

# KIC 006106282

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006106282-01	OBS	4087.01	101.110345	215.524346	883.3	8.133	15.7	16.7	0.56	4133	1.80	0.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006106282-01	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.

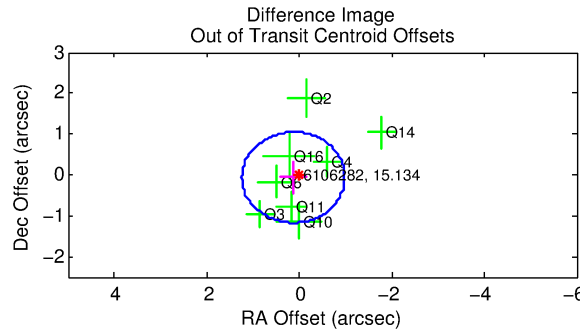
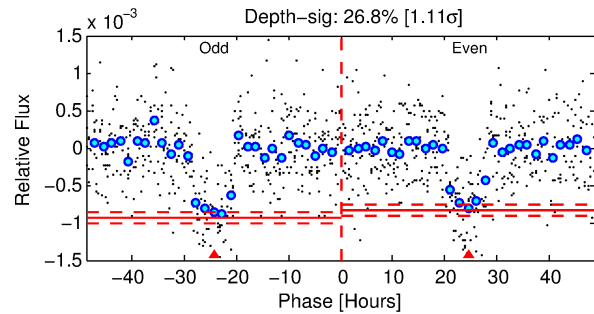
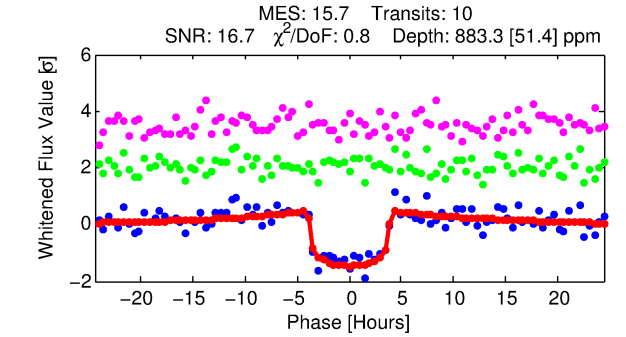
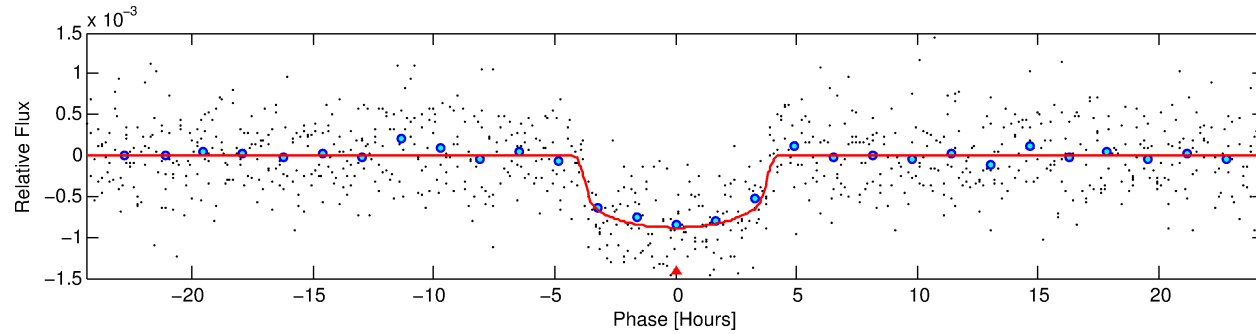
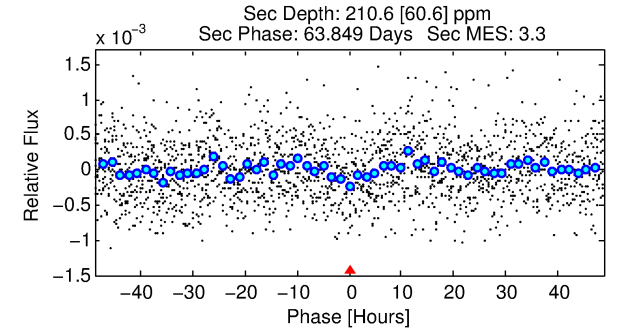
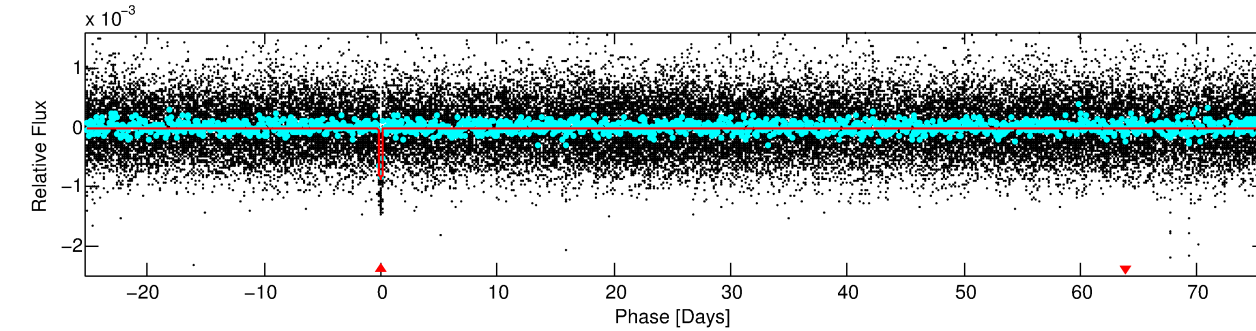
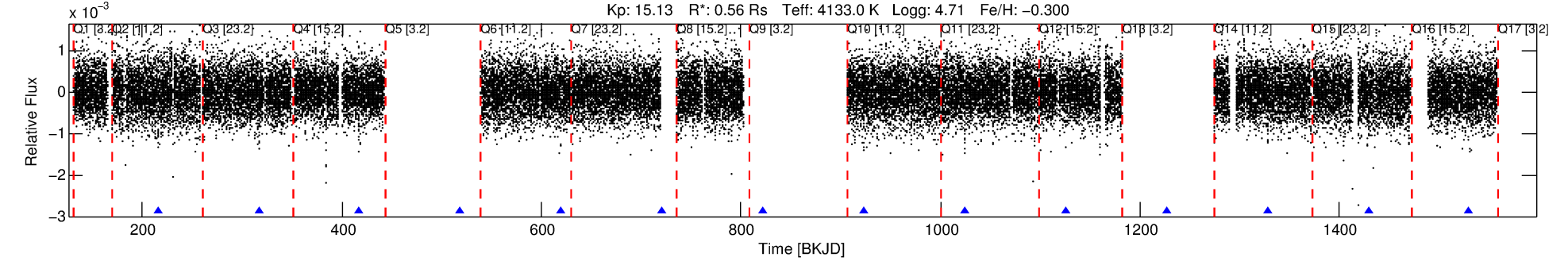
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006106282-01

No Significant Match Found

# DV One-Page Summary

KIC: 6106282 Candidate: 1 of 1 Period: 101.110 d  
KOI: K04087.01 Name: Kepler-440b Corr: 0.988



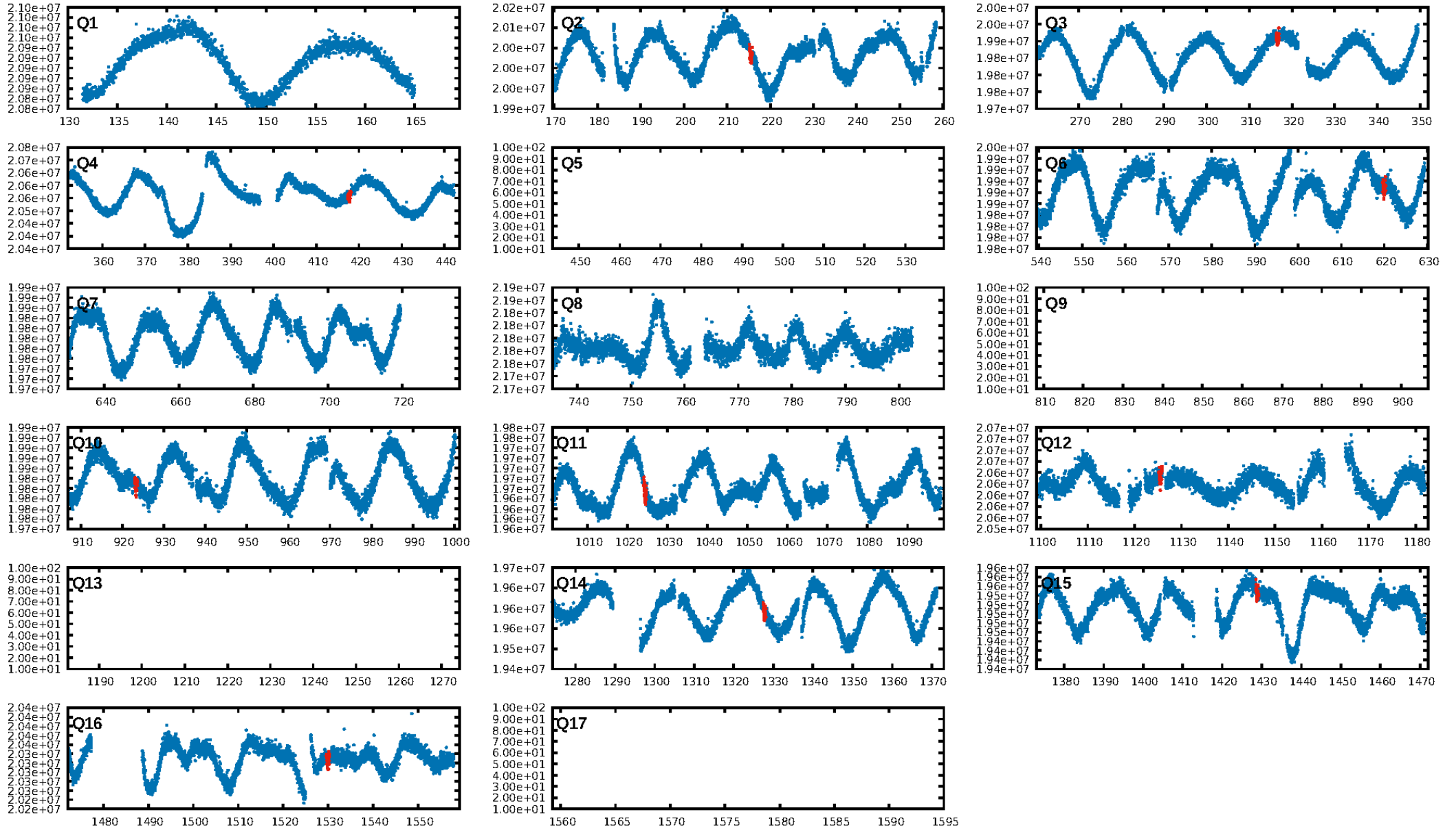
## DV Fit Results:

Period = 101.11035 [0.00081] d  
Epoch = 215.5243 [0.0063] BKJD  
Rp/R\* = 0.0294 [0.0056]  
a/R\* = 68.75 [51.92]  
b = 0.73 [0.48]  
Seff = 0.65 [0.07]  
Teq = 229 [6] K  
Rp = 1.80 [0.36] Re  
a = 0.3547 [0.0166] AU  
Ag = 4493.67 [2165.65] [2.07σ]  
Teffp = 2903 [351] K [7.61σ]

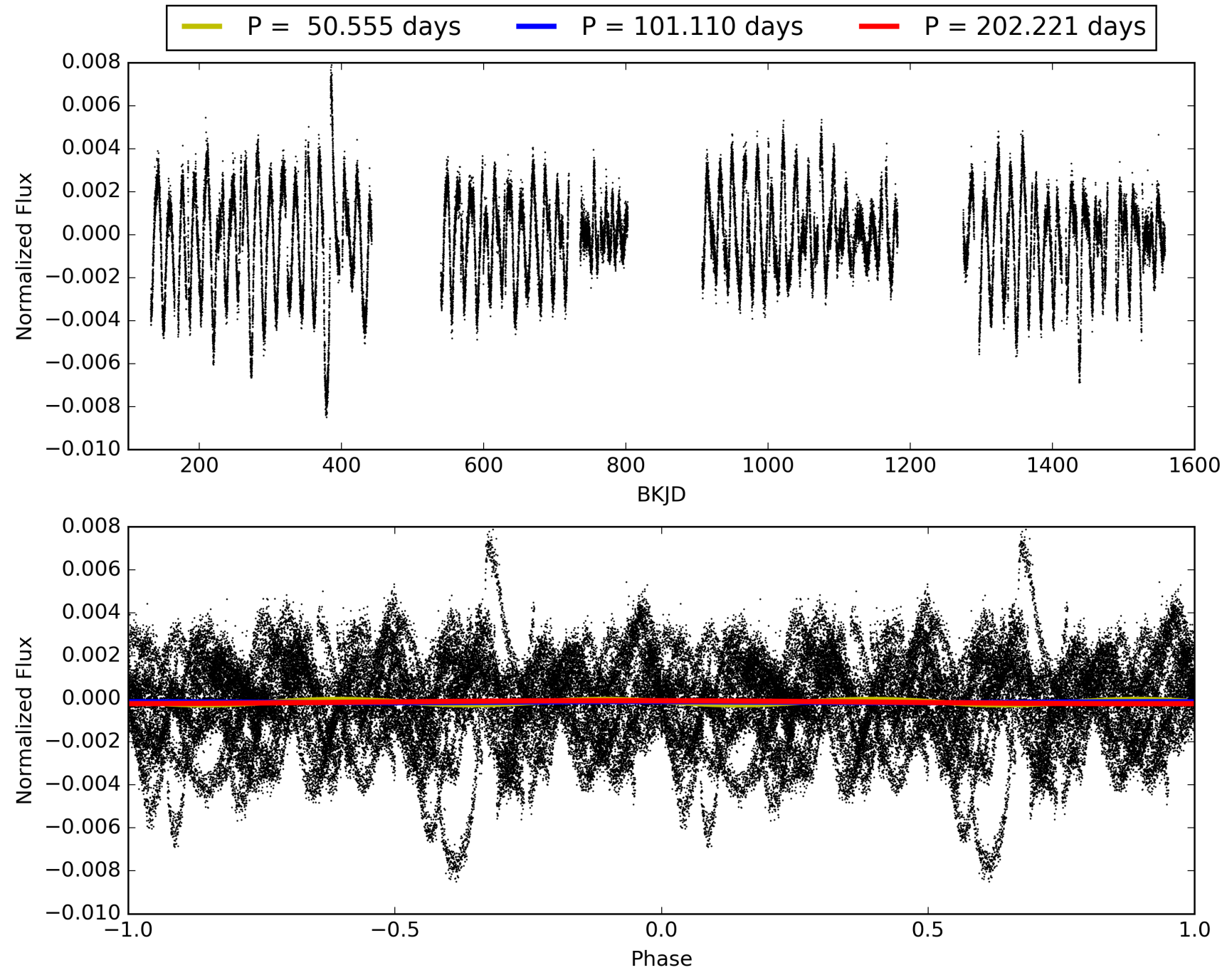
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 64.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.96e-46  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 3.682  
Centroid-sig: 10.7%  
Centroid-so: 1.211 arcsec [1.70σ]  
OotOffset-rm: 0.144 arcsec [0.39σ]  
KicOffset-rm: 0.519 arcsec [1.42σ]  
OotOffset-st: 4/2/2/0 [8]  
KicOffset-st: 4/2/2/0 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [9/9]

# TCE 006106282-01, PDC Light Curves

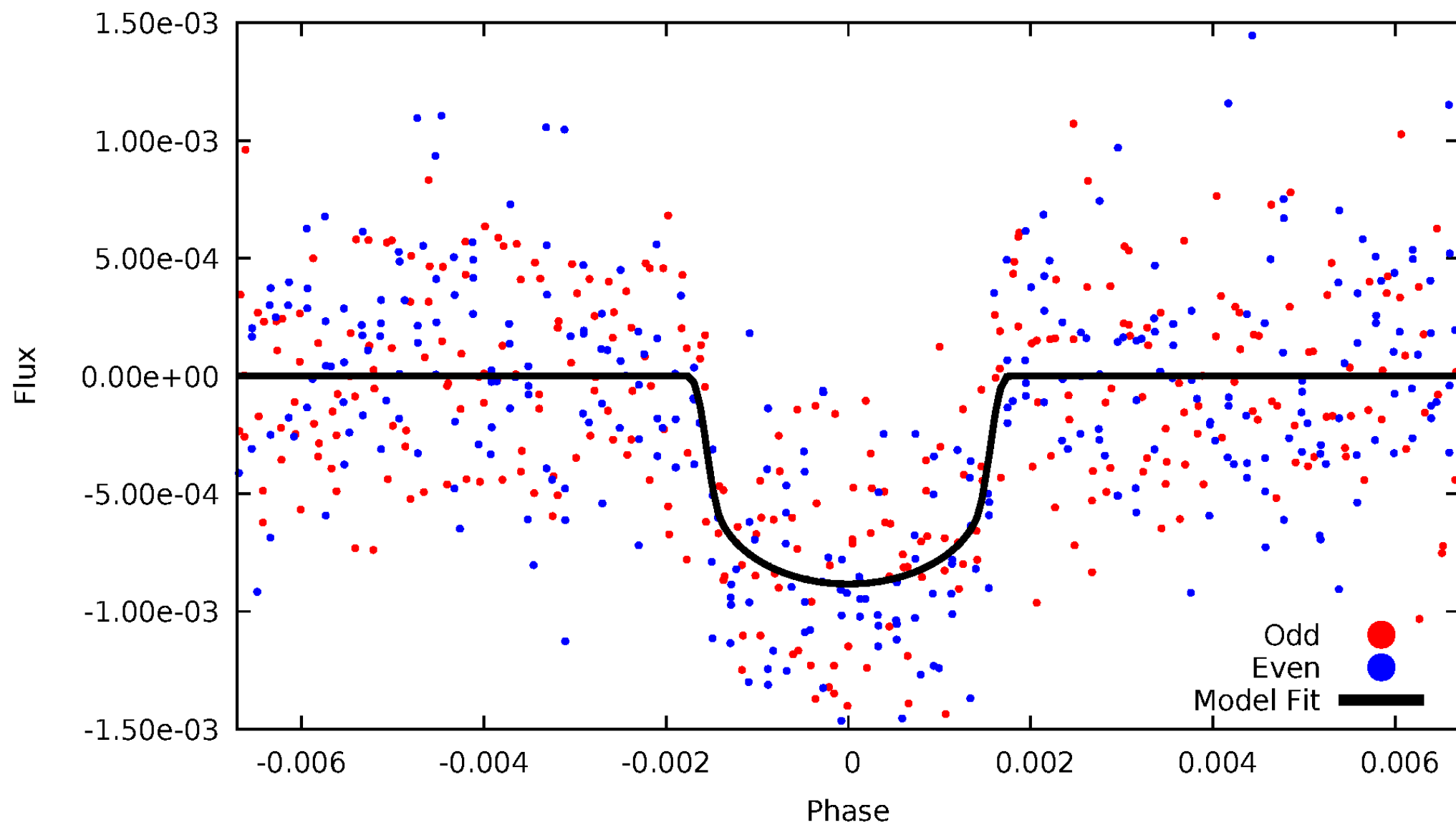


# TCE 006106282-01



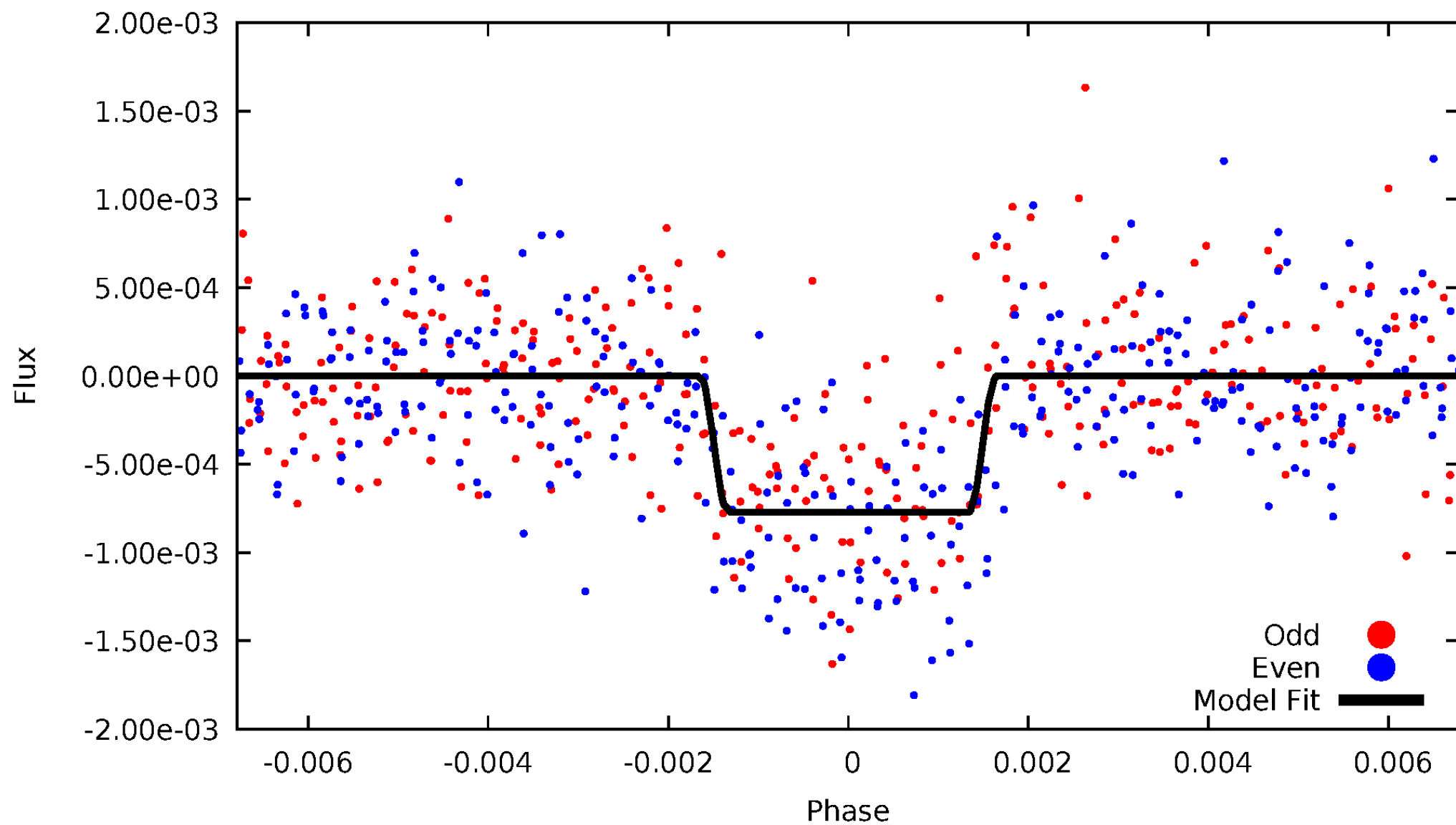
# DV Odd/Even

TCE 006106282-01



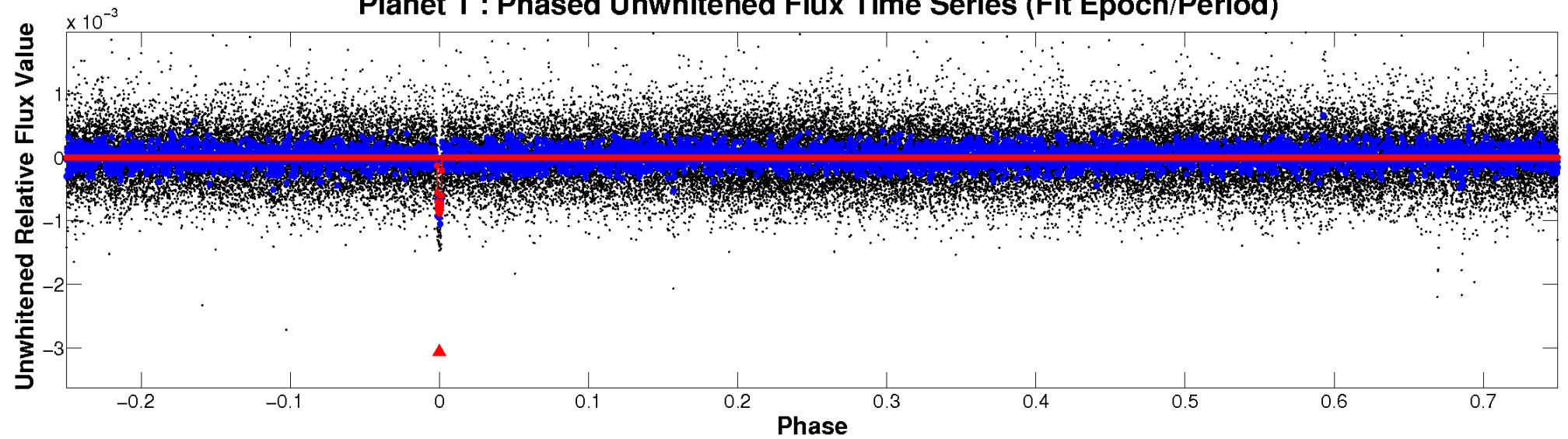
# ALT Odd/Even

TCE 006106282-01

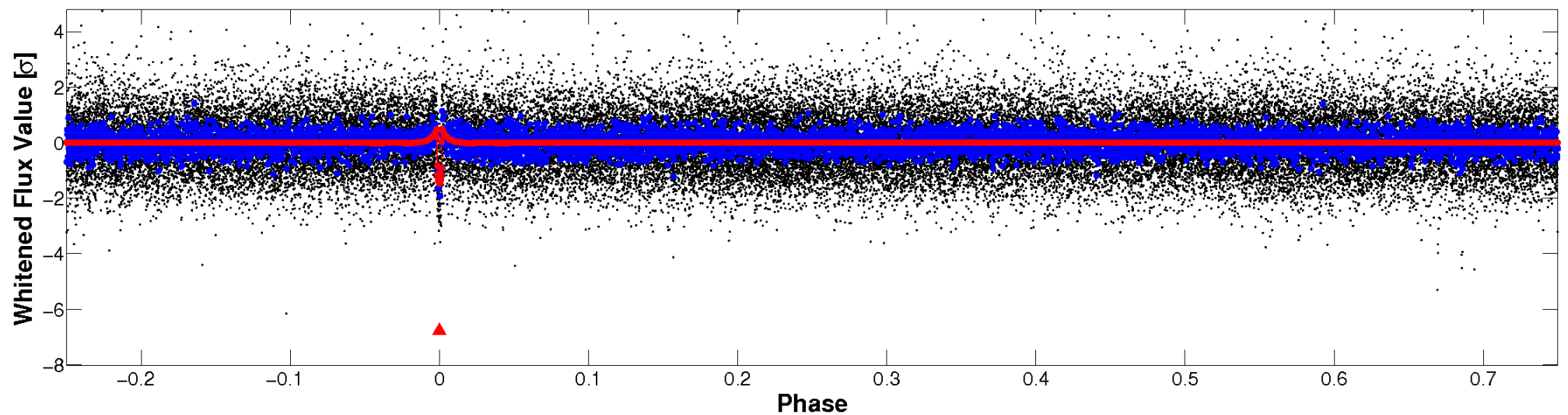


# Non-Whitened Vs. Whitened Light Curve

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



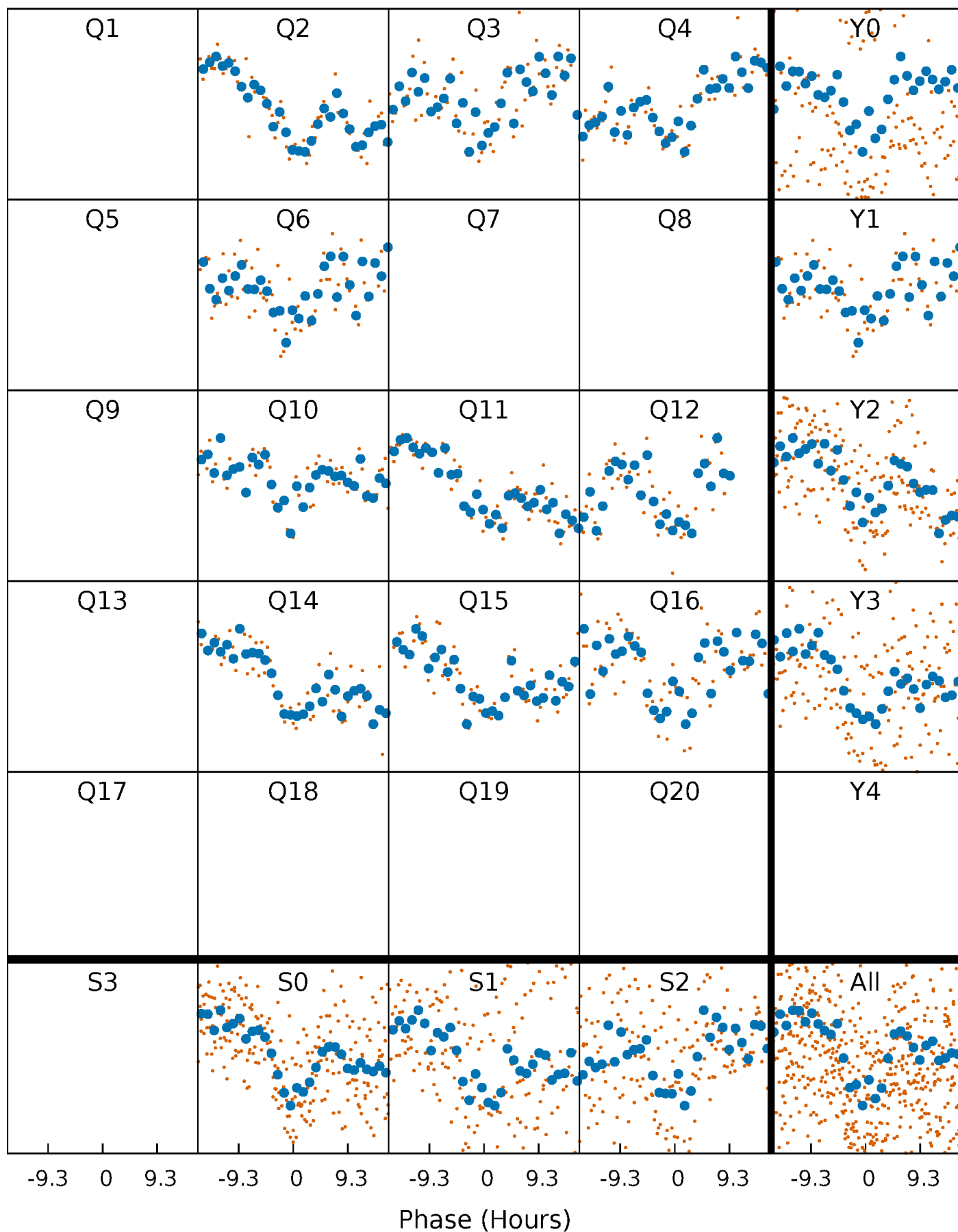
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

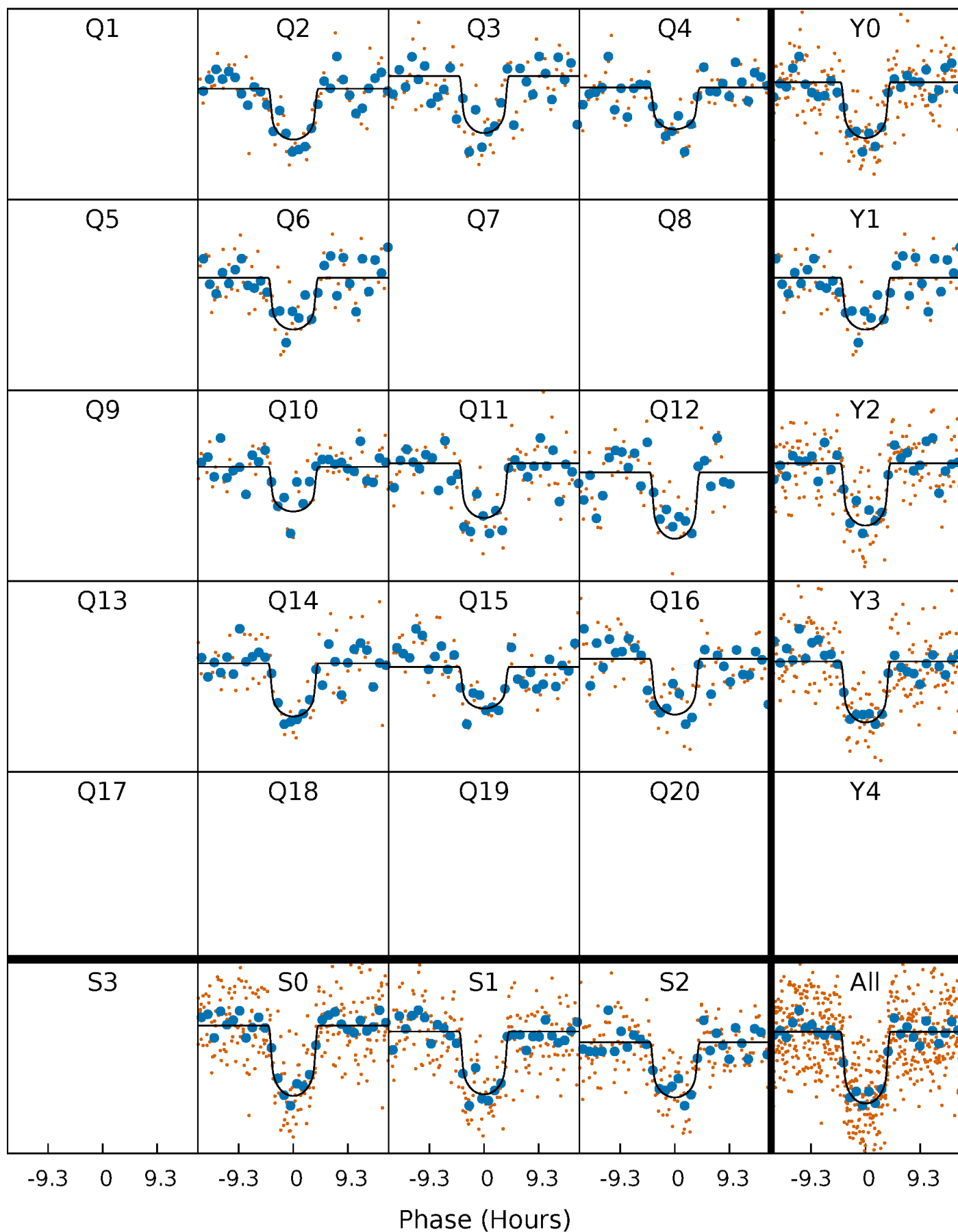
TCE 006106282-01 P=101.110345 Days  $T_0=215.524347$  (BKJD)





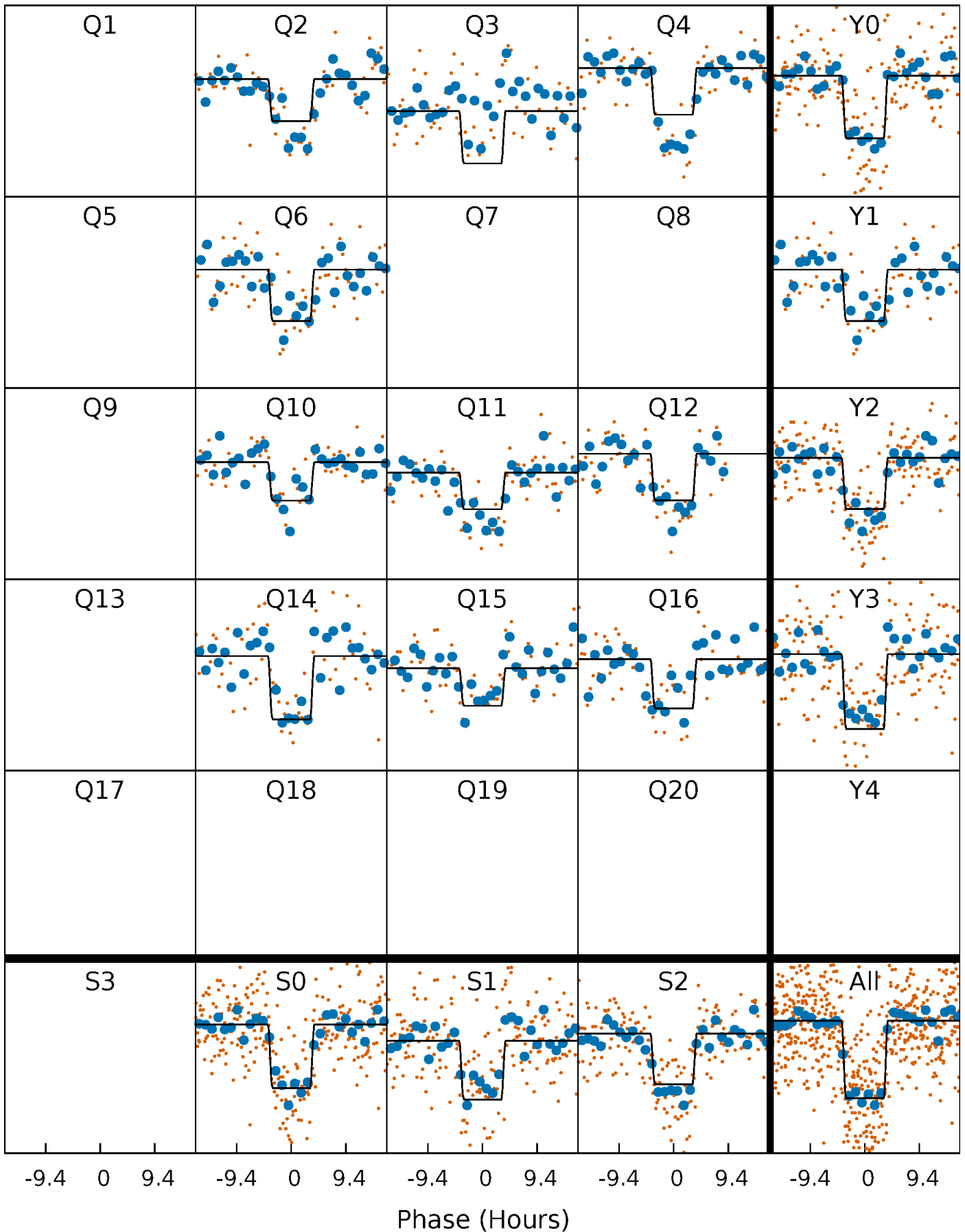
# DV Quarter-Phased Transit Curves

TCE 006106282-01 P=101.110345 Days  $T_0=215.524347$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

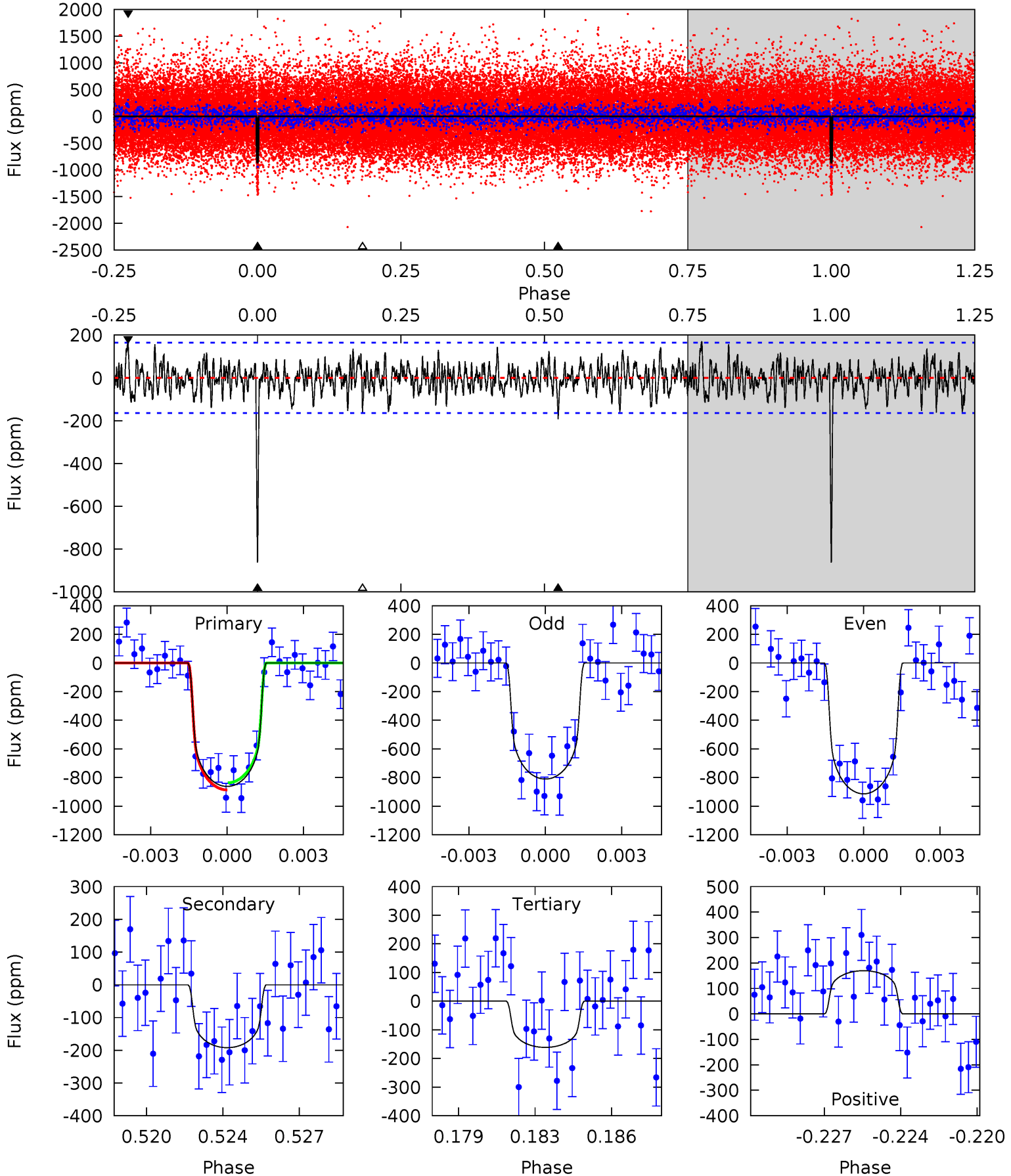
TCE 006106282-01 P=101.112638 Days  $T_0=215.505778$  (BKJD)



# DV Model-Shift Uniqueness Test

006106282-01, P = 101.110345 Days, E = 114.414002 Days

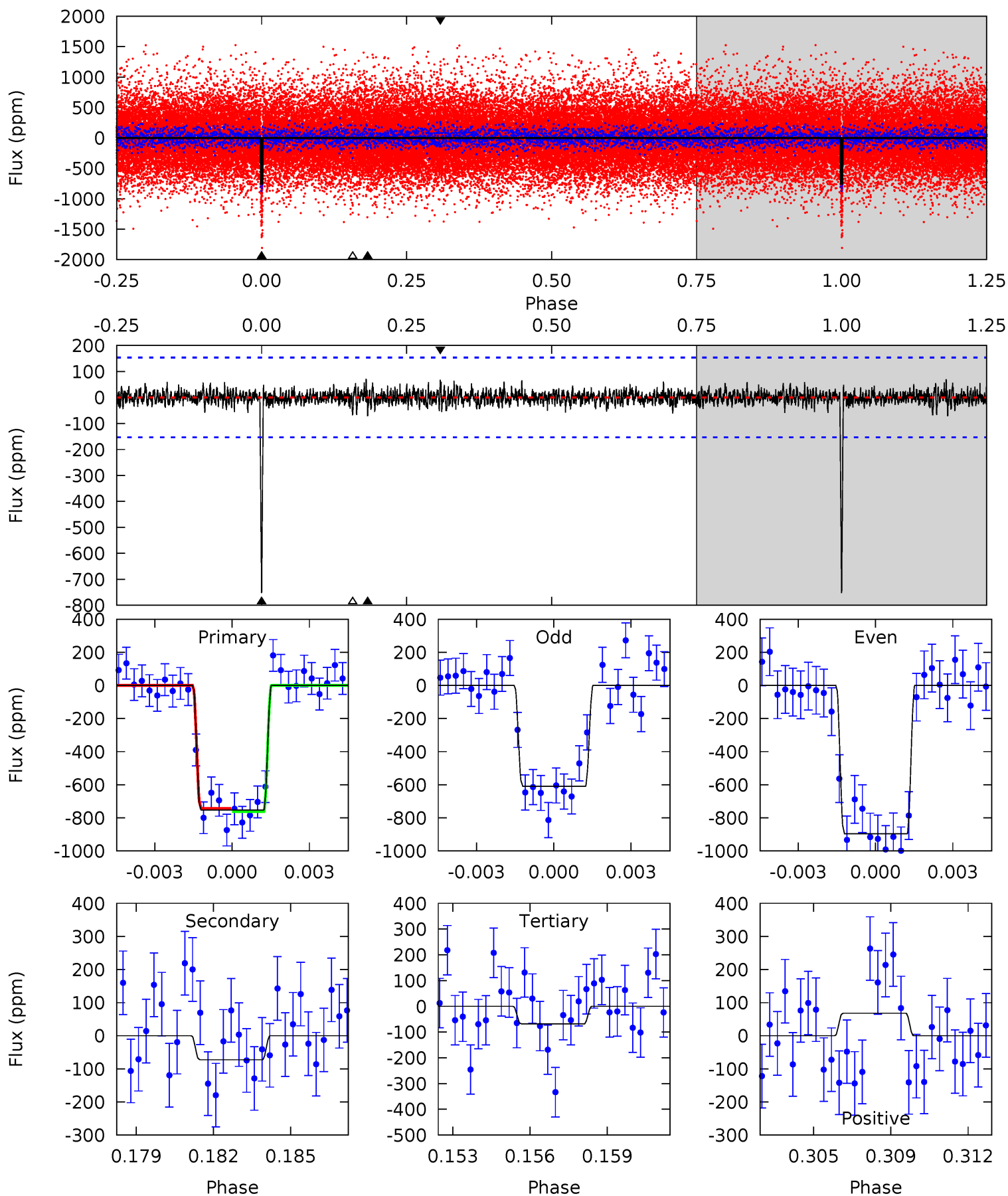
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.5	6.12	5.14	5.40	5.23	2.92	1.67	22.3	22.1	0.98	0.72	1.65	0.97	0.16	0.78



# Alt Model-Shift Uniqueness Test

006106282-01, P = 101.112638 Days, E = 114.393140 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
25.7	2.47	2.34	2.33	5.24	2.94	0.64	23.4	23.4	0.13	0.14	4.92	1.07	0.09	0.33



### Stellar Parameters For KIC 006106282

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4133^{+74}_{-82}$	$4.705^{+0.023}_{-0.033}$	$-0.300^{+0.150}_{-0.150}$	$0.561^{+0.033}_{-0.030}$	$0.578^{+0.027}_{-0.034}$	$4.613^{+0.502}_{-0.500}$
	+2%/-2%	+0%/-1%	+50%/-50%	+6%/-5%	+5%/-6%	+11%/-11%
Source	SPE85	SPE85	SPE85	DSEP		

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

### Secondary Eclipse Parameters for KIC 006106282-01 / KOI 4087.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-192 \pm 31$	$1.82^{+0.34}_{-0.34}$	$321^{+7}_{-7}$	$3217^{+242}_{-186}$	$4010^{+2209}_{-1325}$
Alt.	$-72 \pm 29$	$1.71^{+0.36}_{-0.35}$	$321^{+7}_{-7}$	$2841^{+240}_{-211}$	$1676^{+1271}_{-786}$

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

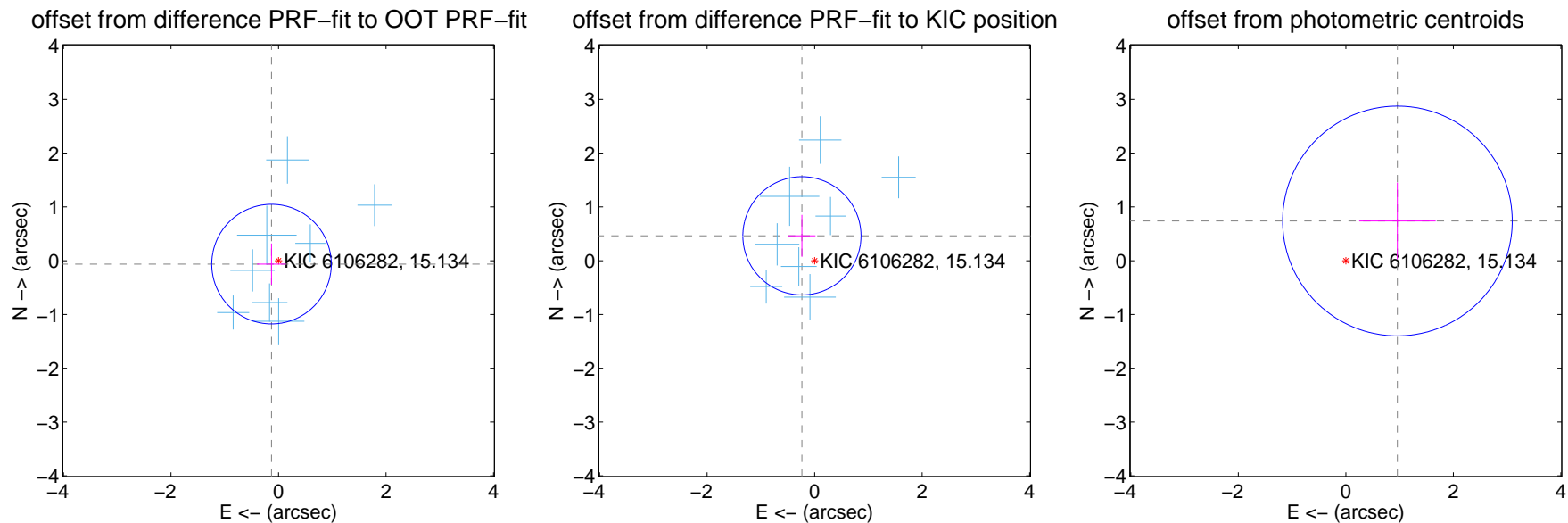
## DV Centroid Data

Supplemental centroid analysis for 006106282-01. Kepler magnitude: 15.13. Transit SNR 16.74

There are 8 quarters with good PRF difference image offsets

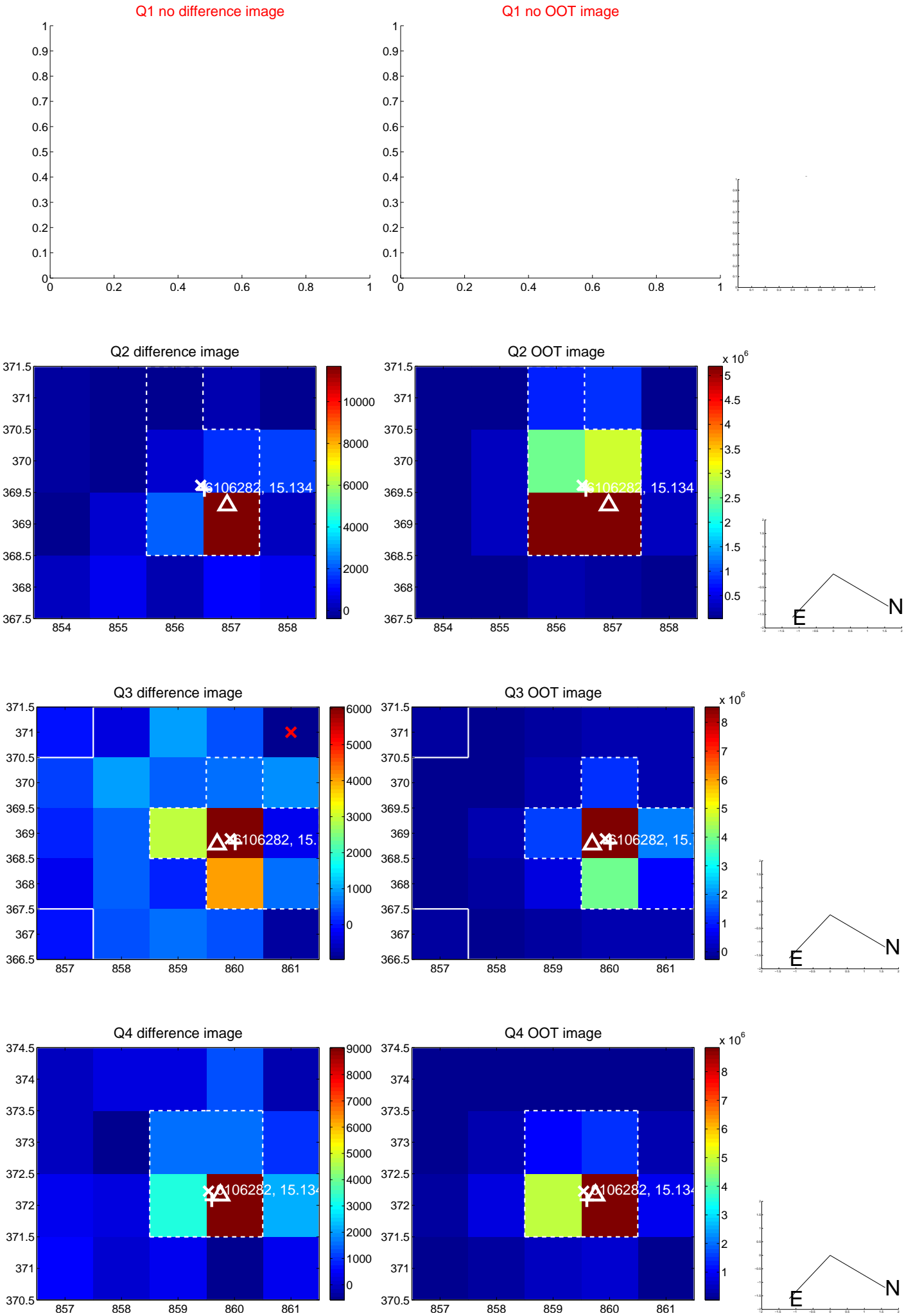
The direct PRF centroid is offset from the target star catalog position by about 0.76 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.144 \pm 0.371$	0.39	$0.130 \pm 0.268$	$-0.064 \pm 0.385$
PRF-fit source offset from KIC position	$0.519 \pm 0.366$	1.42	$0.236 \pm 0.251$	$0.462 \pm 0.391$
photometric centroid source offset	$1.21 \pm 0.71$	1.70	$-0.96 \pm 0.71$	$0.74 \pm 0.71$



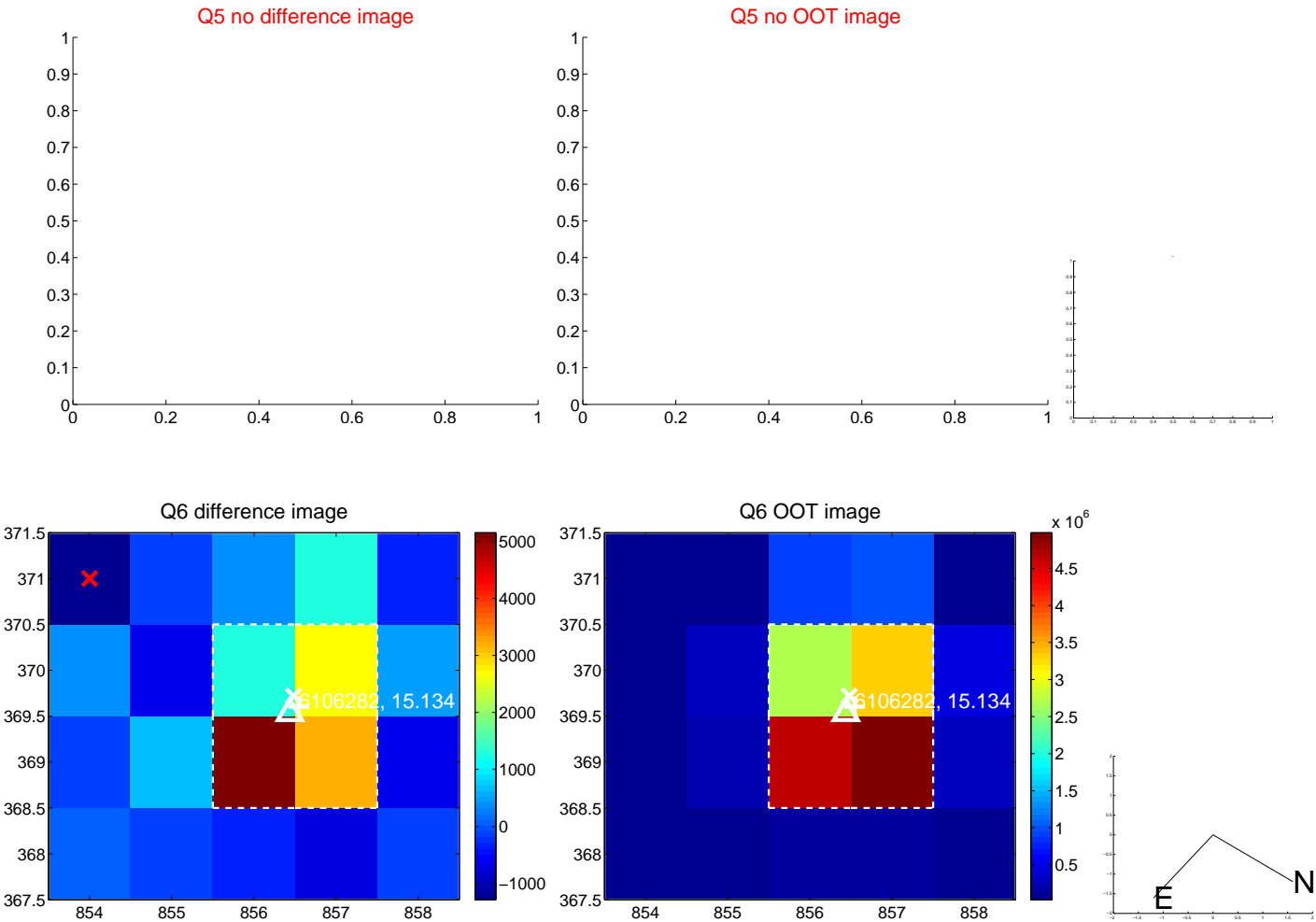
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

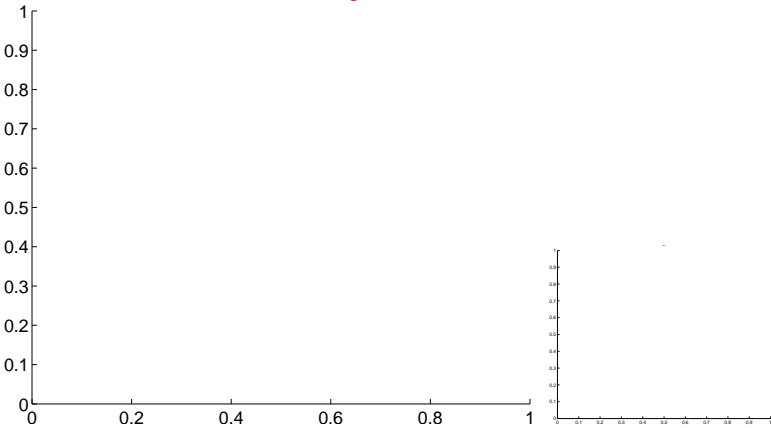


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

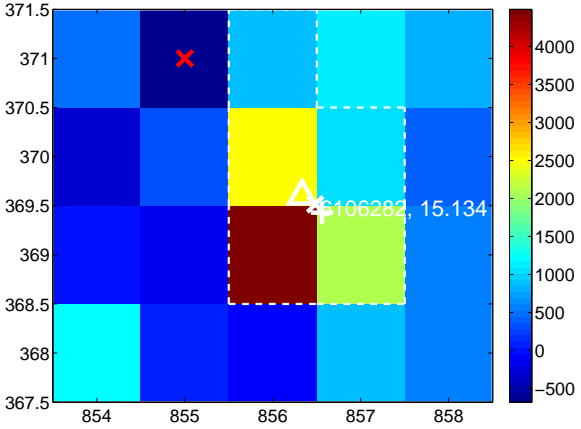
Q9 no difference image



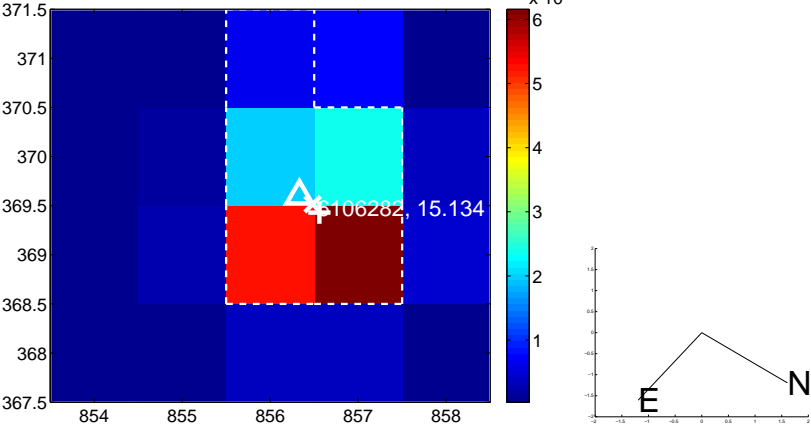
Q9 no OOT image



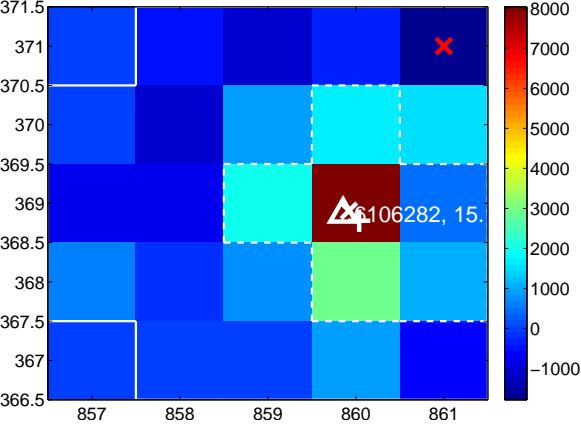
Q10 difference image



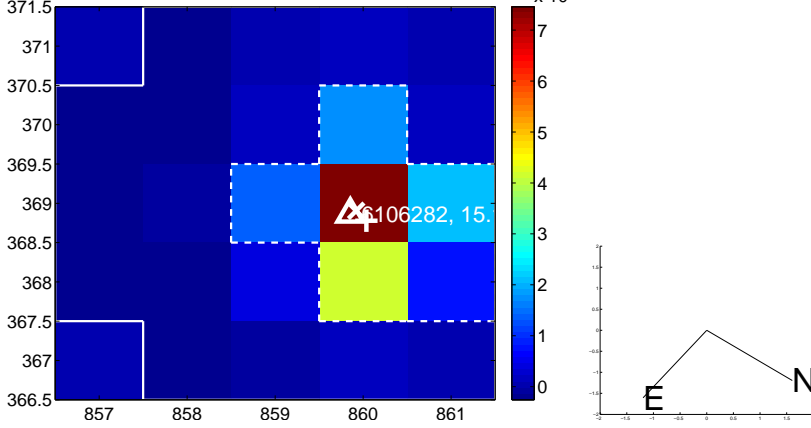
Q10 OOT image



Q11 difference image



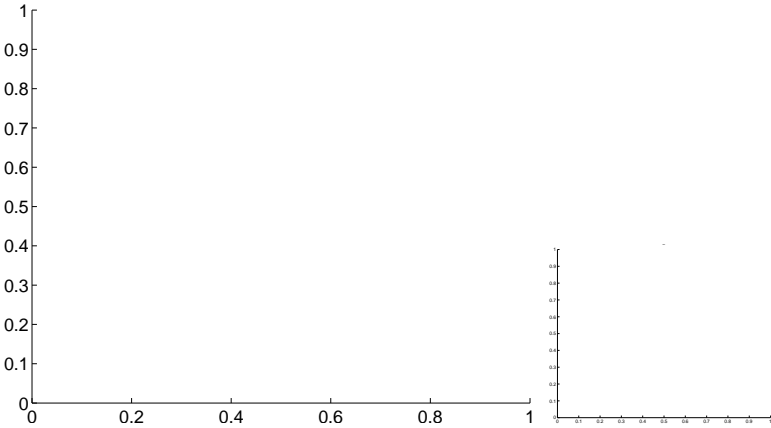
Q11 OOT image



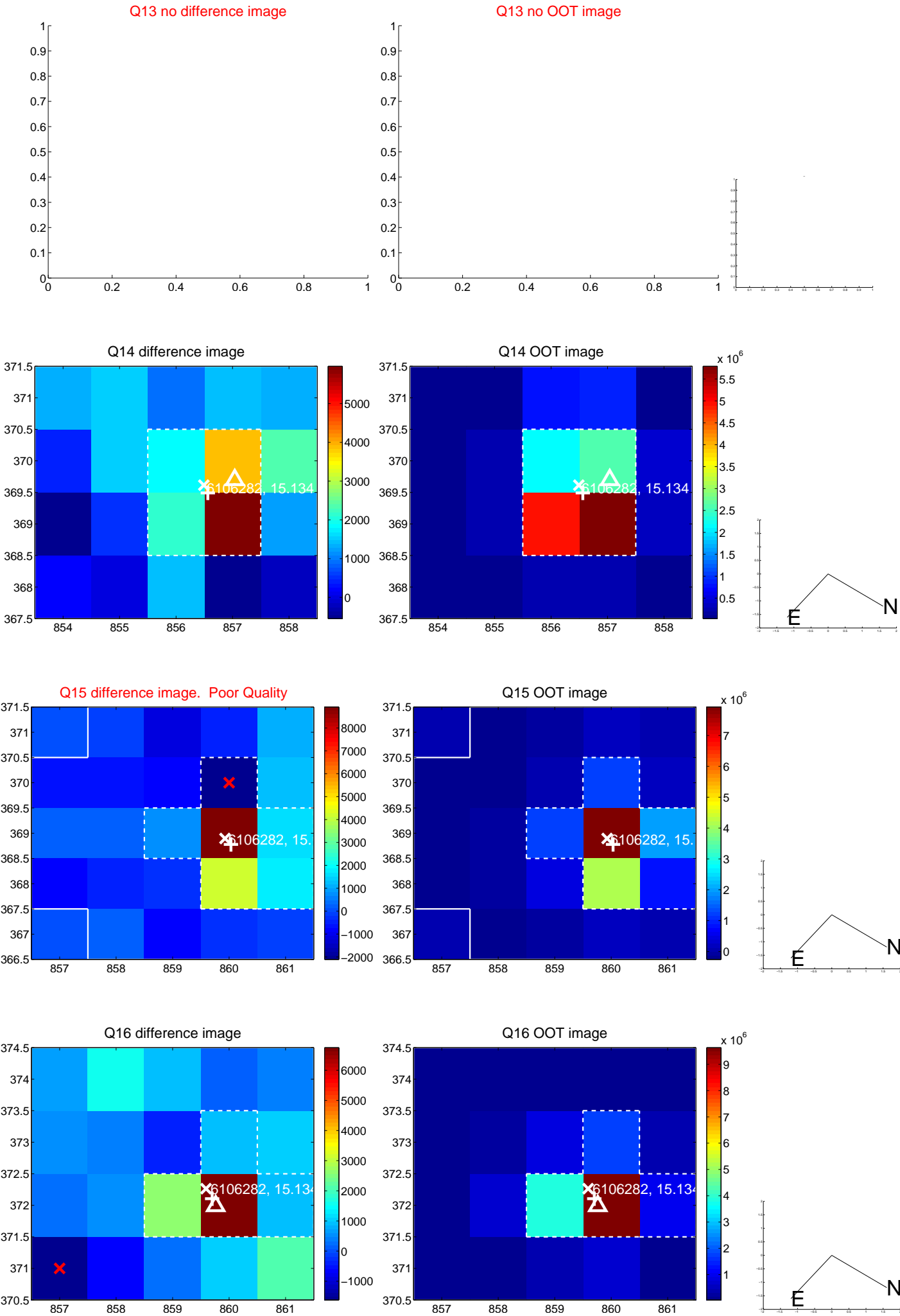
Q12 no difference image



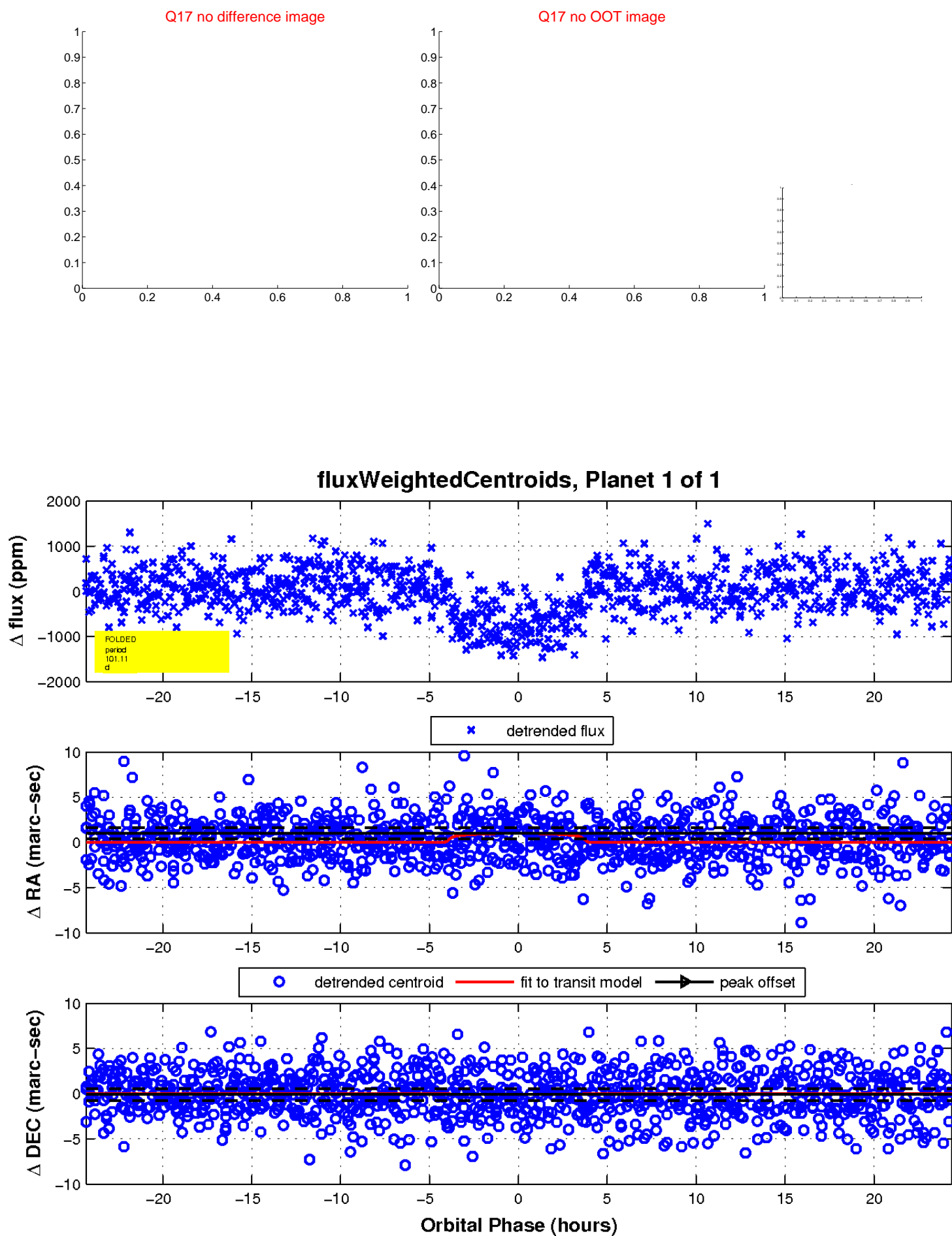
Q12 no OOT image



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

