

# KIC 006113871

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113871-01	OBS	No	0.544537	131.985814	97.7	1.753	8.9	11.8	1.24	6408	1.44	12474.67
006113871-02	OBS	No	0.544543	131.791668	40.8	3.057	9.0	6.1	1.24	6408	0.80	12474.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113871-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
006113871-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET

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

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

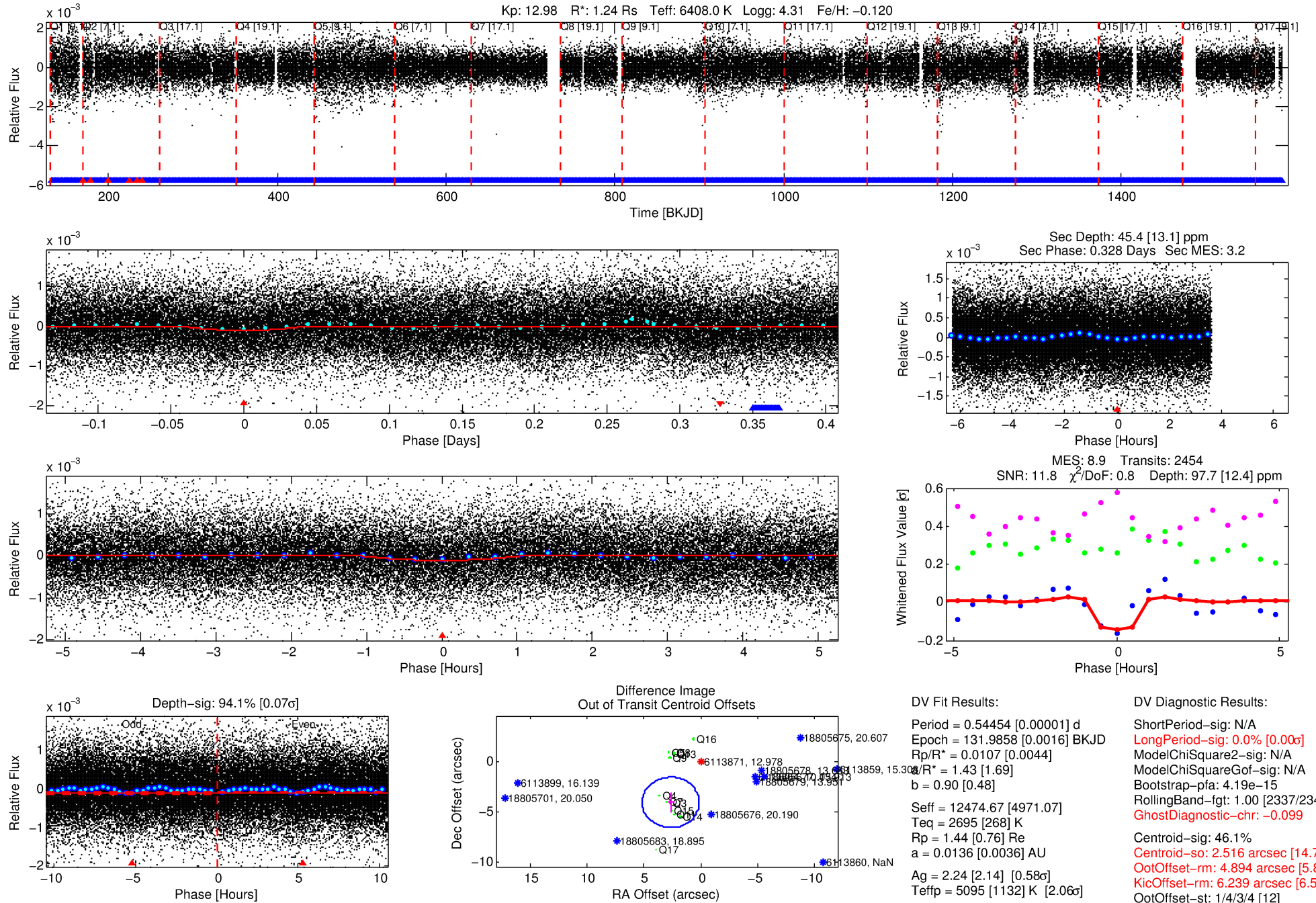
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006113871-01

No Significant Match Found

# DV One-Page Summary

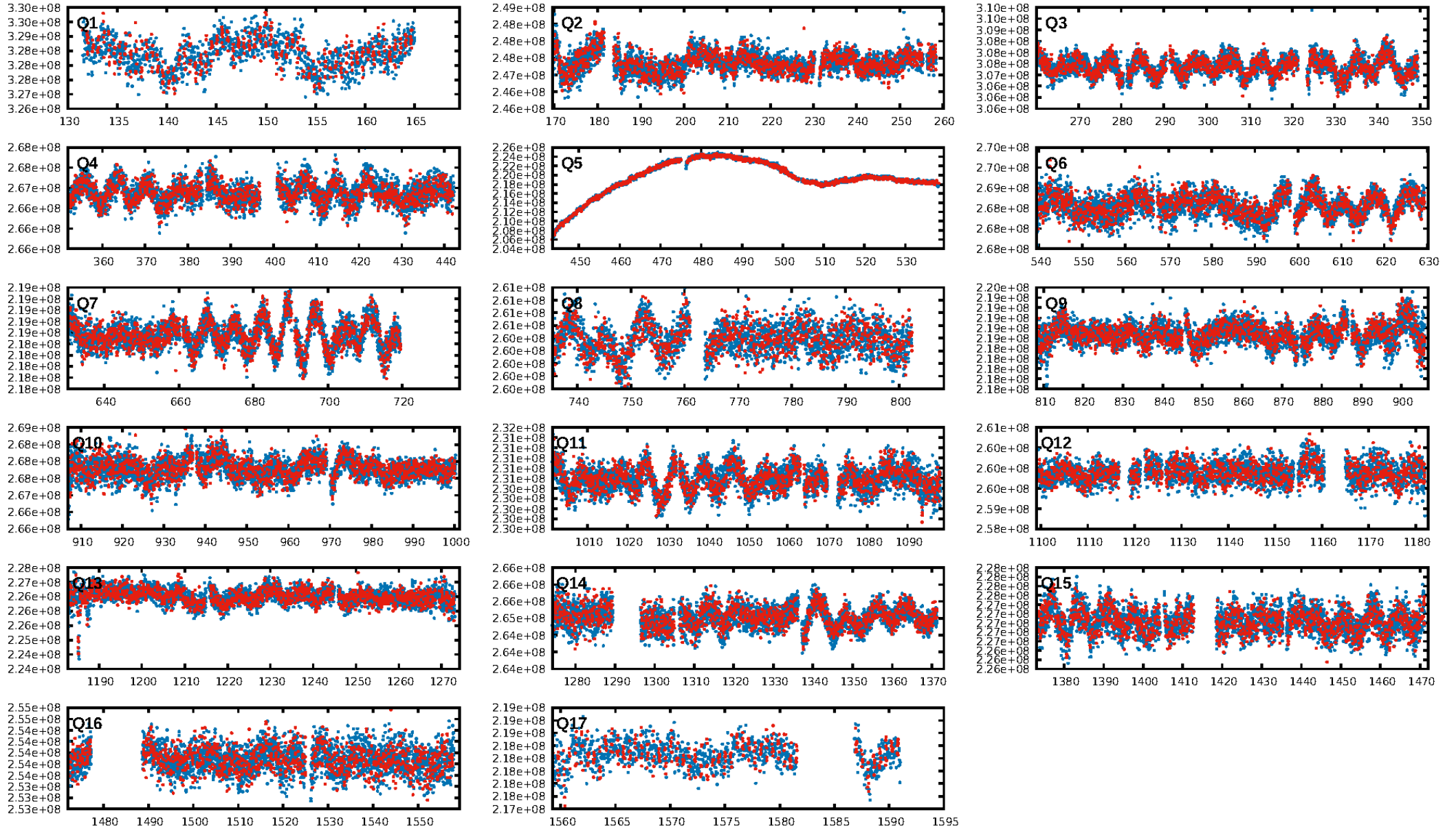
KIC: 6113871 Candidate: 1 of 2 Period: 0.545 d



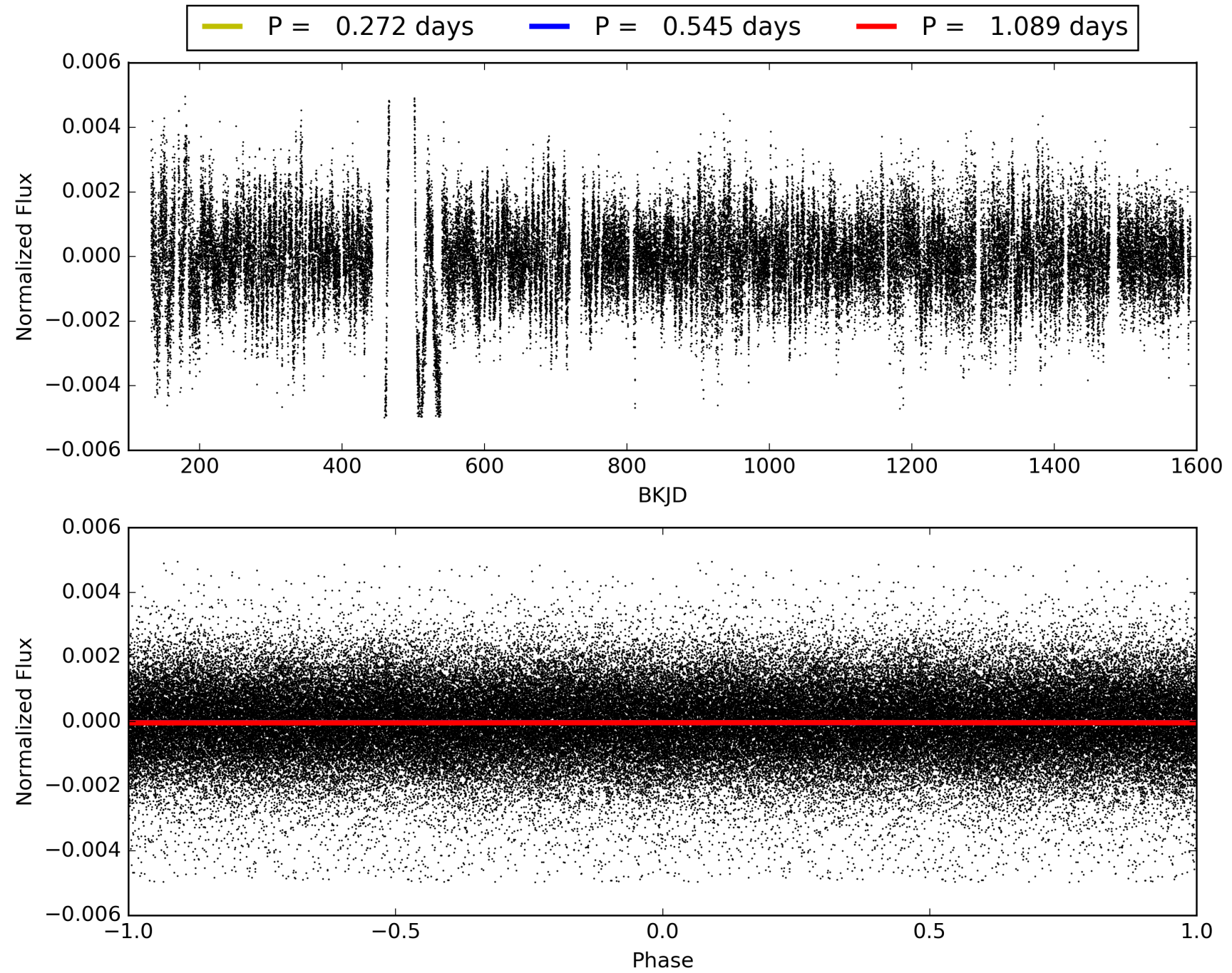
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:08:51 Z

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

# TCE 006113871-01, PDC Light Curves



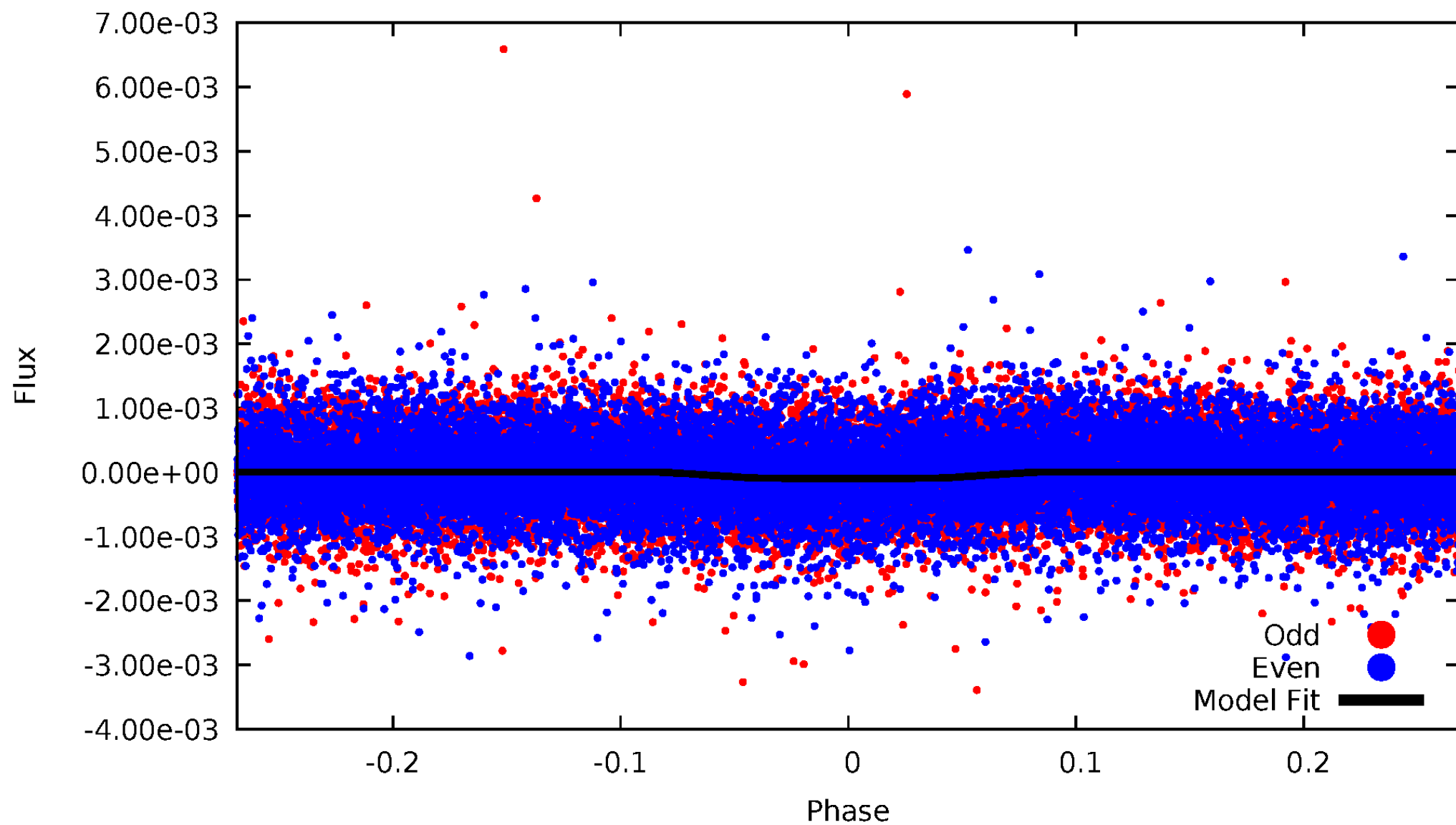
# TCE 006113871-01





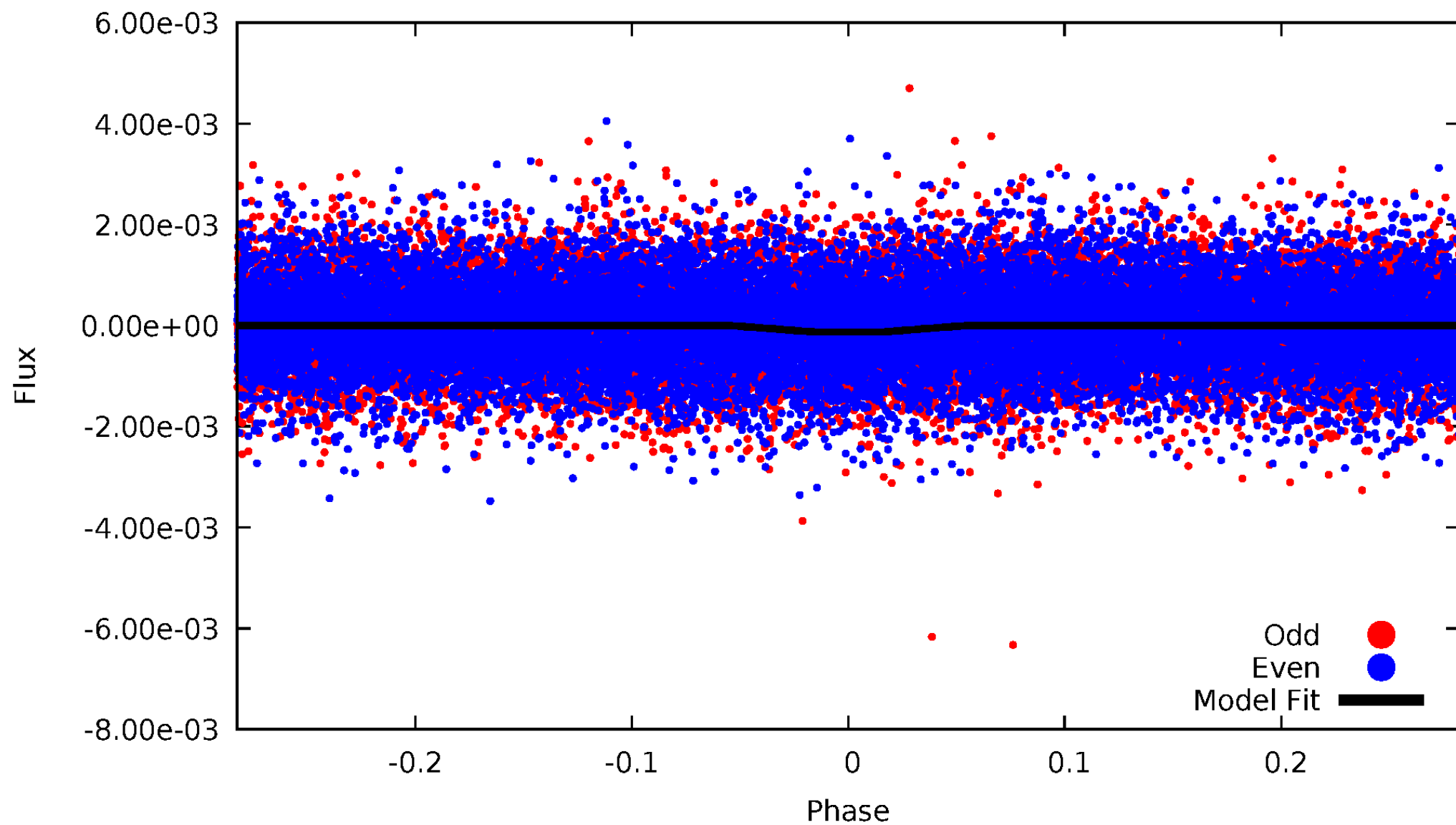
# DV Odd/Even

TCE 006113871-01



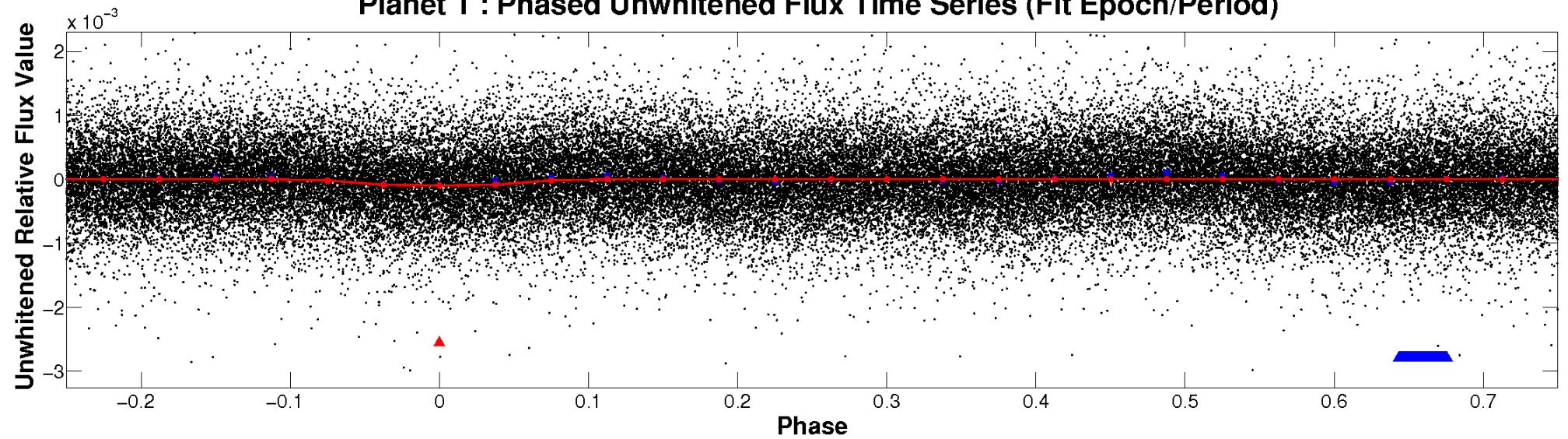
# ALT Odd/Even

TCE 006113871-01

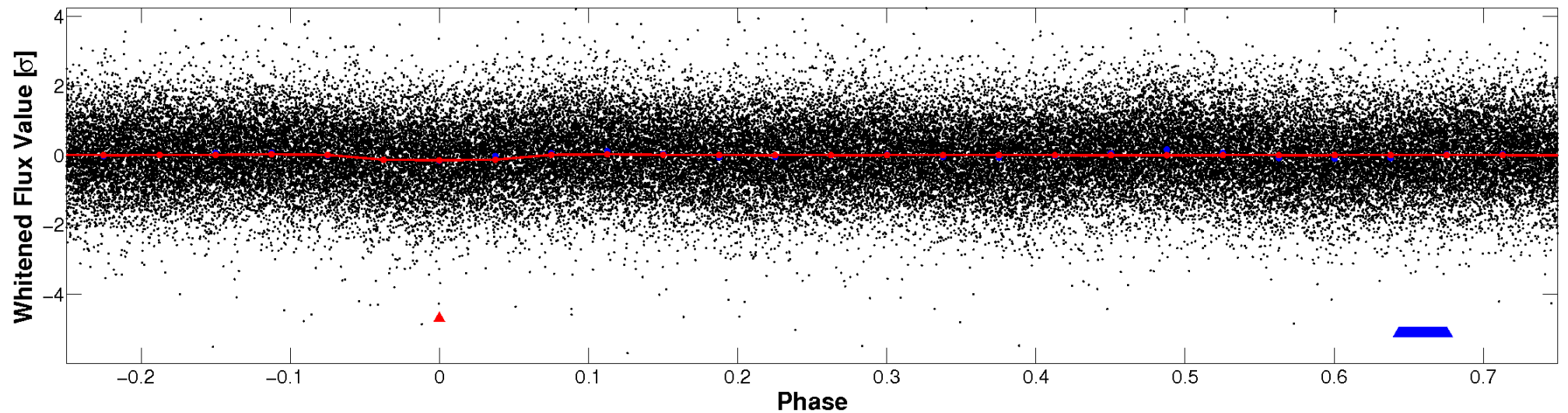


# Non-Whitened Vs. Whitened Light Curve

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

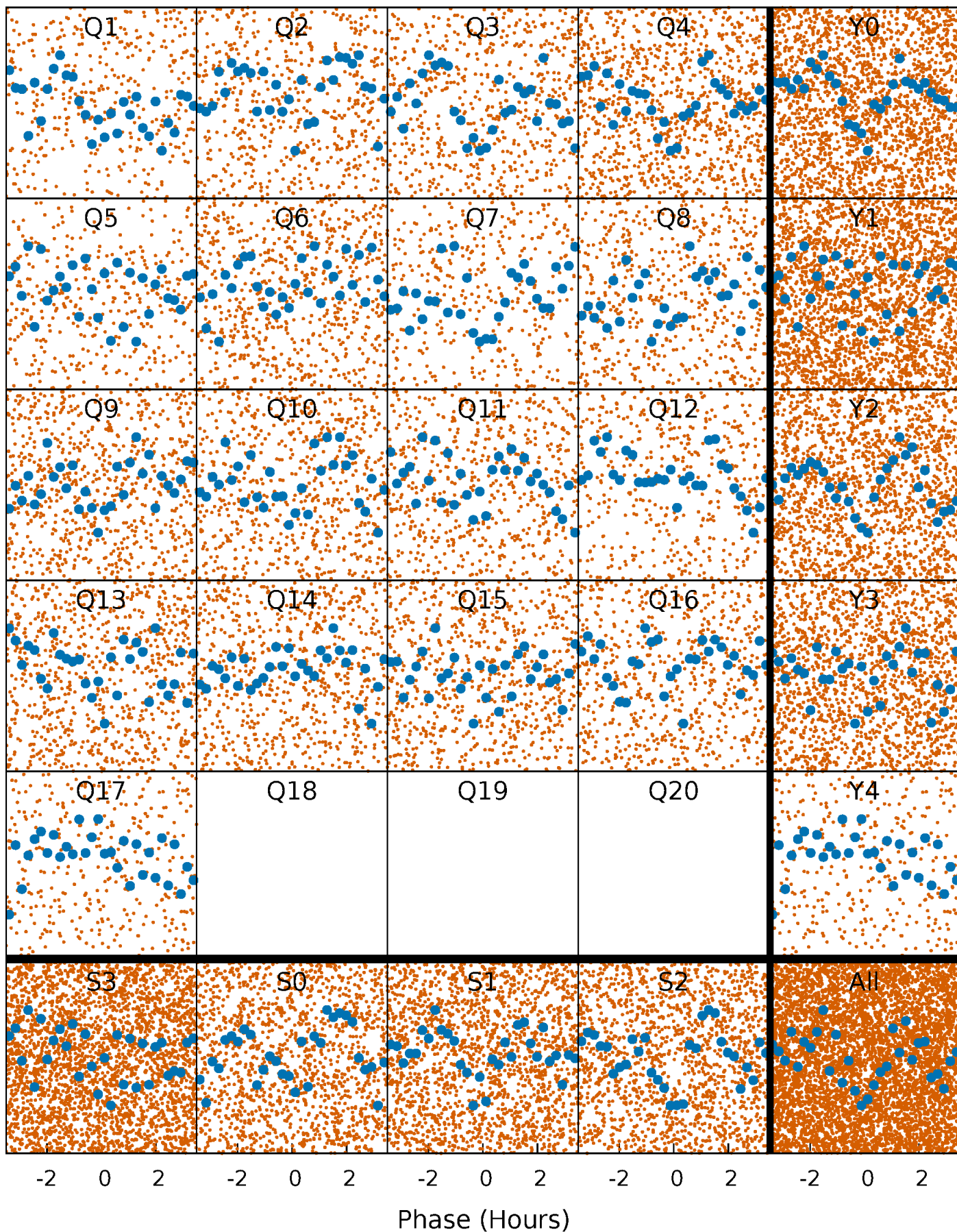


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

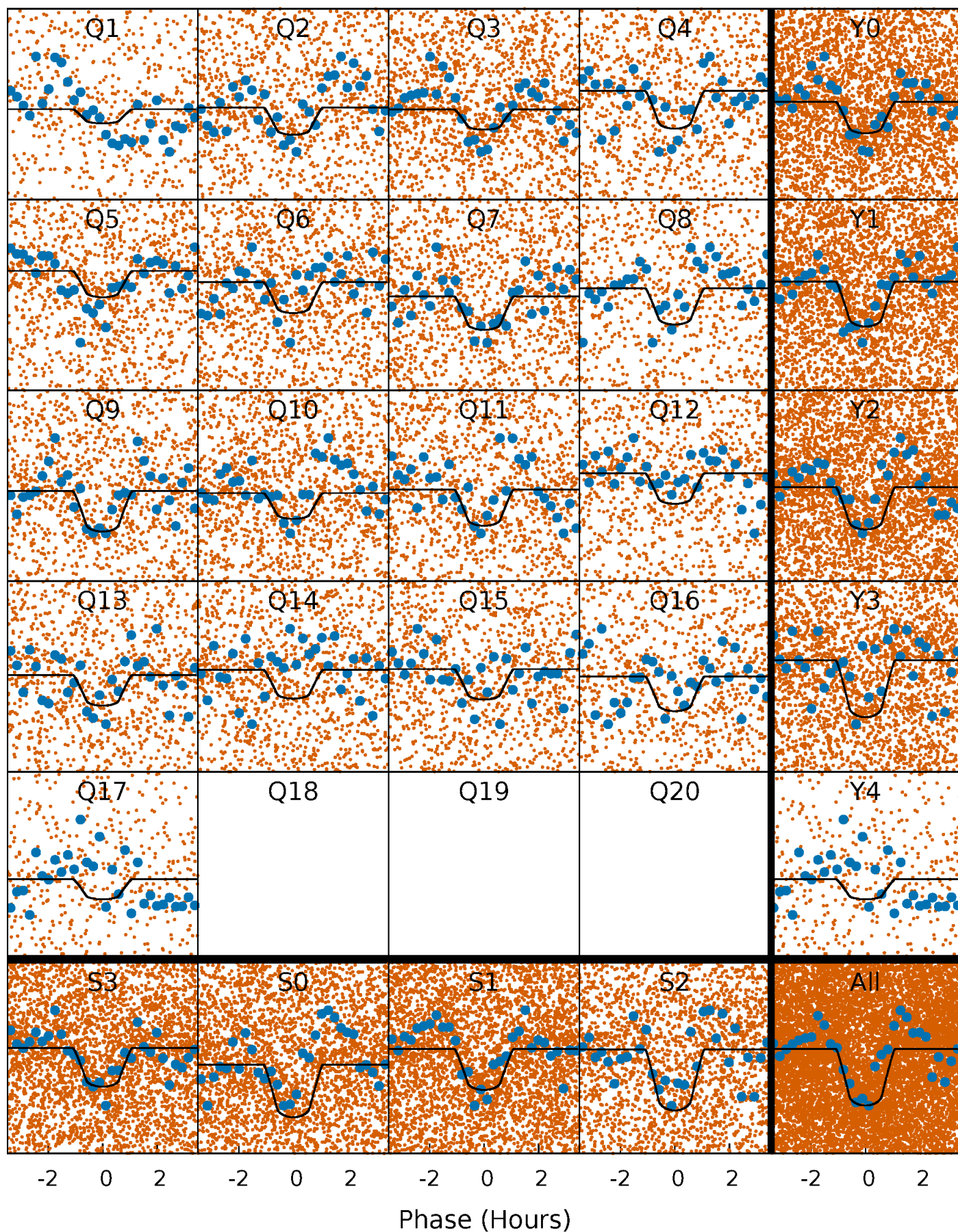
TCE 006113871-01 P= 0.544537 Days  $T_0=131.985814$  (BKJD)





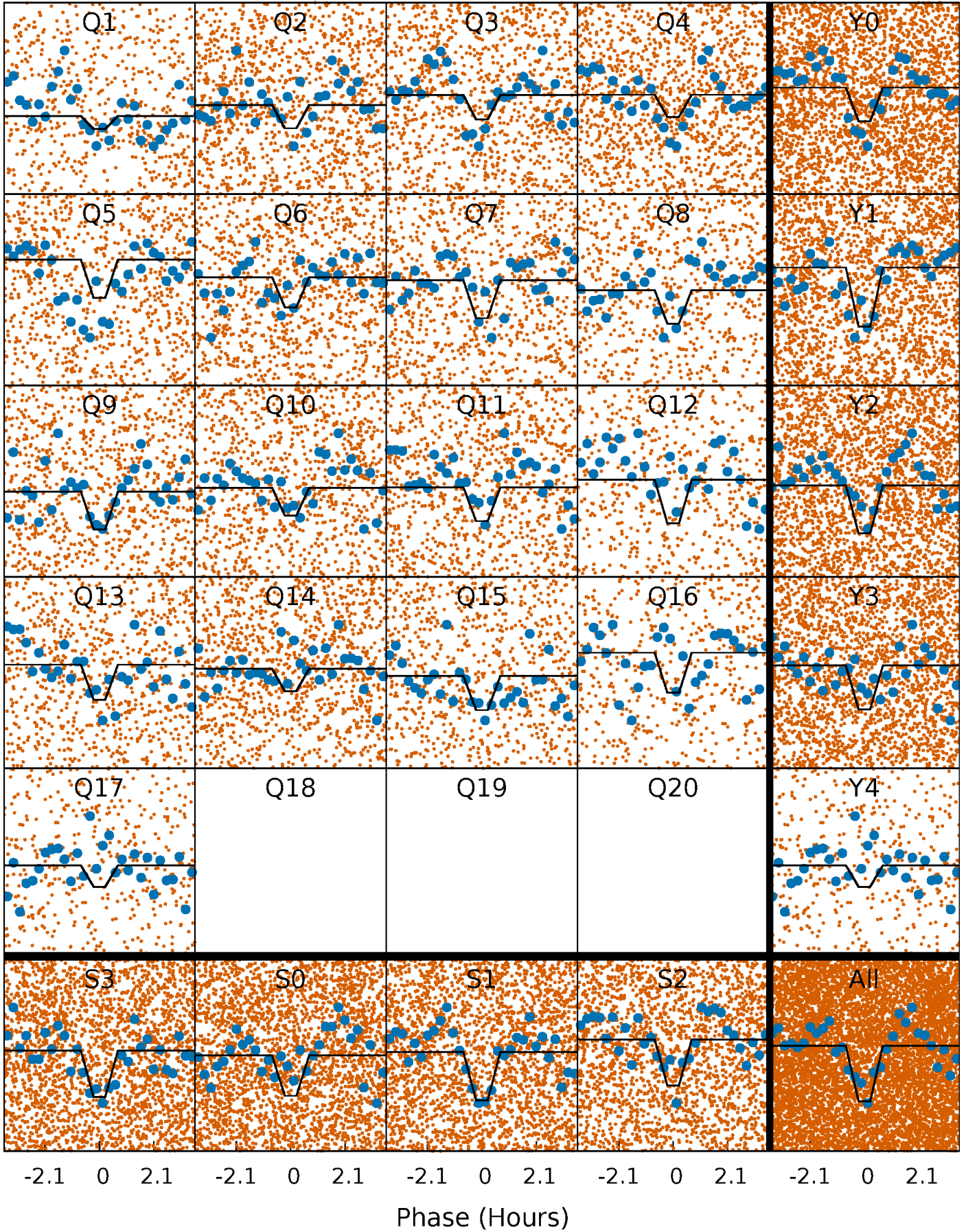
# DV Quarter-Phased Transit Curves

TCE 006113871-01 P= 0.544537 Days  $T_0=131.985814$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006113871-01   P= 0.544530 Days    $T_0=131.985664$  (BKJD)

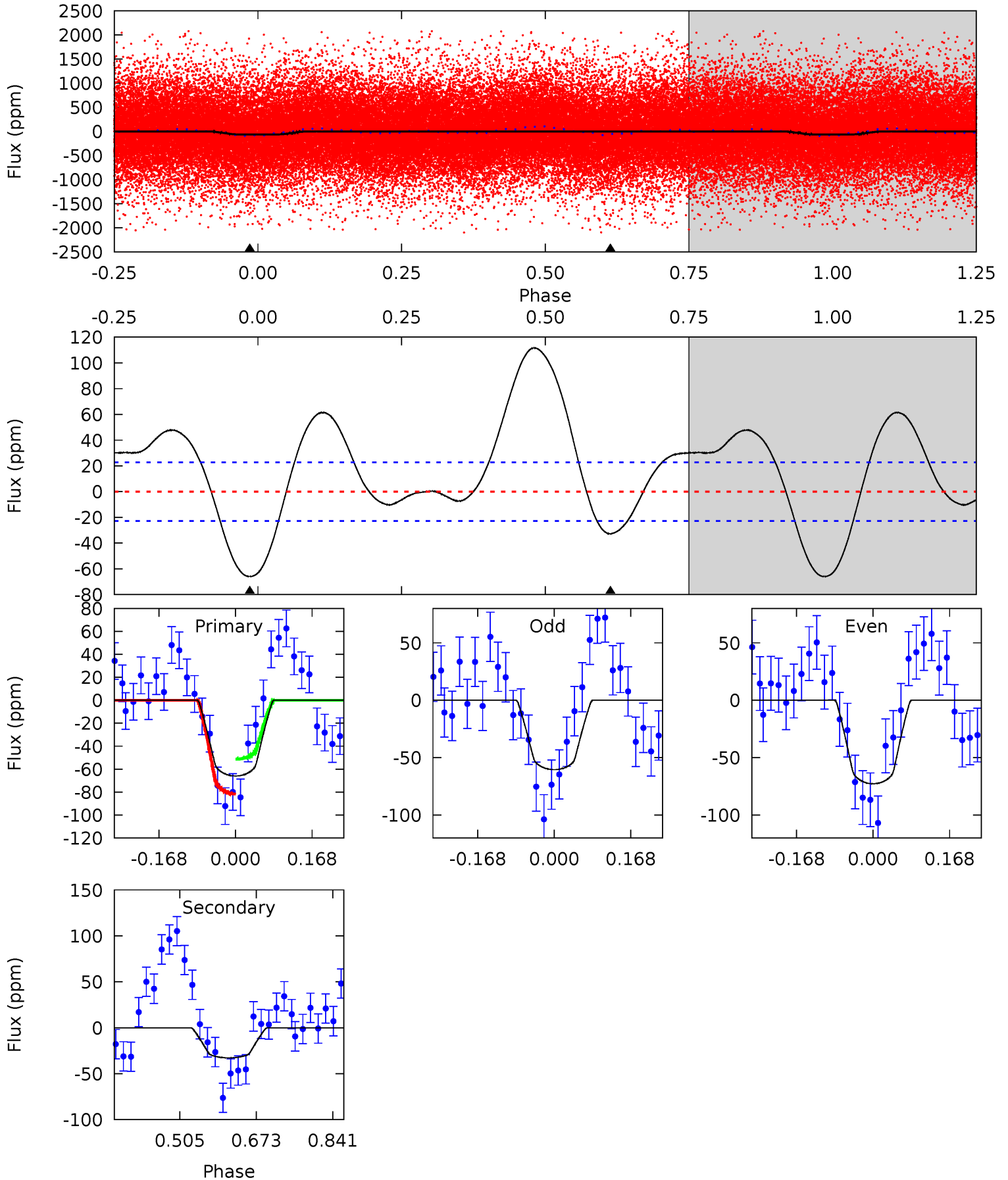




# DV Model-Shift Uniqueness Test

006113871-01, P = 0.544537 Days, E = 131.441277 Days

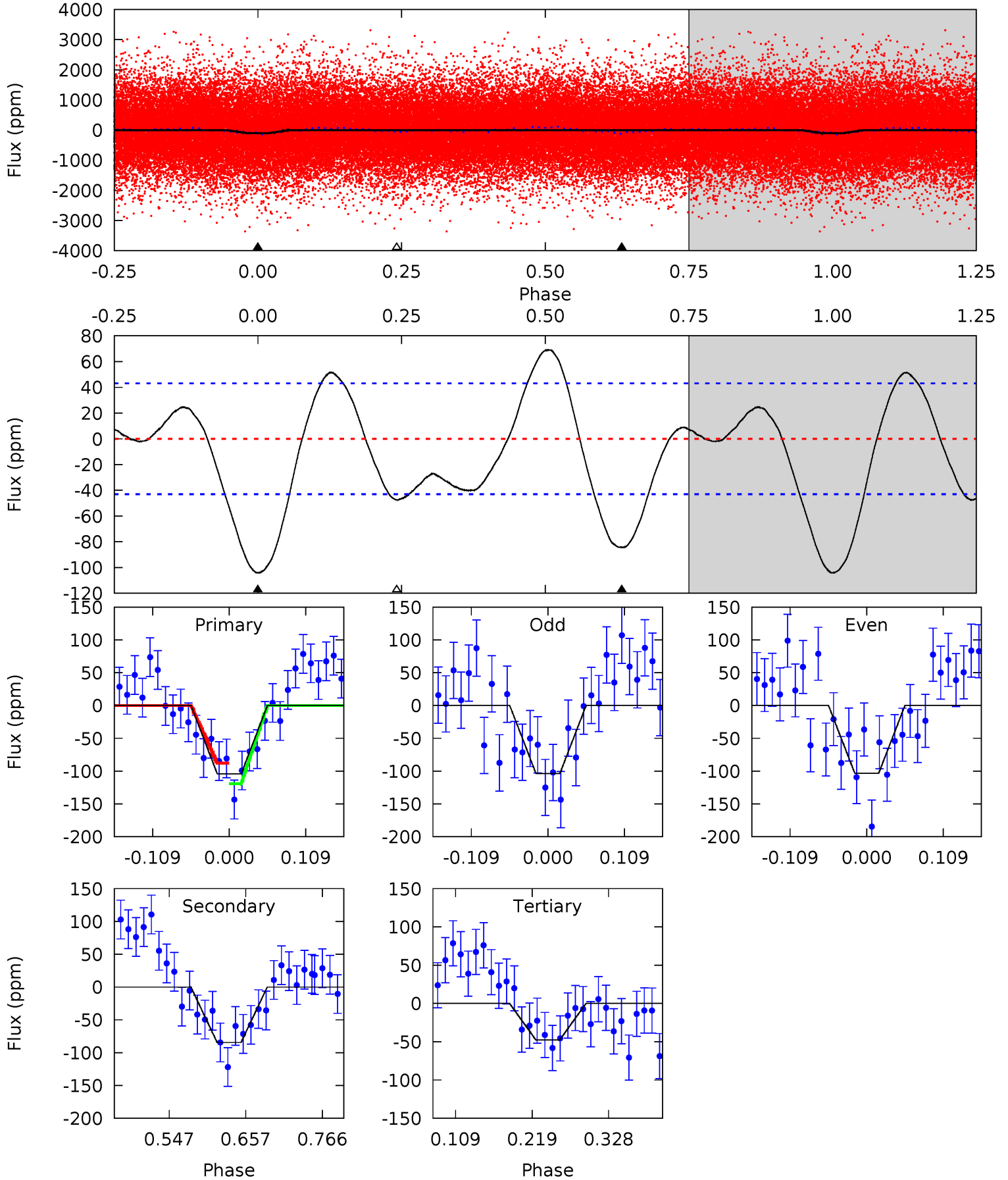
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	6.41	0	0	4.45	1.38	4.29	12.9	12.9	6.41	6.41	1.21	1.04	0.63	2.98



# Alt Model-Shift Uniqueness Test

006113871-01, P = 0.544530 Days, E = 131.441134 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
11.0	8.91	5.02	0	4.55	1.60	3.62	5.98	11.0	3.89	8.91	0.02	1.13	0.40	1.65





### Stellar Parameters For KIC 006113871

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6408^{+173}_{-211}$	$4.309^{+0.108}_{-0.201}$	$-0.120^{+0.250}_{-0.300}$	$1.240^{+0.400}_{-0.200}$	$1.141^{+0.185}_{-0.152}$	$0.843^{+0.407}_{-0.433}$
	+3%/-3%	+3%/-5%	+208%/-250%	+32%/-16%	+16%/-13%	+48%/-51%
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 006113871-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-33 \pm 5$	$1.47^{+0.67}_{-0.63}$	$3802^{+288}_{-229}$	$4608^{+1520}_{-812}$	$1.576^{+3.130}_{-0.861}$
Alt.	$-84 \pm 9$	$1.54^{+0.66}_{-0.65}$	$3803^{+291}_{-218}$	$5696^{+1922}_{-869}$	$3.623^{+7.259}_{-1.811}$

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

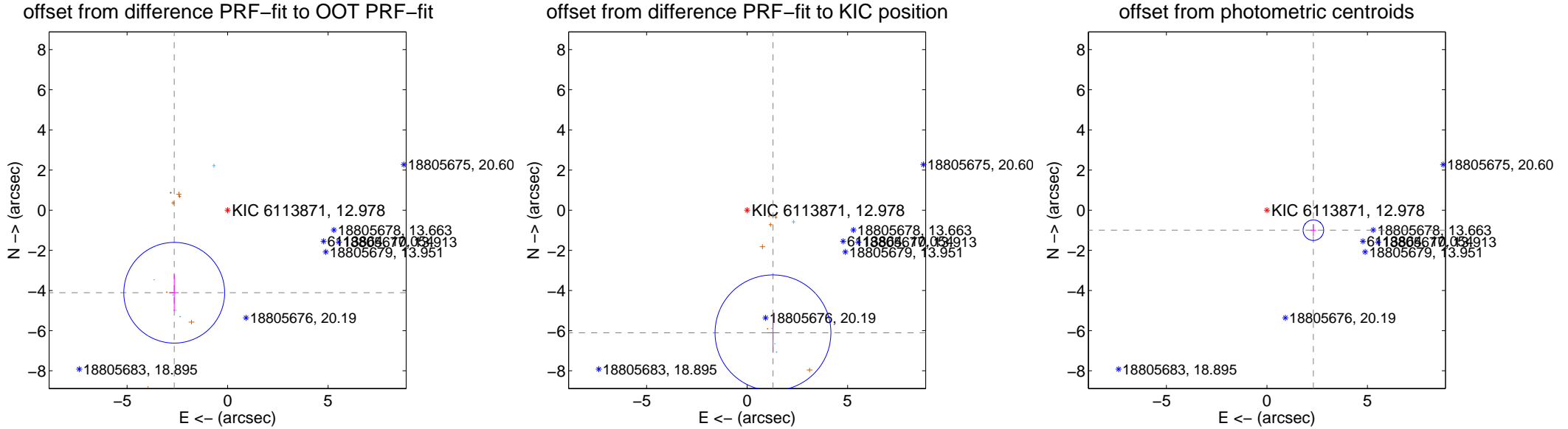
## DV Centroid Data

Supplemental centroid analysis for 006113871-01. Kepler magnitude: 12.98. Transit SNR 11.83

There are 4 quarters with good PRF difference image offsets

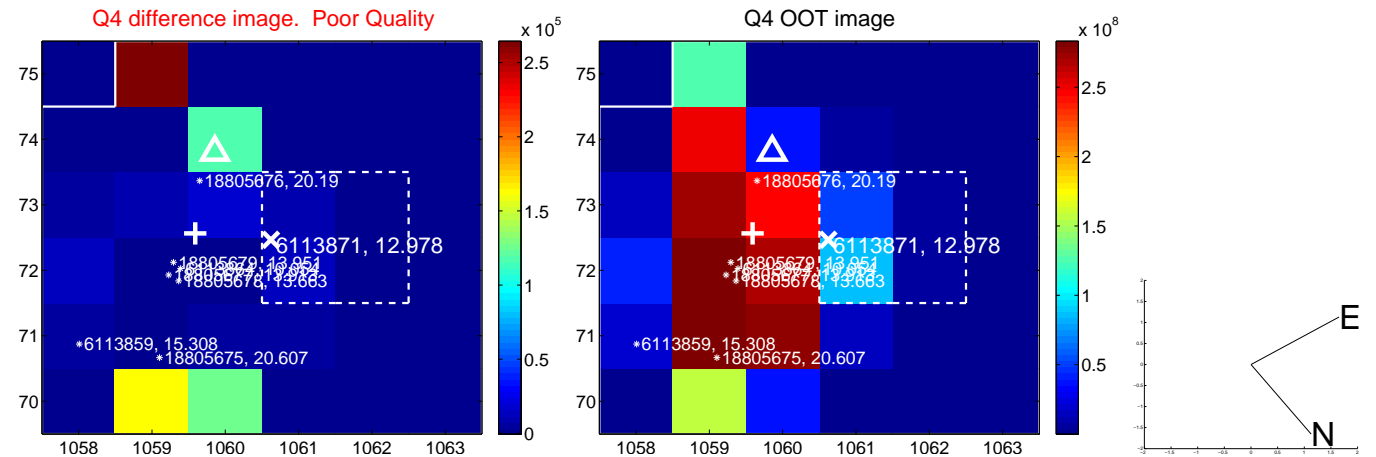
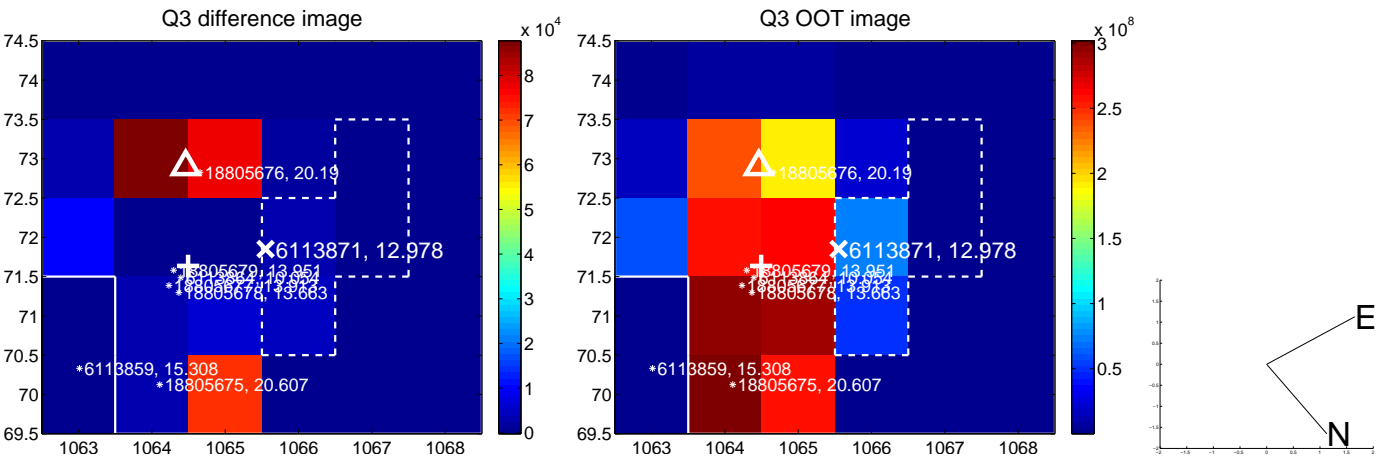
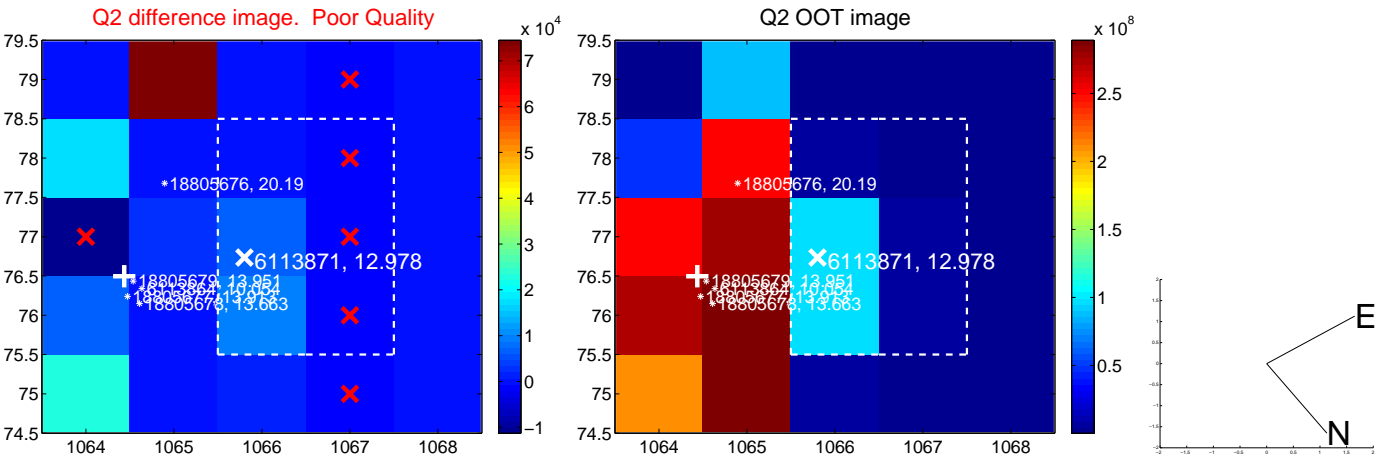
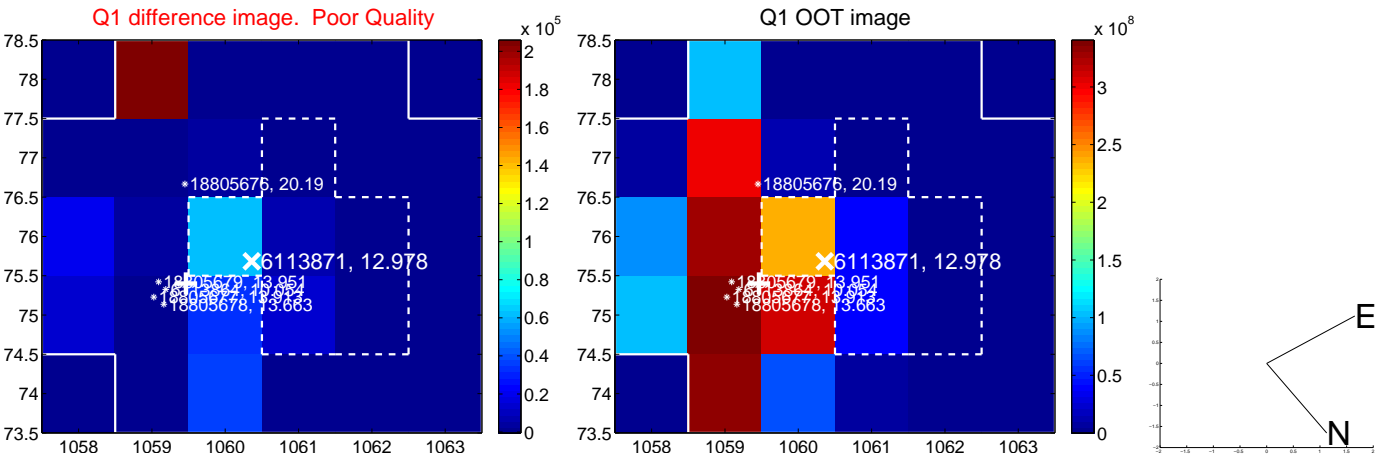
The OOT PRF centroid is offset from the target star catalog position by about 3.99 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.894 \pm 0.836$	5.85	$2.655 \pm 0.229$	$-4.111 \pm 0.918$
PRF-fit source offset from KIC position	$6.239 \pm 0.961$	6.50	$-1.286 \pm 0.294$	$-6.105 \pm 0.994$
photometric centroid source offset	$2.52 \pm 0.17$	14.74	$-2.31 \pm 0.13$	$-1.00 \pm 0.30$

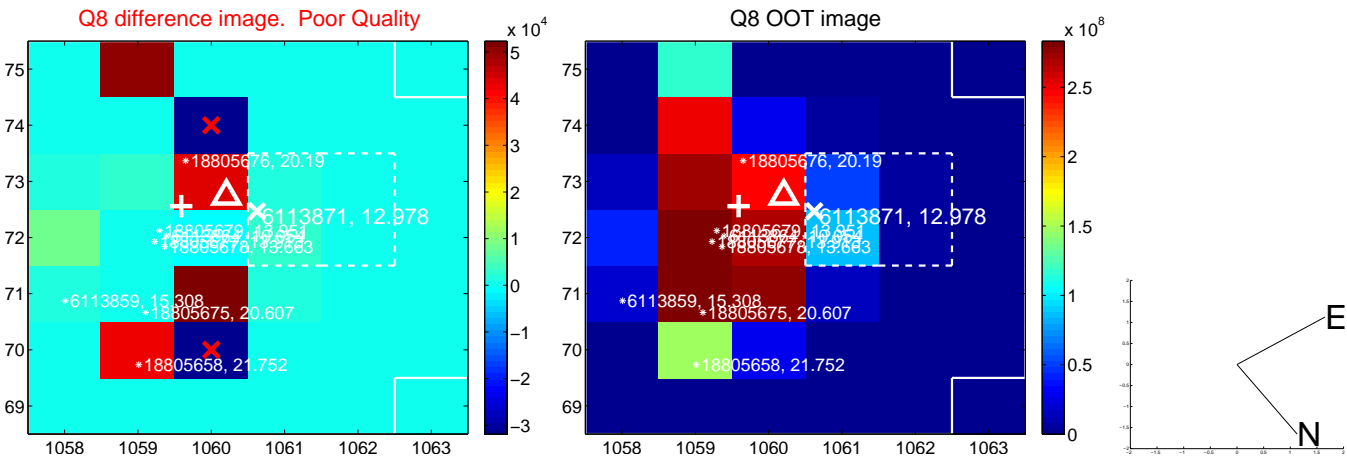
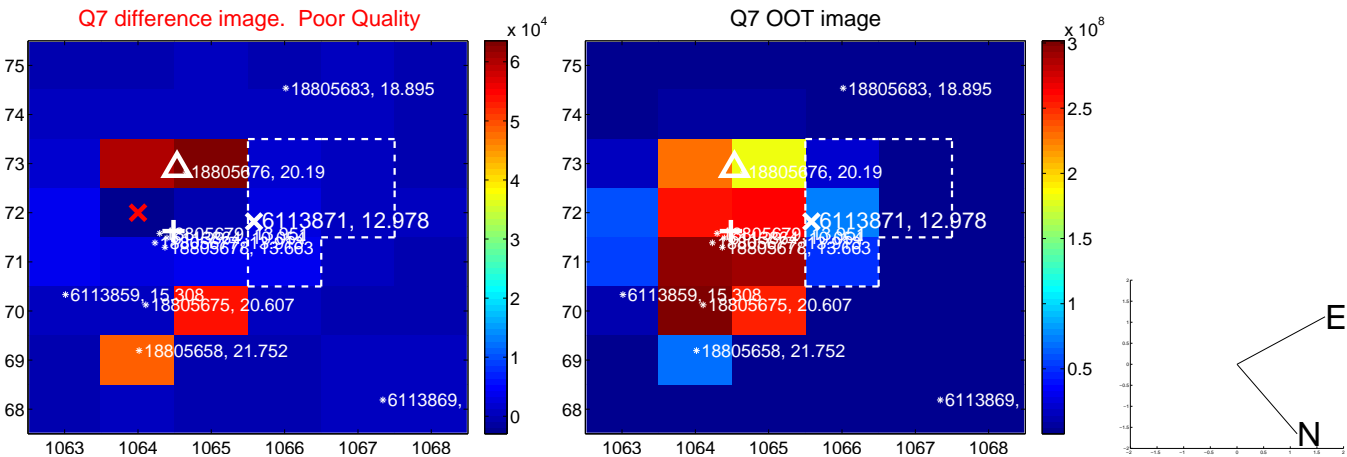
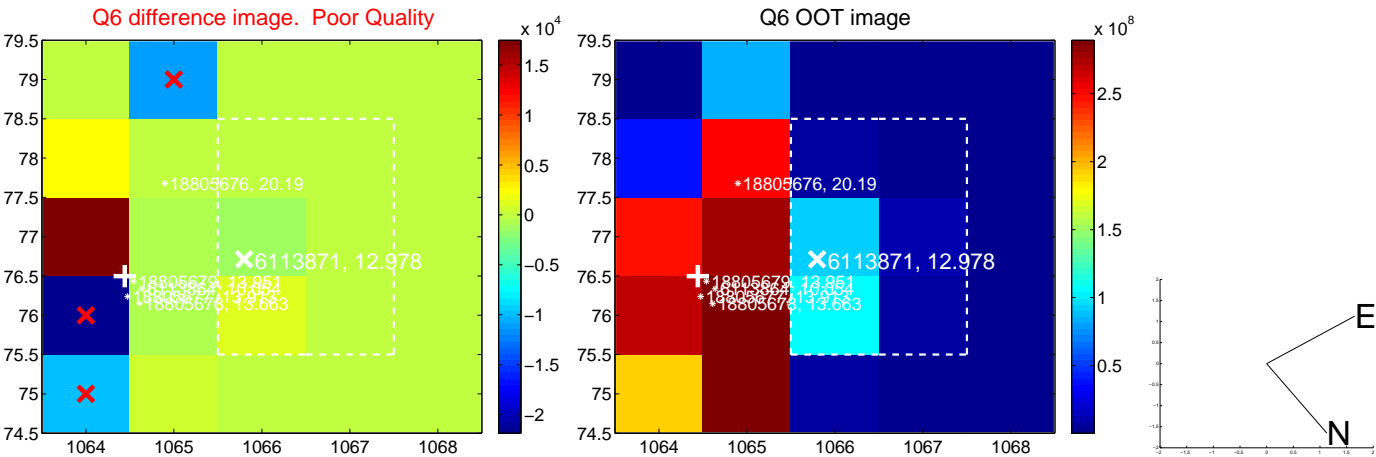
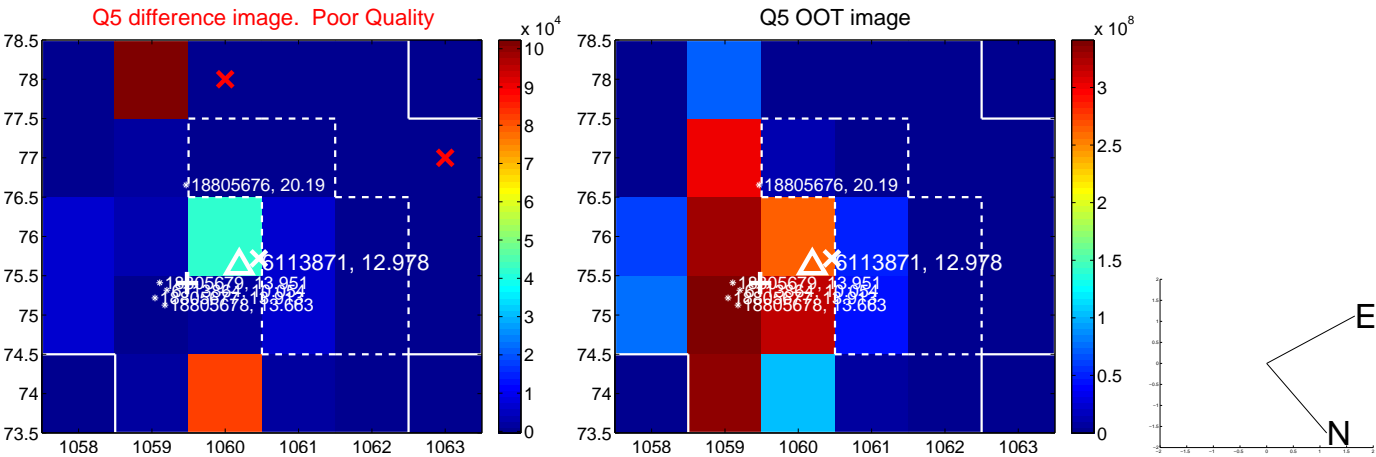


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

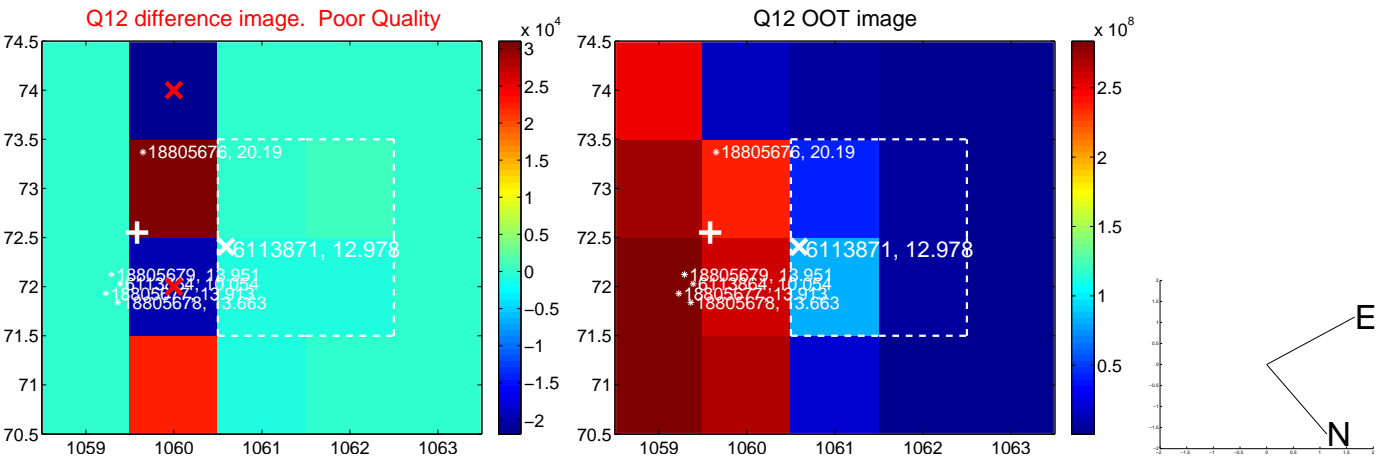
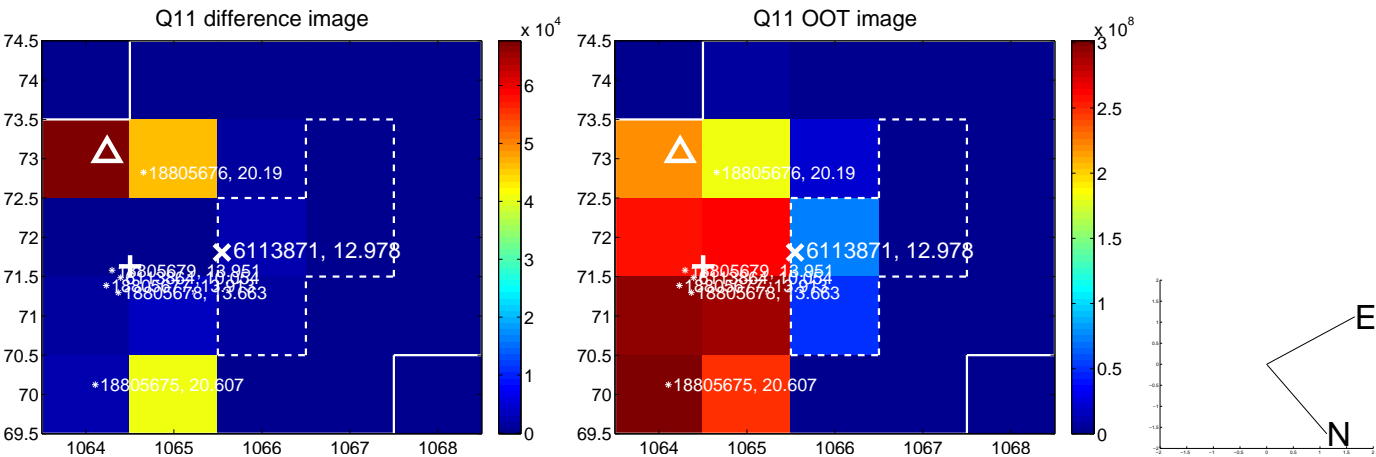
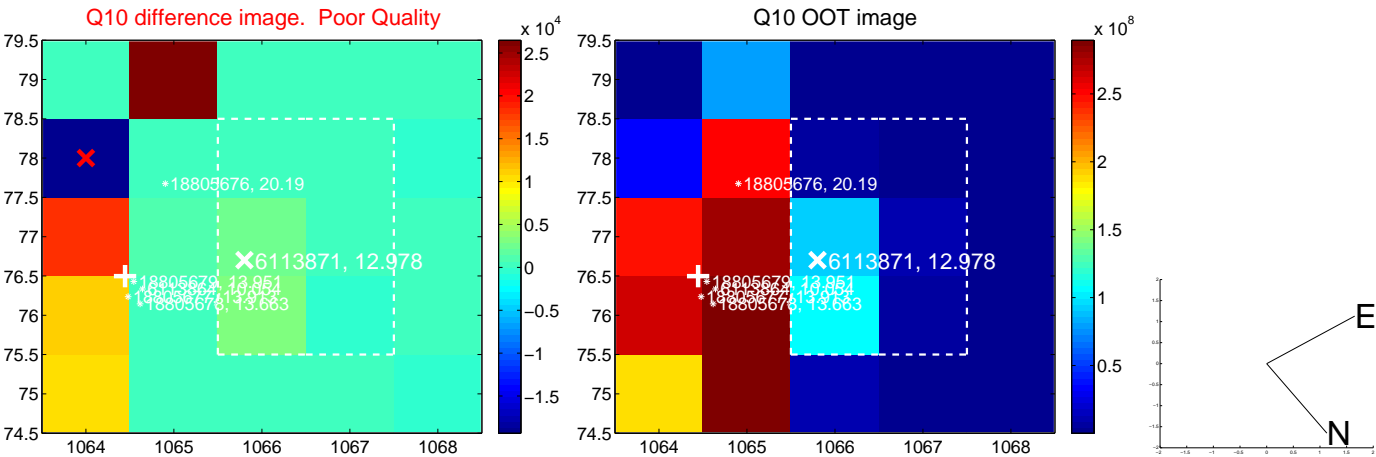
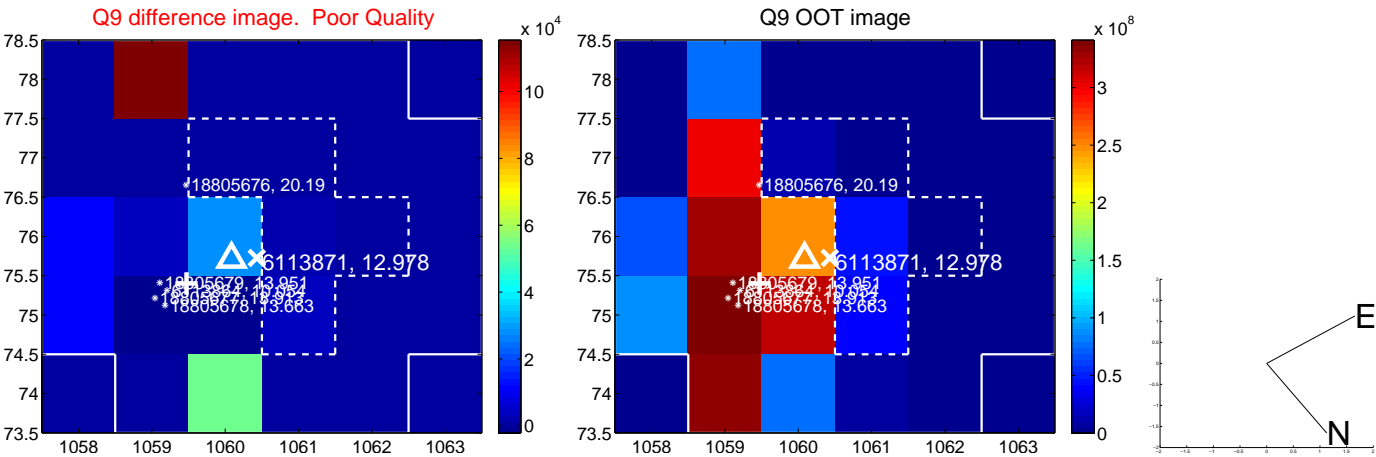


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

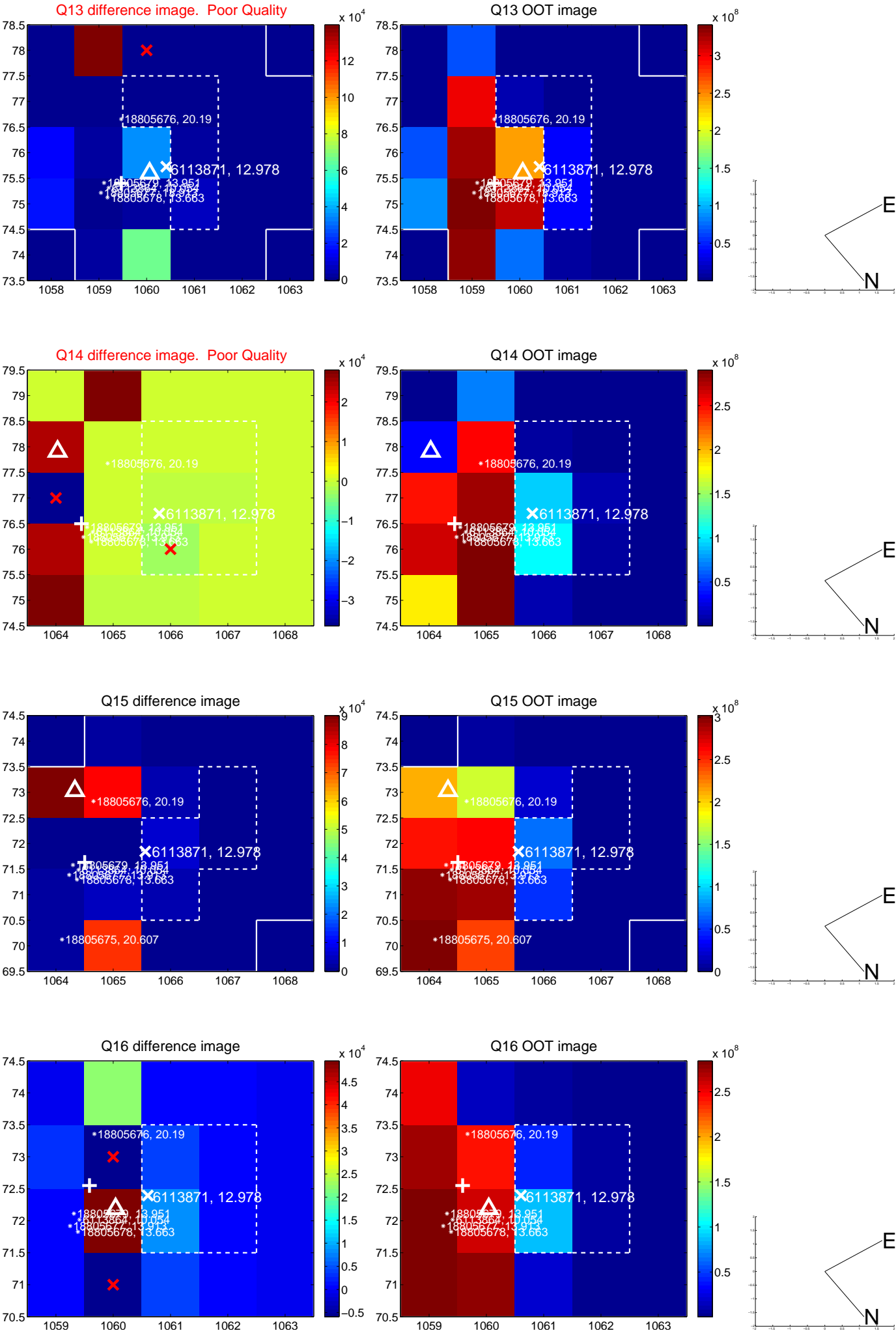




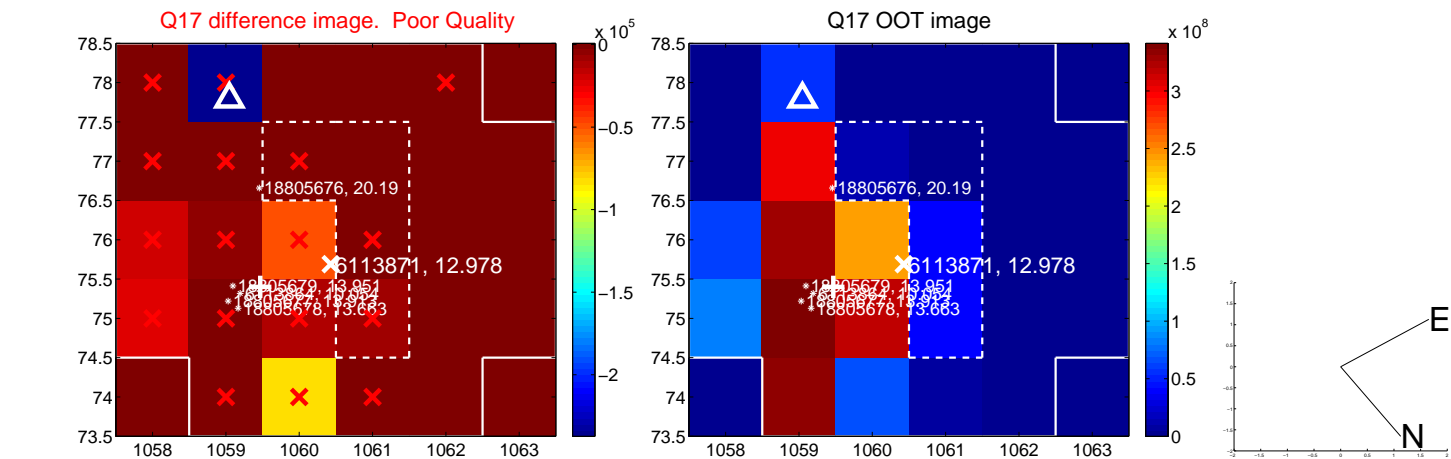
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



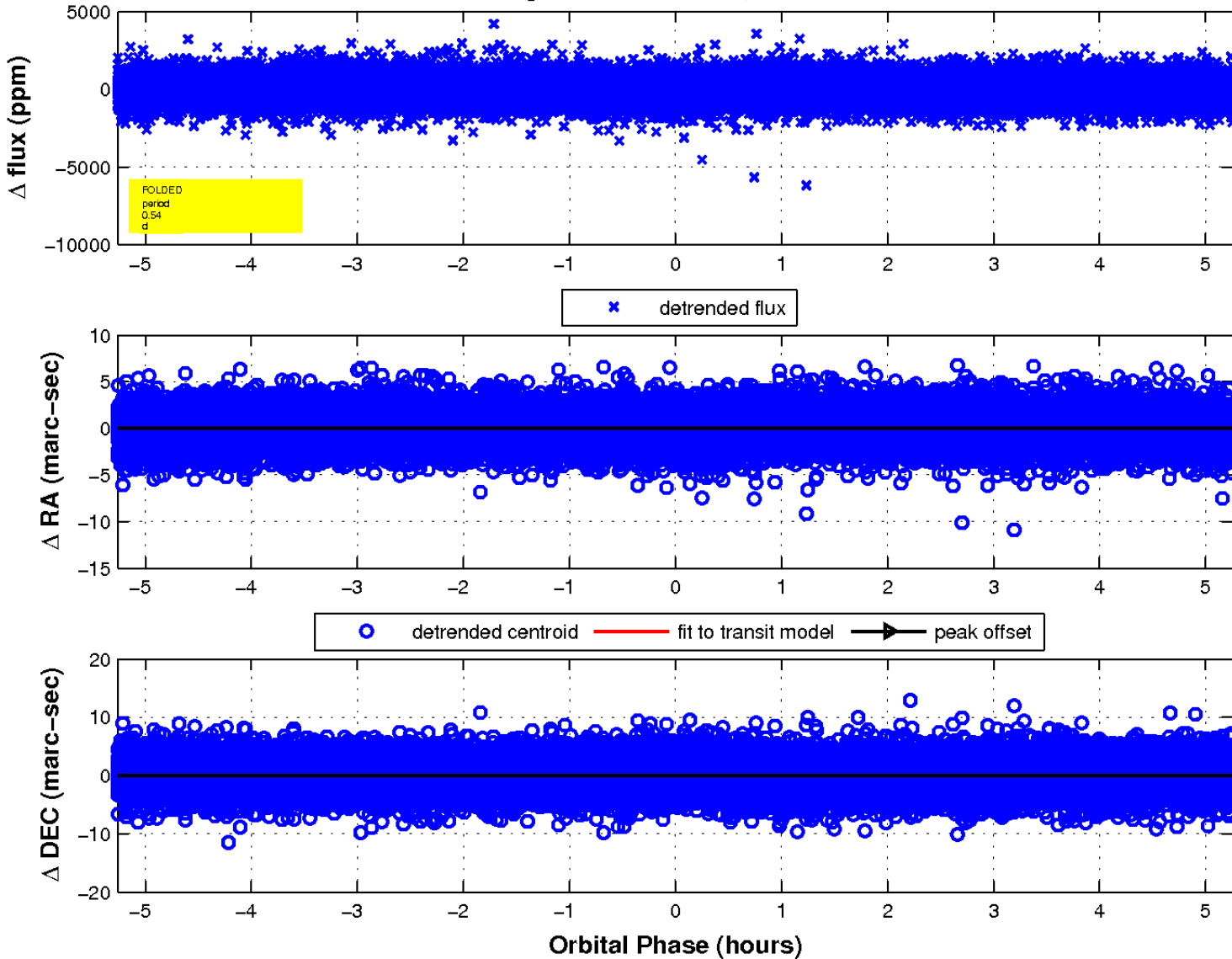
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

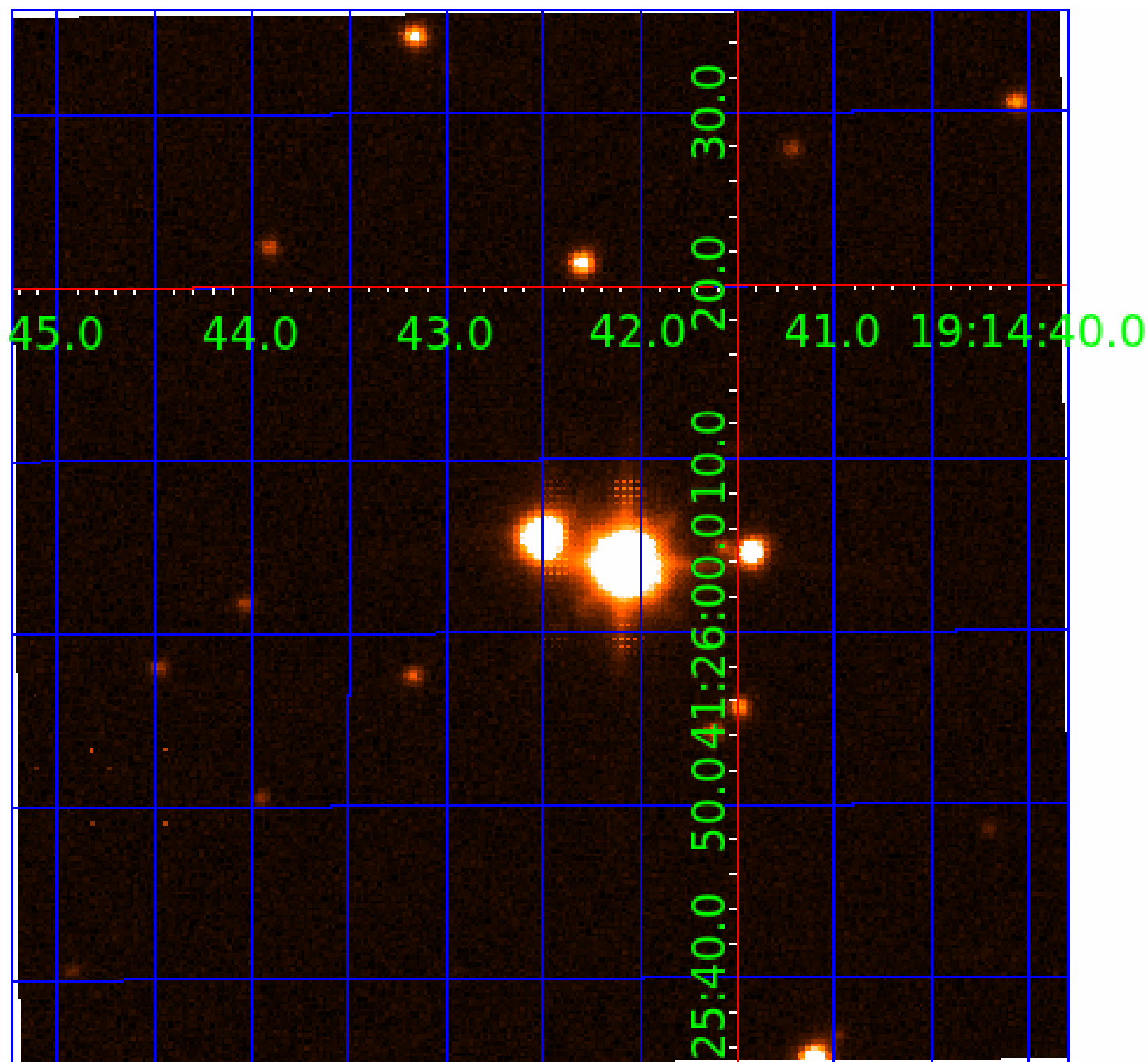


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 006113871

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113871-01	OBS	No	0.544537	131.985814	97.7	1.753	8.9	11.8	1.24	6408	1.44	12474.67
006113871-02	OBS	No	0.544543	131.791668	40.8	3.057	9.0	6.1	1.24	6408	0.80	12474.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113871-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
006113871-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET

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

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

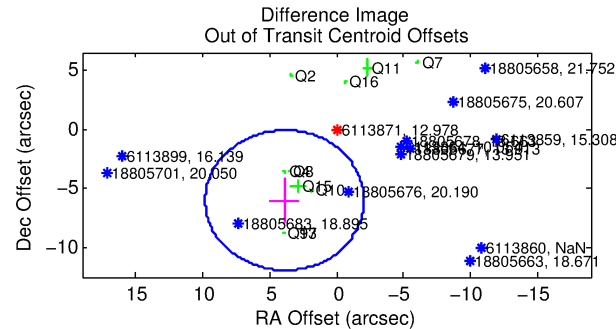
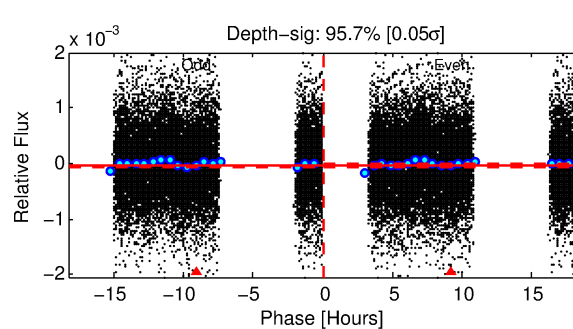
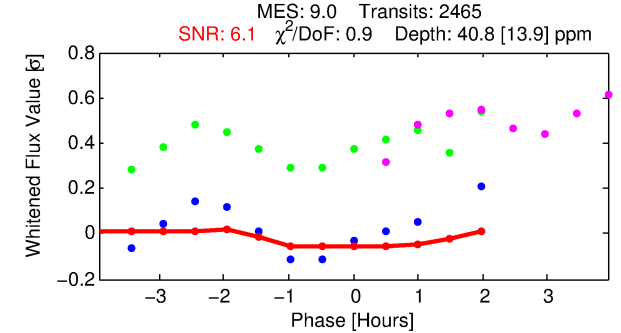
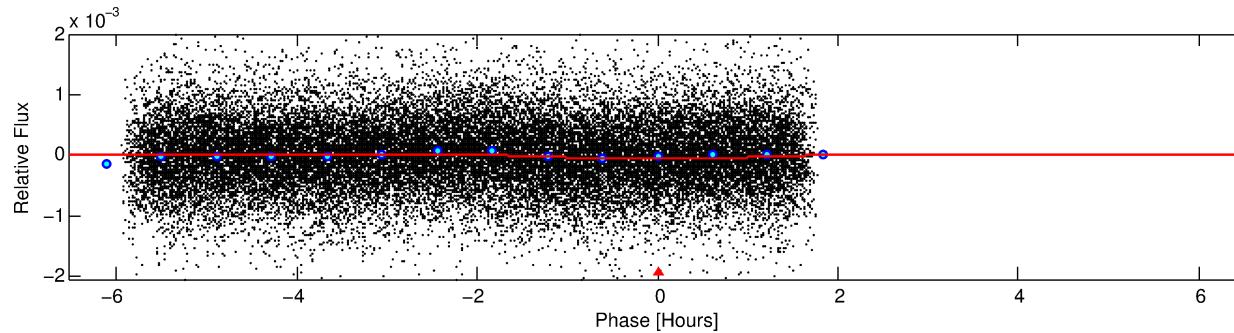
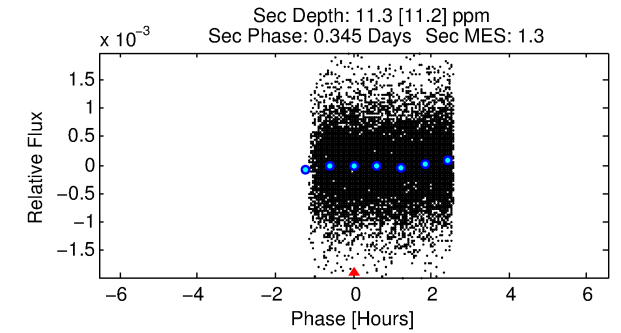
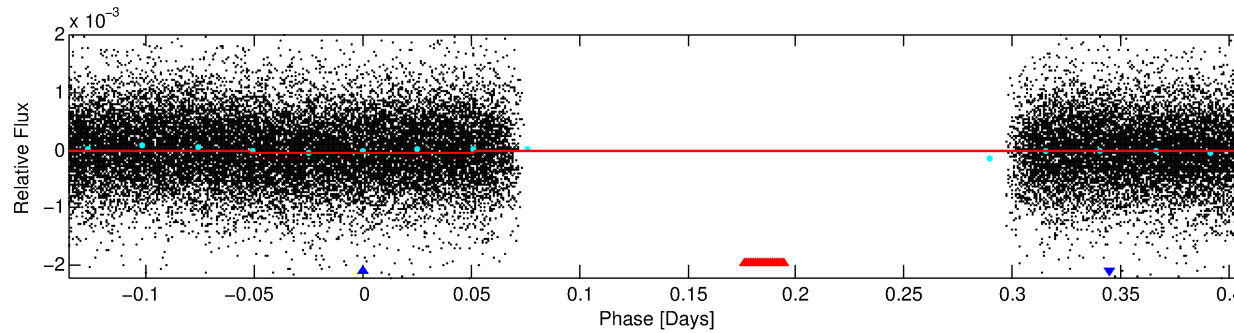
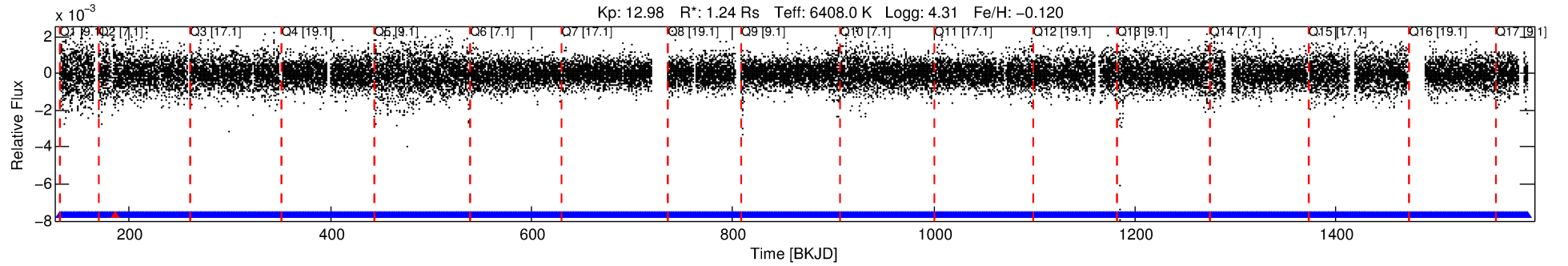
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006113871-02

No Significant Match Found

# DV One-Page Summary

KIC: 6113871 Candidate: 2 of 2 Period: 0.545 d



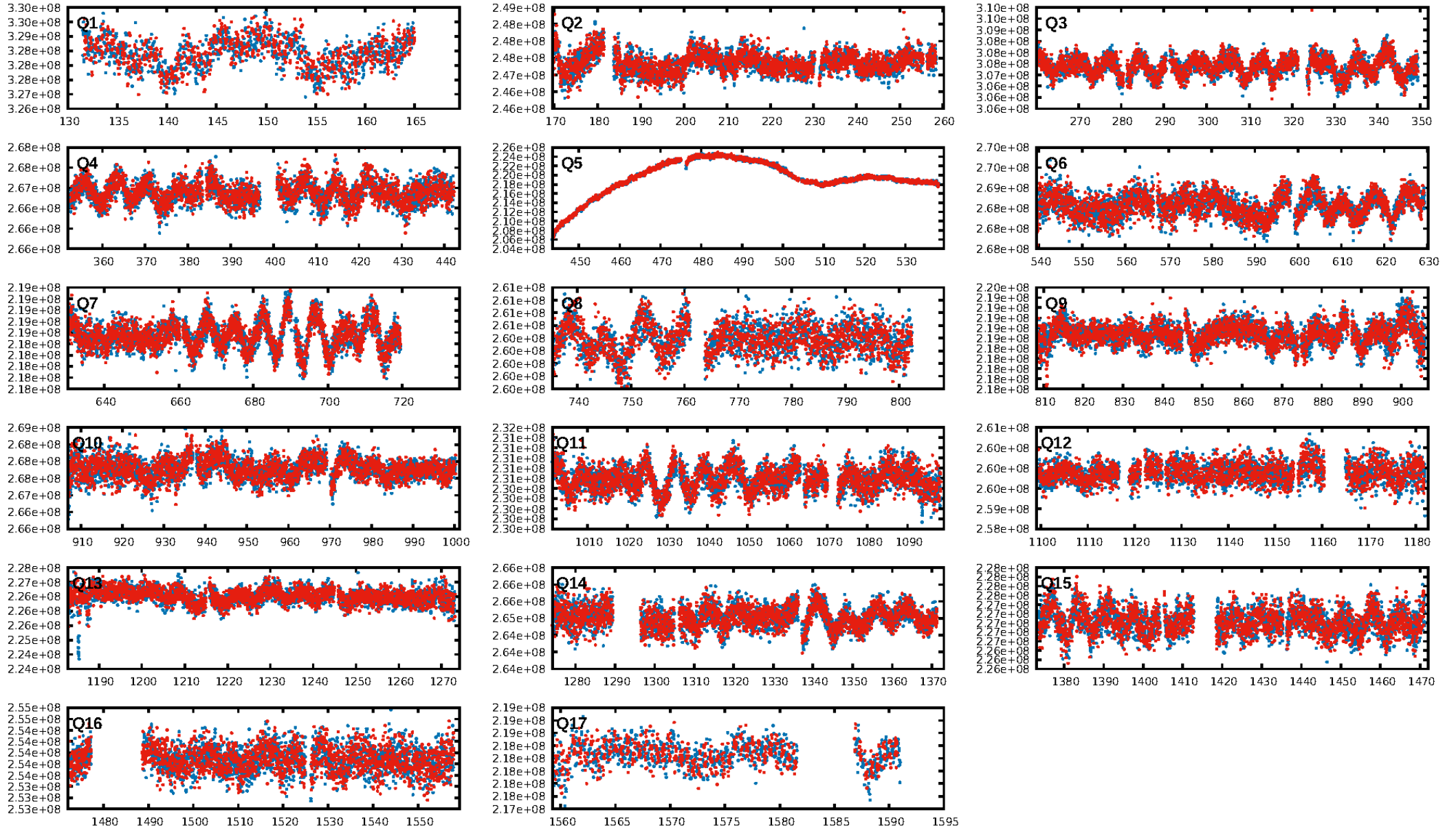
## DV Fit Results:

Period = 0.54454 [0.00003] d  
Epoch = 131.7917 [0.0052] BKJD  
Rp/R\* = 0.0059 [0.0077]  
a/R\* = 1.46 [5.27]  
b = 0.30 [20.71]  
Seff = 12474.47 [4970.99]  
Teff = 2695 [268] K  
Rp = 0.80 [1.08] Re  
a = 0.0136 [0.0036] AU  
Ag = 1.80 [5.06] [0.16σ]  
Teffp = 4823 [3370] K [0.63σ]

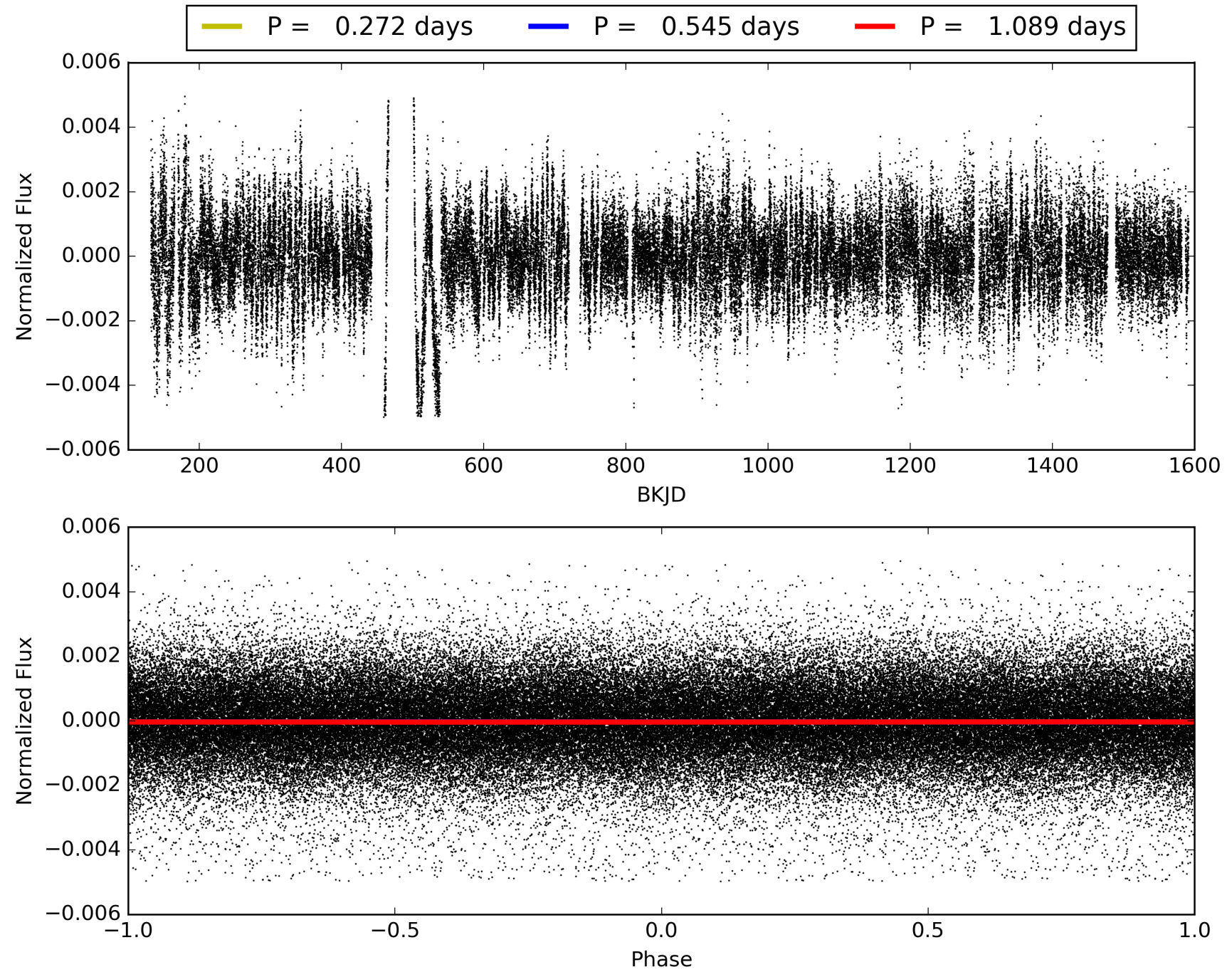
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.77e-14  
RollingBand-fgt: 1.00 [2353/2354]  
GhostDiagnostic-chr: 0.2681  
Centroid-sig: 0.3%  
Centroid-so: 1.753 arcsec [5.69σ]  
OotOffset-rm: 7.159 arcsec [3.62σ]  
KicOffset-rm: 8.027 arcsec [5.27σ]  
OotOffset-st: 2/3/3/3 [11]  
KicOffset-st: 2/3/3/3 [11]  
DiffImageQuality-fgm: 0.18 [2/11]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 006113871-02, PDC Light Curves



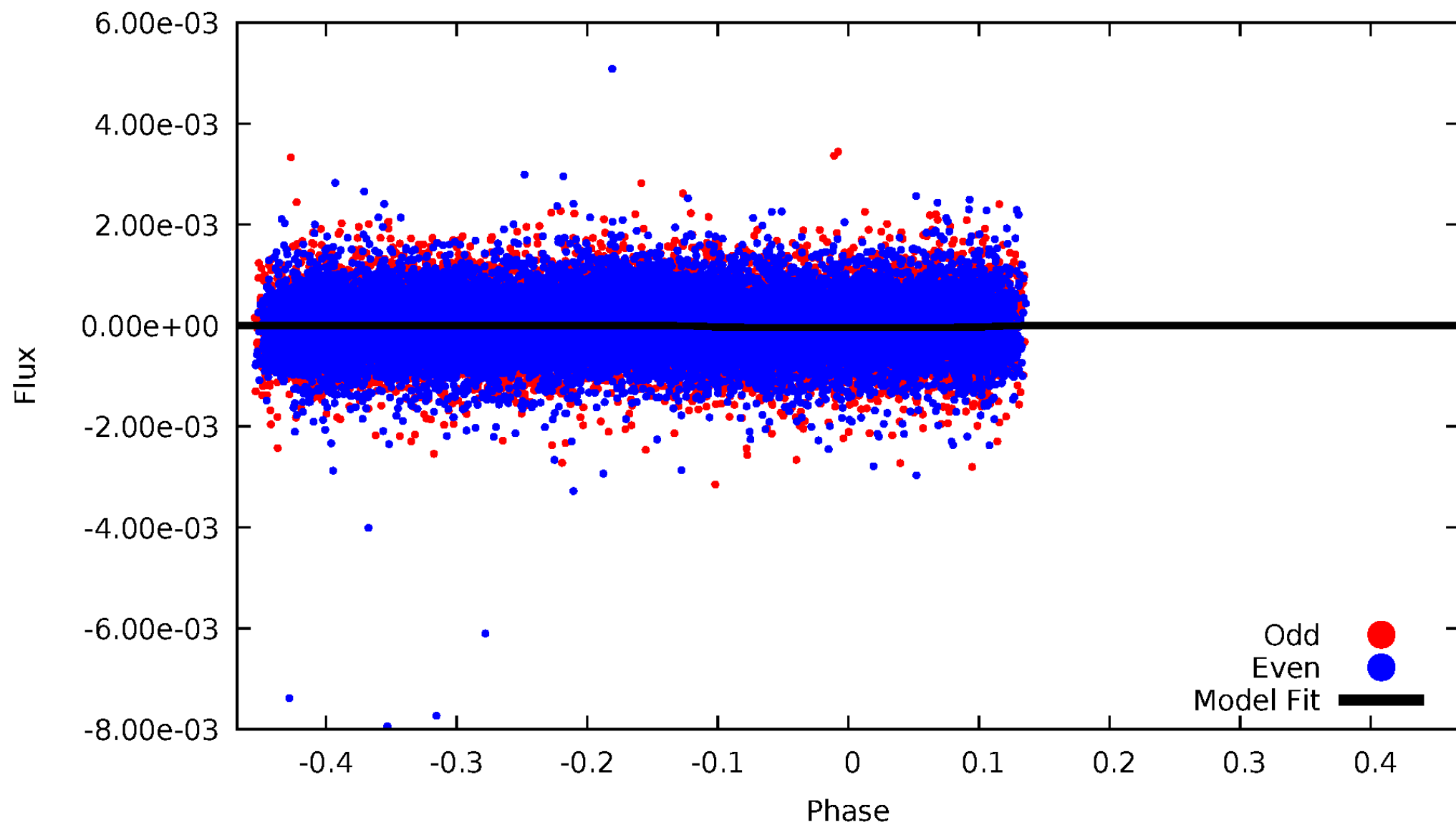
# TCE 006113871-02





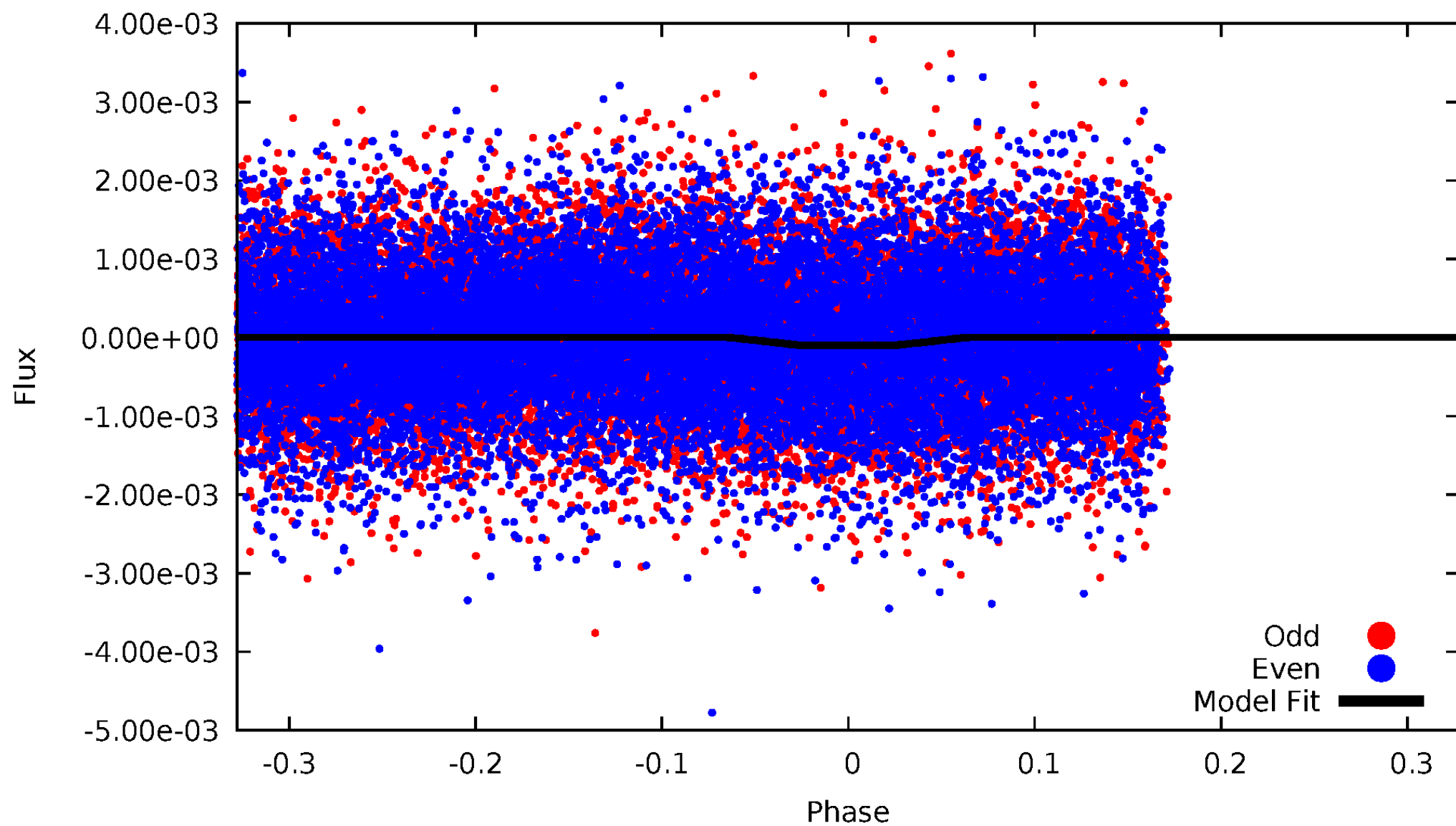
# DV Odd/Even

TCE 006113871-02



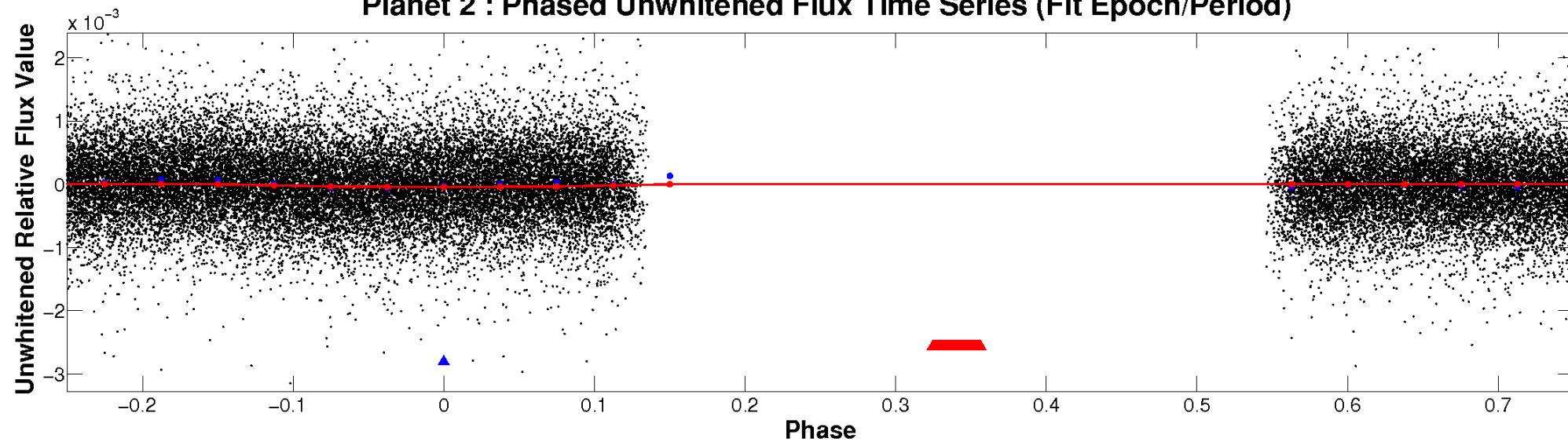
# ALT Odd/Even

TCE 006113871-02

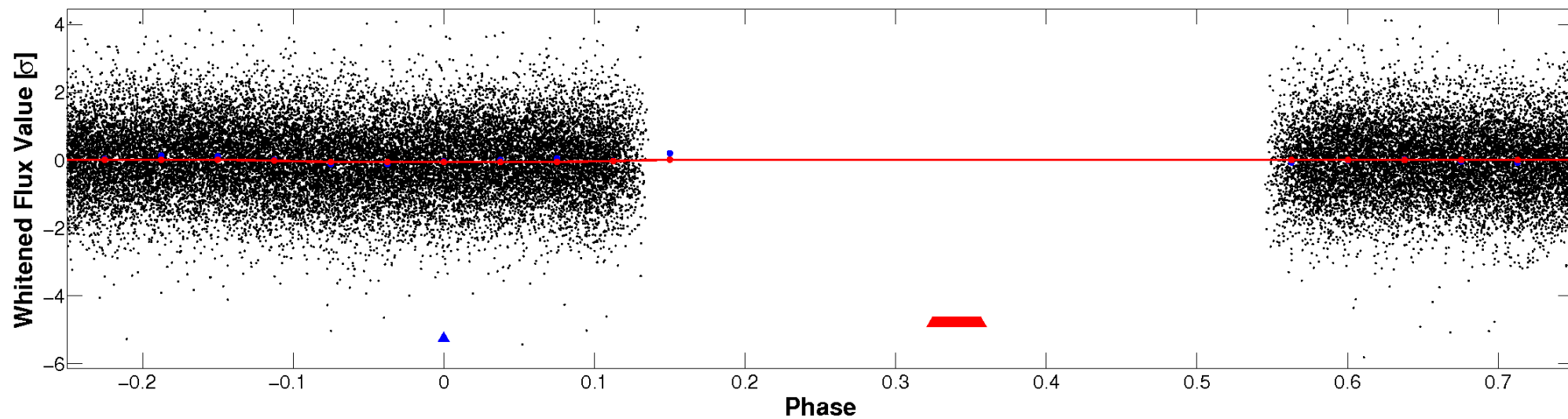


# Non-Whitened Vs. Whitened Light Curve

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

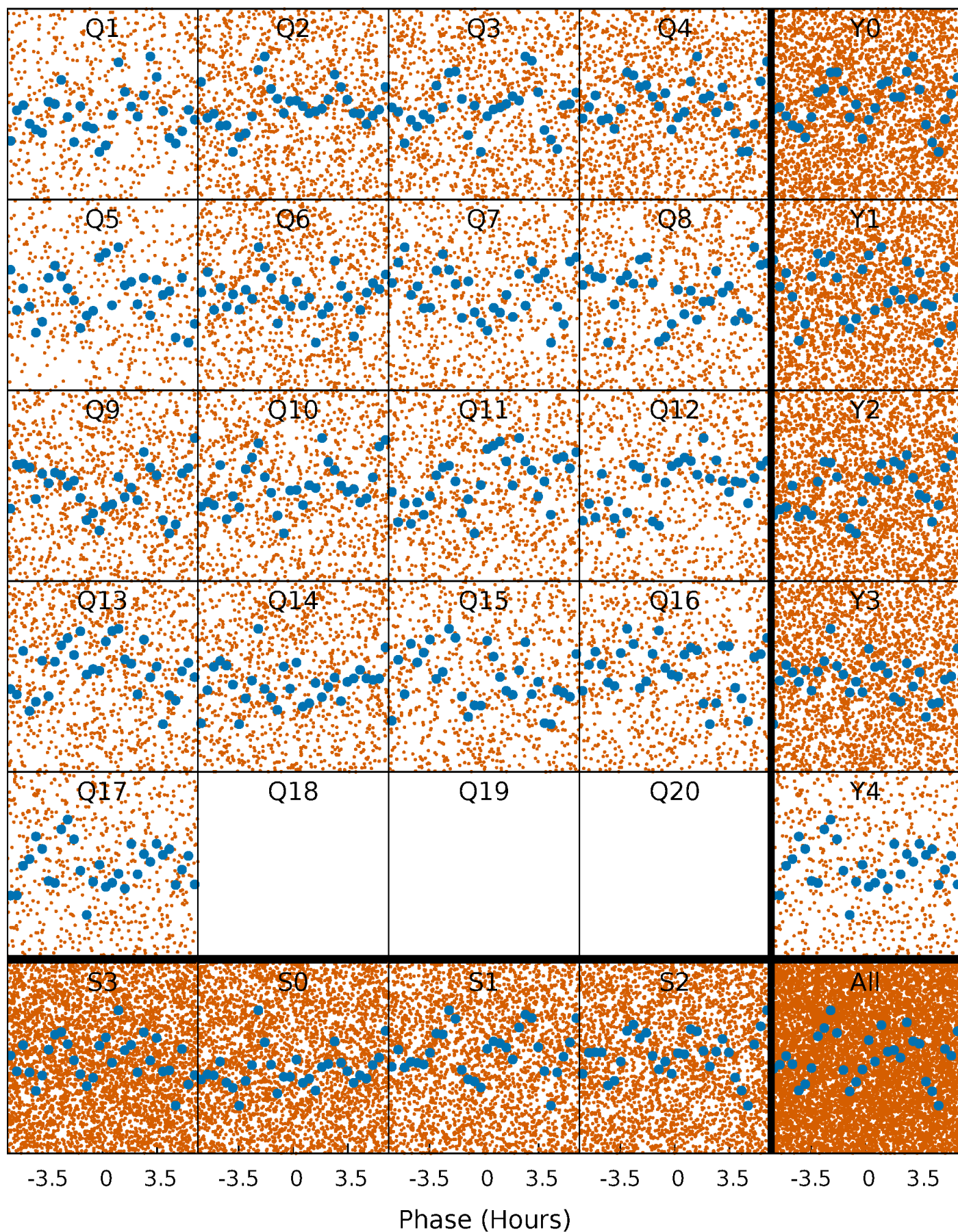


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

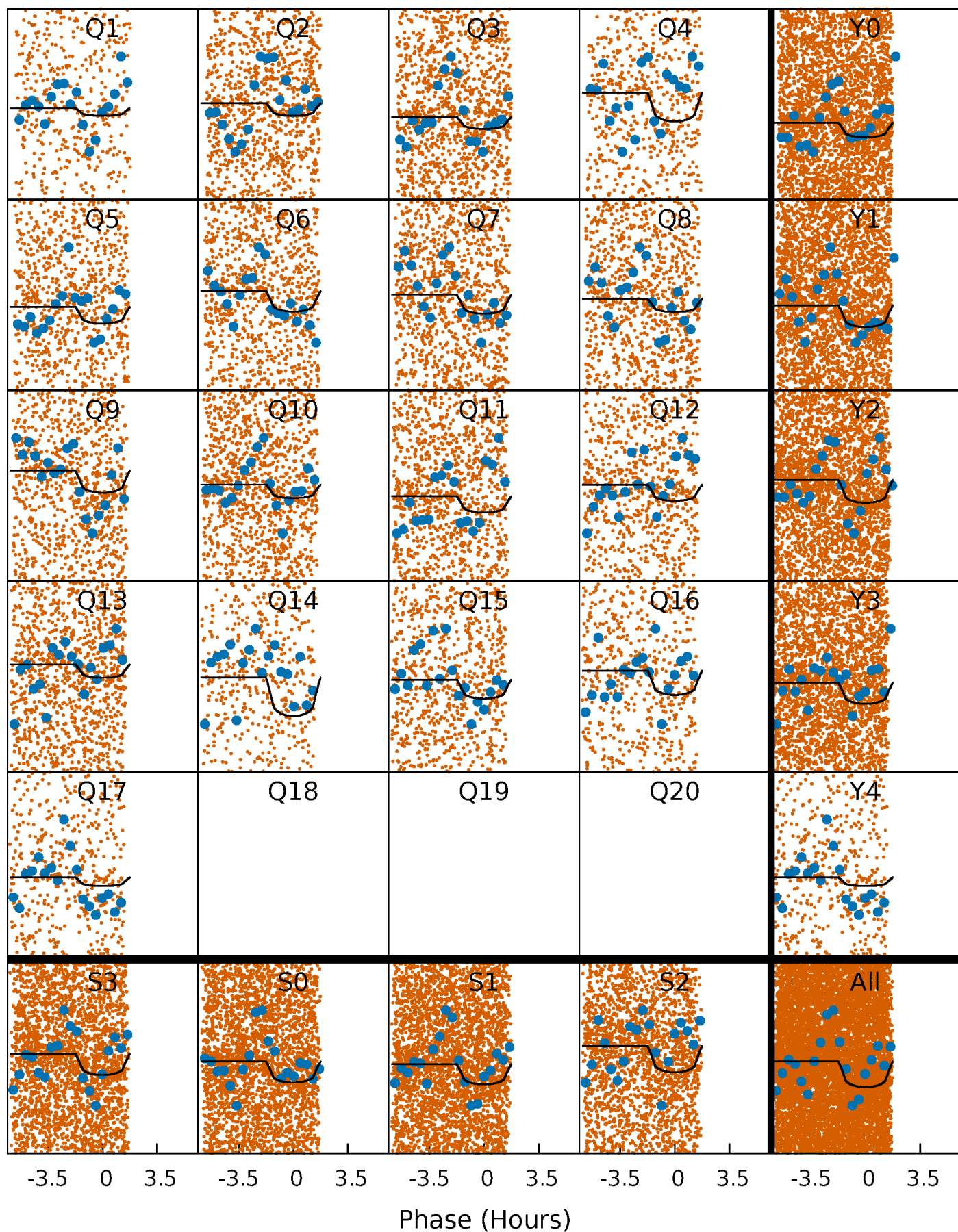
TCE 006113871-02 P= 0.544544 Days  $T_0=131.791668$  (BKJD)





# DV Quarter-Phased Transit Curves

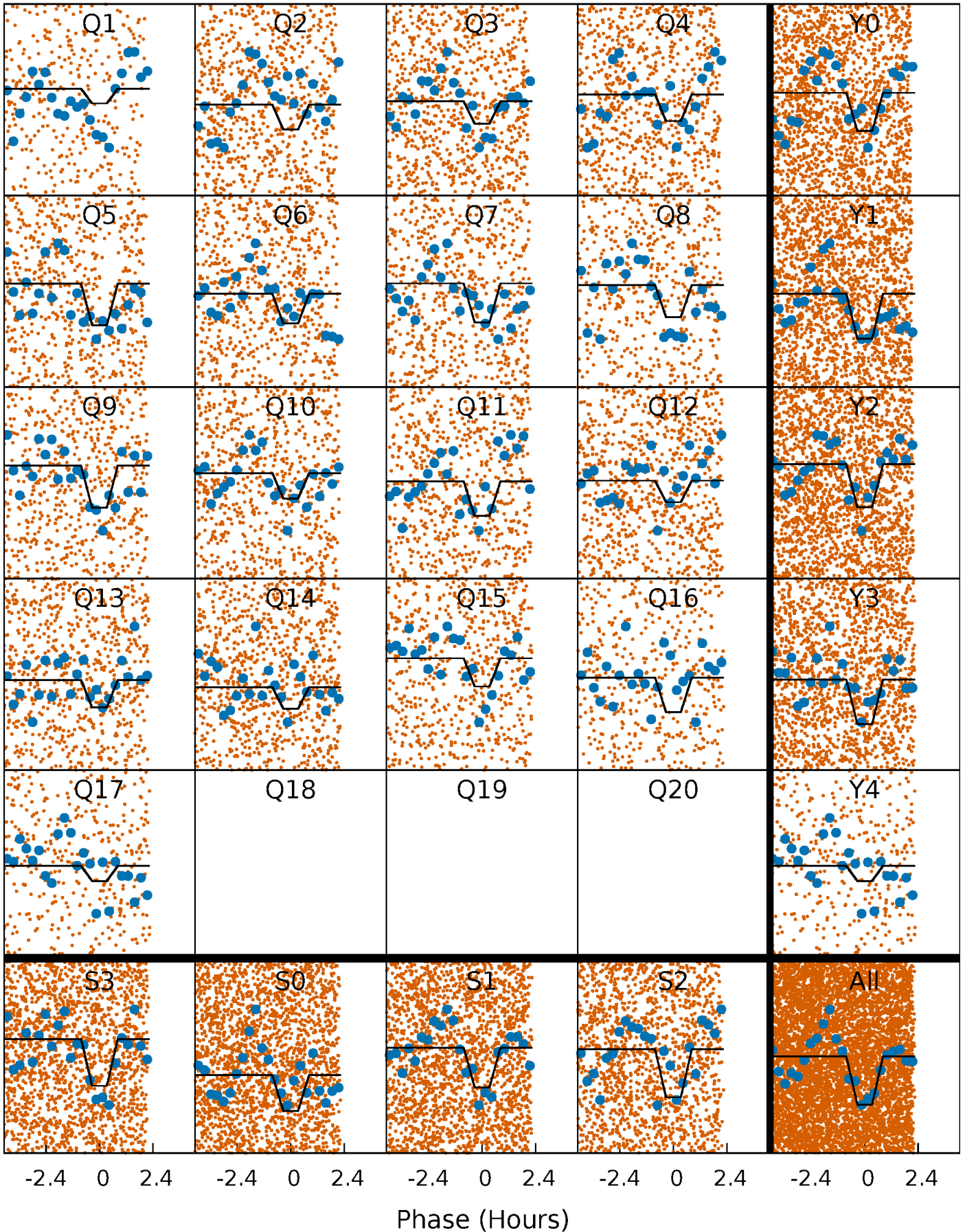
TCE 006113871-02   P= 0.544544 Days    $T_0=131.791668$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

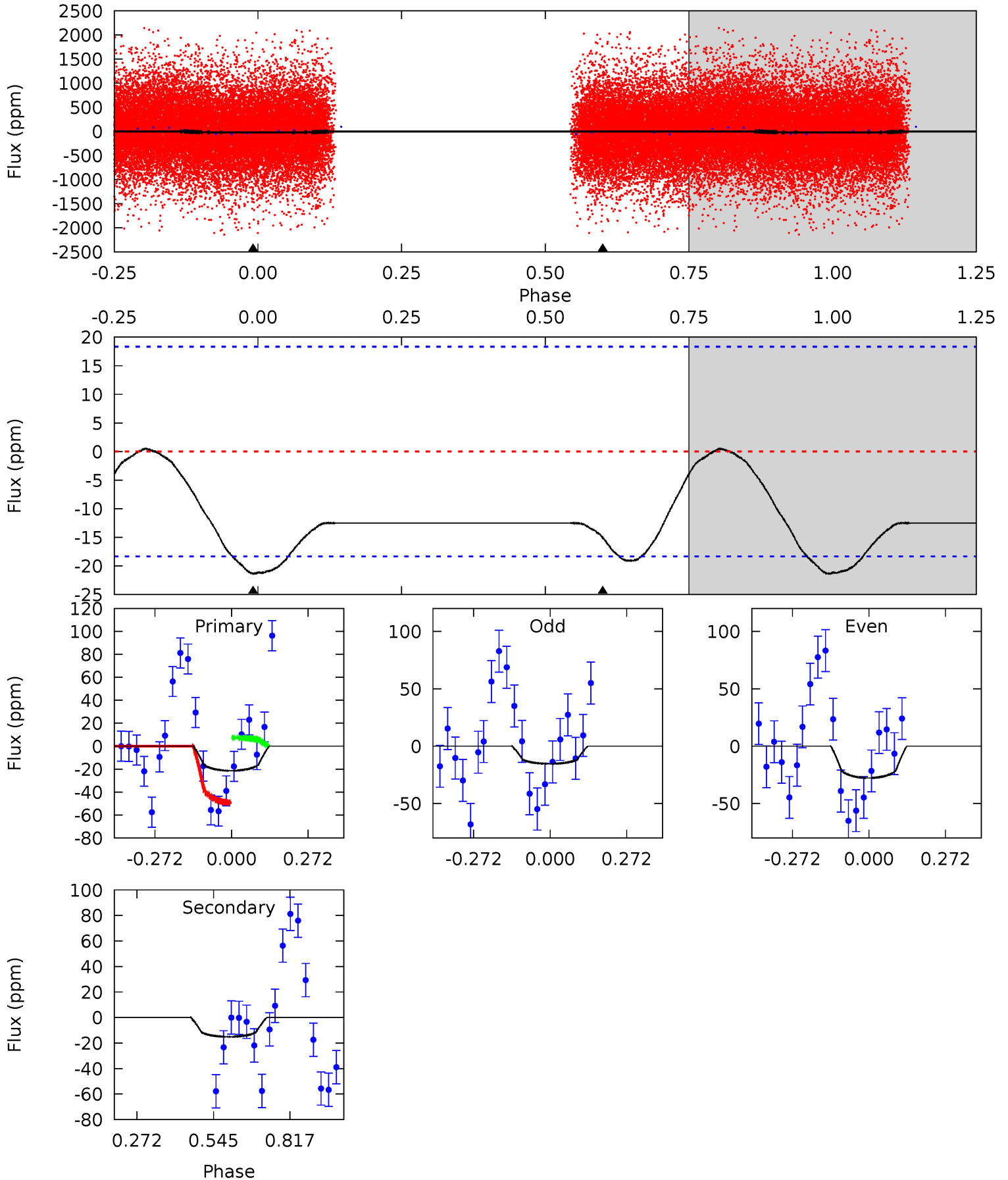
TCE 006113871-02   P= 0.544534 Days    $T_0=131.781215$  (BKJD)



# DV Model-Shift Uniqueness Test

006113871-02, P = 0.544544 Days, E = 131.247124 Days

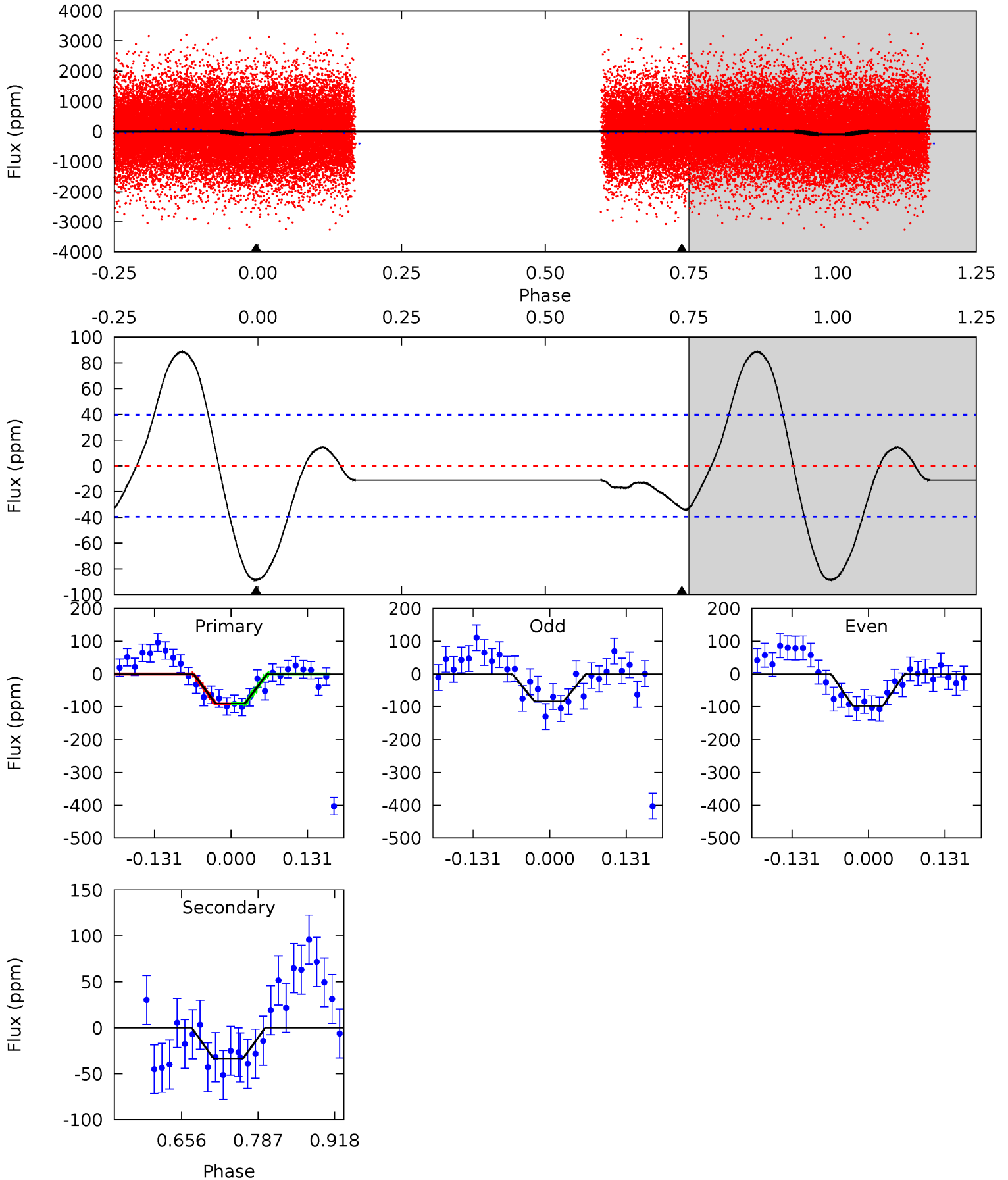
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.08	3.59	0	0	4.35	1.10	0.15	5.08	5.08	3.59	3.59	1.48	1.25	0.02	4.78



# Alt Model-Shift Uniqueness Test

006113871-02, P = 0.544534 Days, E = 131.236681 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	3.81	0	0	4.51	1.51	3.57	10.2	10.2	3.81	3.81	0.88	1.20	0.50	0.06



### Stellar Parameters For KIC 006113871

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6408^{+173}_{-211}$	$4.309^{+0.108}_{-0.201}$	$-0.120^{+0.250}_{-0.300}$	$1.240^{+0.400}_{-0.200}$	$1.141^{+0.185}_{-0.152}$	$0.843^{+0.407}_{-0.433}$
	+3%/-3%	+3%/-5%	+208%/-250%	+32%/-16%	+16%/-13%	+48%/-51%
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 006113871-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-15 \pm 4$	$1.18^{+0.98}_{-0.77}$	$3800^{+281}_{-233}$	$4242^{+2990}_{-1678}$	$1.118^{+7.701}_{-0.787}$
Alt.	$-33 \pm 9$	$1.50^{+1.02}_{-0.85}$	$3815^{+273}_{-221}$	$4553^{+2469}_{-1273}$	$1.376^{+6.648}_{-0.894}$

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

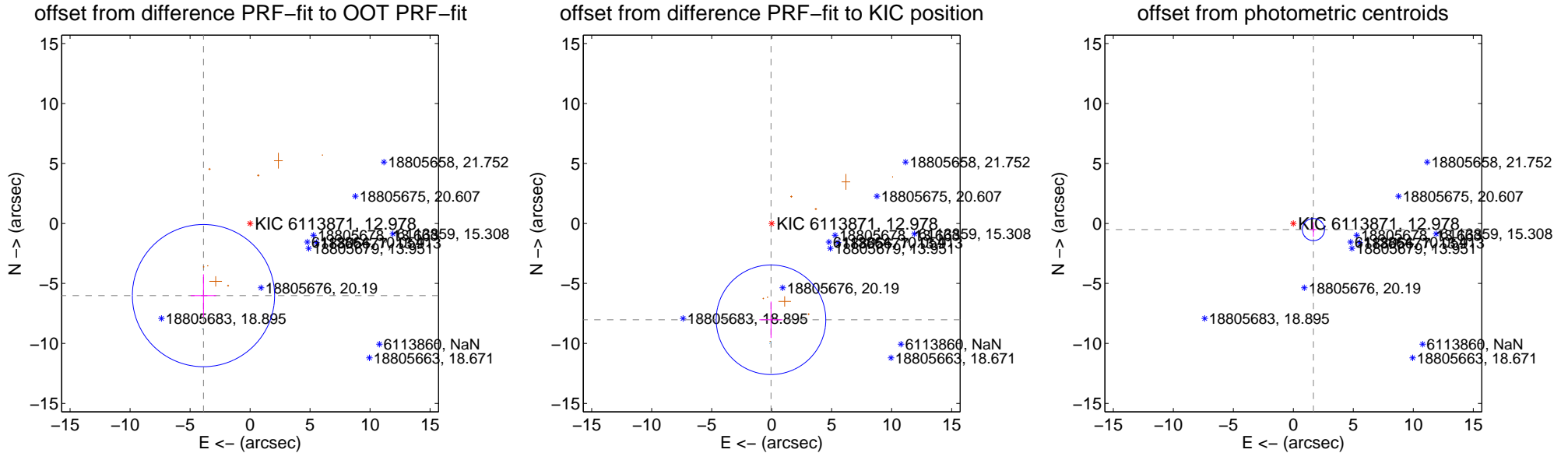
## DV Centroid Data

Supplemental centroid analysis for 006113871-02. Kepler magnitude: 12.98. Transit SNR 6.05

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 3.99 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

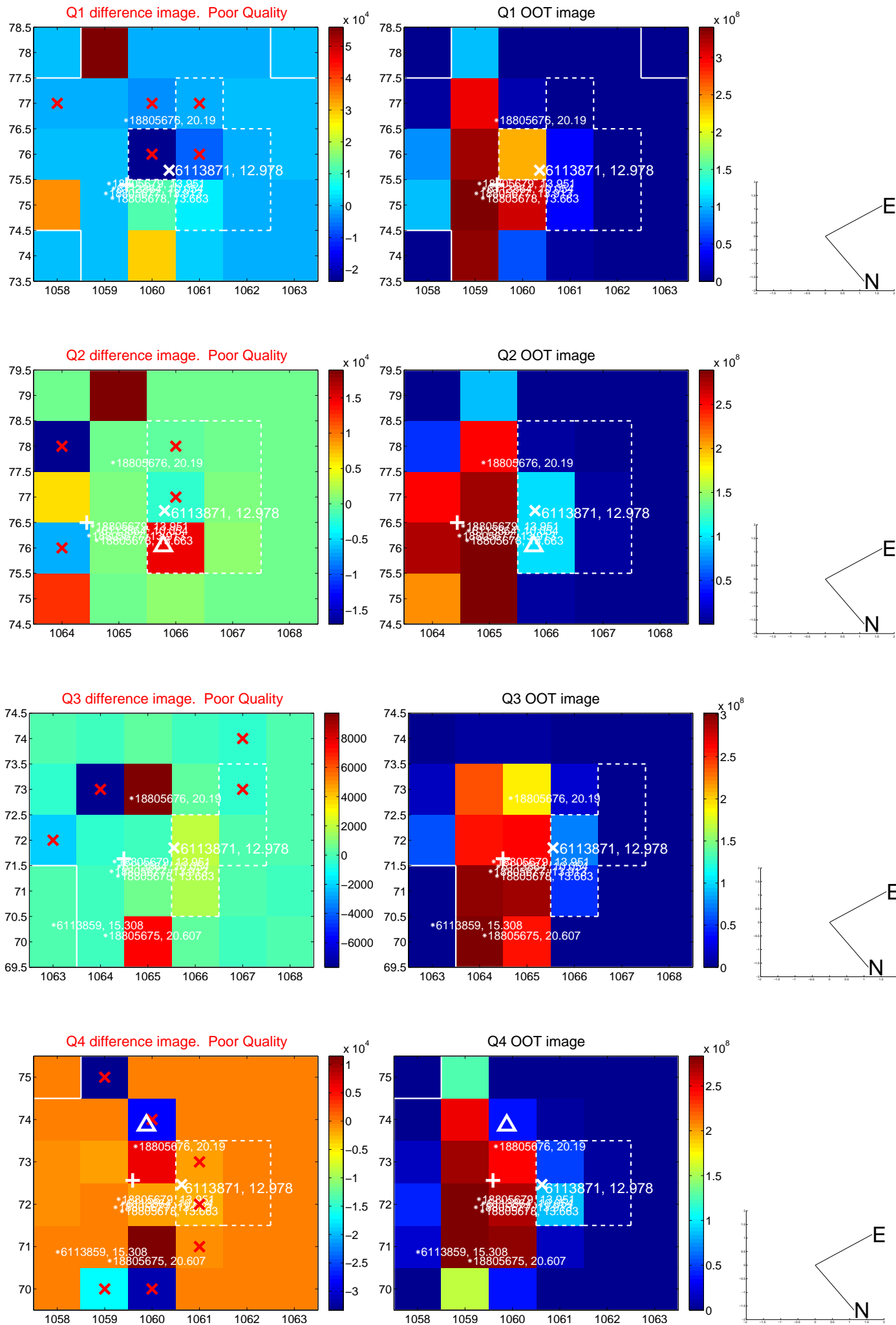
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.159 \pm 1.976$	3.62	$3.883 \pm 1.066$	$-6.015 \pm 1.776$
PRF-fit source offset from KIC position	$8.027 \pm 1.522$	5.27	$0.057 \pm 0.969$	$-8.027 \pm 1.517$
photometric centroid source offset	$1.75 \pm 0.31$	5.69	$-1.68 \pm 0.26$	$-0.51 \pm 0.61$



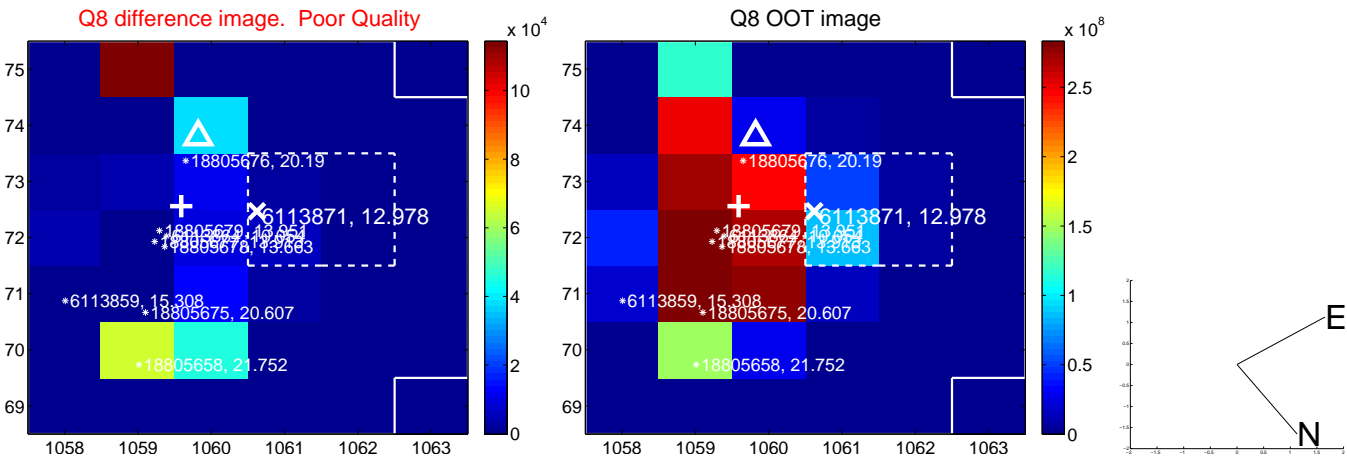
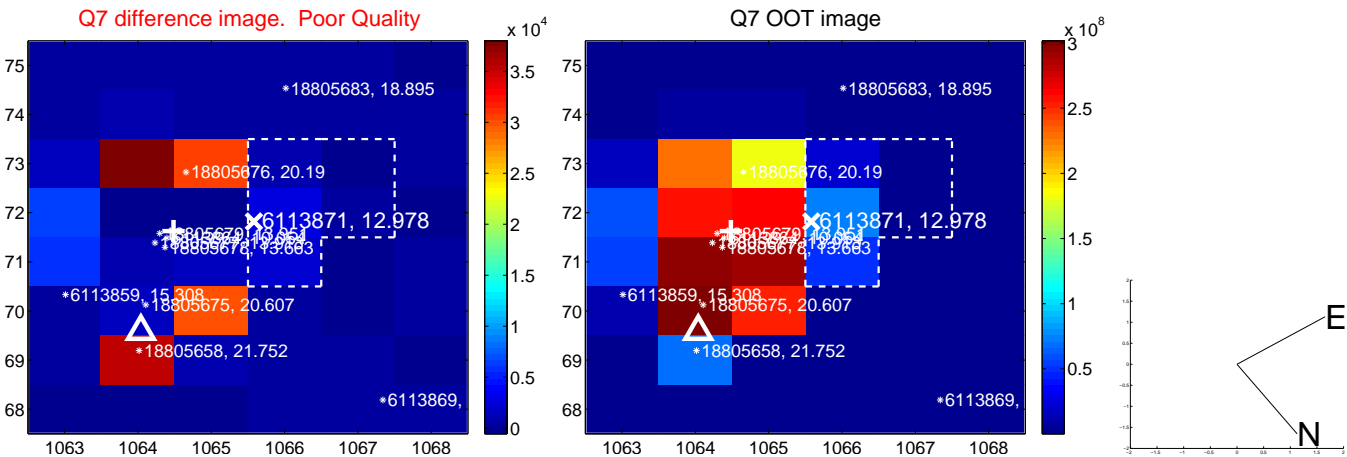
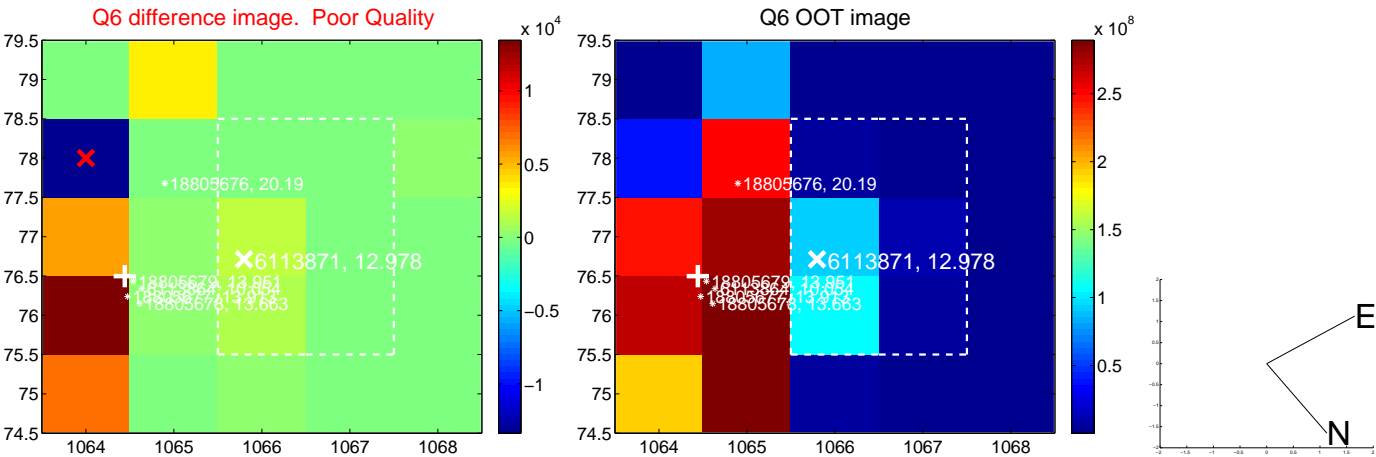
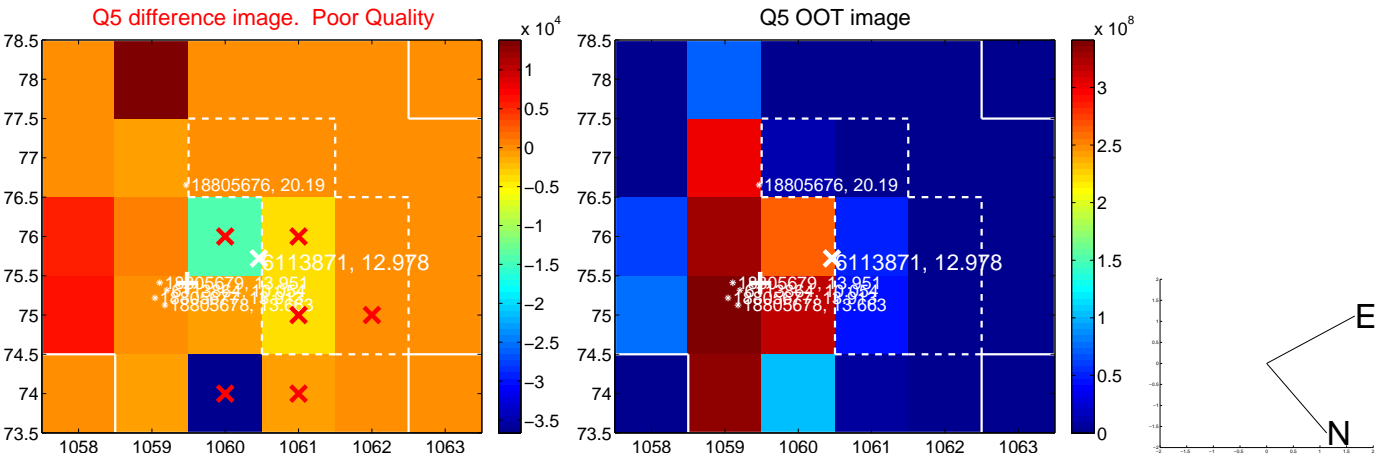
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



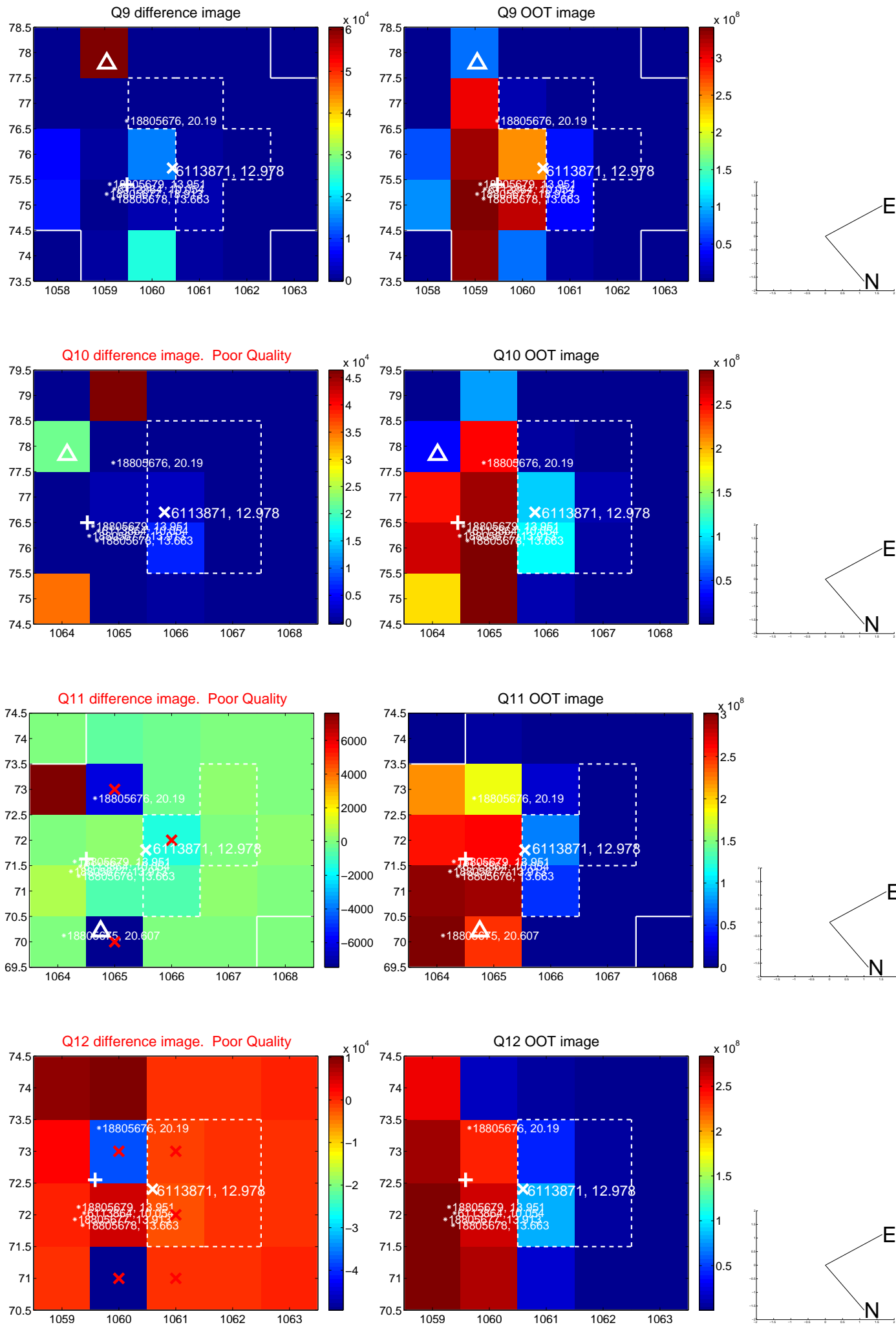
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



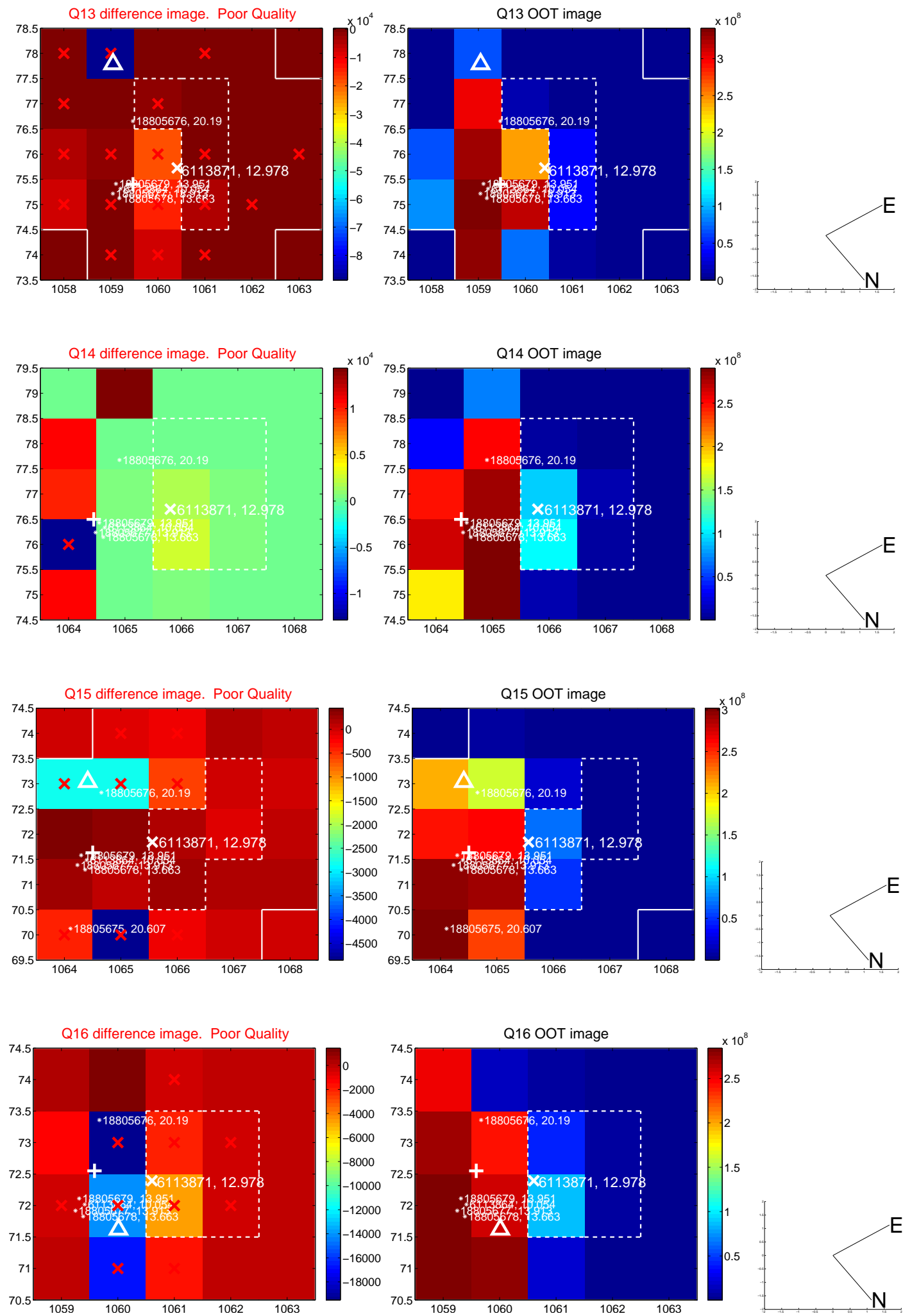
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



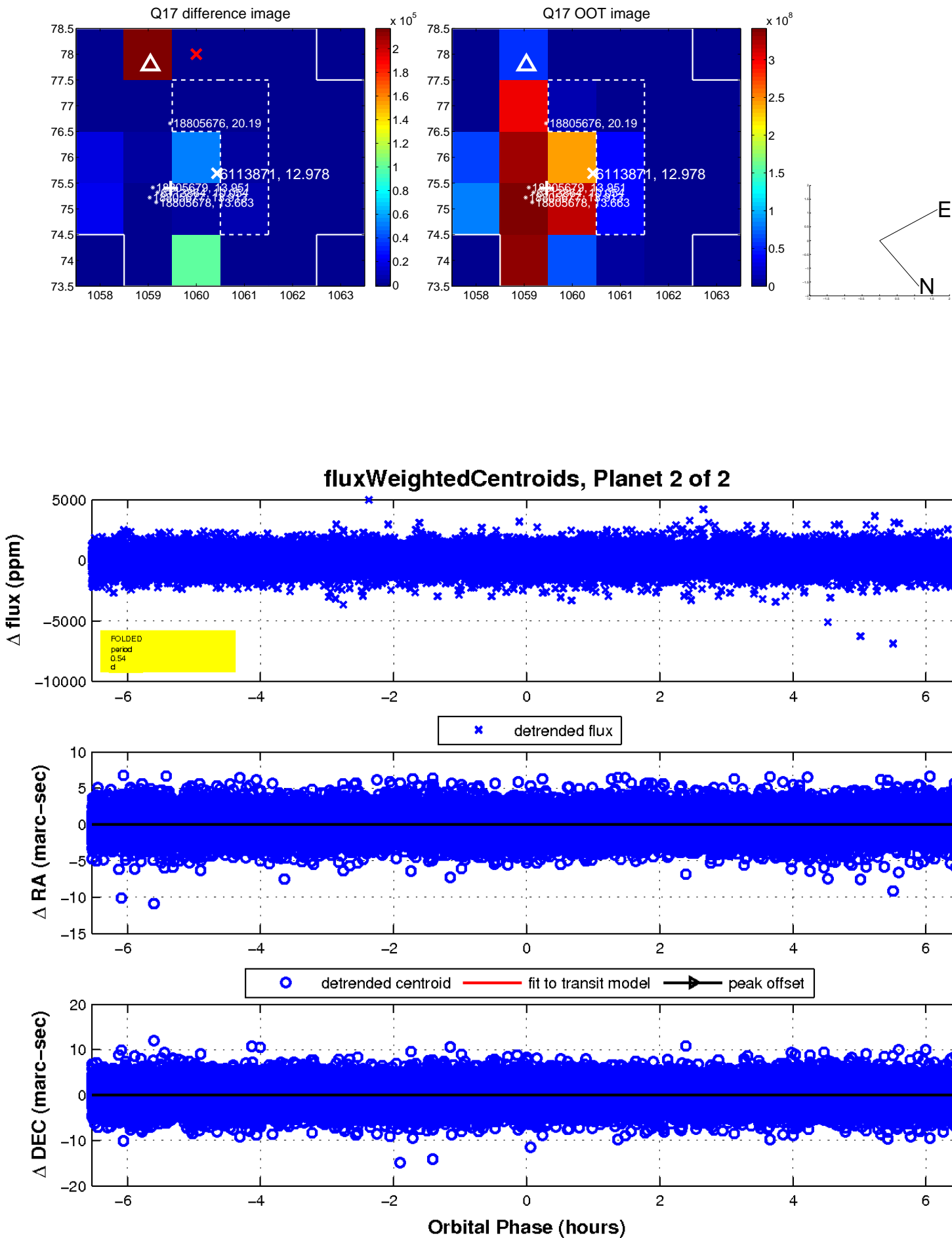
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

