

# KIC 005977470

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005977470-01	OBS	4550.01	140.251650	175.136183	585.2	7.037	9.6	11.2	0.79	4821	2.34	1.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005977470-01	OBS	PC	0.93	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 005977470-01

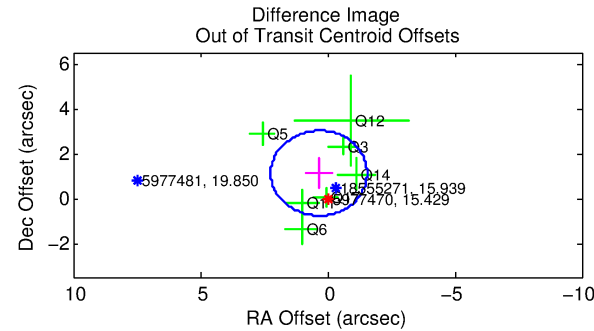
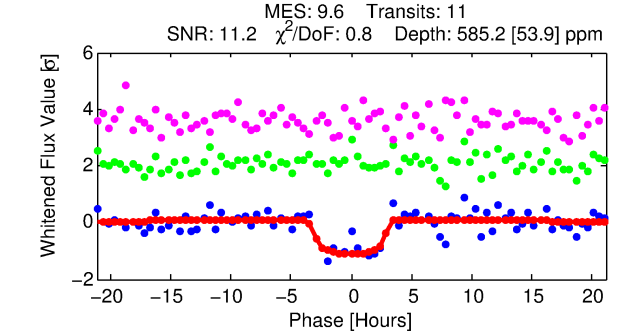
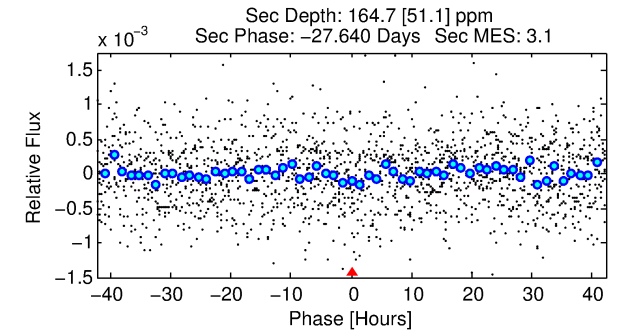
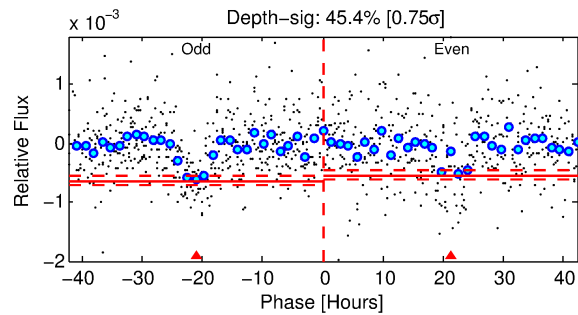
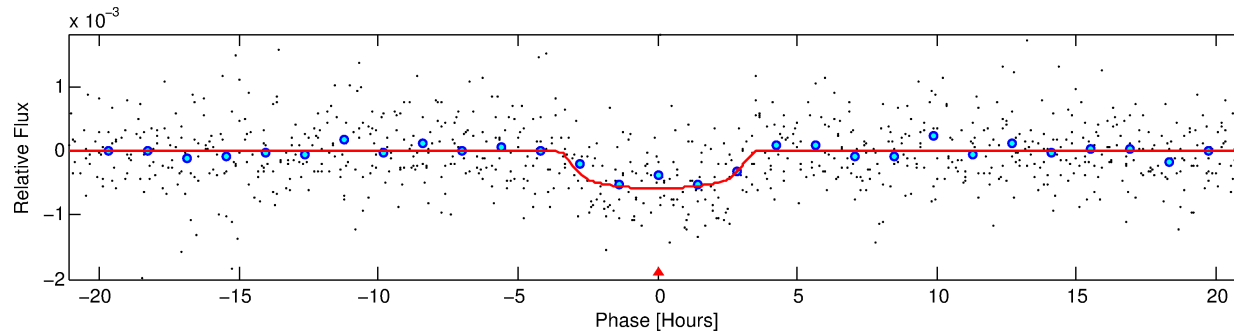
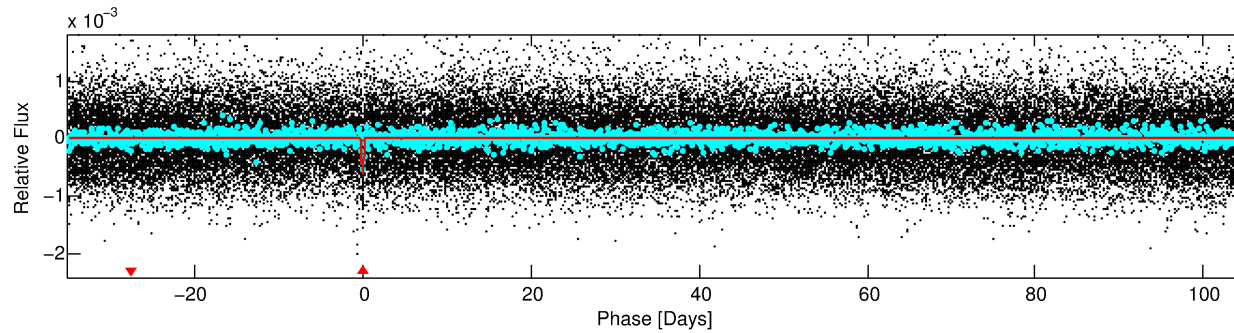
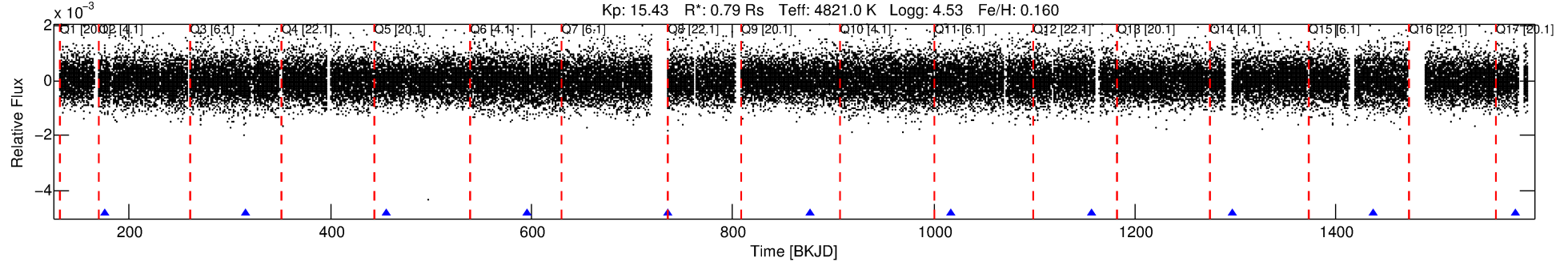
No Significant Match Found

# DV One-Page Summary

KIC: 5977470 Candidate: 1 of 1 Period: 140.252 d

KOI: K04550.01 Corr: 0.974

Kp: 15.43 R\*: 0.79 Rs Teff: 4821.0 K Logg: 4.53 Fe/H: 0.160



## DV Fit Results:

Period = 140.25165 [0.00213] d  
Epoch = 175.1362 [0.0121] BKJD  
Rp/R\* = 0.0272 [0.0044]  
a/R\* = 74.94 [42.47]  
b = 0.90 [0.12]  
Seff = 1.29 [0.17]  
Teq = 272 [9] K  
Rp = 2.34 [0.41] Re  
a = 0.4834 [0.0316] AU  
Ag = 3856.90 [1773.66] [2.17σ]  
Teffp = 3309 [375] K [8.11σ]

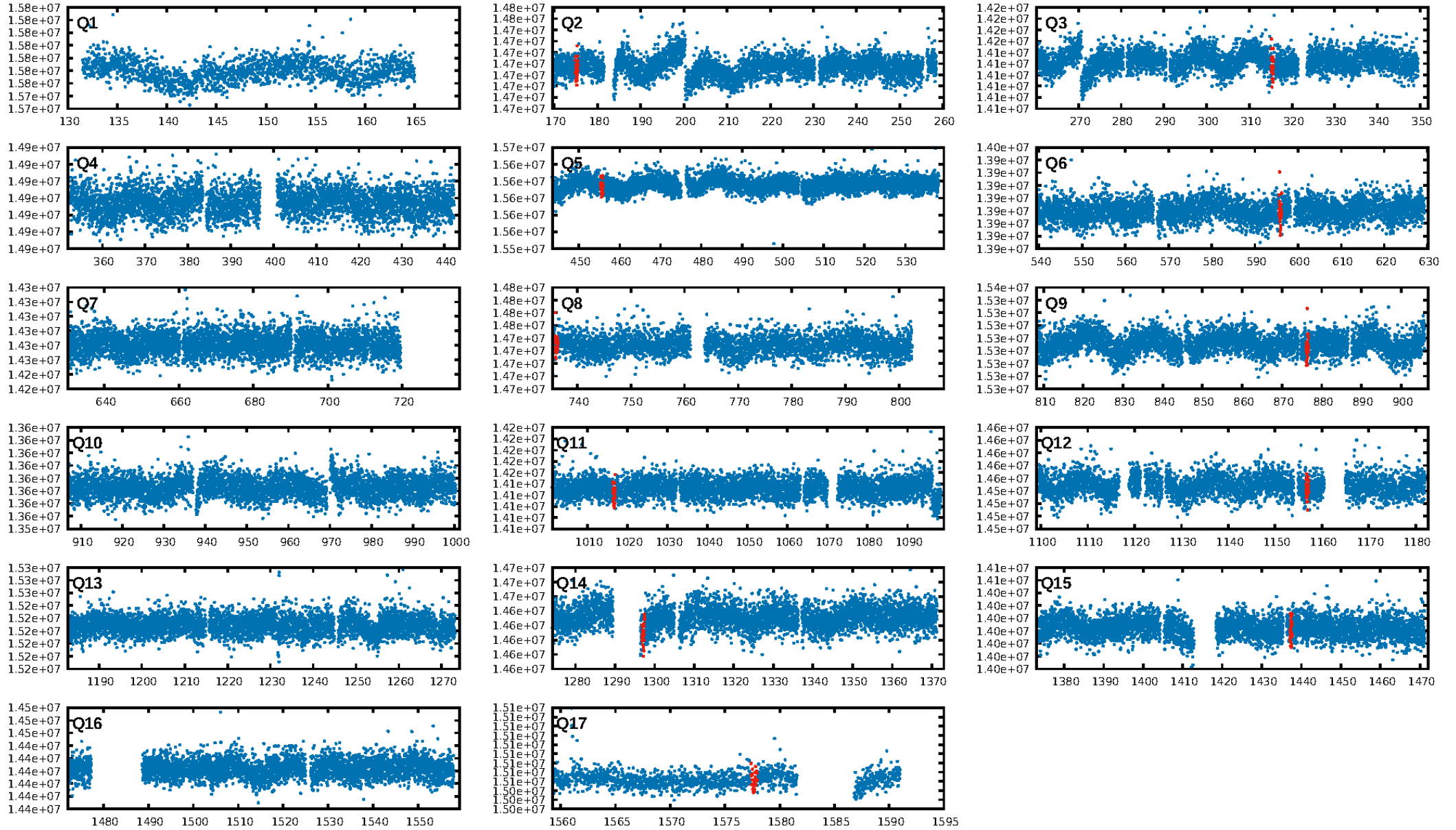
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 77.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.09e-18  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 3.559  
Centroid-sig: 34.9%  
Centroid-so: 0.904 arcsec [0.84σ]  
OotOffset-rm: 1.170 arcsec [1.85σ]  
KicOffset-rm: 1.203 arcsec [1.96σ]  
OotOffset-st: 2/2/1/2 [7]  
KicOffset-st: 2/2/1/2 [7]  
DiffImageQuality-fgm: 0.71 [5/7]  
DiffImageOverlap-fno: 1.00 [9/9]

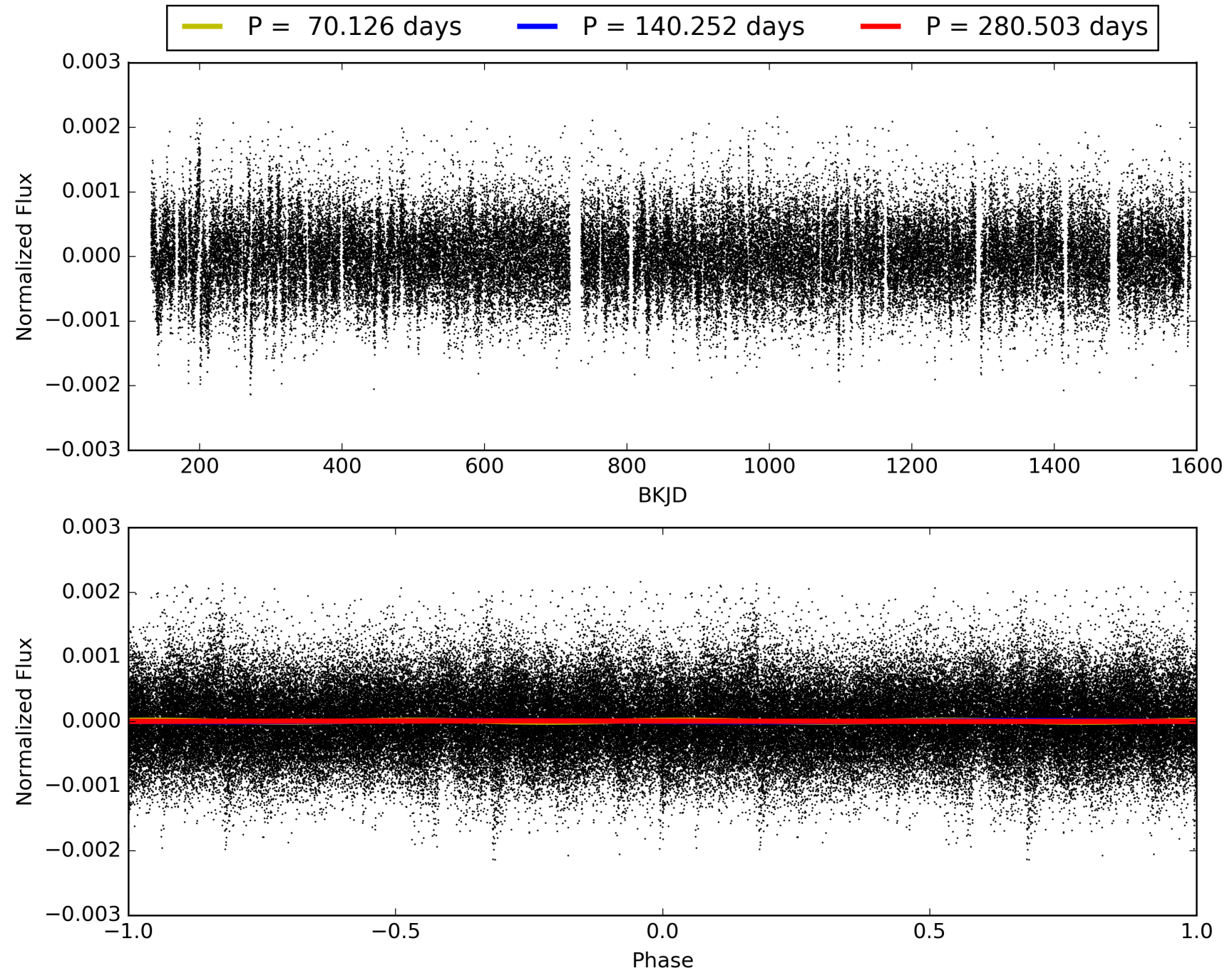
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:36:14 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005977470-01, PDC Light Curves

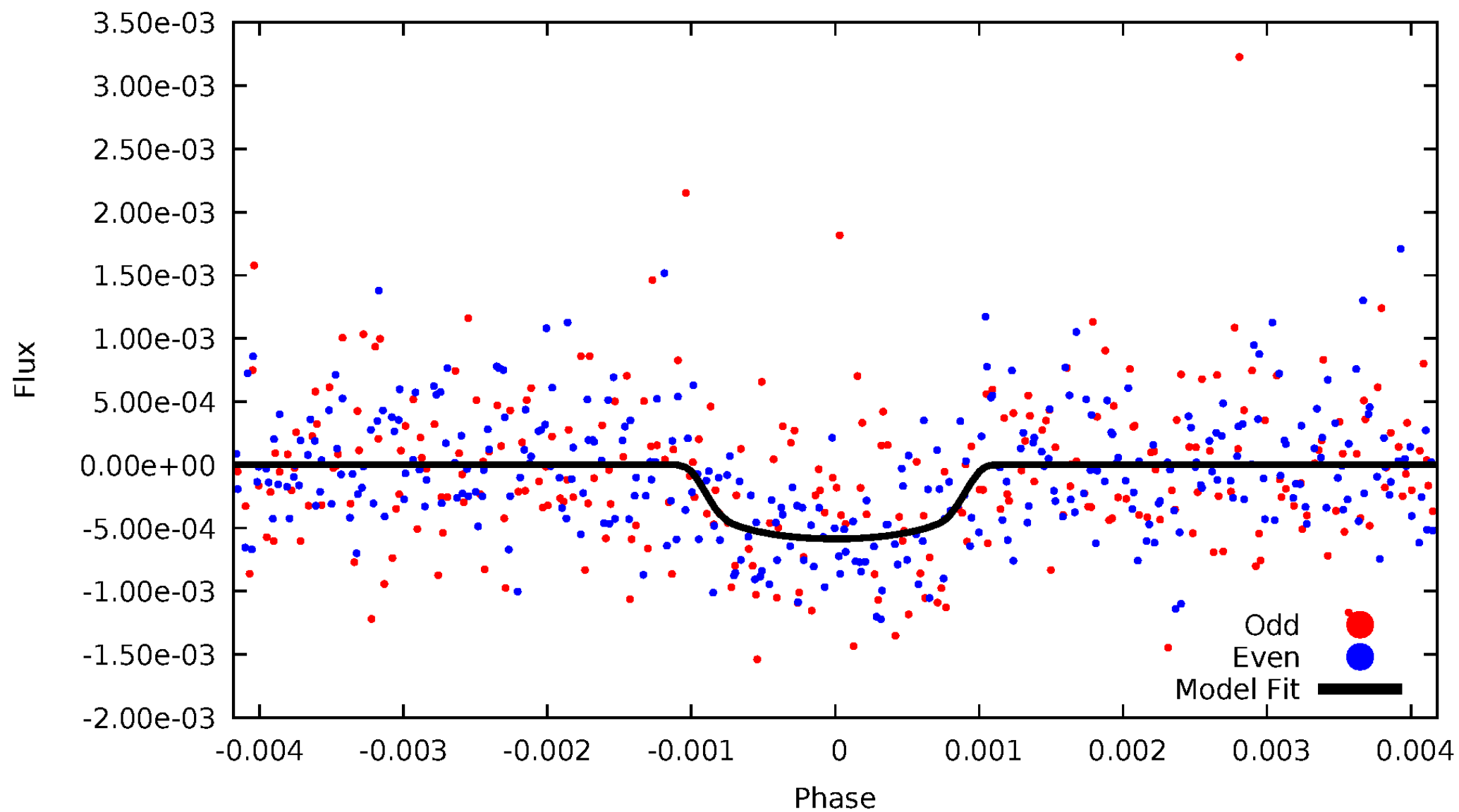


TCE 005977470-01



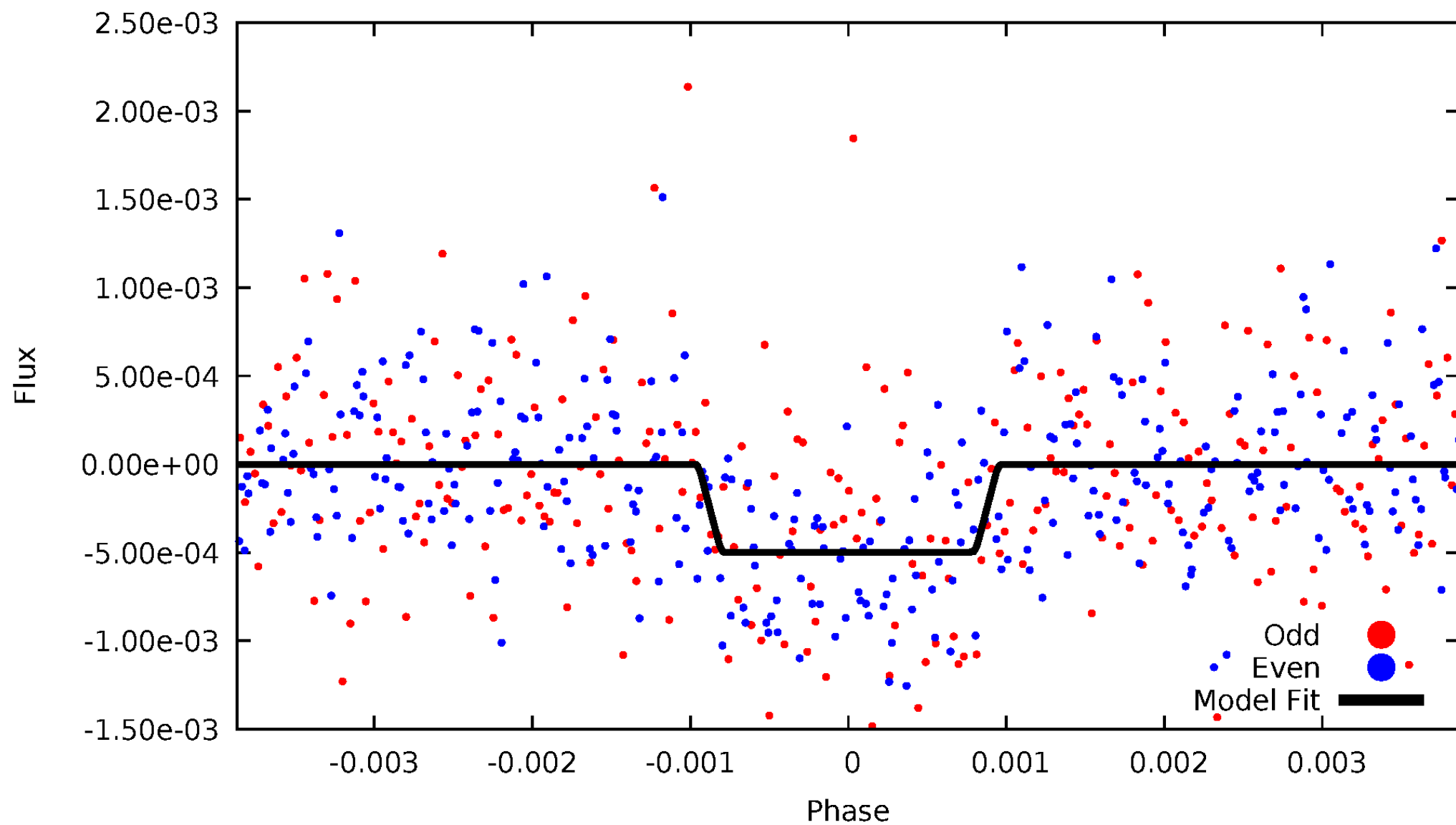
# DV Odd/Even

TCE 005977470-01



# ALT Odd/Even

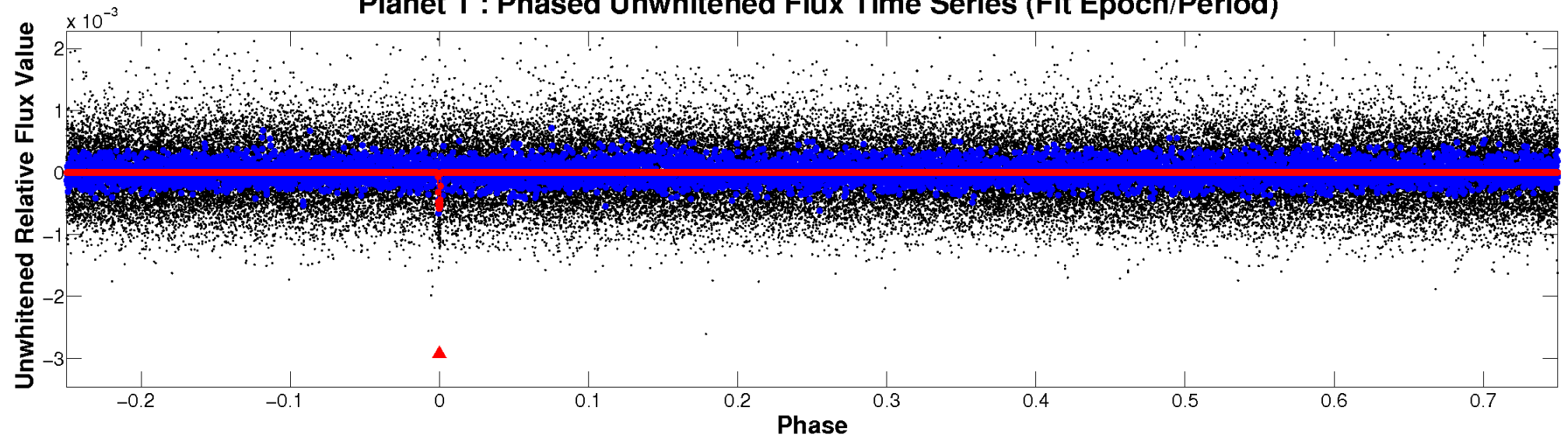
TCE 005977470-01



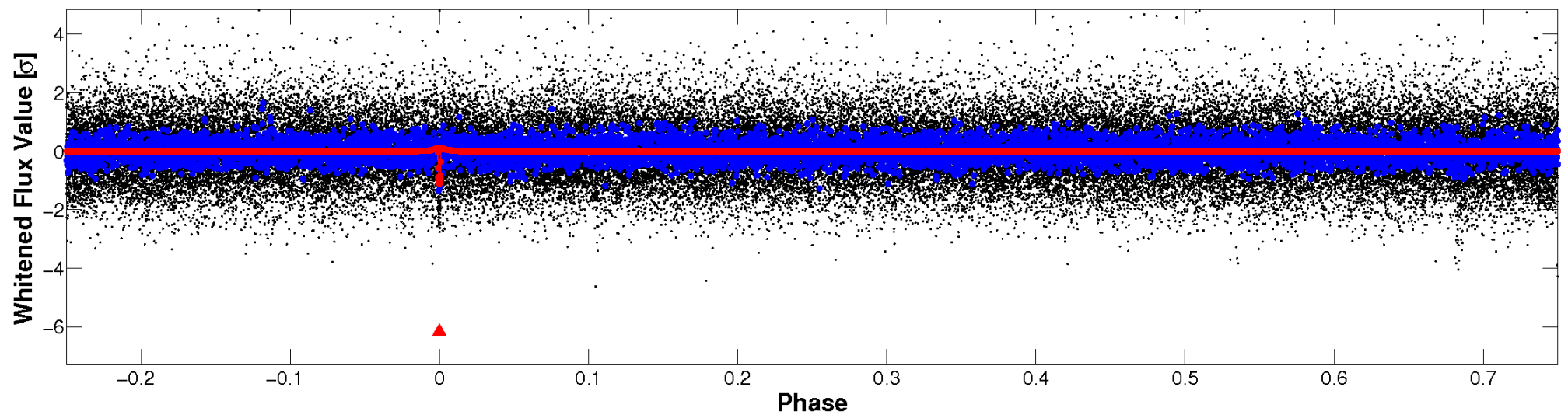


# Non-Whitened Vs. Whitened Light Curve

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

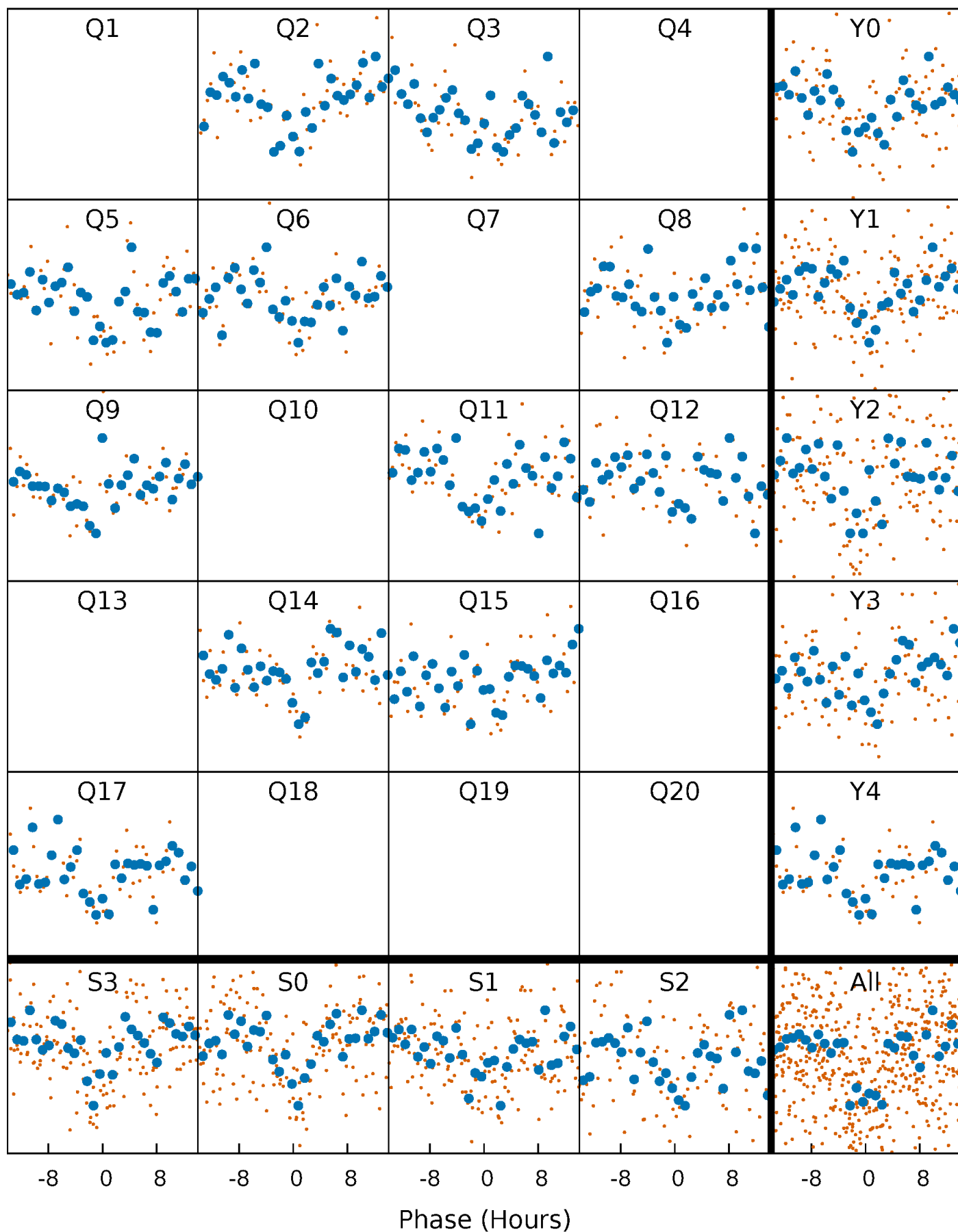


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

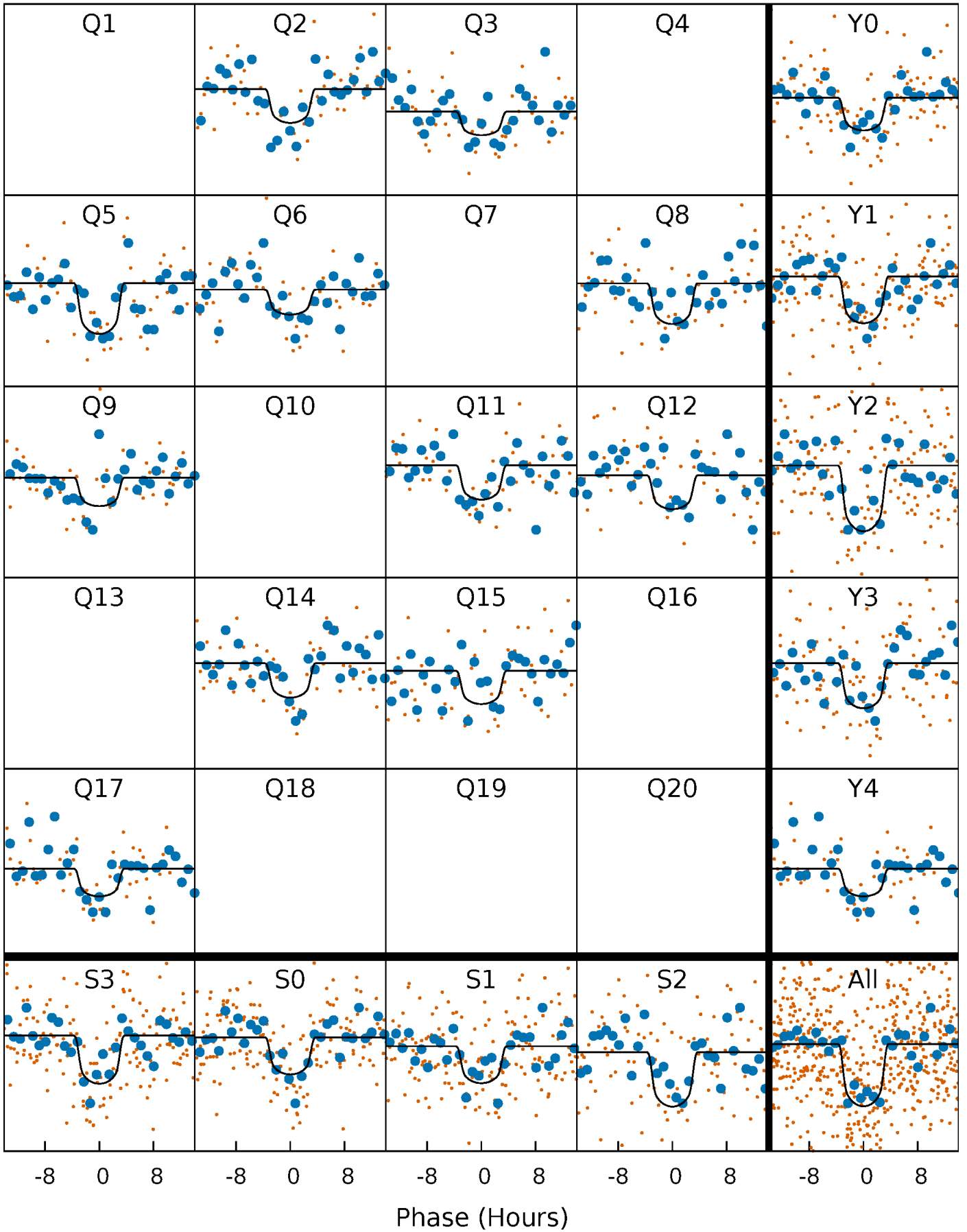
TCE 005977470-01 P=140.251651 Days  $T_0=175.136183$  (BKJD)





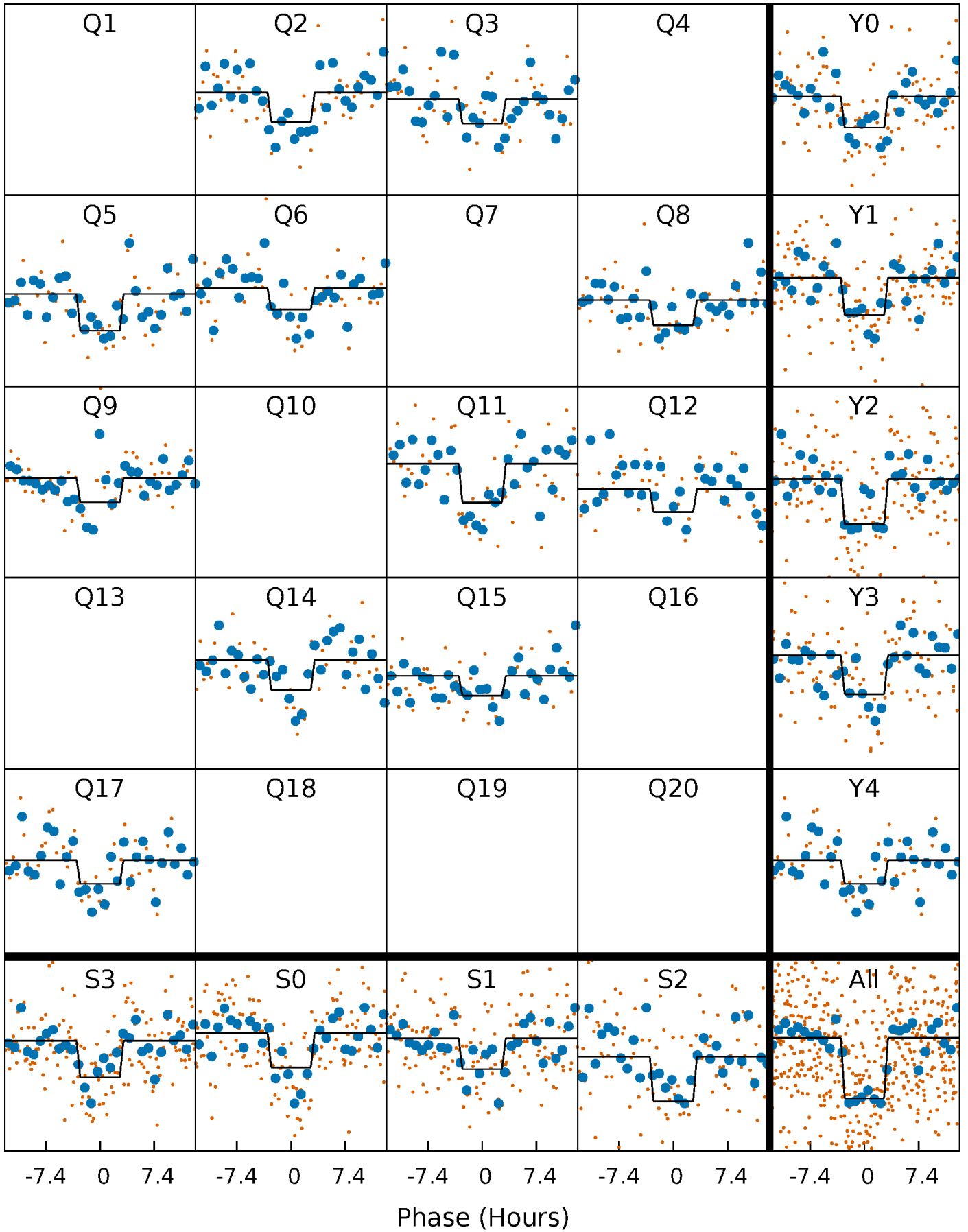
# DV Quarter-Phased Transit Curves

TCE 005977470-01 P=140.251651 Days  $T_0=175.136183$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

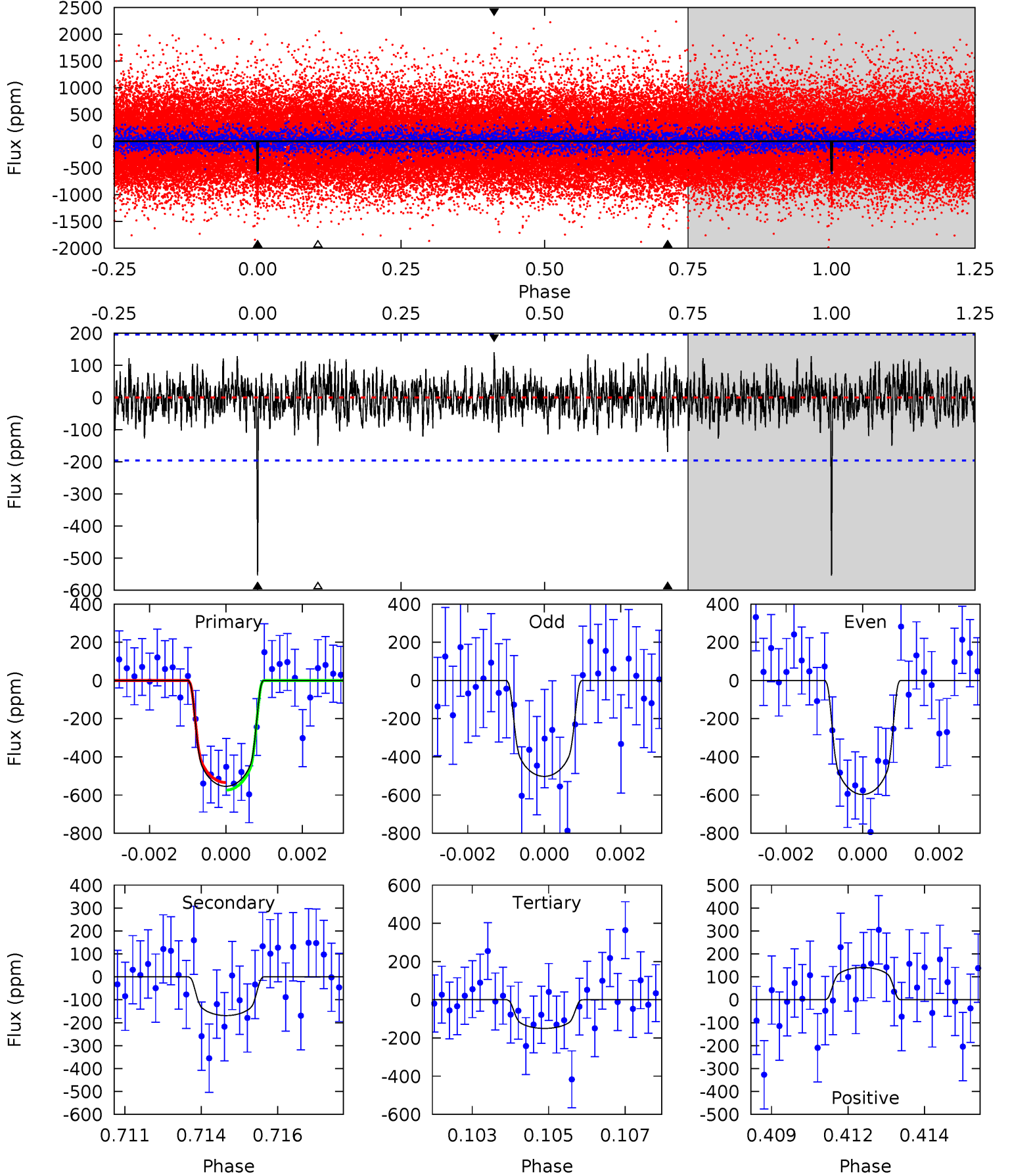
TCE 005977470-01 P=140.253085 Days  $T_0=175.128762$  (BKJD)



# DV Model-Shift Uniqueness Test

005977470-01,  $P = 140.251651$  Days,  $E = 34.884532$  Days

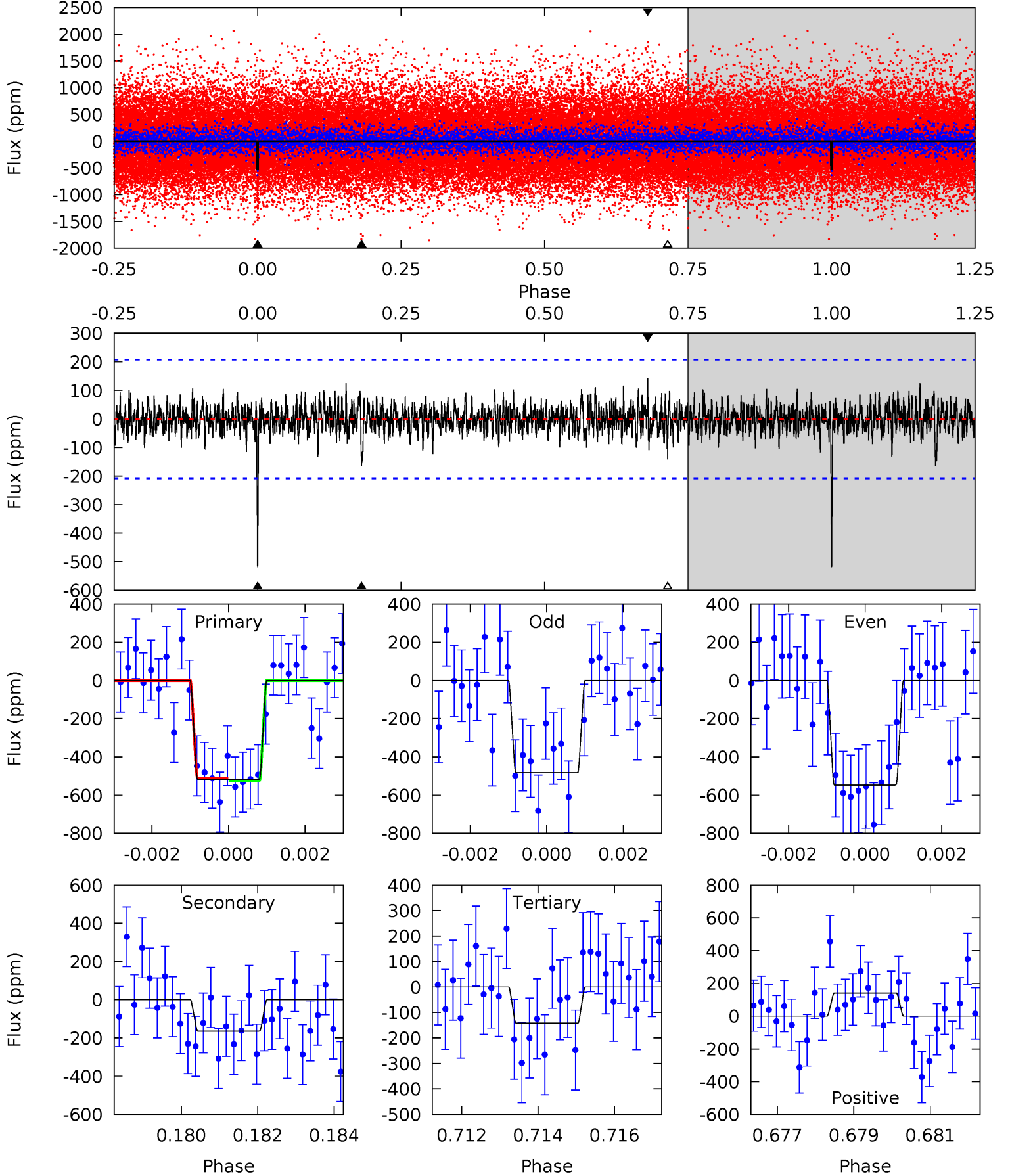
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	4.58	4.06	3.81	5.31	3.06	1.18	10.9	11.2	0.51	0.77	1.28	0.98	0.20	0.54



# Alt Model-Shift Uniqueness Test

005977470-01,  $P = 140.253085$  Days,  $E = 34.875677$  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
13.3	4.21	3.64	3.63	5.33	3.10	0.95	9.67	9.67	0.58	0.58	0.82	1.00	0.21	0.19



### Stellar Parameters For KIC 005977470

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4821^{+76}_{-86}$	$4.529^{+0.064}_{-0.016}$	$0.160^{+0.150}_{-0.150}$	$0.788^{+0.023}_{-0.051}$	$0.765^{+0.047}_{-0.028}$	$2.204^{+0.510}_{-0.148}$
	+2%/-2%	+1%/-0%	+94%/-94%	+3%/-6%	+6%/-4%	+23%/-7%
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 005977470-01 / KOI 4550.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-169 \pm 37$	$2.33^{+0.38}_{-0.38}$	$376^{+7}_{-8}$	$3656^{+275}_{-231}$	$4040^{+2129}_{-1304}$
Alt.	$-164 \pm 39$	$1.91^{+0.37}_{-0.37}$	$377^{+7}_{-10}$	$3891^{+352}_{-276}$	$5793^{+3558}_{-2036}$

$T_{max}$  = 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

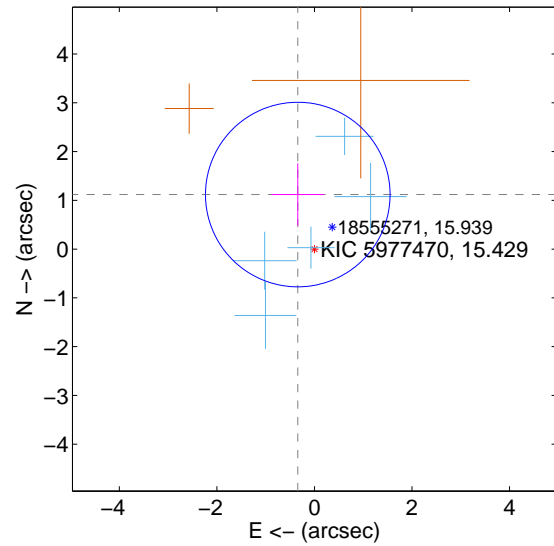
Supplemental centroid analysis for 005977470-01. Kepler magnitude: 15.43. Transit SNR 11.20

There are 5 quarters with good PRF difference image offsets

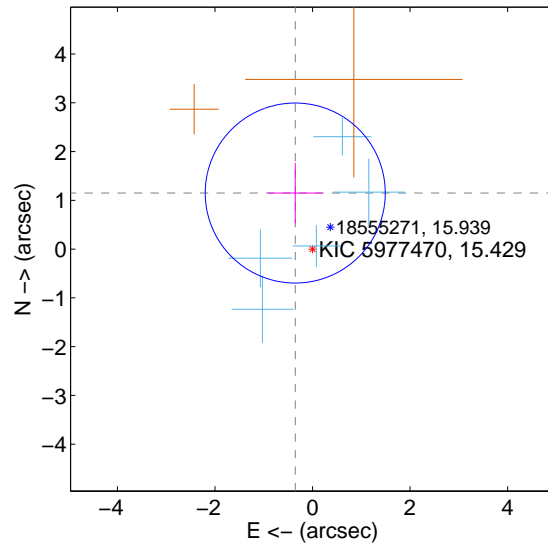
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.170 \pm 0.631$	1.85	$0.342 \pm 0.539$	$1.119 \pm 0.639$
PRF-fit source offset from KIC position	$1.203 \pm 0.615$	1.96	$0.354 \pm 0.557$	$1.150 \pm 0.621$
photometric centroid source offset	$0.90 \pm 1.08$	0.84	$0.12 \pm 1.06$	$0.90 \pm 1.08$

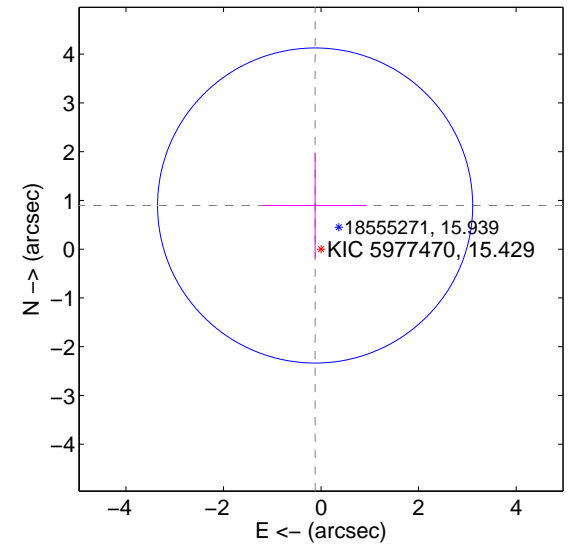
offset from difference PRF-fit to OOT PRF-fit



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  $> 15,000$ , are from the UKIRT catalog.



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

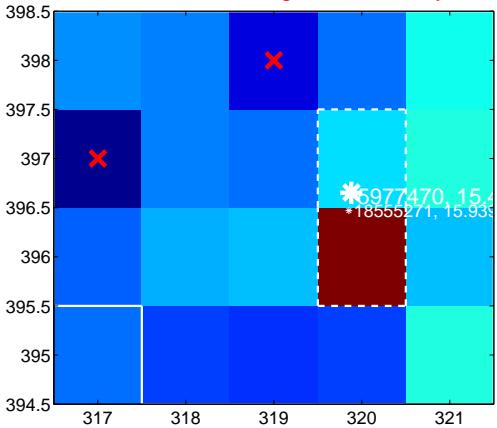
Q1 no difference image



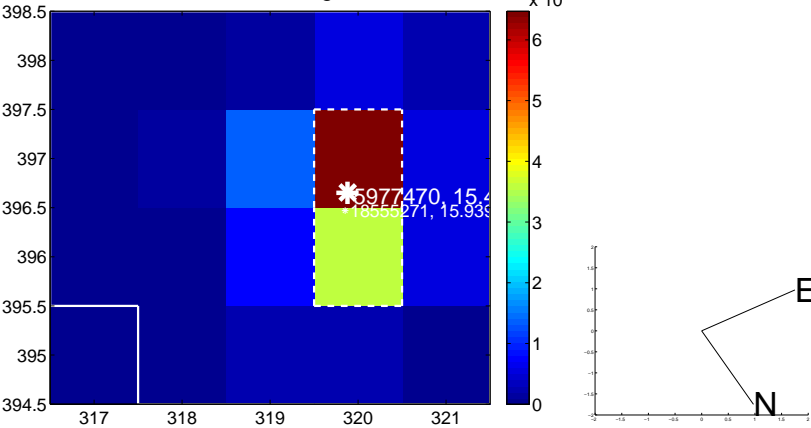
Q1 no OOT image



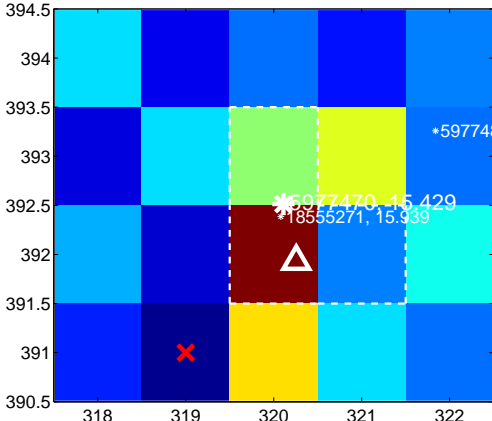
Q2 difference image. Poor Quality



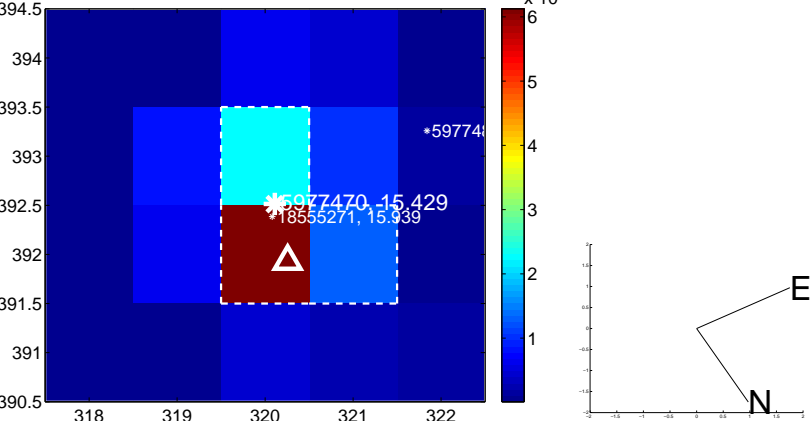
Q2 OOT image



Q3 difference image



Q3 OOT image



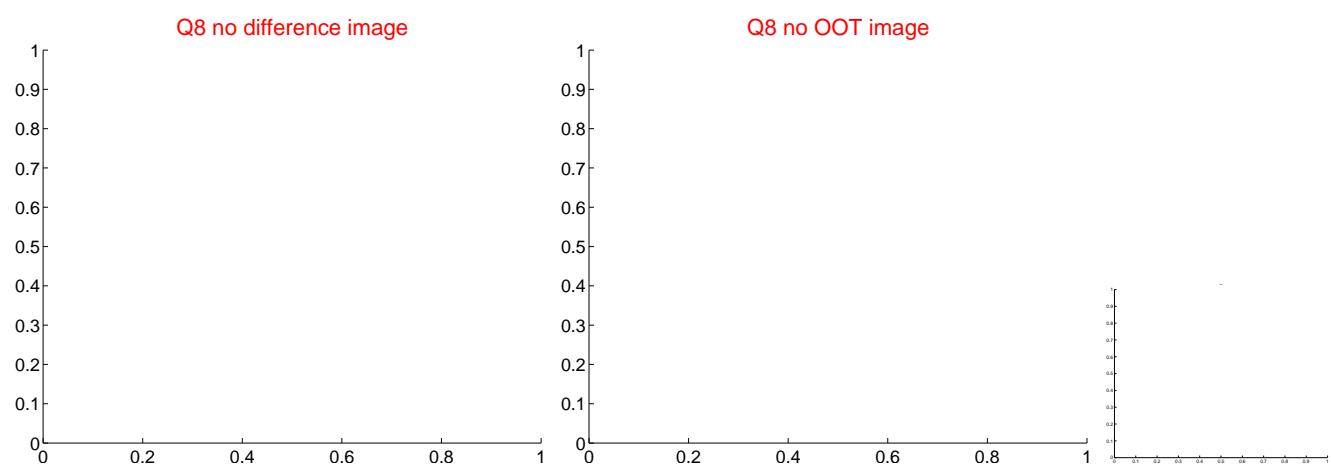
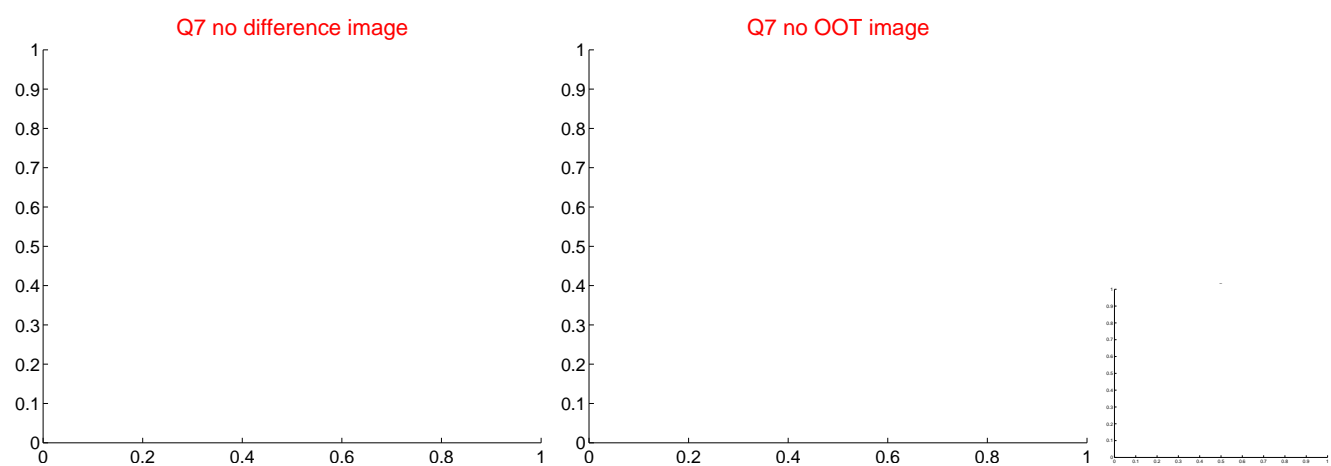
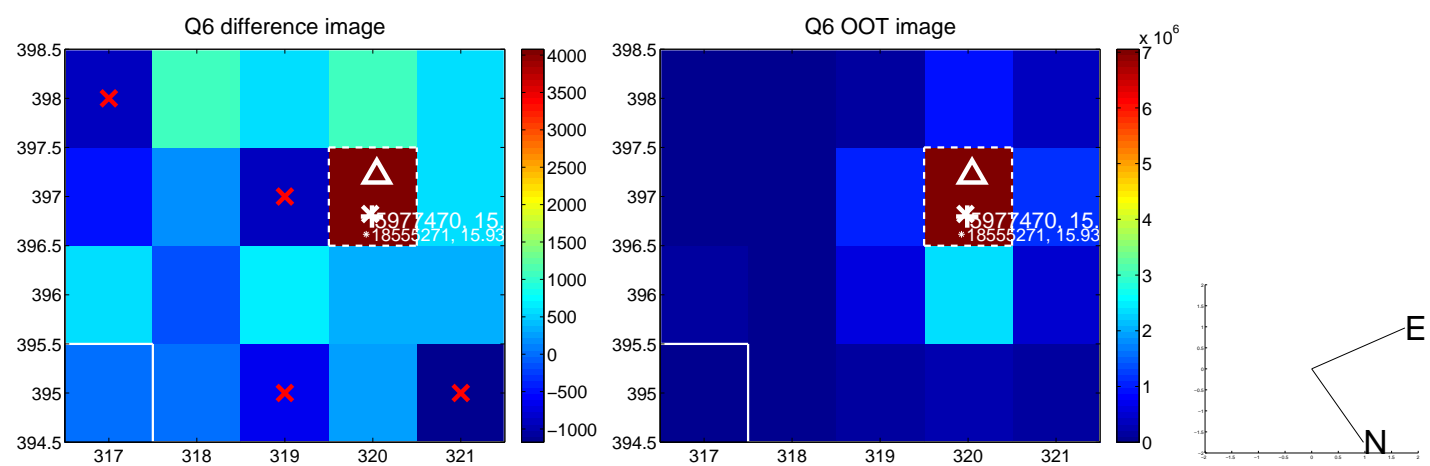
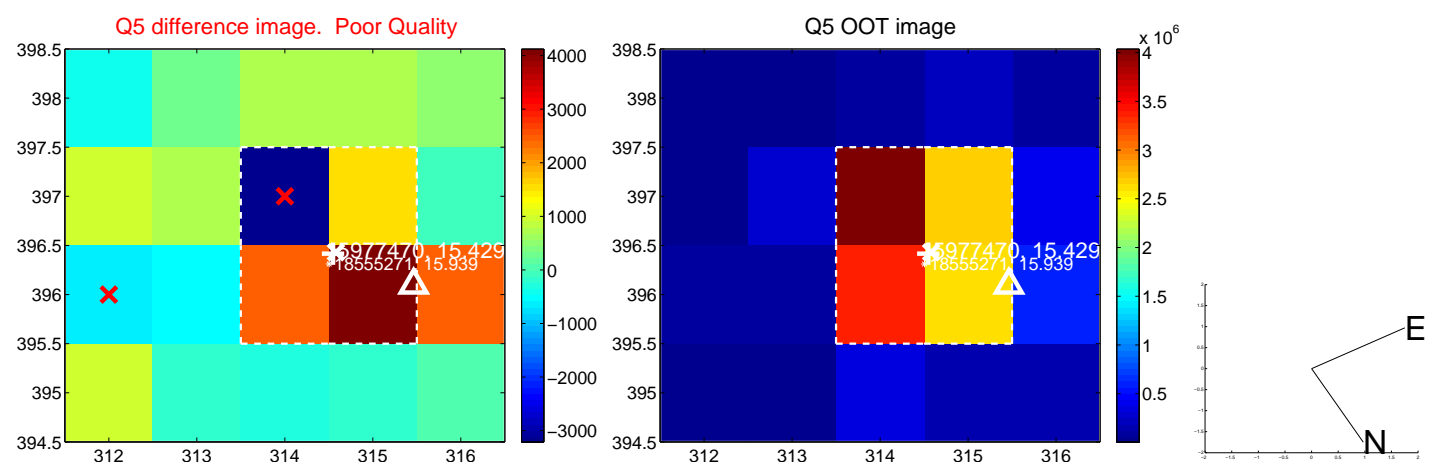
Q4 no difference image



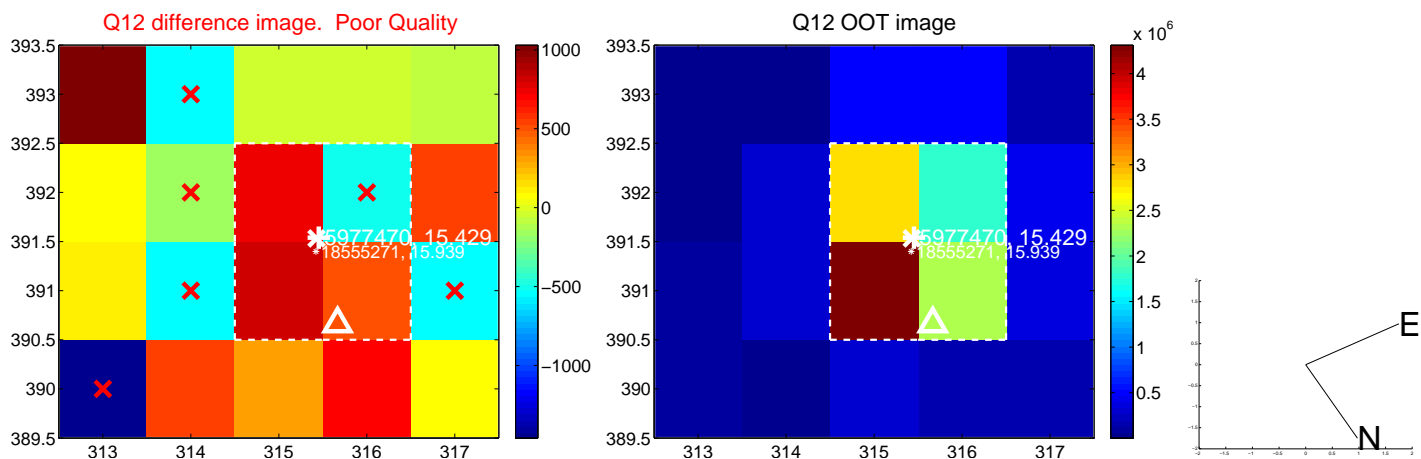
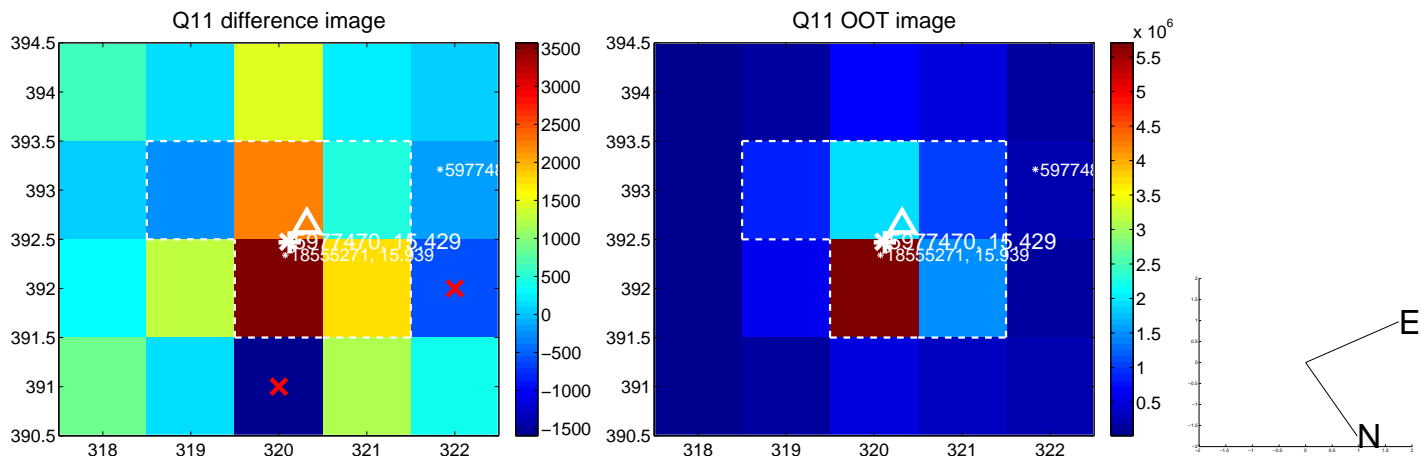
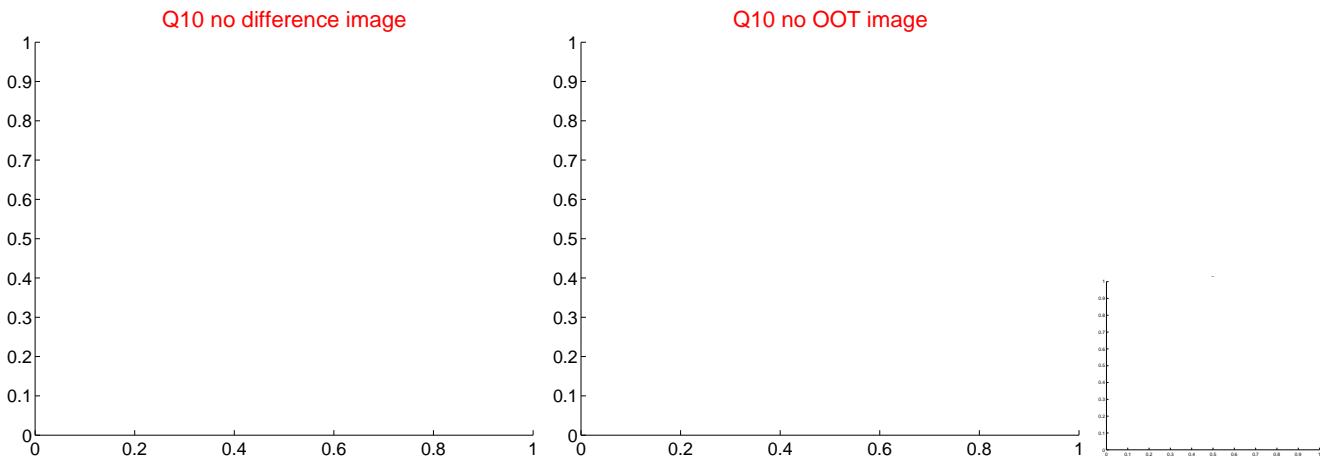
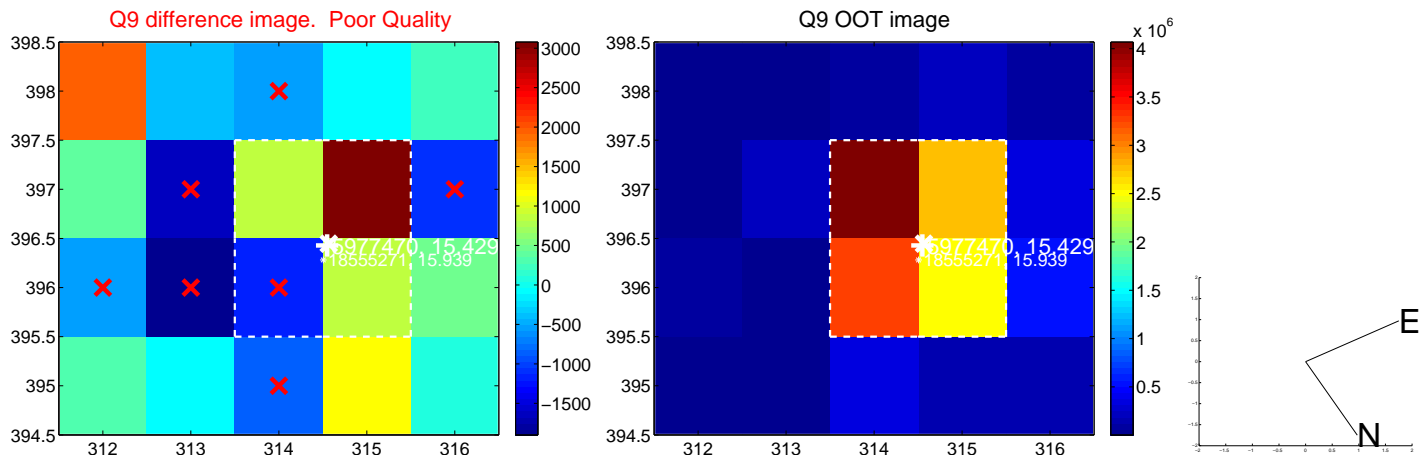
Q4 no OOT image



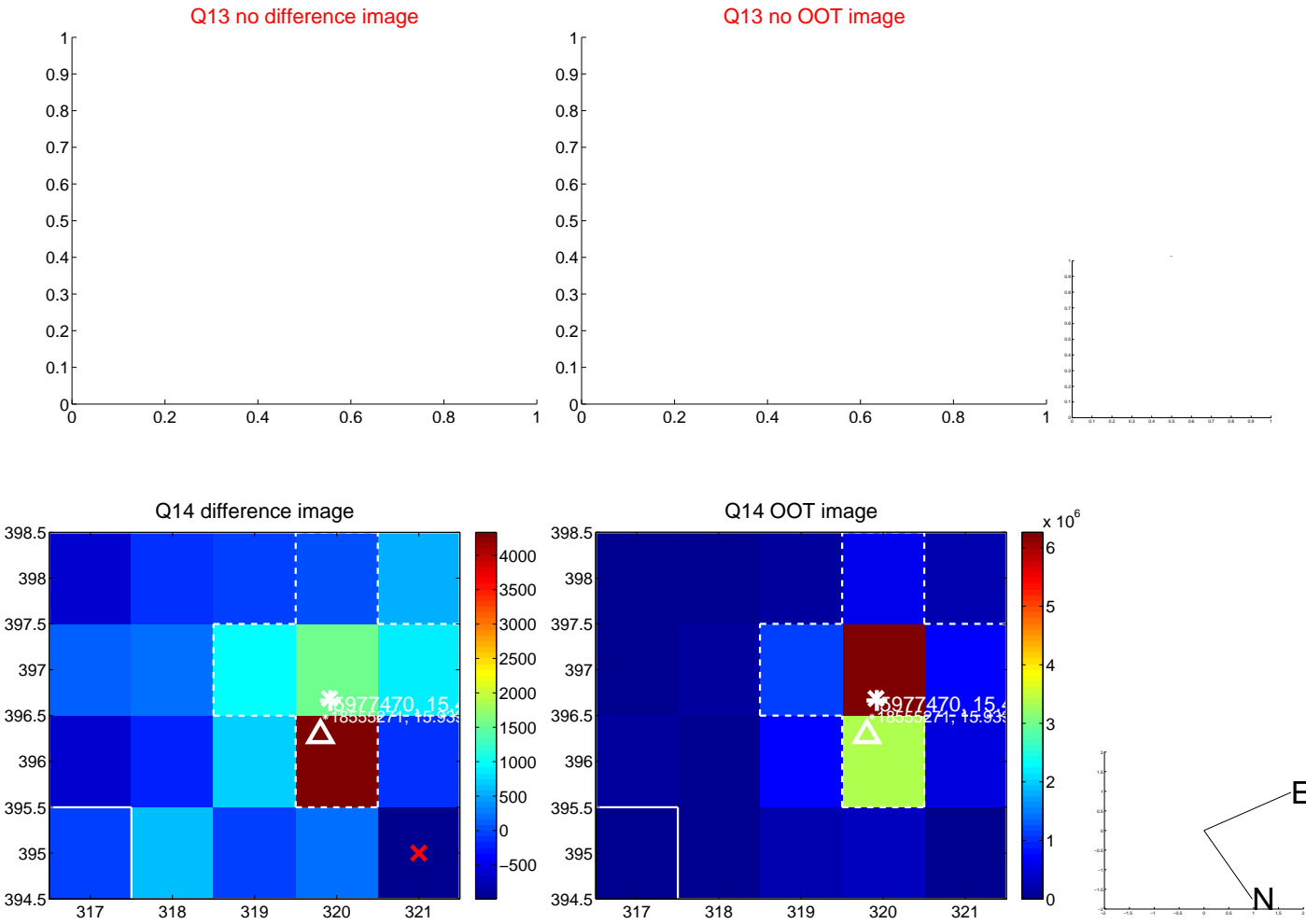
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



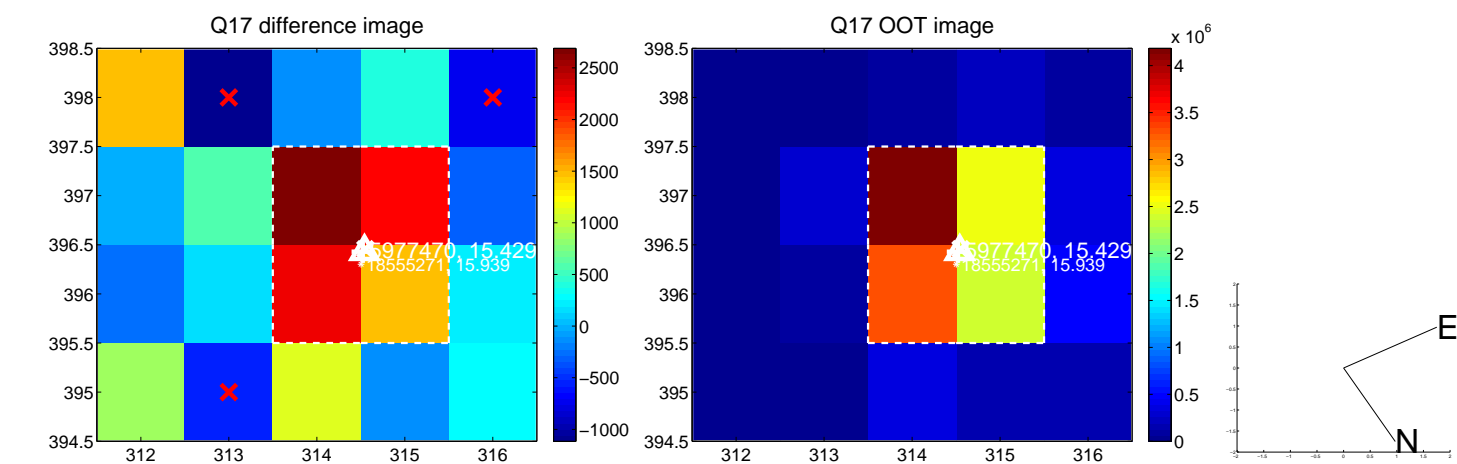
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



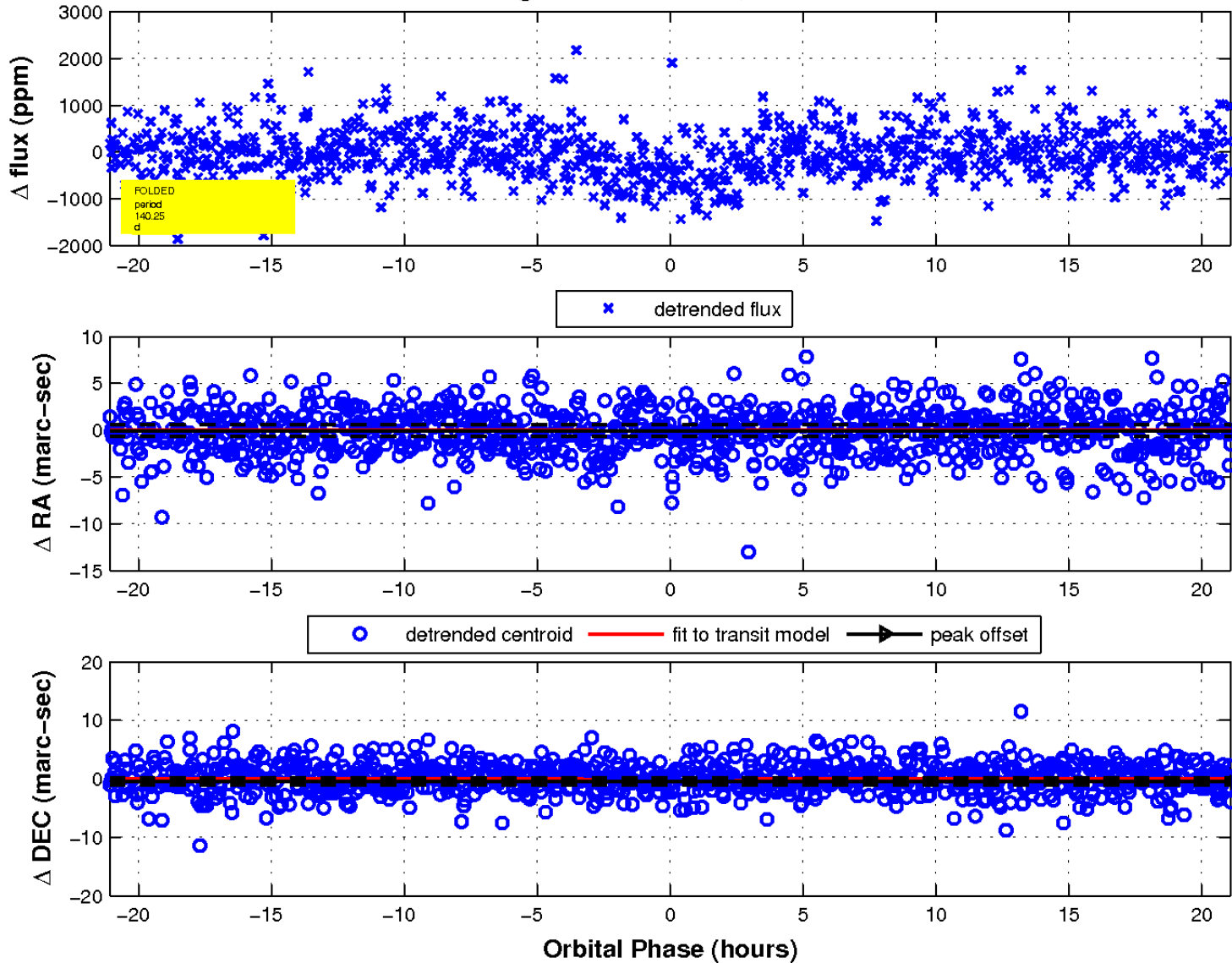
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

