

# KIC 010006096

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010006096-01	OBS	5753.01	70.515974	142.859955	329037.1	2.500	3682.9	-1.0	0.79	5511	41.60	5.48
010006096-02	OBS	No	211.970940	142.694962	17356.2	10.500	149.3	-1.0	0.79	5511	10.29	1.26
010006096-03	OBS	No	70.523229	140.542665	370.5	7.018	13.4	7.4	0.79	5511	1.58	5.48
010006096-04	OBS	No	231.191041	255.176155	1214.1	11.024	13.8	9.2	0.79	5511	3.24	1.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010006096-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
010006096-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010006096-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
010006096-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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.

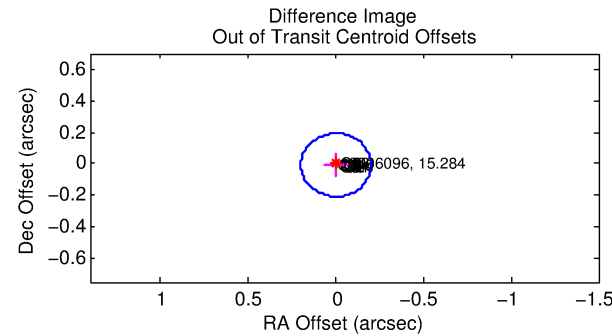
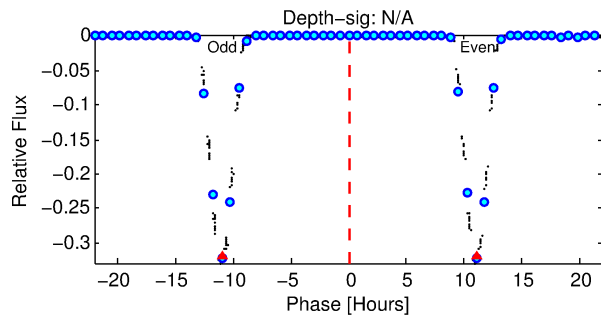
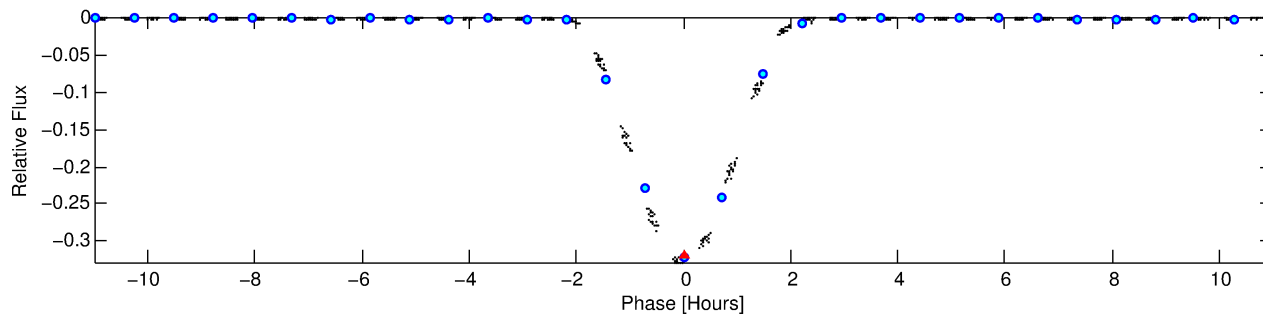
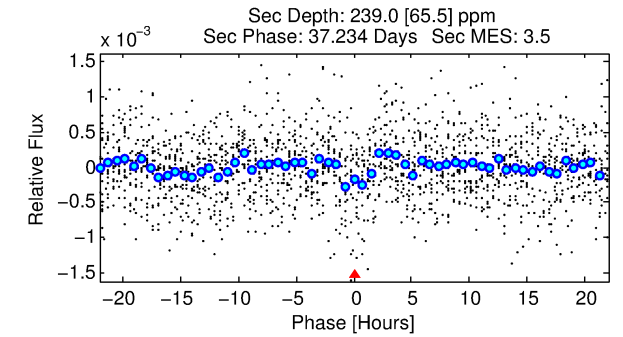
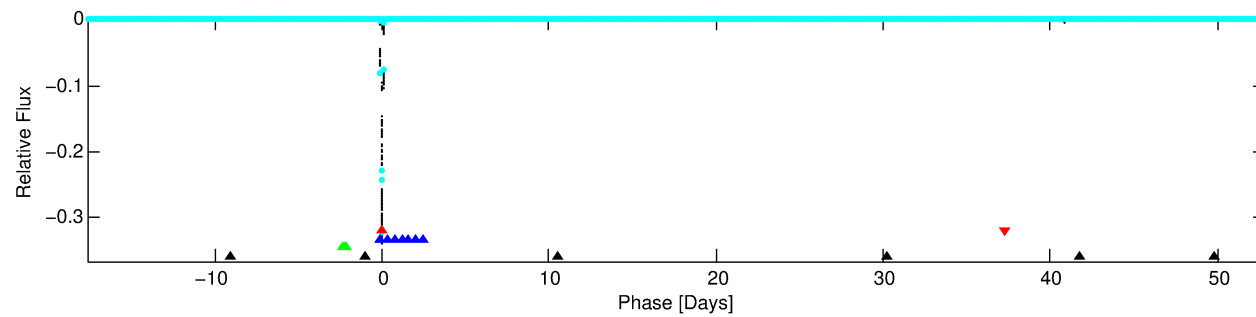
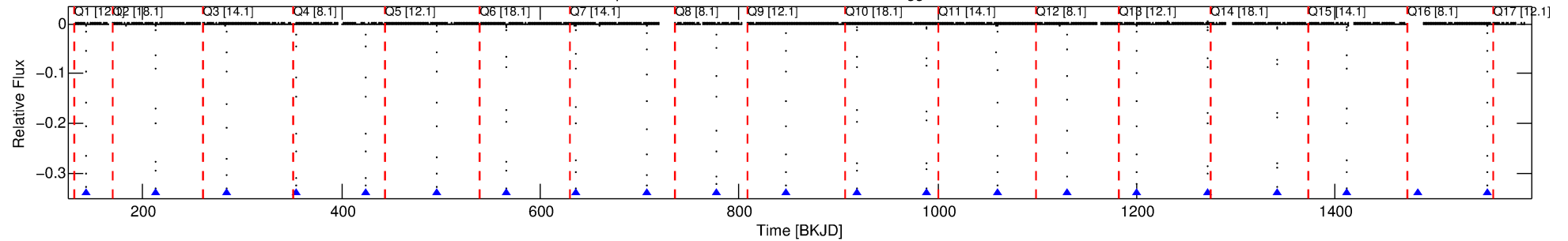
## Ephemeris Match Information For 010006096-01

No Significant Match Found

# DV One-Page Summary

KIC: 10006096 Candidate: 1 of 4 Period: 70.516 d  
KOI: K05753.01 Corr: 0.781

Kp: 15.28 R\*: 0.79 Rs Teff: 5511.0 K Logg: 4.53 Fe/H: -0.420



## TPS TCE Results:

Period = 70.51597 d  
Epoch = 142.8600 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

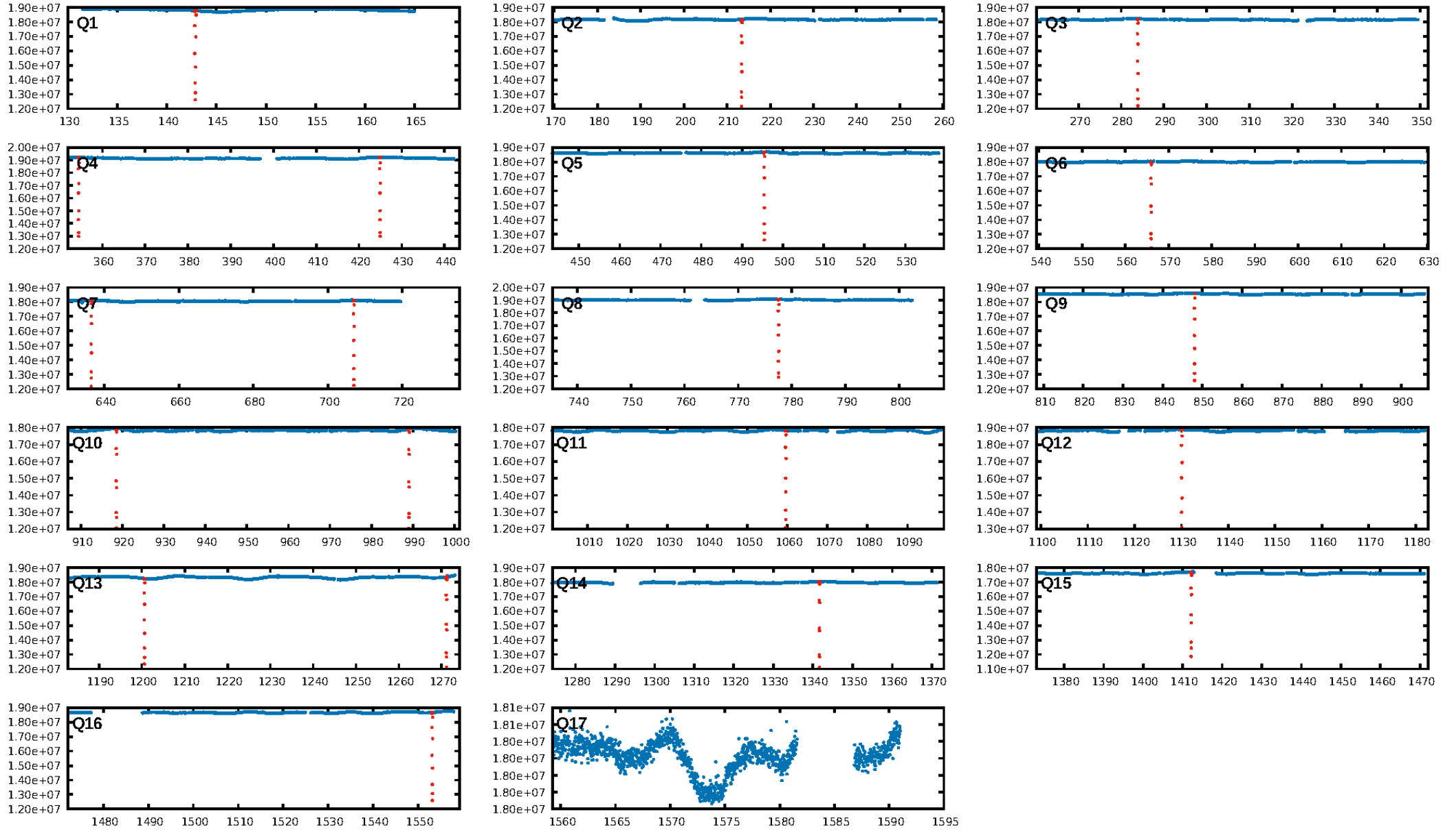
ShortPeriod-sig: N/A  
LongPeriod-sig: 1.9% [0.02σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [19/19]  
GhostDiagnostic-chr: 3.261

Centroid-sig: 0.0%  
Centroid-so: 0.284 arcsec [136.23σ]  
OotOffset-rm: 0.008 arcsec [0.12σ]  
KicOffset-rm: 0.136 arcsec [2.01σ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.93 [13/14]

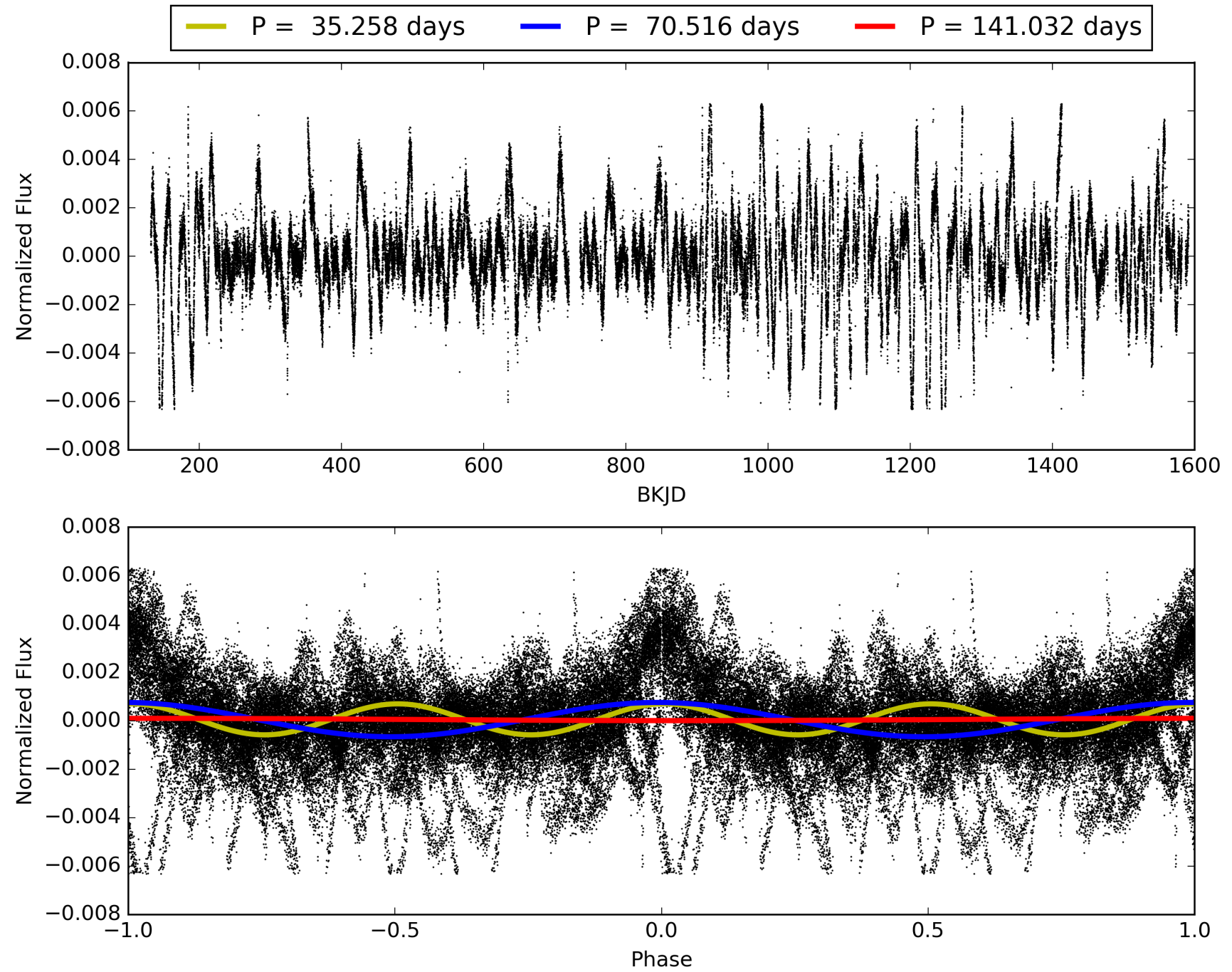
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:33 Z

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

# TCE 010006096-01, PDC Light Curves



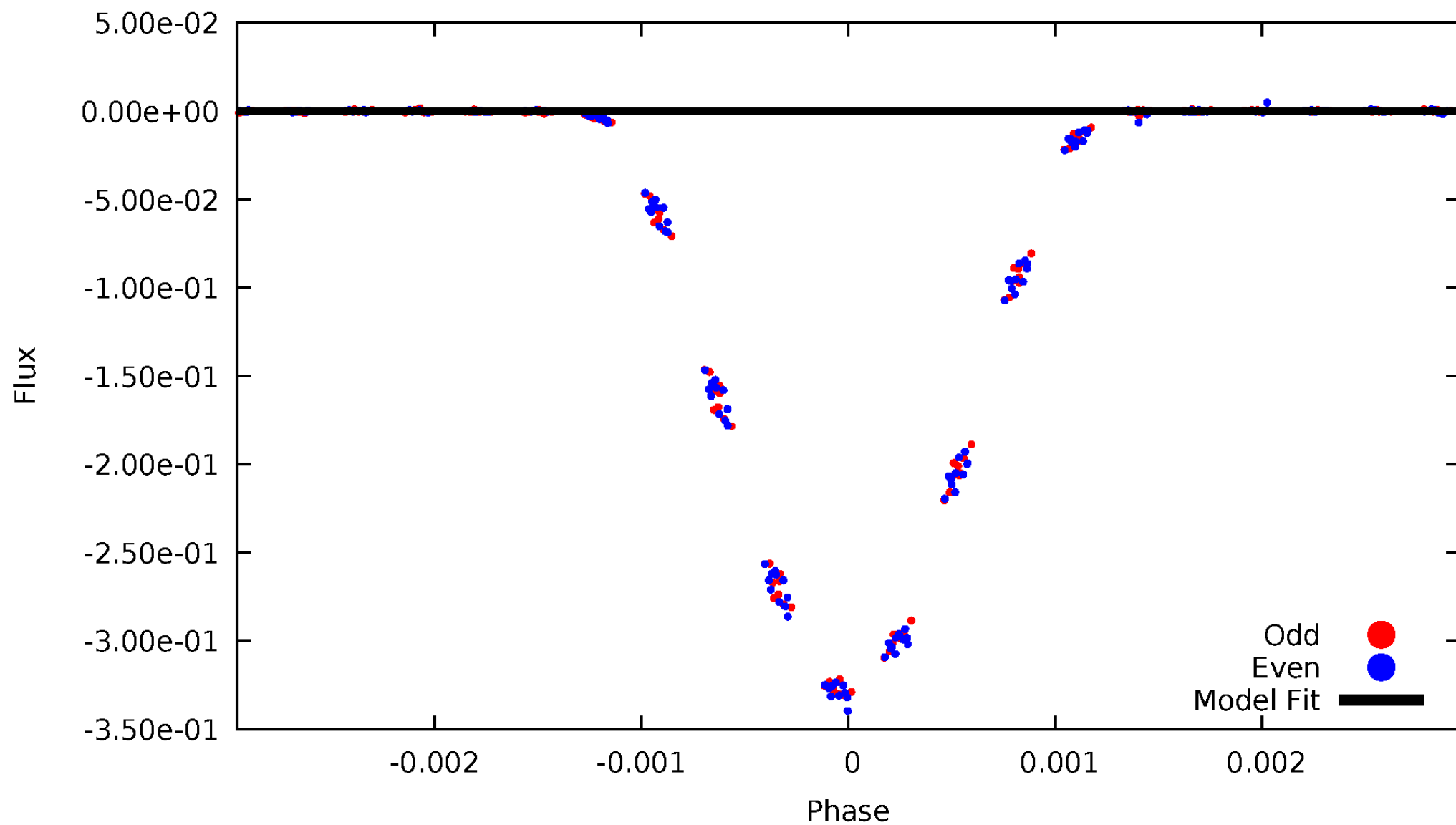
# TCE 010006096-01





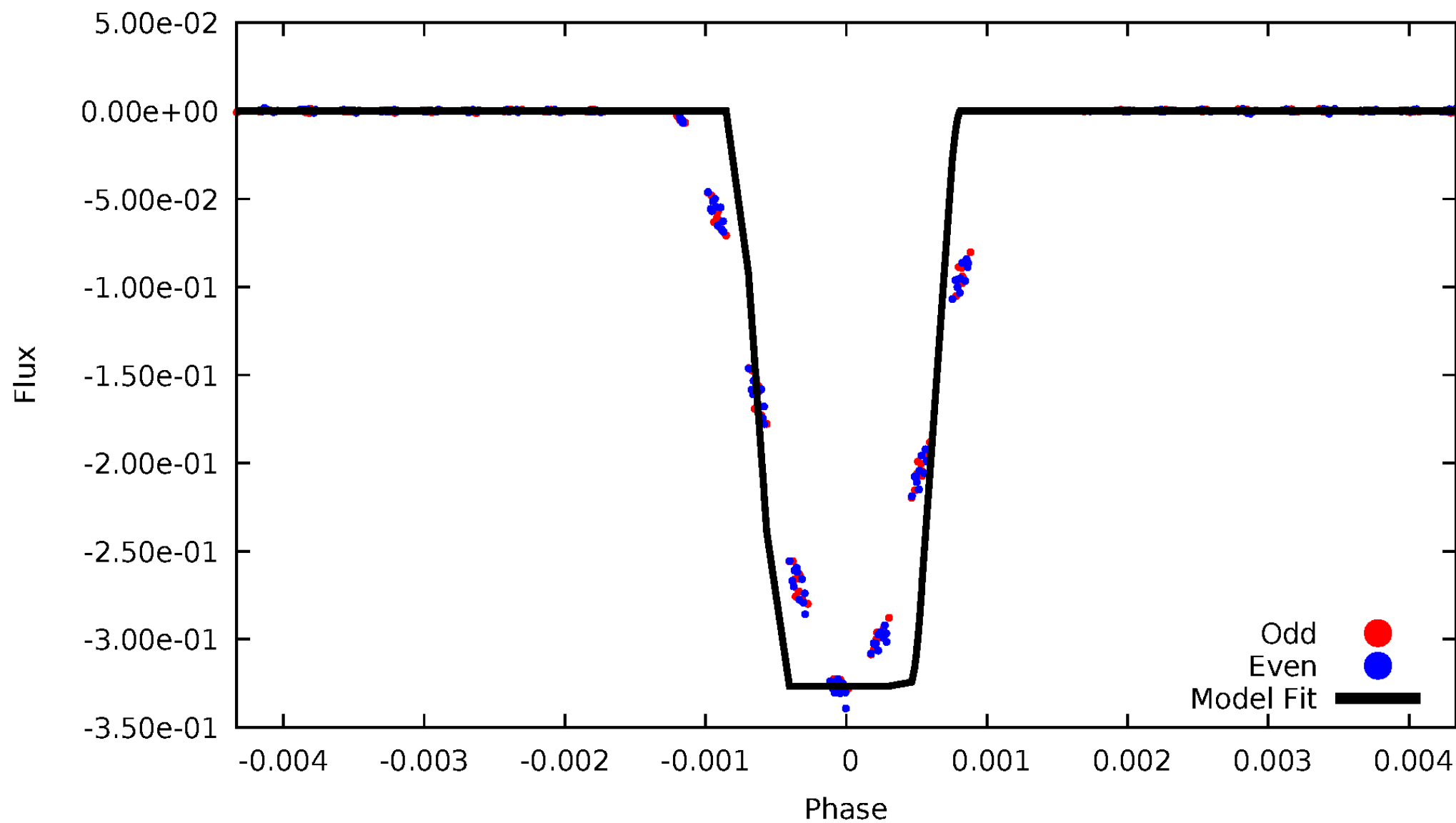
# DV Odd/Even

TCE 010006096-01



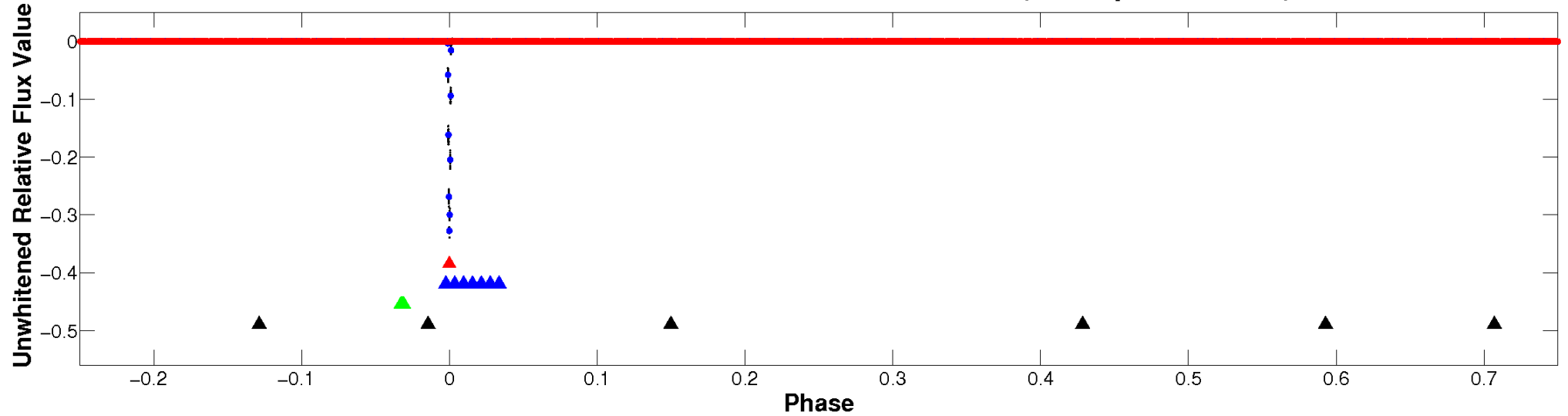
# ALT Odd/Even

TCE 010006096-01

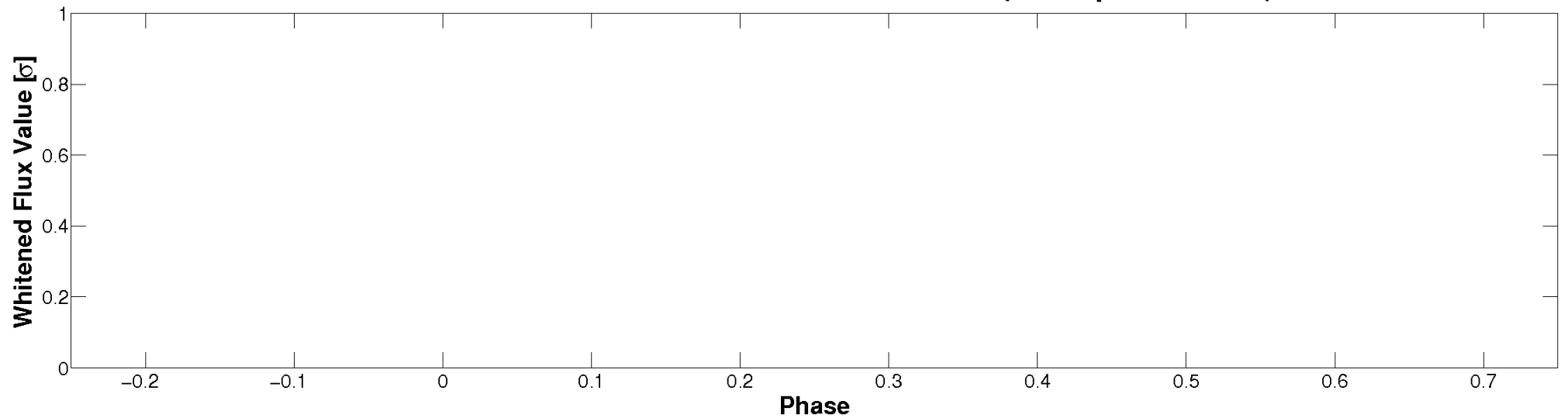


# Non-Whitened Vs. Whitened Light Curve

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

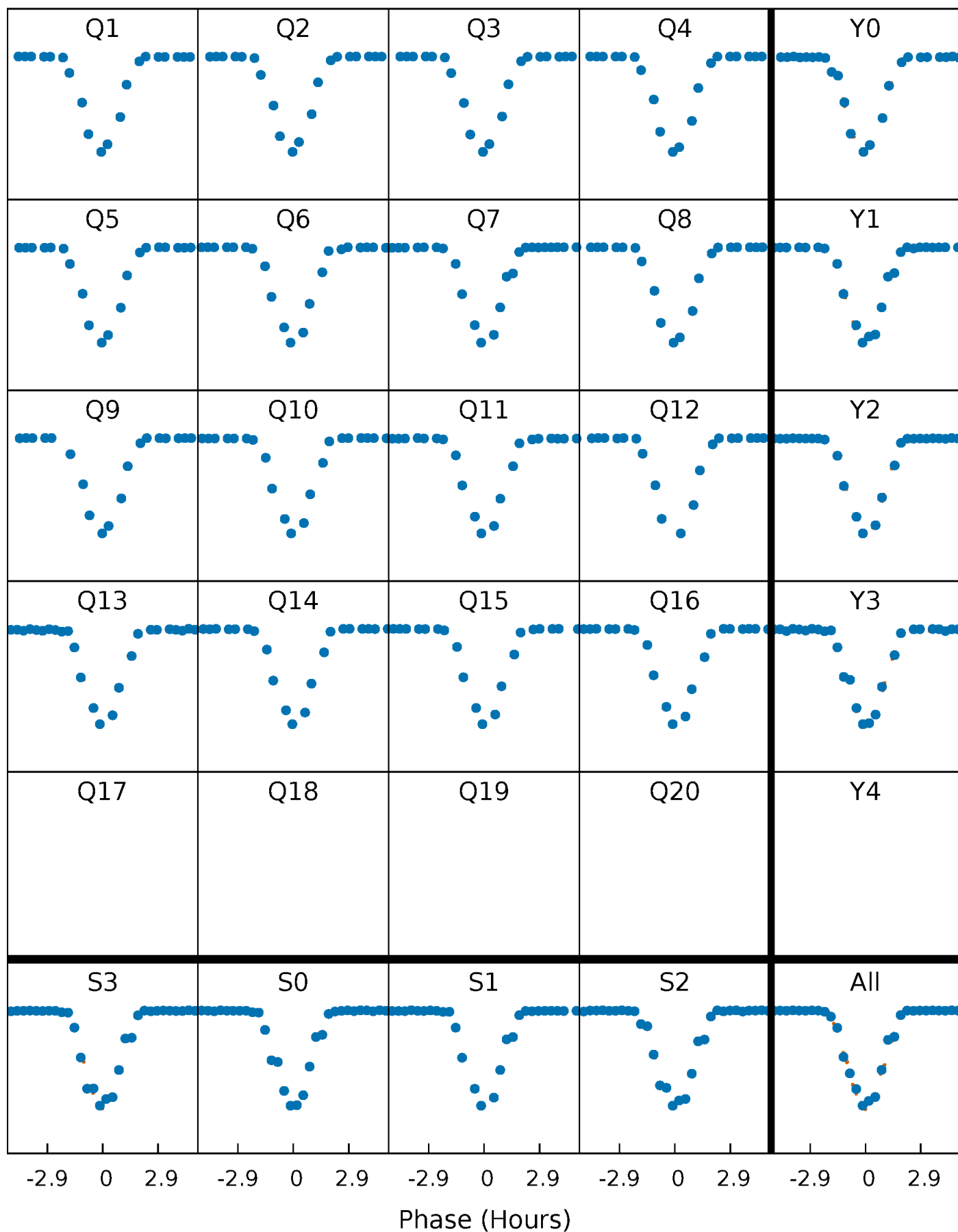


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



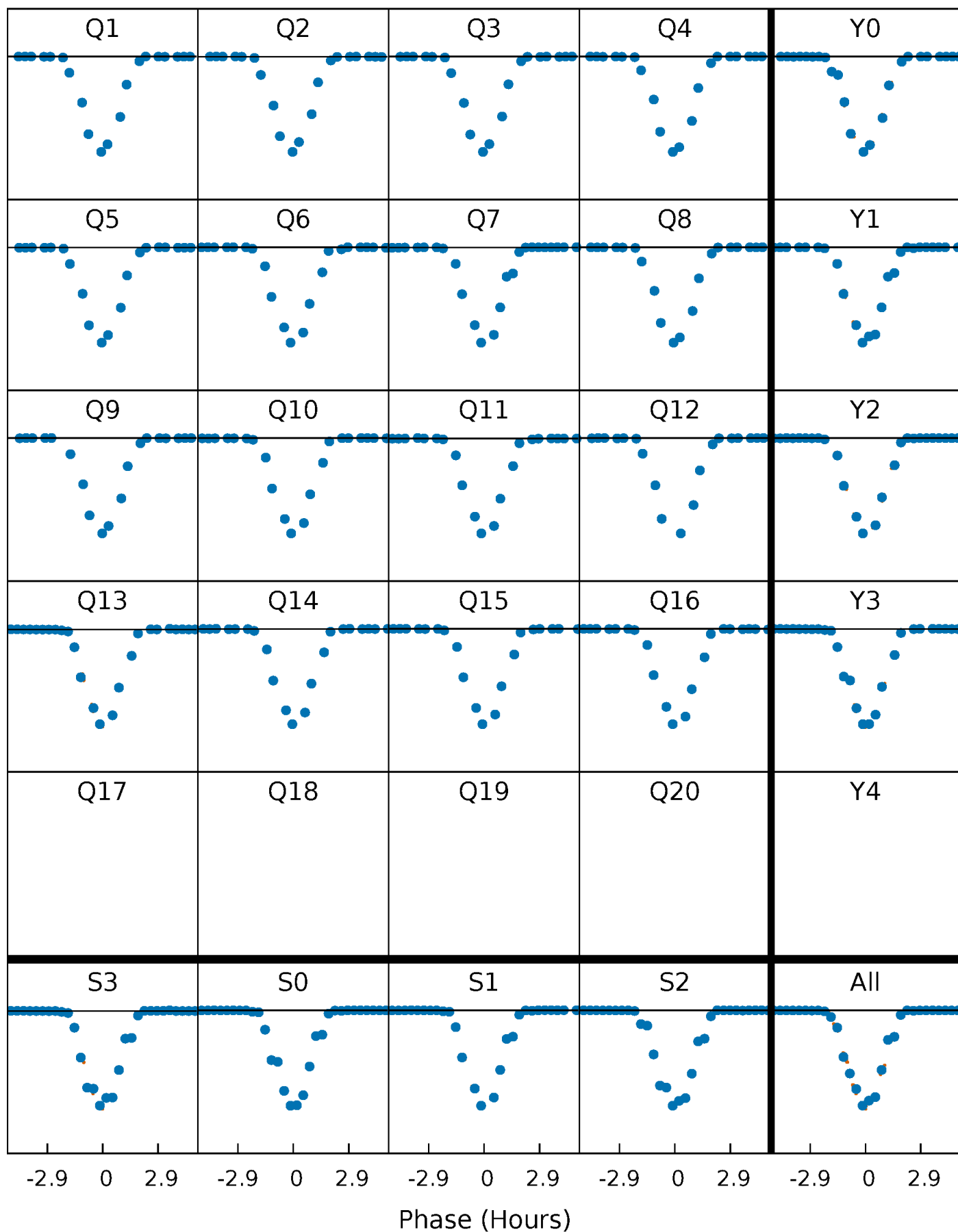
# PDC Quarter-Phased Transit Curves

TCE 010006096-01   P= 70.515974 Days    $T_0=142.859955$  (BKJD)



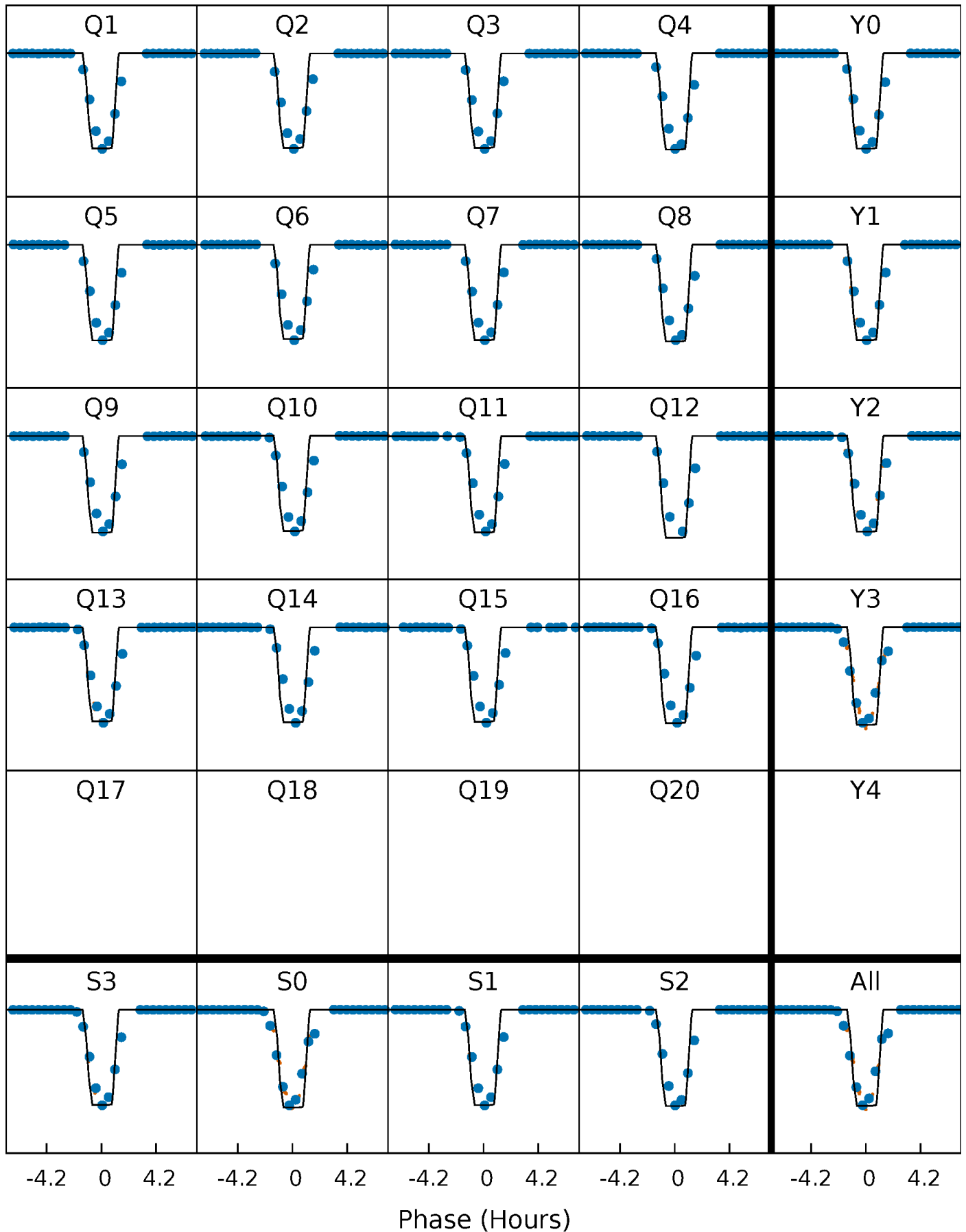
# DV Quarter-Phased Transit Curves

TCE 010006096-01   P= 70.515974 Days    $T_0=142.859955$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

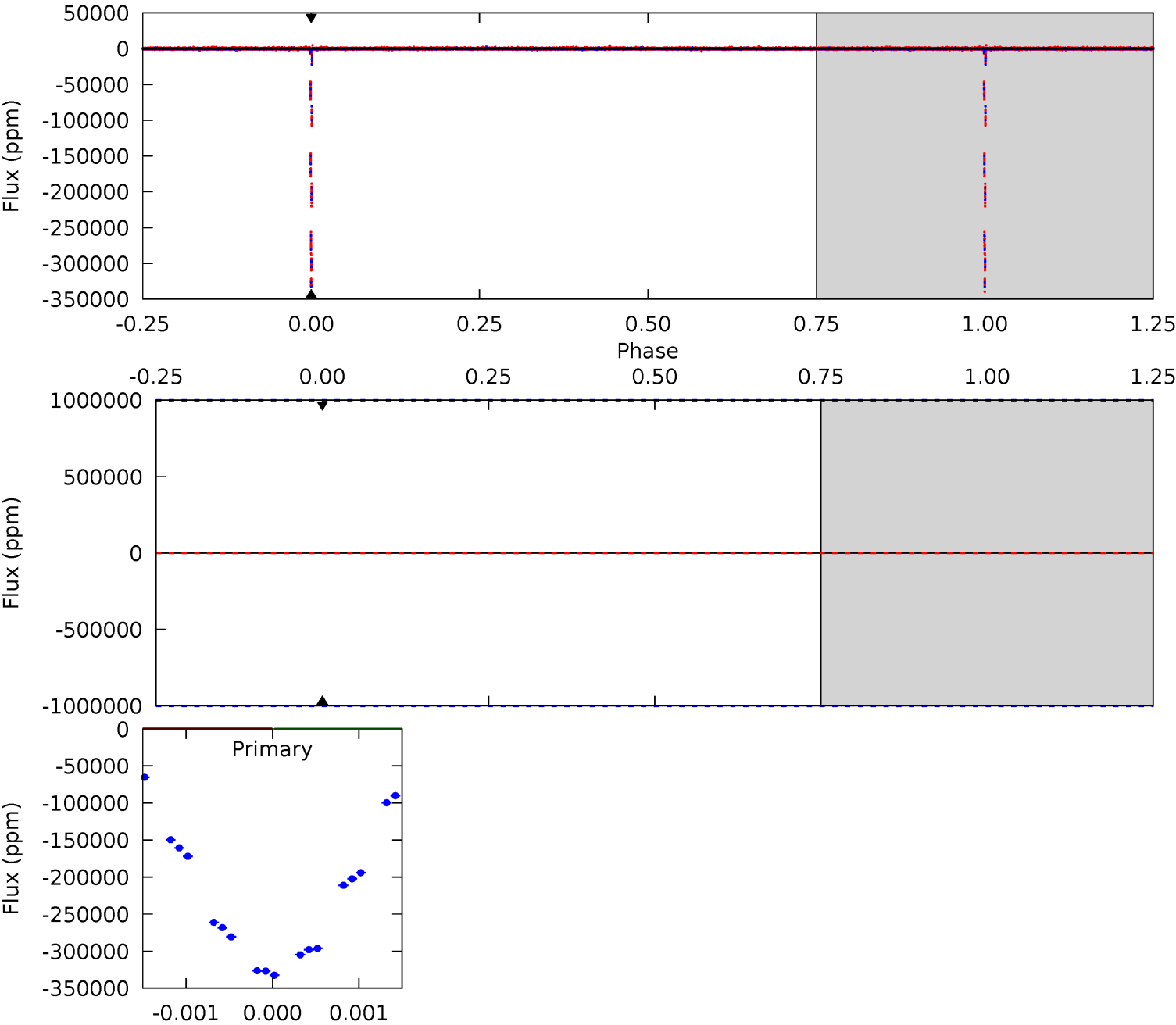
TCE 010006096-01 P= 70.515974 Days  $T_0=142.859949$  (BKJD)



# DV Model-Shift Uniqueness Test

010006096-01, P = 70.515974 Days, E = 72.343981 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	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0

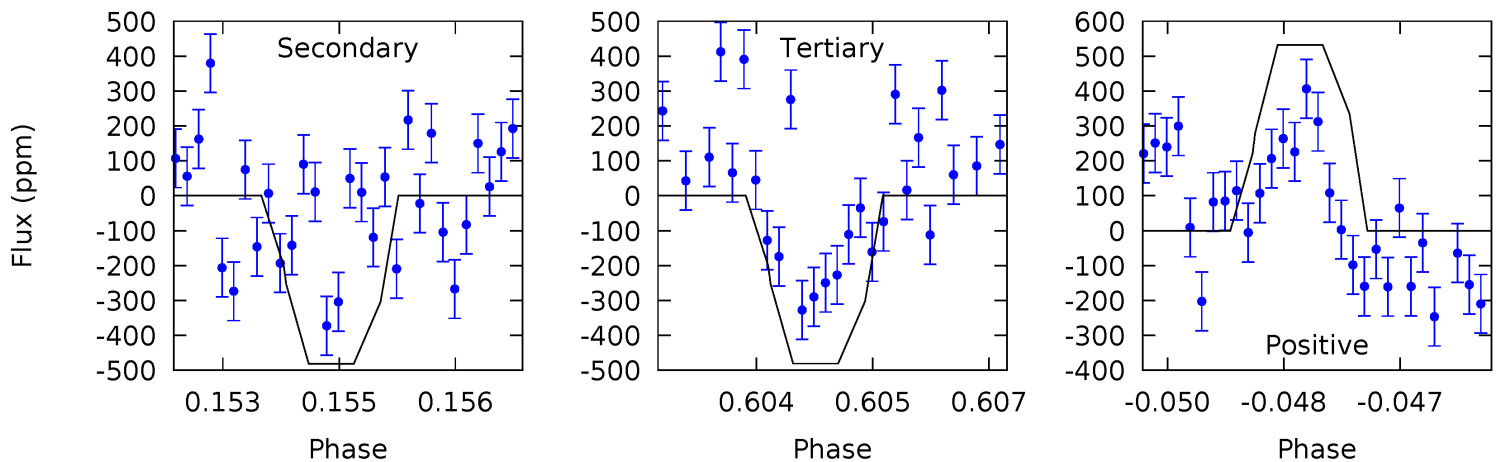
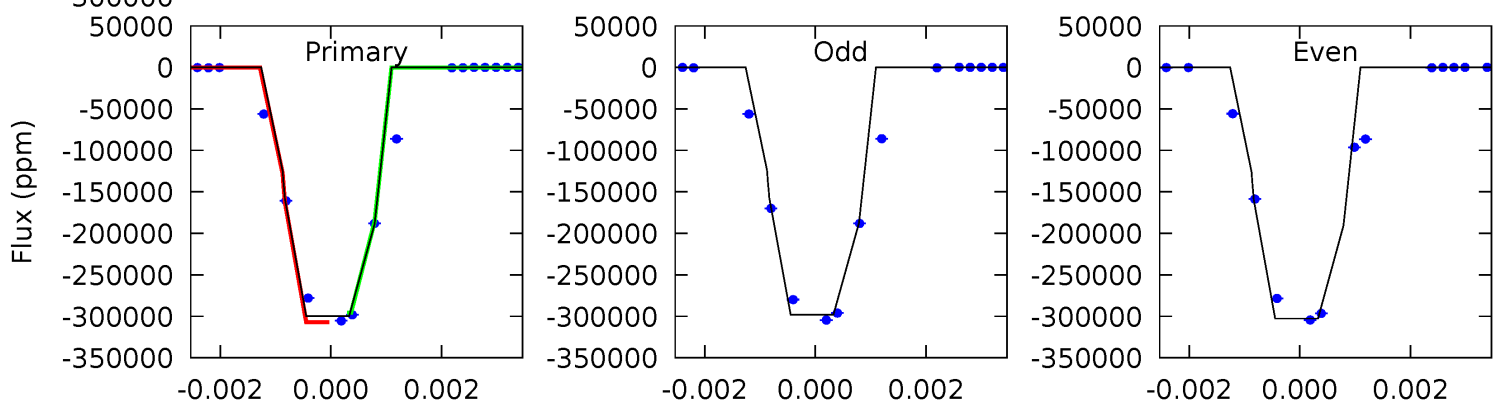
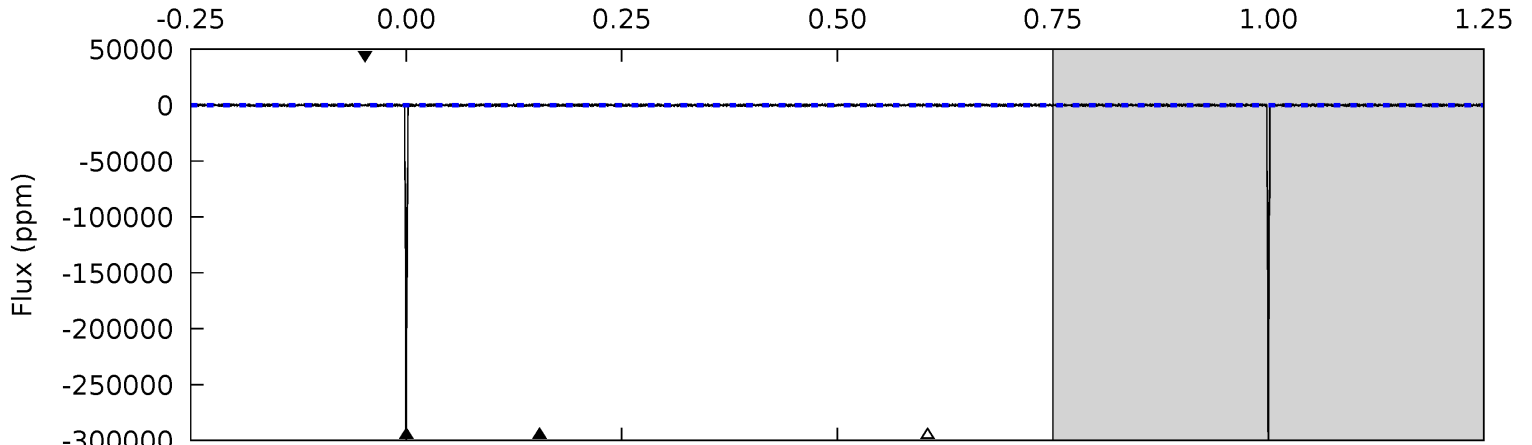
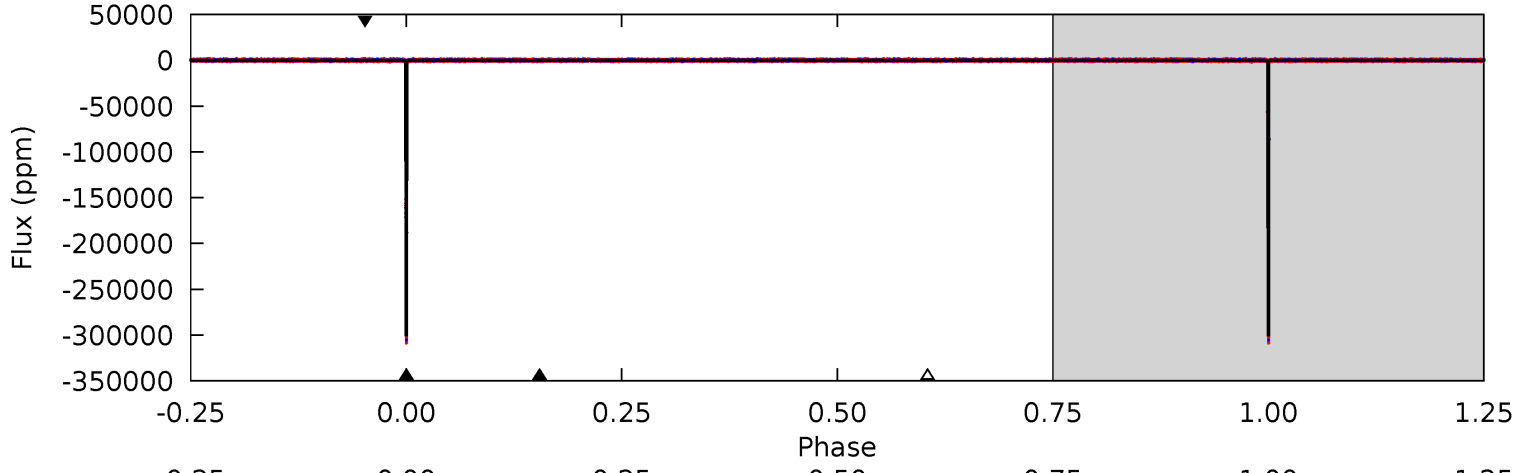




# Alt Model-Shift Uniqueness Test

010006096-01, P = 70.515974 Days, E = 72.343975 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
2738	4.40	4.39	4.86	5.38	3.17	4.16	2734	2733	0.01	-0.45	25.8	1.00	0.00	0



### Stellar Parameters For KIC 010006096

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5511^{+165}_{-148}$	$4.531^{+0.076}_{-0.114}$	$-0.420^{+0.300}_{-0.300}$	$0.789^{+0.145}_{-0.085}$	$0.773^{+0.103}_{-0.055}$	$2.213^{+0.722}_{-0.761}$
	+3%/-3%	+2%/-3%	+71%/-71%	+18%/-11%	+13%/-7%	+33%/-34%
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 010006096-01 / KOI 5753.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$42.86^{+9.62}_{-9.87}$	$549^{+25}_{-22}$	$-2002^{+6795}_{-2531}$	$-7.939^{+3567.053}_{-2609.769}$
Alt.	$-482 \pm 109$	$50.60^{+9.73}_{-9.56}$	$550^{+26}_{-23}$	$2054^{+105}_{-96}$	$9.584^{+6.074}_{-3.447}$

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

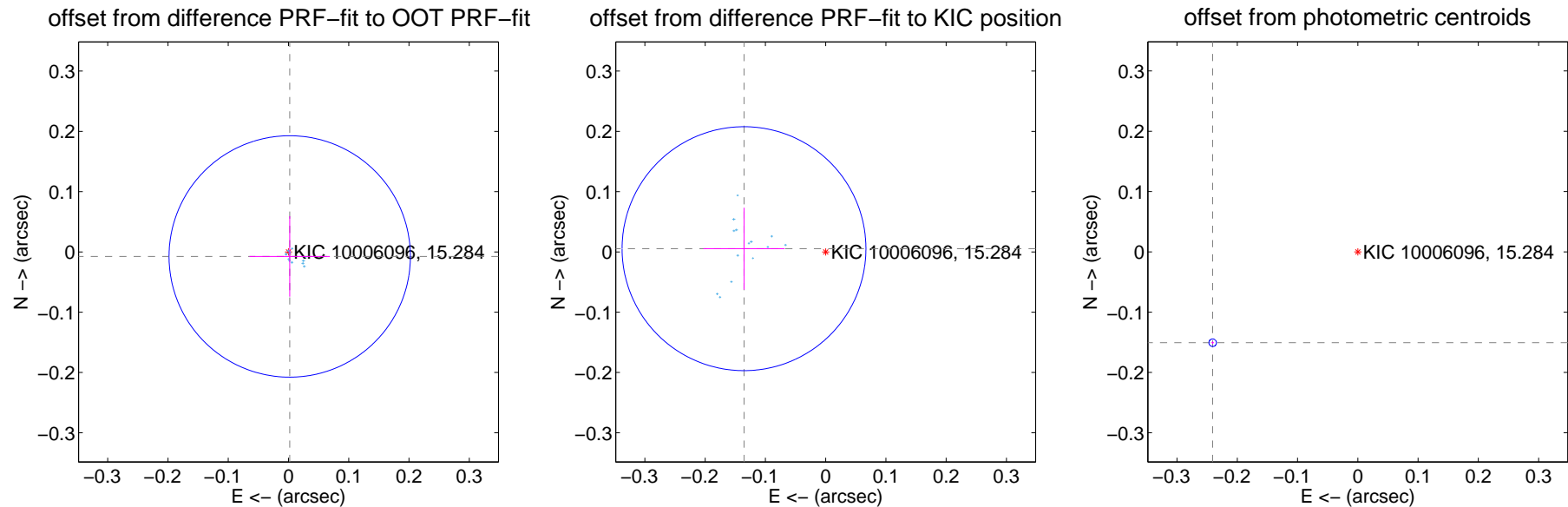
## DV Centroid Data

Supplemental centroid analysis for 010006096-01. Kepler magnitude: 15.28. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

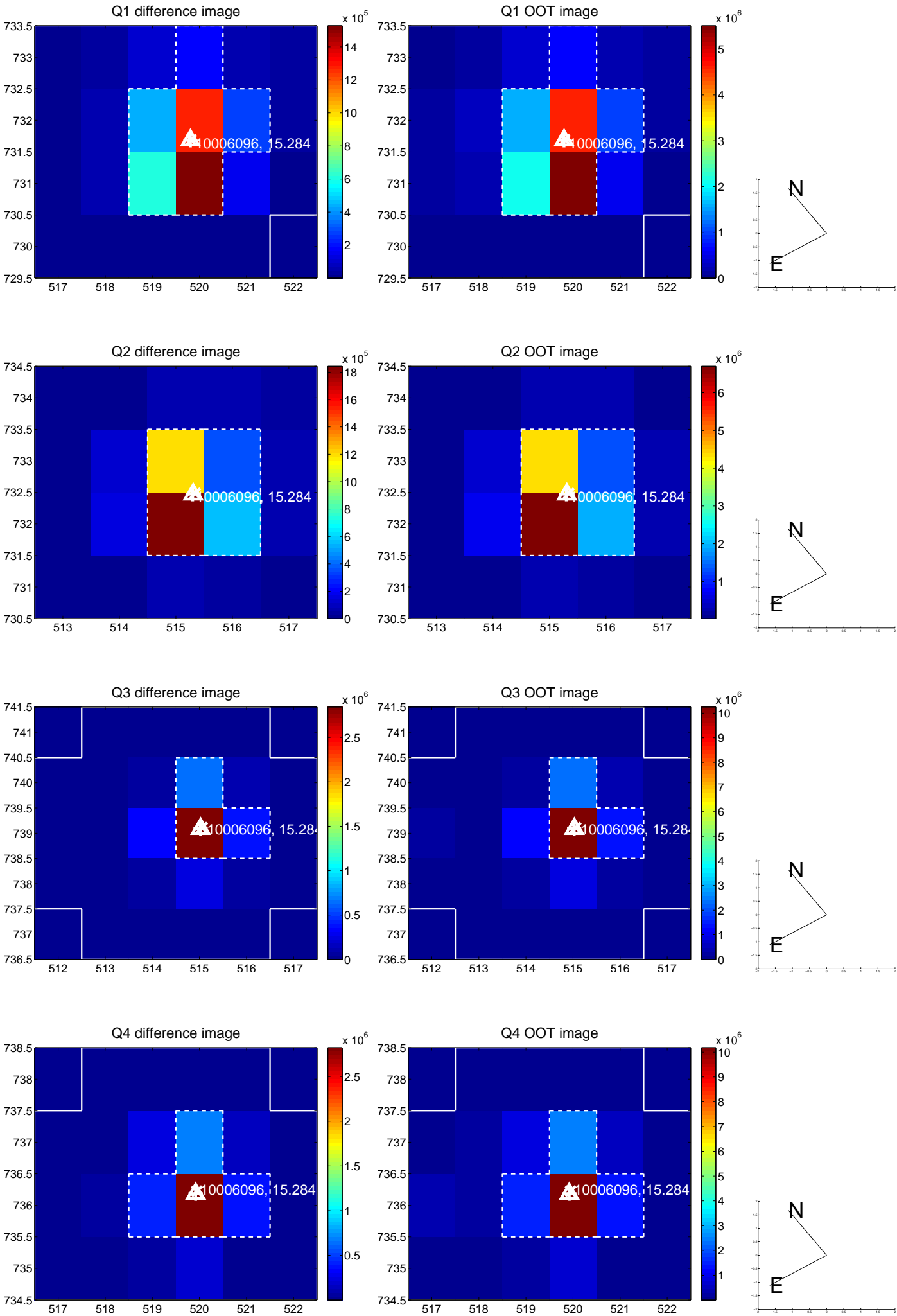
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.008 \pm 0.067$	0.12	$-0.002 \pm 0.067$	$-0.008 \pm 0.067$
PRF-fit source offset from KIC position	$0.136 \pm 0.067$	2.01	$0.136 \pm 0.067$	$0.005 \pm 0.068$
photometric centroid source offset	$0.28 \pm 0.00$	136.23	$0.24 \pm 0.00$	$-0.15 \pm 0.00$

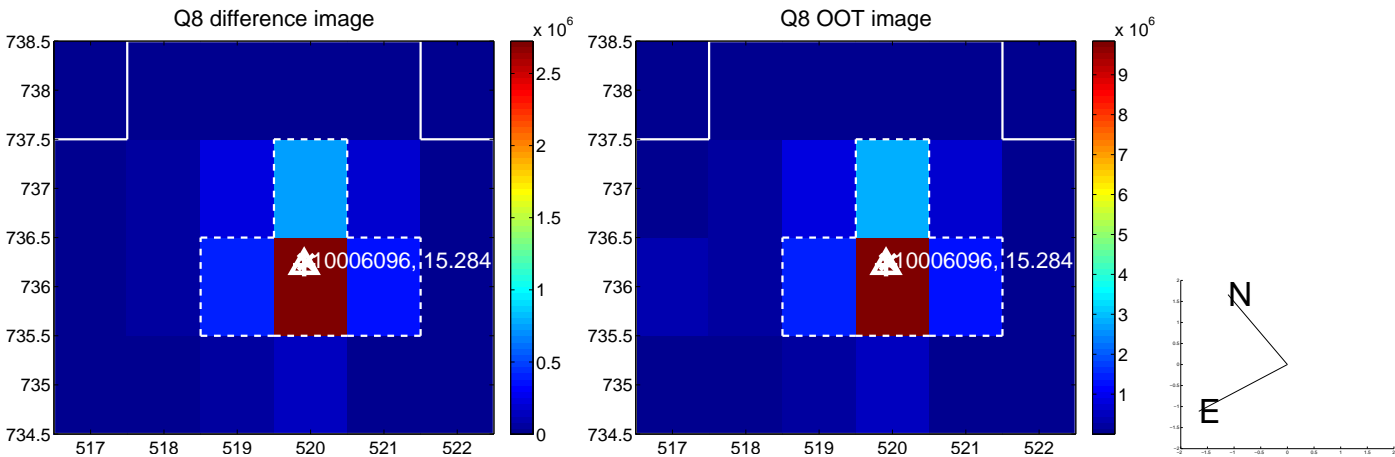
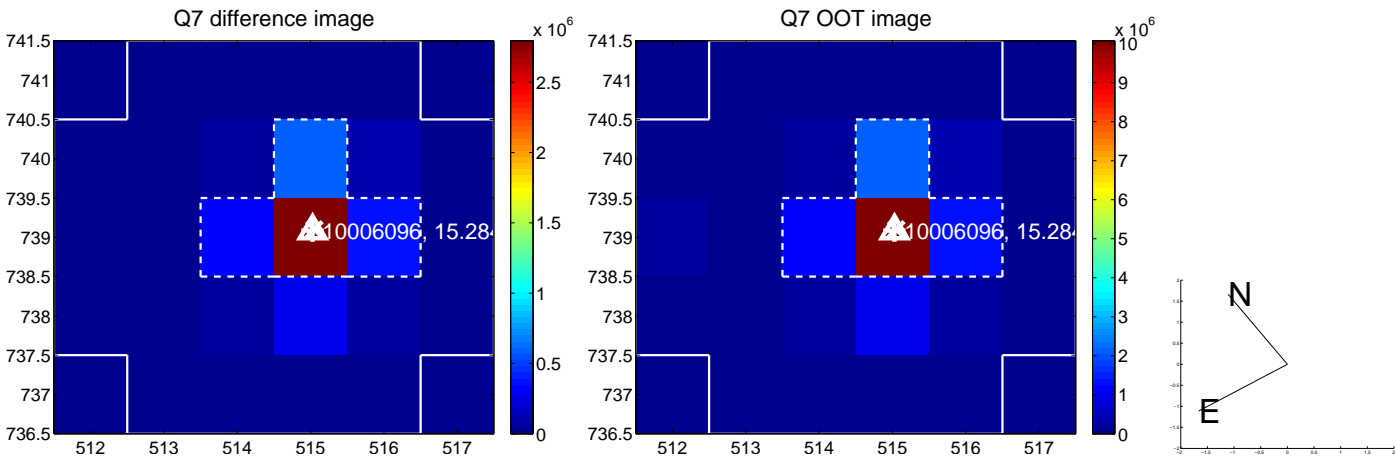
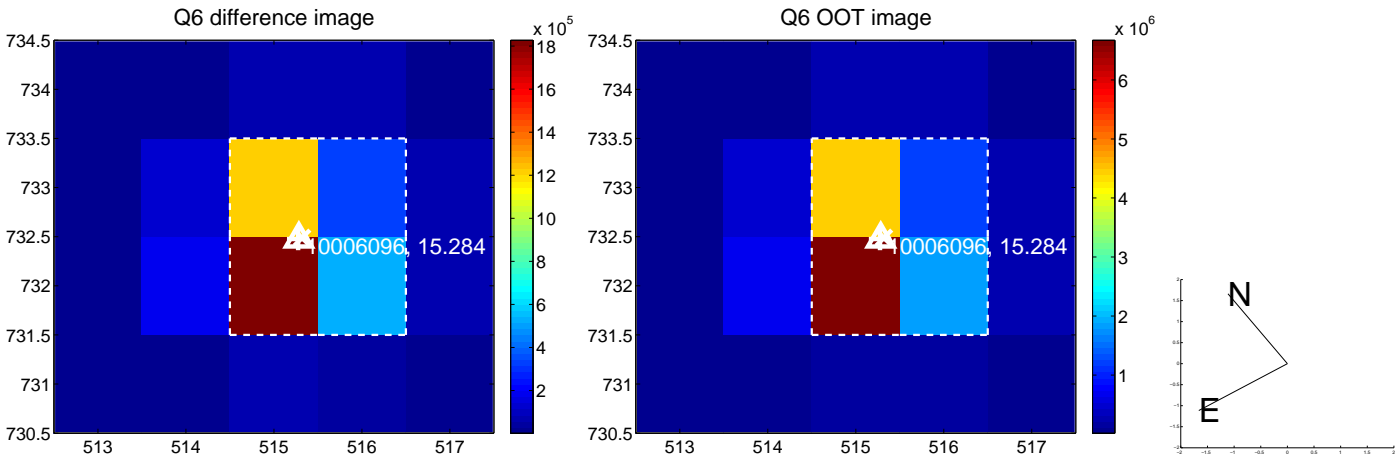
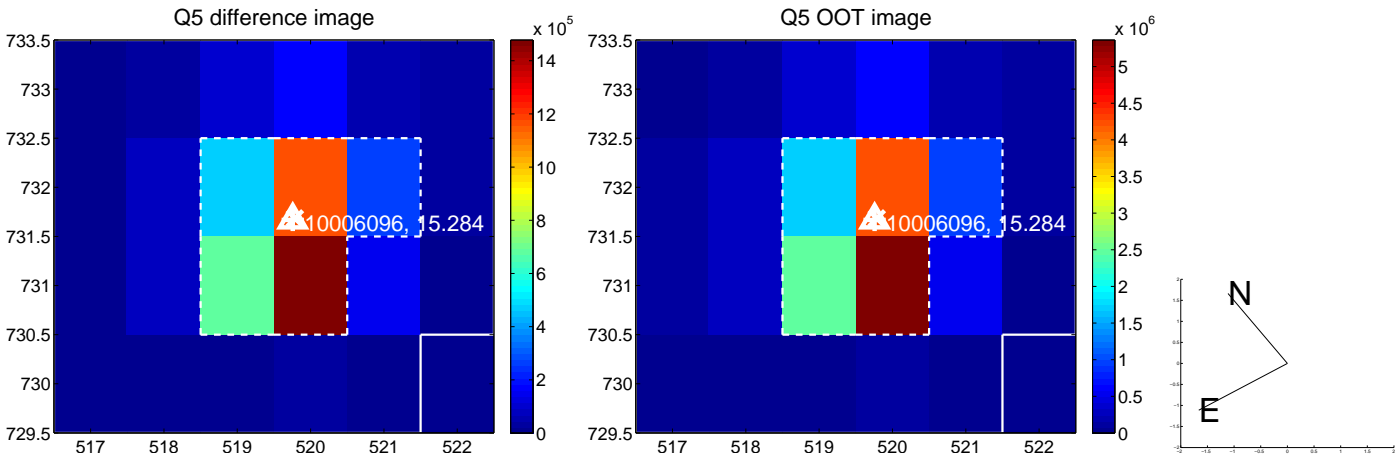


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

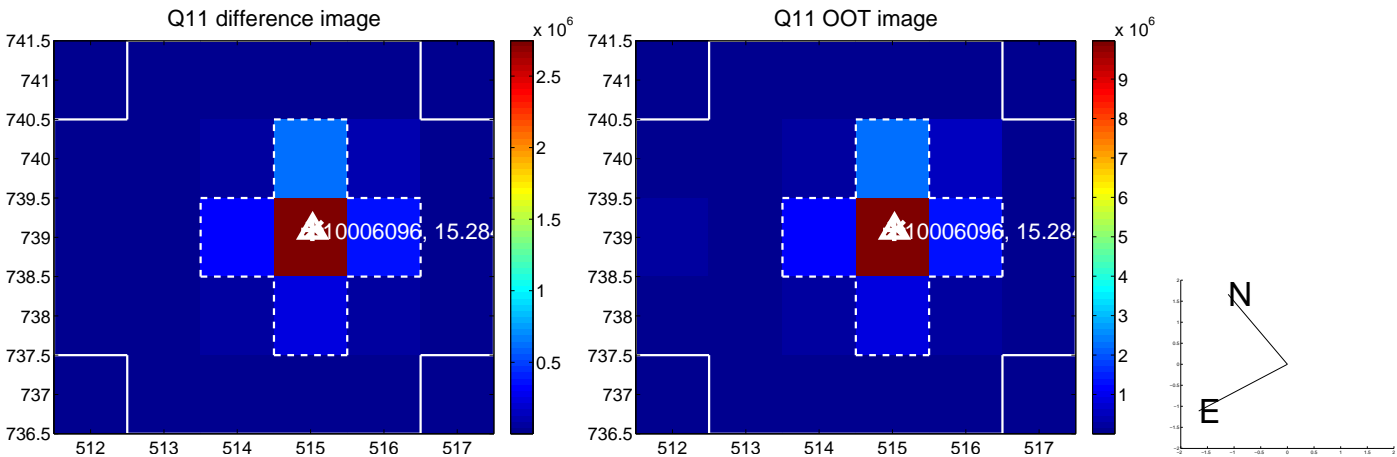
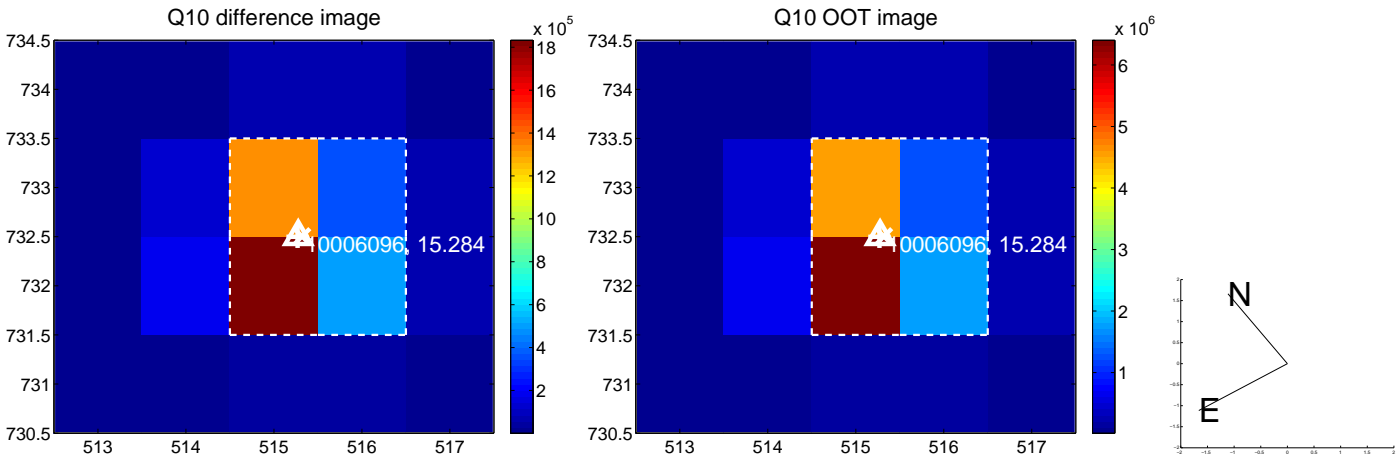
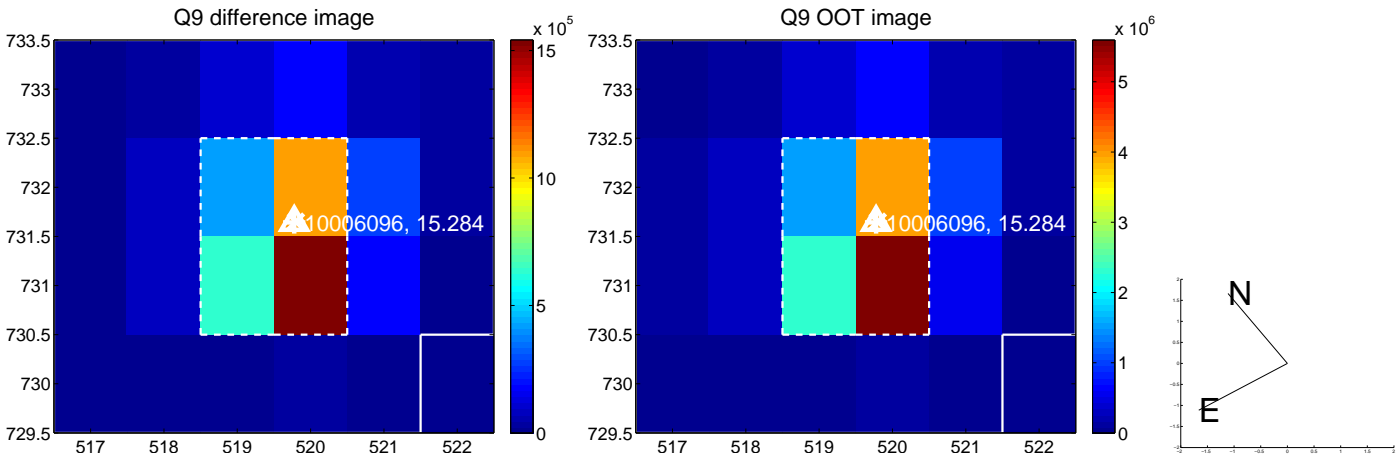
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



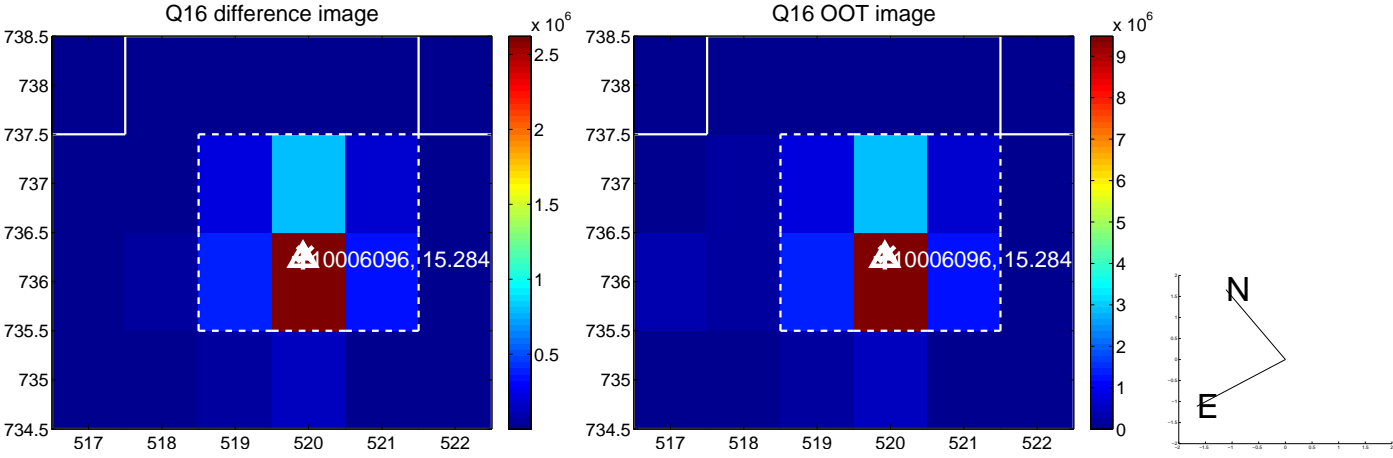
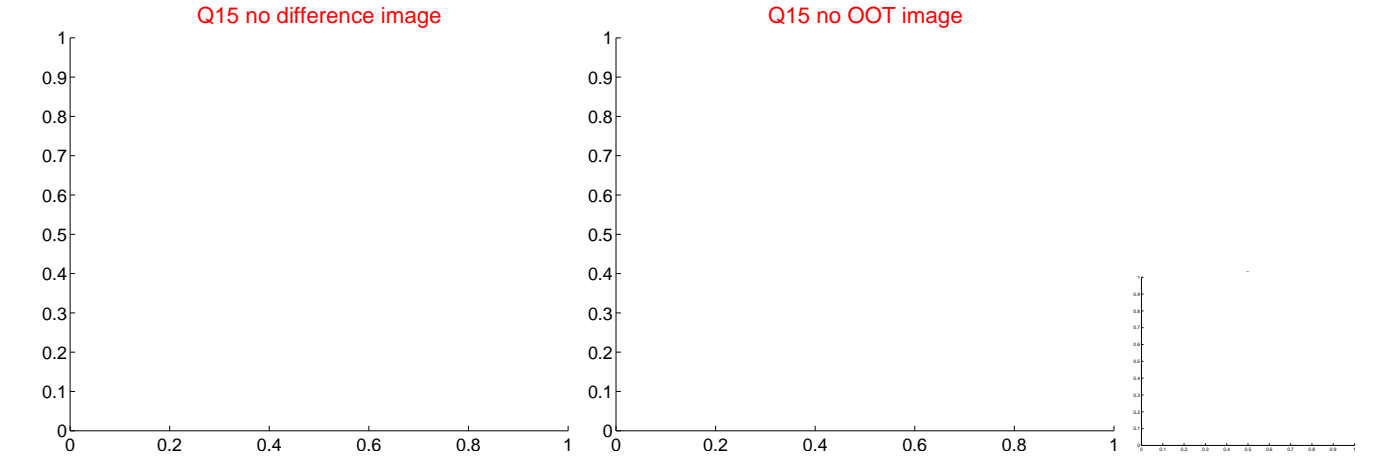
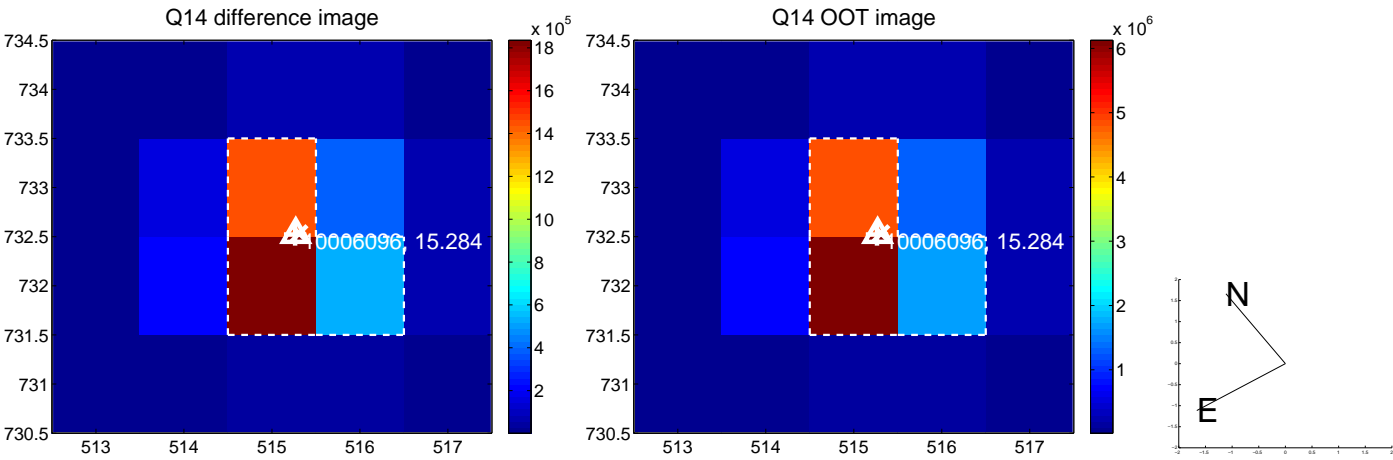
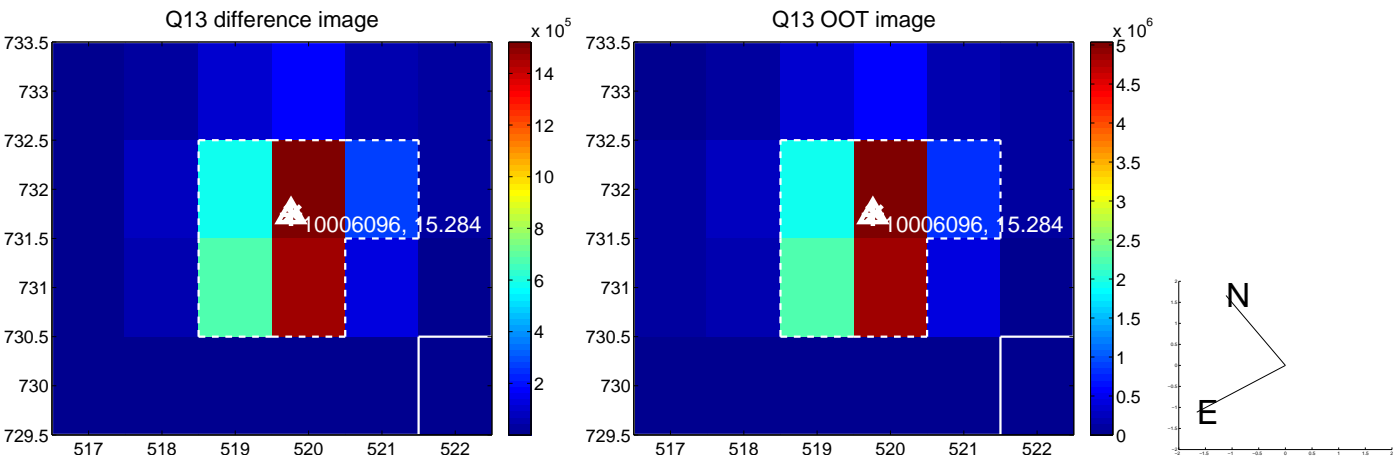
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

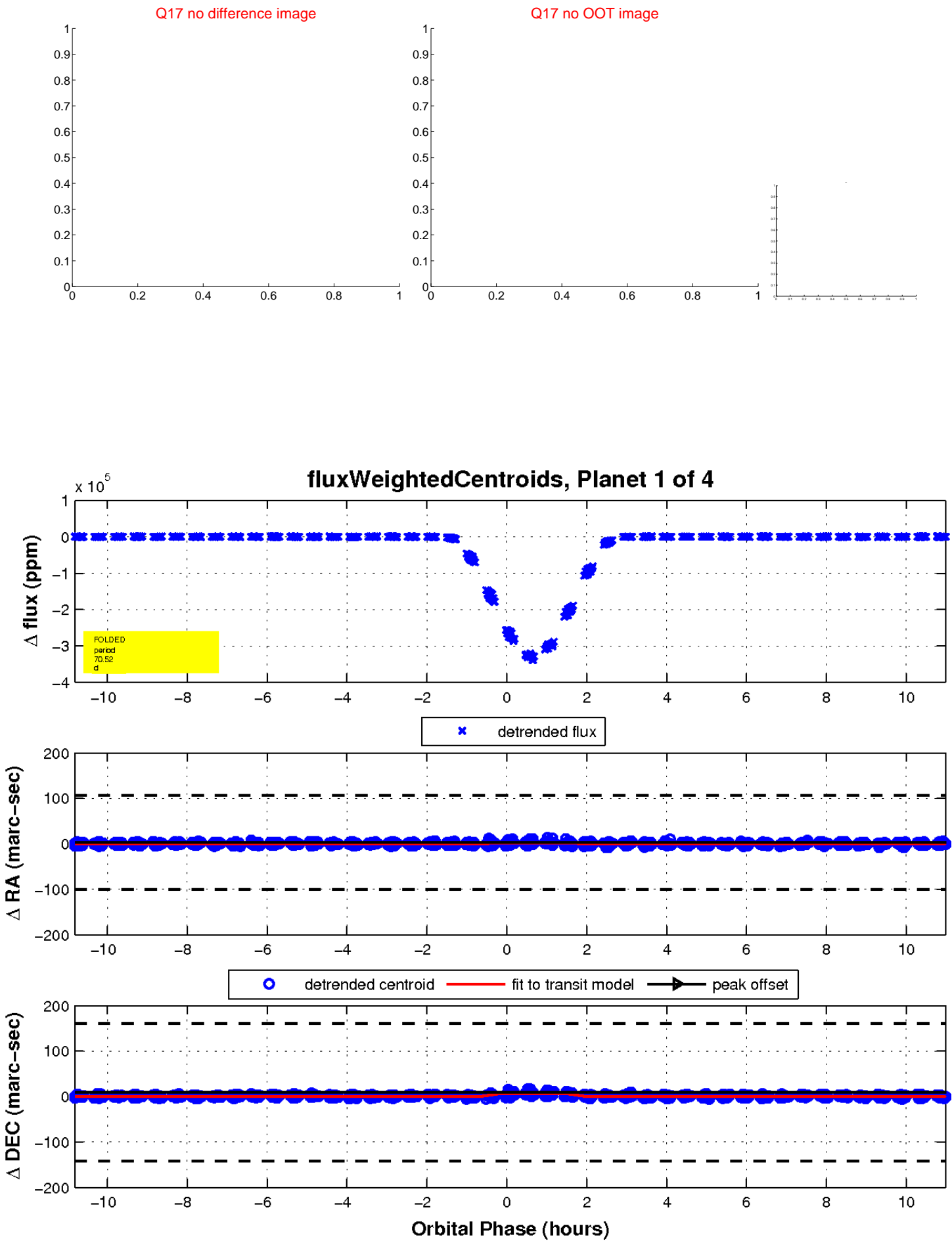


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



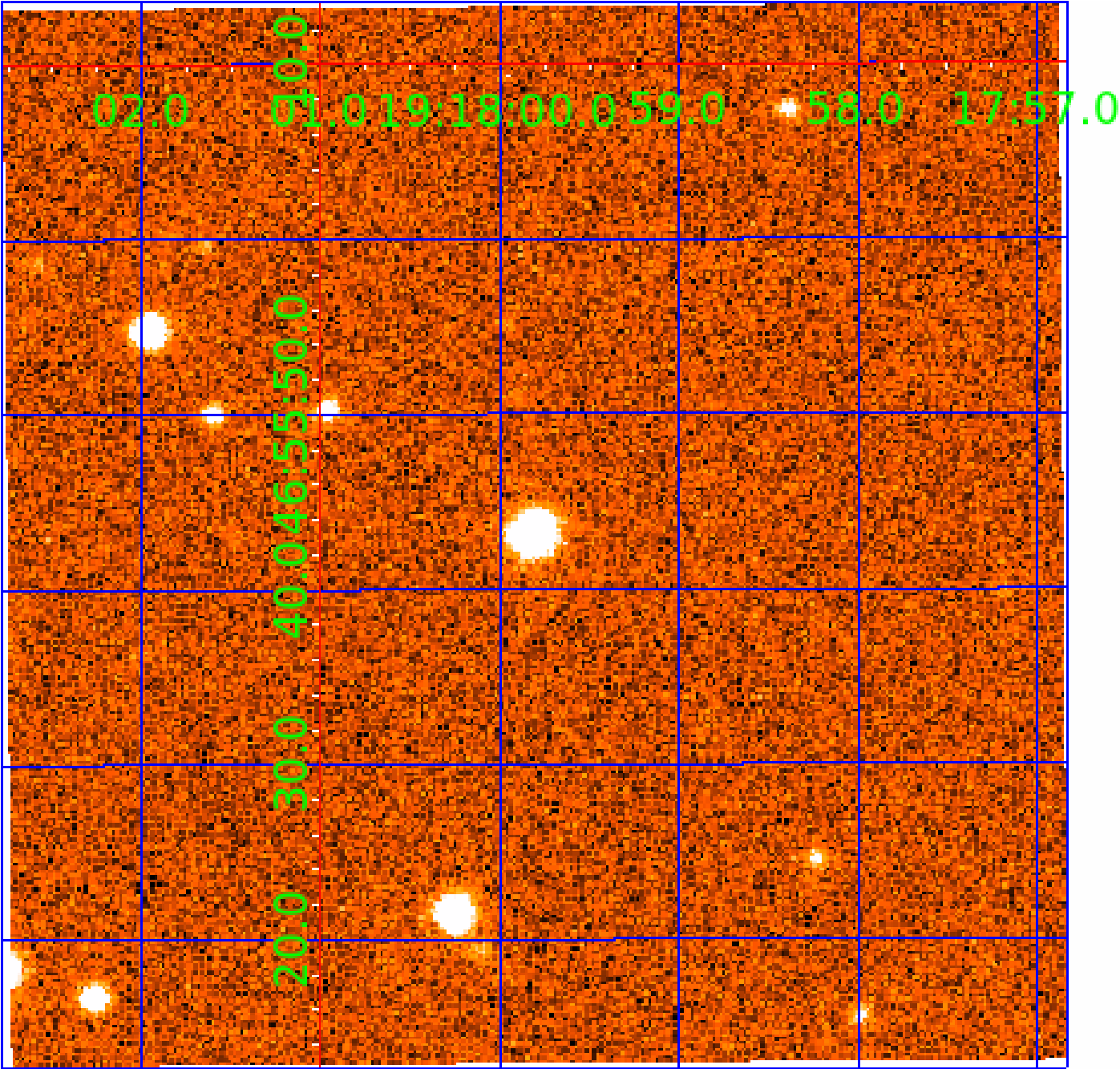


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010006096

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010006096-01	OBS	5753.01	70.515974	142.859955	329037.1	2.500	3682.9	-1.0	0.79	5511	41.60	5.48
010006096-02	OBS	No	211.970940	142.694962	17356.2	10.500	149.3	-1.0	0.79	5511	10.29	1.26
010006096-03	OBS	No	70.523229	140.542665	370.5	7.018	13.4	7.4	0.79	5511	1.58	5.48
010006096-04	OBS	No	231.191041	255.176155	1214.1	11.024	13.8	9.2	0.79	5511	3.24	1.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010006096-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
010006096-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010006096-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
010006096-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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 010006096-02

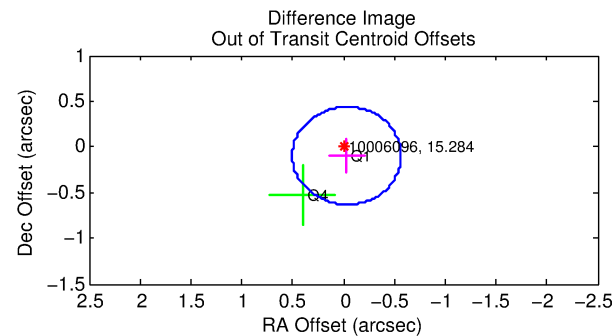
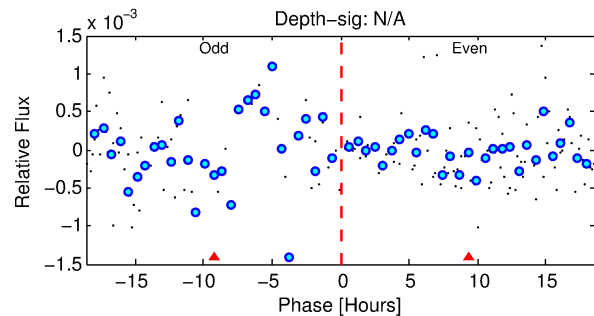
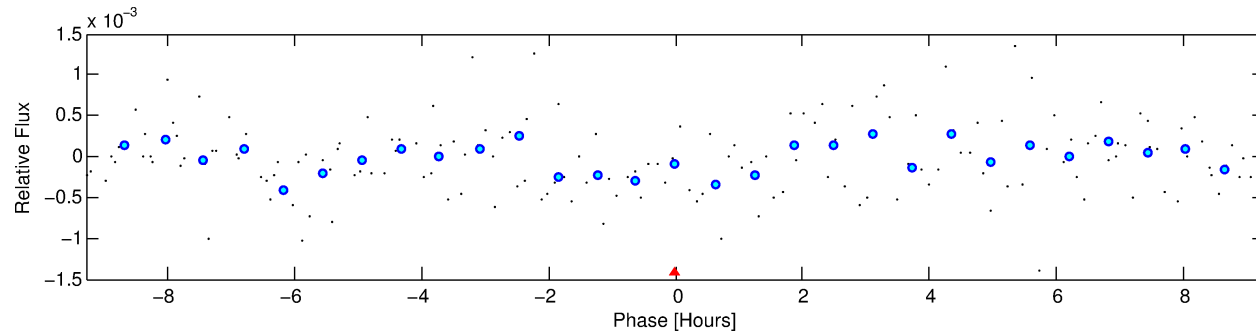
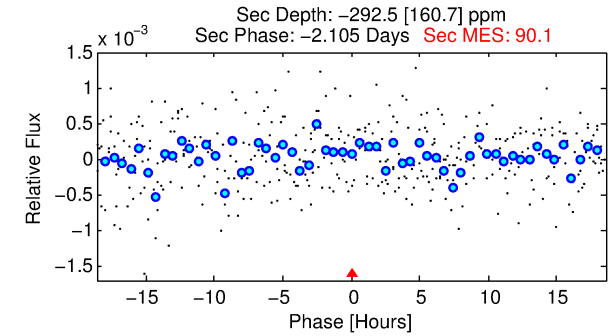
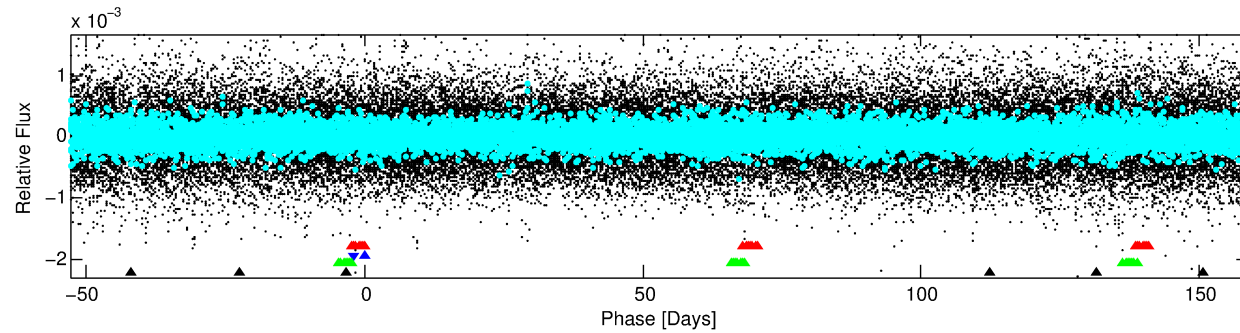
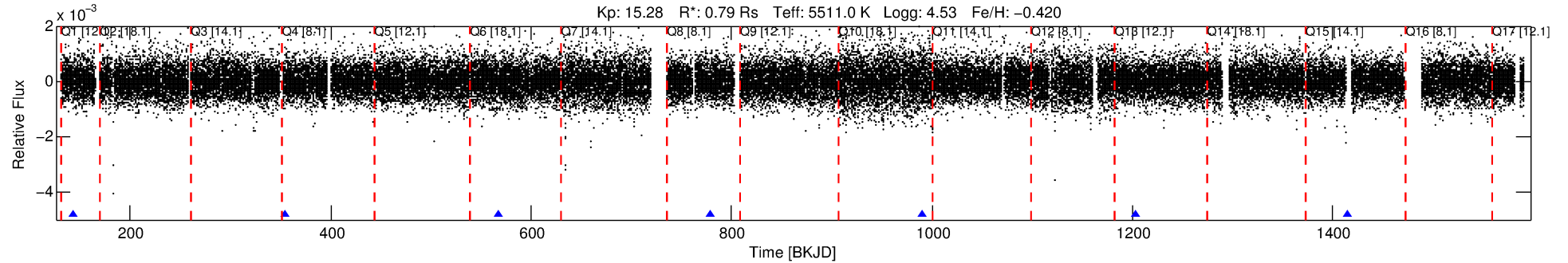
No Significant Match Found

# DV One-Page Summary

KIC: 10006096 Candidate: 2 of 4 Period: 211.971 d

KOI: K05753 Corr: No Ephemeris Match

Kp: 15.28 R\*: 0.79 Rs Teff: 5511.0 K Logg: 4.53 Fe/H: -0.420



## TPS TCE Results:

Period = 211.97094 d  
Epoch = 142.6950 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

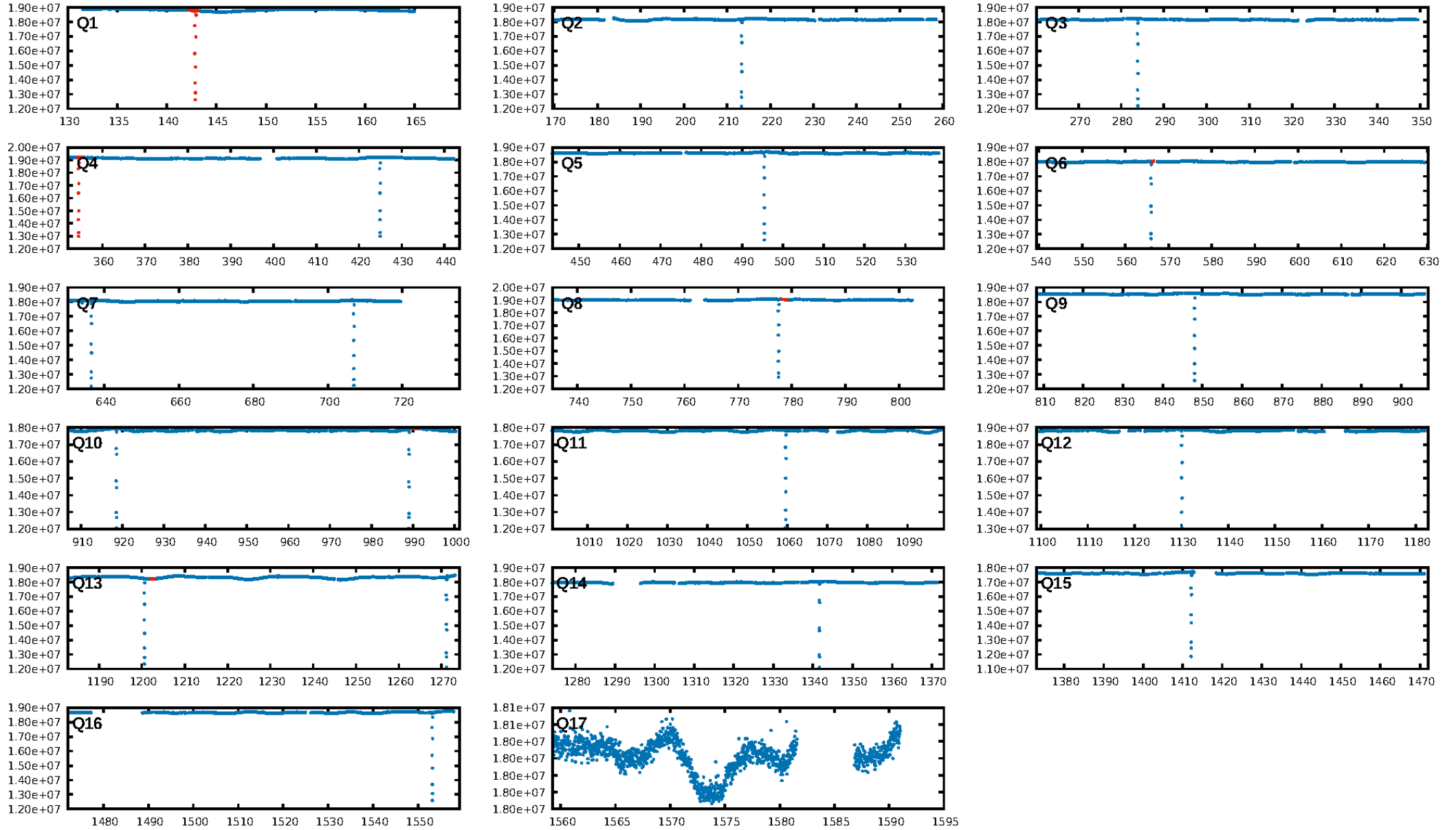
ShortPeriod-sig: 100.0% [268.80σ]  
LongPeriod-sig: 100.0% [30.30σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 13.94

Centroid-sig: 39.1%  
Centroid-so: 5.481 arcsec [1.05σ]  
OotOffset-rm: 0.101 arcsec [0.57σ]  
KicOffset-rm: 0.090 arcsec [0.31σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.60 [3/5]

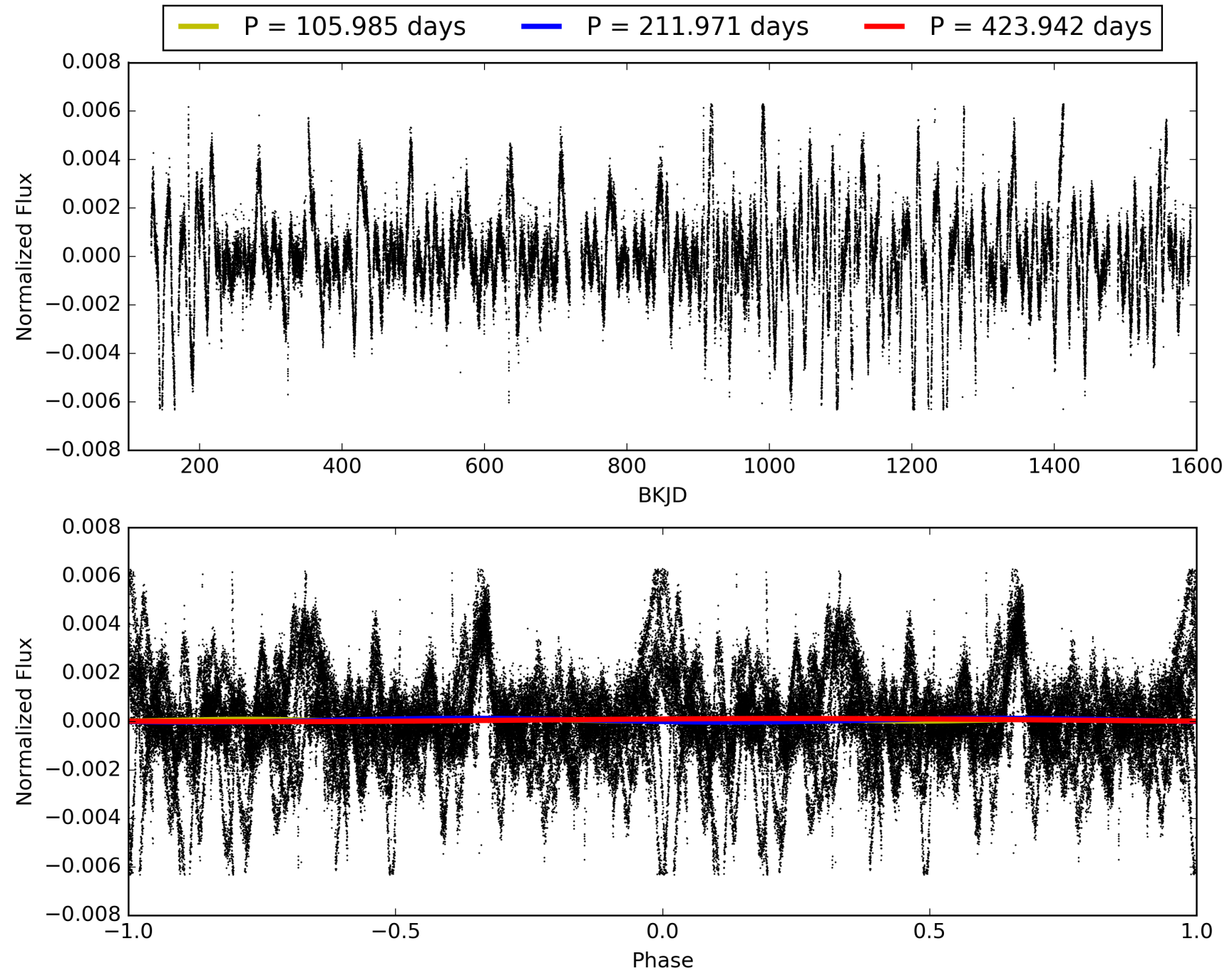
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:43 Z

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

# TCE 010006096-02, PDC Light Curves

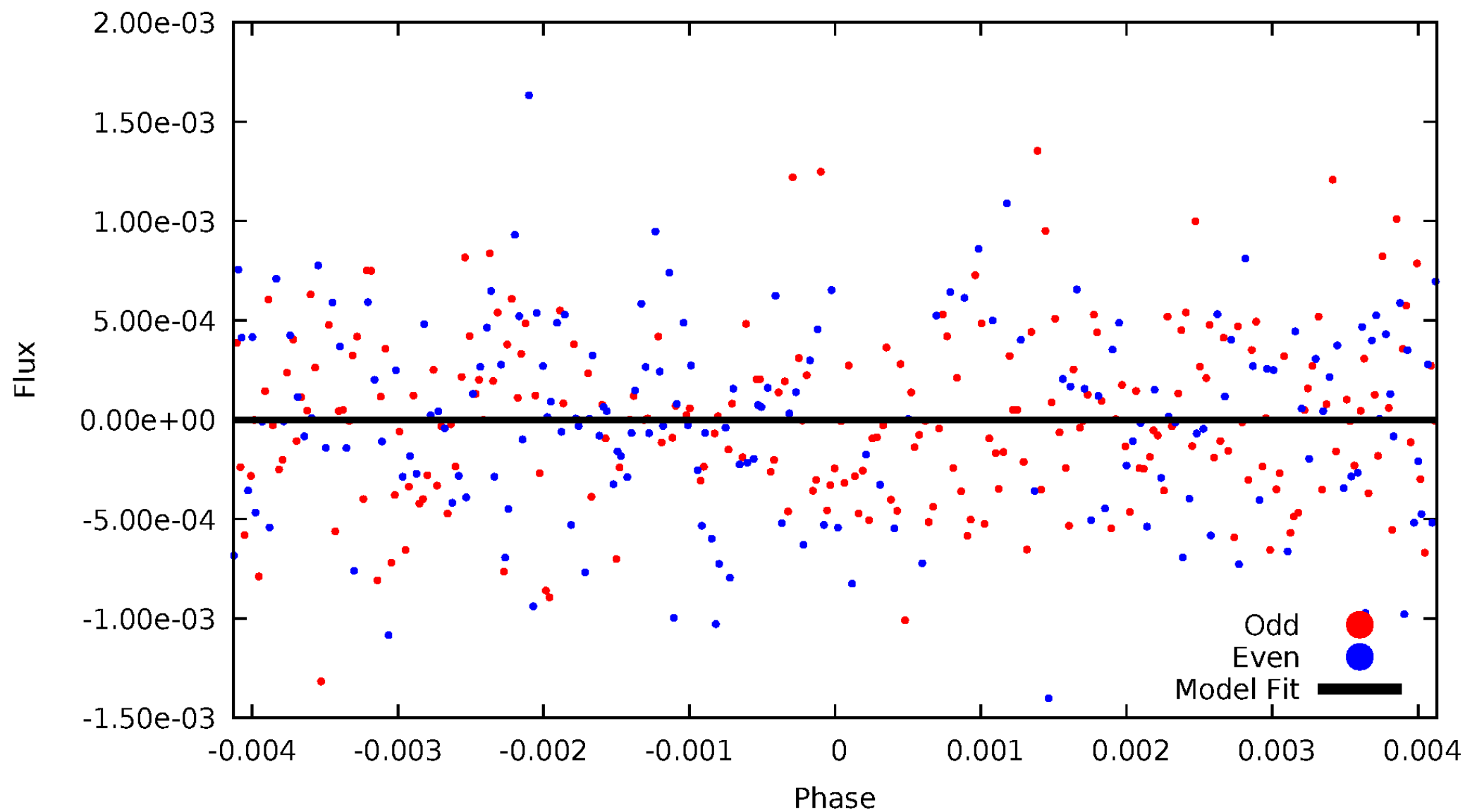


TCE 010006096-02



# DV Odd/Even

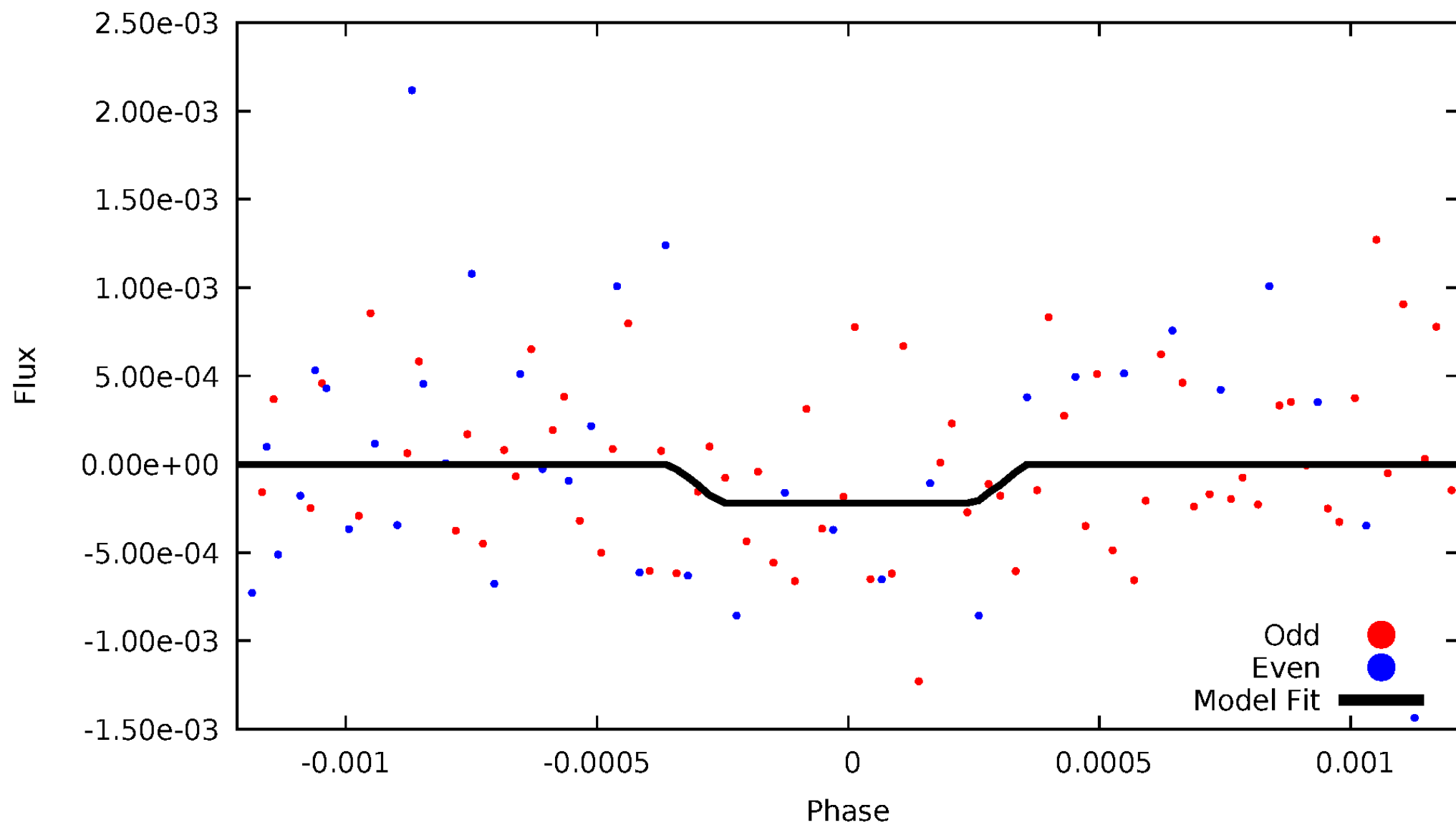
TCE 010006096-02





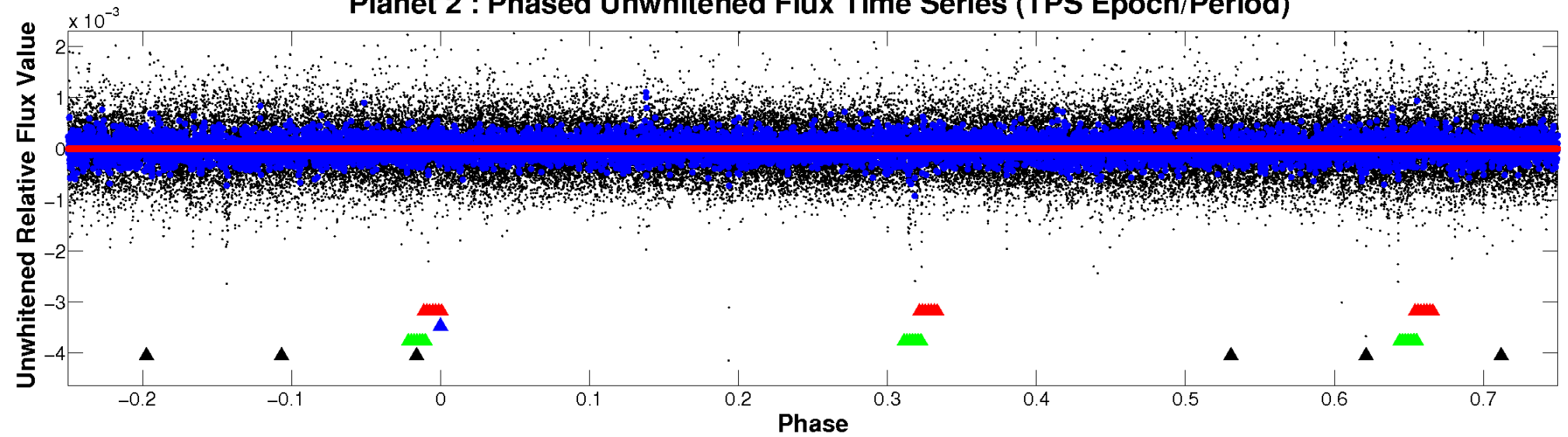
# ALT Odd/Even

TCE 010006096-02

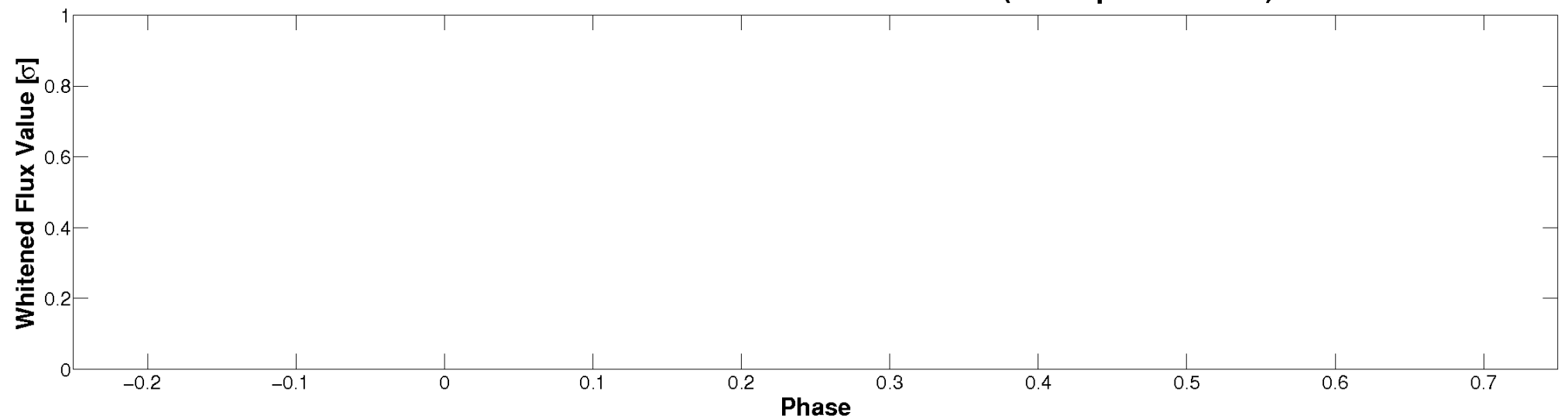


# Non-Whitened Vs. Whitened Light Curve

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

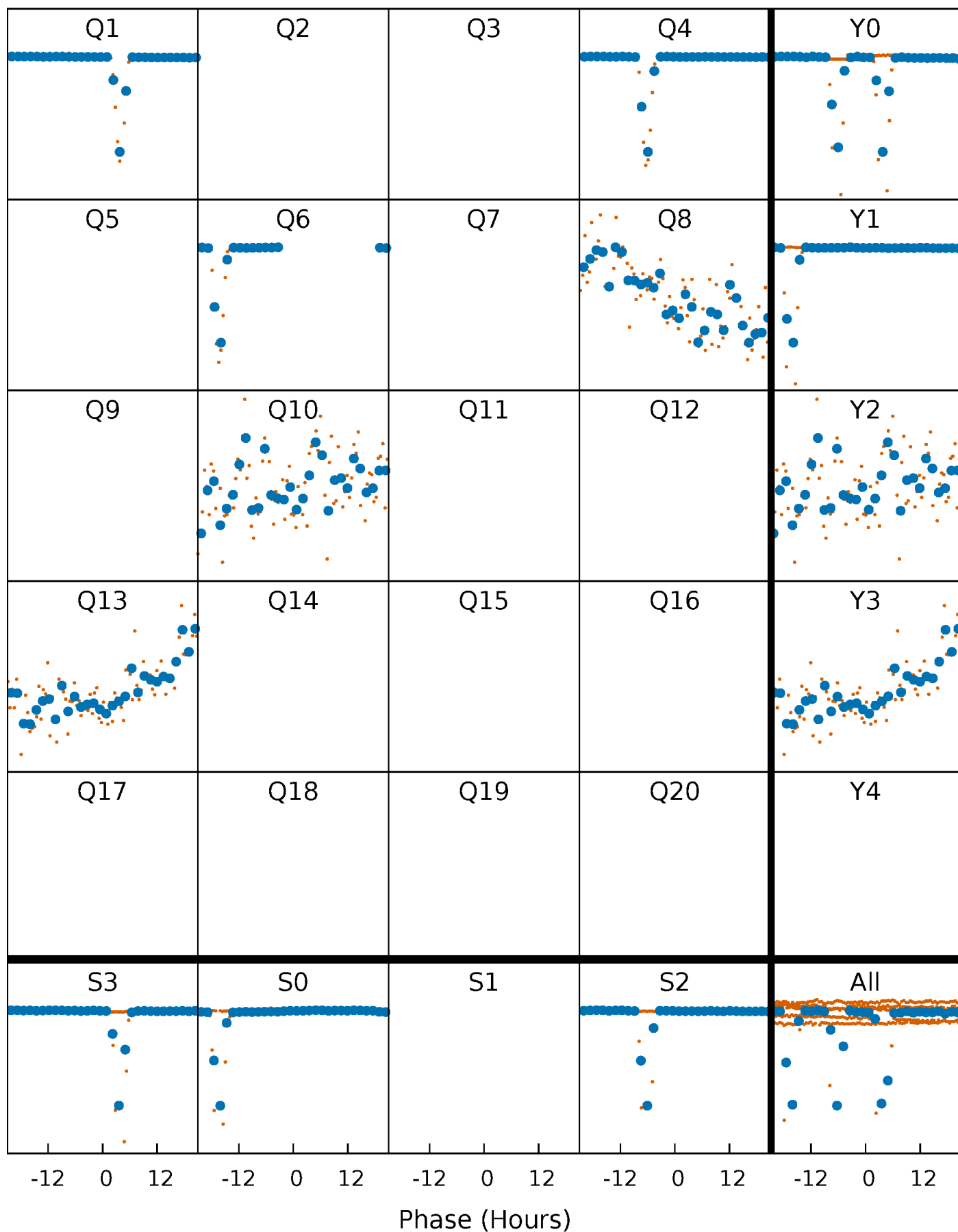


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



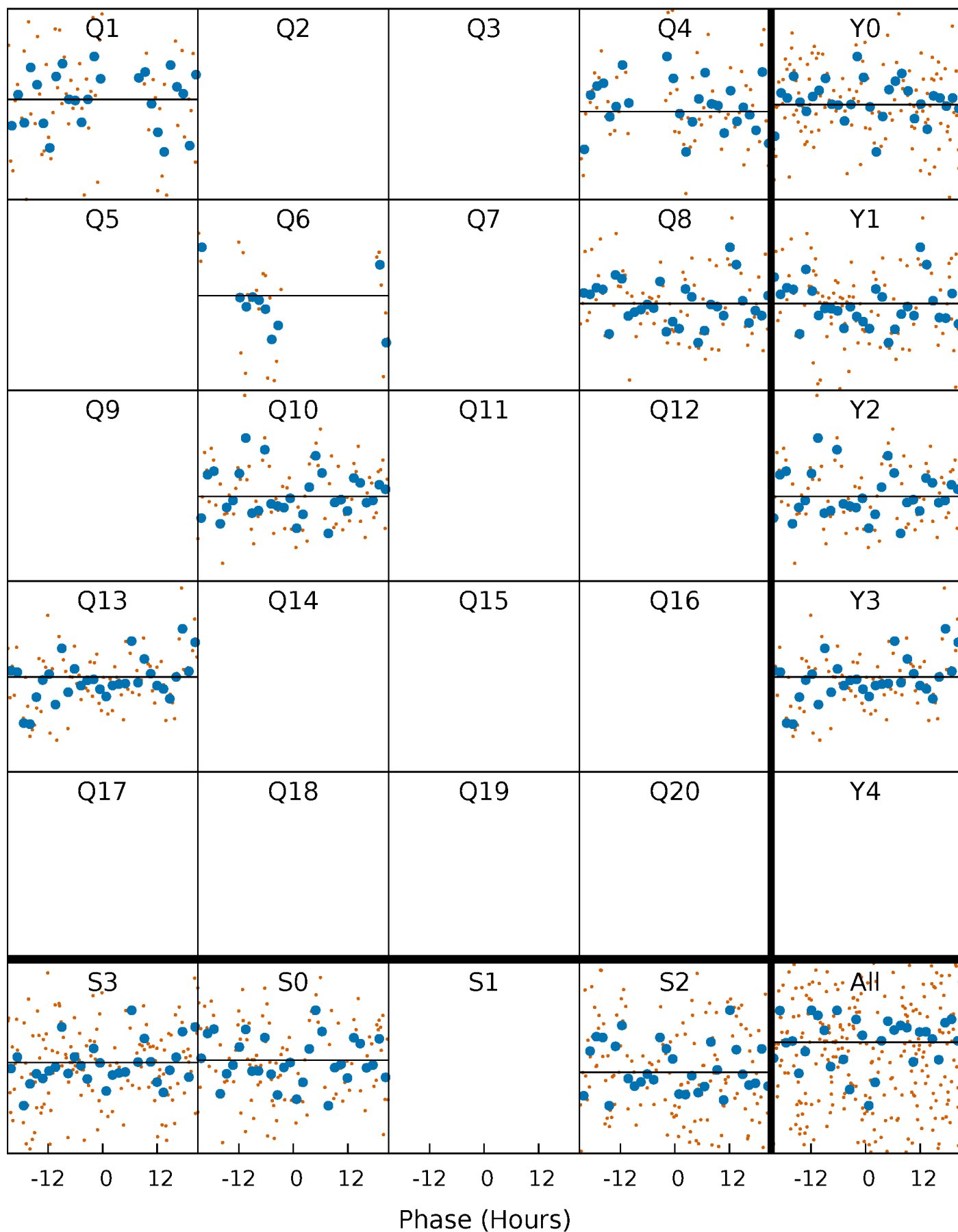
# PDC Quarter-Phased Transit Curves

TCE 010006096-02 P=211.970940 Days  $T_0=142.694962$  (BKJD)



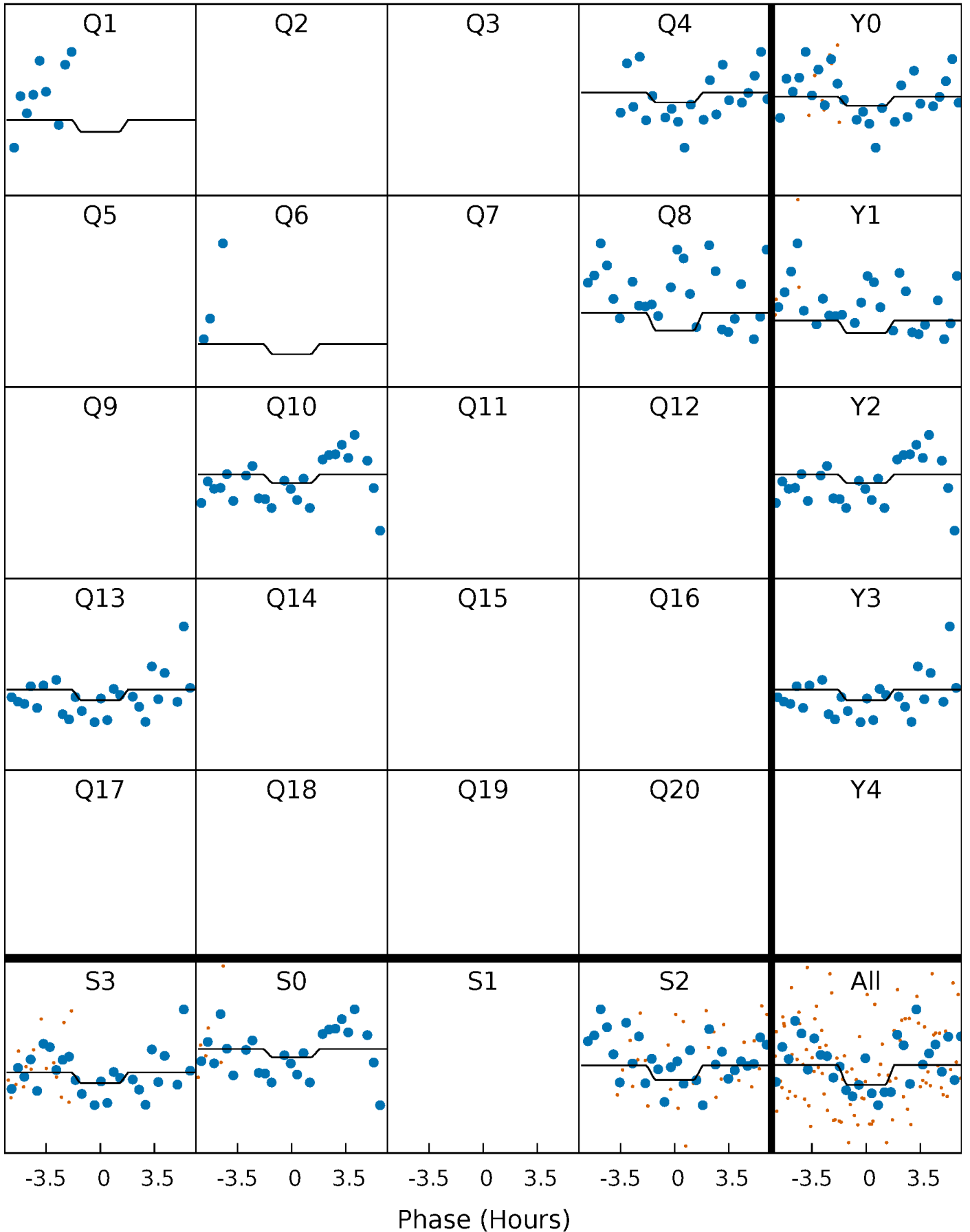
# DV Quarter-Phased Transit Curves

TCE 010006096-02     $P=211.970940$  Days     $T_0=142.694962$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

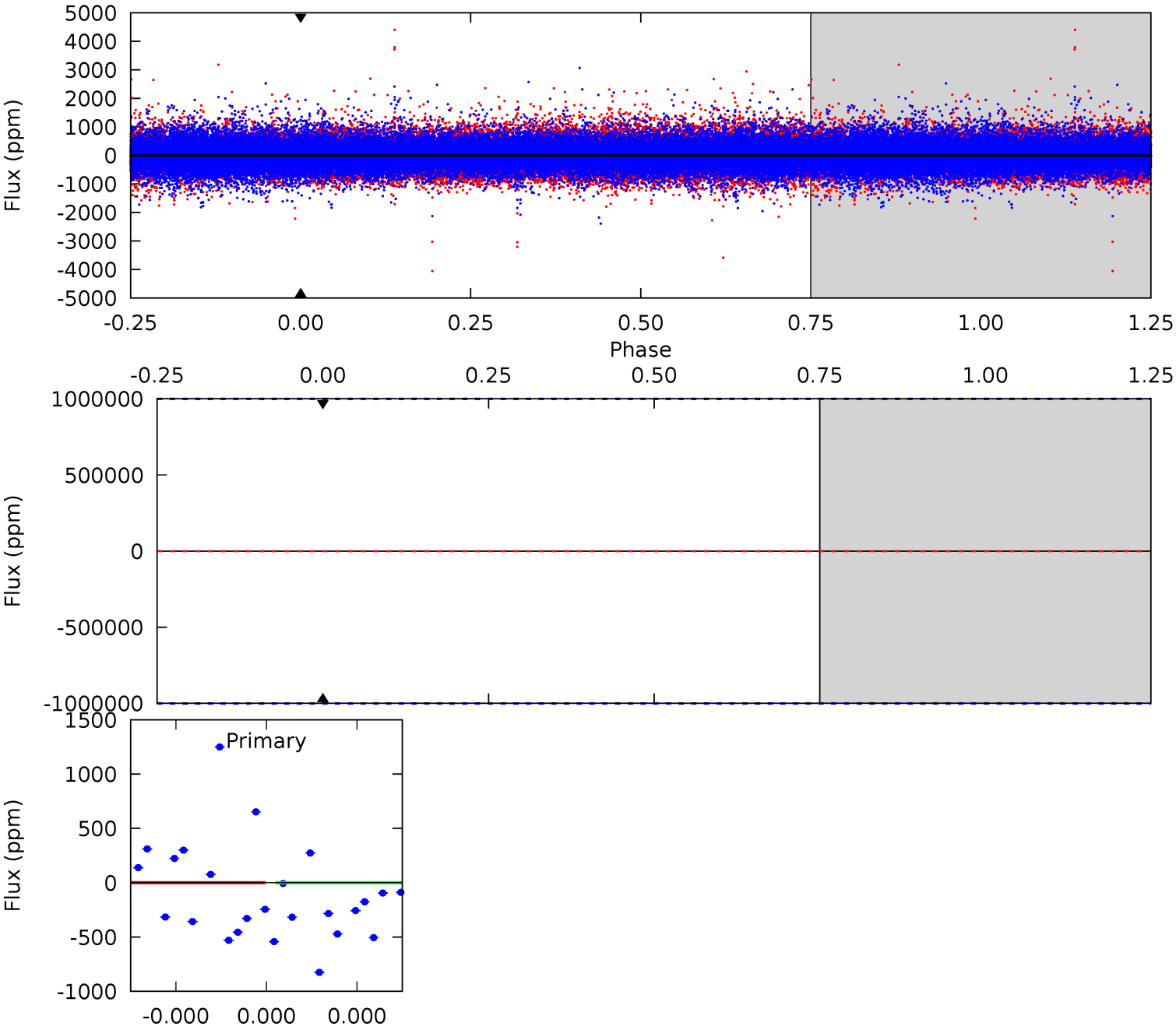
TCE 010006096-02     $P=211.970940$  Days     $T_0=142.766916$  (BKJD)



# DV Model-Shift Uniqueness Test

010006096-02, P = 211.970940 Days, E = 142.694962 Days

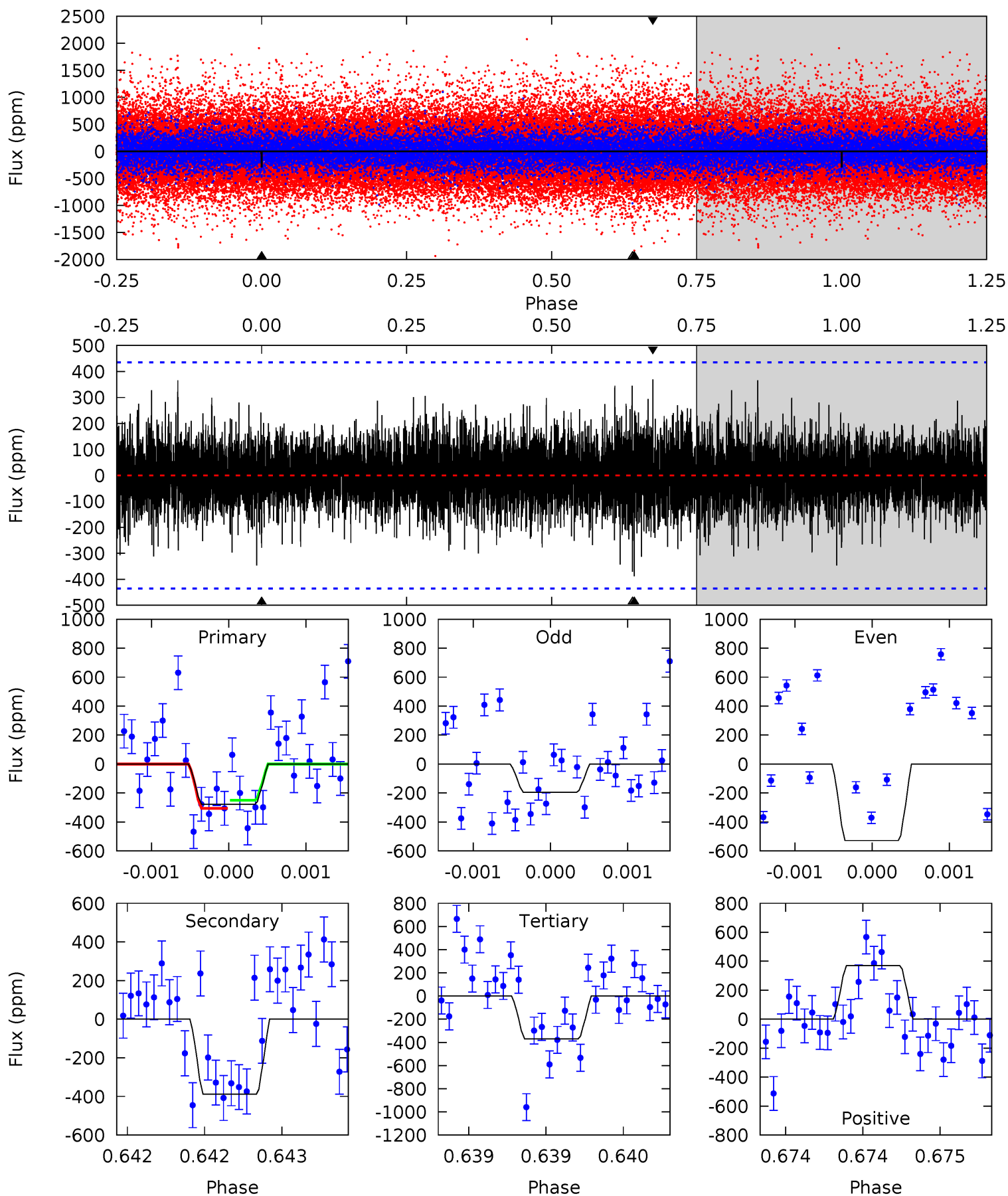
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010006096-02, P = 211.970940 Days, E = 142.766916 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
3.53	4.92	4.70	4.68	5.52	3.39	1.15	-1.16	-1.15	0.22	0.24	1.81	0.63	0.49	0.35





### Stellar Parameters For KIC 010006096

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5511^{+165}_{-148}$	$4.531^{+0.076}_{-0.114}$	$-0.420^{+0.300}_{-0.300}$	$0.789^{+0.145}_{-0.085}$	$0.773^{+0.103}_{-0.055}$	$2.213^{+0.722}_{-0.761}$
	+3%/-3%	+2%/-3%	+71%/-71%	+18%/-11%	+13%/-7%	+33%/-34%
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 010006096-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$11.93^{+8.51}_{-6.79}$	$379^{+20}_{-15}$	$-3503^{+13552}_{-6431}$	$-2853.720^{+231713.749}_{-210474.553}$
Alt.	$-388 \pm 79$	$6.43^{+6.55}_{-4.52}$	$380^{+19}_{-16}$	$3389^{+1829}_{-640}$	$2213^{+22201}_{-1722}$

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

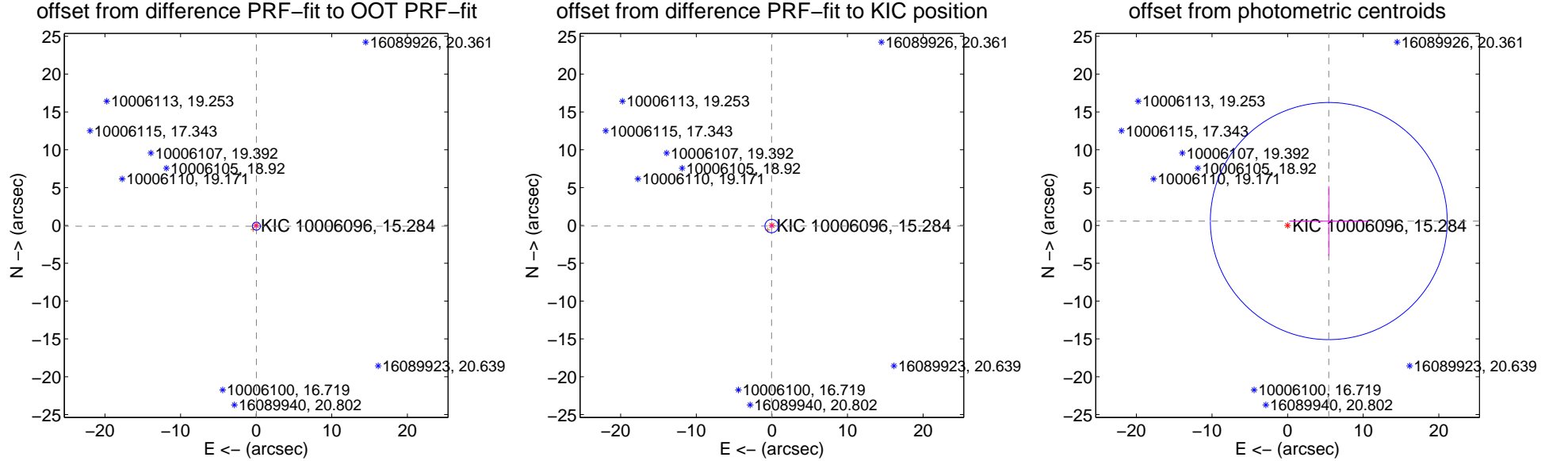
## DV Centroid Data

Supplemental centroid analysis for 010006096-02. Kepler magnitude: 15.28. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

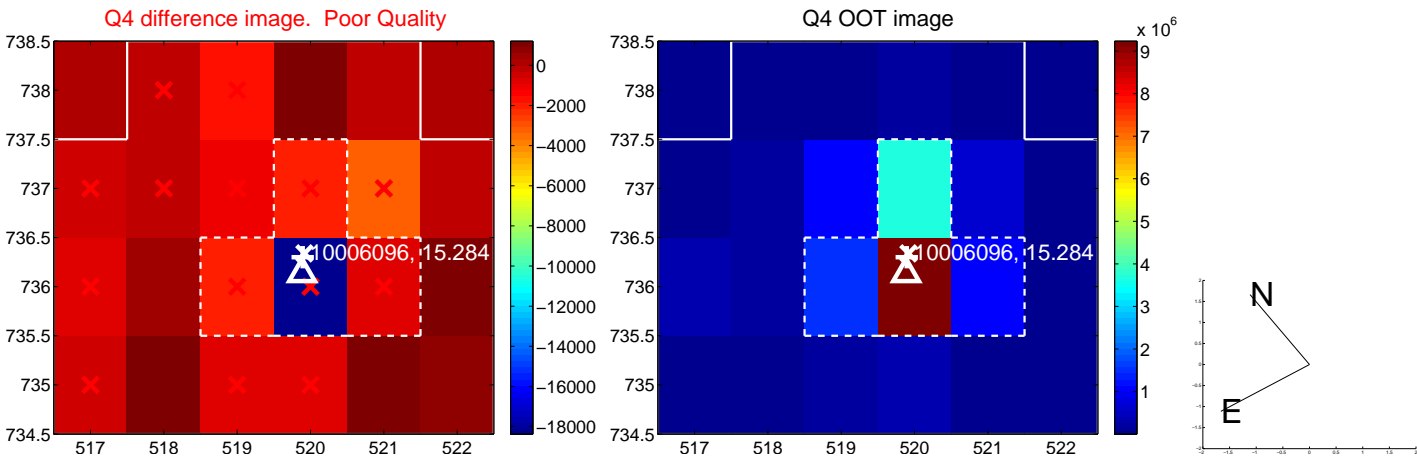
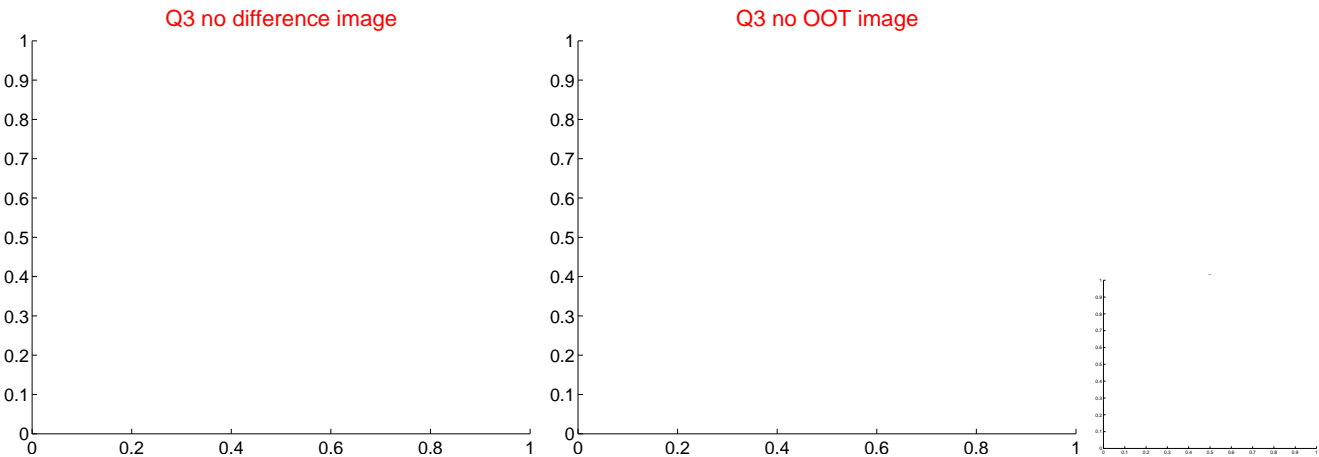
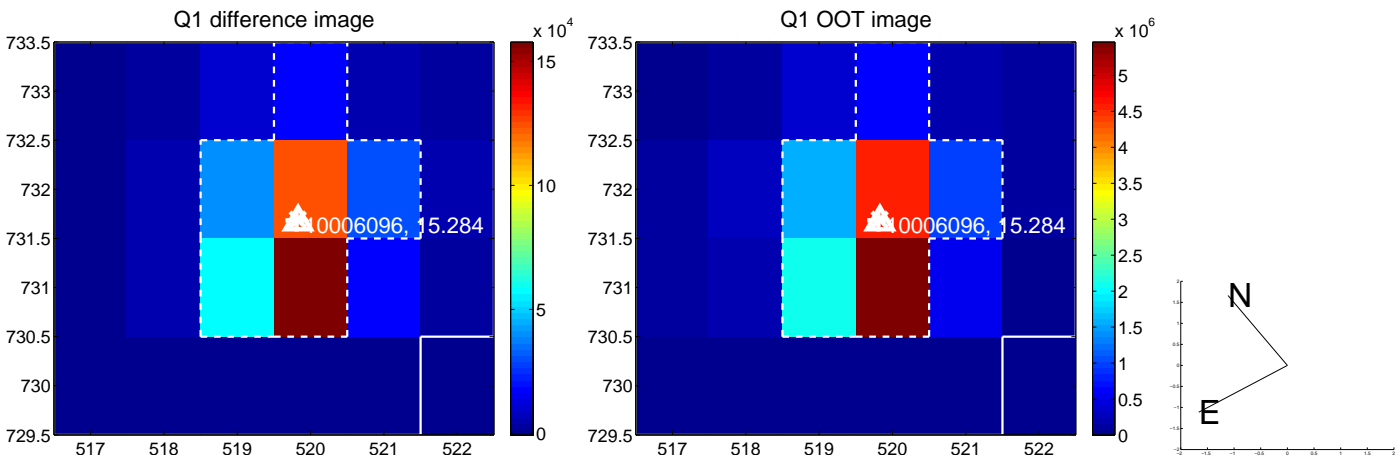
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.101 \pm 0.178$	0.57	$-0.031 \pm 0.174$	$-0.096 \pm 0.178$
PRF-fit source offset from KIC position	$0.090 \pm 0.295$	0.31	$0.038 \pm 0.227$	$-0.082 \pm 0.226$
photometric centroid source offset	$5.48 \pm 5.22$	1.05	$-5.45 \pm 5.23$	$0.57 \pm 4.61$

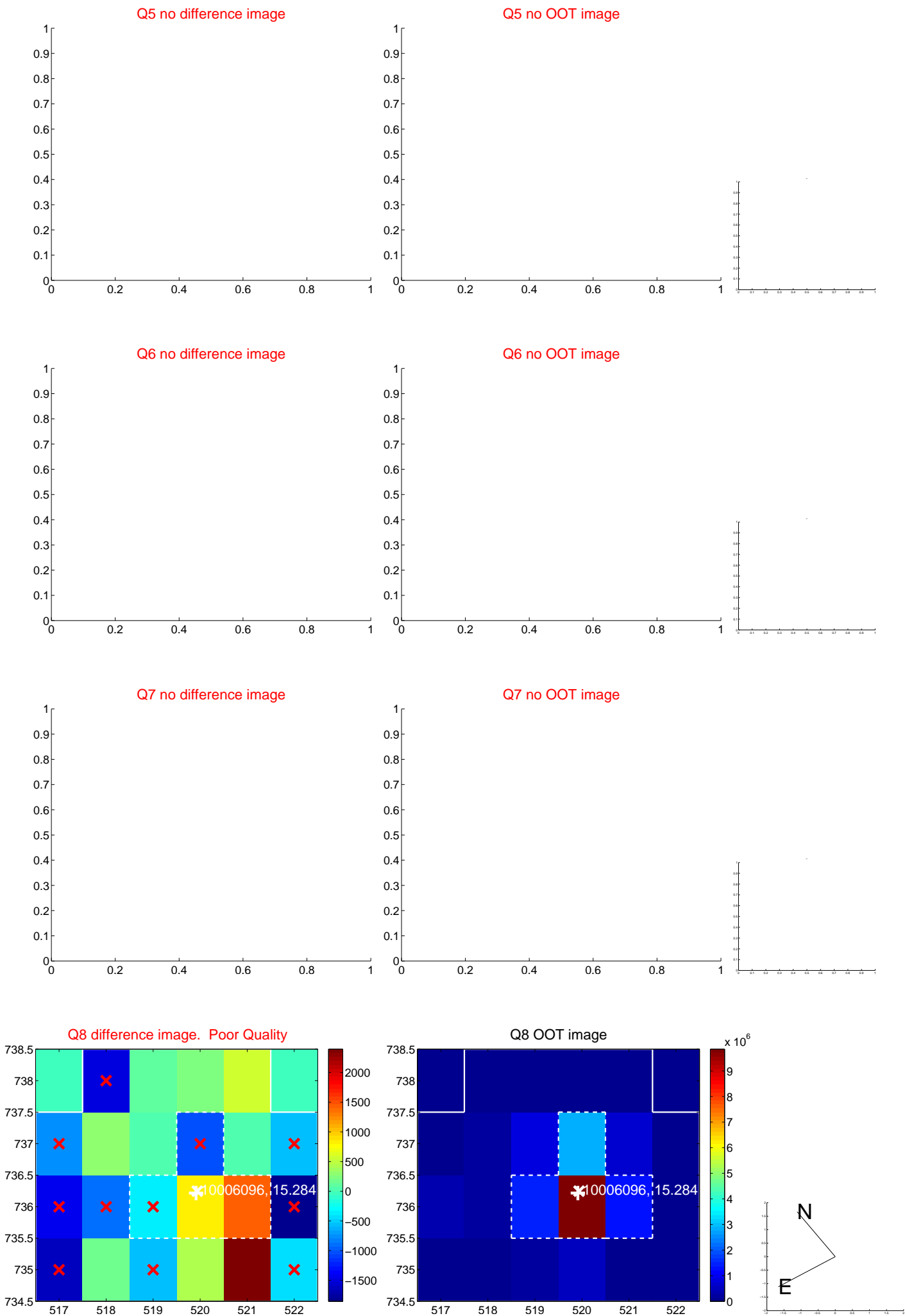


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

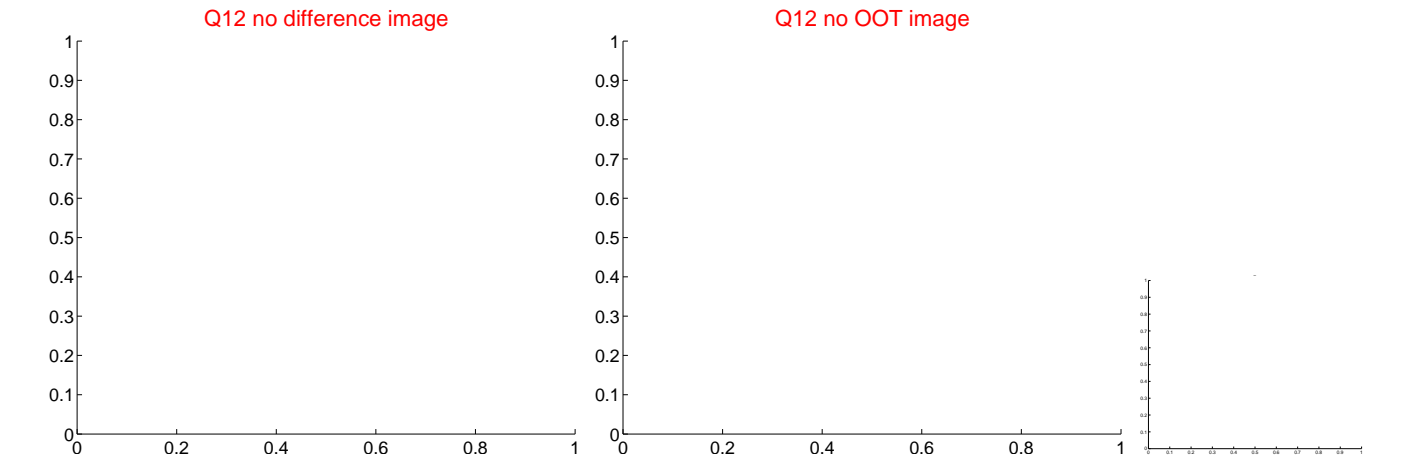
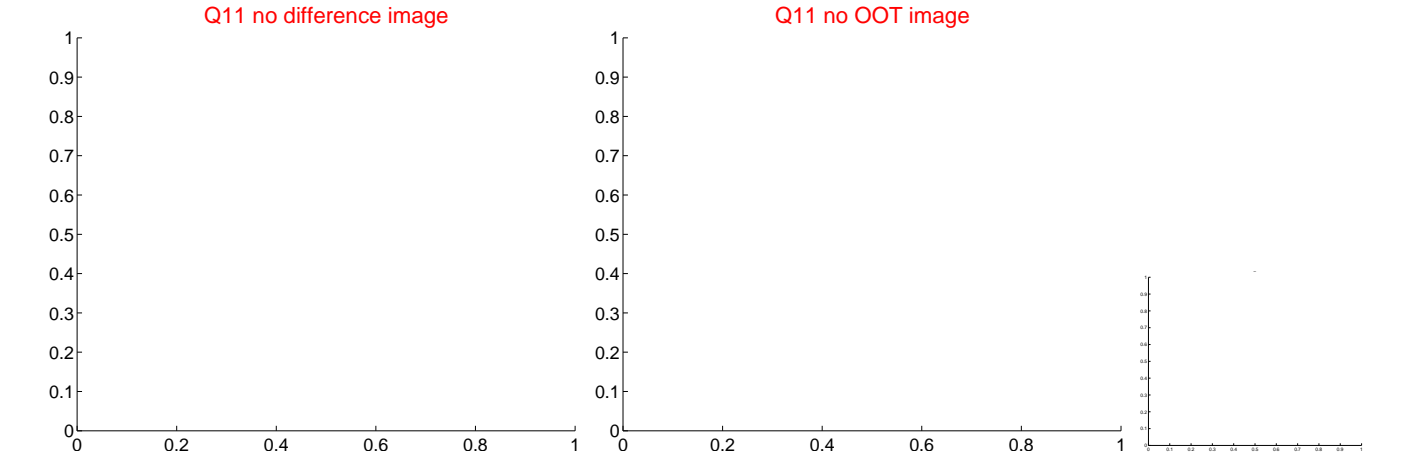
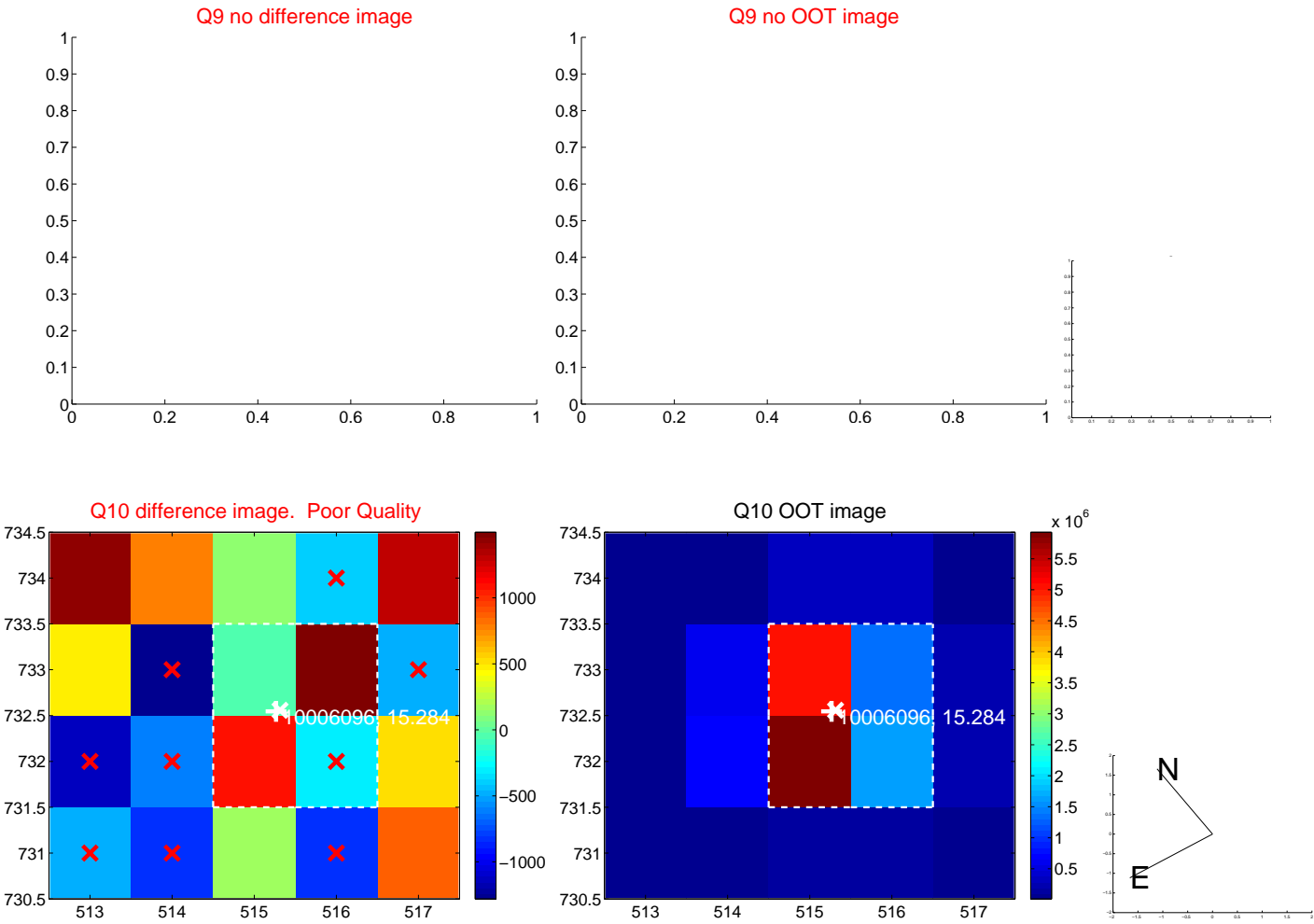
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



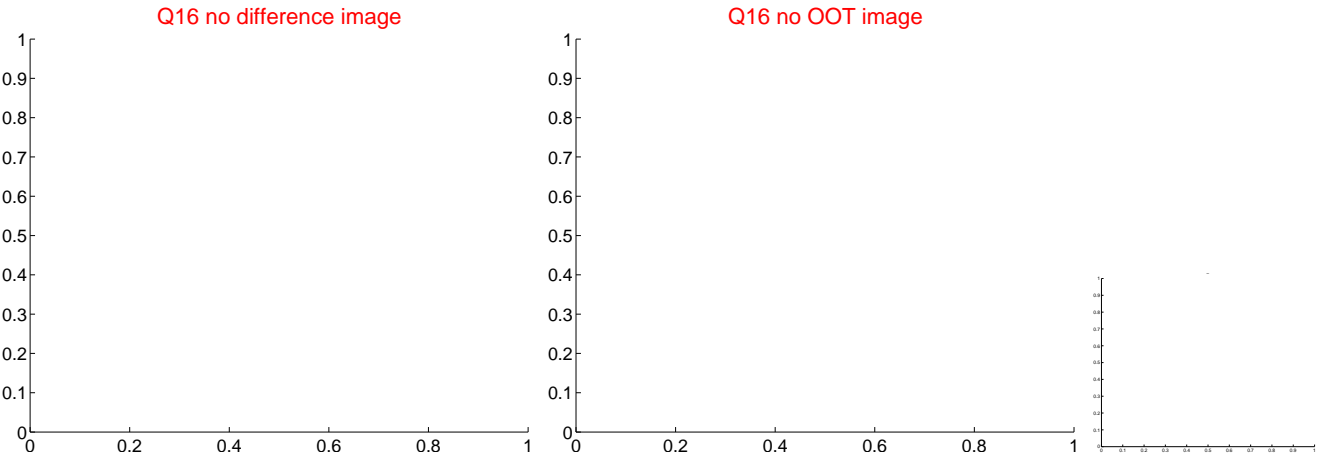
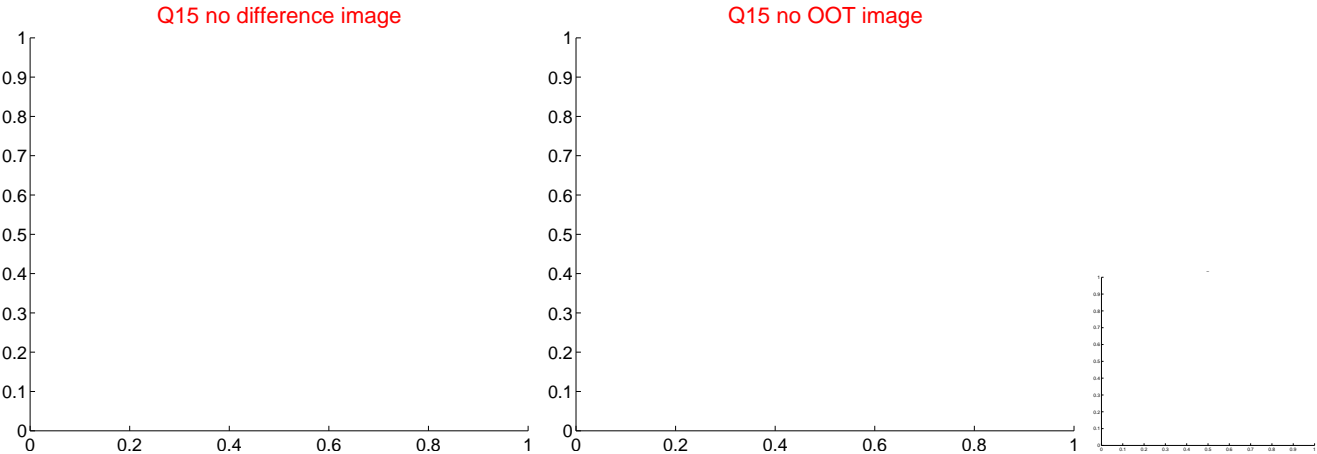
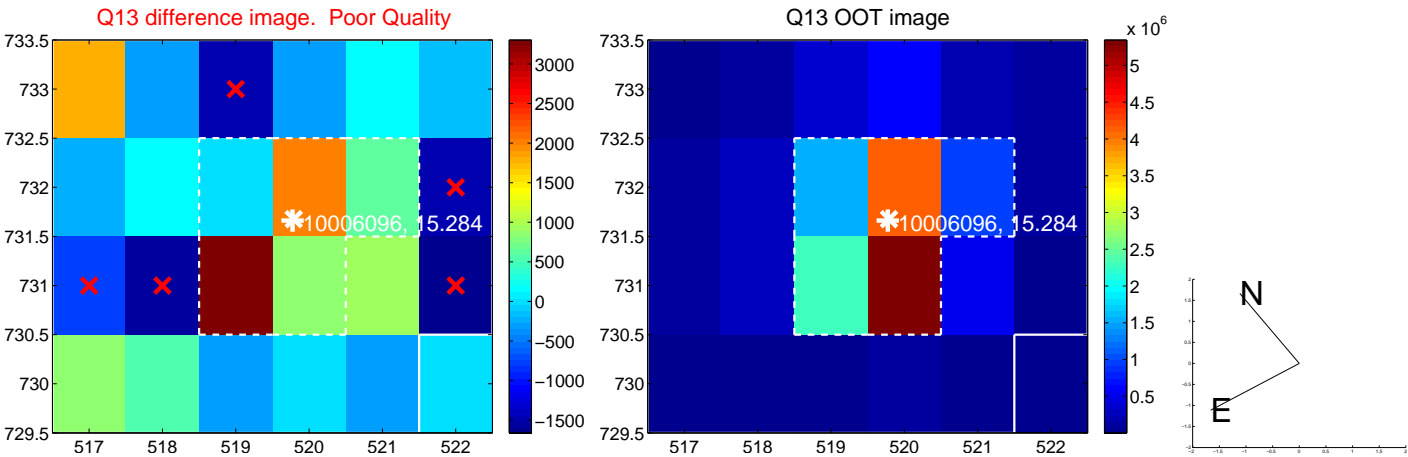
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



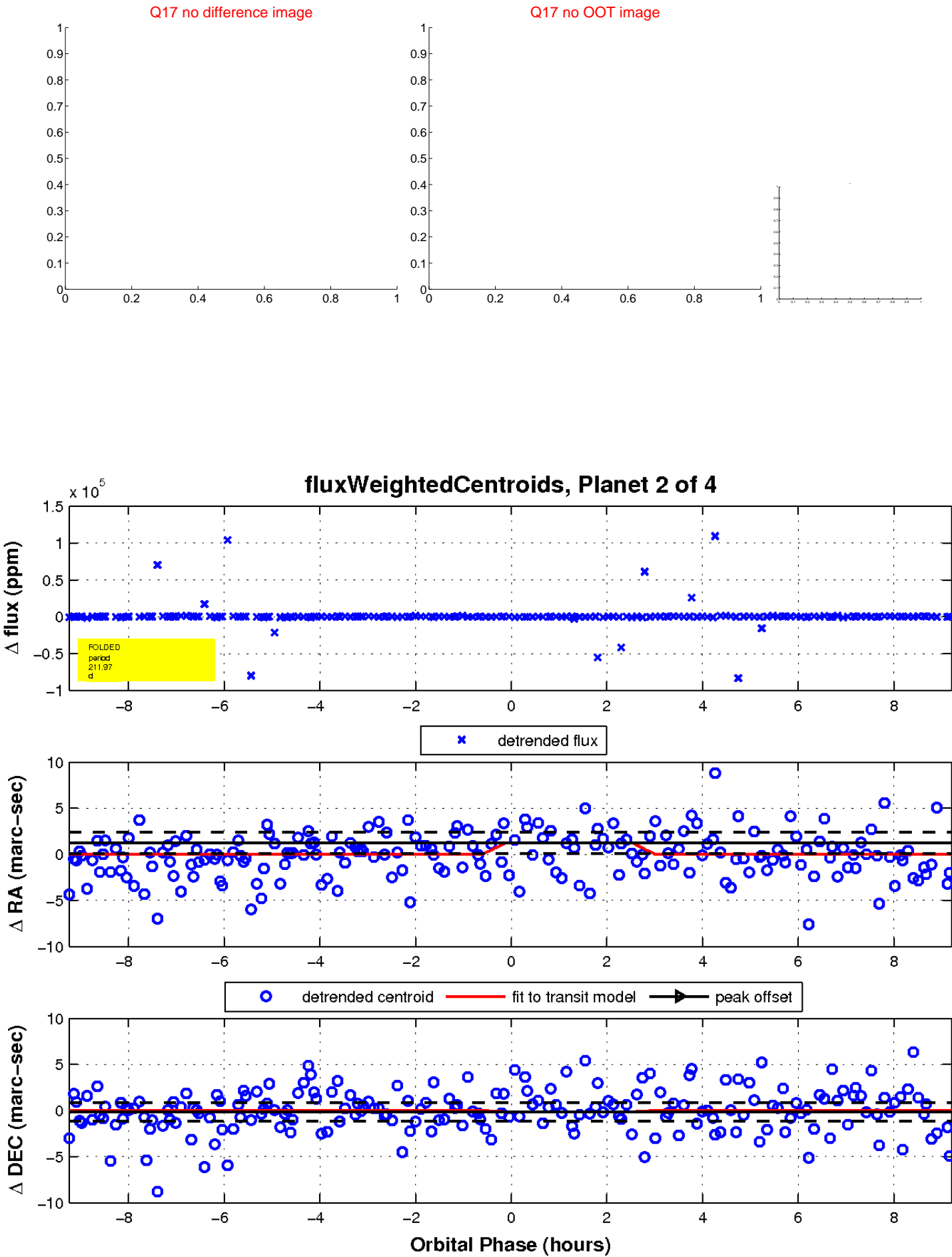
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

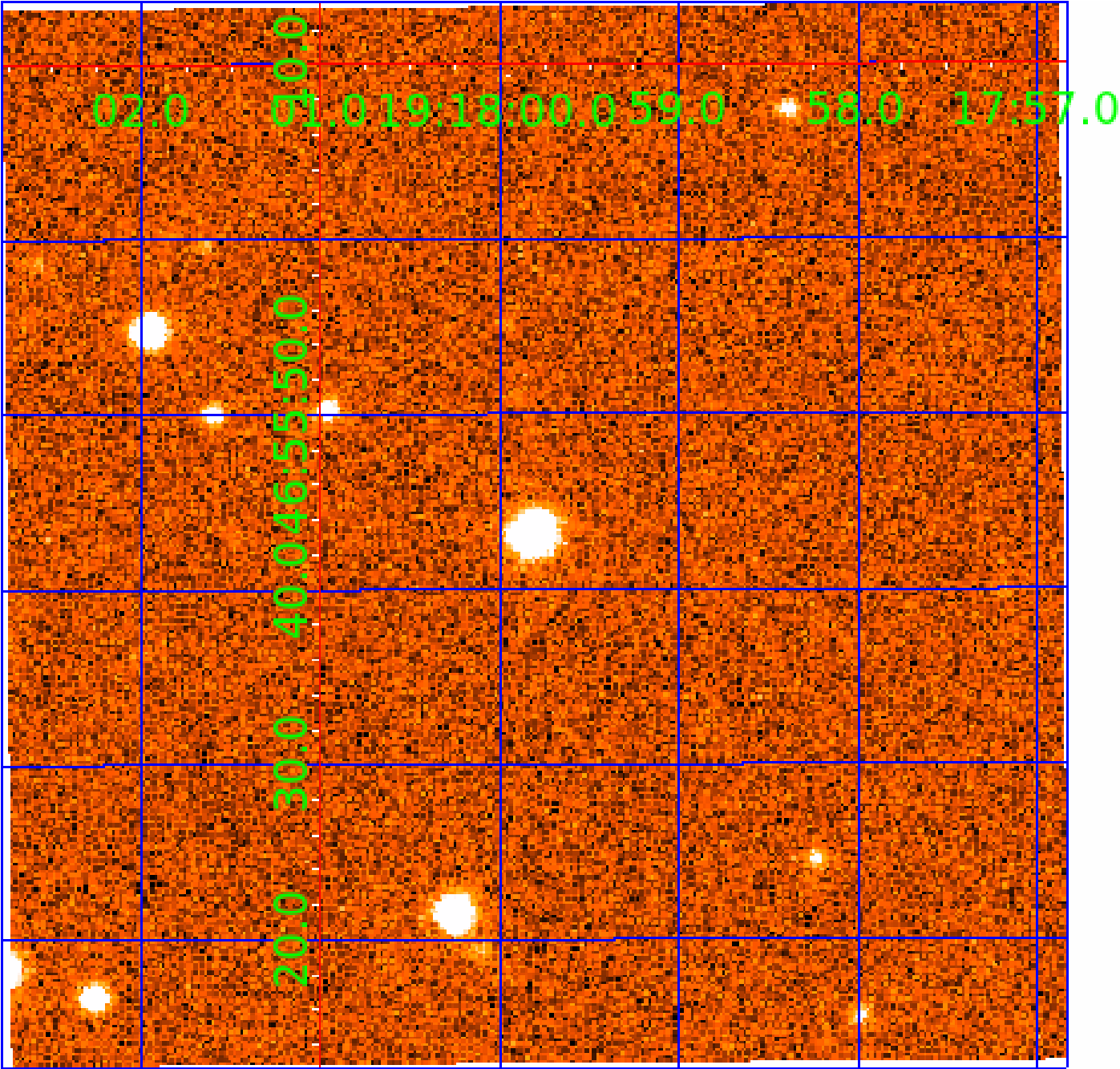


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010006096

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010006096-01	OBS	5753.01	70.515974	142.859955	329037.1	2.500	3682.9	-1.0	0.79	5511	41.60	5.48
010006096-02	OBS	No	211.970940	142.694962	17356.2	10.500	149.3	-1.0	0.79	5511	10.29	1.26
010006096-03	OBS	No	70.523229	140.542665	370.5	7.018	13.4	7.4	0.79	5511	1.58	5.48
010006096-04	OBS	No	231.191041	255.176155	1214.1	11.024	13.8	9.2	0.79	5511	3.24	1.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010006096-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
010006096-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010006096-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
010006096-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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.

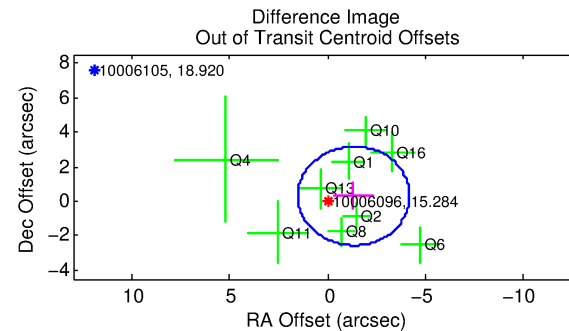
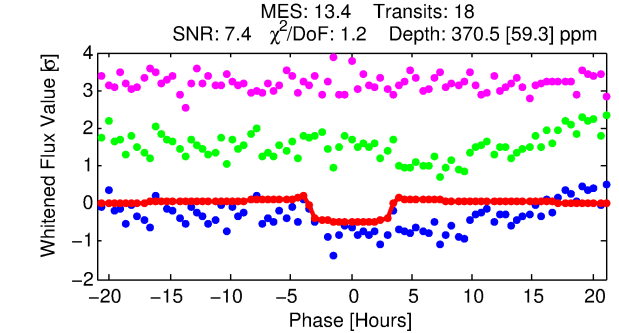
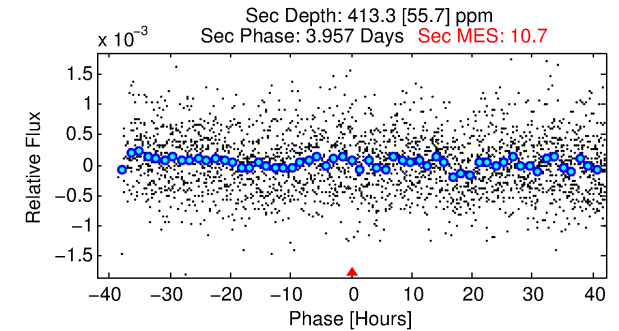
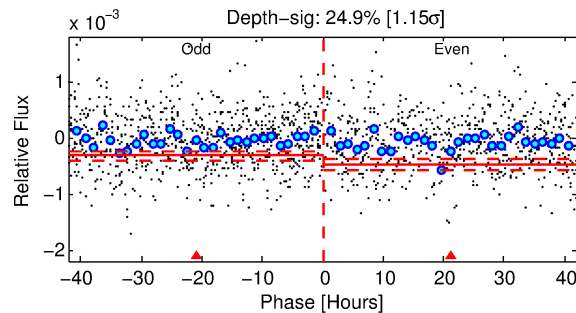
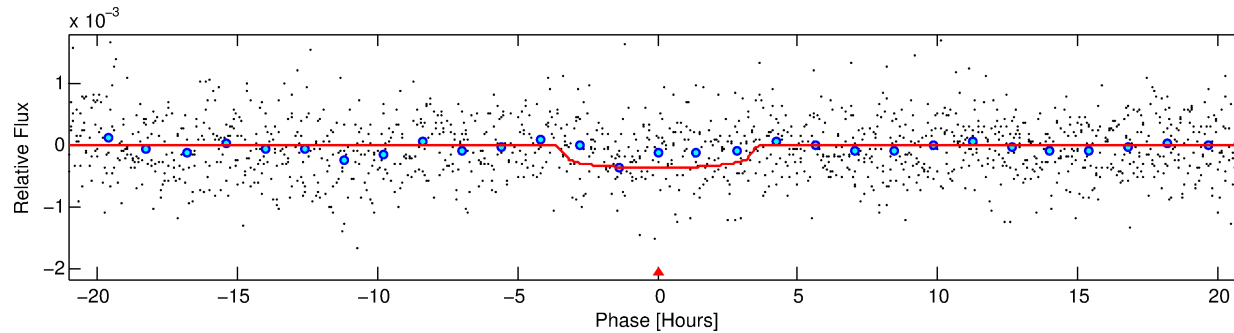
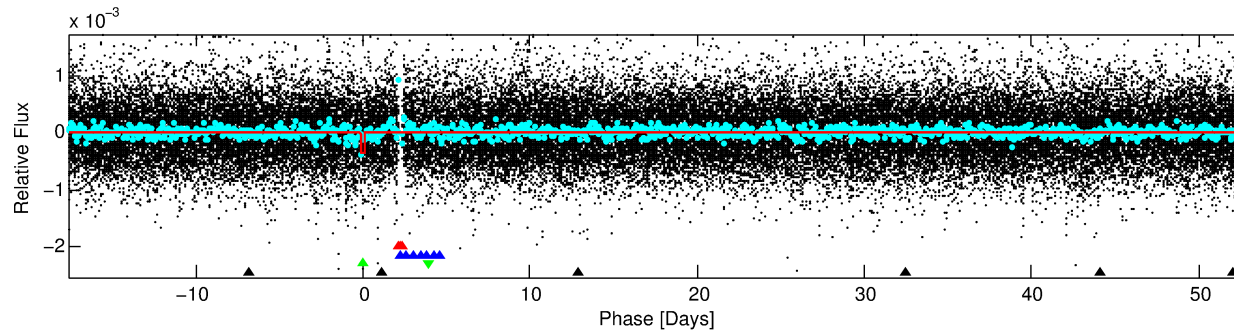
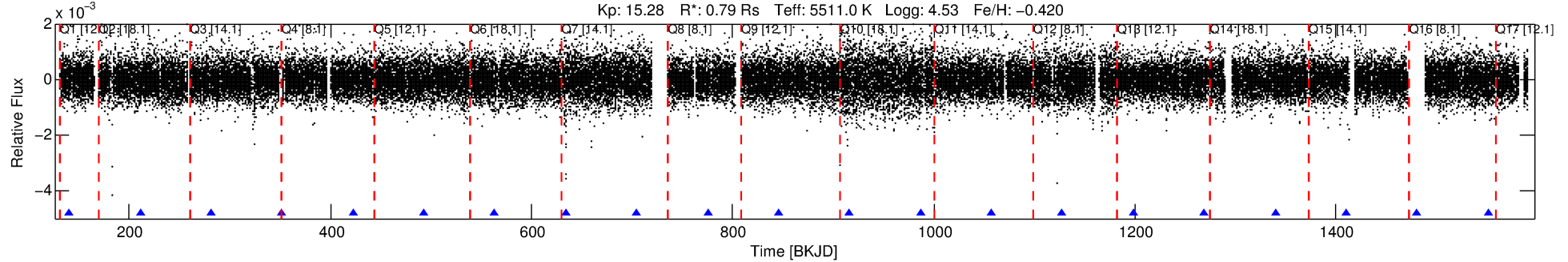
## Ephemeris Match Information For 010006096-03

No Significant Match Found

# DV One-Page Summary

KIC: 10006096 Candidate: 3 of 4 Period: 70.523 d  
KOI: K05753 Corr: No Ephemeris Match

Kp: 15.28 R\*: 0.79 Rs Teff: 5511.0 K Logg: 4.53 Fe/H: -0.420



## DV Fit Results:

Period = 70.52323 [0.00120] d  
Epoch = 140.5427 [0.0139] BKJD  
Rp/R\* = 0.0183 [0.0232]  
a/R\* = 63.29 [346.63]  
b = 0.60 [5.94]  
Seff = 5.48 [1.34]  
Teq = 390 [24] K  
Rp = 1.58 [2.02] Re  
a = 0.3064 [0.0461] AU  
Ag = 8569.67 [21816.66] [0.39σ]  
Teffp = 5804 [3685] K [1.47σ]

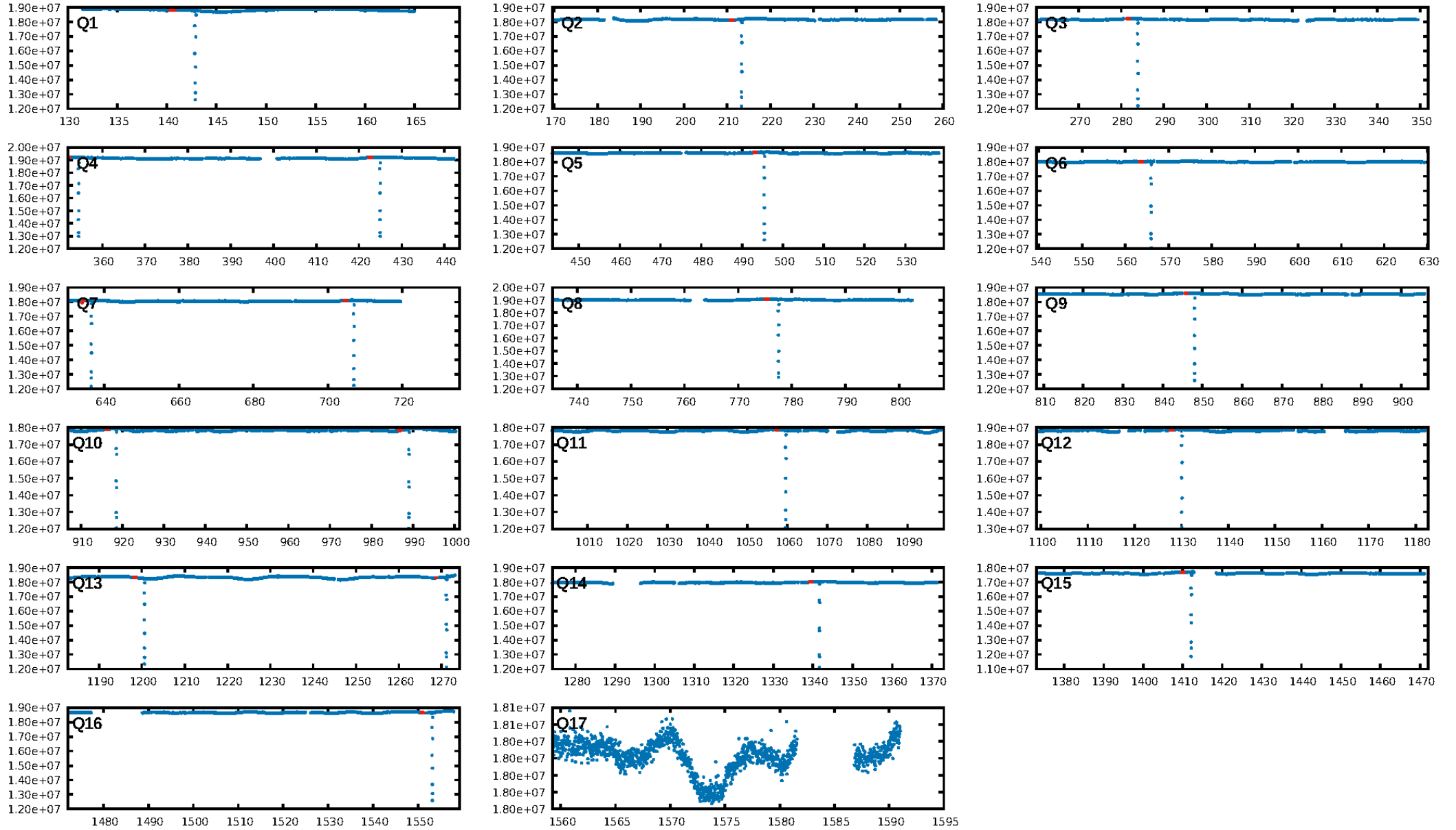
## DV Diagnostic Results:

ShortPeriod-sig: 1.9% [0.02σ]  
LongPeriod-sig: 100.0% [268.80σ]  
ModelChiSquare2-sig: 1.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [17/17]  
GhostDiagnostic-chr: 1.15  
Centroid-sig: 12.7%  
Centroid-so: 1.093 arcsec [0.99σ]  
OotOffset-rm: 1.370 arcsec [1.44σ]  
KicOffset-rm: 1.230 arcsec [1.26σ]  
OotOffset-st: 3/1/3/2 [9]  
KicOffset-st: 3/1/3/2 [9]  
DiffImageQuality-fgm: 0.33 [3/9]  
DiffImageOverlap-fno: 1.00 [12/12]

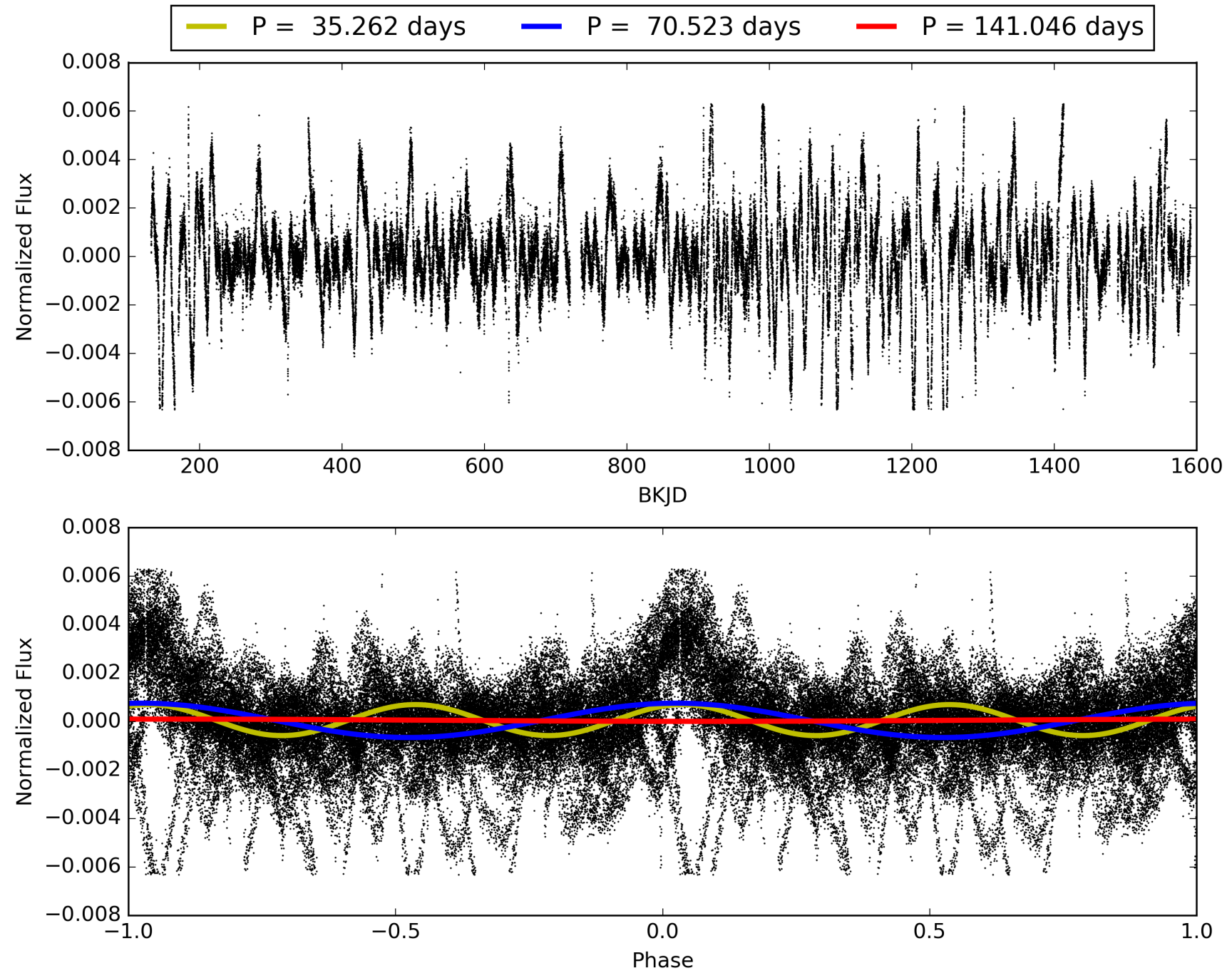
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:50 Z

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

# TCE 010006096-03, PDC Light Curves

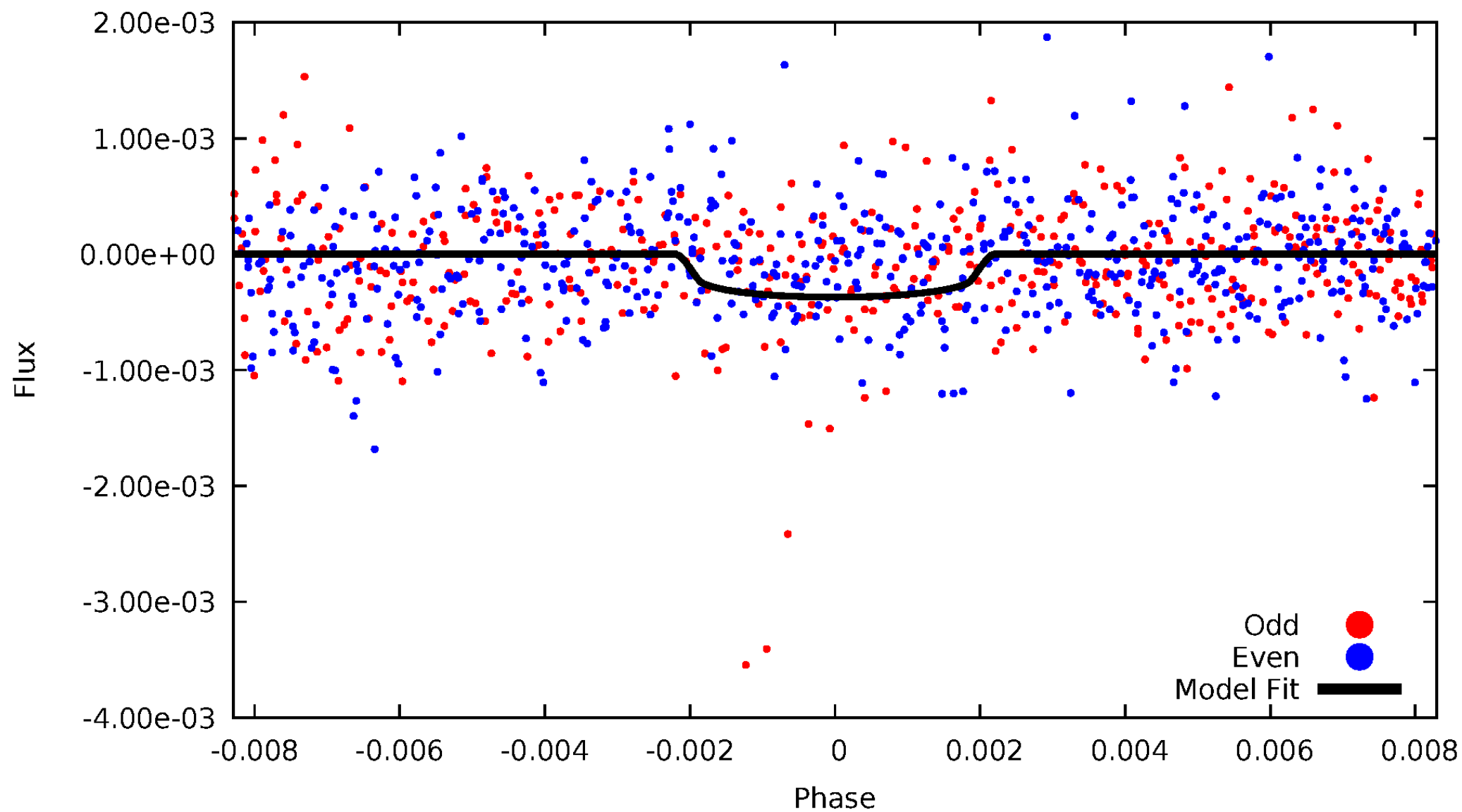


# TCE 010006096-03



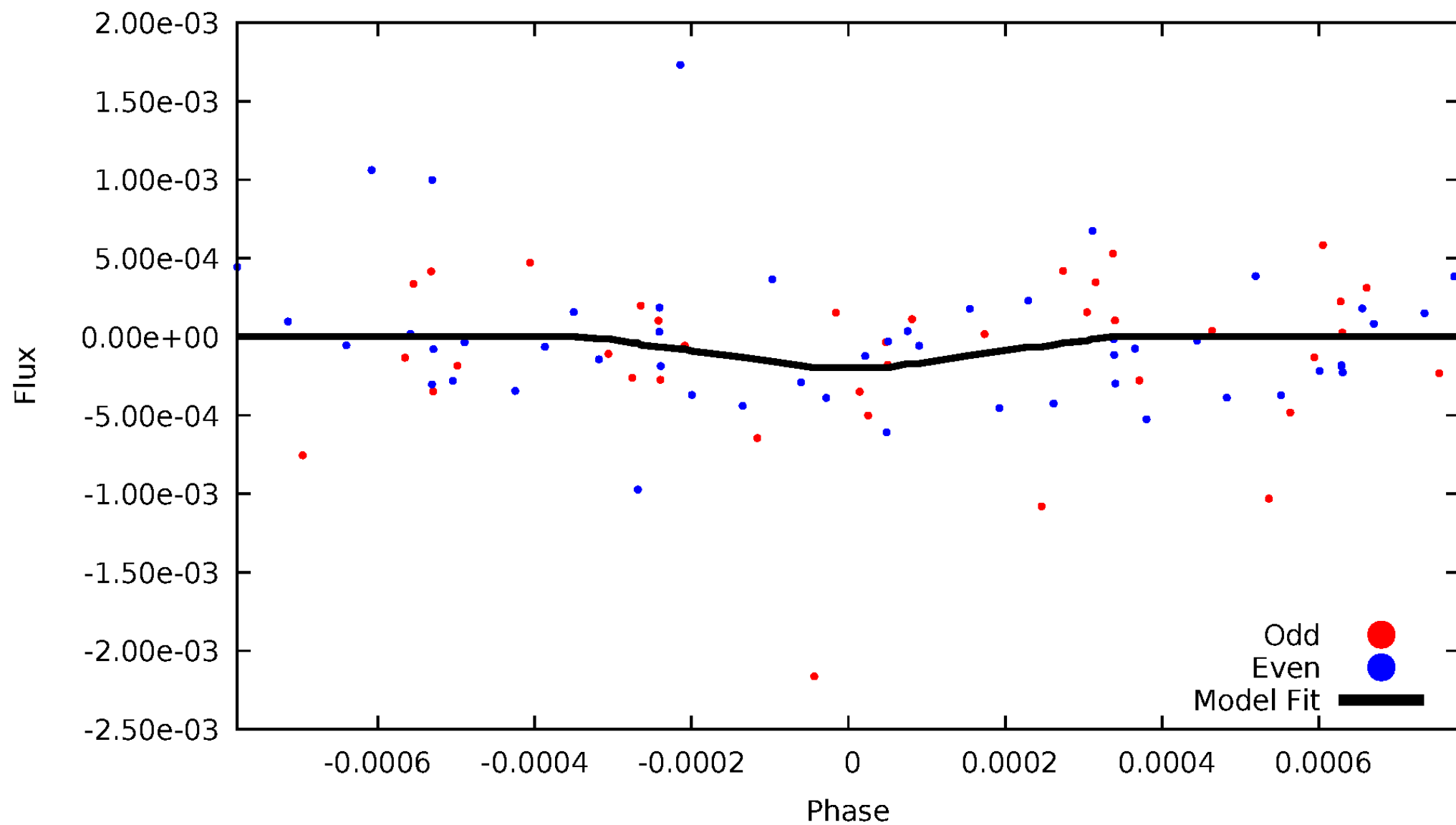
# DV Odd/Even

TCE 010006096-03



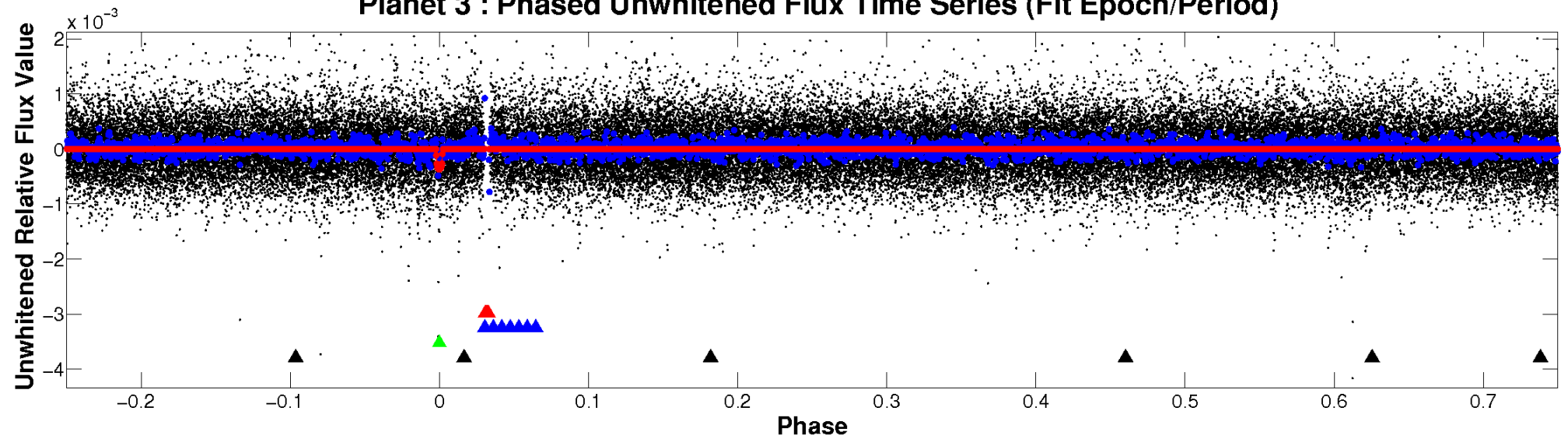
# ALT Odd/Even

TCE 010006096-03

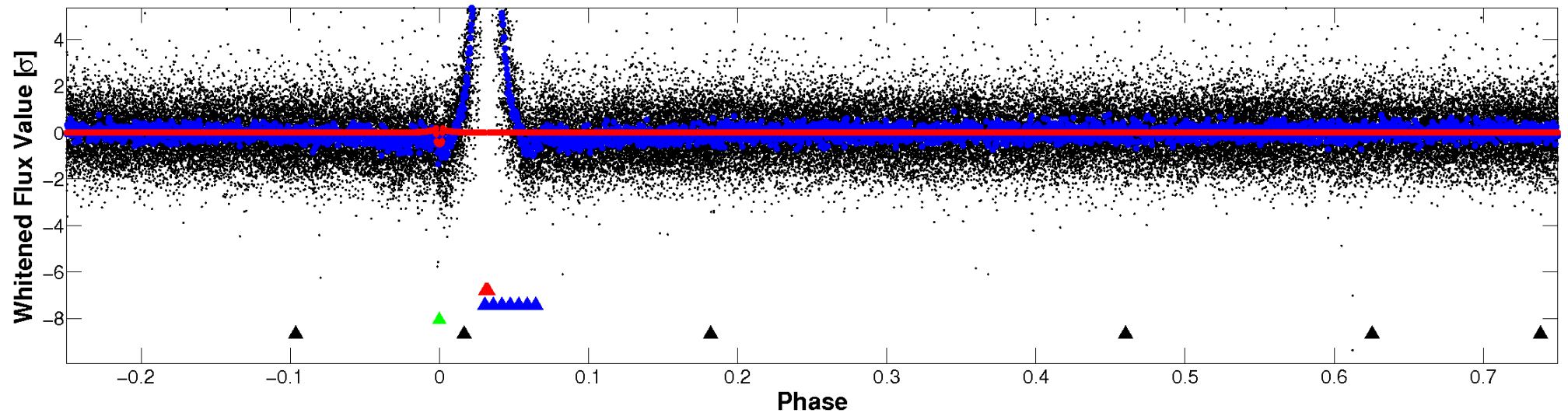


# Non-Whitened Vs. Whitened Light Curve

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



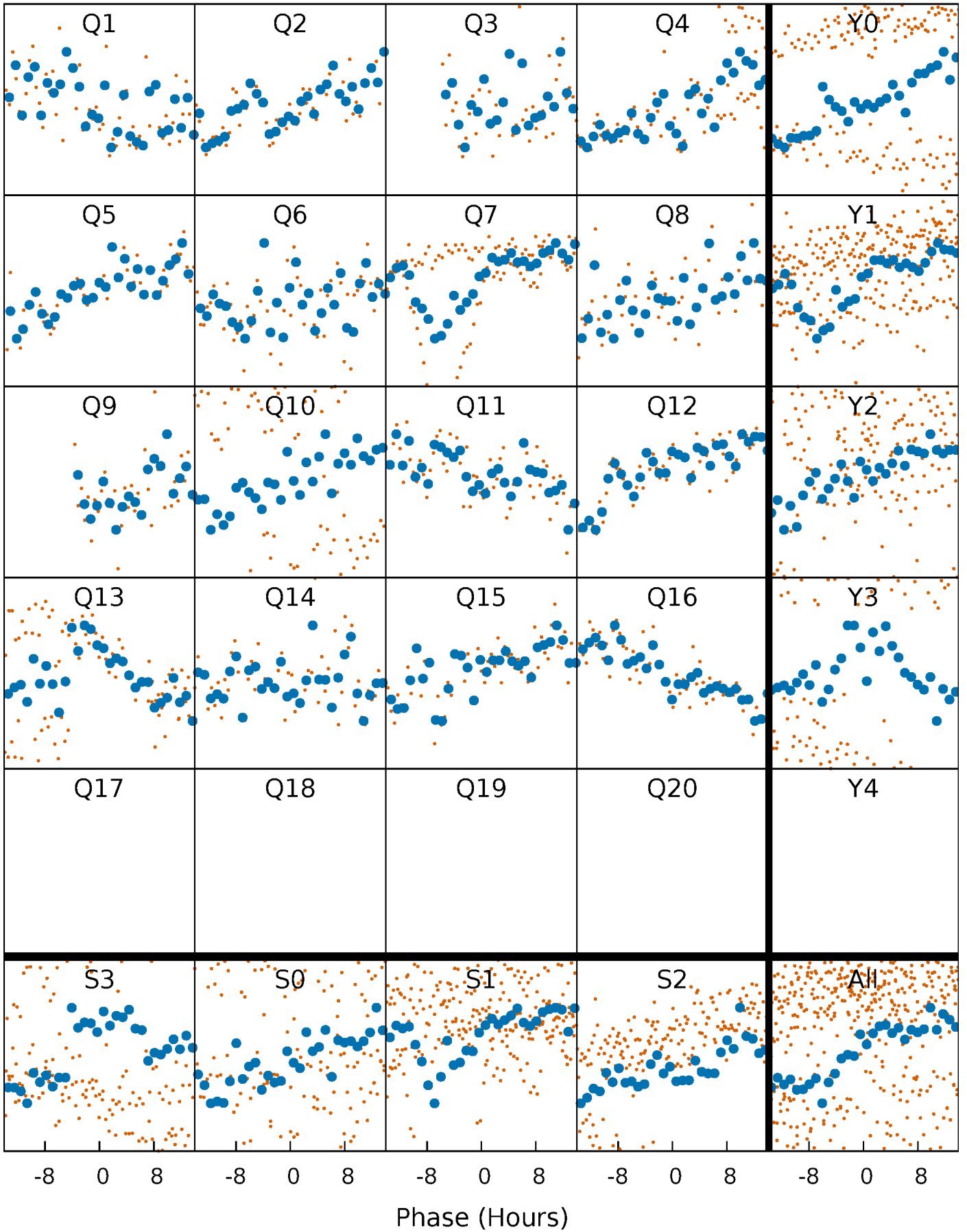
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

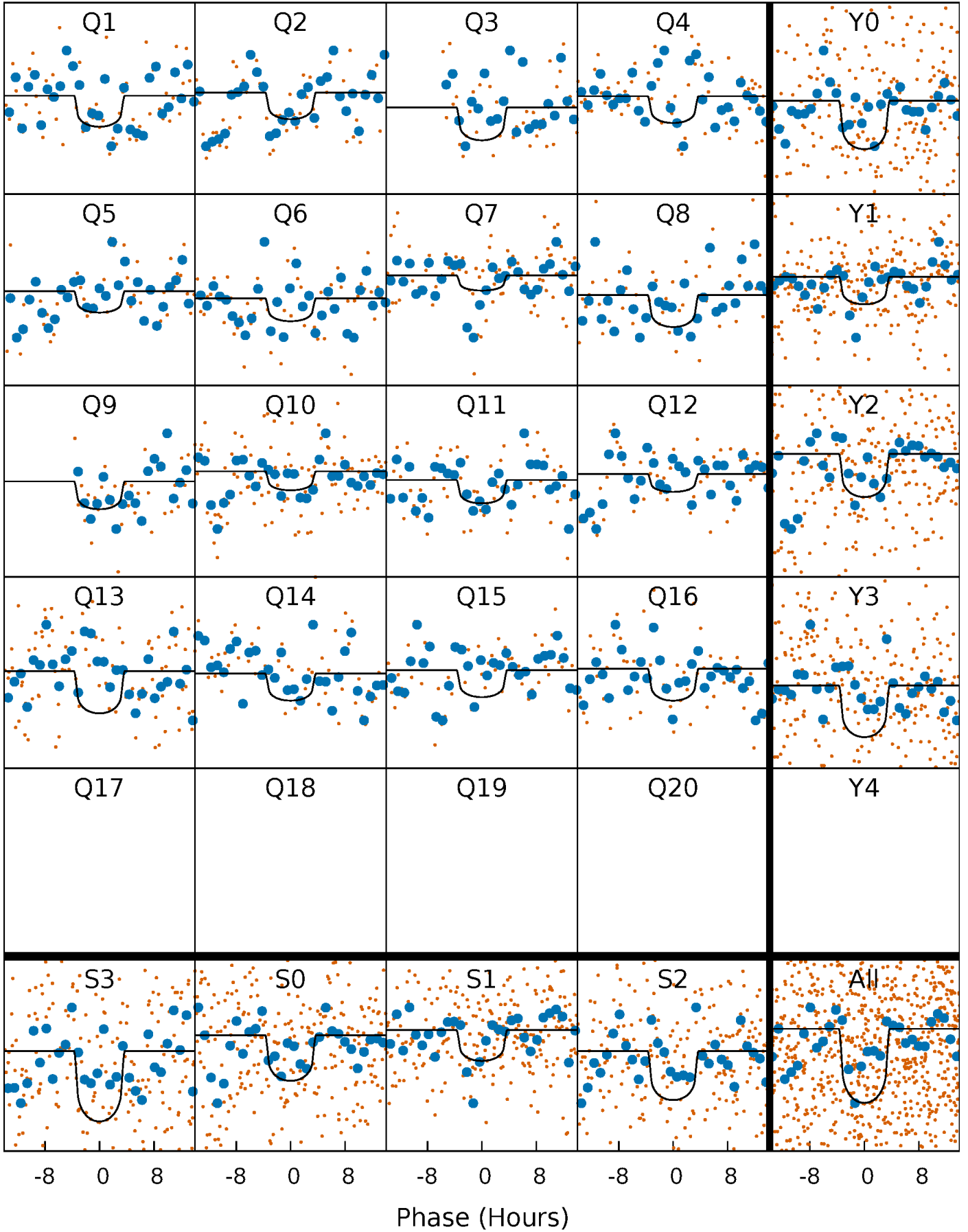
TCE 010006096-03   P= 70.523229 Days    $T_0=140.542665$  (BKJD)





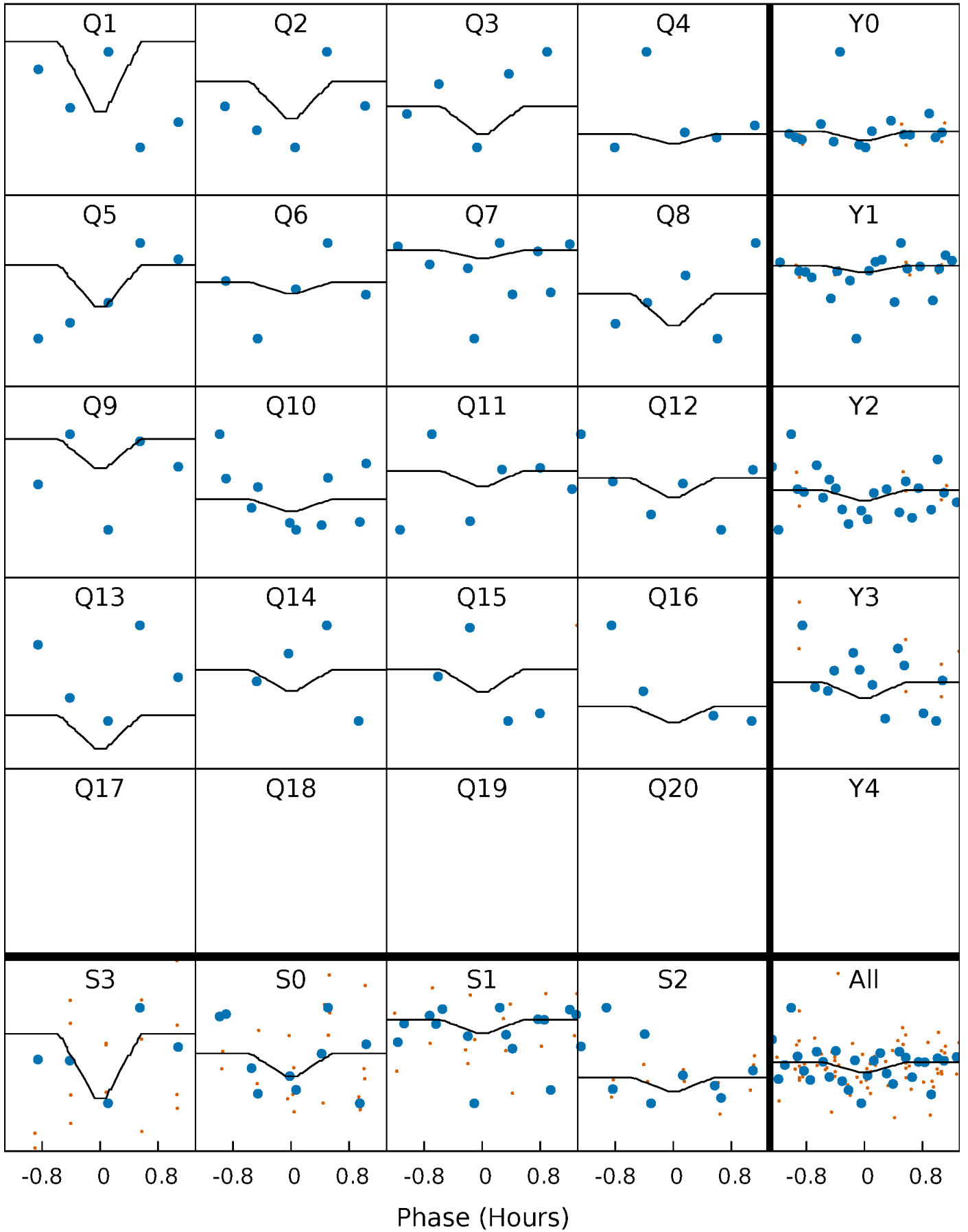
# DV Quarter-Phased Transit Curves

TCE 010006096-03 P= 70.523229 Days  $T_0=140.542665$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

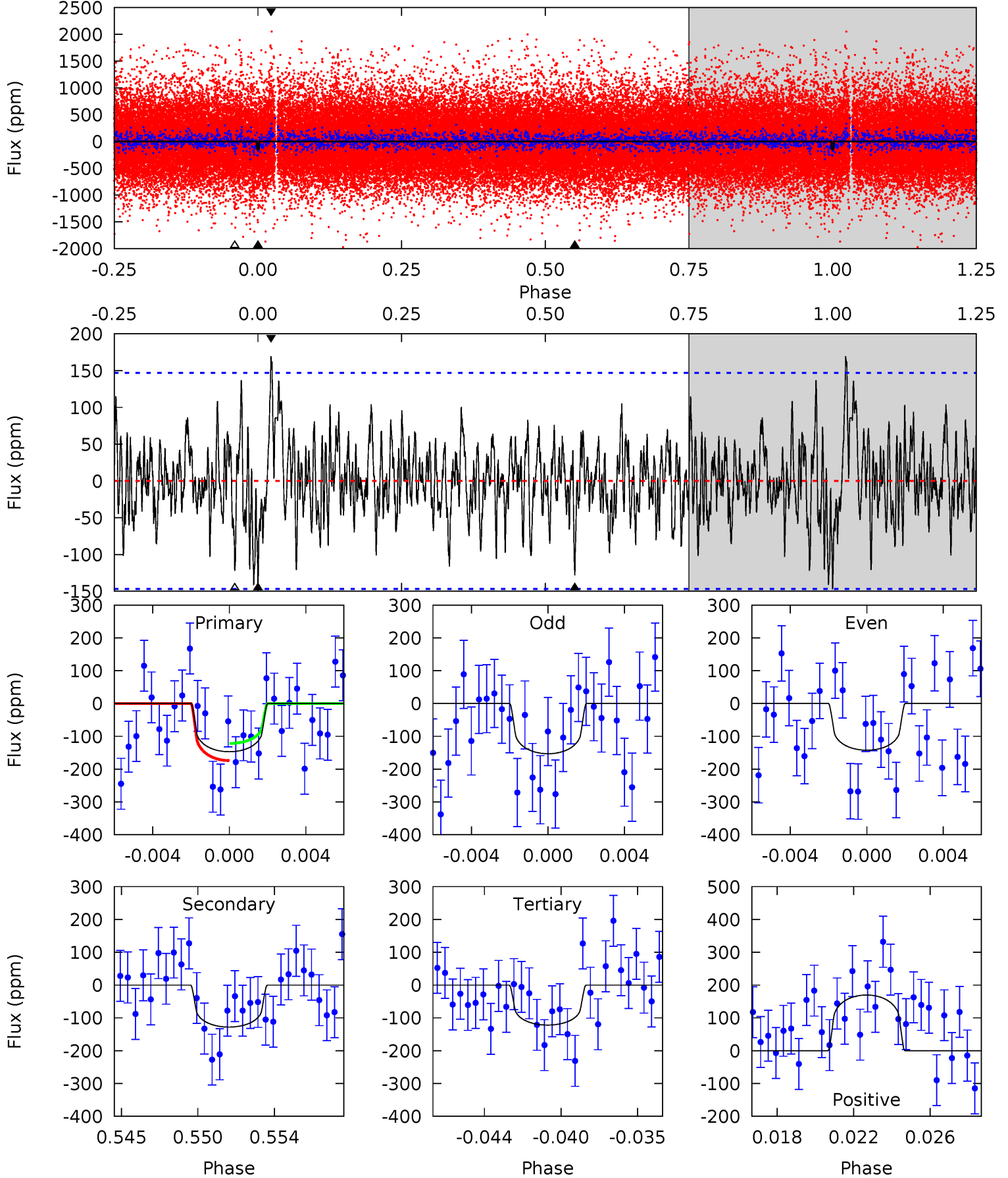
TCE 010006096-03     $P = 70.520314$  Days     $T_0 = 140.520232$  (BKJD)



# DV Model-Shift Uniqueness Test

010006096-03, P = 70.523229 Days, E = 70.019436 Days

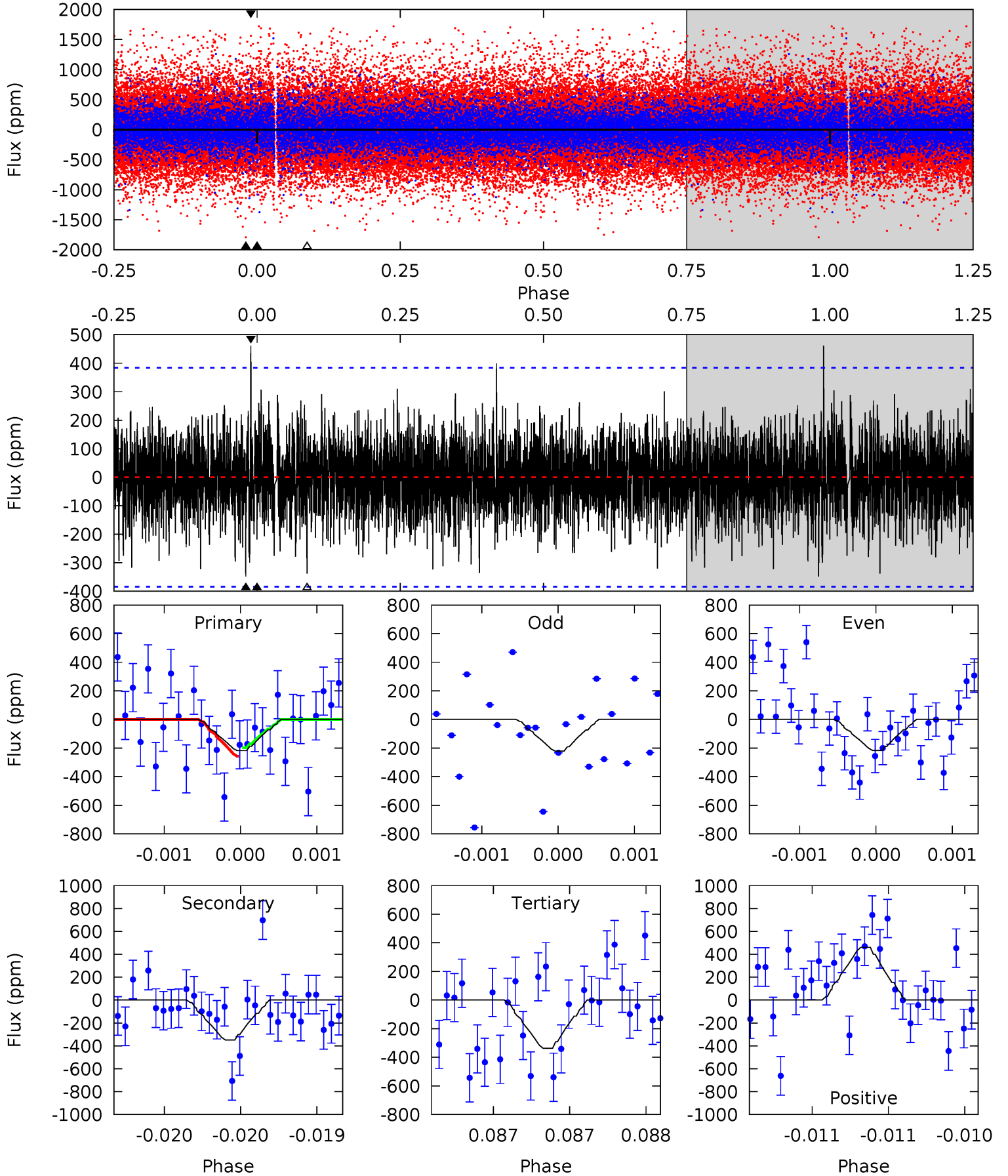
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.19	4.52	4.30	5.98	5.18	2.85	1.54	0.88	-0.80	0.21	-1.47	0.19	1.49	0.54	0.93



# Alt Model-Shift Uniqueness Test

010006096-03, P = 70.520314 Days, E = 69.999918 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
3.14	5.02	4.86	6.64	5.53	3.42	1.34	-1.72	-3.50	0.16	-1.62	0.03	1.18	0.57	0.43



### Stellar Parameters For KIC 010006096

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5511^{+165}_{-148}$	$4.531^{+0.076}_{-0.114}$	$-0.420^{+0.300}_{-0.300}$	$0.789^{+0.145}_{-0.085}$	$0.773^{+0.103}_{-0.055}$	$2.213^{+0.722}_{-0.761}$
	+3%/-3%	+2%/-3%	+71%/-71%	+18%/-11%	+13%/-7%	+33%/-34%
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 010006096-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-128 \pm 28$	$2.17^{+1.82}_{-1.40}$	$550^{+26}_{-24}$	$4024^{+2270}_{-691}$	$1432^{+9846}_{-997}$
Alt.	$-348 \pm 69$	$1.96^{+1.84}_{-1.35}$	$550^{+26}_{-24}$	$5070^{+4596}_{-1162}$	$4620^{+46004}_{-3364}$

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

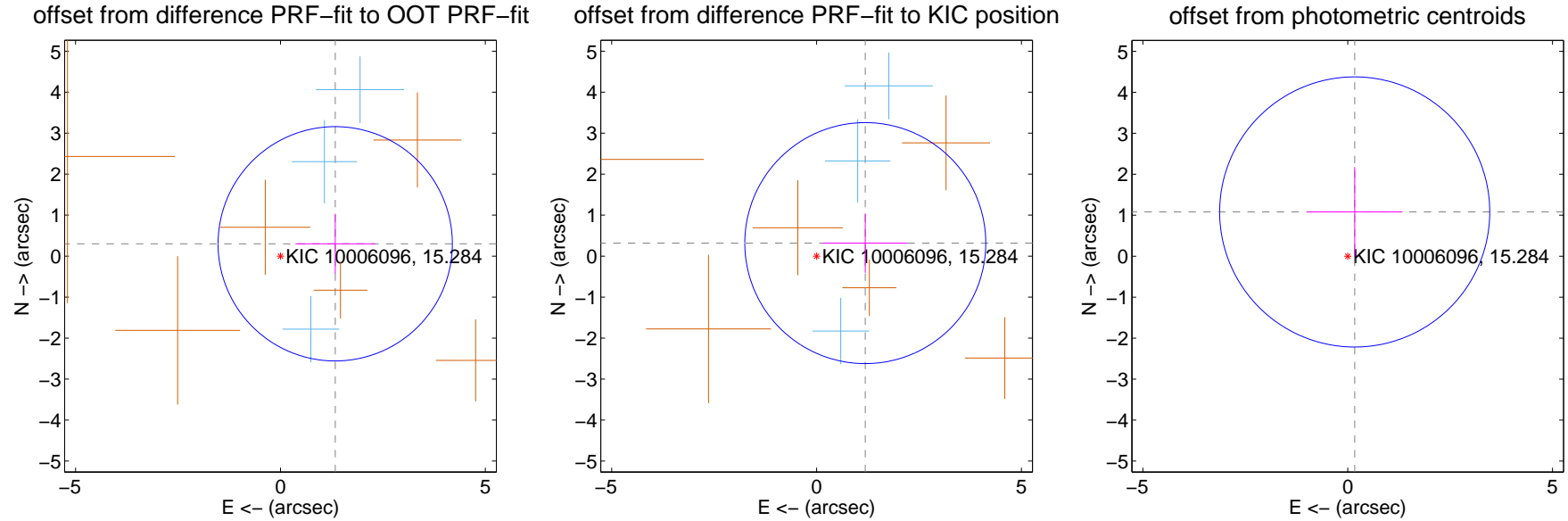
## DV Centroid Data

Supplemental centroid analysis for 010006096-03. Kepler magnitude: 15.28. Transit SNR 7.39

There are 3 quarters with good PRF difference image offsets

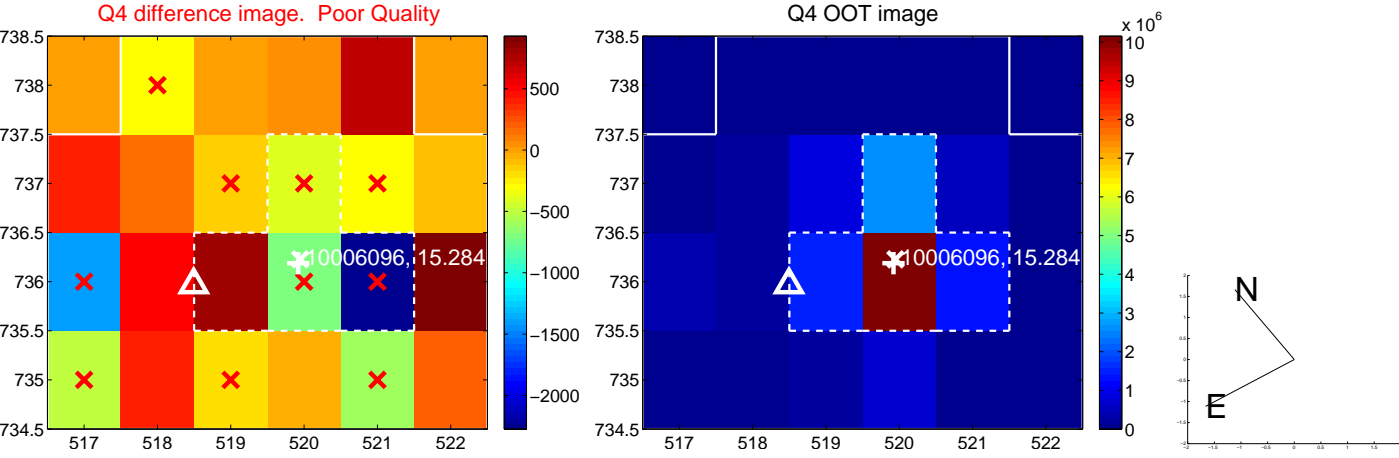
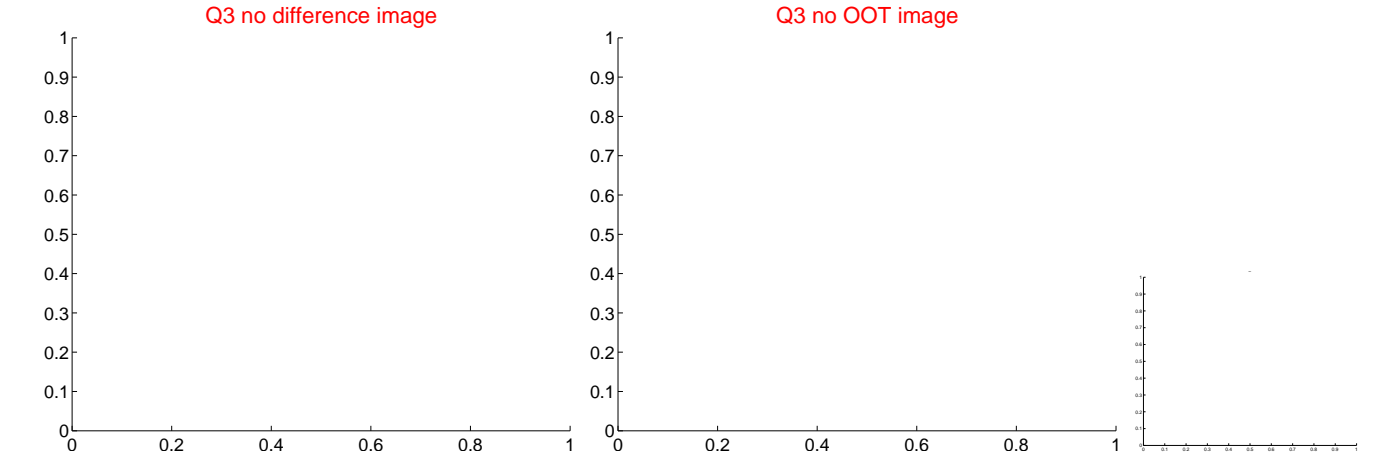
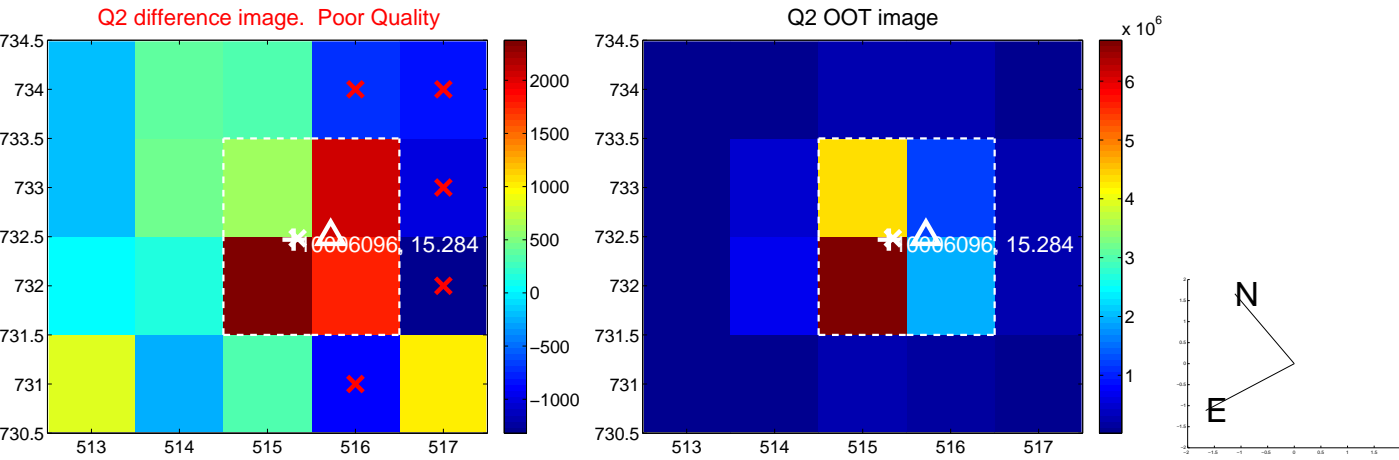
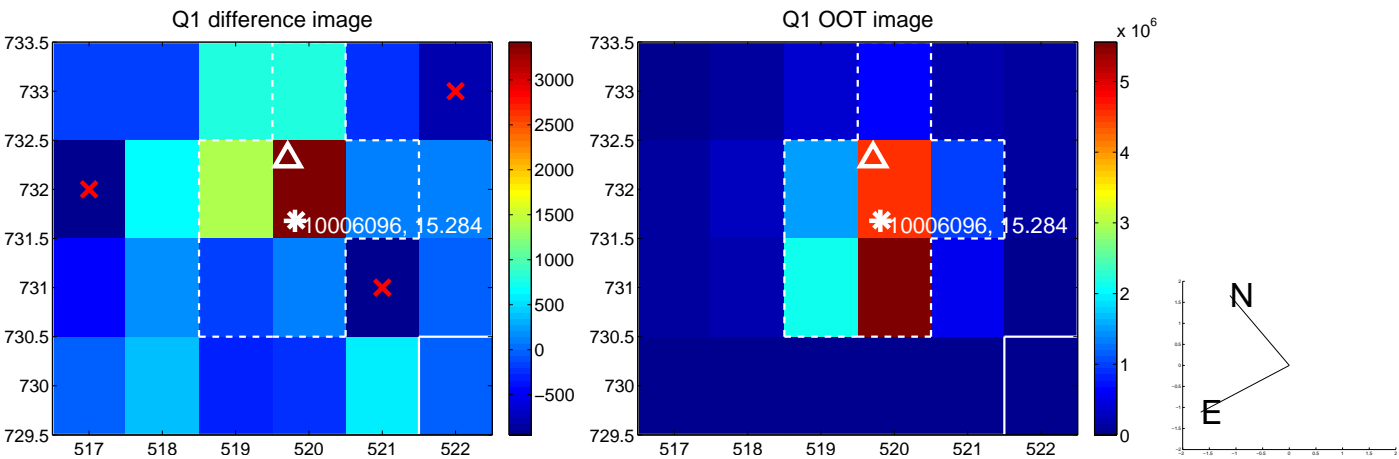
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.370 \pm 0.953$	1.44	$-1.336 \pm 0.974$	$0.301 \pm 0.730$
PRF-fit source offset from KIC position	$1.230 \pm 0.980$	1.26	$-1.188 \pm 1.037$	$0.318 \pm 0.724$
photometric centroid source offset	$1.09 \pm 1.10$	0.99	$-0.17 \pm 1.17$	$1.08 \pm 1.10$

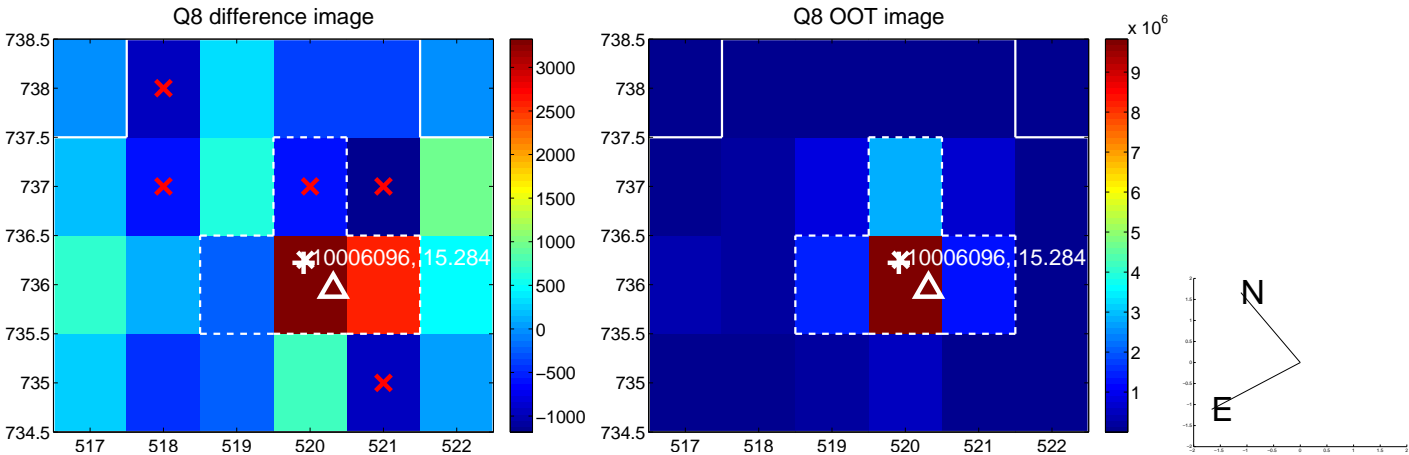
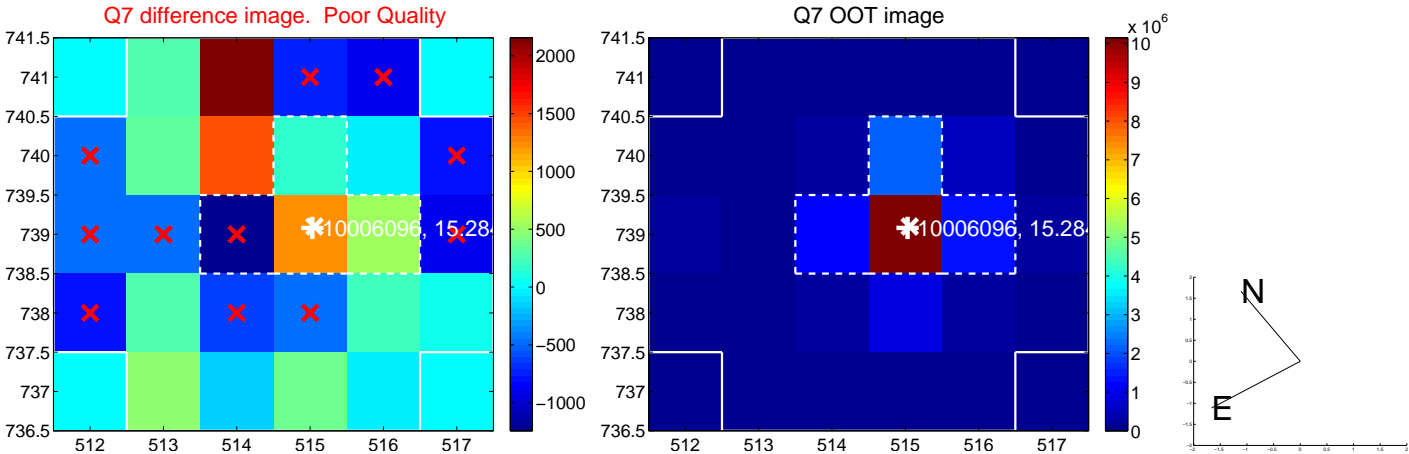
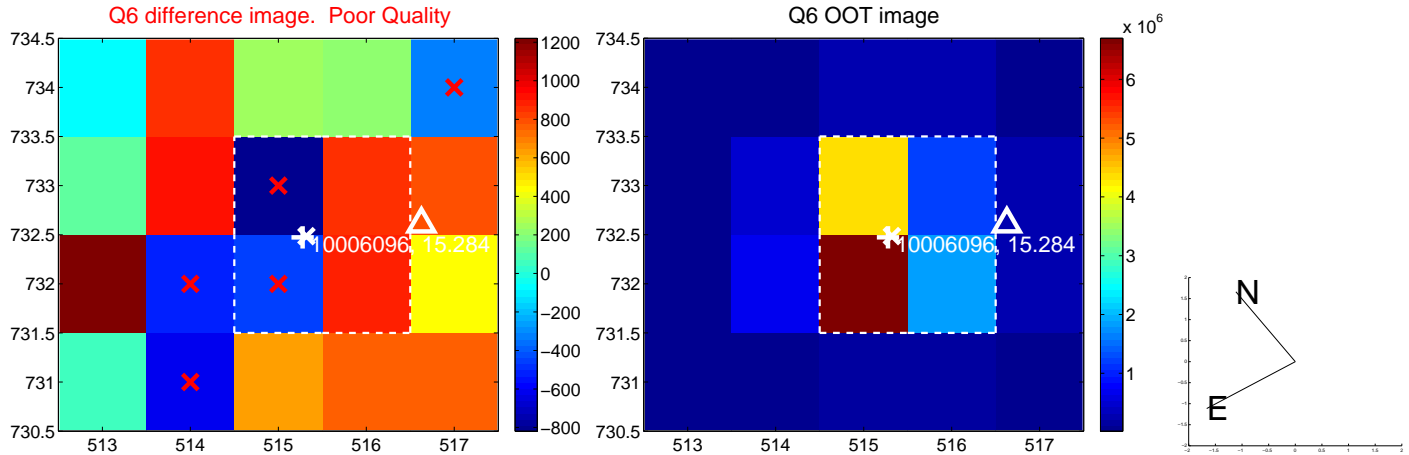
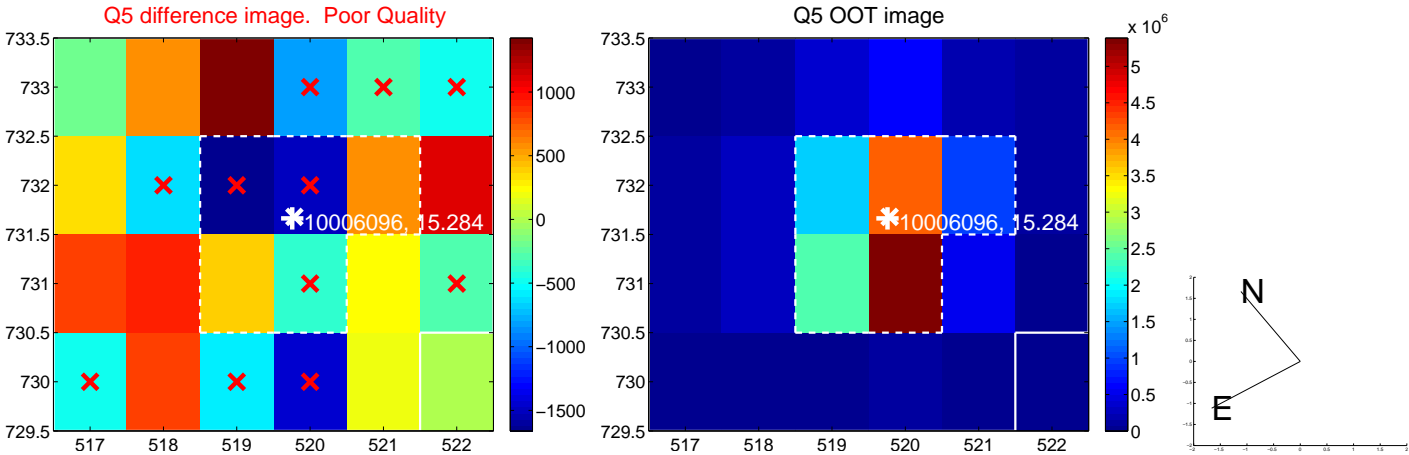


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

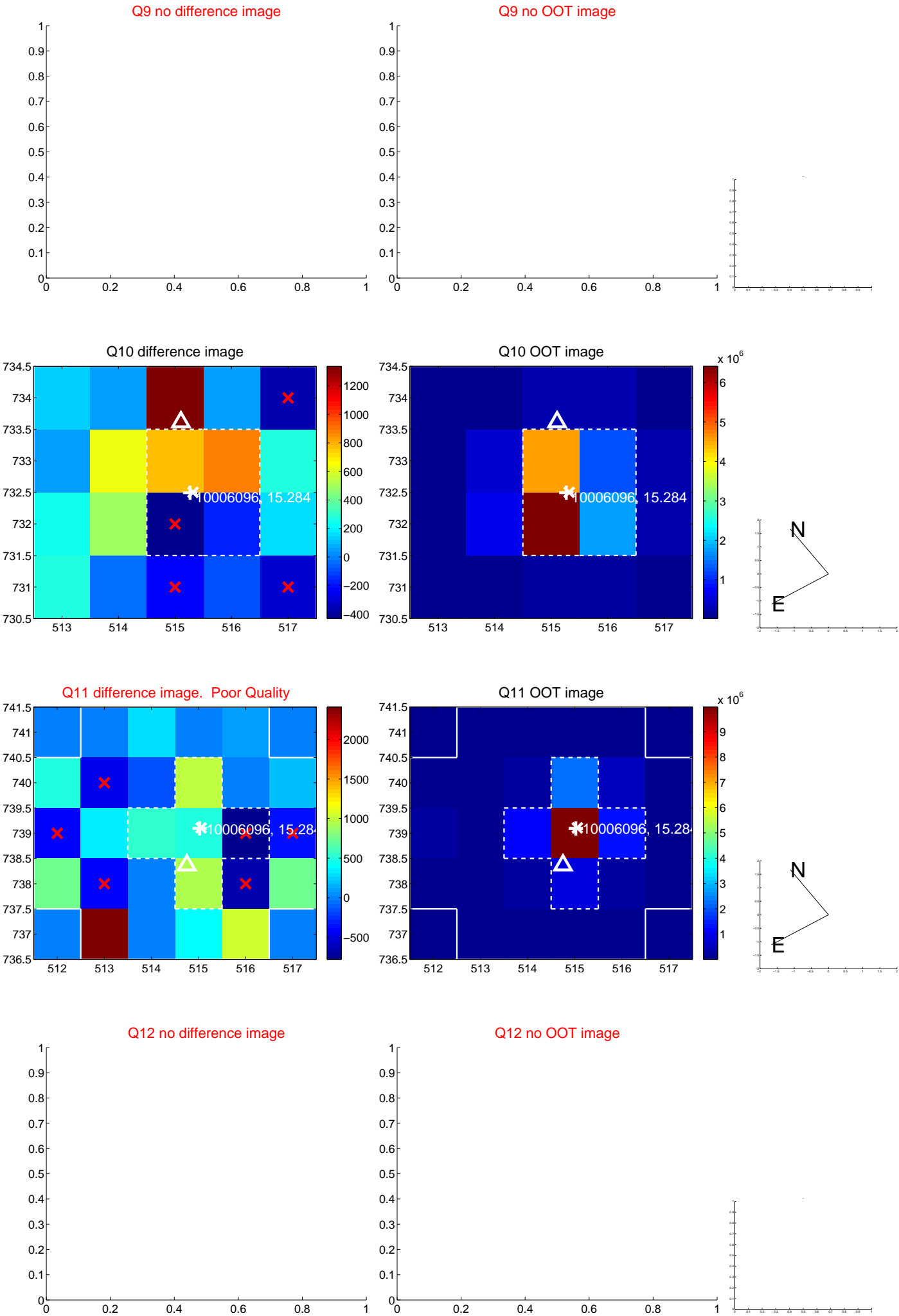


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

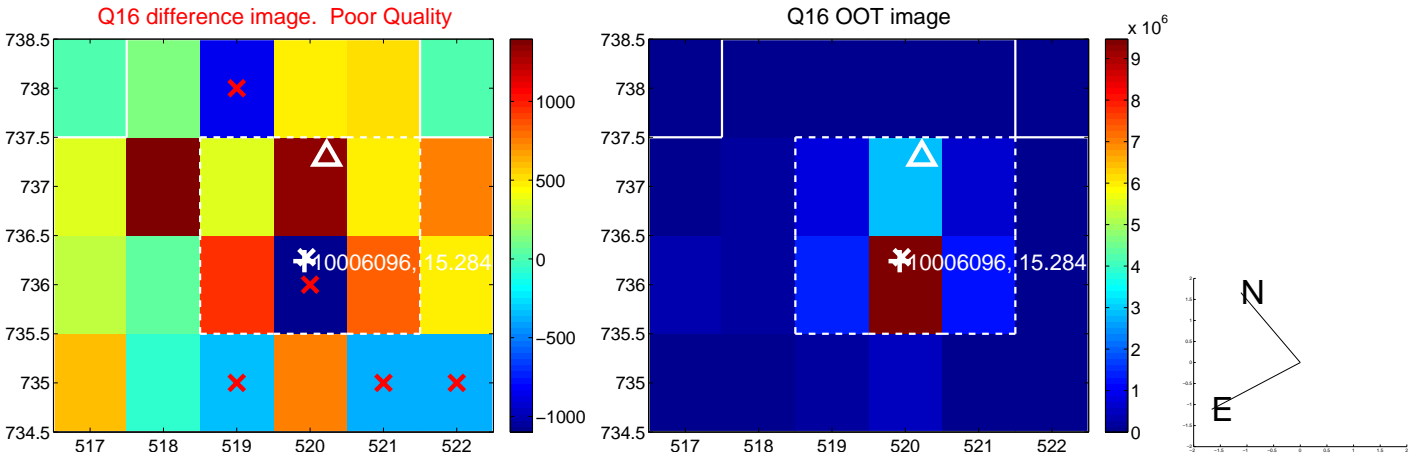
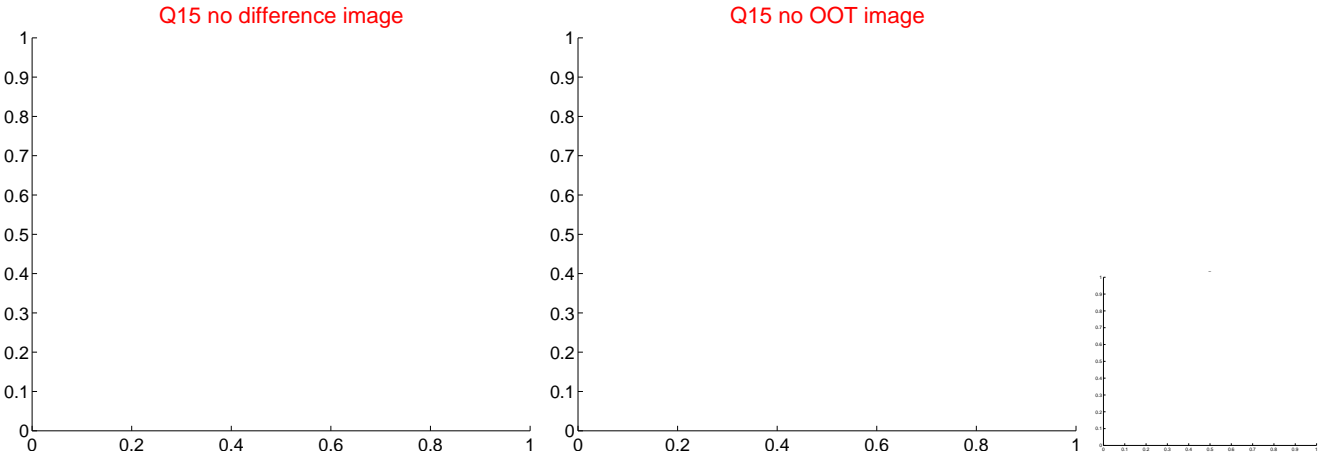
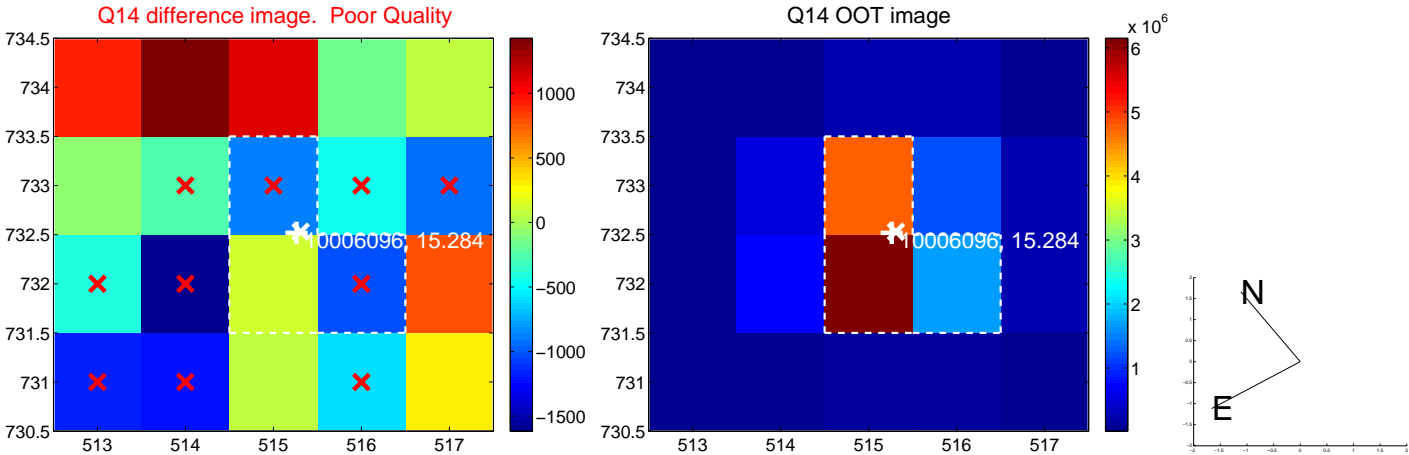
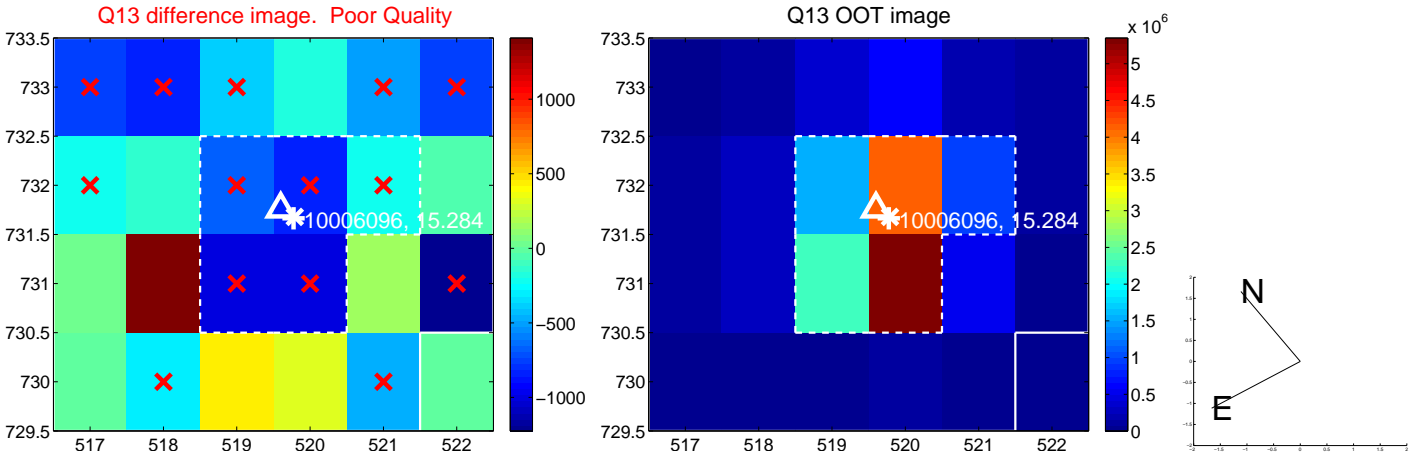




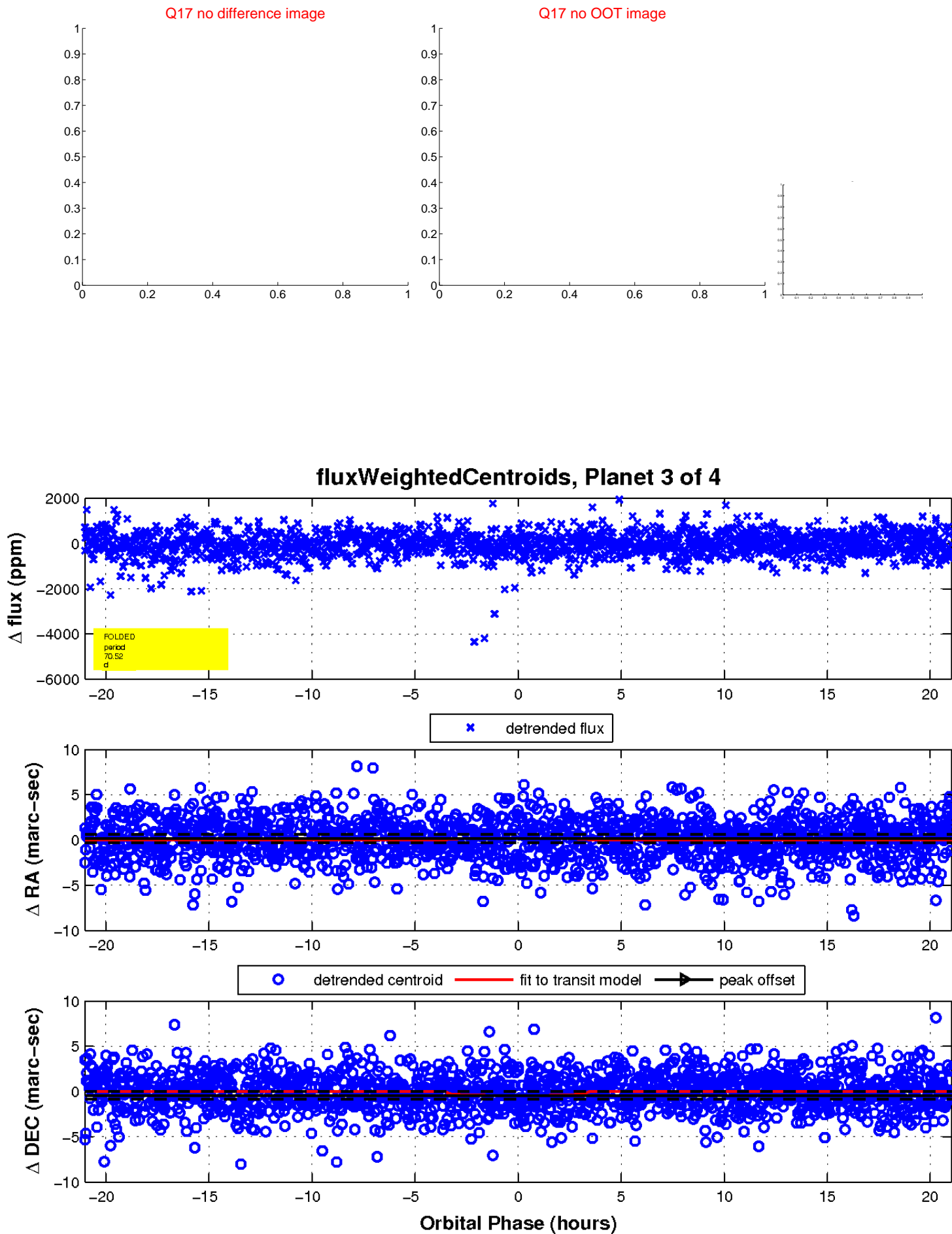
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

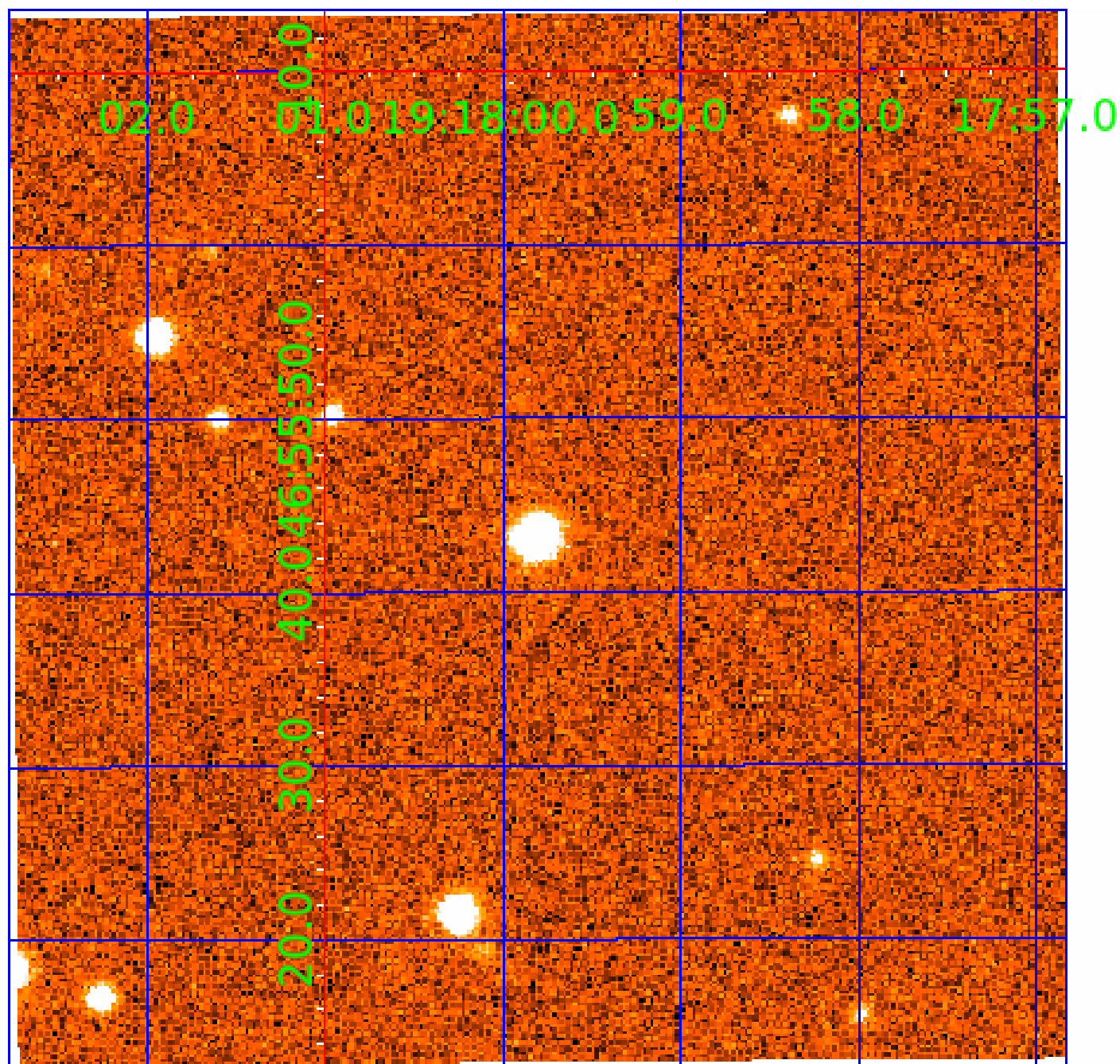


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010006096

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010006096-01	OBS	5753.01	70.515974	142.859955	329037.1	2.500	3682.9	-1.0	0.79	5511	41.60	5.48
010006096-02	OBS	No	211.970940	142.694962	17356.2	10.500	149.3	-1.0	0.79	5511	10.29	1.26
010006096-03	OBS	No	70.523229	140.542665	370.5	7.018	13.4	7.4	0.79	5511	1.58	5.48
010006096-04	OBS	No	231.191041	255.176155	1214.1	11.024	13.8	9.2	0.79	5511	3.24	1.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010006096-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
010006096-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010006096-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
010006096-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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.

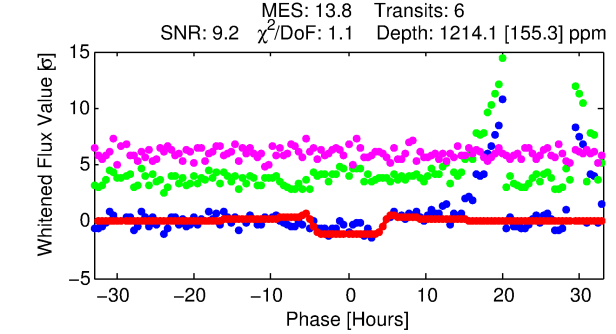
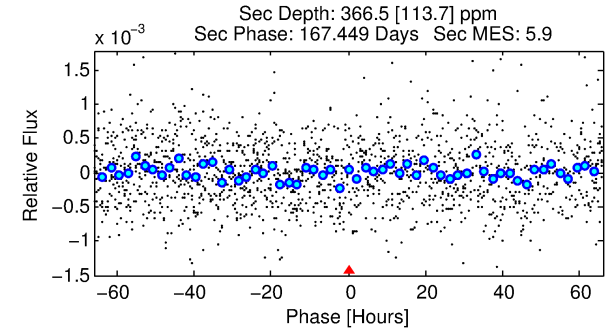
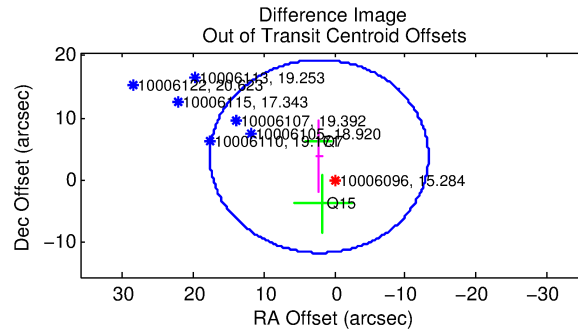
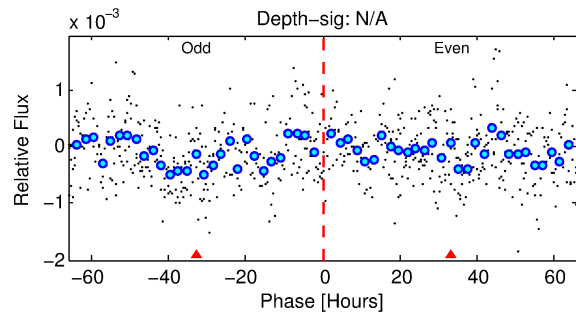
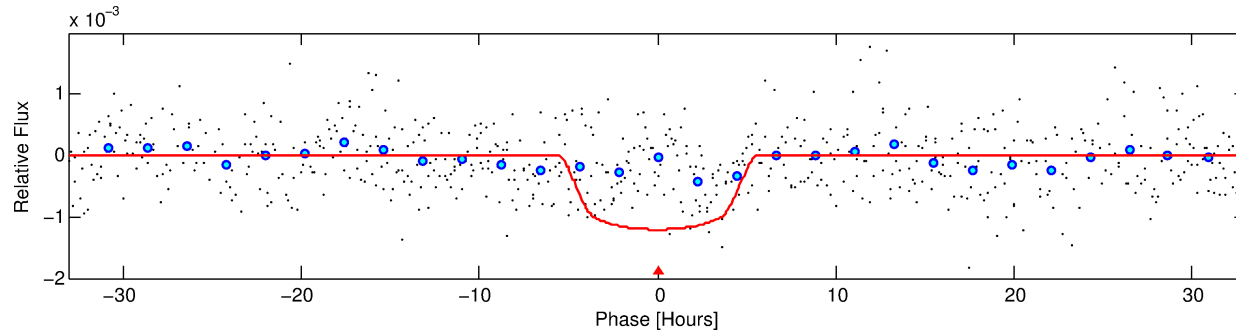
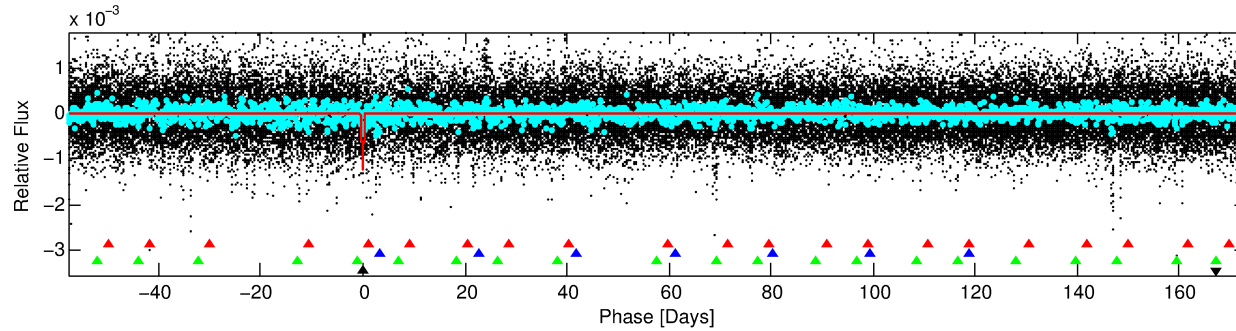
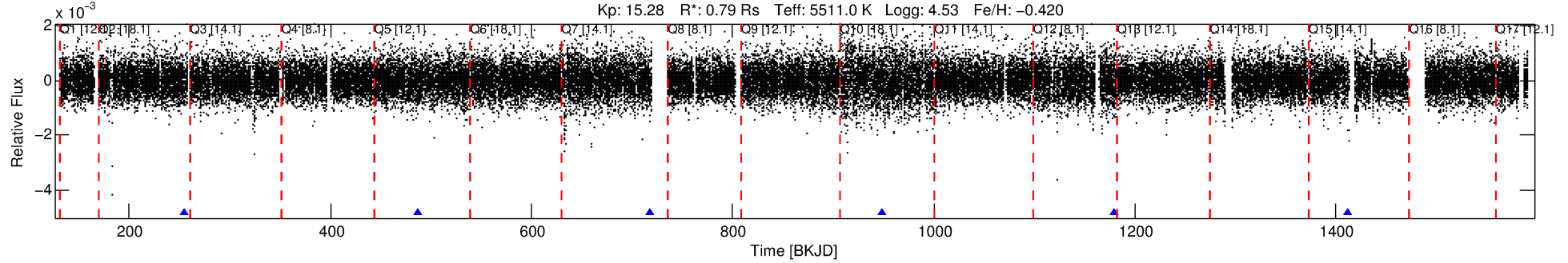
## Ephemeris Match Information For 010006096-04

No Significant Match Found

# DV One-Page Summary

KIC: 10006096 Candidate: 4 of 4 Period: 231.191 d  
KOI: K05753 Corr: No Ephemeris Match

Kp: 15.28 R\*: 0.79 Rs Teff: 5511.0 K Logg: 4.53 Fe/H: -0.420



## DV Fit Results:

Period = 231.19104 [0.00586] d  
Epoch = 255.1762 [0.0229] BKJD  
Rp/R\* = 0.0376 [0.0033]  
a/R\* = 85.71 [20.76]  
b = 0.89 [0.06]  
Seff = 1.13 [0.28]  
Teq = 263 [16] K  
Rp = 3.24 [0.66] Re  
a = 0.6762 [0.1018] AU  
Ag = 8775.57 [3654.27] [2.40σ]  
Teffp = 3930 [370] K [9.89σ]

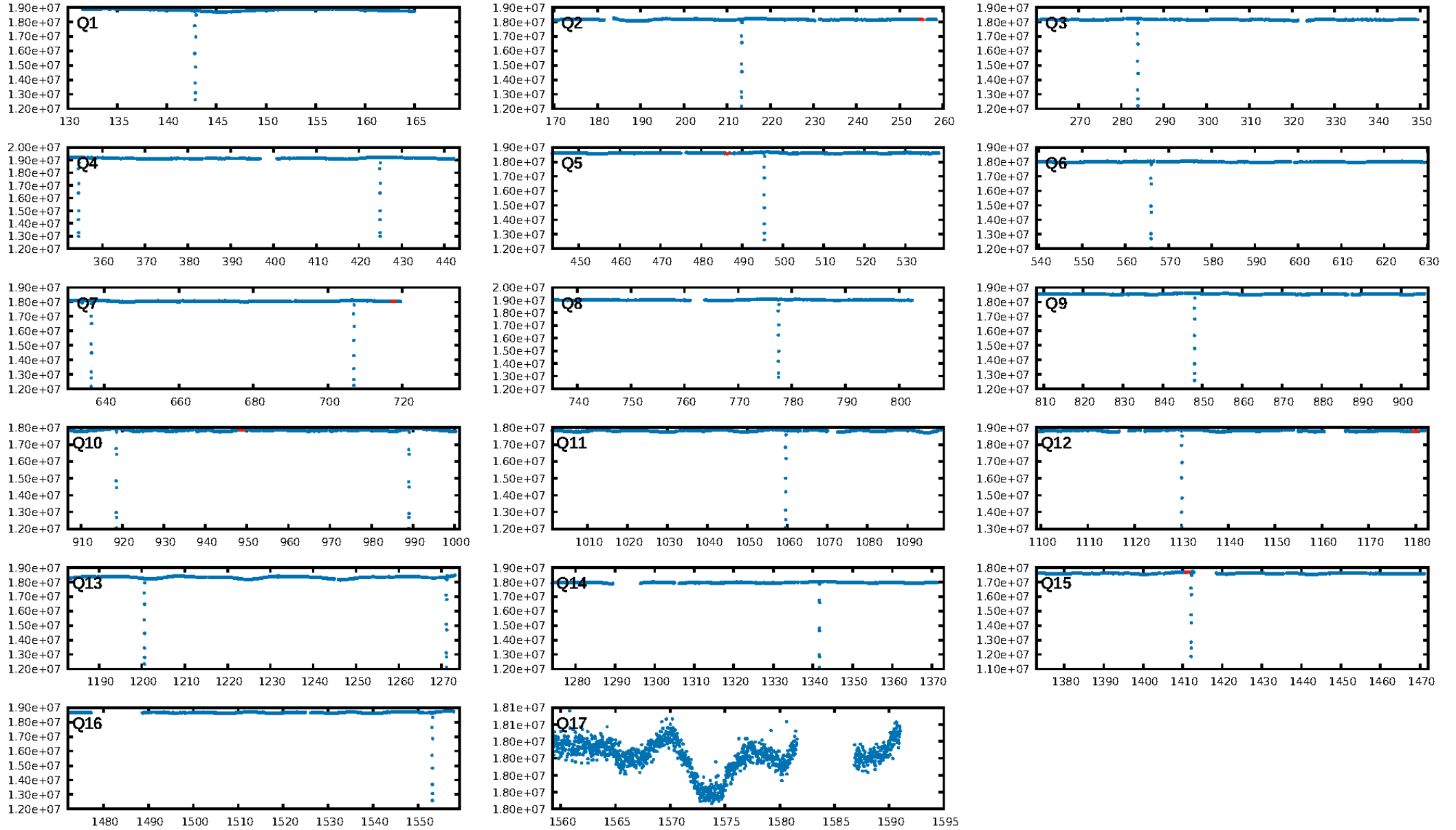
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.30σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -0.5331  
Centroid-sig: 2.0%  
Centroid-so: 0.871 arcsec [1.73σ]  
OotOffset-rm: 4.389 arcsec [0.85σ]  
KicOffset-rm: 4.467 arcsec [1.06σ]  
OotOffset-st: 0/2/0/0 [2]  
KicOffset-st: 0/2/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [5/5]

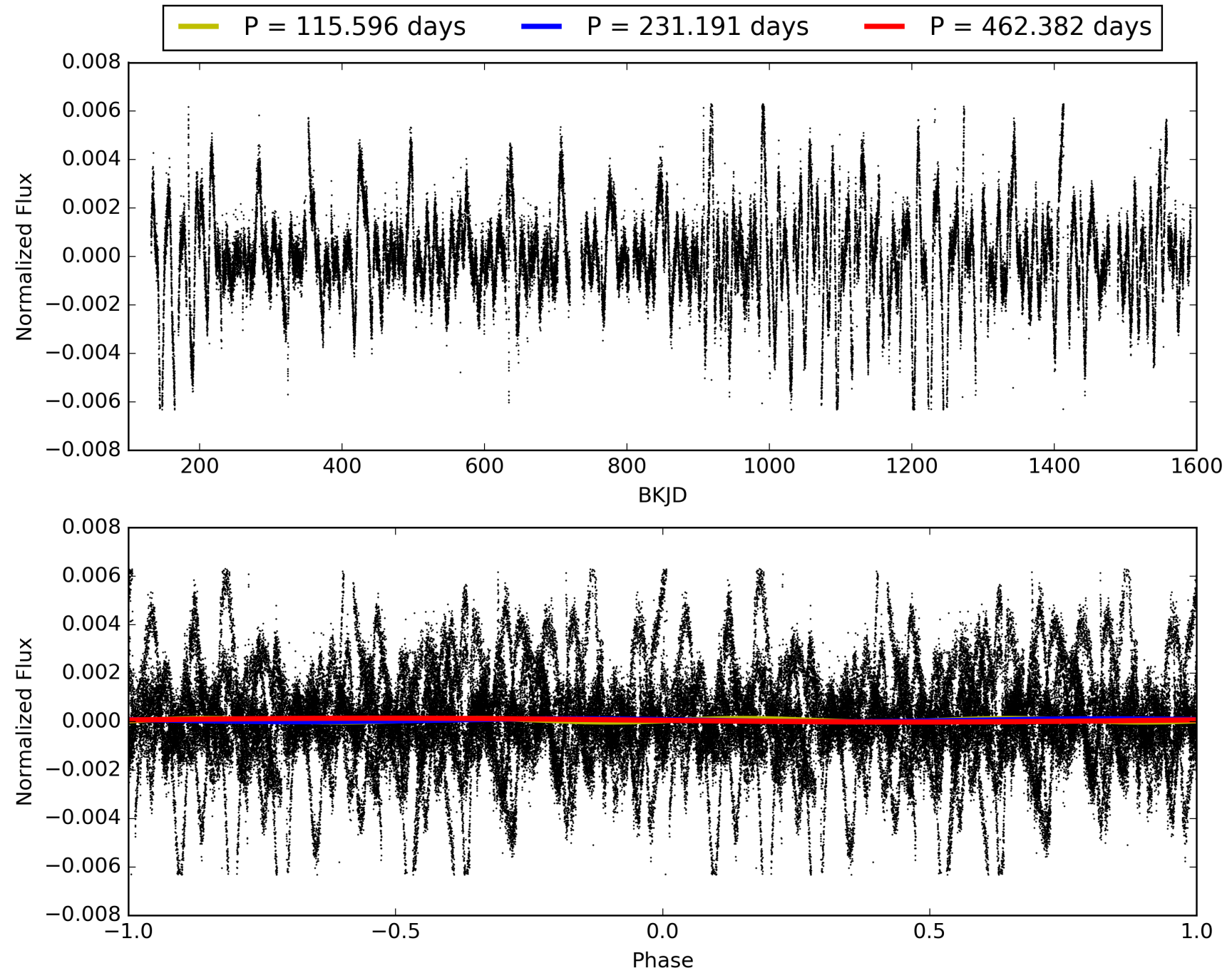
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:38:58 Z

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

# TCE 010006096-04, PDC Light Curves



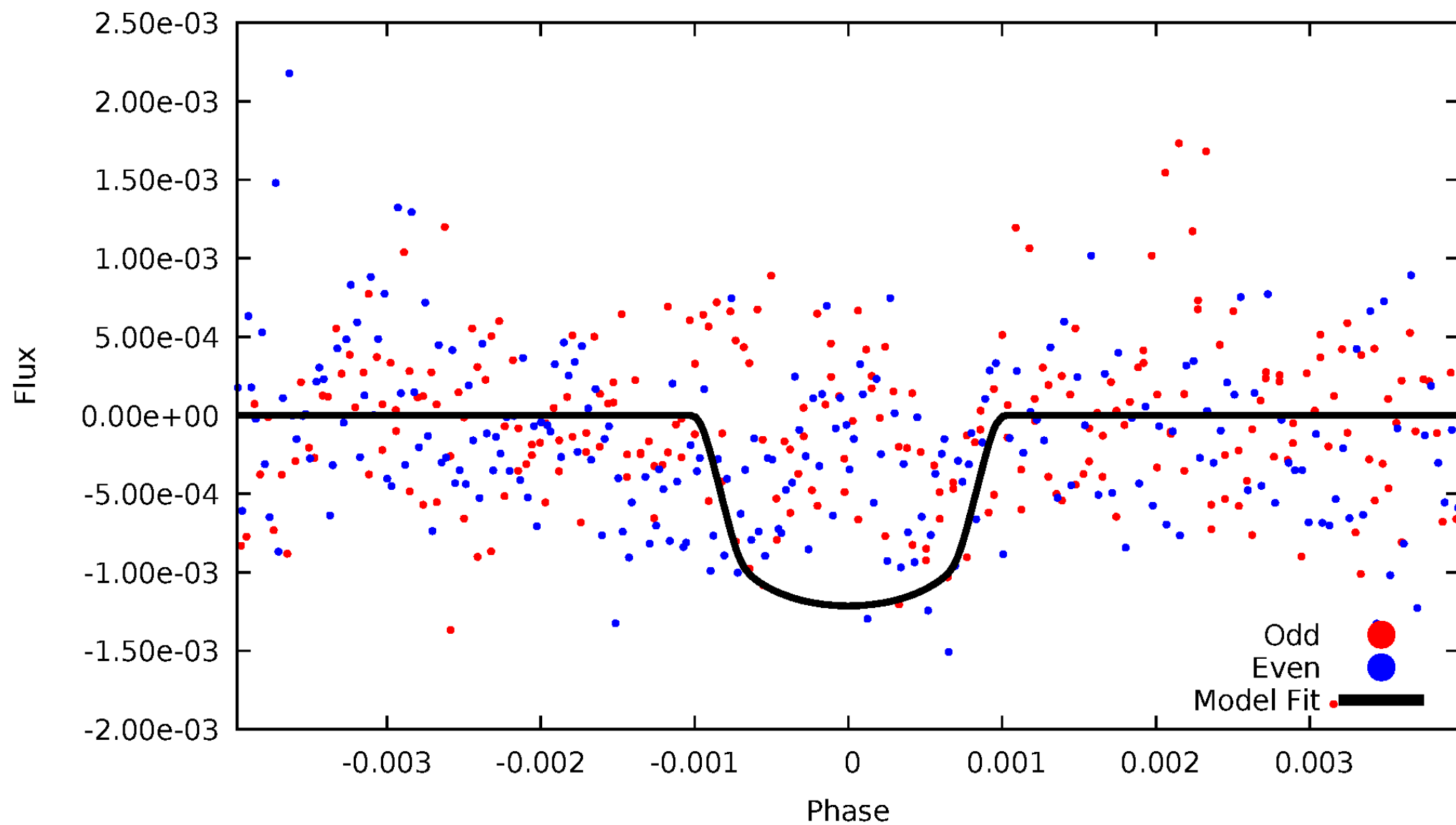
TCE 010006096-04





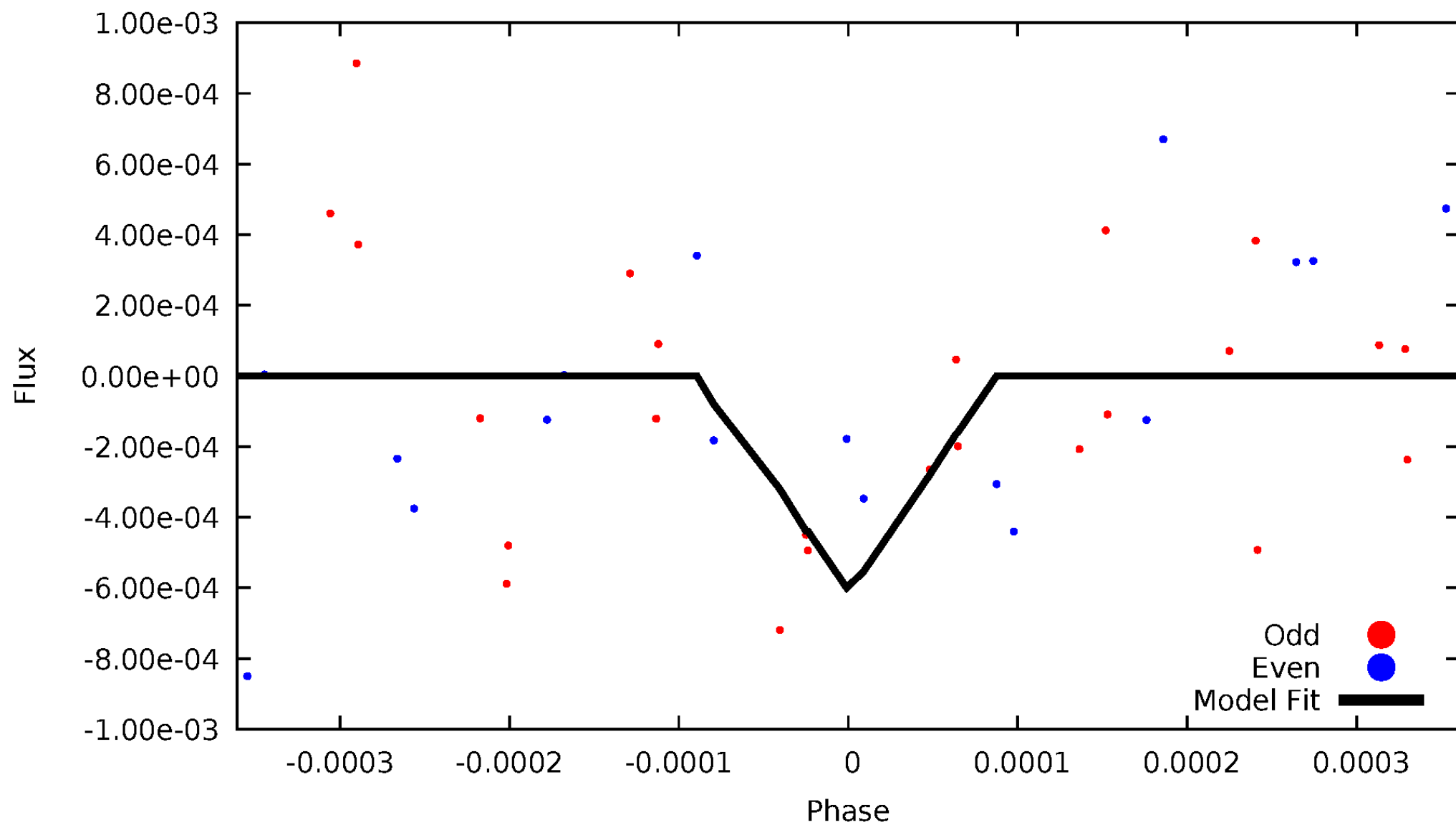
# DV Odd/Even

TCE 010006096-04



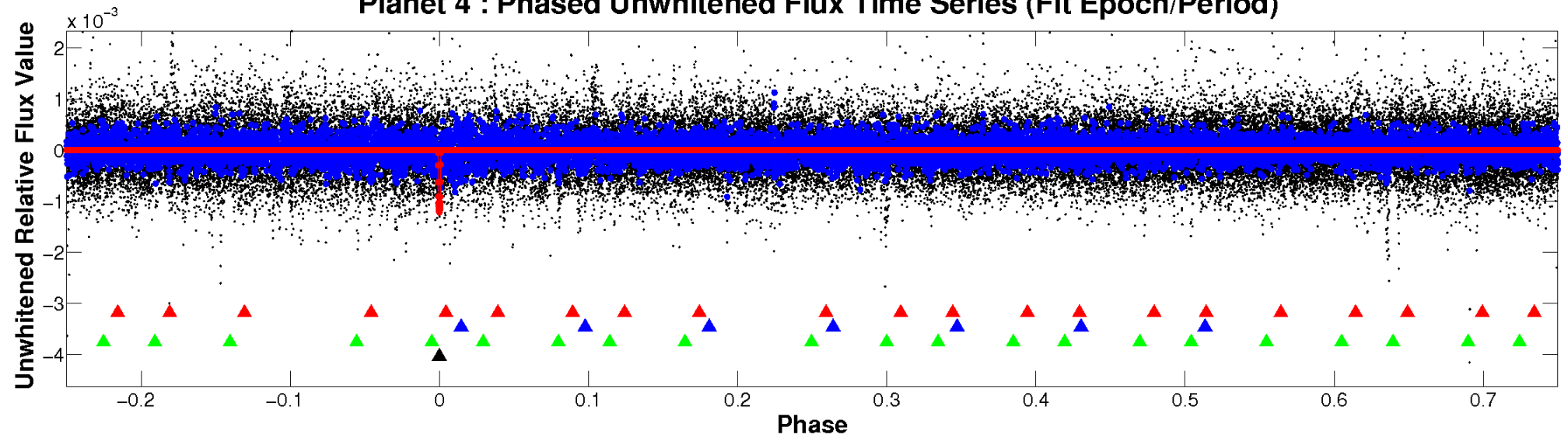
# ALT Odd/Even

TCE 010006096-04

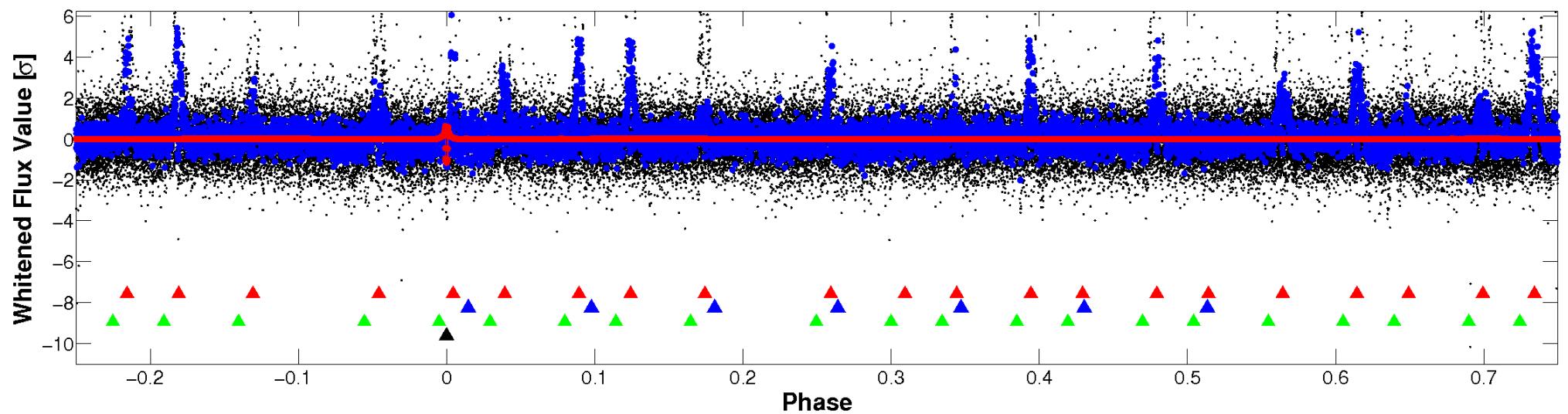


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

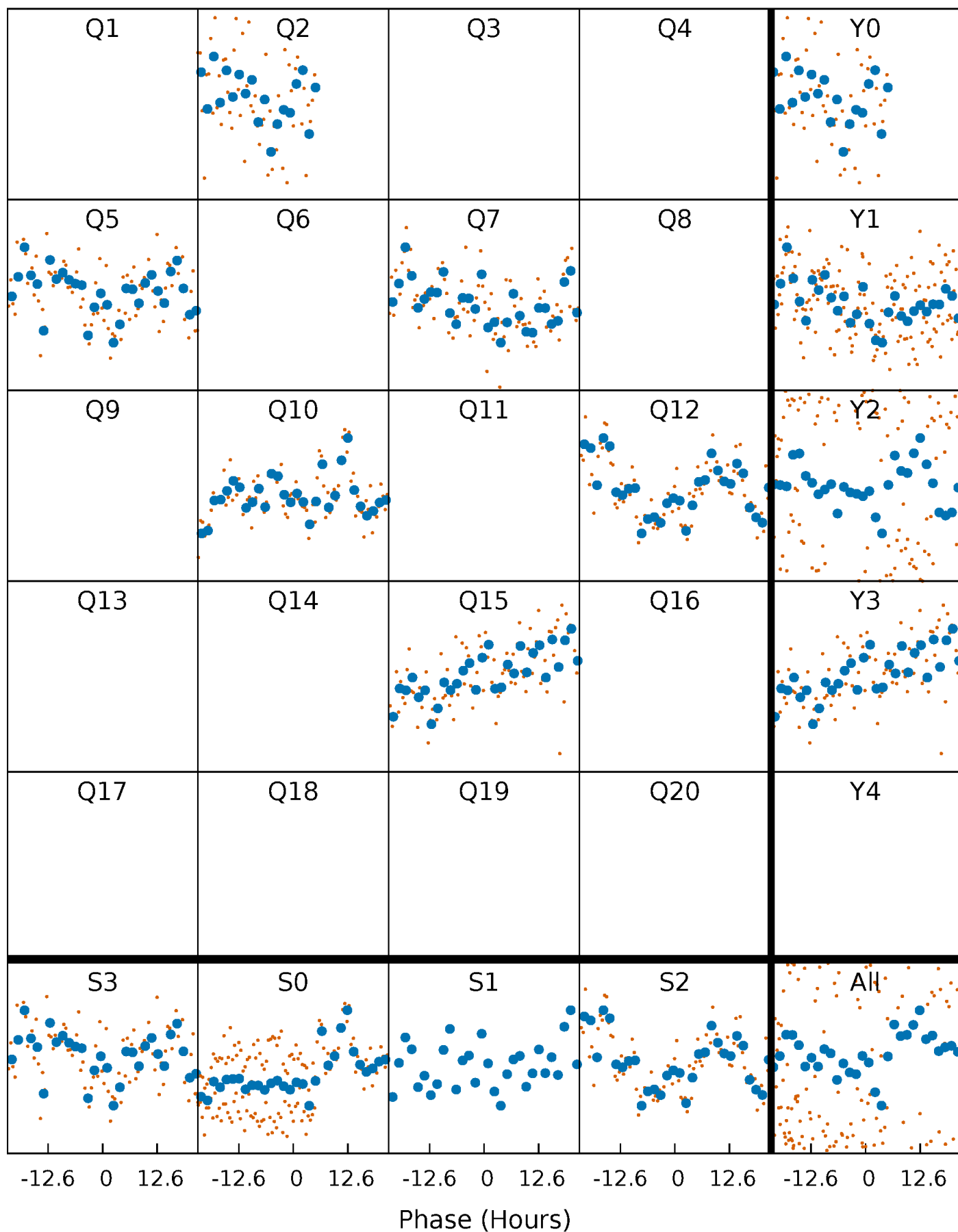


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



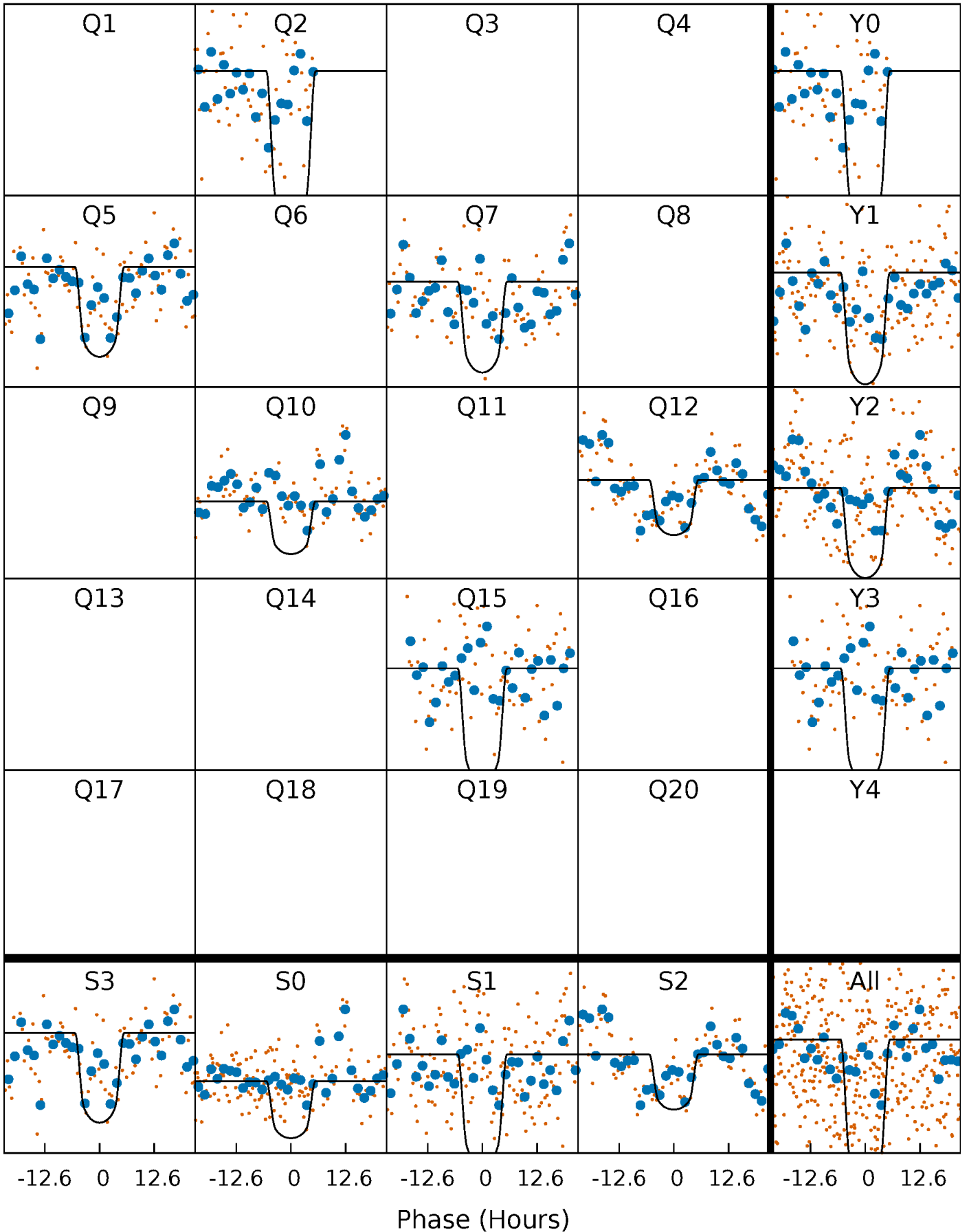
# PDC Quarter-Phased Transit Curves

TCE 010006096-04 P=231.191041 Days  $T_0=255.176155$  (BKJD)



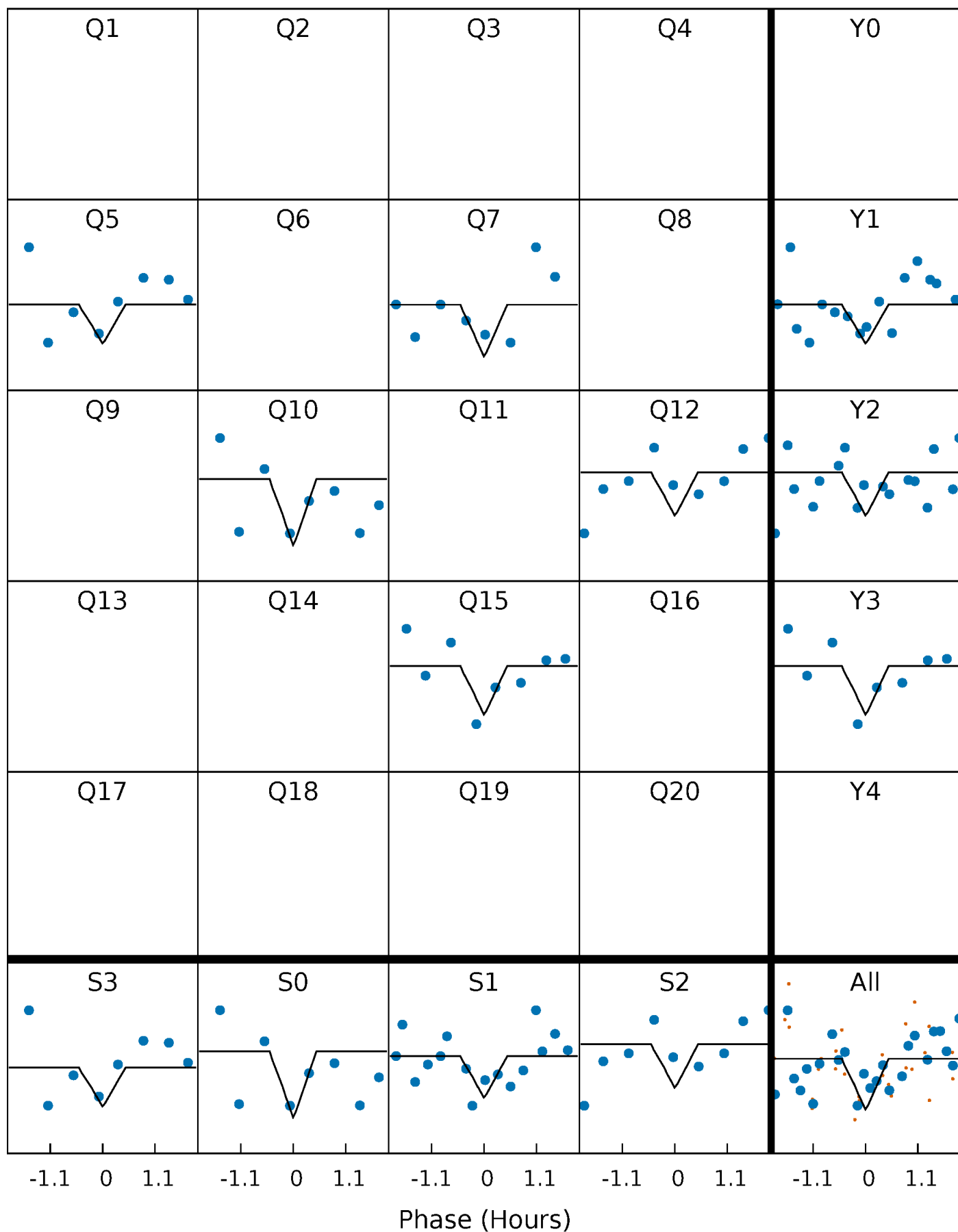
# DV Quarter-Phased Transit Curves

TCE 010006096-04     $P=231.191041$  Days     $T_0=255.176155$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

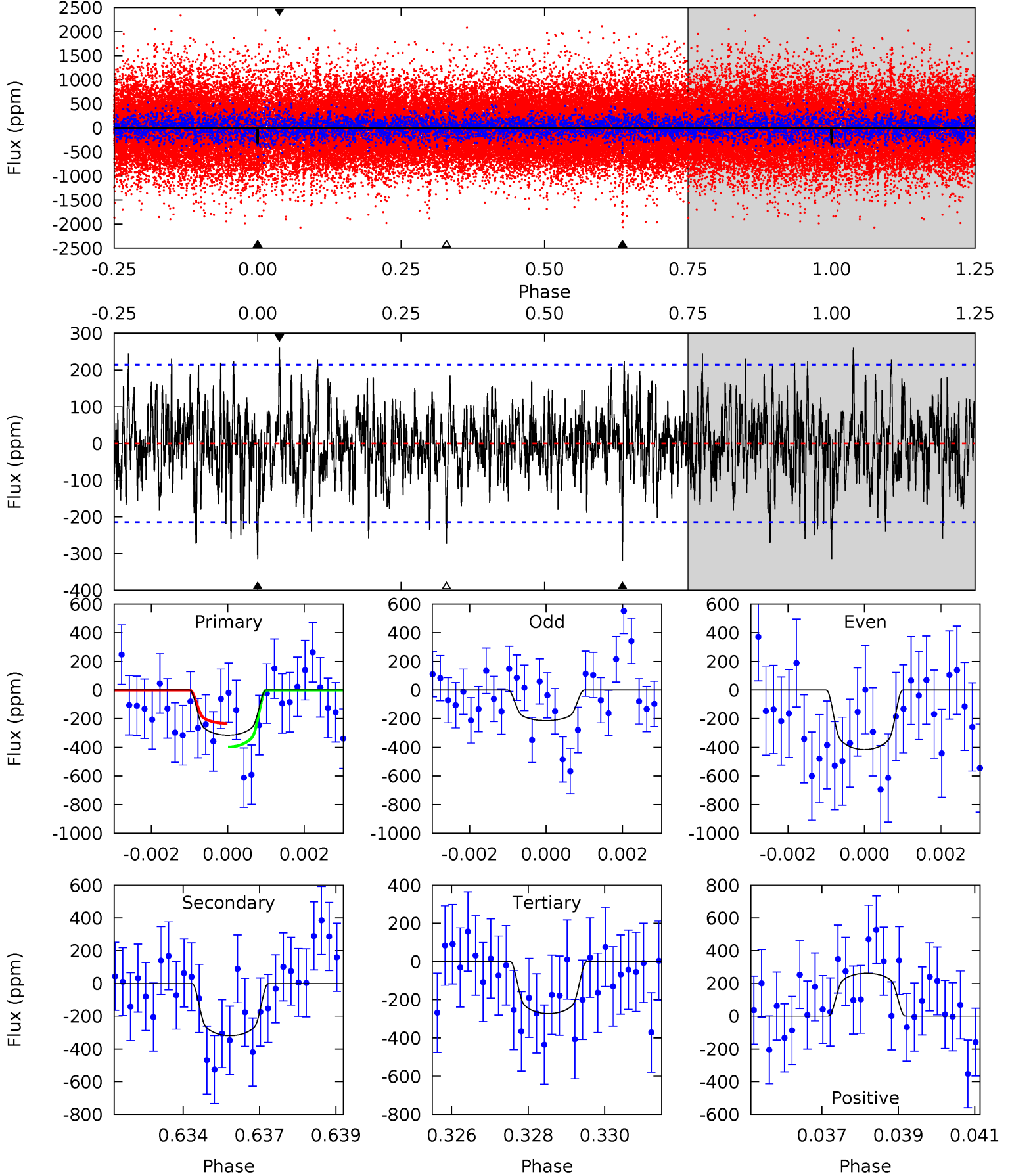
TCE 010006096-04 P=231.074365 Days  $T_0=255.885558$  (BKJD)



# DV Model-Shift Uniqueness Test

010006096-04, P = 231.191041 Days, E = 23.985114 Days

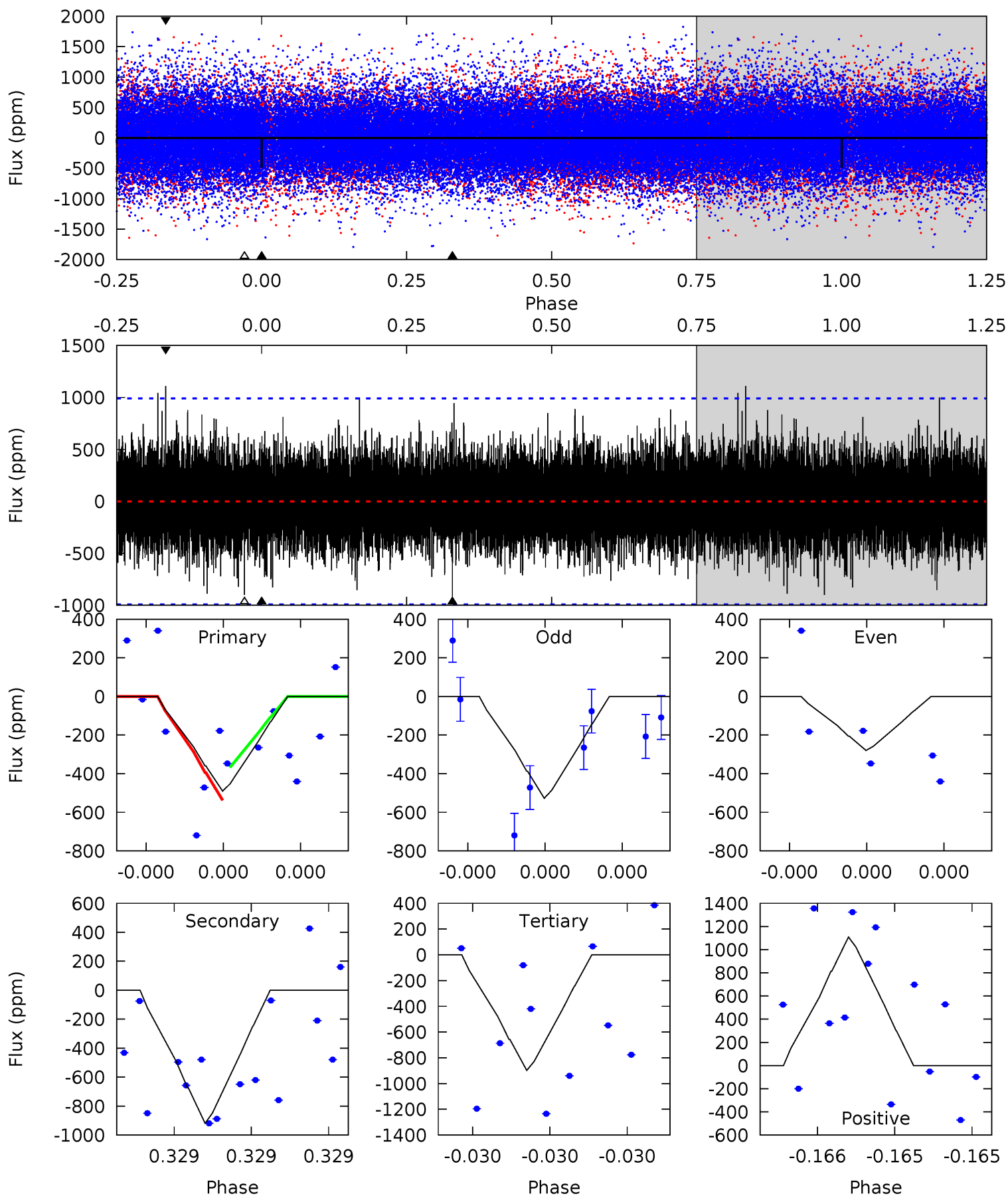
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.83	7.94	6.78	6.50	5.32	3.08	1.94	1.05	1.32	1.16	1.44	2.52	1.11	0.45	2.04



# Alt Model-Shift Uniqueness Test

010006096-04, P = 231.074365 Days, E = 24.811193 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
2.89	5.42	5.29	6.54	5.84	3.88	1.30	-2.40	-3.65	0.12	-1.12	0.69	1.09	0.55	0.50





### Stellar Parameters For KIC 010006096

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5511^{+165}_{-148}$	$4.531^{+0.076}_{-0.114}$	$-0.420^{+0.300}_{-0.300}$	$0.789^{+0.145}_{-0.085}$	$0.773^{+0.103}_{-0.055}$	$2.213^{+0.722}_{-0.761}$
	+3%/-3%	+2%/-3%	+71%/-71%	+18%/-11%	+13%/-7%	+33%/-34%
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 010006096-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-320 \pm 40$	$3.30^{+0.43}_{-0.35}$	$370^{+17}_{-17}$	$4072^{+183}_{-174}$	$7438^{+2074}_{-1686}$
Alt.	$-919 \pm 170$	$2.14^{+0.35}_{-0.32}$	$369^{+18}_{-16}$	$6100^{+618}_{-442}$	$51830^{+21801}_{-15325}$

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

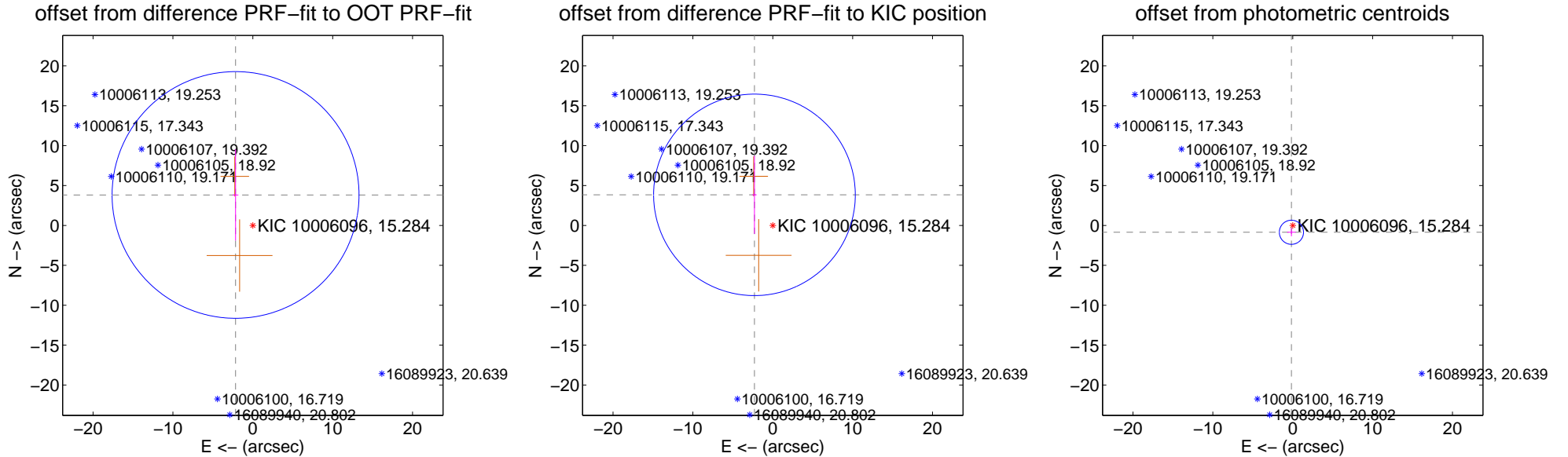
## DV Centroid Data

Supplemental centroid analysis for 010006096-04. Kepler magnitude: 15.28. Transit SNR 9.21

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.389 \pm 5.152$	0.85	$2.160 \pm 0.353$	$3.820 \pm 5.723$
PRF-fit source offset from KIC position	$4.467 \pm 4.208$	1.06	$2.293 \pm 0.274$	$3.834 \pm 4.900$
photometric centroid source offset	$0.87 \pm 0.50$	1.73	$0.16 \pm 0.53$	$-0.86 \pm 0.50$

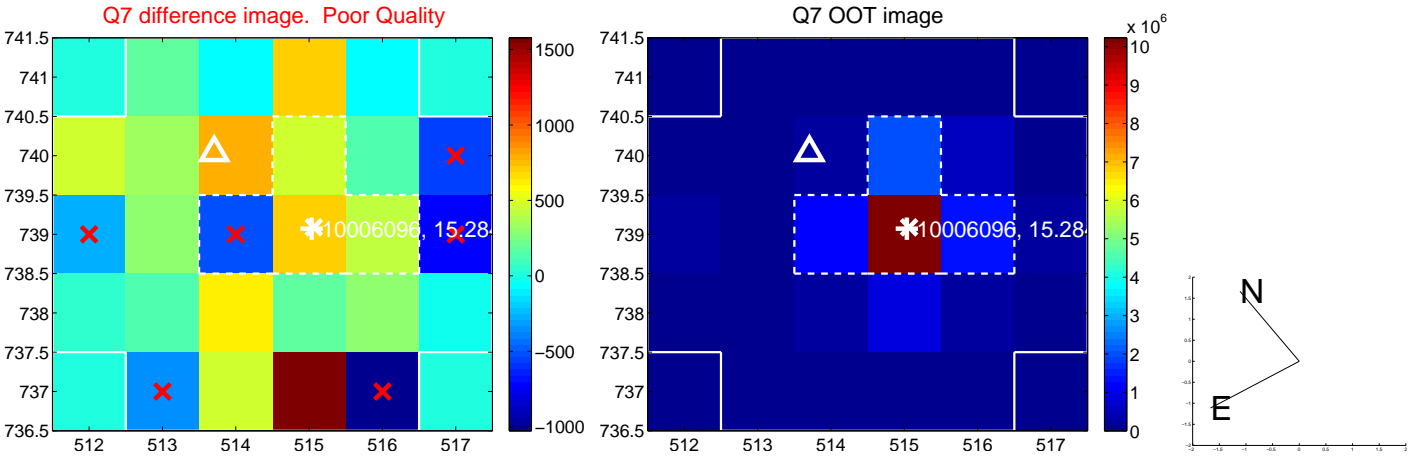
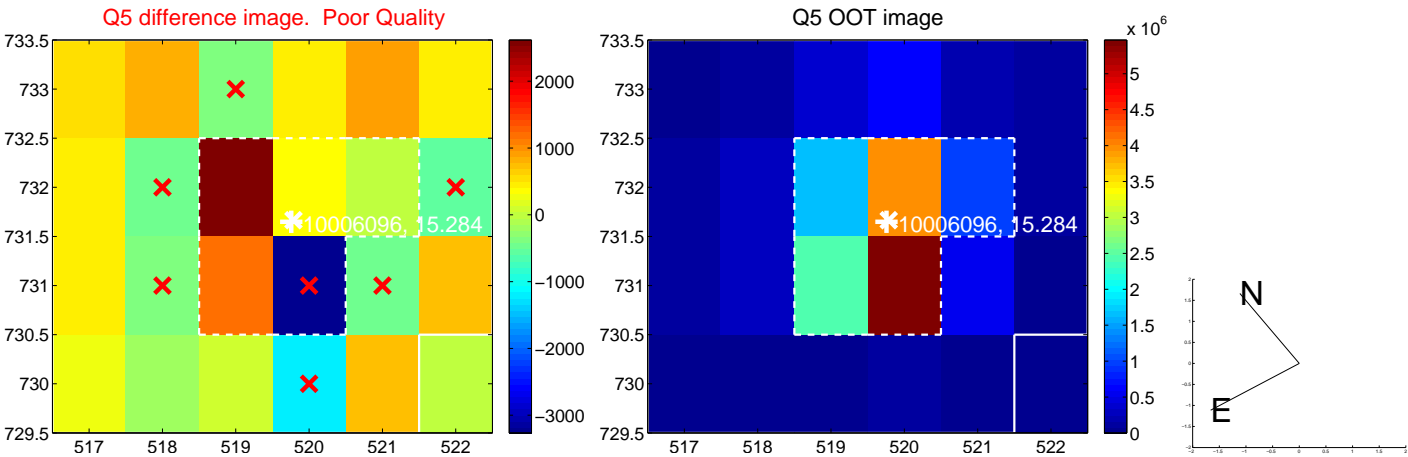


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

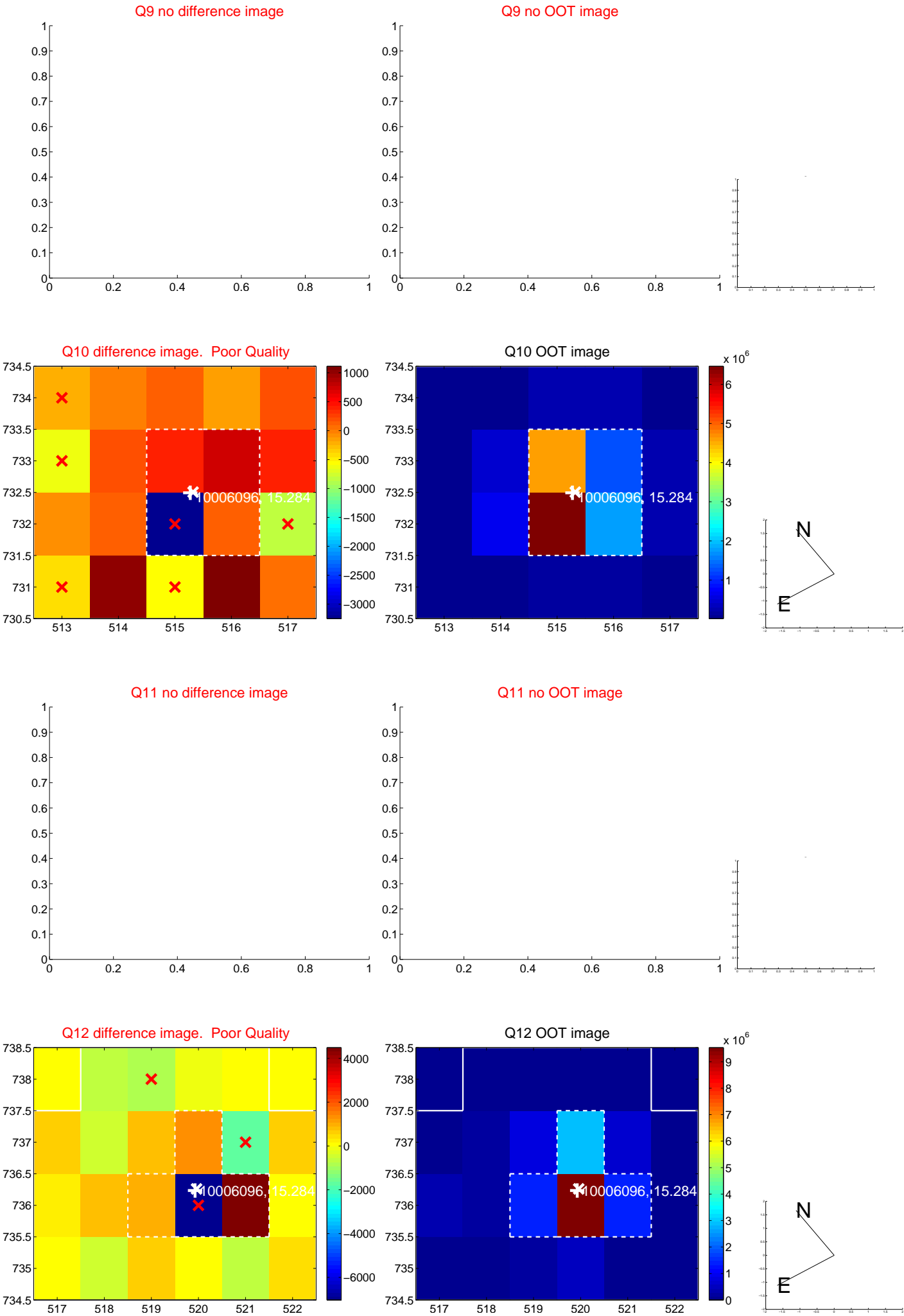
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



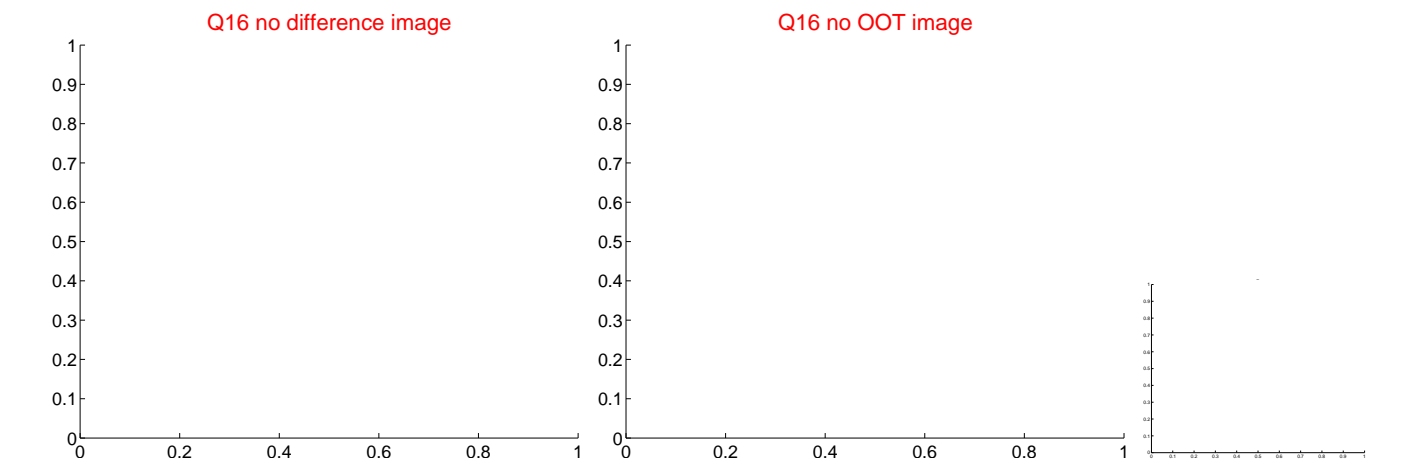
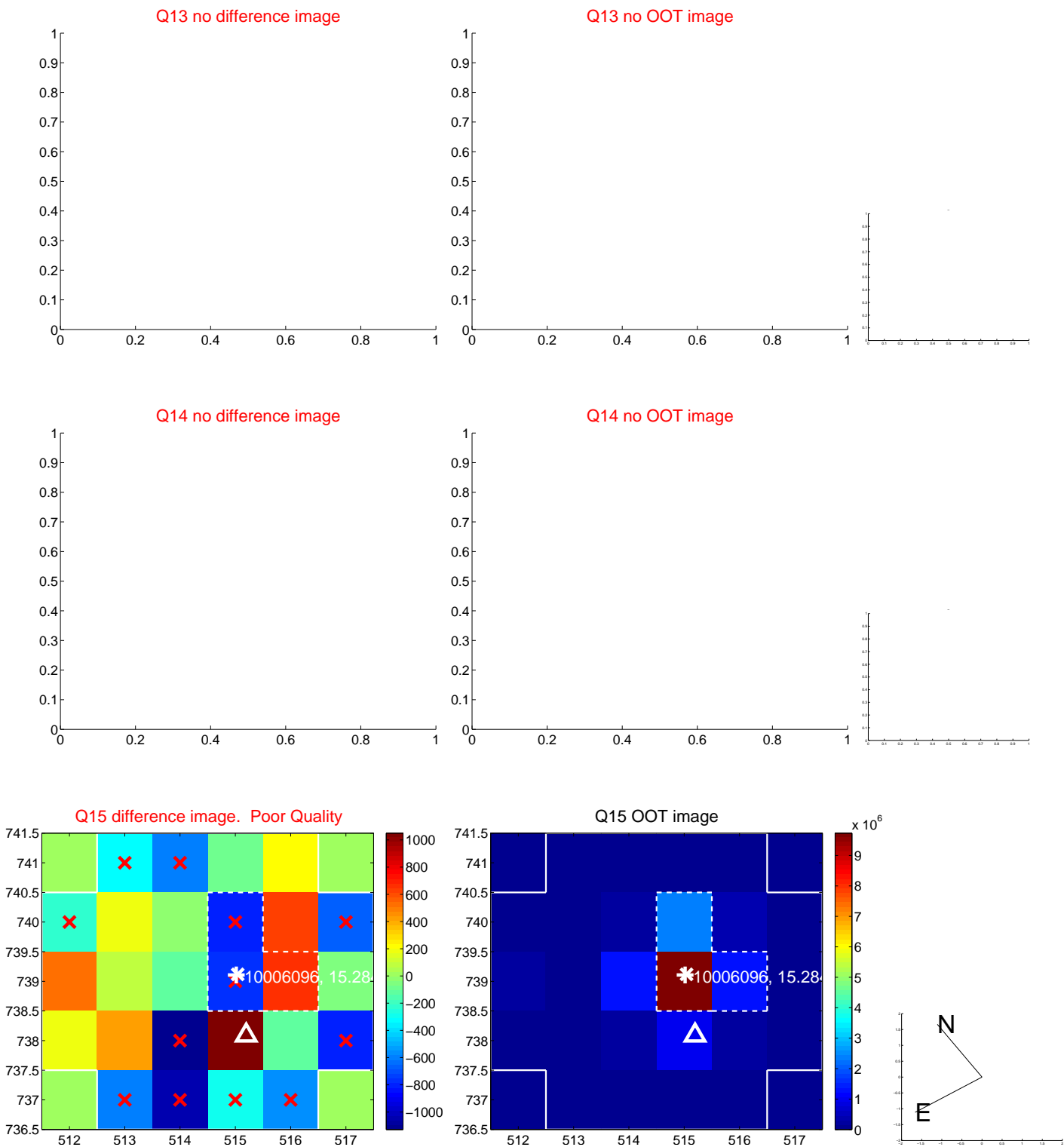
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



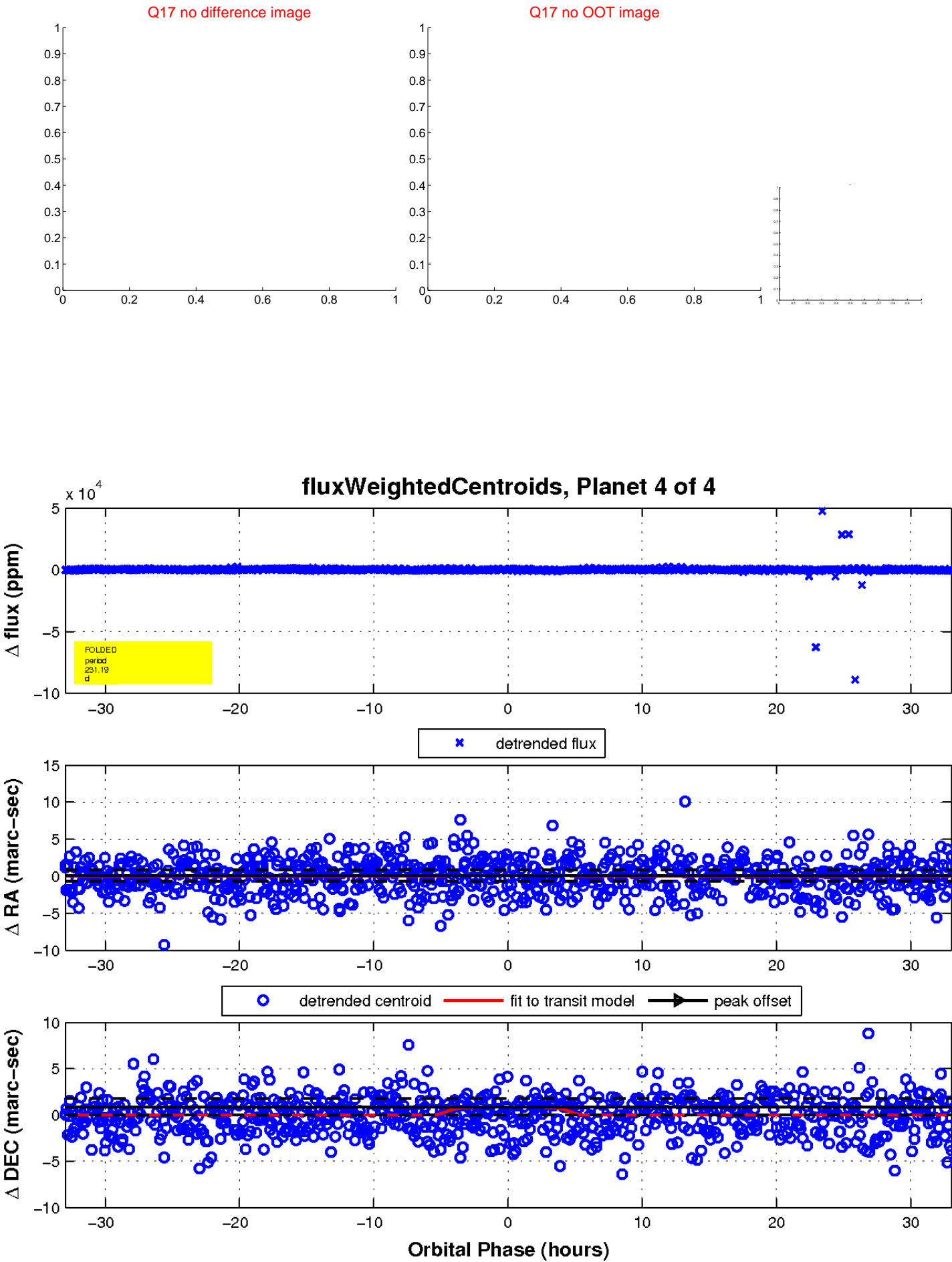
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

