

# KIC 008956025

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008956025-01	OBS	No	123.278691	192.128107	7903.6	13.328	12.1	17.7	0.62	3913	9.03	0.48
008956025-02	OBS	No	86.408921	163.543199	2118.9	13.430	7.7	6.6	0.62	3913	2.96	0.77

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008956025-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
008956025-02	OBS	FP	0.03	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—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.

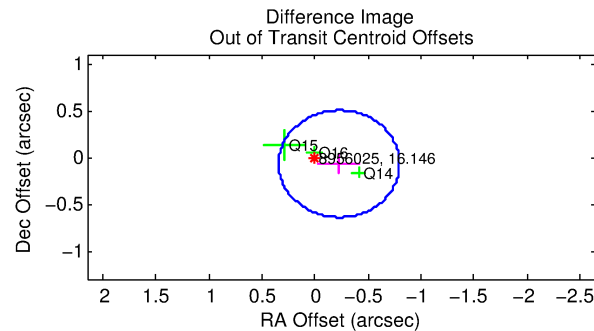
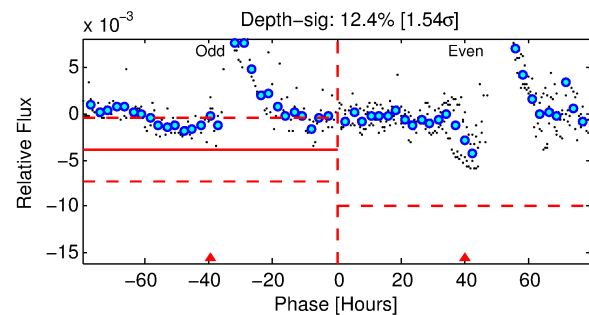
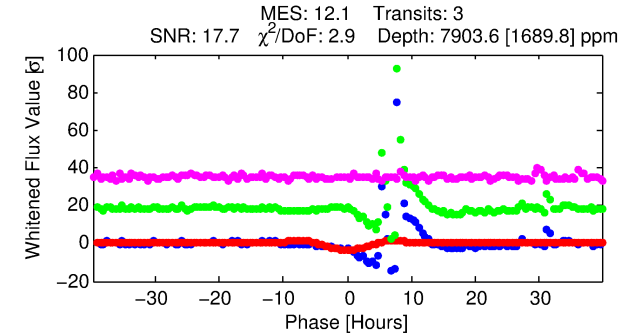
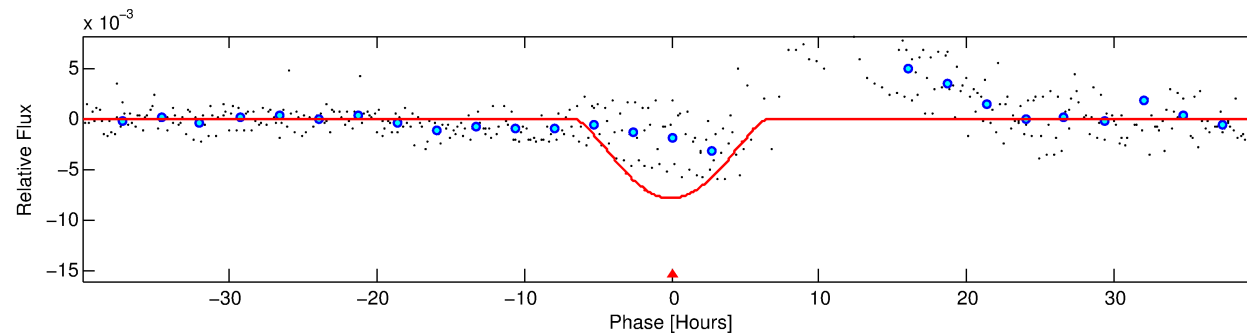
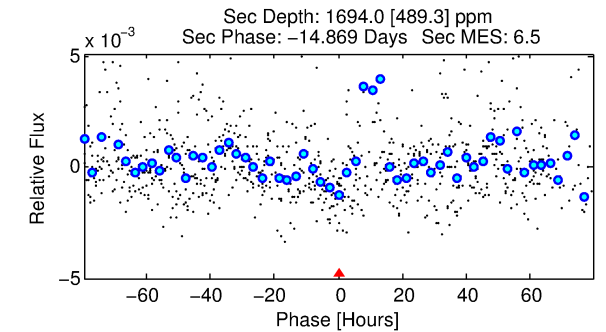
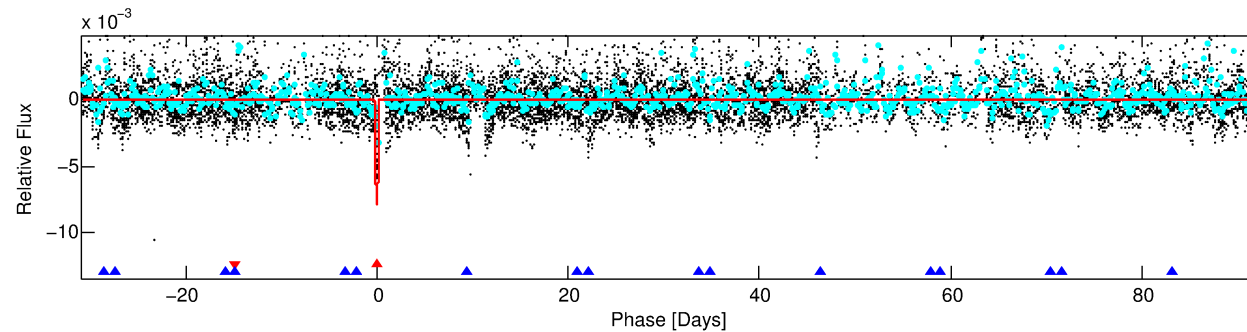
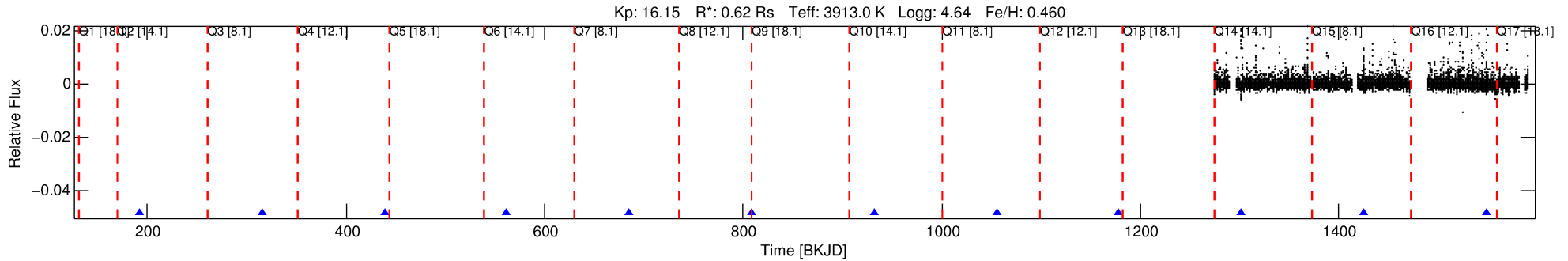
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008956025-01

No Significant Match Found

# DV One-Page Summary

KIC: 8956025 Candidate: 1 of 2 Period: 123.279 d



## DV Fit Results:

Period = 123.27869 [0.03034] d  
Epoch = 192.1281 [0.3051] BKJD  
Rp/R\* = 0.1326 [0.4554]  
a/R\* = 41.76 [30.18]  
b = 0.97 [0.73]  
Seff = 0.48 [0.09]  
Teq = 212 [10] K  
Rp = 9.03 [31.03] Re  
a = 0.4141 [0.0361] AU  
Ag = 1961.51 [13493.04] [0.15σ]  
Teffp = 2180 [3750] K [0.52σ]

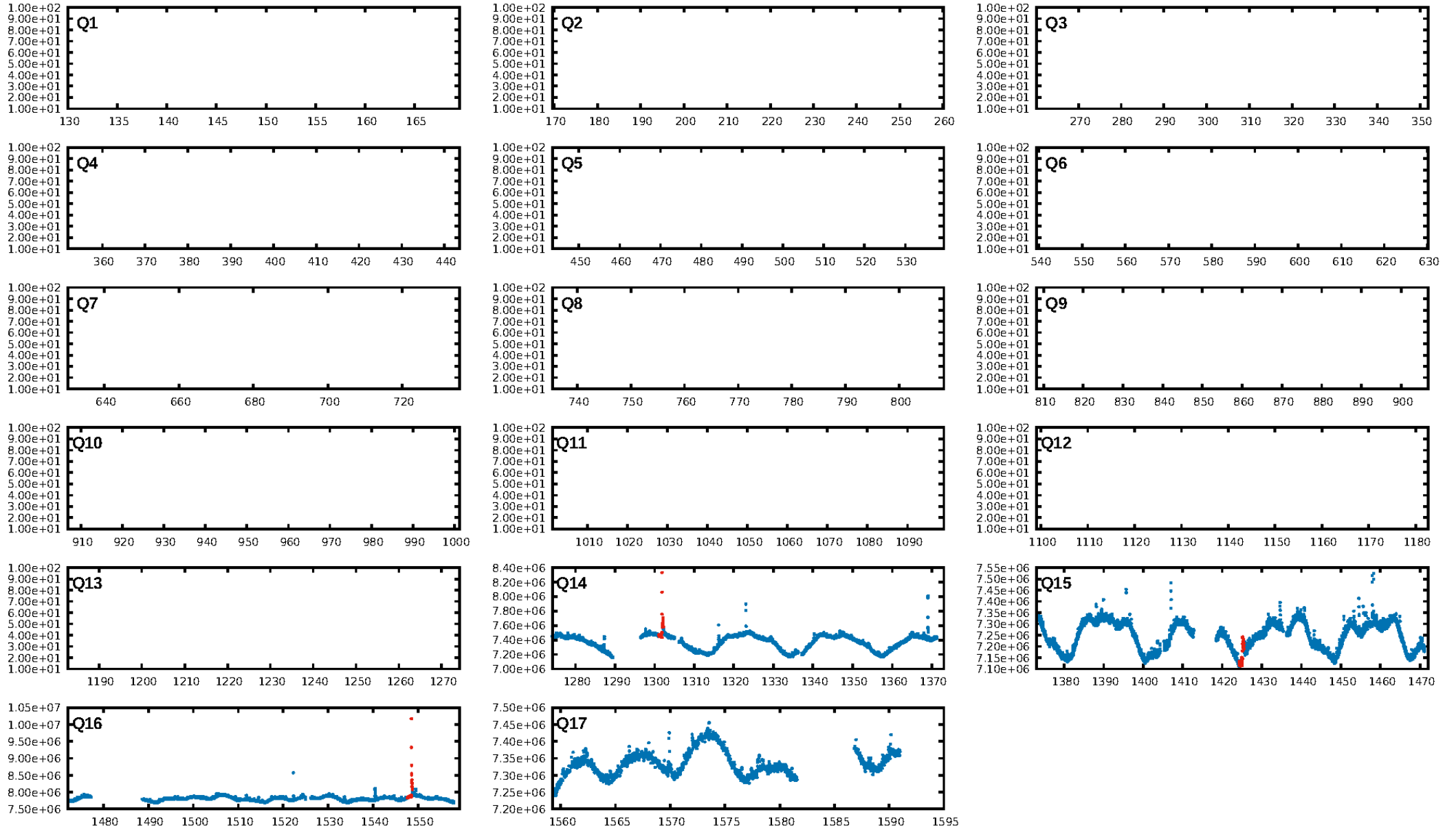
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [46.77σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 3.11e-15  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.344  
Centroid-sig: 30.3%  
Centroid-so: 0.531 arcsec [2.16σ]  
OotOffset-rm: 0.236 arcsec [1.24σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-rm: 0.673 arcsec [3.35σ]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

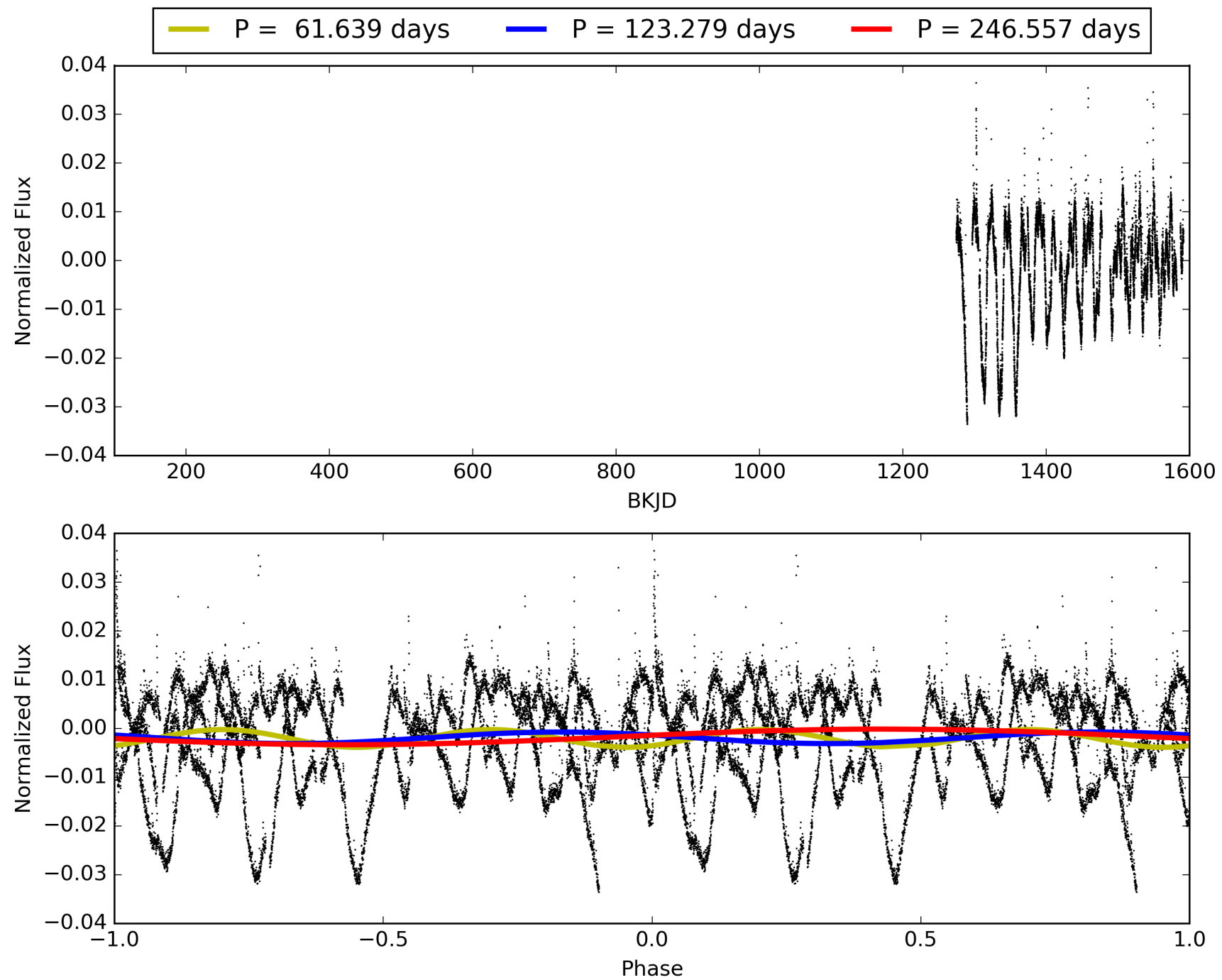
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:24:11 Z

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

# TCE 008956025-01, PDC Light Curves

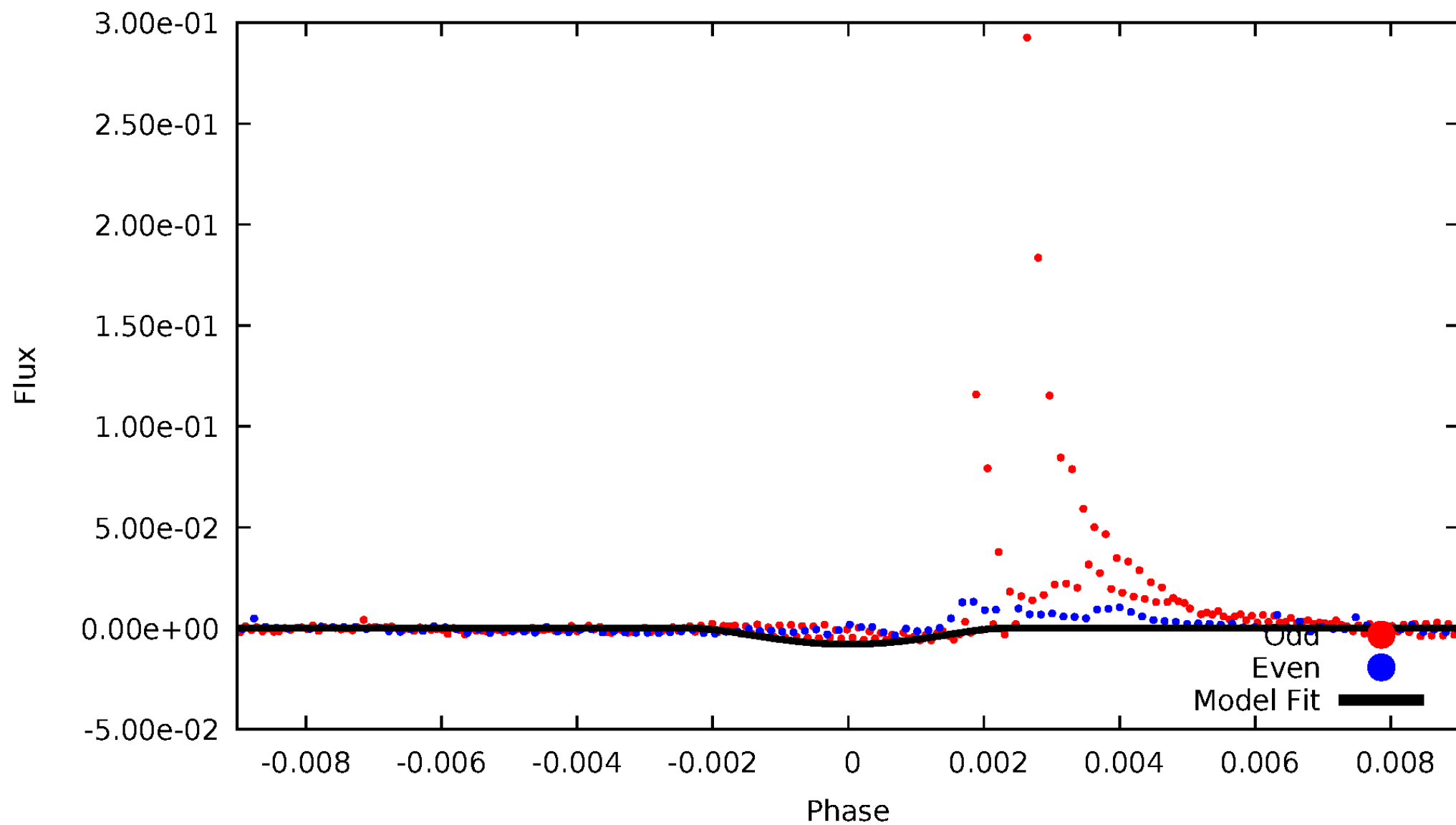


# TCE 008956025-01



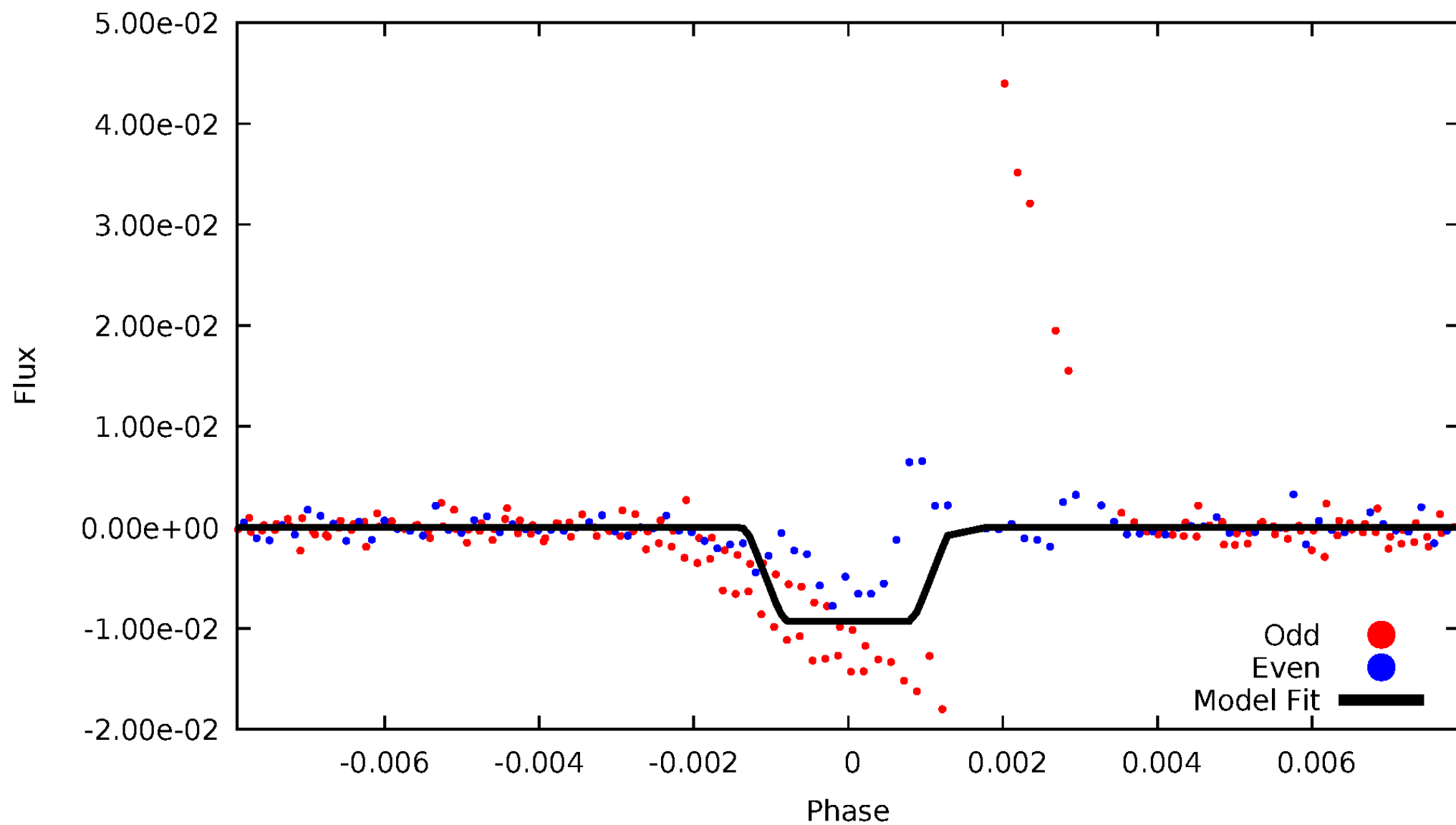
# DV Odd/Even

TCE 008956025-01



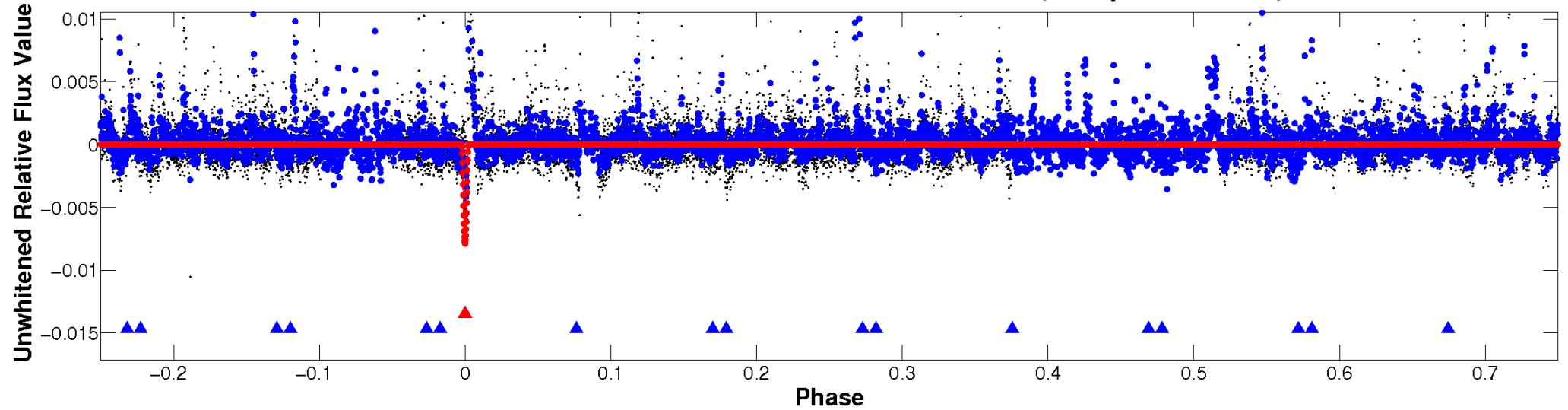
# ALT Odd/Even

TCE 008956025-01

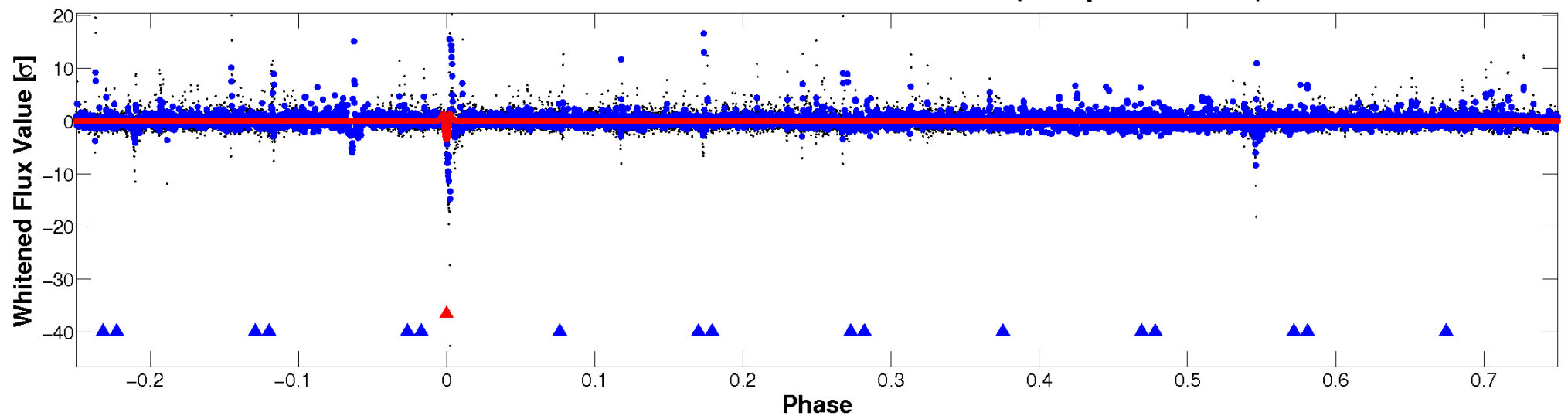


# Non-Whitened Vs. Whitened Light Curve

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

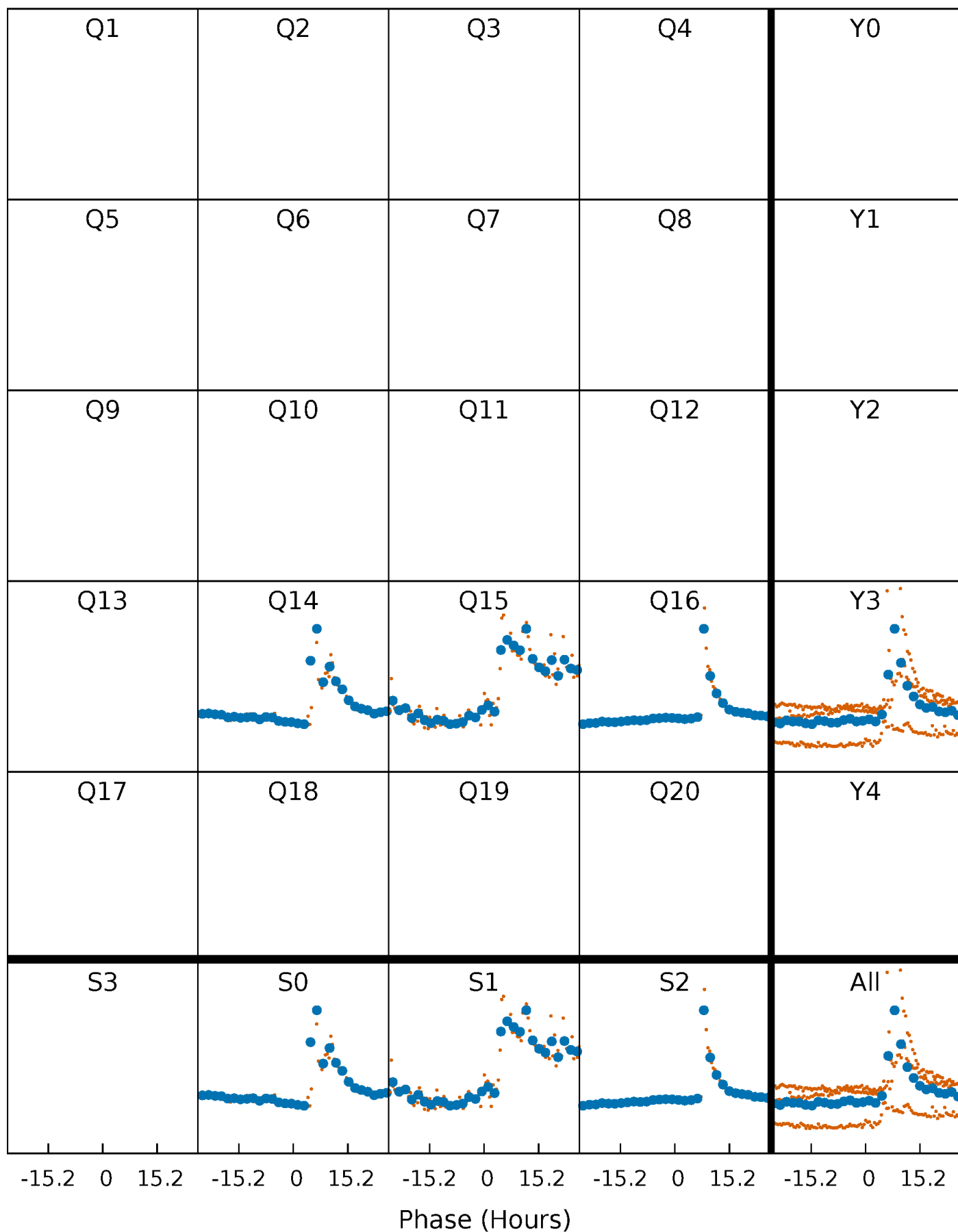


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

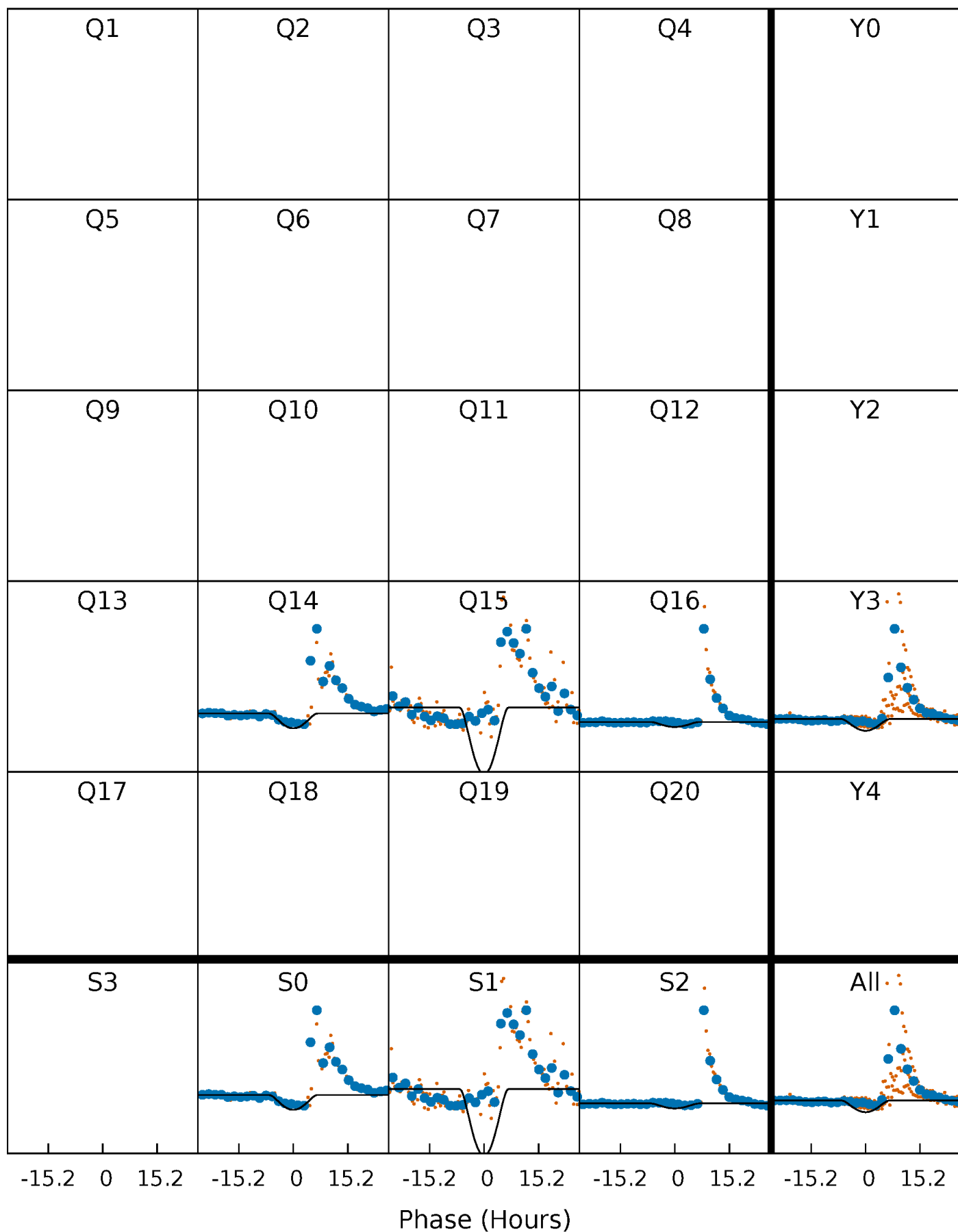
TCE 008956025-01 P=123.278691 Days  $T_0=192.128107$  (BKJD)





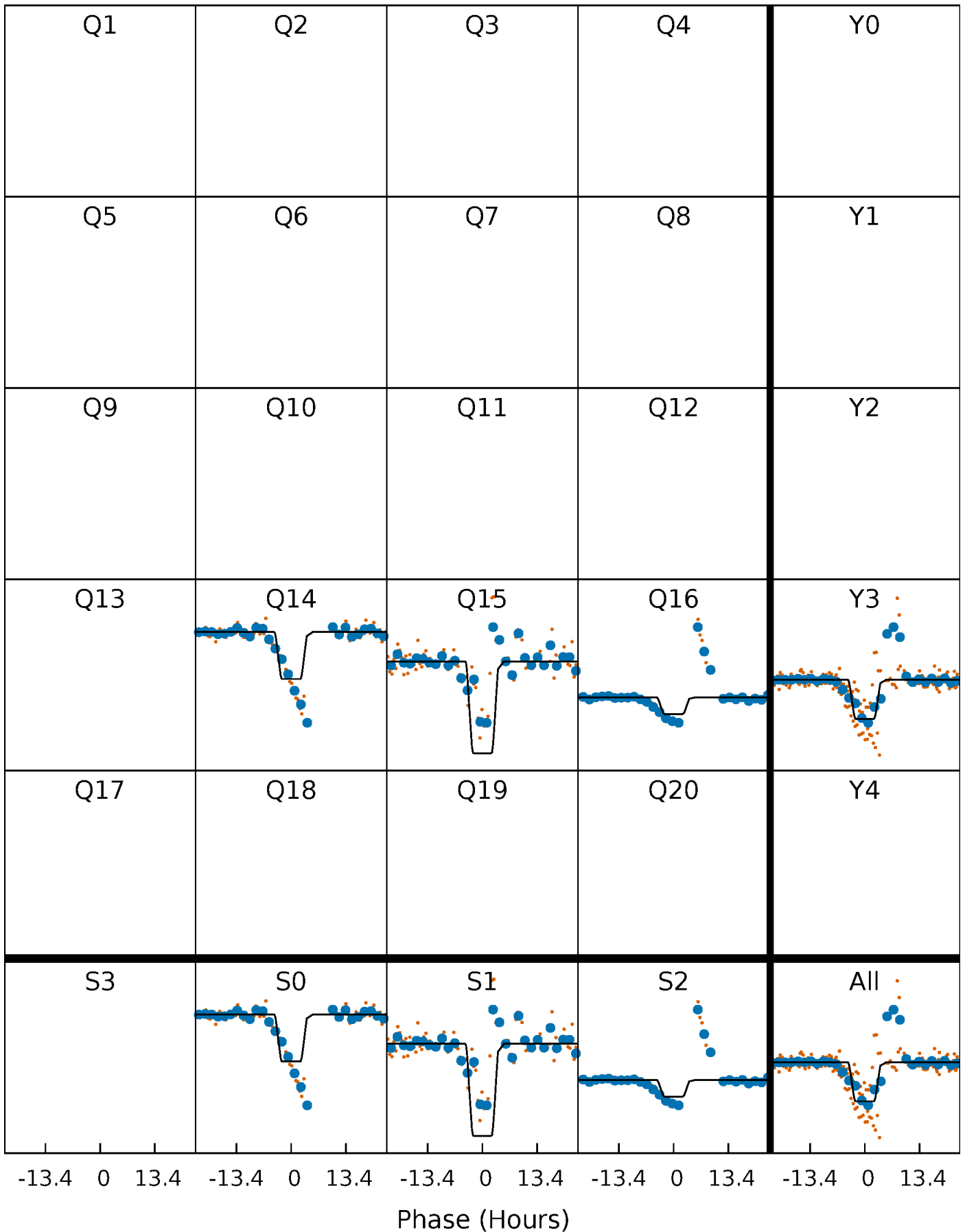
# DV Quarter-Phased Transit Curves

TCE 008956025-01 P=123.278691 Days  $T_0=192.128107$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

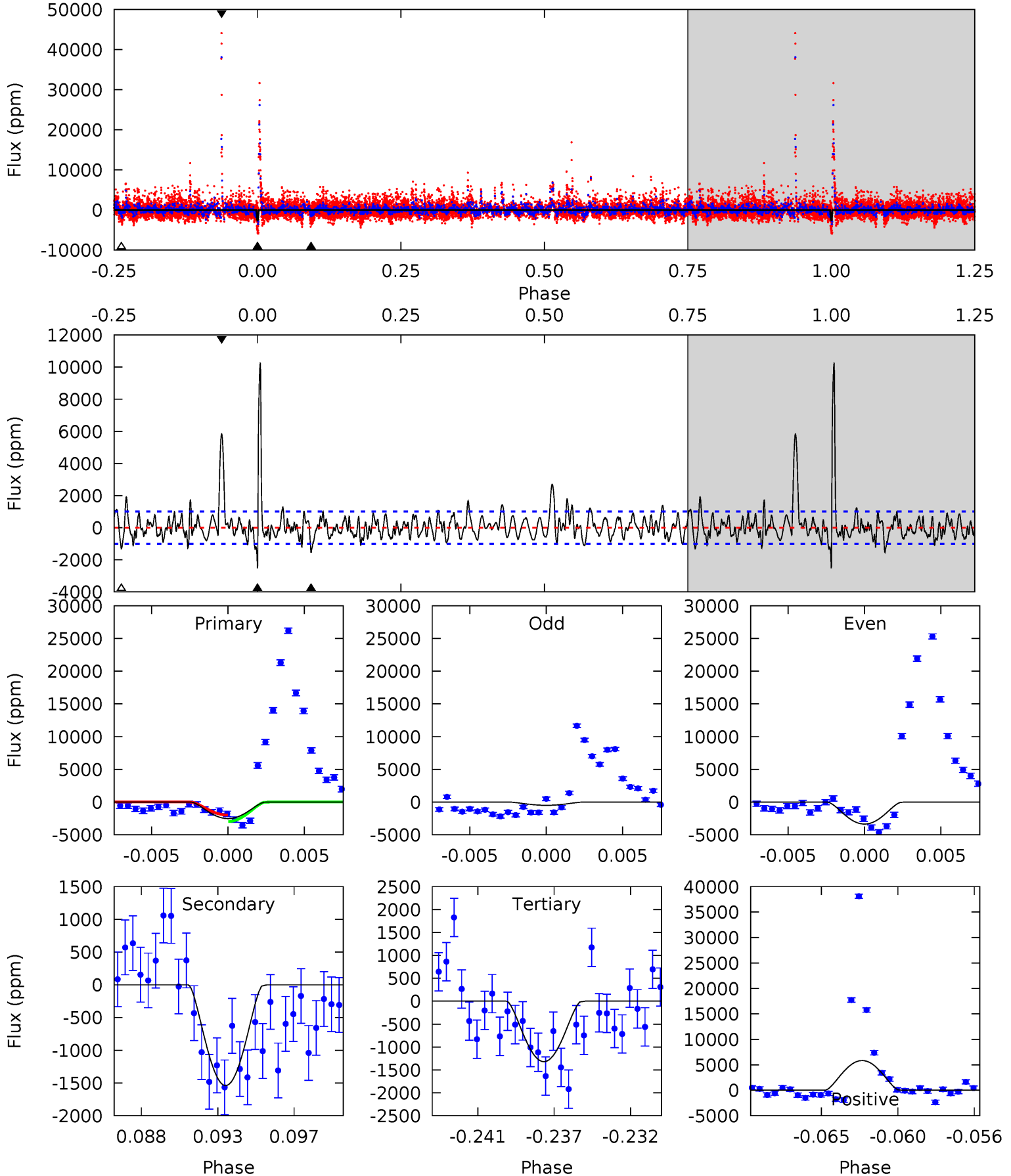
TCE 008956025-01 P=123.346687 Days  $T_0=191.557772$  (BKJD)



# DV Model-Shift Uniqueness Test

008956025-01, P = 123.278691 Days, E = 192.128107 Days

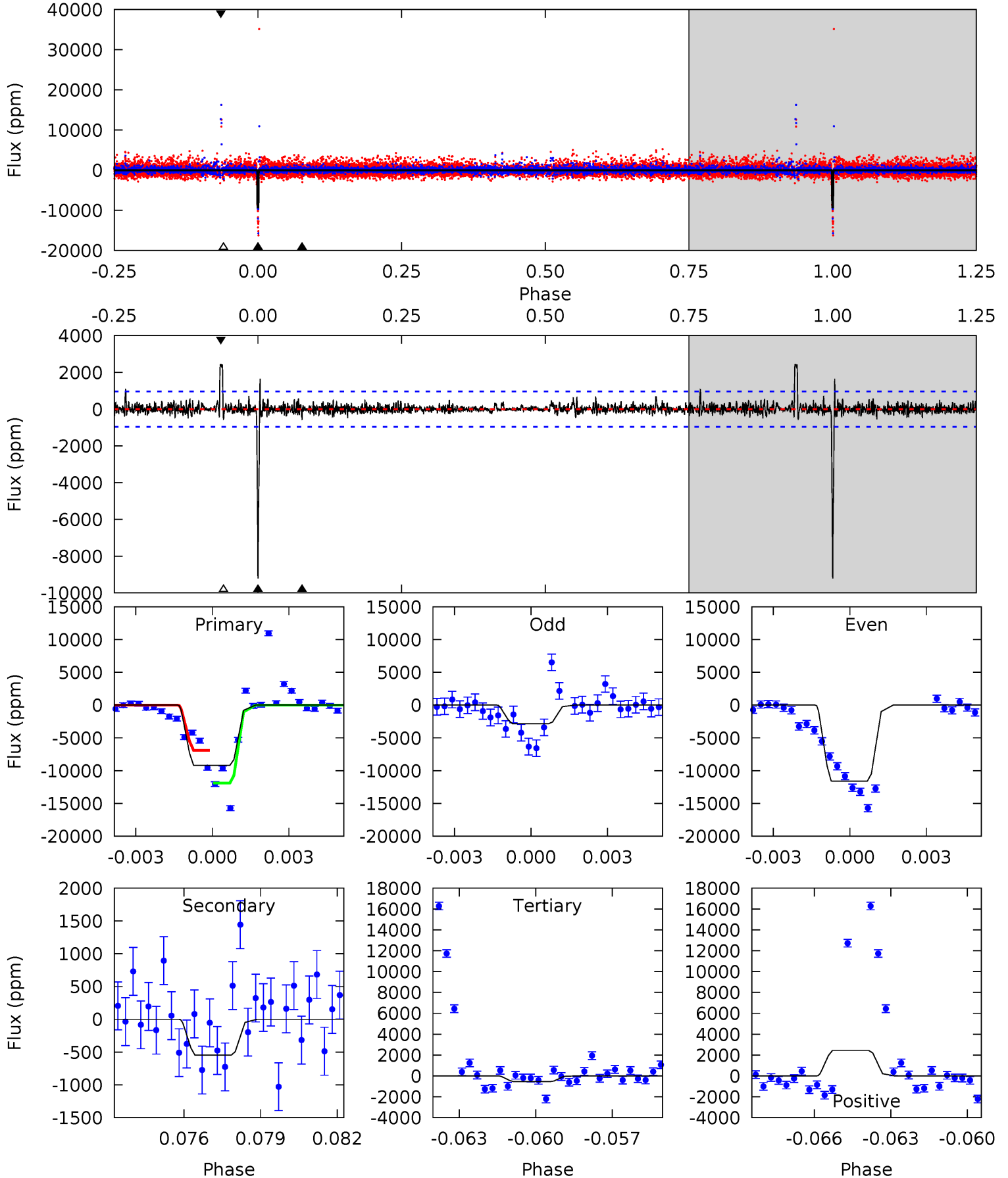
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	7.93	6.80	30.1	5.17	2.83	3.83	6.22	-17.0	1.13	-22.1	4.96	2.21	0.80	2.56



# Alt Model-Shift Uniqueness Test

008956025-01, P = 123.346687 Days, E = 191.557772 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
50.1	2.98	2.96	13.3	5.24	2.95	1.02	47.1	36.8	0.02	-10.3	27.4	0.82	0.21	0



### Stellar Parameters For KIC 008956025

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3913^{+122}_{-136}$	$4.642^{+0.063}_{-0.018}$	$0.460^{+0.050}_{-0.300}$	$0.624^{+0.026}_{-0.068}$	$0.624^{+0.036}_{-0.059}$	$3.608^{+1.067}_{-0.298}$
	+3%/-3%	+1%/-0%	+11%/-65%	+4%/-11%	+6%/-9%	+30%/-8%
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 008956025-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1539 \pm 194$	$23.74^{+23.94}_{-16.10}$	$294^{+9}_{-11}$	$2152^{+670}_{-295}$	$261^{+2341}_{-198}$
Alt.	$-548 \pm 184$	$23.56^{+23.87}_{-16.12}$	$294^{+10}_{-13}$	$1917^{+576}_{-234}$	$81^{+897}_{-59}$

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

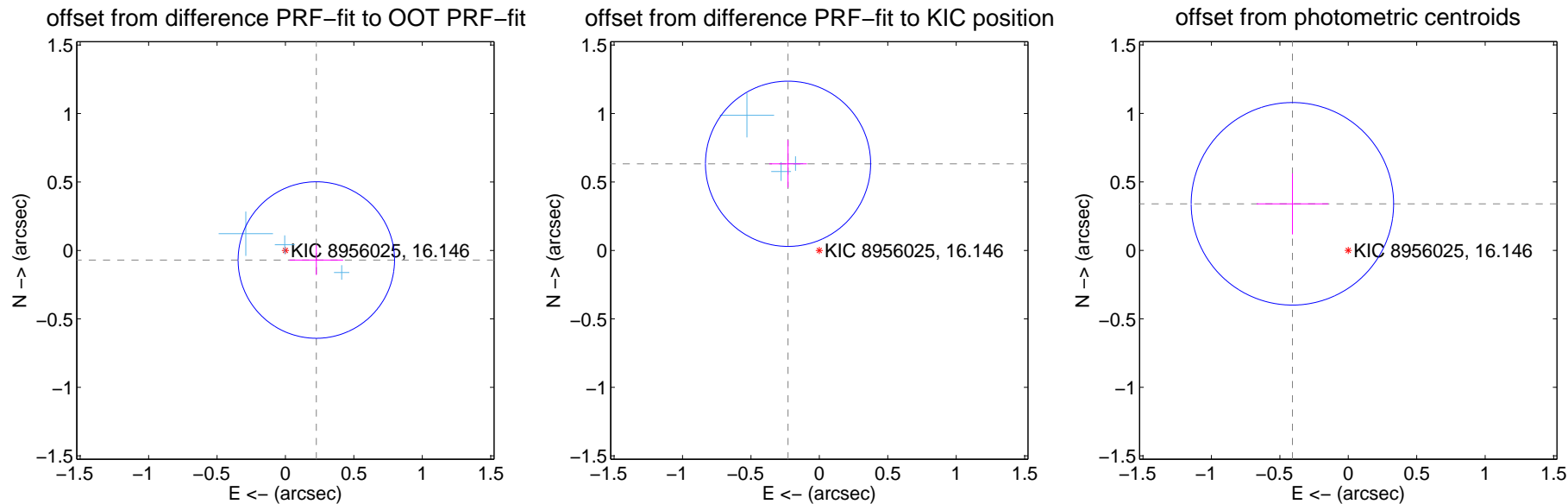
## DV Centroid Data

Supplemental centroid analysis for 008956025-01. Kepler magnitude: 16.15. Transit SNR 17.72

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.60 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.236 \pm 0.190$	1.24	$-0.226 \pm 0.197$	$-0.070 \pm 0.109$
PRF-fit source offset from KIC position	<b><math>0.673 \pm 0.201</math></b>	<b>3.35</b>	$0.229 \pm 0.137$	$0.633 \pm 0.173$
photometric centroid source offset	$0.53 \pm 0.25$	2.16	$0.41 \pm 0.26$	$0.34 \pm 0.22$

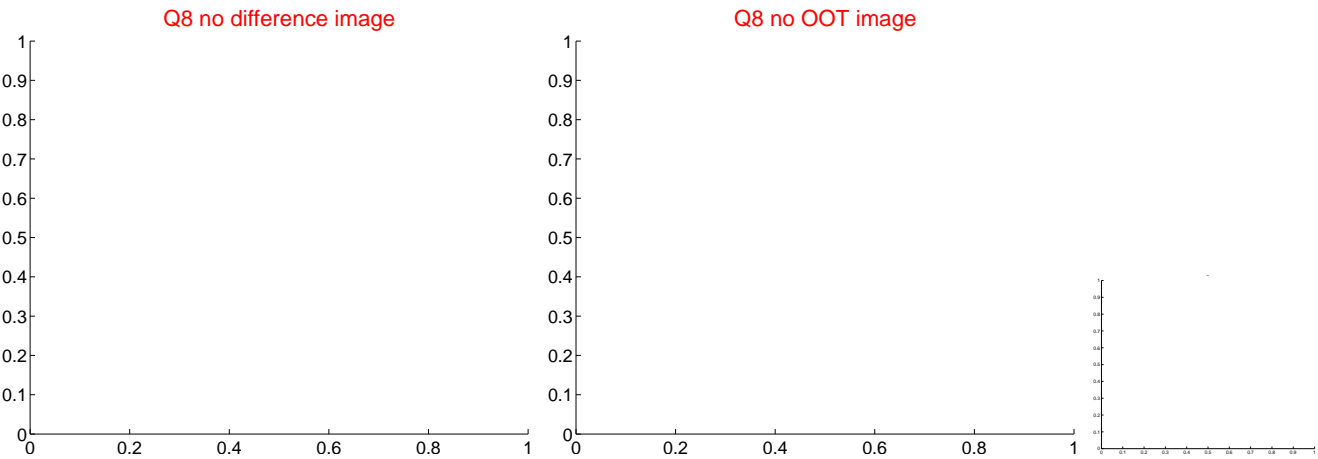
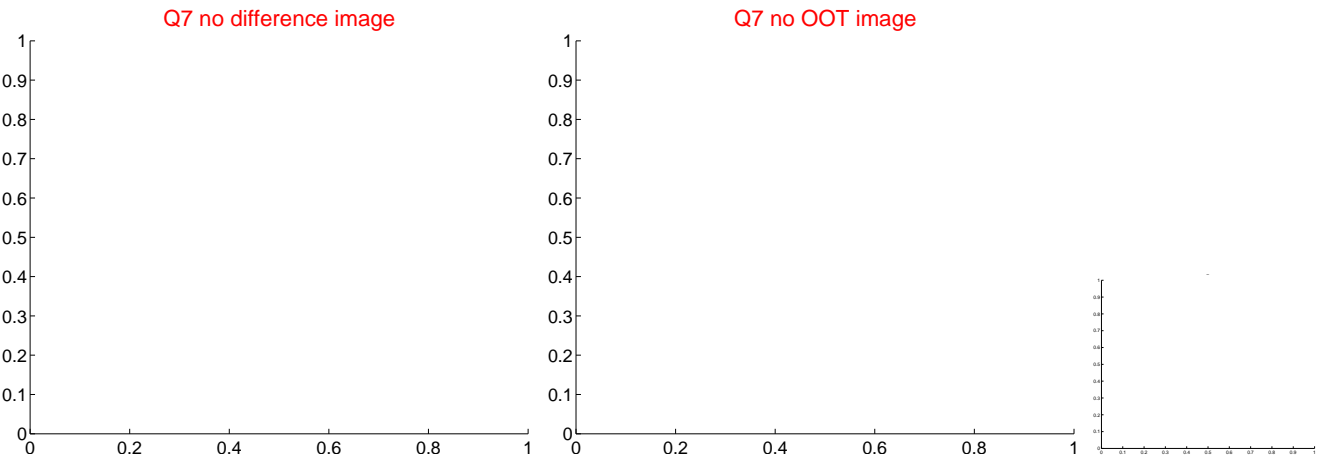
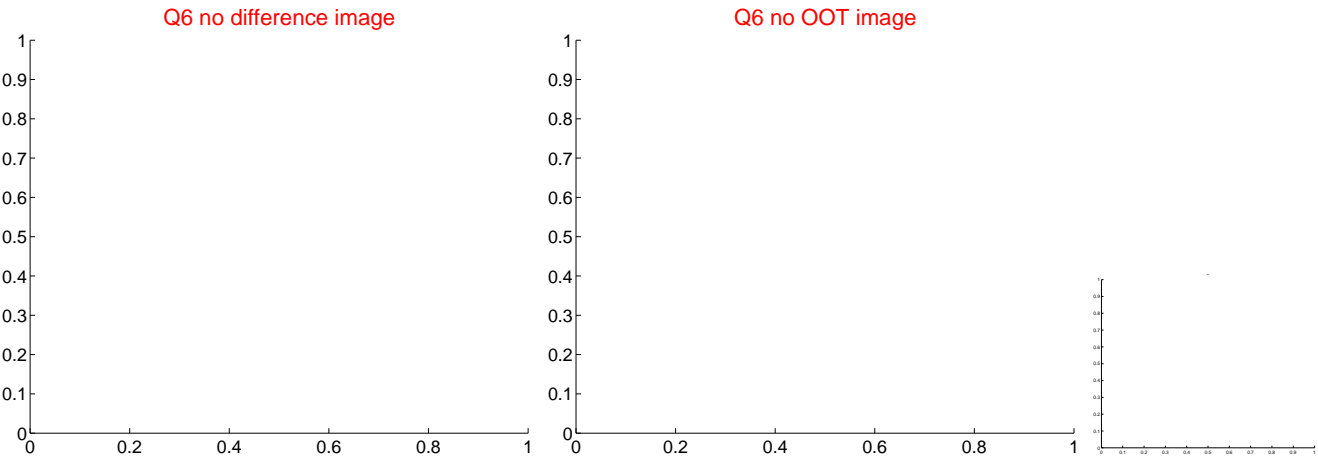
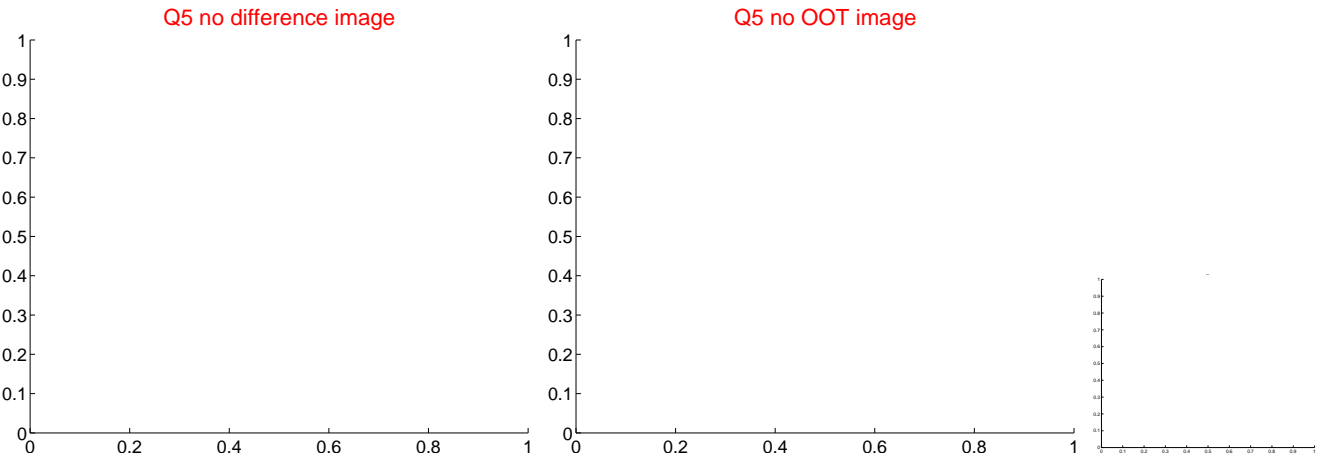


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

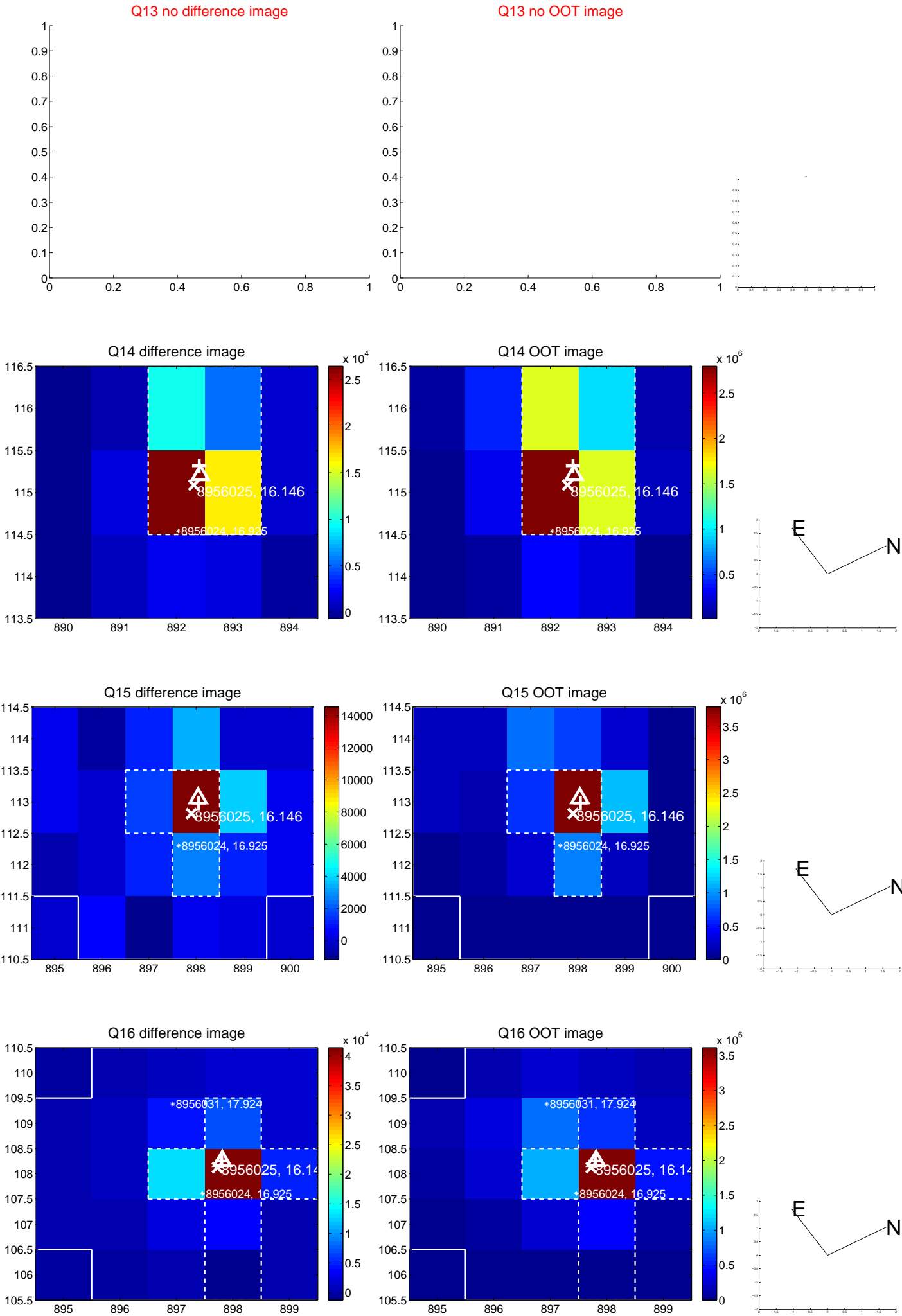




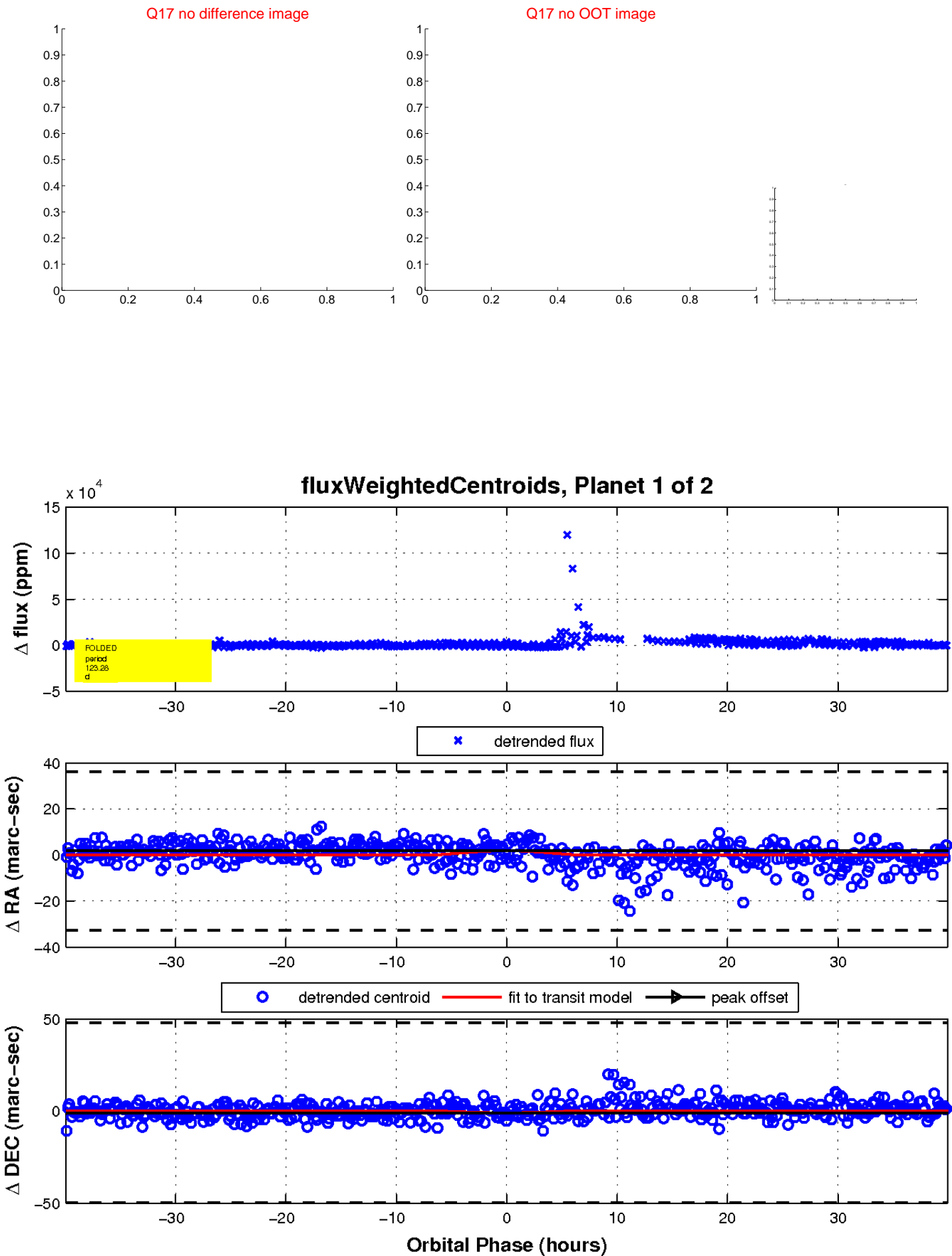
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

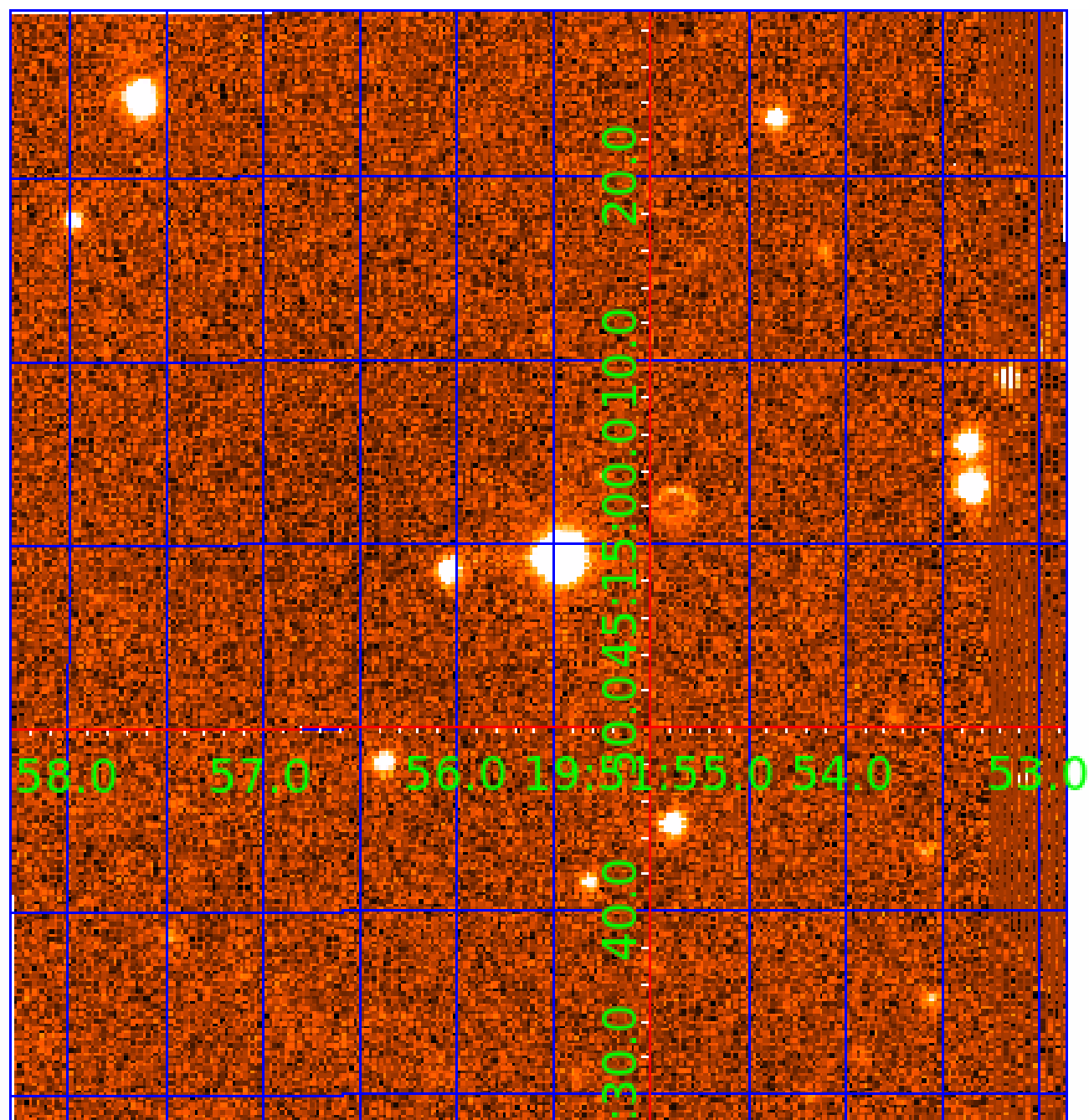


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008956025

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008956025-01	OBS	No	123.278691	192.128107	7903.6	13.328	12.1	17.7	0.62	3913	9.03	0.48
008956025-02	OBS	No	86.408921	163.543199	2118.9	13.430	7.7	6.6	0.62	3913	2.96	0.77

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008956025-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
008956025-02	OBS	FP	0.03	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—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.

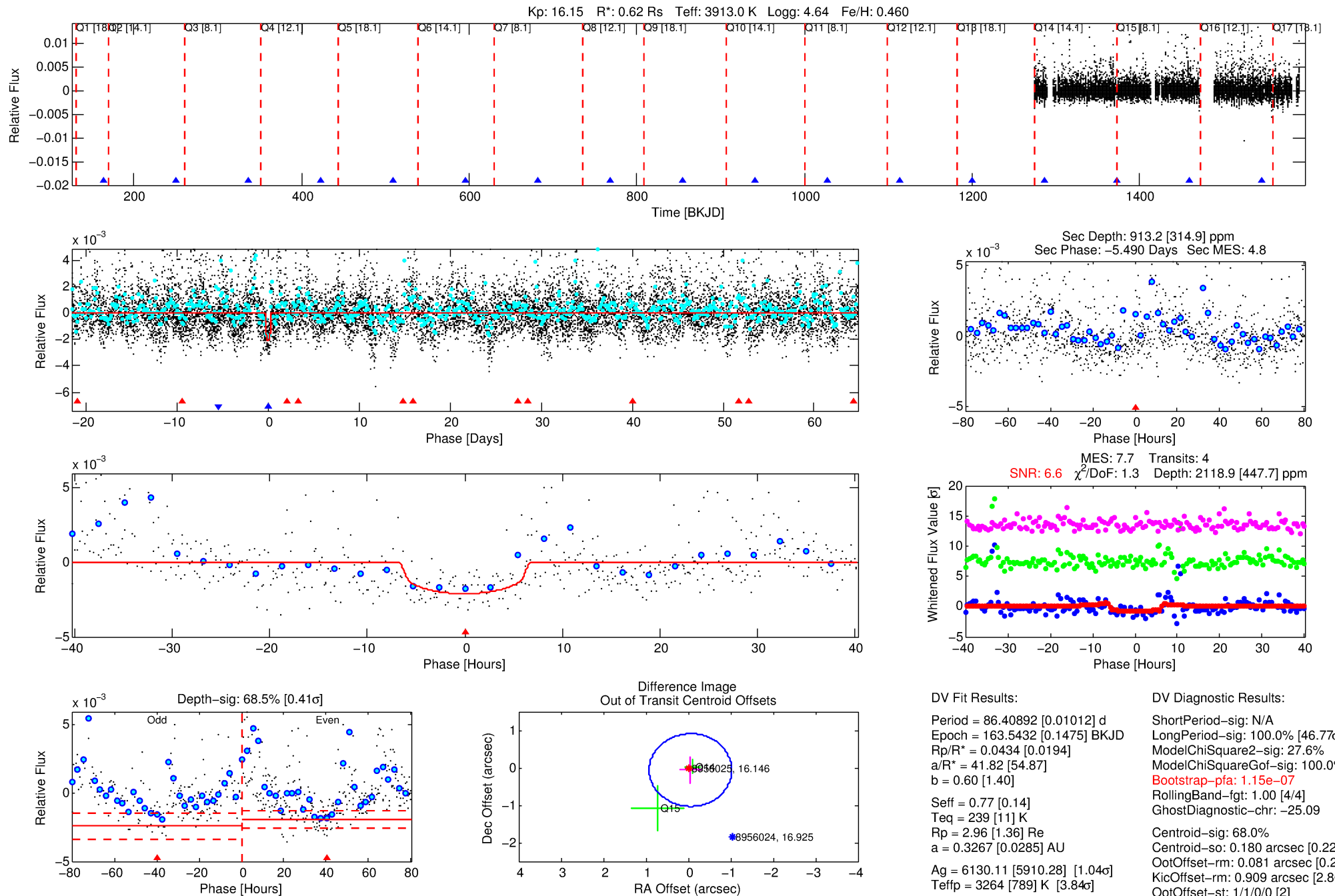
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008956025-02

No Significant Match Found

# DV One-Page Summary

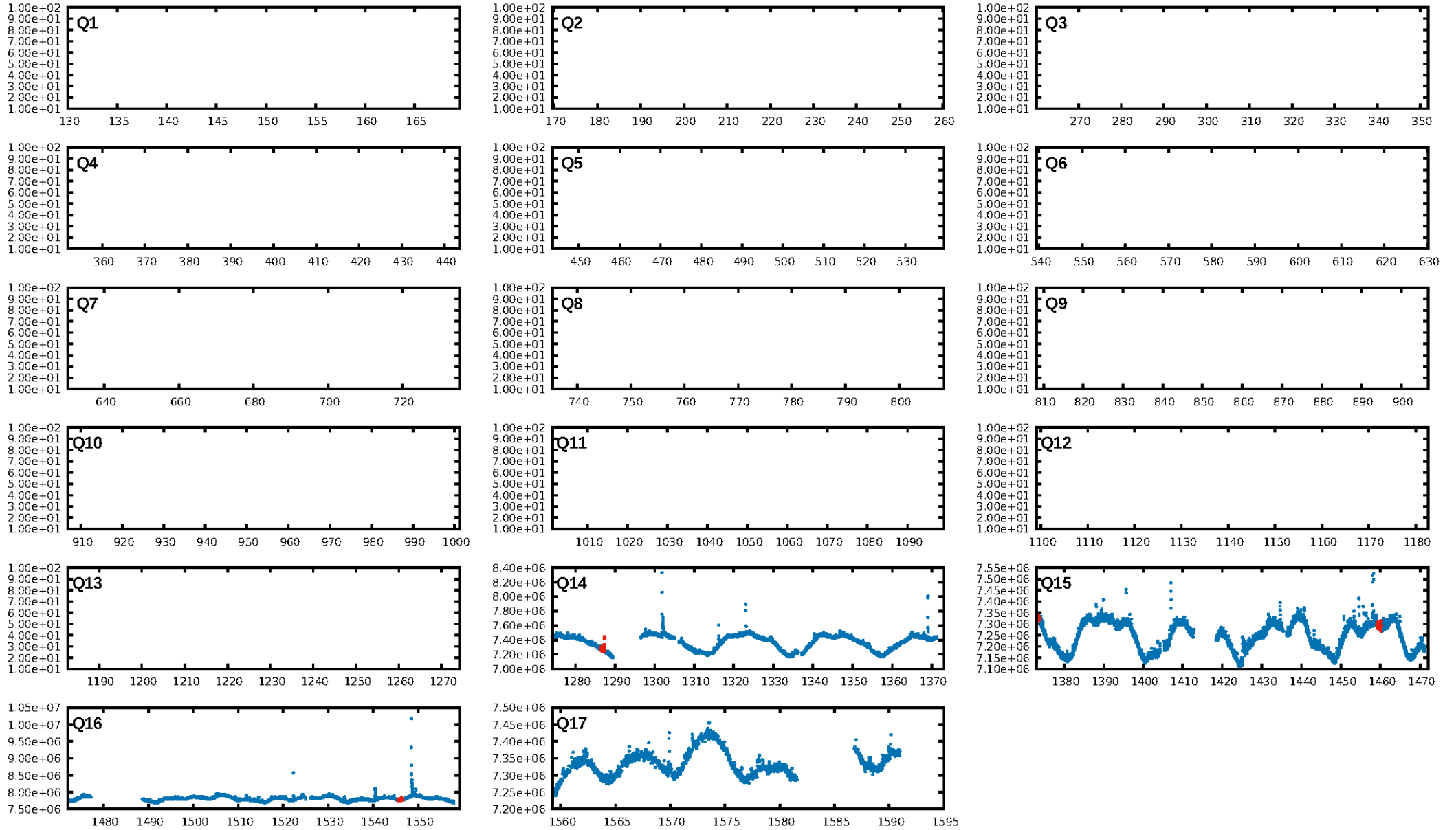
KIC: 8956025 Candidate: 2 of 2 Period: 86.409 d



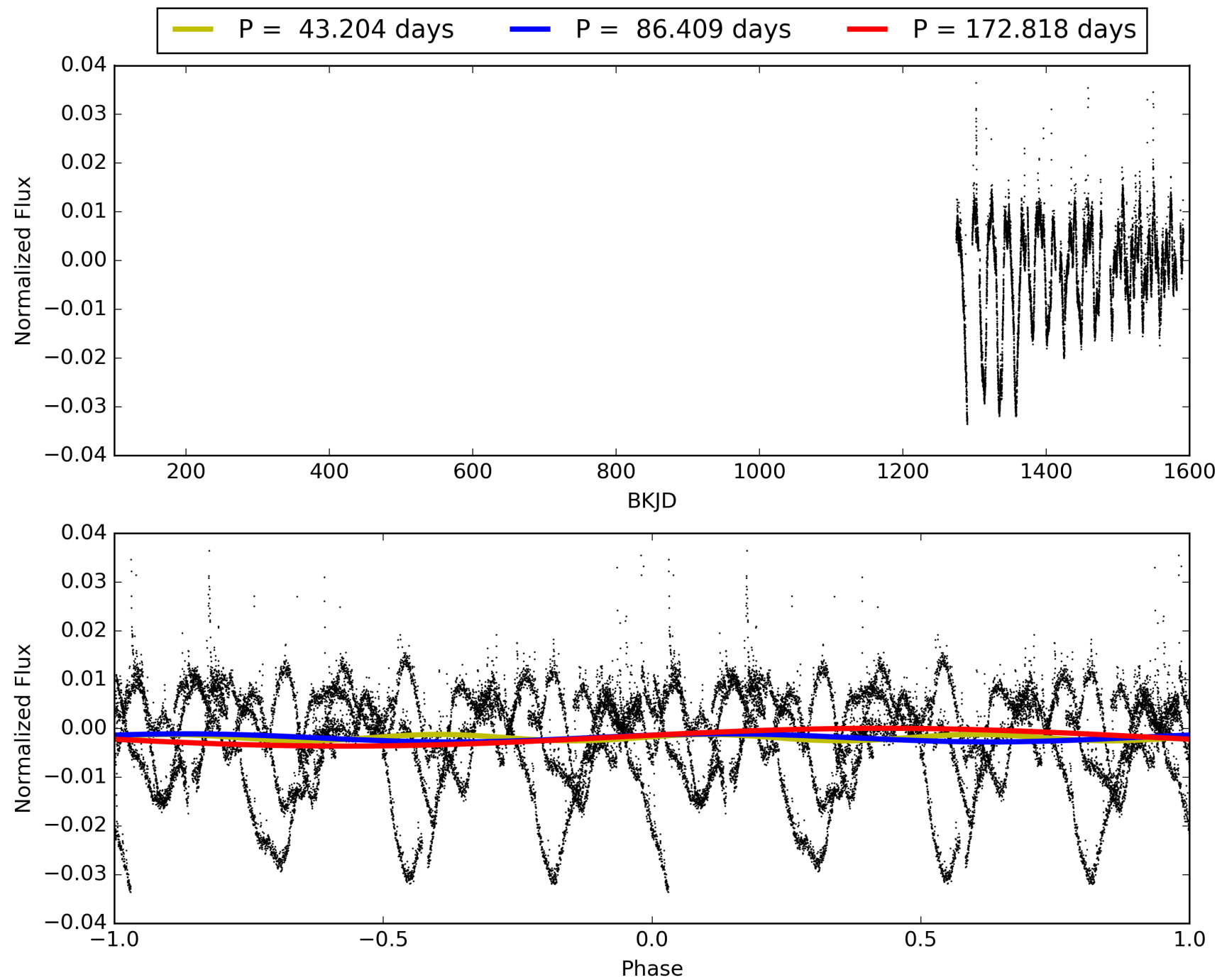
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:24:15 Z

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

# TCE 008956025-02, PDC Light Curves



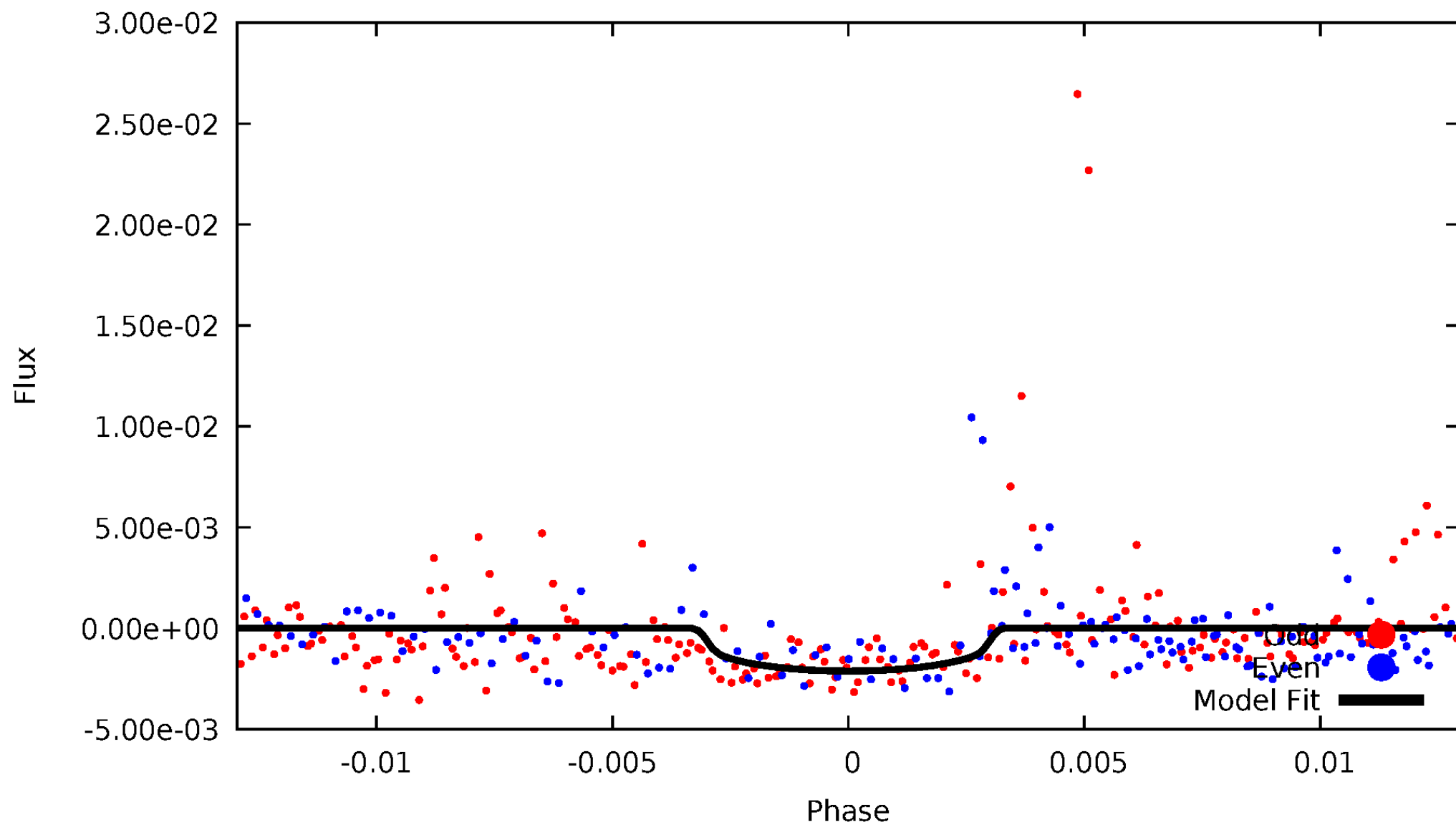
# TCE 008956025-02





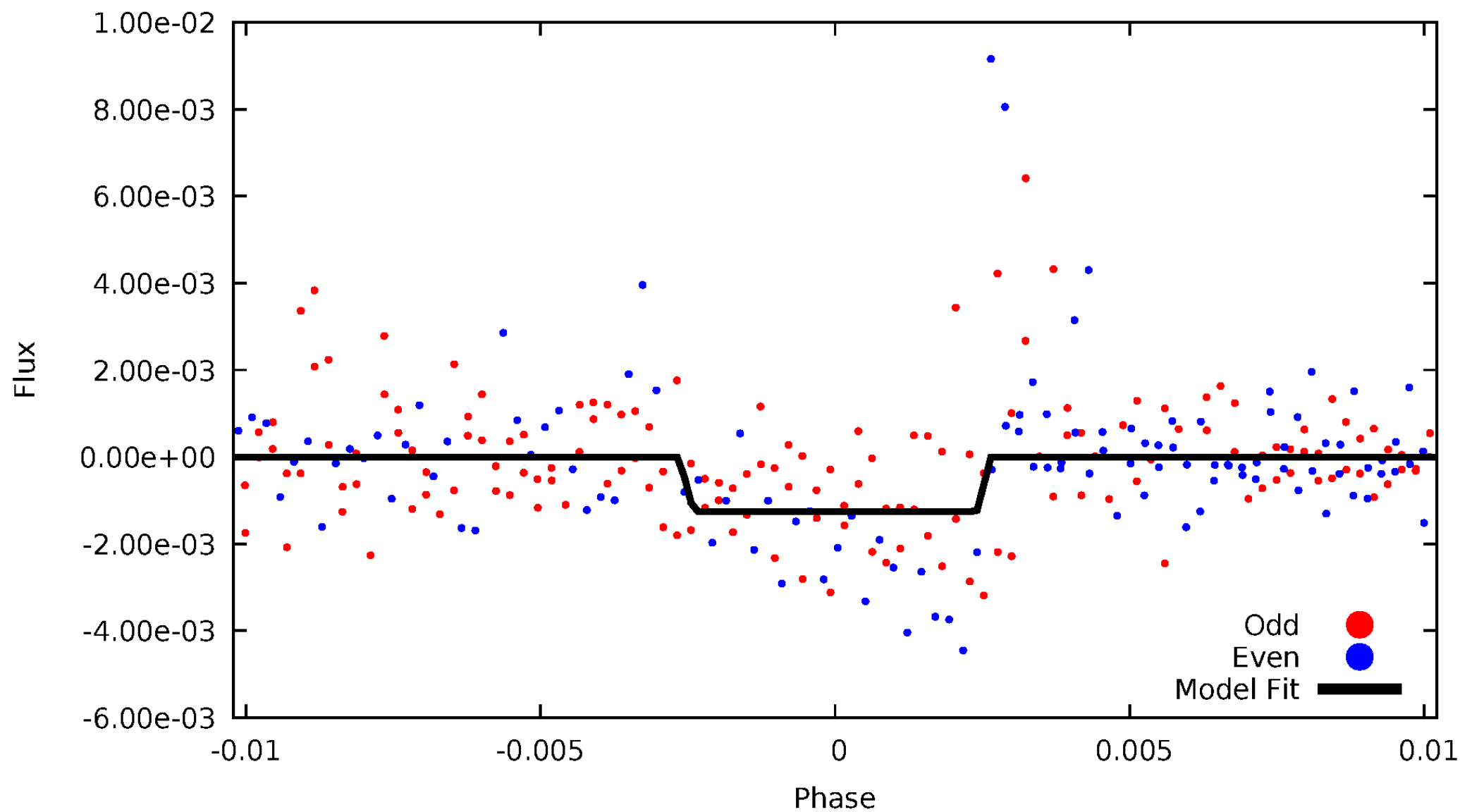
# DV Odd/Even

TCE 008956025-02



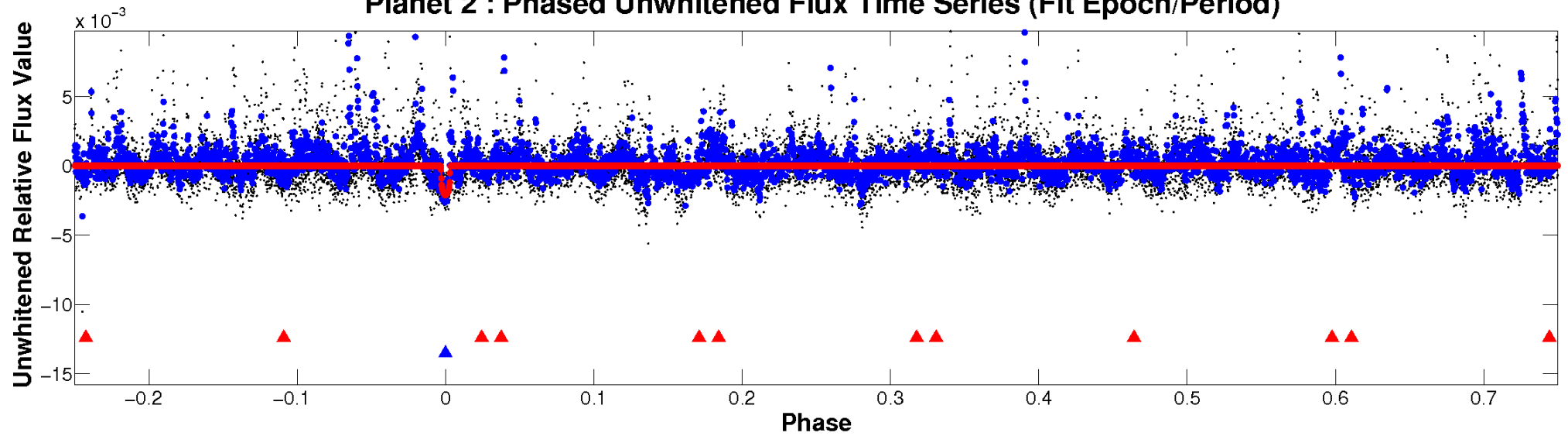
# ALT Odd/Even

TCE 008956025-02

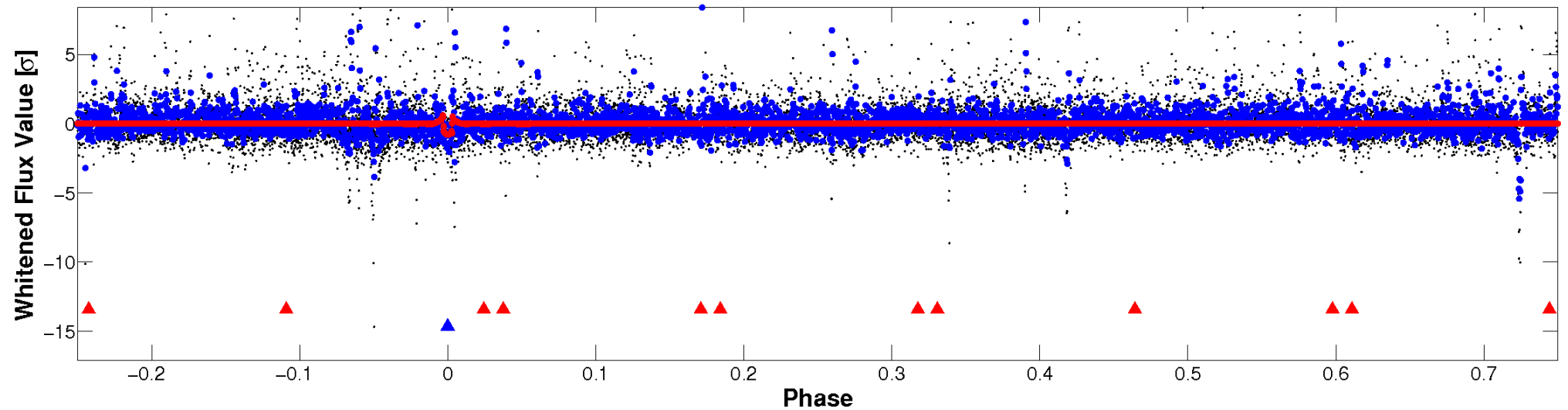


# Non-Whitened Vs. Whitened Light Curve

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

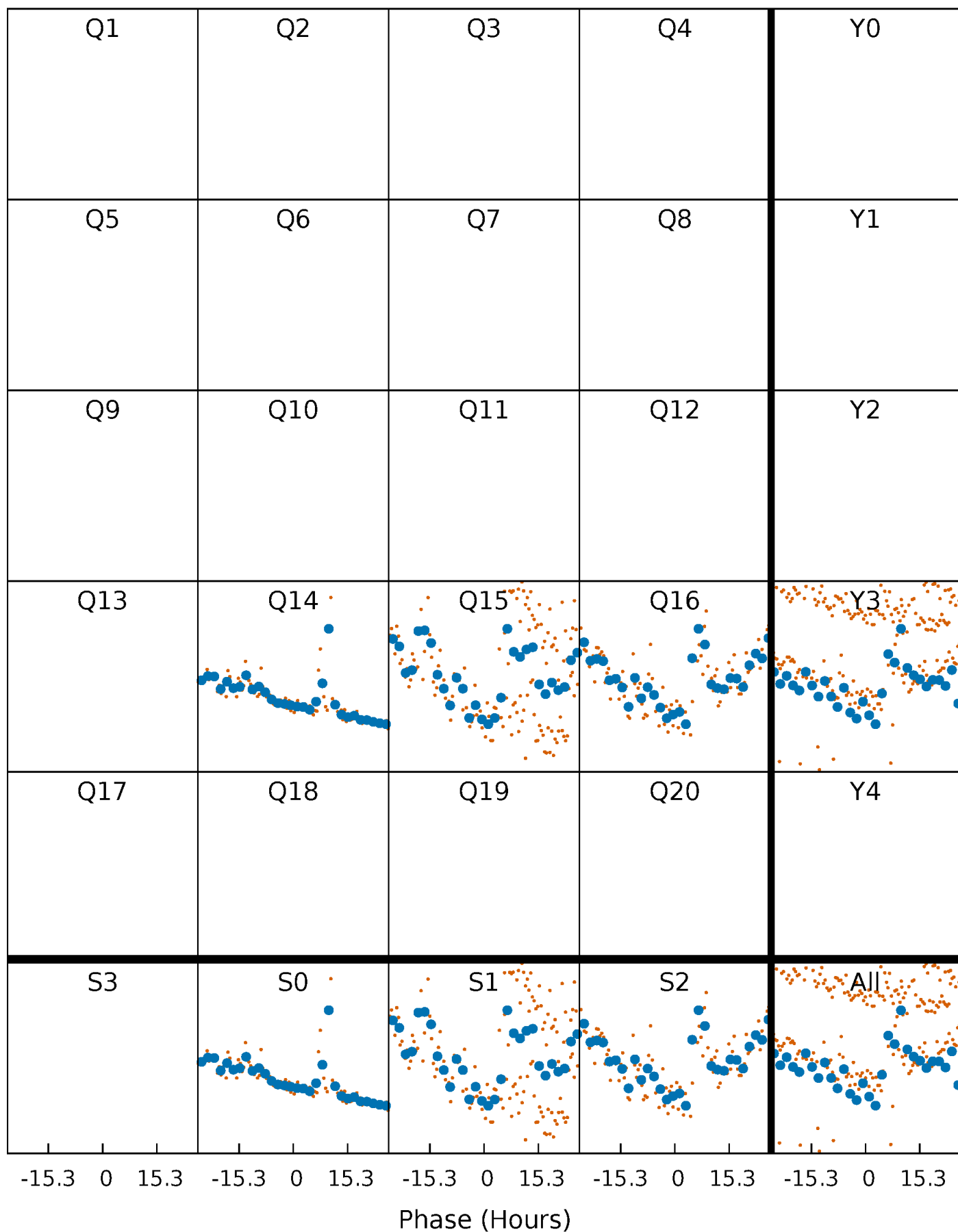


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



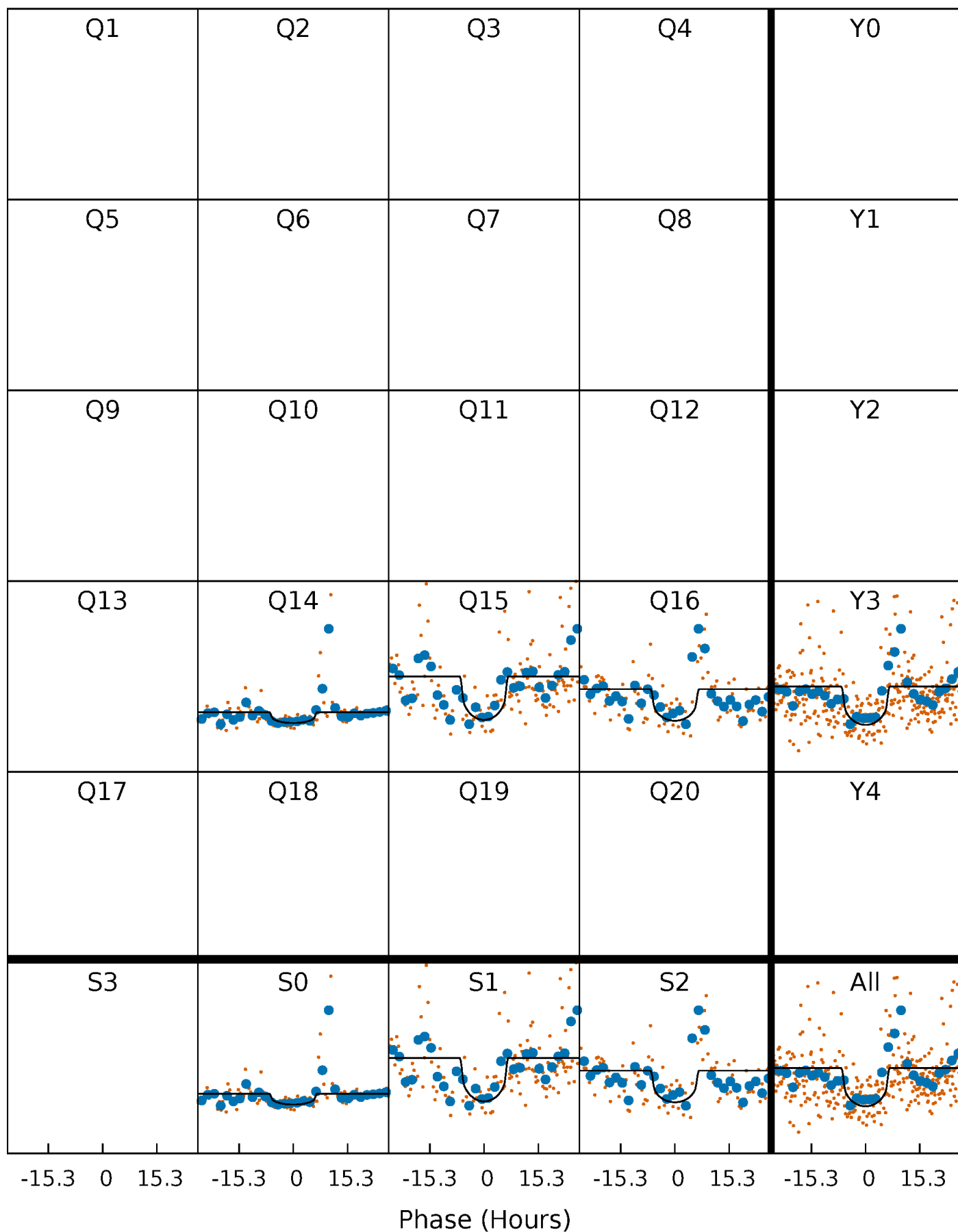
# PDC Quarter-Phased Transit Curves

TCE 008956025-02 P= 86.408921 Days  $T_0=163.543199$  (BKJD)



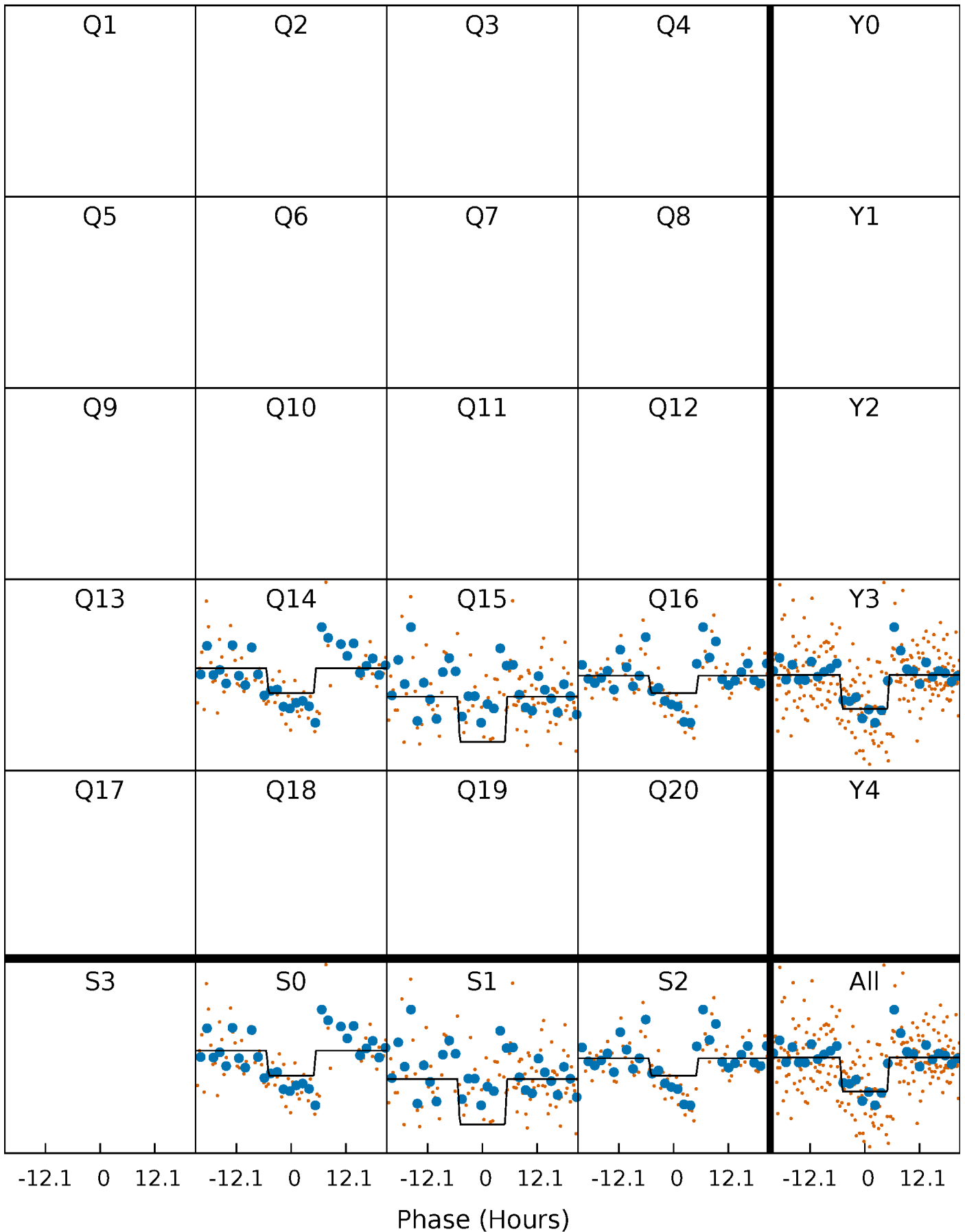
# DV Quarter-Phased Transit Curves

TCE 008956025-02   P= 86.408921 Days    $T_0=163.543199$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

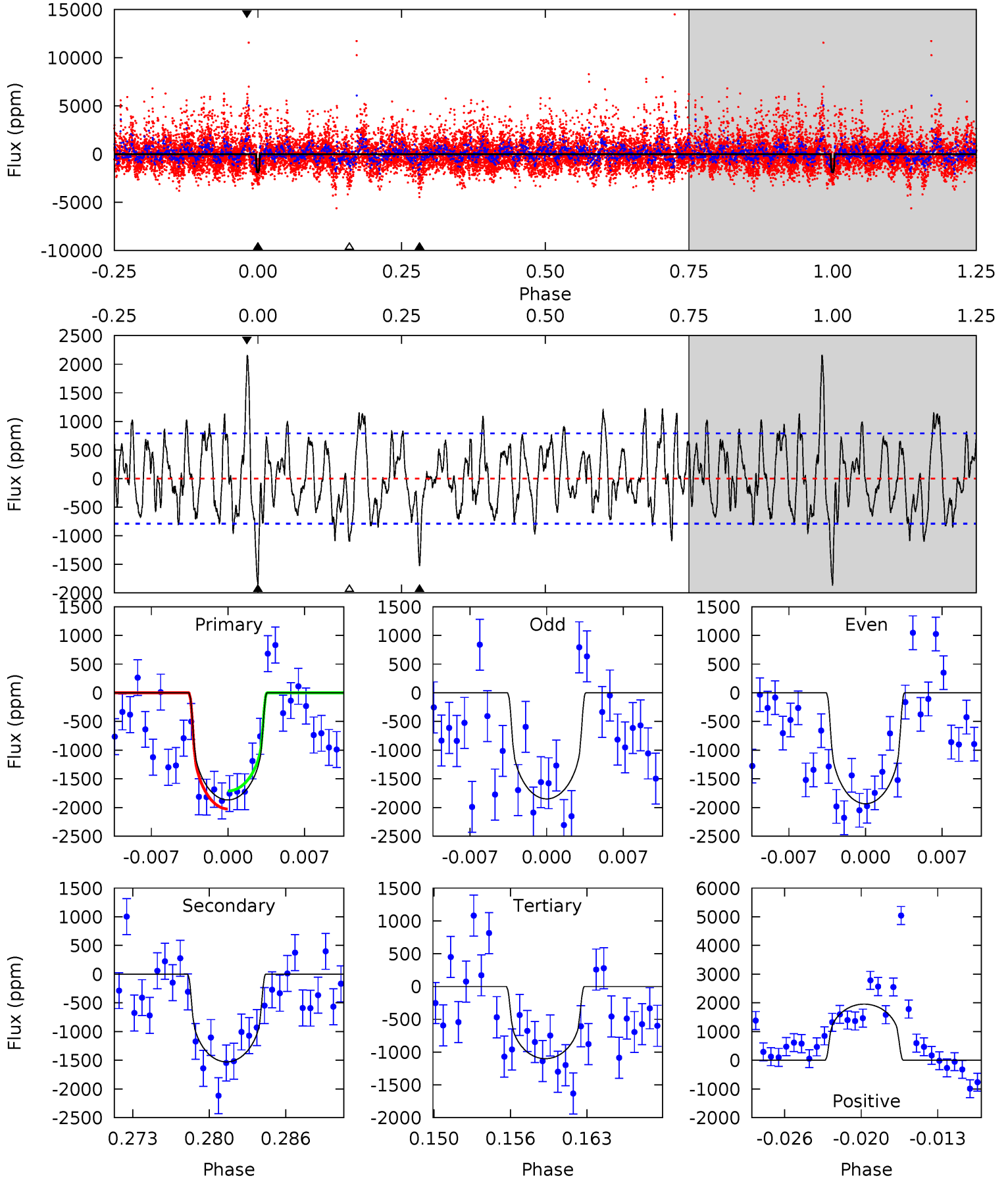
TCE 008956025-02    P= 86.402046 Days     $T_0=163.650223$  (BKJD)



# DV Model-Shift Uniqueness Test

008956025-02, P = 86.408921 Days, E = 163.543199 Days

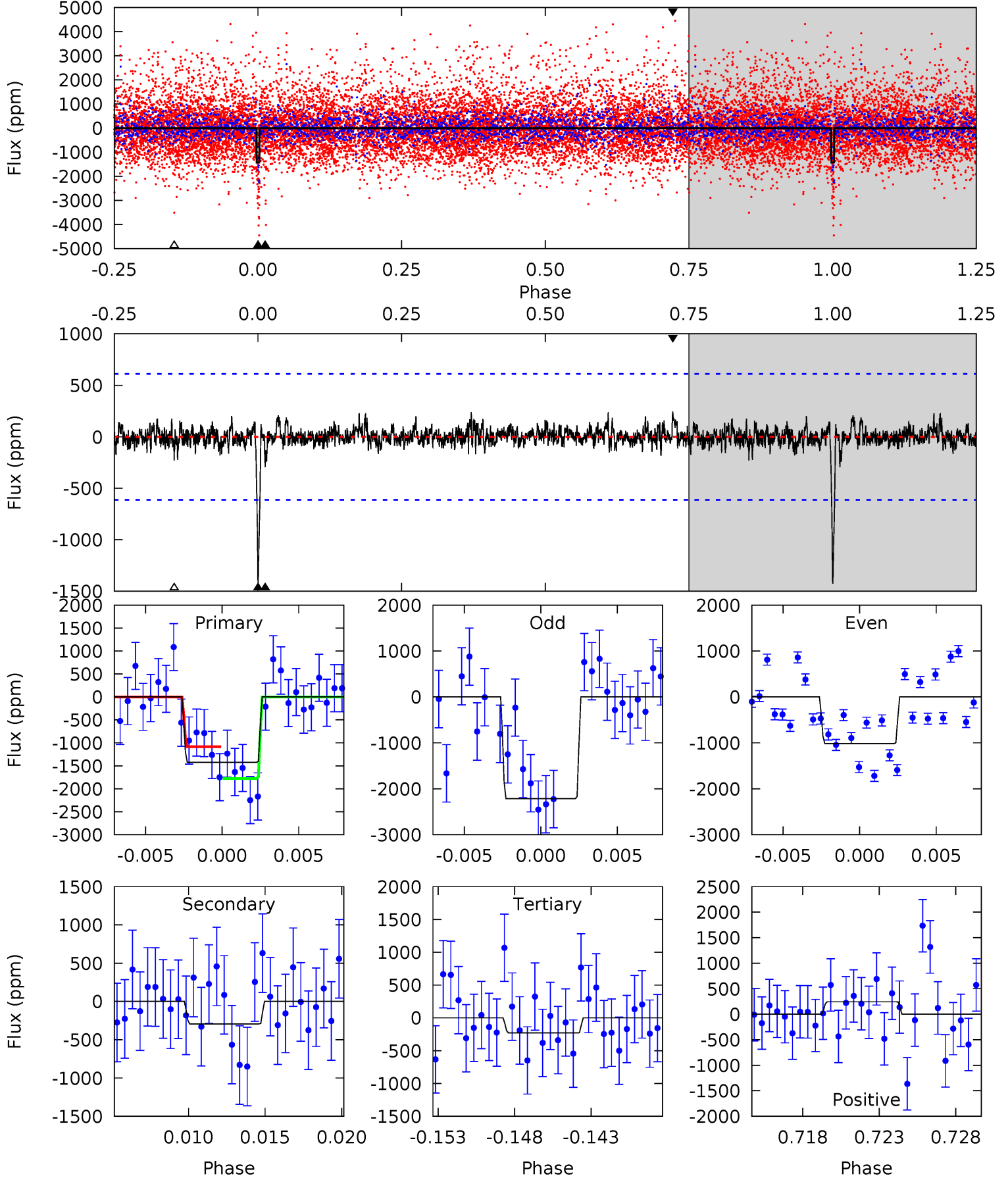
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	9.90	7.13	12.7	5.11	2.72	3.27	4.97	-0.58	2.77	-2.77	0.23	0.94	0.54	1.02



# Alt Model-Shift Uniqueness Test

008956025-02, P = 86.402046 Days, E = 163.650223 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
12.0	2.47	1.94	2.06	5.15	2.80	0.52	10.1	9.97	0.53	0.41	4.71	0.76	0.15	2.96





### Stellar Parameters For KIC 008956025

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3913^{+122}_{-136}$	$4.642^{+0.063}_{-0.018}$	$0.460^{+0.050}_{-0.300}$	$0.624^{+0.026}_{-0.068}$	$0.624^{+0.036}_{-0.059}$	$3.608^{+1.067}_{-0.298}$
	+3%/-3%	+1%/-0%	+11%/-65%	+4%/-11%	+6%/-9%	+30%/-8%
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 008956025-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	-1529 $\pm$ 154	$2.92^{+1.28}_{-1.28}$	$329^{+12}_{-13}$	$3757^{+927}_{-424}$	$10650^{+23250}_{-5657}$
Alt.	-293 $\pm$ 119	$2.47^{+1.21}_{-1.22}$	$330^{+13}_{-13}$	$3058^{+744}_{-391}$	$2825^{+8772}_{-1791}$

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

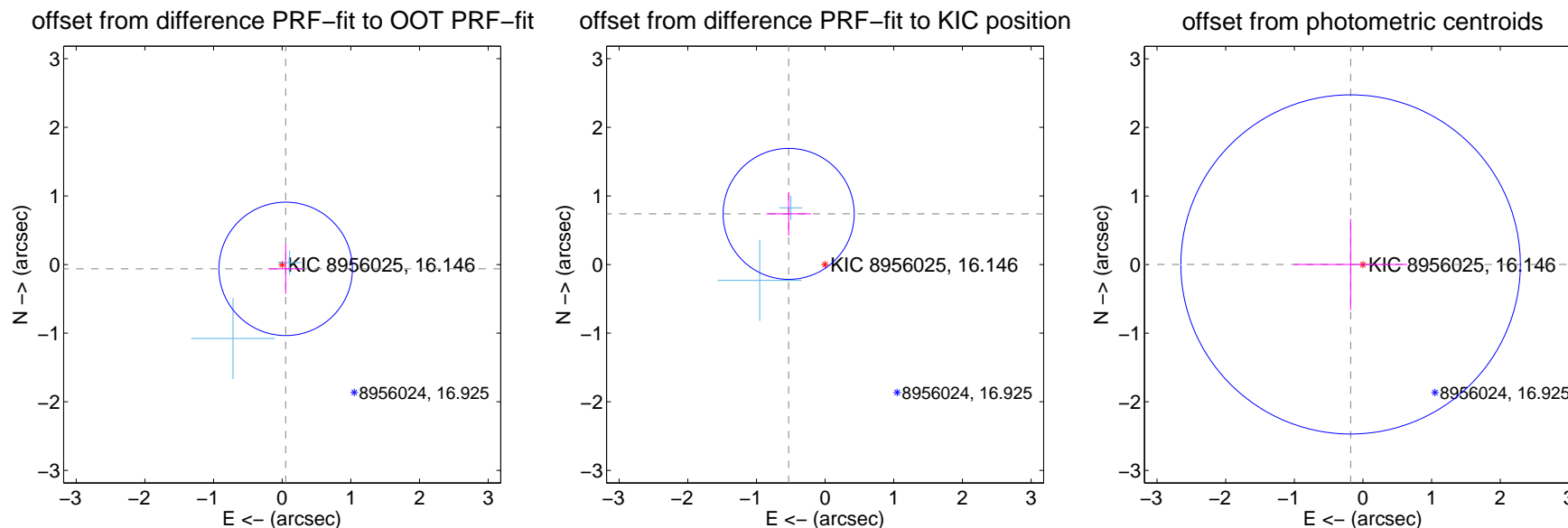
## DV Centroid Data

Supplemental centroid analysis for 008956025-02. Kepler magnitude: 16.15. Transit SNR 6.60

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.081 \pm 0.324$	0.25	$-0.051 \pm 0.254$	$-0.063 \pm 0.362$
PRF-fit source offset from KIC position	$0.909 \pm 0.318$	2.86	$0.531 \pm 0.324$	$0.738 \pm 0.315$
photometric centroid source offset	$0.18 \pm 0.82$	0.22	$0.18 \pm 0.82$	$0.00 \pm 0.66$

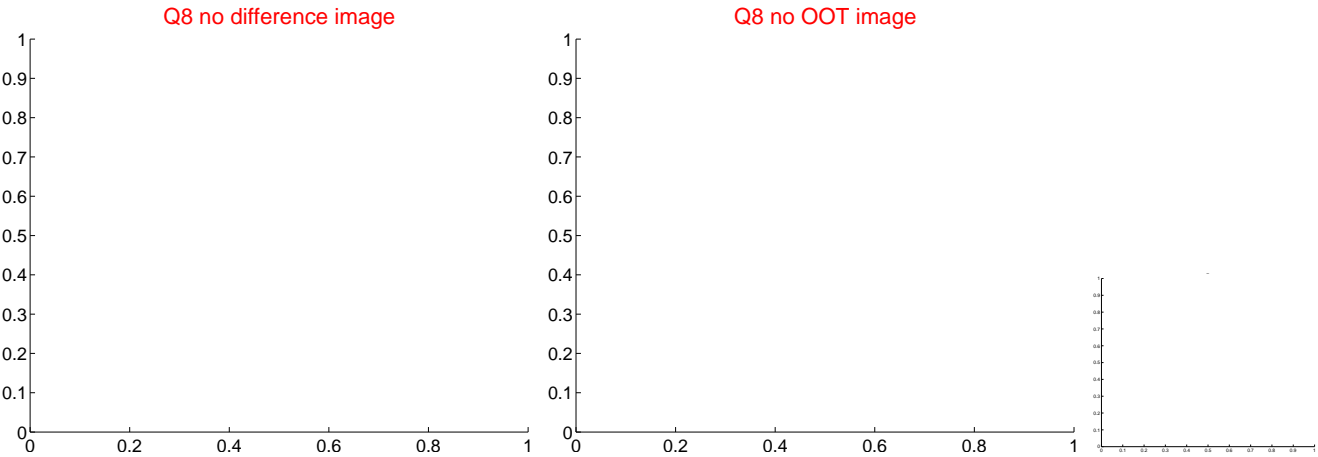
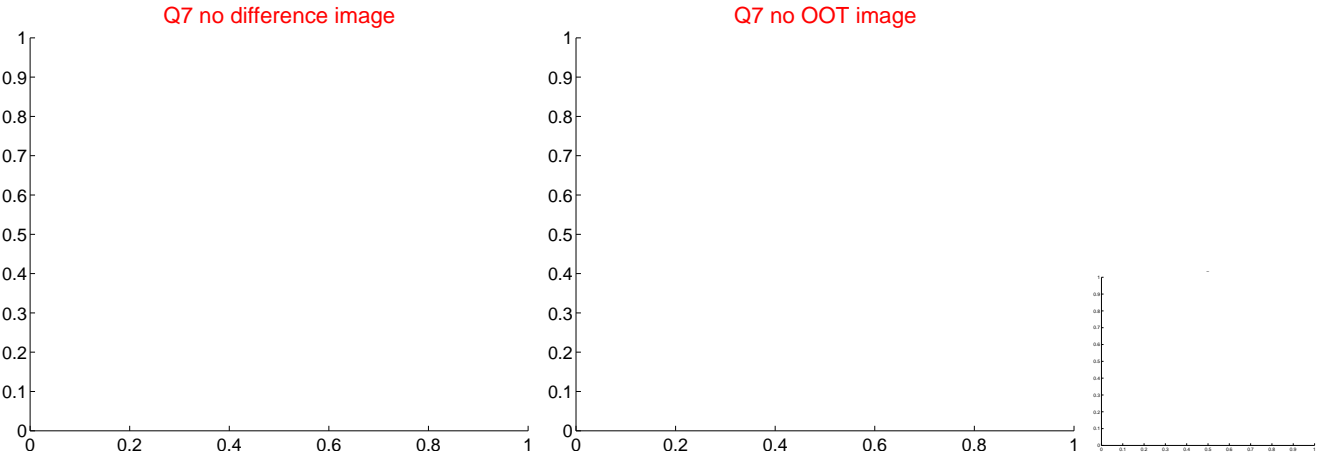
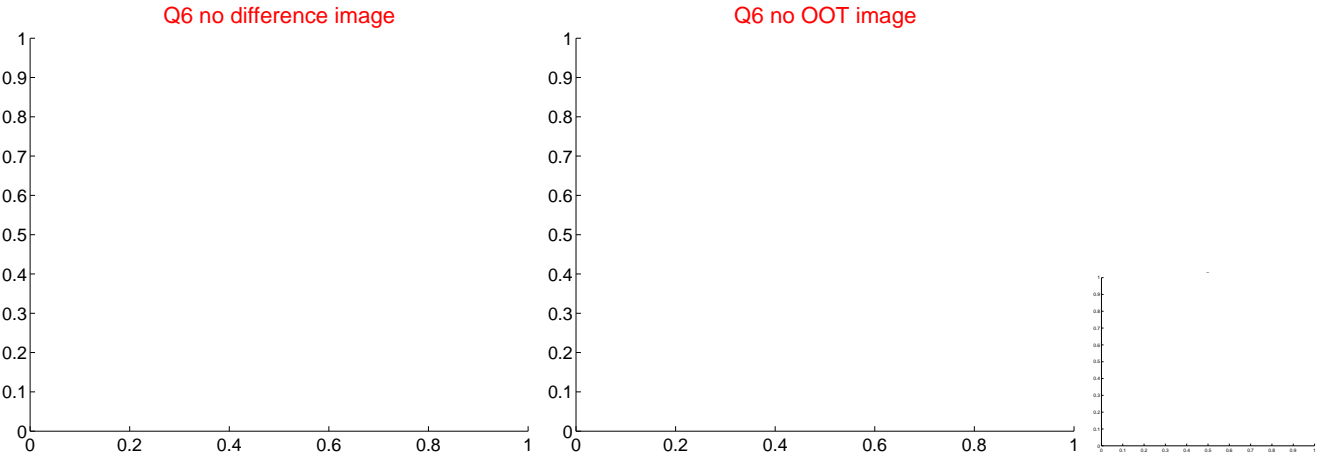
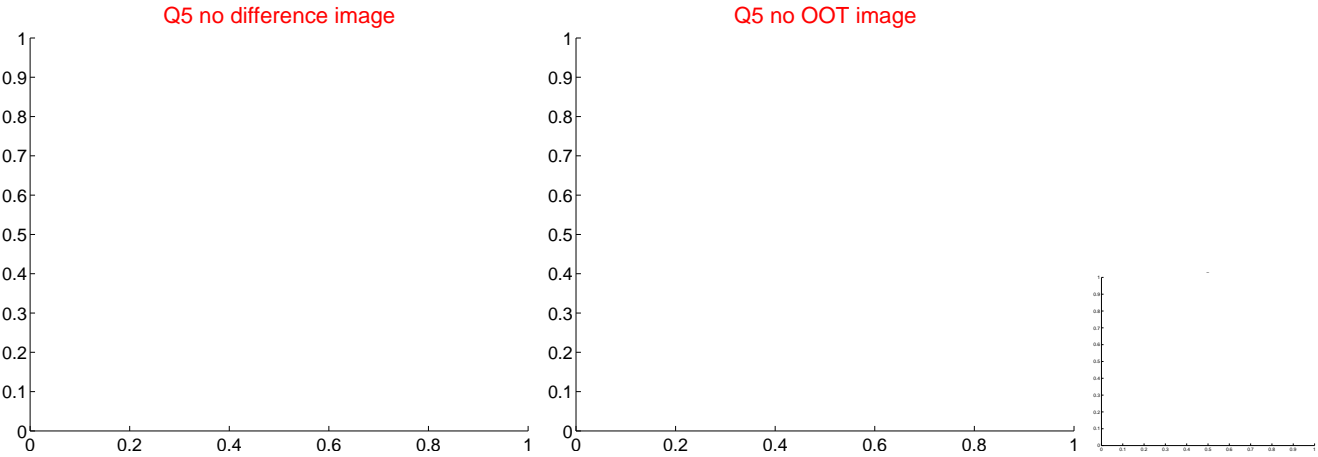


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

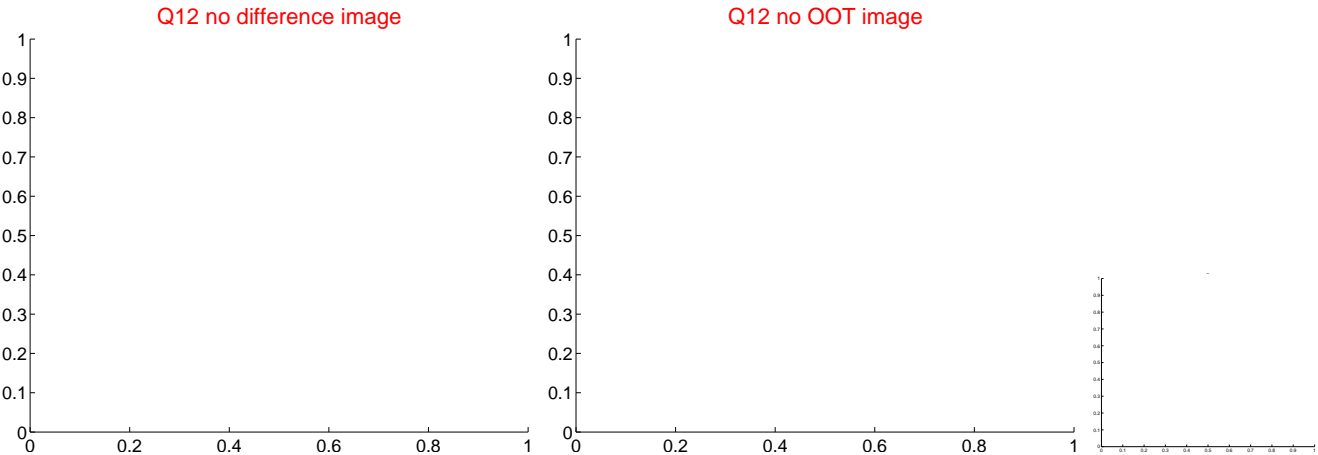
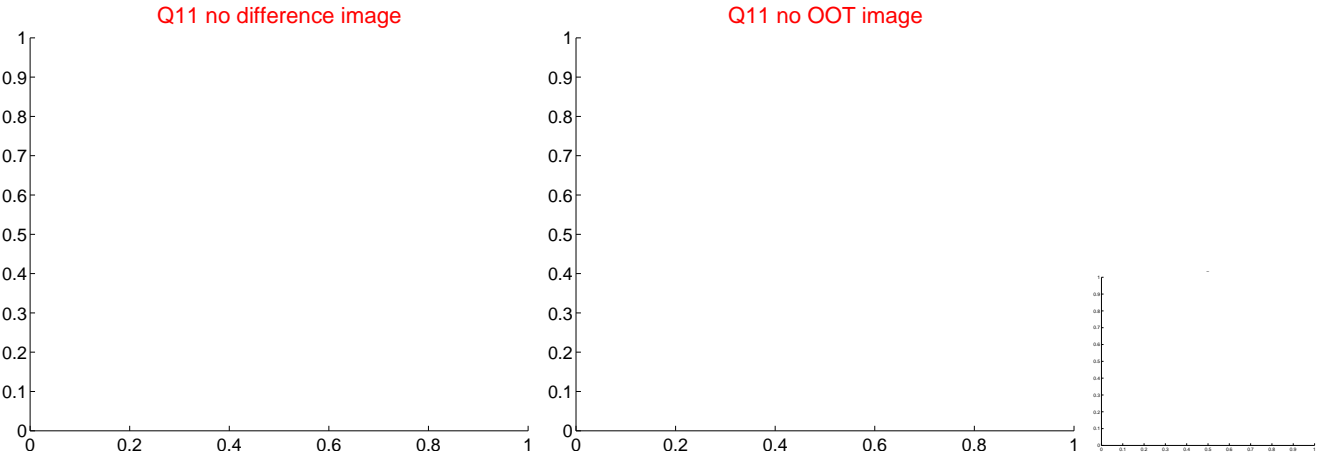
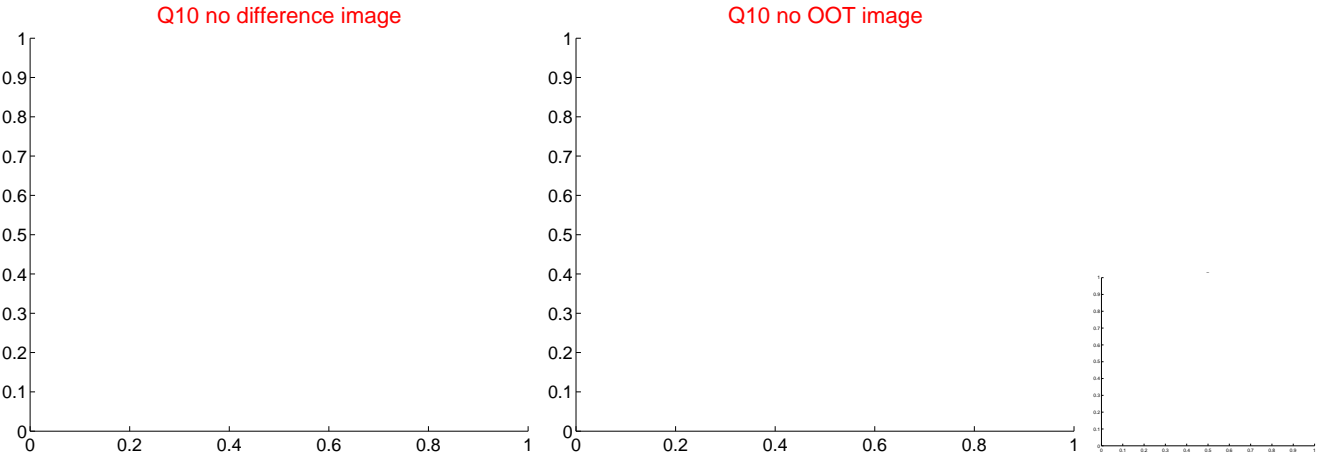
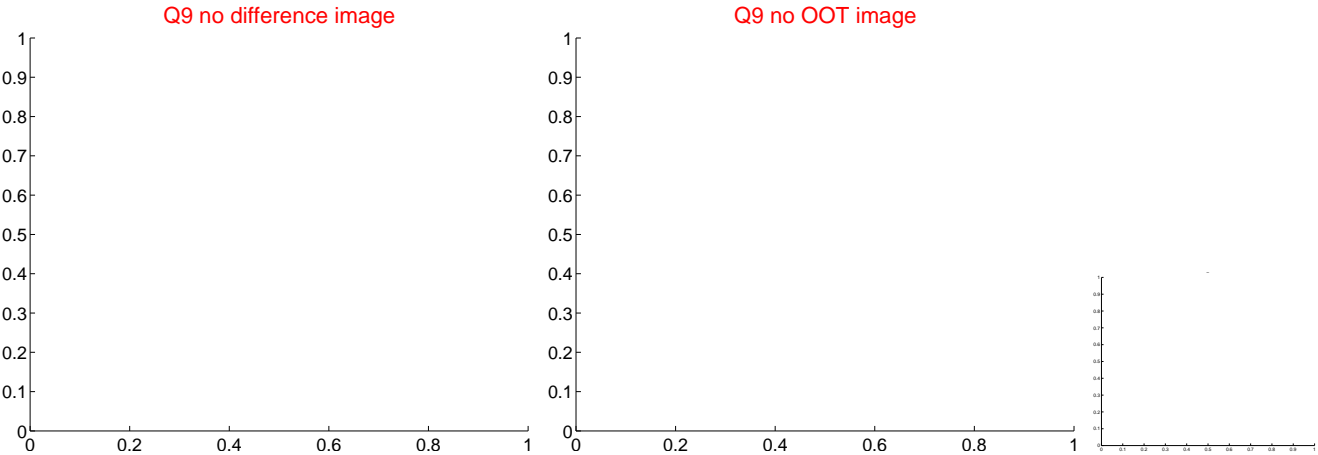
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

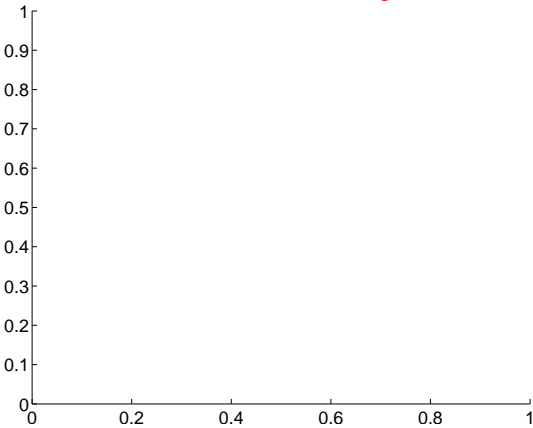


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

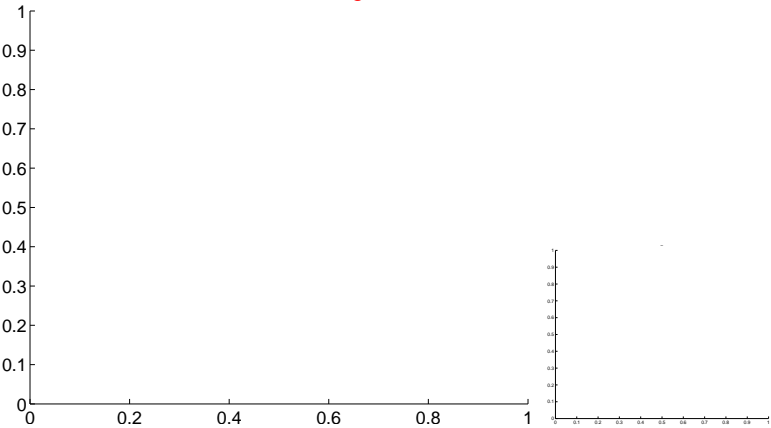


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

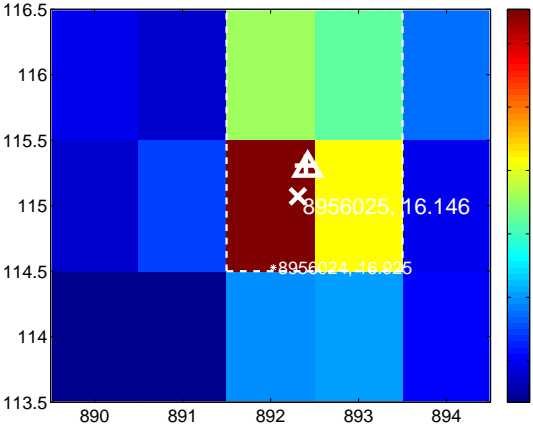
Q13 no difference image



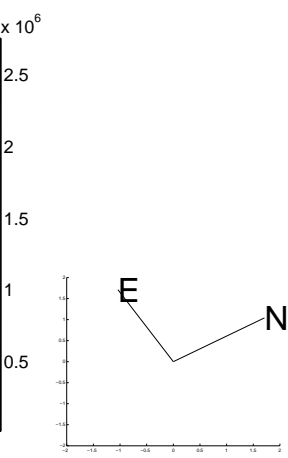
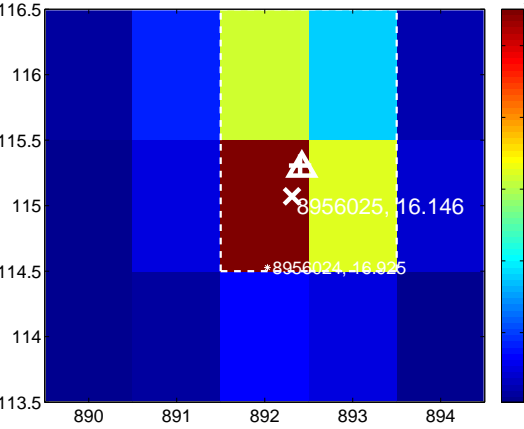
Q13 no OOT image



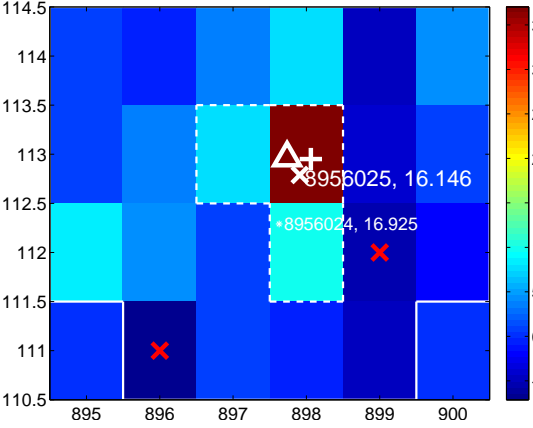
Q14 difference image



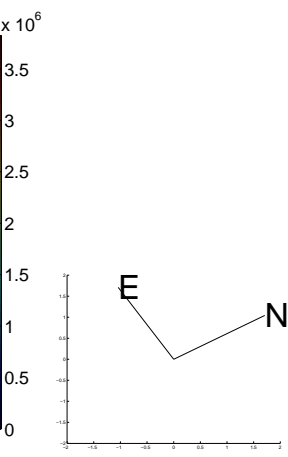
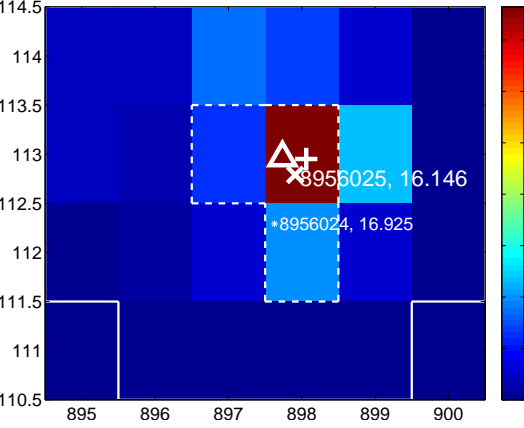
Q14 OOT image



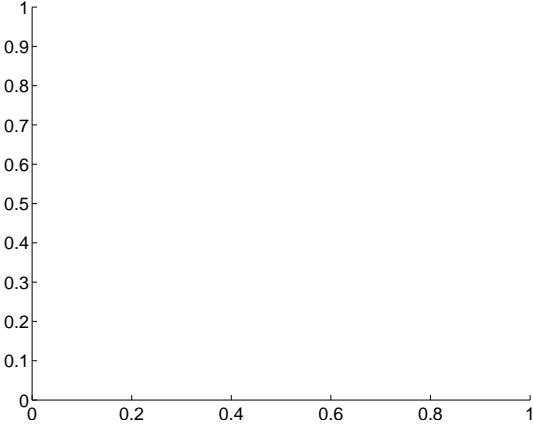
Q15 difference image



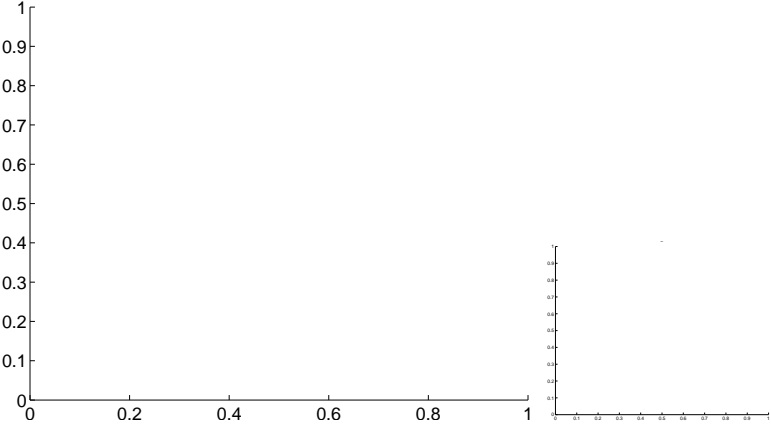
Q15 OOT image



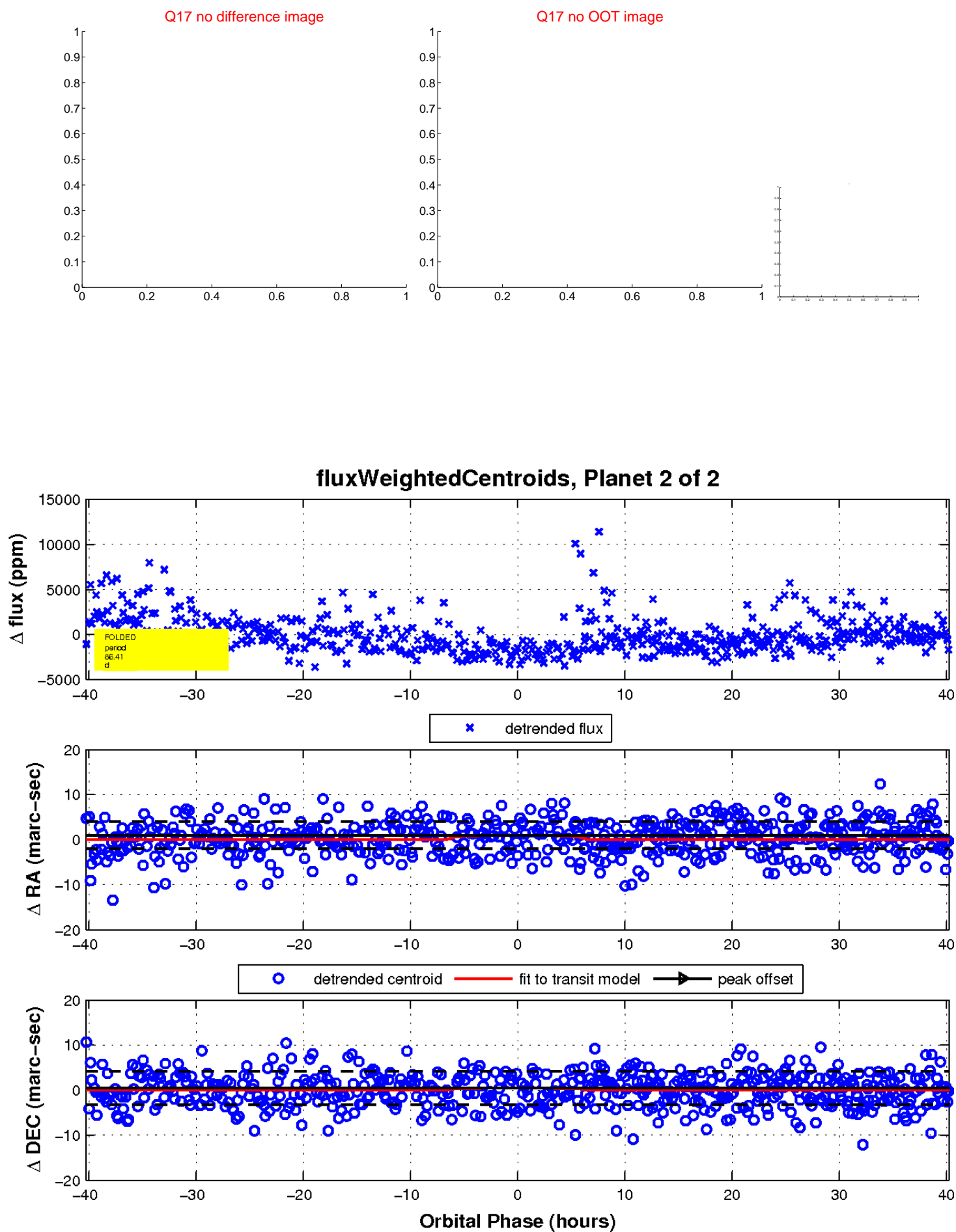
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

