

# KIC 005386872

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005386872-01	OBS	No	1.805997	133.053728	24.2	6.000	8.8	-1.0	2.28	6514	1.13	9002.54
005386872-02	OBS	No	561.632664	209.394342	302.3	10.102	9.0	7.8	2.28	6514	5.94	4.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005386872-01	OBS	FP	0.00	1	0	0	0	<del>SWEET_NTL</del> <del>—LPP_DV</del> <del>—CENT_SATURATED</del>
005386872-02	OBS	FP	0.00	1	0	0	0	<del>INDIV_TRANS_RUBBLE_CHASES</del> <del>—ALL_TRANS_CHASES</del> <del>—MOD_NONUNIQ_DV</del> <del>—INCONSISTENT_TRANS</del> <del>—CENT_SATURATED</del>

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

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

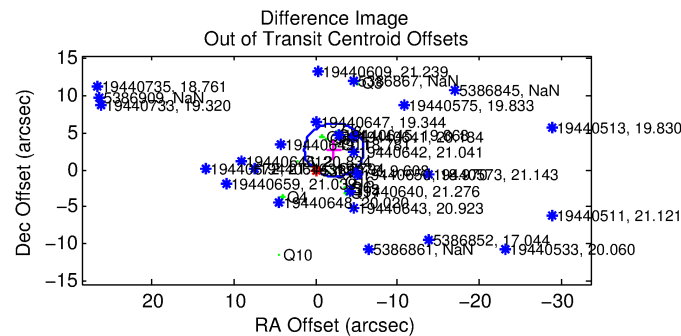
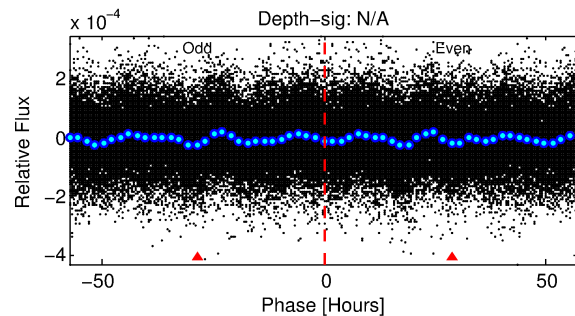
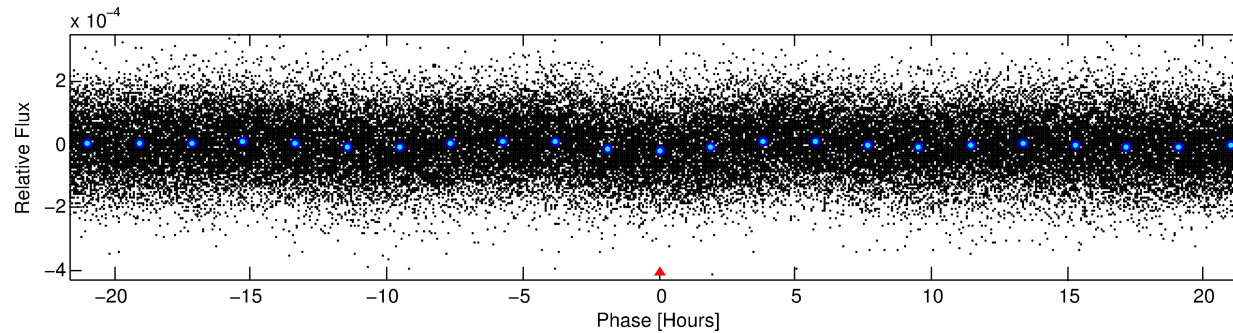
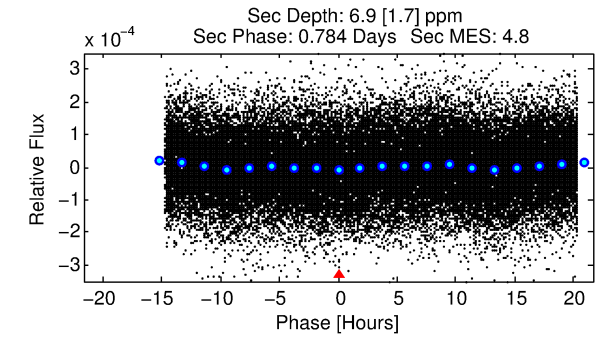
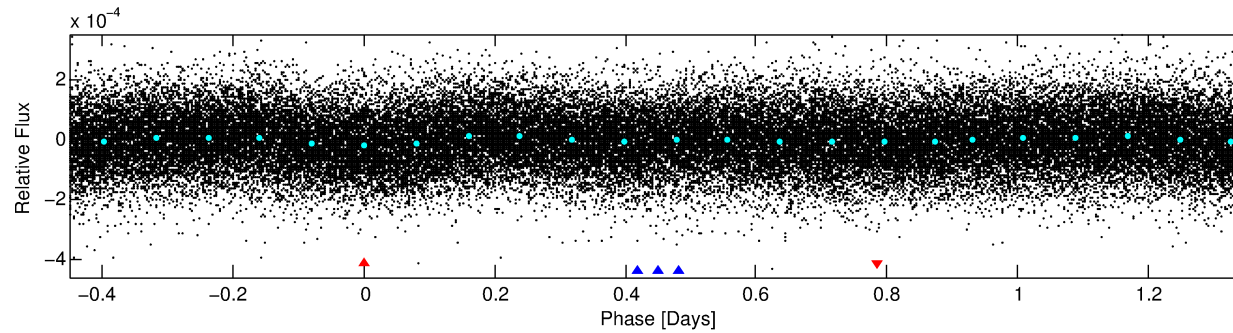
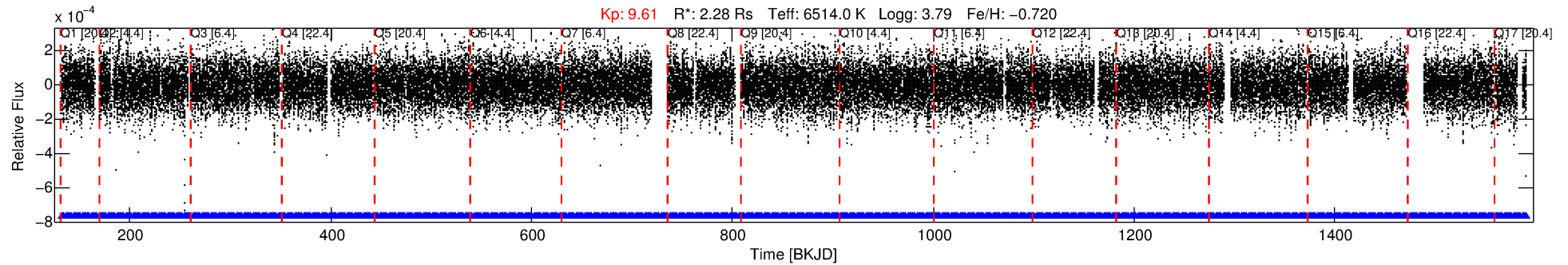
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005386872-01

No Significant Match Found

# DV One-Page Summary

KIC: 5386872 Candidate: 1 of 2 Period: 1.806 d



## TPS TCE Results:

Period = 1.80600 d  
Epoch = 133.0537 BKJD

DV fit results are unavailable

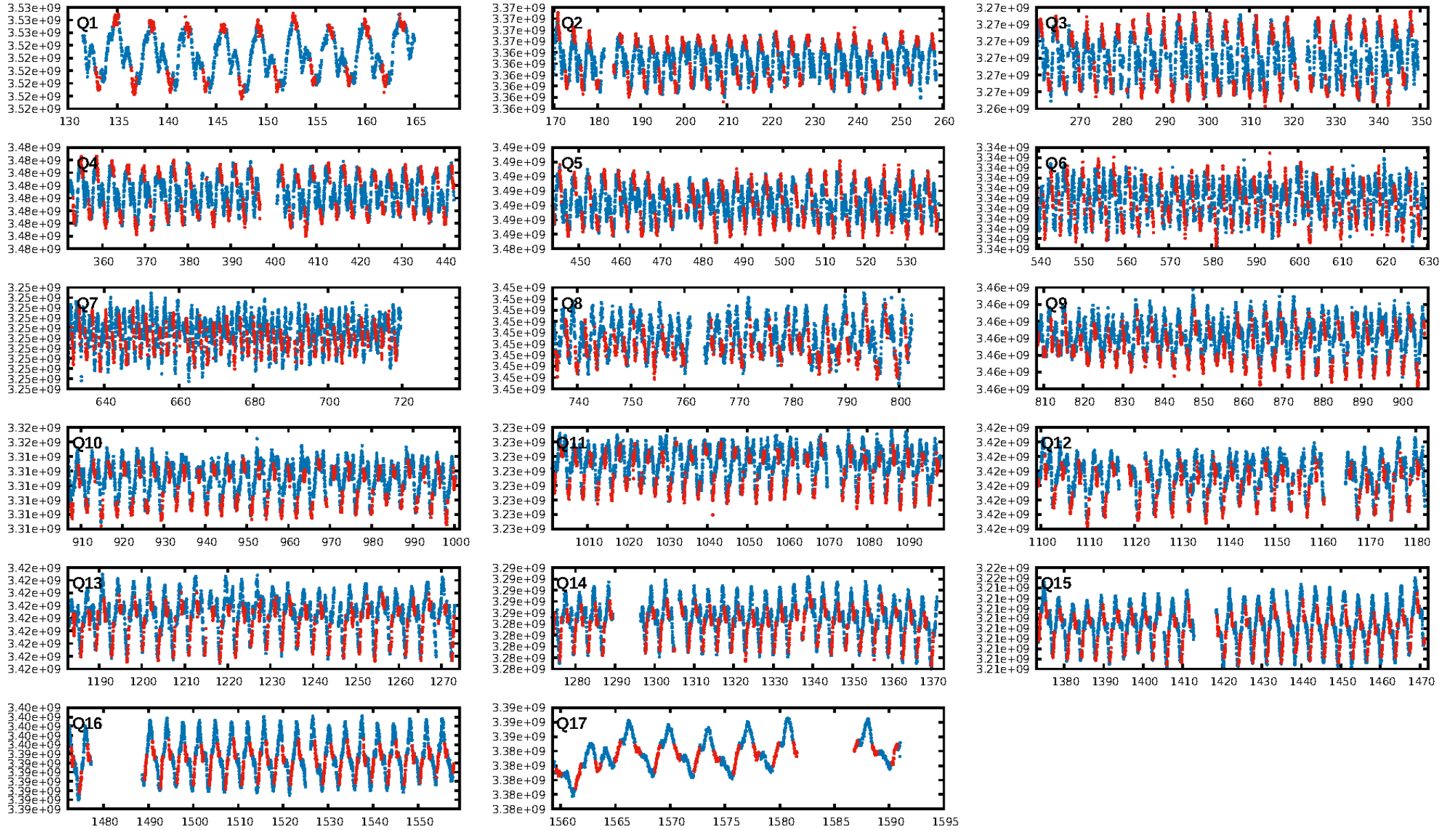
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1143.52σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.44e-13  
RollingBand-fgt: 1.00 [717/717]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 52.1%  
Centroid-so: 0.655 arcsec [3.67σ]  
OotOffset-rm: 3.511 arcsec [2.90σ]  
KicOffset-rm: 3.399 arcsec [2.65σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.00 [0/15]  
DiffImageOverlap-fno: 1.00 [17/17]

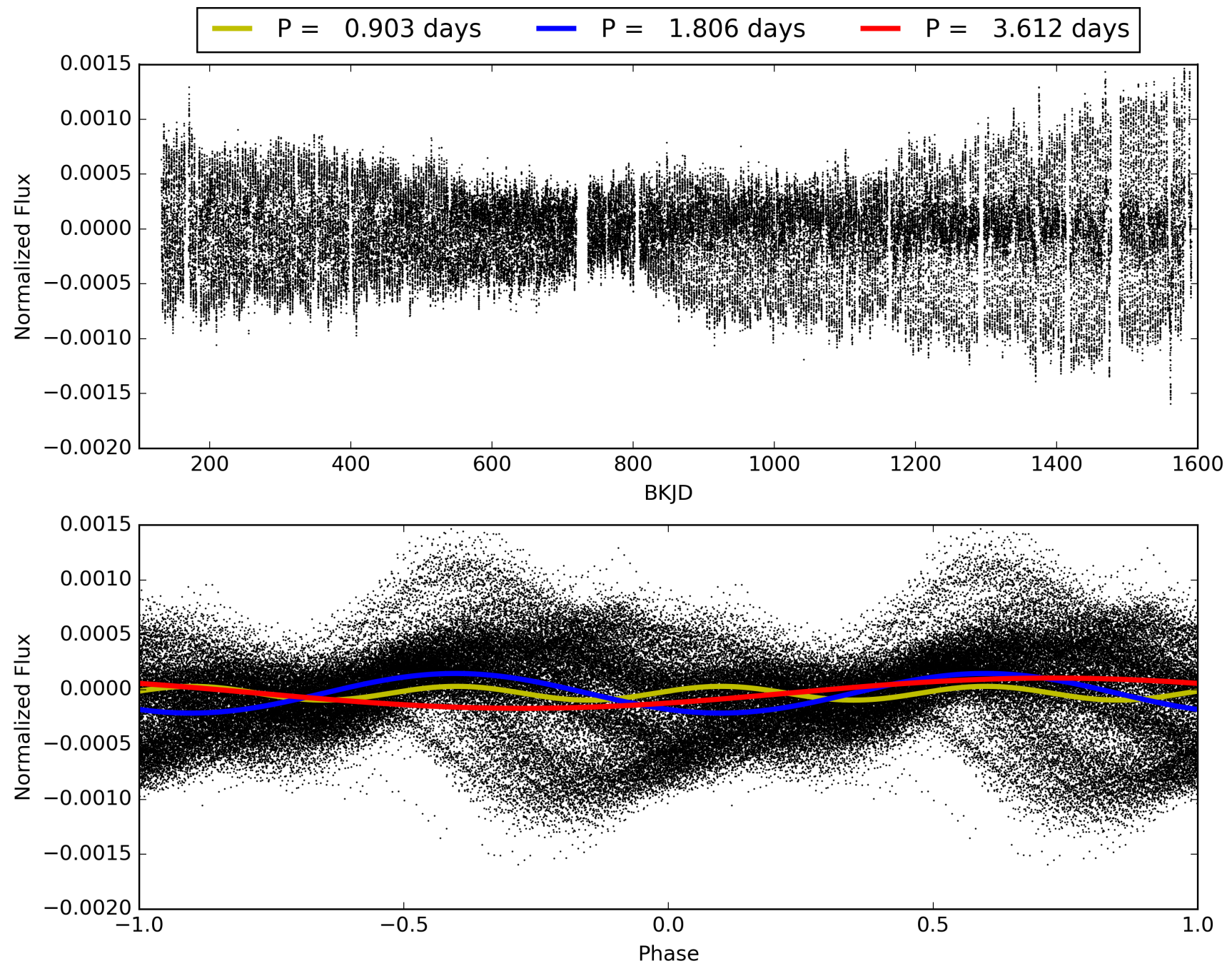
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:14:51 Z

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

# TCE 005386872-01, PDC Light Curves



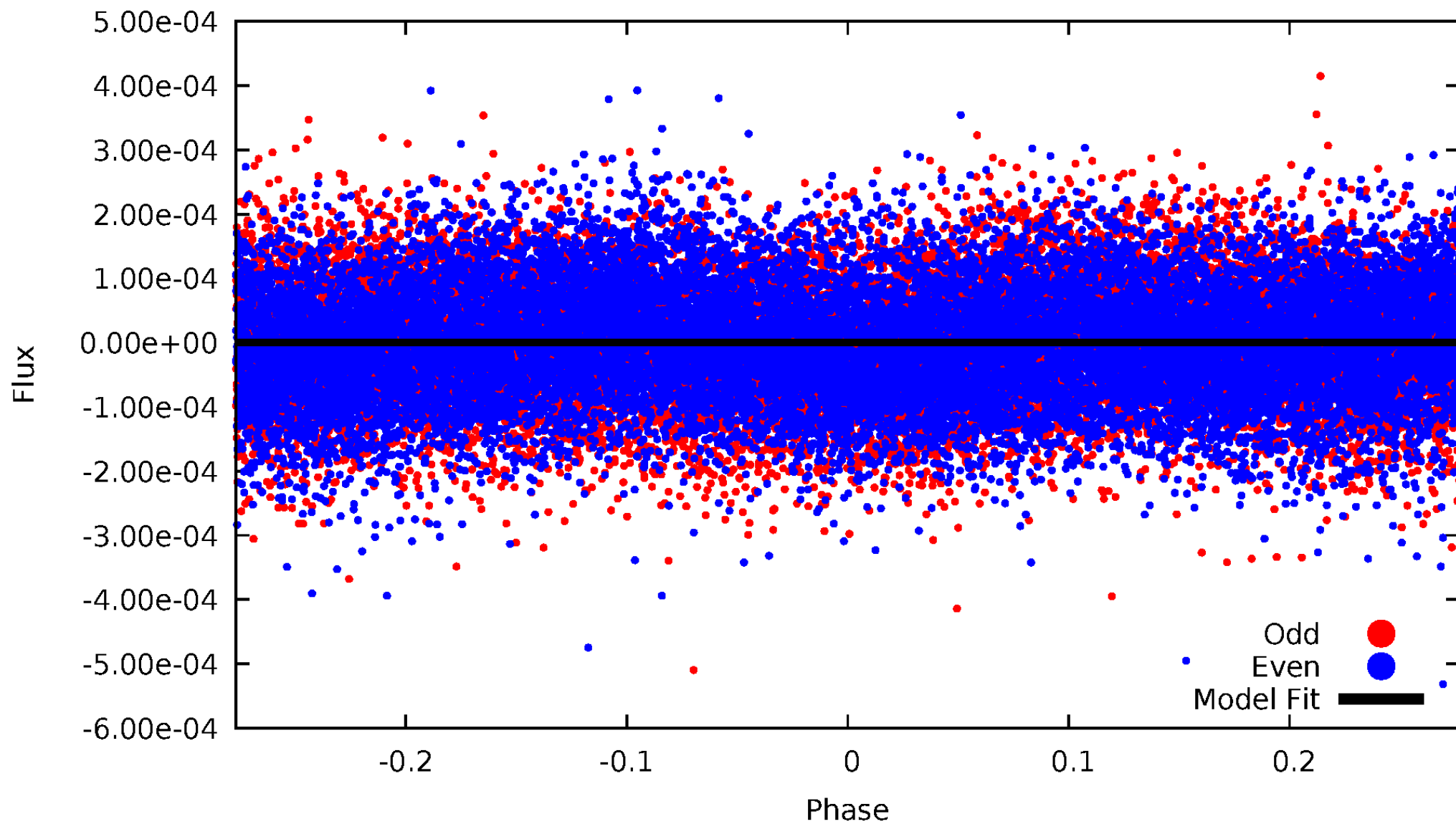
TCE 005386872-01





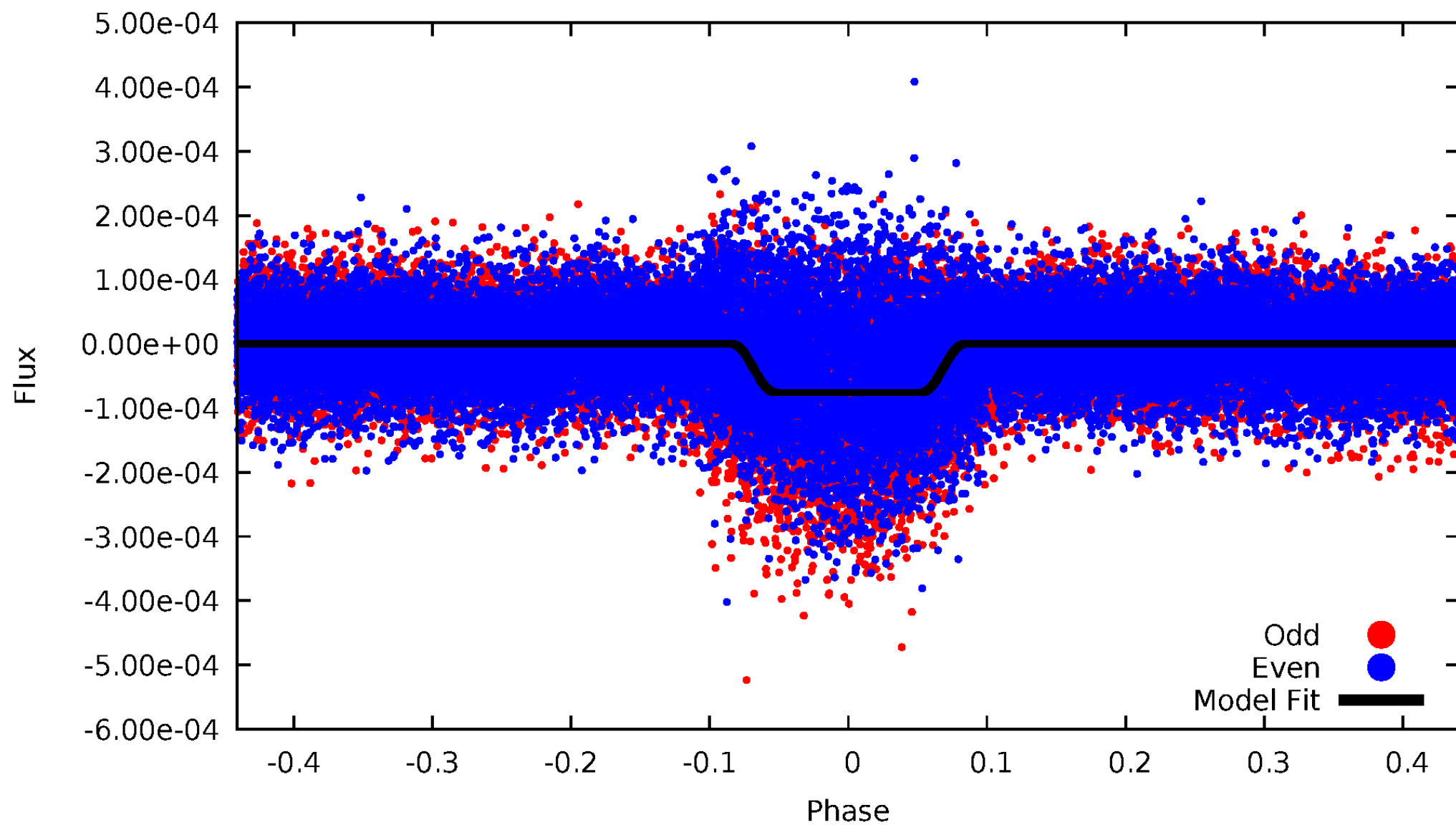
# DV Odd/Even

TCE 005386872-01

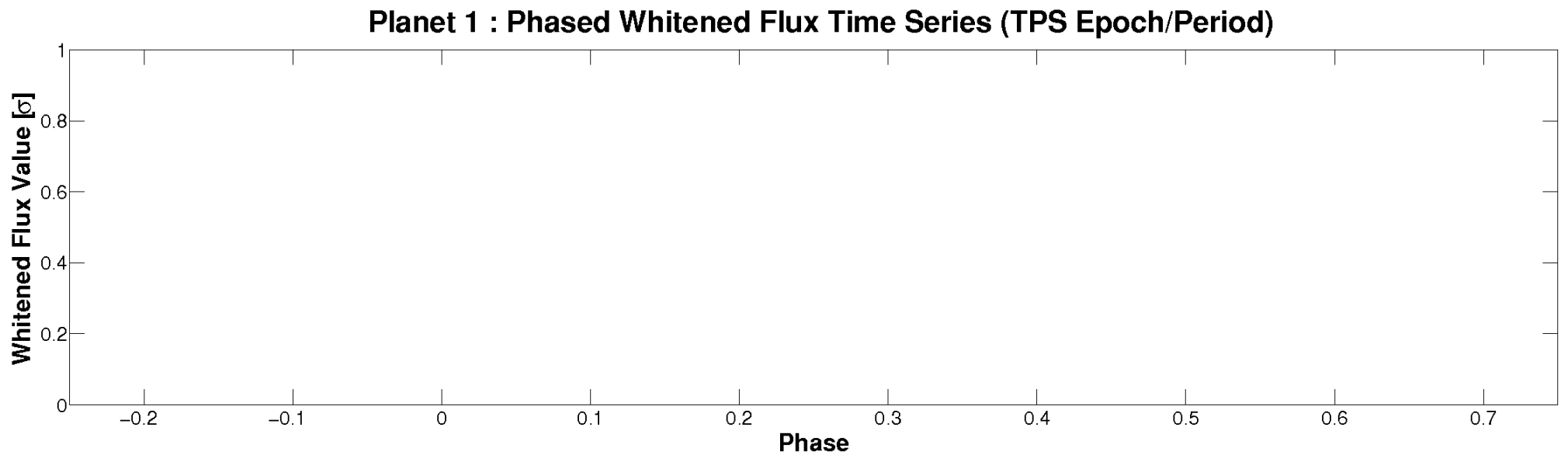
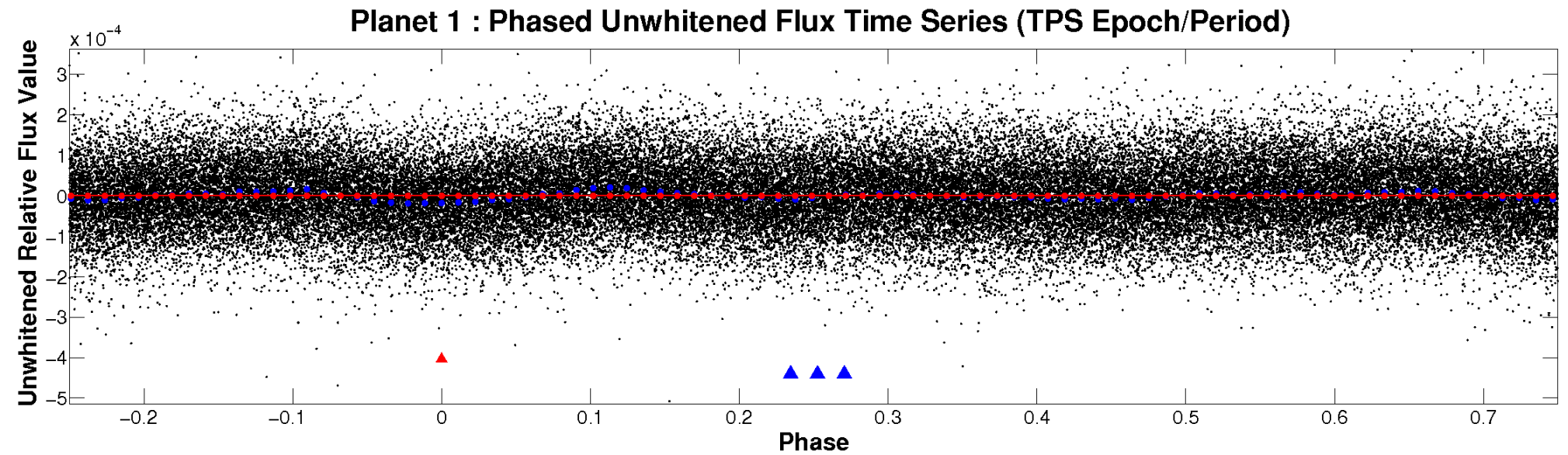


# ALT Odd/Even

TCE 005386872-01

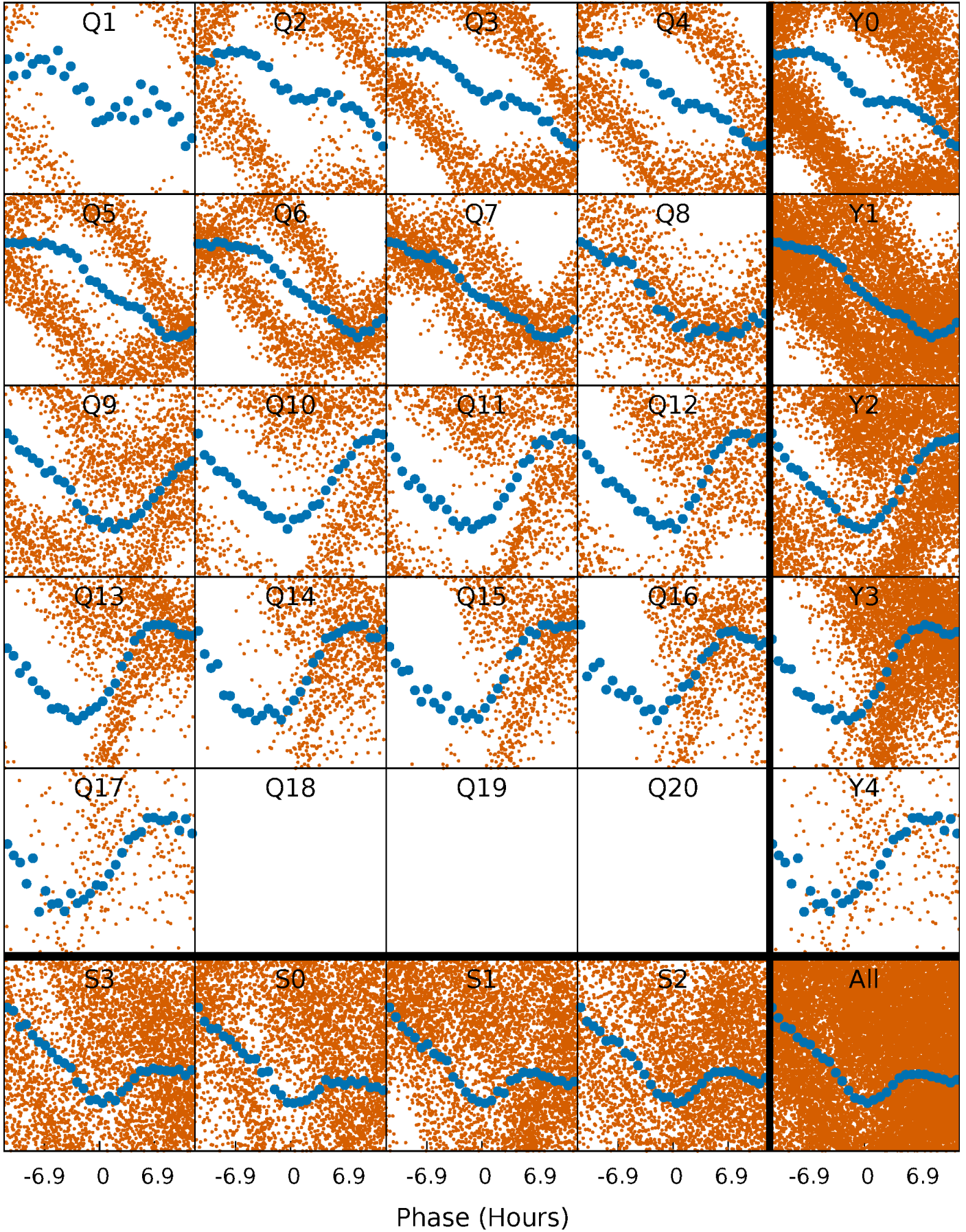


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

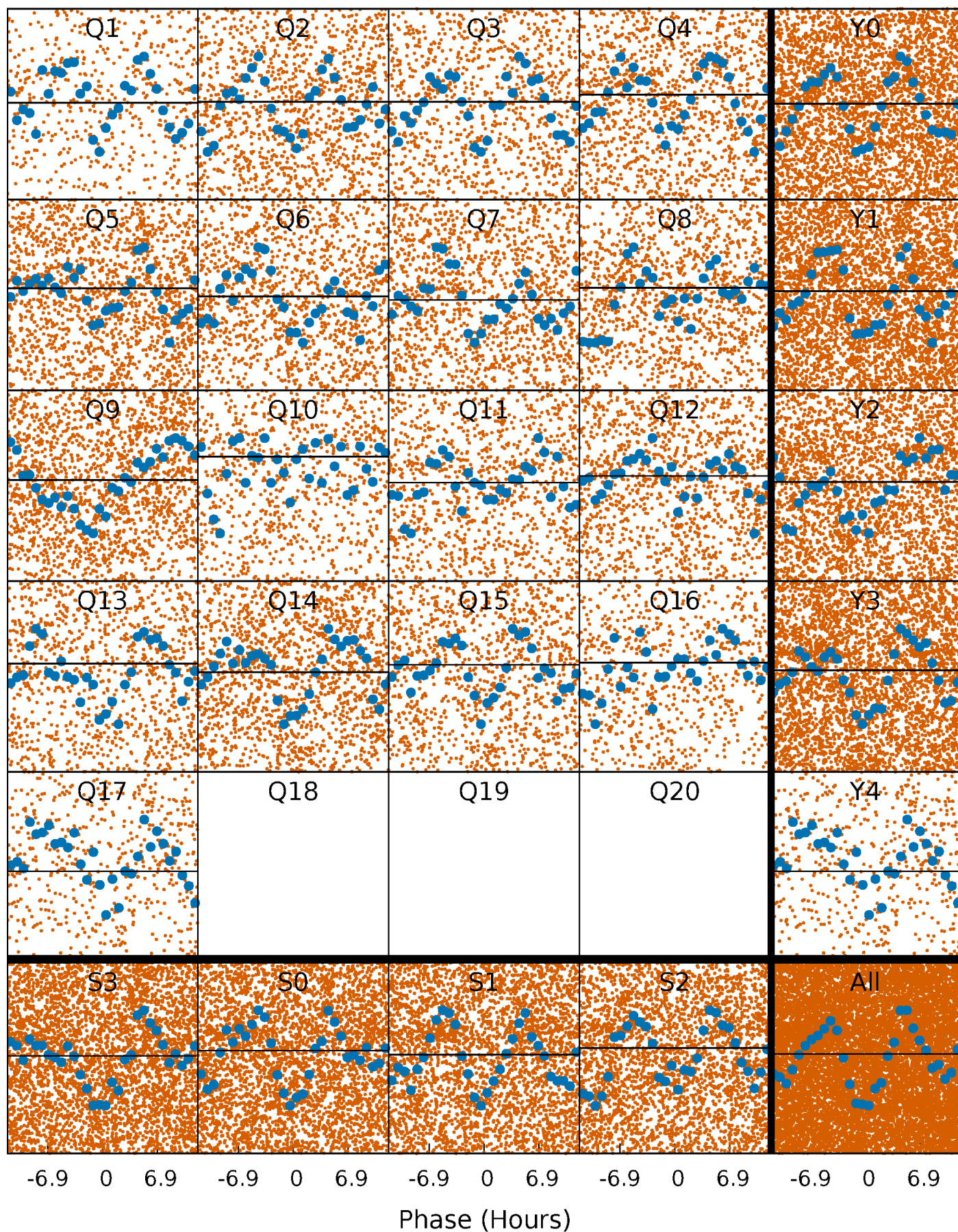
TCE 005386872-01 P= 1.805997 Days  $T_0=133.053728$  (BKJD)





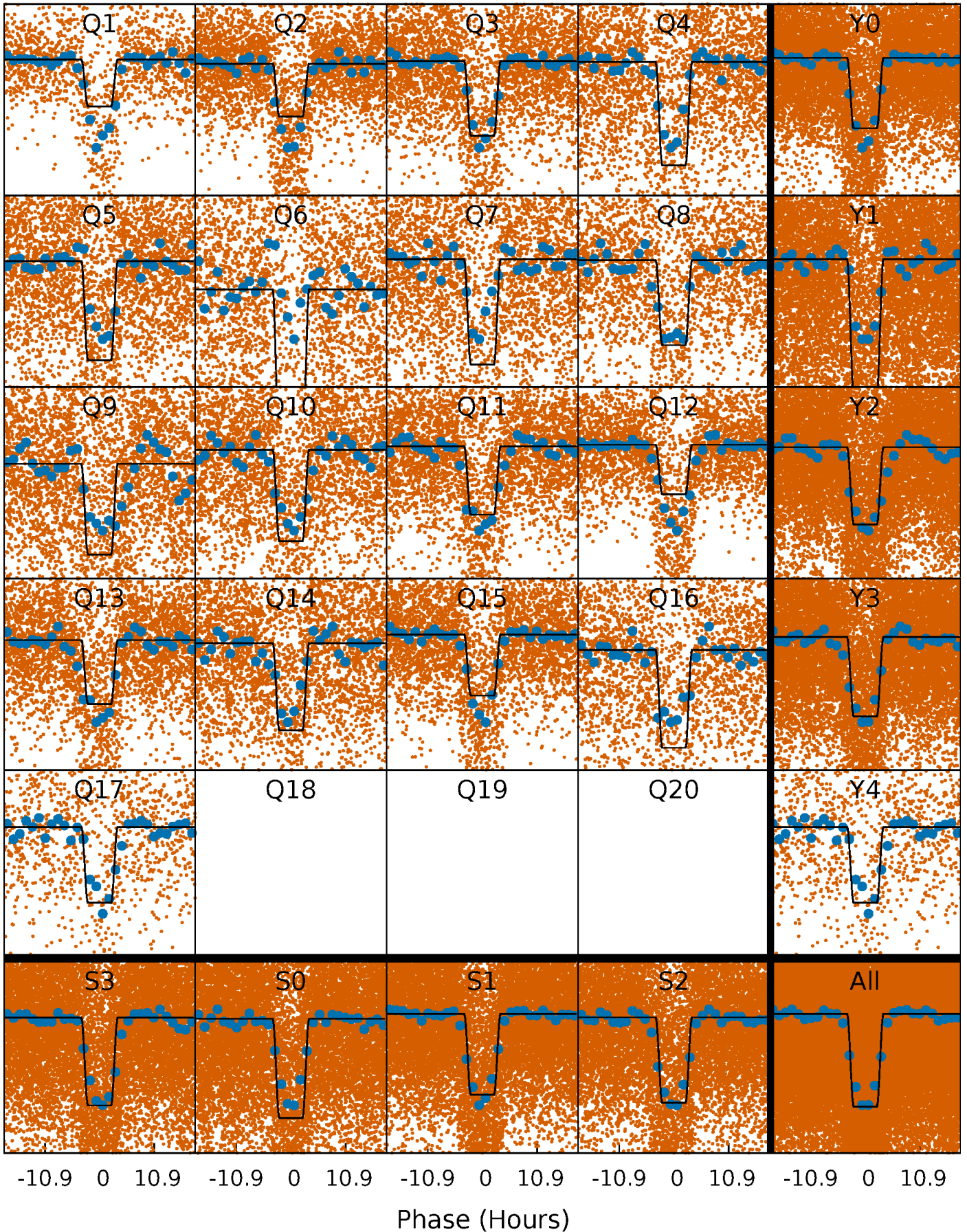
# DV Quarter-Phased Transit Curves

TCE 005386872-01 P= 1.805997 Days  $T_0=133.053728$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005386872-01 P= 1.805997 Days  $T_0=133.060200$  (BKJD)

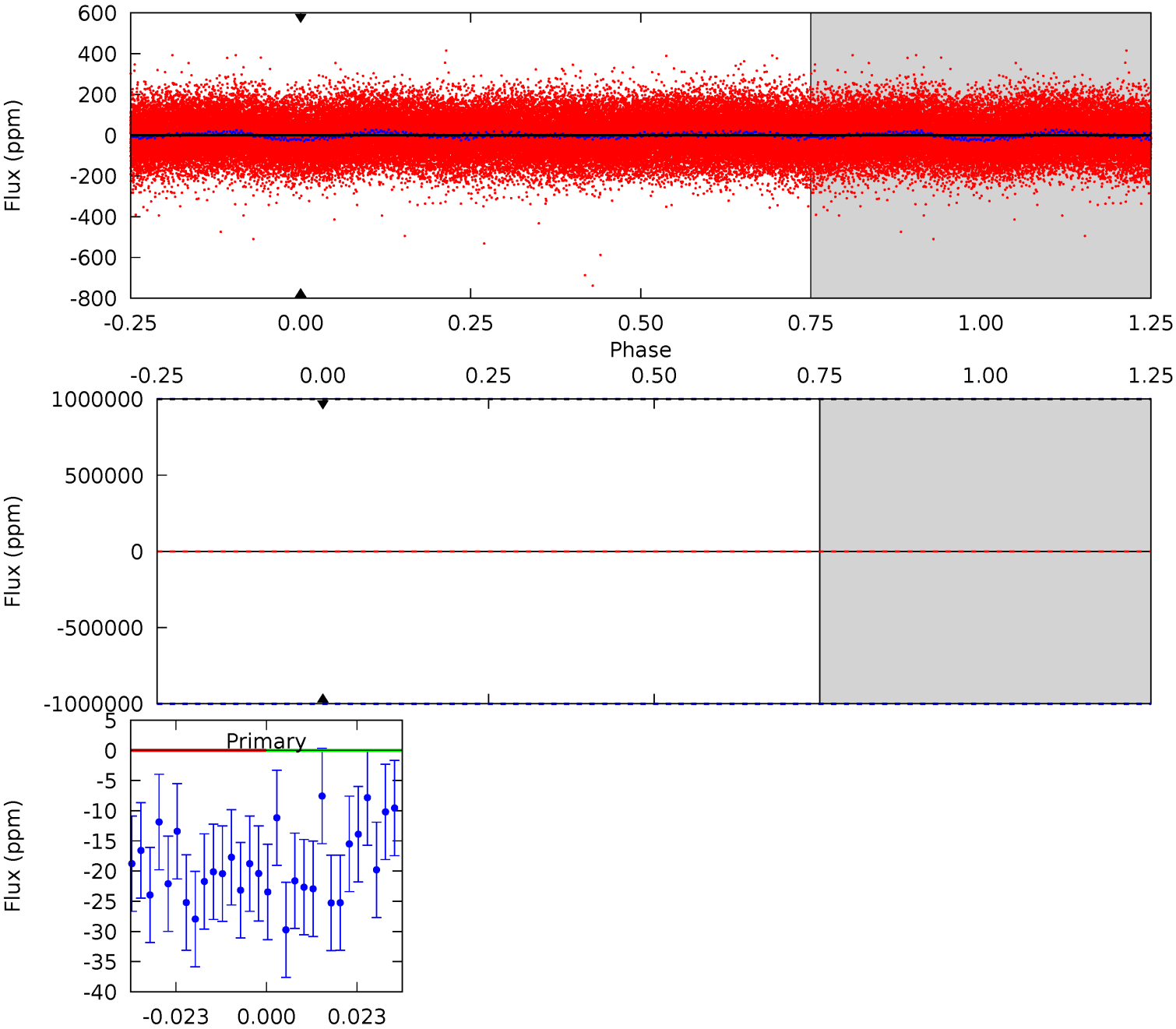




DV Model-Shift Uniqueness Test

005386872-01, P = 1.805997 Days, E = 131.247731 Days

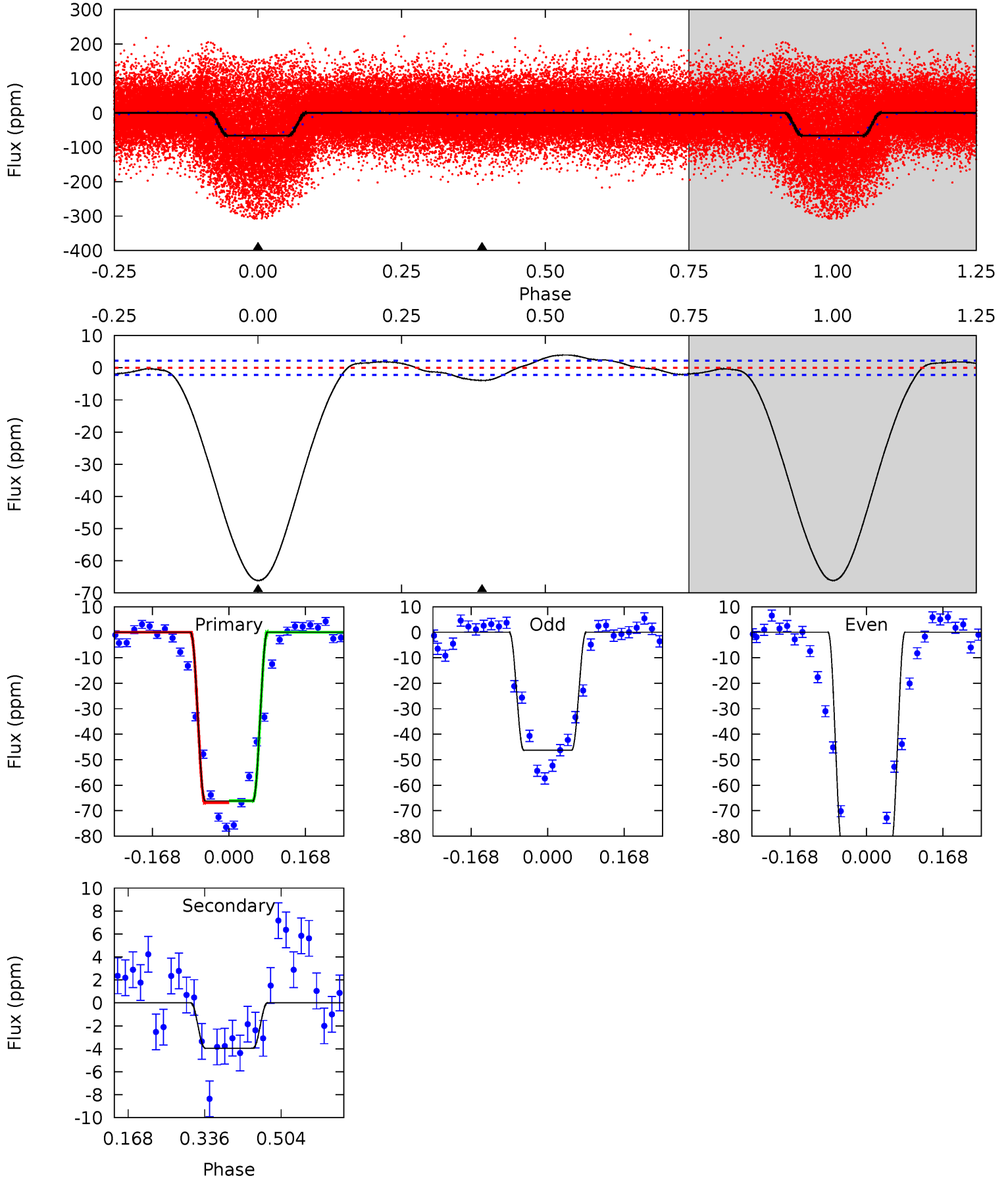
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005386872-01, P = 1.805997 Days, E = 131.254203 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
132.6	7.91	0	0	4.45	1.38	3.25	132.6	132.6	7.91	7.91	39.0	1.05	0.06	0.80





### Stellar Parameters For KIC 005386872

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6514^{+188}_{-236}$	$3.787^{+0.552}_{-0.138}$	$-0.720^{+0.300}_{-0.300}$	$2.278^{+0.511}_{-1.193}$	$1.158^{+0.153}_{-0.241}$	$0.138^{+0.923}_{-0.056}$
	+3%/-4%	+15%/-4%	+42%/-42%	+22%/-52%	+13%/-21%	+668%/-40%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005386872-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$15.96^{+18.26}_{-11.25}$	$3375^{+287}_{-483}$	$-3103^{+32985}_{-24997}$	$0.094^{+409.865}_{-353.588}$
Alt.	$-4 \pm 0$	$14.83^{+18.74}_{-10.25}$	$3355^{+275}_{-411}$	$-3245^{+400}_{-198}$	$0.009^{+0.080}_{-0.007}$

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

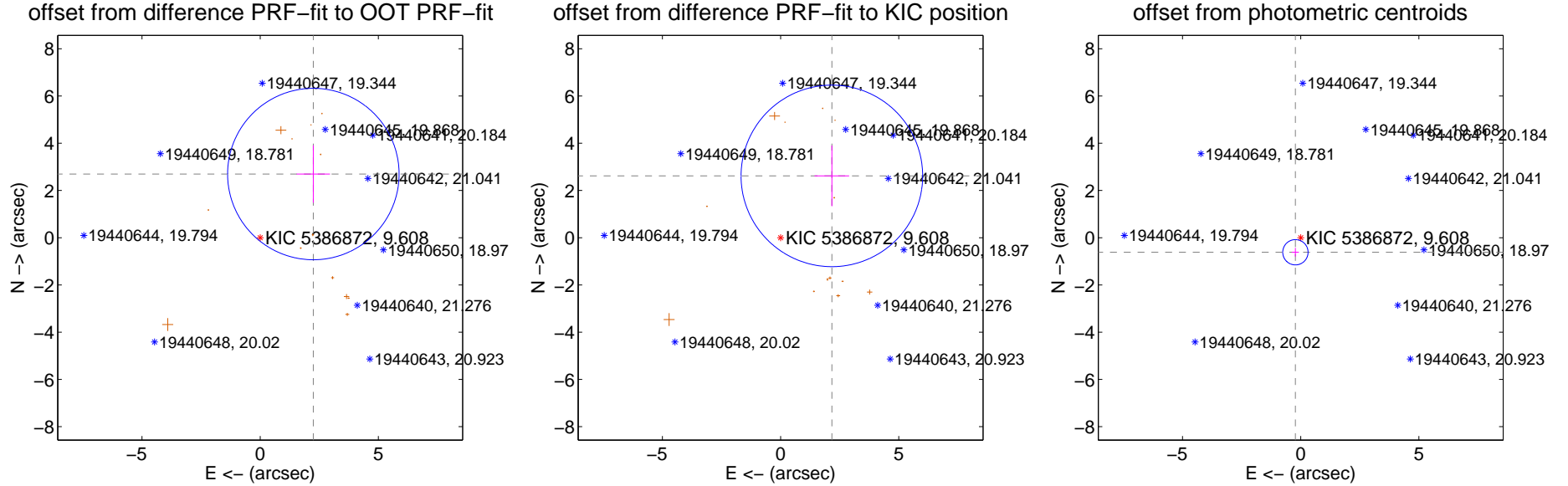
## DV Centroid Data

Supplemental centroid analysis for 005386872-01. **Kepler magnitude: 9.61.** Transit SNR -1.00

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

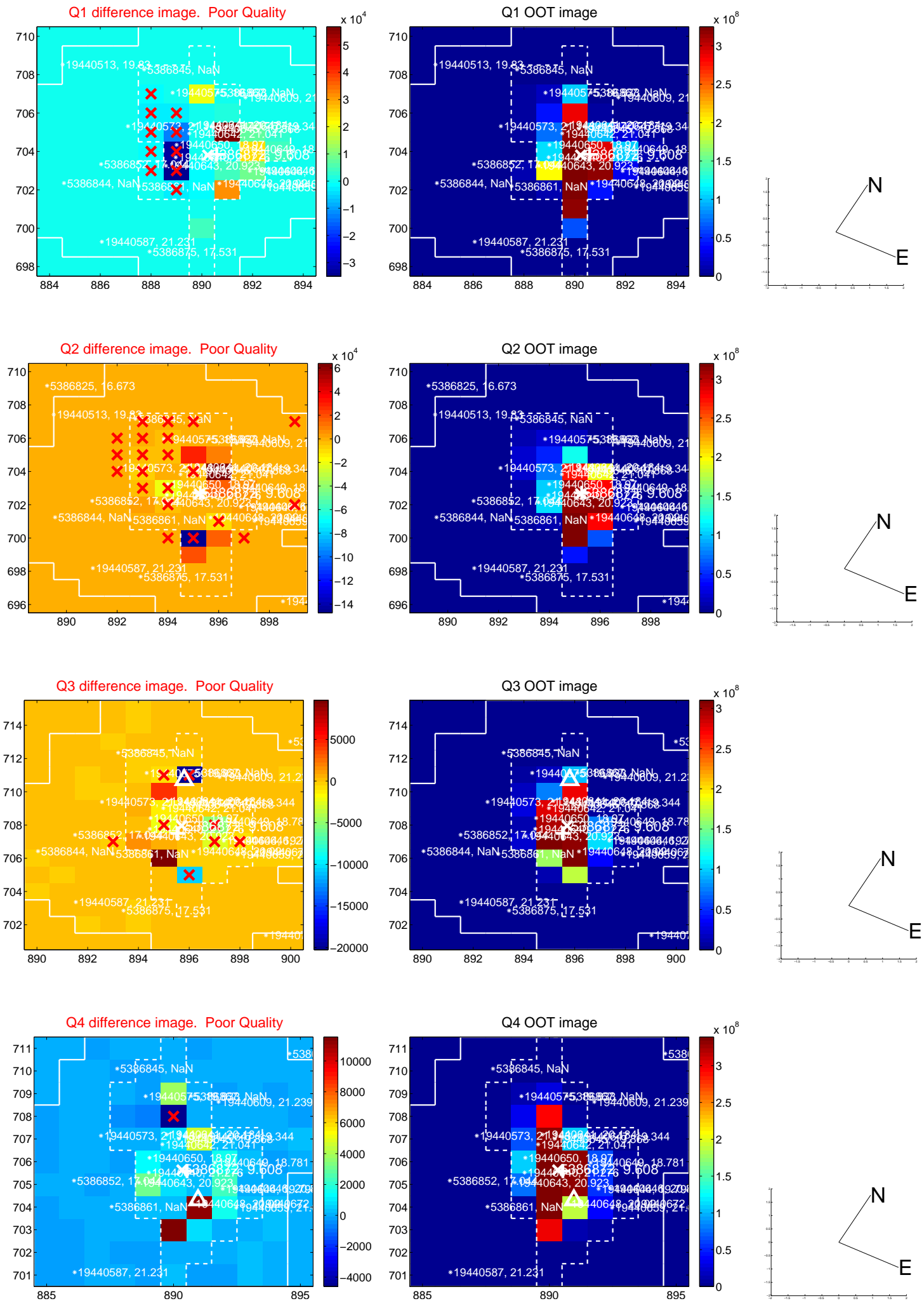
The direct PRF centroid is offset from the target star catalog position by about 1.48 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.511 \pm 1.210$	2.90	$-2.250 \pm 0.706$	$2.696 \pm 1.216$
PRF-fit source offset from KIC position	$3.399 \pm 1.281$	2.65	$-2.170 \pm 0.733$	$2.617 \pm 1.284$
photometric centroid source offset	$0.66 \pm 0.18$	<b>3.67</b>	$0.22 \pm 0.15$	$-0.62 \pm 0.18$

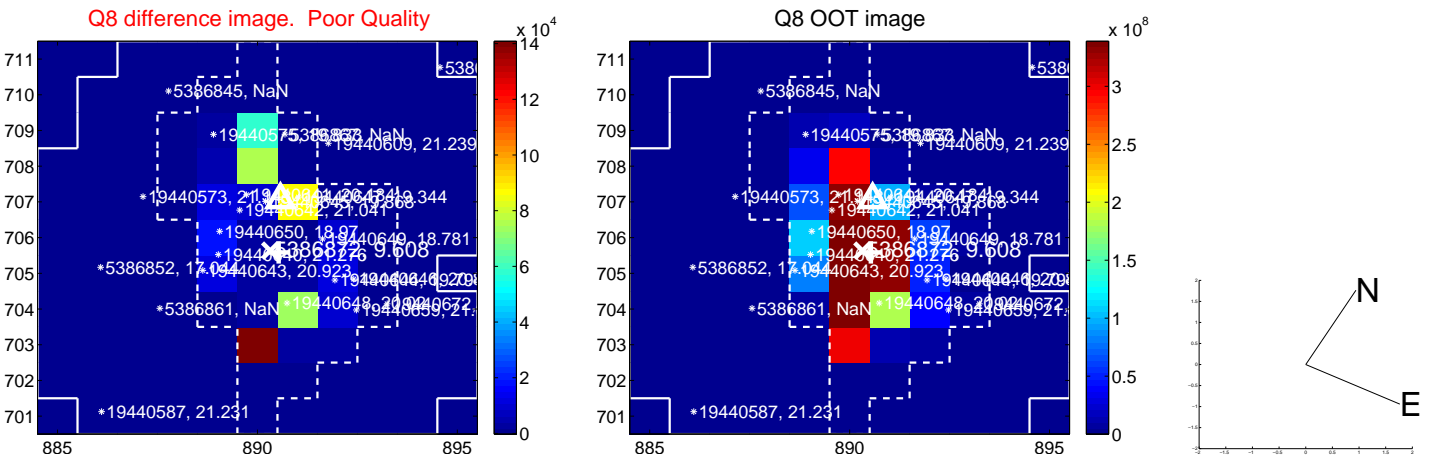
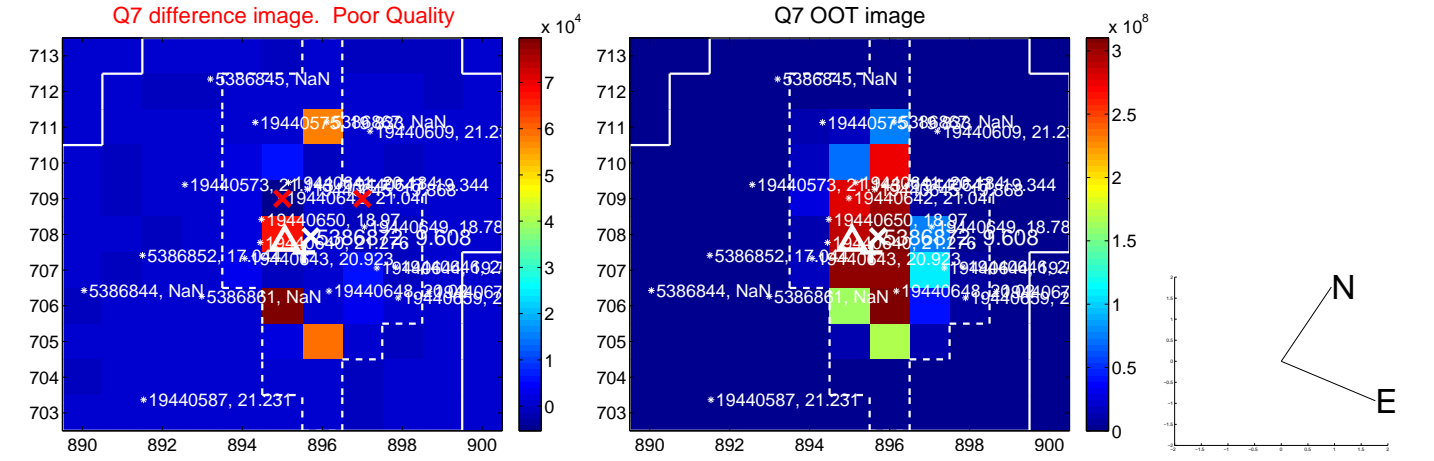
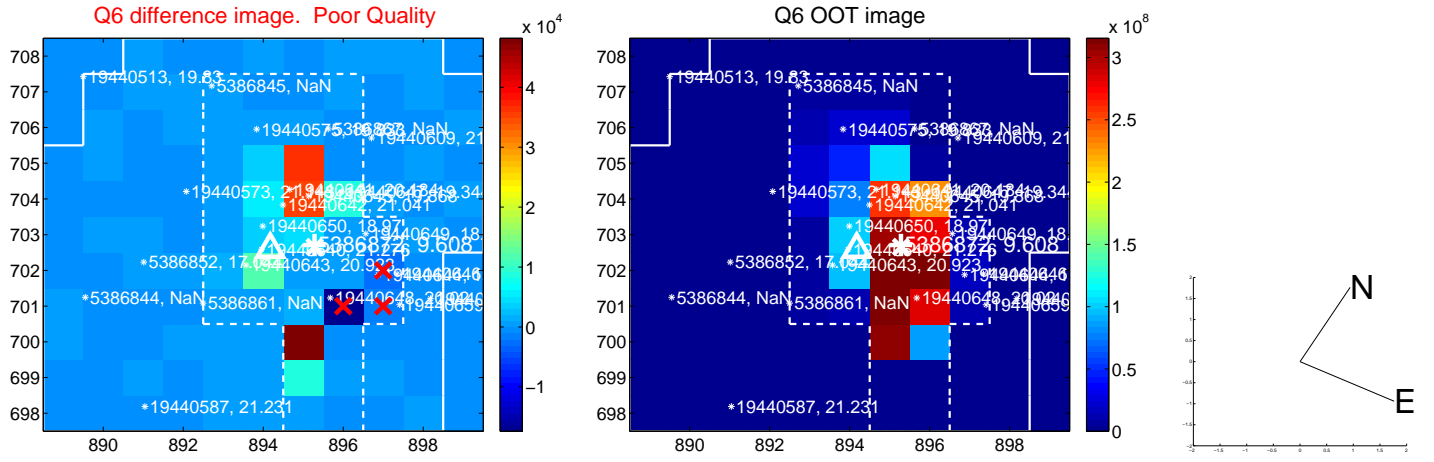
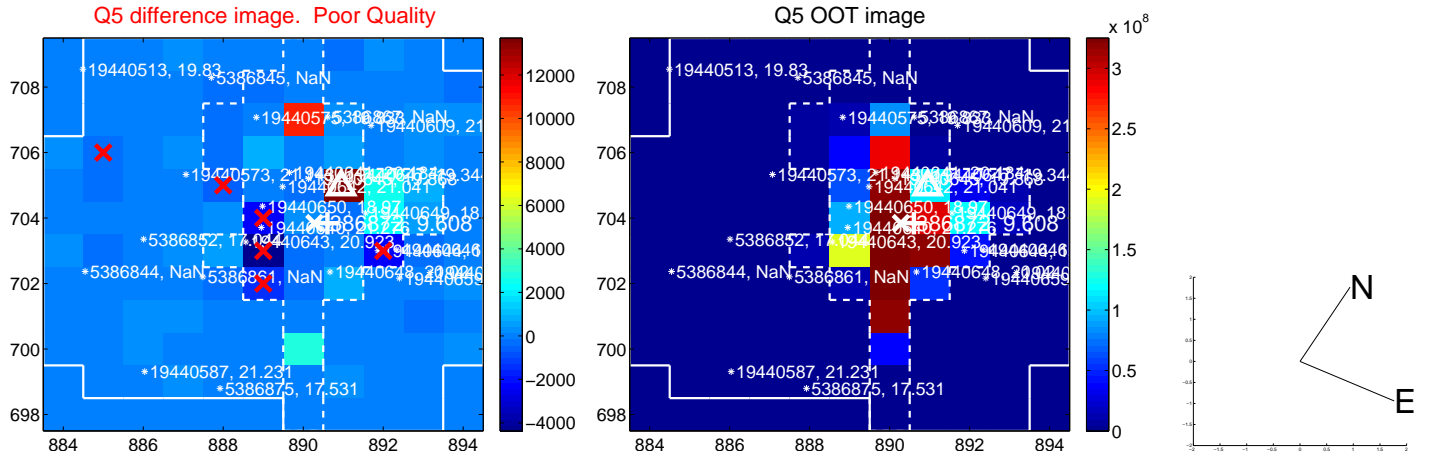


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

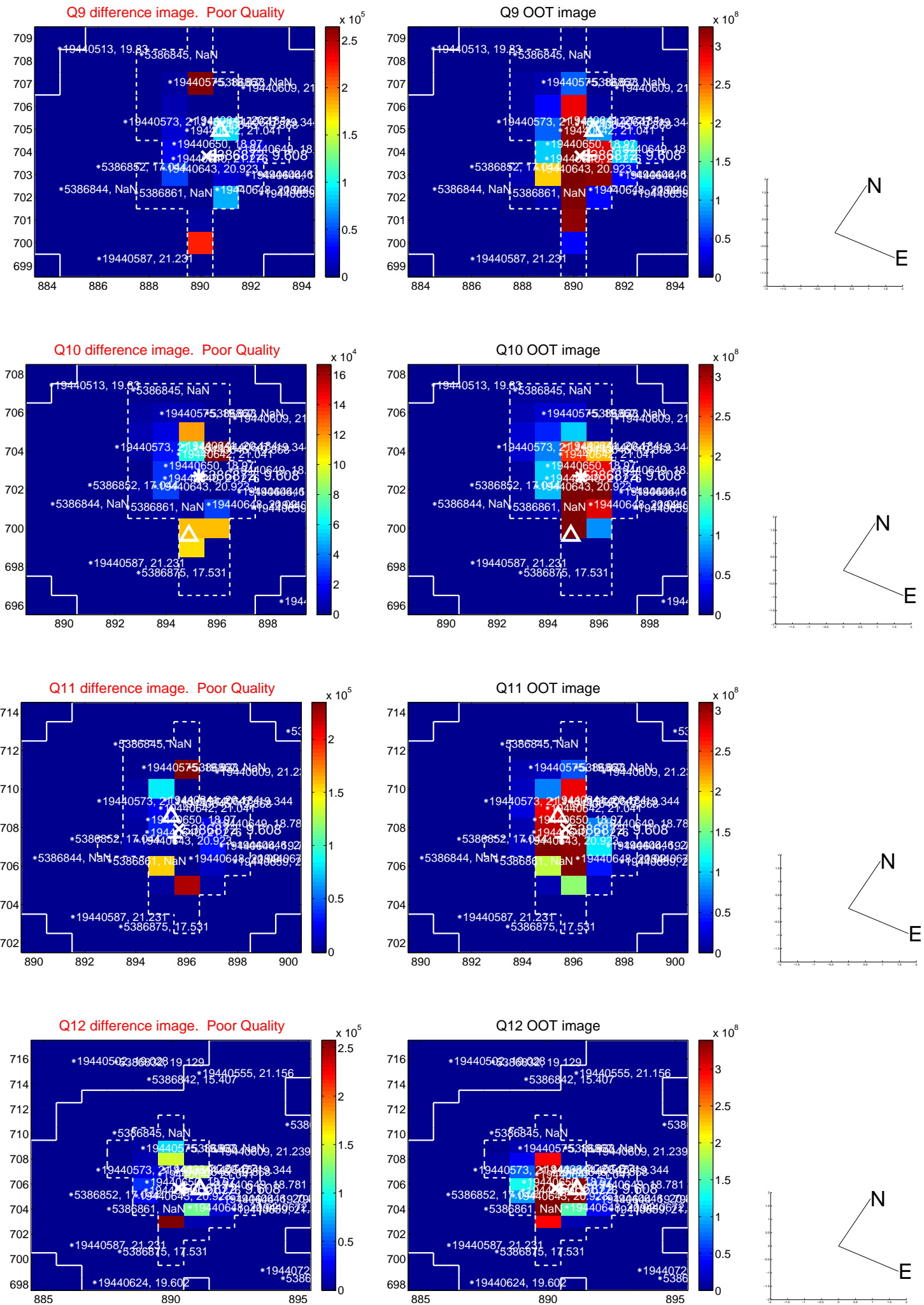


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

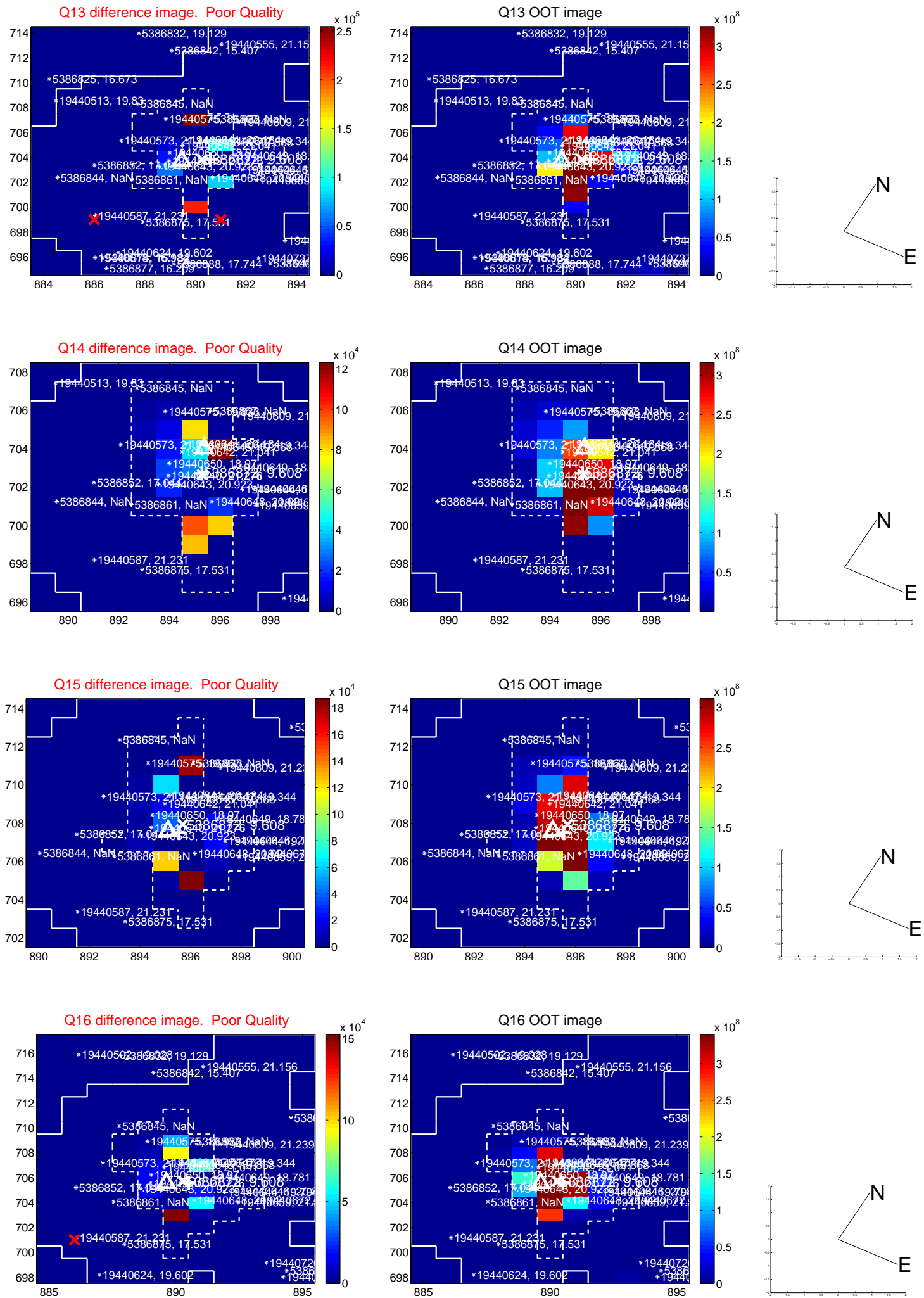




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



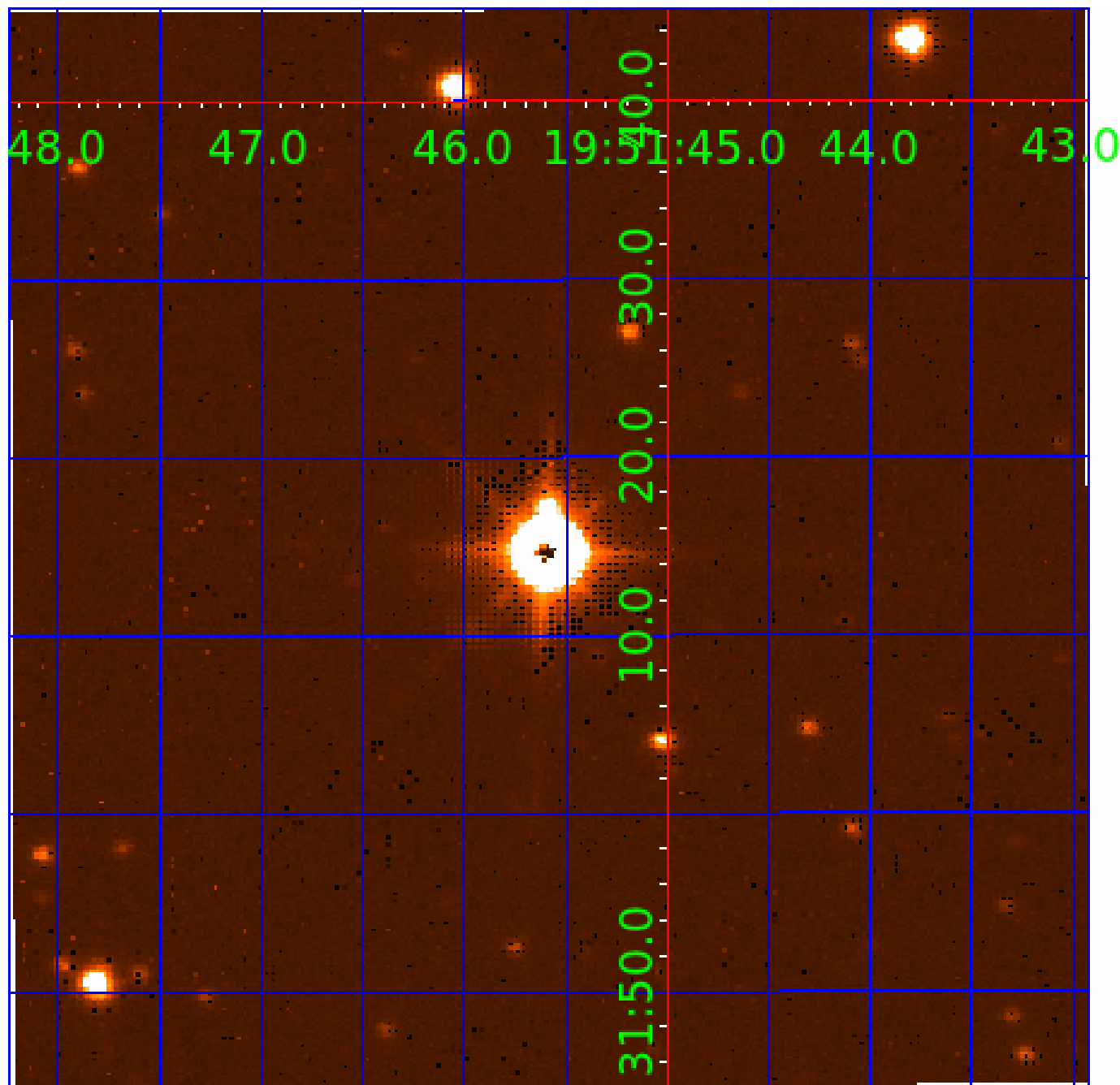
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination





# KIC 005386872

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005386872-01	OBS	No	1.805997	133.053728	24.2	6.000	8.8	-1.0	2.28	6514	1.13	9002.54
005386872-02	OBS	No	561.632664	209.394342	302.3	10.102	9.0	7.8	2.28	6514	5.94	4.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005386872-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
005386872-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

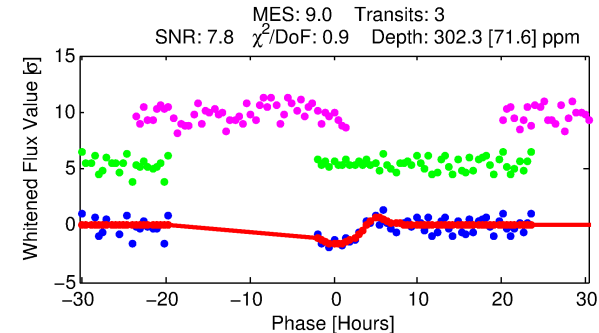
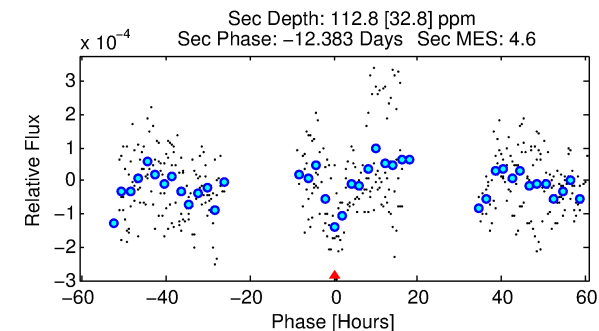
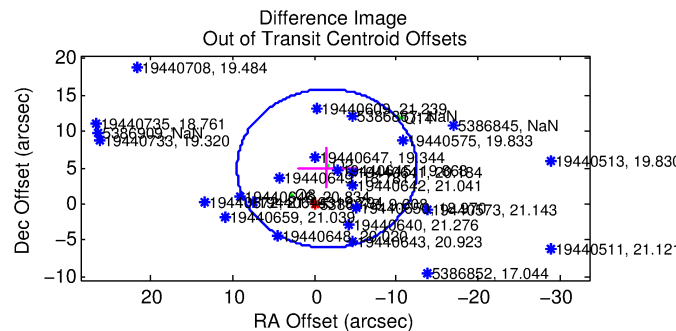
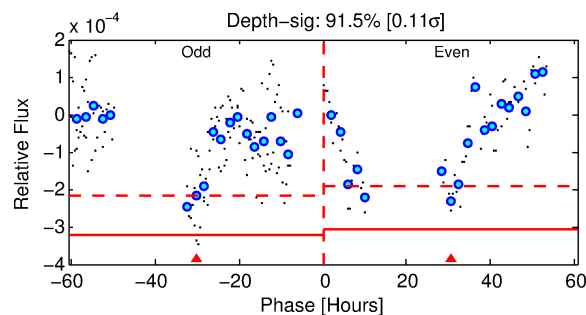
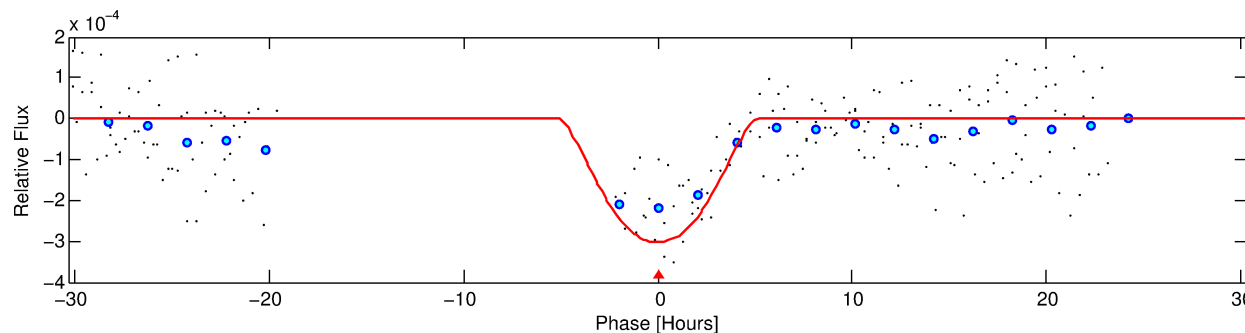
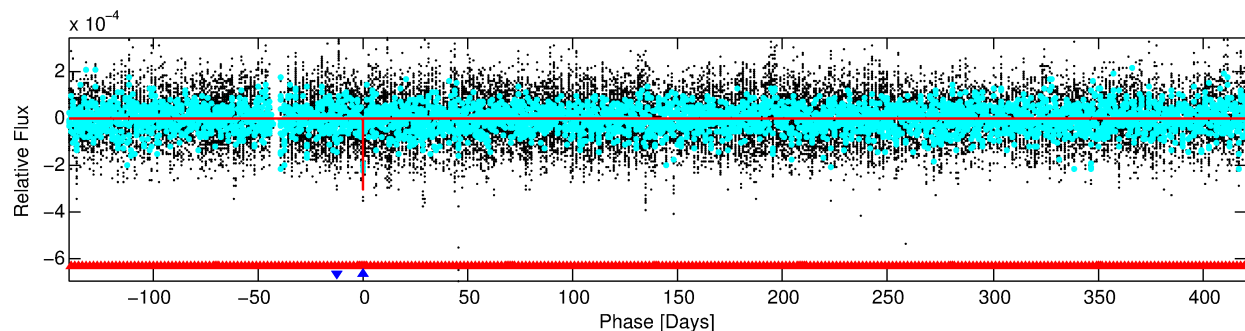
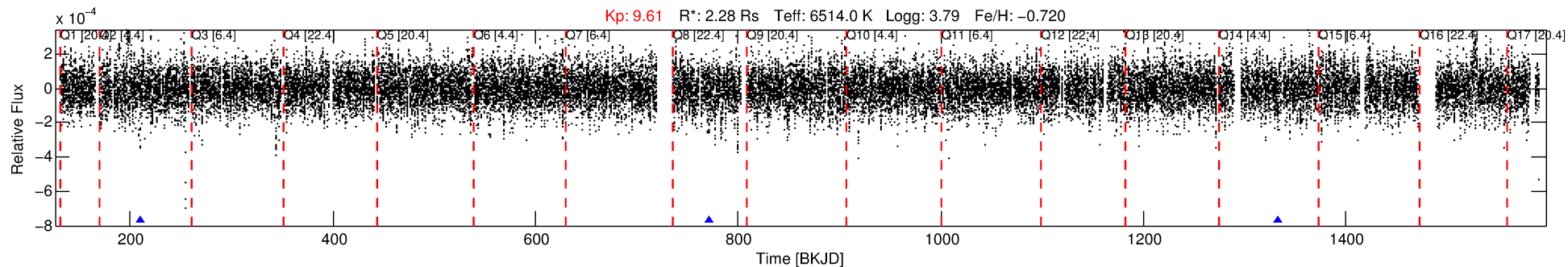
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005386872-02

No Significant Match Found

# DV One-Page Summary

KIC: 5386872 Candidate: 2 of 2 Period: 561.633 d



## DV Fit Results:

Period = 561.63266 [0.01612] d  
Epoch = 209.3943 [0.0367] BKJD  
 $R_p/R^* = 0.0239$  [0.0141]  
 $a/R^* = 114.61$  [36.11]  
 $b = 0.99$  [0.03]  
 $\text{Seff} = 4.27$  [3.96]  
 $\text{Teq} = 367$  [85] K  
 $R_p = 5.94$  [4.69]  $R_e$   
 $a = 1.3997$  [0.7684] AU  
 $\text{Ag} = 3441.90$  [5240.87] [0.66 $\sigma$ ]  
 $\text{Teffp} = 4342$  [1329] K [2.98 $\sigma$ ]

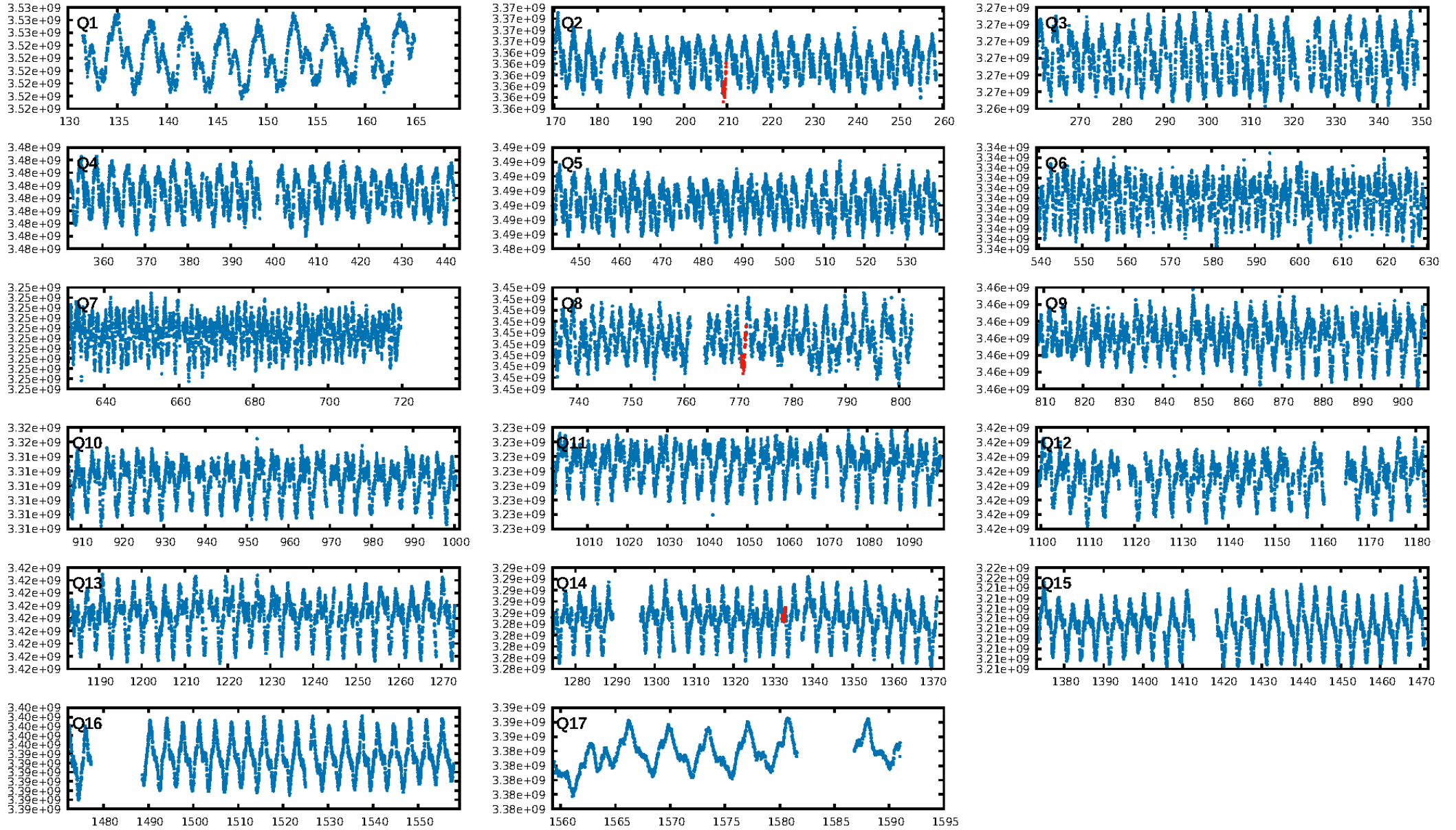
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1143.52 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 47.9%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.79e-12**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 11.2%  
Centroid-so: 2.247 arcsec [1.65 $\sigma$ ]  
OotOffset-rm: 5.124 arcsec [1.40 $\sigma$ ]  
KicOffset-rm: 5.287 arcsec [1.90 $\sigma$ ]  
OotOffset-st: 2/0/1/0 [3]  
KicOffset-st: 2/0/1/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/3]

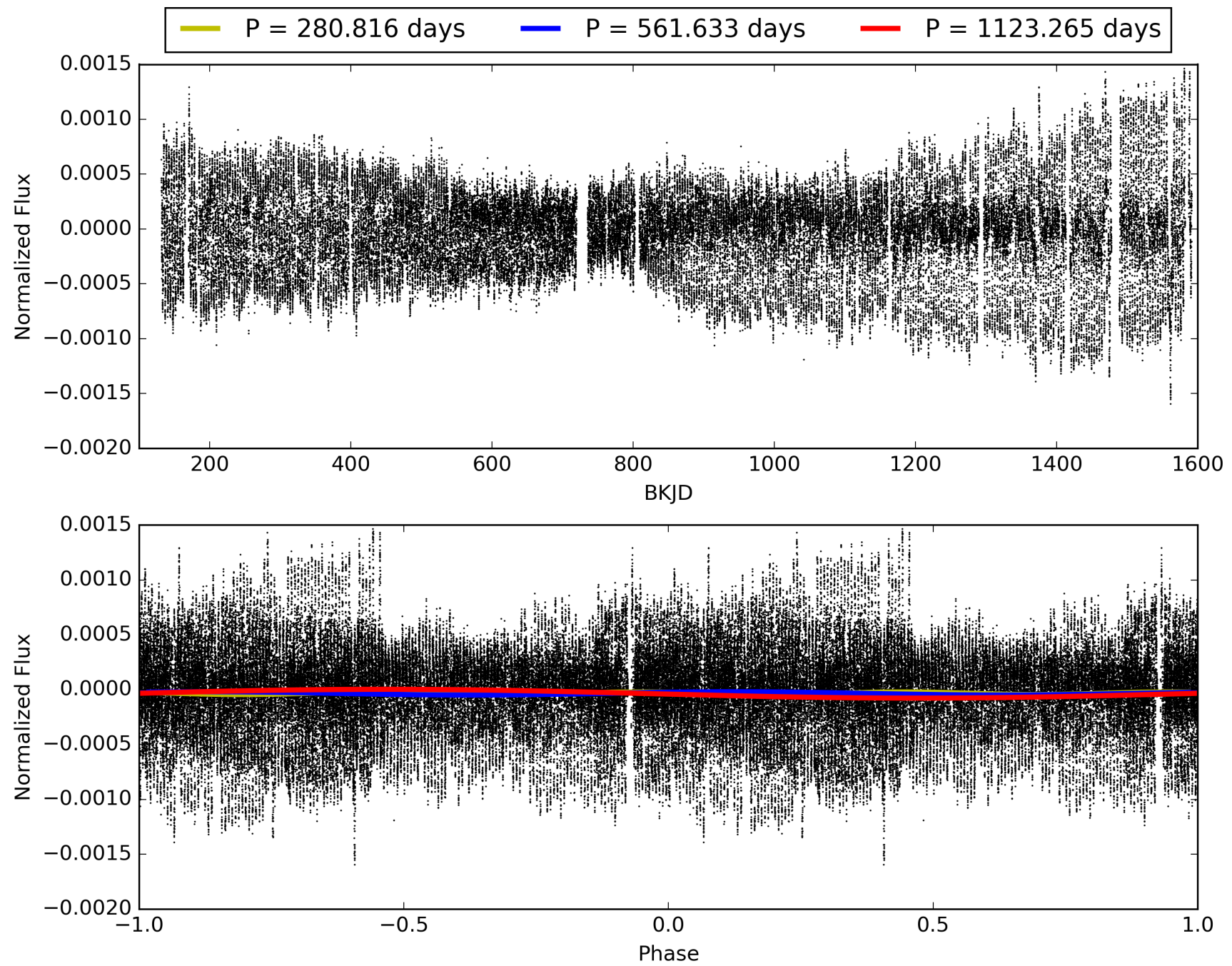
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:15:05 Z

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

# TCE 005386872-02, PDC Light Curves



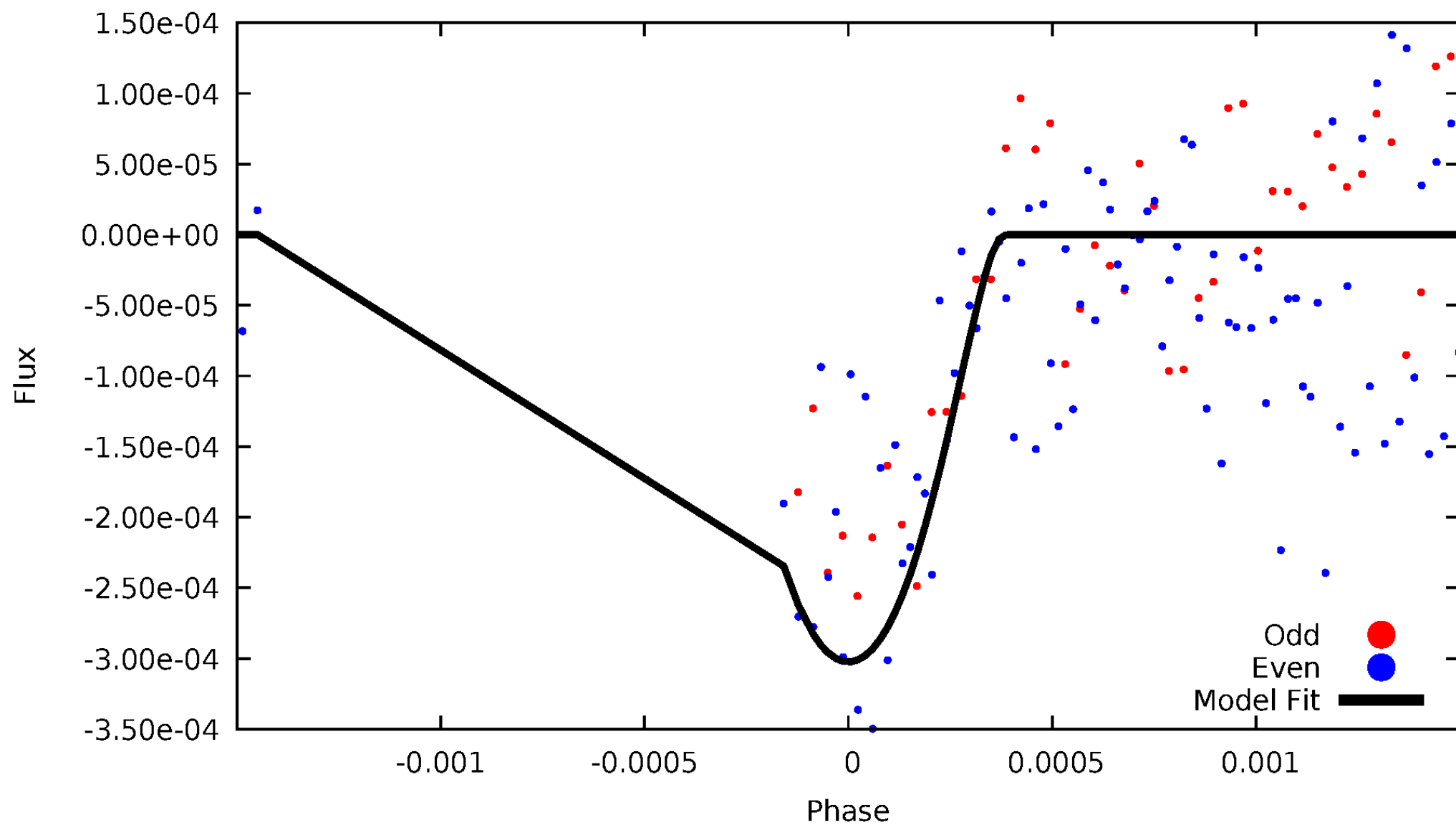
TCE 005386872-02





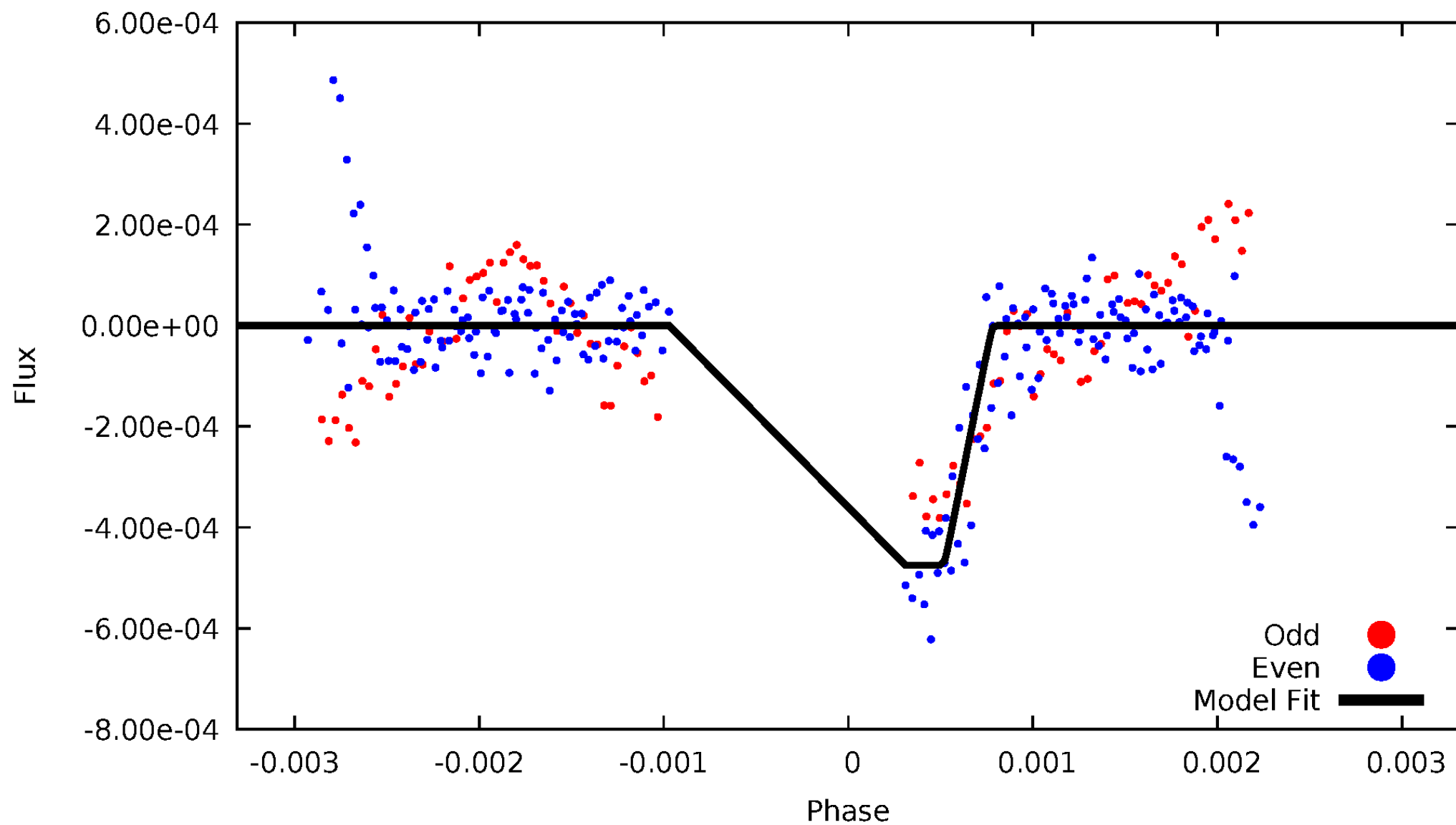
# DV Odd/Even

TCE 005386872-02



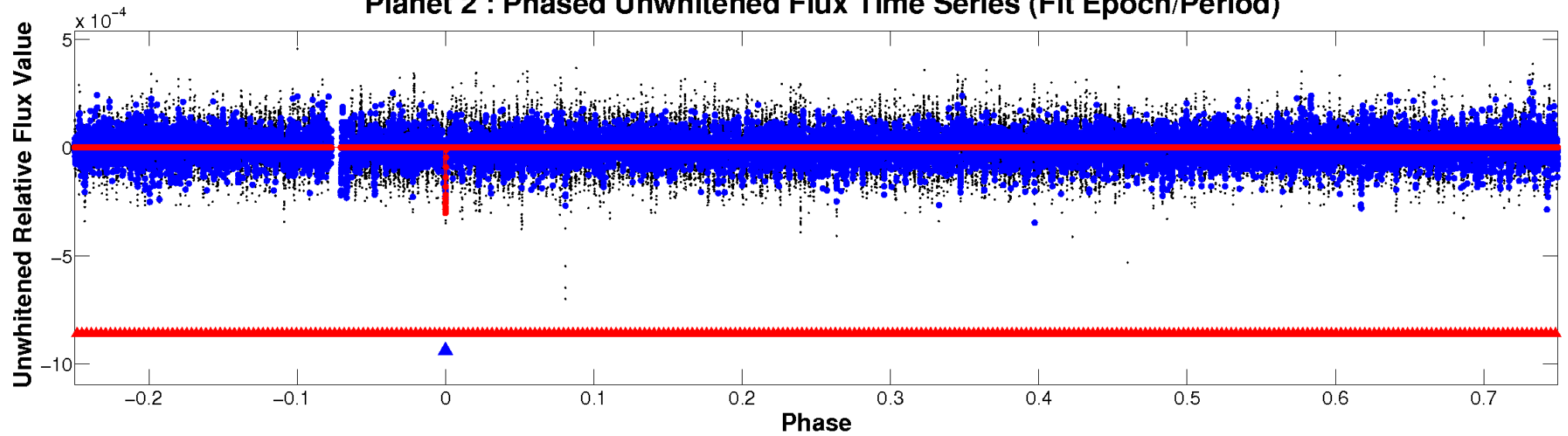
# ALT Odd/Even

TCE 005386872-02

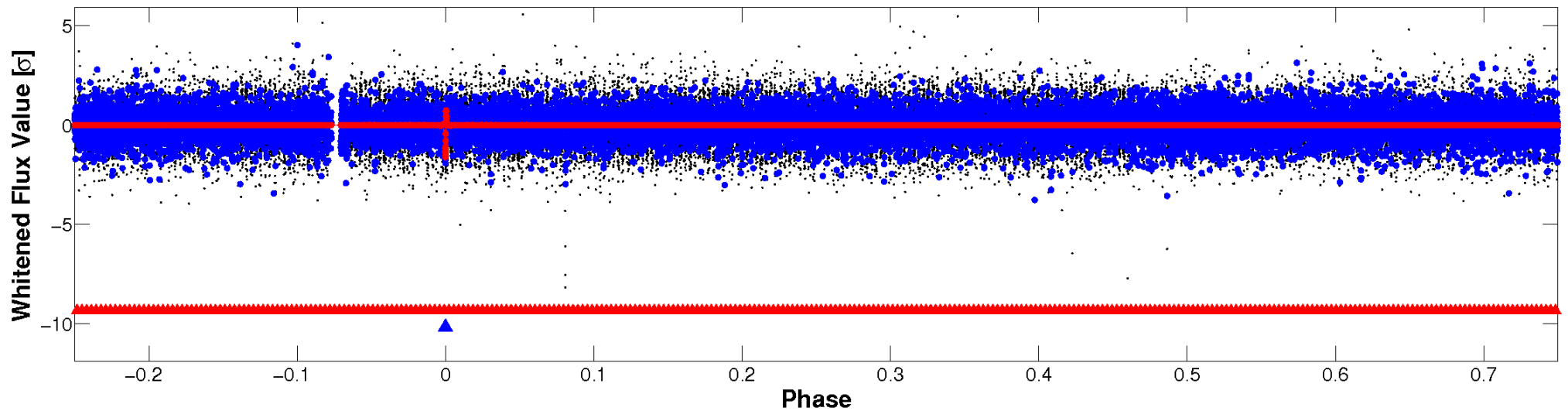


# Non-Whitened Vs. Whitened Light Curve

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

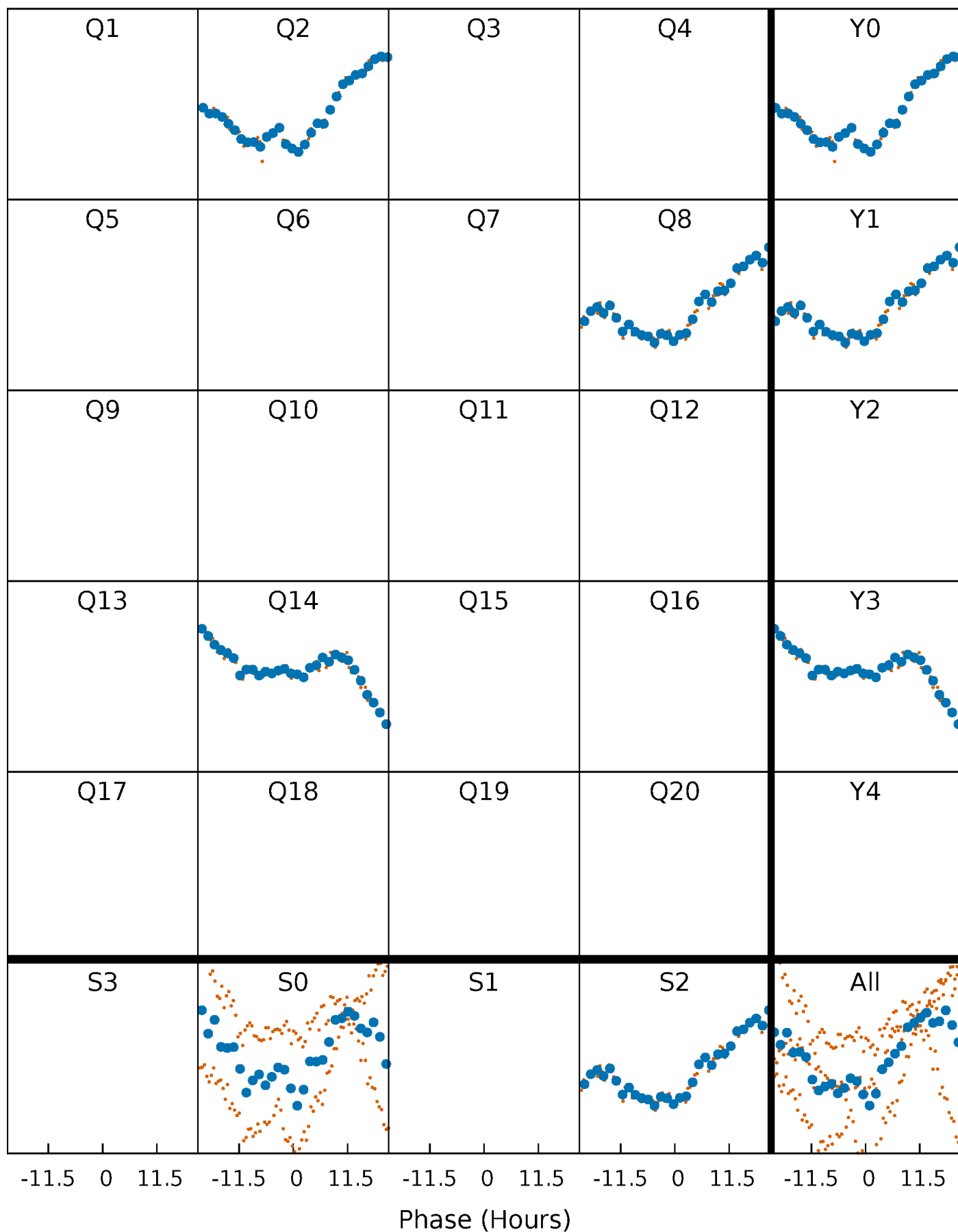


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



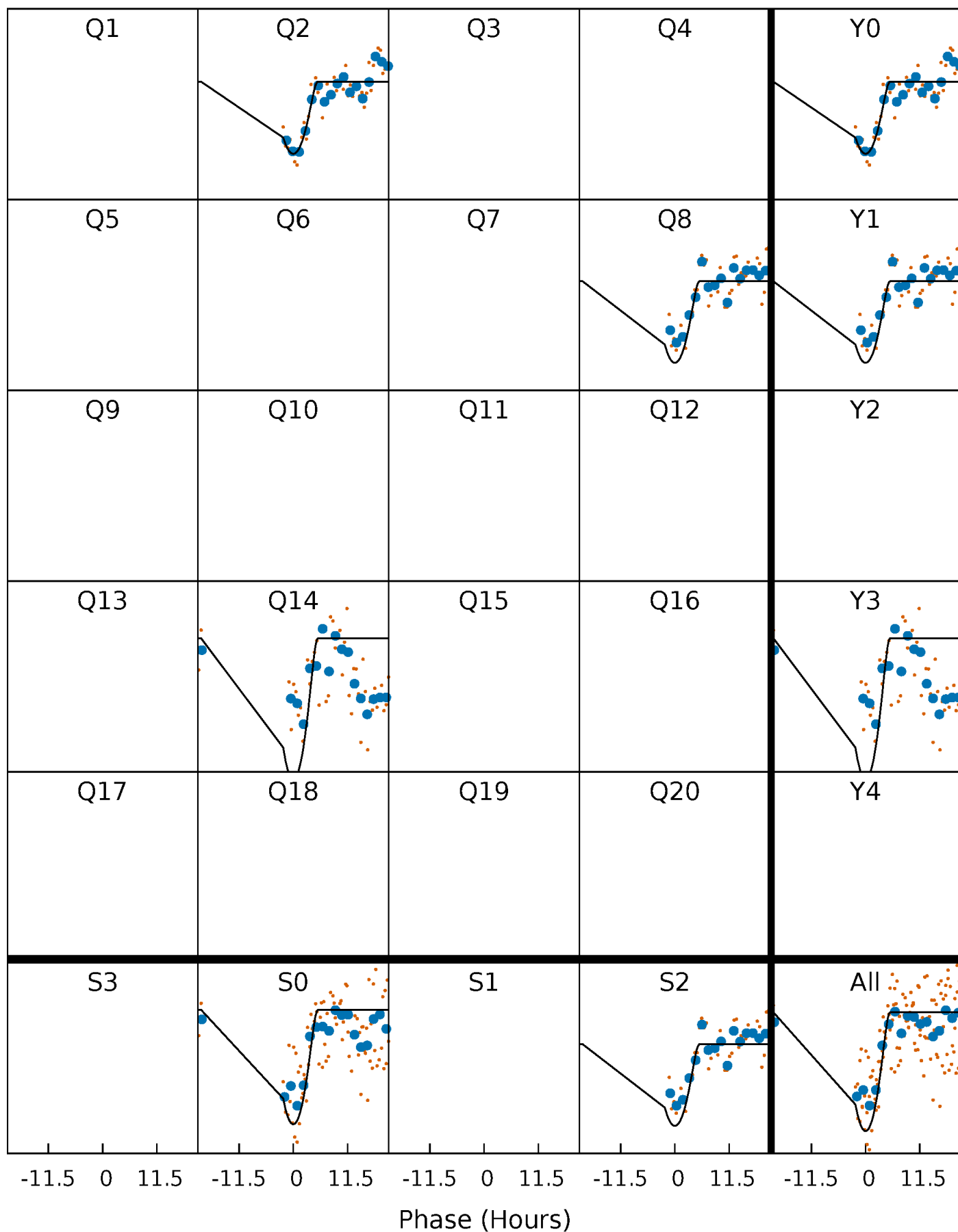
# PDC Quarter-Phased Transit Curves

TCE 005386872-02   P=561.632664 Days    $T_0=209.394342$  (BKJD)



# DV Quarter-Phased Transit Curves

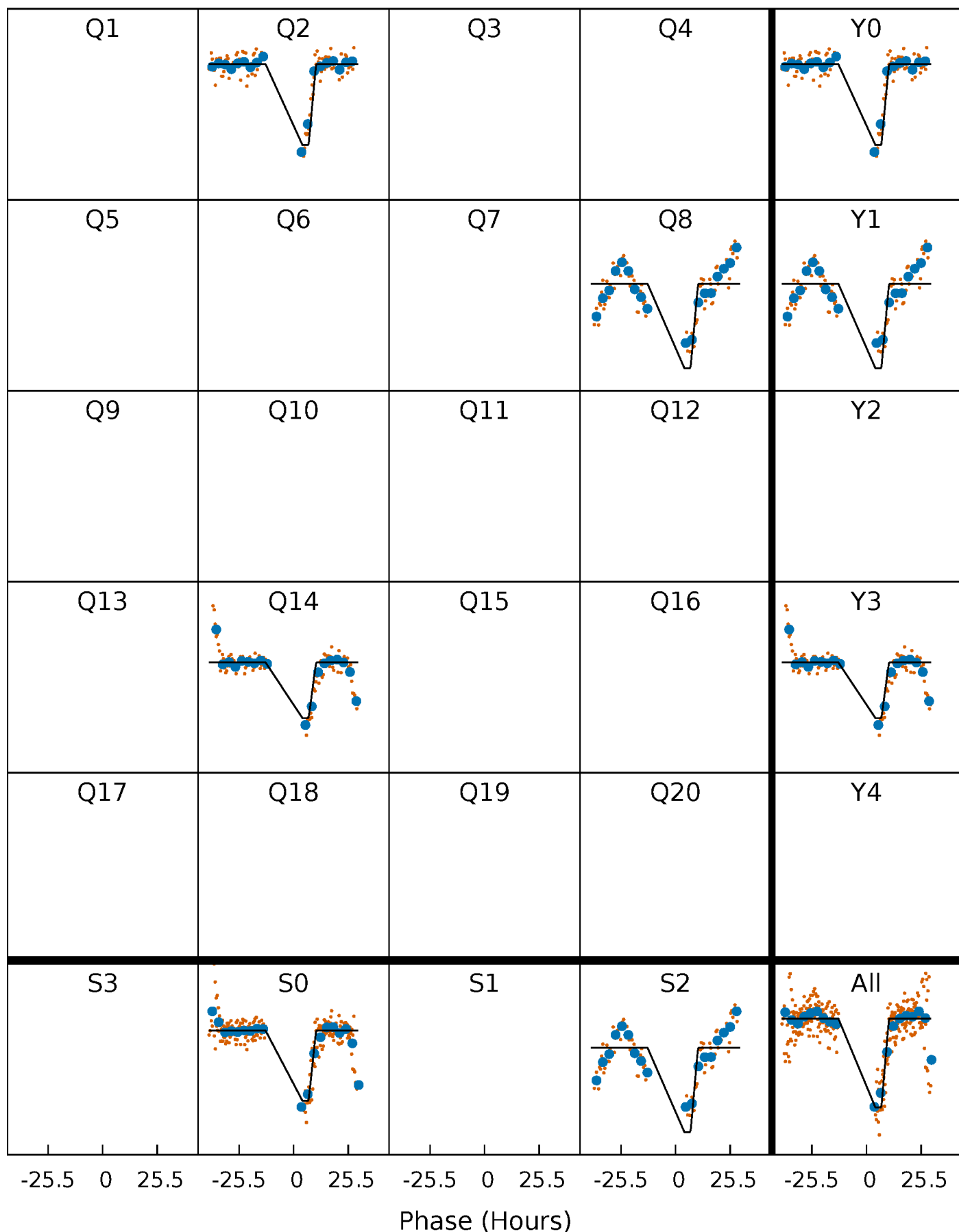
TCE 005386872-02 P=561.632664 Days  $T_0=209.394342$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

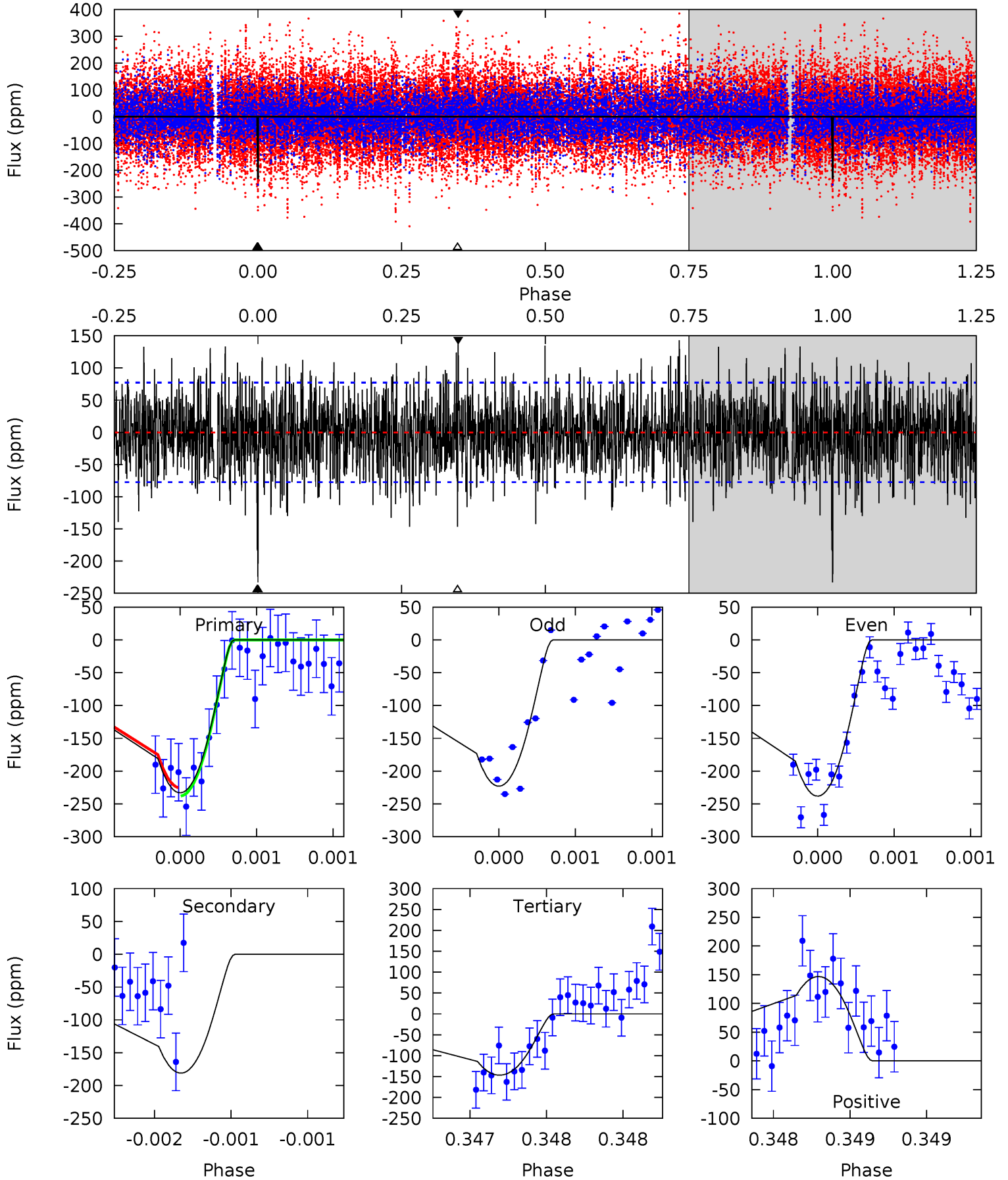
TCE 005386872-02 P=561.630019 Days  $T_0=209.131128$  (BKJD)



# DV Model-Shift Uniqueness Test

005386872-02, P = 561.632664 Days, E = 209.394342 Days

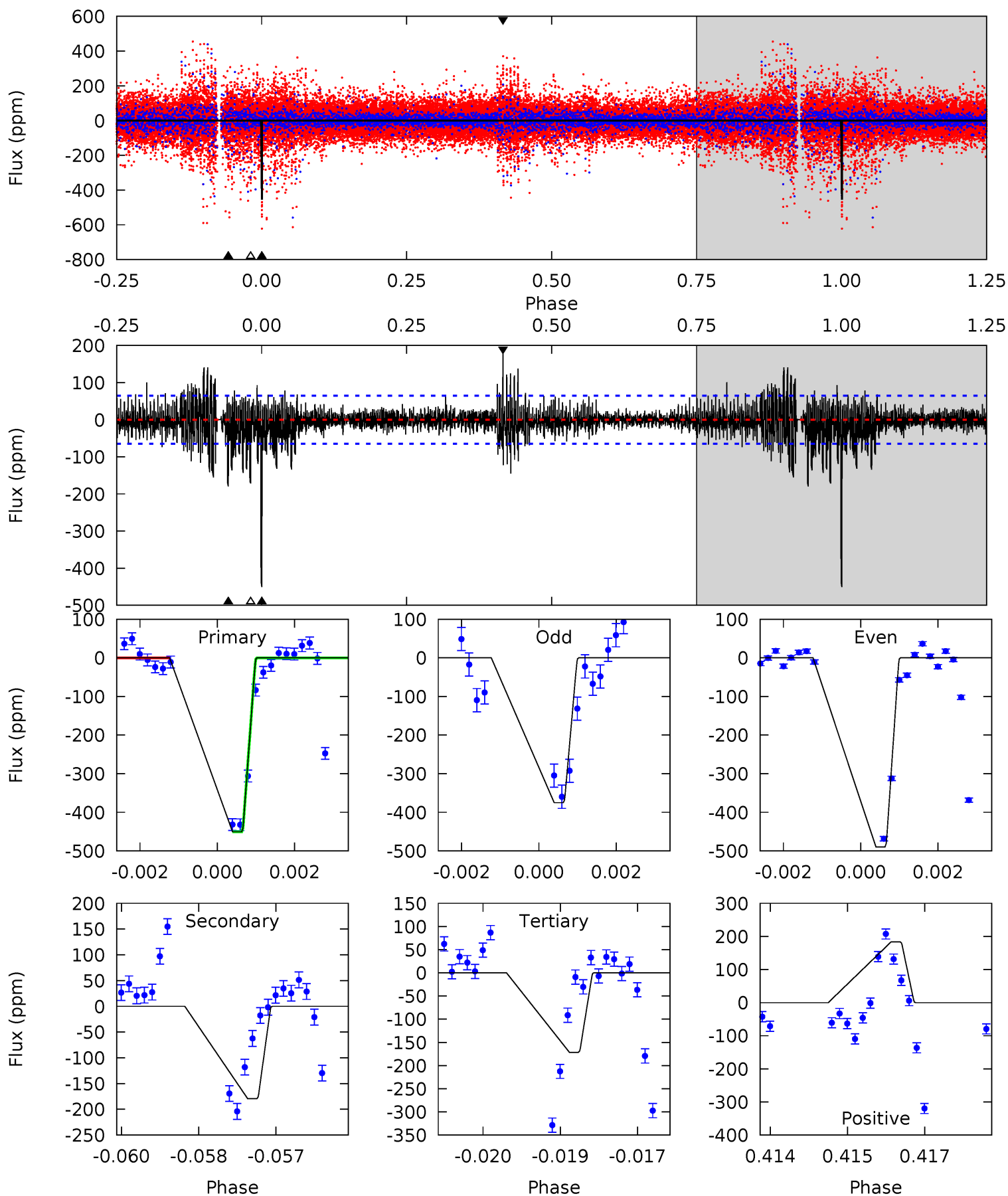
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.7	13.0	10.5	10.6	5.56	3.46	3.06	6.20	6.20	2.47	2.47	0.53	1.02	0.39	0.39



# Alt Model-Shift Uniqueness Test

005386872-02, P = 561.630019 Days, E = 209.131128 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
37.3	14.9	14.2	15.2	5.37	3.16	2.34	23.1	22.1	0.68	-0.34	4.51	1.08	0.29	0



### Stellar Parameters For KIC 005386872

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6514^{+188}_{-236}$	$3.787^{+0.552}_{-0.138}$	$-0.720^{+0.300}_{-0.300}$	$2.278^{+0.511}_{-1.193}$	$1.158^{+0.153}_{-0.241}$	$0.138^{+0.923}_{-0.056}$
	+3%/-4%	+15%/-4%	+42%/-42%	+22%/-52%	+13%/-21%	+668%/-40%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005386872-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-181 \pm 14$	$5.51^{+3.84}_{-3.02}$	$501^{+41}_{-76}$	$4897^{+2027}_{-798}$	$6652^{+23513}_{-4410}$
Alt.	$-180 \pm 12$	$4.86^{+3.80}_{-2.60}$	$494^{+41}_{-66}$	$5085^{+2293}_{-897}$	$8165^{+30219}_{-5605}$

$T_{max}$  = 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

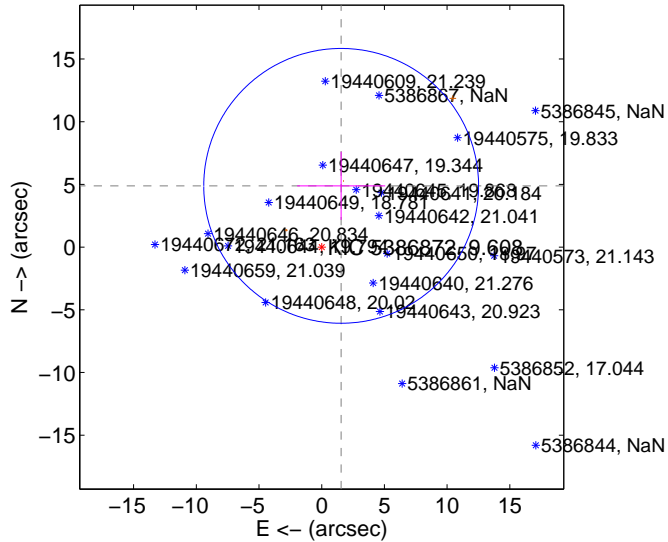
Supplemental centroid analysis for 005386872-02. **Kepler magnitude: 9.61.** Transit SNR 7.85

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

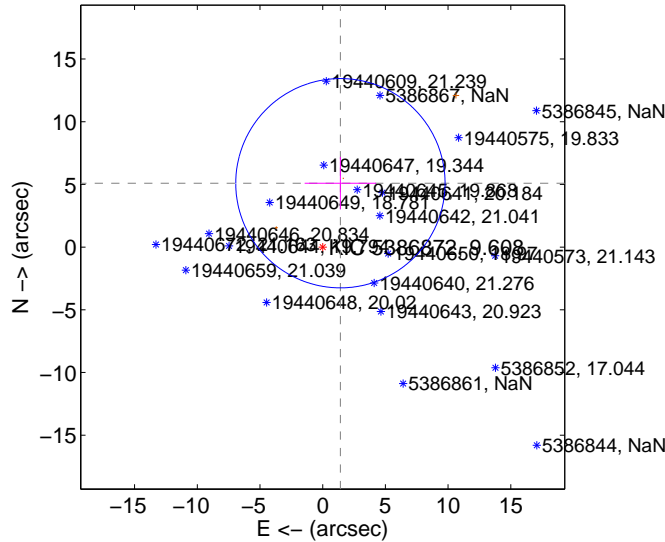
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.124 \pm 3.653$	1.40	$-1.552 \pm 3.512$	$4.884 \pm 2.718$
PRF-fit source offset from KIC position	$5.287 \pm 2.782$	1.90	$-1.413 \pm 2.849$	$5.095 \pm 2.097$
photometric centroid source offset	$2.25 \pm 1.37$	1.65	$1.19 \pm 1.00$	$-1.91 \pm 1.48$

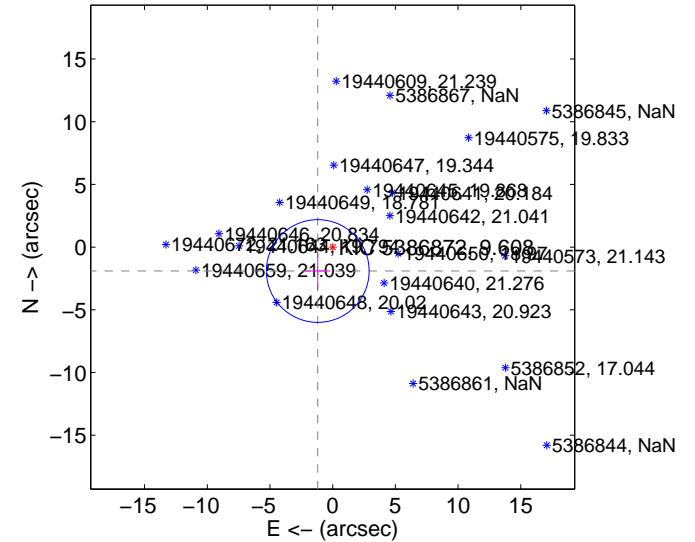
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



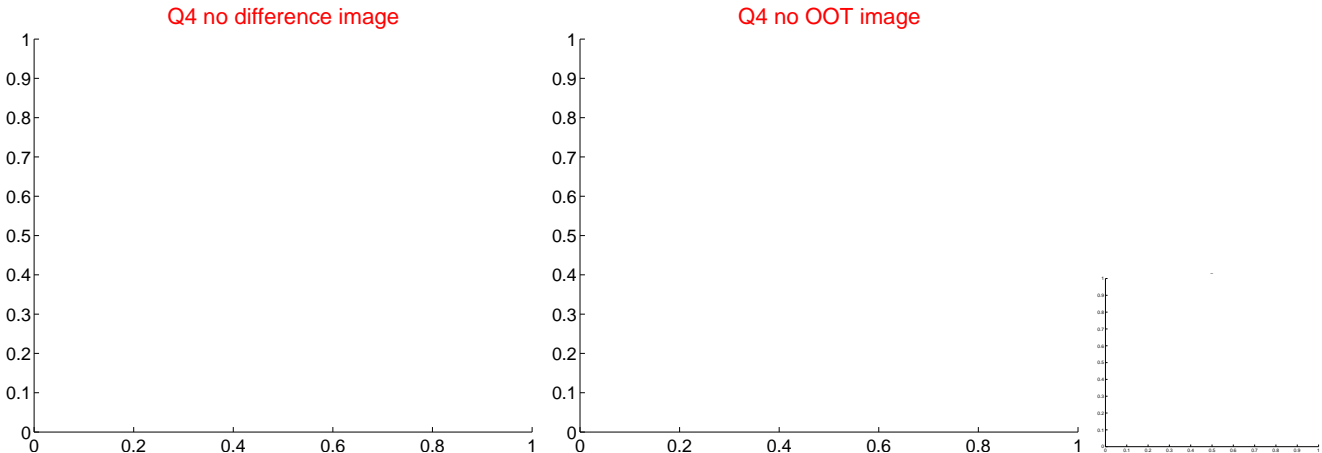
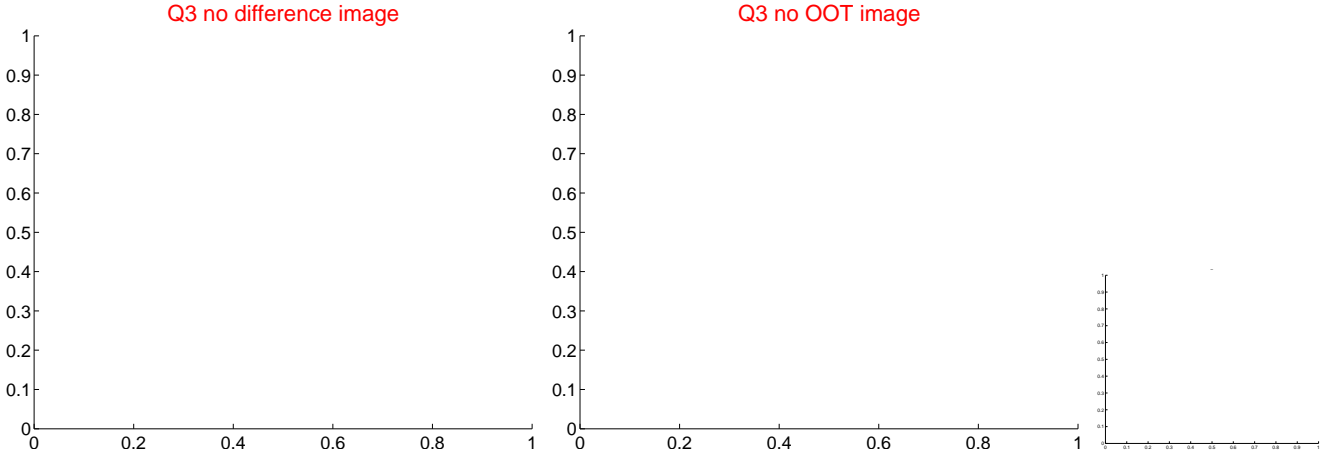
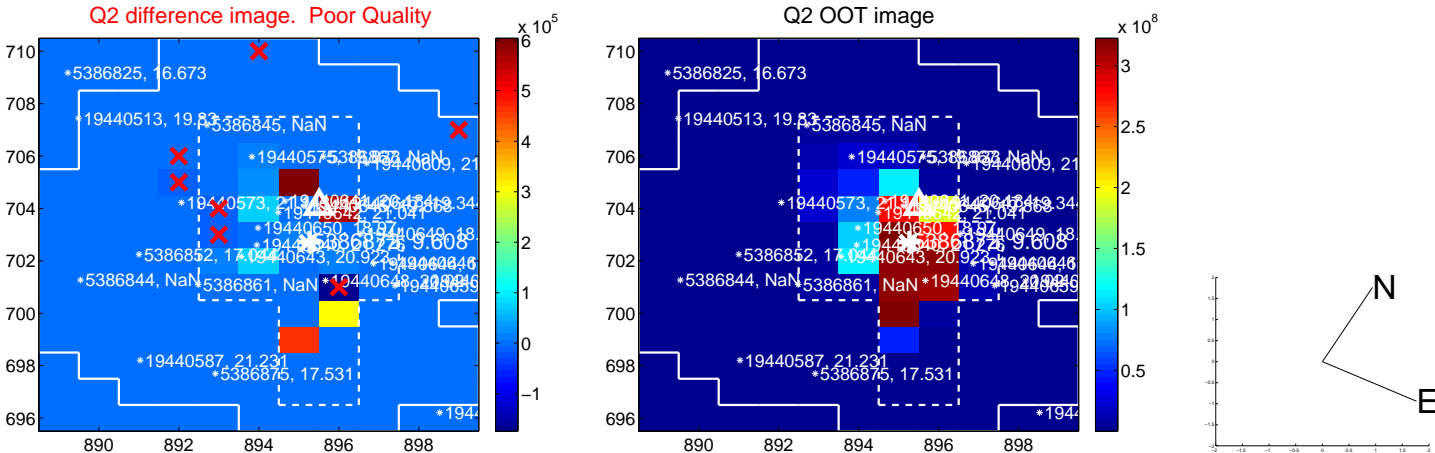
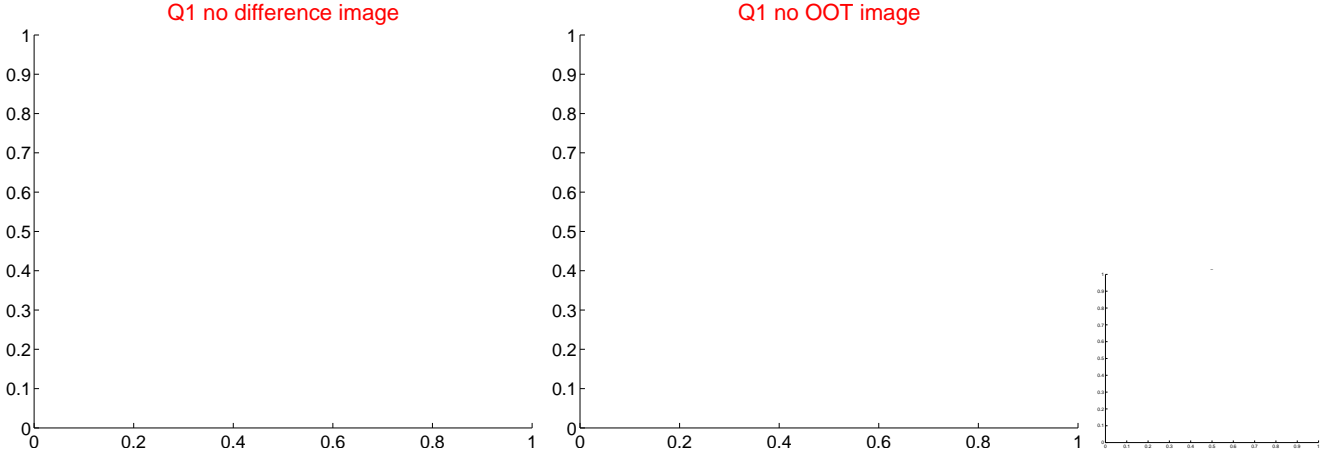
offset from photometric centroids



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.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



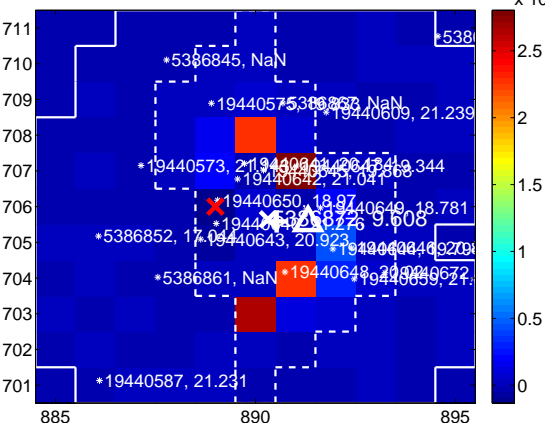
Q7 no difference image



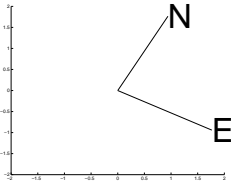
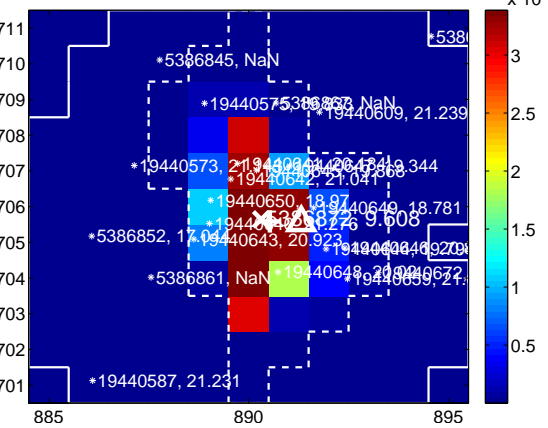
Q7 no OOT image



Q8 difference image. Poor Quality



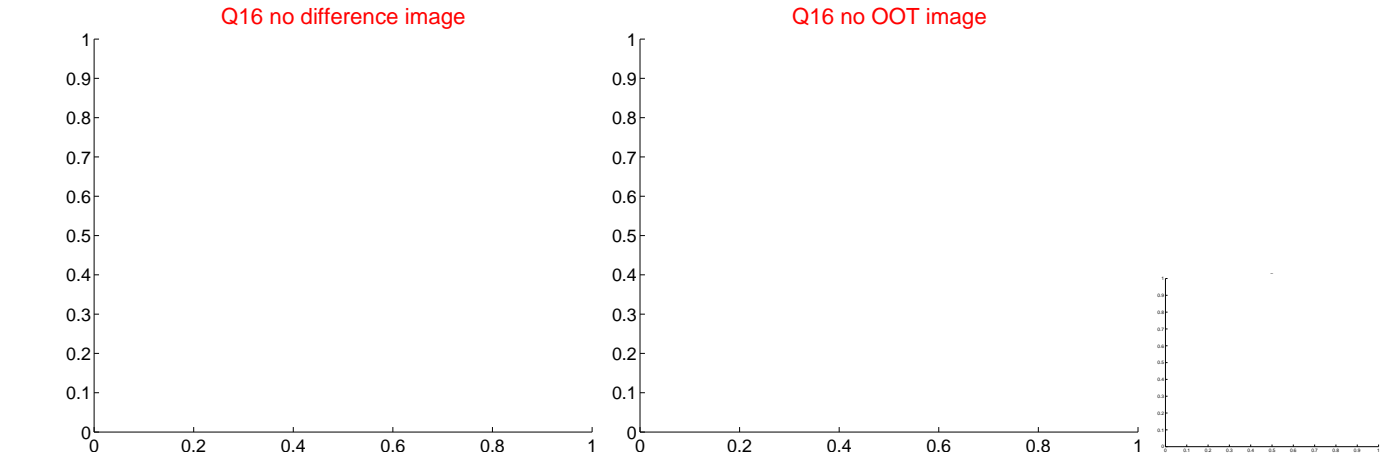
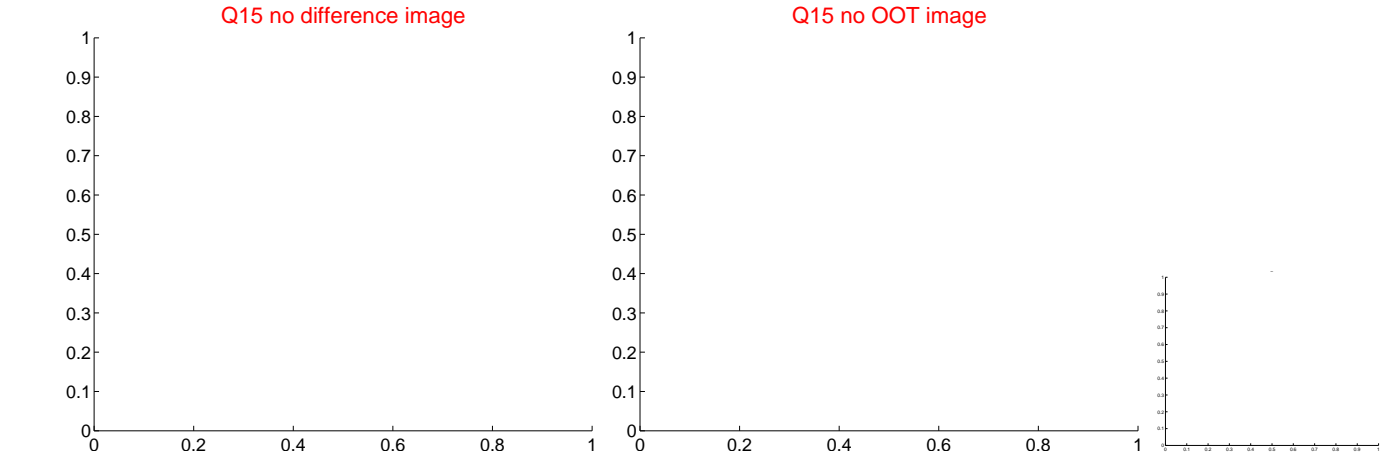
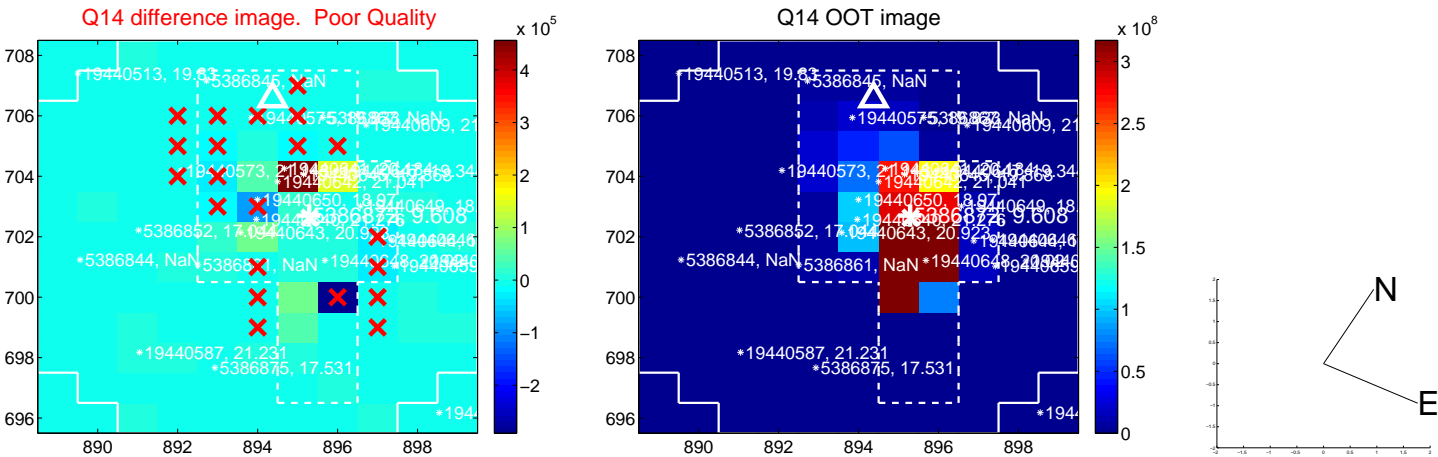
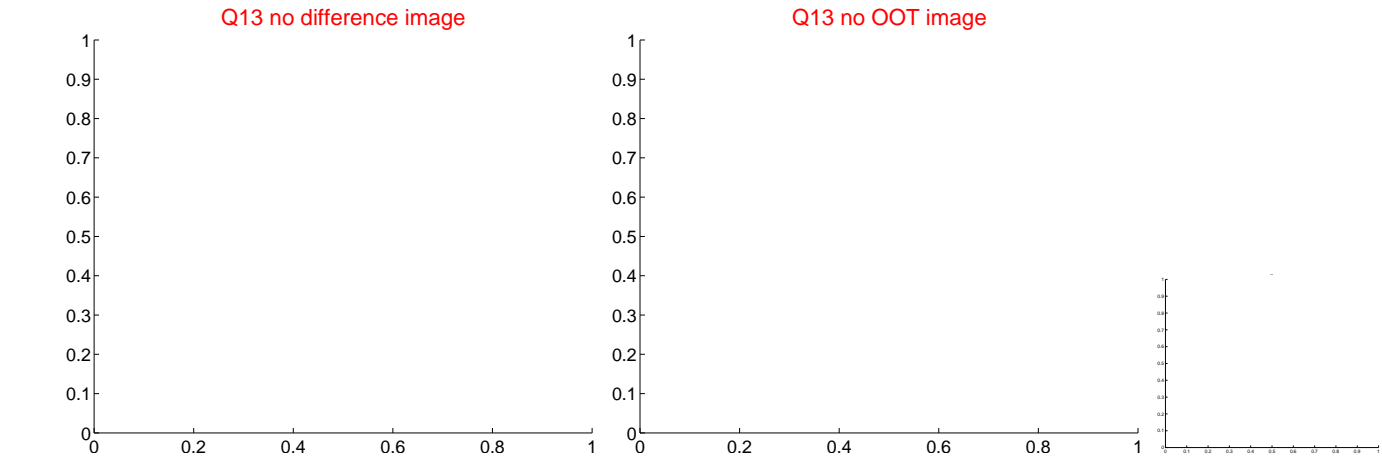
Q8 OOT image



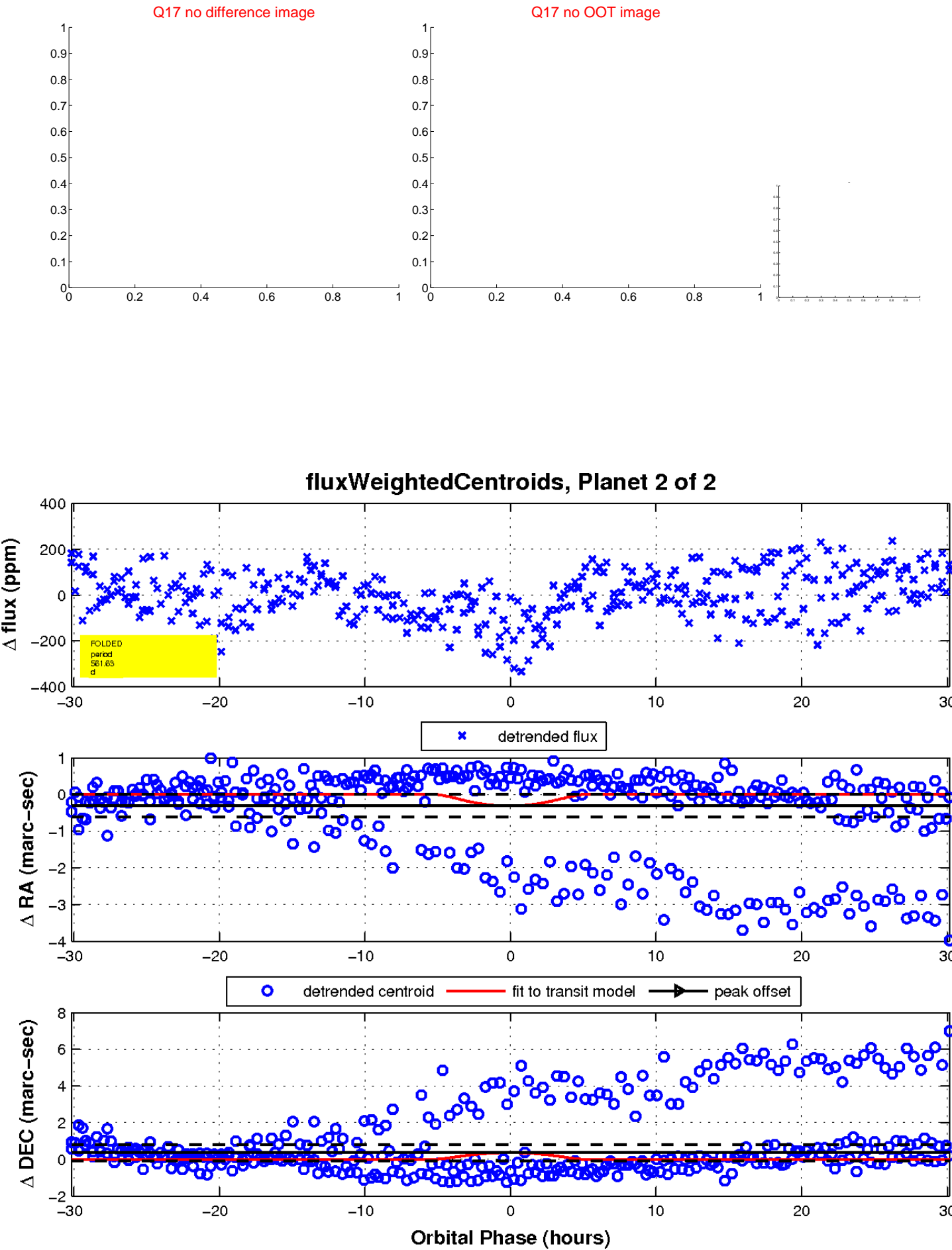
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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





UKIRT Image

Declination

