

# KIC 009455677

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009455677-01	OBS	4076.01	124.828203	208.788789	672.2	6.794	15.8	15.9	1.03	5349	2.99	3.57

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009455677-01	OBS	PC	0.99	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.

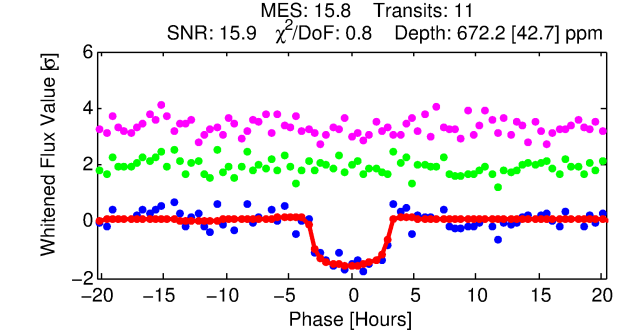
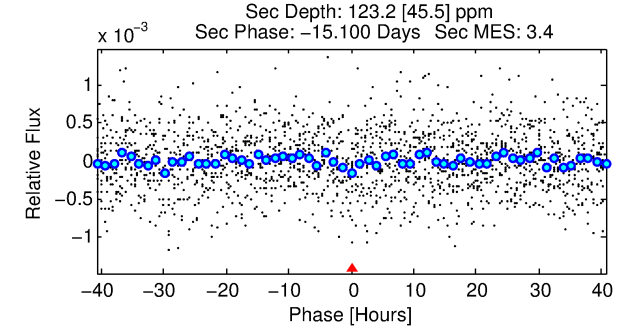
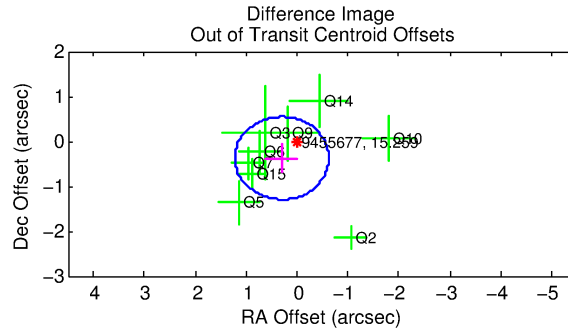
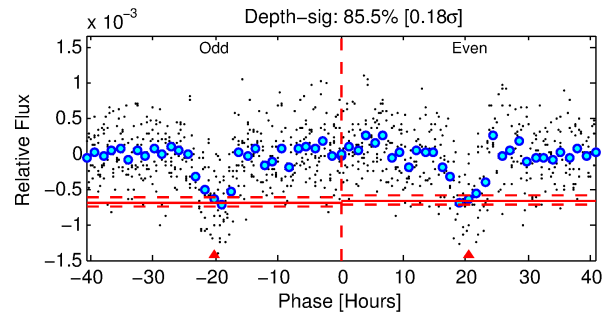
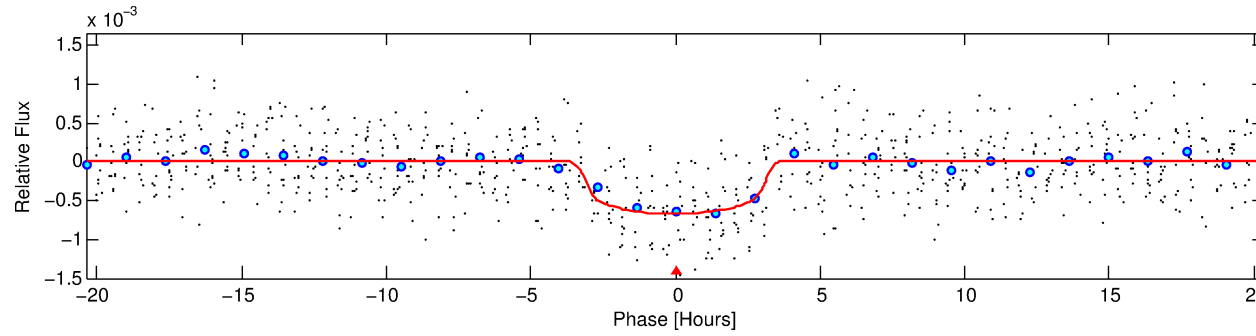
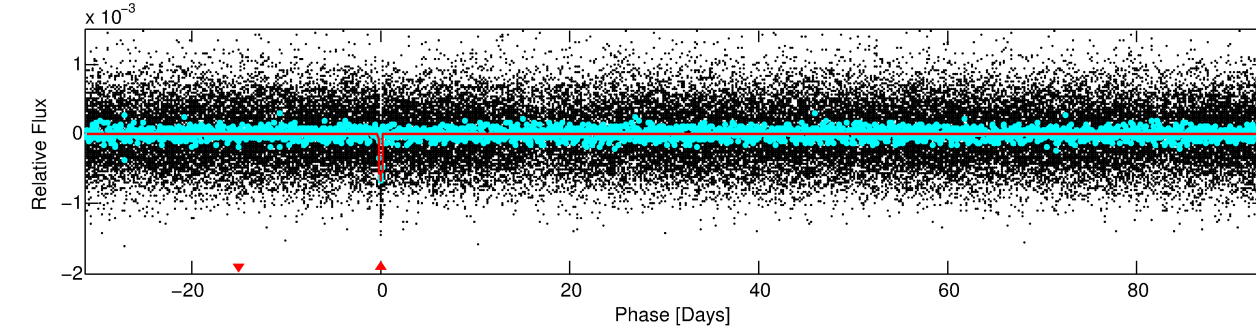
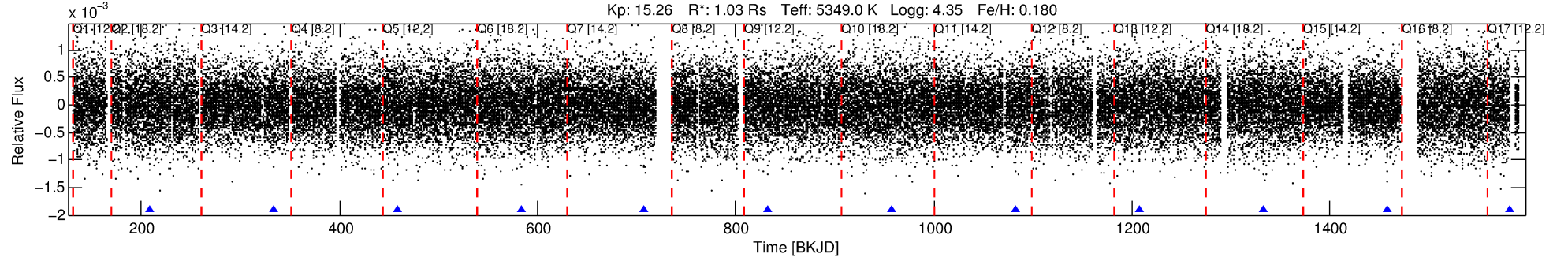
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009455677-01

No Significant Match Found

# DV One-Page Summary

KIC: 9455677 Candidate: 1 of 1 Period: 124.828 d  
KOI: K04076.01 Corr: 0.965



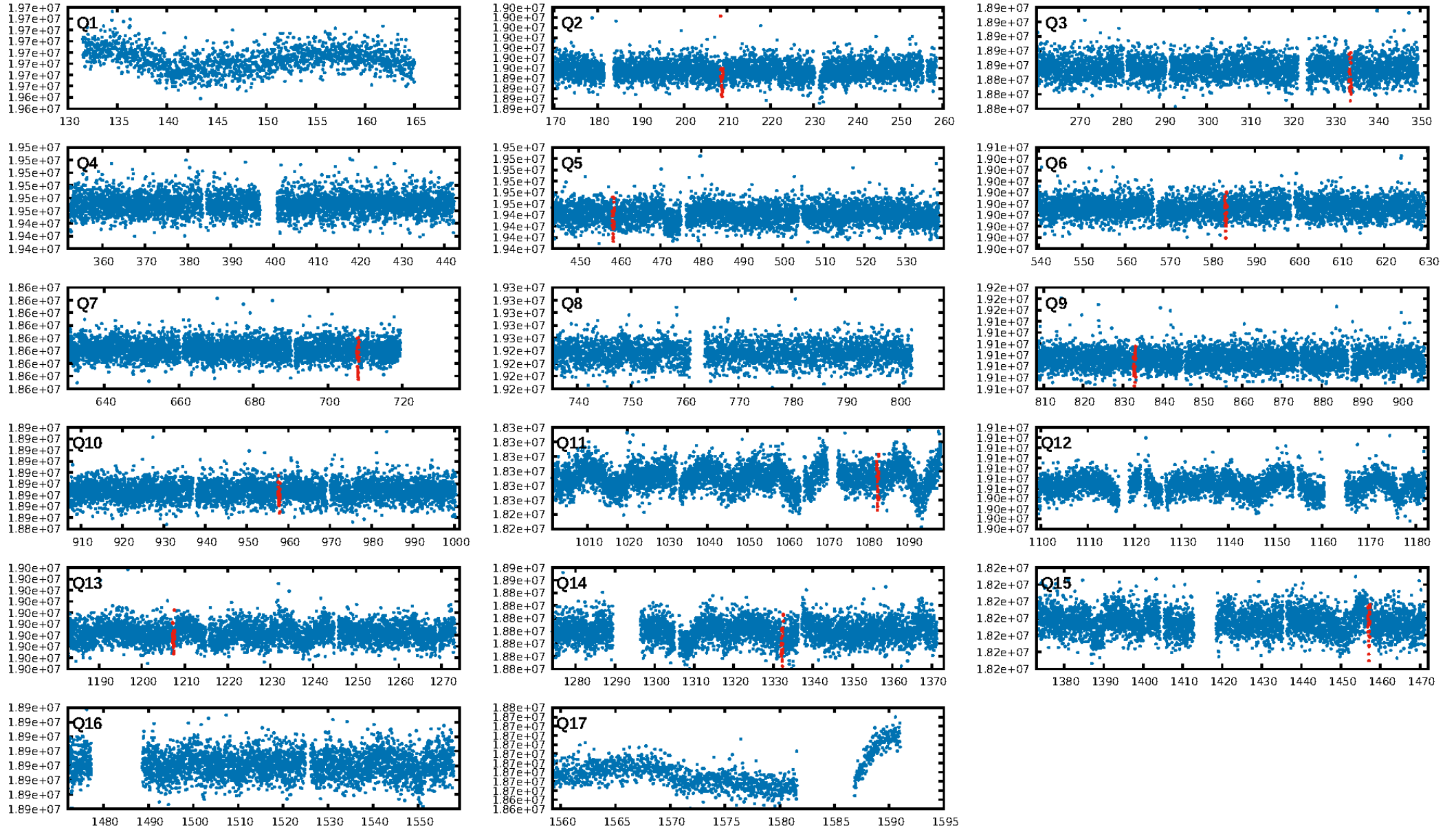
## DV Fit Results:

Period = 124.82820 [0.00130] d  
Epoch = 208.7888 [0.0083] BKJD  
Rp/R\* = 0.0265 [0.0084]  
a/R\* = 90.15 [109.51]  
b = 0.80 [0.56]  
Seff = 3.57 [0.90]  
Teff = 351 [22] K  
Rp = 2.99 [1.08] Re  
a = 0.4678 [0.0754] AU  
Ag = 1661.17 [1280.11] [1.30 $\sigma$ ]  
Teffp = 3460 [634] K [4.90 $\sigma$ ]

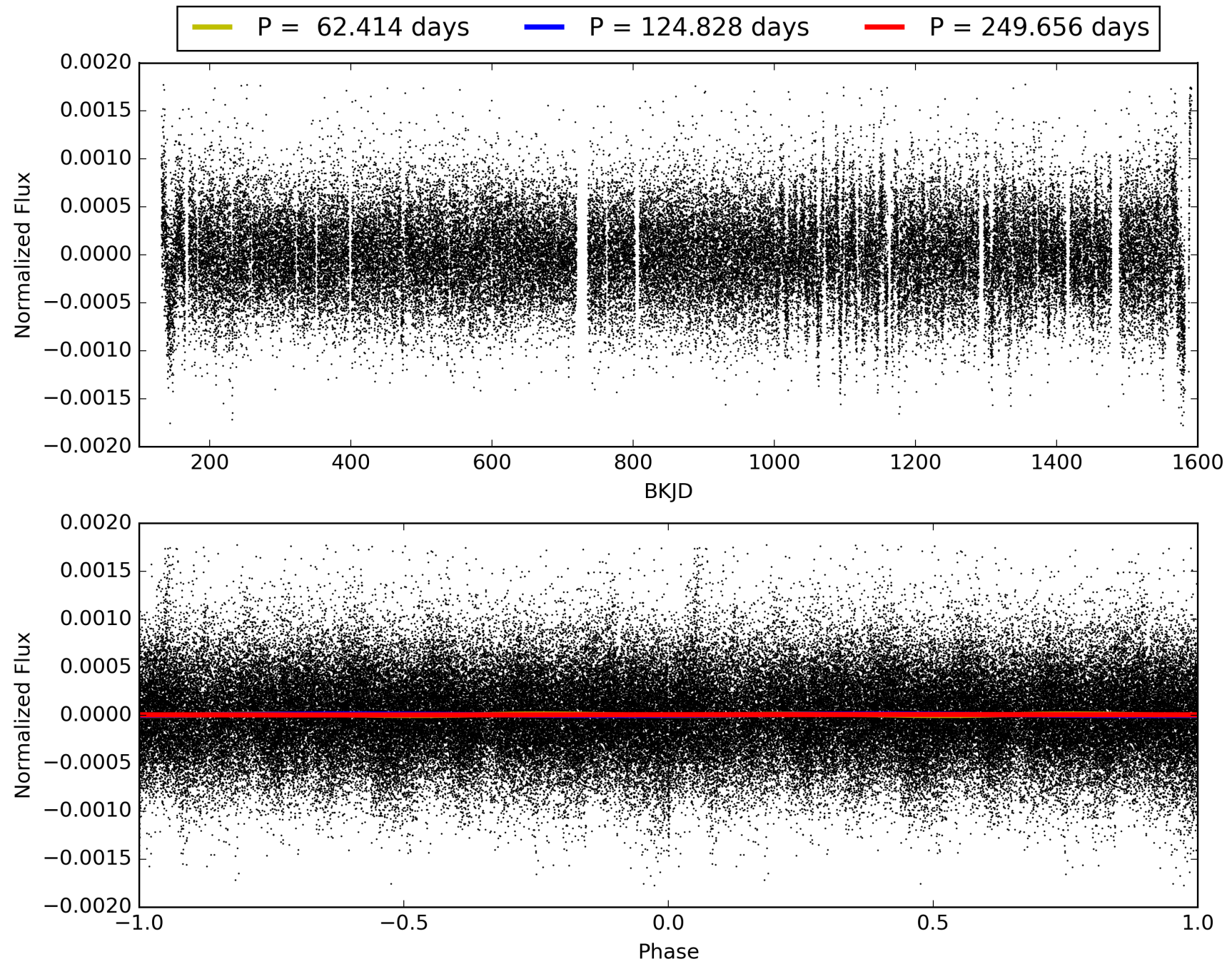
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 90.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.44e-52  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 10.76  
Centroid-sig: 84.8%  
Centroid-so: 0.449 arcsec [0.49 $\sigma$ ]  
OotOffset-rm: 0.482 arcsec [1.57 $\sigma$ ]  
KicOffset-rm: 0.629 arcsec [2.19 $\sigma$ ]  
OotOffset-st: 4/3/0/2 [9]  
KicOffset-st: 4/3/0/2 [9]  
DiffImageQuality-fgm: 1.00 [9/9]  
DiffImageOverlap-fno: 1.00 [10/10]

# TCE 009455677-01, PDC Light Curves

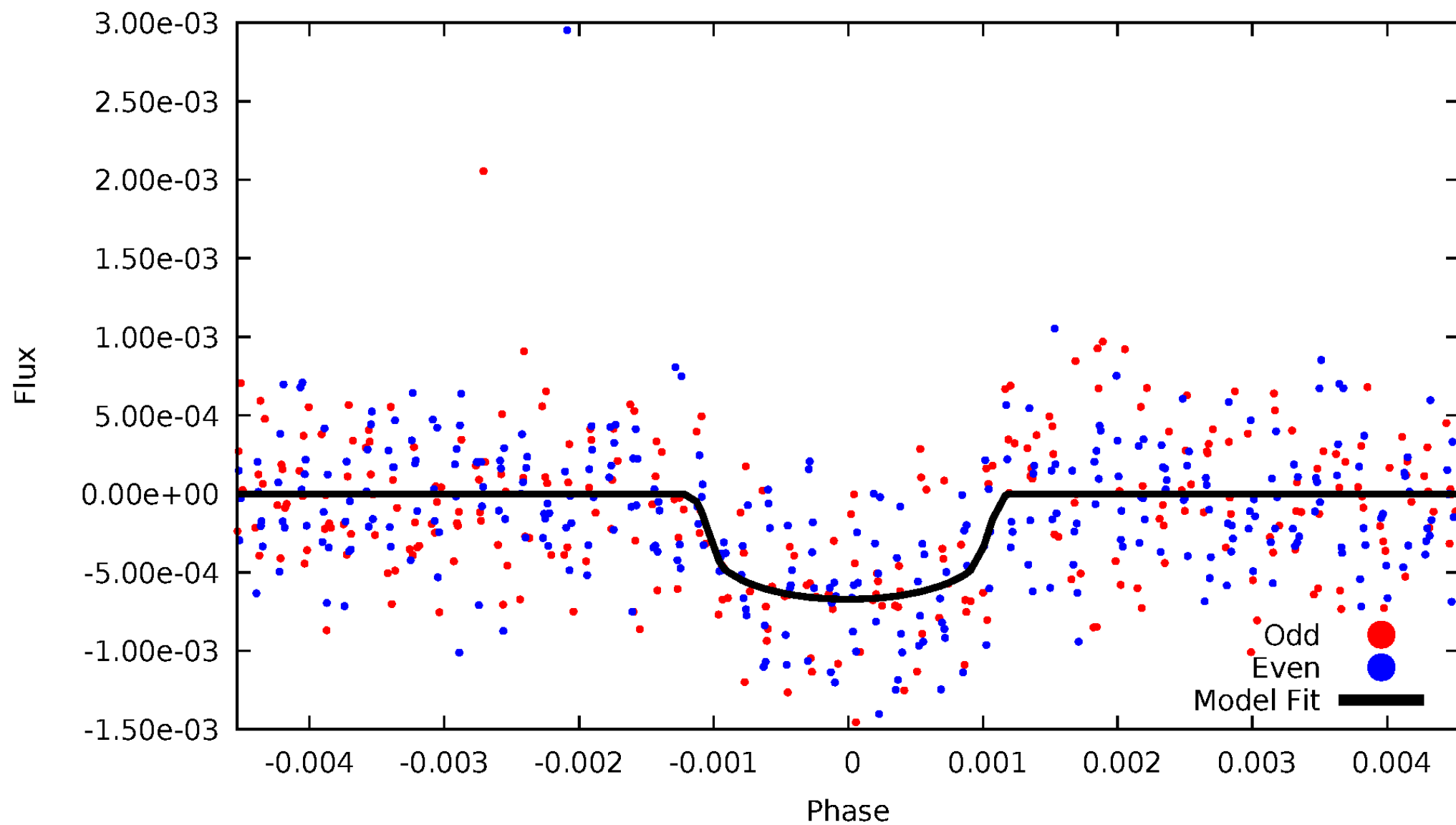


TCE 009455677-01



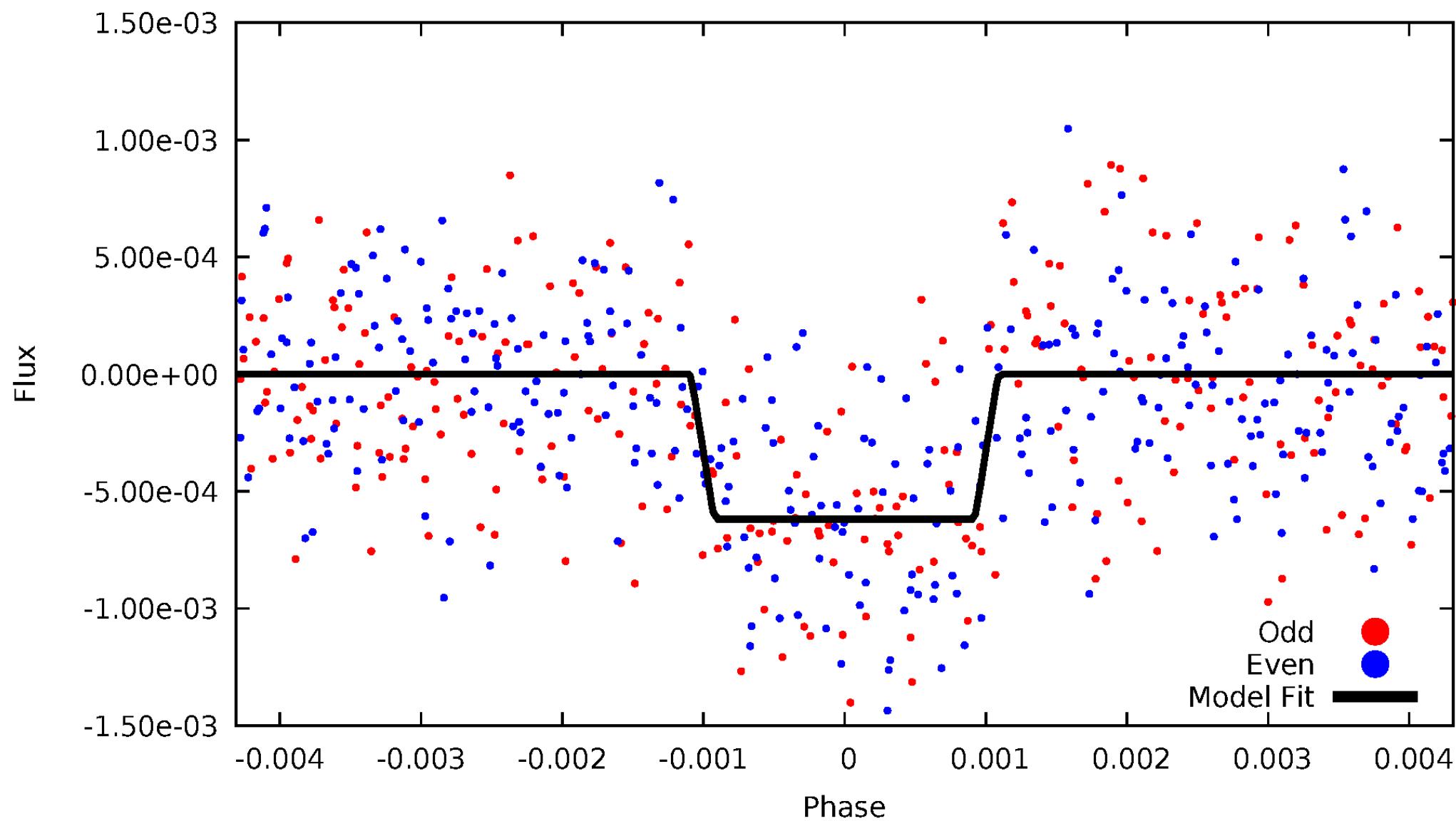
# DV Odd/Even

TCE 009455677-01



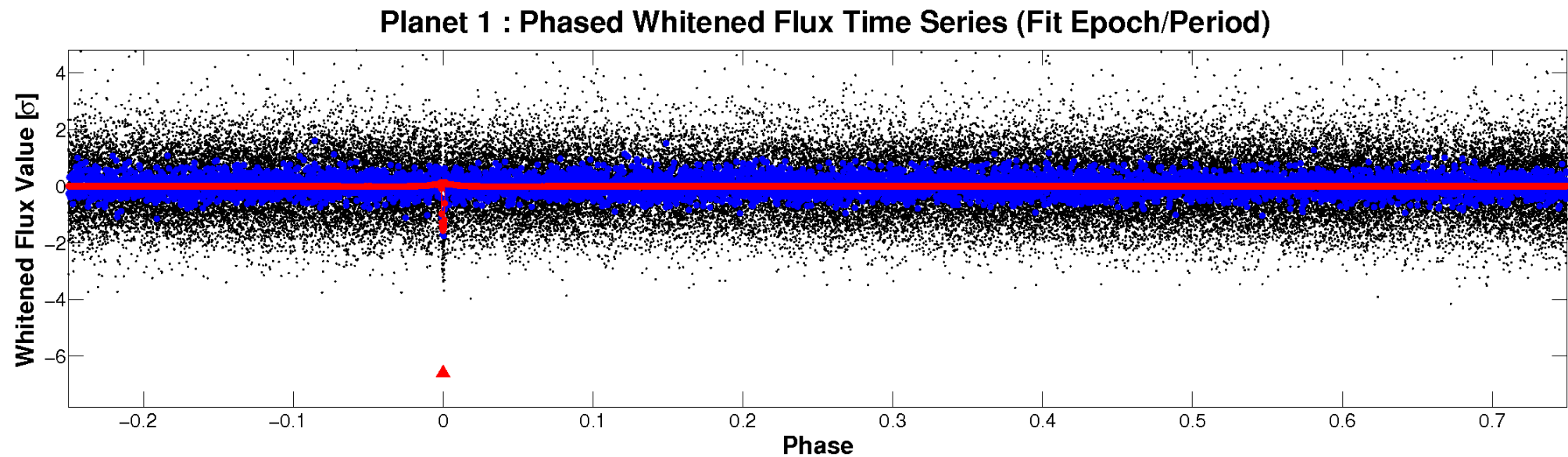
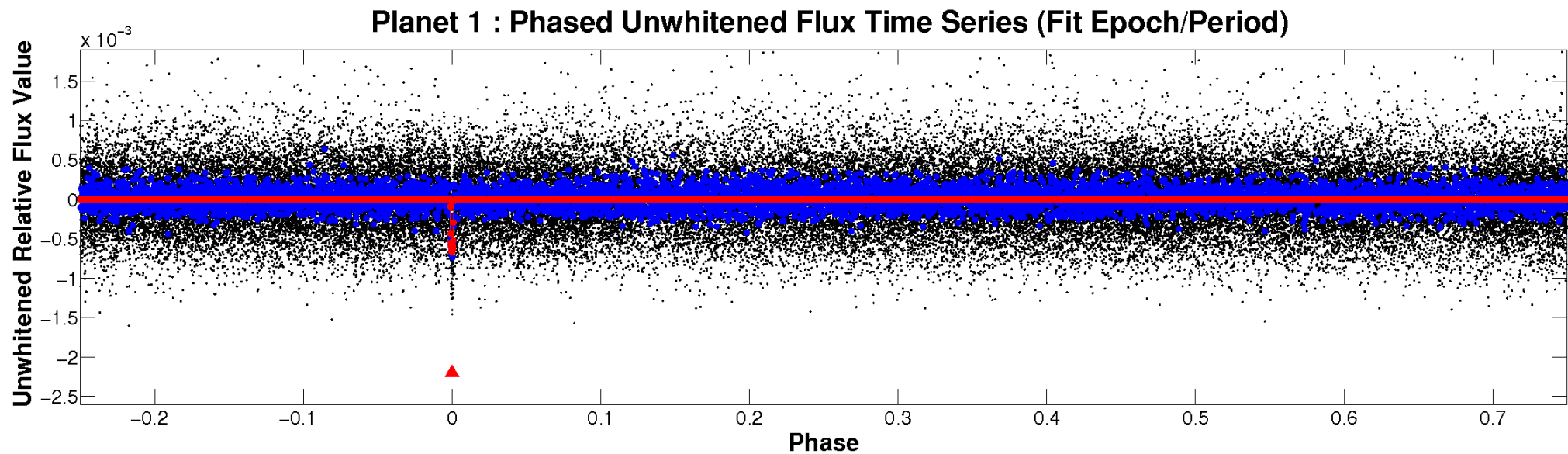
# ALT Odd/Even

TCE 009455677-01



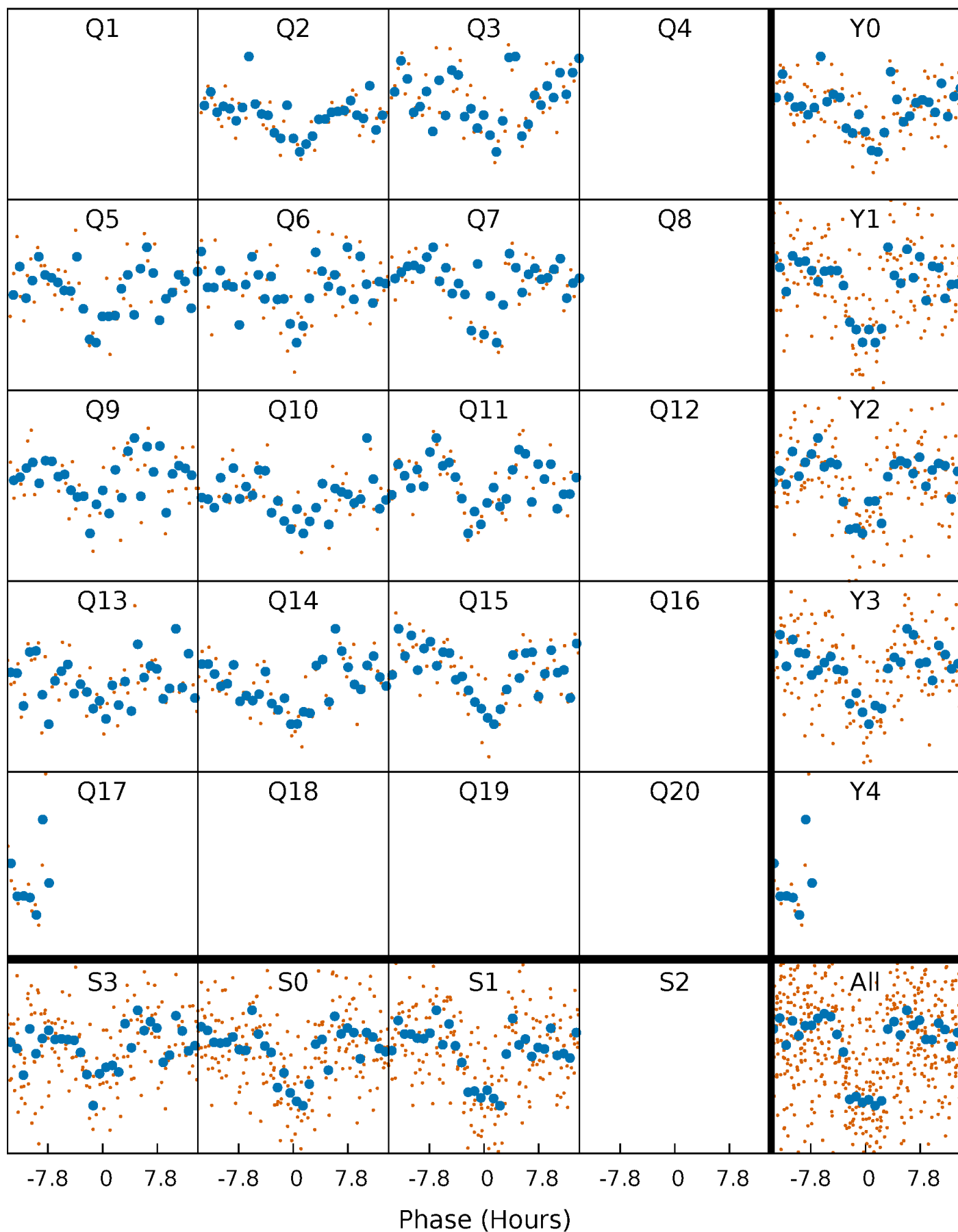


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

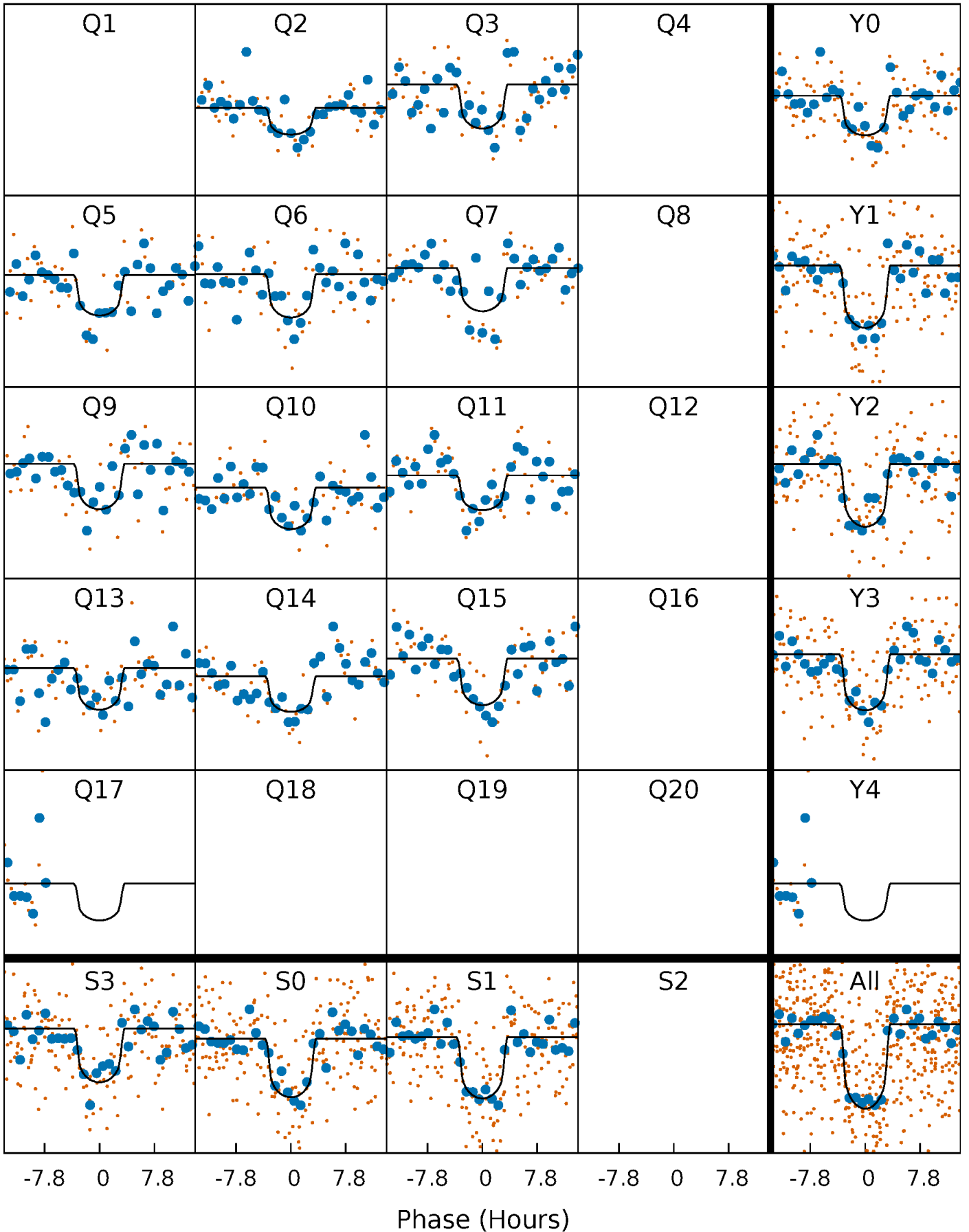
TCE 009455677-01 P=124.828203 Days  $T_0=208.788789$  (BKJD)





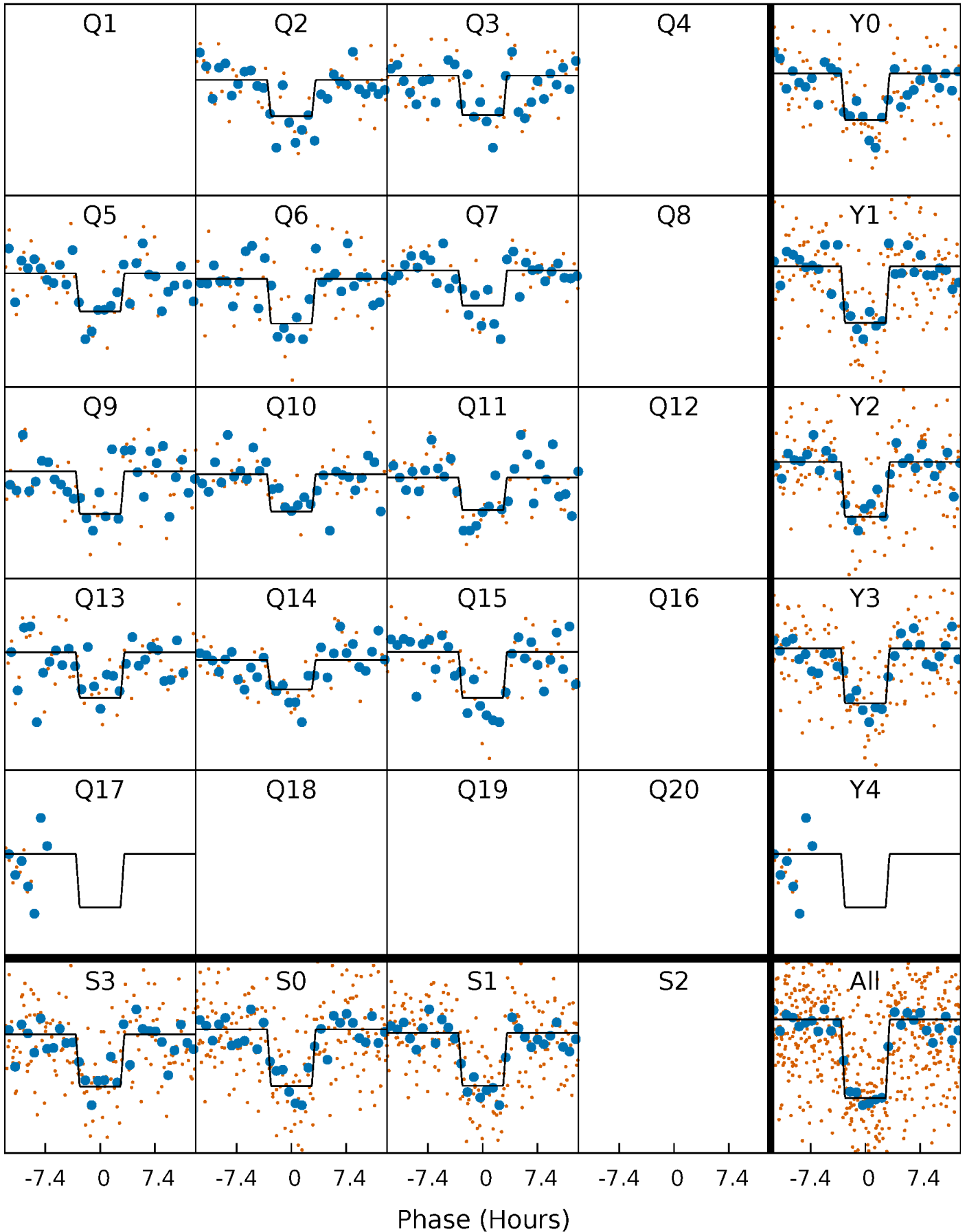
# DV Quarter-Phased Transit Curves

TCE 009455677-01 P=124.828203 Days  $T_0=208.788789$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

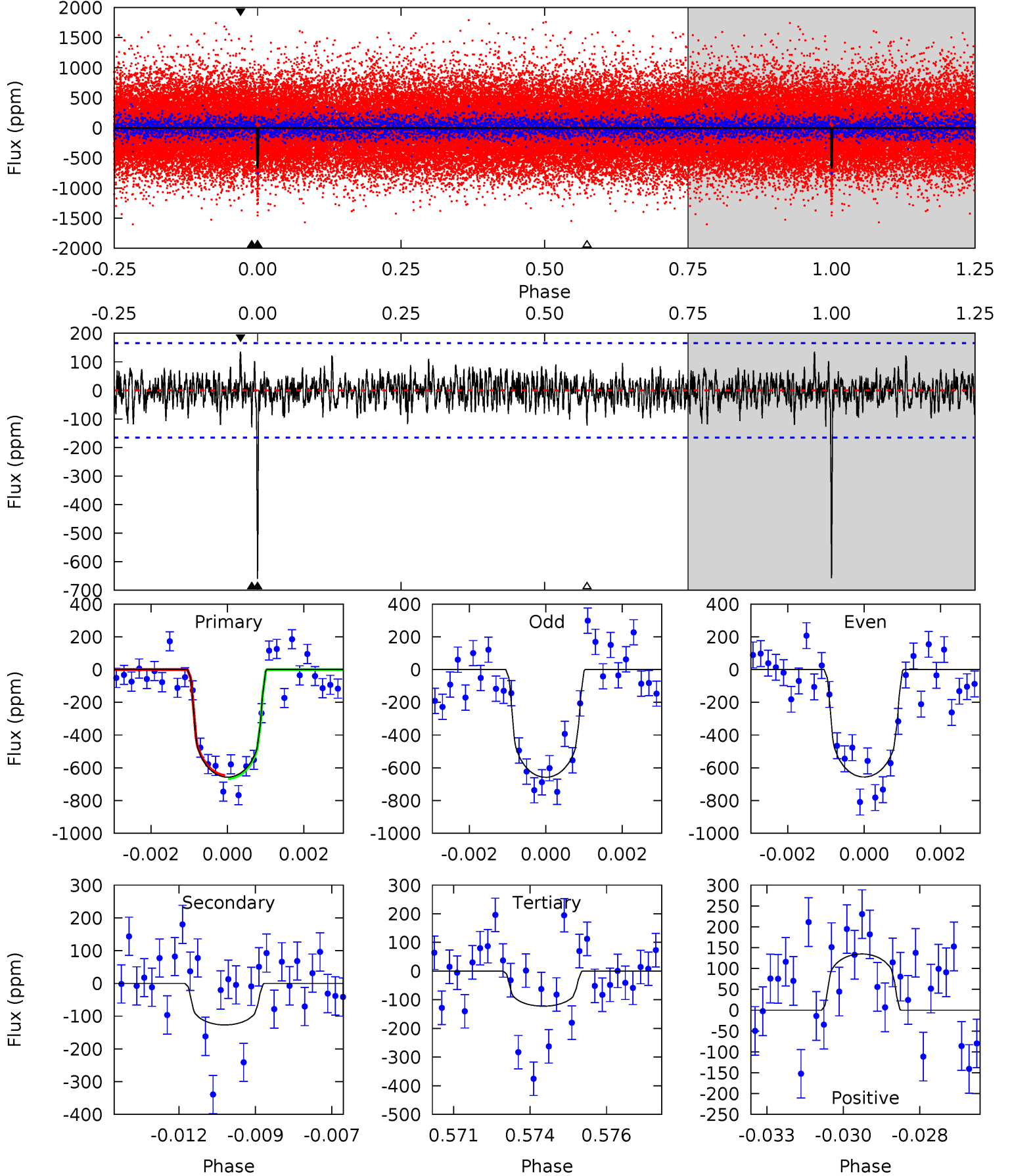
TCE 009455677-01 P=124.826566 Days  $T_0=208.795668$  (BKJD)



# DV Model-Shift Uniqueness Test

009455677-01, P = 124.828203 Days, E = 83.960586 Days

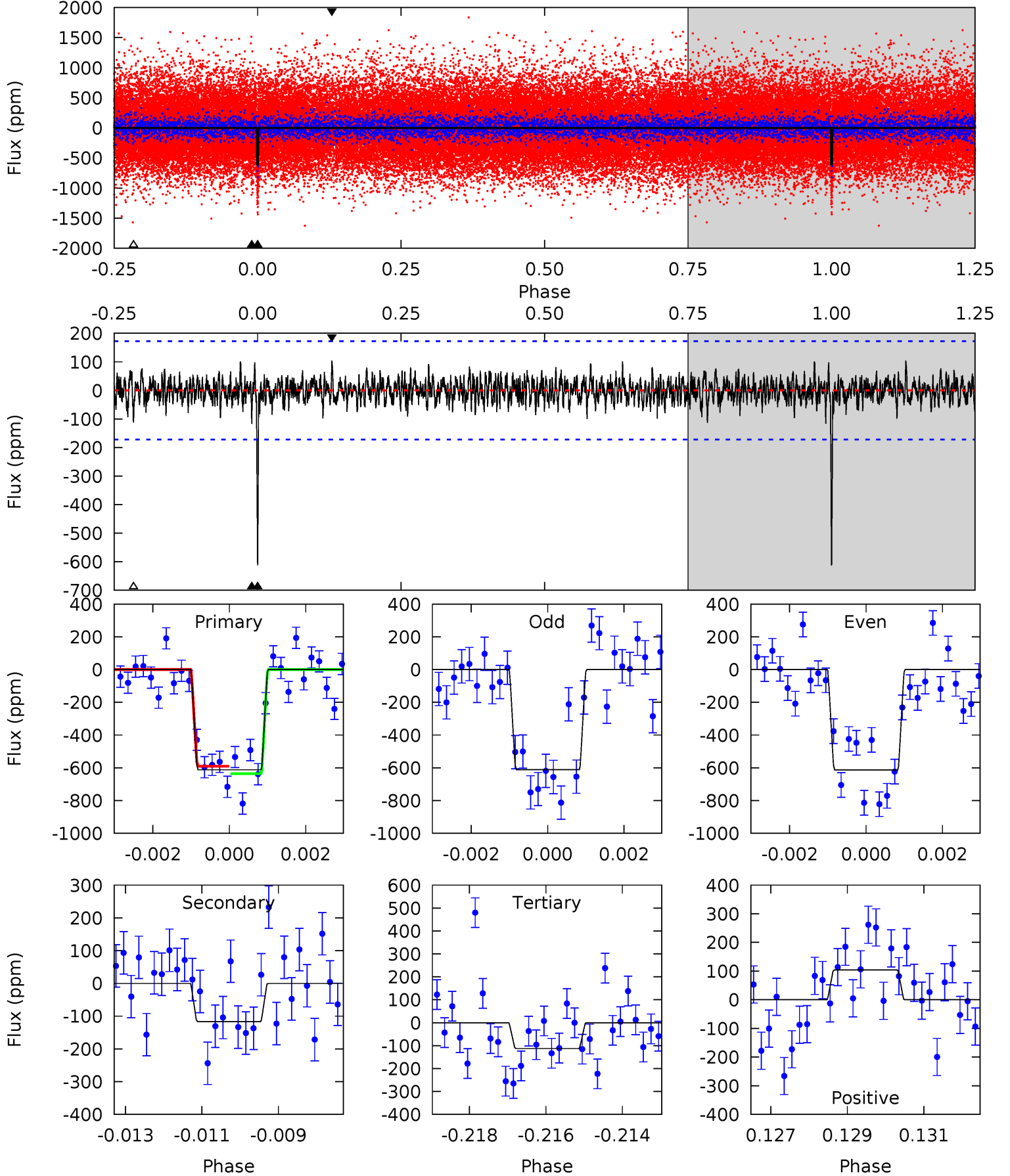
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.0	4.06	3.92	4.32	5.30	3.04	1.18	17.1	16.7	0.14	-0.25	0.03	0.95	0.17	0.29



# Alt Model-Shift Uniqueness Test

009455677-01,  $P = 124.826566$  Days,  $E = 83.969102$  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
18.9	3.59	3.47	3.20	5.31	3.06	0.98	15.4	15.7	0.12	0.39	0.04	0.97	0.15	0.69



### Stellar Parameters For KIC 009455677

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5349^{+80}_{-80}$	$4.353^{+0.140}_{-0.140}$	$0.180^{+0.150}_{-0.100}$	$1.032^{+0.186}_{-0.152}$	$0.875^{+0.061}_{-0.035}$	$1.122^{+0.675}_{-0.421}$
	+1%/-1%	+3%/-3%	+83%/-56%	+18%/-15%	+7%/-4%	+60%/-38%
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 009455677-01 / KOI 4076.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-127 \pm 31$	$2.95^{+1.01}_{-0.93}$	$491^{+25}_{-22}$	$3824^{+649}_{-362}$	$1709^{+2294}_{-806}$
Alt.	$-116 \pm 32$	$2.79^{+1.05}_{-0.96}$	$491^{+24}_{-25}$	$3874^{+637}_{-407}$	$1817^{+2503}_{-949}$

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

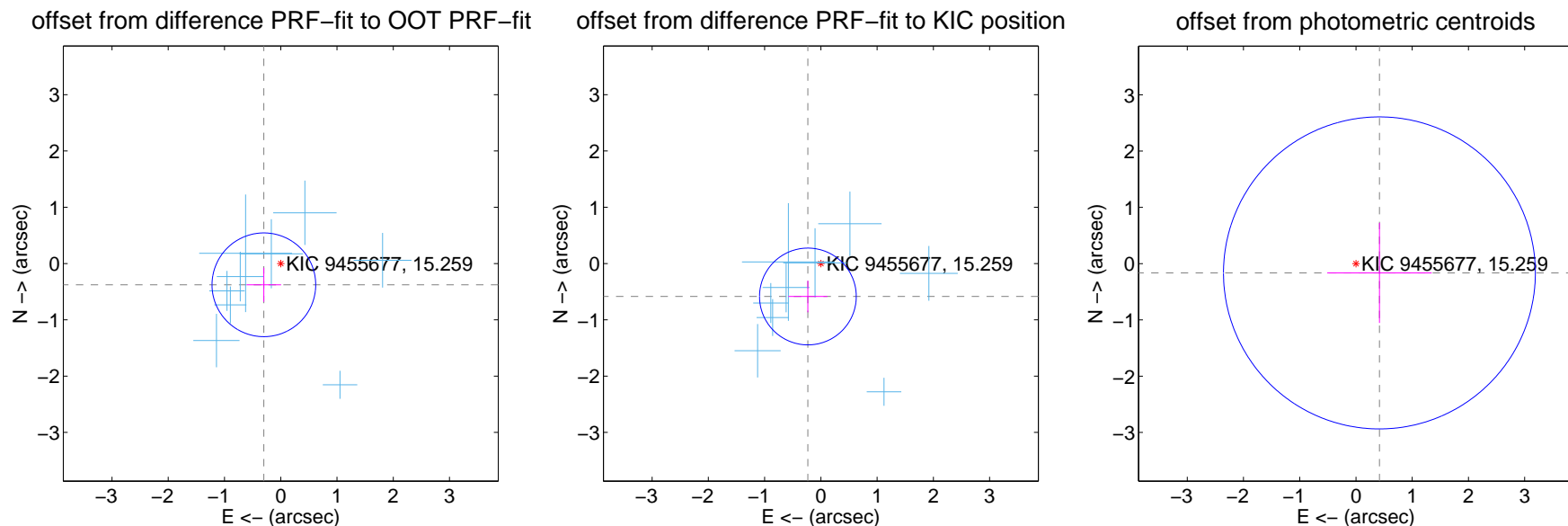
## DV Centroid Data

Supplemental centroid analysis for 009455677-01. Kepler magnitude: 15.26. Transit SNR 15.92

There are 9 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

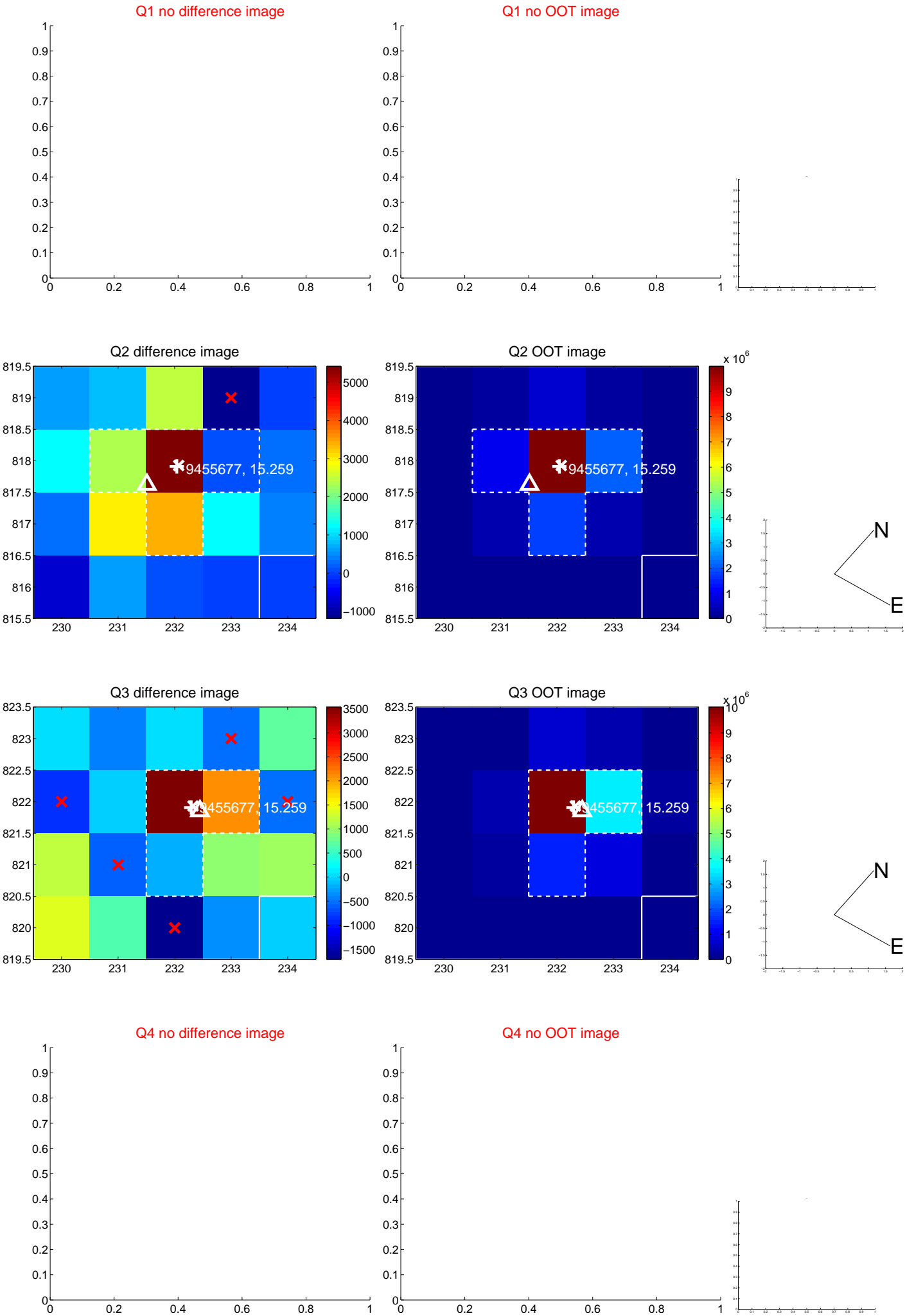
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.482 \pm 0.307$	1.57	$0.300 \pm 0.307$	$-0.378 \pm 0.301$
PRF-fit source offset from KIC position	$0.629 \pm 0.287$	2.19	$0.231 \pm 0.346$	$-0.585 \pm 0.280$
photometric centroid source offset	$0.45 \pm 0.92$	0.49	$-0.42 \pm 0.93$	$-0.17 \pm 0.89$



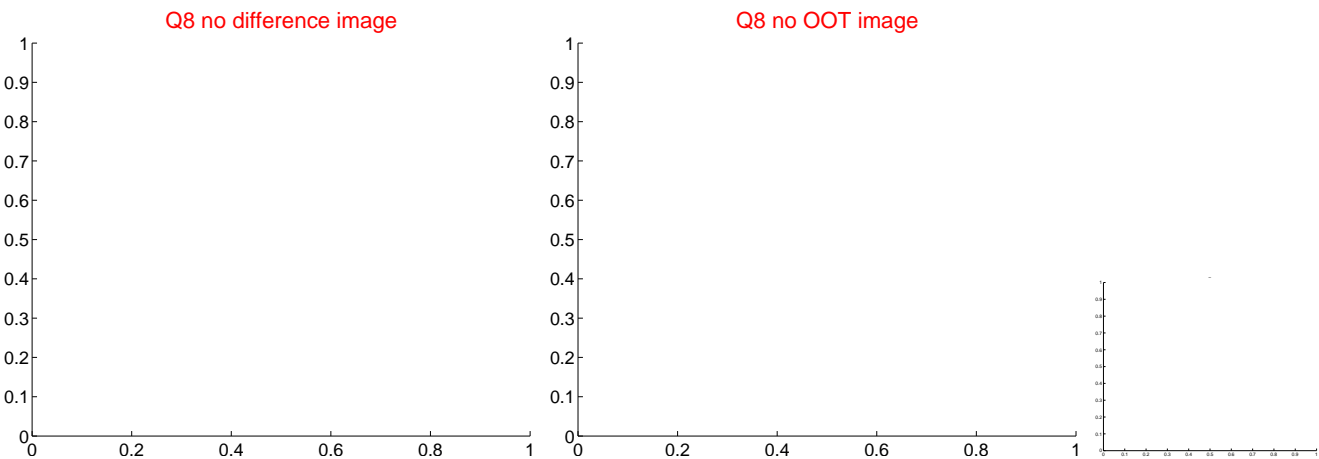
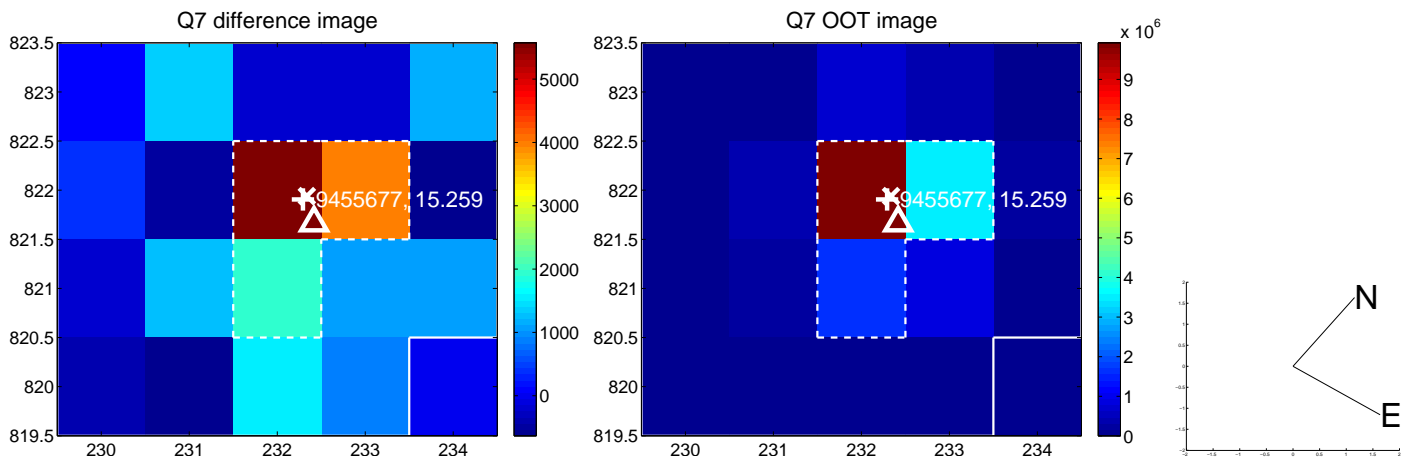
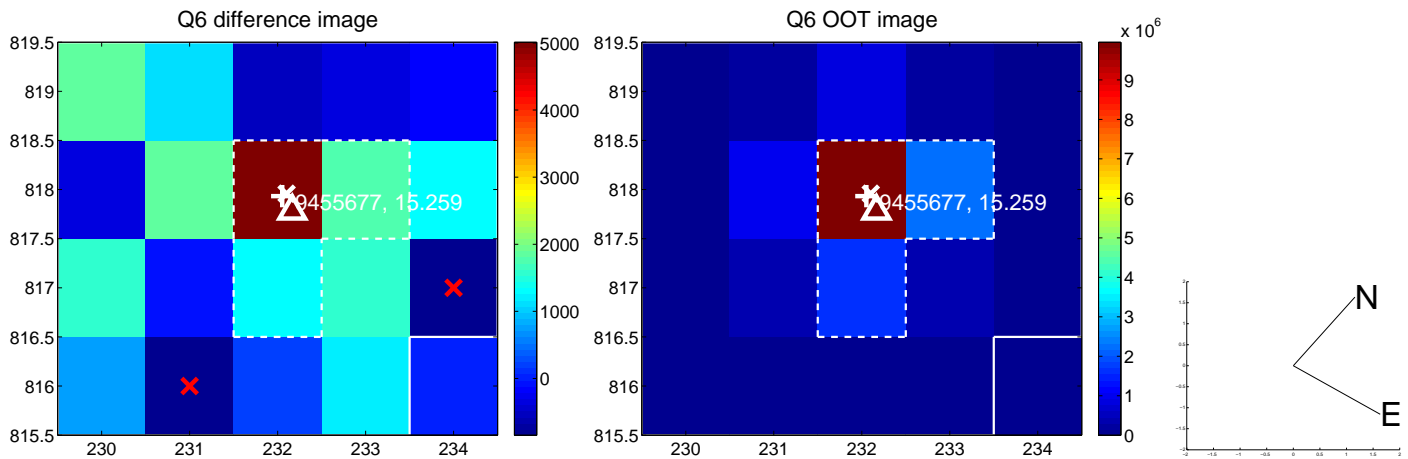
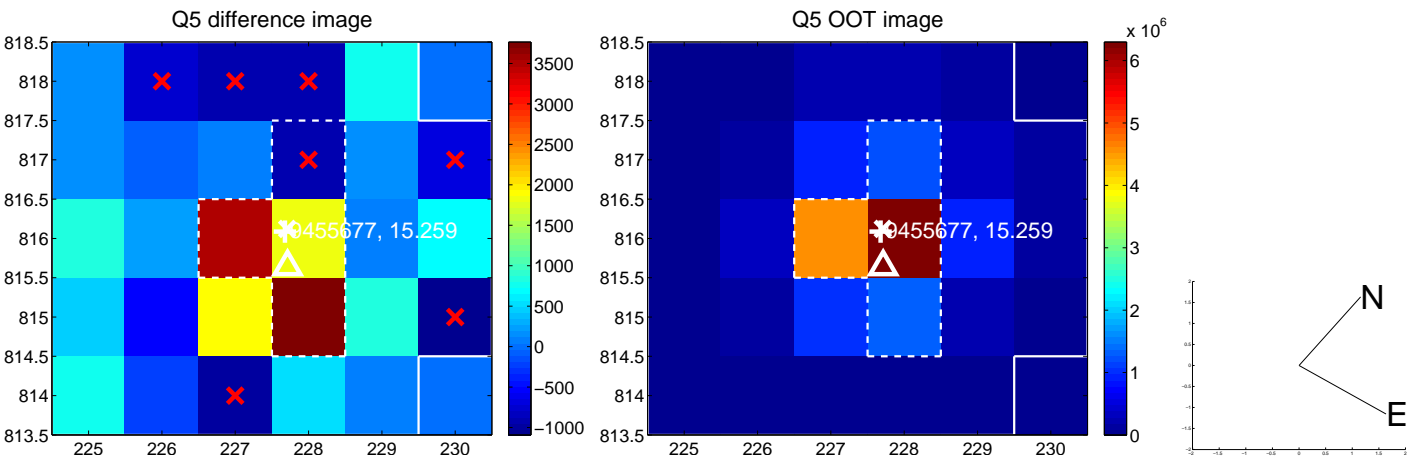
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



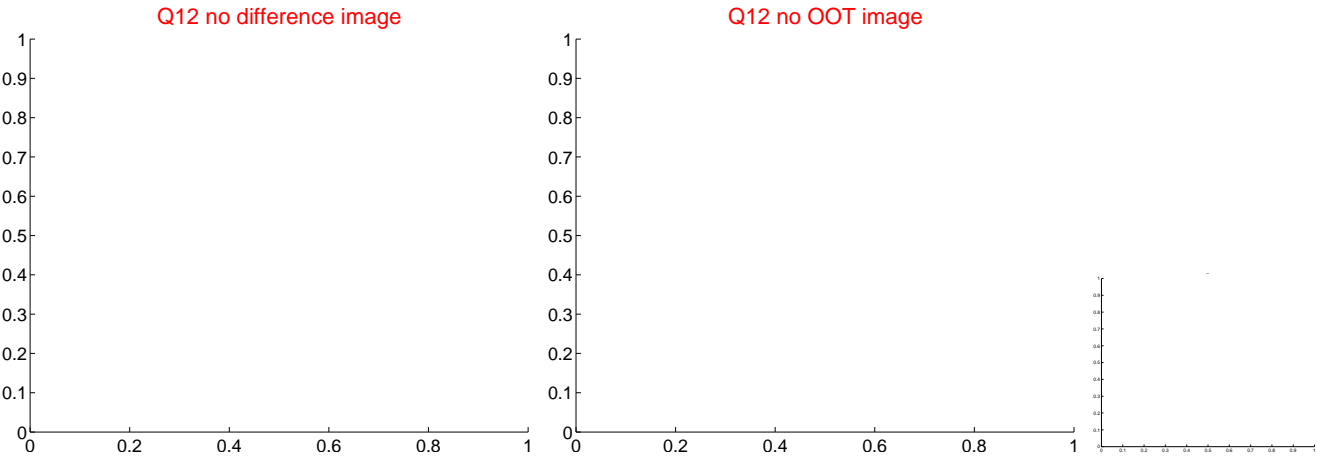
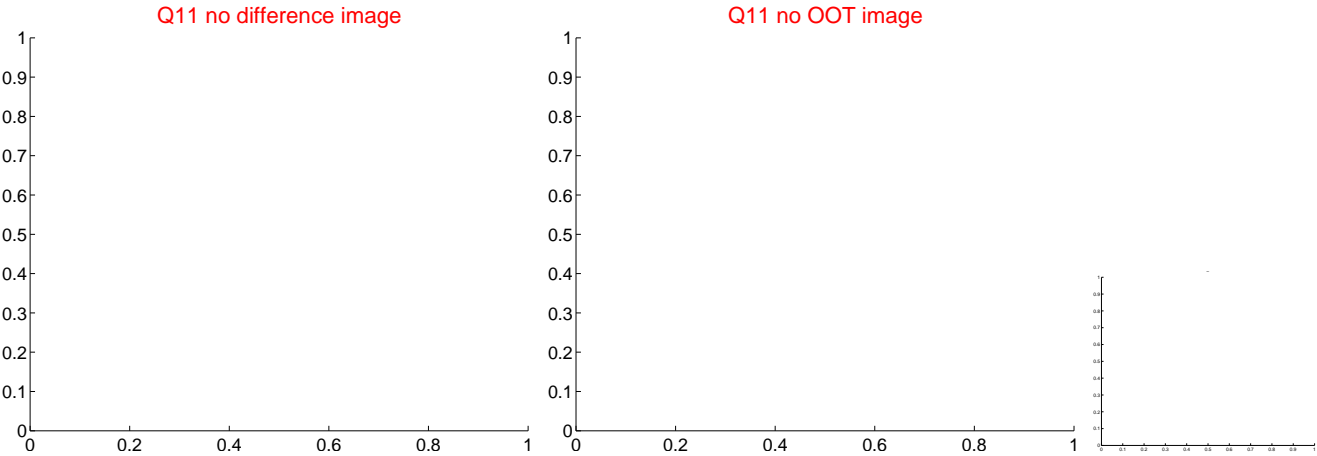
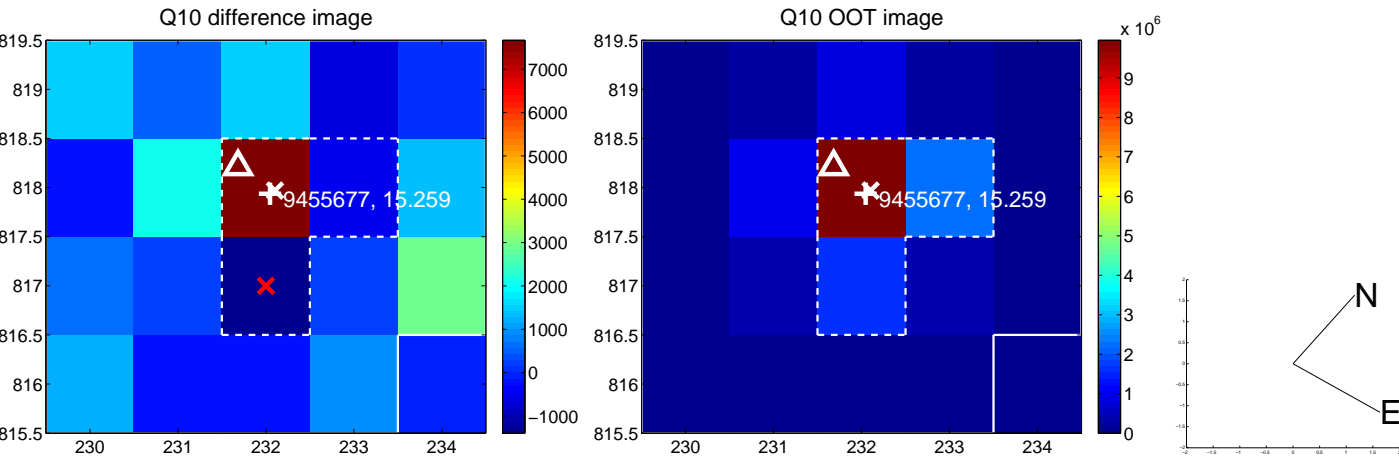
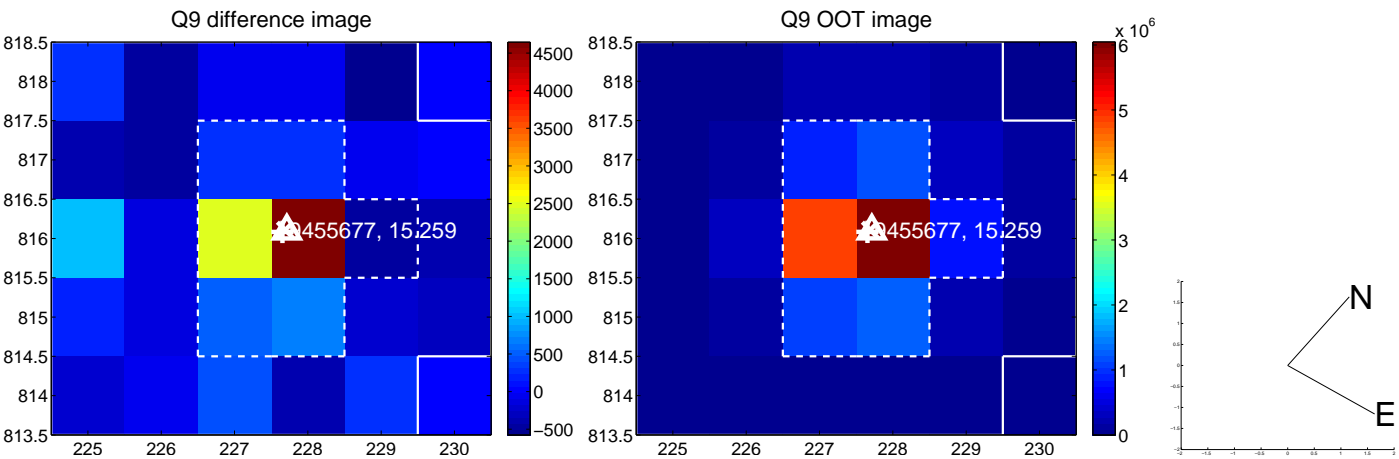
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



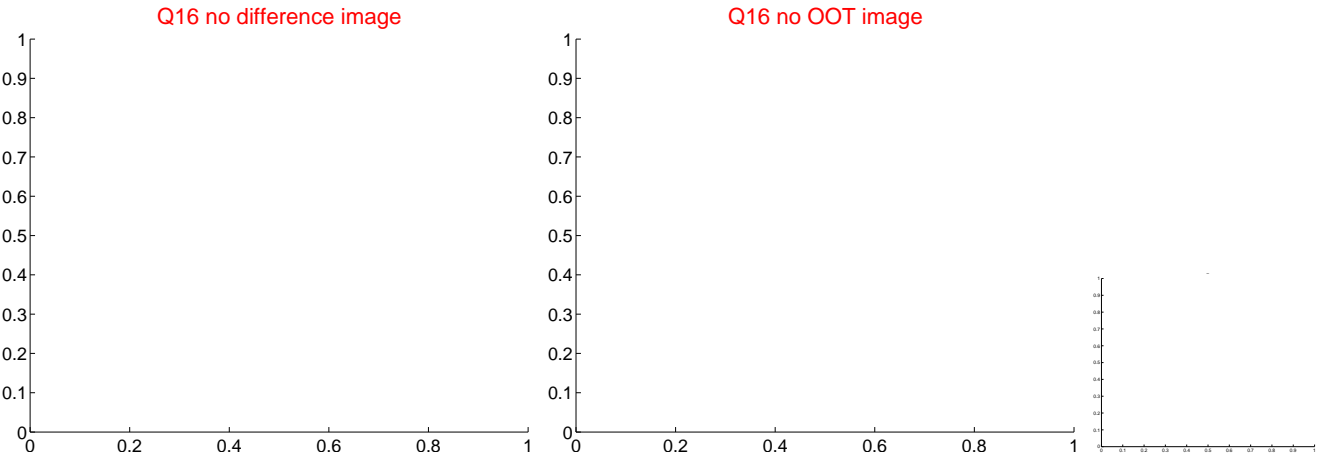
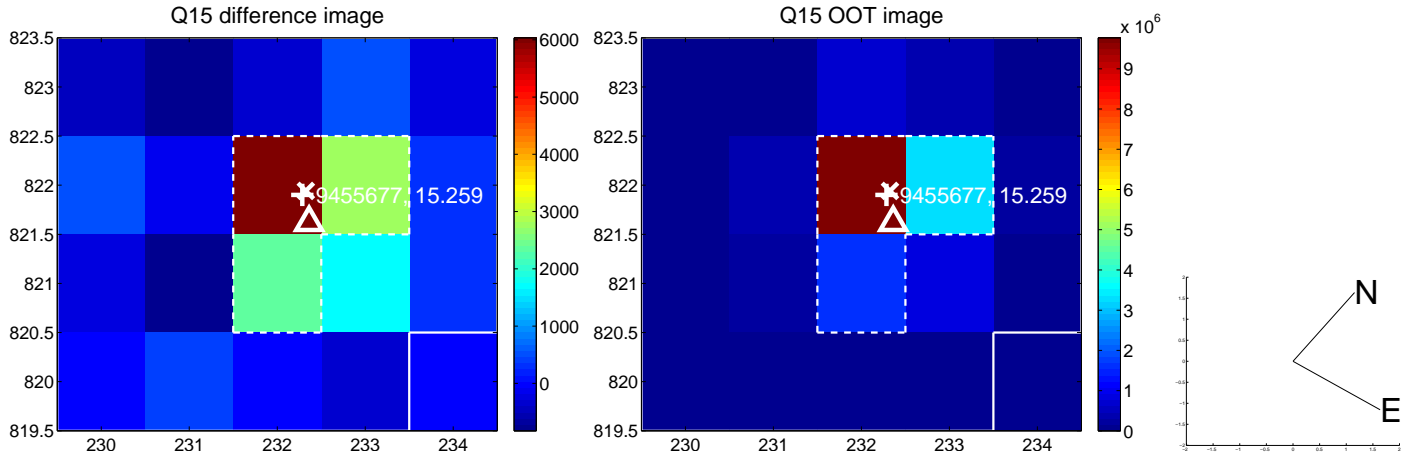
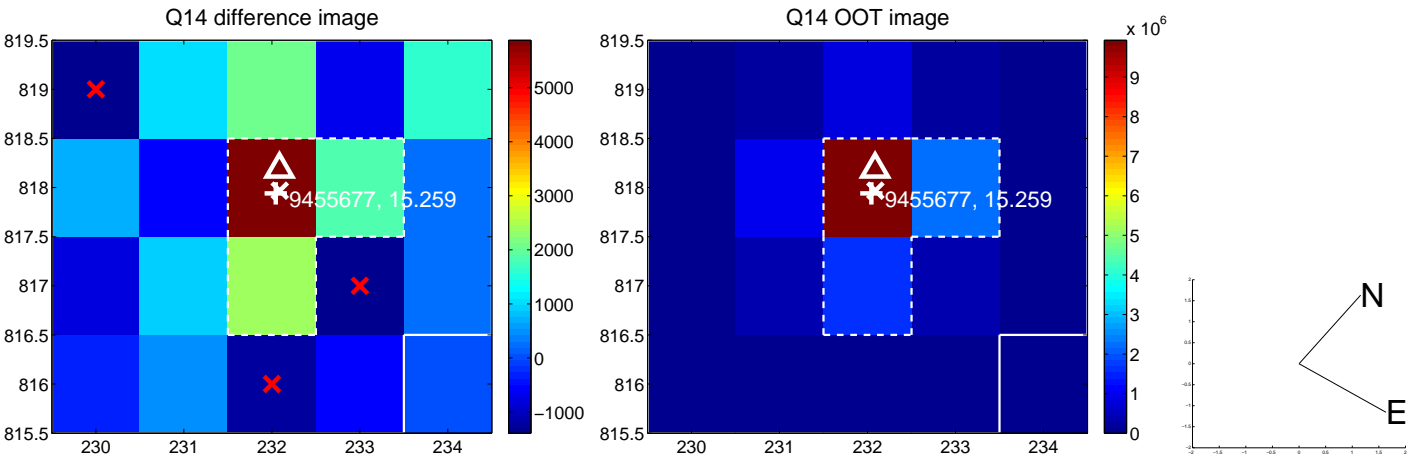
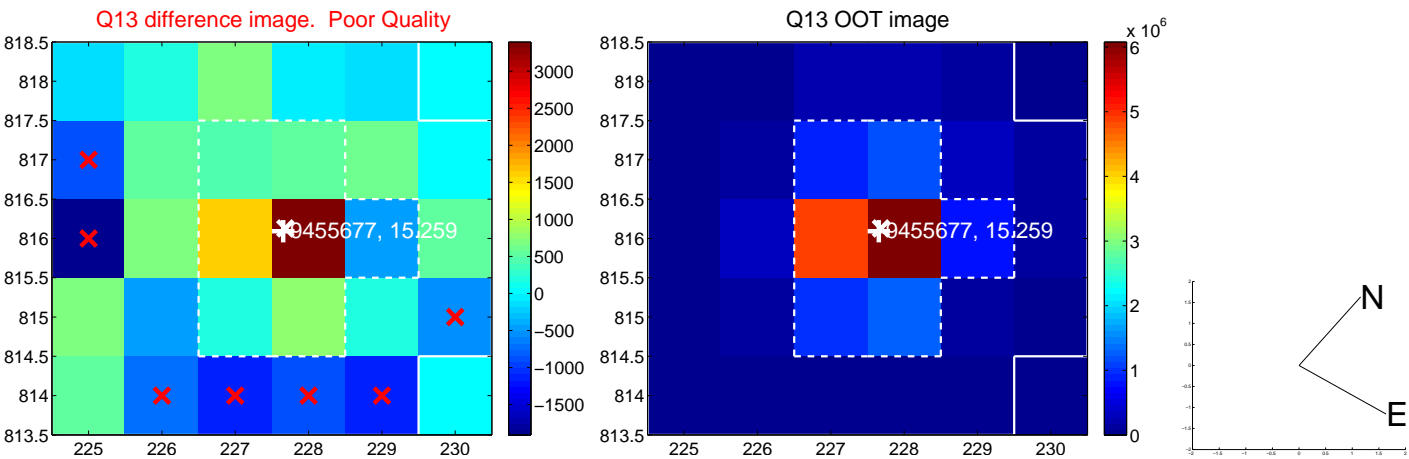
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



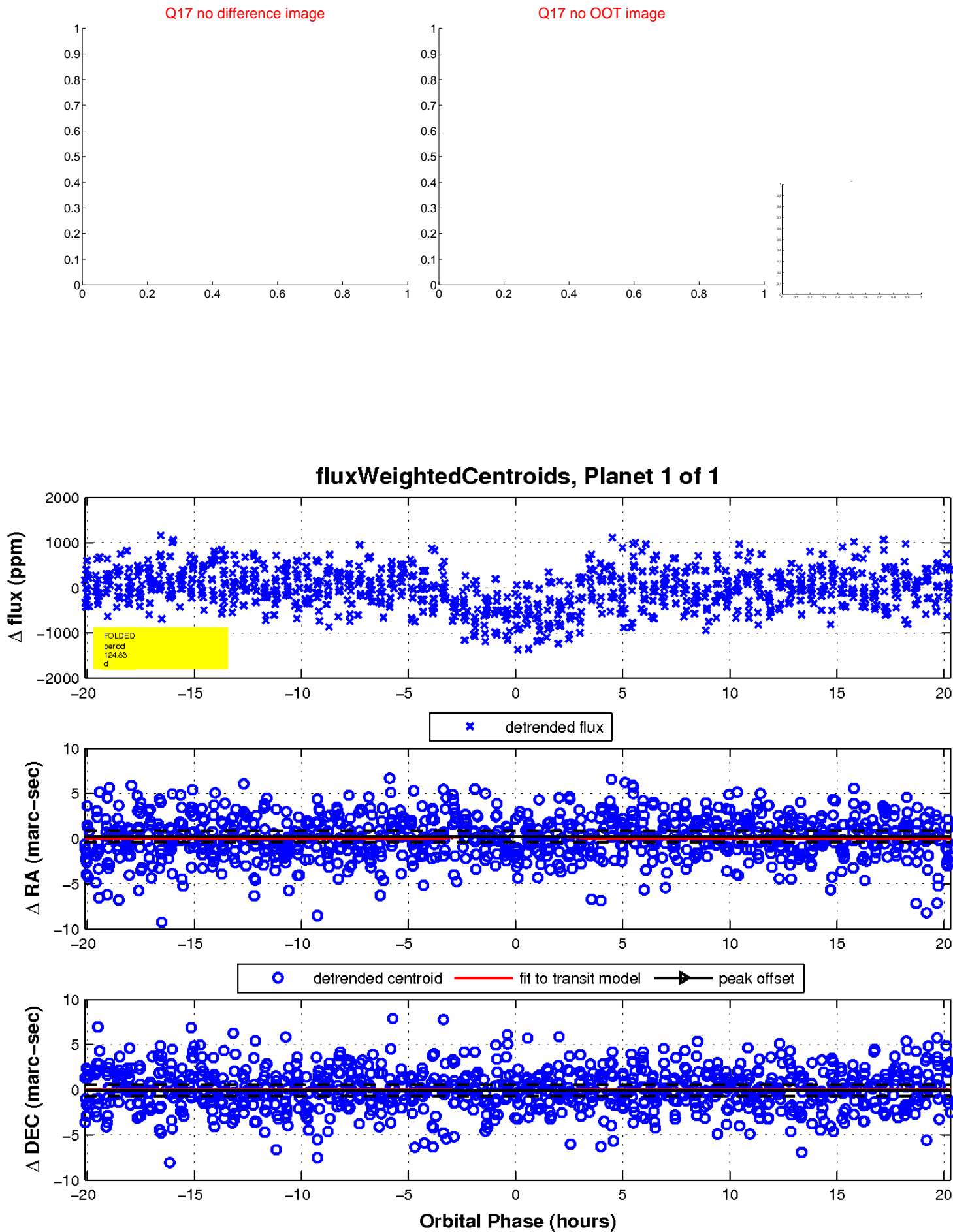
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



# UKIRT Image

Declination

