

# KIC 005876360

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005876360-01	OBS	4279.01	1.050843	132.147039	7141.9	0.878	33.5	32.8	1.00	5780	11.62	2442.80
005876360-02	OBS	No	1.050599	131.951619	22866.8	1.500	16.8	-1.0	1.00	5780	15.07	2443.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005876360-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_ALT—CENT_KIC_POS
005876360-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—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 005876360-01

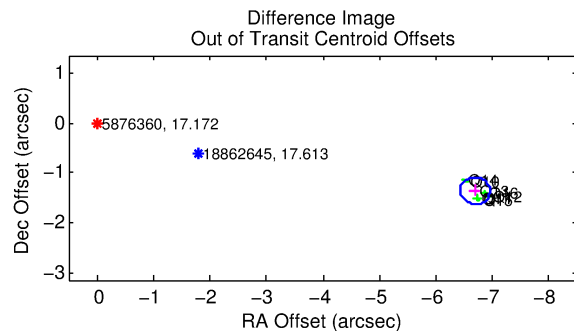
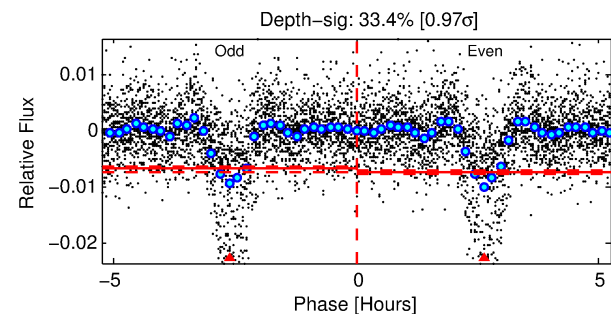
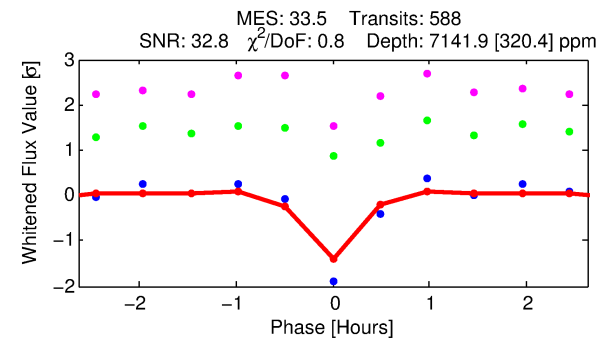
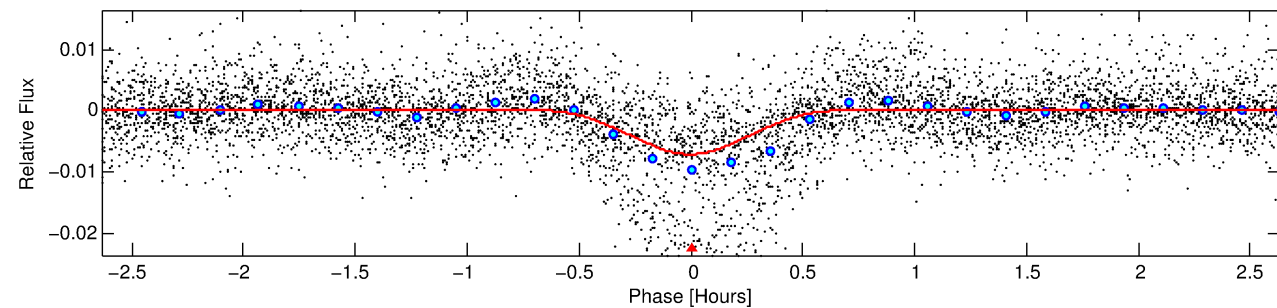
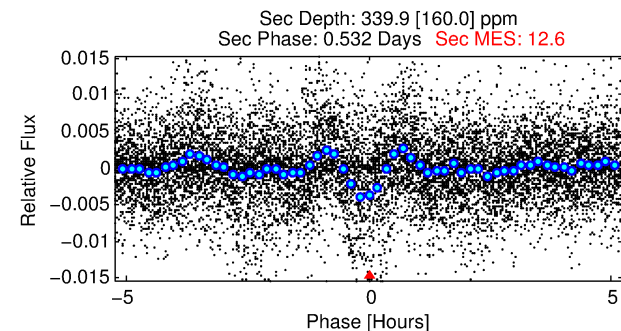
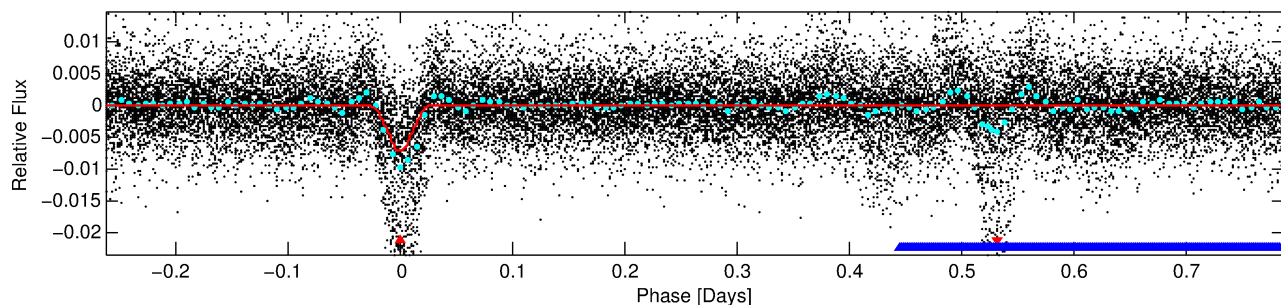
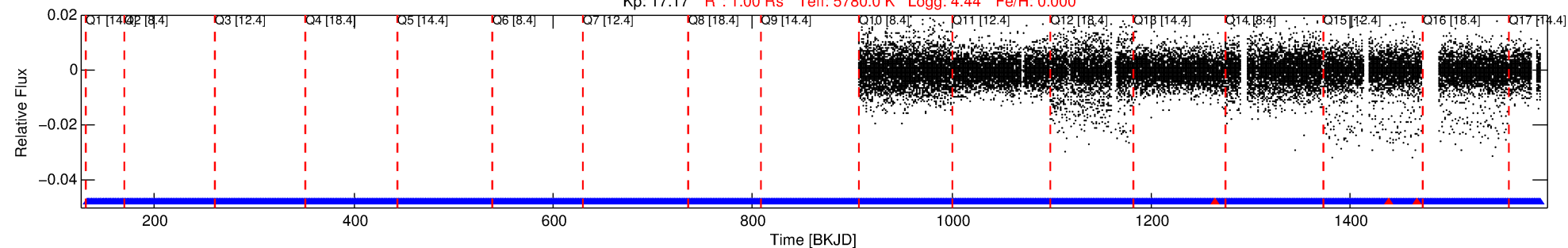
No Significant Match Found

# DV One-Page Summary

KIC: 5876360 Candidate: 1 of 2 Period: 1.051 d

KOI: K04279 Corr: No Ephemeris Match

Kp: 17.17 R\*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



## DV Fit Results:

Period = 1.05084 [0.00000] d  
Epoch = 132.1470 [0.0004] BKJD  
Rp/R\* = 0.1065 [0.1097]  
a/R\* = 5.69 [2.65]  
b = 0.92 [0.26]  
Seff = 2442.80 [0.01]  
Teq = 1793 [0] K  
Rp = 11.62 [11.97] Re  
a = 0.0202 [0.0000] AU  
Ag = 0.57 [1.20] [-0.36σ]  
Teffp = 2404 [1270] K [0.48σ]

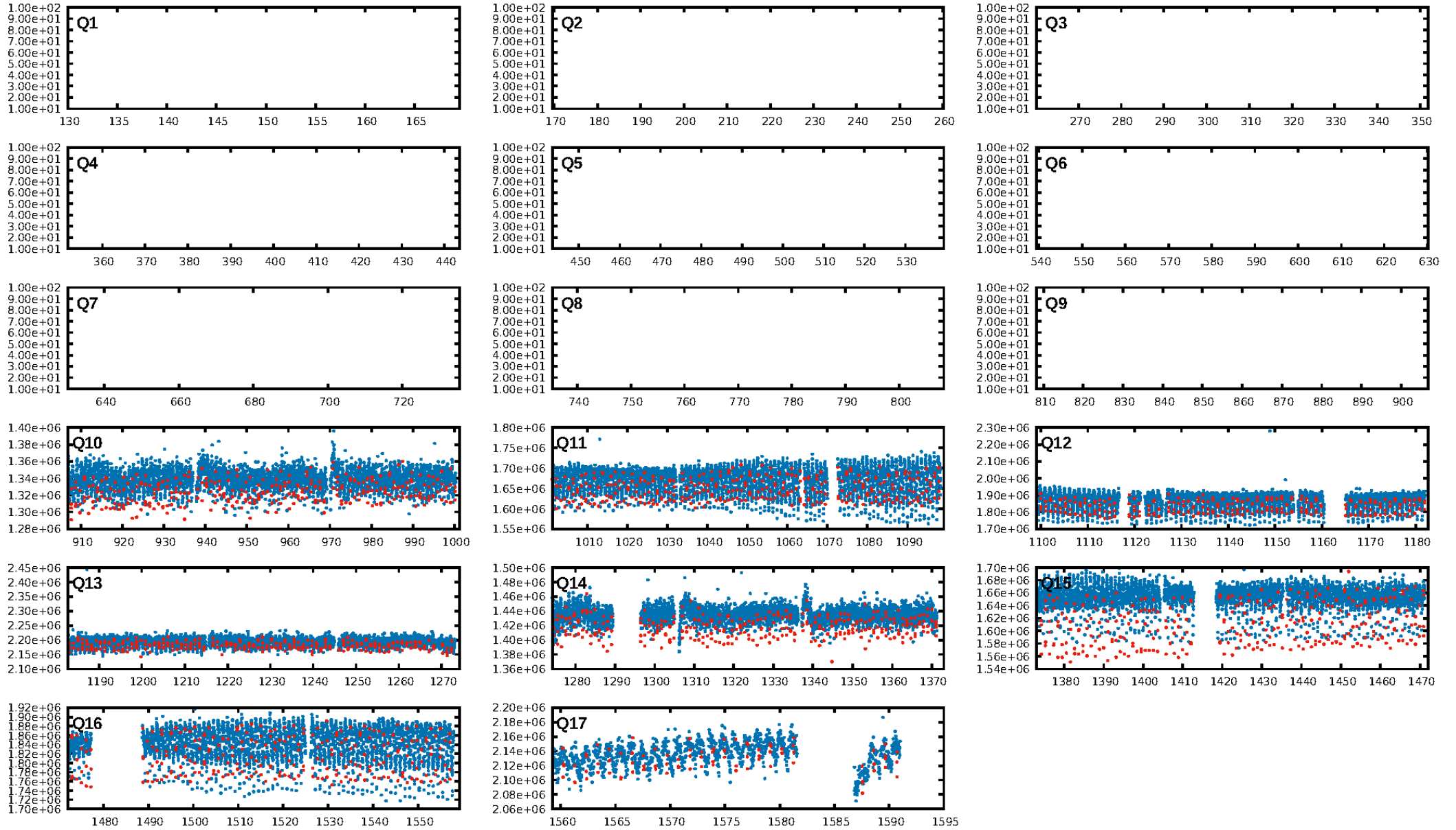
## DV Diagnostic Results:

ShortPeriod-sig: 0.3% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [560/563]  
GhostDiagnostic-chr: 0.8534  
Centroid-sig: 0.0%  
Centroid-so: 3.240 arcsec [92.27σ]  
OotOffset-rm: 6.823 arcsec [76.83σ]  
KicOffset-rm: 1.816 arcsec [24.72σ]  
OotOffset-st: 2/2/2/2 [8]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

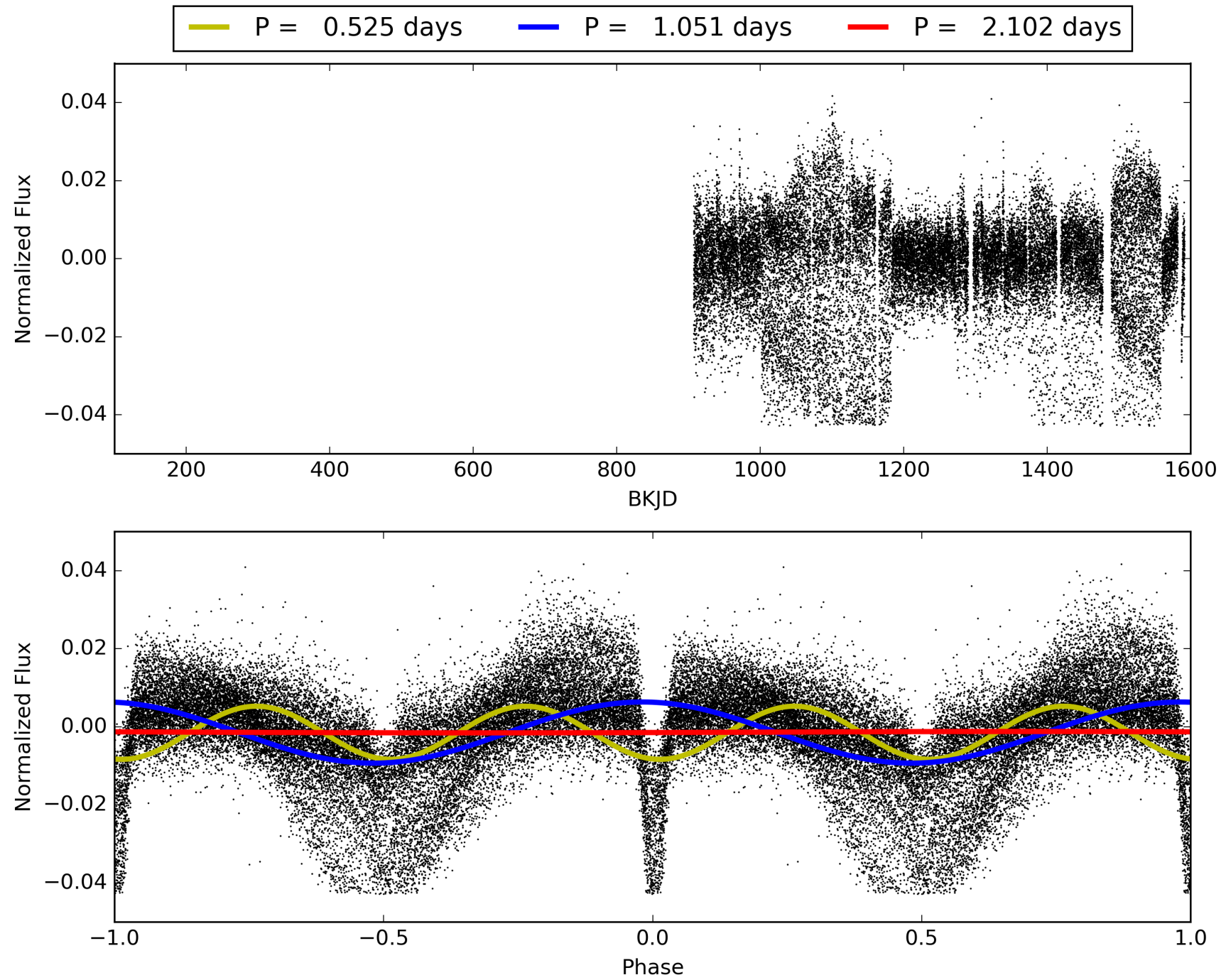
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:21:10 Z

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

# TCE 005876360-01, PDC Light Curves

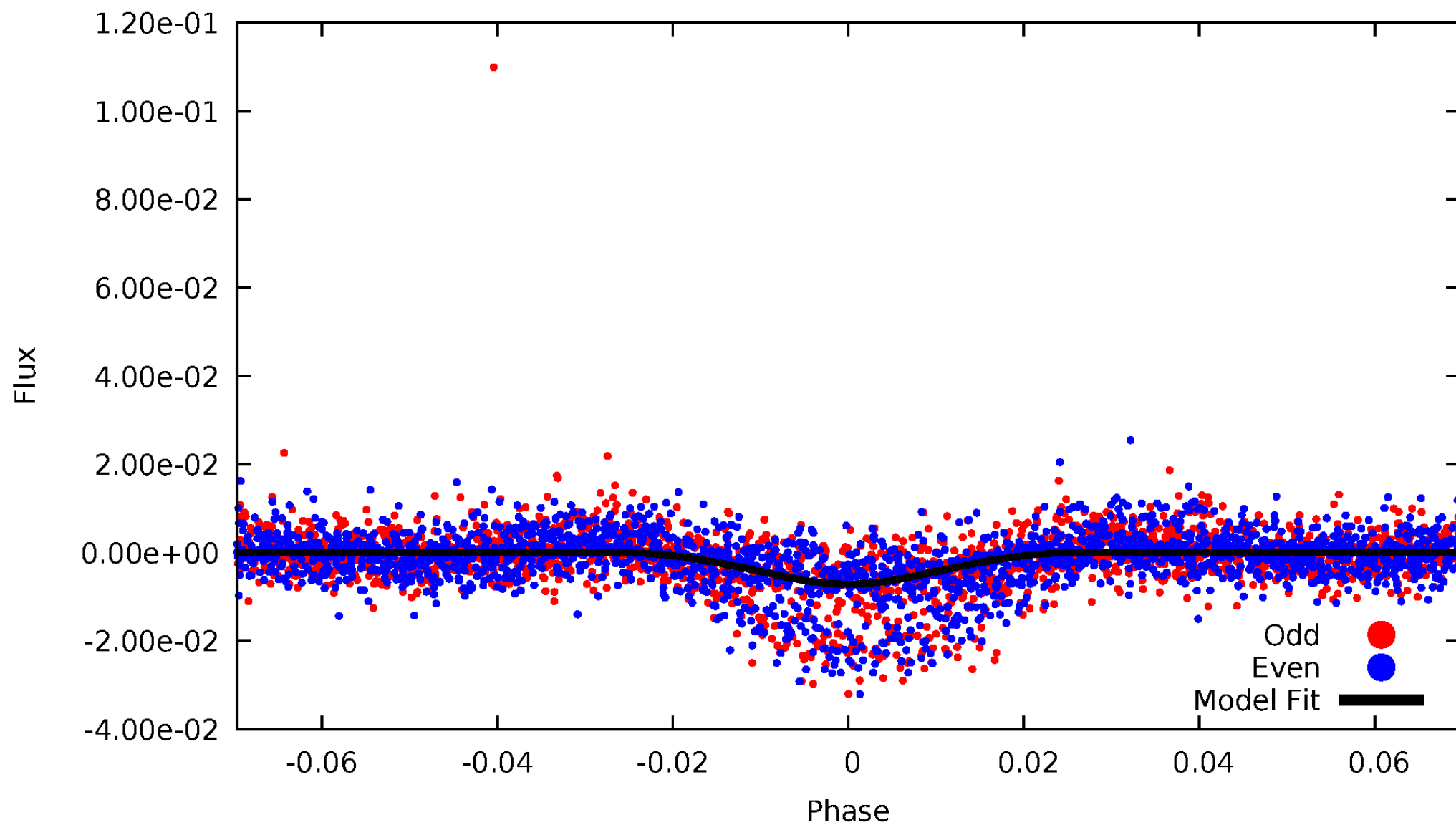


TCE 005876360-01



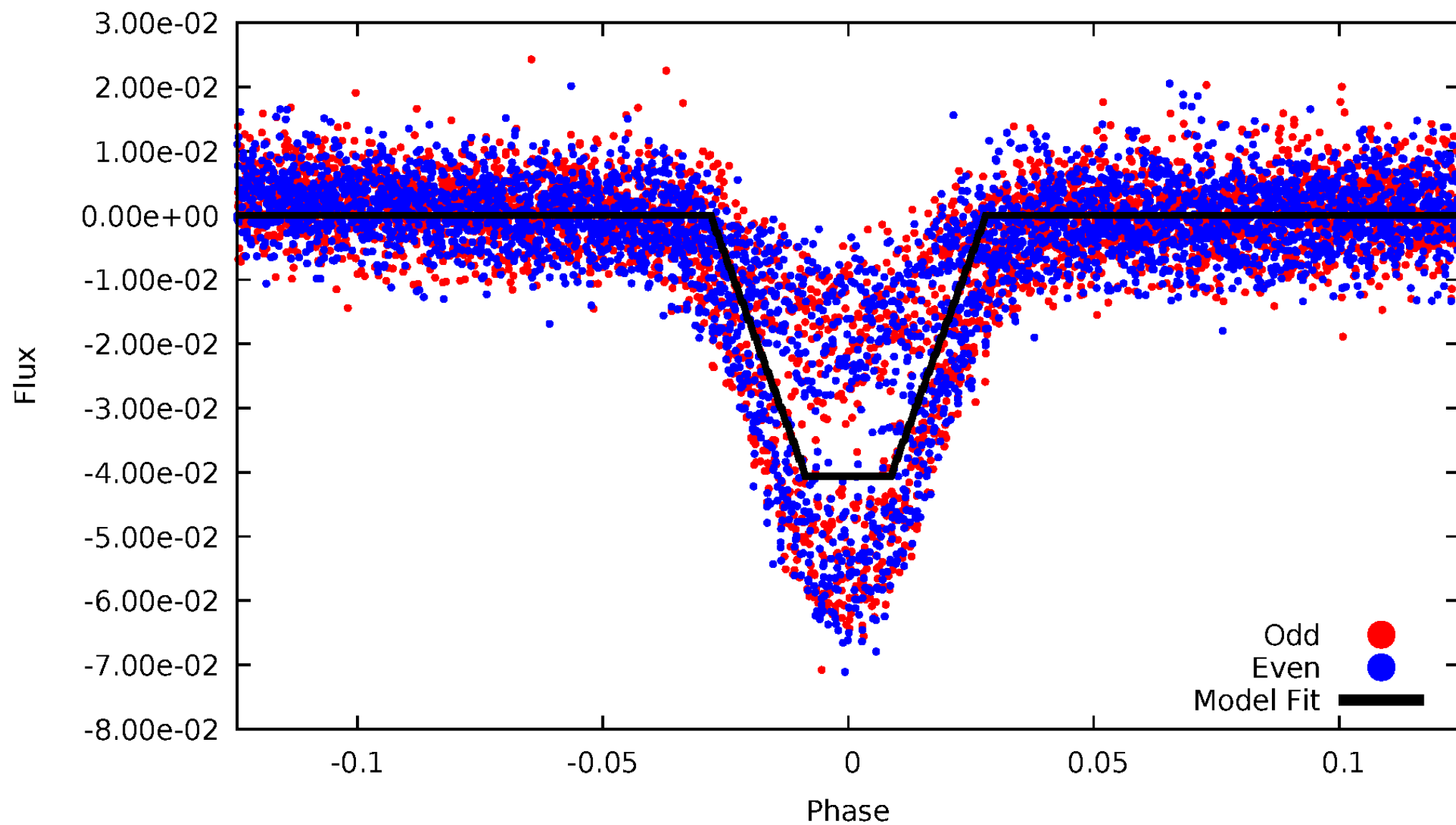
# DV Odd/Even

TCE 005876360-01



# ALT Odd/Even

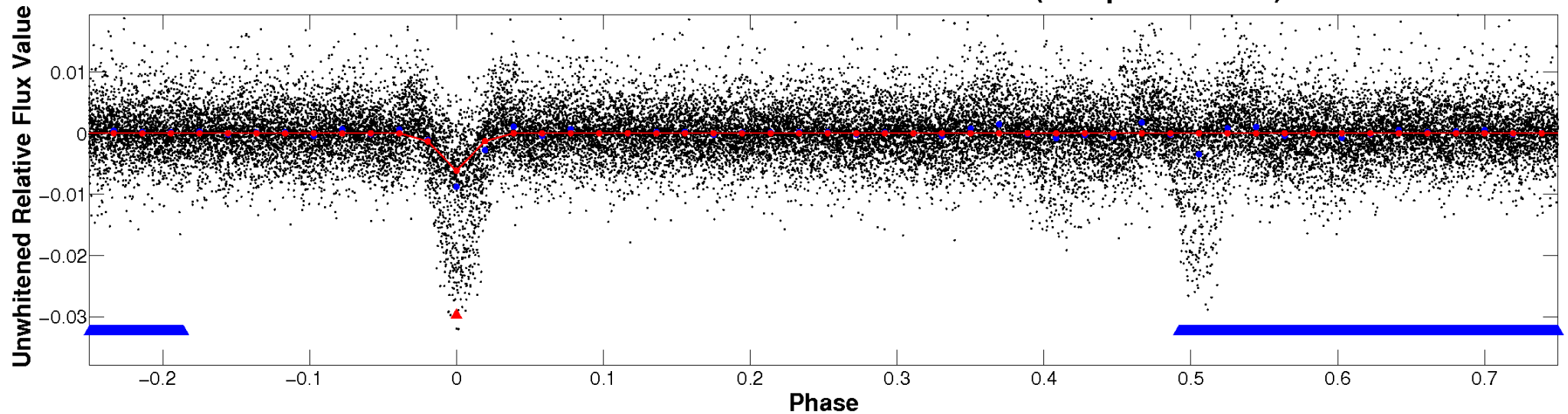
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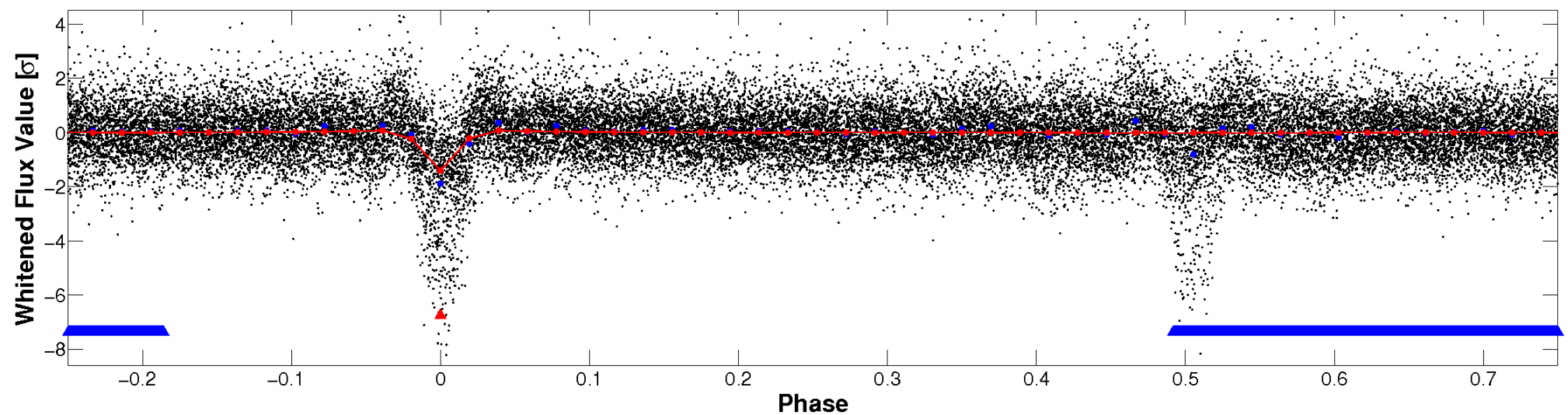


# Non-Whitened Vs. Whitened Light Curve

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

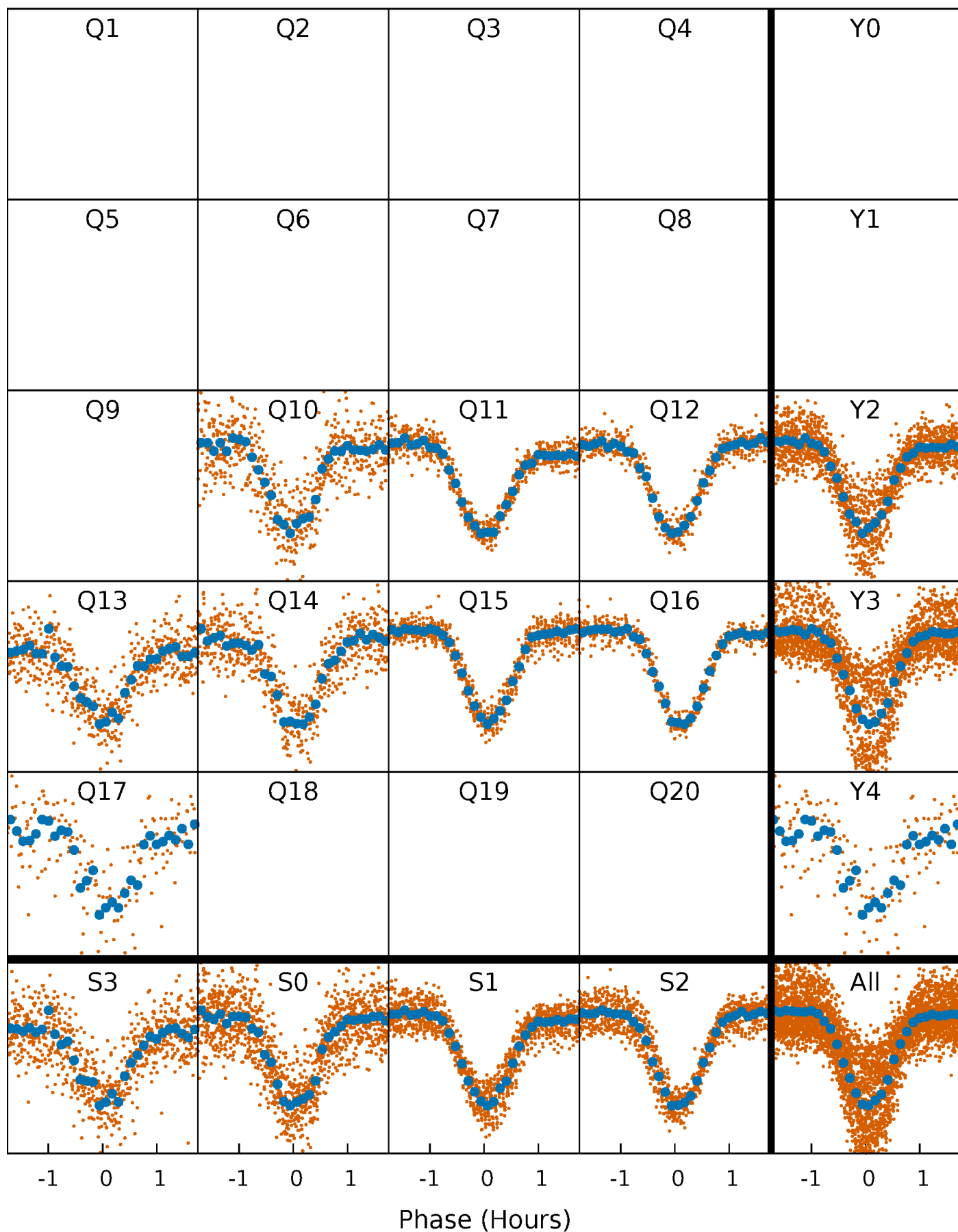


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

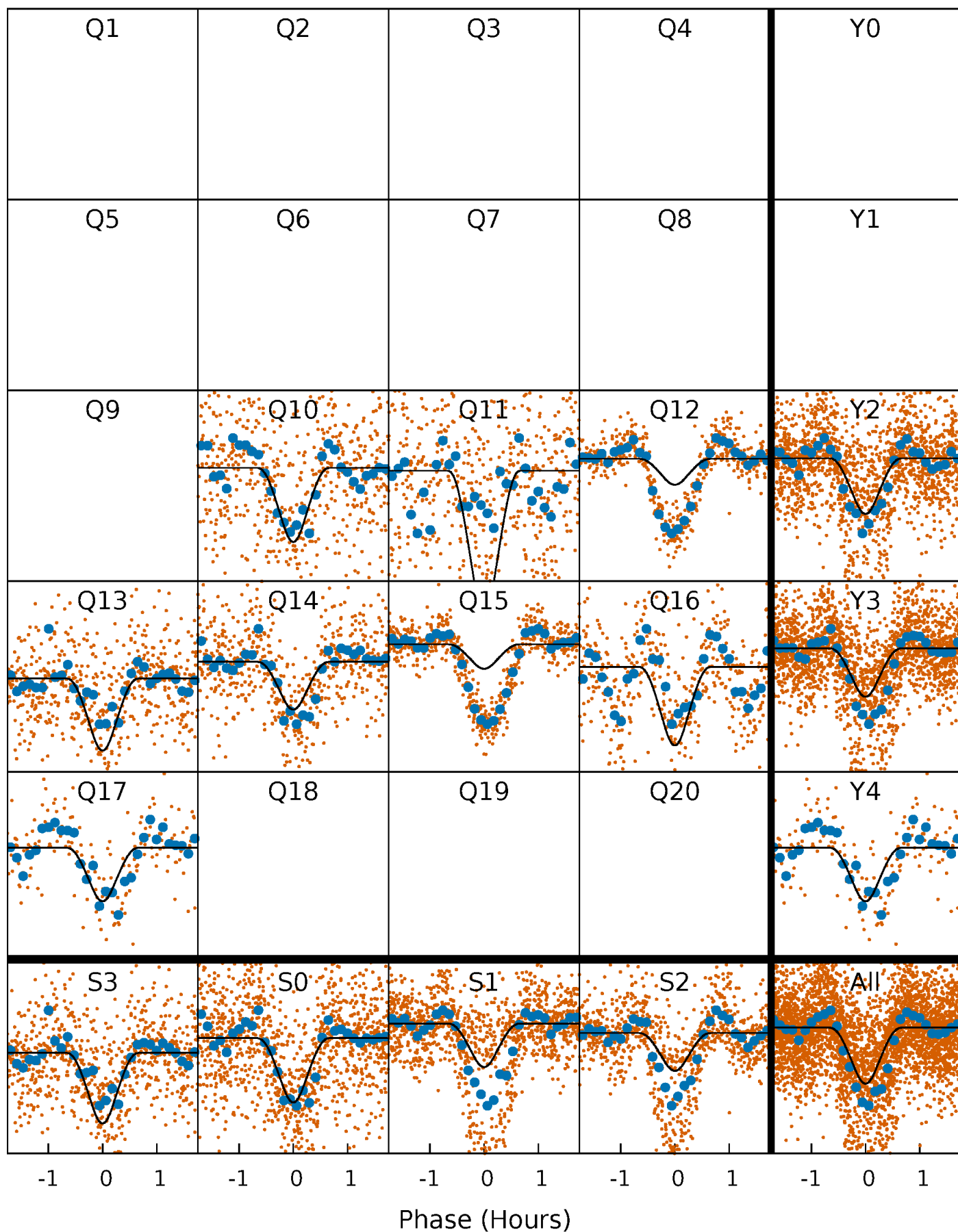
TCE 005876360-01   P= 1.050843 Days    $T_0=132.147039$  (BKJD)





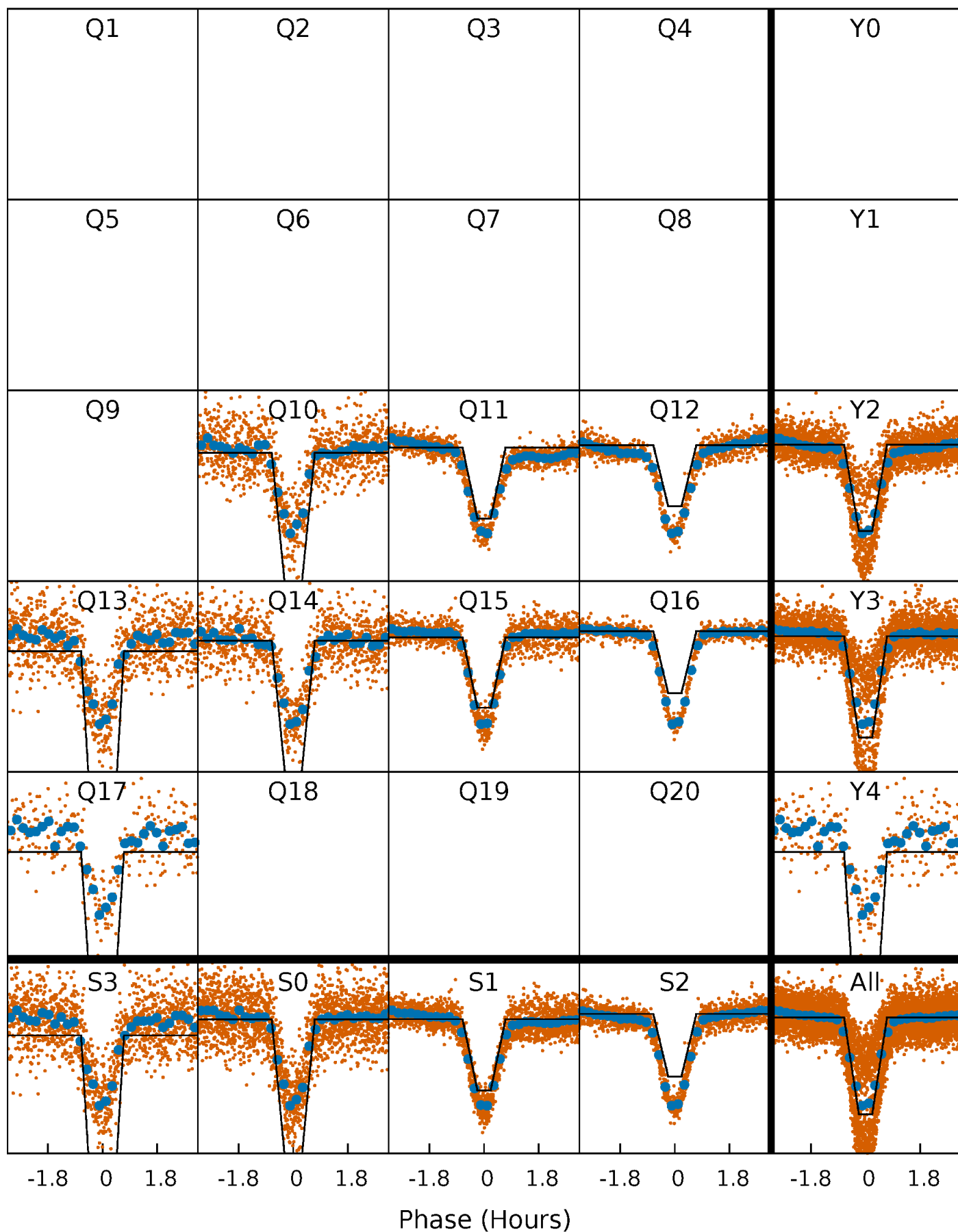
# DV Quarter-Phased Transit Curves

TCE 005876360-01   P= 1.050843 Days    $T_0=132.147039$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

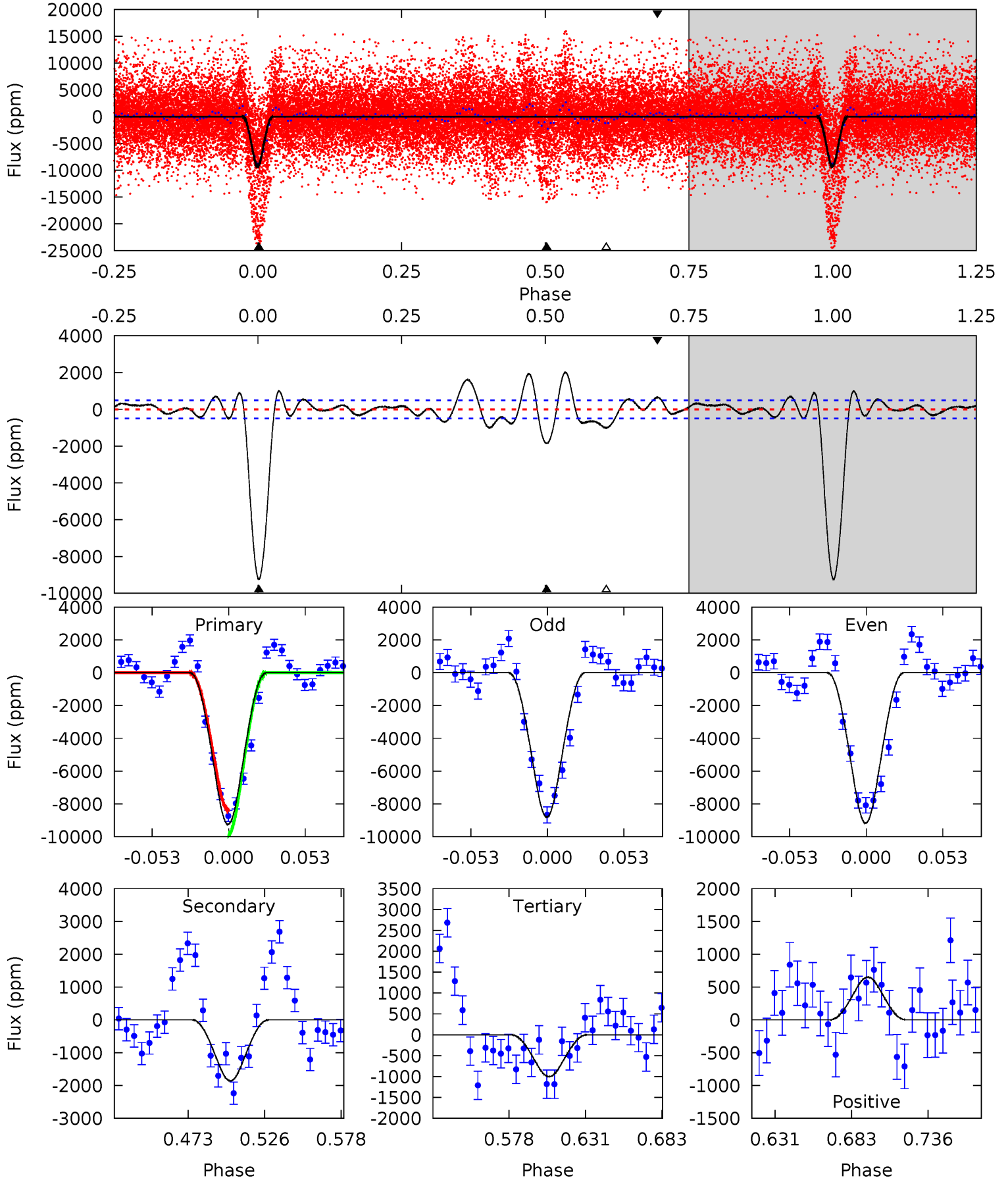
TCE 005876360-01     $P = 1.050850$  Days     $T_0 = 132.141145$  (BKJD)



# DV Model-Shift Uniqueness Test

005876360-01, P = 1.050843 Days, E = 132.147039 Days

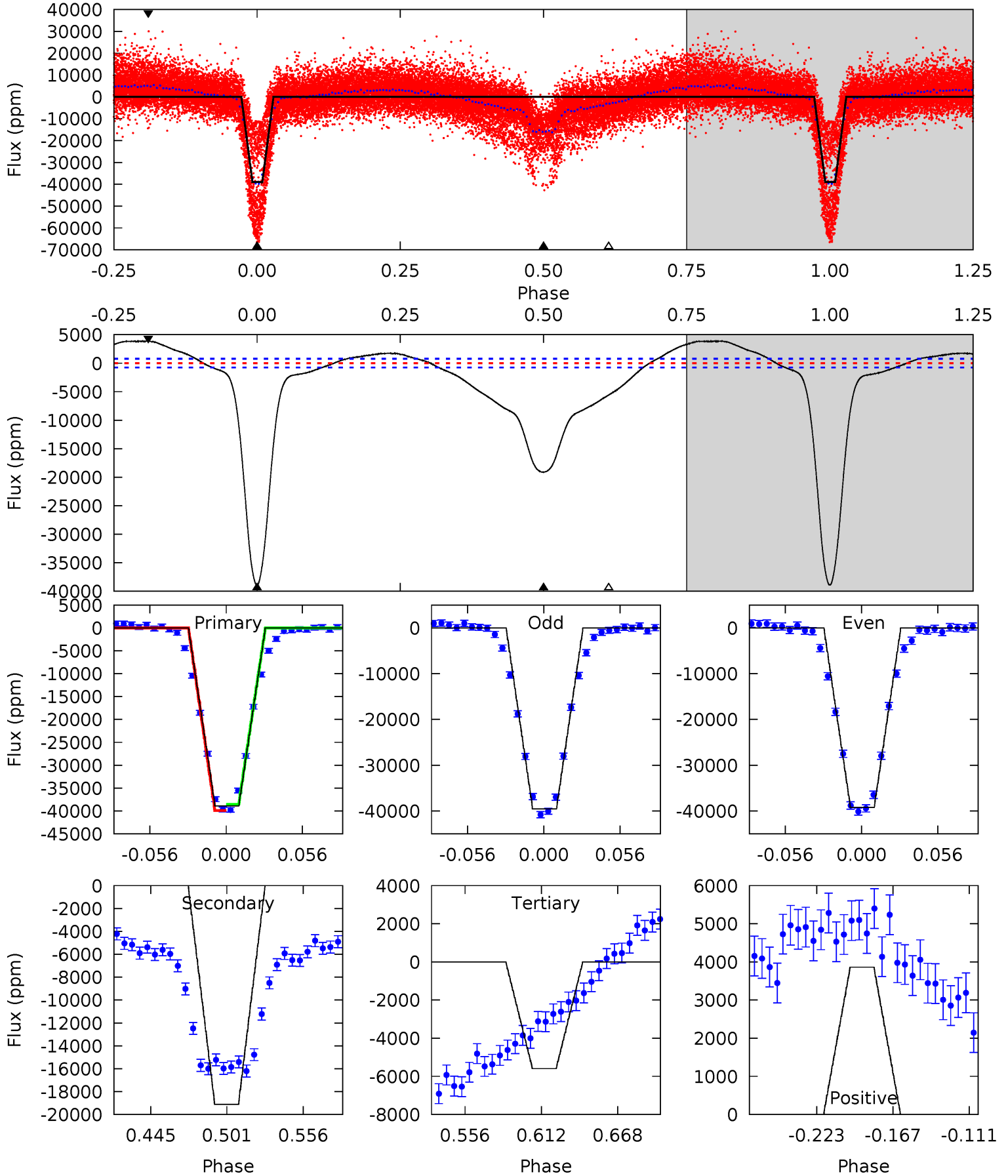
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
87.6	17.6	9.51	6.17	4.70	1.94	4.44	78.1	81.4	8.11	11.4	1.78	1.41	0.18	7.19



# Alt Model-Shift Uniqueness Test

005876360-01, P = 1.050850 Days, E = 132.141145 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
237.2	116.5	34.1	23.5	4.69	1.91	20.6	203.1	213.6	82.4	92.9	1.02	0.89	0.09	4.12



### Stellar Parameters For KIC 005876360

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

### Secondary Eclipse Parameters for KIC 005876360-01 / KOI 4279.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1858 \pm 105$	$14.49^{+11.17}_{-8.96}$	$2504^{+114}_{-121}$	$3604^{+1779}_{-777}$	$2.017^{+11.412}_{-1.387}$
Alt.	$-19113 \pm 164$	$22.16^{+12.00}_{-11.24}$	$2501^{+128}_{-108}$	$4841^{+1854}_{-766}$	$8.967^{+26.961}_{-5.197}$

$T_{max}$  = 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

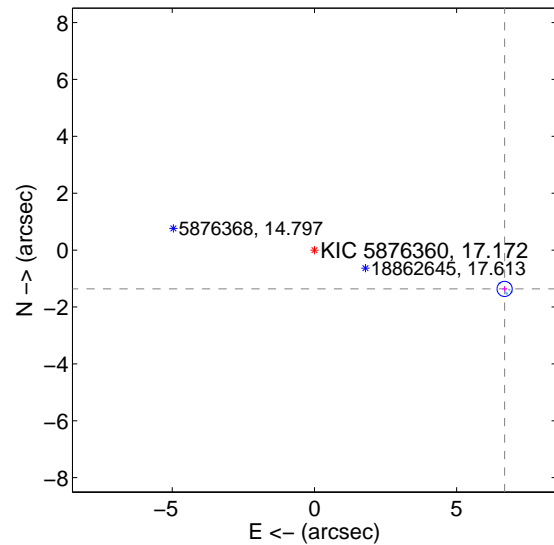
Supplemental centroid analysis for 005876360-01. Kepler magnitude: 17.17. Transit SNR 32.79

There are 8 quarters with good PRF difference image offsets

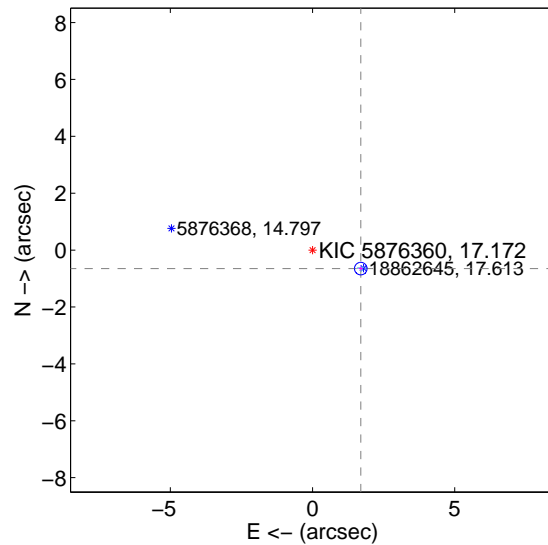
The OOT PRF centroid is offset from the target star catalog position by about 5.08 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.823 \pm 0.089$	76.83	$-6.685 \pm 0.088$	$-1.365 \pm 0.096$
PRF-fit source offset from KIC position	$1.816 \pm 0.073$	24.72	$-1.696 \pm 0.074$	$-0.650 \pm 0.068$
photometric centroid source offset	$3.24 \pm 0.04$	92.27	$3.22 \pm 0.04$	$0.33 \pm 0.02$

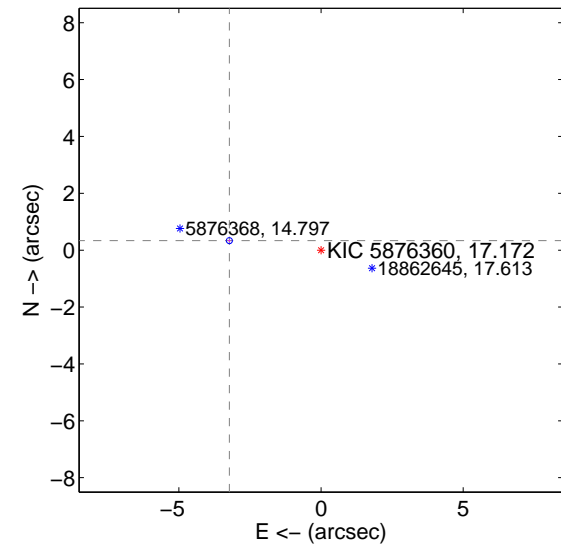
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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.



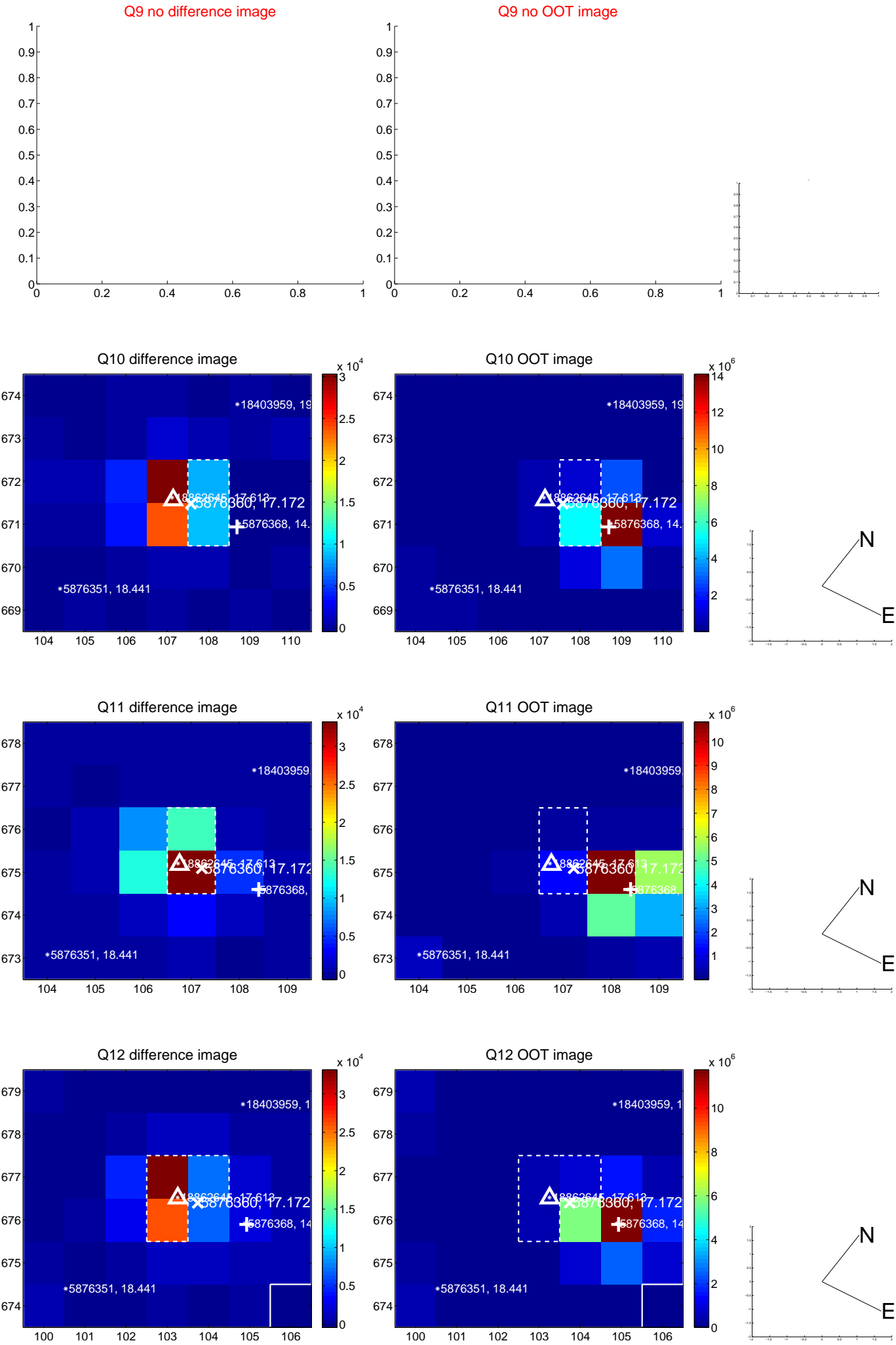
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



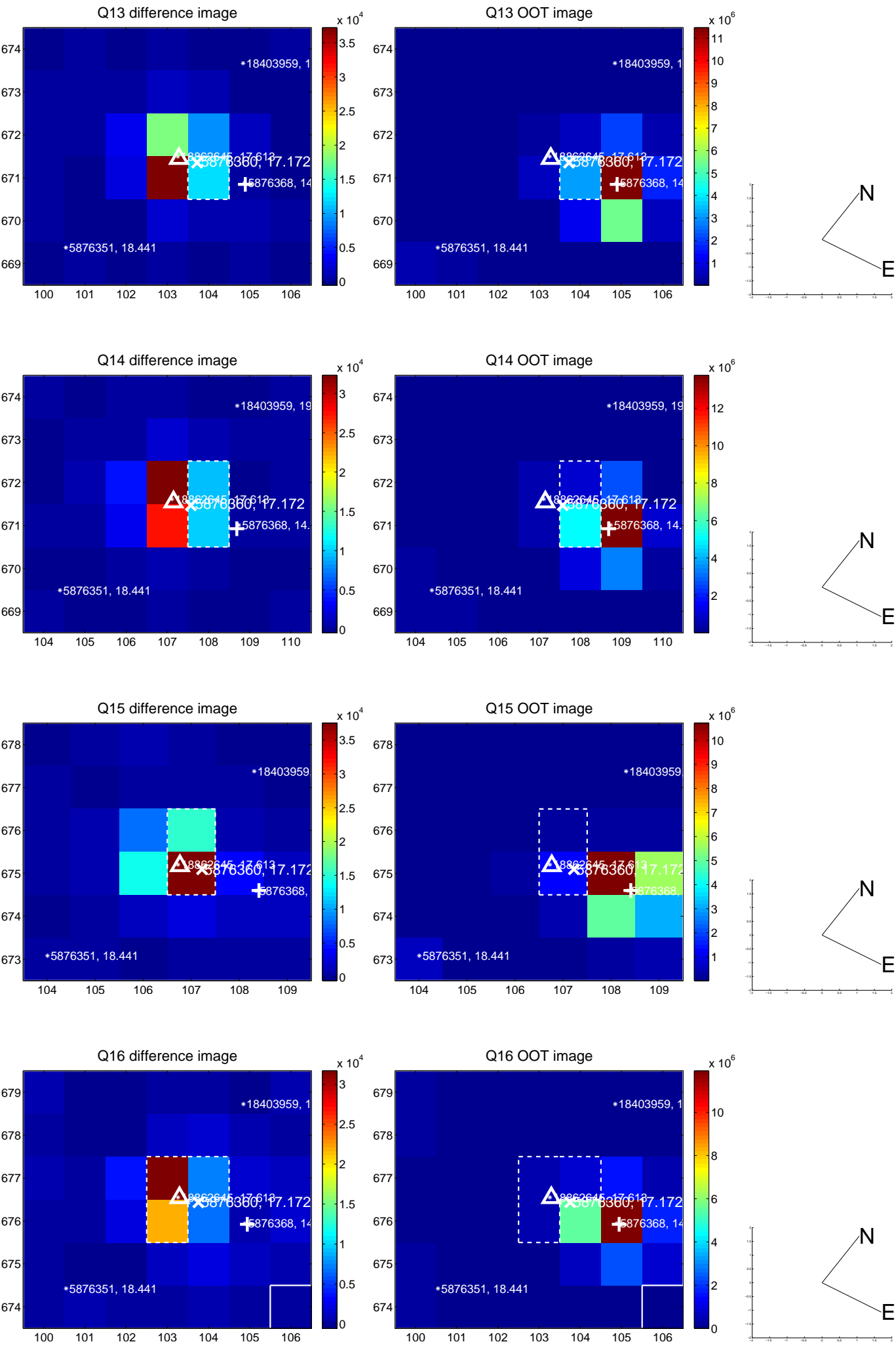
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



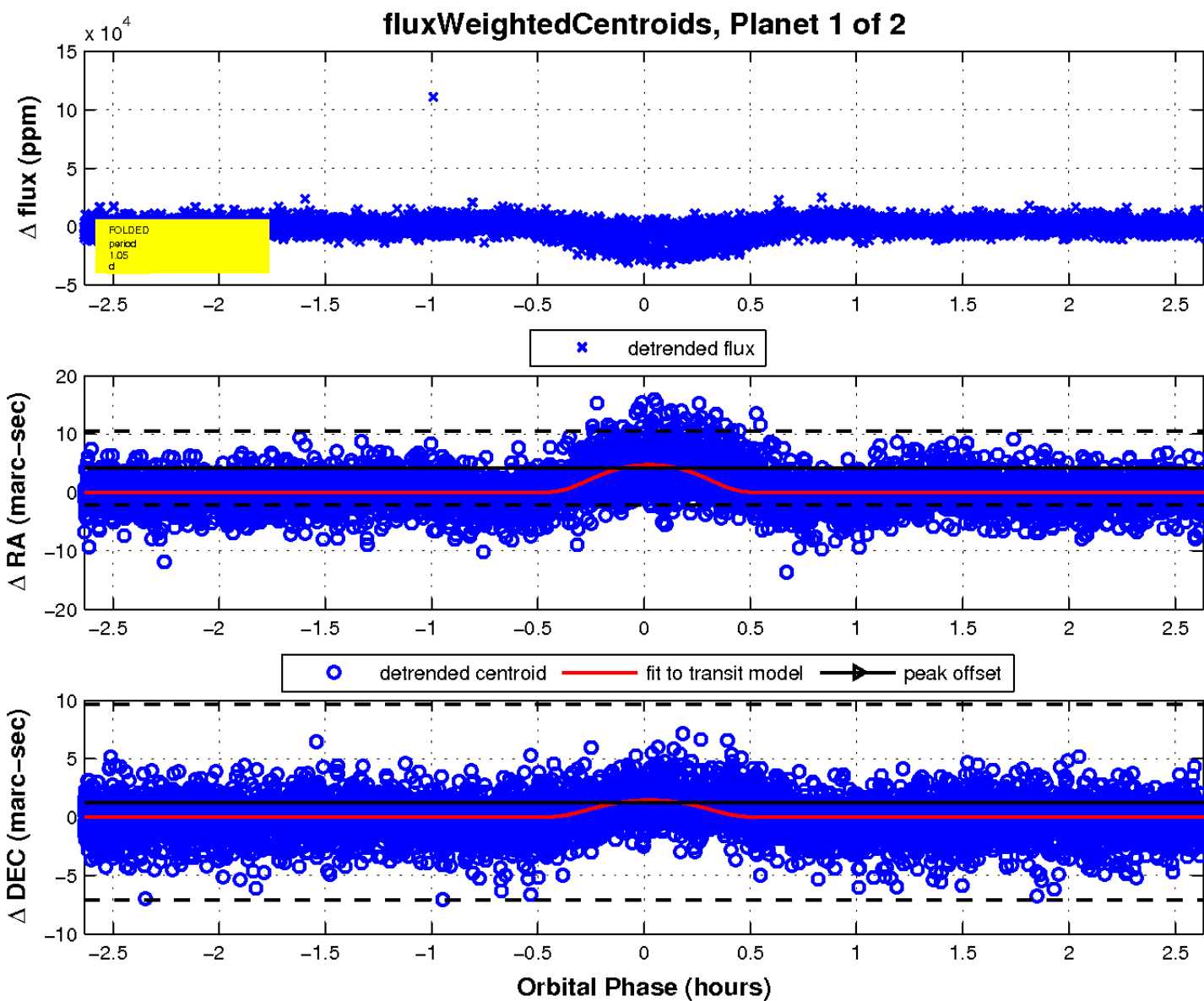
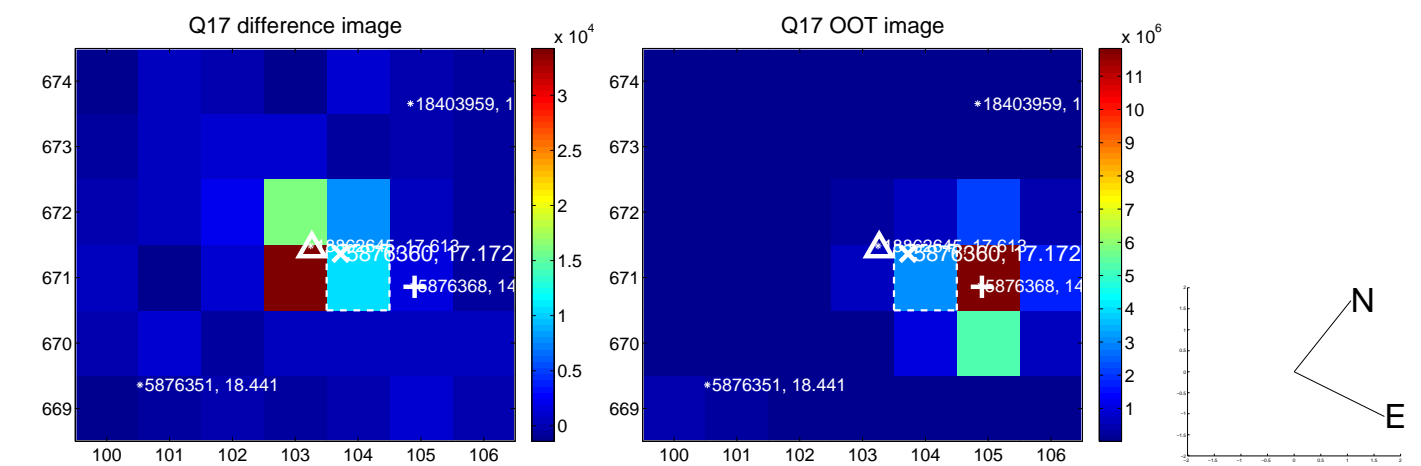
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

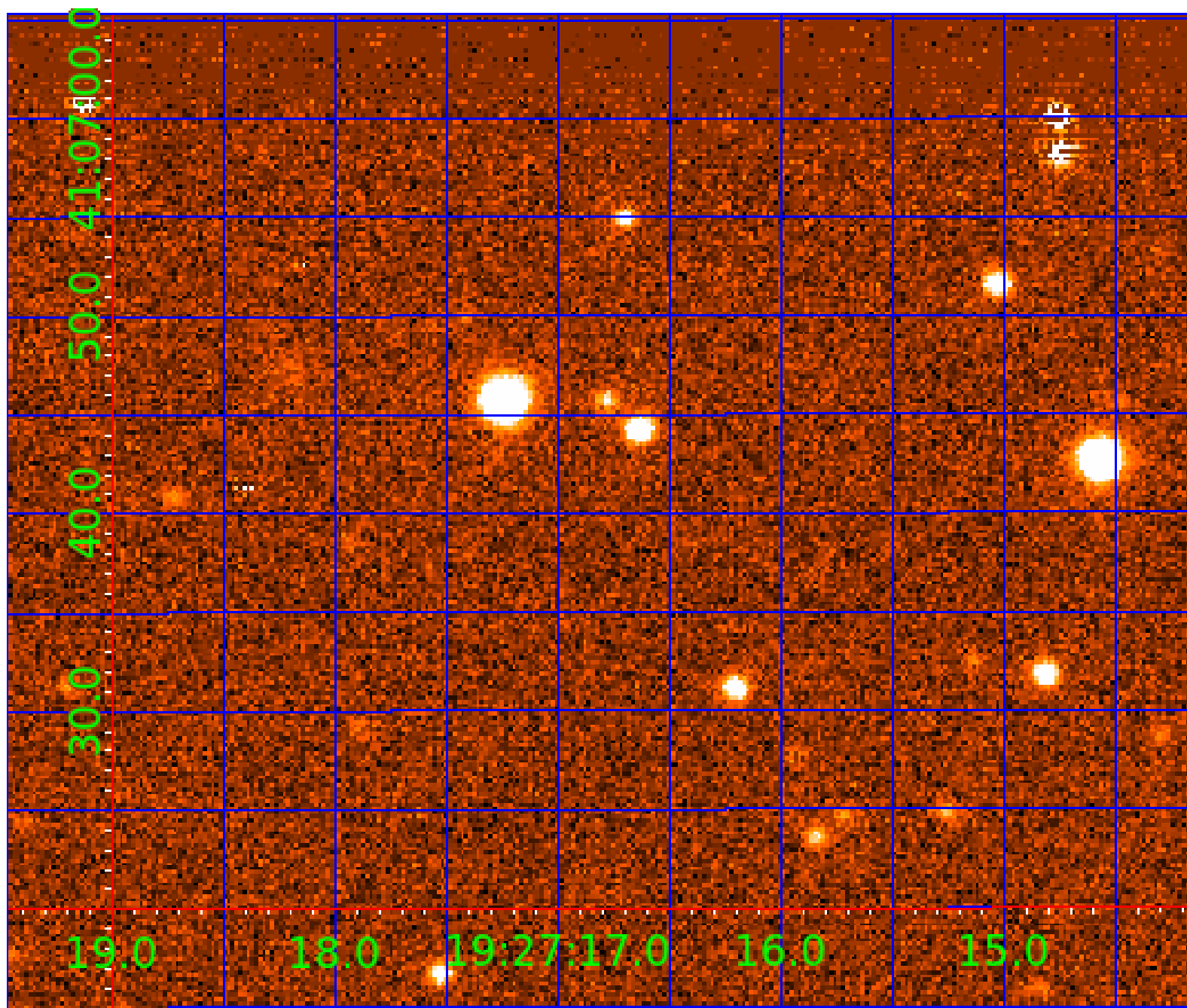


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 005876360

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005876360-01	OBS	4279.01	1.050843	132.147039	7141.9	0.878	33.5	32.8	1.00	5780	11.62	2442.80
005876360-02	OBS	No	1.050599	131.951619	22866.8	1.500	16.8	-1.0	1.00	5780	15.07	2443.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005876360-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_ALT—CENT_KIC_POS
005876360-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—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 005876360-02

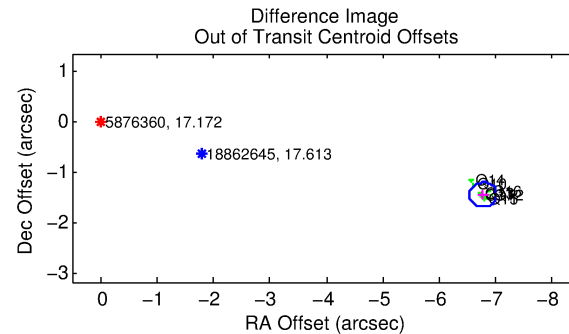
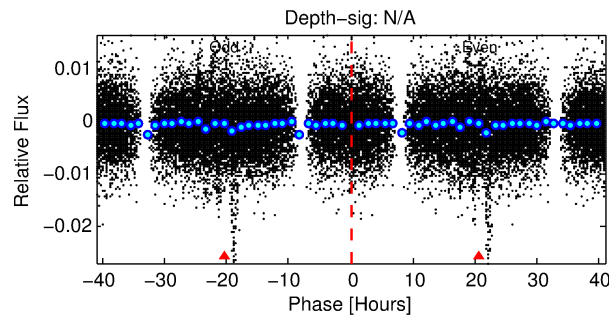
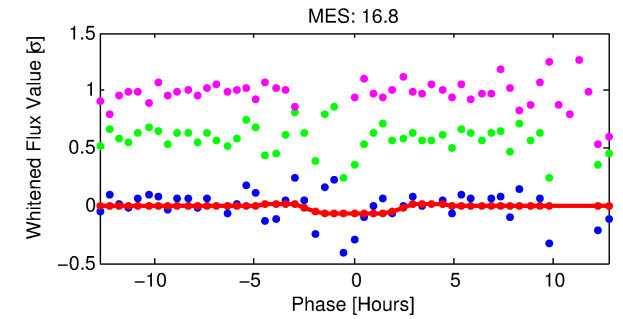
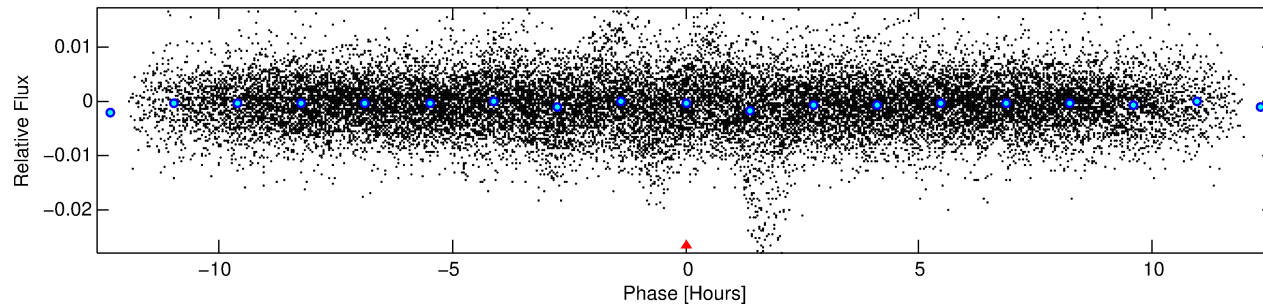
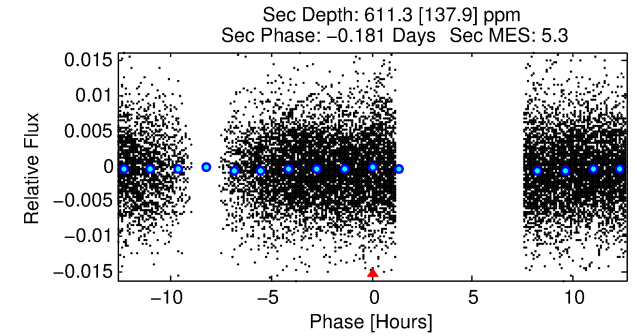
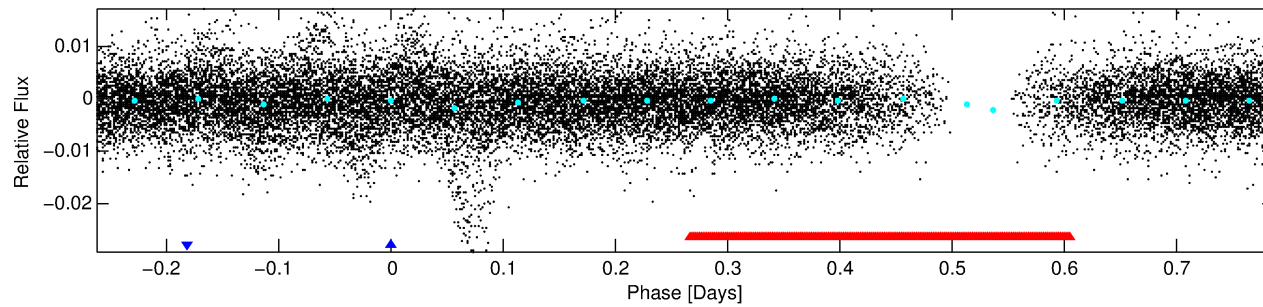
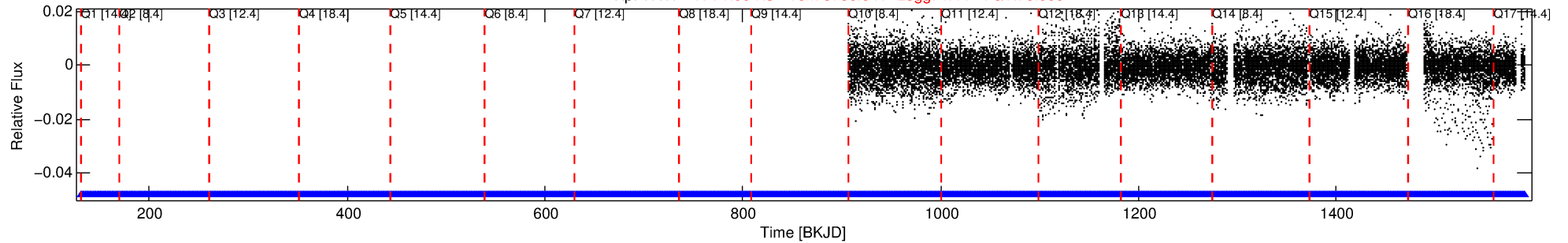
No Significant Match Found

# DV One-Page Summary

KIC: 5876360 Candidate: 2 of 2 Period: 1.051 d

KOI: K04279 Corr: No Ephemeris Match

Kp: 17.17 R\*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



TPS TCE Results:

Period = 1.05060 d

Epoch = 131.9516 BKJD

DV fit results are unavailable

DV Diagnostic Results:

ShortPeriod-sig: N/A

LongPeriod-sig: 0.3% [0.00σ]

ModelChiSquare2-sig: N/A

ModelChiSquareGof-sig: N/A

Bootstrap-pfa: N/A

RollingBand-fgt: 1.00 [572/572]

GhostDiagnostic-chr: 4.479

Centroid-sig: 0.5%

Centroid-so: 3.821 arcsec [399.78σ]

OotOffset-rm: 6.922 arcsec [85.59σ]

KicOffset-rm: 1.864 arcsec [26.80σ]

OotOffset-st: 2/2/2/2 [8]

KicOffset-st: 2/2/2/2 [8]

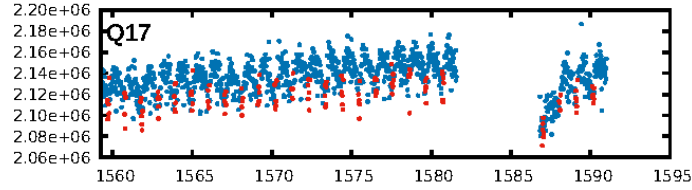
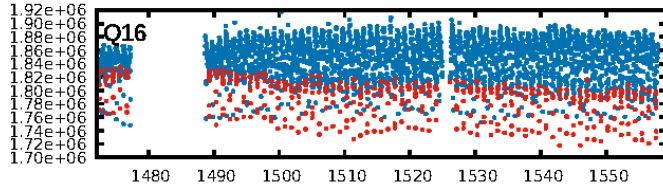
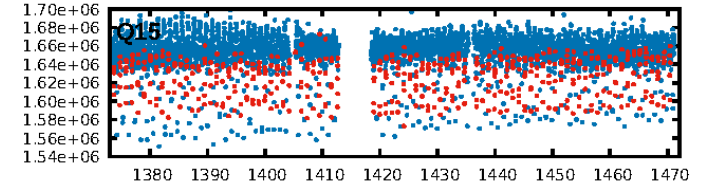
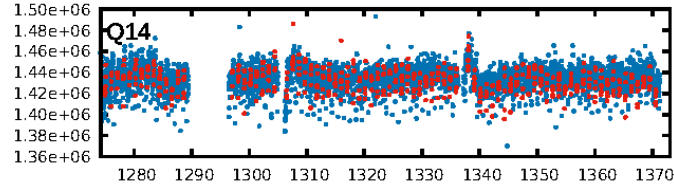
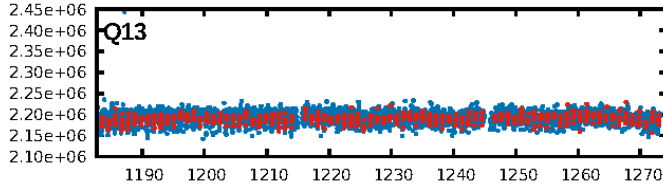
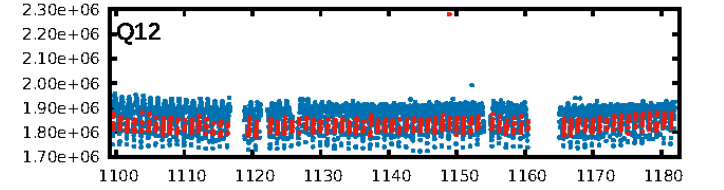
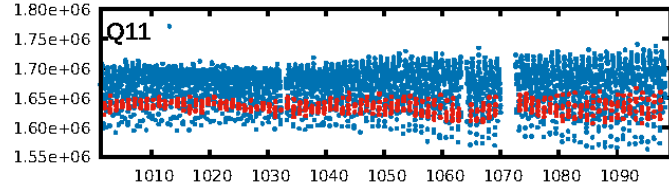
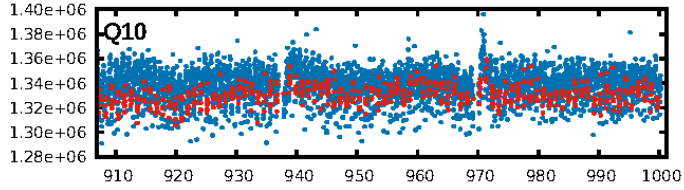
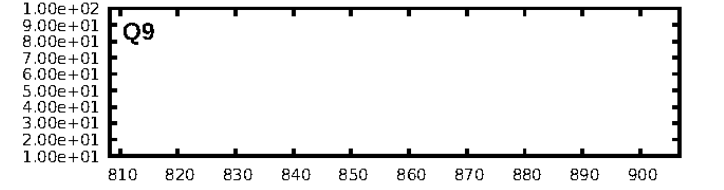
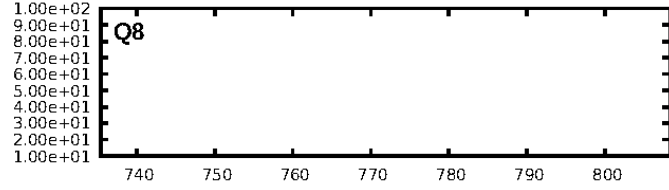
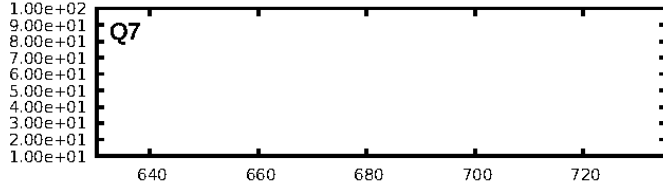
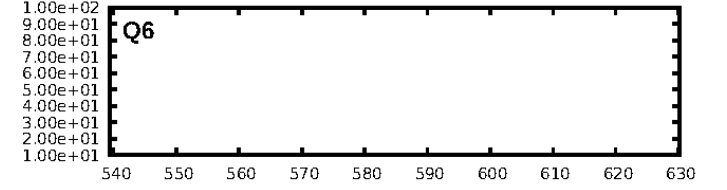
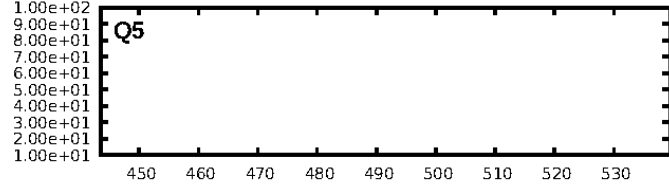
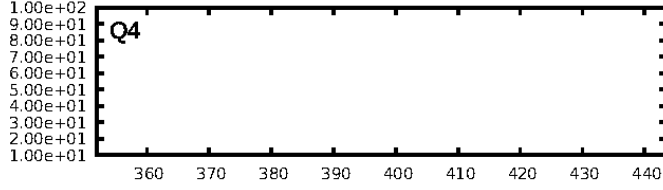
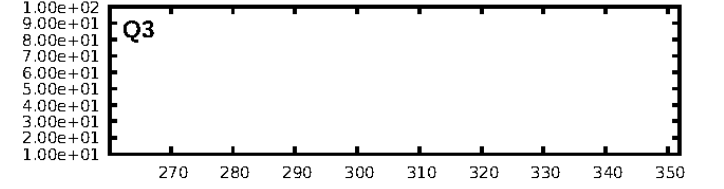
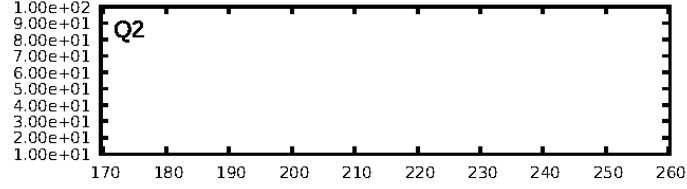
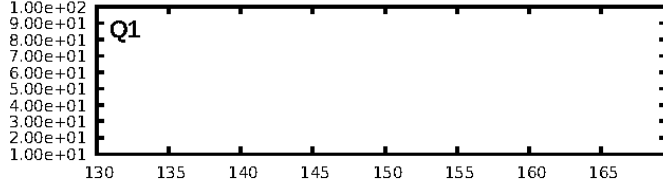
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DiffImageOverlap-fno: 0.00 [0/8]

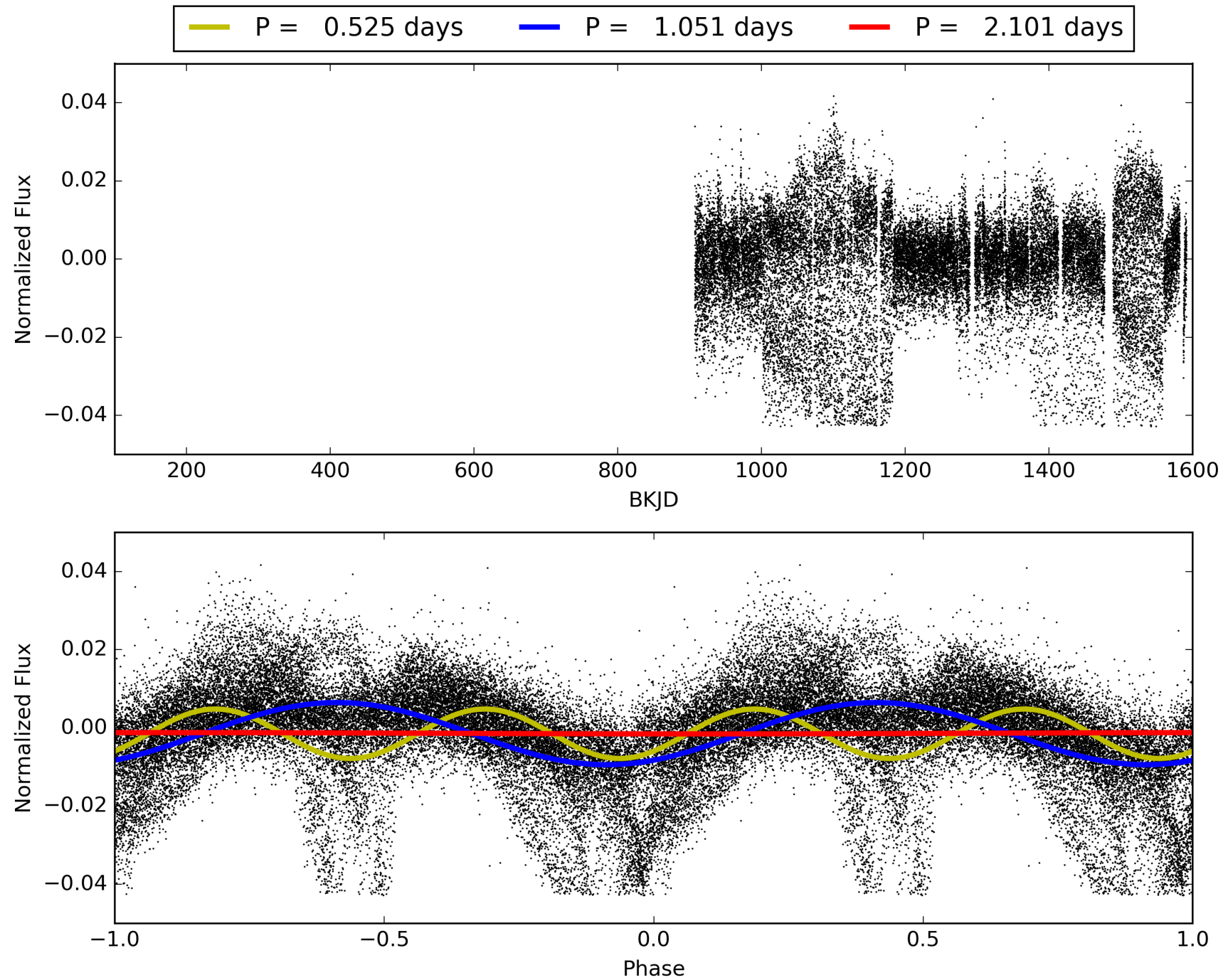
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:21:18 Z

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

# TCE 005876360-02, PDC Light Curves

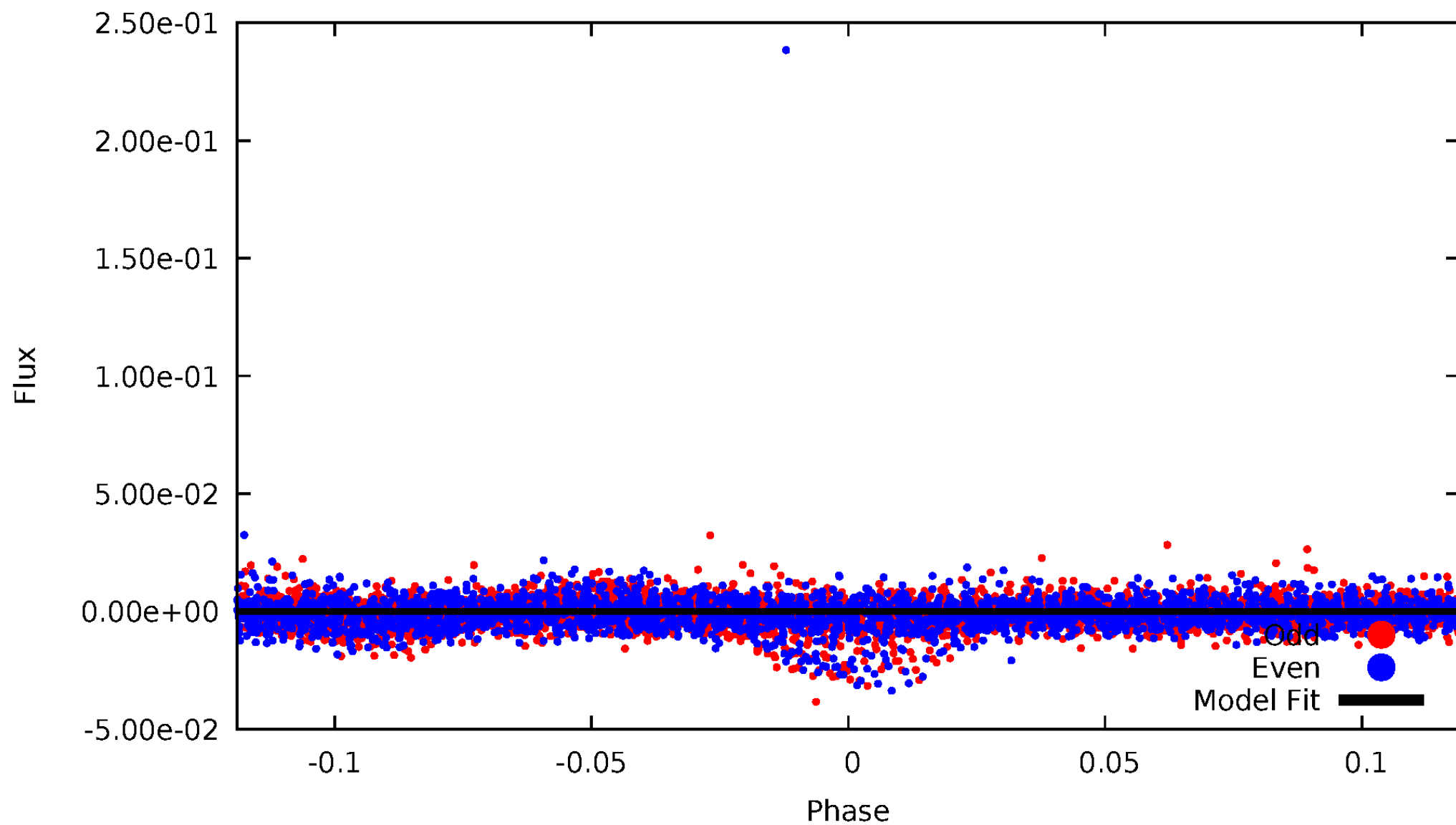


TCE 005876360-02



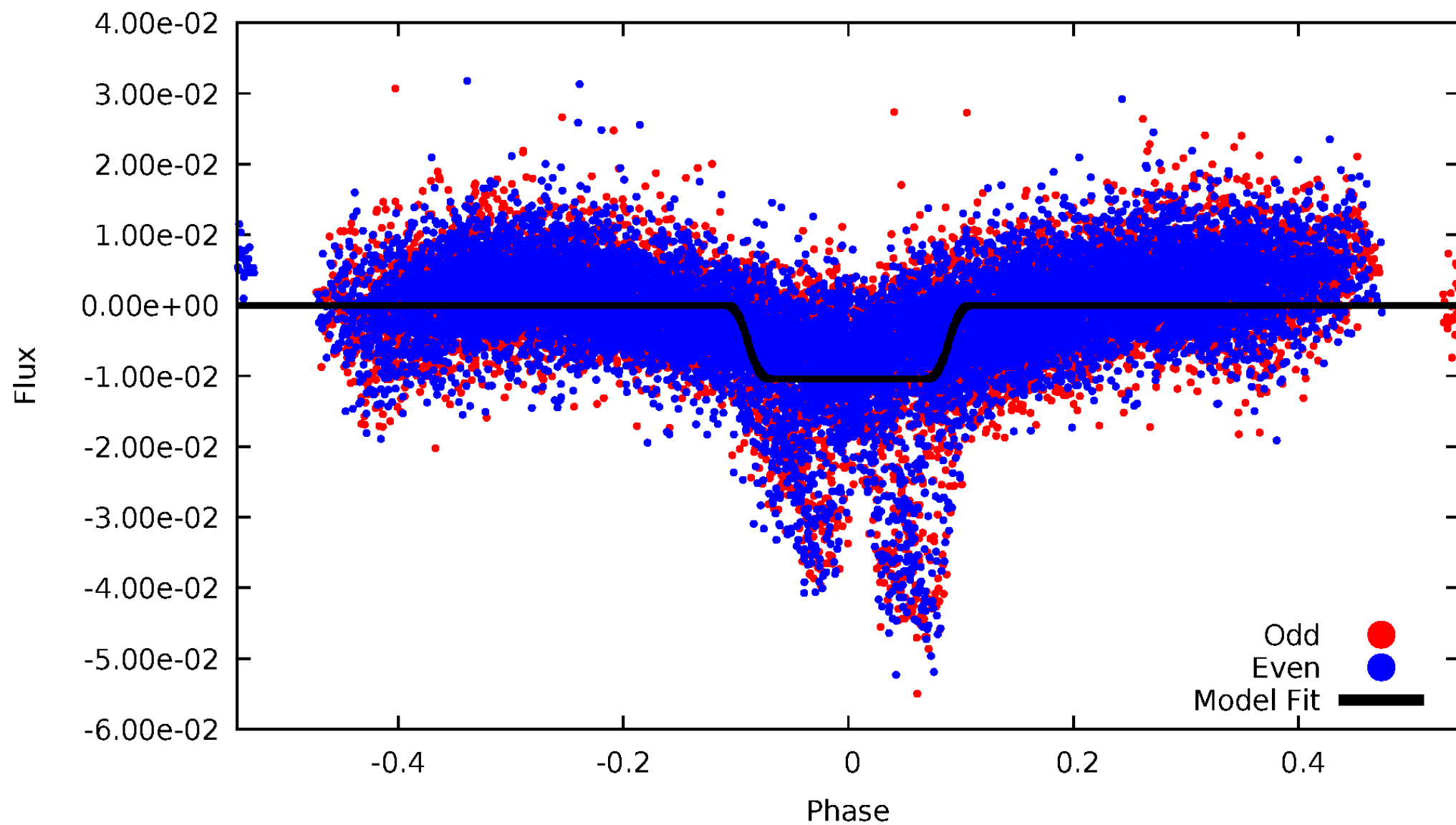
# DV Odd/Even

TCE 005876360-02



# ALT Odd/Even

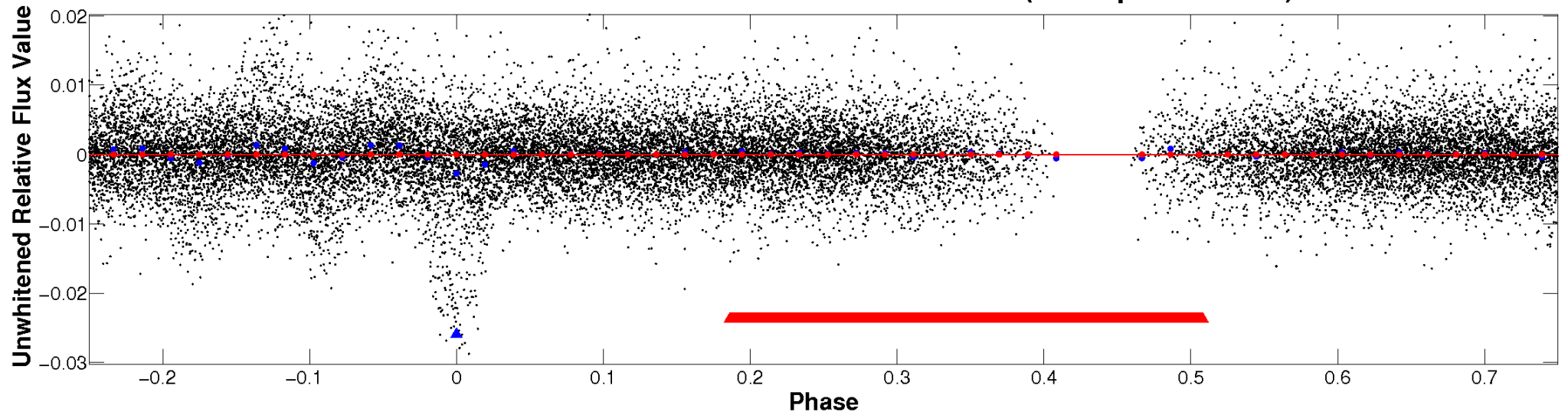
TCE 005876360-02





# Non-Whitened Vs. Whitened Light Curve

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

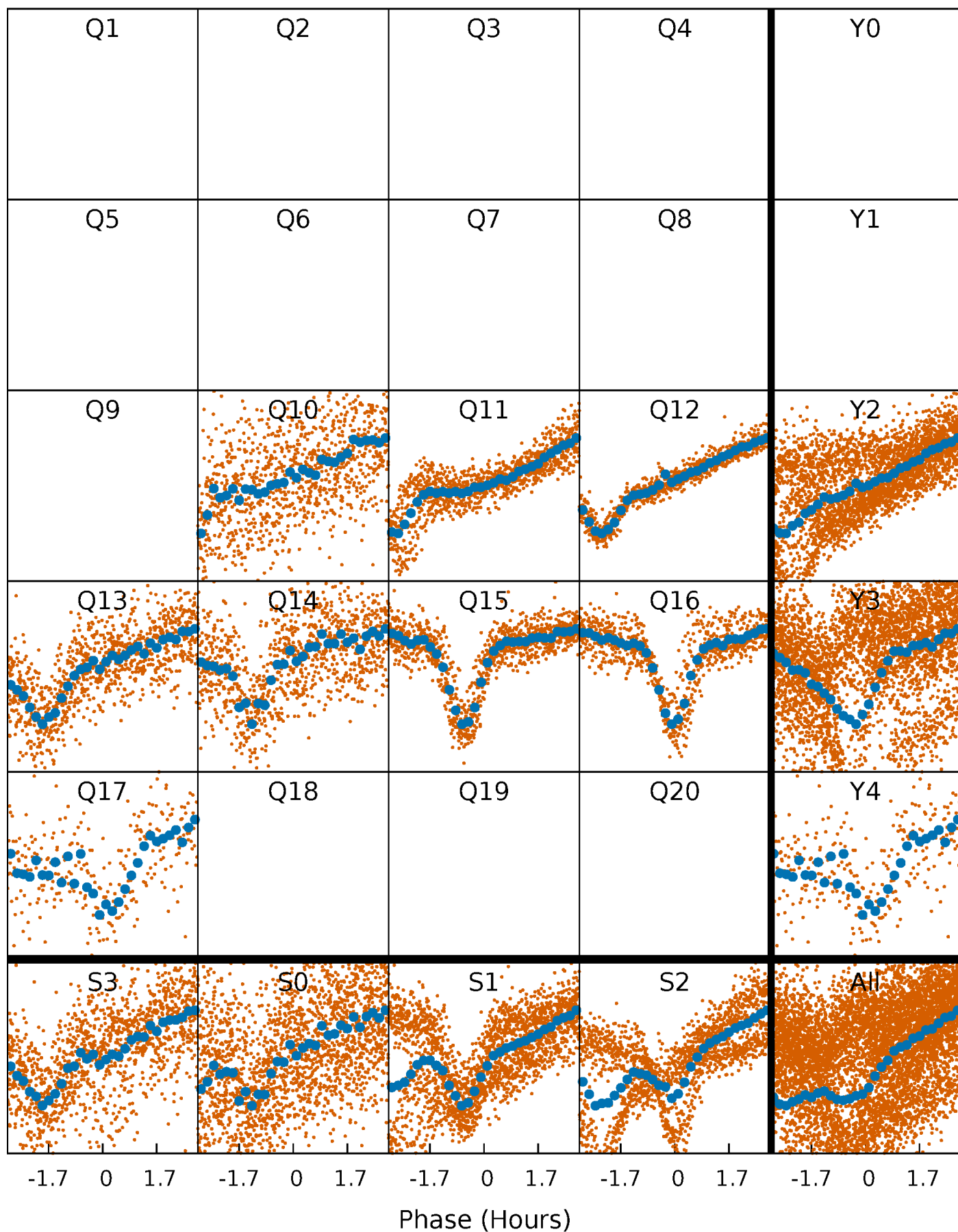


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



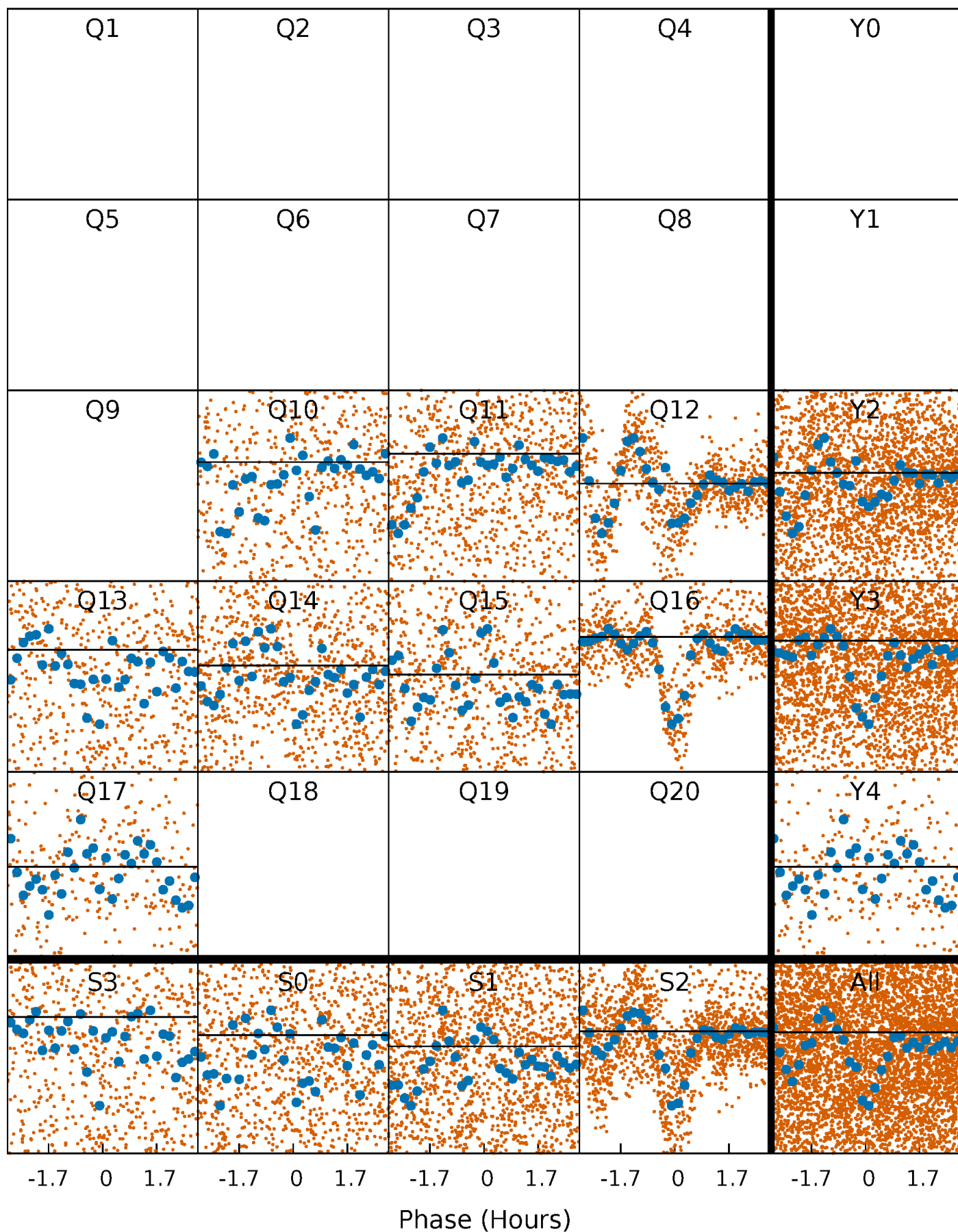
# PDC Quarter-Phased Transit Curves

TCE 005876360-02   P= 1.050599 Days    $T_0=131.951619$  (BKJD)



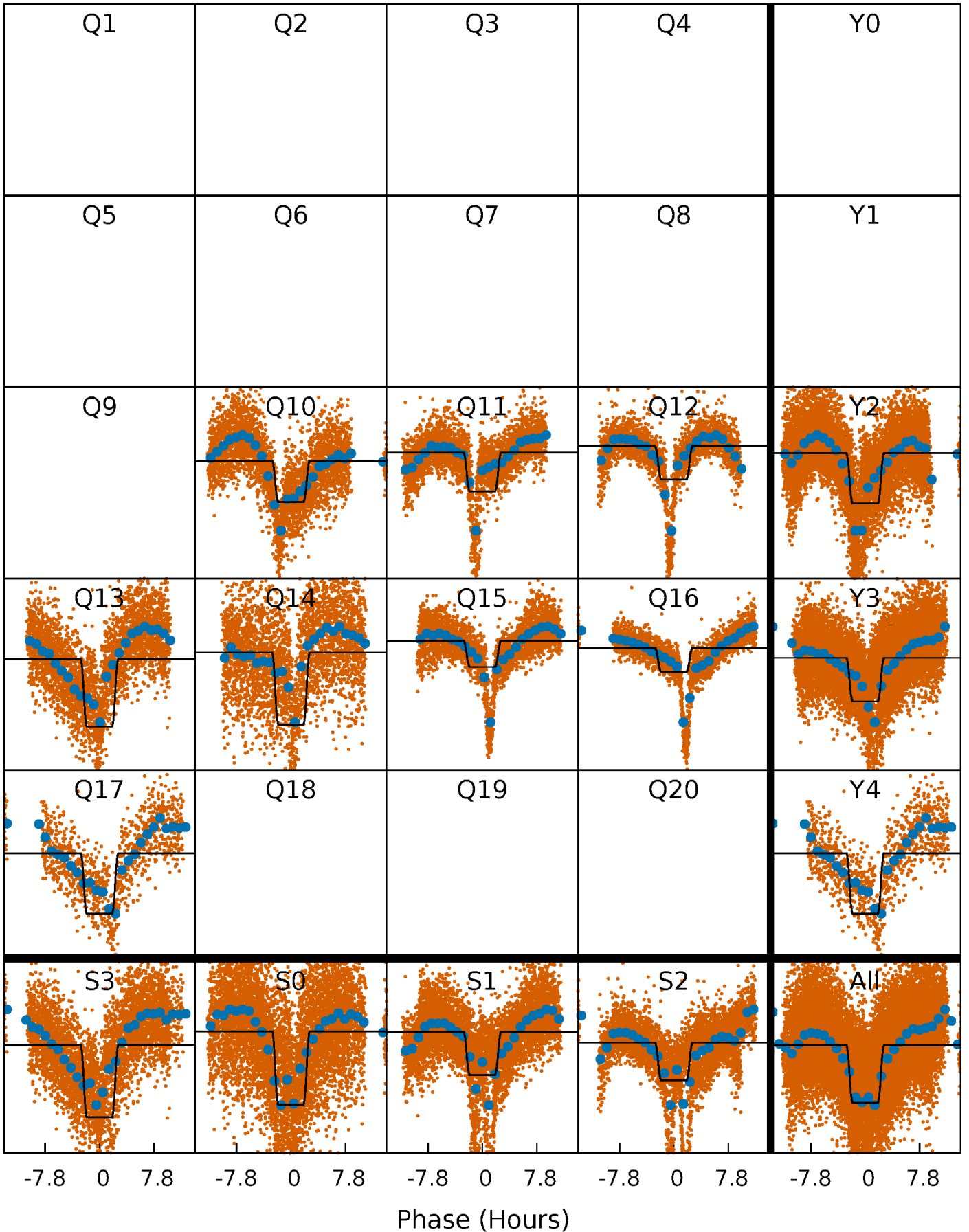
# DV Quarter-Phased Transit Curves

TCE 005876360-02    P= 1.050599 Days     $T_0=131.951619$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

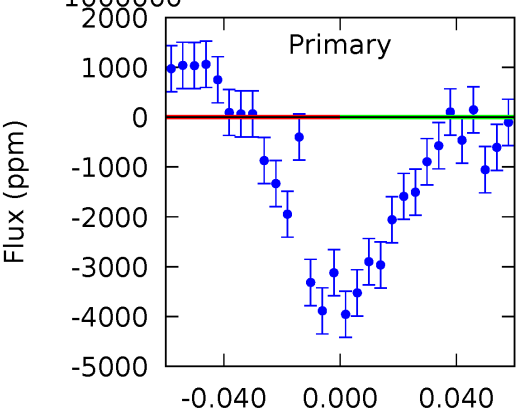
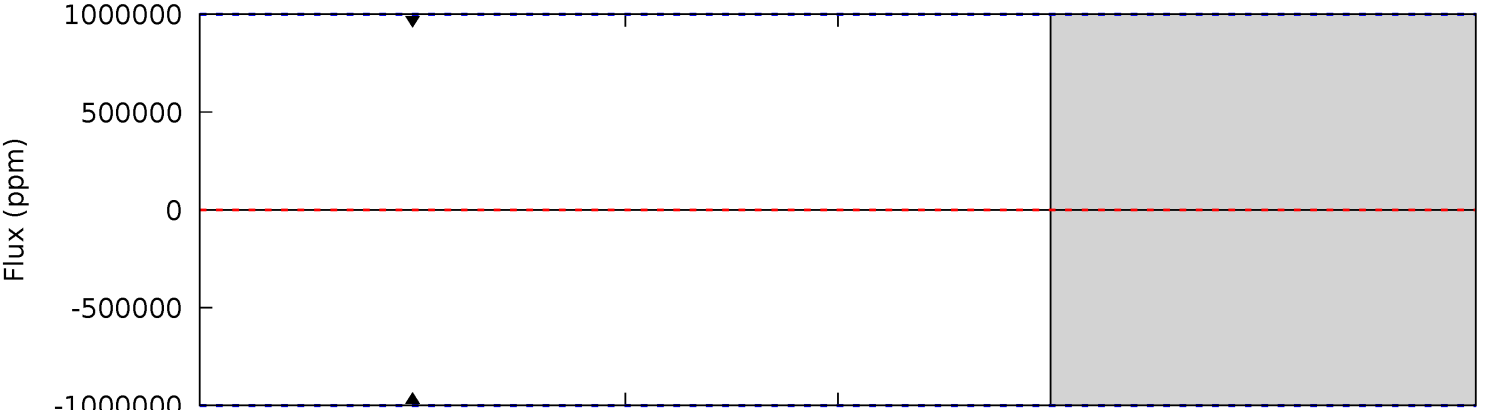
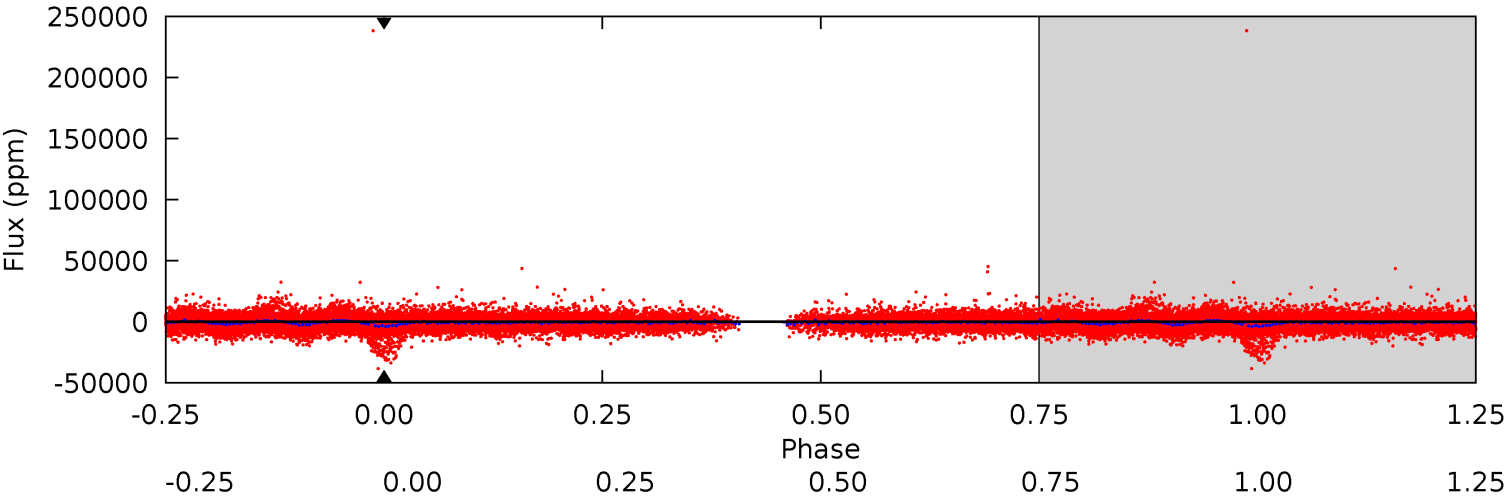
TCE 005876360-02     $P = 1.050599$  Days     $T_0 = 131.880607$  (BKJD)



# DV Model-Shift Uniqueness Test

005876360-02, P = 1.050599 Days, E = 131.951619 Days

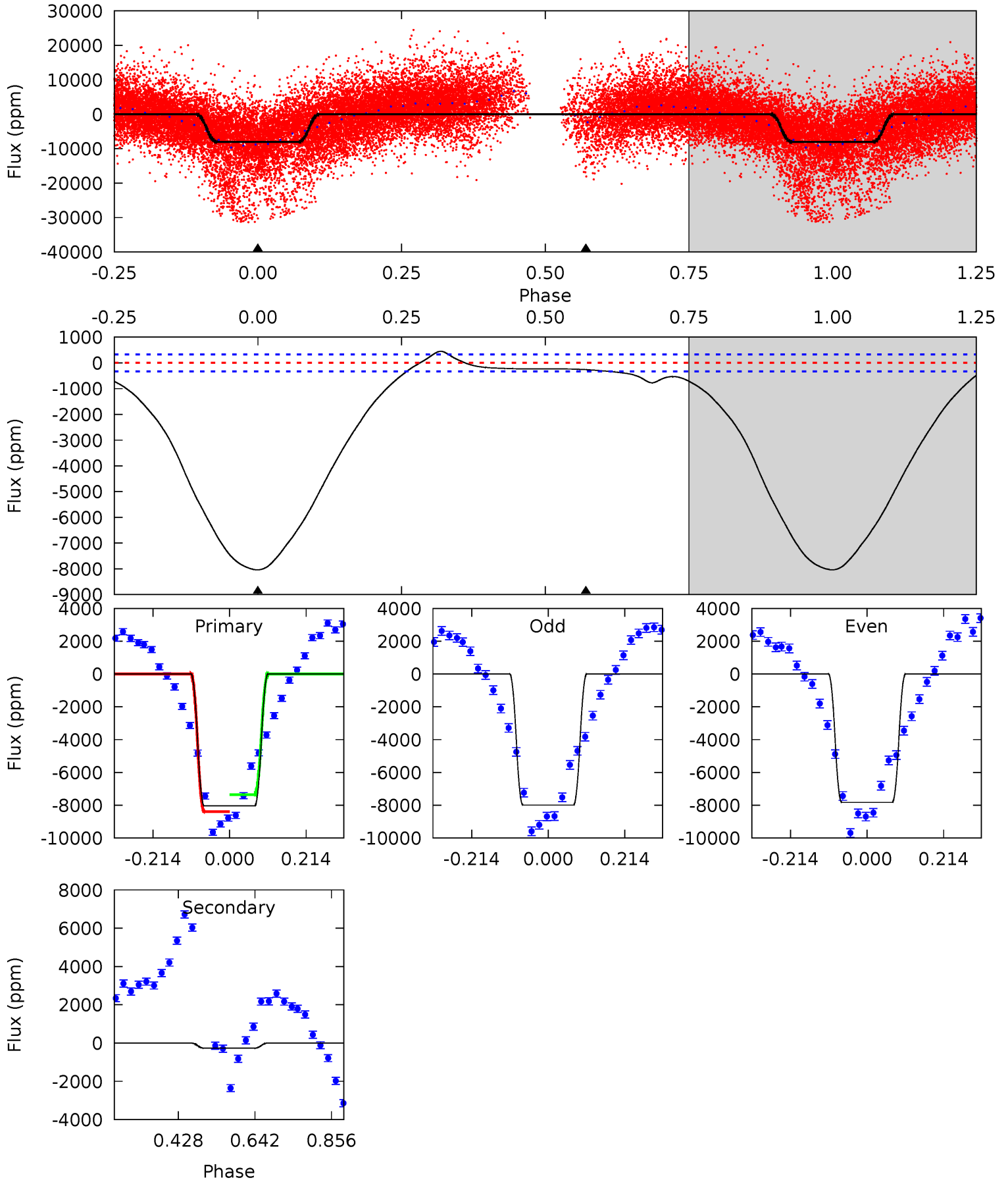
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005876360-02, P = 1.050599 Days, E = 131.880607 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
107.2	3.50	0	0	4.40	1.24	6.71	107.2	107.2	3.50	3.50	1.11	1.00	0.05	7.57





### Stellar Parameters For KIC 005876360

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

### Secondary Eclipse Parameters for KIC 005876360-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$16.54^{+10.49}_{-9.55}$	$2504^{+121}_{-113}$	$3916^{+6677}_{-13035}$	$3.248^{+136.764}_{-103.388}$
Alt.	$-262 \pm 75$	$13.86^{+10.37}_{-8.93}$	$2504^{+123}_{-121}$	$1798^{+1933}_{-4451}$	$0.307^{+2.132}_{-0.207}$

$T_{max}$  = 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

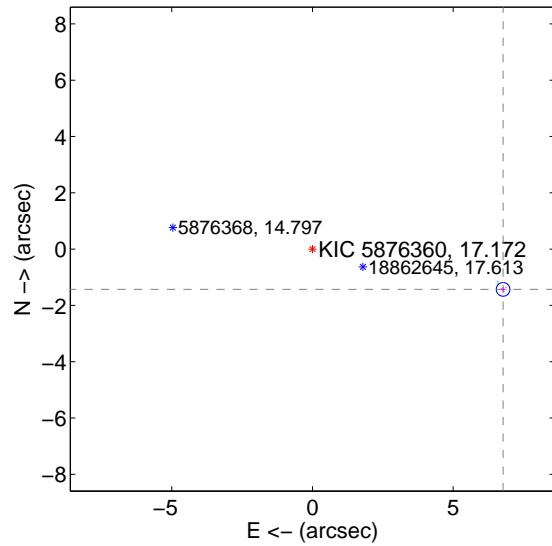
Supplemental centroid analysis for 005876360-02. Kepler magnitude: 17.17. Transit SNR -1.00

There are 8 quarters with good PRF difference image offsets

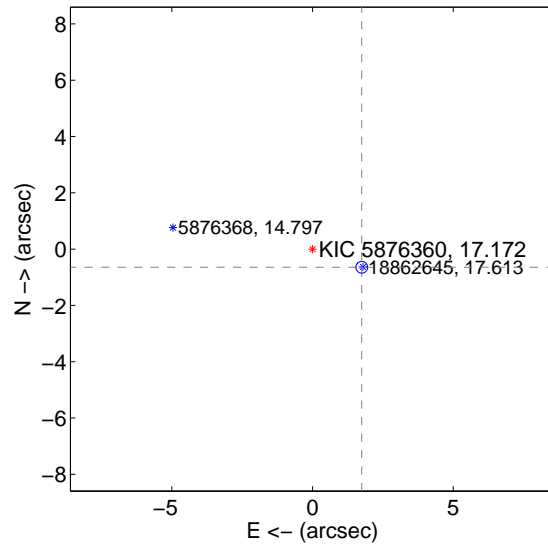
The OOT PRF centroid is offset from the target star catalog position by about 5.08 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.922 \pm 0.081$	85.59	$-6.772 \pm 0.077$	$-1.431 \pm 0.081$
PRF-fit source offset from KIC position	$1.864 \pm 0.070$	26.80	$-1.748 \pm 0.070$	$-0.646 \pm 0.068$
photometric centroid source offset	$3.82 \pm 0.01$	399.78	$3.79 \pm 0.01$	$0.50 \pm 0.01$

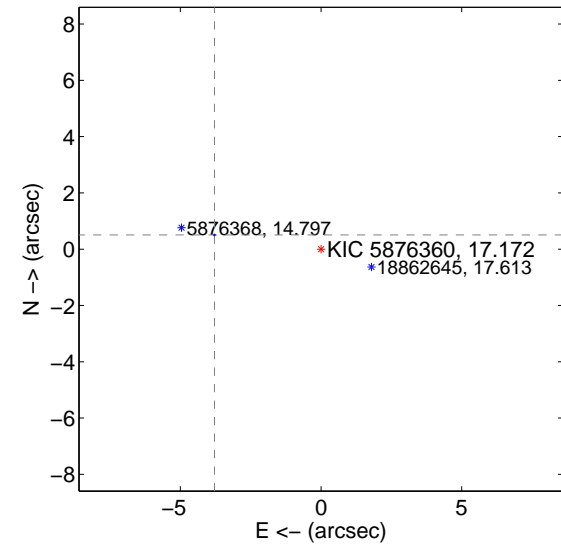
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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.

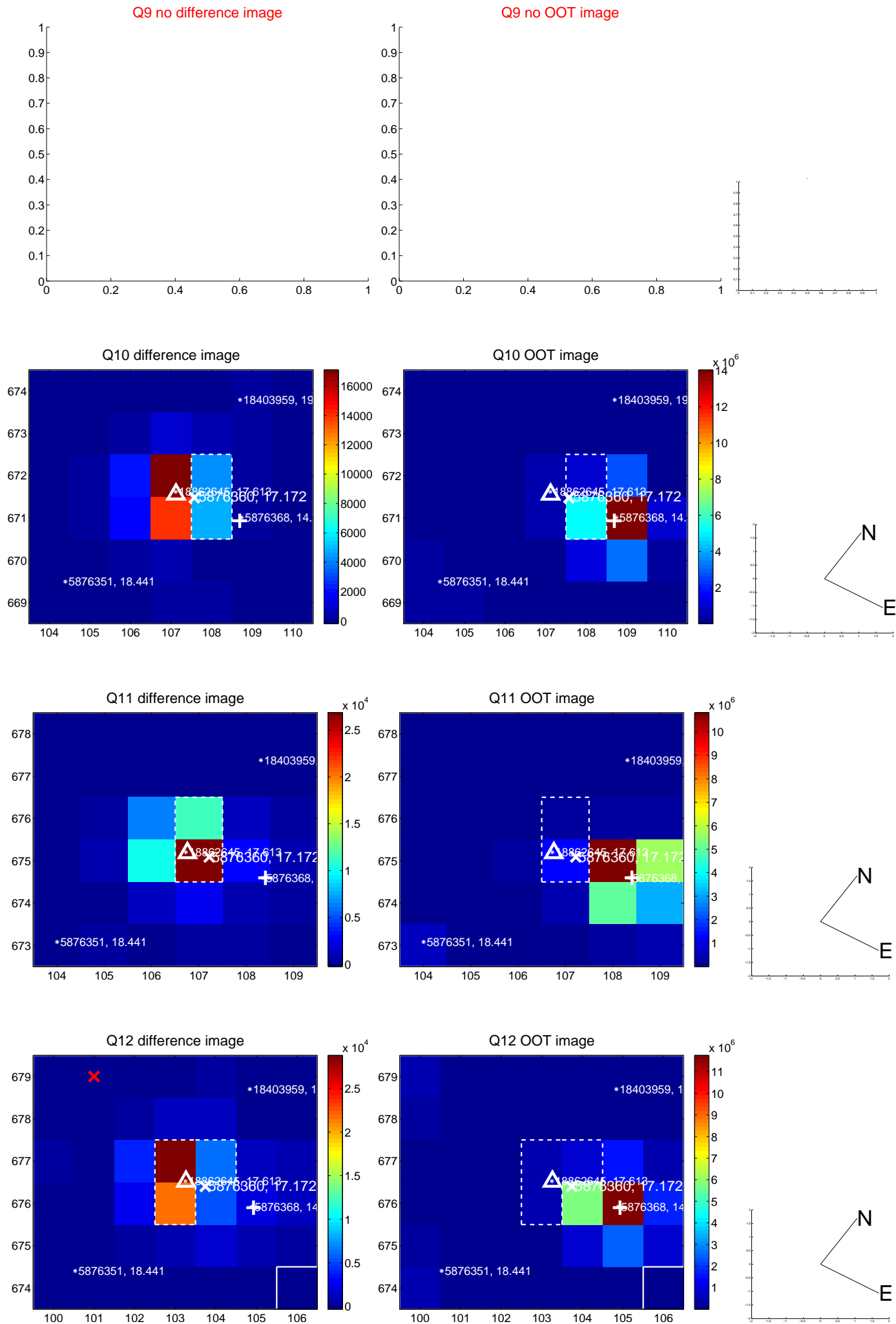
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



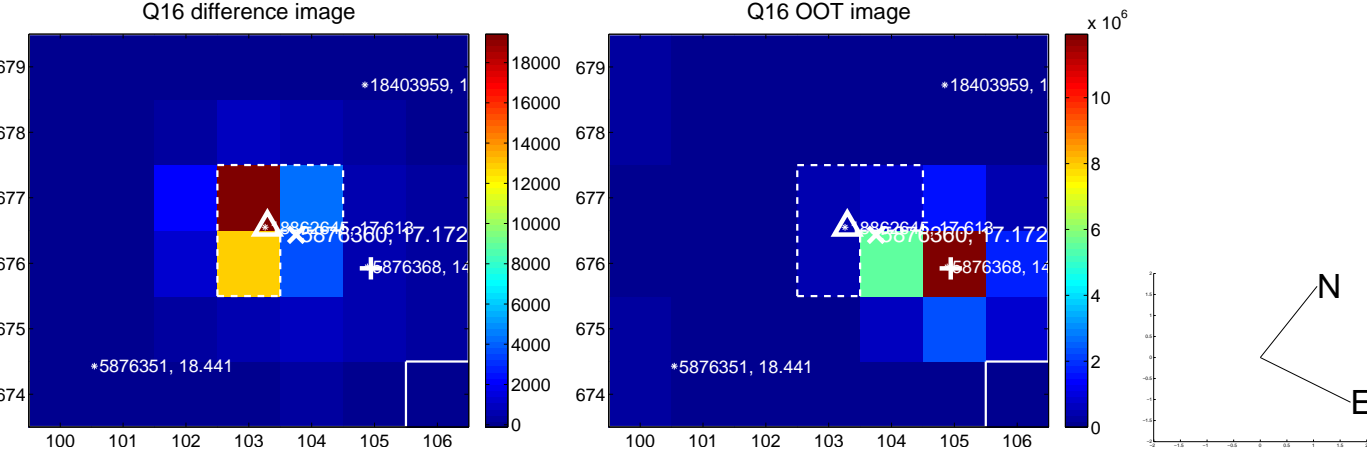
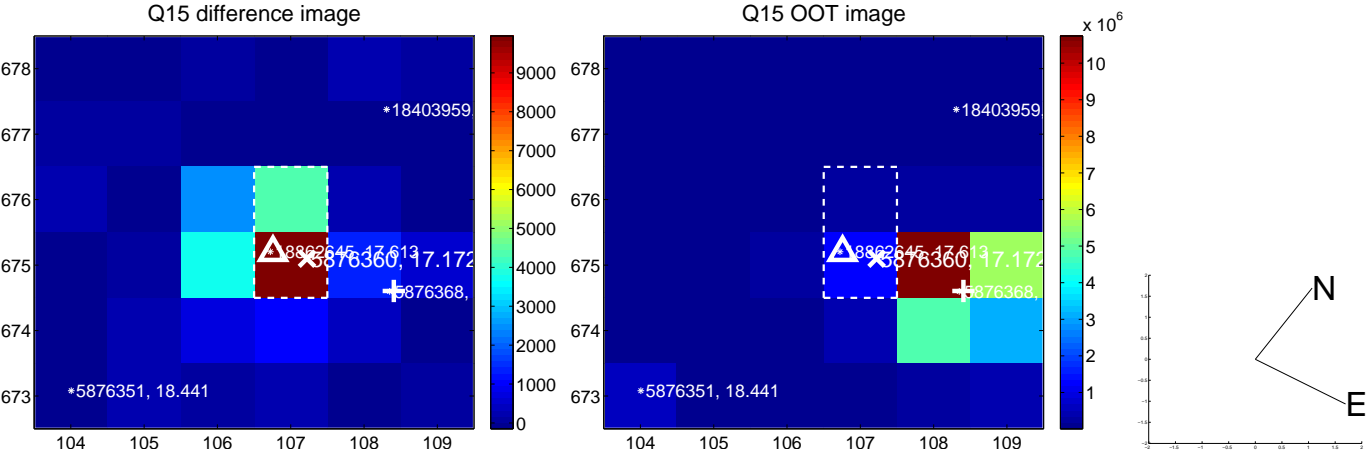
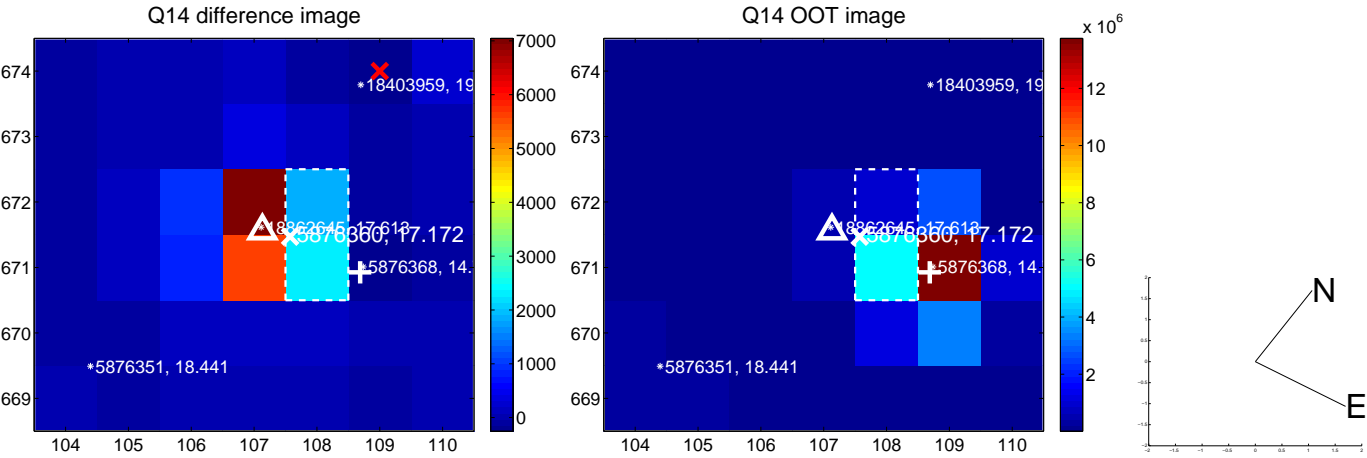
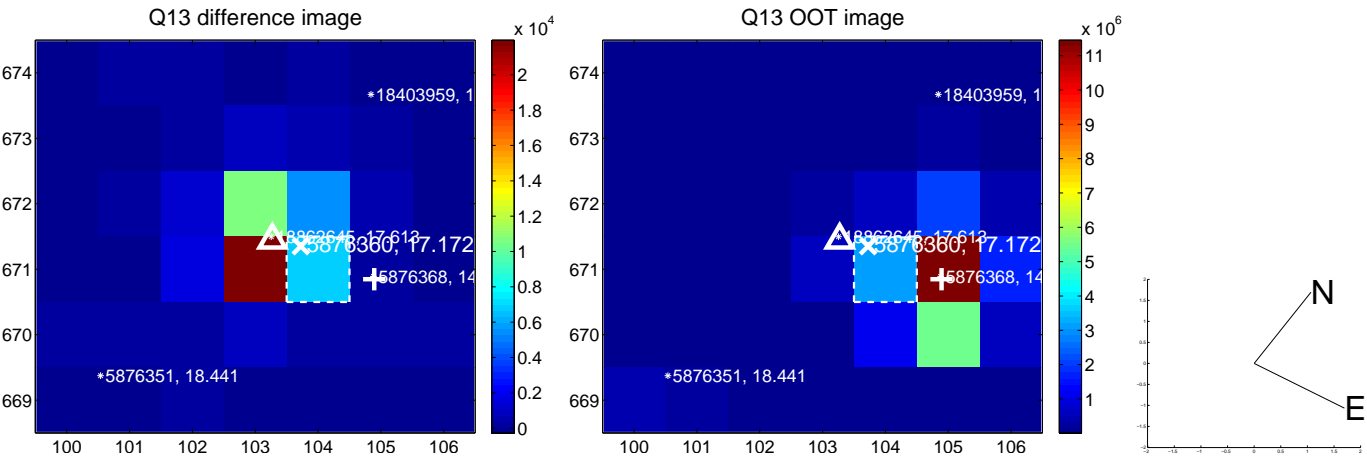
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.





# UKIRT Image

Declination

