

# KIC 009715925

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009715925-01	OBS	3599.01	6.308211	134.387360	87501.1	2.495	1623.0	835.7	0.78	5069	29.73	98.35
009715925-02	OBS	No	6.308272	136.742783	8279.5	2.415	134.9	125.2	0.78	5069	9.23	98.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009715925-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009715925-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 009715925-01

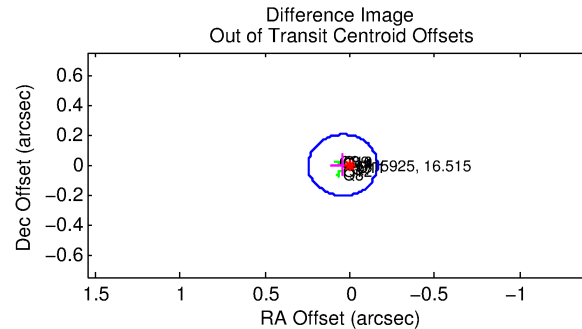
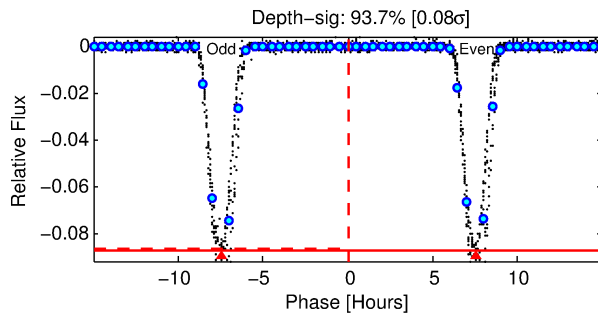
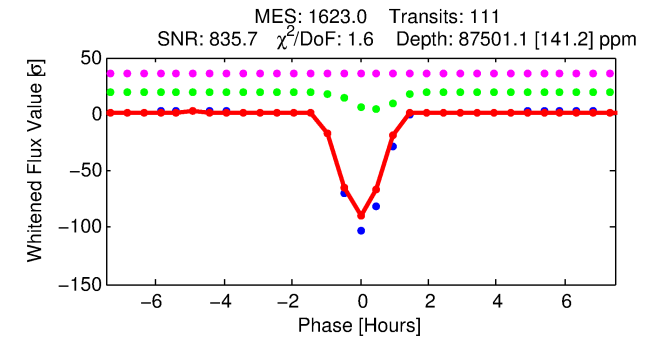
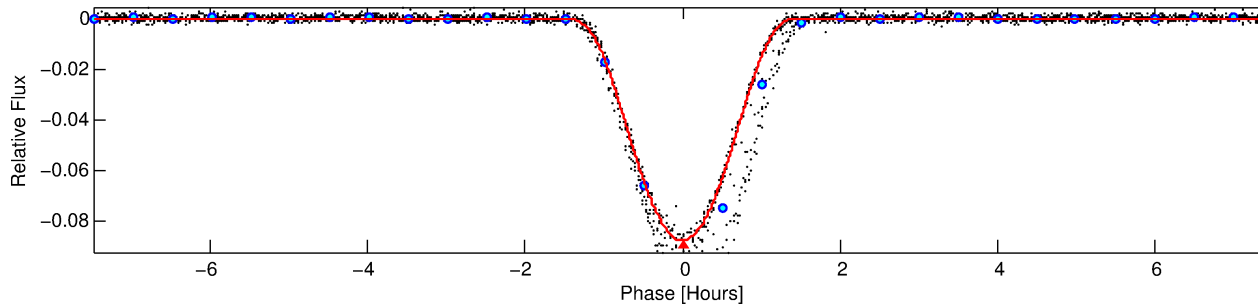
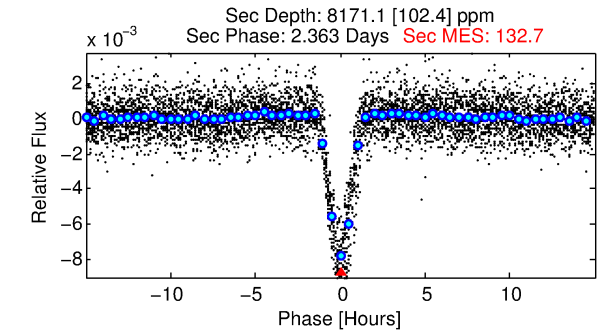
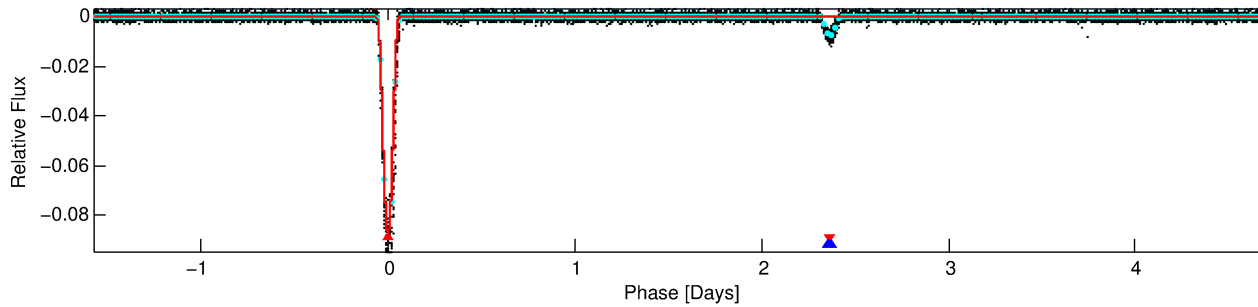
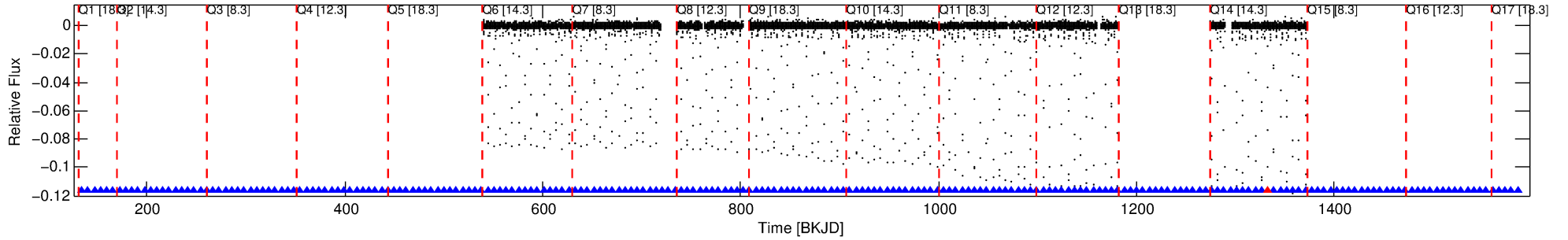
No Significant Match Found

# DV One-Page Summary

KIC: 9715925 Candidate: 1 of 2 Period: 6.308 d

KOI: K03599.01 Corr: 0.973

Kp: 16.51 R\*: 0.78 Rs Teff: 5069.0 K Logg: 4.52 Fe/H: -0.140



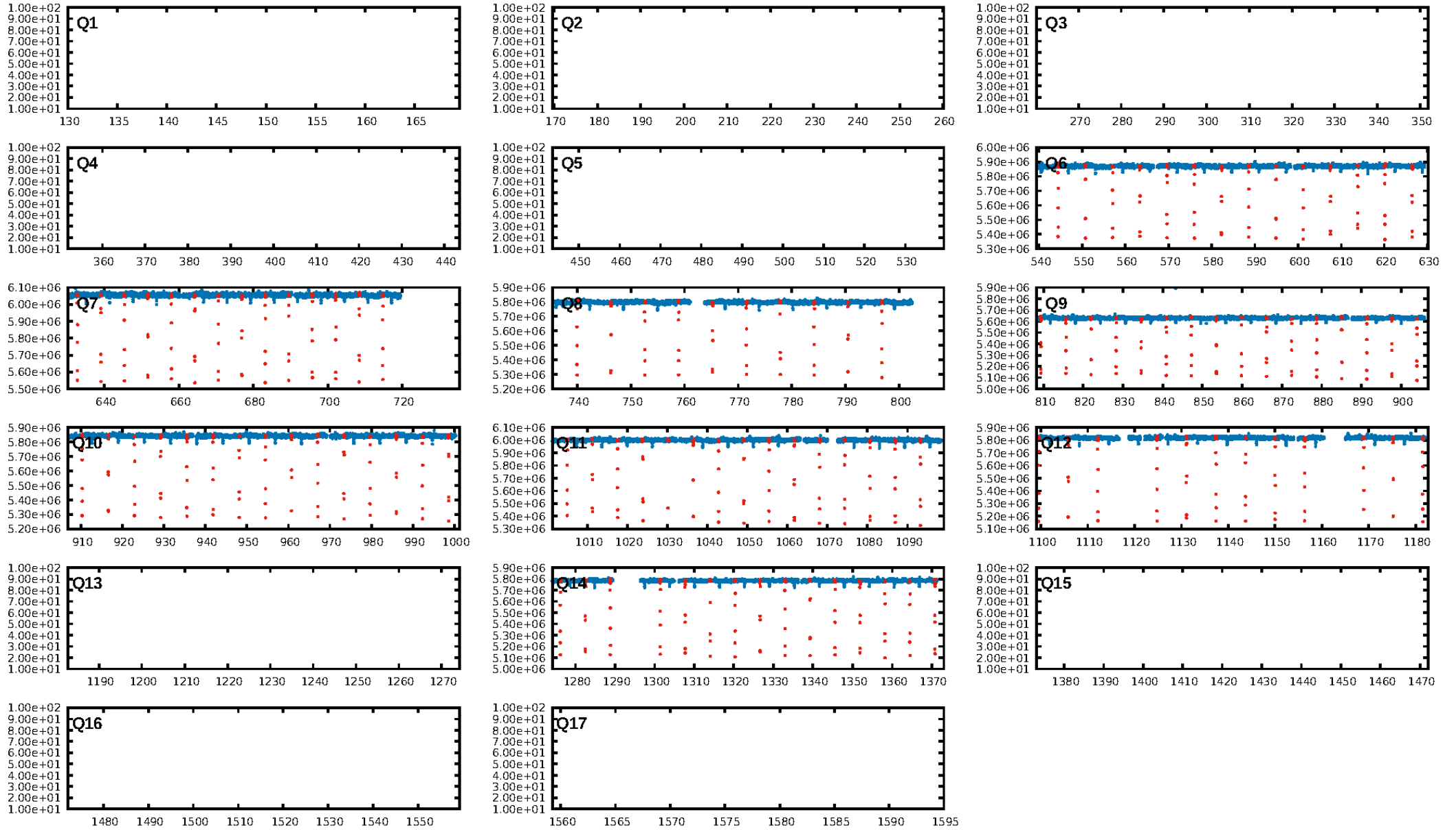
## DV Fit Results:

Period = 6.30821 [0.00000] d  
Epoch = 134.3874 [0.0001] BKJD  
Rp/R\* = 0.3493 [0.0138]  
a/R\* = 20.73 [0.08]  
b = 0.82 [0.02]  
Seff = 98.35 [20.61]  
Teff = 803 [42] K  
Rp = 29.73 [3.48] Re  
a = 0.0605 [0.0058] AU  
Ag = 18.61 [3.05] [5.78σ]  
Teffp = 2579 [111] K [14.93σ]

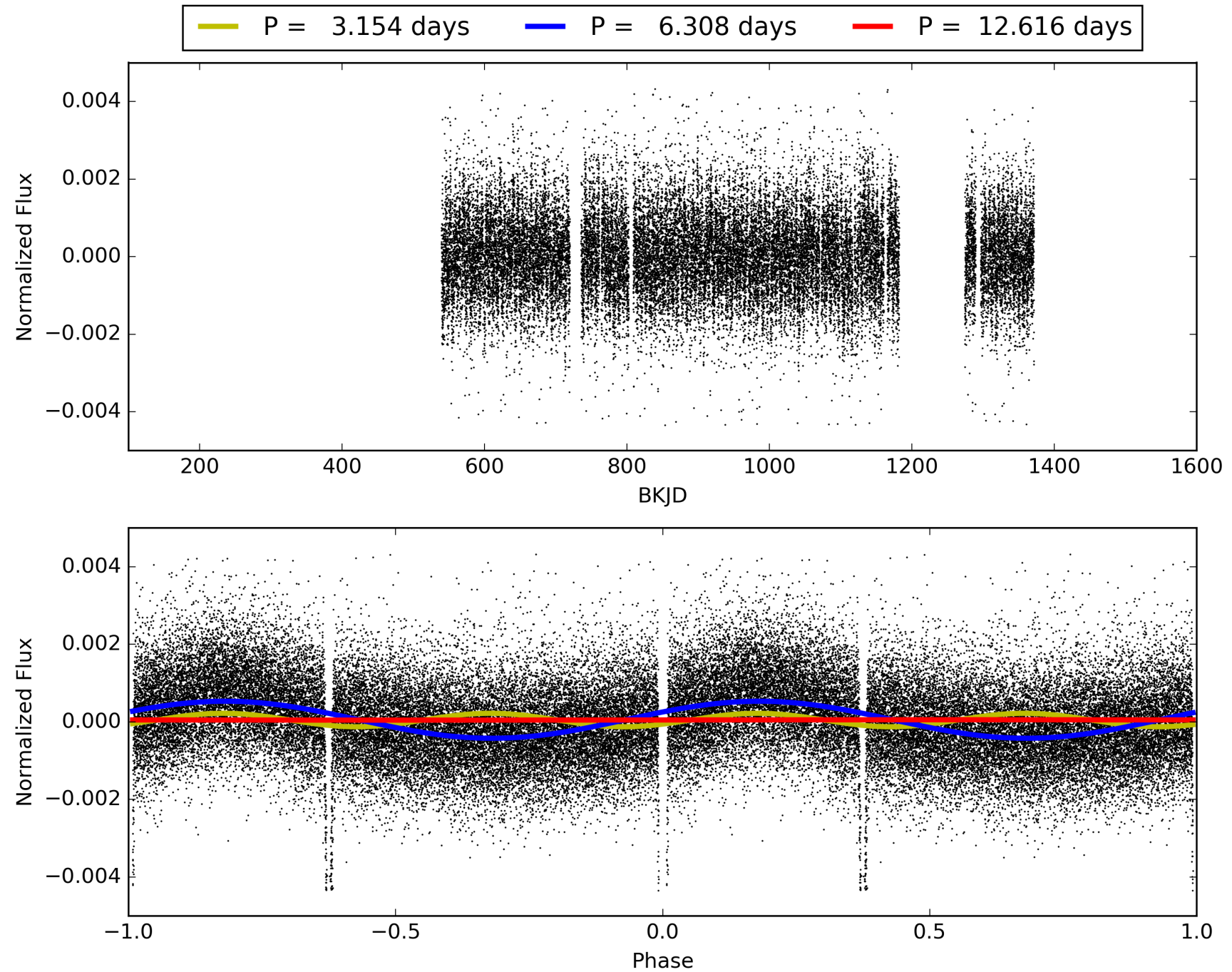
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 65.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.99 [110/111]  
GhostDiagnostic-chr: 4.451  
Centroid-sig: 0.0%  
Centroid-so: 0.140 arcsec [13.17σ]  
OotOffset-rm: 0.043 arcsec [0.63σ]  
KicOffset-rm: 0.053 arcsec [0.78σ]  
OotOffset-st: 3/2/2/1 [8]  
KicOffset-st: 3/2/2/1 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

# TCE 009715925-01, PDC Light Curves

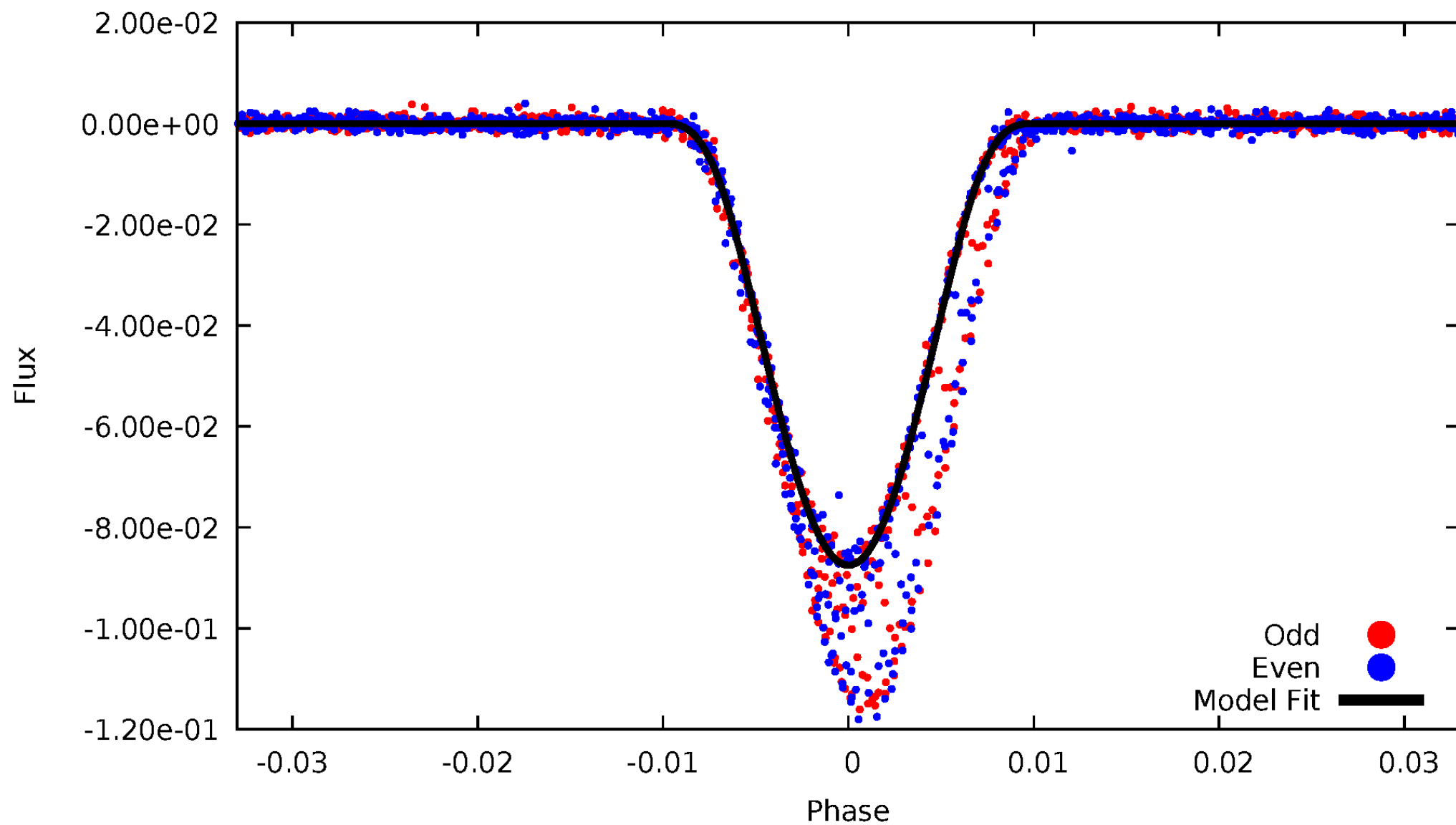


TCE 009715925-01



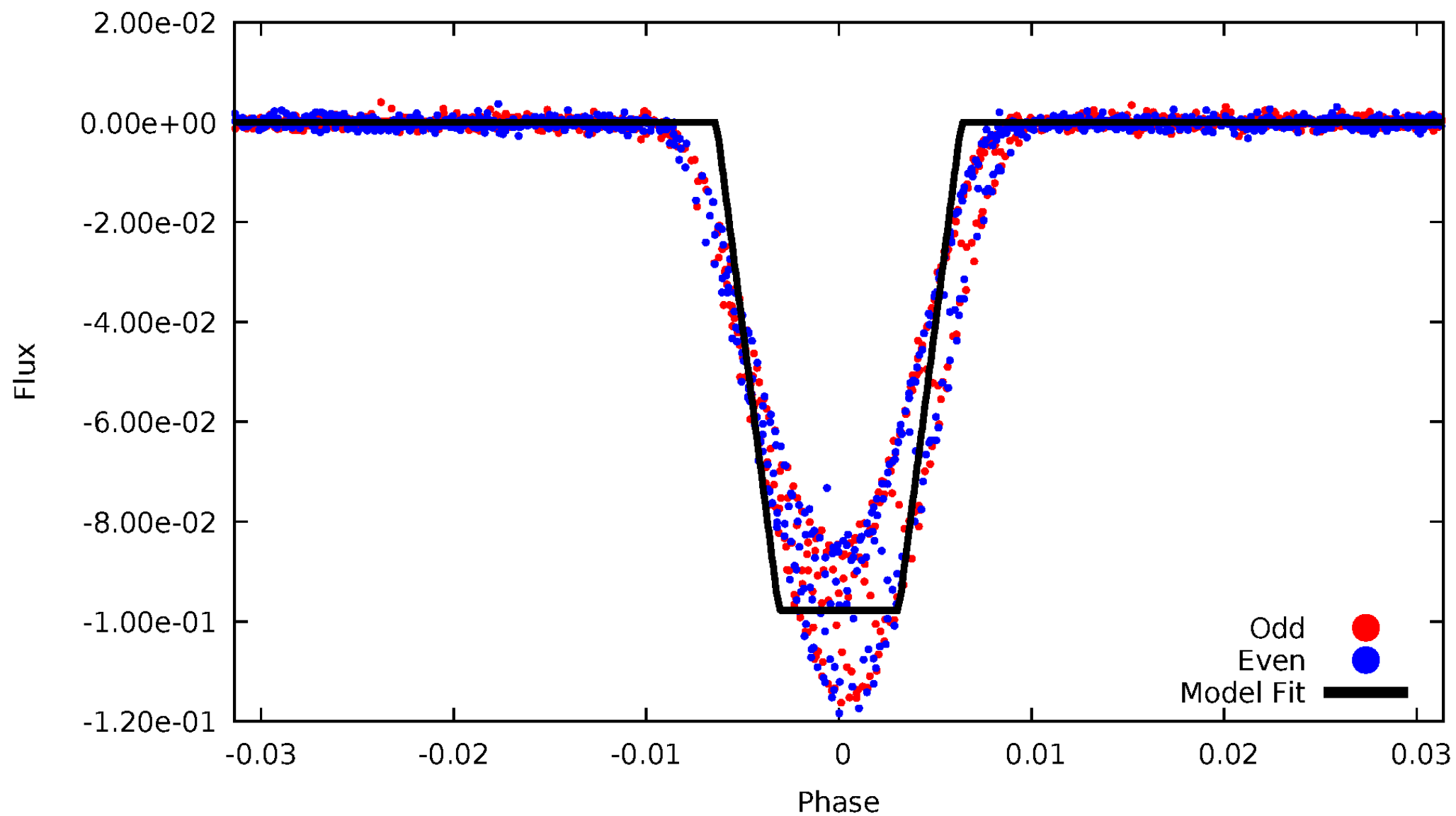
# DV Odd/Even

TCE 009715925-01



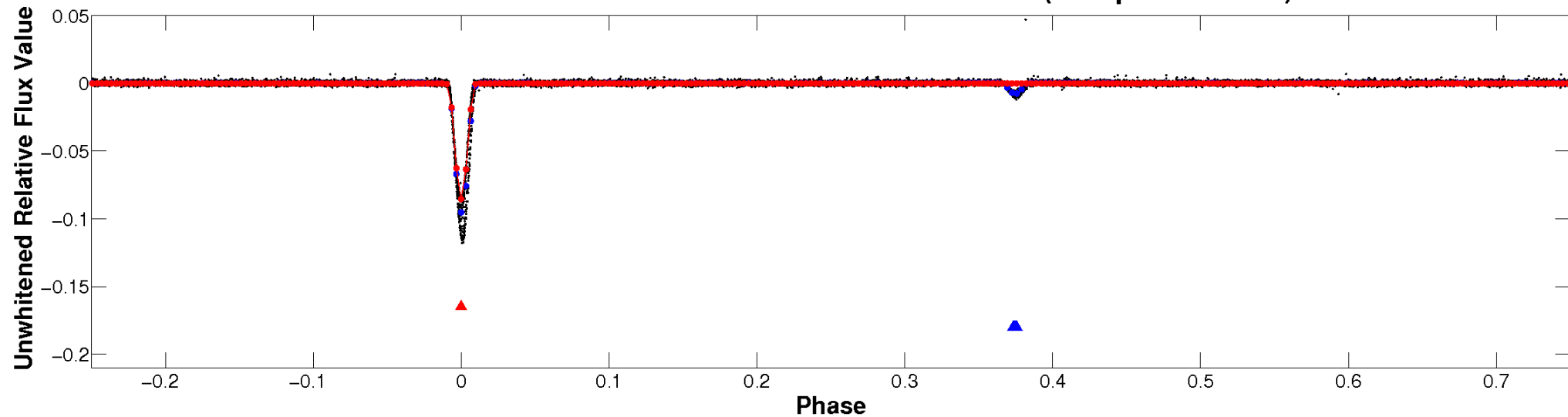
# ALT Odd/Even

TCE 009715925-01

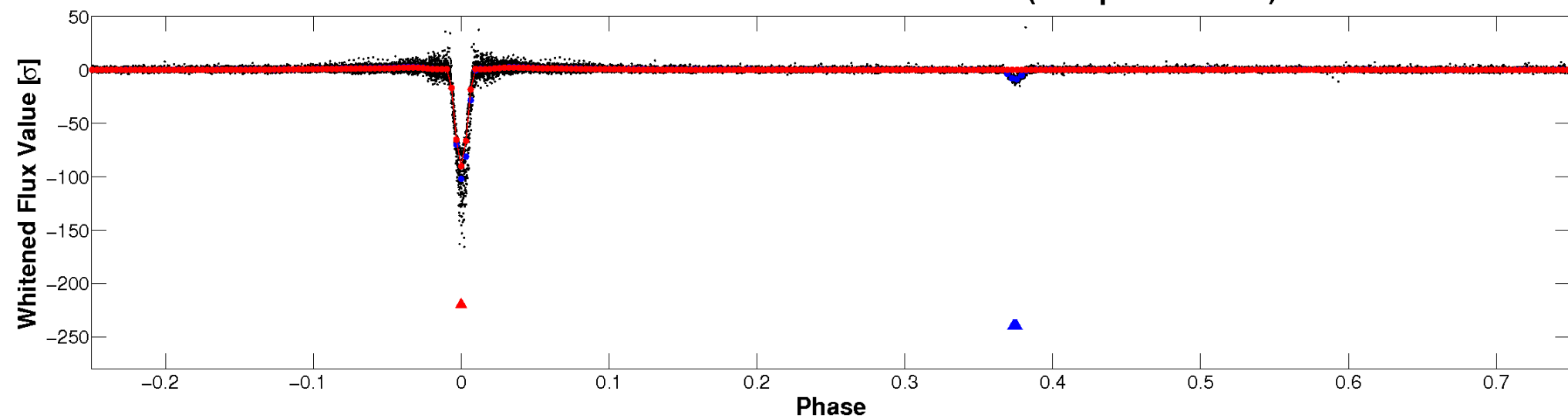


# Non-Whitened Vs. Whitened Light Curve

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

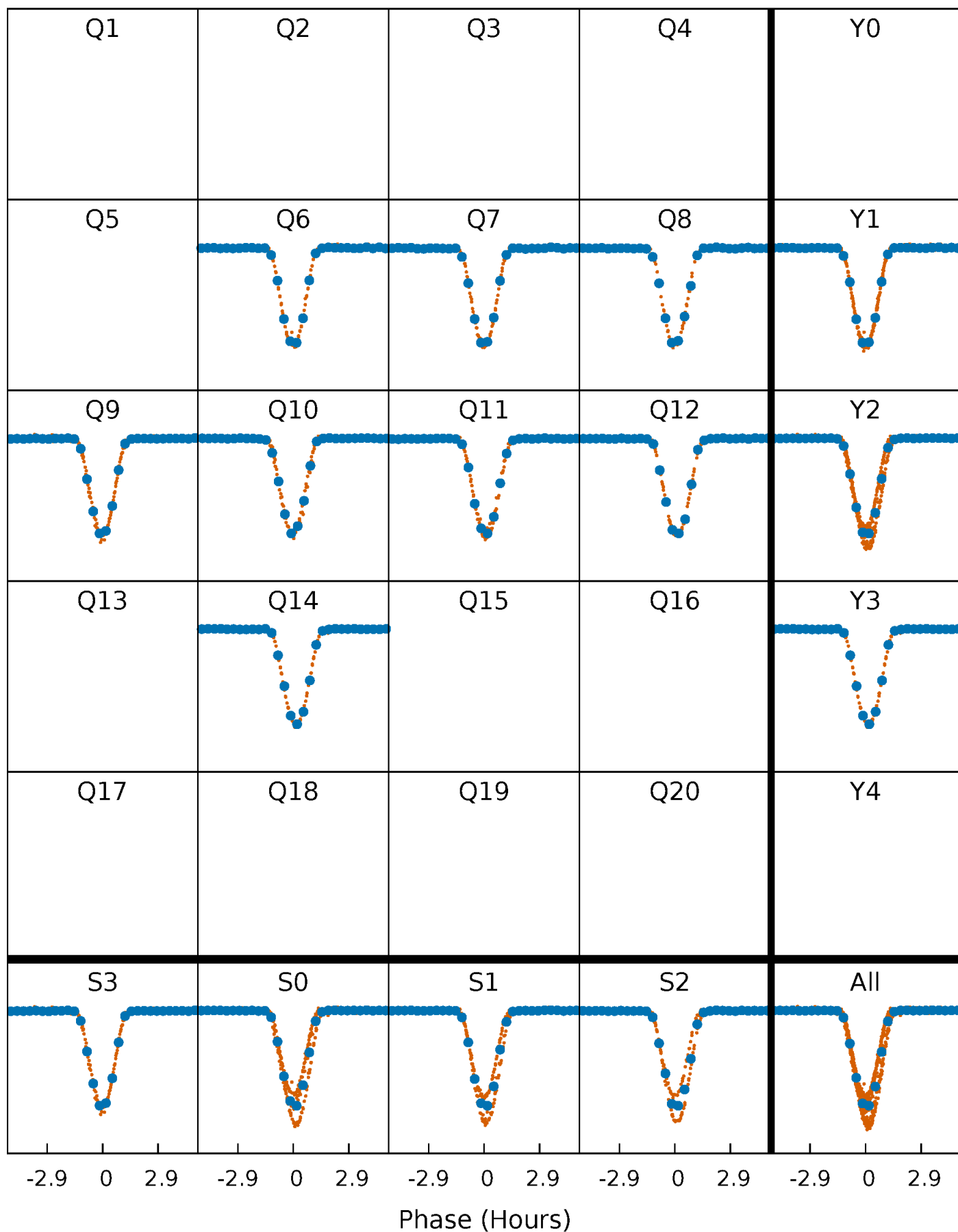


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

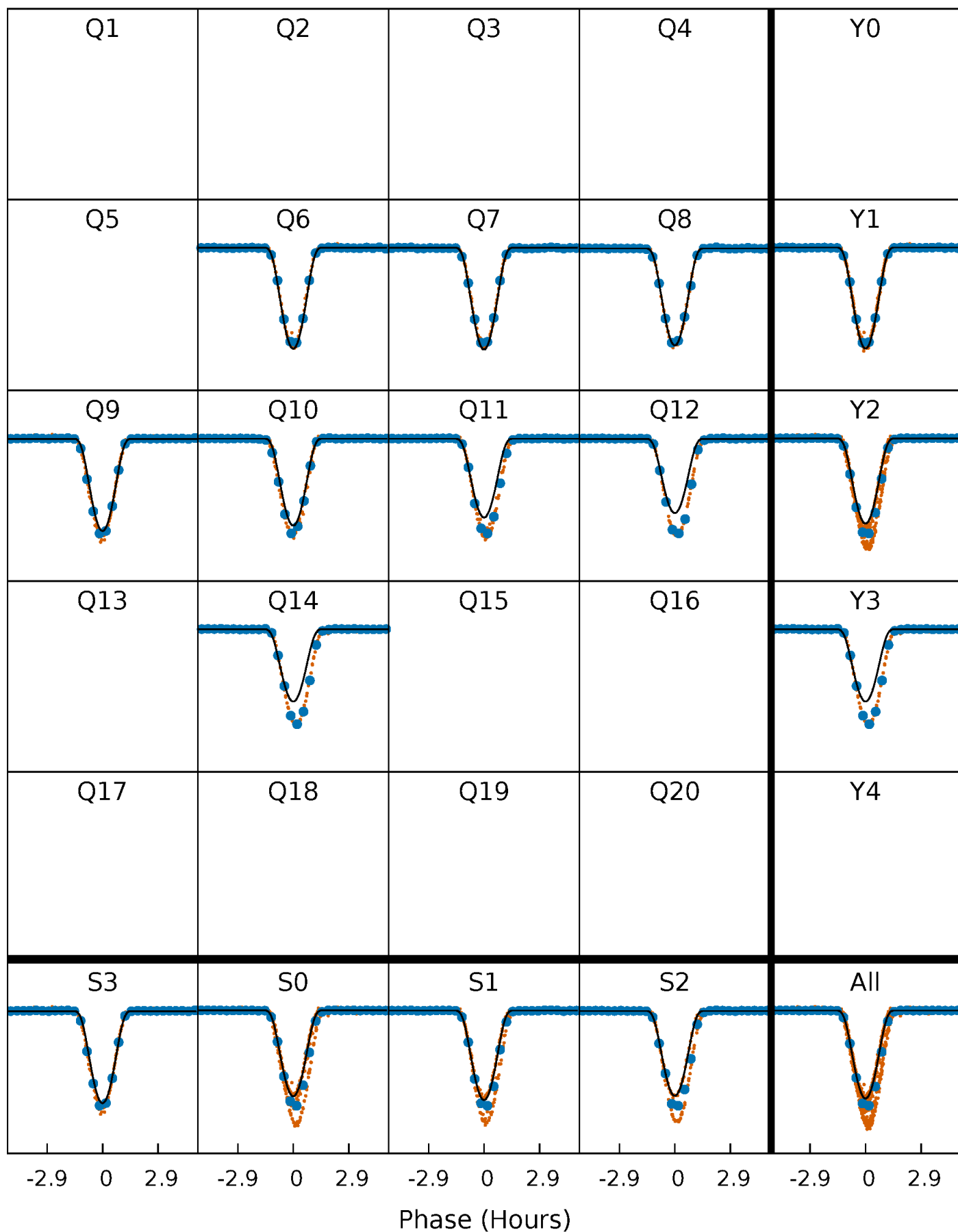
TCE 009715925-01 P= 6.308211 Days  $T_0=134.387360$  (BKJD)





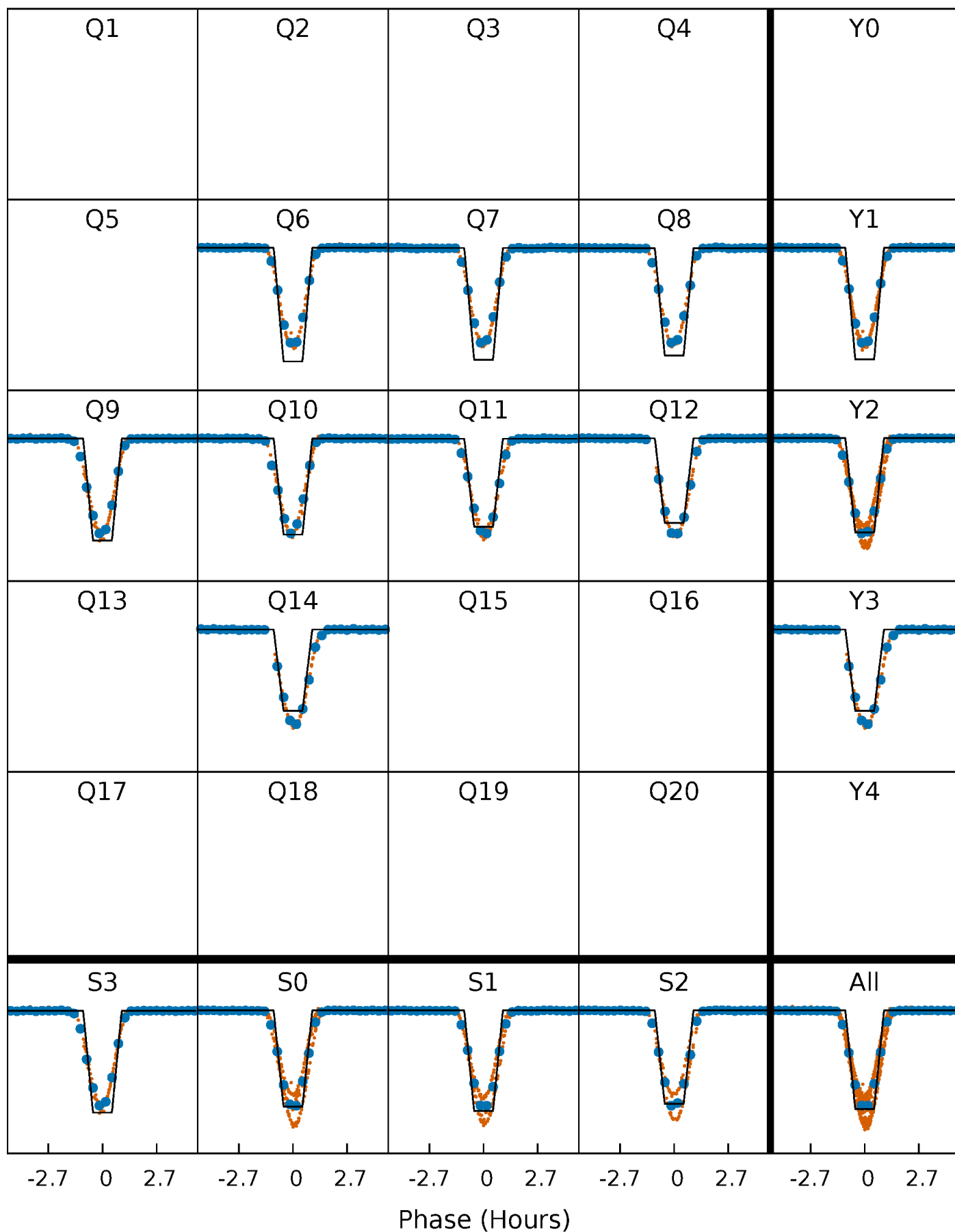
# DV Quarter-Phased Transit Curves

TCE 009715925-01 P= 6.308211 Days  $T_0=134.387360$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

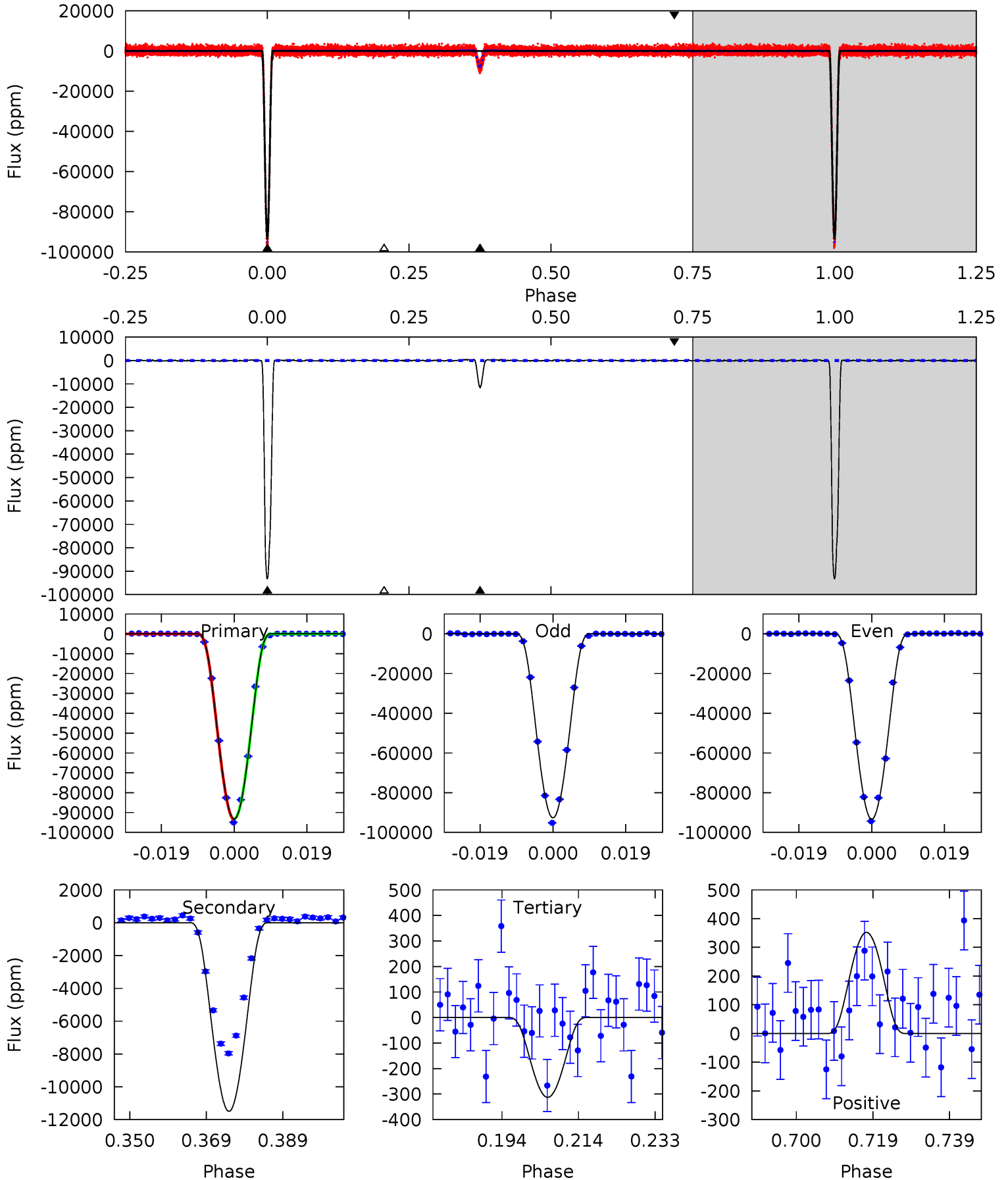
TCE 009715925-01 P= 6.308234 Days  $T_0=134.386317$  (BKJD)



# DV Model-Shift Uniqueness Test

009715925-01, P = 6.308211 Days, E = 134.387360 Days

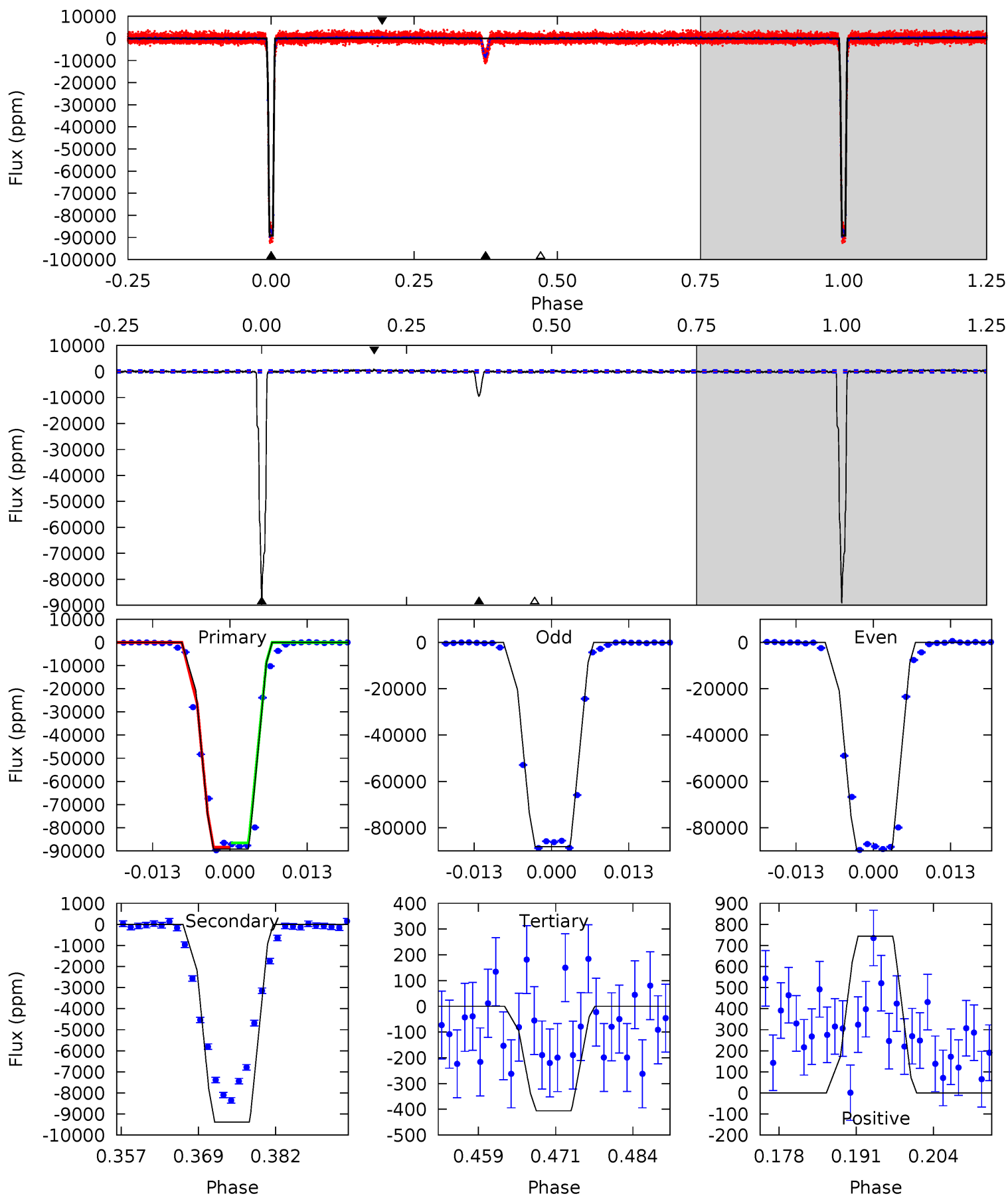
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1838	226.5	6.16	6.94	4.90	2.34	2.48	1831	1831	220.3	219.5	6.83	1.02	0.01	0



# Alt Model-Shift Uniqueness Test

009715925-01, P = 6.308234 Days, E = 134.386317 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
886.3	93.3	4.03	7.39	4.98	2.49	1.82	882.3	878.9	89.2	85.9	8.73	1.04	0.01	0



### Stellar Parameters For KIC 009715925

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5069^{+194}_{-176}$	$4.524^{+0.080}_{-0.064}$	$-0.140^{+0.300}_{-0.300}$	$0.780^{+0.086}_{-0.086}$	$0.742^{+0.103}_{-0.055}$	$2.203^{+0.783}_{-0.486}$
	+4%/-3%	+2%/-1%	+214%/-214%	+11%/-11%	+14%/-7%	+36%/-22%
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 009715925-01 / KOI 3599.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-11495 \pm 51$	$29.70^{+2.49}_{-2.18}$	$1120^{+51}_{-50}$	$3316^{+97}_{-89}$	$27^{+4}_{-3}$
Alt.	$-9384 \pm 101$	$26.70^{+2.34}_{-2.00}$	$1125^{+49}_{-50}$	$3336^{+97}_{-105}$	$27^{+4}_{-3}$

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

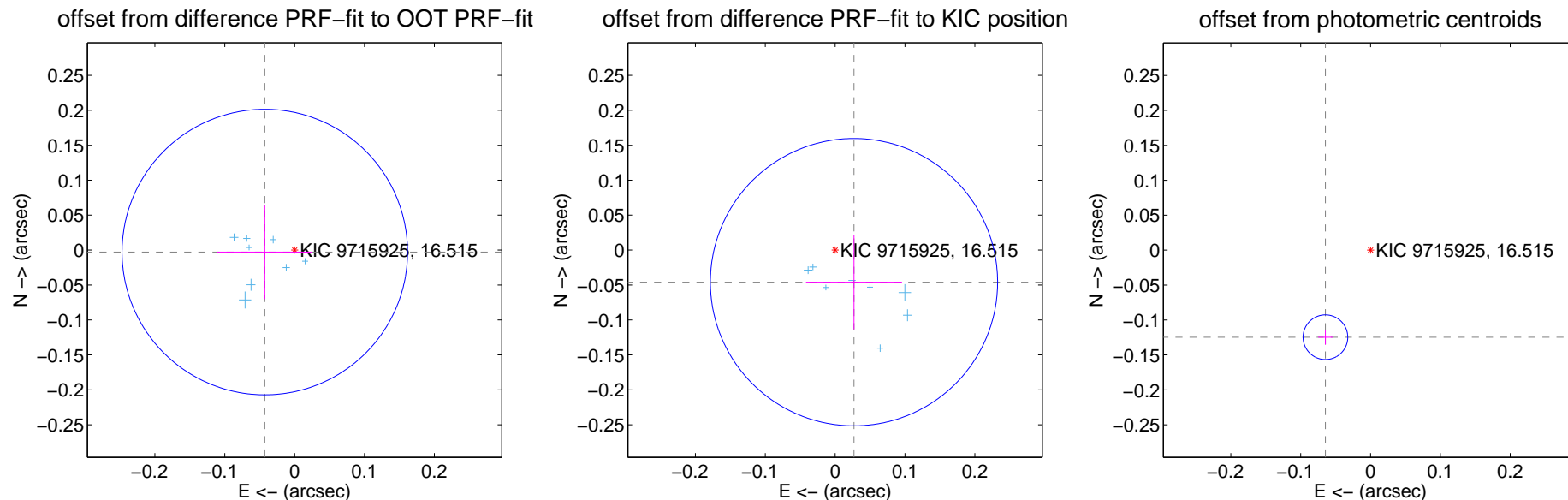
## DV Centroid Data

Supplemental centroid analysis for 009715925-01. Kepler magnitude: 16.52. Transit SNR 835.74

There are 8 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.043 \pm 0.068$	0.63	$0.043 \pm 0.068$	$-0.003 \pm 0.067$
PRF-fit source offset from KIC position	$0.053 \pm 0.069$	0.78	$-0.027 \pm 0.069$	$-0.046 \pm 0.068$
photometric centroid source offset	$0.14 \pm 0.01$	13.17	$0.06 \pm 0.01$	$-0.12 \pm 0.01$

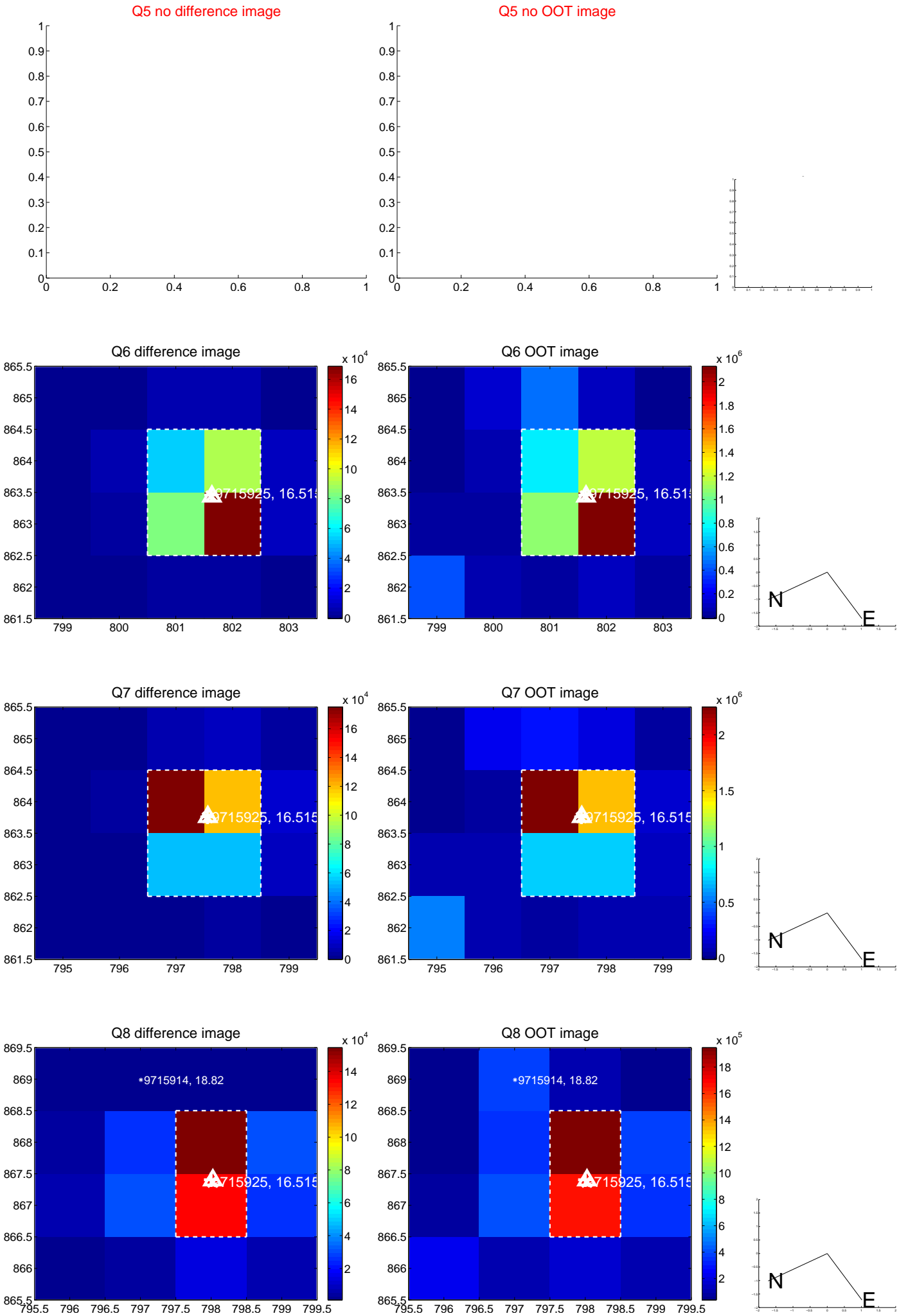


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

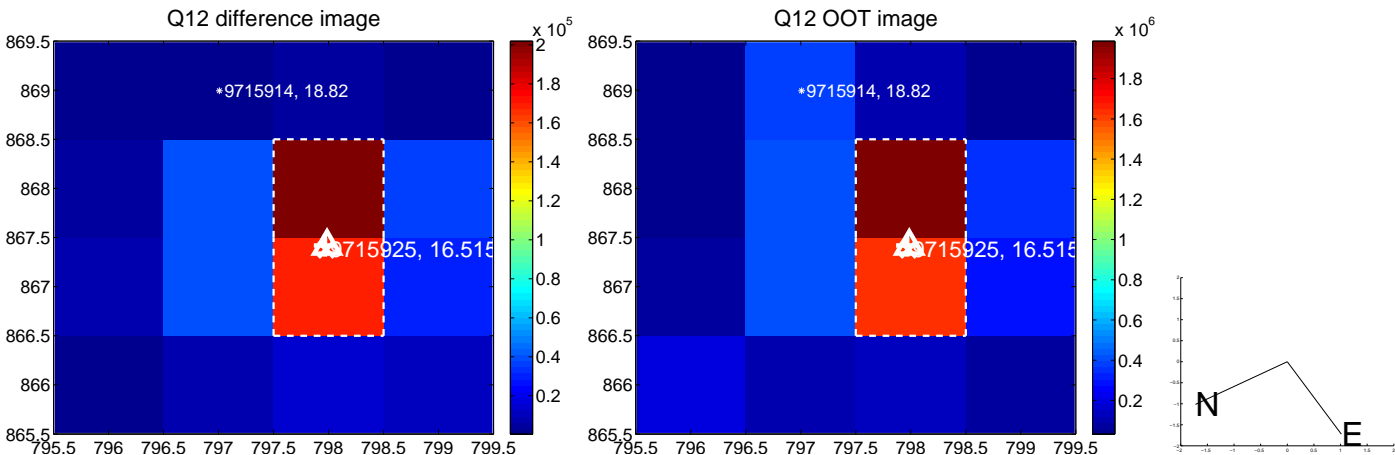
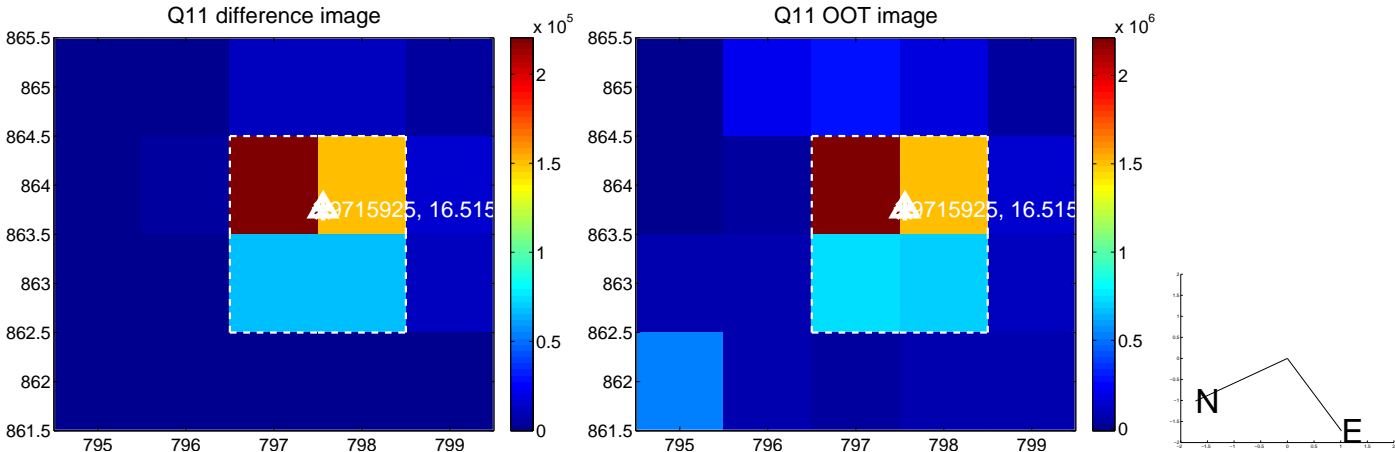
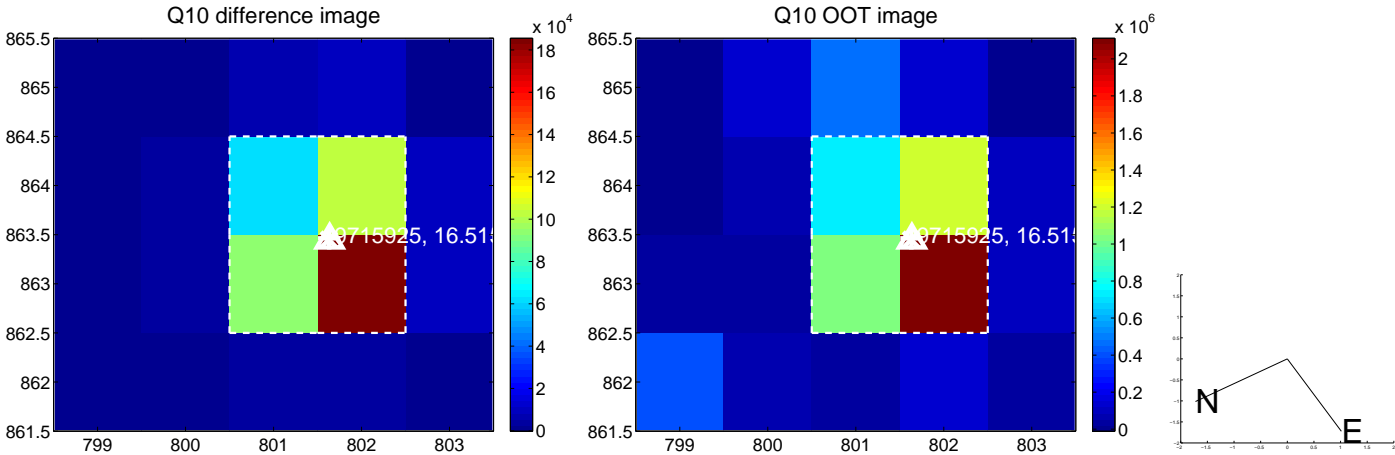
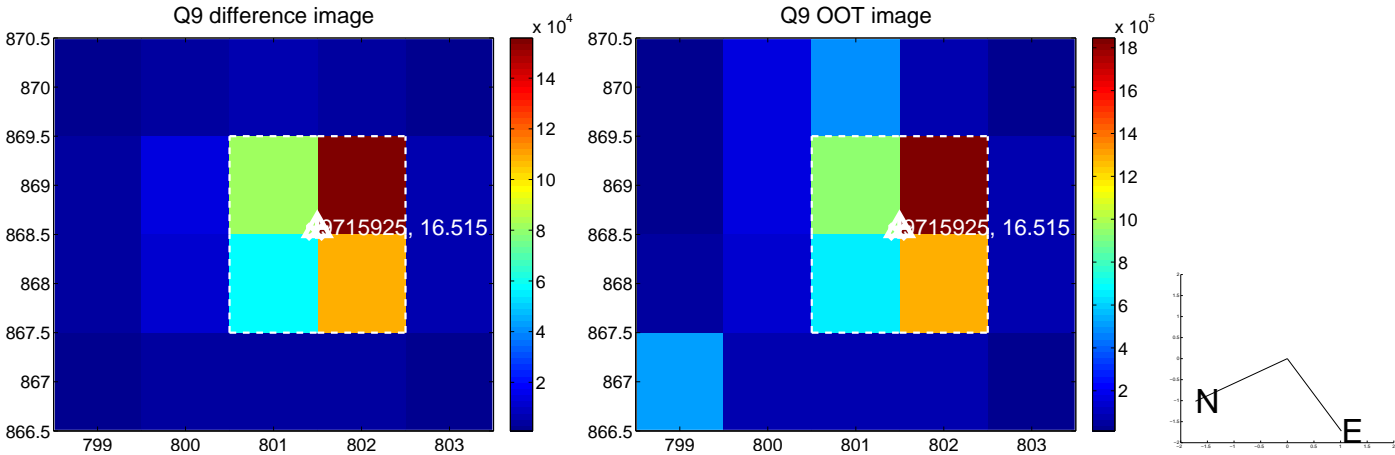


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



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

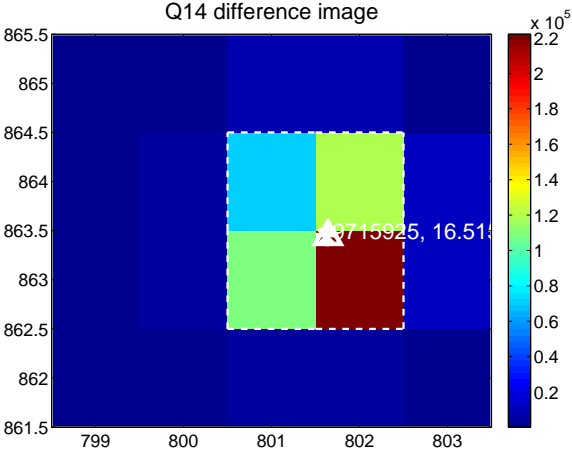
Q13 no difference image



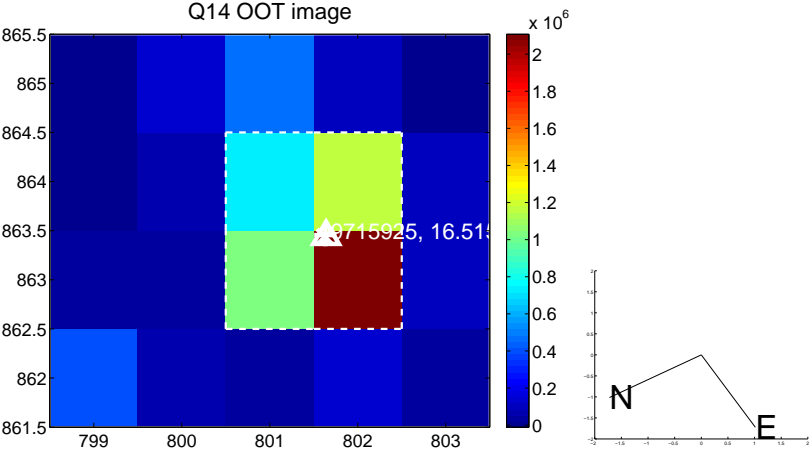
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



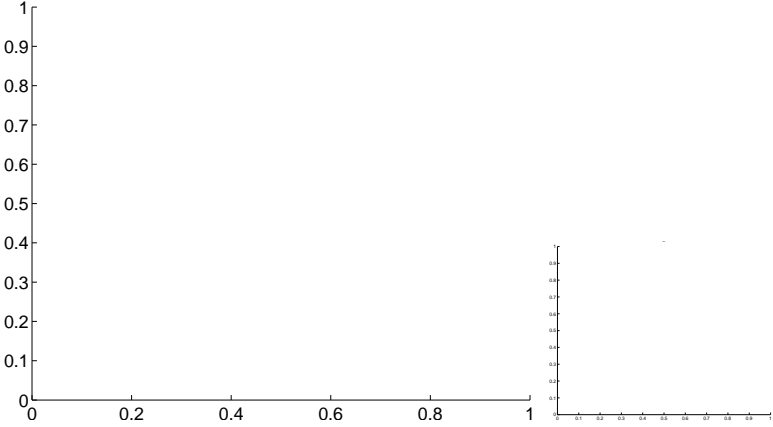
Q15 no OOT image



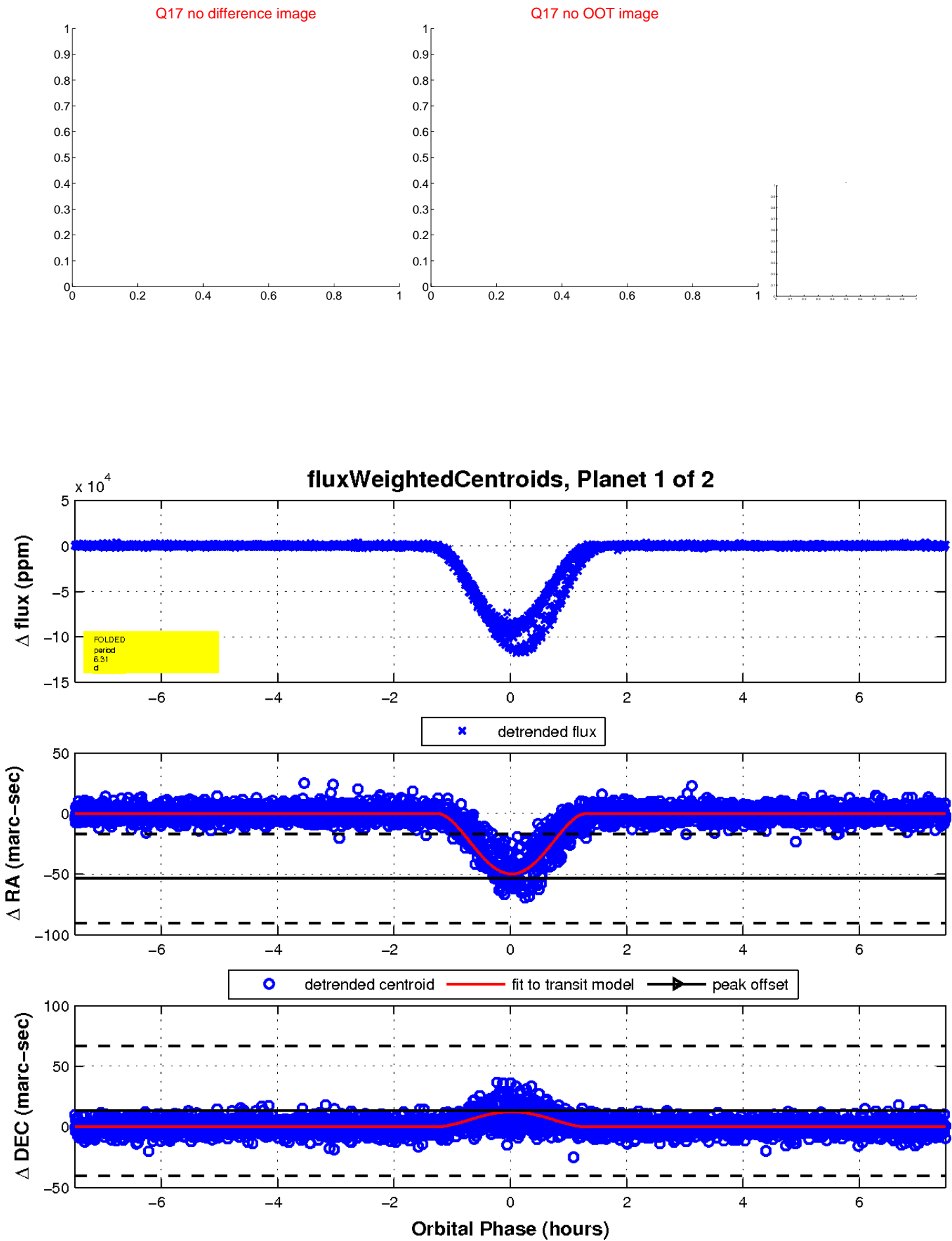
Q16 no difference image



Q16 no OOT image

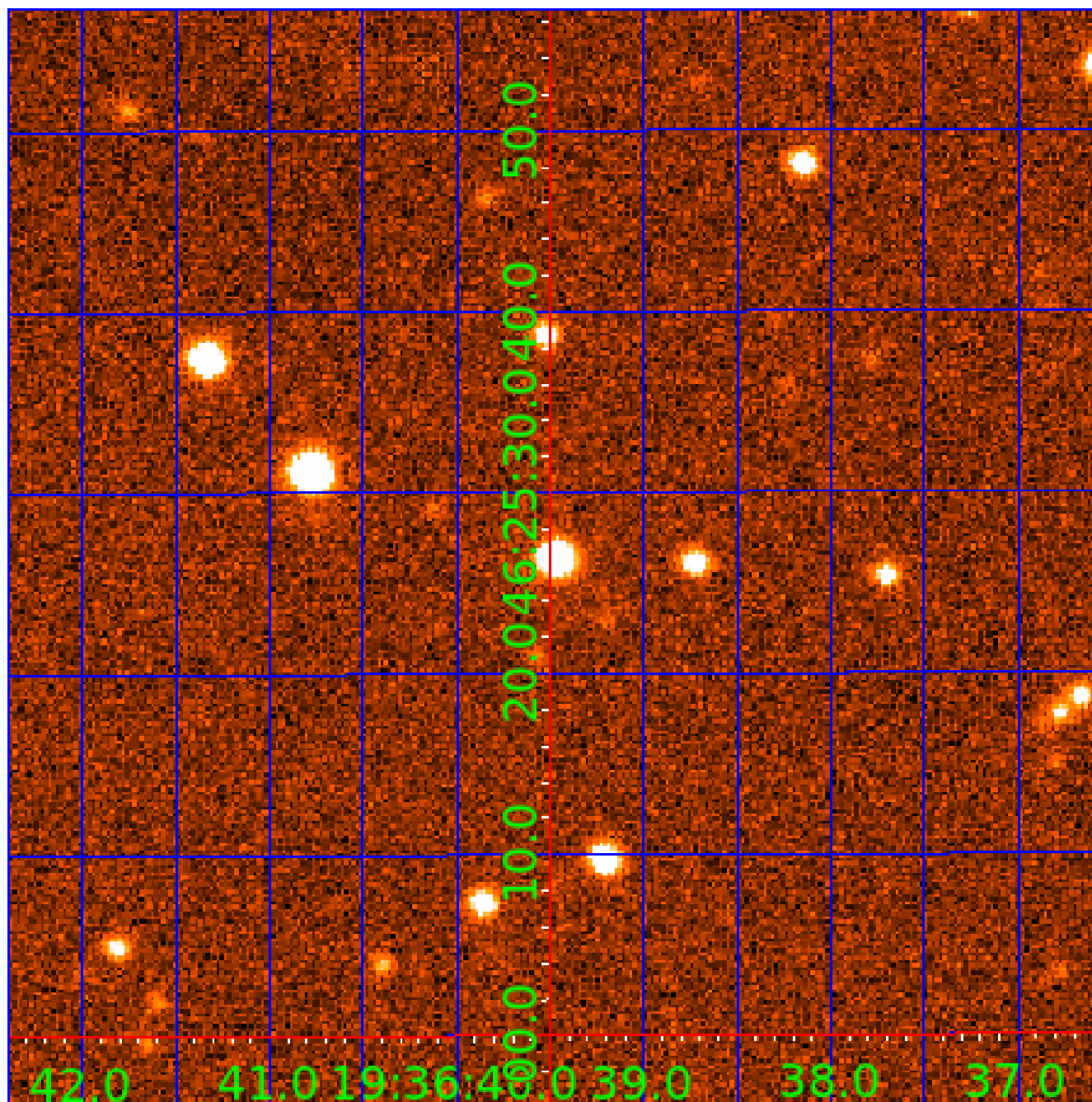


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009715925

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009715925-01	OBS	3599.01	6.308211	134.387360	87501.1	2.495	1623.0	835.7	0.78	5069	29.73	98.35
009715925-02	OBS	No	6.308272	136.742783	8279.5	2.415	134.9	125.2	0.78	5069	9.23	98.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009715925-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009715925-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 009715925-02

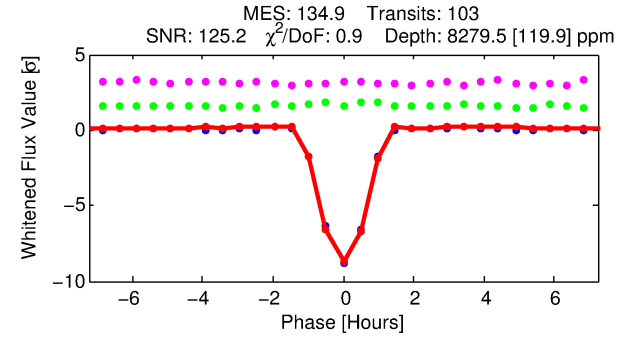
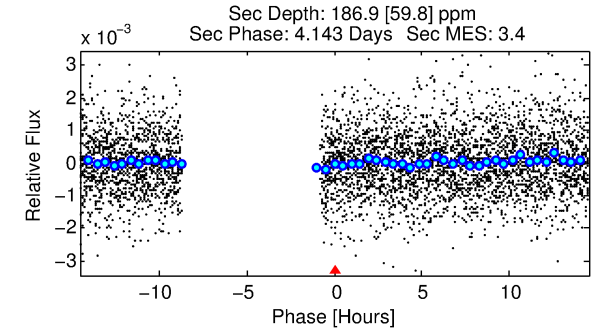
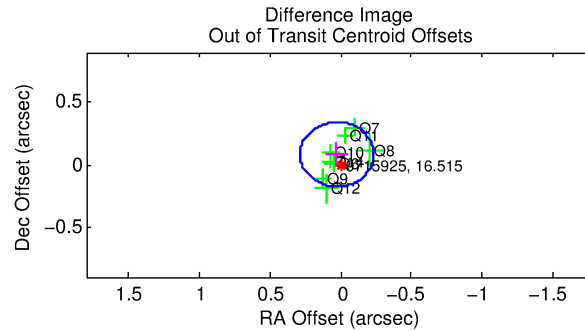
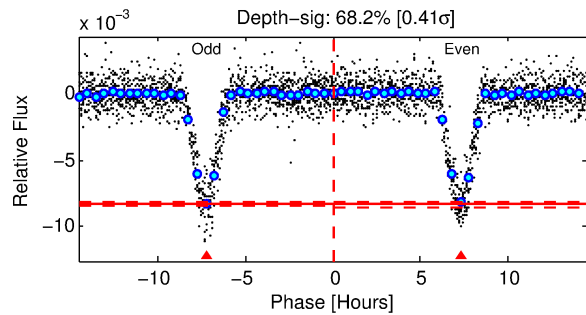
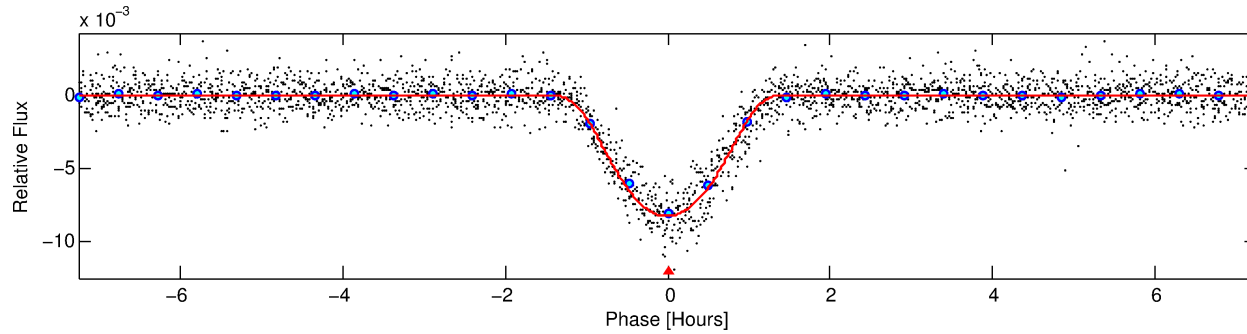
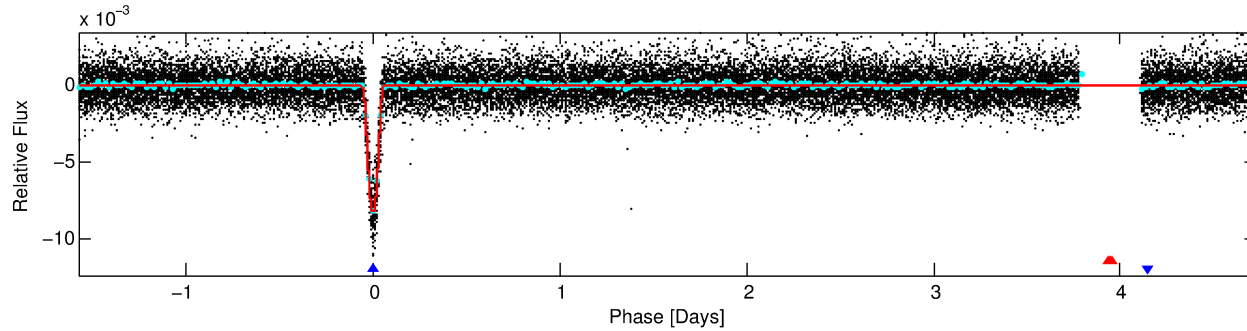
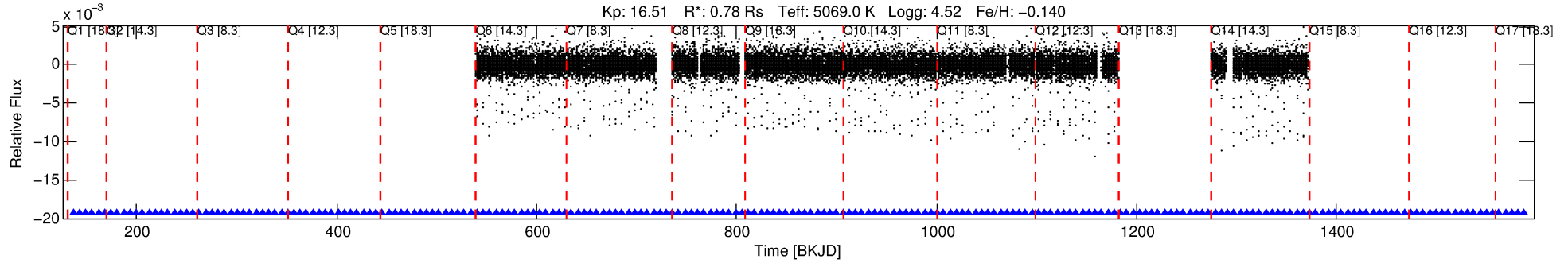
No Significant Match Found

# DV One-Page Summary

KIC: 9715925 Candidate: 2 of 2 Period: 6.308 d

KOI: K03599 Corr: No Ephemeris Match

Kp: 16.51 R\*: 0.78 Rs Teff: 5069.0 K Logg: 4.52 Fe/H: -0.140



## DV Fit Results:

Period = 6.30827 [0.00001] d  
Epoch = 136.7428 [0.0007] BKJD  
Rp/R\* = 0.1085 [0.0080]  
a/R\* = 12.50 [0.51]  
b = 0.92 [0.02]  
Seff = 98.35 [20.61]  
Teff = 803 [42] K  
Rp = 9.23 [1.22] Re  
a = 0.0605 [0.0058] AU  
Ag = 4.41 [1.68] [2.03σ]  
Teffp = 1800 [173] K [5.60σ]

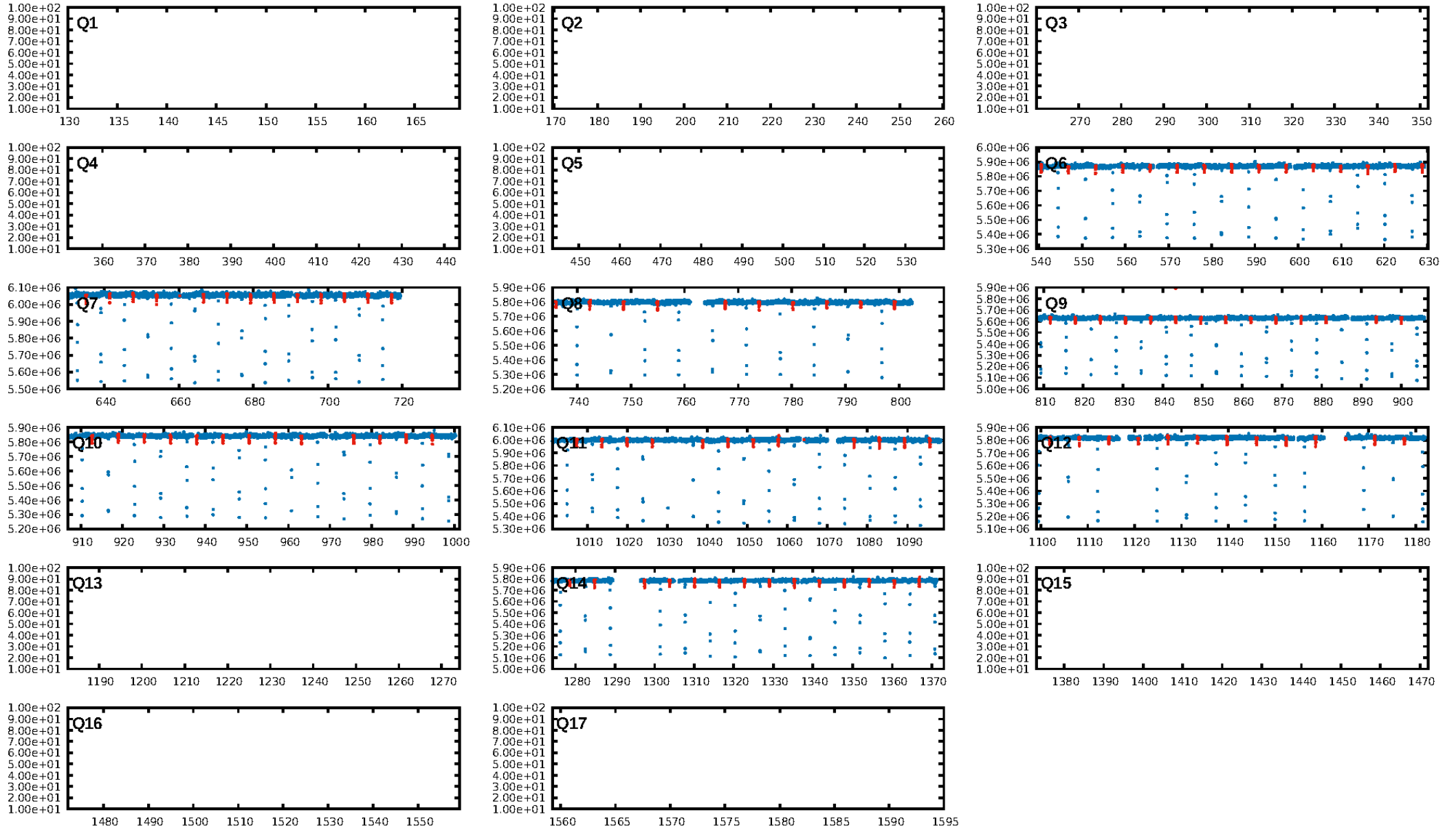
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00e]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [103/103]  
GhostDiagnostic-chr: 6.429  
Centroid-sig: 0.2%  
Centroid-so: 0.248 arcsec [2.31σ]  
OotOffset-rm: 0.086 arcsec [1.00σ]  
KicOffset-rm: 0.046 arcsec [0.47σ]  
OotOffset-st: 3/2/2/1 [8]  
KicOffset-st: 3/2/2/1 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

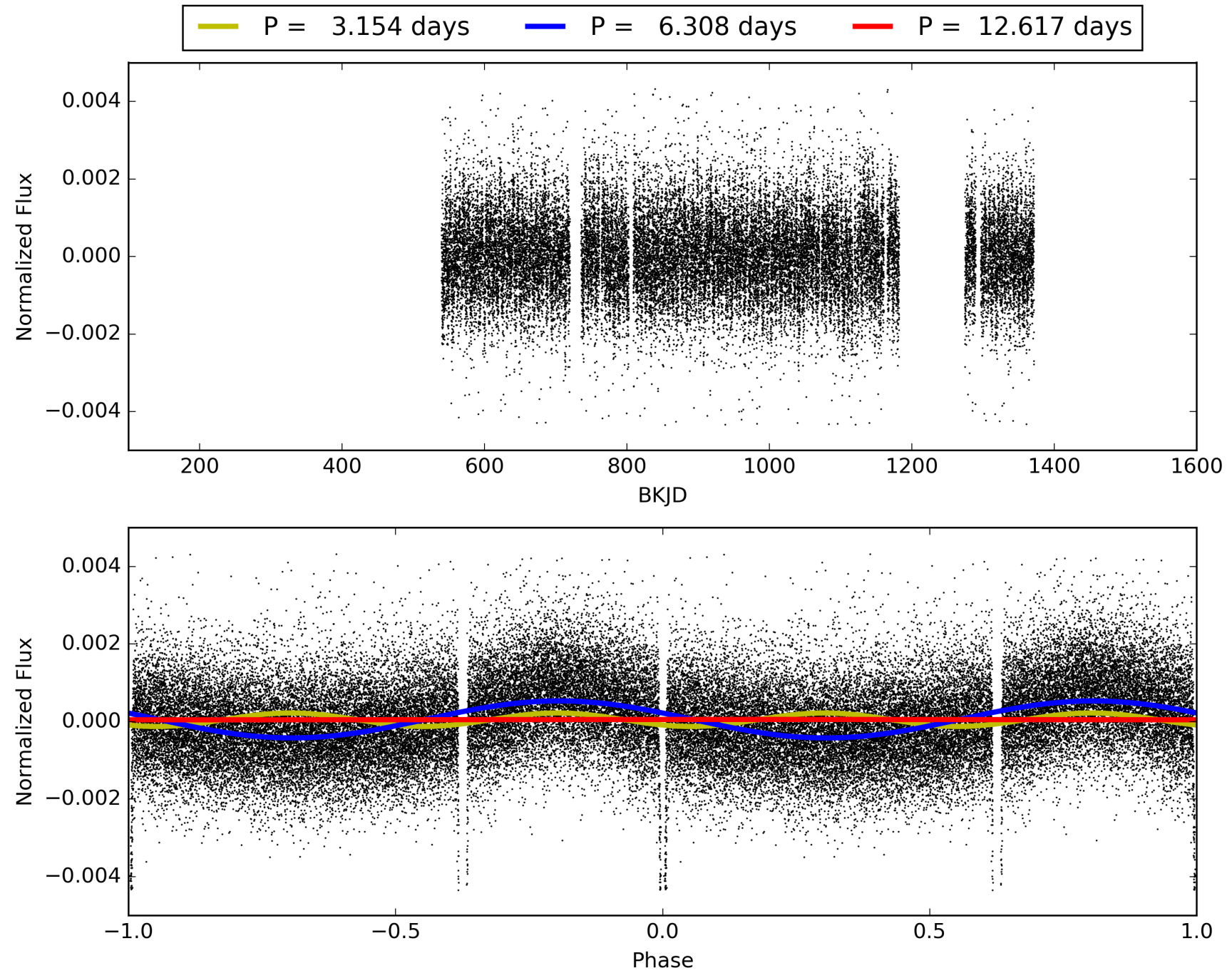
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:31:46 Z

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

# TCE 009715925-02, PDC Light Curves



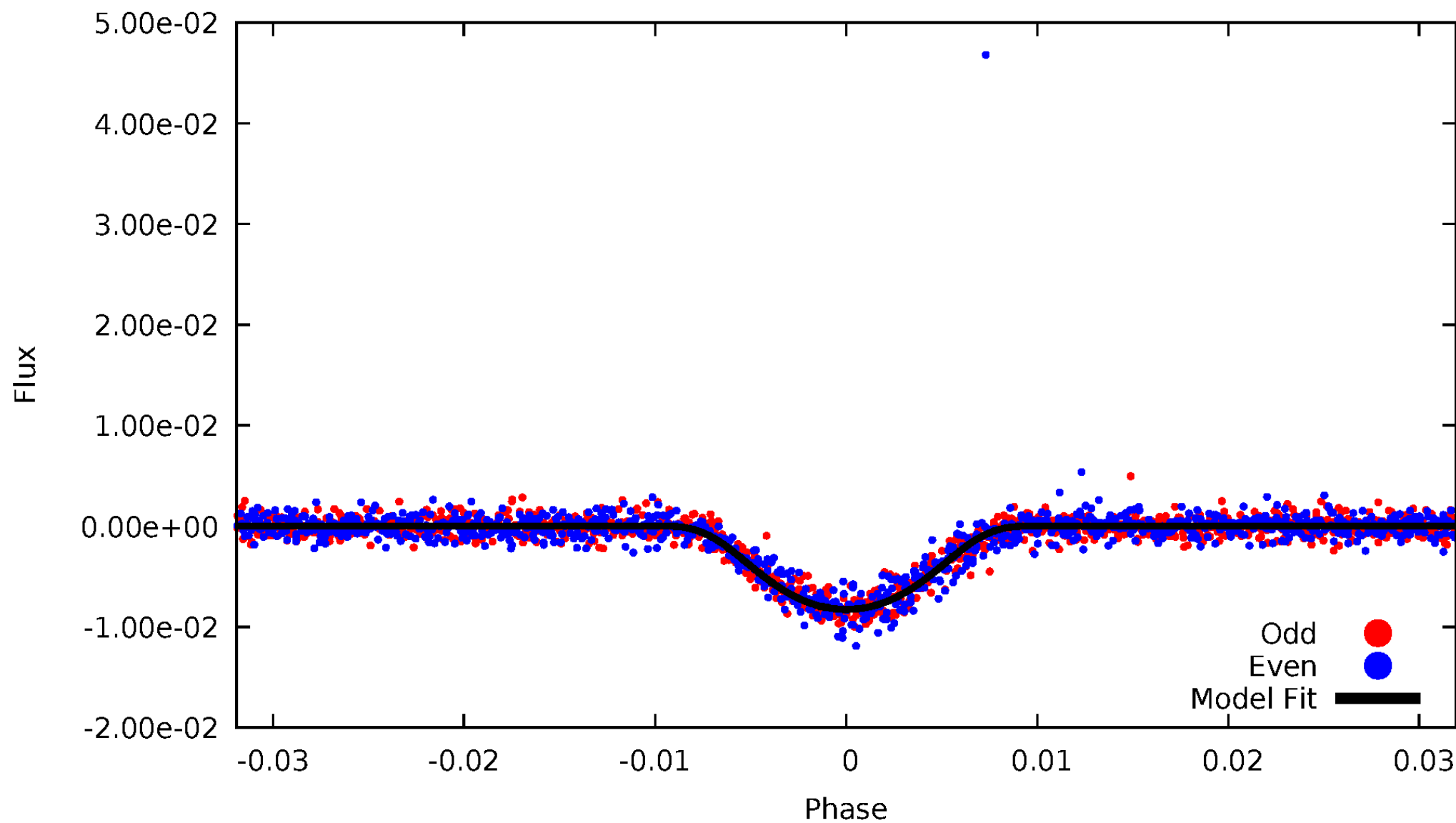
TCE 009715925-02





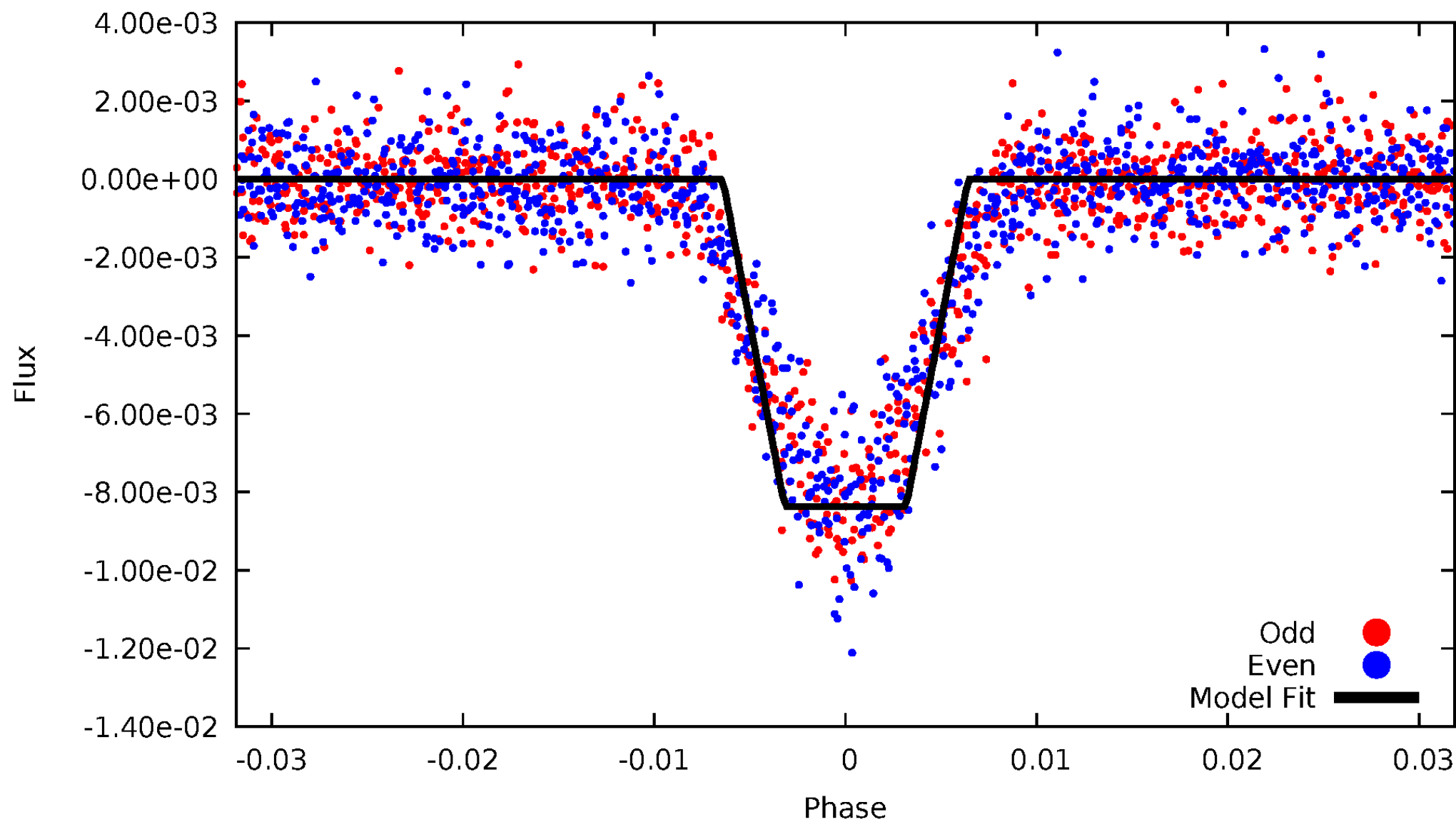
# DV Odd/Even

TCE 009715925-02



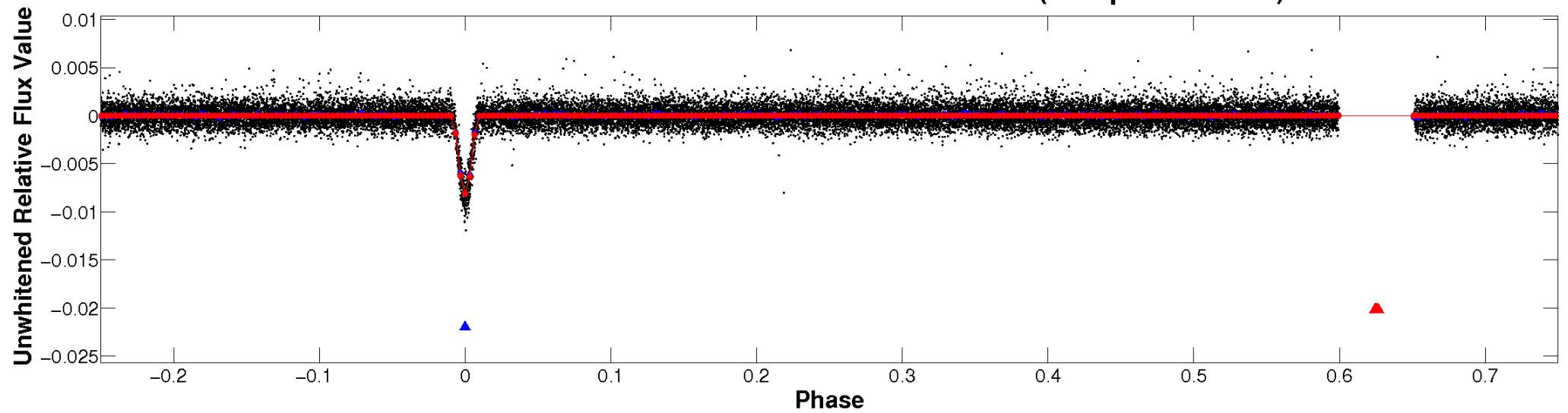
# ALT Odd/Even

TCE 009715925-02

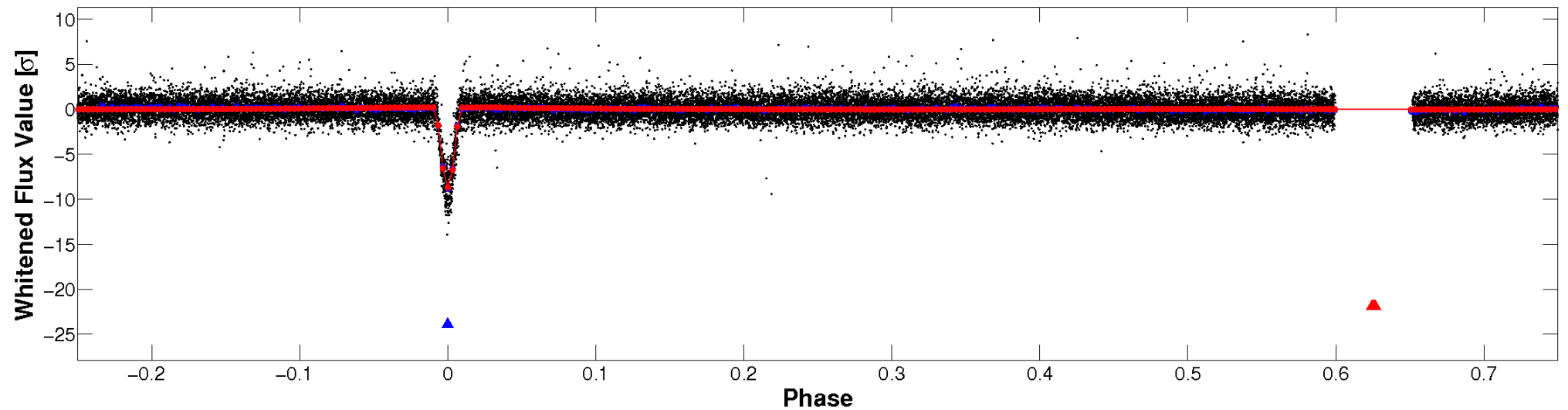


# Non-Whitened Vs. Whitened Light Curve

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

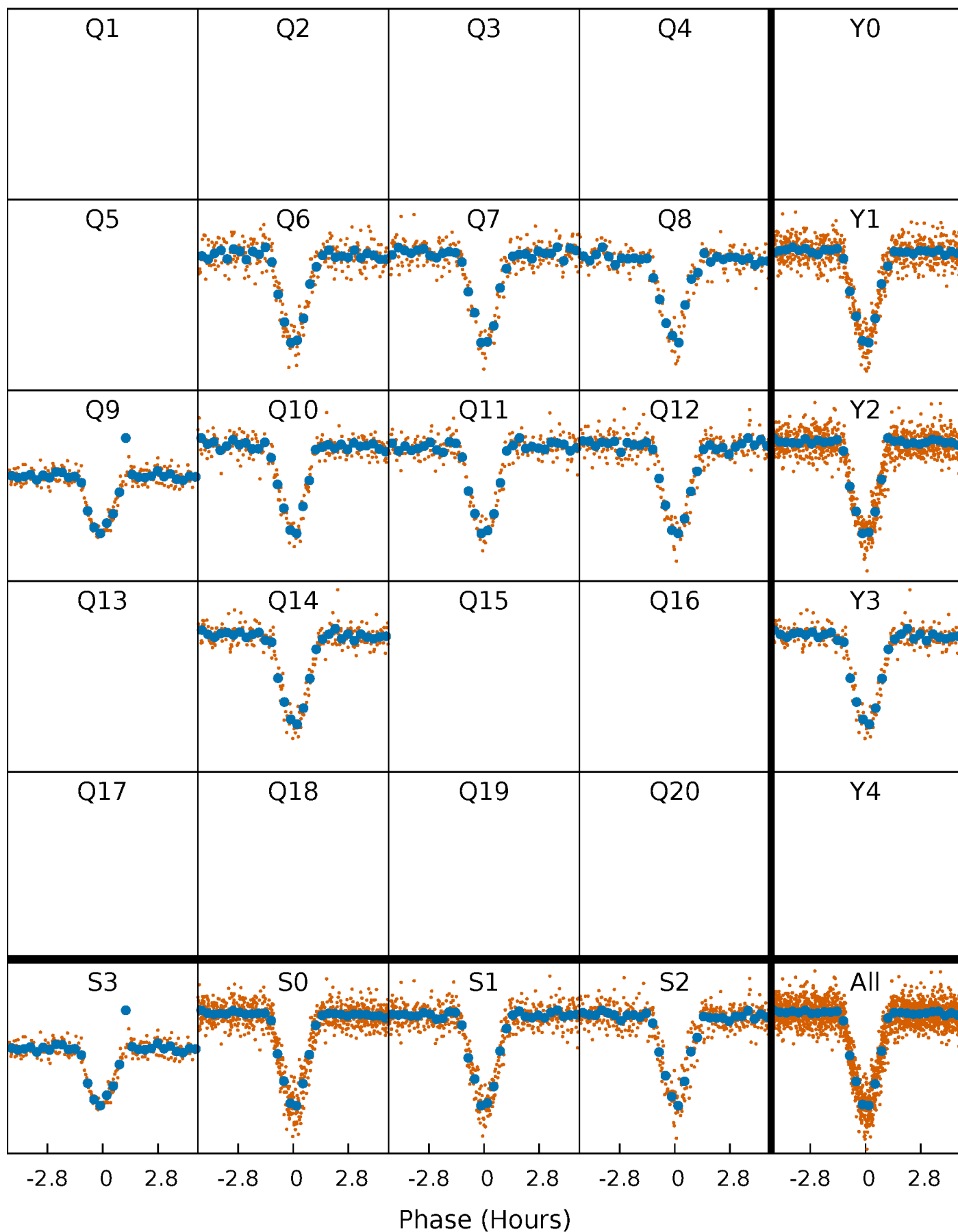


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



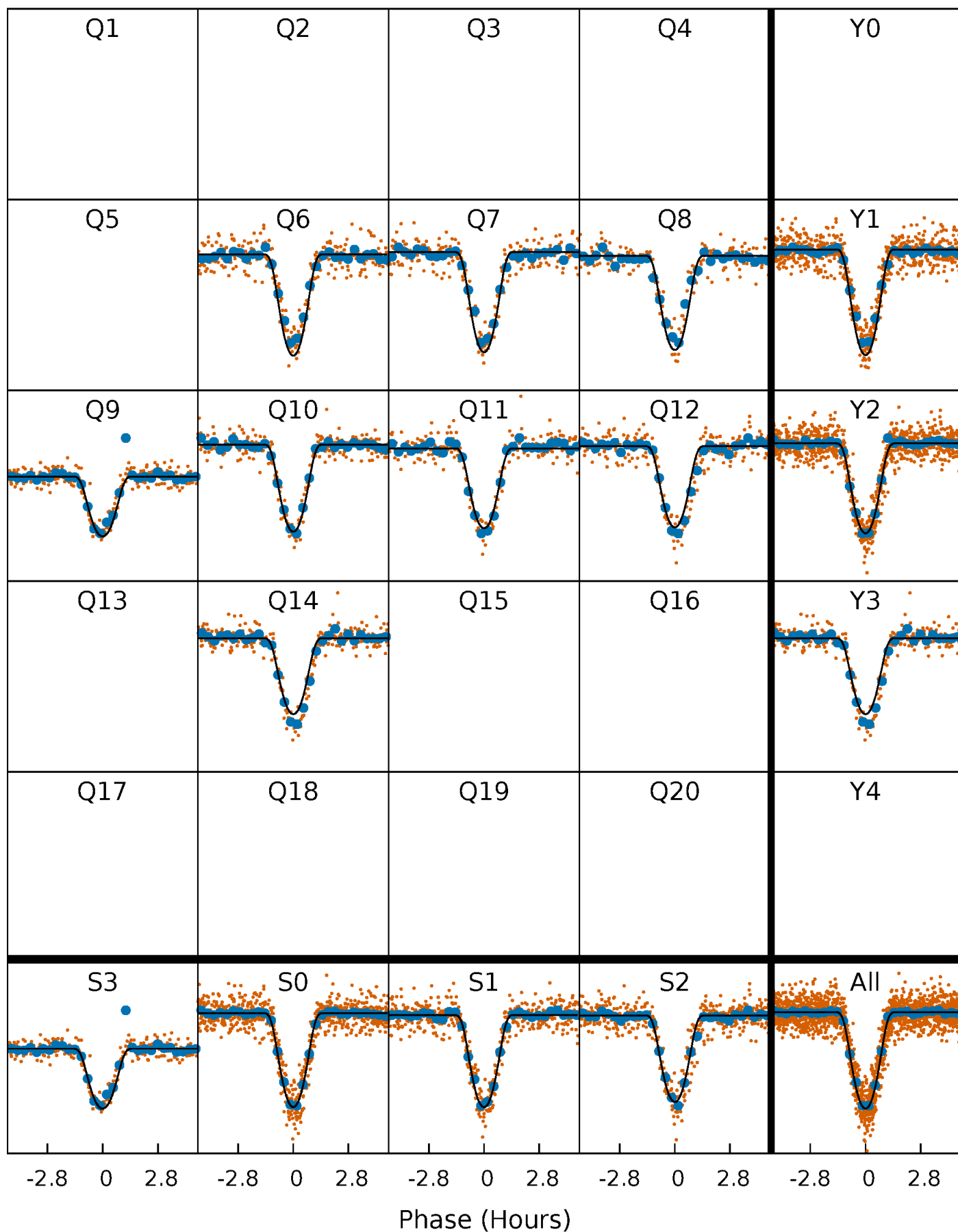
# PDC Quarter-Phased Transit Curves

TCE 009715925-02 P= 6.308272 Days  $T_0=136.742783$  (BKJD)



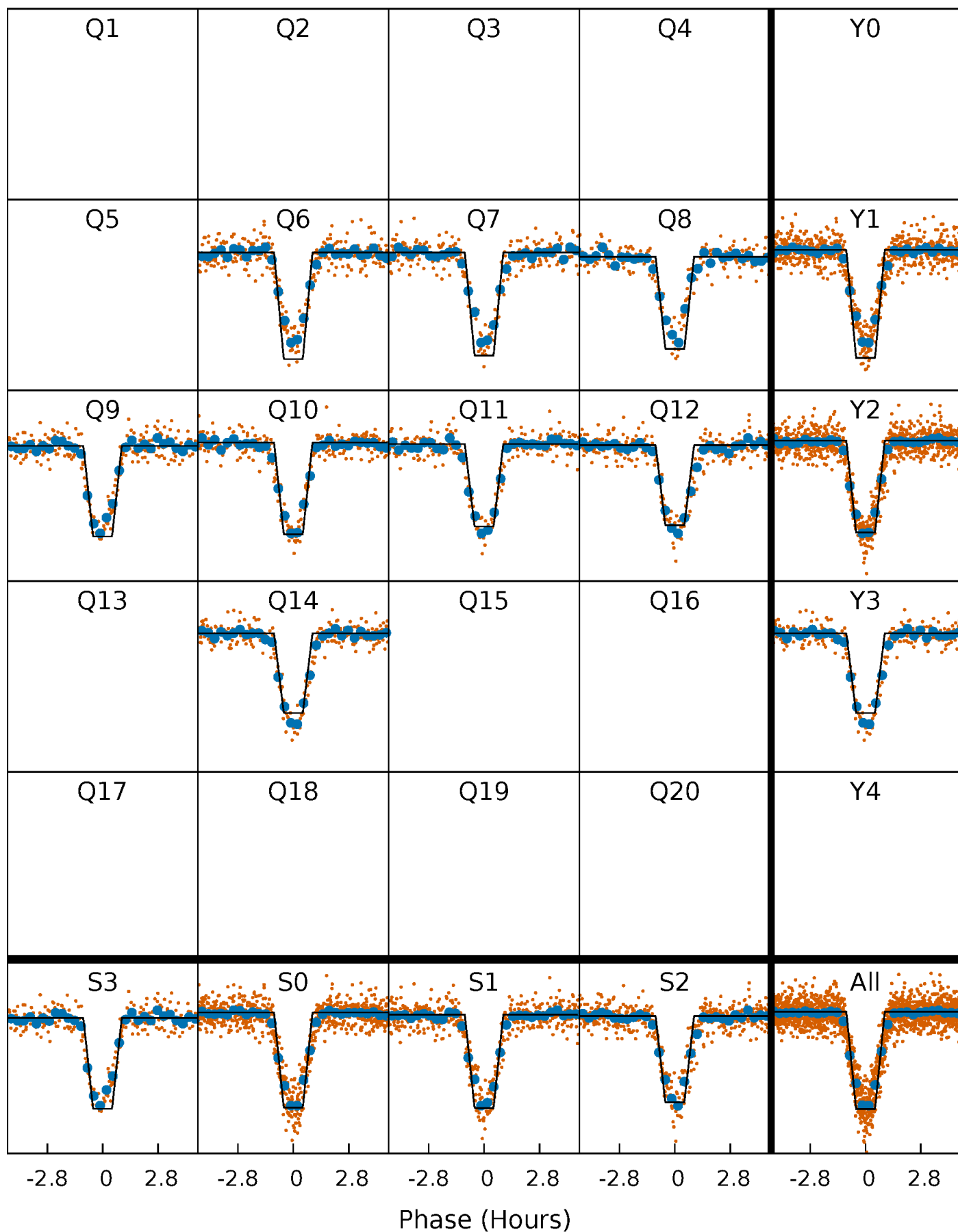
# DV Quarter-Phased Transit Curves

TCE 009715925-02   P= 6.308272 Days    $T_0=136.742783$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

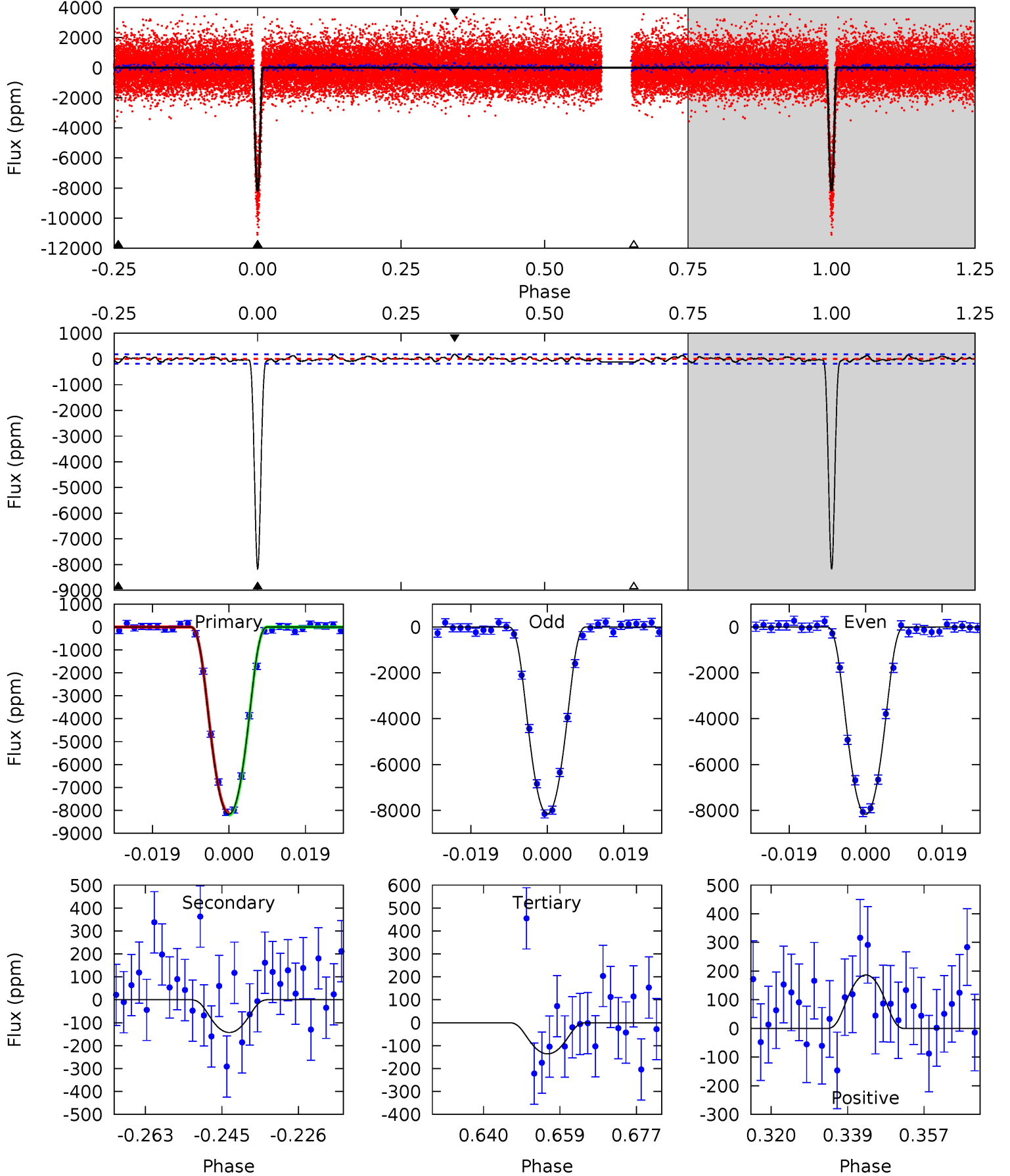
TCE 009715925-02     $P = 6.308288$  Days     $T_0 = 136.741181$  (BKJD)



# DV Model-Shift Uniqueness Test

009715925-02, P = 6.308272 Days, E = 136.742783 Days

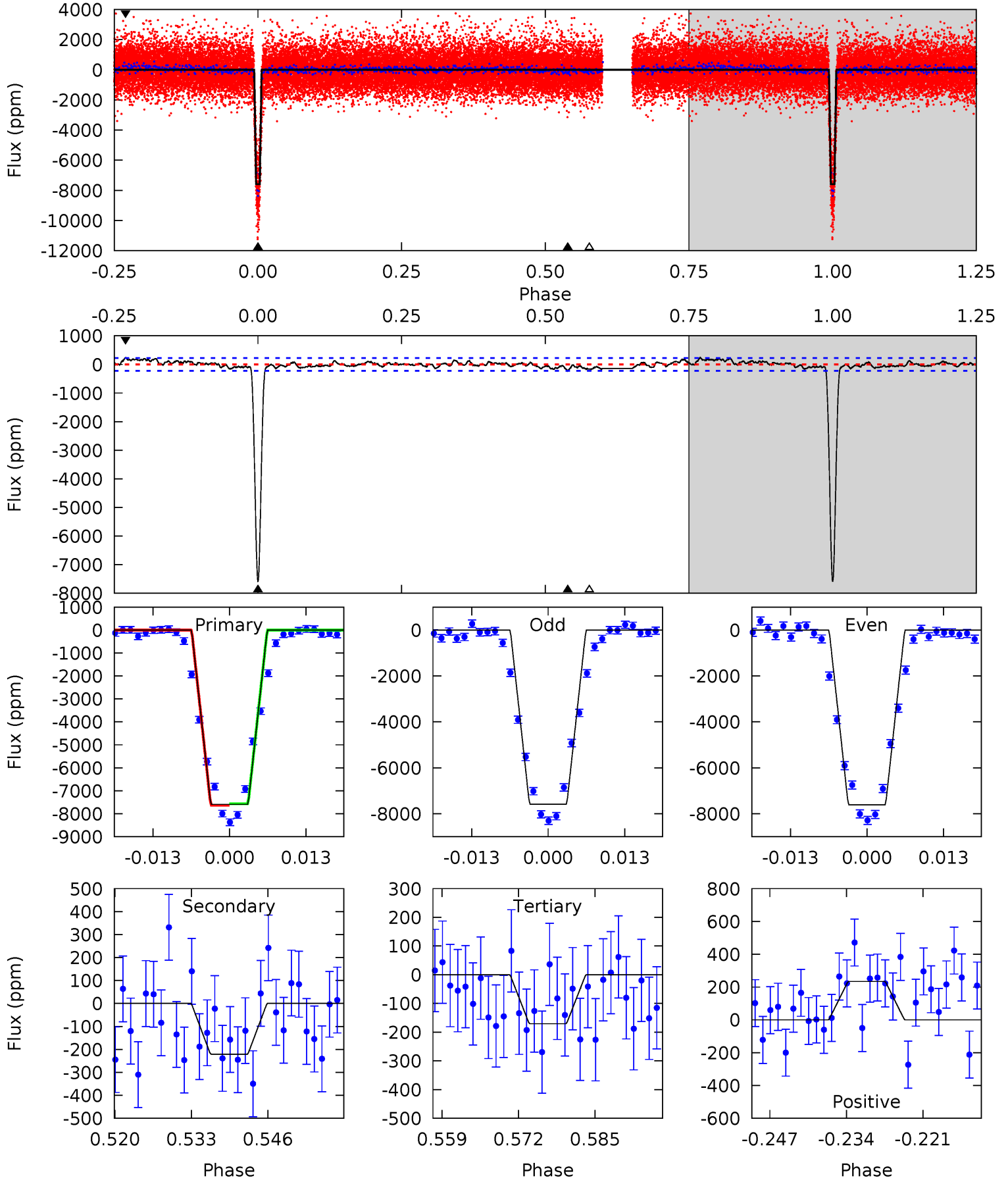
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
216.9	3.79	3.61	4.95	4.90	2.35	1.49	213.3	212.0	0.18	-1.16	0.24	1.01	0.02	1.17



# Alt Model-Shift Uniqueness Test

009715925-02, P = 6.308288 Days, E = 136.741181 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
167.2	4.88	3.75	5.15	4.98	2.48	1.81	163.4	162.0	1.12	-0.28	0.33	1.01	0.03	0.64





### Stellar Parameters For KIC 009715925

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5069^{+194}_{-176}$	$4.524^{+0.080}_{-0.064}$	$-0.140^{+0.300}_{-0.300}$	$0.780^{+0.086}_{-0.086}$	$0.742^{+0.103}_{-0.055}$	$2.203^{+0.783}_{-0.486}$
	+4%/-3%	+2%/-1%	+214%/-214%	+11%/-11%	+14%/-7%	+36%/-22%
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 009715925-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-143 \pm 38$	$9.21^{+0.94}_{-0.86}$	$1120^{+51}_{-48}$	$2486^{+111}_{-122}$	$3.444^{+1.302}_{-1.037}$
Alt.	$-221 \pm 45$	$7.83^{+0.89}_{-0.90}$	$1121^{+47}_{-53}$	$2759^{+111}_{-126}$	$7.497^{+2.408}_{-1.997}$

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

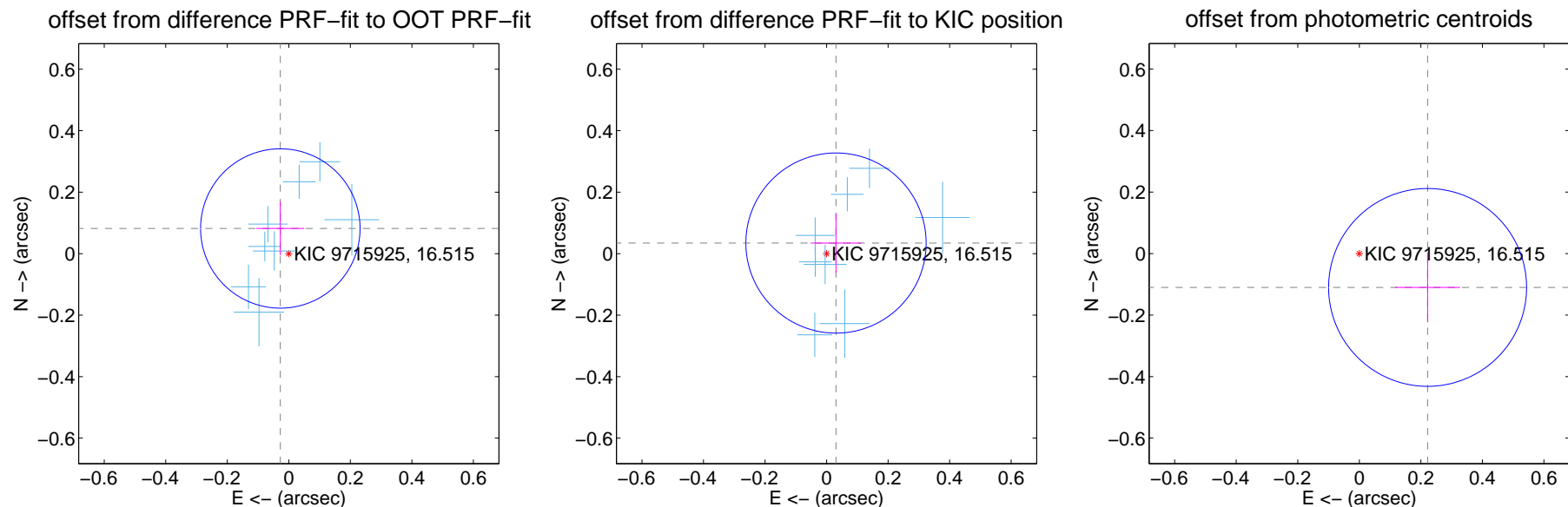
## DV Centroid Data

Supplemental centroid analysis for 009715925-02. Kepler magnitude: 16.52. Transit SNR 125.21

There are 8 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.086 \pm 0.086$	1.00	$0.028 \pm 0.078$	$0.082 \pm 0.087$
PRF-fit source offset from KIC position	$0.046 \pm 0.098$	0.47	$-0.031 \pm 0.083$	$0.035 \pm 0.097$
photometric centroid source offset	$0.25 \pm 0.11$	2.31	$-0.22 \pm 0.11$	$-0.11 \pm 0.11$

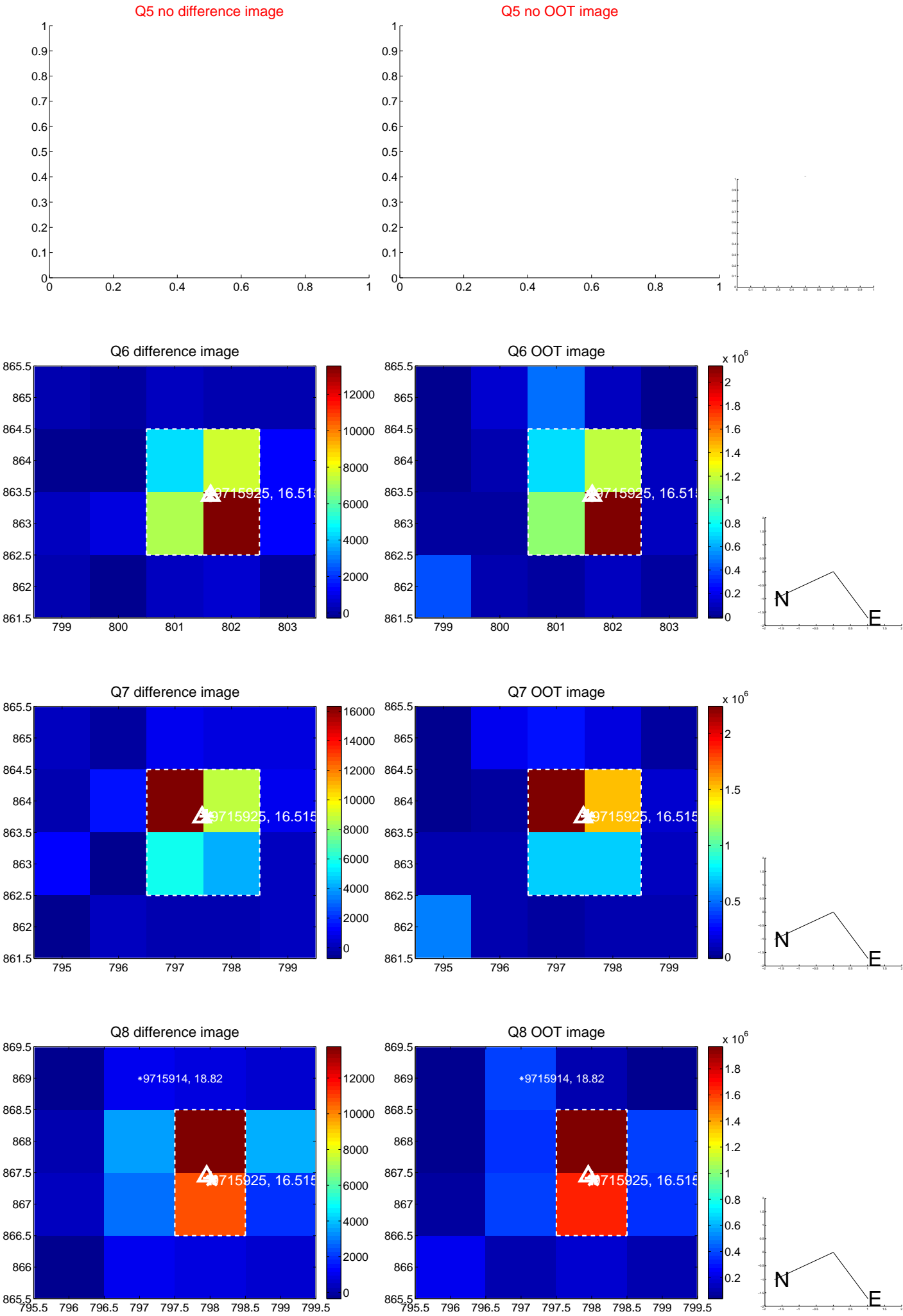


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

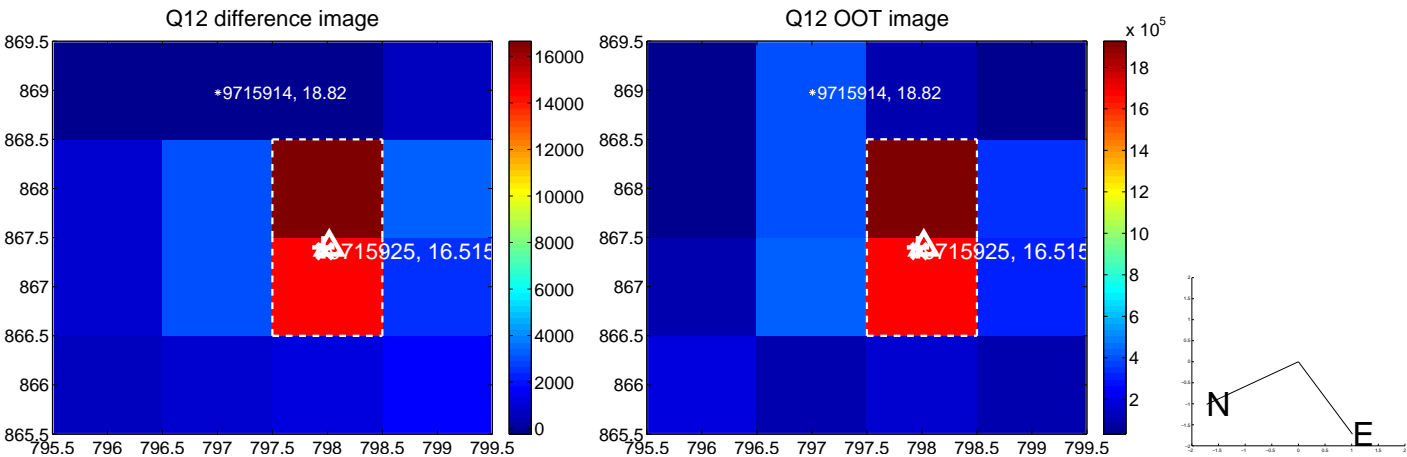
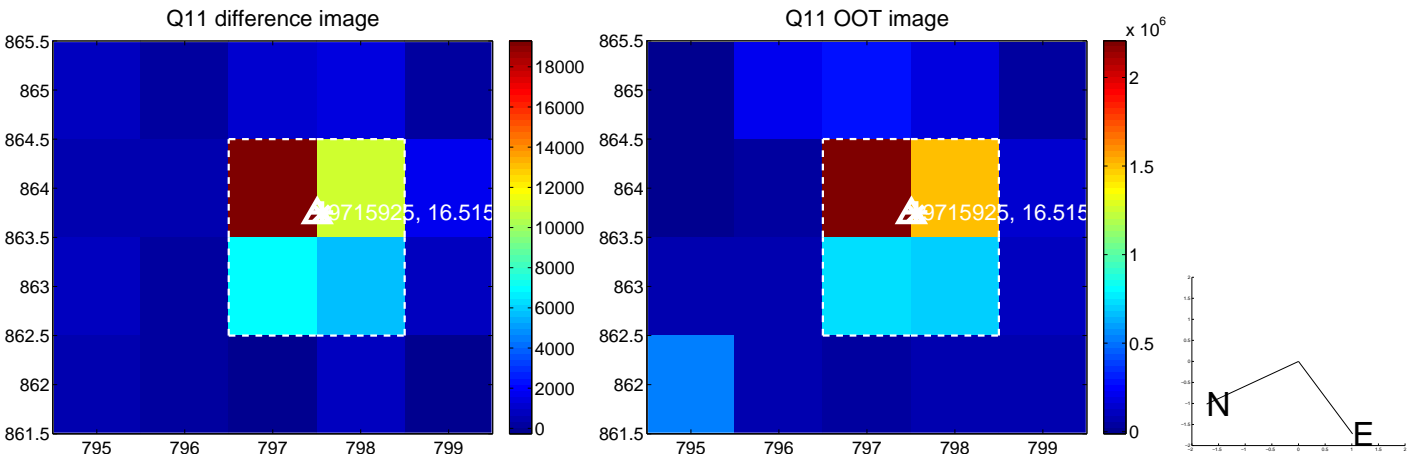
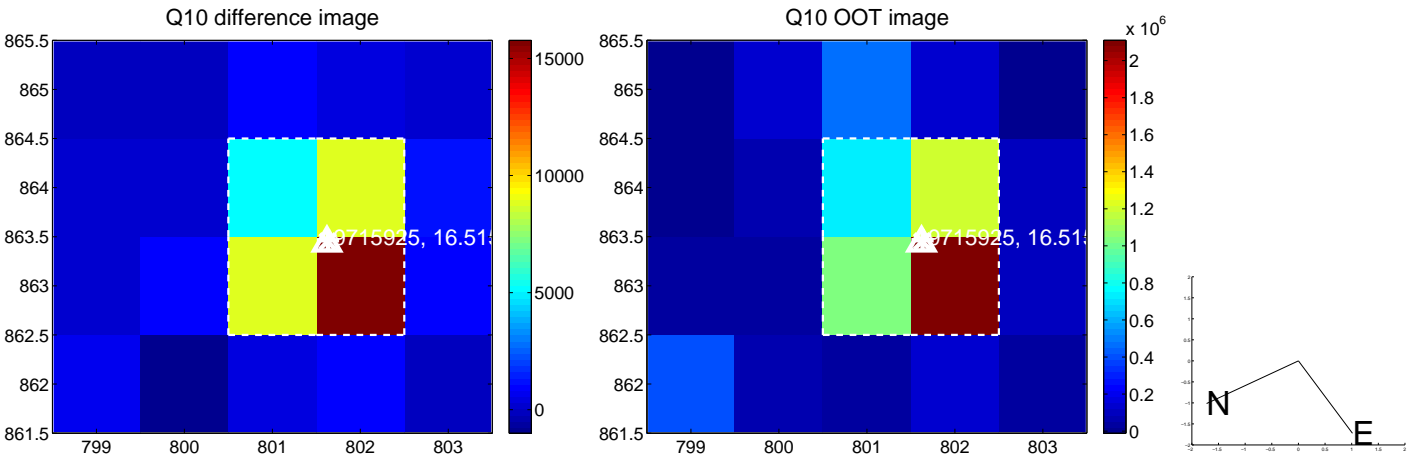
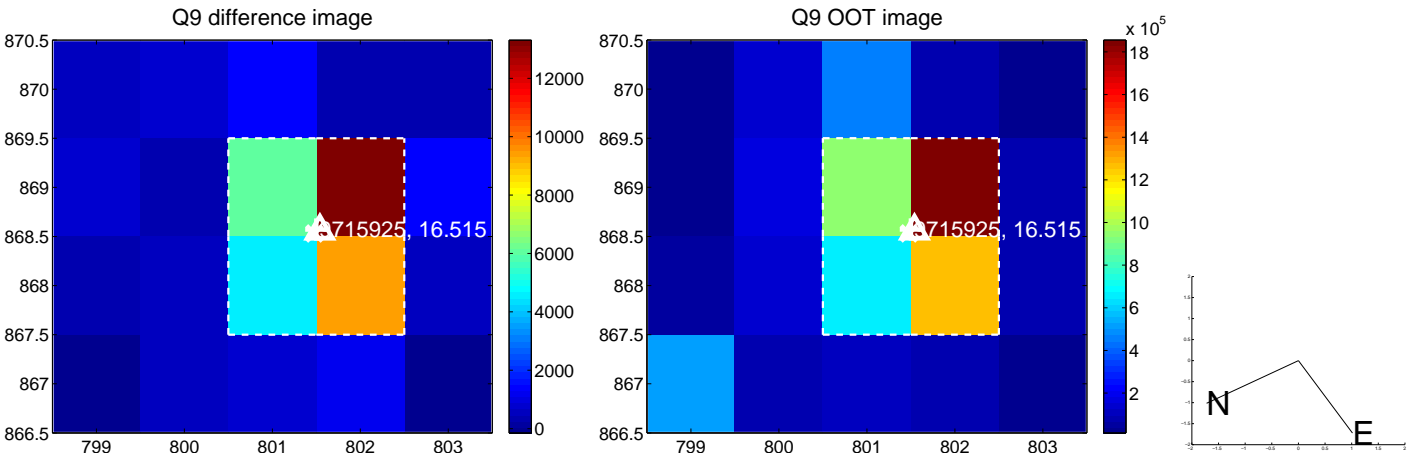
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



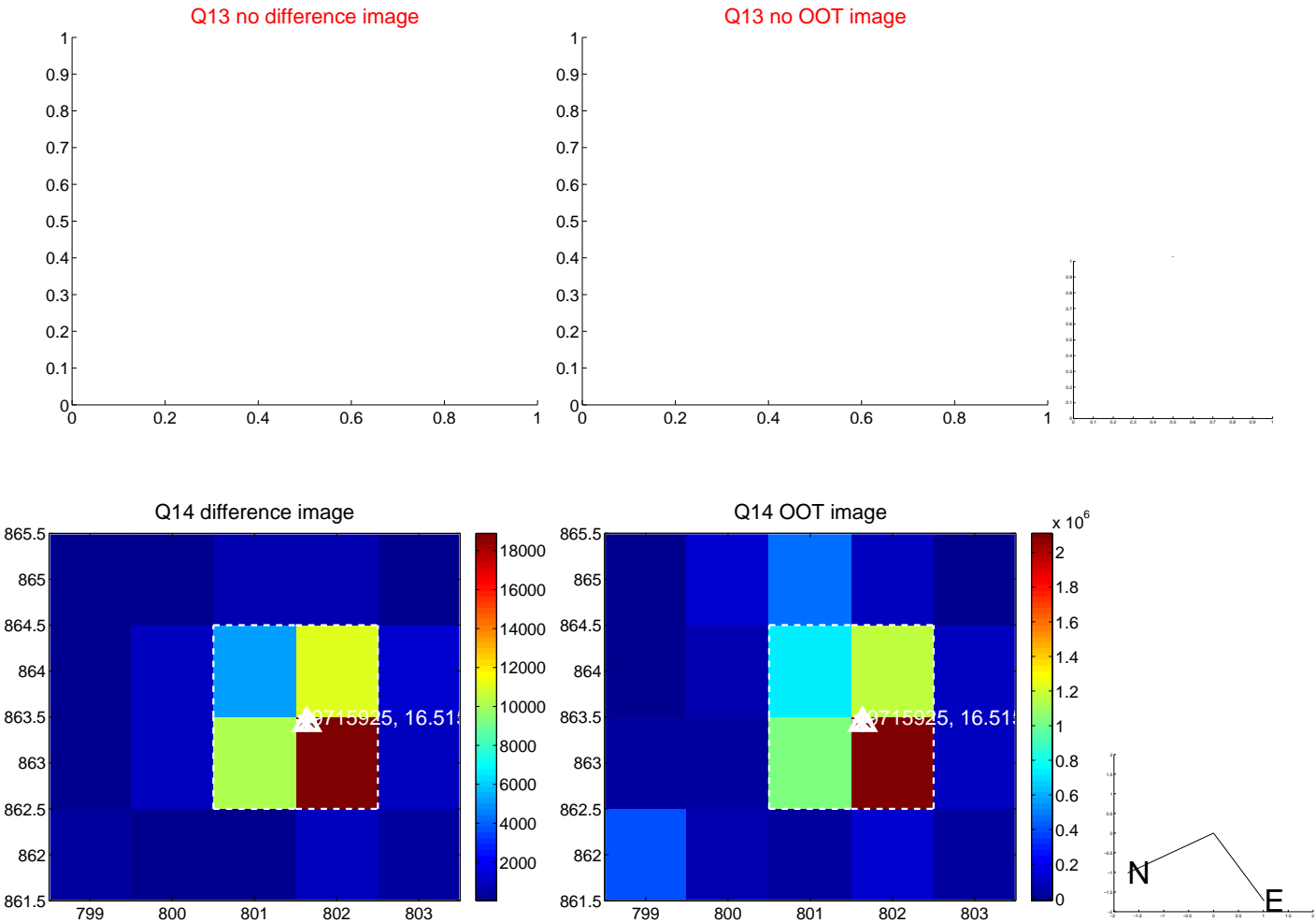
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



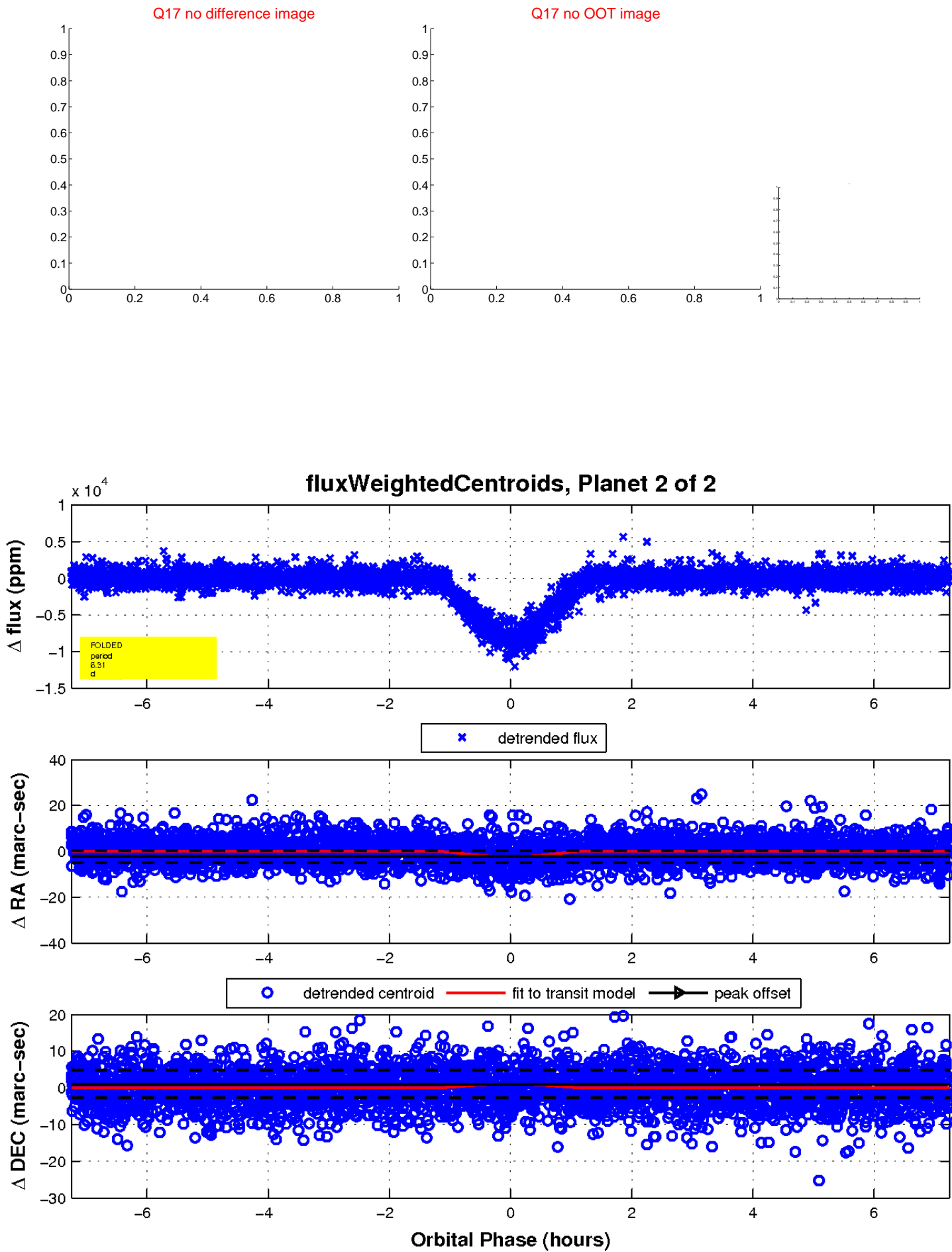
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

