

# KIC 004459939

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004459939-01	OBS	No	0.910967	132.276808	7.6	3.622	8.6	7.8	2.15	8066	0.69	34904.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004459939-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

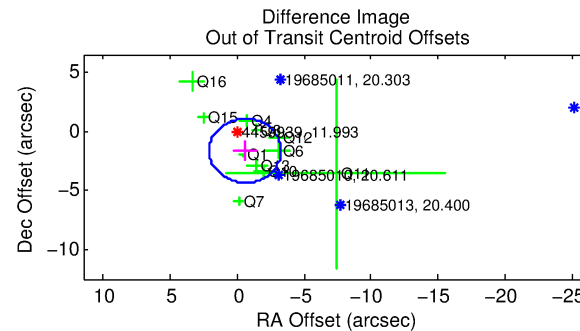
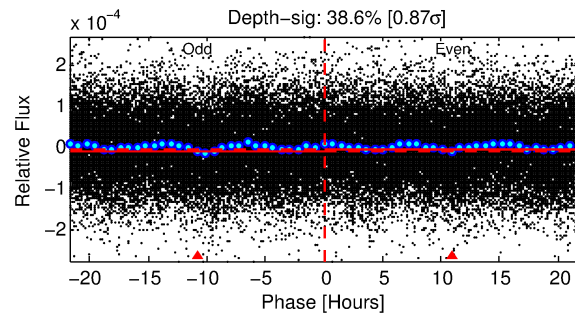
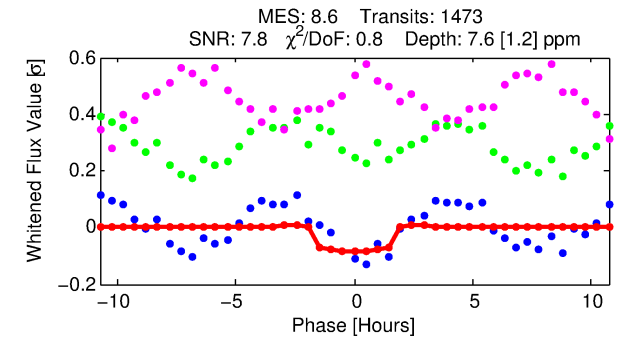
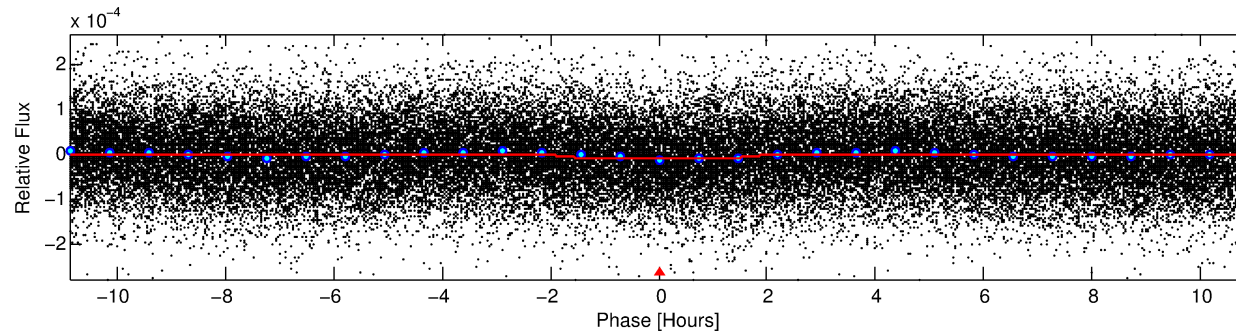
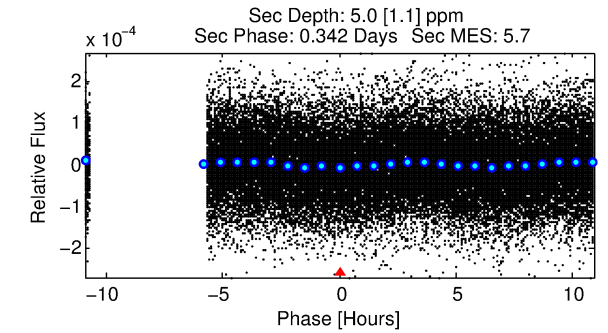
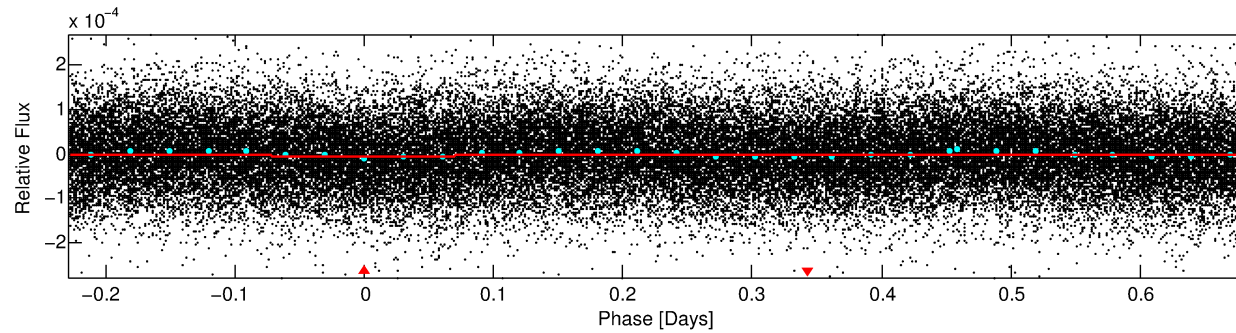
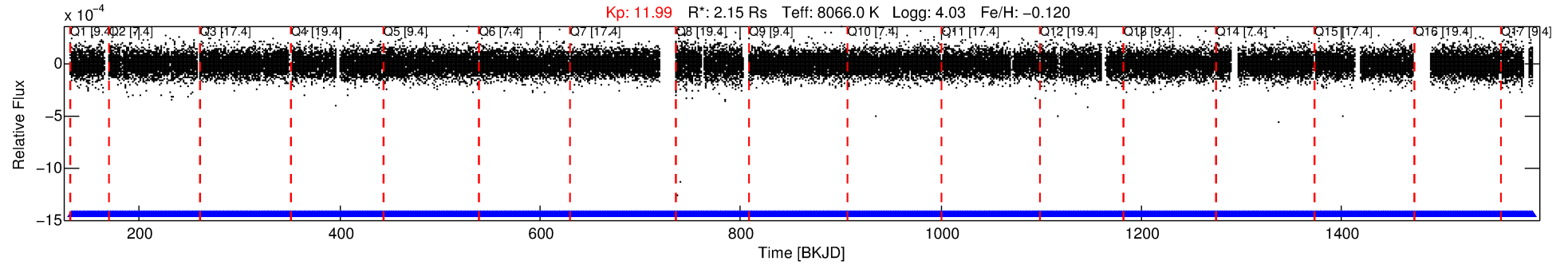
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004459939-01

No Significant Match Found

# DV One-Page Summary

KIC: 4459939 Candidate: 1 of 1 Period: 0.911 d



## DV Fit Results:

Period = 0.91097 [0.00001] d  
Epoch = 132.2768 [0.0046] BKJD  
Rp/R\* = 0.0029 [0.0008]  
a/R\* = 1.26 [0.74]  
b = 0.90 [0.33]  
Seff = 34904.36 [8016.44]  
Teq = 3485 [200] K  
Rp = 0.69 [0.22] Re  
a = 0.0224 [0.0034] AU  
Ag = 2.91 [1.77] [1.08σ]  
Teffp = 7039 [995] K [3.50σ]

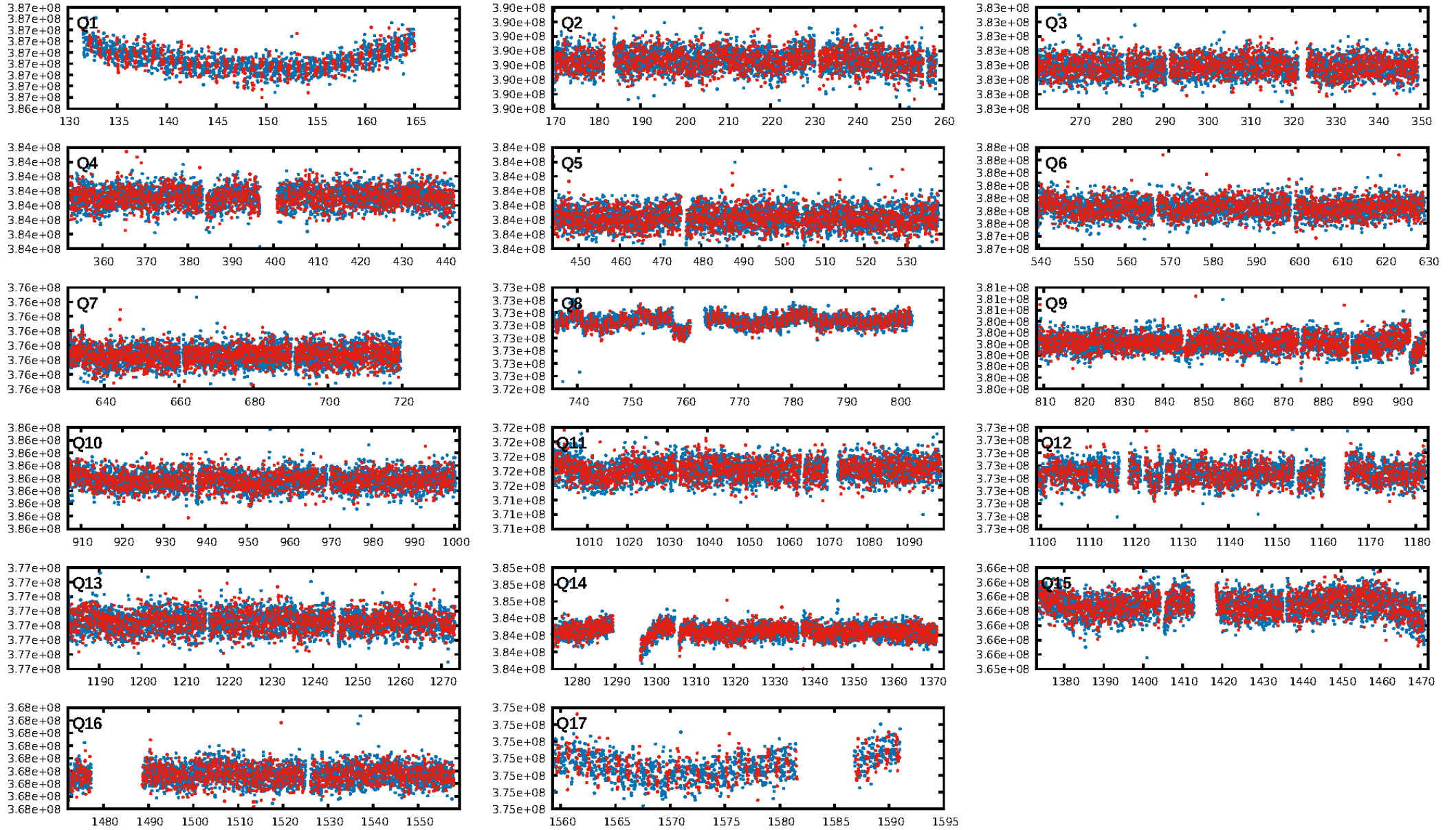
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.09e-15  
RollingBand-fgt: 1.00 [1407/1407]  
GhostDiagnostic-chr: 2.658  
Centroid-sig: 61.9%  
Centroid-so: 0.625 arcsec [0.55σ]  
OotOffset-rm: 1.757 arcsec [1.95σ]  
OotOffset-st: 2/3/4/2 [11]  
KicOffset-rm: 1.903 arcsec [1.89σ]  
KicOffset-st: 2/3/4/2 [11]  
DiffImageQuality-fgm: 0.55 [6/11]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:09:22 Z

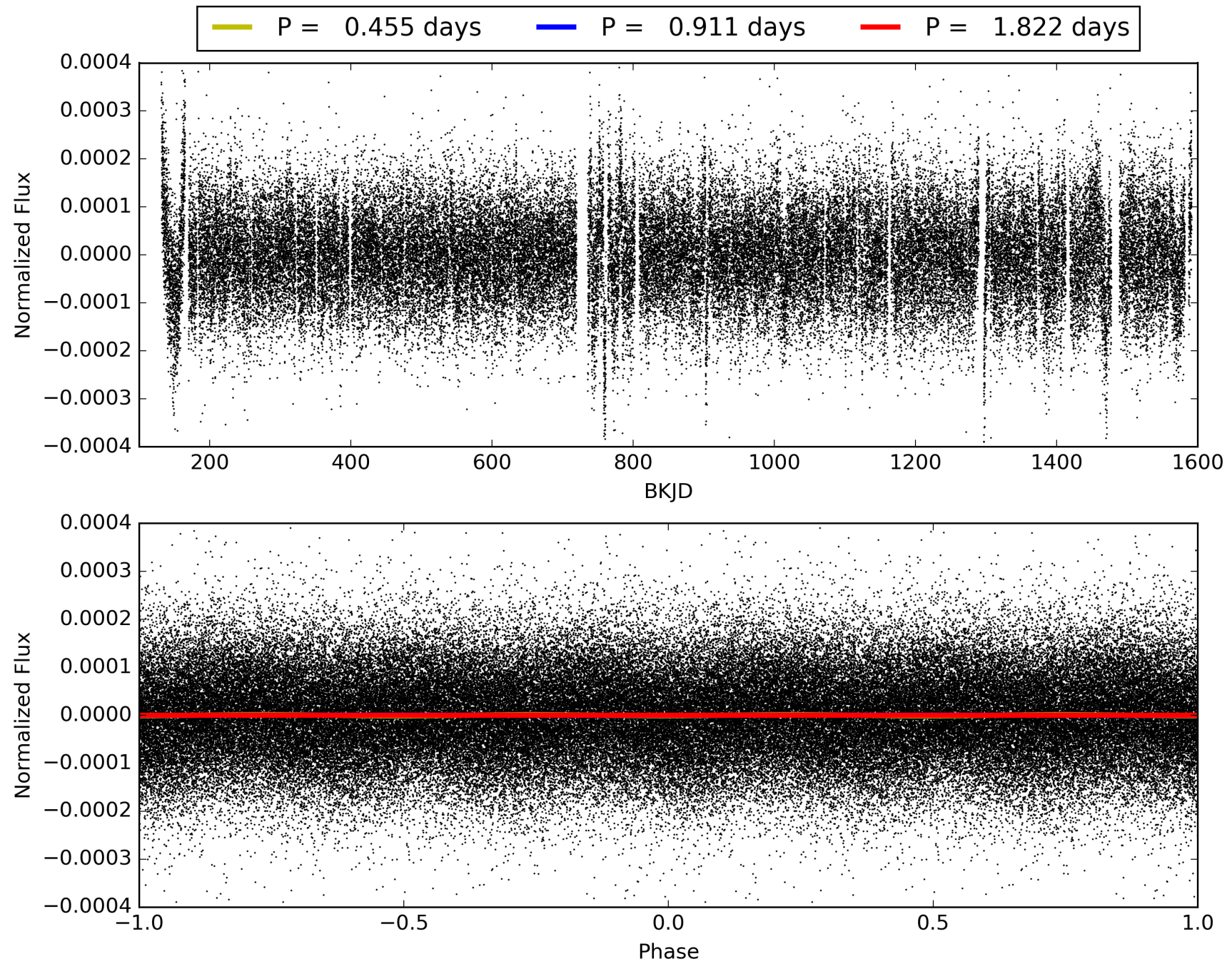
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004459939-01, PDC Light Curves



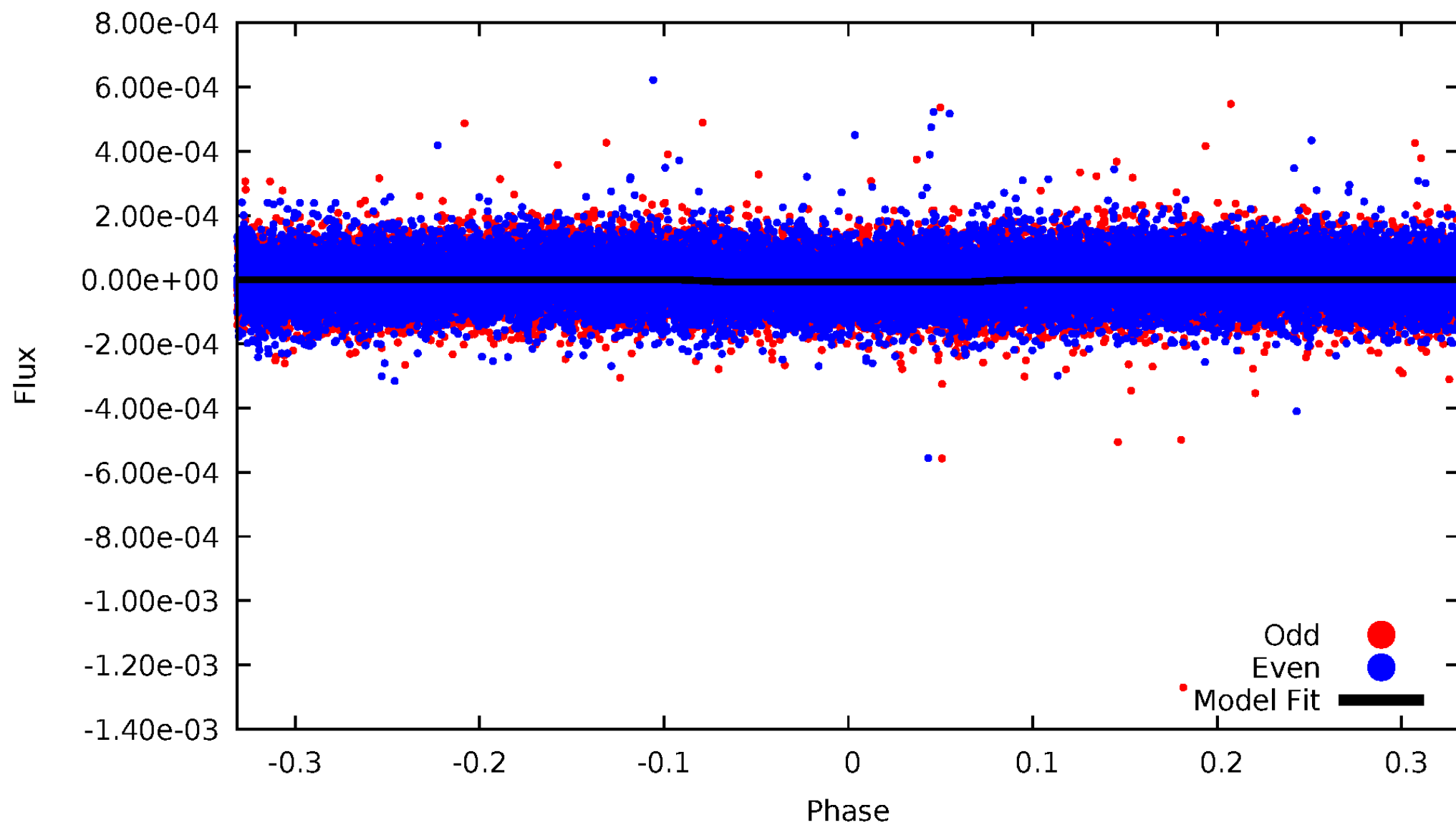


TCE 004459939-01



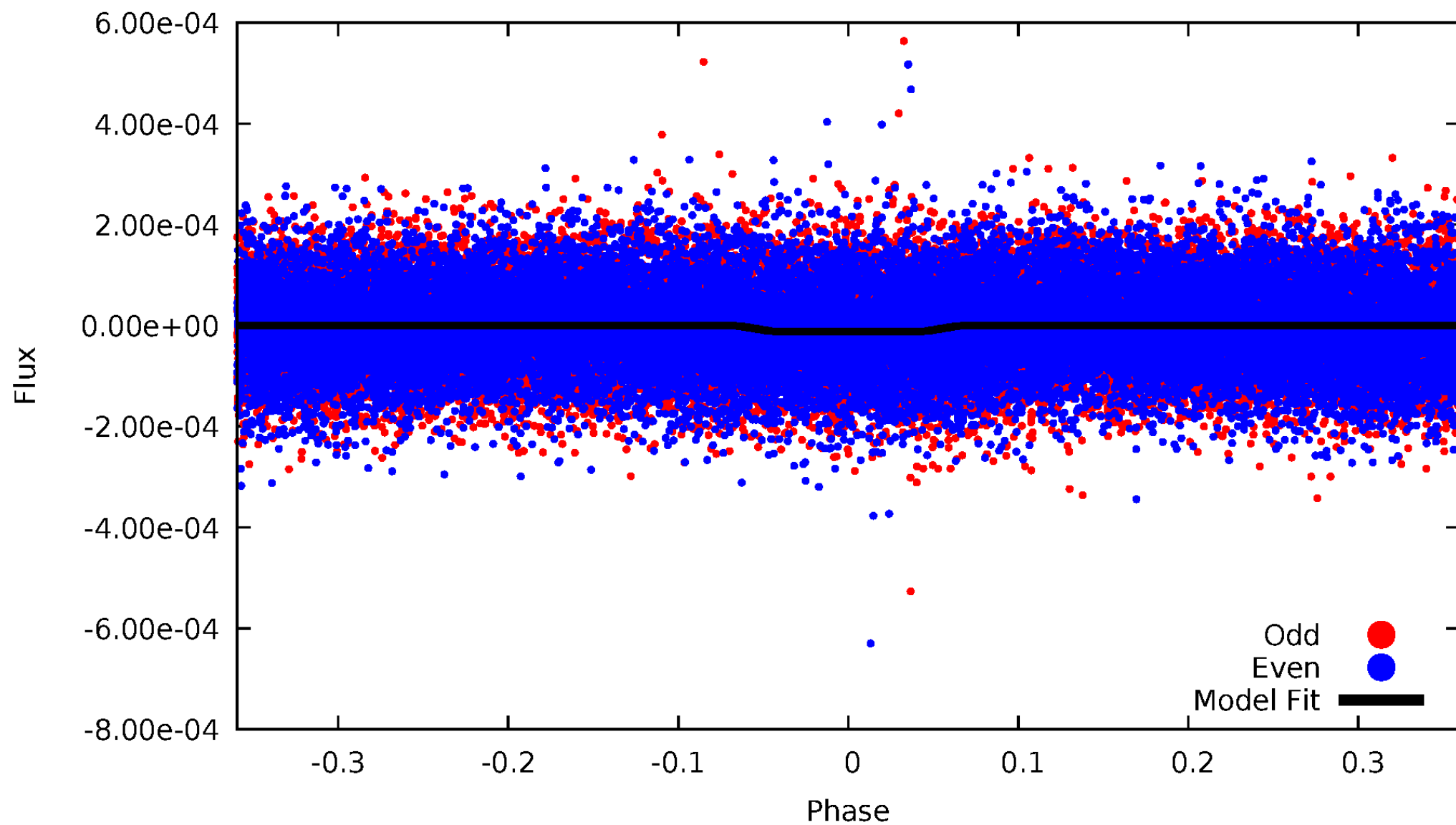
# DV Odd/Even

TCE 004459939-01



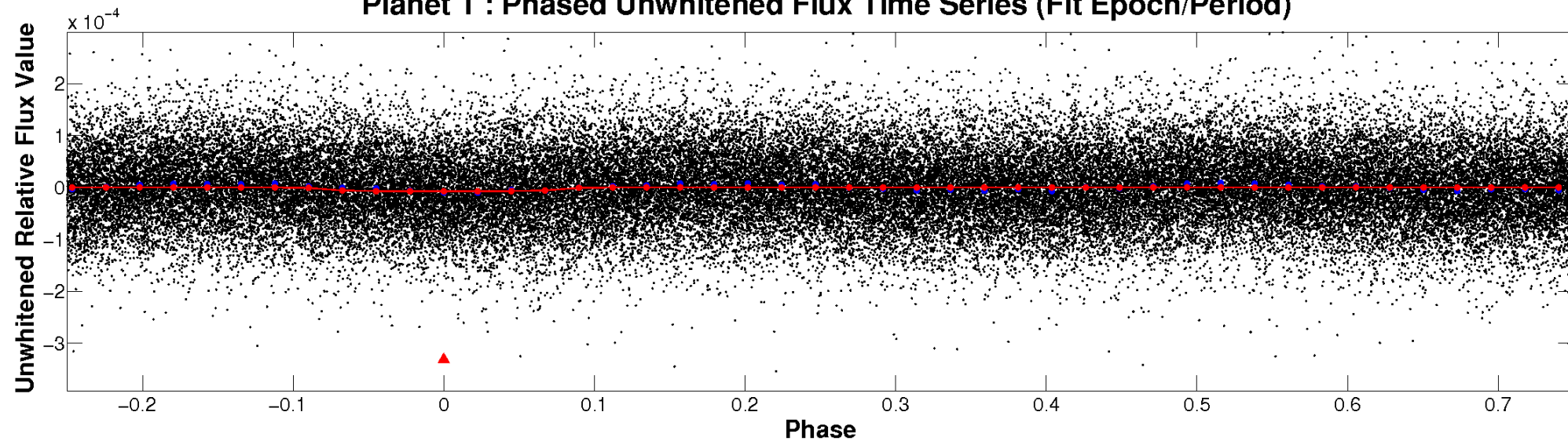
# ALT Odd/Even

TCE 004459939-01

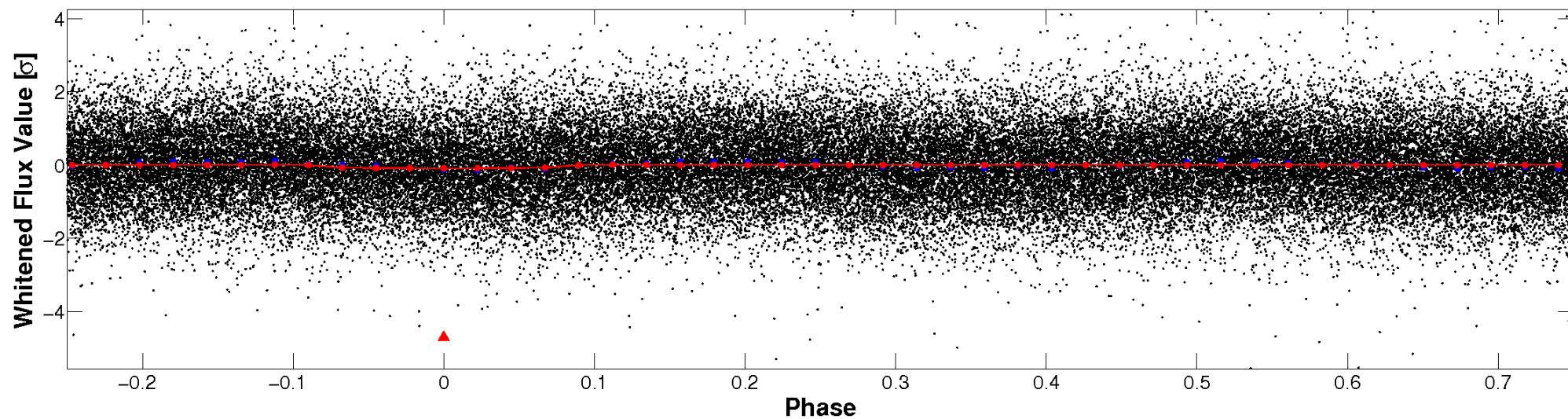


# Non-Whitened Vs. Whitened Light Curve

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



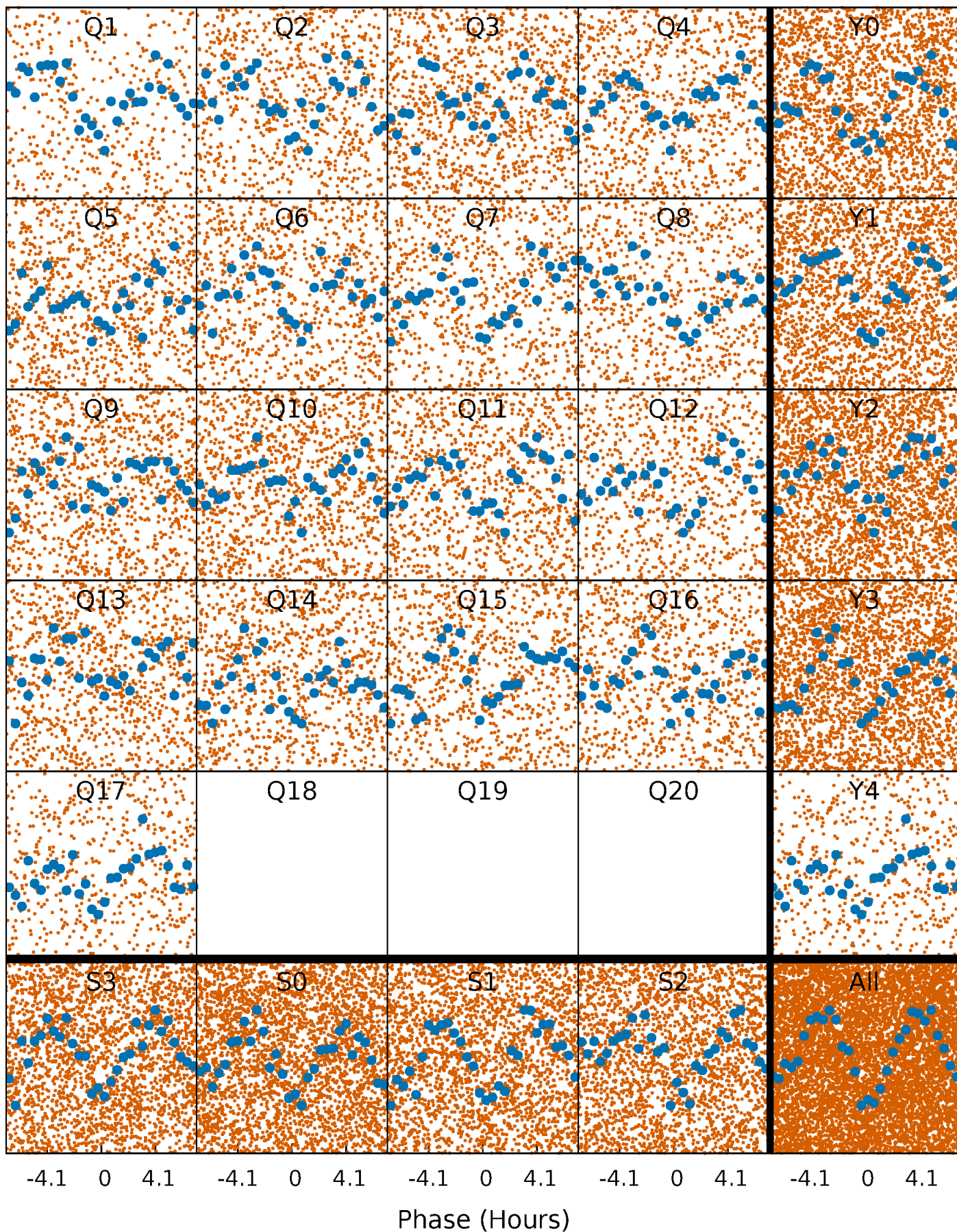
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

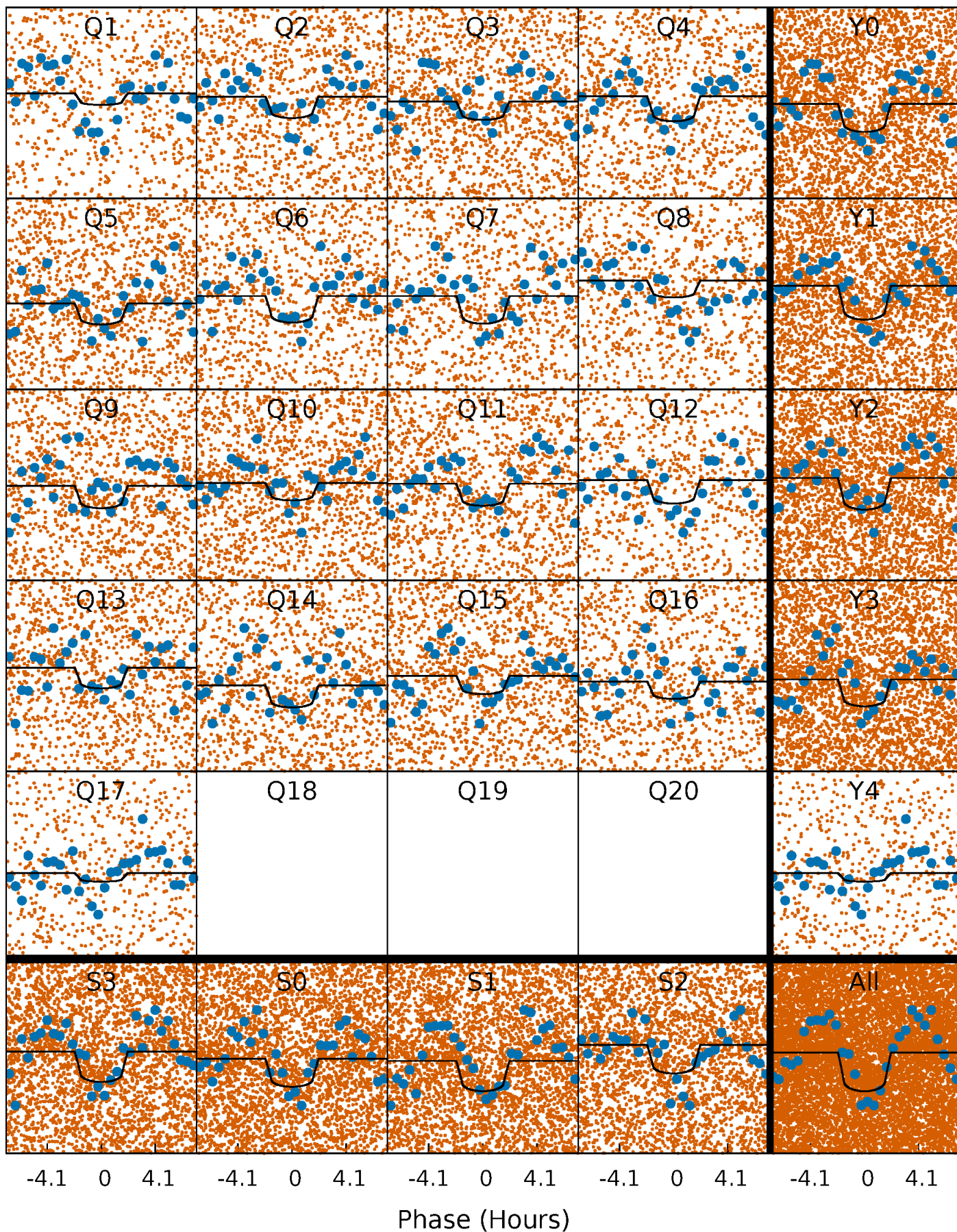
TCE 004459939-01 P= 0.910967 Days  $T_0=132.276808$  (BKJD)





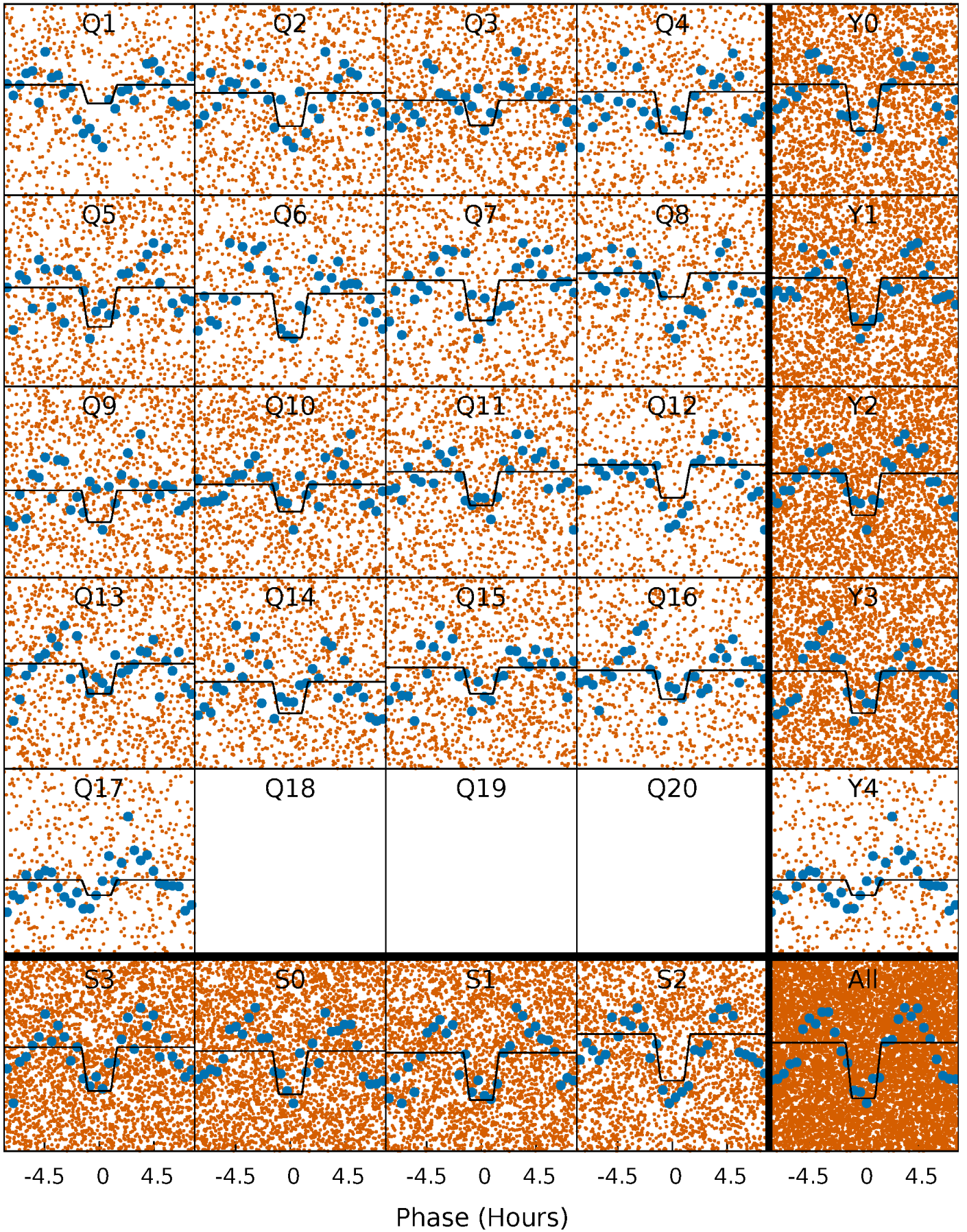
# DV Quarter-Phased Transit Curves

TCE 004459939-01 P= 0.910967 Days  $T_0=132.276808$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004459939-01   P= 0.910990 Days    $T_0=132.274936$  (BKJD)

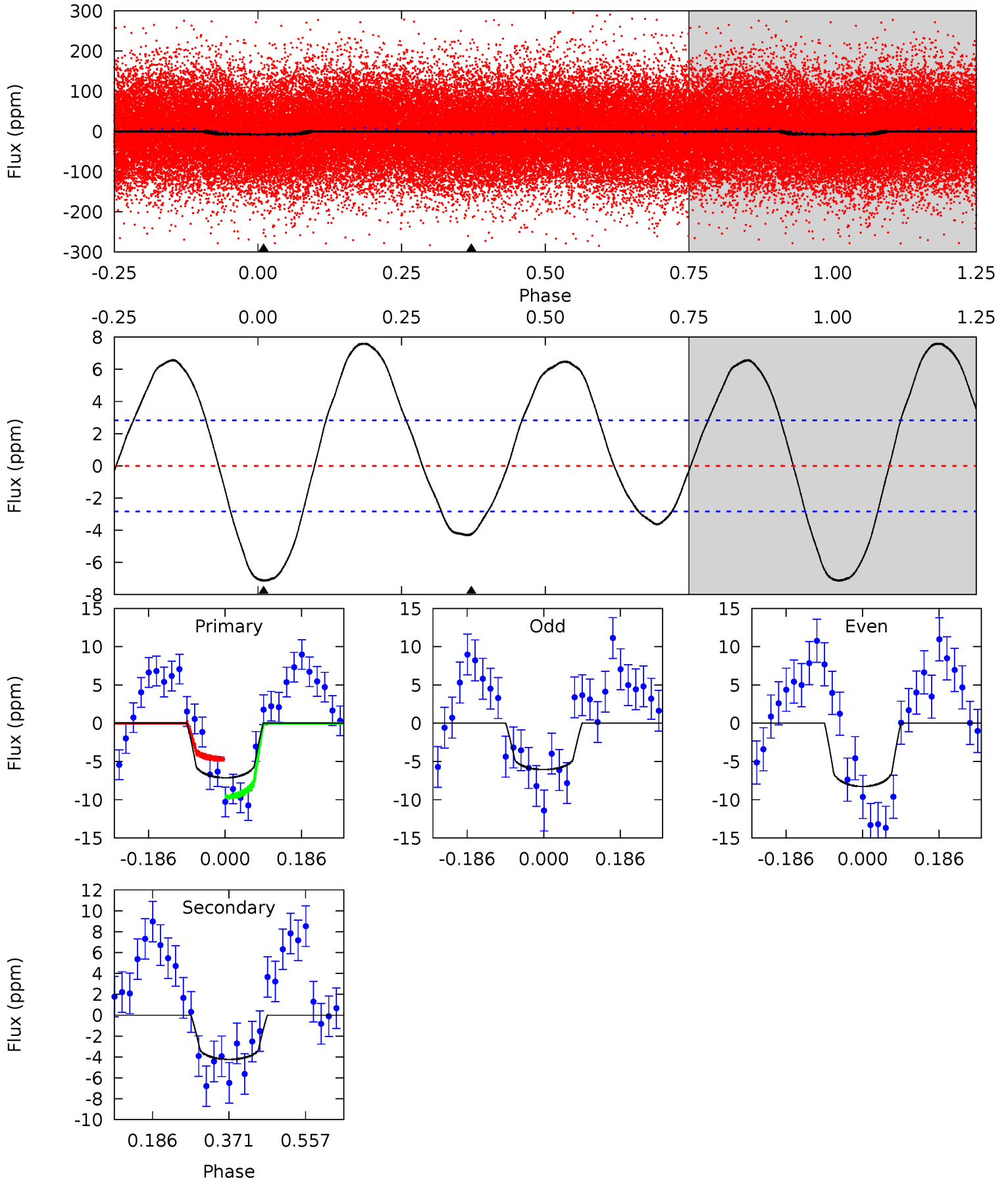




# DV Model-Shift Uniqueness Test

004459939-01, P = 0.910967 Days, E = 131.365841 Days

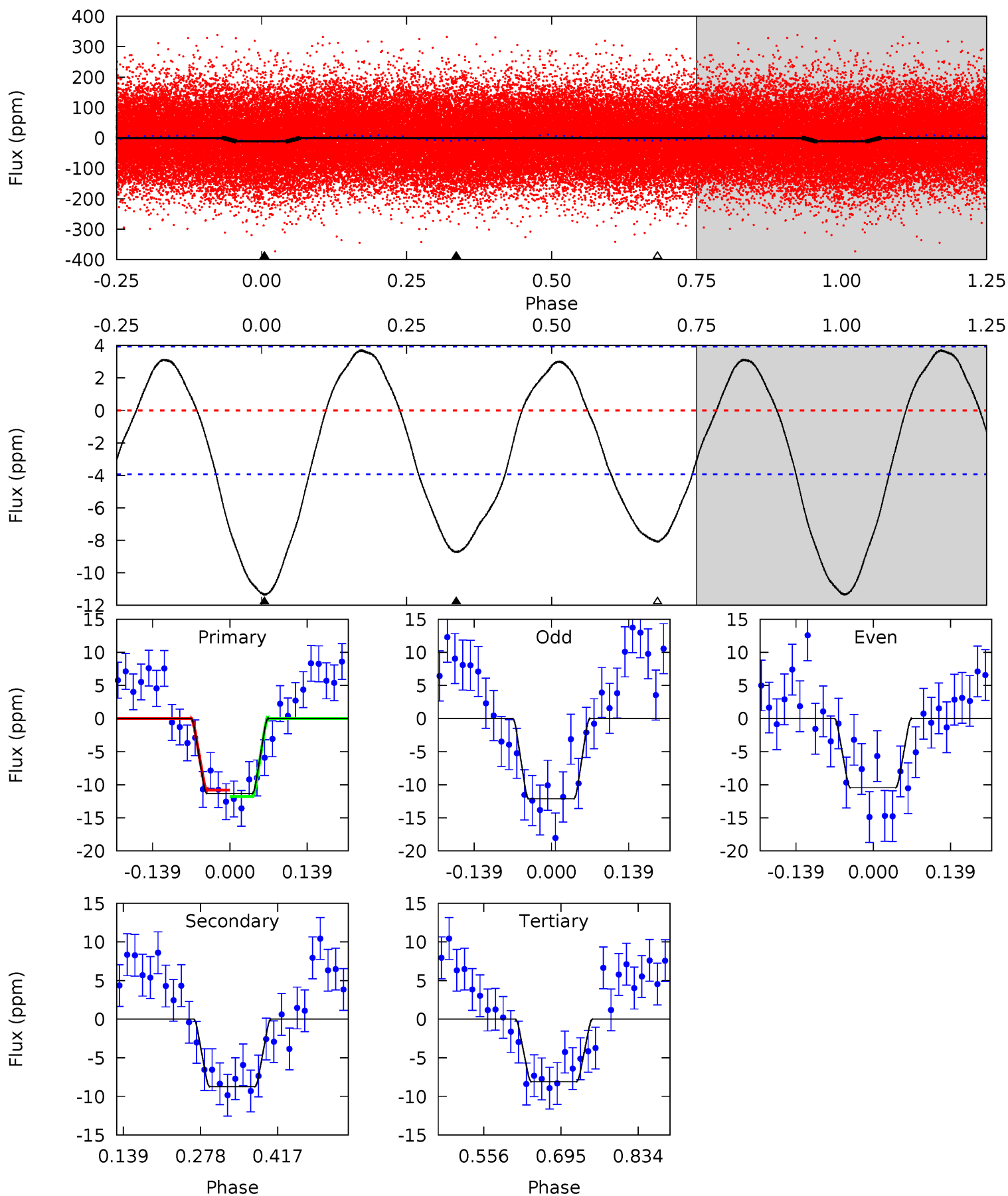
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	6.63	0	0	4.43	1.32	4.95	11.2	11.2	6.63	6.63	1.73	1.05	0.52	3.92



# Alt Model-Shift Uniqueness Test

004459939-01, P = 0.910990 Days, E = 131.363946 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
13.0	9.99	9.26	0	4.50	1.48	4.72	3.72	13.0	0.73	9.99	0.96	0.99	0.25	0.56





### Stellar Parameters For KIC 004459939

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8066^{+80}_{-80}$	$4.030^{+0.126}_{-0.084}$	$-0.120^{+0.150}_{-0.200}$	$2.148^{+0.275}_{-0.378}$	$1.805^{+0.076}_{-0.189}$	$0.256^{+0.160}_{-0.071}$
	+1%/-1%	+3%/-2%	+125%/-167%	+13%/-18%	+4%/-10%	+62%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 004459939-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-4\pm 1$	$0.66^{+0.19}_{-0.18}$	$4857^{+175}_{-214}$	$6427^{+1264}_{-886}$	$2.630^{+2.259}_{-1.110}$
Alt.	$-9\pm 1$	$0.80^{+0.18}_{-0.18}$	$4841^{+181}_{-210}$	$7109^{+1159}_{-792}$	$3.687^{+2.459}_{-1.238}$

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

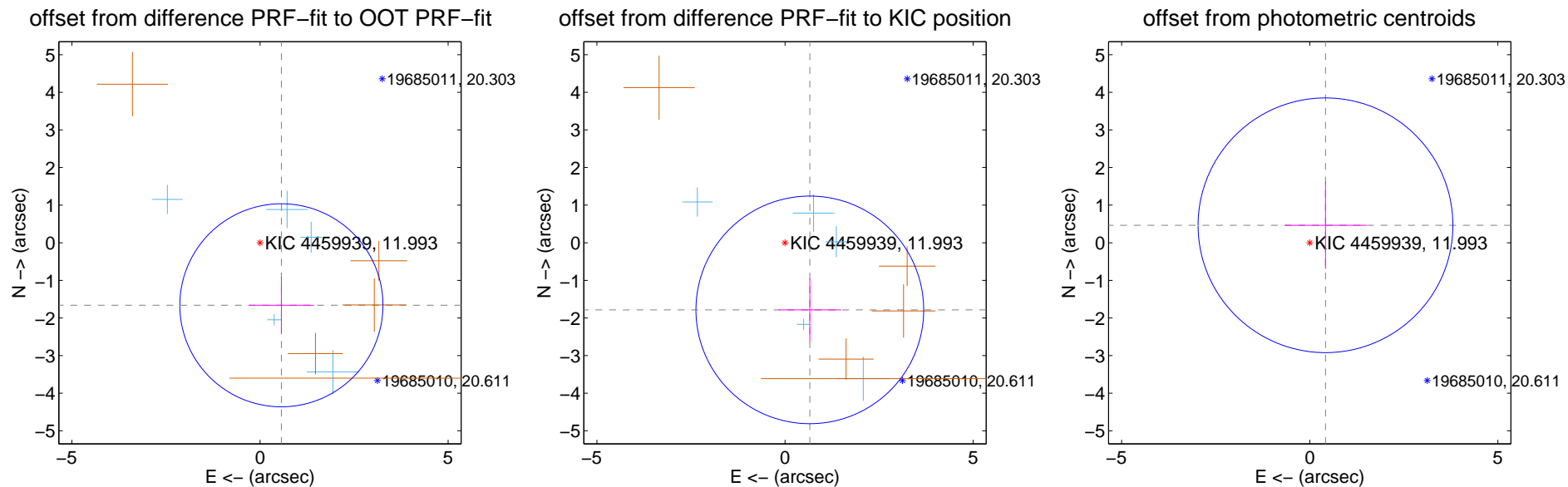
## DV Centroid Data

Supplemental centroid analysis for 004459939-01. **Kepler magnitude: 11.99.** Transit SNR 7.77

There are 6 quarters with good PRF difference image offsets

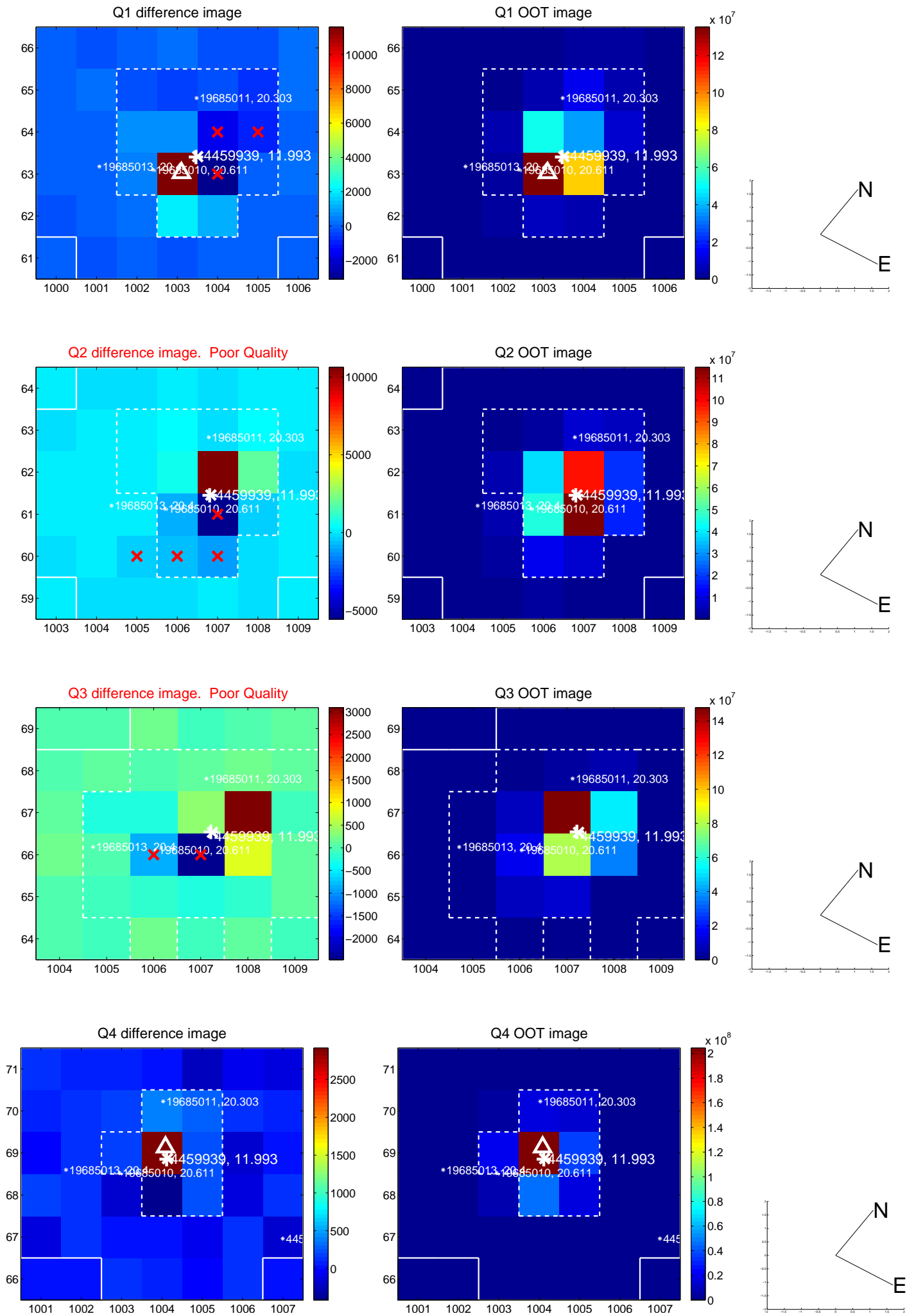
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.757 \pm 0.900$	1.95	$-0.568 \pm 0.865$	$-1.663 \pm 0.752$
PRF-fit source offset from KIC position	$1.903 \pm 1.009$	1.89	$-0.659 \pm 0.833$	$-1.785 \pm 0.837$
photometric centroid source offset	$0.63 \pm 1.13$	0.55	$-0.42 \pm 1.09$	$0.46 \pm 1.16$

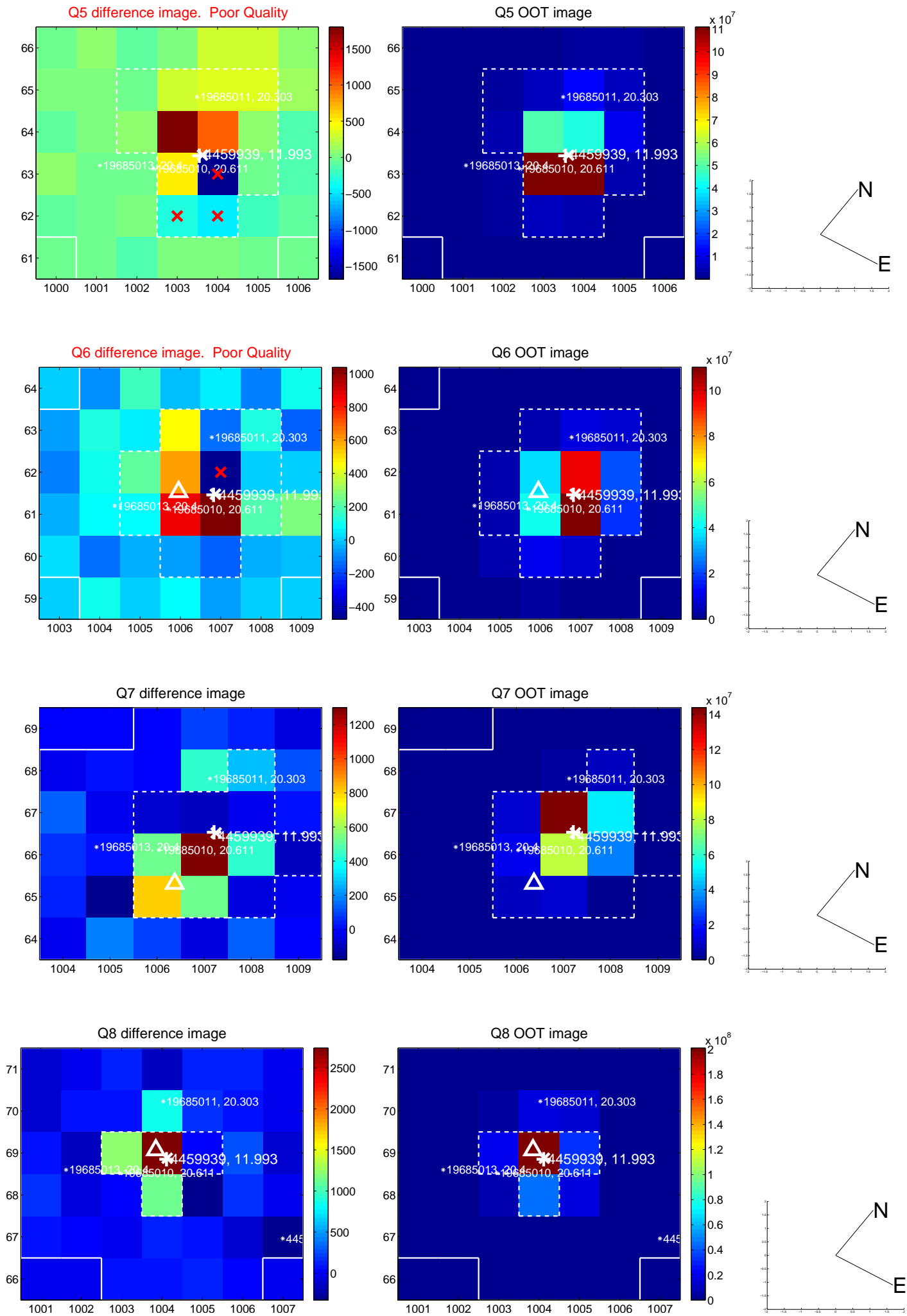


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

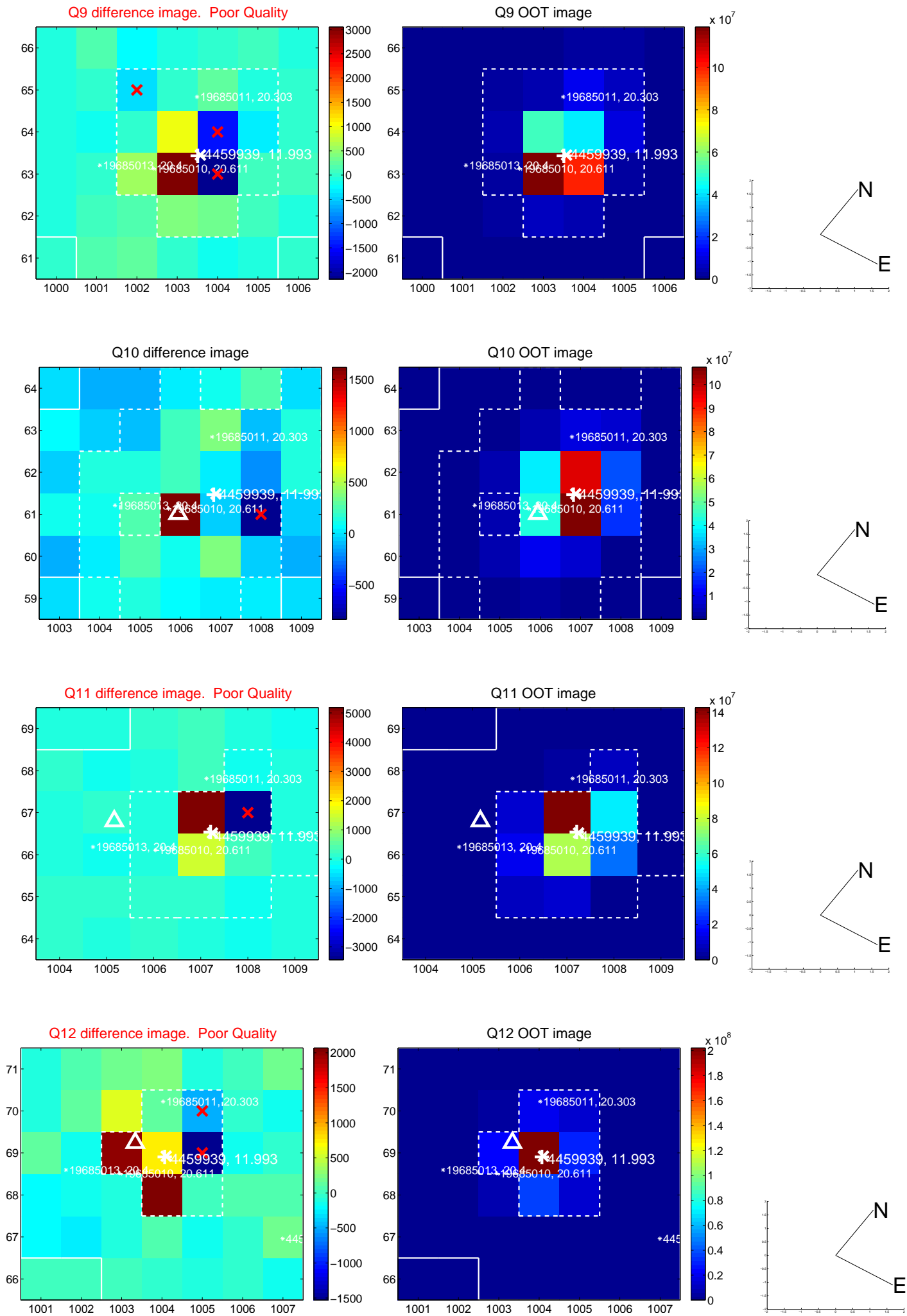


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

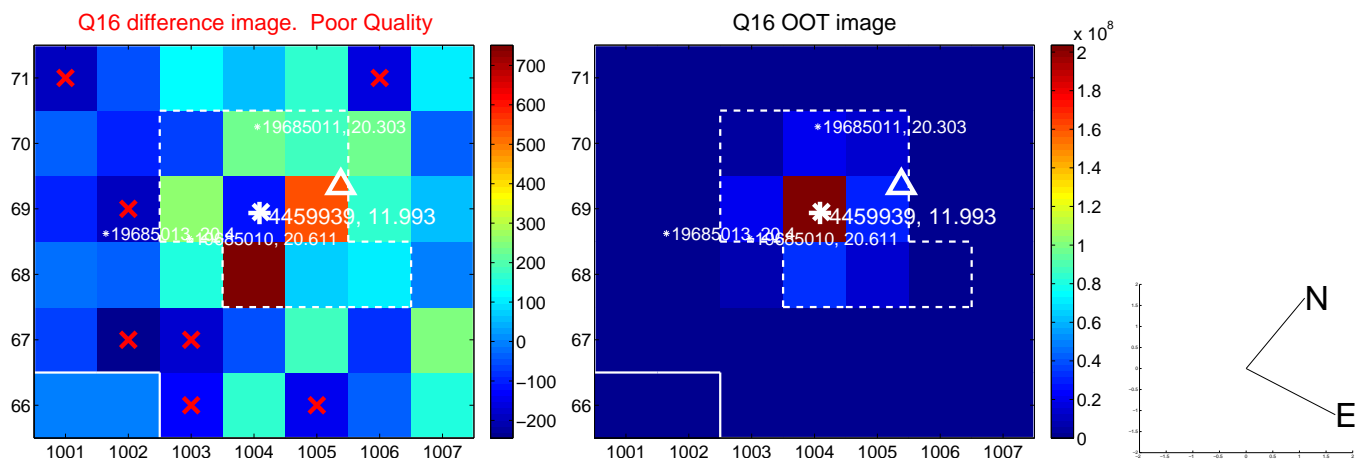
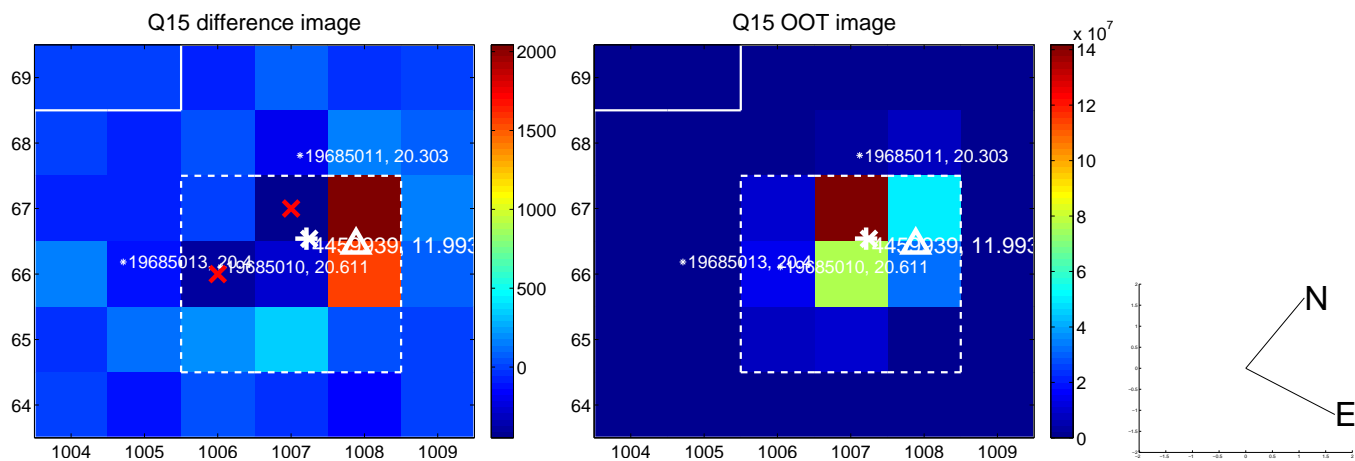
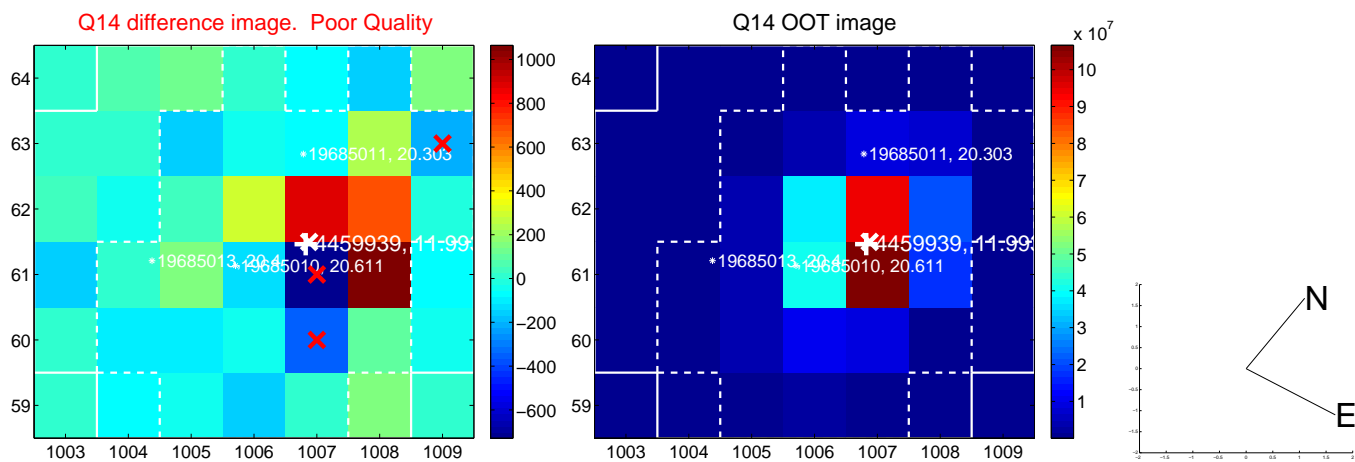
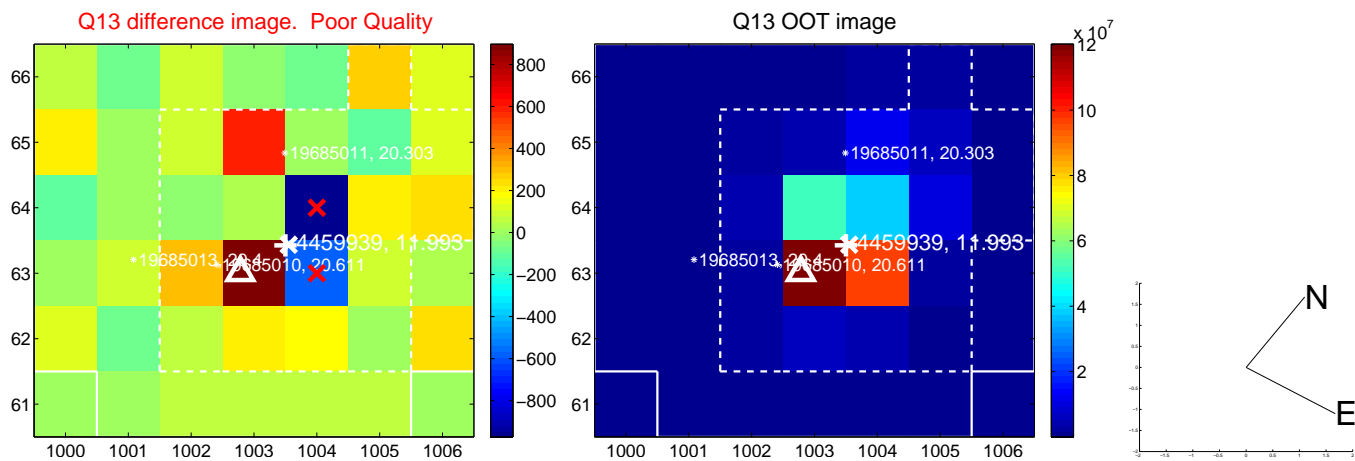




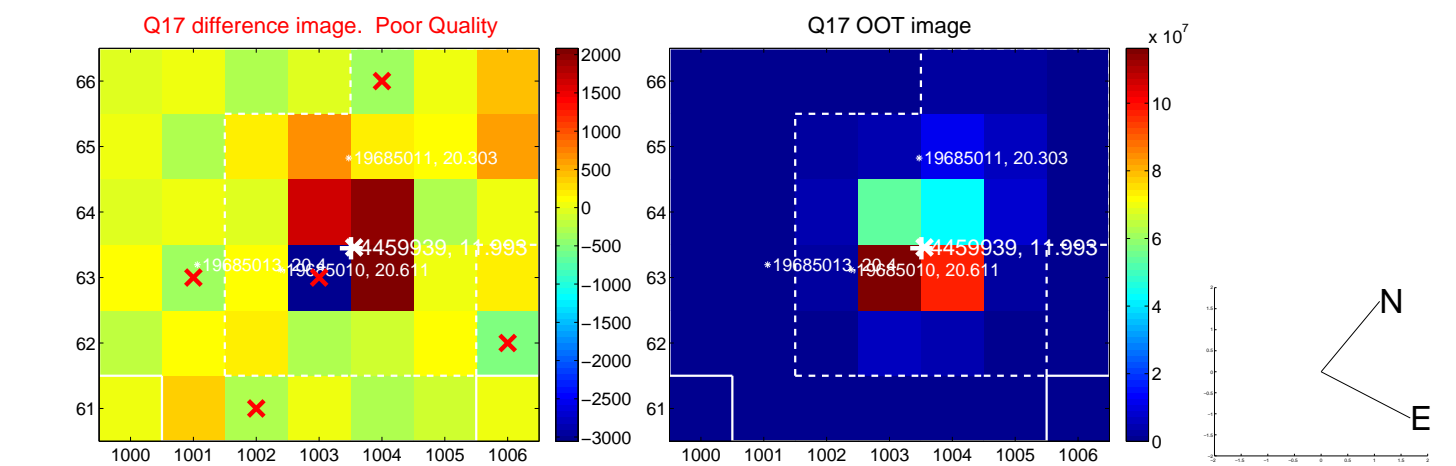
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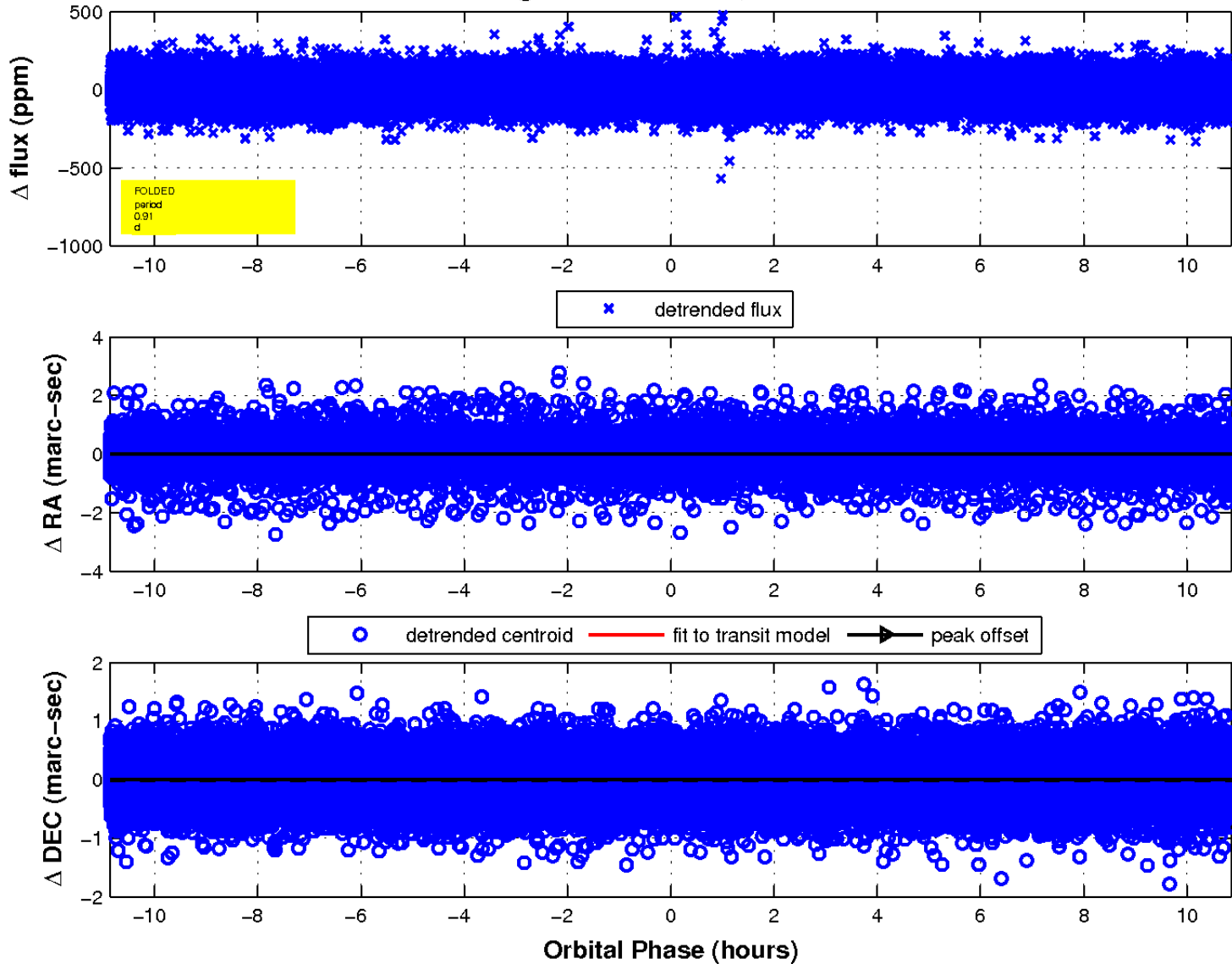
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

