

# KIC 008751933

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008751933-01	OBS	1257.01	86.647693	173.794195	7294.6	4.263	214.9	226.9	1.12	5522	9.41	7.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008751933-01	OBS	FP	0.12	0	1	0	0	DEPTH_ODDEVEN_ALT

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

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

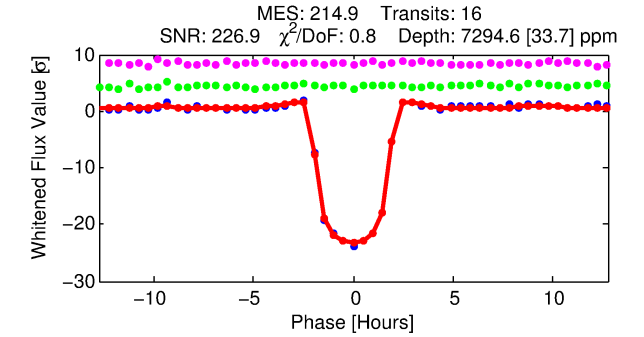
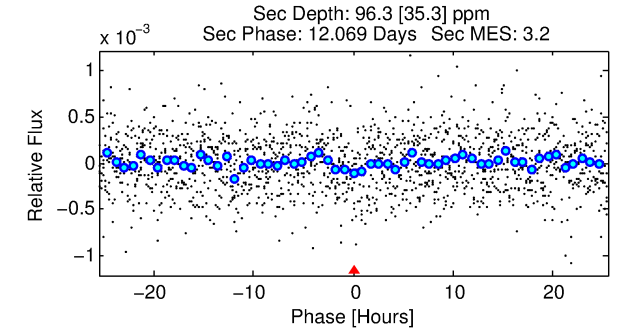
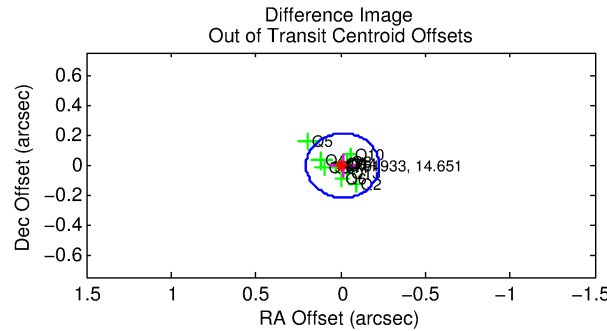
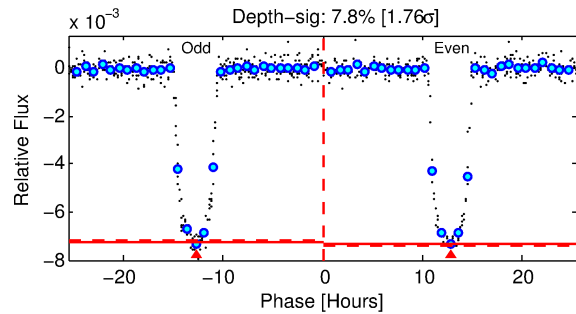
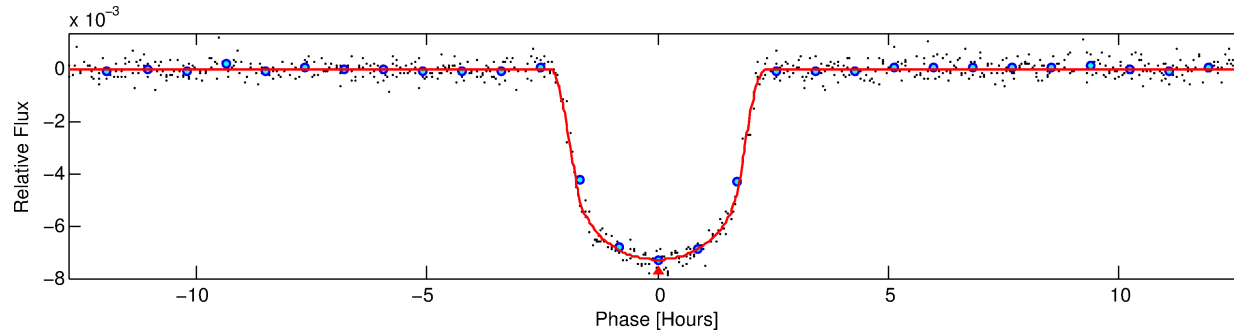
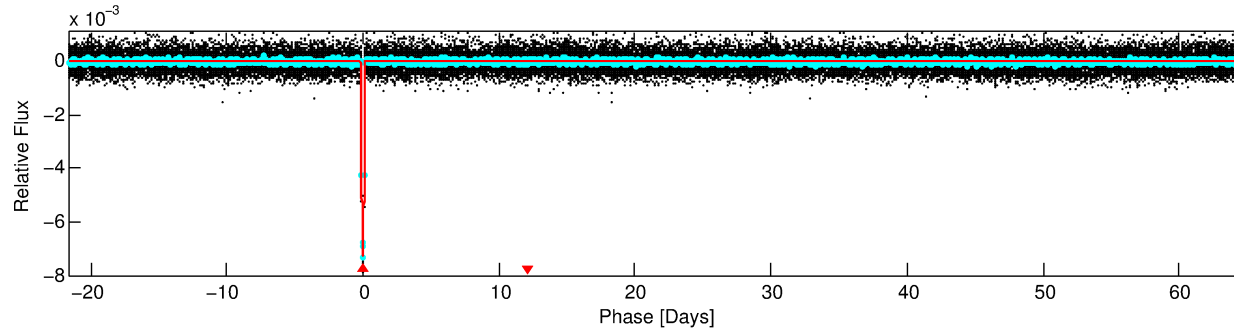
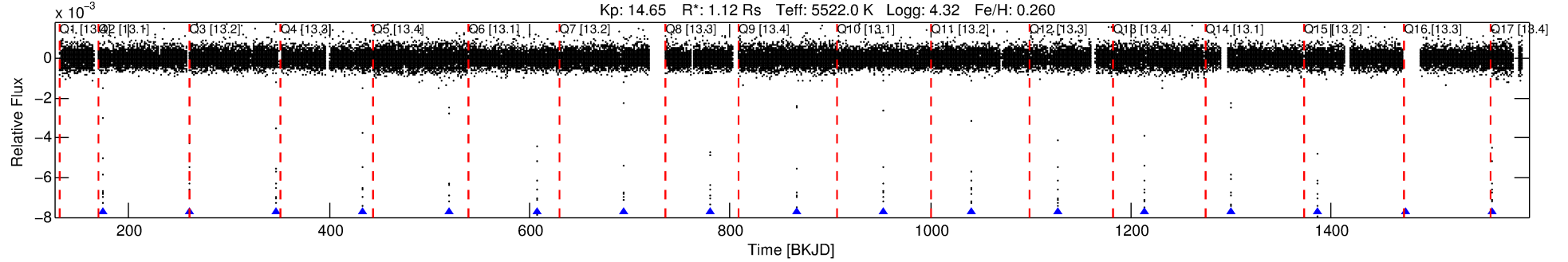
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008751933-01

No Significant Match Found

# DV One-Page Summary

KIC: 8751933 Candidate: 1 of 1 Period: 86.648 d  
KOI: K01257.01 Name: Kepler-420b Corr: 0.998



## DV Fit Results:

Period = 86.64769 [0.00005] d  
Epoch = 173.7942 [0.0004] BKJD  
Rp/R\* = 0.0770 [0.0025]  
a/R\* = 164.94 [19.99]  
b = 0.18 [0.67]  
Seff = 7.30 [1.69]  
Teq = 419 [24] K  
Rp = 9.41 [1.36] Re  
a = 0.3785 [0.0523] AU  
Ag = 85.72 [37.23] [2.28 $\sigma$ ]  
Teffp = 1972 [186] K [8.28 $\sigma$ ]

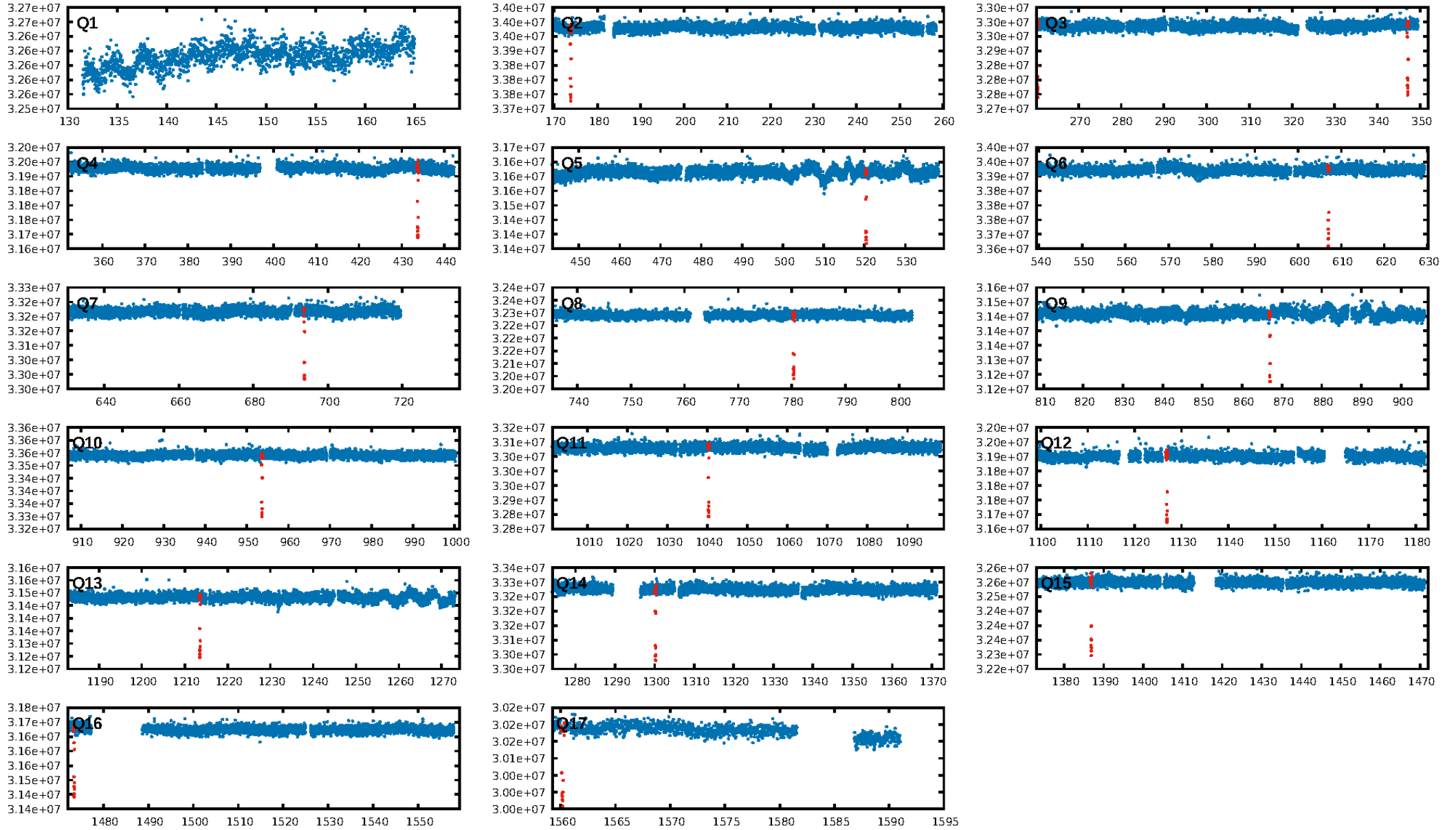
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 12.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: 5.356  
Centroid-sig: 6.5%  
Centroid-so: 0.172 arcsec [2.69 $\sigma$ ]  
OotOffset-rm: 0.013 arcsec [0.18 $\sigma$ ]  
KicOffset-rm: 0.215 arcsec [2.90 $\sigma$ ]  
OotOffset-st: 4/3/2/3 [12]  
KicOffset-st: 4/3/2/3 [12]  
DiffImageQuality-fgm: 1.00 [12/12]  
DiffImageOverlap-fno: 1.00 [12/12]

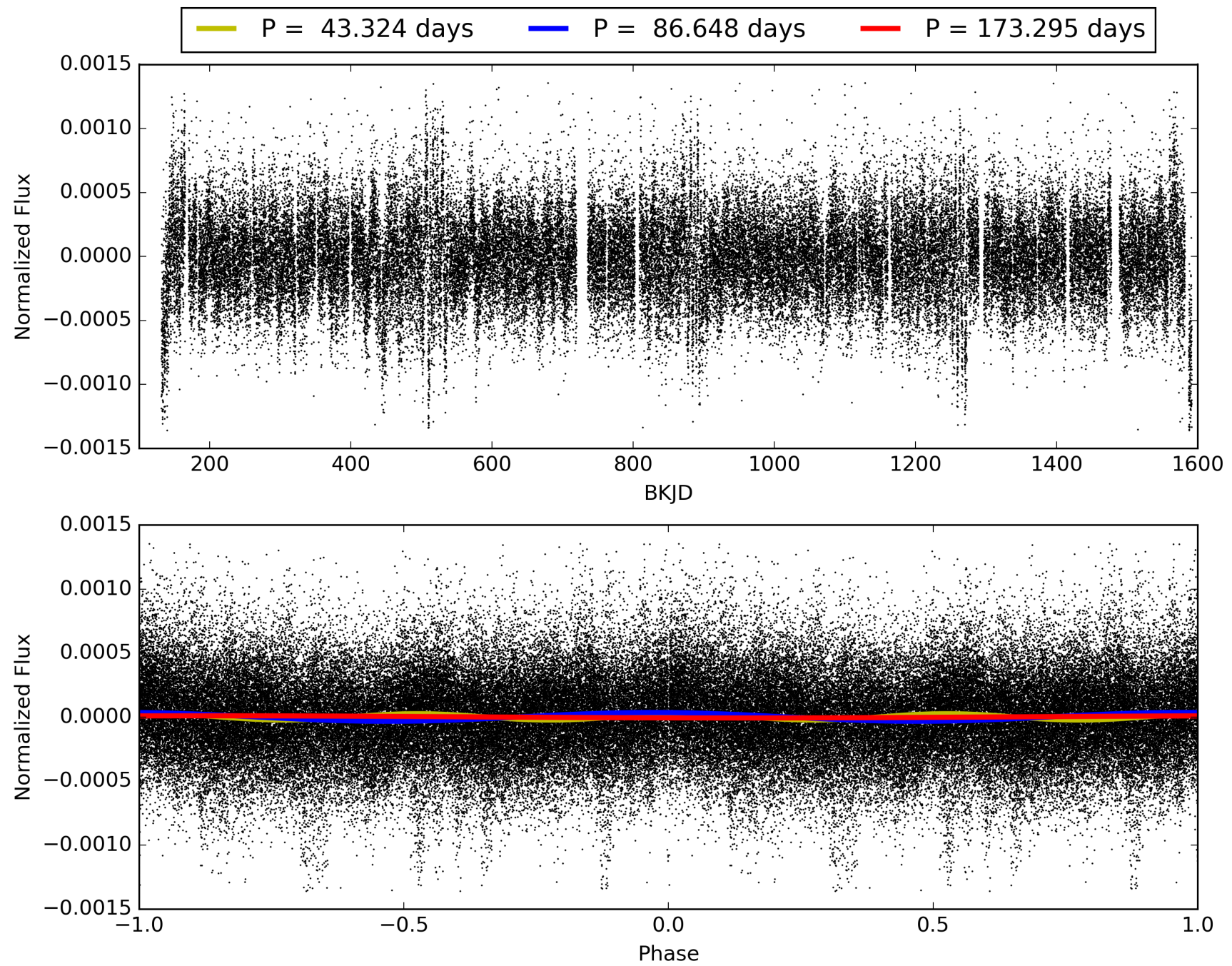
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:16:42 Z

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

# TCE 008751933-01, PDC Light Curves

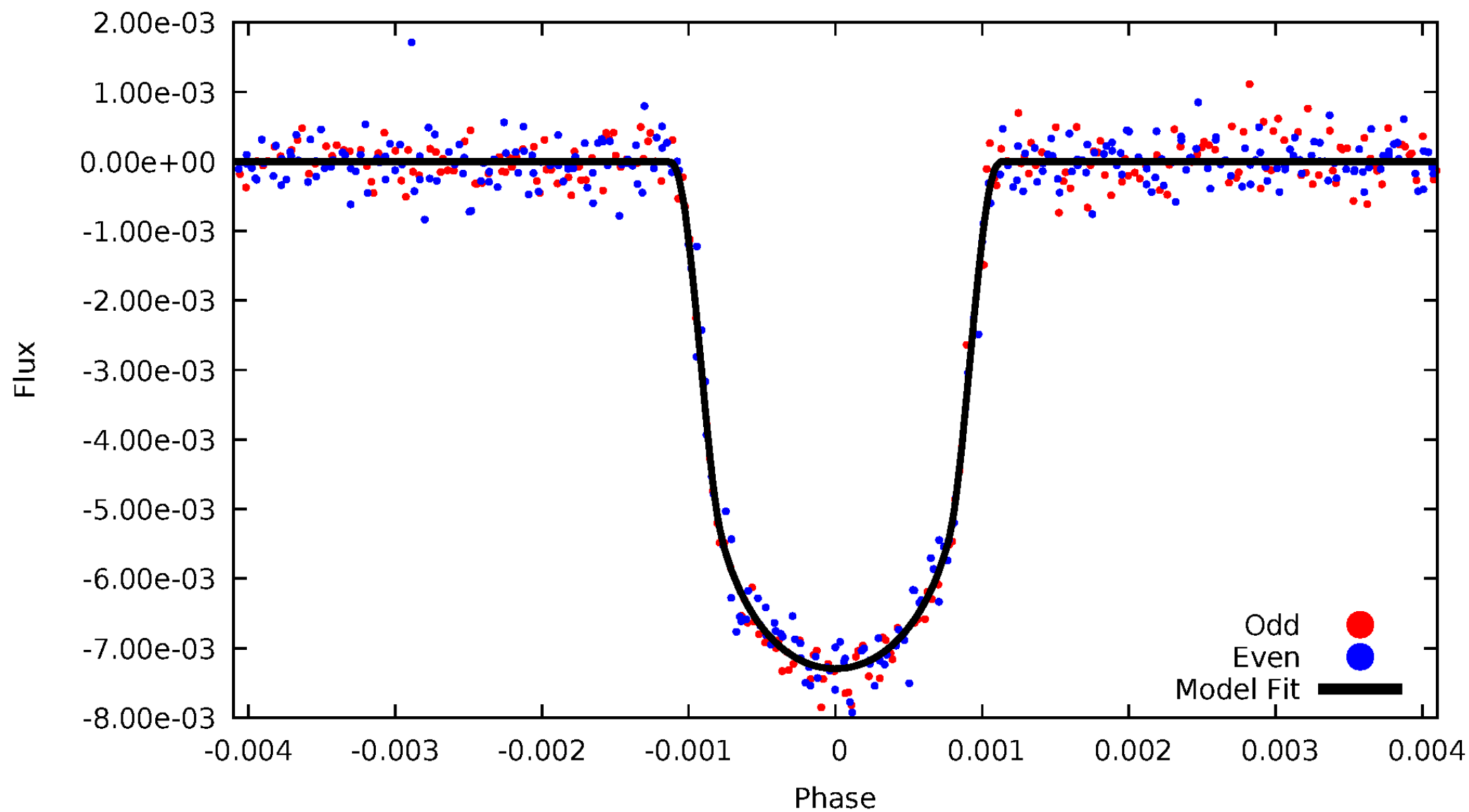


# TCE 008751933-01



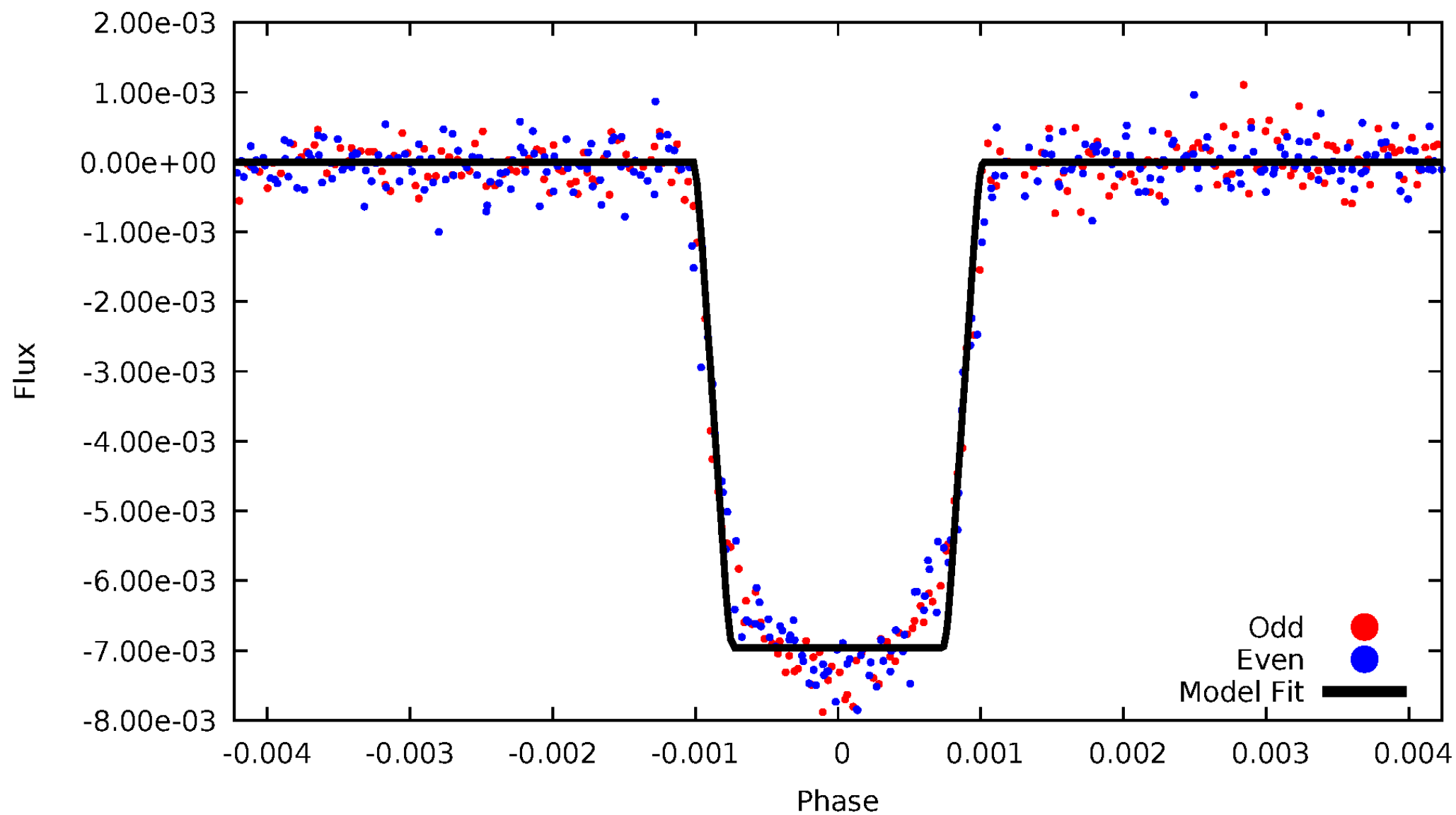
# DV Odd/Even

TCE 008751933-01



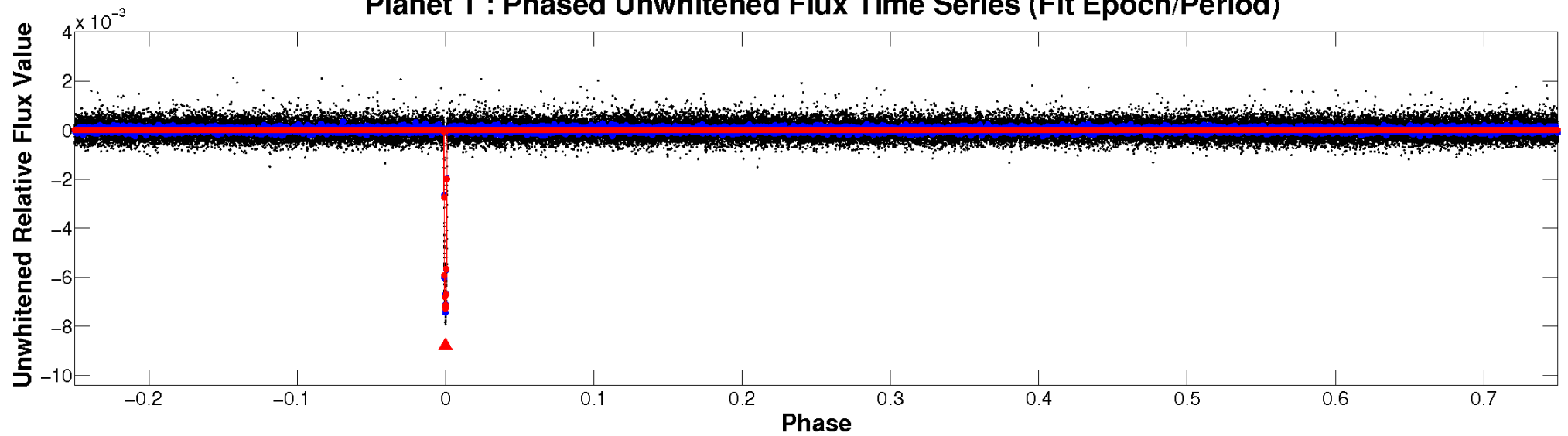
# ALT Odd/Even

TCE 008751933-01

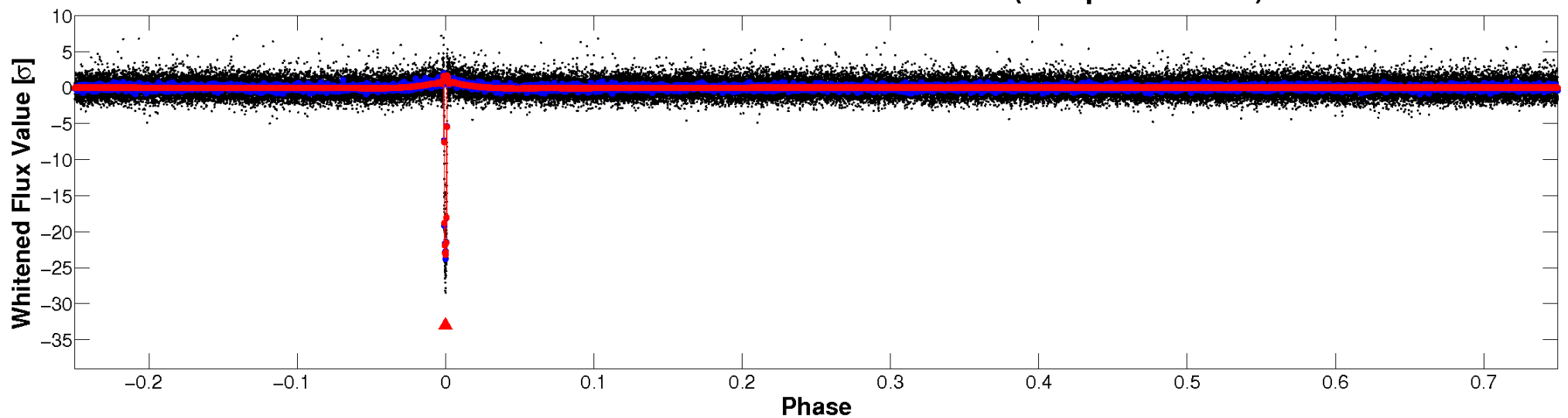


# Non-Whitened Vs. Whitened Light Curve

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

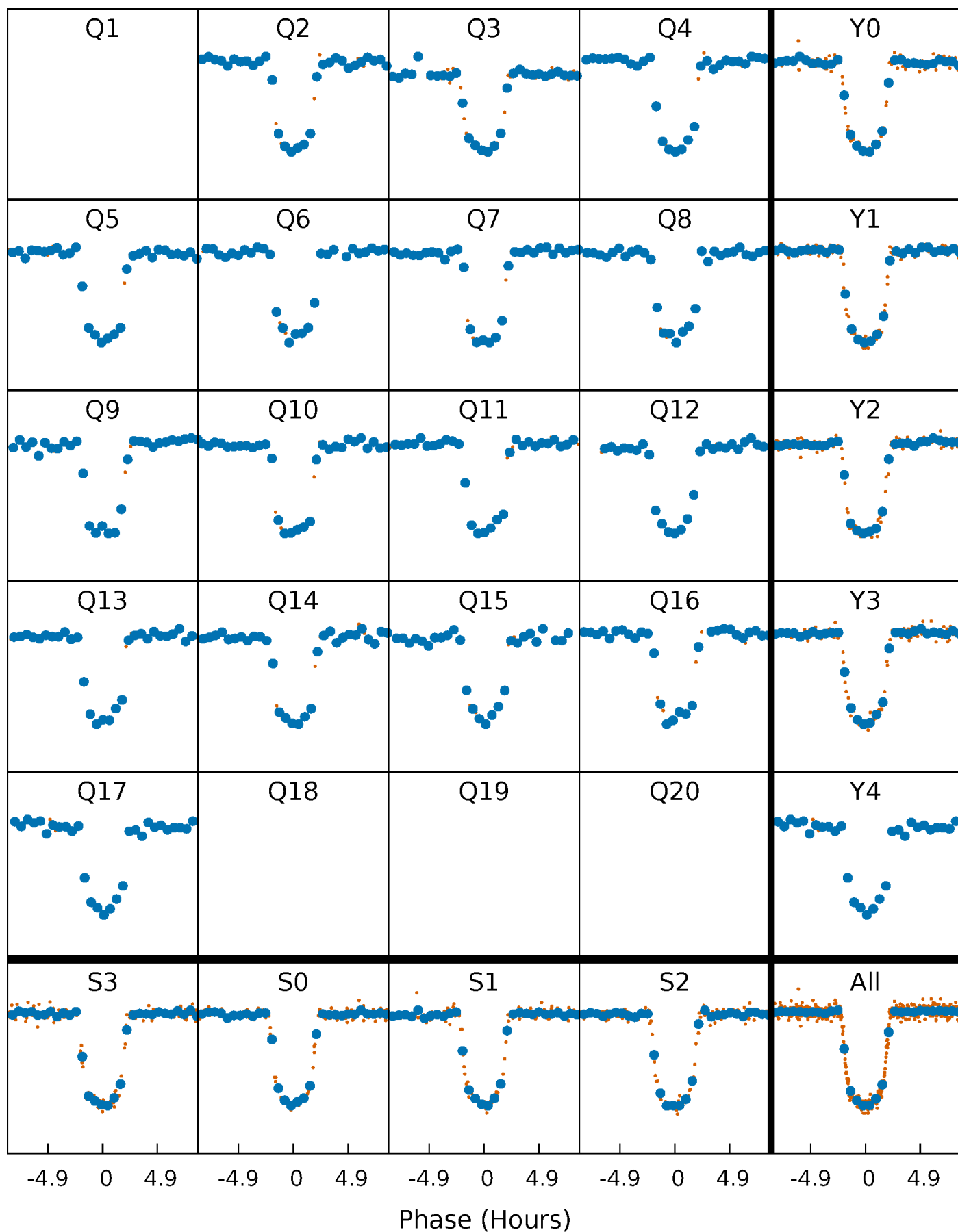


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

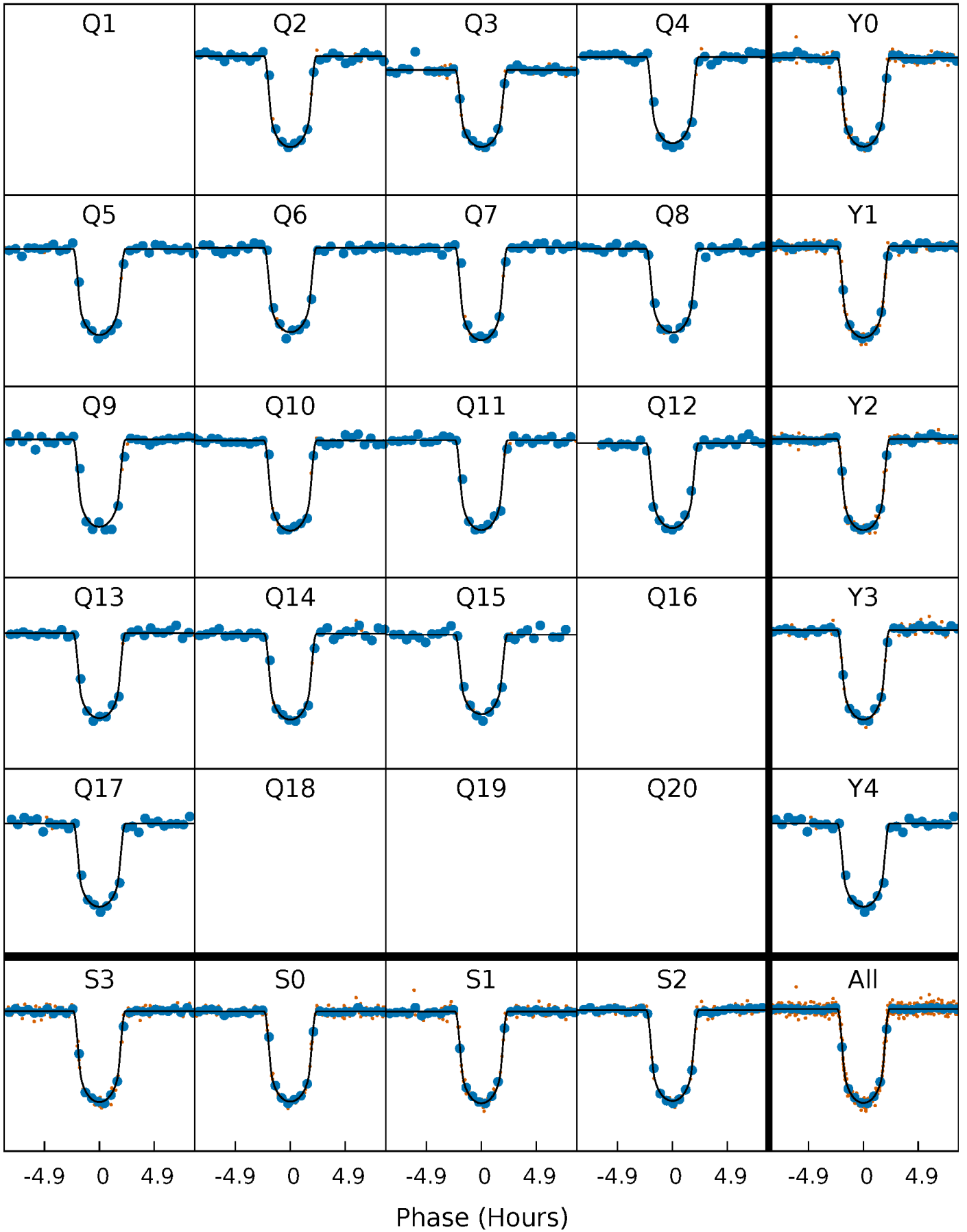
TCE 008751933-01   P= 86.647693 Days    $T_0=173.794195$  (BKJD)





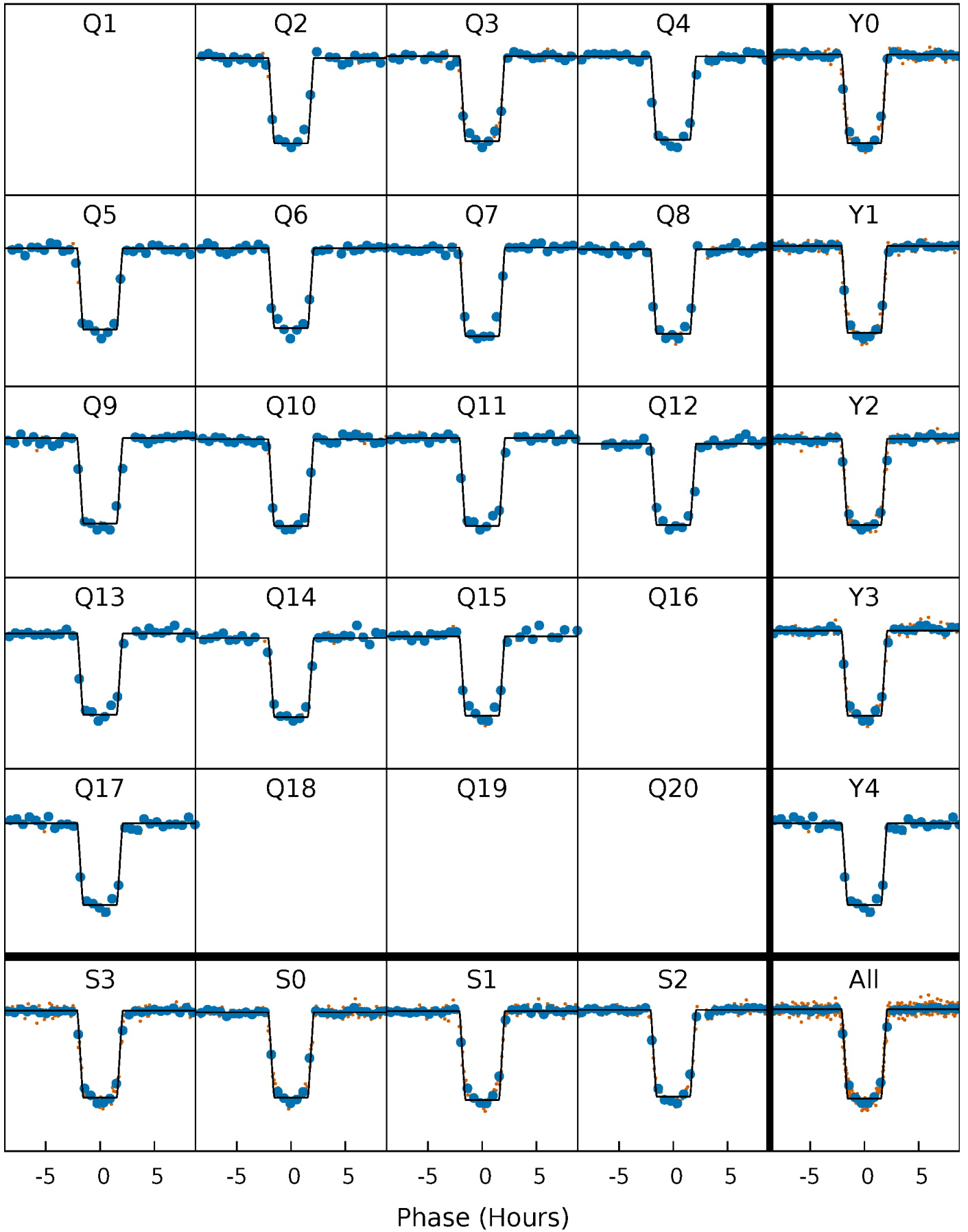
# DV Quarter-Phased Transit Curves

TCE 008751933-01 P= 86.647693 Days  $T_0=173.794195$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

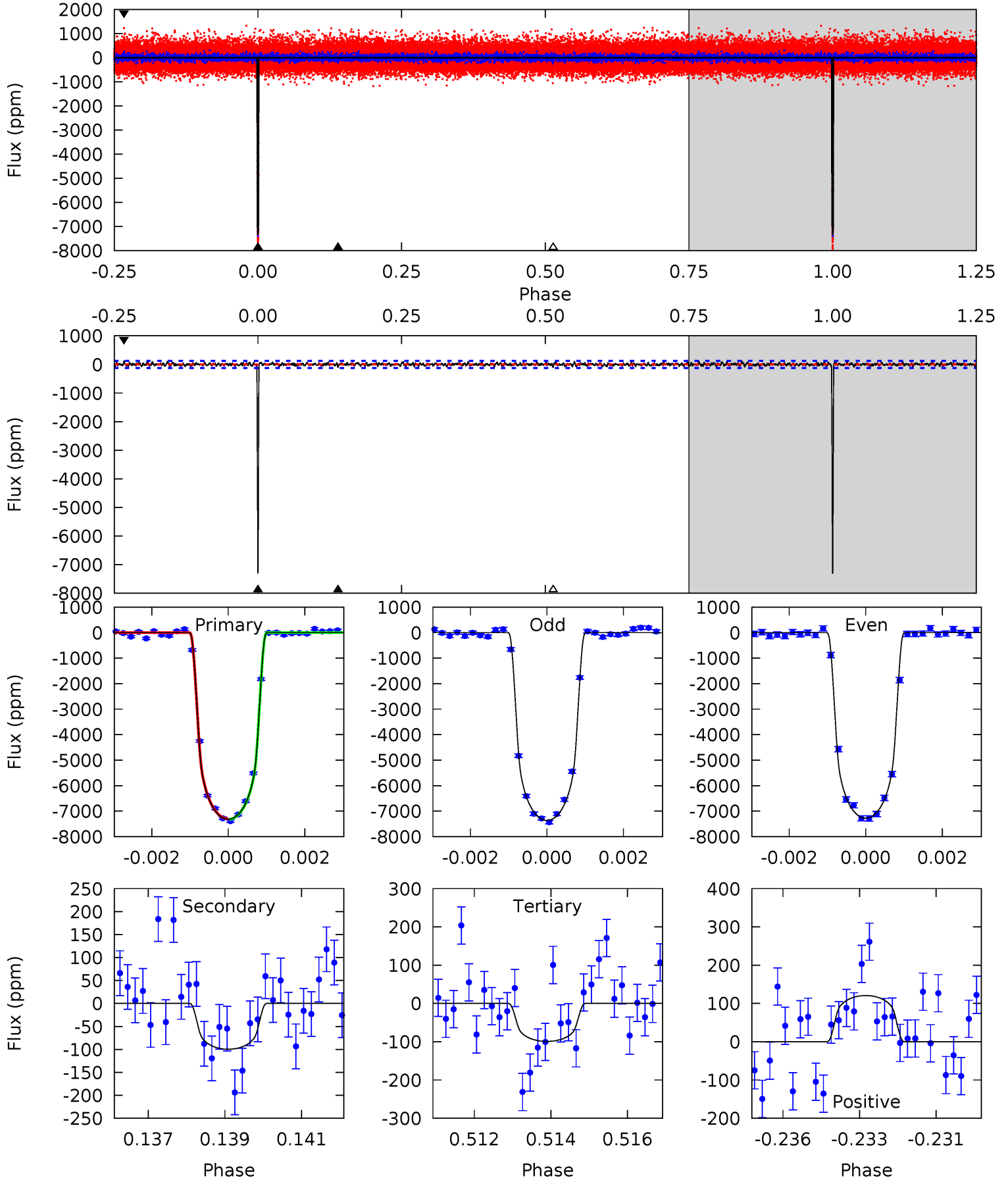
TCE 008751933-01   P= 86.647377 Days    $T_0=173.796666$  (BKJD)



# DV Model-Shift Uniqueness Test

008751933-01, P = 86.647693 Days, E = 87.146502 Days

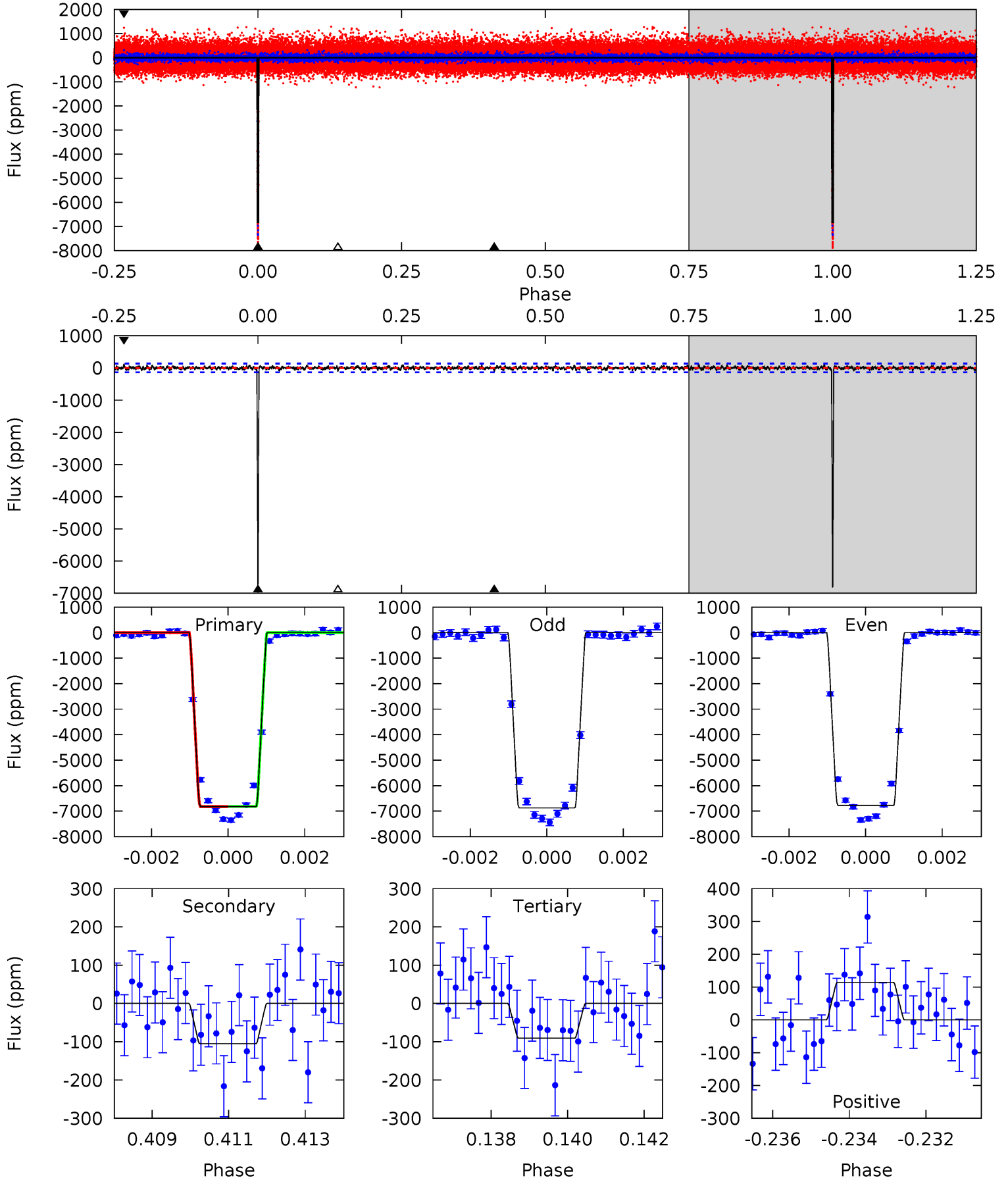
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
309.1	4.21	4.19	5.10	5.31	3.06	1.27	304.9	304.0	0.02	-0.89	1.89	0.99	0.02	0.49



# Alt Model-Shift Uniqueness Test

008751933-01, P = 86.647377 Days, E = 87.149289 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
267.5	4.12	3.57	4.48	5.33	3.09	1.11	264.0	263.1	0.55	-0.36	1.86	1.00	0.02	0.04



### Stellar Parameters For KIC 008751933

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5522^{+75}_{-83}$	$4.323^{+0.132}_{-0.108}$	$0.260^{+0.150}_{-0.150}$	$1.120^{+0.158}_{-0.158}$	$0.963^{+0.058}_{-0.047}$	$0.965^{+0.563}_{-0.303}$
	+1%/-2%	+3%/-2%	+58%/-58%	+14%/-14%	+6%/-5%	+58%/-31%
Source	SPE78	SPE78	SPE78	DSEP		

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

### Secondary Eclipse Parameters for KIC 008751933-01 / KOI 1257.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-100 \pm 24$	$9.44^{+0.84}_{-0.86}$	$586^{+23}_{-26}$	$2743^{+94}_{-99}$	$88^{+30}_{-23}$
Alt.	$-105 \pm 25$	$10.22^{+0.89}_{-0.95}$	$585^{+23}_{-25}$	$2704^{+86}_{-98}$	$79^{+27}_{-21}$

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

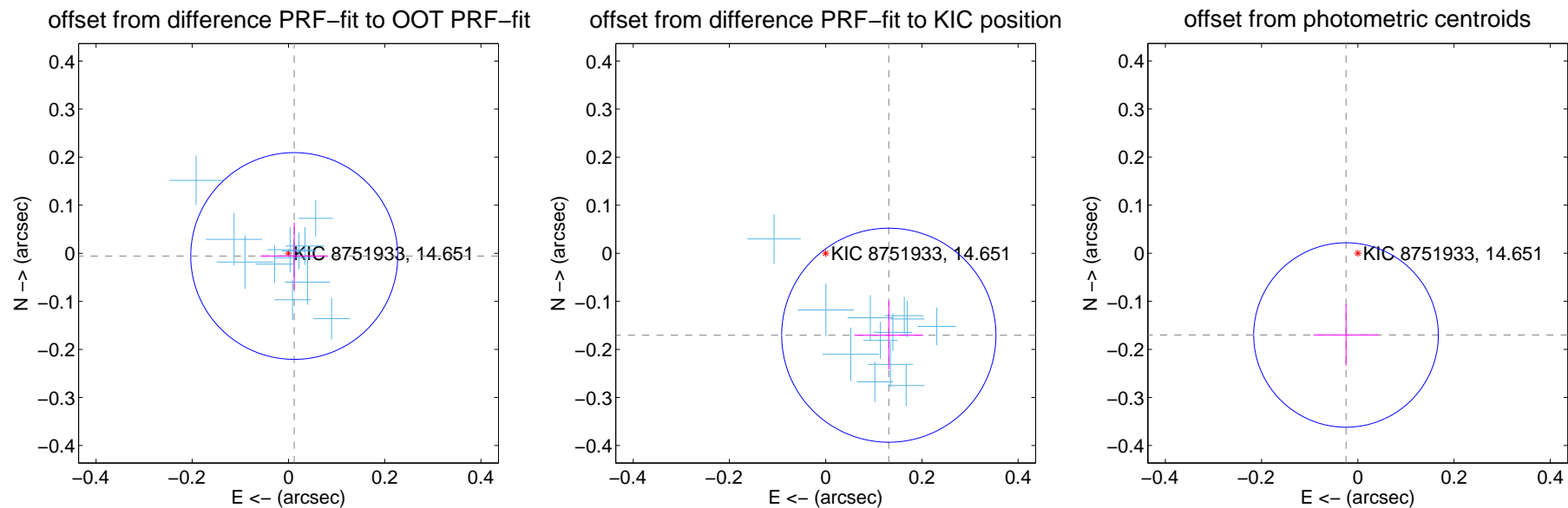
## DV Centroid Data

Supplemental centroid analysis for 008751933-01. Kepler magnitude: 14.65. Transit SNR 226.88

There are 12 quarters with good PRF difference image offsets

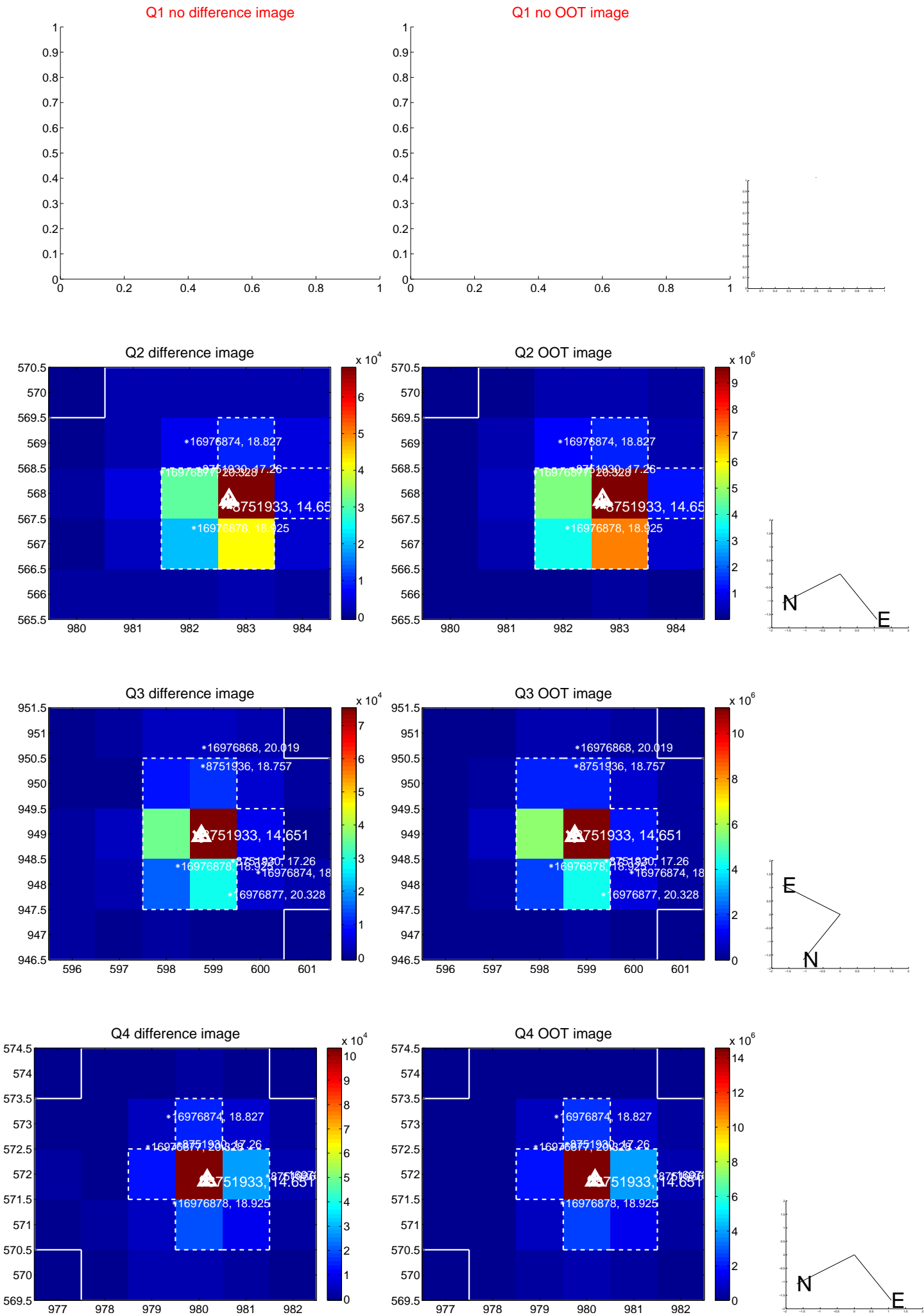
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.013 \pm 0.072$	0.18	$-0.012 \pm 0.070$	$-0.006 \pm 0.069$
PRF-fit source offset from KIC position	$0.215 \pm 0.074$	2.90	$-0.131 \pm 0.072$	$-0.170 \pm 0.071$
photometric centroid source offset	$0.17 \pm 0.06$	2.69	$0.02 \pm 0.07$	$-0.17 \pm 0.06$

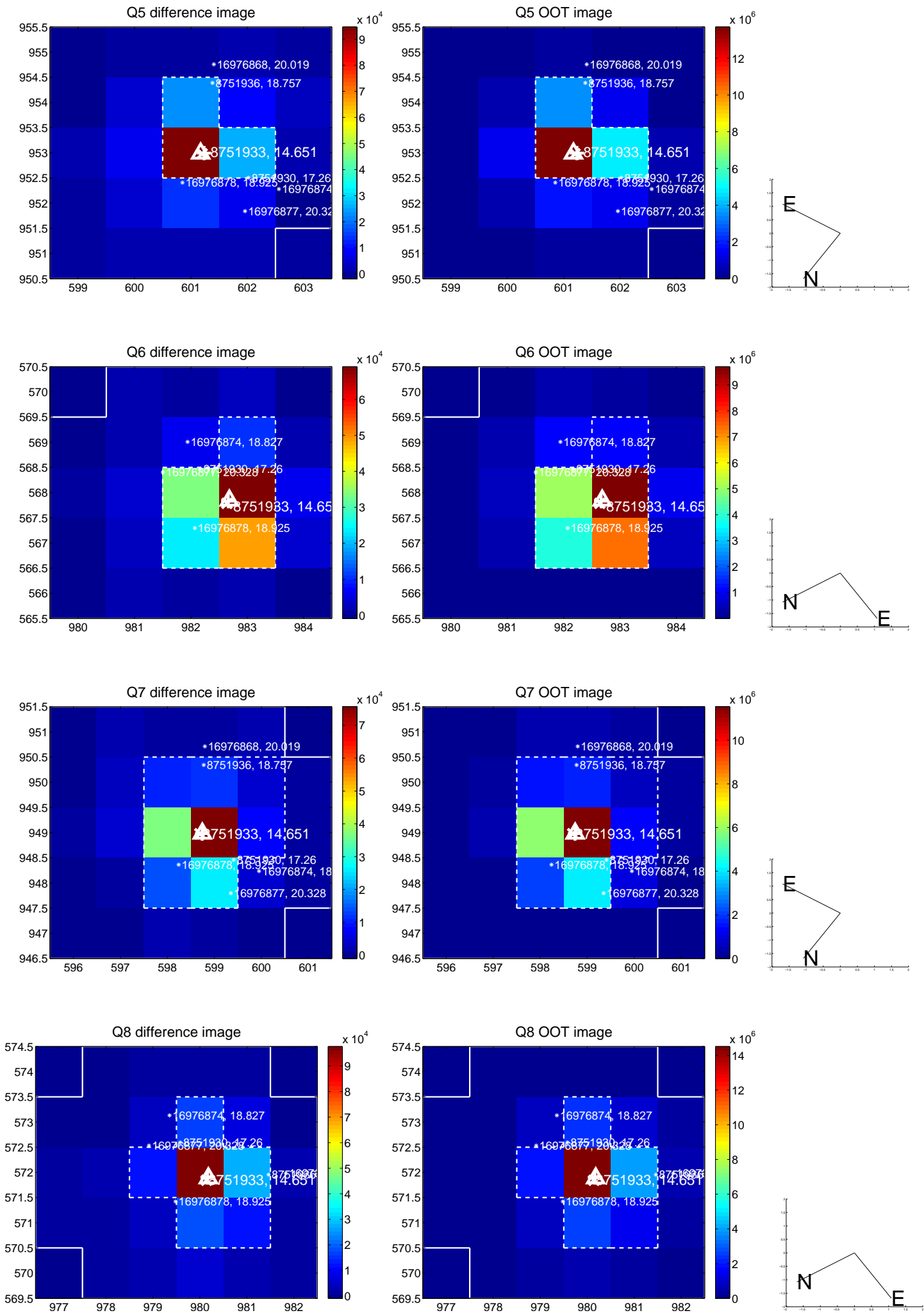


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

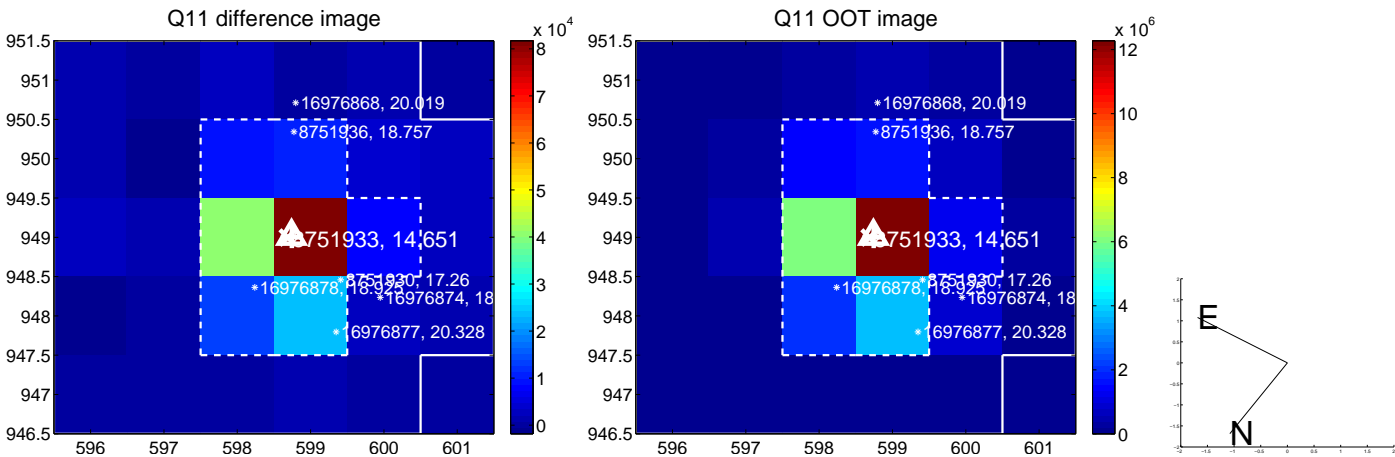
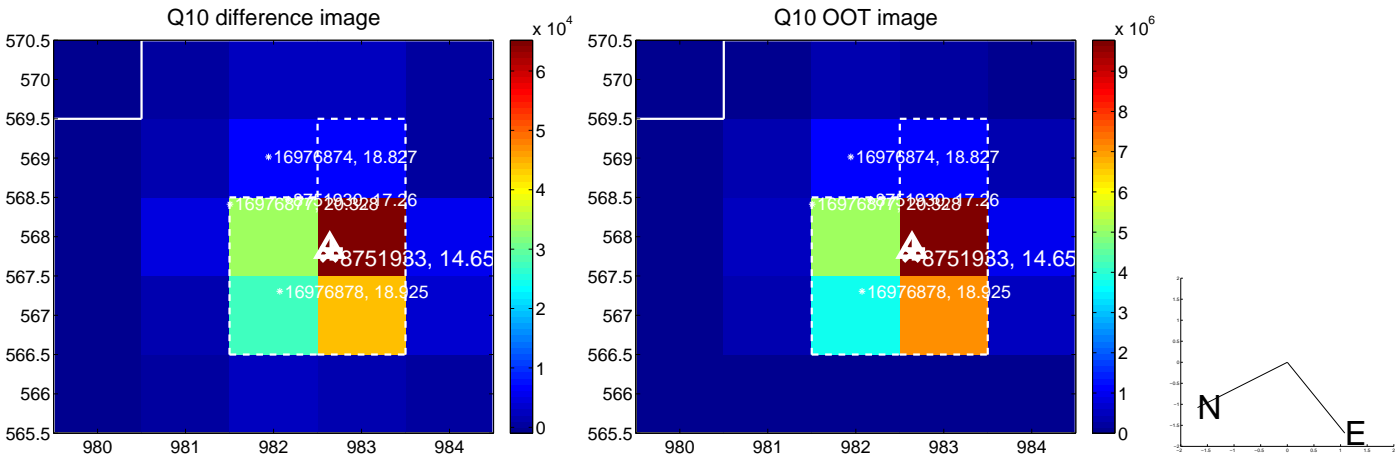
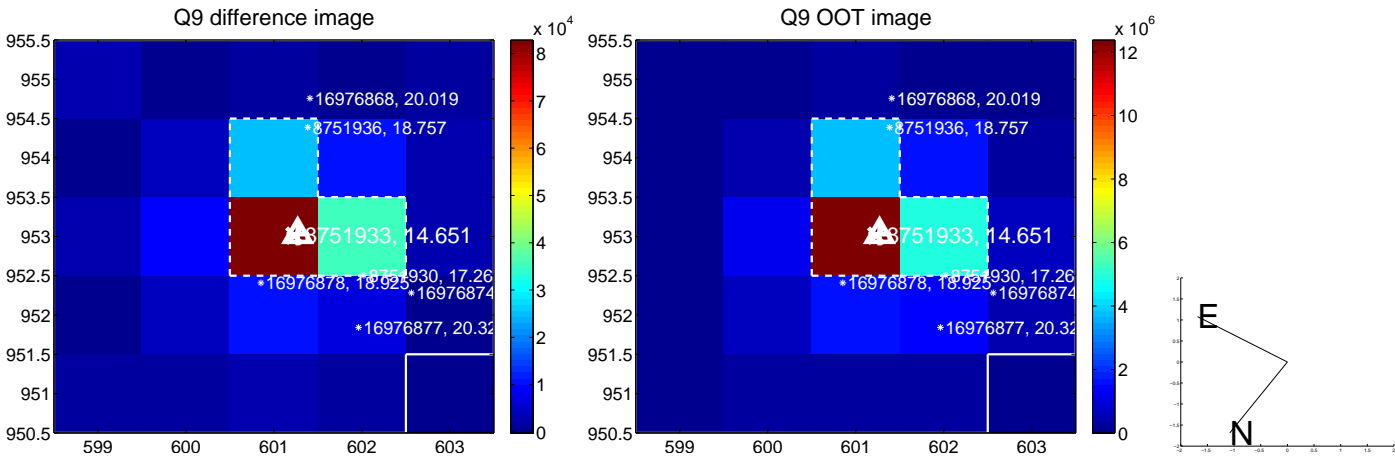


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

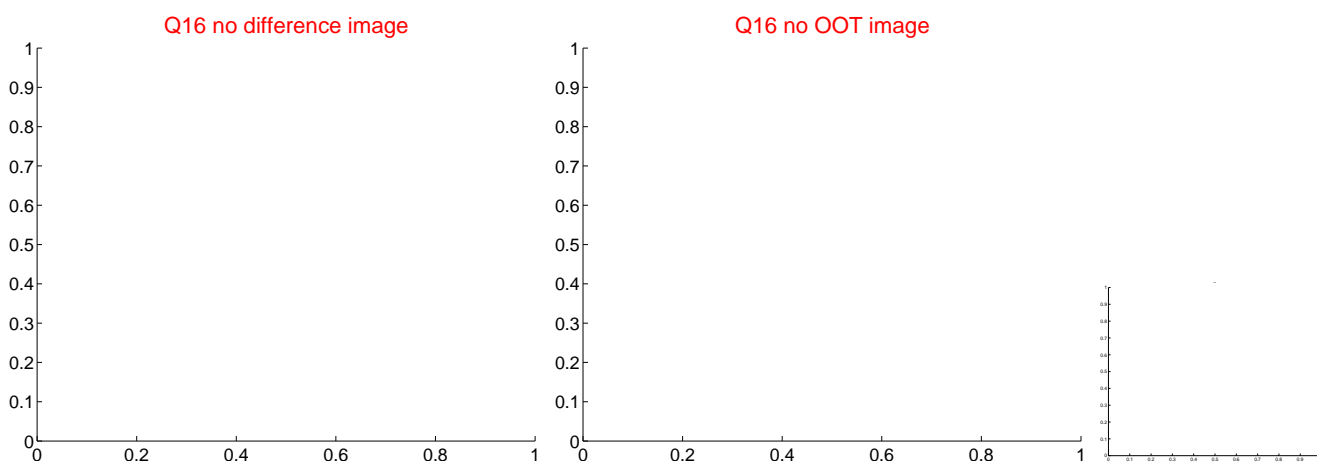
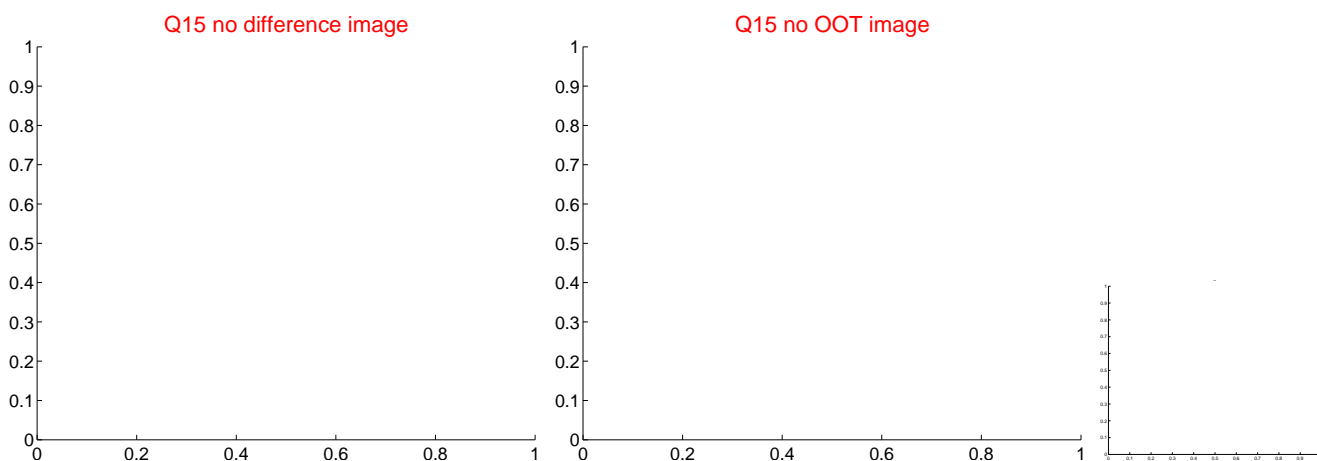
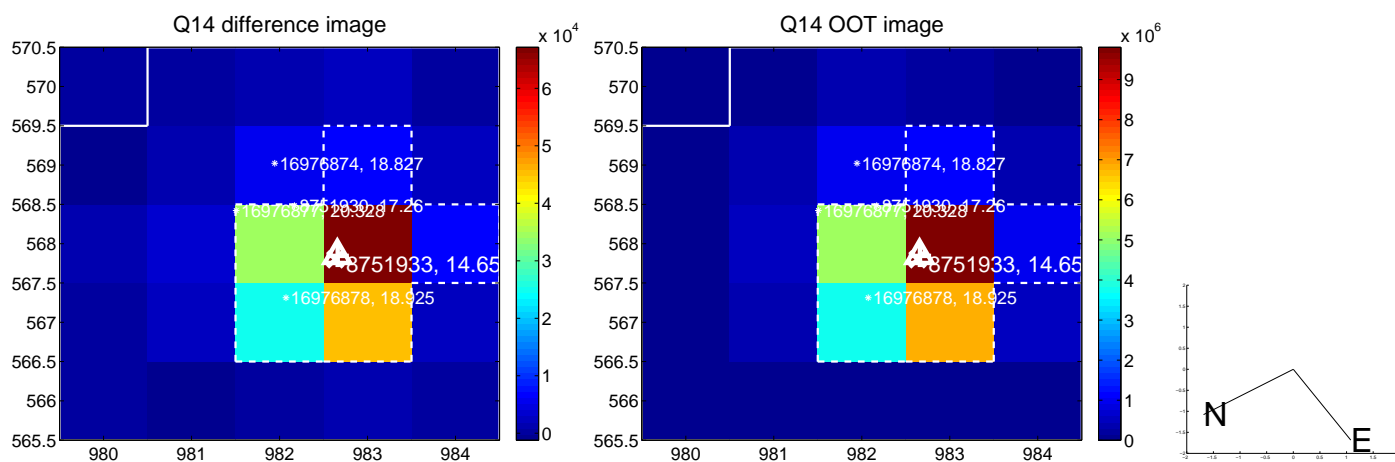
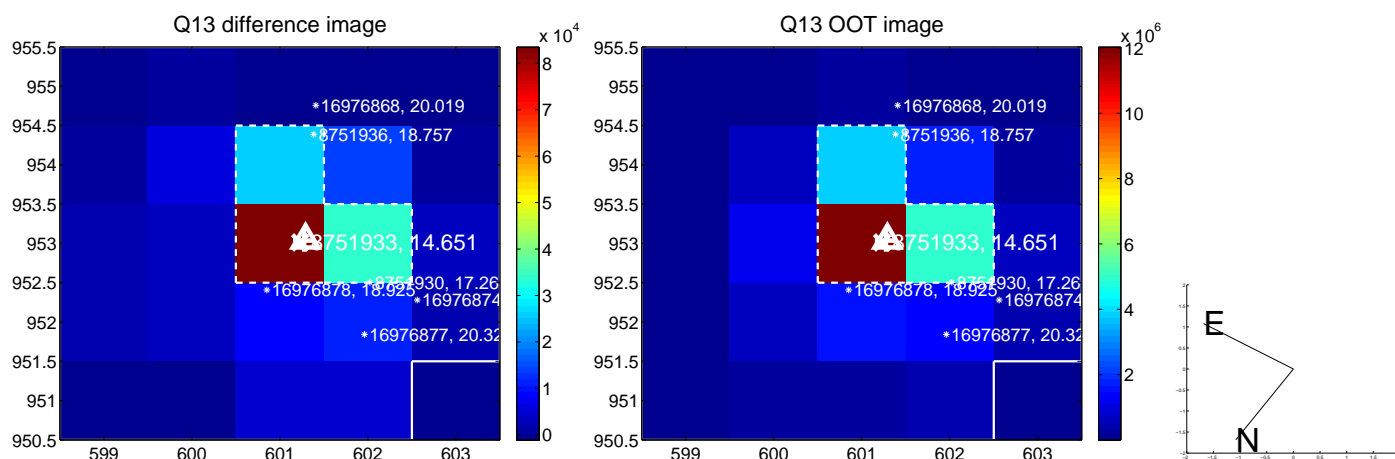




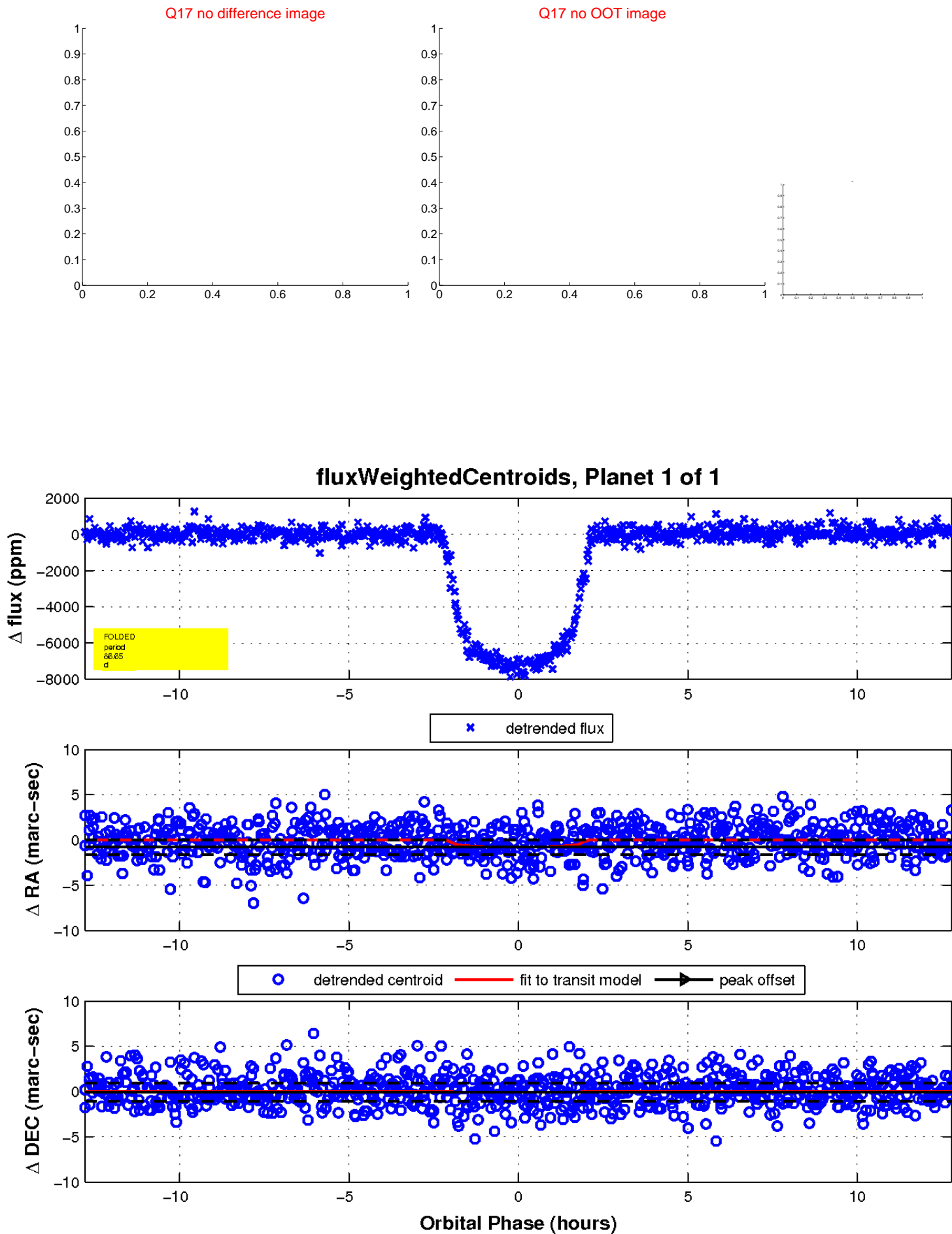
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



# UKIRT Image

Declination

