

# KIC 012071037

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012071037-01	OBS	2388.01	6.096052	135.025521	125.2	15.654	22.9	25.9	0.89	5826	2.00	225.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012071037-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

**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.

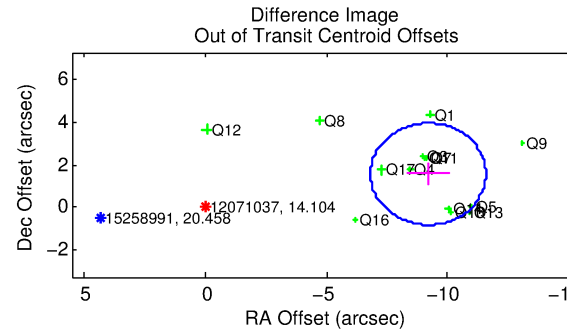
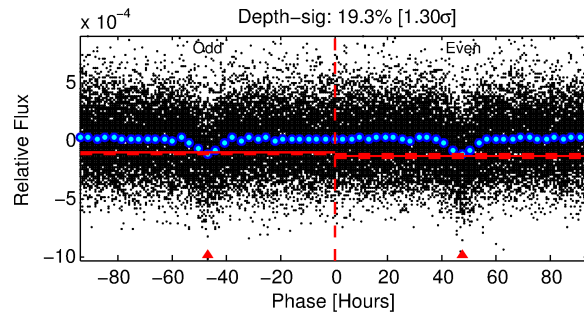
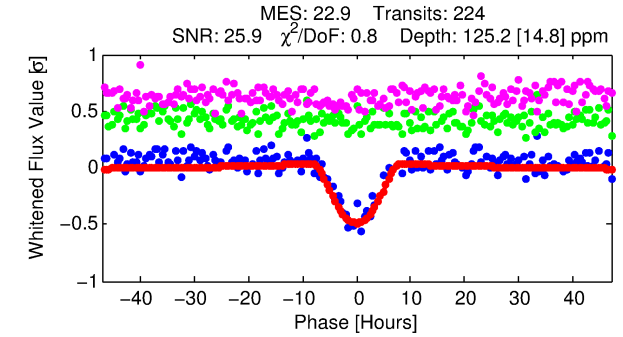
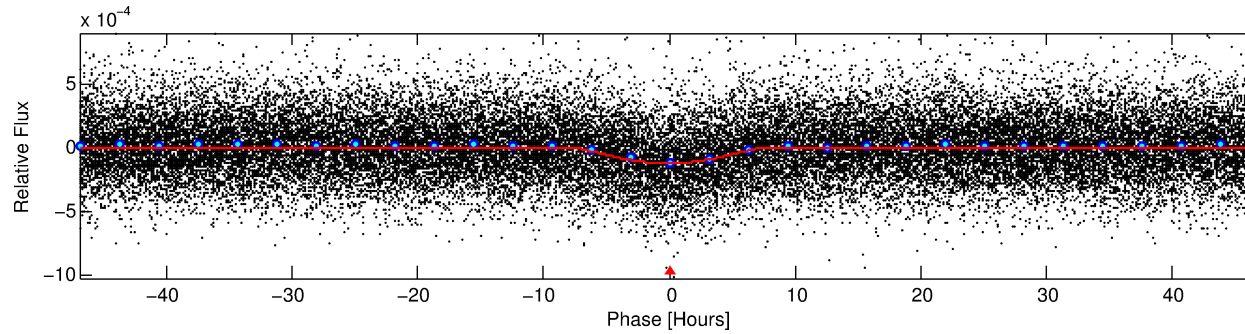
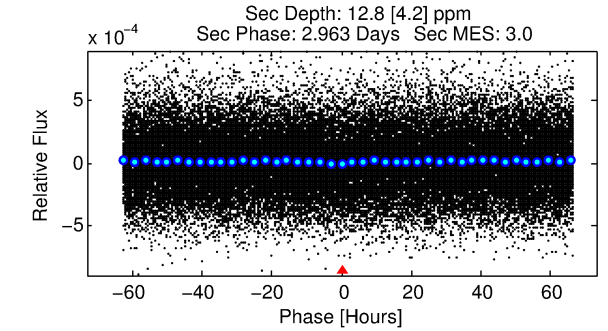
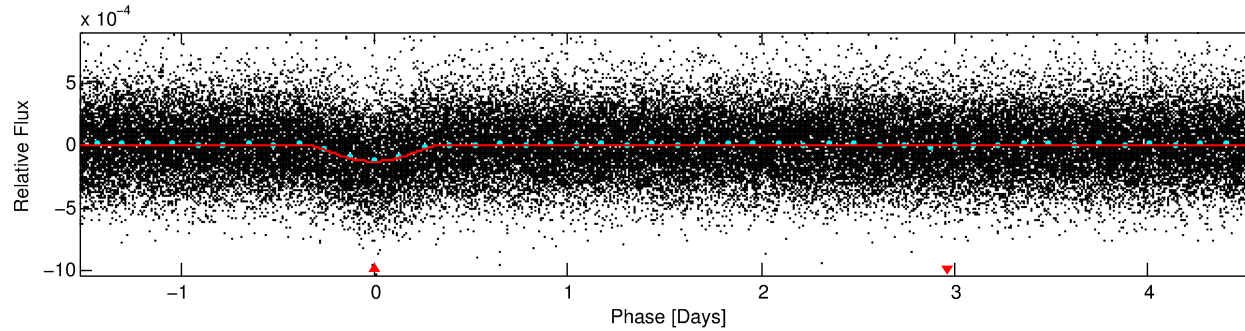
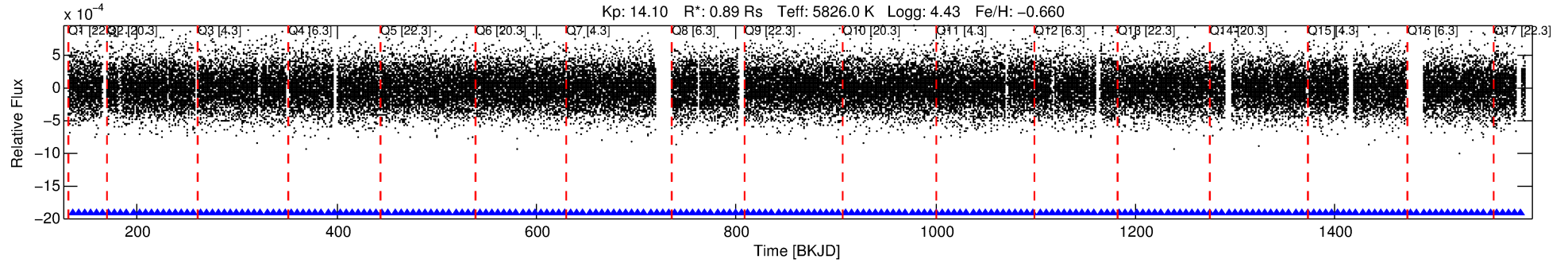
## Ephemeris Match Information For 012071037-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
012071037-01	12071037	7511.01	12071006	1:1	30.7	-6	6	13.53	14.10	7333.50	Direct-PRF	0	0.16	0.20

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 12071037 Candidate: 1 of 1 Period: 6.096 d  
KOI: K02388.01 Corr: 0.822



## DV Fit Results:

Period = 6.09605 [0.00010] d  
Epoch = 135.0255 [0.0138] BKJD  
Rp/R\* = 0.0208 [0.0258]  
a/R\* = 1.18 [0.08]  
b = 1.00 [0.04]  
Seff = 225.74 [74.50]  
Teq = 988 [82] K  
Rp = 2.00 [2.54] Re  
a = 0.0598 [0.0123] AU  
Ag = 6.30 [15.92] [0.33σ]  
Teffp = 2421 [1520] K [0.94σ]

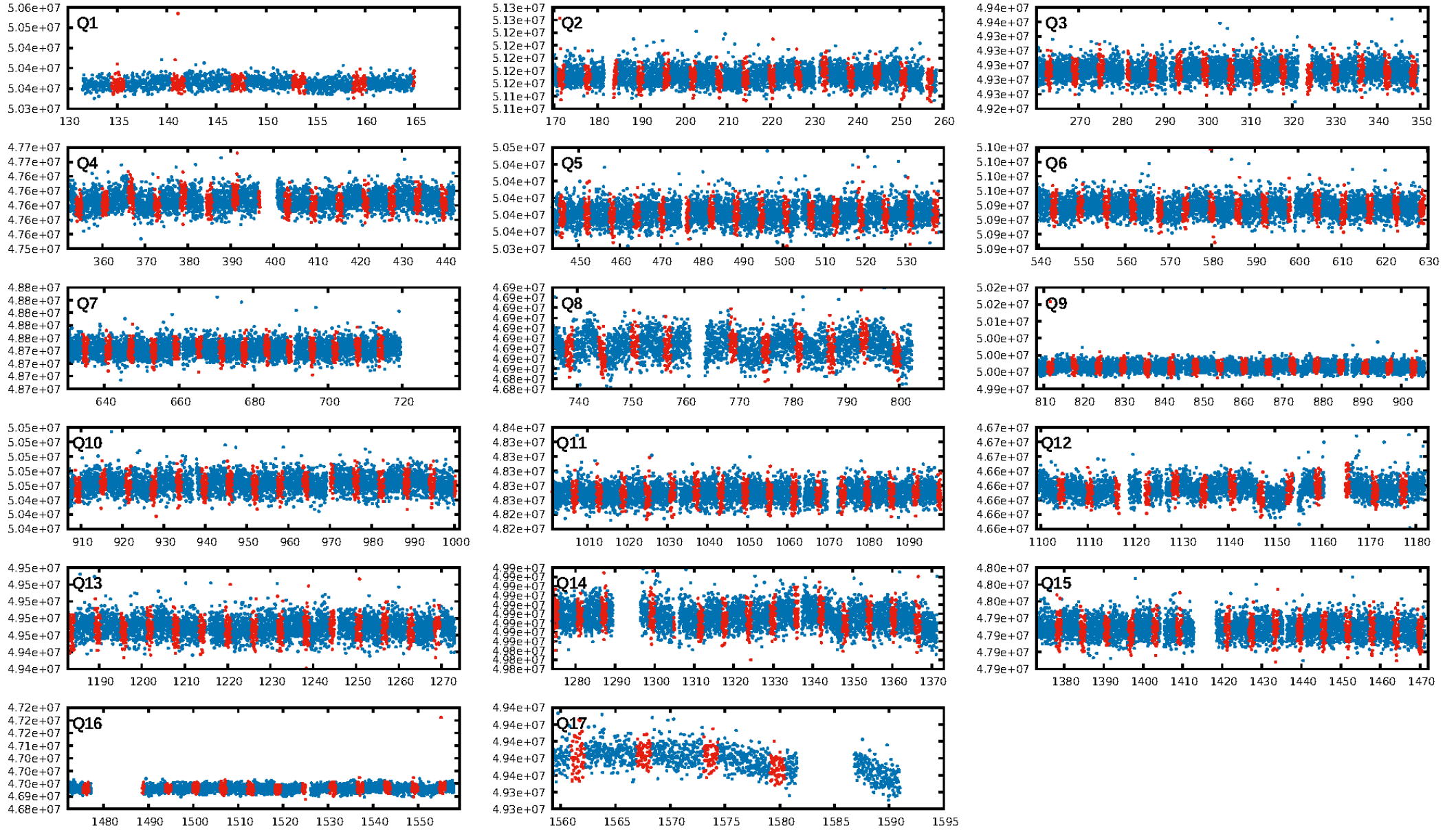
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.61e-106  
RollingBand-fgt: 1.00 [215/215]  
GhostDiagnostic-chr: -0.0469  
Centroid-sig: 0.0%  
Centroid-so: 8.177 arcsec [14.52σ]  
OotOffset-rm: 9.328 arcsec [11.77σ]  
KicOffset-rm: 9.237 arcsec [11.14σ]  
OotOffset-st: 2/3/4/5 [14]  
KicOffset-st: 2/3/4/5 [14]  
DiffImageQuality-fgm: 0.29 [4/14]  
DiffImageOverlap-fno: 1.00 [17/17]

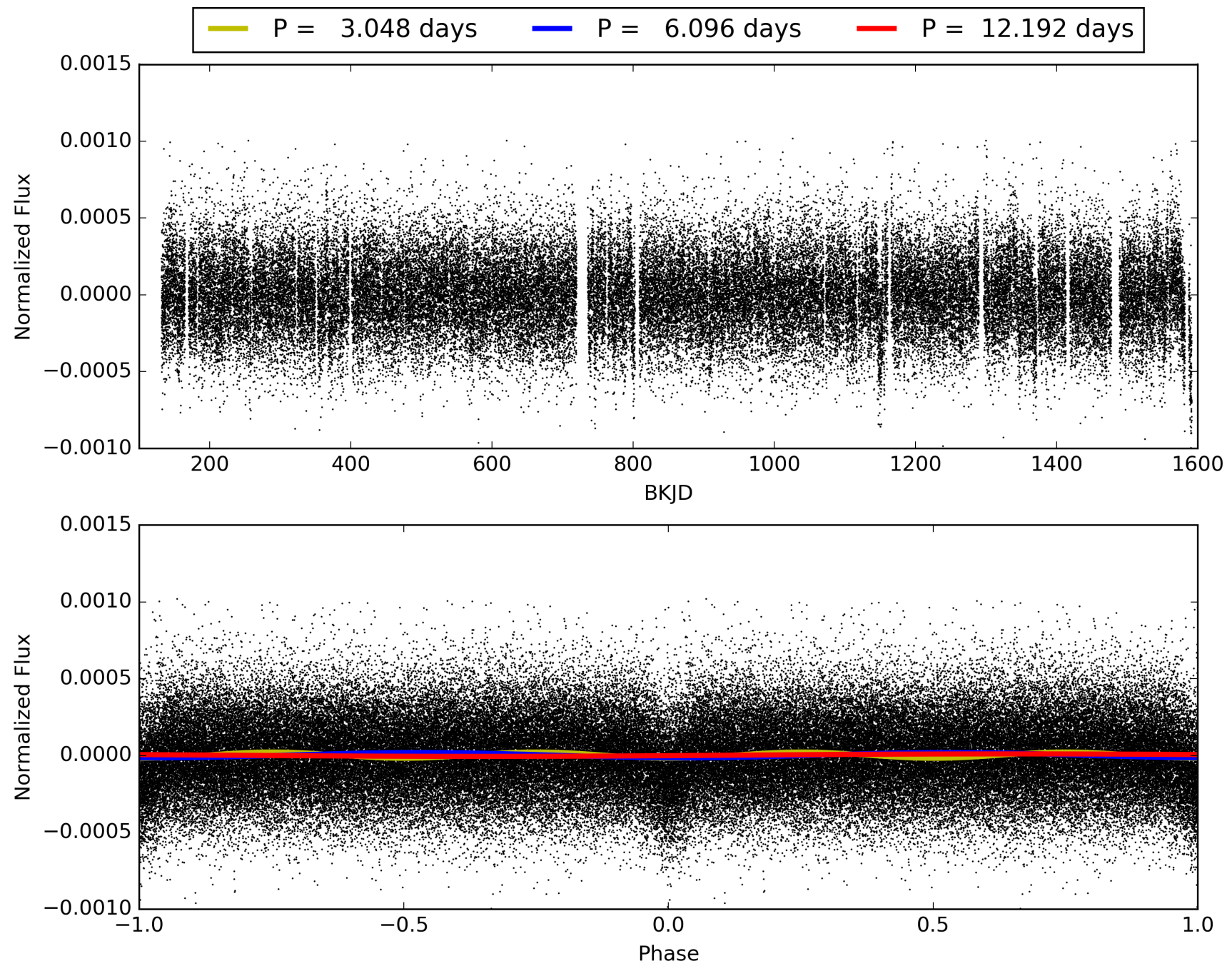
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:22:06 Z

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

# TCE 012071037-01, PDC Light Curves

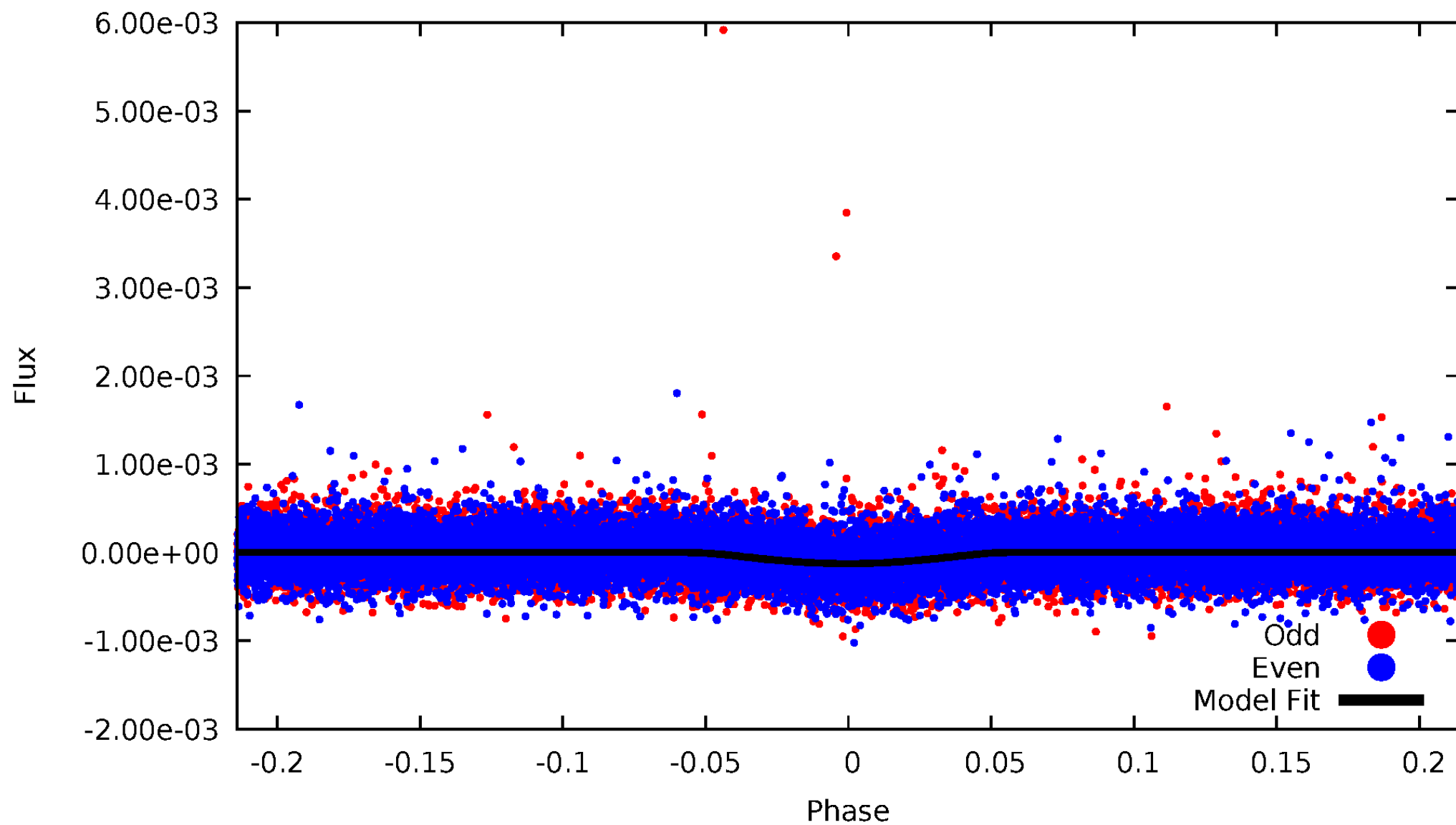


TCE 012071037-01



# DV Odd/Even

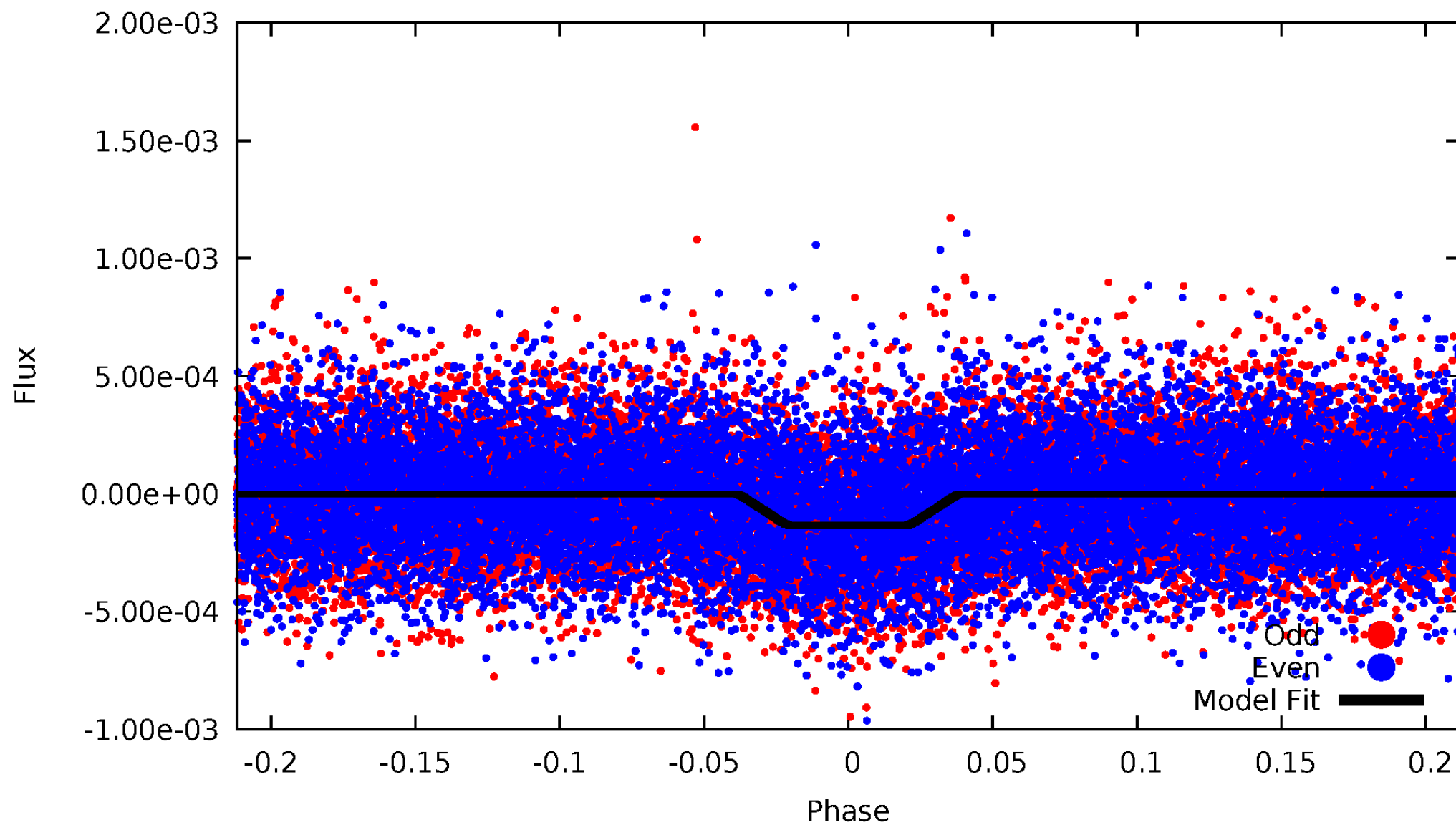
TCE 012071037-01





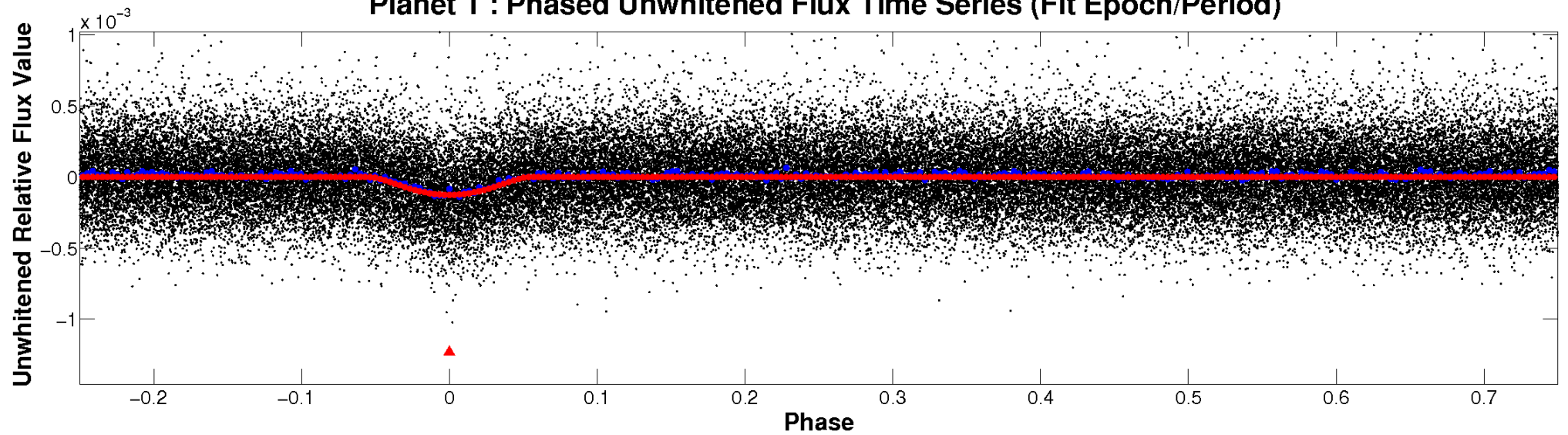
# ALT Odd/Even

TCE 012071037-01

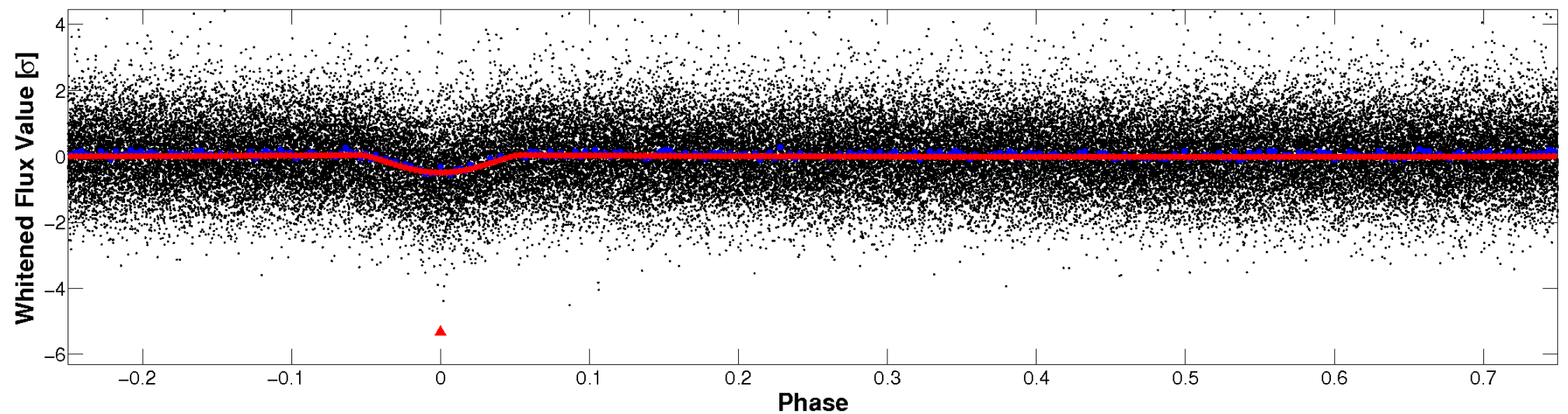


# Non-Whitened Vs. Whitened Light Curve

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

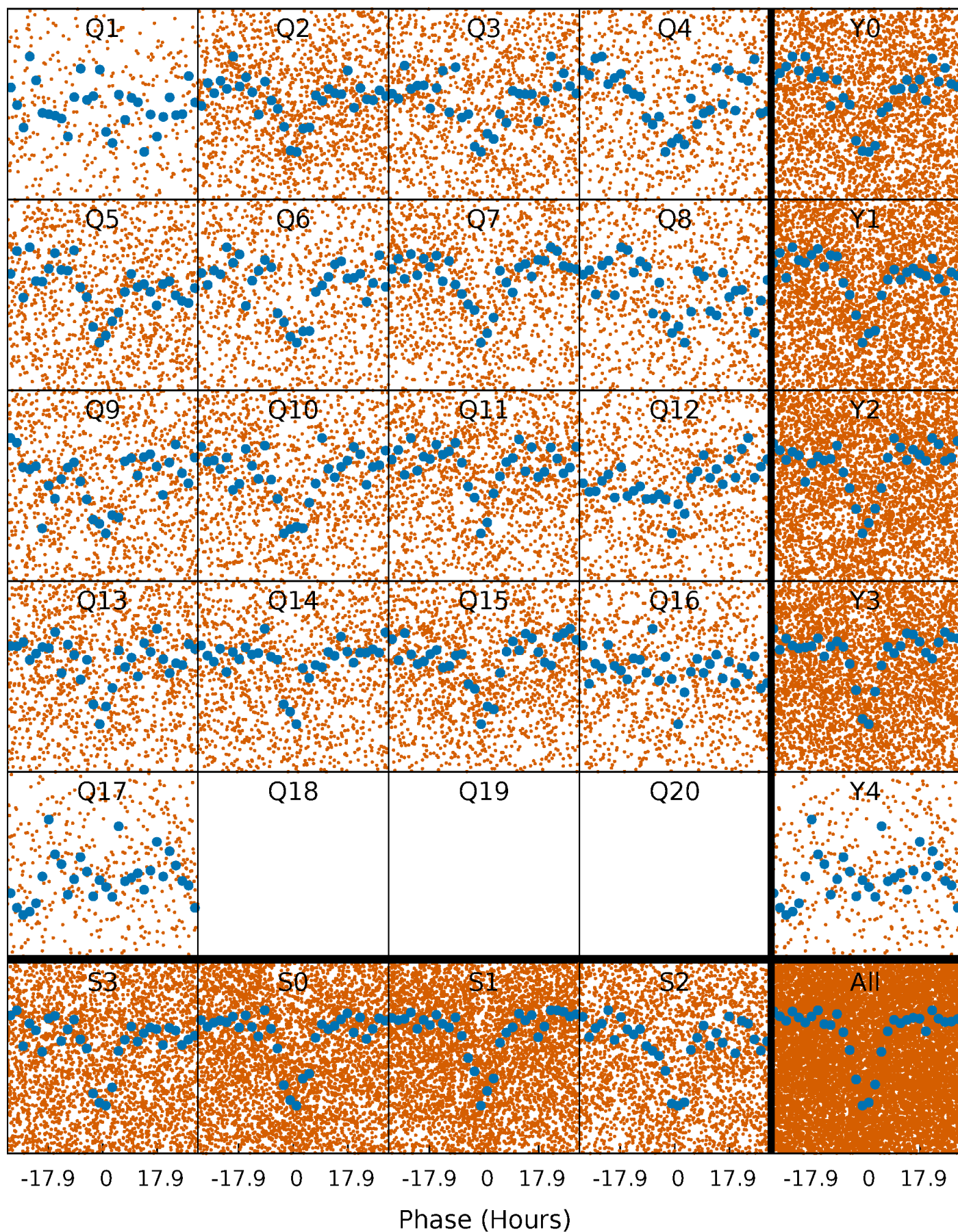


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

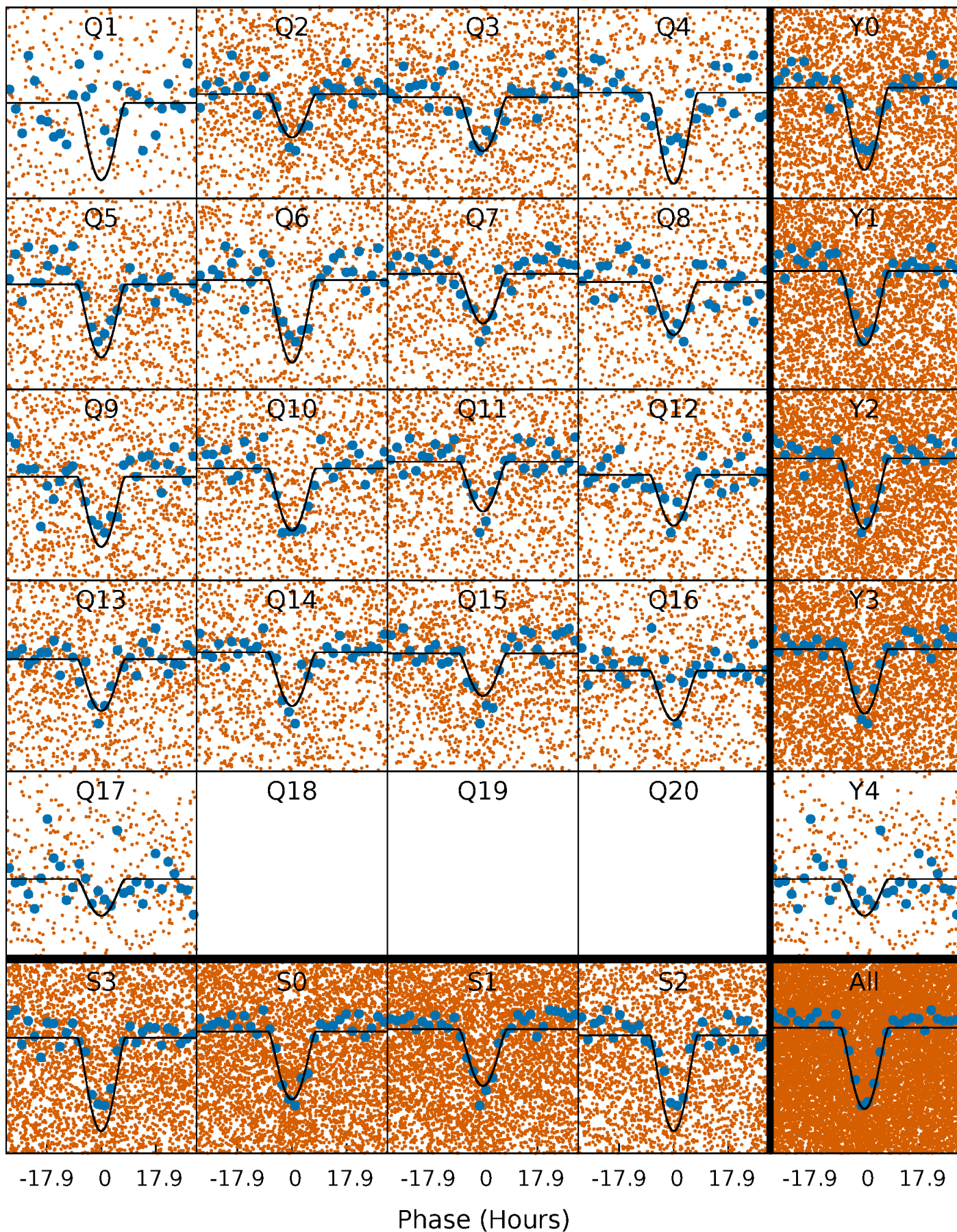
TCE 012071037-01 P= 6.096052 Days  $T_0=135.025521$  (BKJD)





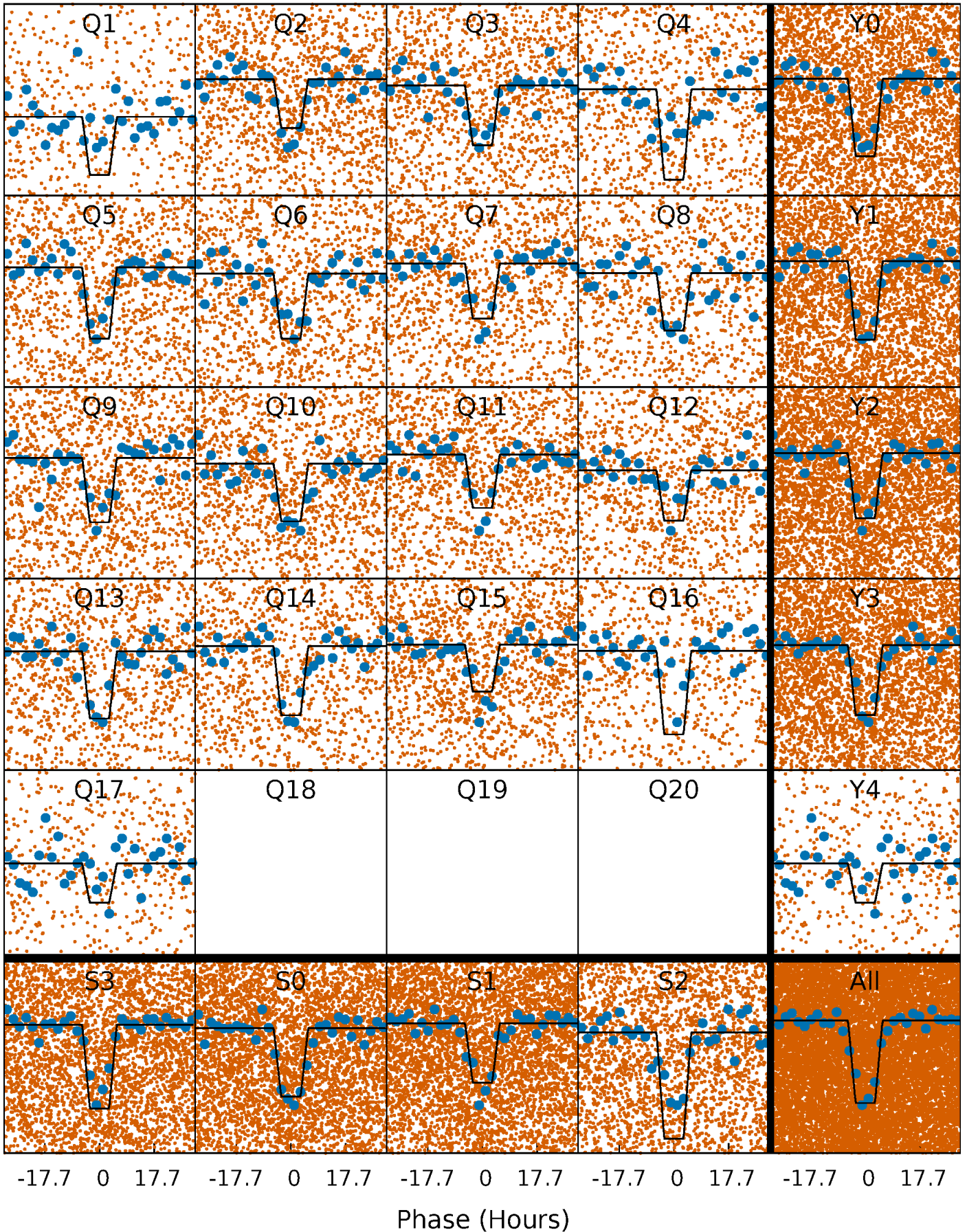
# DV Quarter-Phased Transit Curves

TCE 012071037-01 P= 6.096052 Days  $T_0=135.025521$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 012071037-01 P= 6.095812 Days  $T_0=135.053728$  (BKJD)

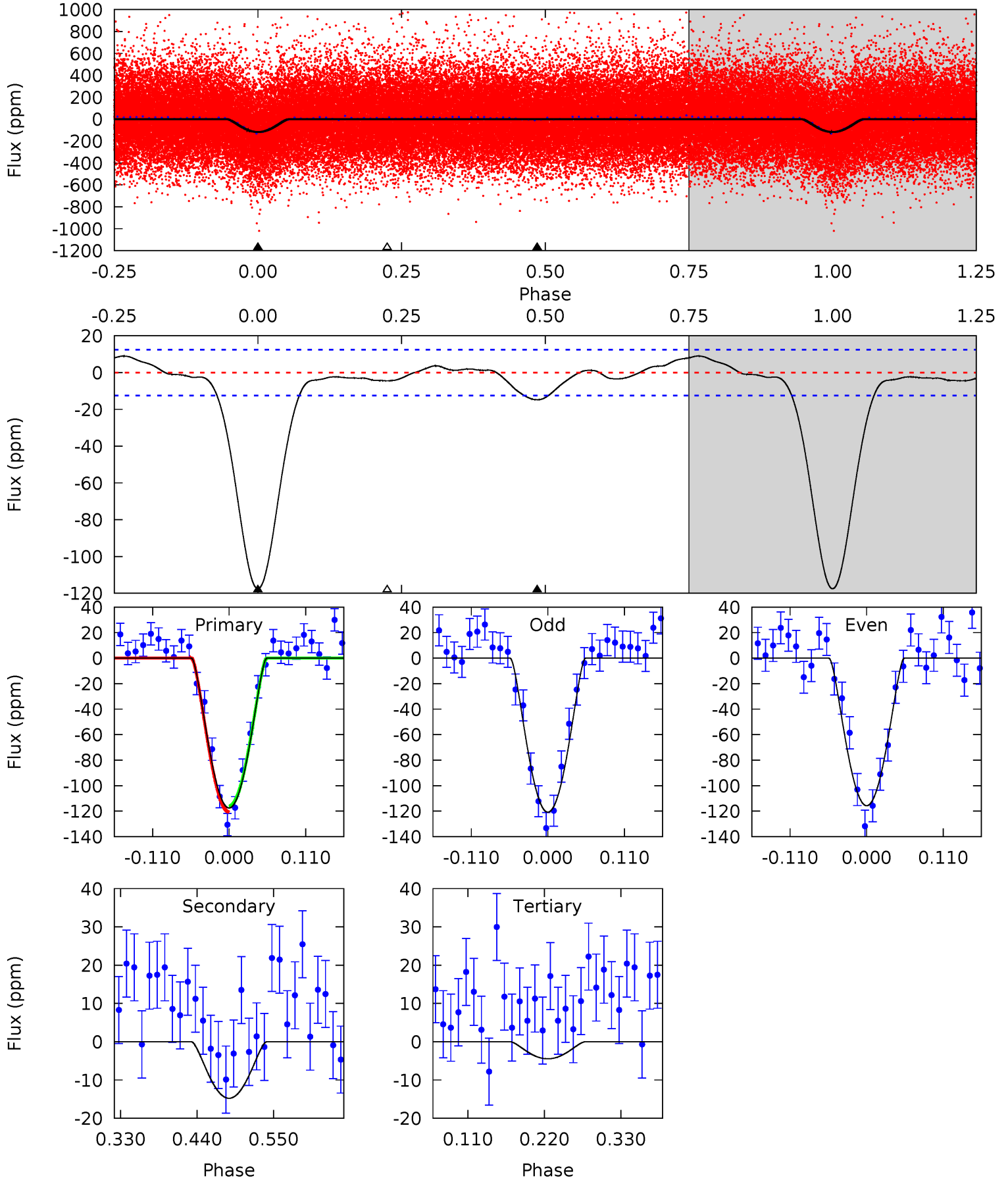




# DV Model-Shift Uniqueness Test

012071037-01, P = 6.096052 Days, E = 128.929469 Days

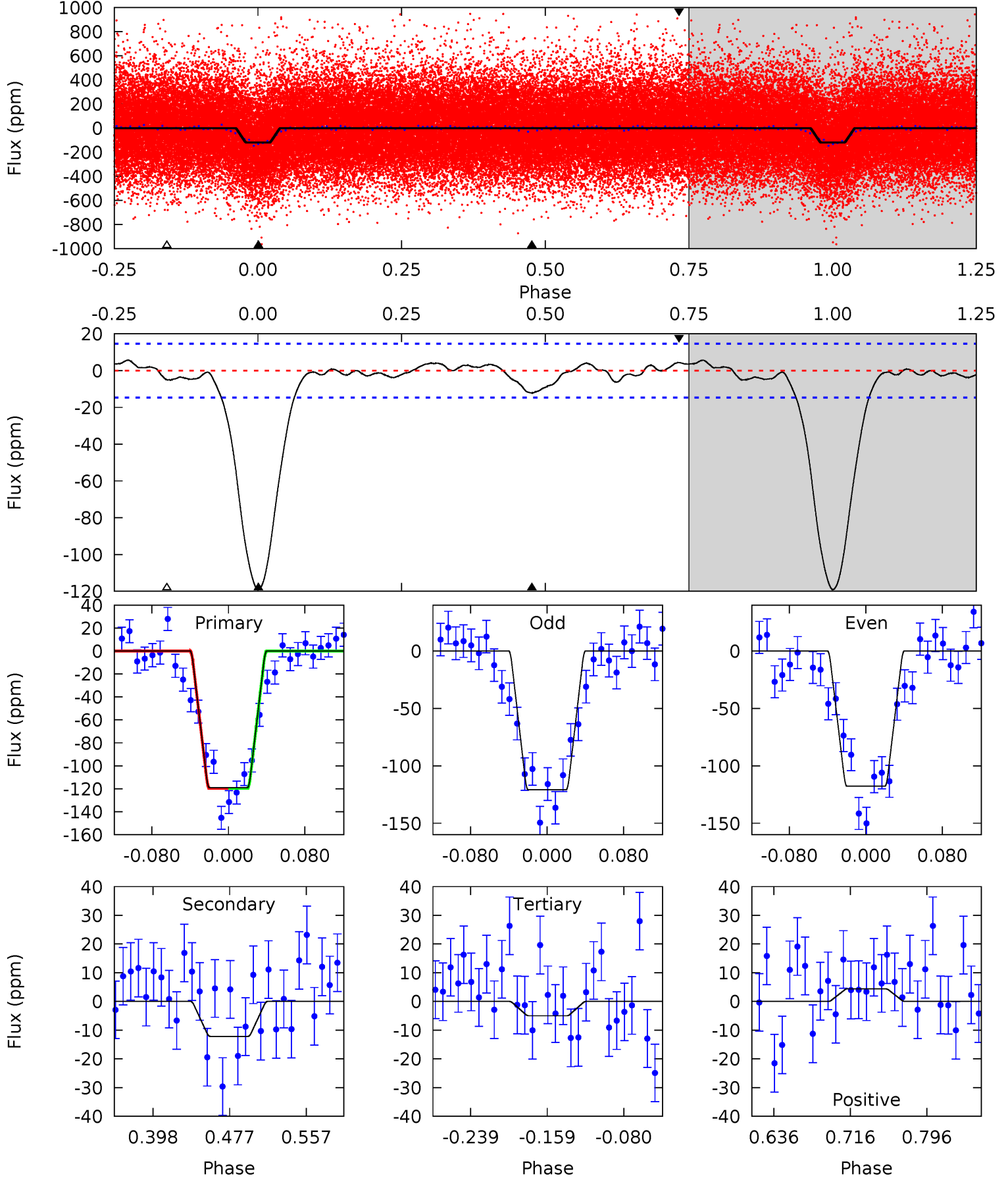
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.9	5.39	1.63	0	4.54	1.60	1.42	41.2	42.9	3.76	5.39	0.93	0.99	0.07	0.85



# Alt Model-Shift Uniqueness Test

012071037-01, P = 6.095812 Days, E = 128.957916 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
37.5	3.82	1.57	1.39	4.61	1.75	0.90	35.9	36.1	2.25	2.44	0.49	0.95	0.05	0.02





### Stellar Parameters For KIC 012071037

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5826^{+157}_{-157}$	$4.430^{+0.144}_{-0.176}$	$-0.660^{+0.300}_{-0.300}$	$0.885^{+0.207}_{-0.138}$	$0.767^{+0.100}_{-0.046}$	$1.561^{+0.996}_{-0.704}$
	+3%/-3%	+3%/-4%	+45%/-45%	+23%/-16%	+13%/-6%	+64%/-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 012071037-01 / KOI 2388.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-15 \pm 3$	$2.69^{+2.41}_{-1.68}$	$1384^{+94}_{-81}$	$2840^{+1078}_{-487}$	$4.083^{+25.824}_{-2.970}$
Alt.	$-12 \pm 3$	$2.29^{+2.13}_{-1.55}$	$1385^{+88}_{-73}$	$2903^{+1309}_{-519}$	$4.499^{+39.823}_{-3.343}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

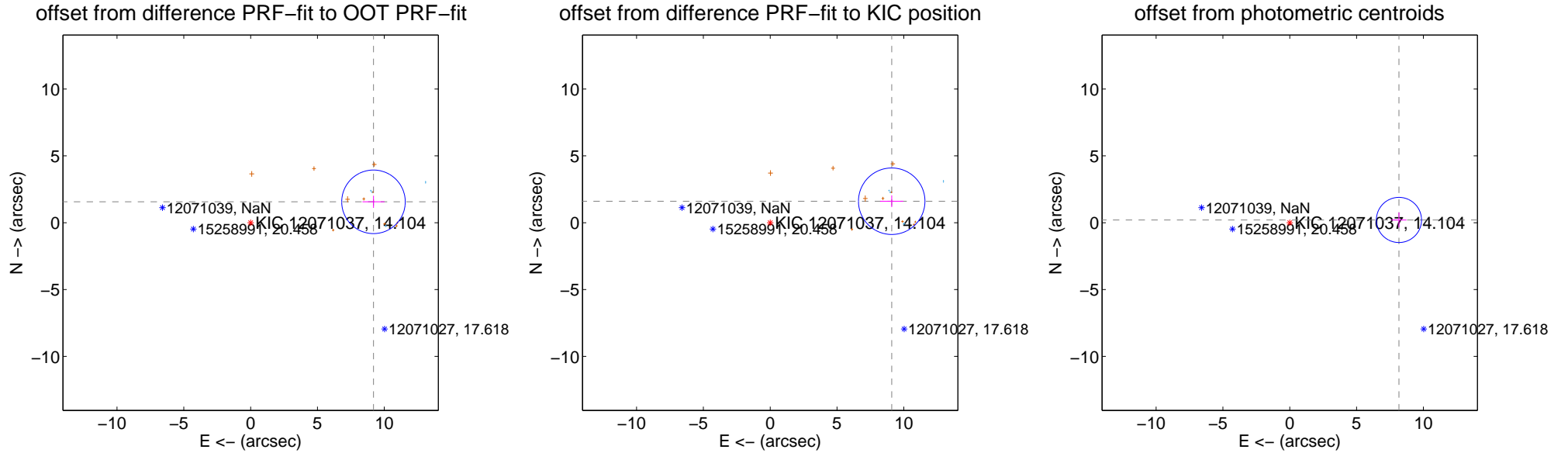
## DV Centroid Data

Supplemental centroid analysis for 012071037-01. Kepler magnitude: 14.10. Transit SNR 25.87

There are 4 quarters with good PRF difference image offsets

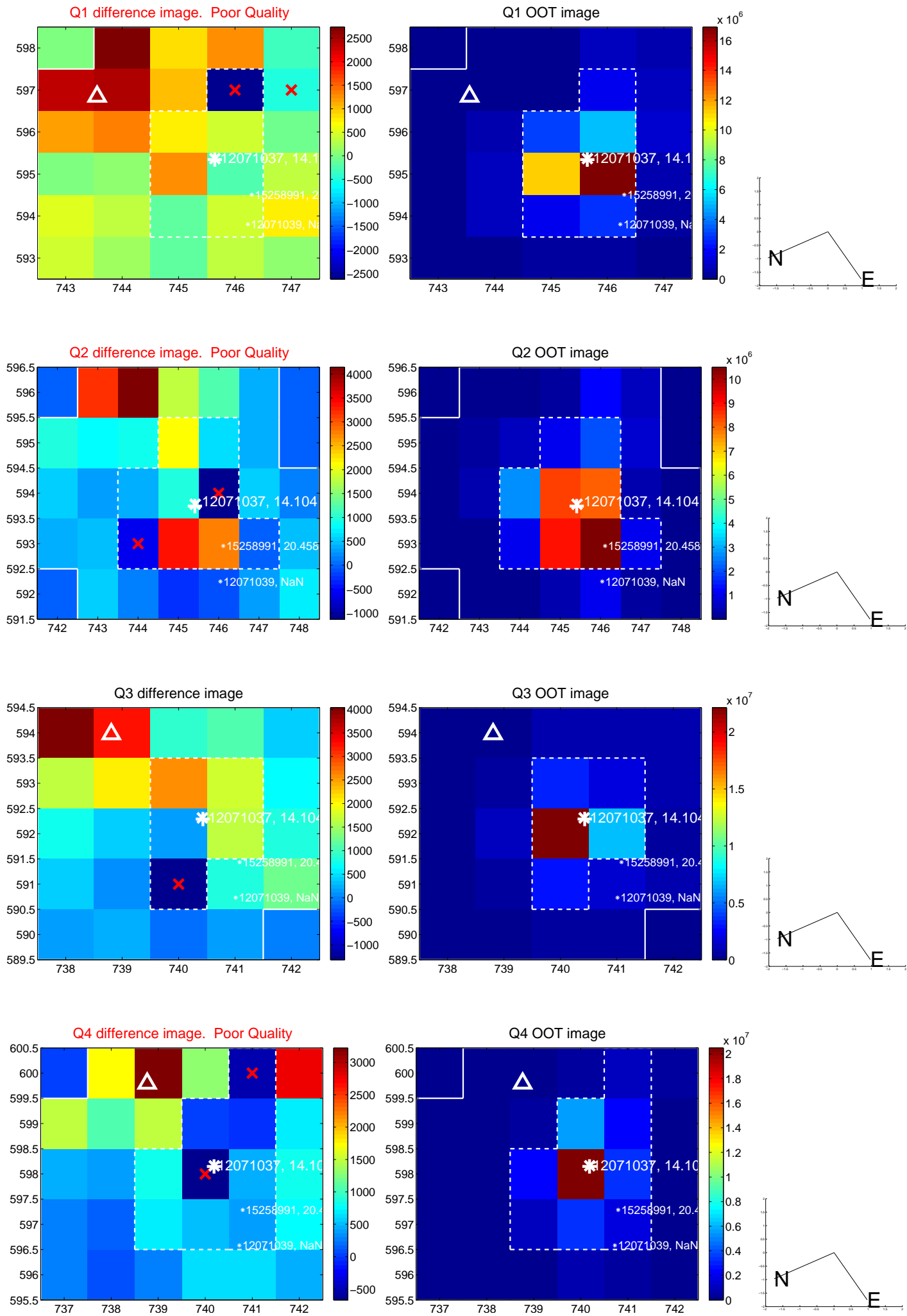
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$9.328 \pm 0.793$	$11.77$	$-9.196 \pm 0.823$	$1.563 \pm 0.454$
PRF-fit source offset from KIC position	$9.237 \pm 0.829$	$11.14$	$-9.096 \pm 0.869$	$1.607 \pm 0.440$
photometric centroid source offset	$8.18 \pm 0.56$	$14.52$	$-8.17 \pm 0.56$	$0.21 \pm 0.56$

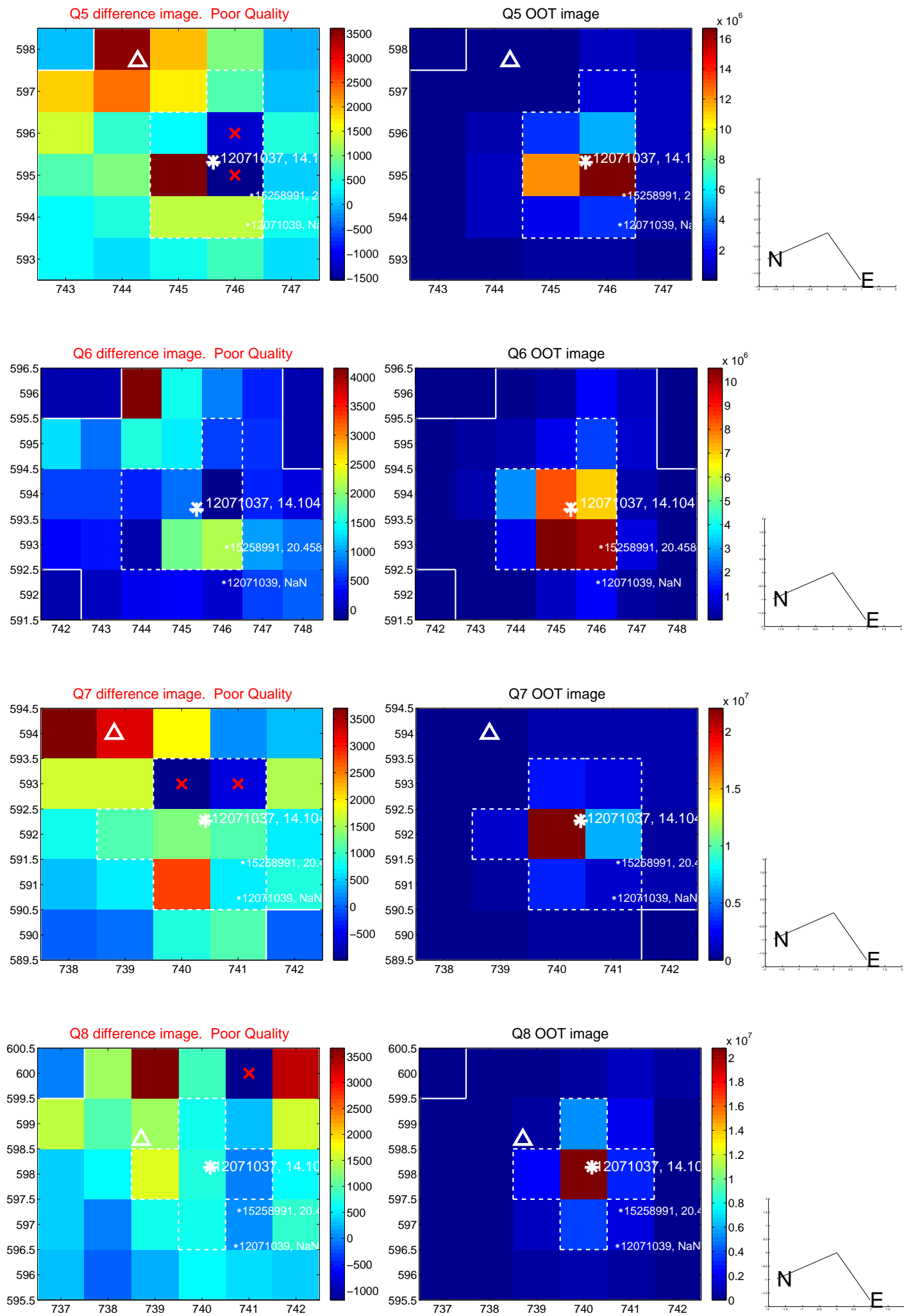


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

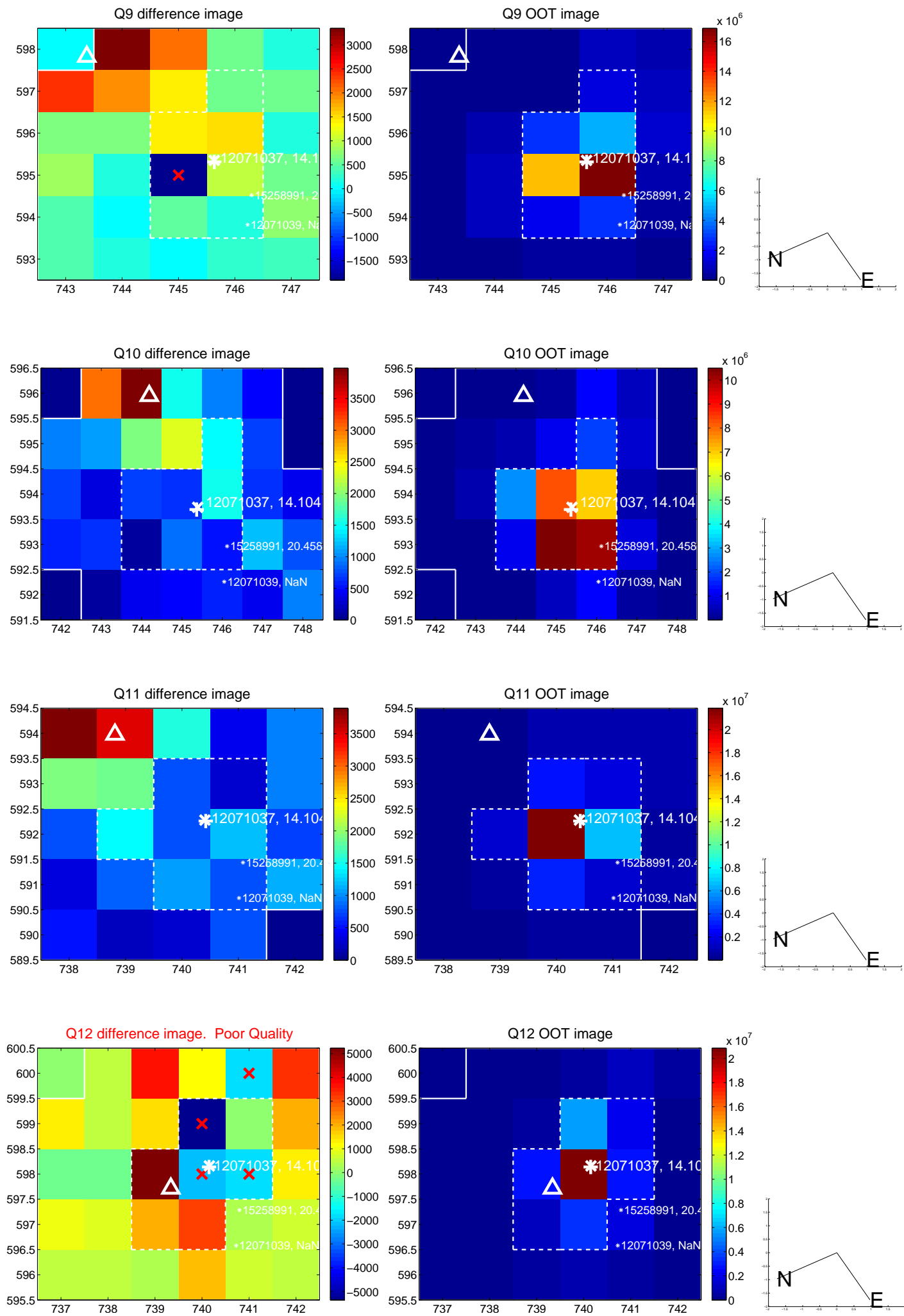


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

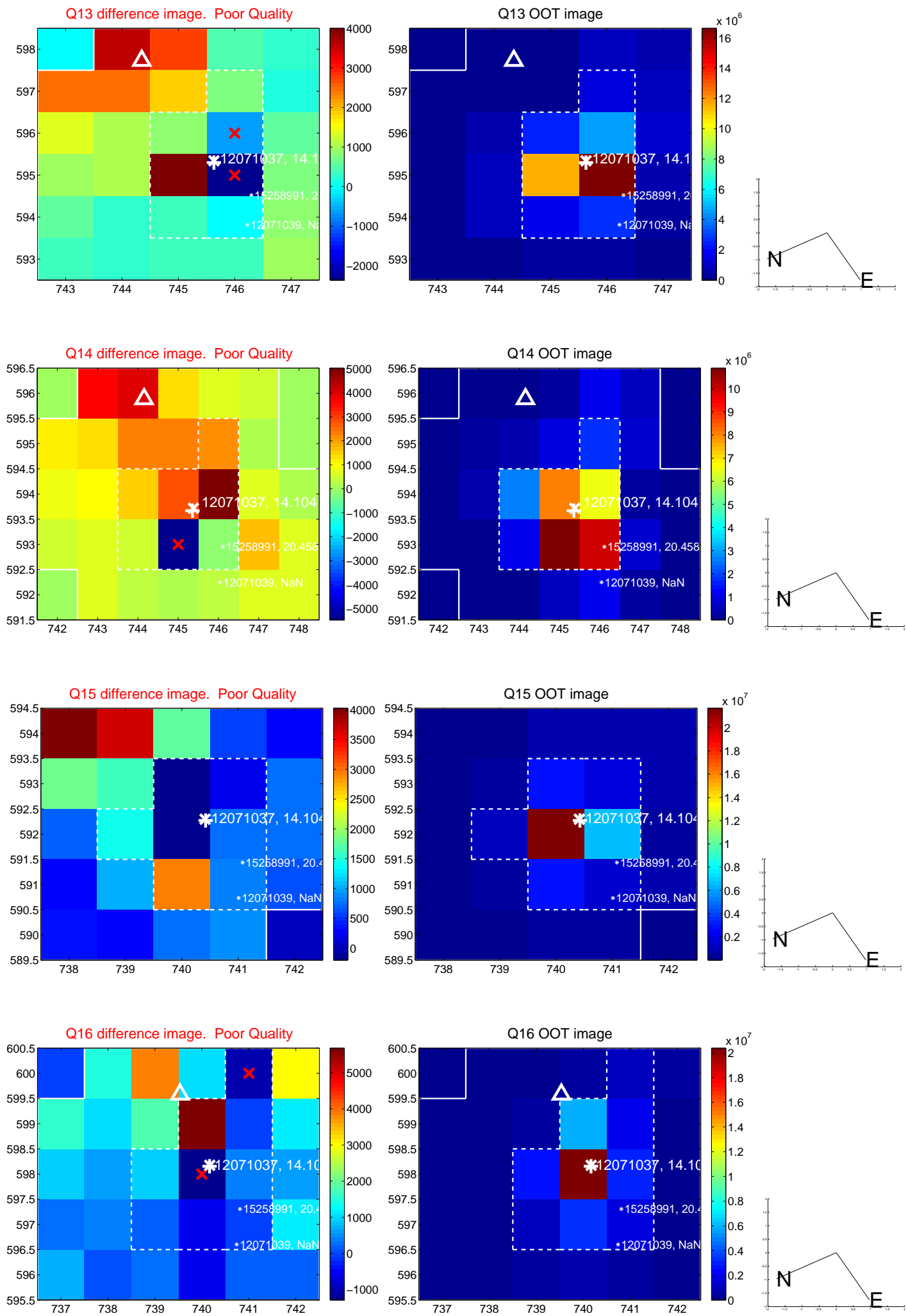




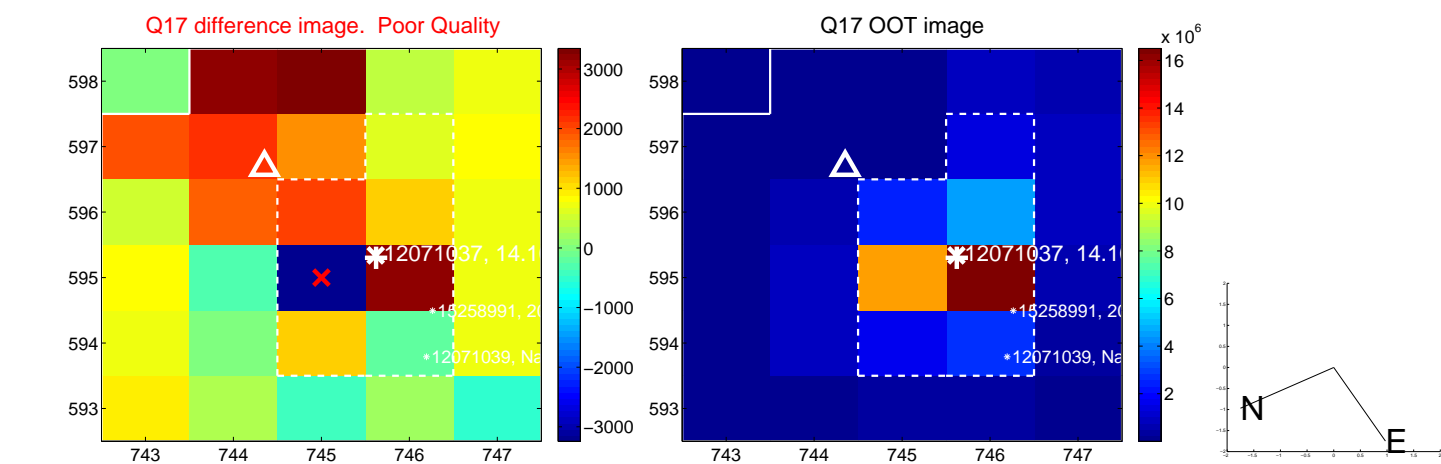
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



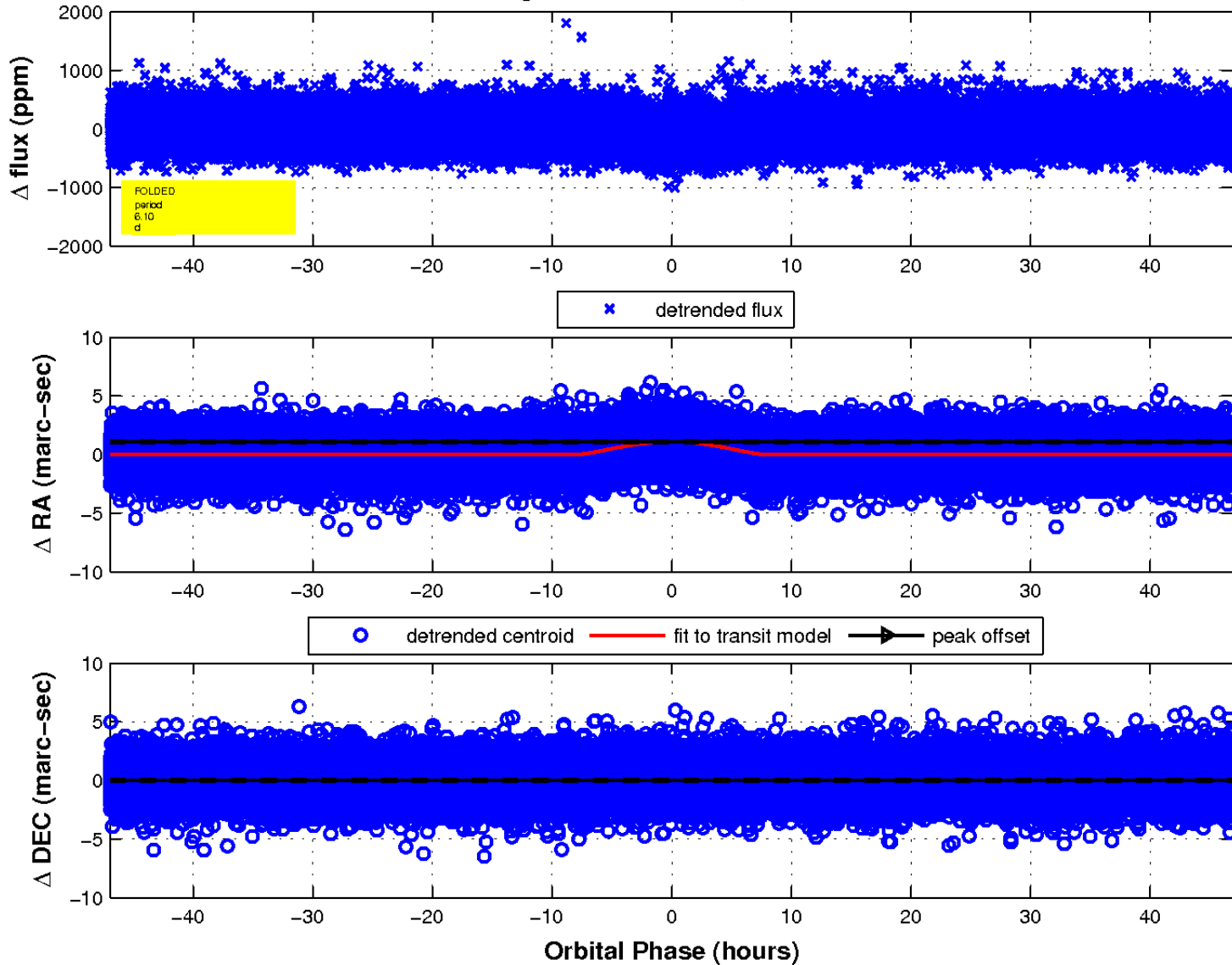
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

