

# KIC 009873759

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009873759-01	OBS	4635.01	4.994578	136.211284	89.4	3.275	15.1	15.2	0.82	5406	0.93	167.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009873759-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH

**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.

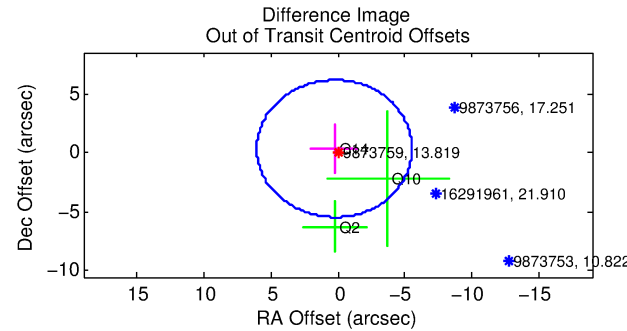
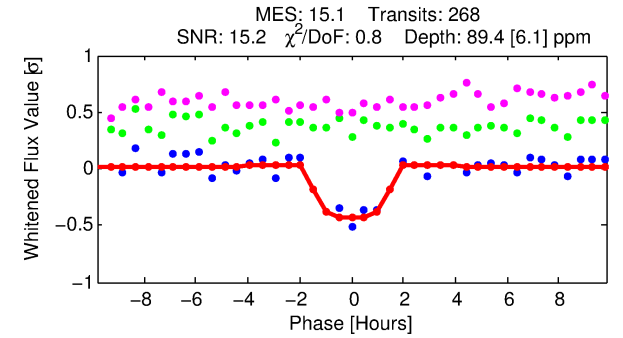
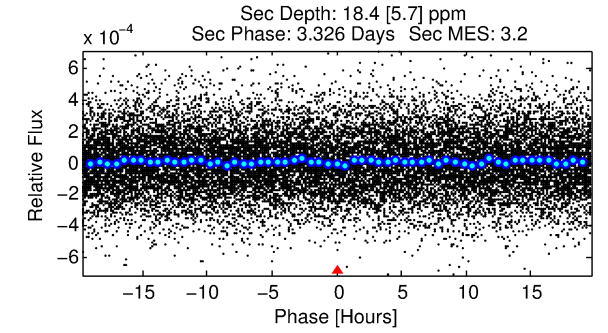
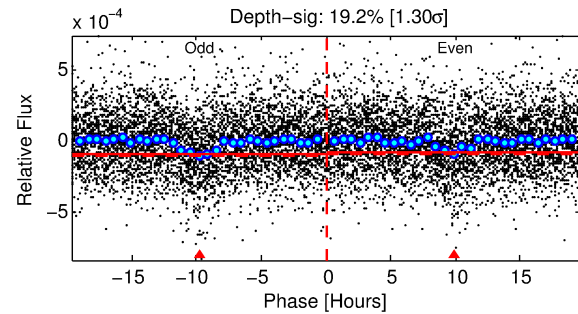
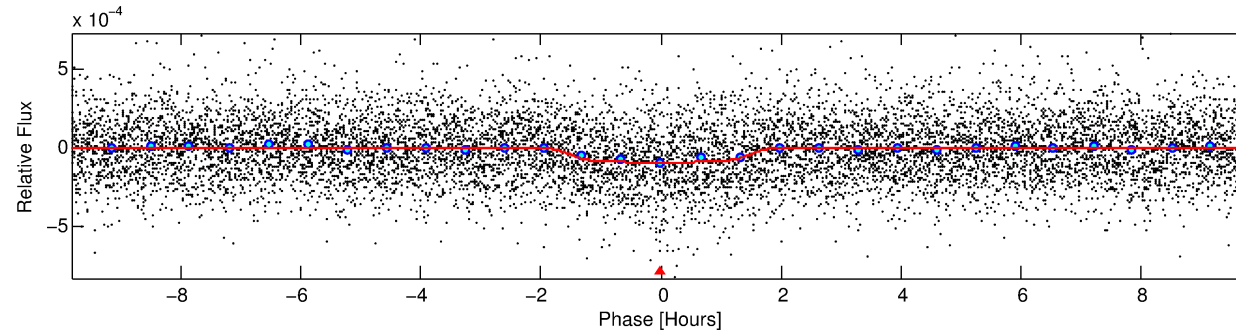
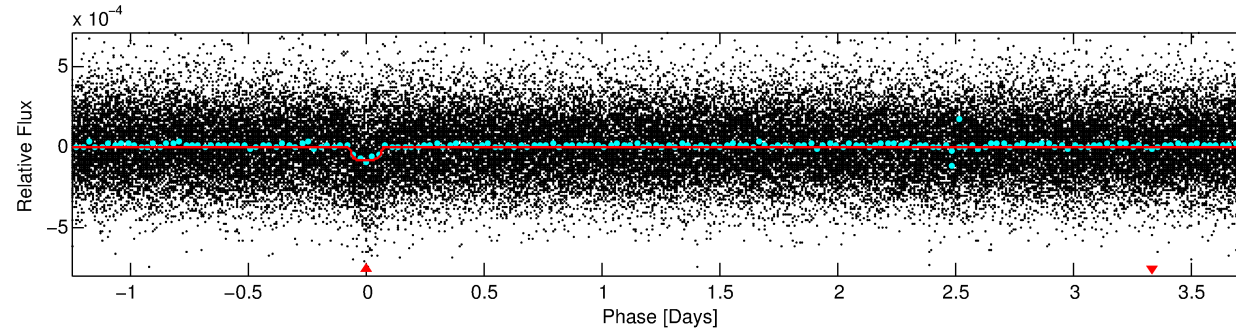
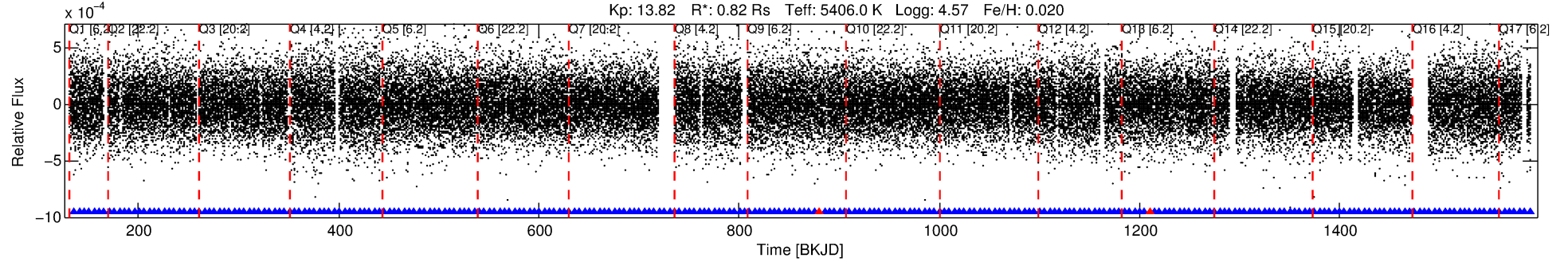
## Ephemeris Match Information For 009873759-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009873759-01	9873759	7241.01	9873869	1:1	324.1	82	1	13.04	13.82	2931.70	Col-Anomaly	0	1.97	1.50

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 9873759 Candidate: 1 of 1 Period: 4.995 d  
KOI: K04635.01 Corr: 0.896



## DV Fit Results:

Period = 4.99458 [0.00003] d  
Epoch = 136.2113 [0.0037] BKJD  
Rp/R\* = 0.0105 [0.0043]  
a/R\* = 5.36 [9.36]  
b = 0.90 [0.38]  
Seff = 167.46 [48.81]  
Teq = 917 [67] K  
Rp = 0.93 [0.43] Re  
a = 0.0554 [0.0098] AU  
Ag = 35.55 [32.35] [1.07 $\sigma$ ]  
Teffp = 3463 [763] K [3.32 $\sigma$ ]

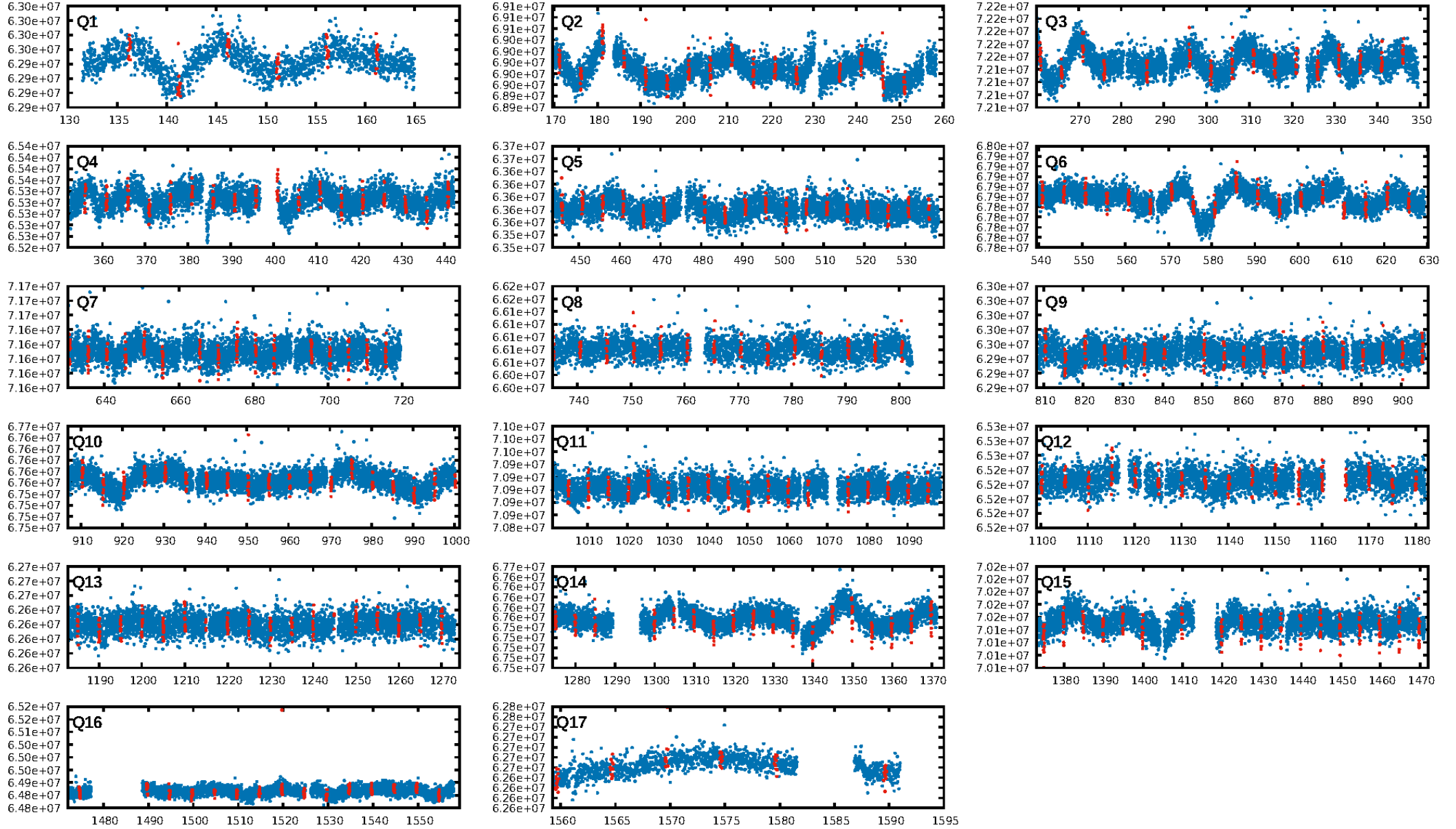
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.42e-50  
RollingBand-fgt: 0.99 [254/256]  
GhostDiagnostic-chr: 2.492  
Centroid-sig: 0.0%  
Centroid-so: 0.450 arcsec [0.51 $\sigma$ ]  
OotOffset-rm: 0.435 arcsec [0.23 $\sigma$ ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 10.880 arcsec [5.11 $\sigma$ ]  
KicOffset-st: 3/2/1/1 [7]  
DiffImageQuality-fgm: 0.29 [2/7]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 22:10:28 Z

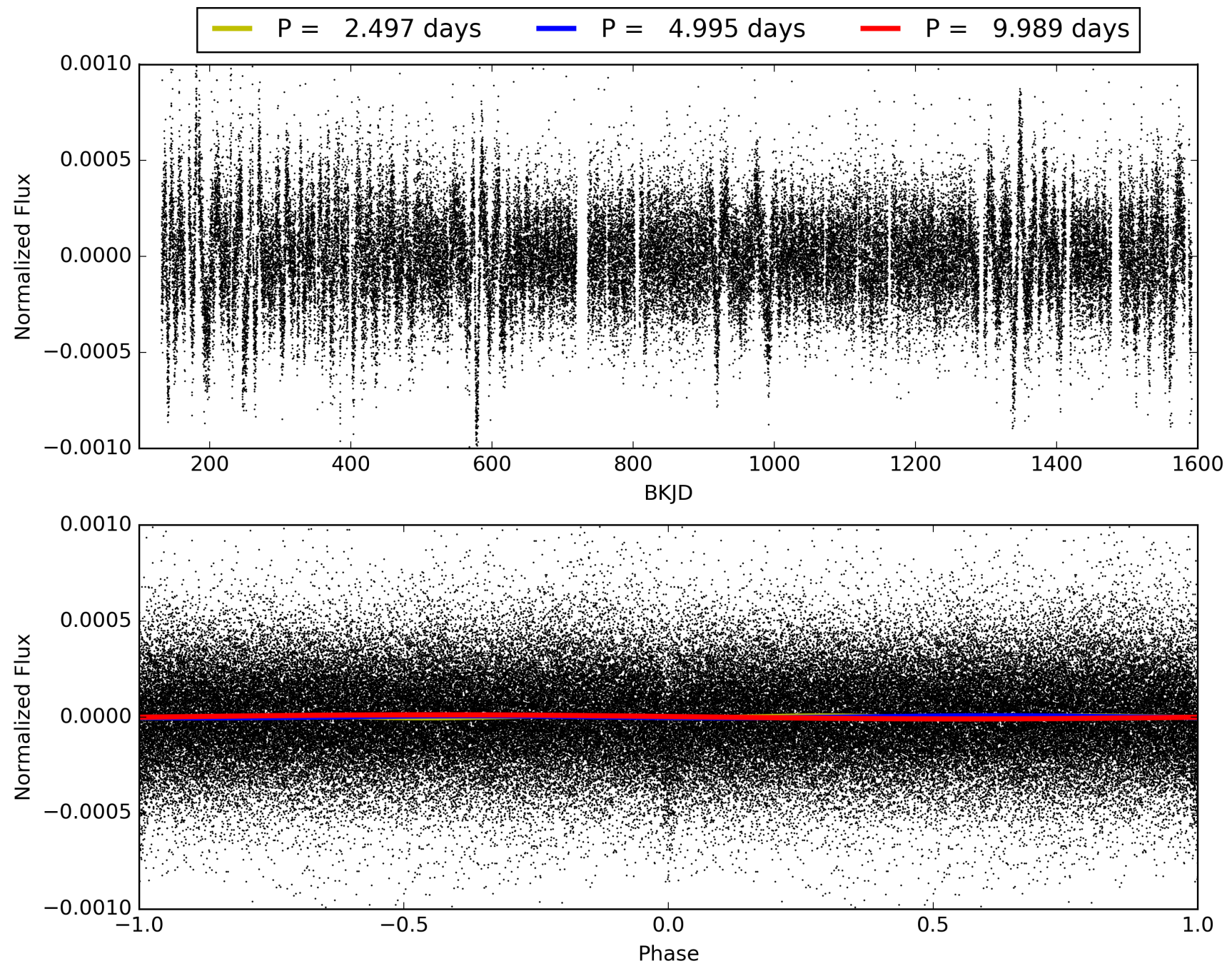
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009873759-01, PDC Light Curves



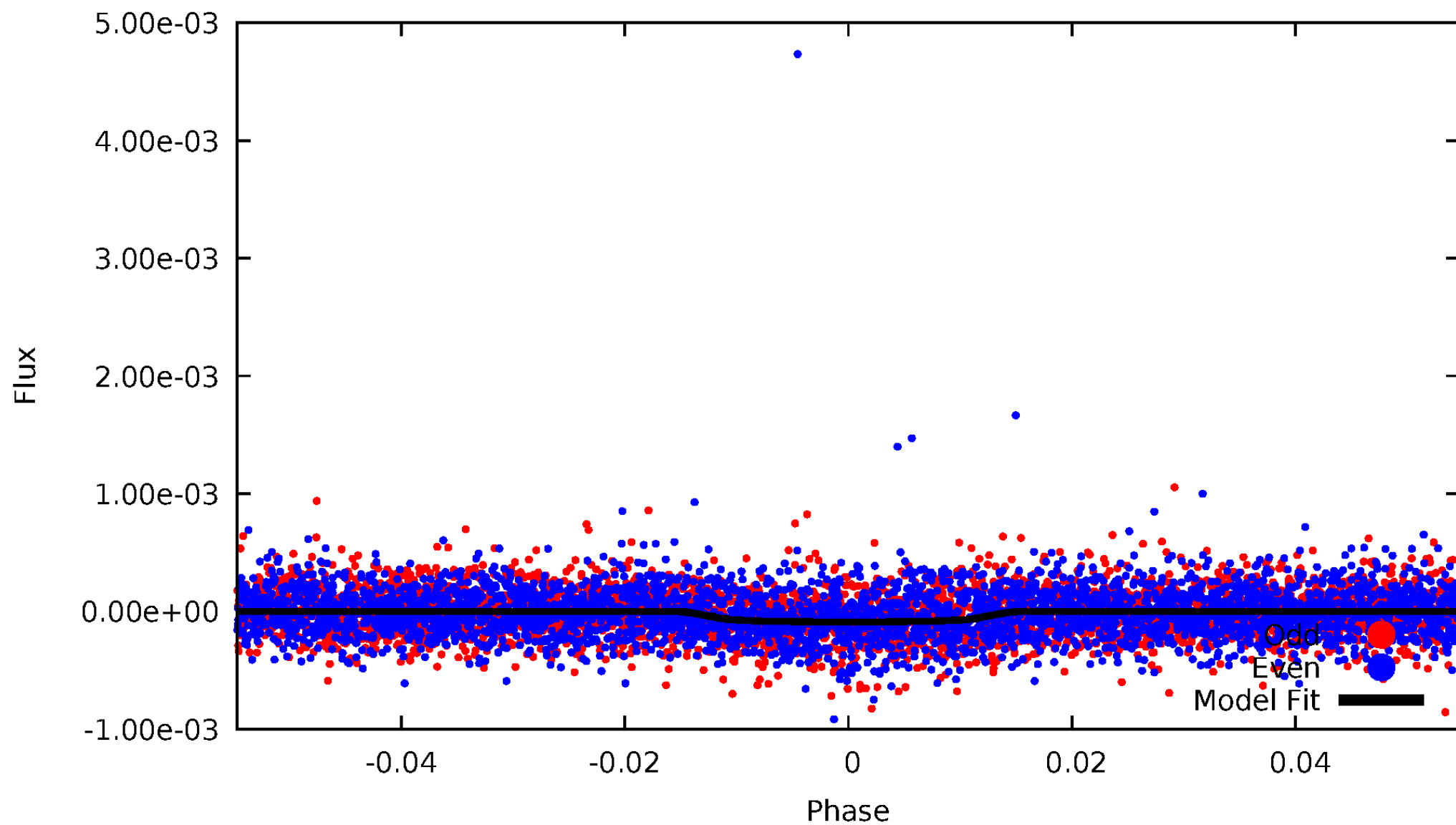


TCE 009873759-01



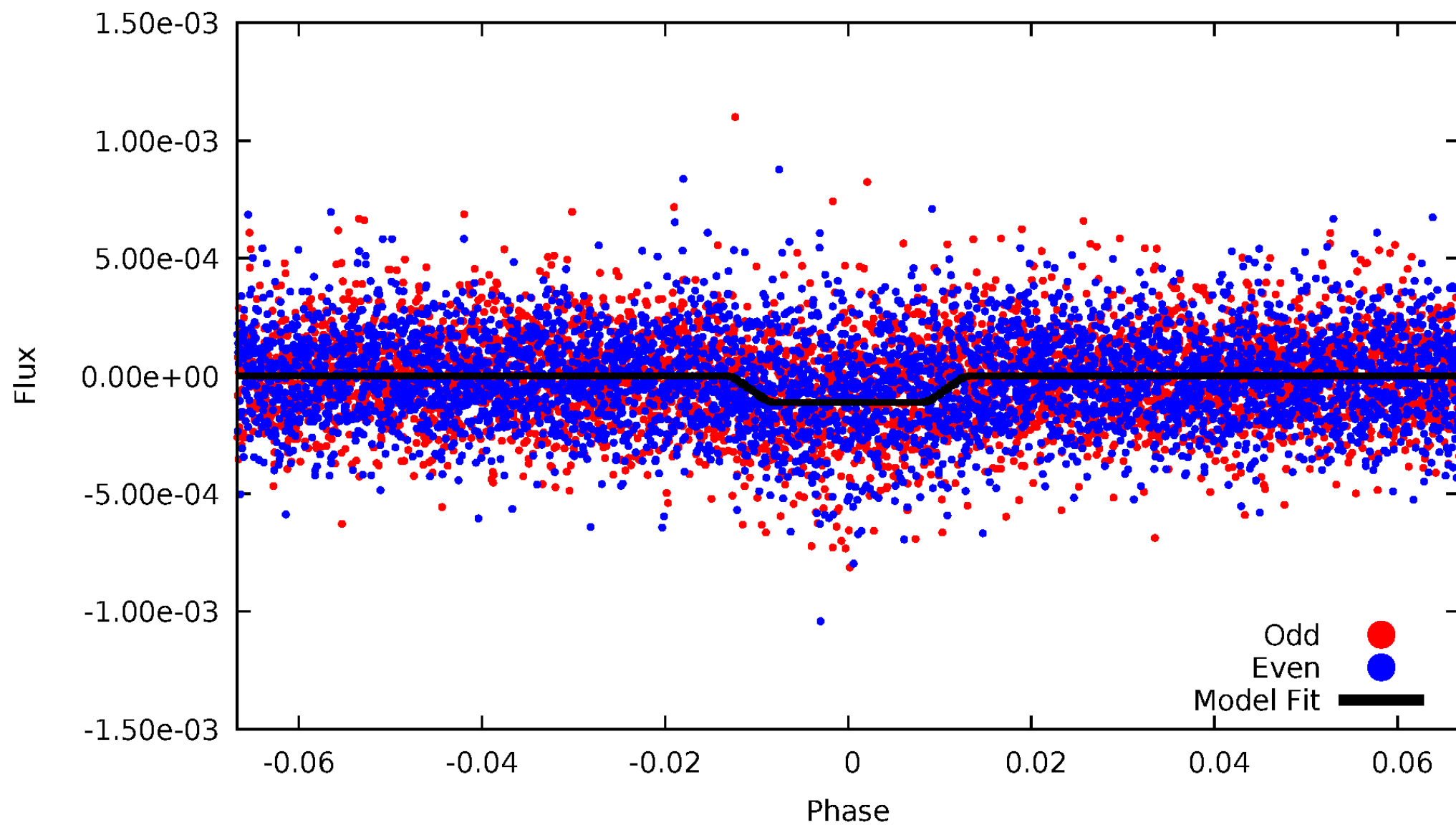
# DV Odd/Even

TCE 009873759-01

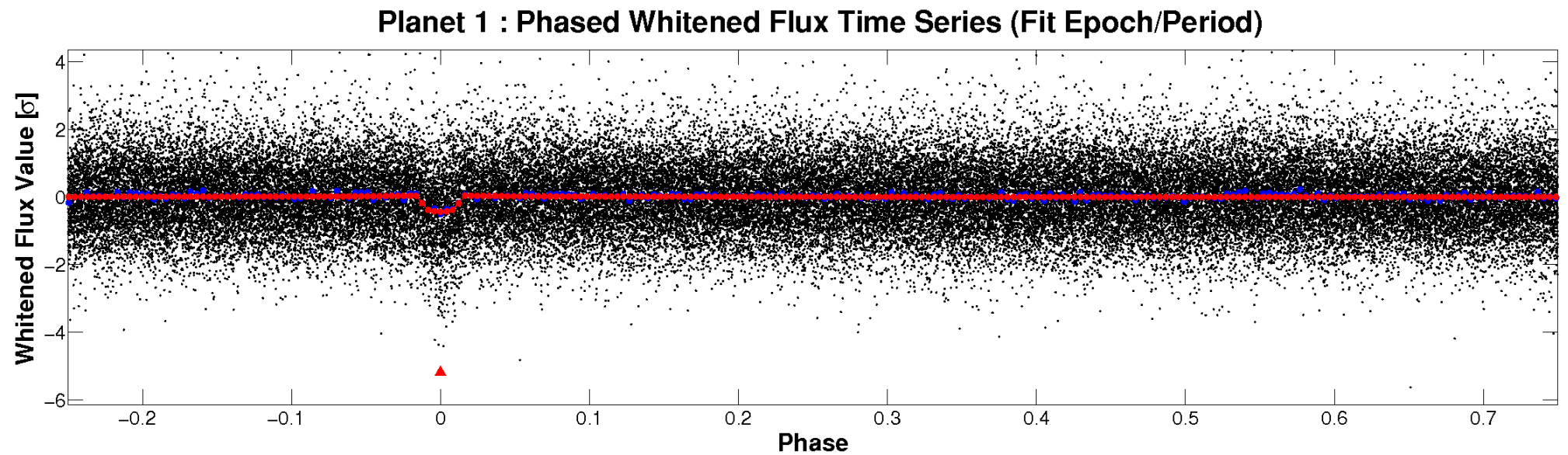
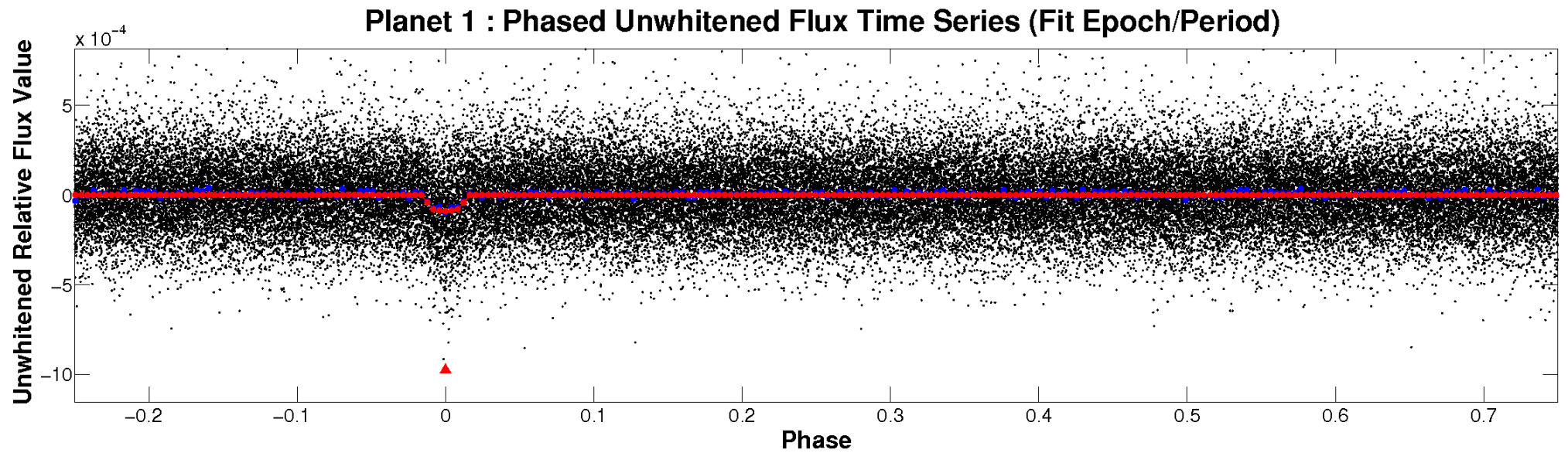


# ALT Odd/Even

TCE 009873759-01



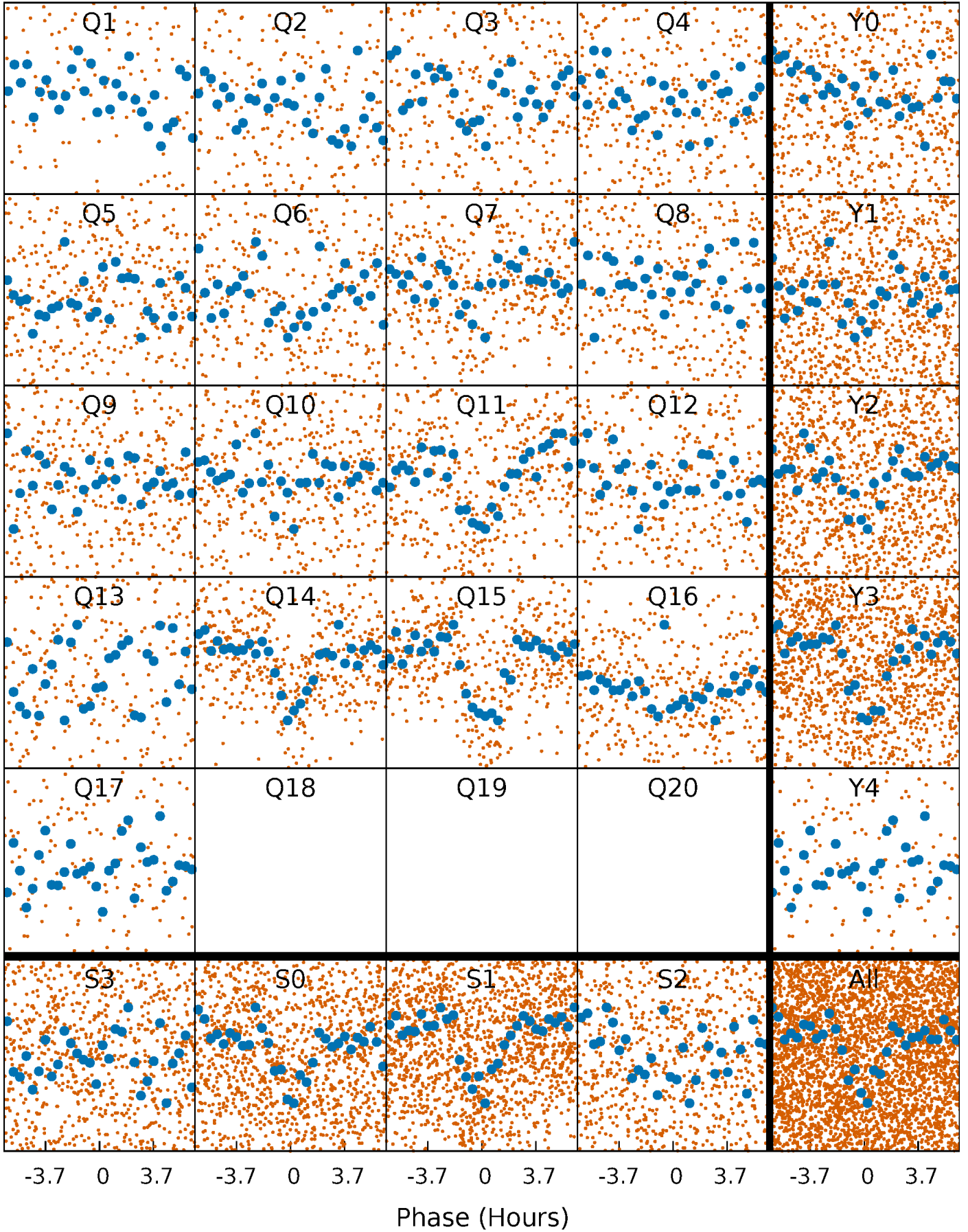
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

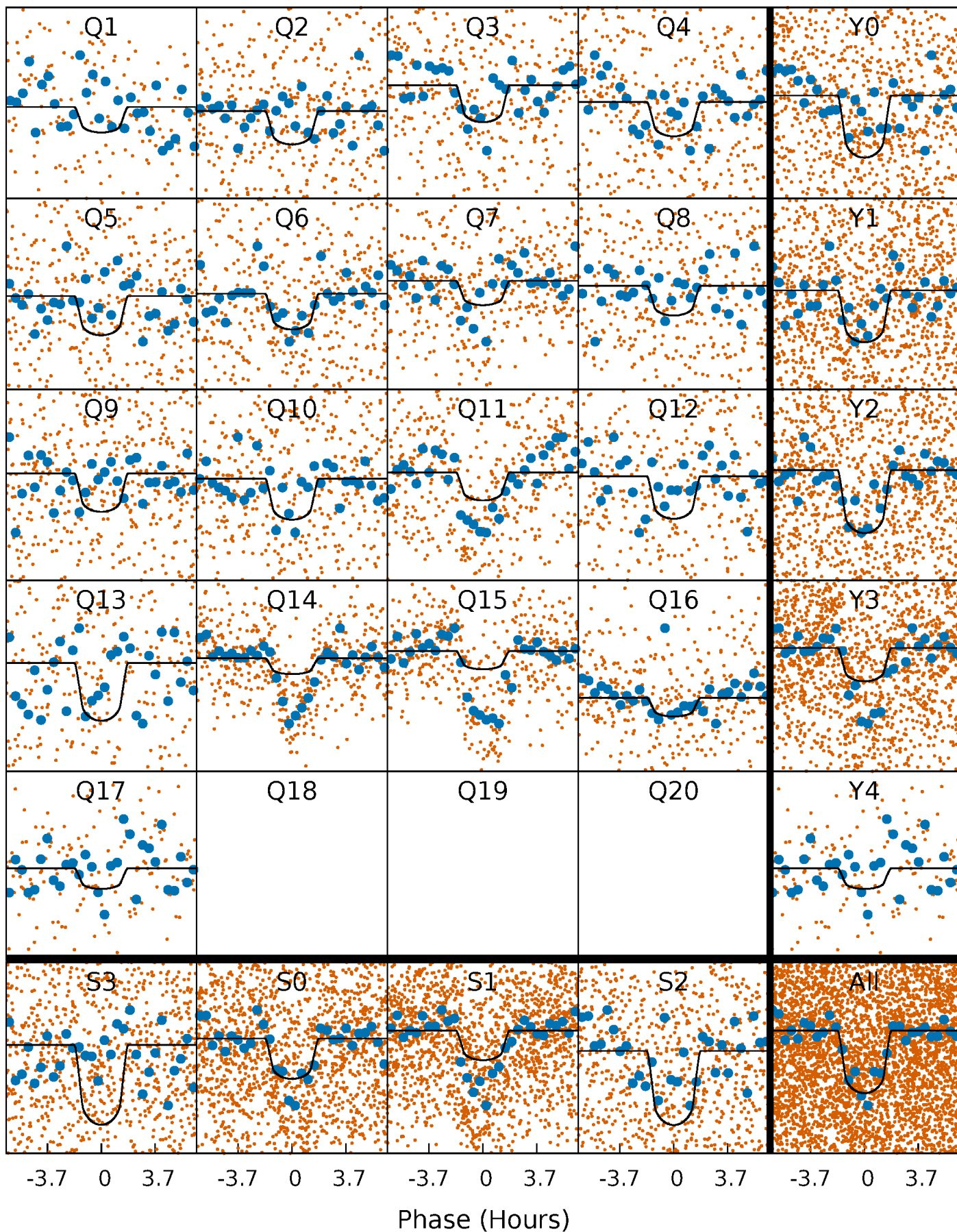
TCE 009873759-01 P= 4.994578 Days  $T_0=136.211284$  (BKJD)





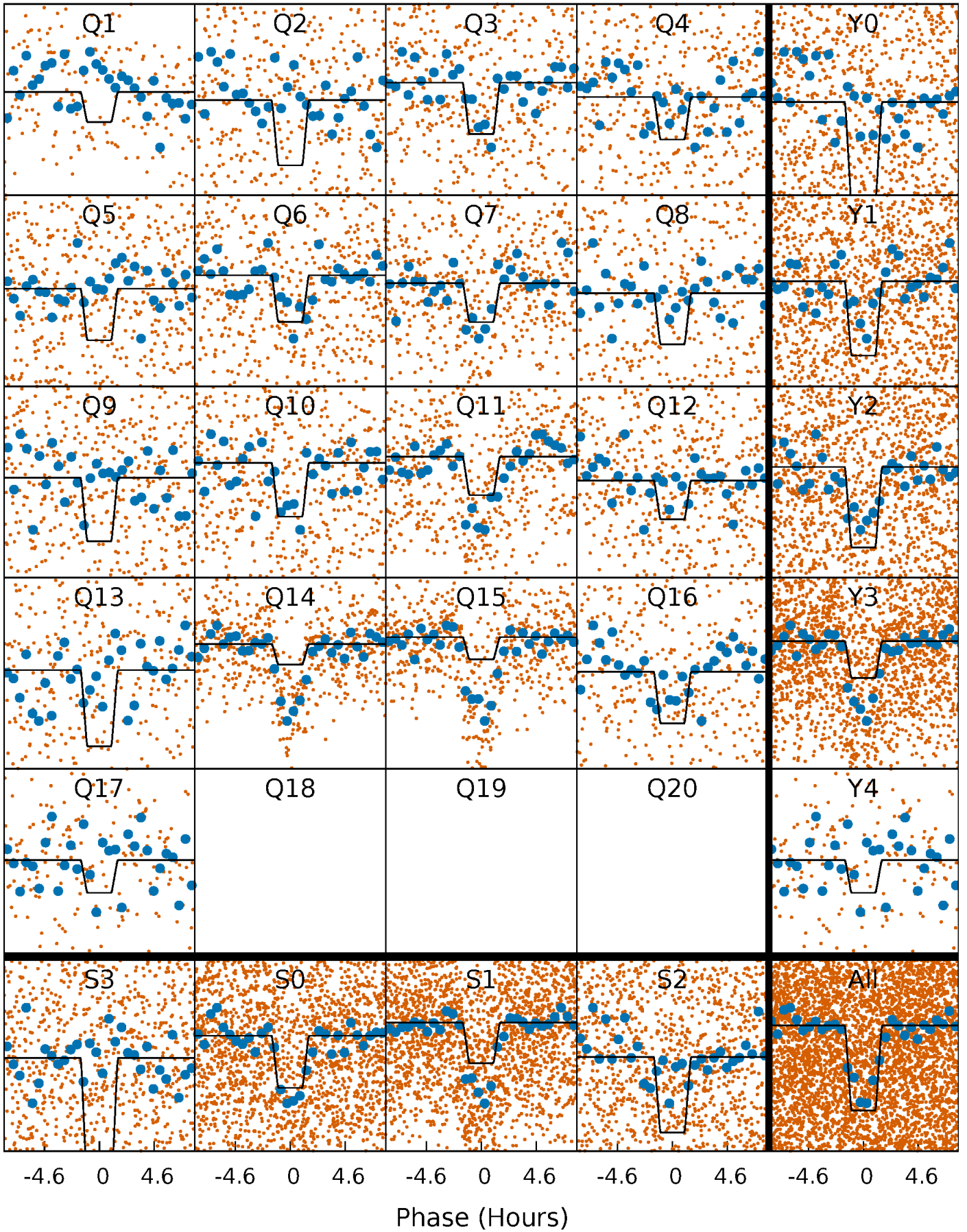
# DV Quarter-Phased Transit Curves

TCE 009873759-01   P= 4.994578 Days    $T_0=136.211284$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

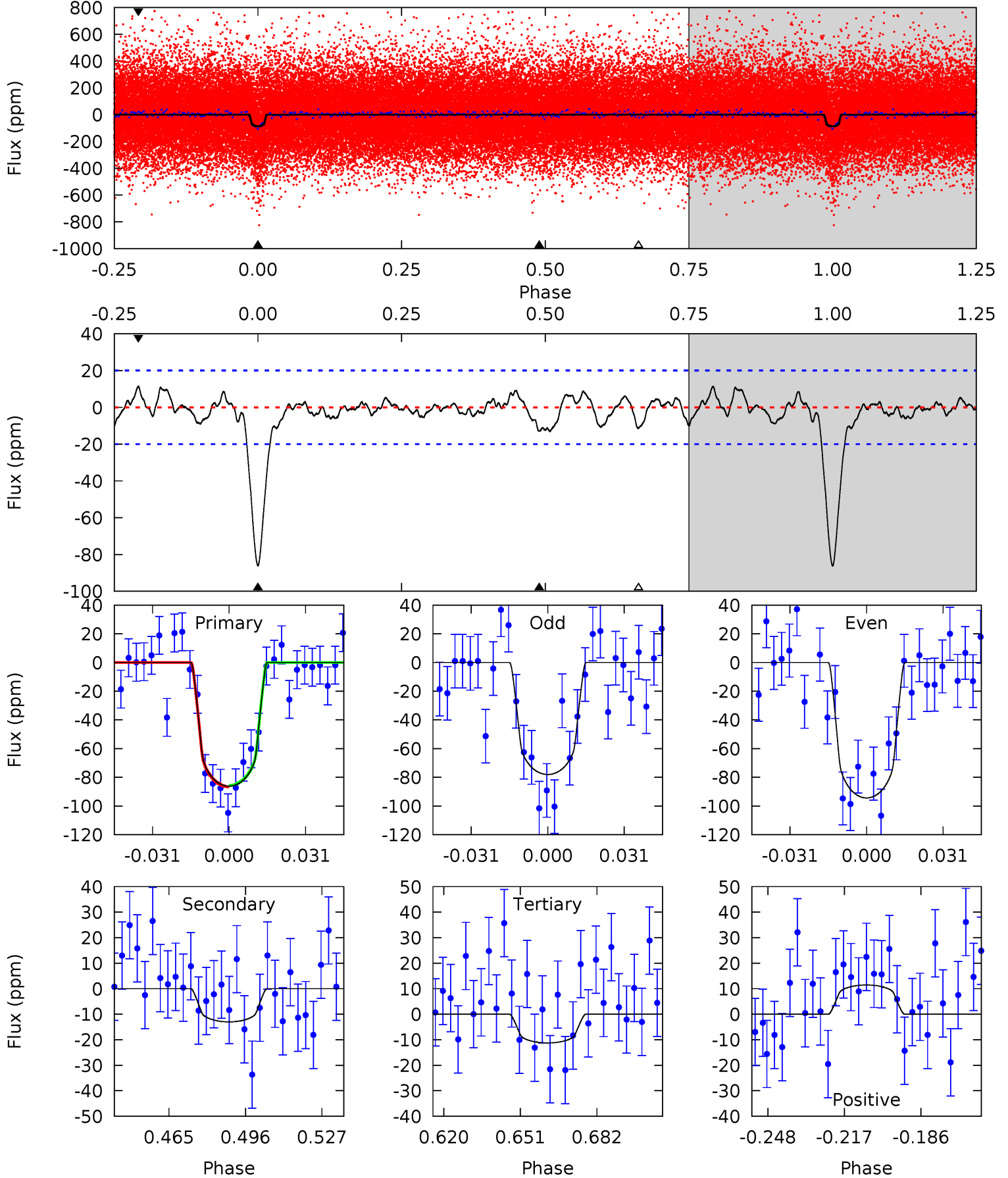
TCE 009873759-01 P= 4.994742 Days  $T_0=136.180179$  (BKJD)



# DV Model-Shift Uniqueness Test

009873759-01, P = 4.994578 Days, E = 131.216706 Days

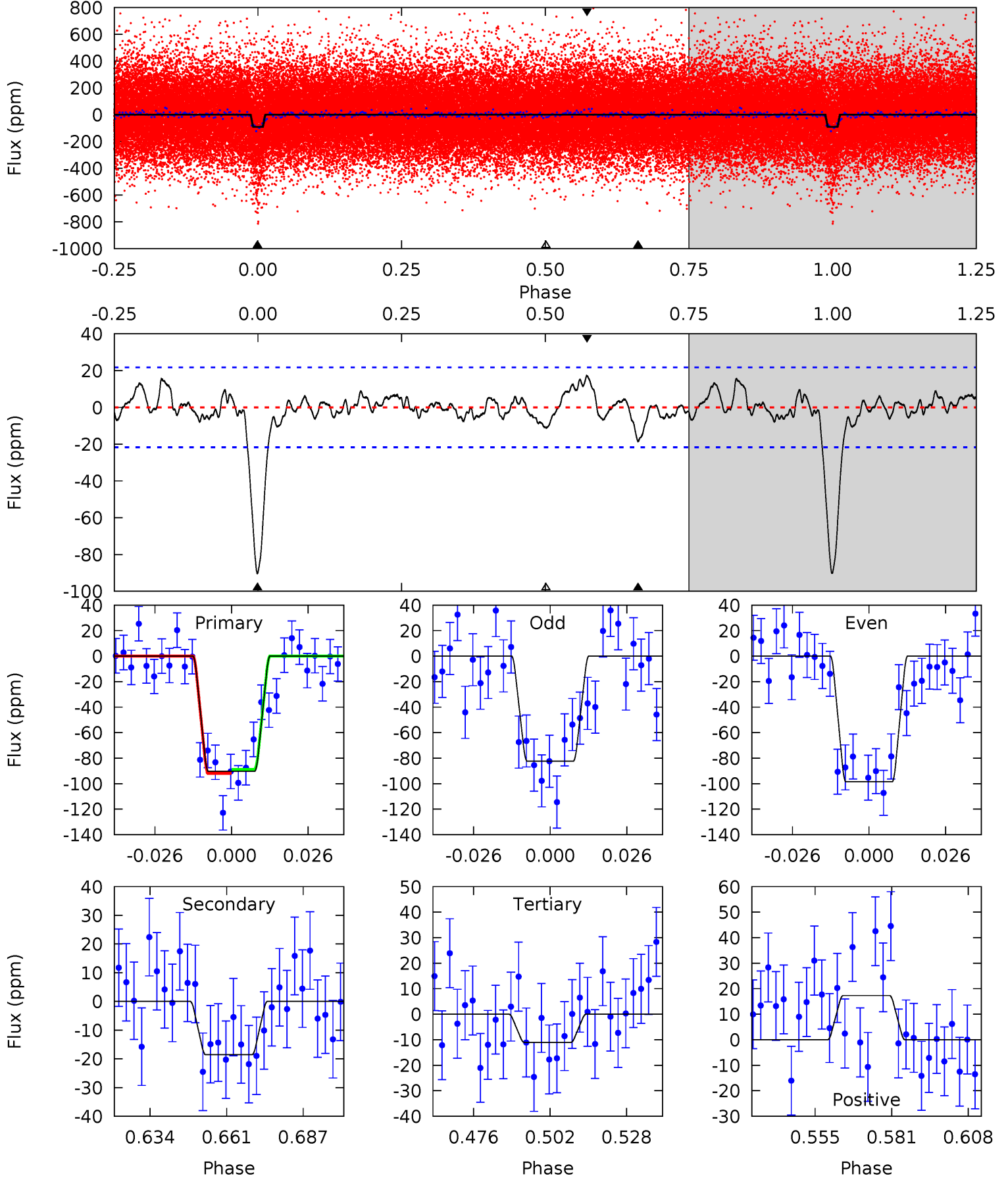
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.7	3.12	2.70	2.75	4.80	2.16	1.08	18.0	17.9	0.42	0.37	1.97	1.13	0.12	0.11



# Alt Model-Shift Uniqueness Test

009873759-01, P = 4.994742 Days, E = 131.185437 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
20.1	4.12	2.46	3.85	4.84	2.22	1.23	17.6	16.2	1.66	0.27	1.82	1.18	0.16	0.36





### Stellar Parameters For KIC 009873759

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5406^{+177}_{-160}$	$4.569^{+0.034}_{-0.144}$	$0.020^{+0.250}_{-0.300}$	$0.819^{+0.169}_{-0.060}$	$0.907^{+0.073}_{-0.097}$	$2.328^{+0.430}_{-0.979}$
	+3%/-3%	+1%/-3%	+1250%/-1500%	+21%/-7%	+8%/-11%	+18%/-42%
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 009873759-01 / KOI 4635.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-13 \pm 4$	$0.99^{+0.40}_{-0.40}$	$1302^{+72}_{-54}$	$3562^{+696}_{-415}$	$21^{+39}_{-11}$
Alt.	$-19 \pm 4$	$0.97^{+0.41}_{-0.40}$	$1306^{+63}_{-57}$	$3806^{+821}_{-446}$	$31^{+60}_{-16}$

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

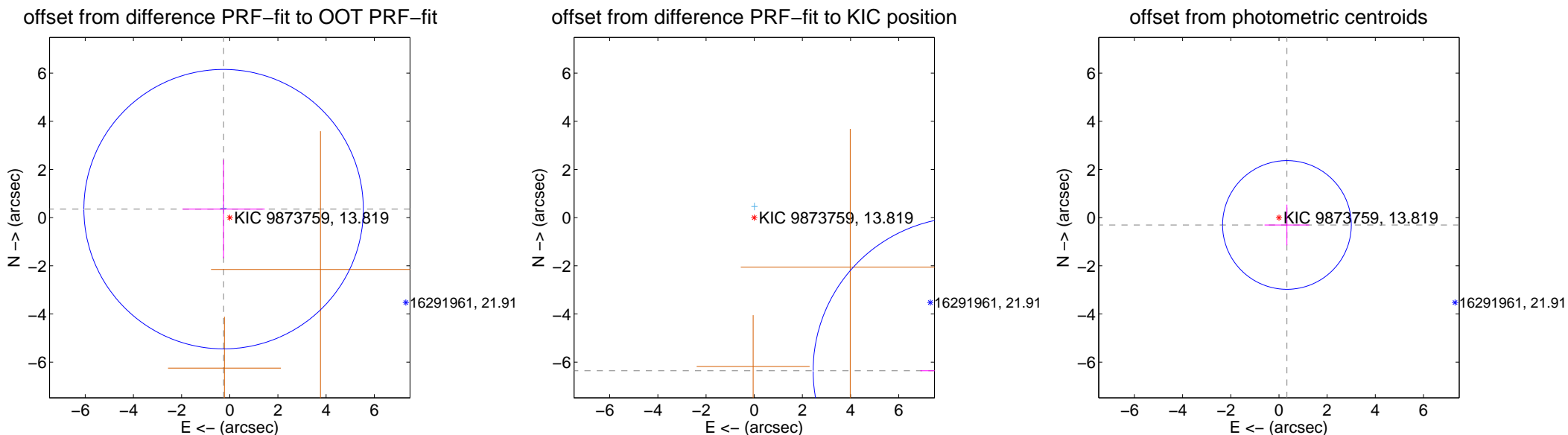
## DV Centroid Data

Supplemental centroid analysis for 009873759-01. Kepler magnitude: 13.82. Transit SNR 15.15

There are 2 quarters with good PRF difference image offsets

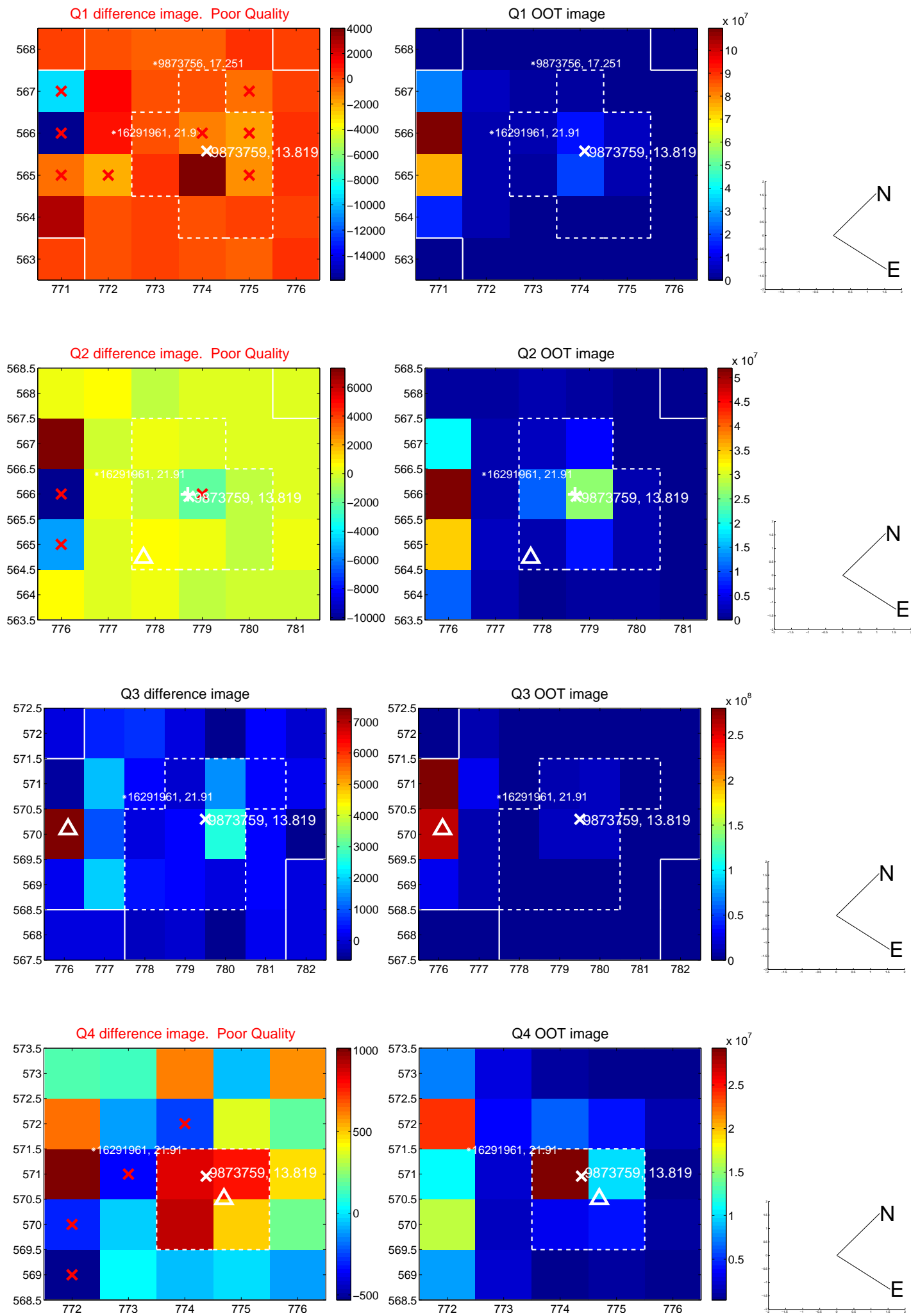
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.435 \pm 1.934$	0.23	$0.256 \pm 1.706$	$0.352 \pm 2.043$
PRF-fit source offset from KIC position	$10.880 \pm 2.127$	5.11	$-8.828 \pm 1.933$	$-6.359 \pm 1.244$
photometric centroid source offset	$0.45 \pm 0.89$	0.51	$-0.33 \pm 0.93$	$-0.30 \pm 0.85$

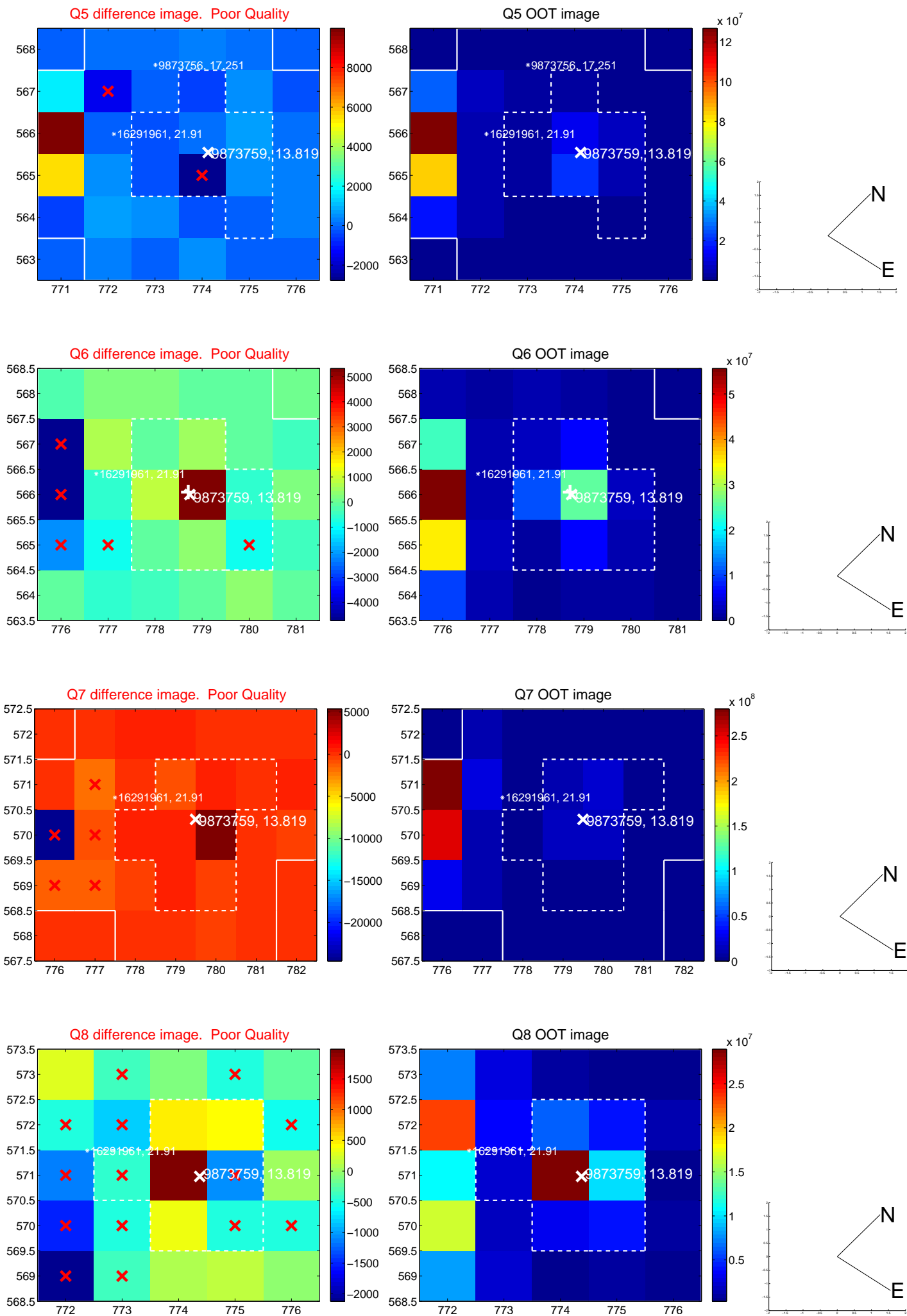


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

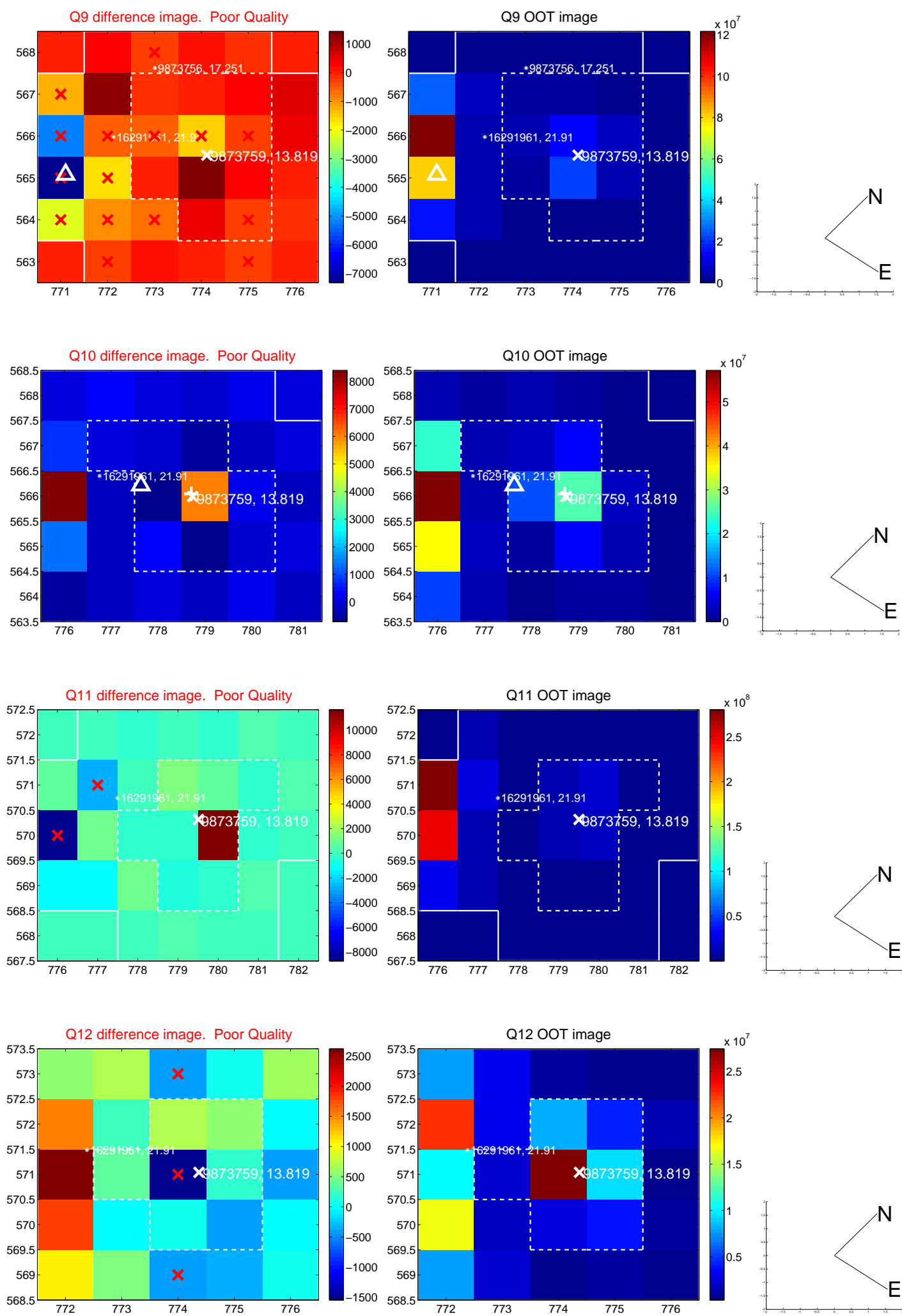


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

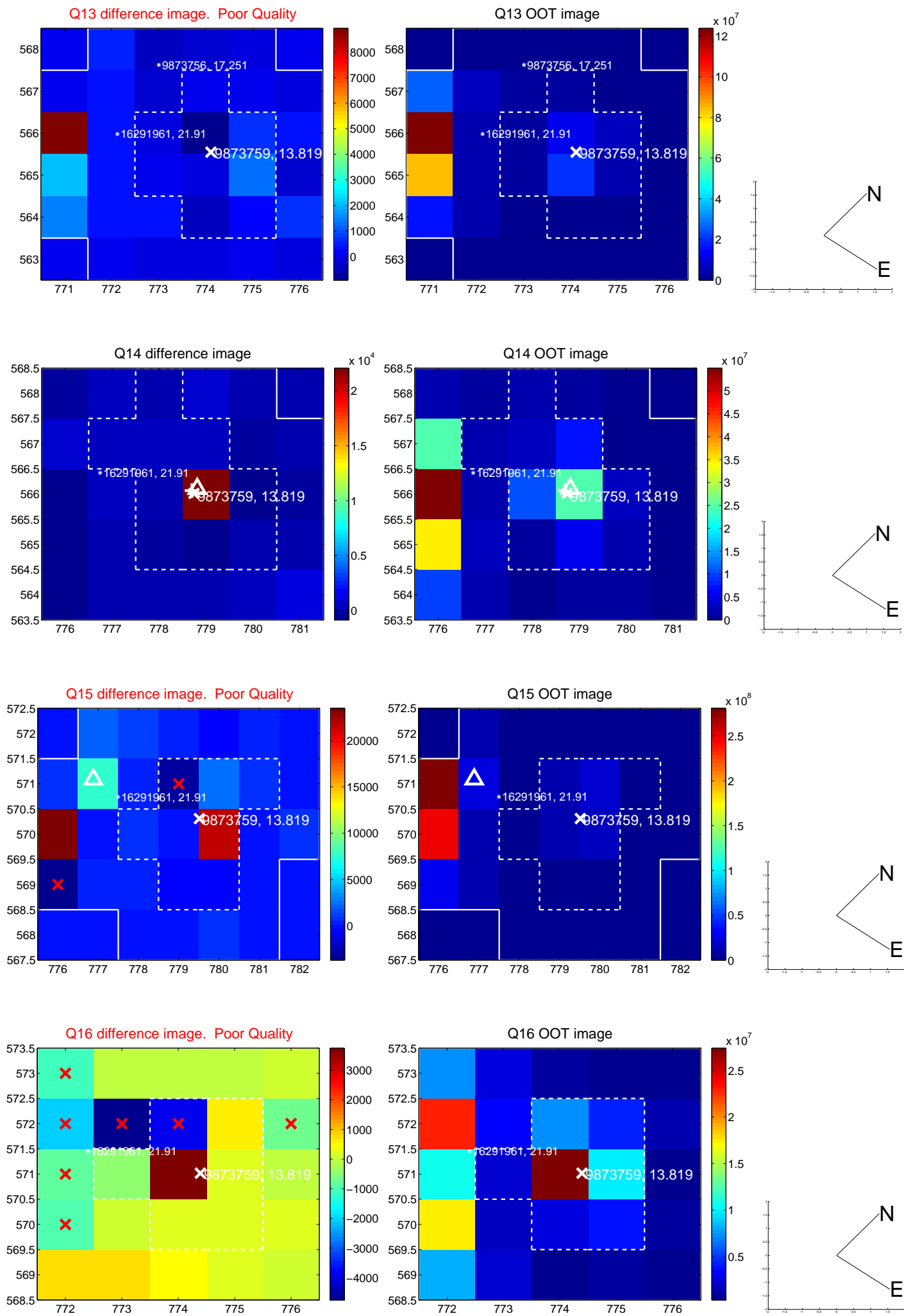




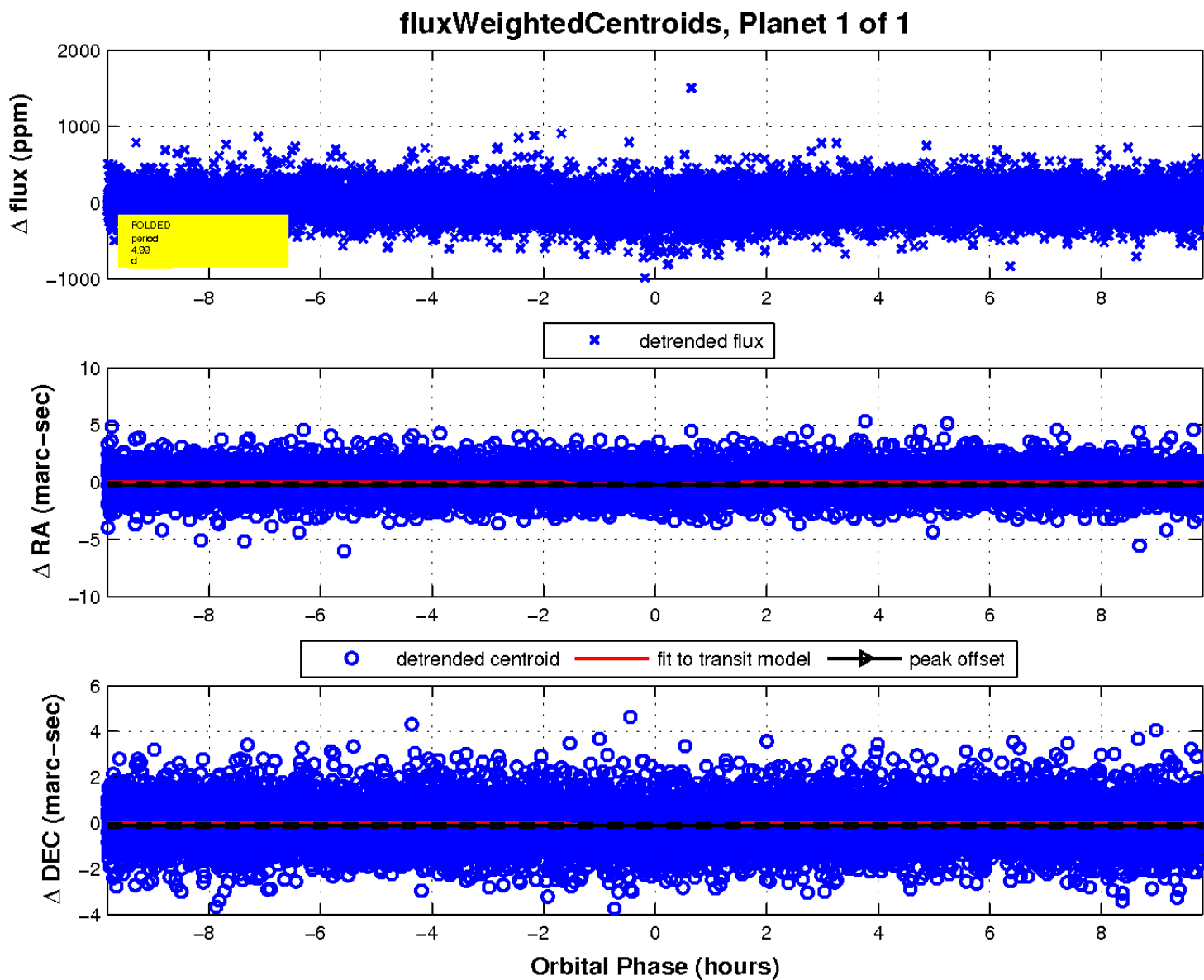
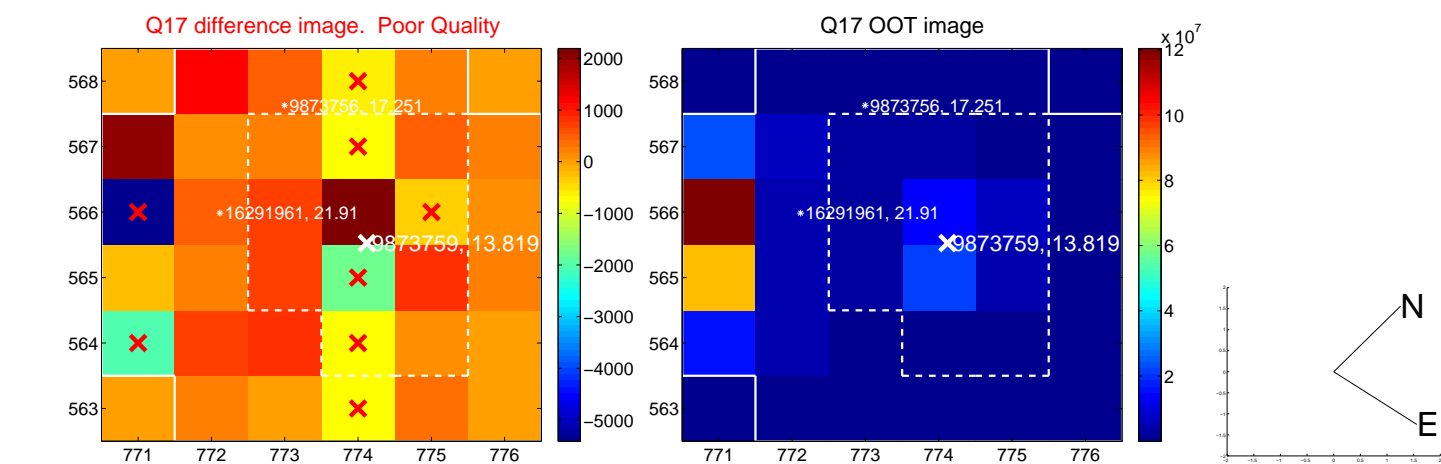
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

