

# KIC 008115647

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008115647-01	OBS	6970.01	40.771151	158.860060	187.2	5.488	8.2	8.2	1.21	5884	1.85	27.77

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008115647-01	OBS	PC	0.99	0	0	0	0	CENT_FEW_MEAS

**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.

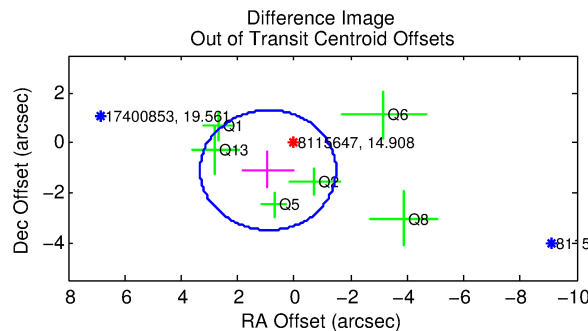
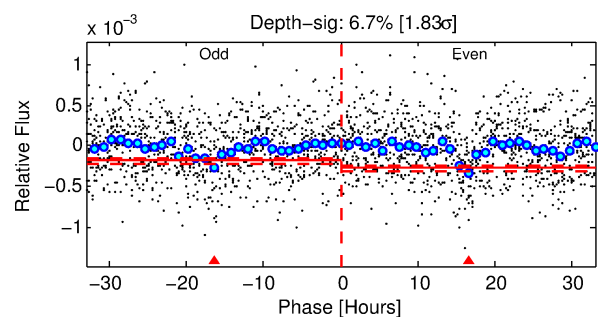
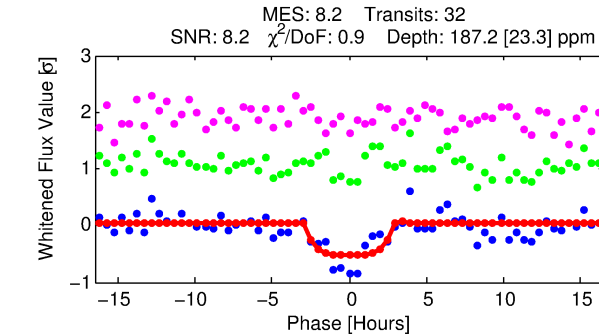
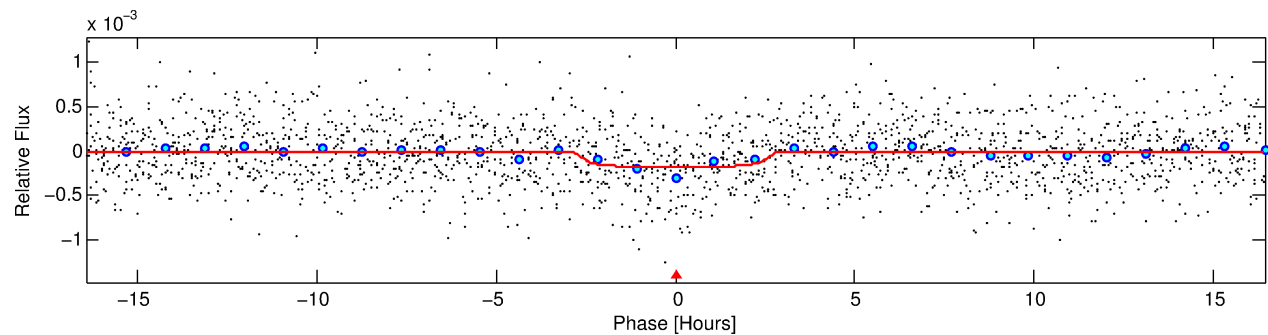
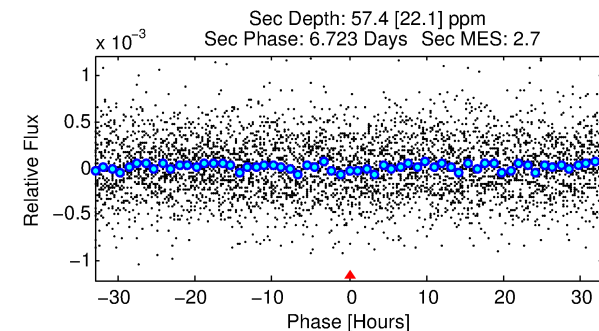
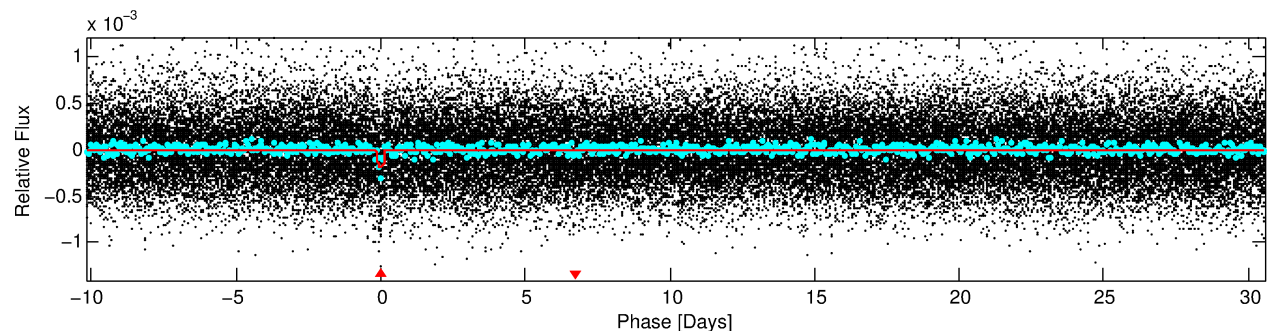
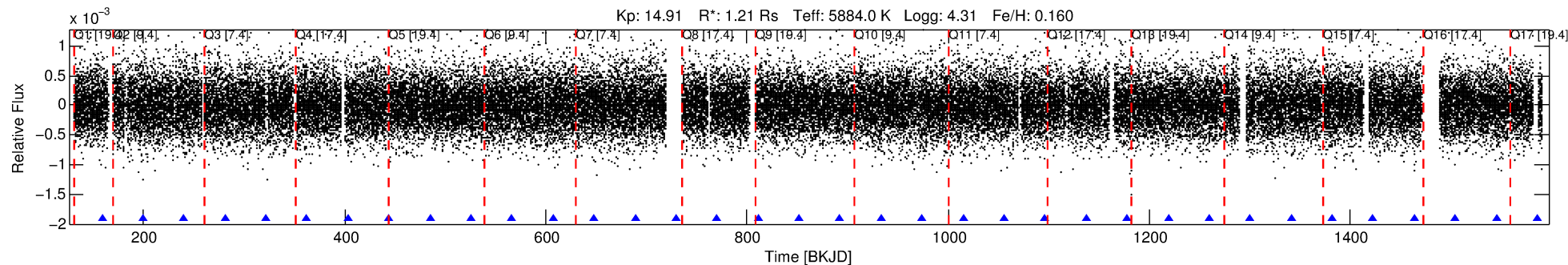
## Ephemeris Match Information For 008115647-01

No Significant Match Found

# DV One-Page Summary

KIC: 8115647 Candidate: 1 of 1 Period: 40.771 d

KOI: K06970 Corr: No Ephemeris Match



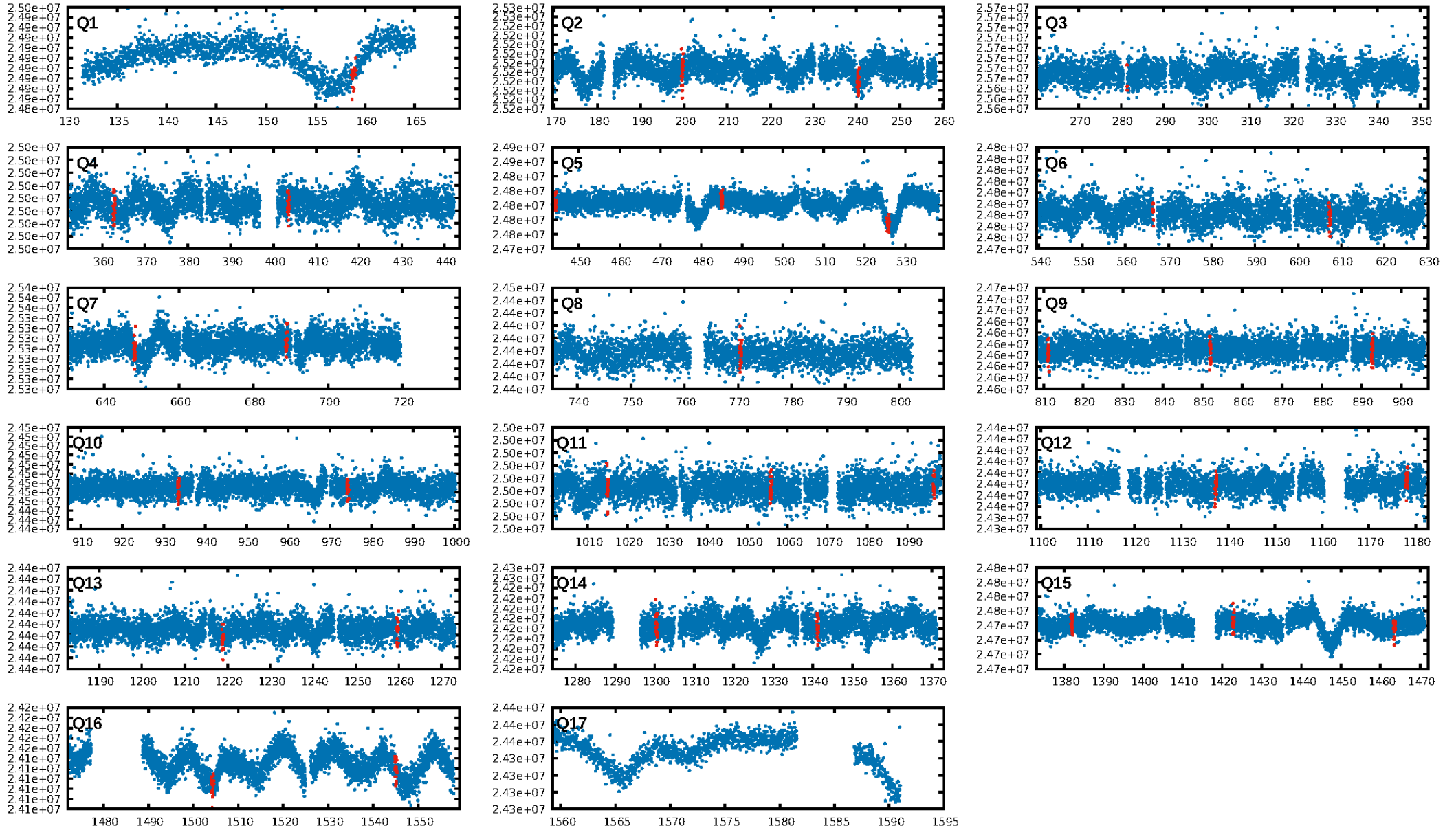
## DV Fit Results:

Period = 40.77115 [0.00068] d  
Epoch = 158.8601 [0.0139] BKJD  
Rp/R\* = 0.0140 [0.0122]  
a/R\* = 34.08 [136.56]  
b = 0.82 [1.65]  
Seff = 27.77 [5.96]  
Teff = 585 [31] K  
Rp = 1.85 [1.64] Re  
a = 0.2379 [0.0335] AU  
Ag = 520.72 [931.15] [0.56σ]  
Teffp = 4323 [1921] K [1.95σ]

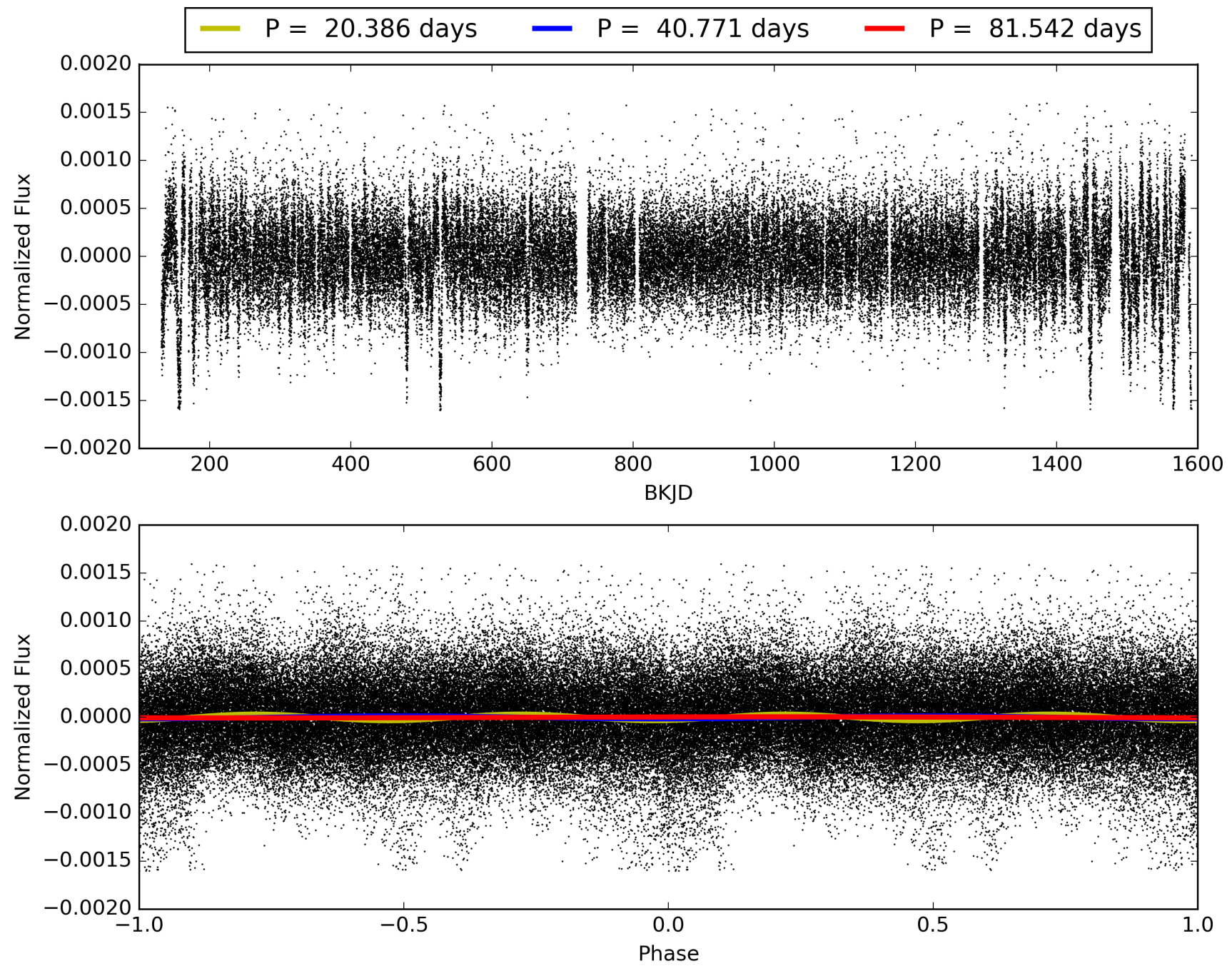
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 87.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.07e-16  
RollingBand-fgt: 1.00 [31/31]  
GhostDiagnostic-chr: 10.1  
Centroid-sig: 36.6%  
Centroid-so: 1.989 arcsec [1.29σ]  
OotOffset-rm: 1.434 arcsec [1.79σ]  
KicOffset-rm: 1.516 arcsec [1.85σ]  
OotOffset-st: 2/0/1/3 [6]  
KicOffset-st: 2/0/1/3 [6]  
DiffImageQuality-fgm: 0.67 [4/6]  
DiffImageOverlap-fno: 1.00 [15/15]

# TCE 008115647-01, PDC Light Curves

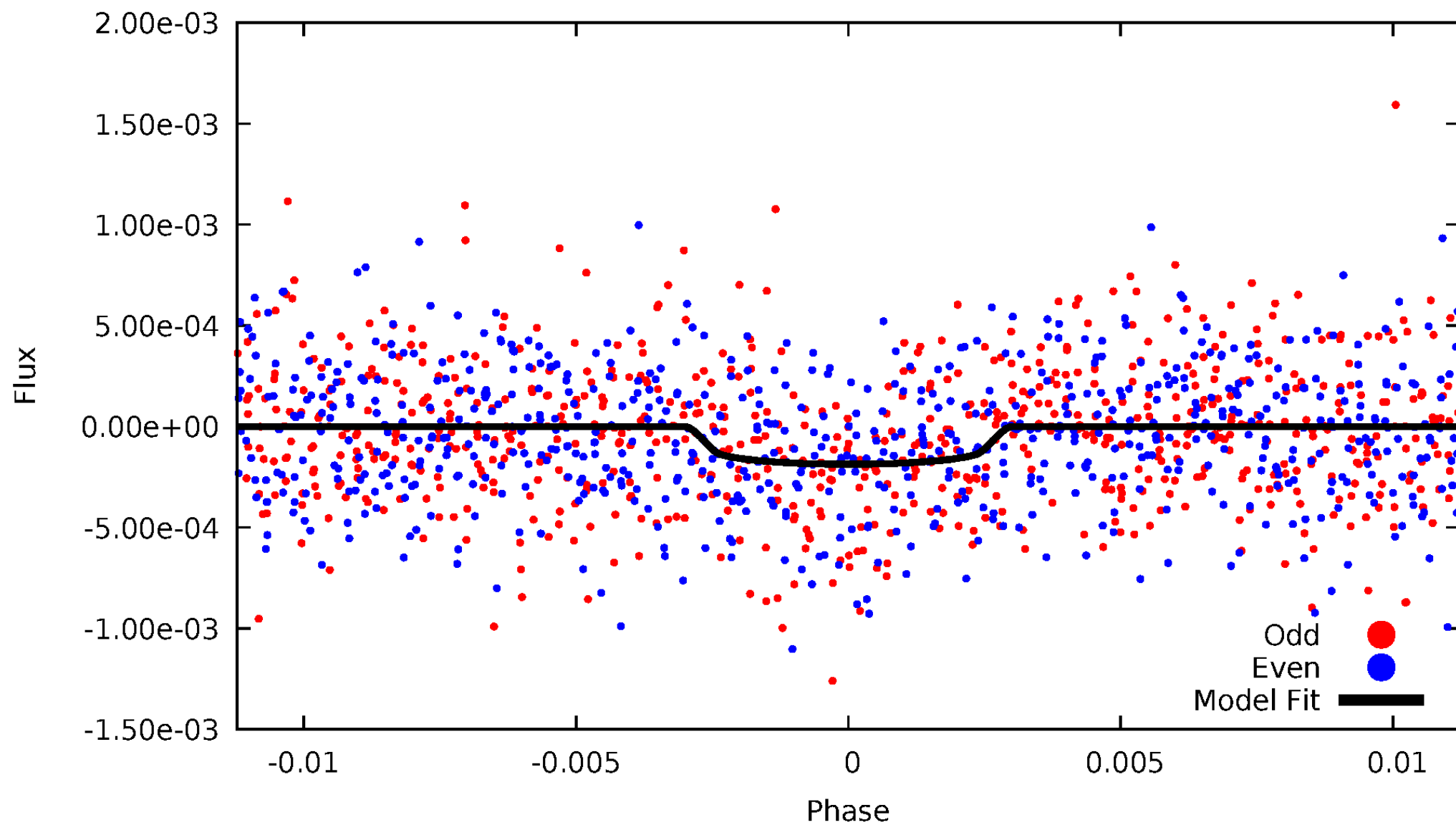


# TCE 008115647-01



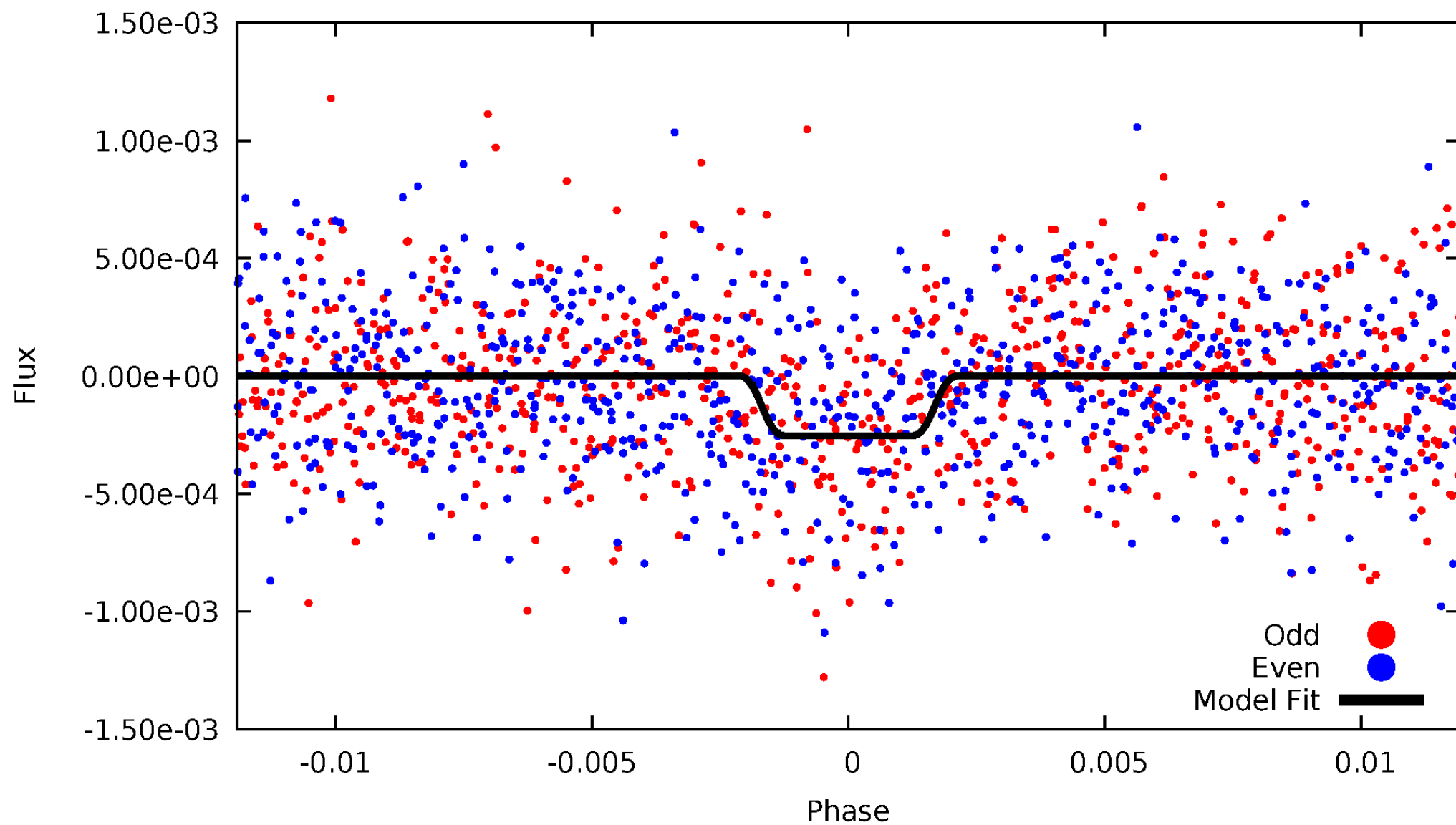
# DV Odd/Even

TCE 008115647-01



# ALT Odd/Even

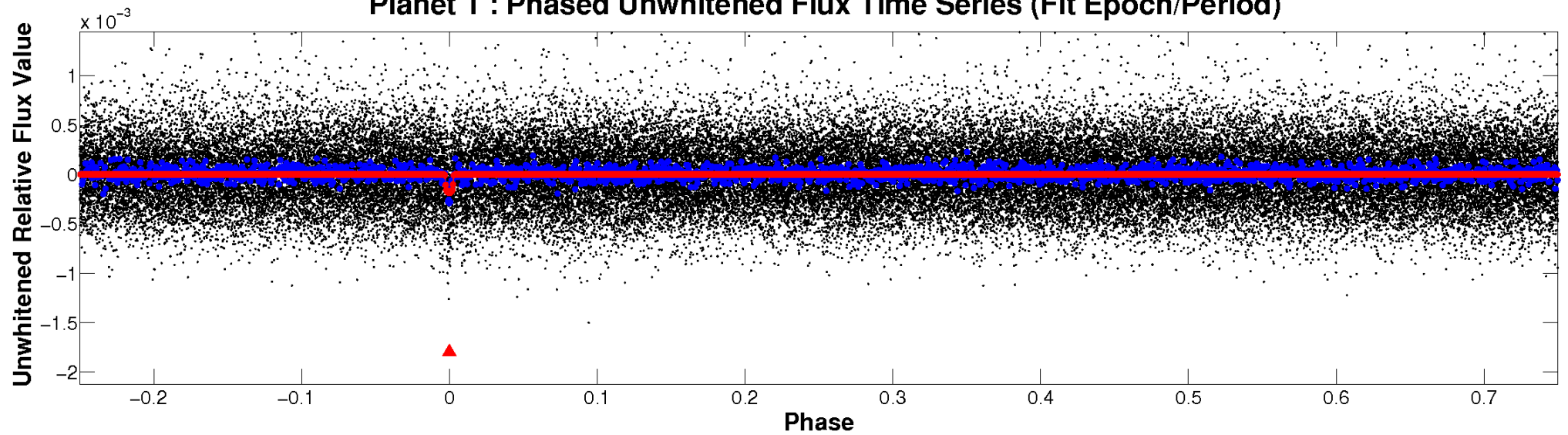
TCE 008115647-01



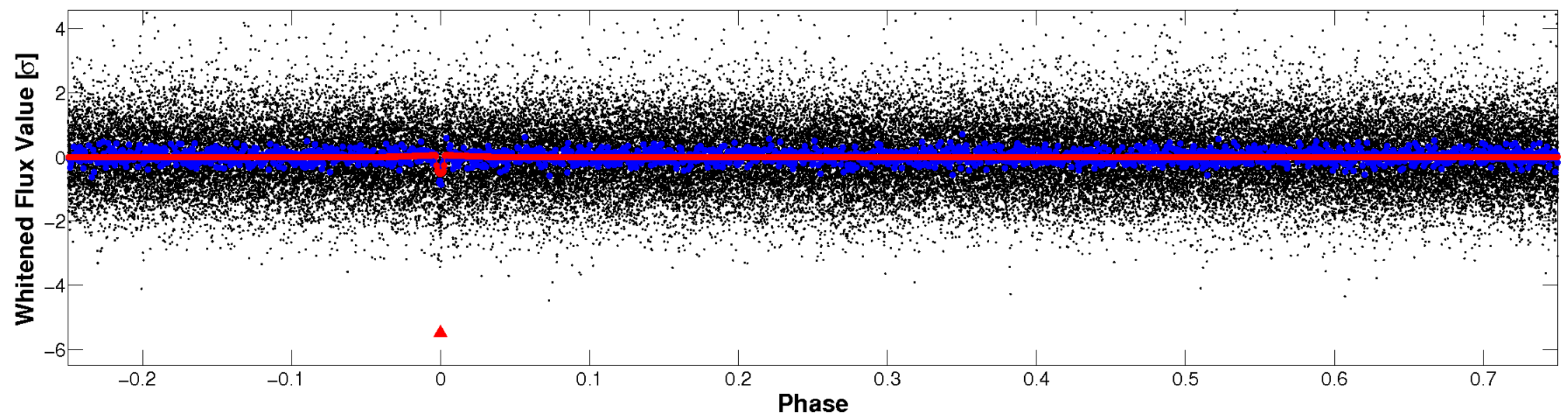


# Non-Whitened Vs. Whitened Light Curve

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

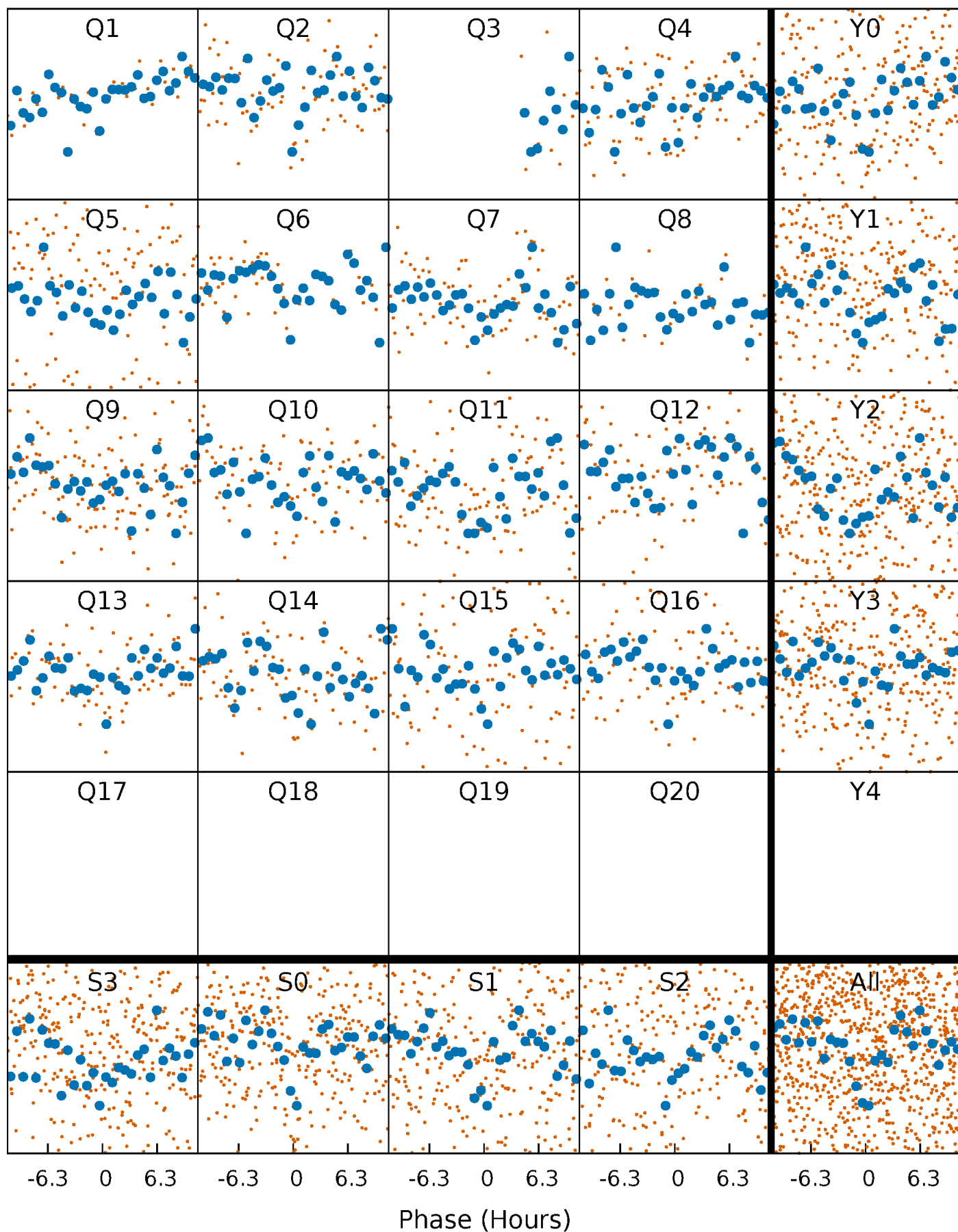


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

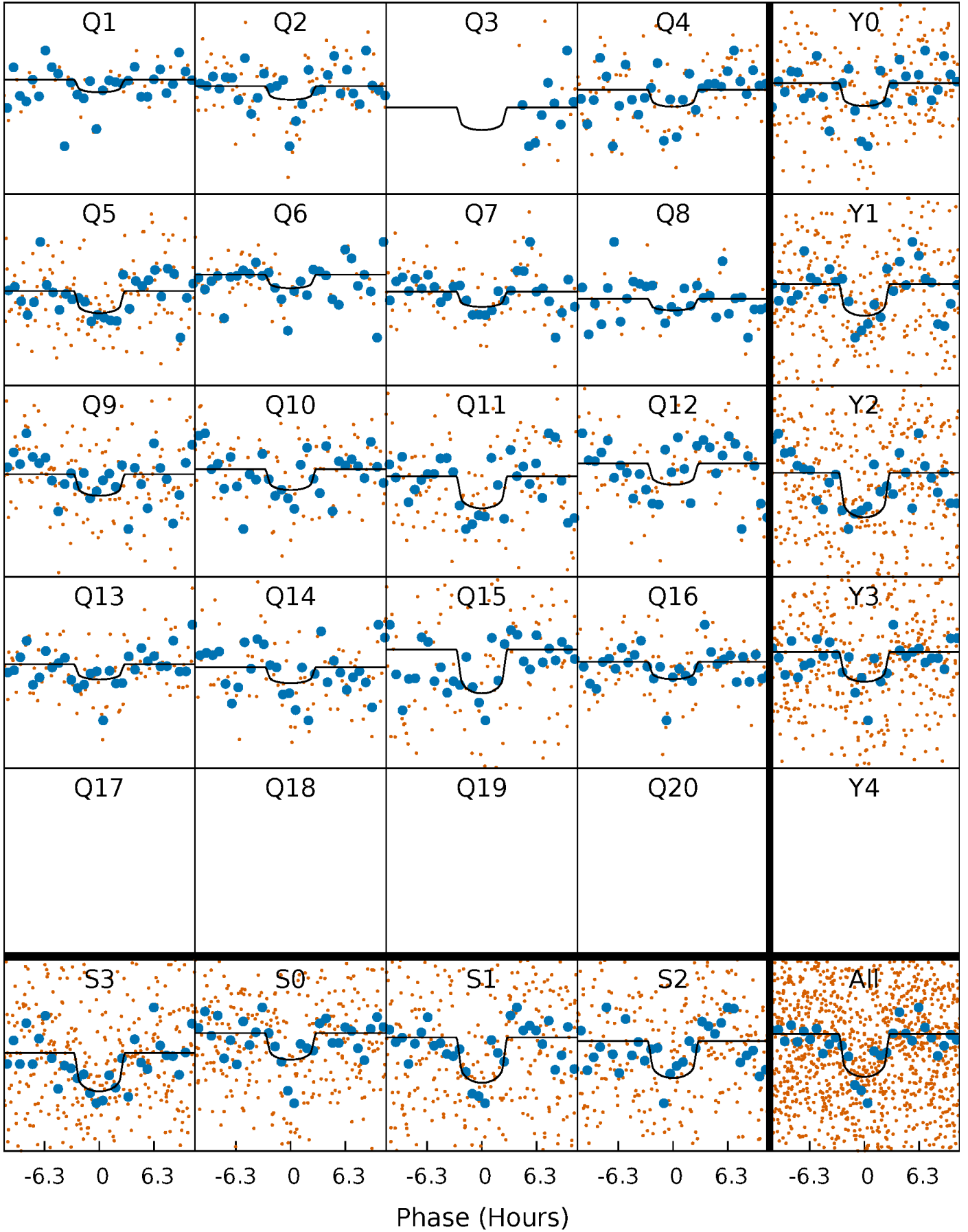
TCE 008115647-01 P= 40.771151 Days  $T_0=158.860060$  (BKJD)





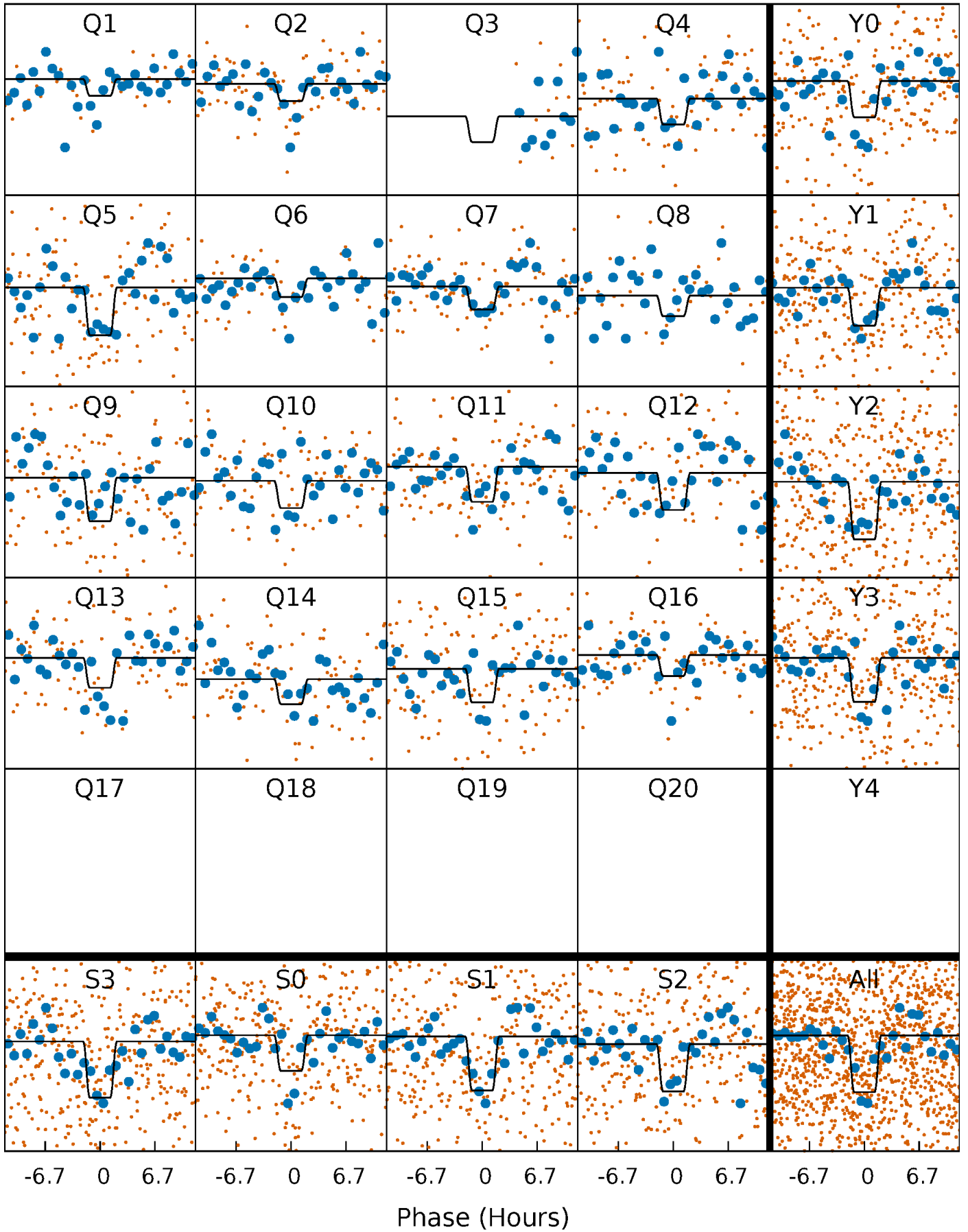
# DV Quarter-Phased Transit Curves

TCE 008115647-01 P= 40.771151 Days  $T_0=158.860060$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

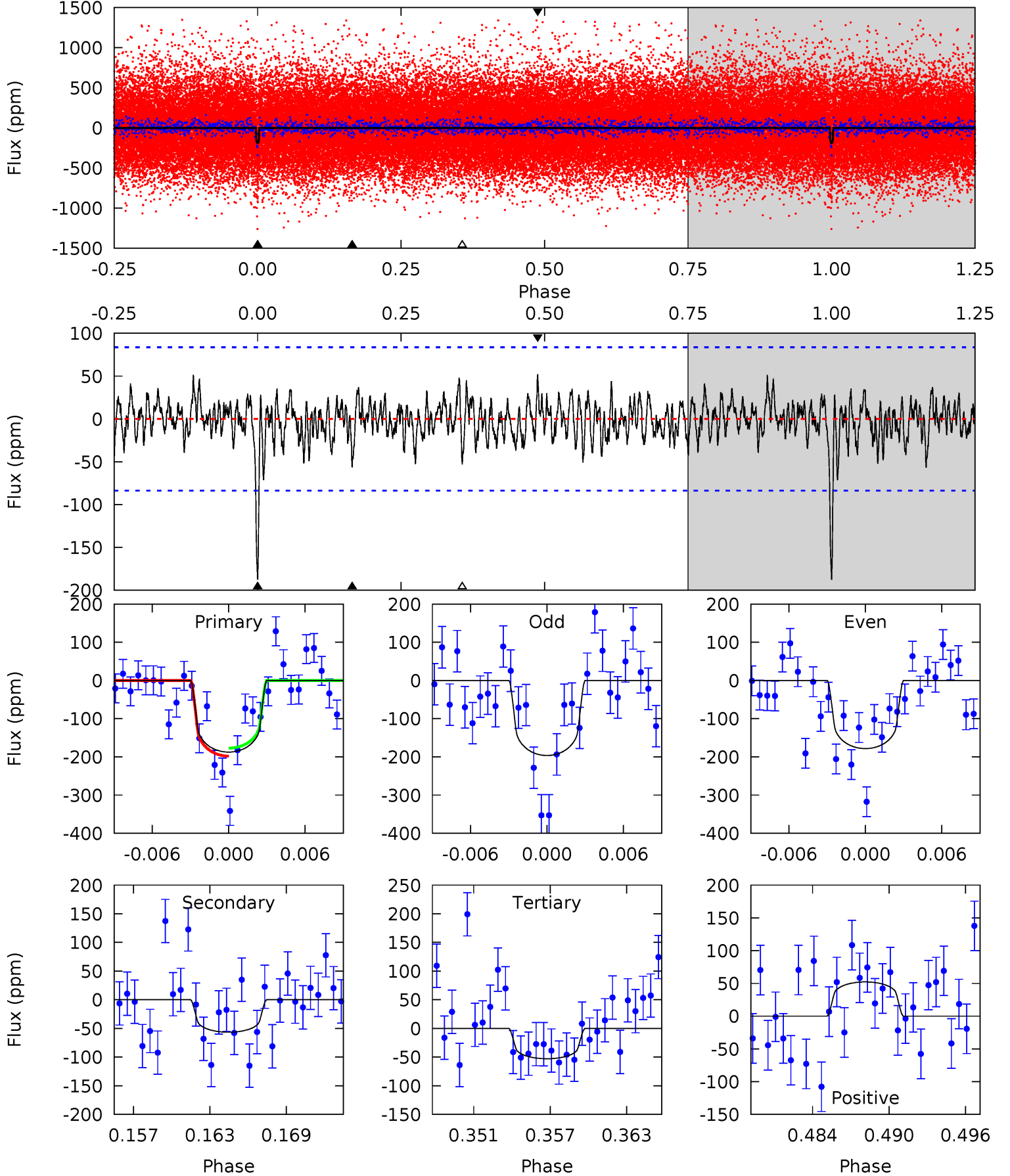
TCE 008115647-01 P= 40.770163 Days  $T_0=158.868826$  (BKJD)



# DV Model-Shift Uniqueness Test

008115647-01,  $P = 40.771151$  Days,  $E = 118.088909$  Days

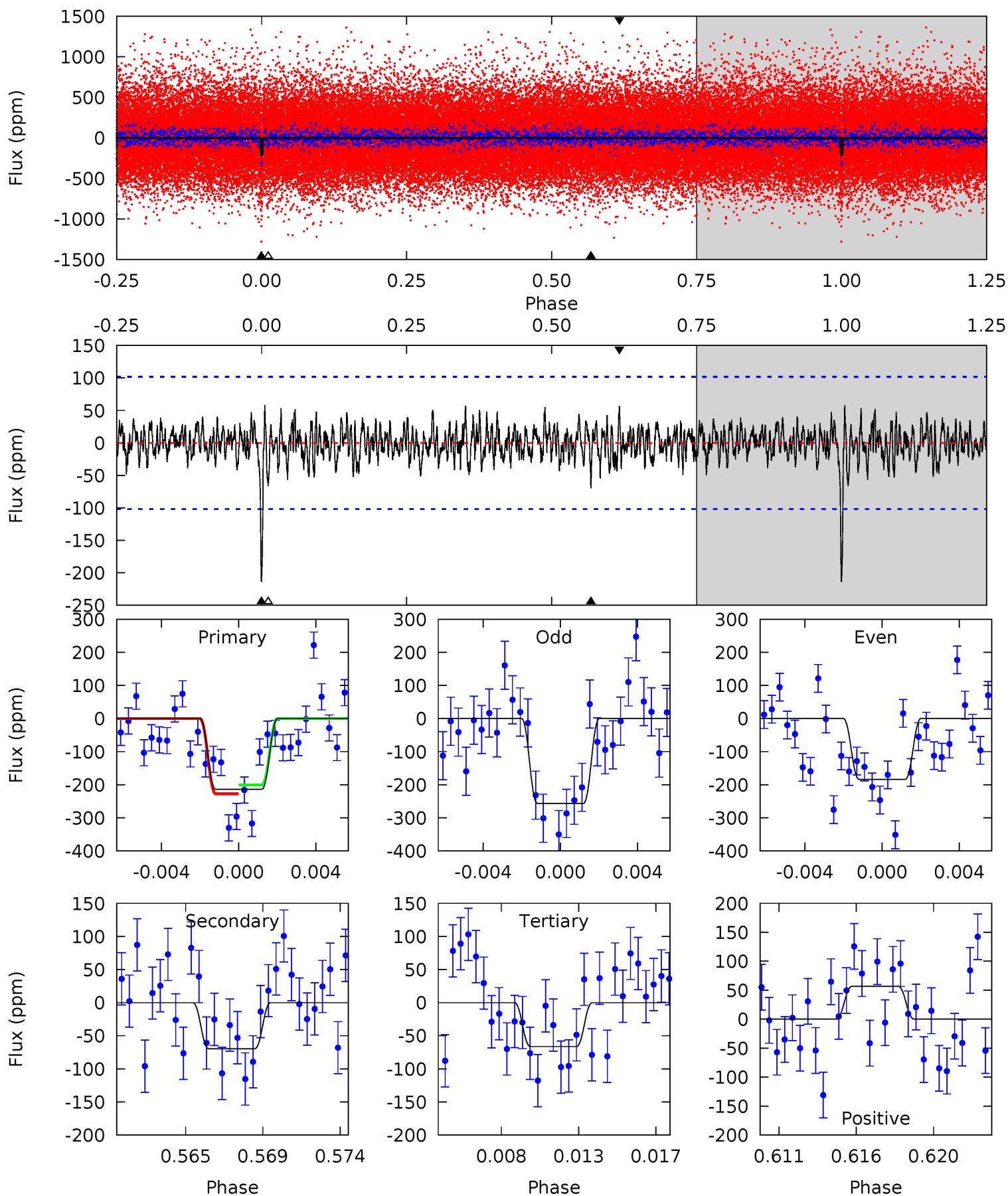
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	3.46	3.24	3.19	5.12	2.75	1.12	8.23	8.27	0.23	0.27	0.56	0.95	0.22	0.64



# Alt Model-Shift Uniqueness Test

008115647-01, P = 40.770163 Days, E = 118.098663 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
10.9	3.55	3.38	2.89	5.19	2.86	1.02	7.52	8.00	0.17	0.65	1.85	1.22	0.21	0.68



### Stellar Parameters For KIC 008115647

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5884^{+70}_{-79}$	$4.306^{+0.115}_{-0.115}$	$0.160^{+0.150}_{-0.150}$	$1.210^{+0.199}_{-0.163}$	$1.081^{+0.070}_{-0.070}$	$0.859^{+0.445}_{-0.294}$
	+1%/-1%	+3%/-3%	+94%/-94%	+16%/-13%	+6%/-6%	+52%/-34%
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 008115647-01 / KOI 6970.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-57 \pm 16$	$2.09^{+1.54}_{-1.32}$	$818^{+41}_{-35}$	$4275^{+2201}_{-734}$	$395^{+2341}_{-271}$
Alt.	$-70 \pm 20$	$2.27^{+1.72}_{-1.32}$	$816^{+36}_{-32}$	$4267^{+2132}_{-718}$	$402^{+2131}_{-271}$

$T_{max}$  = 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

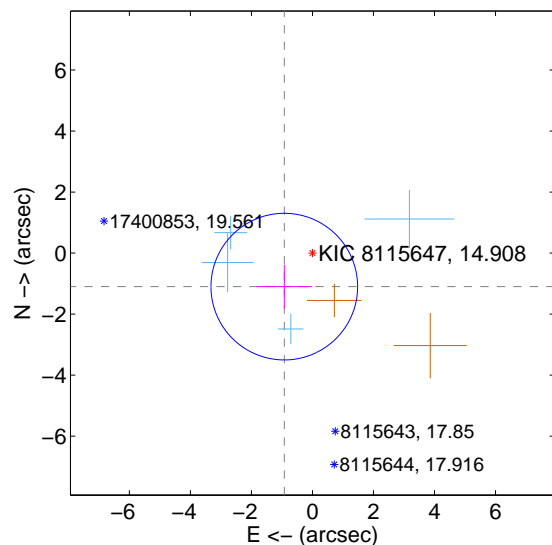
Supplemental centroid analysis for 008115647-01. Kepler magnitude: 14.91. Transit SNR 8.25

There are 4 quarters with good PRF difference image offsets

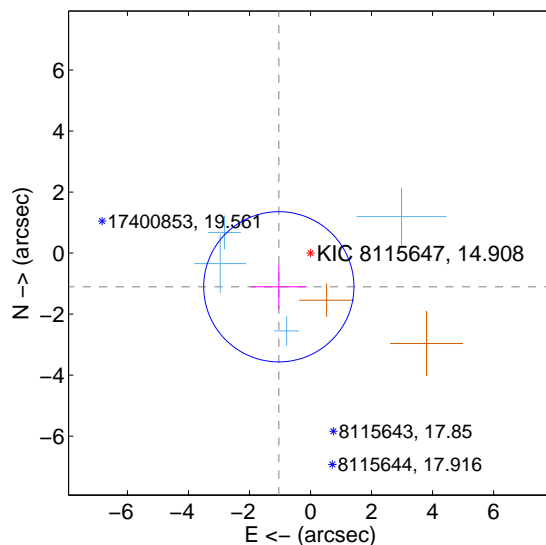
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.434 \pm 0.801$	1.79	$0.922 \pm 0.906$	$-1.099 \pm 0.717$
PRF-fit source offset from KIC position	$1.516 \pm 0.820$	1.85	$1.038 \pm 0.912$	$-1.104 \pm 0.730$
photometric centroid source offset	$1.99 \pm 1.54$	1.29	$-1.93 \pm 1.55$	$-0.48 \pm 1.44$

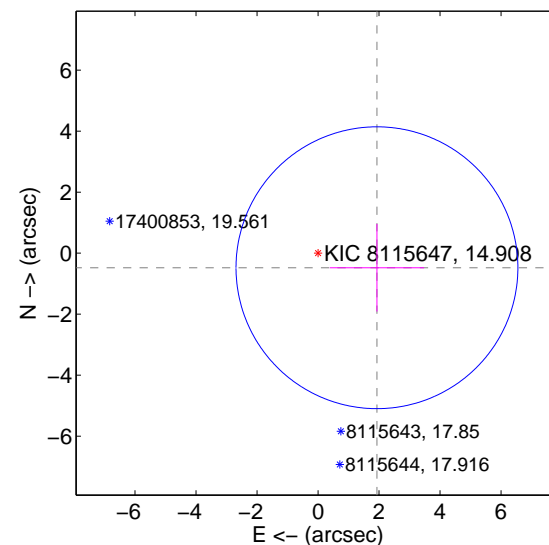
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

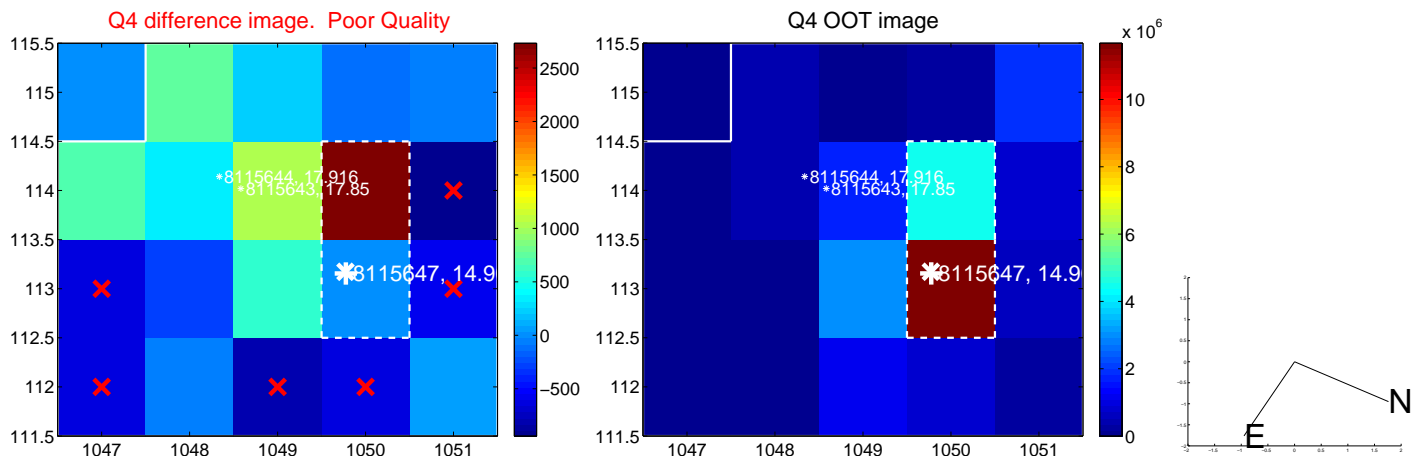
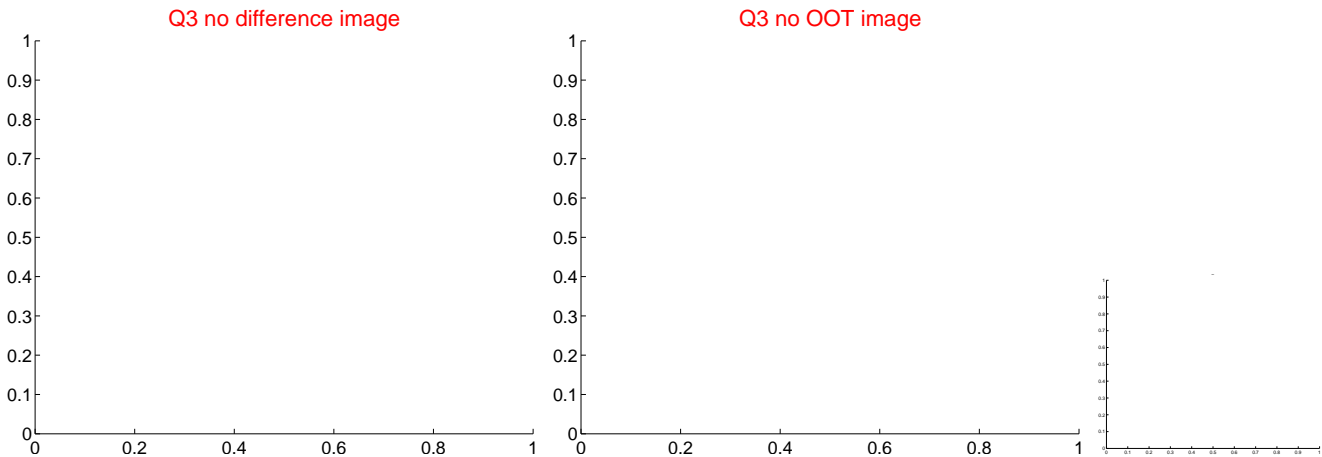
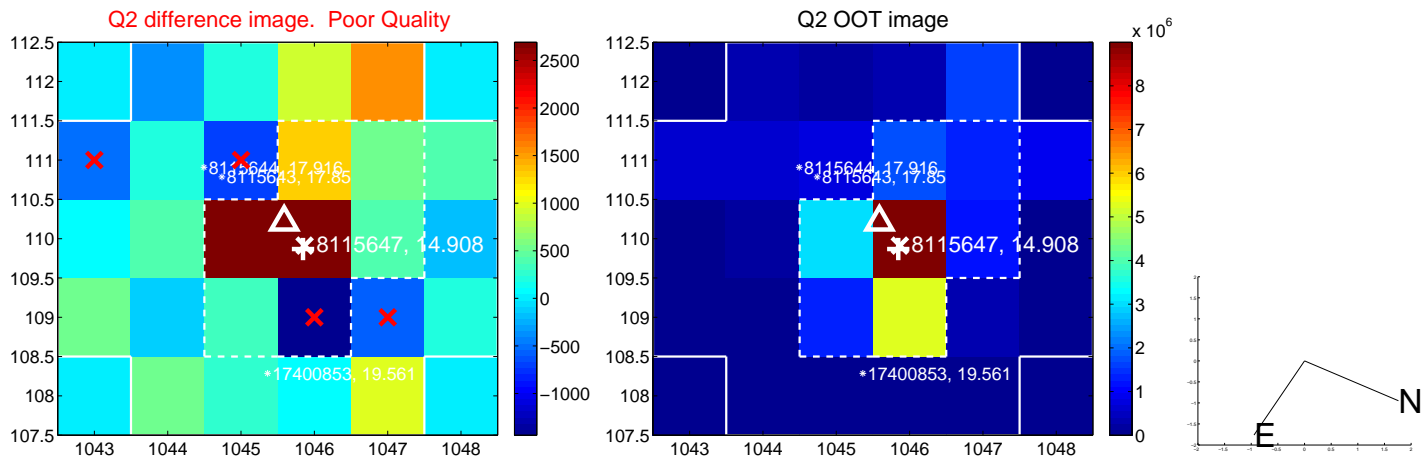
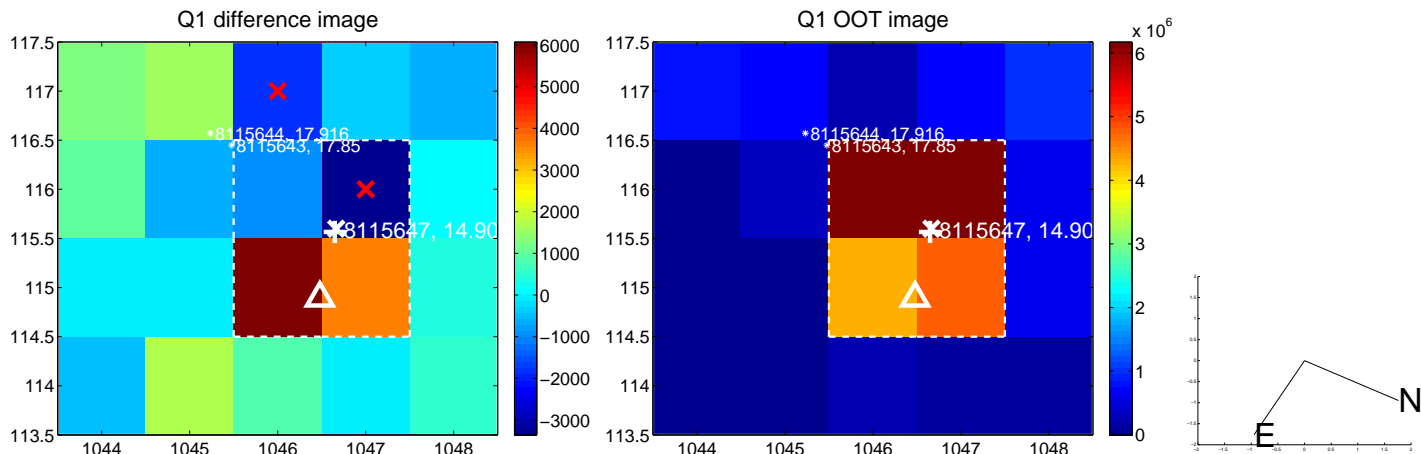


offset from photometric centroids

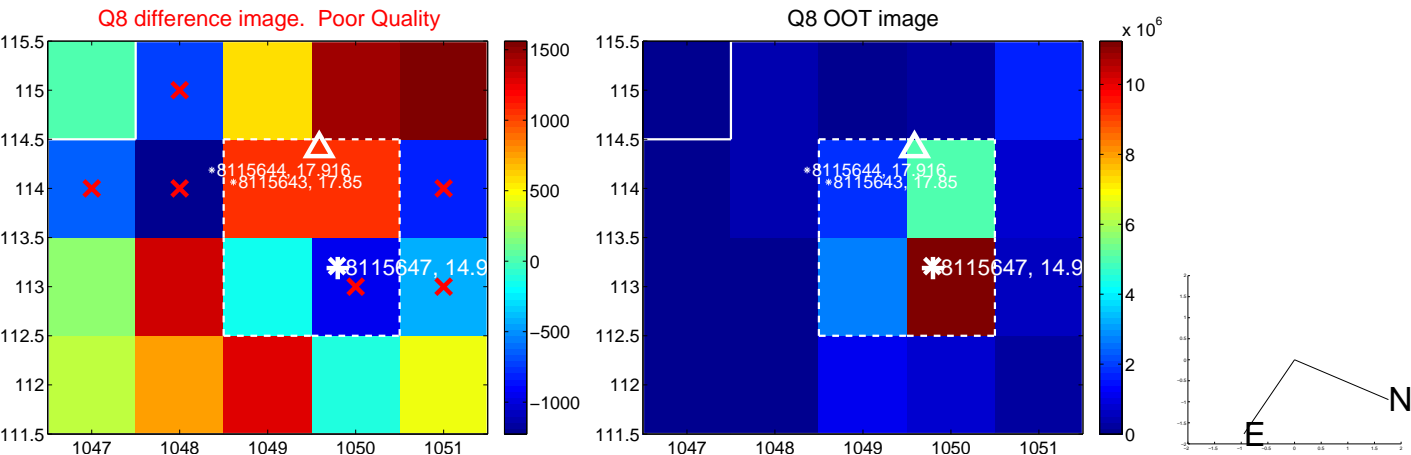
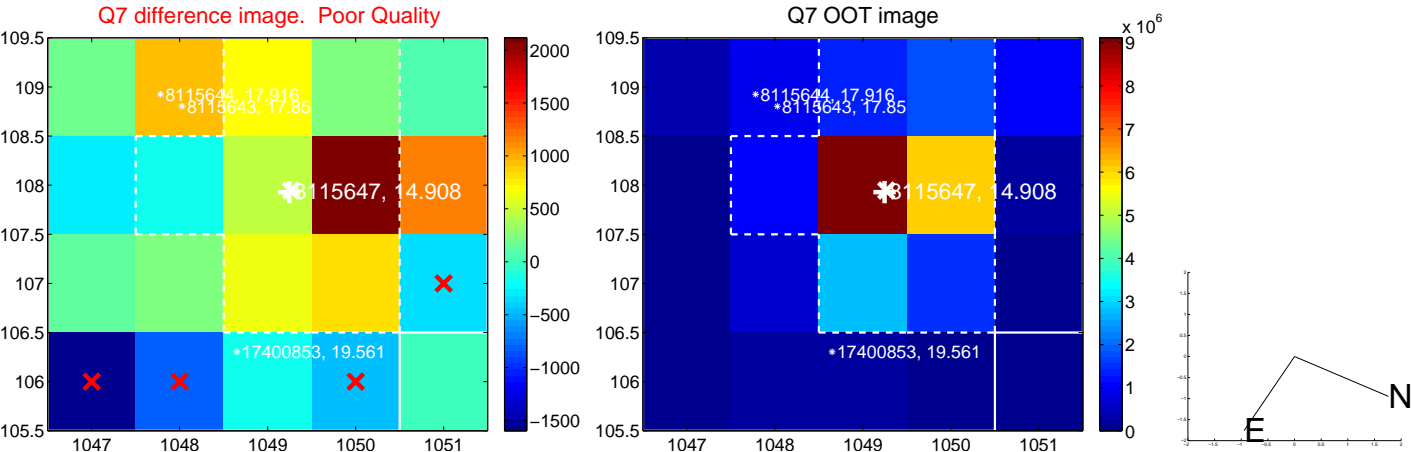
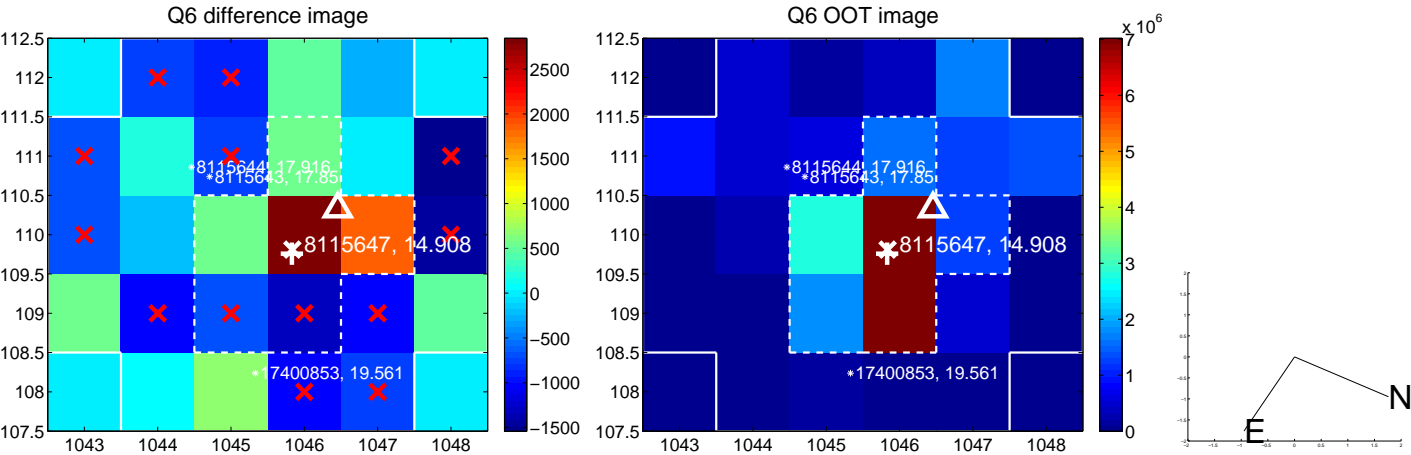
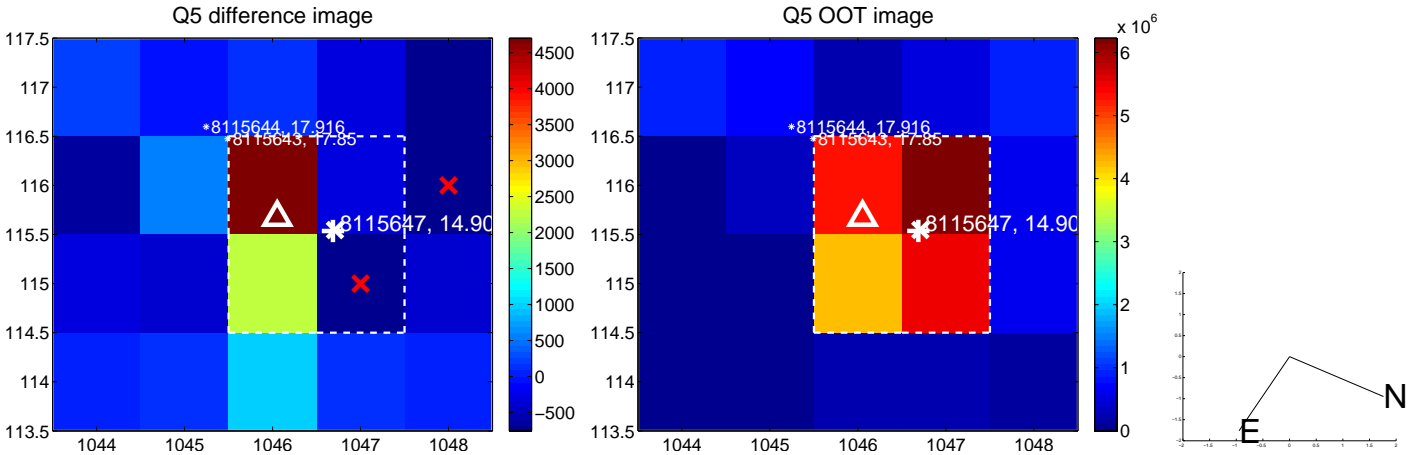


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

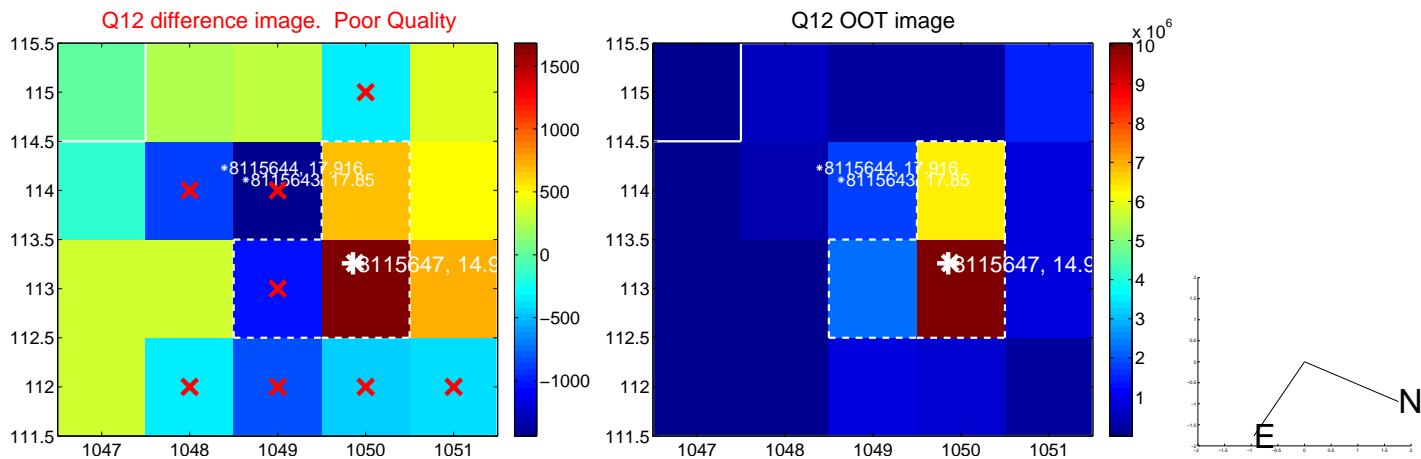
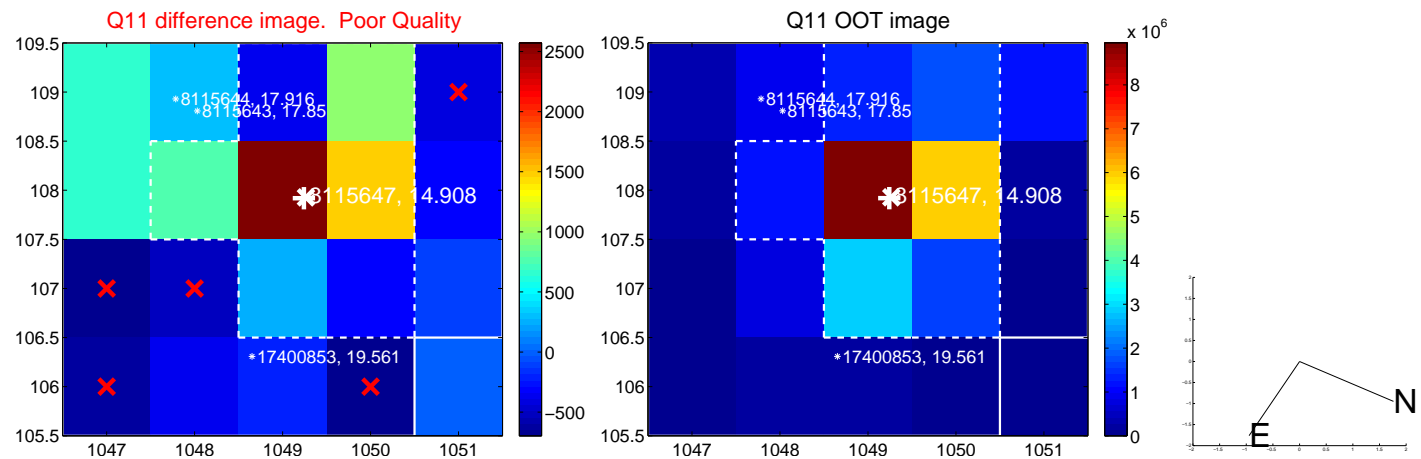
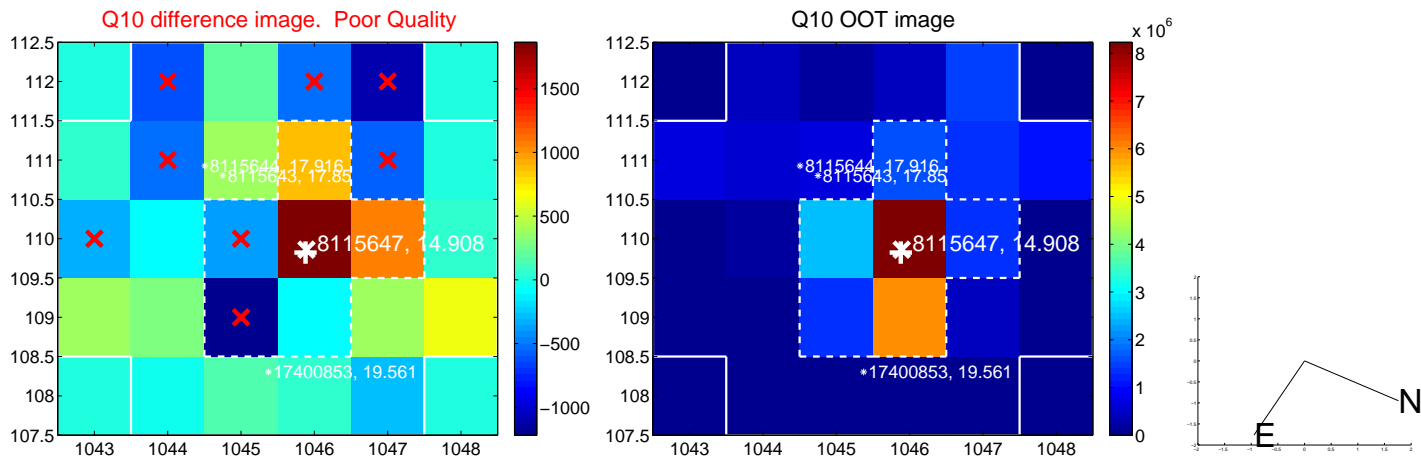
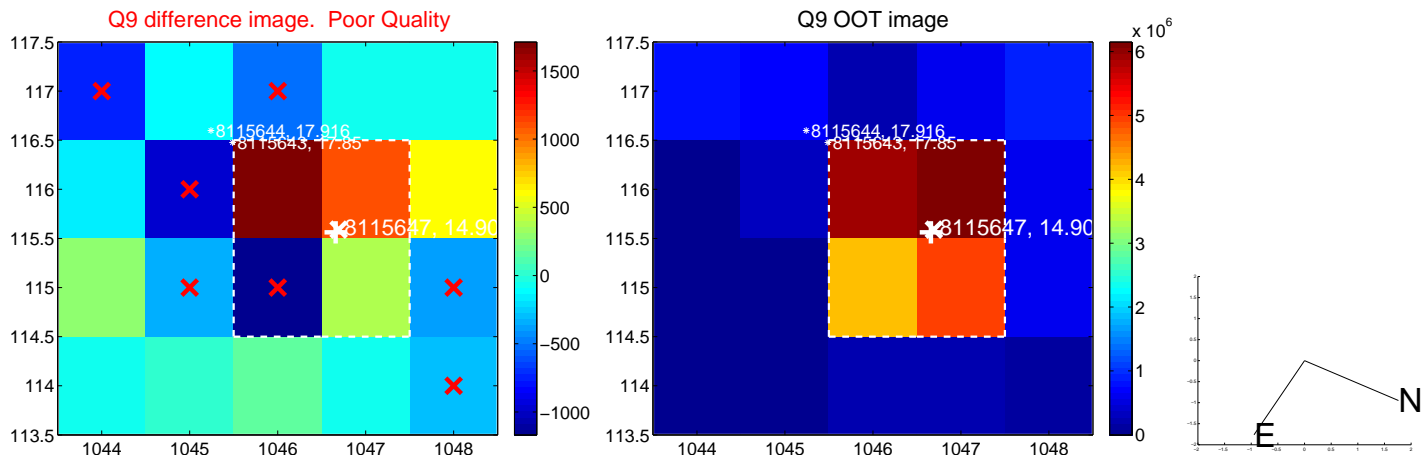
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



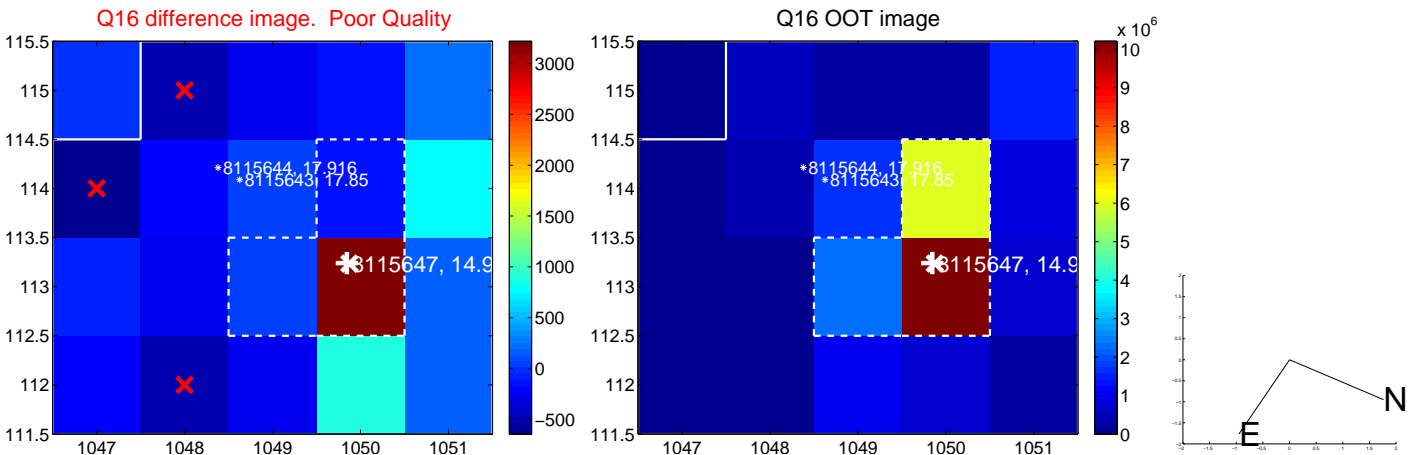
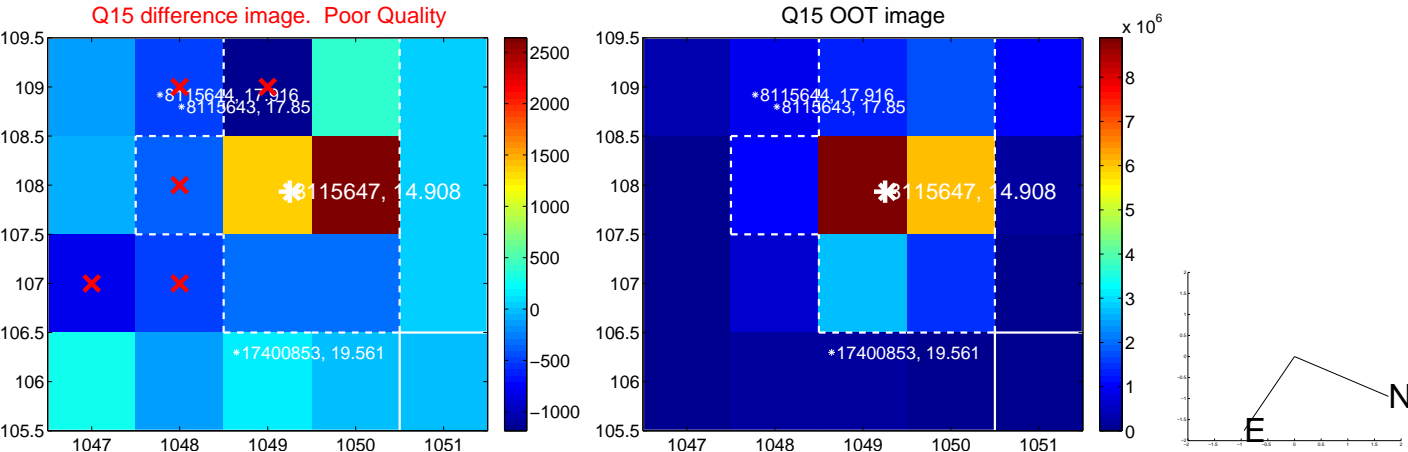
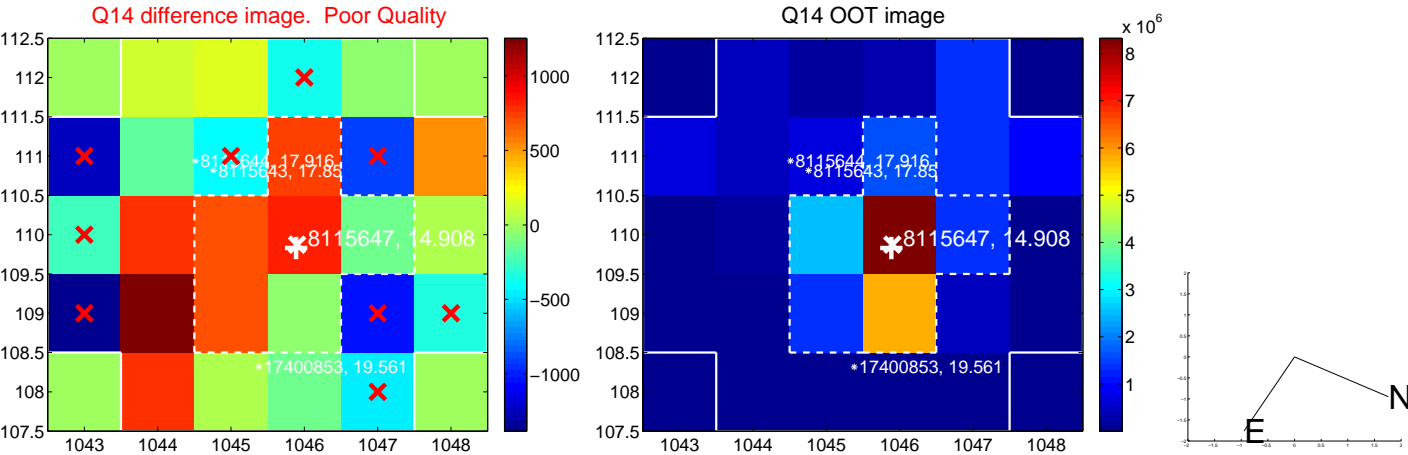
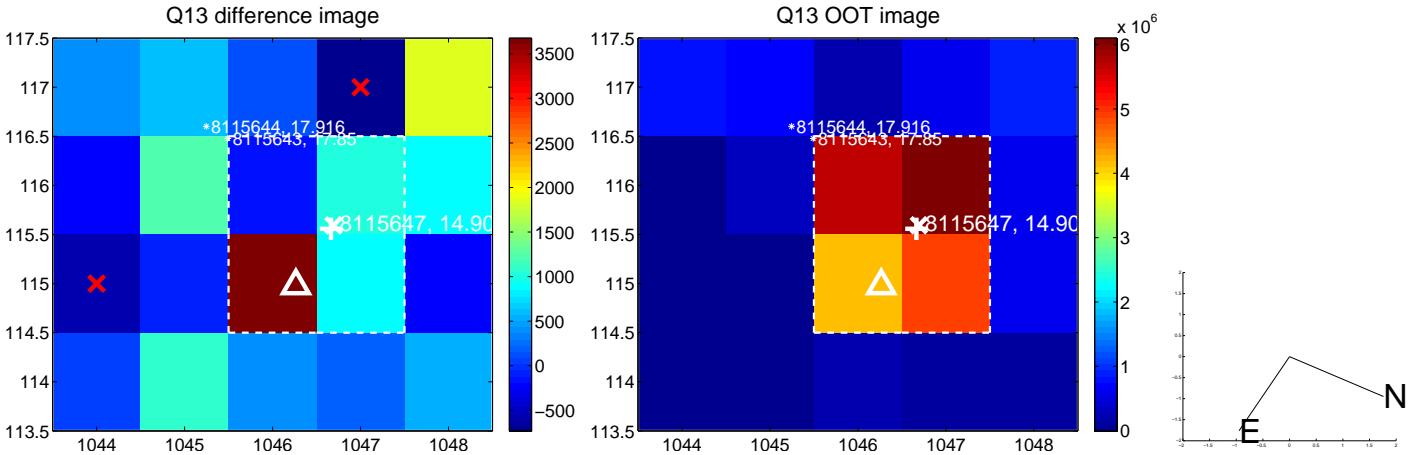
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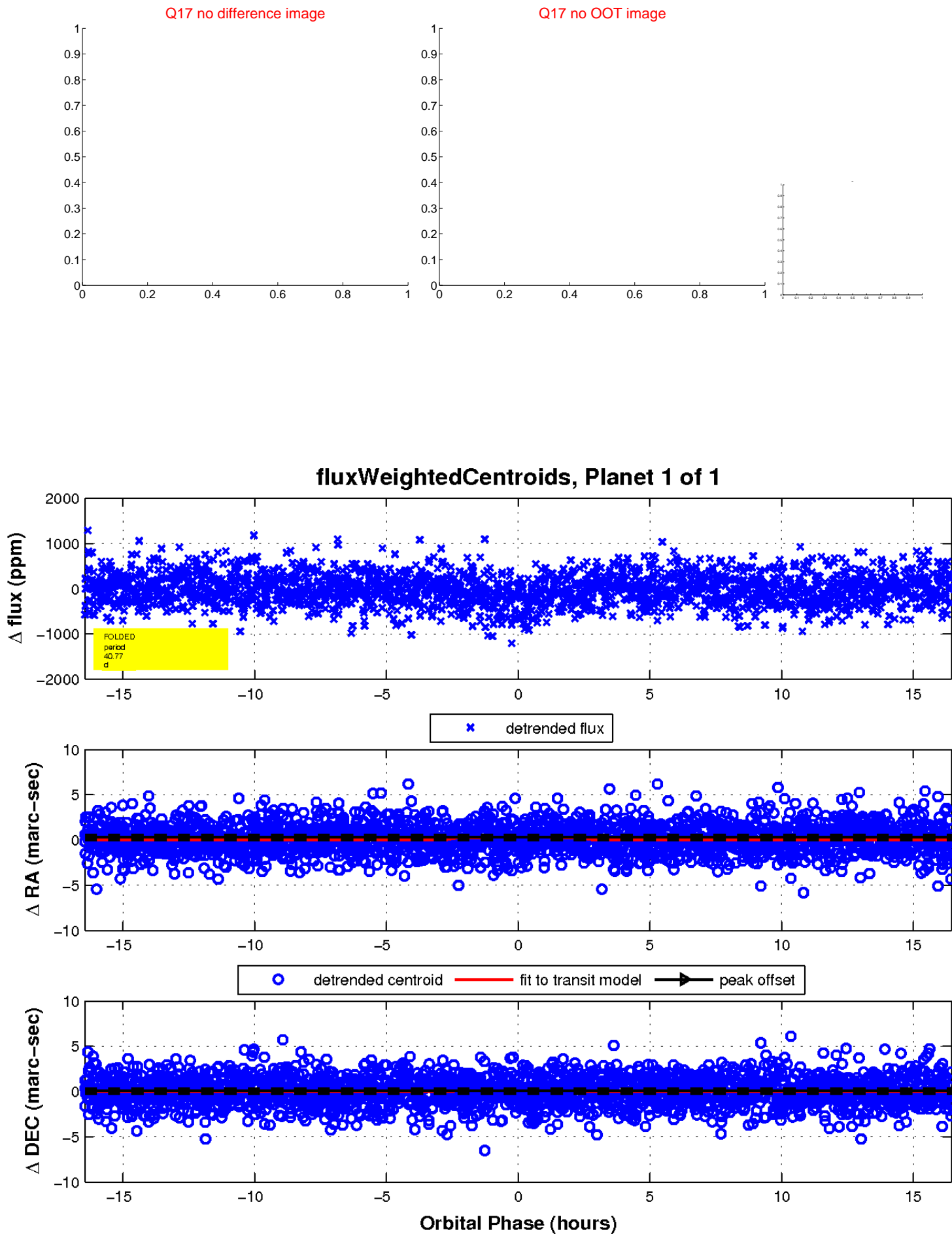


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

