

# KIC 010016874

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010016874-01	OBS	0426.01	16.301426	139.544230	912.9	3.708	50.4	54.4	1.14	6072	3.93	99.24

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010016874-01	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.

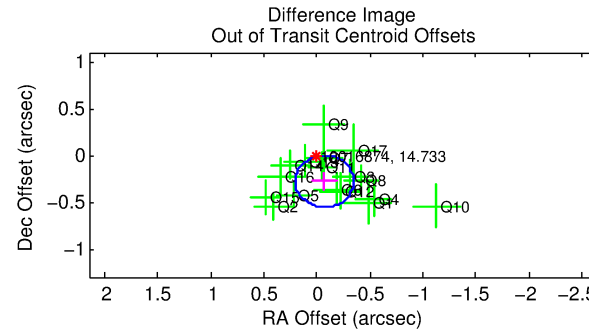
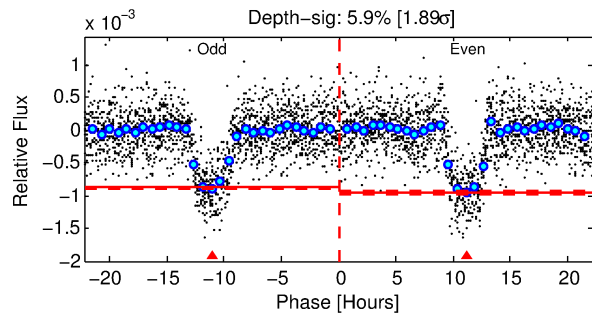
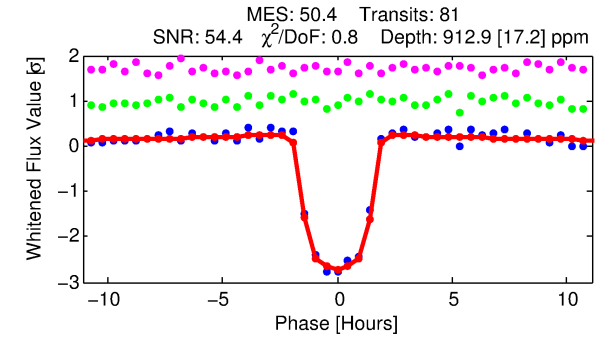
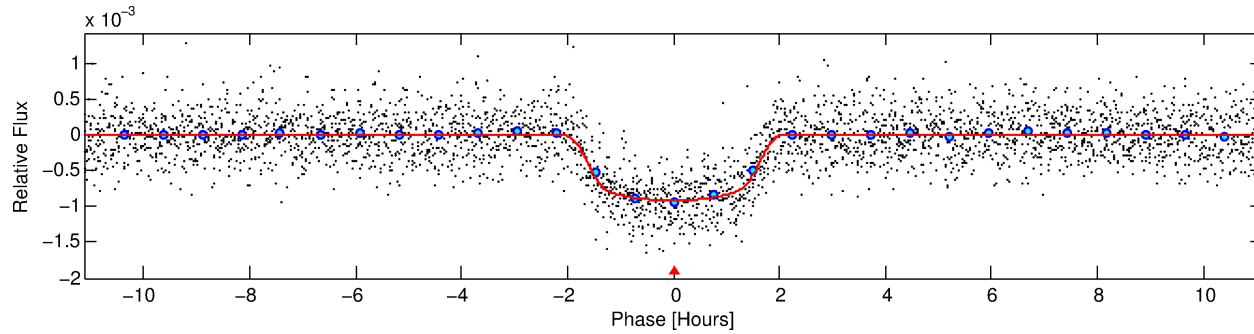
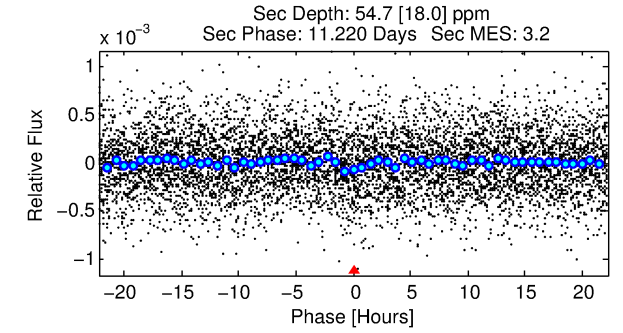
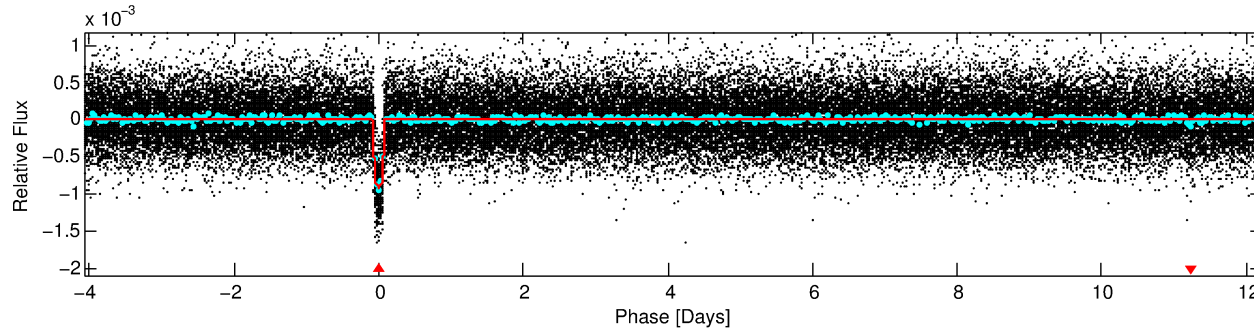
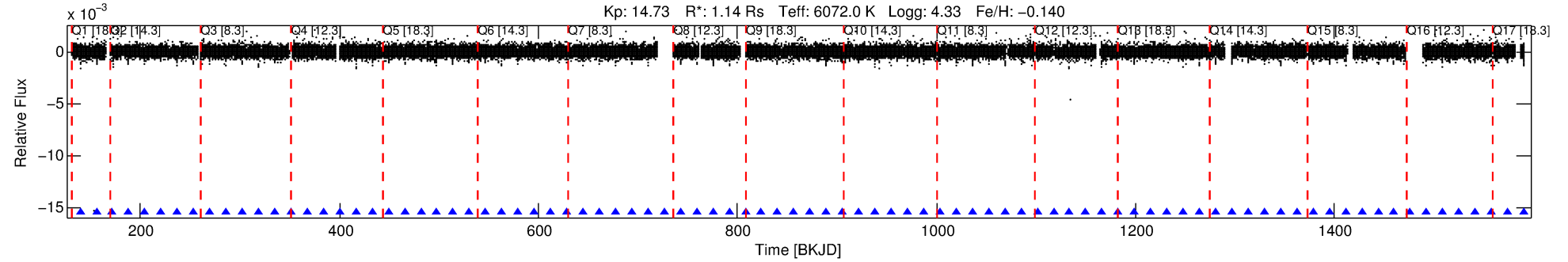
## Ephemeris Match Information For 010016874-01

No Significant Match Found

# DV One-Page Summary

KIC: 10016874 Candidate: 1 of 1 Period: 16.301 d

KOI: K00426.01 Corr: 0.971



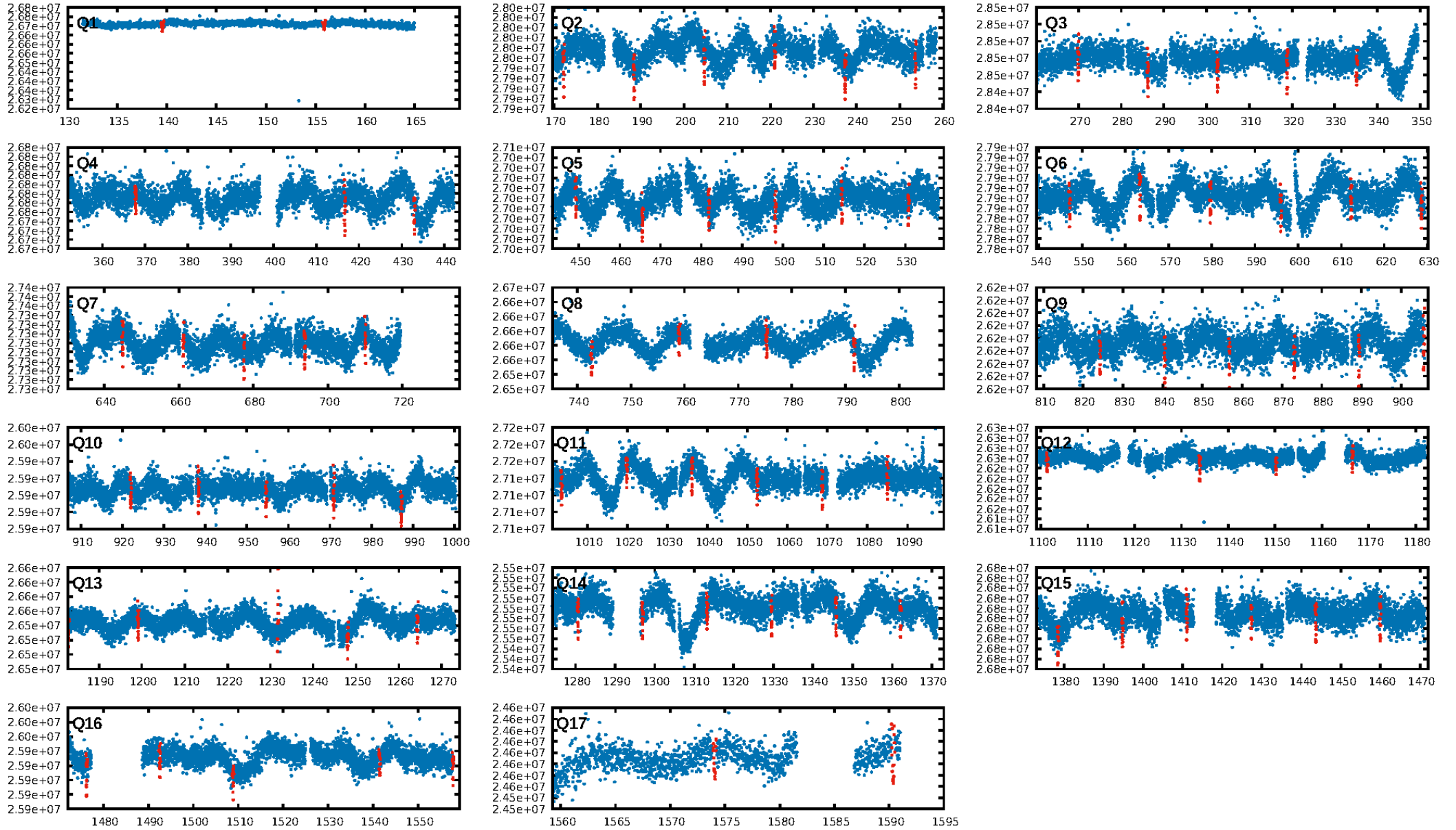
## DV Fit Results:

Period = 16.30143 [0.00003] d  
Epoch = 139.5442 [0.0014] BKJD  
Rp/R\* = 0.0316 [0.0015]  
a/R\* = 19.27 [4.49]  
b = 0.86 [0.07]  
Seff = 99.24 [38.92]  
Teff = 805 [79] K  
Rp = 3.93 [1.23] Re  
a = 0.1261 [0.0322] AU  
Ag = 31.04 [15.58] [1.93σ]  
Teffp = 2937 [271] K [7.55σ]

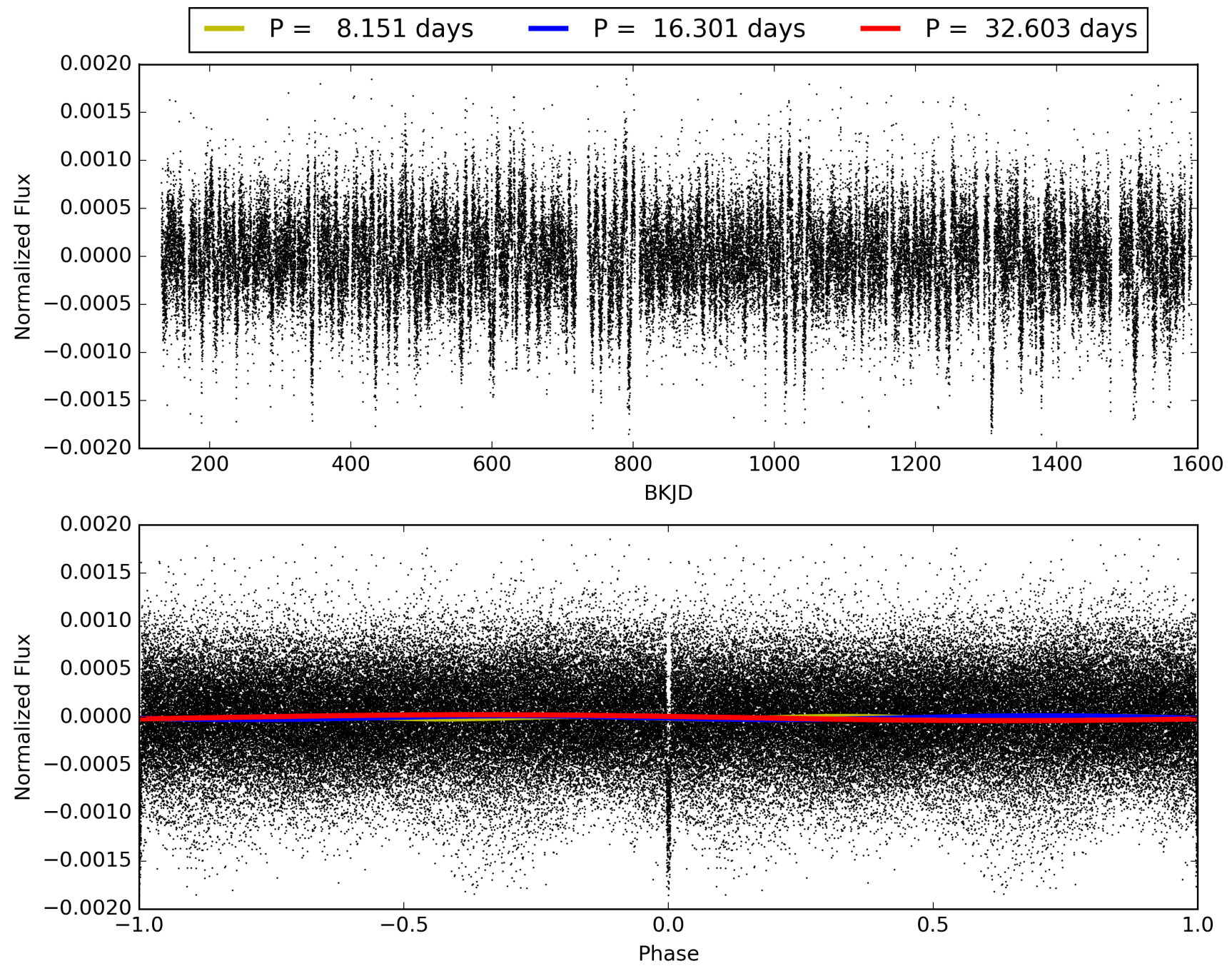
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 81.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [77/77]  
GhostDiagnostic-chr: 13.14  
Centroid-sig: 0.8%  
Centroid-so: 0.263 arcsec [1.25σ]  
OOTOffset-rm: 0.287 arcsec [3.11σ]  
KicOffset-rm: 0.117 arcsec [0.96σ]  
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 010016874-01, PDC Light Curves

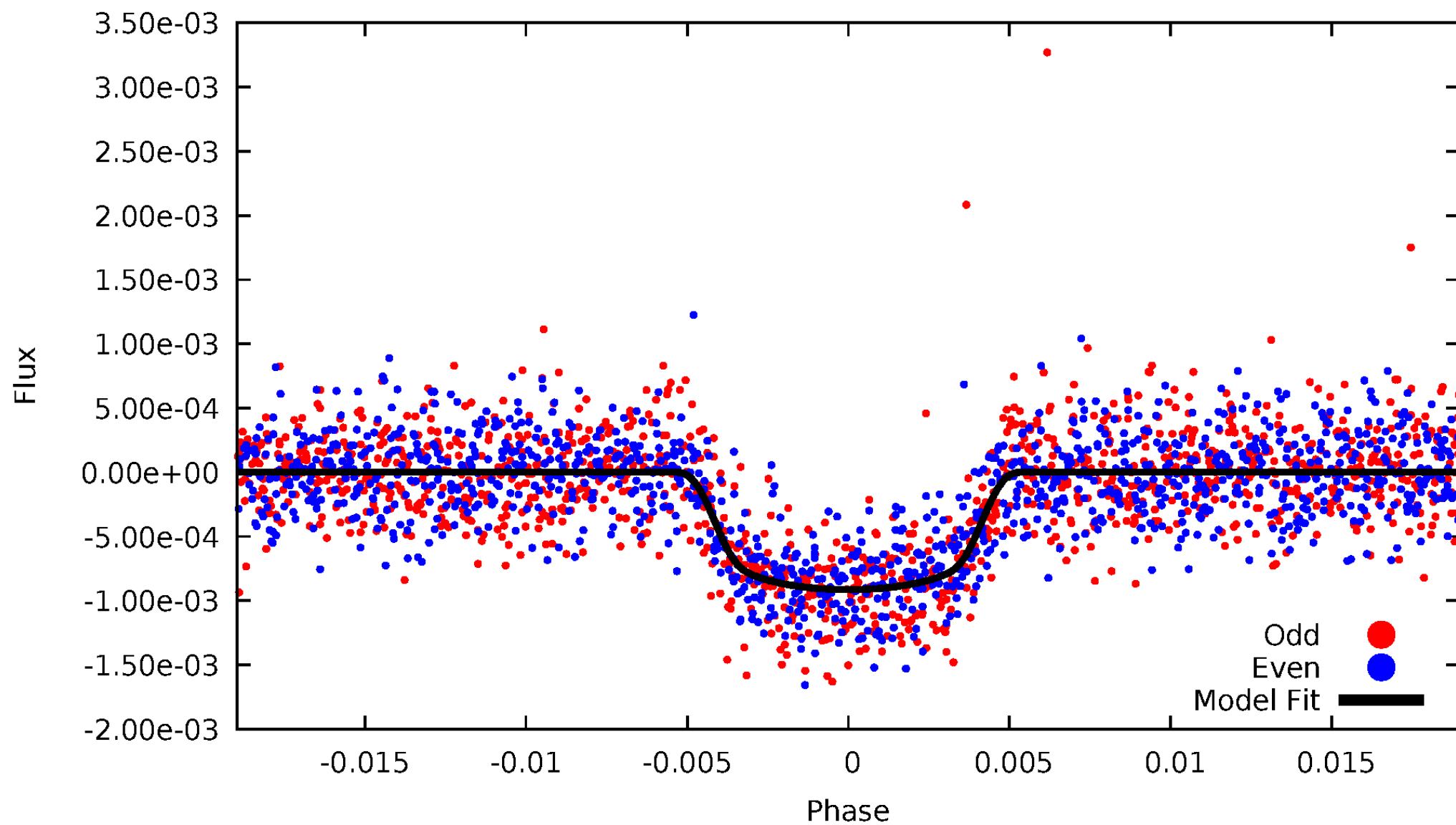


# TCE 010016874-01



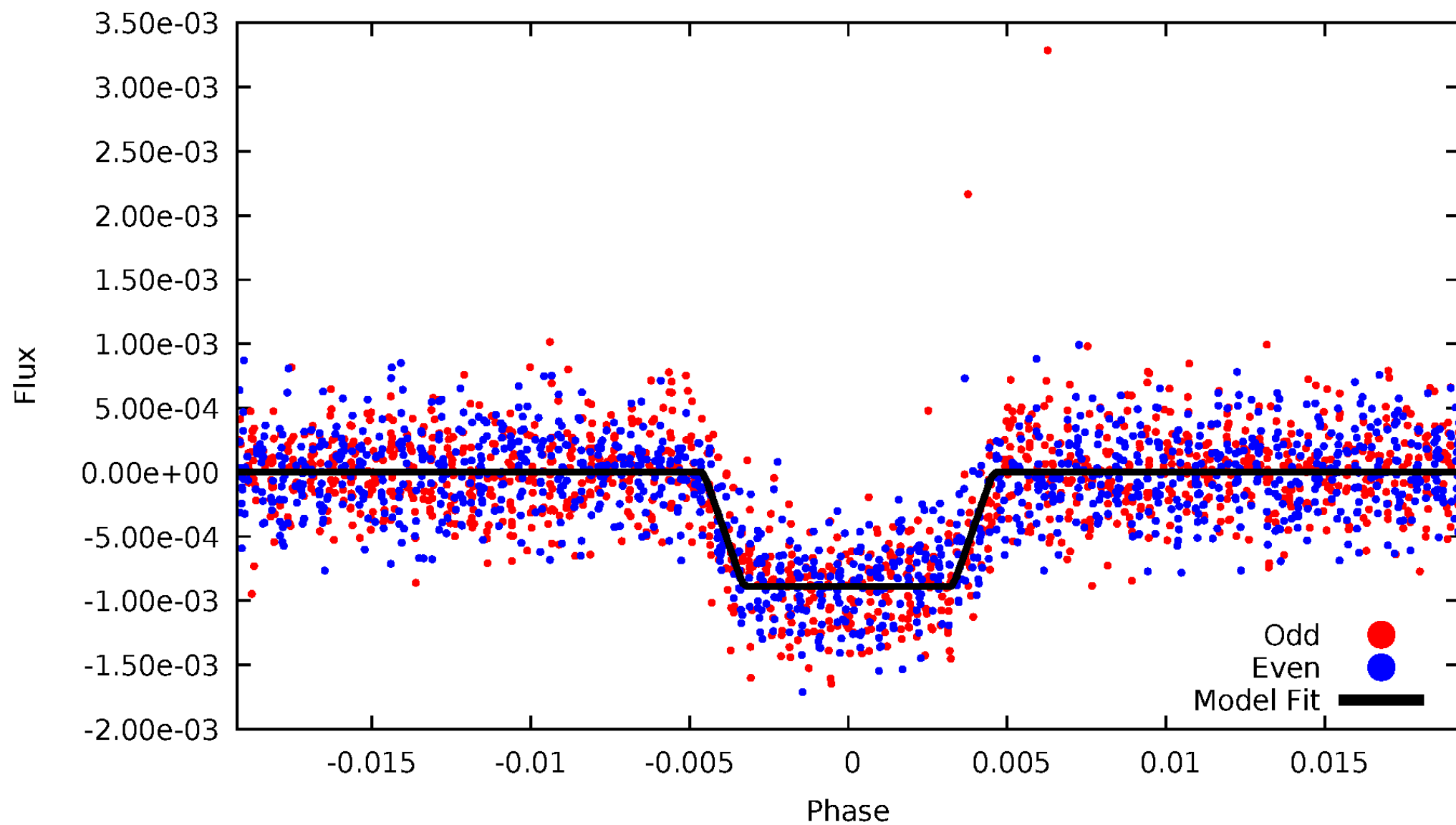
# DV Odd/Even

TCE 010016874-01



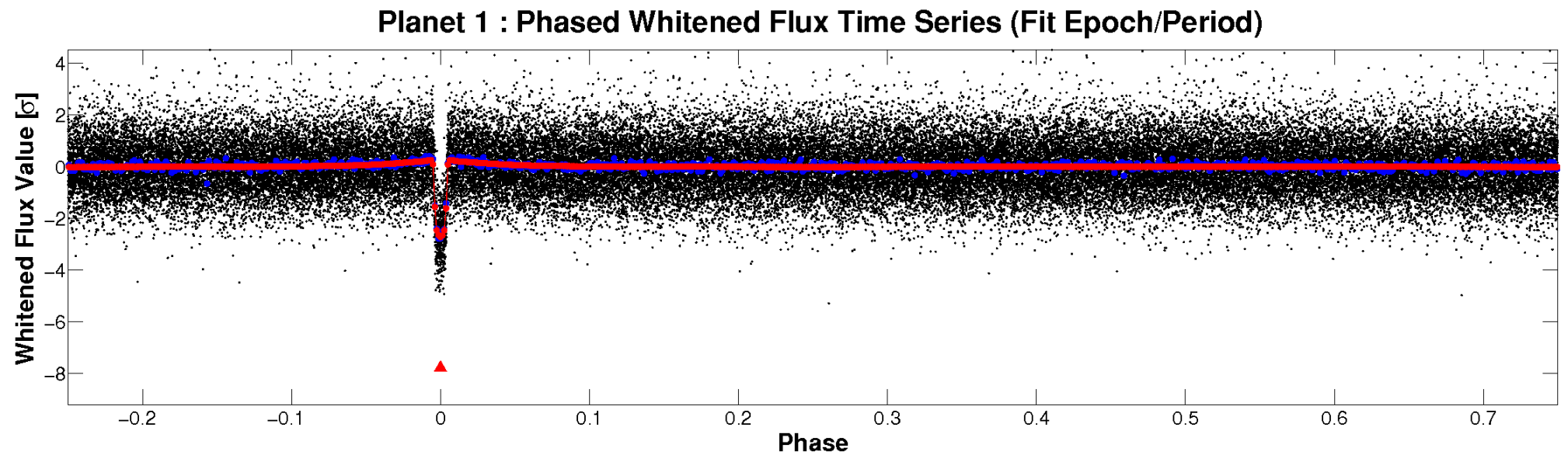
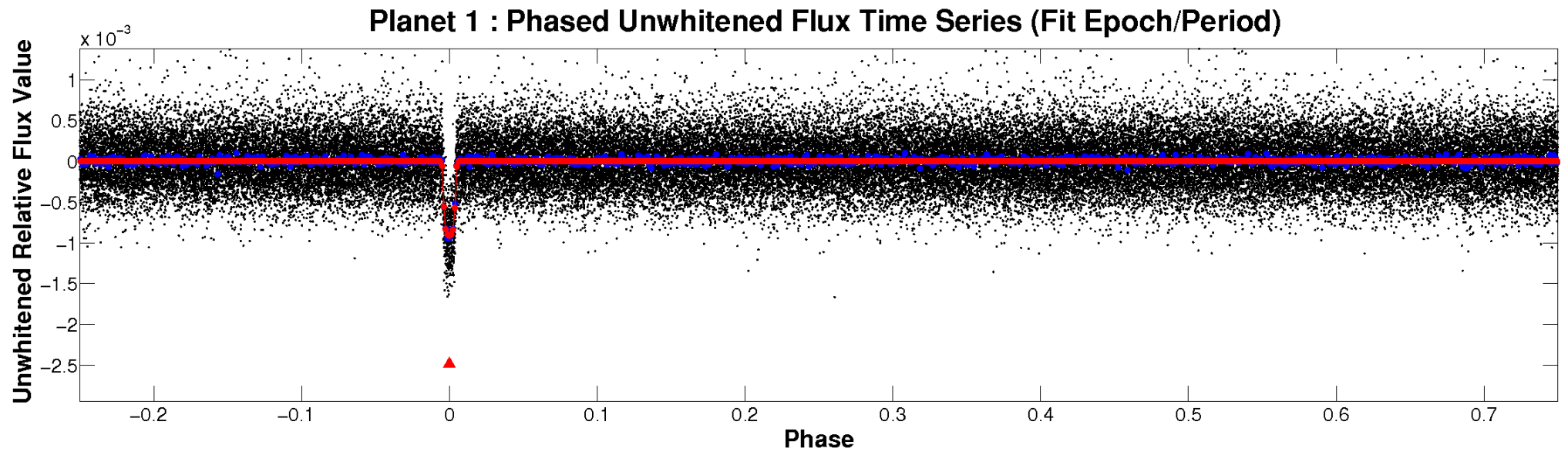
# ALT Odd/Even

TCE 010016874-01



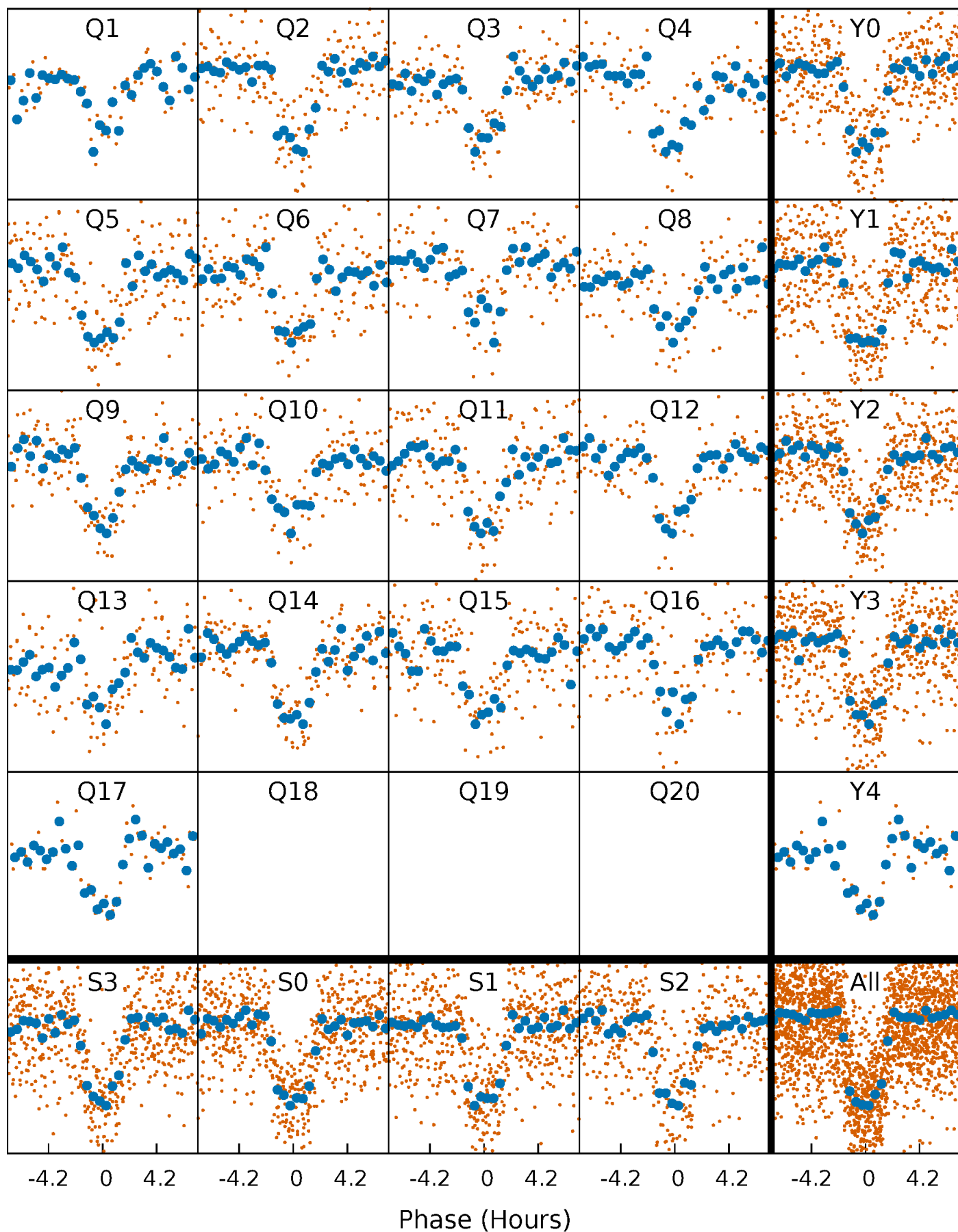


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

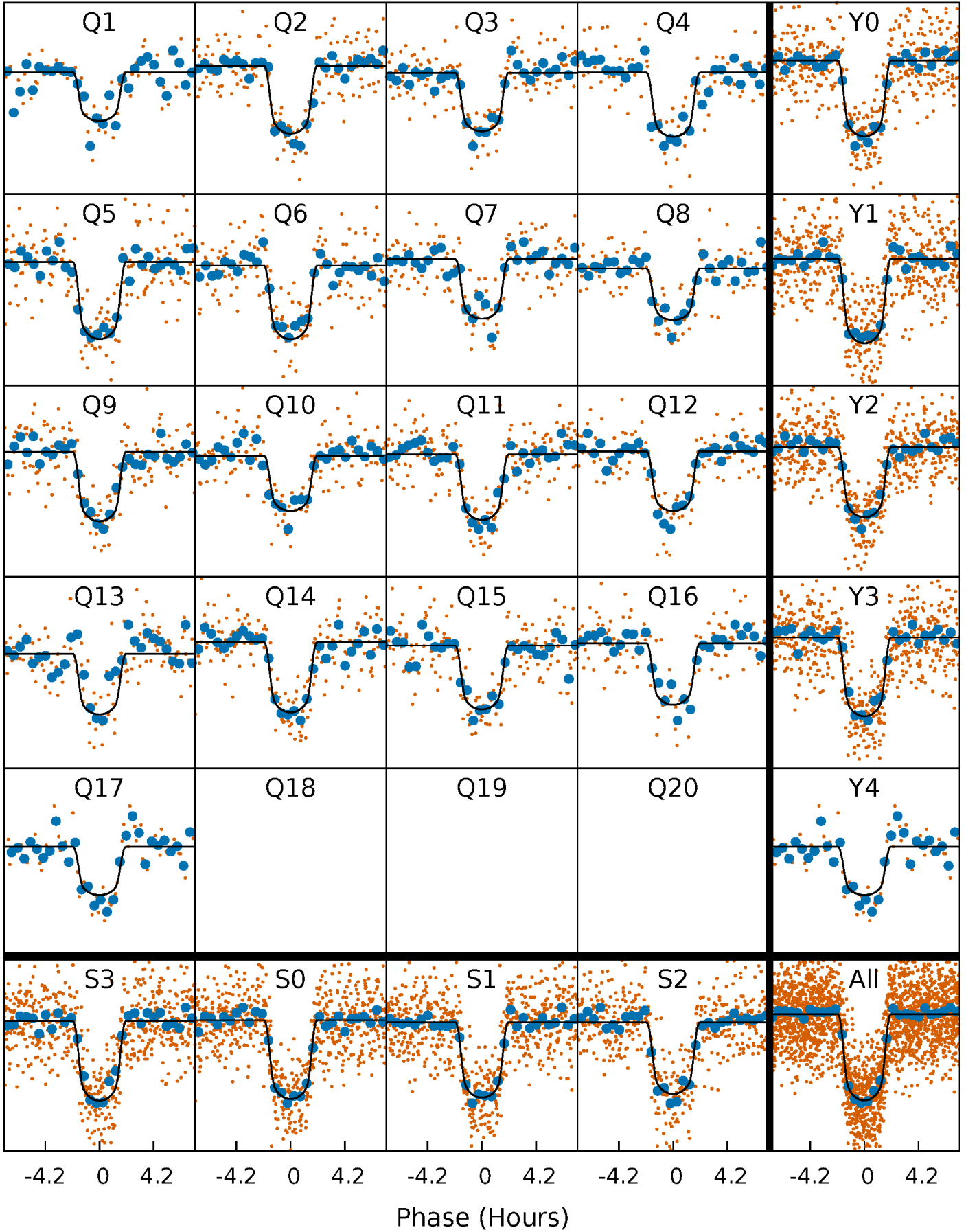
TCE 010016874-01 P= 16.301426 Days  $T_0=139.544230$  (BKJD)





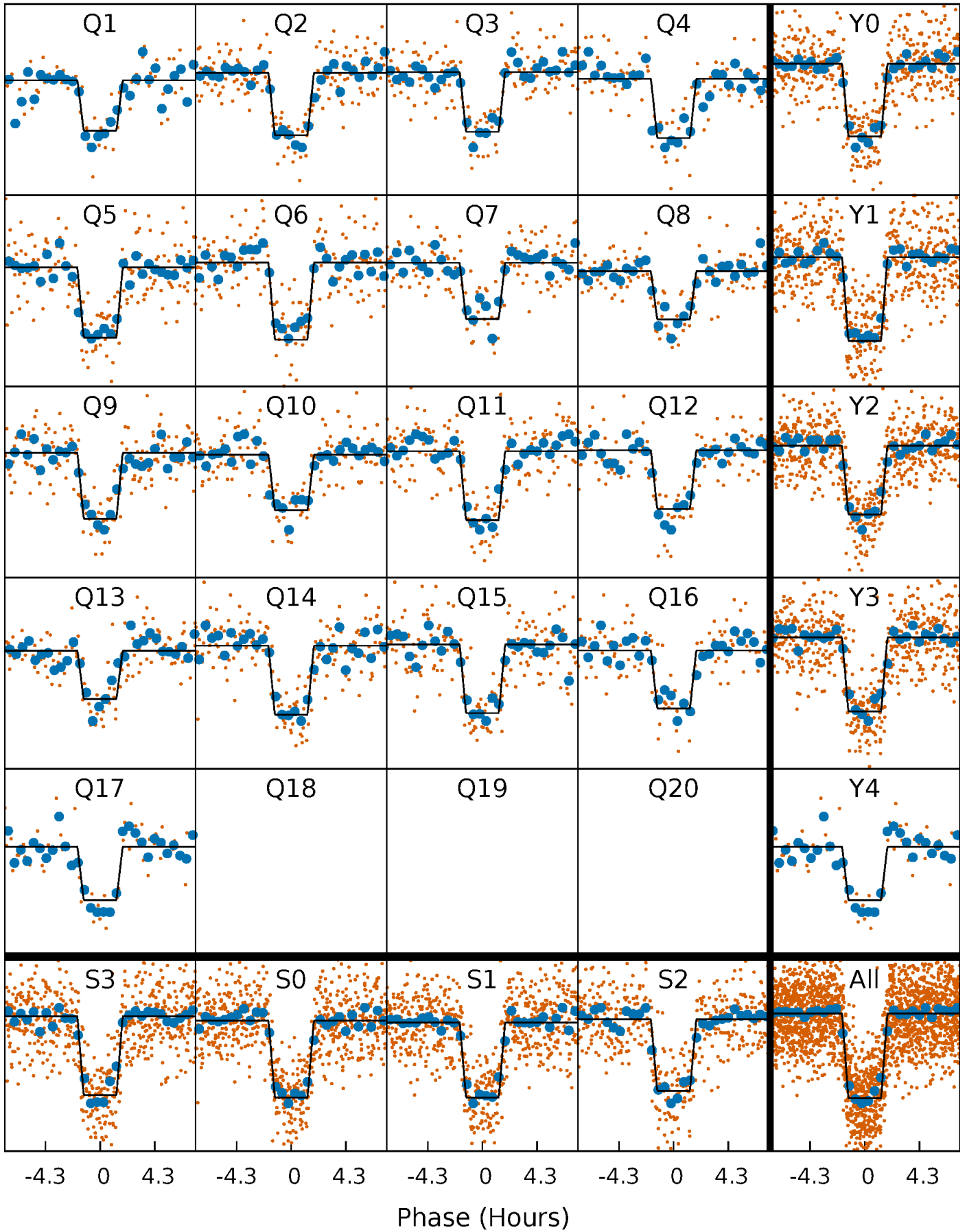
# DV Quarter-Phased Transit Curves

TCE 010016874-01 P= 16.301426 Days  $T_0=139.544230$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

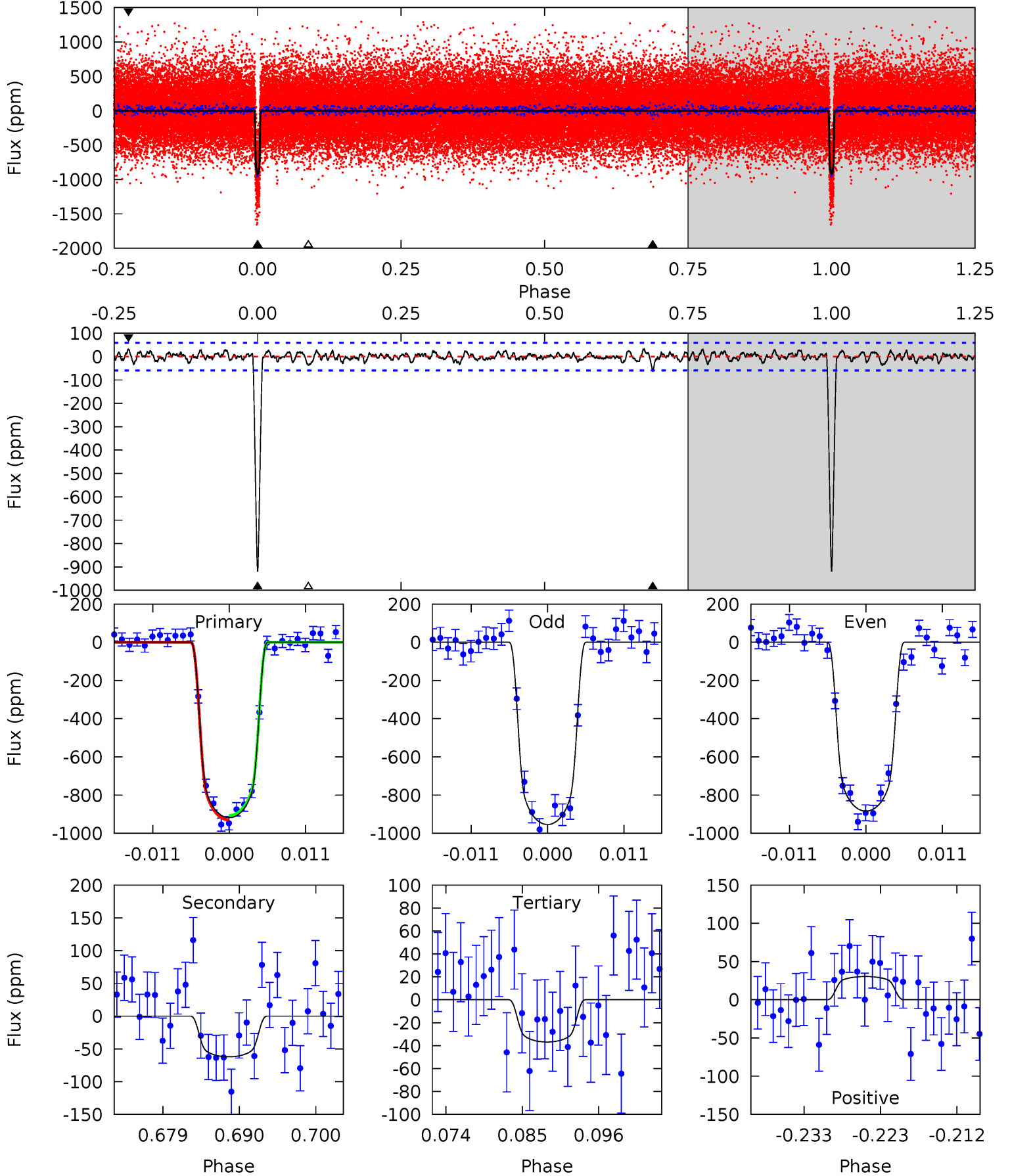
TCE 010016874-01 P= 16.301378 Days  $T_0=139.545675$  (BKJD)



# DV Model-Shift Uniqueness Test

010016874-01, P = 16.301426 Days, E = 123.242804 Days

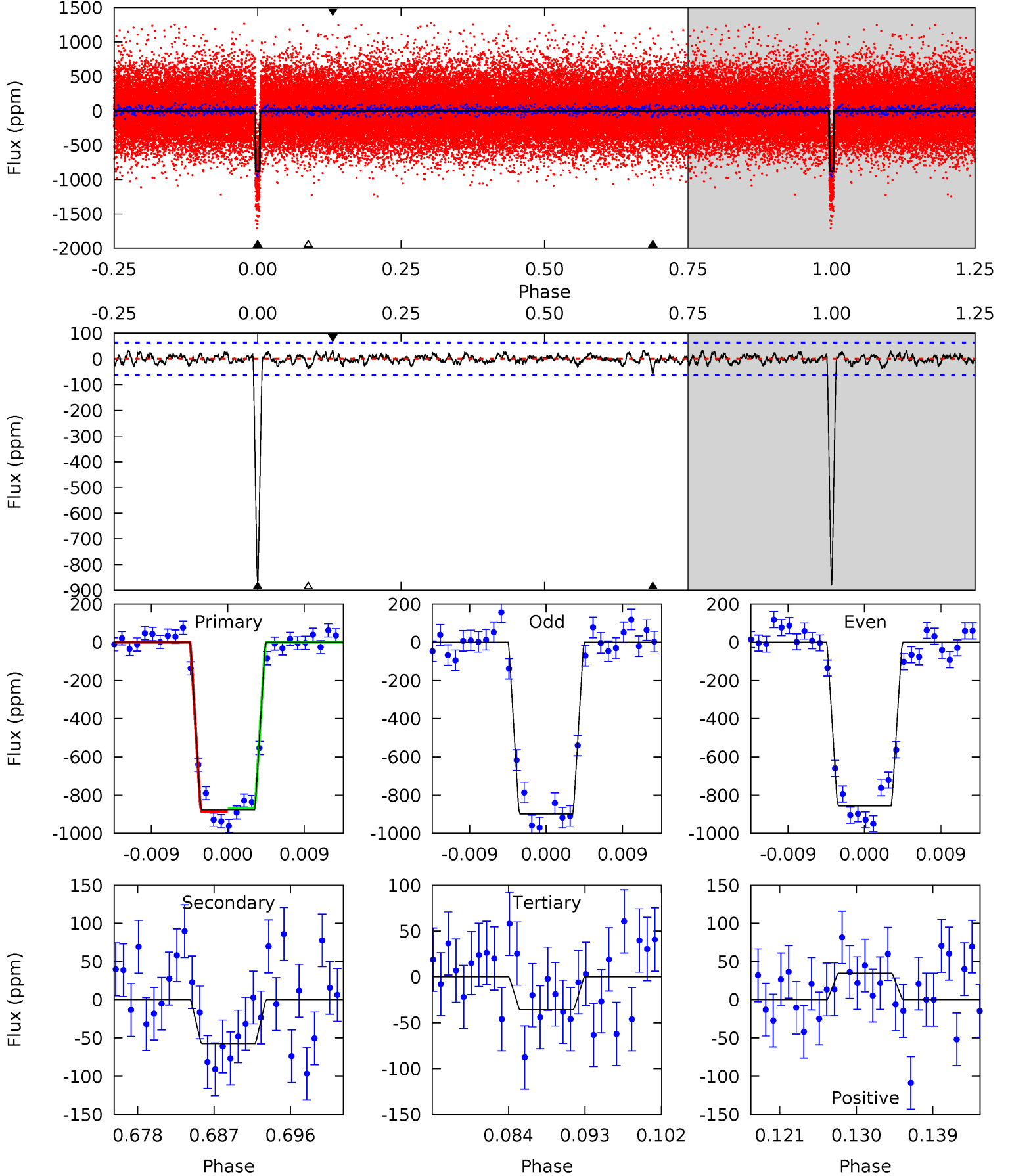
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
77.5	5.23	3.11	2.56	5.01	2.56	1.04	74.3	74.9	2.13	2.67	2.97	0.96	0.03	0.98



# Alt Model-Shift Uniqueness Test

010016874-01, P = 16.301378 Days, E = 123.244297 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
69.5	4.56	2.85	2.75	5.04	2.60	0.97	66.7	66.8	1.71	1.81	1.69	0.97	0.04	0.58



### Stellar Parameters For KIC 010016874

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6072^{+168}_{-210}$	$4.328^{+0.132}_{-0.198}$	$-0.140^{+0.300}_{-0.300}$	$1.138^{+0.351}_{-0.216}$	$1.004^{+0.167}_{-0.112}$	$0.960^{+0.610}_{-0.503}$
	+3%/-3%	+3%/-5%	+214%/-214%	+31%/-19%	+17%/-11%	+64%/-52%
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 010016874-01 / KOI 0426.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-62 \pm 12$	$4.01^{+0.62}_{-0.49}$	$1129^{+86}_{-71}$	$3496^{+127}_{-146}$	$33^{+11}_{-10}$
Alt.	$-58 \pm 13$	$3.78^{+0.65}_{-0.47}$	$1132^{+92}_{-71}$	$3526^{+144}_{-168}$	$35^{+15}_{-11}$

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



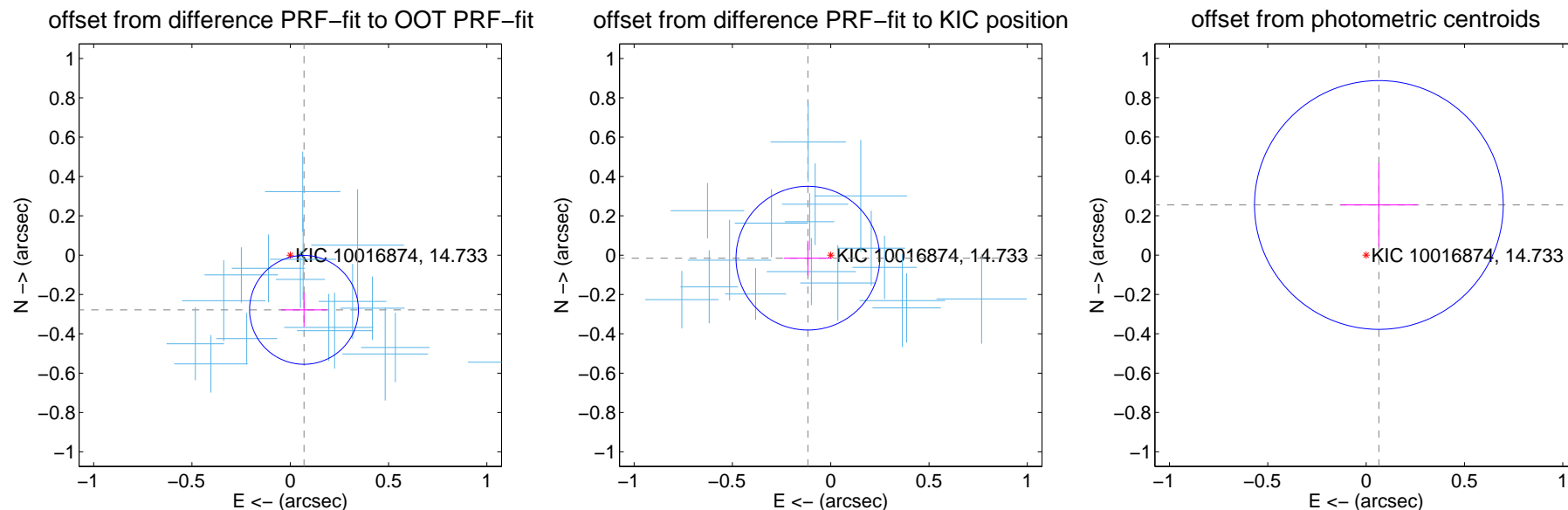
## DV Centroid Data

Supplemental centroid analysis for 010016874-01. Kepler magnitude: 14.73. Transit SNR 54.37

There are 17 quarters with good PRF difference image offsets

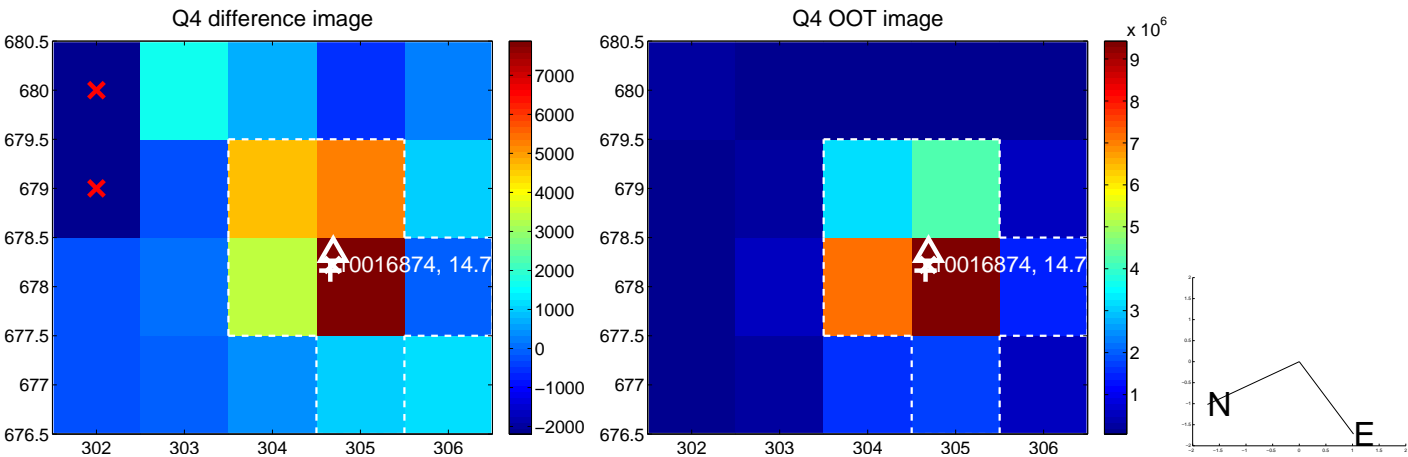
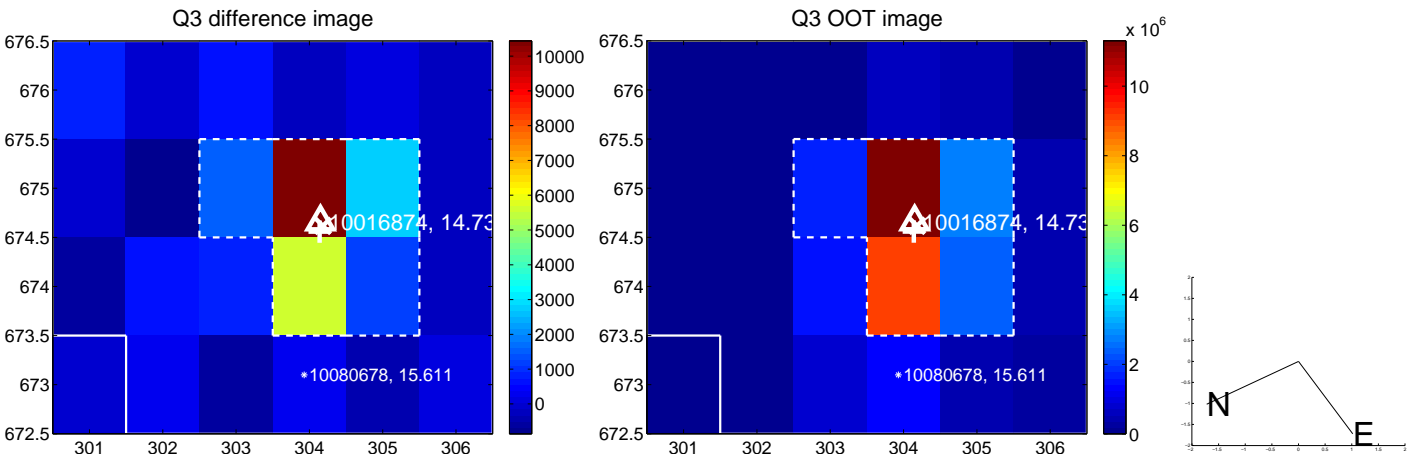
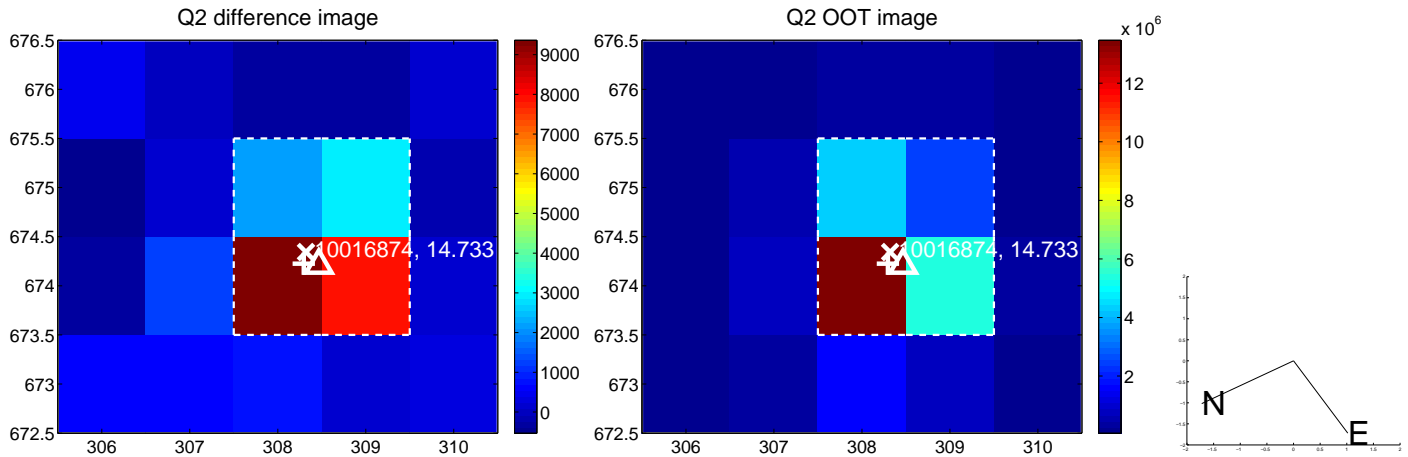
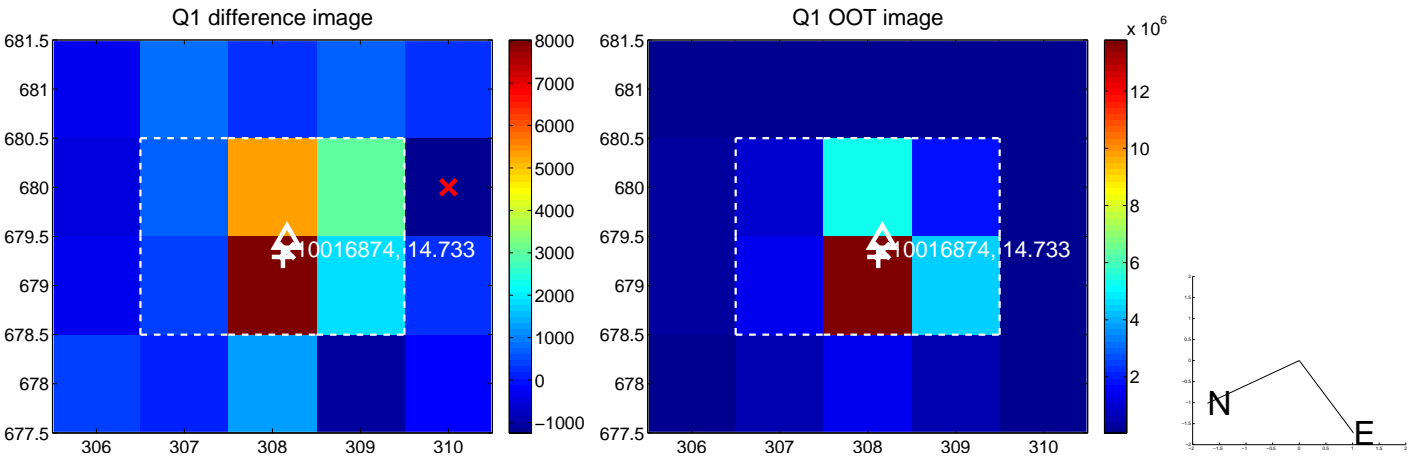
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.287 \pm 0.092$	<b>3.11</b>	$-0.070 \pm 0.117$	$-0.278 \pm 0.087$
PRF-fit source offset from KIC position	$0.117 \pm 0.122$	0.96	$0.116 \pm 0.122$	$-0.015 \pm 0.088$
photometric centroid source offset	$0.26 \pm 0.21$	1.25	$-0.06 \pm 0.20$	$0.25 \pm 0.21$

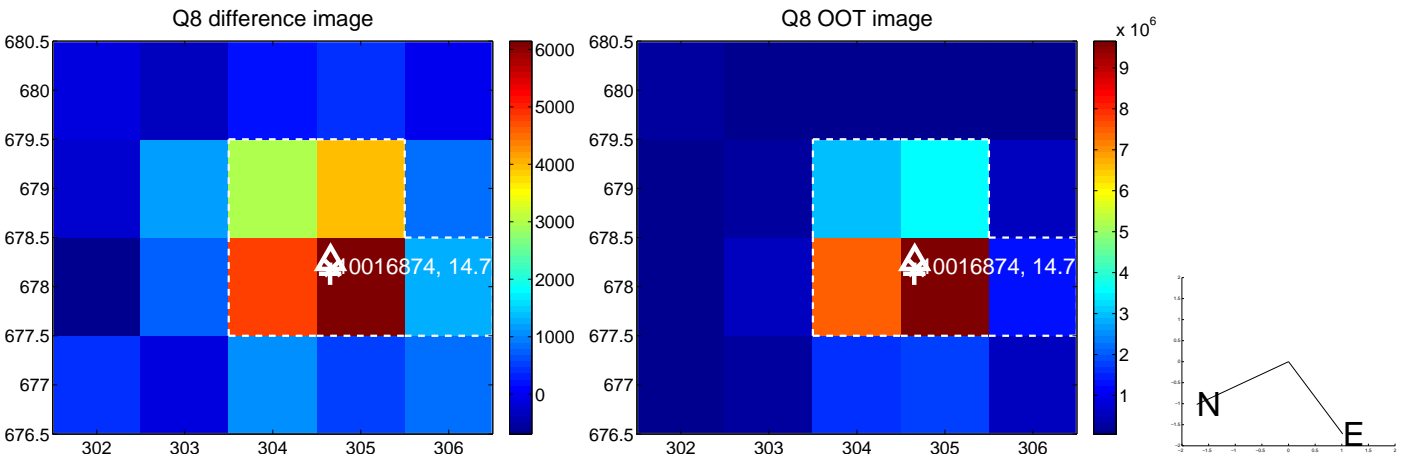
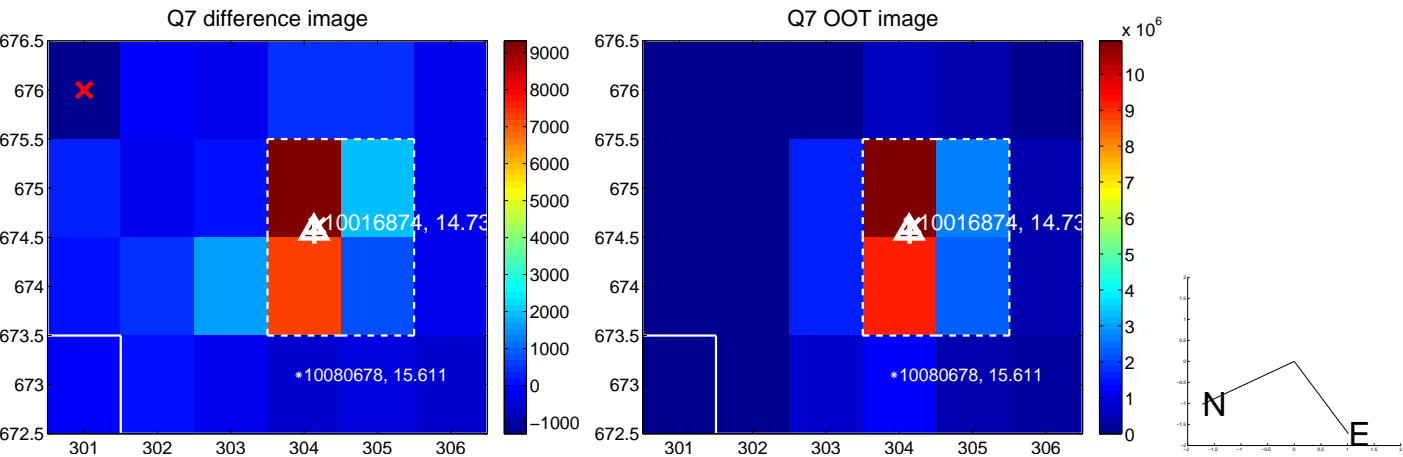
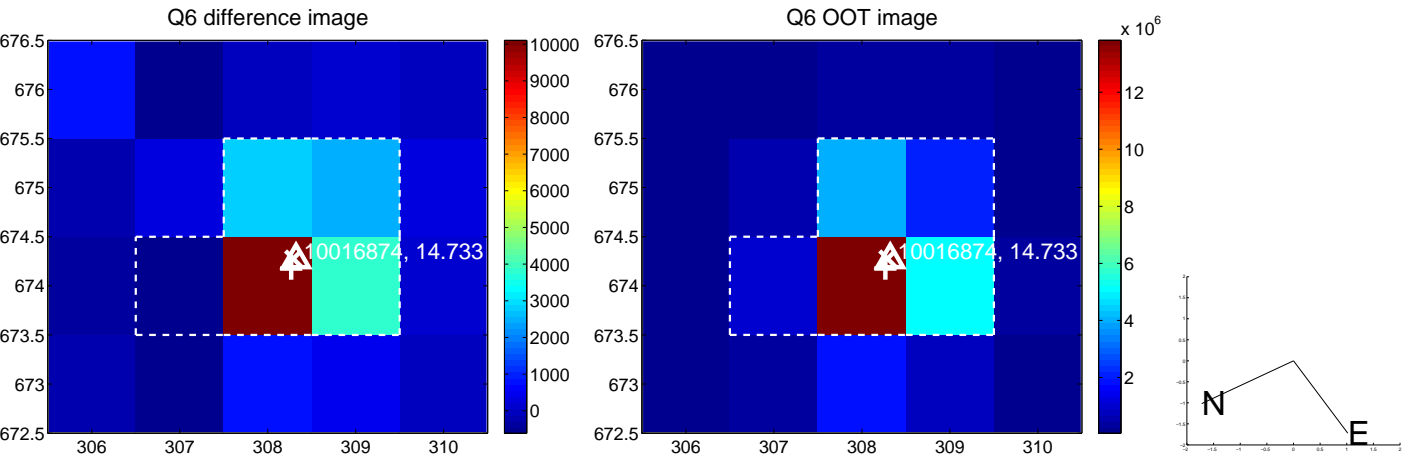
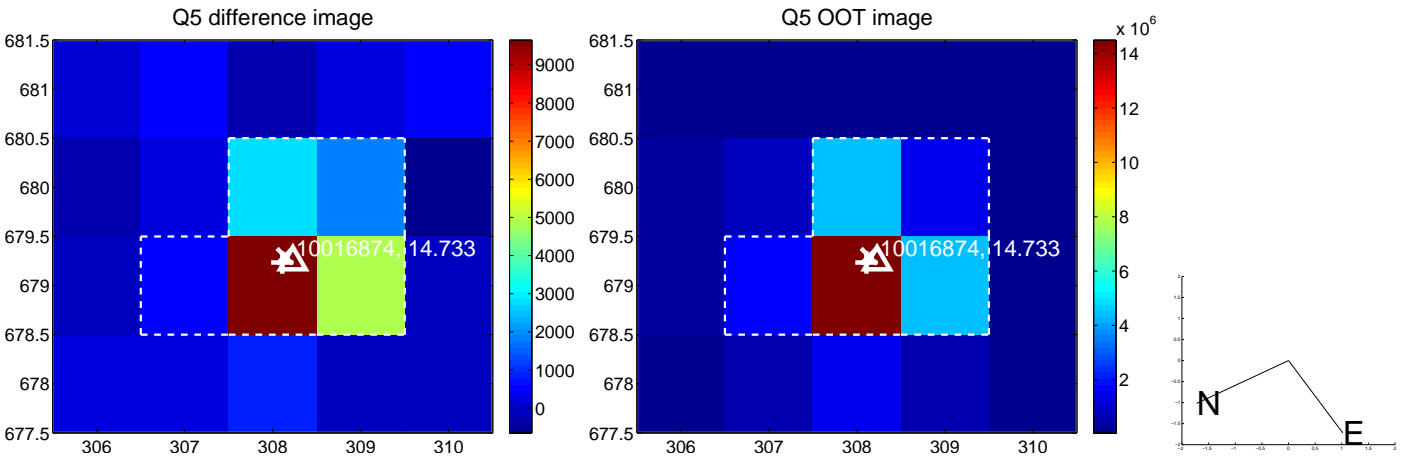


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

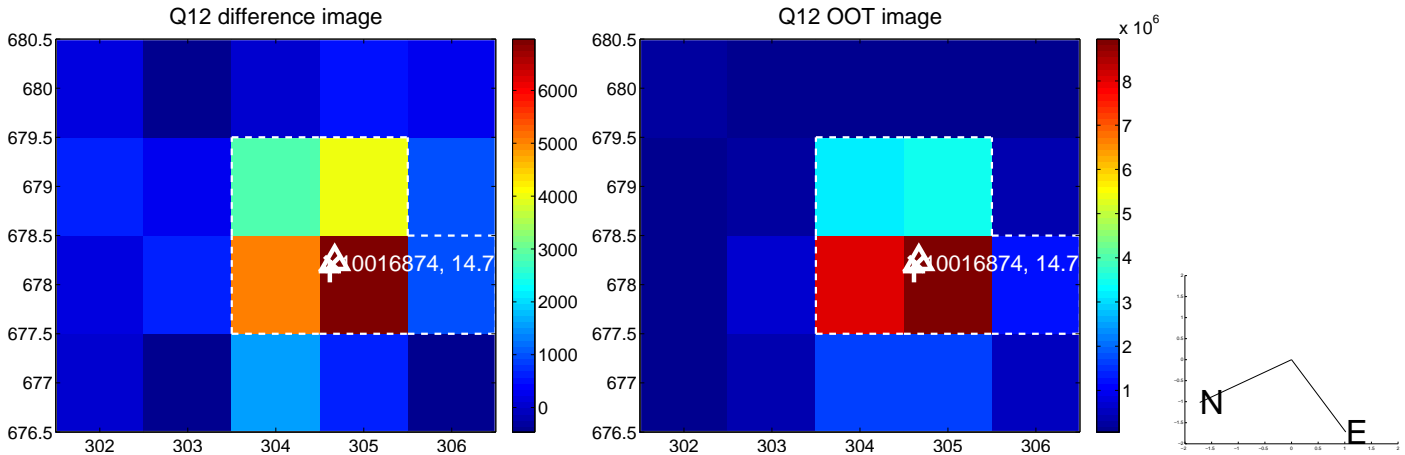
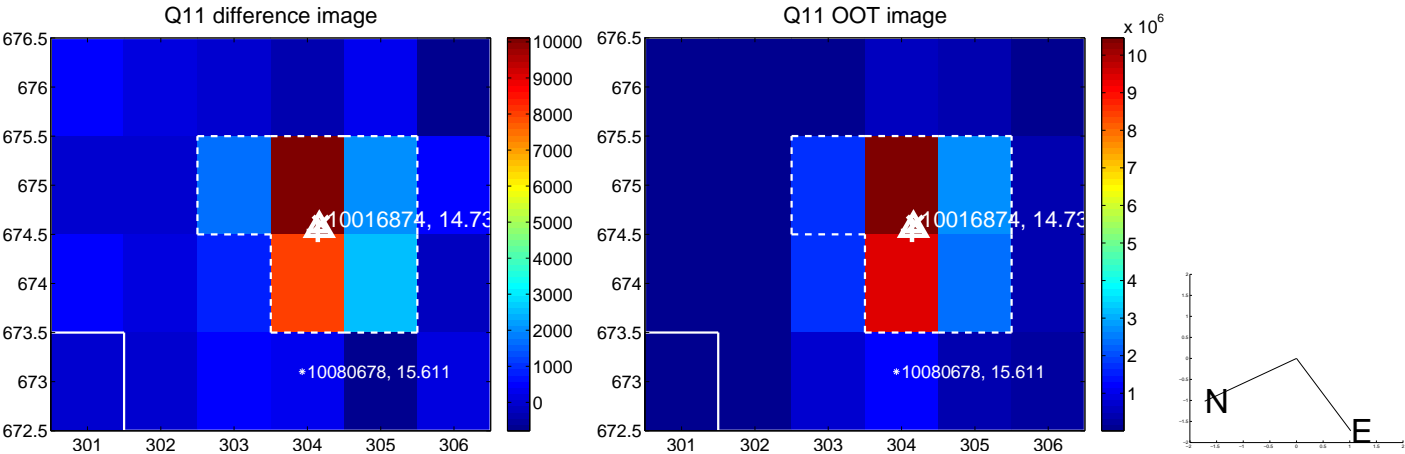
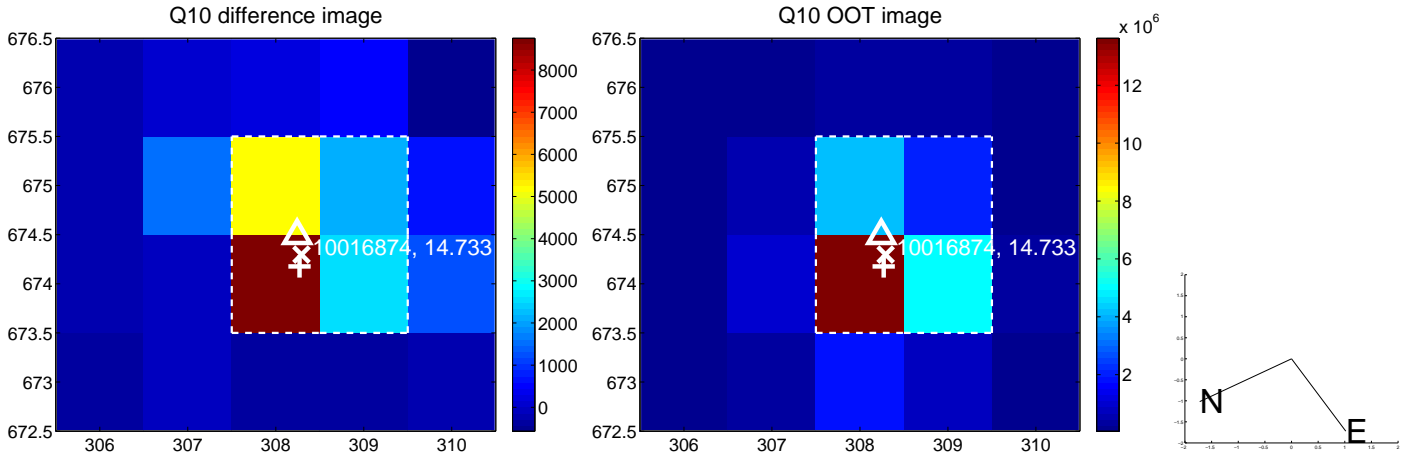
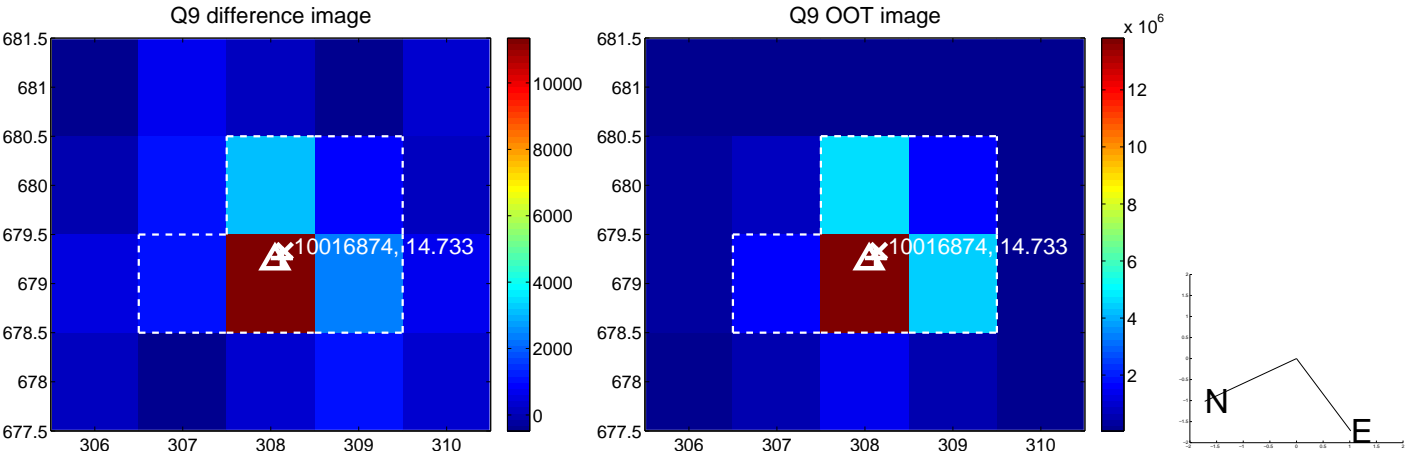
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



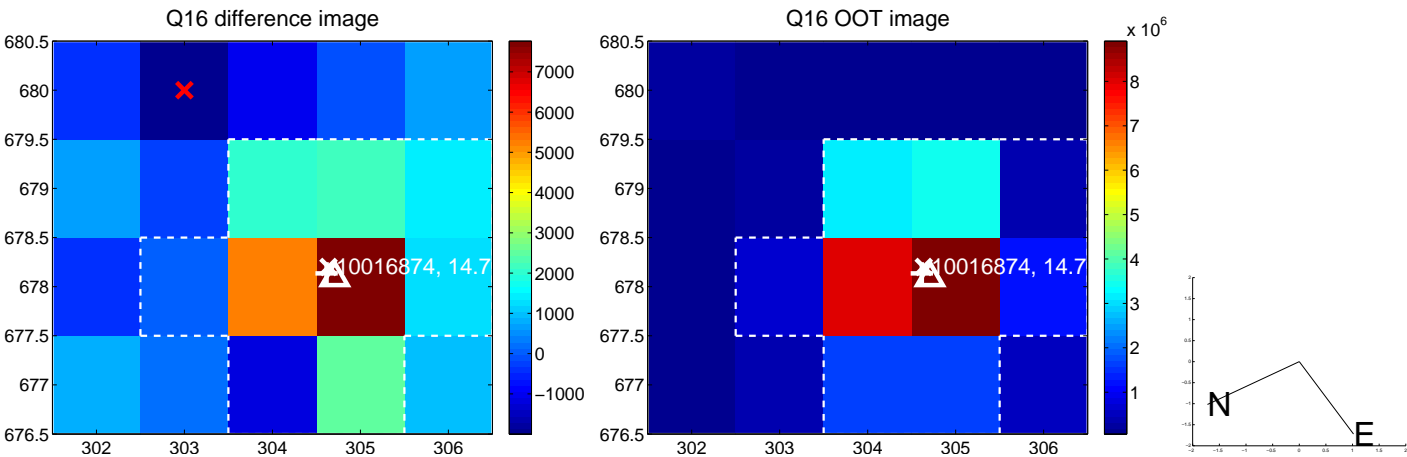
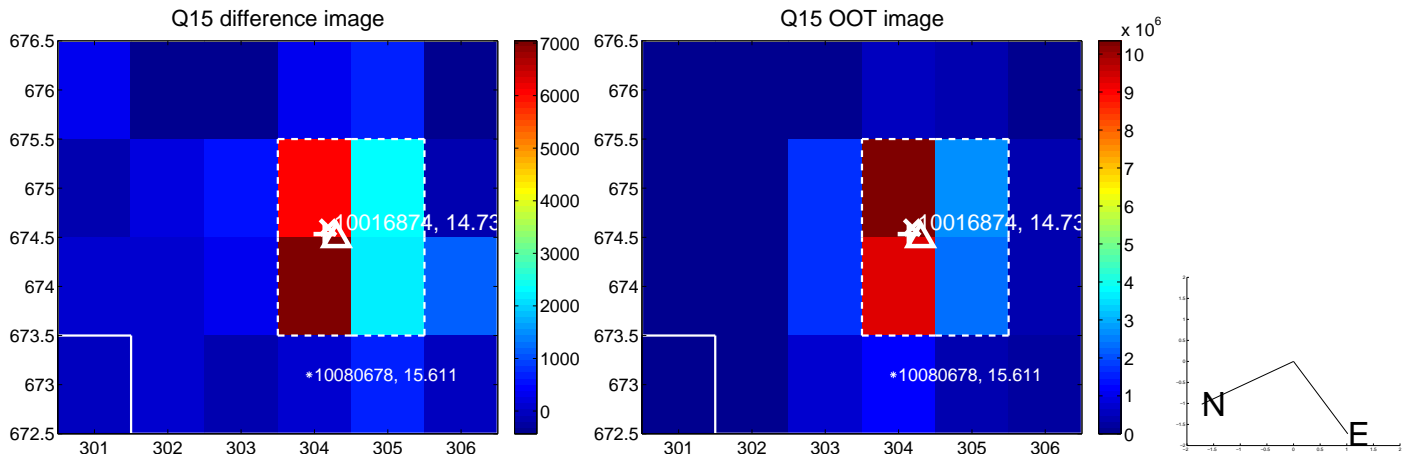
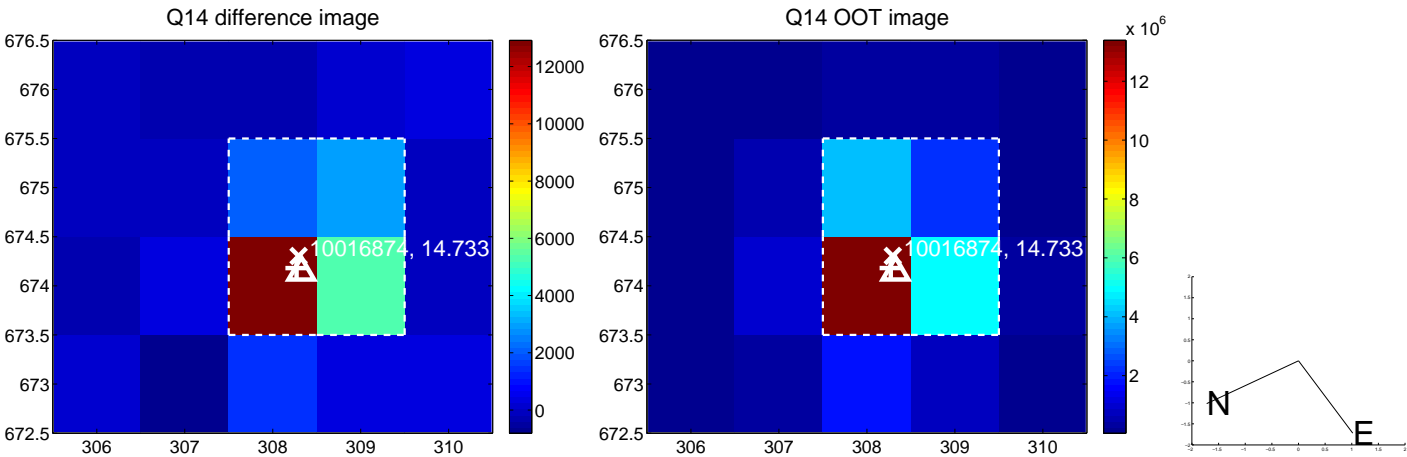
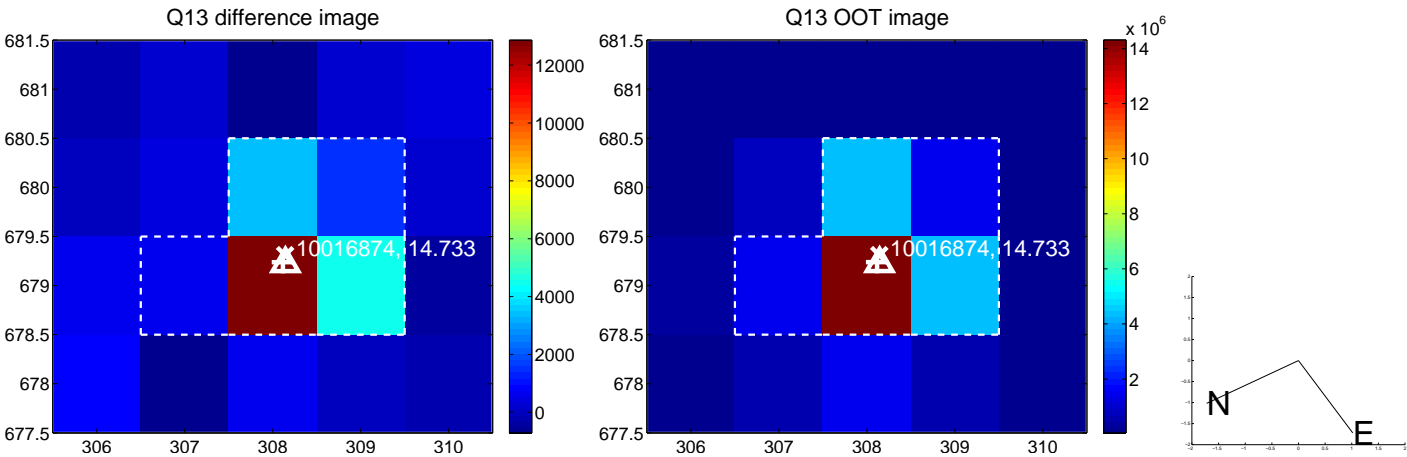
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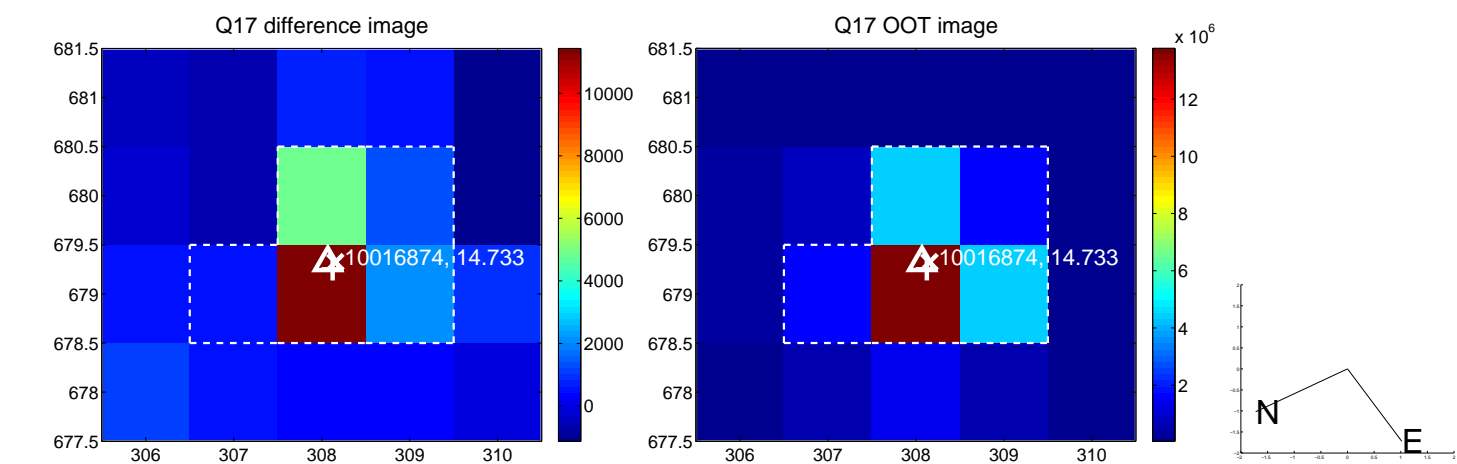


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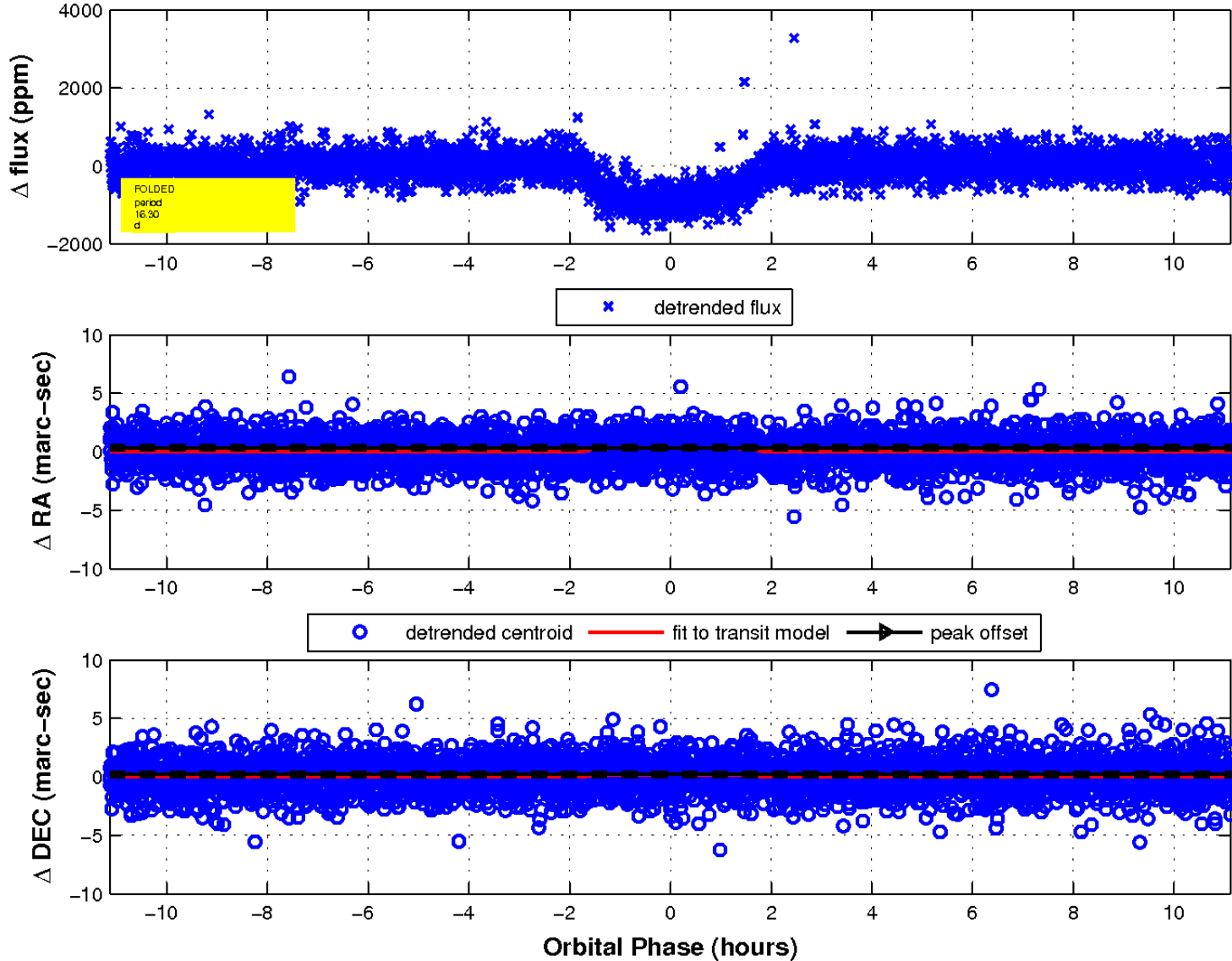




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

