

# KIC 004078693

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004078693-01	OBS	6386.01	2.756544	133.023617	3472.5	1.558	322.3	324.5	1.67	5496	13.43	1475.36
004078693-02	OBS	No	2.756542	131.647275	1398.6	1.492	125.5	140.0	1.67	5496	8.23	1475.36
004078693-03	OBS	No	656.139992	134.924647	524.9	10.671	10.3	7.3	1.67	5496	4.04	1.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004078693-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
004078693-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
004078693-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

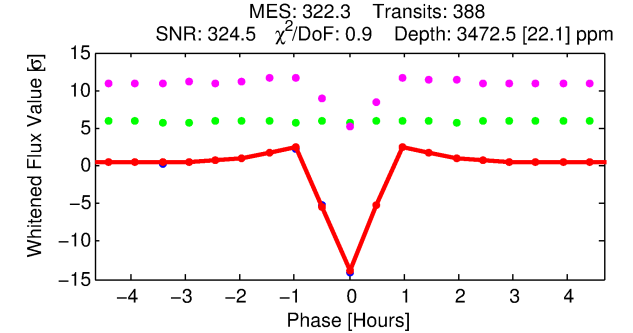
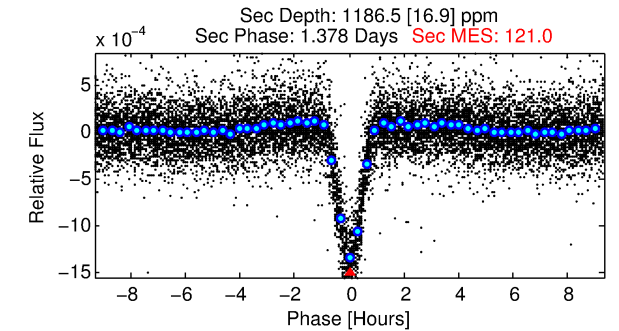
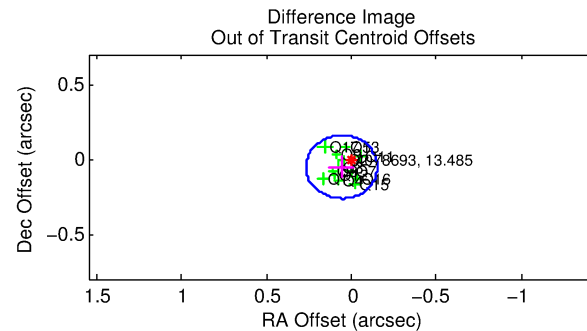
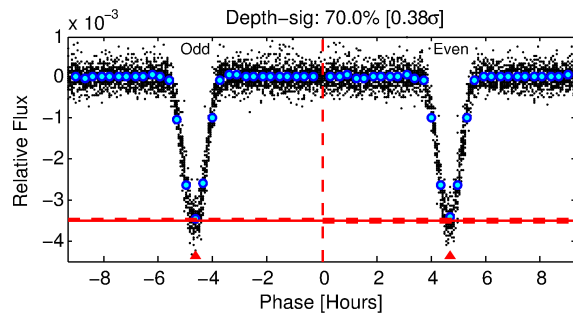
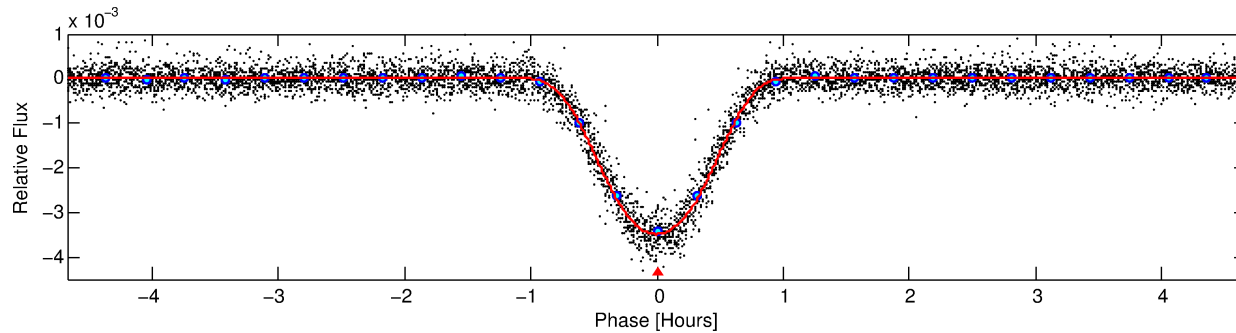
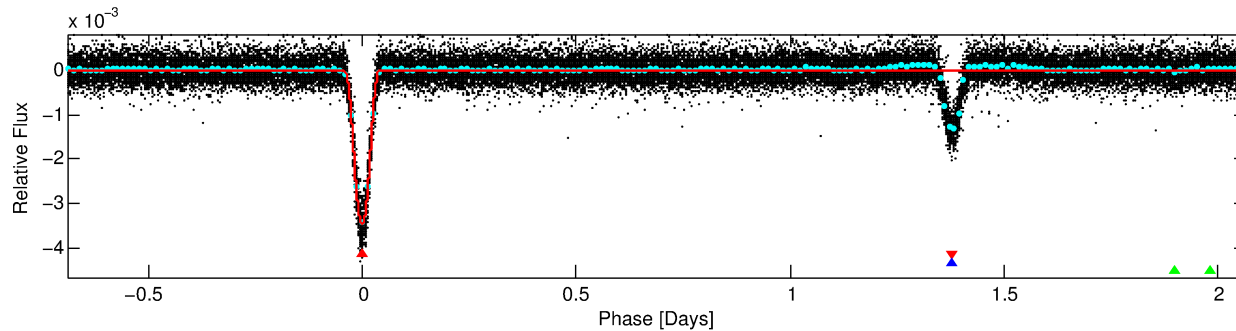
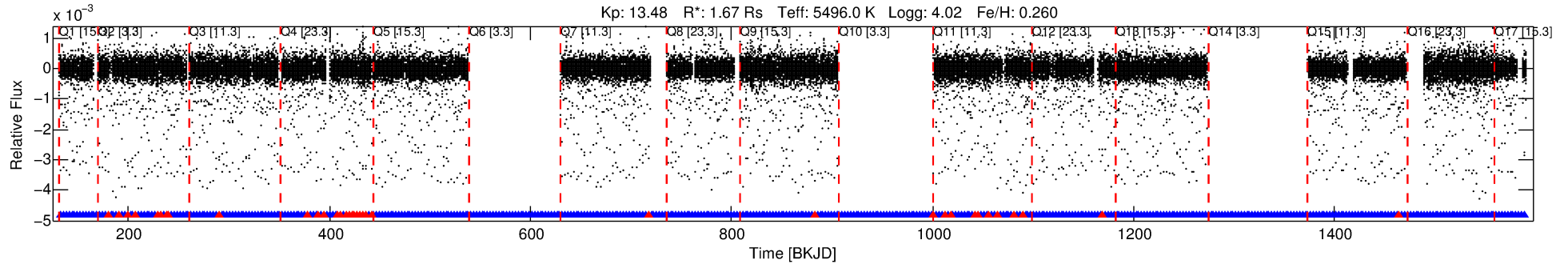
## Ephemeris Match Information For 004078693-01

No Significant Match Found

# DV One-Page Summary

KIC: 4078693 Candidate: 1 of 3 Period: 2.757 d  
KOI: K06386.01 Corr: 0.981

Kp: 13.48 R\*: 1.67 Rs Teff: 5496.0 K Logg: 4.02 Fe/H: 0.260



## DV Fit Results:

Period = 2.75654 [0.00000] d  
Epoch = 133.0236 [0.0001] BKJD  
Rp/R\* = 0.0737 [0.0027]  
a/R\* = 6.97 [0.15]  
b = 0.94 [0.01]  
Seff = 1475.36 [1050.04]  
Teq = 1580 [281] K  
Rp = 13.43 [5.60] Re  
a = 0.0393 [0.0167] AU  
Ag = 5.59 [3.94] [1.16σ]  
Teff = 3757 [133] K [7.00σ]

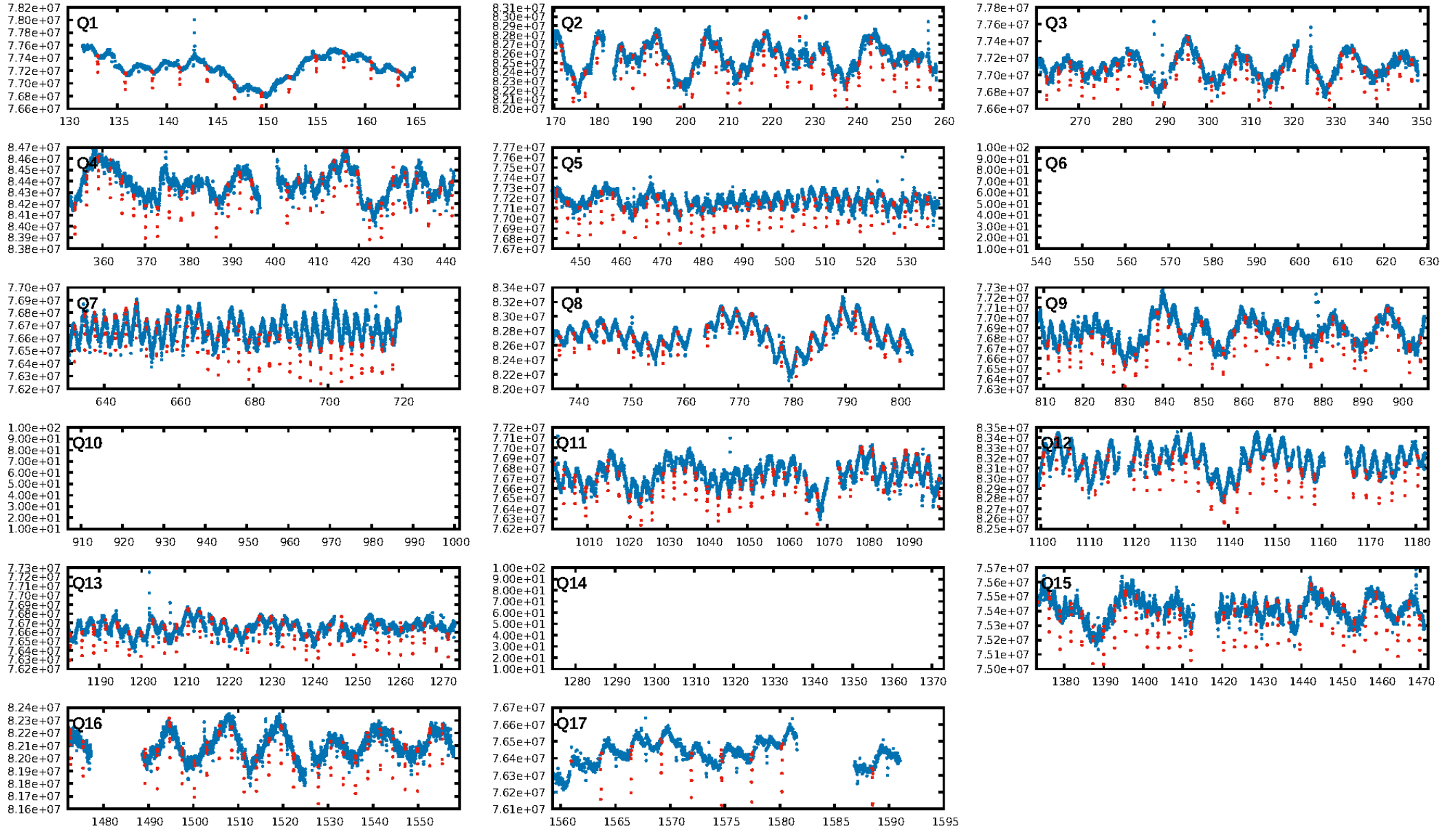
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 100.0% [1454.14σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.90 [332/368]  
GhostDiagnostic-chr: 4.667  
Centroid-sig: 0.5%  
Centroid-so: 0.400 arcsec [11.05σ]  
OotOffset-rm: 0.079 arcsec [1.12σ]  
KicOffset-rm: 0.344 arcsec [4.42σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

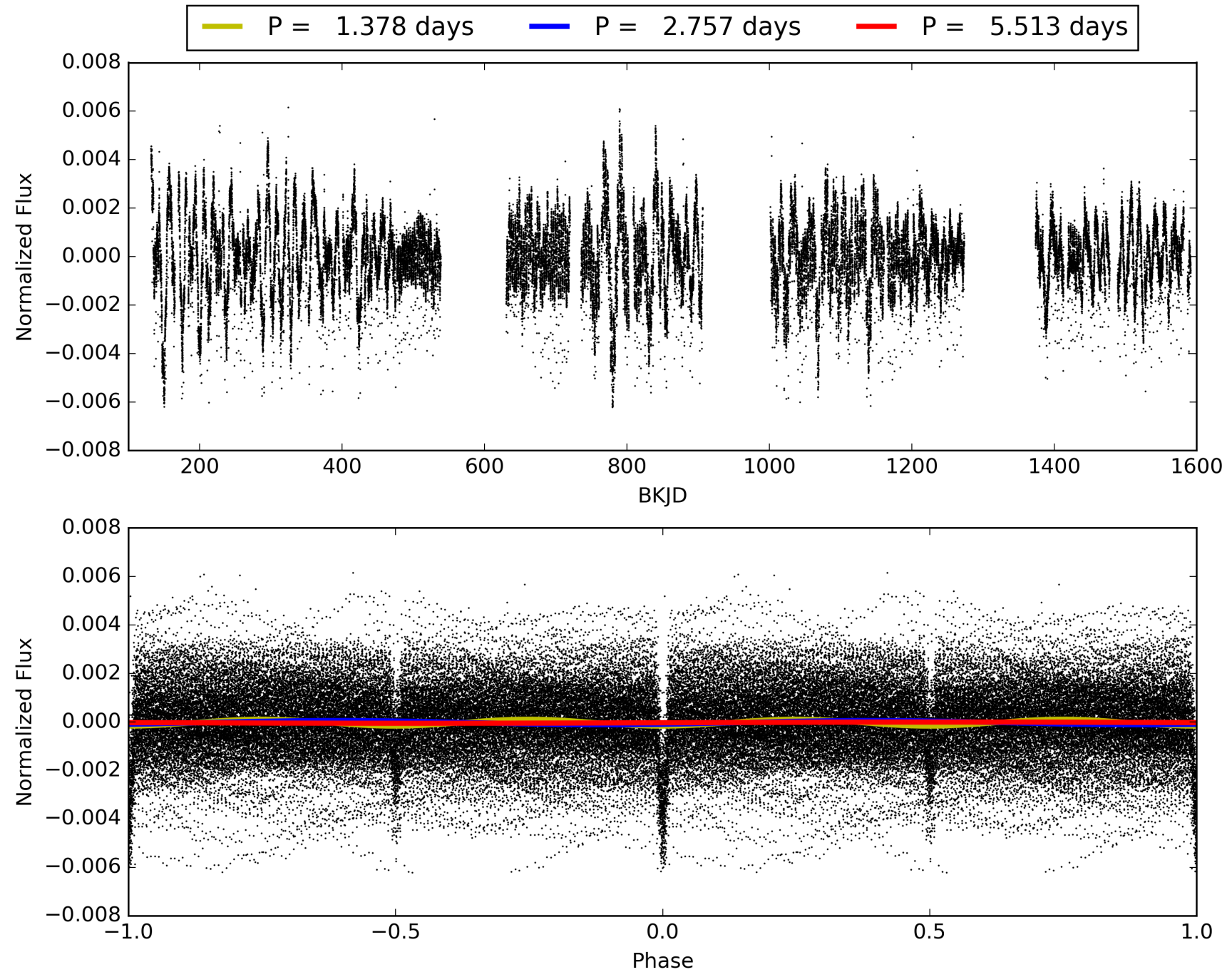
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:47:04 Z

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

# TCE 004078693-01, PDC Light Curves

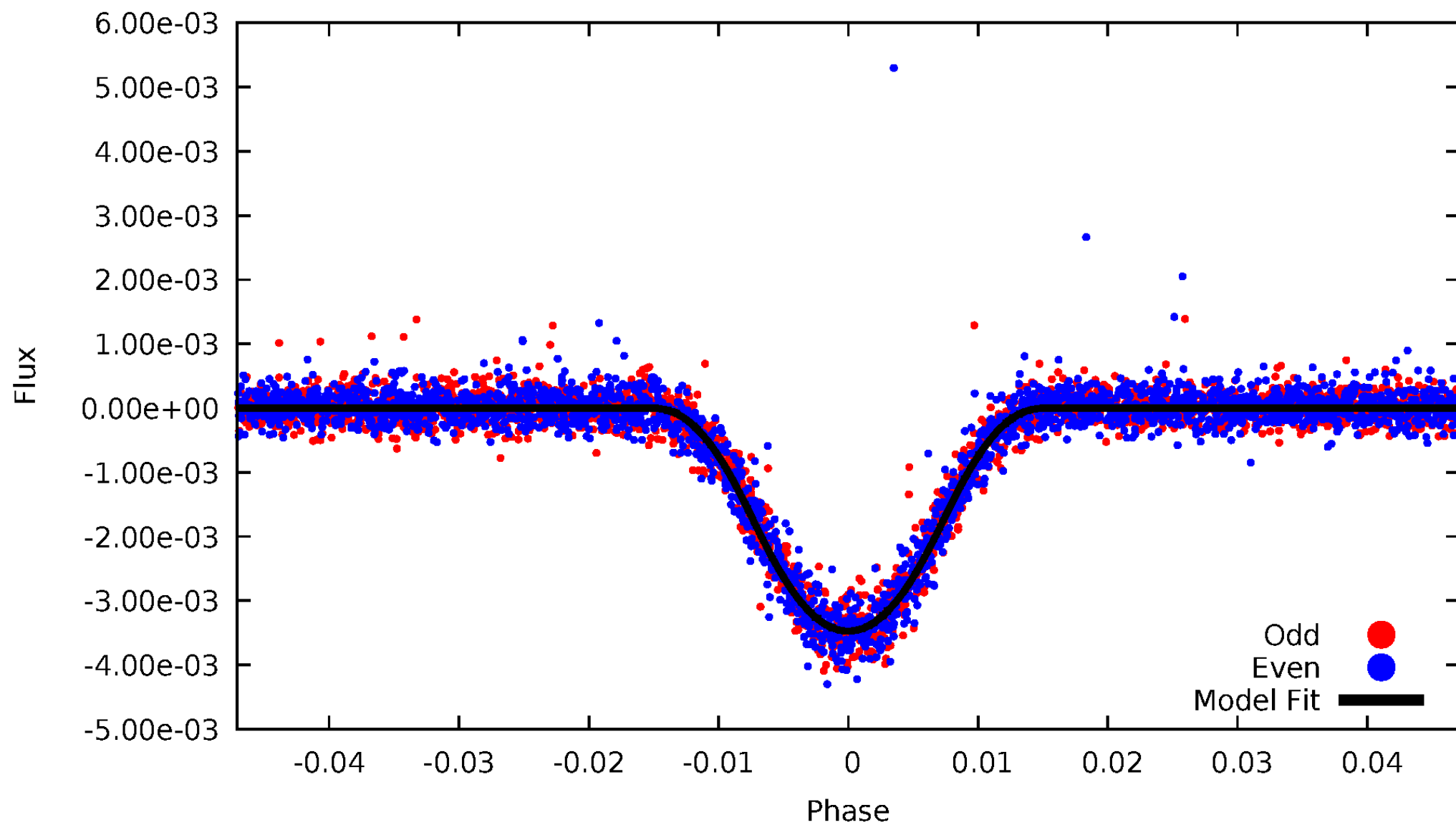


TCE 004078693-01



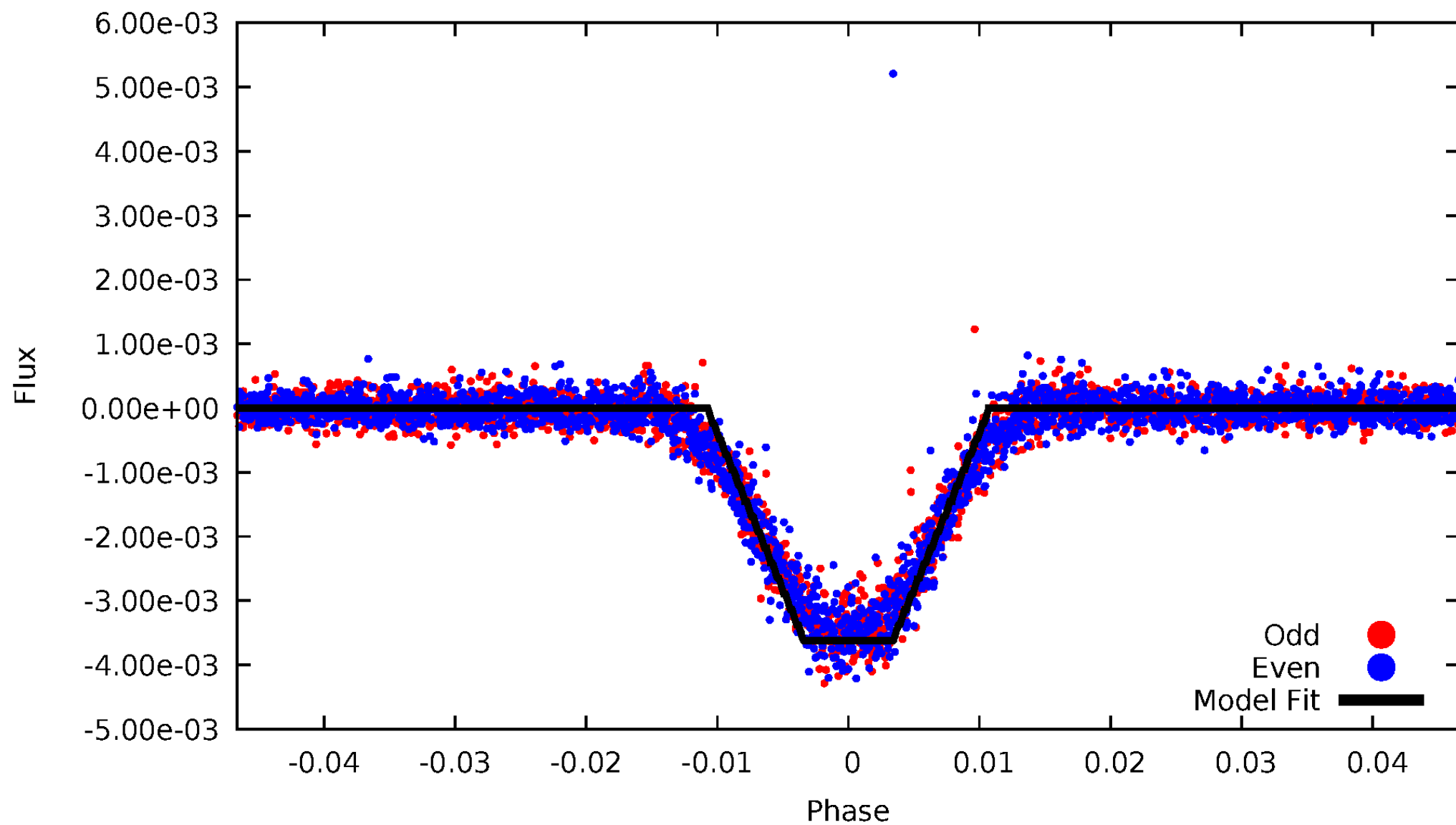
# DV Odd/Even

TCE 004078693-01



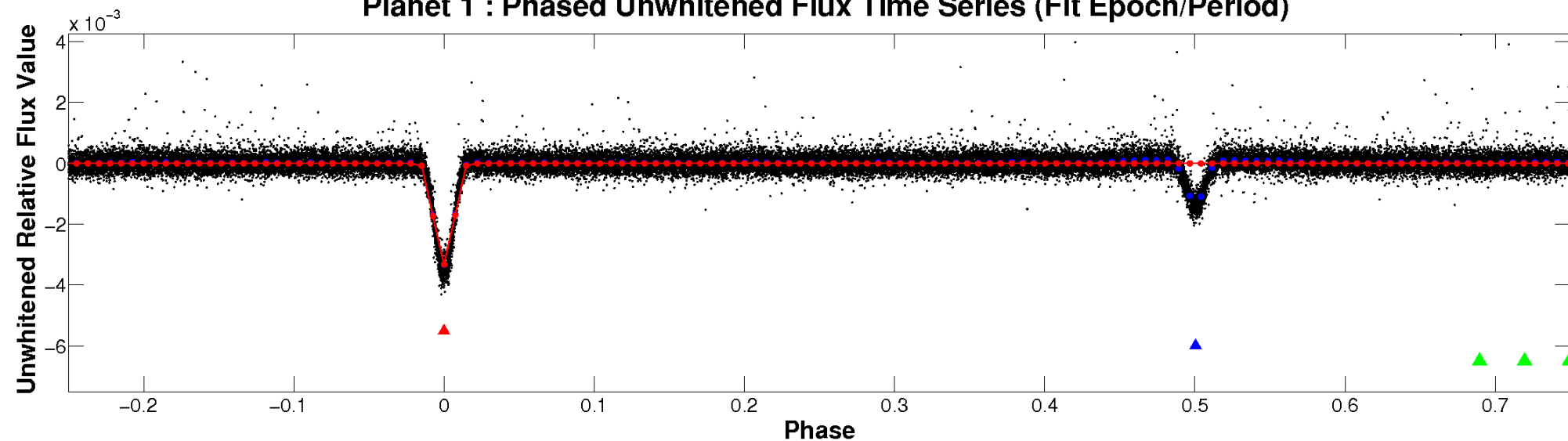
# ALT Odd/Even

TCE 004078693-01

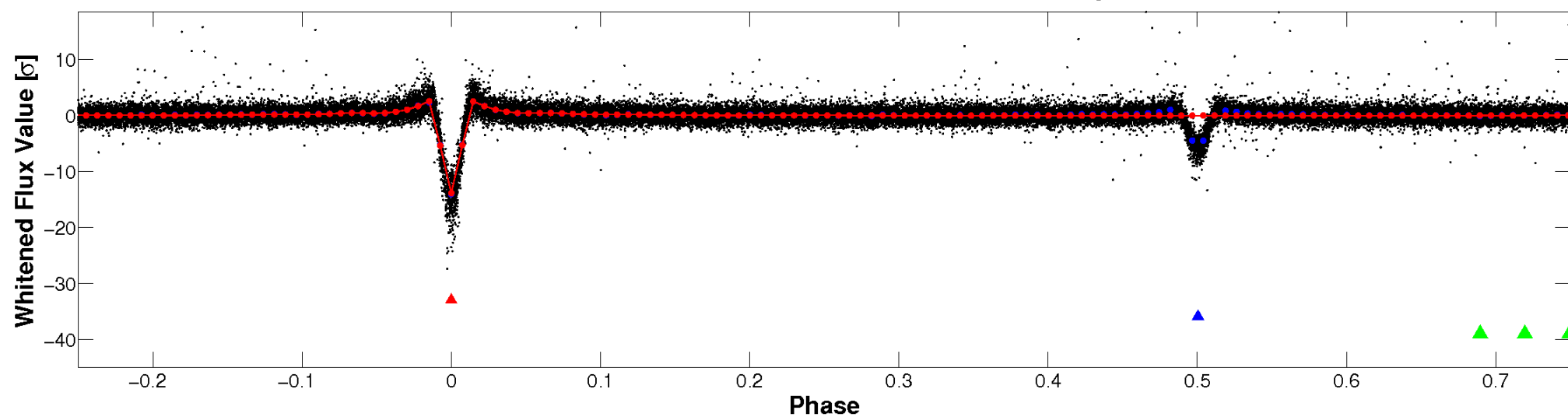


# Non-Whitened Vs. Whitened Light Curve

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



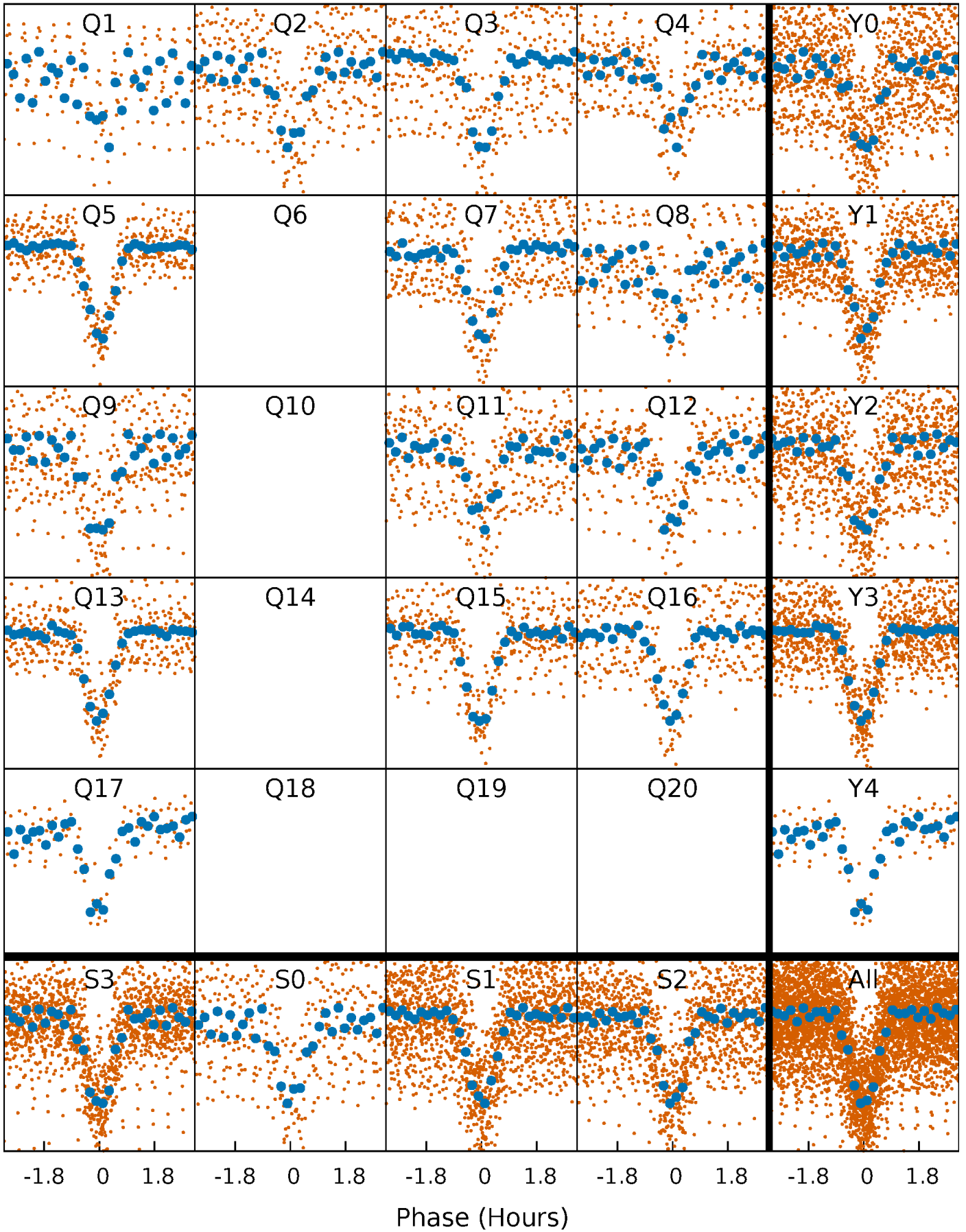
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

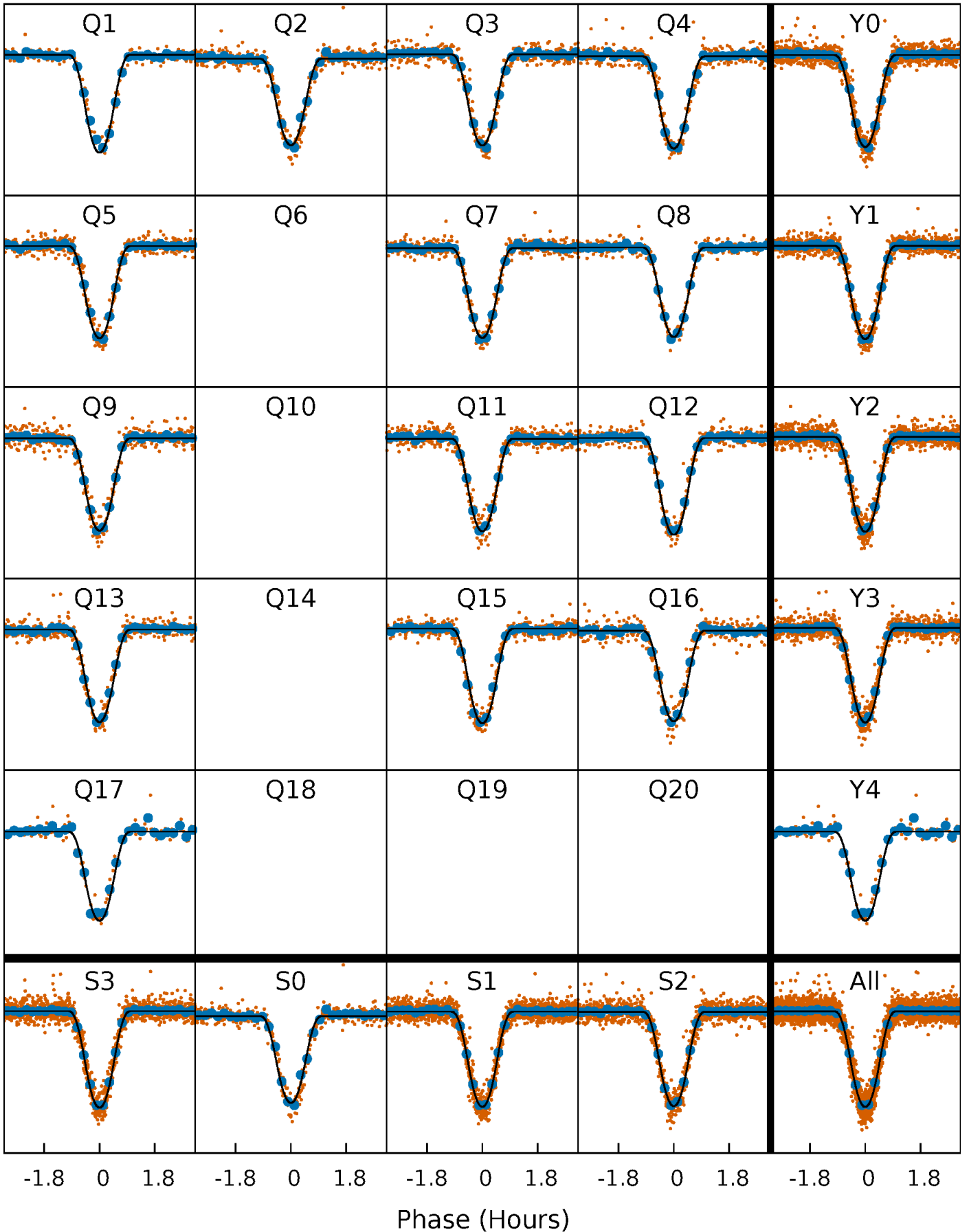
TCE 004078693-01 P= 2.756544 Days  $T_0=133.023617$  (BKJD)





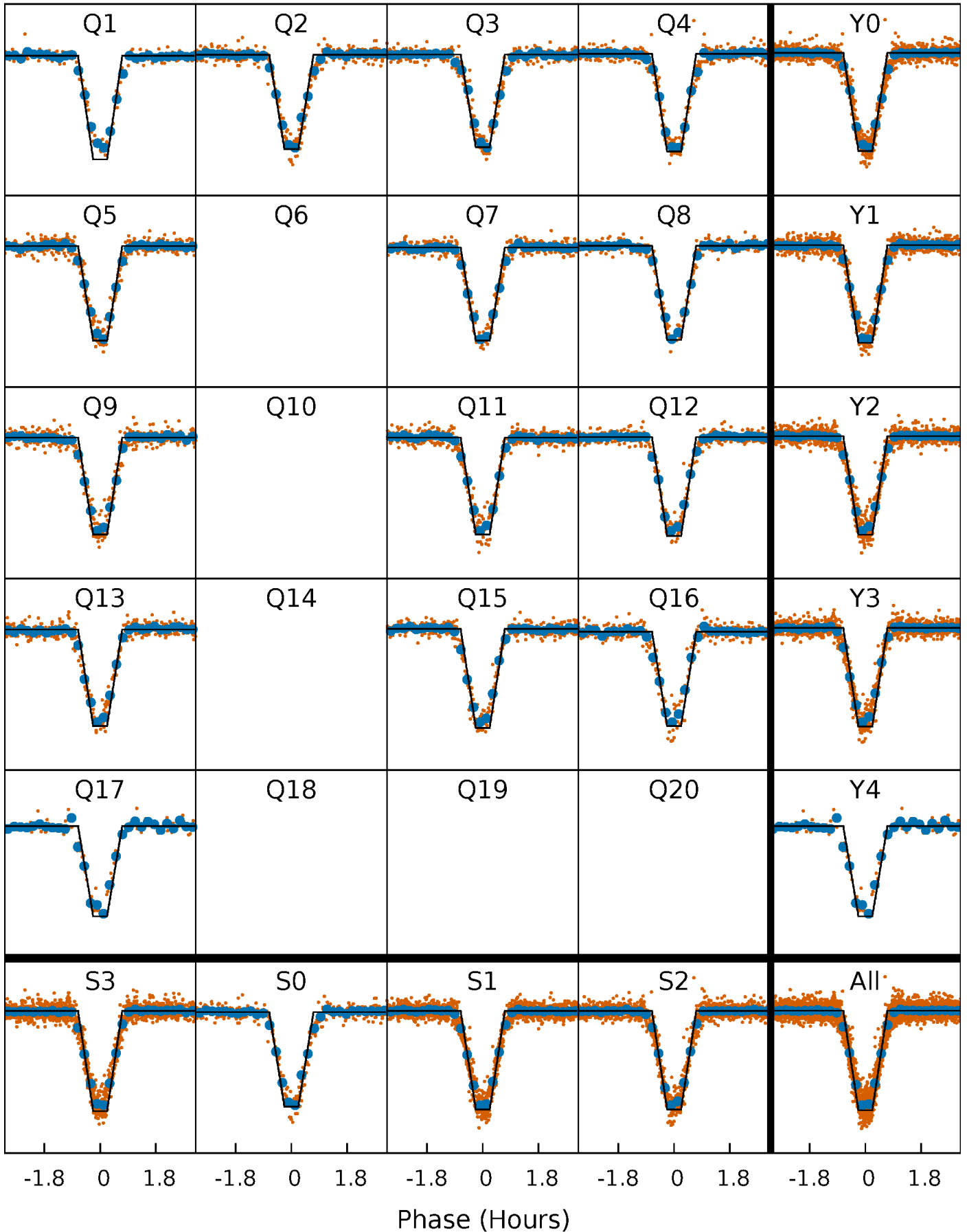
# DV Quarter-Phased Transit Curves

TCE 004078693-01   P= 2.756544 Days    $T_0=133.023617$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

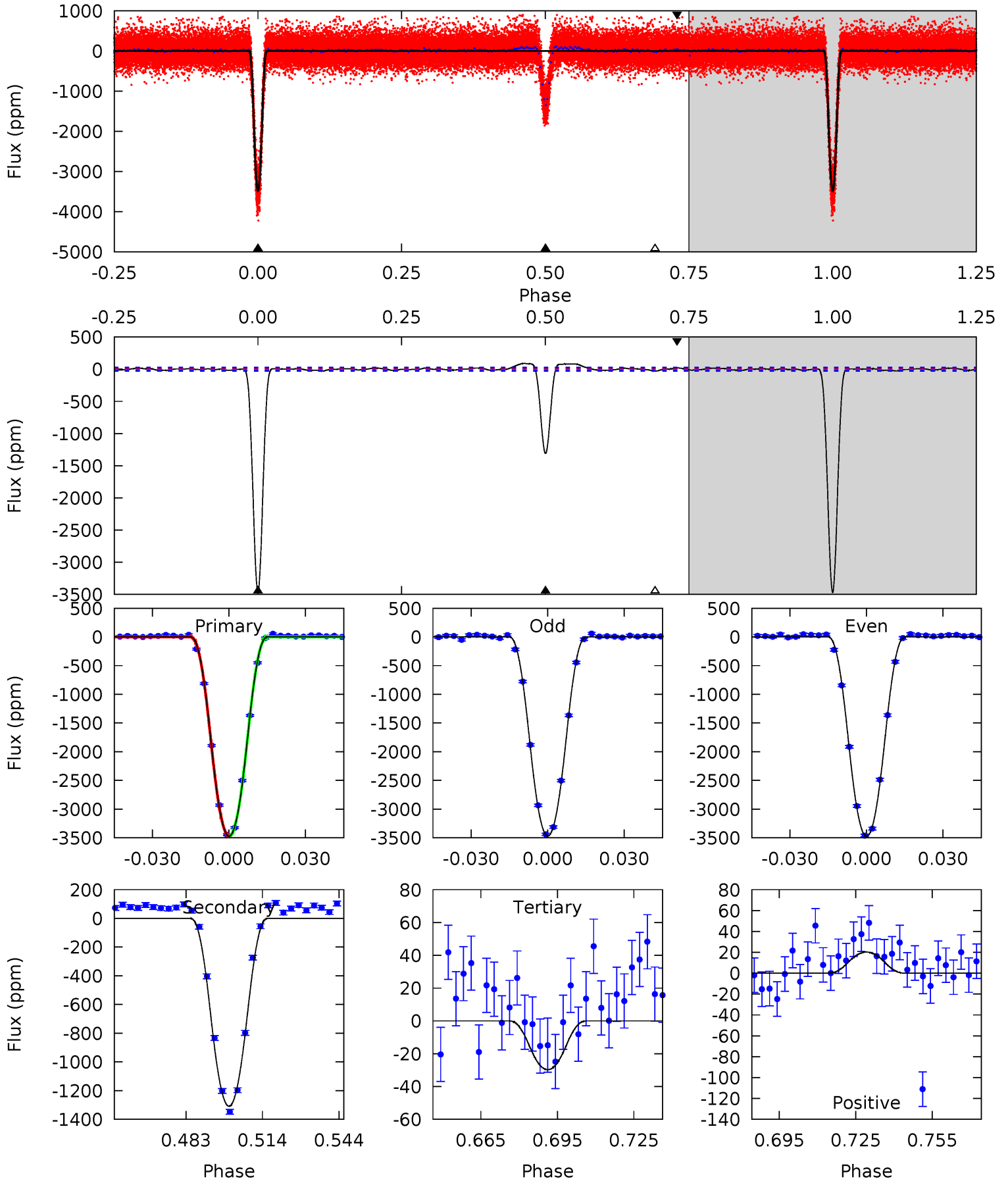
TCE 004078693-01   P= 2.756543 Days    $T_0=133.023885$  (BKJD)



# DV Model-Shift Uniqueness Test

004078693-01, P = 2.756544 Days, E = 130.267073 Days

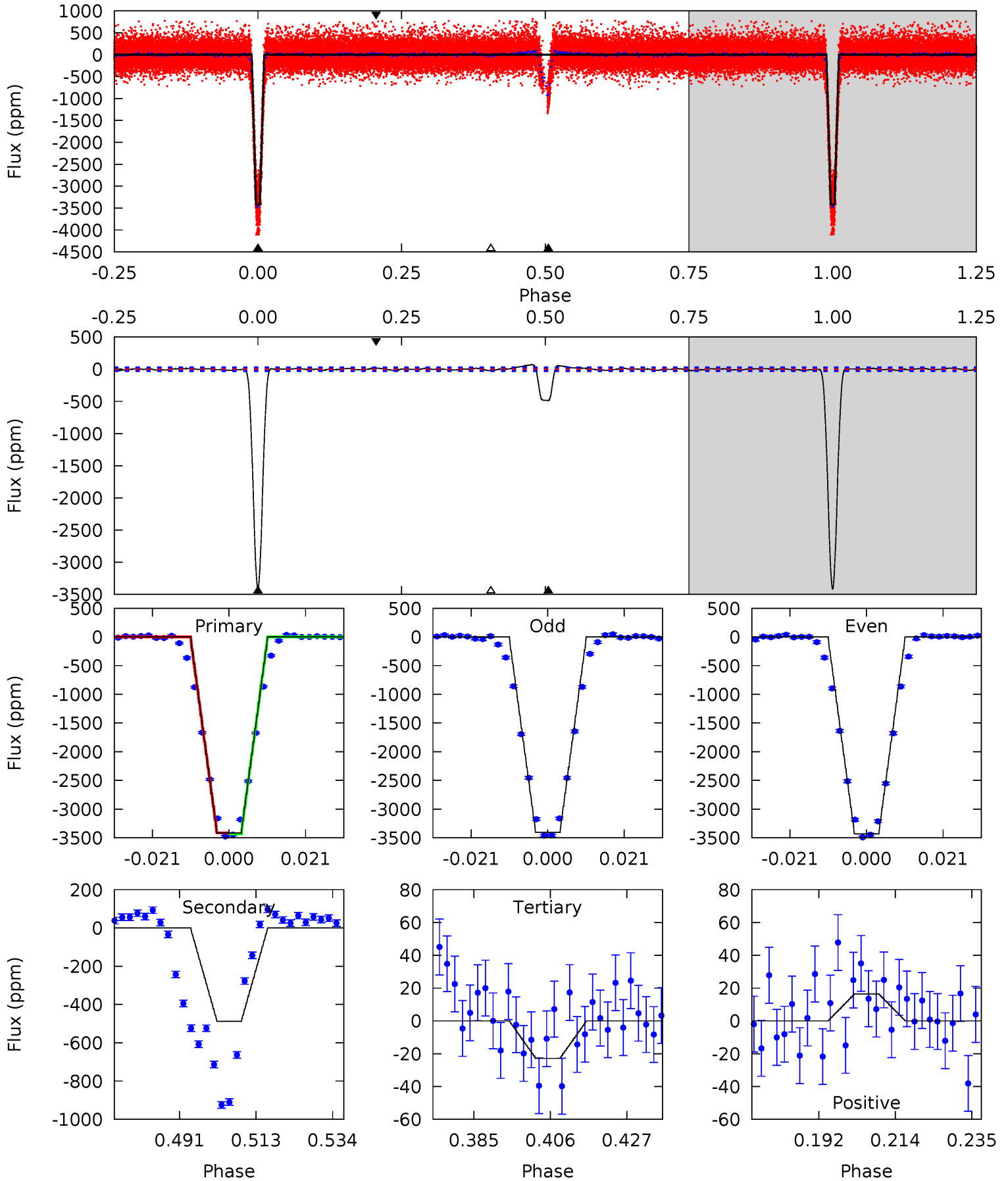
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
638.2	240.6	5.46	3.71	4.81	2.17	4.08	632.7	634.5	235.2	236.9	0.69	0.99	0.03	0.32



# Alt Model-Shift Uniqueness Test

004078693-01, P = 2.756543 Days, E = 130.267342 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
593.9	84.9	3.97	2.86	4.88	2.30	2.51	590.0	591.1	80.9	82.0	2.19	1.00	0.02	1.76



### Stellar Parameters For KIC 004078693

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5496^{+164}_{-147}$	$4.020^{+0.420}_{-0.140}$	$0.260^{+0.150}_{-0.250}$	$1.669^{+0.373}_{-0.693}$	$1.063^{+0.115}_{-0.143}$	$0.322^{+1.146}_{-0.128}$
	+3%/-3%	+10%/-3%	+58%/-96%	+22%/-42%	+11%/-13%	+355%/-40%
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 004078693-01 / KOI 6386.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1309 \pm 5$	$13.19^{+1.81}_{-3.00}$	$2181^{+157}_{-258}$	$4095^{+102}_{-108}$	$6.419^{+4.091}_{-1.375}$
Alt.	$-488 \pm 6$	$10.71^{+1.62}_{-2.27}$	$2181^{+161}_{-247}$	$3670^{+100}_{-94}$	$3.613^{+2.156}_{-0.839}$

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

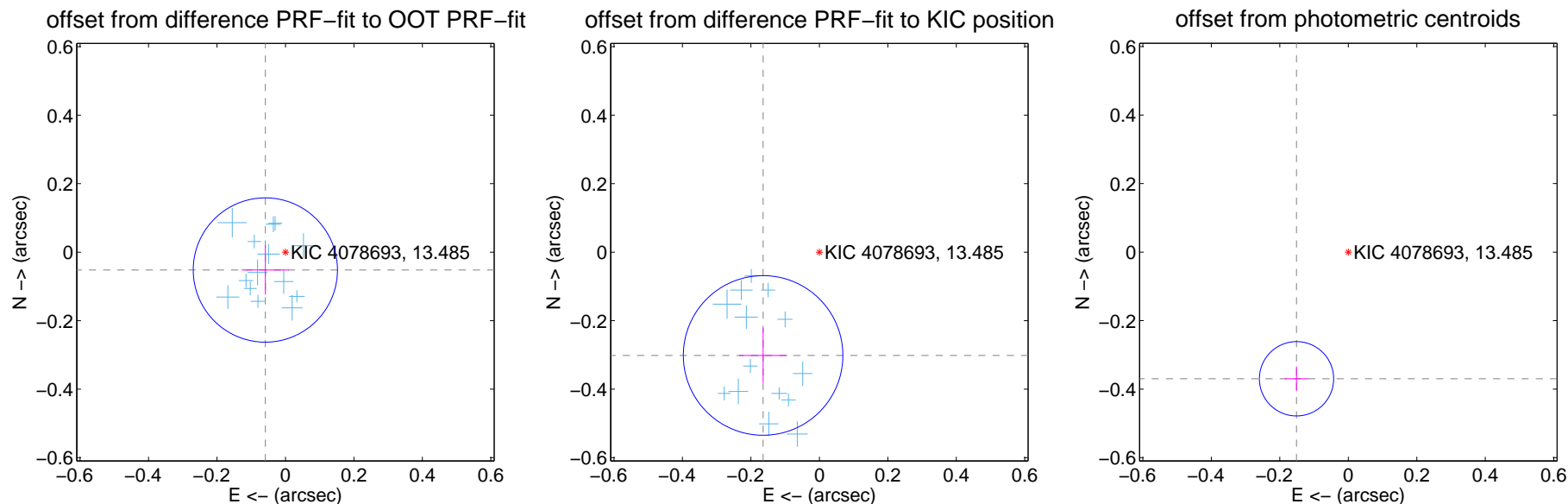
## DV Centroid Data

Supplemental centroid analysis for 004078693-01. Kepler magnitude: 13.48. Transit SNR 324.51

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

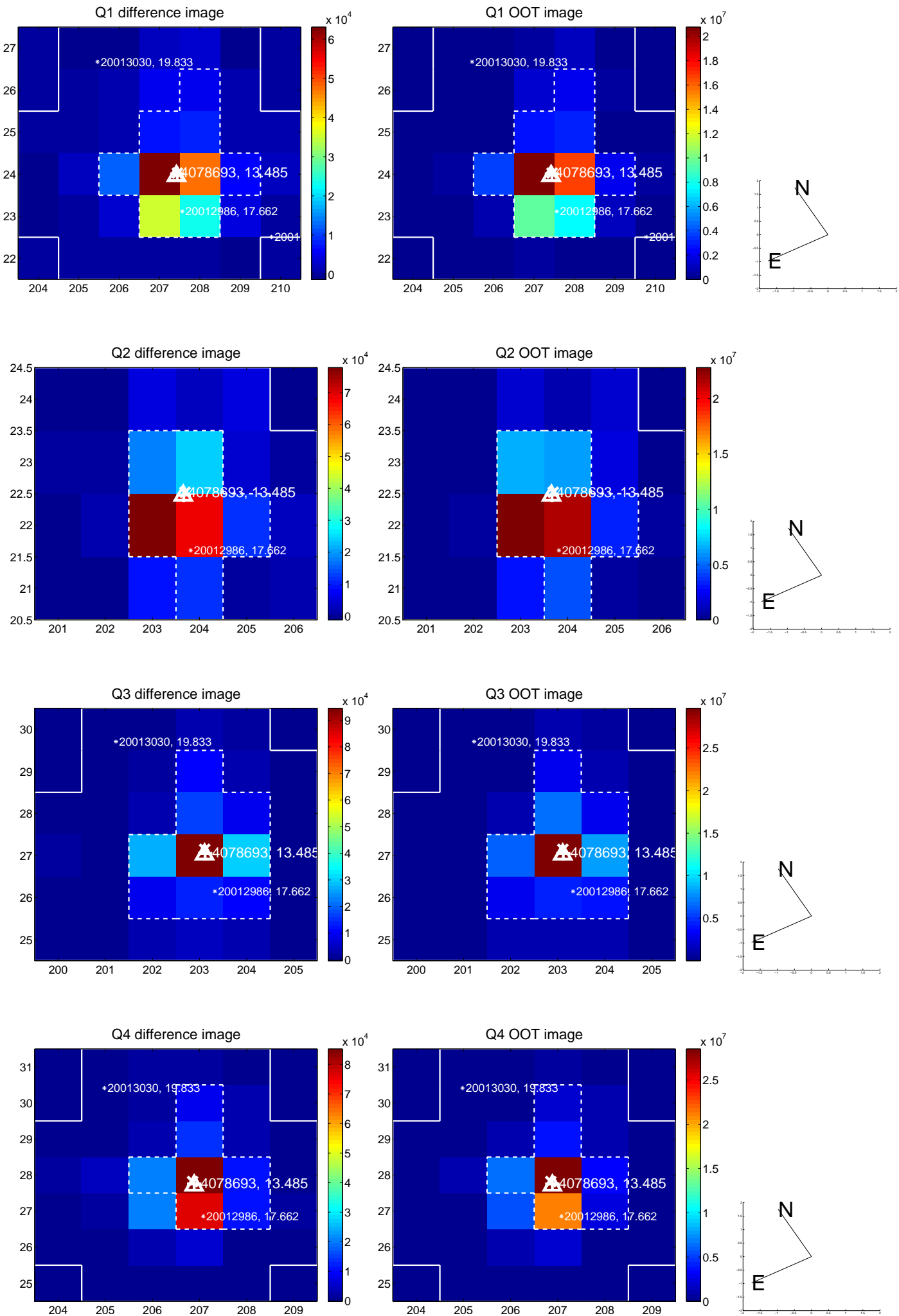
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.079 \pm 0.070$	1.12	$0.059 \pm 0.069$	$-0.052 \pm 0.072$
PRF-fit source offset from KIC position	$0.344 \pm 0.078$	4.42	$0.164 \pm 0.070$	$-0.302 \pm 0.080$
photometric centroid source offset	$0.40 \pm 0.04$	11.05	$0.15 \pm 0.04$	$-0.37 \pm 0.04$



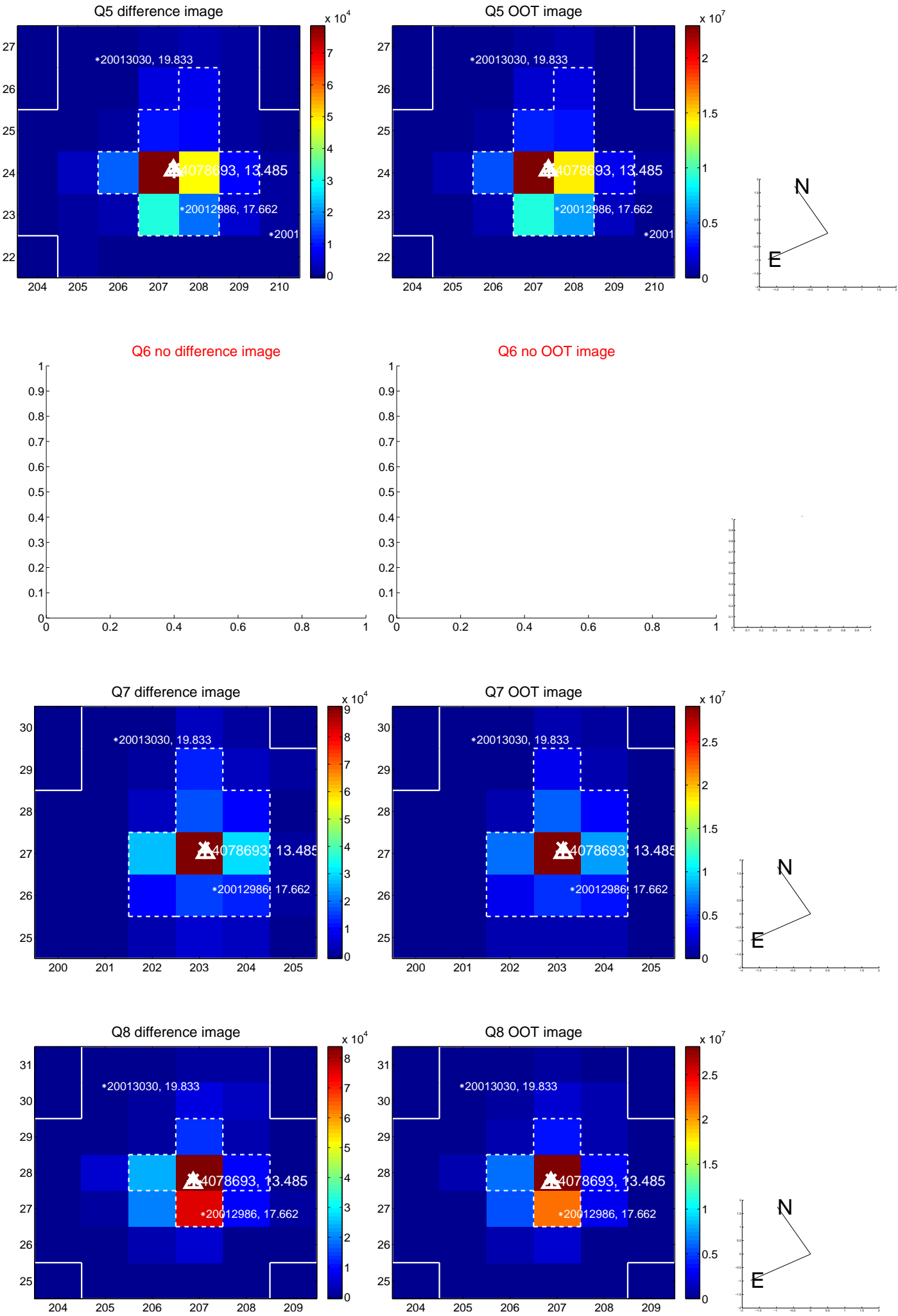
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



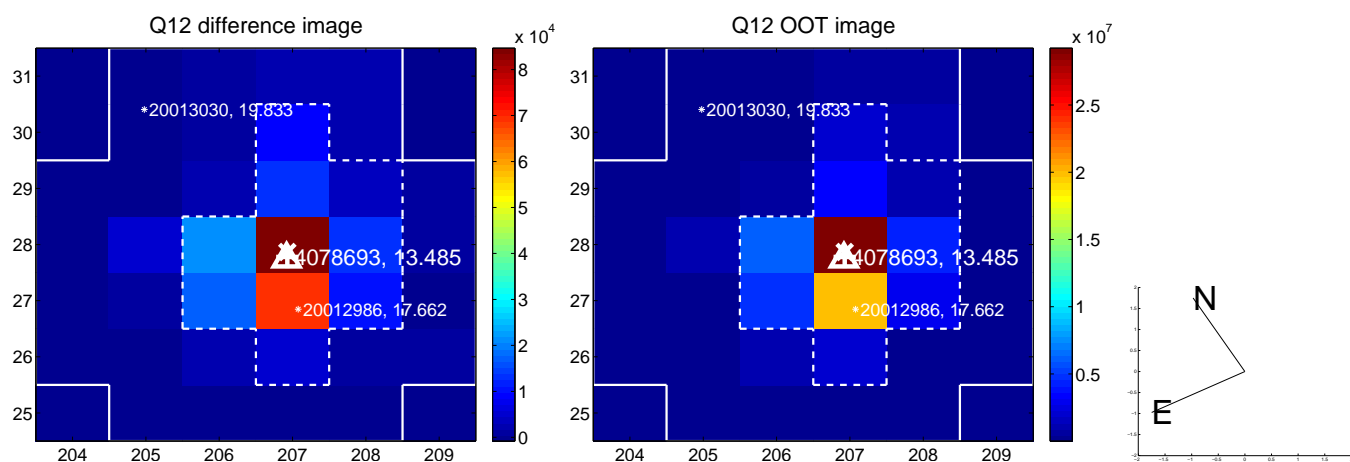
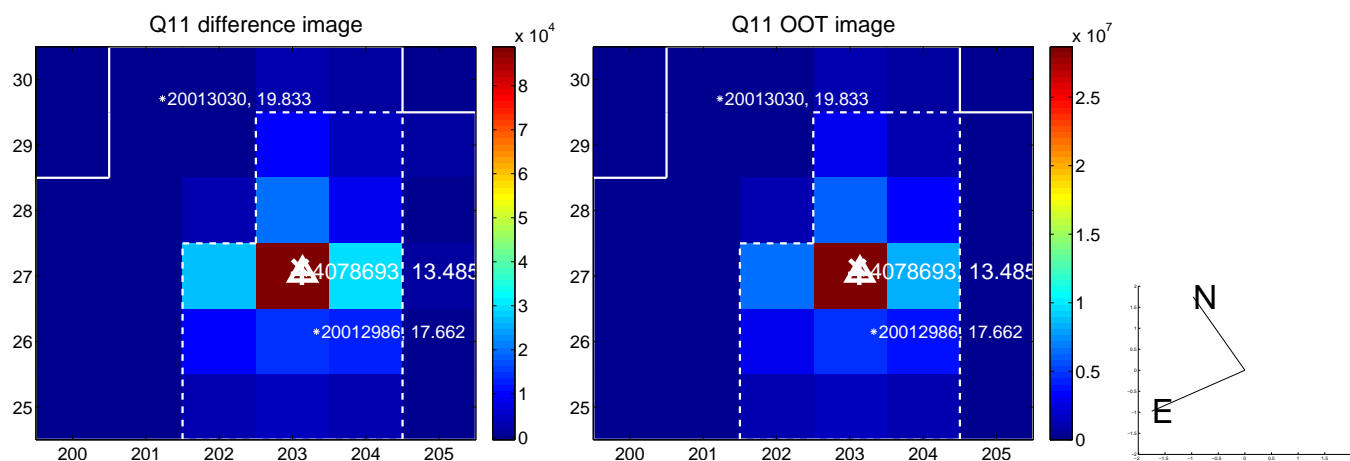
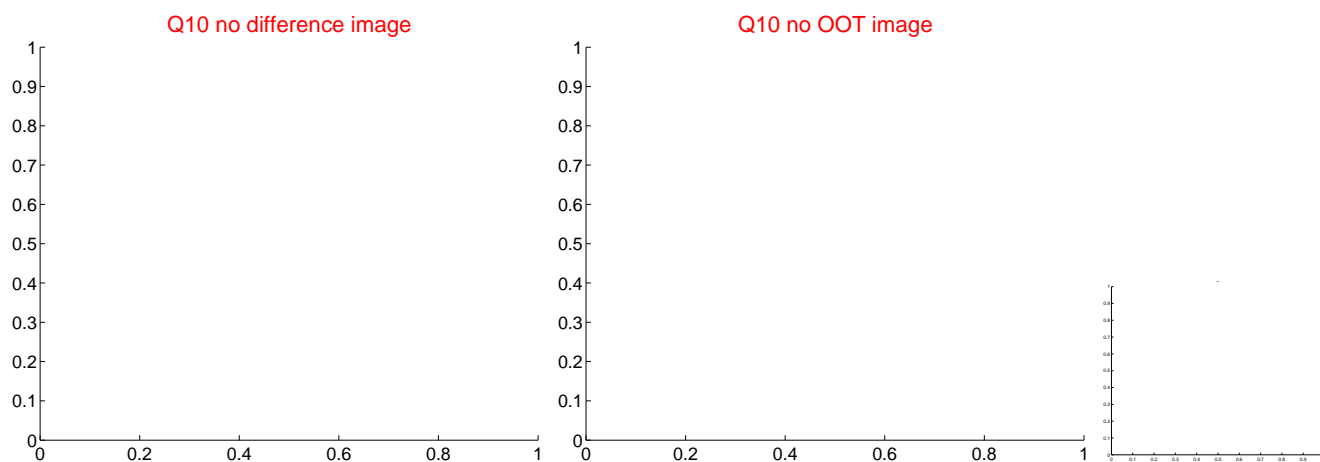
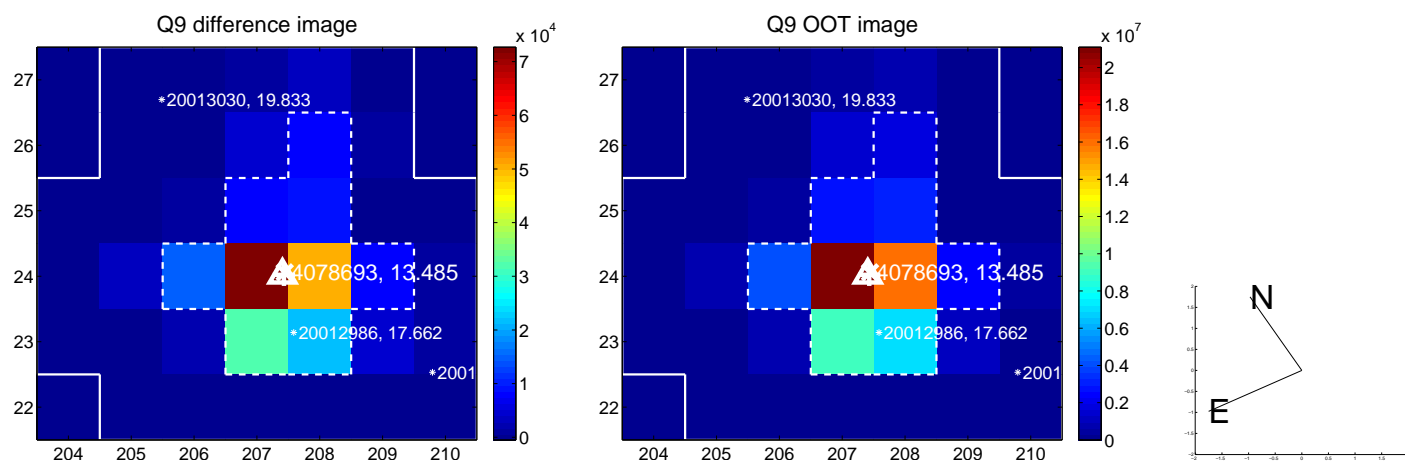
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



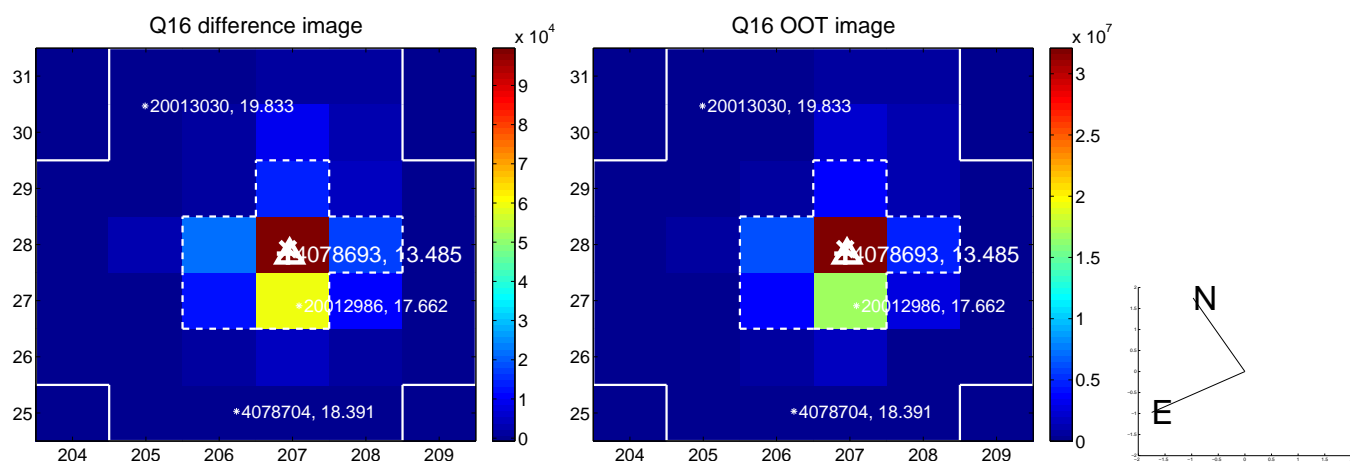
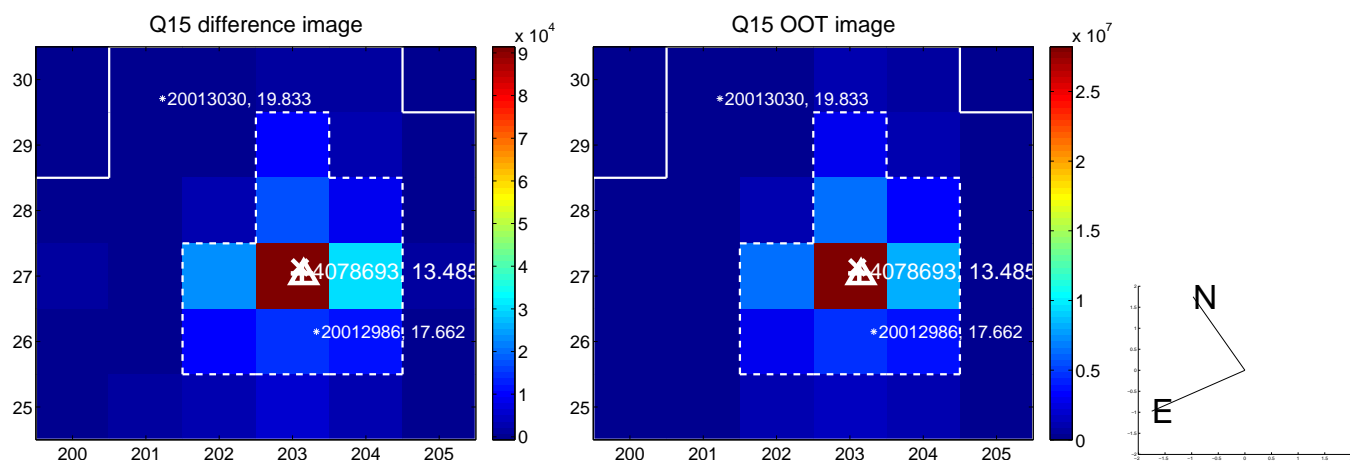
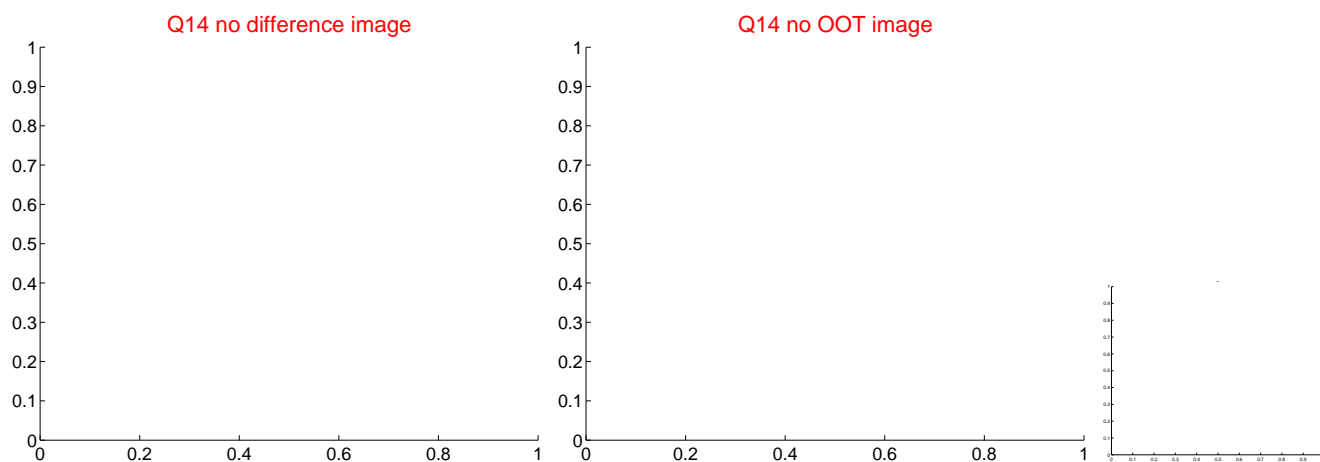
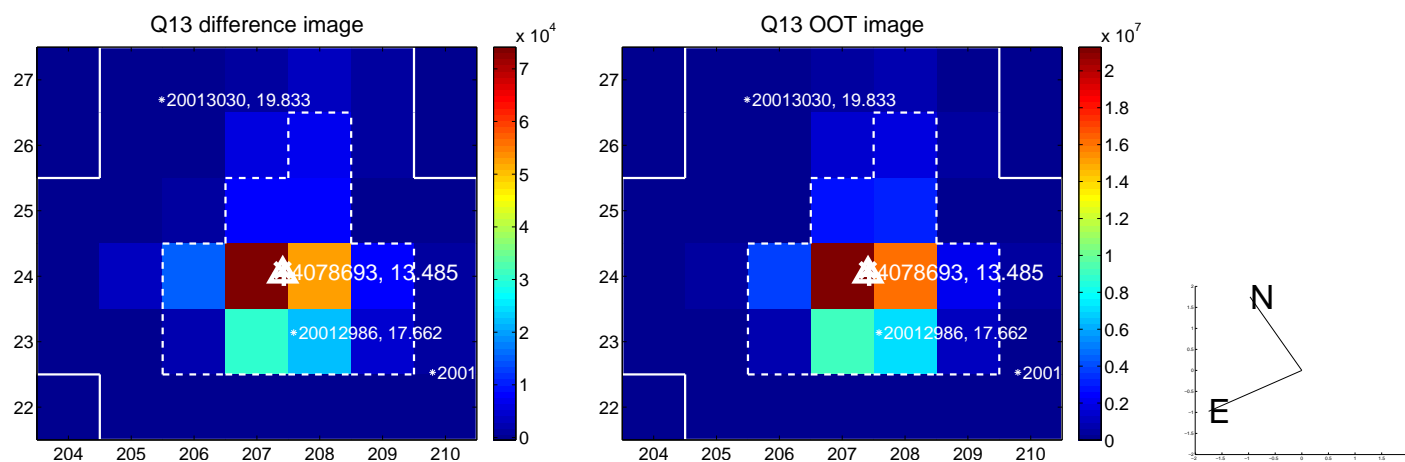
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



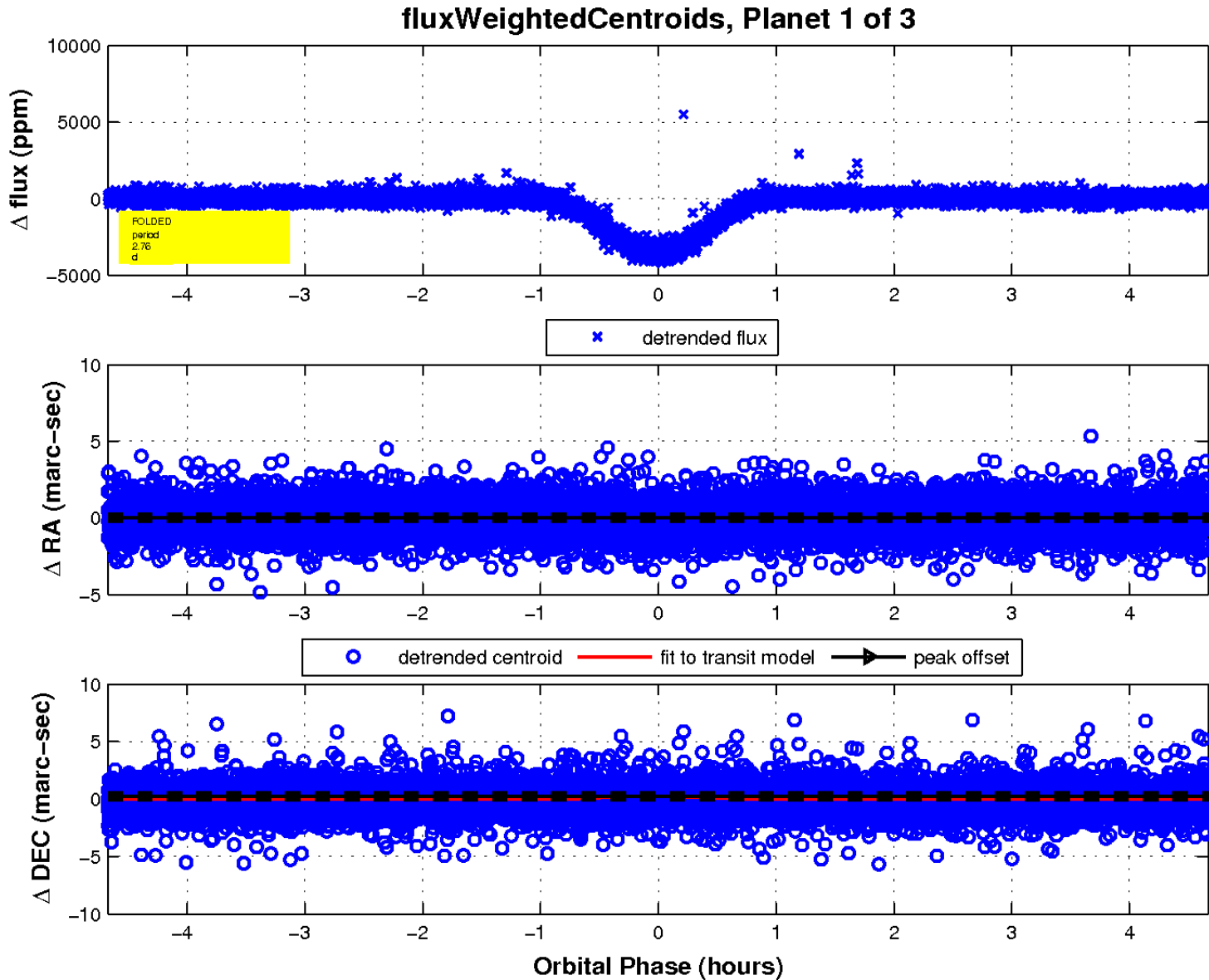
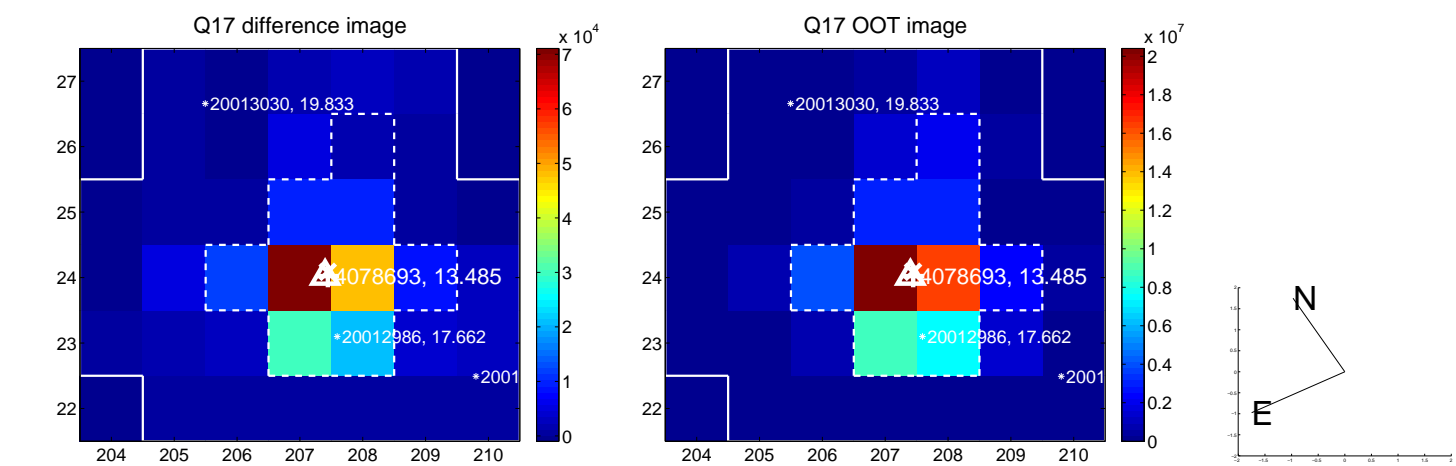
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

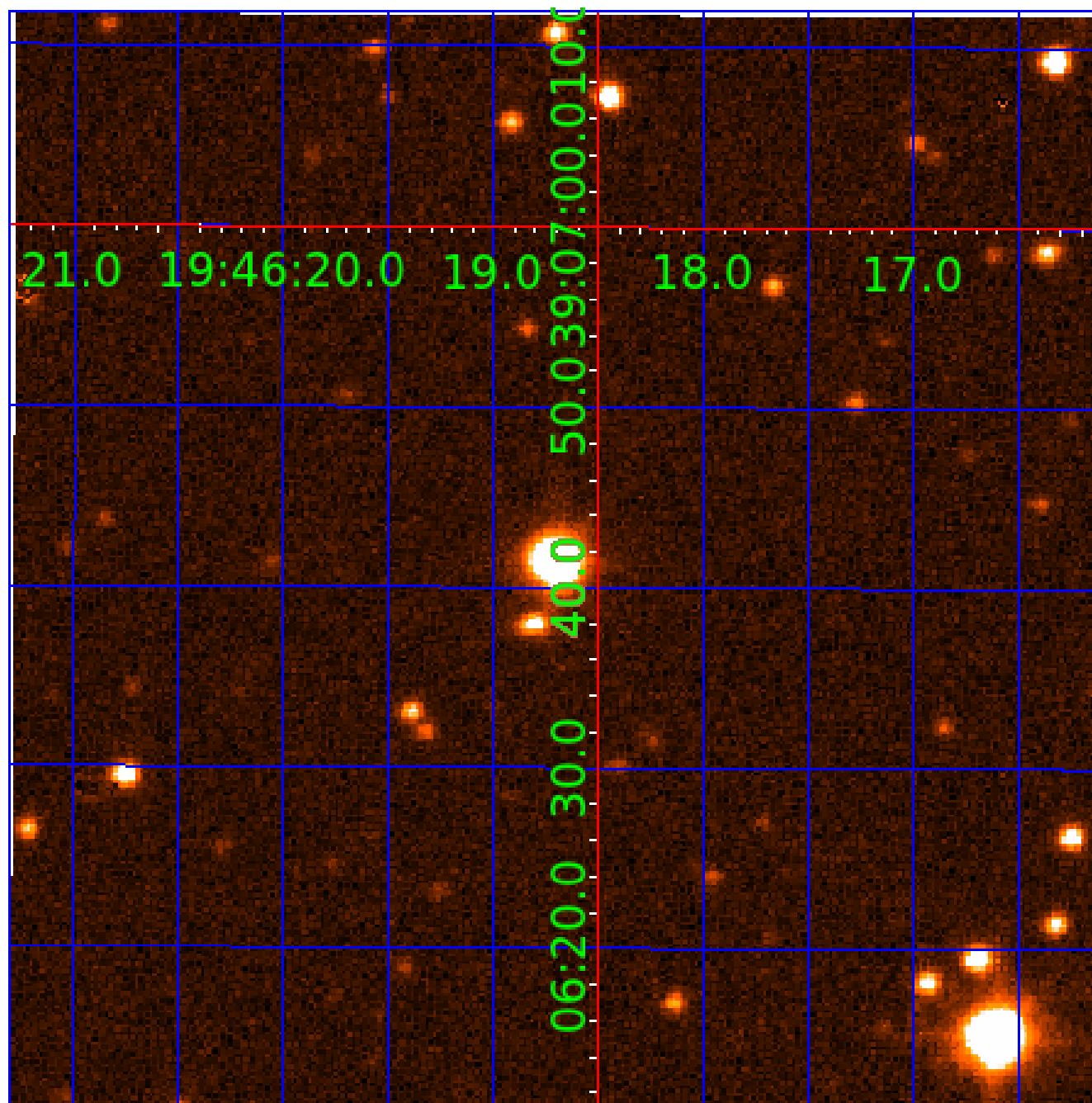


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 004078693

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004078693-01	OBS	6386.01	2.756544	133.023617	3472.5	1.558	322.3	324.5	1.67	5496	13.43	1475.36
004078693-02	OBS	No	2.756542	131.647275	1398.6	1.492	125.5	140.0	1.67	5496	8.23	1475.36
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004078693-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
004078693-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
004078693-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

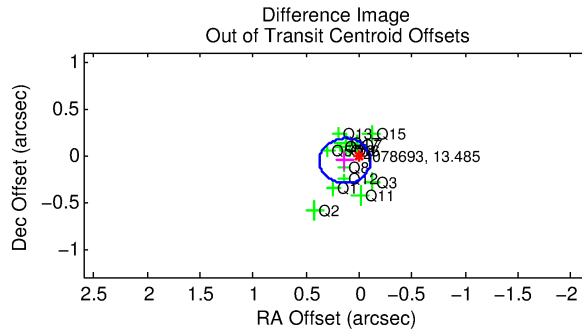
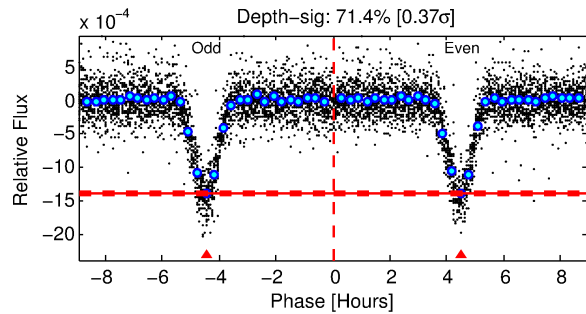
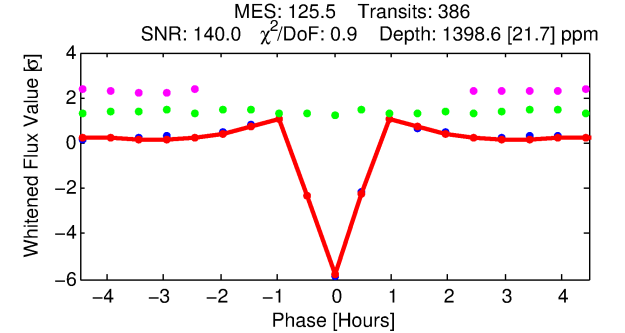
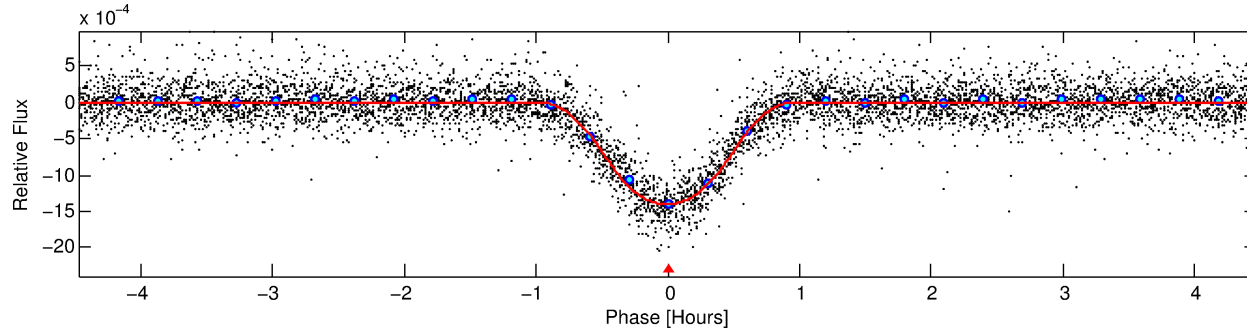
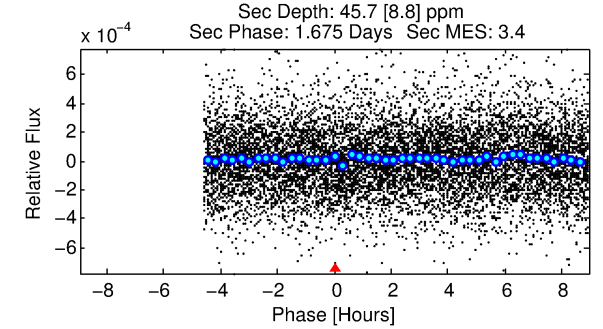
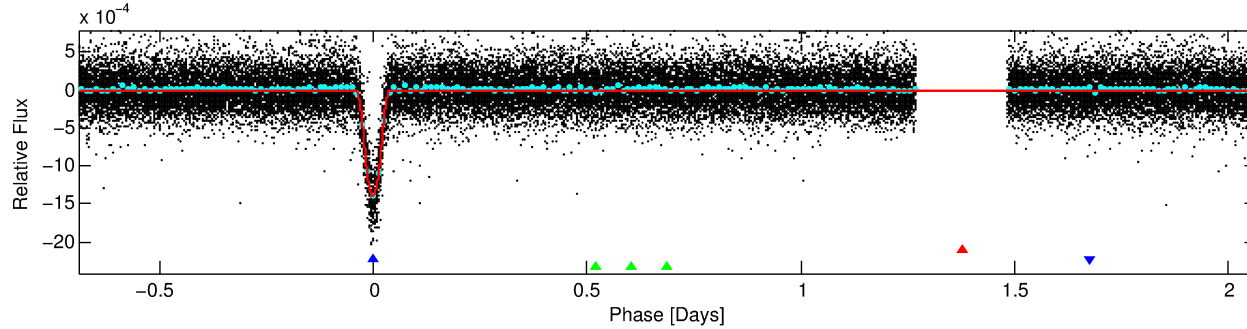
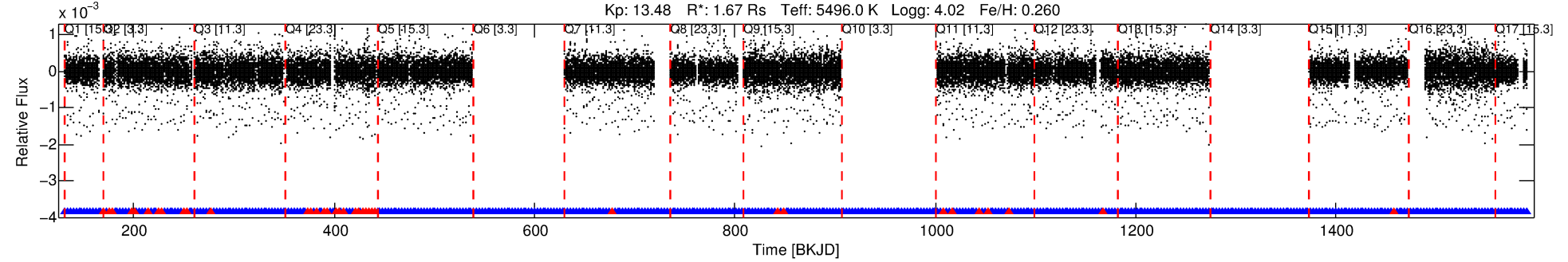
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004078693-02

No Significant Match Found

# DV One-Page Summary

KIC: 4078693 Candidate: 2 of 3 Period: 2.757 d  
KOI: K06386 Corr: No Ephemeris Match



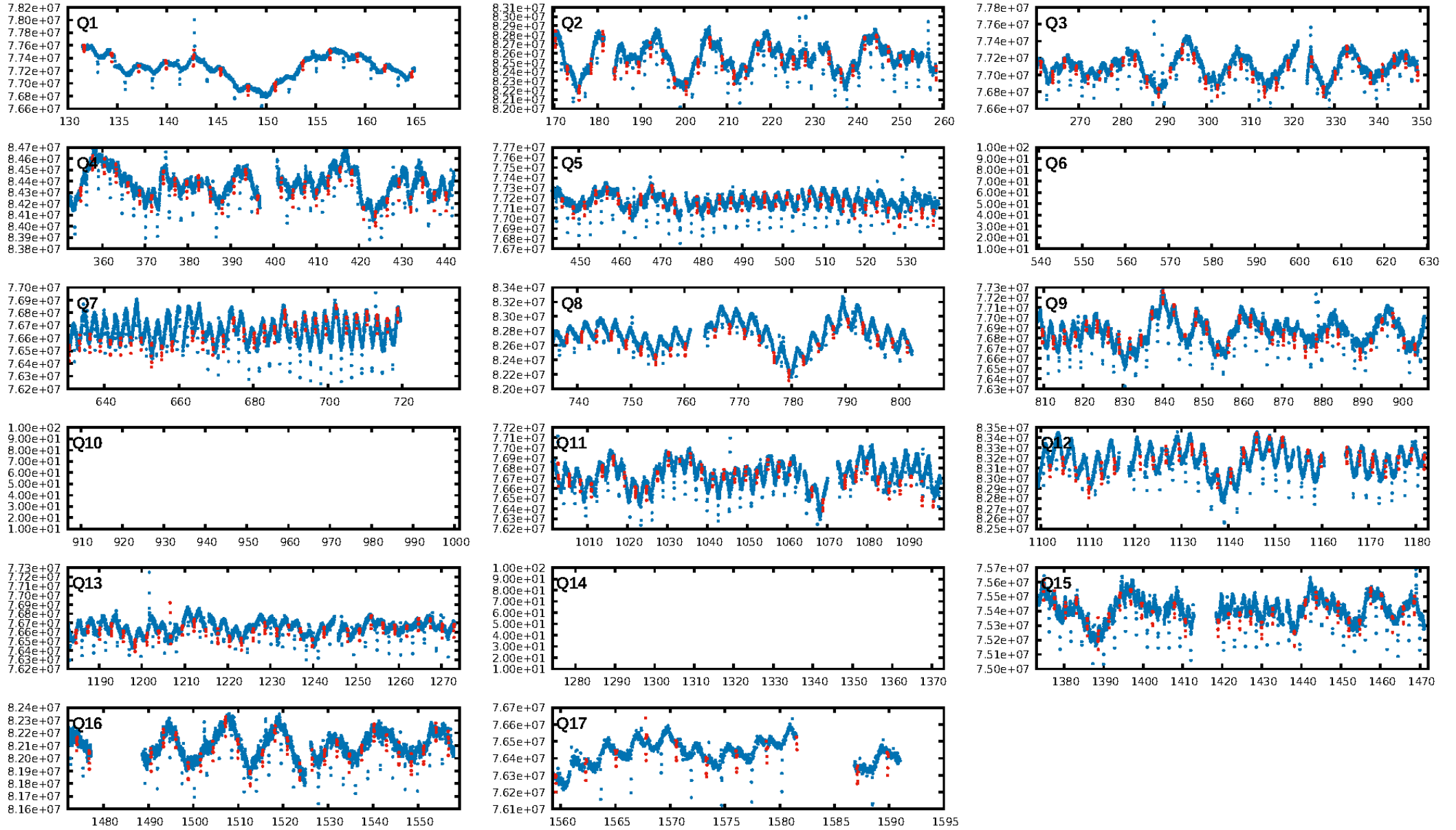
## DV Fit Results:

Period = 2.75654 [0.00000] d  
Epoch = 131.6473 [0.0001] BKJD  
Rp/R\* = 0.0452 [0.0008]  
a/R\* = 6.19 [0.19]  
b = 0.95 [0.00]  
Seff = 1475.36 [1050.04]  
Teq = 1580 [281] K  
Rp = 8.24 [3.42] Re  
a = 0.0393 [0.0167] AU  
Ag = 0.57 [0.42] [-1.02σ]  
Teffp = 2126 [121] K [1.78σ]

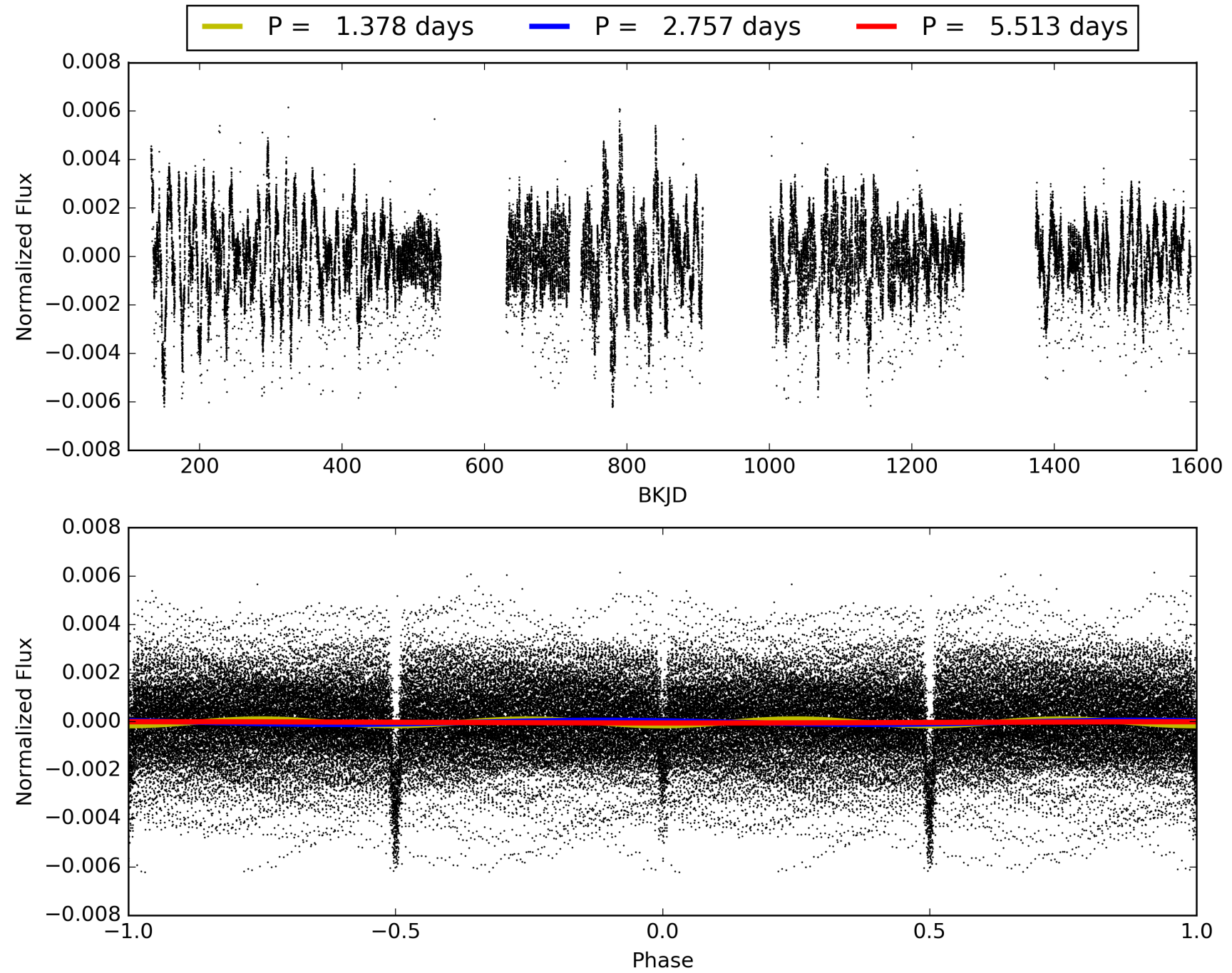
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.90 [326/362]  
GhostDiagnostic-chr: 4.654  
Centroid-sig: 0.0%  
Centroid-so: 0.566 arcsec [6.47σ]  
OotOffset-rm: 0.145 arcsec [1.80σ]  
KicOffset-rm: 0.375 arcsec [4.32σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 004078693-02, PDC Light Curves

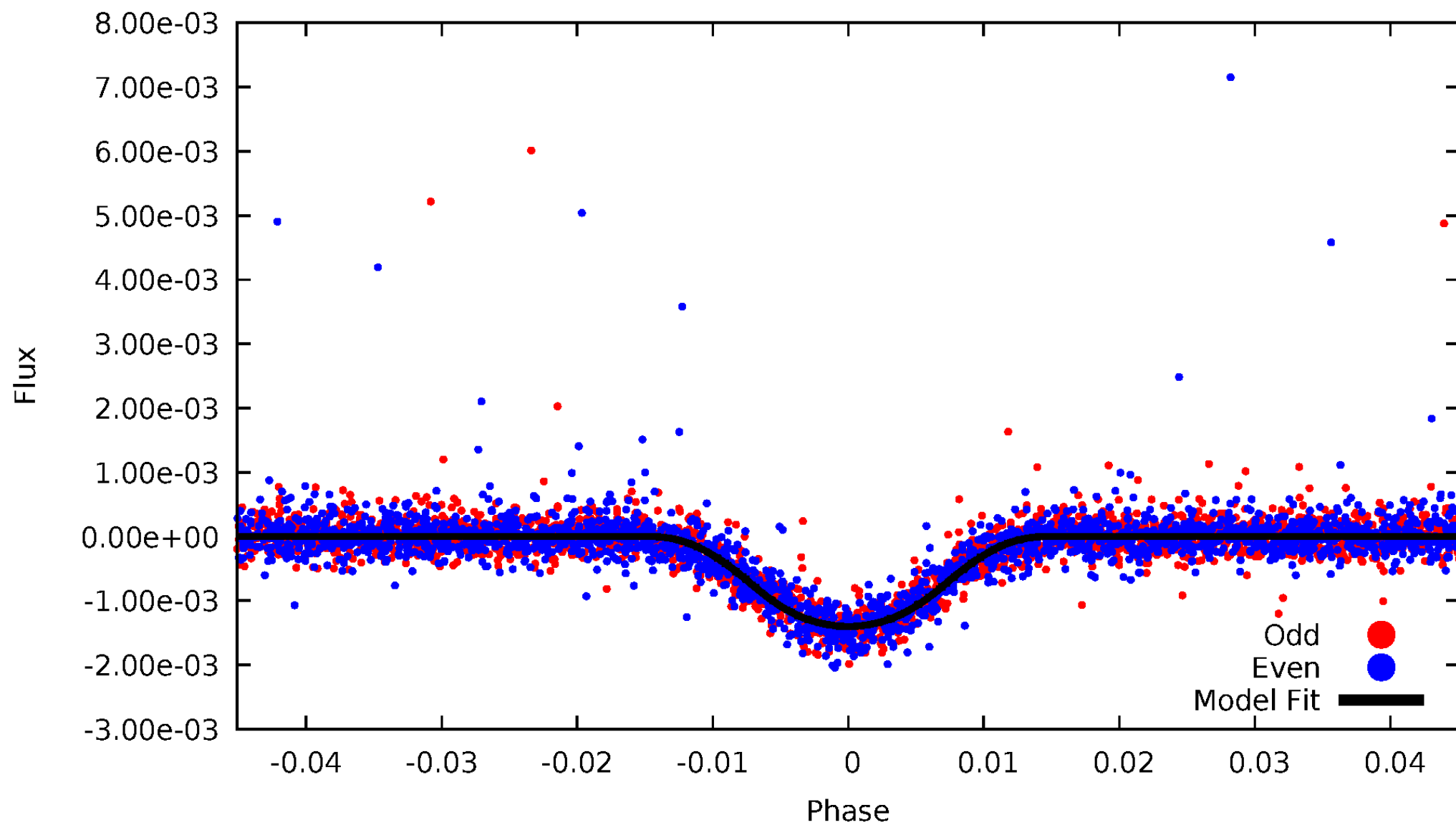


TCE 004078693-02



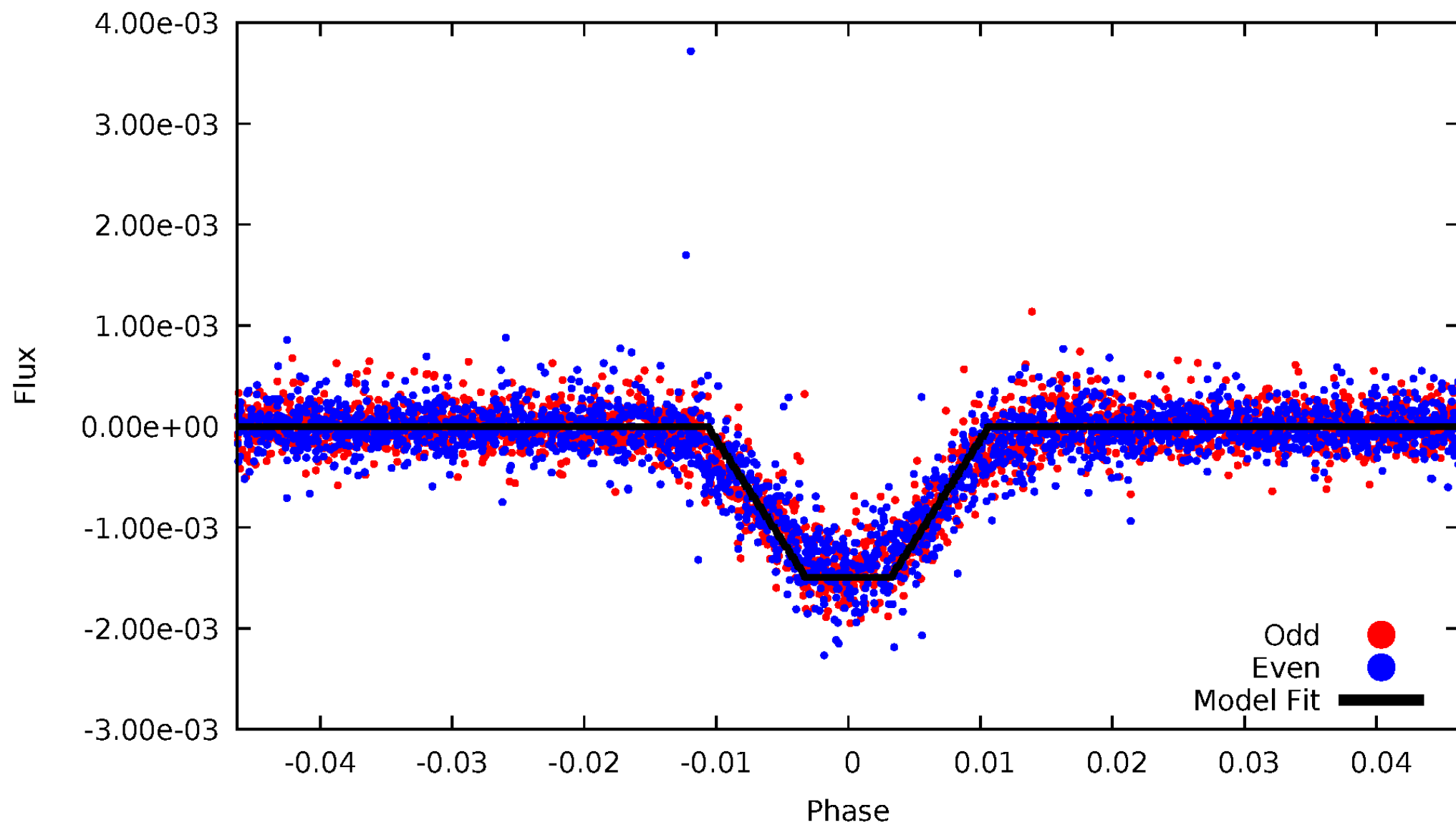
# DV Odd/Even

TCE 004078693-02



# ALT Odd/Even

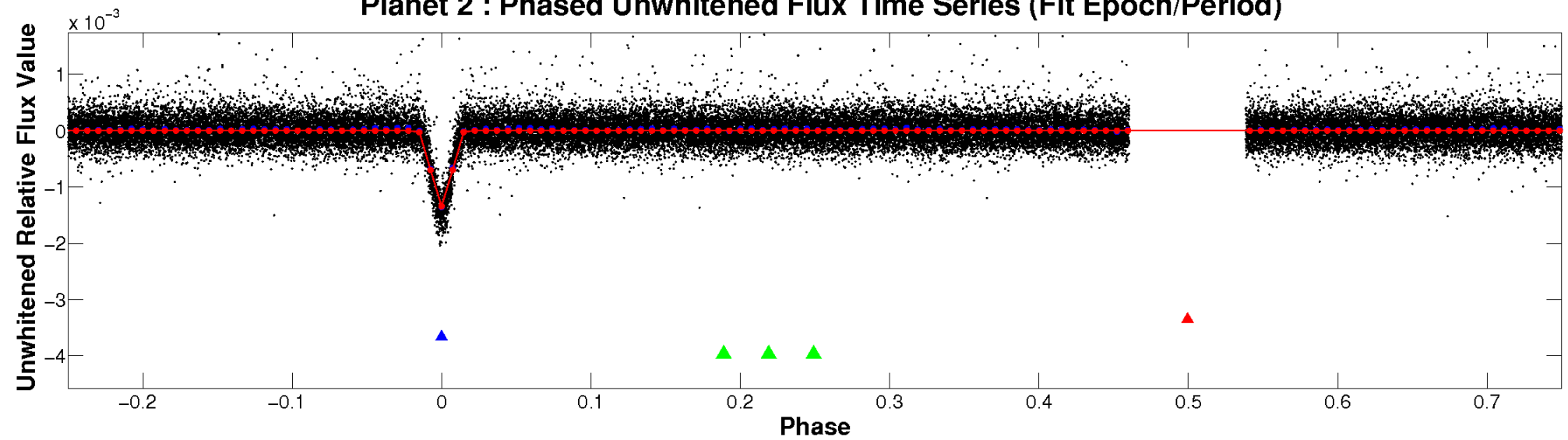
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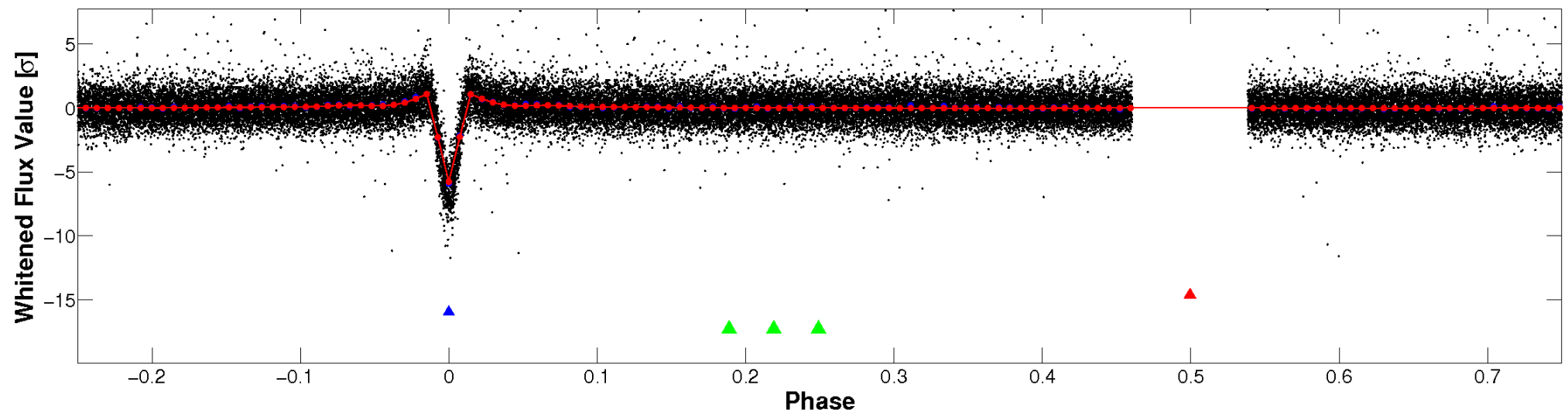


# Non-Whitened Vs. Whitened Light Curve

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

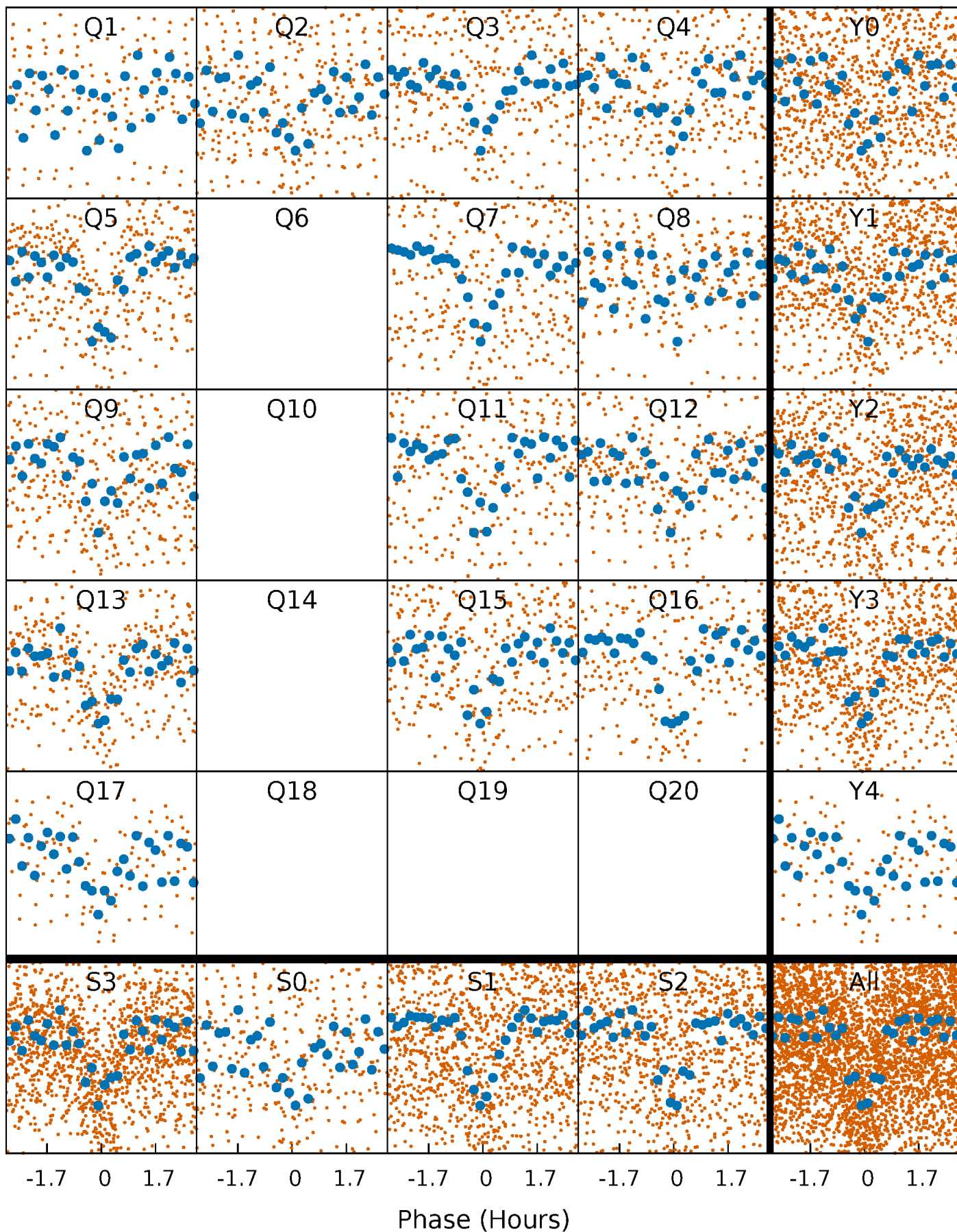


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



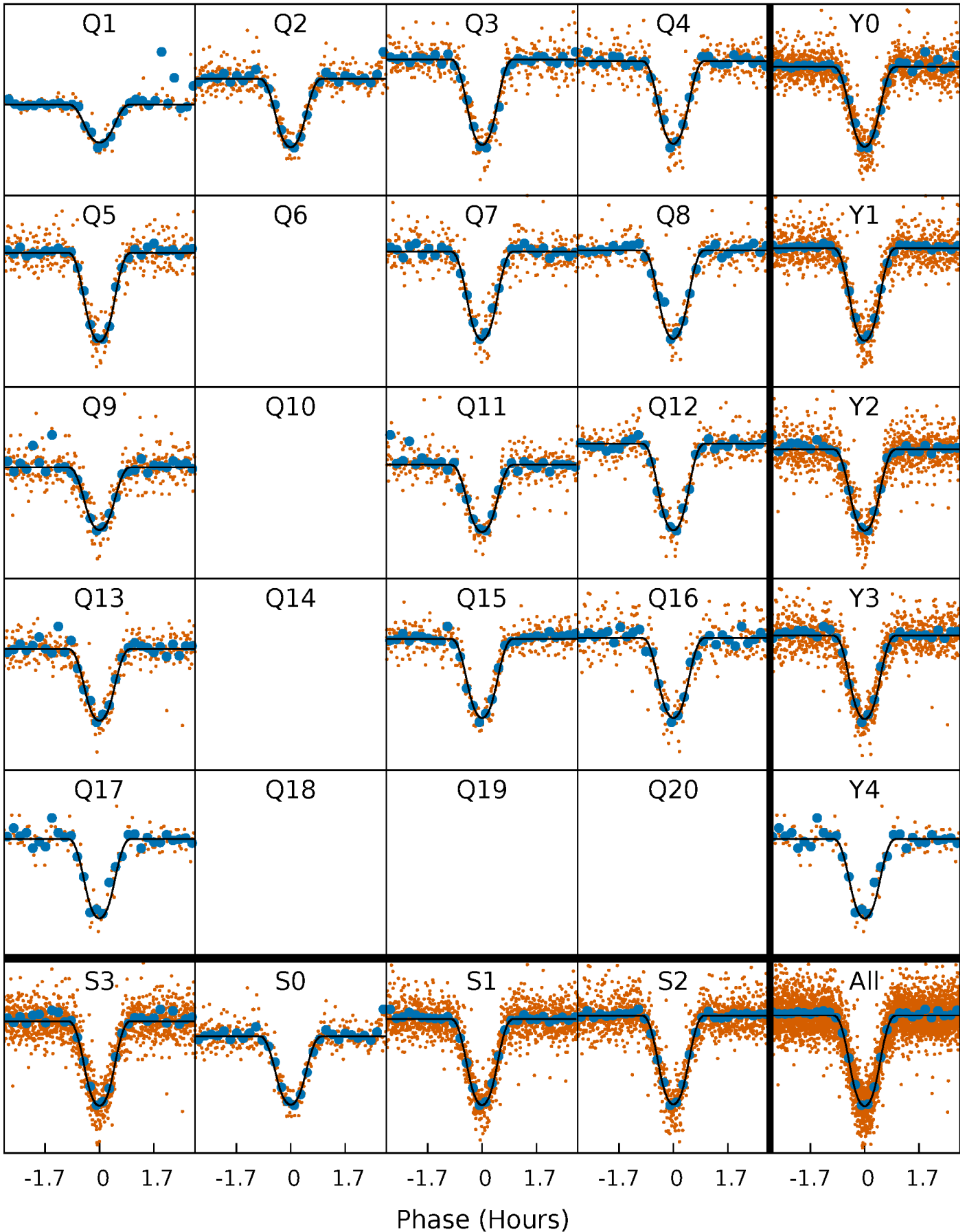
# PDC Quarter-Phased Transit Curves

TCE 004078693-02   P= 2.756542 Days    $T_0=131.647275$  (BKJD)



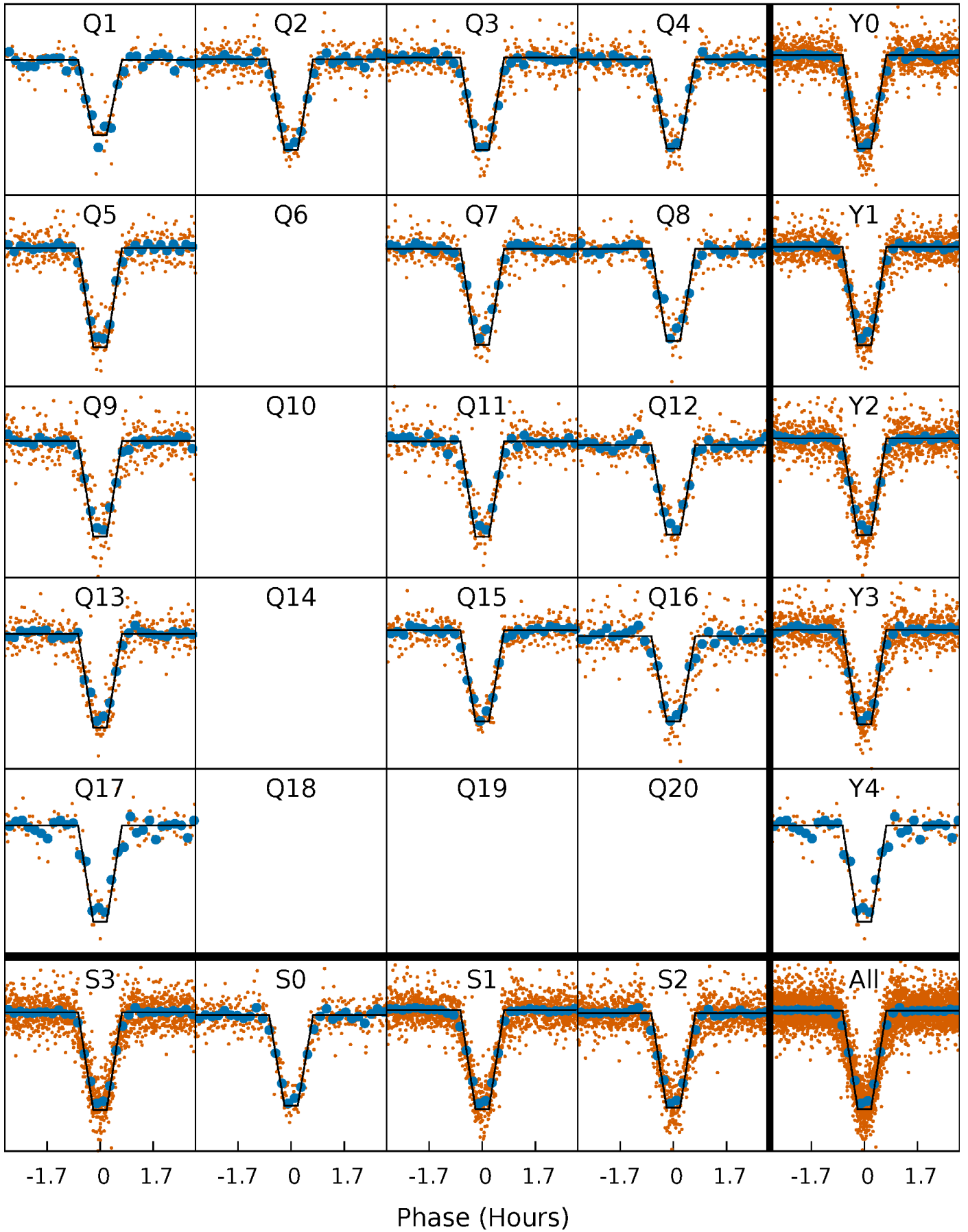
# DV Quarter-Phased Transit Curves

TCE 004078693-02   P= 2.756542 Days    $T_0=131.647275$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

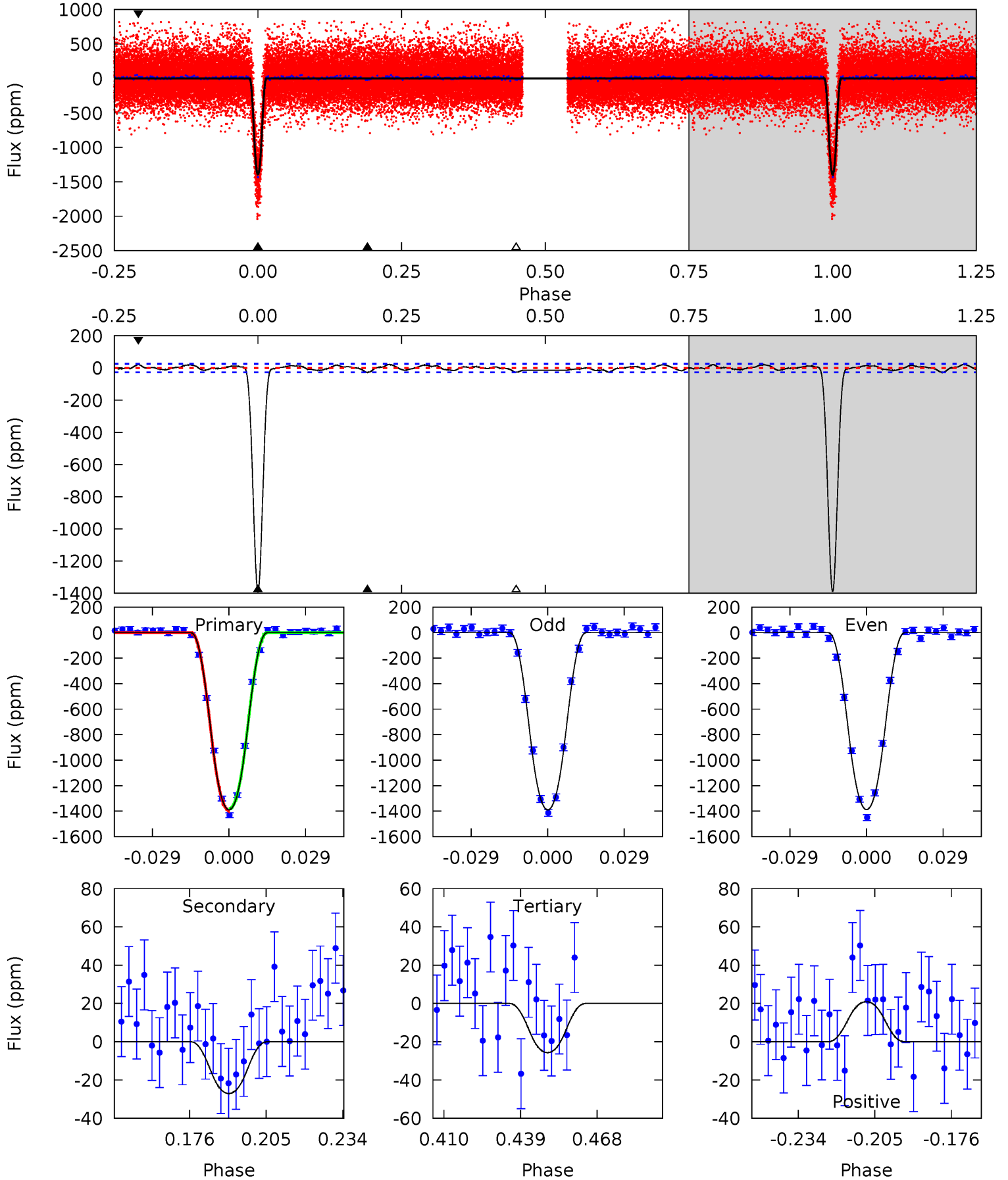
TCE 004078693-02   P= 2.756537 Days    $T_0=131.648404$  (BKJD)



# DV Model-Shift Uniqueness Test

004078693-02, P = 2.756542 Days, E = 128.890733 Days

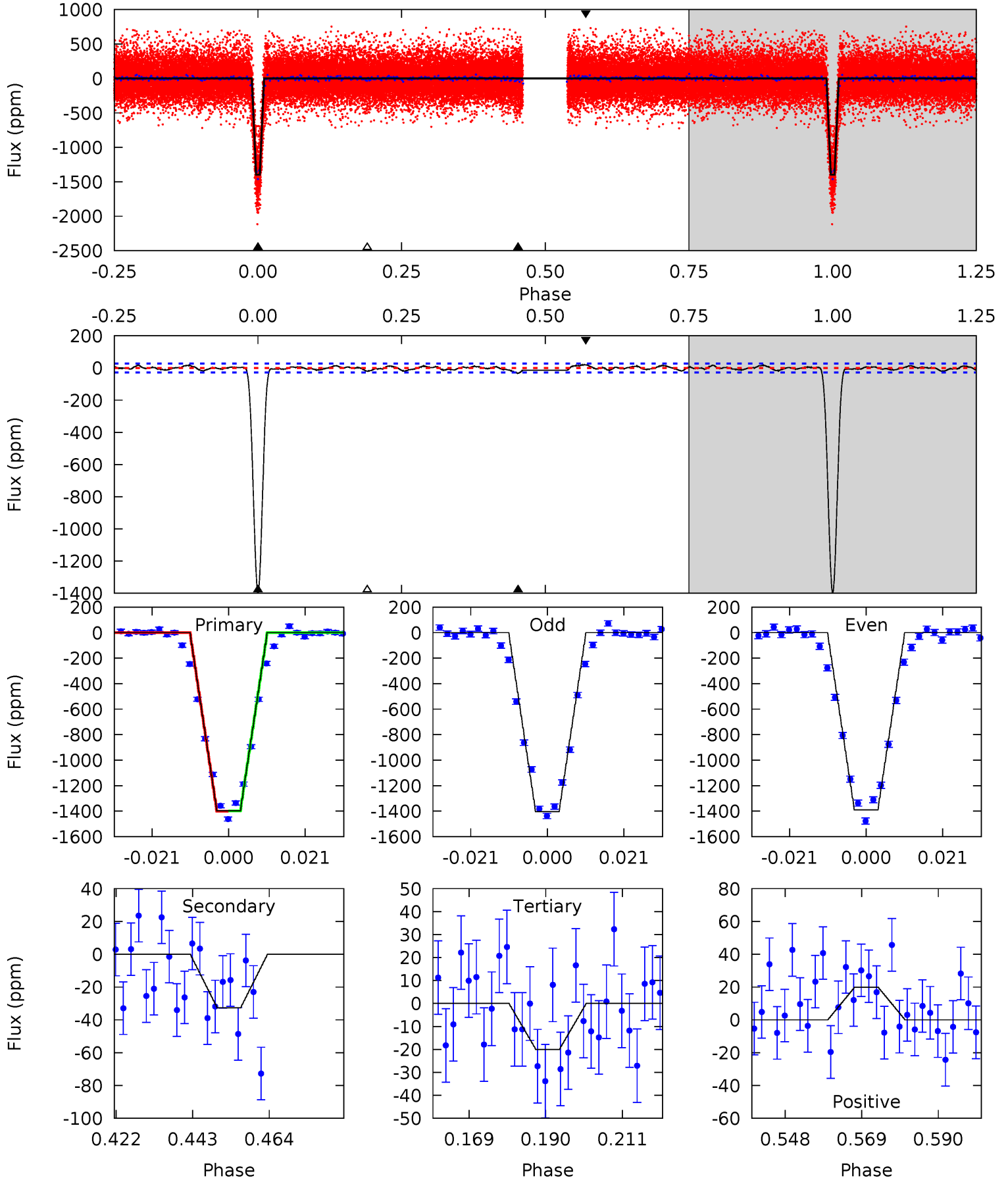
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
252.1	4.91	4.66	3.80	4.82	2.18	1.88	247.4	248.3	0.24	1.11	0.26	1.00	0.02	1.03



# Alt Model-Shift Uniqueness Test

004078693-02, P = 2.756537 Days, E = 128.891867 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
244.9	5.72	3.51	3.49	4.88	2.31	1.44	241.3	241.4	2.21	2.23	1.13	0.99	0.01	0.12





### Stellar Parameters For KIC 004078693

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5496^{+164}_{-147}$	$4.020^{+0.420}_{-0.140}$	$0.260^{+0.150}_{-0.250}$	$1.669^{+0.373}_{-0.693}$	$1.063^{+0.115}_{-0.143}$	$0.322^{+1.146}_{-0.128}$
	+3%/-3%	+10%/-3%	+58%/-96%	+22%/-42%	+11%/-13%	+355%/-40%
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 004078693-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-27 \pm 6$	$8.00^{+1.11}_{-1.72}$	$2174^{+158}_{-246}$	$2149^{+305}_{-4266}$	$0.359^{+0.226}_{-0.102}$
Alt.	$-33 \pm 6$	$6.92^{+0.97}_{-1.38}$	$2179^{+169}_{-210}$	$2584^{+142}_{-219}$	$0.589^{+0.316}_{-0.181}$

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

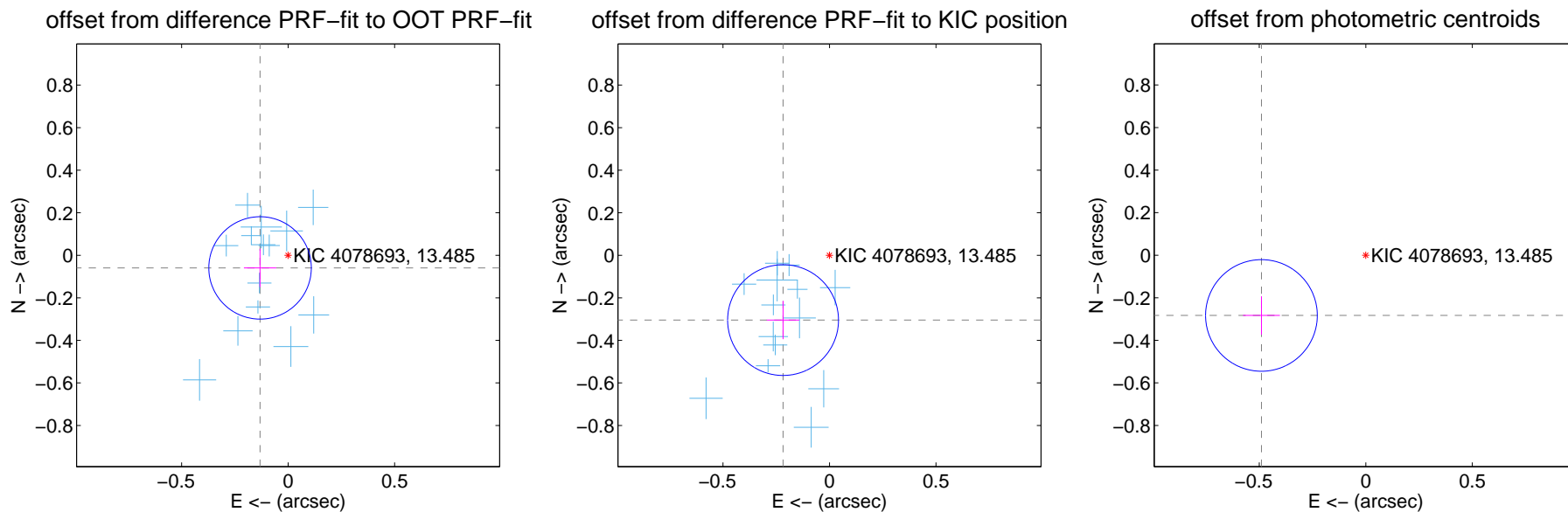
## DV Centroid Data

Supplemental centroid analysis for 004078693-02. Kepler magnitude: 13.48. Transit SNR 140.04

There are 14 quarters with good PRF difference image offsets

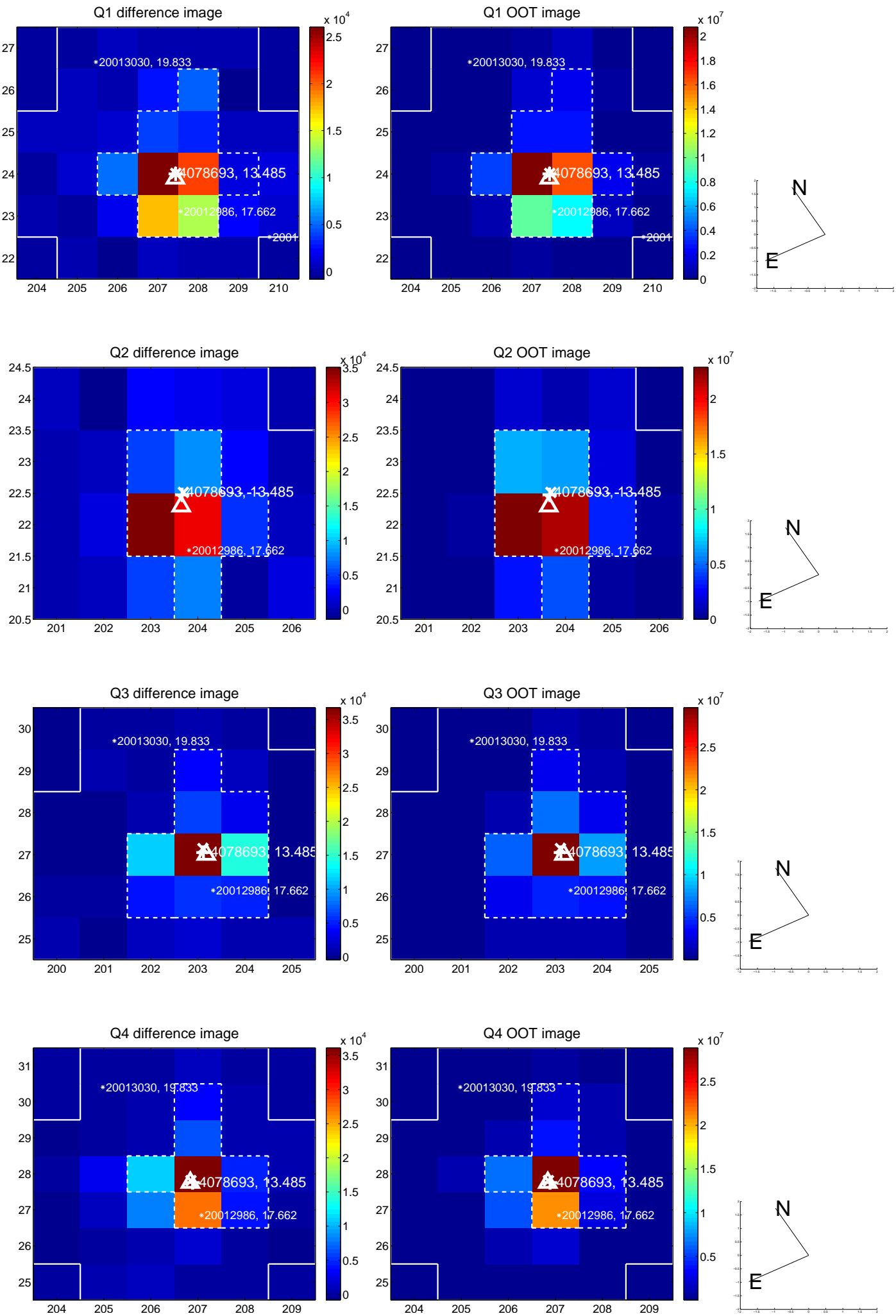
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.145 \pm 0.080$	1.80	$0.132 \pm 0.076$	$-0.059 \pm 0.090$
PRF-fit source offset from KIC position	$0.375 \pm 0.087$	4.32	$0.218 \pm 0.077$	$-0.305 \pm 0.090$
photometric centroid source offset	$0.57 \pm 0.09$	6.47	$0.49 \pm 0.09$	$-0.28 \pm 0.09$

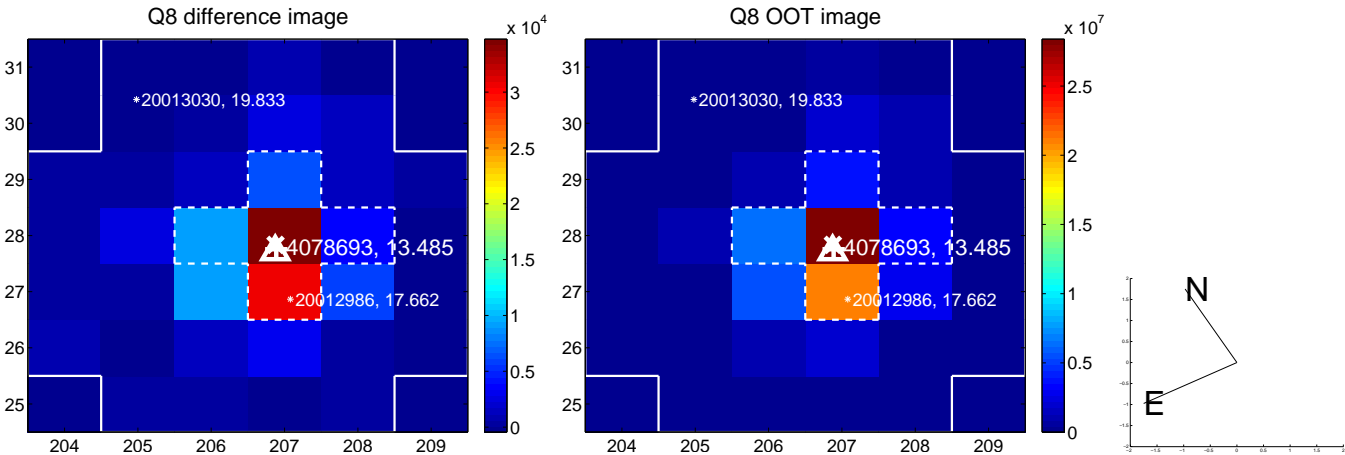
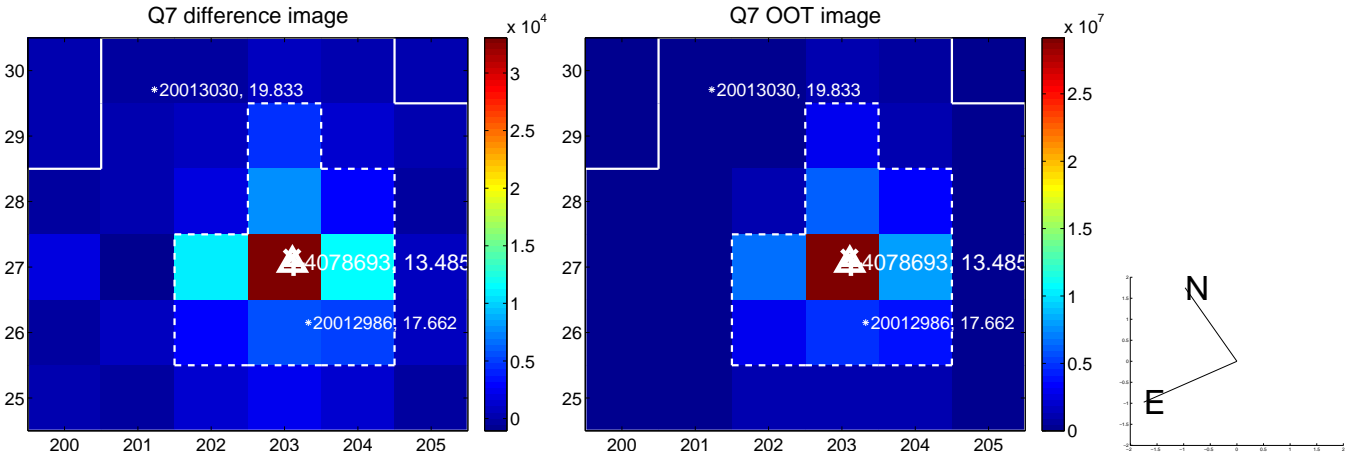
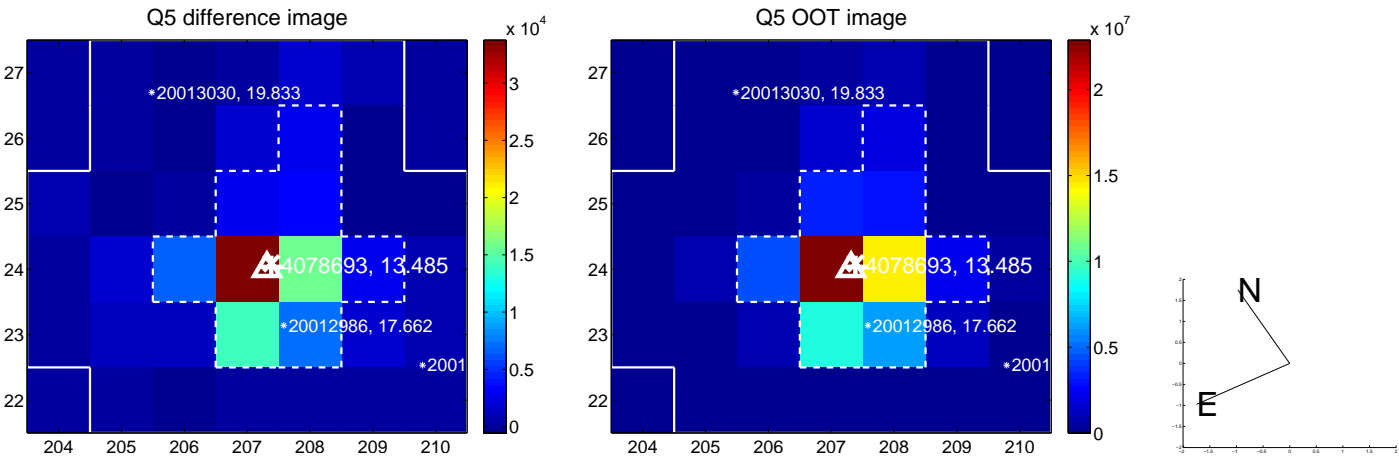


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

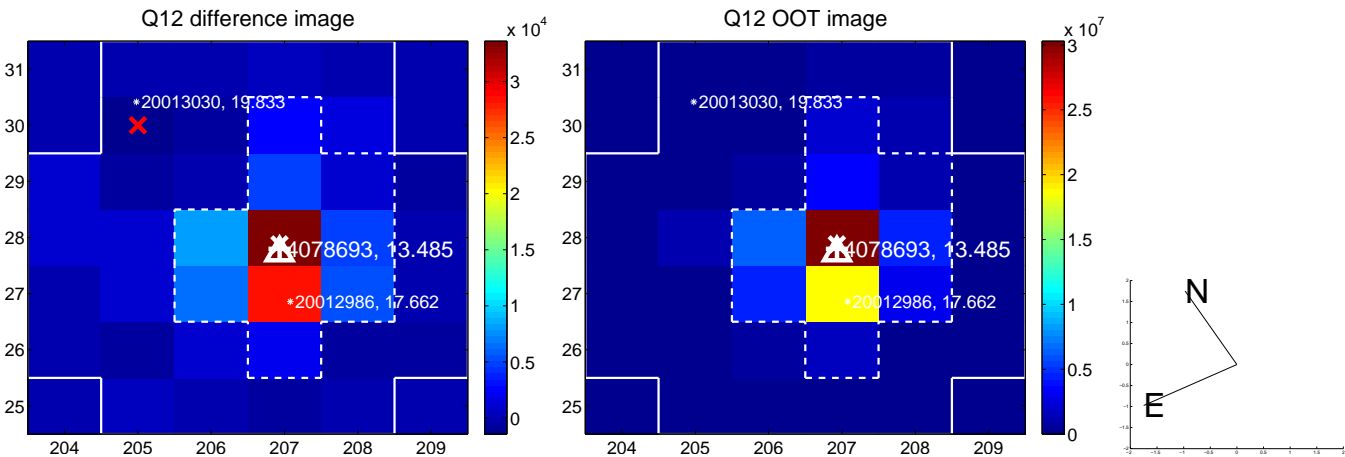
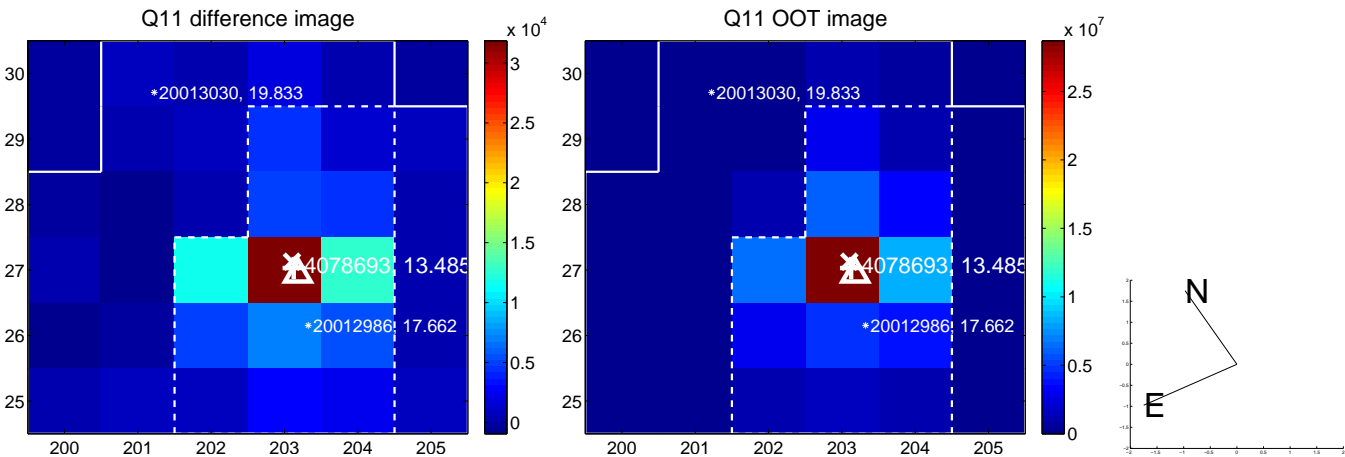
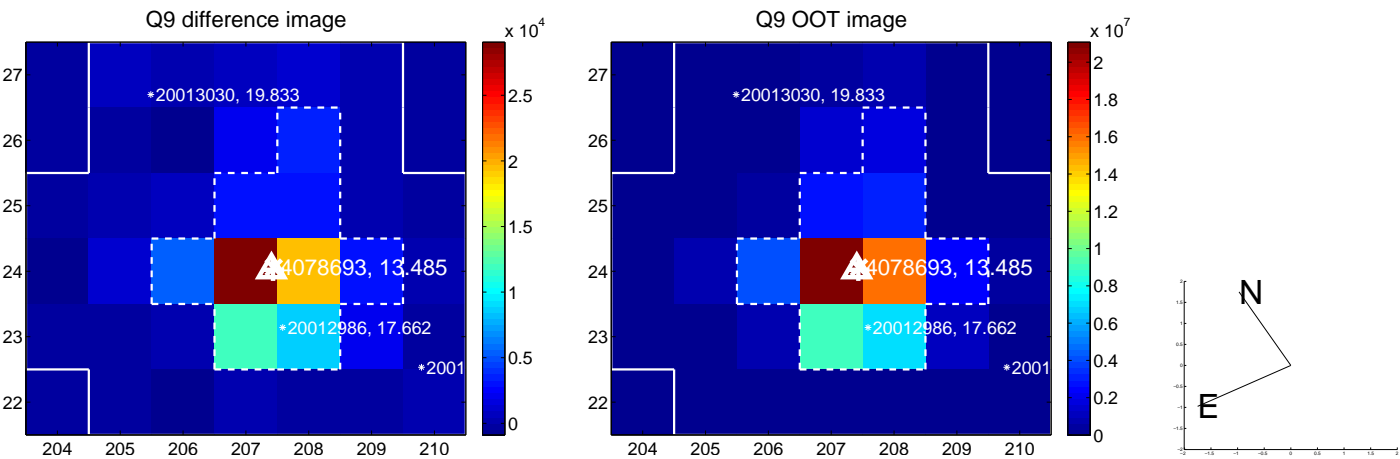
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



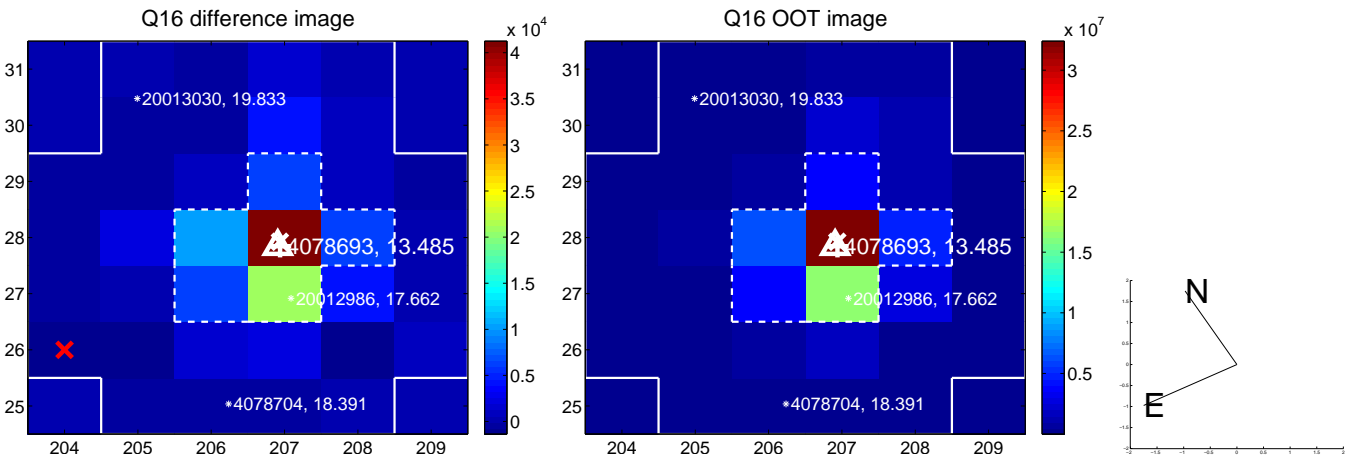
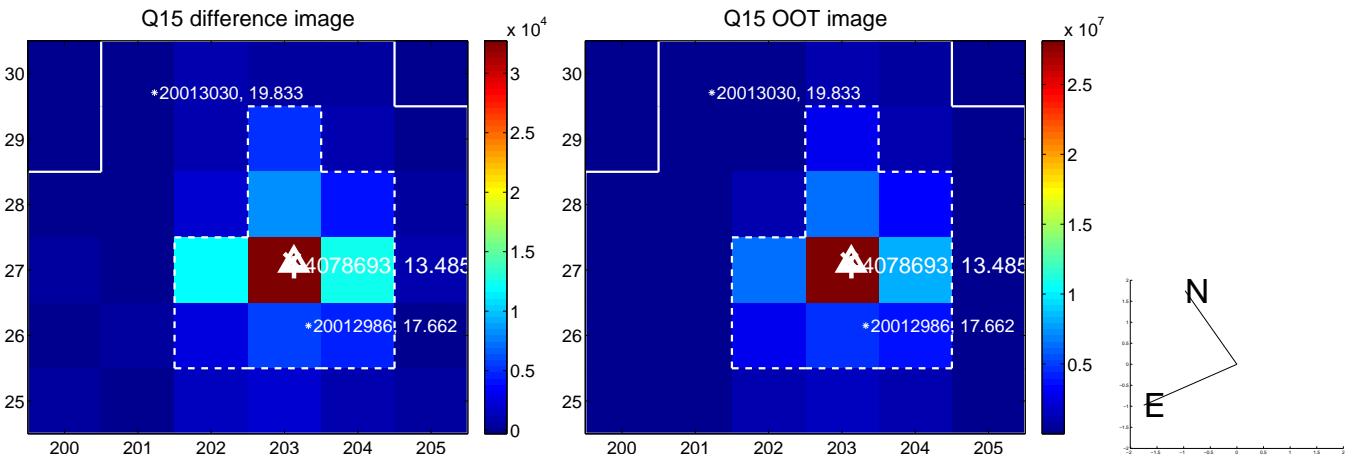
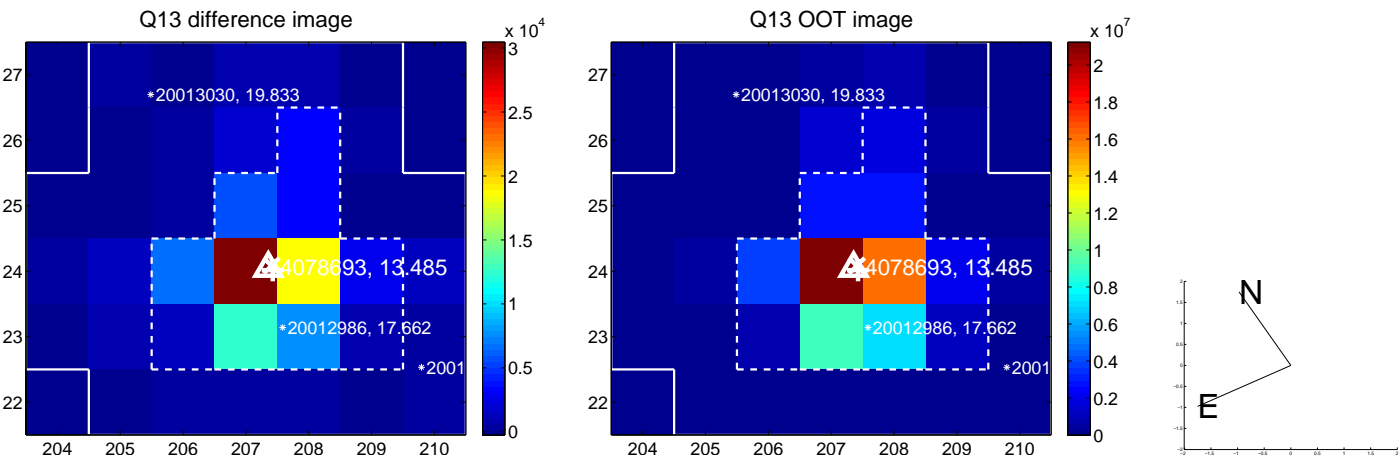
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



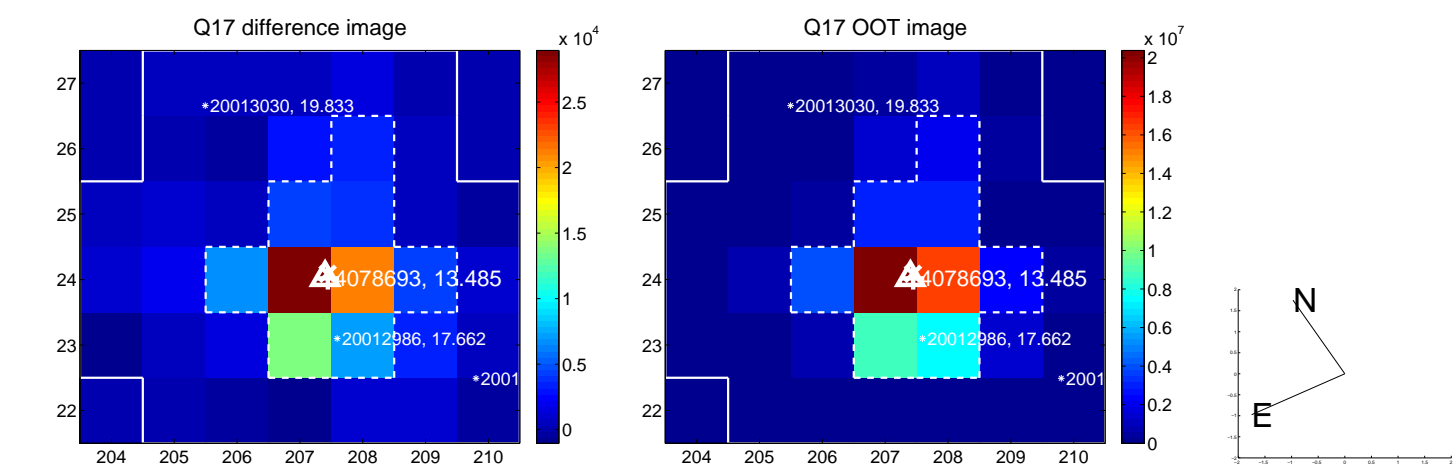
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



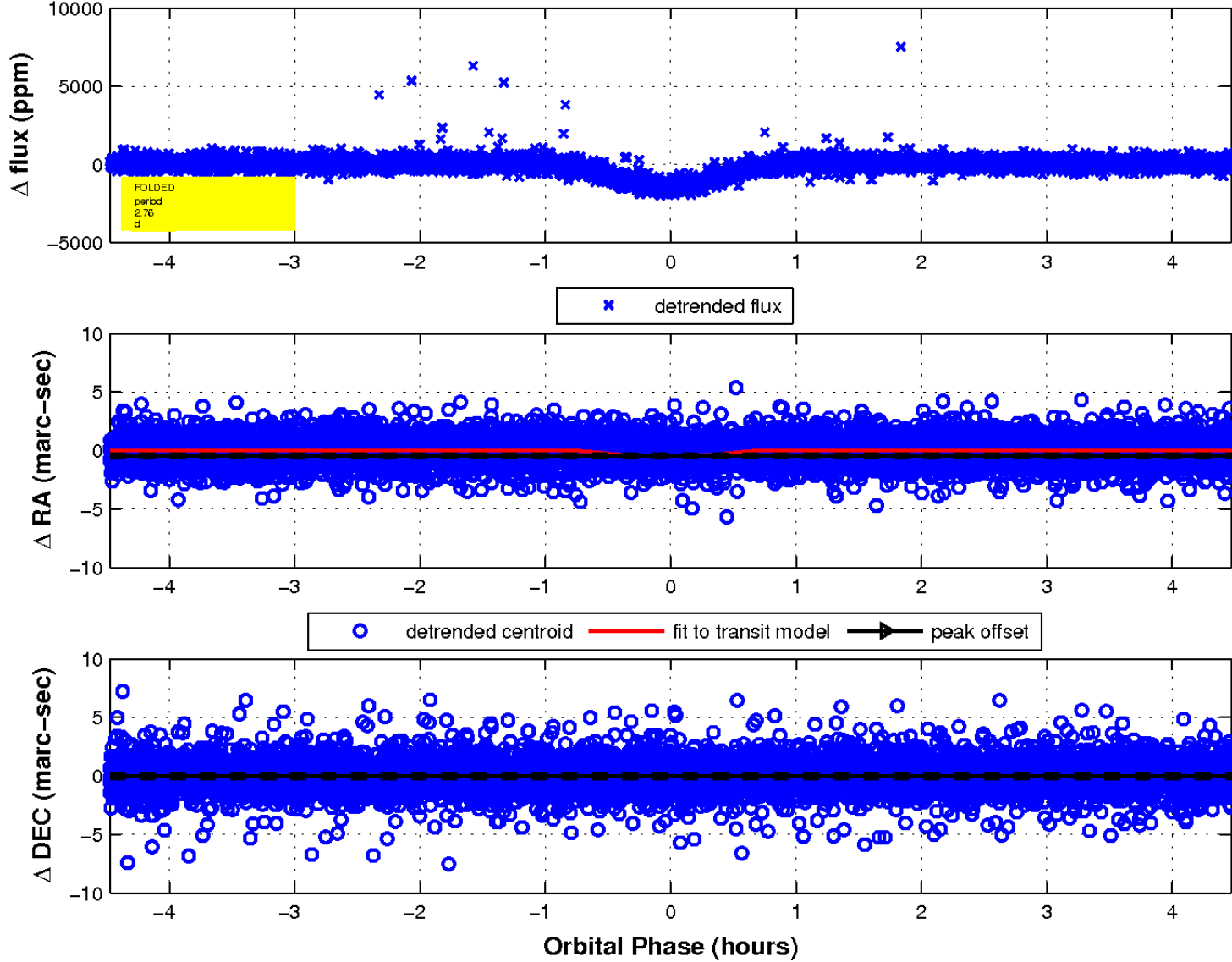
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

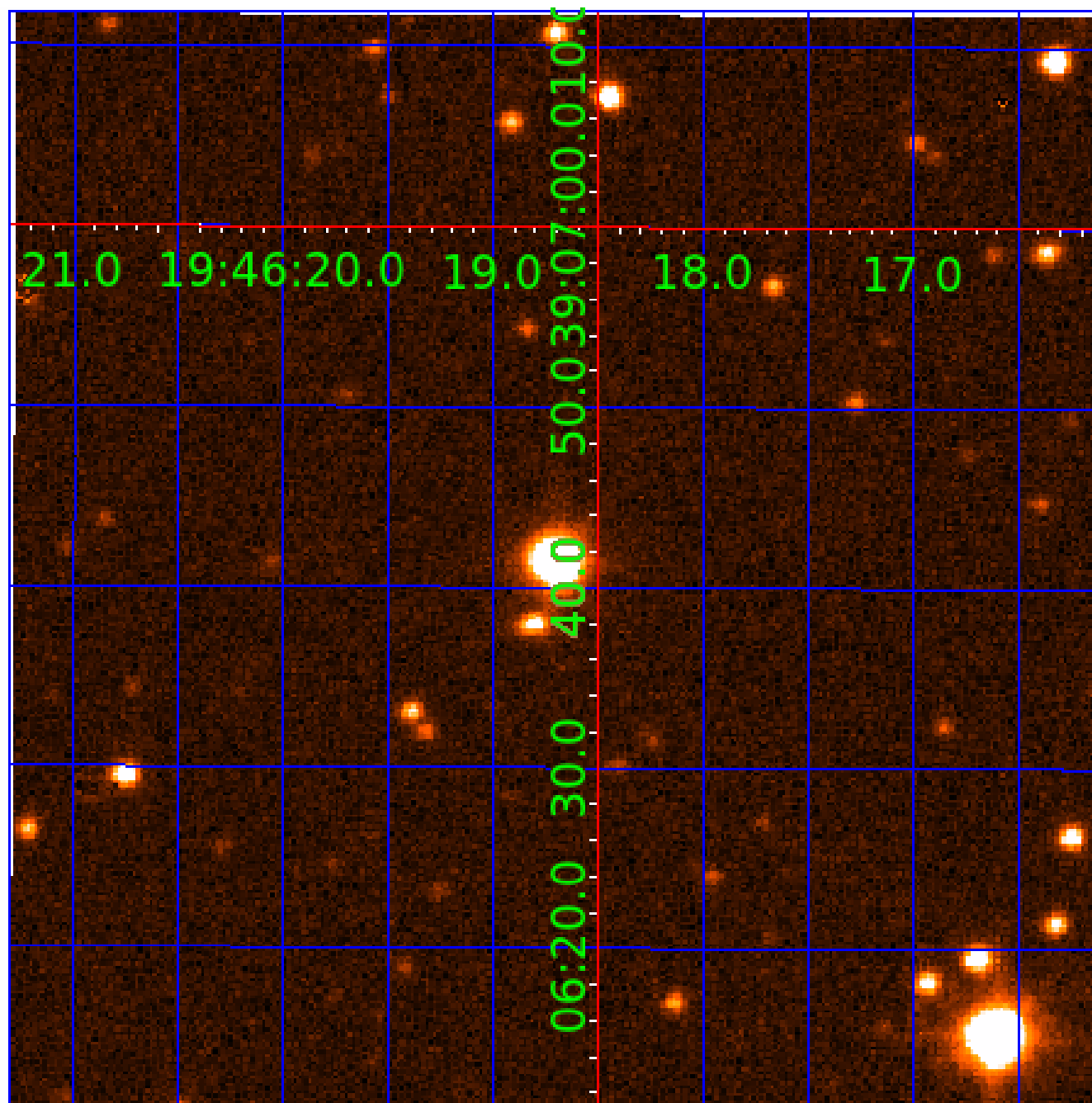


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination





# KIC 004078693

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004078693-01	OBS	6386.01	2.756544	133.023617	3472.5	1.558	322.3	324.5	1.67	5496	13.43	1475.36
004078693-02	OBS	No	2.756542	131.647275	1398.6	1.492	125.5	140.0	1.67	5496	8.23	1475.36
004078693-03	OBS	No	656.139992	134.924647	524.9	10.671	10.3	7.3	1.67	5496	4.04	1.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004078693-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
004078693-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
004078693-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

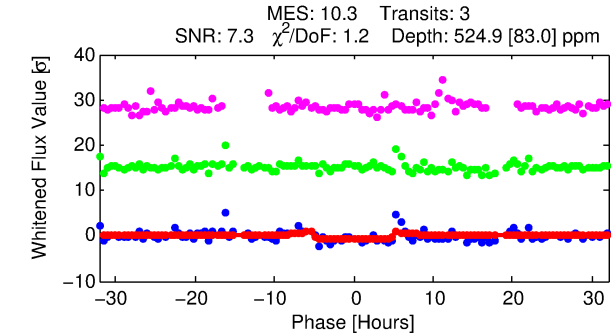
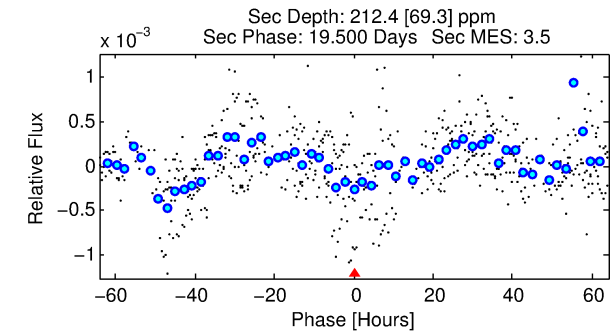
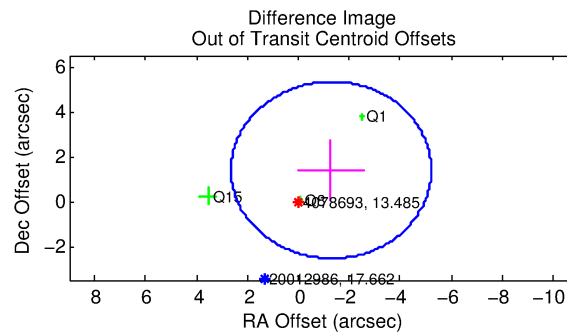
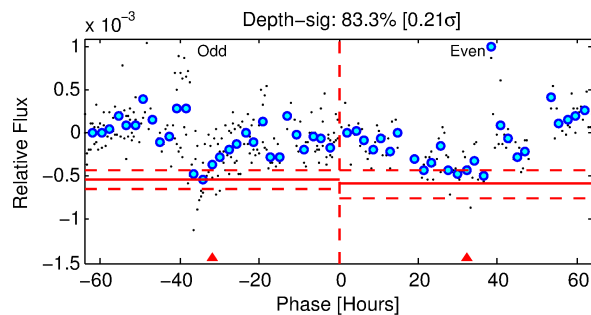
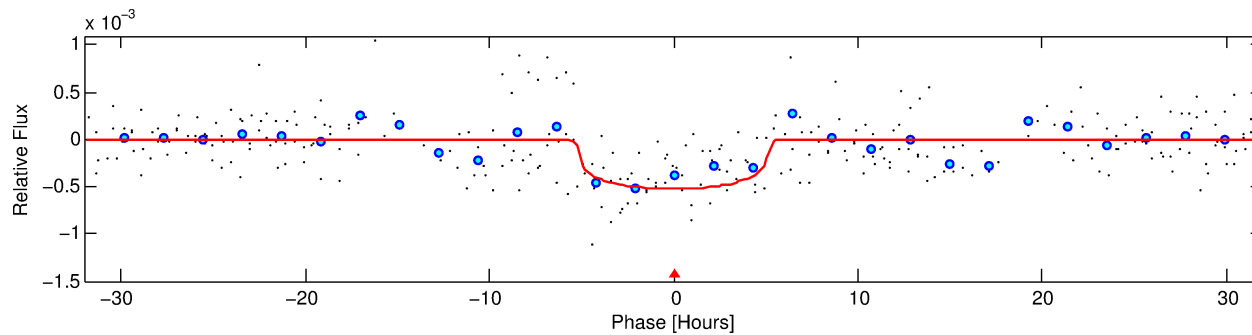
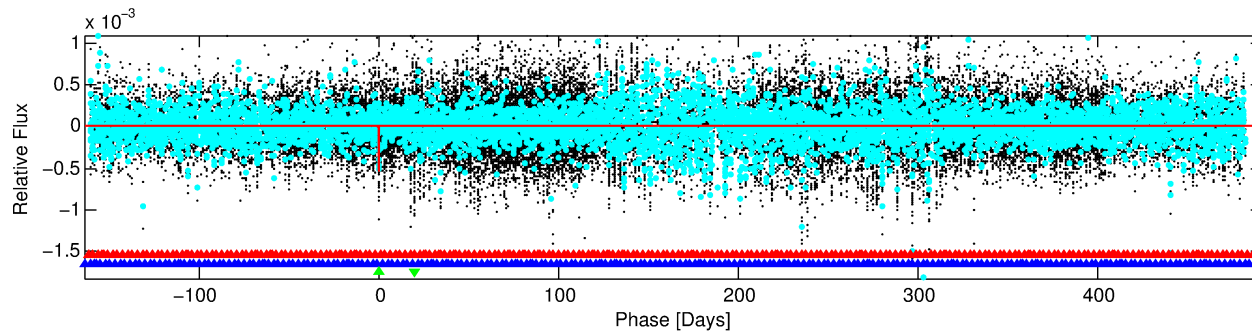
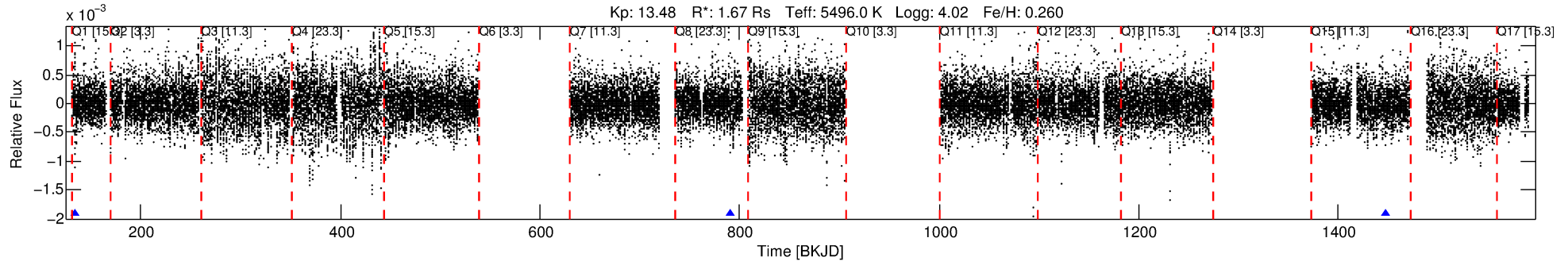
## Ephemeris Match Information For 004078693-03

No Significant Match Found

# DV One-Page Summary

KIC: 4078693 Candidate: 3 of 3 Period: 656.140 d  
KOI: K06386 Corr: No Ephemeris Match

Kp: 13.48 R\*: 1.67 Rs Teff: 5496.0 K Logg: 4.02 Fe/H: 0.260



## DV Fit Results:

Period = 656.13999 [0.01075] d  
Epoch = 134.9246 [0.0161] BKJD  
Rp/R\* = 0.0222 [0.0093]  
a/R\* = 363.19 [573.58]  
b = 0.67 [1.32]  
Seff = 1.00 [0.71]  
Teq = 255 [45] K  
Rp = 4.04 [2.38] Re  
a = 1.5089 [0.6411] AU  
Ag = 16328.92 [18588.79] [0.88σ]  
Teffp = 4457 [1008] K [4.17σ]

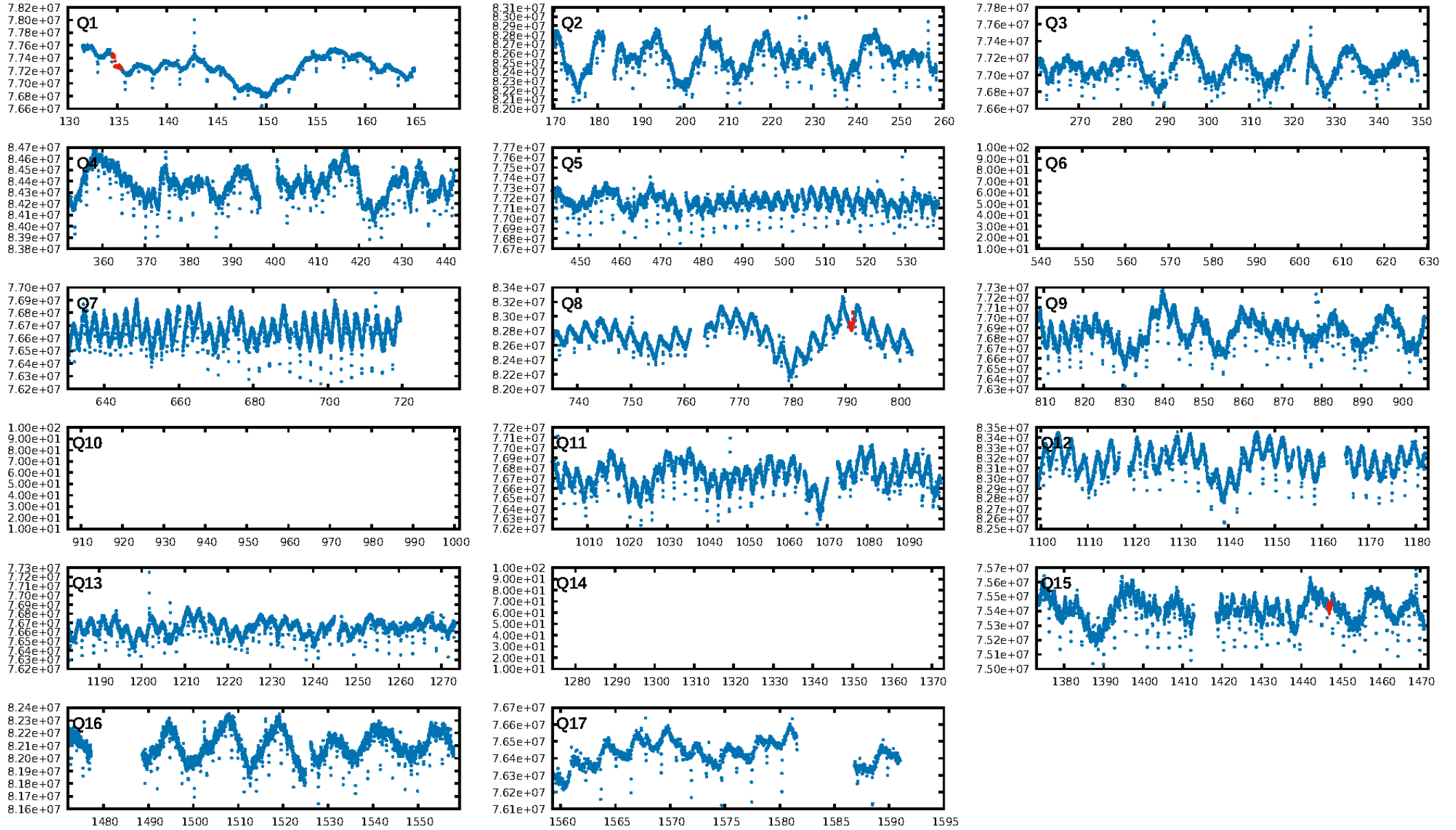
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1454.14σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.8%  
ModelChiSquareGof-sig: 90.4%  
Bootstrap-pfa: 5.60e-18  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -3.031  
Centroid-sig: 76.0%  
Centroid-so: 0.711 arcsec [0.80σ]  
OotOffset-rm: 1.900 arcsec [1.45σ]  
KicOffset-rm: 1.707 arcsec [1.24σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

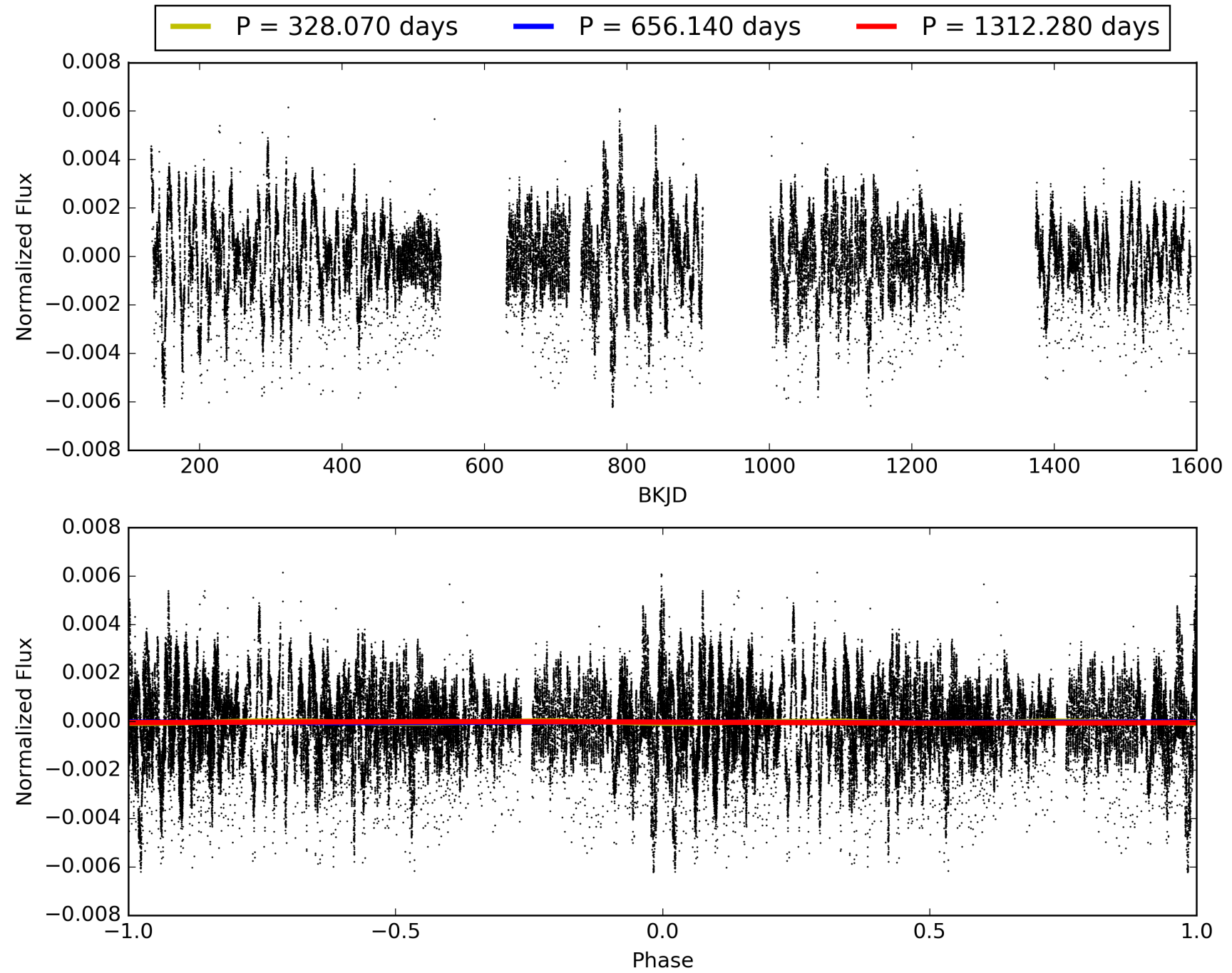
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:47:20 Z

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

# TCE 004078693-03, PDC Light Curves

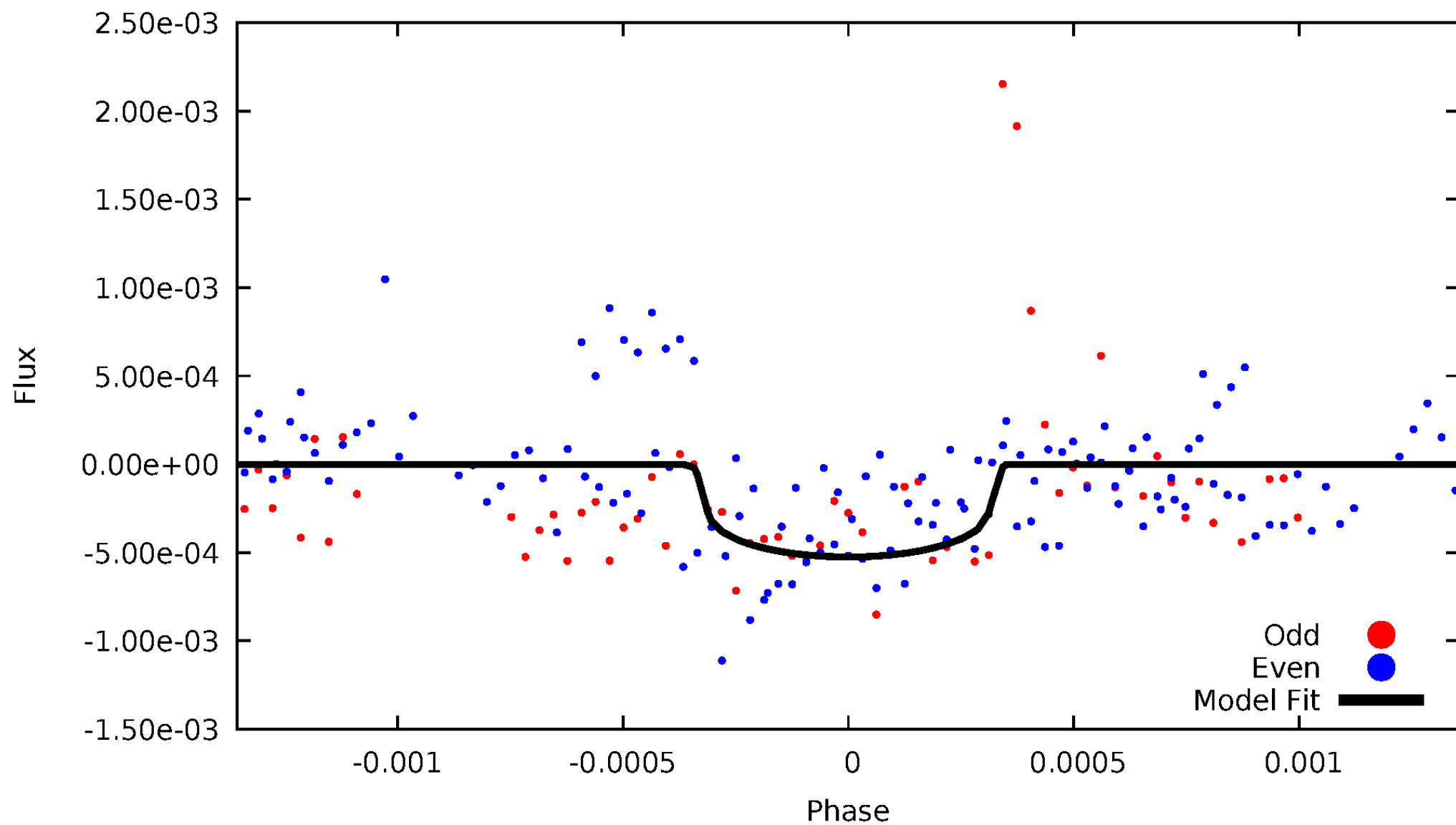


TCE 004078693-03



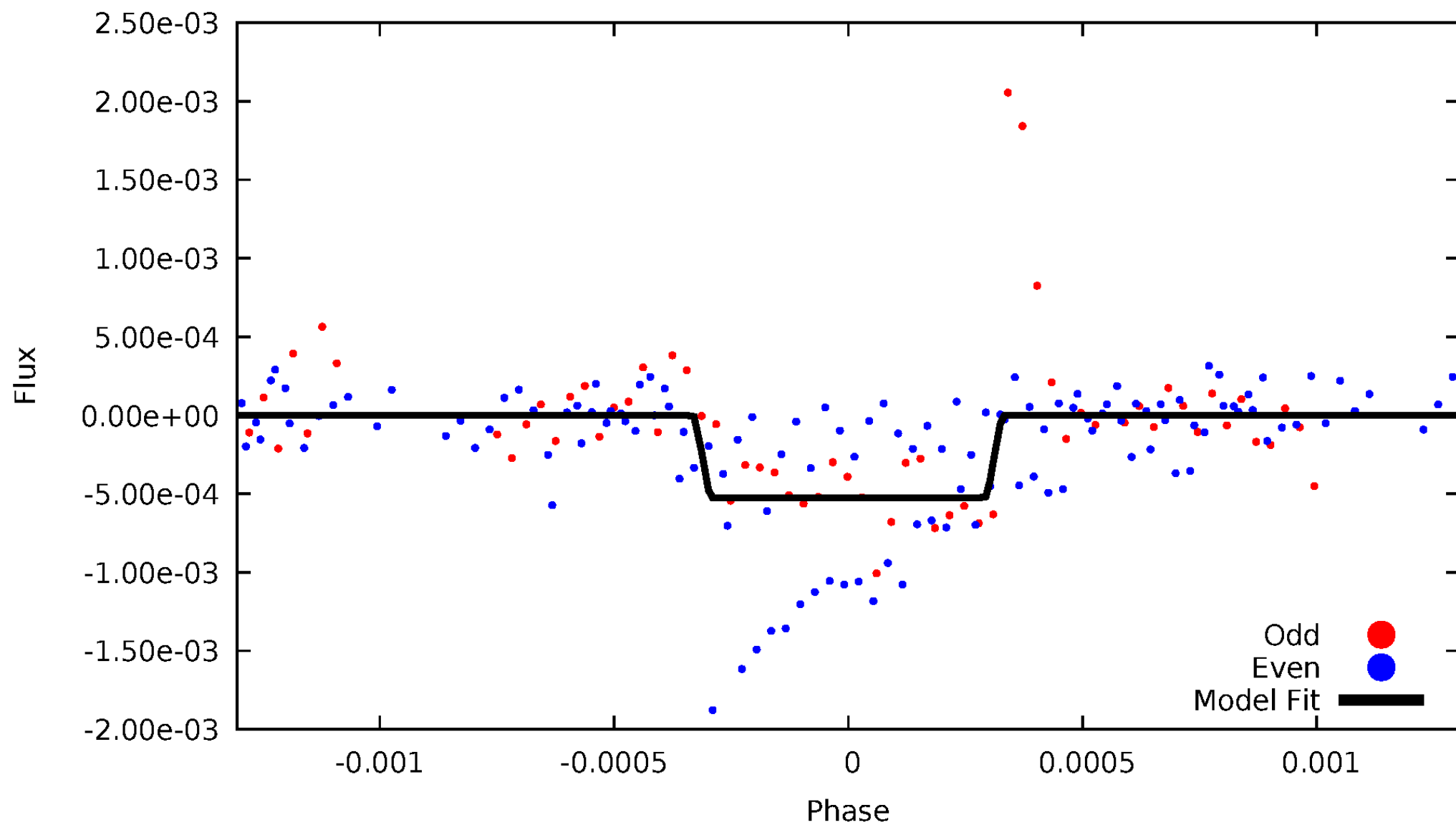
# DV Odd/Even

TCE 004078693-03



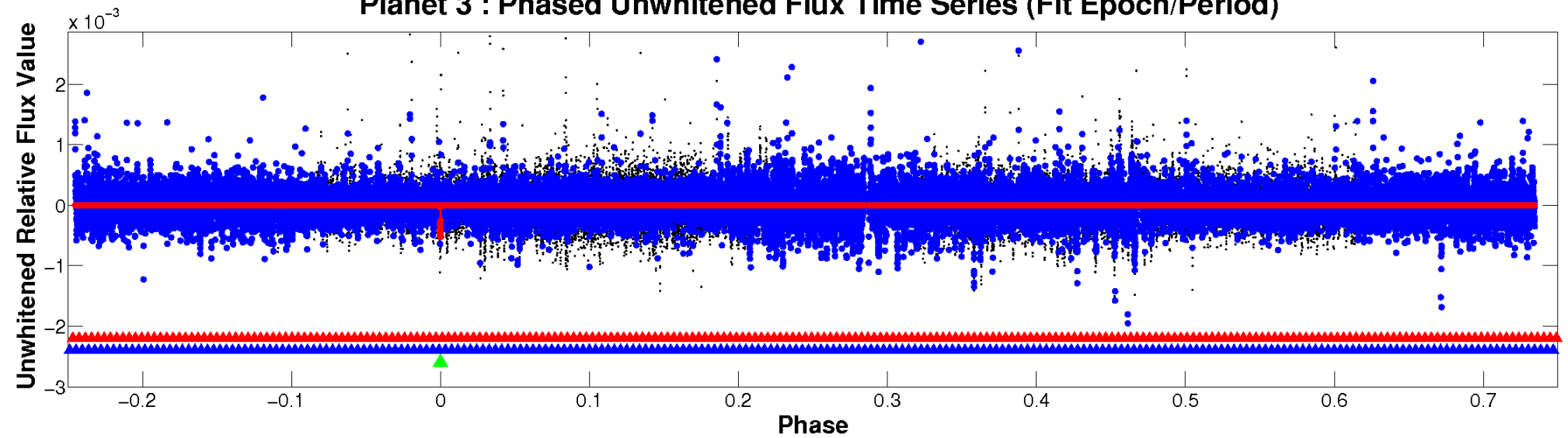
# ALT Odd/Even

TCE 004078693-03

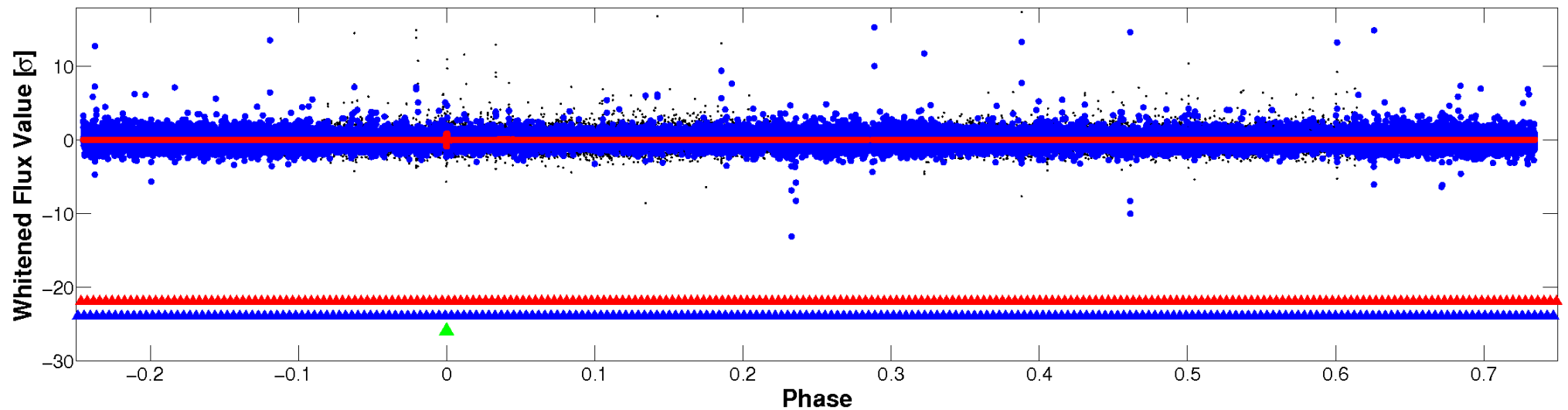


# Non-Whitened Vs. Whitened Light Curve

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

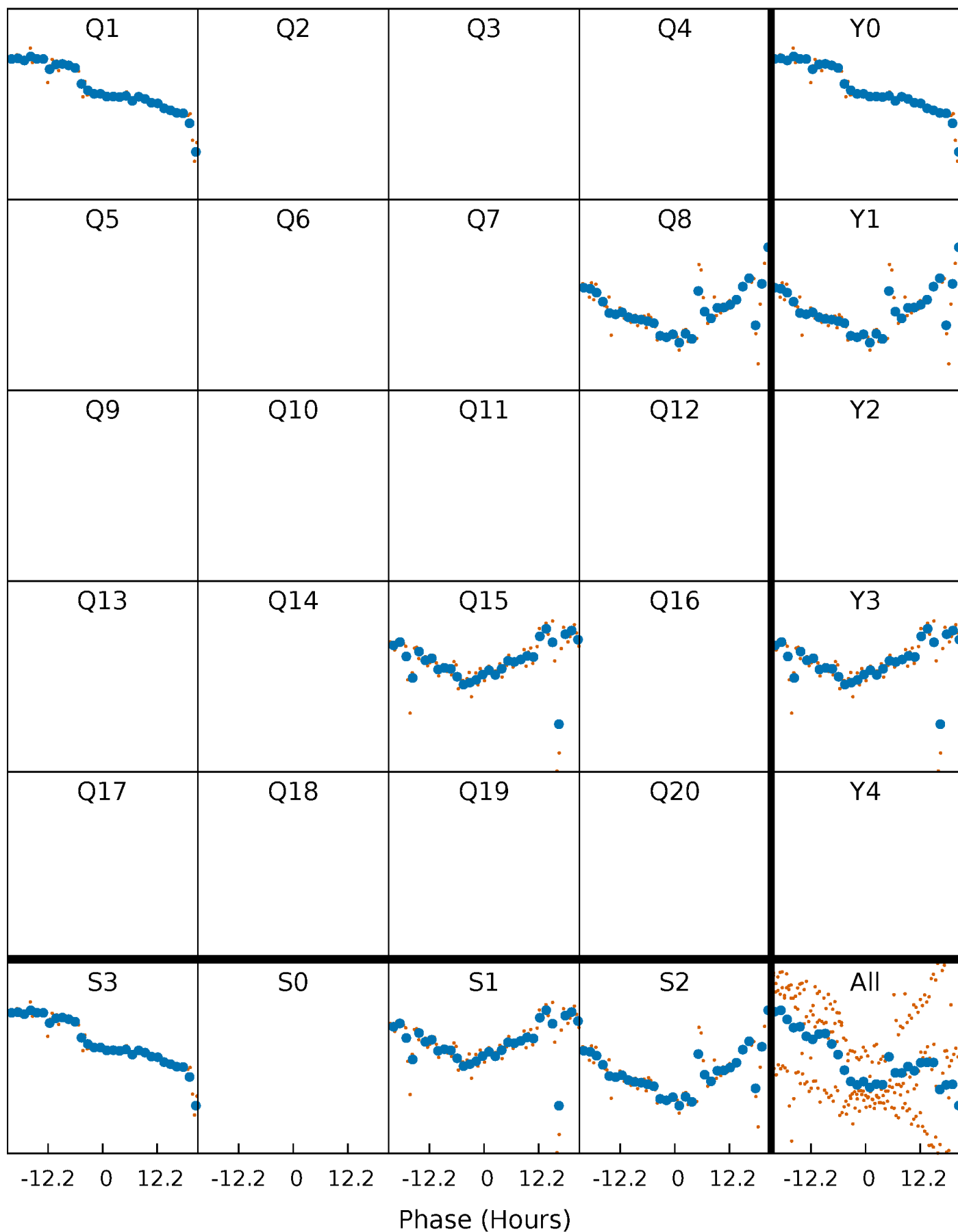


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

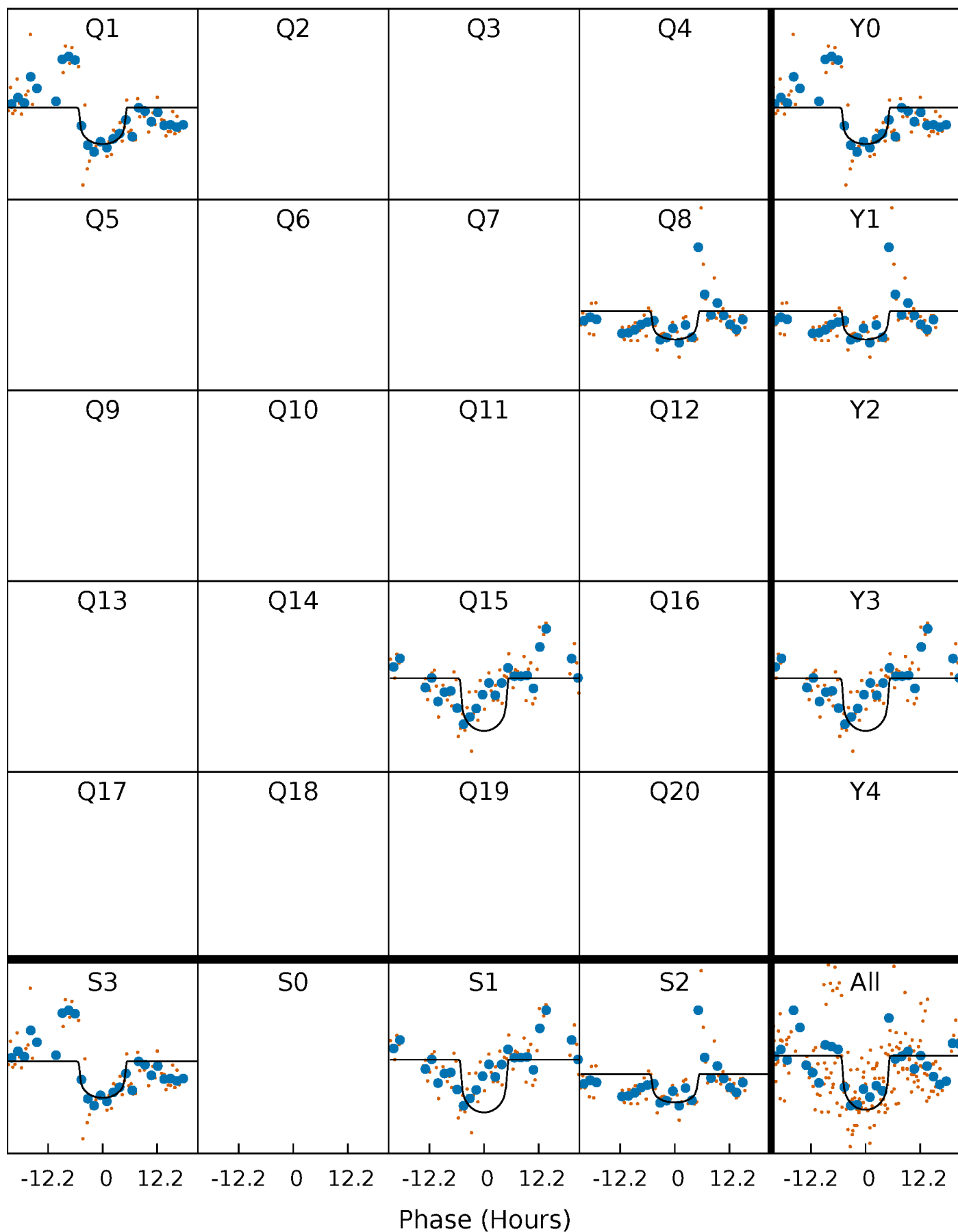
TCE 004078693-03     $P=656.139992$  Days     $T_0=134.924647$  (BKJD)





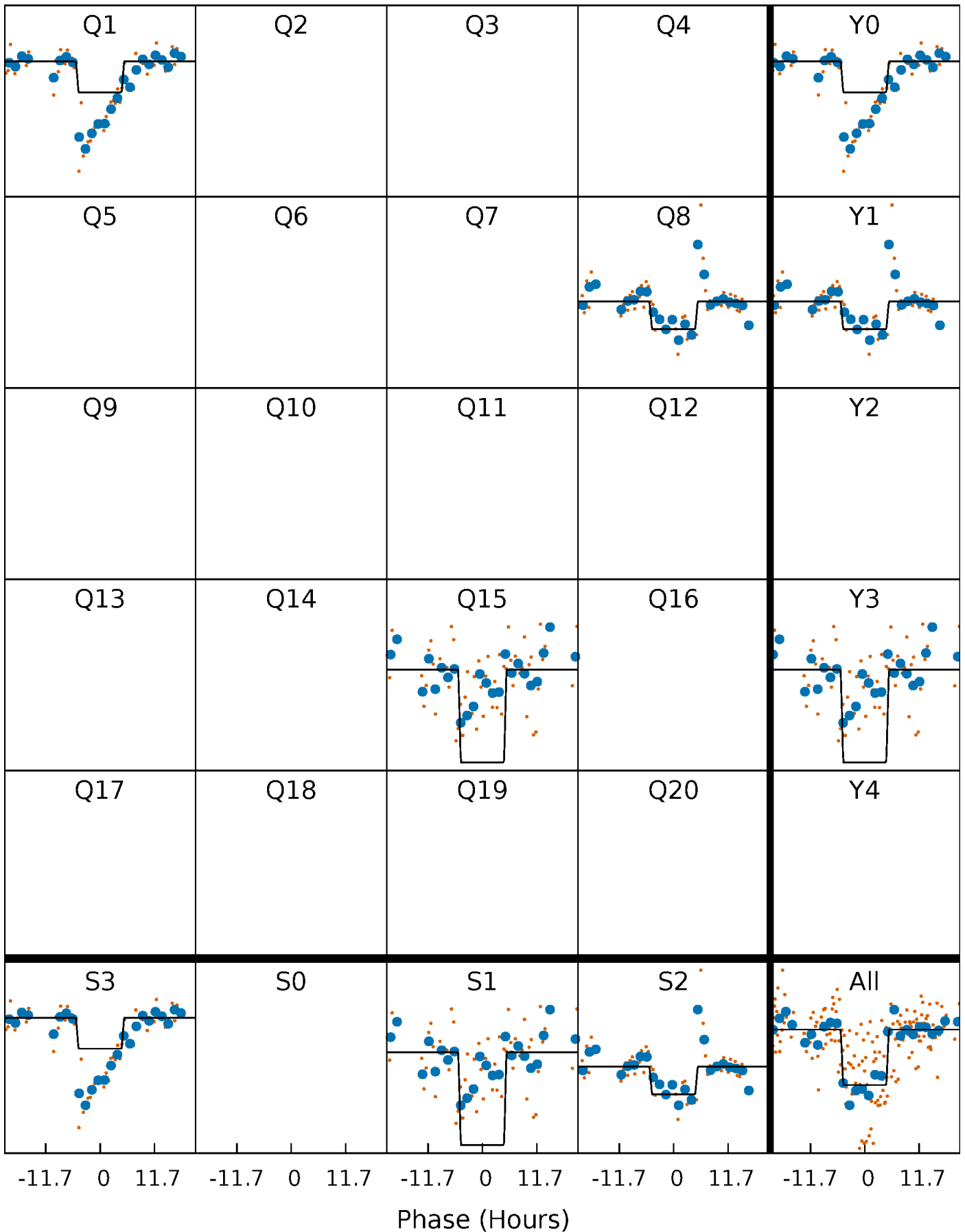
# DV Quarter-Phased Transit Curves

TCE 004078693-03     $P=656.139992$  Days     $T_0=134.924647$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

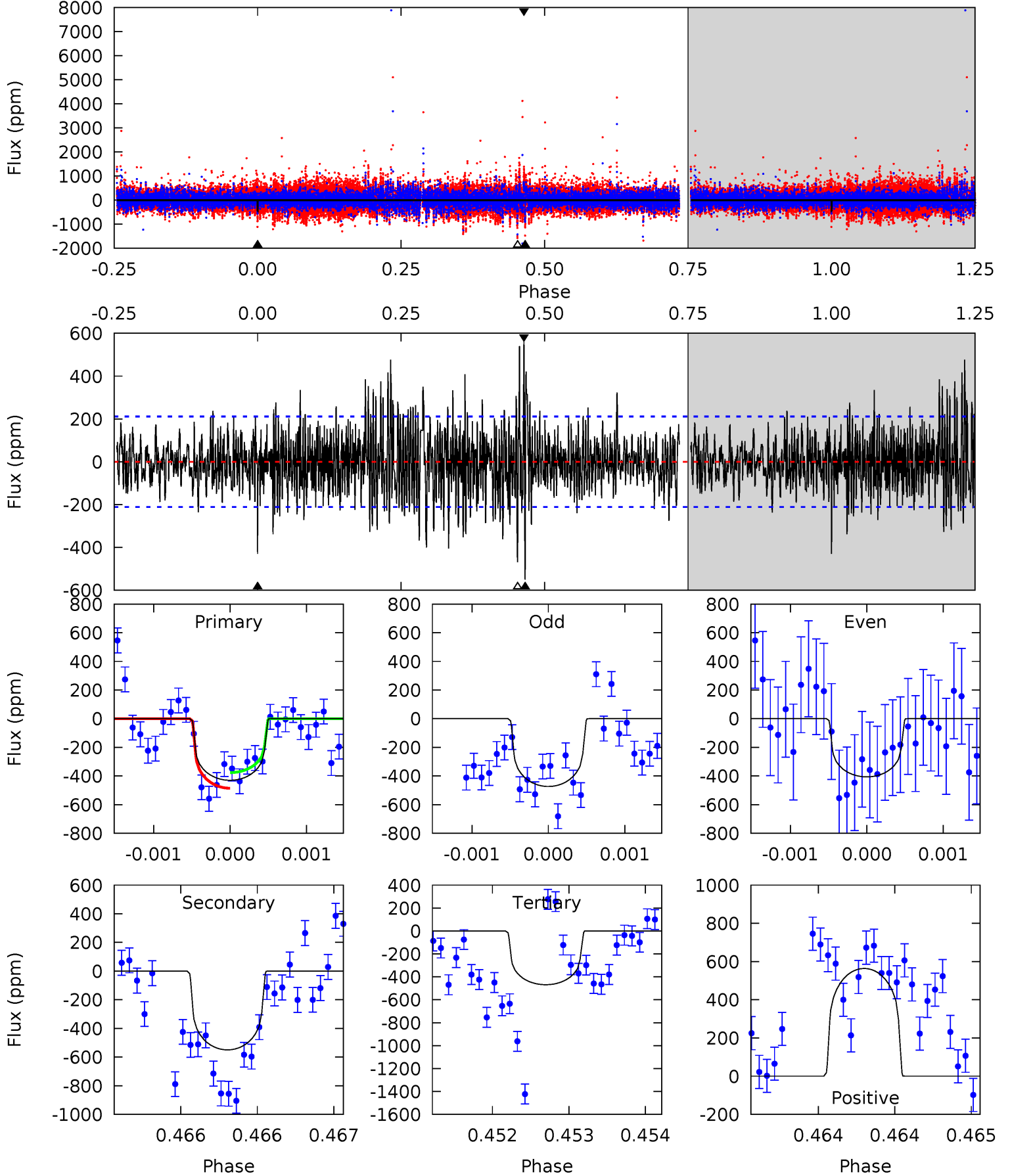
TCE 004078693-03   P=656.135234 Days    $T_0=134.930681$  (BKJD)



# DV Model-Shift Uniqueness Test

004078693-03, P = 656.139992 Days, E = 134.924647 Days

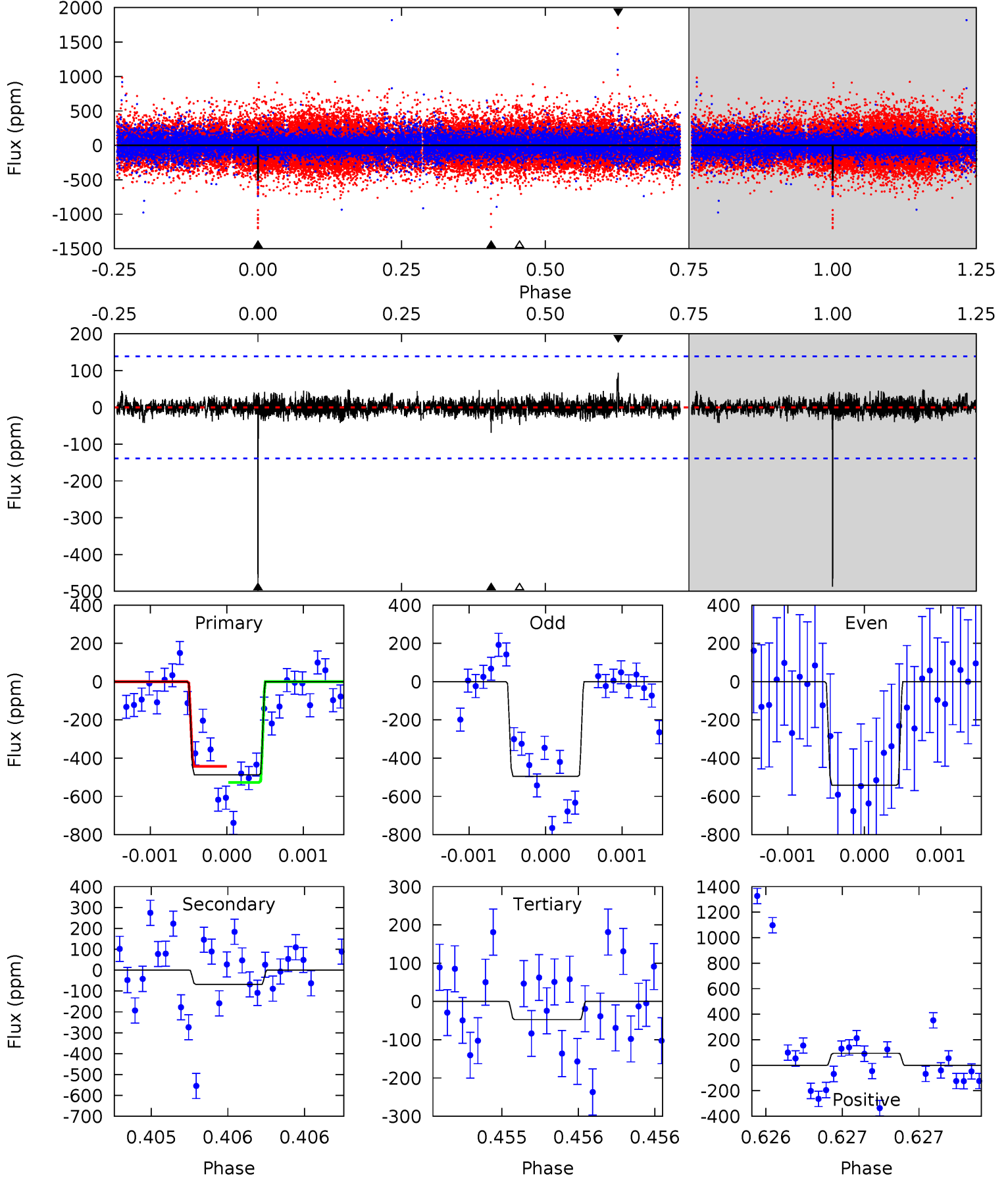
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	14.4	12.3	14.7	5.52	3.39	3.01	-1.01	-3.49	2.11	-0.37	0.83	0.91	0.51	1.46



# Alt Model-Shift Uniqueness Test

004078693-03, P = 656.135234 Days, E = 134.930681 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
19.4	2.73	1.89	3.73	5.52	3.40	0.49	17.5	15.7	0.84	-1.00	0.92	1.15	0.16	1.67



### Stellar Parameters For KIC 004078693

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5496^{+164}_{-147}$	$4.020^{+0.420}_{-0.140}$	$0.260^{+0.150}_{-0.250}$	$1.669^{+0.373}_{-0.693}$	$1.063^{+0.115}_{-0.143}$	$0.322^{+1.146}_{-0.128}$
	+3%/-3%	+10%/-3%	+58%/-96%	+22%/-42%	+11%/-13%	+355%/-40%
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 004078693-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-550 \pm 38$	$3.67^{+2.02}_{-1.42}$	$351^{+25}_{-42}$	$5638^{+1648}_{-839}$	$51090^{+80271}_{-30273}$
Alt.	$-69 \pm 25$	$3.85^{+1.94}_{-1.67}$	$351^{+28}_{-38}$	$3672^{+793}_{-460}$	$5317^{+12449}_{-3190}$

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

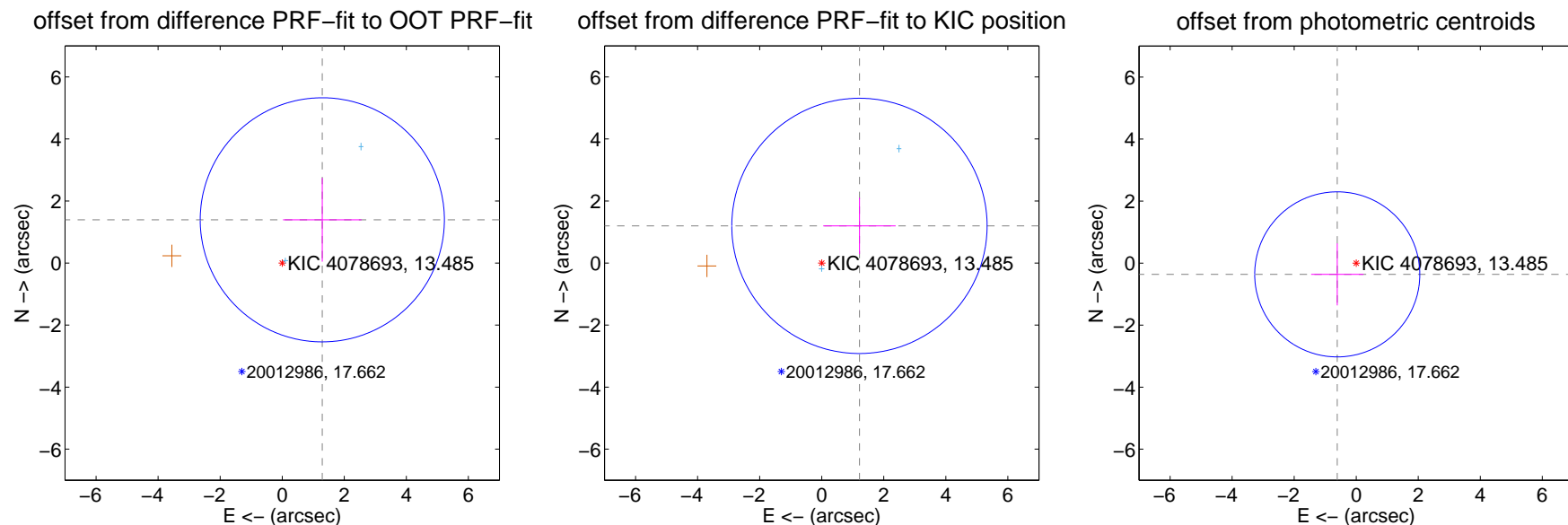
## DV Centroid Data

Supplemental centroid analysis for 004078693-03. Kepler magnitude: 13.48. Transit SNR 7.32

There are 2 quarters with good PRF difference image offsets

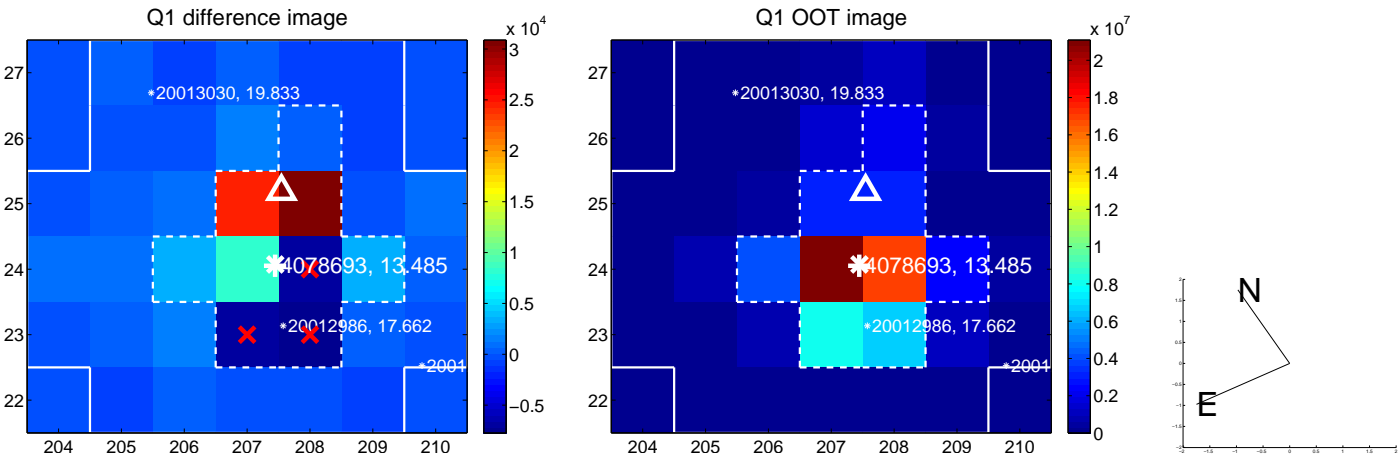
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.900 \pm 1.312$	1.45	$-1.292 \pm 1.266$	$1.393 \pm 1.349$
PRF-fit source offset from KIC position	$1.707 \pm 1.371$	1.24	$-1.216 \pm 1.169$	$1.198 \pm 0.908$
photometric centroid source offset	$0.71 \pm 0.89$	0.80	$0.61 \pm 0.84$	$-0.36 \pm 1.00$

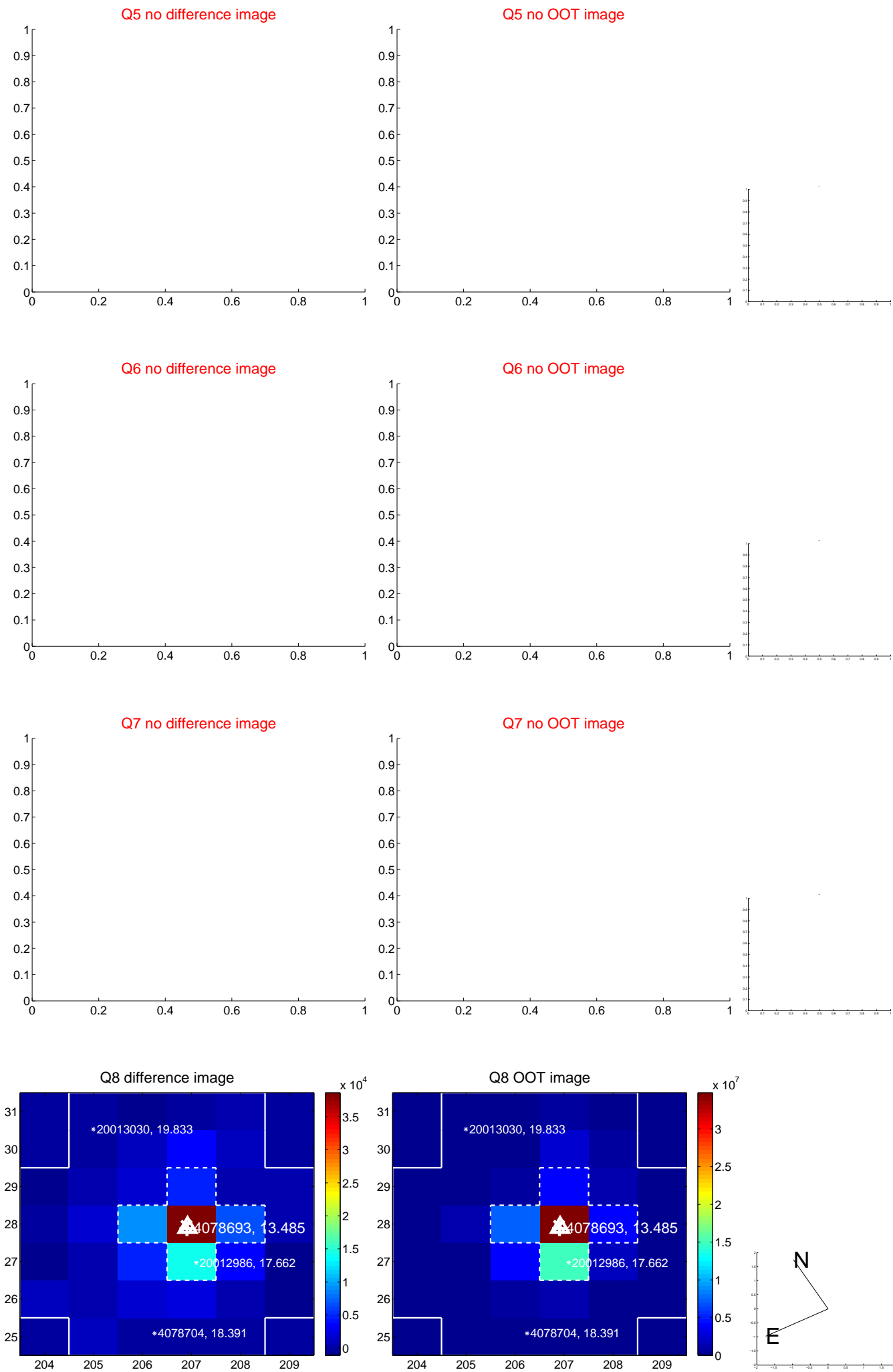


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

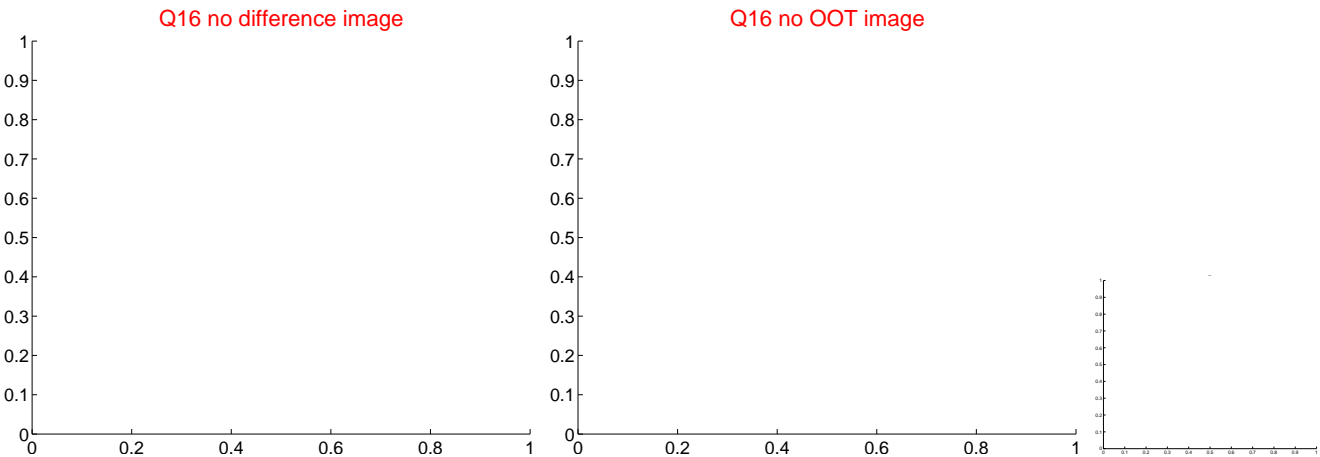
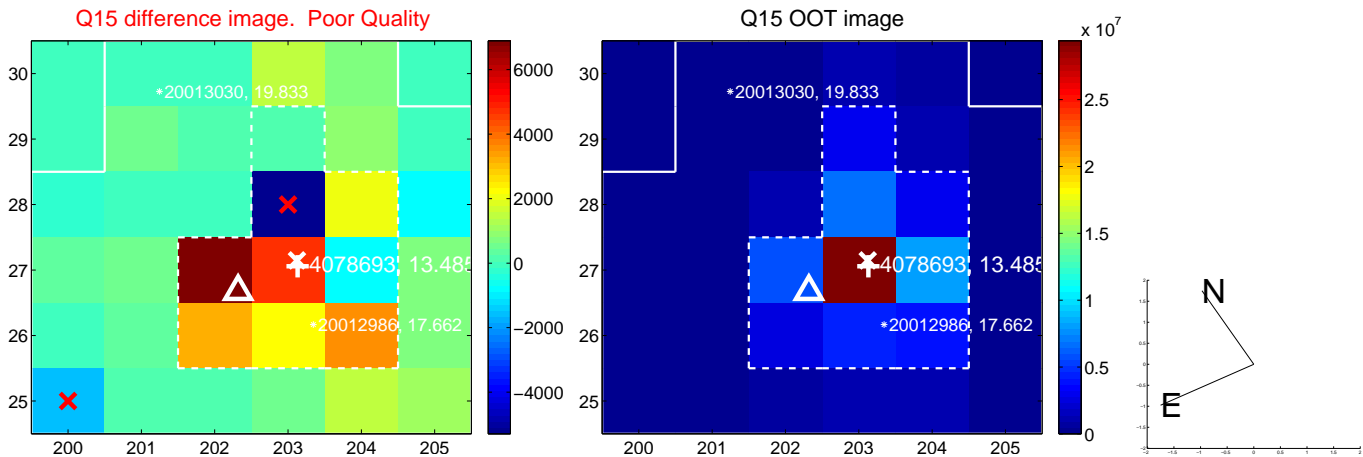
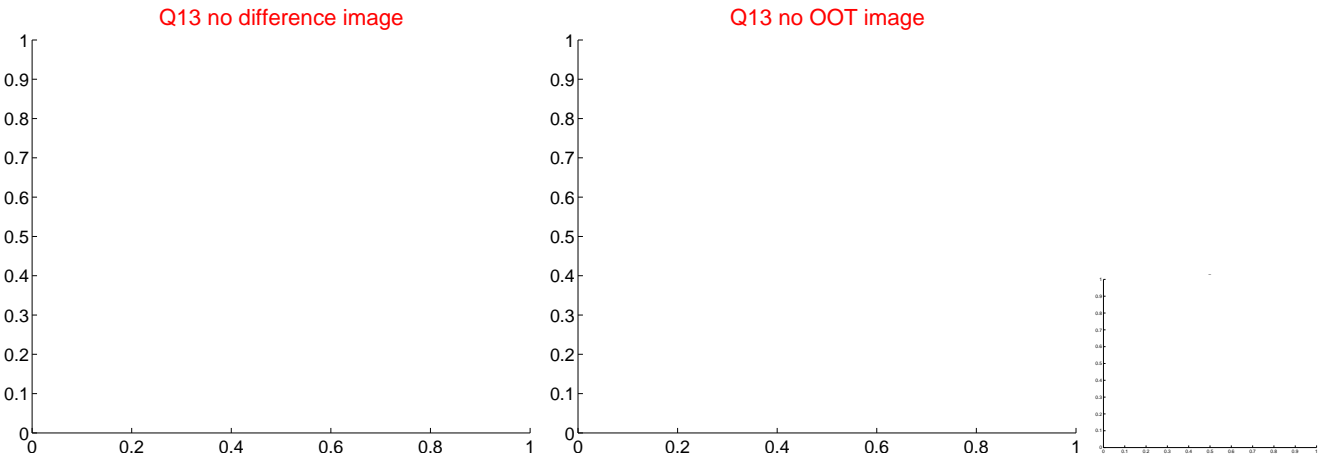




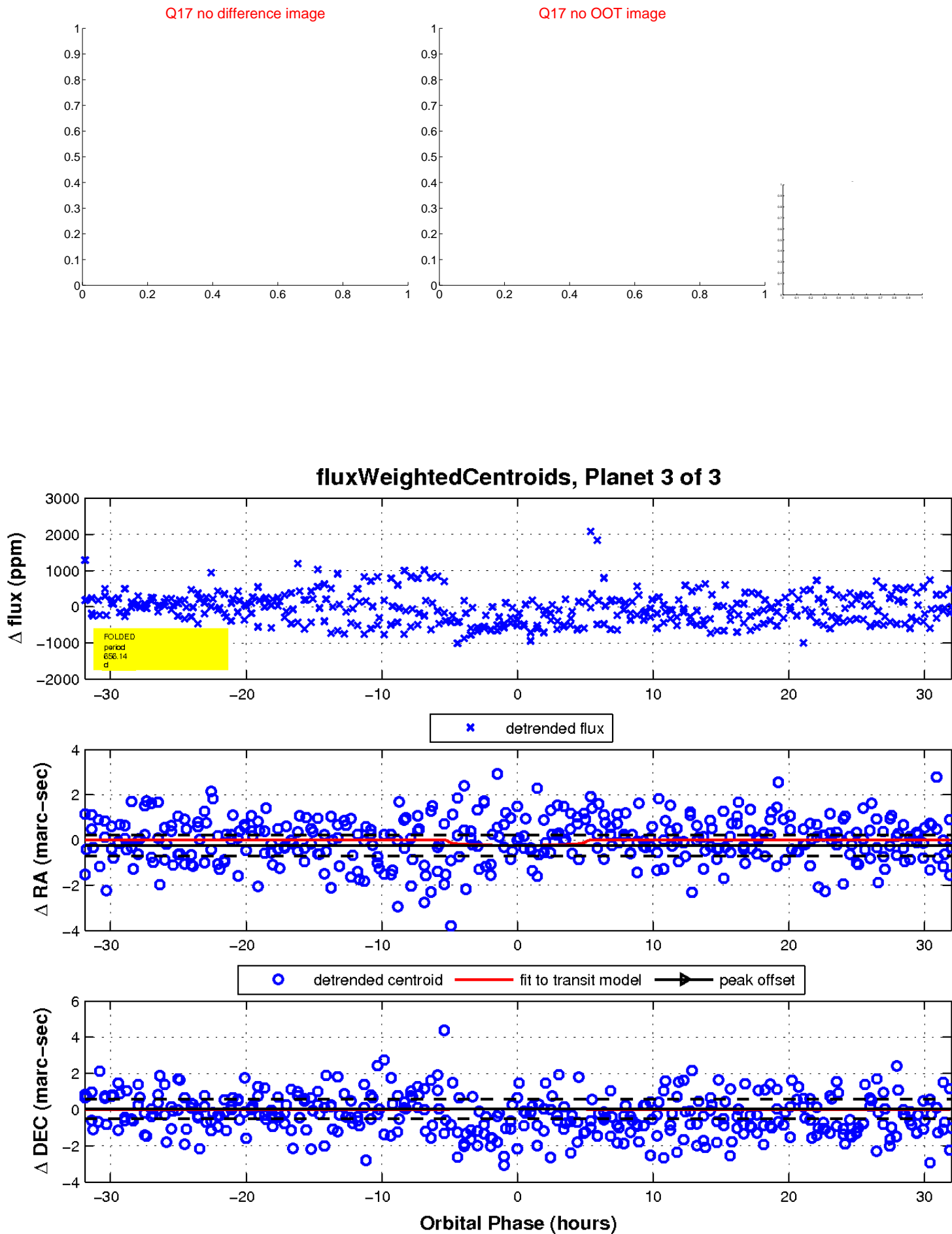
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

