

# KIC 009109857

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009109857-01	OBS	2833.01	1.791884	132.873988	40.8	1.369	14.6	16.3	2.14	6002	1.62	5787.25

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009109857-01	OBS	PC	0.96	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.

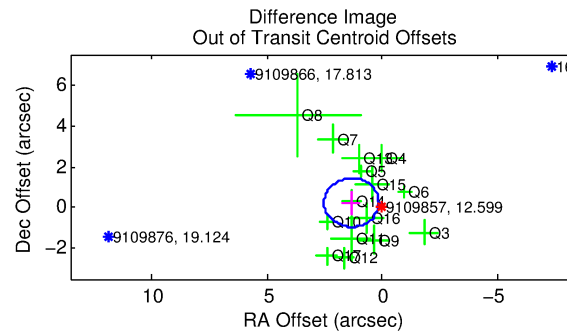
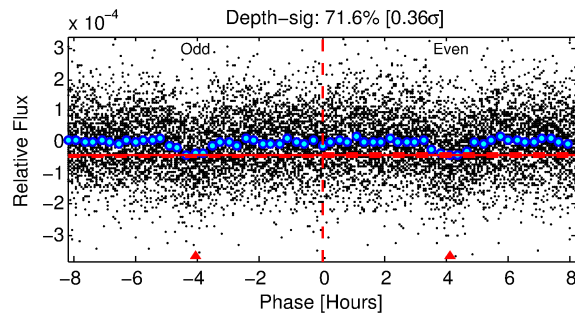
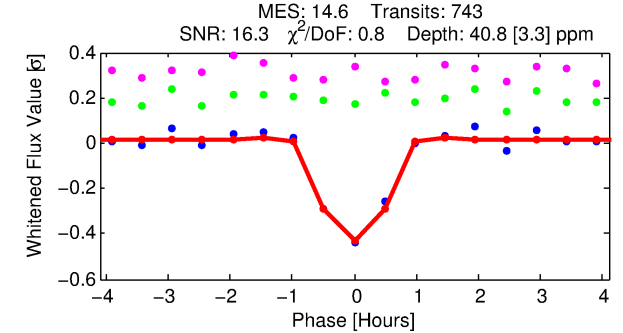
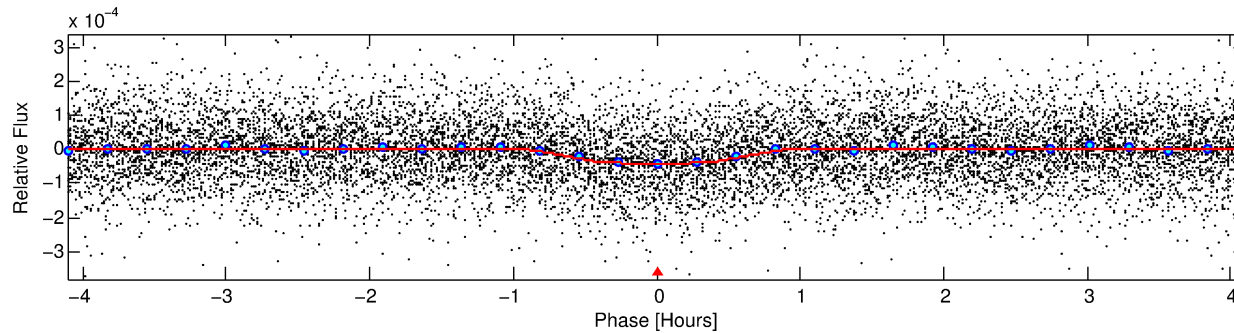
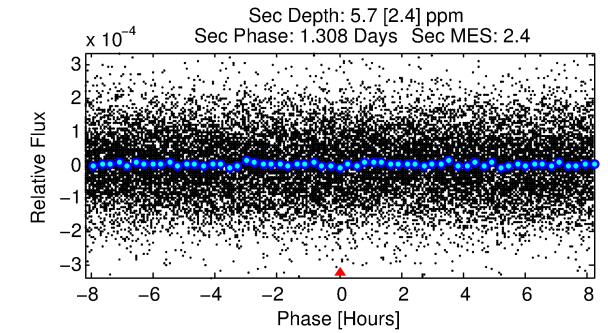
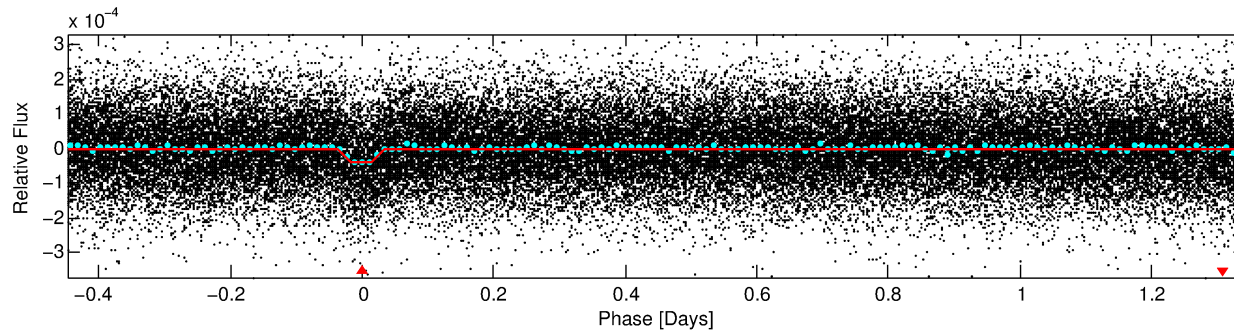
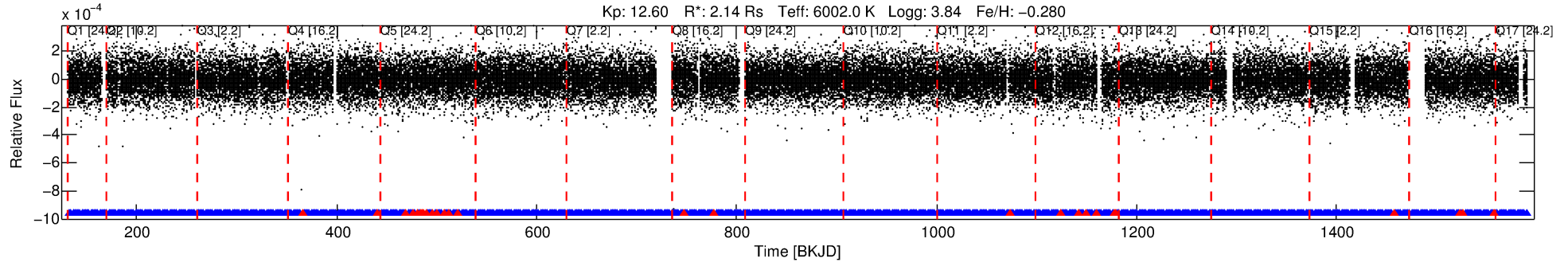
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009109857-01

No Significant Match Found

# DV One-Page Summary

KIC: 9109857 Candidate: 1 of 1 Period: 1.792 d  
KOI: K02833.01 Corr: 0.939



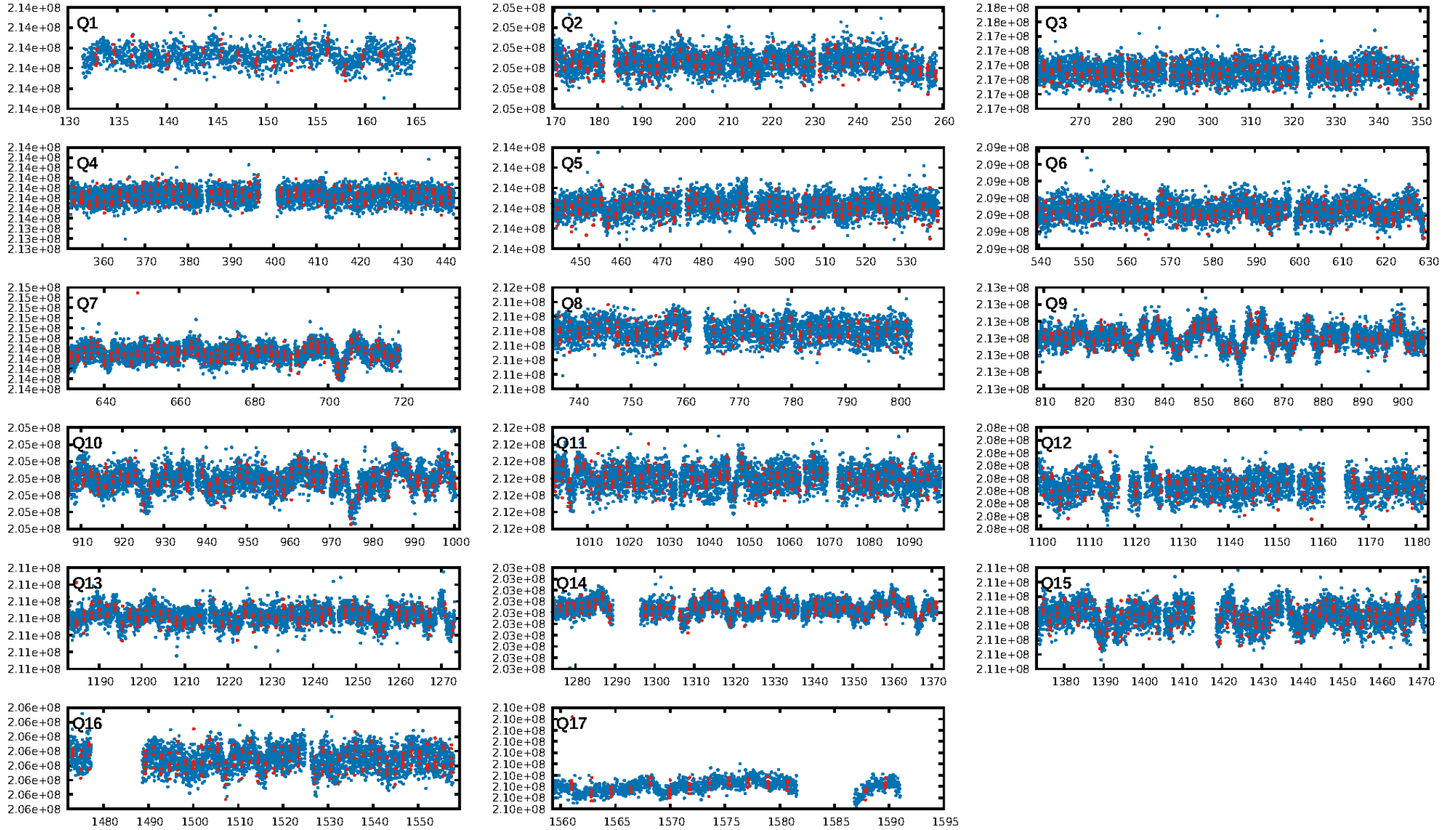
## DV Fit Results:

Period = 1.79188 [0.00001] d  
Epoch = 132.8740 [0.0013] BKJD  
Rp/R\* = 0.0069 [0.0017]  
a/R\* = 4.59 [5.69]  
b = 0.90 [0.28]  
Seff = 5787.25 [2260.93]  
Teq = 2224 [217] K  
Rp = 1.62 [0.60] Re  
a = 0.0303 [0.0075] AU  
Ag = 1.11 [0.83] [0.13σ]  
Teffp = 3528 [576] K [2.12σ]

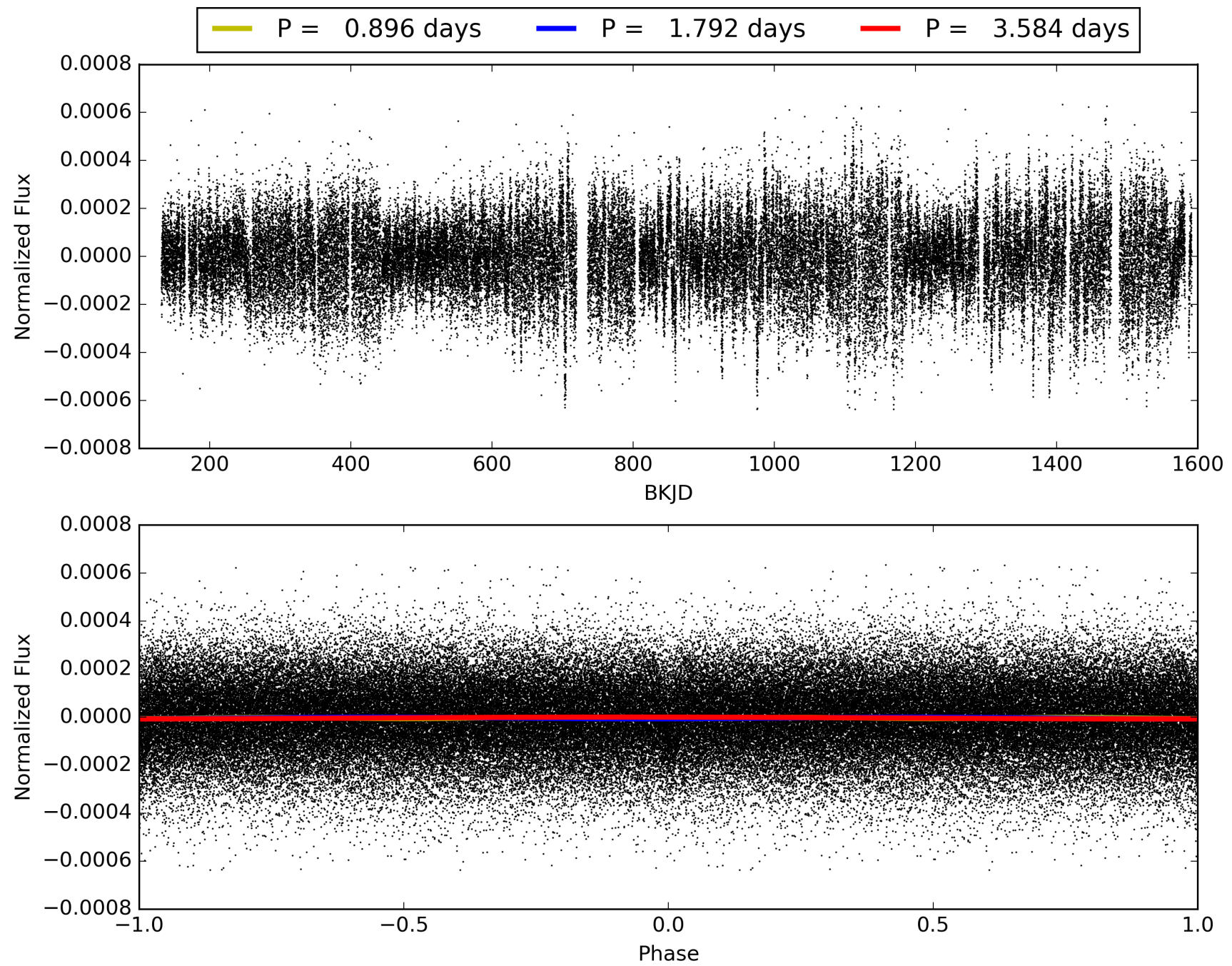
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.22e-45  
RollingBand-fgt: 0.96 [683/710]  
GhostDiagnostic-chr: 12.09  
Centroid-sig: 1.0%  
Centroid-so: 1.299 arcsec [1.64σ]  
OotOffset-rm: 1.362 arcsec [3.44σ]  
KicOffset-rm: 1.004 arcsec [2.83σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.80 [12/15]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009109857-01, PDC Light Curves

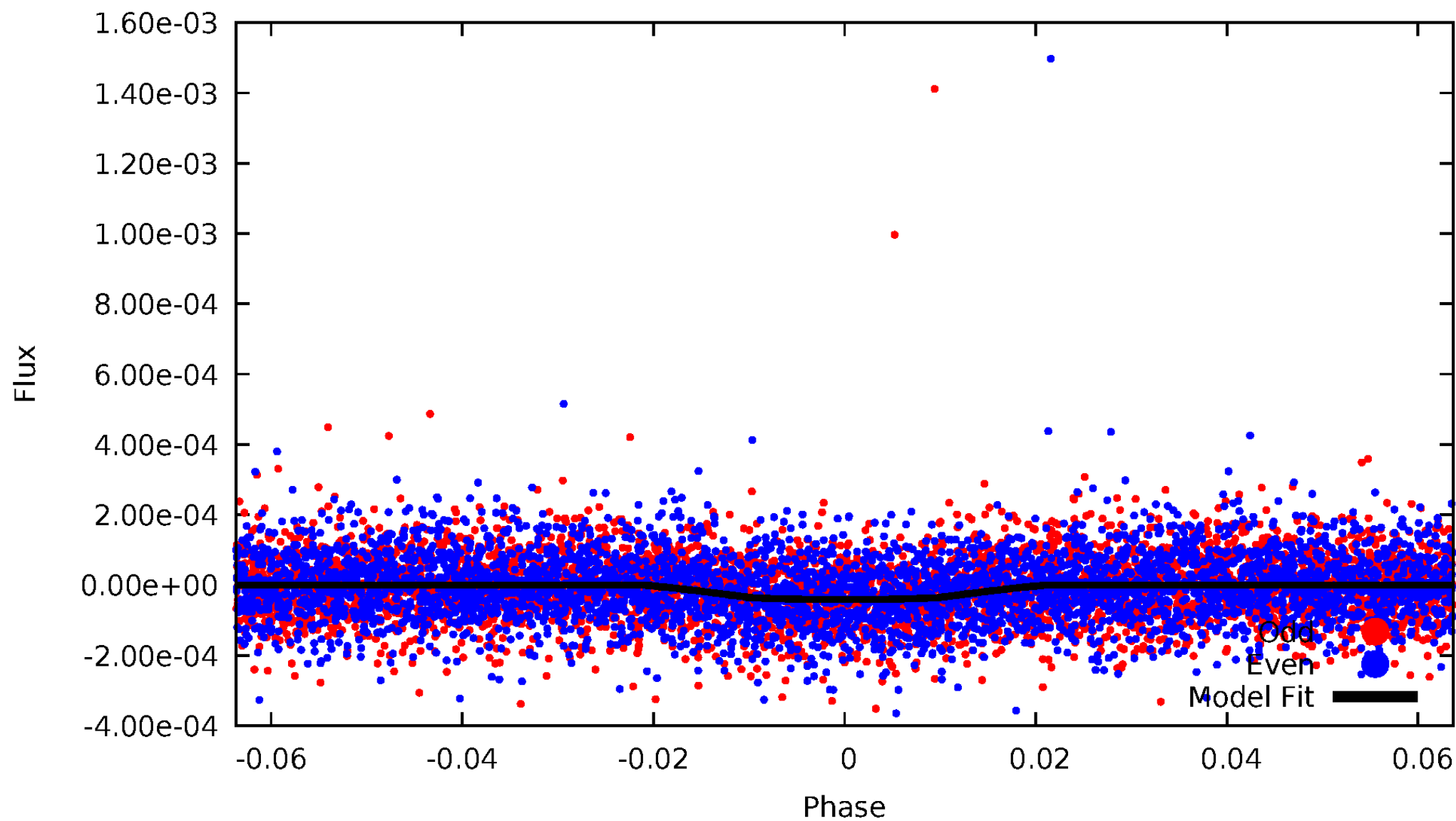


TCE 009109857-01



# DV Odd/Even

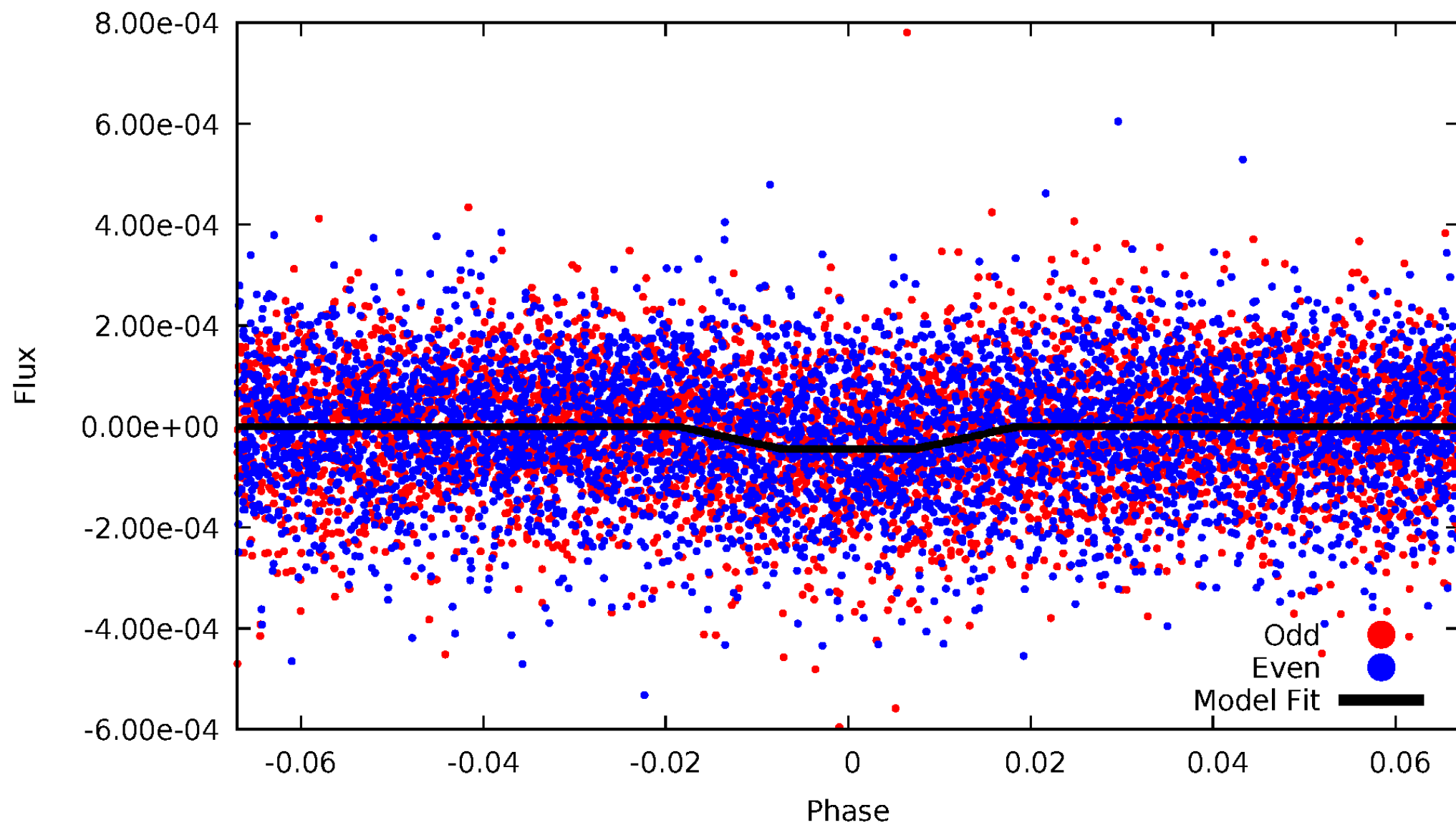
TCE 009109857-01





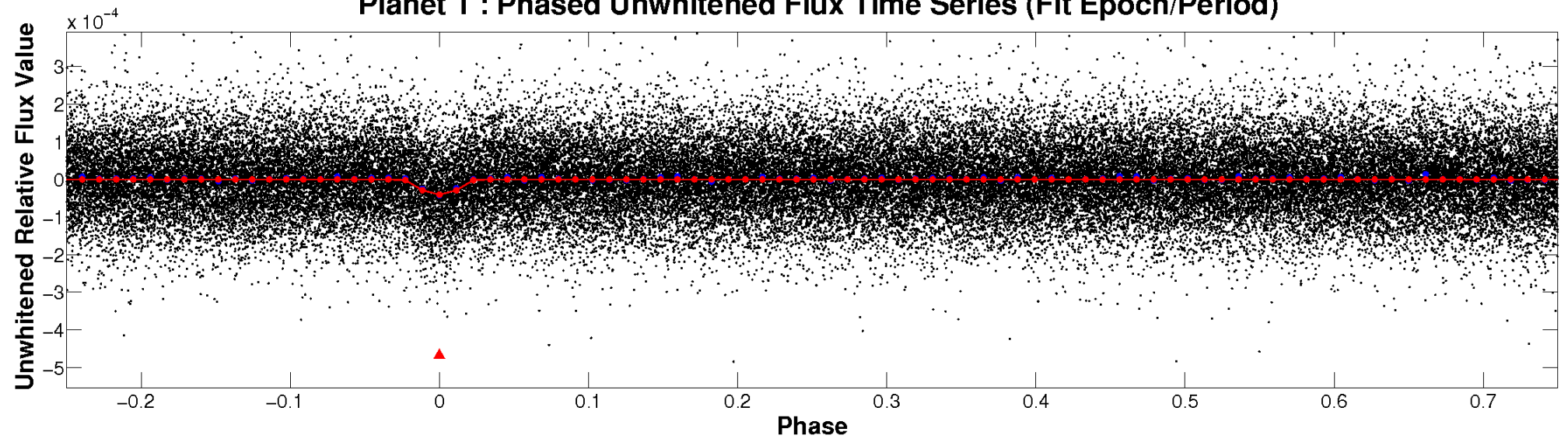
# ALT Odd/Even

TCE 009109857-01

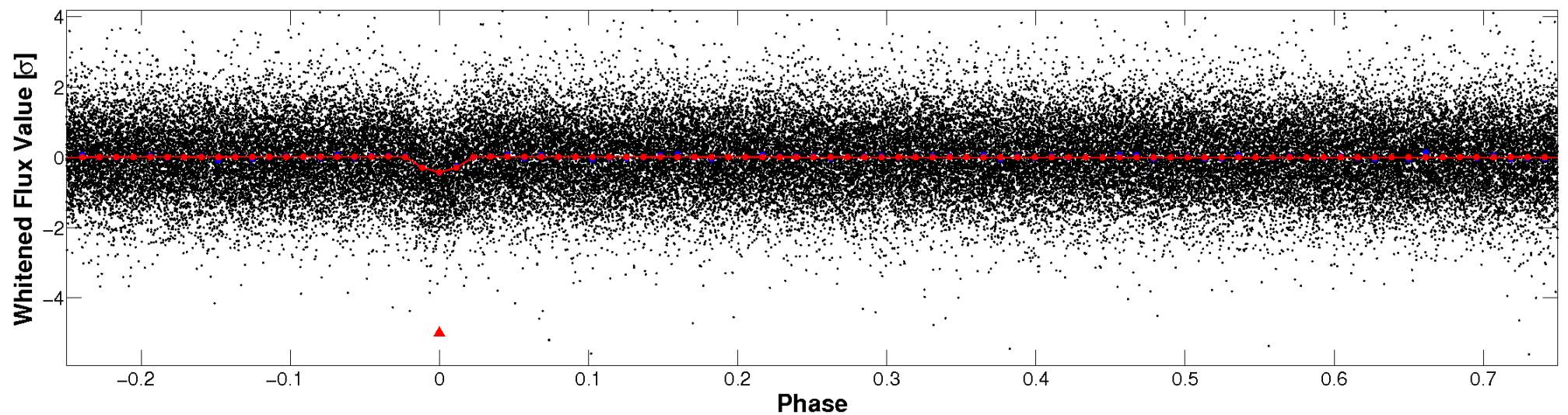


# Non-Whitened Vs. Whitened Light Curve

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

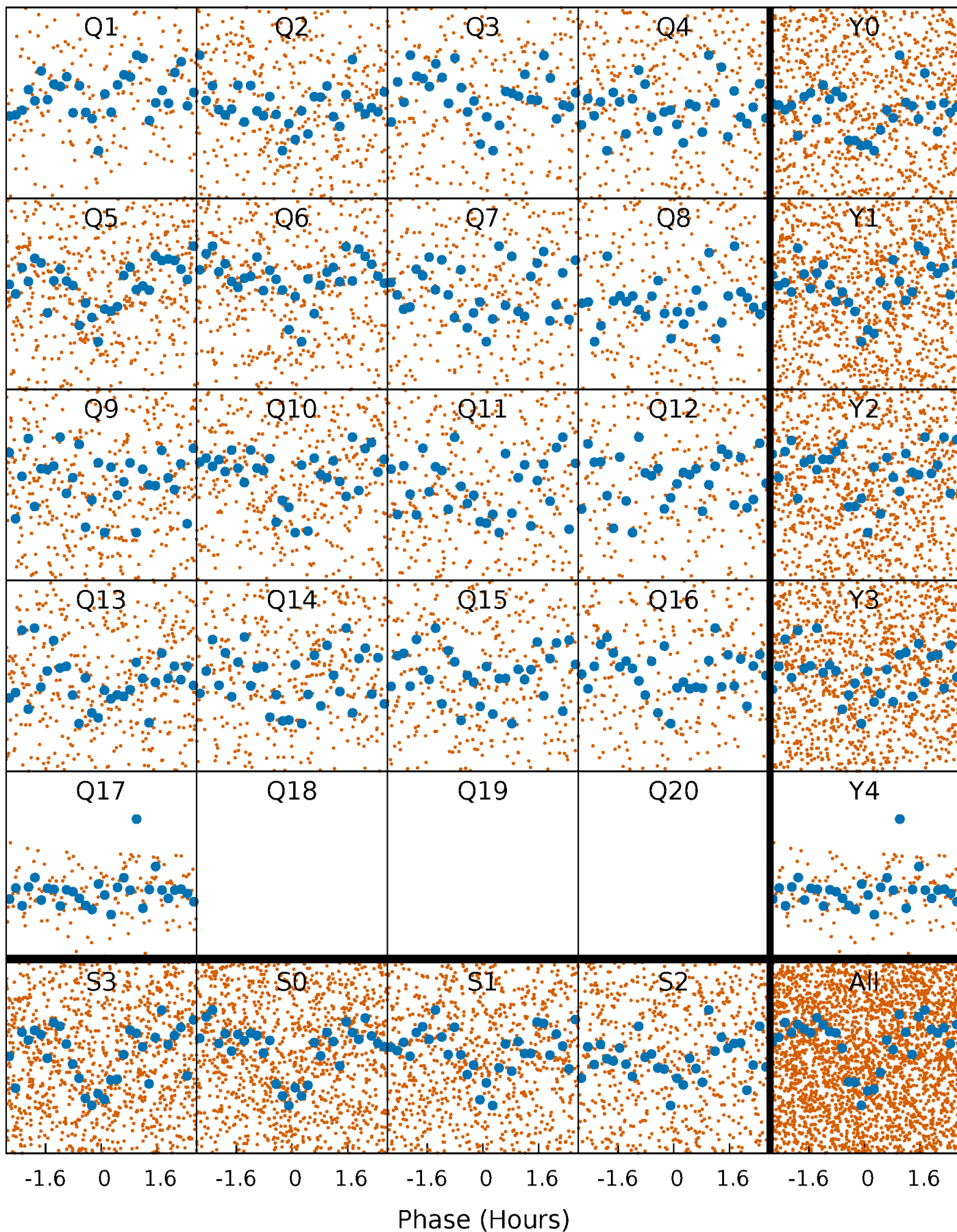


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

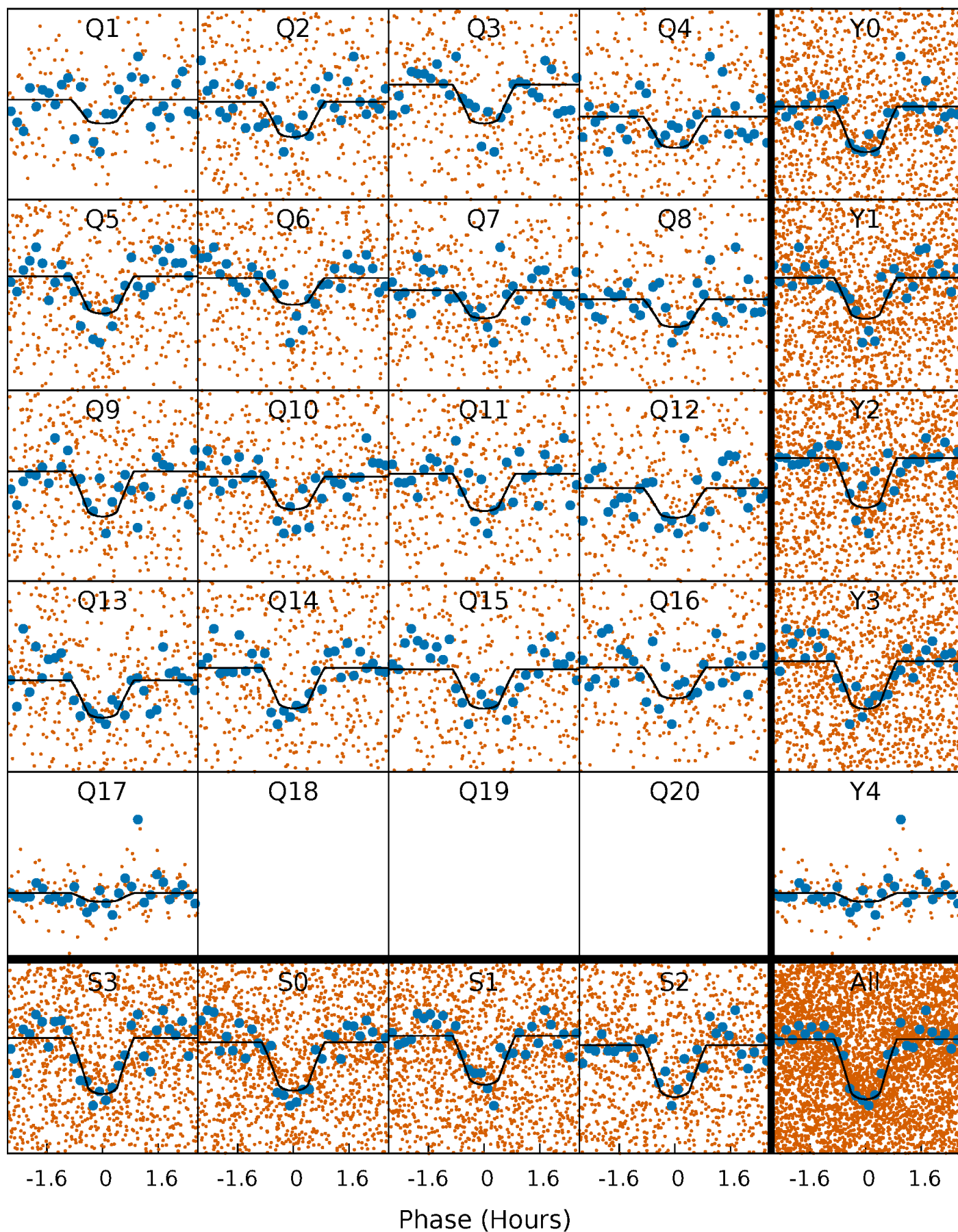
TCE 009109857-01 P= 1.791884 Days  $T_0=132.873988$  (BKJD)





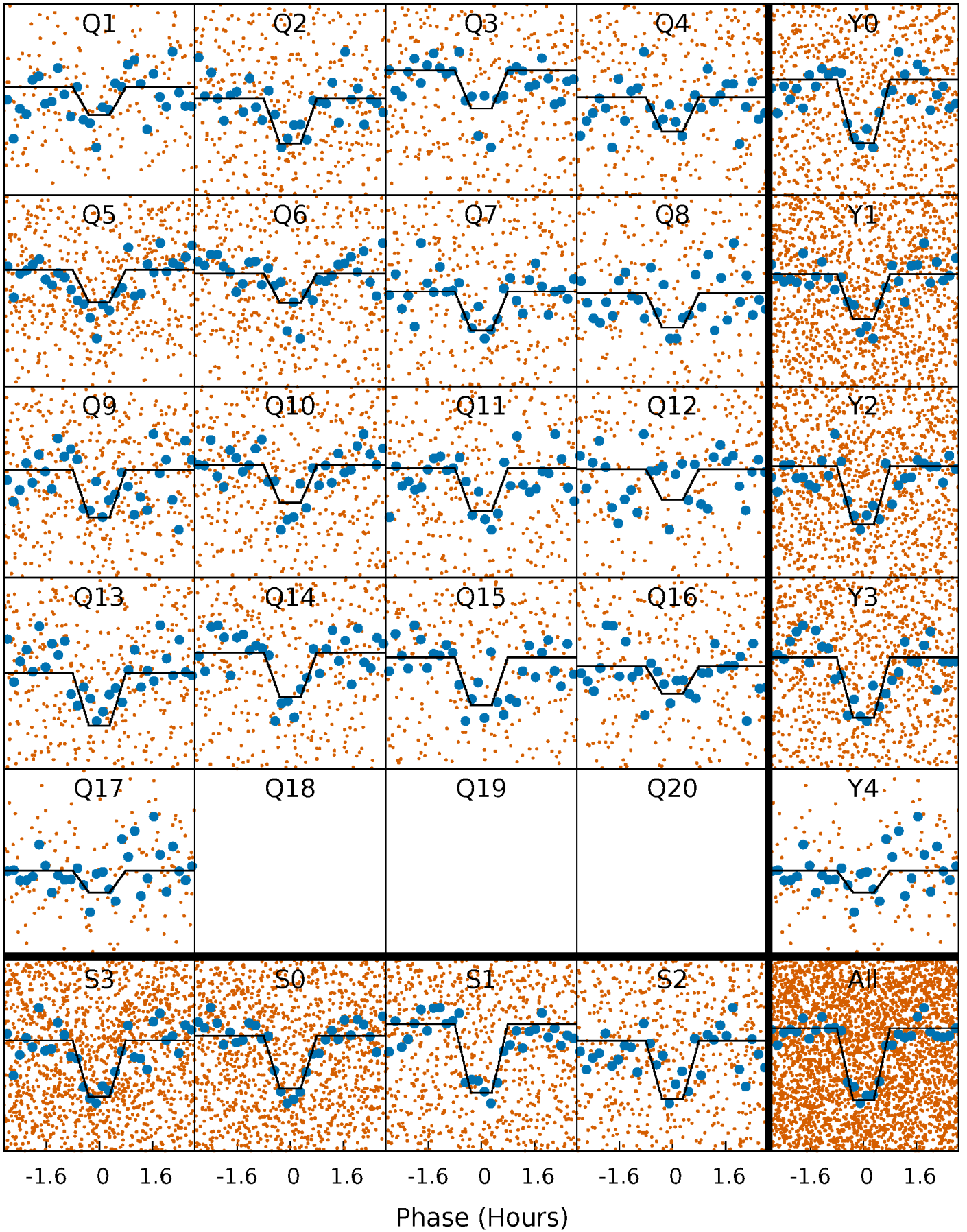
# DV Quarter-Phased Transit Curves

TCE 009109857-01 P= 1.791884 Days  $T_0=132.873988$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

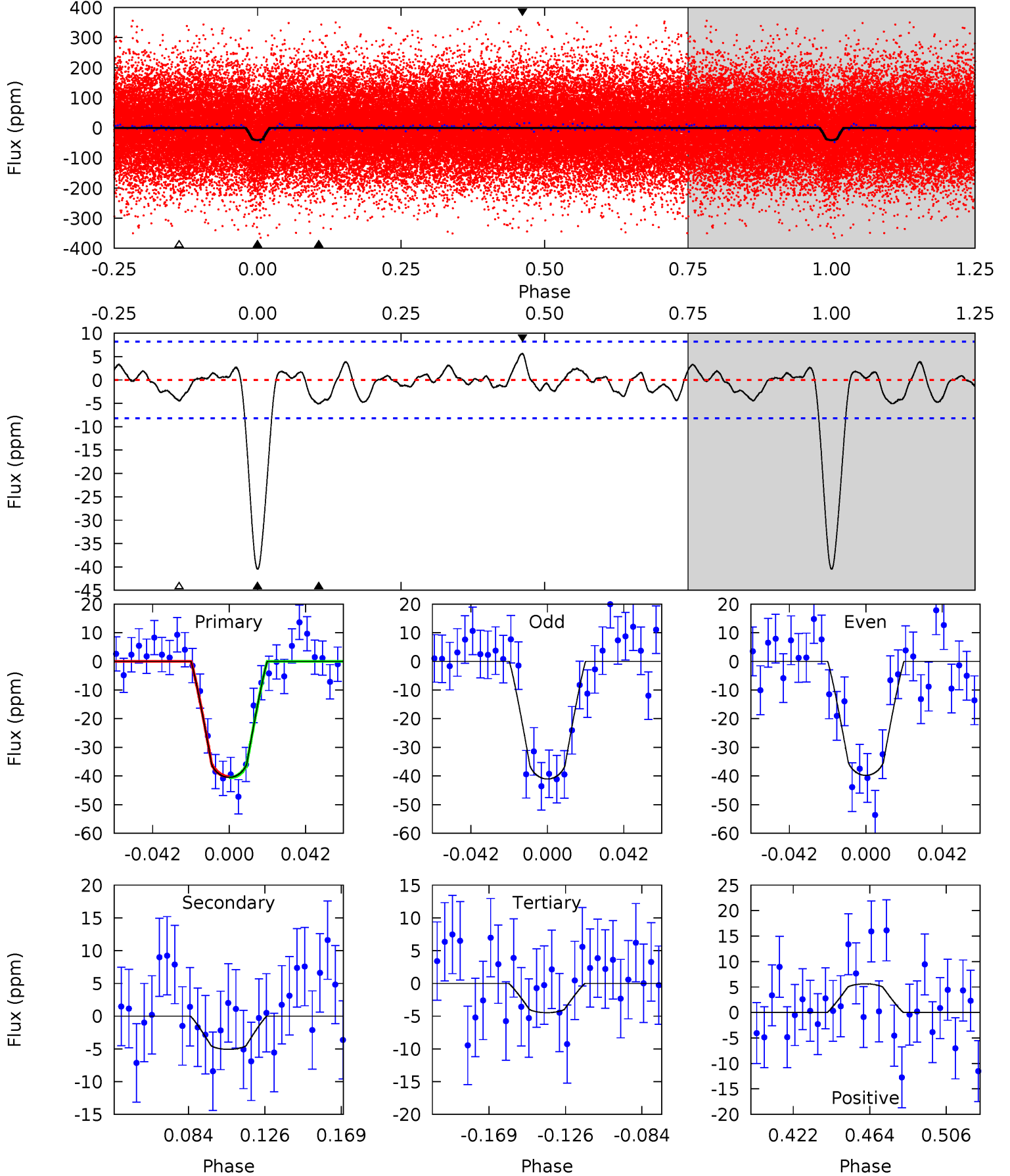
TCE 009109857-01 P= 1.791880 Days  $T_0=132.874074$  (BKJD)



# DV Model-Shift Uniqueness Test

009109857-01, P = 1.791884 Days, E = 131.082104 Days

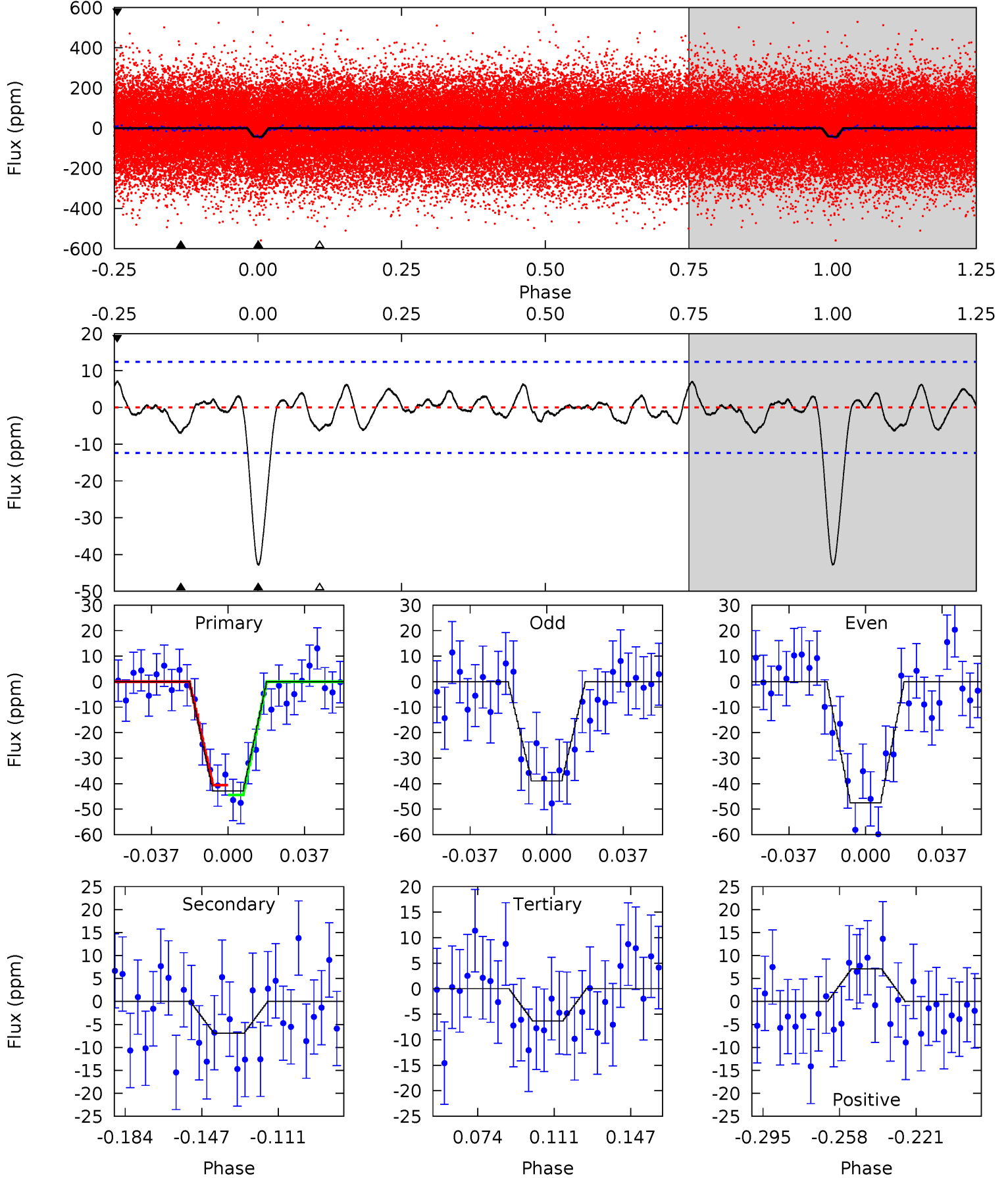
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.4	2.94	2.59	3.25	4.74	2.03	1.11	20.9	20.2	0.35	-0.31	0.37	0.96	0.12	0.12



# Alt Model-Shift Uniqueness Test

009109857-01, P = 1.791880 Days, E = 131.082194 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
16.5	2.66	2.43	2.72	4.77	2.09	1.03	14.0	13.8	0.23	-0.06	1.65	0.94	0.14	0.75





### Stellar Parameters For KIC 009109857

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6002^{+119}_{-131}$	$3.841^{+0.217}_{-0.093}$	$-0.280^{+0.150}_{-0.150}$	$2.139^{+0.319}_{-0.592}$	$1.156^{+0.115}_{-0.172}$	$0.166^{+0.215}_{-0.050}$
	+2%/-2%	+6%/-2%	+54%/-54%	+15%/-28%	+10%/-15%	+129%/-30%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 009109857-01 / KOI 2833.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-5 \pm 2$	$1.56^{+0.46}_{-0.44}$	$3067^{+154}_{-202}$	$3573^{+559}_{-531}$	$1.032^{+1.054}_{-0.486}$
Alt.	$-7 \pm 3$	$1.51^{+0.42}_{-0.44}$	$3074^{+157}_{-219}$	$3897^{+660}_{-554}$	$1.505^{+1.690}_{-0.738}$

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

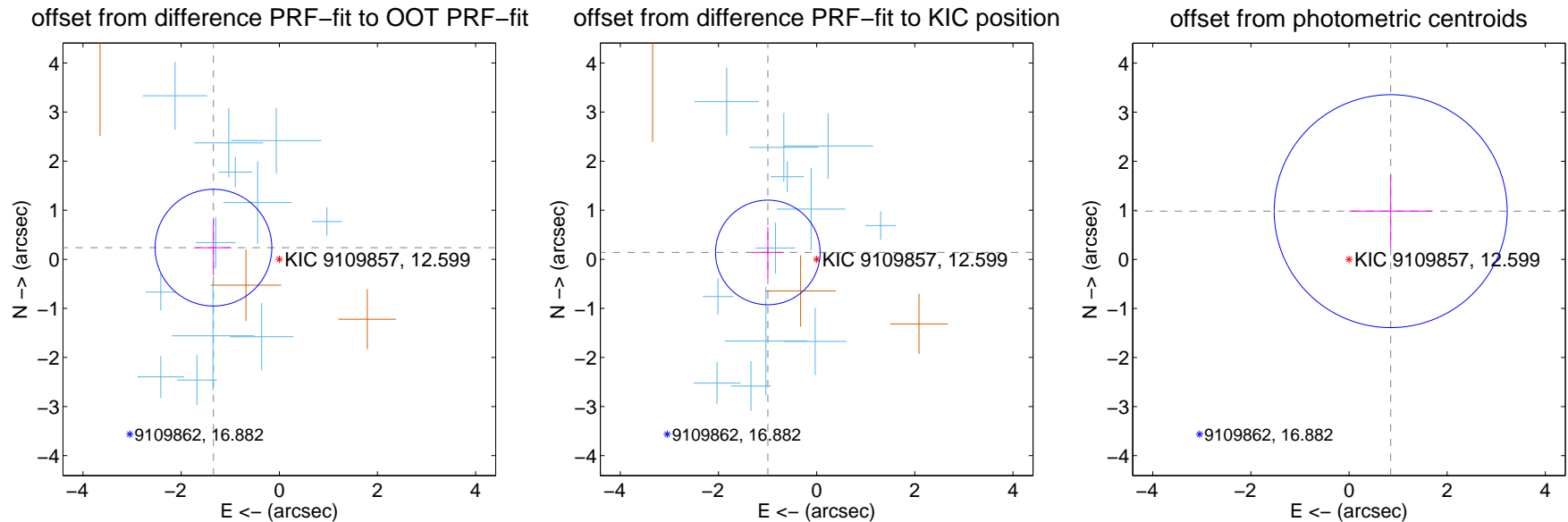
## DV Centroid Data

Supplemental centroid analysis for 009109857-01. Kepler magnitude: 12.60. Transit SNR 16.29

There are 12 quarters with good PRF difference image offsets

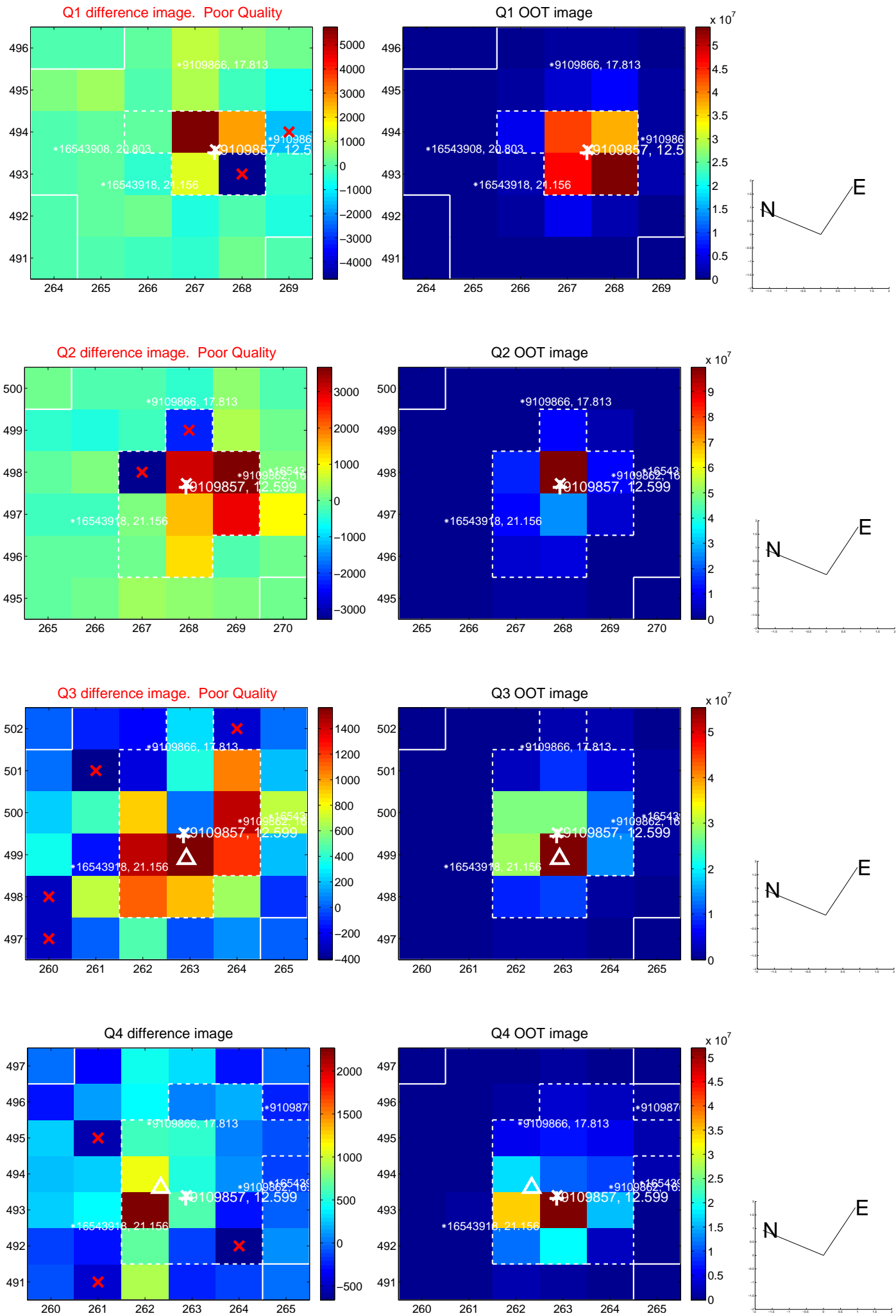
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>1.362 <math>\pm</math> 0.396</b>	<b>3.44</b>	1.341 $\pm$ 0.361	0.237 $\pm$ 0.570
PRF-fit source offset from KIC position	1.004 $\pm$ 0.355	2.83	0.995 $\pm$ 0.331	0.140 $\pm$ 0.517
photometric centroid source offset	1.30 $\pm$ 0.79	1.64	-0.85 $\pm$ 0.85	0.98 $\pm$ 0.75

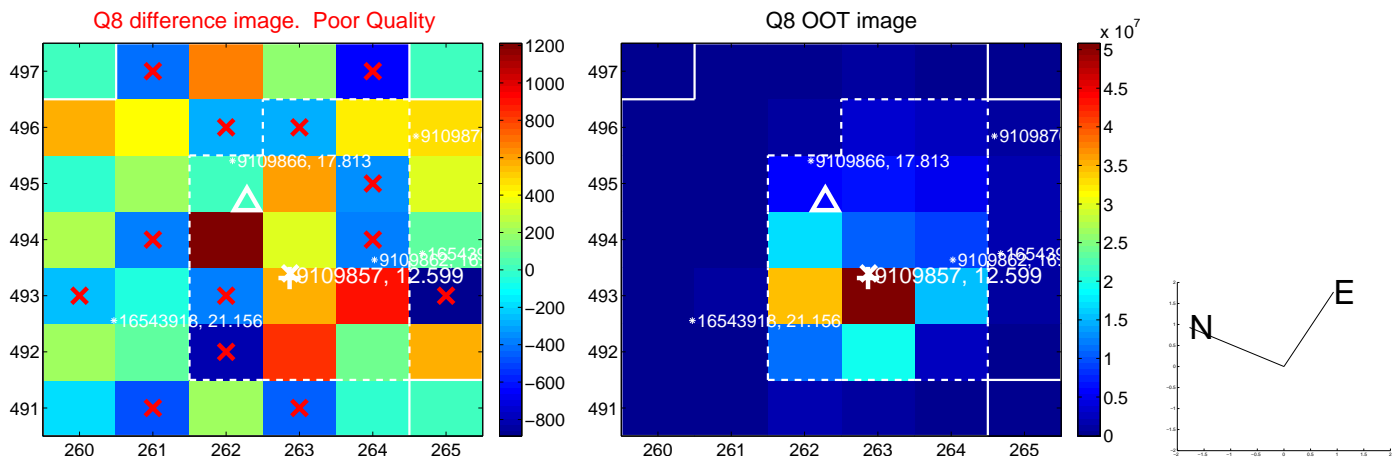
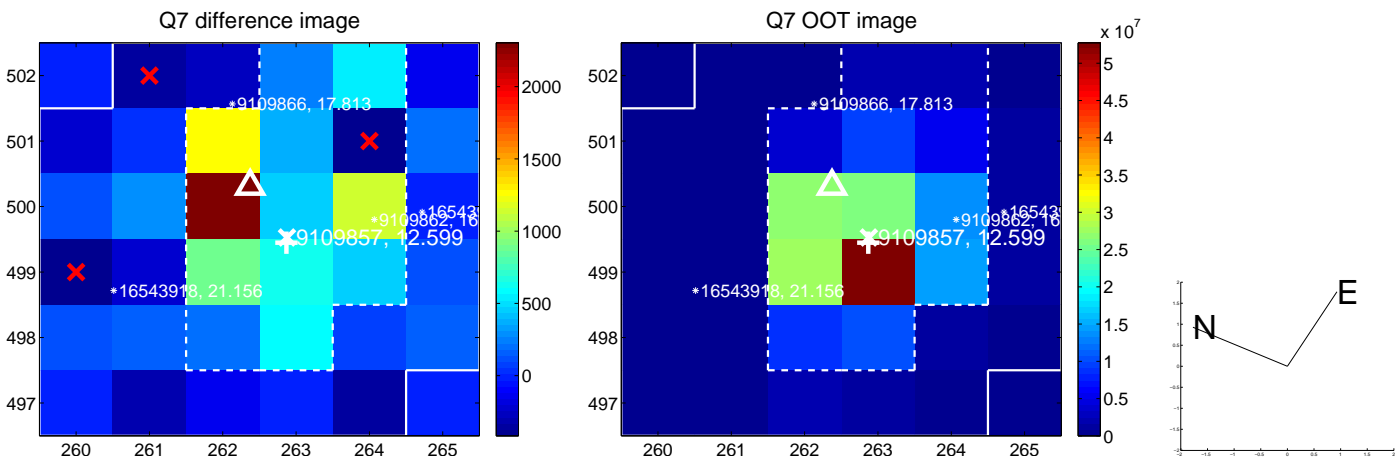
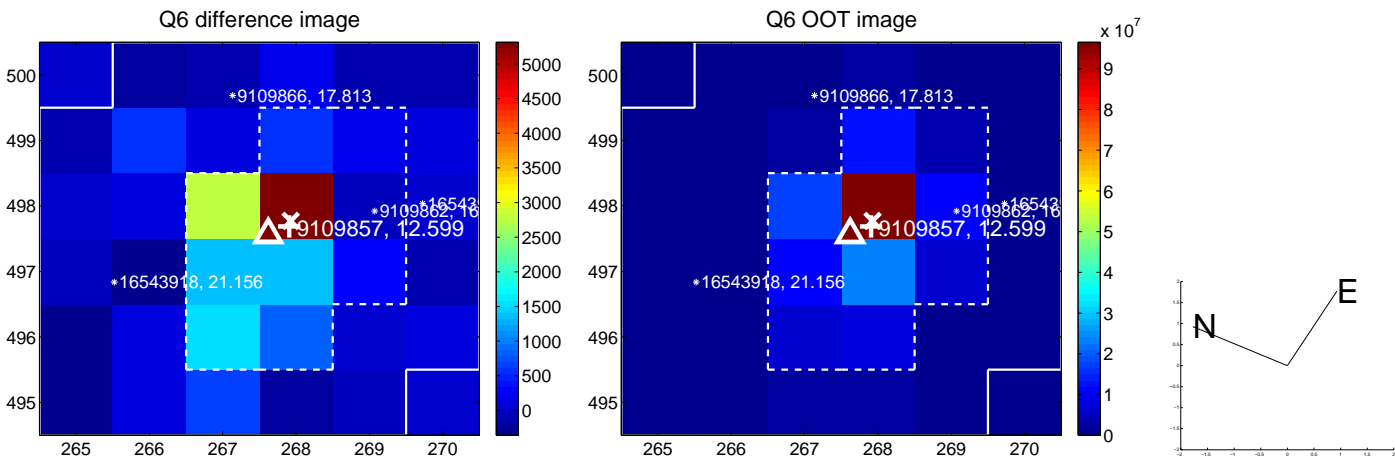
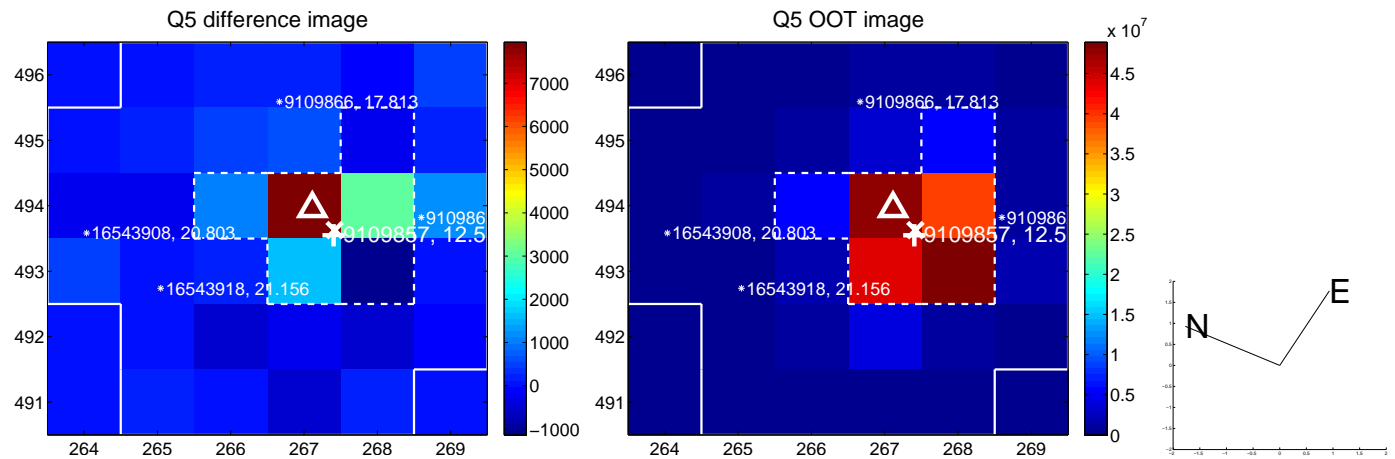


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

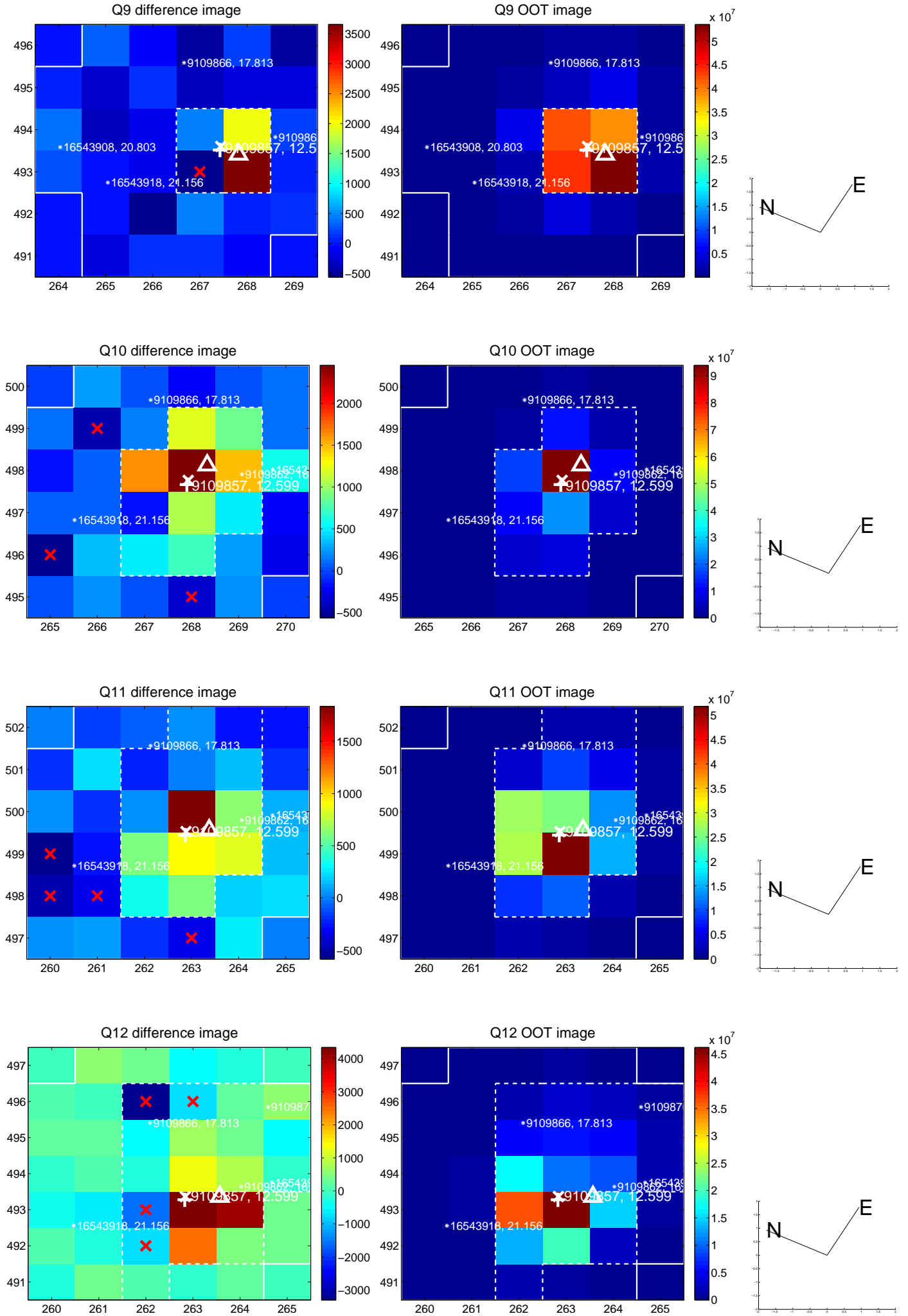


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

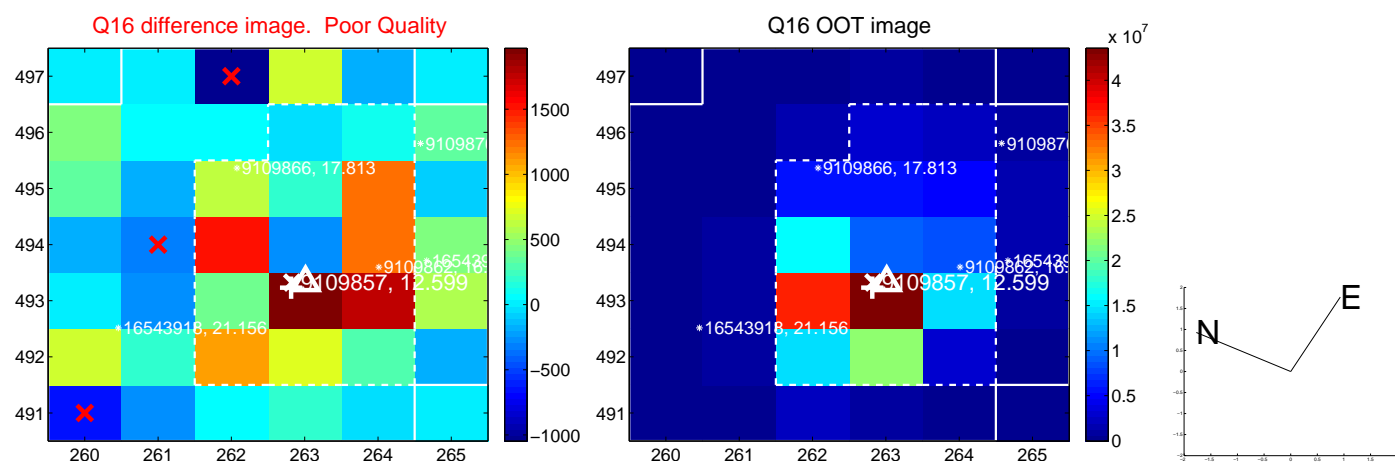
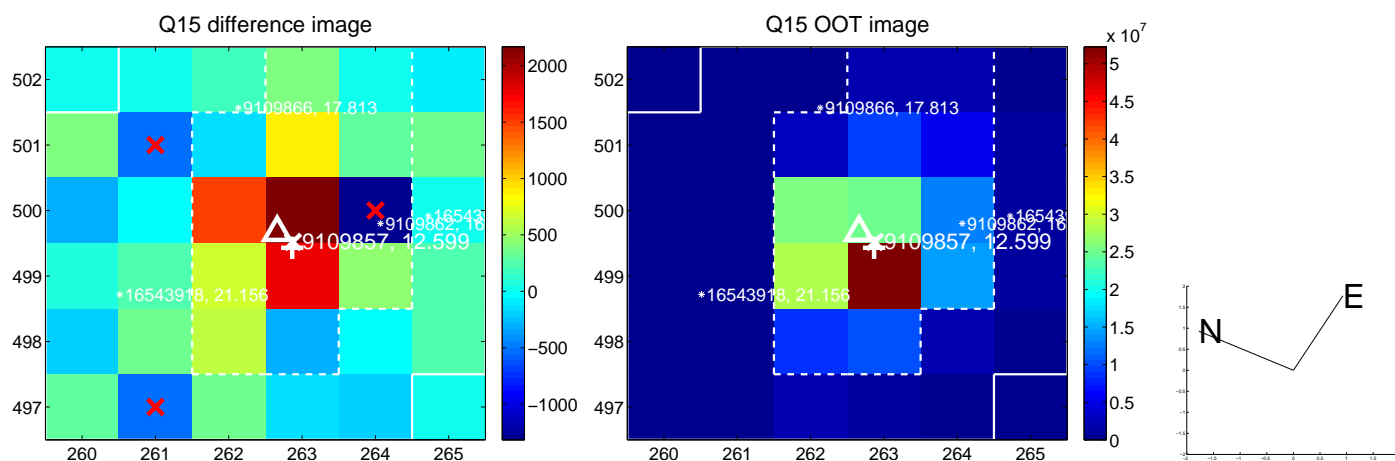
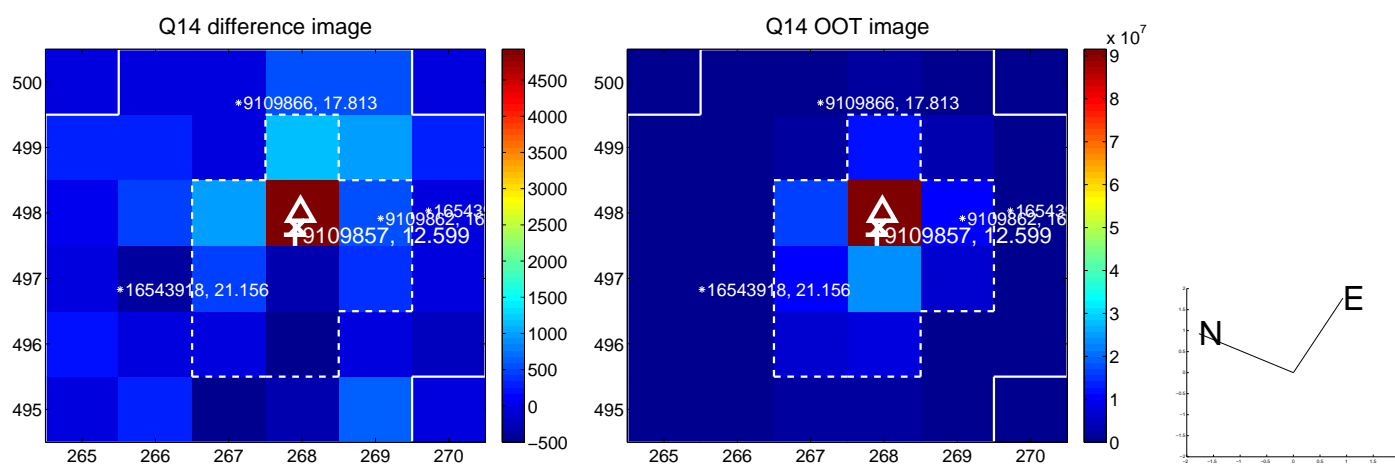
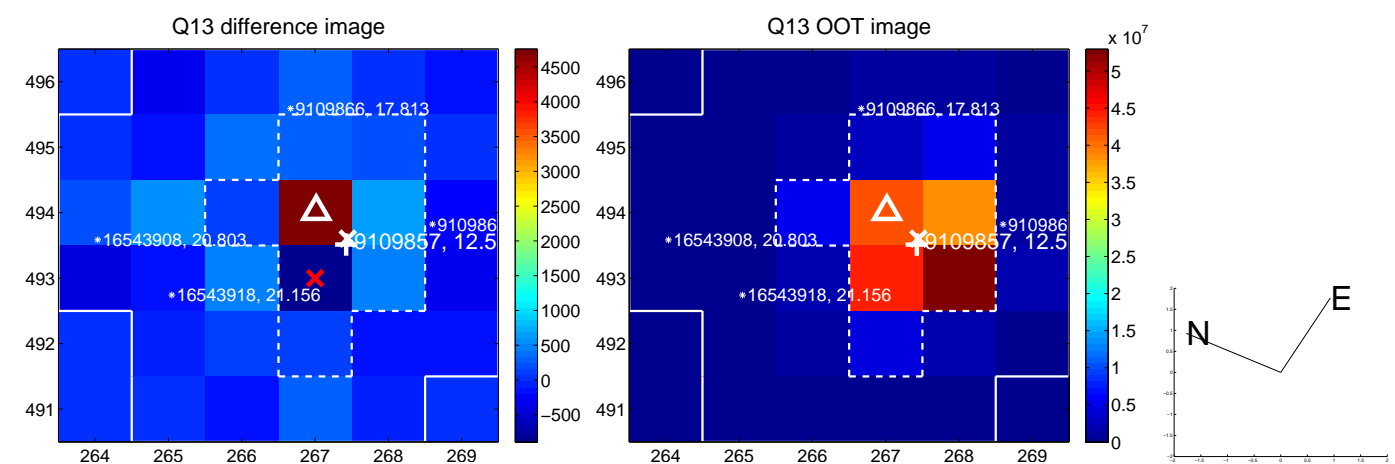




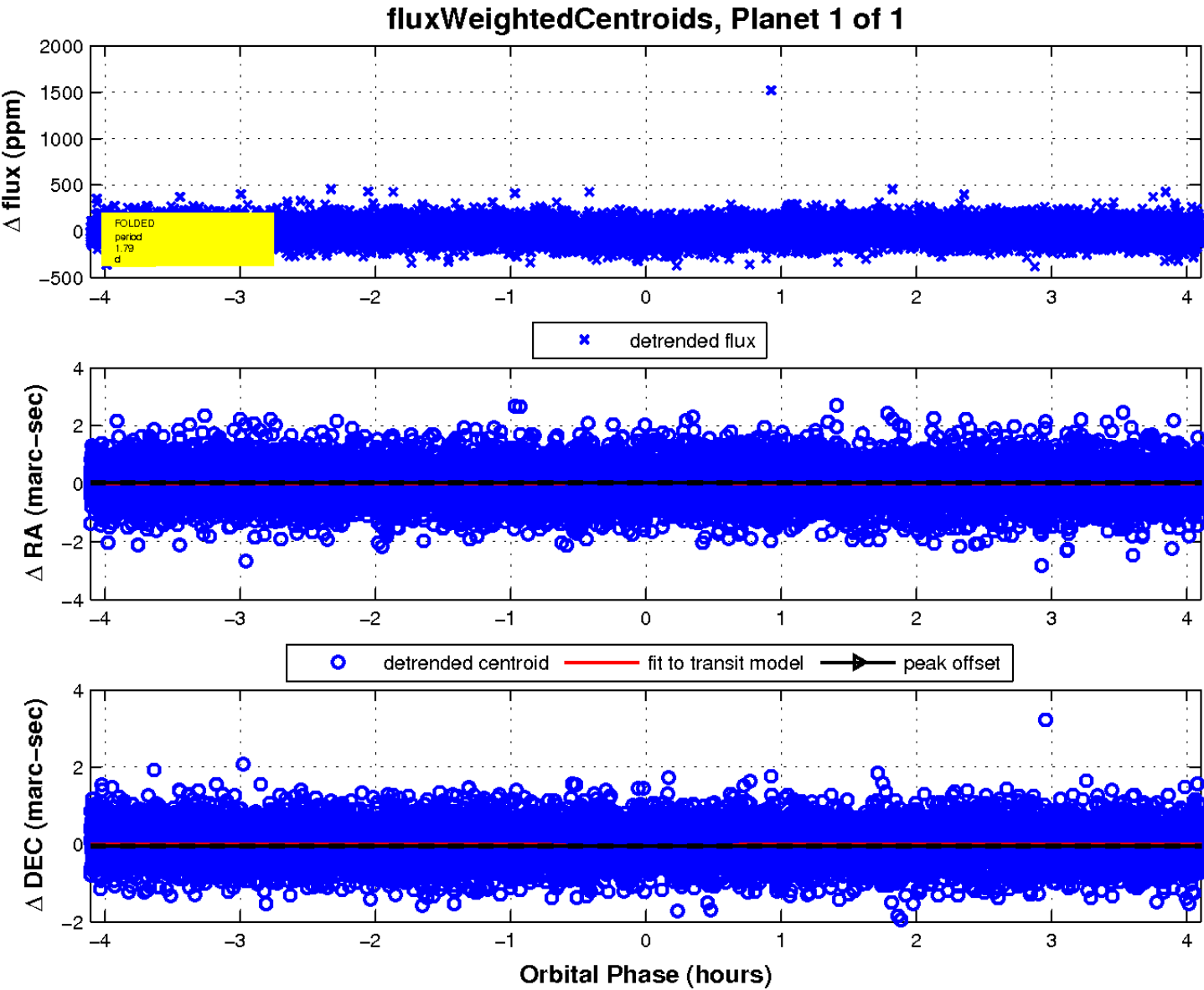
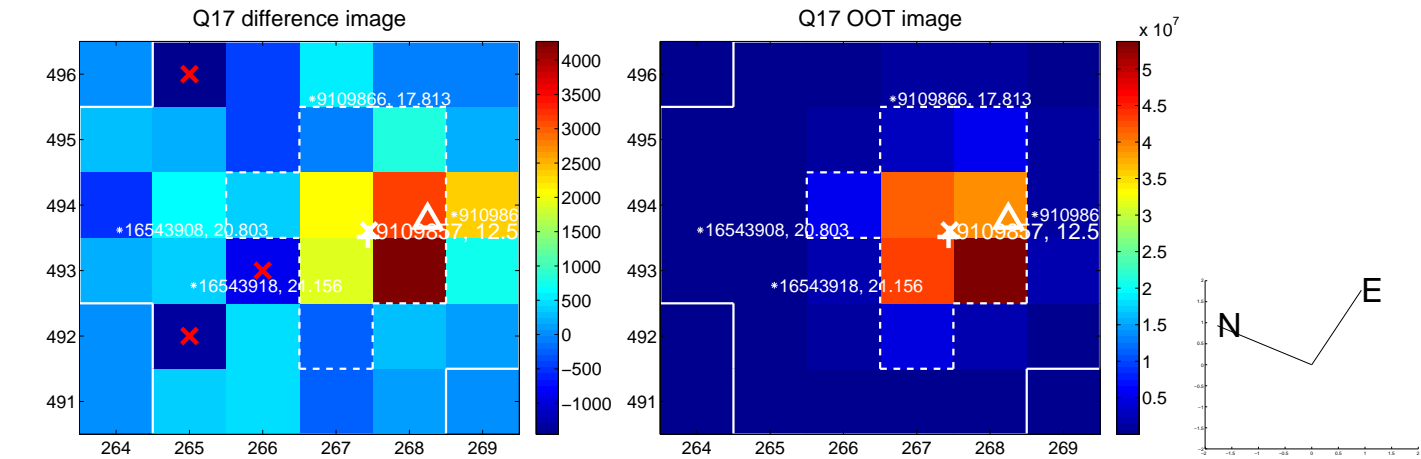
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

