

# KIC 005511076

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005511076-01	OBS	No	6.513105	136.137932	1.1	2.220	9.2	0.3	1.77	6225	0.22	792.87
005511076-02	OBS	No	6.512776	134.854904	22.4	10.754	9.0	9.0	1.77	6225	1.16	792.92

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005511076-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005511076-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD—CENT_KIC_POS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

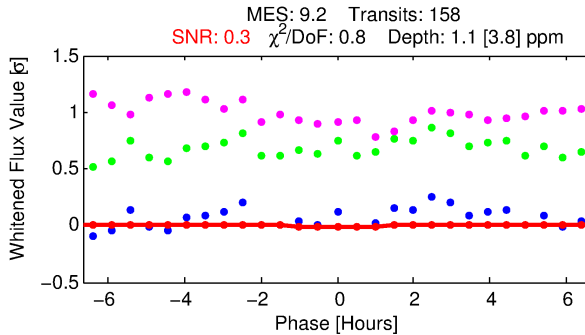
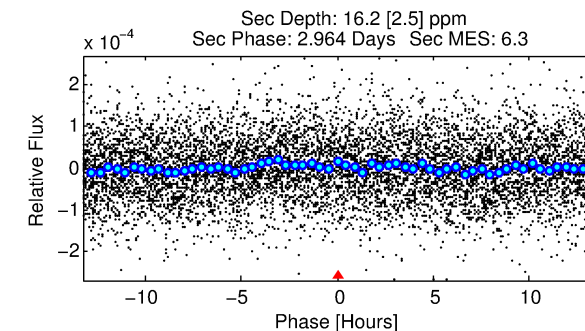
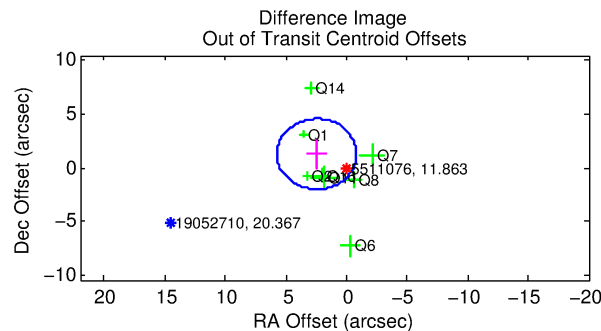
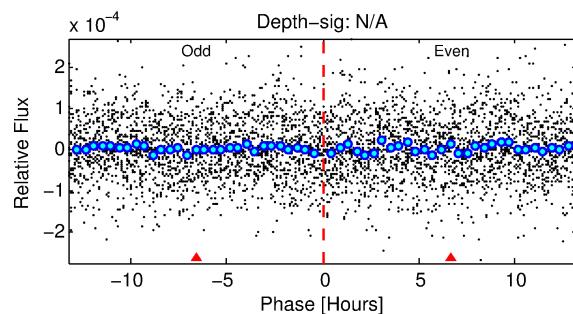
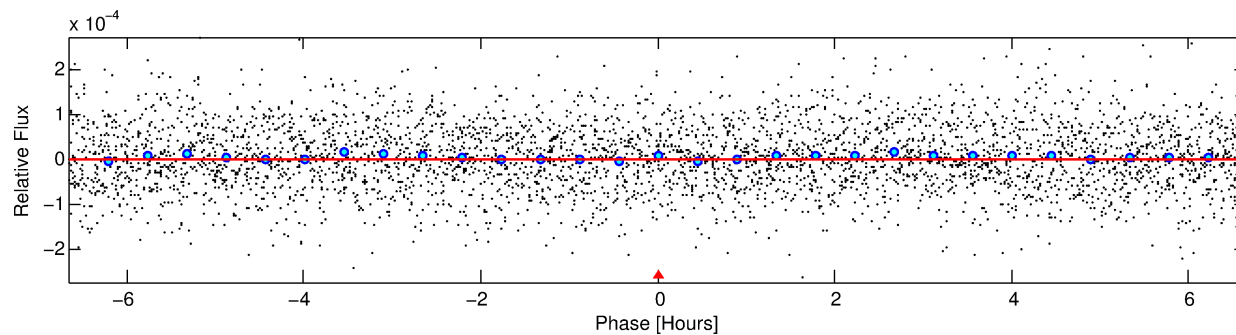
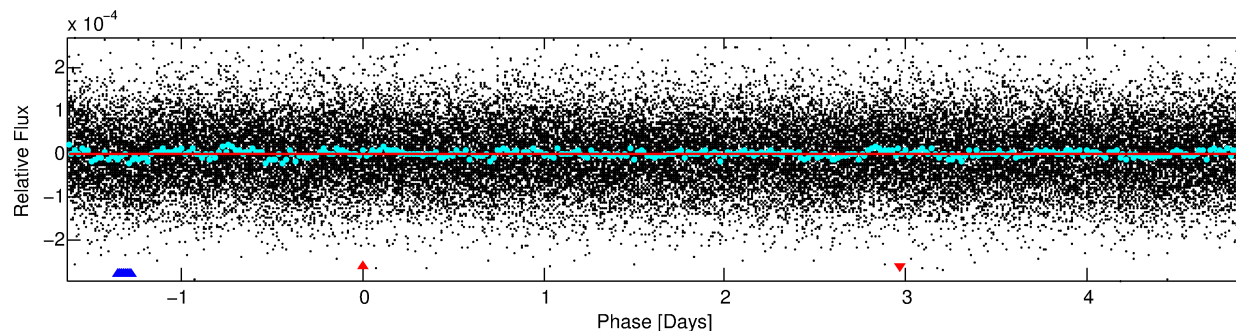
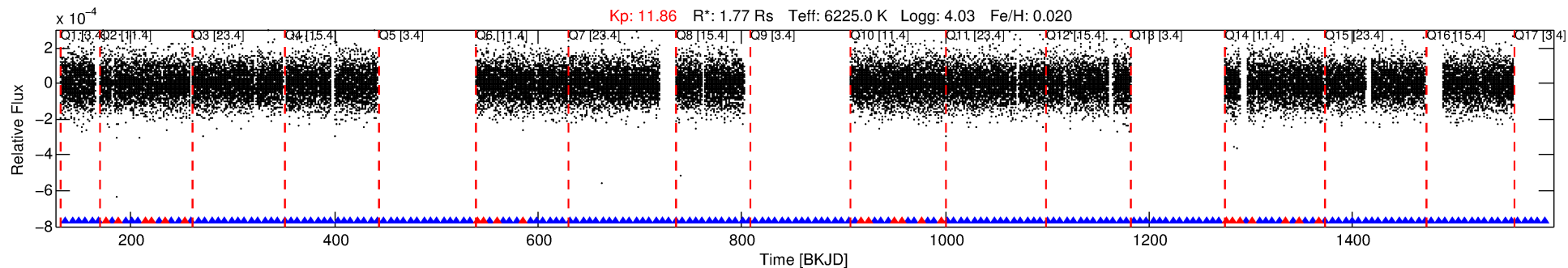
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005511076-01

No Significant Match Found

# DV One-Page Summary

KIC: 5511076 Candidate: 1 of 2 Period: 6.513 d



## DV Fit Results:

Period = 6.51311 [0.00126] d  
Epoch = 136.1379 [0.1432] BKJD  
 $R_p/R^* = 0.0011$  [0.0024]  
 $a/R^* = 9.95$  [58.32]  
 $b = 0.90$  [1.35]  
 $\text{Seff} = 792.87$  [333.74]  
 $\text{Teq} = 1353$  [142] K  
 $R_p = 0.22$  [0.47]  $R_e$   
 $a = 0.0731$  [0.0188] AU  
 $\text{Ag} = 1009.29$  [4370.25] [0.23σ]  
 $\text{Teff} = 11792$  [12714] K [0.8σ]

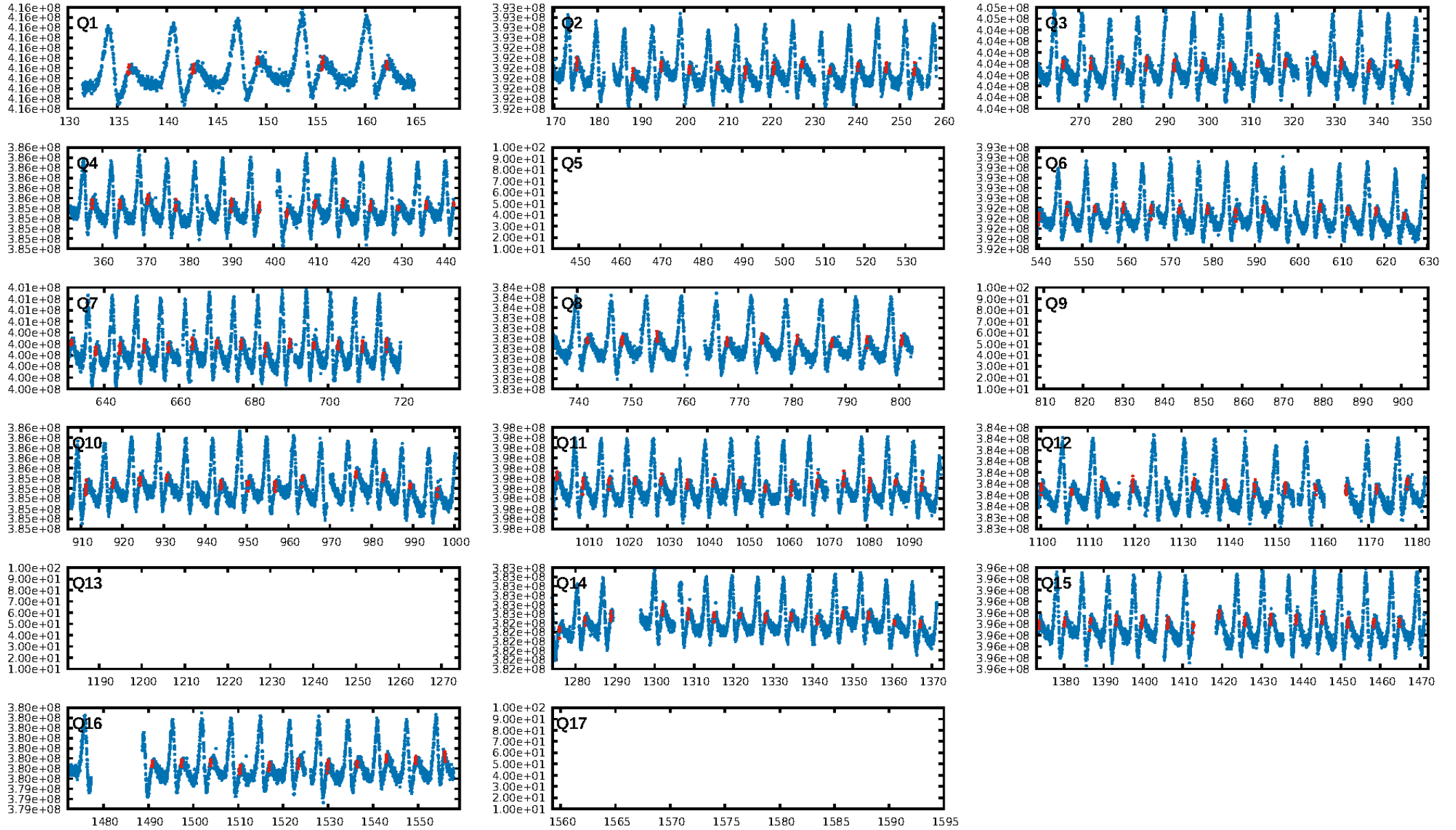
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.90e-18  
RollingBand-fgt: 0.85 [130/153]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 2.795 arcsec [2.55σ]  
KicOffset-rm: 2.917 arcsec [2.84σ]  
OotOffset-st: 3/2/2/1 [8]  
KicOffset-st: 3/2/2/1 [8]  
DiffImageQuality-fgm: 0.00 [0/8]  
DiffImageOverlap-fno: 1.00 [13/13]

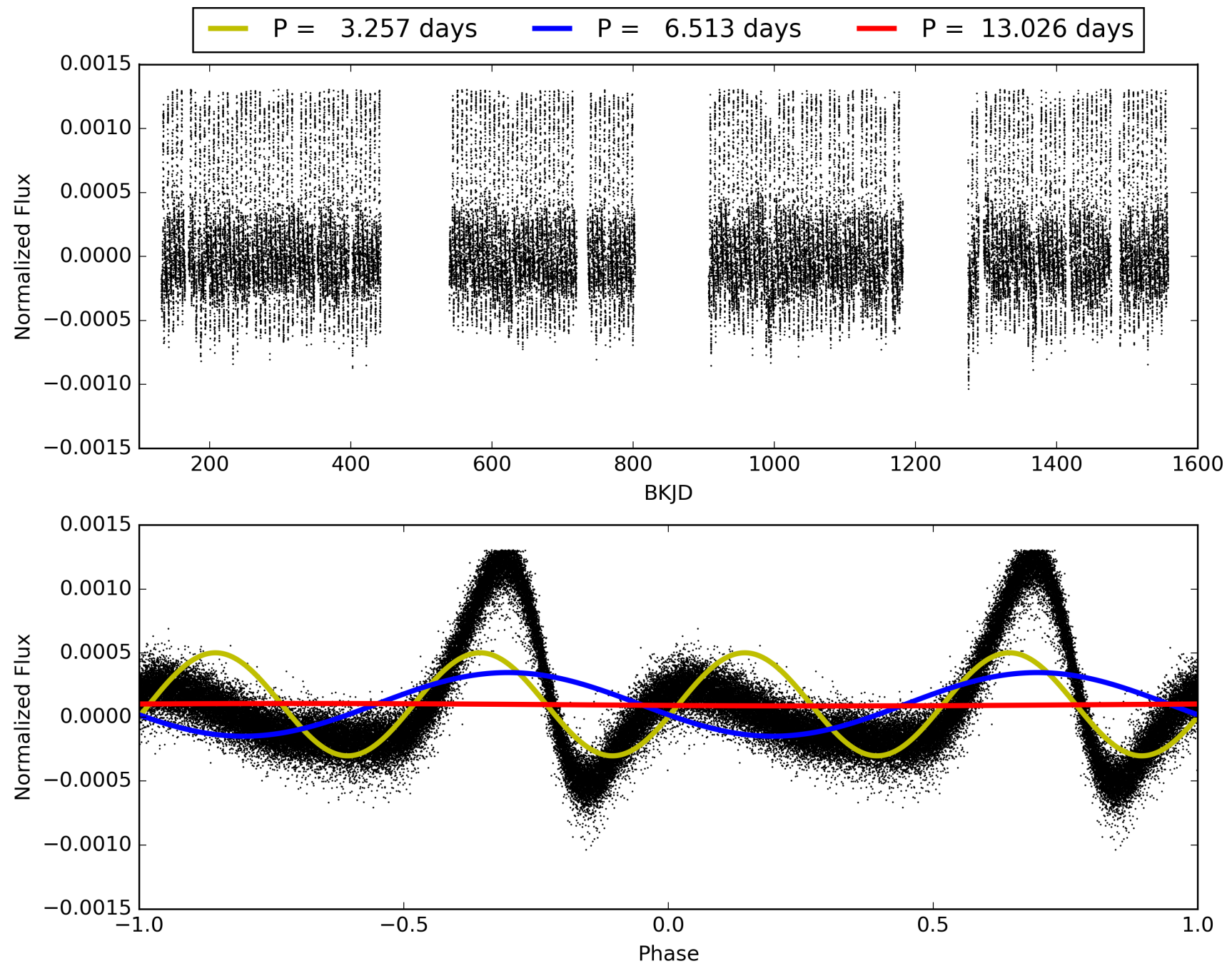
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:57:12 Z

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

# TCE 005511076-01, PDC Light Curves

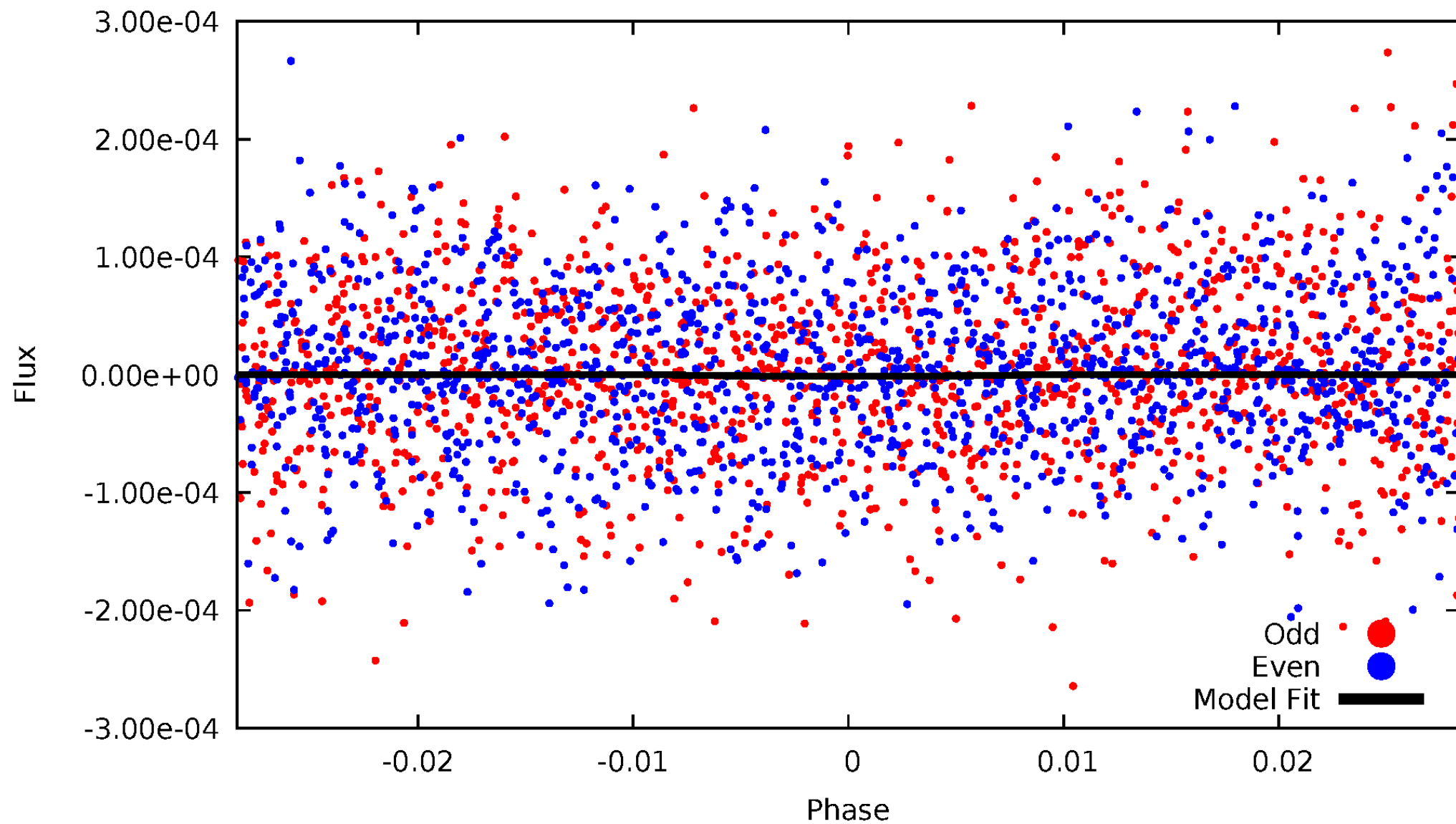


# TCE 005511076-01



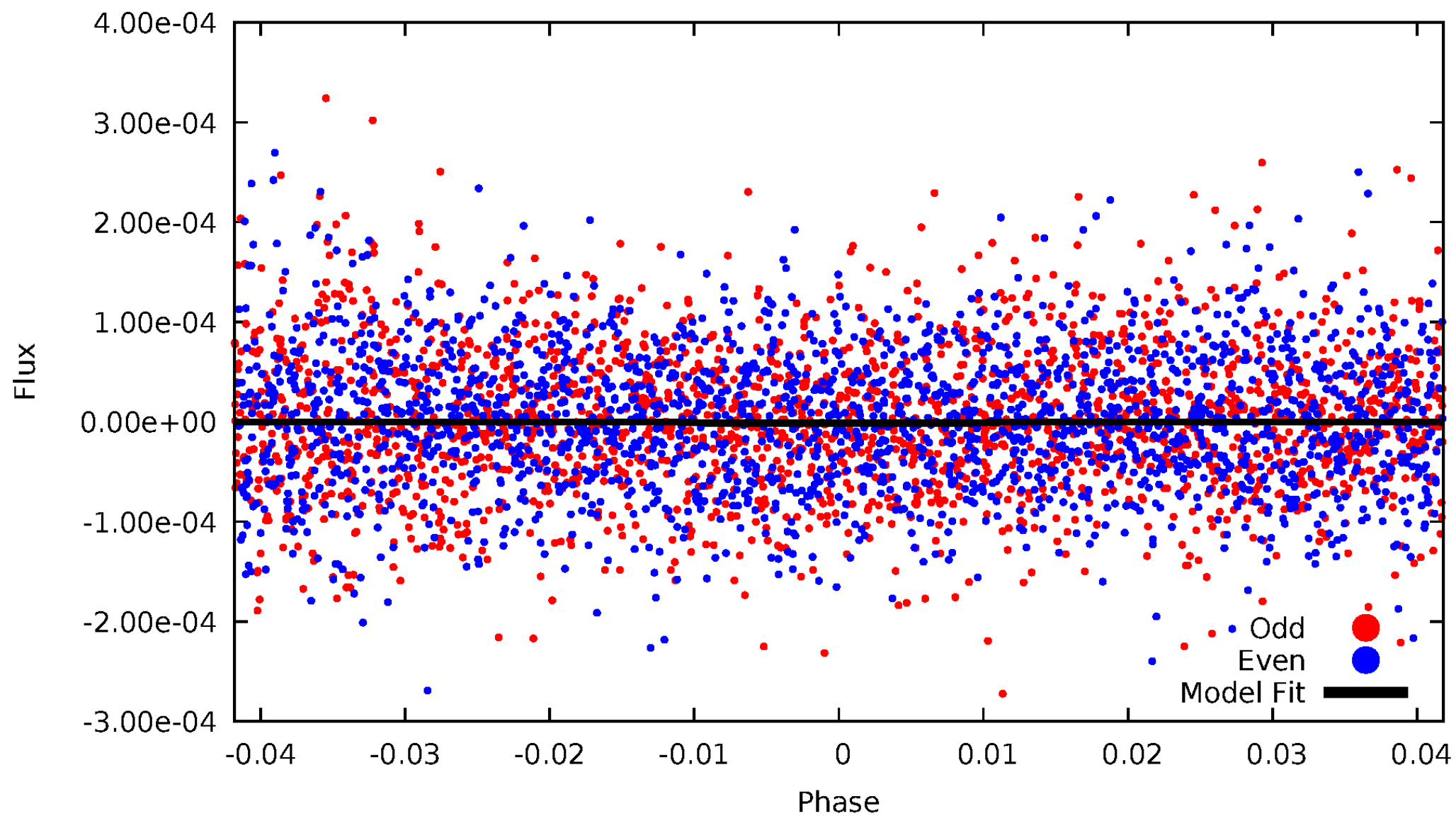
# DV Odd/Even

TCE 005511076-01



# ALT Odd/Even

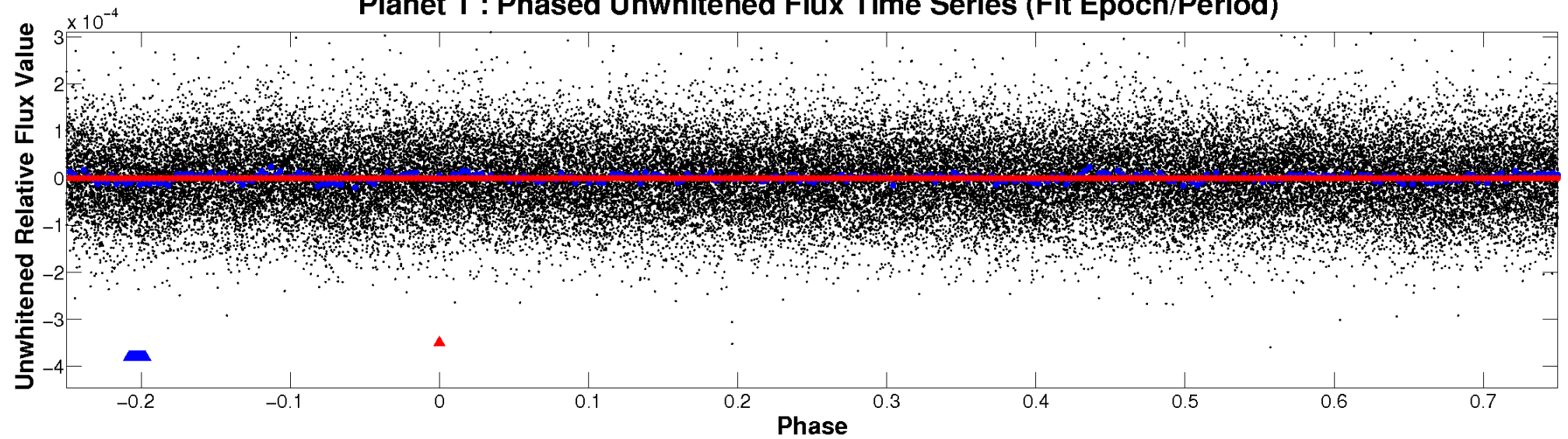
TCE 005511076-01



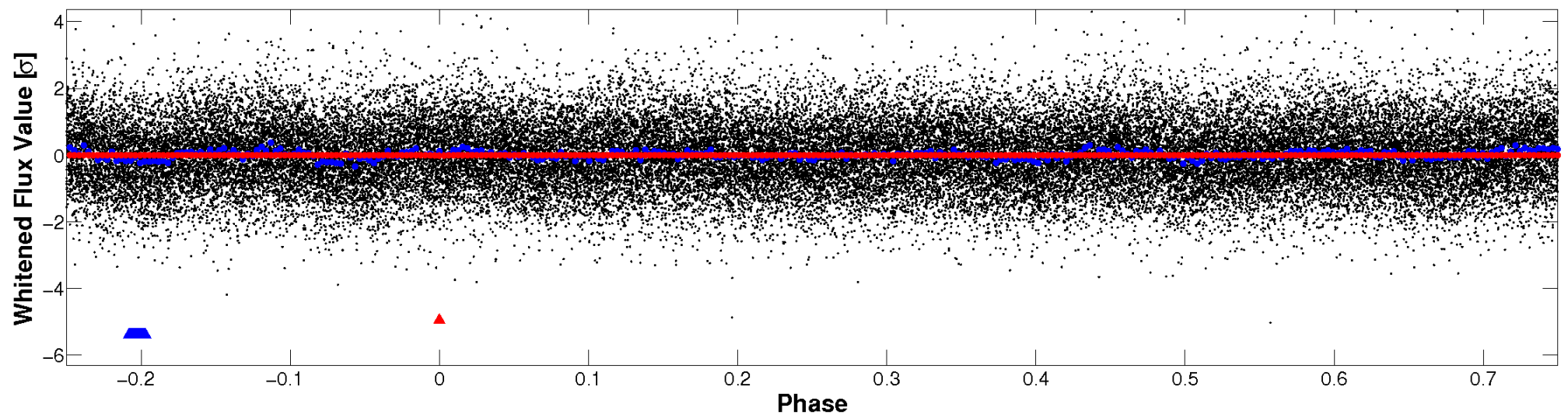


# Non-Whitened Vs. Whitened Light Curve

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

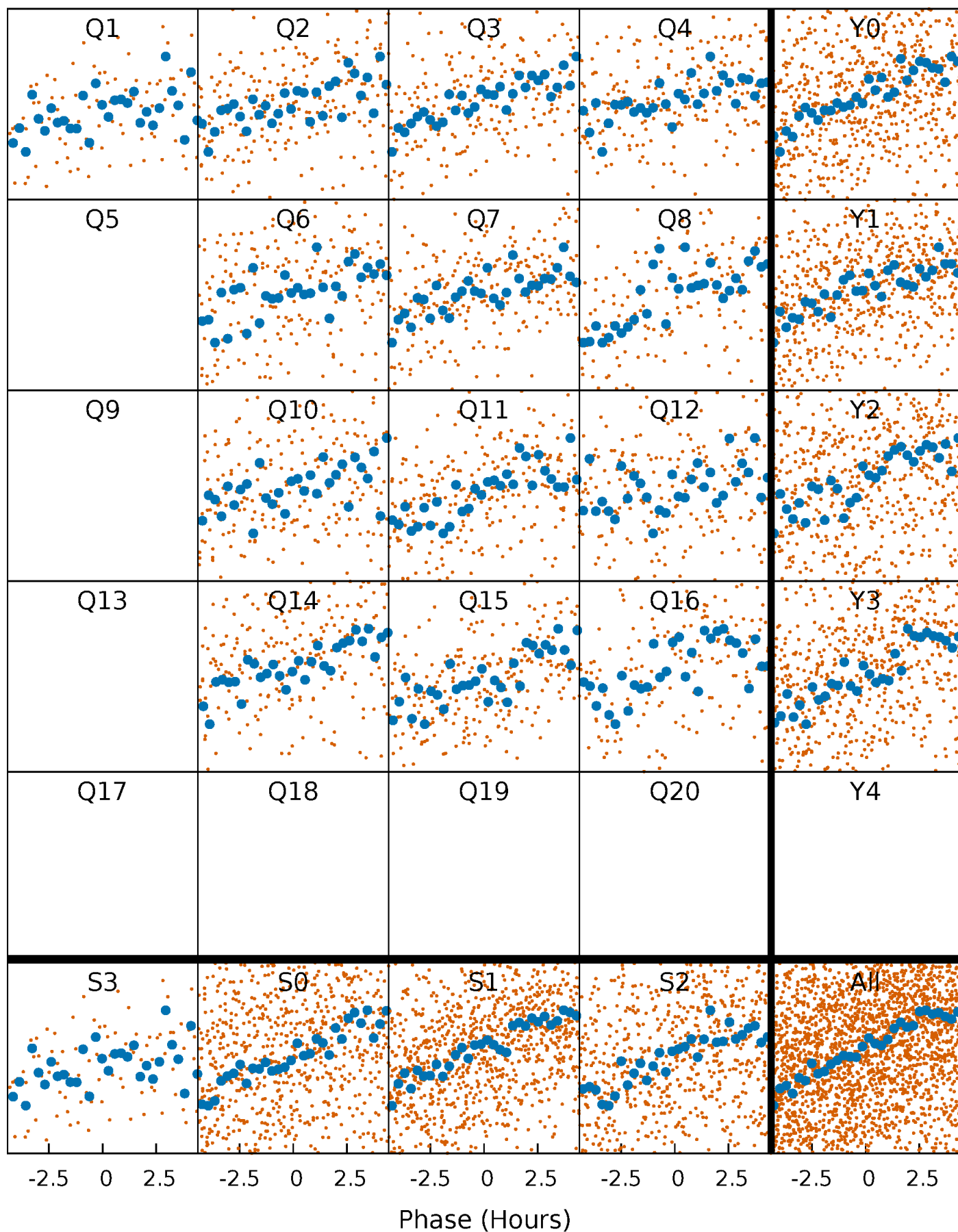


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

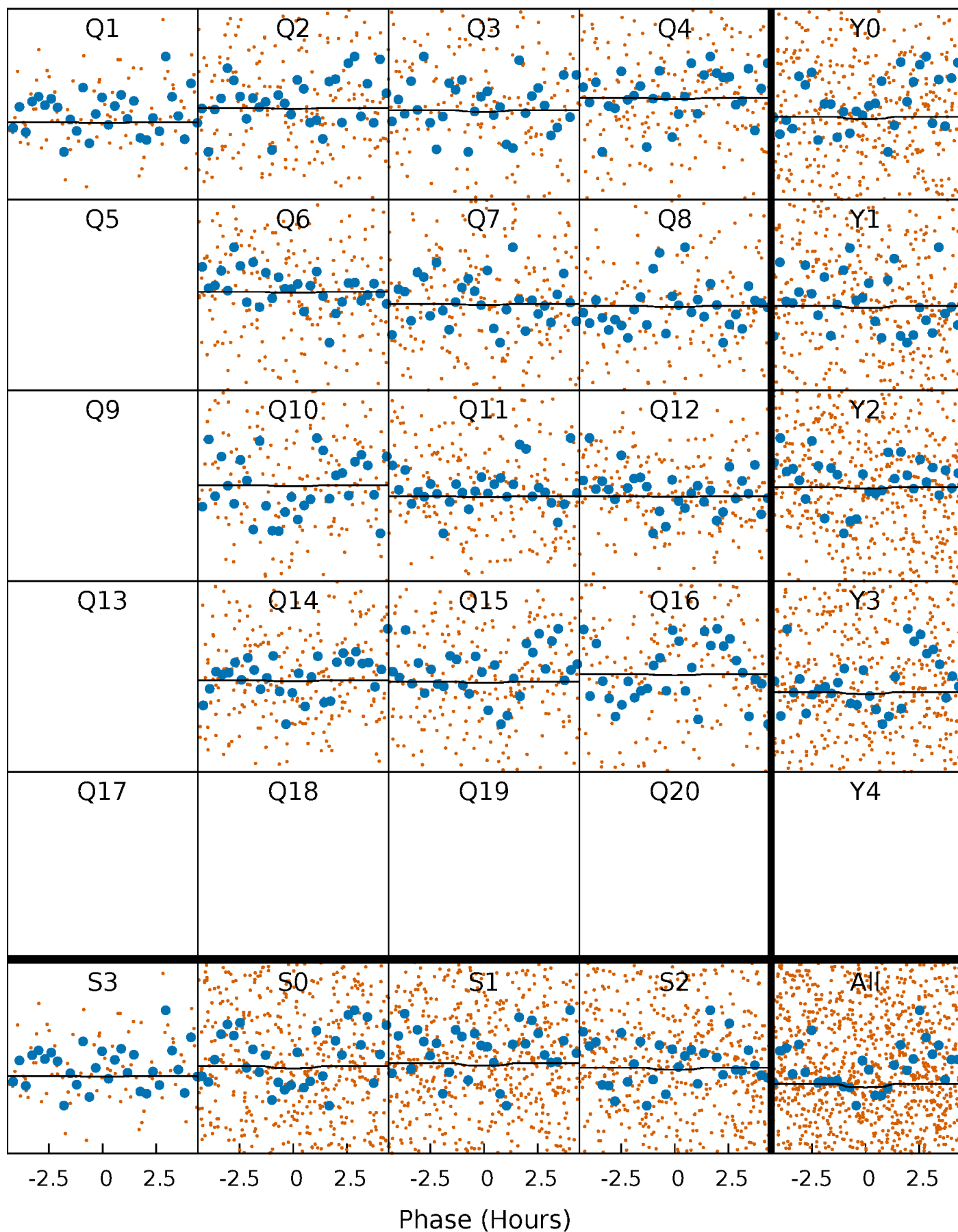
TCE 005511076-01 P= 6.513105 Days  $T_0=136.137932$  (BKJD)





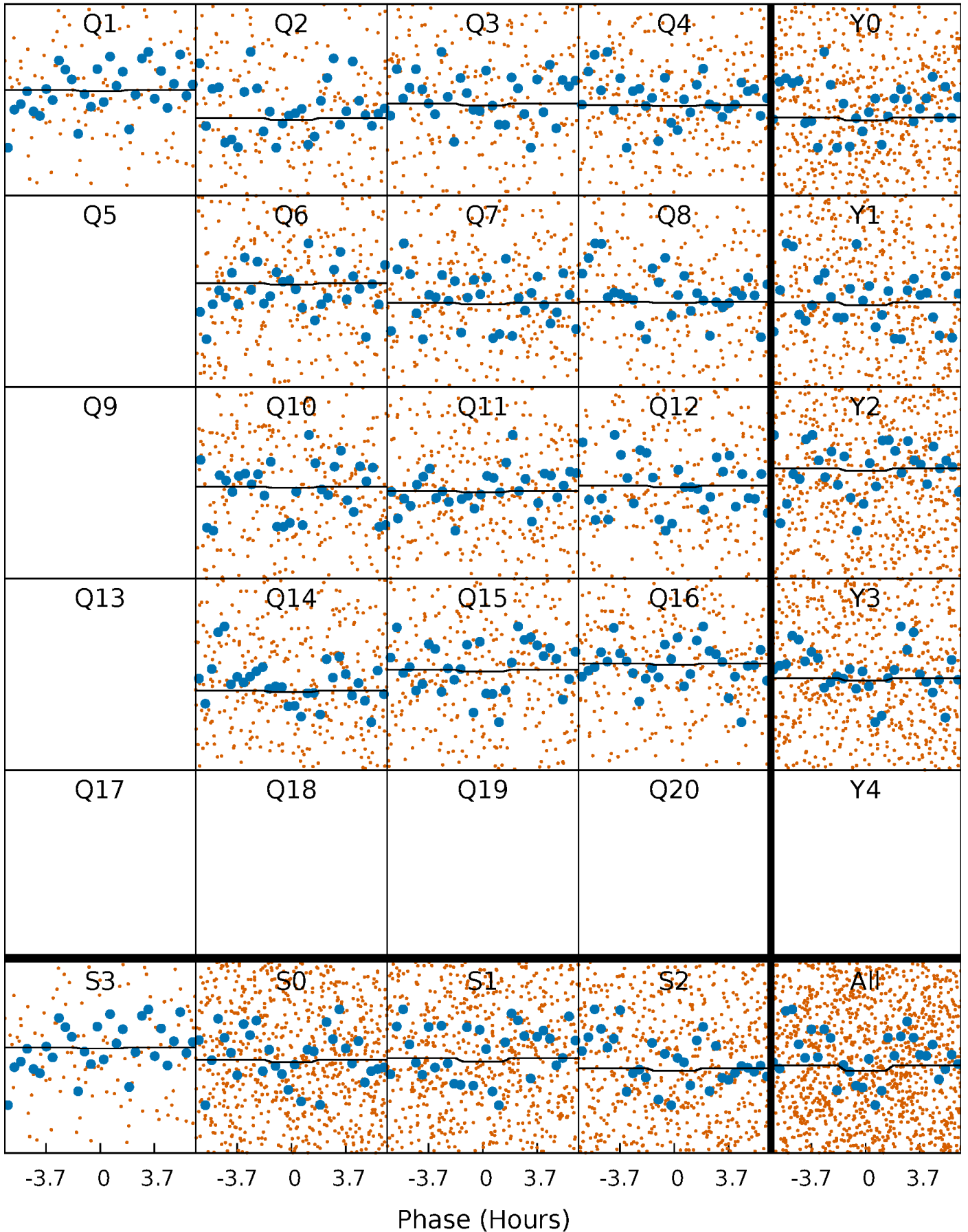
# DV Quarter-Phased Transit Curves

TCE 005511076-01 P= 6.513105 Days  $T_0=136.137932$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

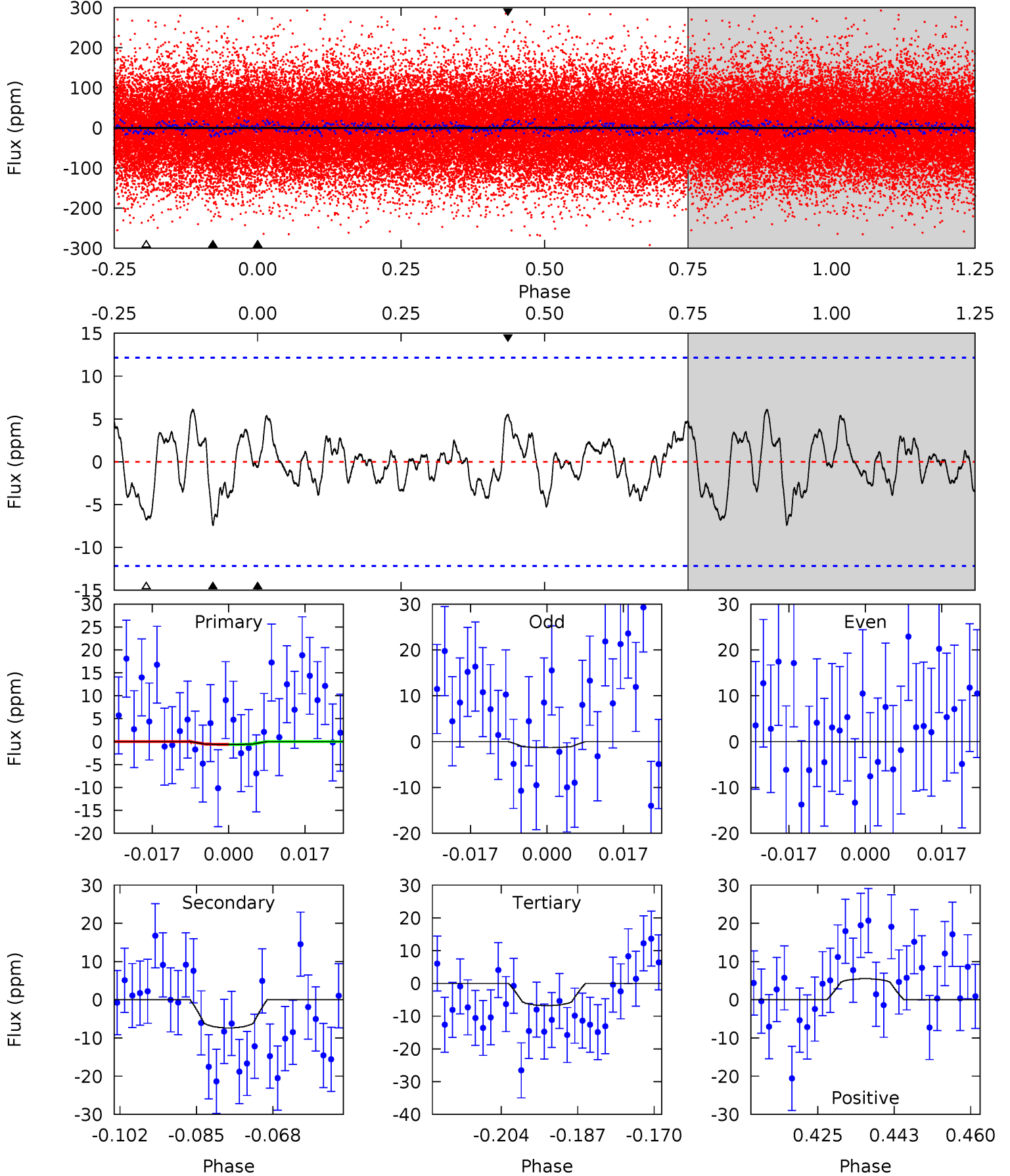
TCE 005511076-01 P= 6.513096 Days  $T_0=136.132740$  (BKJD)



# DV Model-Shift Uniqueness Test

005511076-01, P = 6.513105 Days, E = 129.624827 Days

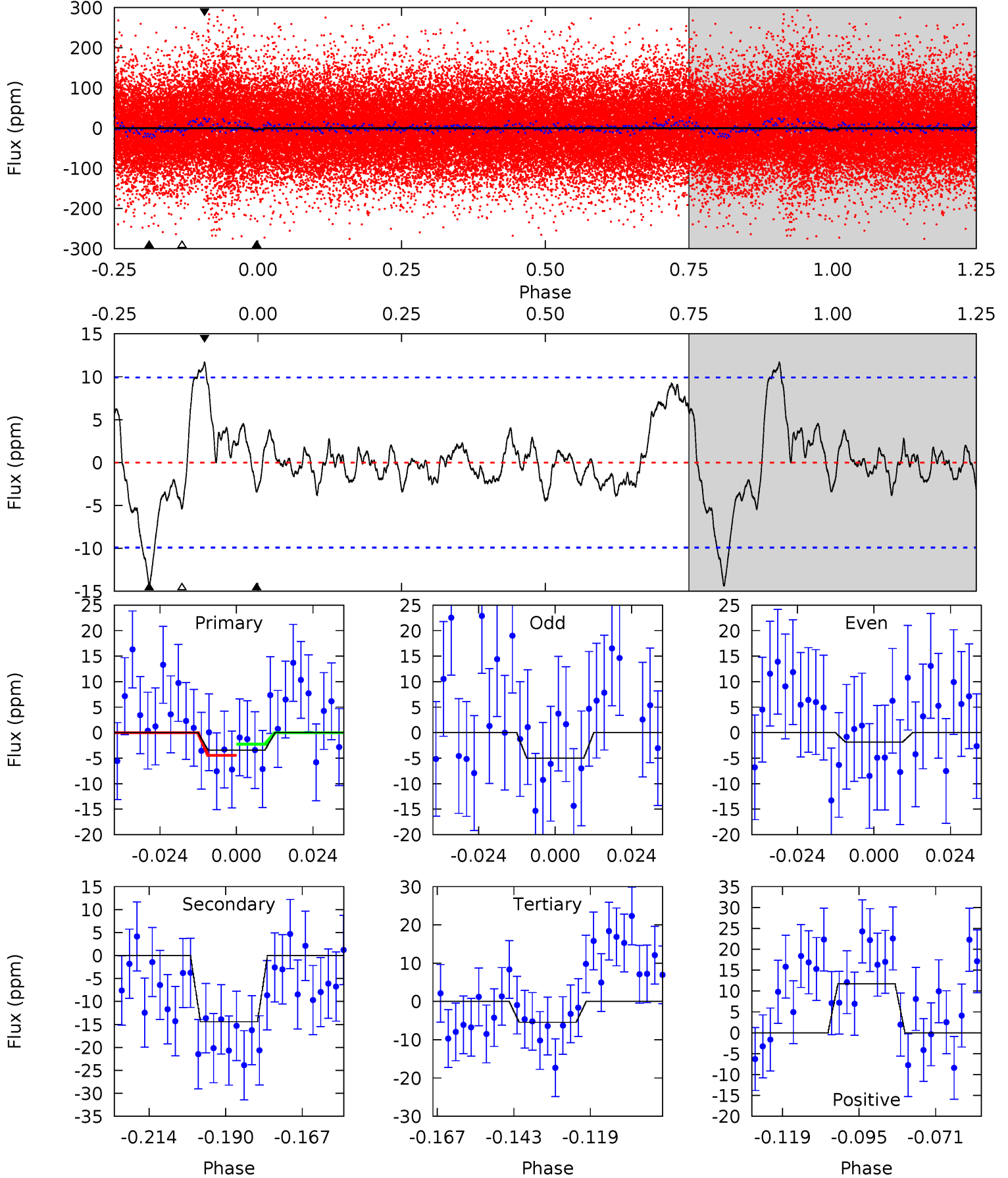
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.25	2.99	2.74	2.23	4.92	2.39	1.02	-2.49	-1.98	0.24	0.75	0.26	0.72	0.45	0.00



# Alt Model-Shift Uniqueness Test

005511076-01, P = 6.513096 Days, E = 129.619644 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
1.67	7.06	2.67	5.76	4.86	2.26	1.67	-1.00	-4.09	4.40	1.31	0.77	1.16	0.45	0.53



### Stellar Parameters For KIC 005511076

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6225^{+167}_{-186}$	$4.029^{+0.234}_{-0.126}$	$0.020^{+0.250}_{-0.250}$	$1.775^{+0.401}_{-0.490}$	$1.225^{+0.185}_{-0.167}$	$0.309^{+0.414}_{-0.112}$
	+3%/-3%	+6%/-3%	+1250%/-1250%	+23%/-28%	+15%/-14%	+134%/-36%
Source	PHO1	FLK73	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 005511076-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-7 \pm 2$	$0.40^{+0.37}_{-0.28}$	$1870^{+117}_{-138}$	$6990^{+9302}_{-2002}$	$128^{+1242}_{-96}$
Alt.	$-14 \pm 2$	$0.41^{+0.42}_{-0.28}$	$1869^{+119}_{-141}$	$8492^{+14996}_{-2638}$	$257^{+2254}_{-192}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



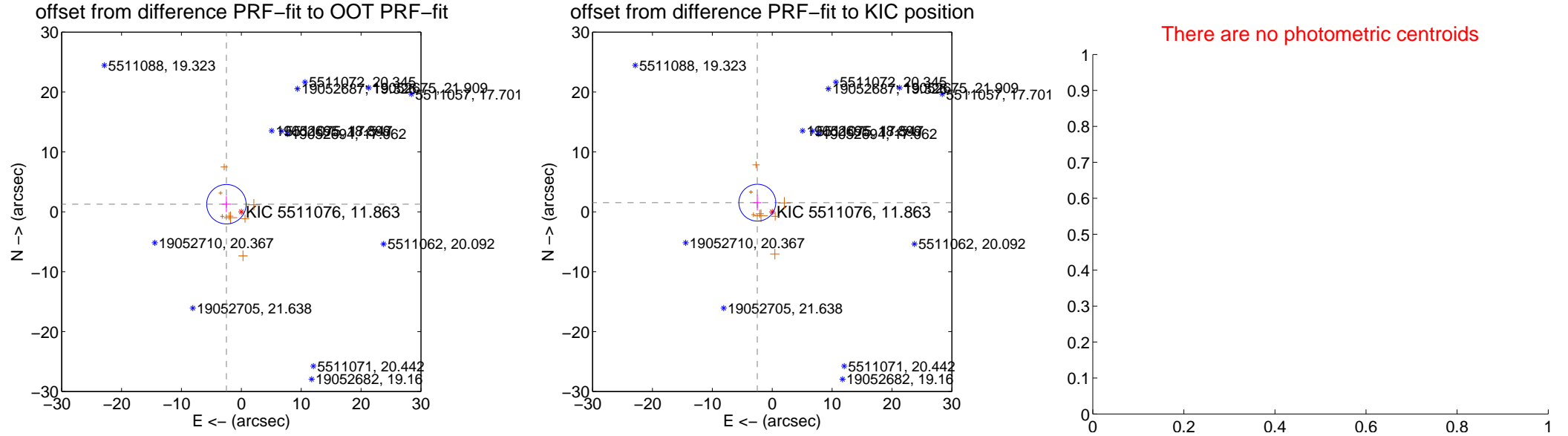
## DV Centroid Data

Supplemental centroid analysis for 005511076-01. **Kepler magnitude: 11.86.** Transit SNR 0.29

**There are 0 quarters with good PRF difference image offsets**

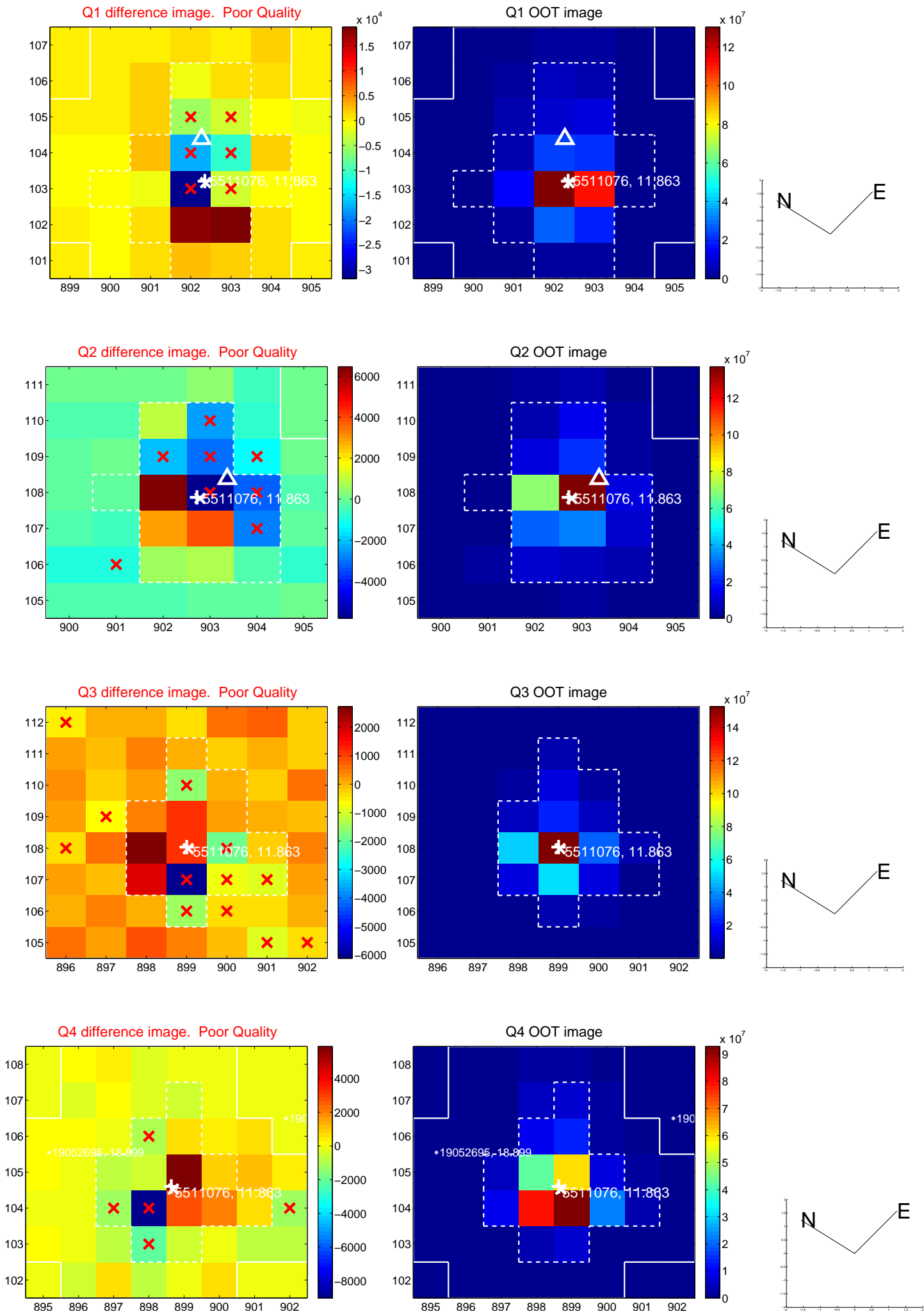
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.795 \pm 1.098$	2.55	$2.490 \pm 0.757$	$1.270 \pm 1.325$
PRF-fit source offset from KIC position	$2.917 \pm 1.026$	2.84	$2.486 \pm 0.673$	$1.526 \pm 1.287$
photometric centroid source offset	—	—	—	—



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.

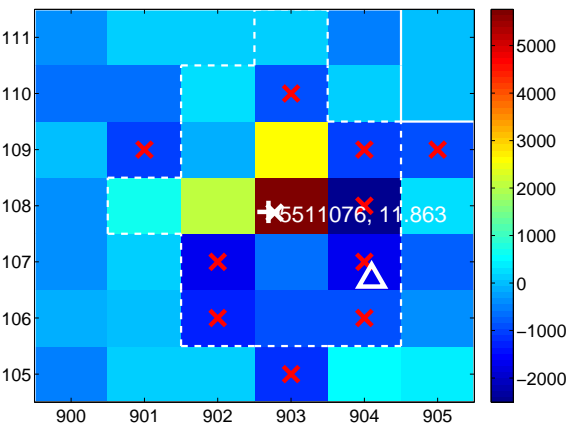
Q5 no difference image



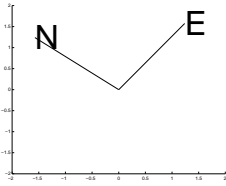
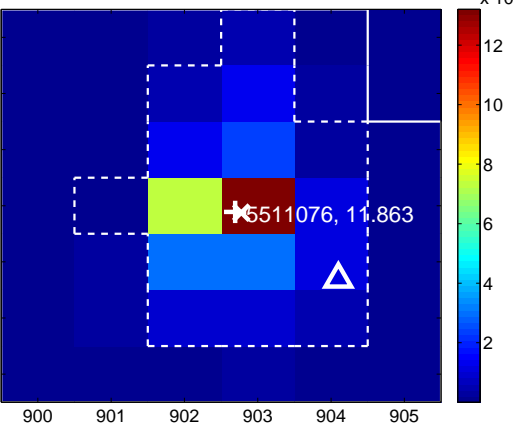
Q5 no OOT image



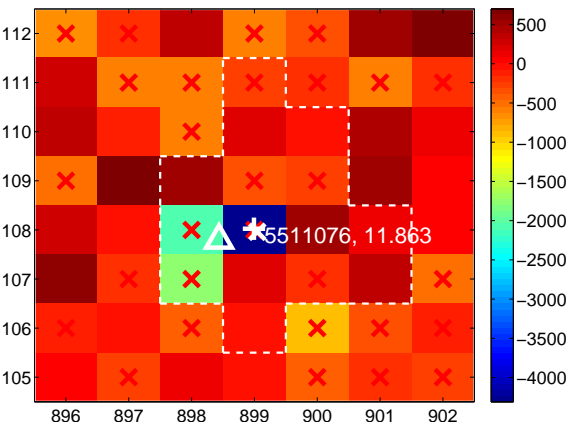
Q6 difference image. Poor Quality



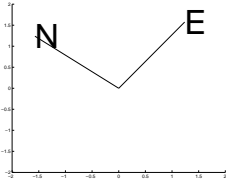
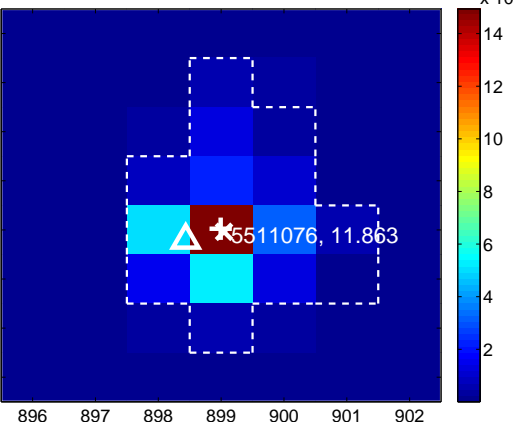
Q6 OOT image



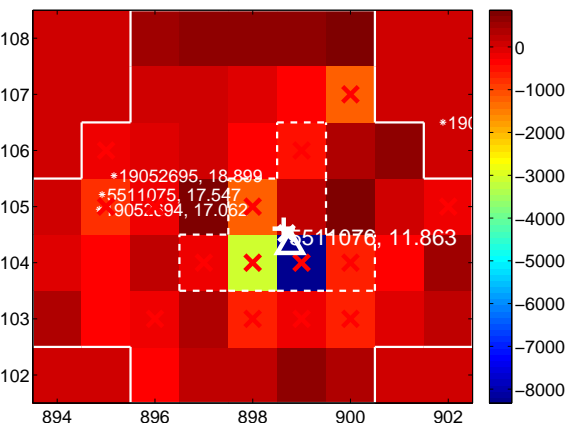
Q7 difference image. Poor Quality



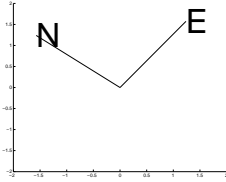
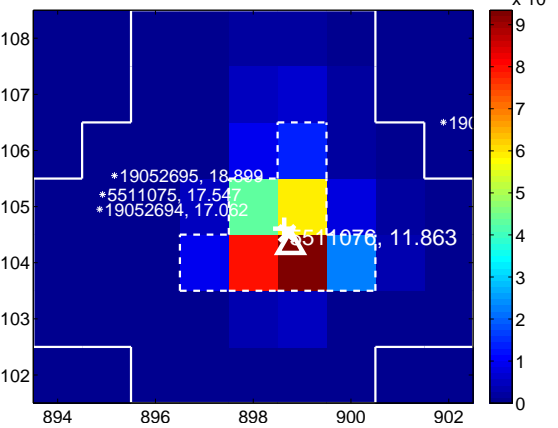
Q7 OOT image



Q8 difference image. Poor Quality



Q8 OOT image

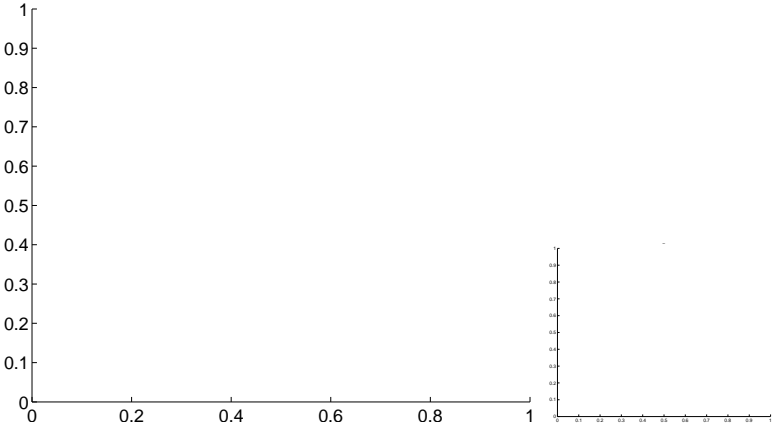


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

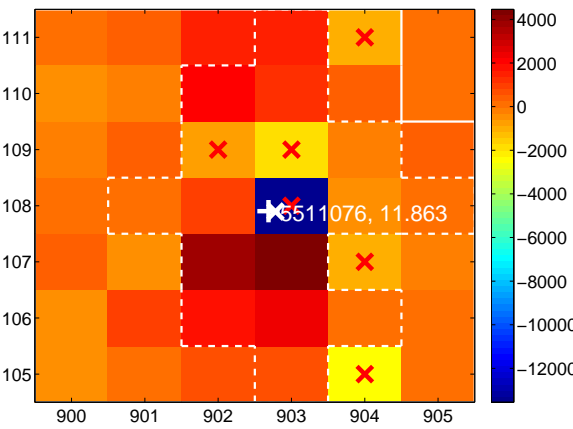
Q9 no difference image



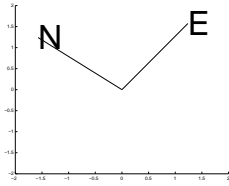
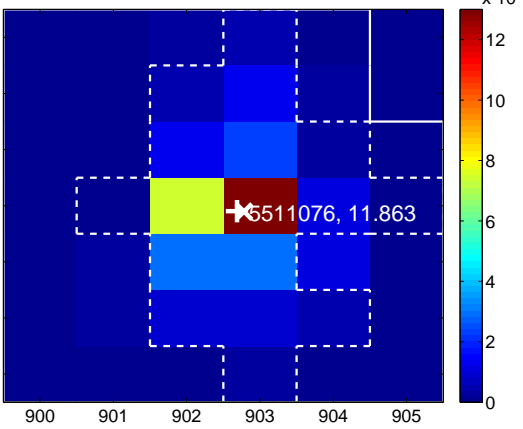
Q9 no OOT image



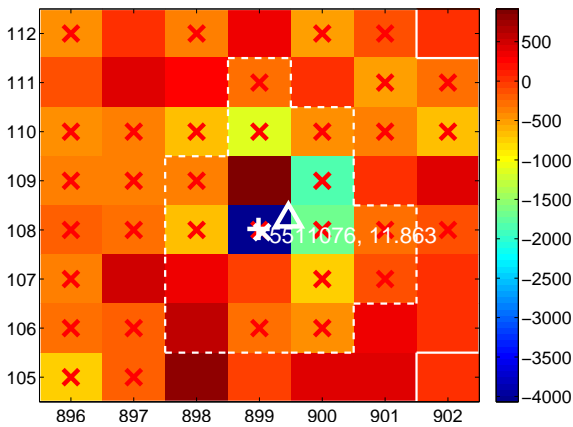
Q10 difference image. Poor Quality



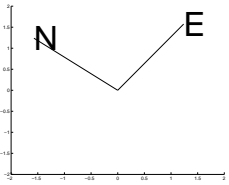
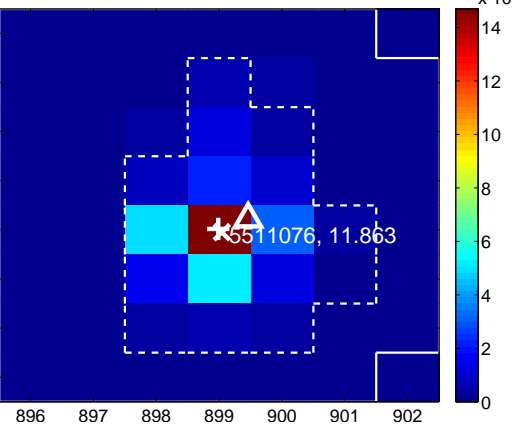
Q10 OOT image



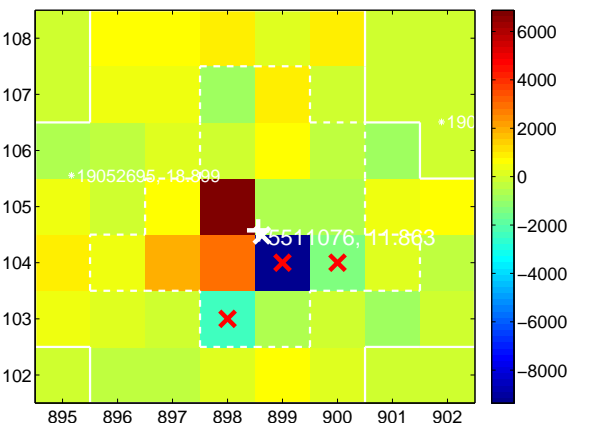
Q11 difference image. Poor Quality



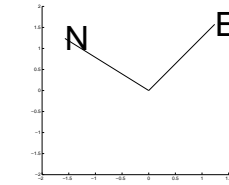
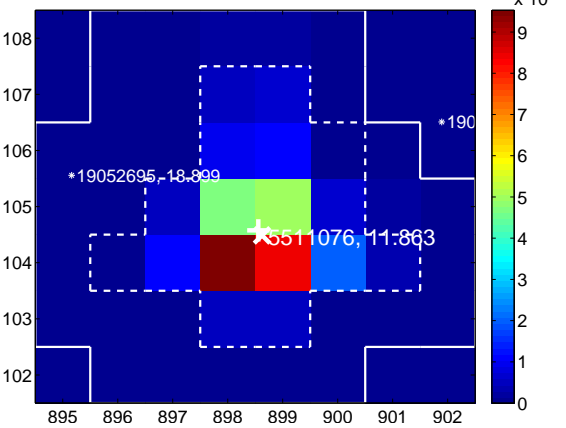
Q11 OOT image



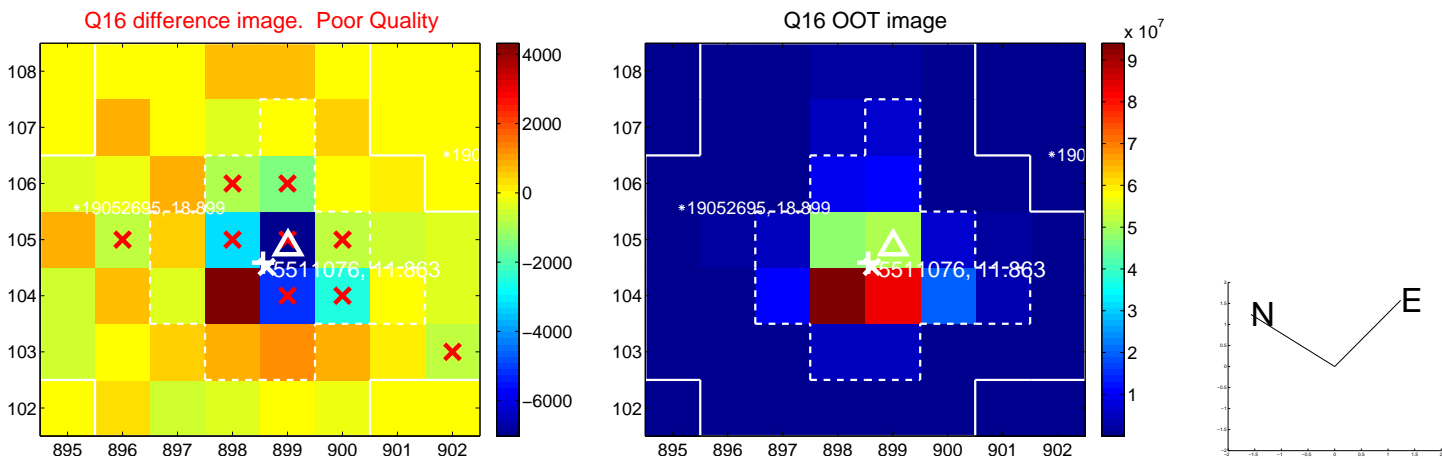
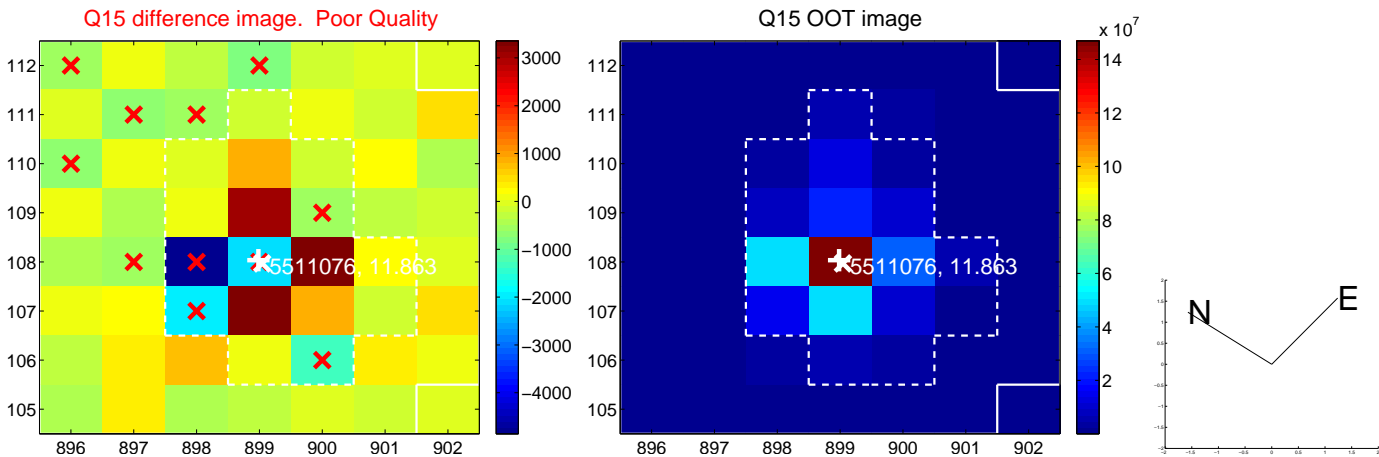
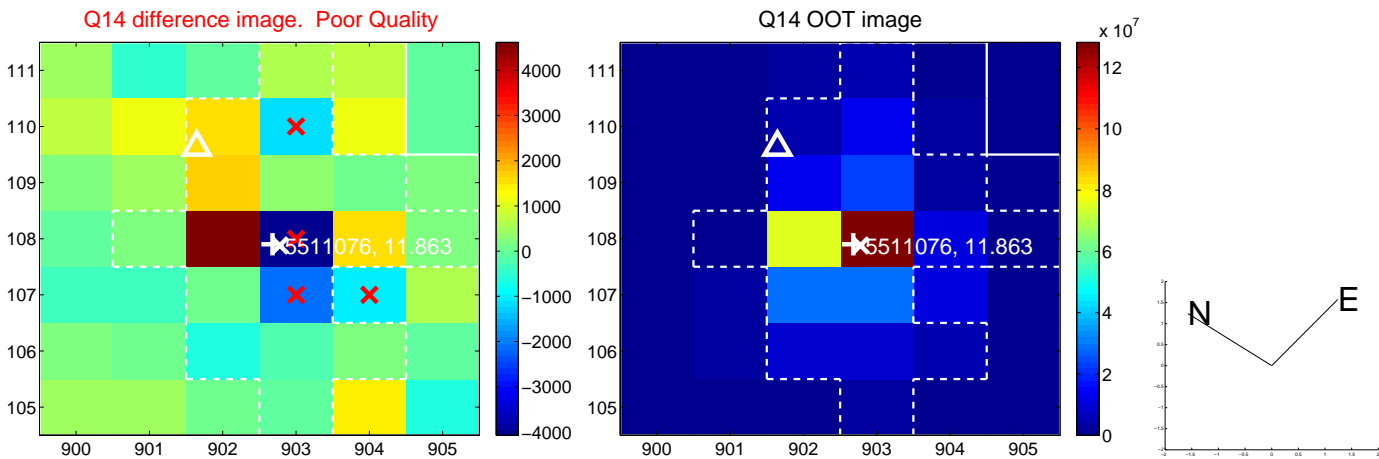
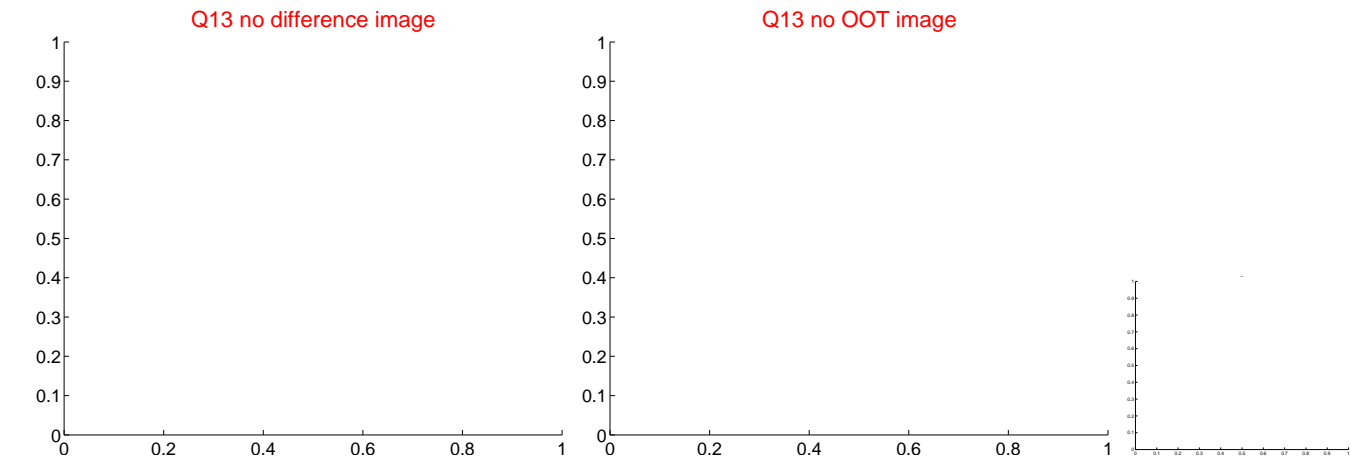
Q12 difference image. Poor Quality



Q12 OOT image



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





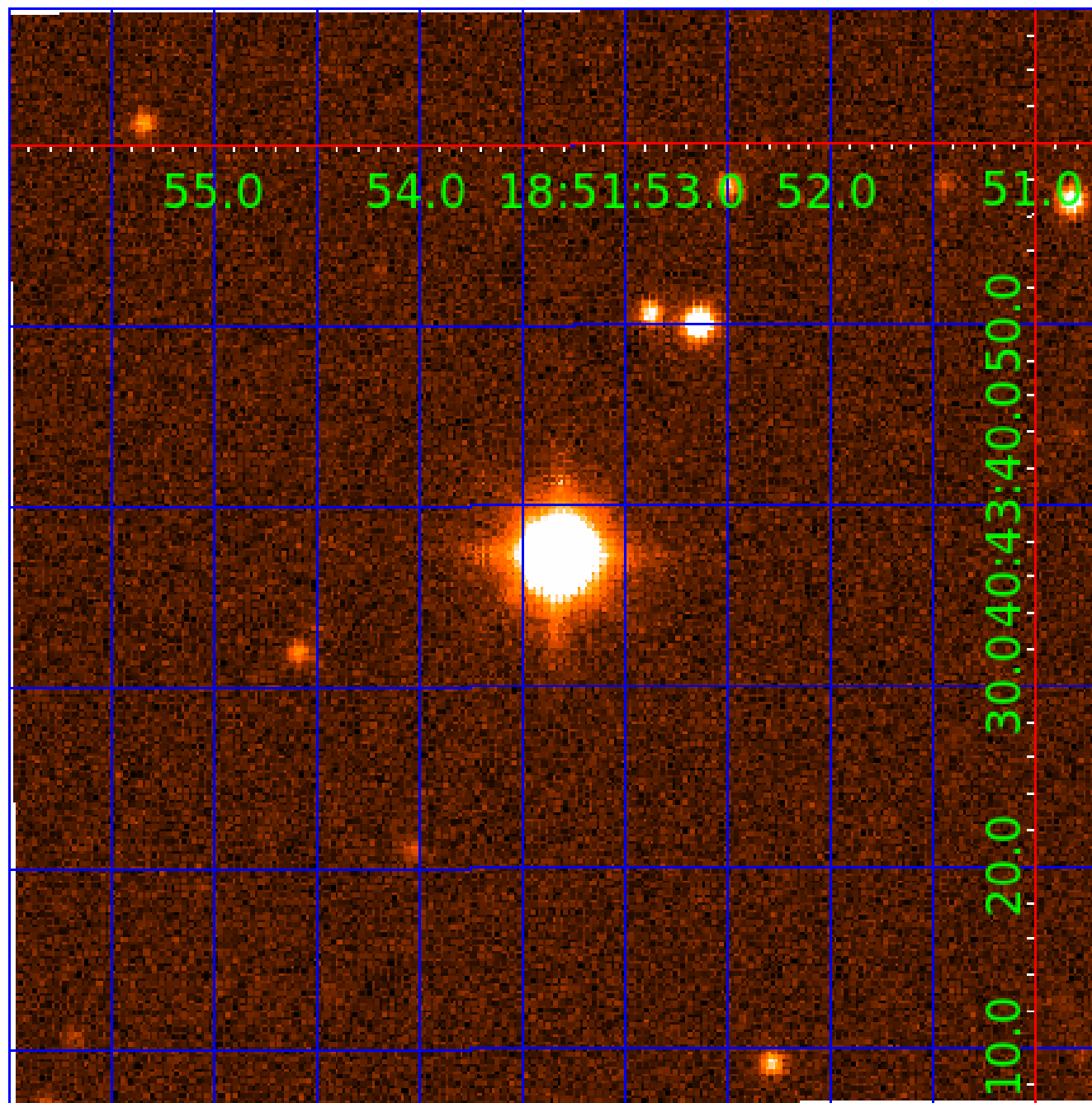
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 005511076

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005511076-01	OBS	No	6.513105	136.137932	1.1	2.220	9.2	0.3	1.77	6225	0.22	792.87
005511076-02	OBS	No	6.512776	134.854904	22.4	10.754	9.0	9.0	1.77	6225	1.16	792.92

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005511076-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005511076-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD—CENT_KIC_POS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

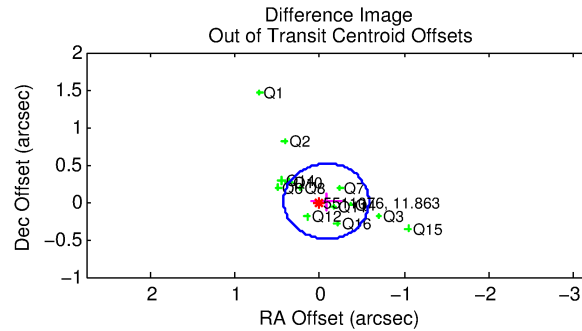
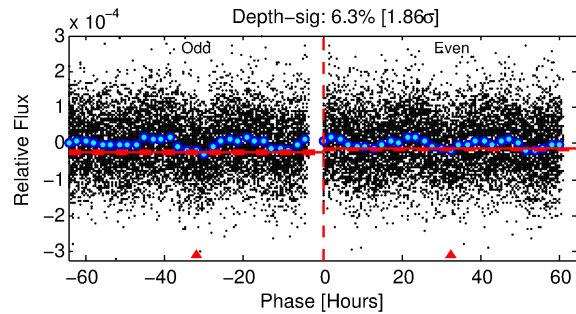
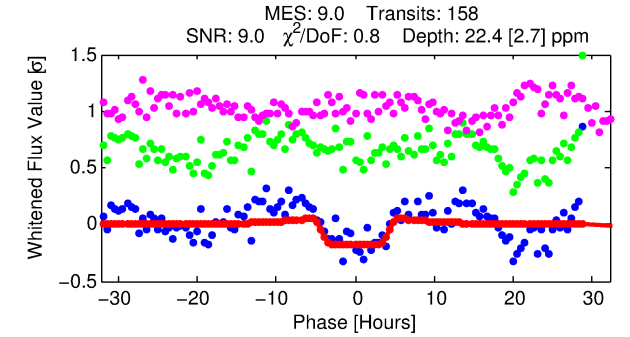
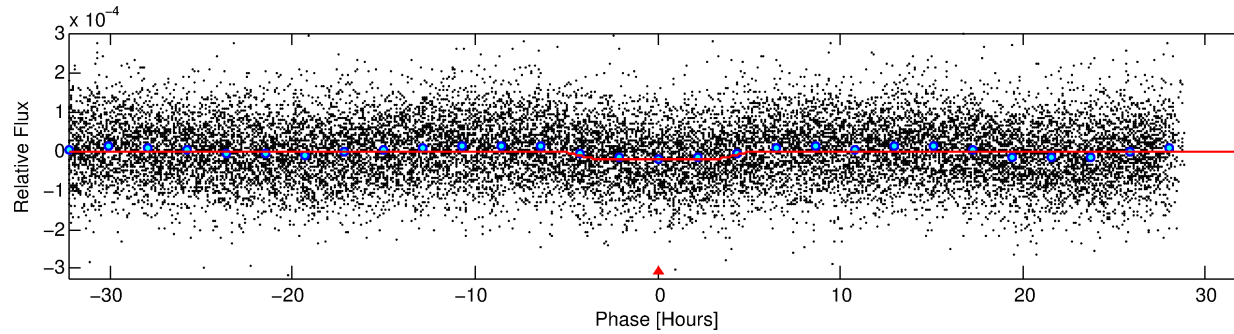
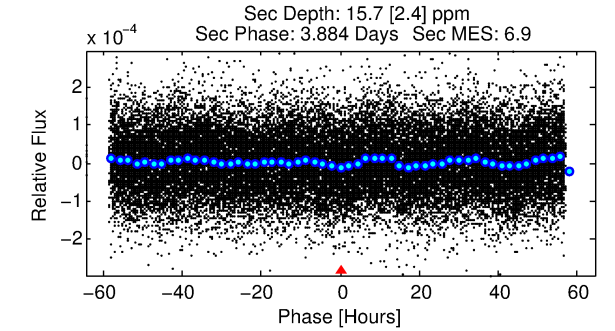
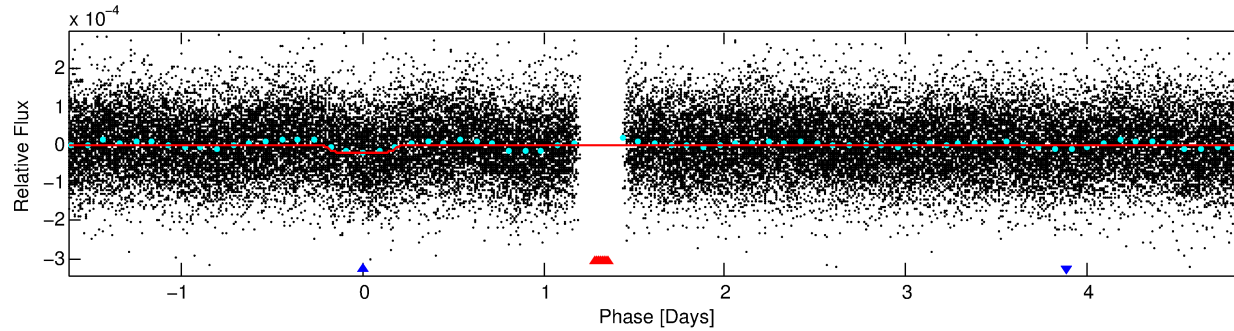
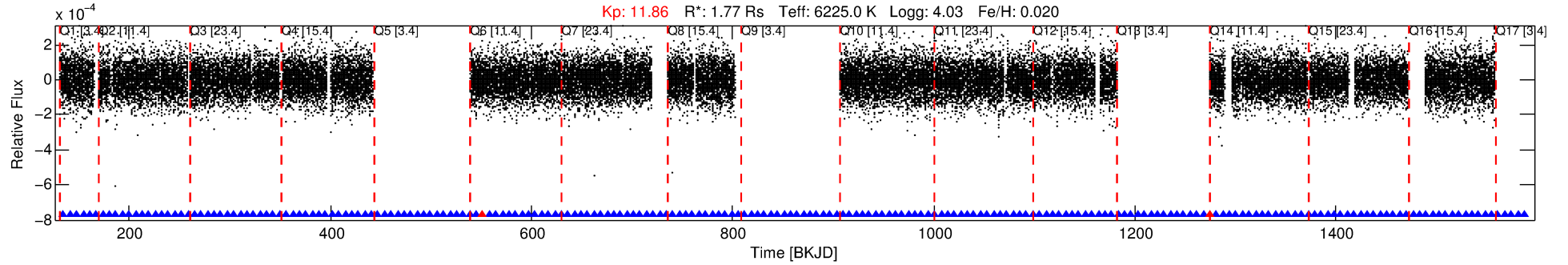
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005511076-02

No Significant Match Found

# DV One-Page Summary

KIC: 5511076 Candidate: 2 of 2 Period: 6.513 d



## DV Fit Results:

Period = 6.51278 [0.00015] d  
Epoch = 134.8549 [0.0183] BKJD  
Rp/R\* = 0.0060 [0.0005]  
a/R\* = 1.34 [0.15]  
b = 0.99 [0.01]  
Seff = 792.92 [333.76]  
Teq = 1353 [142] K  
Rp = 1.16 [0.33] Re  
a = 0.0731 [0.0188] AU  
Ag = 34.10 [15.58] [2.12σ]  
Teffp = 5056 [310] K [10.85σ]

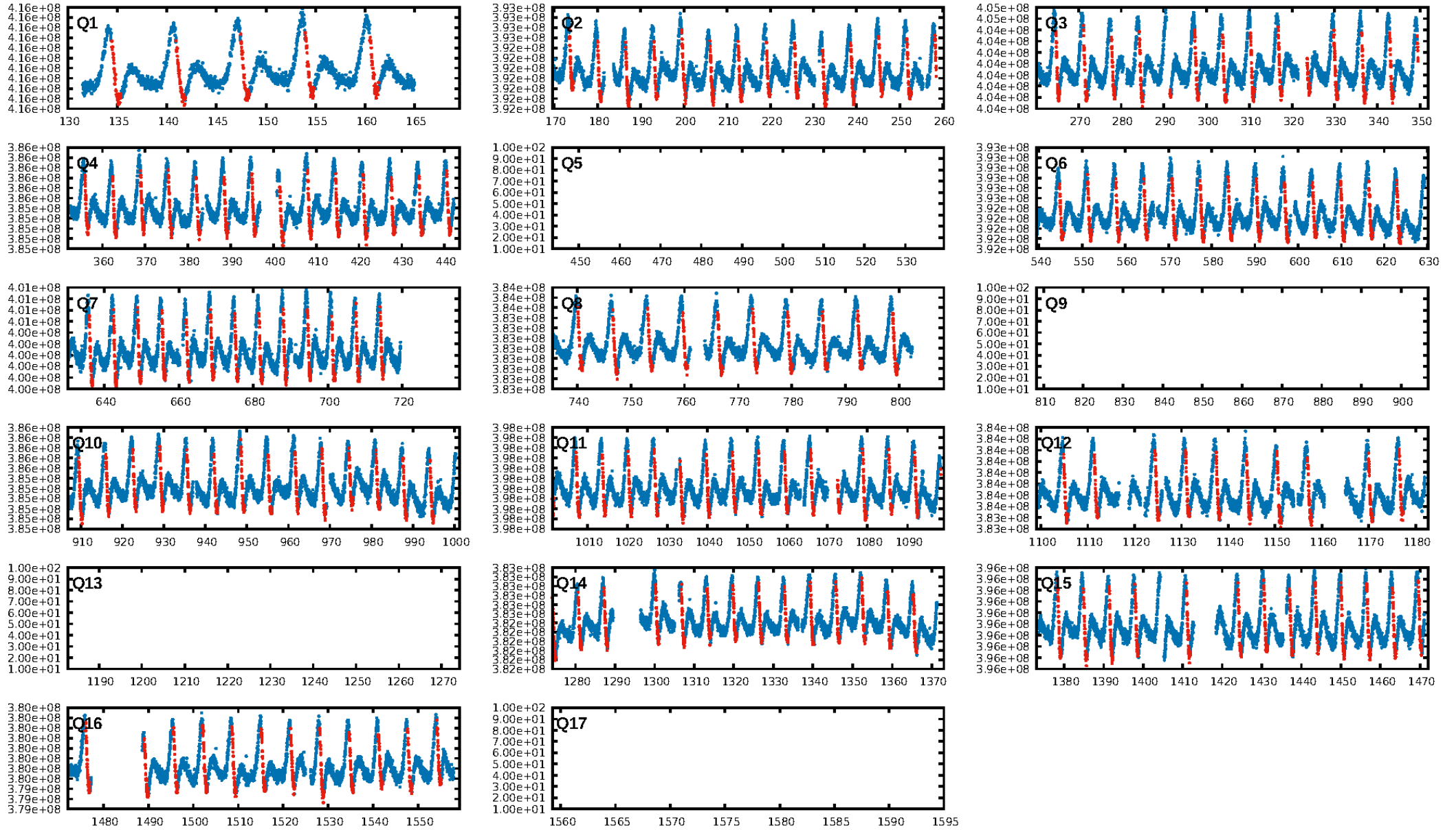
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 86.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.48e-17  
RollingBand-fgt: 0.99 [151/153]  
GhostDiagnostic-chr: 2.075  
Centroid-sig: 0.8%  
Centroid-so: 2.991 arcsec [2.28σ]  
OotOffset-rm: 0.083 arcsec [0.49σ]  
KicOffset-rm: 0.362 arcsec [2.68σ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:57:19 Z

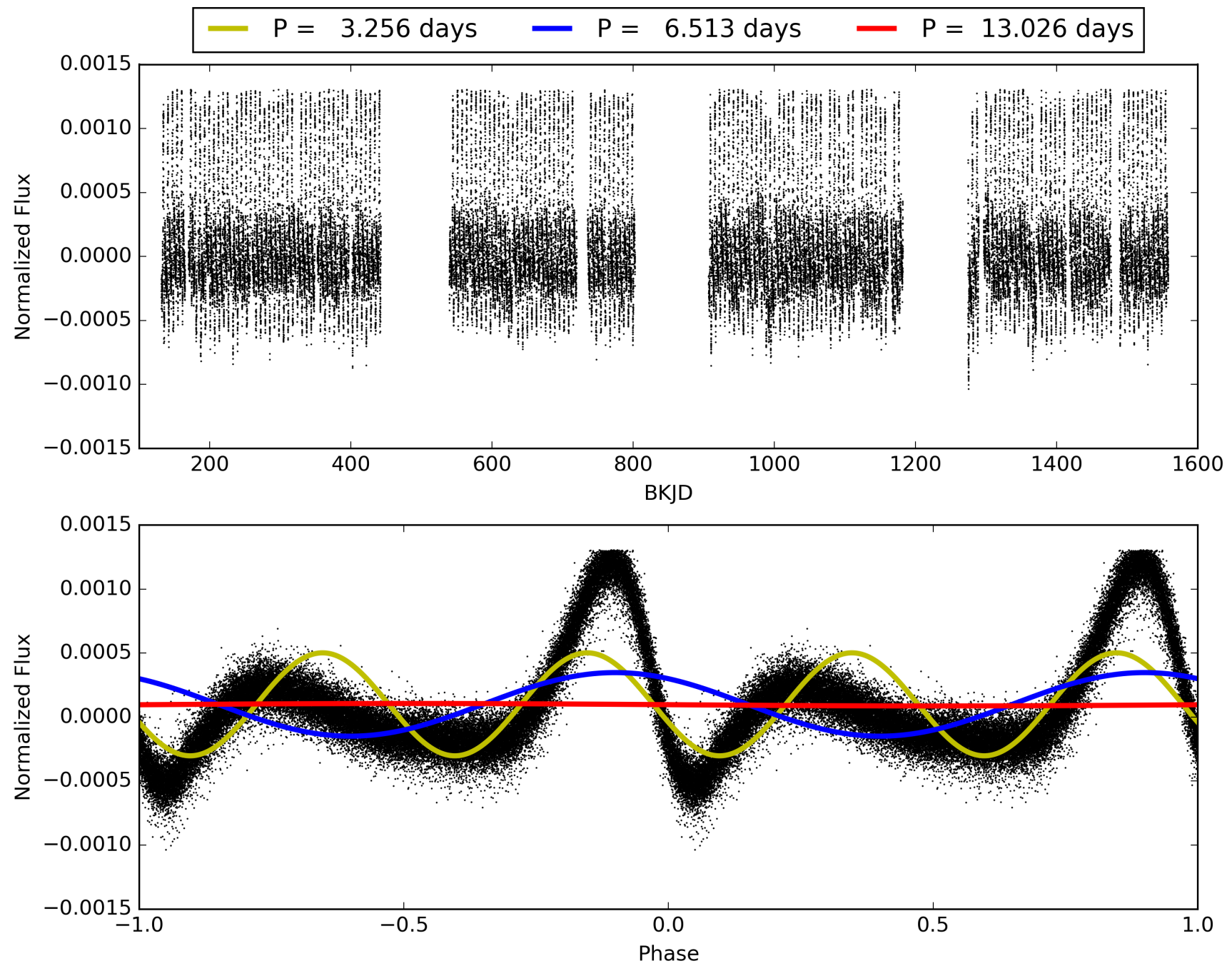
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005511076-02, PDC Light Curves



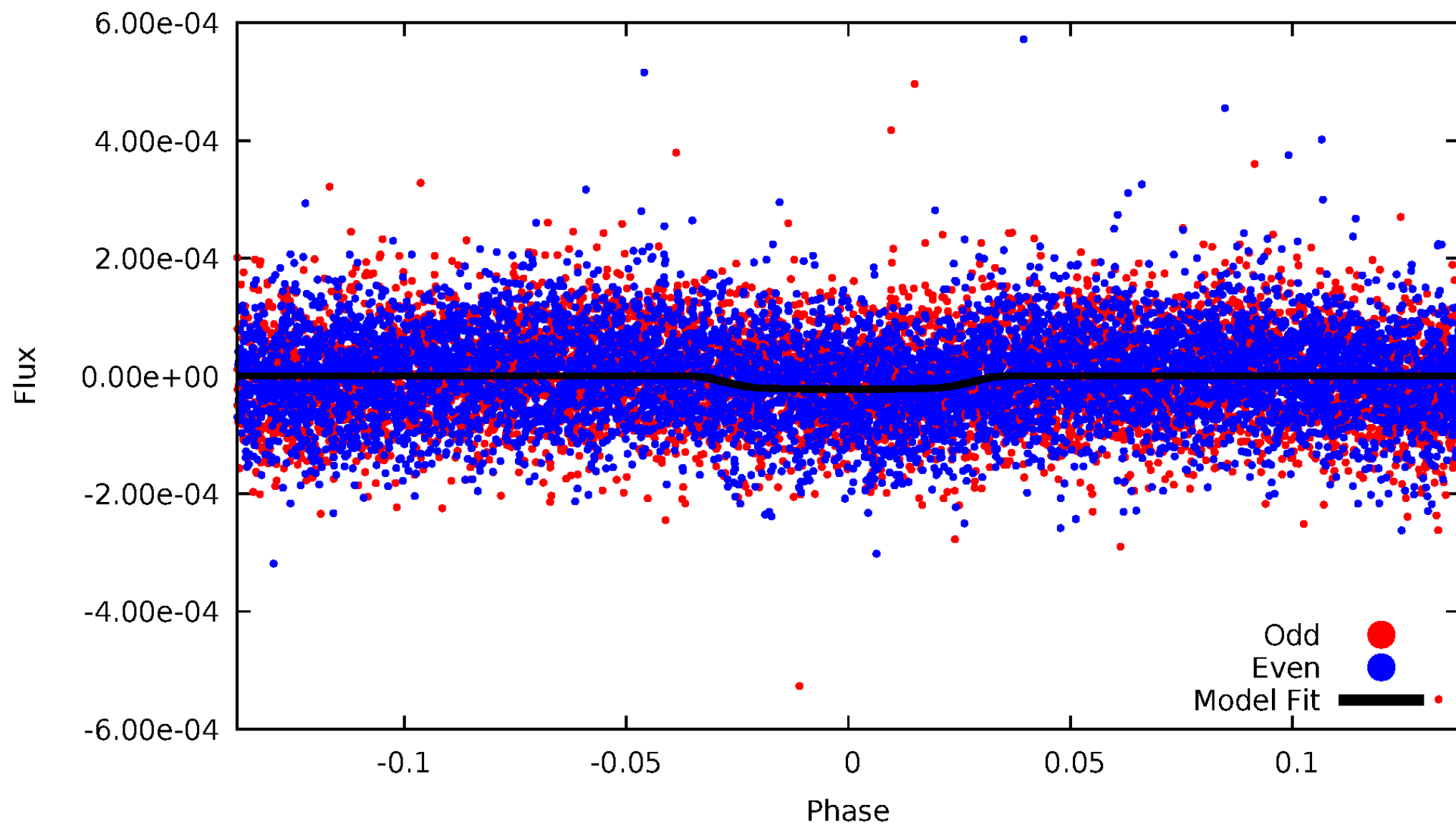


TCE 005511076-02



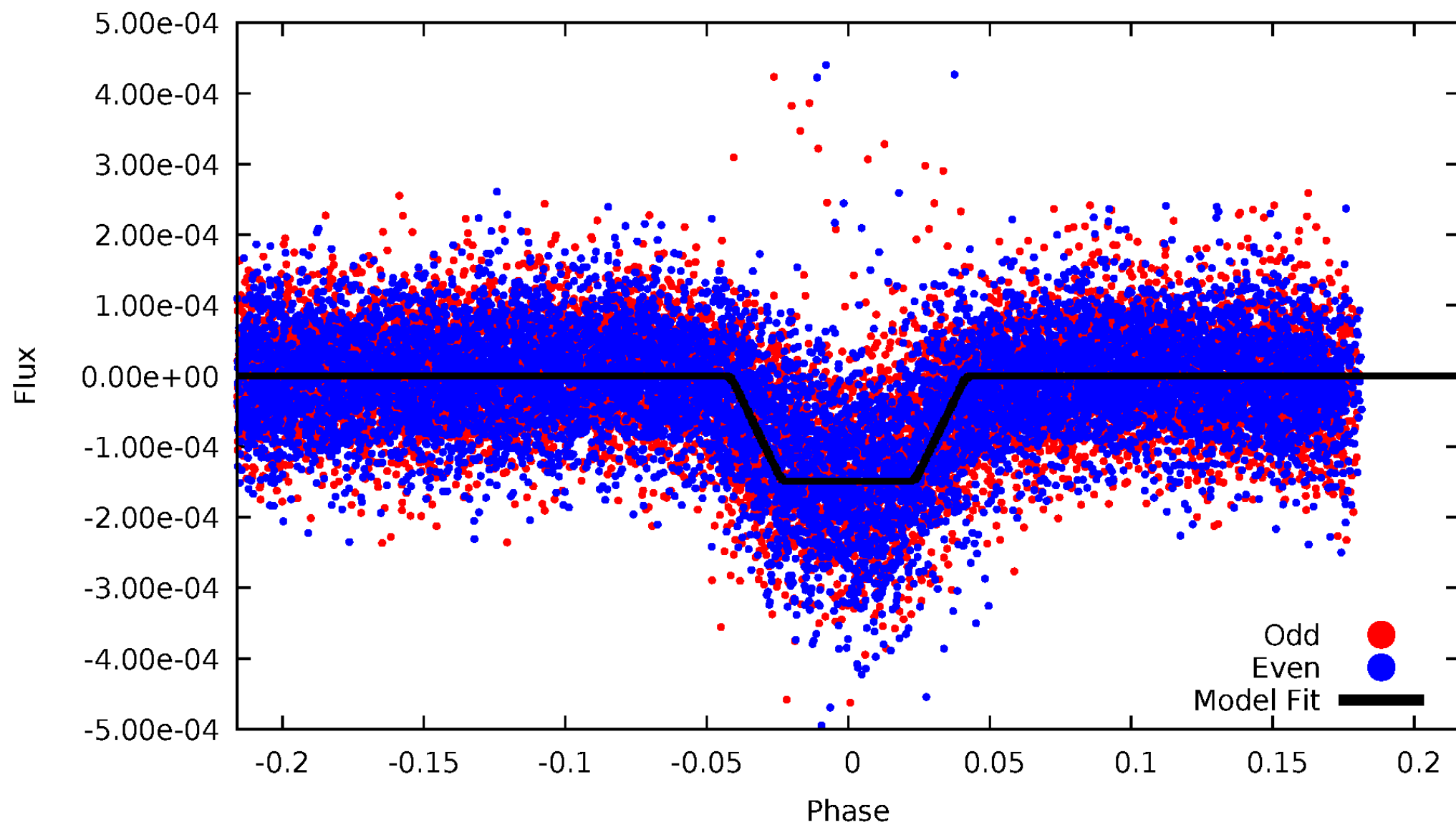
# DV Odd/Even

TCE 005511076-02



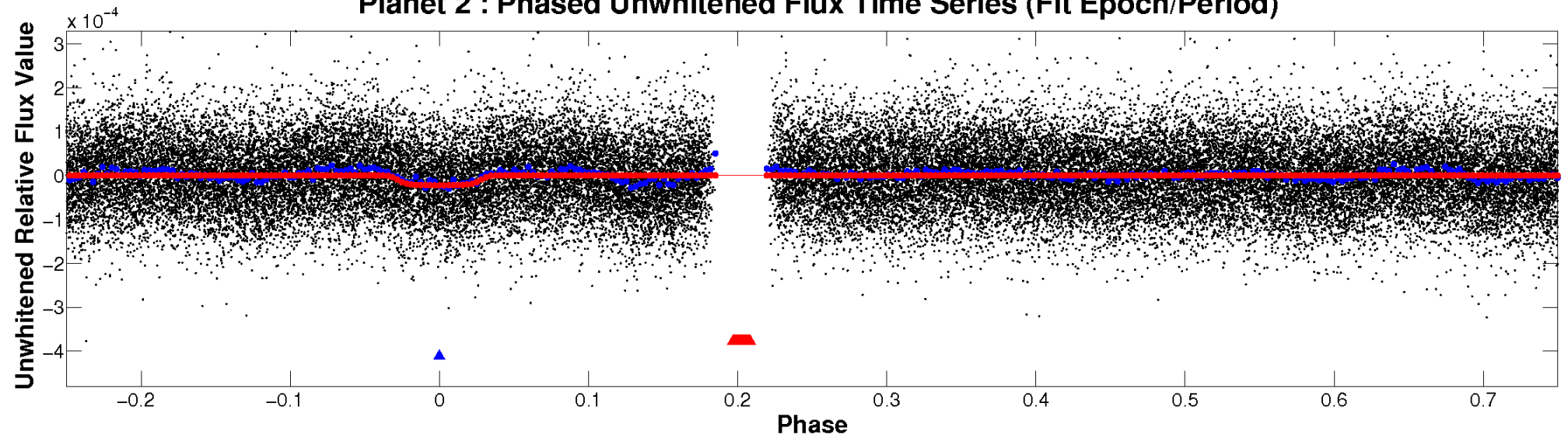
# ALT Odd/Even

TCE 005511076-02

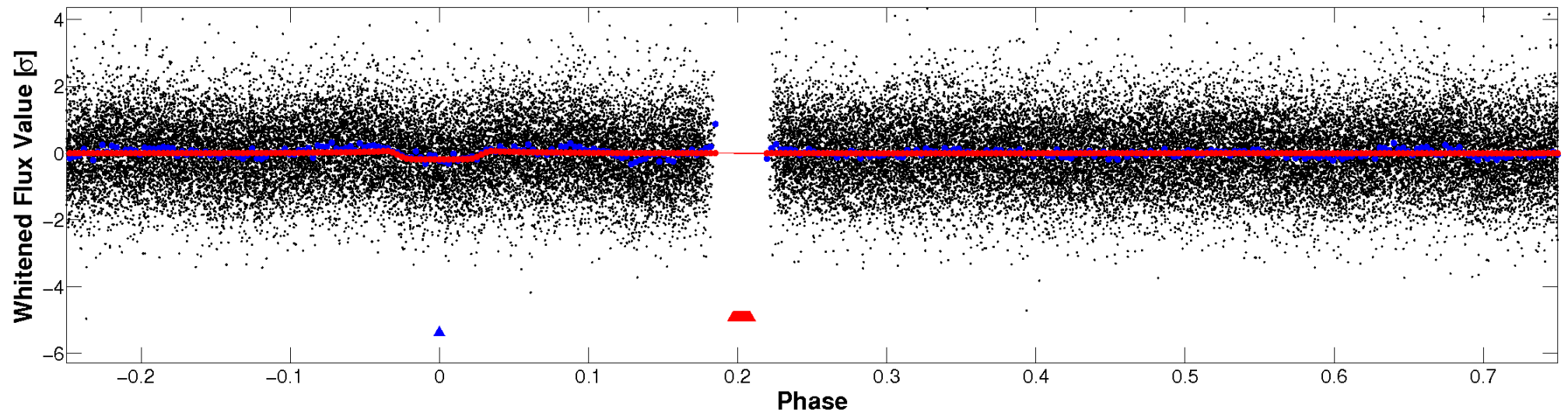


# Non-Whitened Vs. Whitened Light Curve

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

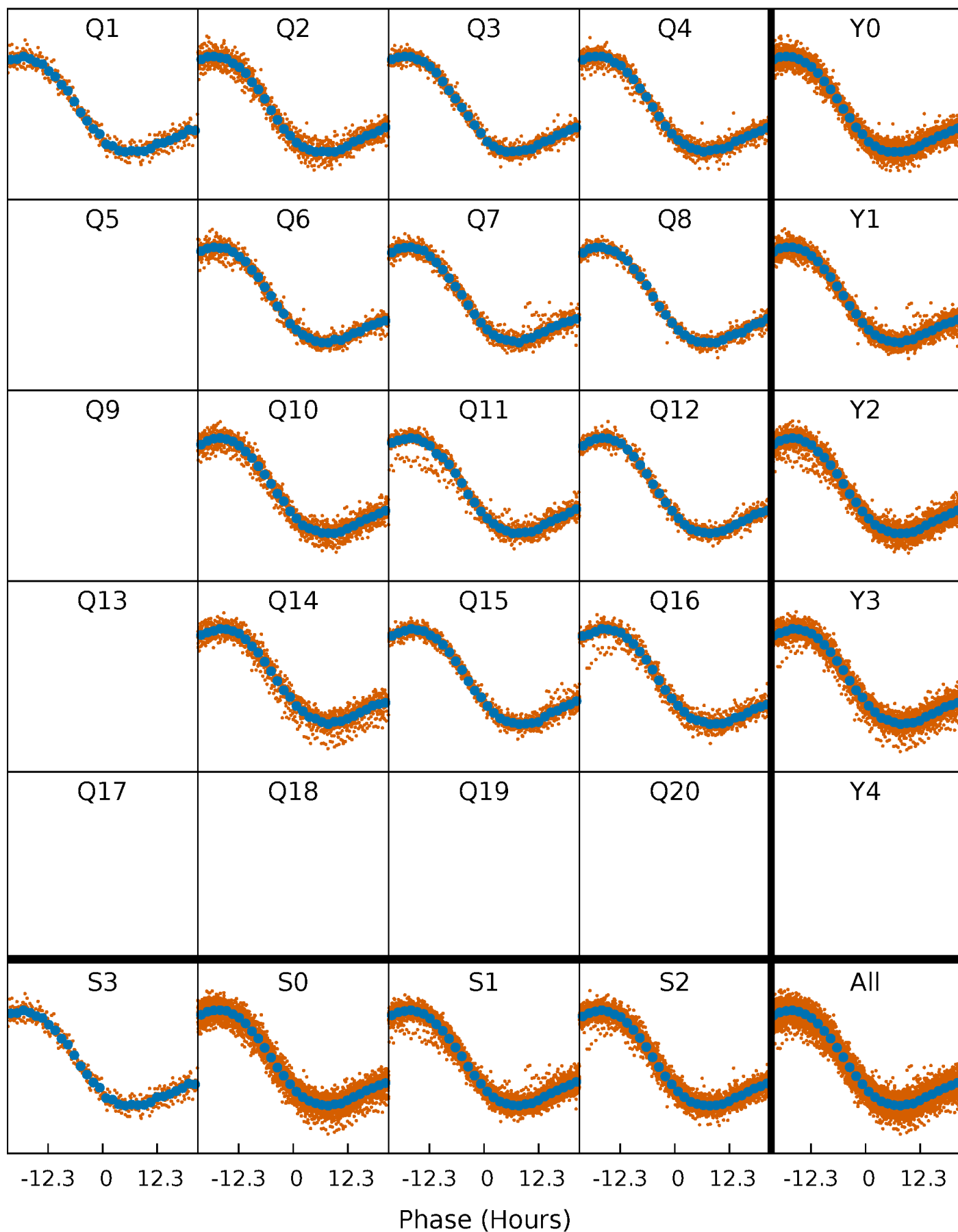


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

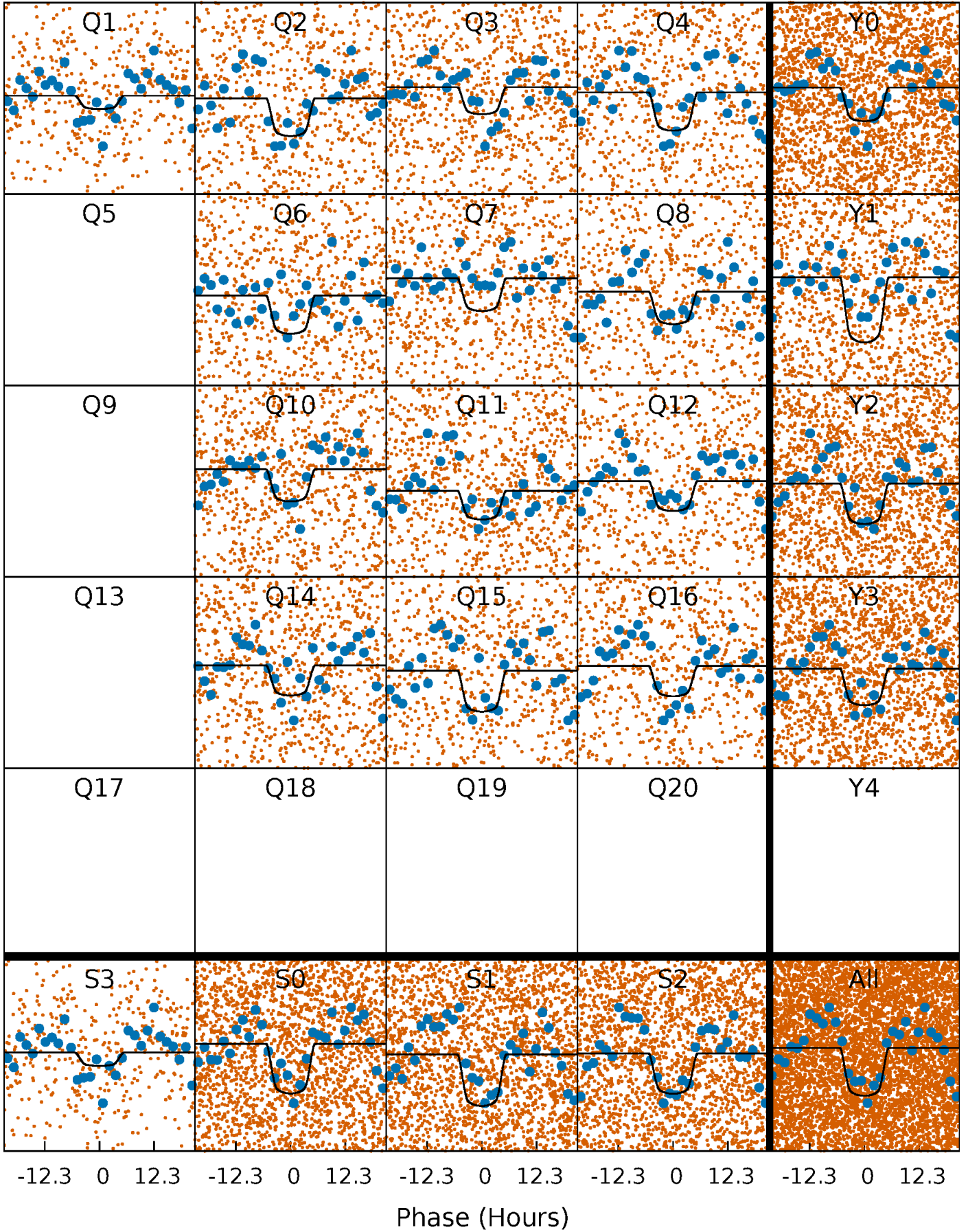
TCE 005511076-02   P= 6.512776 Days    $T_0=134.854904$  (BKJD)





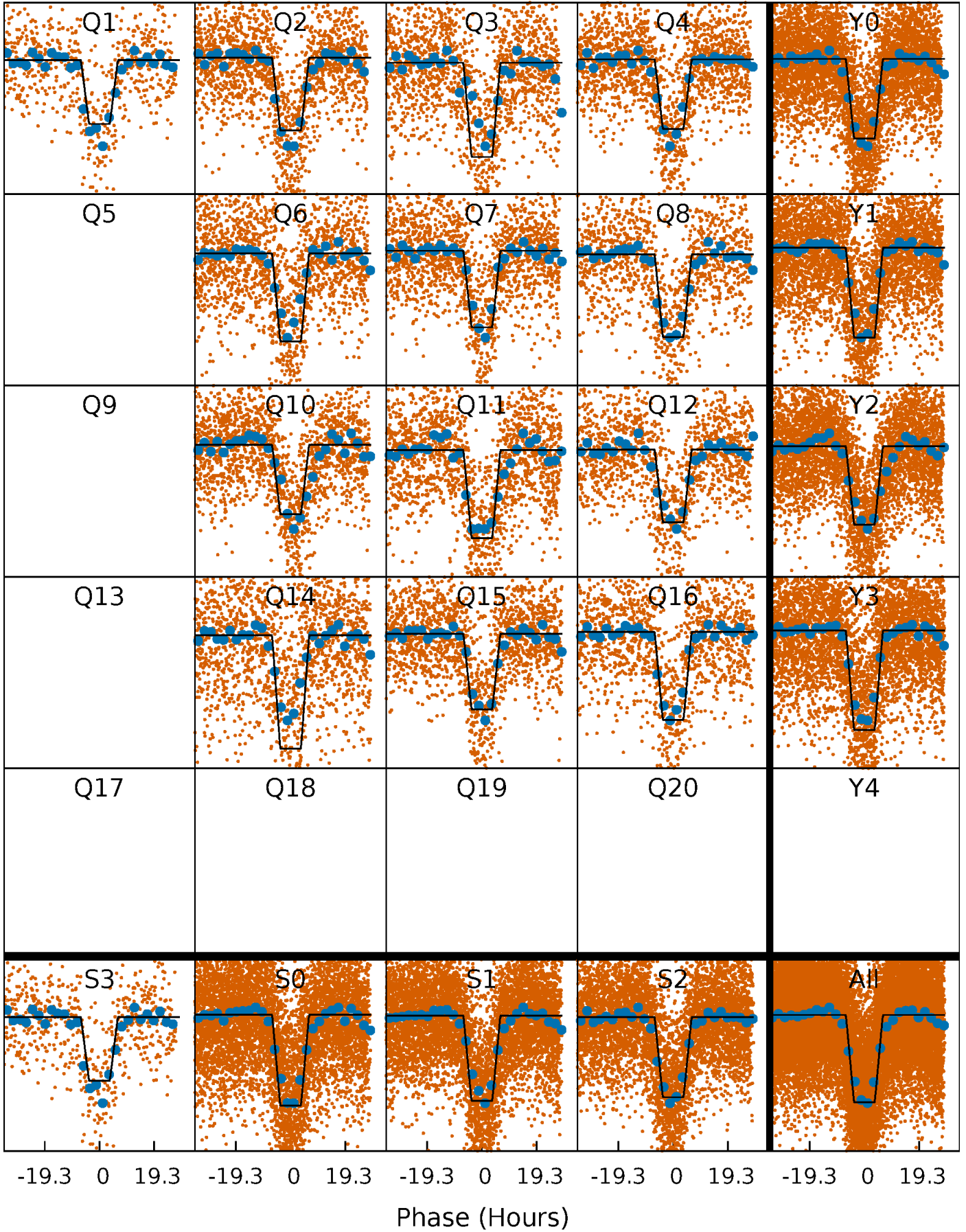
# DV Quarter-Phased Transit Curves

TCE 005511076-02   P= 6.512776 Days    $T_0=134.854904$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005511076-02 P= 6.512831 Days  $T_0=134.865084$  (BKJD)

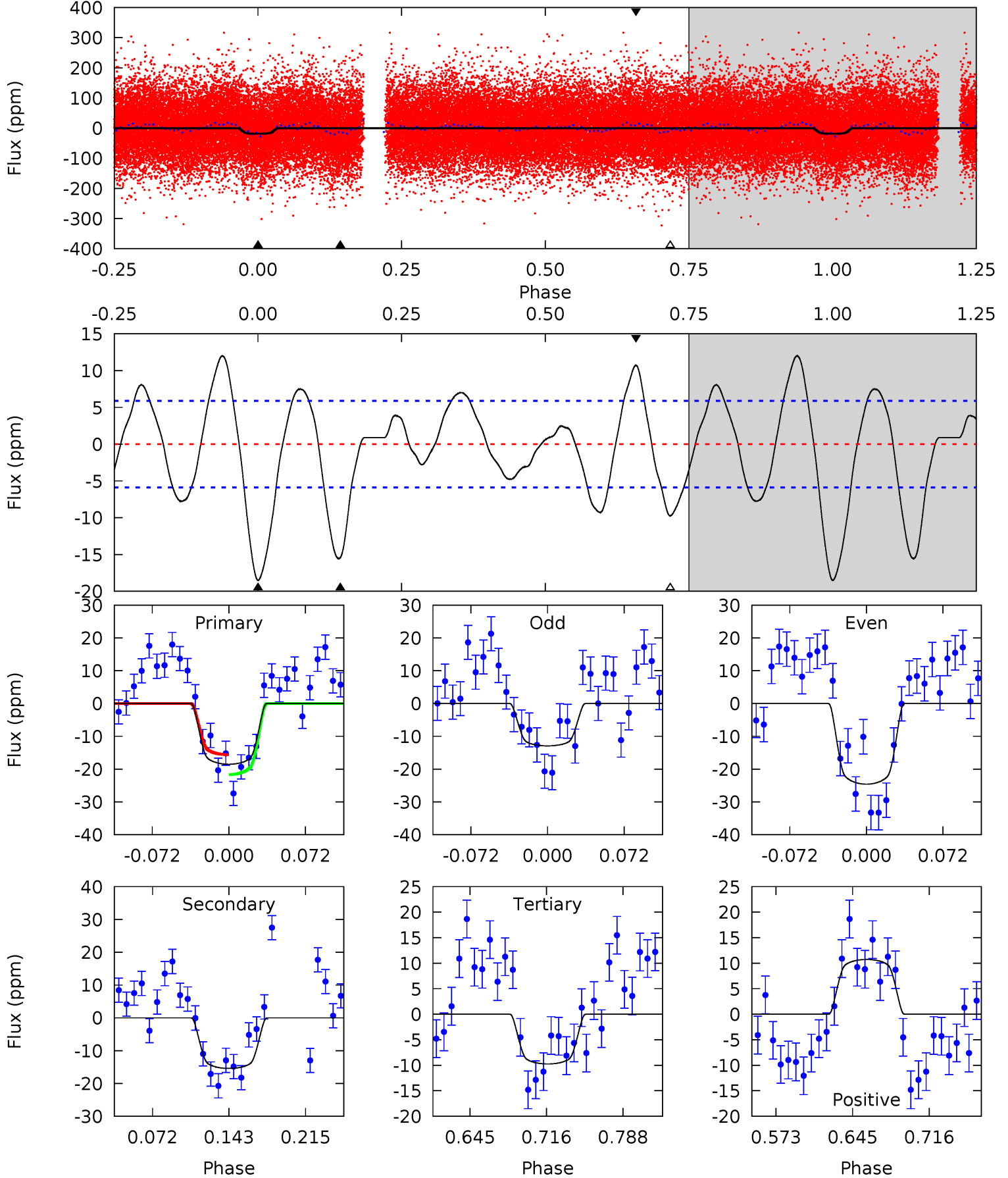




# DV Model-Shift Uniqueness Test

005511076-02, P = 6.512776 Days, E = 128.342128 Days

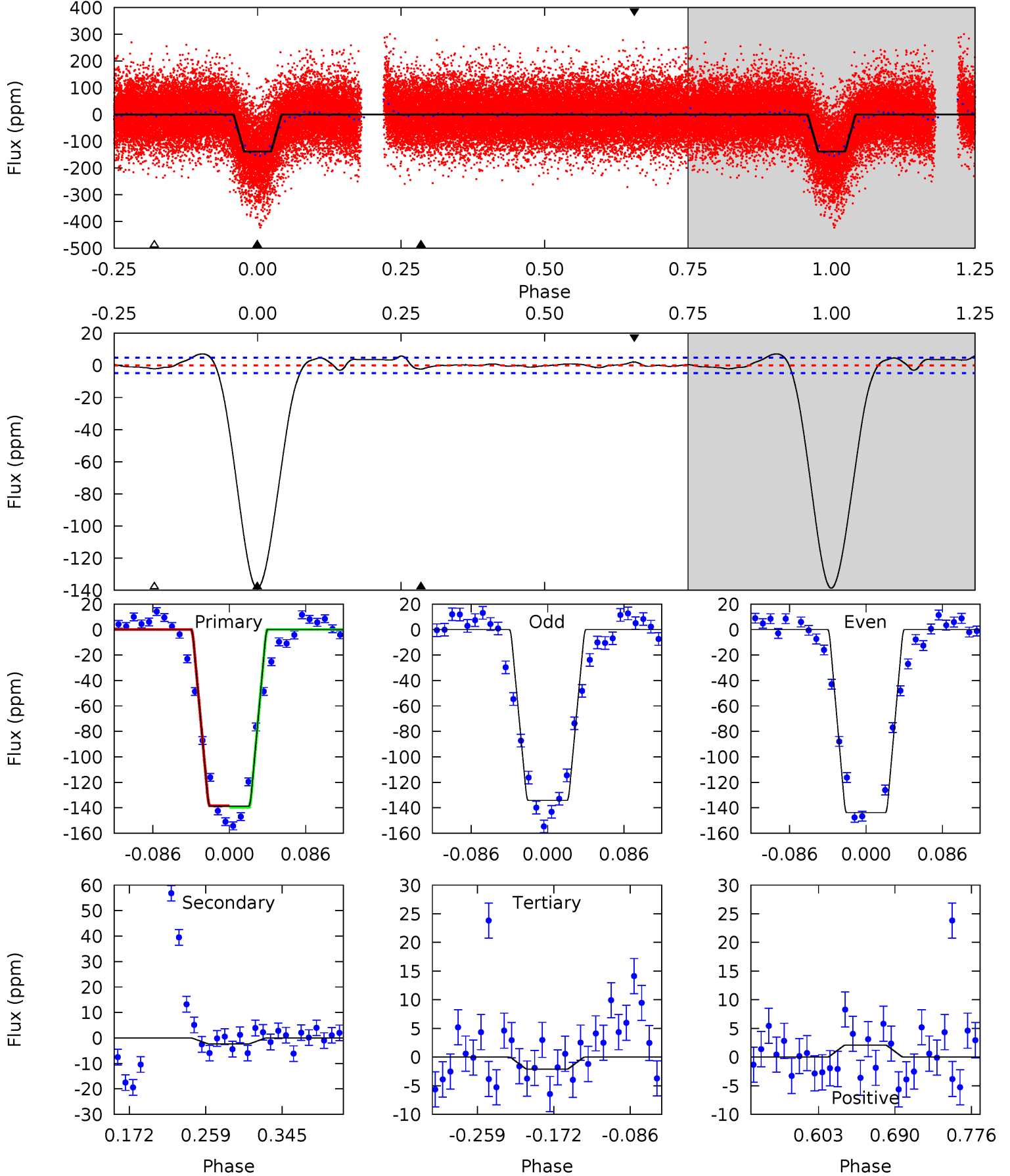
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.6	12.2	7.68	8.45	4.63	1.80	4.00	6.91	6.14	4.47	3.70	4.60	0.83	0.39	2.38



# Alt Model-Shift Uniqueness Test

005511076-02, P = 6.512831 Days, E = 128.352253 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
133.7	2.22	2.03	2.03	4.60	1.72	1.90	131.7	131.7	0.19	0.19	4.59	0.98	0.05	0.53



### Stellar Parameters For KIC 005511076

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6225^{+167}_{-186}$	$4.029^{+0.234}_{-0.126}$	$0.020^{+0.250}_{-0.250}$	$1.775^{+0.401}_{-0.490}$	$1.225^{+0.185}_{-0.167}$	$0.309^{+0.414}_{-0.112}$
	+3%/-3%	+6%/-3%	+1250%/-1250%	+23%/-28%	+15%/-14%	+134%/-36%
Source	PHO1	FLK73	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 005511076-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-15 \pm 1$	$1.15^{+0.18}_{-0.18}$	$1874^{+121}_{-142}$	$5101^{+228}_{-226}$	$35^{+15}_{-9}$
Alt.	$-2 \pm 1$	$2.32^{+0.31}_{-0.34}$	$1867^{+116}_{-148}$	$2793^{+212}_{-315}$	$1.254^{+0.867}_{-0.601}$

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

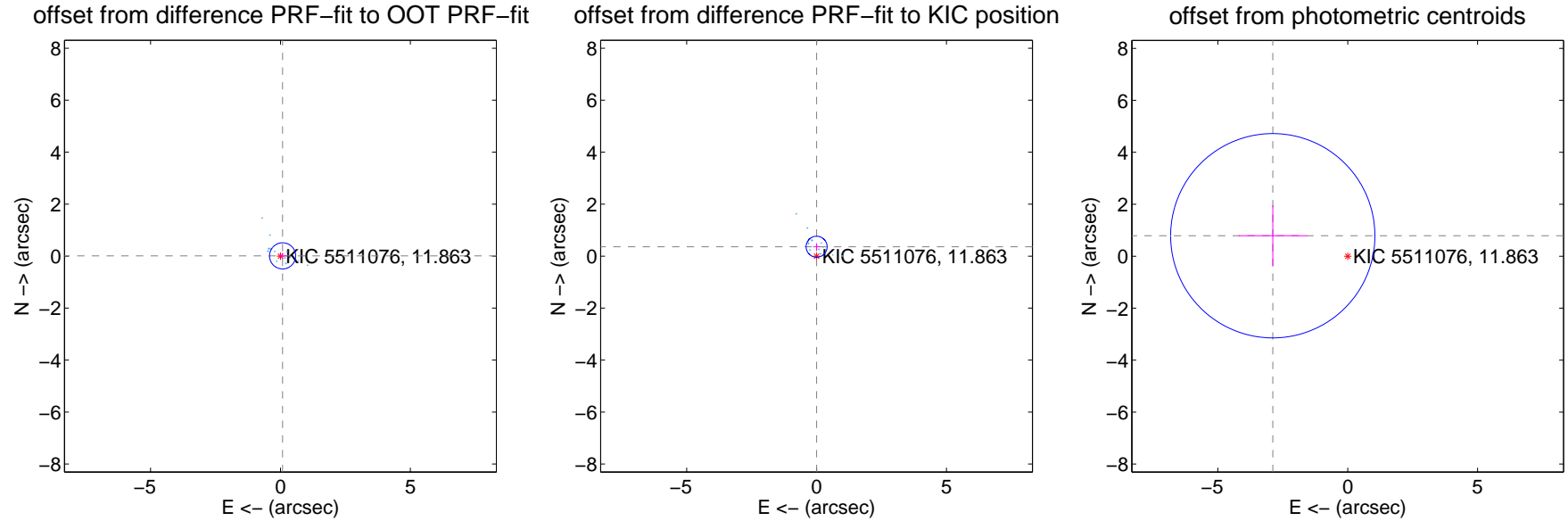
## DV Centroid Data

Supplemental centroid analysis for 005511076-02. **Kepler magnitude: 11.86.** Transit SNR 8.99

There are 13 quarters with good PRF difference image offsets

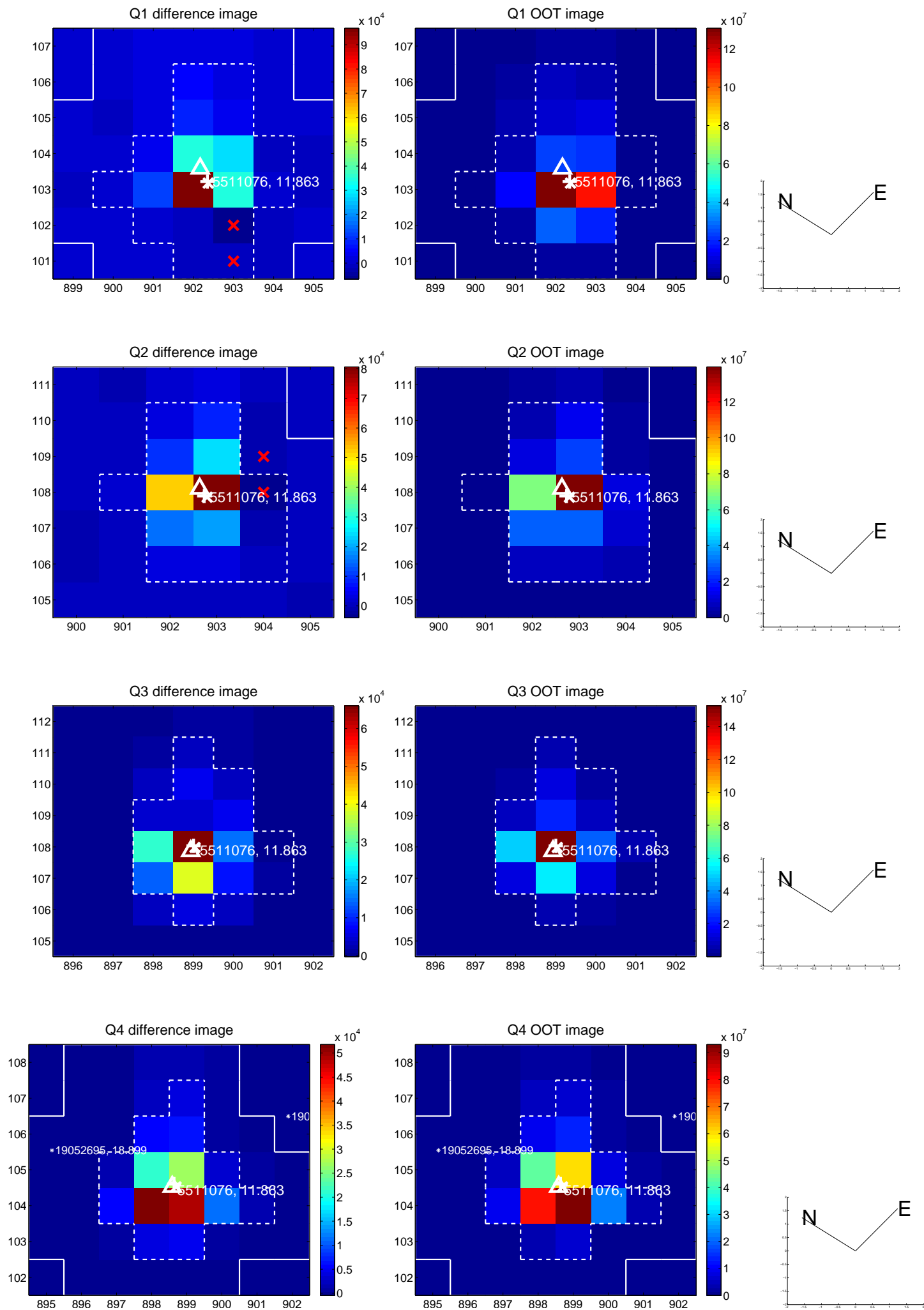
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.083 \pm 0.168$	0.49	$-0.082 \pm 0.168$	$0.010 \pm 0.113$
PRF-fit source offset from KIC position	$0.362 \pm 0.135$	2.68	$-0.002 \pm 0.134$	$0.362 \pm 0.135$
photometric centroid source offset	$2.99 \pm 1.31$	2.28	$2.89 \pm 1.32$	$0.79 \pm 1.18$



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.

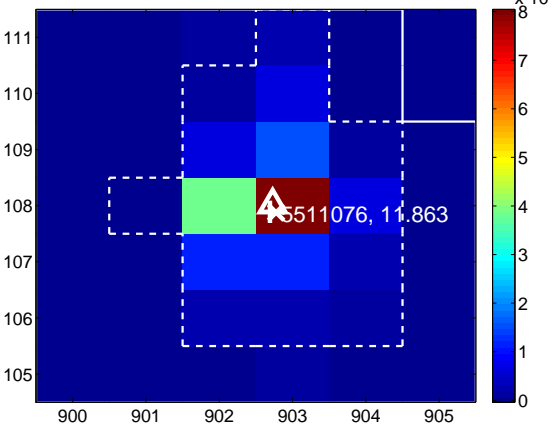
Q5 no difference image



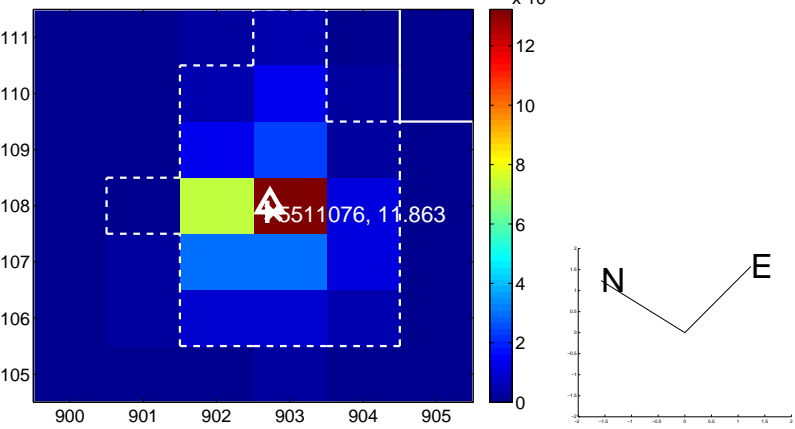
Q5 no OOT image



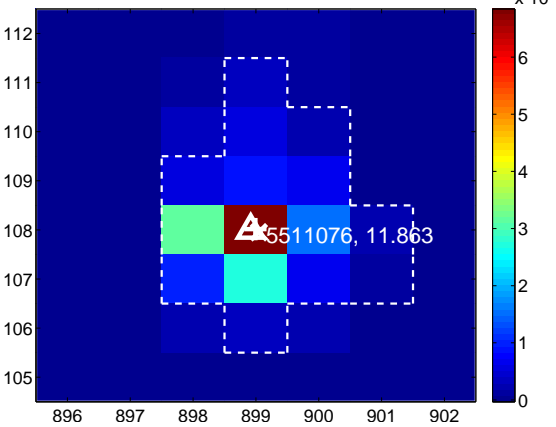
Q6 difference image



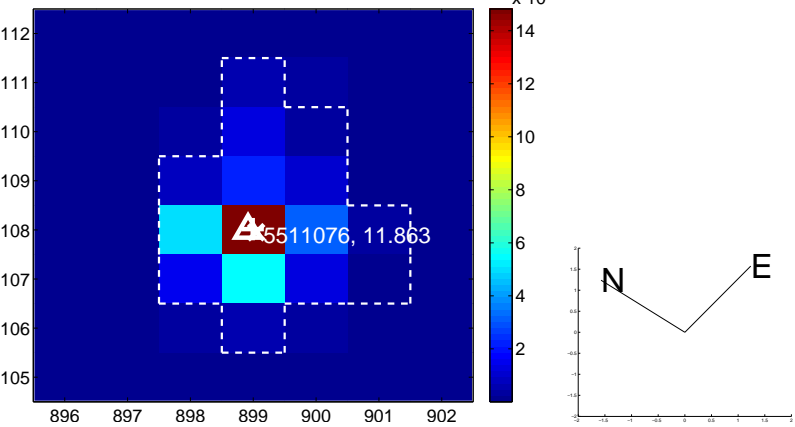
Q6 OOT image



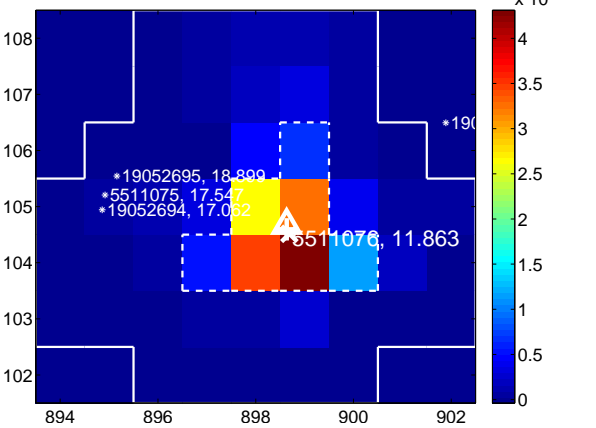
Q7 difference image



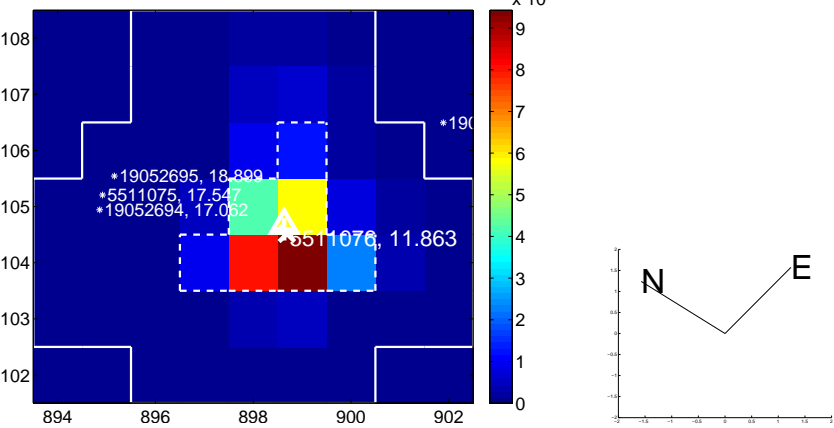
Q7 OOT image



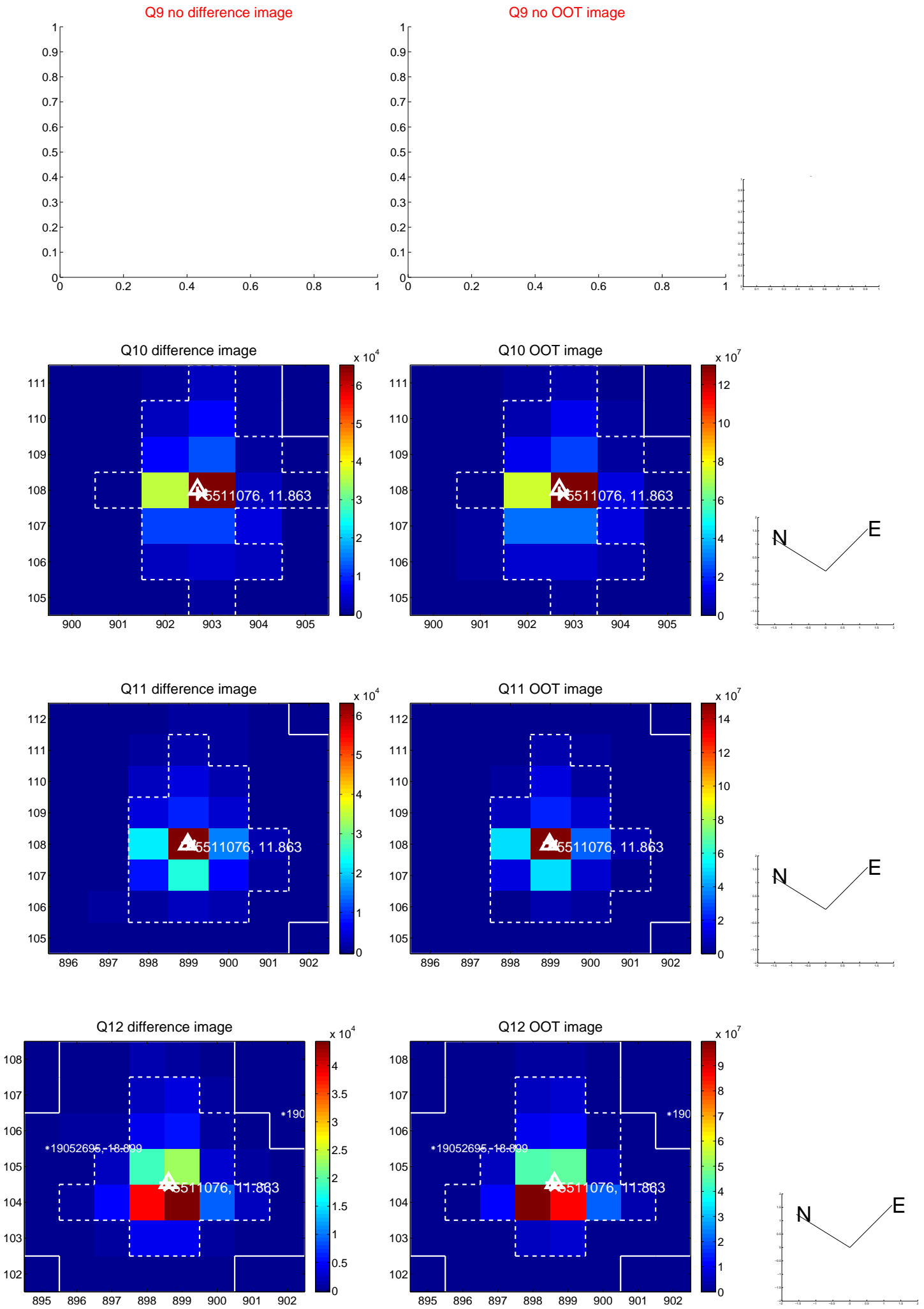
Q8 difference image



Q8 OOT image



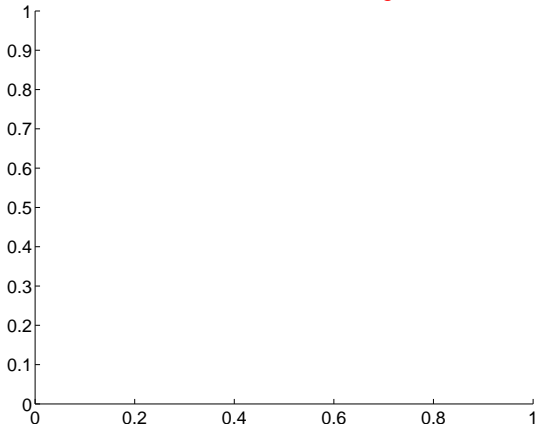
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



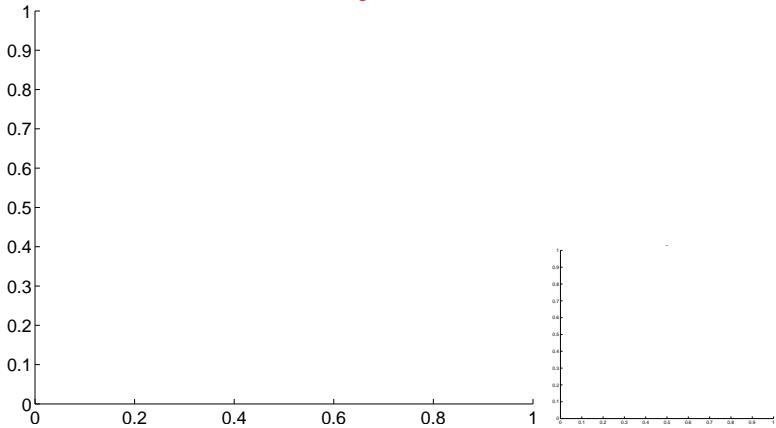


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

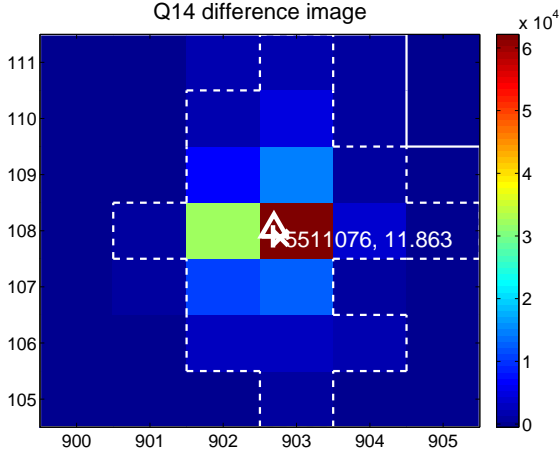
Q13 no difference image



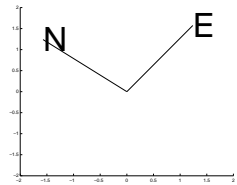
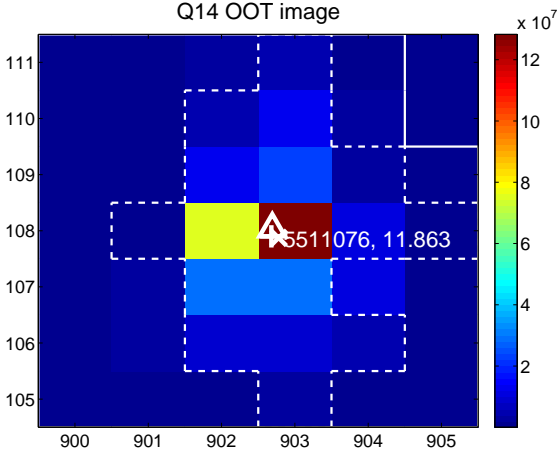
Q13 no OOT image



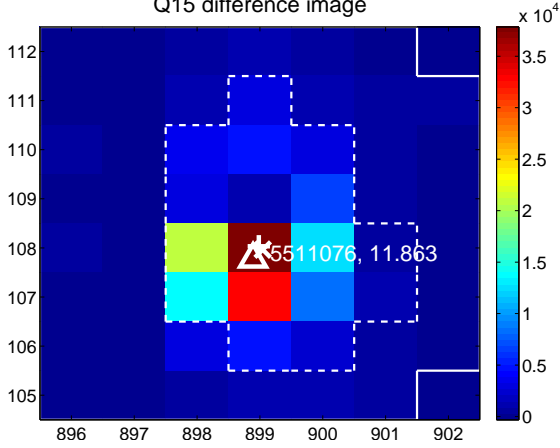
Q14 difference image



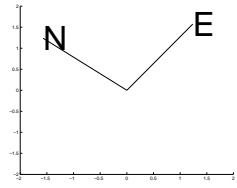
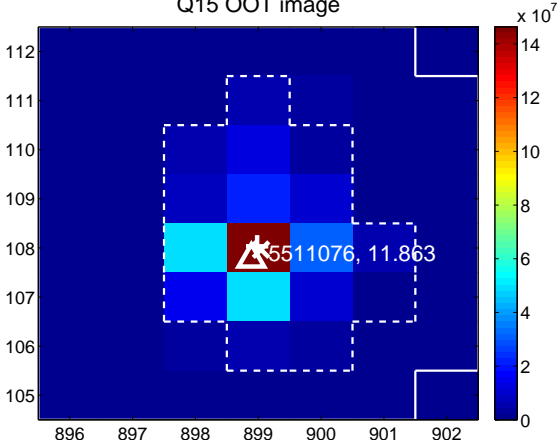
Q14 OOT image



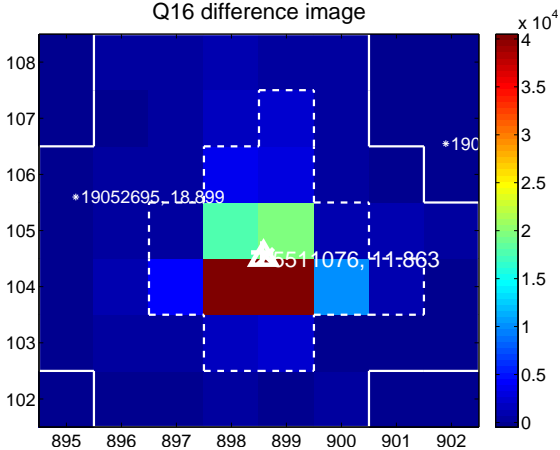
Q15 difference image



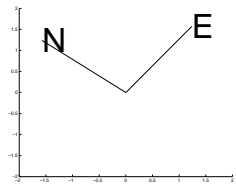
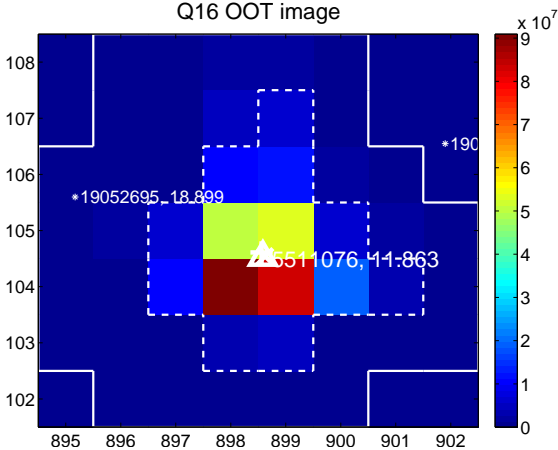
Q15 OOT image



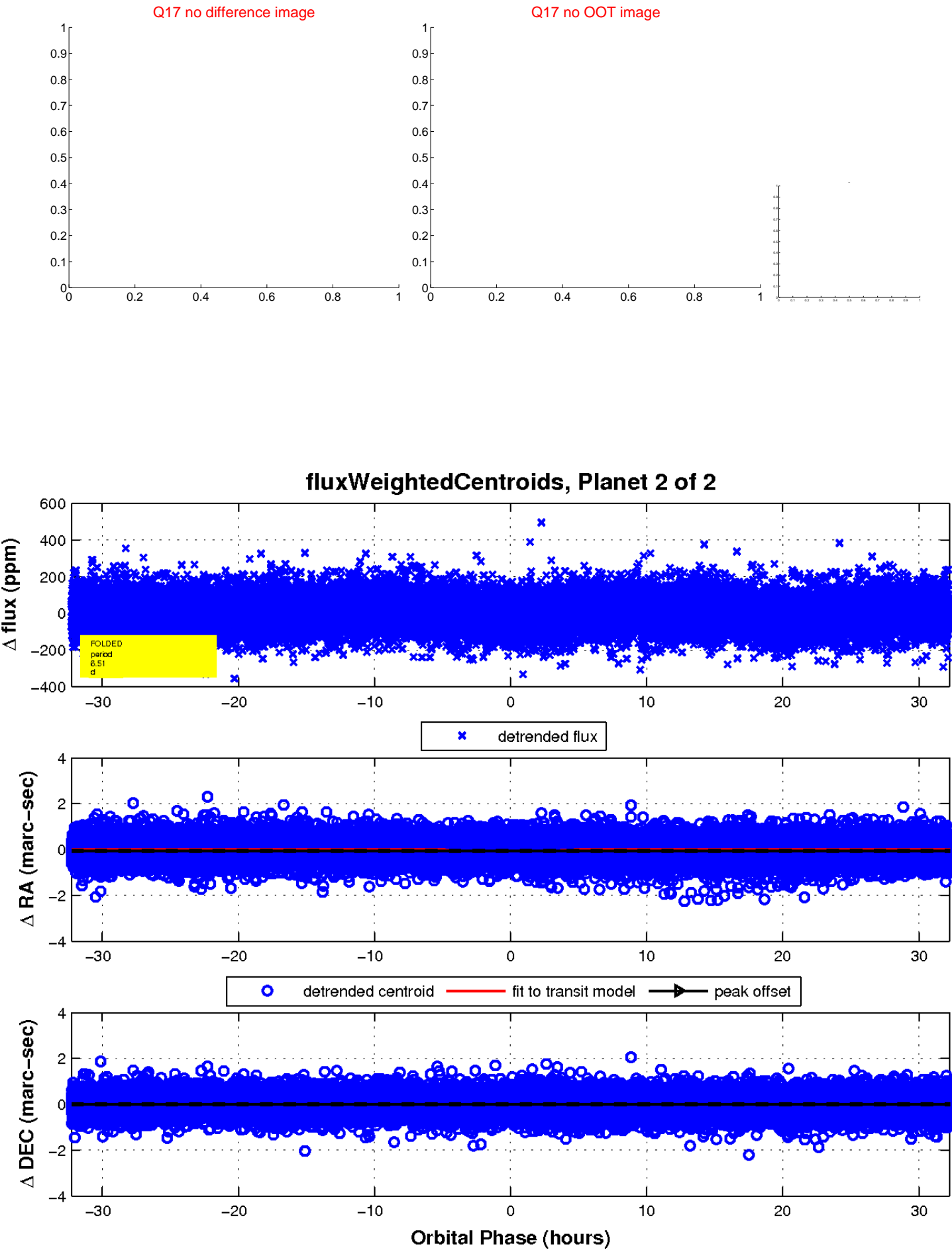
Q16 difference image



Q16 OOT image



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



UKIRT Image

Declination

