

# KIC 008043721

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008043721-01	OBS	4812.01	0.779542	131.743285	28.2	2.645	8.8	4.5	0.85	5699	0.48	2591.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008043721-01	OBS	FP	0.22	1	0	0	0	MOD_NONUNIQ_ALT—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 008043721-01

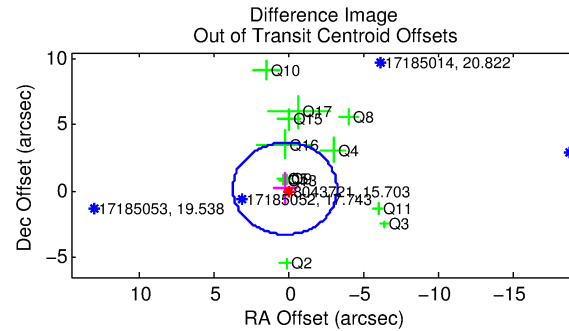
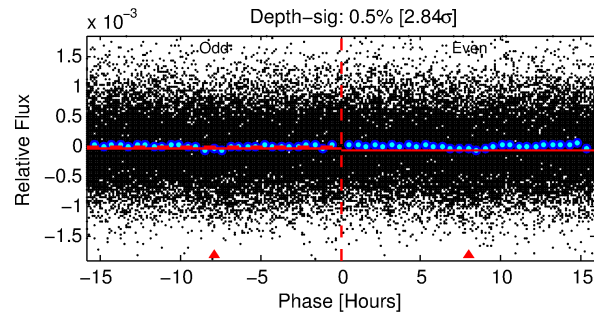
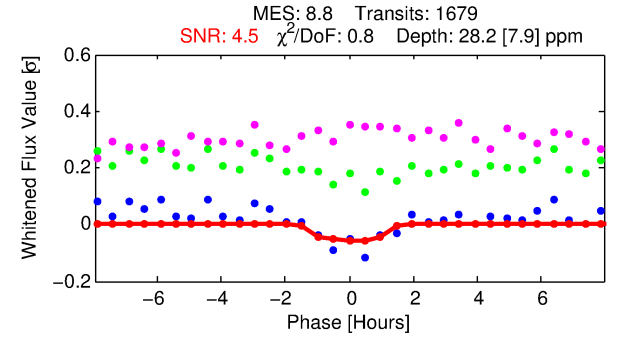
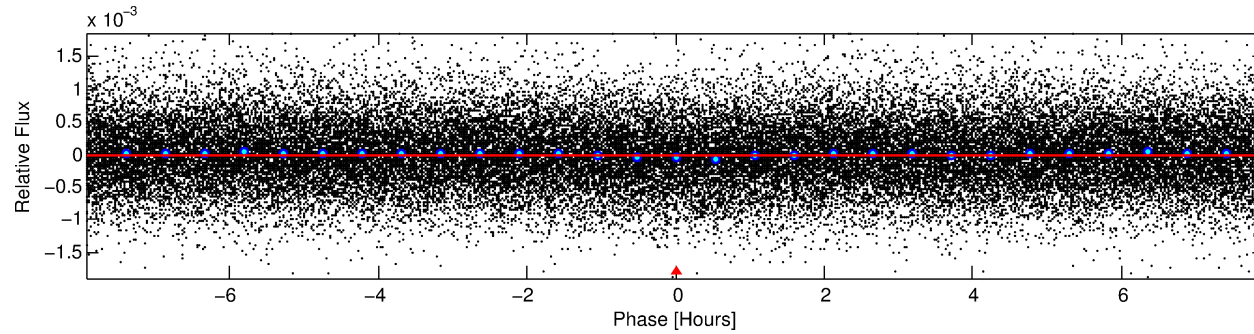
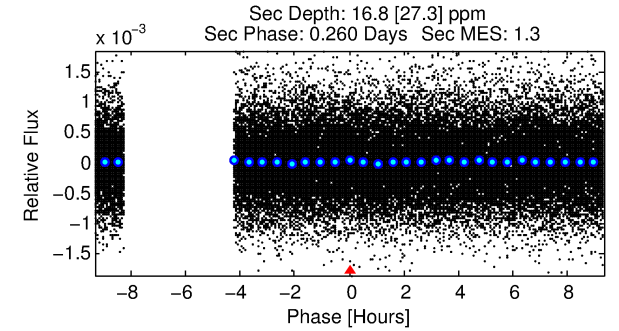
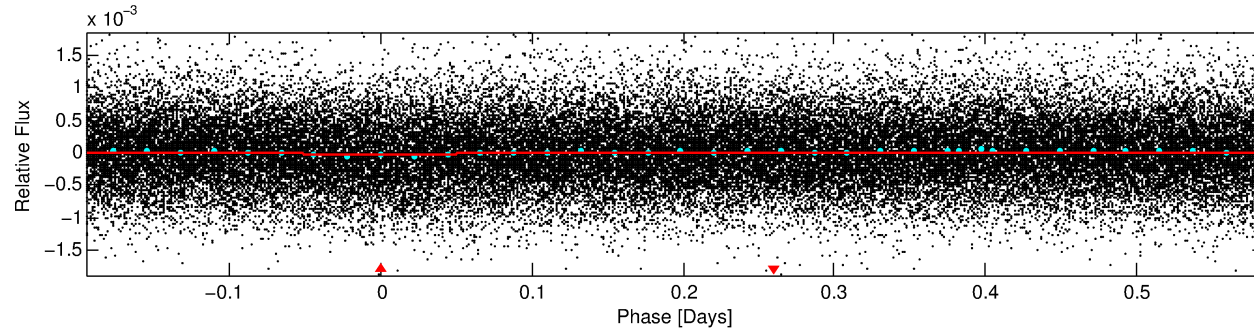
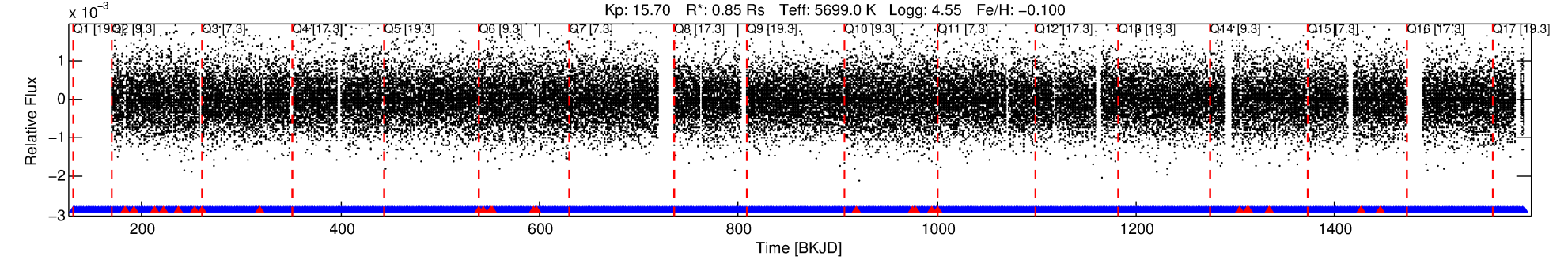
No Significant Match Found

# DV One-Page Summary

KIC: 8043721 Candidate: 1 of 1 Period: 0.780 d

KOI: K04812 Corr: No Ephemeris Match

Kp: 15.70 R\*: 0.85 Rs Teff: 5699.0 K Logg: 4.55 Fe/H: -0.100



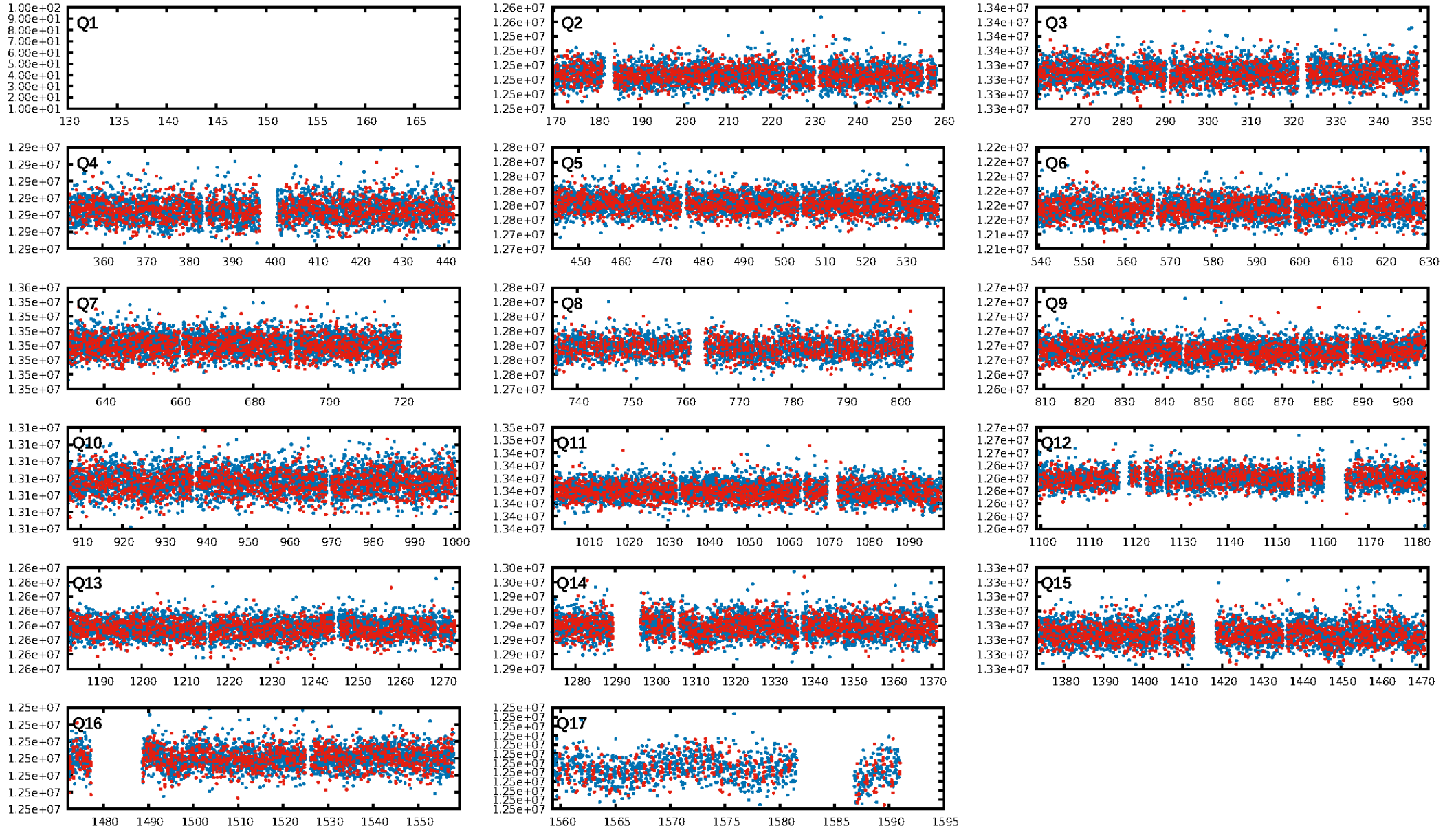
## DV Fit Results:

Period = 0.77954 [0.00002] d  
Epoch = 131.7433 [0.0080] BKJD  
Rp/R\* = 0.0051 [0.0046]  
a/R\* = 1.91 [5.36]  
b = 0.64 [3.56]  
Seff = 2591.81 [984.25]  
Teff = 1819 [173] K  
Rp = 0.48 [0.45] Re  
a = 0.0163 [0.0040] AU  
Ag = 10.77 [26.35] [0.37σ]  
Teffp = 5096 [3088] K [1.06σ]

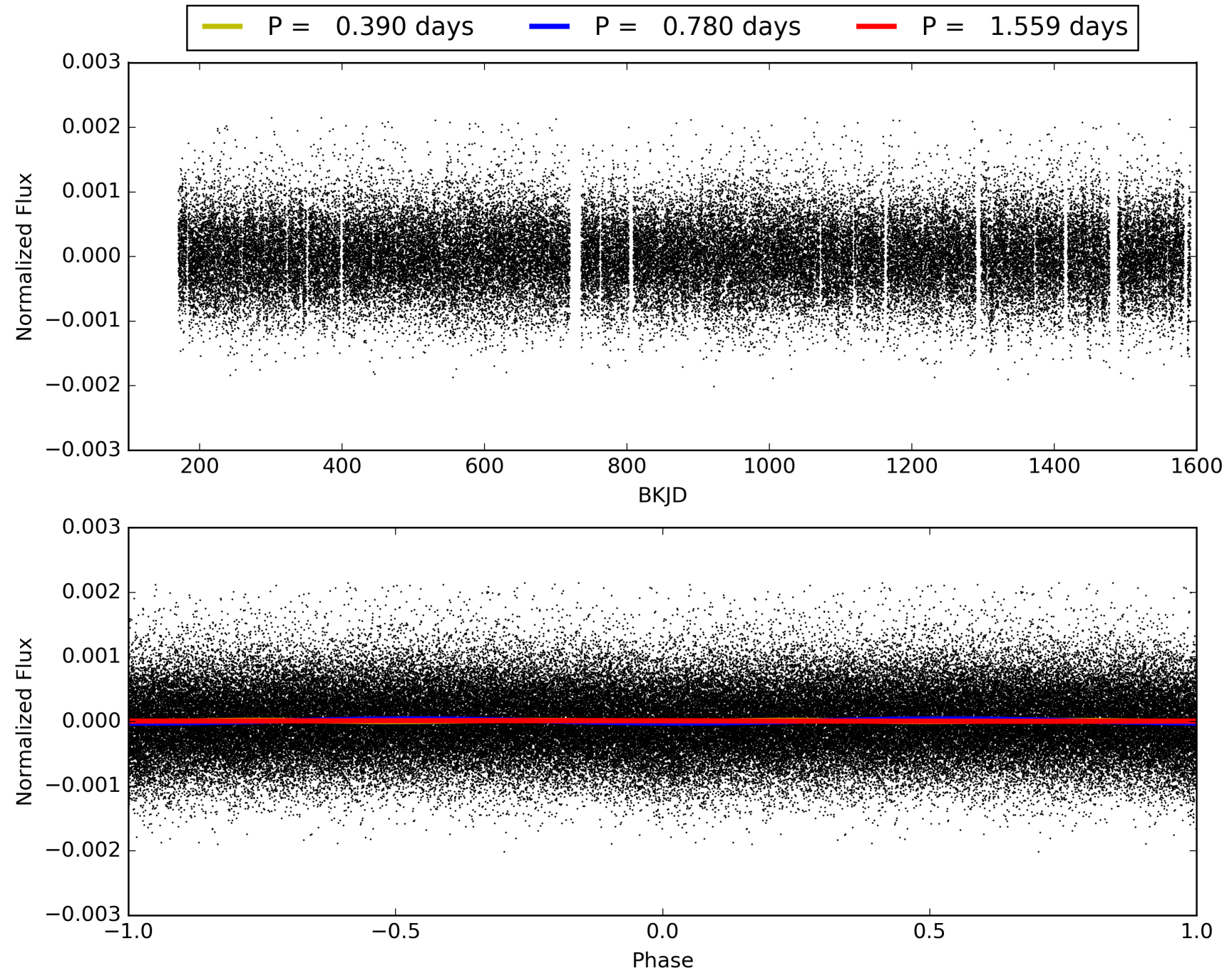
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.66e-21  
RollingBand-fgt: 0.98 [1619/1645]  
GhostDiagnostic-chr: 2.275  
Centroid-sig: 0.1%  
Centroid-so: 7.605 arcsec [2.10σ]  
OotOffset-rm: 0.276 arcsec [0.24σ]  
KicOffset-rm: 0.542 arcsec [0.61σ]  
OotOffset-st: 2/3/3/4 [12]  
KicOffset-st: 2/3/3/4 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 1.00 [16/16]

# TCE 008043721-01, PDC Light Curves



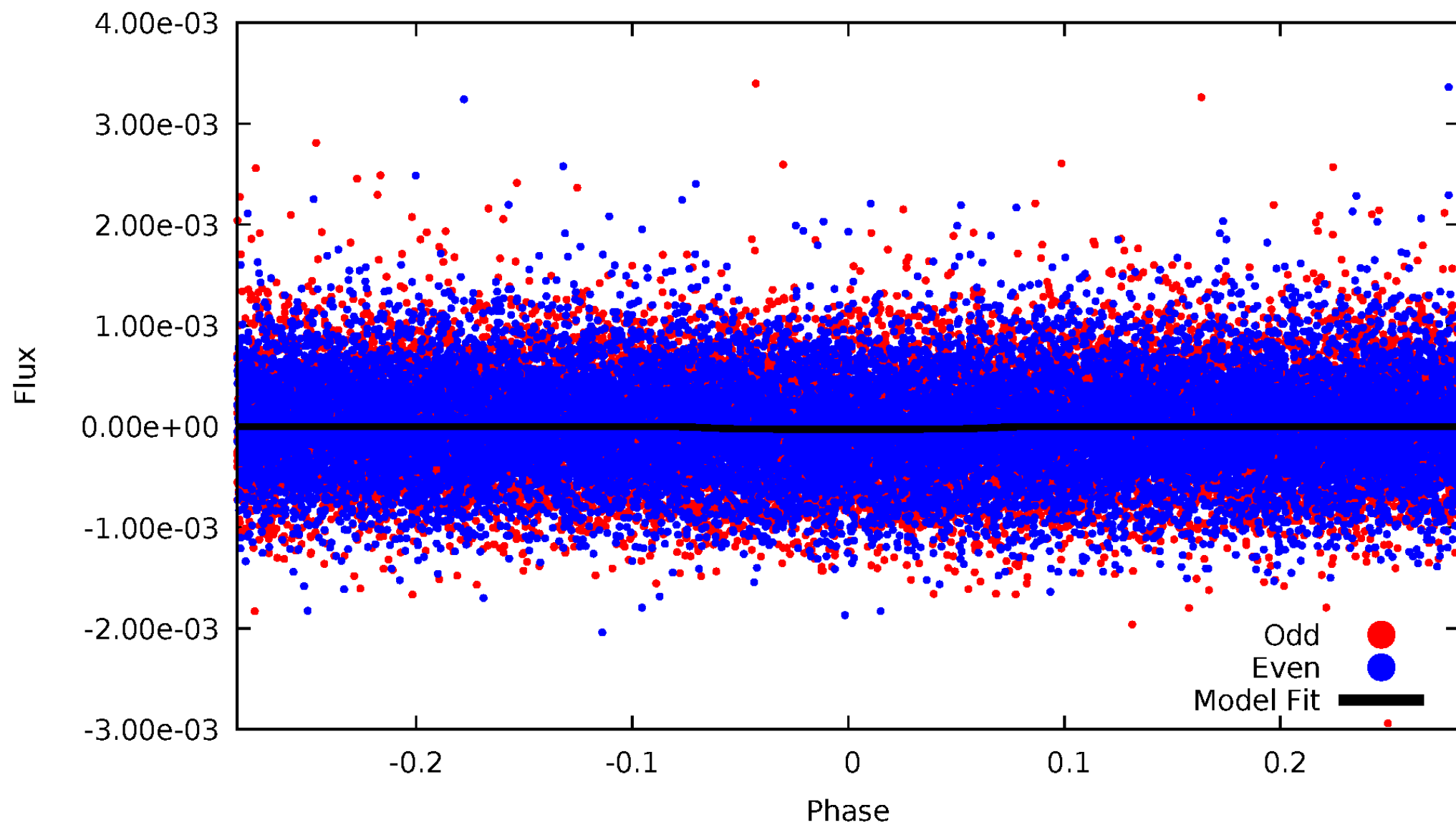
TCE 008043721-01





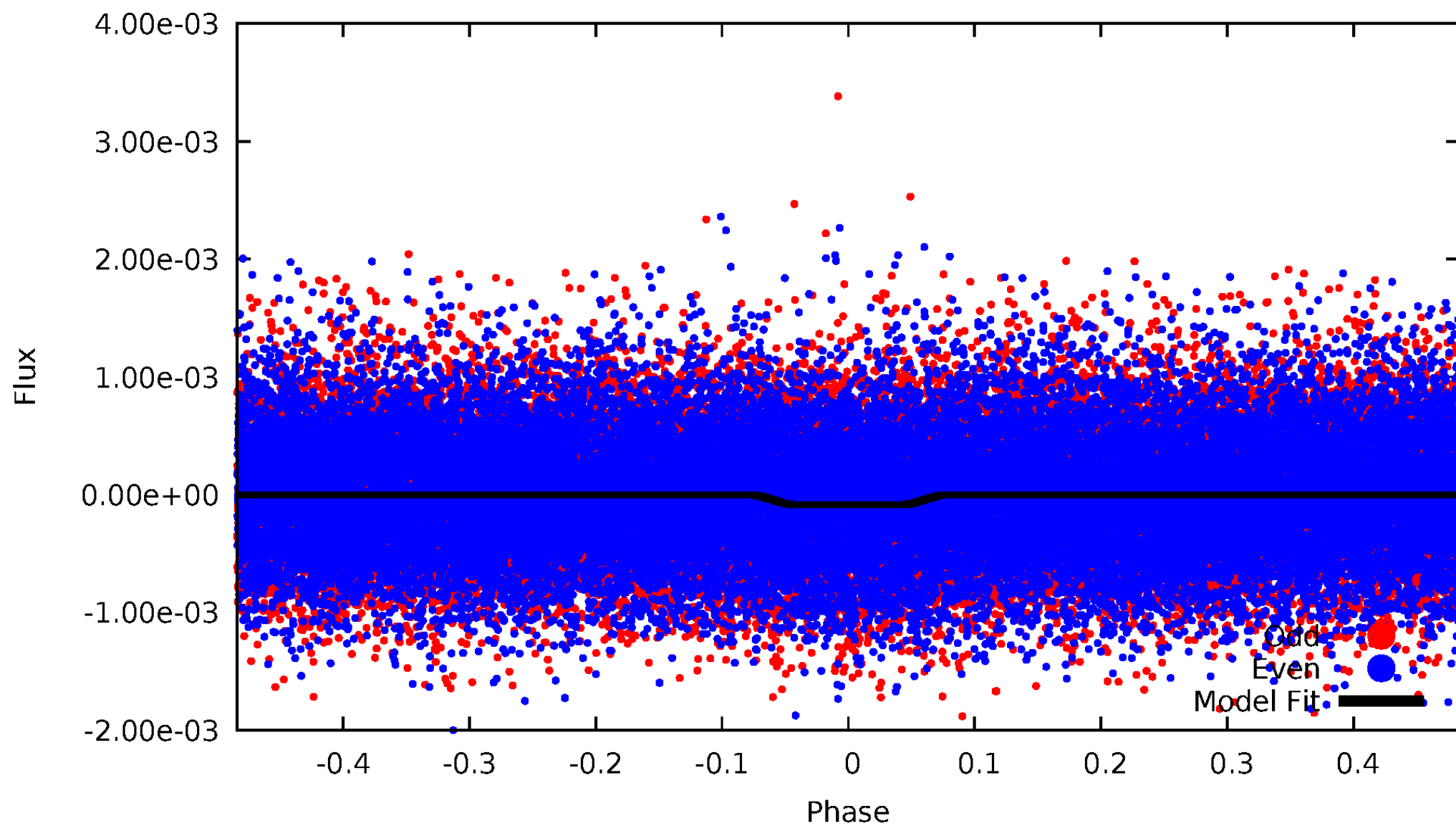
# DV Odd/Even

TCE 008043721-01



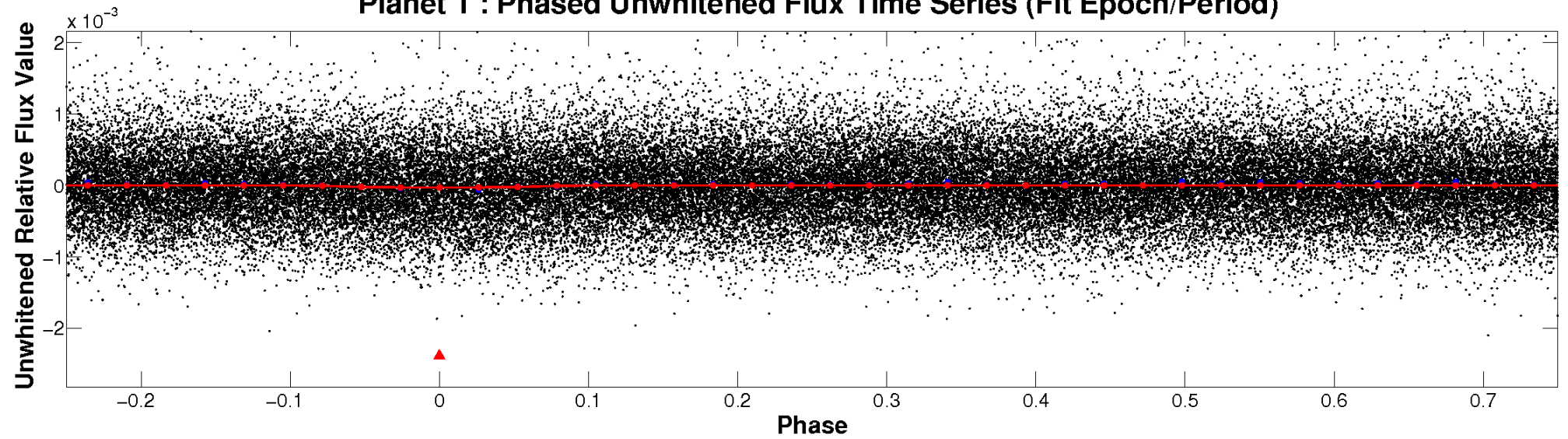
# ALT Odd/Even

TCE 008043721-01

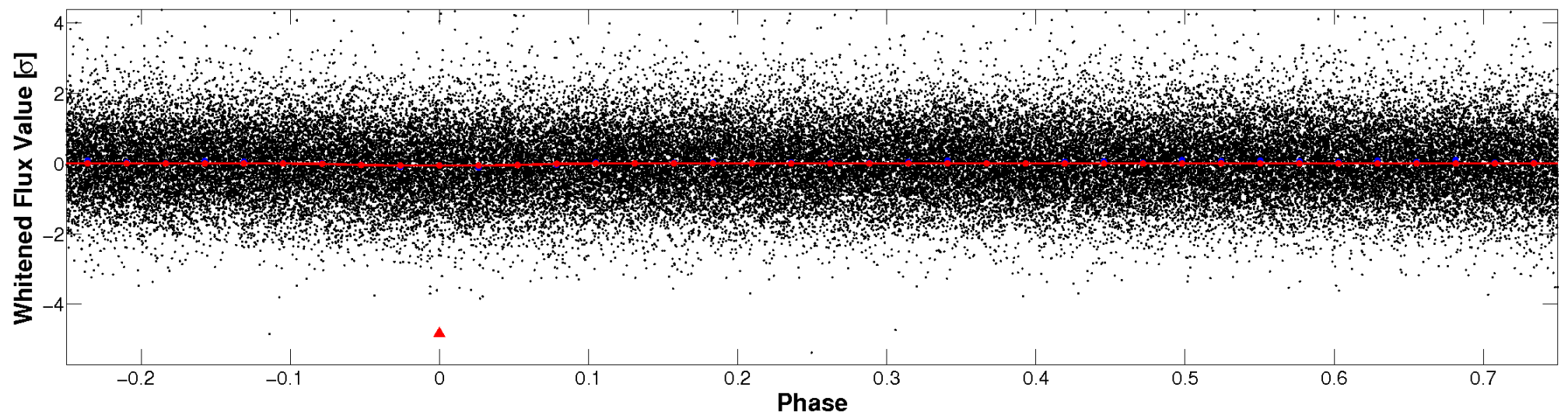


# Non-Whitened Vs. Whitened Light Curve

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

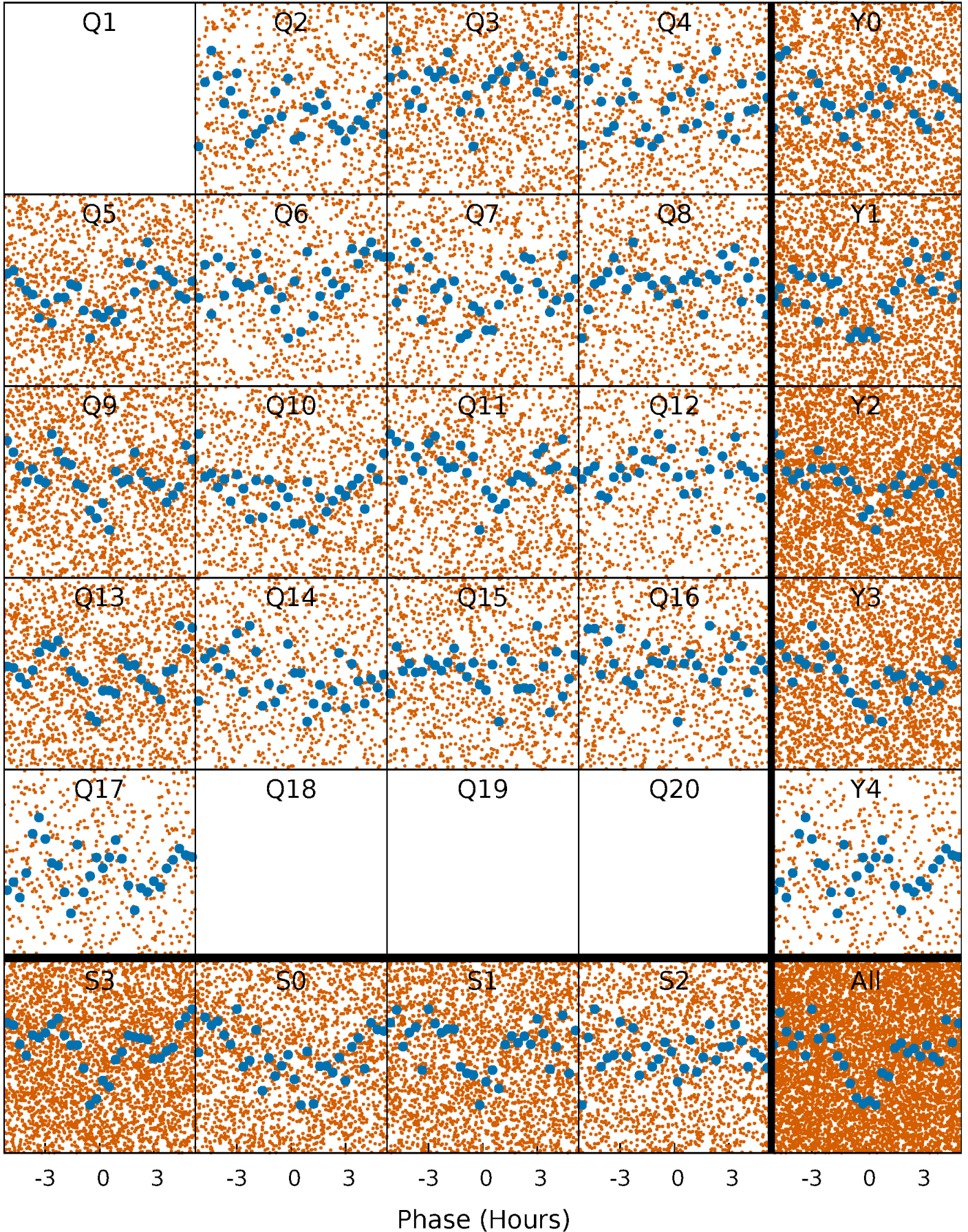


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

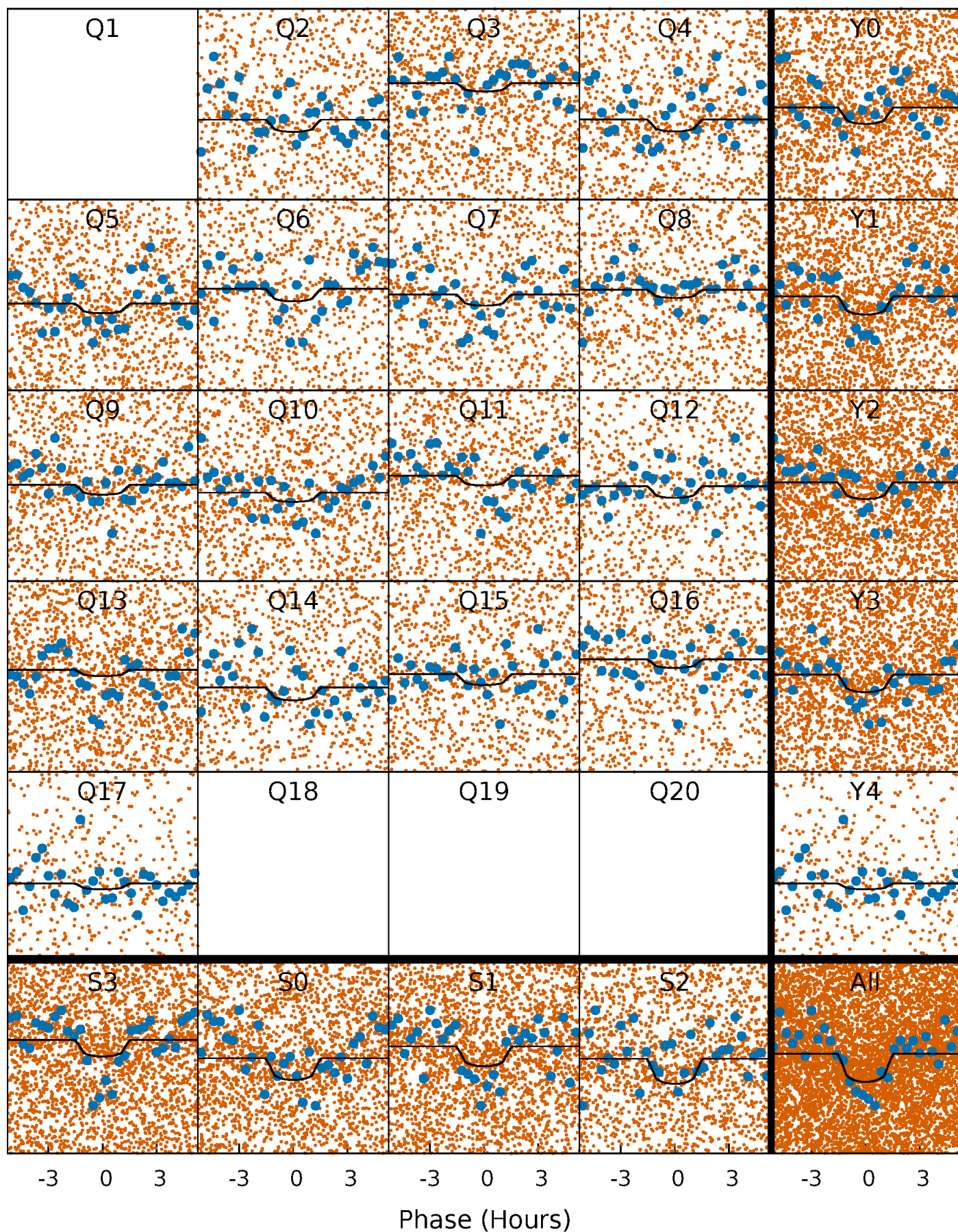
TCE 008043721-01 P= 0.779542 Days  $T_0=131.743285$  (BKJD)





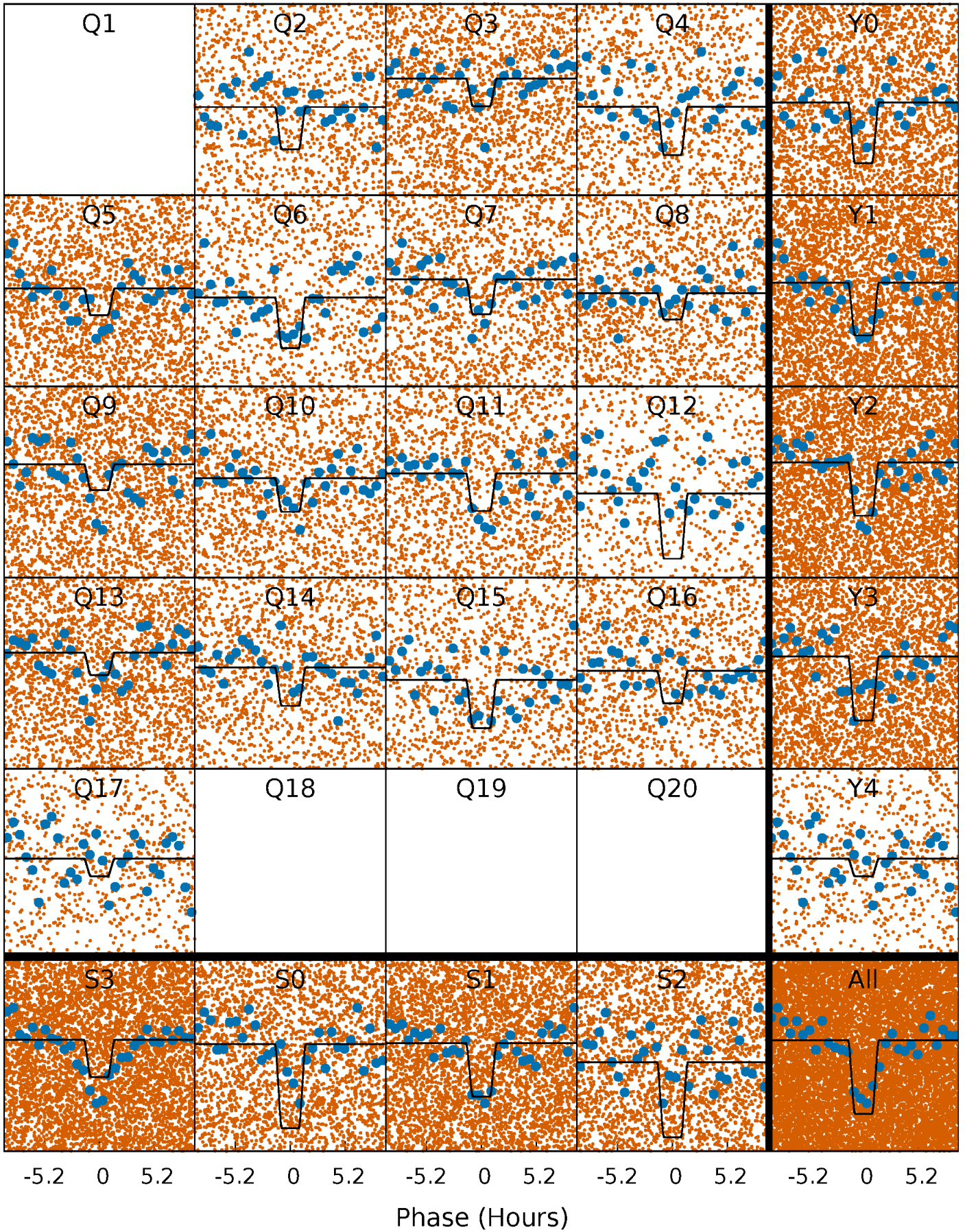
# DV Quarter-Phased Transit Curves

TCE 008043721-01 P= 0.779542 Days  $T_0=131.743285$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008043721-01 P= 0.779591 Days  $T_0=131.706054$  (BKJD)

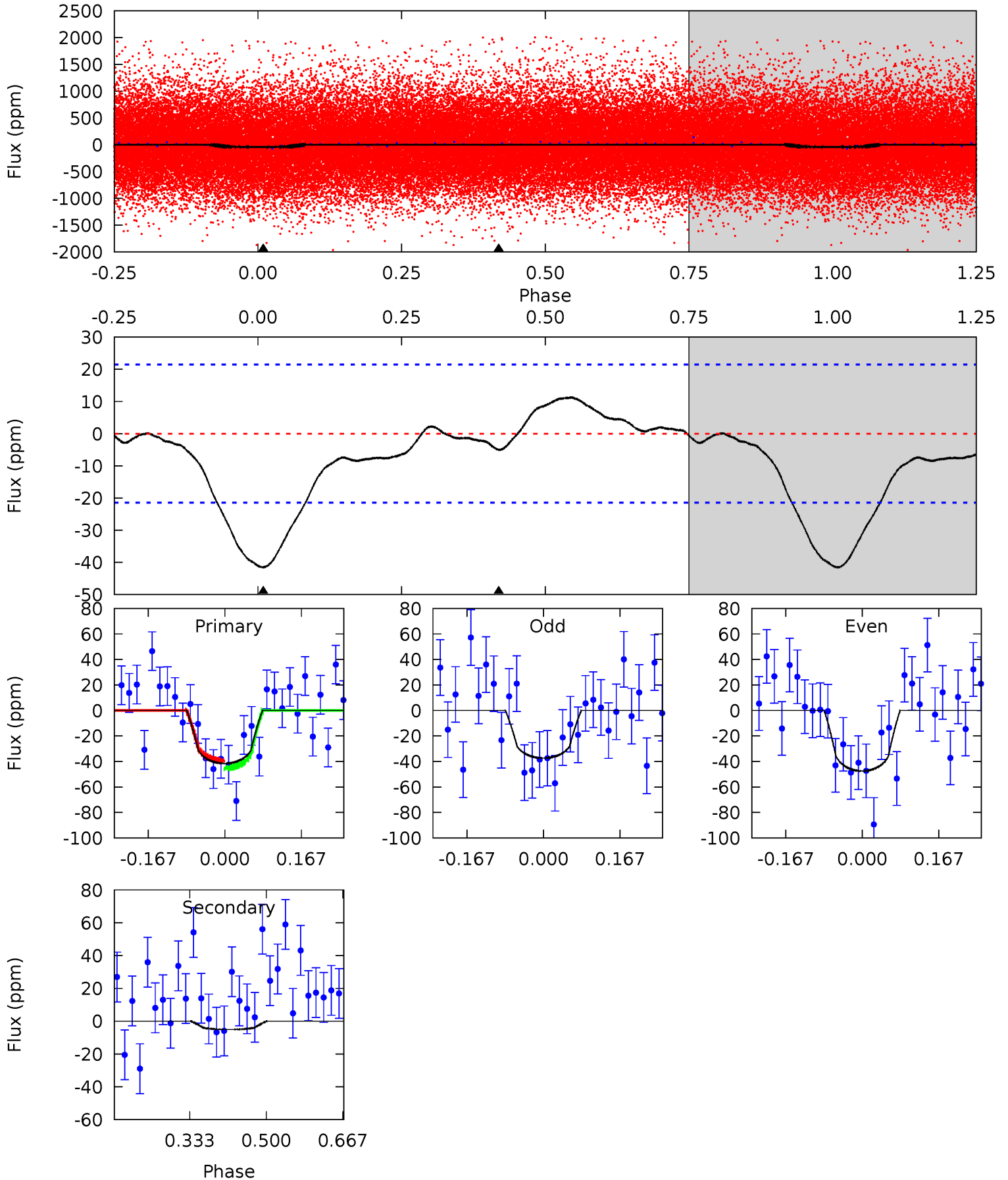




# DV Model-Shift Uniqueness Test

008043721-01, P = 0.779542 Days, E = 131.743285 Days

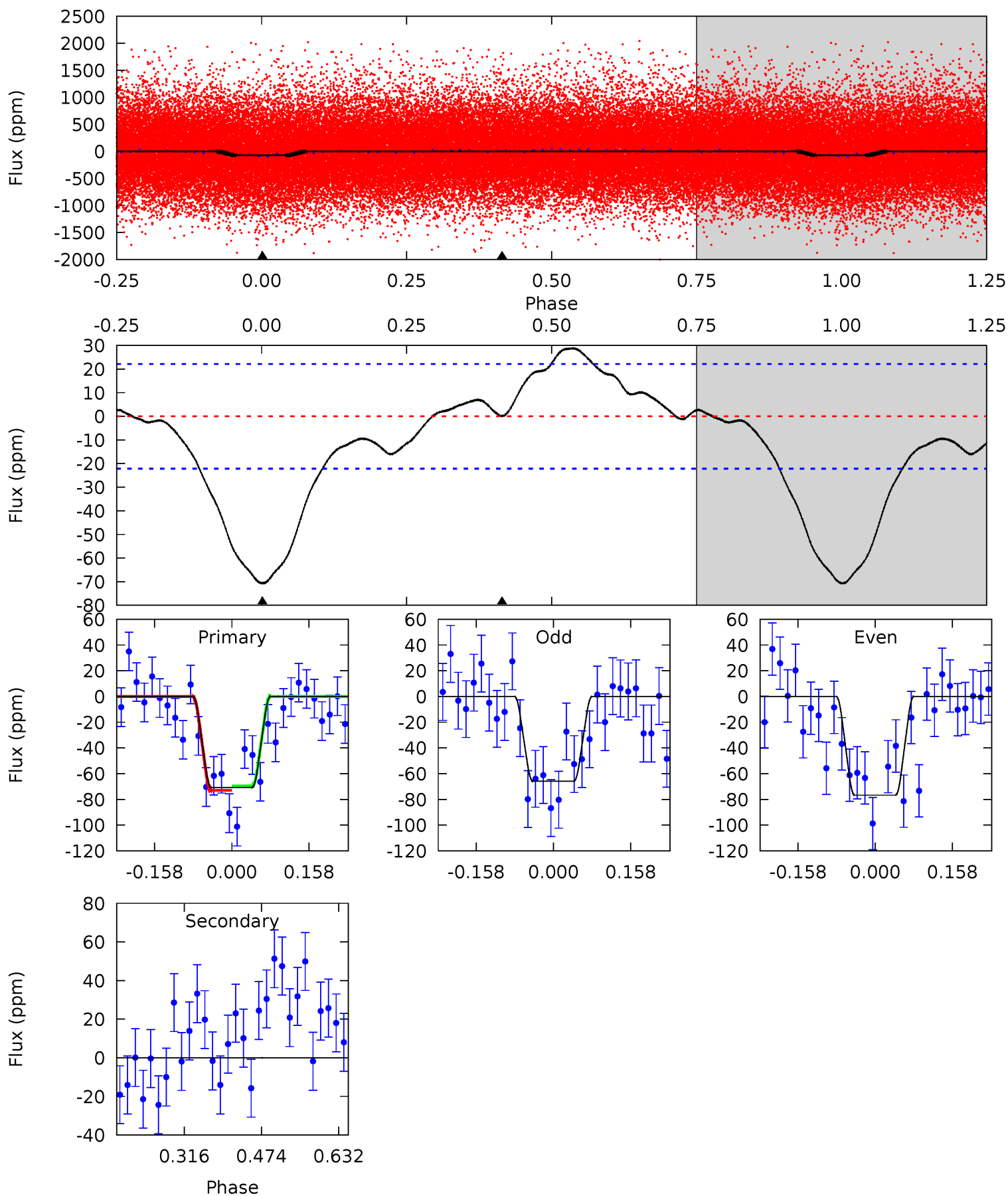
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.63	1.06	0	0	4.46	1.38	0.89	8.63	8.63	1.06	1.06	1.06	1.00	0.21	0.59



# Alt Model-Shift Uniqueness Test

008043721-01, P = 0.779591 Days, E = 131.706054 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
14.2	0	0	0	4.47	1.41	2.03	14.2	14.2	0	0	1.09	0.92	0.29	0.34





### Stellar Parameters For KIC 008043721

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5699^{+169}_{-186}$	$4.553^{+0.034}_{-0.195}$	$-0.100^{+0.300}_{-0.300}$	$0.853^{+0.248}_{-0.078}$	$0.950^{+0.104}_{-0.104}$	$2.159^{+0.407}_{-1.073}$
	+3%/-3%	+1%/-4%	+300%/-300%	+29%/-9%	+11%/-11%	+19%/-50%
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 008043721-01 / KOI 4812.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-5 \pm 5$	$0.59^{+0.46}_{-0.36}$	$2605^{+163}_{-128}$	$3574^{+1825}_{-6444}$	$1.661^{+10.618}_{-1.667}$
Alt.	$0 \pm 5$	$0.93^{+0.43}_{-0.47}$	$2612^{+181}_{-131}$	$-2875^{+6165}_{-728}$	$0.010^{+1.116}_{-1.118}$

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

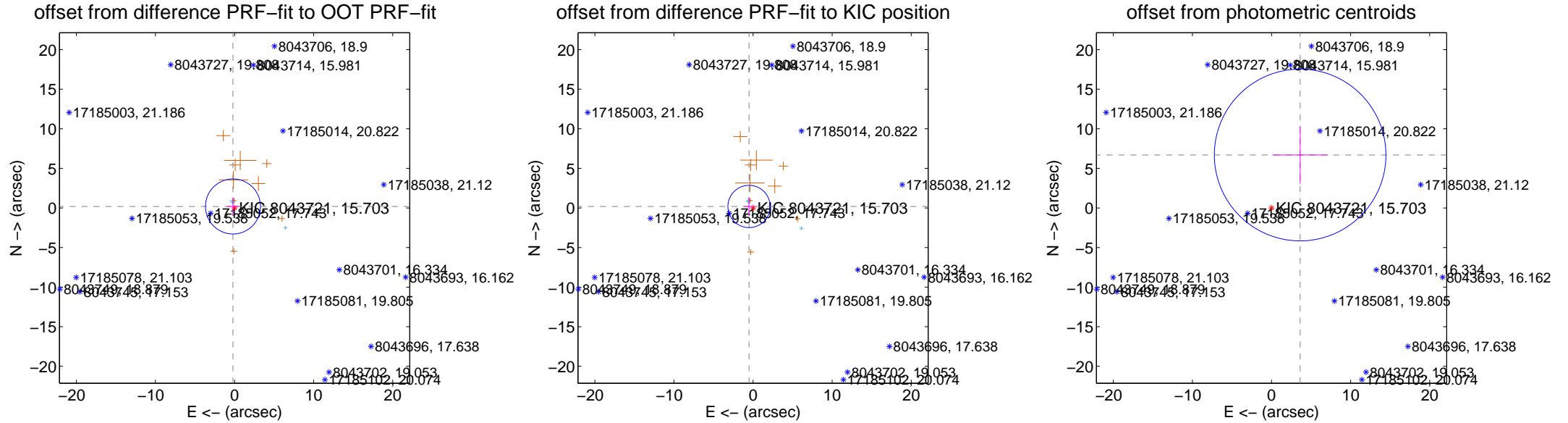
## DV Centroid Data

Supplemental centroid analysis for 008043721-01. Kepler magnitude: 15.70. Transit SNR 4.53

There are 3 quarters with good PRF difference image offsets

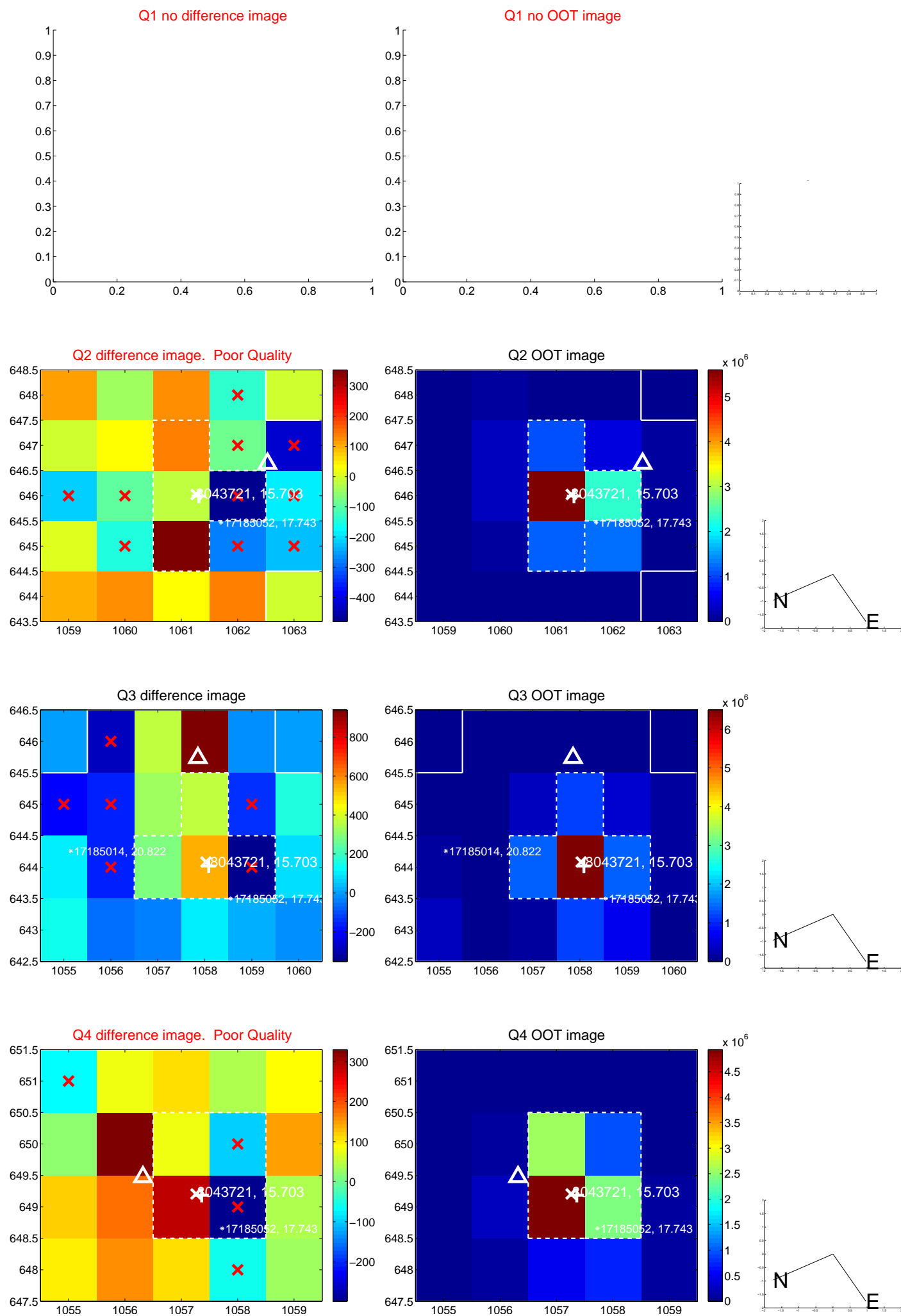
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.276 \pm 1.159$	0.24	$0.203 \pm 0.771$	$0.188 \pm 1.146$
PRF-fit source offset from KIC position	$0.542 \pm 0.890$	0.61	$0.508 \pm 0.706$	$0.188 \pm 1.164$
photometric centroid source offset	$7.60 \pm 3.62$	2.10	$-3.62 \pm 3.51$	$6.69 \pm 3.65$

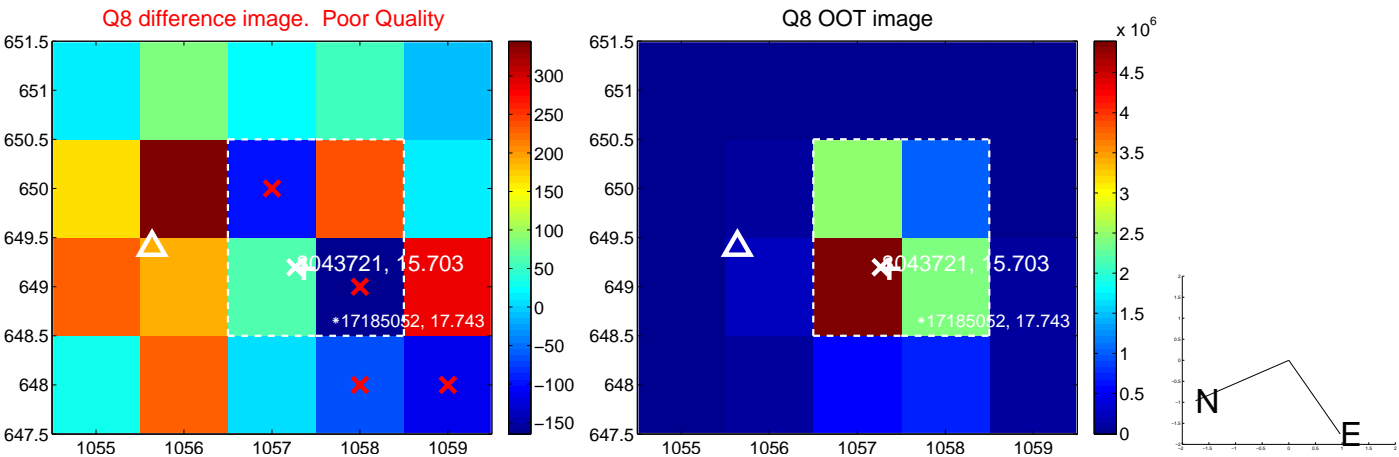
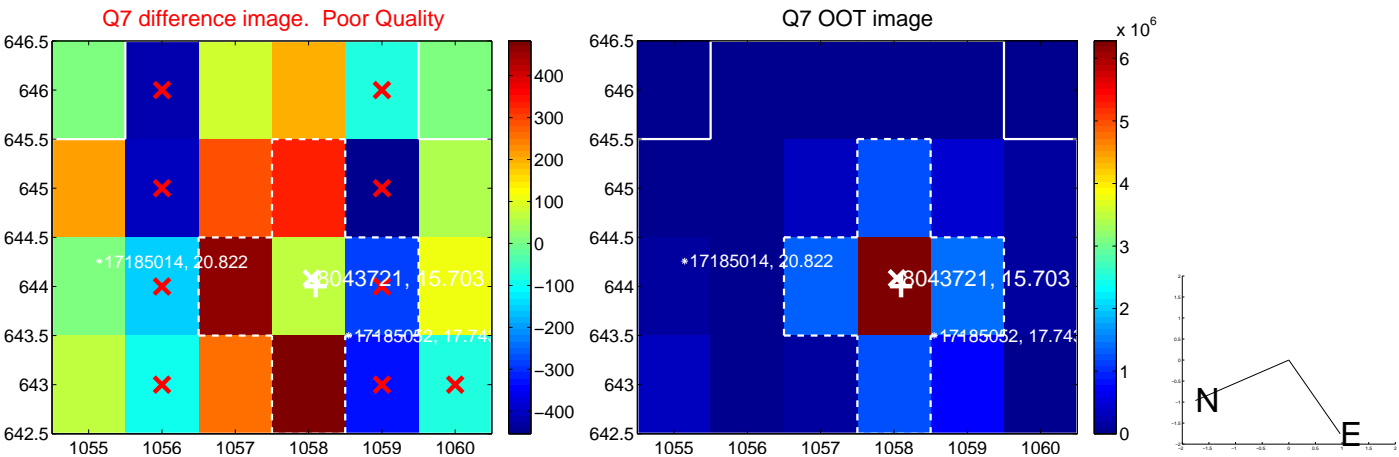
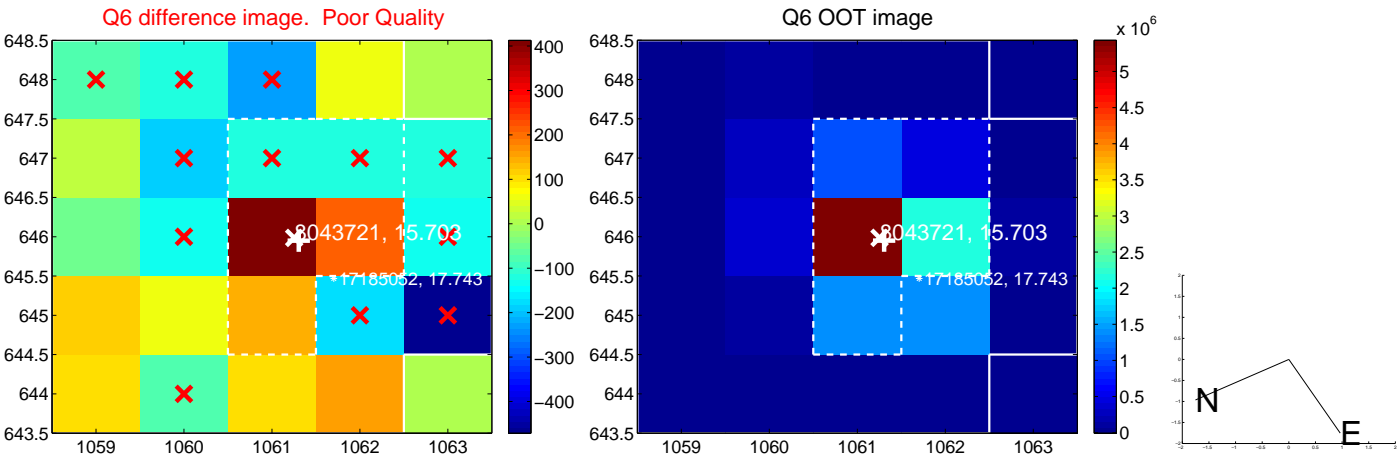
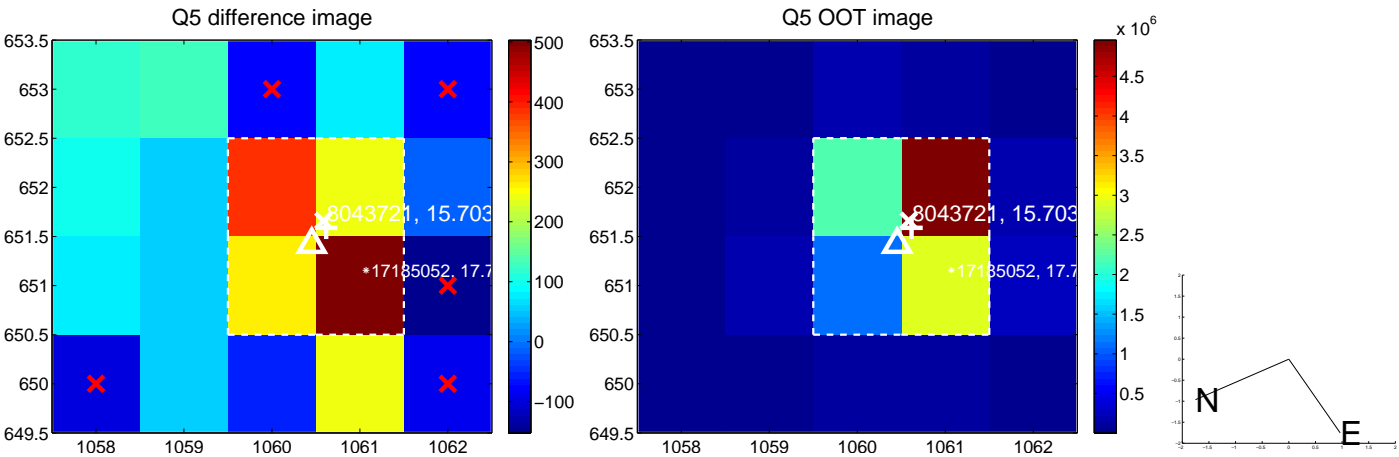


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

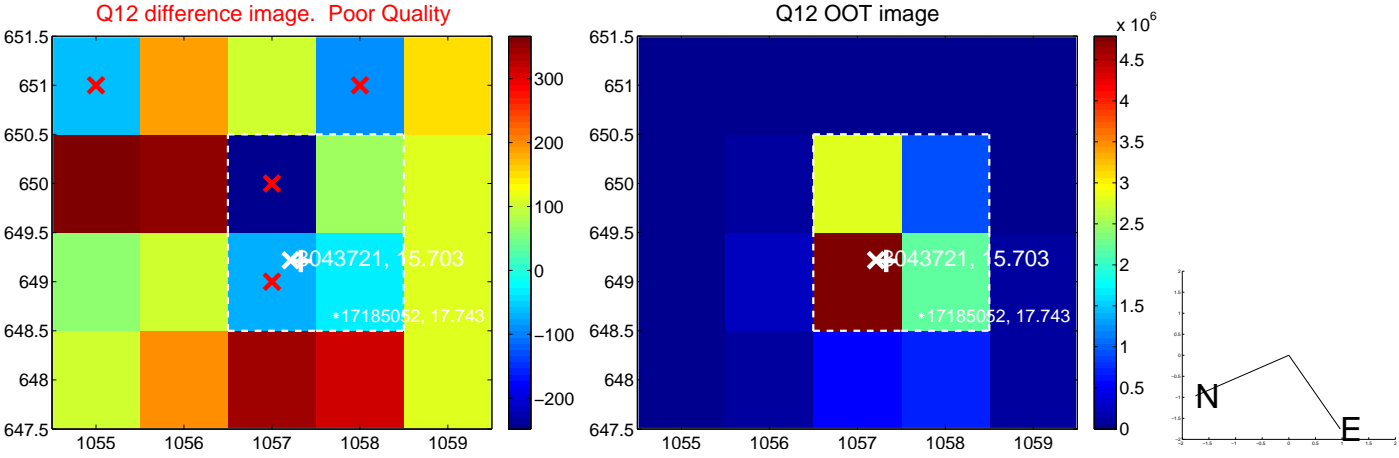
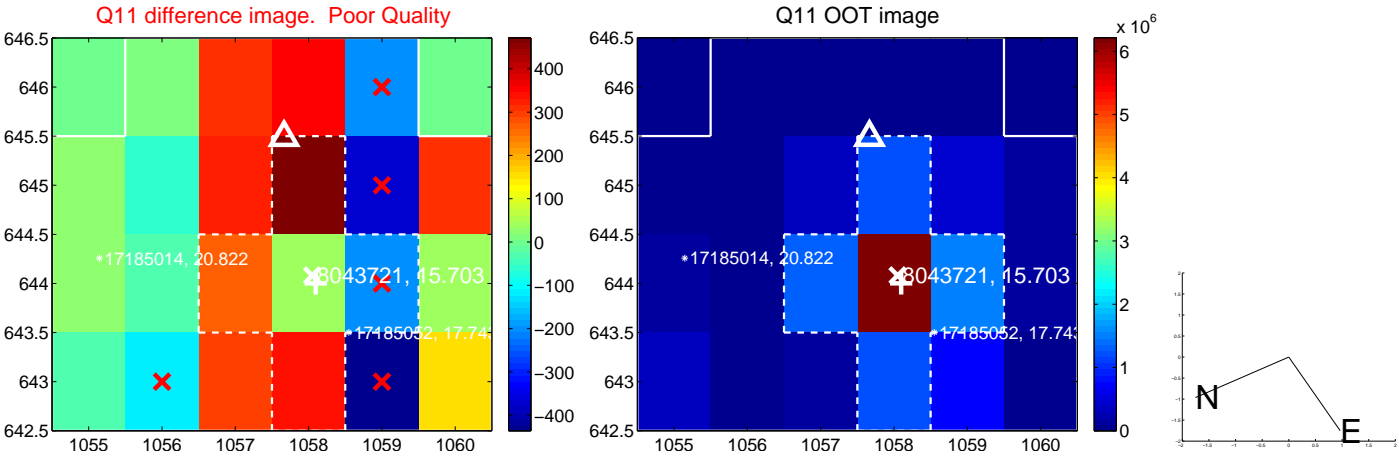
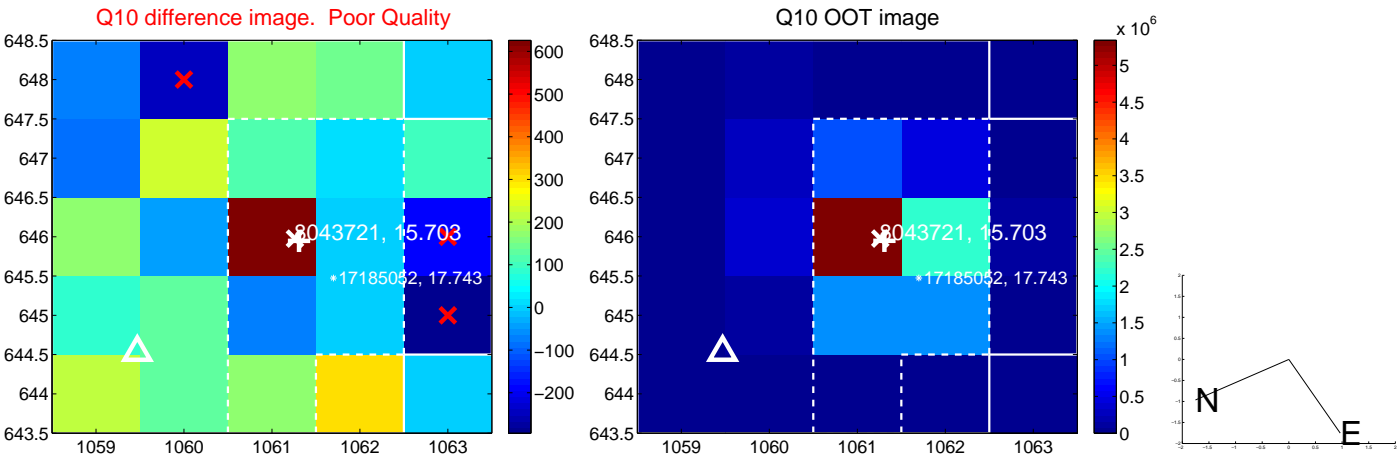
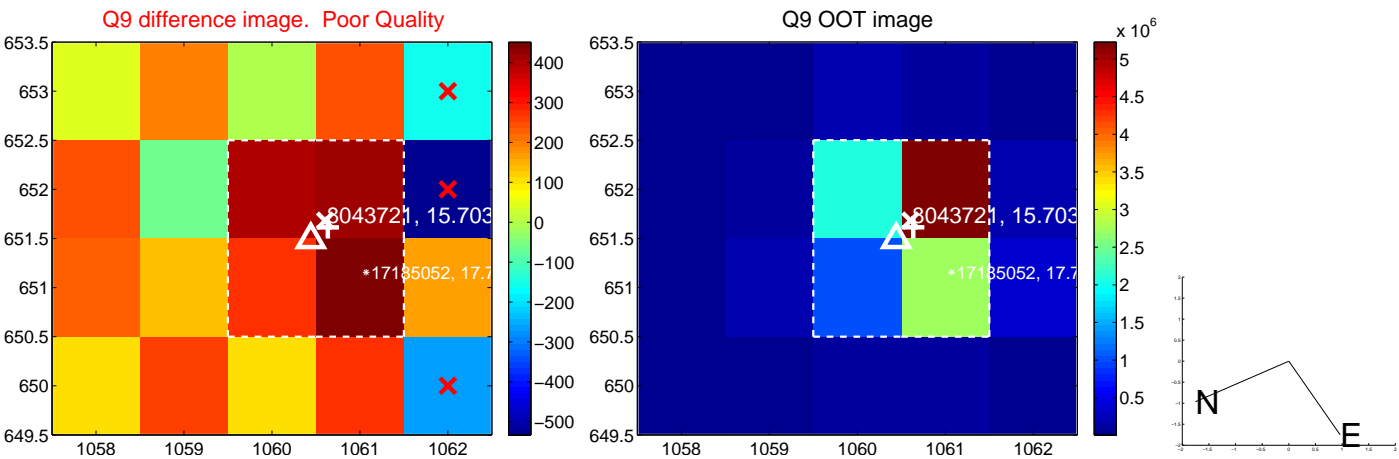


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

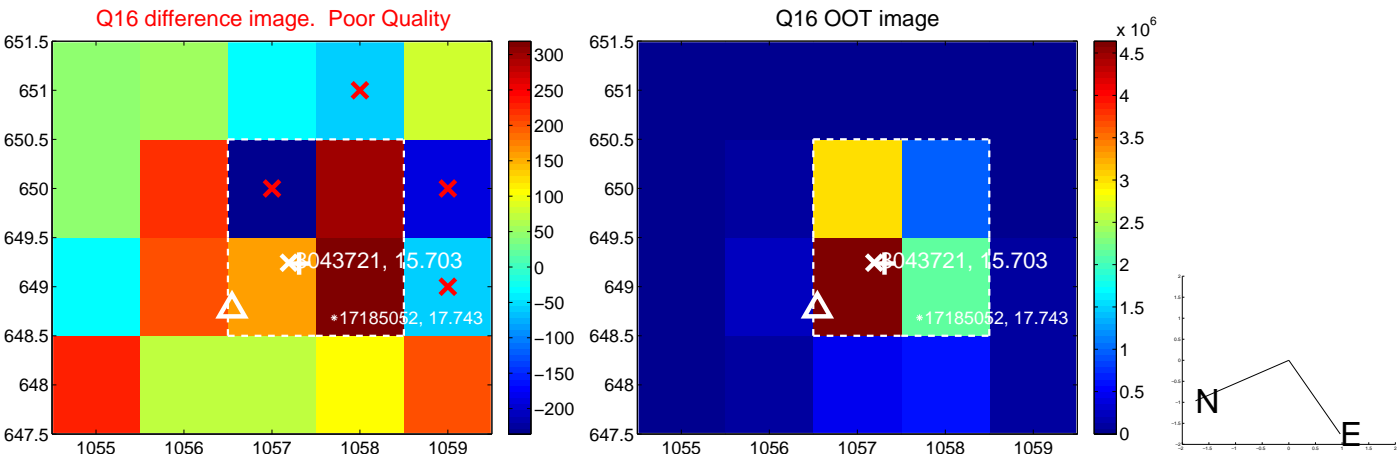
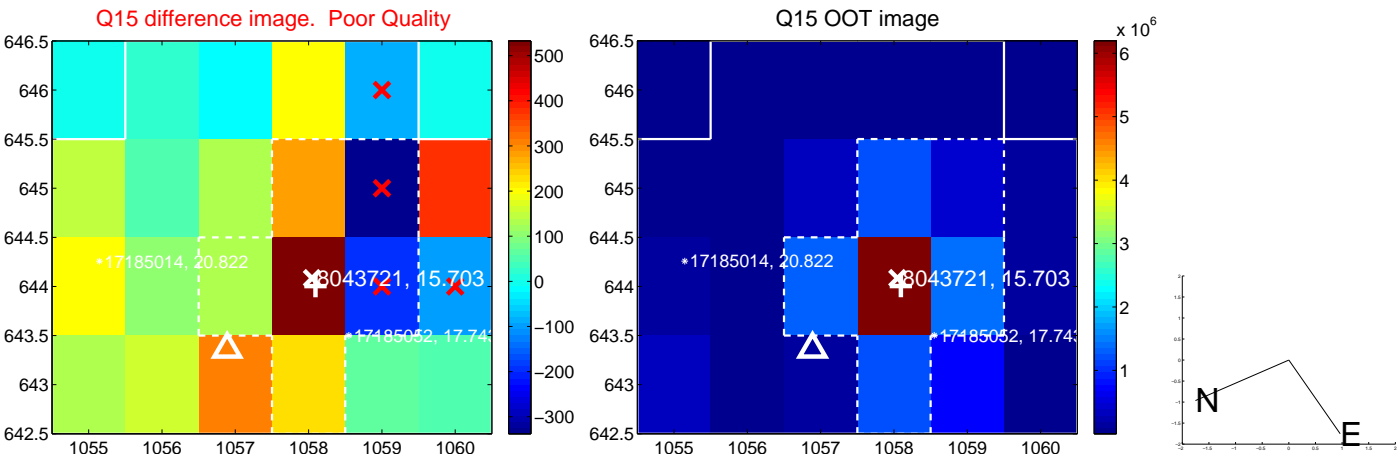
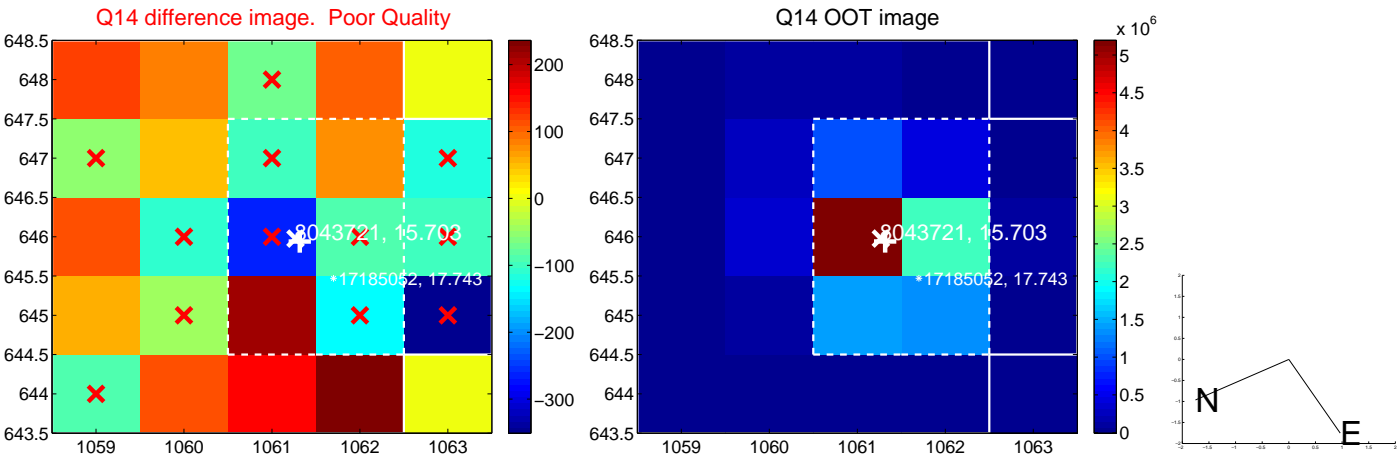
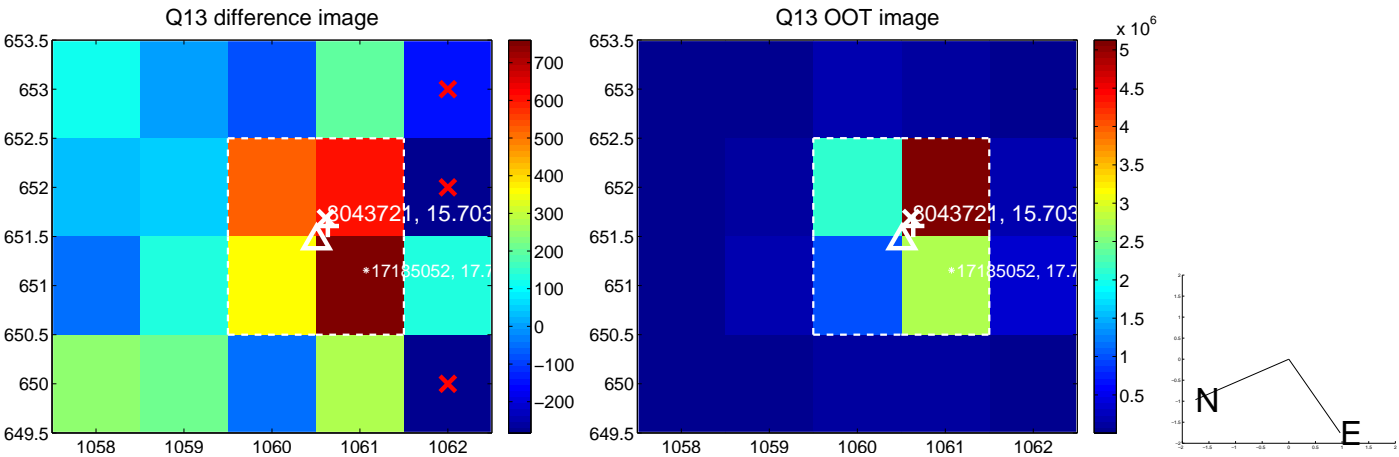




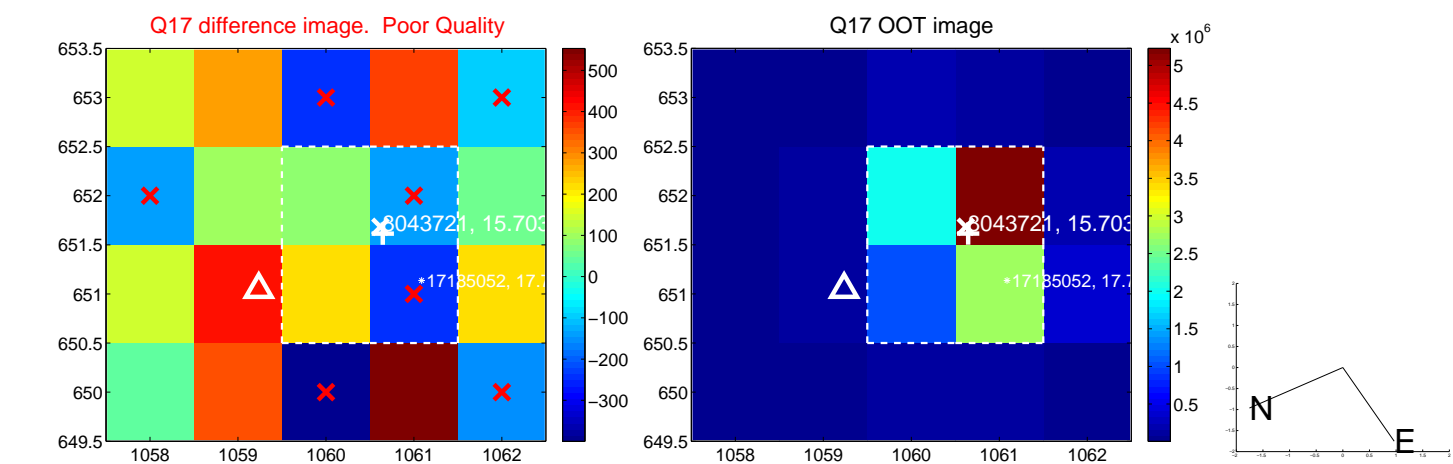
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



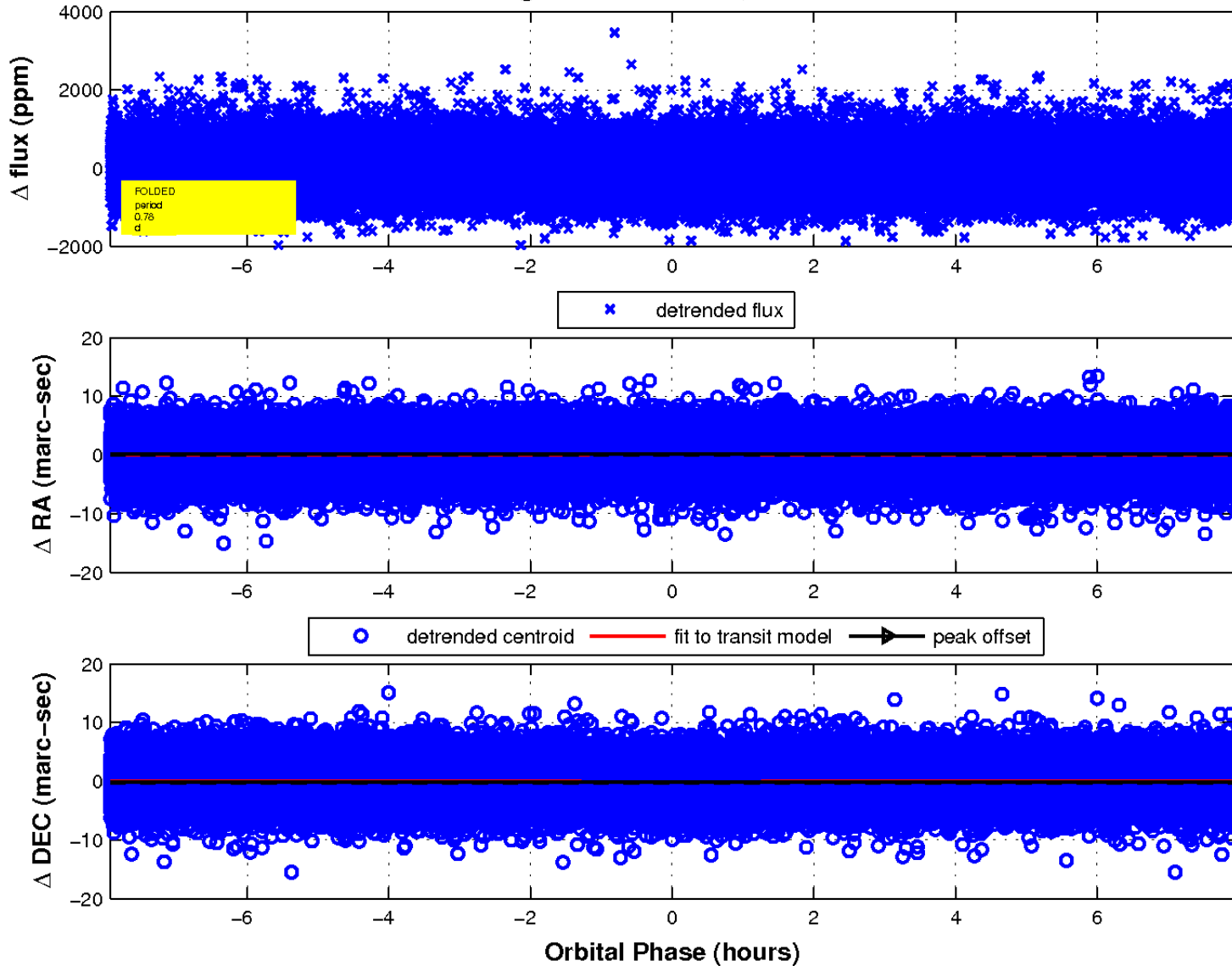
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

