

# KIC 009101400

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009101400-01	OBS	6192.01	0.829009	132.313077	370878.9	2.500	3423.0	-1.0	1.33	6645	55.80	9139.61
009101400-02	OBS	No	4.977141	132.262618	90945.8	9.345	236.1	205.4	1.33	6645	61.76	837.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009101400-01	OBS	FP	0.00	0	1	1	0	SWEET_EB—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_ALT—CENT_NOFITS—HALO_GHOST
009101400-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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 009101400-01

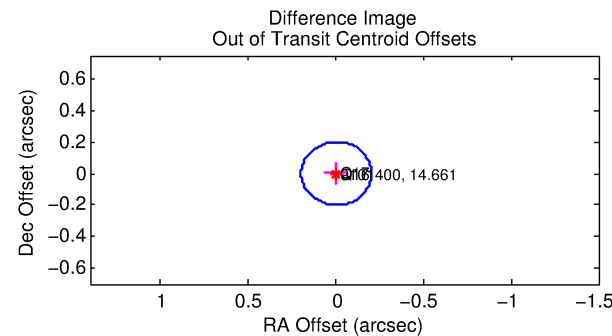
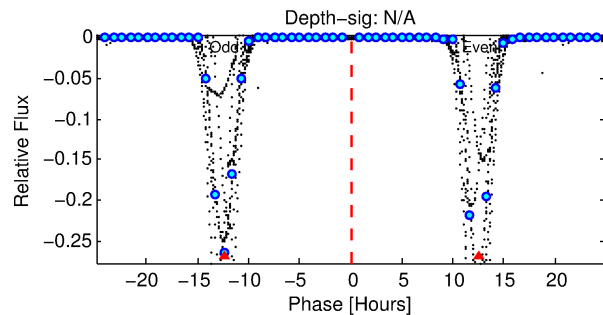
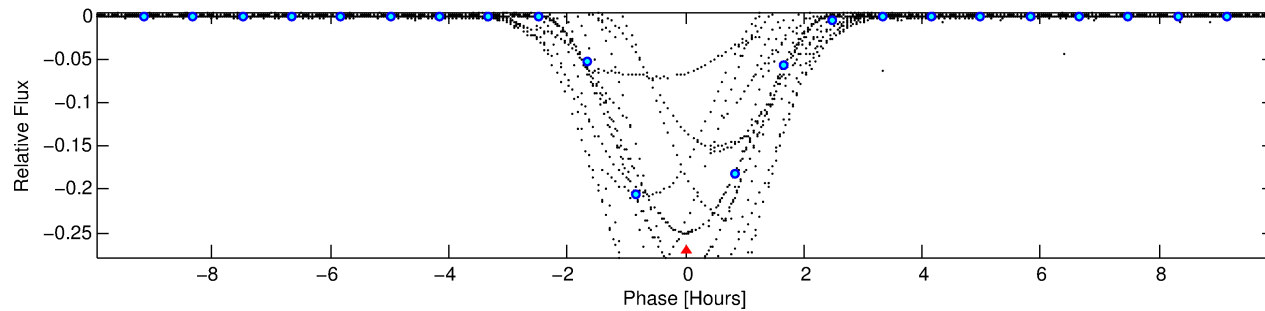
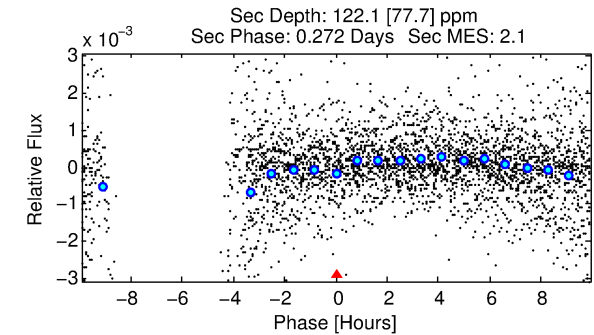
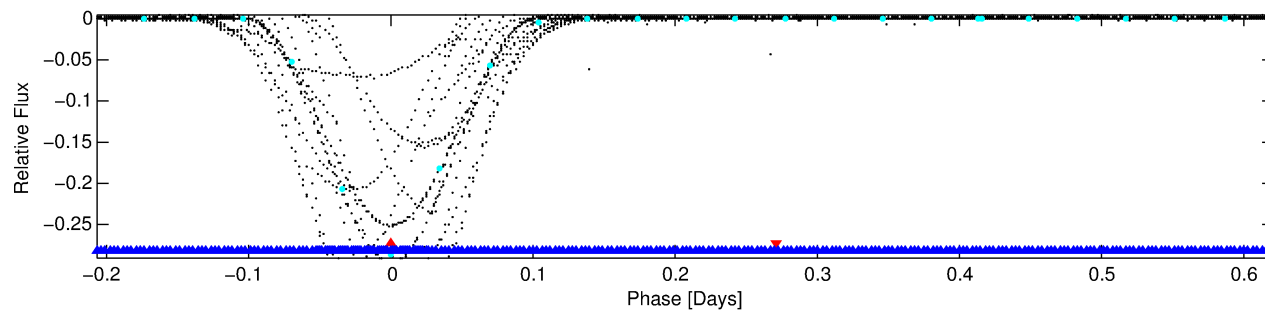
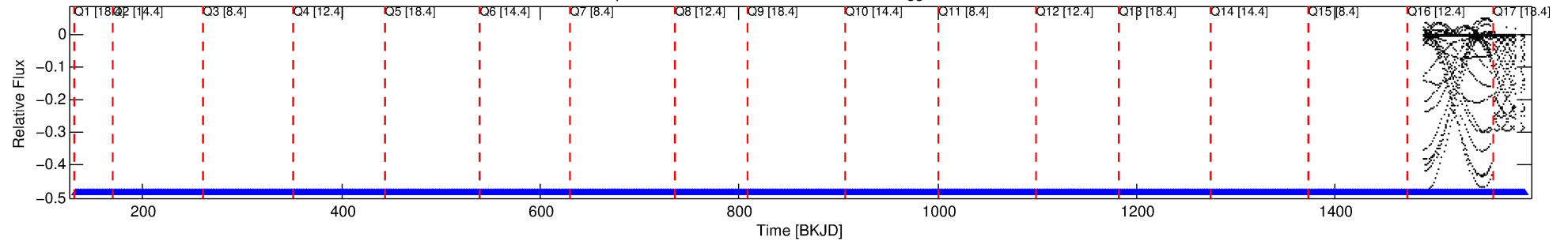
No Significant Match Found

# DV One-Page Summary

KIC: 9101400 Candidate: 1 of 2 Period: 0.829 d

KOI: K06192 Corr: No Ephemeris Match

Kp: 14.66 R\*: 1.33 Rs Teff: 6645.0 K Logg: 4.27 Fe/H: -0.240



## TPS TCE Results:

Period = 0.82901 d  
Epoch = 132.3131 BKJD

DV fit results are unavailable

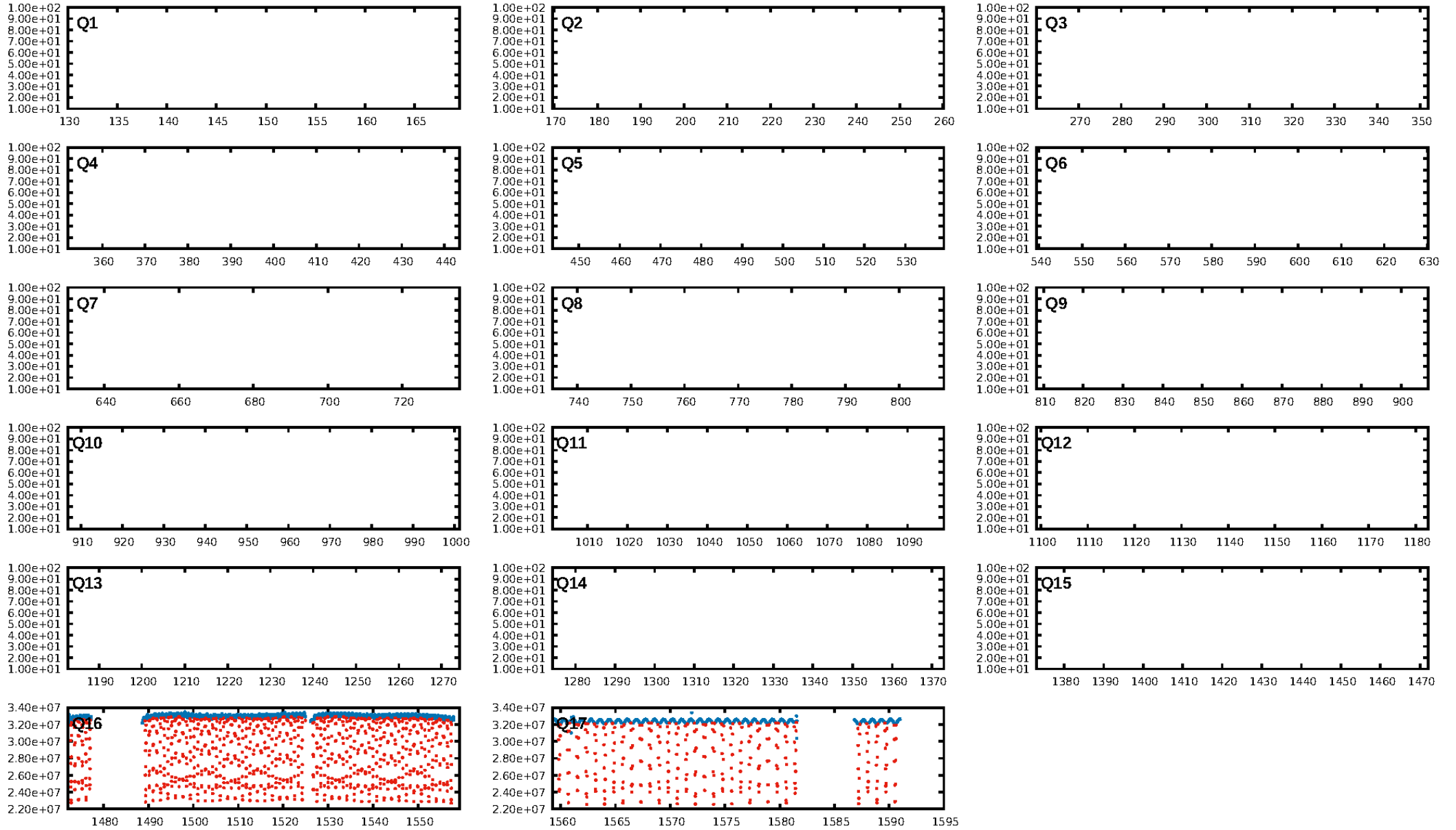
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [10.29σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [82/82]  
GhostDiagnostic-chr: 0.0212  
Centroid-sig: 0.0%  
Centroid-so: 0.176 arcsec [108.55σ]  
OotOffset-rm: 0.004 arcsec [0.06σ]  
KicOffset-rm: 0.037 arcsec [0.55σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

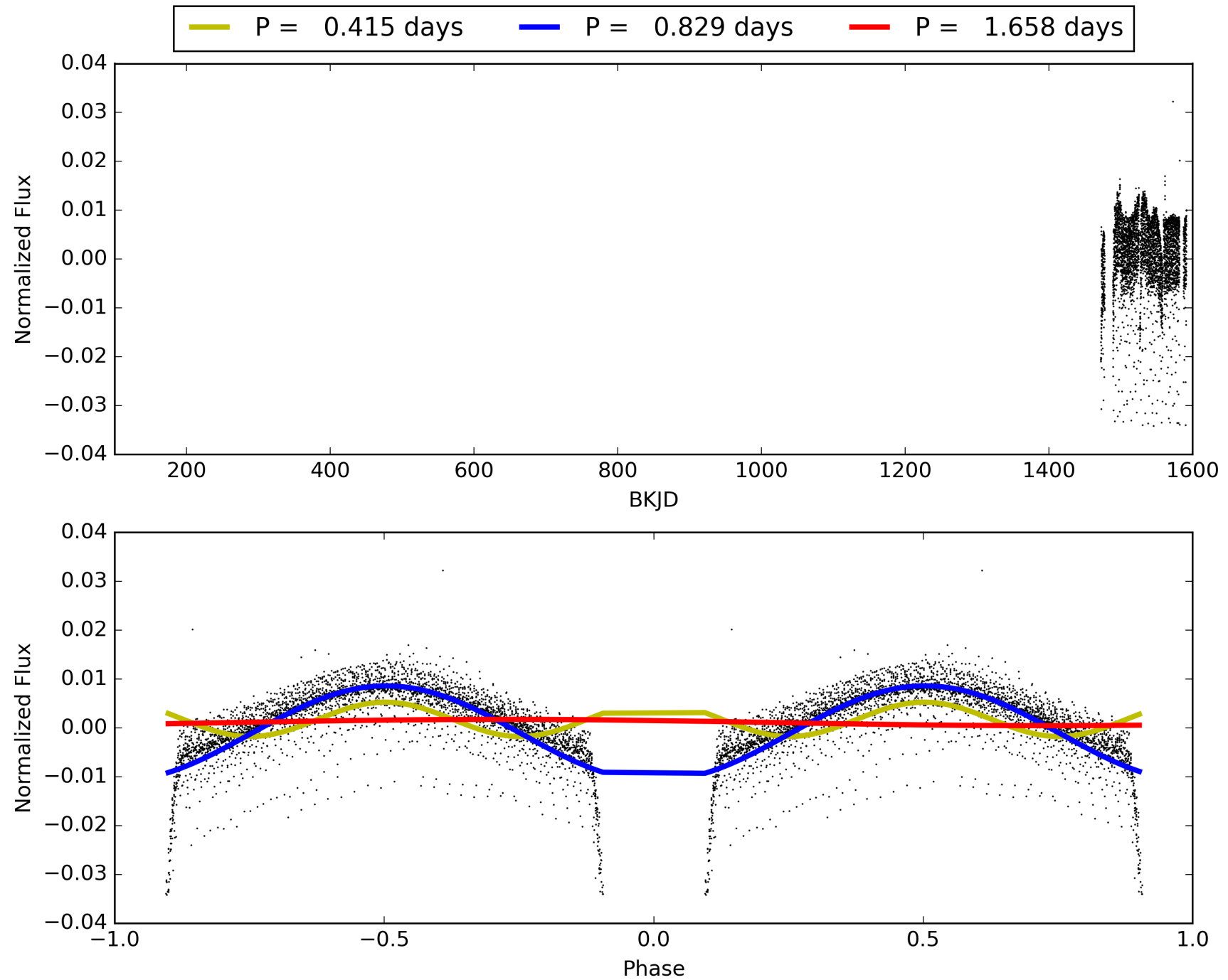
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 07:31:14 Z

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

# TCE 009101400-01, PDC Light Curves

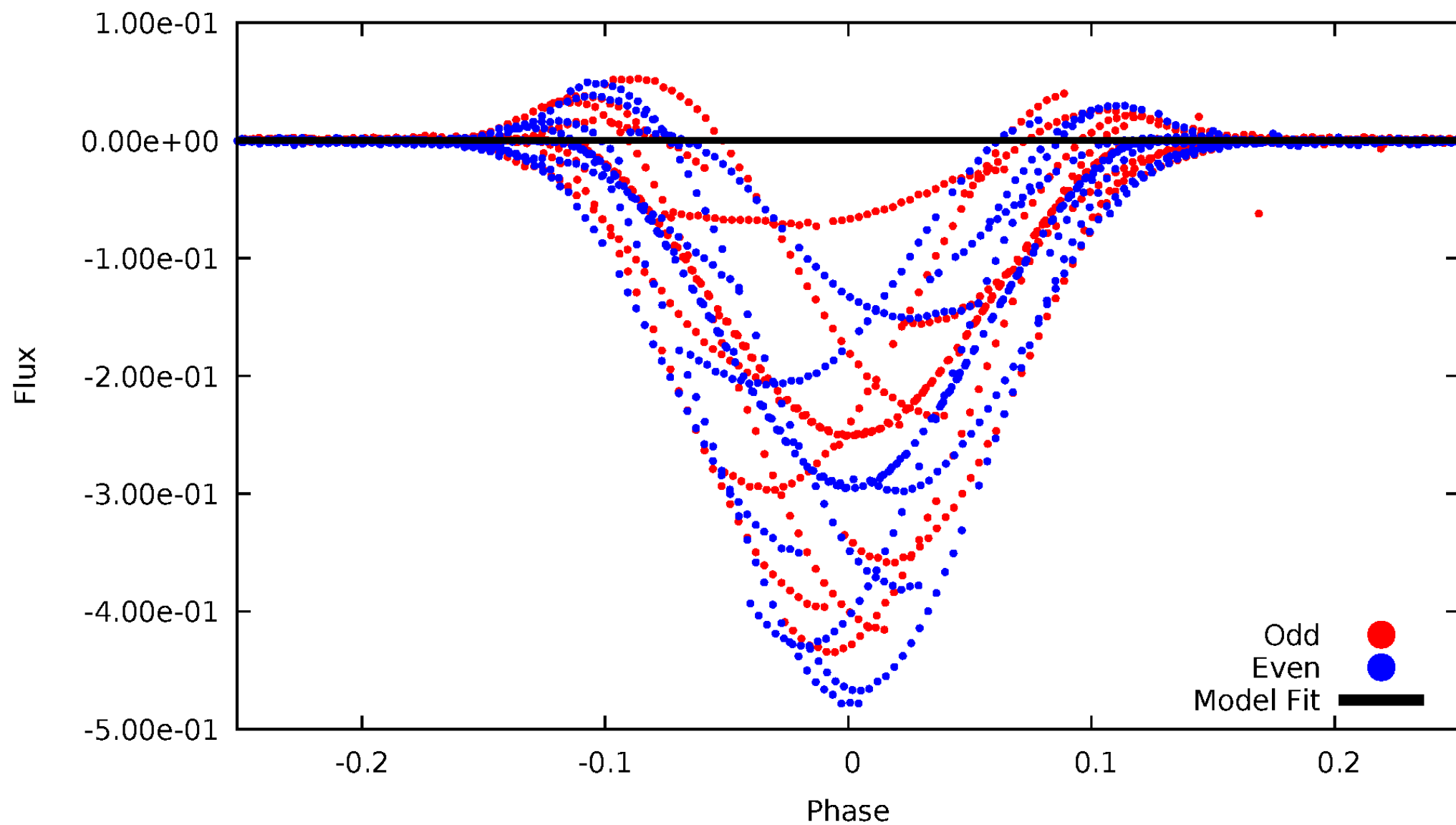


# TCE 009101400-01



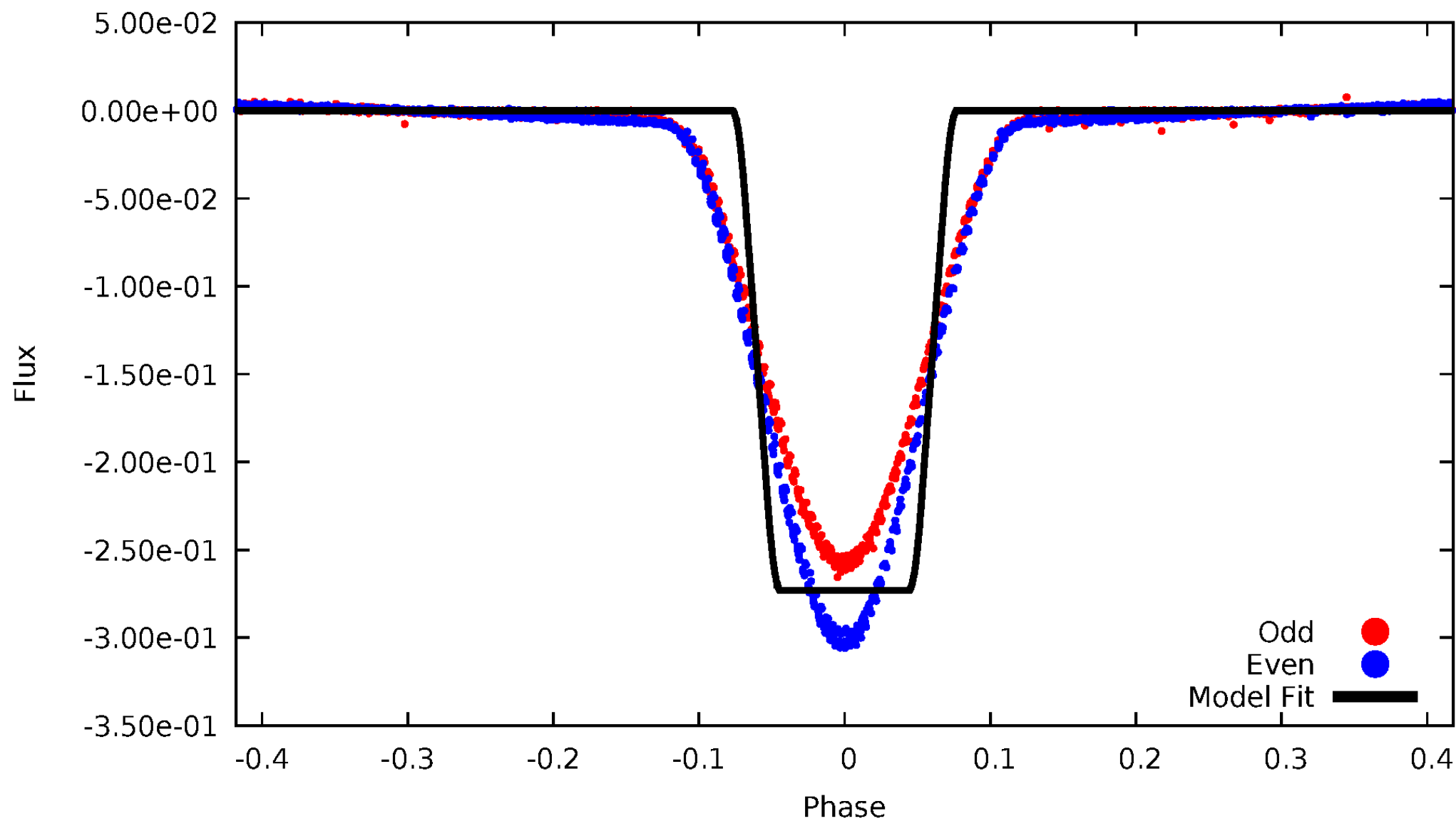
# DV Odd/Even

TCE 009101400-01



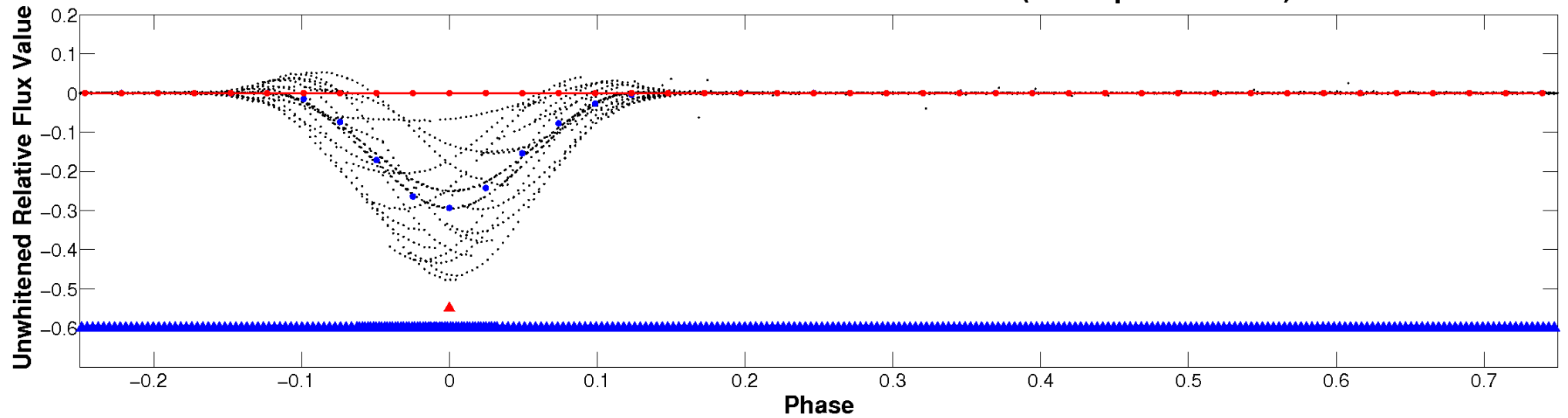
# ALT Odd/Even

TCE 009101400-01



# Non-Whitened Vs. Whitened Light Curve

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

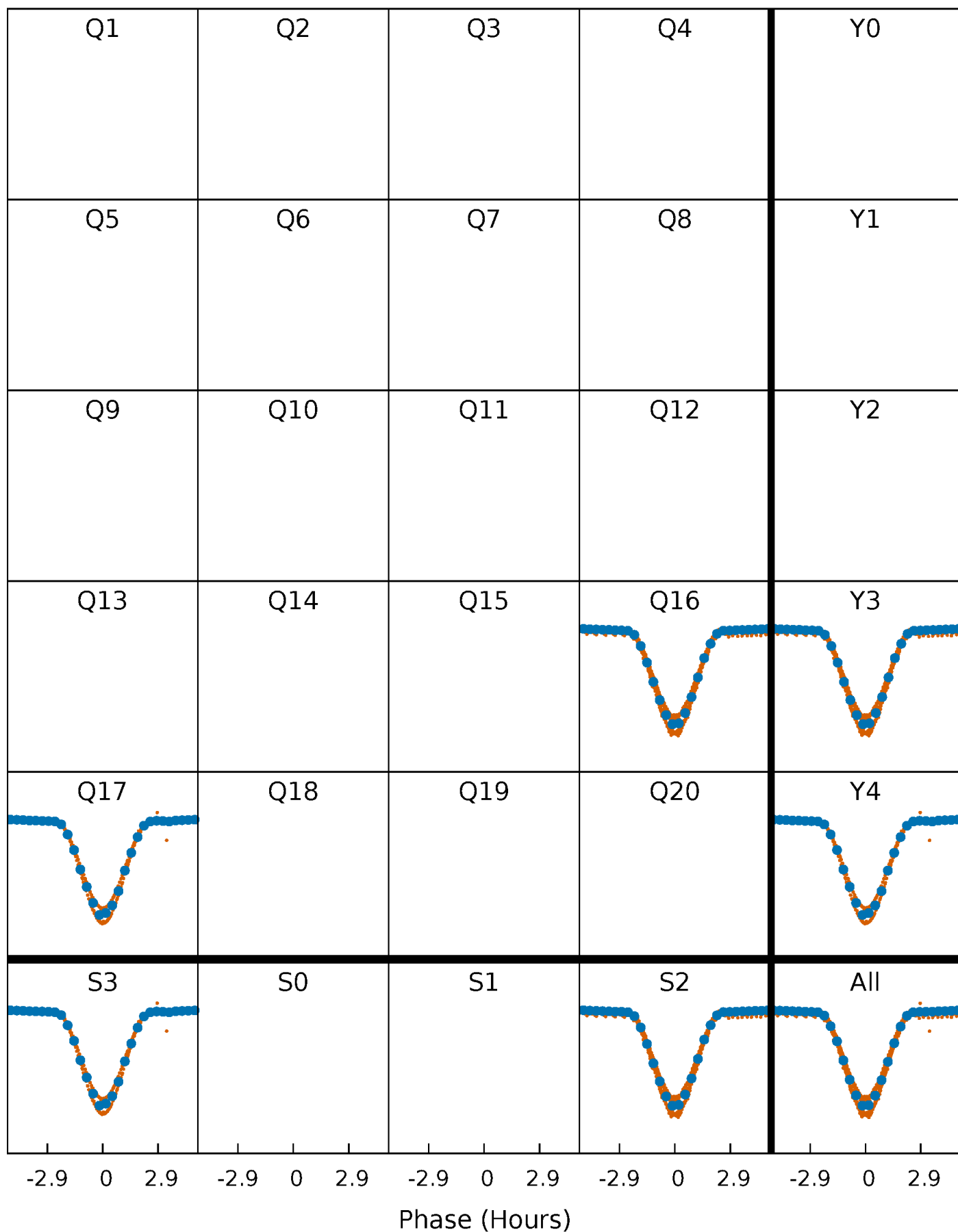


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

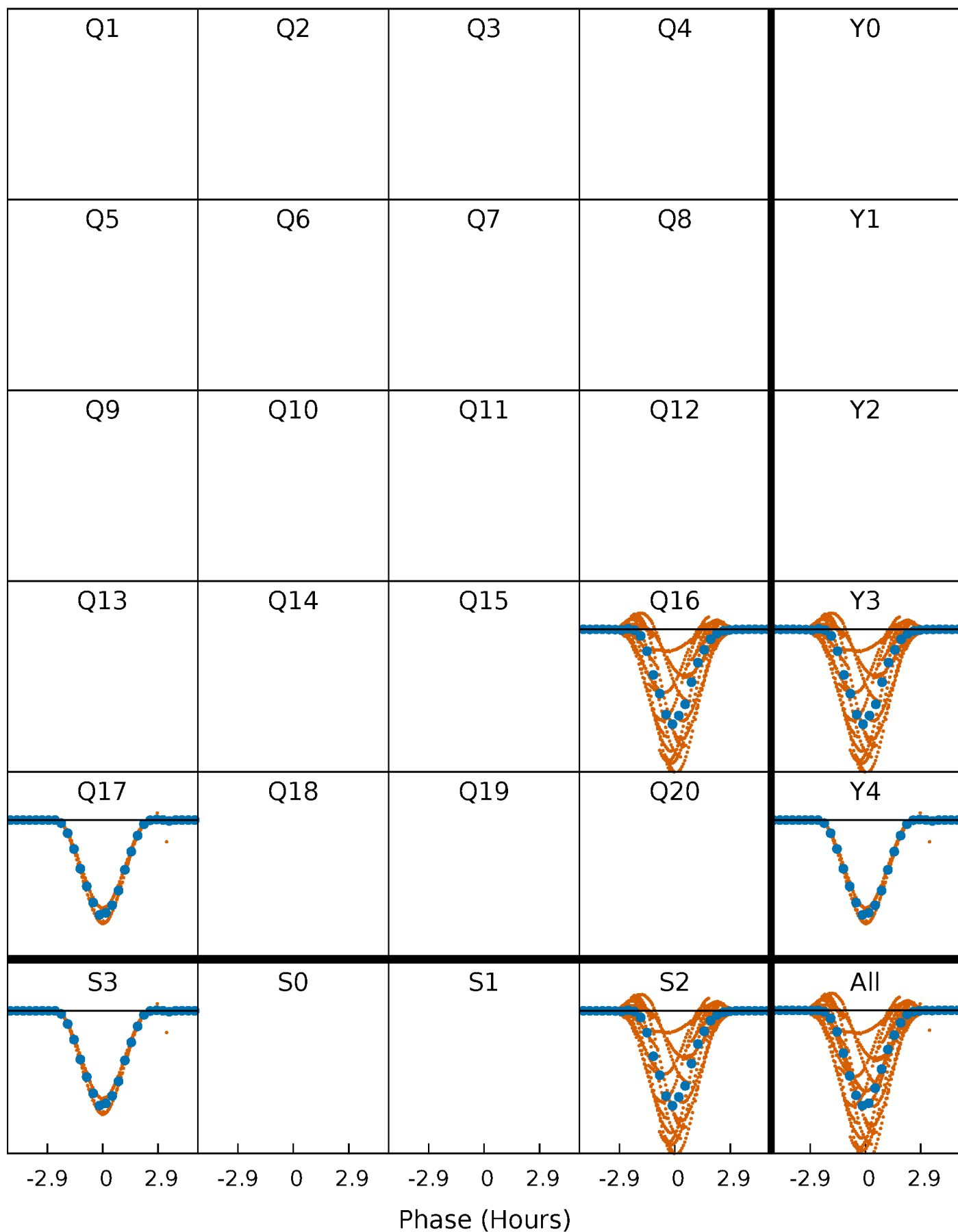
TCE 009101400-01 P= 0.829009 Days  $T_0=132.313077$  (BKJD)





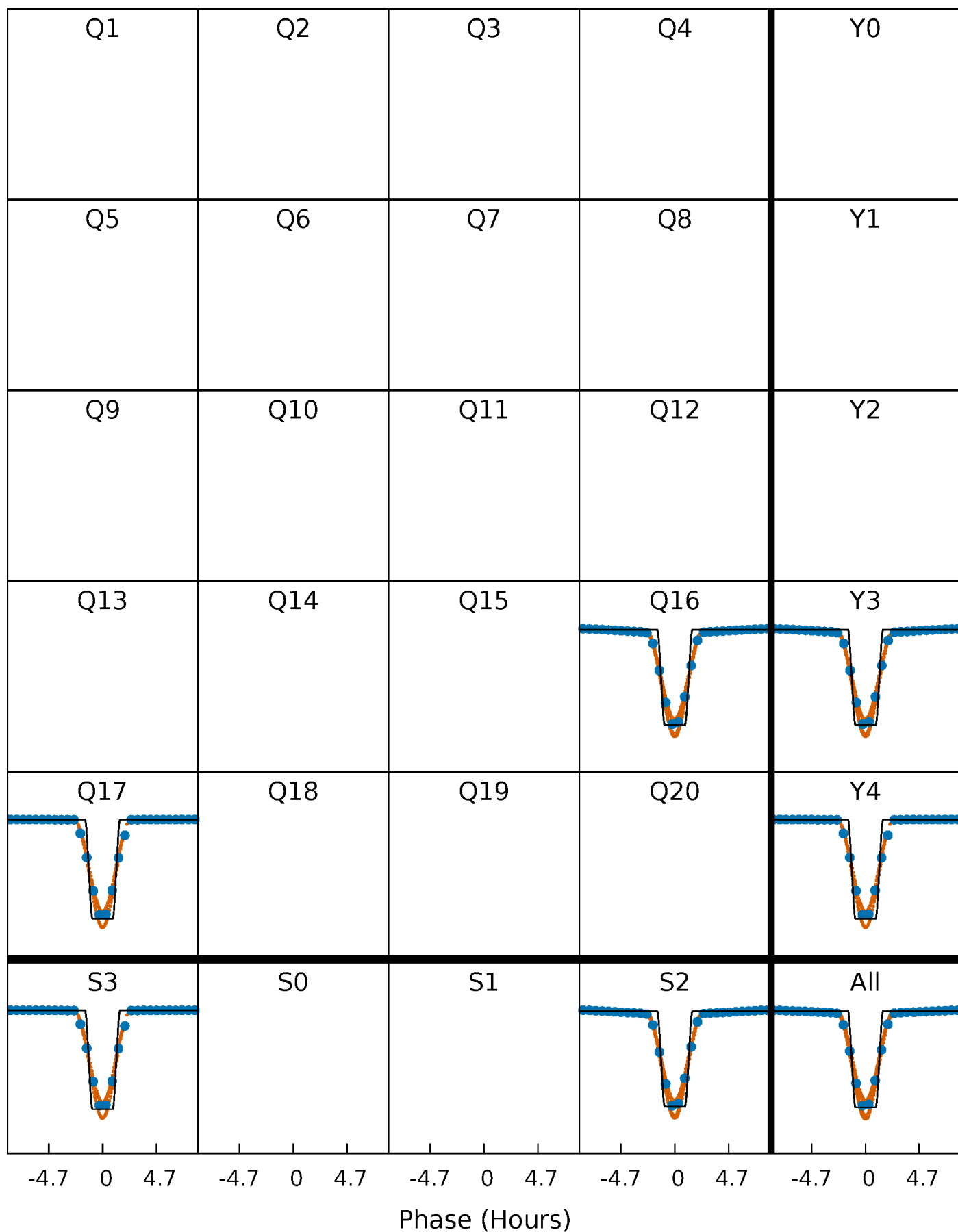
# DV Quarter-Phased Transit Curves

TCE 009101400-01 P= 0.829009 Days  $T_0=132.313077$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

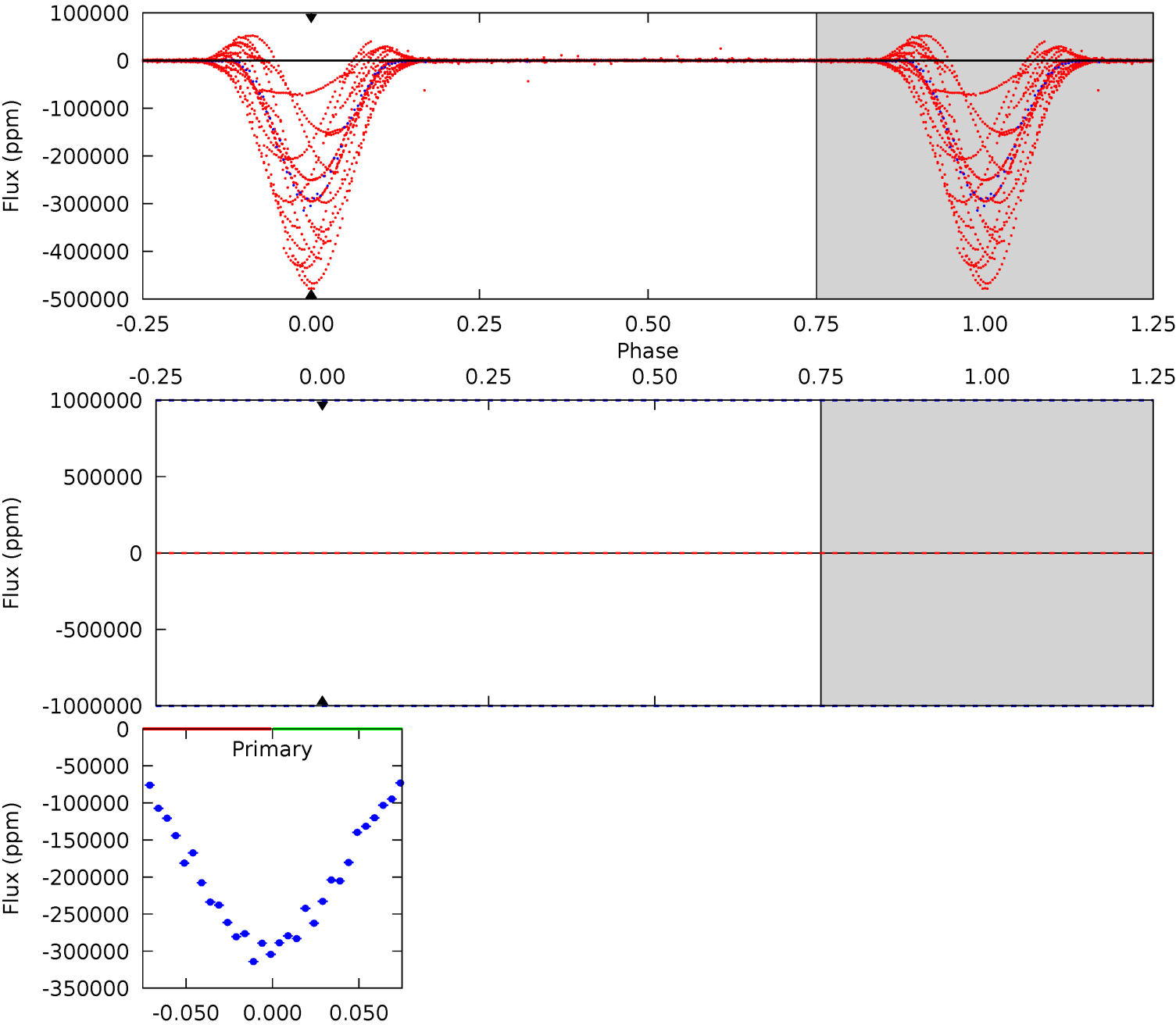
TCE 009101400-01 P= 0.829009 Days  $T_0=132.314017$  (BKJD)



# DV Model-Shift Uniqueness Test

009101400-01, P = 0.829009 Days, E = 132.313077 Days

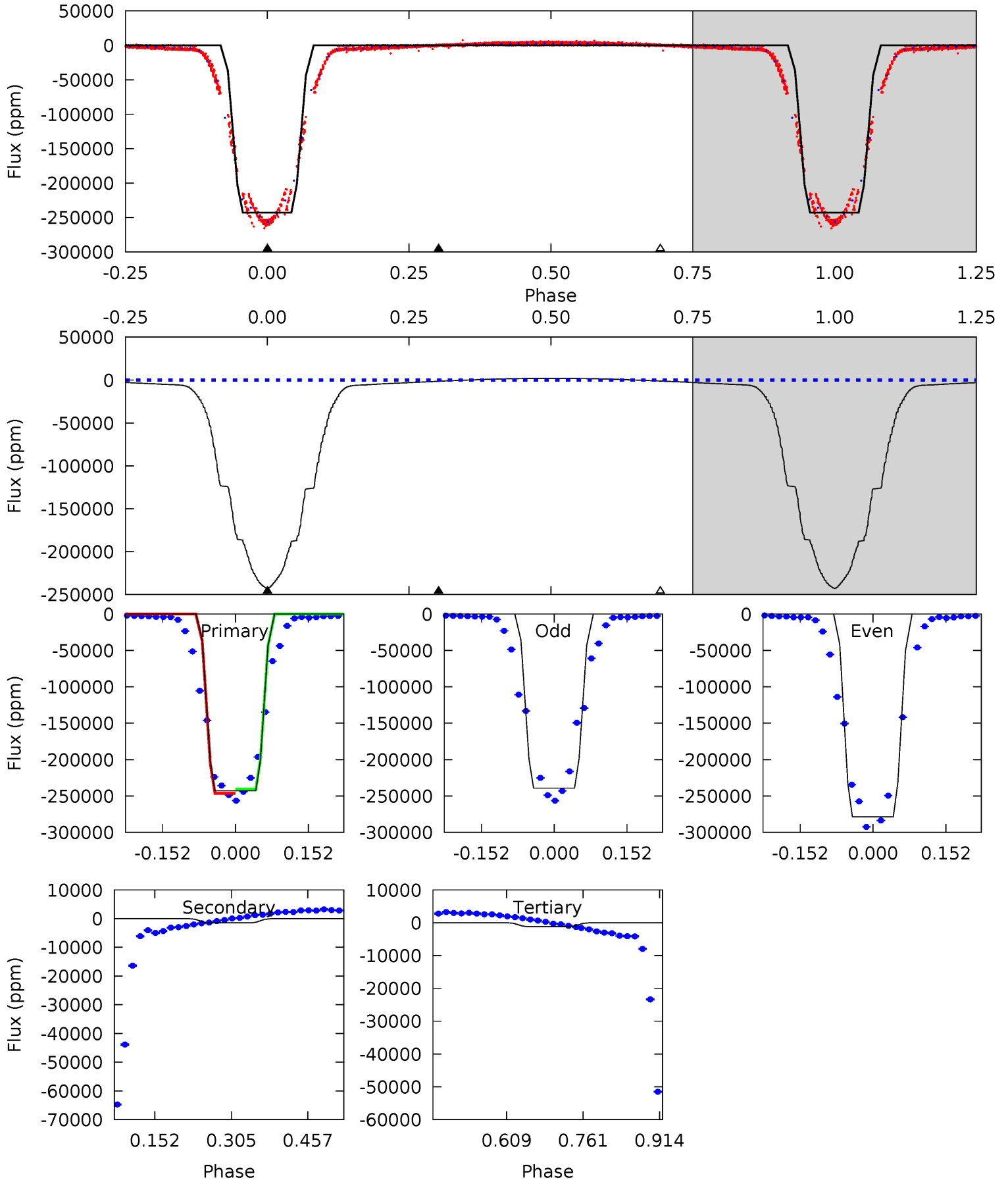
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009101400-01, P = 0.829009 Days, E = 132.314017 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
1575	9.62	7.68	0	4.48	1.43	16.3	1568	1575	1.94	9.62	151.3	1.00	0.01	19.6



### Stellar Parameters For KIC 009101400

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6645^{+186}_{-255}$	$4.271^{+0.124}_{-0.186}$	$-0.240^{+0.250}_{-0.300}$	$1.328^{+0.408}_{-0.220}$	$1.206^{+0.183}_{-0.183}$	$0.726^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+104%/-125%	+31%/-17%	+15%/-15%	+60%/-51%
Source	KIC0	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 009101400-01 / KOI 6192.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$56.16^{+18.36}_{-16.17}$	$3497^{+267}_{-215}$	$-3797^{+9740}_{-2300}$	$-0.300^{+6.356}_{-5.978}$
Alt.	$-1483 \pm 154$	$76.60^{+19.31}_{-16.63}$	$3488^{+267}_{-203}$	$-3282^{+139}_{-176}$	$0.047^{+0.027}_{-0.017}$

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

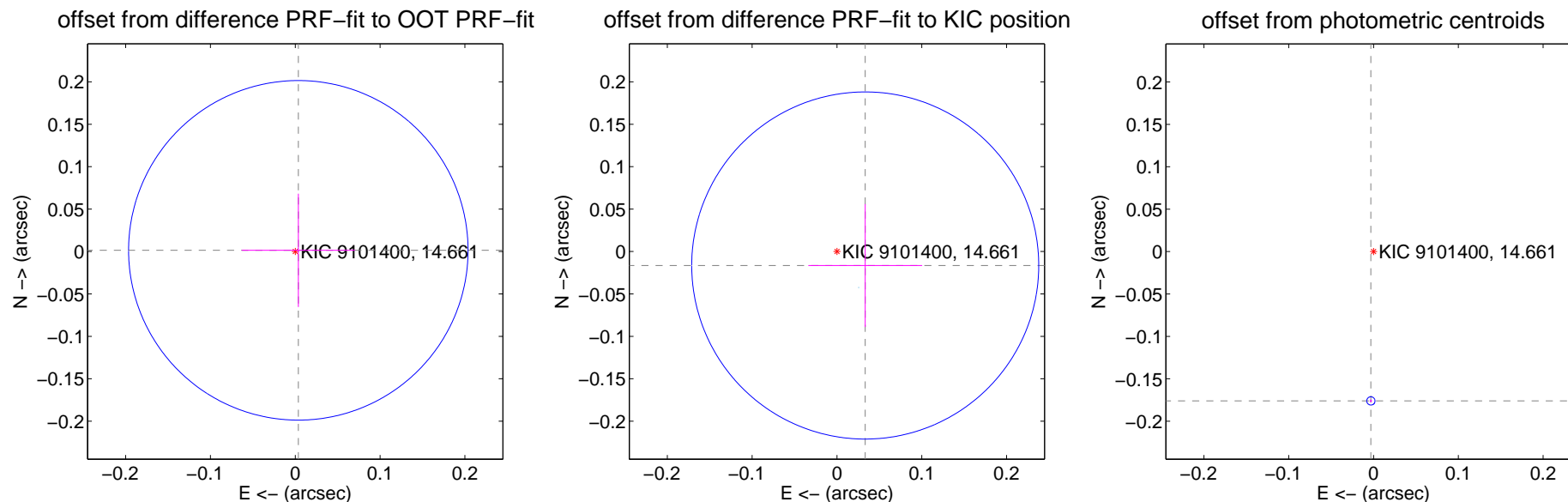
## DV Centroid Data

Supplemental centroid analysis for 009101400-01. Kepler magnitude: 14.66. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.004 \pm 0.067$	0.06	$-0.004 \pm 0.067$	$0.001 \pm 0.067$
PRF-fit source offset from KIC position	$0.037 \pm 0.068$	0.55	$-0.033 \pm 0.067$	$-0.016 \pm 0.072$
photometric centroid source offset	$0.18 \pm 0.00$	108.55	$0.00 \pm 0.00$	$-0.18 \pm 0.00$



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.

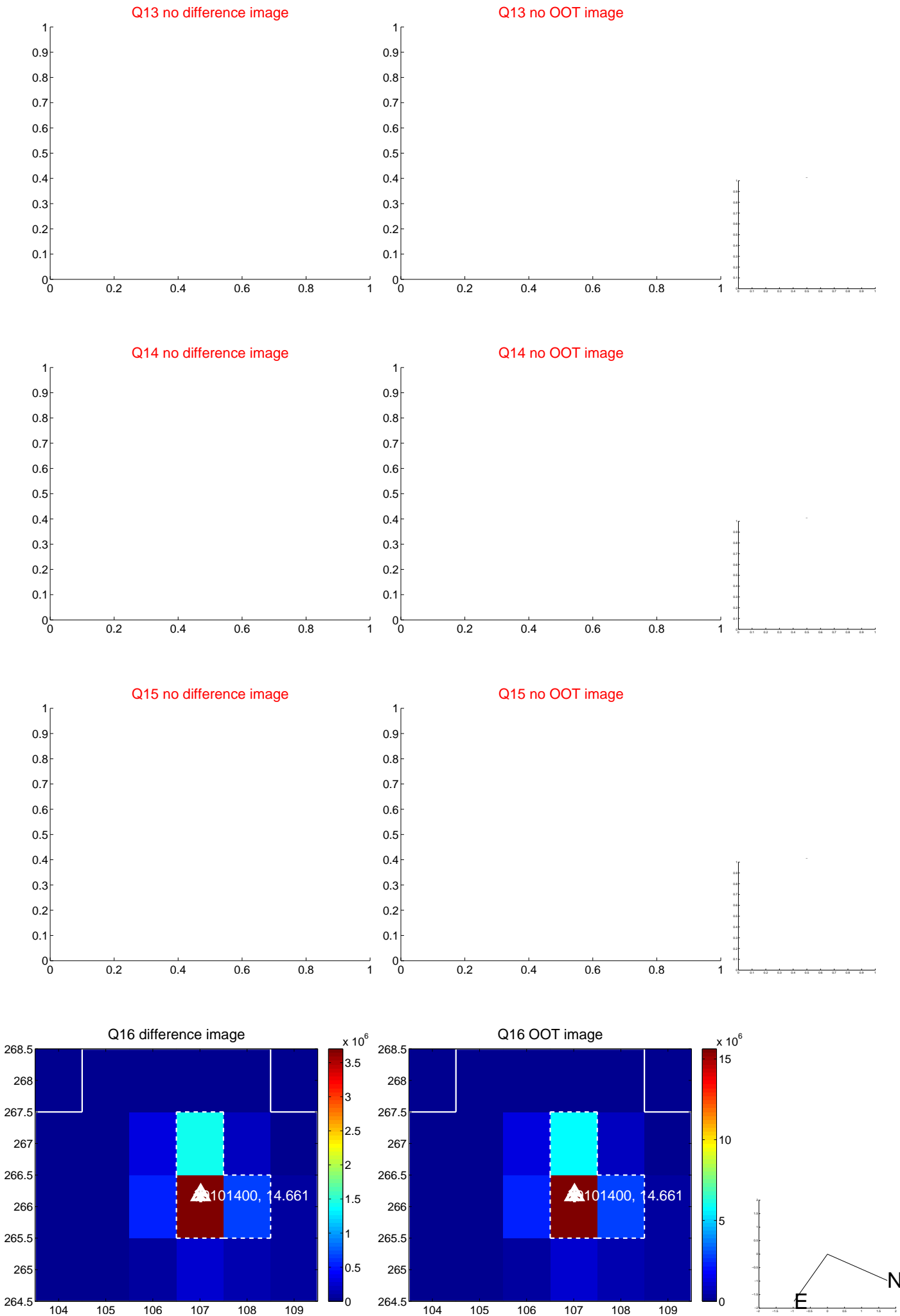




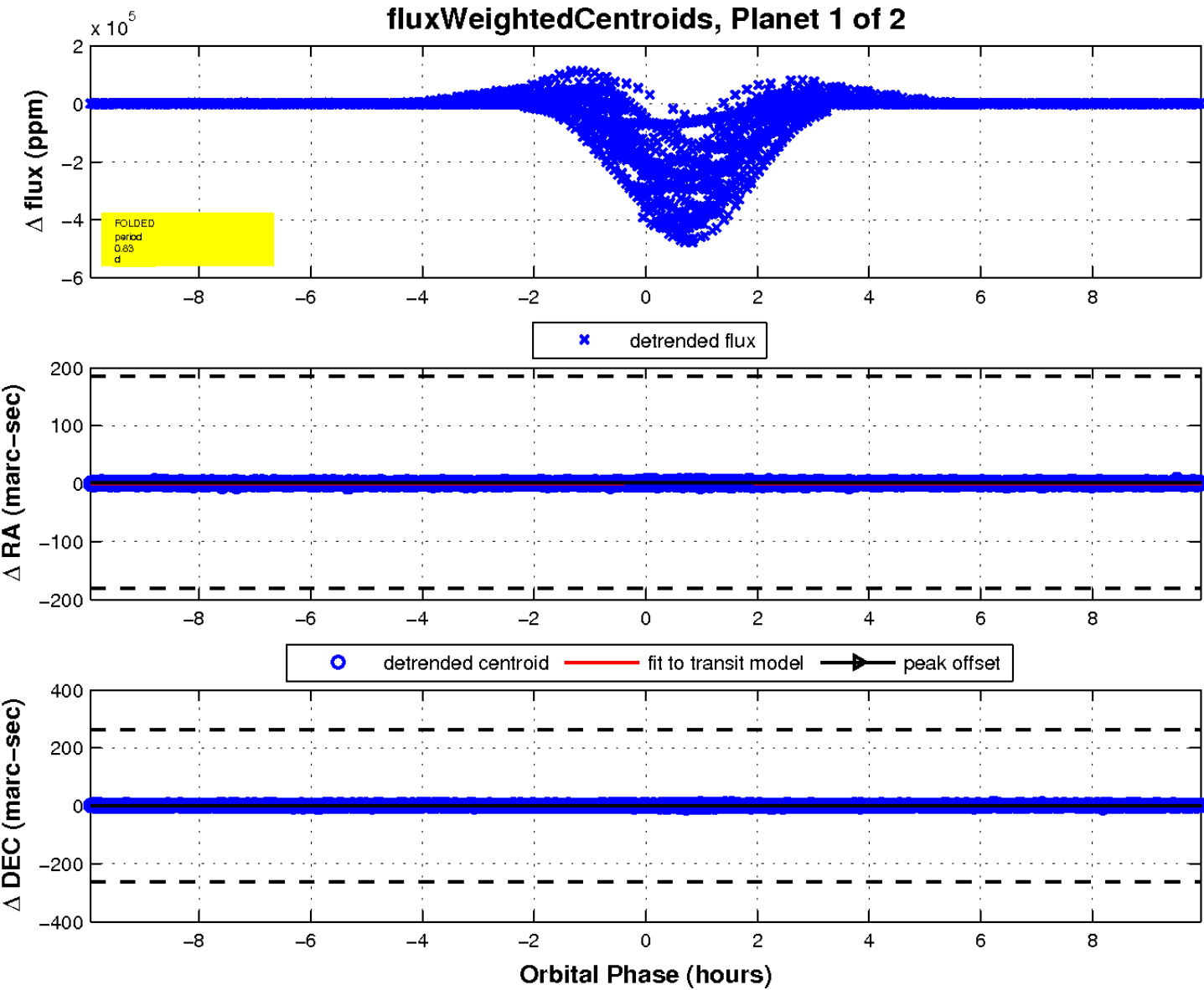
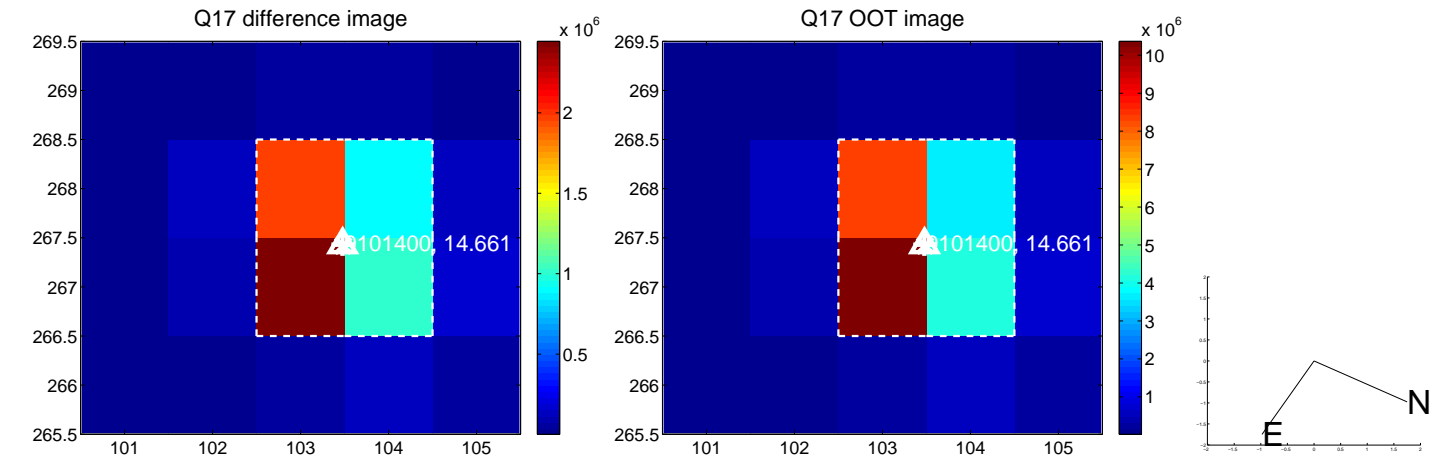
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

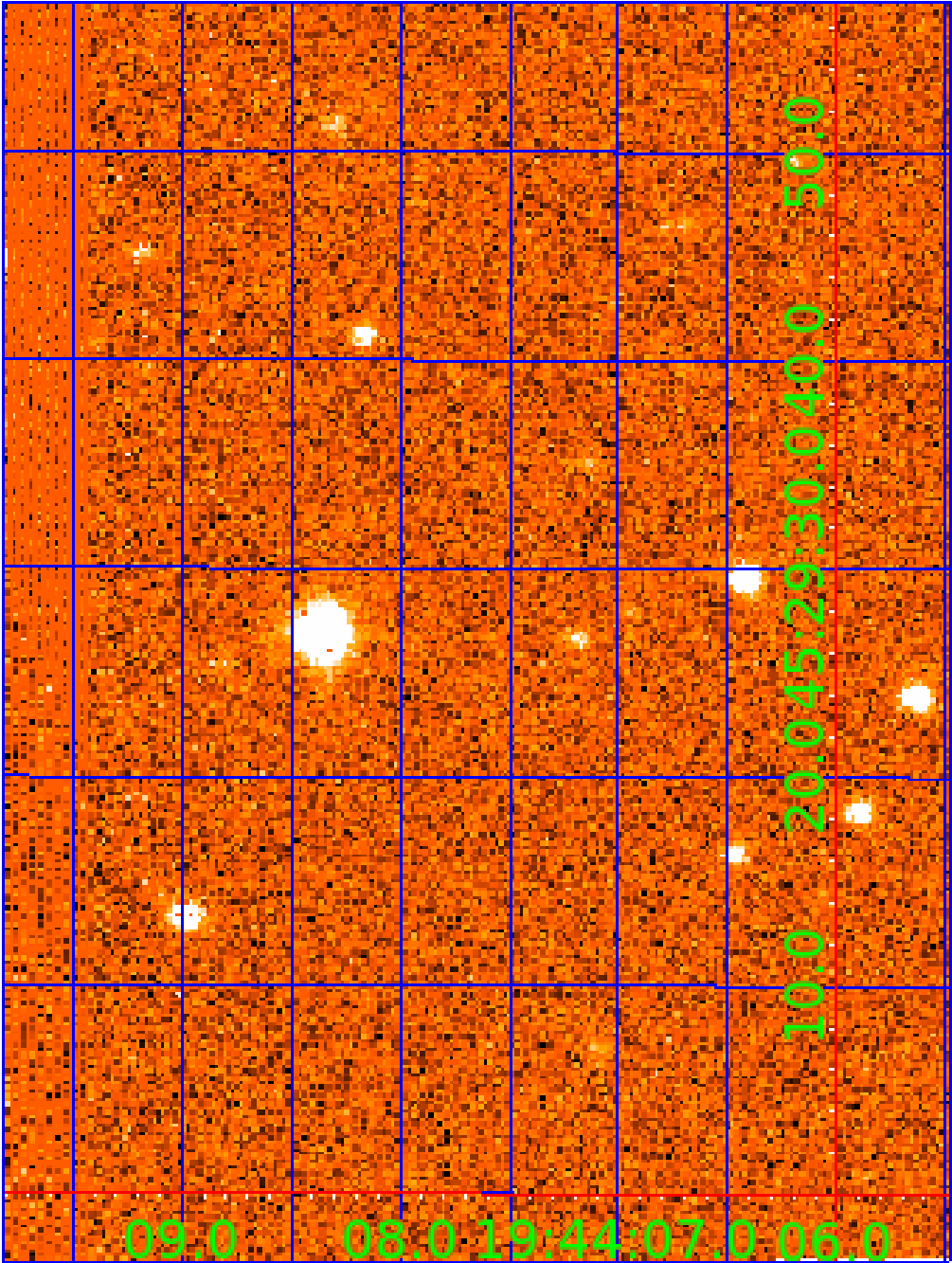


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009101400

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009101400-01	OBS	6192.01	0.829009	132.313077	370878.9	2.500	3423.0	-1.0	1.33	6645	55.80	9139.61
009101400-02	OBS	No	4.977141	132.262618	90945.8	9.345	236.1	205.4	1.33	6645	61.76	837.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009101400-01	OBS	FP	0.00	0	1	1	0	SWEET_EB—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_ALT—CENT_NOFITS—HALO_GHOST
009101400-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

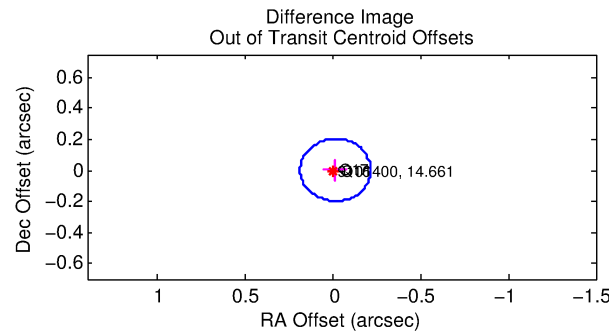
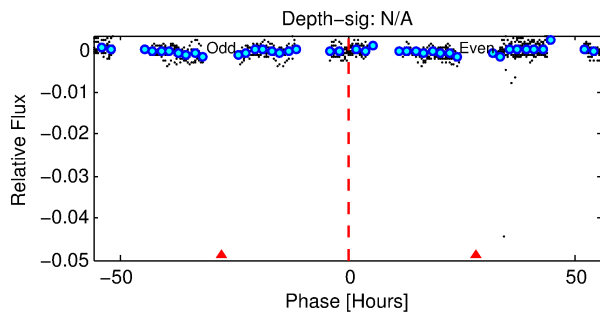
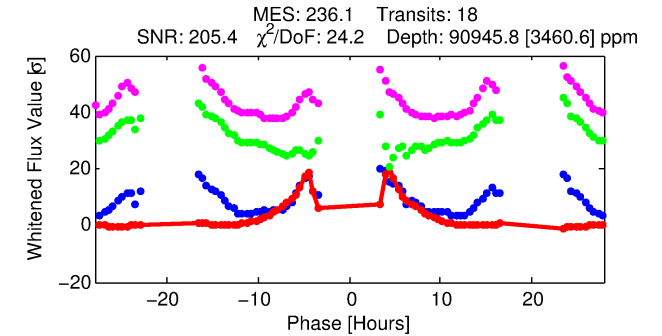
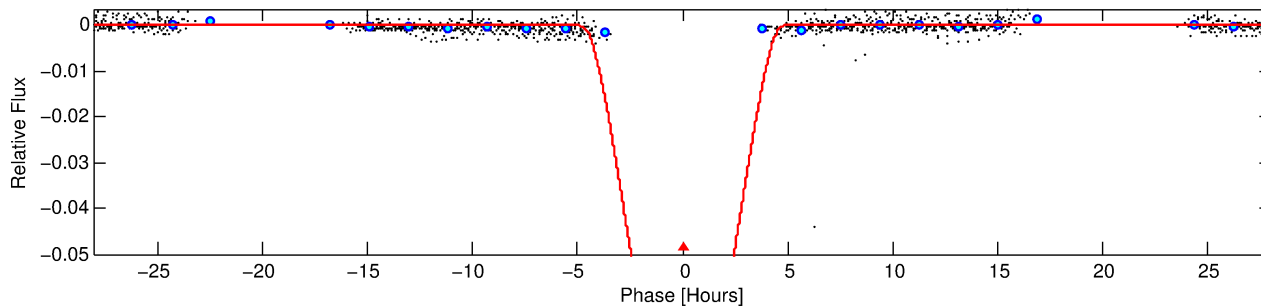
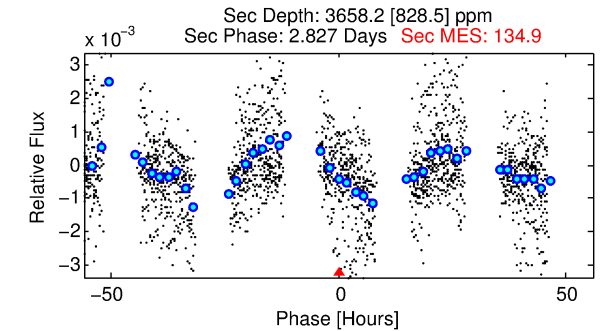
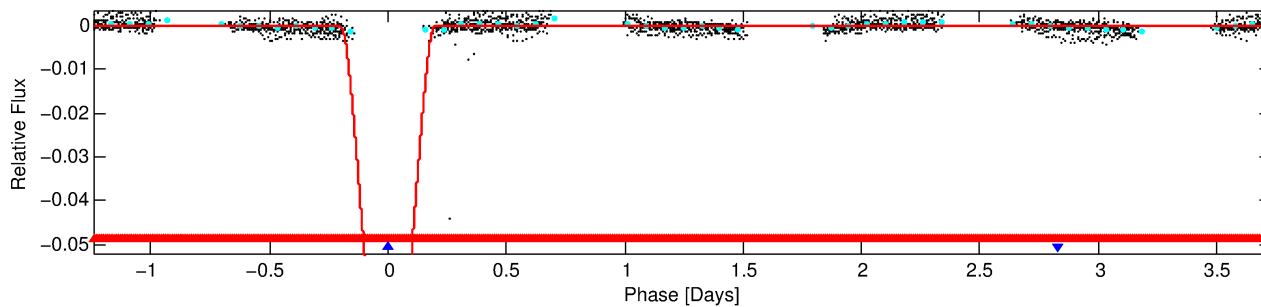
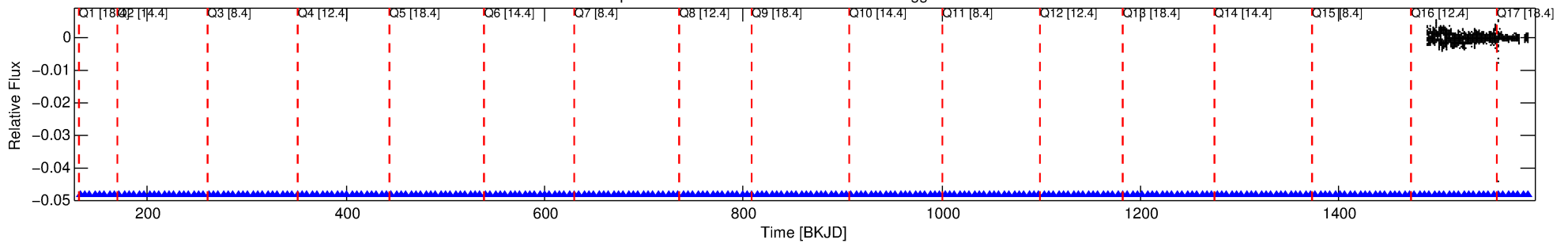
## Ephemeris Match Information For 009101400-02

No Significant Match Found

# DV One-Page Summary

KIC: 9101400 Candidate: 2 of 2 Period: 4.977 d  
KOI: K06192 Corr: No Ephemeris Match

Kp: 14.66 R\*: 1.33 Rs Teff: 6645.0 K Logg: 4.27 Fe/H: -0.240



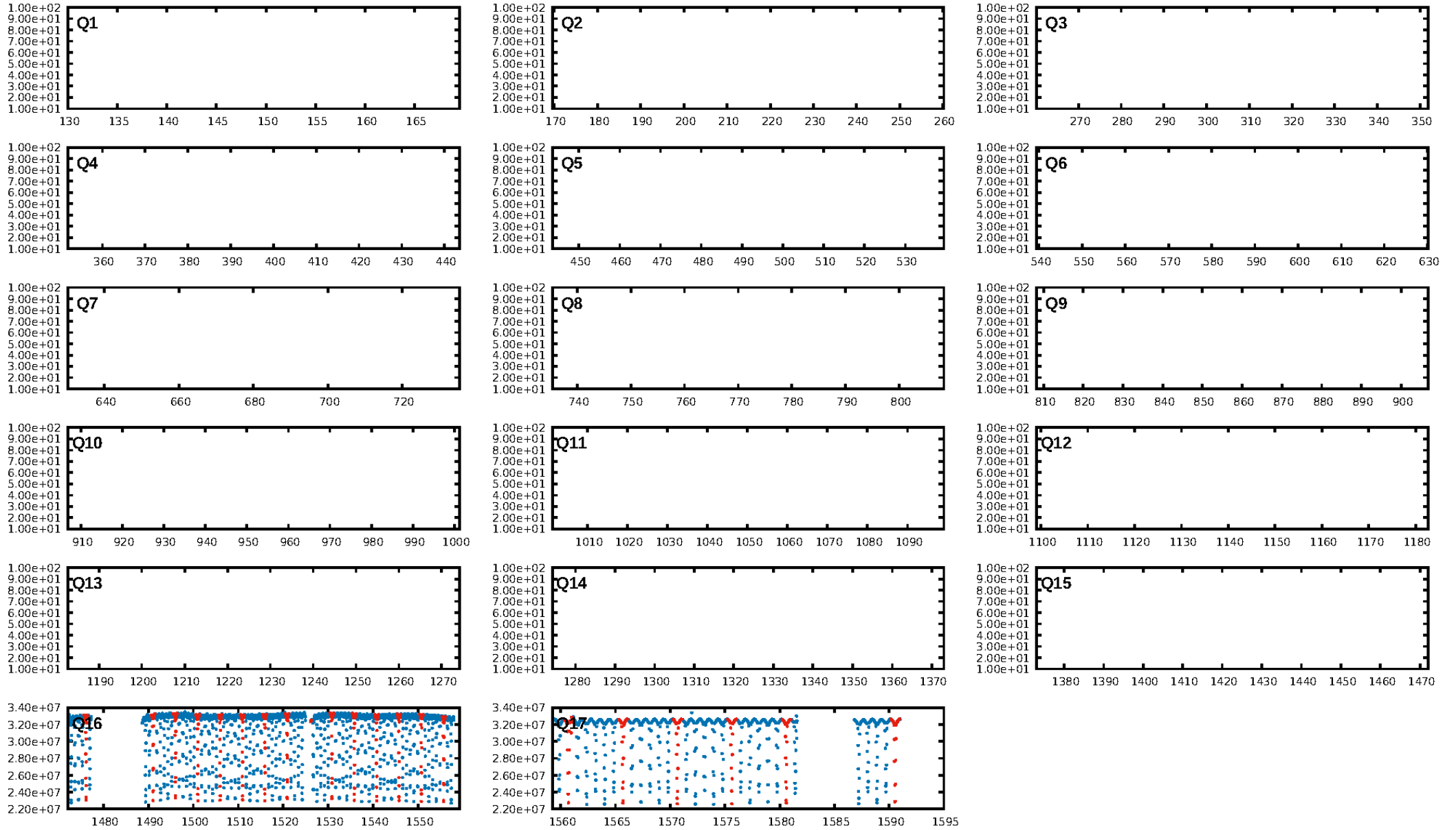
## DV Fit Results:

Period = 4.97714 [0.00002] d  
Epoch = 132.2626 [0.0057] BKJD  
Rp/R\* = 0.4262 [2.5396]  
a/R\* = 4.49 [1.66]  
b = 0.94 [3.57]  
Seff = 837.59 [321.18]  
Teq = 1372 [132] K  
Rp = 61.76 [368.52] Re  
a = 0.0606 [0.0151] AU  
Ag = 1.94 [23.15] [0.04σ]  
Teffp = 2503 [7461] K [0.15σ]

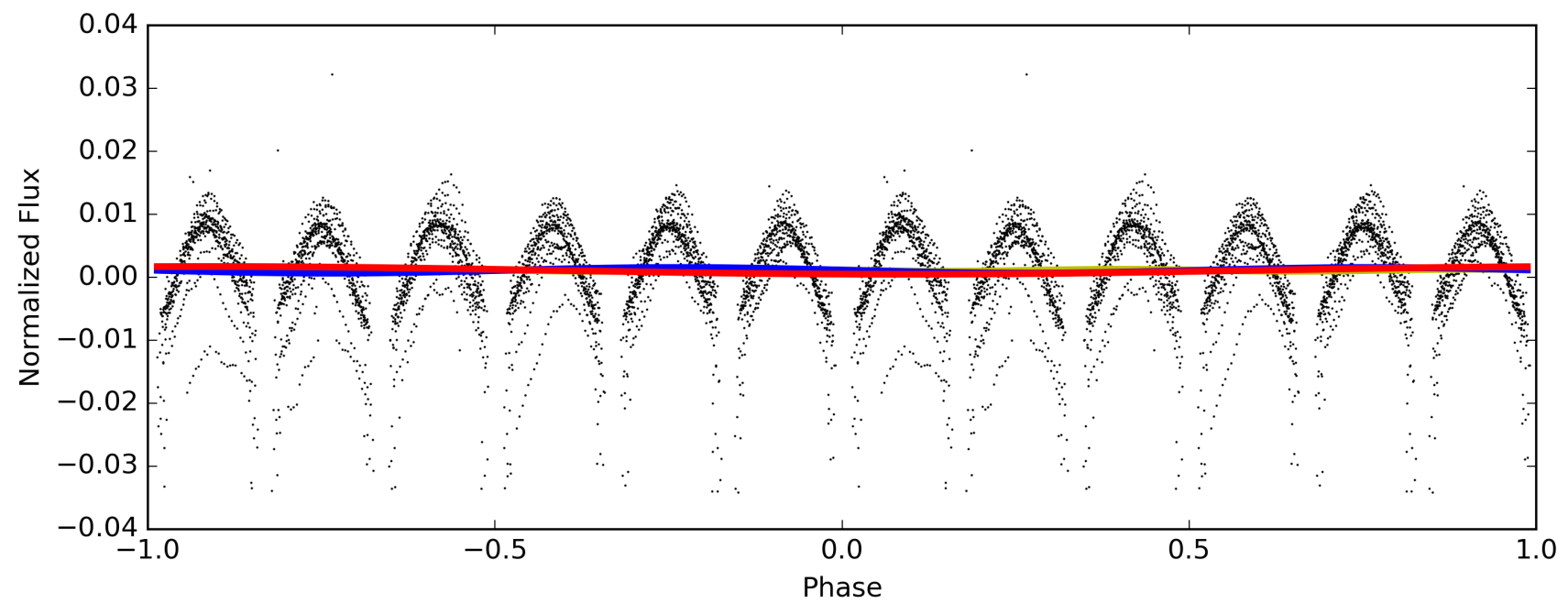
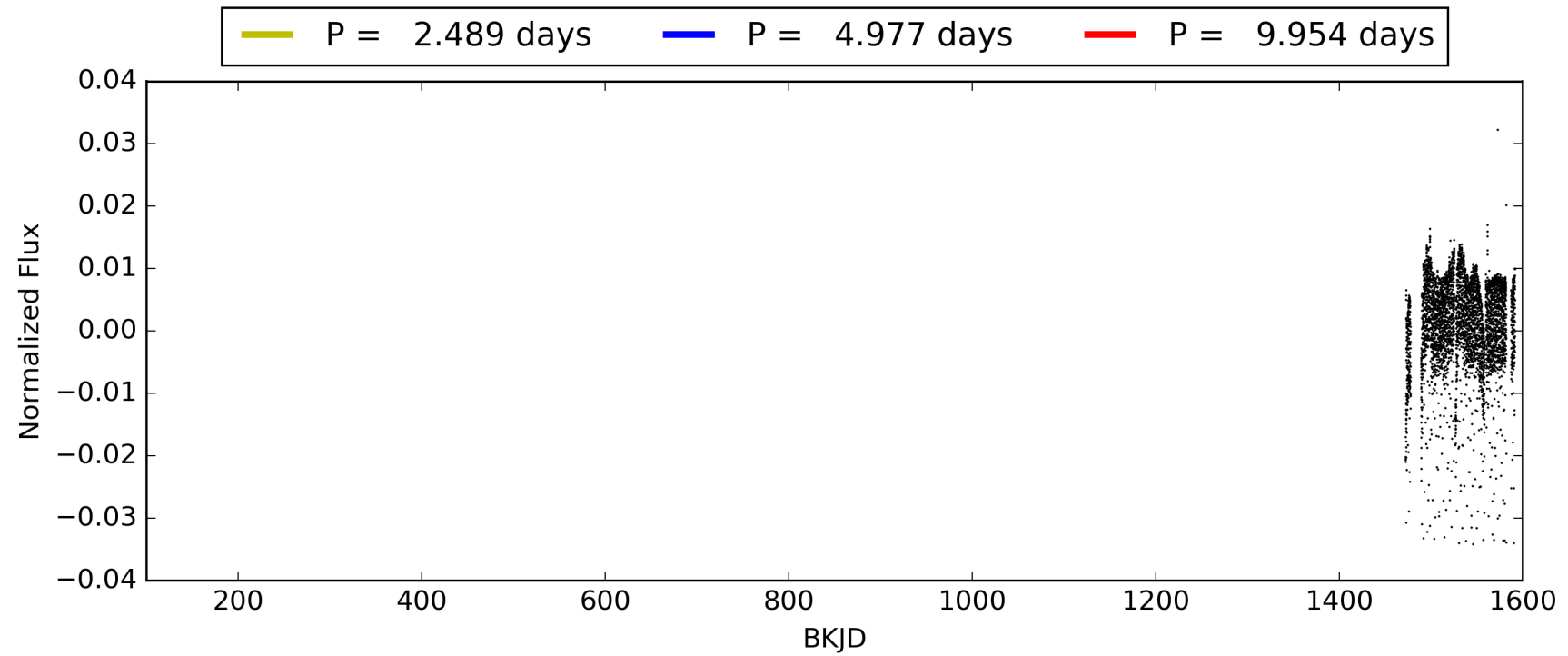
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.29σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: 27.03  
Centroid-sig: 2.3%  
Centroid-so: 0.183 arcsec [37.28σ]  
OotOffset-rm: 0.015 arcsec [0.23σ]  
KicOffset-rm: 0.049 arcsec [0.72σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.00 [0/2]

# TCE 009101400-02, PDC Light Curves



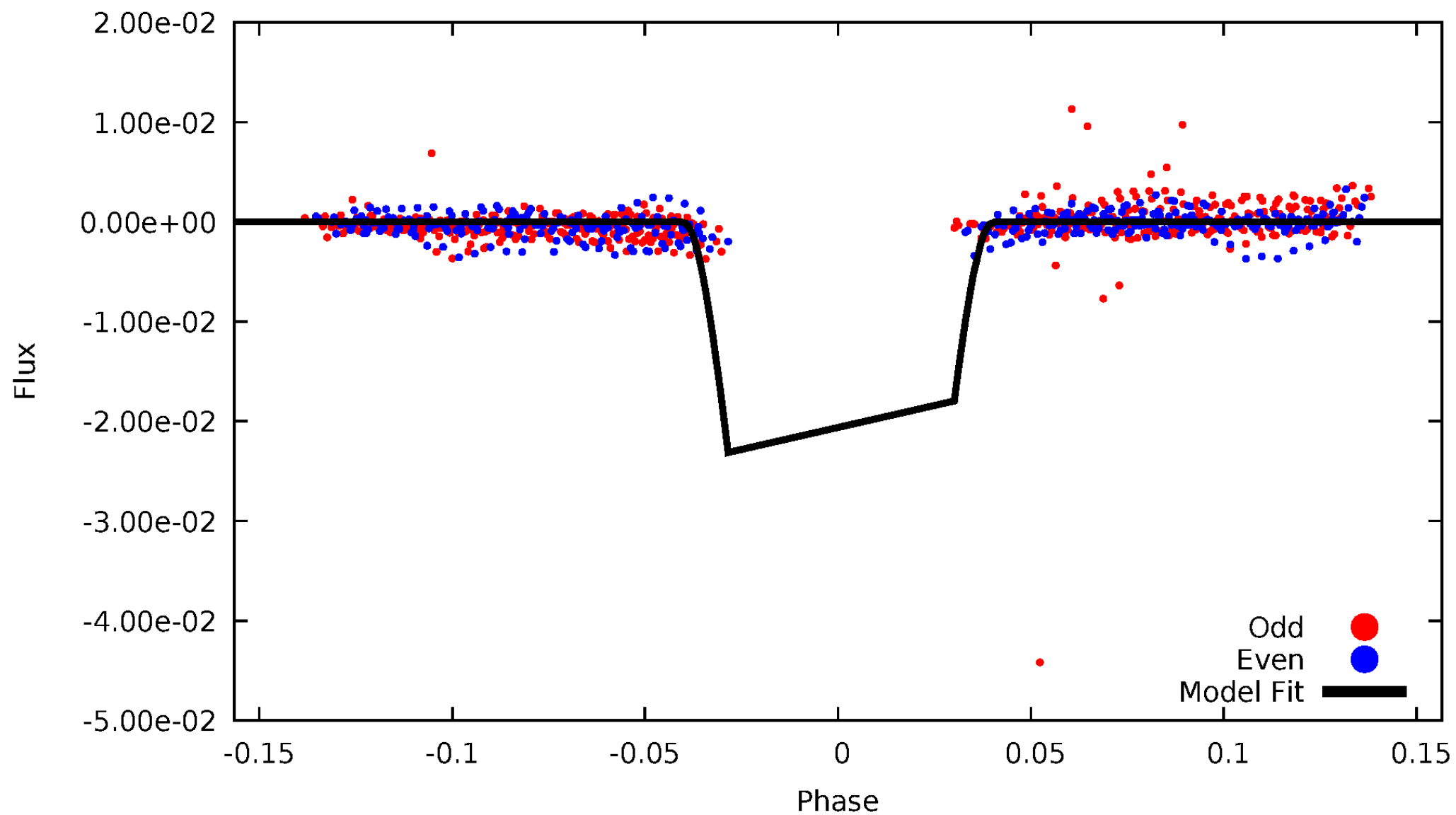
TCE 009101400-02





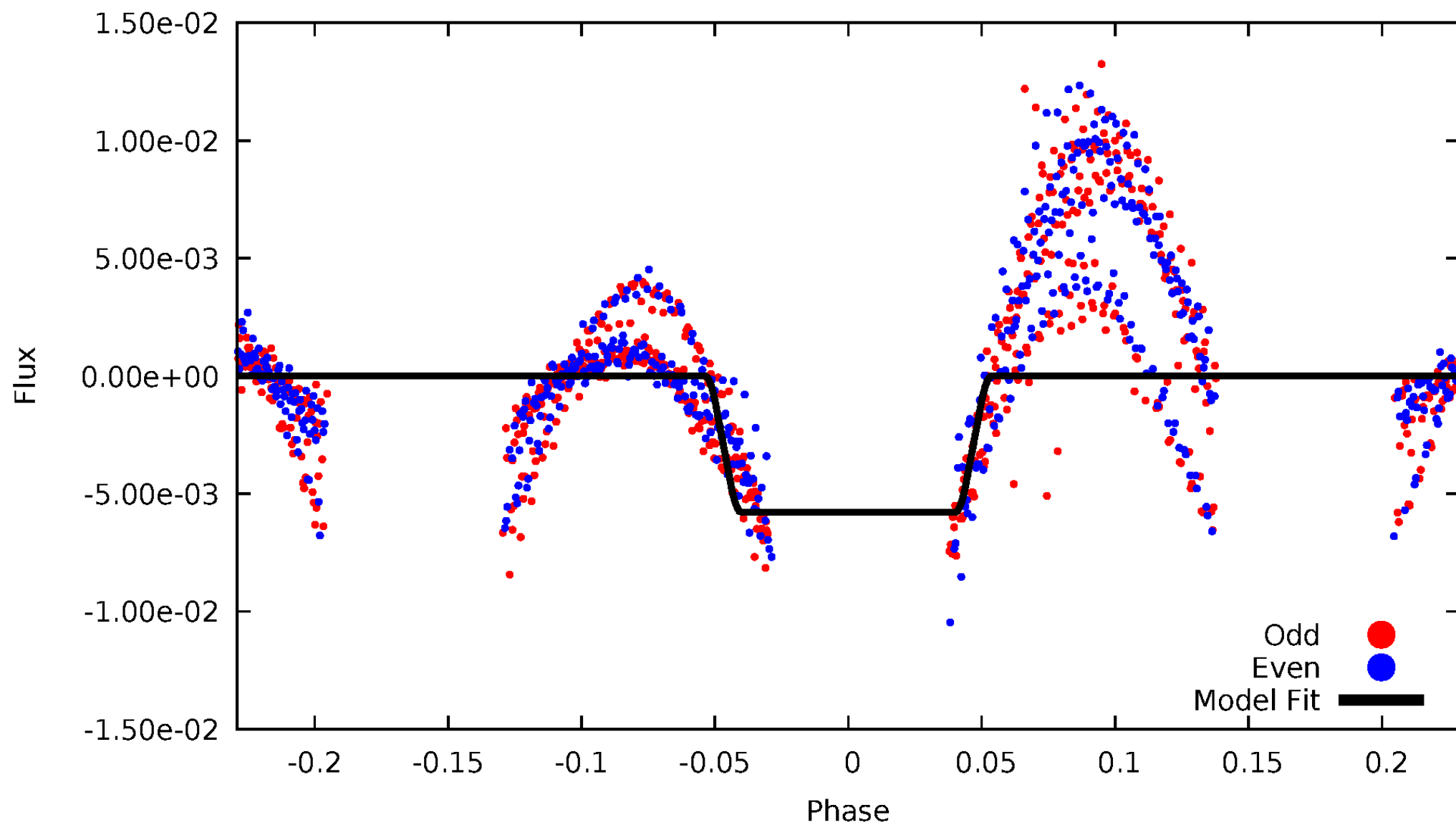
DV Odd/Even

TCE 009101400-02



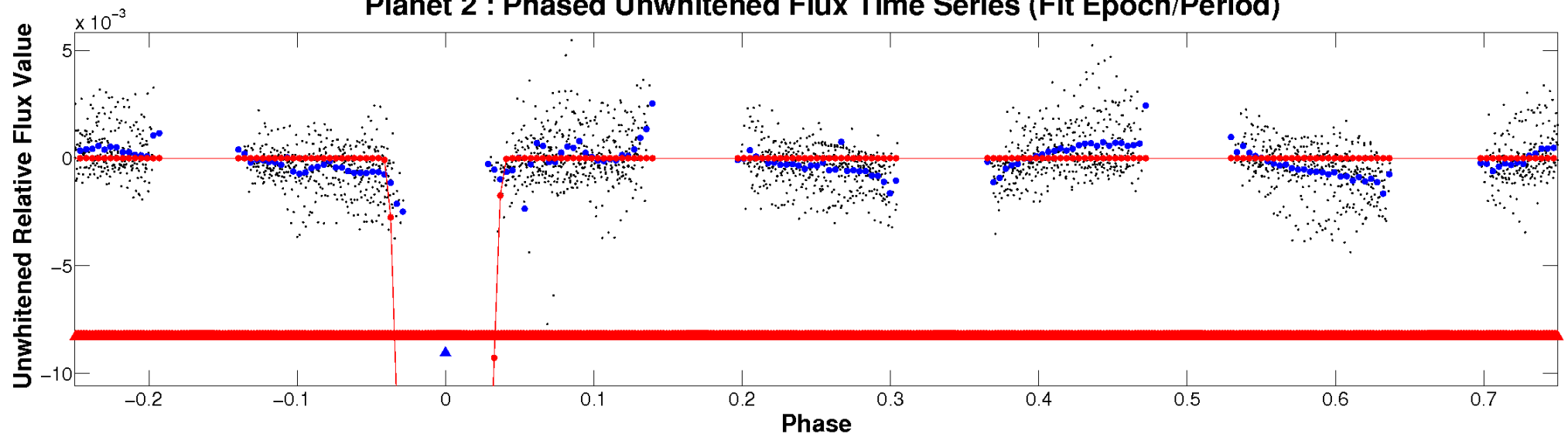
# ALT Odd/Even

TCE 009101400-02

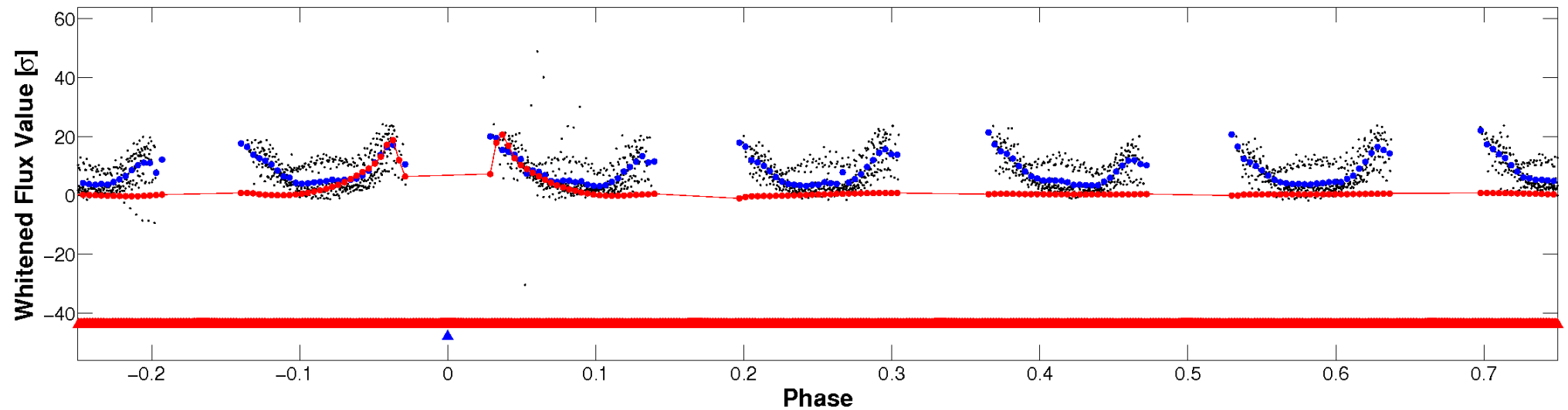


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

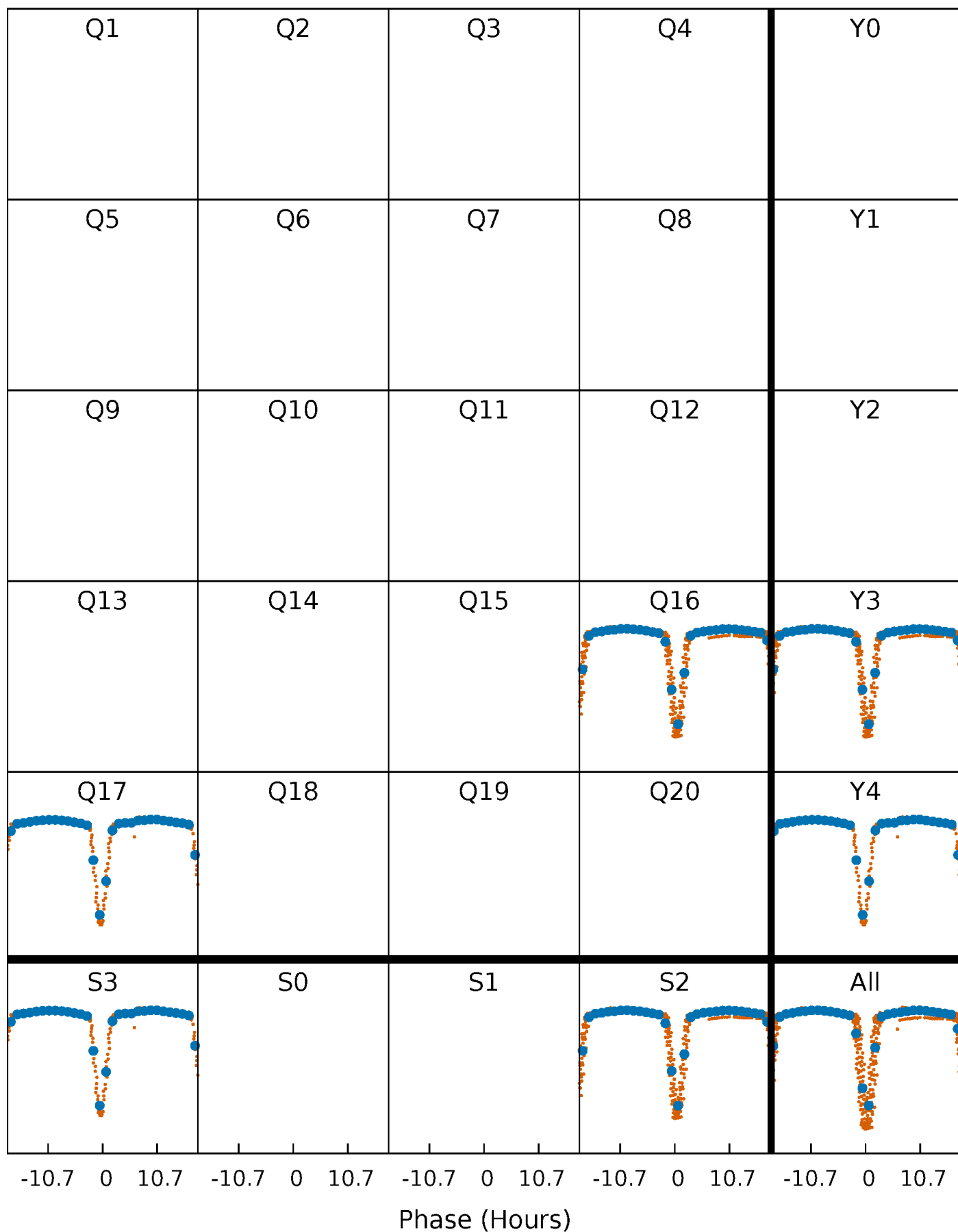


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



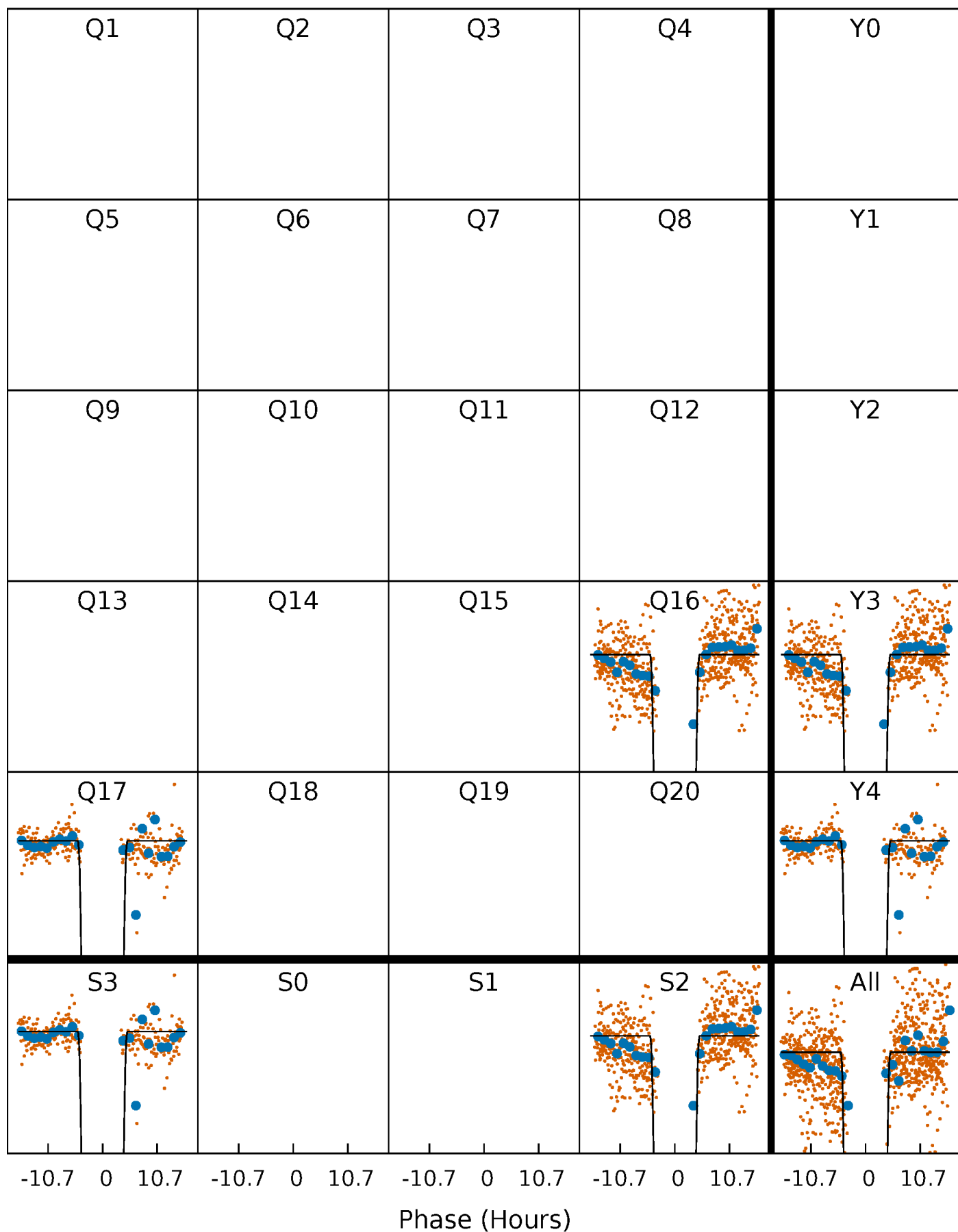
# PDC Quarter-Phased Transit Curves

TCE 009101400-02     $P = 4.977141$  Days     $T_0 = 132.262618$  (BKJD)



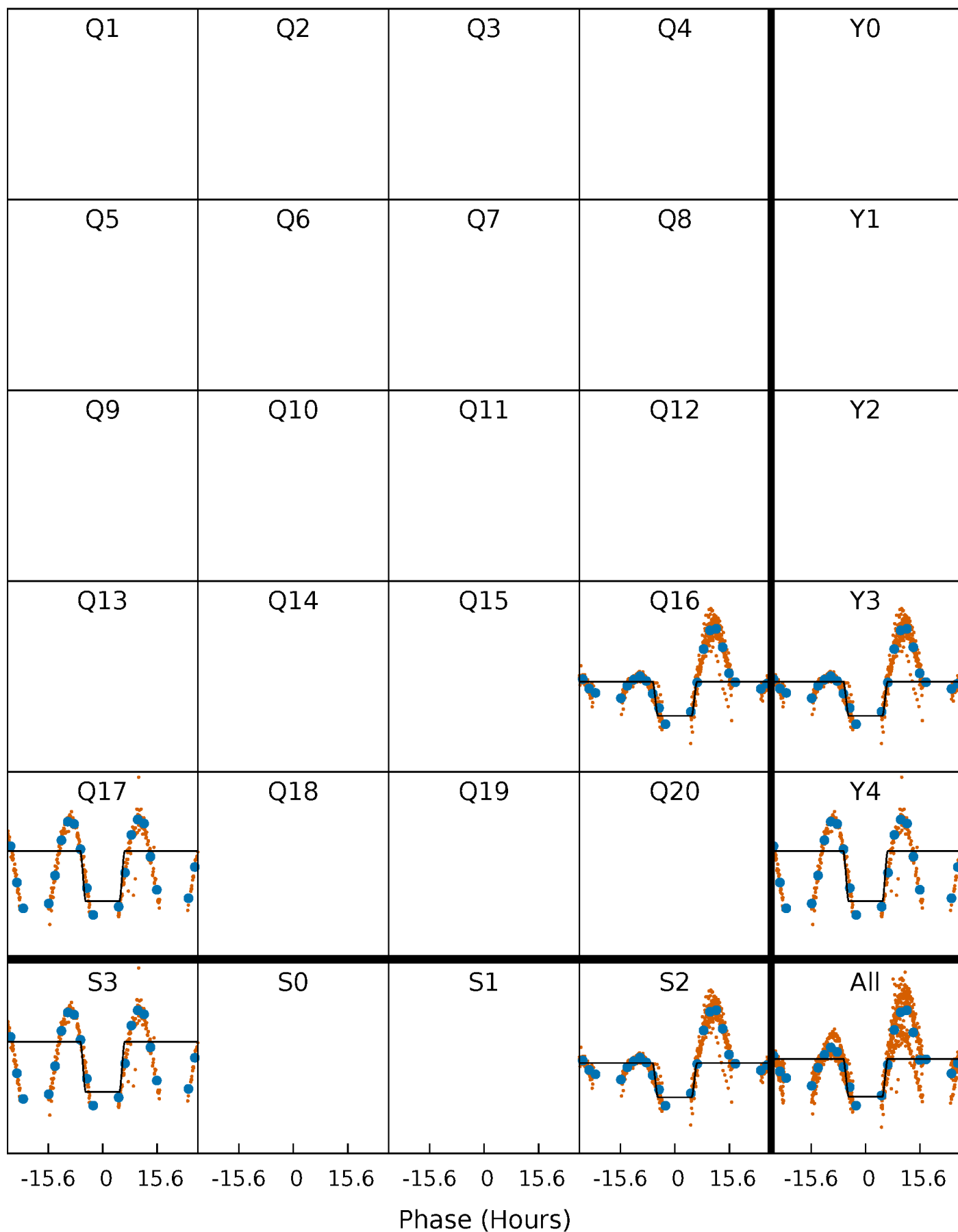
# DV Quarter-Phased Transit Curves

TCE 009101400-02     $P = 4.977141$  Days     $T_0 = 132.262618$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

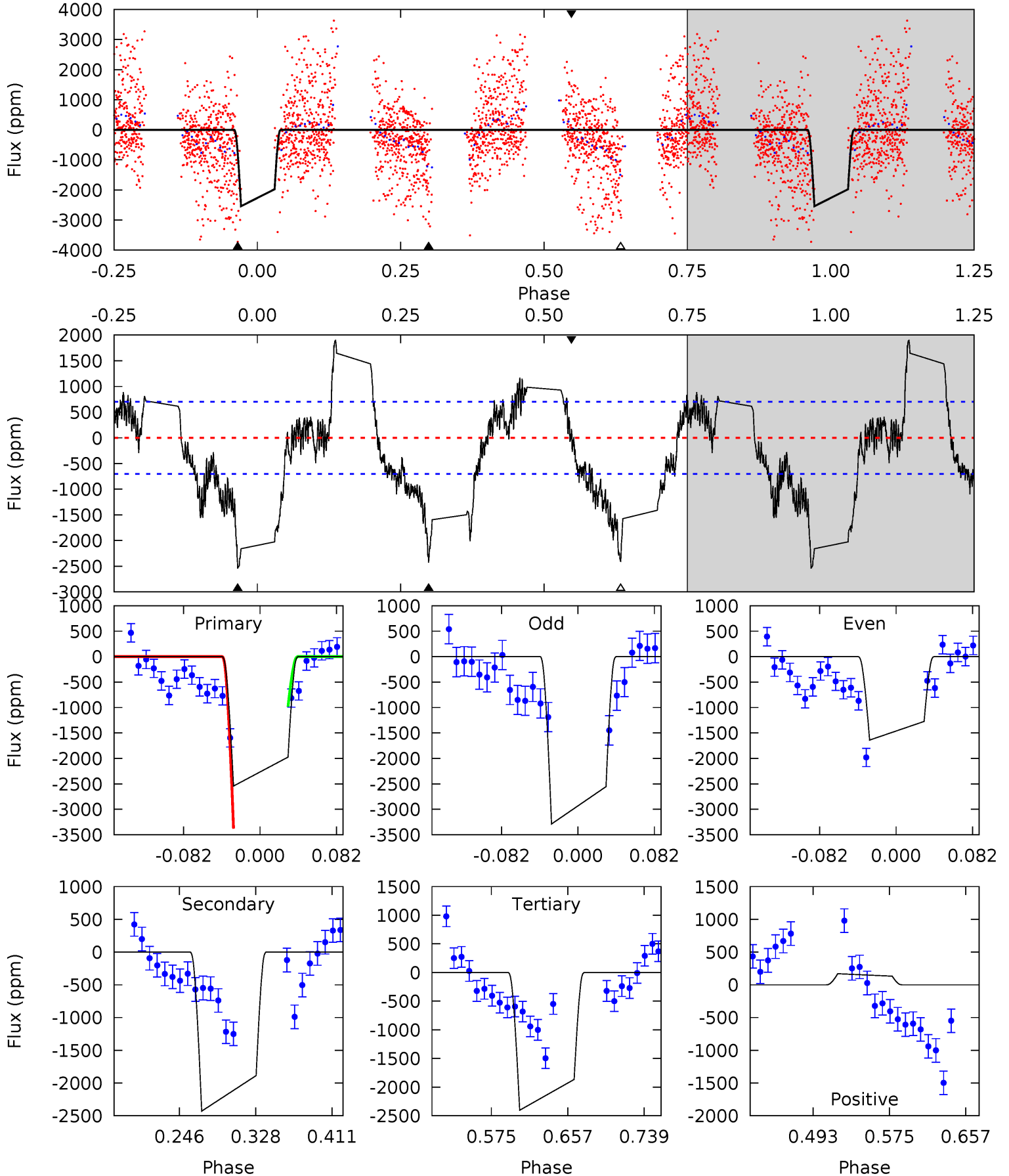
TCE 009101400-02     $P = 4.974476$  Days     $T_0 = 132.999806$  (BKJD)



# DV Model-Shift Uniqueness Test

009101400-02, P = 4.977141 Days, E = 132.262618 Days

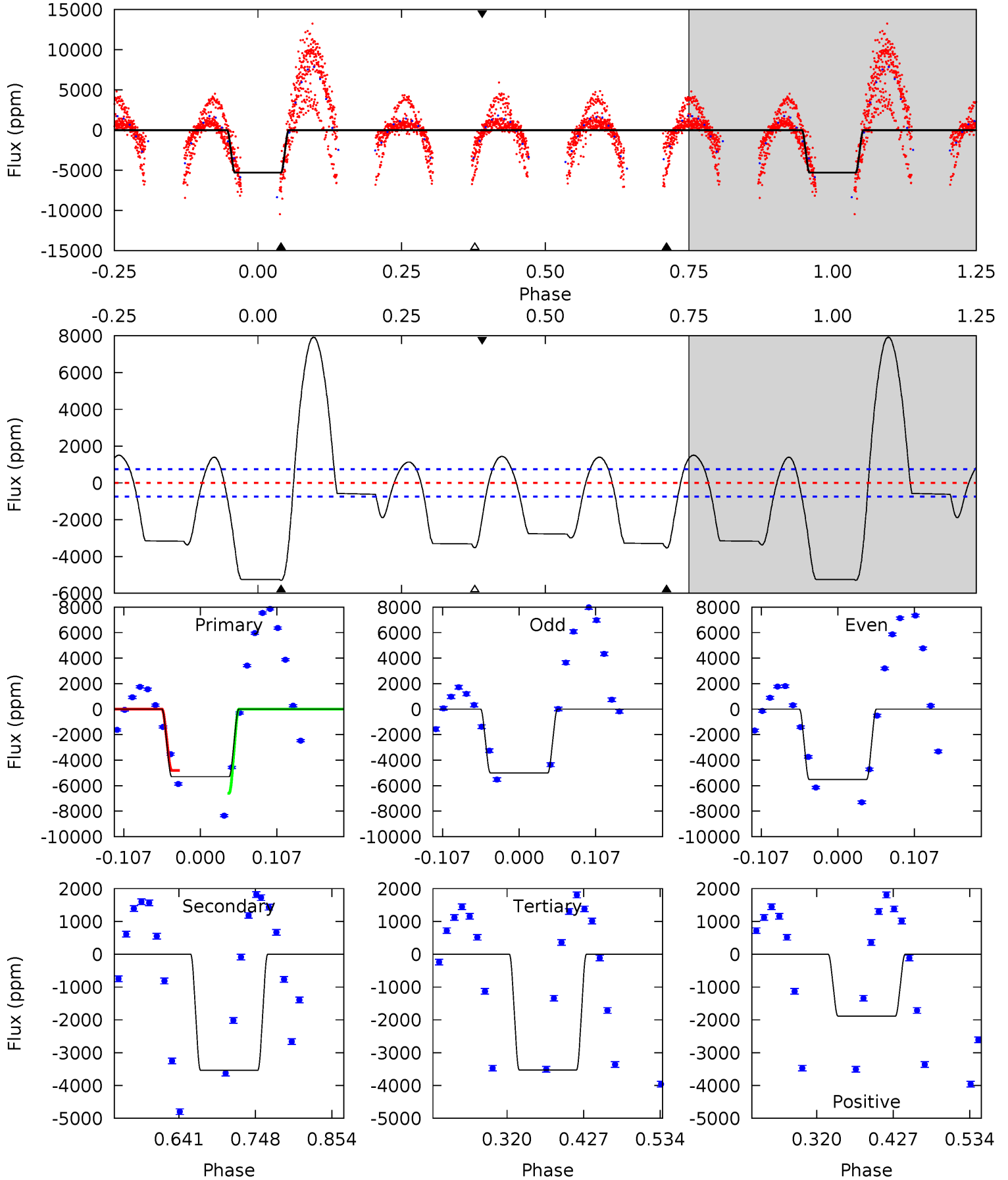
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.7	15.9	15.8	1.11	4.61	1.74	4.50	0.91	15.5	0.17	14.8	5.49	1.53	0.43	7.87



# Alt Model-Shift Uniqueness Test

009101400-02, P = 4.974476 Days, E = 132.999806 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
32.5	21.7	21.6	-11.6	4.55	1.61	9.70	10.9	44.1	0.06	33.3	1.59	0.97	0.60	5.49





### Stellar Parameters For KIC 009101400

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6645^{+186}_{-255}$	$4.271^{+0.124}_{-0.186}$	$-0.240^{+0.250}_{-0.300}$	$1.328^{+0.408}_{-0.220}$	$1.206^{+0.183}_{-0.183}$	$0.726^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+104%/-125%	+31%/-17%	+15%/-15%	+60%/-51%
Source	KIC0	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 009101400-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2429 \pm 153$	$272.66^{+285.01}_{-188.75}$	$1922^{+137}_{-116}$	$-2341^{+4884}_{-122}$	$0.066^{+0.642}_{-0.050}$
Alt.	$-3535 \pm 163$	$280.19^{+280.89}_{-208.77}$	$1934^{+142}_{-109}$	$-2312^{+5154}_{-148}$	$0.091^{+1.256}_{-0.069}$

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

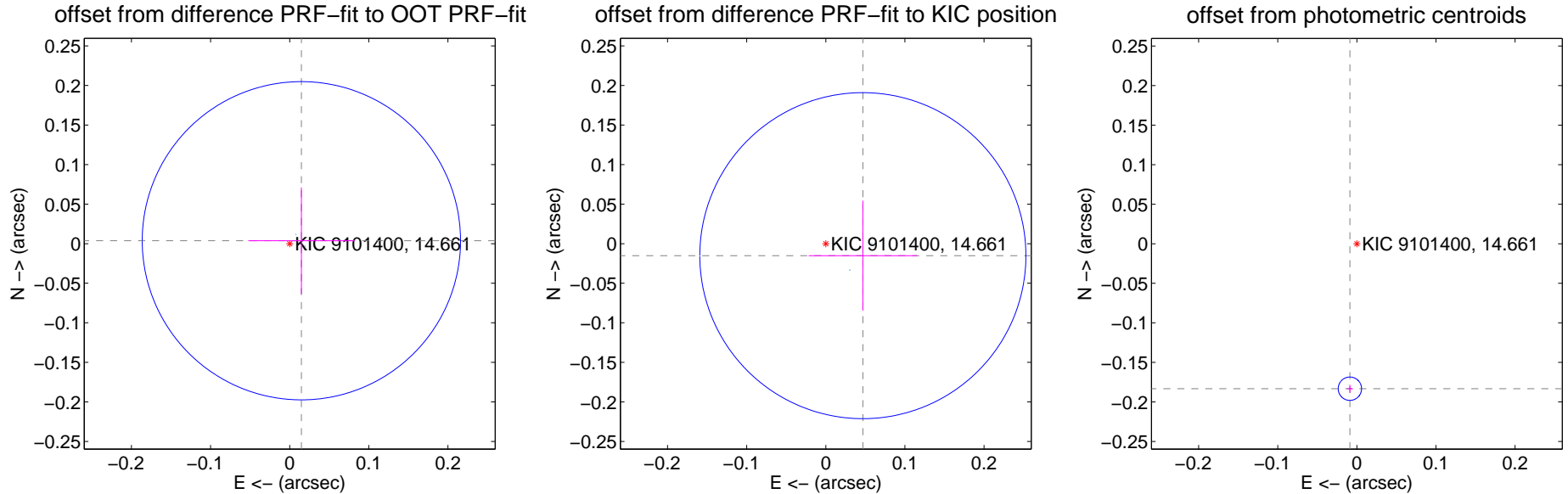
## DV Centroid Data

Supplemental centroid analysis for 009101400-02. Kepler magnitude: 14.66. Transit SNR 205.42

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.015 \pm 0.067$	0.23	$-0.015 \pm 0.067$	$0.004 \pm 0.067$
PRF-fit source offset from KIC position	$0.049 \pm 0.069$	0.72	$-0.047 \pm 0.069$	$-0.015 \pm 0.070$
photometric centroid source offset	$0.18 \pm 0.00$	37.28	$0.01 \pm 0.00$	$-0.18 \pm 0.00$



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.



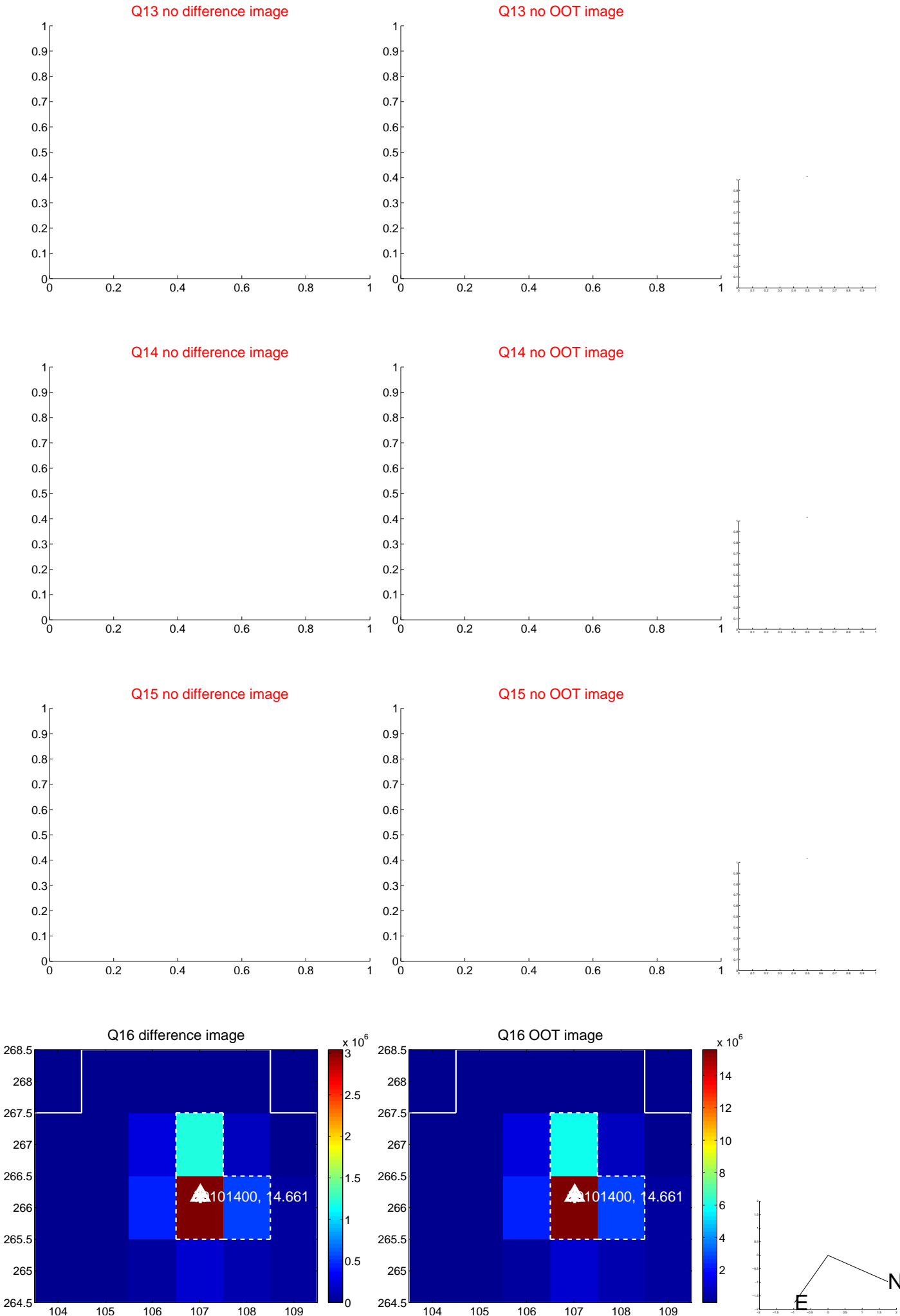
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



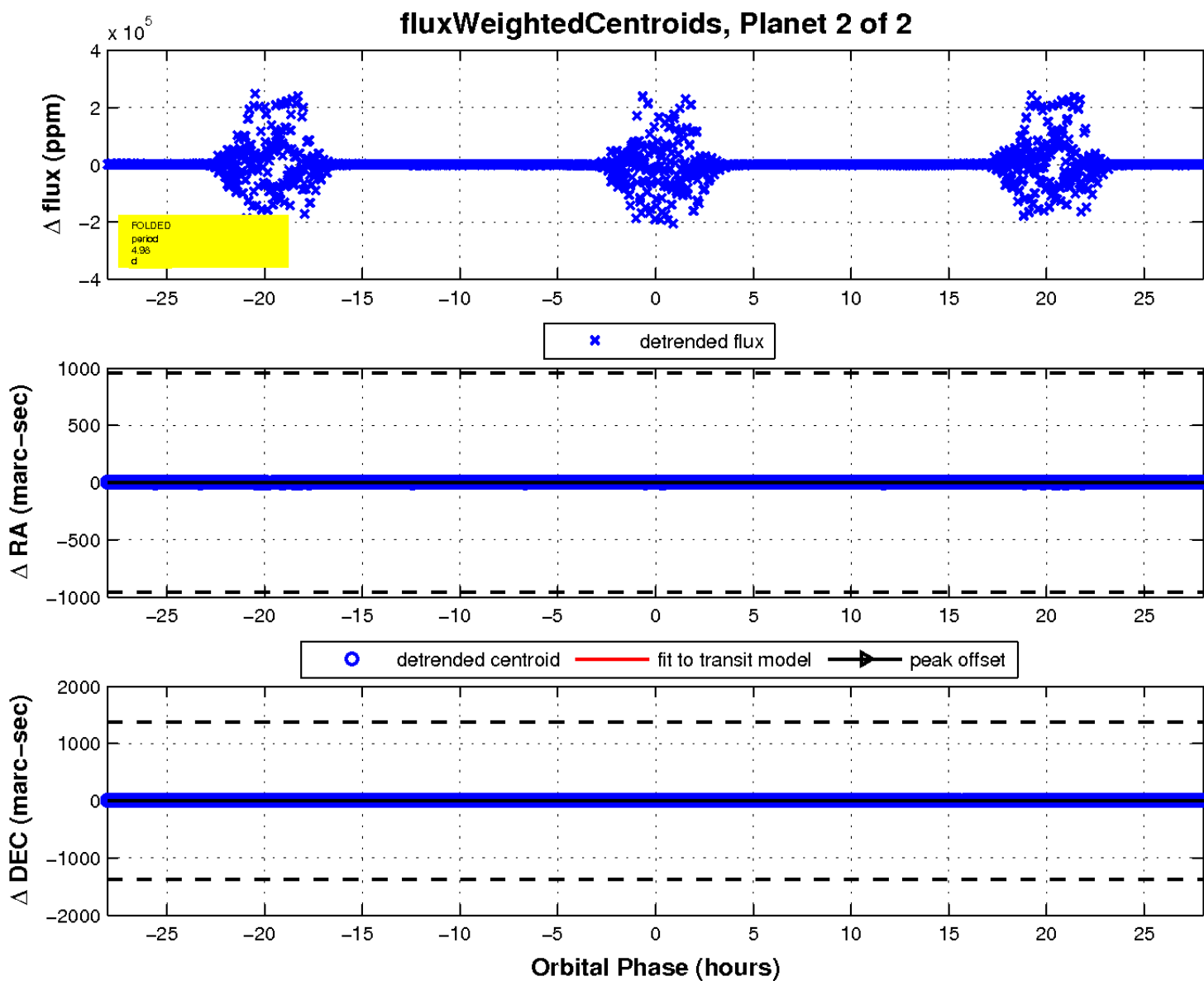
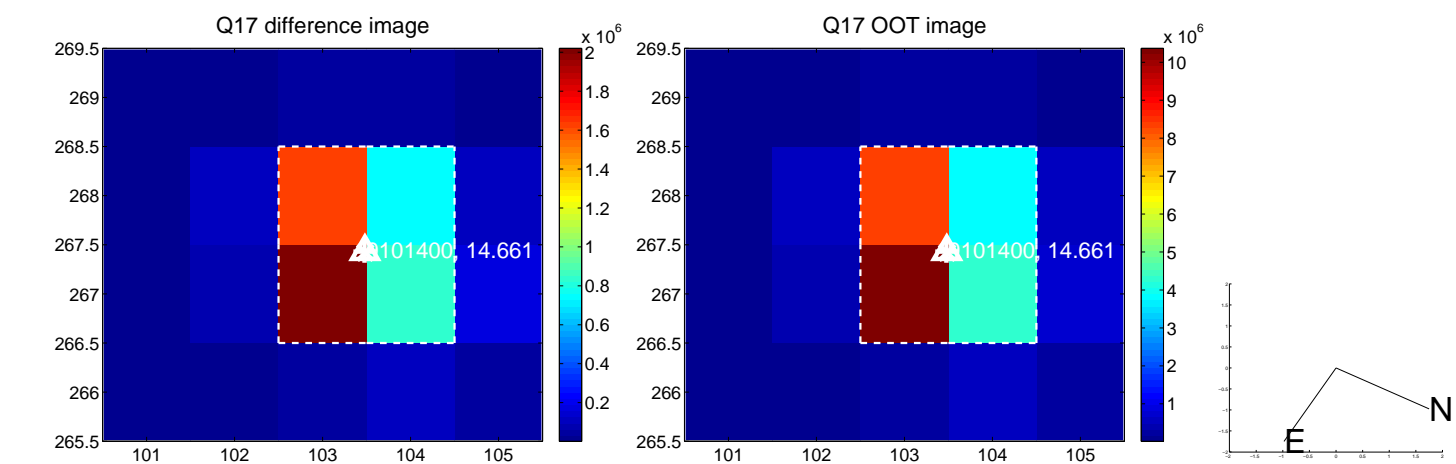
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: 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.



# UKIRT Image

Declination

