

# KIC 002571417

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002571417-01	OBS	No	3.778177	132.057633	41.5	8.918	10.3	9.8	2.12	6635	1.56	2596.34
002571417-02	OBS	No	3.778153	134.180241	45.4	7.505	11.2	11.0	2.12	6635	1.69	2596.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002571417-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002571417-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

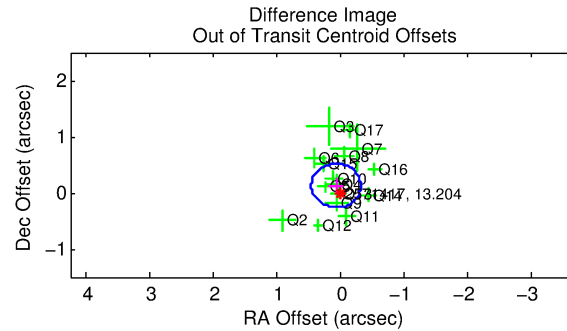
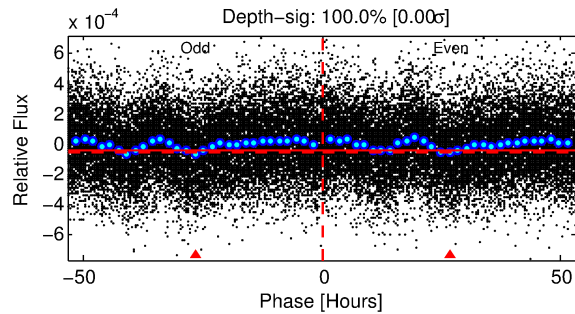
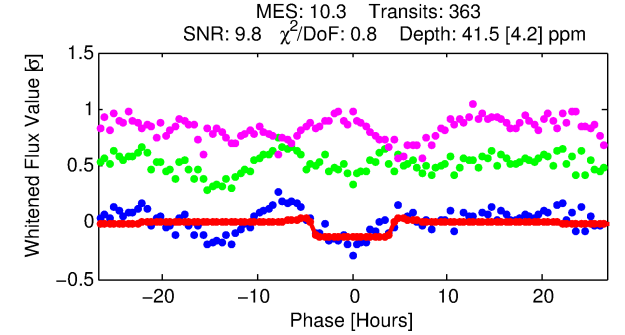
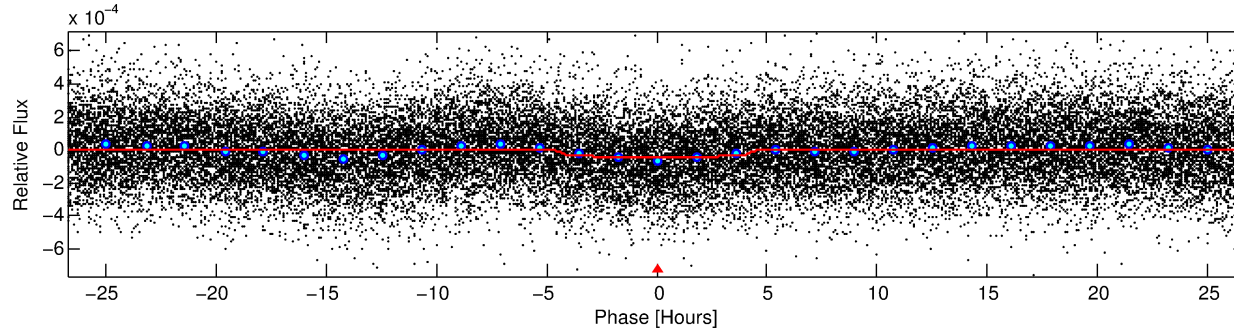
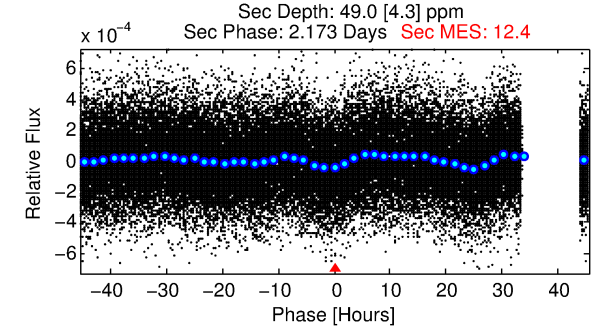
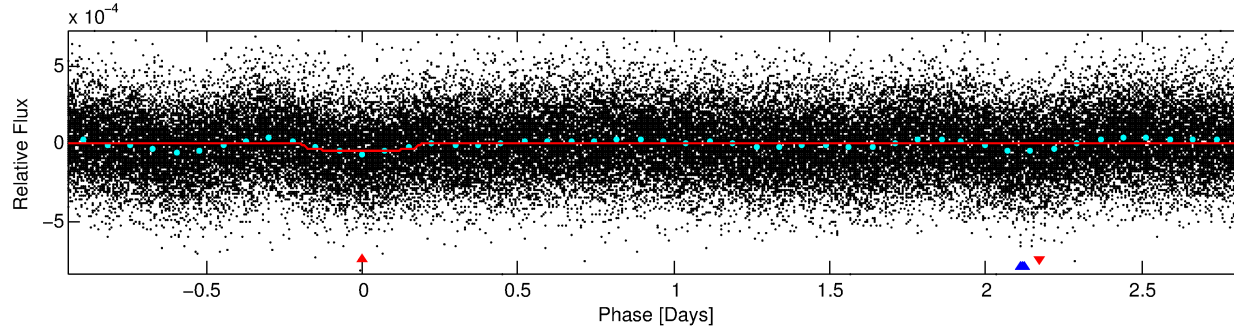
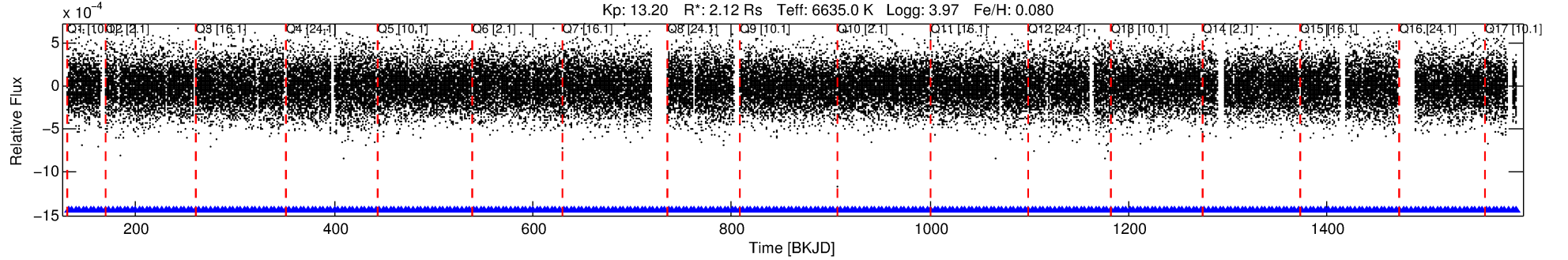
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002571417-01

No Significant Match Found

# DV One-Page Summary

KIC: 2571417 Candidate: 1 of 2 Period: 3.778 d



## DV Fit Results:

Period = 3.77818 [0.00004] d  
Epoch = 132.0576 [0.0065] BKJD  
Rp/R\* = 0.0067 [0.0015]  
a/R\* = 1.89 [1.66]  
b = 0.87 [0.35]  
Seff = 2596.34 [898.38]  
Teff = 1820 [157] K  
Rp = 1.56 [0.51] Re  
a = 0.0547 [0.0122] AU  
Ag = 33.38 [18.68] [1.73σ]  
**Teffp = 6764 [754] K [6.42σ]**

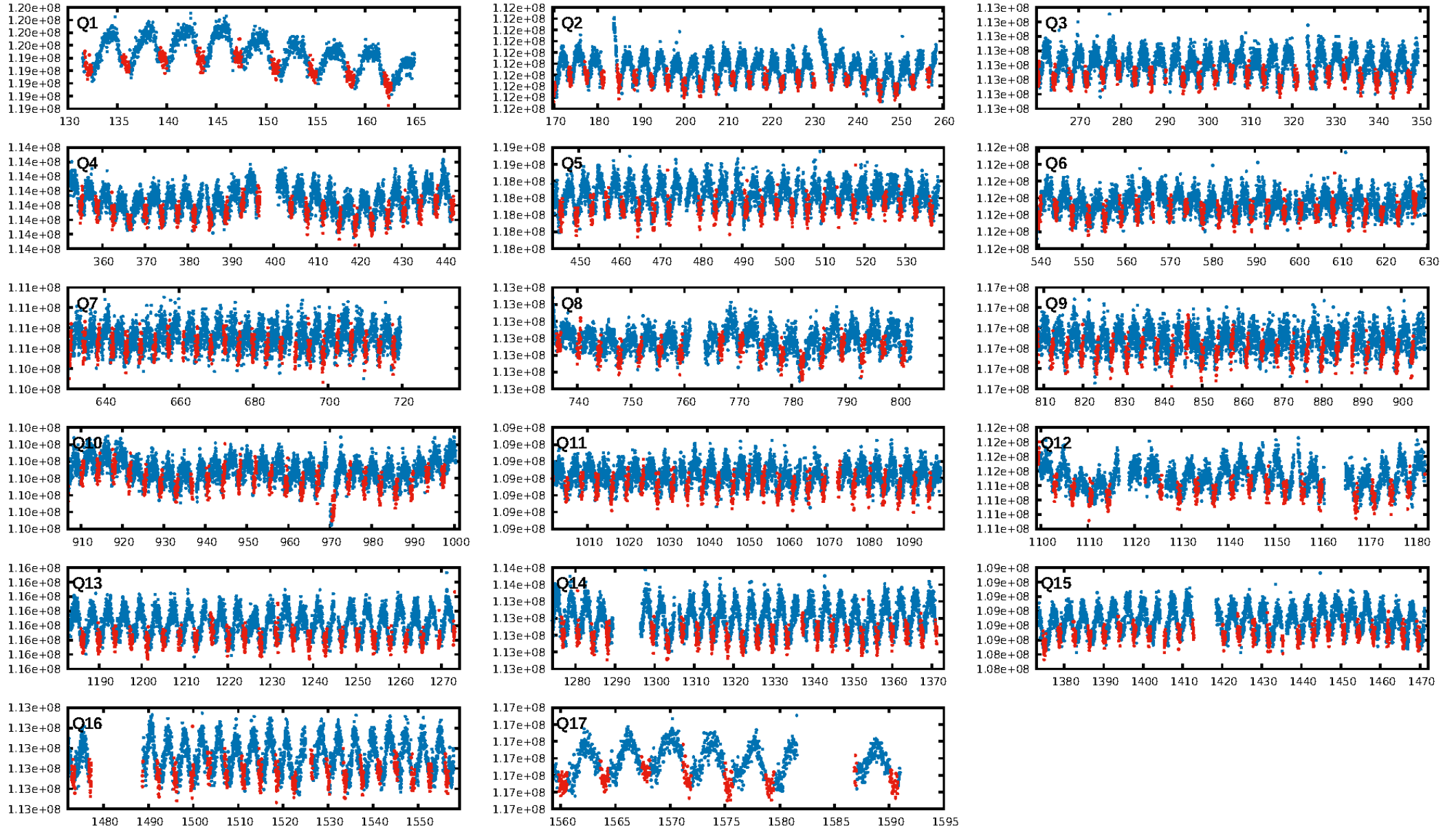
## DV Diagnostic Results:

**ShortPeriod-sig: 0.0% [0.00σ]**  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.66e-18  
RollingBand-fgt: 1.00 [346/346]  
**GhostDiagnostic-chr: 0.8559**  
Centroid-sig: 52.7%  
Centroid-so: 0.399 arcsec [0.52σ]  
OotOffset-rm: 0.145 arcsec [1.12σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.135 arcsec [0.95σ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

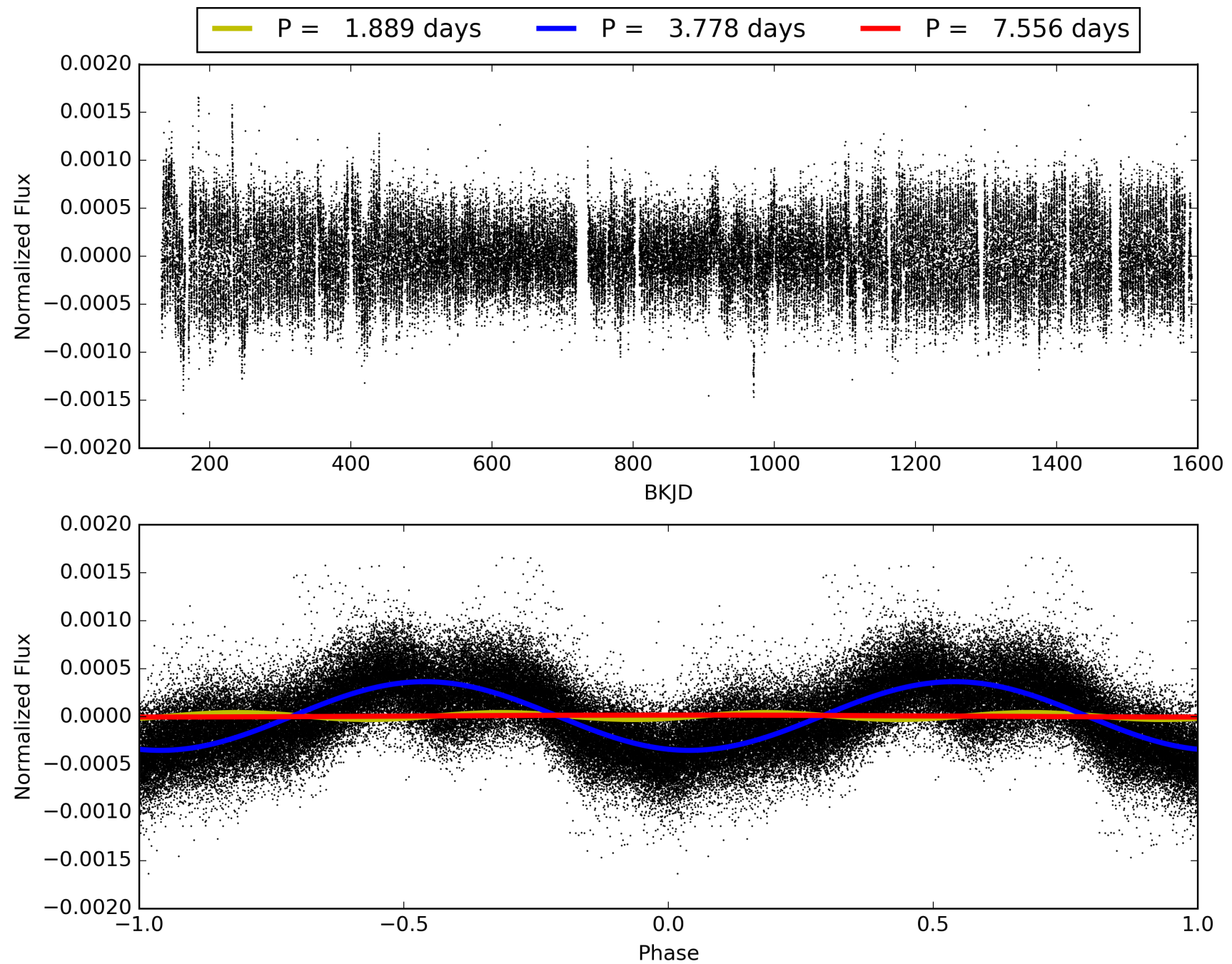
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:10:21 Z

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

# TCE 002571417-01, PDC Light Curves

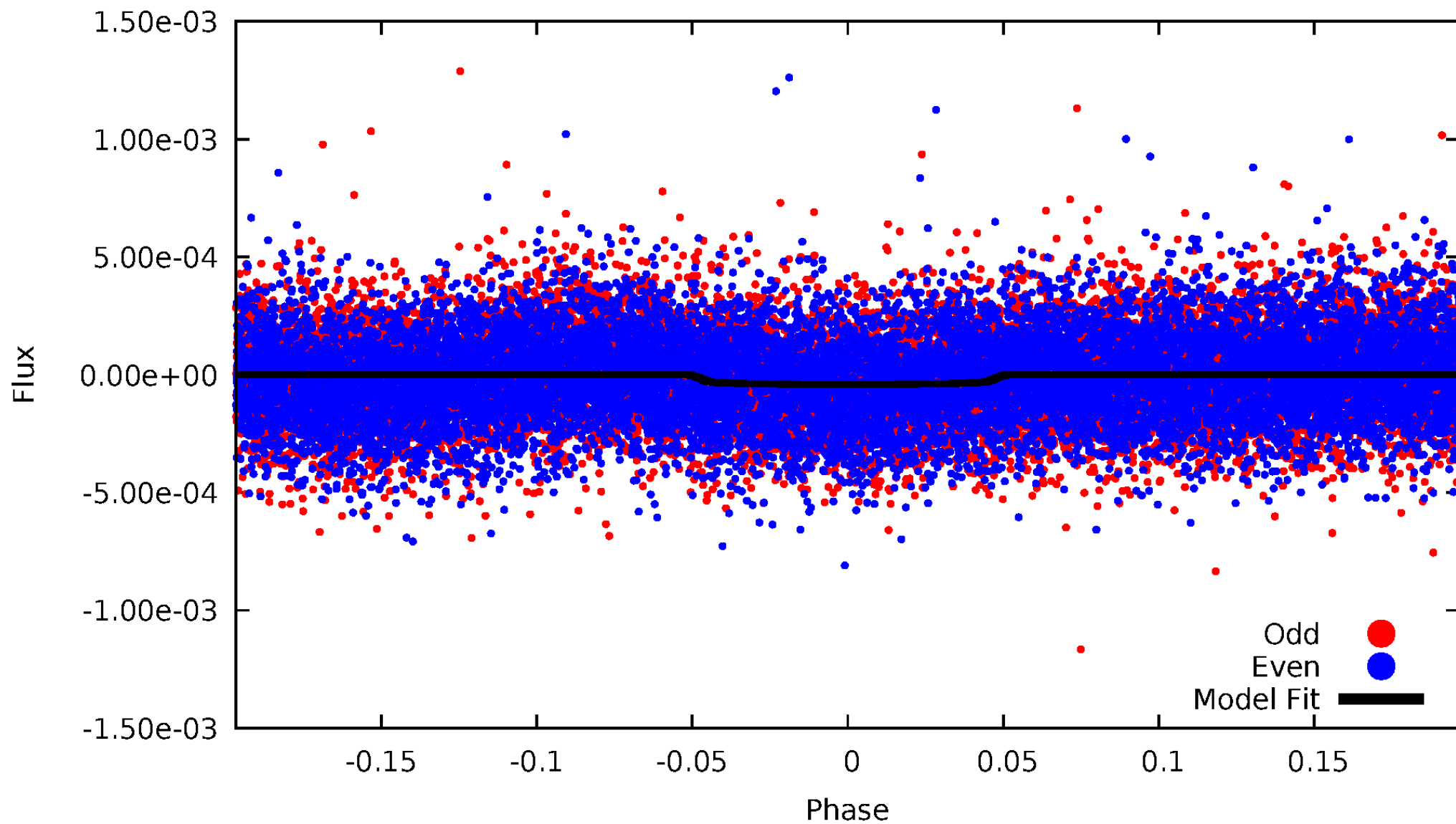


TCE 002571417-01



# DV Odd/Even

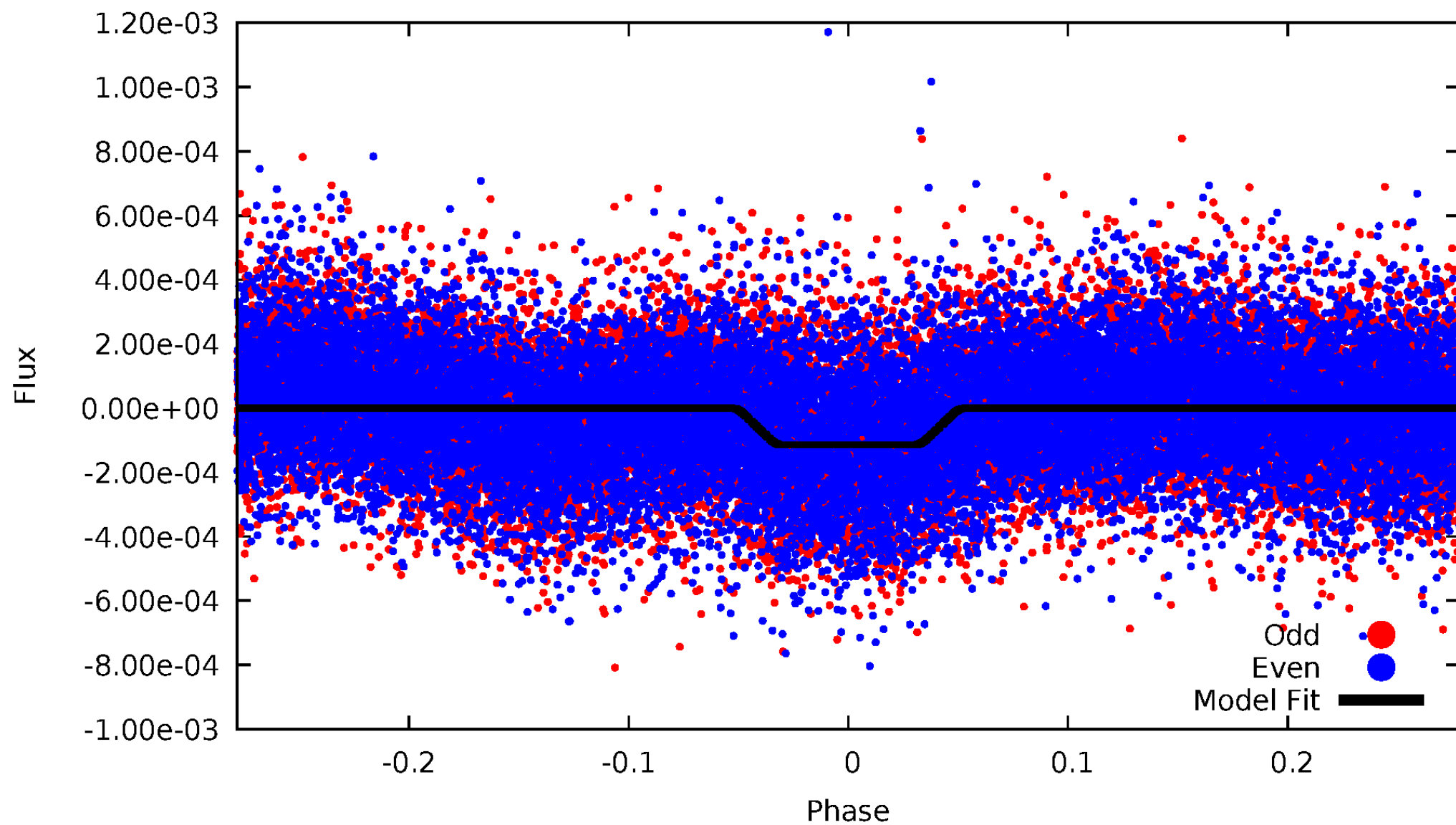
TCE 002571417-01



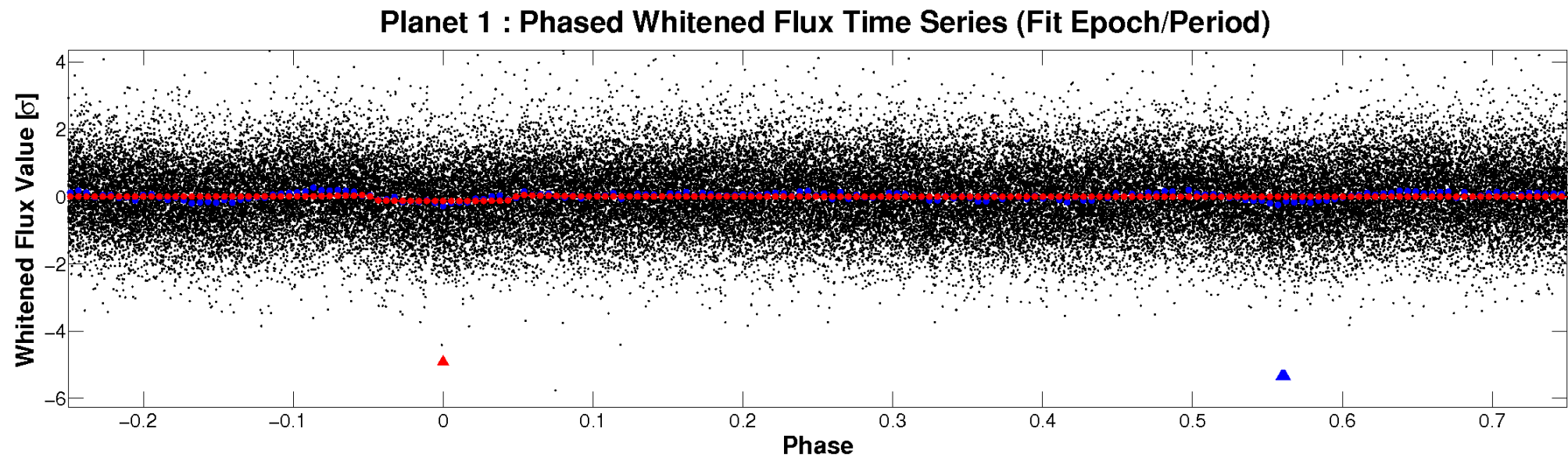
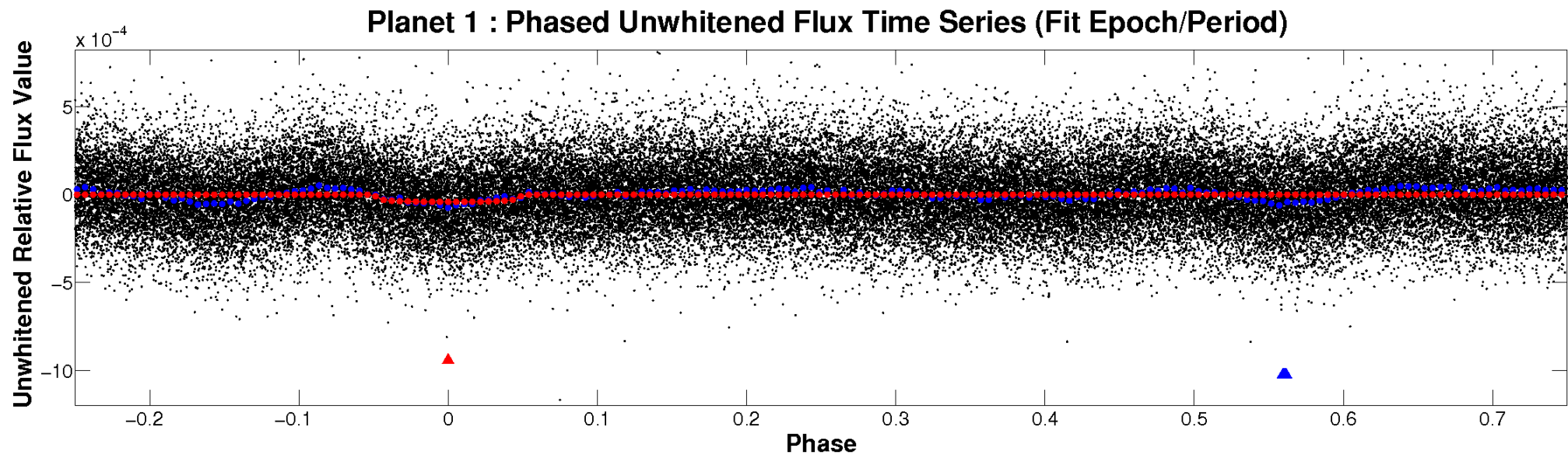


# ALT Odd/Even

TCE 002571417-01

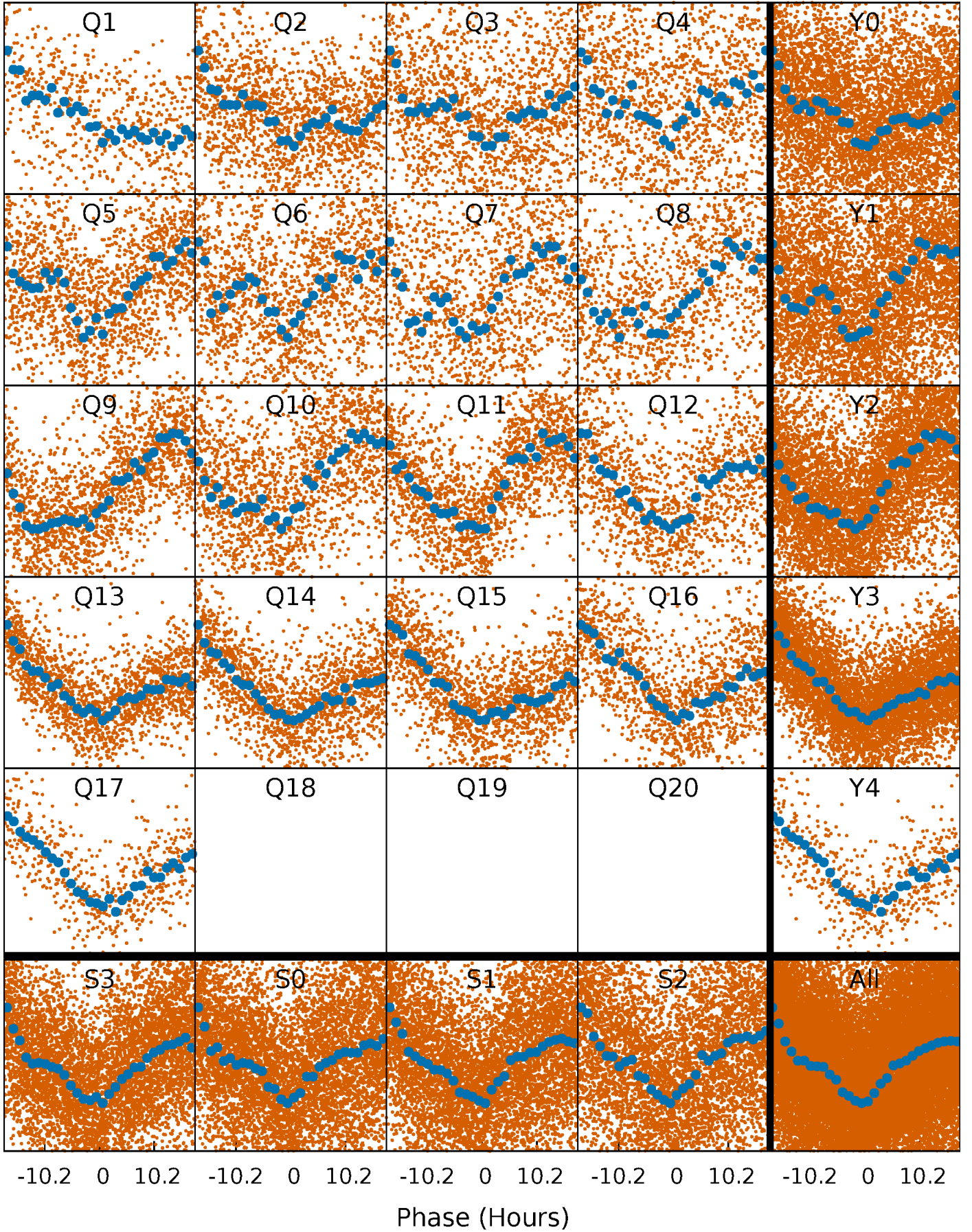


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

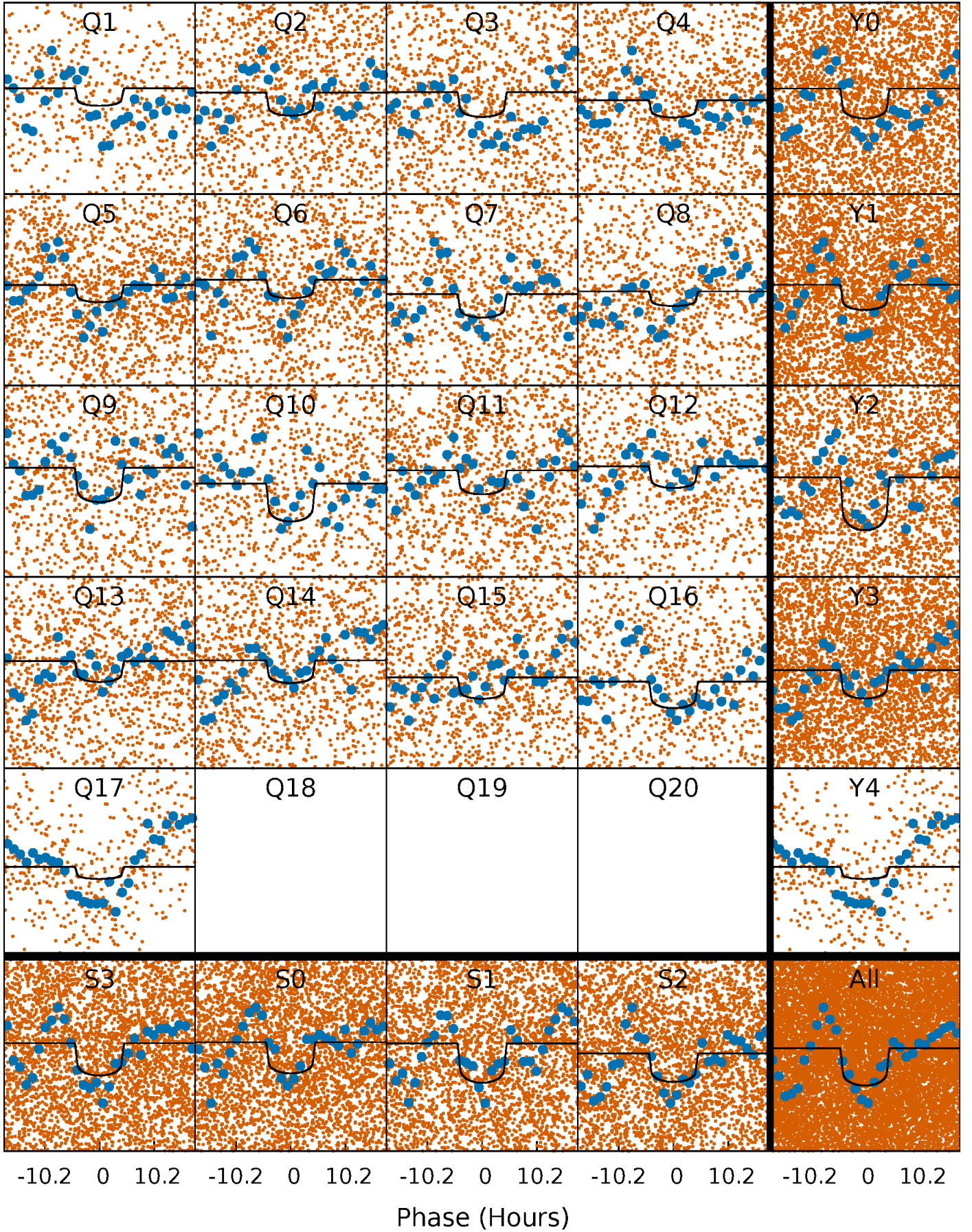
TCE 002571417-01 P= 3.778177 Days  $T_0=132.057633$  (BKJD)





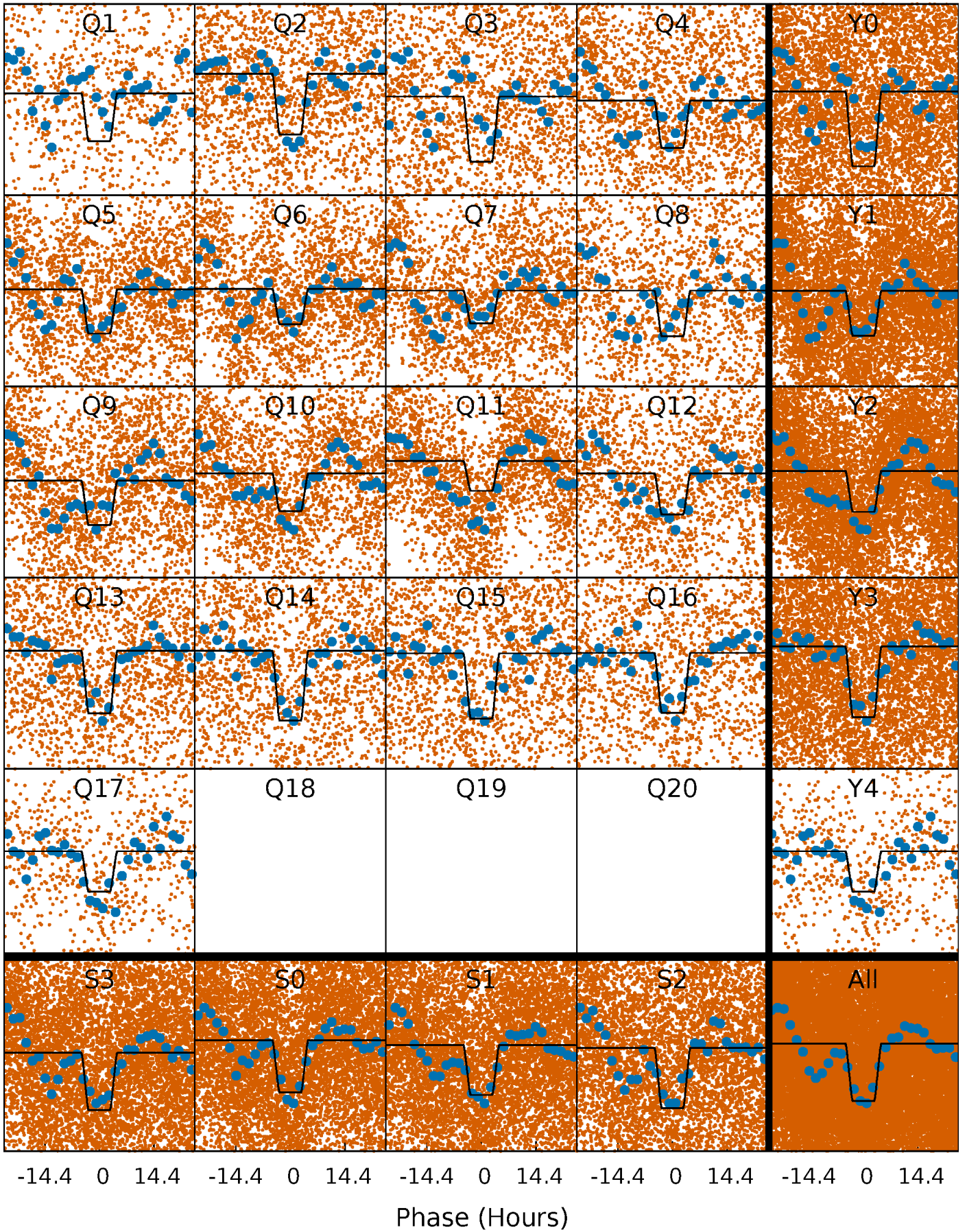
# DV Quarter-Phased Transit Curves

TCE 002571417-01 P= 3.778177 Days  $T_0=132.057633$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 002571417-01 P= 3.778192 Days  $T_0=132.016924$  (BKJD)

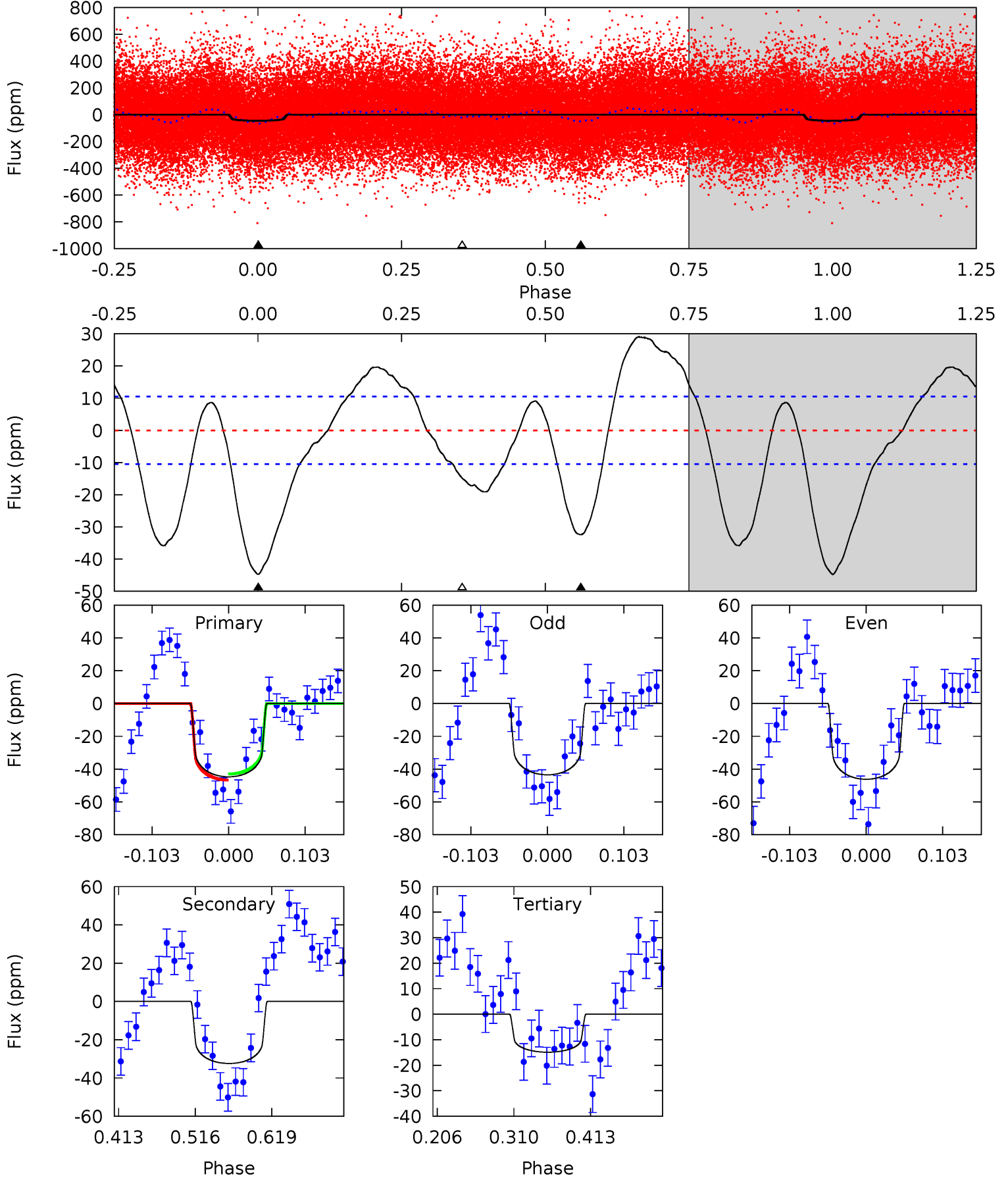




# DV Model-Shift Uniqueness Test

002571417-01, P = 3.778177 Days, E = 128.279456 Days

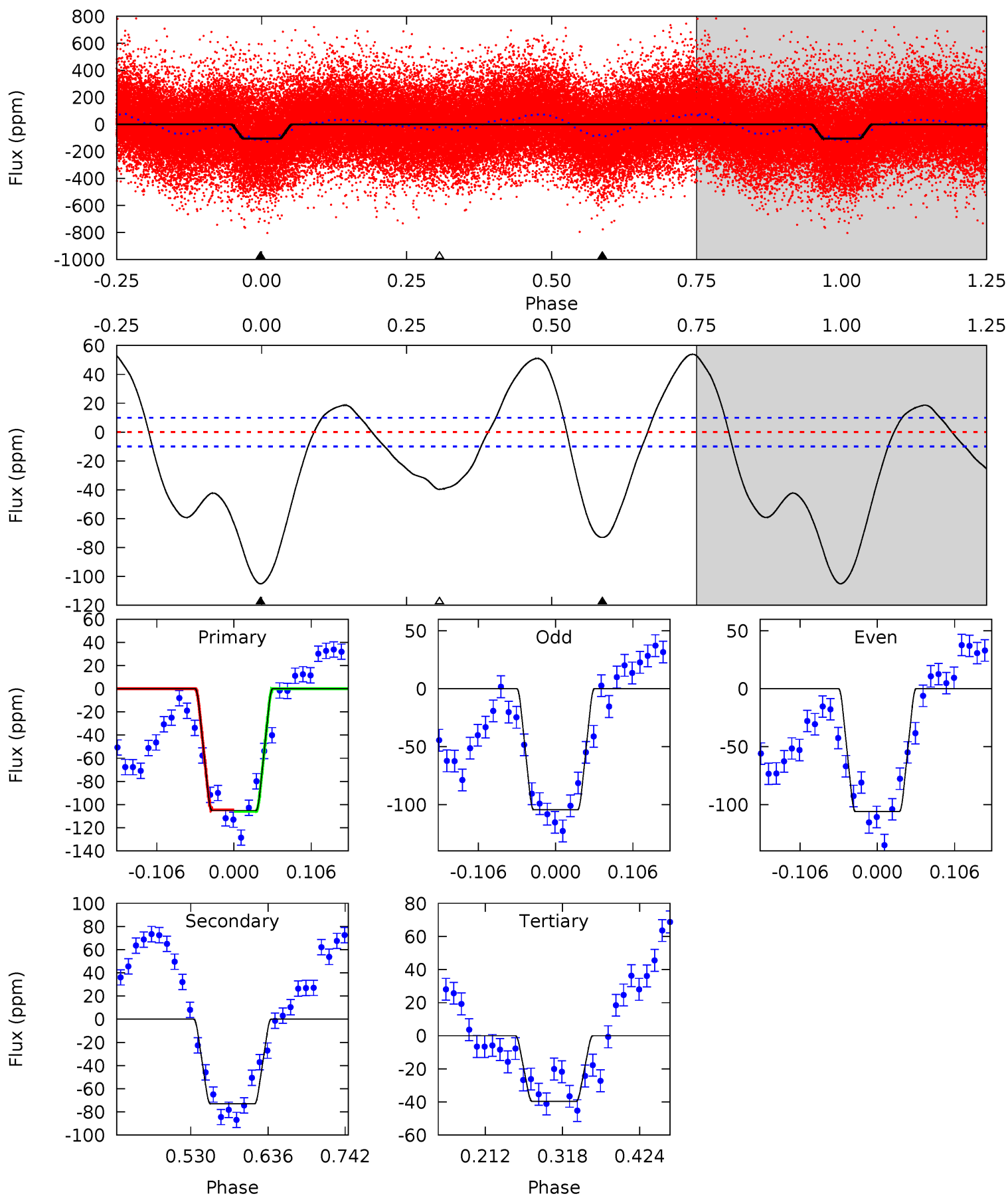
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.4	14.1	6.46	0	4.56	1.63	7.63	13.0	19.4	7.61	14.1	0.59	0.91	0.39	0.82



# Alt Model-Shift Uniqueness Test

002571417-01, P = 3.778192 Days, E = 128.238732 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
48.2	33.5	18.2	0	4.55	1.62	15.5	30.0	48.2	15.3	33.5	0.33	0.91	0.34	0.25





### Stellar Parameters For KIC 002571417

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6635^{+72}_{-86}$	$3.972^{+0.195}_{-0.105}$	$0.080^{+0.150}_{-0.150}$	$2.117^{+0.351}_{-0.526}$	$1.534^{+0.115}_{-0.187}$	$0.228^{+0.253}_{-0.075}$
	+1%/-1%	+5%/-3%	+188%/-188%	+17%/-25%	+7%/-12%	+111%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 002571417-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-32 \pm 2$	$1.51^{+0.43}_{-0.35}$	$2535^{+109}_{-161}$	$6010^{+861}_{-539}$	$23^{+16}_{-9}$
Alt.	$-73 \pm 2$	$2.36^{+0.47}_{-0.38}$	$2524^{+115}_{-166}$	$5928^{+463}_{-387}$	$21^{+9}_{-6}$

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

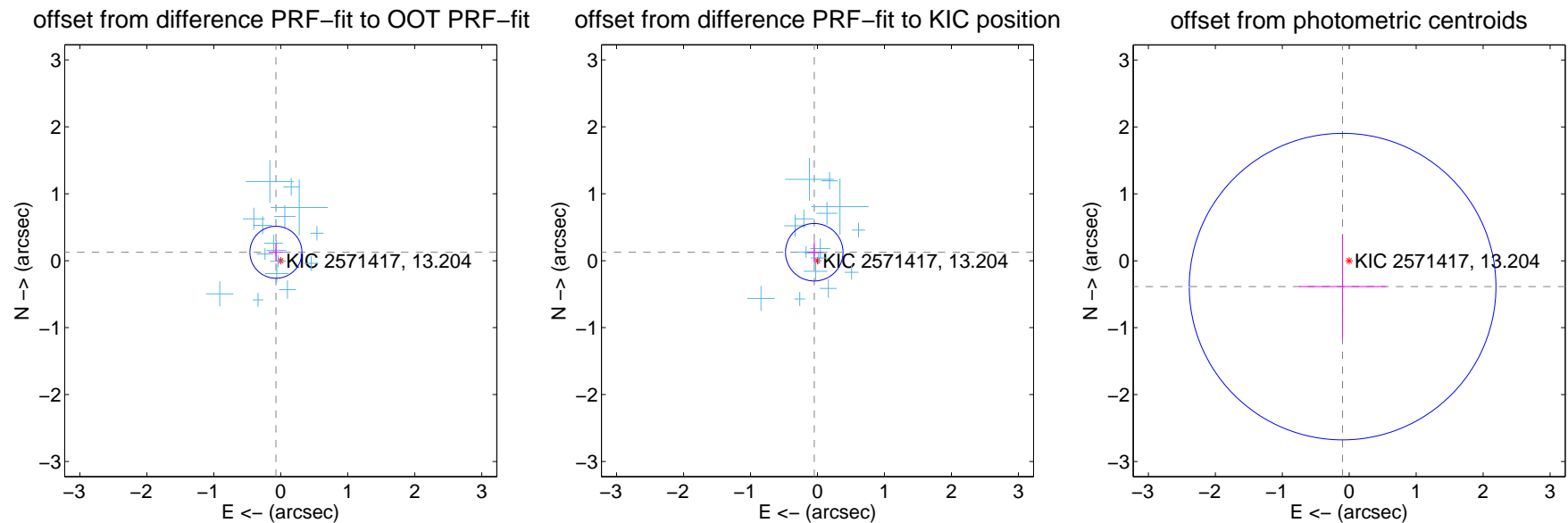
## DV Centroid Data

Supplemental centroid analysis for 002571417-01. Kepler magnitude: 13.20. Transit SNR 9.81

There are 16 quarters with good PRF difference image offsets

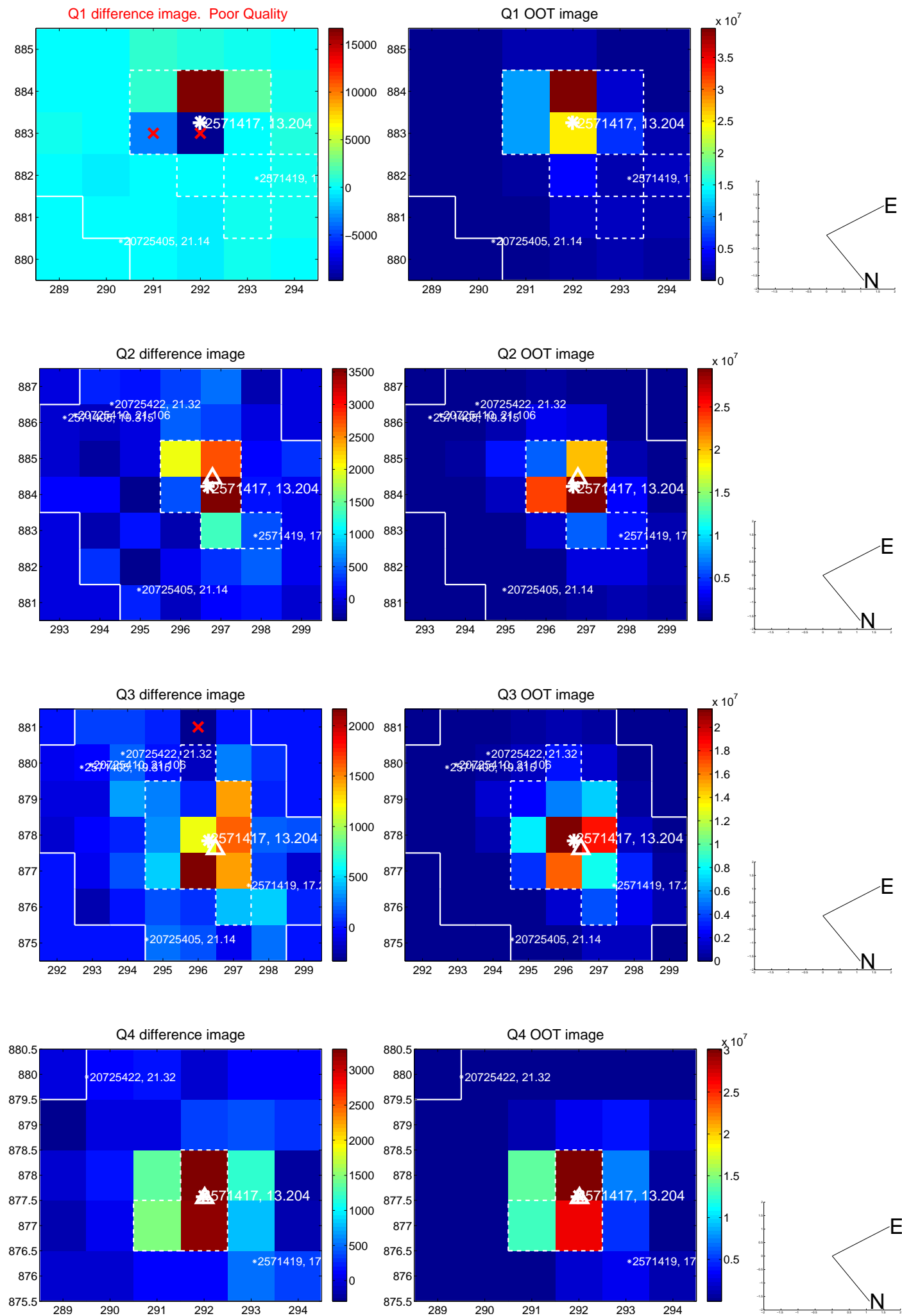
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.145 \pm 0.129$	1.12	$0.073 \pm 0.106$	$0.126 \pm 0.136$
PRF-fit source offset from KIC position	$0.135 \pm 0.143$	0.95	$0.048 \pm 0.102$	$0.126 \pm 0.161$
photometric centroid source offset	$0.40 \pm 0.76$	0.52	$0.10 \pm 0.65$	$-0.39 \pm 0.77$

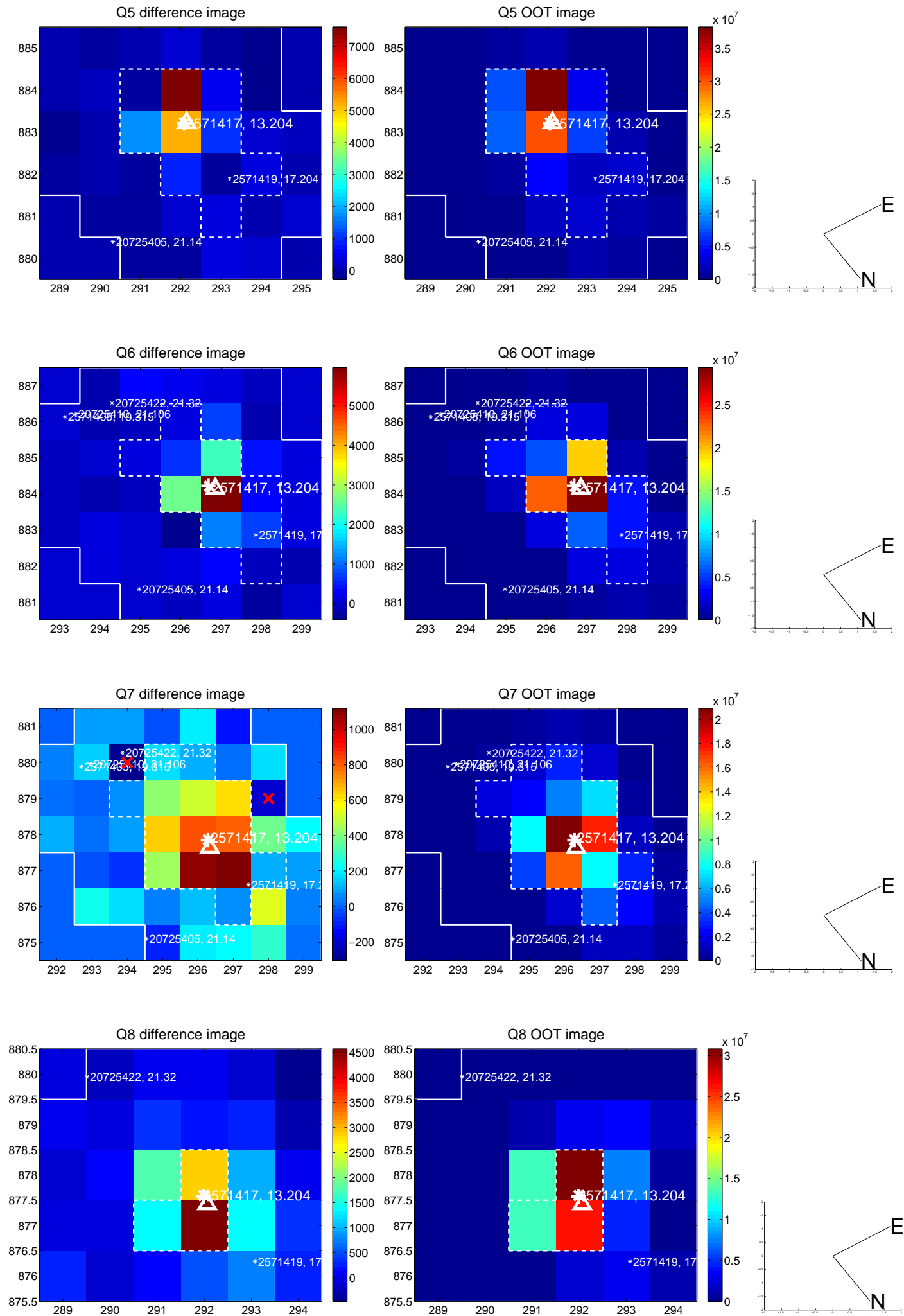


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

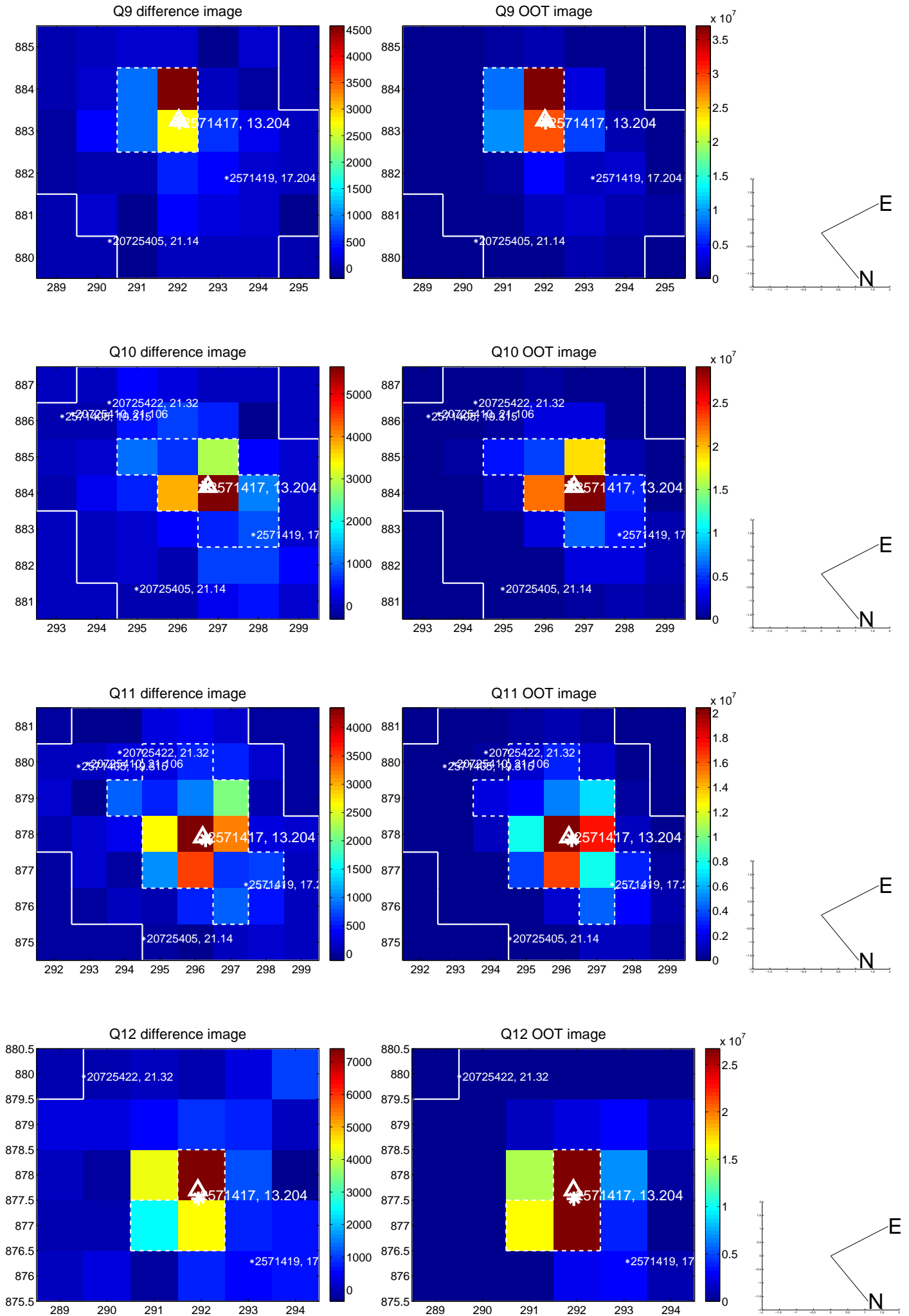


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

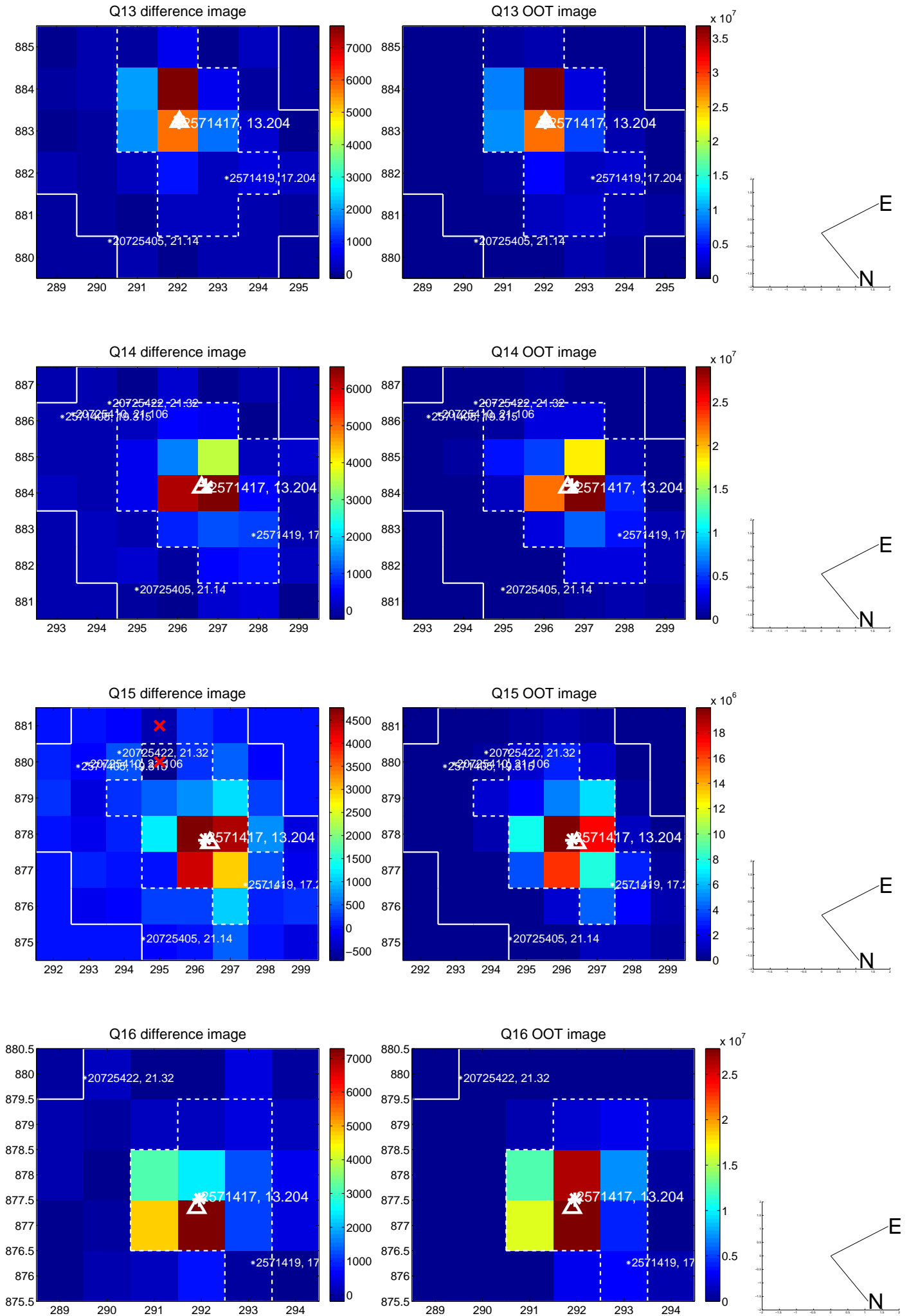




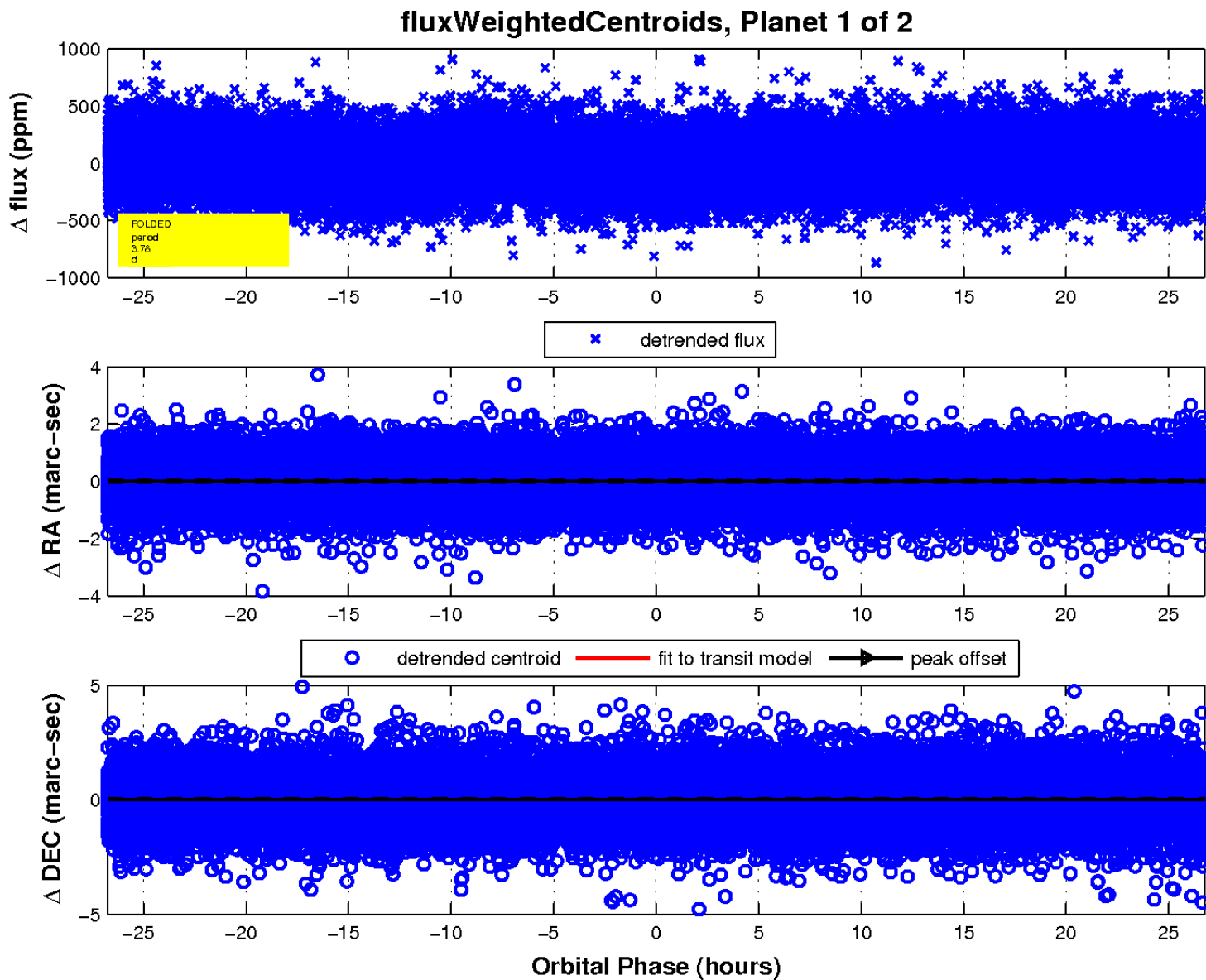
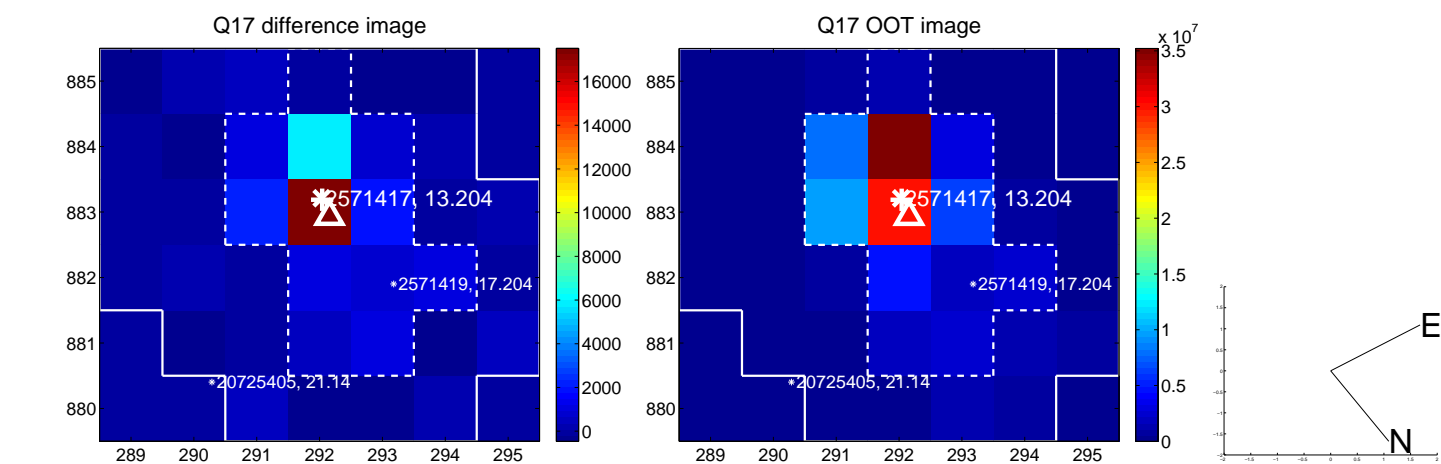
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

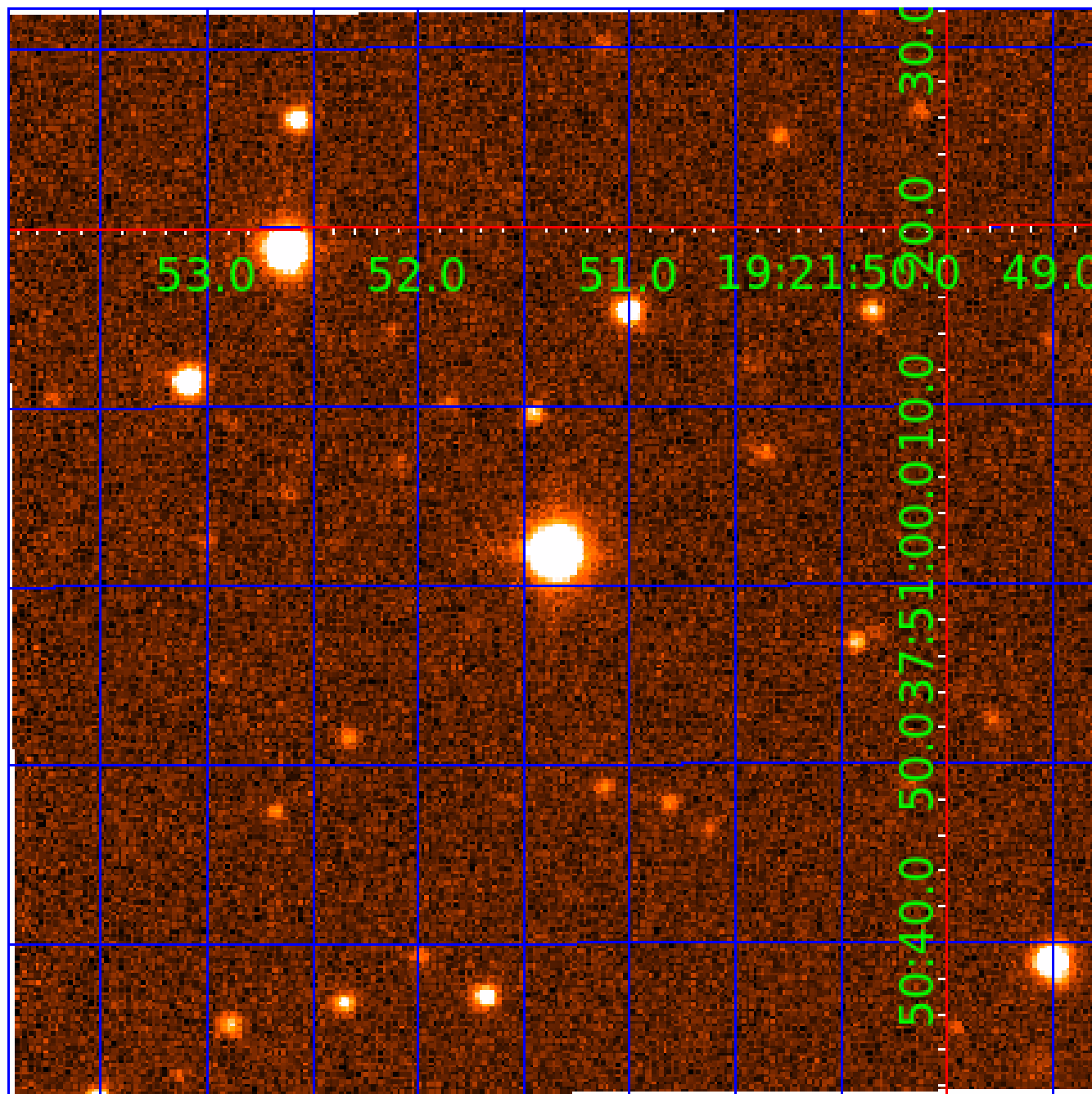


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 002571417

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002571417-01	OBS	No	3.778177	132.057633	41.5	8.918	10.3	9.8	2.12	6635	1.56	2596.34
002571417-02	OBS	No	3.778153	134.180241	45.4	7.505	11.2	11.0	2.12	6635	1.69	2596.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002571417-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002571417-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

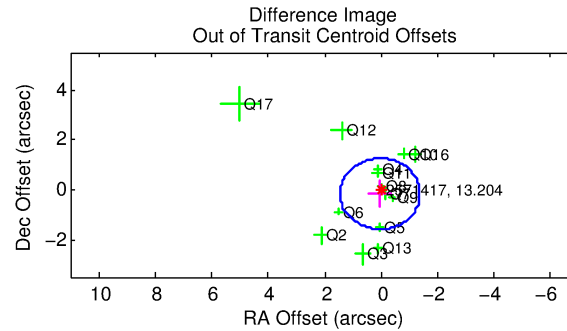
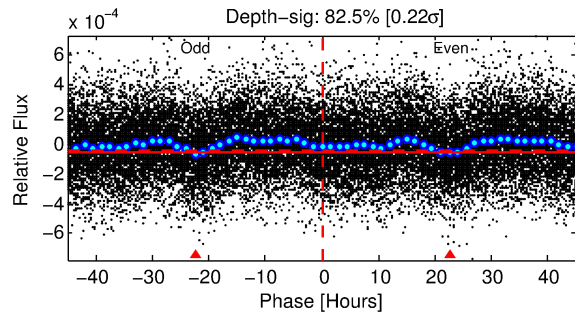
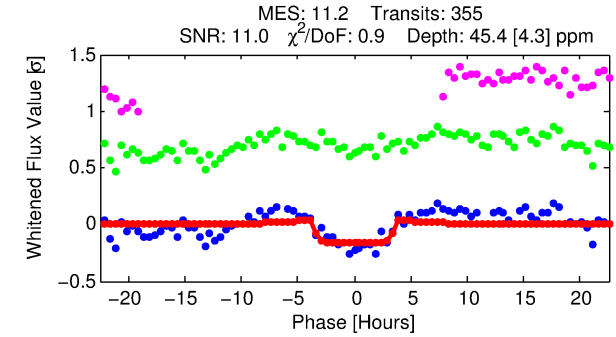
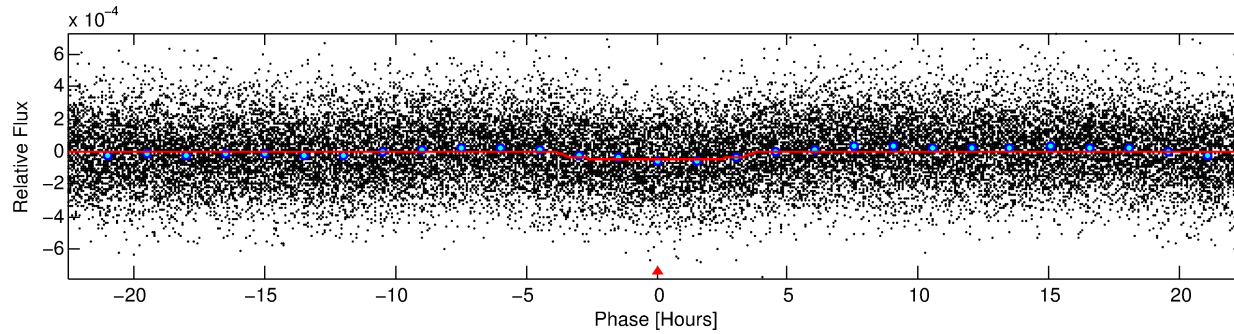
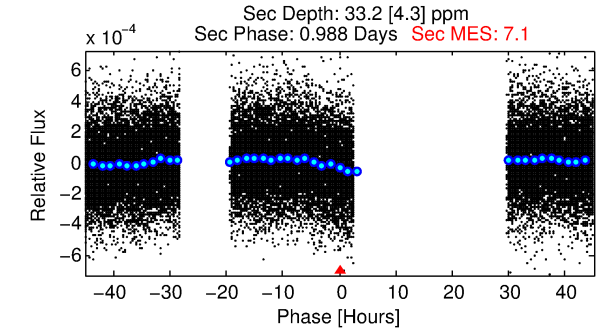
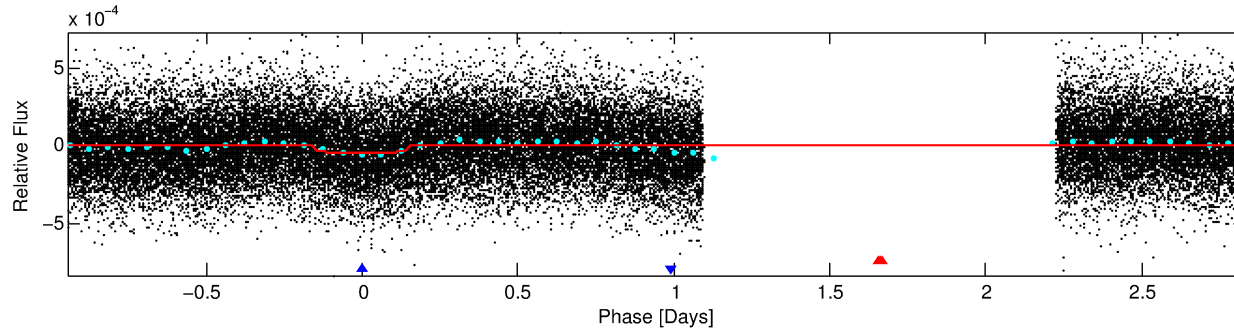
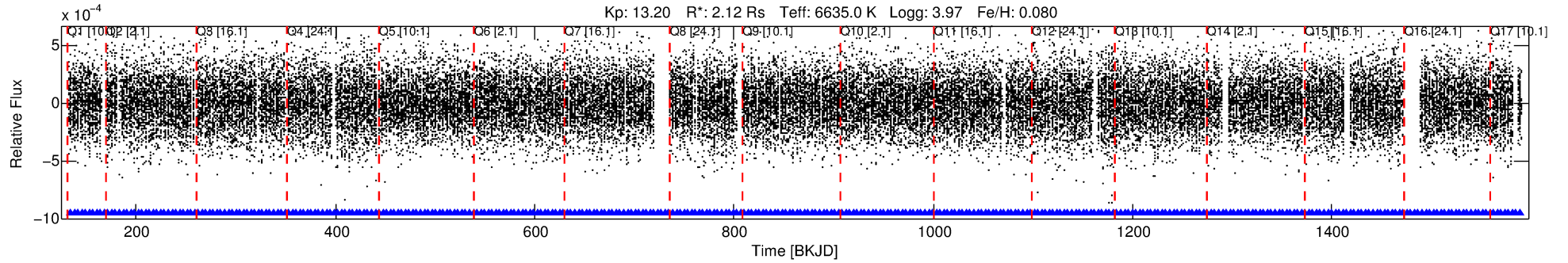
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002571417-02

No Significant Match Found

# DV One-Page Summary

KIC: 2571417 Candidate: 2 of 2 Period: 3.778 d



## DV Fit Results:

Period = 3.77815 [0.00004] d  
Epoch = 134.1802 [0.0061] BKJD  
Rp/R\* = 0.0073 [0.0013]  
a/R\* = 1.86 [1.35]  
b = 0.92 [0.18]  
Seff = 2596.37 [898.39]  
Teq = 1820 [157] K  
Rp = 1.69 [0.52] Re  
a = 0.0547 [0.0122] AU  
Ag = 19.18 [9.81] [1.85σ]  
Teffp = 5890 [565] K [6.94σ]

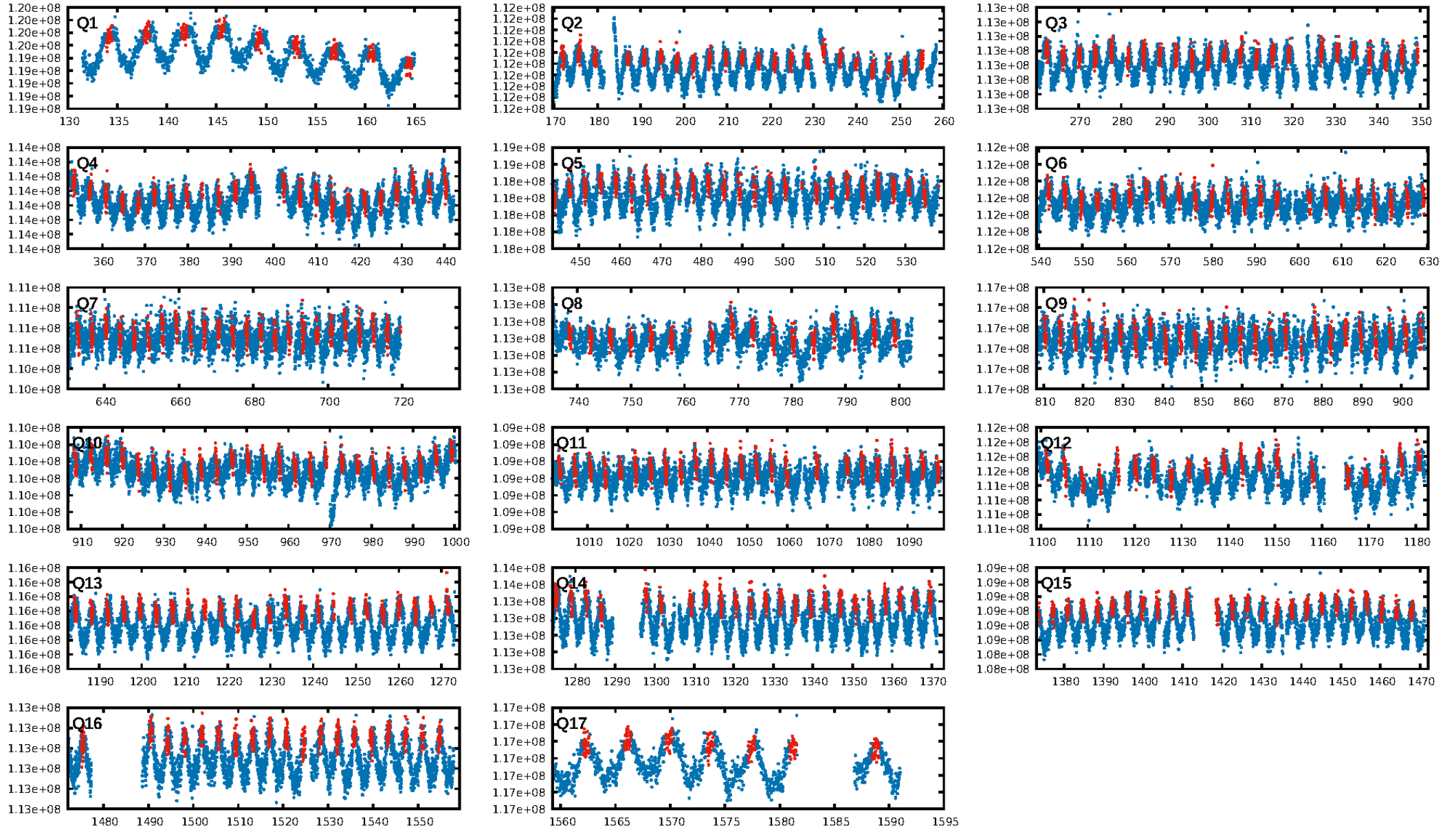
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.67e-20  
RollingBand-fgt: 1.00 [339/339]  
GhostDiagnostic-chr: 1.678  
Centroid-sig: 0.0%  
Centroid-so: 1.806 arcsec [2.44σ]  
OotOffset-rm: 0.175 arcsec [0.37σ]  
KicOffset-rm: 0.164 arcsec [0.36σ]  
OotOffset-st: 3/3/4/4 [14]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 0.79 [11/14]  
DiffImageOverlap-fno: 1.00 [17/17]

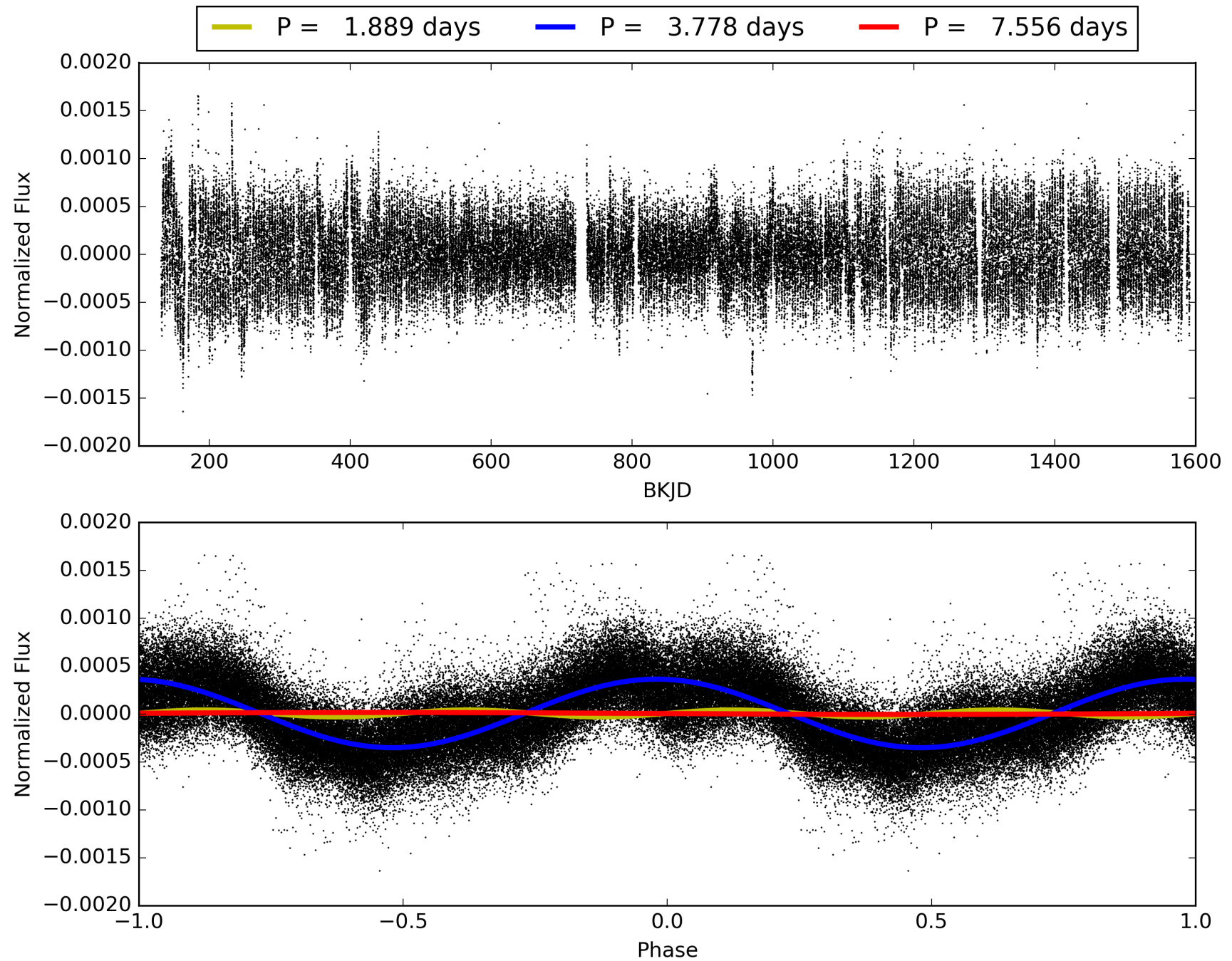
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:10:31 Z

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

# TCE 002571417-02, PDC Light Curves



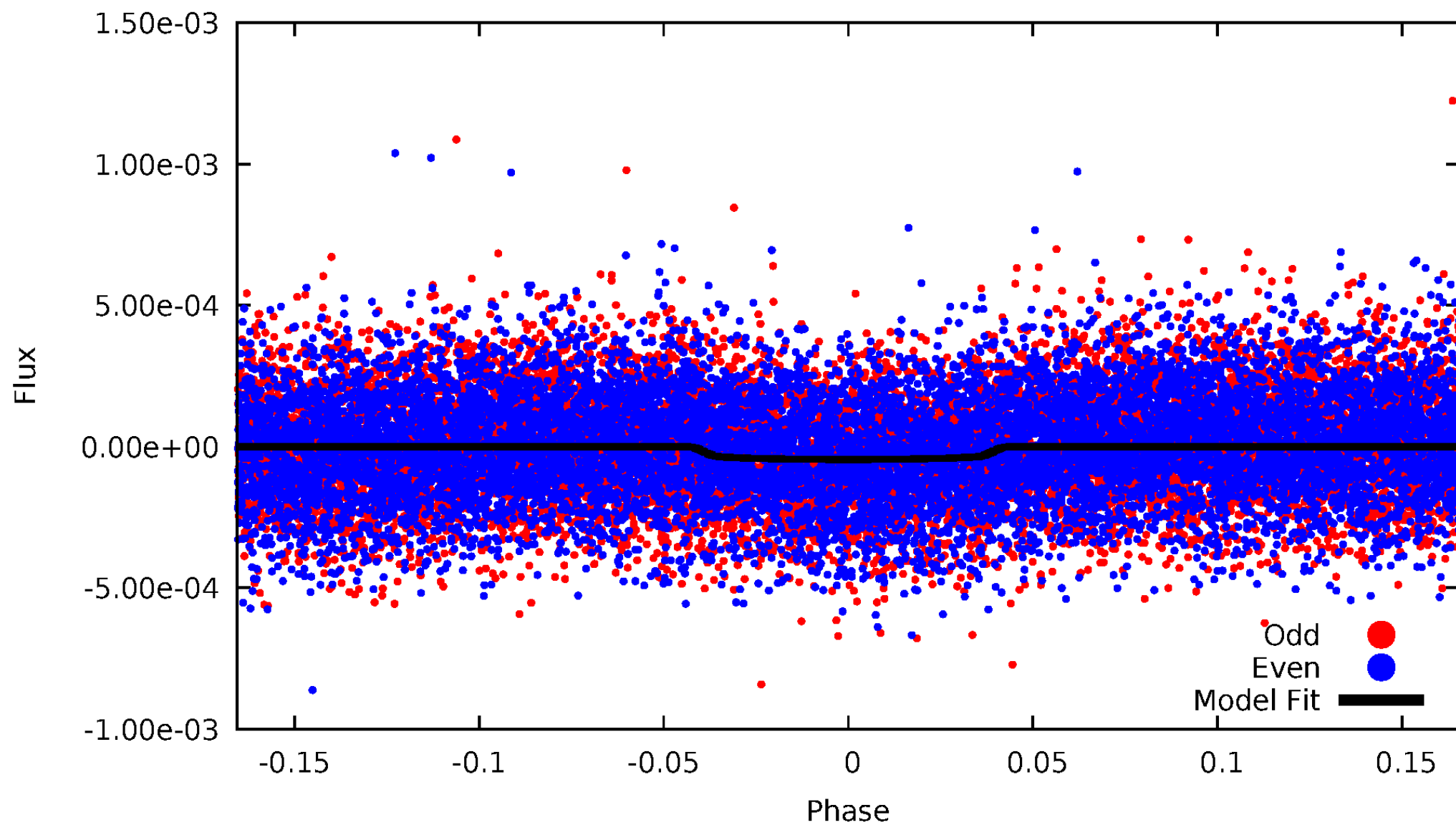
TCE 002571417-02





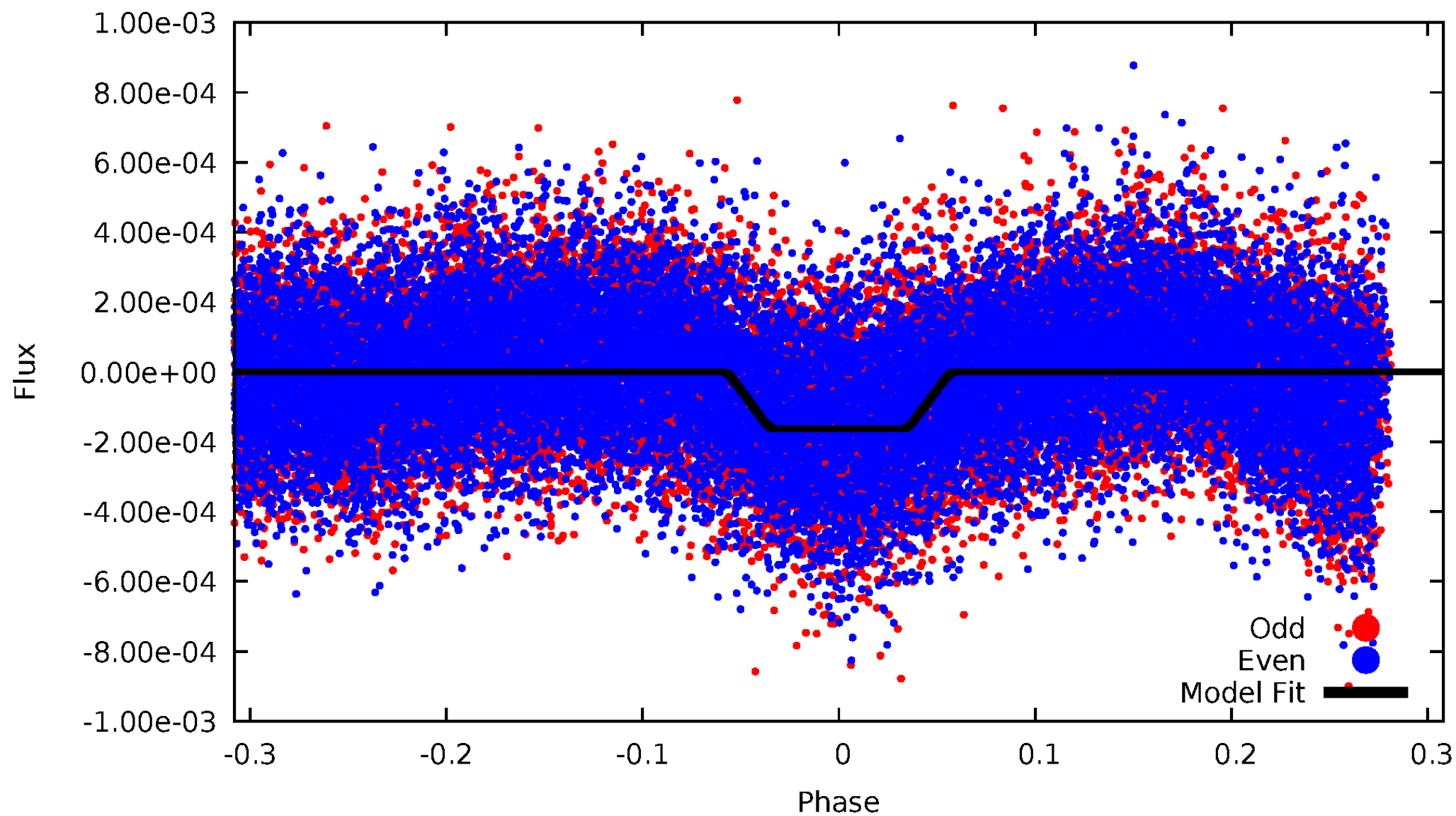
# DV Odd/Even

TCE 002571417-02



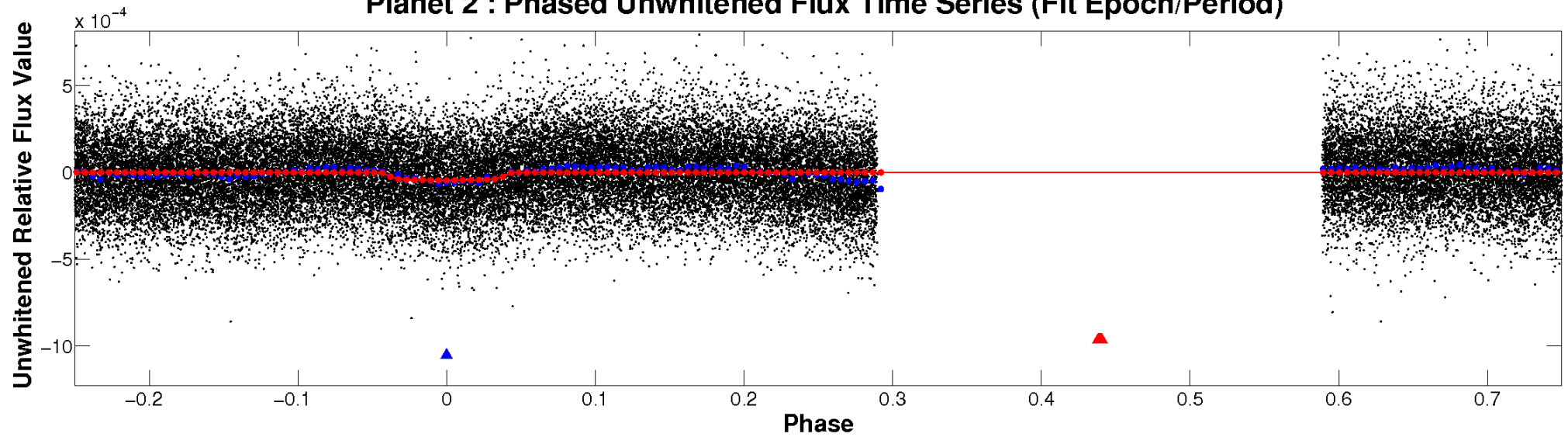
# ALT Odd/Even

TCE 002571417-02

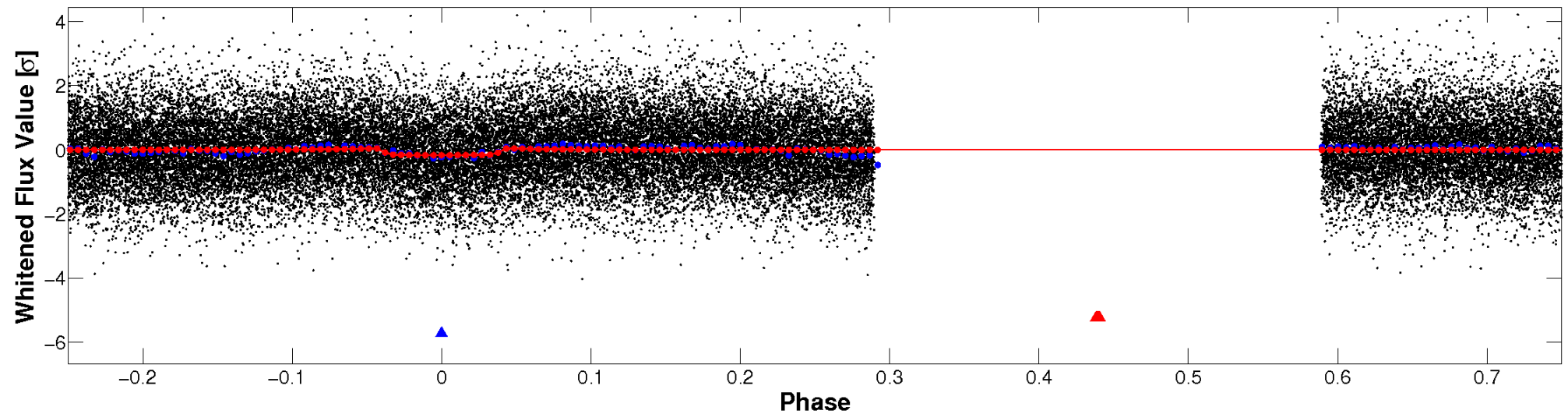


# Non-Whitened Vs. Whitened Light Curve

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

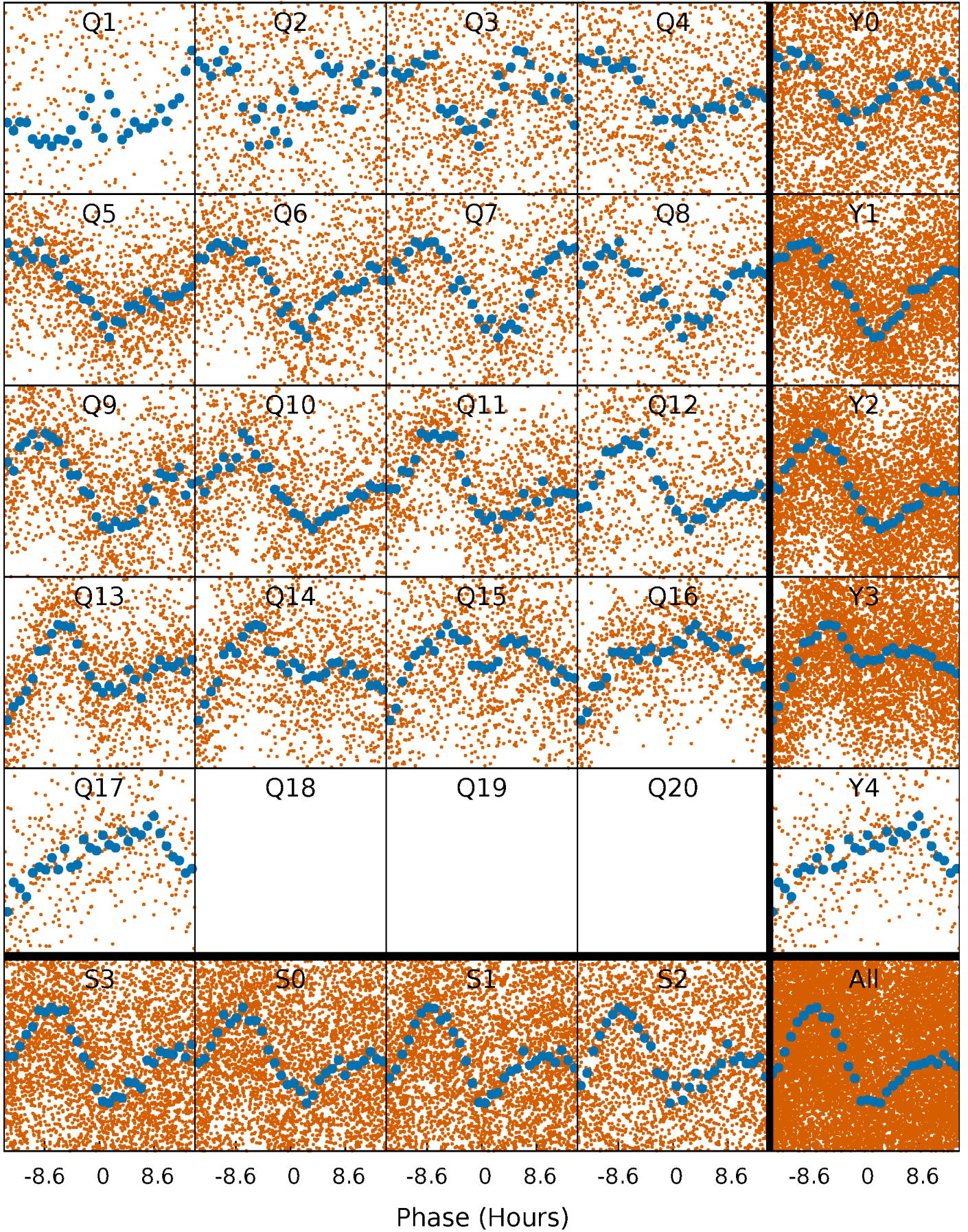


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

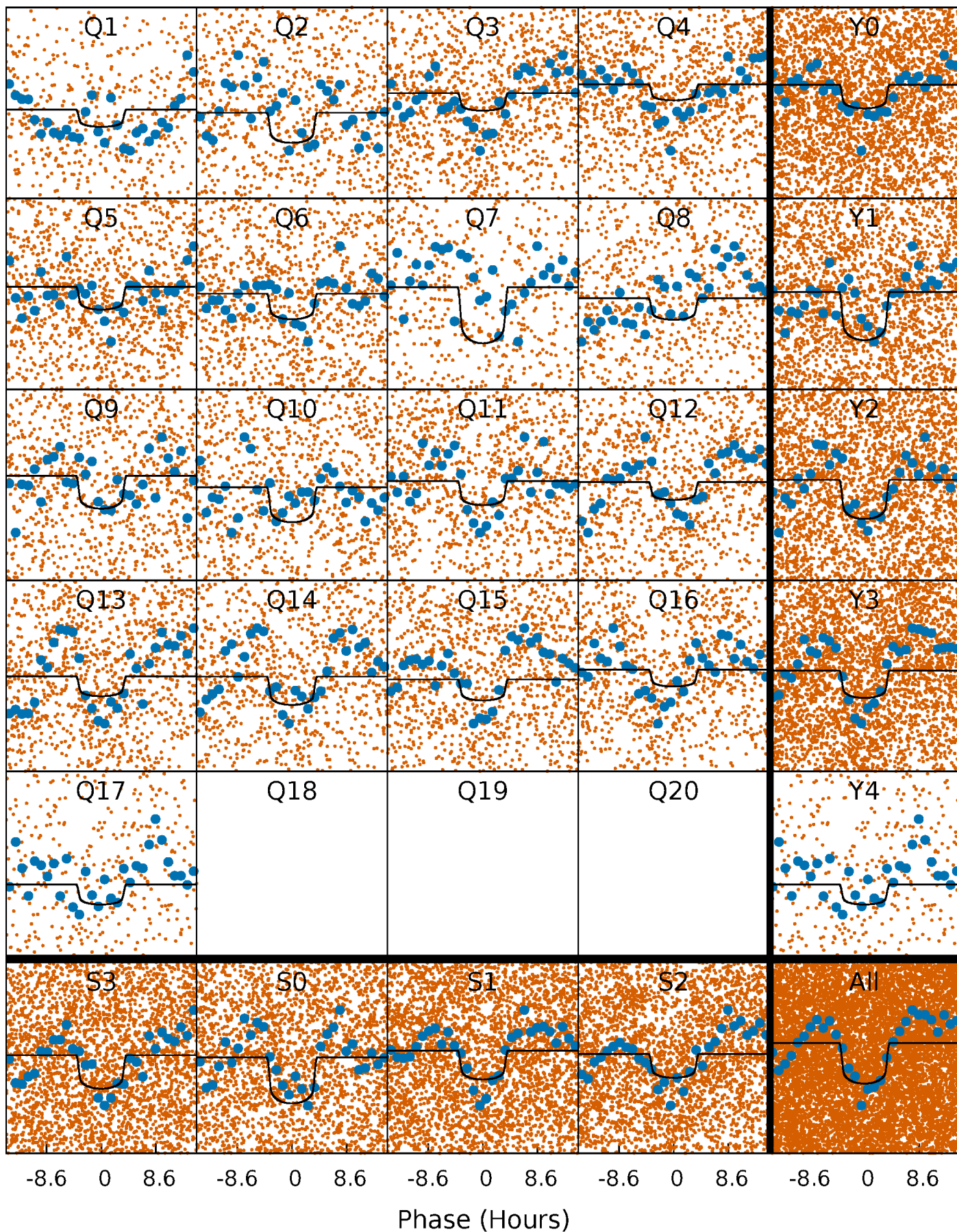
TCE 002571417-02   P= 3.778153 Days    $T_0=134.180241$  (BKJD)





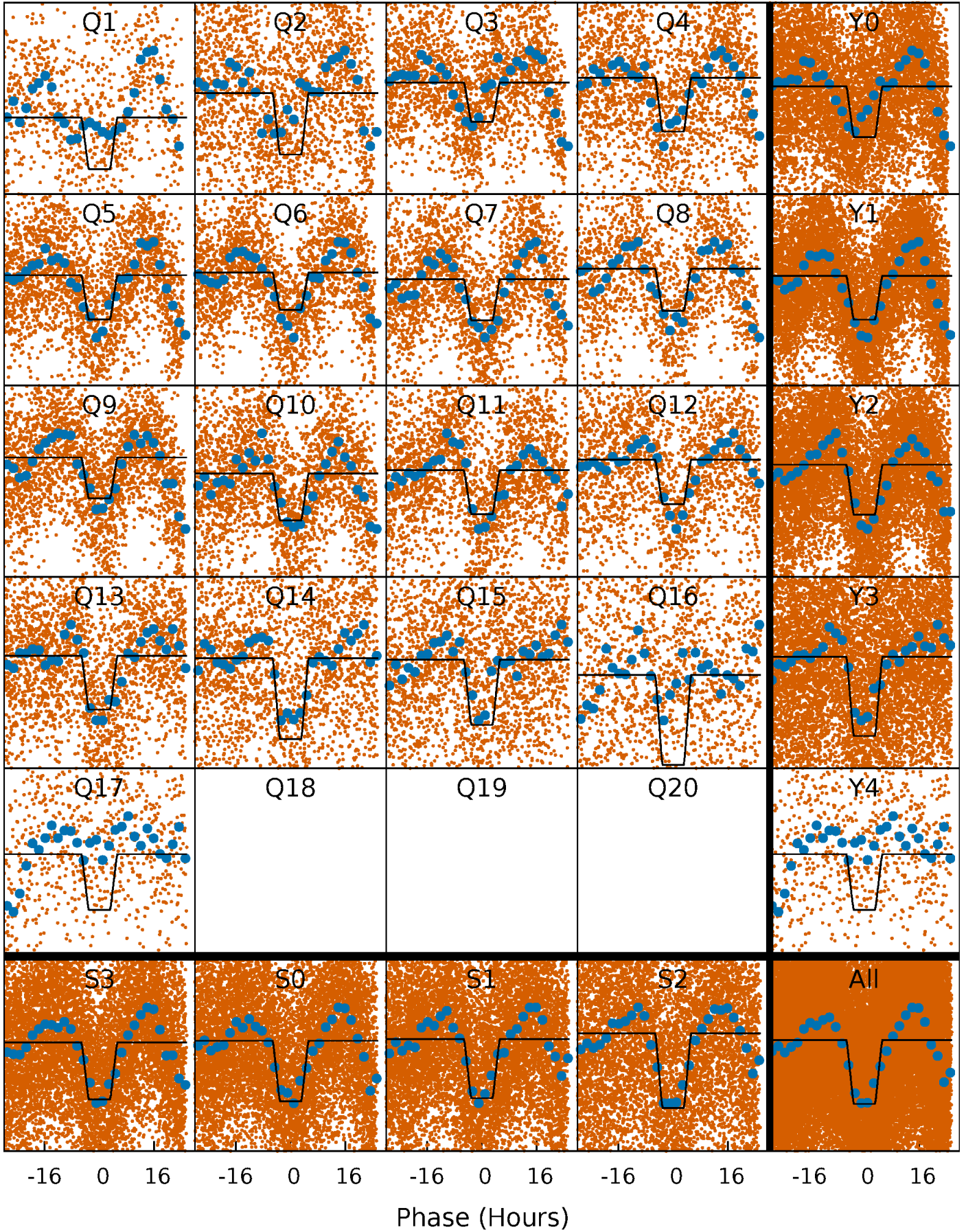
# DV Quarter-Phased Transit Curves

TCE 002571417-02   P= 3.778153 Days    $T_0=134.180241$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 002571417-02   P= 3.778026 Days    $T_0=134.261178$  (BKJD)

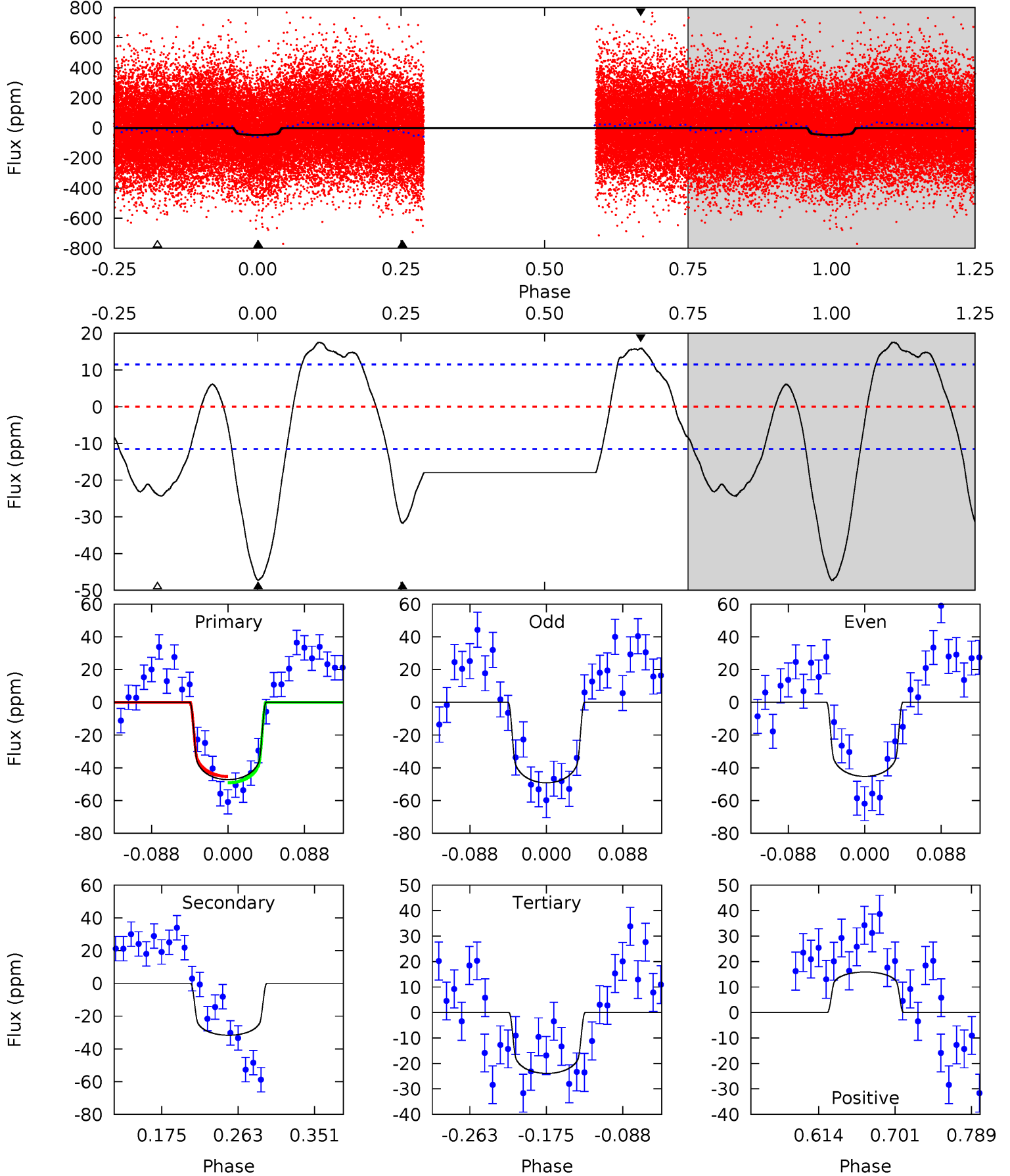




# DV Model-Shift Uniqueness Test

002571417-02, P = 3.778153 Days, E = 130.402088 Days

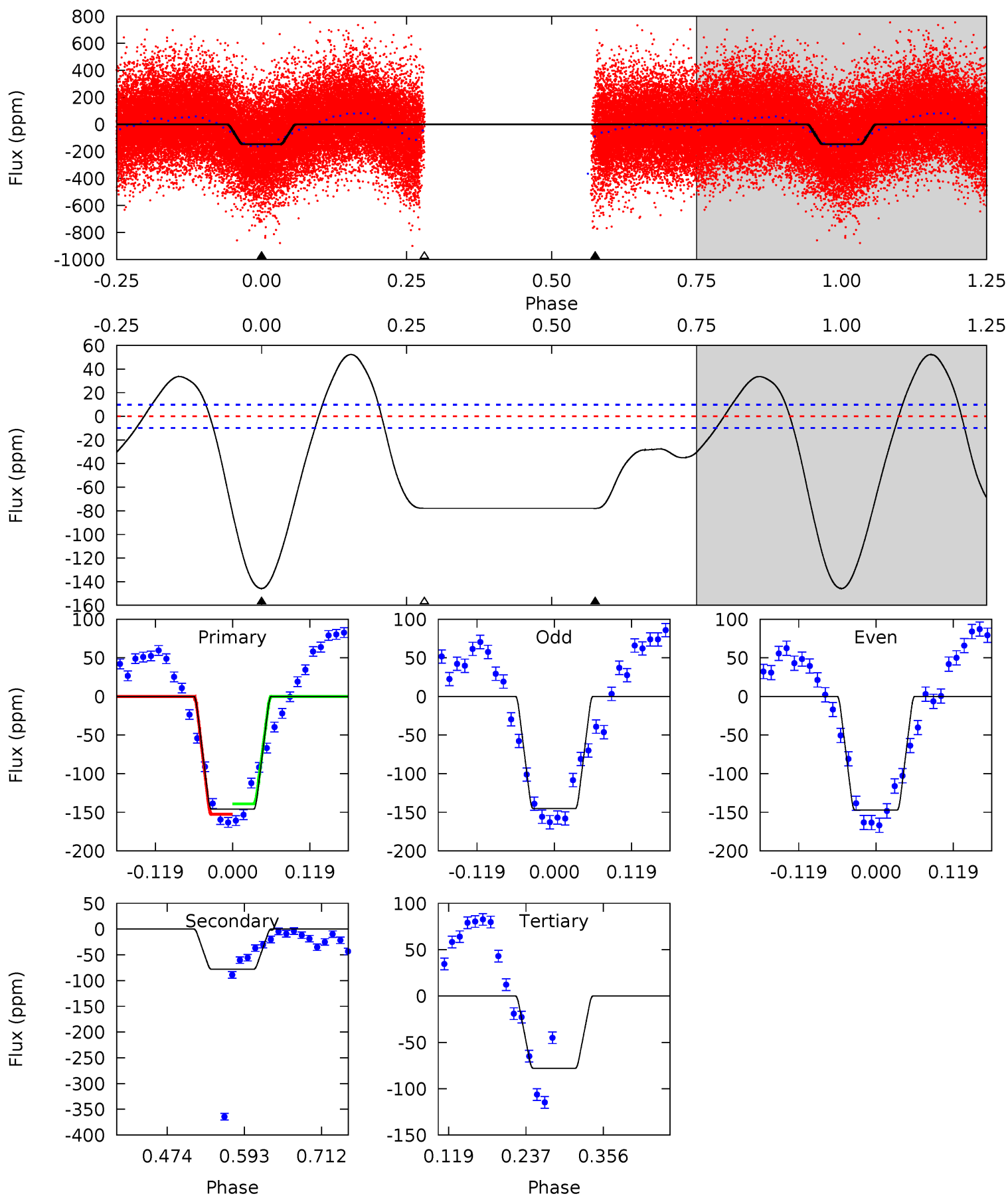
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.8	12.6	9.54	6.34	4.59	1.71	5.98	9.31	12.5	3.10	6.30	0.78	1.05	0.27	0.77



# Alt Model-Shift Uniqueness Test

002571417-02, P = 3.778026 Days, E = 130.483152 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
67.4	36.0	36.0	0	4.53	1.56	17.4	31.4	67.4	0.03	36.0	0.46	1.00	0.26	3.13



### Stellar Parameters For KIC 002571417

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6635^{+72}_{-86}$	$3.972^{+0.195}_{-0.105}$	$0.080^{+0.150}_{-0.150}$	$2.117^{+0.351}_{-0.526}$	$1.534^{+0.115}_{-0.187}$	$0.228^{+0.253}_{-0.075}$
	+1%/-1%	+5%/-3%	+188%/-188%	+17%/-25%	+7%/-12%	+111%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 002571417-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-32 \pm 3$	$1.62^{+0.37}_{-0.34}$	$2523^{+130}_{-152}$	$5804^{+634}_{-444}$	$20^{+12}_{-7}$
Alt.	$-78 \pm 2$	$2.90^{+0.42}_{-0.45}$	$2523^{+116}_{-166}$	$5498^{+297}_{-263}$	$15^{+6}_{-4}$

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

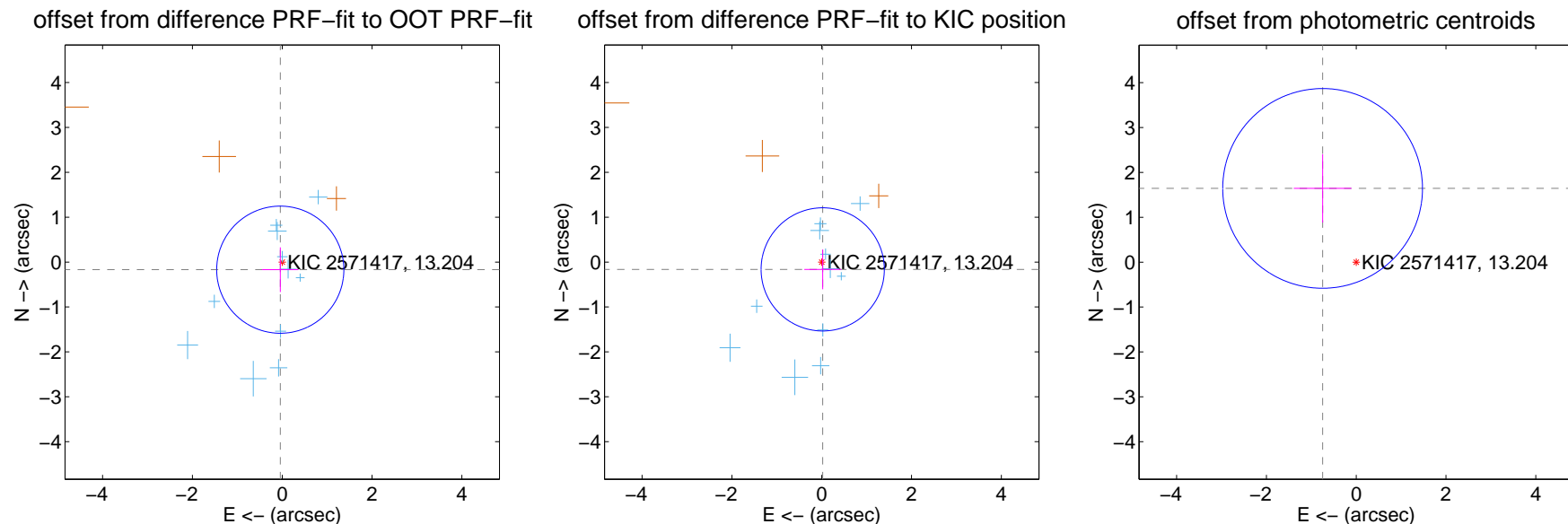
## DV Centroid Data

Supplemental centroid analysis for 002571417-02. Kepler magnitude: 13.20. Transit SNR 11.02

There are 11 quarters with good PRF difference image offsets

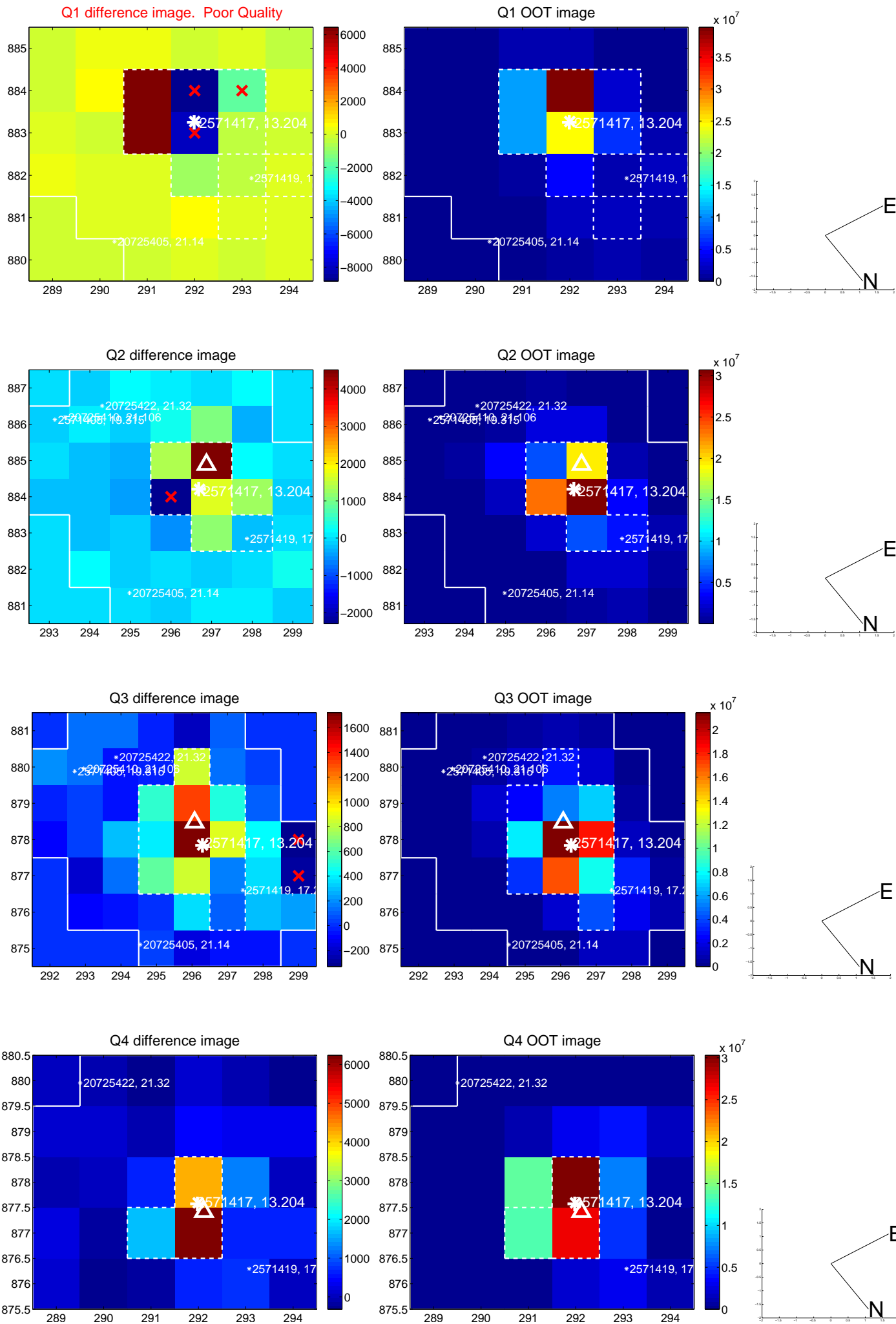
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.175 \pm 0.472$	0.37	$0.043 \pm 0.405$	$-0.169 \pm 0.497$
PRF-fit source offset from KIC position	$0.164 \pm 0.457$	0.36	$-0.022 \pm 0.410$	$-0.163 \pm 0.443$
photometric centroid source offset	$1.81 \pm 0.74$	2.44	$0.75 \pm 0.64$	$1.64 \pm 0.76$

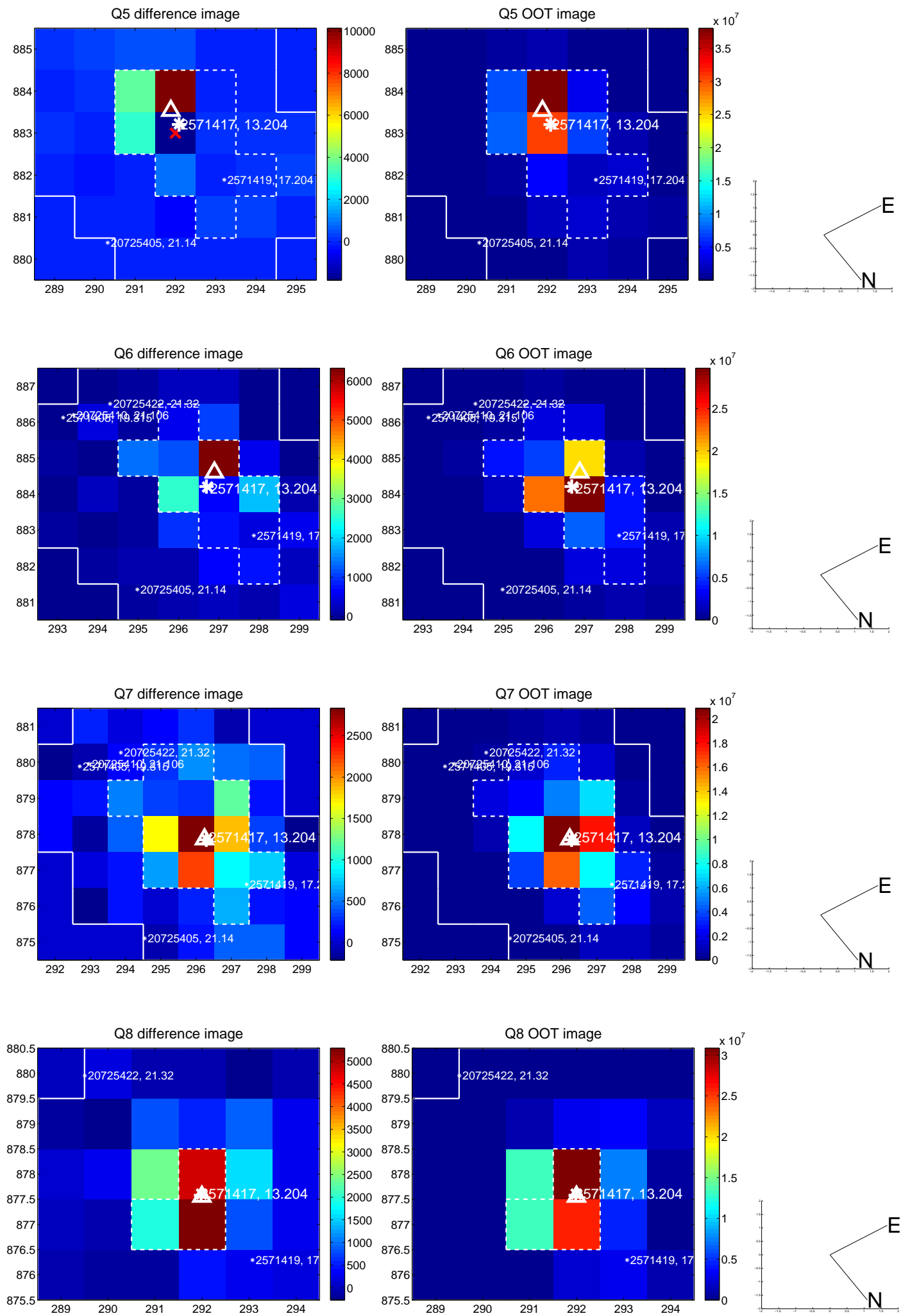


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

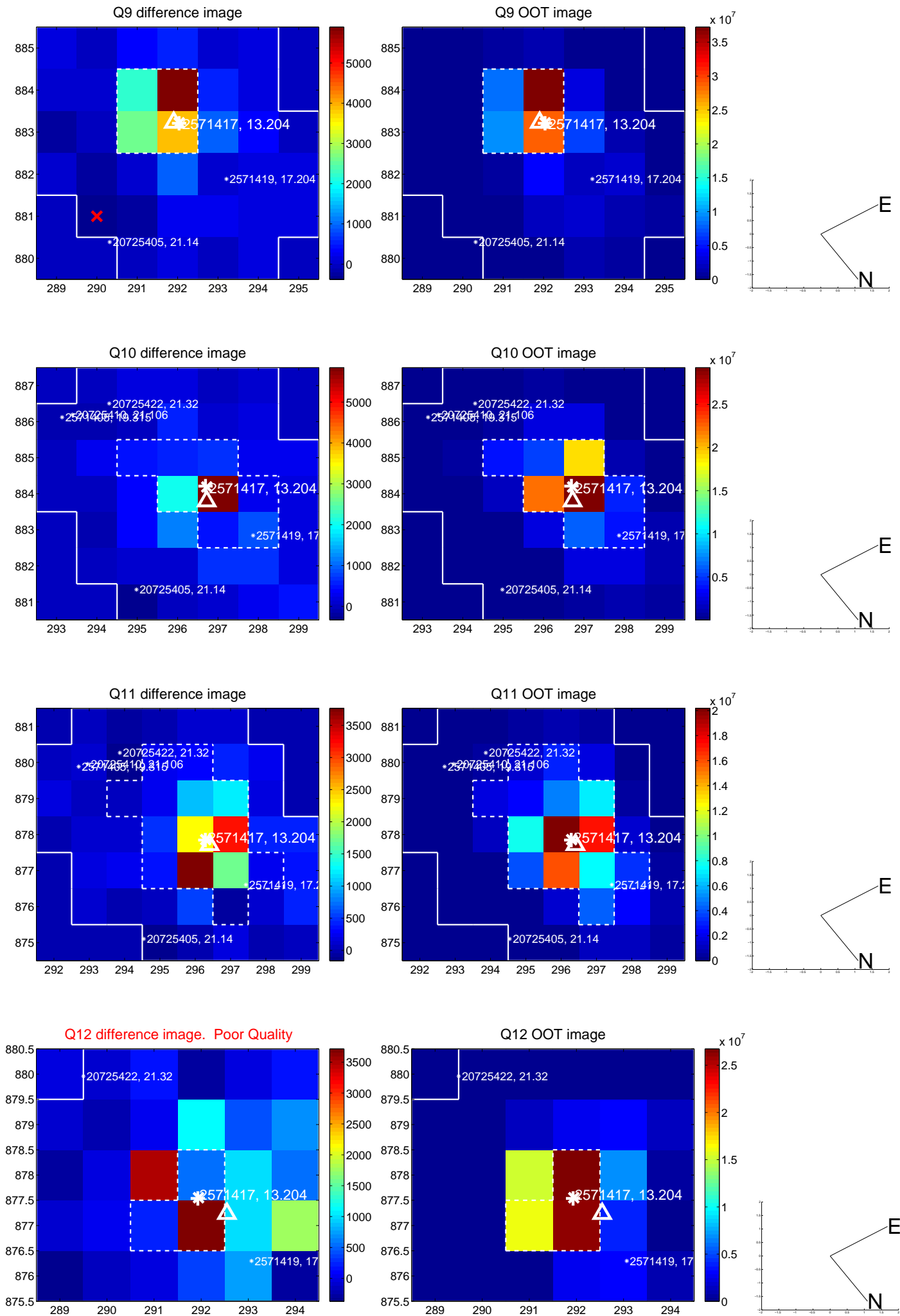


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

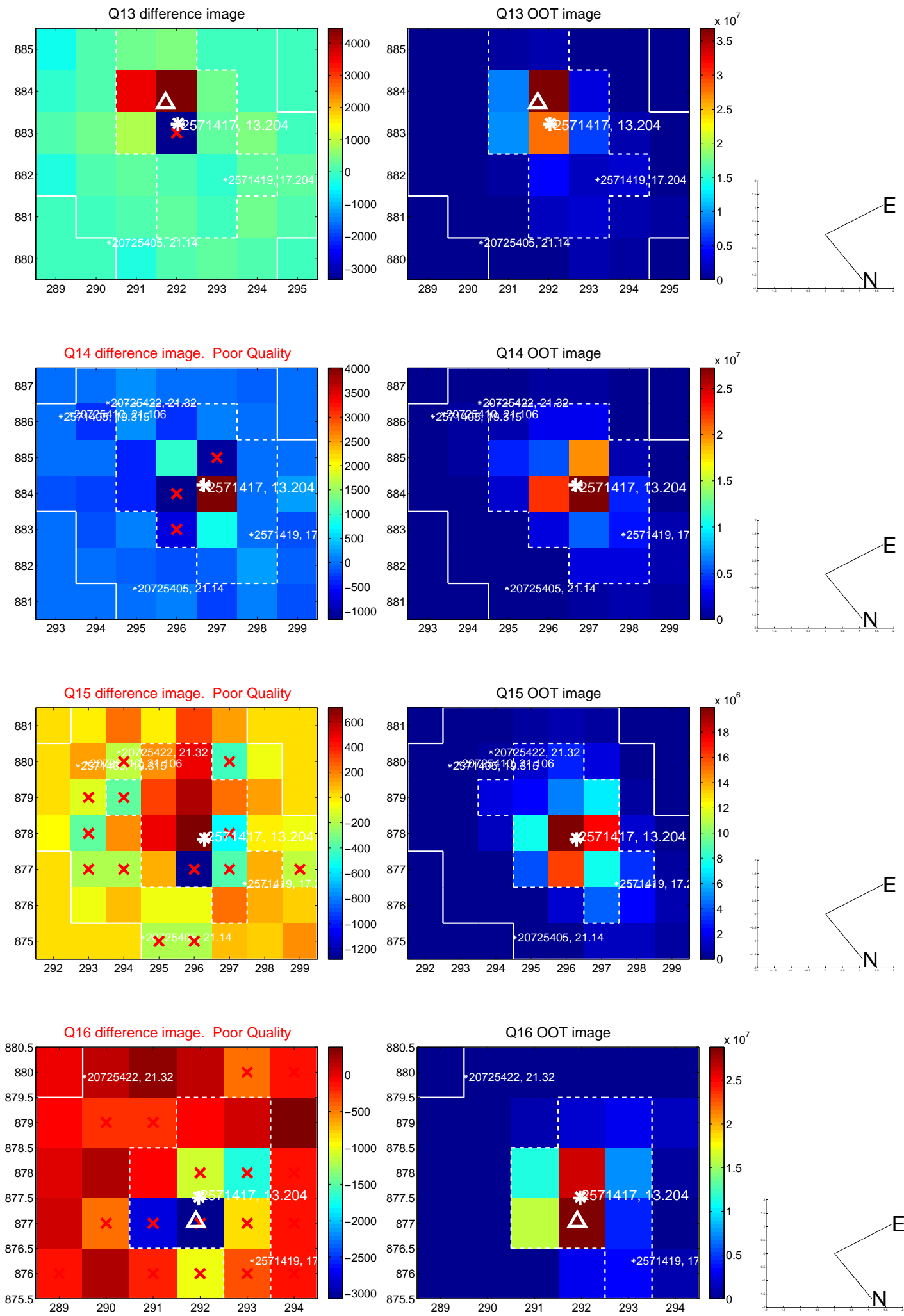




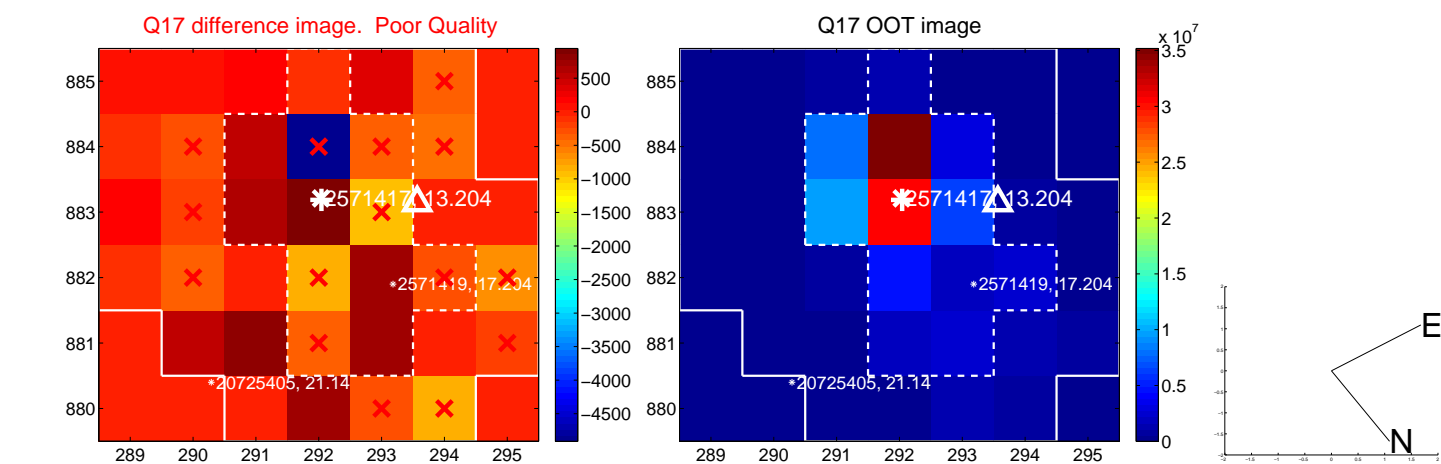
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



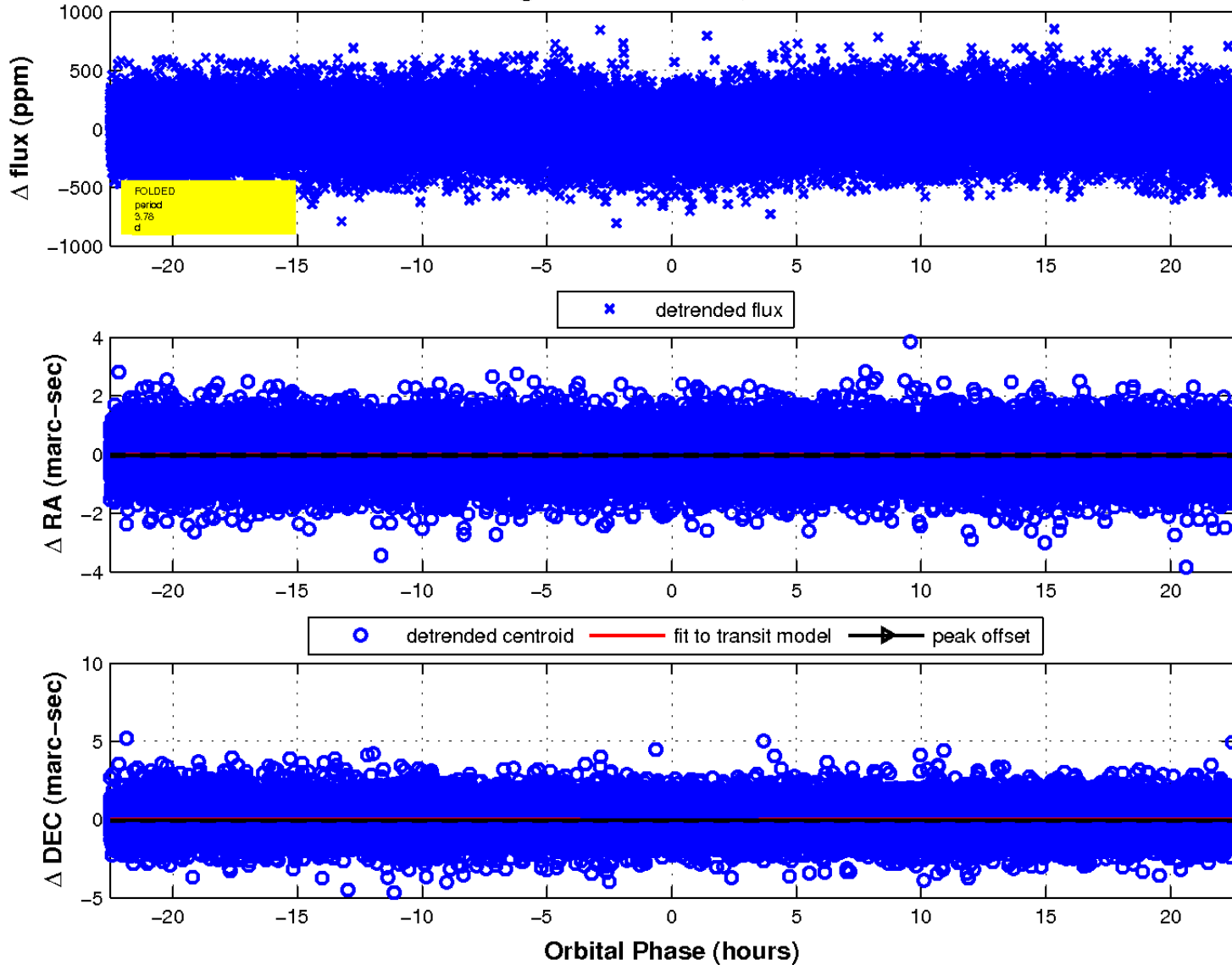
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

