

# KIC 012352520

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012352520-01	OBS	3094.01	4.577024	132.096297	699.8	0.825	13.2	16.8	0.50	3805	1.36	24.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012352520-01	OBS	PC	1.00	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.

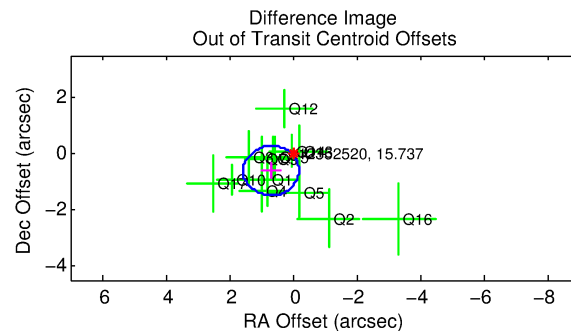
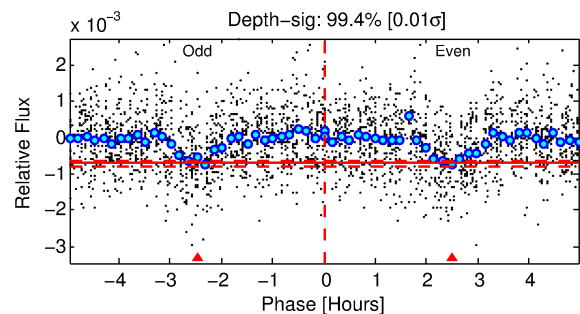
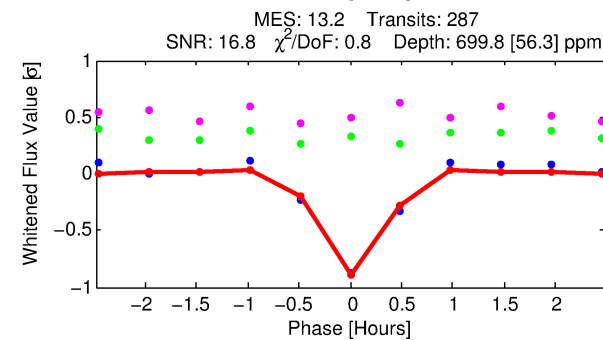
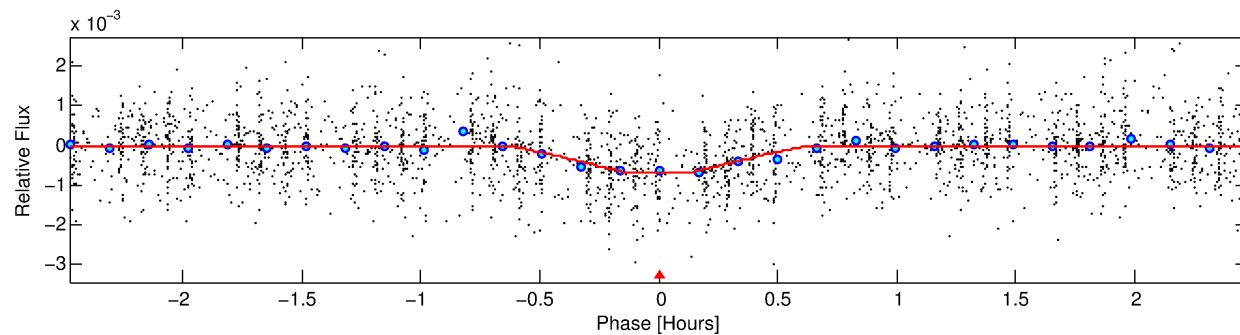
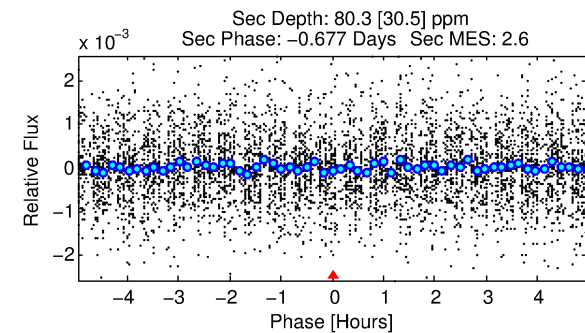
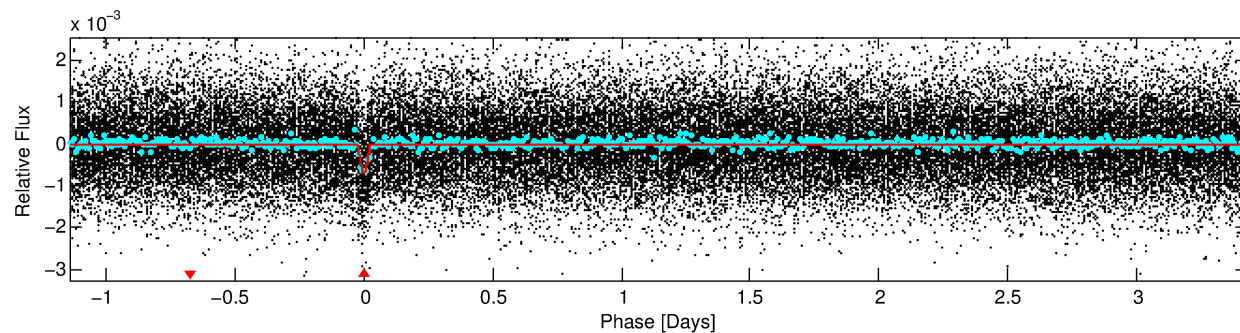
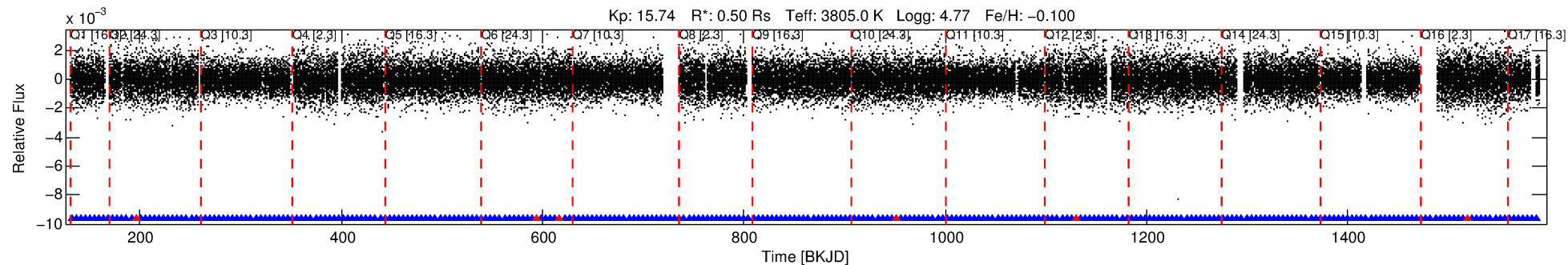
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012352520-01

No Significant Match Found

# DV One-Page Summary

KIC: 12352520 Candidate: 1 of 1 Period: 4.577 d  
KOI: K03094.01 Corr: 0.922



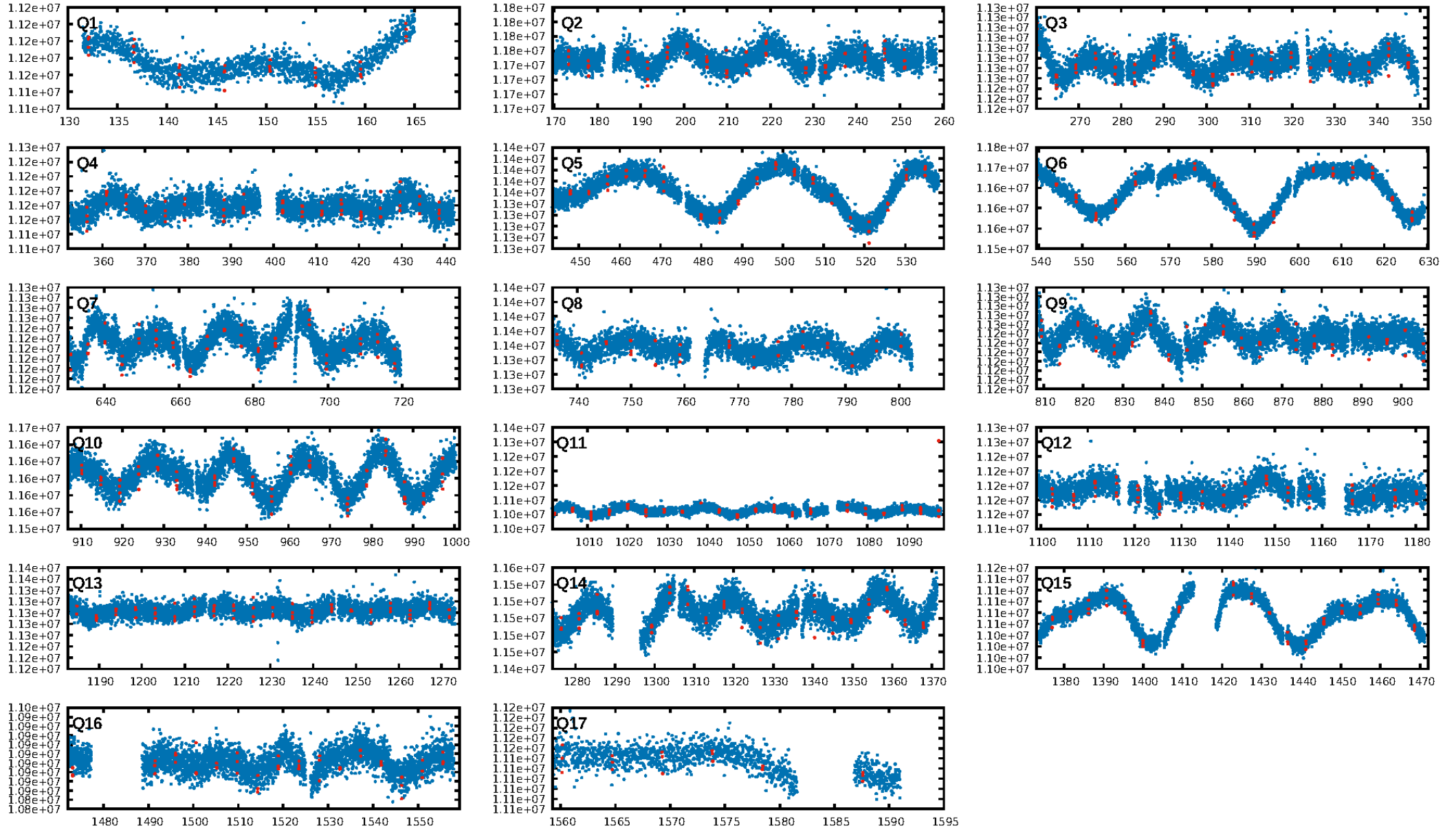
## DV Fit Results:

Period = 4.57702 [0.00001] d  
Epoch = 132.0963 [0.0011] BKJD  
Rp/R\* = 0.0251 [0.0131]  
a/R\* = 38.10 [88.15]  
b = 0.49 [3.57]  
Seff = 24.42 [2.52]  
Teq = 567 [15] K  
Rp = 1.36 [0.72] Re  
a = 0.0436 [0.0020] AU  
Ag = 45.20 [50.28] [0.88σ]  
Teffp = 2272 [633] K [2.70σ]

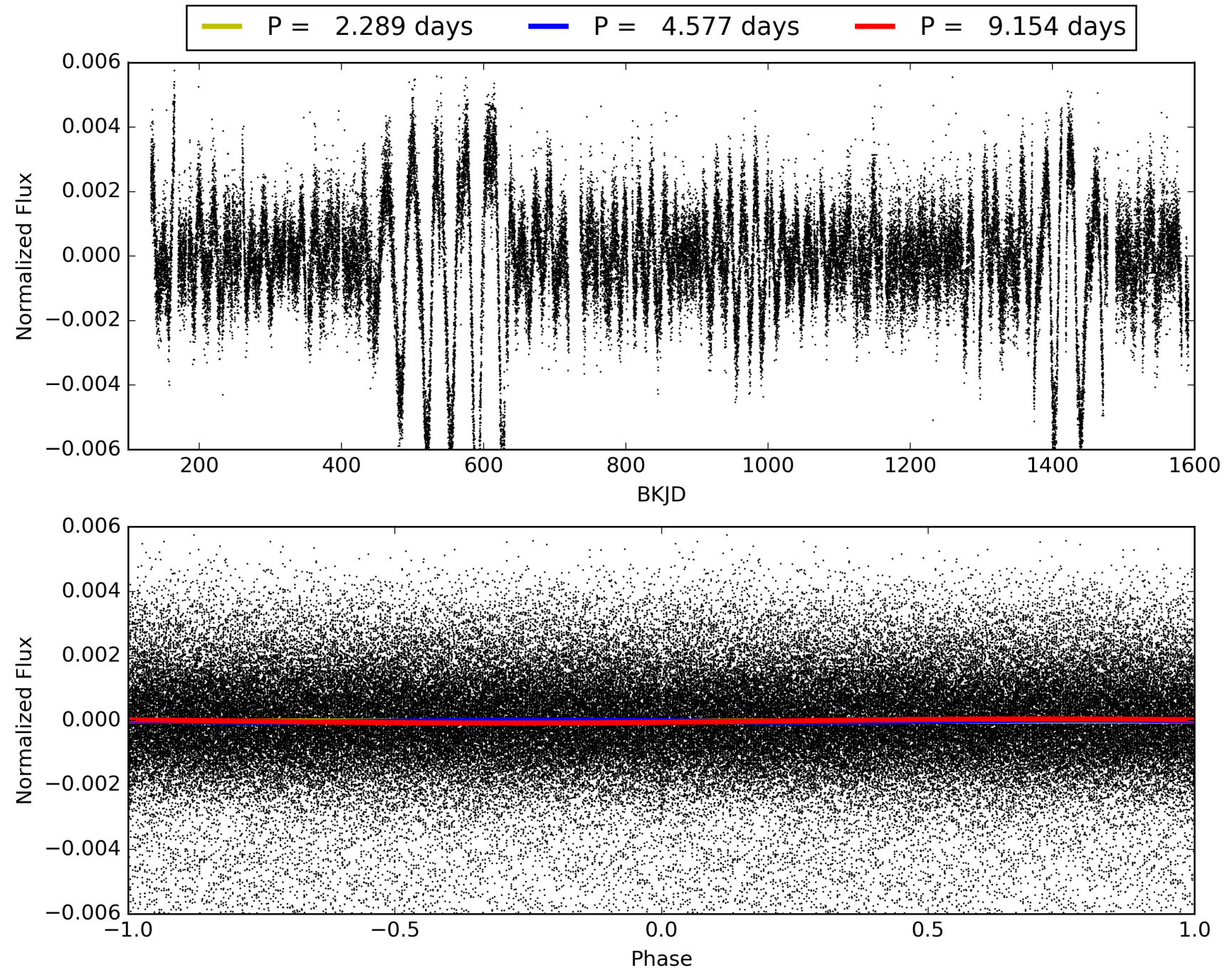
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.83e-39  
RollingBand-fgt: 0.98 [267/273]  
GhostDiagnostic-chr: 1.857  
Centroid-sig: 0.2%  
Centroid-so: 2.396 arcsec [3.11σ]  
OotOffset-rm: 0.915 arcsec [3.14σ]  
KicOffset-rm: 0.742 arcsec [2.16σ]  
OotOffset-st: 3/3/3/5 [14]  
KicOffset-st: 3/3/3/5 [14]  
DiffImageQuality-fgm: 0.71 [10/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012352520-01, PDC Light Curves

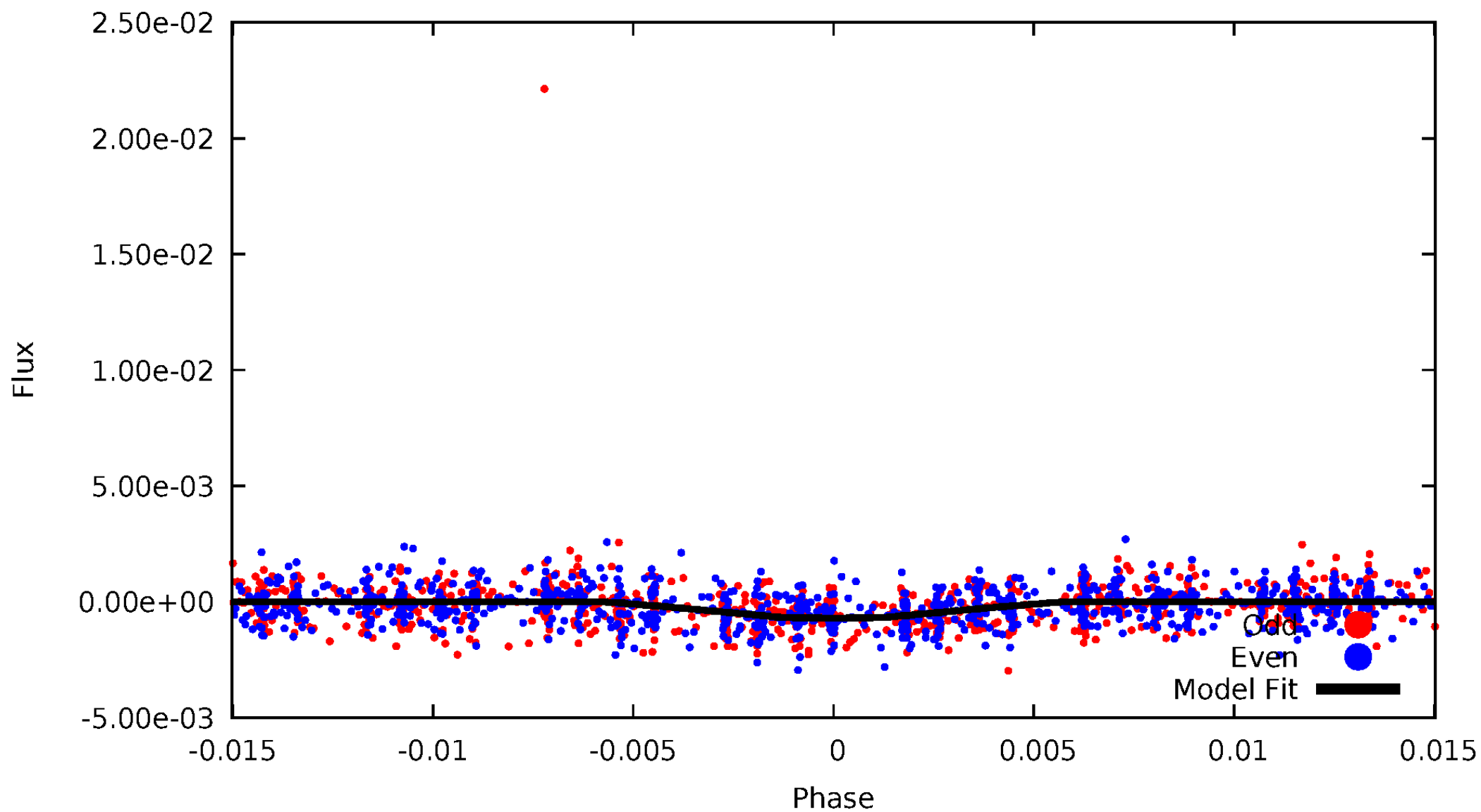


# TCE 012352520-01



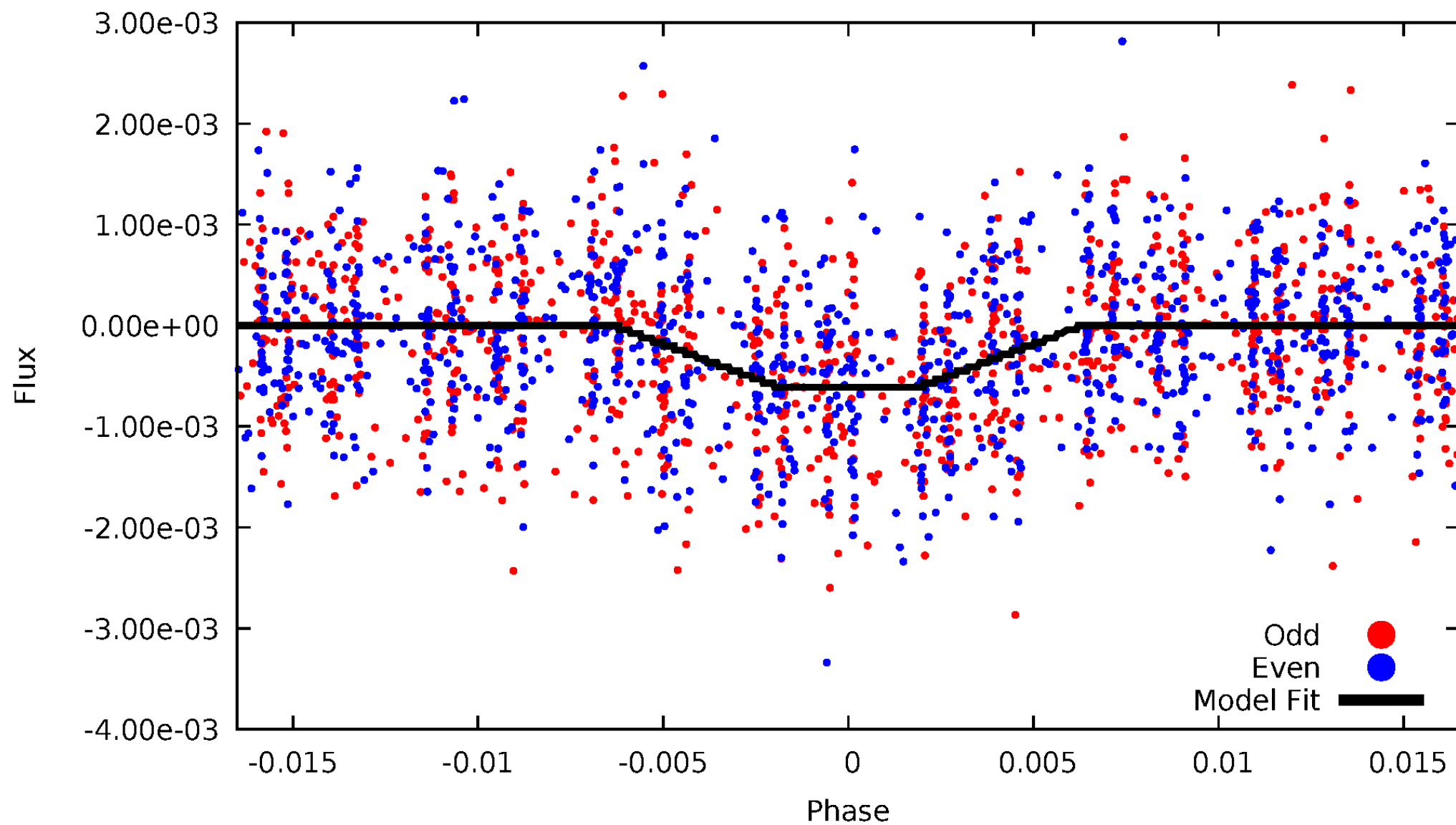
# DV Odd/Even

TCE 012352520-01



# ALT Odd/Even

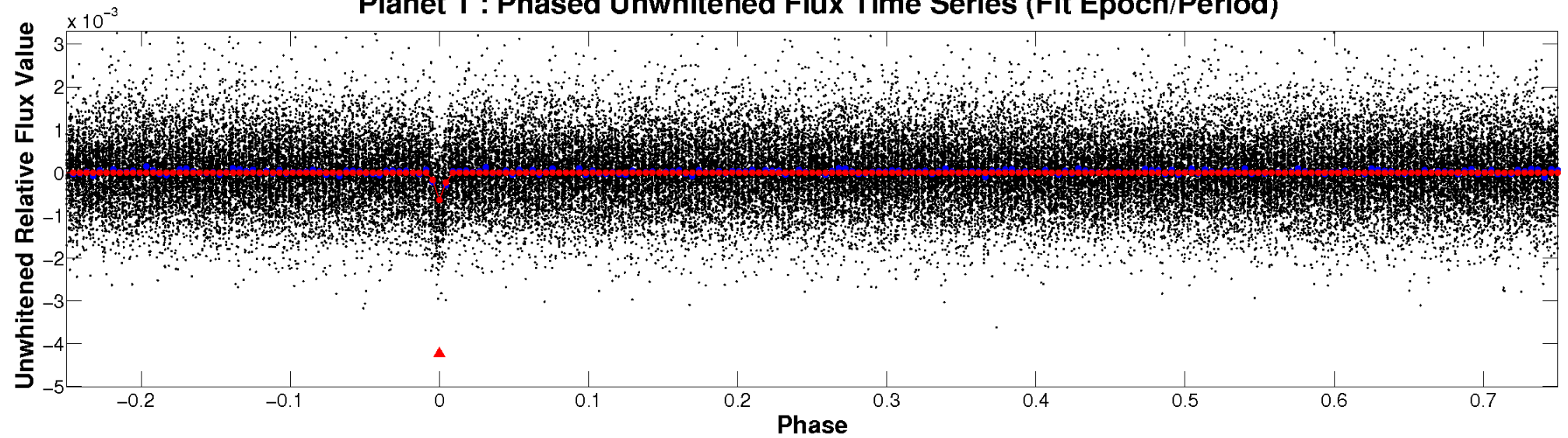
TCE 012352520-01



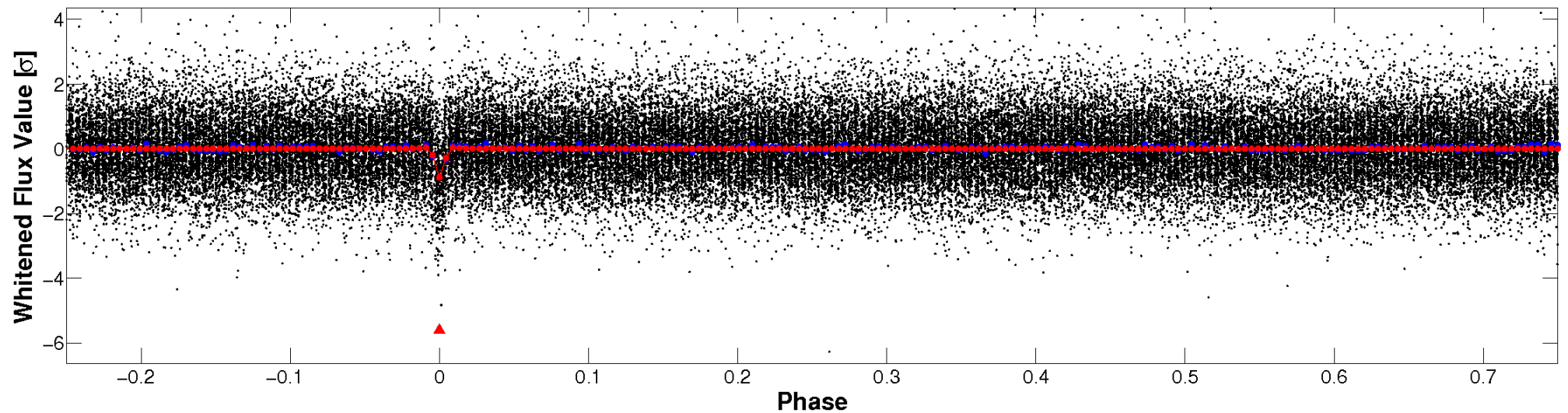


# Non-Whitened Vs. Whitened Light Curve

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

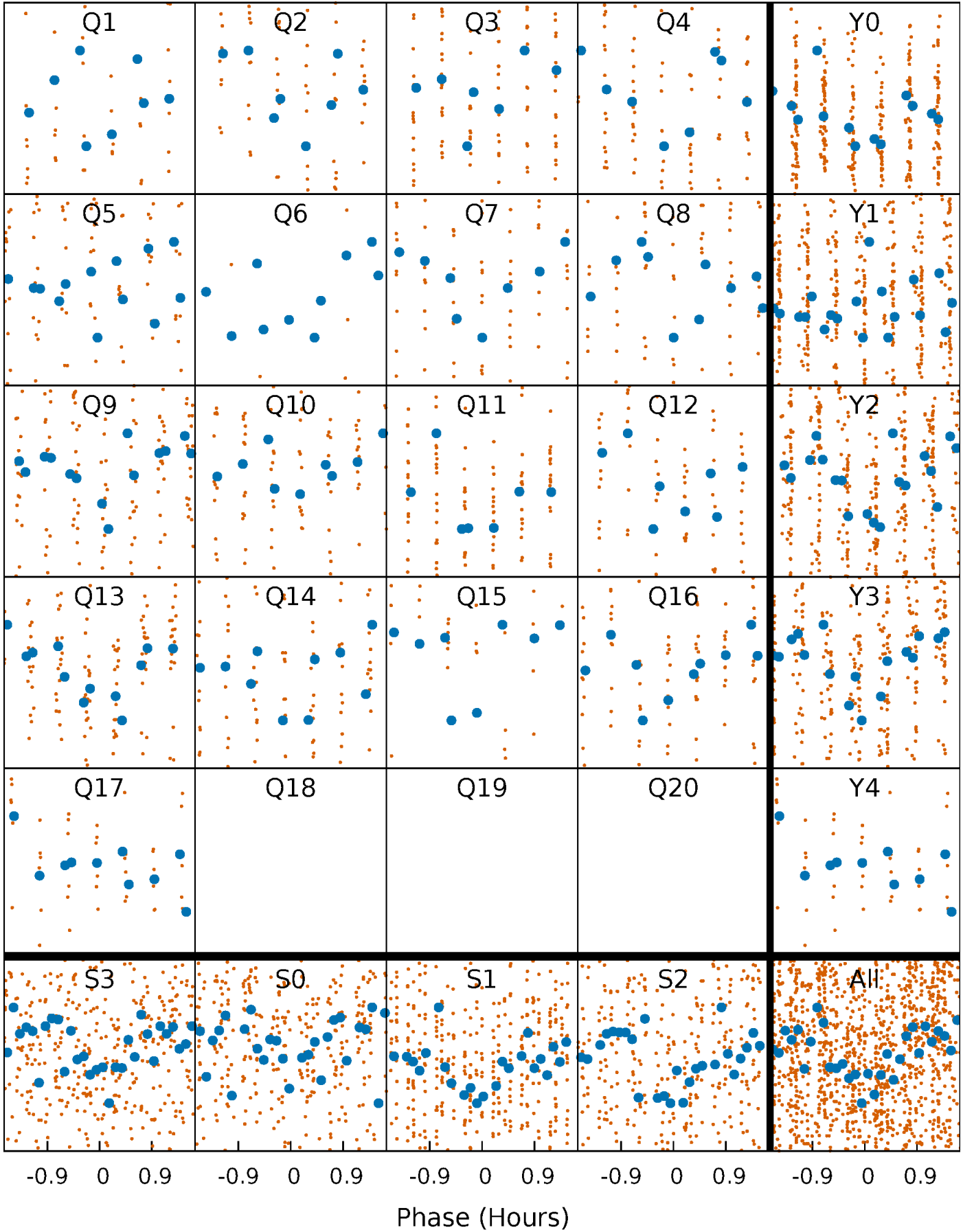


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

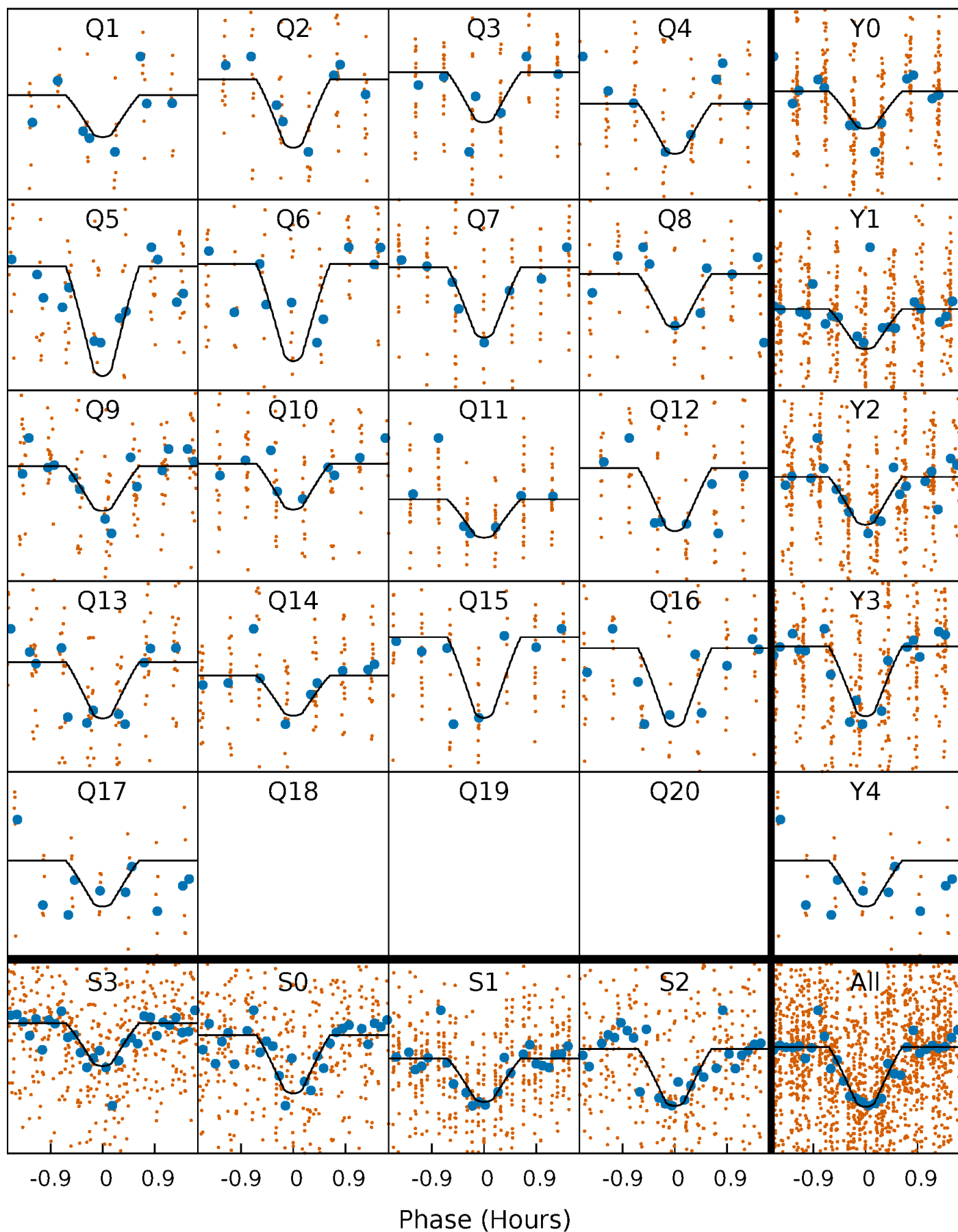
TCE 012352520-01   P= 4.577024 Days    $T_0=132.096297$  (BKJD)





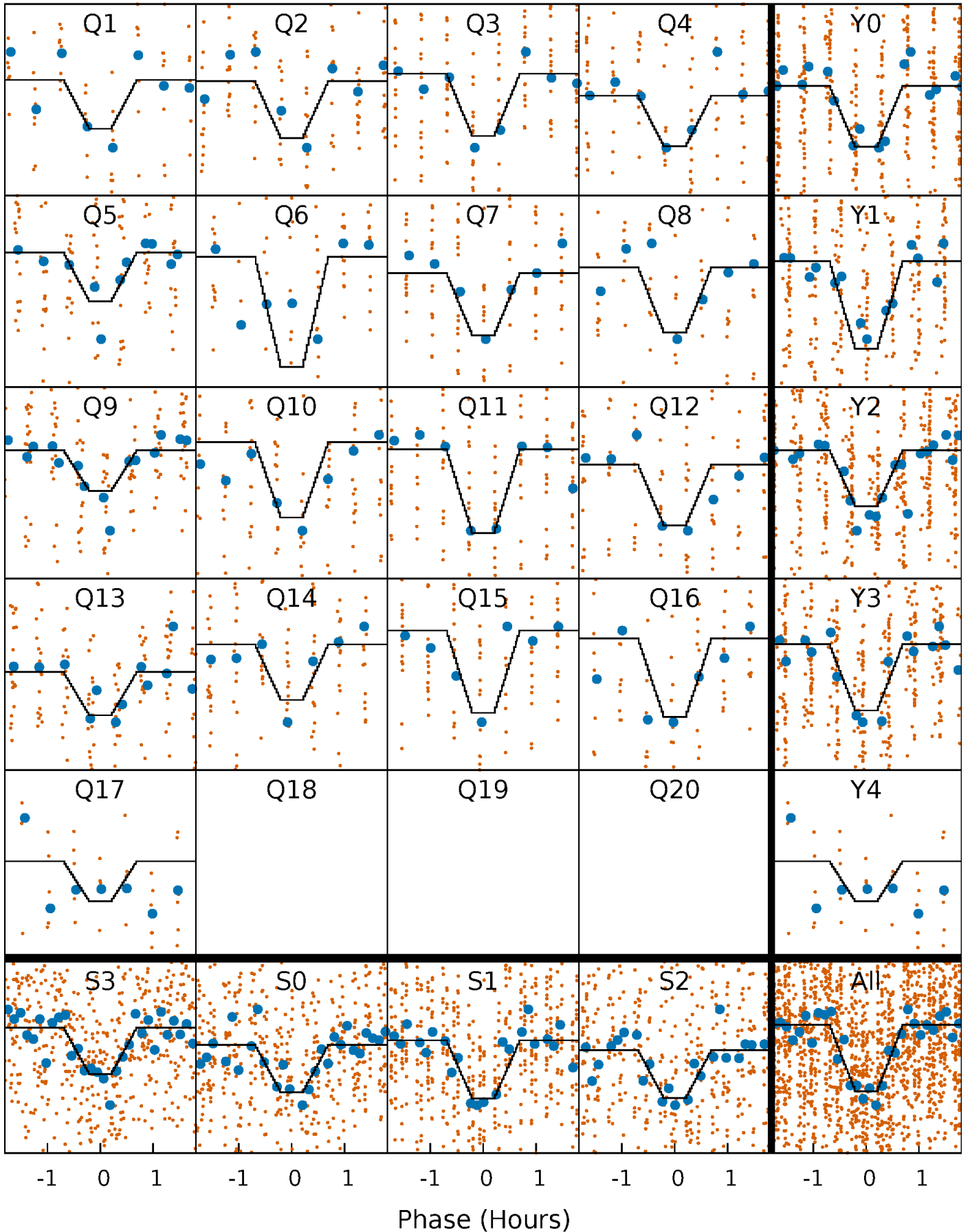
# DV Quarter-Phased Transit Curves

TCE 012352520-01 P= 4.577024 Days  $T_0=132.096297$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

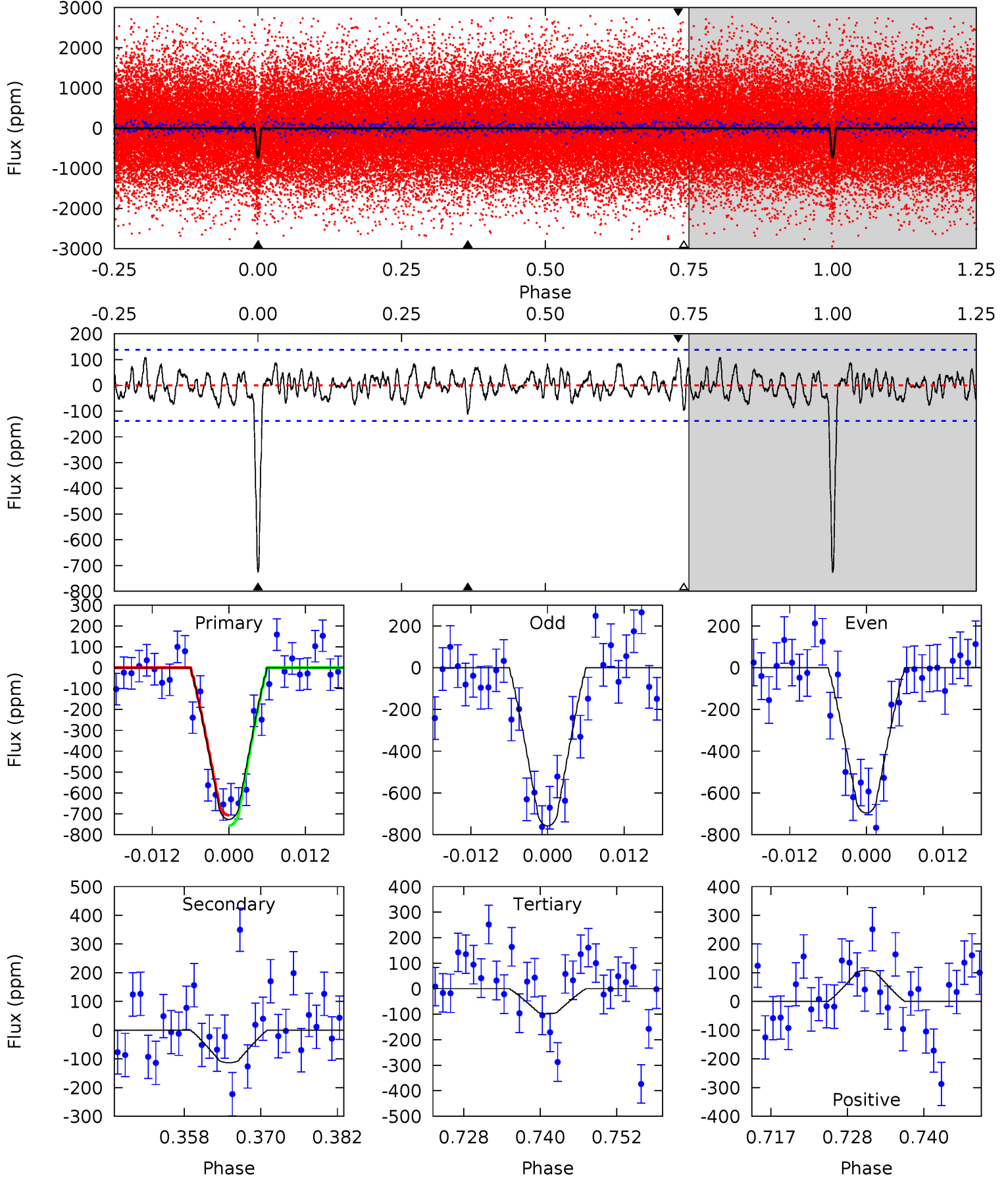
TCE 012352520-01   P= 4.577020 Days    $T_0=132.096069$  (BKJD)



# DV Model-Shift Uniqueness Test

012352520-01, P = 4.577024 Days, E = 127.519273 Days

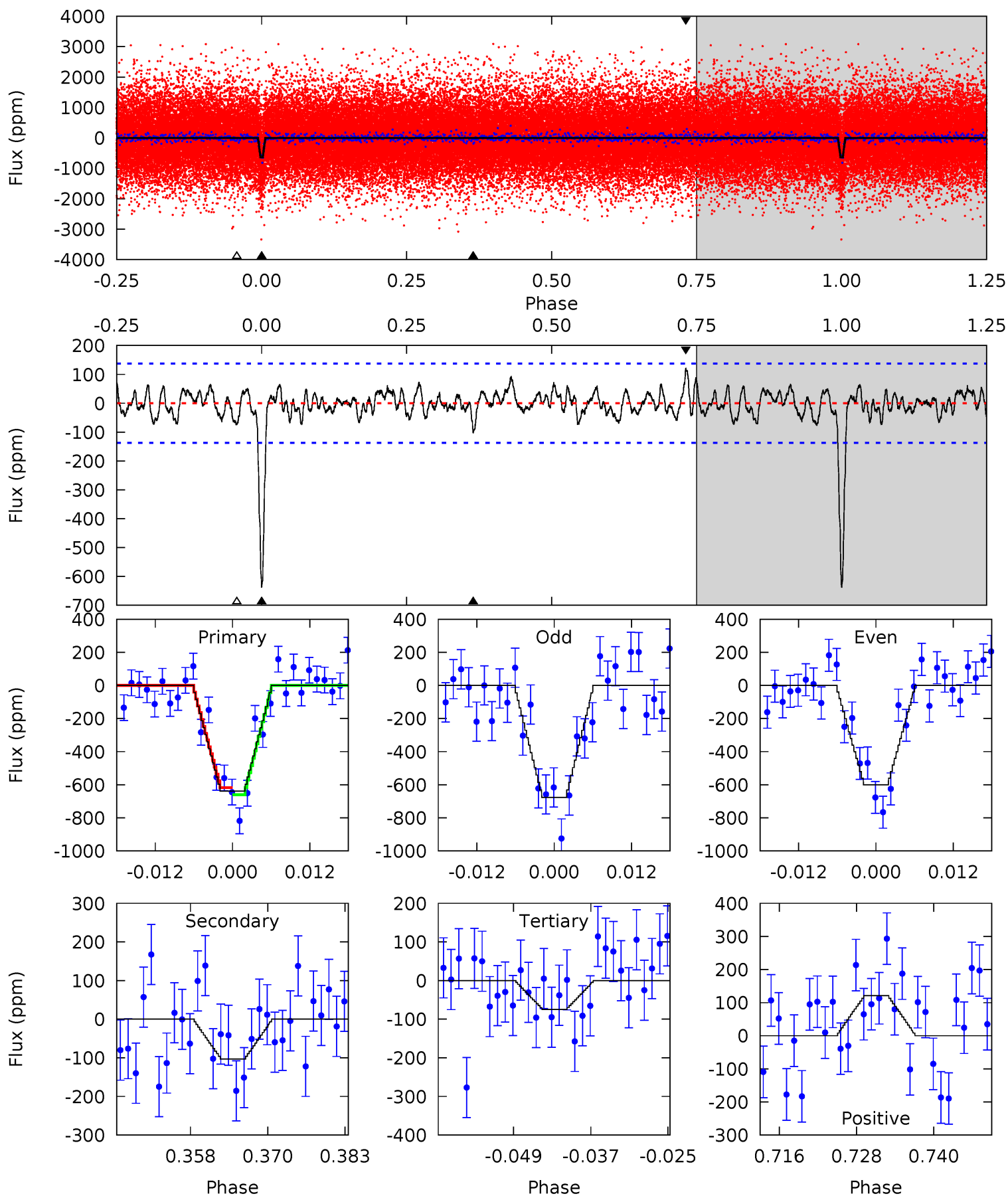
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.3	4.11	3.58	3.91	5.00	2.53	1.35	22.7	22.4	0.53	0.19	1.12	1.05	0.13	0.91



# Alt Model-Shift Uniqueness Test

012352520-01, P = 4.577020 Days, E = 127.519049 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
23.2	3.75	2.71	4.39	4.99	2.50	1.21	20.5	18.8	1.03	-0.64	1.39	0.95	0.16	0.77



### Stellar Parameters For KIC 012352520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3805^{+61}_{-76}$	$4.767^{+0.025}_{-0.035}$	$-0.100^{+0.100}_{-0.100}$	$0.497^{+0.028}_{-0.028}$	$0.526^{+0.022}_{-0.032}$	$6.048^{+0.733}_{-0.790}$
	+2%/-2%	+1%/-1%	+100%/-100%	+6%/-6%	+4%/-6%	+12%/-13%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 012352520-01 / KOI 3094.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-113 \pm 28$	$1.44^{+0.64}_{-0.77}$	$793^{+17}_{-17}$	$2891^{+715}_{-305}$	$58^{+199}_{-33}$
Alt.	$-103 \pm 28$	$1.34^{+0.66}_{-0.65}$	$792^{+18}_{-16}$	$2905^{+607}_{-319}$	$60^{+167}_{-34}$

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



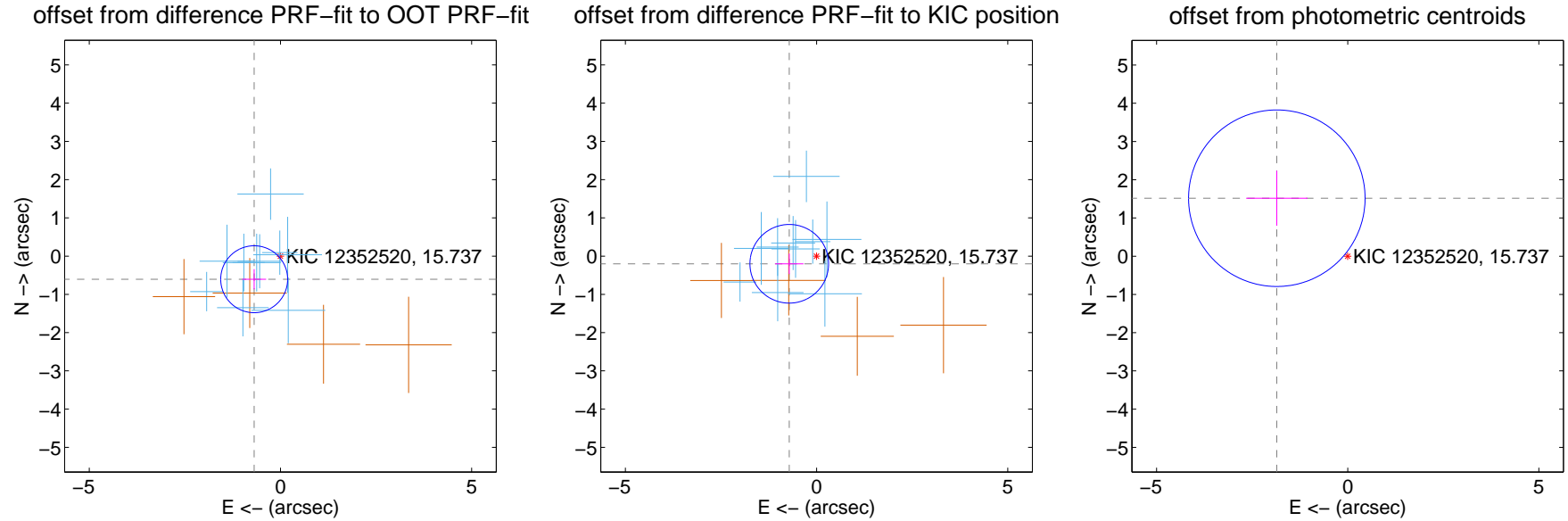
## DV Centroid Data

Supplemental centroid analysis for 012352520-01. Kepler magnitude: 15.74. Transit SNR 16.83

There are 10 quarters with good PRF difference image offsets

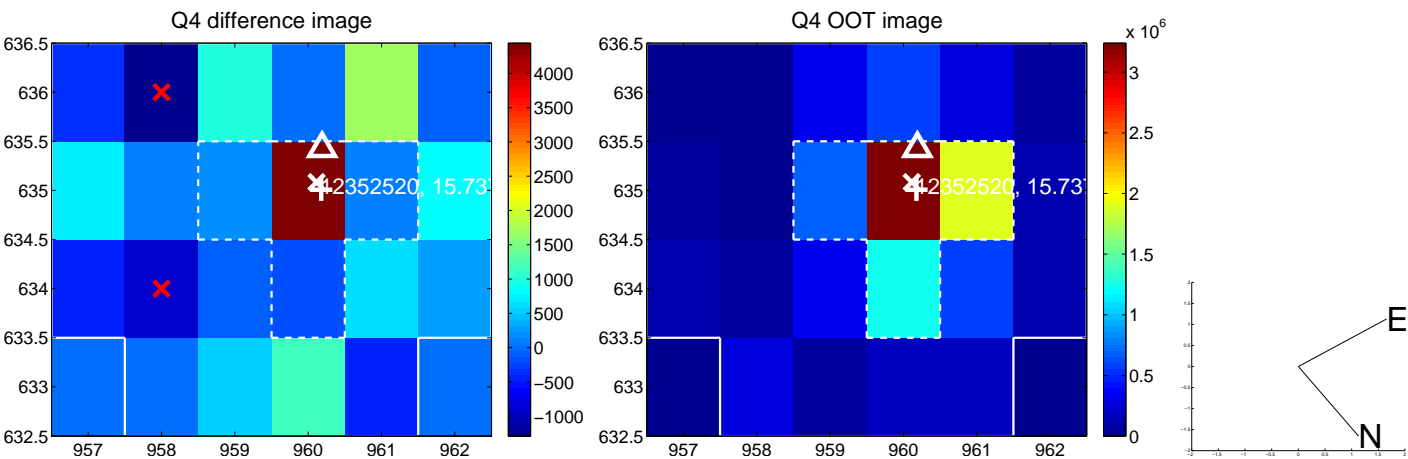
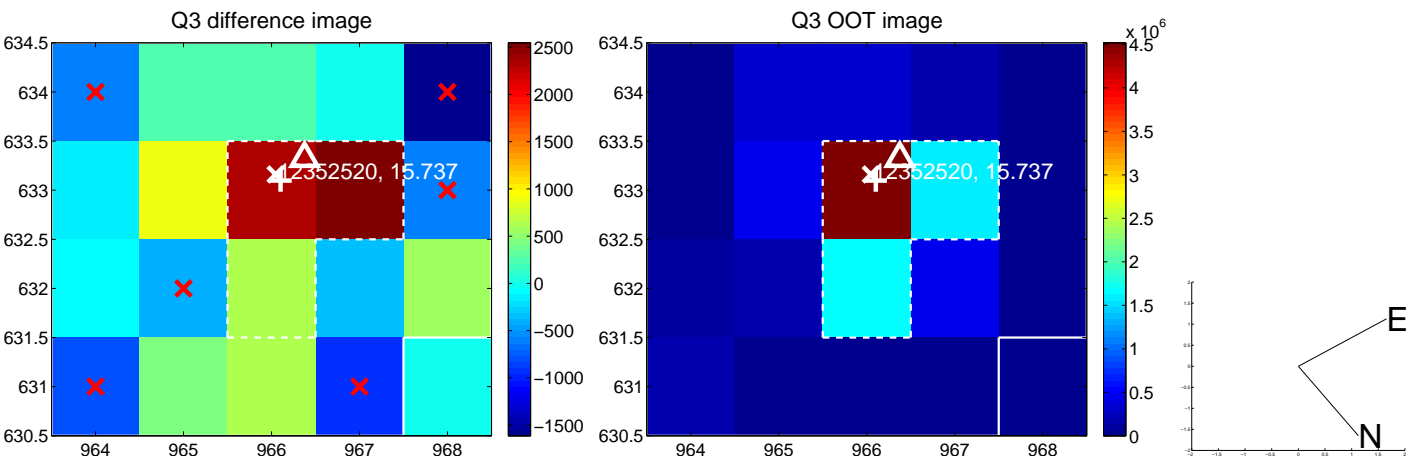
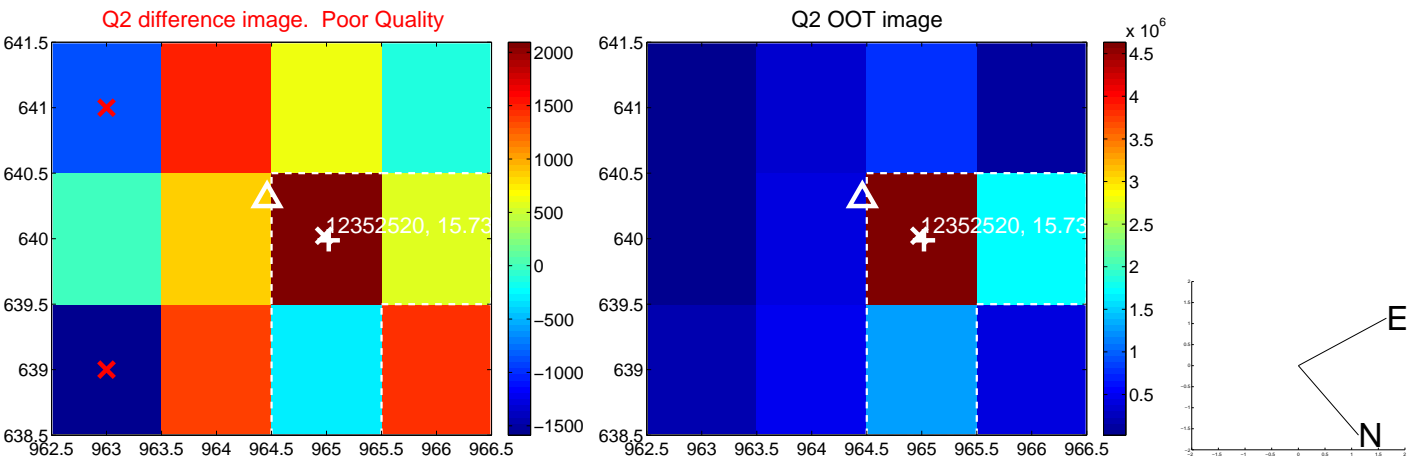
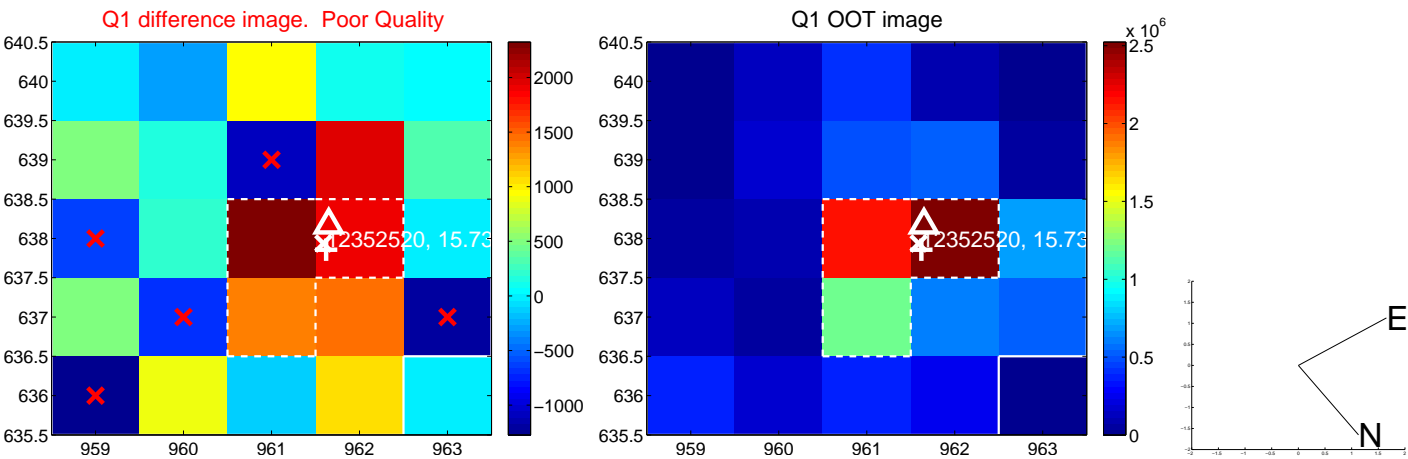
The direct PRF centroid is offset from the target star catalog position by about 0.42 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.915 \pm 0.292$	3.14	$0.688 \pm 0.312$	$-0.604 \pm 0.263$
PRF-fit source offset from KIC position	$0.742 \pm 0.343$	2.16	$0.714 \pm 0.370$	$-0.200 \pm 0.270$
photometric centroid source offset	$2.40 \pm 0.77$	3.11	$1.85 \pm 0.80$	$1.52 \pm 0.72$

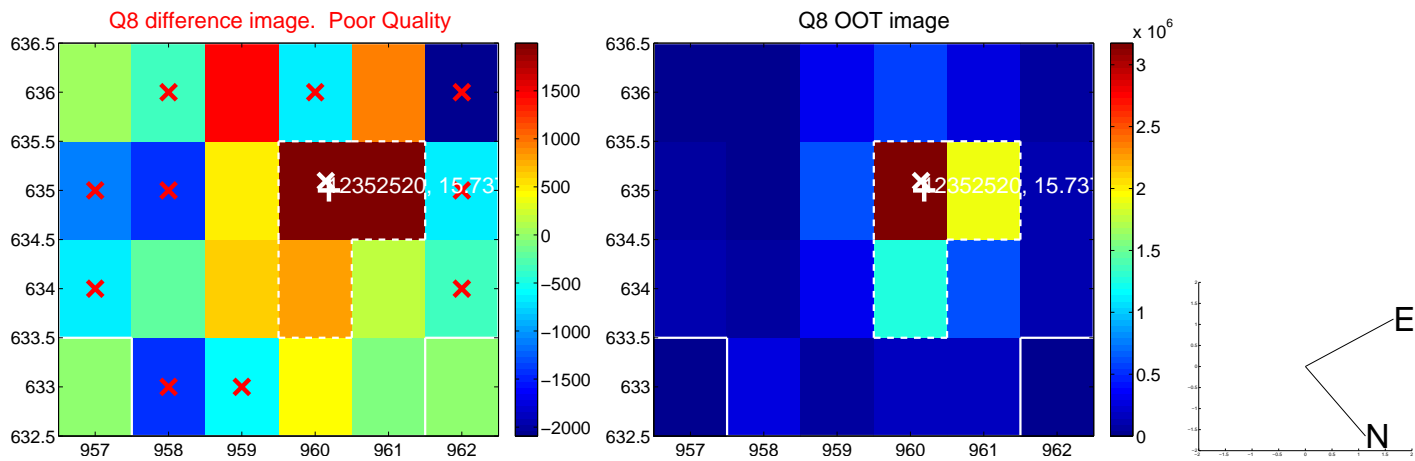
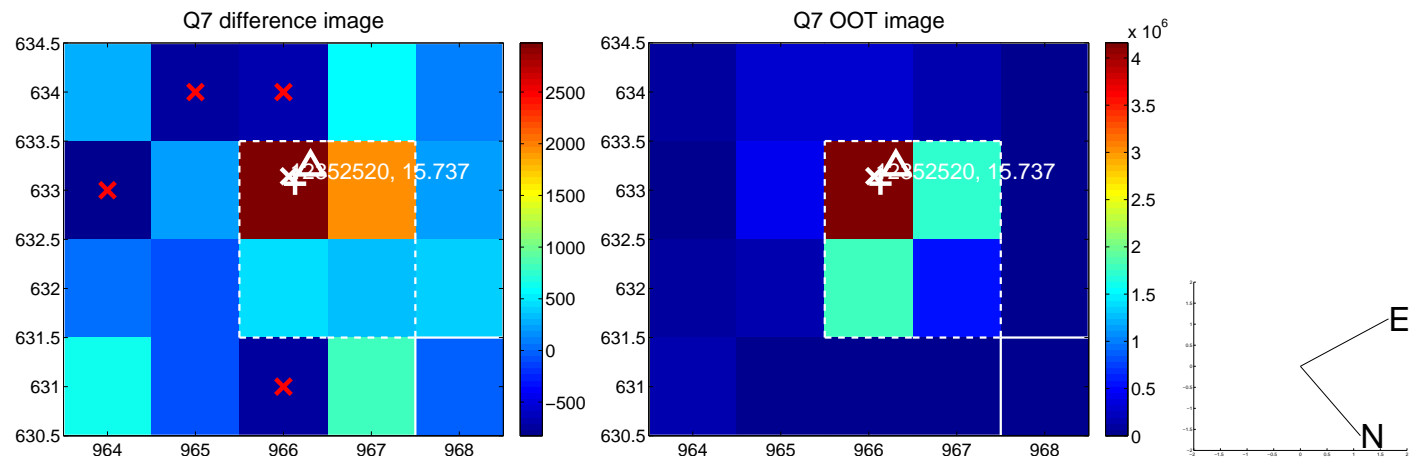
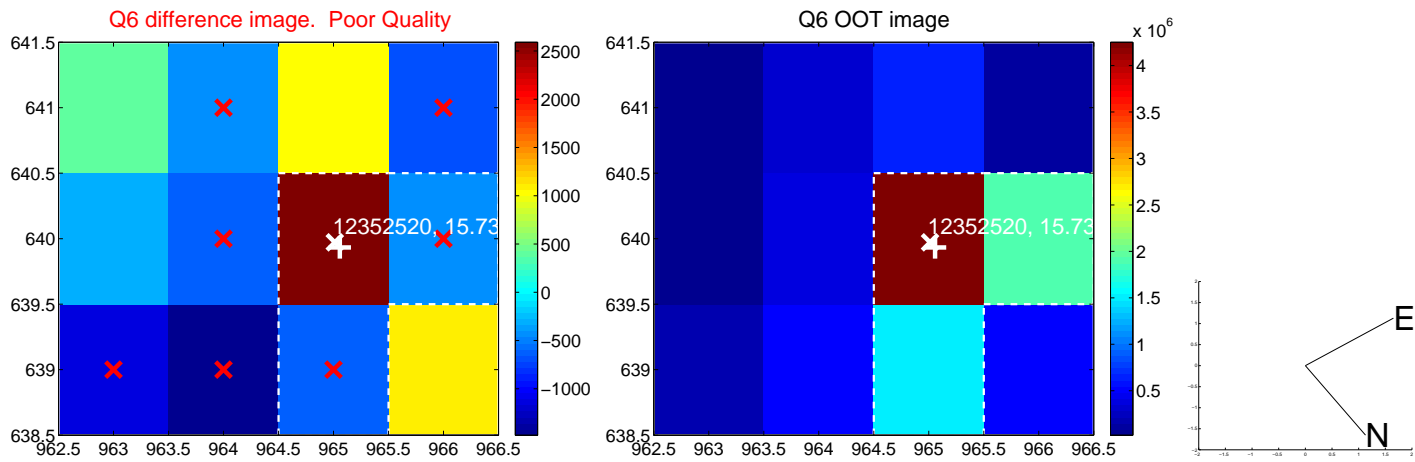
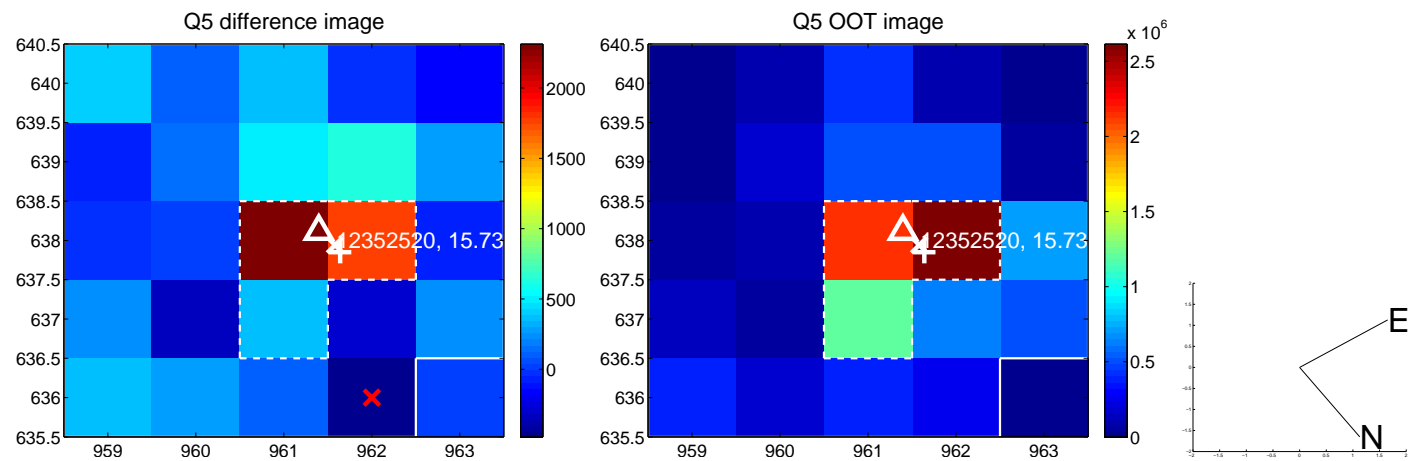


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

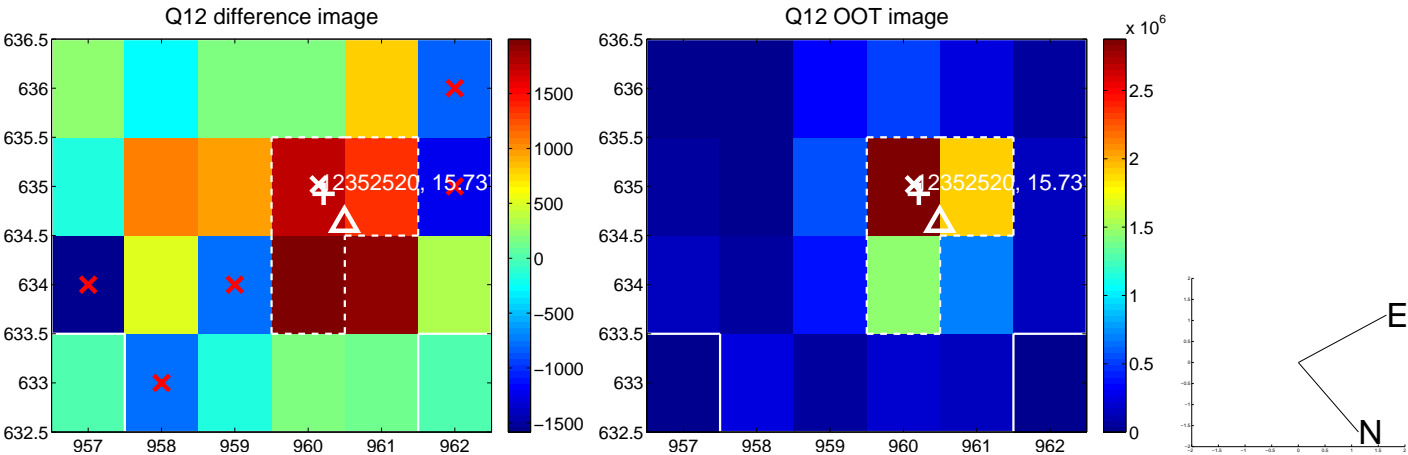
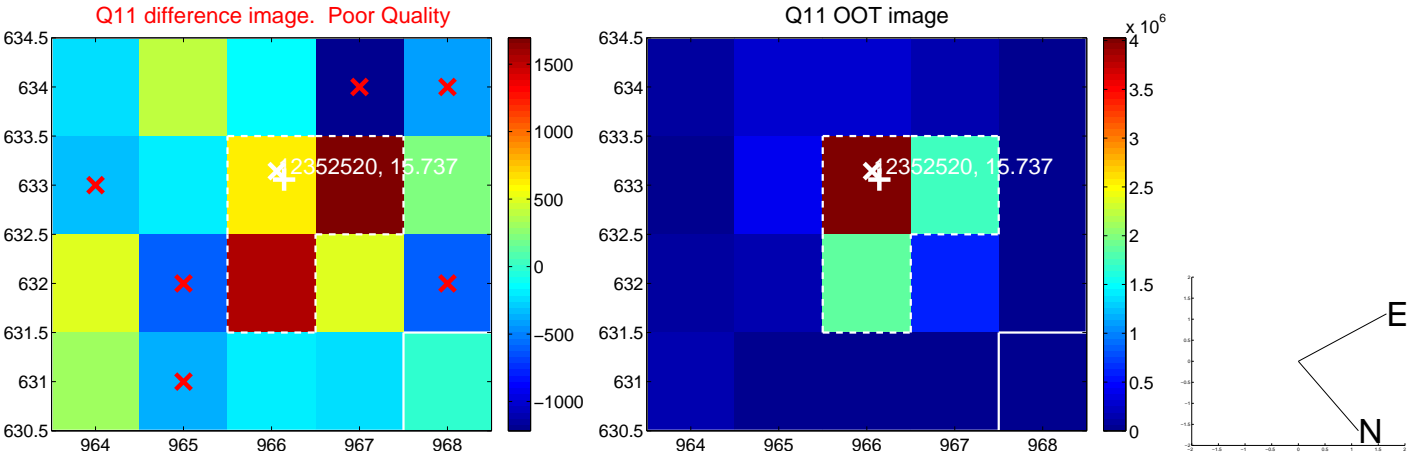
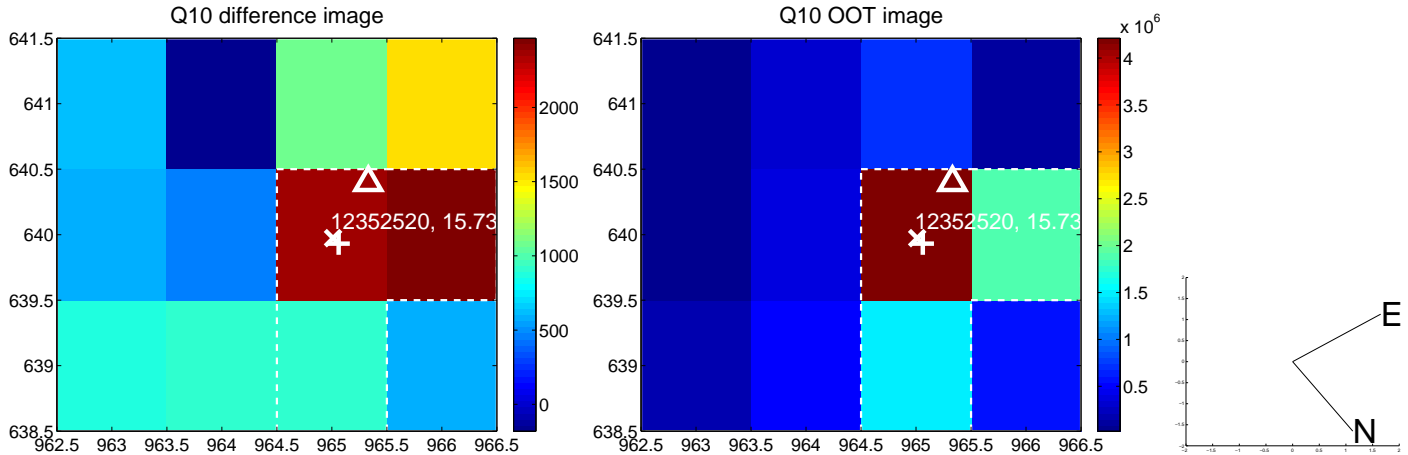
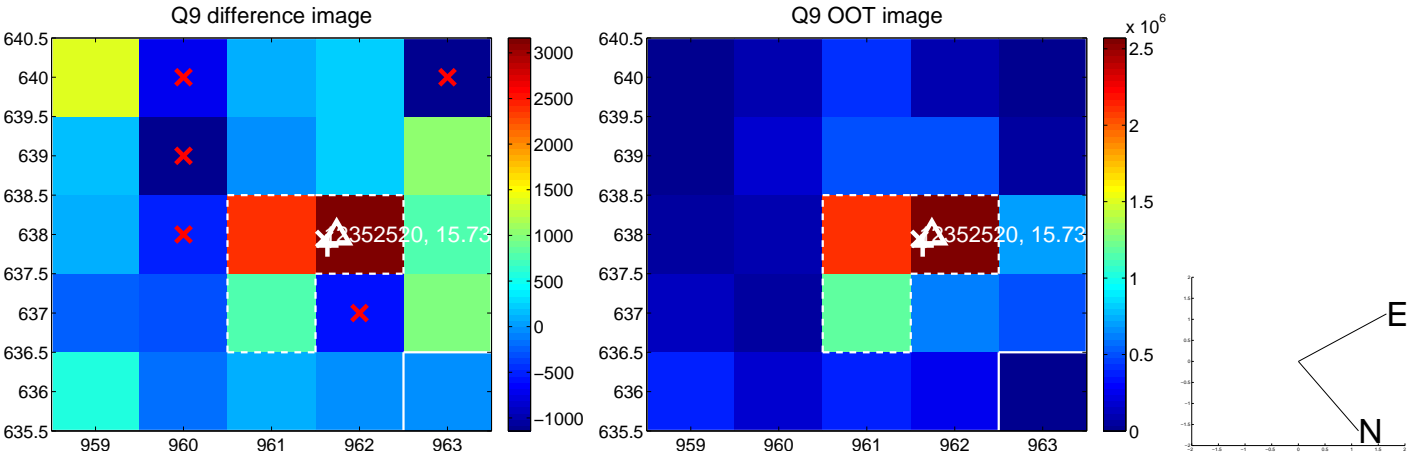
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



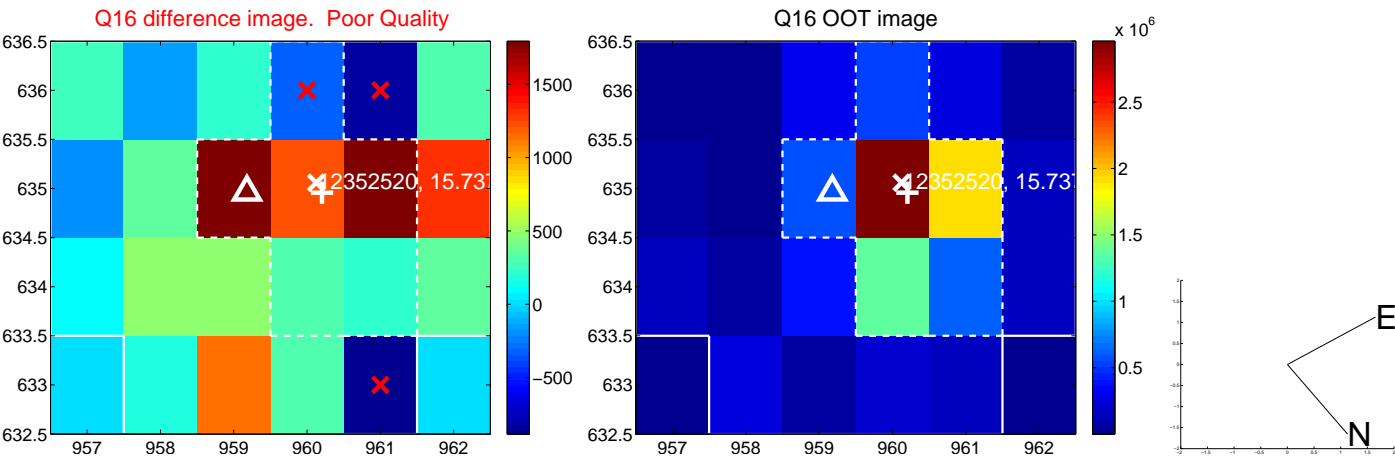
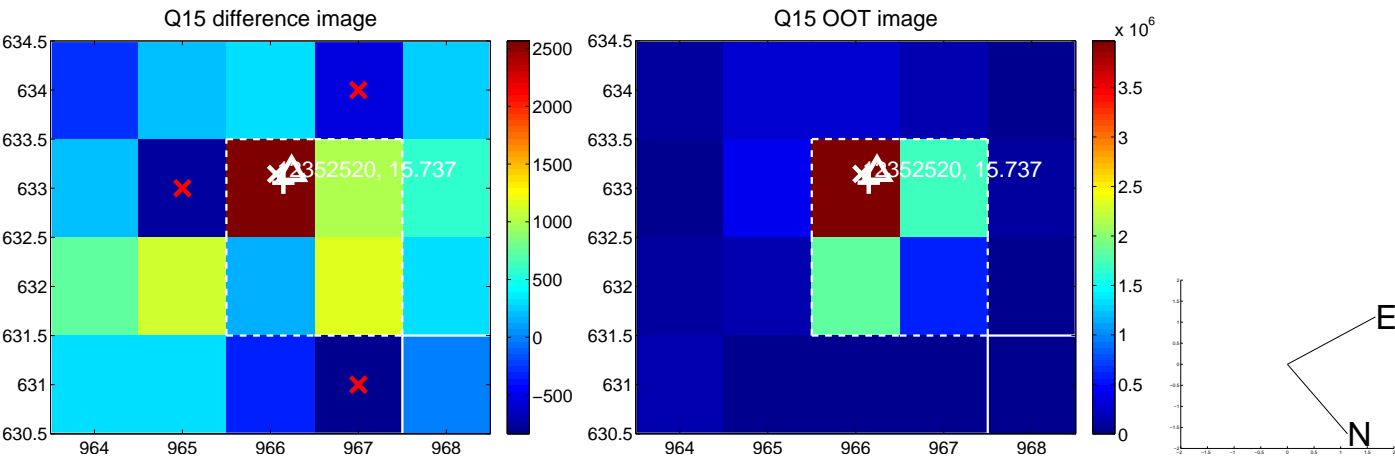
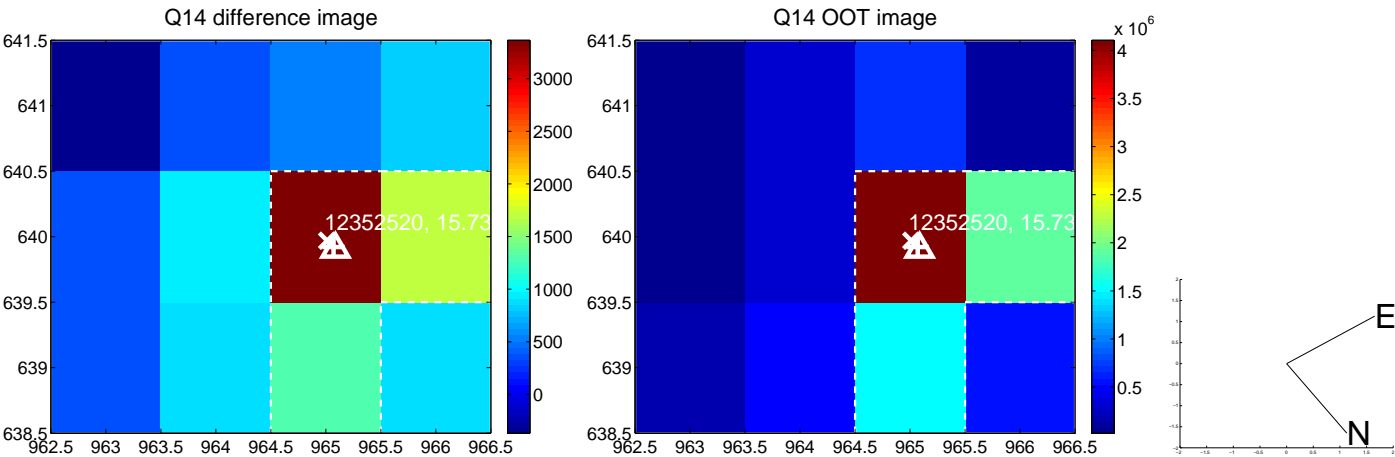
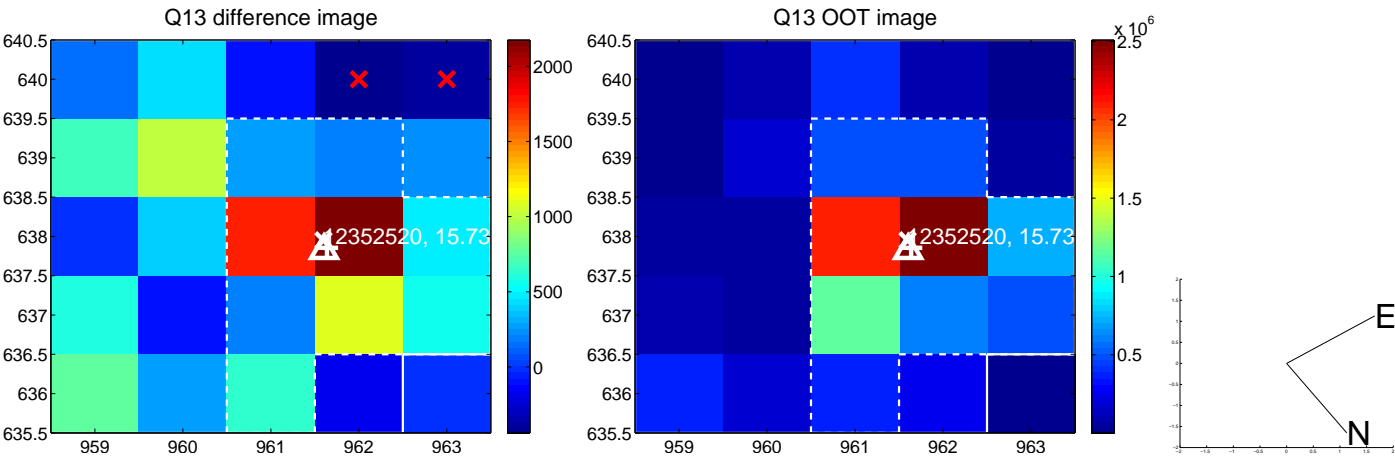
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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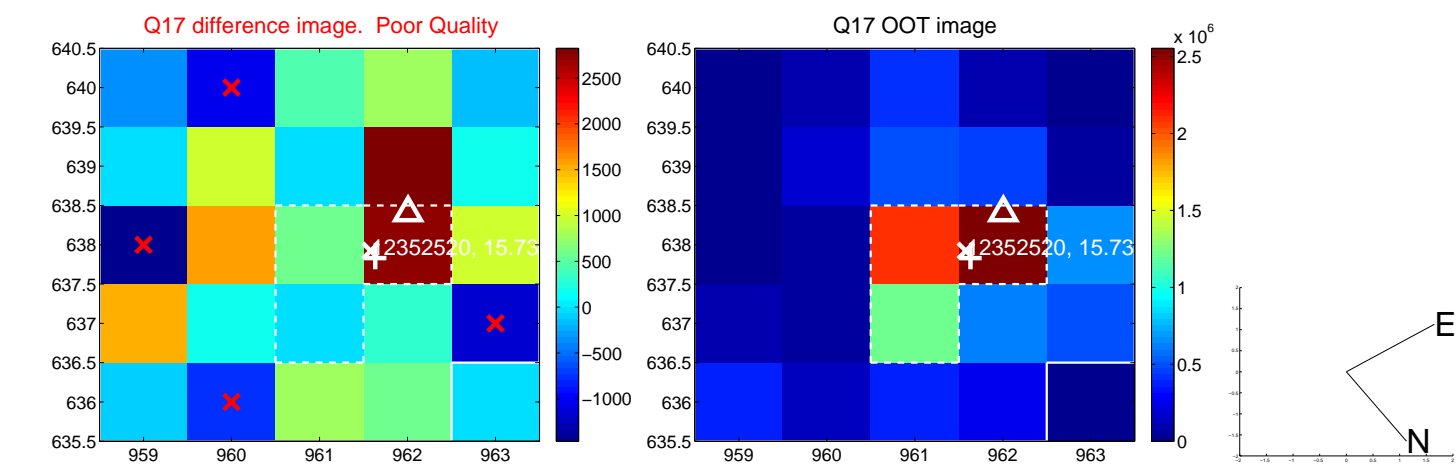


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

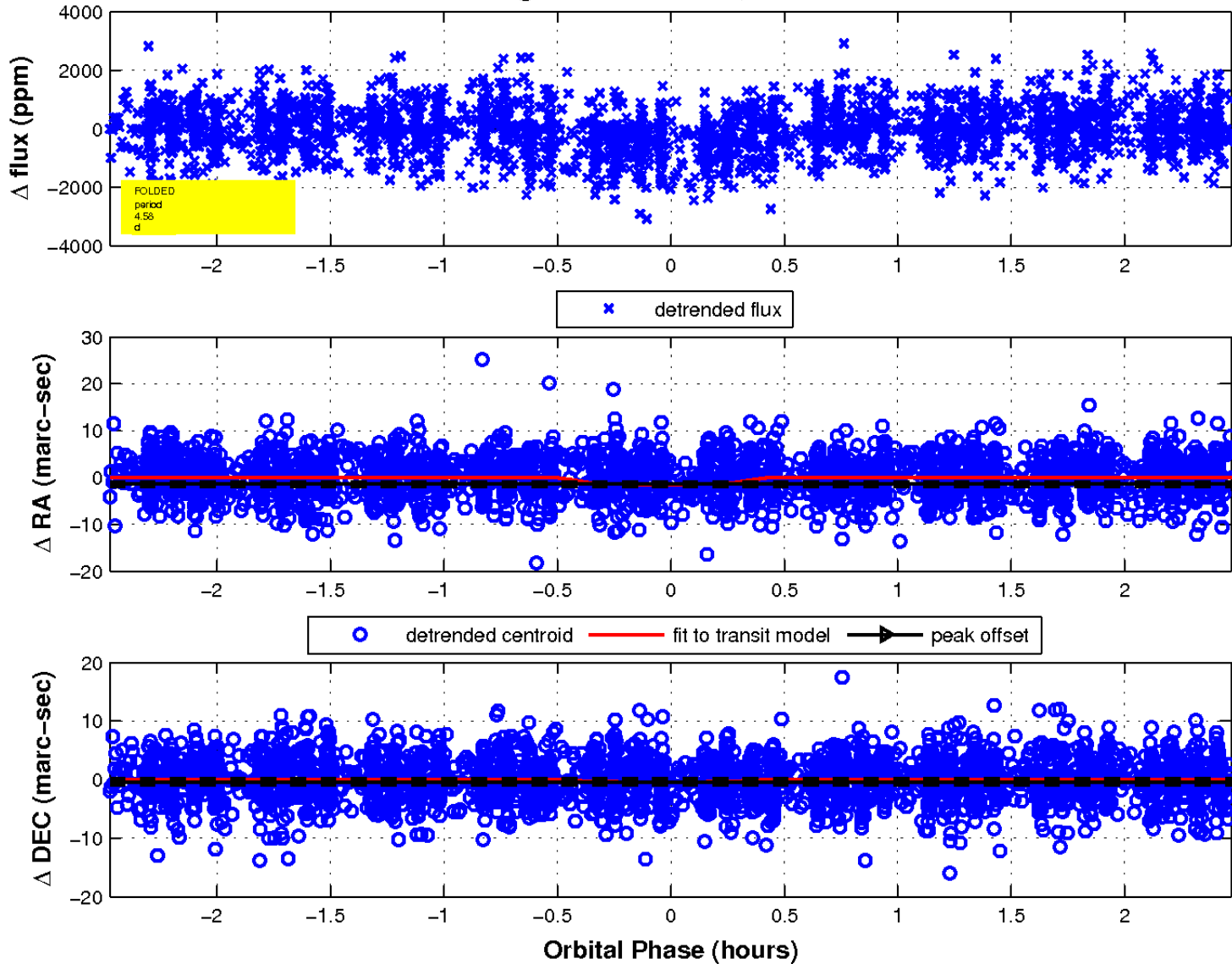




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

