

# KIC 012356839

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012356839-01	OBS	No	0.680423	132.121954	159.3	2.288	46.6	14.1	0.80	5613	1.04	2672.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012356839-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

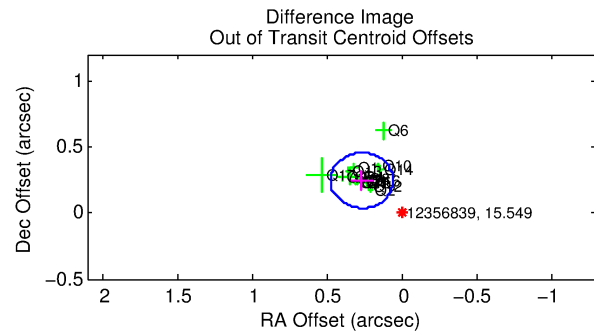
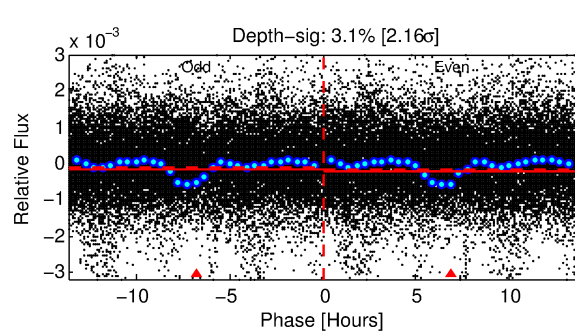
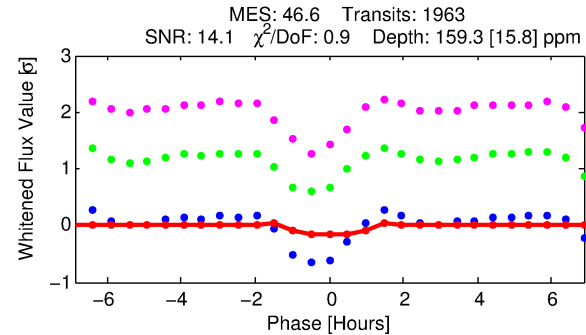
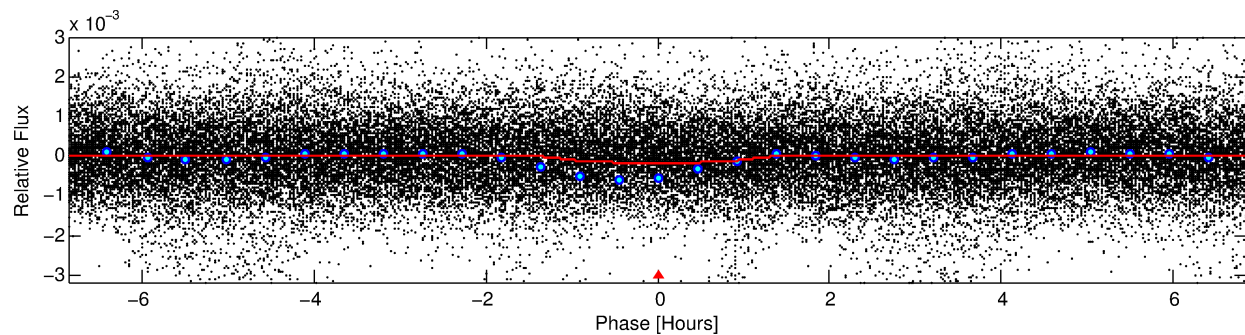
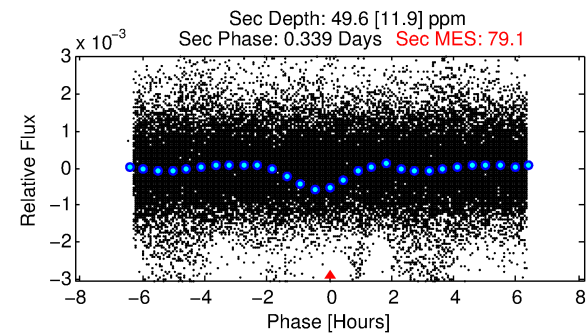
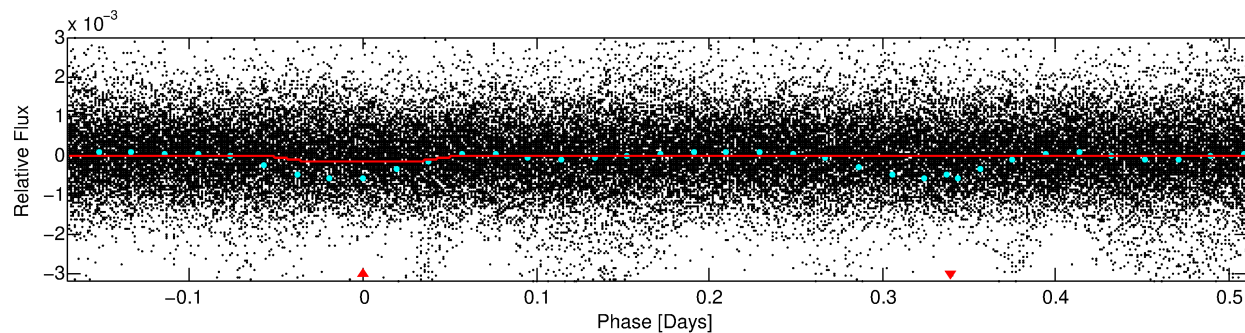
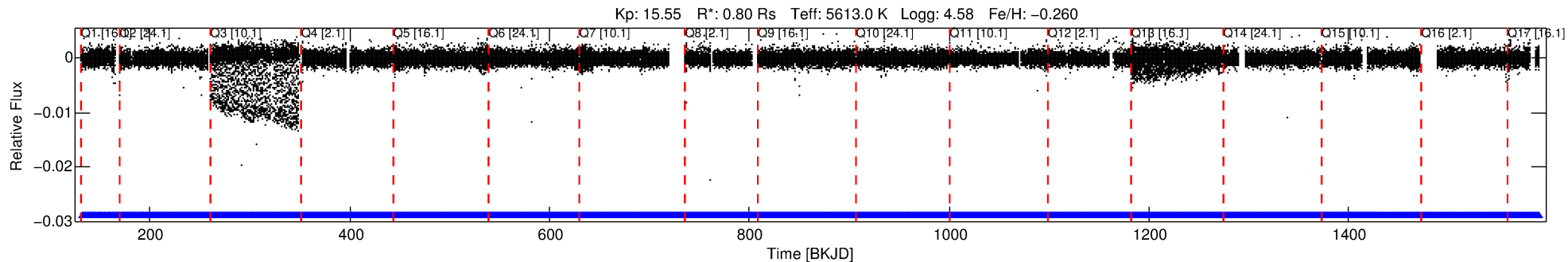
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012356839-01

No Significant Match Found

# DV One-Page Summary

KIC: 12356839 Candidate: 1 of 1 Period: 0.680 d



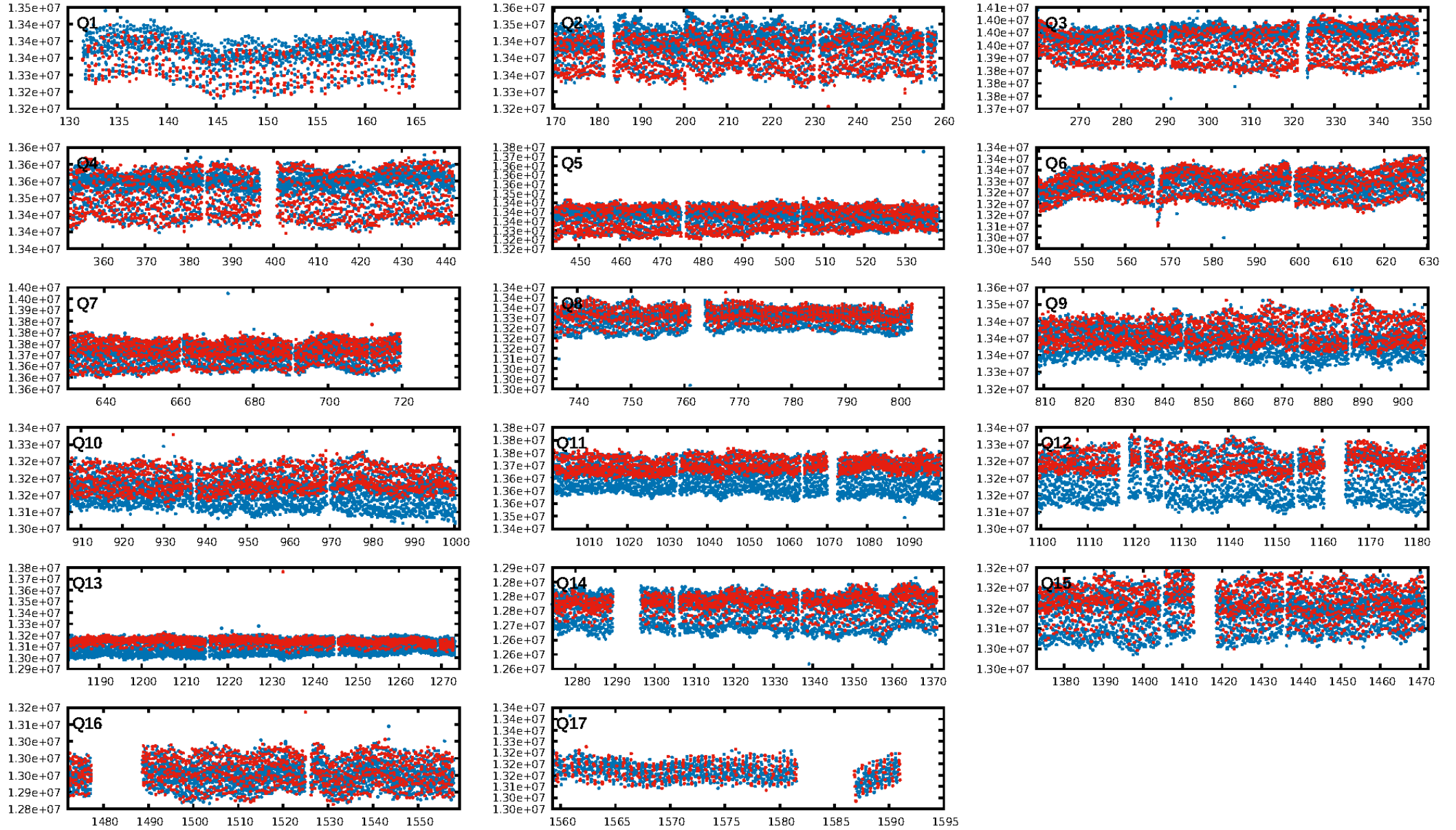
## DV Fit Results:

Period = 0.68042 [0.00001] d  
Epoch = 132.1220 [0.0018] BKJD  
Rp/R\* = 0.0120 [0.0056]  
a/R\* = 2.03 [3.10]  
b = 0.58 [2.32]  
Seff = 2672.27 [811.60]  
Teq = 1833 [139] K  
Rp = 1.04 [0.54] Re  
a = 0.0145 [0.0028] AU  
Ag = 5.28 [5.32] [0.80σ]  
Teffp = 4298 [1048] K [2.33σ]

## DV Diagnostic Results:

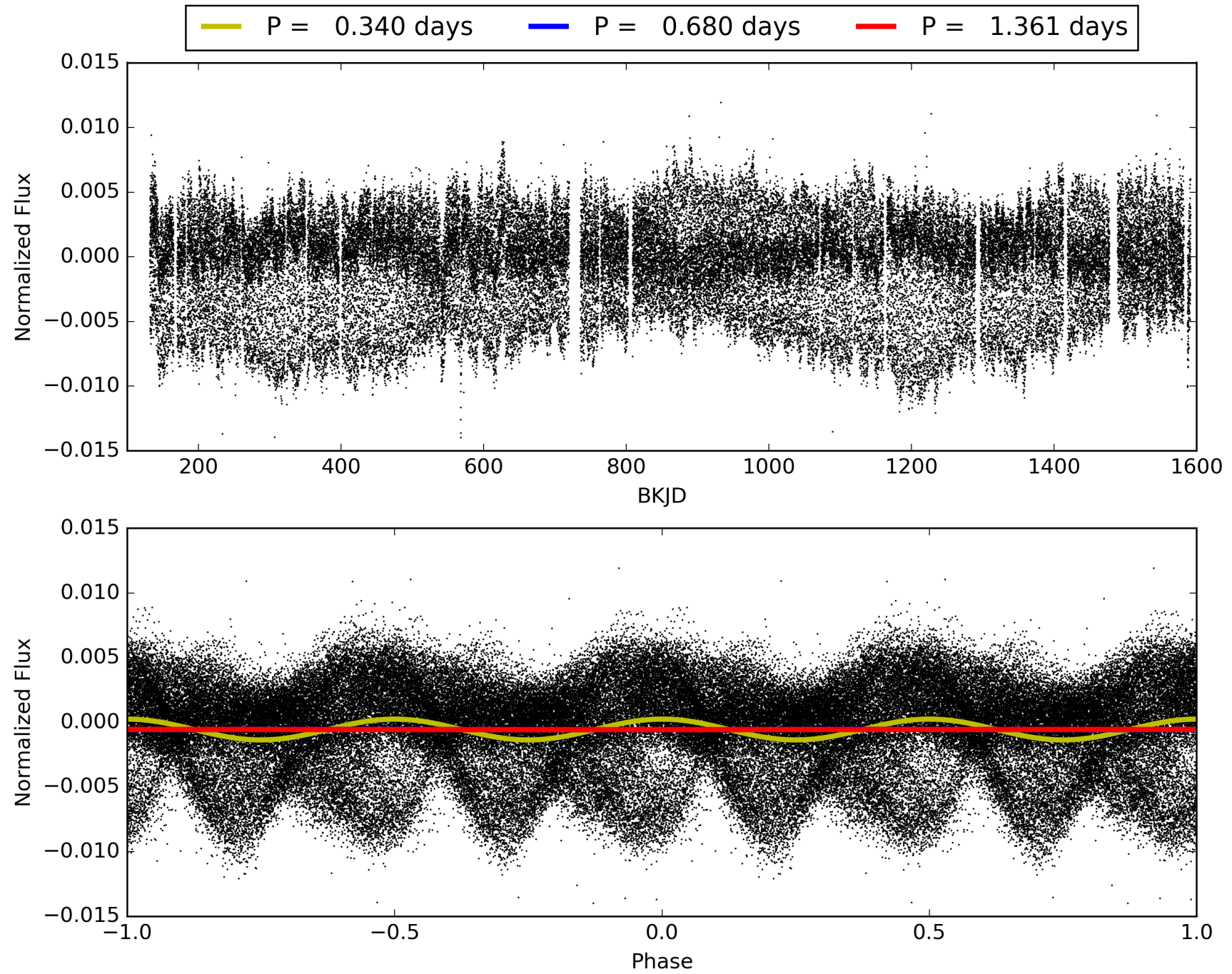
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.77e-13  
RollingBand-fgt: 1.00 [1874/1874]  
GhostDiagnostic-chr: -5.151  
Centroid-sig: 20.4%  
Centroid-so: 0.483 arcsec [0.69σ]  
**OotOffset-rm: 0.361 arcsec [5.18σ]**  
KicOffset-rm: 0.223 arcsec [2.88σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.29 [5/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012356839-01, PDC Light Curves



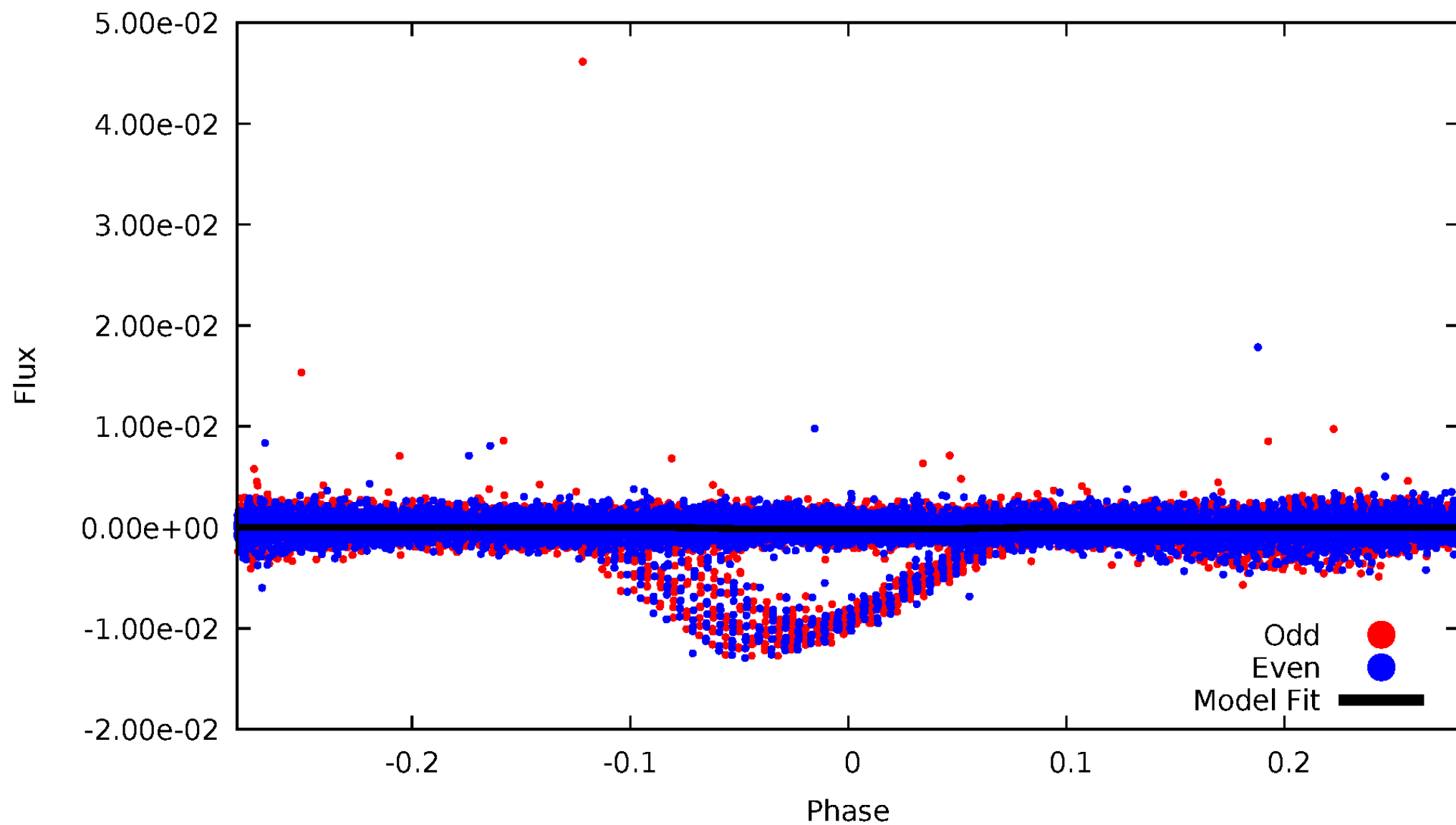


TCE 012356839-01



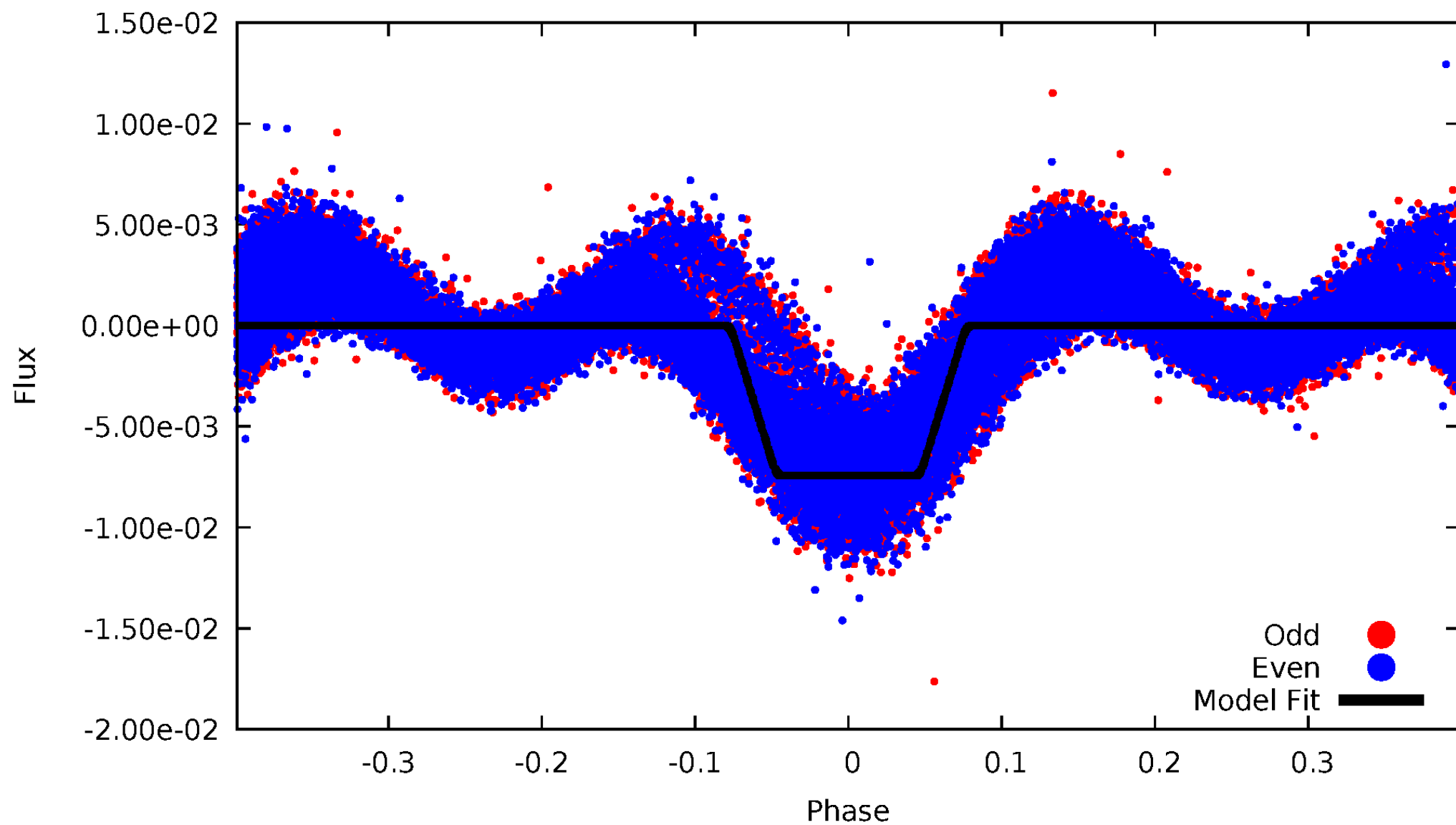
# DV Odd/Even

TCE 012356839-01



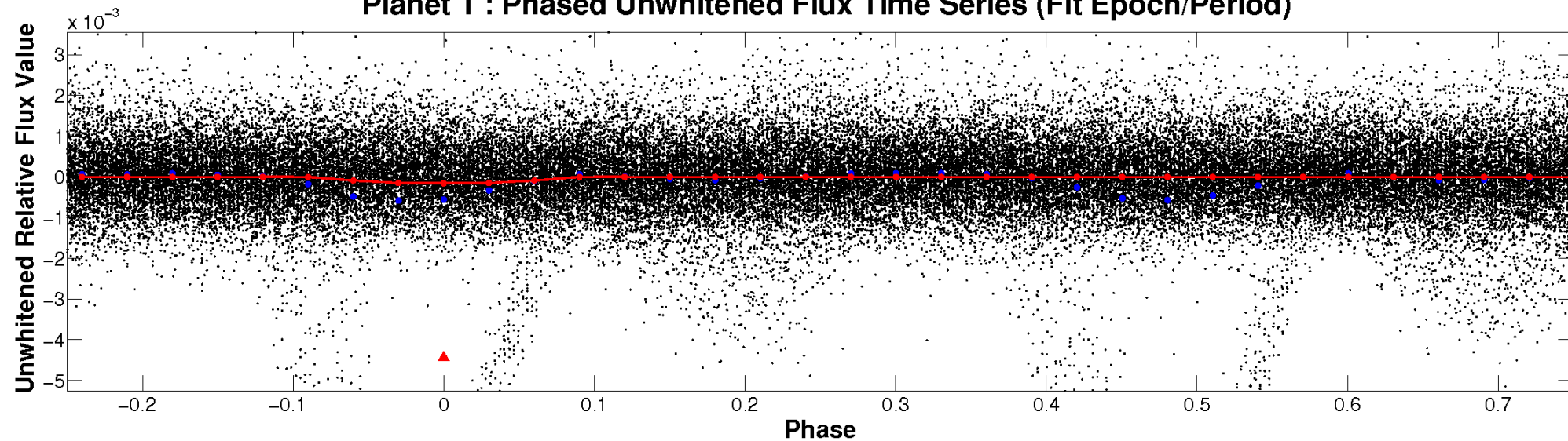
# ALT Odd/Even

TCE 012356839-01

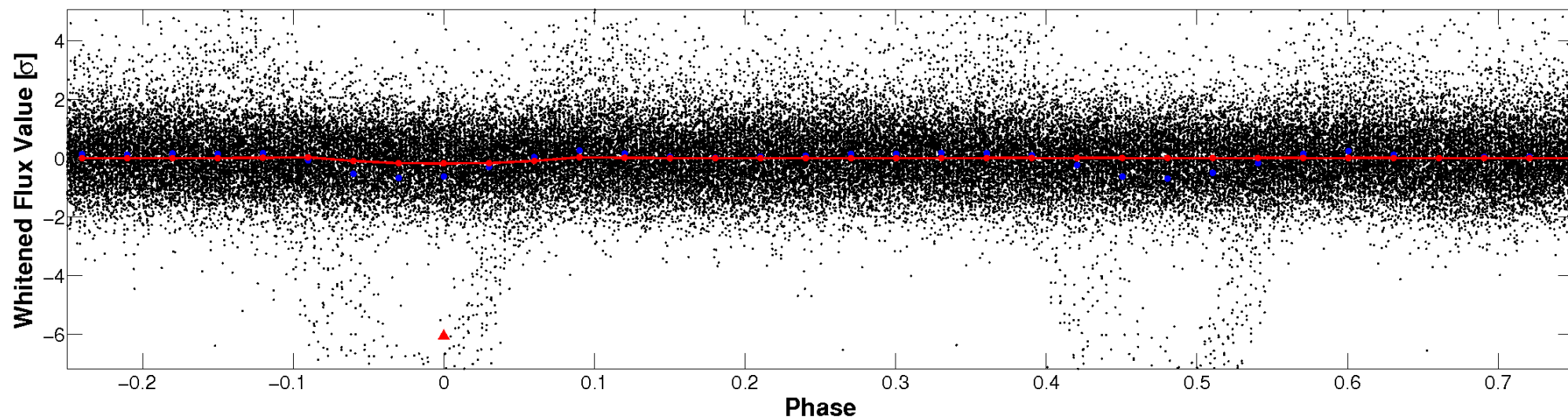


# Non-Whitened Vs. Whitened Light Curve

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

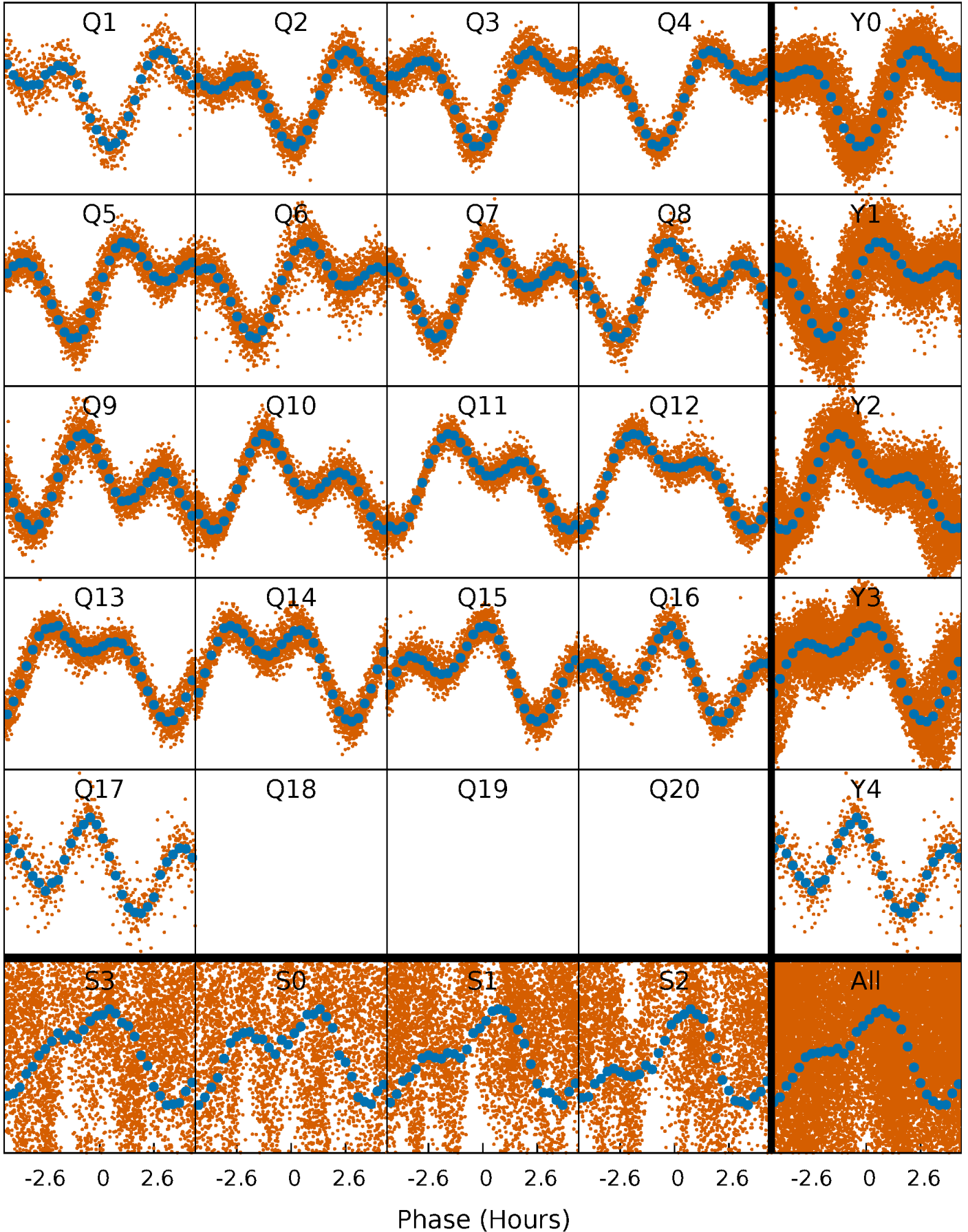


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

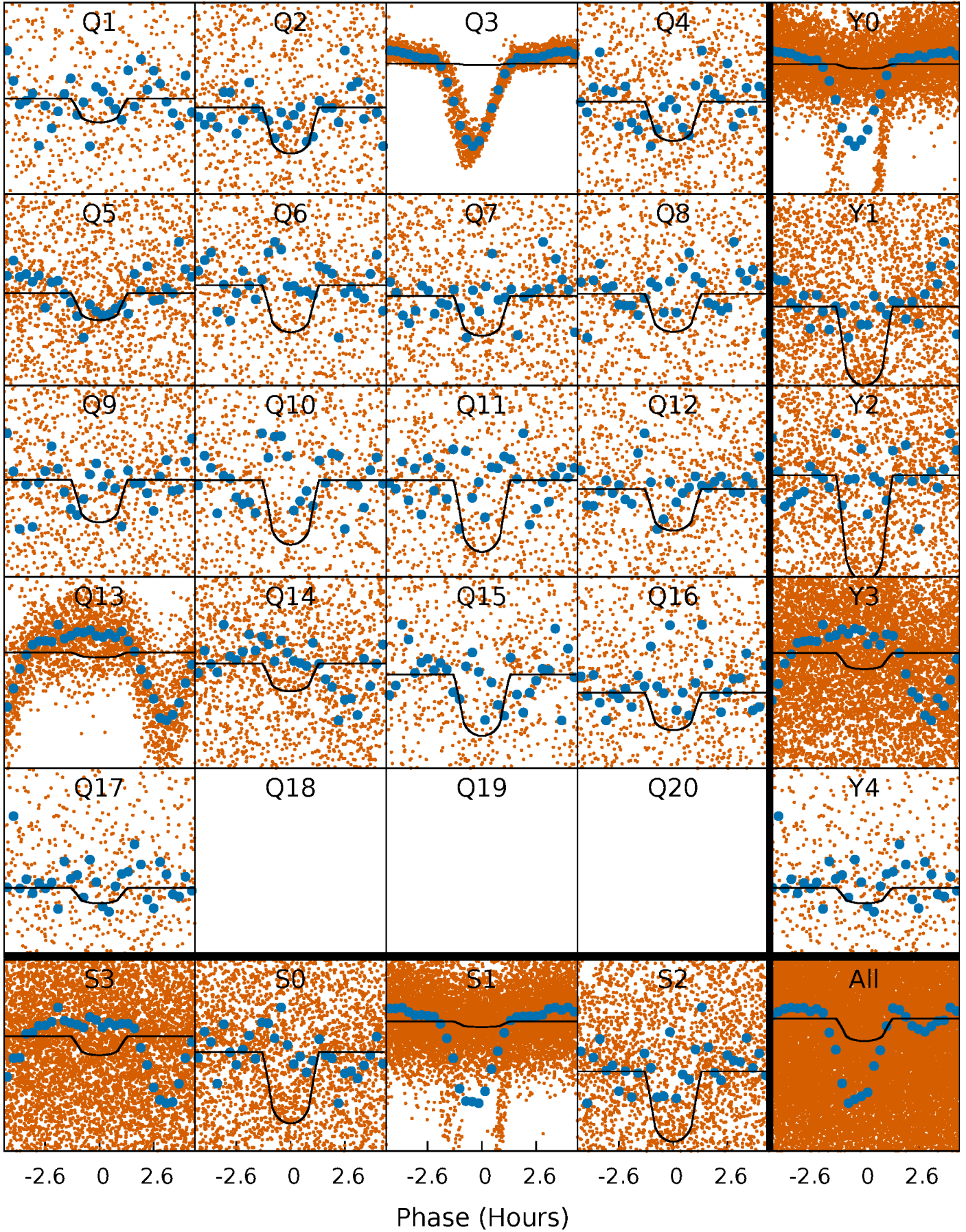
TCE 012356839-01   P= 0.680423 Days    $T_0=132.121953$  (BKJD)





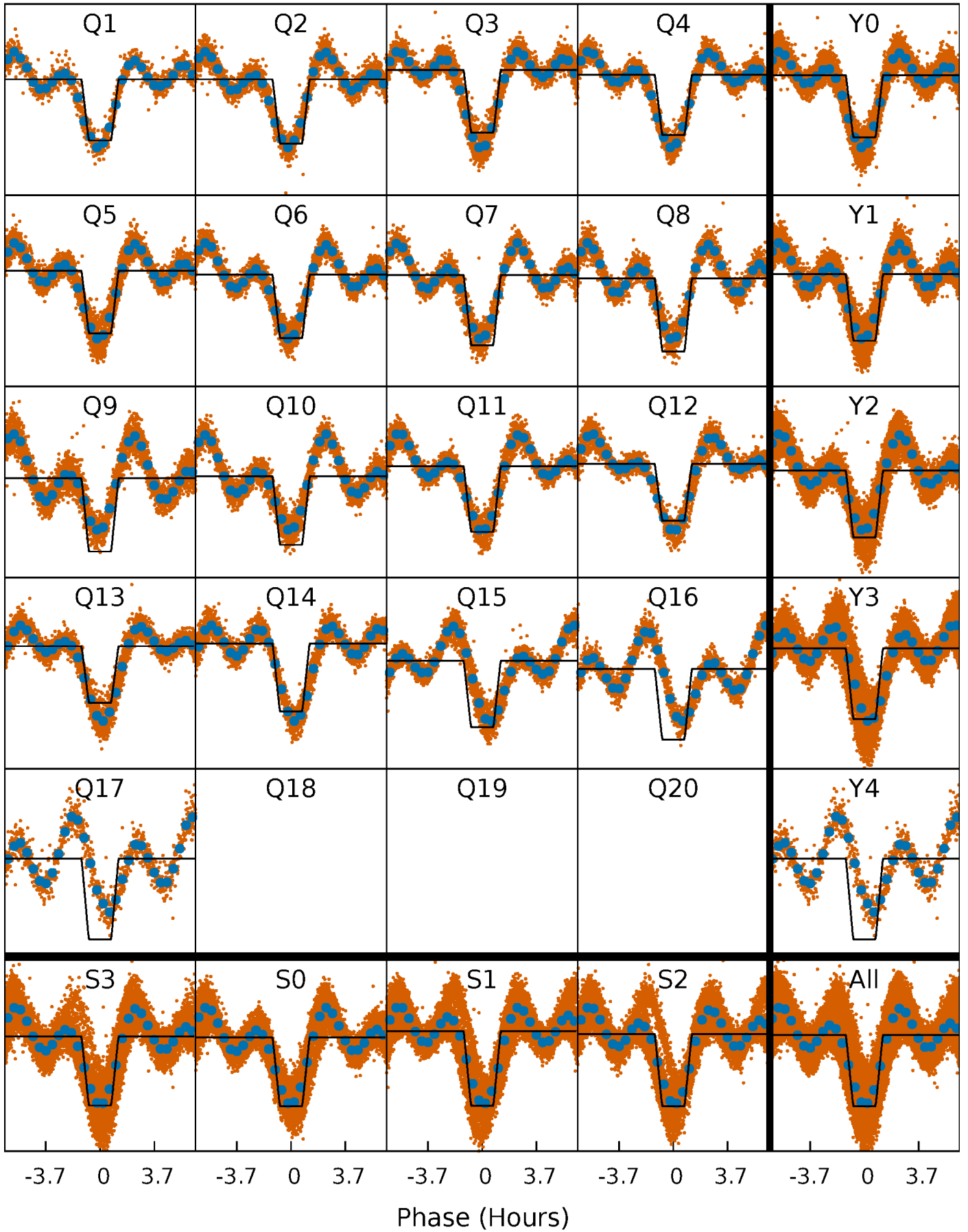
# DV Quarter-Phased Transit Curves

TCE 012356839-01 P= 0.680423 Days  $T_0=132.121953$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

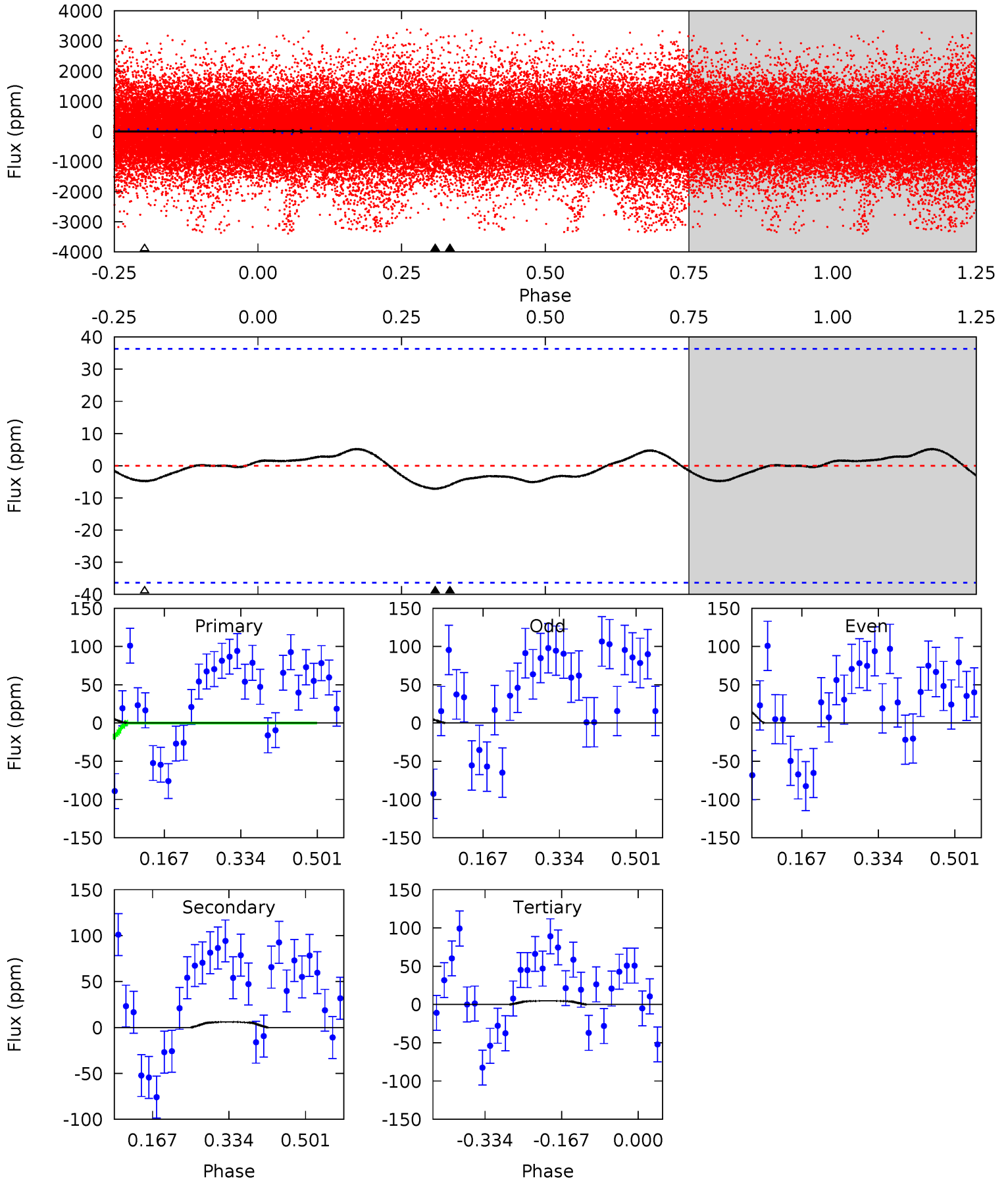
TCE 012356839-01   P= 0.680274 Days    $T_0=132.151549$  (BKJD)



# DV Model-Shift Uniqueness Test

012356839-01, P = 0.680423 Days, E = 131.441530 Days

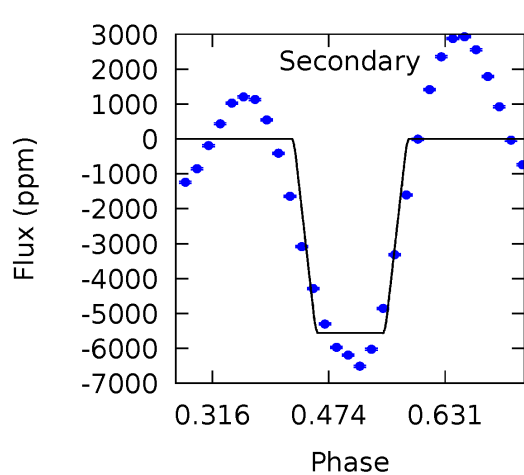
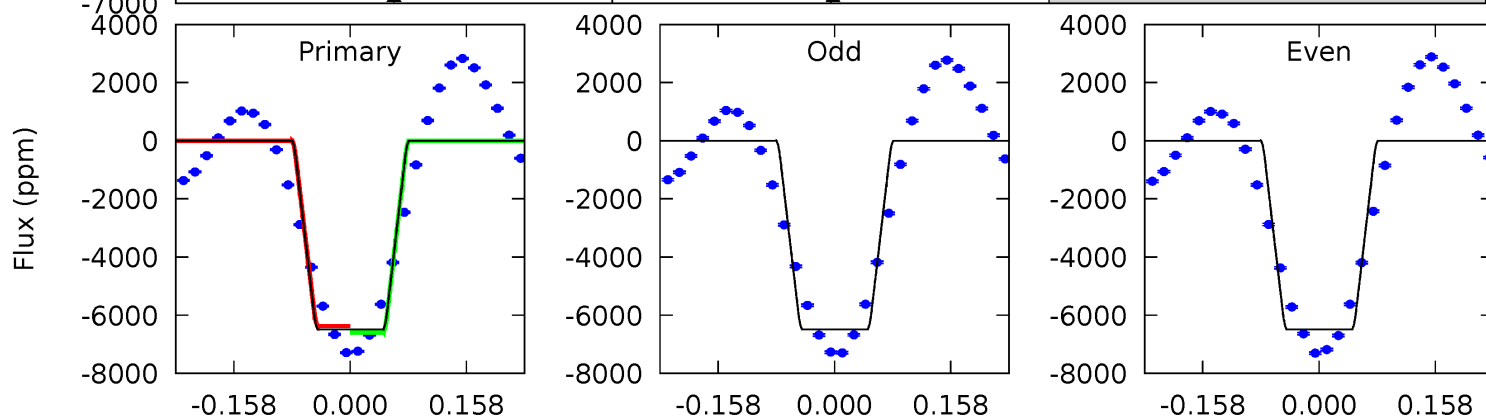
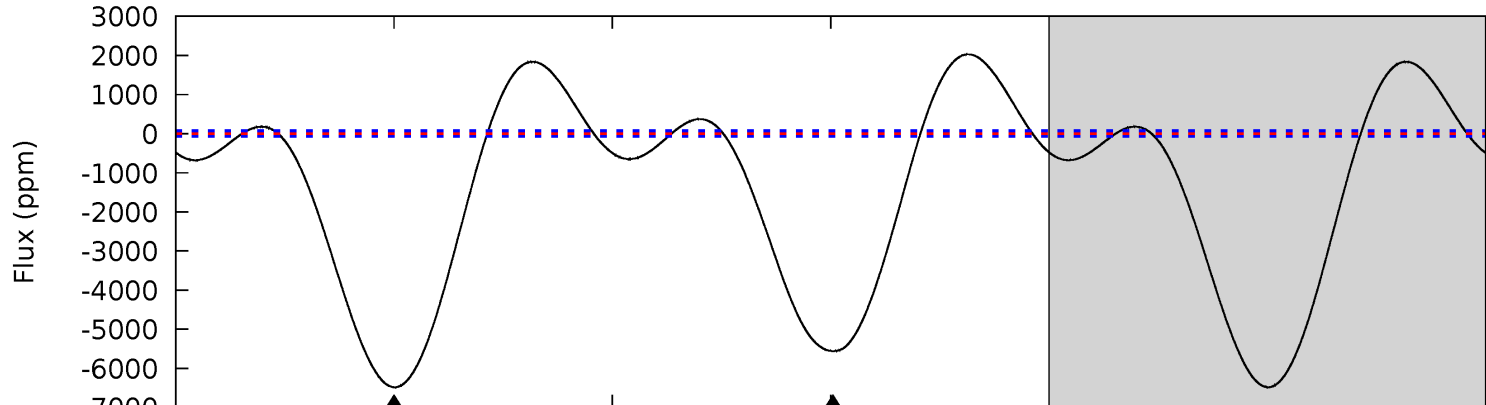
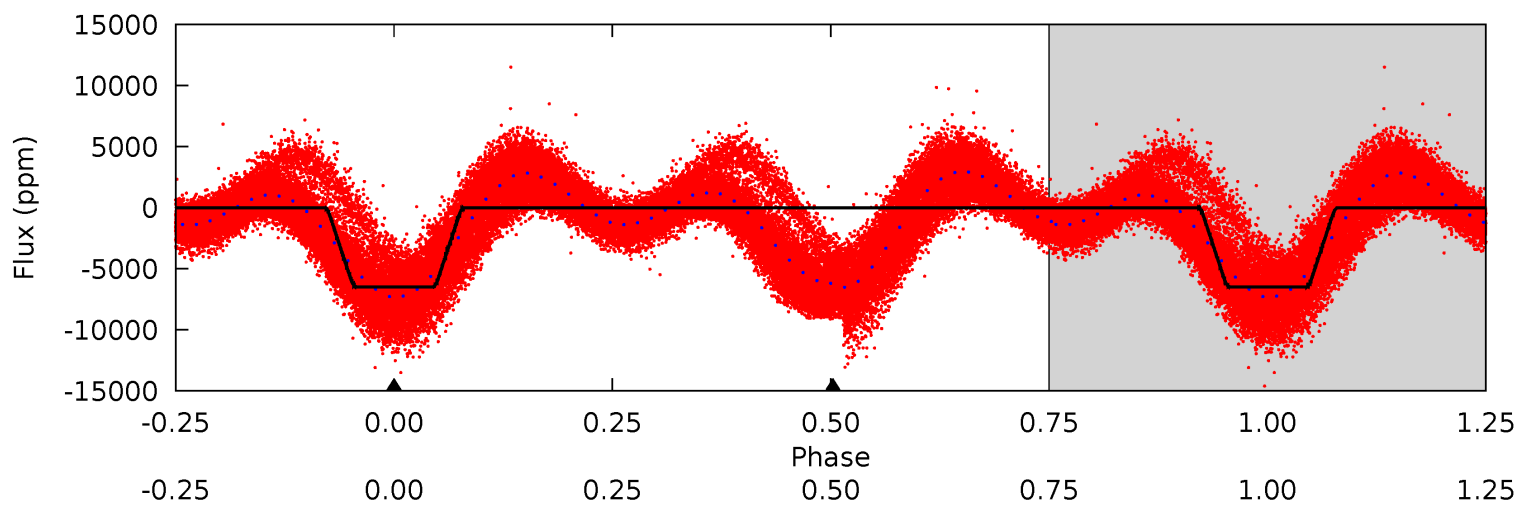
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.88	0.73	0.59	0	4.46	1.38	0.32	0.29	0.88	0.15	0.73	0.95	20.2	0.42	1.12



# Alt Model-Shift Uniqueness Test

012356839-01, P = 0.680274 Days, E = 131.471275 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
404.7	346.9	0	0	4.47	1.41	52.0	404.7	404.7	346.9	346.9	0.15	0.99	0.24	7.43





### Stellar Parameters For KIC 012356839

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5613^{+152}_{-169}$	$4.581^{+0.038}_{-0.152}$	$-0.260^{+0.300}_{-0.300}$	$0.795^{+0.182}_{-0.061}$	$0.888^{+0.088}_{-0.107}$	$2.492^{+0.402}_{-1.127}$
	+3%/-3%	+1%/-3%	+115%/-115%	+23%/-8%	+10%/-12%	+16%/-45%
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 012356839-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-6 \pm 8$	$1.05^{+0.50}_{-0.49}$	$2599^{+127}_{-100}$	$2785^{+1070}_{-5816}$	$0.556^{+1.826}_{-0.716}$
Alt.	$-5561 \pm 16$	$7.73^{+1.03}_{-0.71}$	$2607^{+138}_{-104}$	$5224^{+222}_{-206}$	$11^{+2}_{-2}$

$T_{max}$  = 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

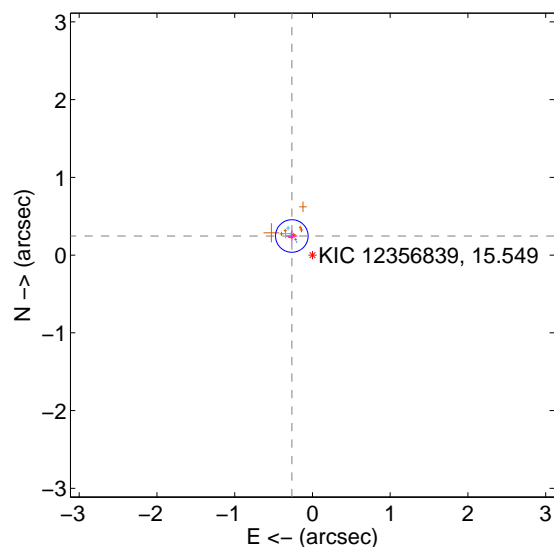
Supplemental centroid analysis for 012356839-01. Kepler magnitude: 15.55. Transit SNR 14.07

There are 5 quarters with good PRF difference image offsets

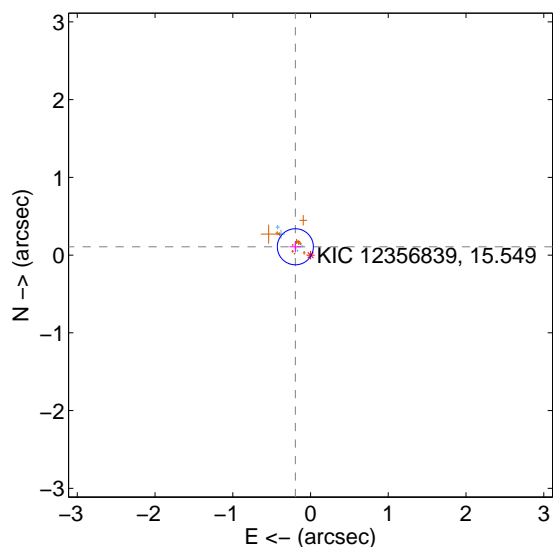
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>0.361 <math>\pm</math> 0.070</b>	<b>5.18</b>	0.265 $\pm$ 0.071	0.246 $\pm$ 0.071
PRF-fit source offset from KIC position	0.223 $\pm$ 0.077	2.88	0.195 $\pm$ 0.076	0.107 $\pm$ 0.072
photometric centroid source offset	0.48 $\pm$ 0.70	0.69	-0.19 $\pm$ 0.77	-0.44 $\pm$ 0.69

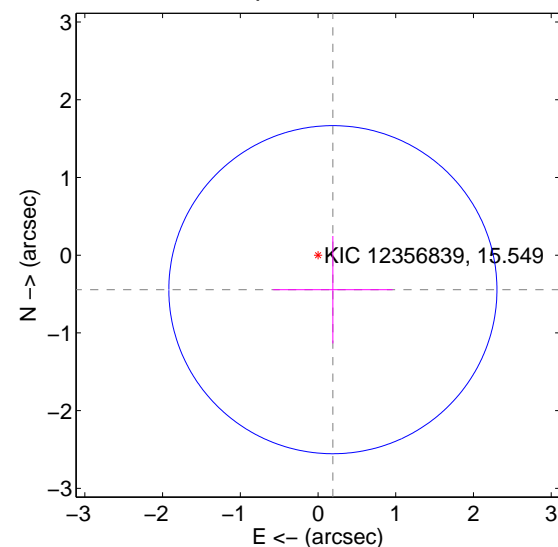
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

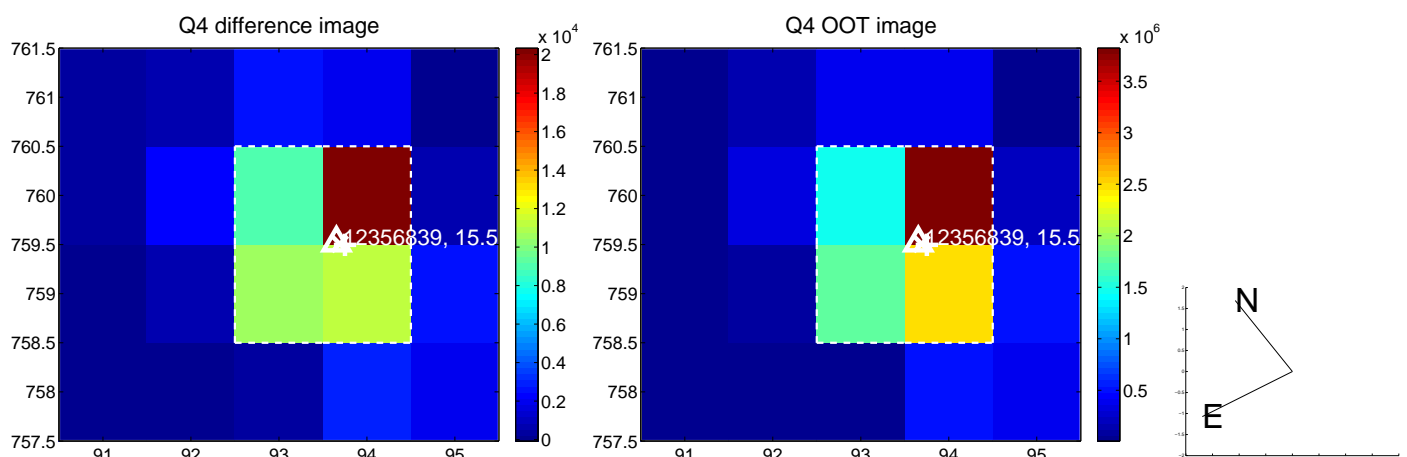
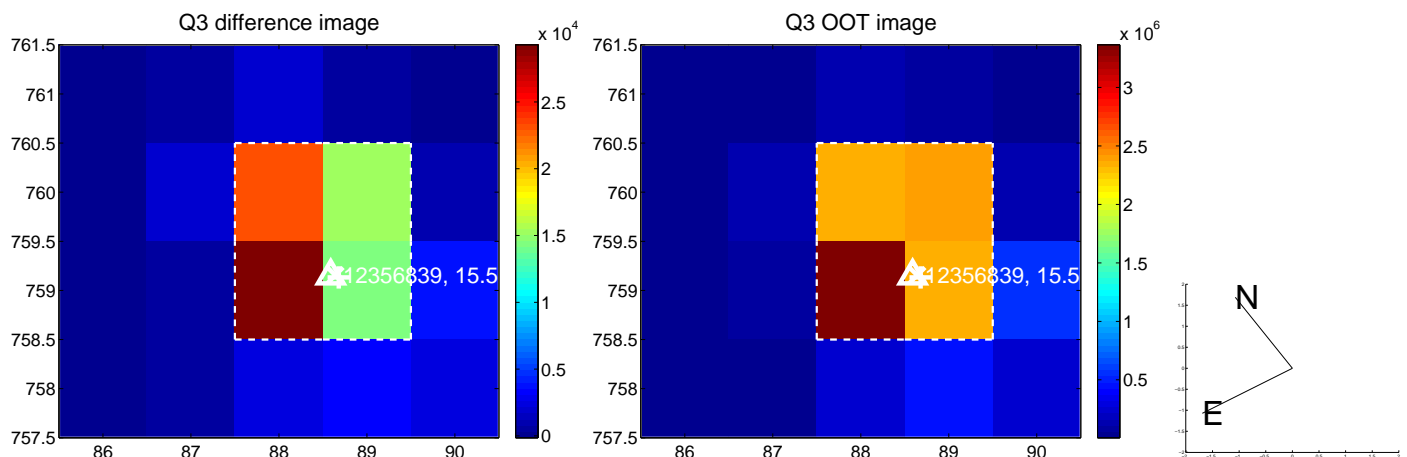
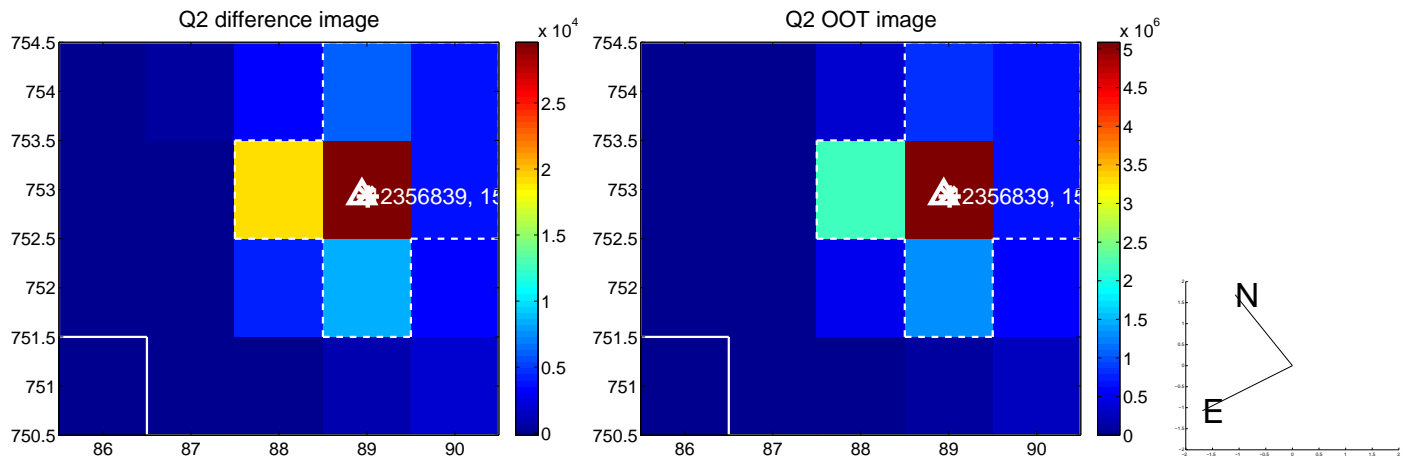
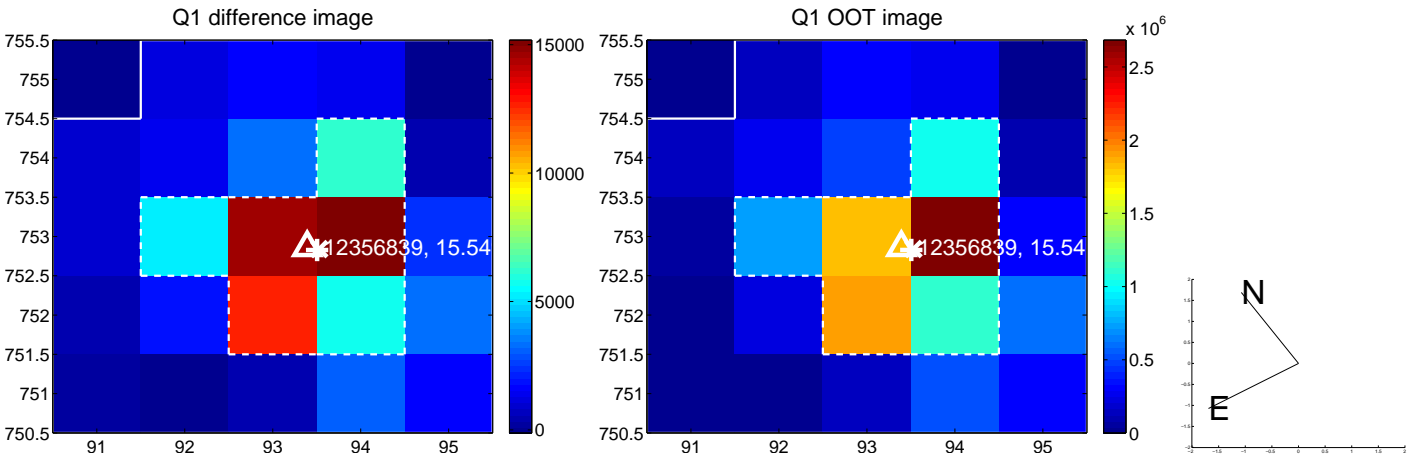


offset from photometric centroids

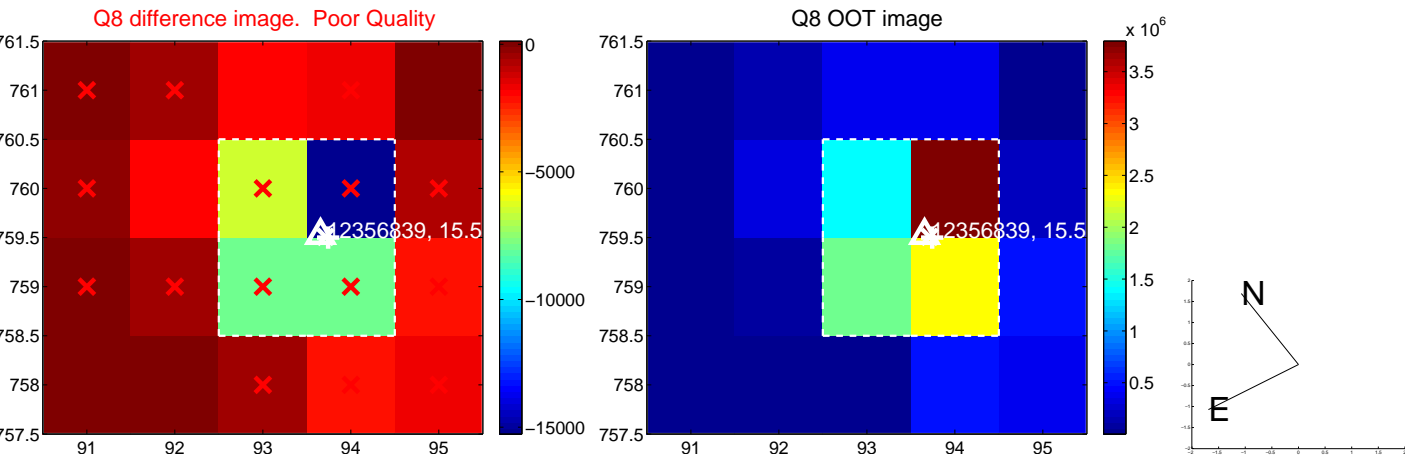
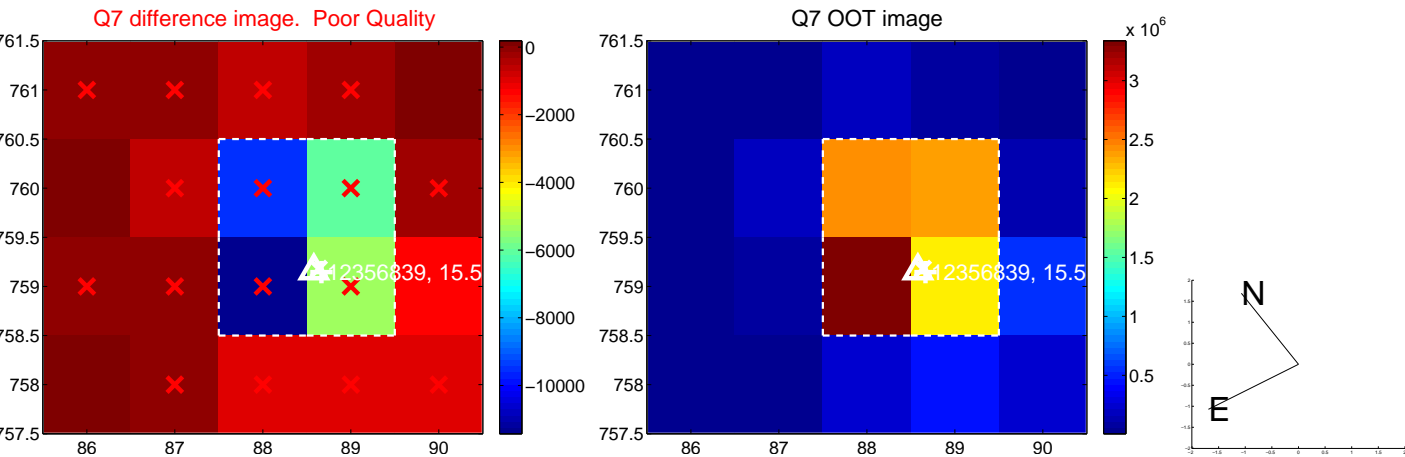
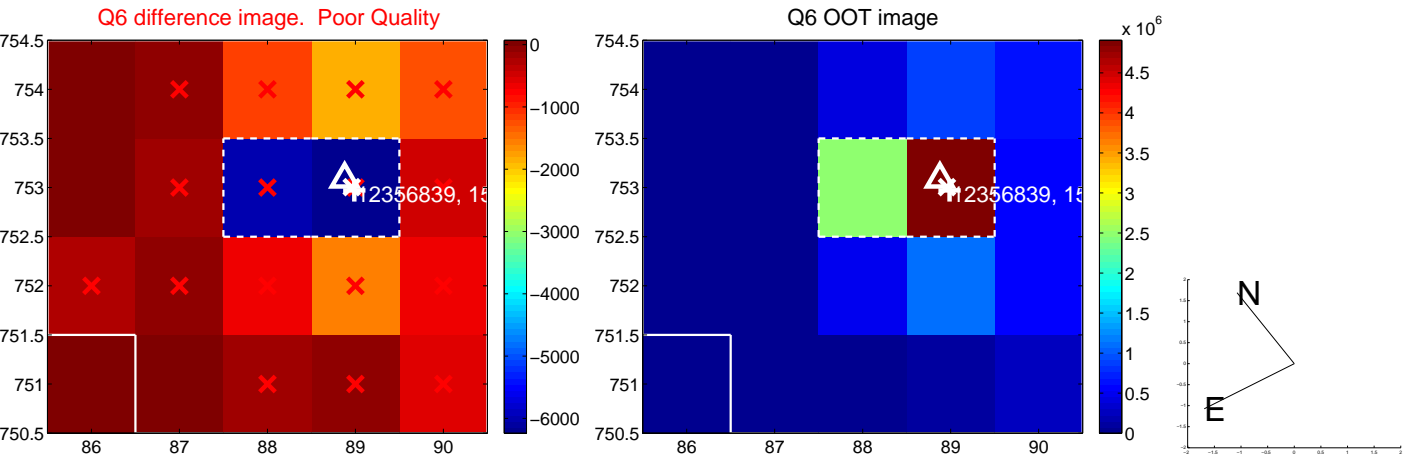
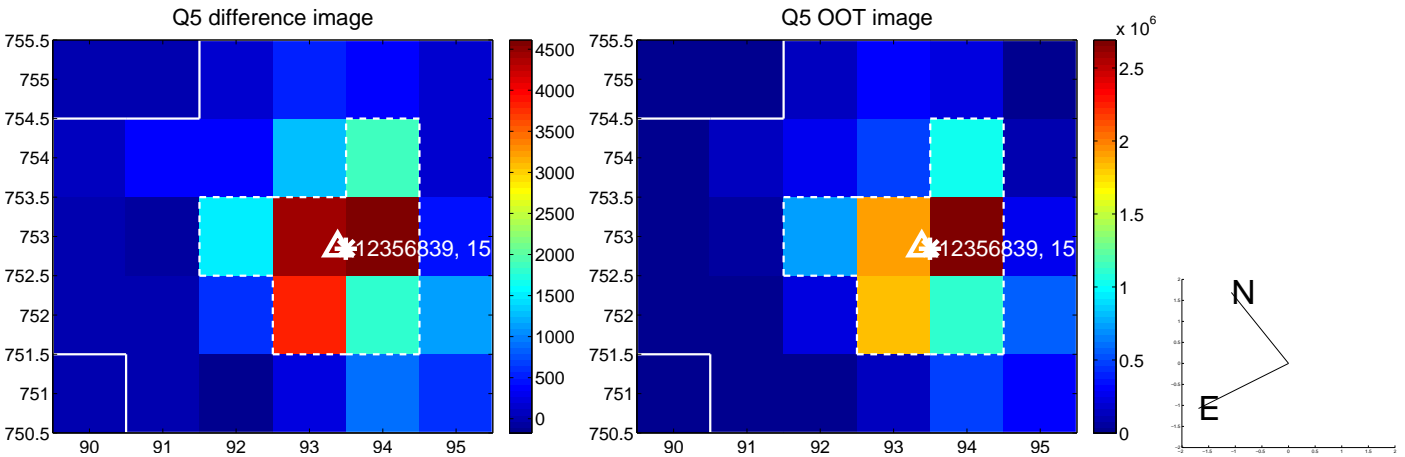


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

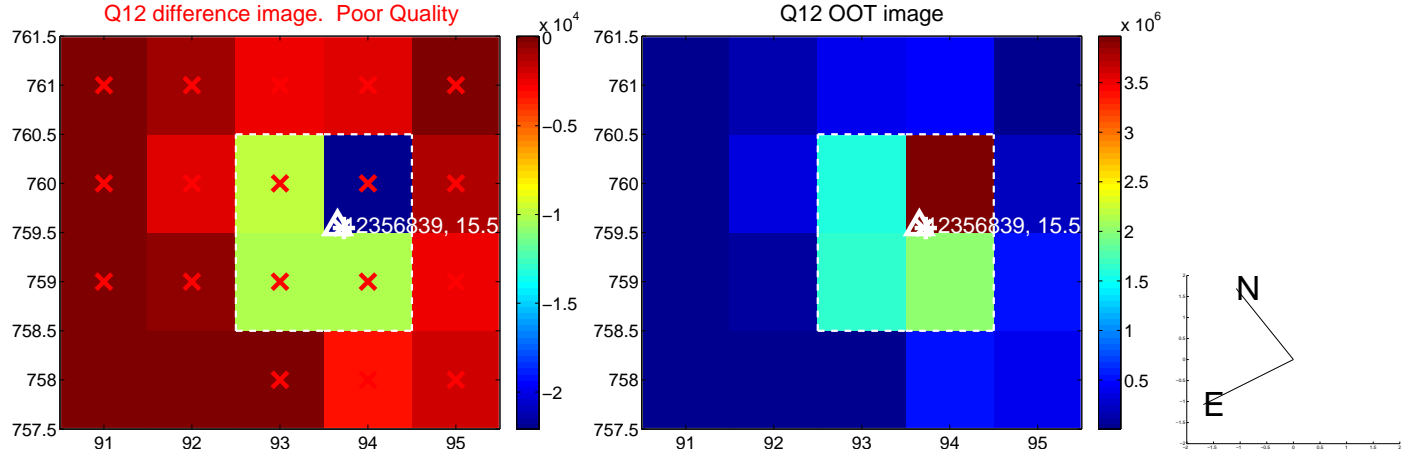
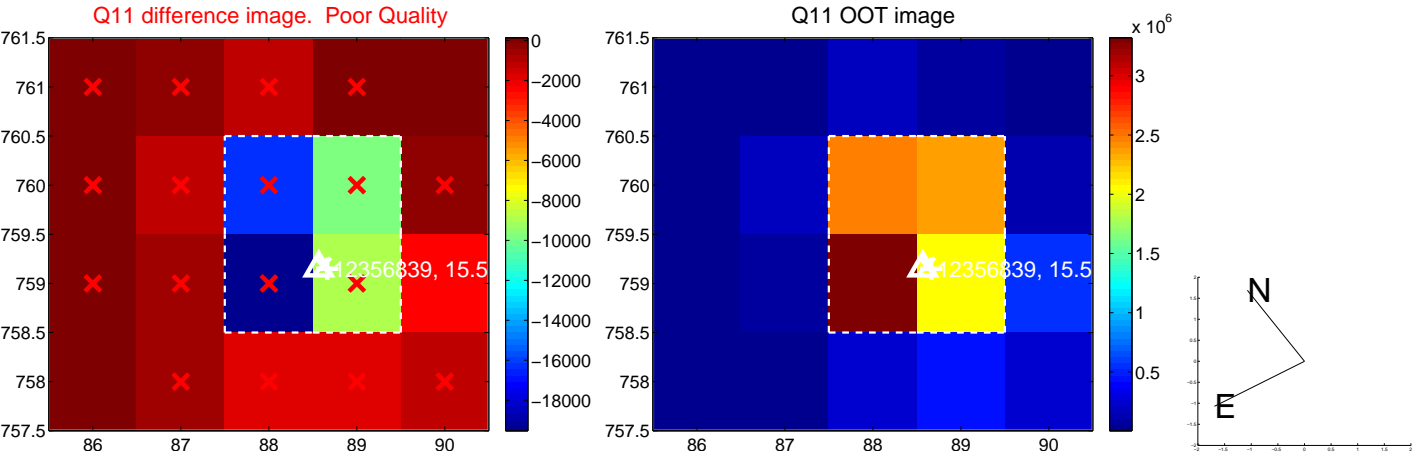
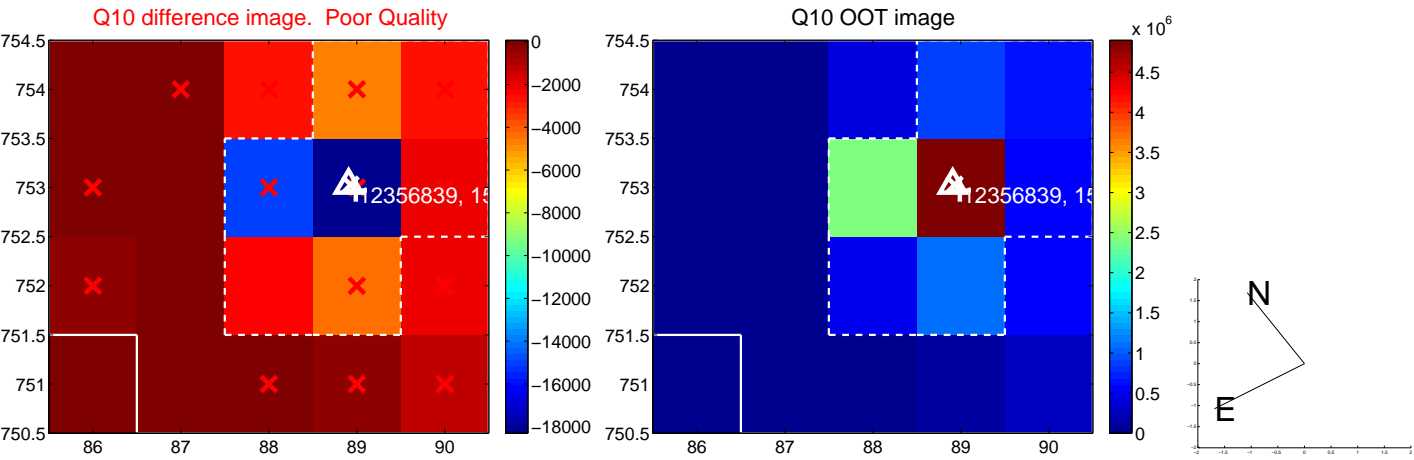
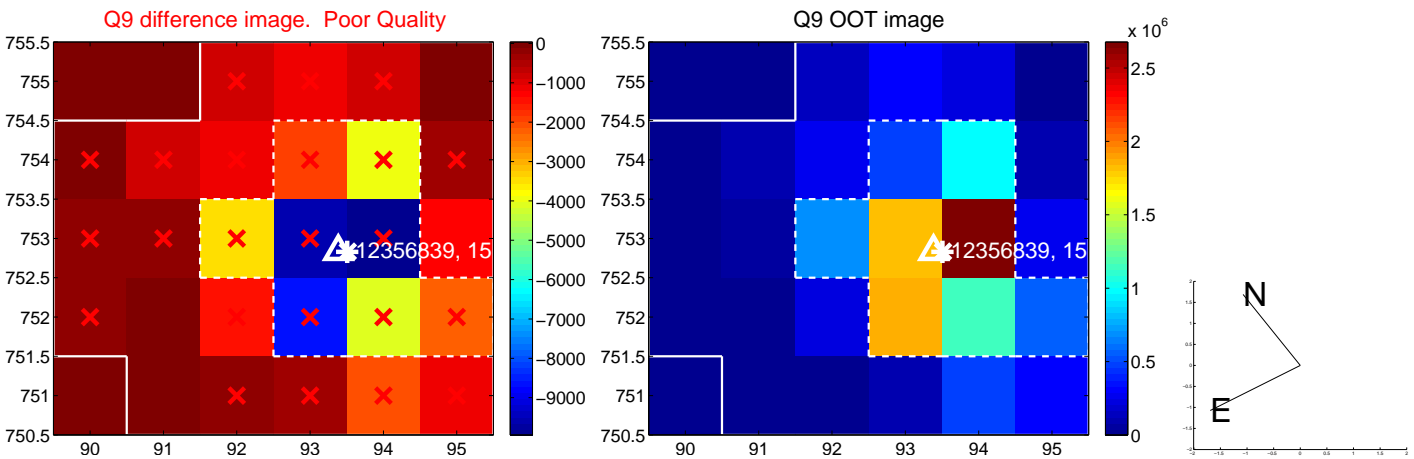


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

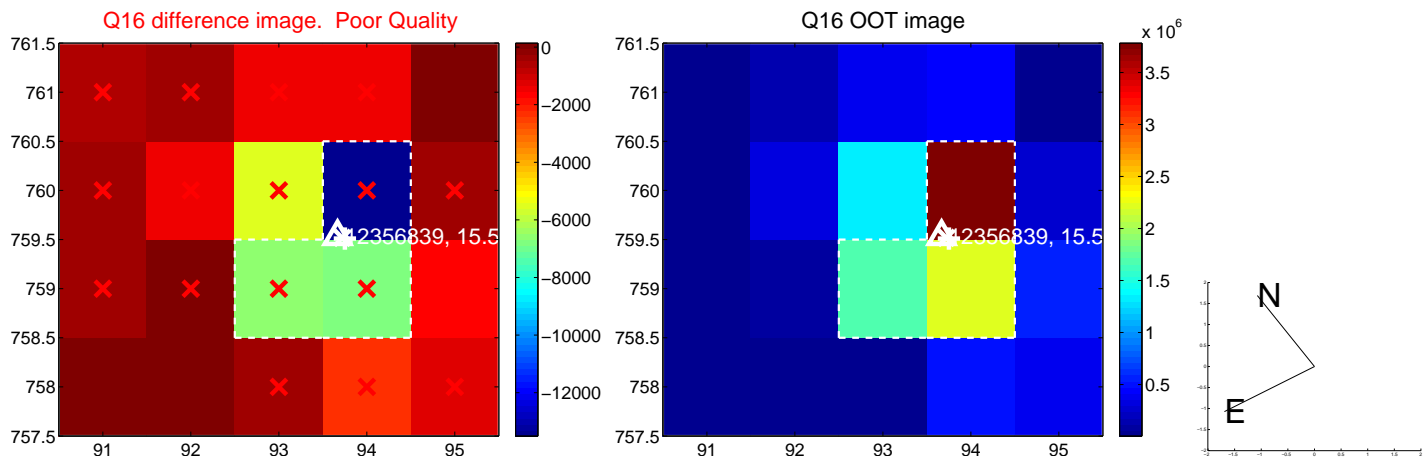
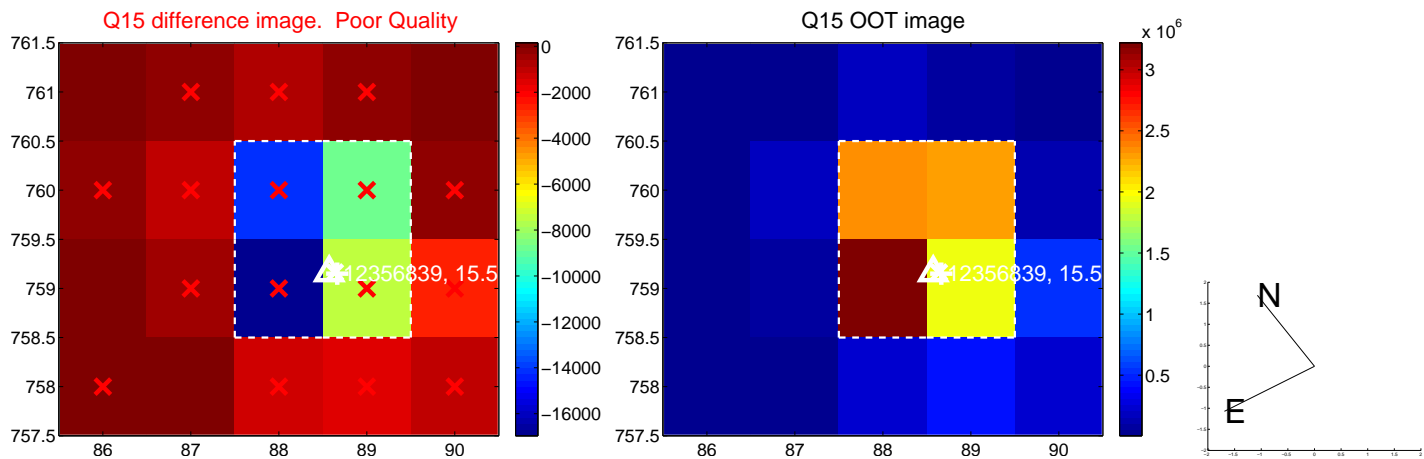
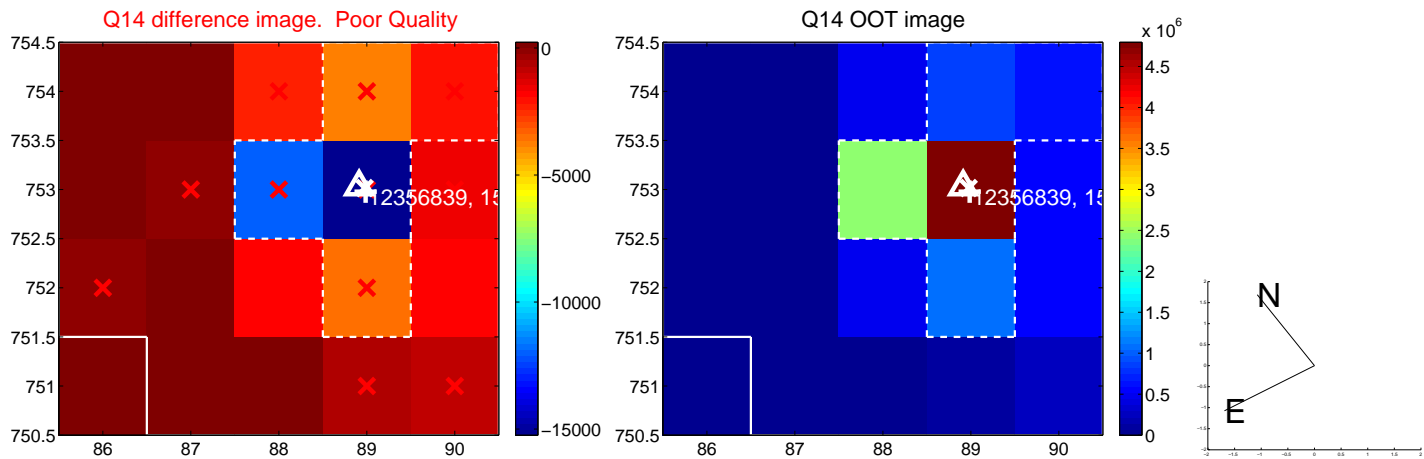
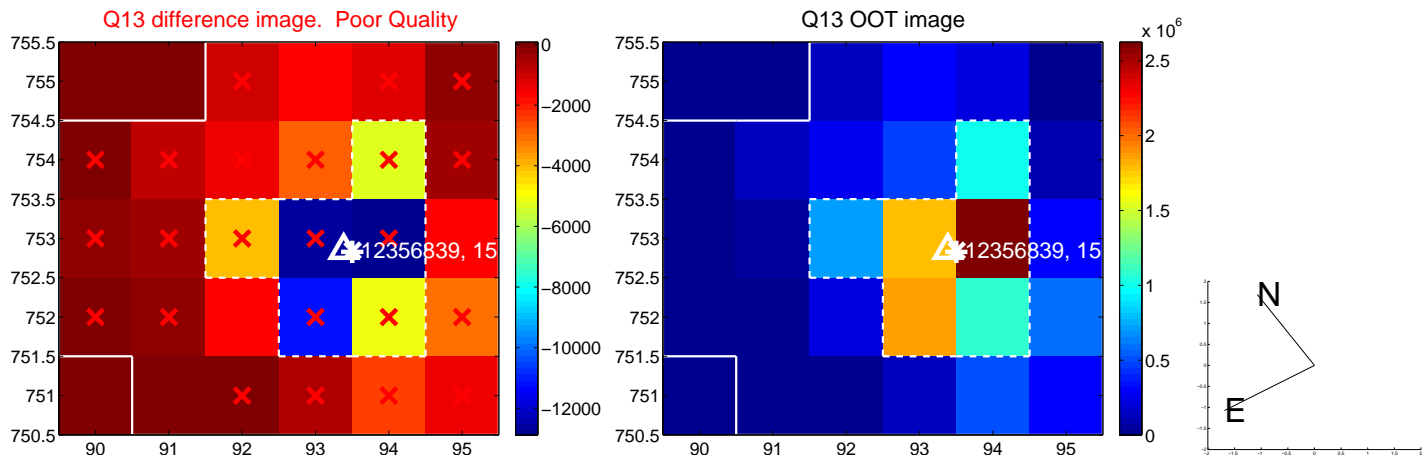




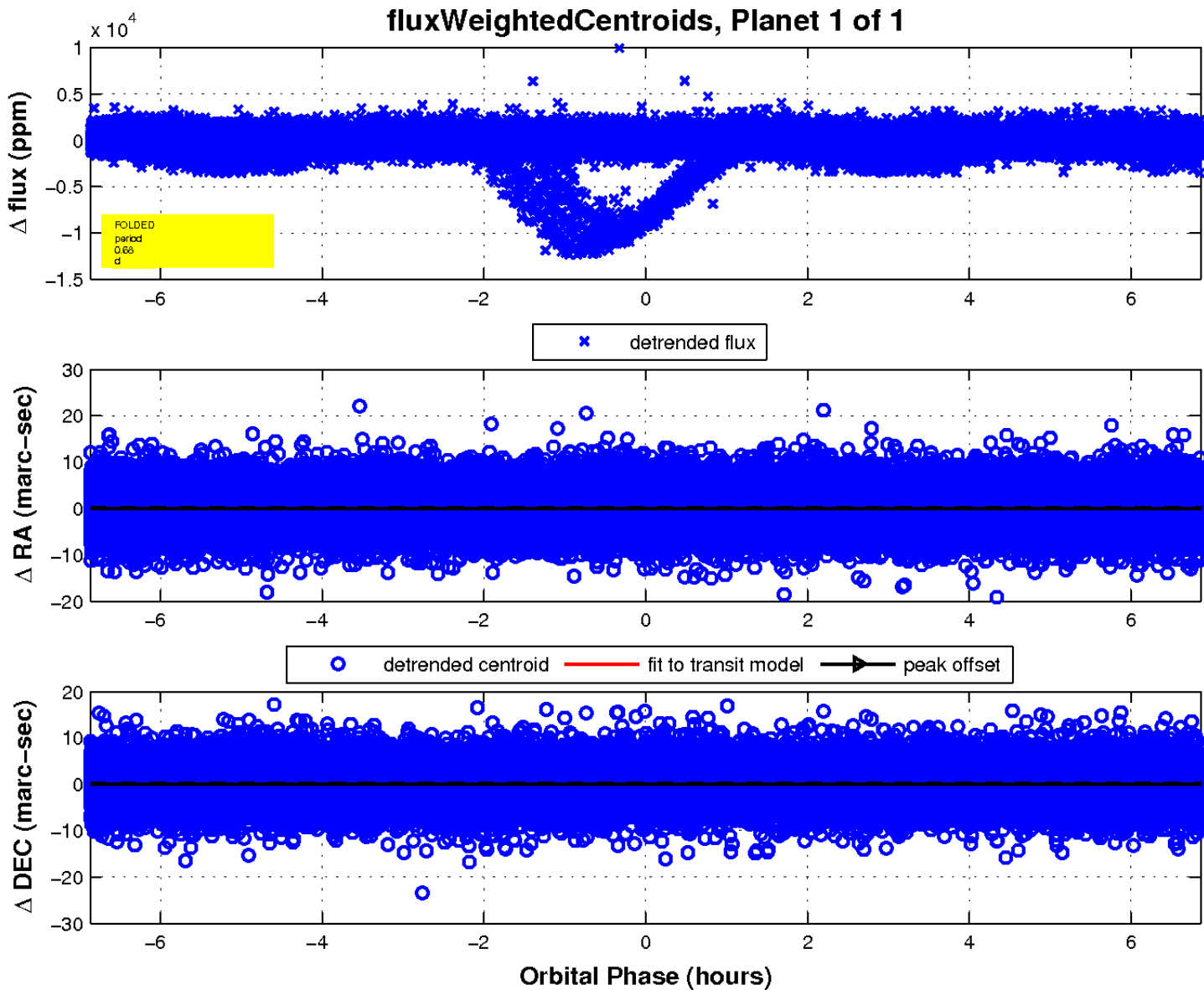
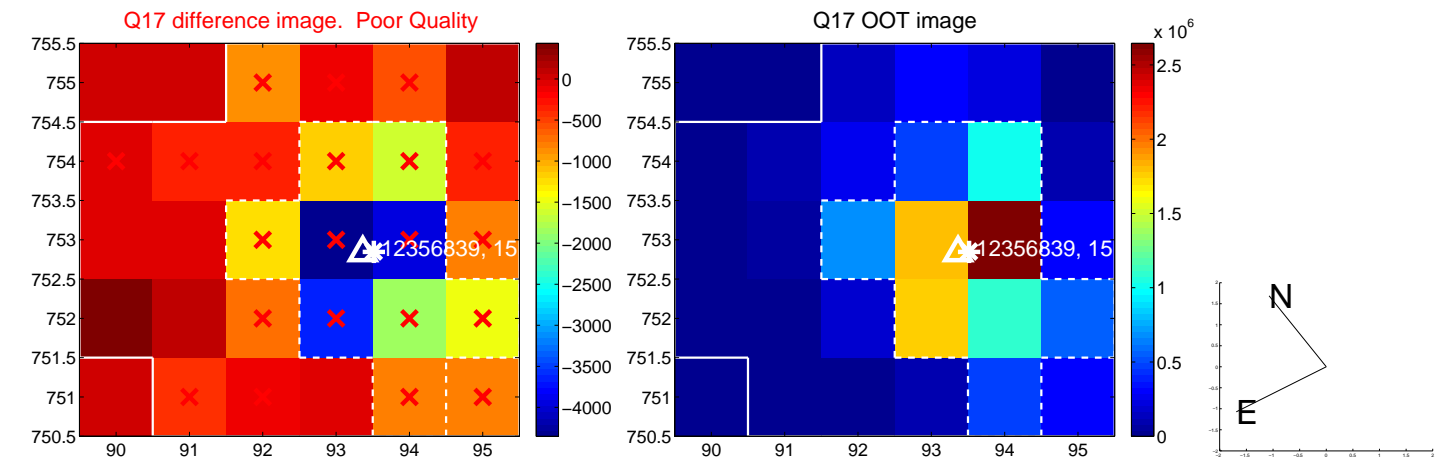
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

