

# KIC 012351586

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012351586-01	OBS	No	563.375051	142.651544	997.4	16.692	7.9	10.2	0.98	5984	3.14	0.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012351586-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

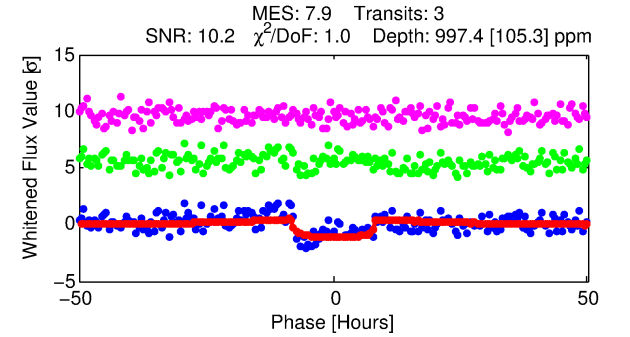
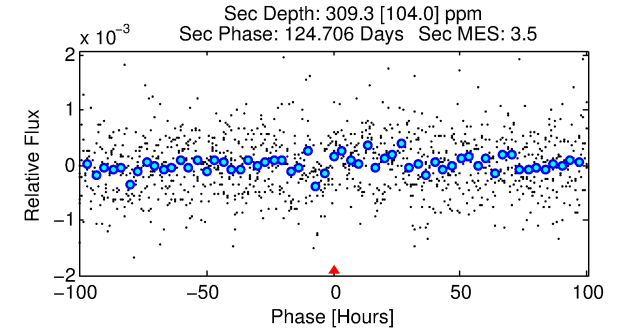
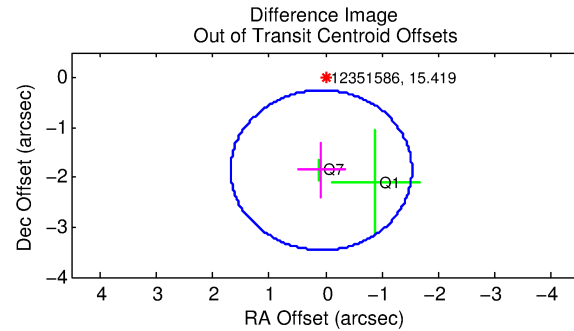
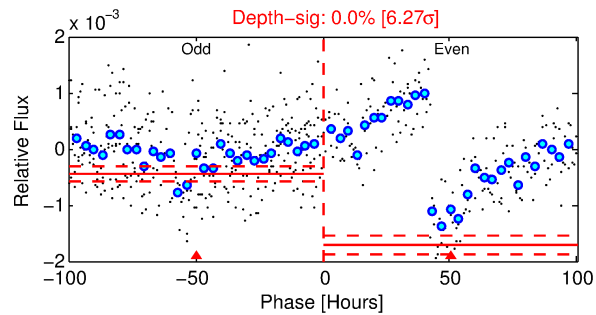
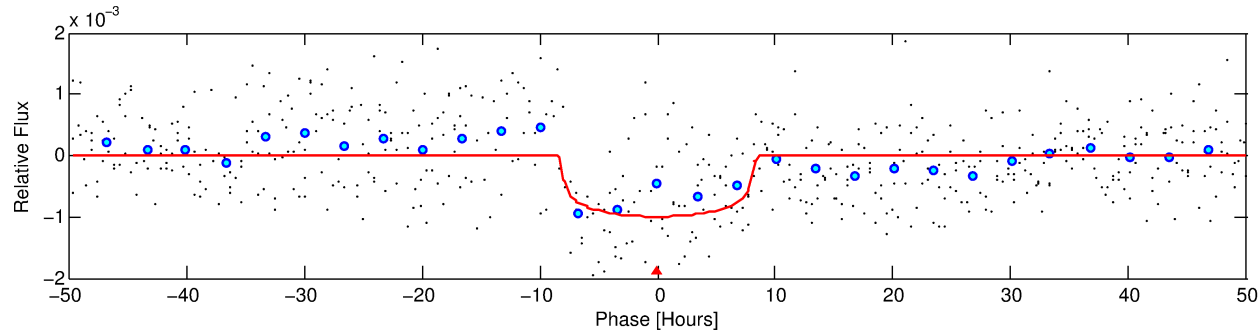
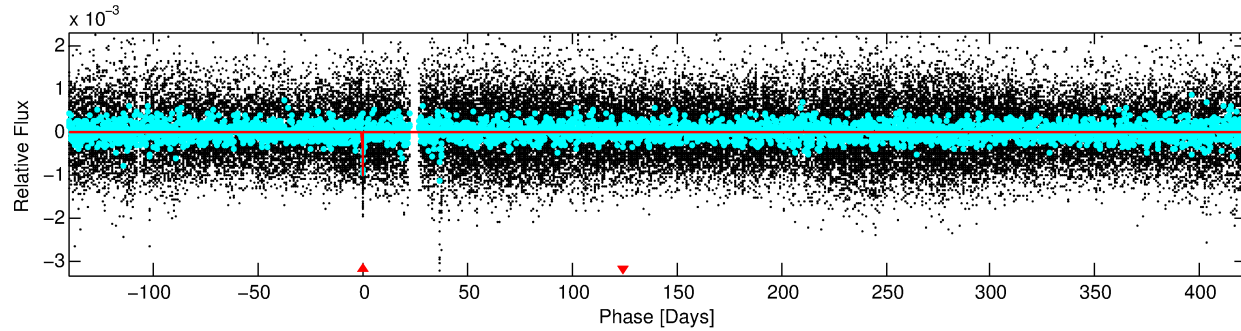
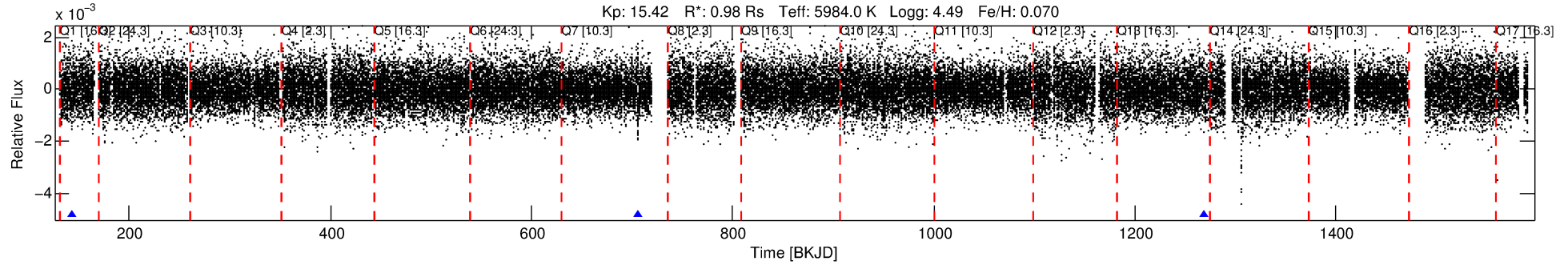
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012351586-01

No Significant Match Found

# DV One-Page Summary

KIC: 12351586 Candidate: 1 of 1 Period: 563.375 d



## DV Fit Results:

Period = 563.37505 [0.01722] d  
Epoch = 142.6515 [0.0184] BKJD  
Rp/R\* = 0.0292 [0.0124]  
a/R\* = 247.52 [474.43]  
b = 0.37 [4.48]  
Seff = 0.59 [0.25]  
Teq = 223 [24] K  
Rp = 3.14 [1.66] Re  
a = 1.3748 [0.3693] AU  
Ag = 32712.87 [32466.71] [1.01 $\sigma$ ]  
Teffp = 4644 [1075] K [4.11 $\sigma$ ]

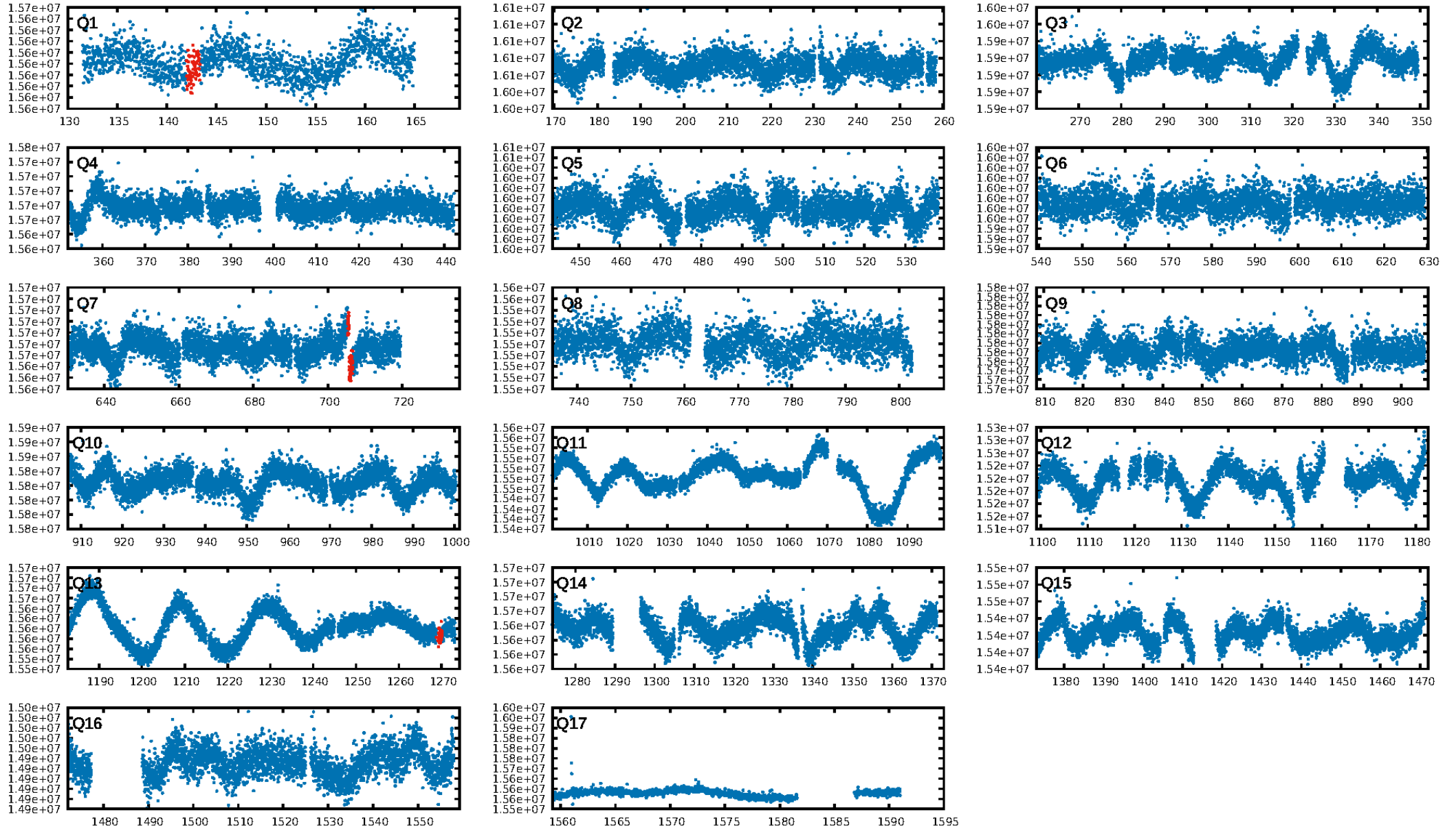
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.5%  
Bootstrap-pfa: 1.78e-16  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 8.629  
Centroid-sig: 0.0%  
Centroid-so: 3.247 arcsec [3.08 $\sigma$ ]  
OotOffset-rm: 1.862 arcsec [3.49 $\sigma$ ]  
KicOffset-rm: 1.724 arcsec [3.23 $\sigma$ ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

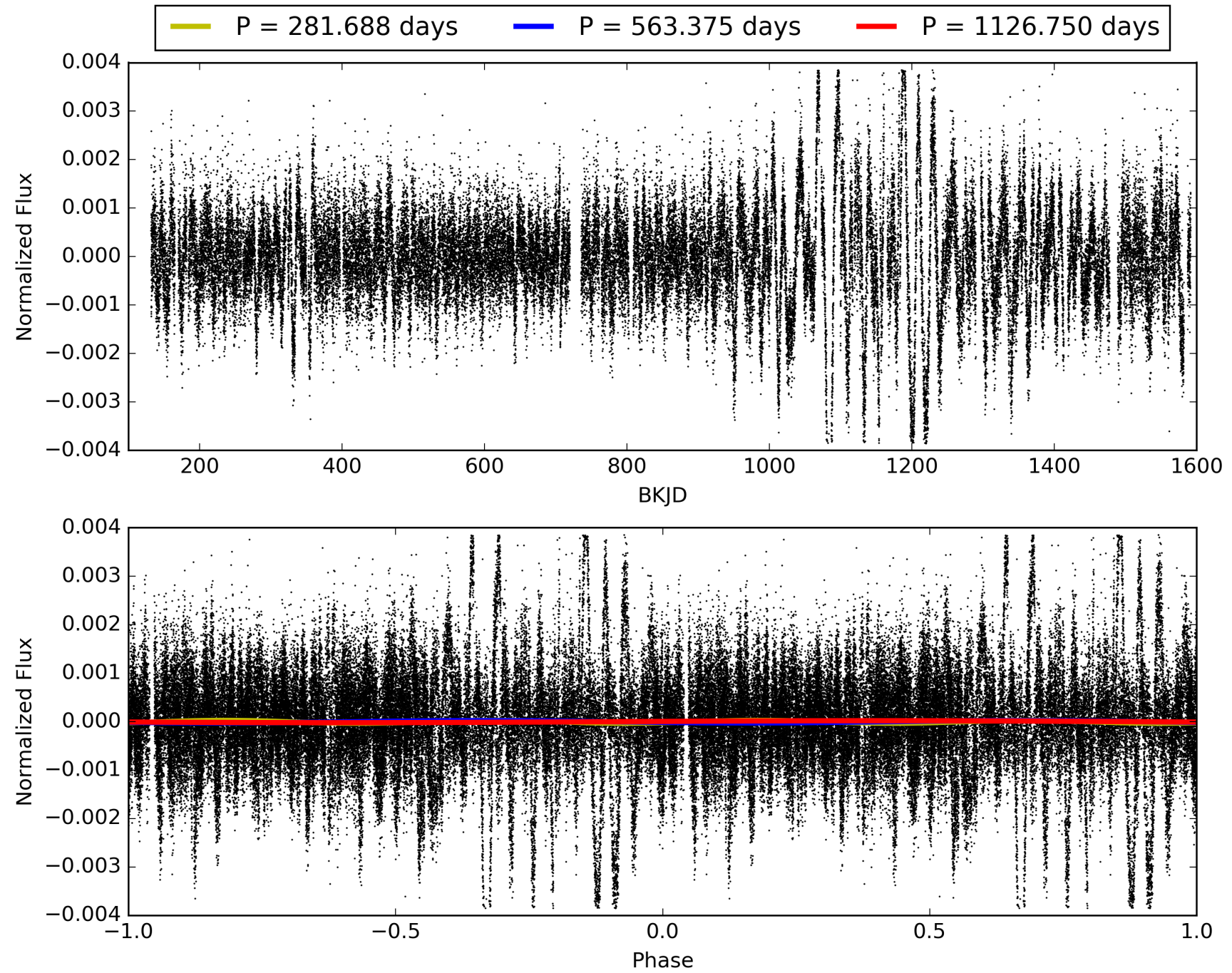
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:55:09 Z

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

# TCE 012351586-01, PDC Light Curves

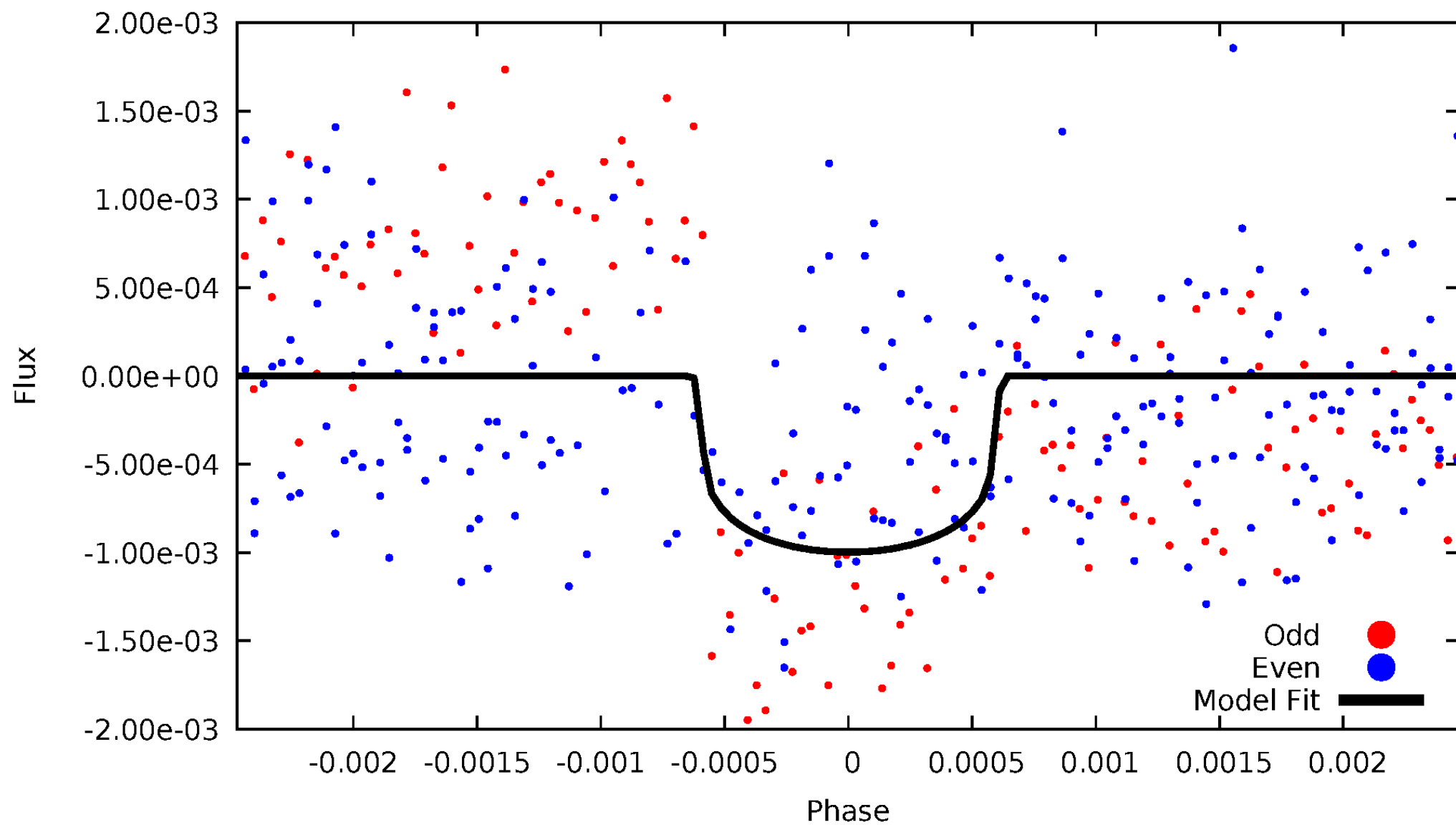


TCE 012351586-01



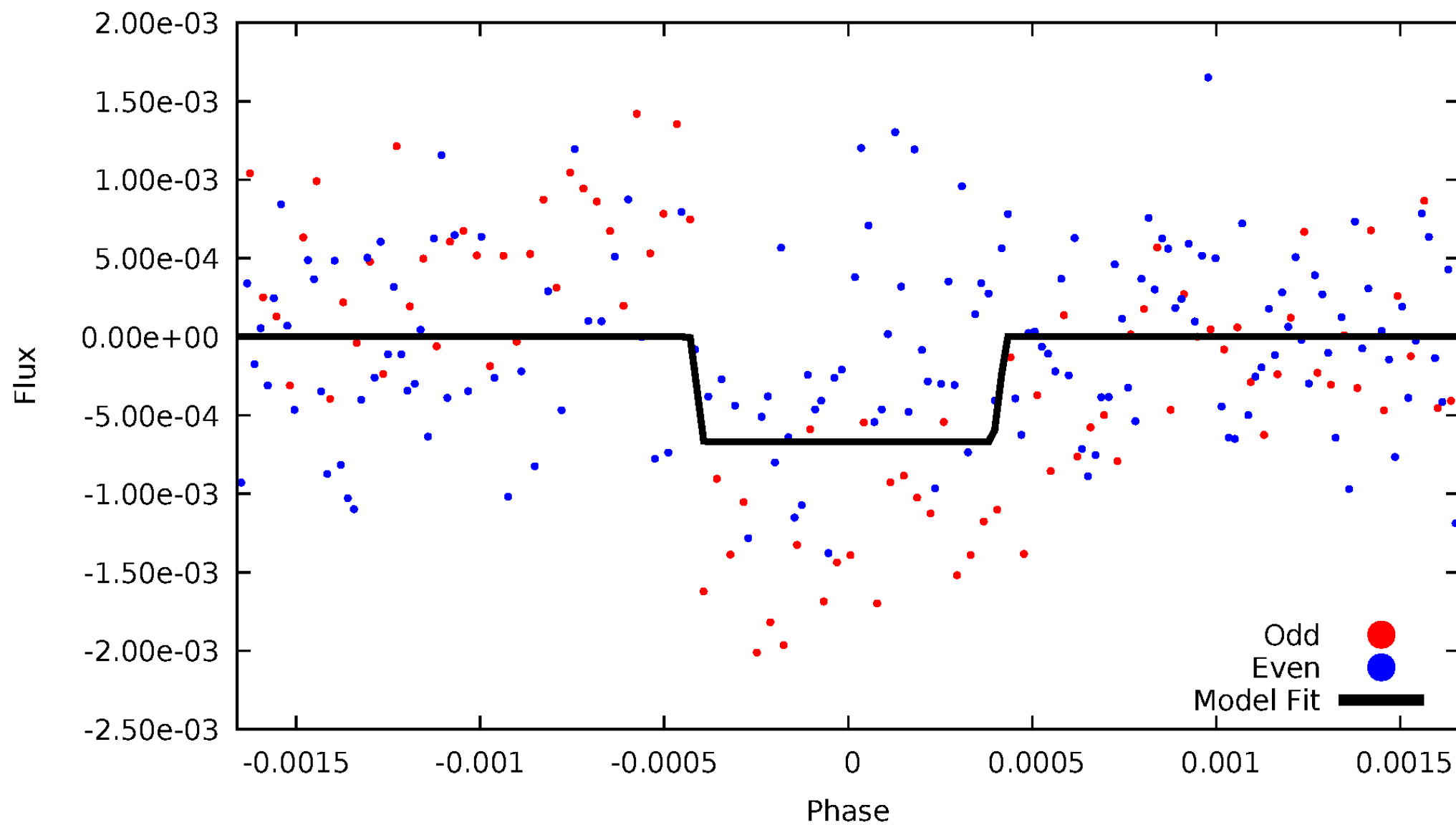
# DV Odd/Even

TCE 012351586-01



# ALT Odd/Even

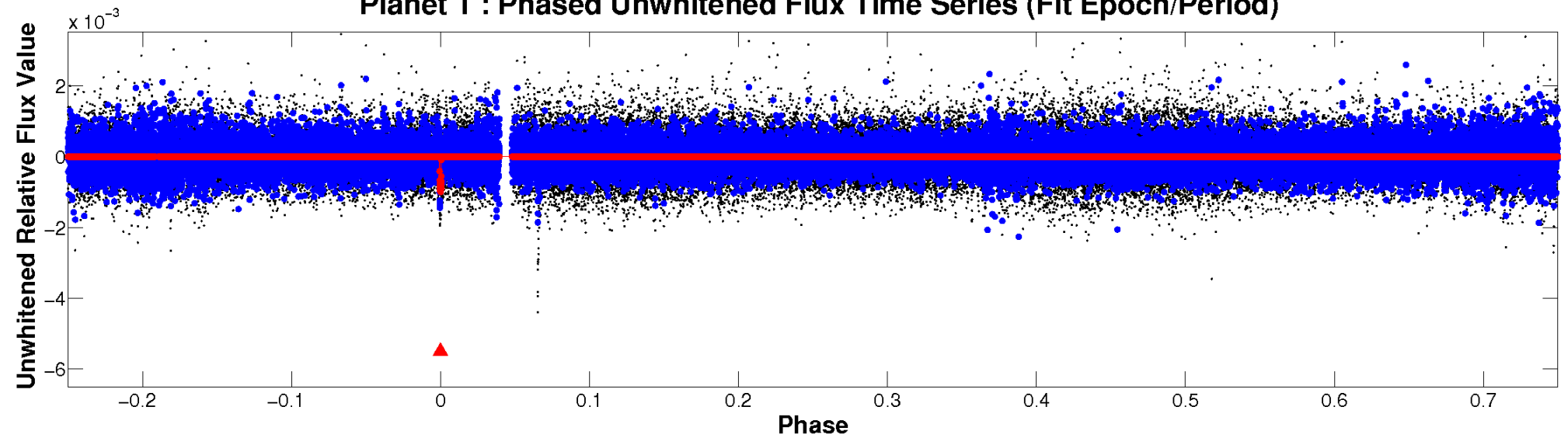
TCE 012351586-01



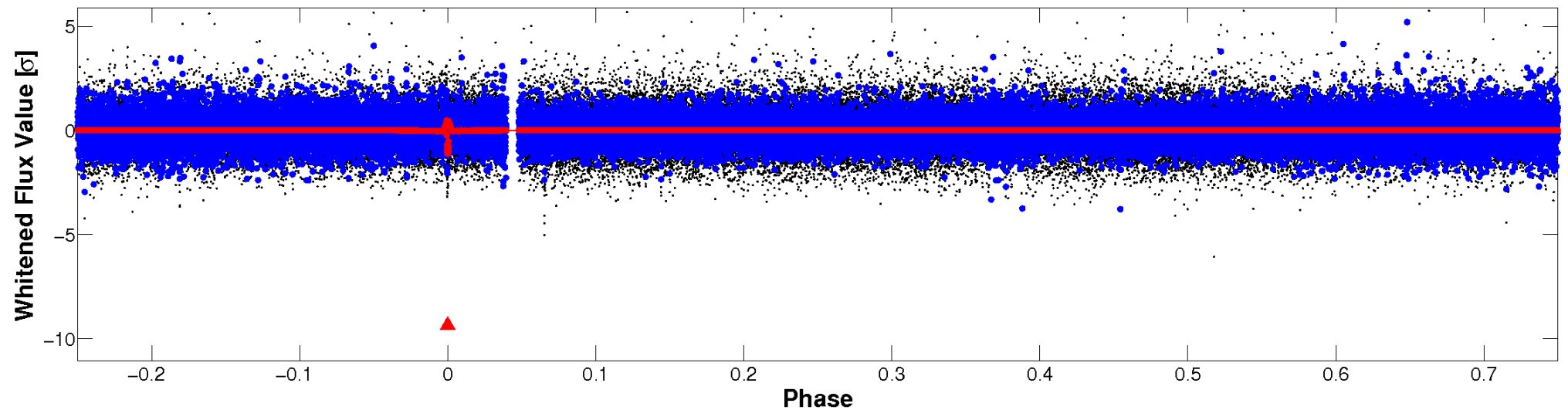


# Non-Whitened Vs. Whitened Light Curve

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

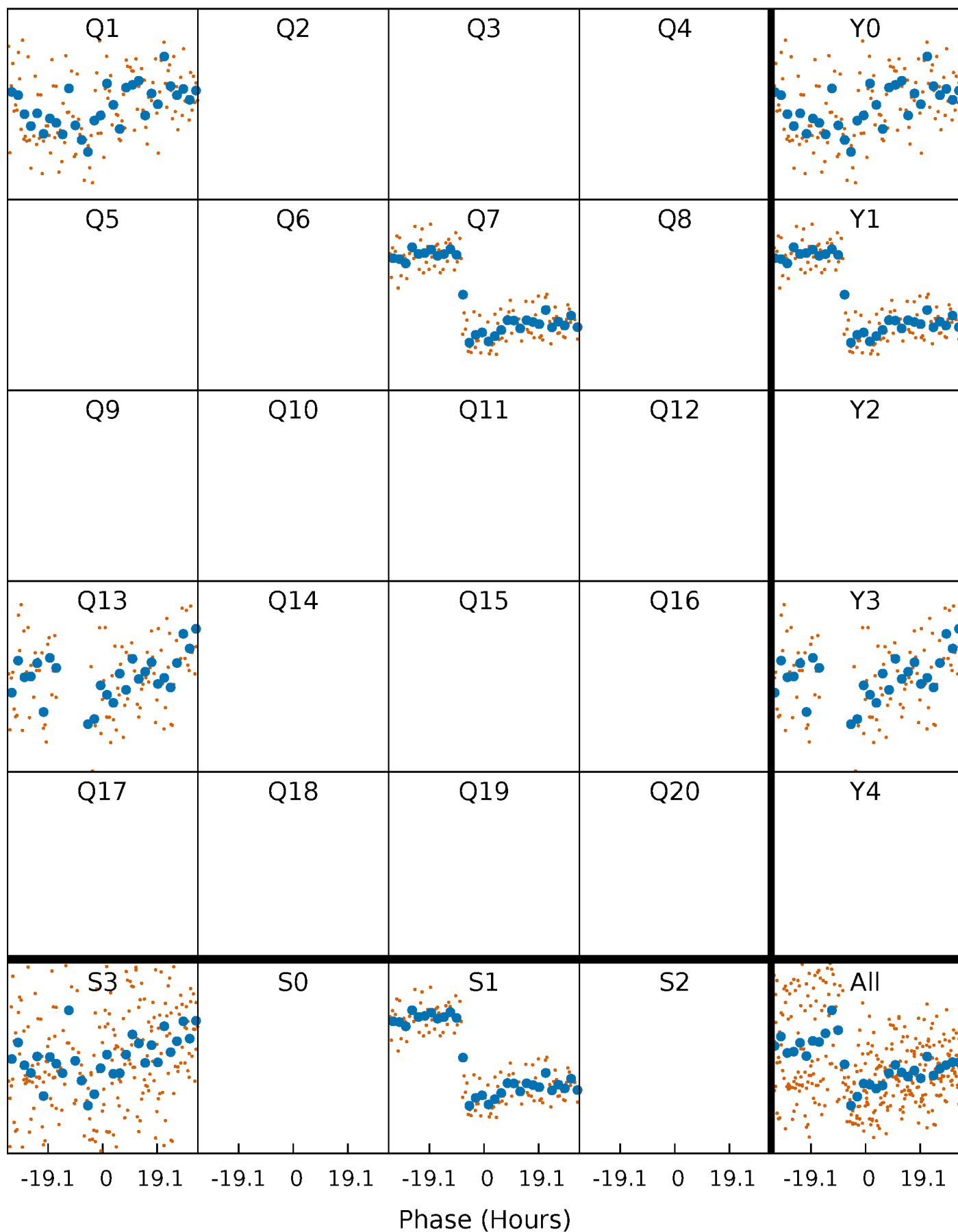


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

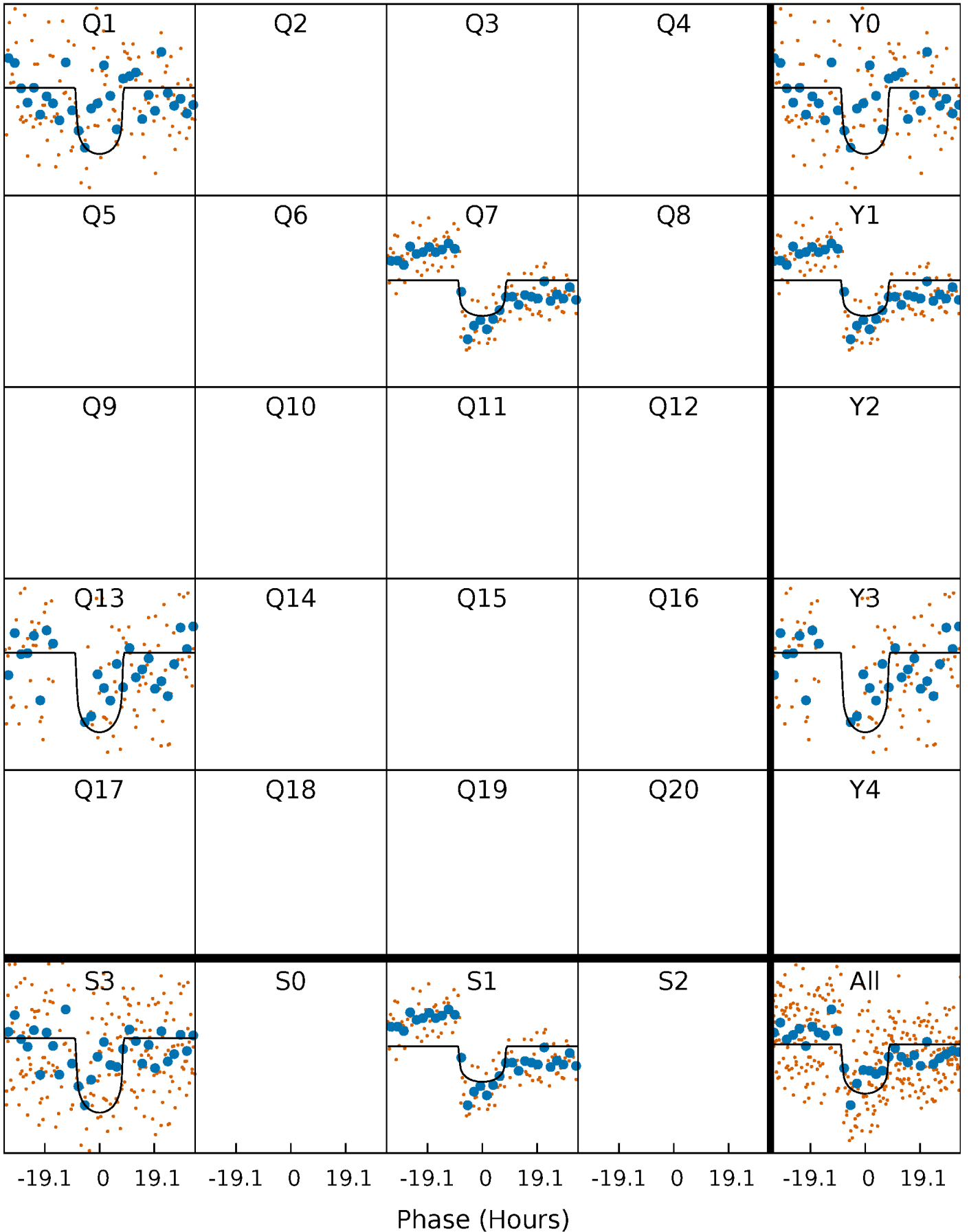
TCE 012351586-01 P=563.375051 Days  $T_0=142.651544$  (BKJD)





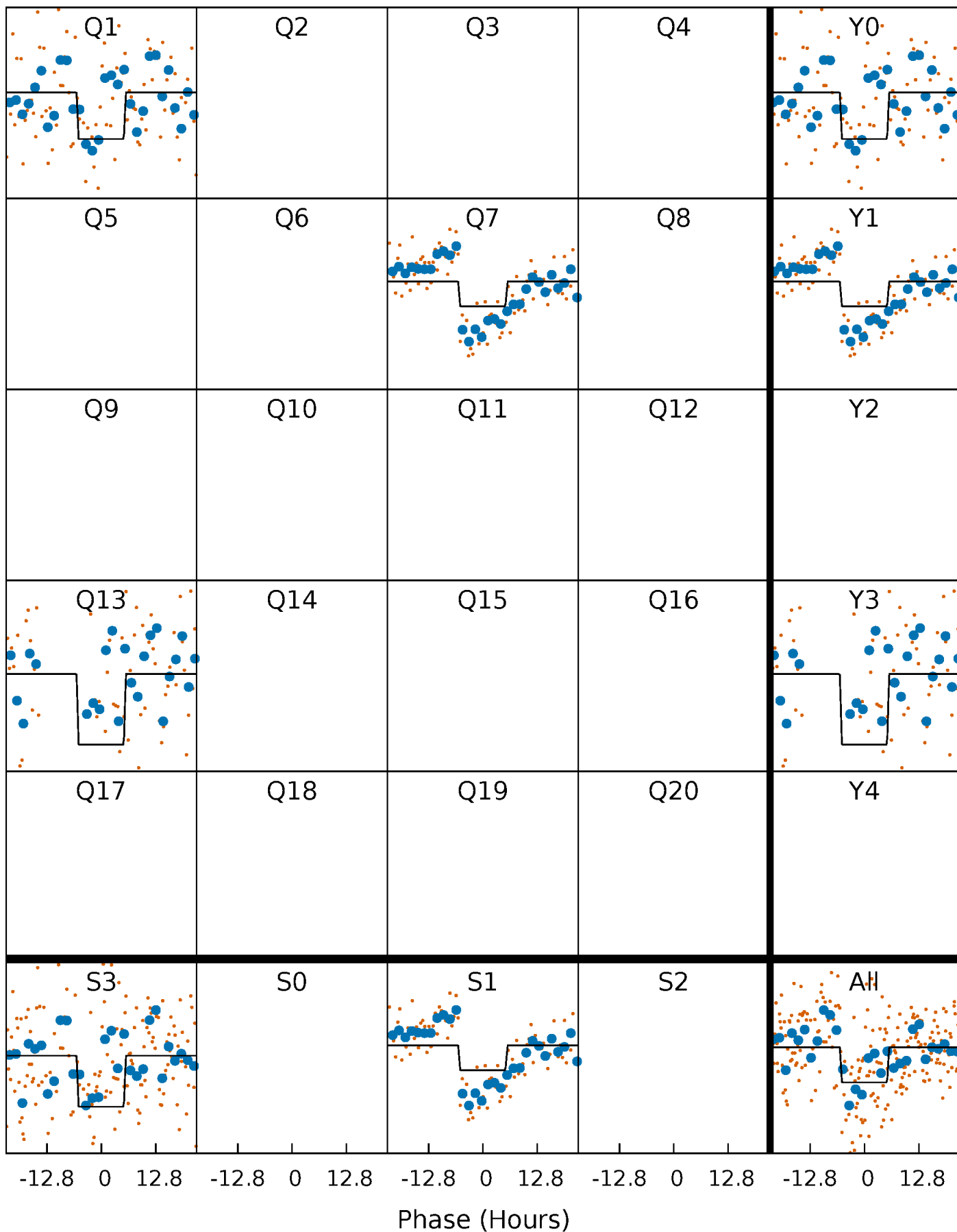
# DV Quarter-Phased Transit Curves

TCE 012351586-01 P=563.375051 Days  $T_0=142.651544$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

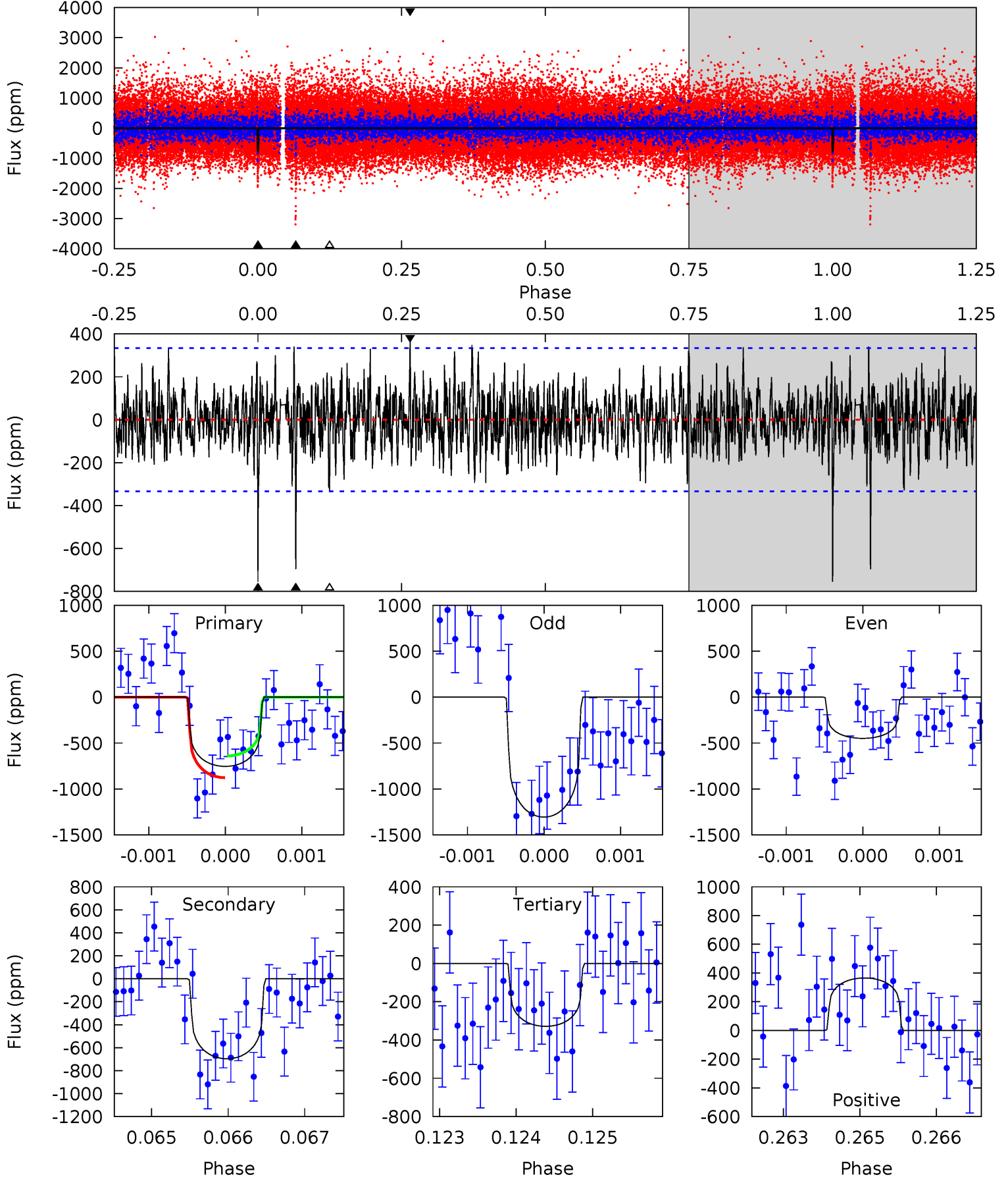
TCE 012351586-01 P=563.400927 Days  $T_0=142.536235$  (BKJD)



# DV Model-Shift Uniqueness Test

012351586-01, P = 563.375051 Days, E = 142.651544 Days

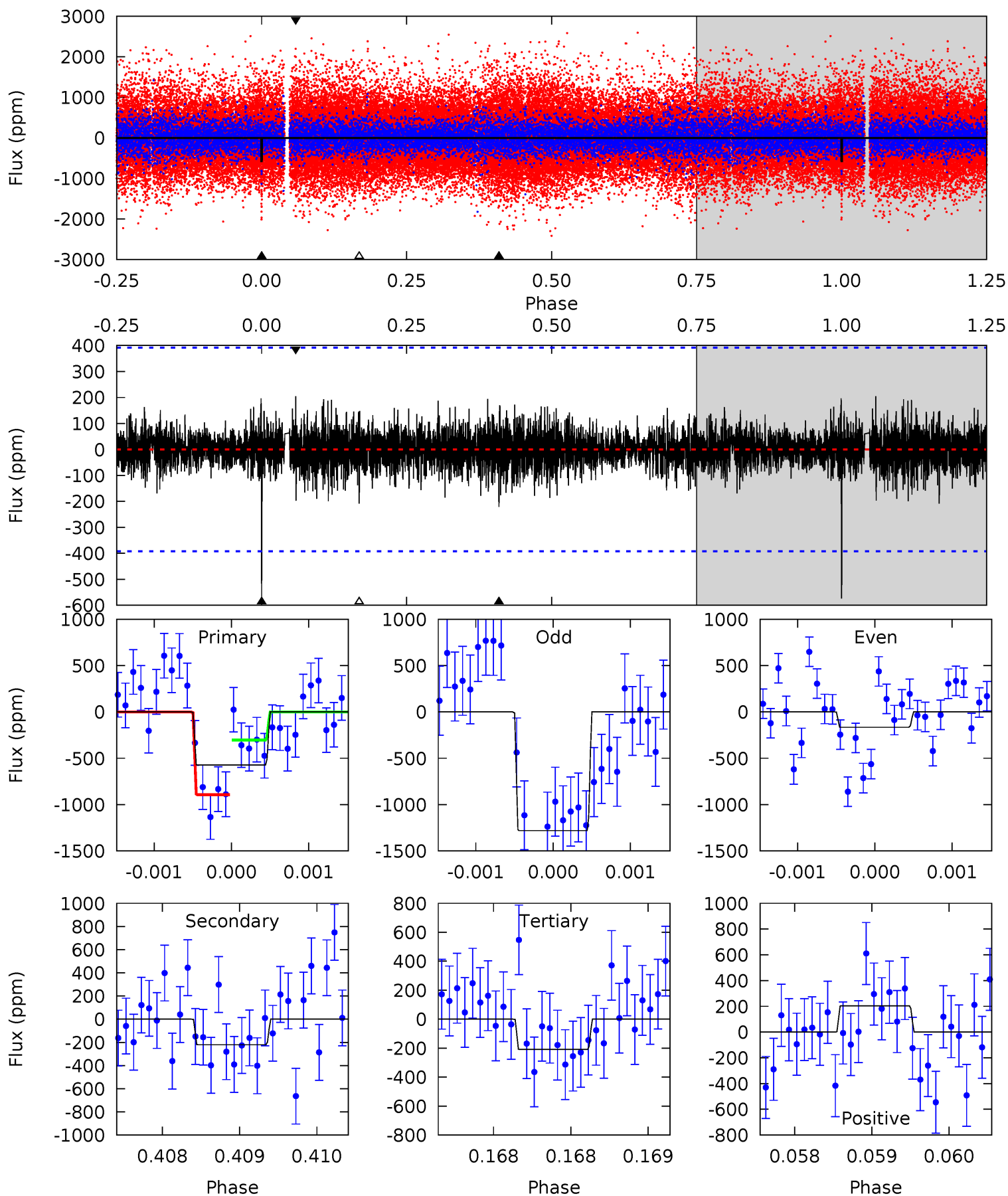
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	11.3	5.32	5.92	5.41	3.22	1.67	6.90	6.30	5.96	5.36	6.68	1.32	0.33	1.91



# Alt Model-Shift Uniqueness Test

012351586-01, P = 563.400927 Days, E = 142.536235 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
8.01	3.08	2.92	2.86	5.48	3.33	0.72	5.09	5.16	0.16	0.23	7.48	2.29	0.26	4.13



### Stellar Parameters For KIC 012351586

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5984^{+184}_{-246}$	$4.490^{+0.040}_{-0.216}$	$0.070^{+0.250}_{-0.300}$	$0.984^{+0.312}_{-0.104}$	$1.090^{+0.138}_{-0.152}$	$1.613^{+0.365}_{-0.903}$
	+3%/-4%	+1%/-5%	+357%/-429%	+32%/-11%	+13%/-14%	+23%/-56%
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 012351586-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-696 \pm 62$	$3.31^{+1.57}_{-1.35}$	$321^{+25}_{-17}$	$5690^{+1644}_{-868}$	$63000^{+117786}_{-32979}$
Alt.	$-221 \pm 72$	$2.97^{+1.43}_{-1.41}$	$320^{+23}_{-17}$	$4621^{+1481}_{-711}$	$25026^{+61378}_{-15455}$

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

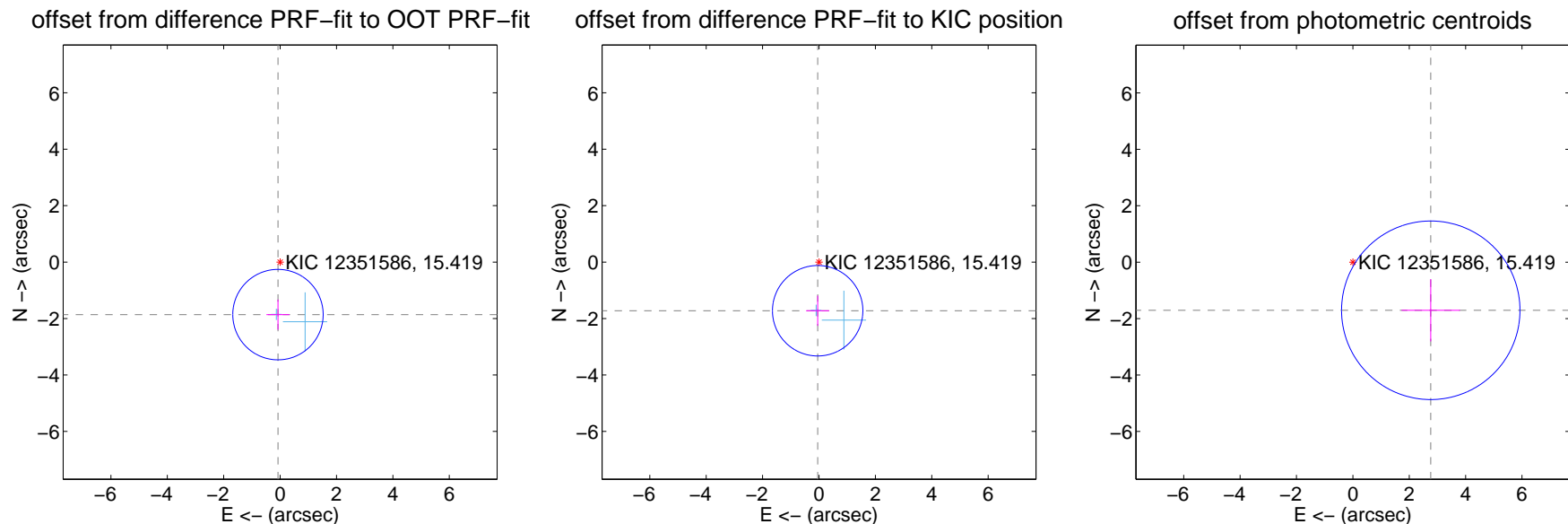
## DV Centroid Data

Supplemental centroid analysis for 012351586-01. Kepler magnitude: 15.42. Transit SNR 10.16

There are 2 quarters with good PRF difference image offsets

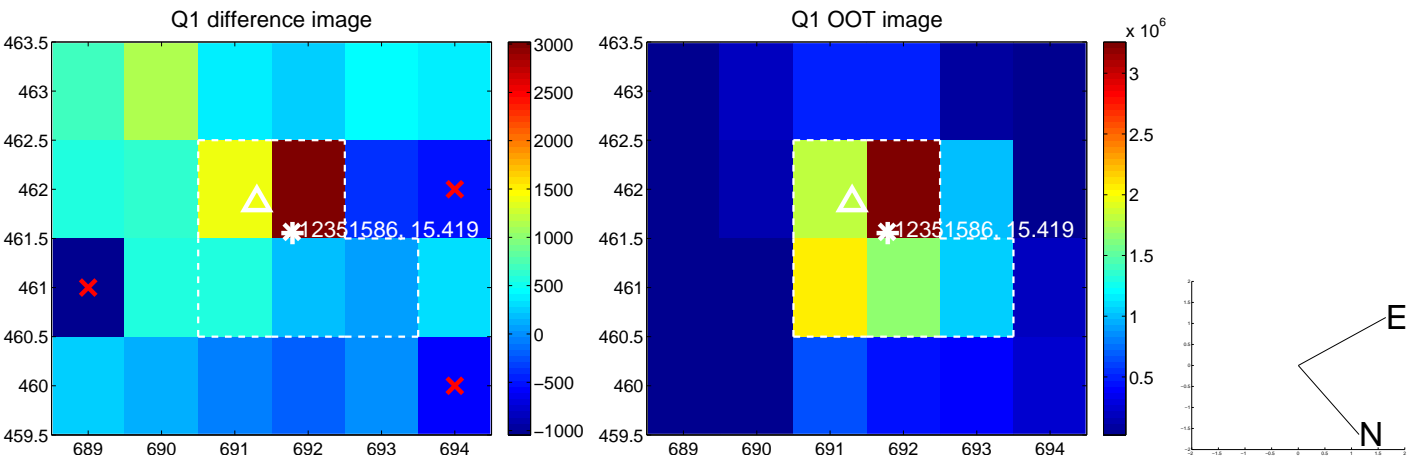
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.862 \pm 0.534$	3.49	$0.076 \pm 0.409$	$-1.861 \pm 0.534$
PRF-fit source offset from KIC position	$1.724 \pm 0.534$	3.23	$0.047 \pm 0.409$	$-1.724 \pm 0.534$
photometric centroid source offset	$3.25 \pm 1.05$	3.08	$-2.76 \pm 1.04$	$-1.71 \pm 1.10$



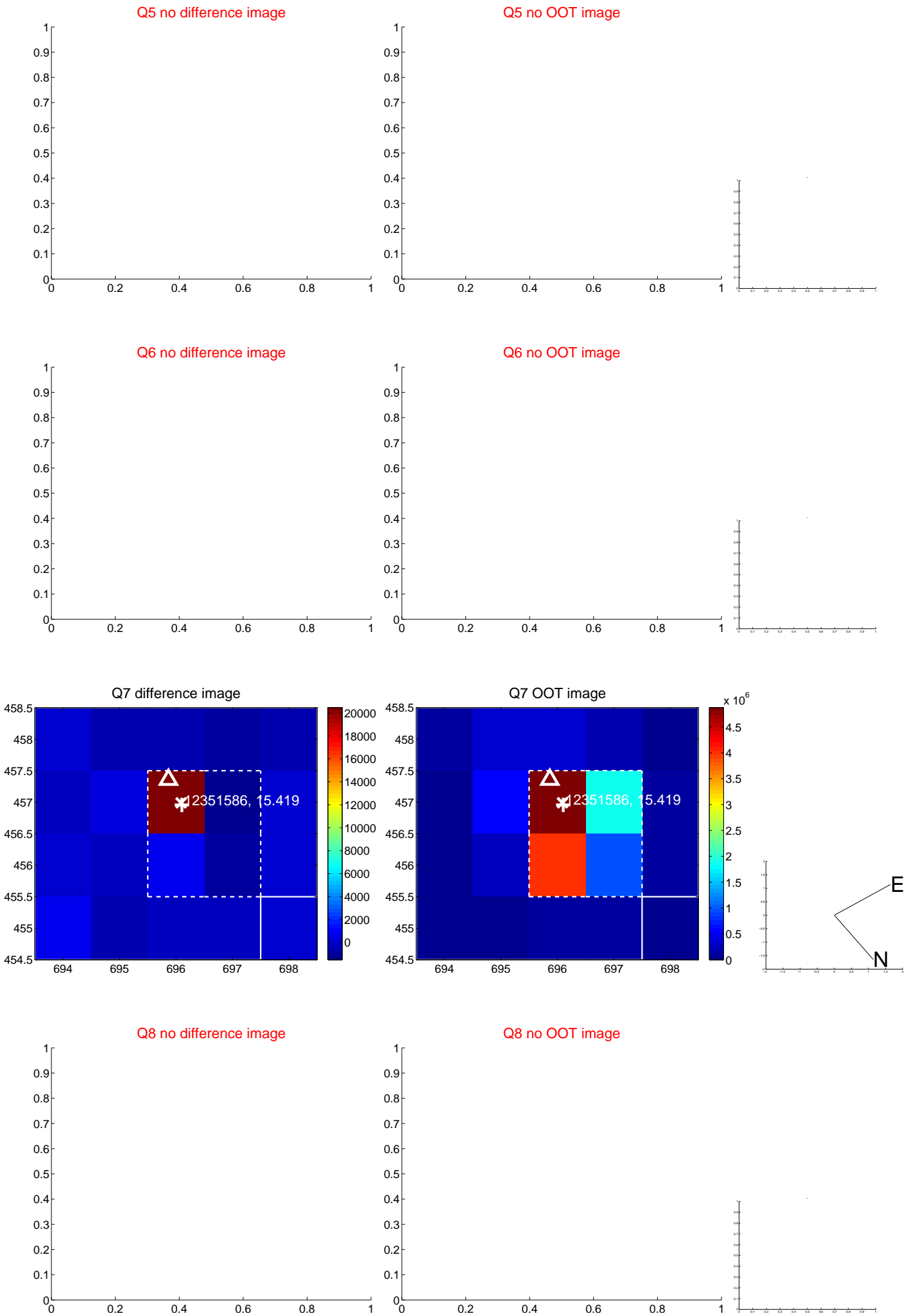
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



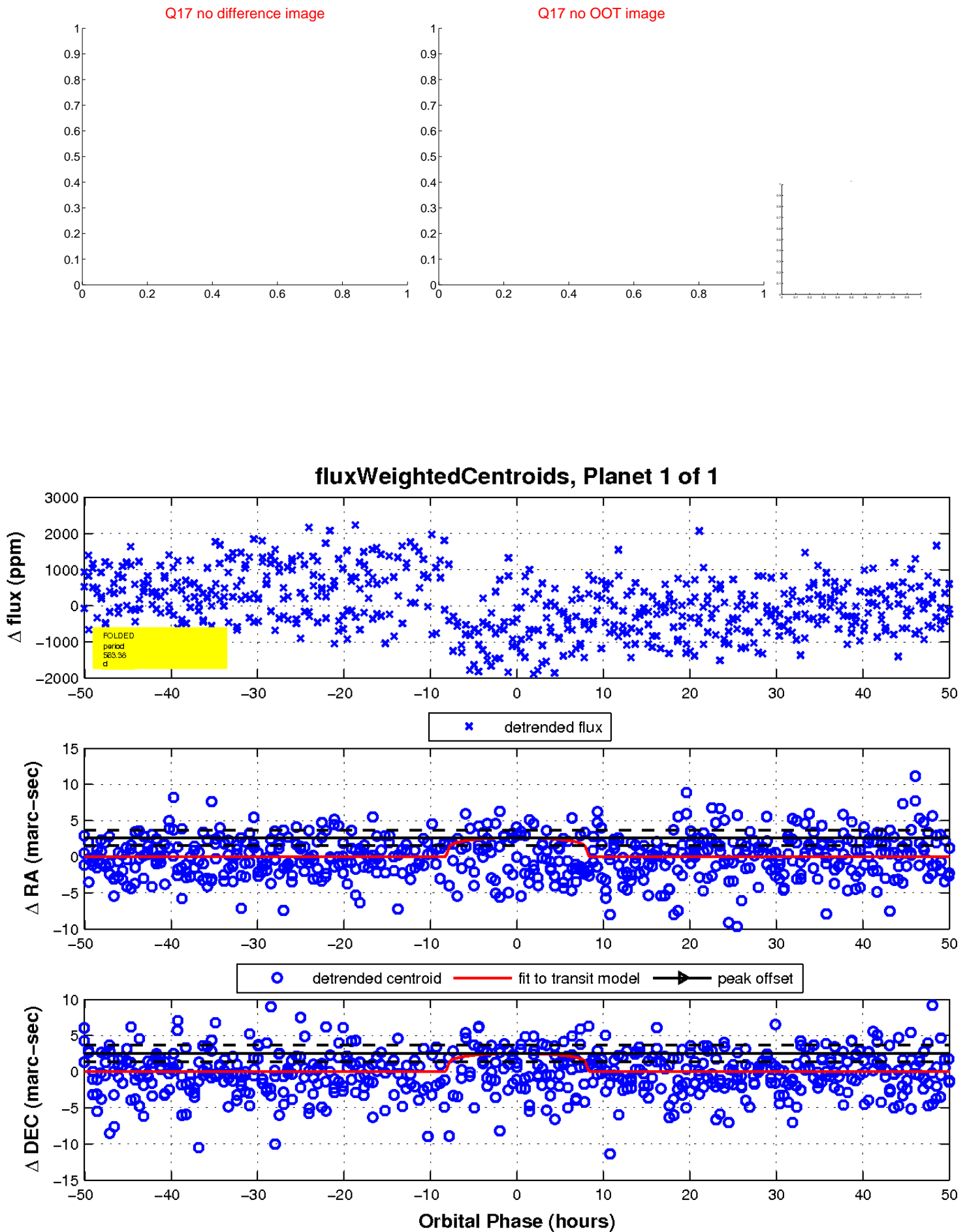
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

