

# KIC 007466053

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007466053-01	OBS	No	523.500147	317.130138	38.2	2.092	26.4	1.4	13.45	5172	9.55	32.67
007466053-02	OBS	No	382.264862	419.307288	10231.5	89.190	33.0	48.5	13.45	5172	156.12	49.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007466053-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007466053-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_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.

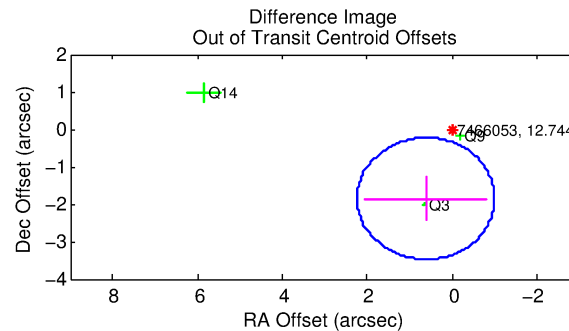
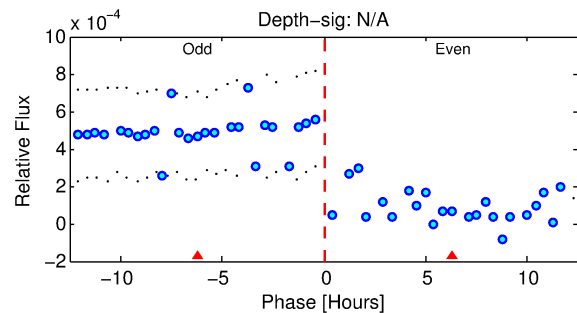
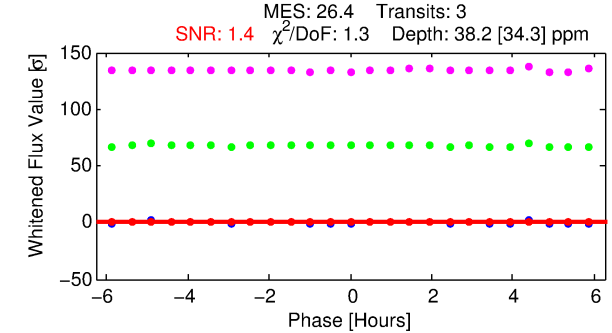
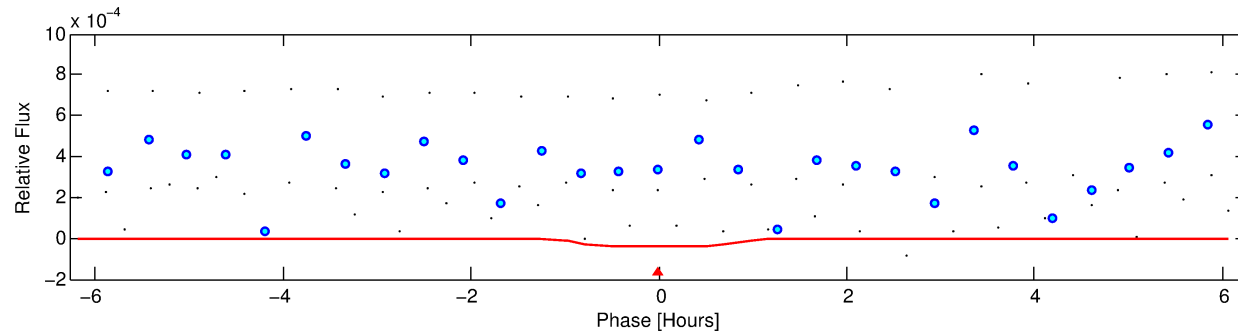
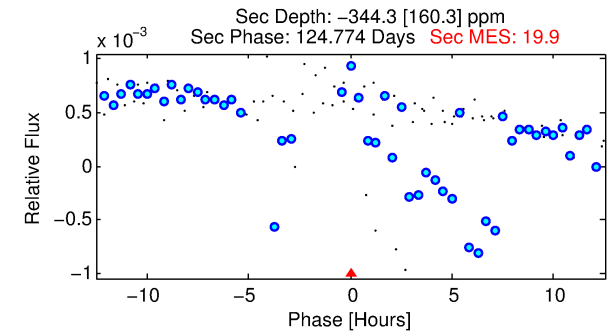
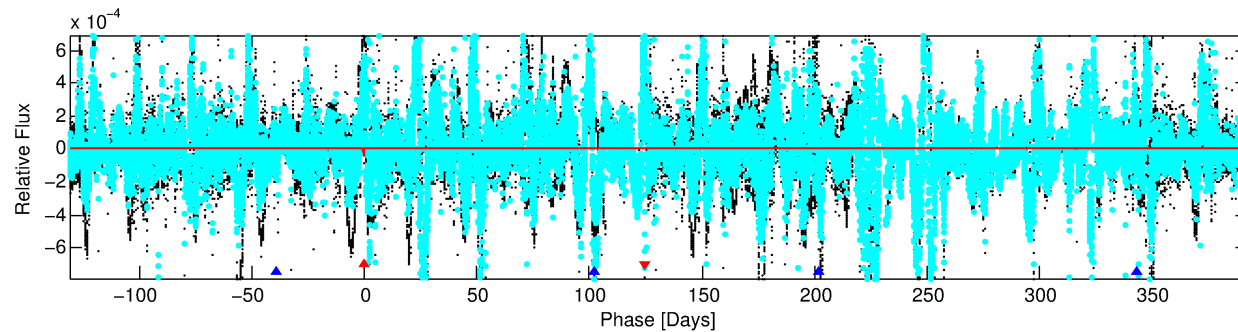
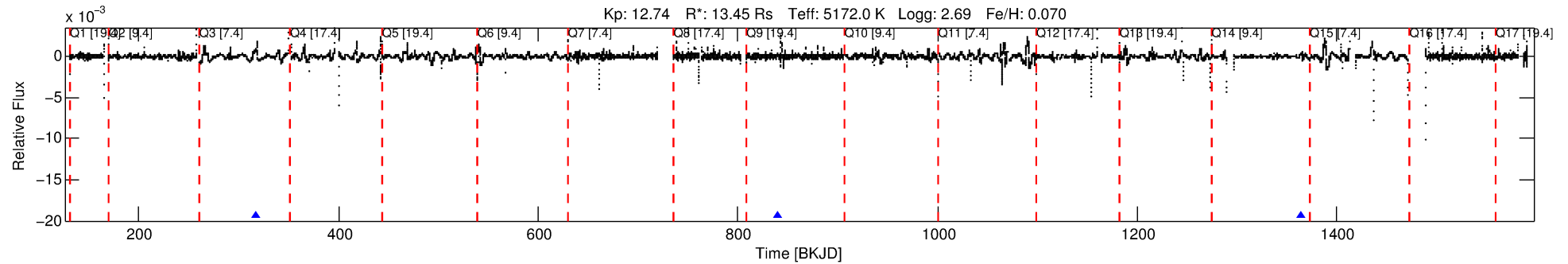
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007466053-01

No Significant Match Found

# DV One-Page Summary

KIC: 7466053 Candidate: 1 of 2 Period: 523.500 d



## DV Fit Results:

Period = 523.50015 [0.03024] d  
Epoch = 317.1301 [0.0467] BKJD  
Rp/R\* = 0.0065 [0.0690]  
a/R\* = 1054.42 [44188.15]  
b = 0.84 [14.96]  
Seff = 32.67 [35.16]  
Teq = 610 [164] K  
Rp = 9.55 [101.53] Re  
a = 1.8846 [1.2803] AU  
Ag = N/A  
Teffp = N/A

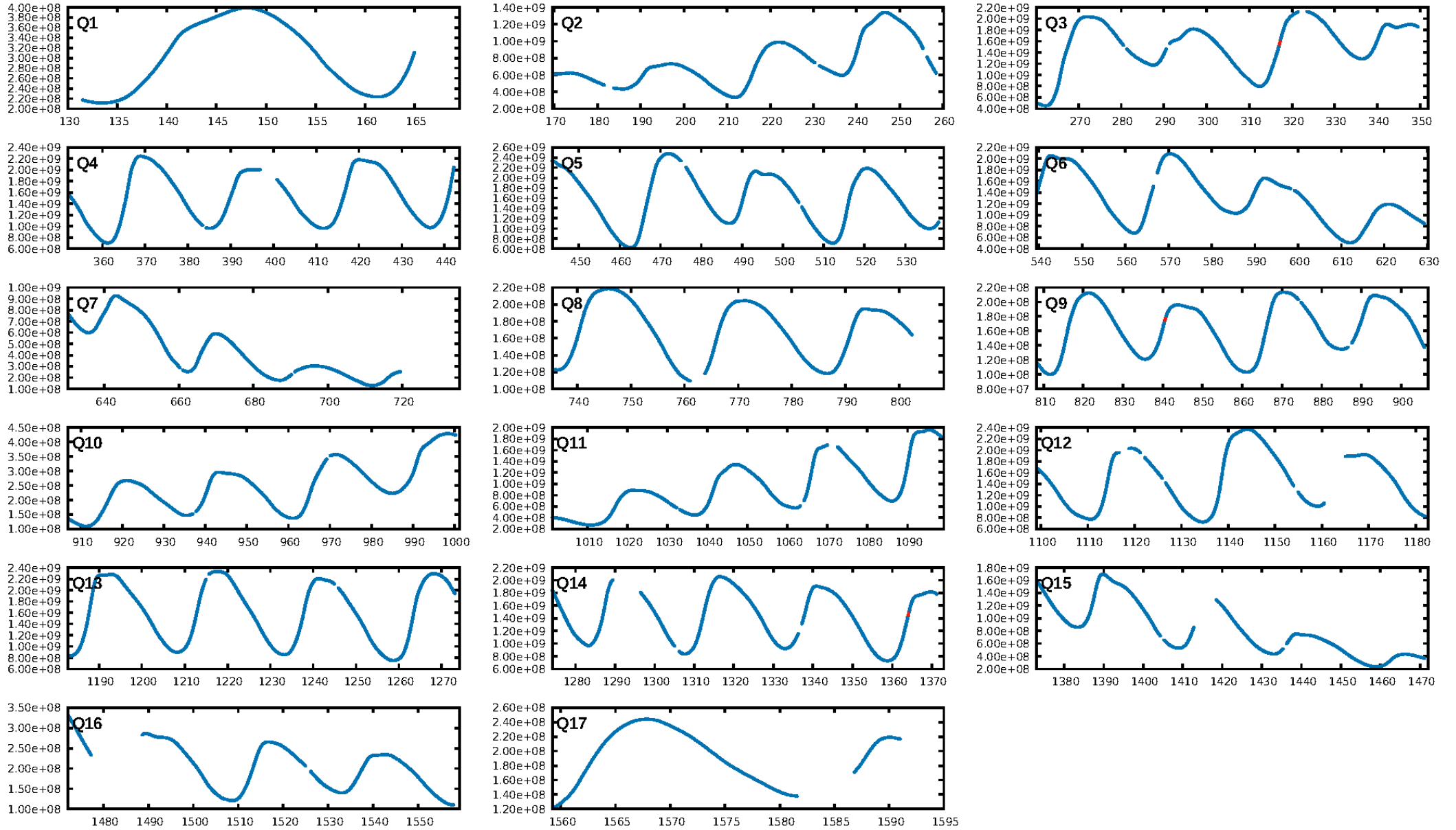
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.99%]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 40.1%  
ModelChiSquareGof-sig: 80.6%  
Bootstrap-pfa: 3.97e-04  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.29  
Centroid-sig: 90.4%  
Centroid-so: 5.964 arcsec [0.26%]  
OotOffset-rm: 1.950 arcsec [3.60%]  
KicOffset-rm: 2.587 arcsec [2.90%]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

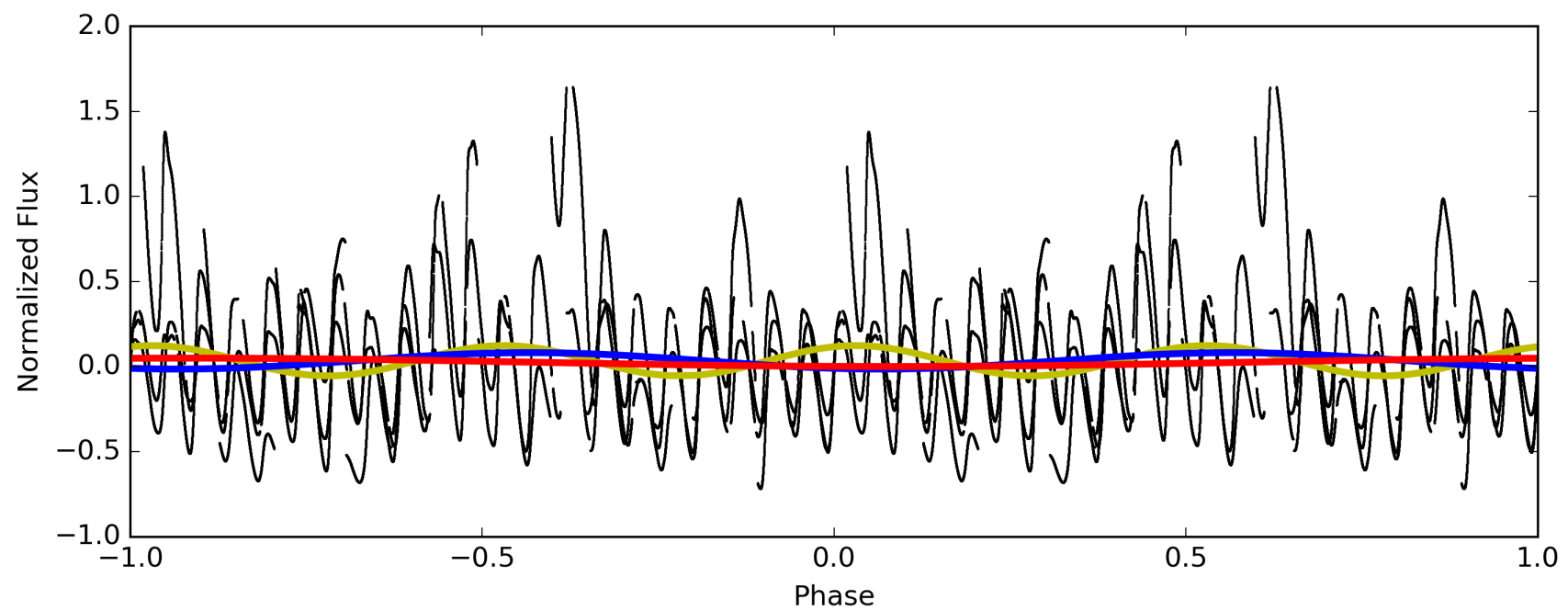
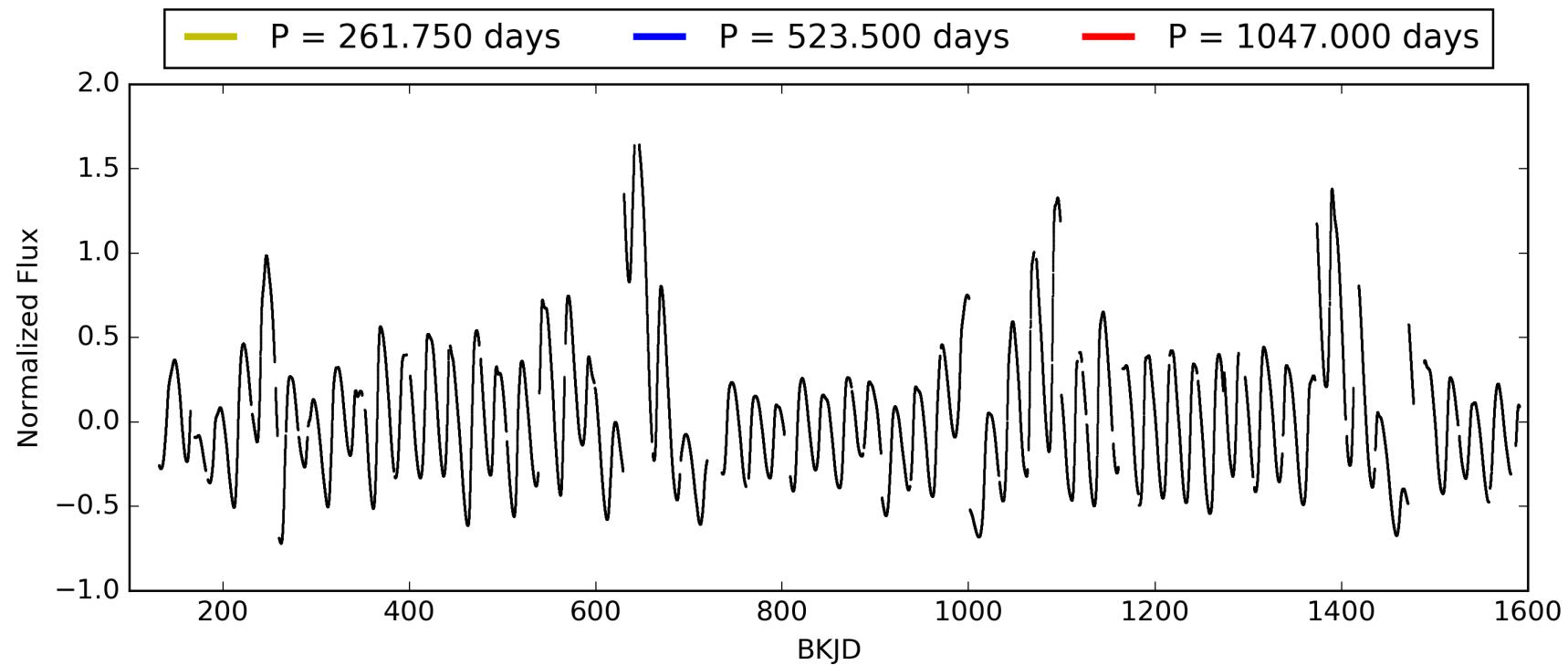
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:07:49 Z

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

# TCE 007466053-01, PDC Light Curves

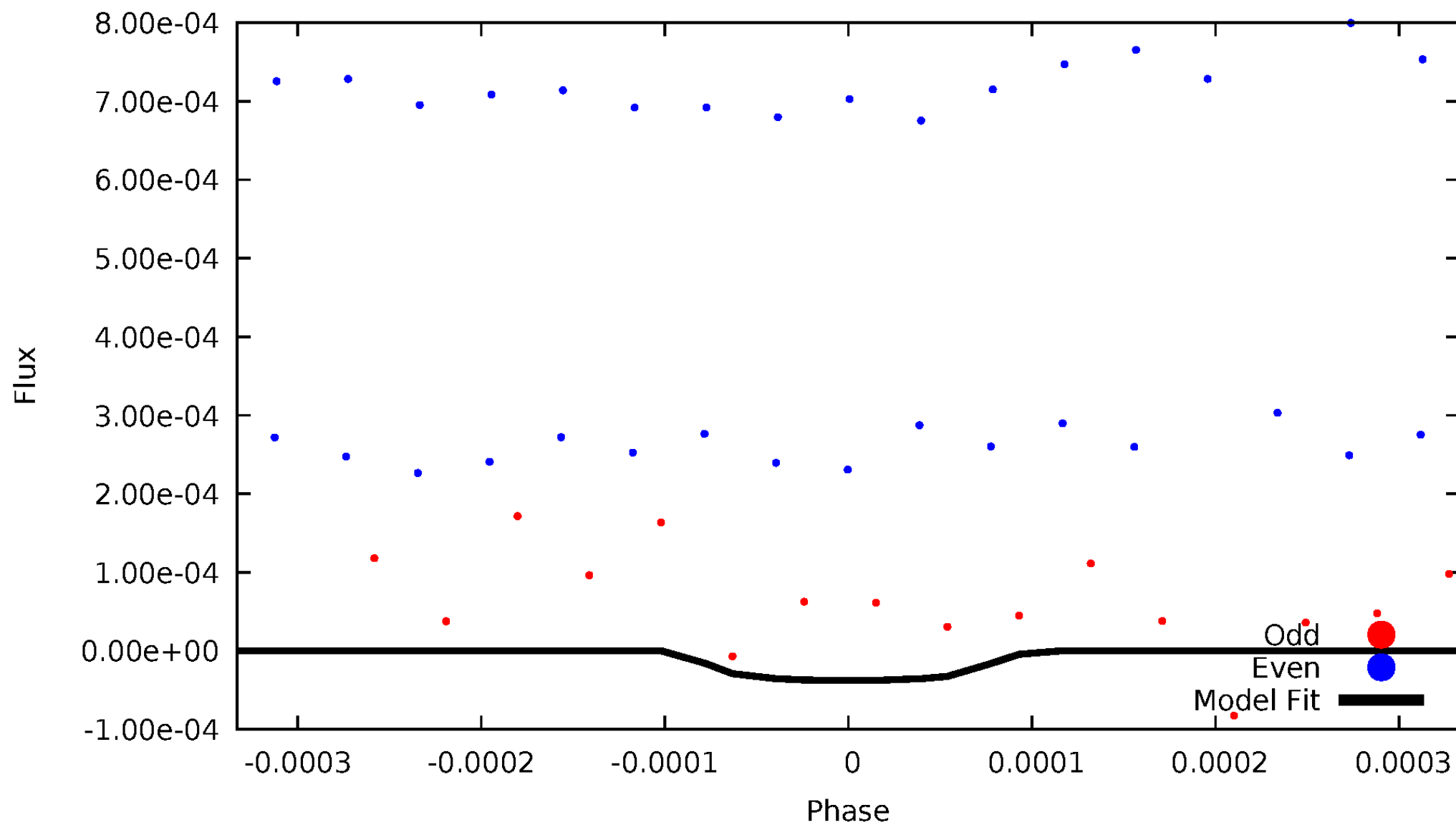


TCE 007466053-01



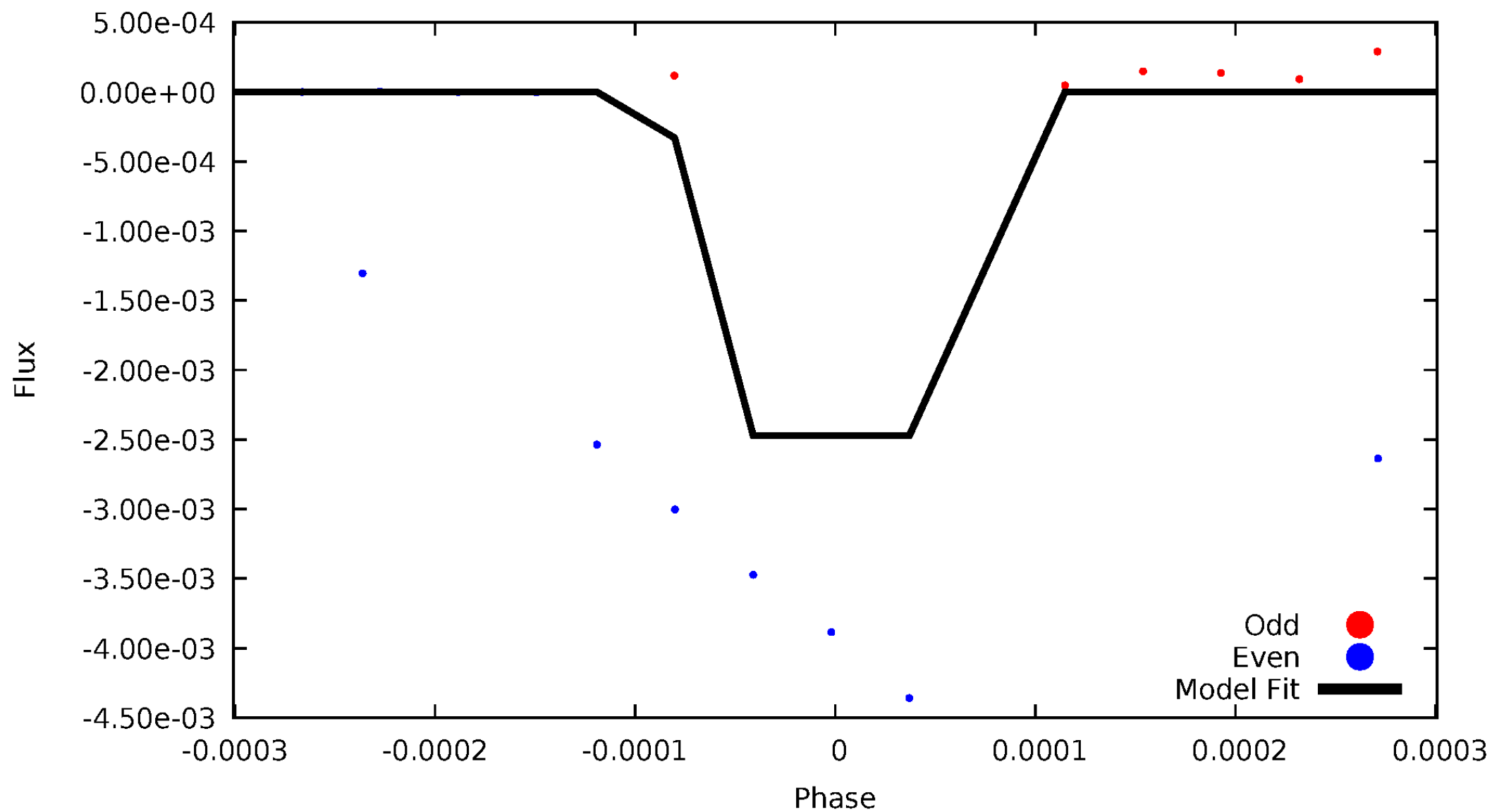
# DV Odd/Even

TCE 007466053-01



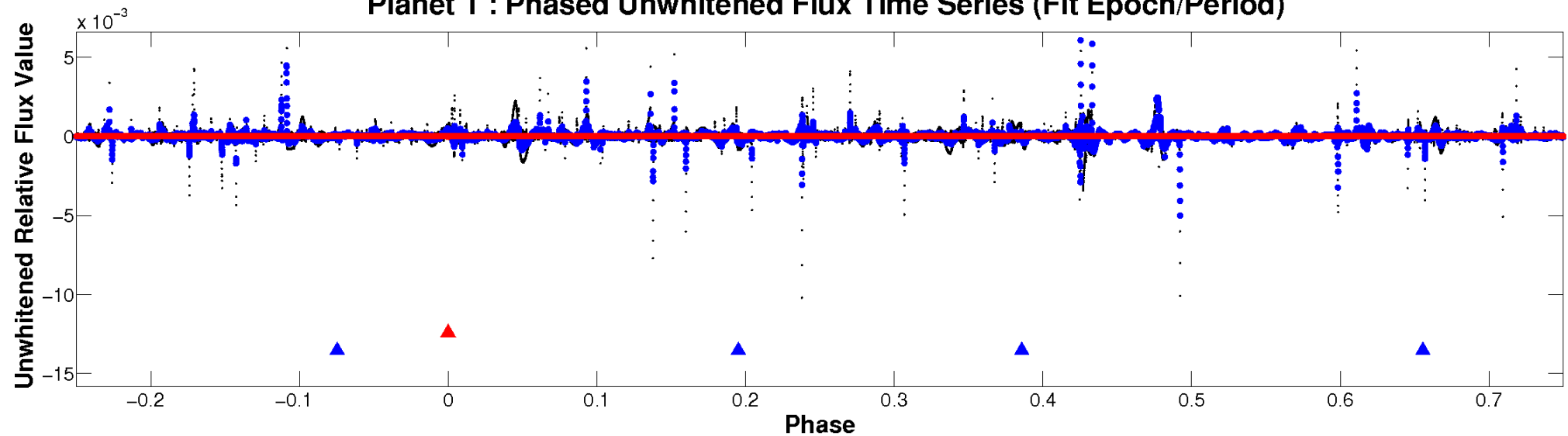
# ALT Odd/Even

TCE 007466053-01

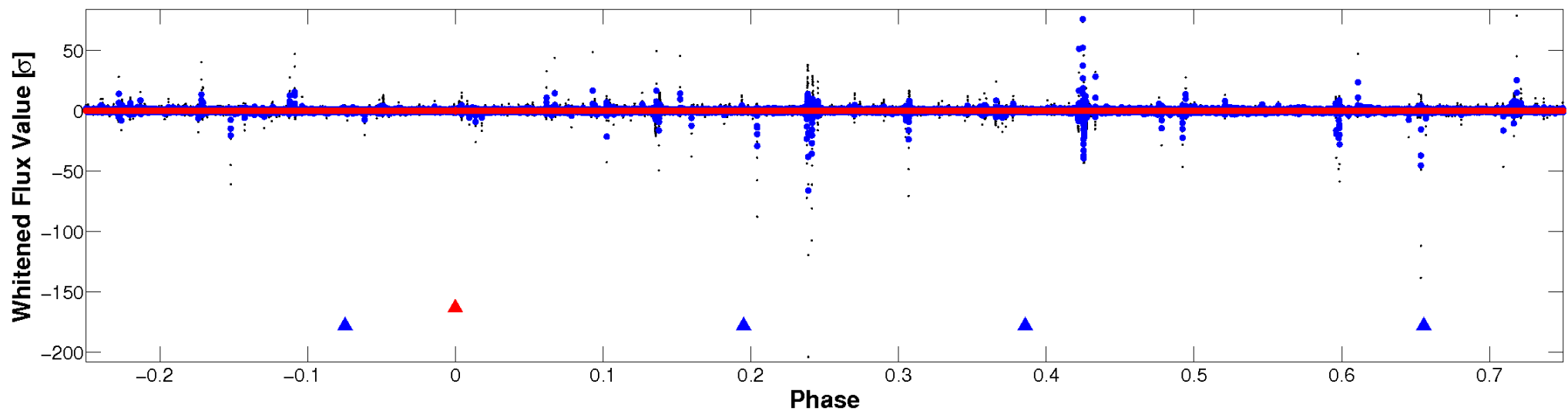


# Non-Whitened Vs. Whitened Light Curve

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

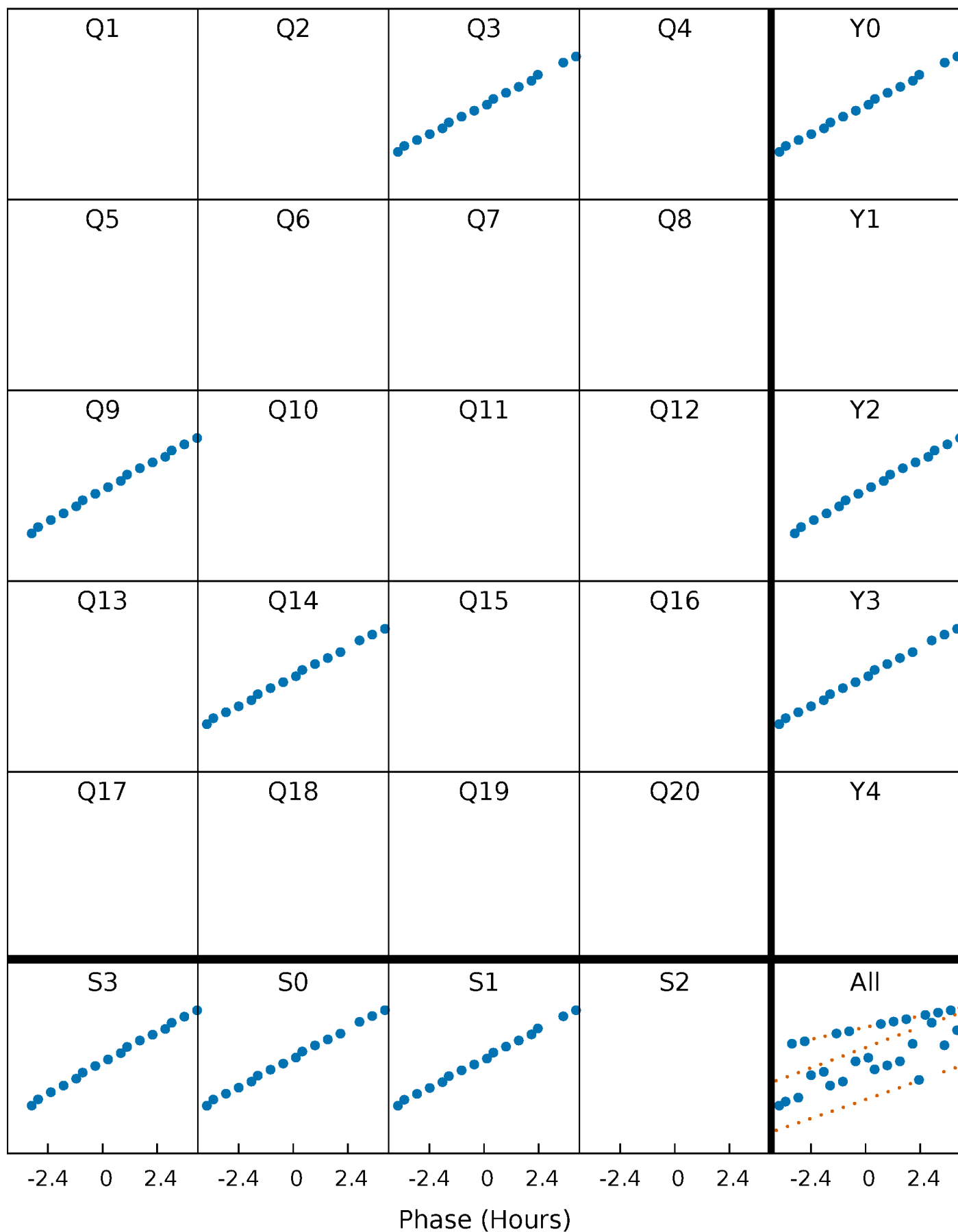


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

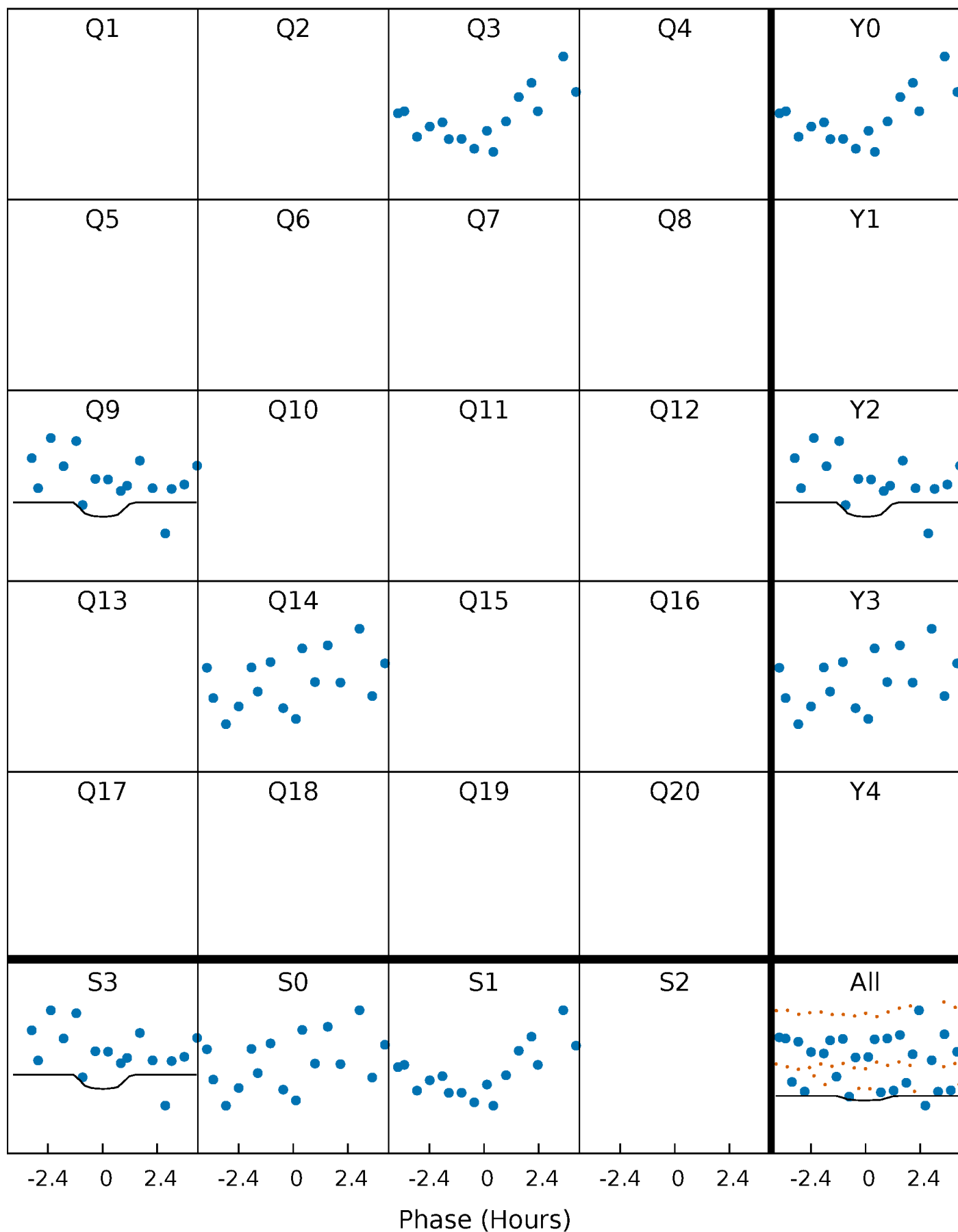
TCE 007466053-01 P=523.500147 Days  $T_0=317.130138$  (BKJD)





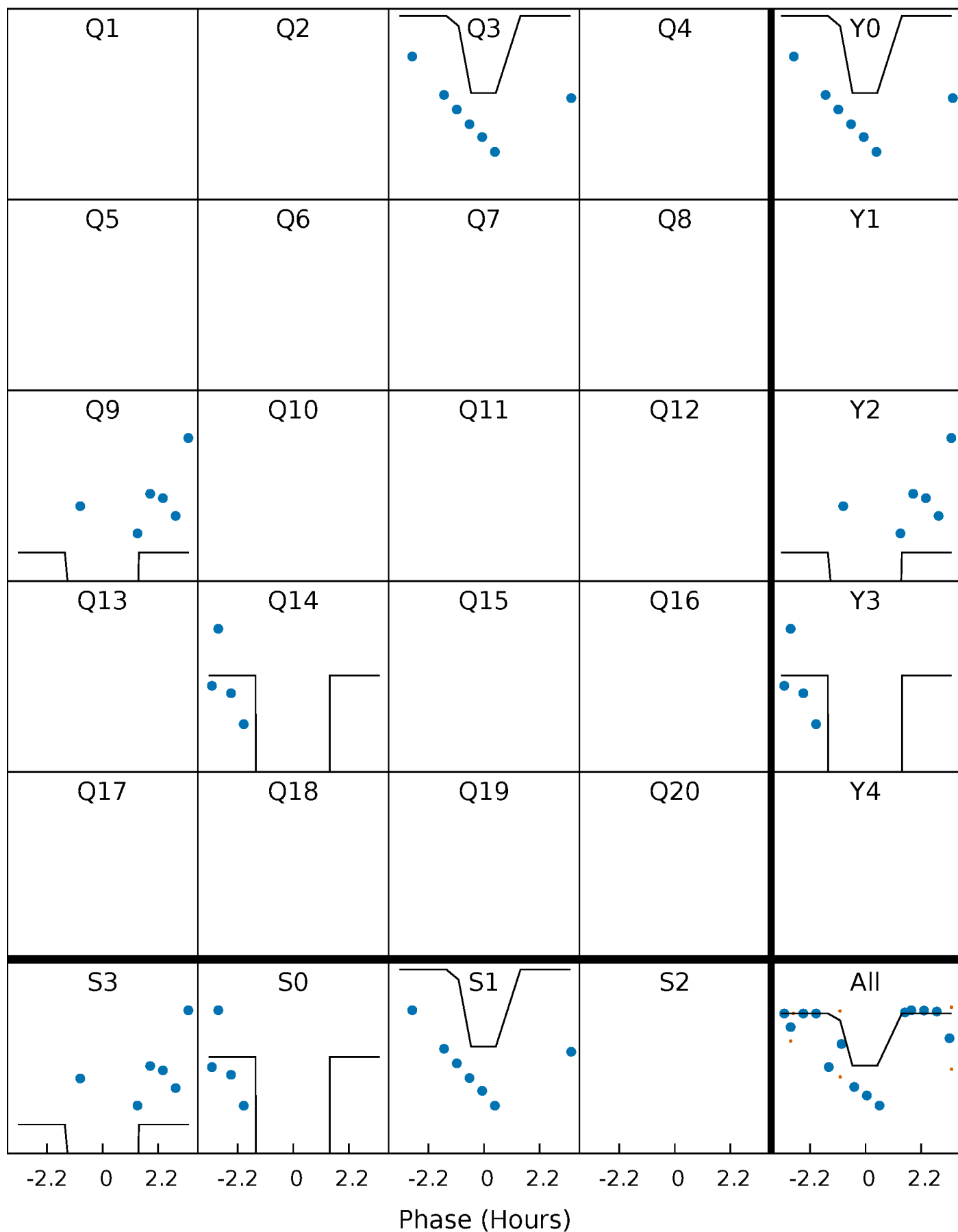
# DV Quarter-Phased Transit Curves

TCE 007466053-01 P=523.500147 Days  $T_0=317.130138$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

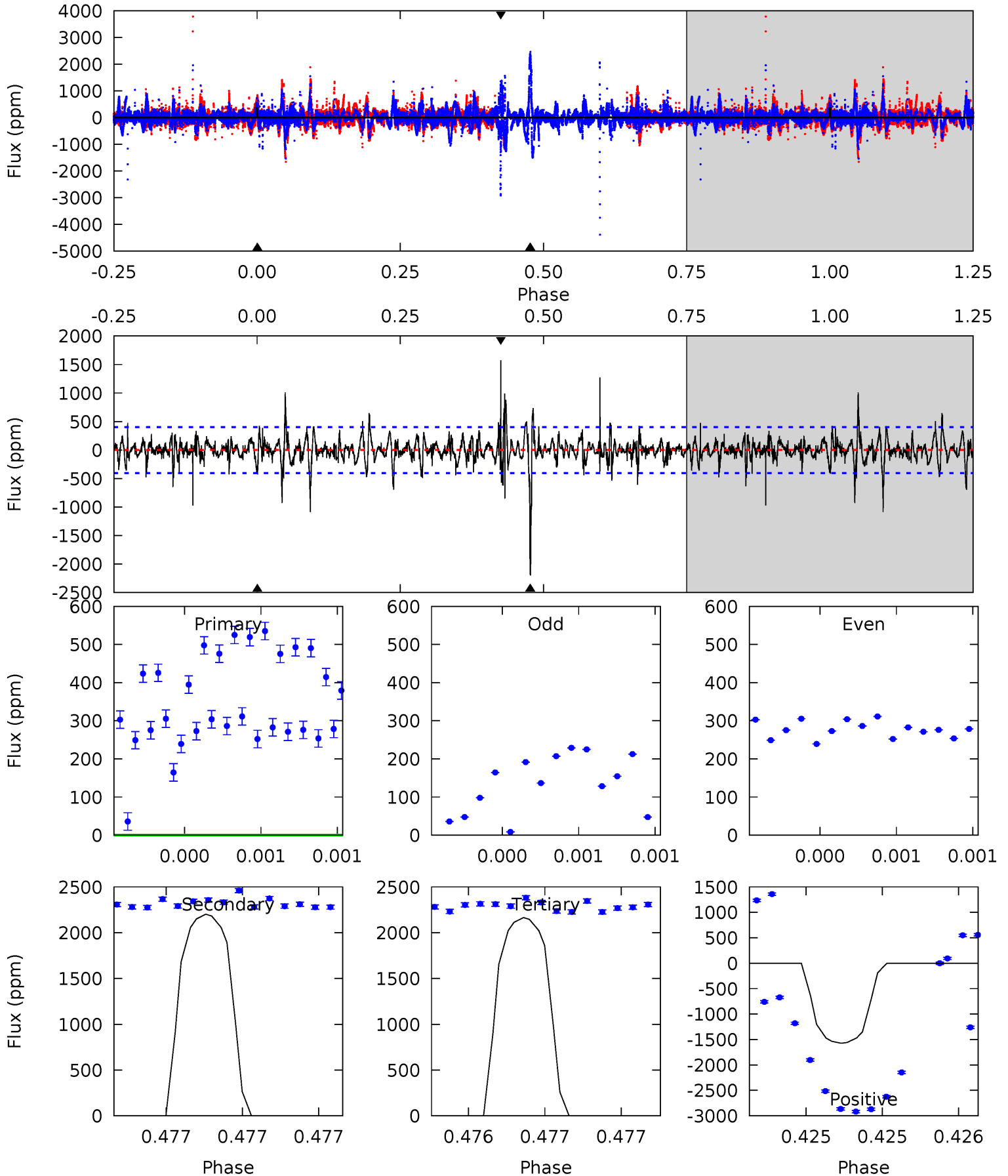
TCE 007466053-01 P=523.487374 Days  $T_0=317.131520$  (BKJD)



# DV Model-Shift Uniqueness Test

007466053-01, P = 523.500147 Days, E = 317.130138 Days

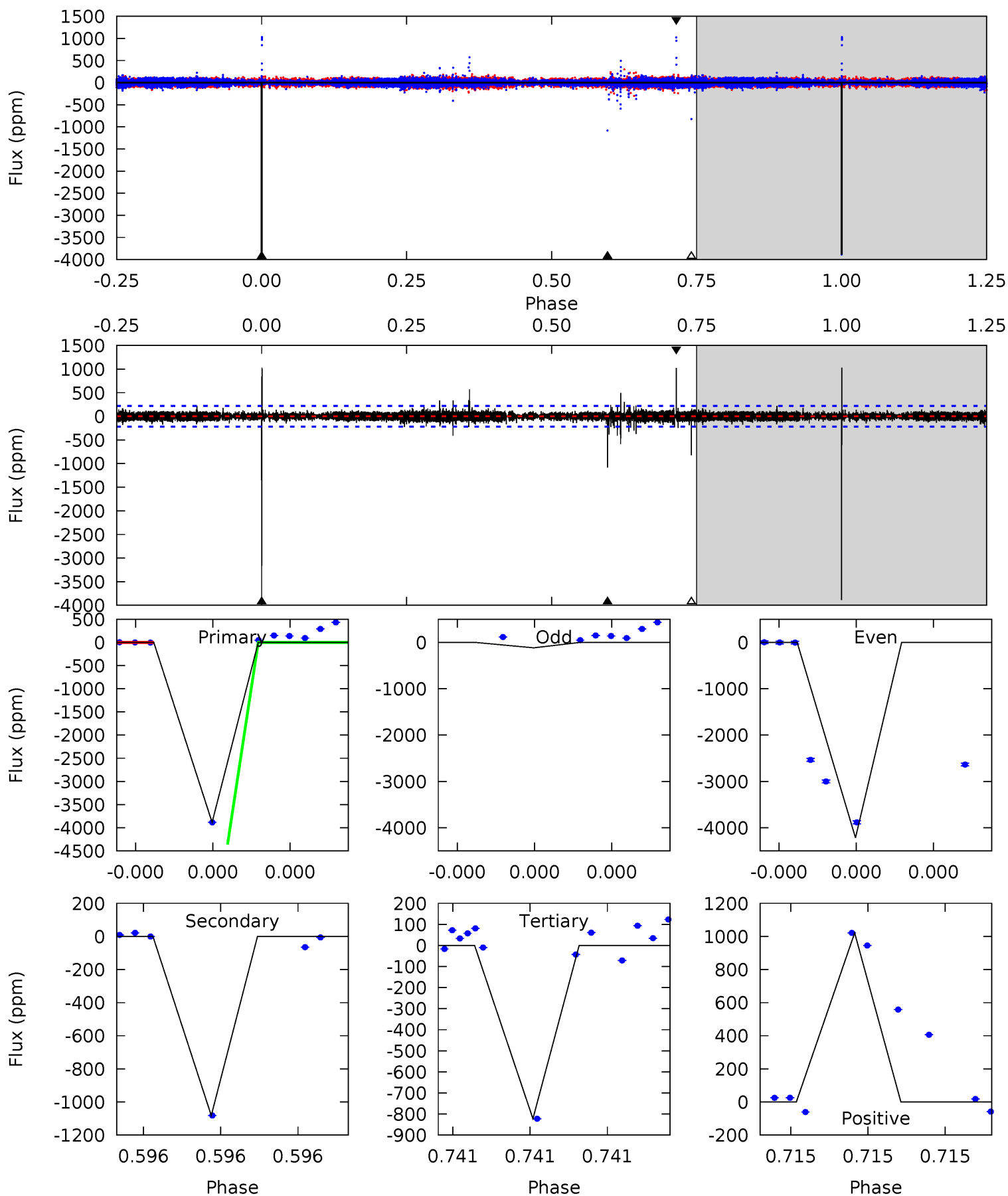
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.50	31.4	30.8	22.4	5.73	3.73	2.45	-25.3	-16.9	0.52	8.96	3.00	1.28	0.42	0.71



# Alt Model-Shift Uniqueness Test

007466053-01, P = 523.487374 Days, E = 317.131520 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
101.6	28.3	21.5	26.7	5.73	3.73	1.00	80.1	74.9	6.79	1.59	81.4	1.00	0.21	0



### Stellar Parameters For KIC 007466053

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5172^{+107}_{-215}$	$2.693^{+0.615}_{-0.205}$	$0.070^{+0.150}_{-0.600}$	$13.454^{+3.287}_{-9.861}$	$3.257^{+0.115}_{-2.180}$	$0.002^{+0.023}_{-0.001}$
	+2%/-4%	+23%/-8%	+214%/-857%	+24%/-73%	+4%/-67%	+1231%/-45%
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 007466053-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-2201 \pm 70$	$60.78^{+71.61}_{-41.95}$	$835^{+81}_{-127}$	$5052^{+4745}_{-1185}$	$1089^{+10125}_{-855}$
Alt.	$-1082 \pm 38$	$97.07^{+92.39}_{-66.68}$	$842^{+76}_{-136}$	$3772^{+1789}_{-635}$	$209^{+1841}_{-153}$

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

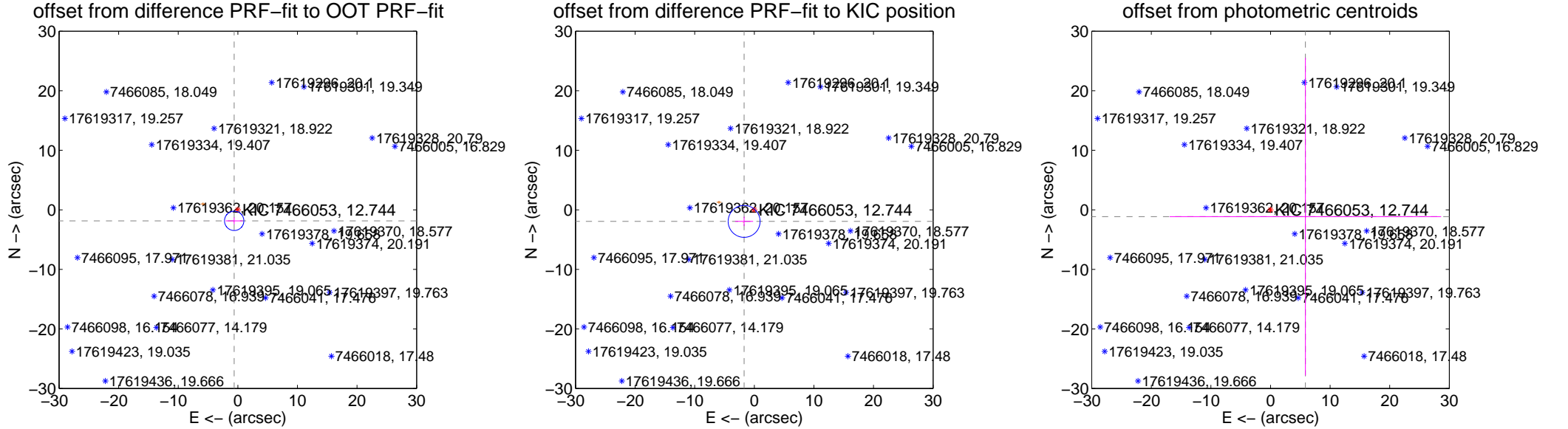
## DV Centroid Data

Supplemental centroid analysis for 007466053-01. Kepler magnitude: 12.74. Transit SNR 1.37

There are 1 quarters with good PRF difference image offsets

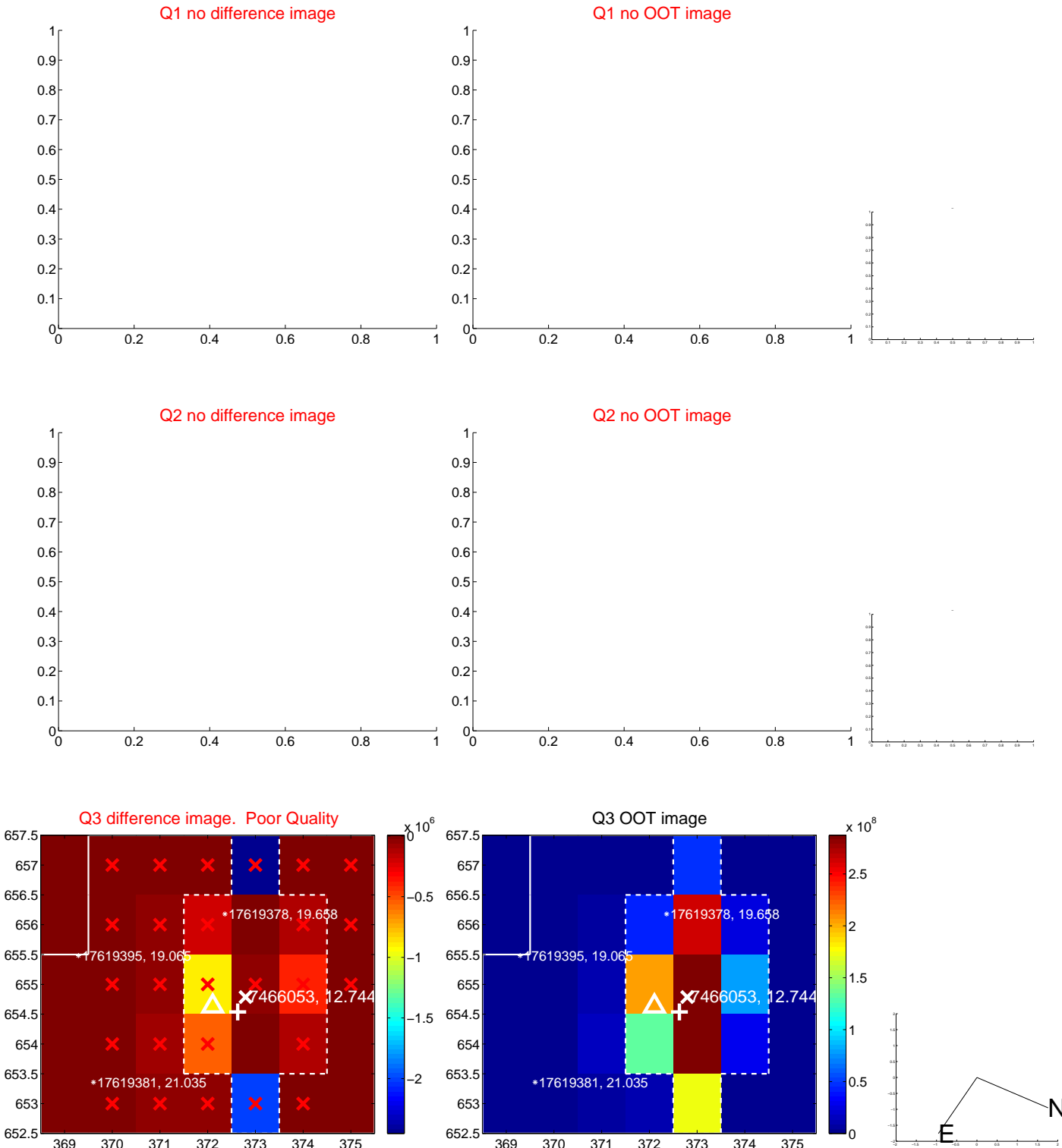
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.950 \pm 0.541$	3.60	$0.614 \pm 1.428$	$-1.851 \pm 0.571$
PRF-fit source offset from KIC position	$2.587 \pm 0.893$	2.90	$1.710 \pm 1.499$	$-1.941 \pm 0.781$
photometric centroid source offset	$5.96 \pm 22.94$	0.26	$-5.85 \pm 22.78$	$-1.14 \pm 26.67$



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.

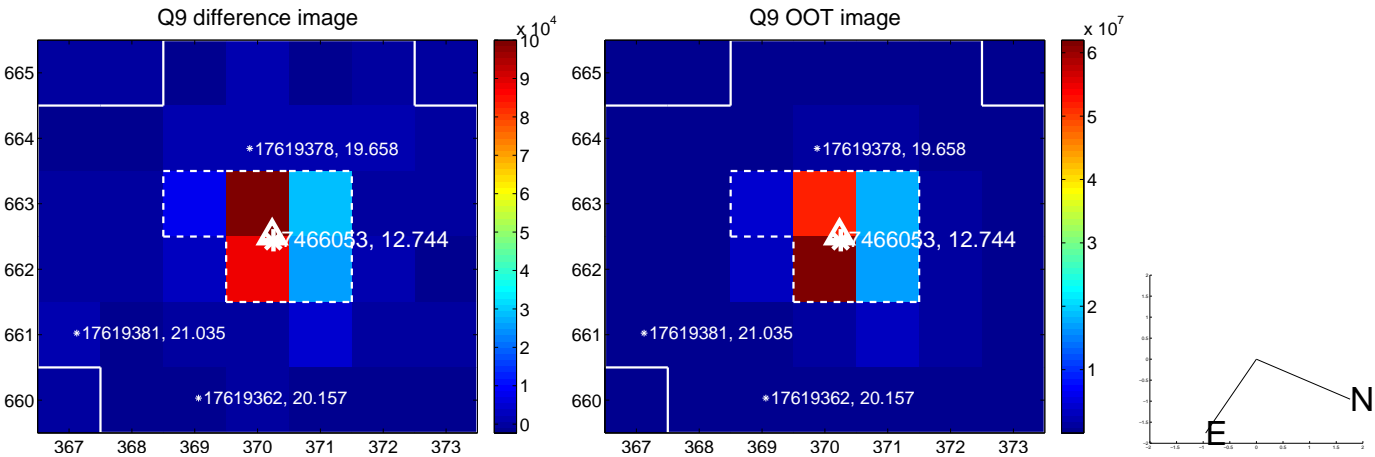


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

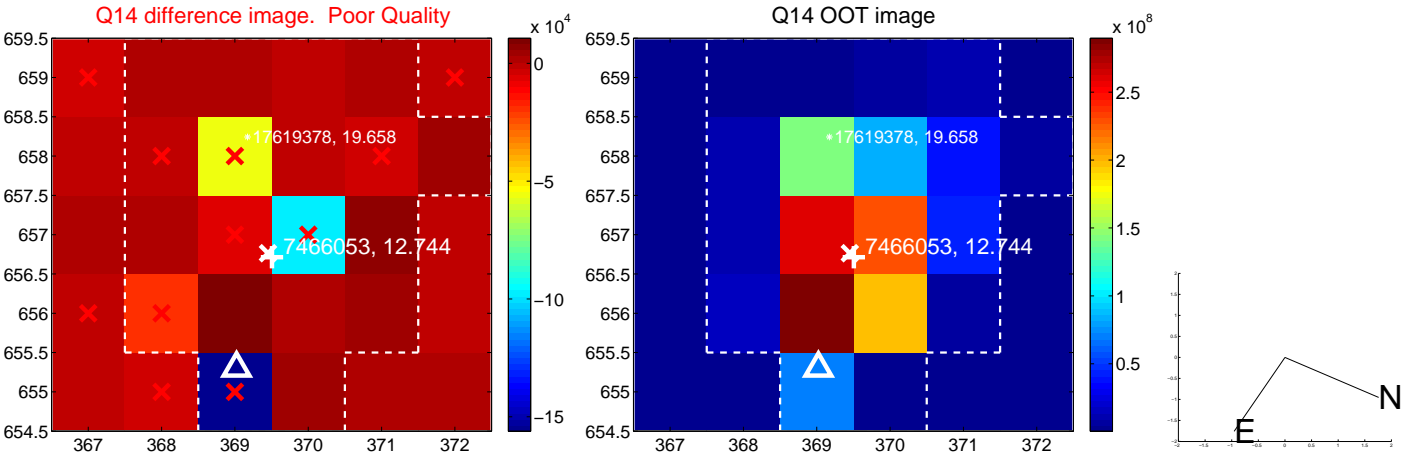
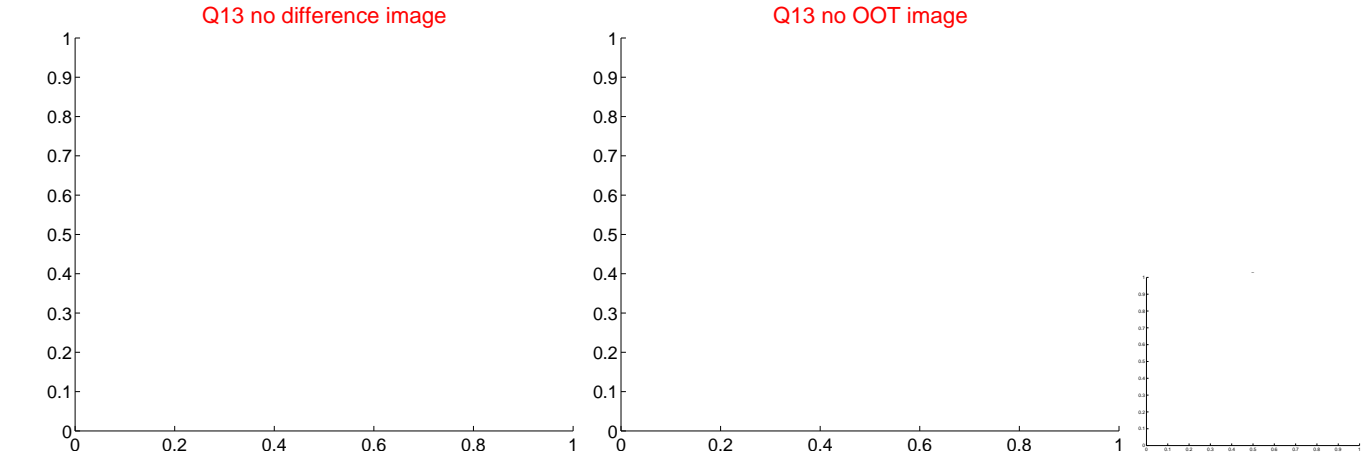




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

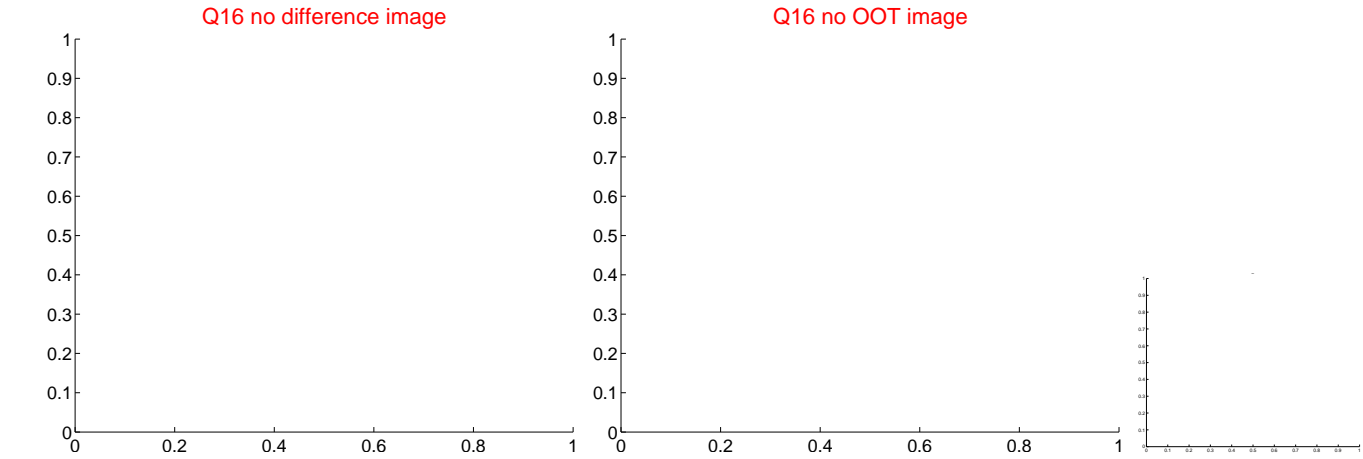
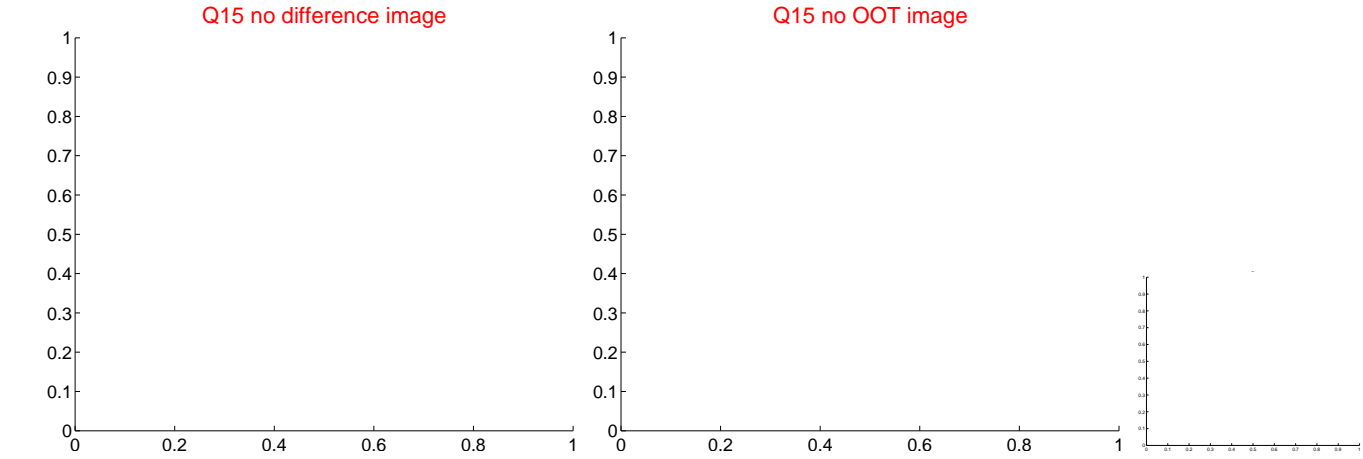


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

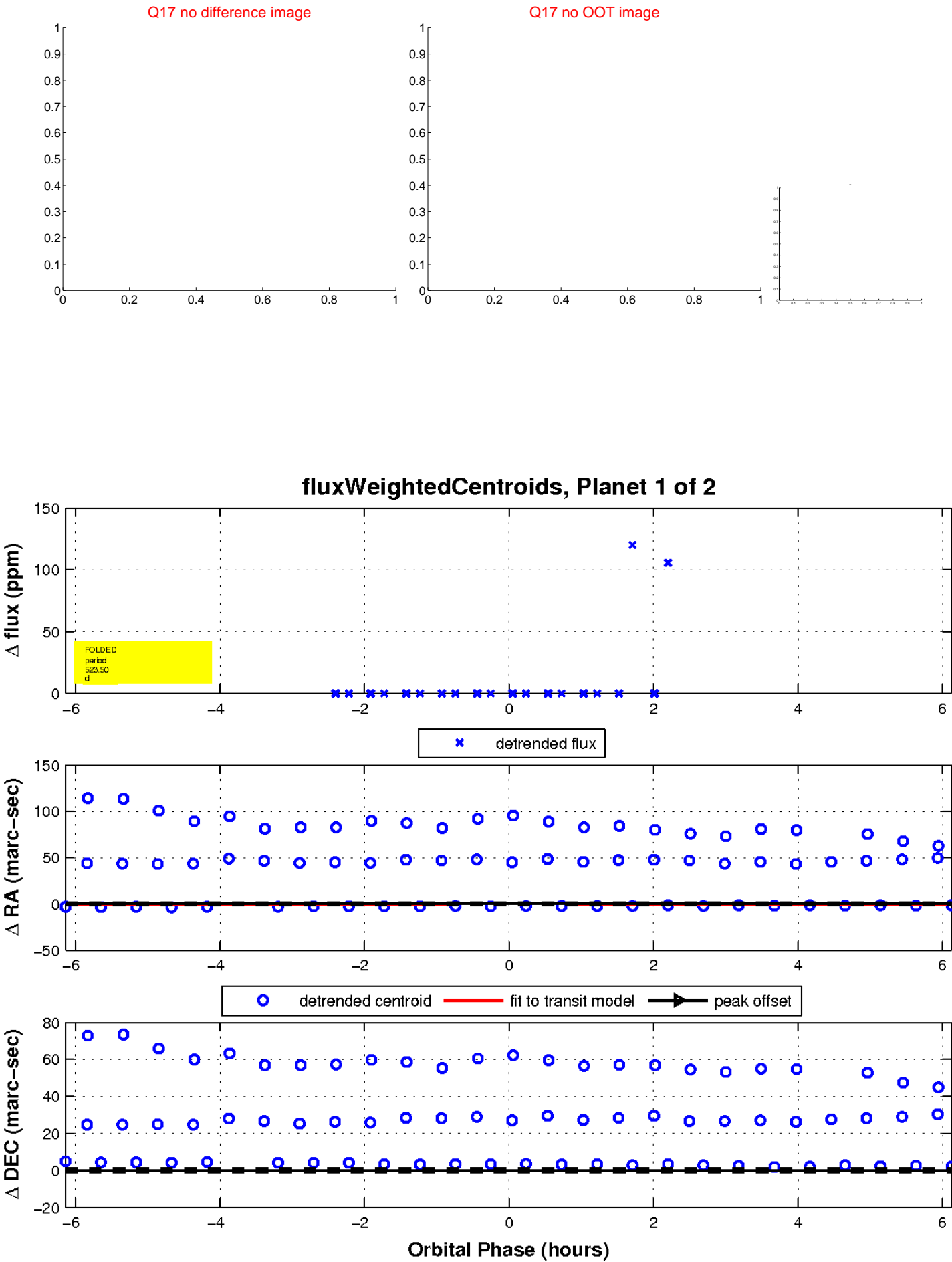


E

N

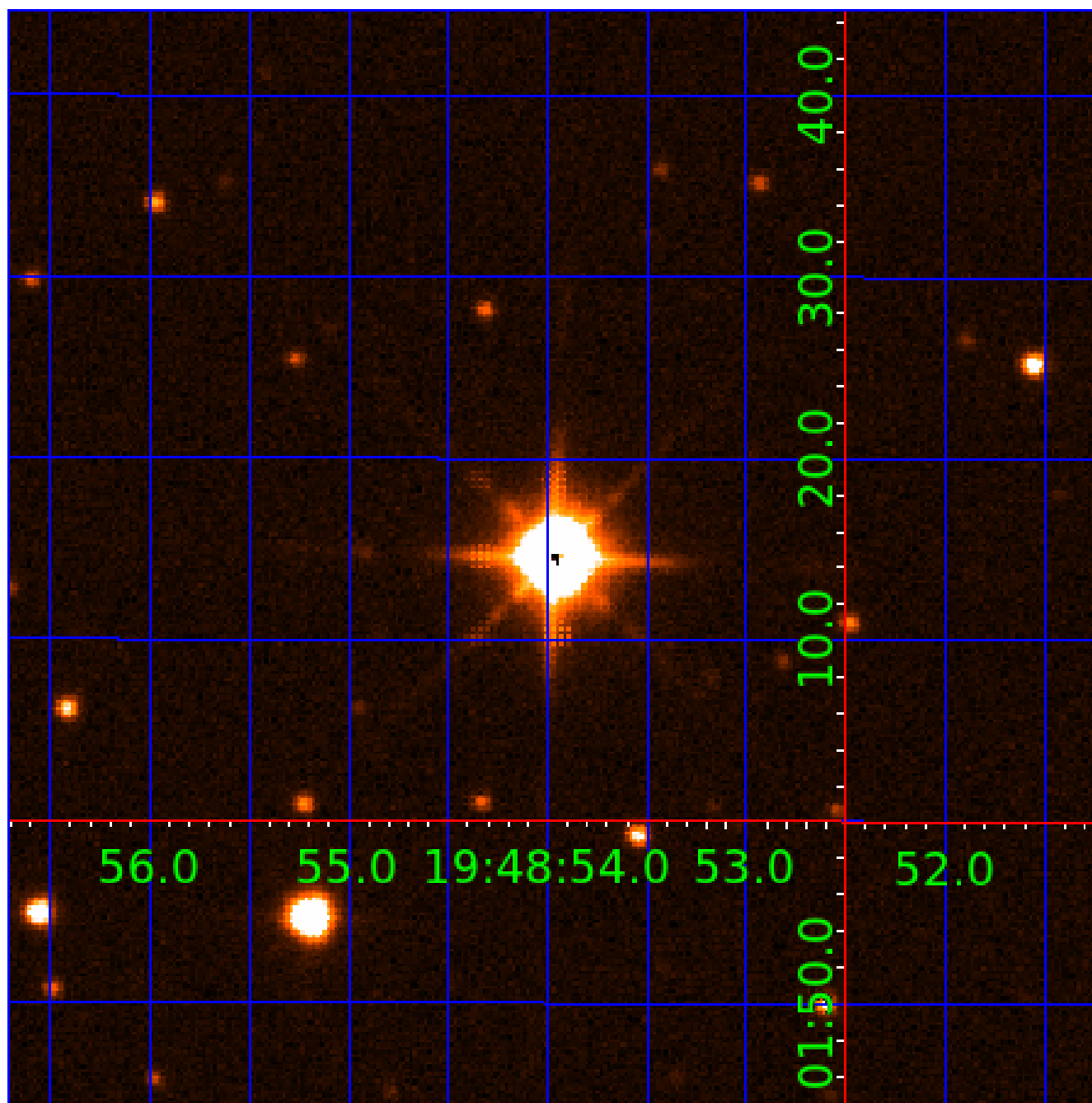


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007466053

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007466053-01	OBS	No	523.500147	317.130138	38.2	2.092	26.4	1.4	13.45	5172	9.55	32.67
007466053-02	OBS	No	382.264862	419.307288	10231.5	89.190	33.0	48.5	13.45	5172	156.12	49.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007466053-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007466053-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_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.

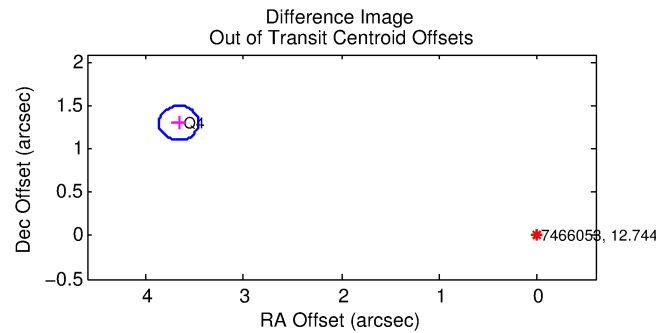
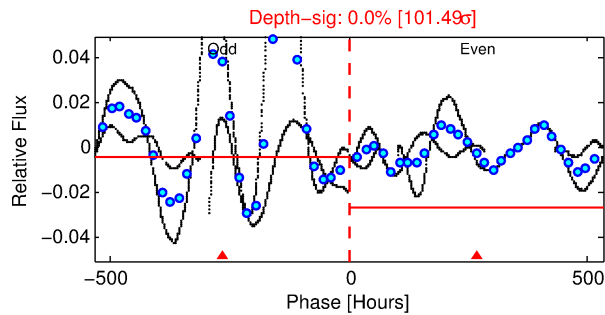
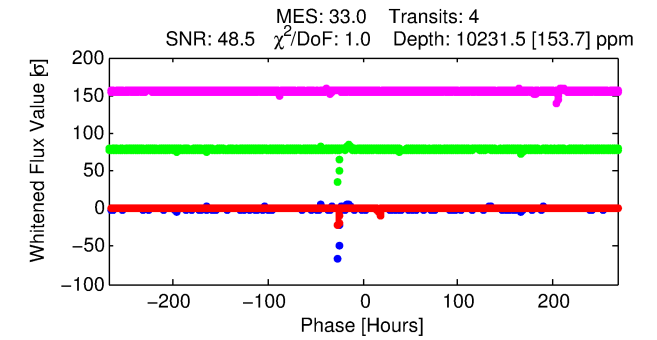
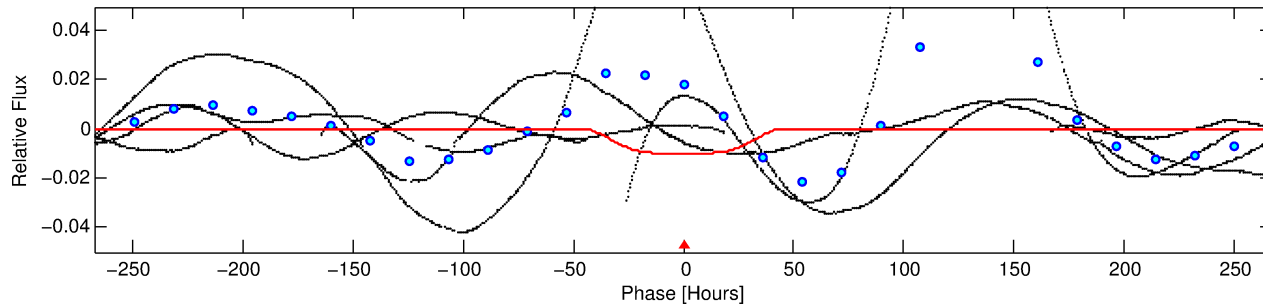
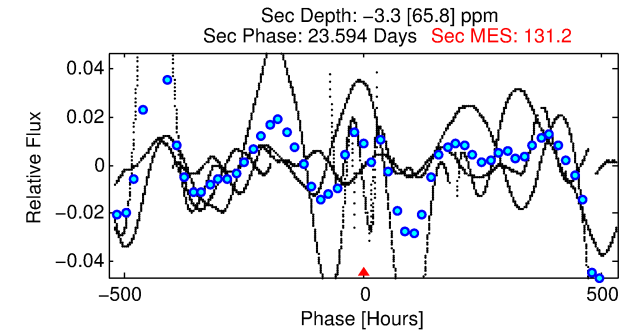
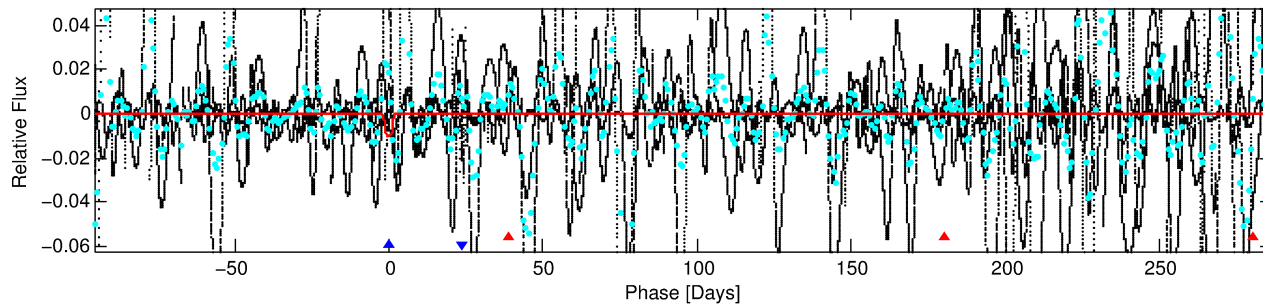
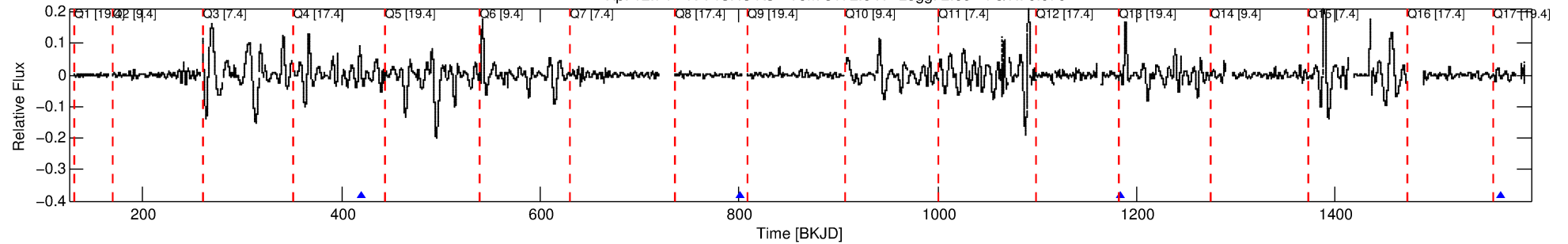
## Ephemeris Match Information For 007466053-02

No Significant Match Found

# DV One-Page Summary

KIC: 7466053 Candidate: 2 of 2 Period: 382.265 d

Kp: 12.74 R\*: 13.45 Rs Teff: 5172.0 K Logg: 2.69 Fe/H: 0.070



## DV Fit Results:

Period = 382.26486 [0.00727] d  
Epoch = 419.3073 [0.0121] BKJD  
Rp/R\* = 0.1063 [0.0009]  
a/R\* = 23.80 [0.16]  
b = 0.83 [0.00]  
Seff = 49.69 [53.46]  
Teq = 677 [182] K  
Rp = 156.12 [114.43] Re  
a = 1.5282 [1.0382] AU  
Ag = N/A  
Teffp = N/A

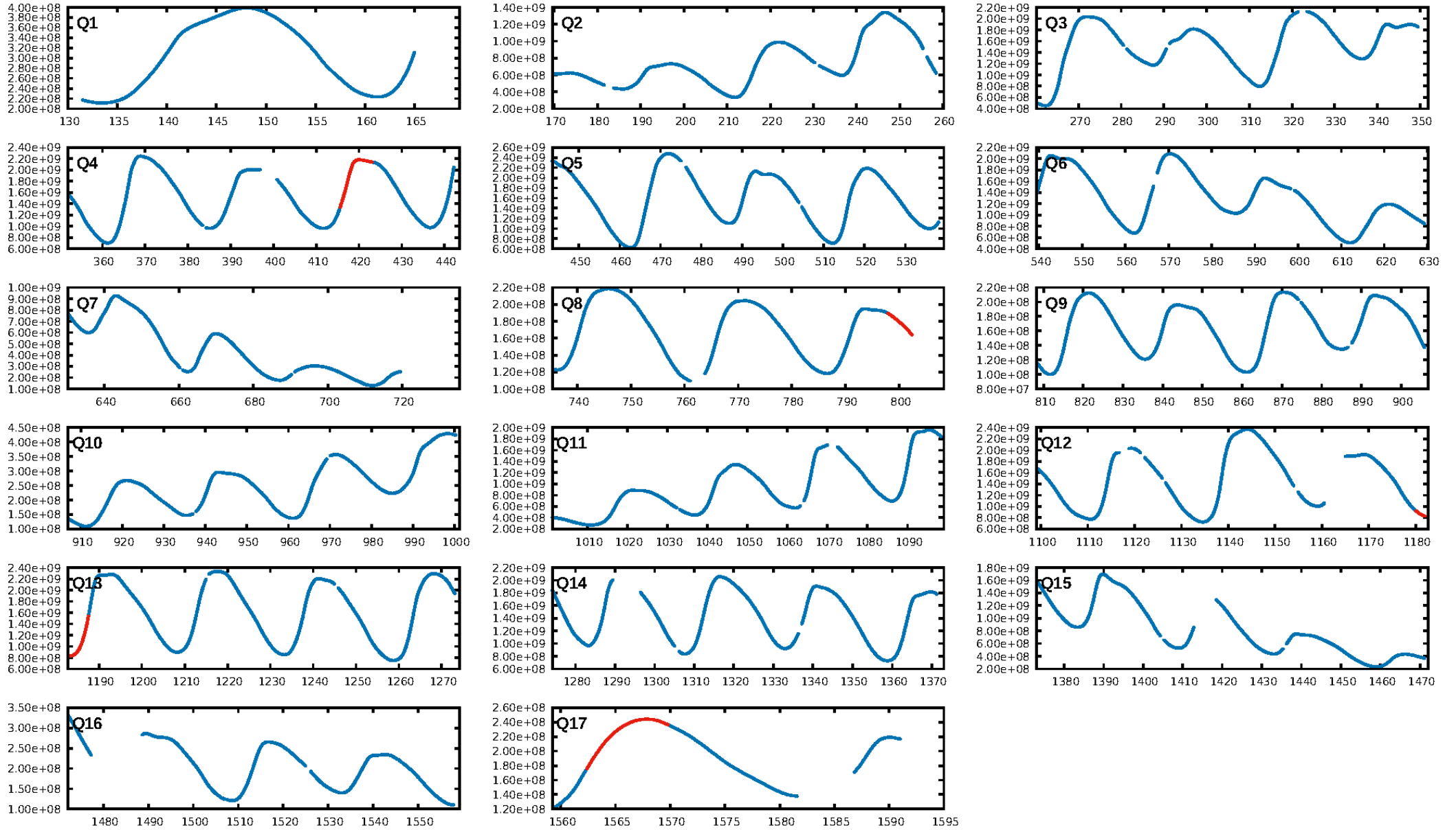
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [37.99σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.65e-05  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.404  
Centroid-sig: 2.0%  
Centroid-so: 0.122 arcsec [6.96σ]  
OotOffset-rm: 3.888 arcsec [58.30σ]  
KicOffset-rm: 4.211 arcsec [63.13σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

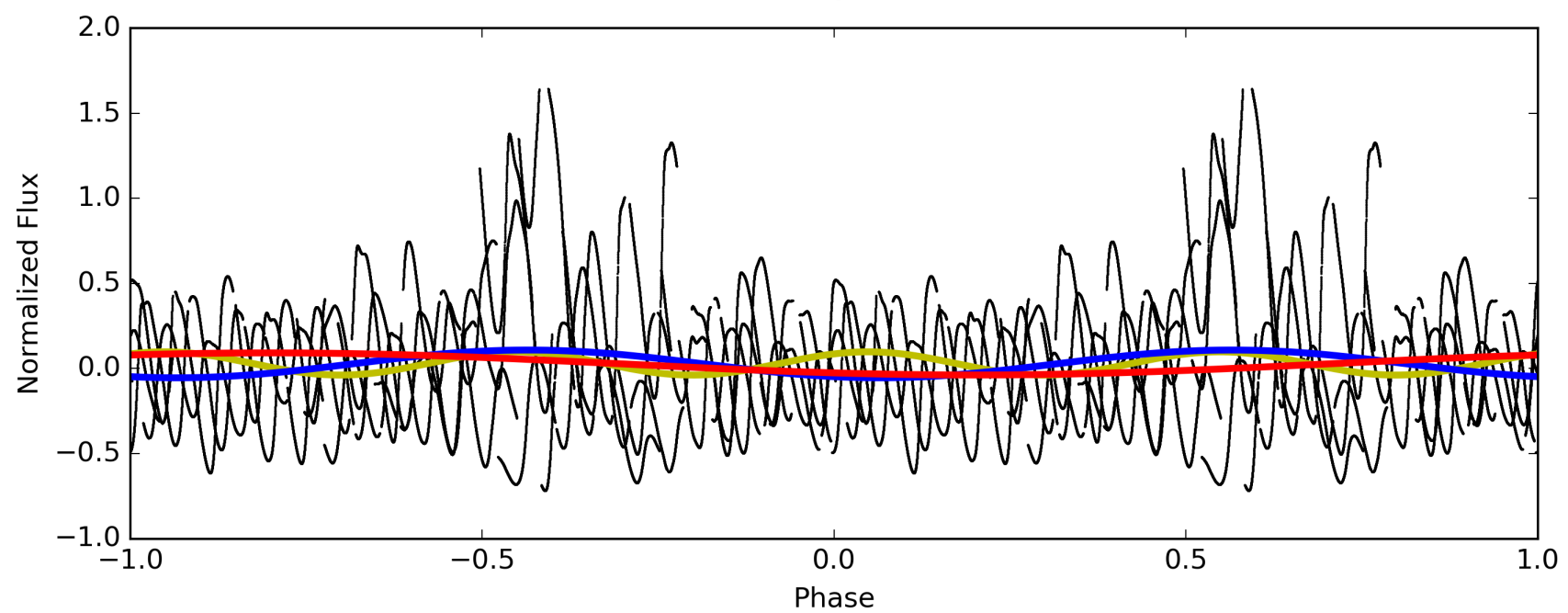
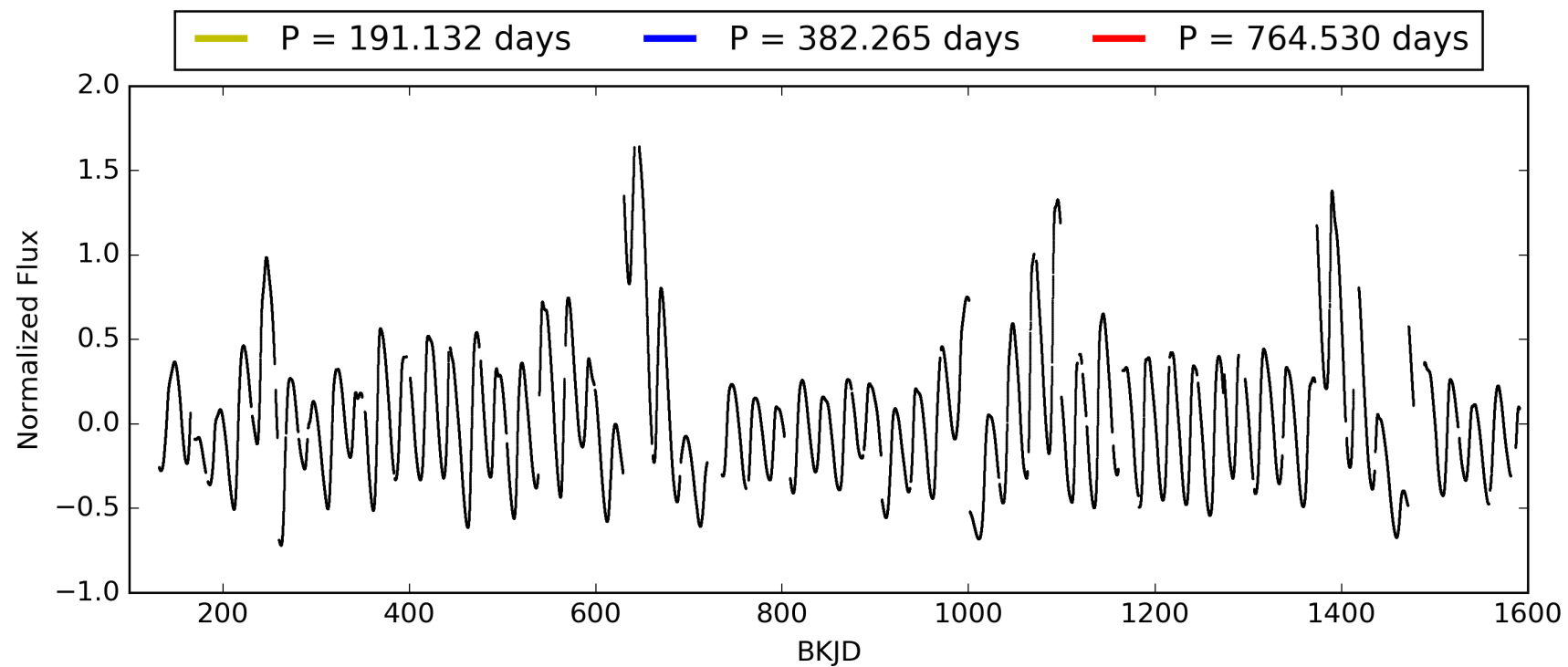
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:07:58 Z

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

# TCE 007466053-02, PDC Light Curves



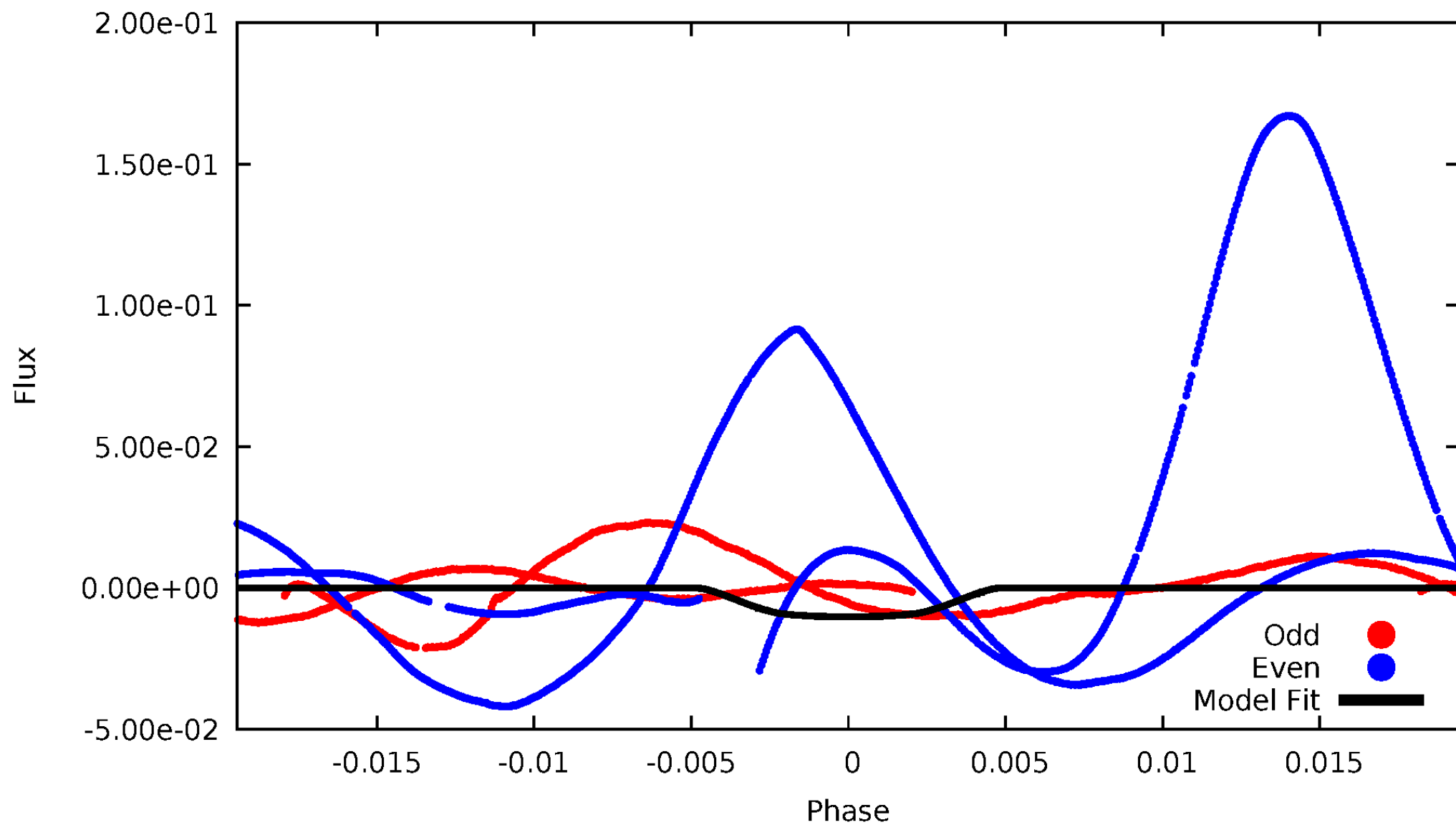
TCE 007466053-02





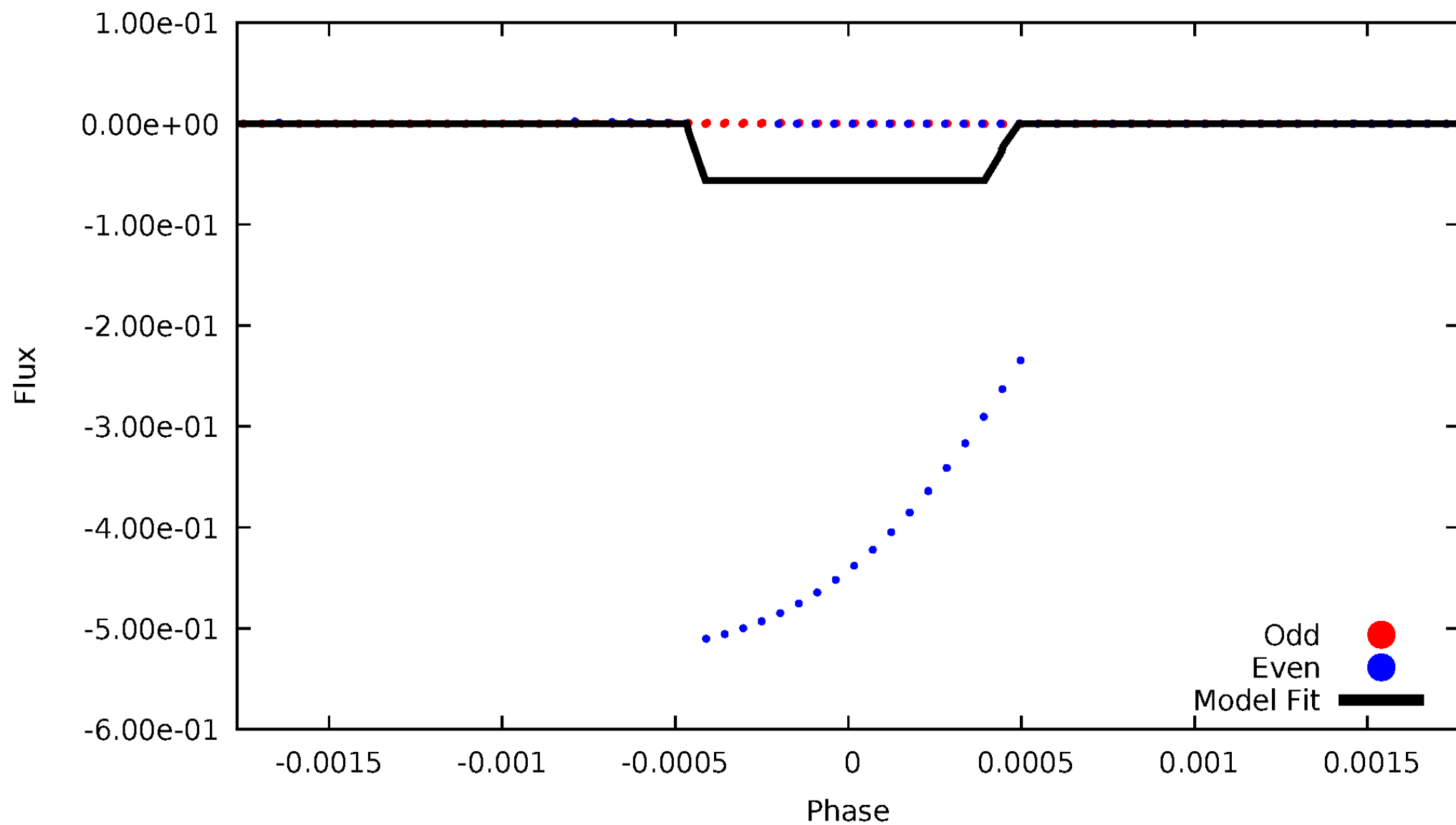
# DV Odd/Even

TCE 007466053-02



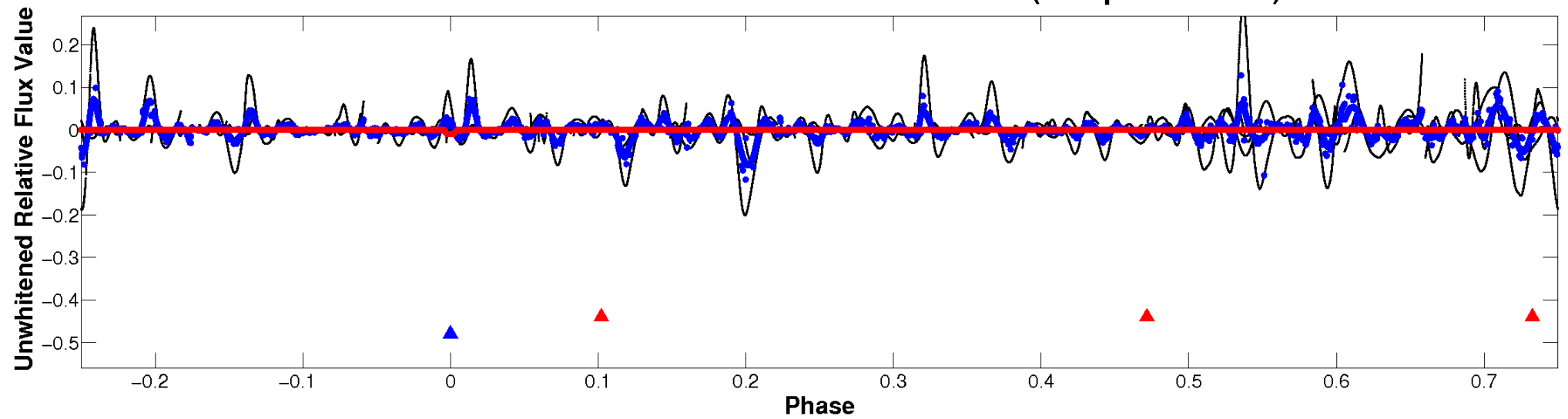
# ALT Odd/Even

TCE 007466053-02

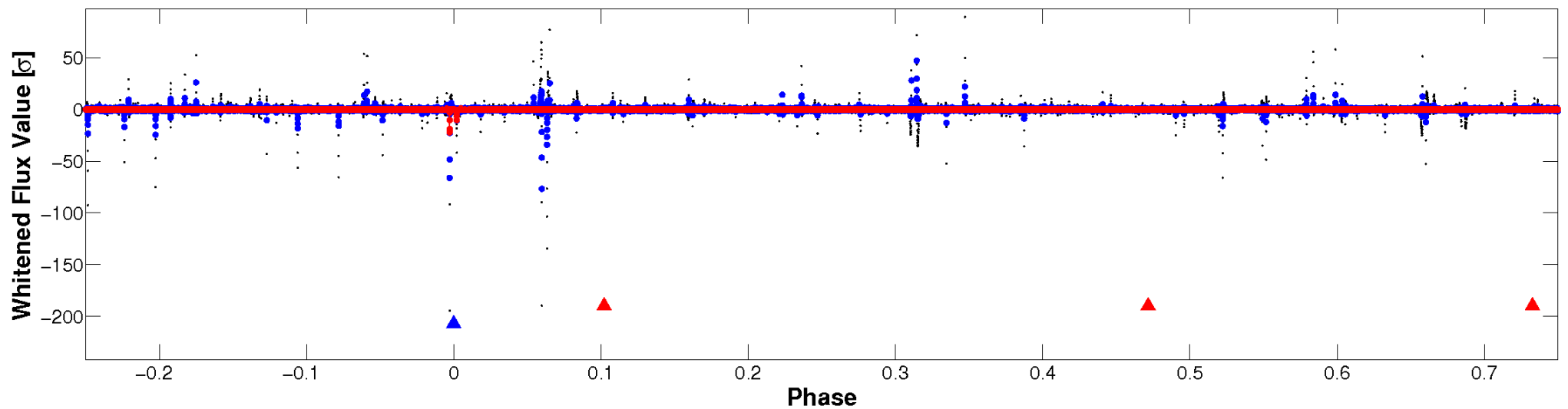


# Non-Whitened Vs. Whitened Light Curve

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

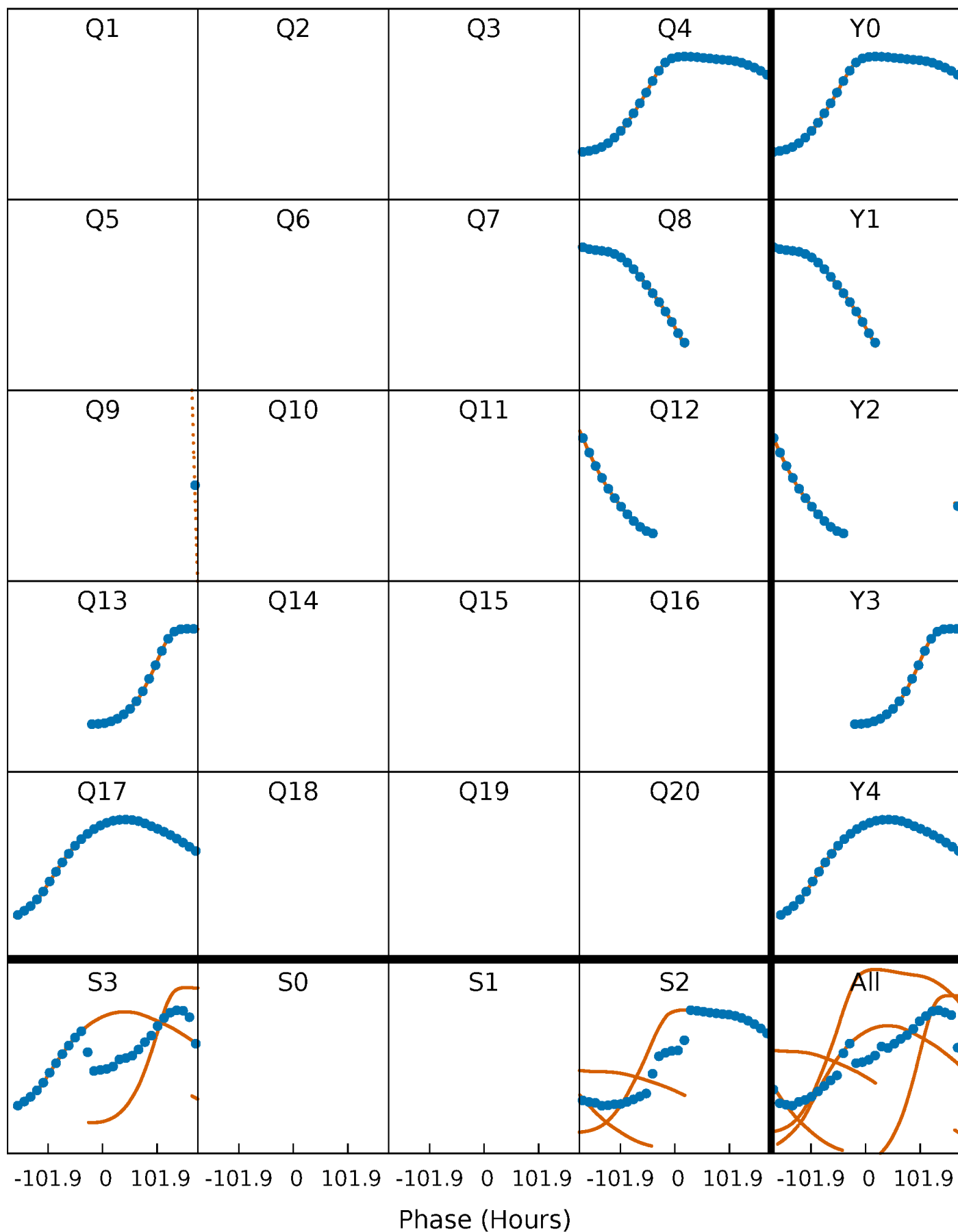


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



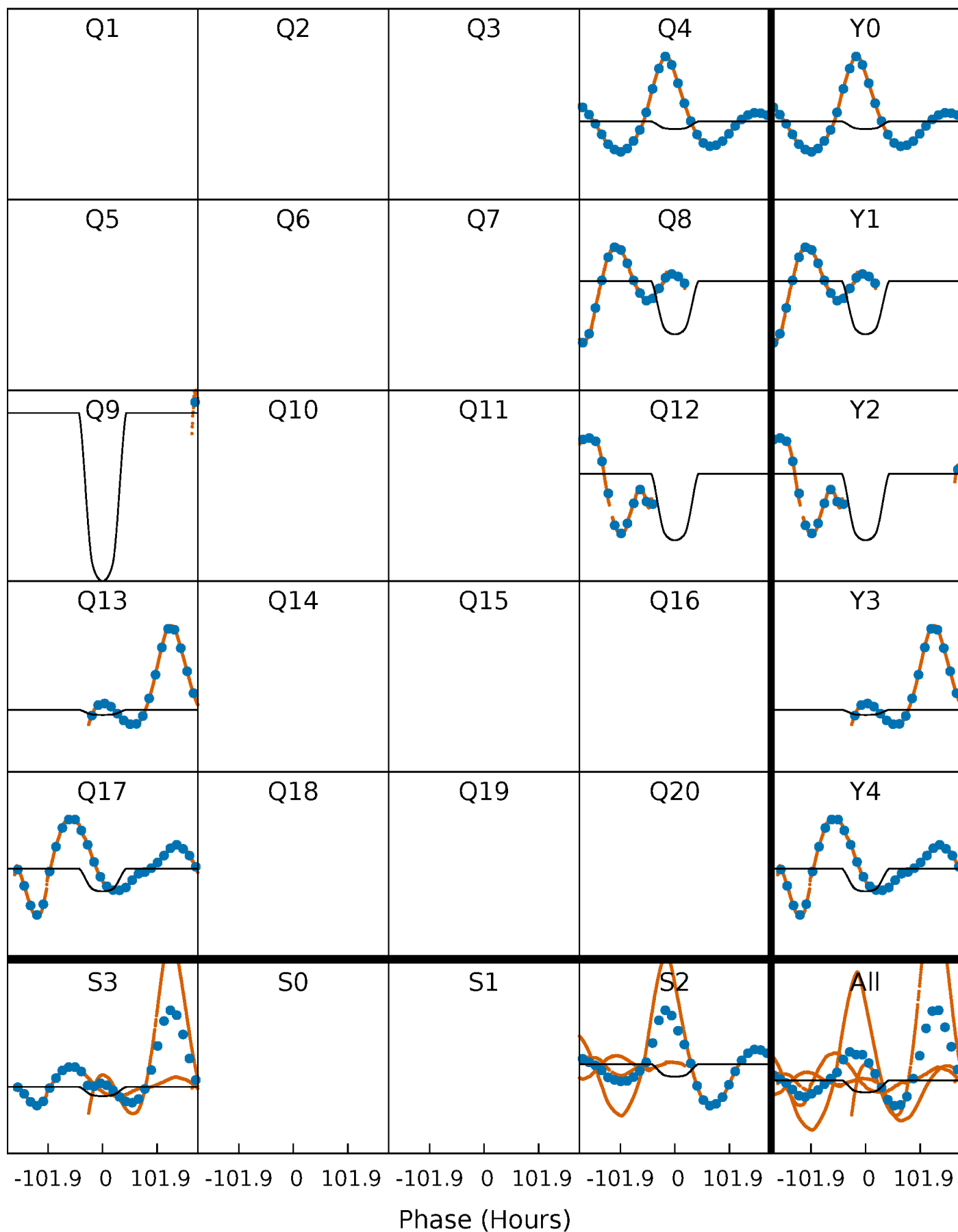
# PDC Quarter-Phased Transit Curves

TCE 007466053-02 P=382.264862 Days  $T_0=419.307288$  (BKJD)



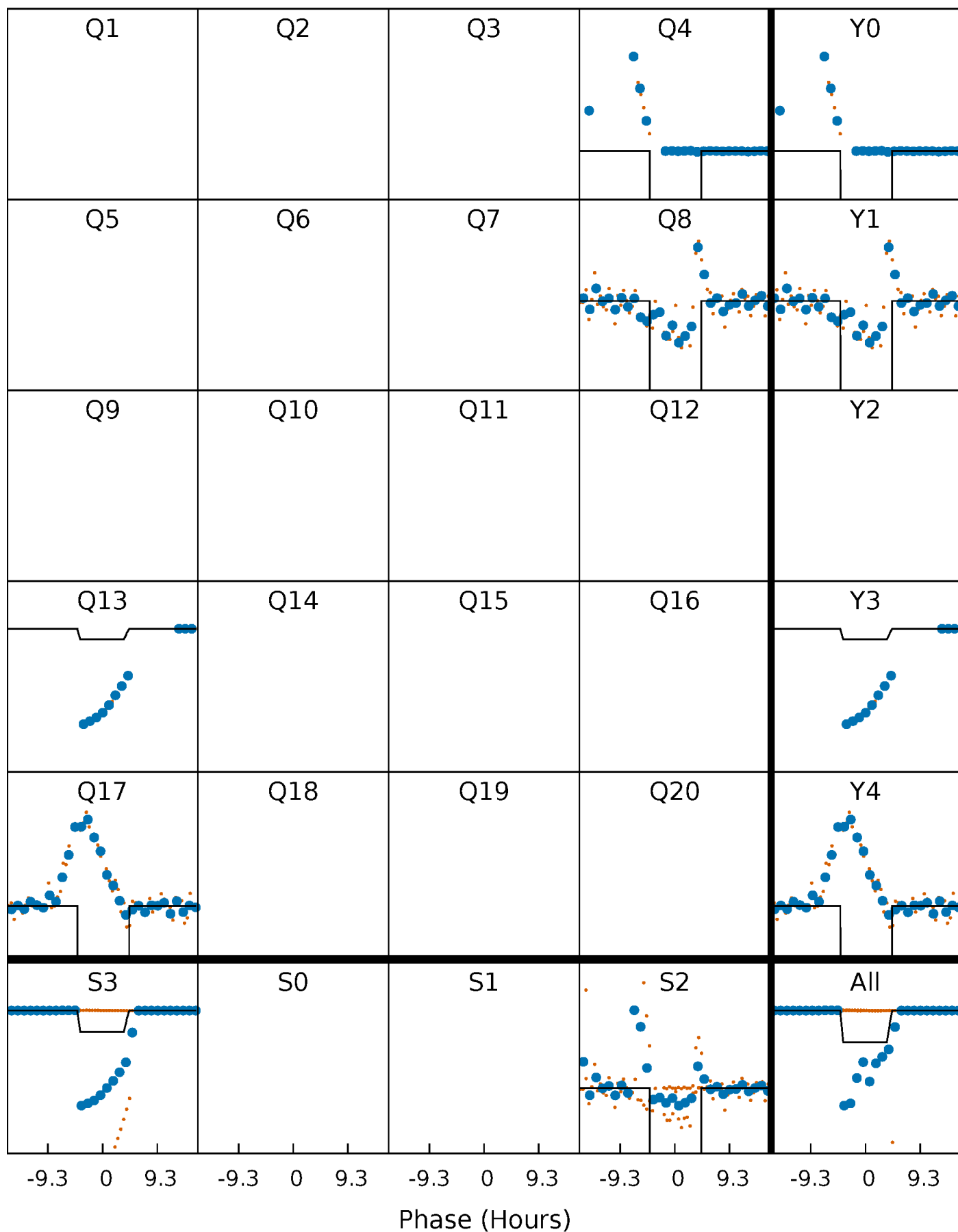
# DV Quarter-Phased Transit Curves

TCE 007466053-02 P=382.264862 Days  $T_0=419.307288$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

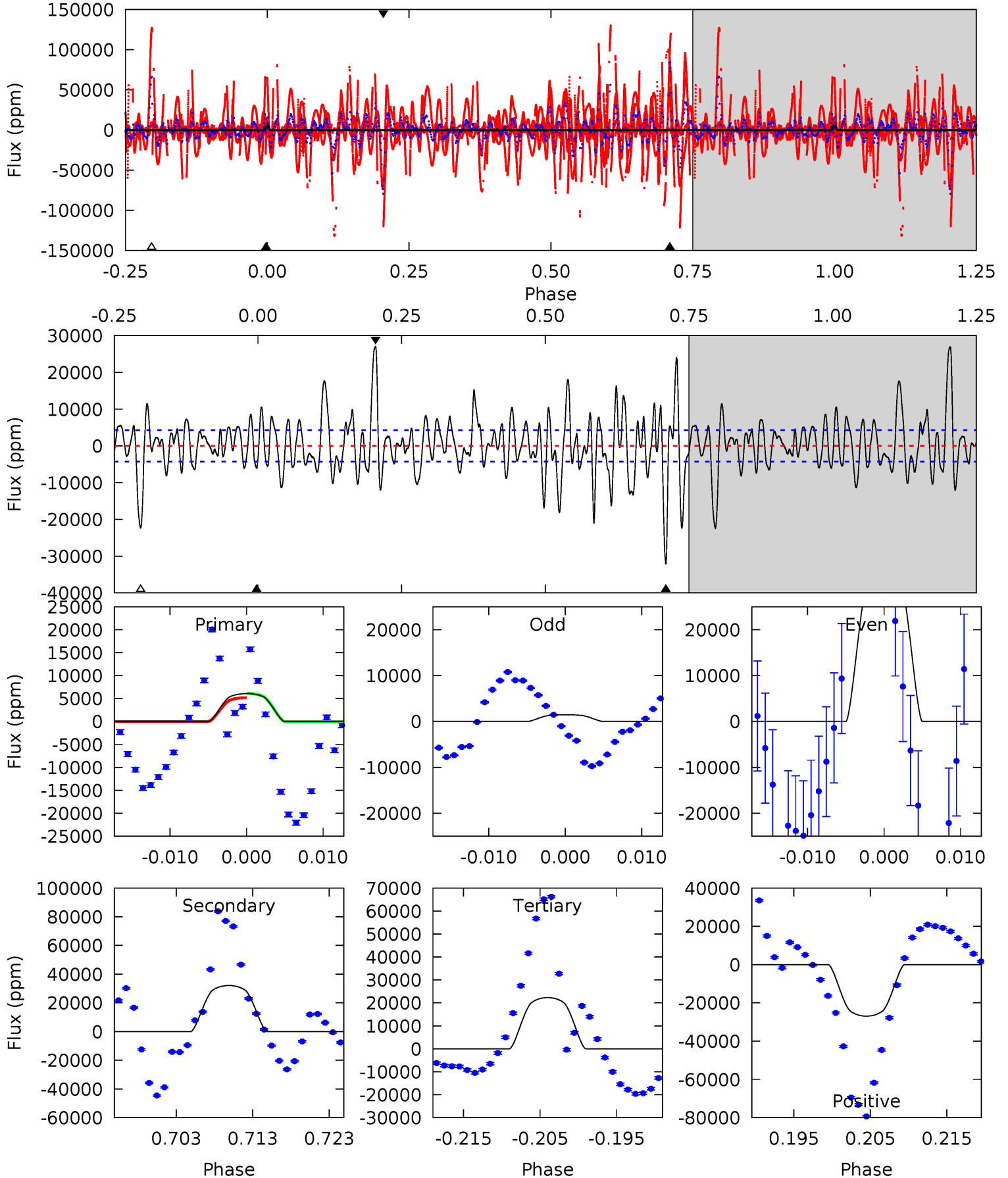
TCE 007466053-02 P=382.250607 Days  $T_0=418.494327$  (BKJD)



# DV Model-Shift Uniqueness Test

007466053-02, P = 382.264862 Days, E = 37.042426 Days

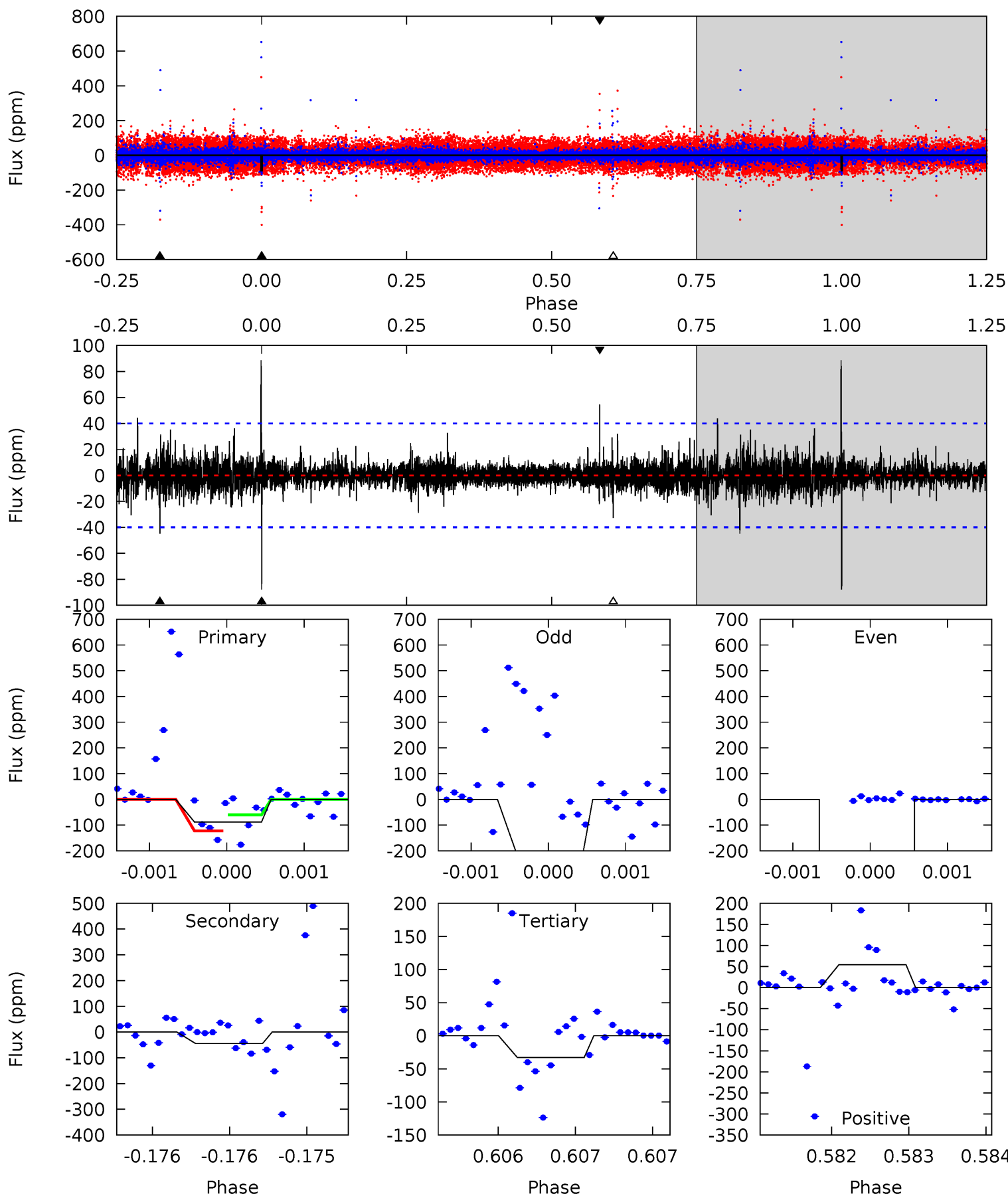
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.12	37.7	26.2	31.7	5.03	2.58	8.06	-19.1	-24.5	11.5	6.08	12.7	9.73	0.46	0.55



# Alt Model-Shift Uniqueness Test

007466053-02, P = 382.250607 Days, E = 36.243720 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	6.13	4.48	7.48	5.48	3.33	0.81	7.57	4.57	1.65	-1.35	6255	1255	0.50	0





### Stellar Parameters For KIC 007466053

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5172^{+107}_{-215}$	$2.693^{+0.615}_{-0.205}$	$0.070^{+0.150}_{-0.600}$	$13.454^{+3.287}_{-9.861}$	$3.257^{+0.115}_{-2.180}$	$0.002^{+0.023}_{-0.001}$
	+2%/-4%	+23%/-8%	+214%/-857%	+24%/-73%	+4%/-67%	+1231%/-45%
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 007466053-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	-32121 $\pm$ 851	$155.67^{+26.49}_{-55.08}$	$933^{+89}_{-152}$	$6695^{+187}_{-335}$	$1755^{+1945}_{-506}$
Alt.	-45 $\pm$ 7	$348.92^{+51.42}_{-132.26}$	$933^{+84}_{-158}$	$1717^{+99}_{-214}$	$0.484^{+0.545}_{-0.155}$

$T_{\text{max}}$  = 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

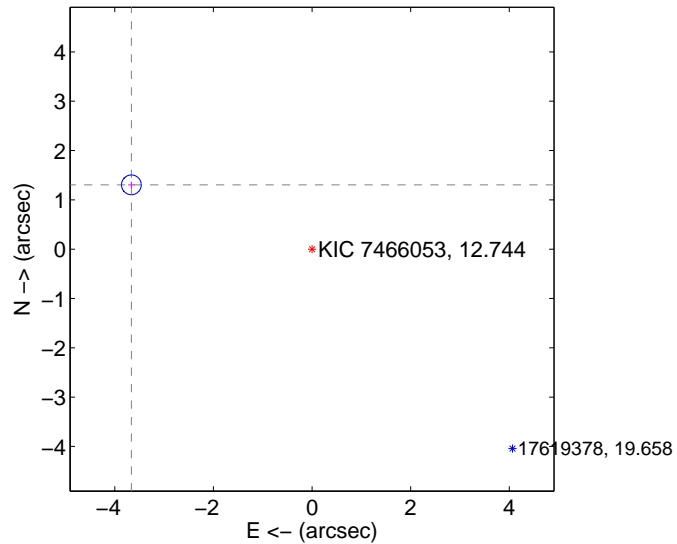
Supplemental centroid analysis for 007466053-02. Kepler magnitude: 12.74. Transit SNR 48.48

There are 0 quarters with good PRF difference image offsets

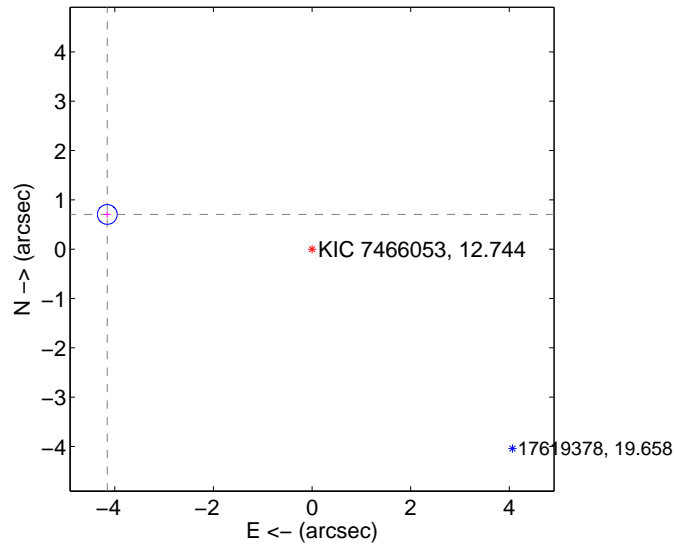
The direct PRF centroid is offset from the target star catalog position by about 0.77 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.888 \pm 0.067$	58.30	$3.663 \pm 0.067$	$1.305 \pm 0.067$
PRF-fit source offset from KIC position	$4.211 \pm 0.067$	63.13	$4.152 \pm 0.067$	$0.704 \pm 0.067$
photometric centroid source offset	$0.12 \pm 0.02$	6.96	$0.09 \pm 0.02$	$0.08 \pm 0.02$

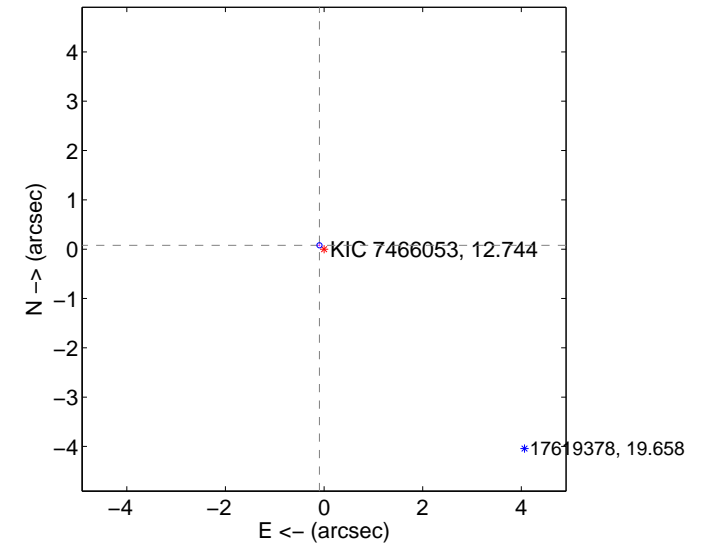
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

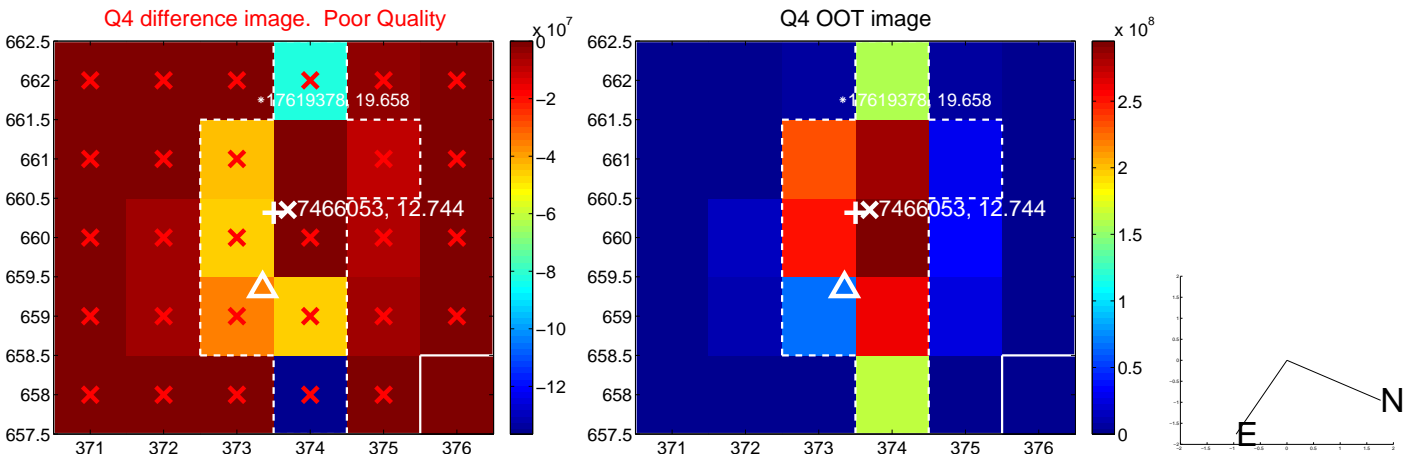
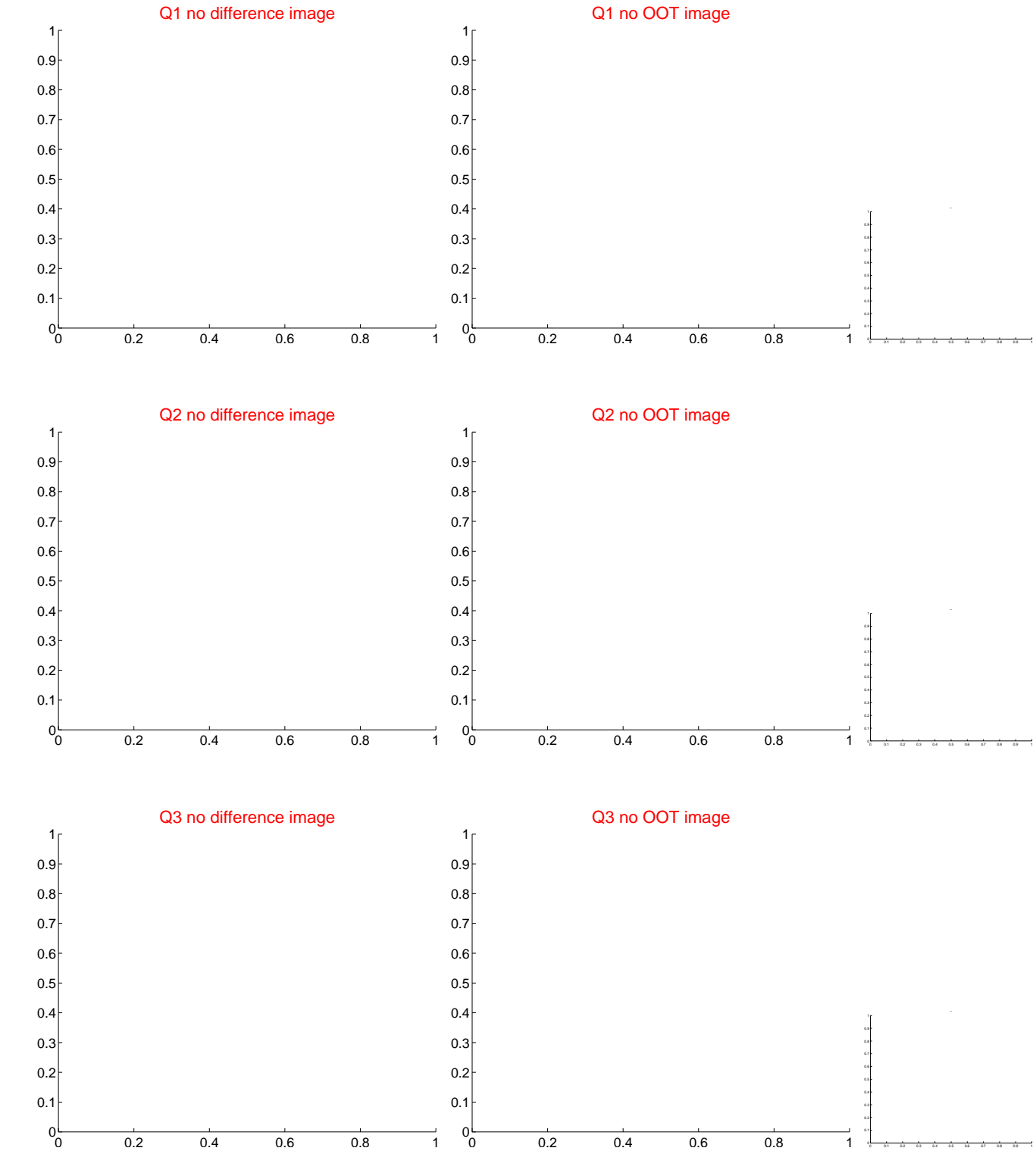


offset from photometric centroids



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 ×: 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.



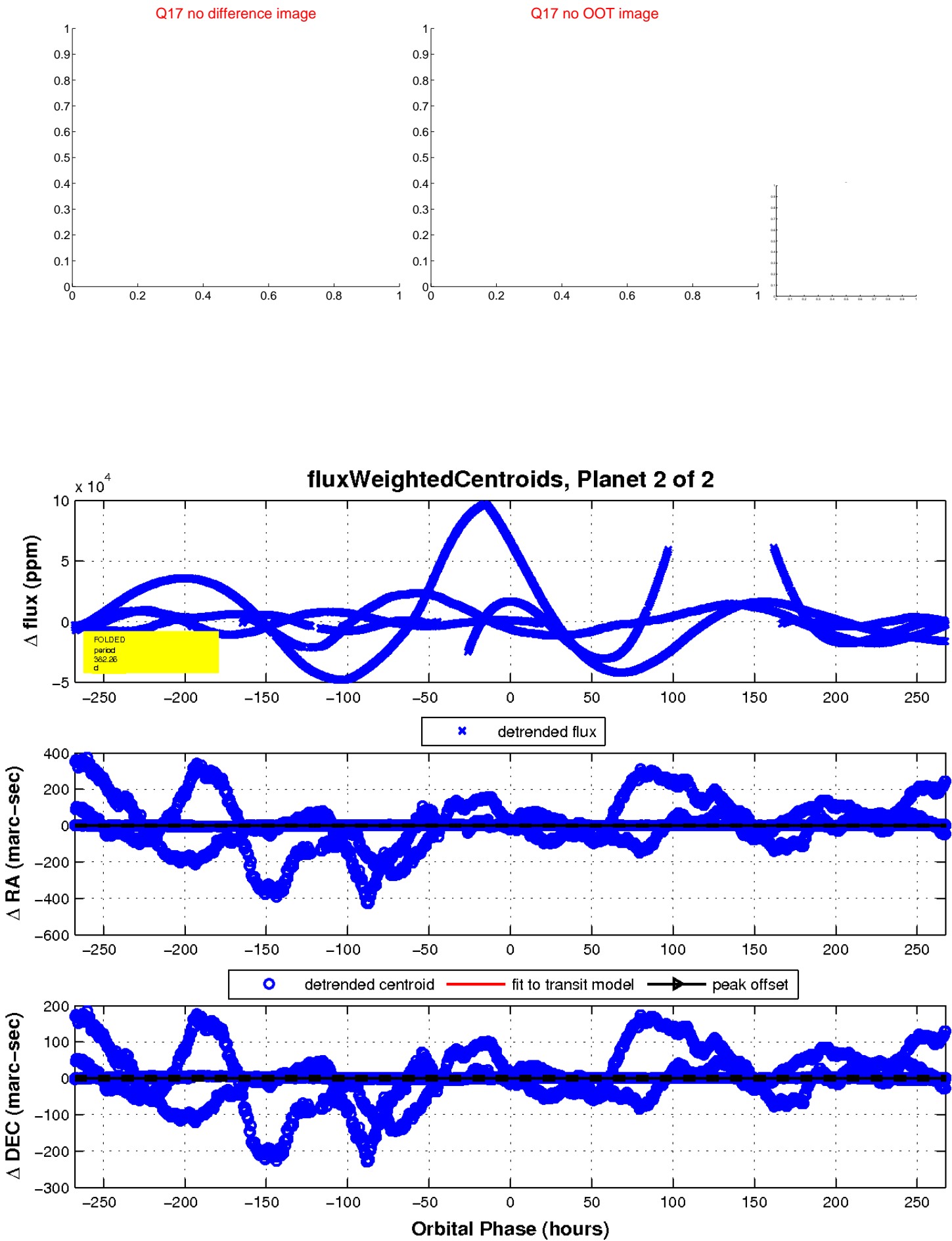
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

