

# KIC 006774679

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006774679-01	OBS	No	608.995941	302.665847	2183.2	3.931	16.5	6.8	0.69	4935	3.15	0.17
006774679-02	OBS	No	428.902212	499.383527	1499.7	3.462	18.6	4.1	0.69	4935	2.69	0.26

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006774679-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006774679-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

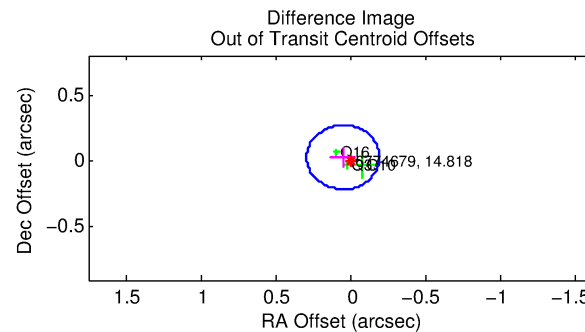
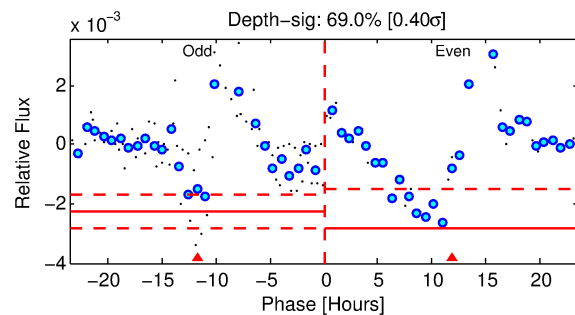
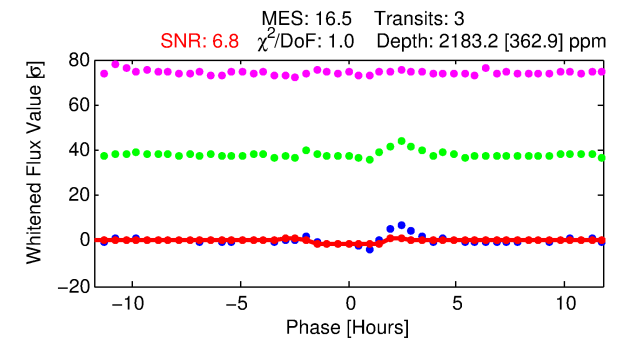
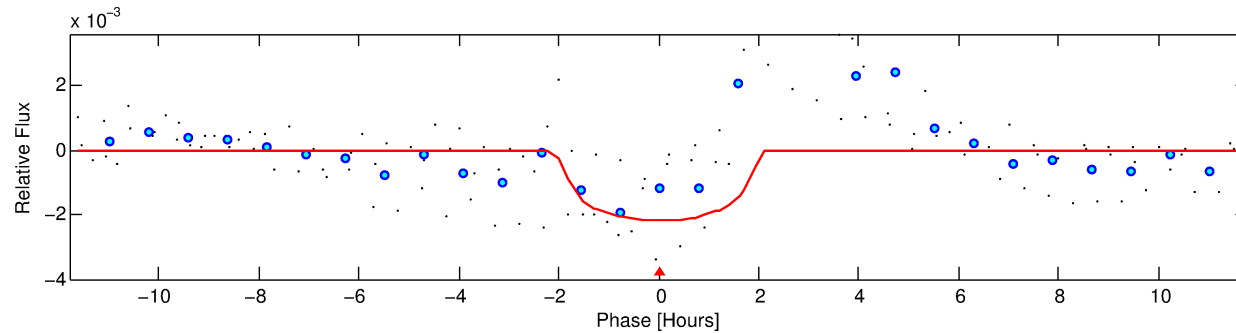
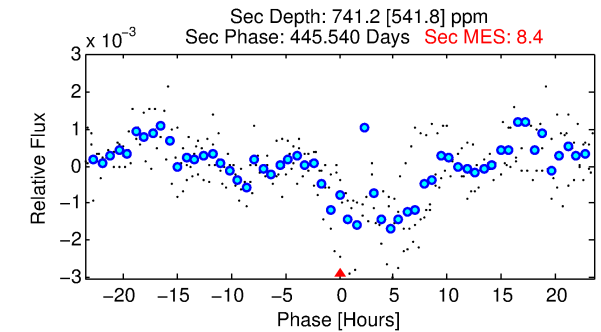
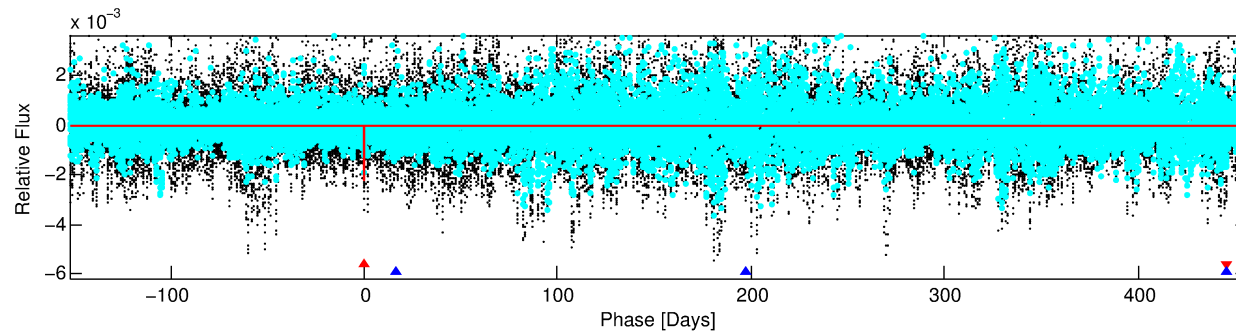
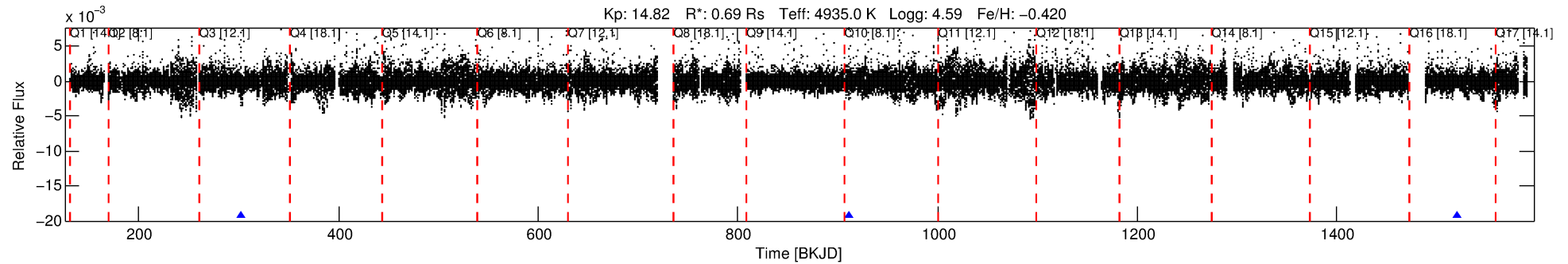
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006774679-01

No Significant Match Found

# DV One-Page Summary

KIC: 6774679 Candidate: 1 of 2 Period: 608.996 d



## DV Fit Results:

Period = 608.99594 [0.00389] d  
Epoch = 302.6658 [0.0063] BKJD  
Rp/R\* = 0.0422 [0.0616]  
a/R\* = 1177.13 [5948.40]  
b = 0.31 [14.88]  
Seff = 0.17 [0.03]  
Teq = 163 [7] K  
Rp = 3.15 [4.61] Re  
a = 1.2272 [0.1023] AU  
Ag = 61850.13 [186363.99] [0.33 $\sigma$ ]  
Teffp = 3966 [2987] K [1.27 $\sigma$ ]

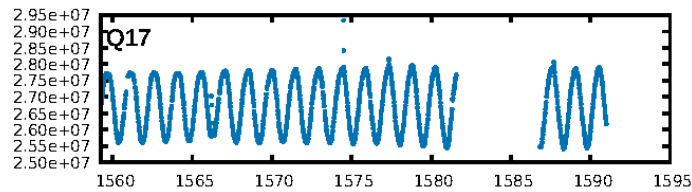
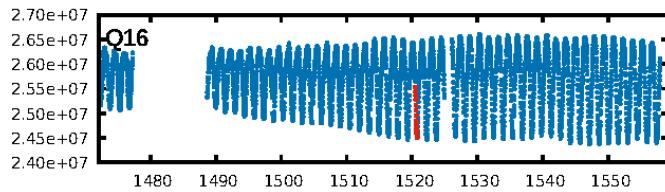
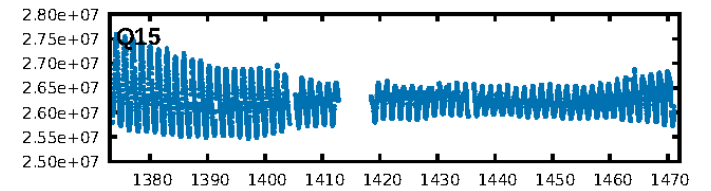
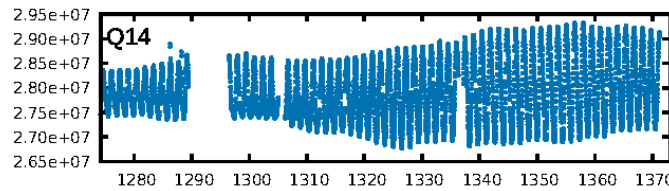
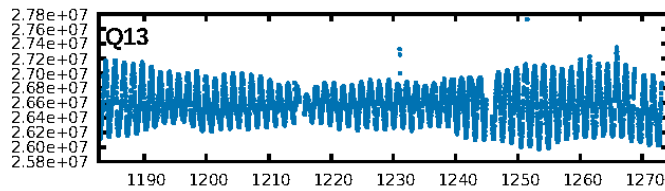
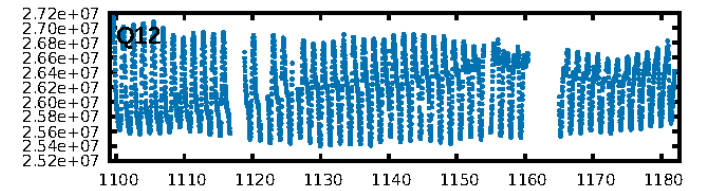
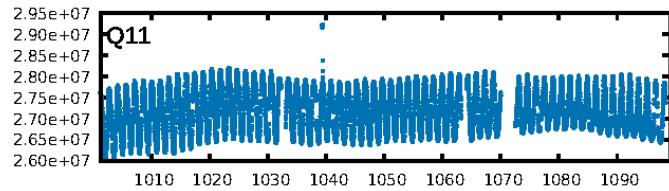
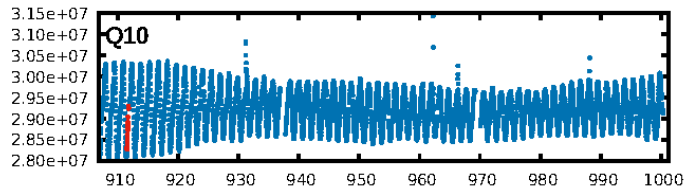
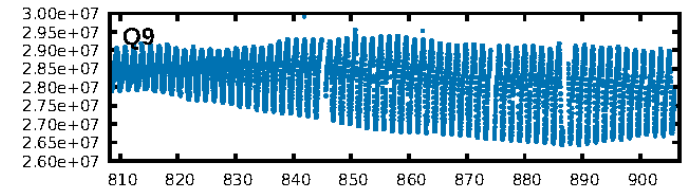
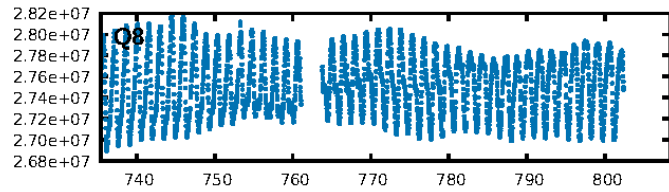
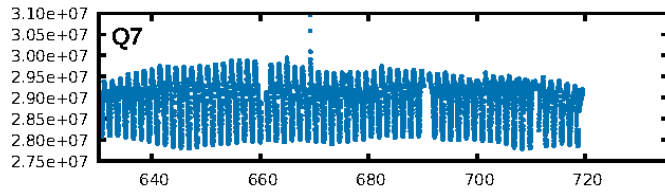
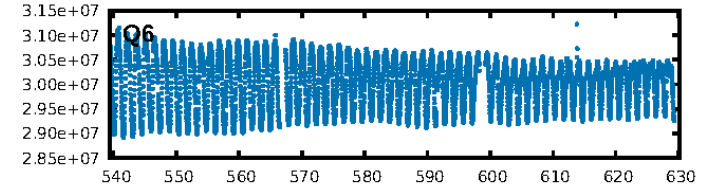
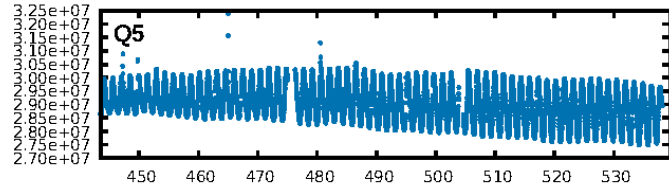
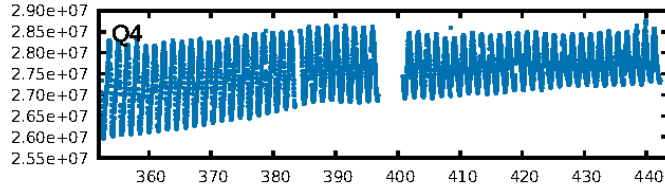
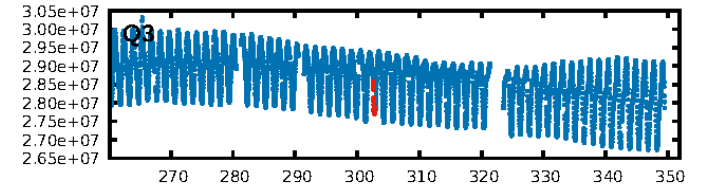
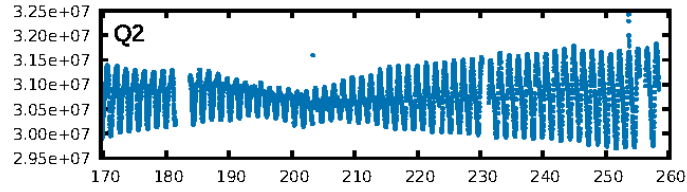
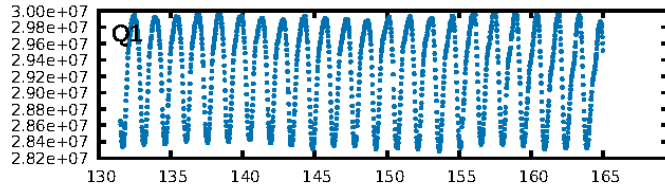
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [825.15 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 2.1%  
ModelChiSquareGof-sig: 90.4%  
Bootstrap-pfa: 9.25e-13  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.362  
Centroid-sig: 4.5%  
Centroid-so: 0.871 arcsec [1.54 $\sigma$ ]  
OotOffset-rm: 0.056 arcsec [0.70 $\sigma$ ]  
KicOffset-rm: 0.294 arcsec [3.92 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

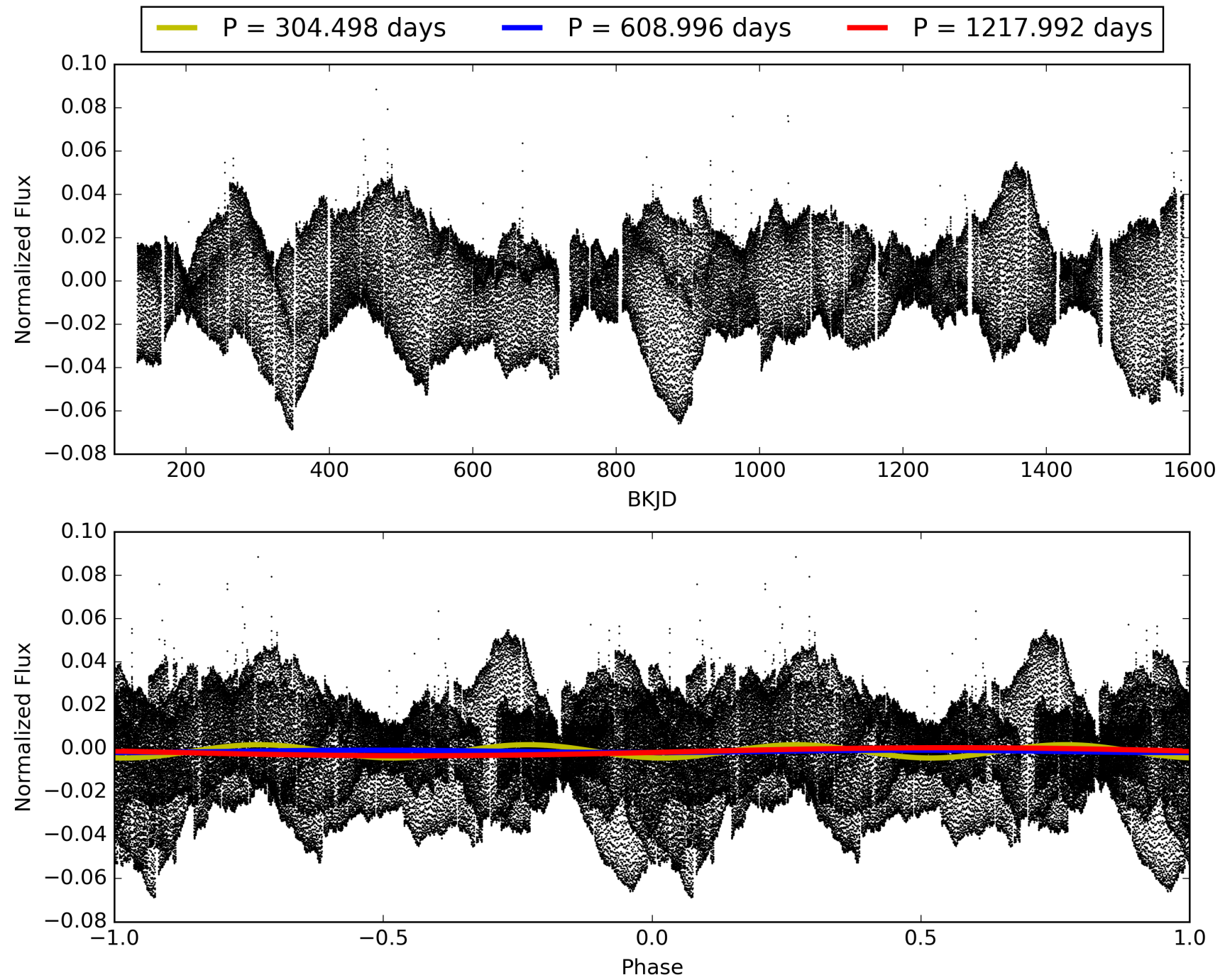
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:07:53 Z

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

# TCE 006774679-01, PDC Light Curves

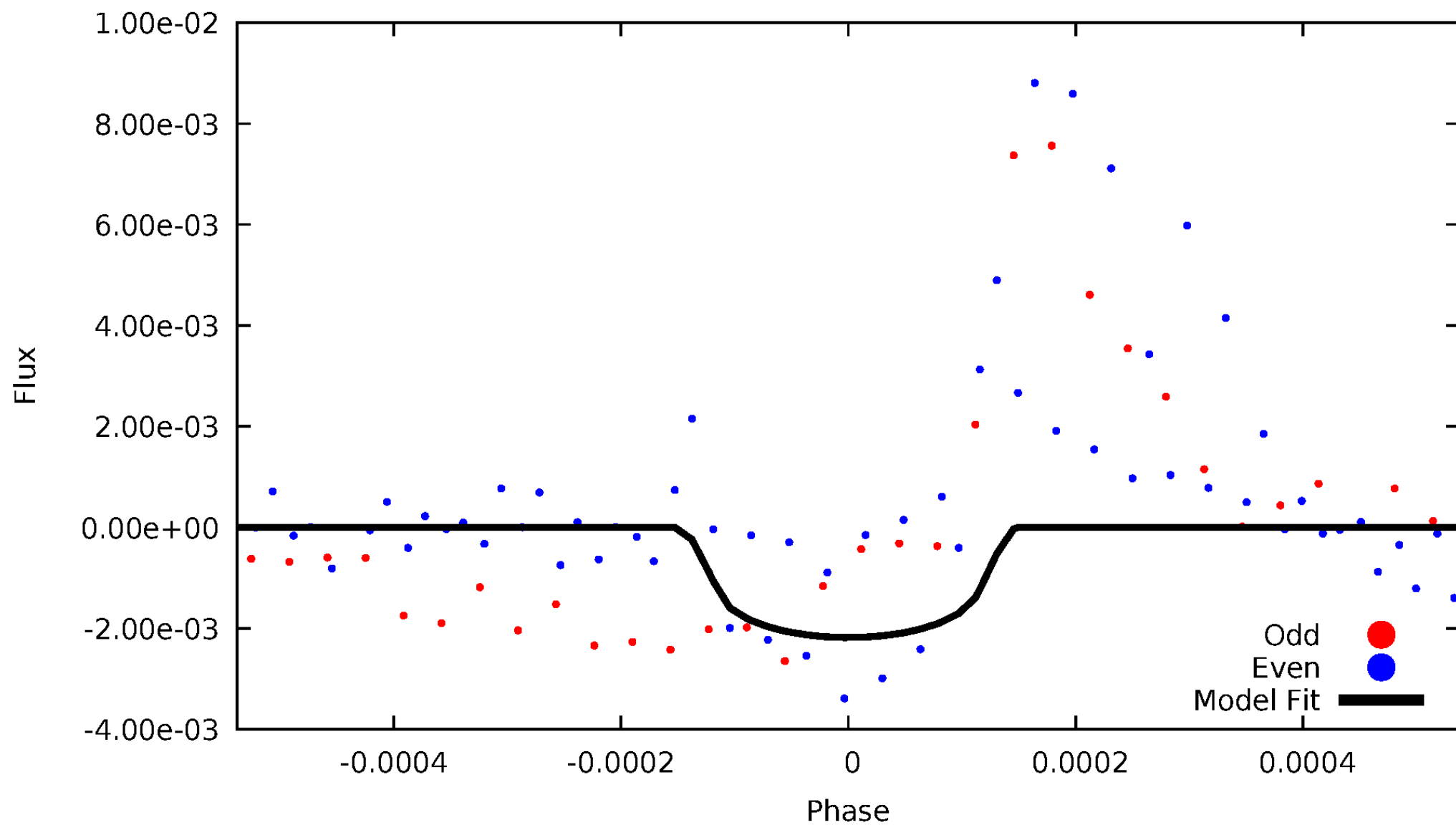


TCE 006774679-01



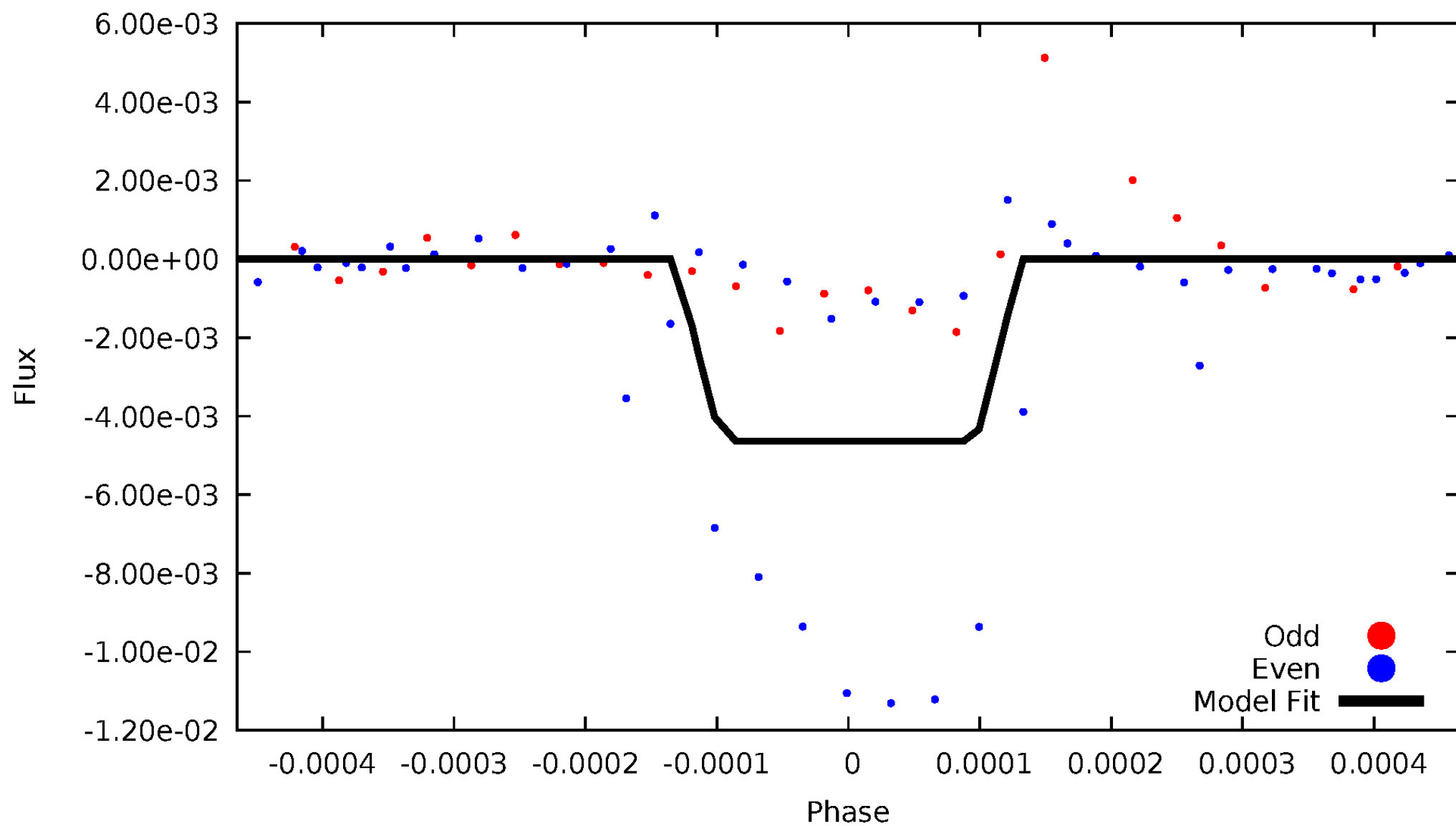
# DV Odd/Even

TCE 006774679-01



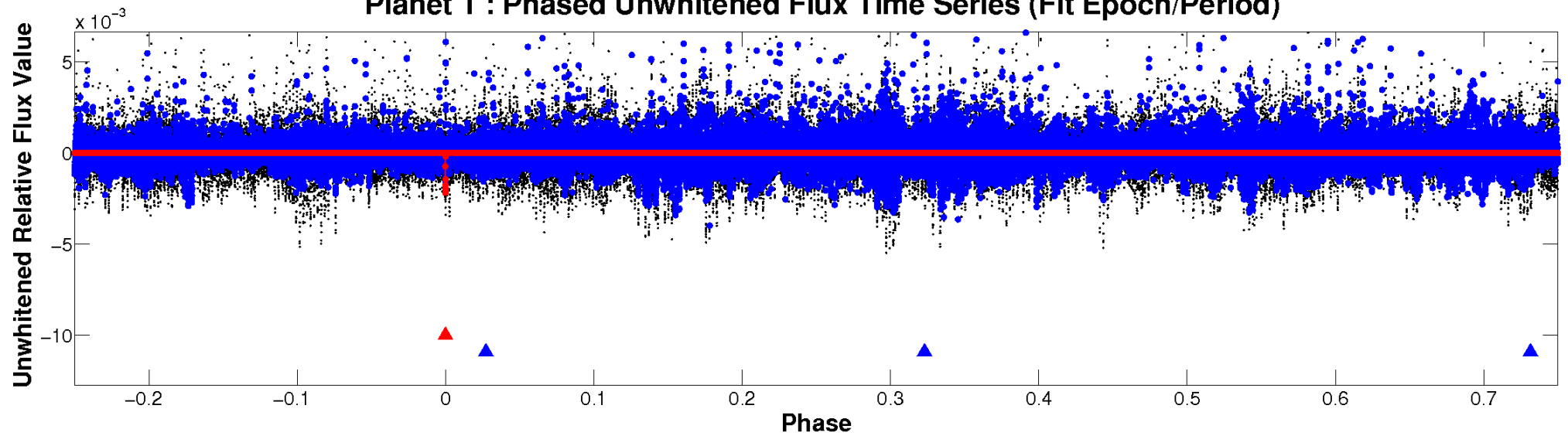
# ALT Odd/Even

TCE 006774679-01

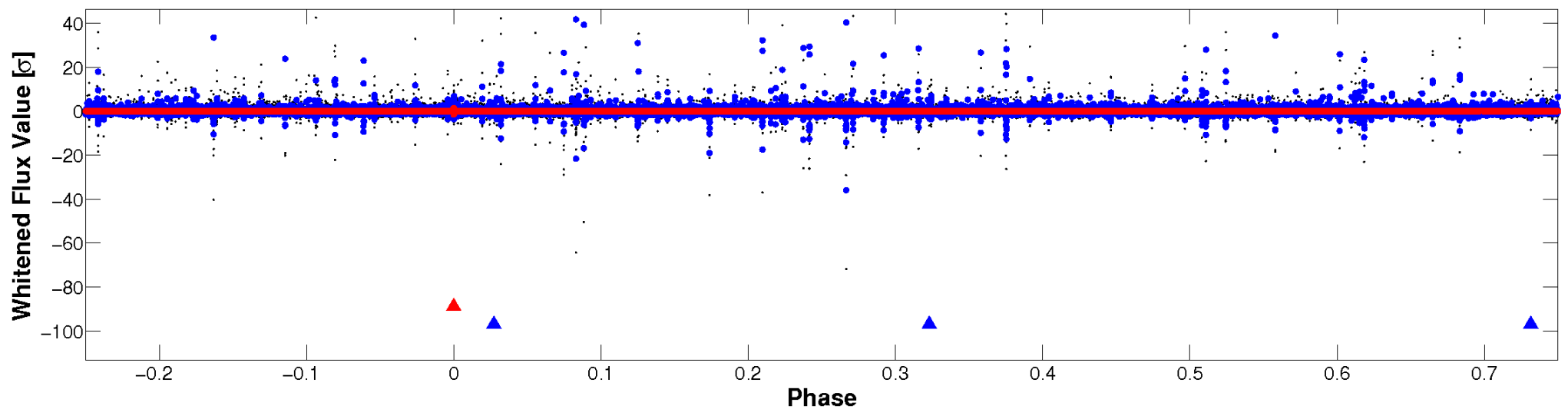


# Non-Whitened Vs. Whitened Light Curve

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

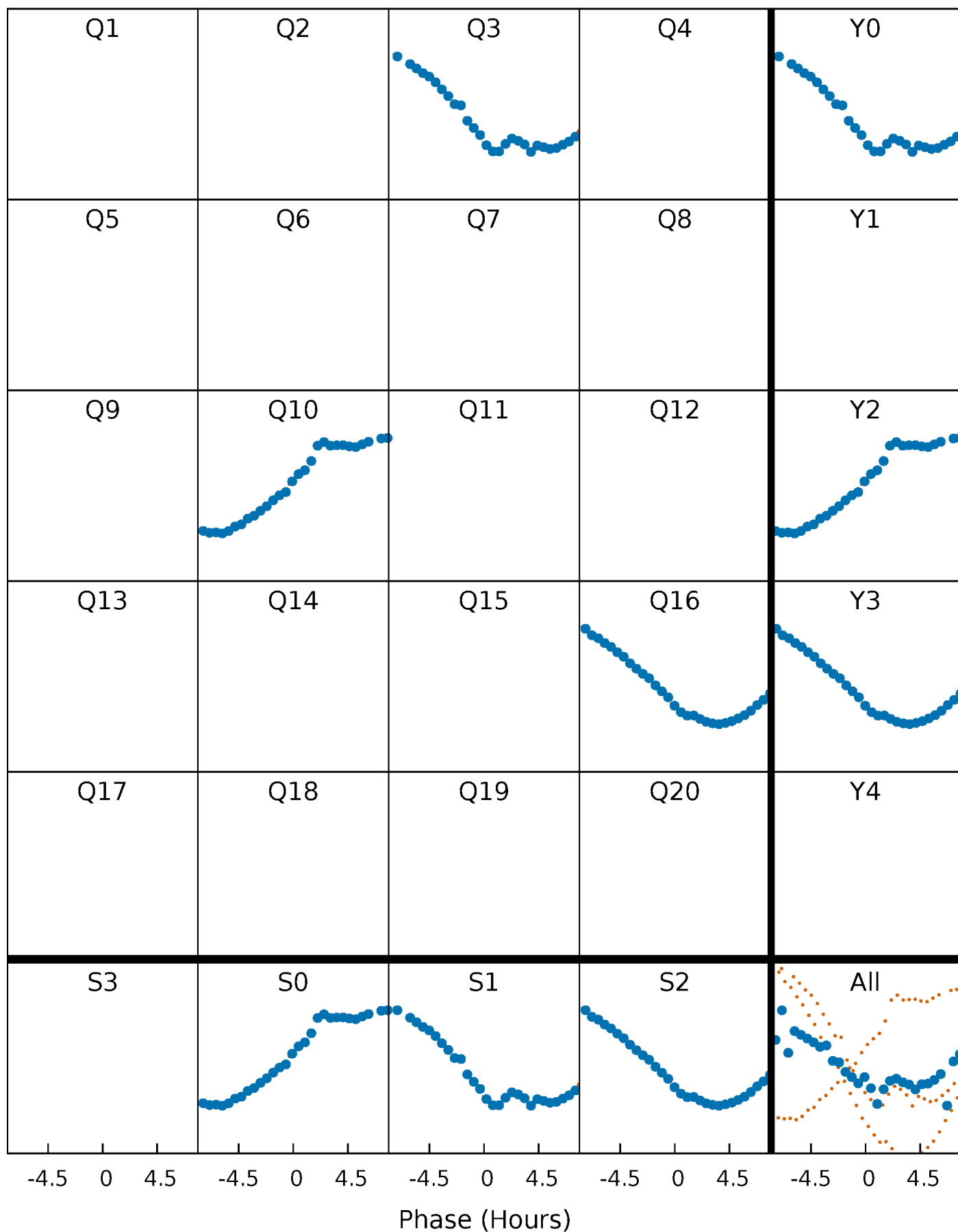


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

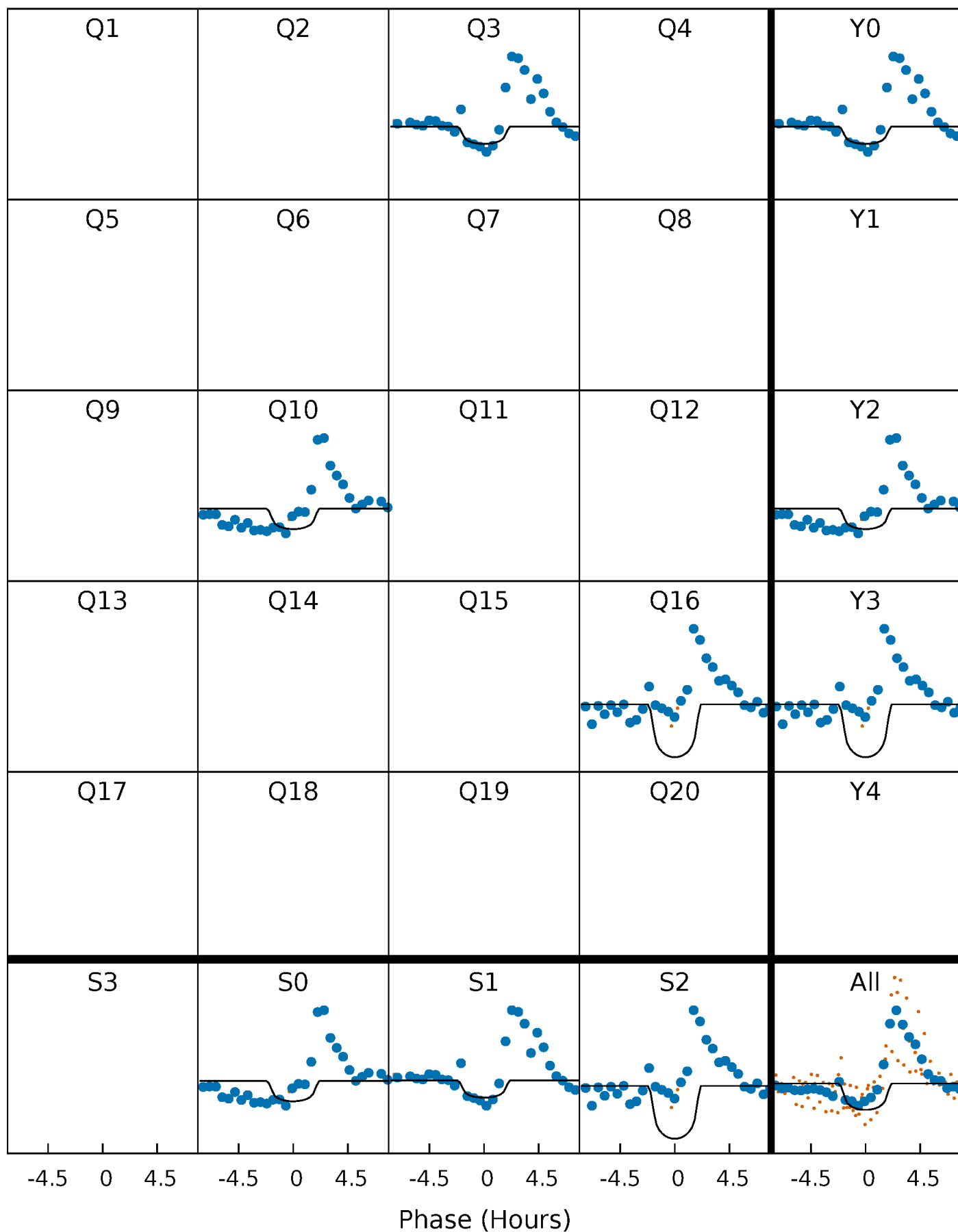
TCE 006774679-01 P=608.995941 Days  $T_0=302.665847$  (BKJD)





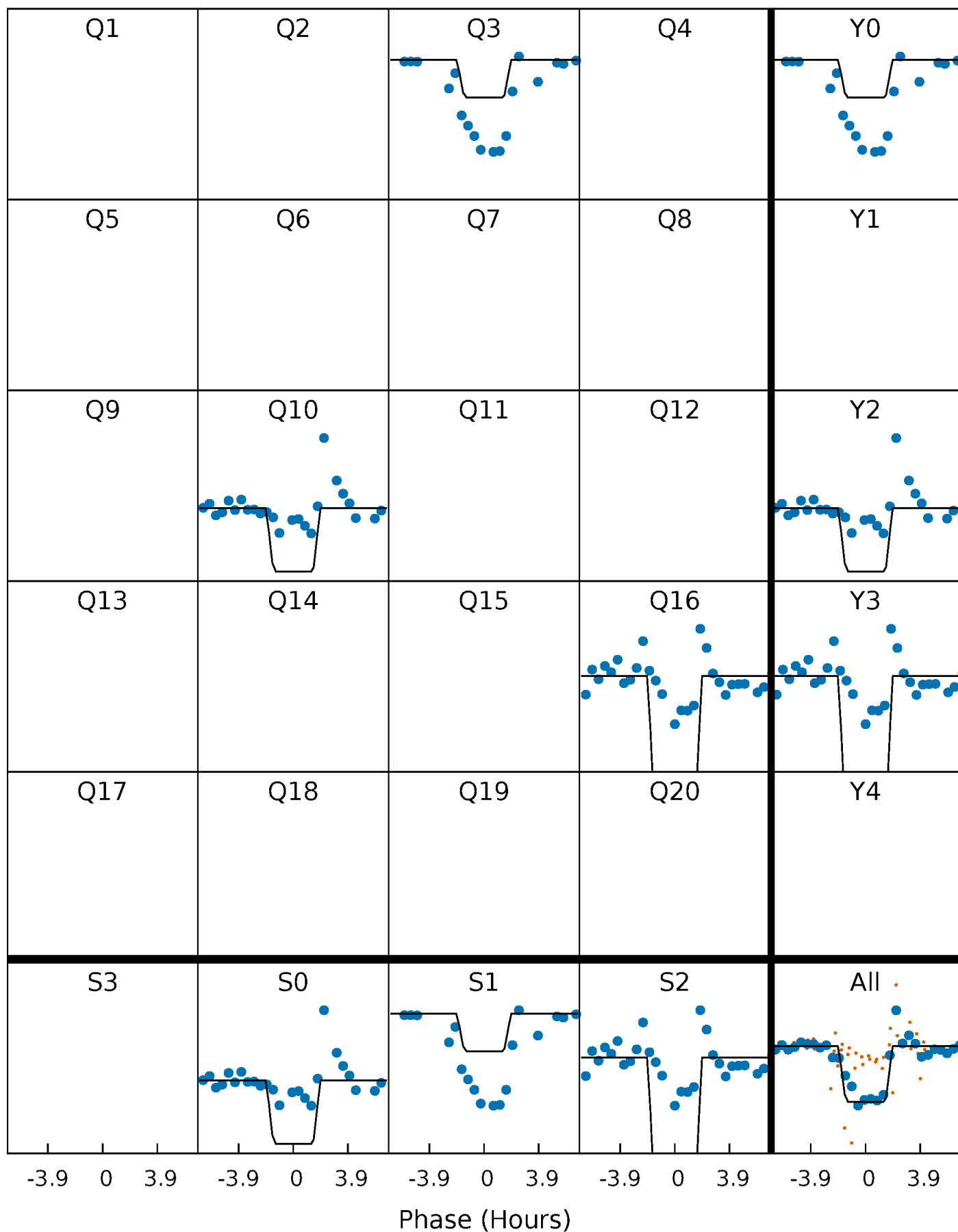
# DV Quarter-Phased Transit Curves

TCE 006774679-01 P=608.995941 Days  $T_0=302.665847$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

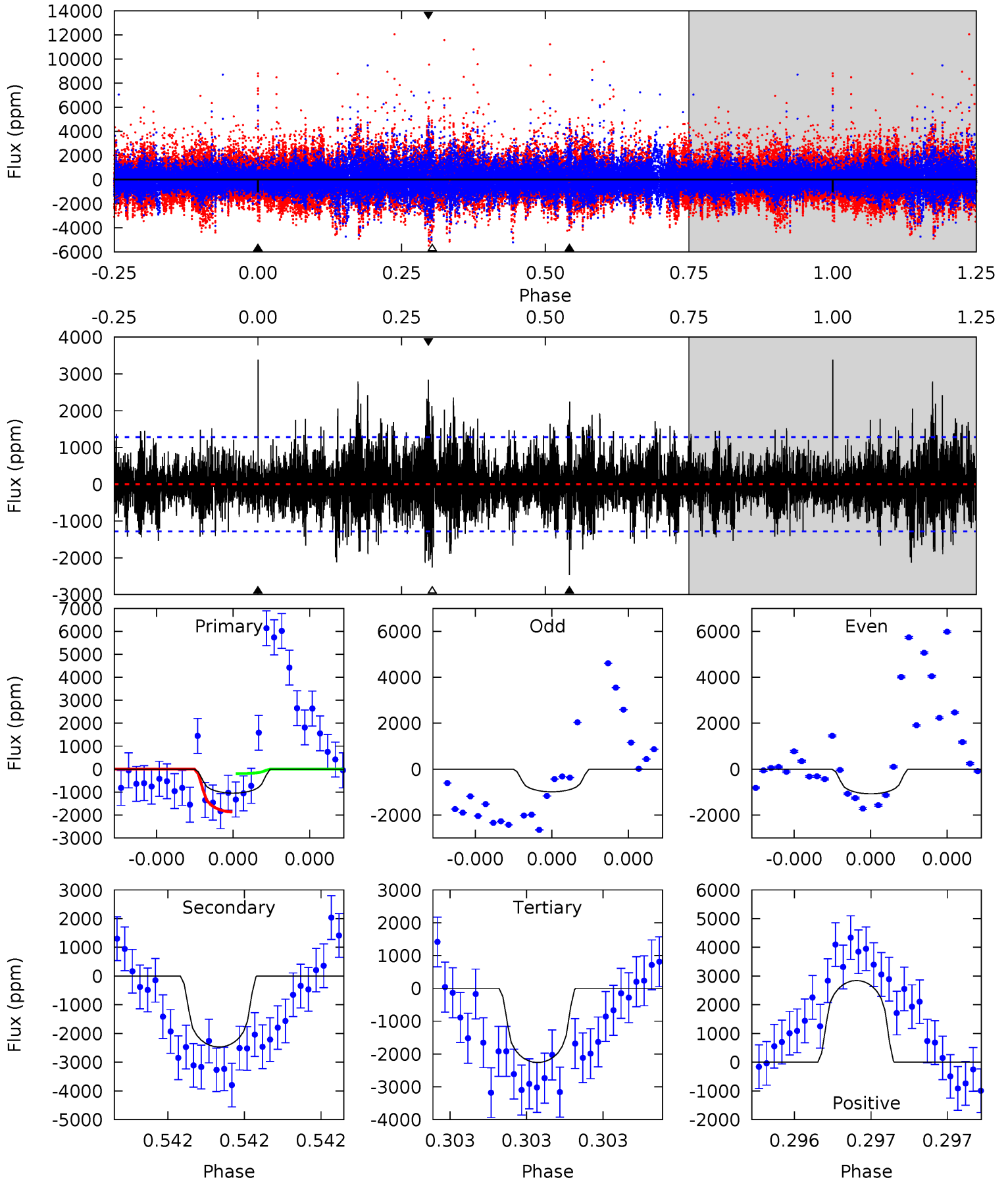
TCE 006774679-01 P=608.995011 Days  $T_0=302.664374$  (BKJD)



# DV Model-Shift Uniqueness Test

006774679-01, P = 608.995941 Days, E = 302.665847 Days

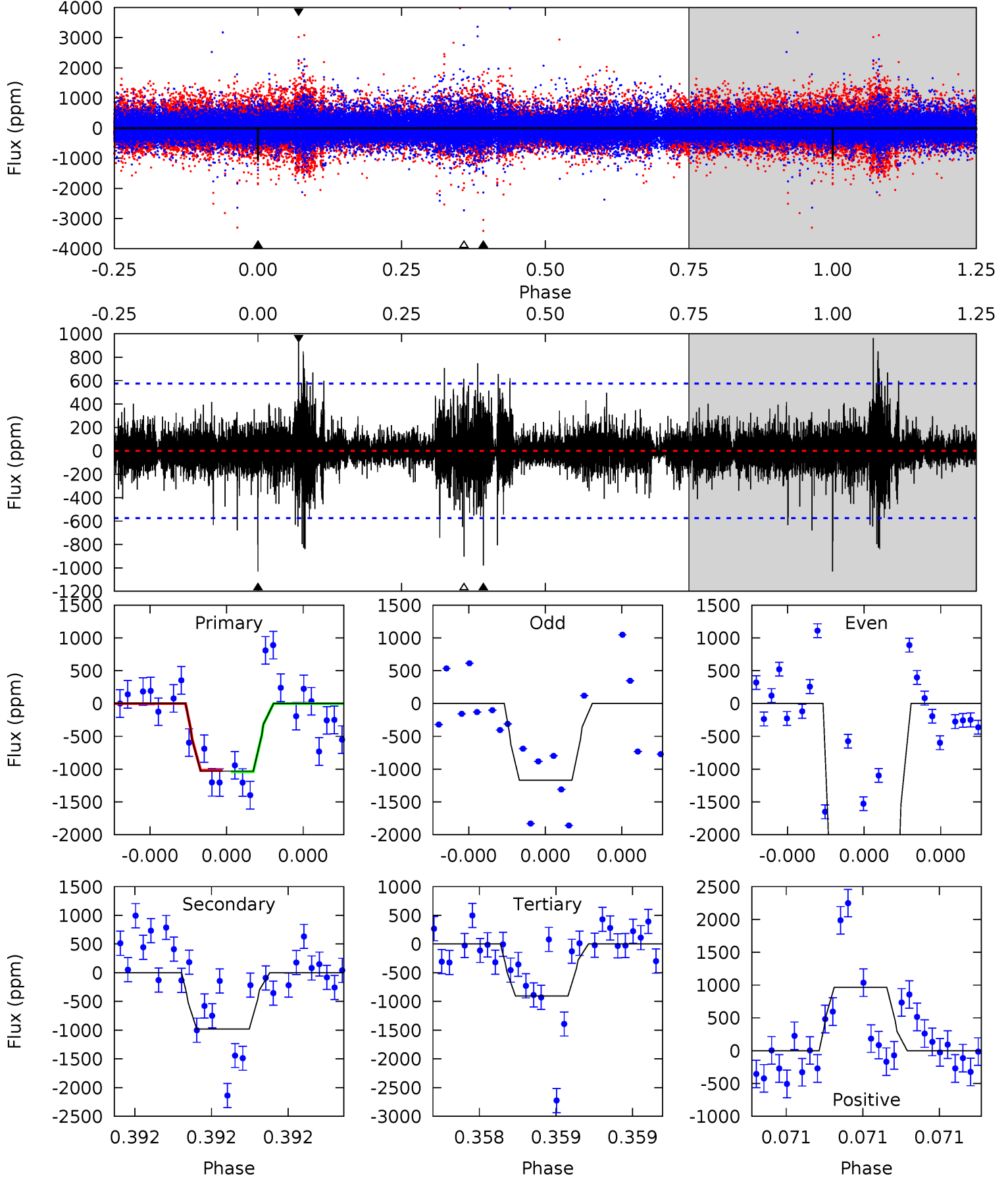
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.63	10.9	9.99	12.6	5.66	3.61	2.42	-5.36	-7.95	0.93	-1.66	0.14	1.06	0.58	3.68



# Alt Model-Shift Uniqueness Test

006774679-01, P = 608.995011 Days, E = 302.664374 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
10.2	9.67	8.94	9.53	5.69	3.66	1.19	1.26	0.67	0.74	0.14	17.8	3.38	0.48	0



### Stellar Parameters For KIC 006774679

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4935^{+147}_{-147}$	$4.589^{+0.066}_{-0.048}$	$-0.420^{+0.350}_{-0.300}$	$0.685^{+0.068}_{-0.068}$	$0.663^{+0.088}_{-0.044}$	$2.910^{+0.872}_{-0.519}$
	+3%/-3%	+1%/-1%	+83%/-71%	+10%/-10%	+13%/-7%	+30%/-18%
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 006774679-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2469 \pm 226$	$4.66^{+4.17}_{-3.18}$	$227^{+9}_{-8}$	$4540^{+3335}_{-928}$	$97395^{+863548}_{-70387}$
Alt.	$-978 \pm 101$	$5.93^{+4.29}_{-3.58}$	$227^{+8}_{-9}$	$3515^{+1421}_{-533}$	$23604^{+124262}_{-15671}$

$T_{max}$  = 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

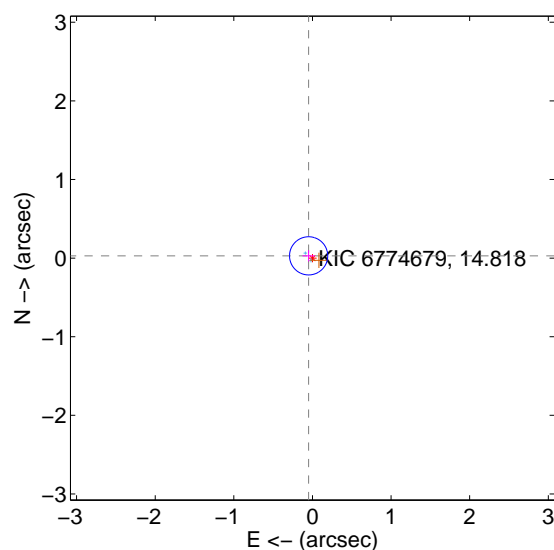
Supplemental centroid analysis for 006774679-01. Kepler magnitude: 14.82. Transit SNR 6.84

There are 2 quarters with good PRF difference image offsets

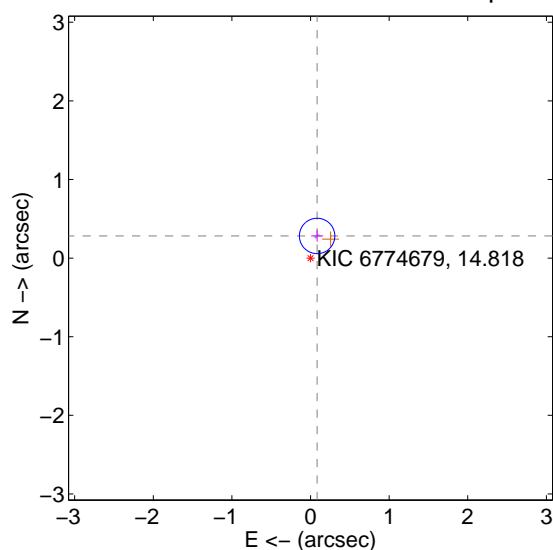
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.056 \pm 0.081$	0.70	$0.048 \pm 0.078$	$0.029 \pm 0.071$
PRF-fit source offset from KIC position	$0.294 \pm 0.075$	3.92	$-0.084 \pm 0.076$	$0.282 \pm 0.075$
photometric centroid source offset	$0.87 \pm 0.56$	1.54	$-0.20 \pm 0.53$	$0.85 \pm 0.57$

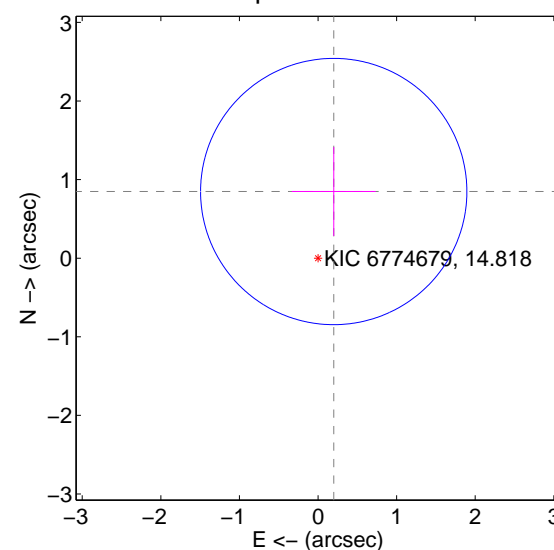
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

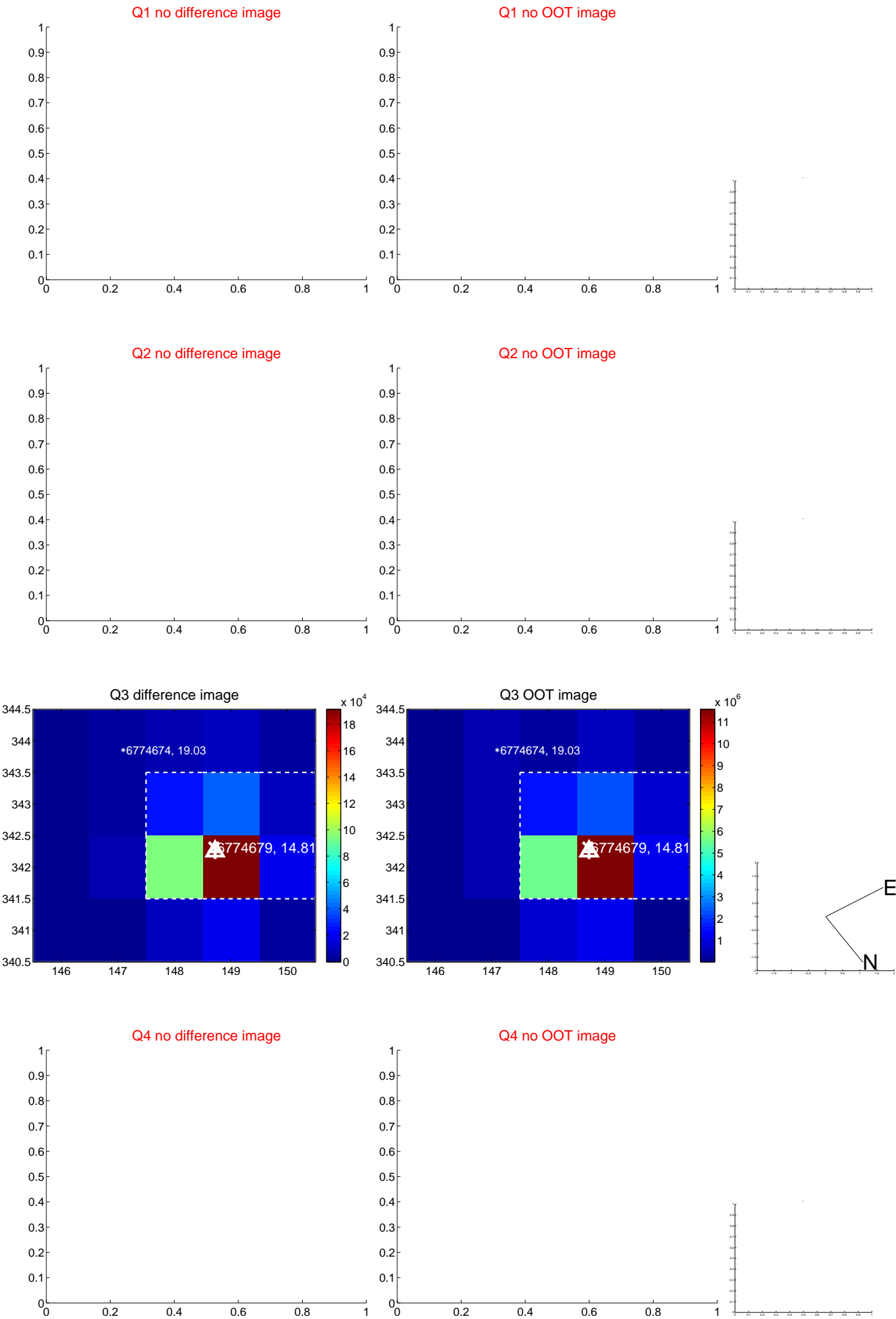


offset from photometric centroids



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.



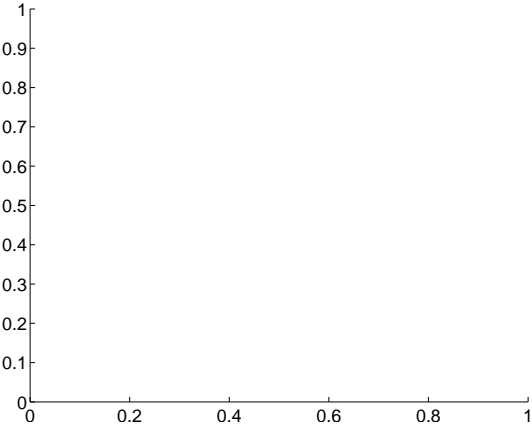
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



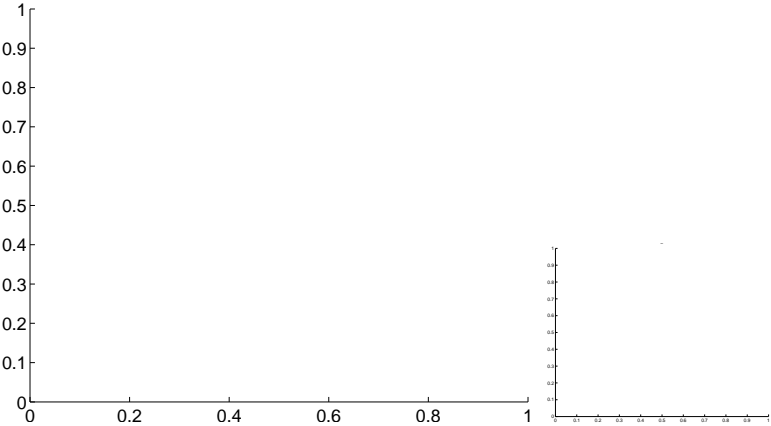


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

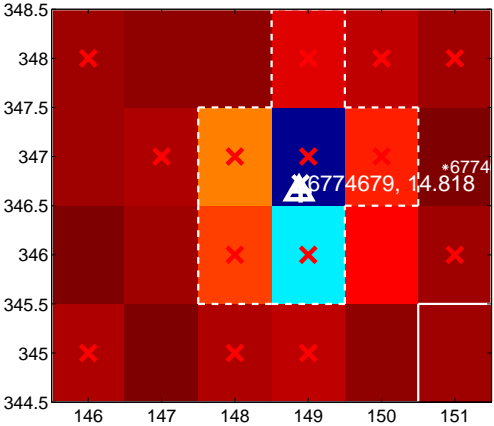
Q9 no difference image



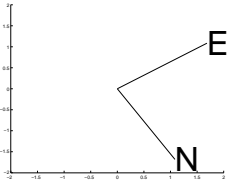
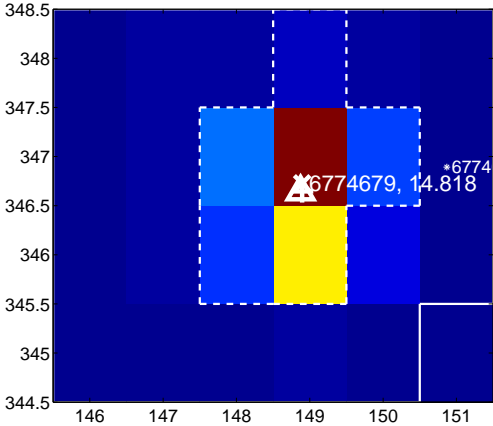
Q9 no OOT image



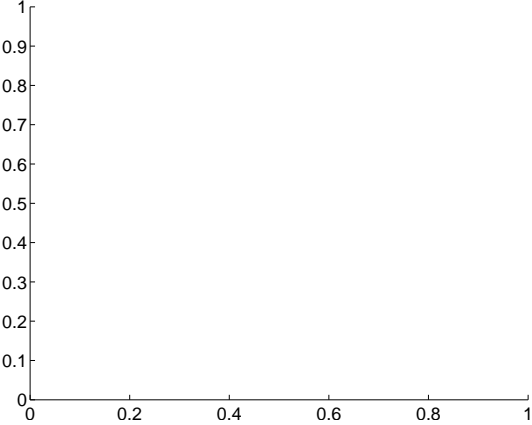
Q10 difference image. Poor Quality



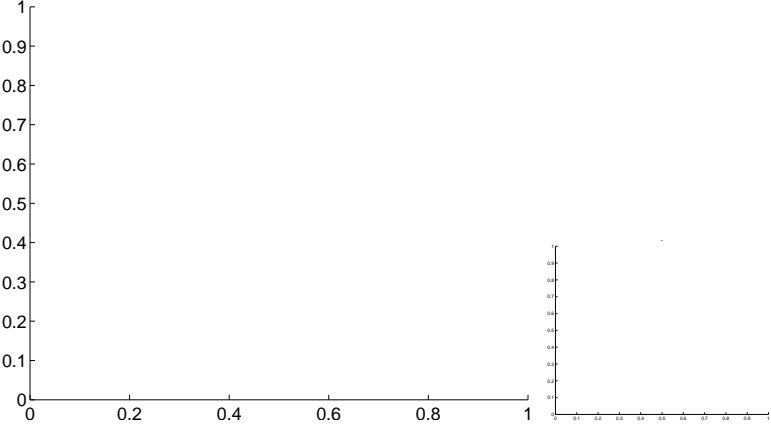
Q10 OOT image



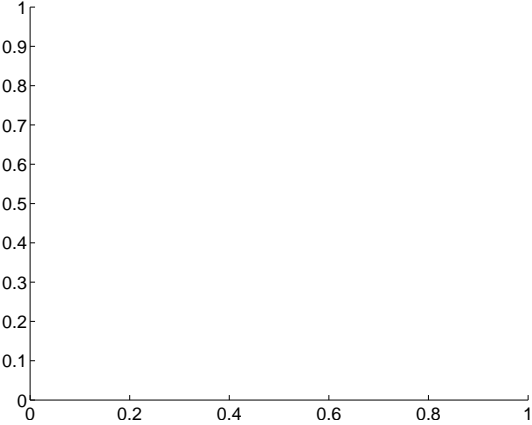
Q11 no difference image



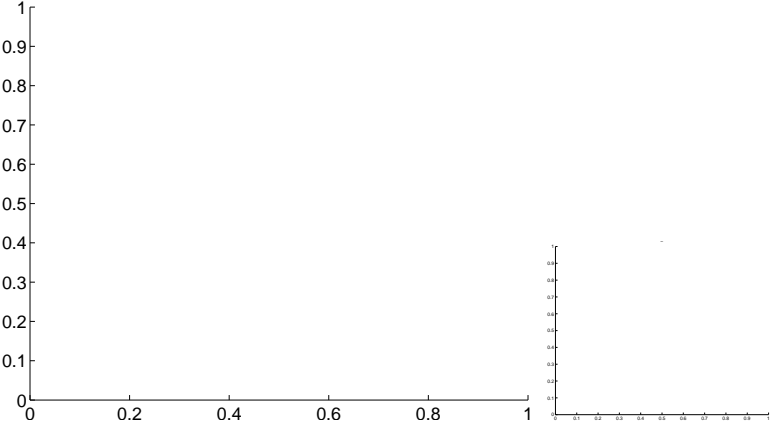
Q11 no OOT image



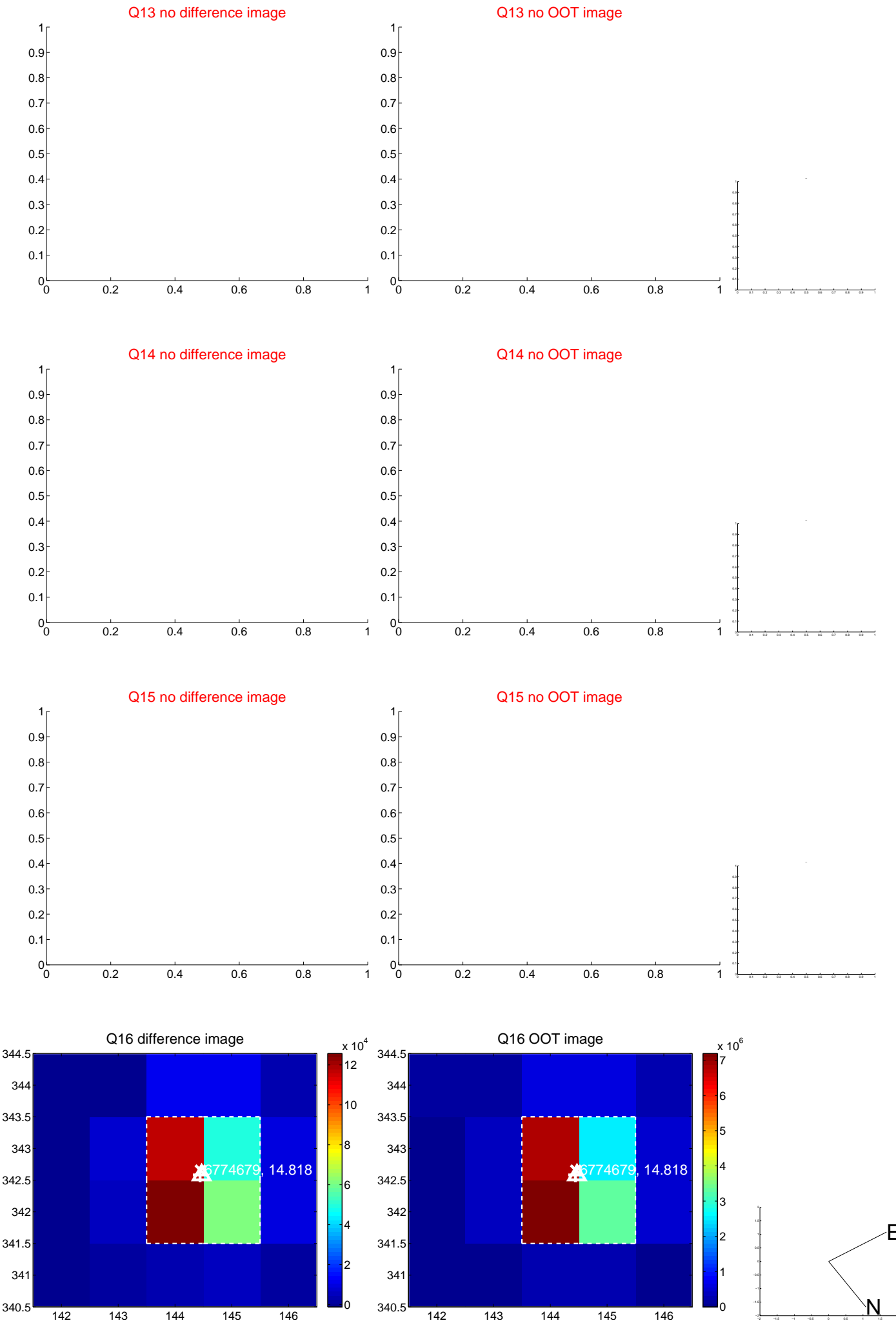
Q12 no difference image



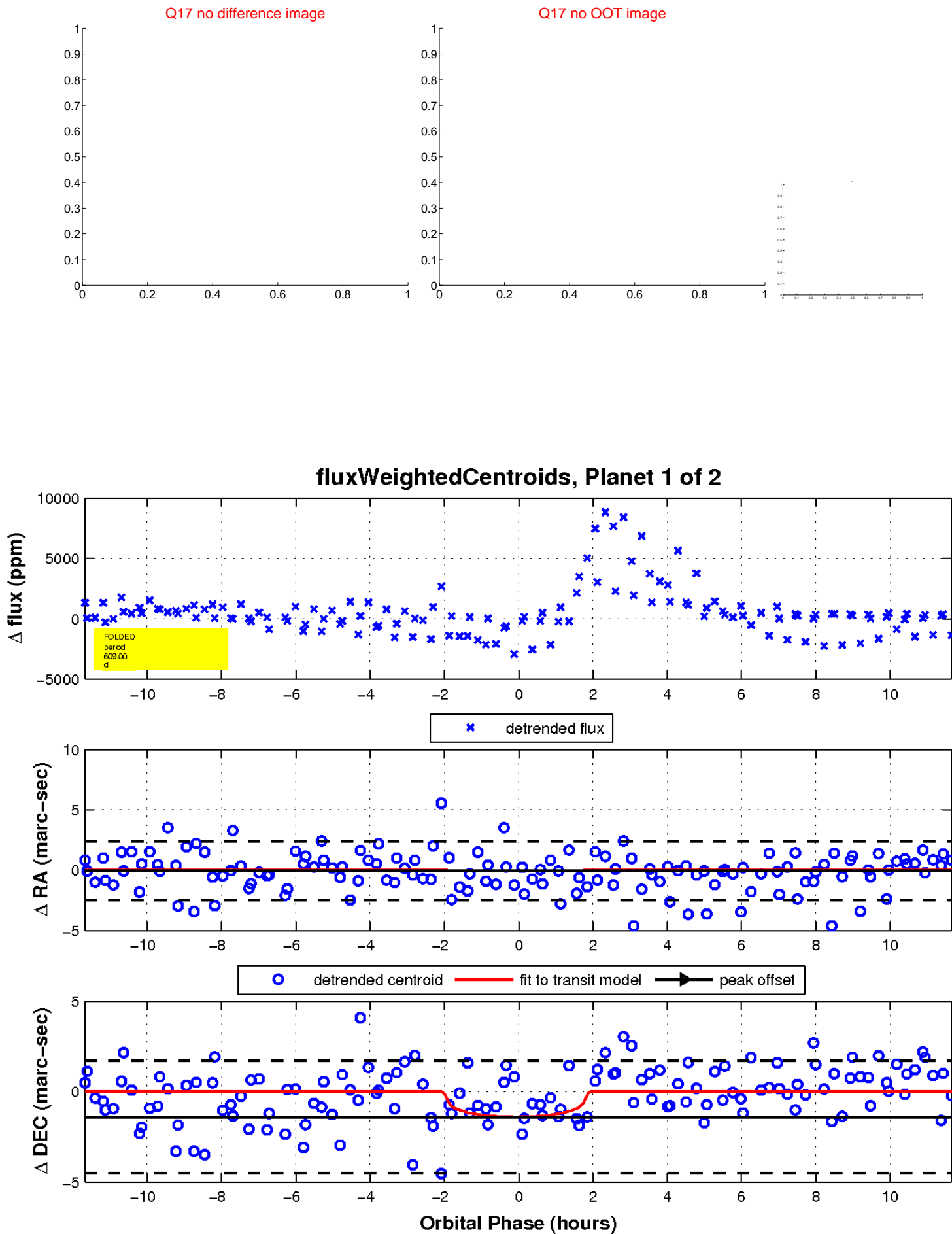
Q12 no OOT image



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

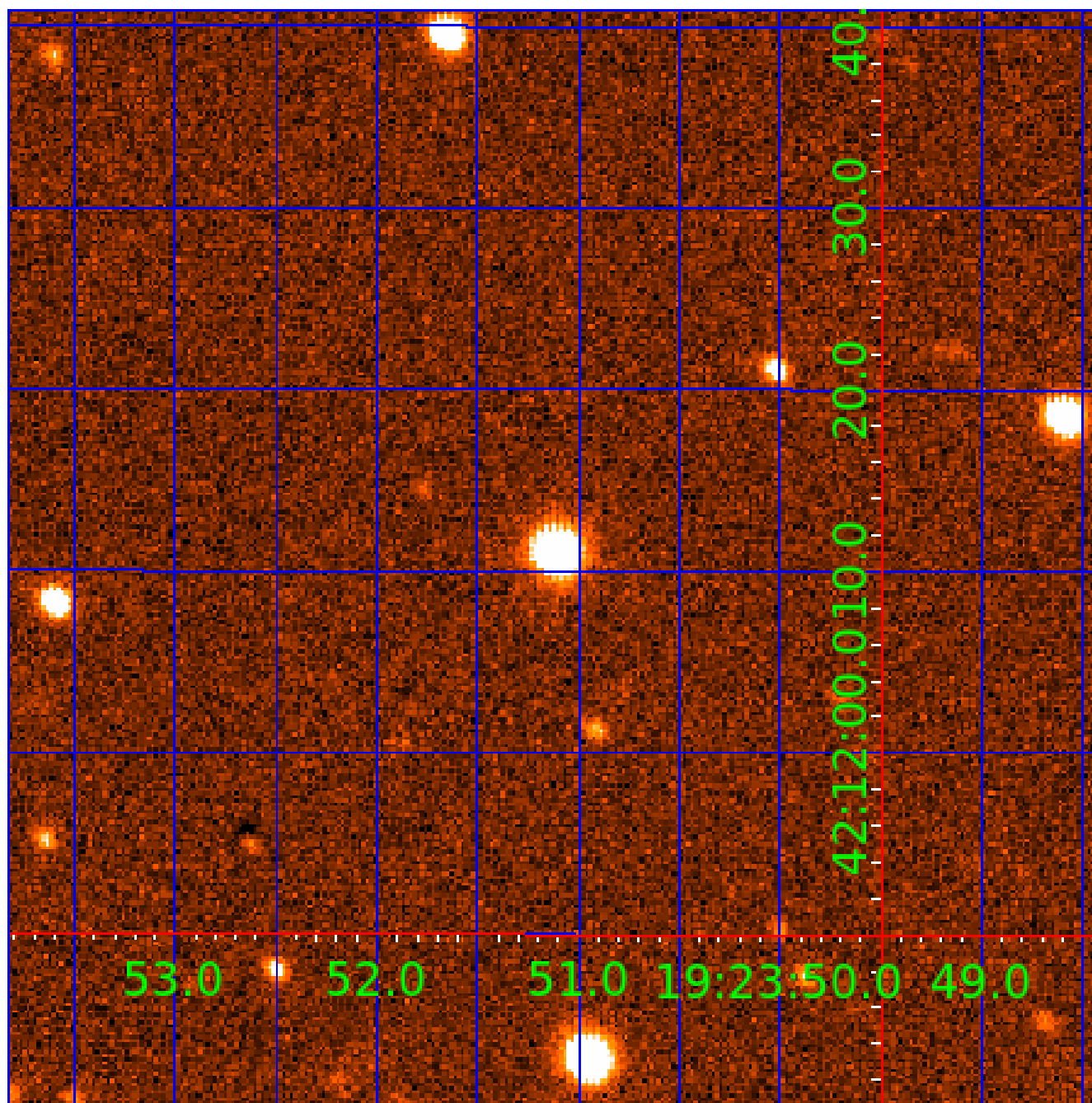


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 006774679

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006774679-01	OBS	No	608.995941	302.665847	2183.2	3.931	16.5	6.8	0.69	4935	3.15	0.17
006774679-02	OBS	No	428.902212	499.383527	1499.7	3.462	18.6	4.1	0.69	4935	2.69	0.26

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006774679-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006774679-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

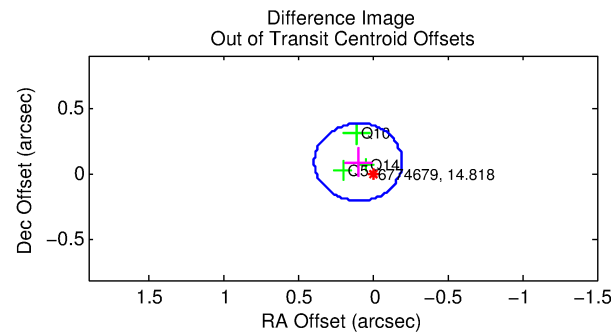
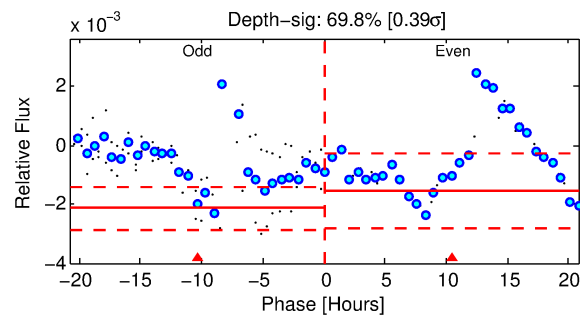
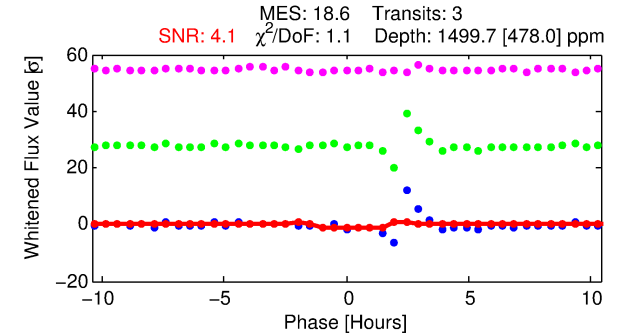
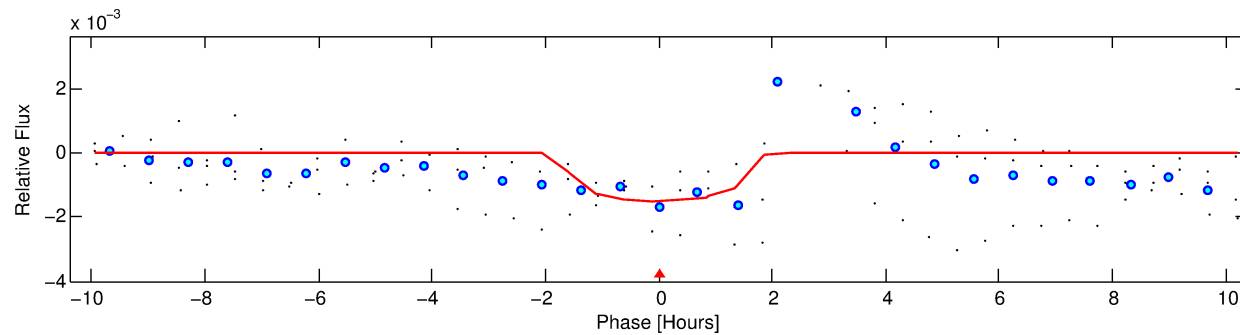
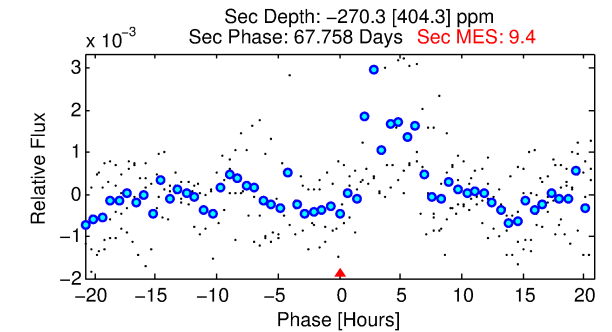
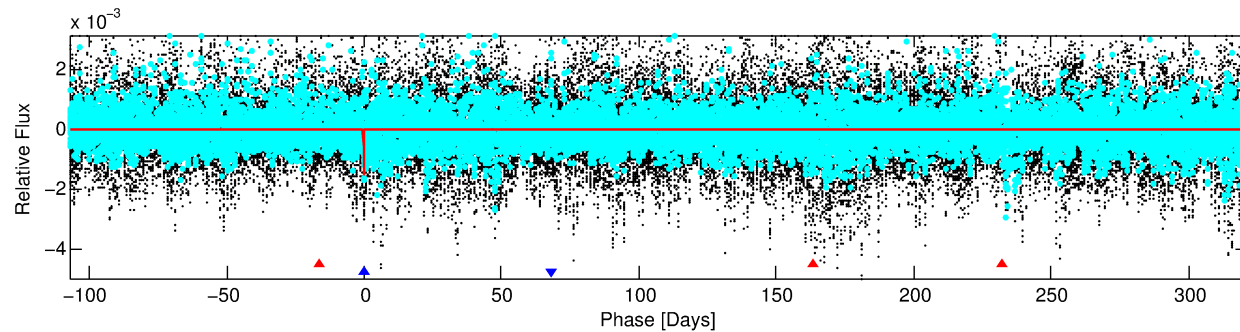
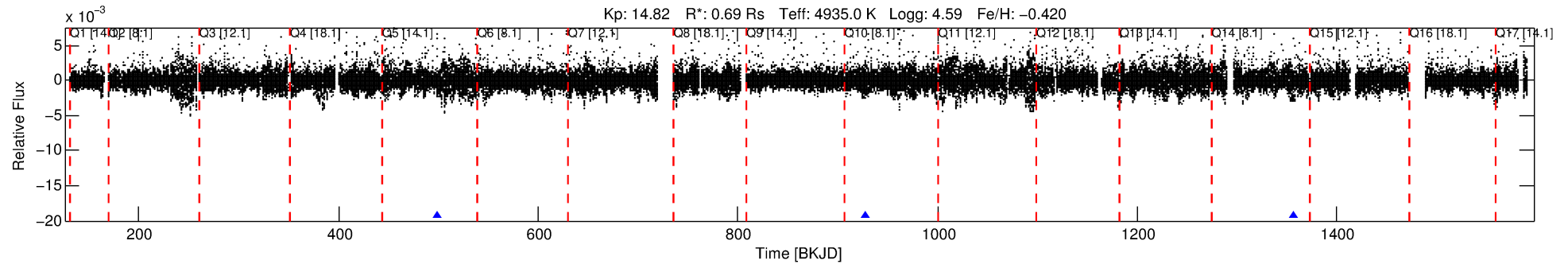
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006774679-02

No Significant Match Found

# DV One-Page Summary

KIC: 6774679 Candidate: 2 of 2 Period: 428.902 d



## DV Fit Results:

Period = 428.90221 [0.00750] d  
Epoch = 499.3835 [0.0095] BKJD  
Rp/R\* = 0.0359 [0.0864]  
a/R\* = 854.43 [7035.97]  
b = 0.51 [12.28]  
Seff = 0.26 [0.04]  
Teq = 183 [8] K  
Rp = 2.69 [6.46] Re  
a = 0.9714 [0.0810] AU  
Ag = N/A  
Teffp = N/A

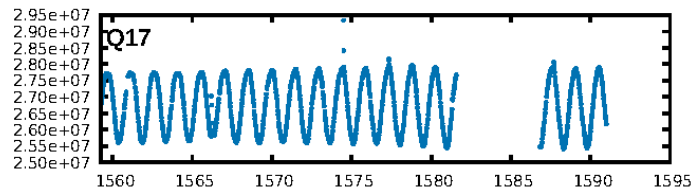
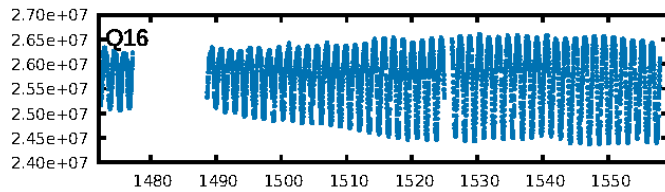
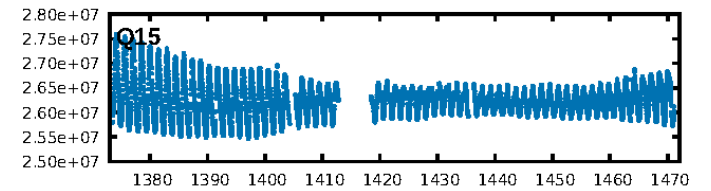
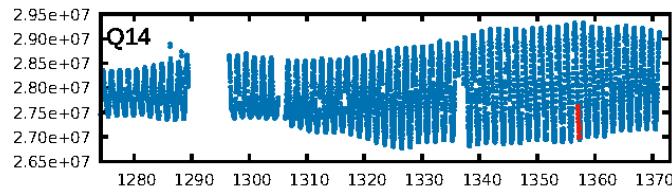
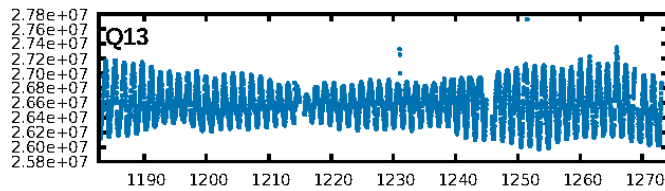
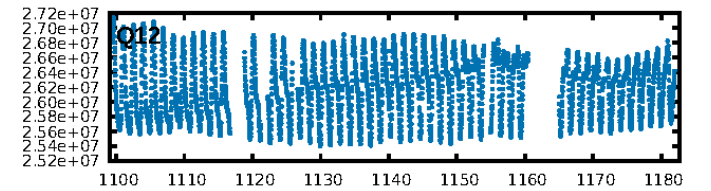
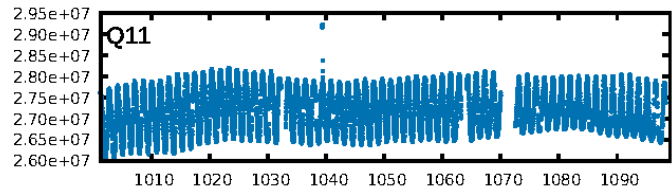
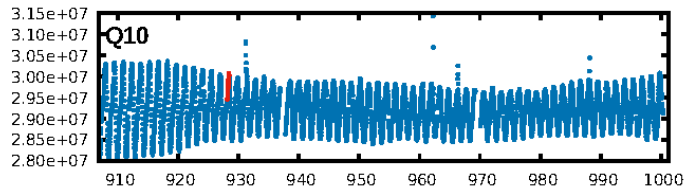
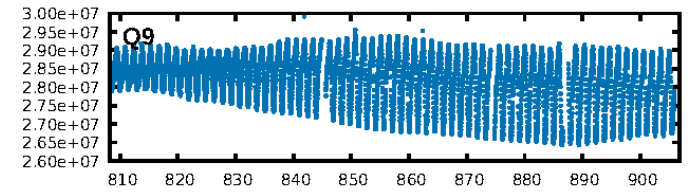
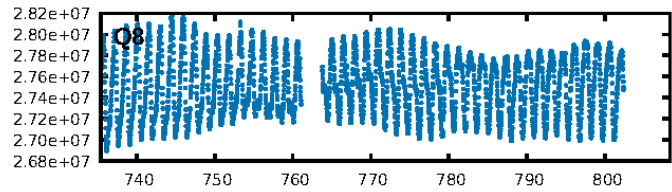
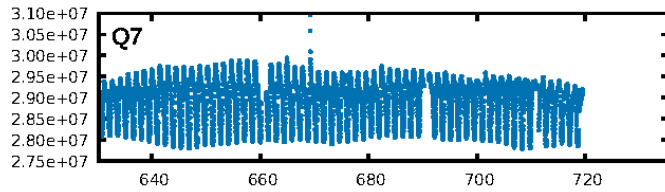
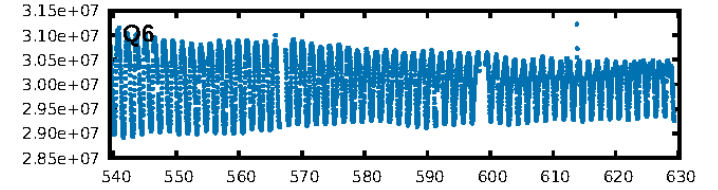
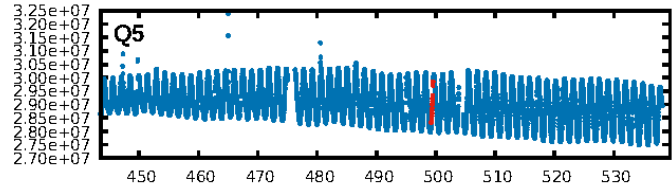
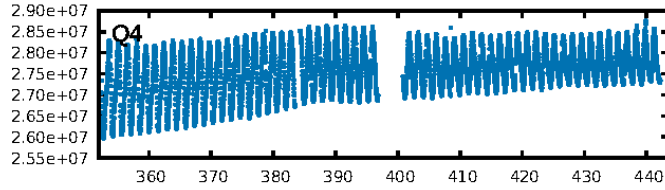
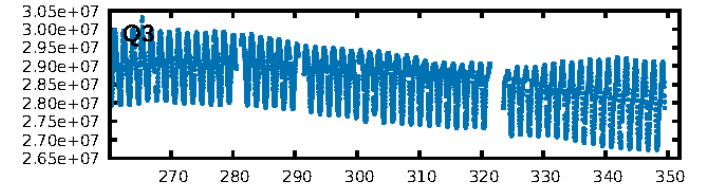
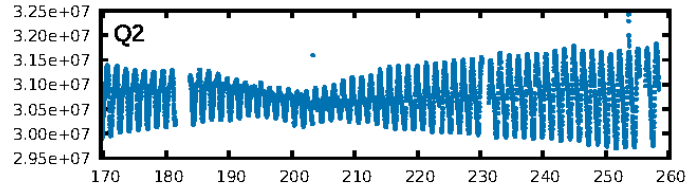
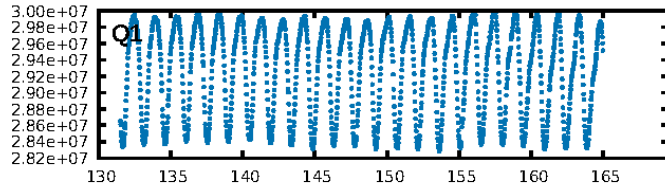
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [825.15 $\sigma$ ]  
ModelChiSquare2-sig: 34.2%  
ModelChiSquareGof-sig: 98.0%  
Bootstrap-pfa: 6.68e-15  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.3958  
Centroid-sig: 30.6%  
Centroid-so: 0.422 arcsec [0.56 $\sigma$ ]  
OotOffset-rm: 0.133 arcsec [1.36 $\sigma$ ]  
KicOffset-rm: 0.391 arcsec [2.77 $\sigma$ ]  
OotOffset-st: 2/0/0/1 [3]  
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: 30-Jan-2016 05:08:12 Z

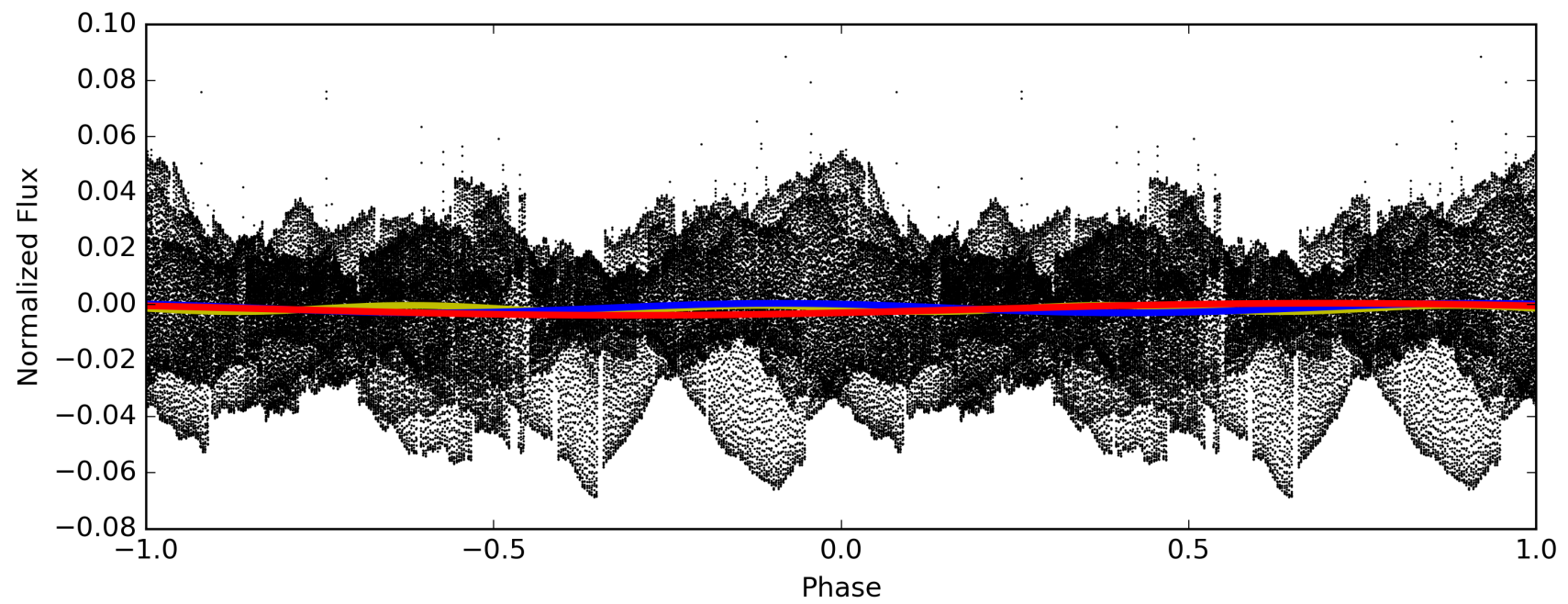
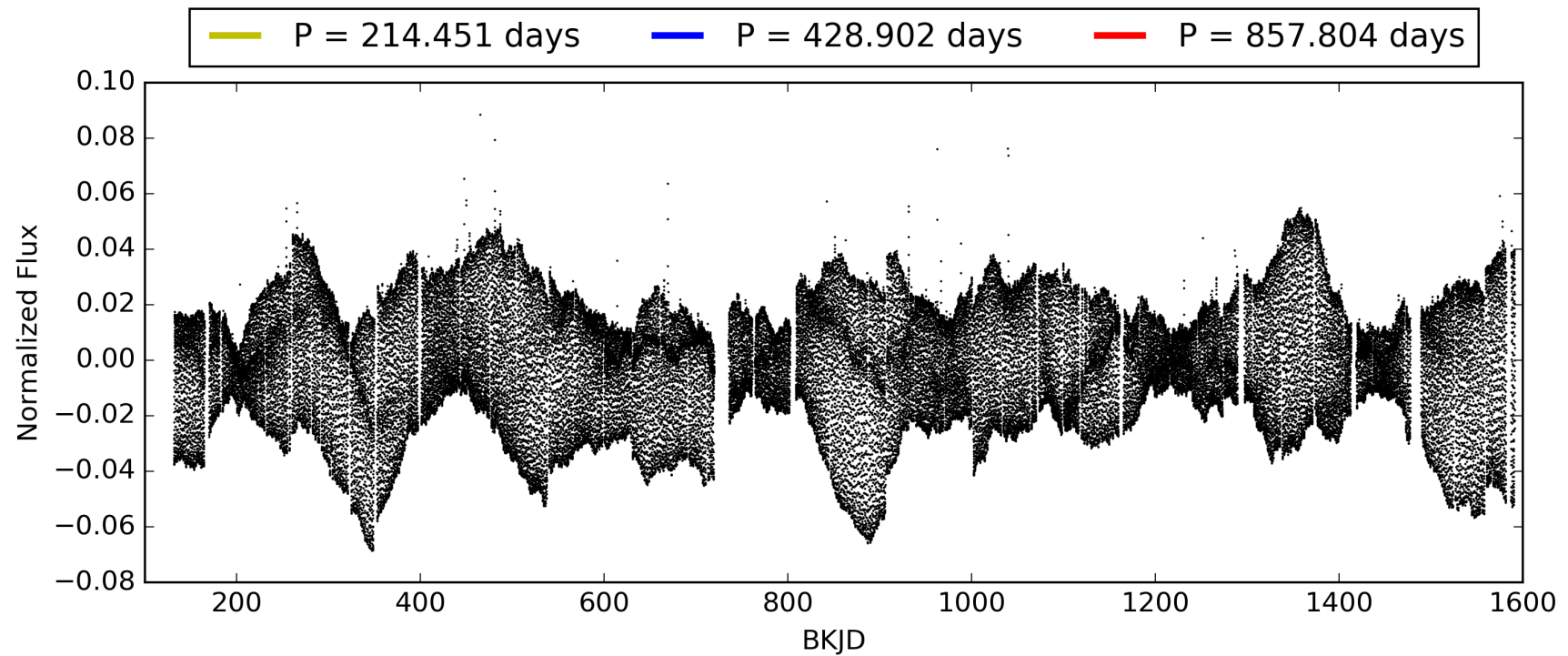
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006774679-02, PDC Light Curves





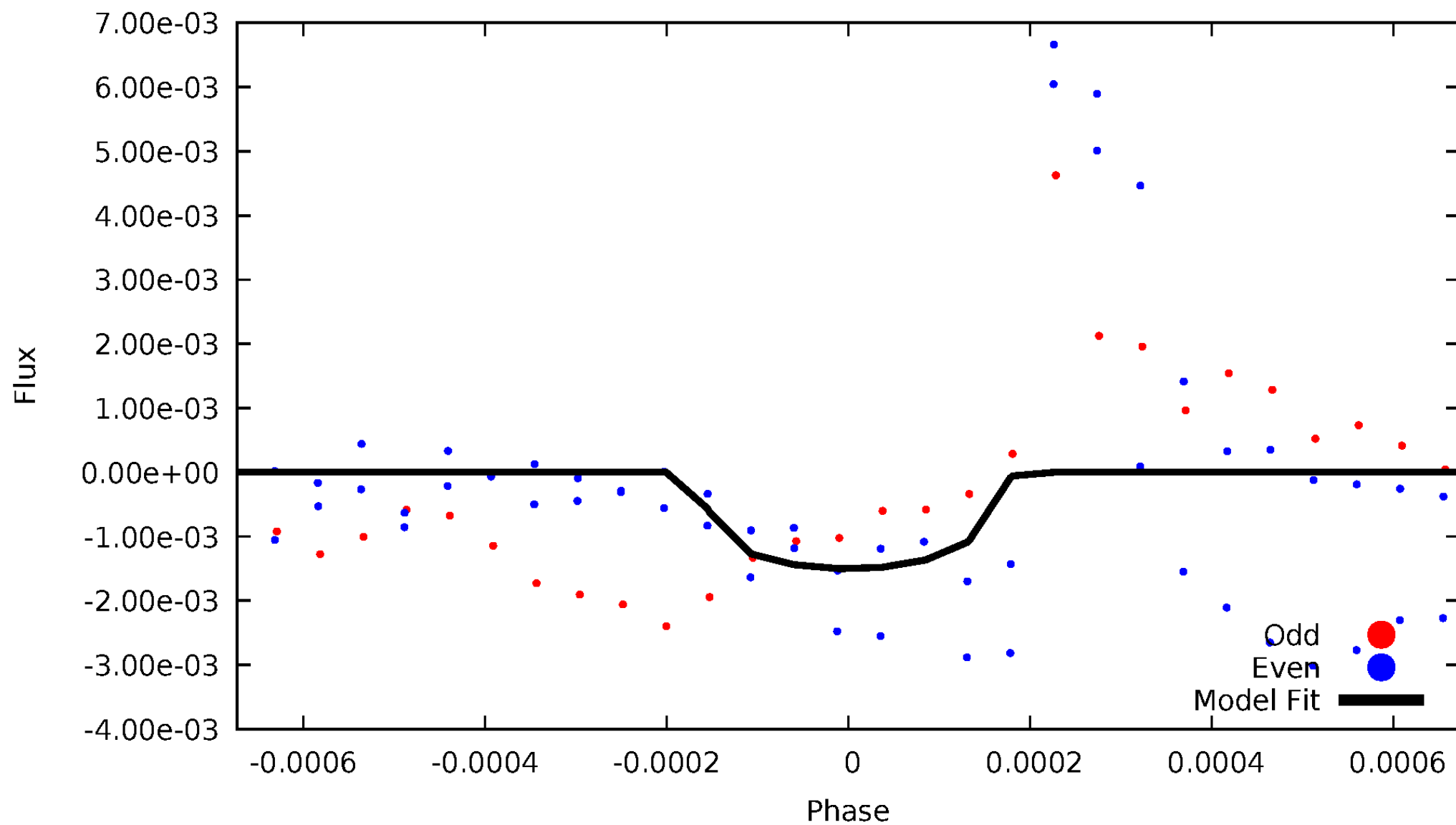
TCE 006774679-02





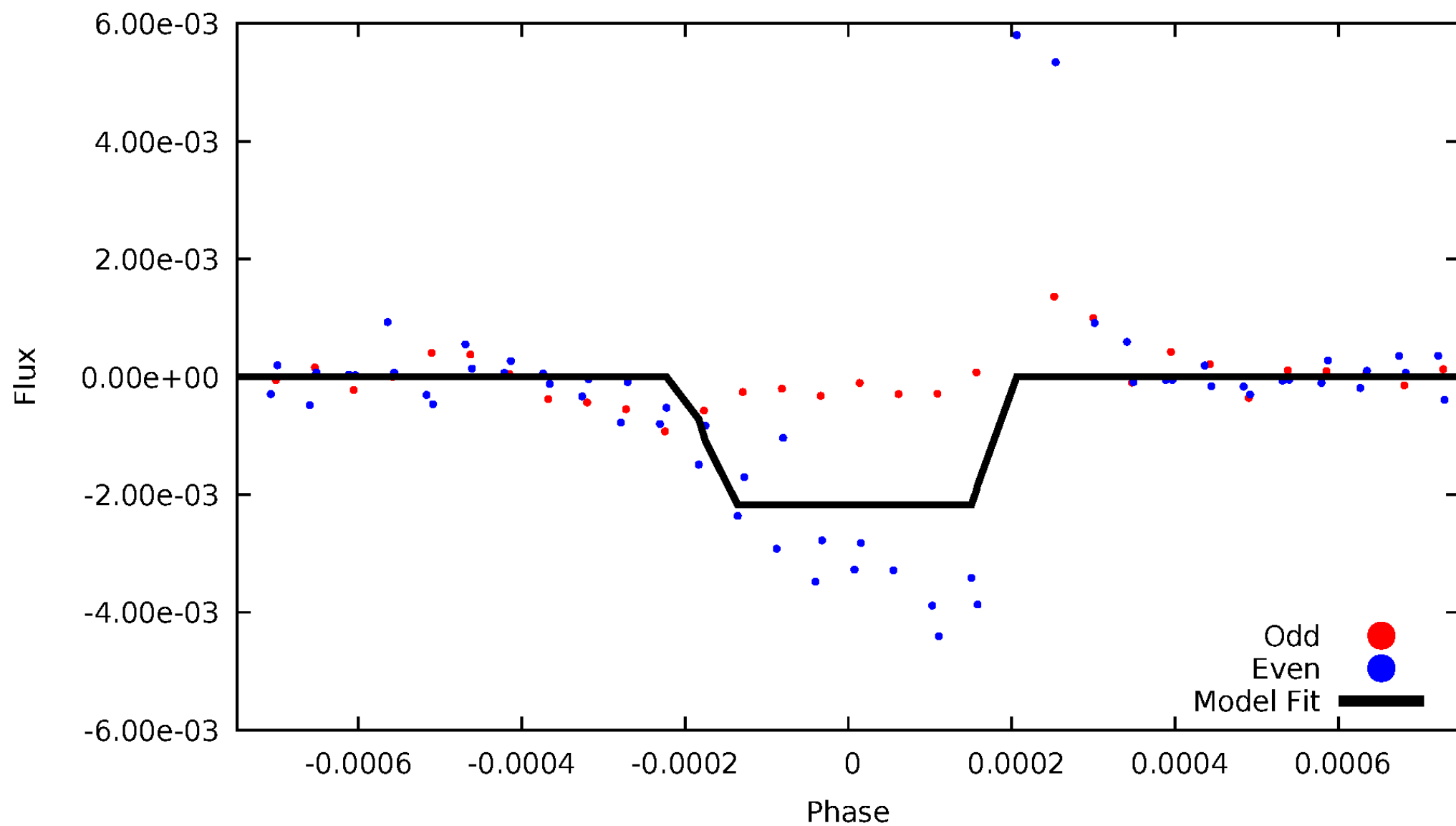
# DV Odd/Even

TCE 006774679-02



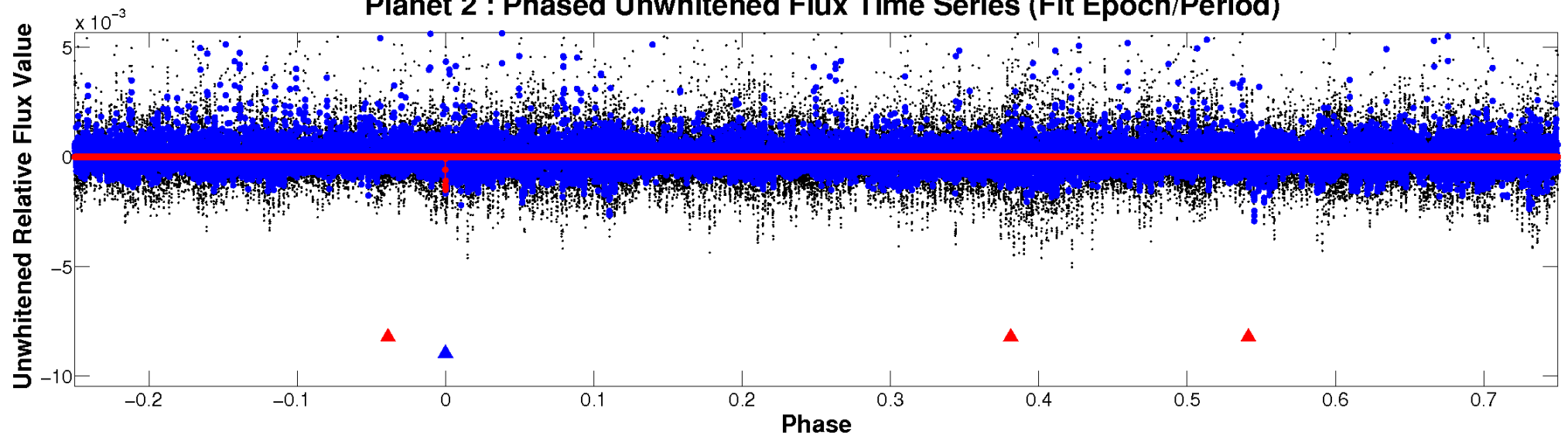
# ALT Odd/Even

TCE 006774679-02

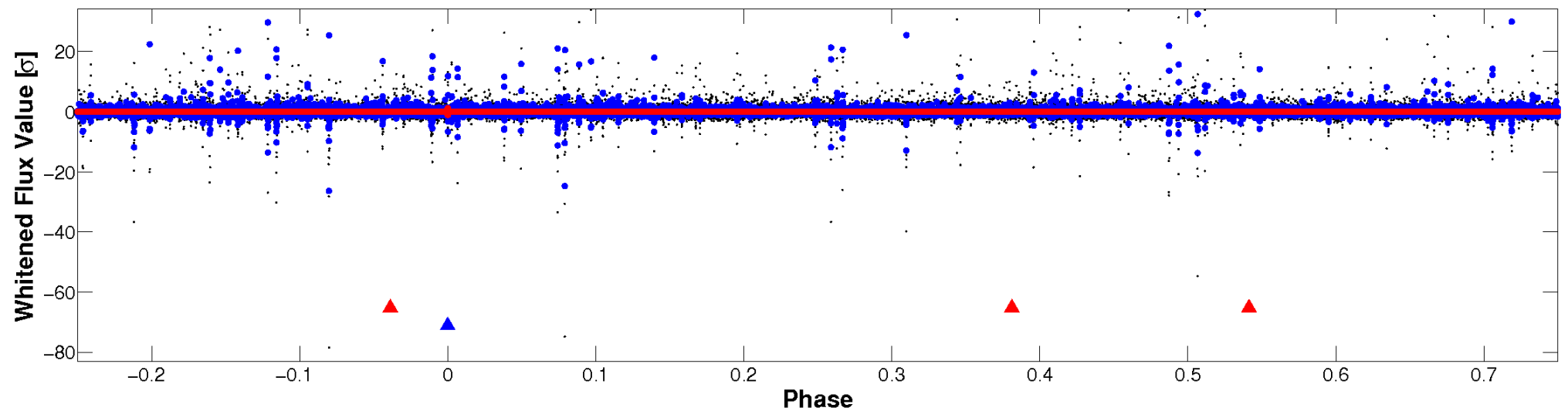


# Non-Whitened Vs. Whitened Light Curve

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

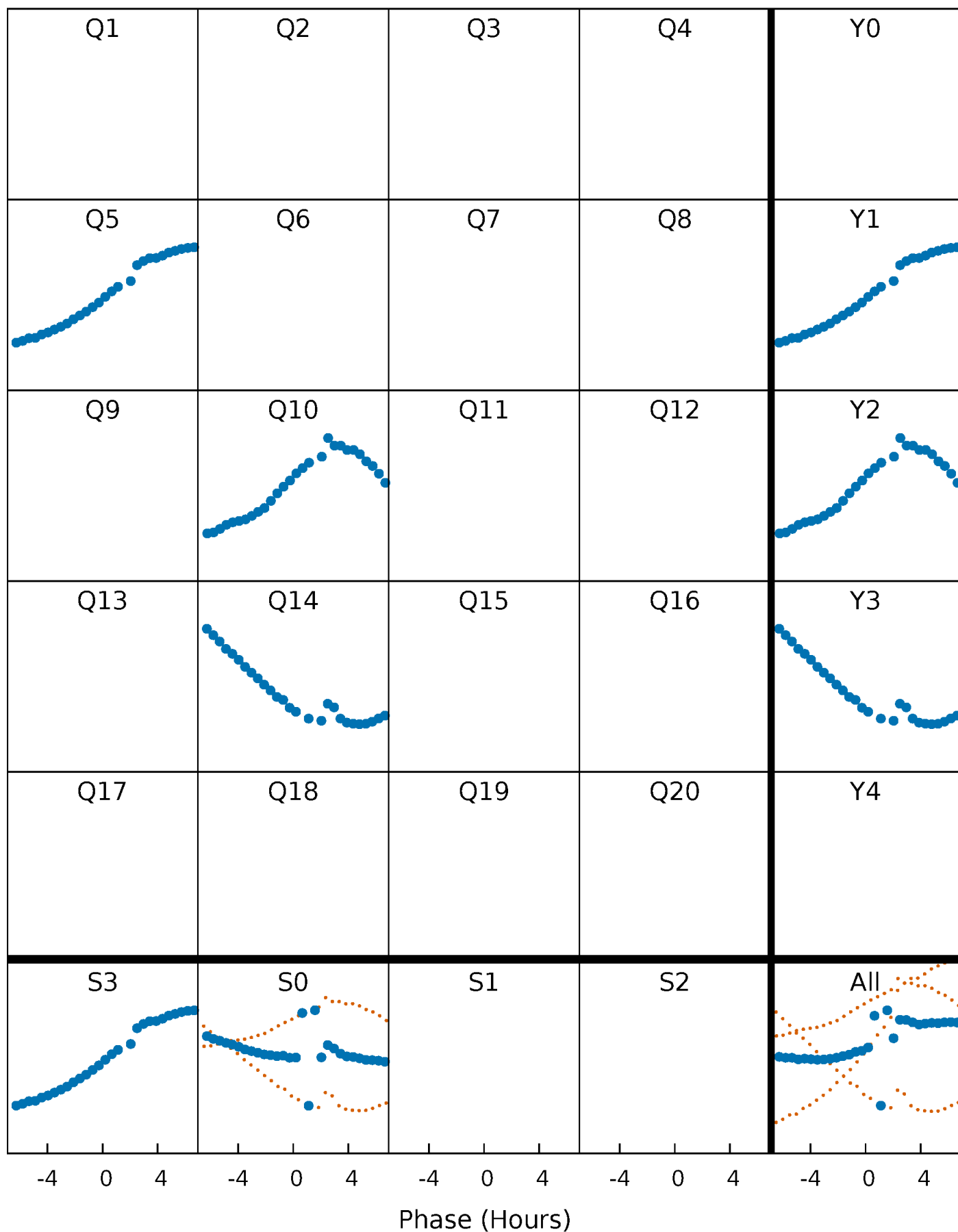


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



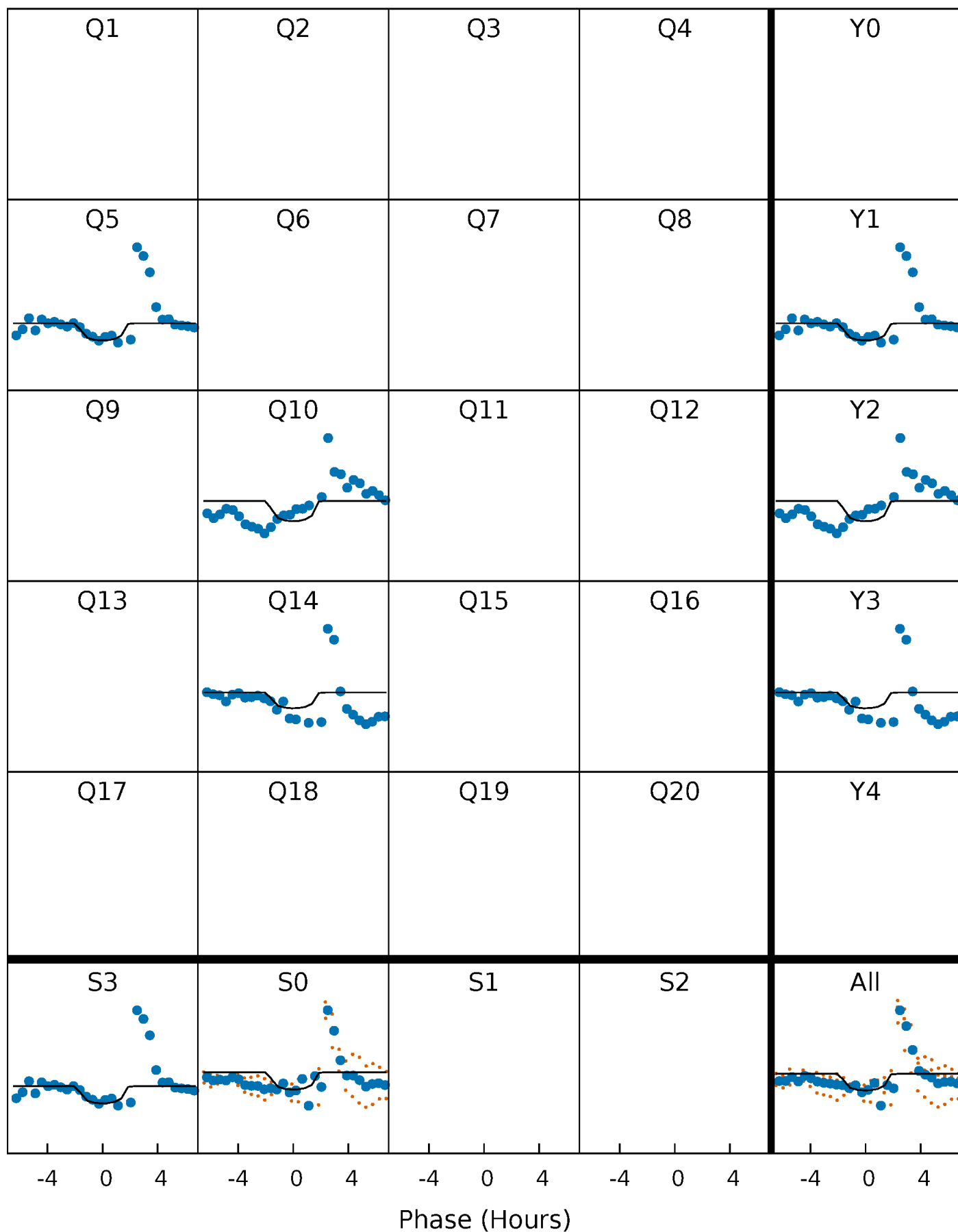
# PDC Quarter-Phased Transit Curves

TCE 006774679-02 P=428.902213 Days  $T_0=499.383527$  (BKJD)



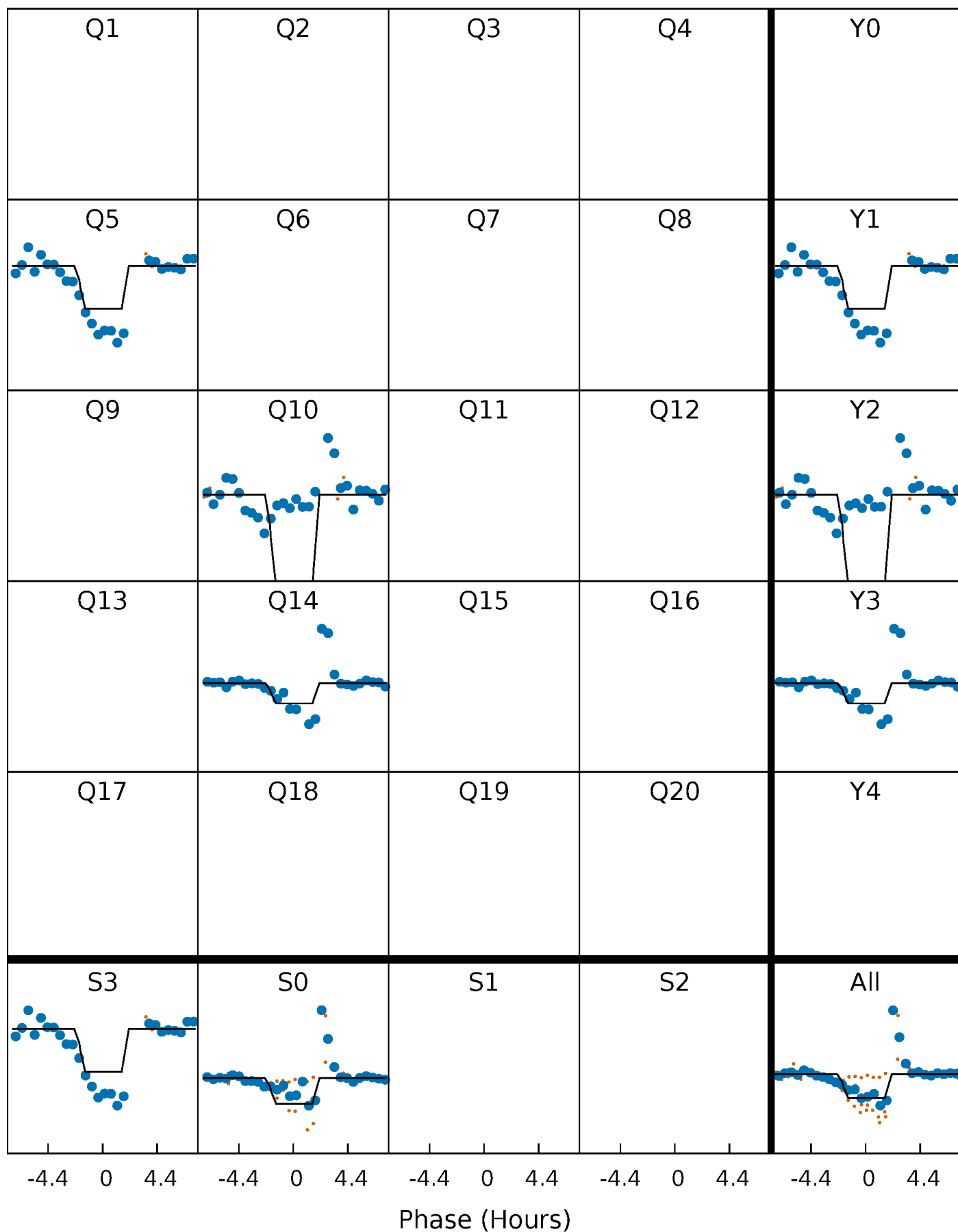
# DV Quarter-Phased Transit Curves

TCE 006774679-02 P=428.902213 Days  $T_0=499.383527$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

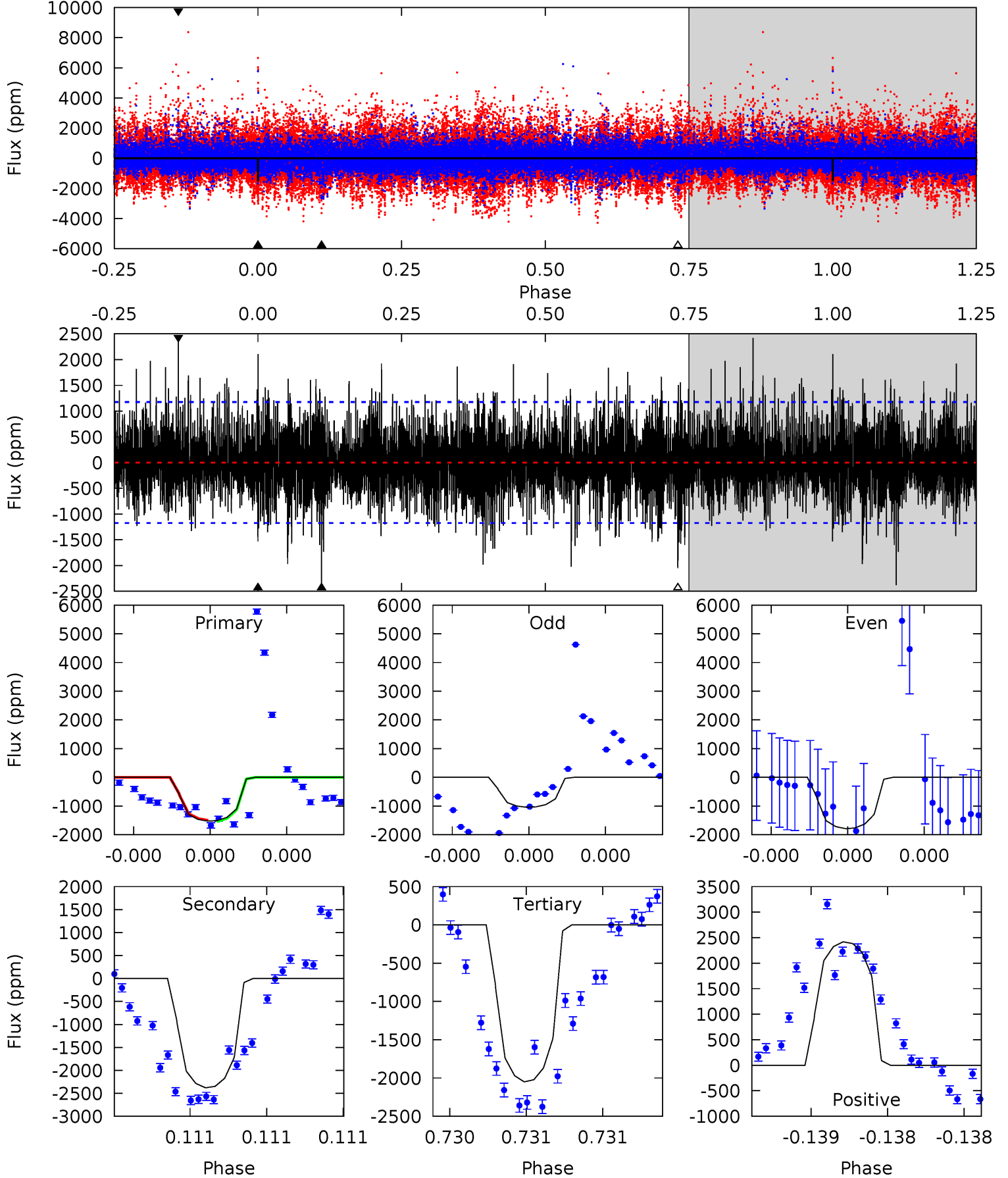
TCE 006774679-02 P=428.900424 Days  $T_0=499.395609$  (BKJD)



# DV Model-Shift Uniqueness Test

006774679-02,  $P = 428.902213$  Days,  $E = 70.481314$  Days

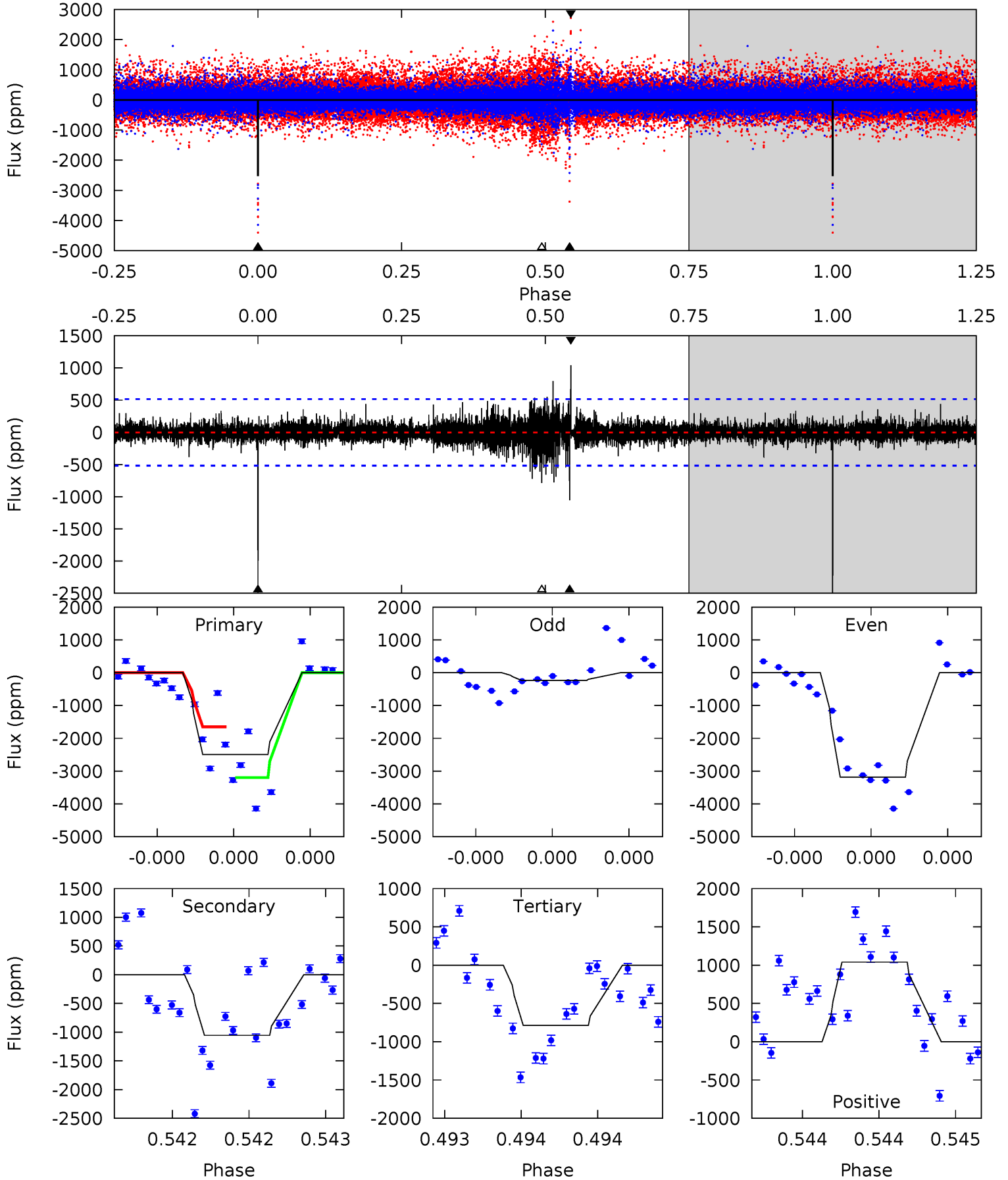
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.30	11.4	9.80	11.6	5.62	3.55	2.47	-2.50	-4.26	1.58	-0.18	1.39	1.14	0.50	0.11



# Alt Model-Shift Uniqueness Test

006774679-02, P = 428.900424 Days, E = 70.495185 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
27.2	11.5	8.58	11.4	5.64	3.59	1.22	18.7	15.9	2.95	0.17	15.7	0.76	0.29	8.18





### Stellar Parameters For KIC 006774679

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4935^{+147}_{-147}$	$4.589^{+0.066}_{-0.048}$	$-0.420^{+0.350}_{-0.300}$	$0.685^{+0.068}_{-0.068}$	$0.663^{+0.088}_{-0.044}$	$2.910^{+0.872}_{-0.519}$
	+3%/-3%	+1%/-1%	+83%/-71%	+10%/-10%	+13%/-7%	+30%/-18%
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 006774679-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2380 \pm 209$	$5.63^{+5.66}_{-3.89}$	$255^{+9}_{-9}$	$4176^{+2797}_{-844}$	$39048^{+373705}_{-28906}$
Alt.	$-1055 \pm 92$	$6.10^{+4.97}_{-4.26}$	$255^{+9}_{-9}$	$3514^{+2058}_{-571}$	$14765^{+151675}_{-10322}$

$T_{max}$  = 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

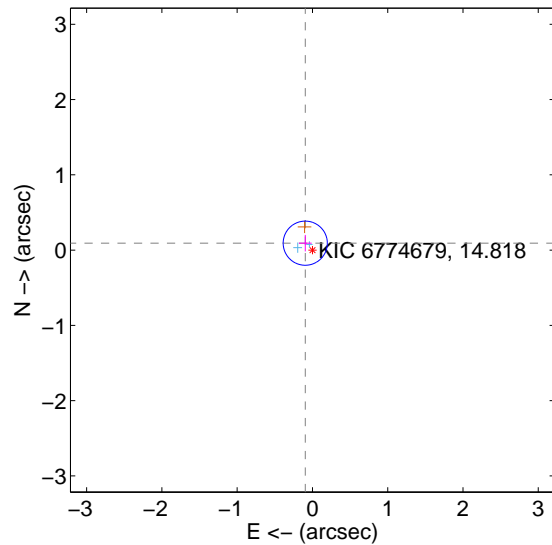
Supplemental centroid analysis for 006774679-02. Kepler magnitude: 14.82. Transit SNR 4.13

There are 2 quarters with good PRF difference image offsets

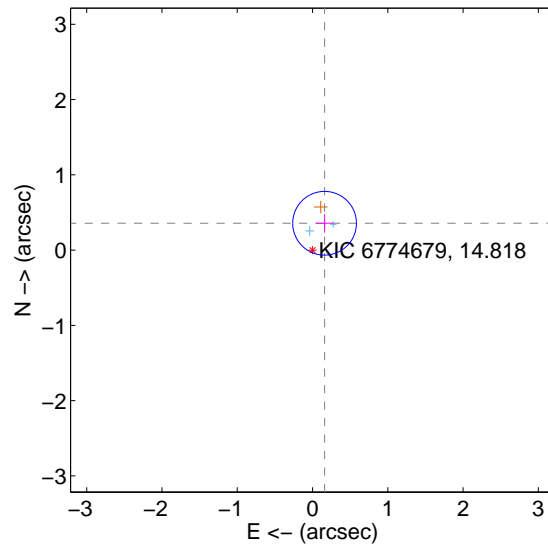
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.133 \pm 0.098$	1.36	$0.095 \pm 0.085$	$0.092 \pm 0.110$
PRF-fit source offset from KIC position	$0.391 \pm 0.141$	2.77	$-0.160 \pm 0.113$	$0.356 \pm 0.123$
photometric centroid source offset	$0.42 \pm 0.75$	0.56	$-0.18 \pm 0.79$	$-0.38 \pm 0.74$

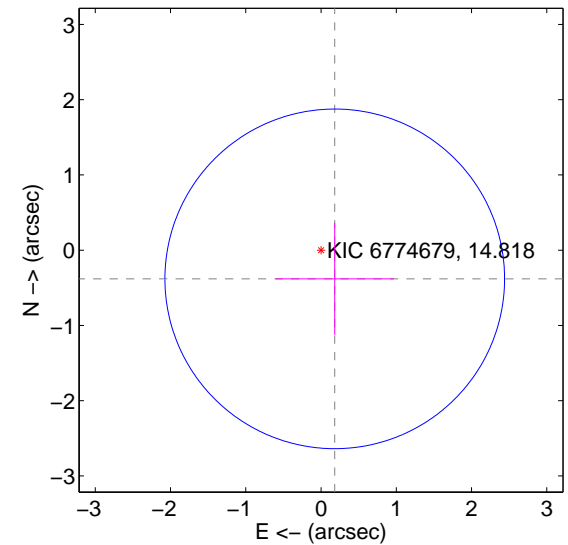
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

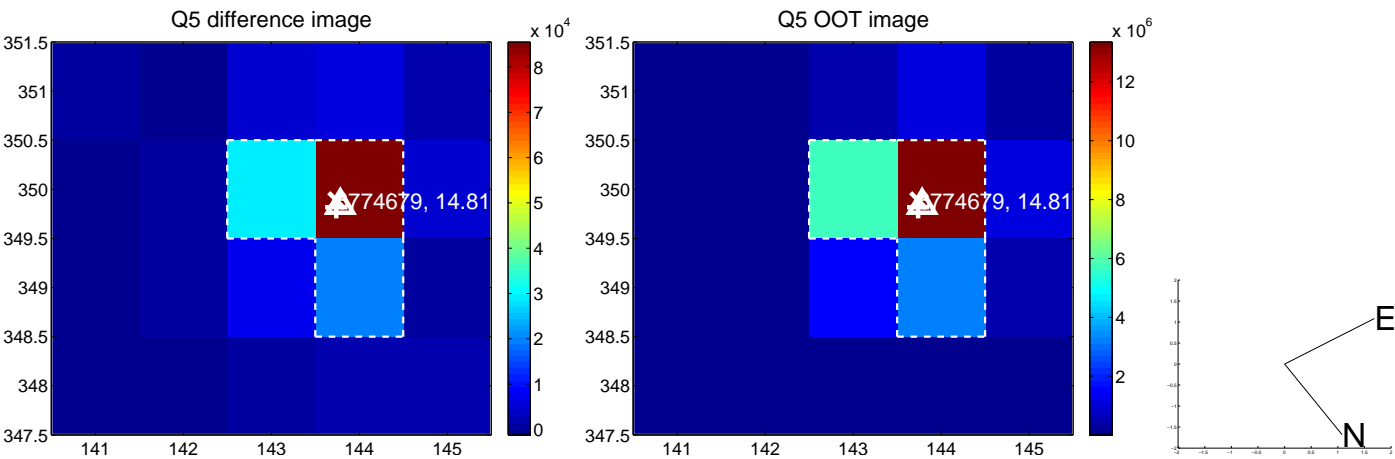


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

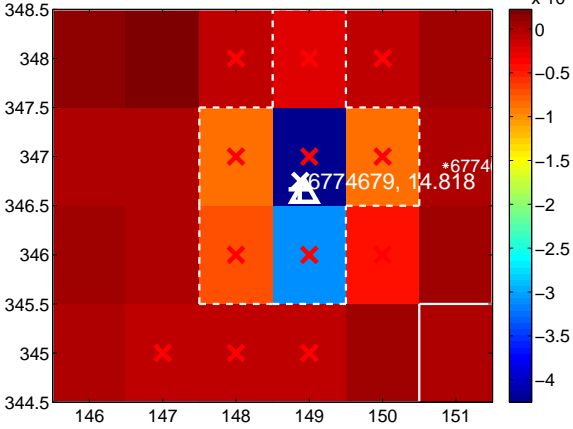
Q9 no difference image



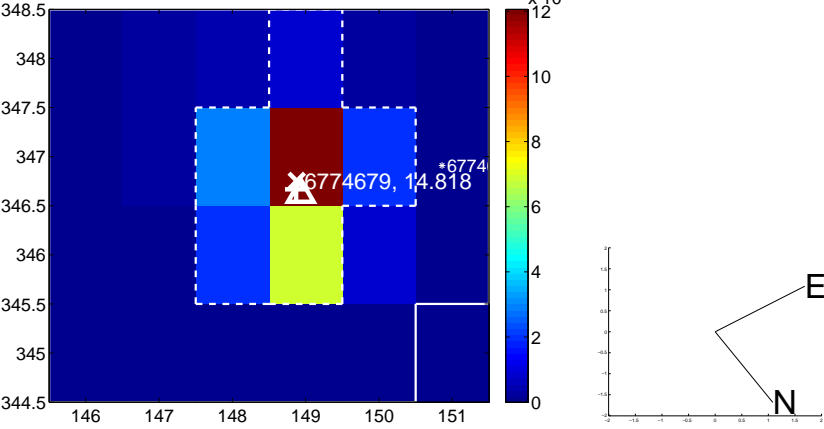
Q9 no OOT image



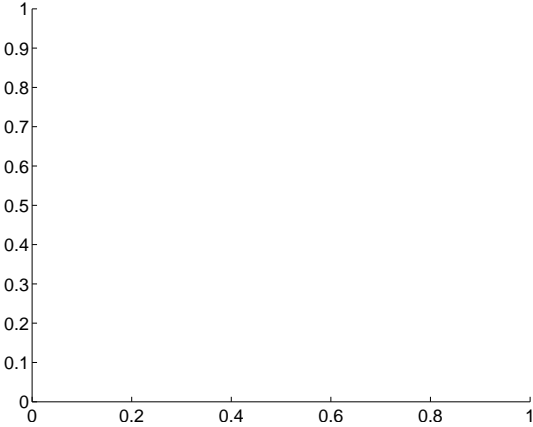
Q10 difference image. Poor Quality



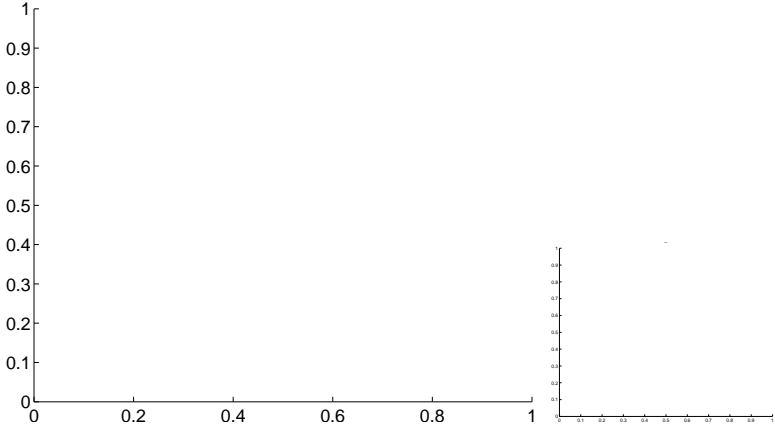
Q10 OOT image



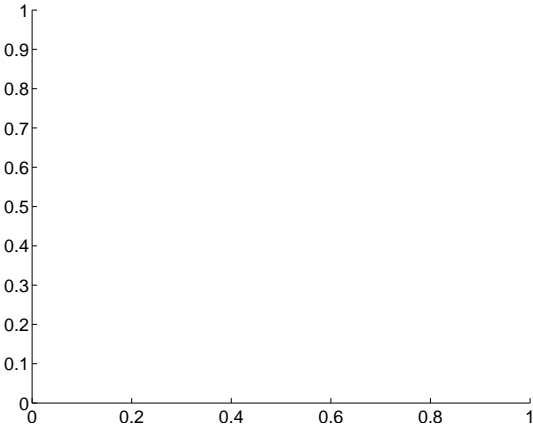
Q11 no difference image



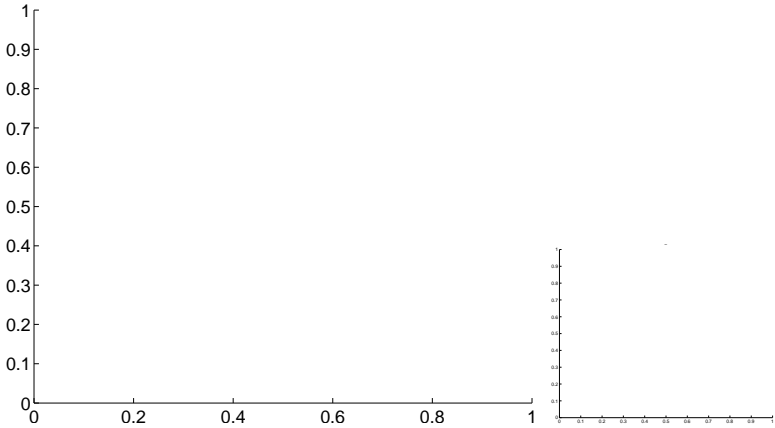
Q11 no OOT image



Q12 no difference image



Q12 no OOT image



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

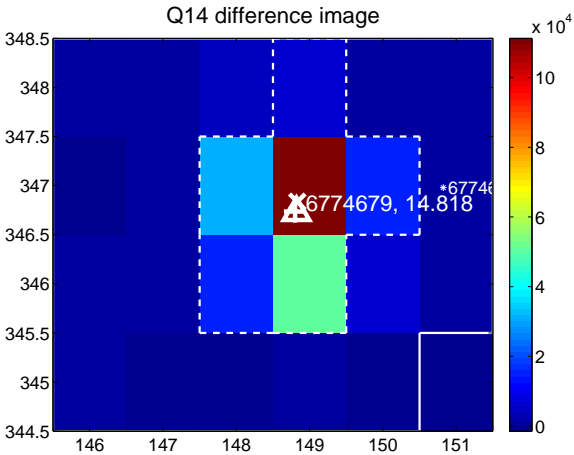
Q13 no difference image



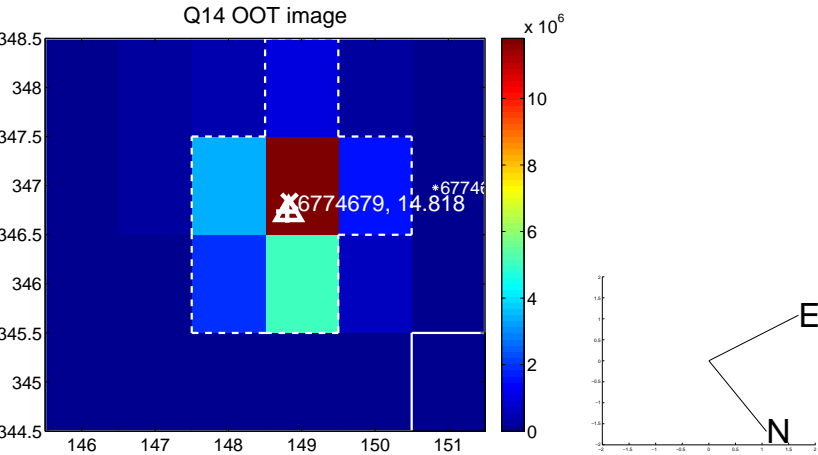
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



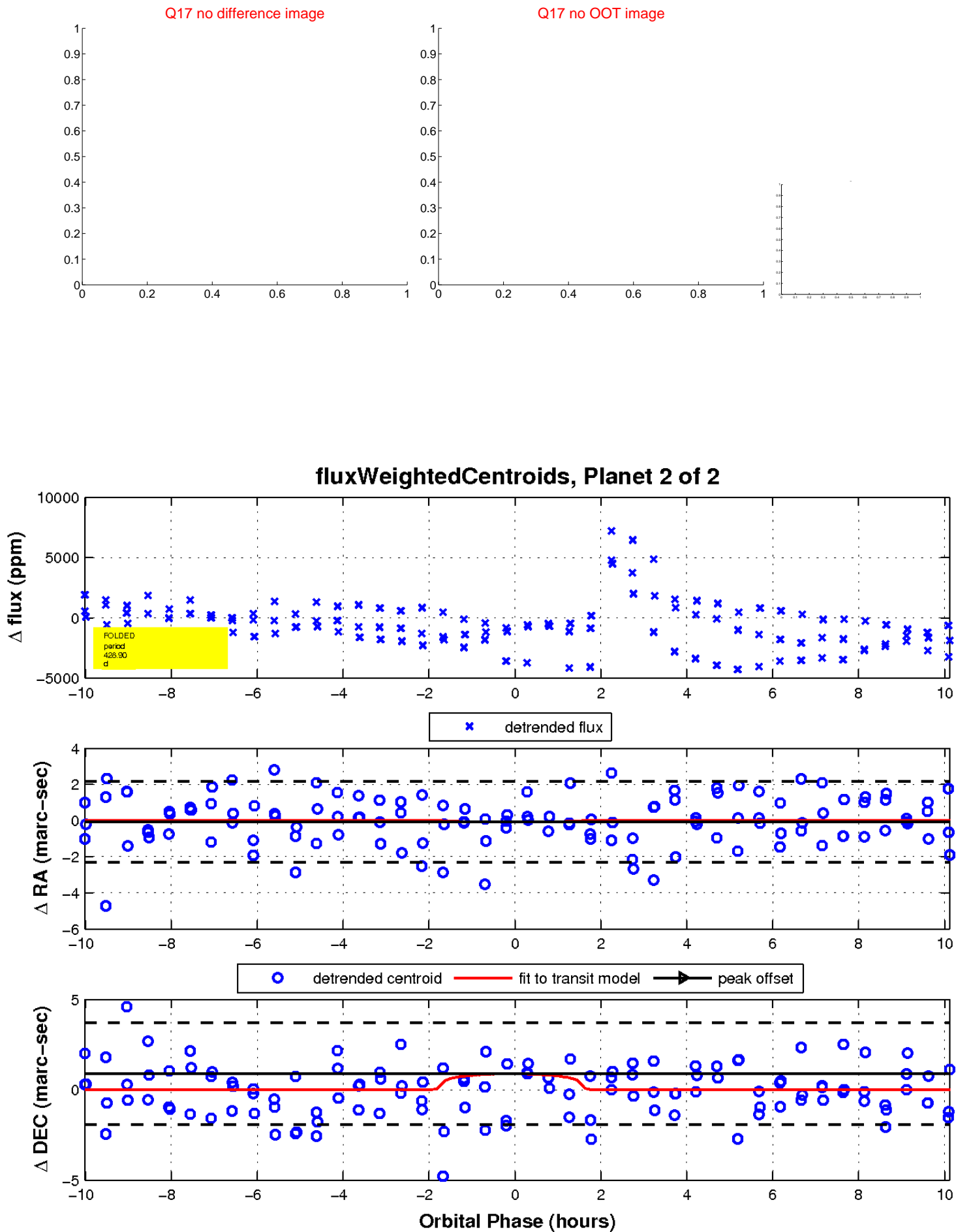
Q16 no difference image



Q16 no OOT image



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



# UKIRT Image

Declination

