

# KIC 009658089

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009658089-01	OBS	7220.01	1.057083	131.693783	64.3	1.616	9.4	11.5	0.95	6000	0.89	2515.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009658089-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

**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.

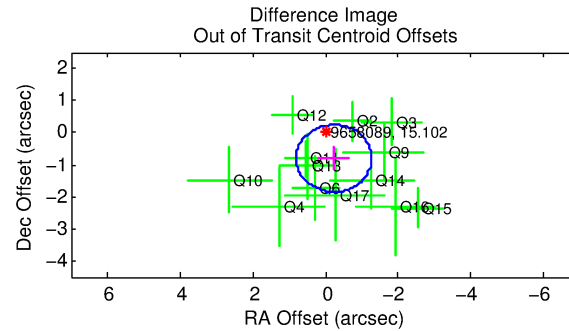
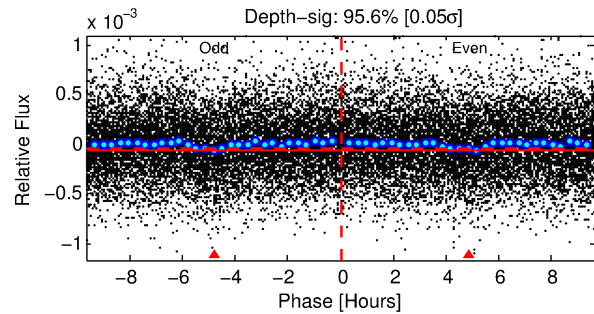
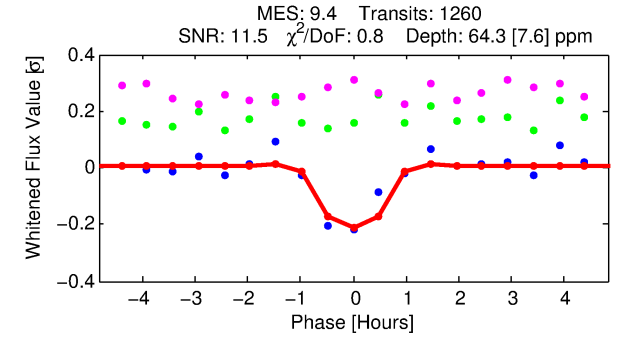
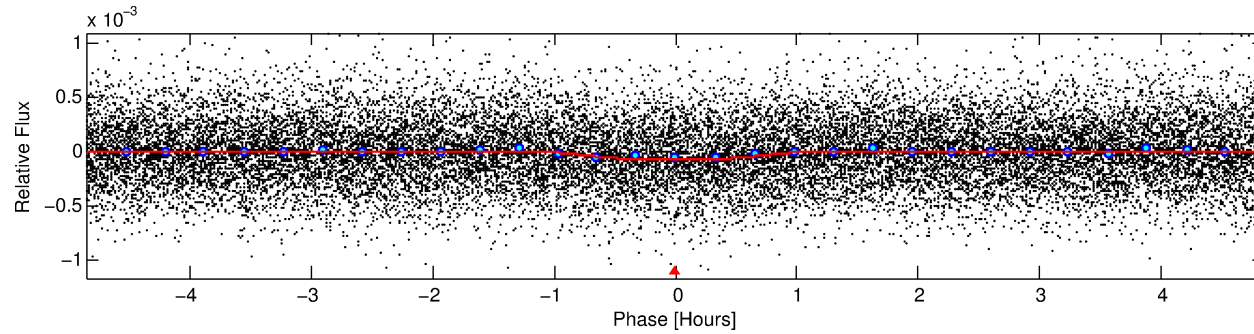
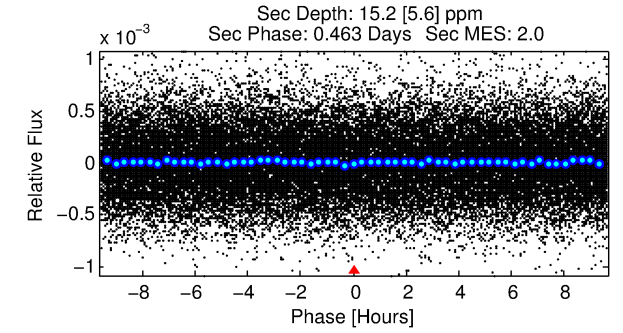
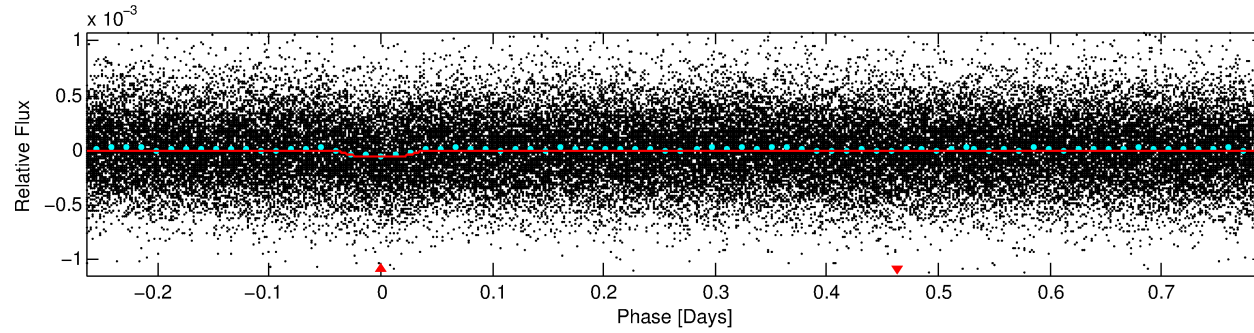
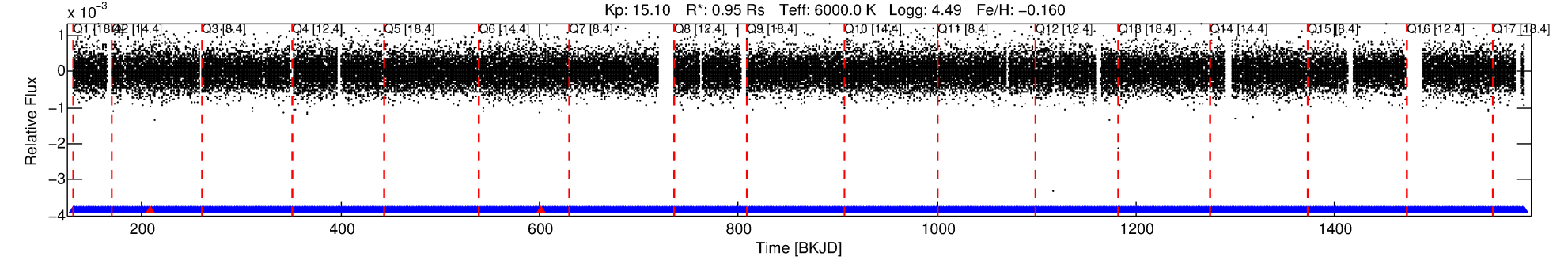
## Ephemeris Match Information For 009658089-01

No Significant Match Found

# DV One-Page Summary

KIC: 9658089 Candidate: 1 of 1 Period: 1.057 d

KOI: K07220.01 Corr: 0.921



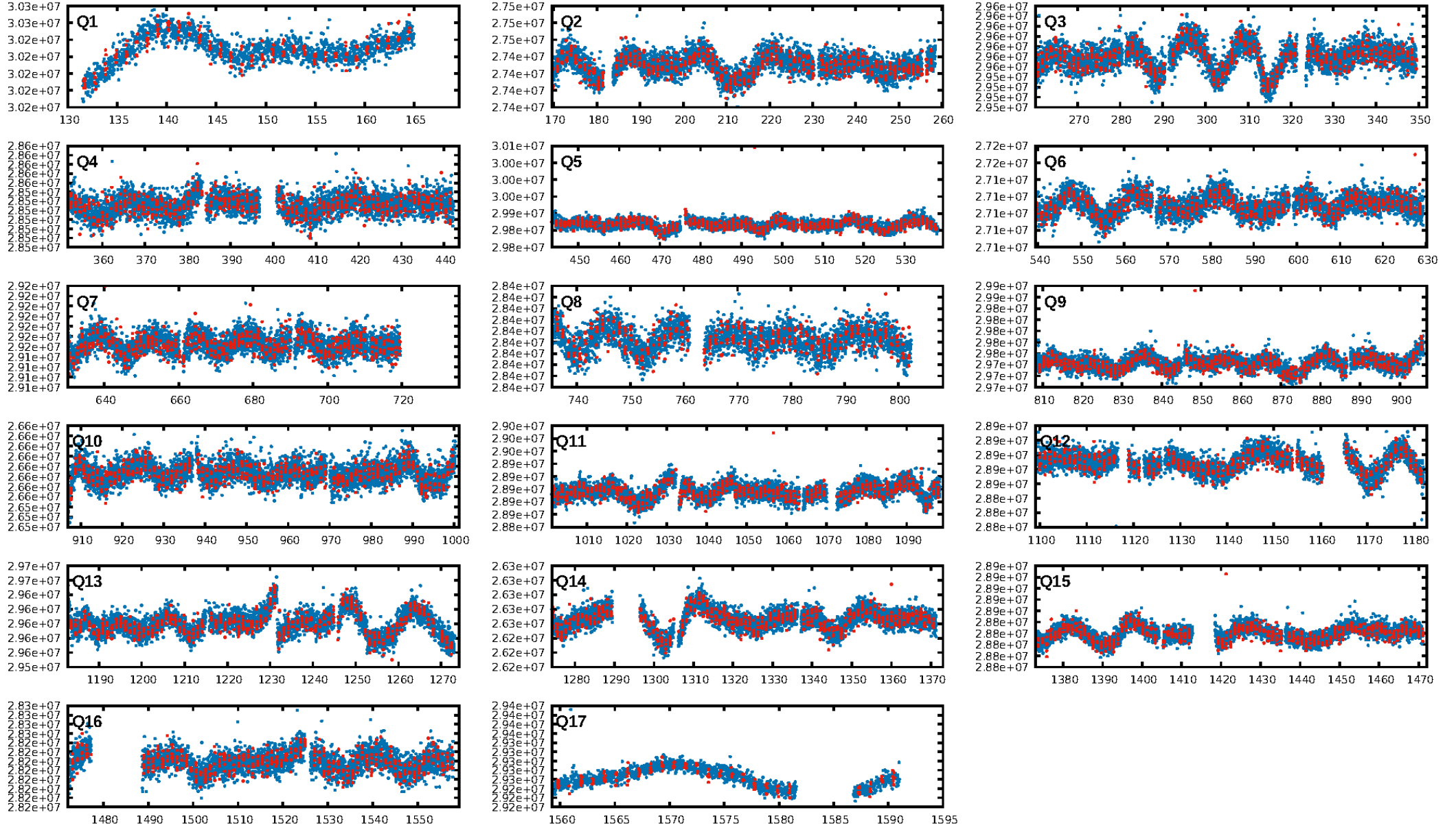
## DV Fit Results:

Period = 1.05708 [0.00001] d  
Epoch = 131.6938 [0.0021] BKJD  
Rp/R\* = 0.0086 [0.0049]  
a/R\* = 2.51 [6.20]  
b = 0.89 [0.67]  
Seff = 2515.44 [1060.37]  
Teff = 1806 [190] K  
Rp = 0.89 [0.59] Re  
a = 0.0203 [0.0056] AU  
Ag = 4.33 [5.47] [0.61 $\sigma$ ]  
Teffp = 4027 [1216] K [1.80 $\sigma$ ]

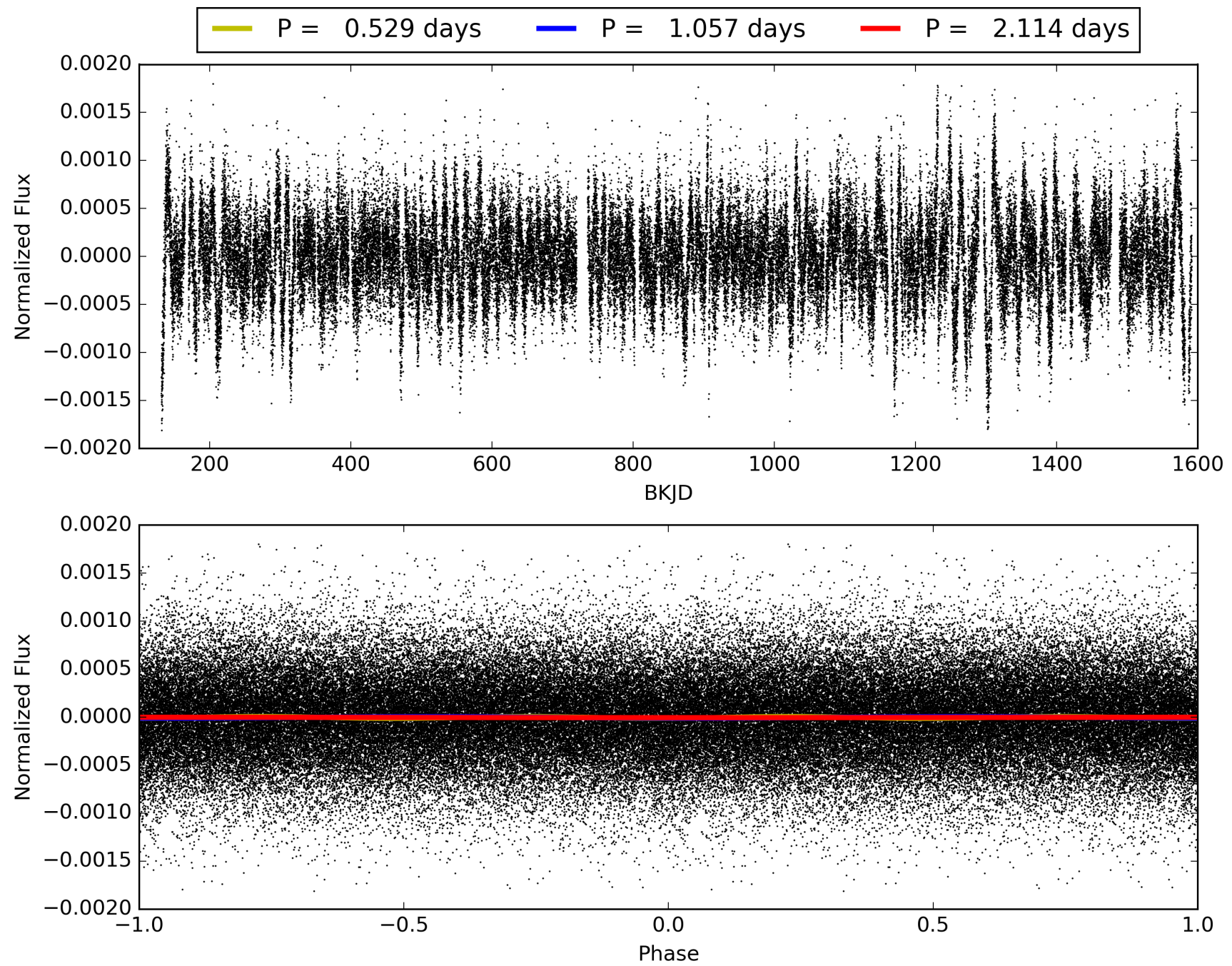
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.72e-20  
RollingBand-fgt: 1.00 [1201/1203]  
GhostDiagnostic-chr: 1.944  
Centroid-sig: 25.6%  
Centroid-so: 1.534 arcsec [1.41 $\sigma$ ]  
OotOffset-rm: 0.836 arcsec [2.40 $\sigma$ ]  
KicOffset-rm: 0.135 arcsec [0.38 $\sigma$ ]  
OotOffset-st: 4/3/3/3 [13]  
KicOffset-st: 4/3/3/3 [13]  
DiffImageQuality-fgm: 0.69 [9/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009658089-01, PDC Light Curves



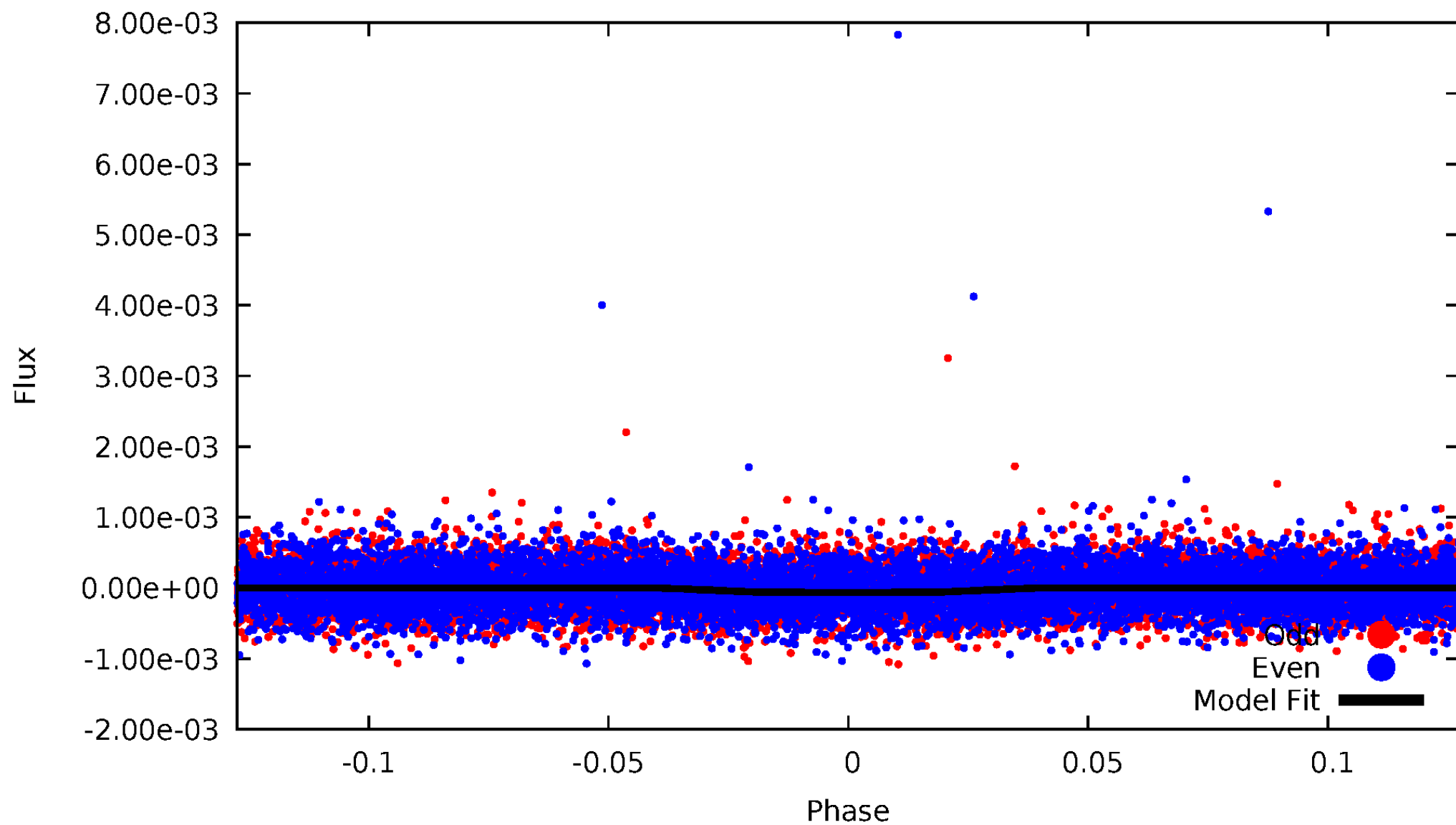
TCE 009658089-01





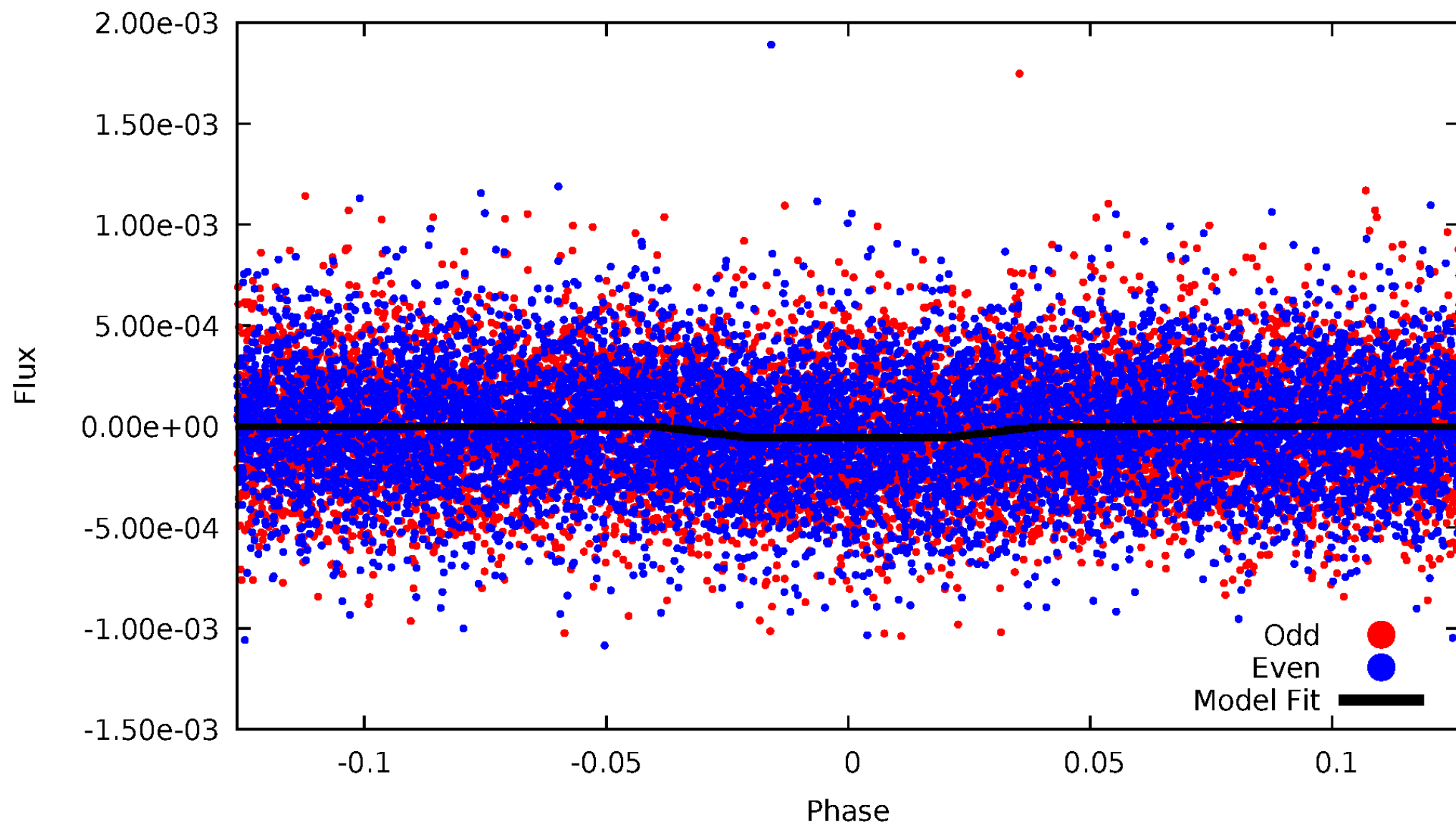
# DV Odd/Even

TCE 009658089-01

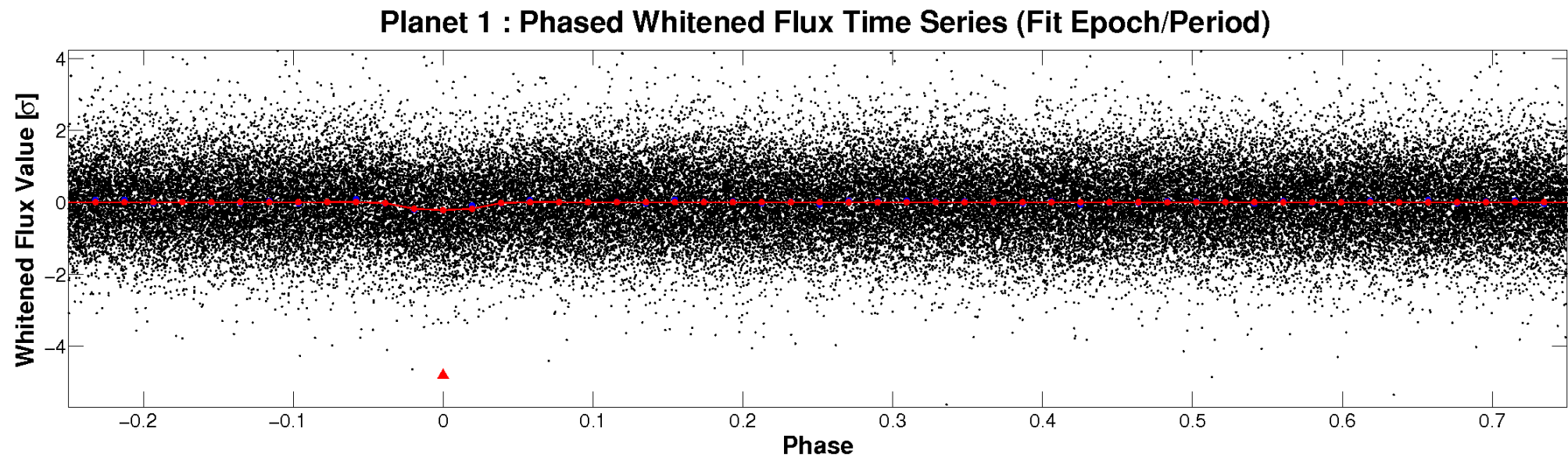
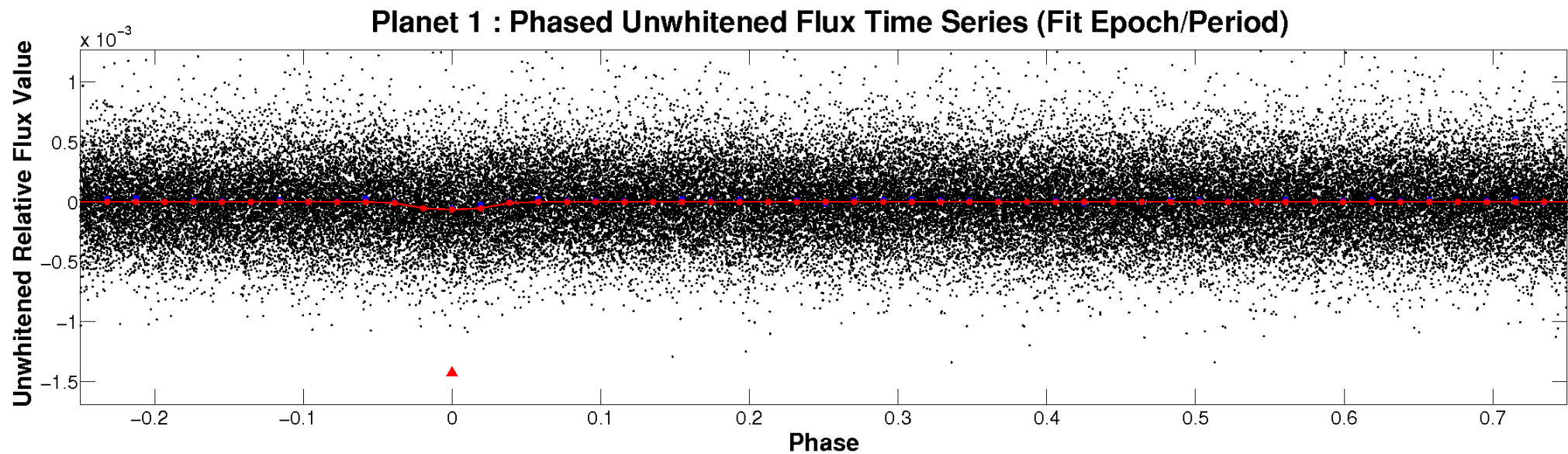


# ALT Odd/Even

TCE 009658089-01

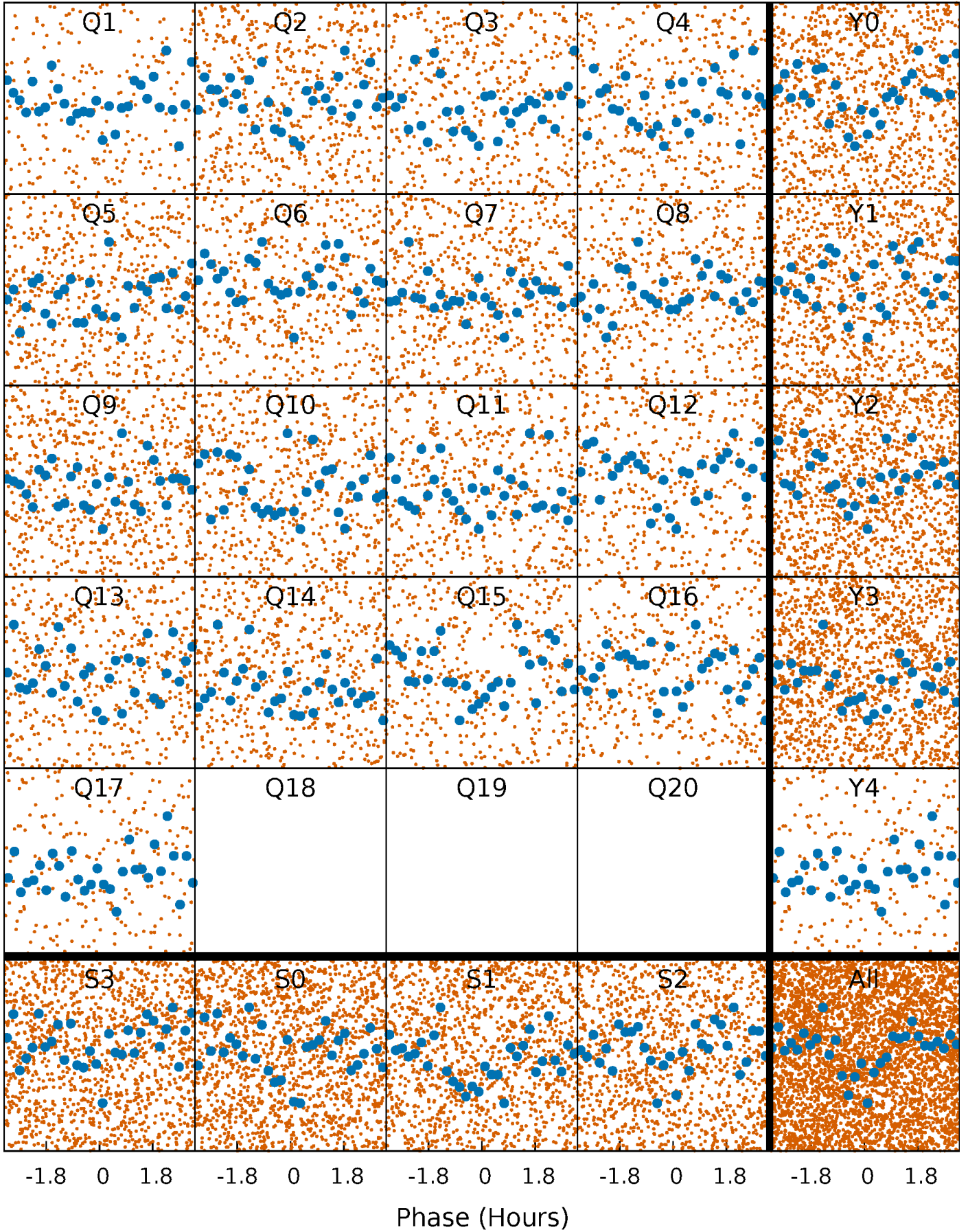


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

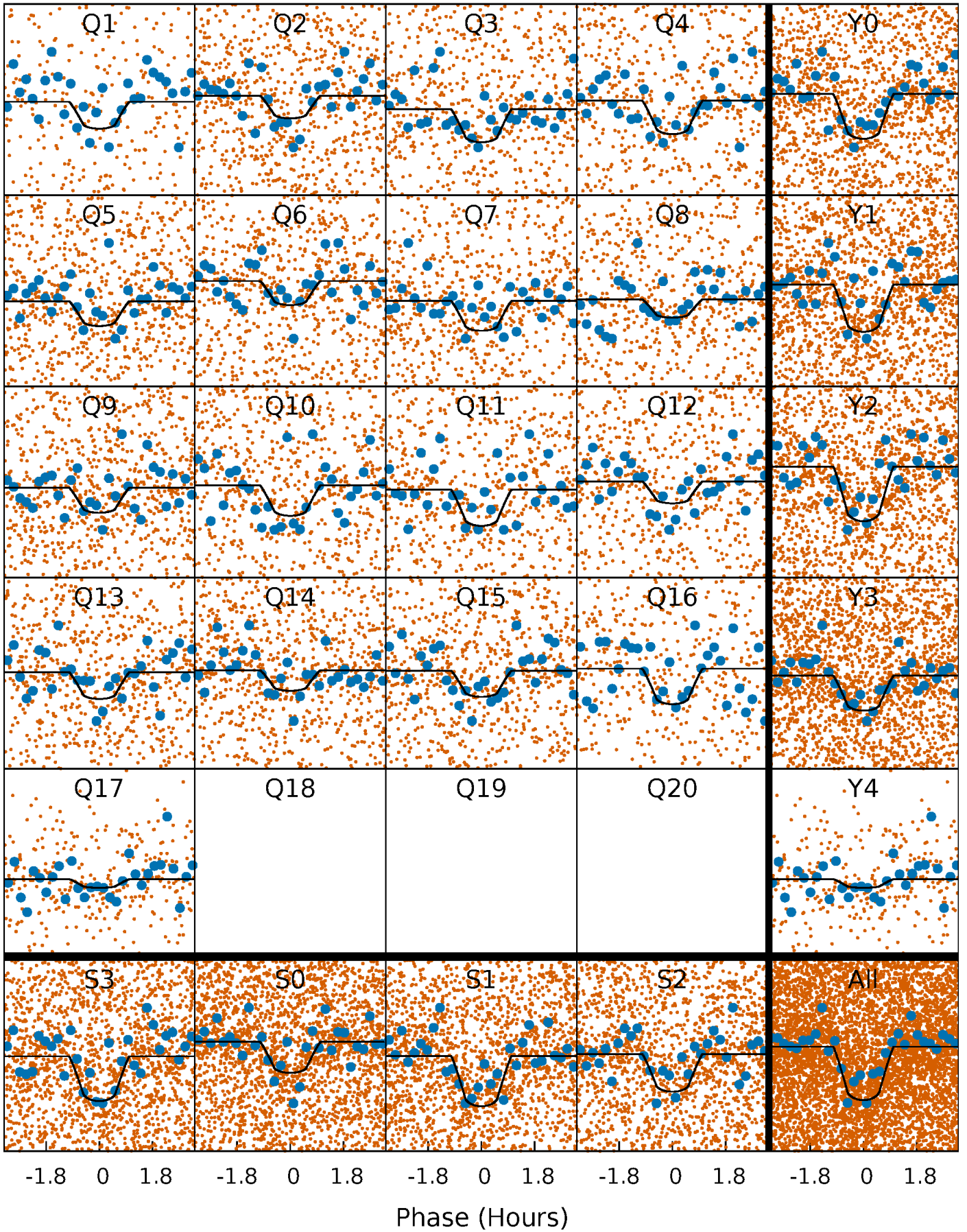
TCE 009658089-01   P= 1.057083 Days    $T_0=131.693783$  (BKJD)





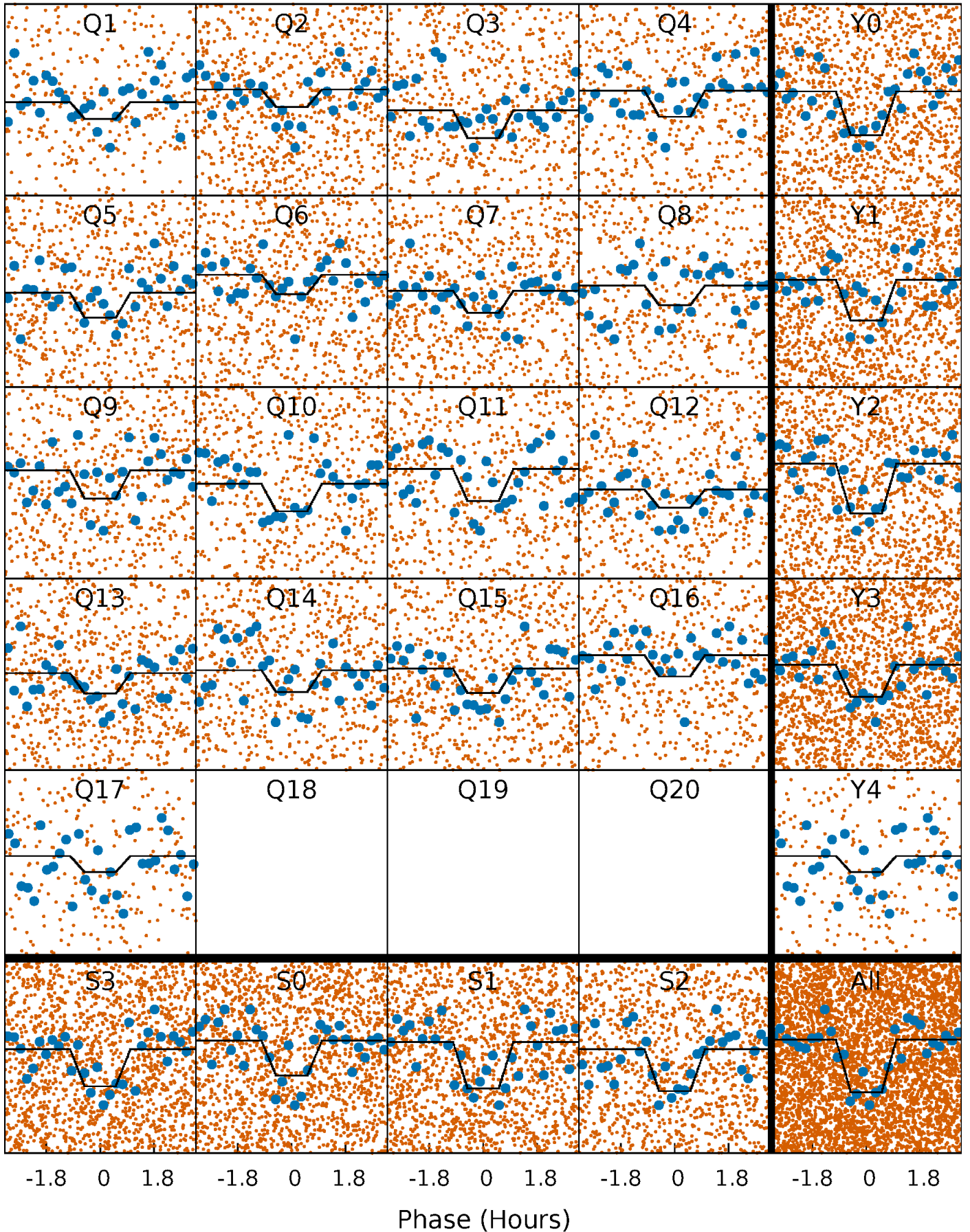
# DV Quarter-Phased Transit Curves

TCE 009658089-01 P= 1.057083 Days  $T_0=131.693783$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

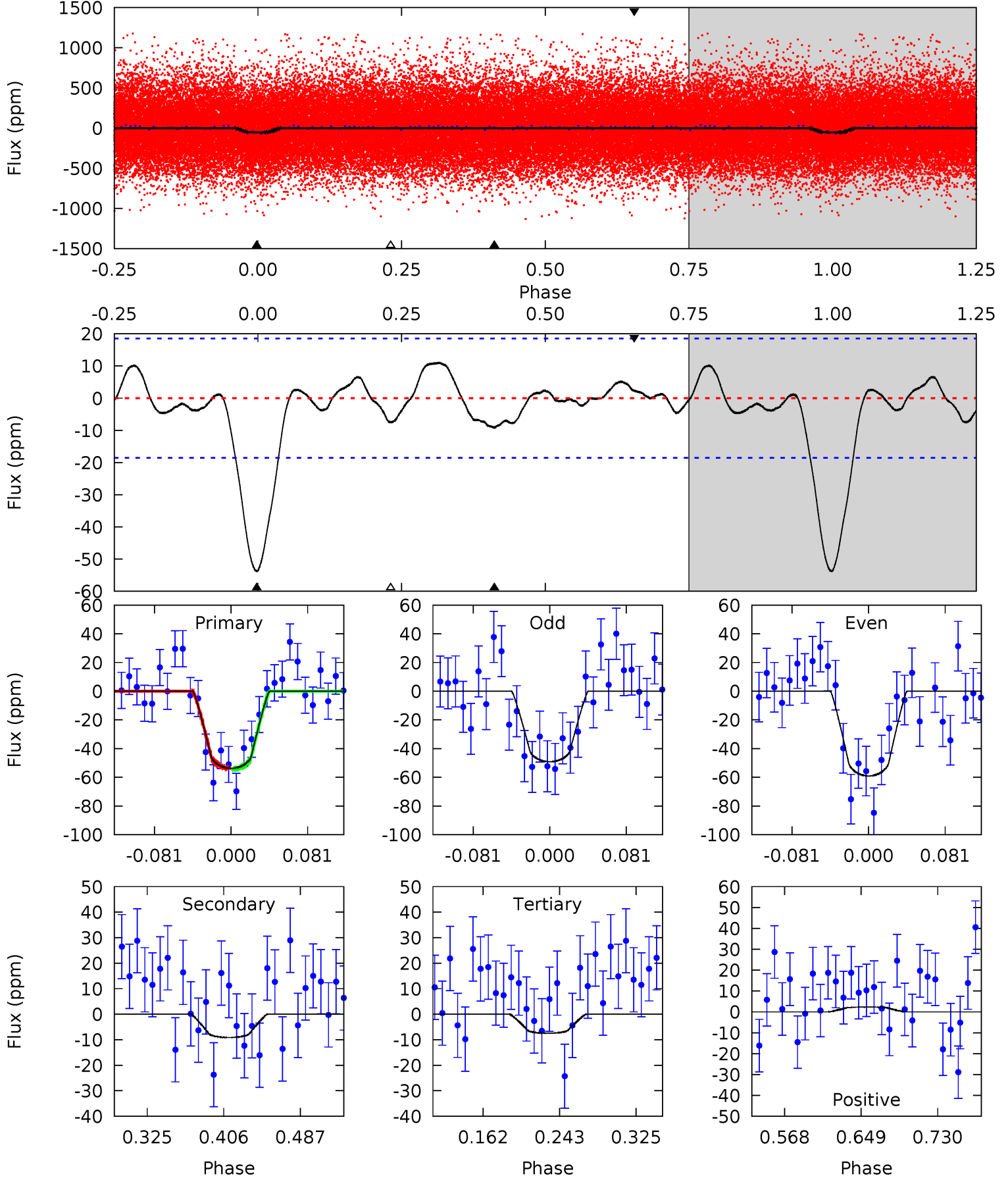
TCE 009658089-01 P= 1.057077 Days  $T_0=131.696222$  (BKJD)



# DV Model-Shift Uniqueness Test

009658089-01, P = 1.057083 Days, E = 130.636700 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
13.4	2.27	1.86	0.58	4.61	1.74	1.09	11.5	12.8	0.41	1.69	1.23	0.89	0.17	0.07

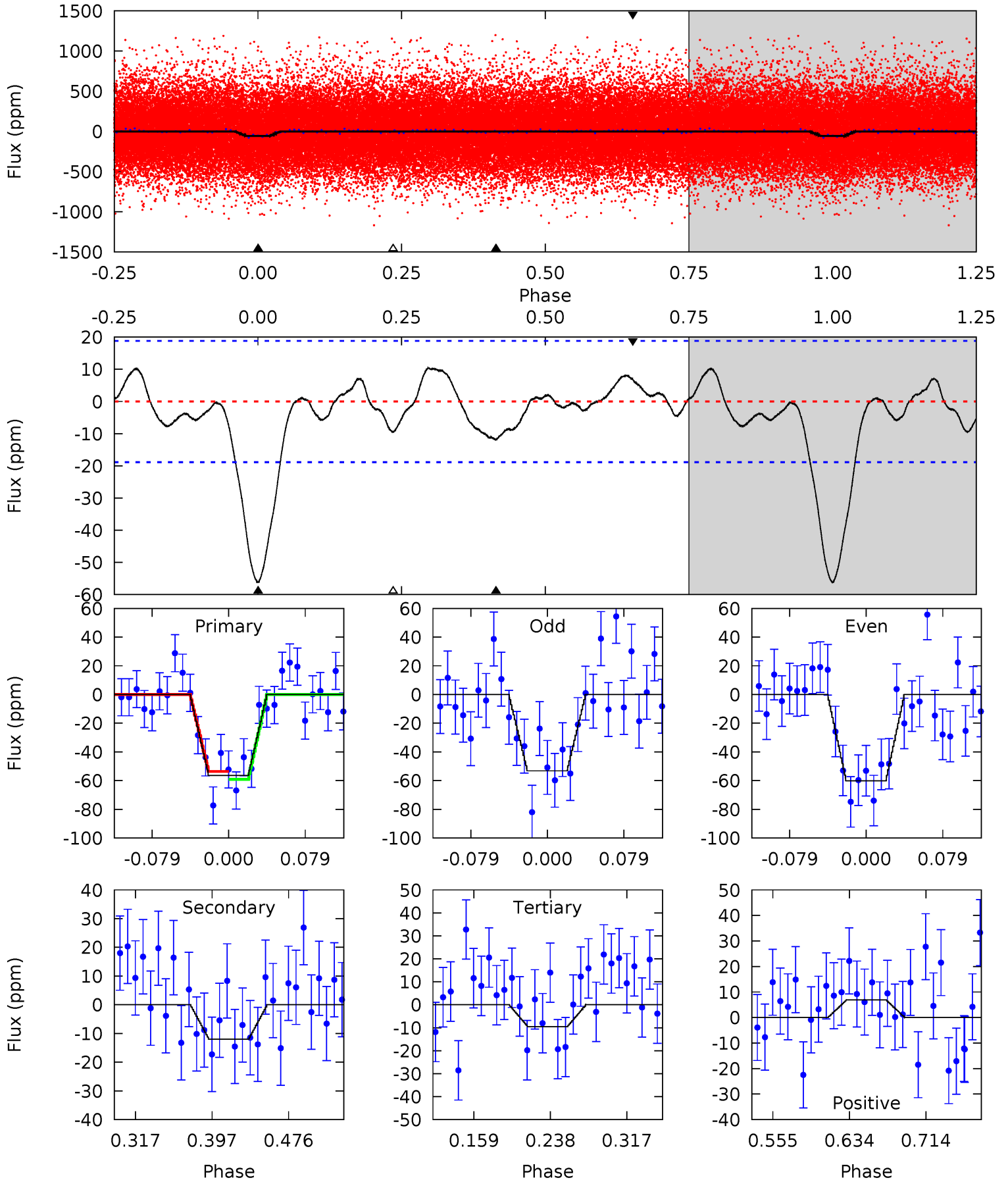




# Alt Model-Shift Uniqueness Test

009658089-01, P = 1.057077 Days, E = 130.639145 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
13.8	2.94	2.34	1.69	4.61	1.75	1.22	11.5	12.1	0.61	1.26	0.86	0.98	0.16	0.67





### Stellar Parameters For KIC 009658089

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6000^{+167}_{-209}$	$4.487^{+0.054}_{-0.216}$	$-0.160^{+0.300}_{-0.300}$	$0.946^{+0.312}_{-0.098}$	$1.003^{+0.131}_{-0.131}$	$1.668^{+0.474}_{-0.923}$
	+3%/-3%	+1%/-5%	+188%/-188%	+33%/-10%	+13%/-13%	+28%/-55%
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 009658089-01 / KOI 7220.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 4$	$1.01^{+0.54}_{-0.50}$	$2584^{+186}_{-142}$	$3690^{+1220}_{-733}$	$1.944^{+6.575}_{-1.272}$
Alt.	$-12 \pm 4$	$0.85^{+0.53}_{-0.47}$	$2577^{+179}_{-131}$	$4117^{+1939}_{-773}$	$3.553^{+16.335}_{-2.351}$

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

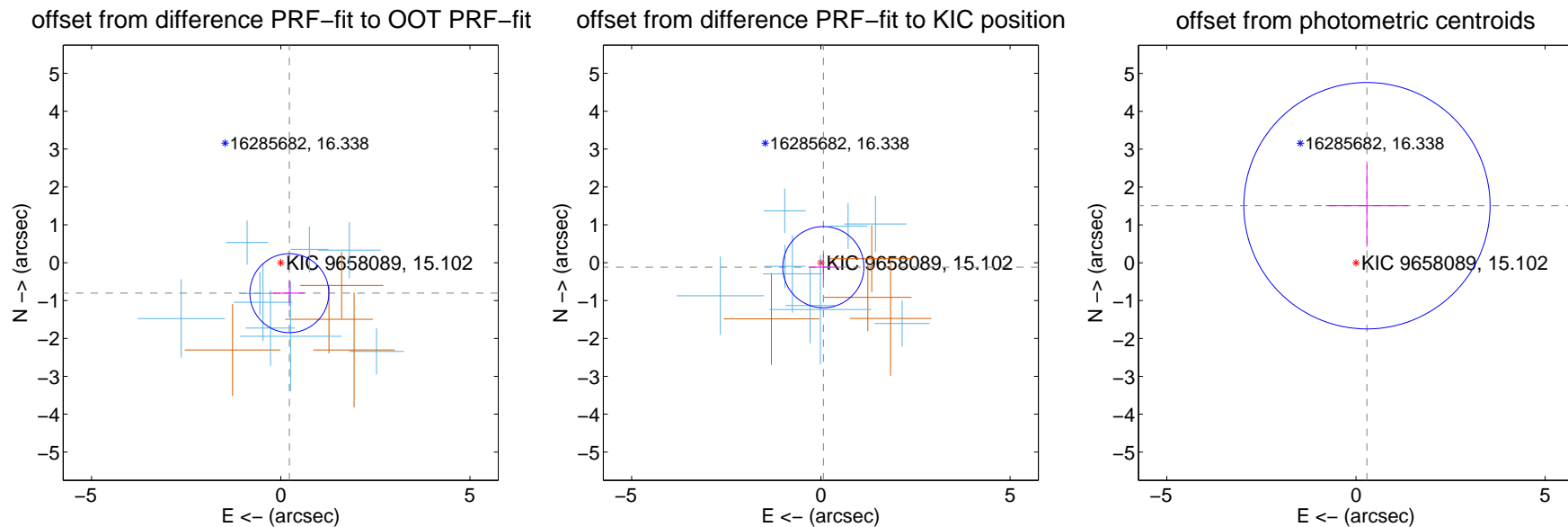
## DV Centroid Data

Supplemental centroid analysis for 009658089-01. Kepler magnitude: 15.10. Transit SNR 11.45

There are 9 quarters with good PRF difference image offsets

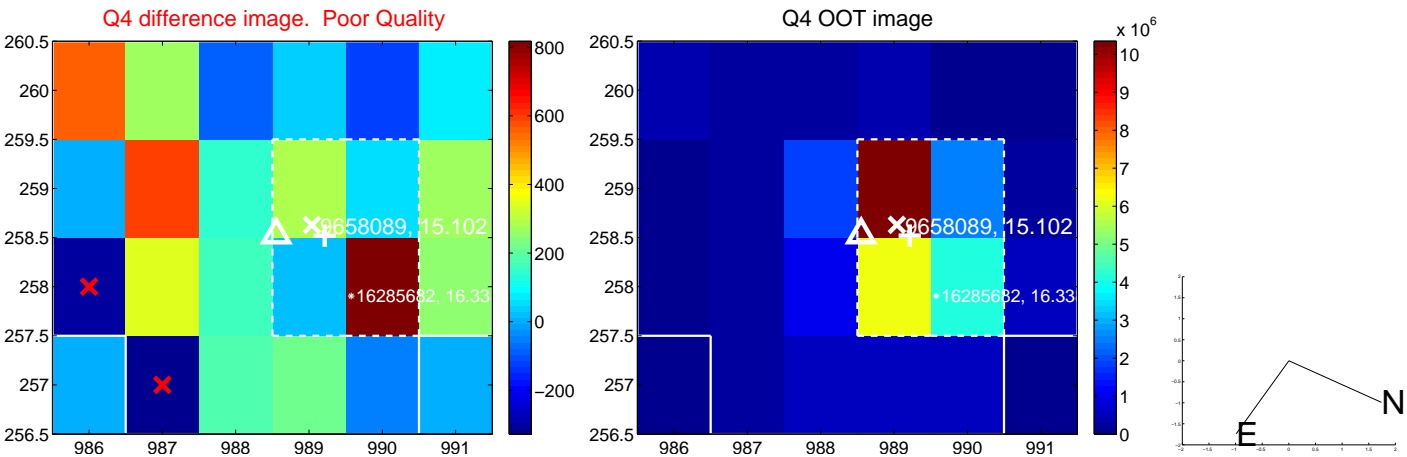
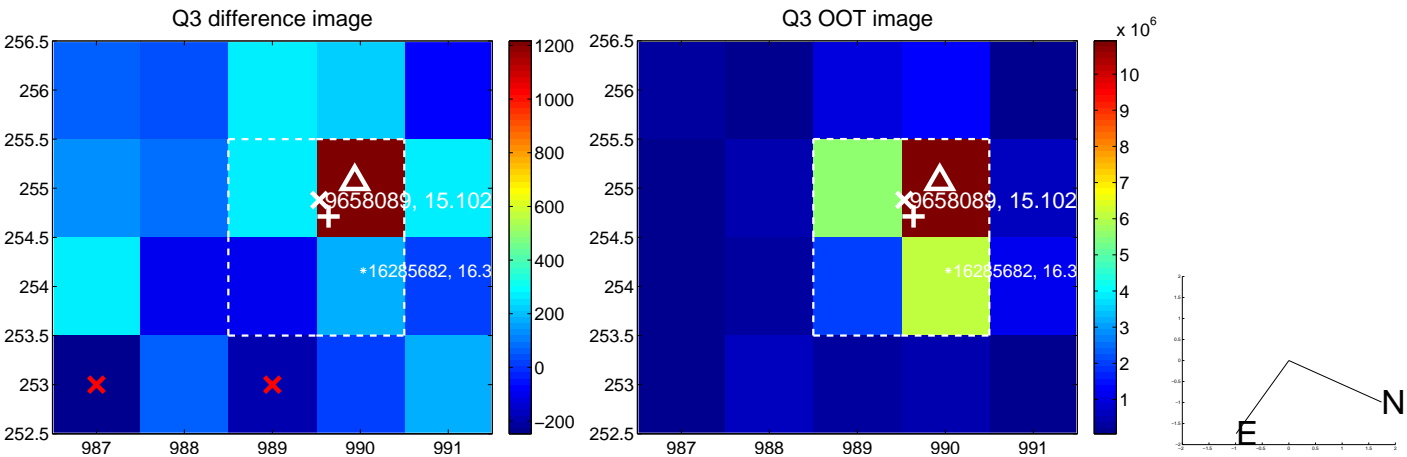
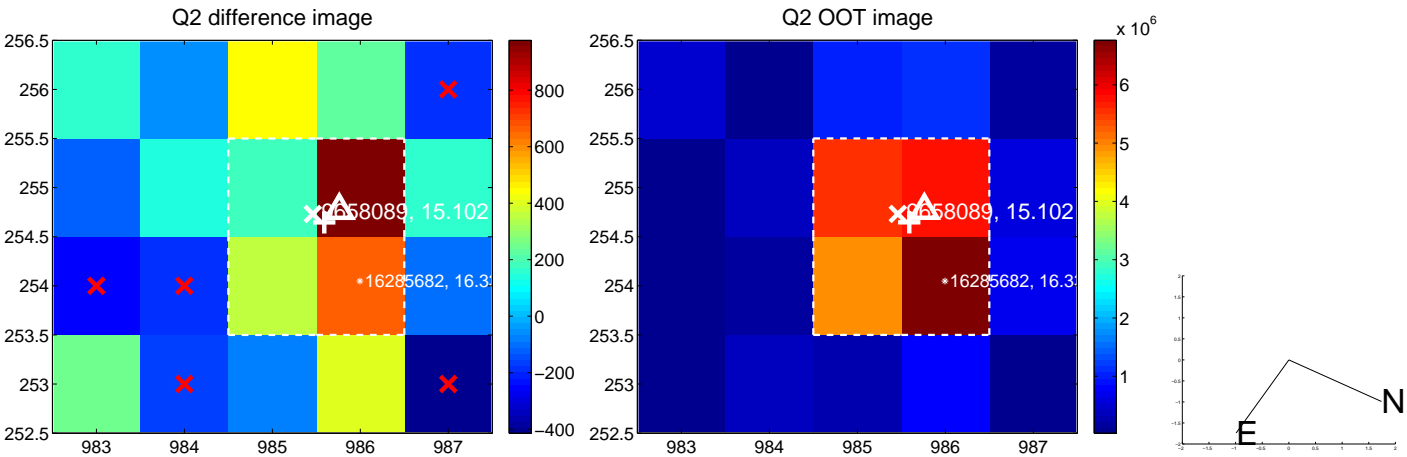
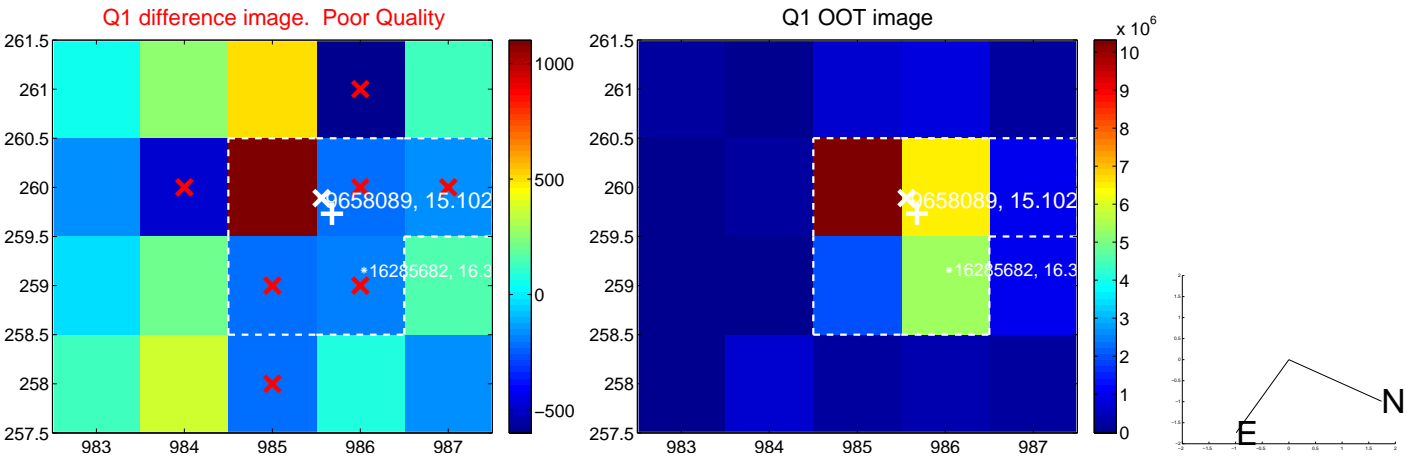
The direct PRF centroid is offset from the target star catalog position by about 0.76 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.836 \pm 0.348$	2.40	$-0.227 \pm 0.406$	$-0.804 \pm 0.343$
PRF-fit source offset from KIC position	$0.135 \pm 0.357$	0.38	$-0.066 \pm 0.388$	$-0.118 \pm 0.347$
photometric centroid source offset	$1.53 \pm 1.08$	1.41	$-0.29 \pm 1.09$	$1.51 \pm 1.08$

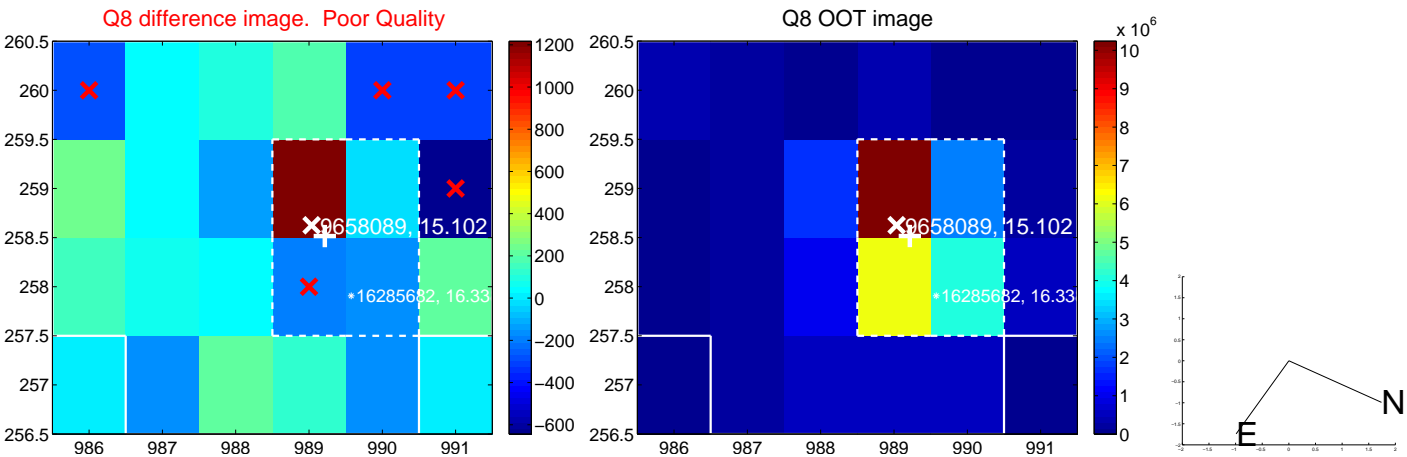
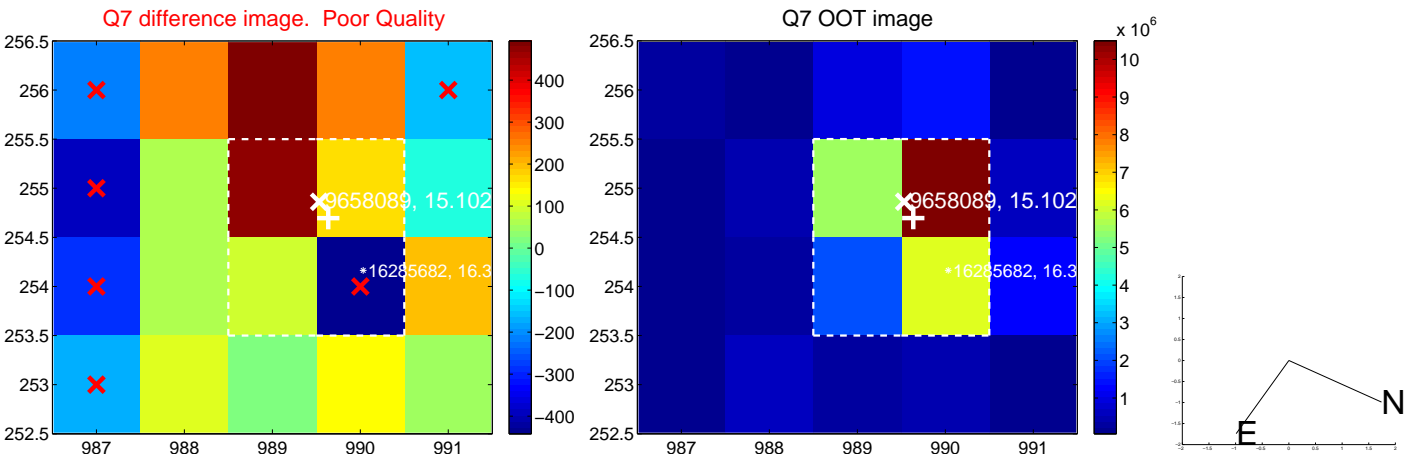
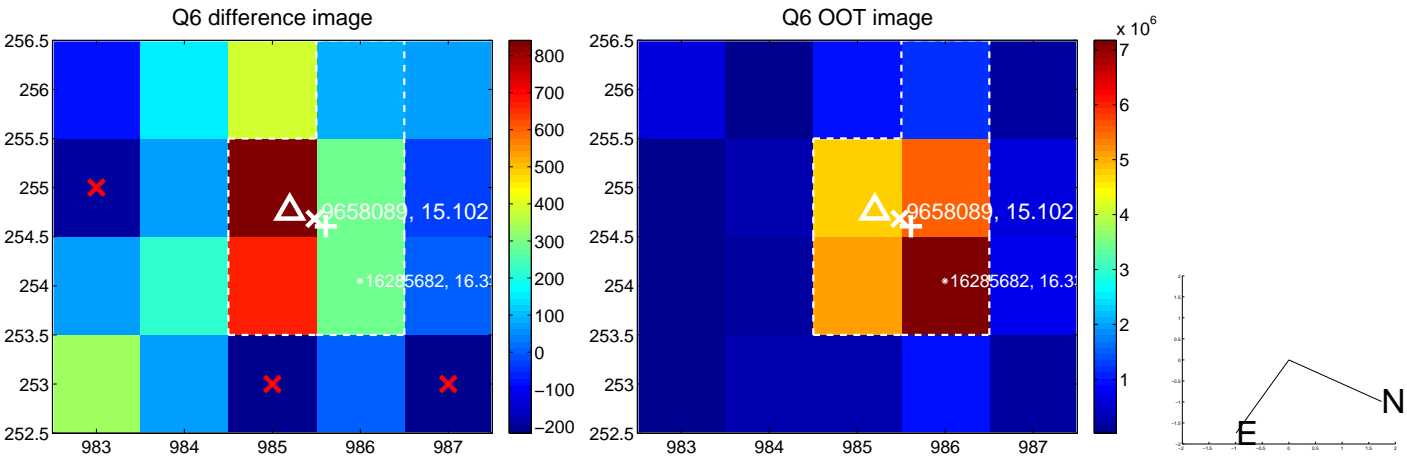
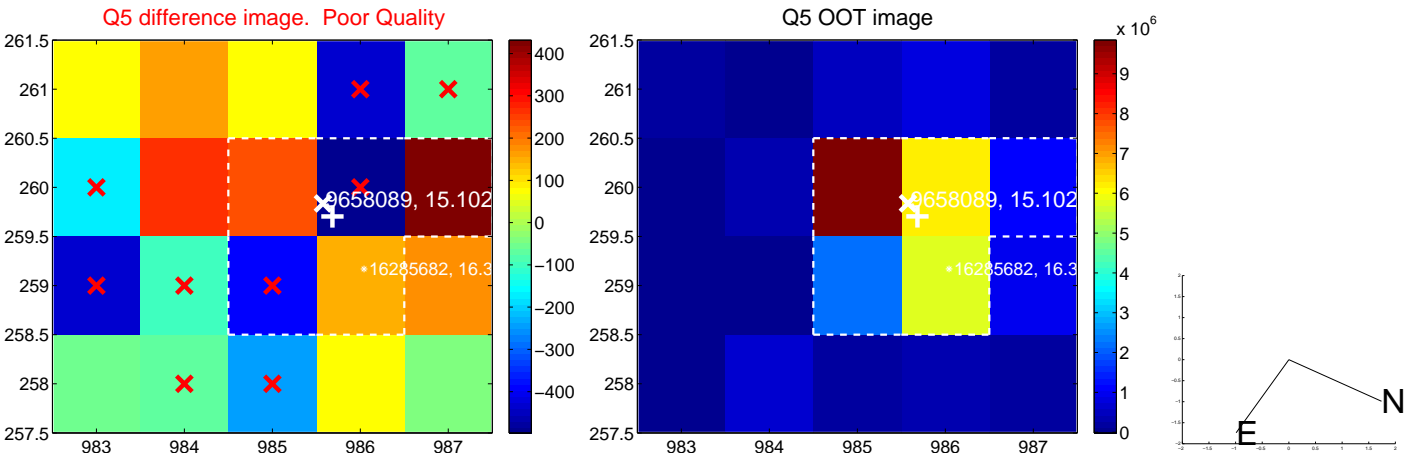


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

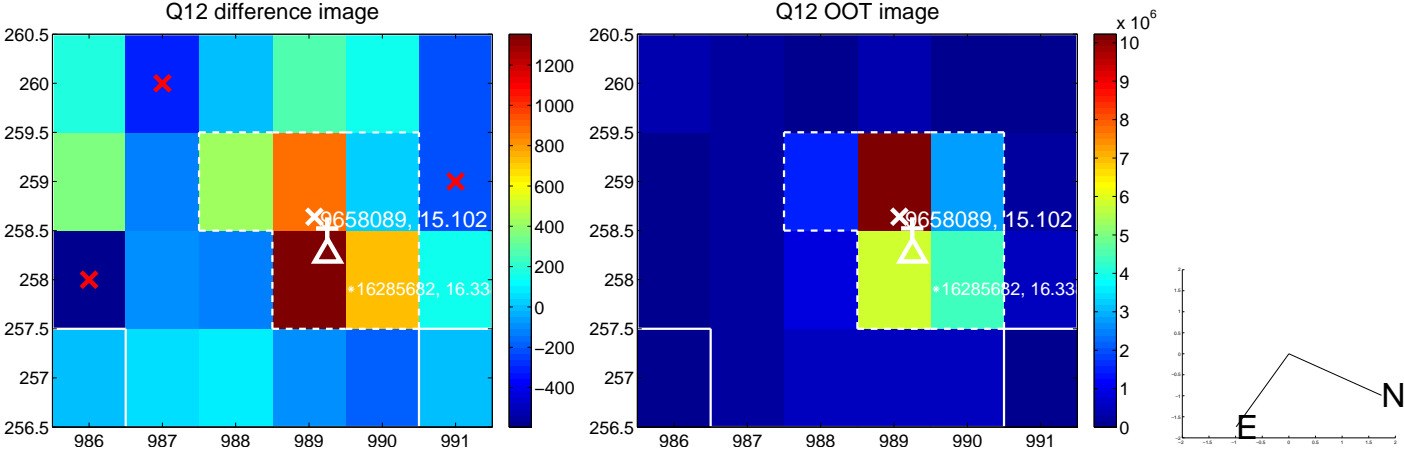
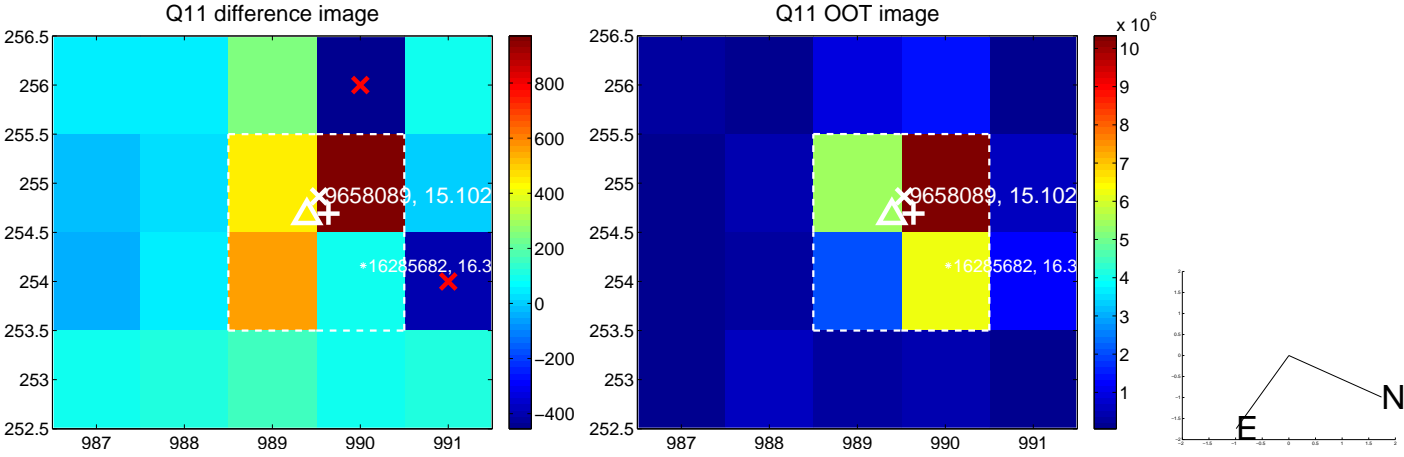
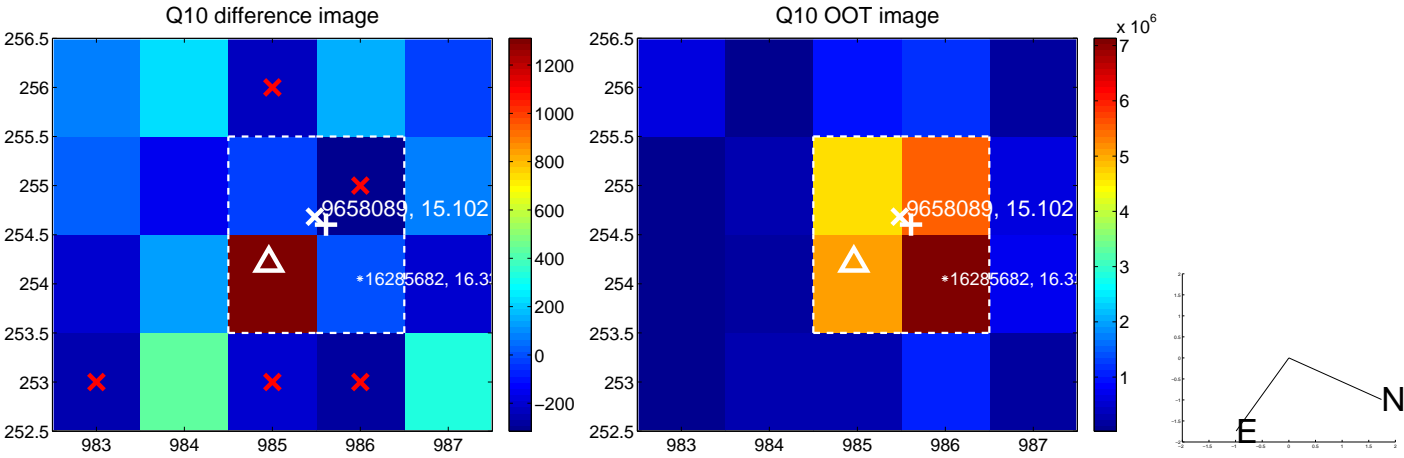
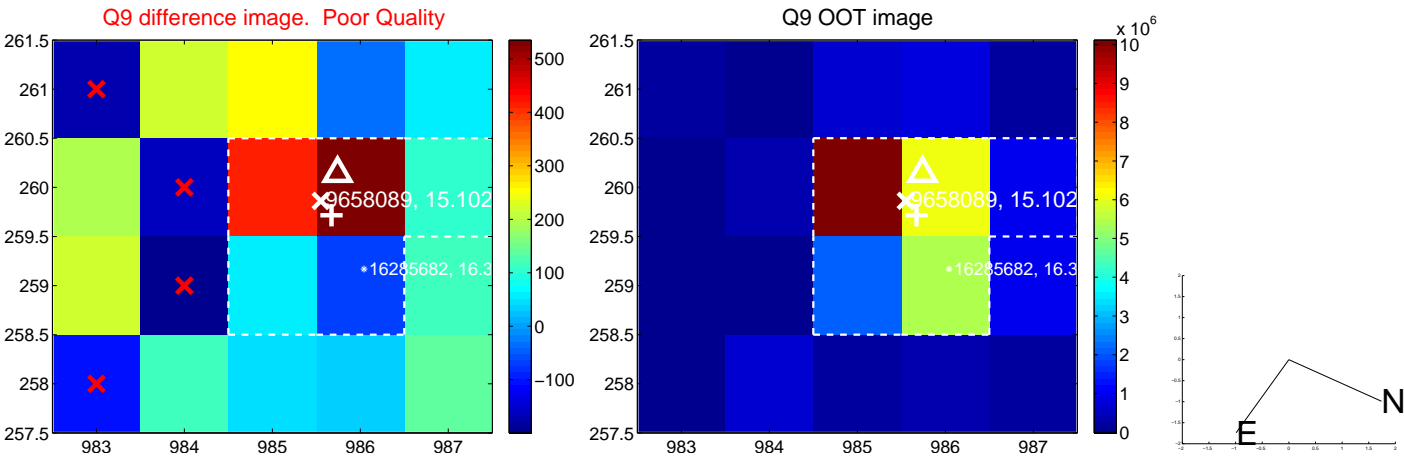


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

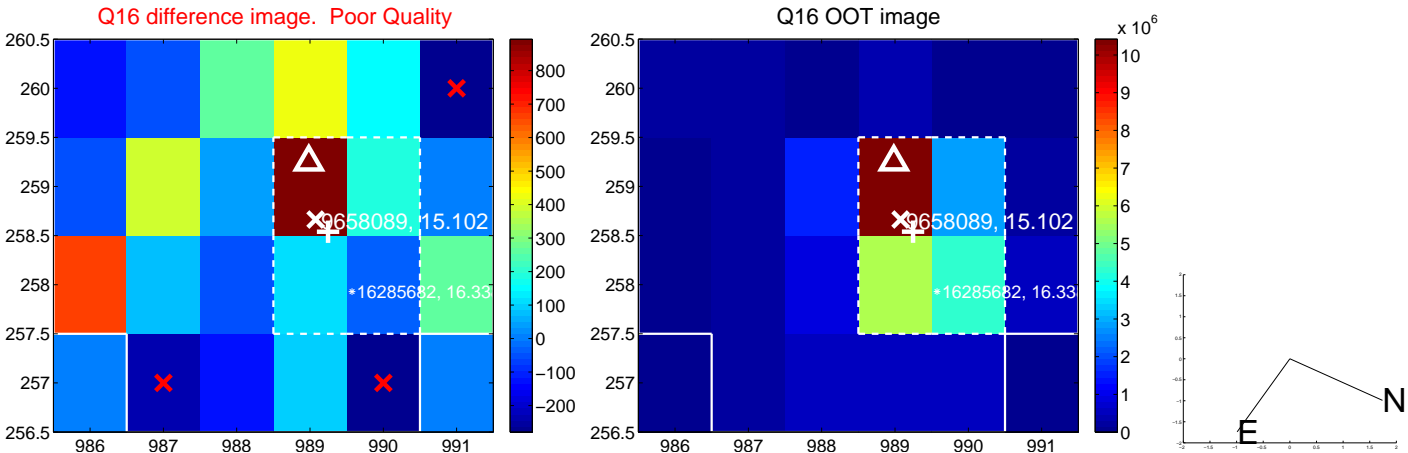
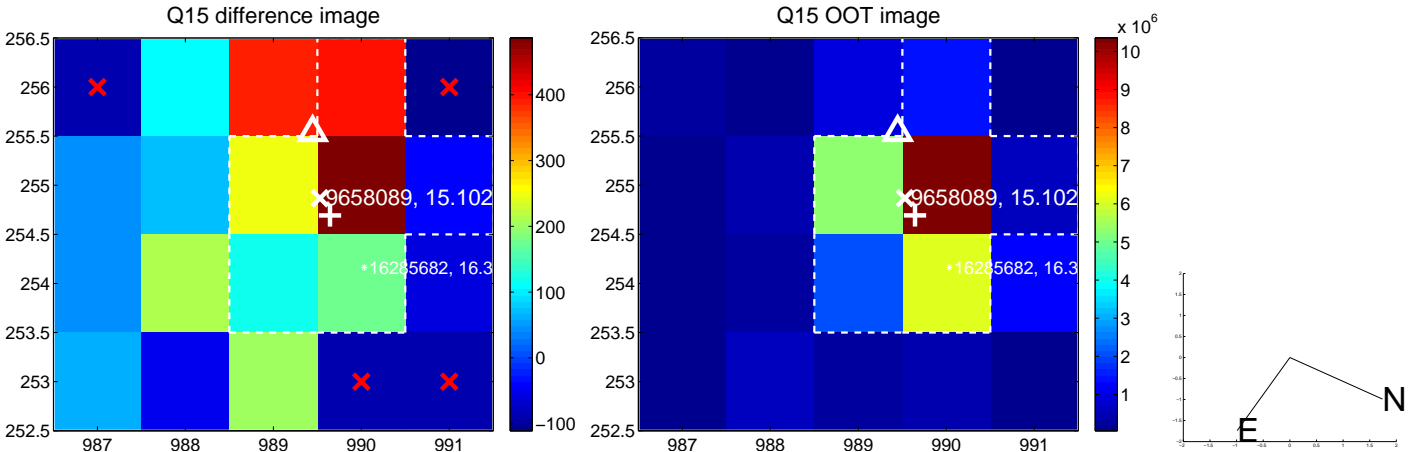
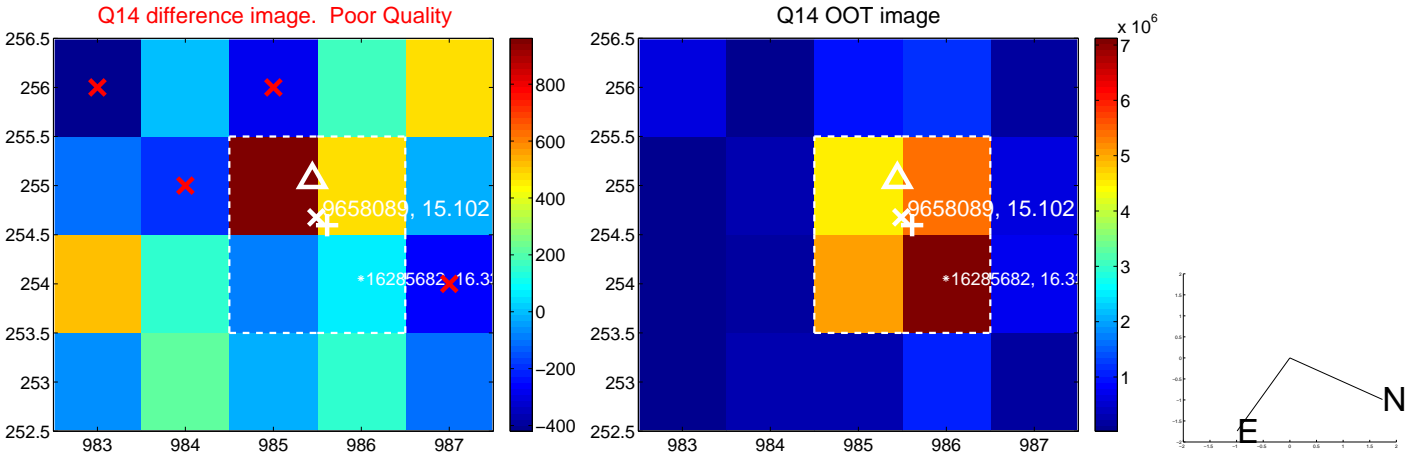
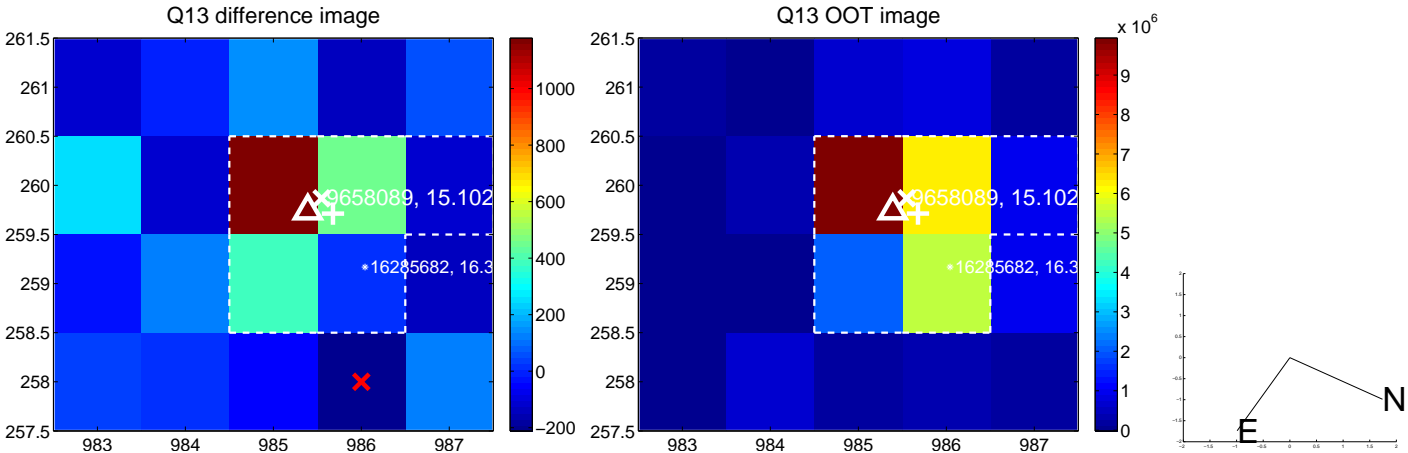




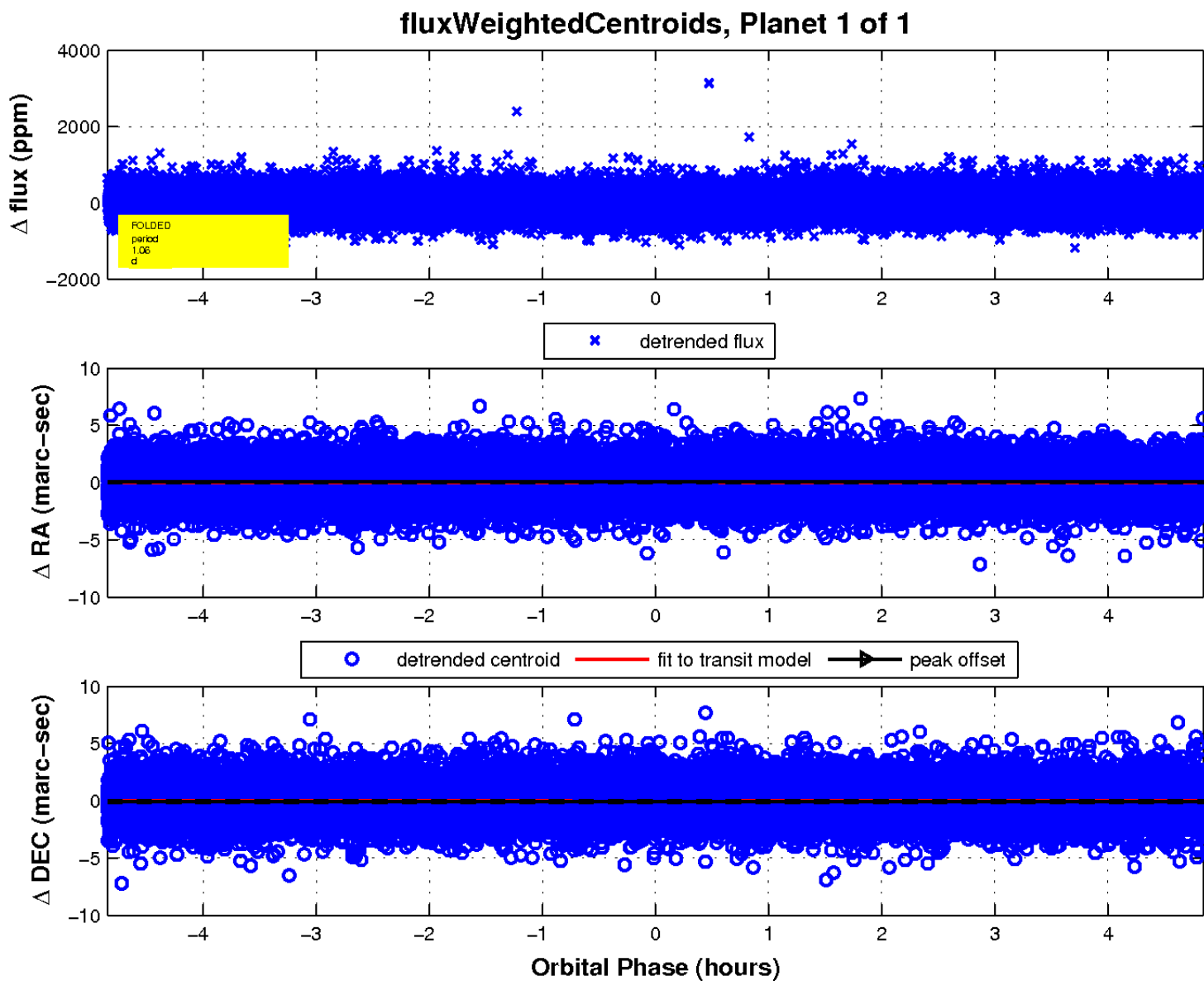
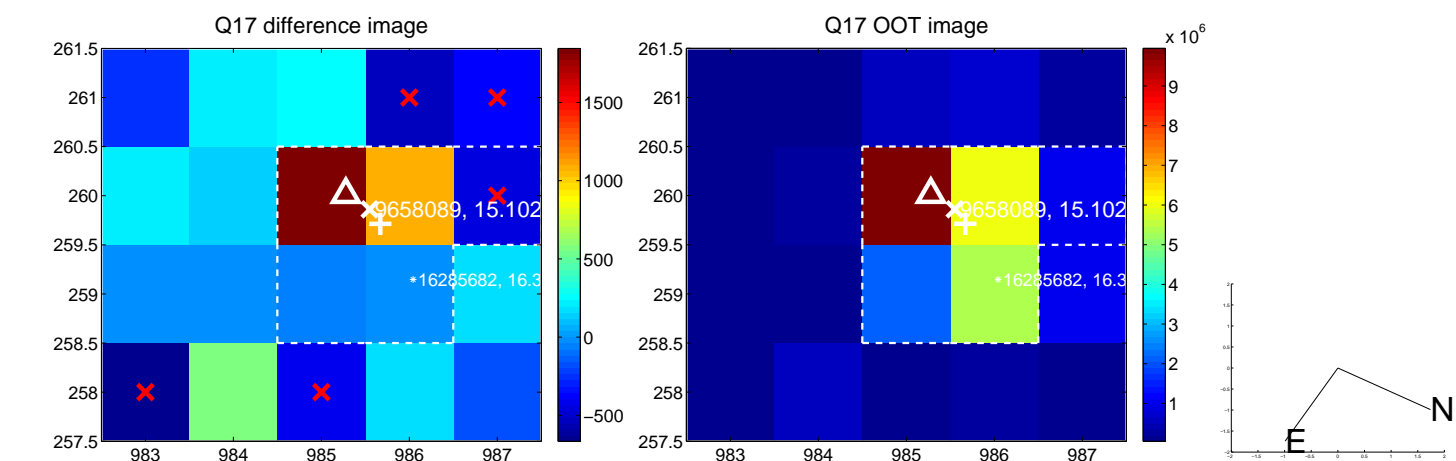
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

