

# KIC 012555616

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012555616-01	OBS	7540.01	21.981509	150.680409	83.4	5.625	8.1	8.9	0.94	5573	0.97	36.14

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012555616-01	OBS	PC	0.35	0	0	0	0	CENT_KIC_POS

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

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

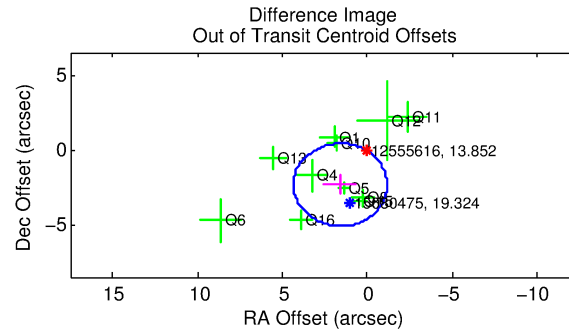
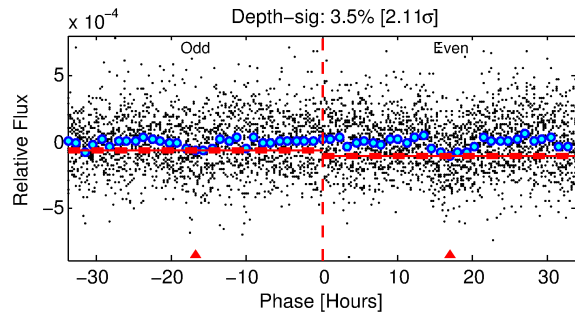
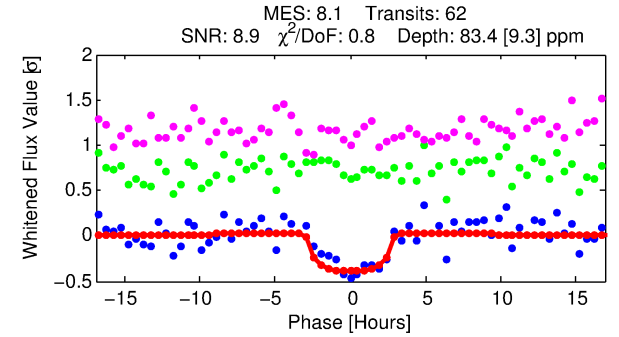
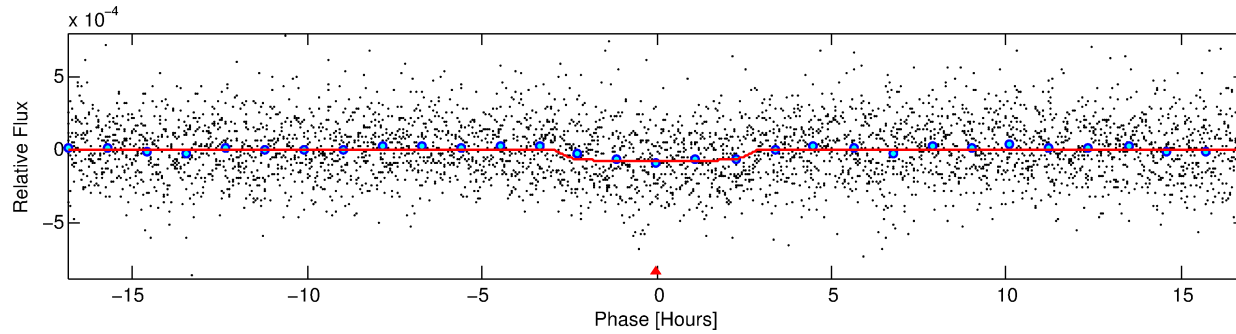
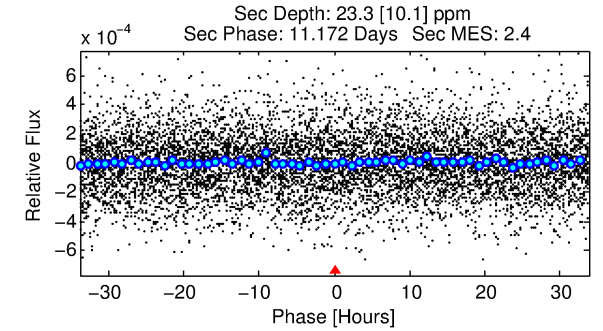
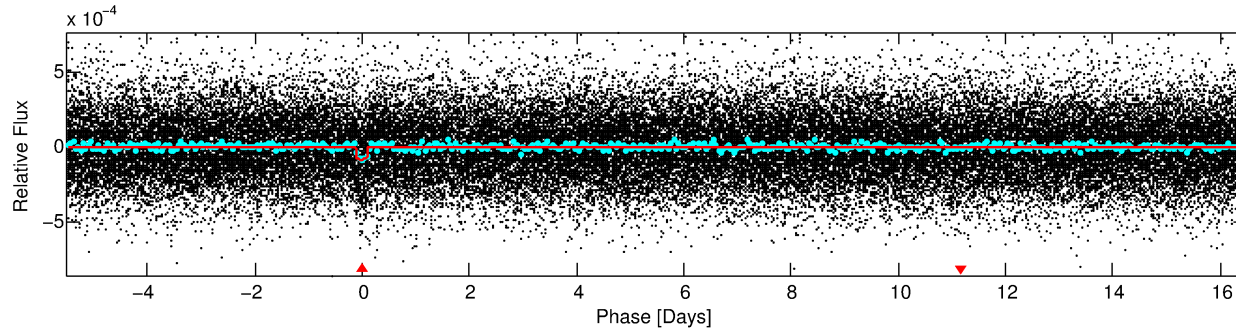
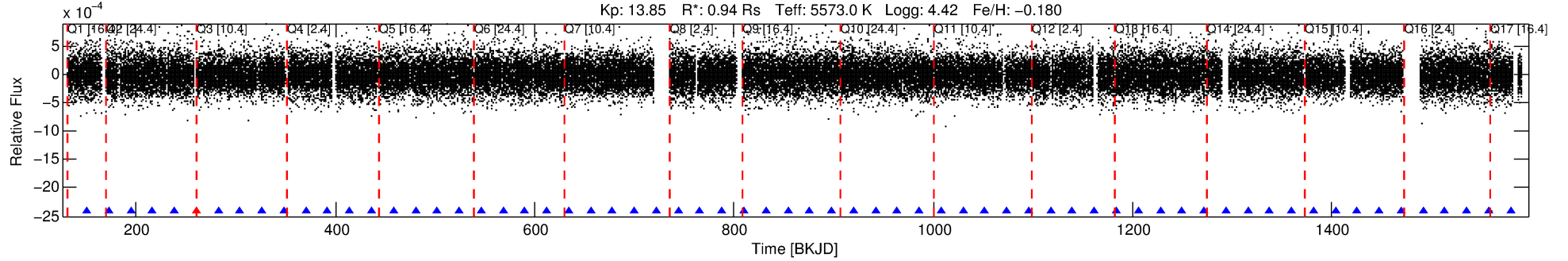
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012555616-01

No Significant Match Found

# DV One-Page Summary

KIC: 12555616 Candidate: 1 of 1 Period: 21.982 d  
KOI: K07540.01 Corr: 0.878



## DV Fit Results:

Period = 21.98151 [0.00033] d  
Epoch = 150.6804 [0.0122] BKJD  
Rp/R\* = 0.0095 [0.0064]  
a/R\* = 16.62 [49.93]  
b = 0.84 [1.05]  
Seff = 36.14 [12.62]  
Teff = 625 [55] K  
Rp = 0.97 [0.70] Re  
a = 0.1447 [0.0322] AU  
Ag = 283.16 [410.78] [0.69σ]  
Teffp = 3965 [1404] K [2.38σ]

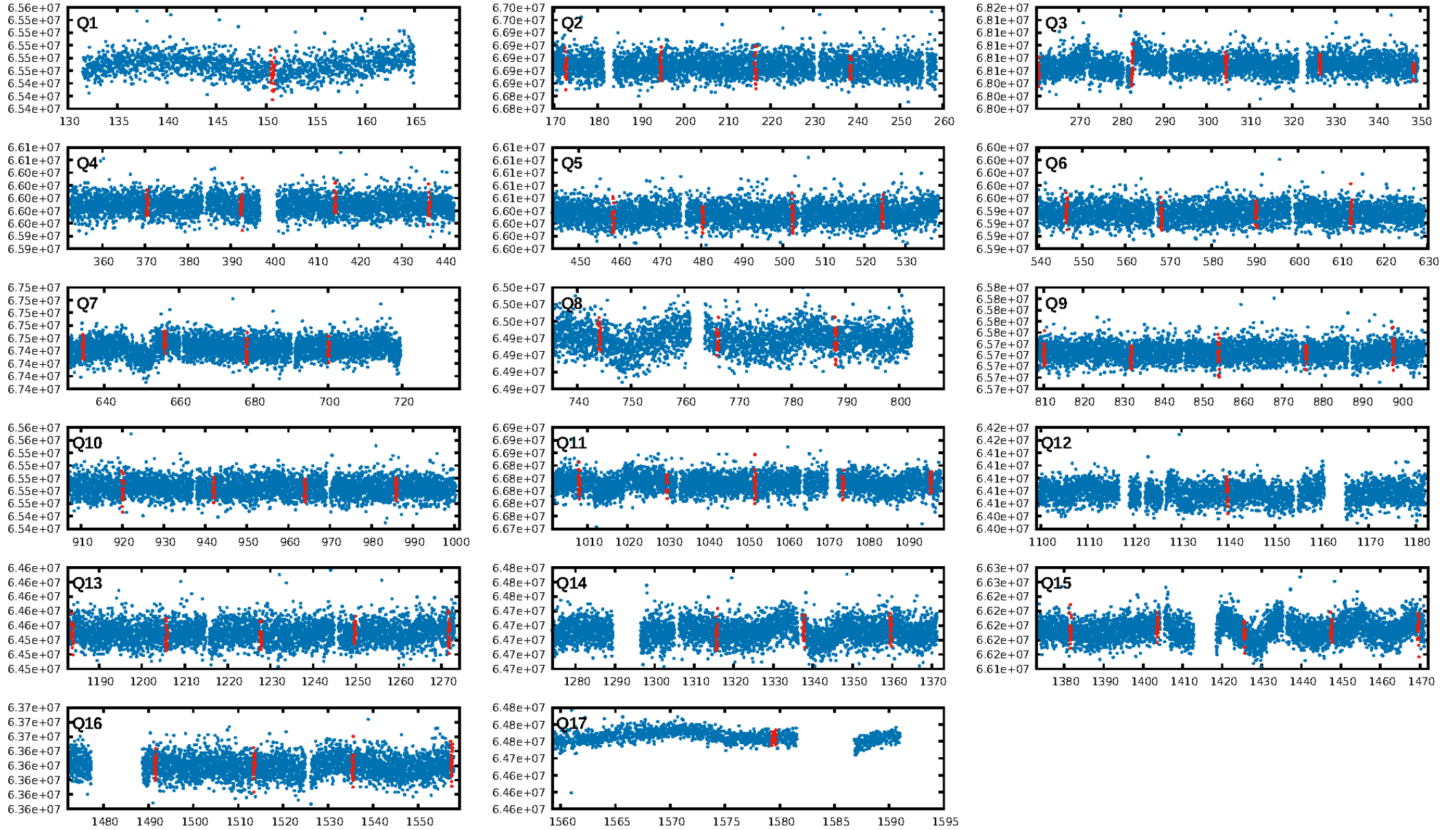
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 73.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.74e-16  
RollingBand-fgt: 0.98 [59/60]  
**GhostDiagnostic-chr: 0.9084**  
Centroid-sig: 0.0%  
Centroid-so: 3.149 arcsec [2.00σ]  
**OotOffset-rm: 2.833 arcsec [3.08σ]**  
**KicOffset-rm: 2.862 arcsec [3.35σ]**  
OotOffset-st: 2/2/4/3 [11]  
KicOffset-st: 2/2/4/3 [11]  
DiffImageQuality-fgm: 0.36 [4/11]  
DiffImageOverlap-fno: 1.00 [17/17]

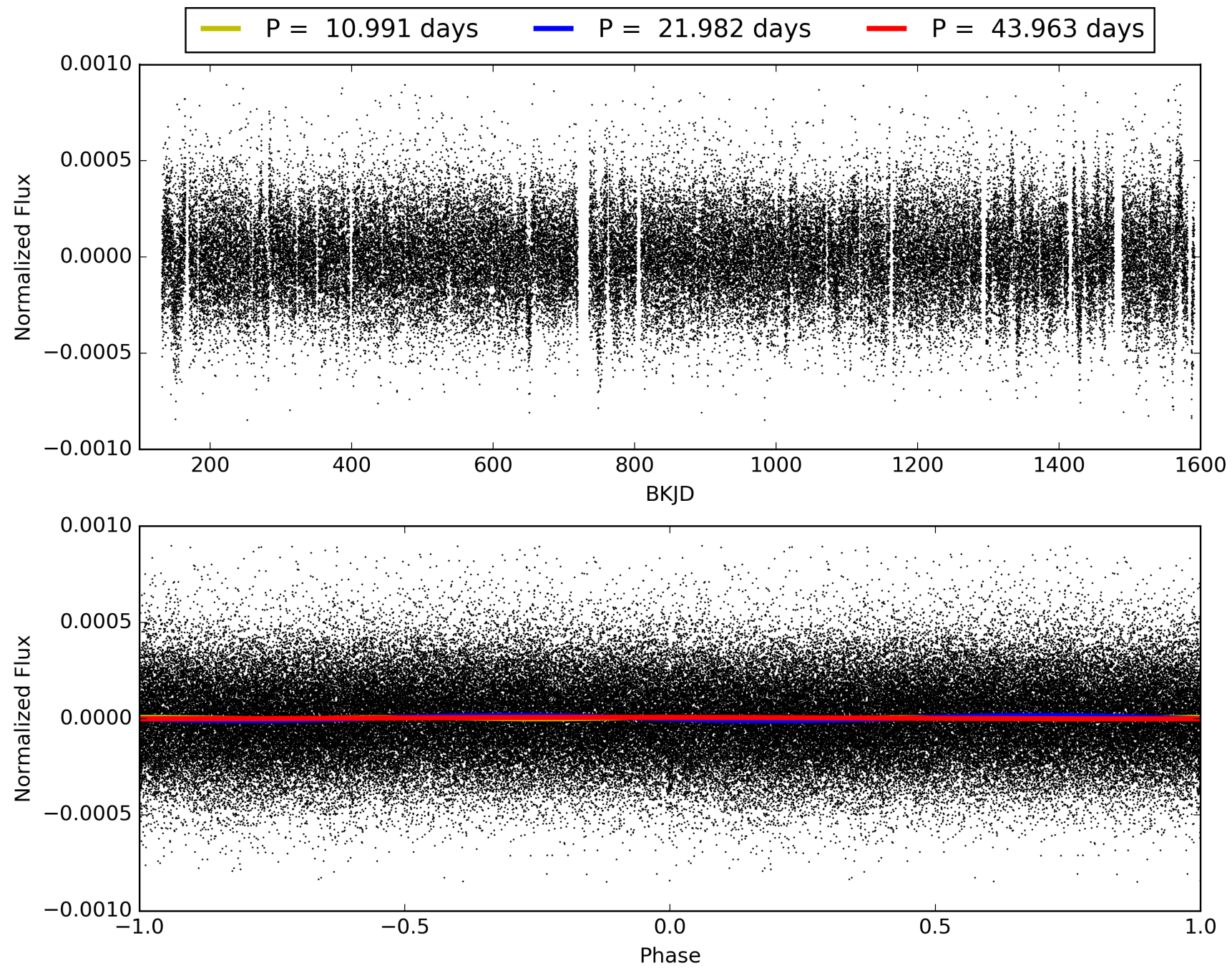
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 19:43:59 Z

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

# TCE 012555616-01, PDC Light Curves

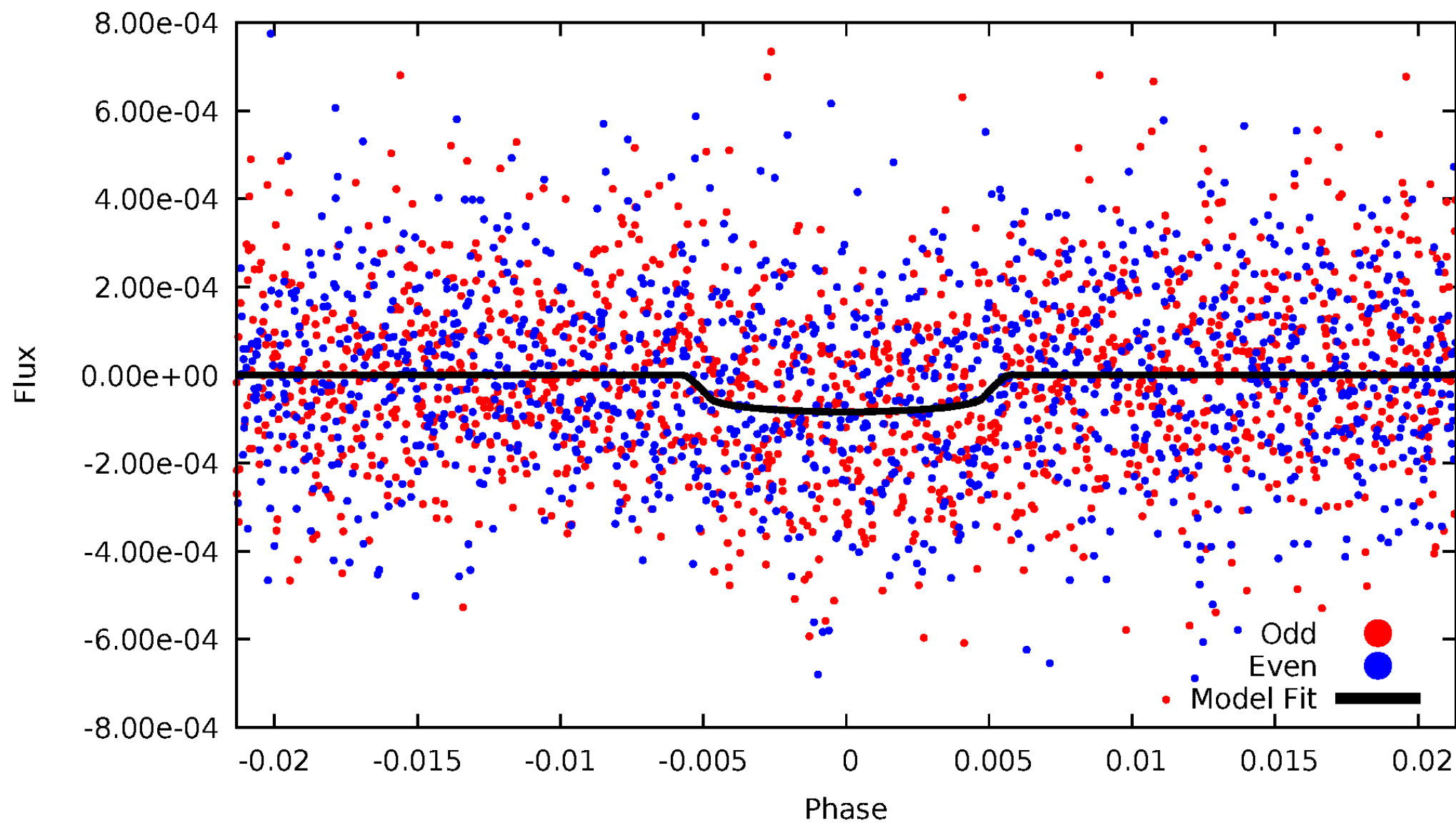


# TCE 012555616-01



# DV Odd/Even

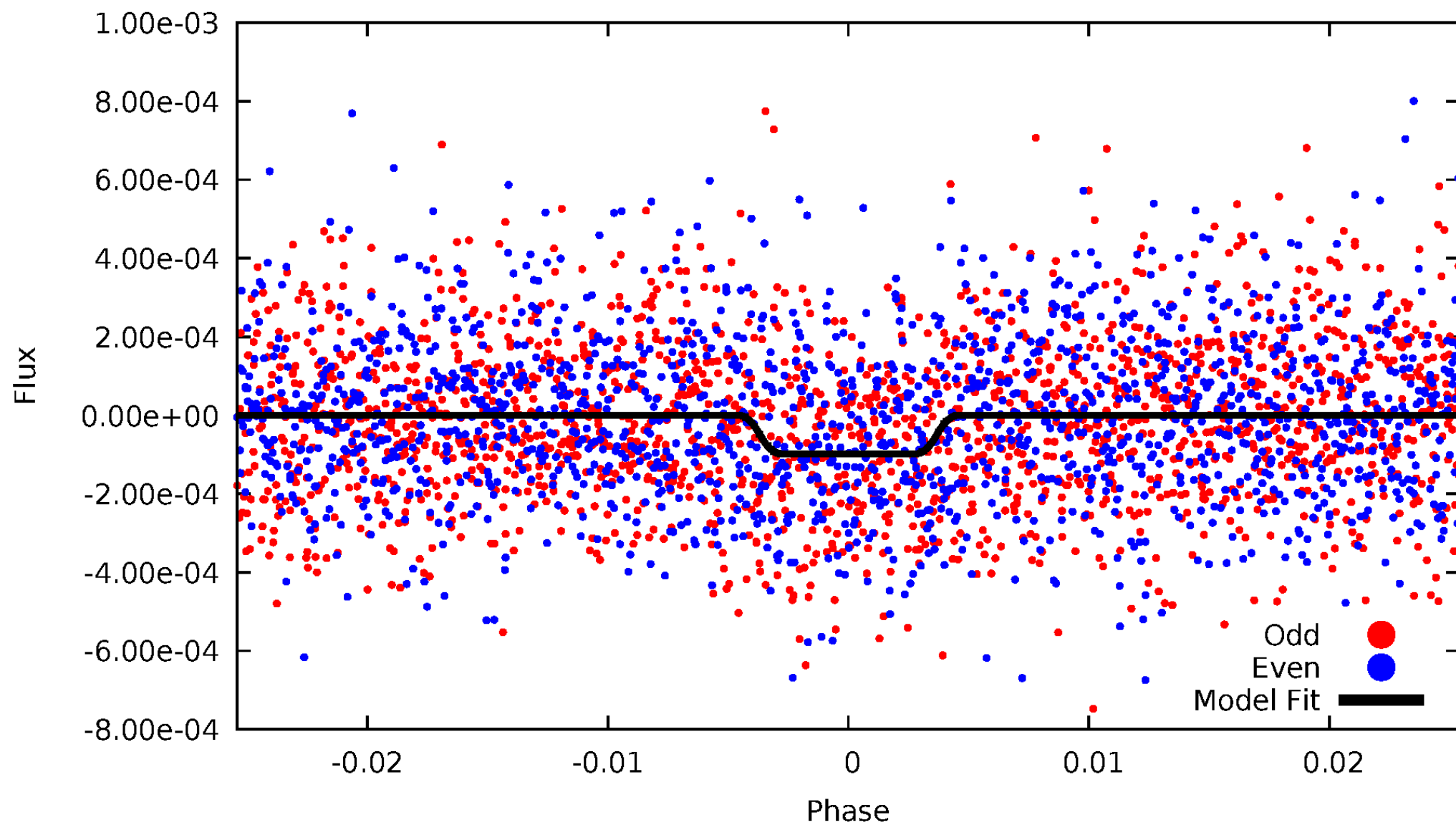
TCE 012555616-01





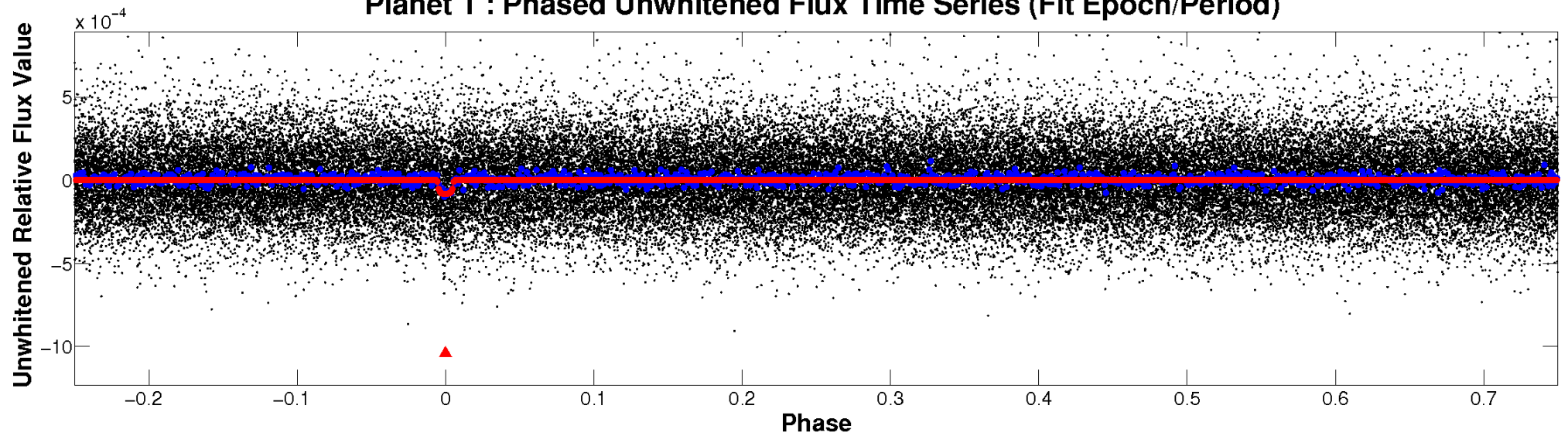
# ALT Odd/Even

TCE 012555616-01

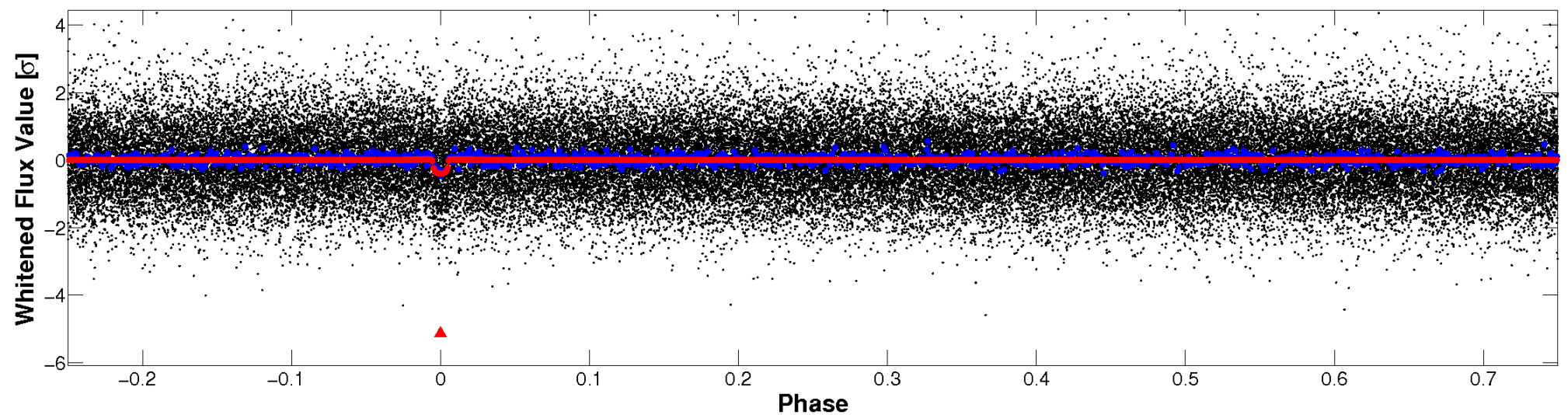


# Non-Whitened Vs. Whitened Light Curve

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

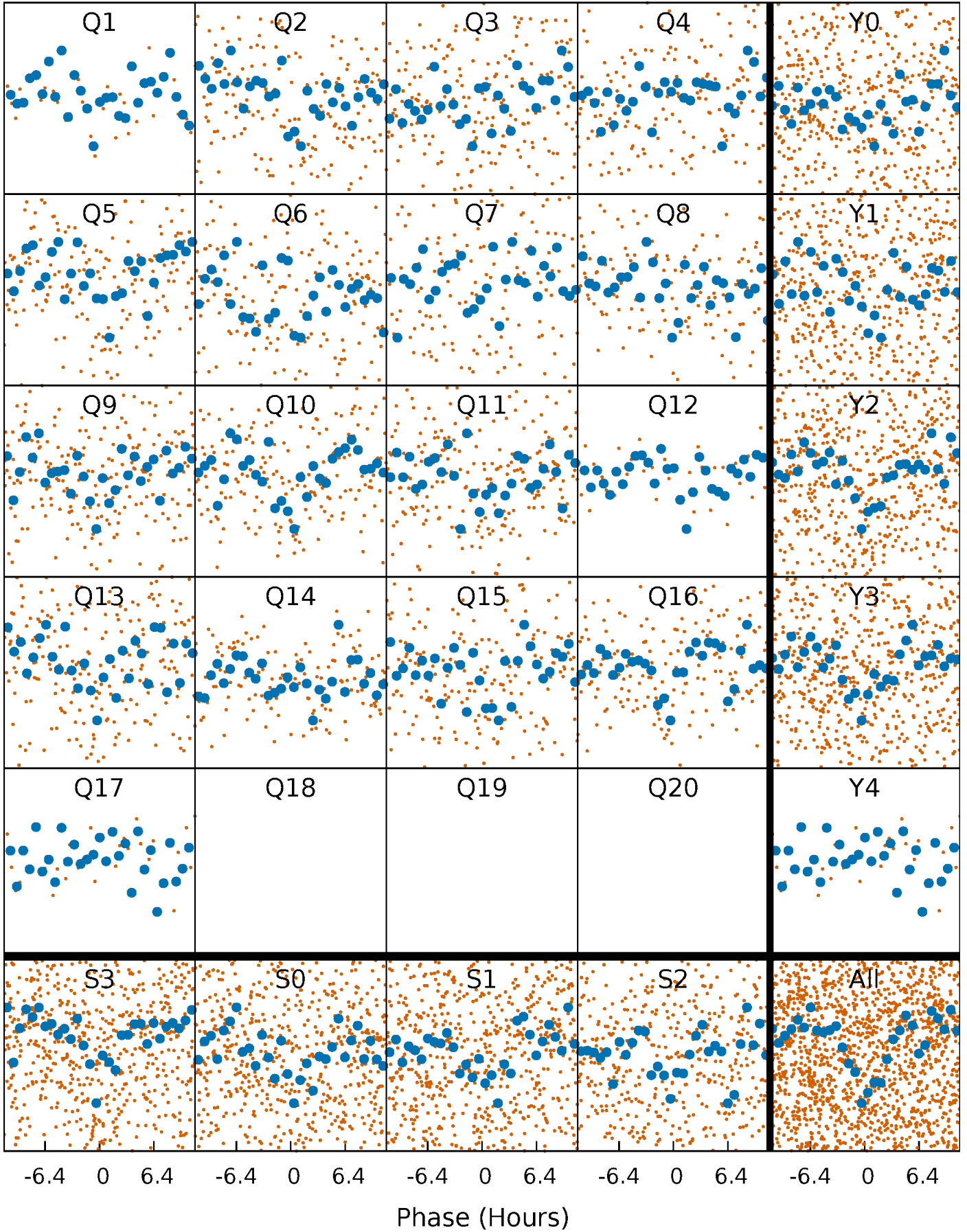


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

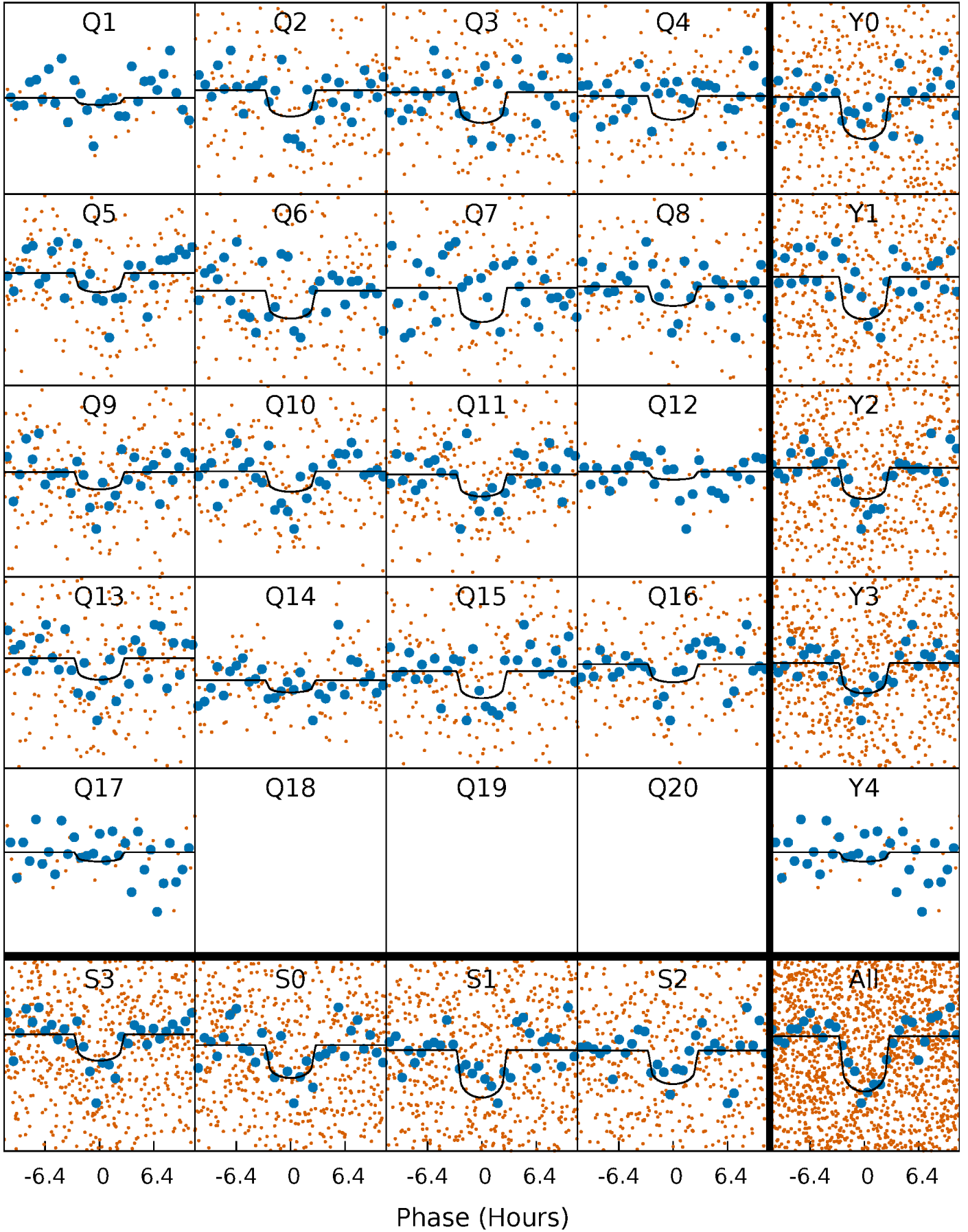
TCE 012555616-01 P= 21.981509 Days  $T_0=150.680409$  (BKJD)





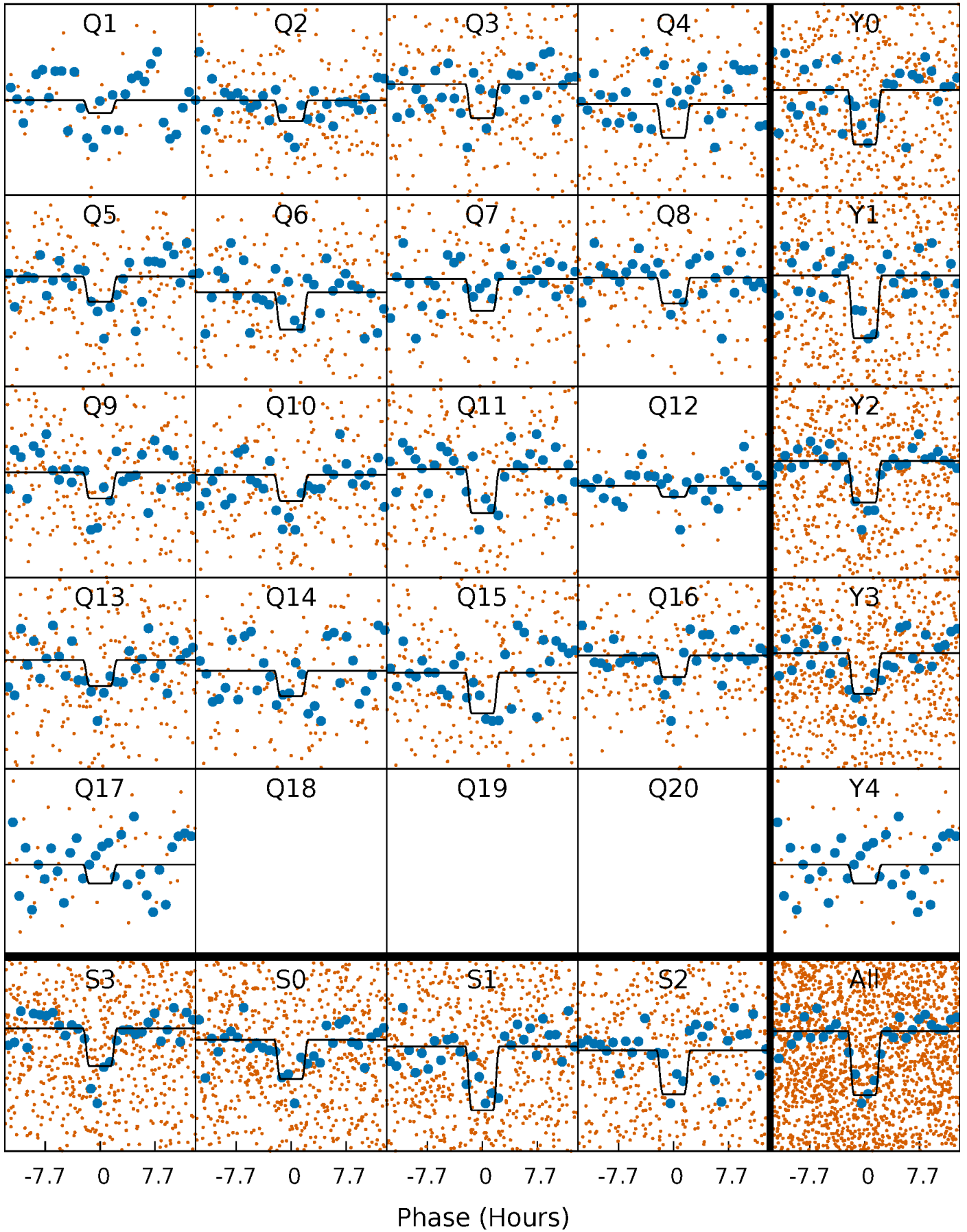
# DV Quarter-Phased Transit Curves

TCE 012555616-01 P= 21.981509 Days  $T_0=150.680409$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

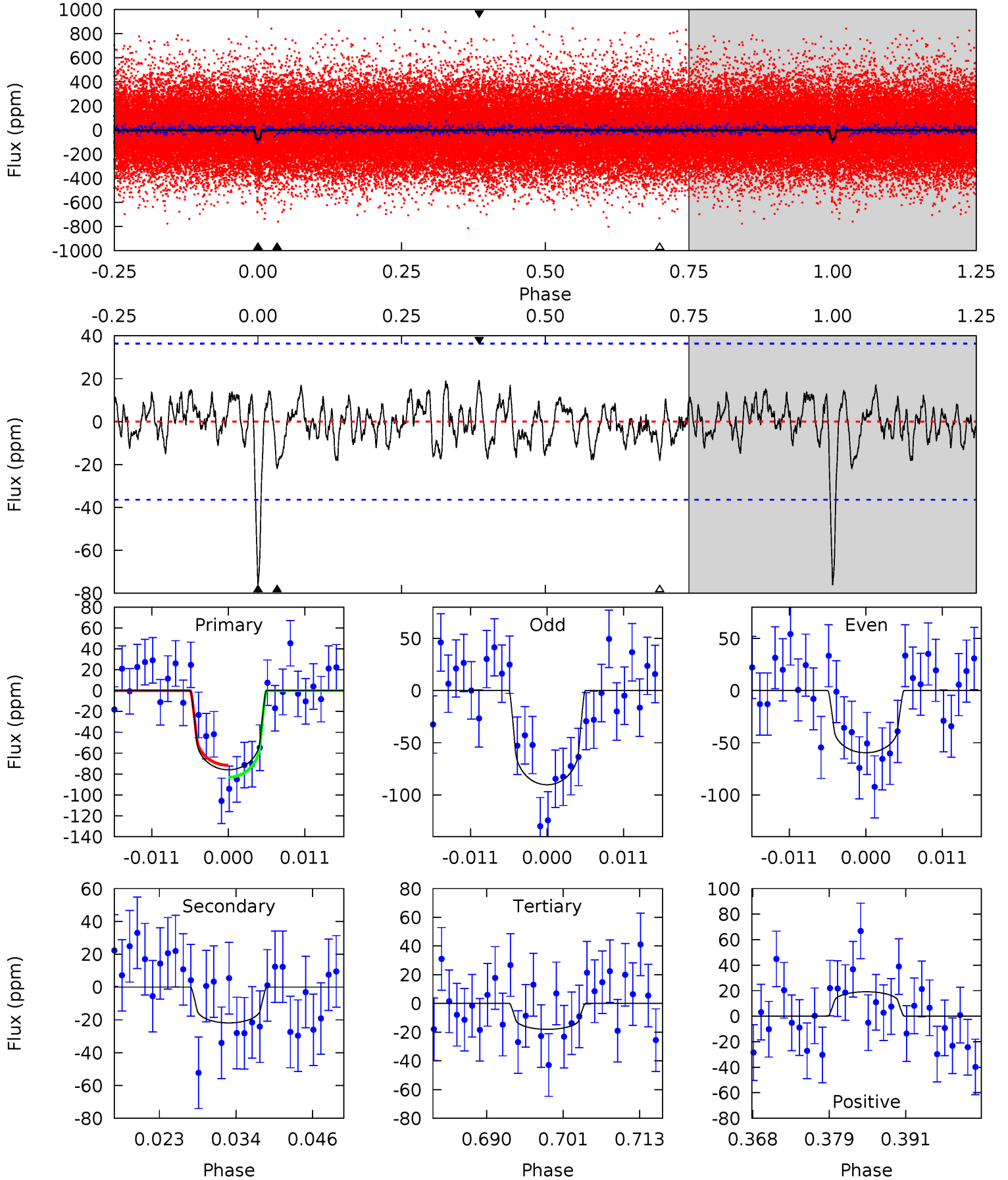
TCE 012555616-01 P= 21.980981 Days  $T_0=150.709507$  (BKJD)



# DV Model-Shift Uniqueness Test

012555616-01, P = 21.981509 Days, E = 128.698900 Days

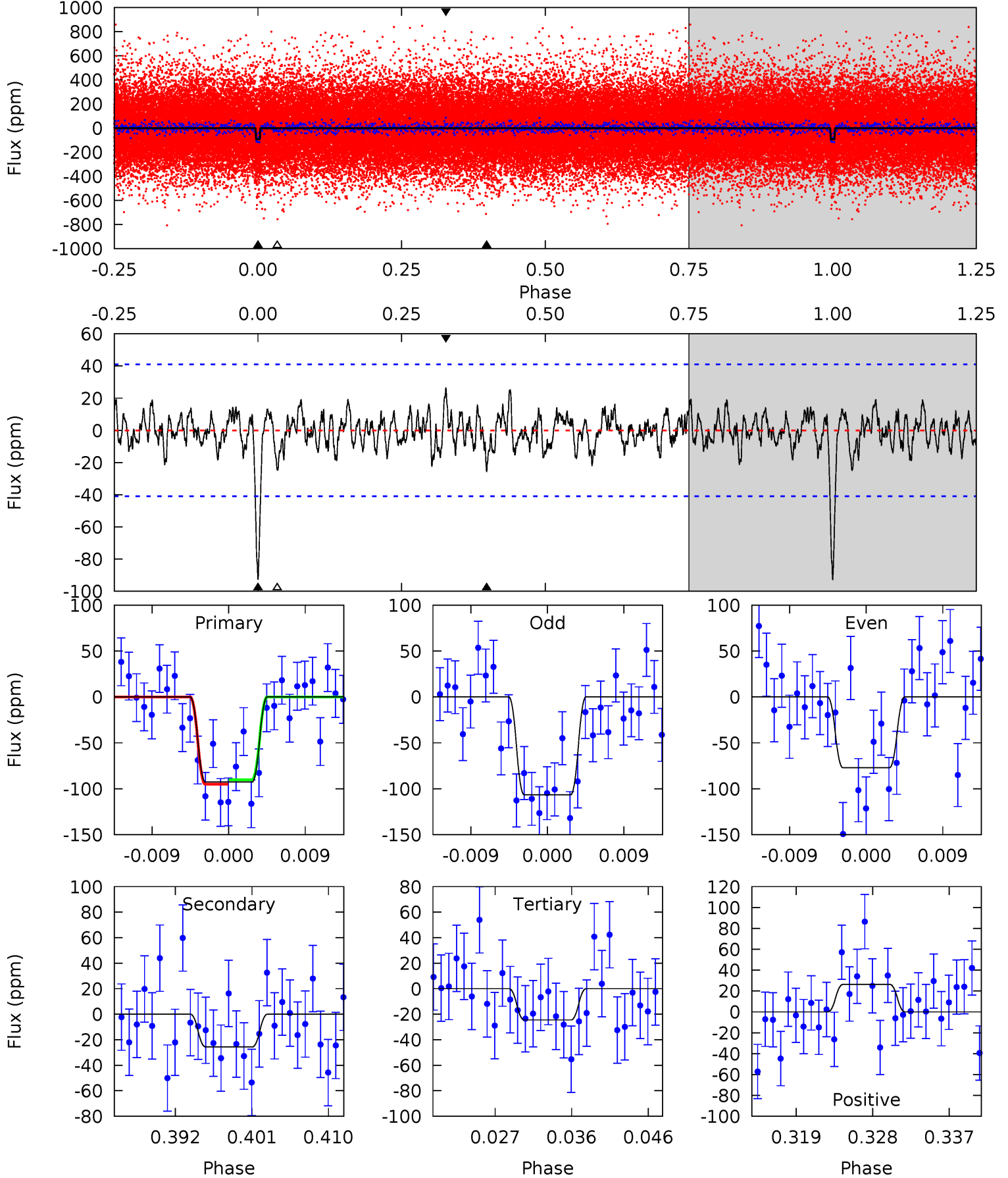
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	3.01	2.48	2.63	5.00	2.53	1.03	7.96	7.80	0.53	0.37	2.11	1.01	0.20	0.79



# Alt Model-Shift Uniqueness Test

012555616-01, P = 21.980981 Days, E = 128.728526 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
11.4	3.16	3.02	3.25	5.04	2.61	1.05	8.38	8.15	0.14	-0.09	1.81	1.05	0.22	0.29



### Stellar Parameters For KIC 012555616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5573^{+149}_{-149}$	$4.418^{+0.139}_{-0.186}$	$-0.180^{+0.300}_{-0.300}$	$0.936^{+0.239}_{-0.147}$	$0.837^{+0.120}_{-0.065}$	$1.438^{+0.786}_{-0.693}$
	+3%/-3%	+3%/-4%	+167%/-167%	+26%/-16%	+14%/-8%	+55%/-48%
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 012555616-01 / KOI 7540.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-22 \pm 7$	$1.05^{+0.63}_{-0.63}$	$879^{+56}_{-51}$	$4073^{+1788}_{-670}$	$223^{+1160}_{-143}$
Alt.	$-26 \pm 8$	$1.05^{+0.72}_{-0.57}$	$877^{+62}_{-50}$	$4186^{+1623}_{-732}$	$262^{+1009}_{-175}$

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



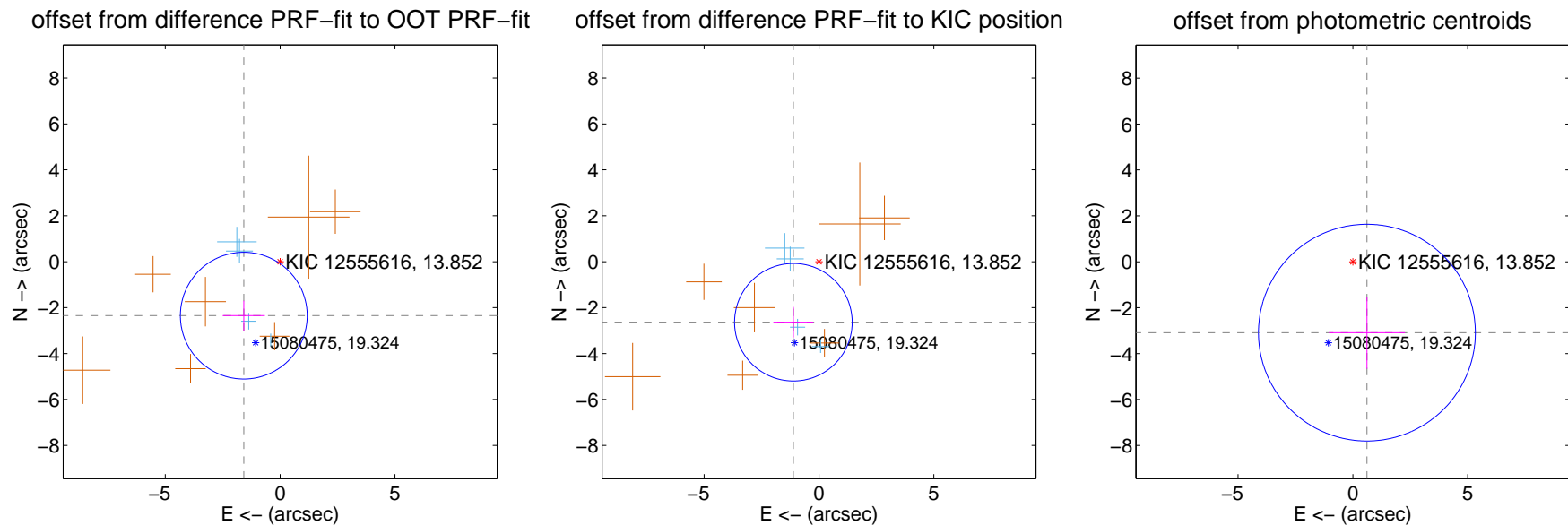
## DV Centroid Data

Supplemental centroid analysis for 012555616-01. Kepler magnitude: 13.85. Transit SNR 8.88

There are 4 quarters with good PRF difference image offsets

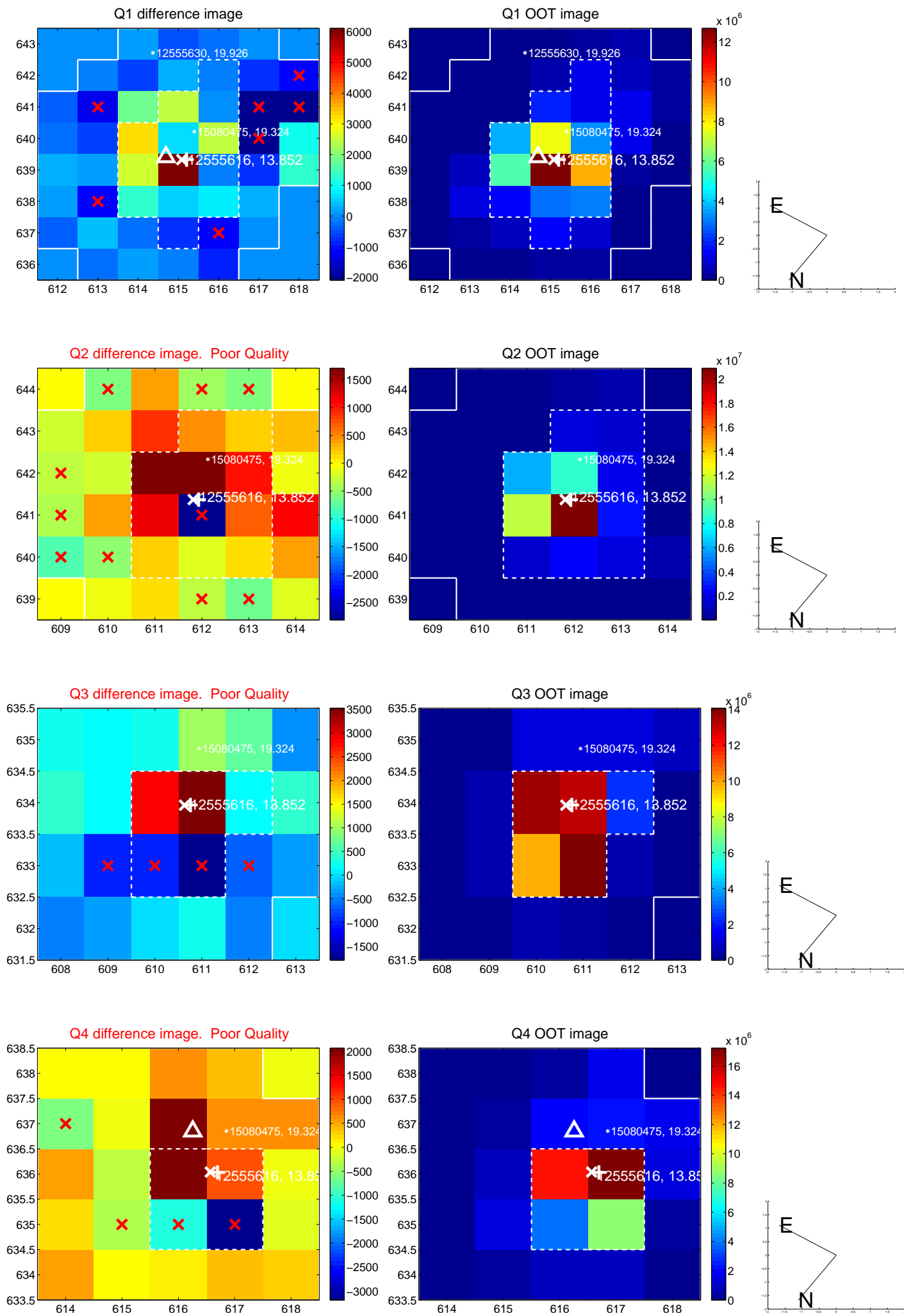
The direct PRF centroid is offset from the target star catalog position by about 0.65 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>2.833 \pm 0.920</math></b>	<b>3.08</b>	$1.582 \pm 0.919$	$-2.350 \pm 0.649$
PRF-fit source offset from KIC position	<b><math>2.862 \pm 0.853</math></b>	<b>3.35</b>	$1.115 \pm 0.871$	$-2.636 \pm 0.666$
photometric centroid source offset	$3.15 \pm 1.57$	2.00	$-0.61 \pm 1.66$	$-3.09 \pm 1.57$

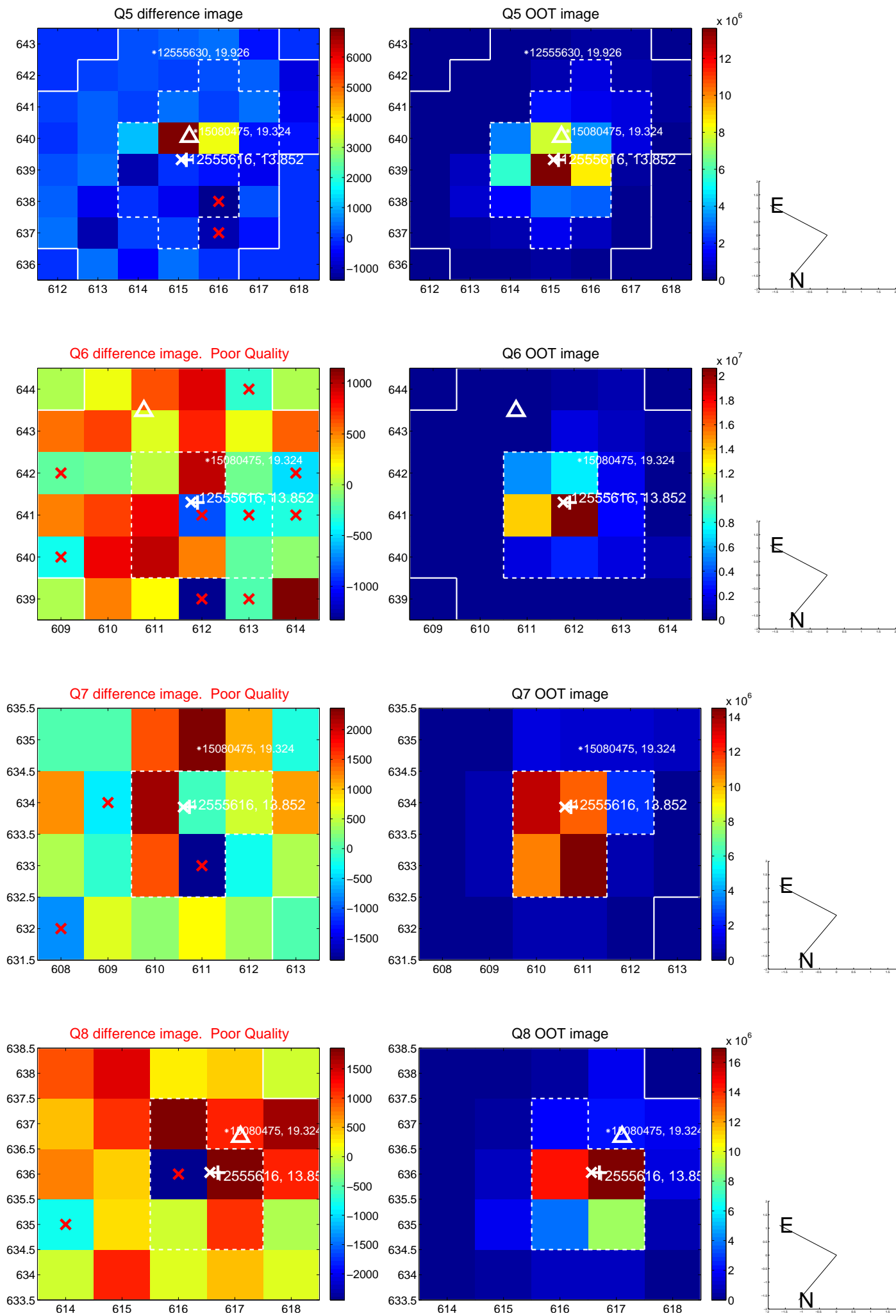


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

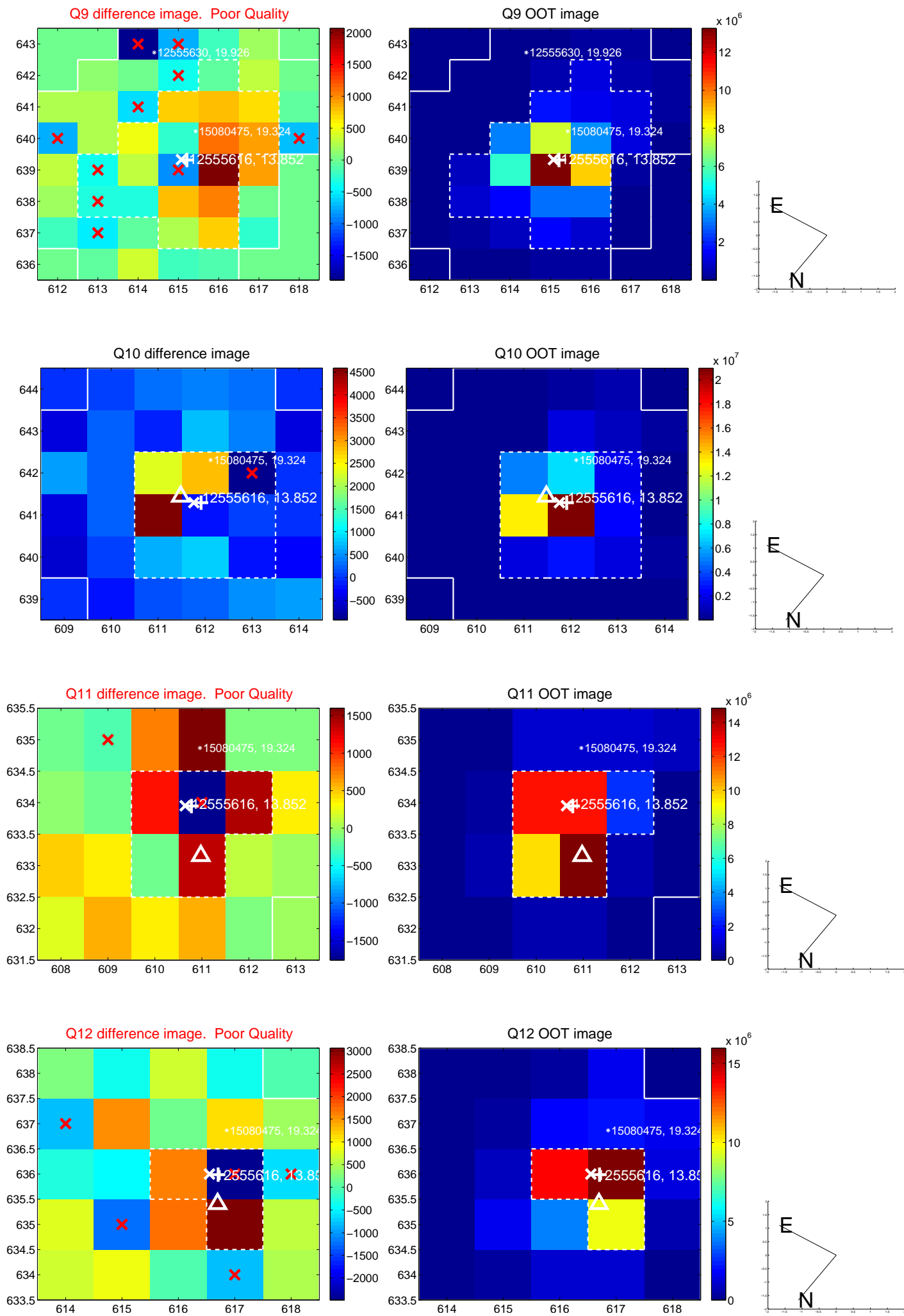
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



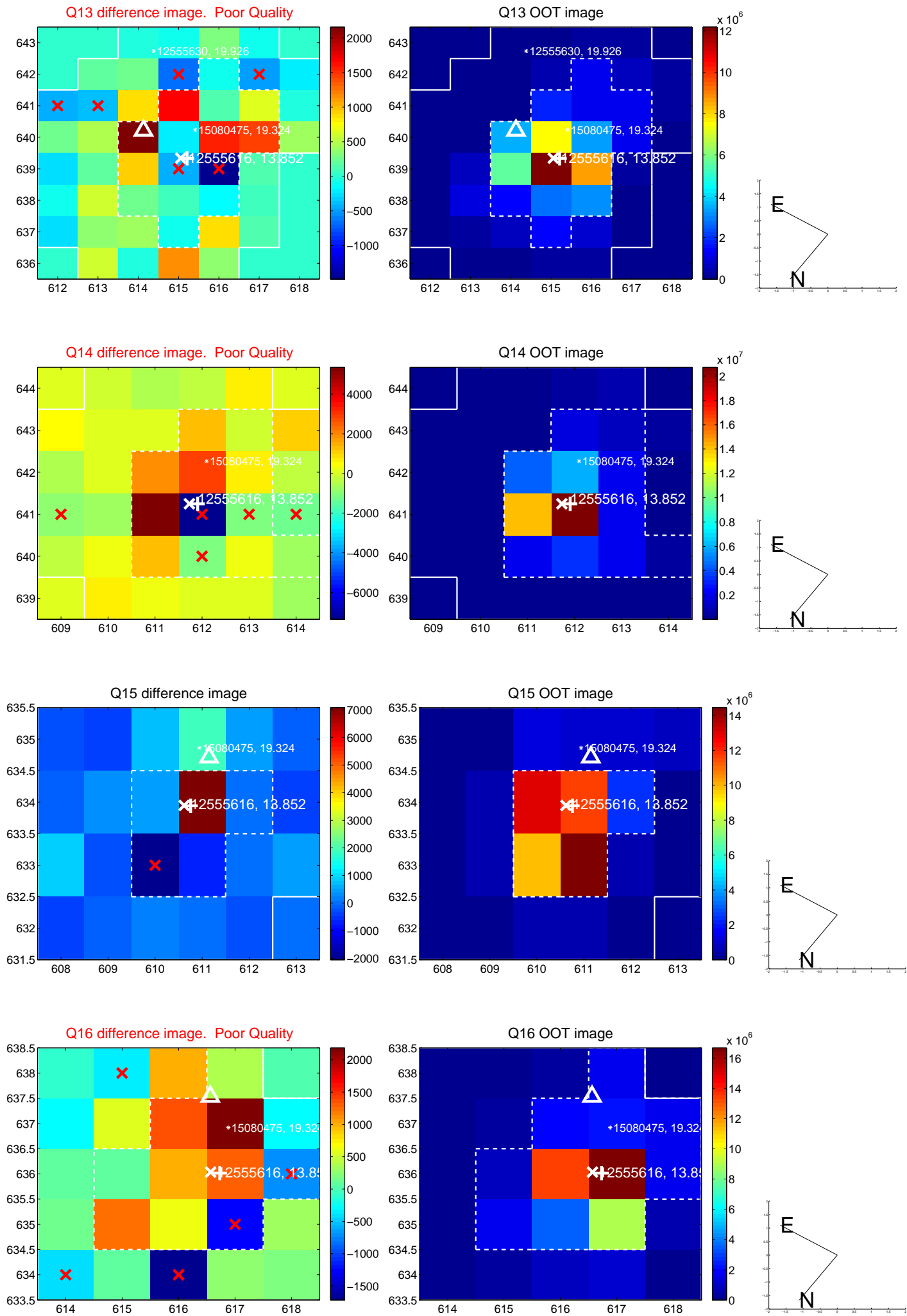
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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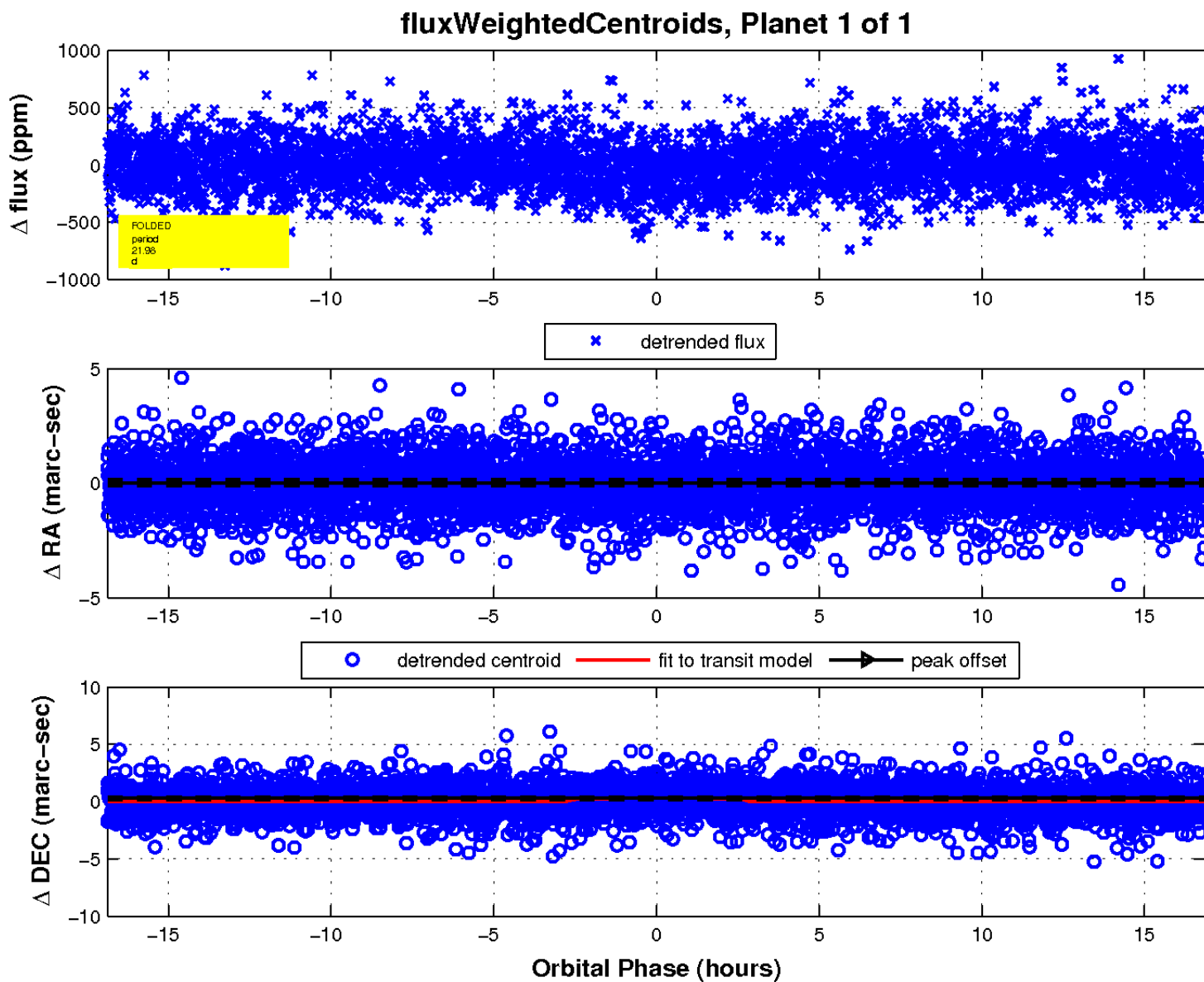
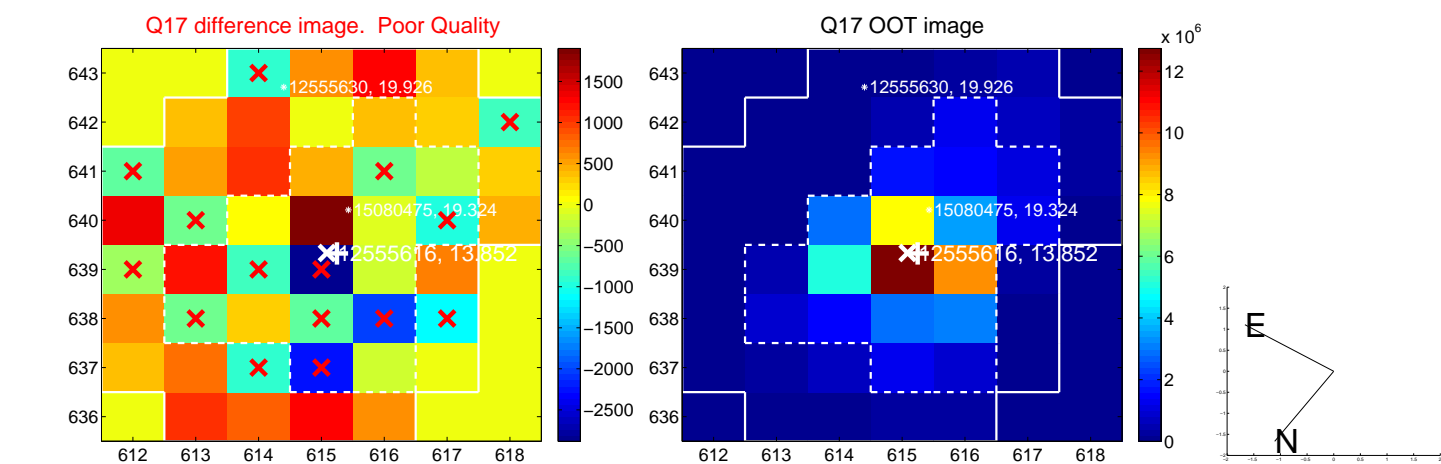


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

