

# KIC 009163488

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009163488-01	OBS	No	437.047414	300.434152	648.1	11.532	7.5	7.5	0.91	5830	2.47	0.70

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009163488-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—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.

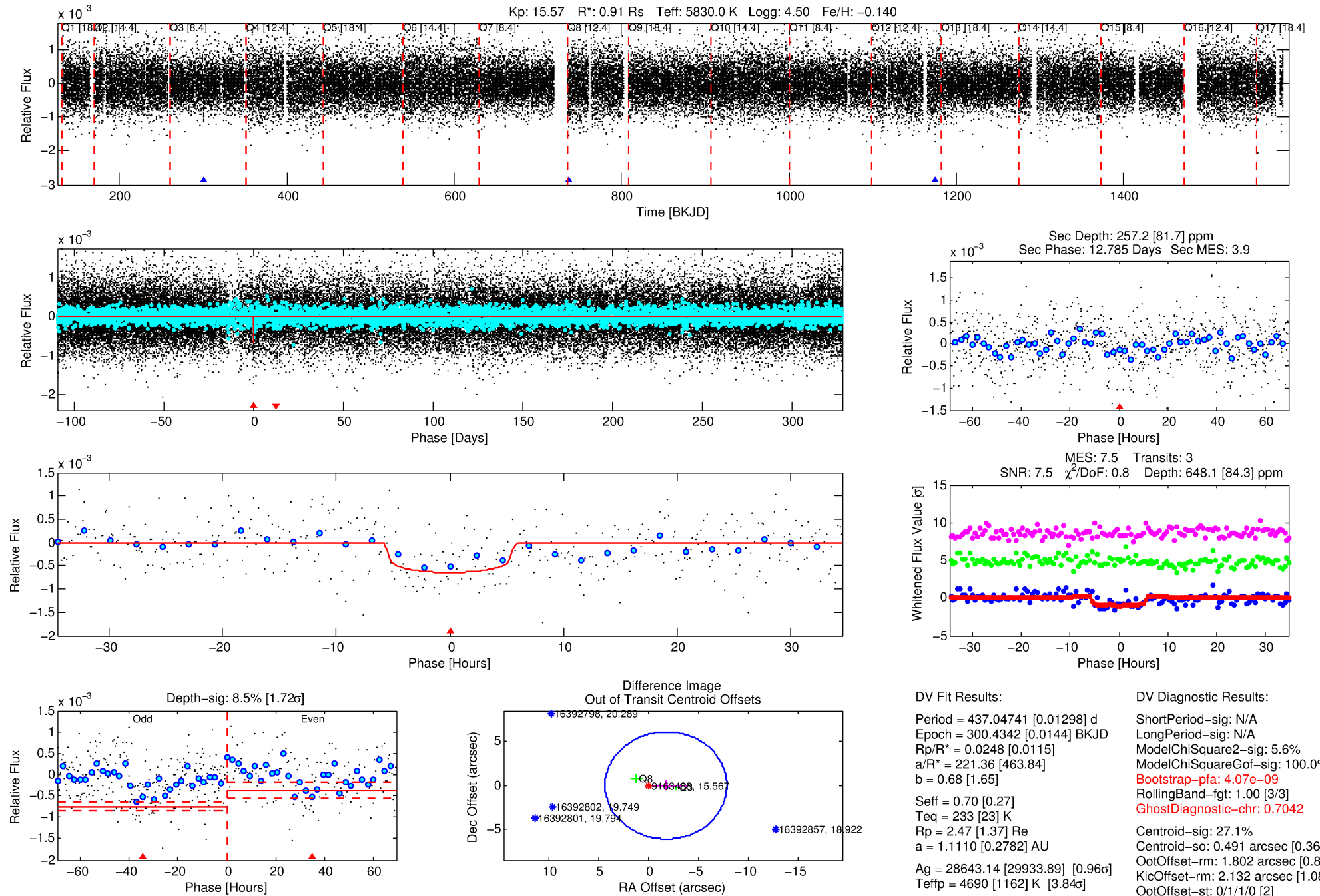
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009163488-01

No Significant Match Found

# DV One-Page Summary

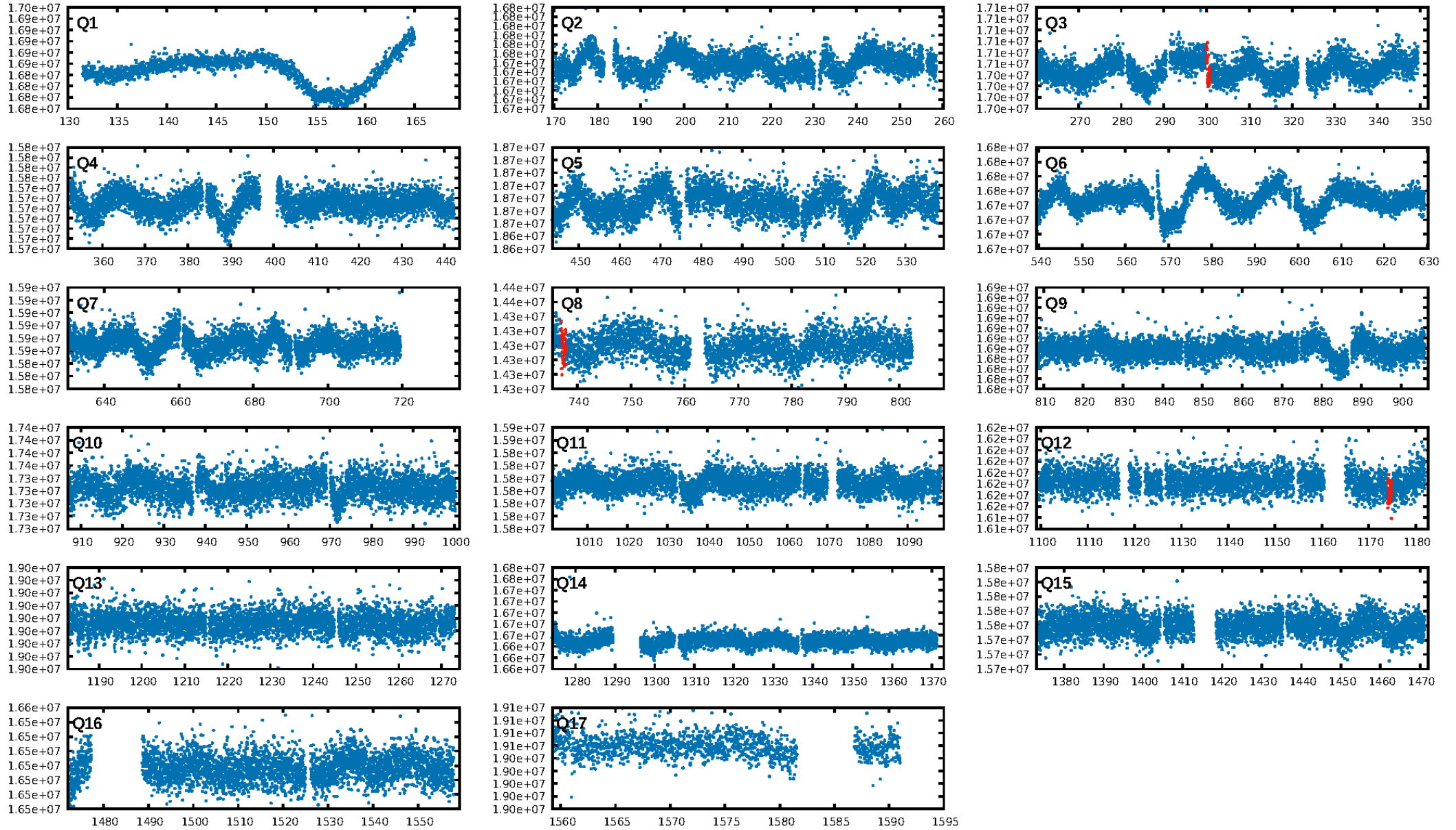
KIC: 9163488 Candidate: 1 of 1 Period: 437.047 d



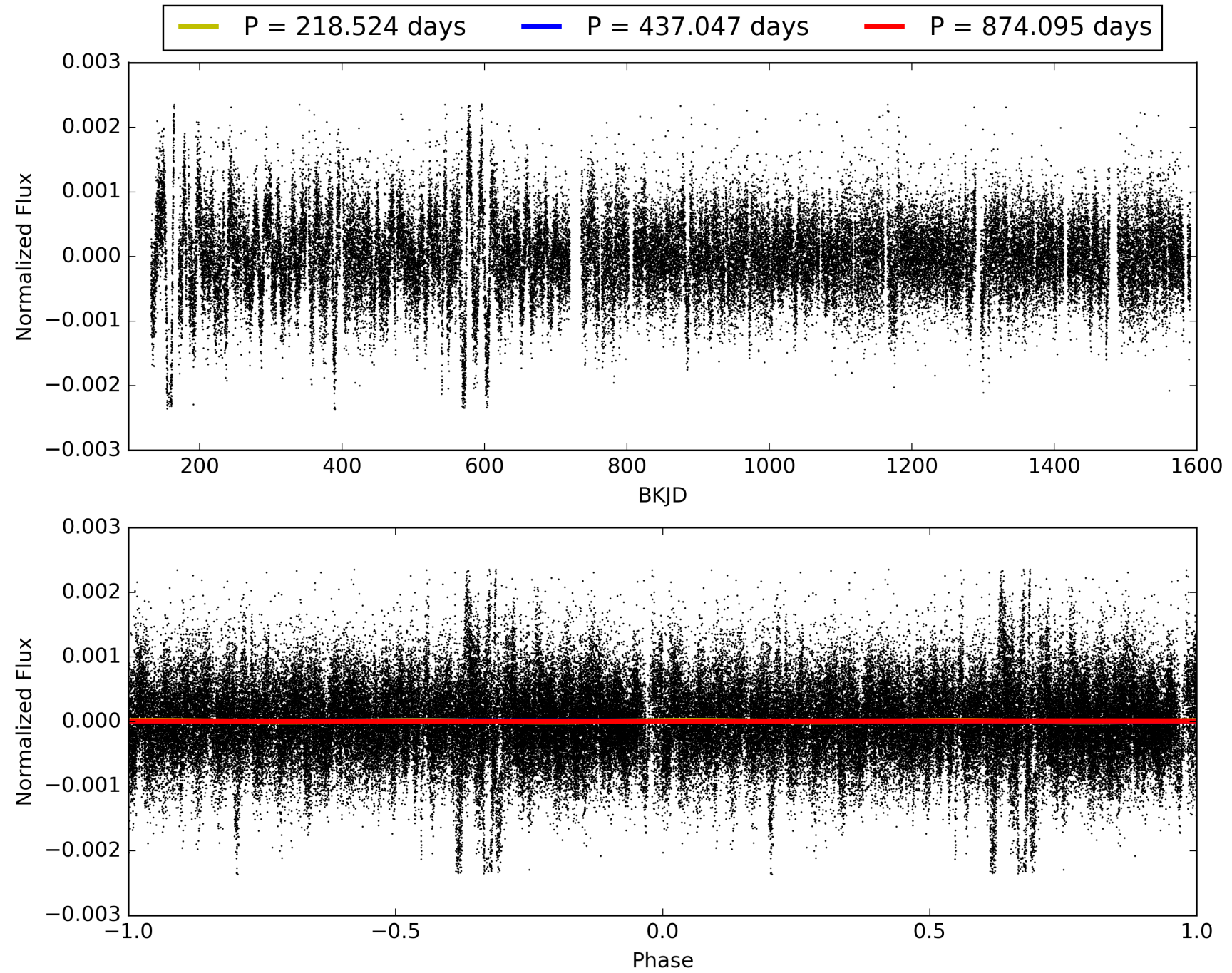
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:50:46 Z

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

# TCE 009163488-01, PDC Light Curves

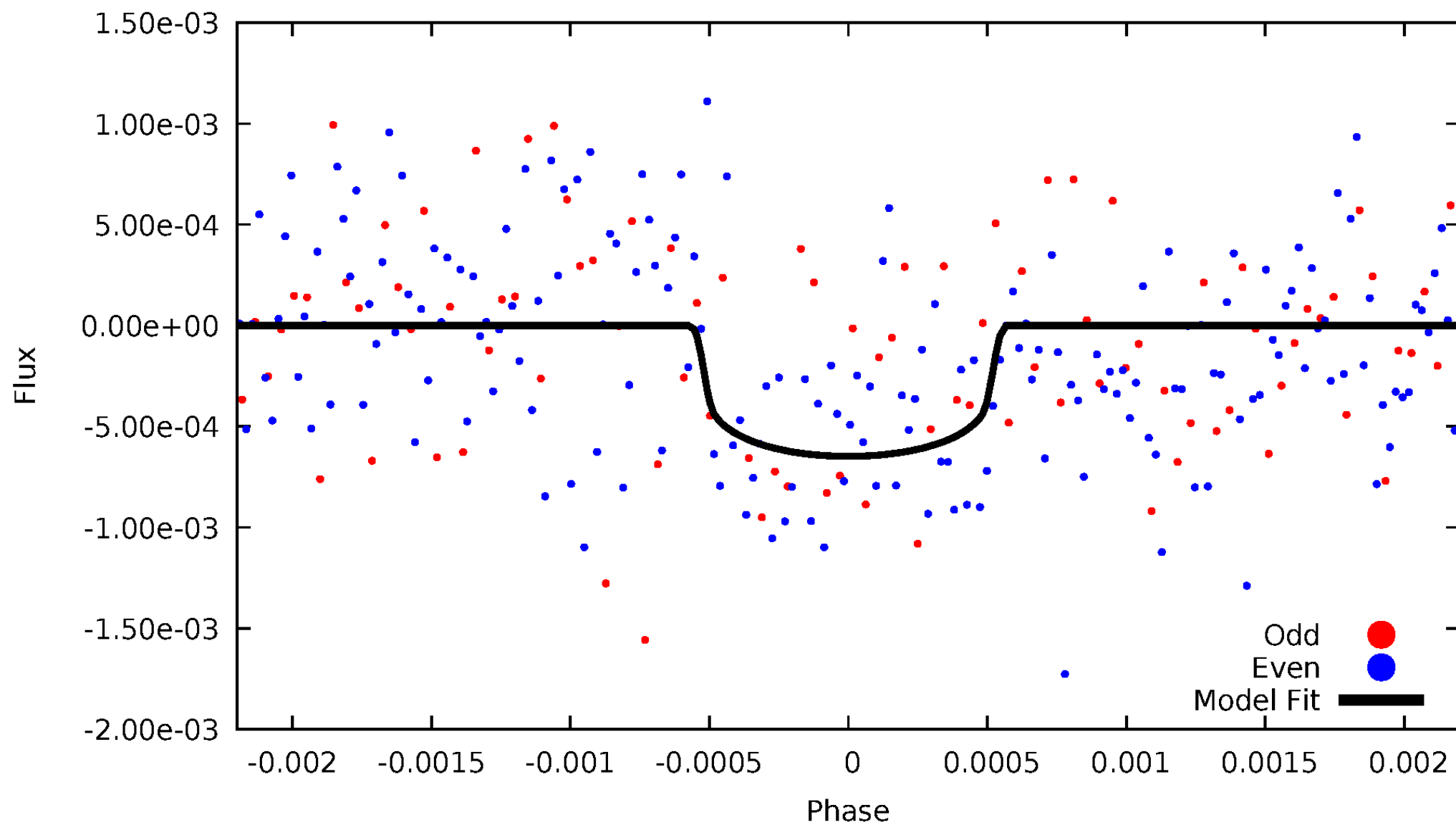


TCE 009163488-01



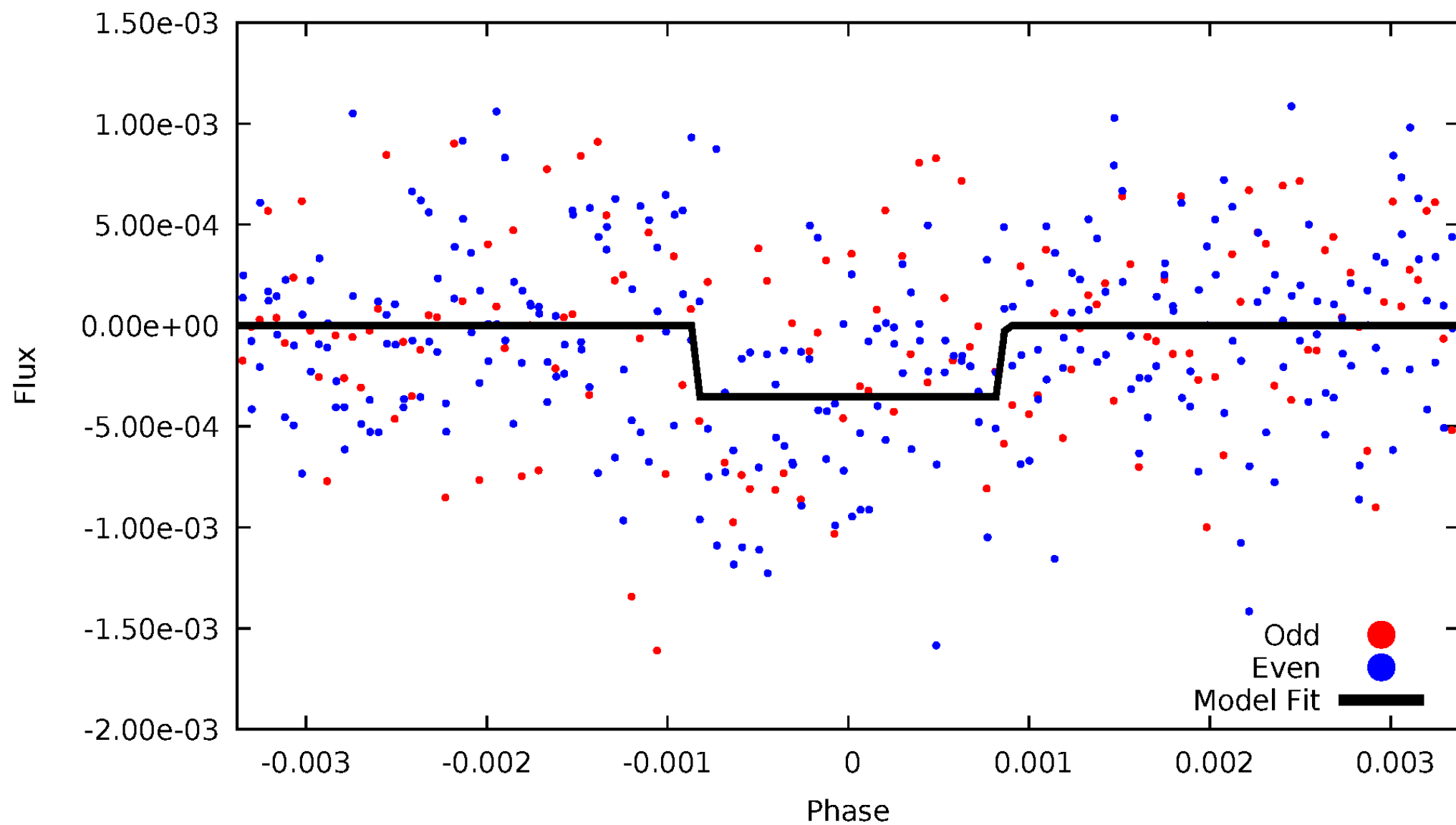
# DV Odd/Even

TCE 009163488-01



# ALT Odd/Even

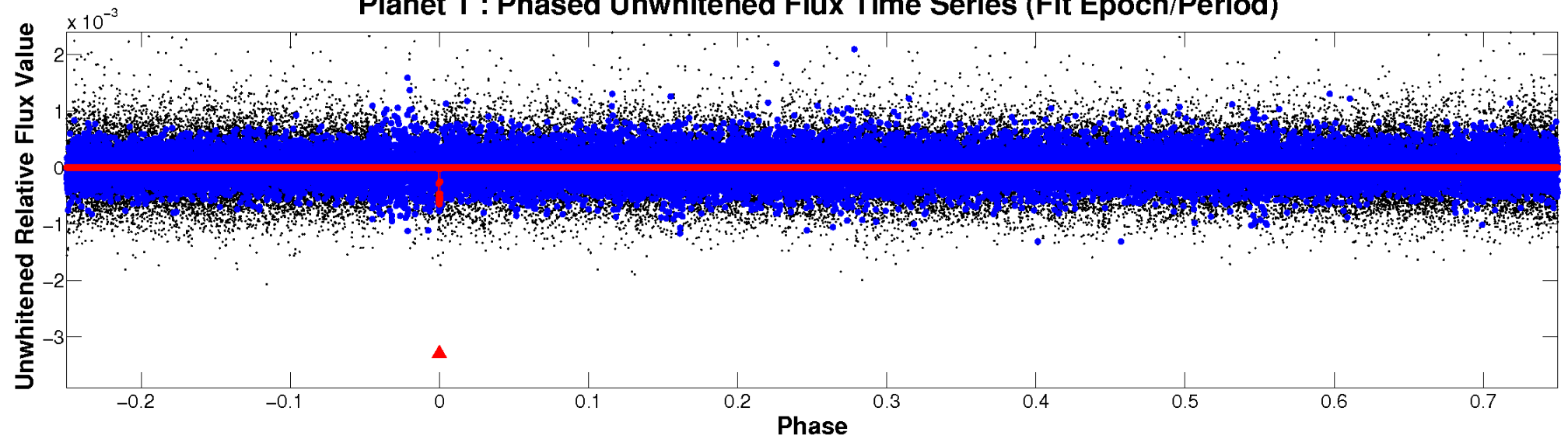
TCE 009163488-01



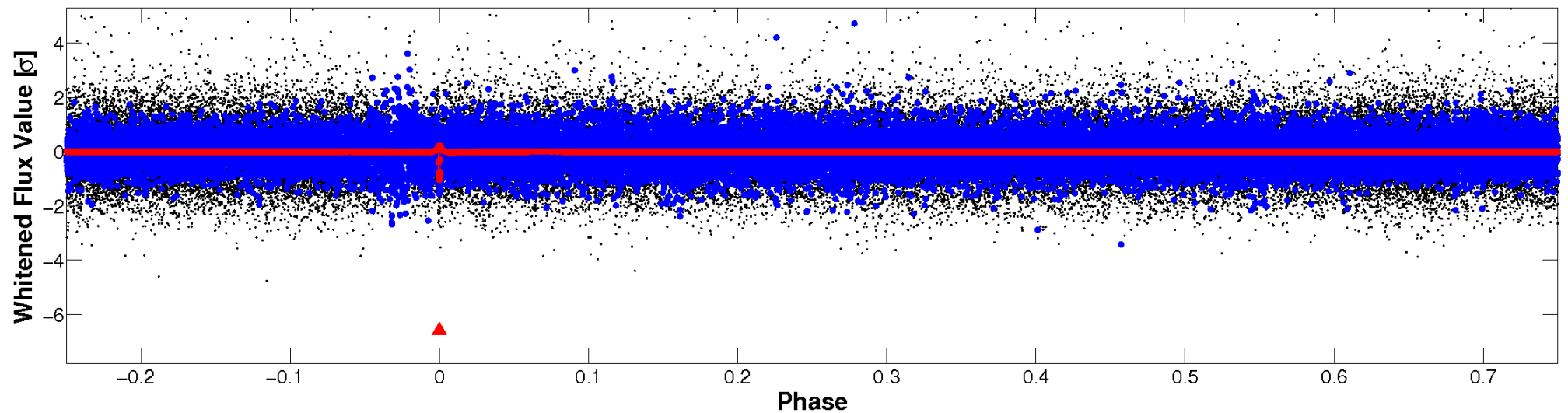


# Non-Whitened Vs. Whitened Light Curve

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

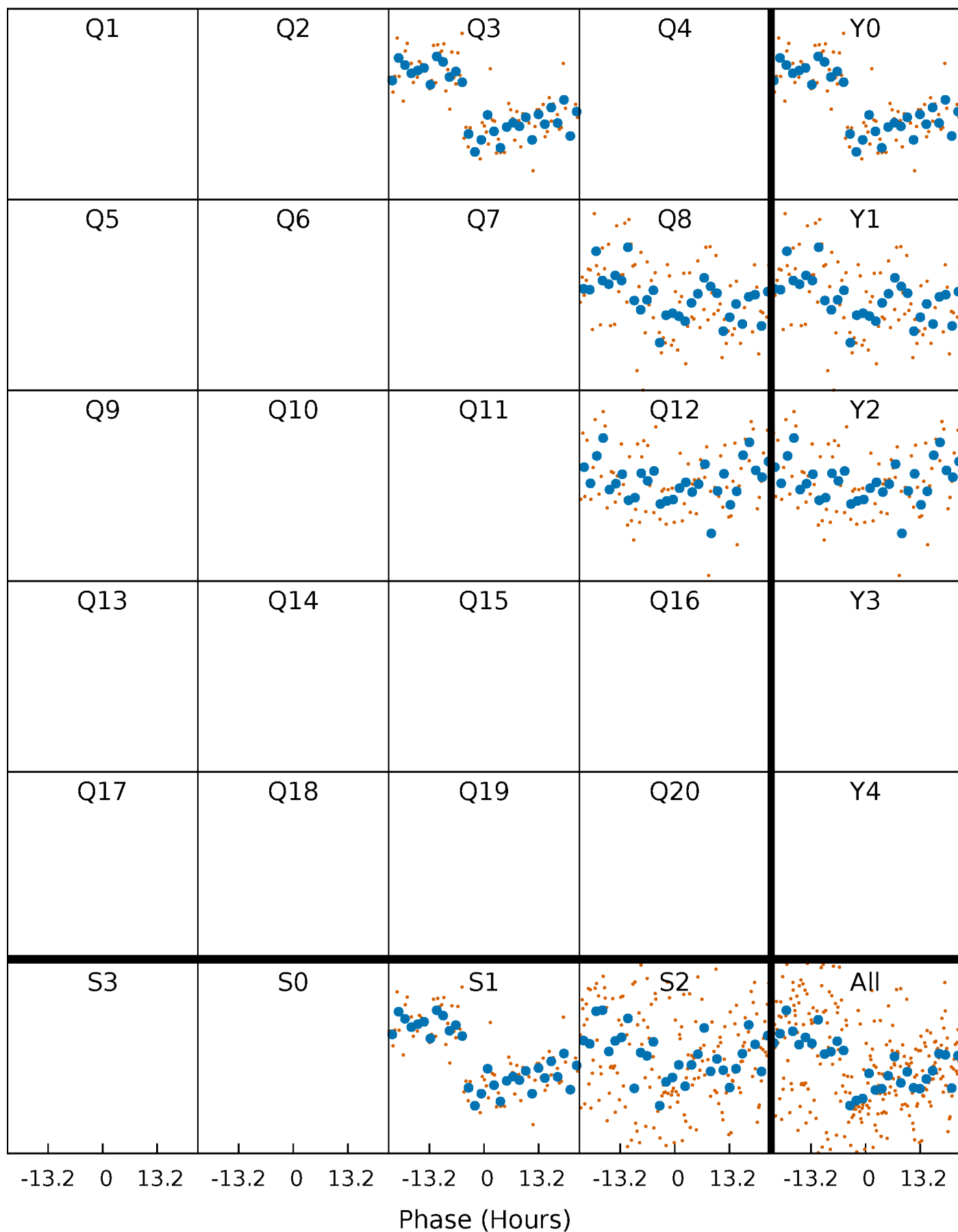


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

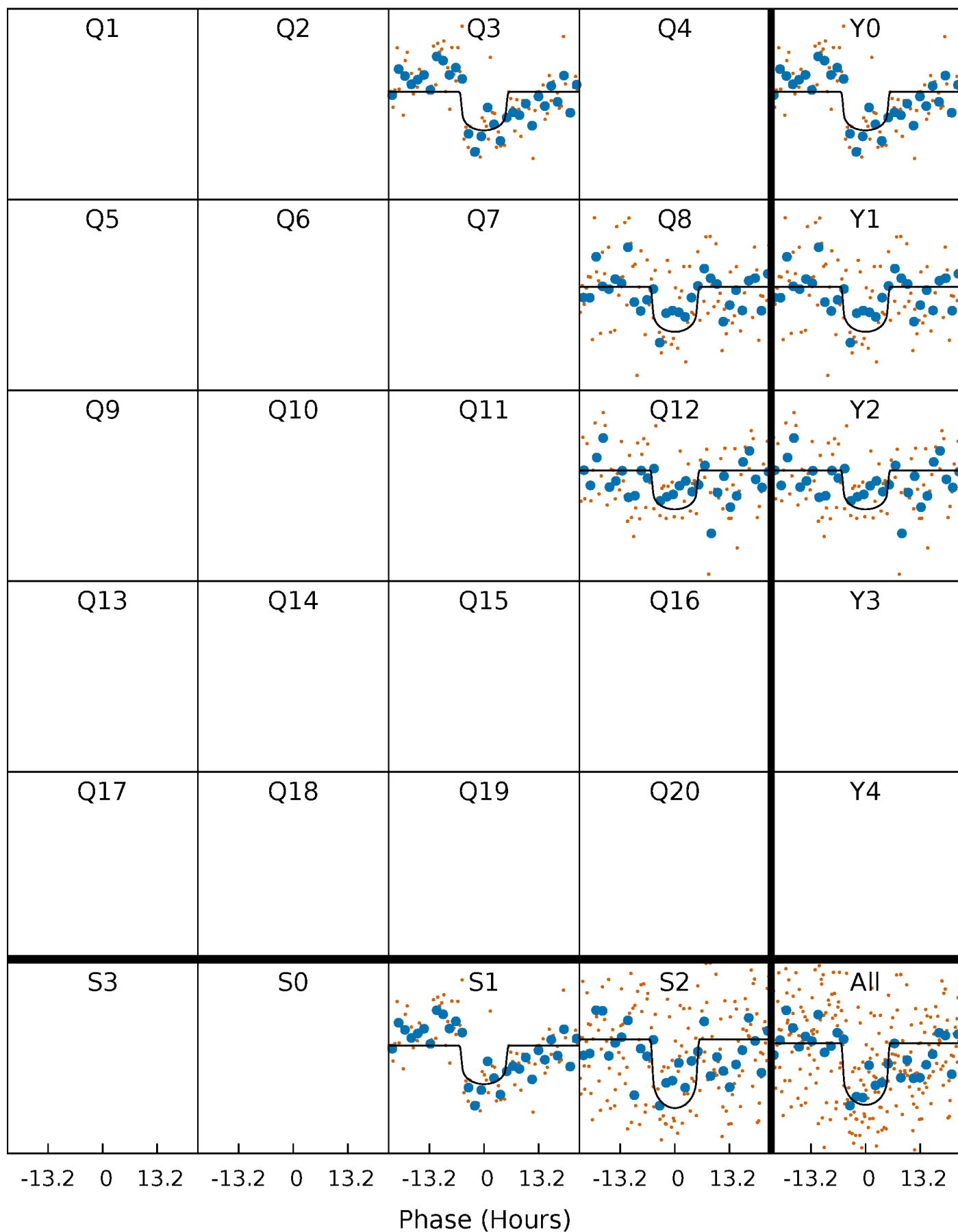
TCE 009163488-01 P=437.047414 Days  $T_0=300.434152$  (BKJD)





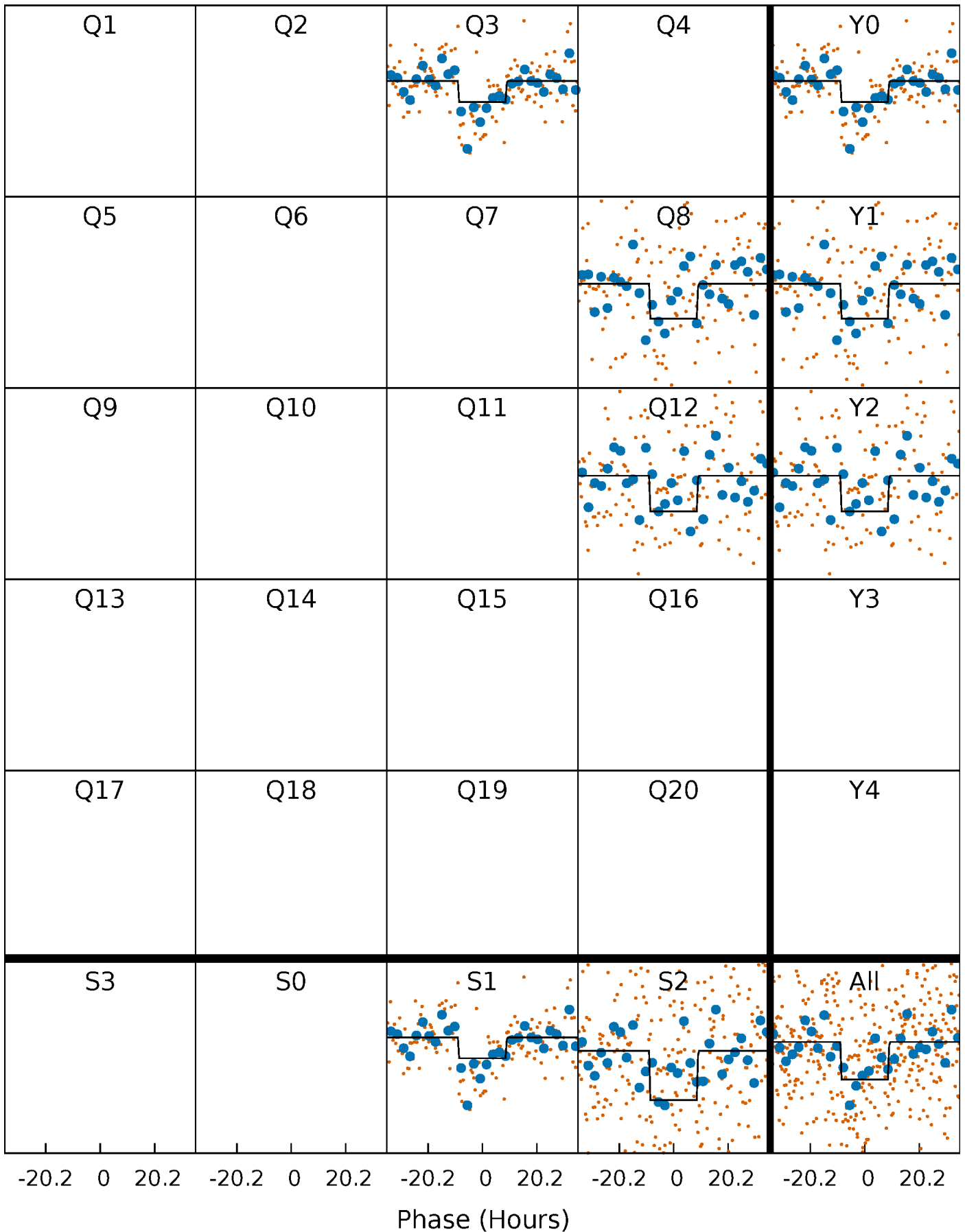
# DV Quarter-Phased Transit Curves

TCE 009163488-01 P=437.047414 Days  $T_0=300.434152$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

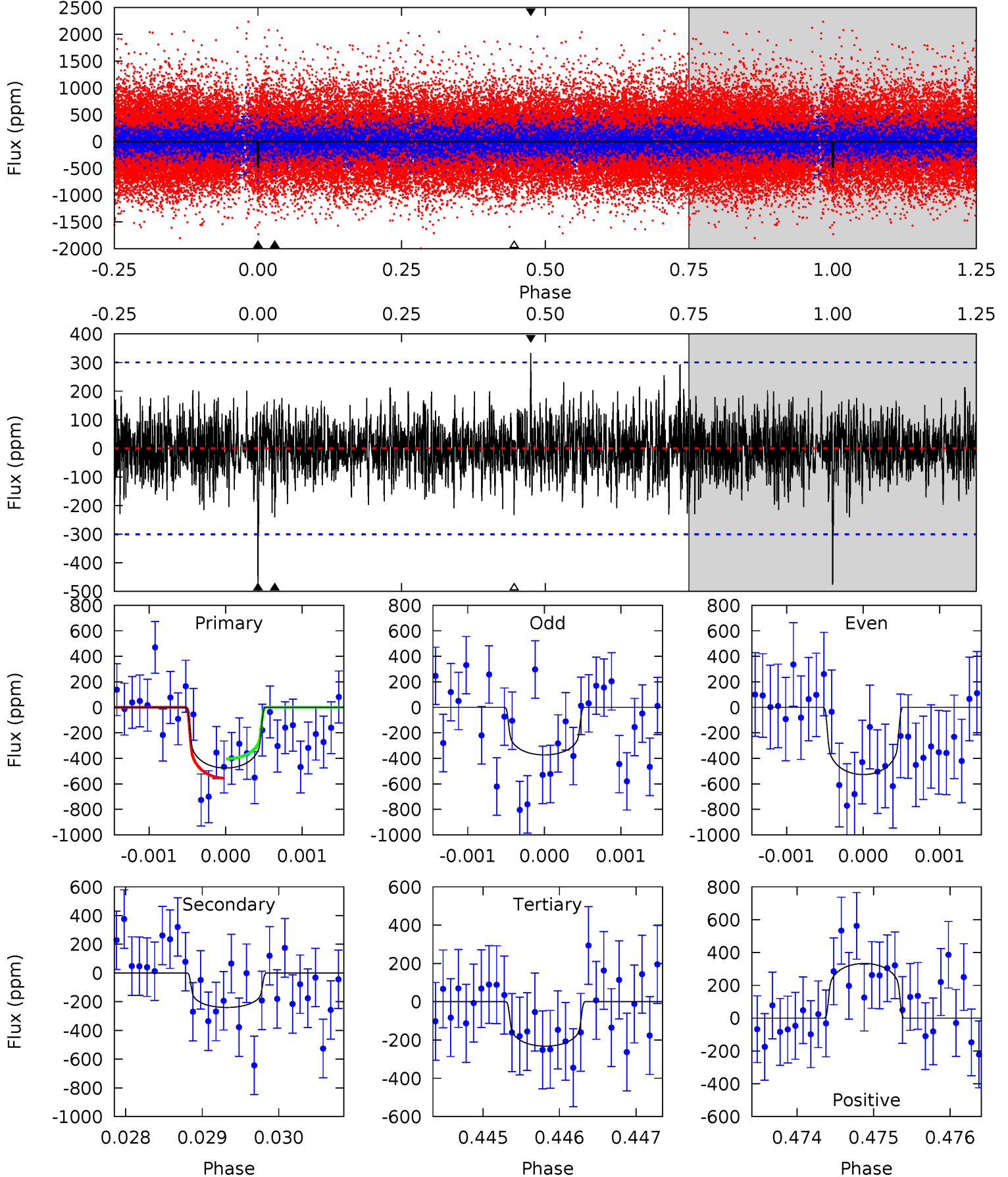
TCE 009163488-01 P=437.032981 Days  $T_0=300.591126$  (BKJD)



# DV Model-Shift Uniqueness Test

009163488-01, P = 437.047414 Days, E = 300.434152 Days

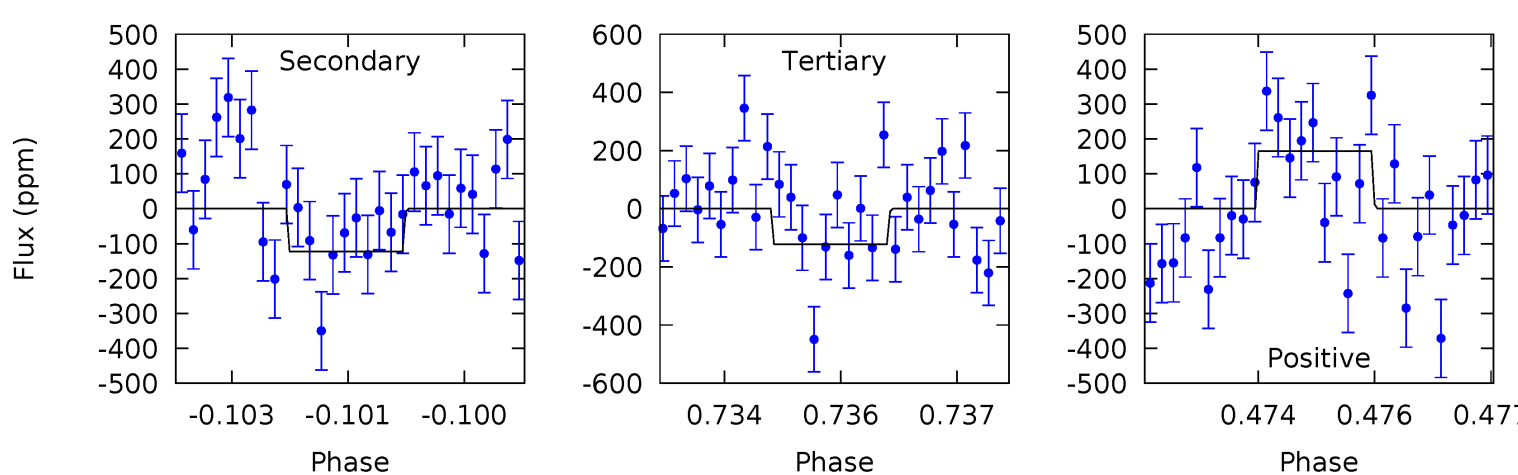
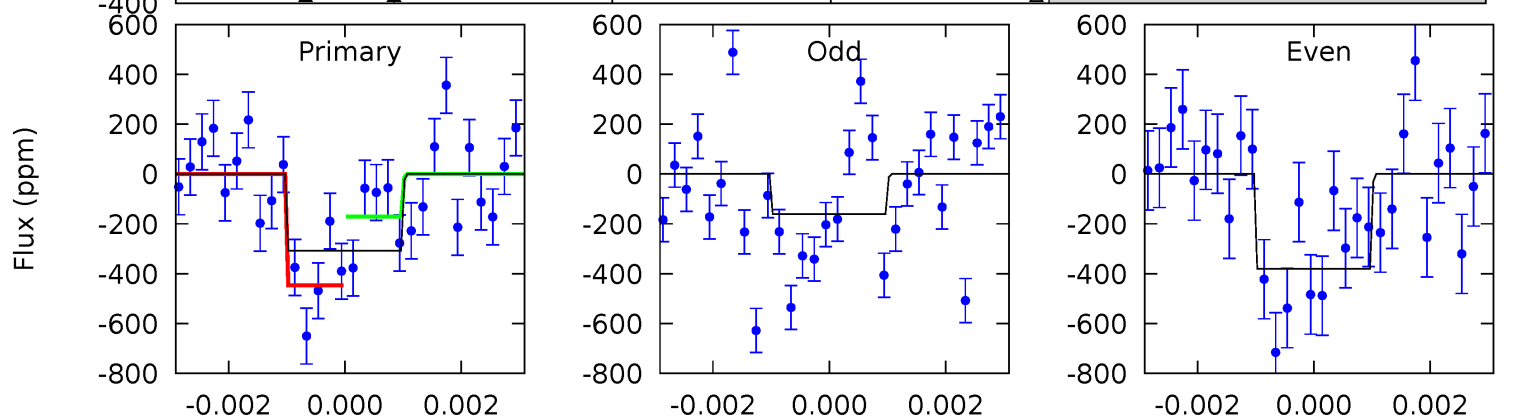
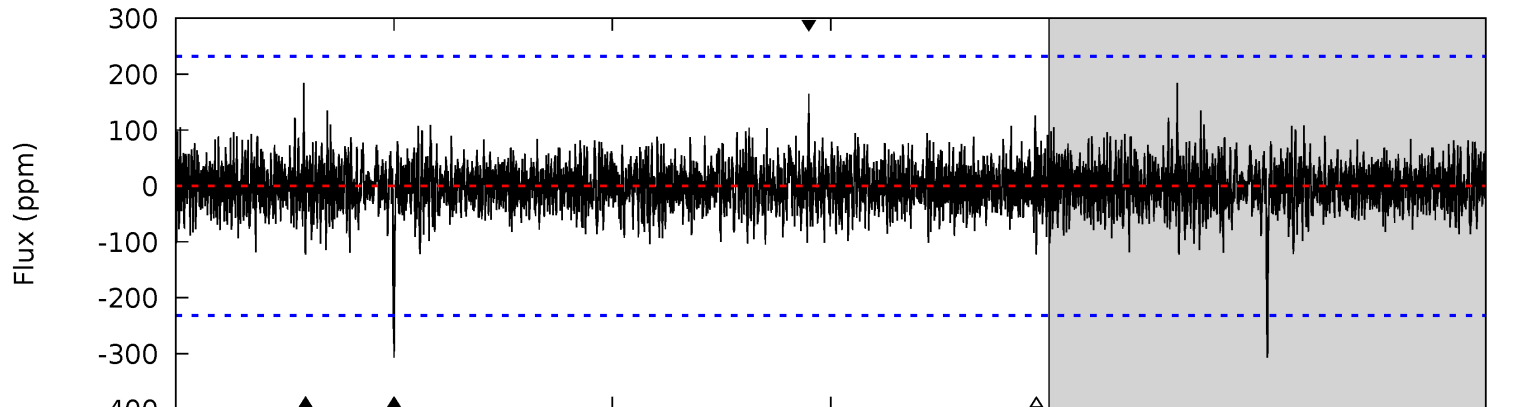
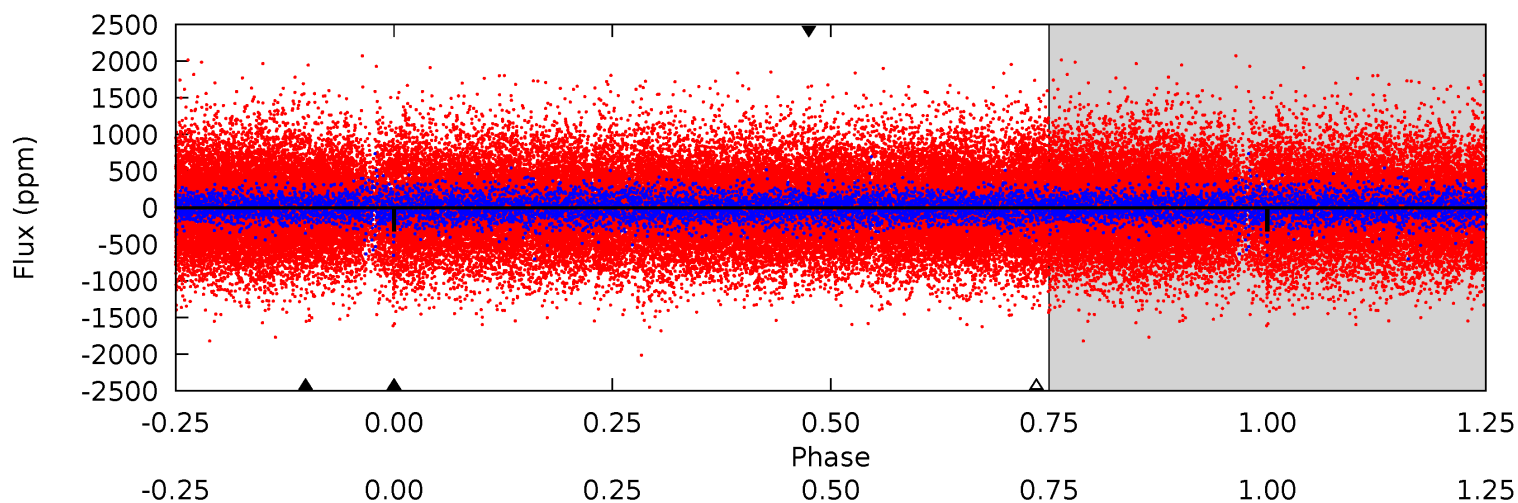
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.61	4.34	4.20	6.02	5.43	3.26	1.32	4.41	2.59	0.14	-1.68	1.31	1.28	0.41	1.38



# Alt Model-Shift Uniqueness Test

009163488-01, P = 437.032981 Days, E = 300.591126 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
7.11	2.84	2.83	3.82	5.36	3.14	0.79	4.28	3.29	0.02	-0.97	2.39	1.72	0.38	3.19



### Stellar Parameters For KIC 009163488

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5830^{+164}_{-205}$	$4.498^{+0.052}_{-0.195}$	$-0.140^{+0.300}_{-0.300}$	$0.913^{+0.275}_{-0.092}$	$0.956^{+0.121}_{-0.121}$	$1.771^{+0.478}_{-0.902}$
	+3%/-4%	+1%/-4%	+214%/-214%	+30%/-10%	+13%/-13%	+27%/-51%
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 009163488-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-240 \pm 55$	$2.62^{+1.25}_{-1.15}$	$332^{+21}_{-16}$	$4752^{+1317}_{-705}$	$23409^{+51253}_{-13056}$
Alt.	$-123 \pm 43$	$2.00^{+1.25}_{-1.10}$	$333^{+24}_{-18}$	$4520^{+2009}_{-766}$	$19285^{+79927}_{-12252}$

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

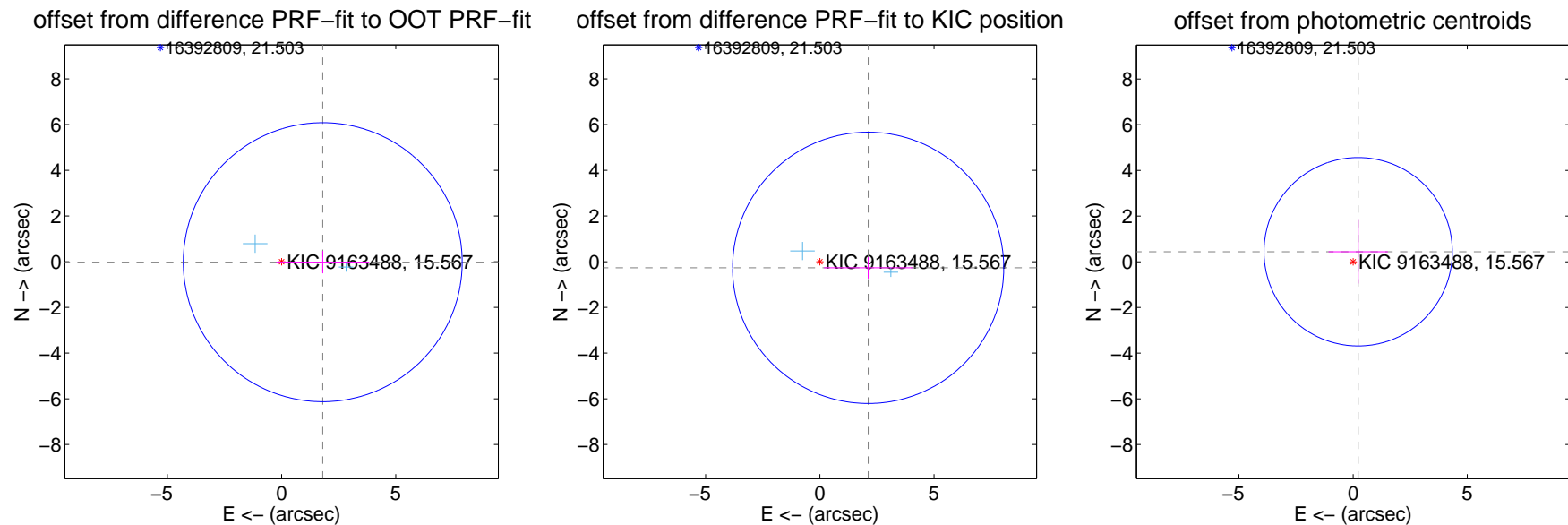
## DV Centroid Data

Supplemental centroid analysis for 009163488-01. Kepler magnitude: 15.57. Transit SNR 7.54

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

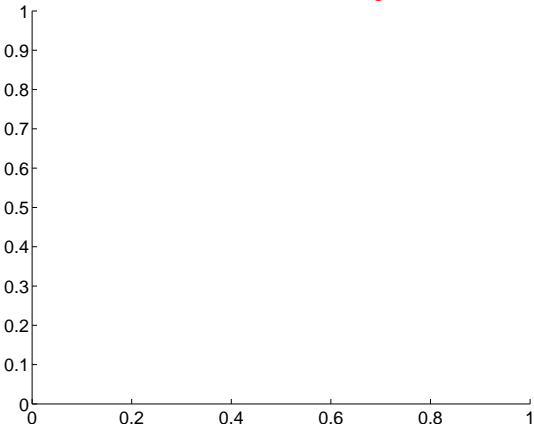
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.802 \pm 2.035$	0.89	$-1.802 \pm 2.035$	$-0.022 \pm 0.489$
PRF-fit source offset from KIC position	$2.132 \pm 1.979$	1.08	$-2.115 \pm 1.935$	$-0.269 \pm 0.470$
photometric centroid source offset	$0.49 \pm 1.37$	0.36	$-0.22 \pm 1.30$	$0.44 \pm 1.39$



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.

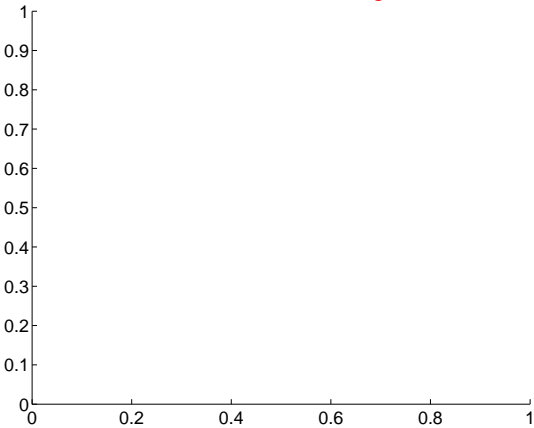
Q1 no difference image



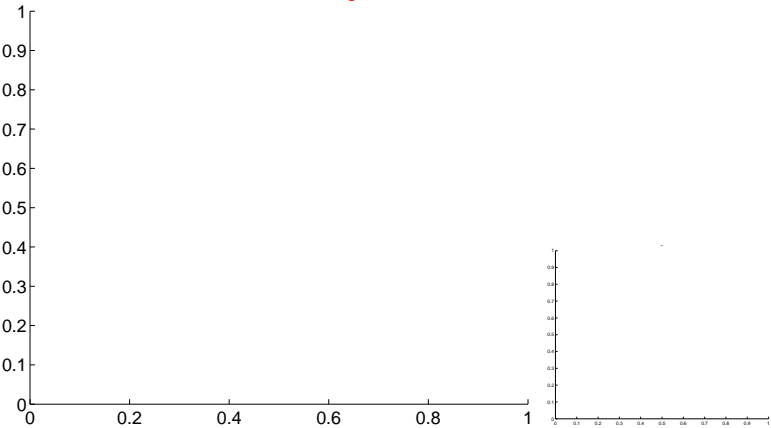
Q1 no OOT image



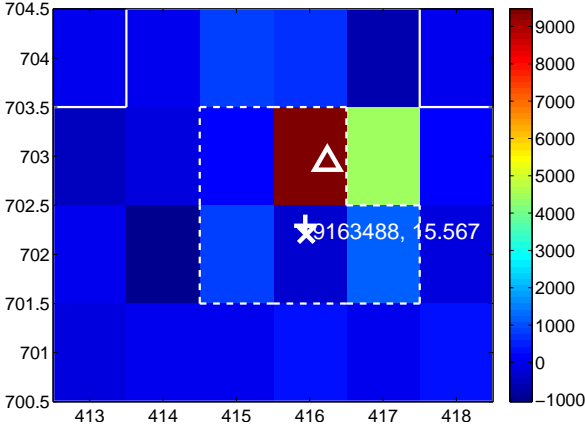
Q2 no difference image



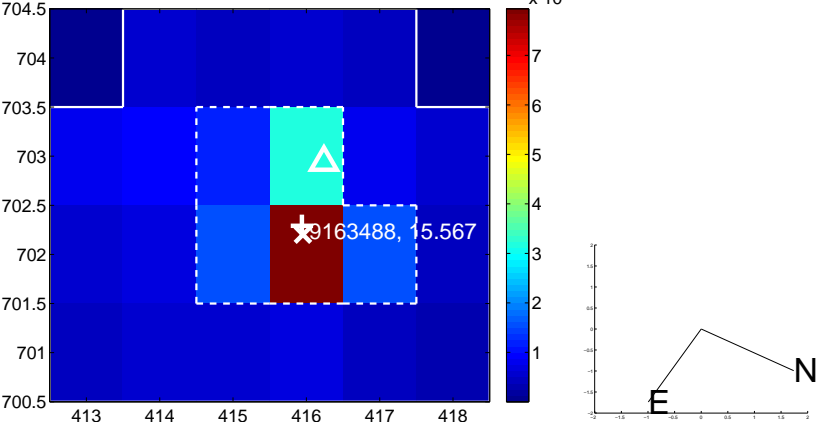
Q2 no OOT image



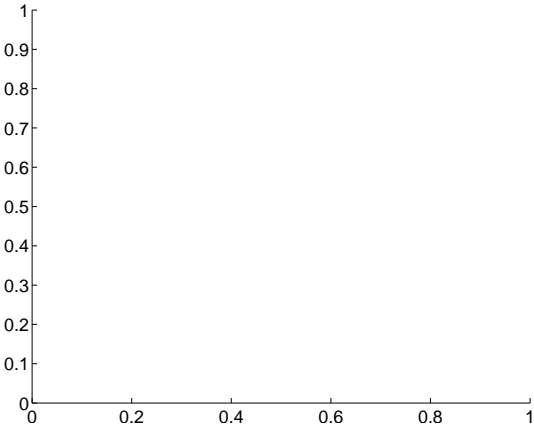
Q3 difference image



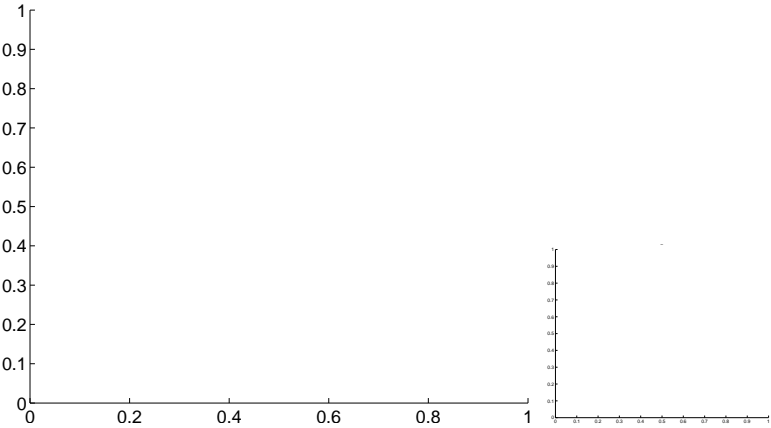
Q3 OOT image



Q4 no difference image



Q4 no OOT image





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

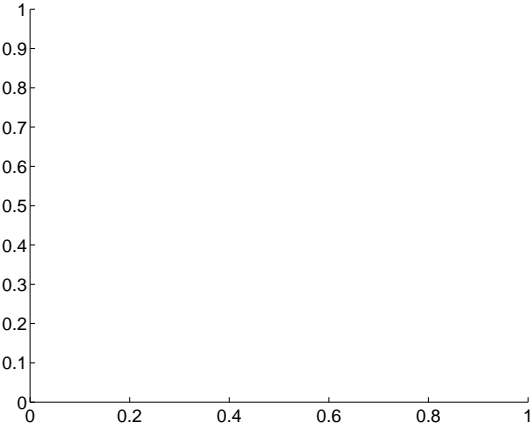
Q5 no difference image



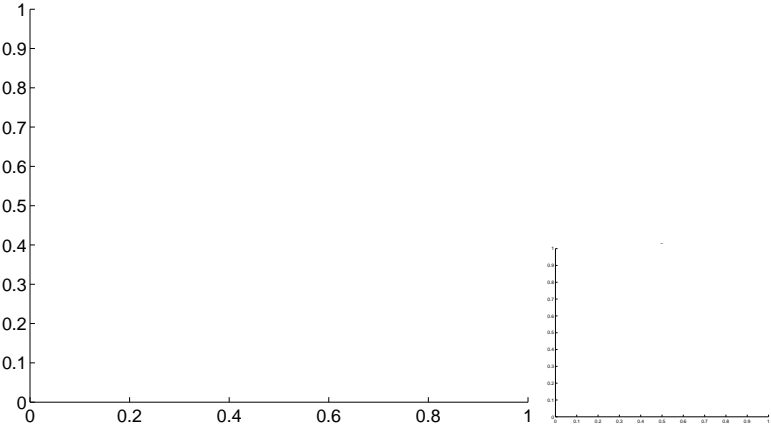
Q5 no OOT image



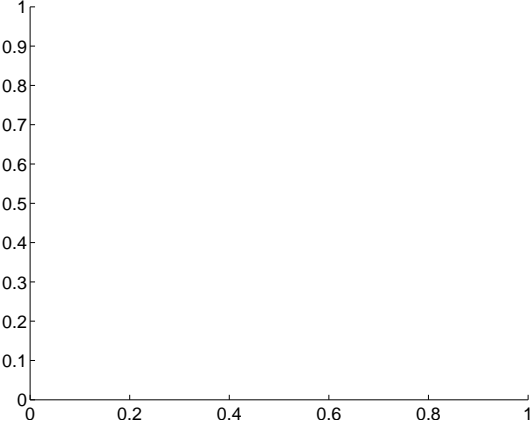
Q6 no difference image



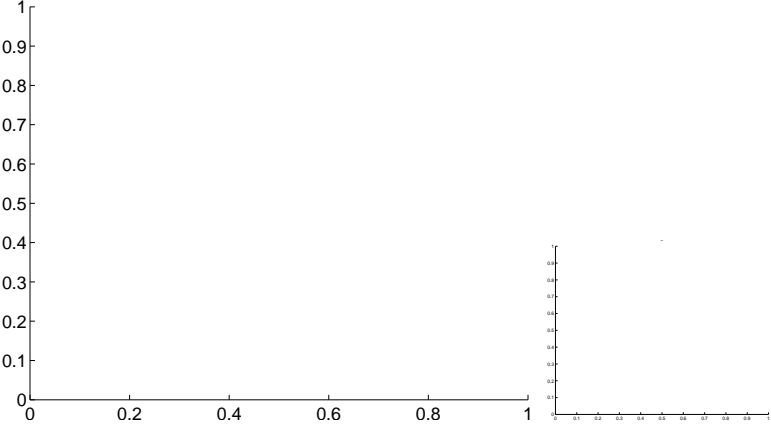
Q6 no OOT image



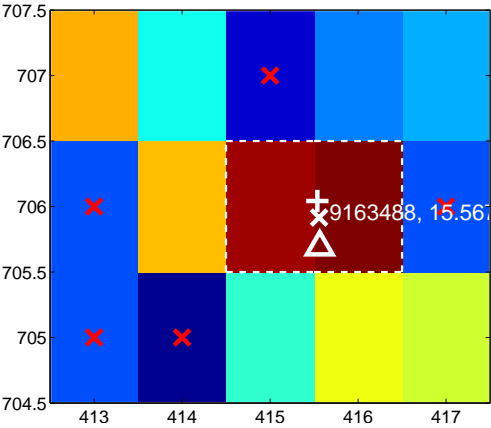
Q7 no difference image



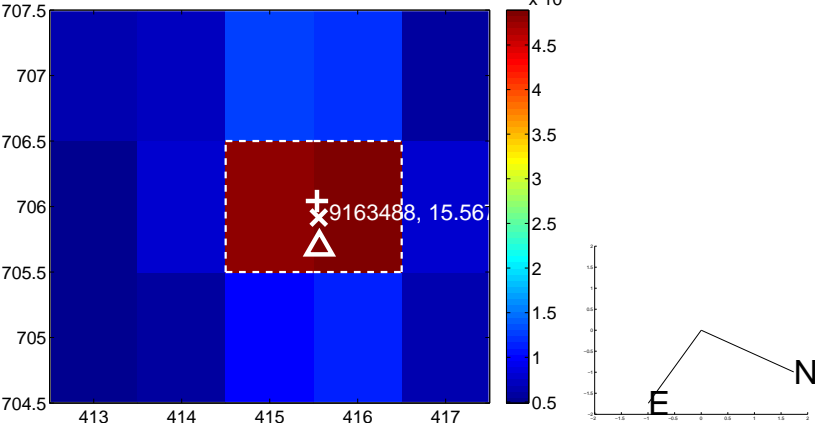
Q7 no OOT image



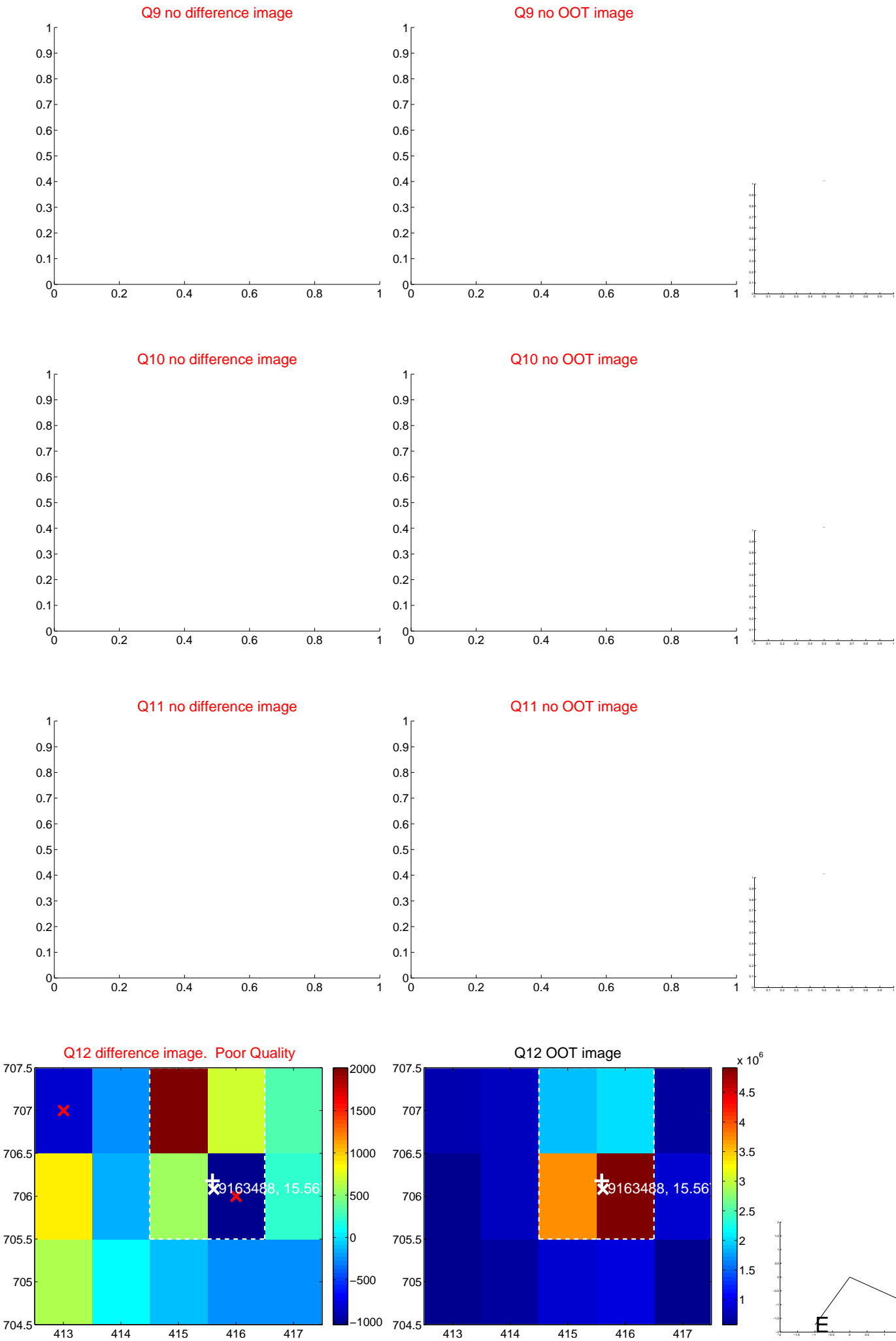
Q8 difference image



Q8 OOT image



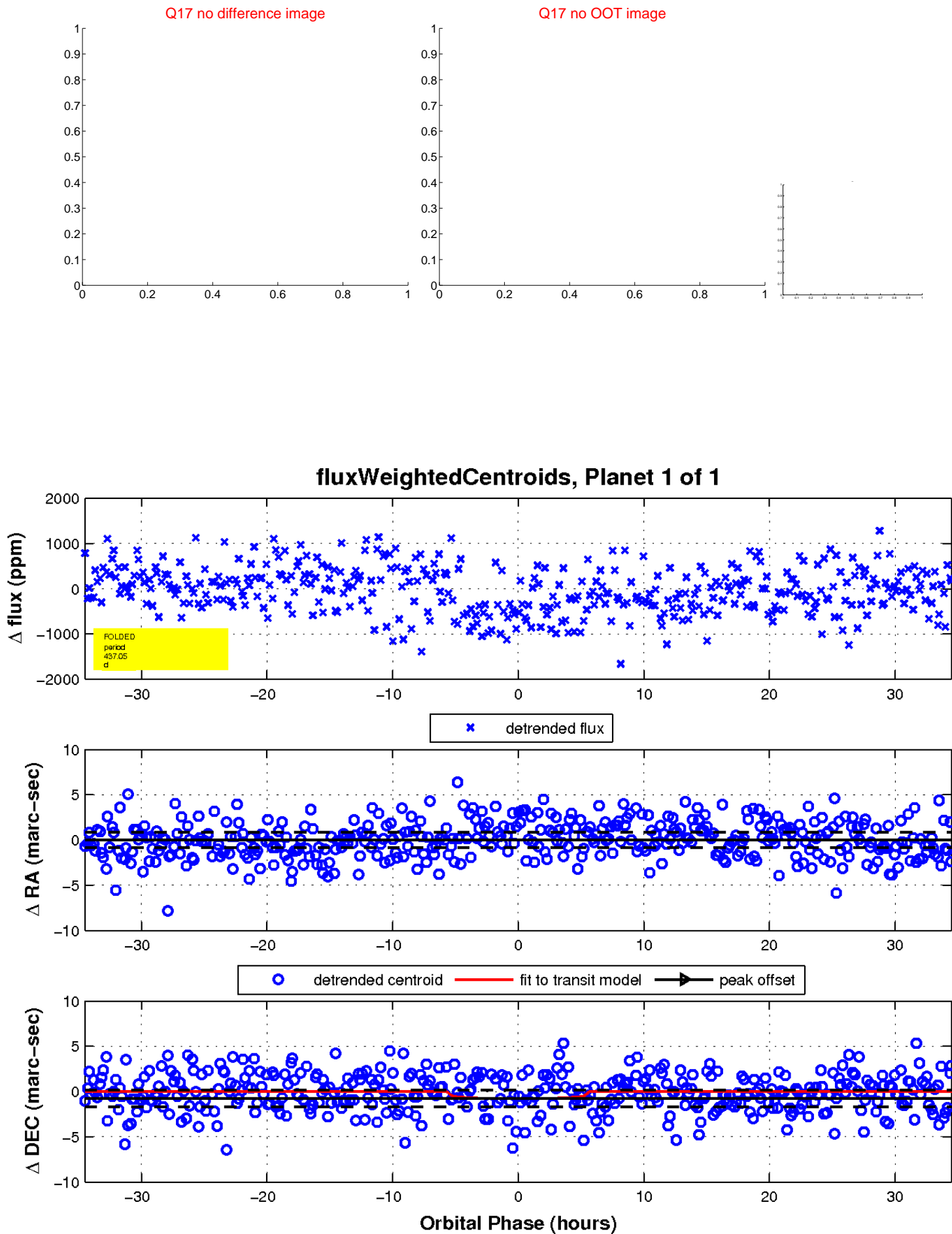
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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.



# UKIRT Image

Declination

