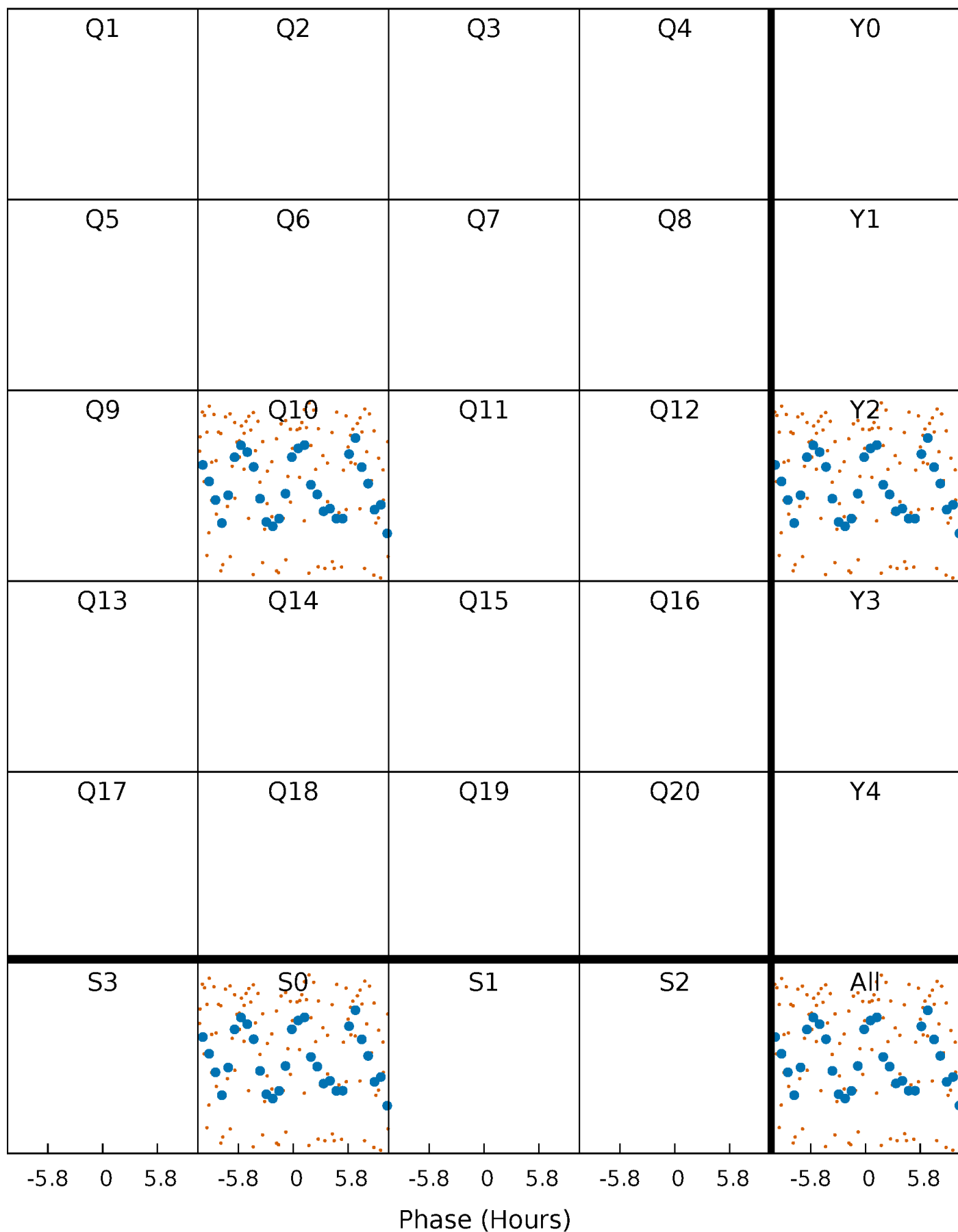


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

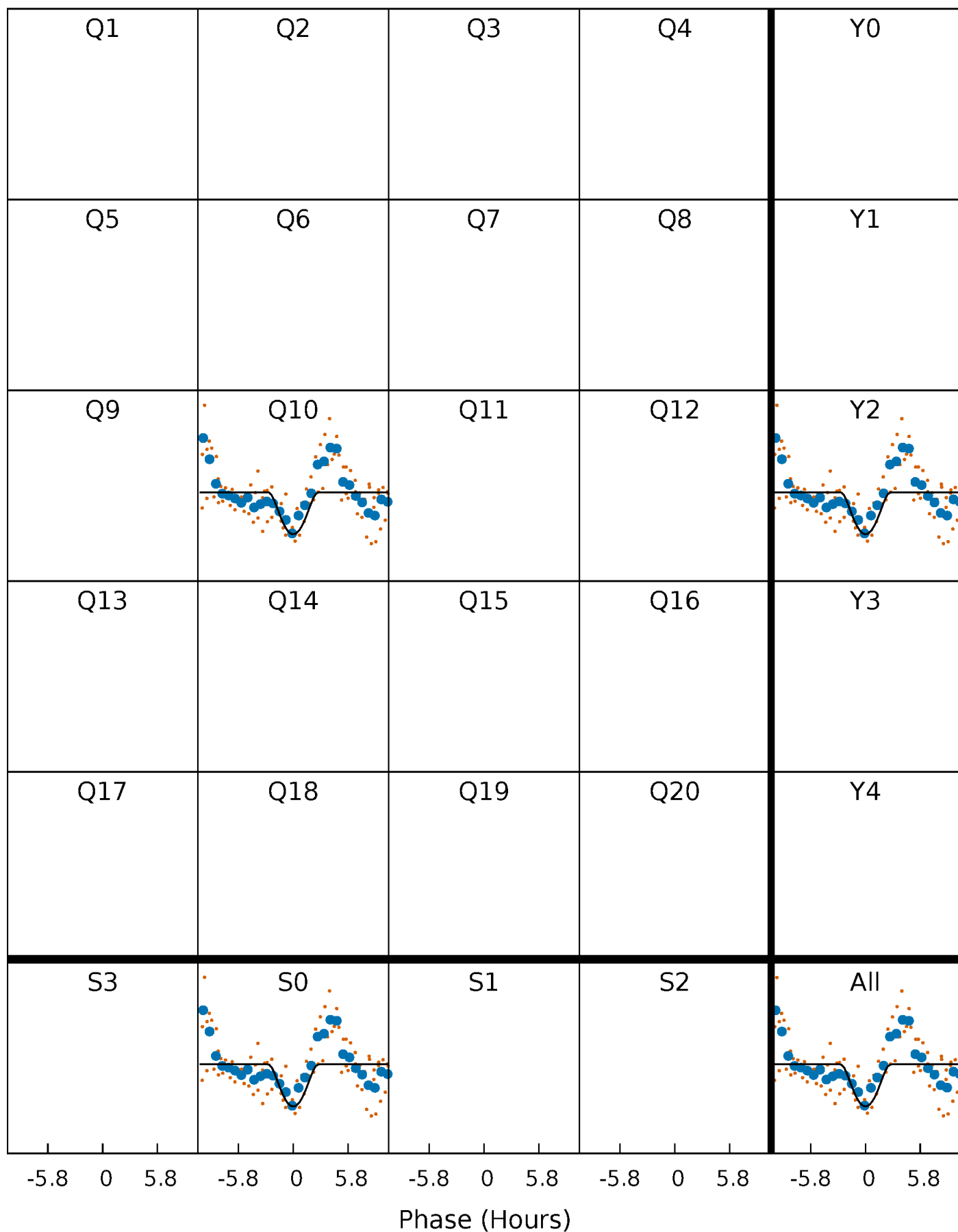
TCE 004139673-03 P= 24.591023 Days  $T_0=133.464815$  (BKJD)





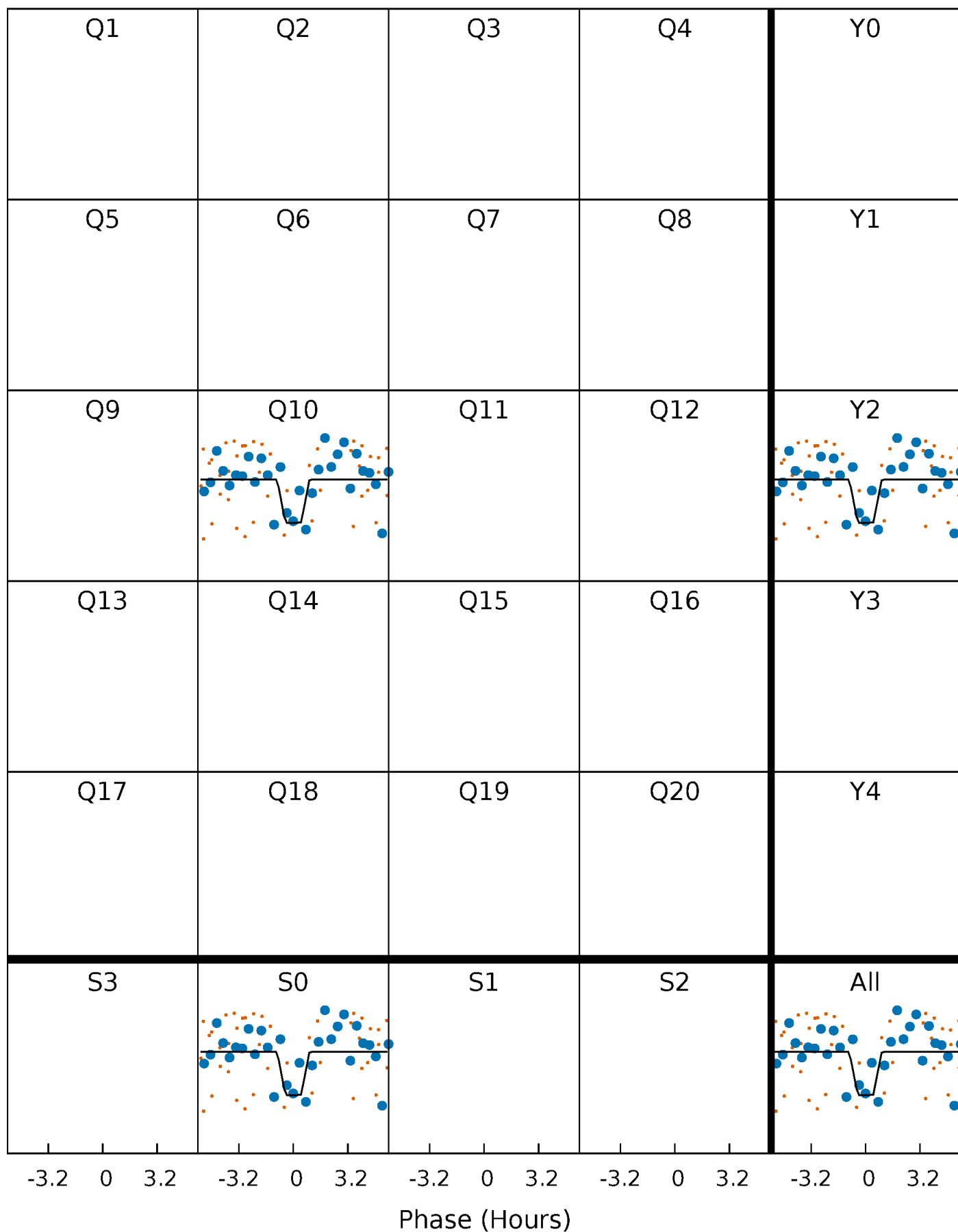
# DV Quarter-Phased Transit Curves

TCE 004139673-03     $P = 24.591023$  Days     $T_0 = 133.464815$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

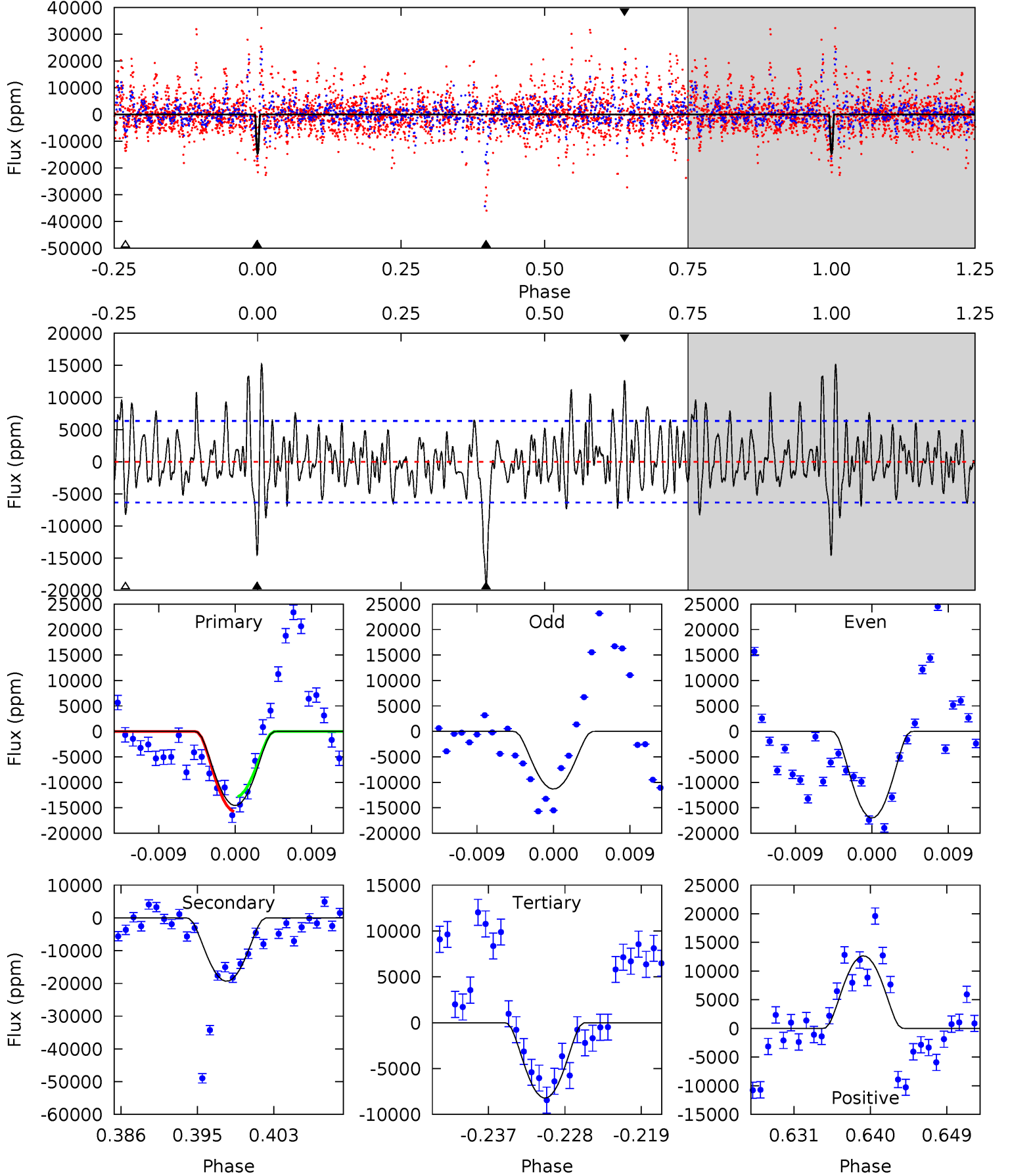
TCE 004139673-03   P= 24.567996 Days    $T_0=134.335997$  (BKJD)



# DV Model-Shift Uniqueness Test

004139673-03, P = 24.591023 Days, E = 133.464815 Days

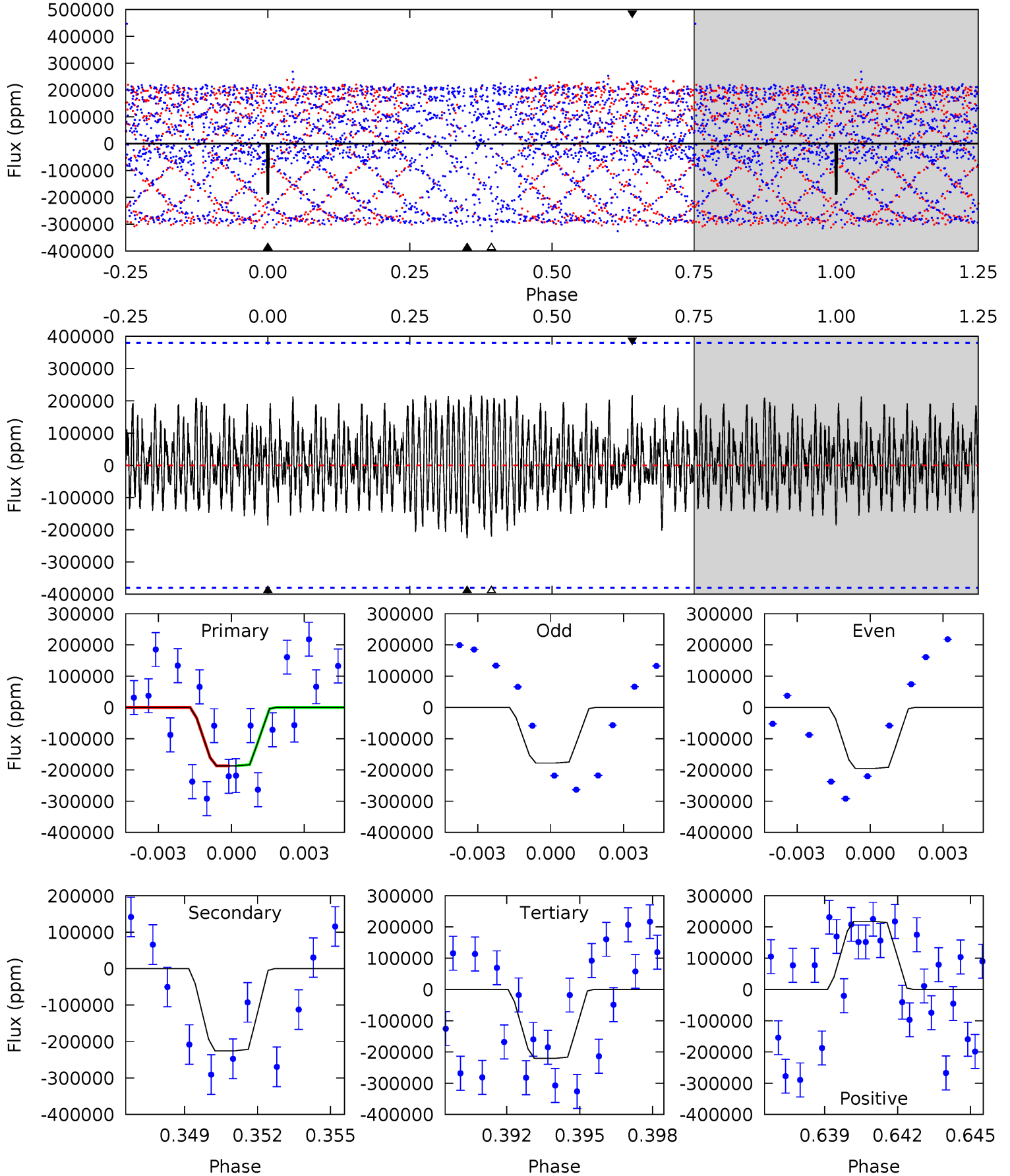
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	15.4	6.55	10.1	5.05	2.62	2.74	5.04	1.51	8.85	5.32	1.64	1.11	0.44	1.16



# Alt Model-Shift Uniqueness Test

004139673-03, P = 24.567996 Days, E = 134.335997 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.58	3.12	3.05	3.01	5.25	2.96	1.15	-0.47	-0.43	0.06	0.10	0.12	1.00	0.49	0.00



### Stellar Parameters For KIC 004139673

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6127^{+193}_{-236}$	$4.337^{+0.132}_{-0.198}$	$-0.140^{+0.250}_{-0.300}$	$1.132^{+0.355}_{-0.191}$	$1.014^{+0.167}_{-0.111}$	$0.984^{+0.598}_{-0.499}$
	+3%/-4%	+3%/-5%	+179%/-214%	+31%/-17%	+16%/-11%	+61%/-51%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004139673-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-19329 \pm 1256$	$34.09^{+30.17}_{-22.17}$	$991^{+75}_{-63}$	$4562^{+2905}_{-930}$	$261^{+1794}_{-188}$
Alt.	$-225423 \pm 72326$	$63.35^{+38.77}_{-34.90}$	$986^{+83}_{-63}$	$6333^{+4311}_{-1376}$	$1153^{+4806}_{-779}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = 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  $A_{\text{obs}} \gg 1.0$

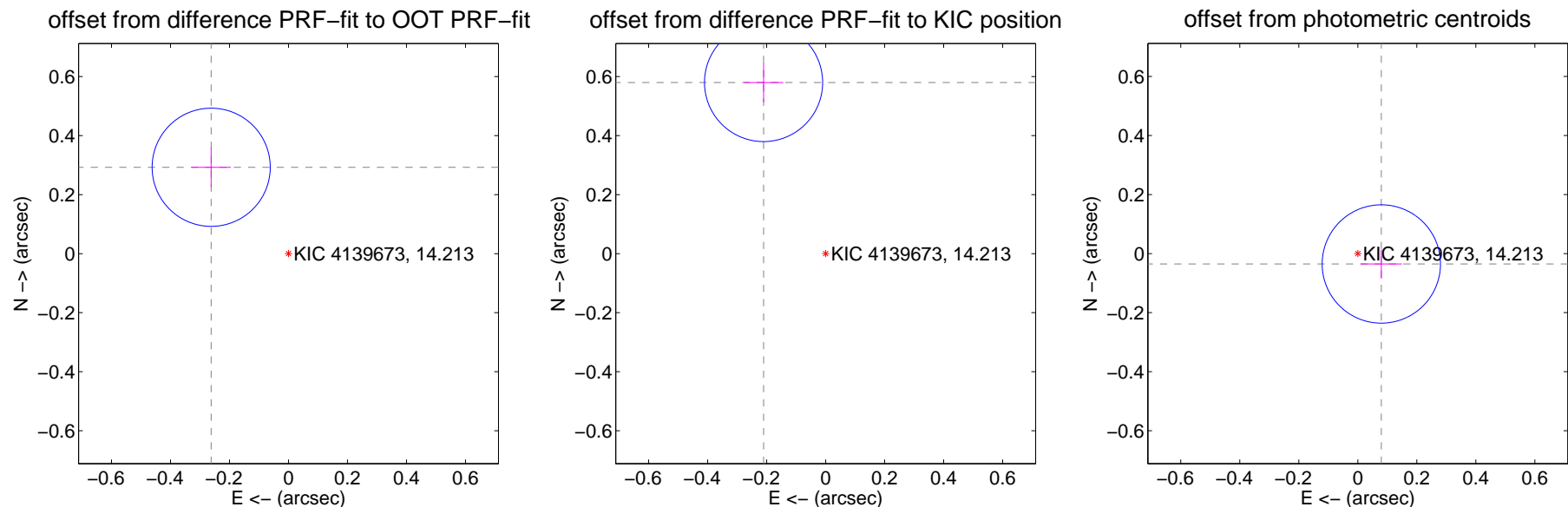
## DV Centroid Data

Supplemental centroid analysis for 004139673-03. Kepler magnitude: 14.21. Transit SNR 9.38

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 / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.393 \pm 0.067$	5.89	$0.262 \pm 0.067$	$0.293 \pm 0.067$
PRF-fit source offset from KIC position	$0.617 \pm 0.067$	9.24	$0.210 \pm 0.067$	$0.580 \pm 0.067$
photometric centroid source offset	$0.09 \pm 0.07$	1.30	$-0.08 \pm 0.07$	$-0.04 \pm 0.05$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

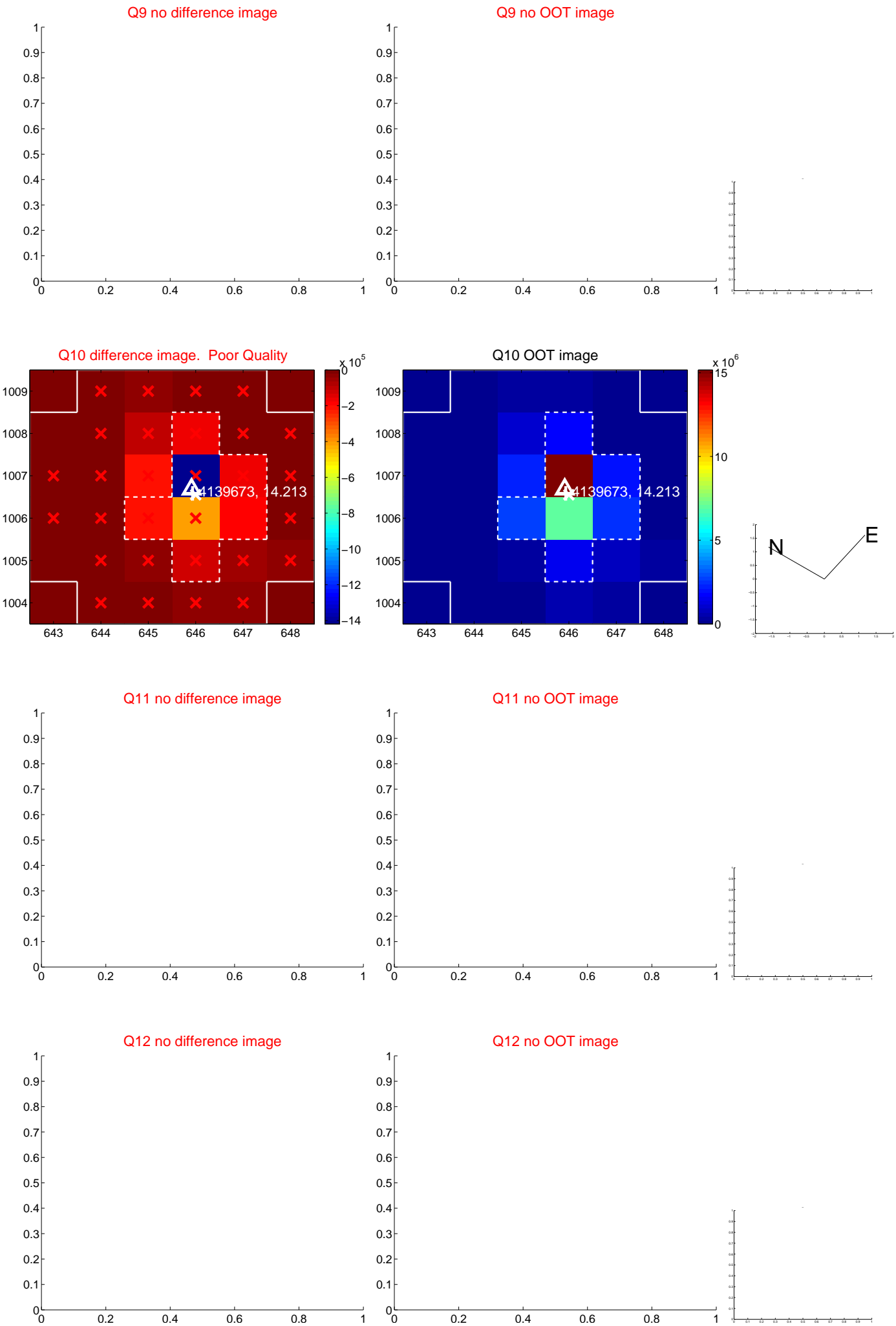


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





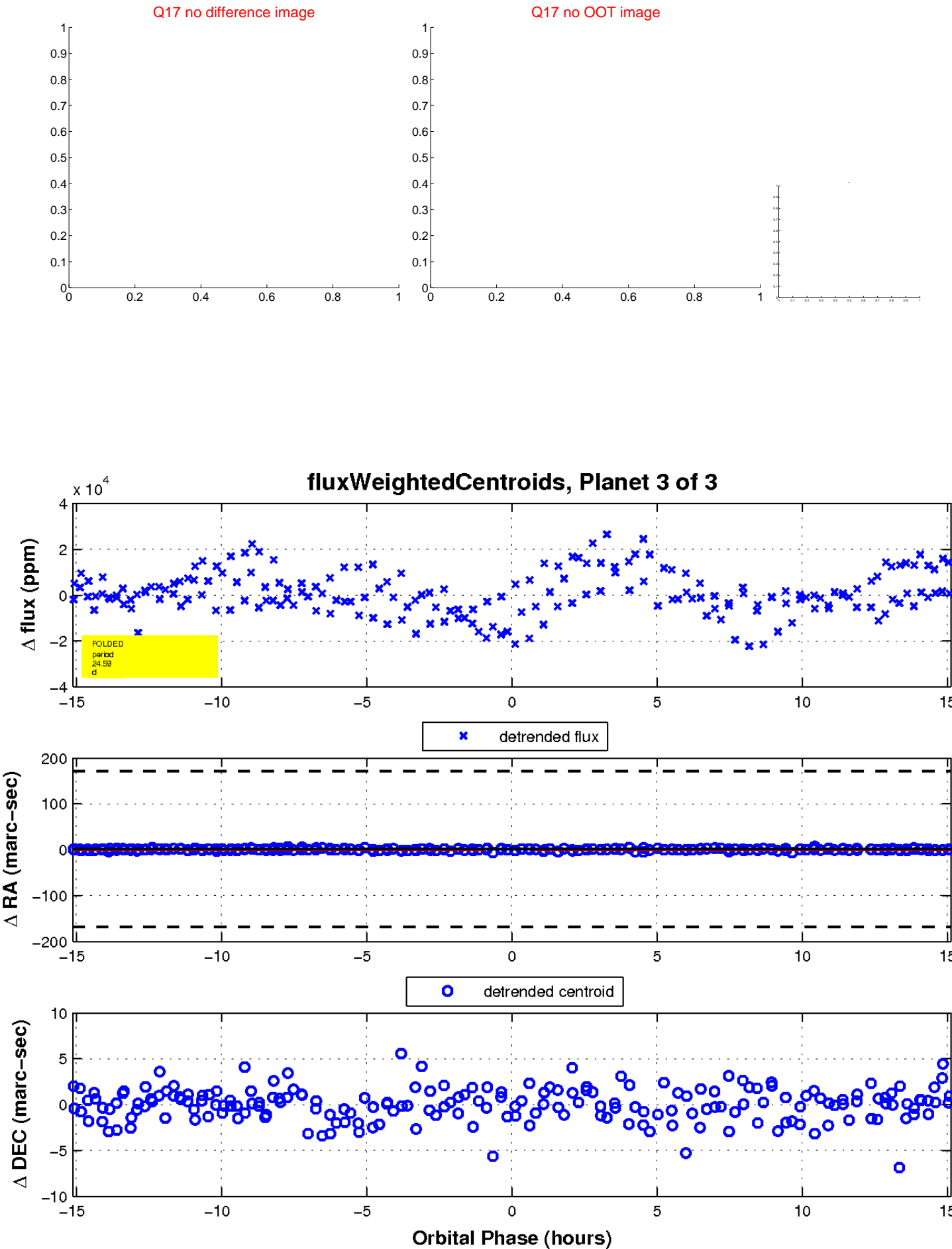
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

