

# KIC 009513865

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009513865-01	OBS	0943.01	3.601471	132.374570	787.0	2.671	42.1	47.6	0.85	5052	3.11	233.03

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009513865-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

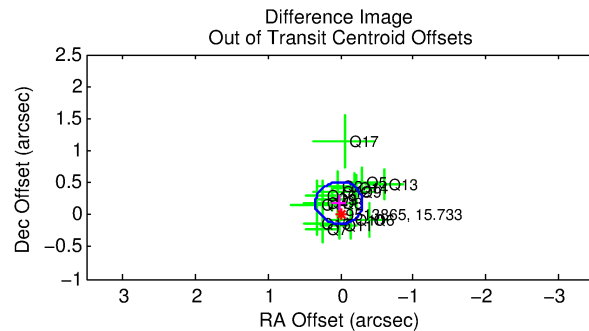
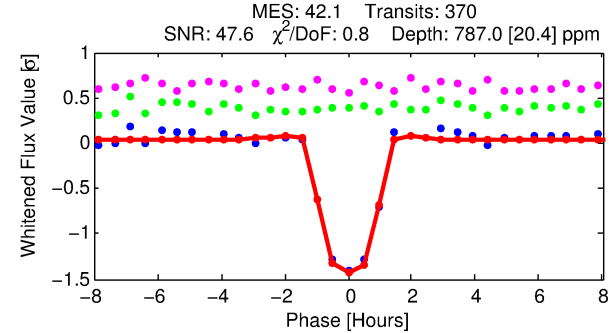
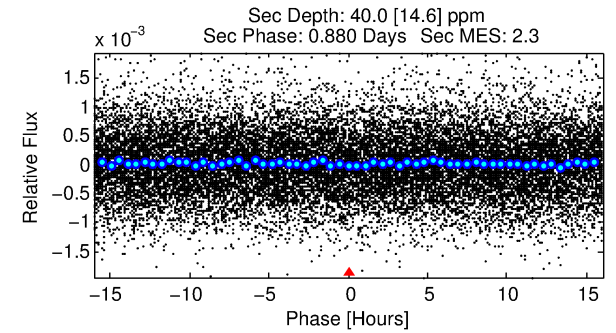
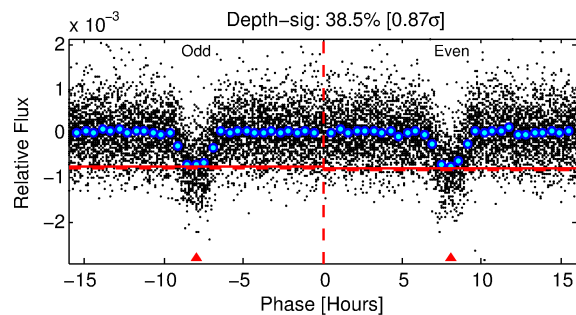
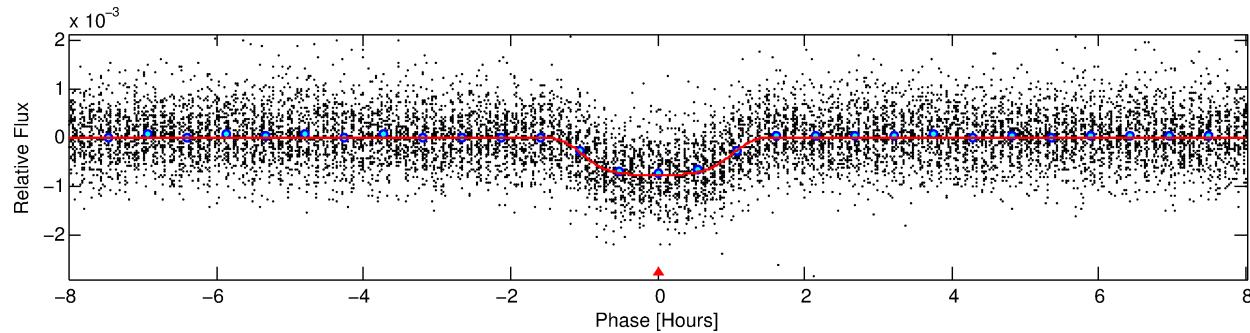
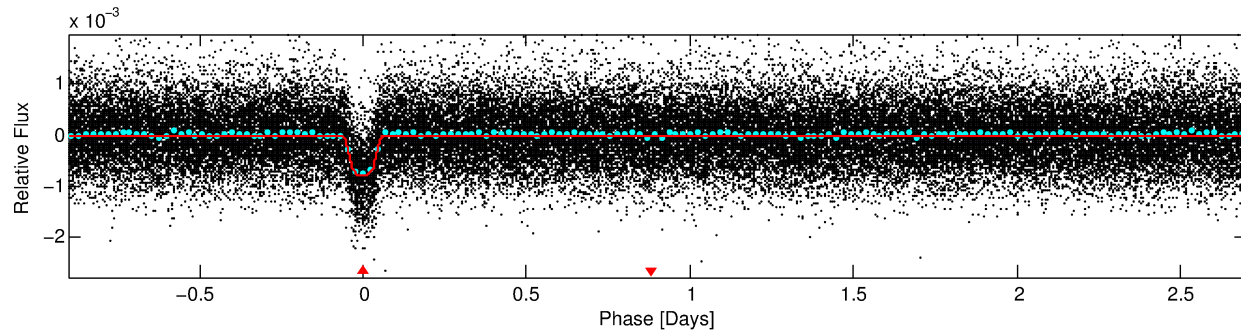
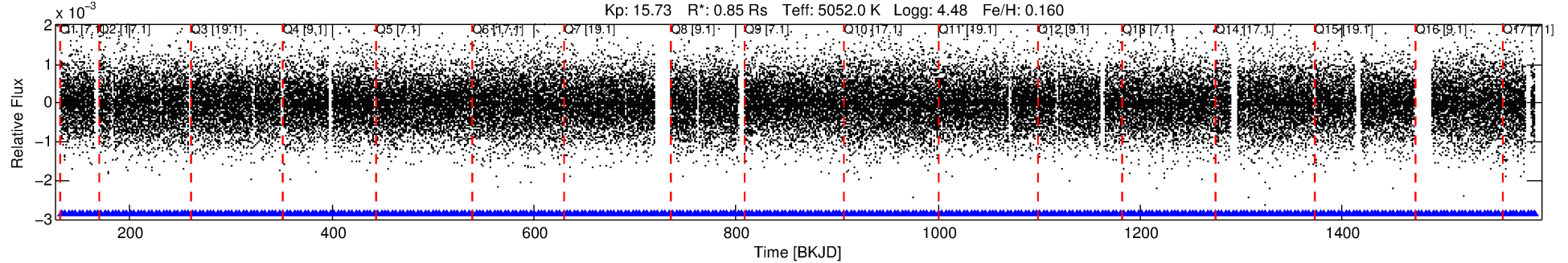
## Ephemeris Match Information For 009513865-01

No Significant Match Found

# DV One-Page Summary

KIC: 9513865 Candidate: 1 of 1 Period: 3.601 d  
KOI: K00943.01 Corr: 0.972

Kp: 15.73 R\*: 0.85 Rs Teff: 5052.0 K Logg: 4.48 Fe/H: 0.160



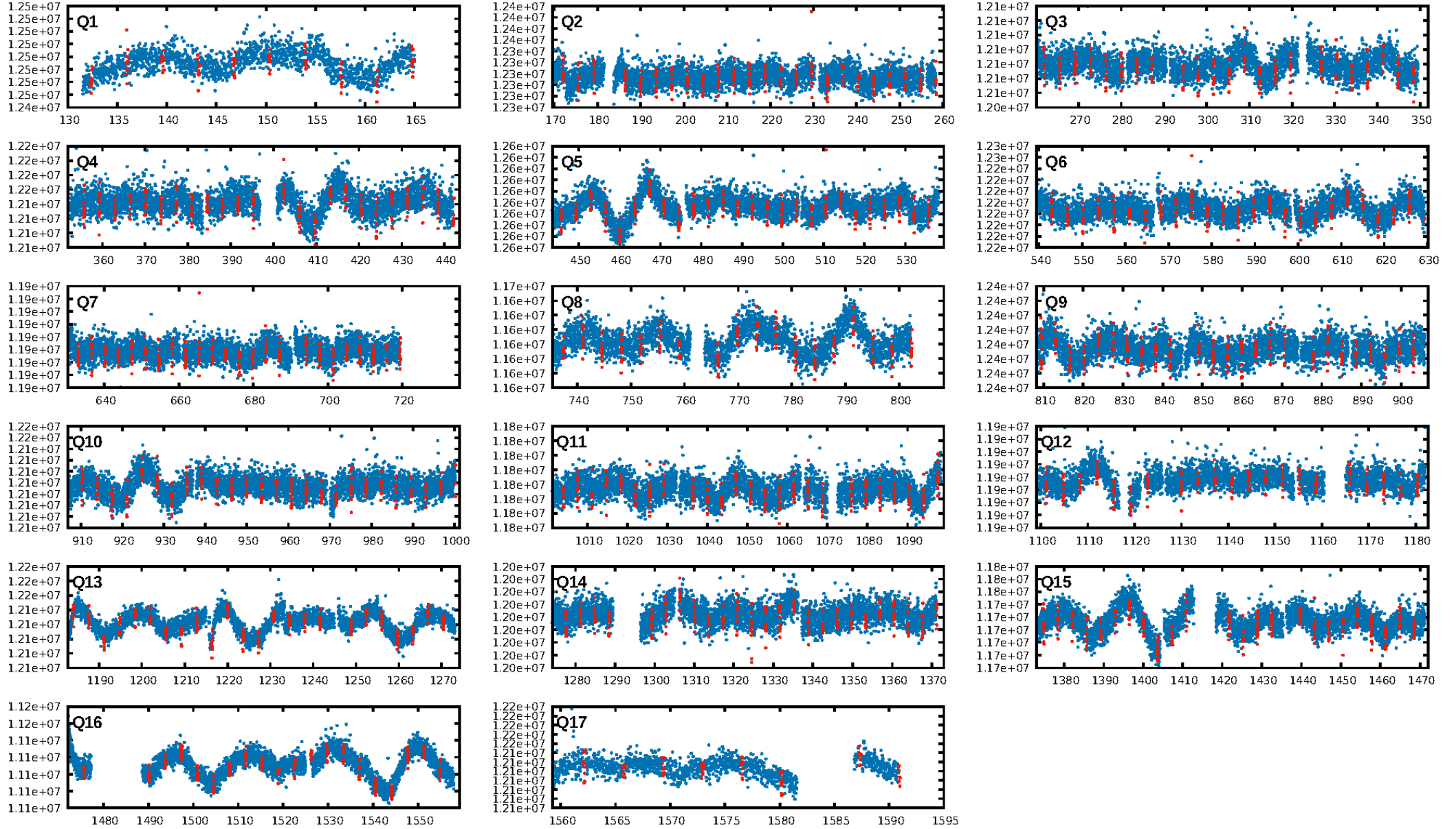
## DV Fit Results:

Period = 3.60147 [0.00001] d  
Epoch = 132.3746 [0.0010] BKJD  
Rp/R\* = 0.0333 [0.0011]  
a/R\* = 4.51 [0.45]  
b = 0.94 [0.01]  
Seff = 233.03 [33.72]  
Teq = 996 [36] K  
Rp = 3.11 [0.26] Re  
a = 0.0428 [0.0034] AU  
Ag = 4.16 [1.64] [1.93σ]  
Teffp = 2200 [207] K [5.72σ]

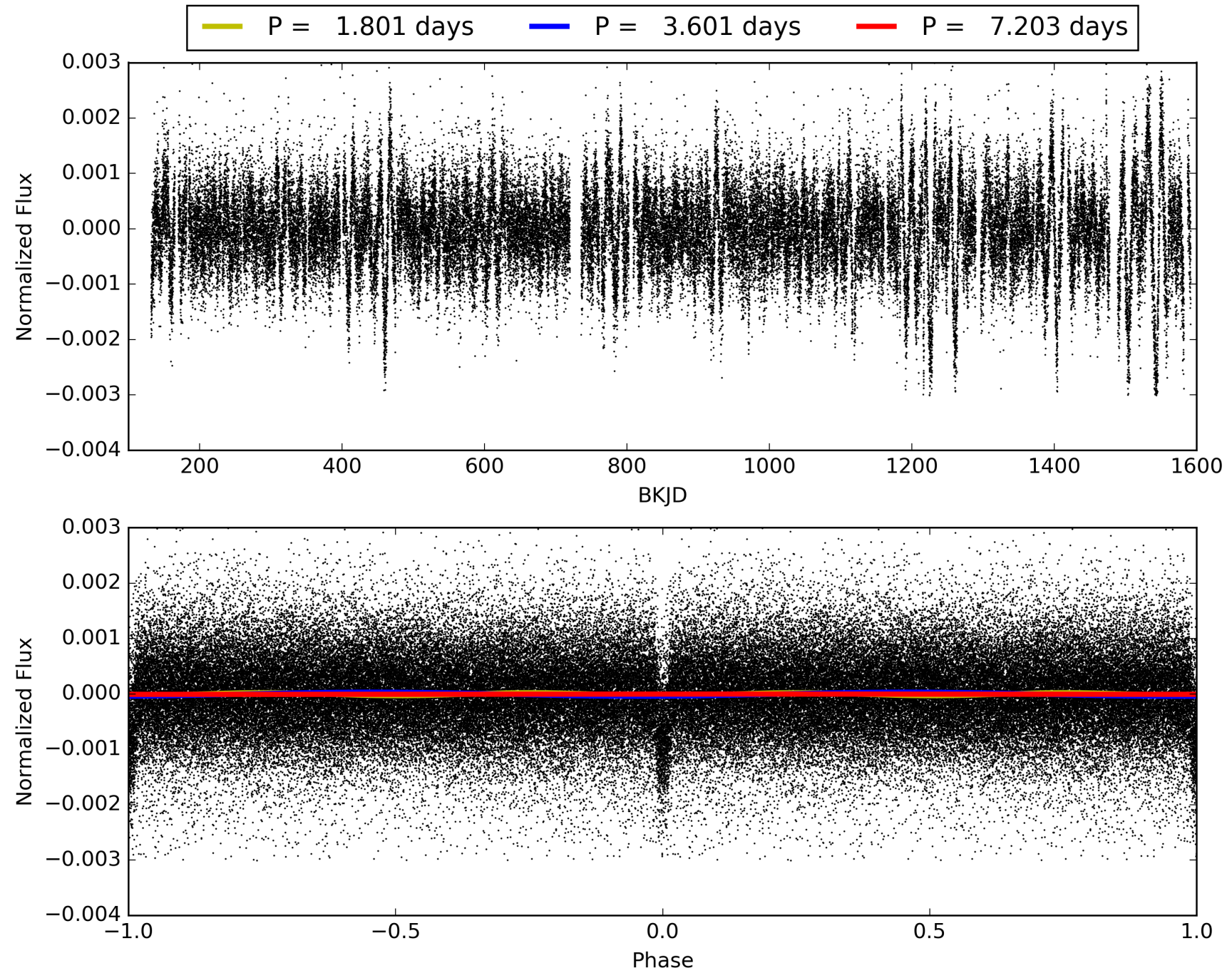
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [352/352]  
GhostDiagnostic-chr: 4.277  
Centroid-sig: 84.9%  
Centroid-so: 0.173 arcsec [0.63σ]  
OotOffset-rm: 0.187 arcsec [1.72σ]  
KicOffset-rm: 0.227 arcsec [2.03σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009513865-01, PDC Light Curves

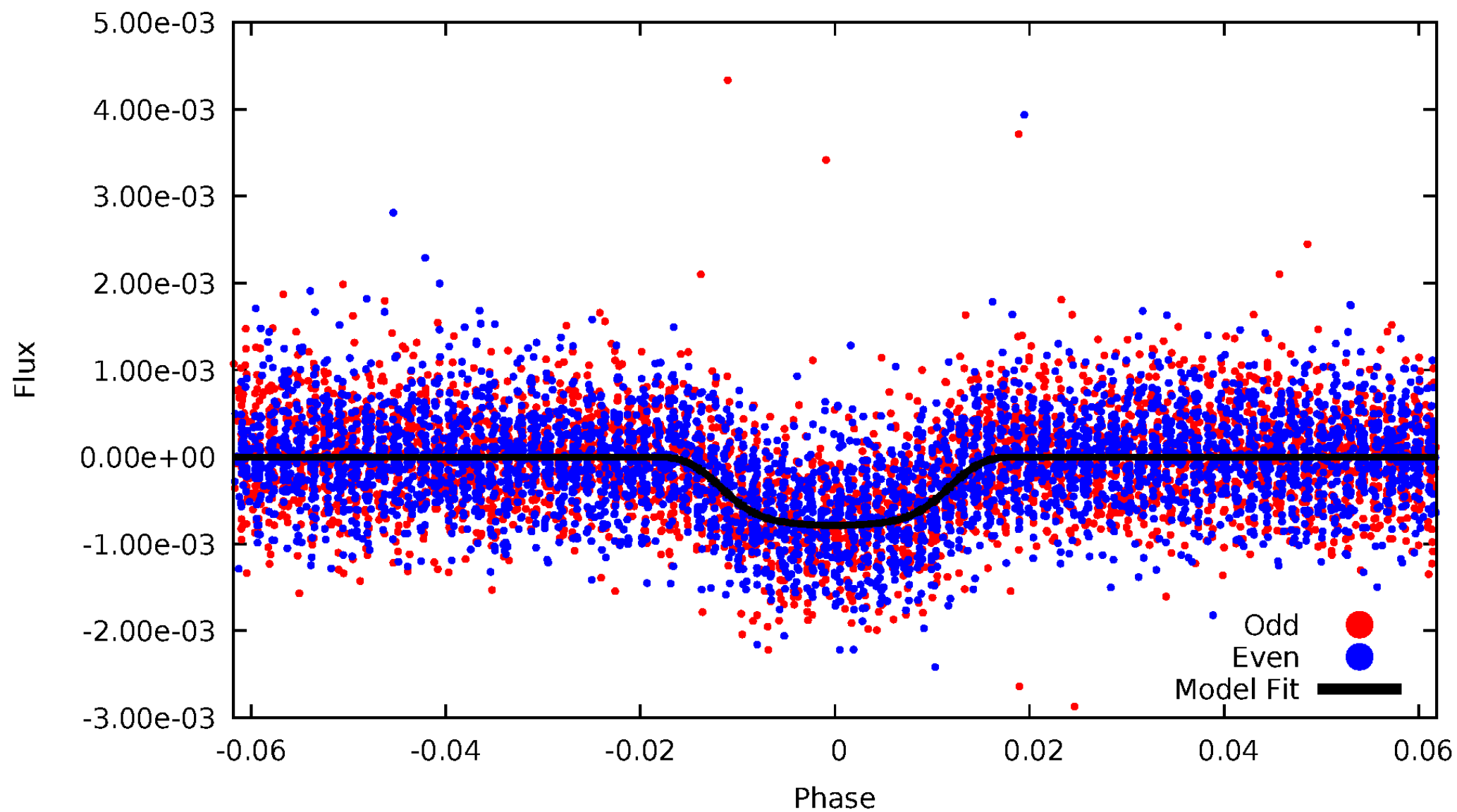


TCE 009513865-01



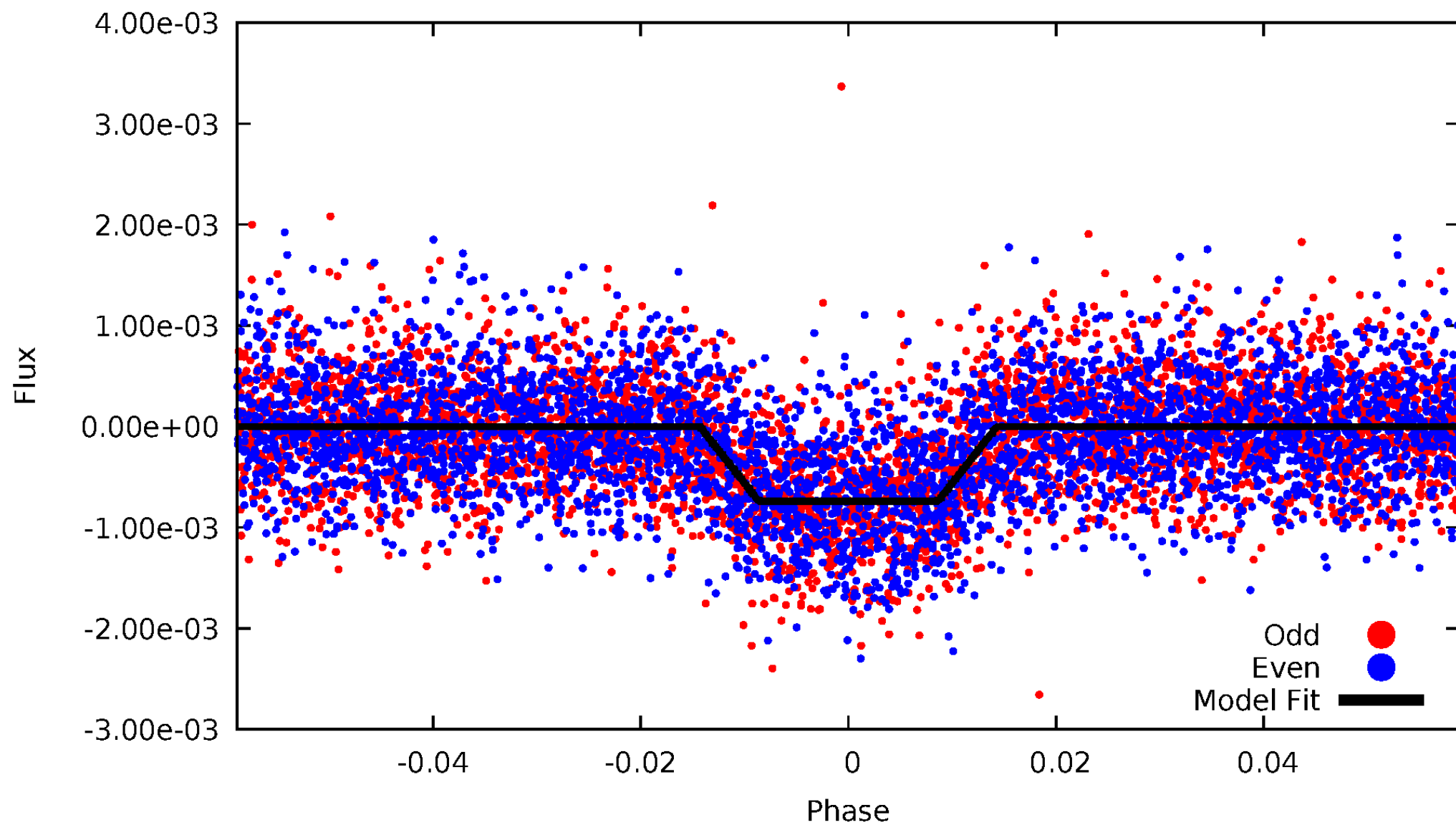
# DV Odd/Even

TCE 009513865-01

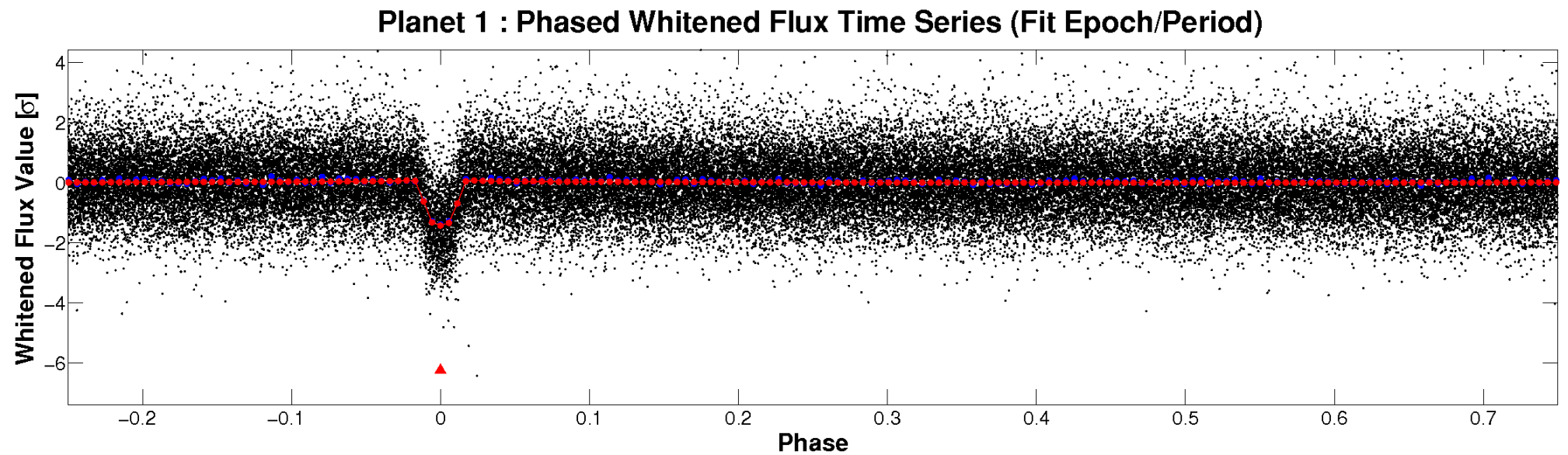
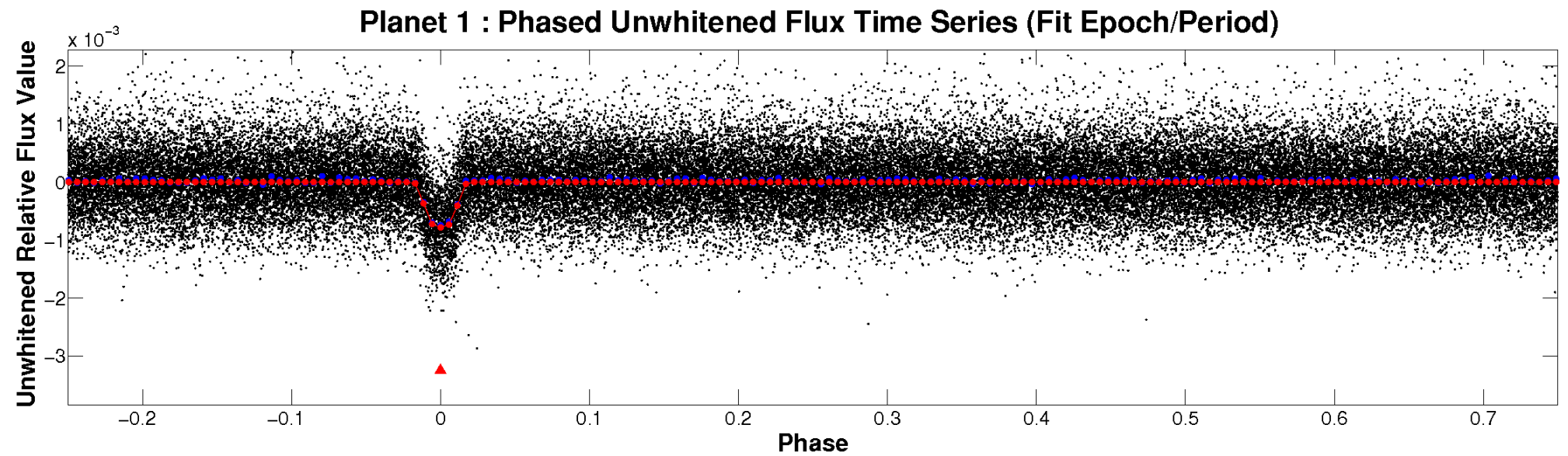


# ALT Odd/Even

TCE 009513865-01

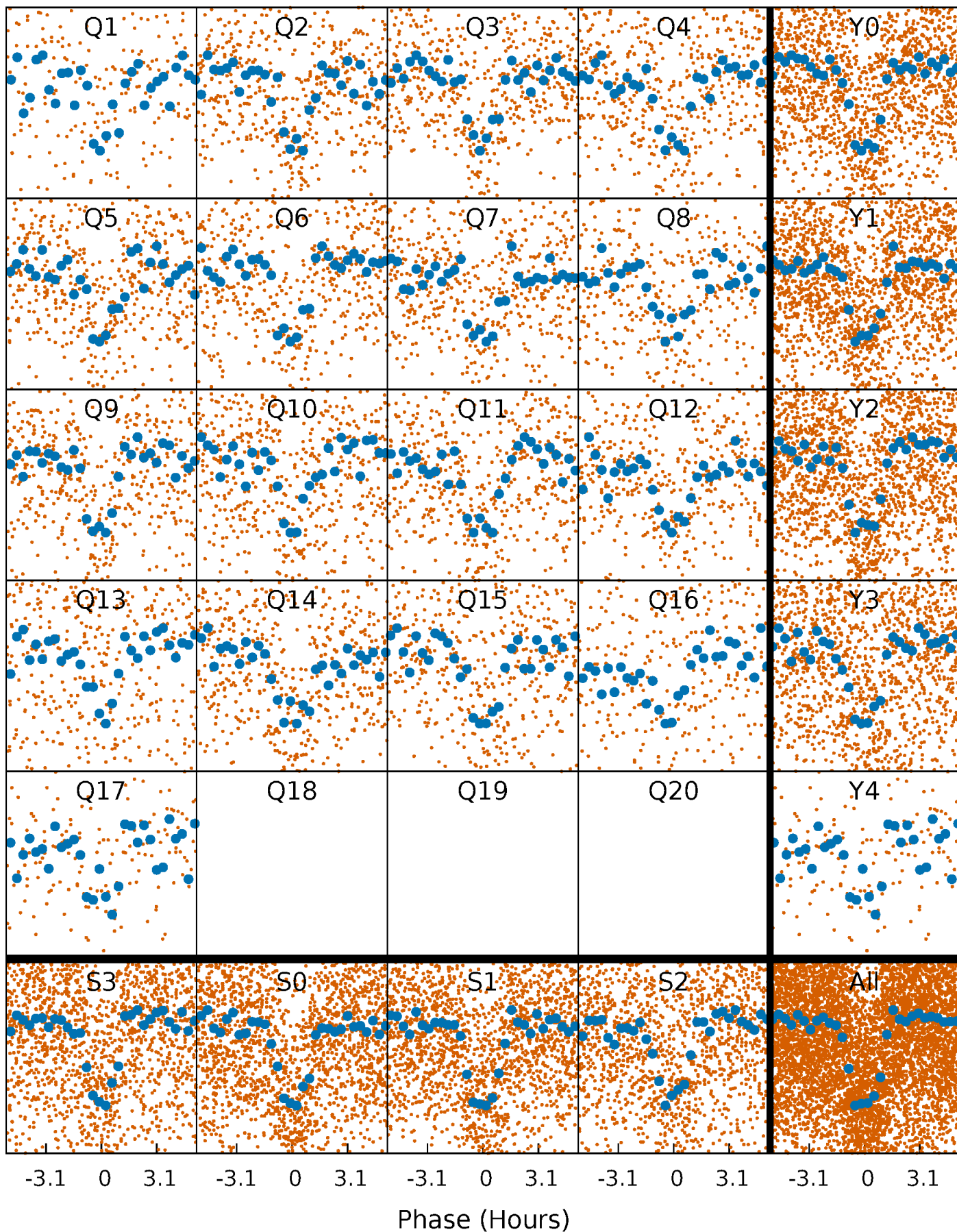


# Non-Whitened Vs. Whitened Light Curve



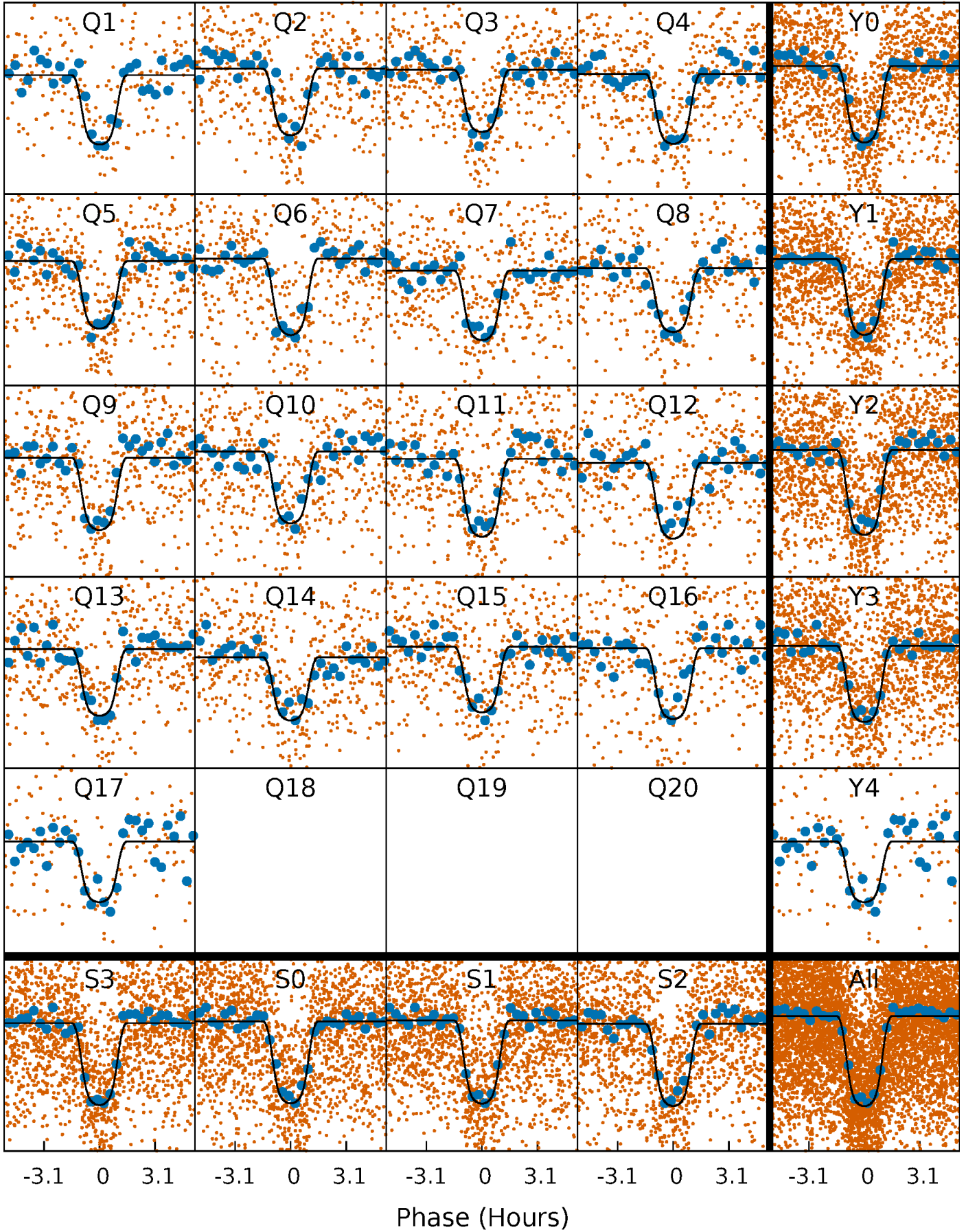
# PDC Quarter-Phased Transit Curves

TCE 009513865-01 P= 3.601471 Days  $T_0=132.374570$  (BKJD)



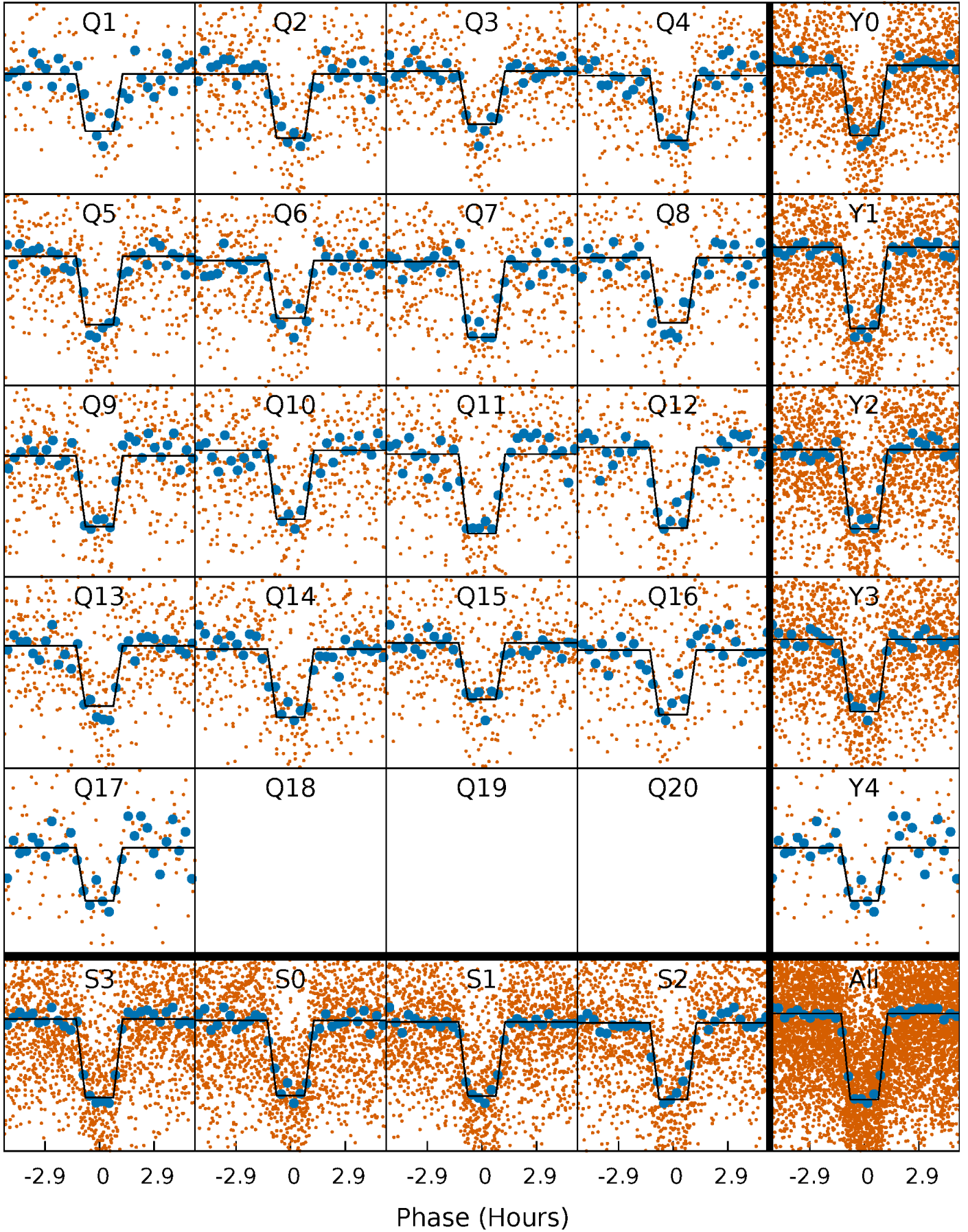
# DV Quarter-Phased Transit Curves

TCE 009513865-01   P= 3.601471 Days    $T_0=132.374570$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

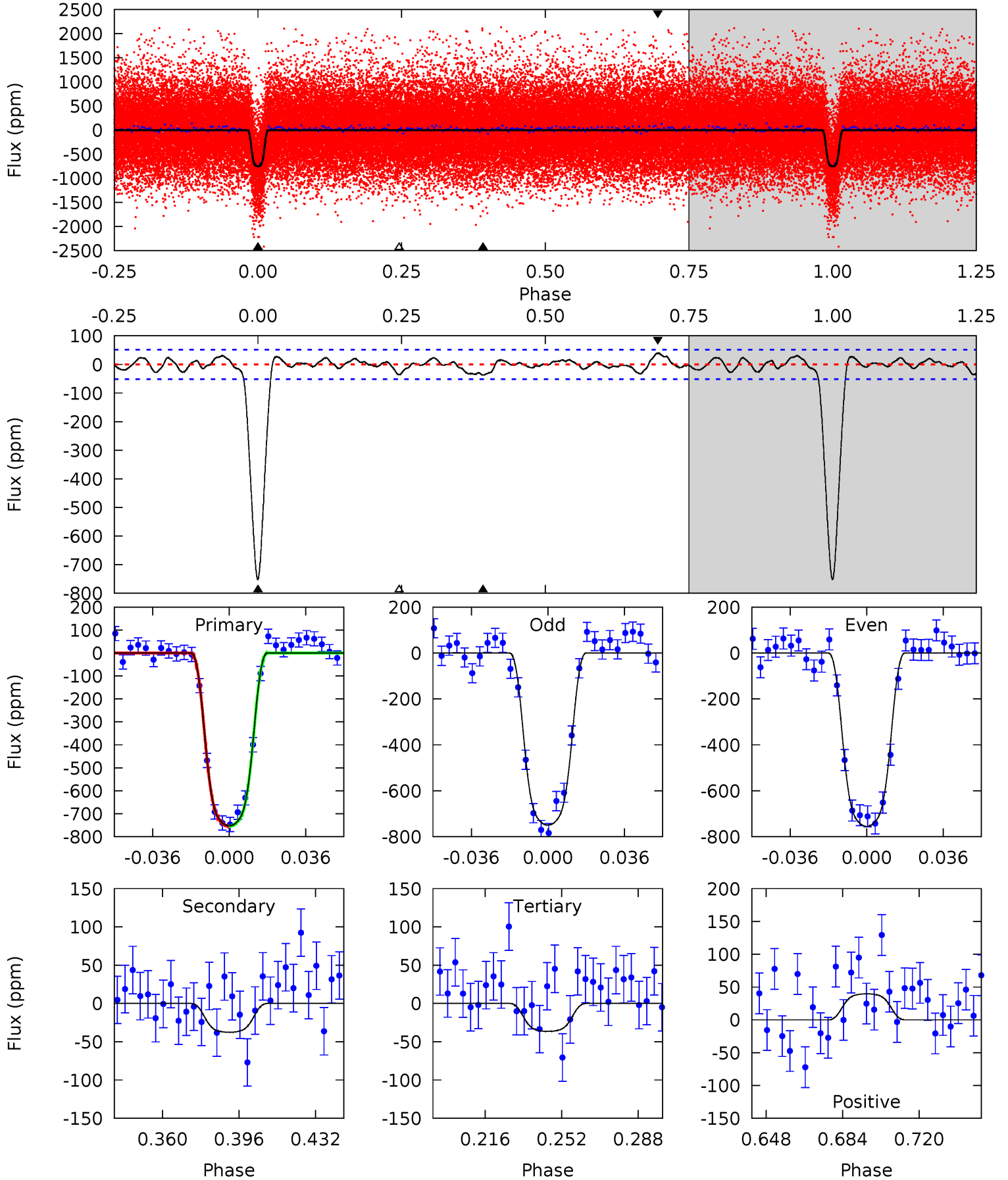
TCE 009513865-01   P= 3.601485 Days    $T_0=132.371984$  (BKJD)



# DV Model-Shift Uniqueness Test

009513865-01, P = 3.601471 Days, E = 128.773099 Days

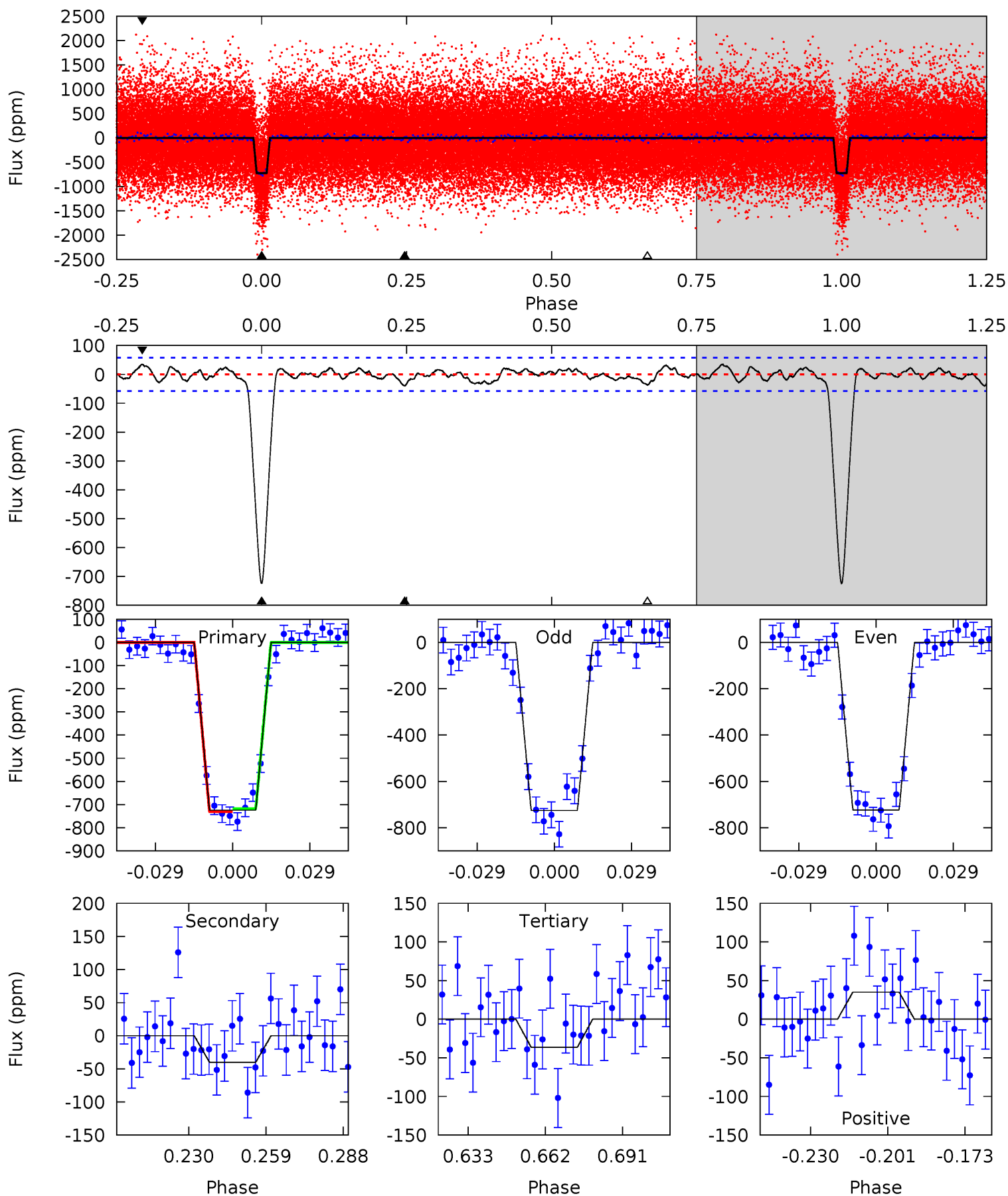
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
70.0	3.50	3.40	3.69	4.77	2.10	1.29	66.6	66.3	0.10	-0.19	0.25	1.00	0.05	0.04



# Alt Model-Shift Uniqueness Test

009513865-01, P = 3.601485 Days, E = 128.770499 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
60.5	3.34	3.03	2.92	4.82	2.19	1.24	57.5	57.6	0.31	0.41	0.08	1.00	0.05	0.53



### Stellar Parameters For KIC 009513865

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5052^{+83}_{-75}$	$4.480^{+0.077}_{-0.033}$	$0.160^{+0.150}_{-0.150}$	$0.855^{+0.039}_{-0.066}$	$0.805^{+0.056}_{-0.026}$	$1.811^{+0.528}_{-0.202}$
	+2%/-1%	+2%/-1%	+94%/-94%	+5%/-8%	+7%/-3%	+29%/-11%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009513865-01 / KOI 0943.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-38 \pm 11$	$3.10^{+0.15}_{-0.17}$	$1386^{+32}_{-33}$	$2825^{+116}_{-151}$	$3.941^{+1.294}_{-1.229}$
Alt.	$-40 \pm 12$	$2.53^{+0.13}_{-0.15}$	$1384^{+33}_{-35}$	$3025^{+143}_{-154}$	$6.379^{+2.230}_{-1.961}$

$T_{\text{max}}$  = 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

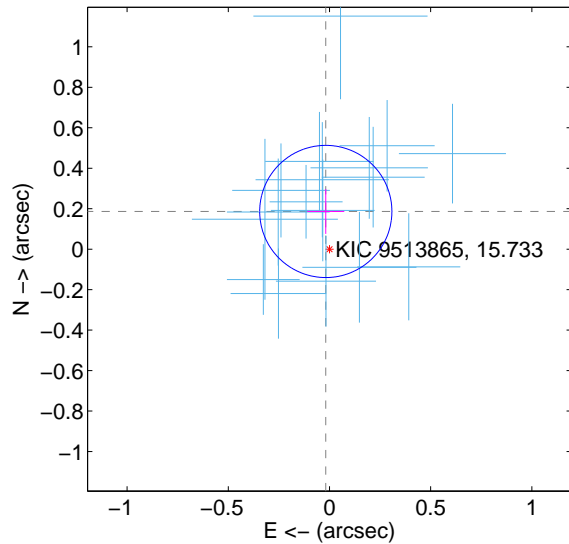
Supplemental centroid analysis for 009513865-01. Kepler magnitude: 15.73. Transit SNR 47.61

There are 17 quarters with good PRF difference image offsets

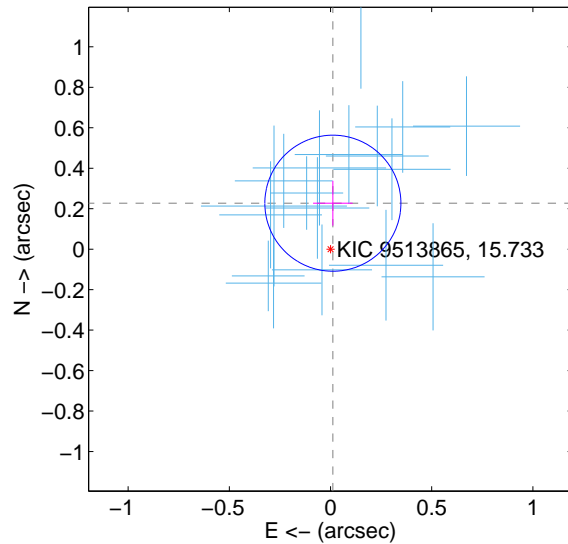
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.187 \pm 0.109$	1.72	$0.018 \pm 0.092$	$0.186 \pm 0.111$
PRF-fit source offset from KIC position	$0.227 \pm 0.112$	2.03	$-0.012 \pm 0.098$	$0.227 \pm 0.111$
photometric centroid source offset	$0.17 \pm 0.27$	0.63	$-0.13 \pm 0.28$	$0.11 \pm 0.27$

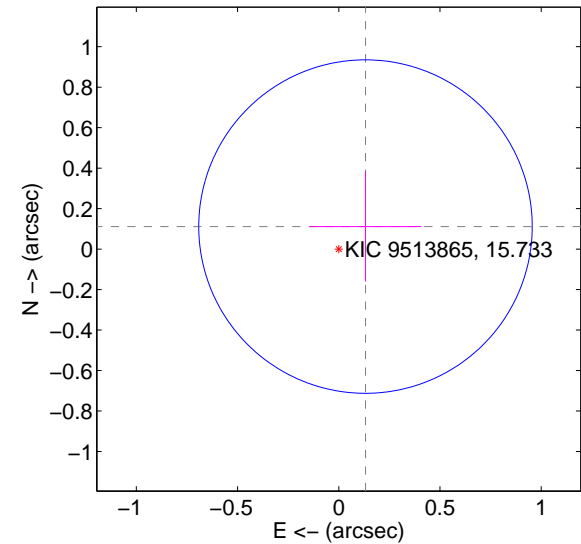
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

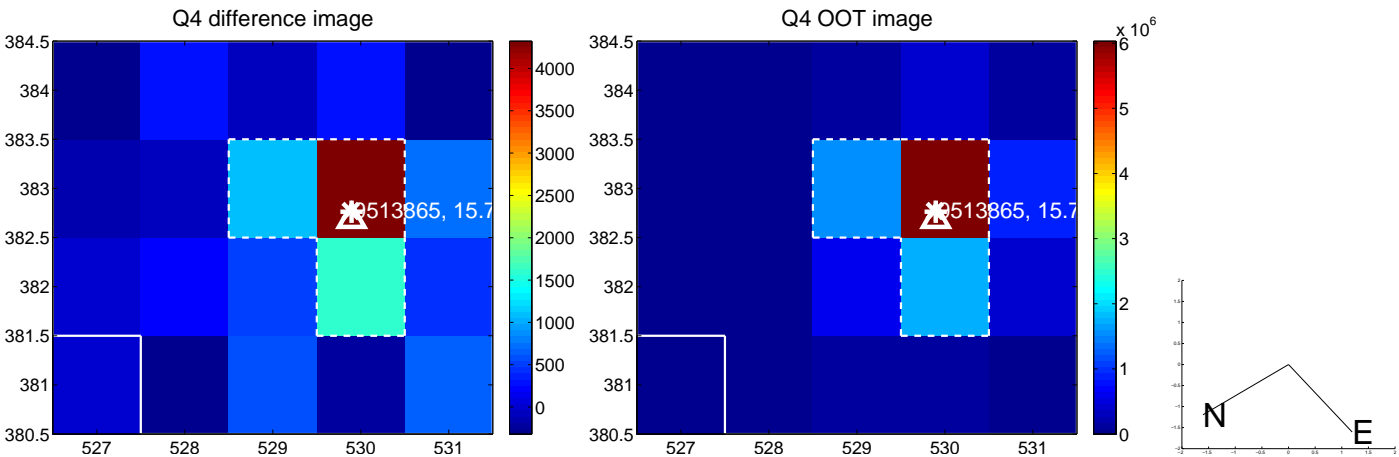
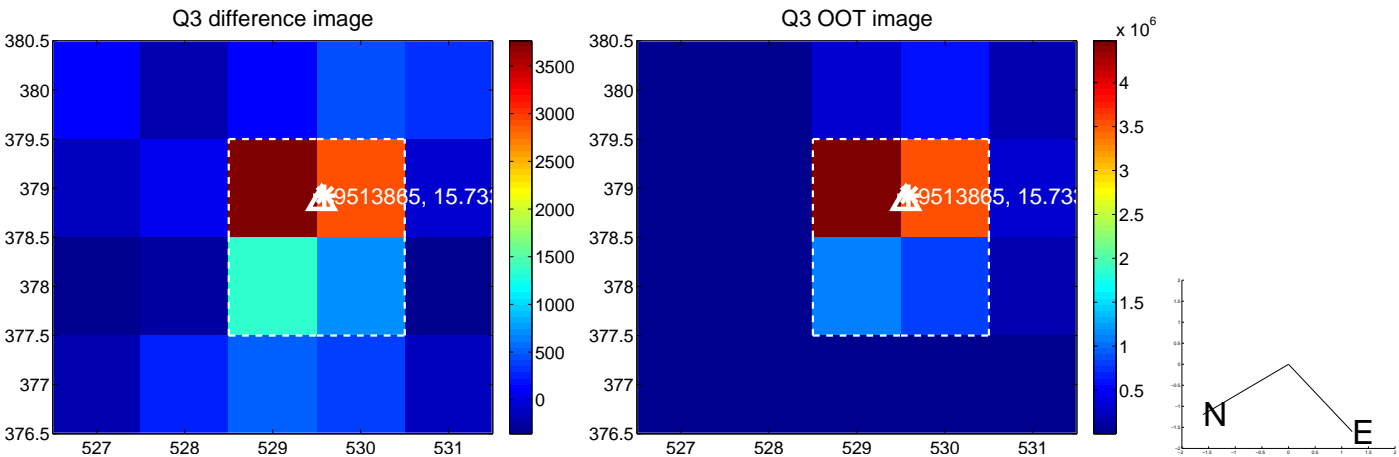
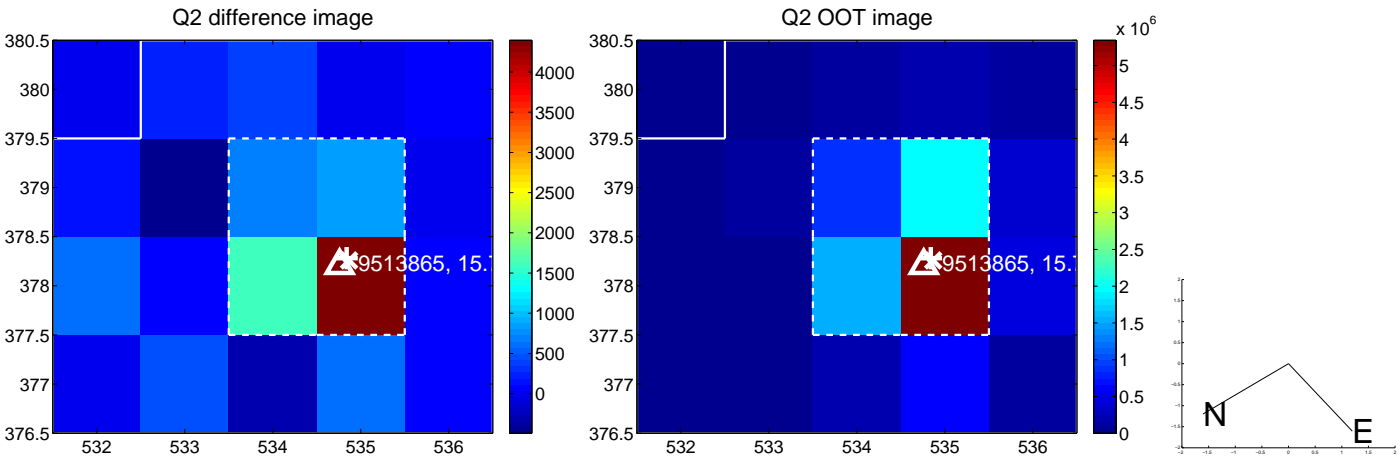
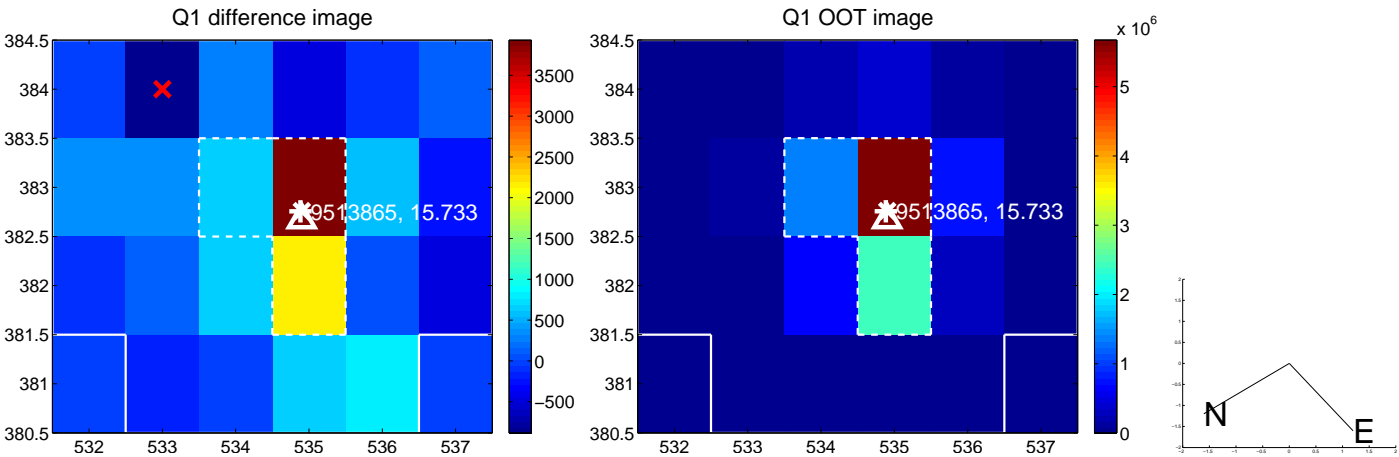


offset from photometric centroids

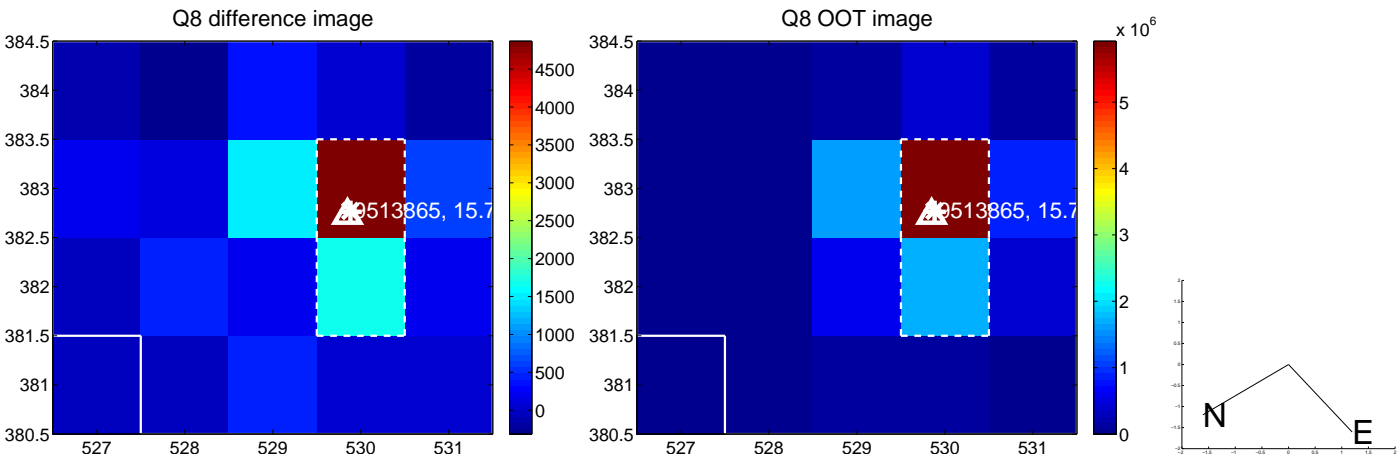
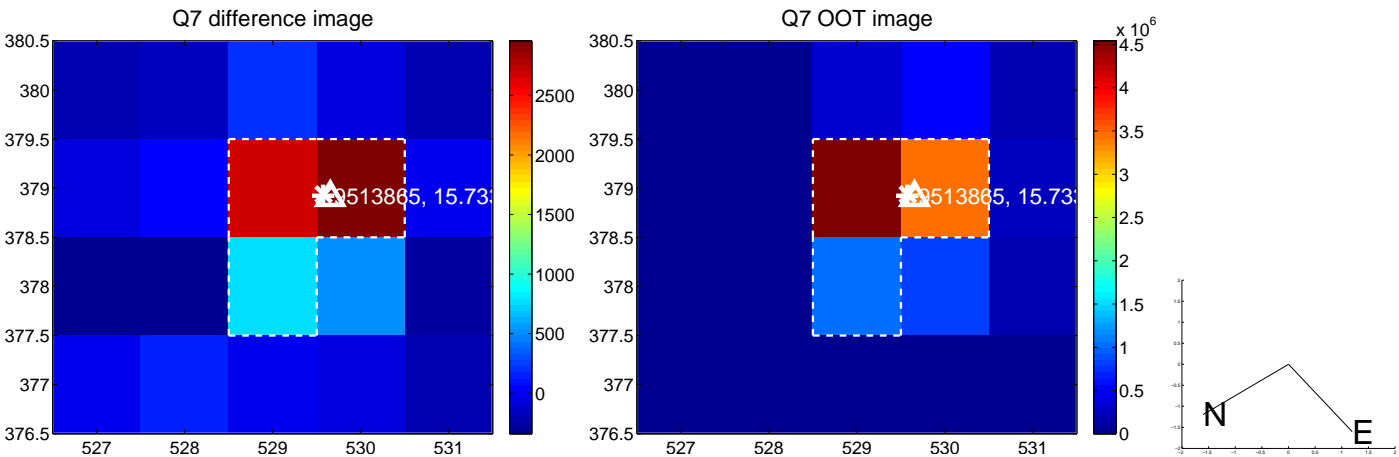
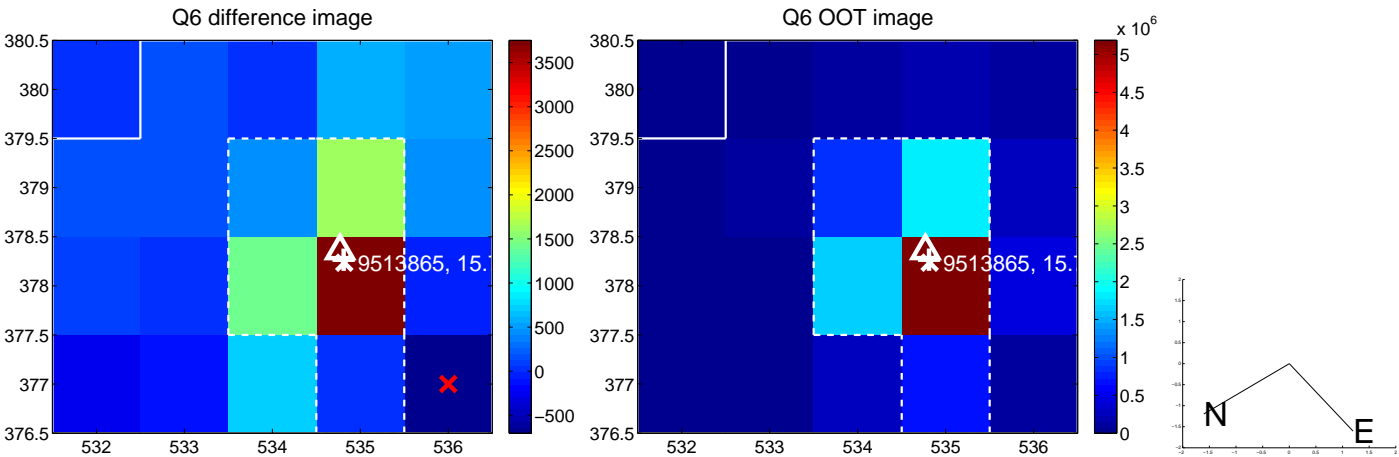
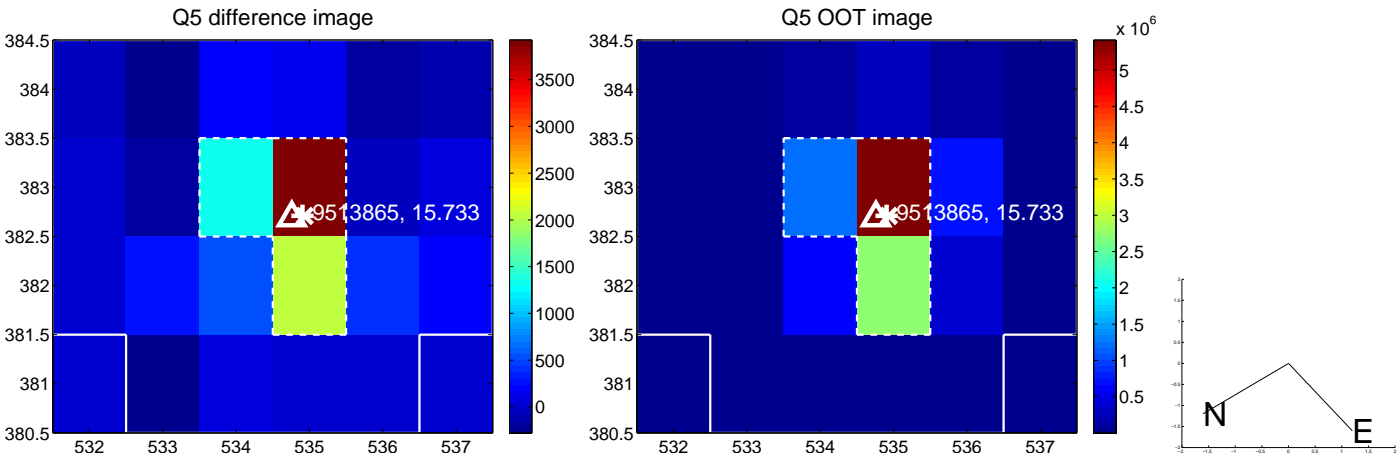


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

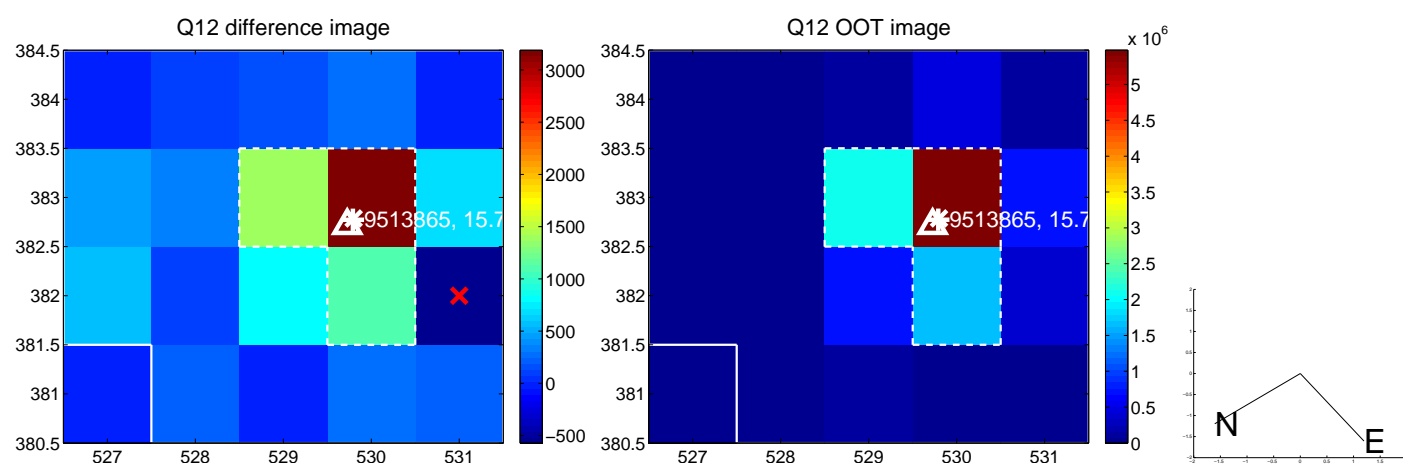
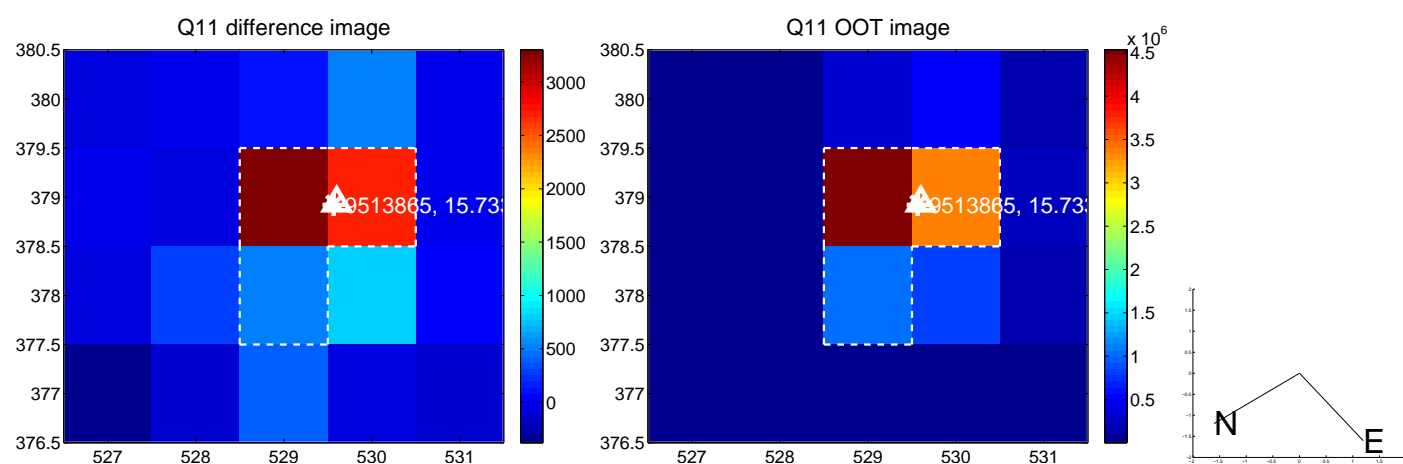
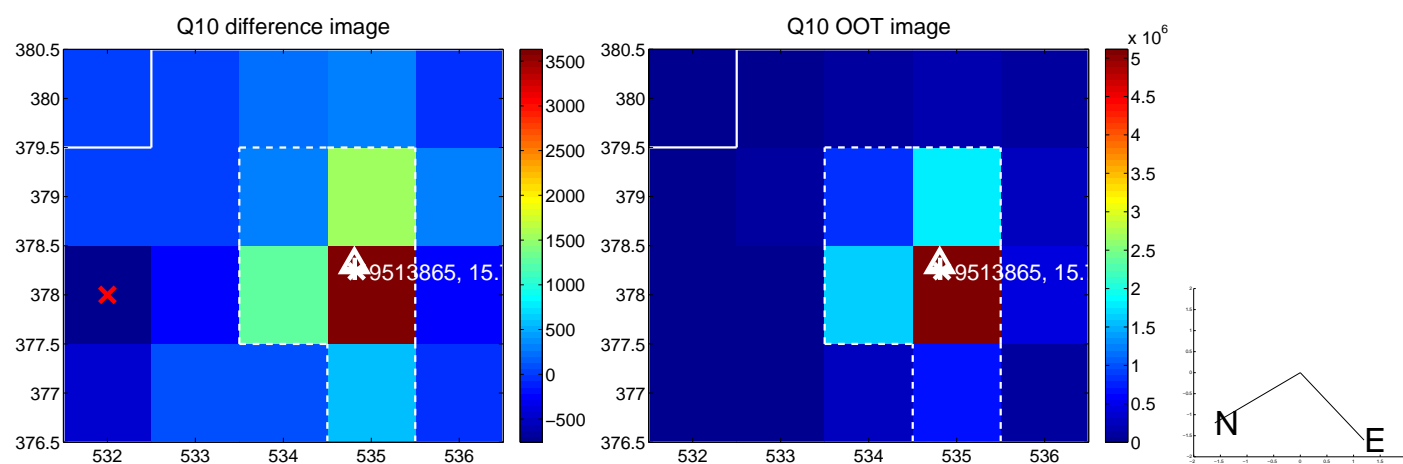
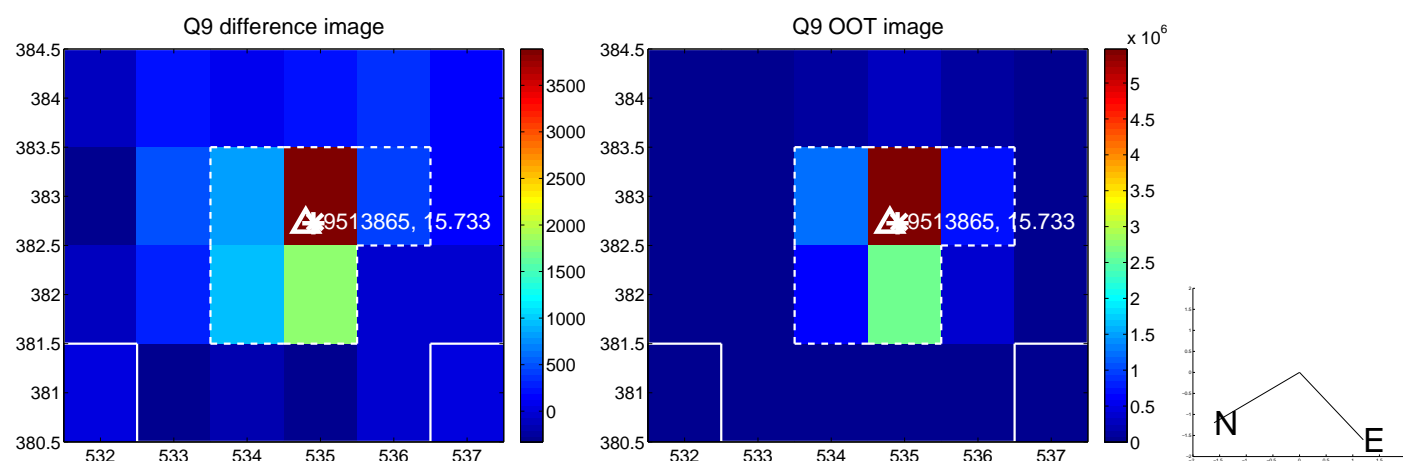
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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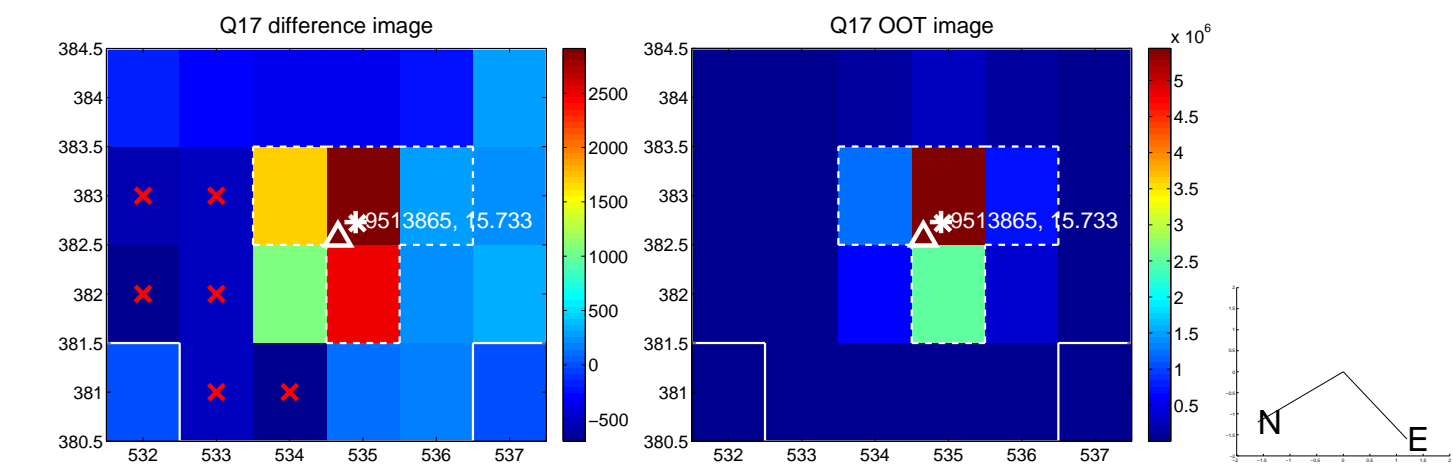


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

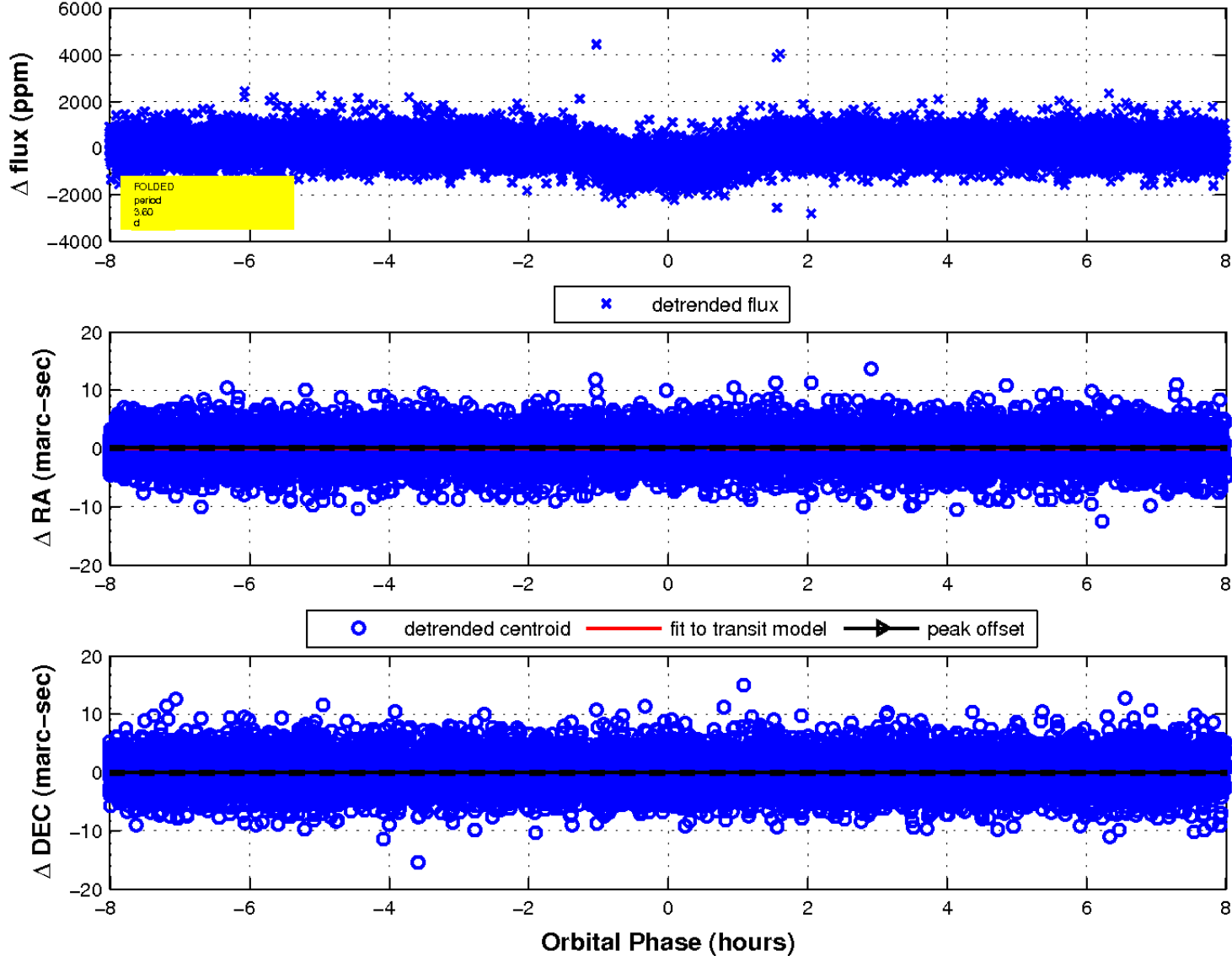




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

