

# KIC 005460828

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005460828-01	OBS	No	518.774223	338.687369	2120.6	3.296	13.0	6.4	0.48	4321	2.22	0.07
005460828-02	OBS	No	253.840139	163.276760	1489.0	2.430	14.1	6.7	0.48	4321	1.90	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005460828-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005460828-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

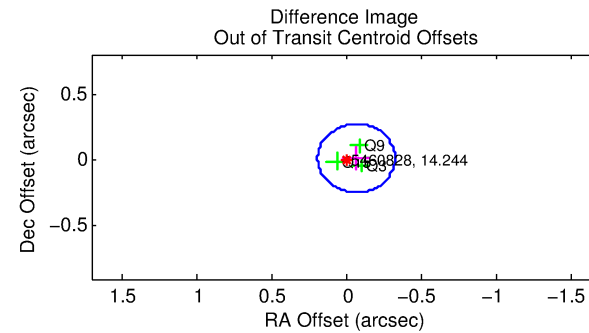
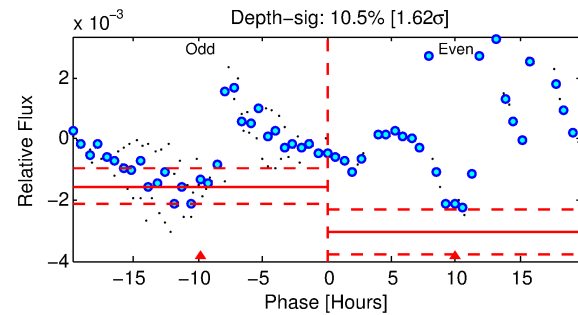
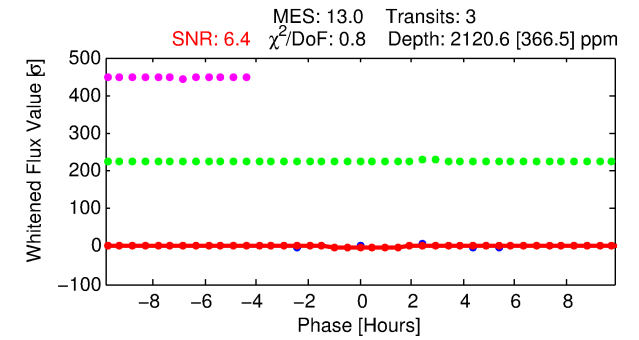
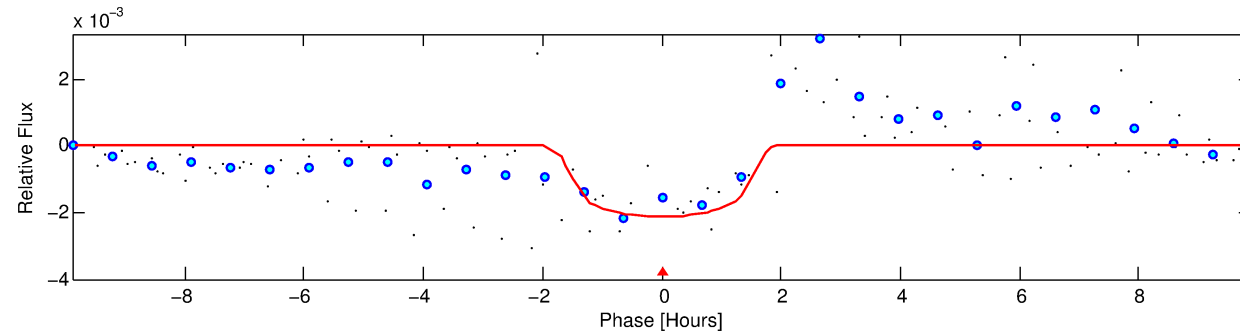
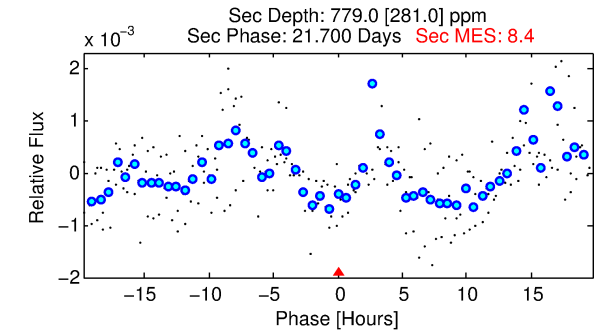
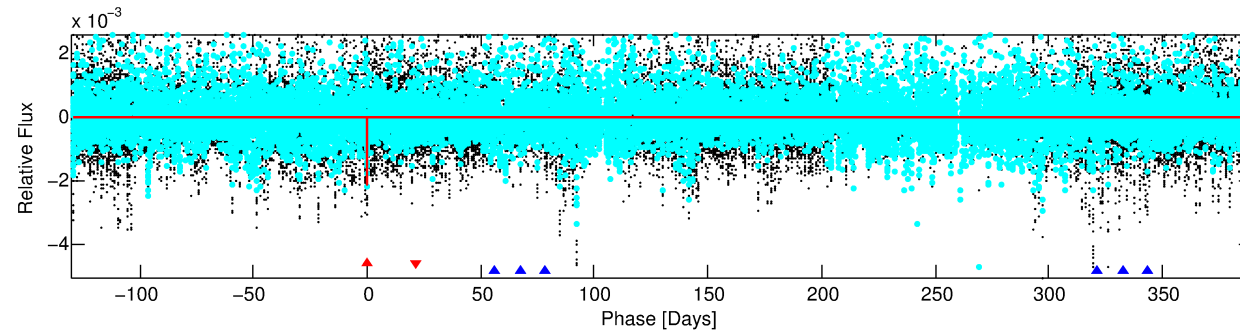
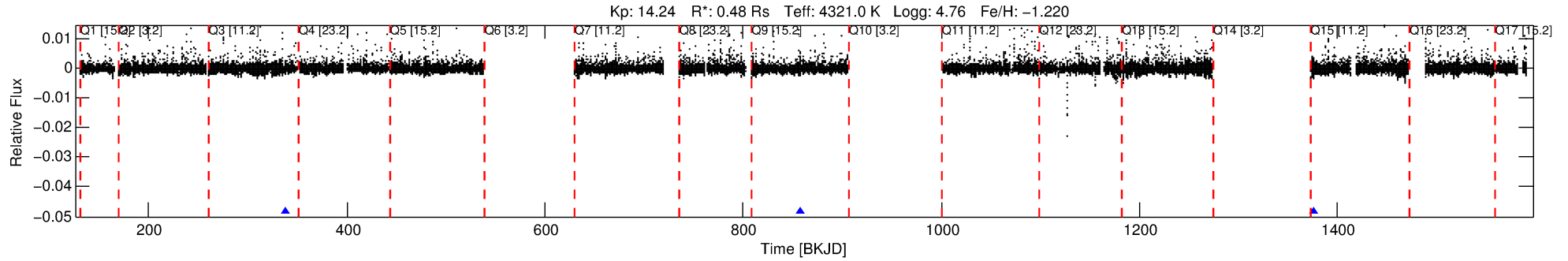
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005460828-01

No Significant Match Found

# DV One-Page Summary

KIC: 5460828 Candidate: 1 of 2 Period: 518.774 d



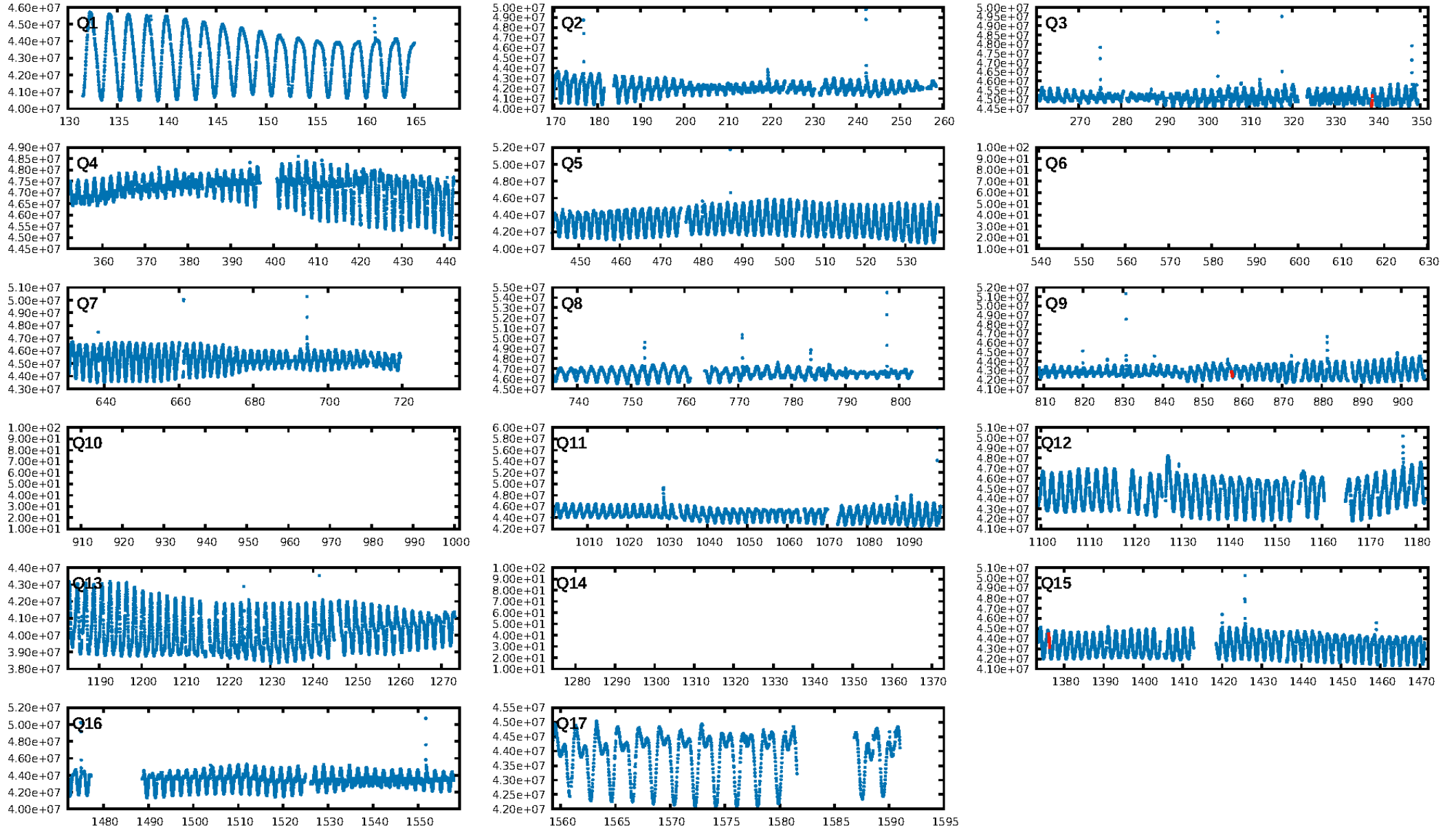
## DV Fit Results:

Period = 518.77422 [0.00348] d  
Epoch = 338.6874 [0.0037] BKJD  
Rp/R\* = 0.0421 [0.0345]  
a/R\* = 1223.05 [4395.14]  
b = 0.23 [15.15]  
Seff = 0.07 [0.01]  
Teq = 133 [7] K  
Rp = 2.22 [1.84] Re  
a = 0.9967 [0.1002] AU  
Ag = 86214.44 [145454.64] [0.59σ]  
Teffp = 3519 [1484] K [2.28σ]

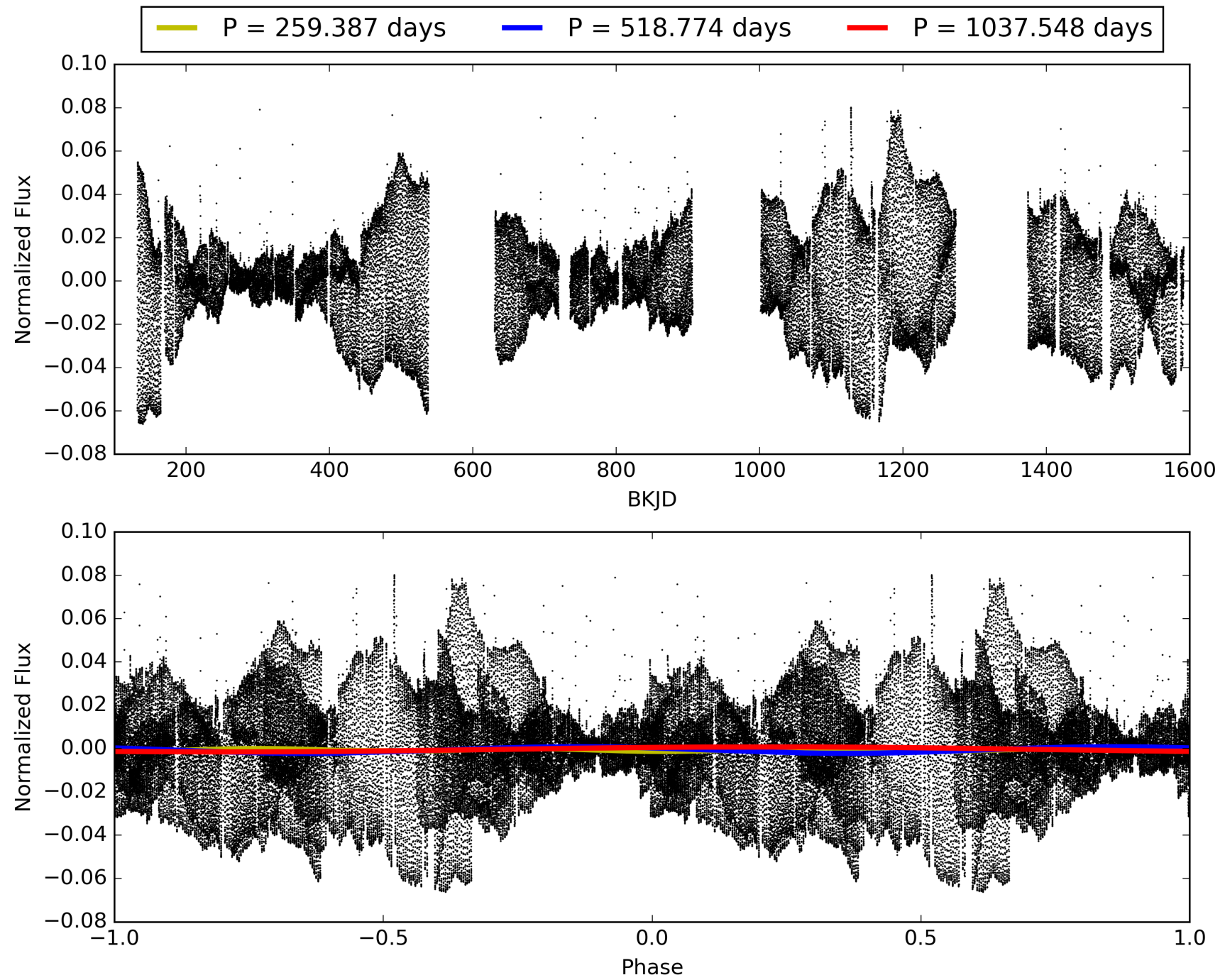
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1552.95σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 28.6%  
ModelChiSquareGof-sig: 98.7%  
**Bootstrap-pfa: 6.13e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.811  
Centroid-sig: 27.7%  
Centroid-so: 1.048 arcsec [2.20σ]  
OotOffset-rm: 0.071 arcsec [0.82σ]  
**KicOffset-rm: 0.681 arcsec [8.19σ]**  
OotOffset-st: 0/2/0/1 [3]  
KicOffset-st: 0/2/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 005460828-01, PDC Light Curves

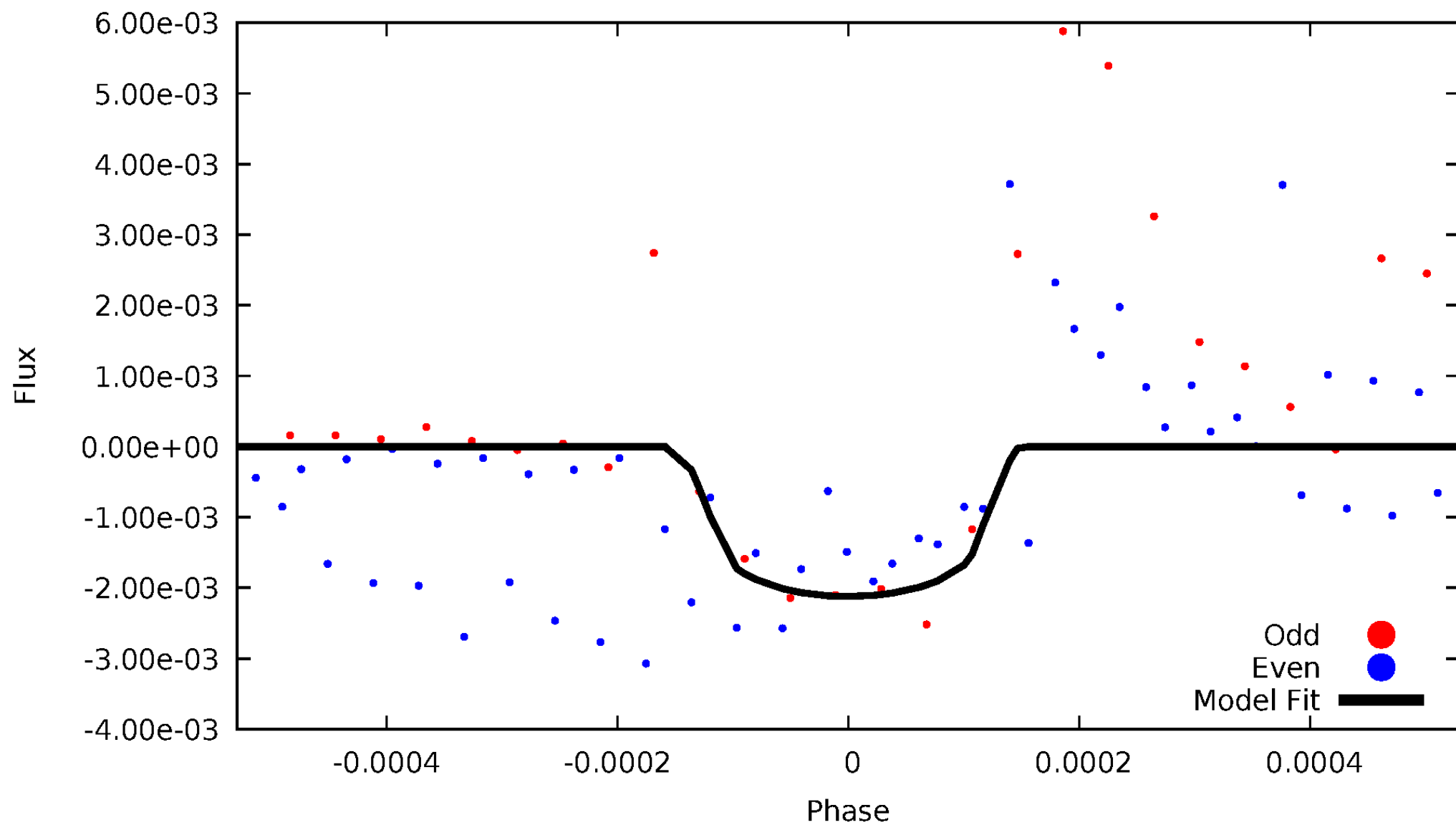


TCE 005460828-01



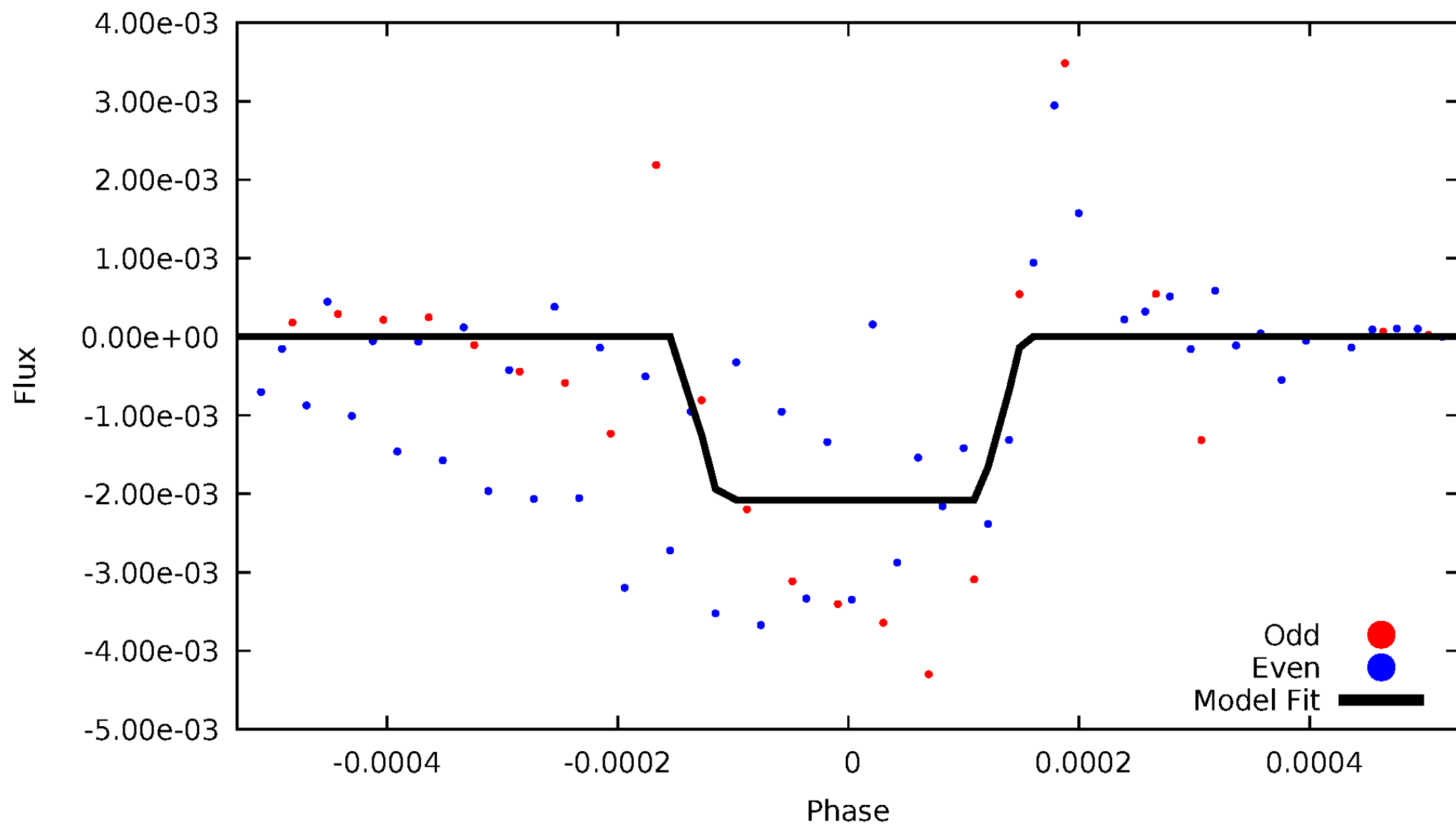
# DV Odd/Even

TCE 005460828-01



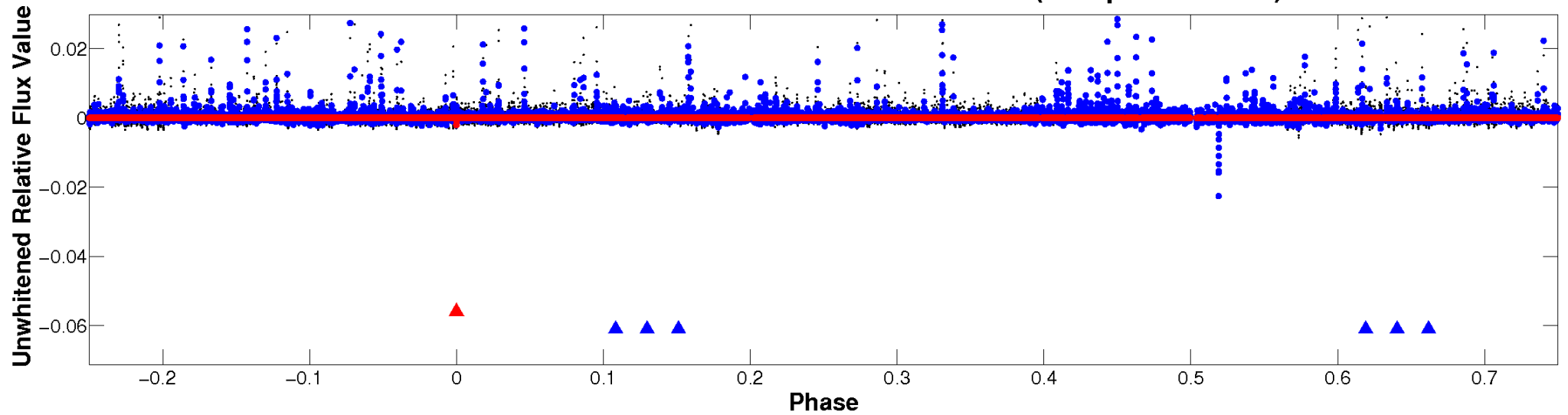
# ALT Odd/Even

TCE 005460828-01

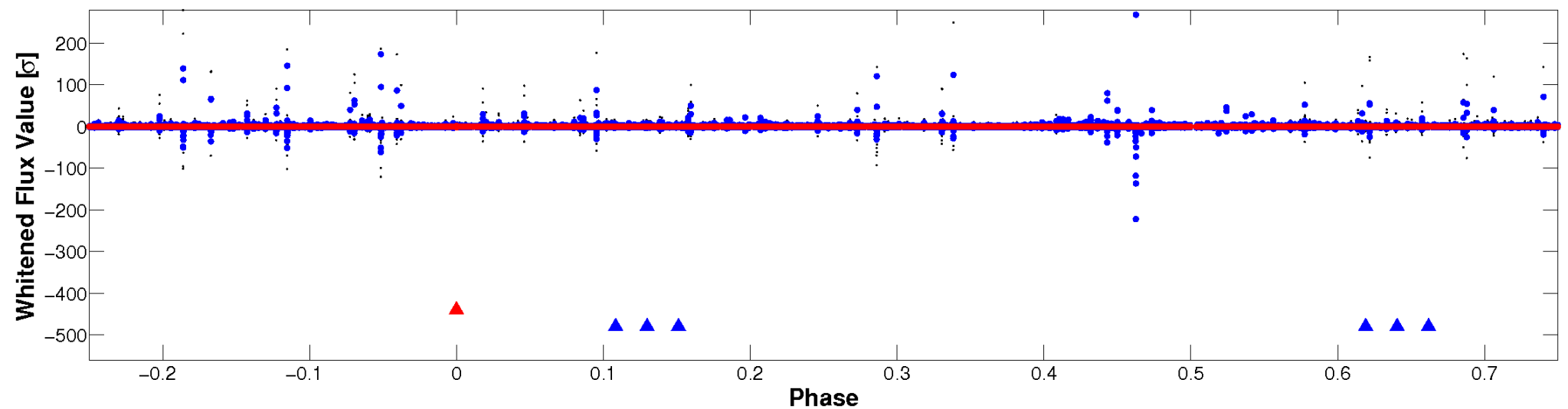


# Non-Whitened Vs. Whitened Light Curve

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

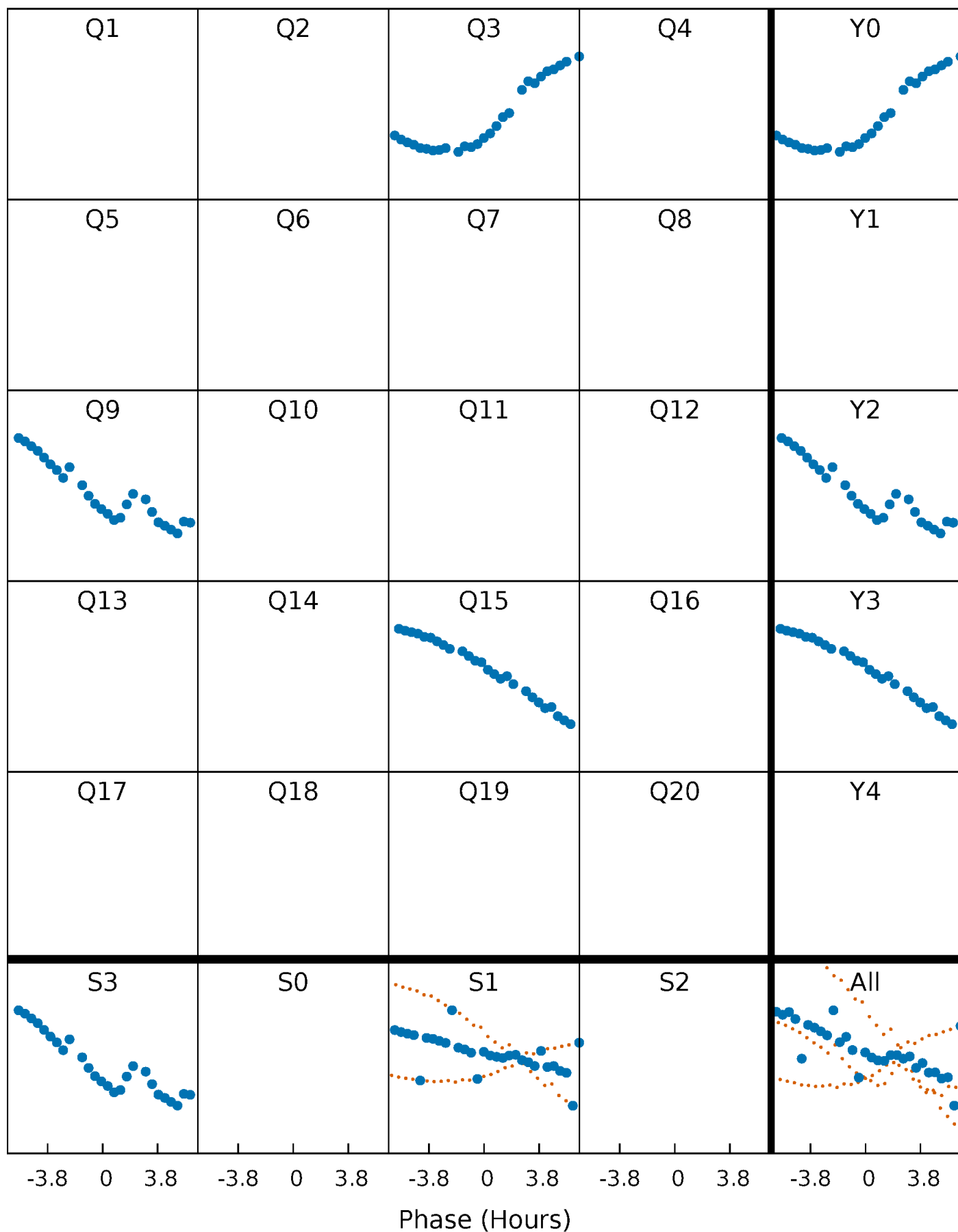


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

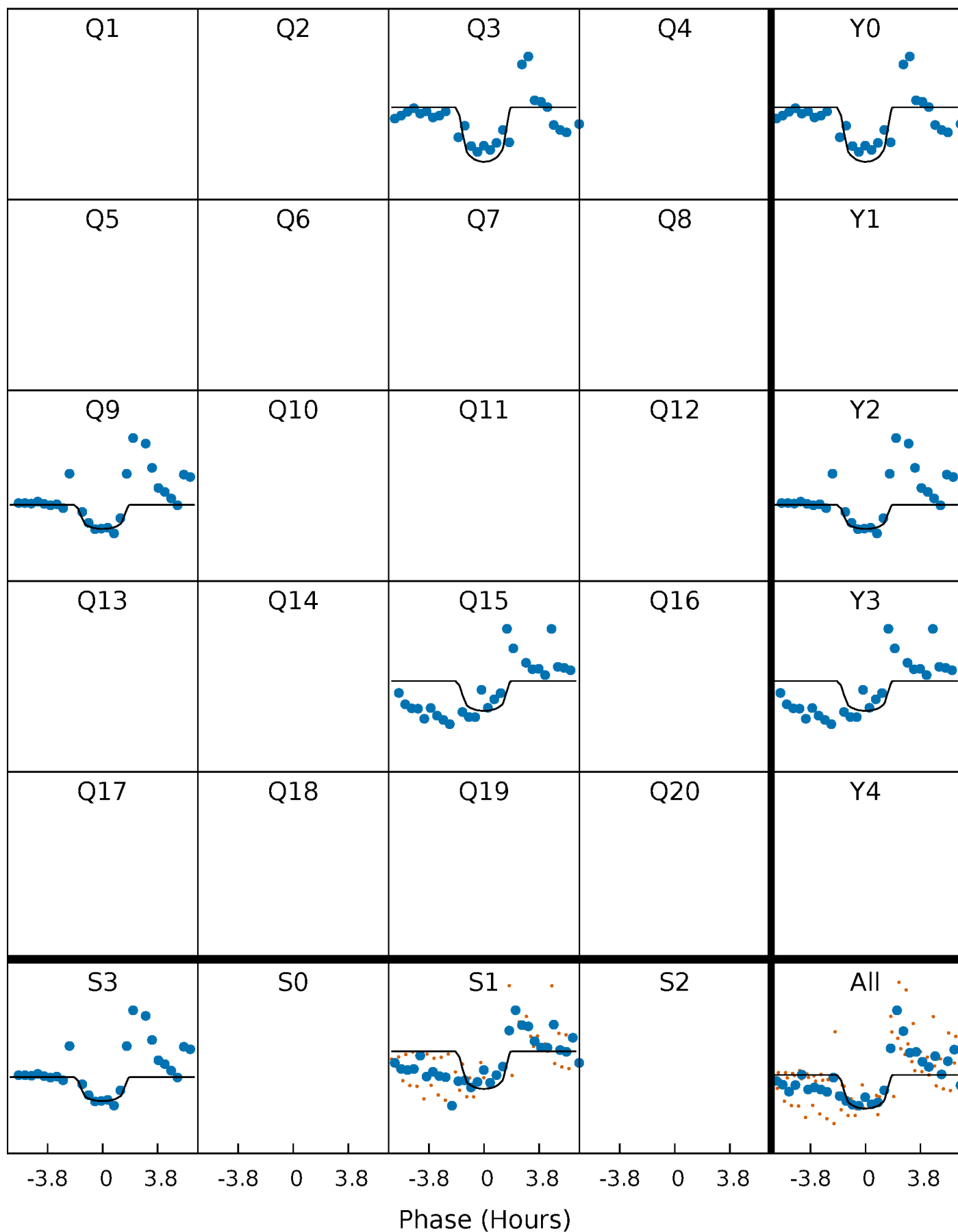
TCE 005460828-01 P=518.774223 Days  $T_0=338.687369$  (BKJD)





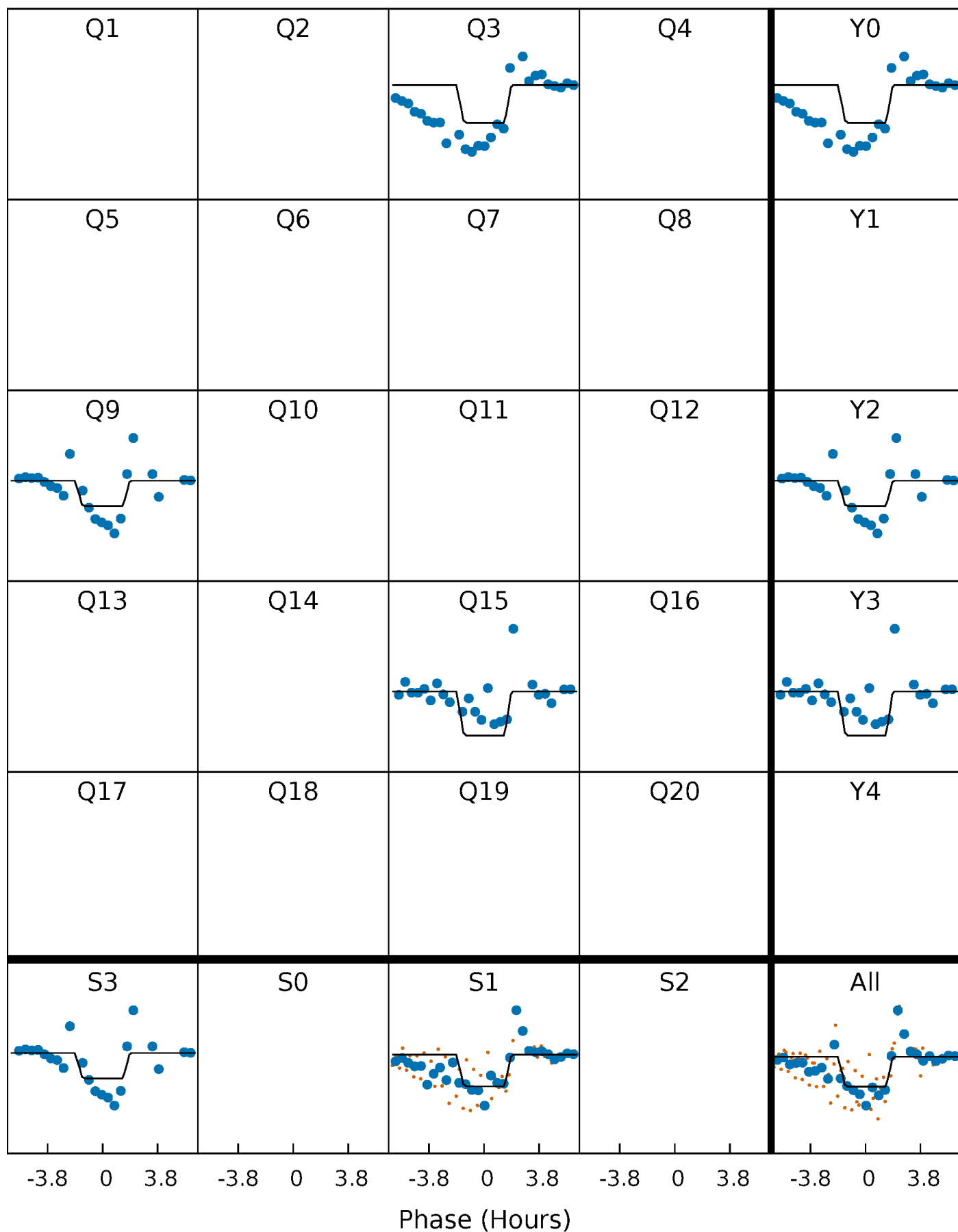
# DV Quarter-Phased Transit Curves

TCE 005460828-01 P=518.774223 Days  $T_0=338.687369$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

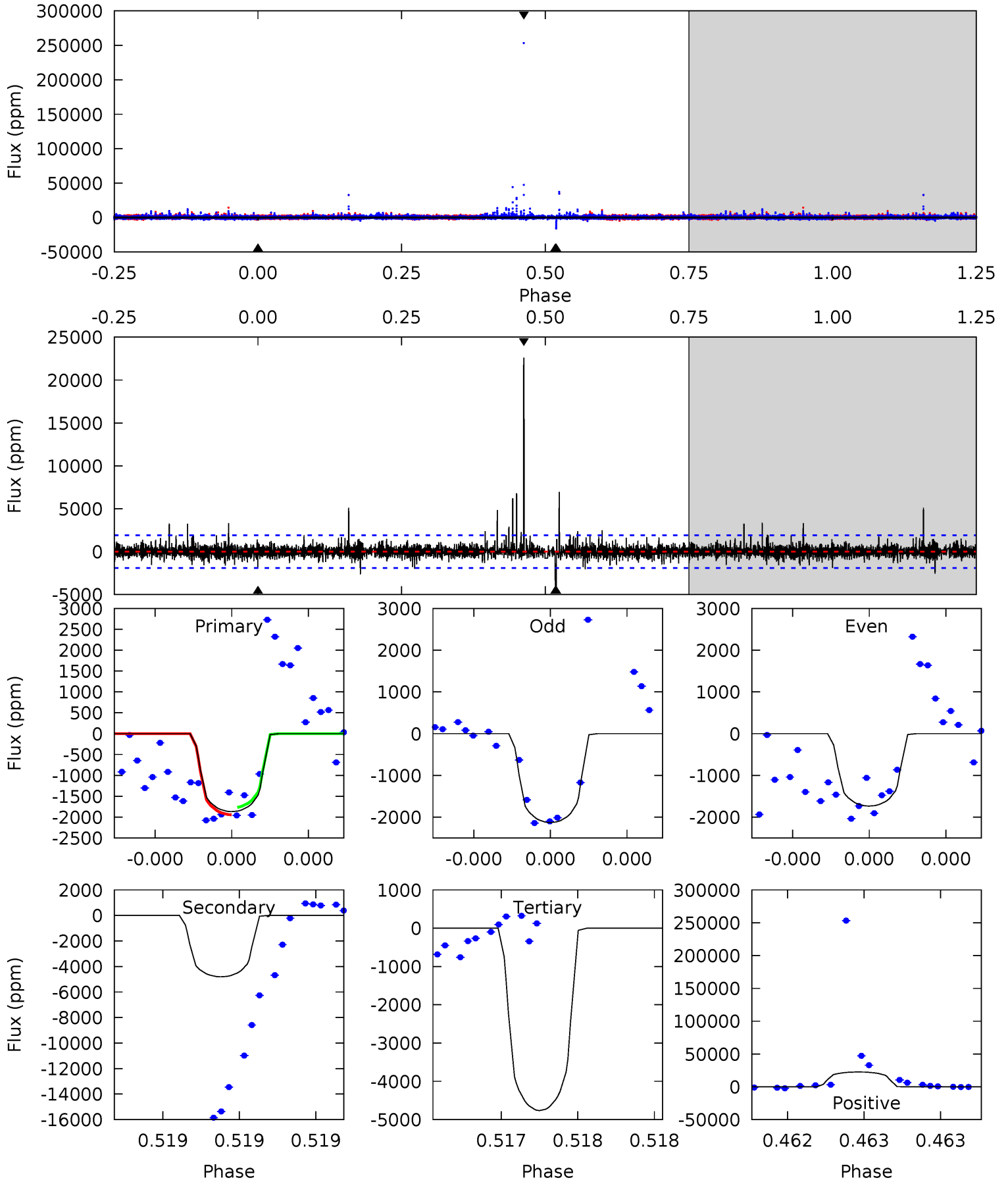
TCE 005460828-01 P=518.755054 Days  $T_0=338.705586$  (BKJD)



# DV Model-Shift Uniqueness Test

005460828-01, P = 518.774223 Days, E = 338.687369 Days

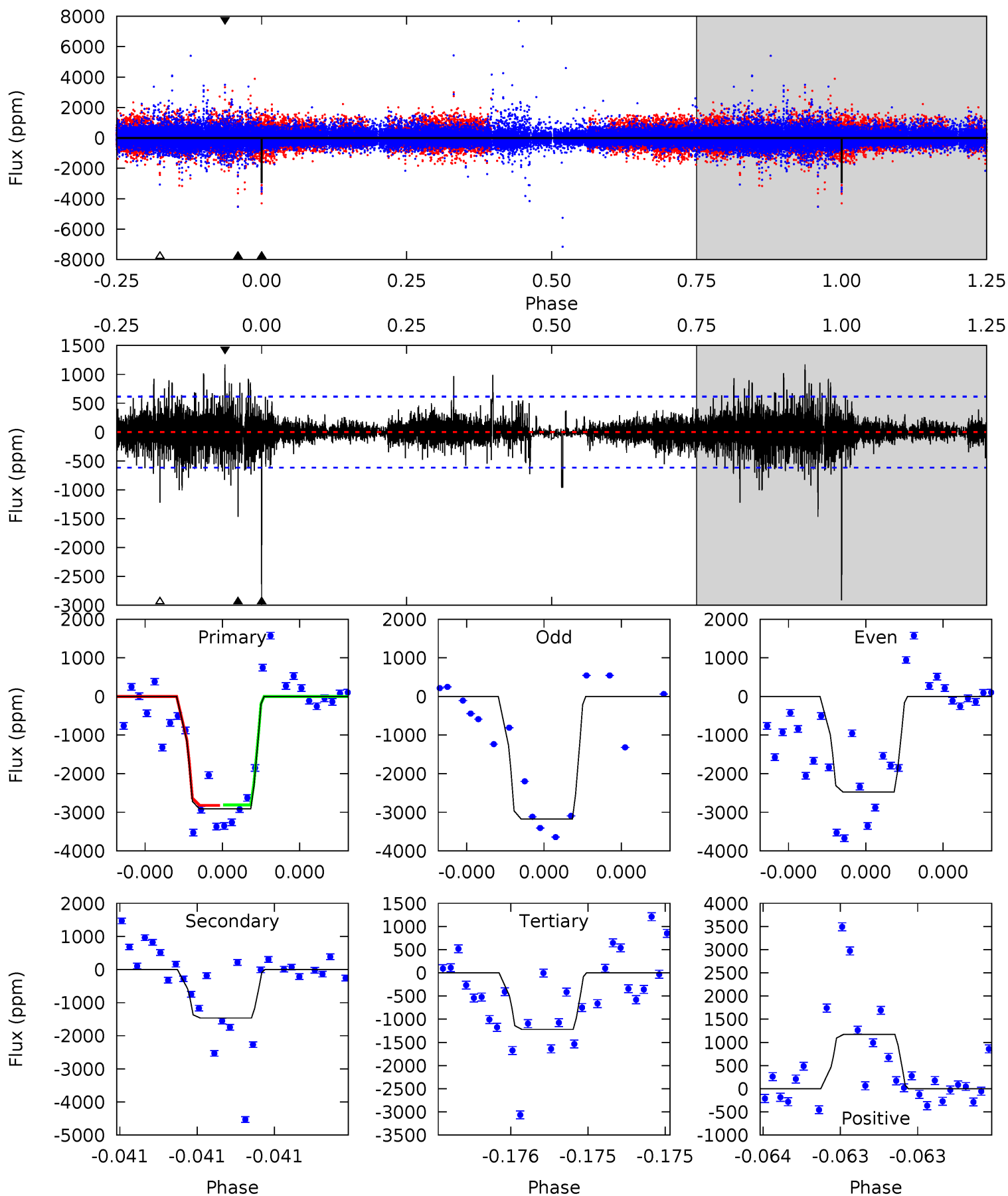
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.55	14.3	14.1	67.1	5.67	3.62	1.91	-8.60	-61.6	0.15	-52.8	0.30	1.05	0.82	0.26



# Alt Model-Shift Uniqueness Test

005460828-01, P = 518.755054 Days, E = 338.705586 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
26.8	13.5	11.2	10.8	5.66	3.62	1.58	15.5	16.0	2.24	2.69	2.99	0.77	0.29	0.05



### Stellar Parameters For KIC 005460828

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4321^{+118}_{-145}$	$4.759^{+0.077}_{-0.033}$	$-1.220^{+0.300}_{-0.350}$	$0.484^{+0.036}_{-0.059}$	$0.489^{+0.035}_{-0.043}$	$6.092^{+2.160}_{-0.741}$
	+3%/-3%	+2%/-1%	+25%/-29%	+7%/-12%	+7%/-9%	+35%/-12%
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 005460828-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-4813 \pm 337$	$2.33^{+1.69}_{-1.46}$	$184^{+6}_{-8}$	$5153^{+3507}_{-999}$	$480168^{+2938362}_{-313000}$
Alt.	$-1466 \pm 109$	$2.59^{+1.56}_{-1.52}$	$184^{+7}_{-7}$	$3923^{+1731}_{-580}$	$119310^{+569563}_{-72649}$

$T_{\text{max}}$  = 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

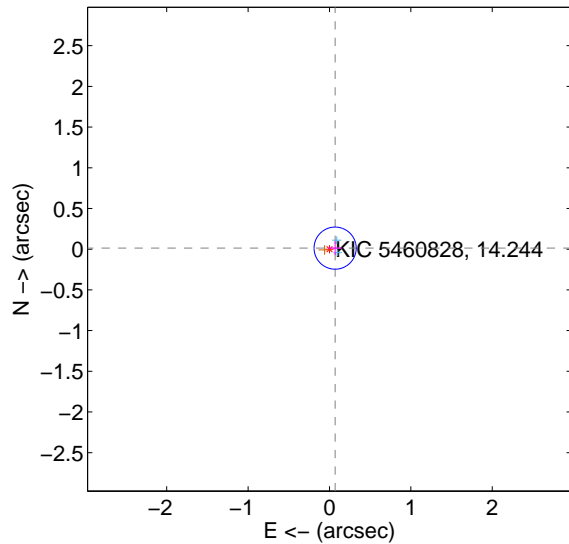
Supplemental centroid analysis for 005460828-01. Kepler magnitude: 14.24. Transit SNR 6.43

There are 2 quarters with good PRF difference image offsets

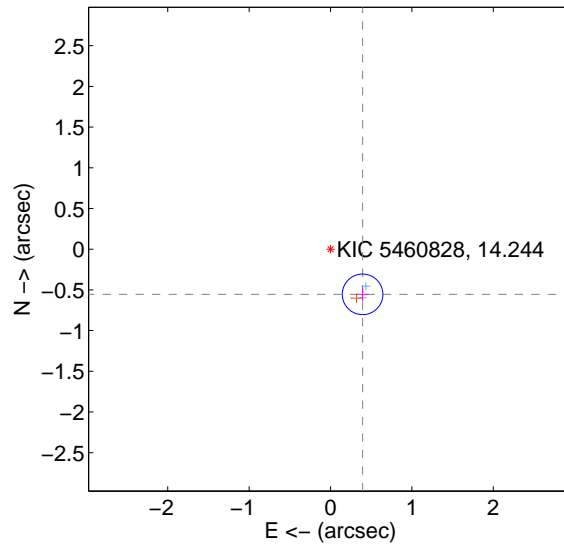
The direct PRF centroid is offset from the target star catalog position by about 0.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.071 \pm 0.086$	0.82	$-0.069 \pm 0.086$	$0.013 \pm 0.085$
PRF-fit source offset from KIC position	<b><math>0.681 \pm 0.083</math></b>	<b>8.19</b>	$-0.394 \pm 0.074$	$-0.555 \pm 0.087$
photometric centroid source offset	$1.05 \pm 0.48$	2.20	$-0.71 \pm 0.48$	$-0.77 \pm 0.47$

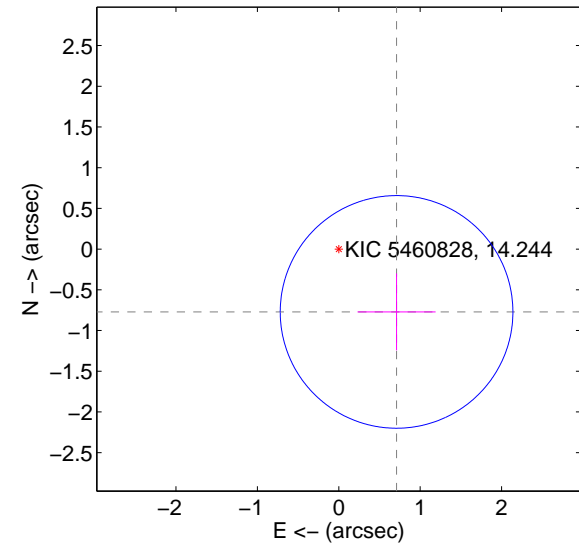
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

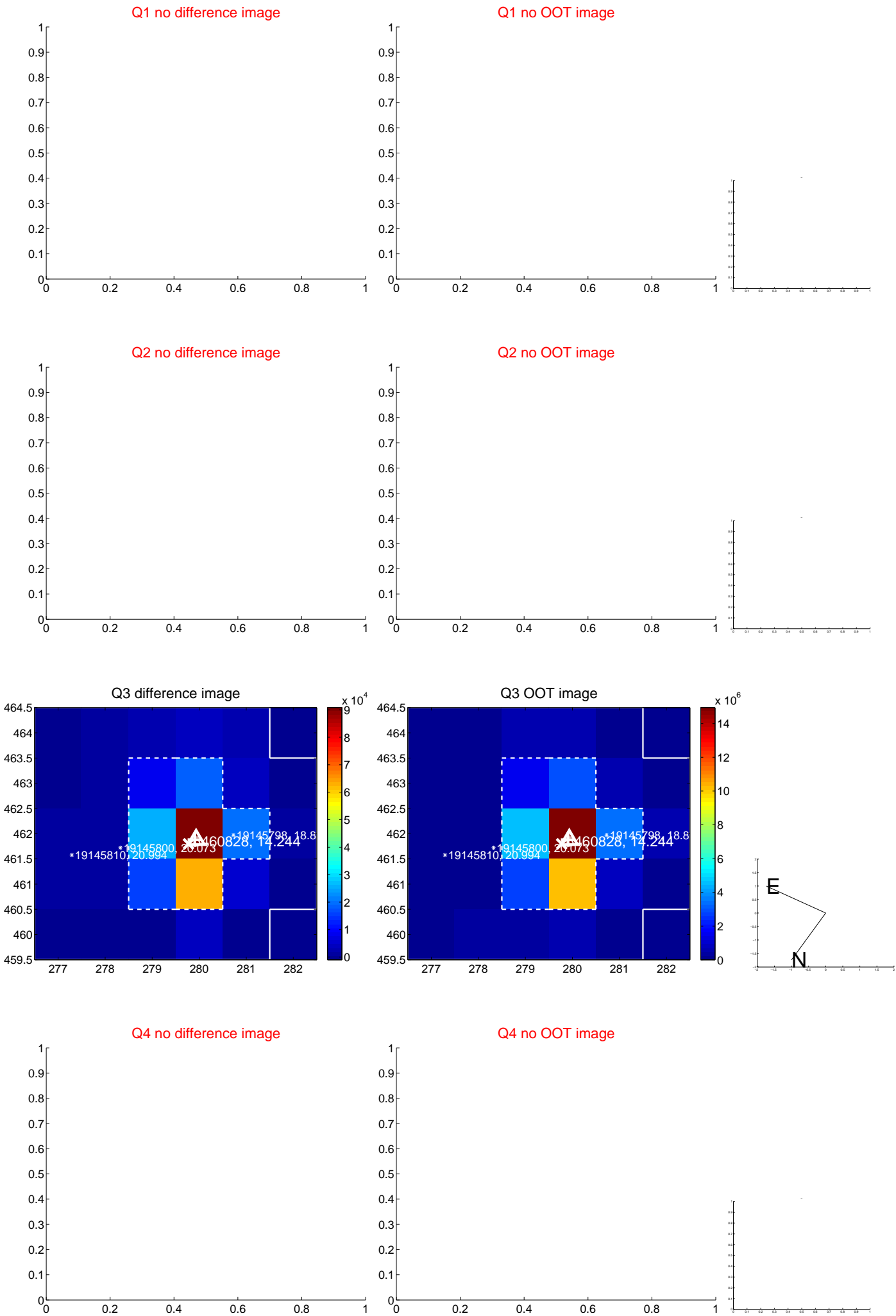


offset from photometric centroids



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

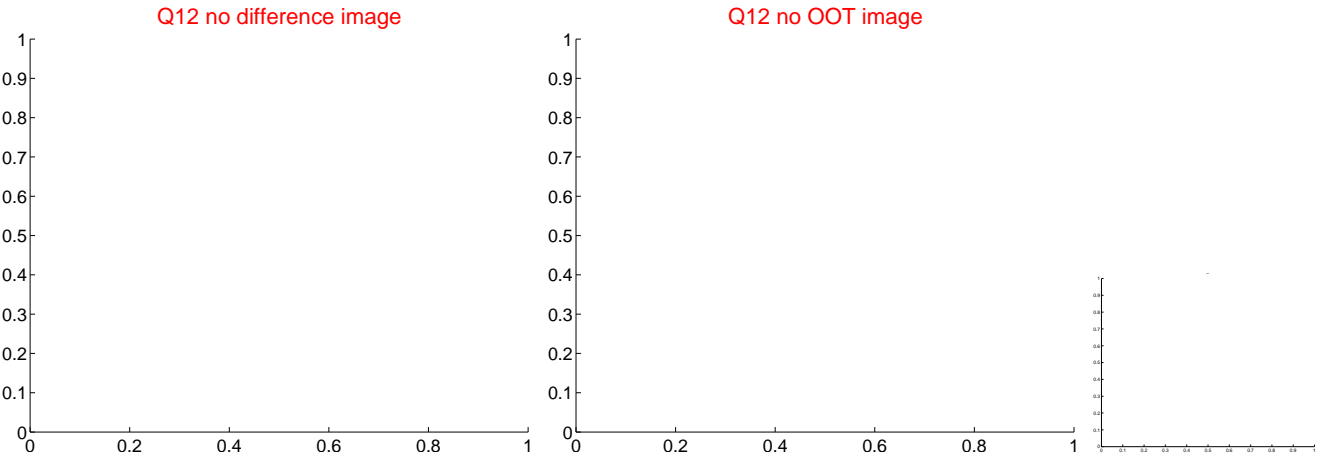
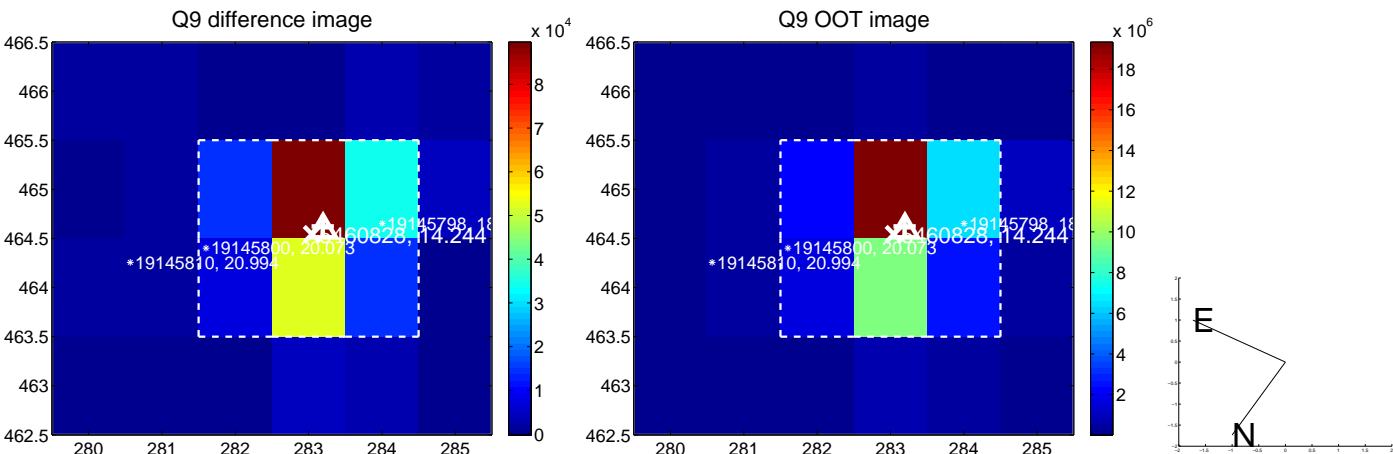


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

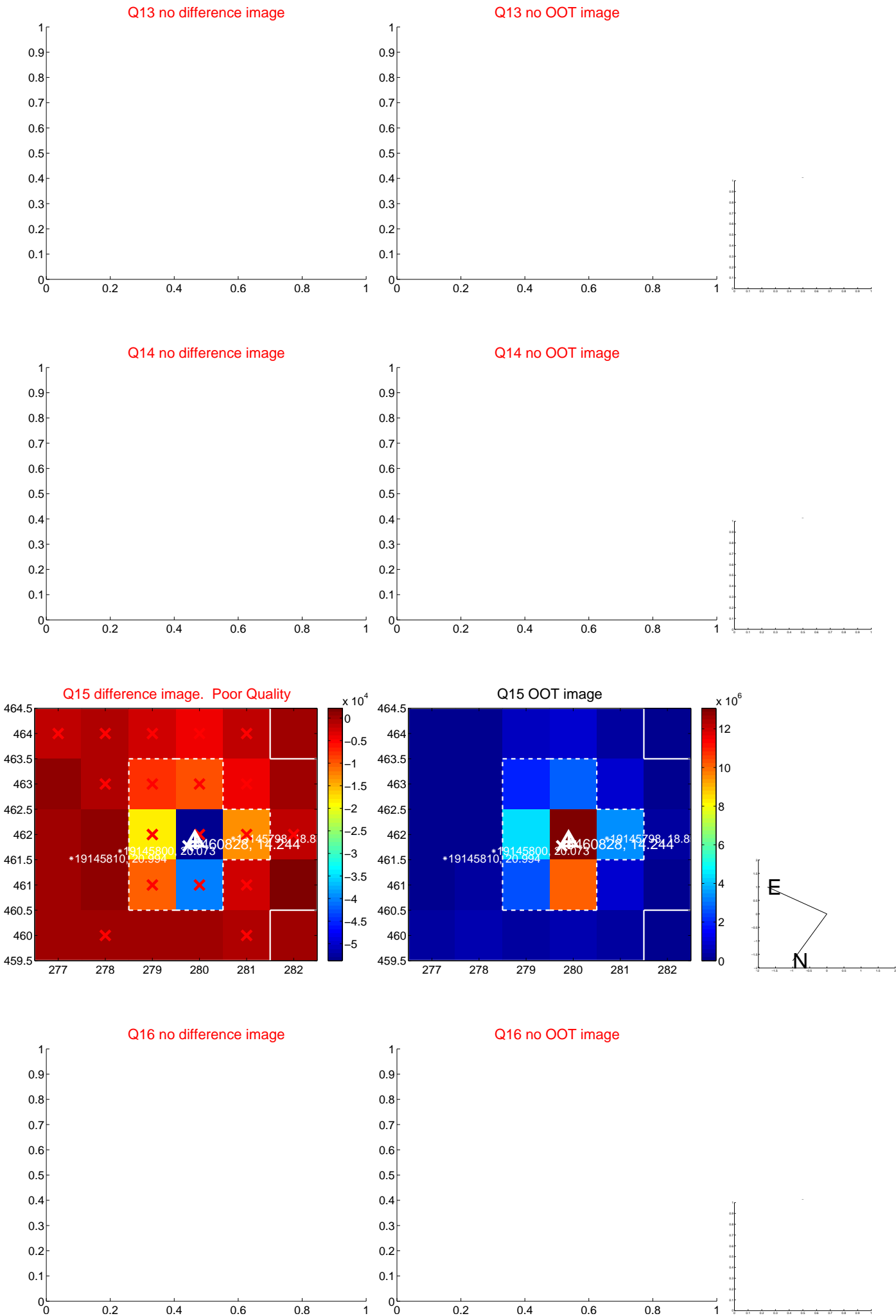




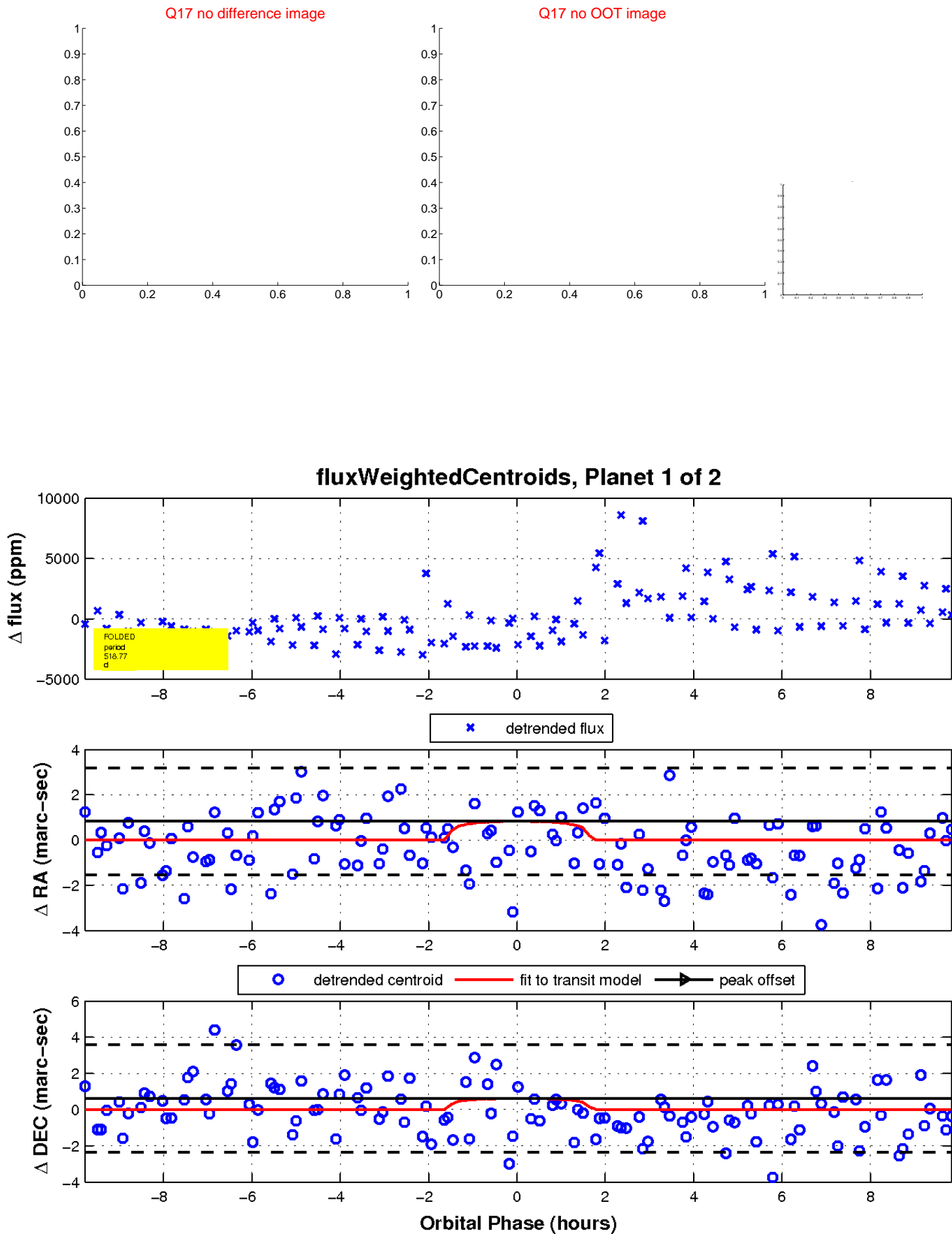
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

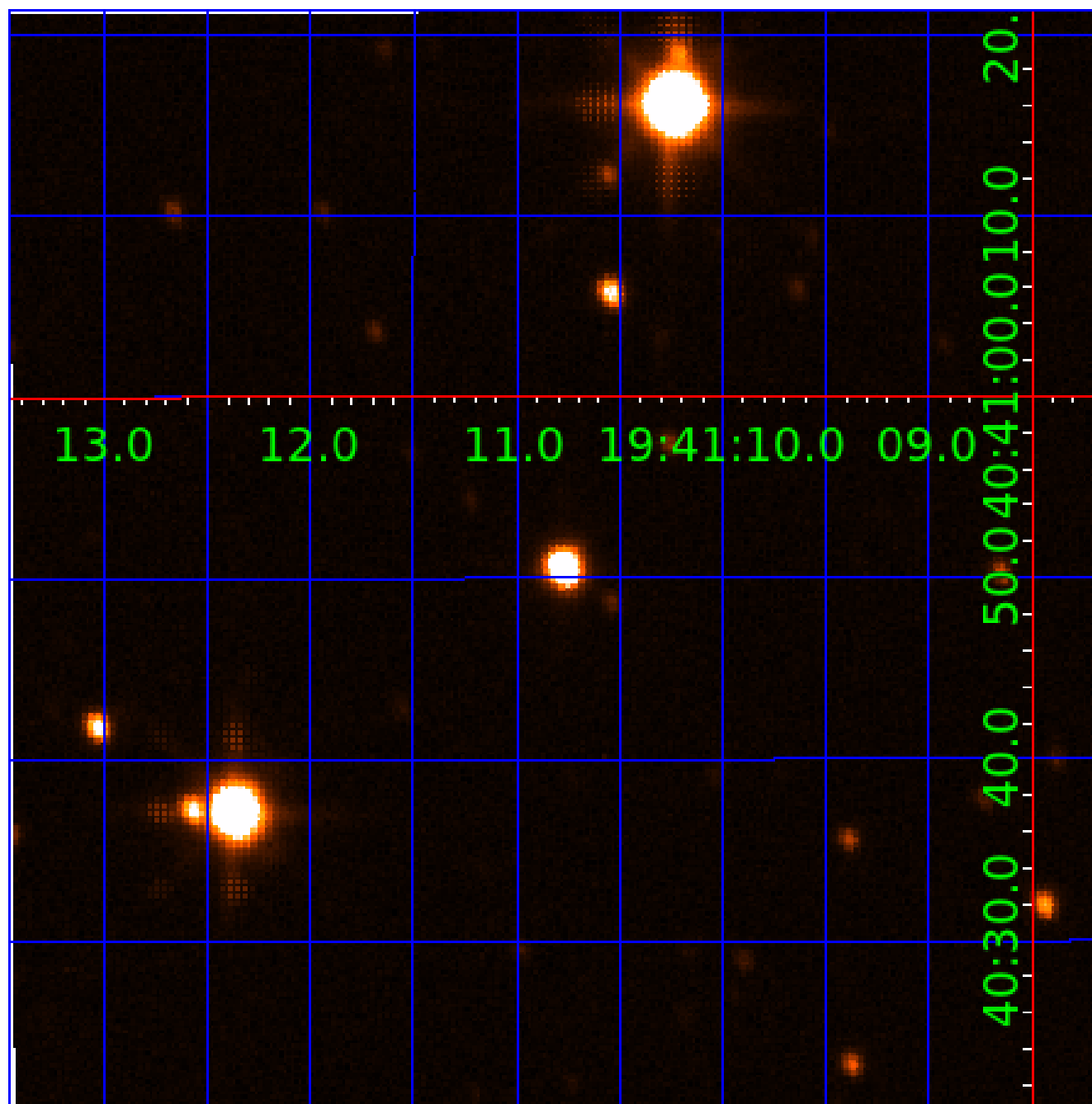


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005460828

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005460828-01	OBS	No	518.774223	338.687369	2120.6	3.296	13.0	6.4	0.48	4321	2.22	0.07
005460828-02	OBS	No	253.840139	163.276760	1489.0	2.430	14.1	6.7	0.48	4321	1.90	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005460828-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
005460828-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

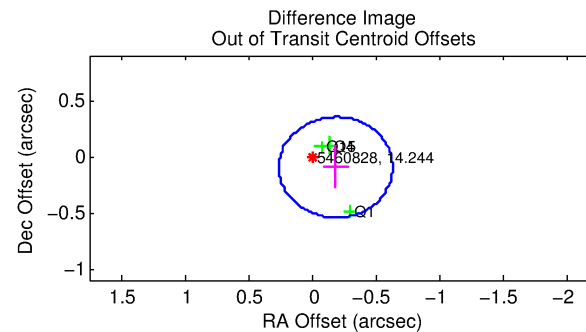
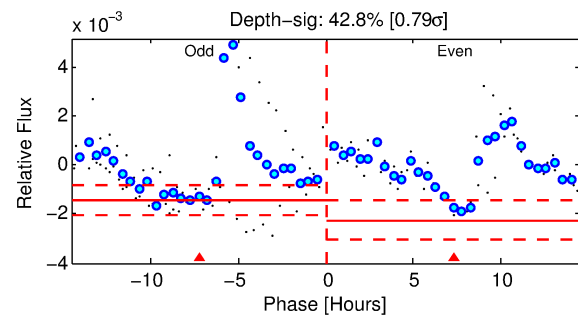
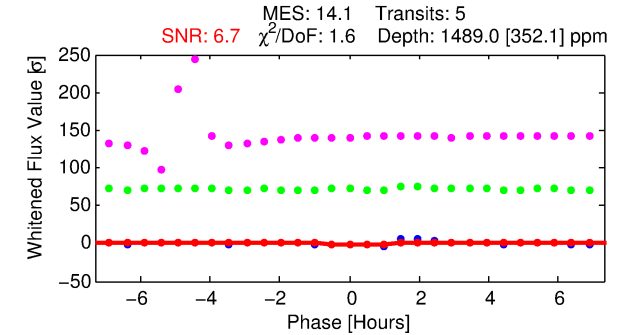
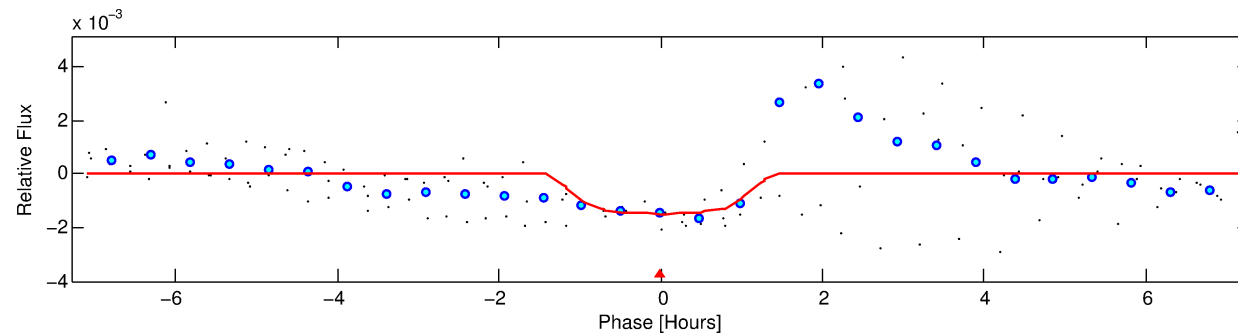
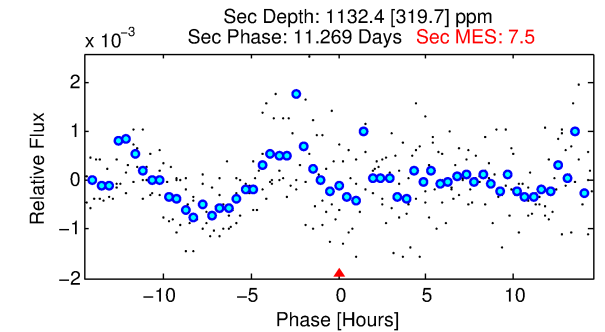
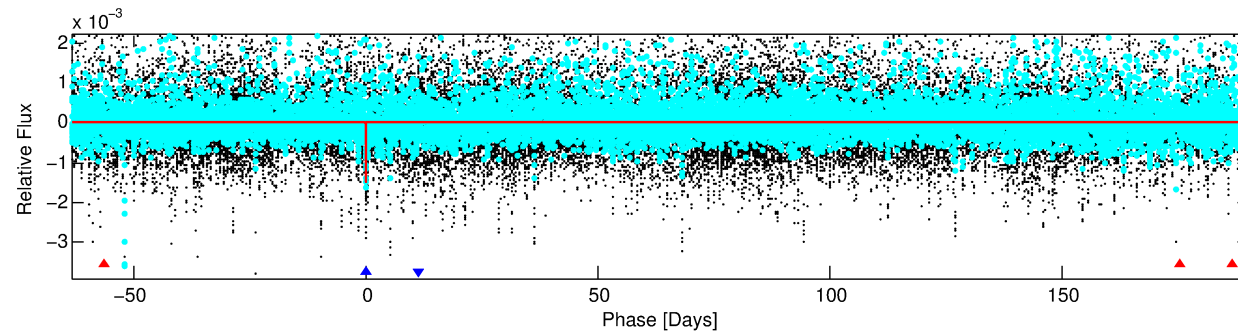
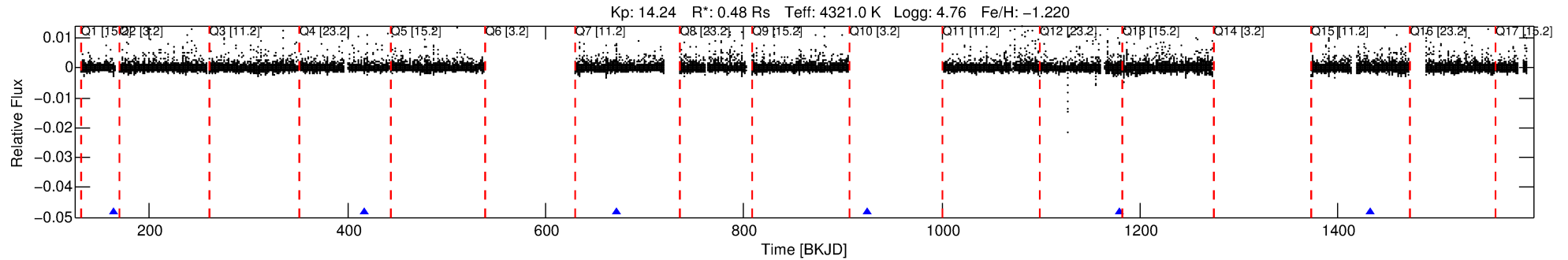
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005460828-02

No Significant Match Found

# DV One-Page Summary

KIC: 5460828 Candidate: 2 of 2 Period: 253.840 d



## DV Fit Results:

Period = 253.84014 [0.00192] d  
Epoch = 163.2768 [0.0069] BKJD  
Rp/R\* = 0.0361 [0.0754]  
a/R\* = 740.26 [6796.07]  
b = 0.46 [15.87]  
Seff = 0.19 [0.04]  
Teq = 169 [8] K  
Rp = 1.90 [3.99] Re  
a = 0.6189 [0.0622] AU  
Ag = 65805.72 [276149.74] [0.24σ]  
Teffp = 4174 [4379] K [0.91σ]

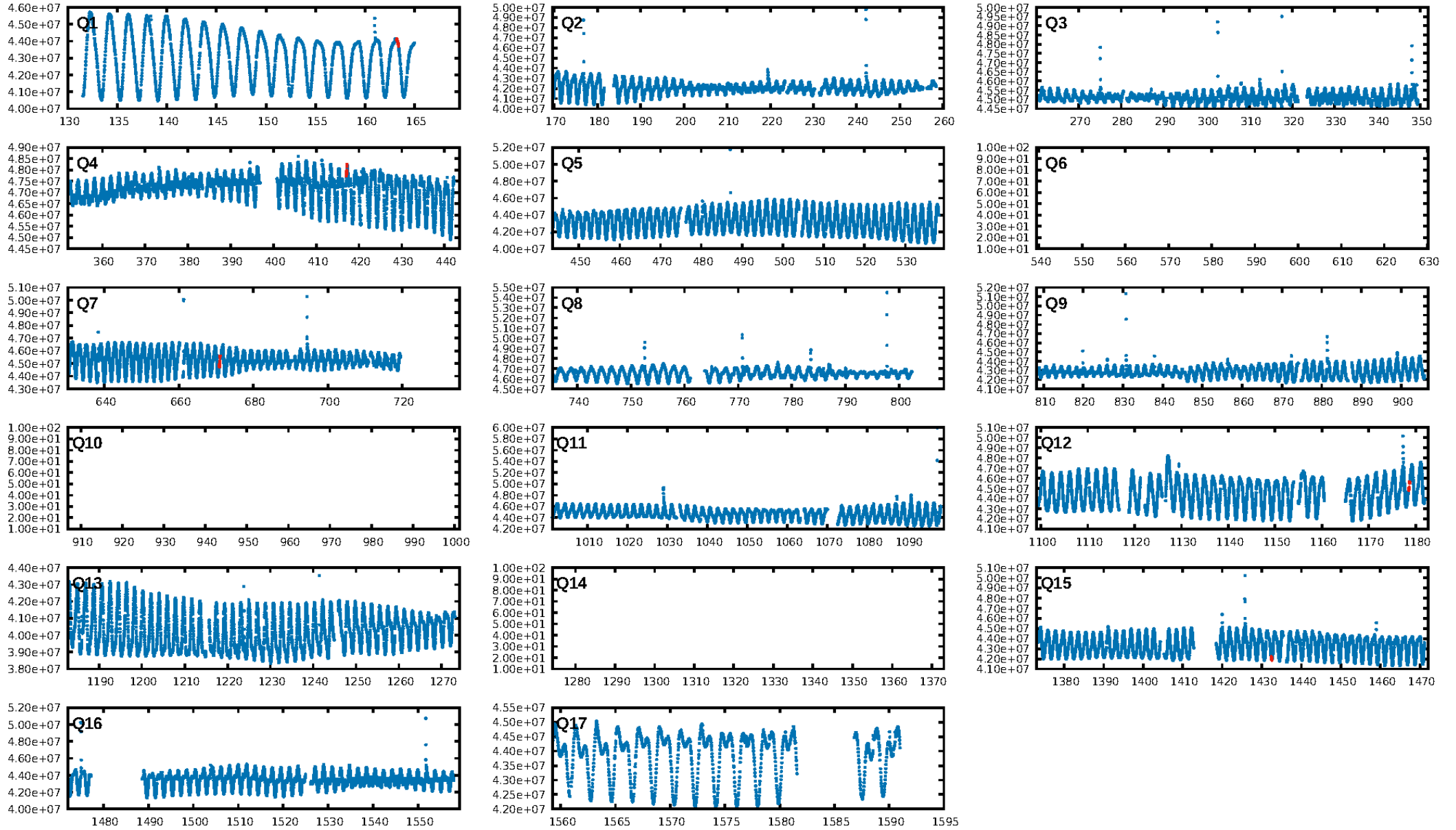
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1552.95σ]  
ModelChiSquare2-sig: 9.2%  
ModelChiSquareGoF-sig: 40.2%  
Bootstrap-pfa: 3.24e-11  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.3758  
Centroid-sig: 32.9%  
Centroid-so: 0.791 arcsec [1.40σ]  
OotOffset-rm: 0.211 arcsec [1.42σ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-rm: 0.859 arcsec [4.85σ]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [4/4]

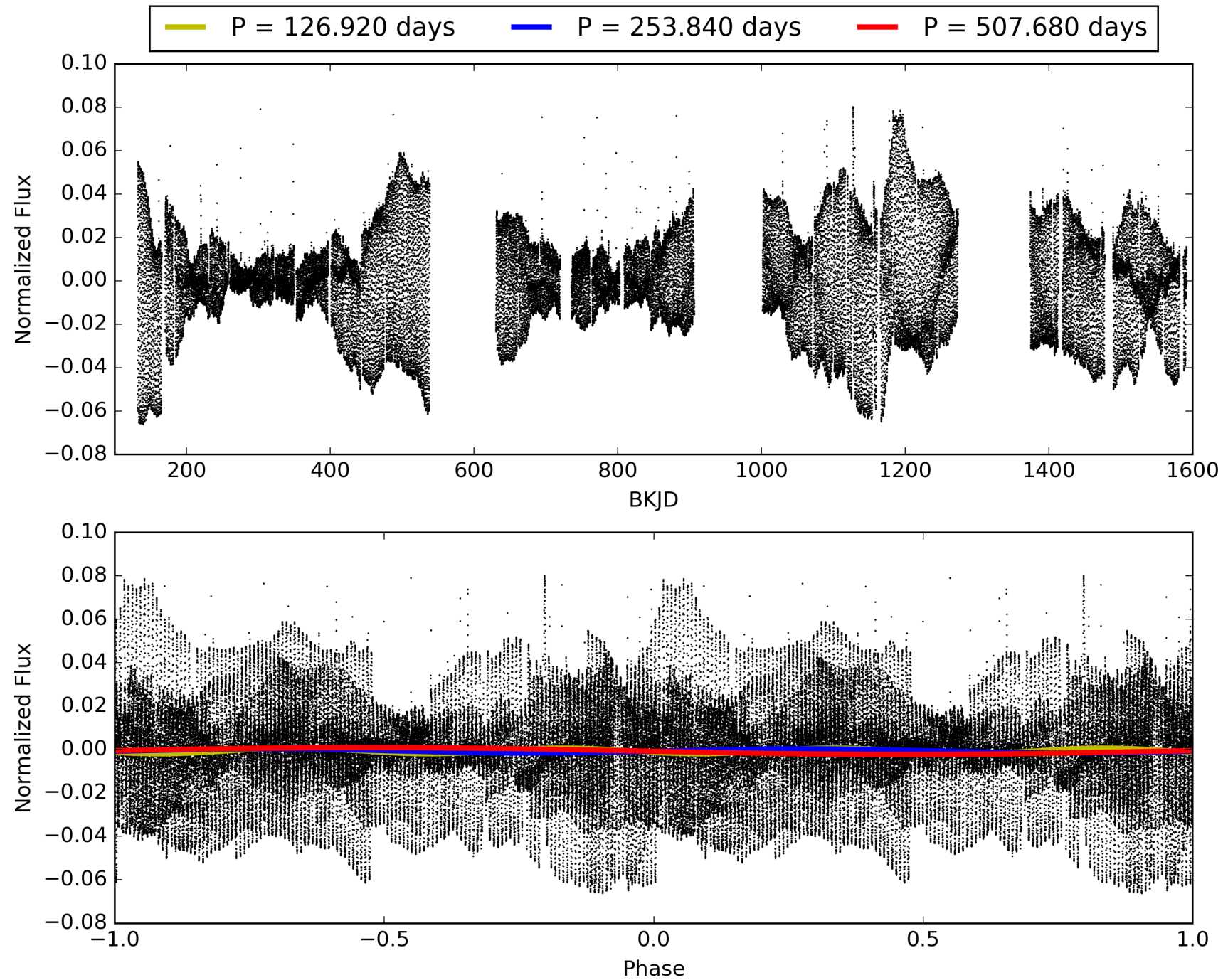
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:14:21 Z

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

# TCE 005460828-02, PDC Light Curves



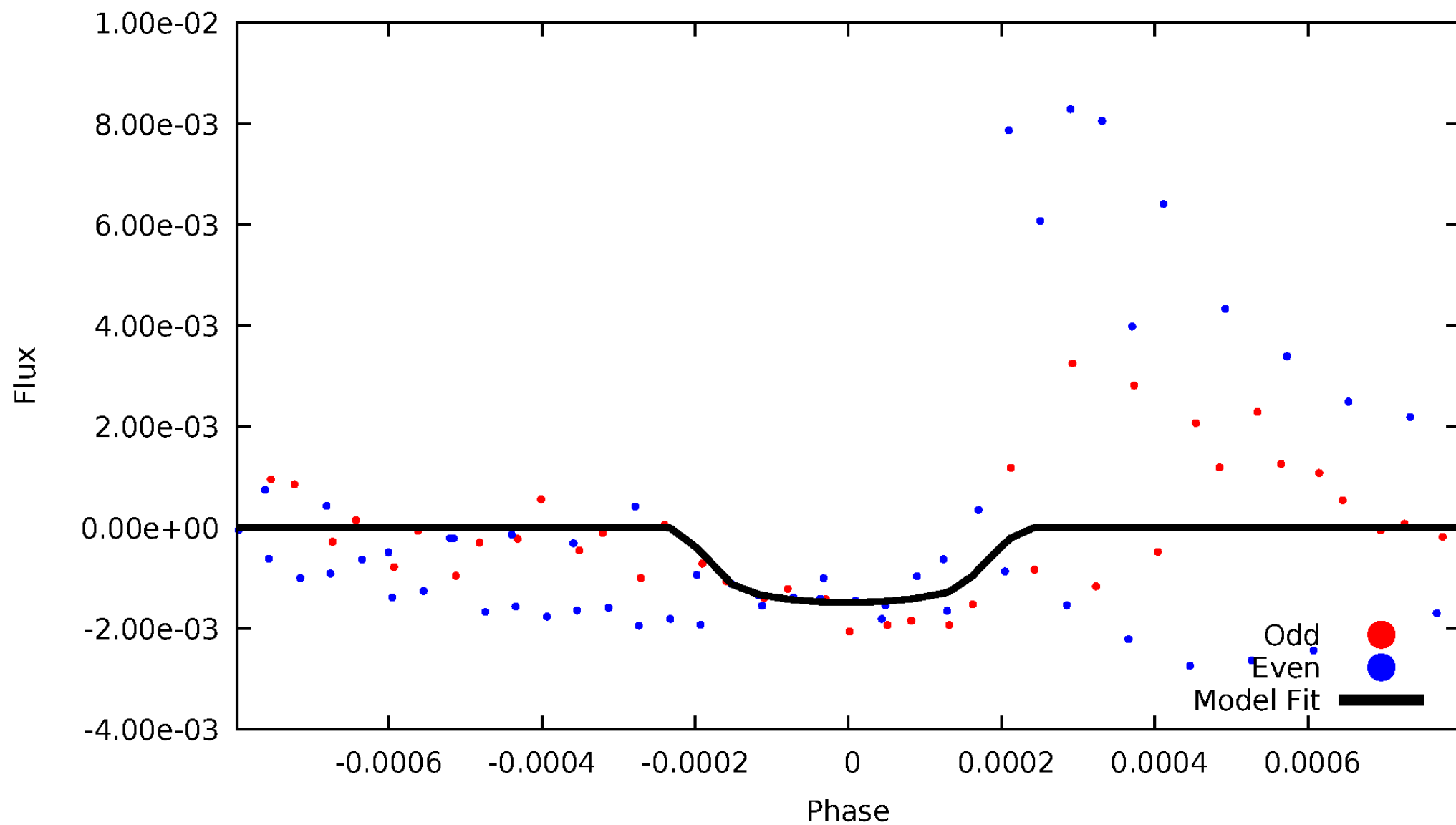
TCE 005460828-02





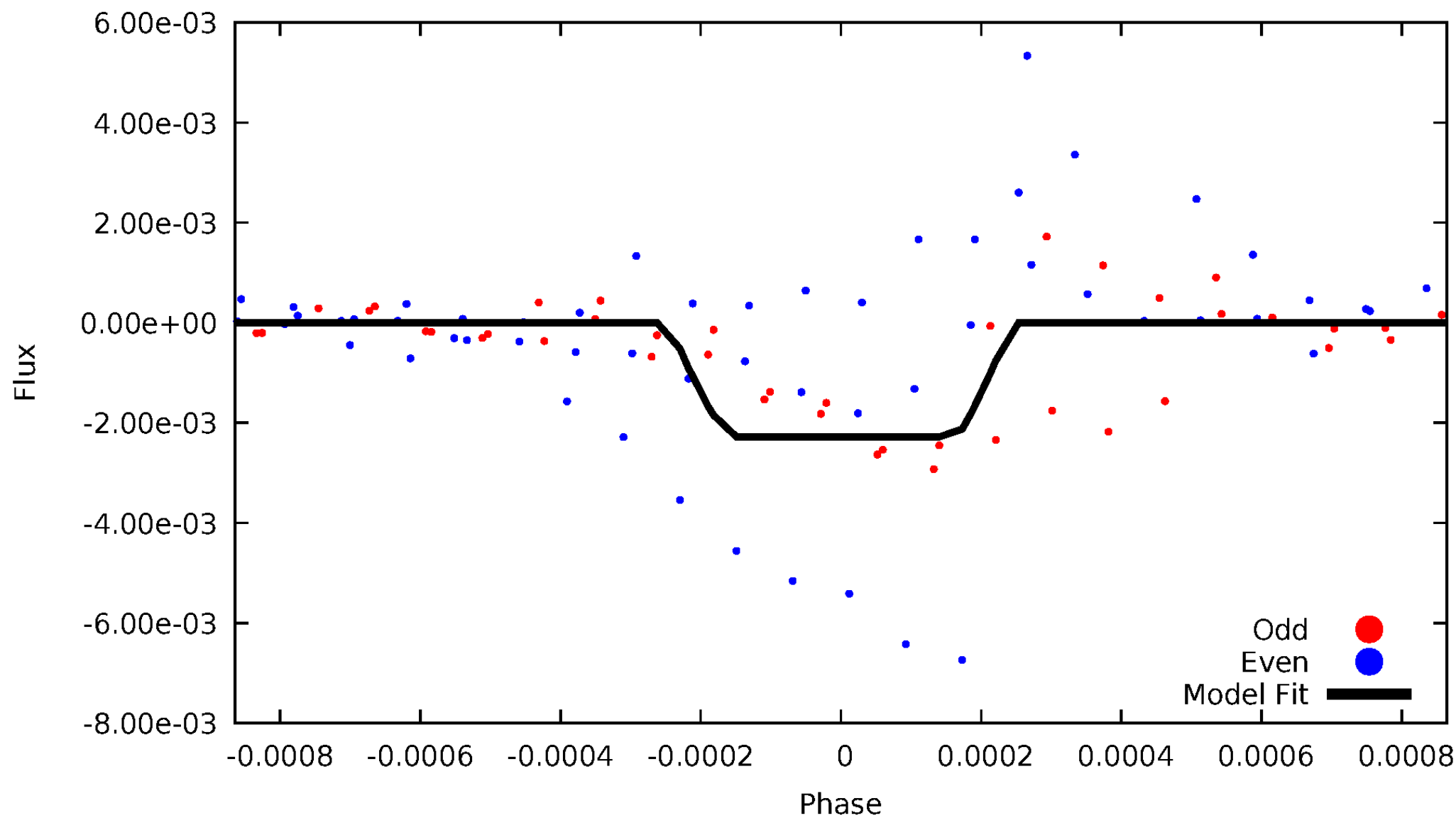
# DV Odd/Even

TCE 005460828-02



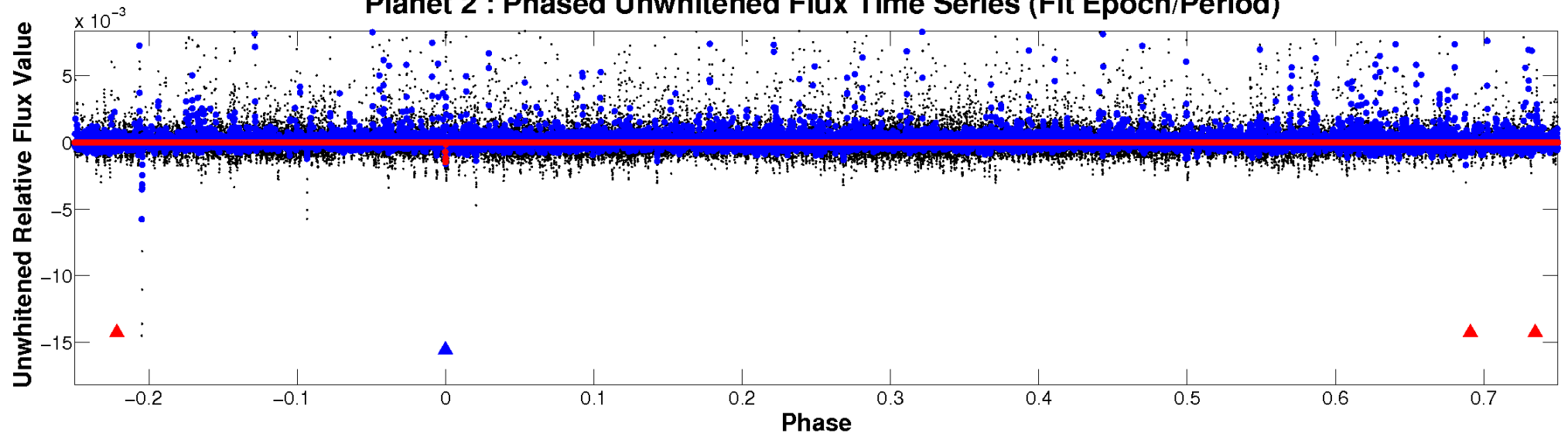
# ALT Odd/Even

TCE 005460828-02

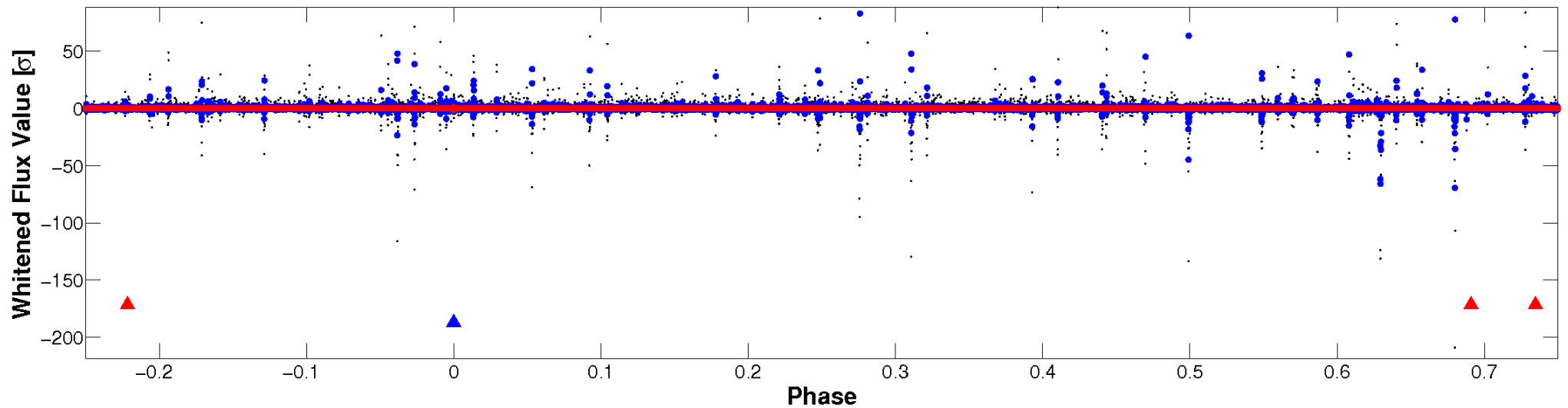


# Non-Whitened Vs. Whitened Light Curve

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

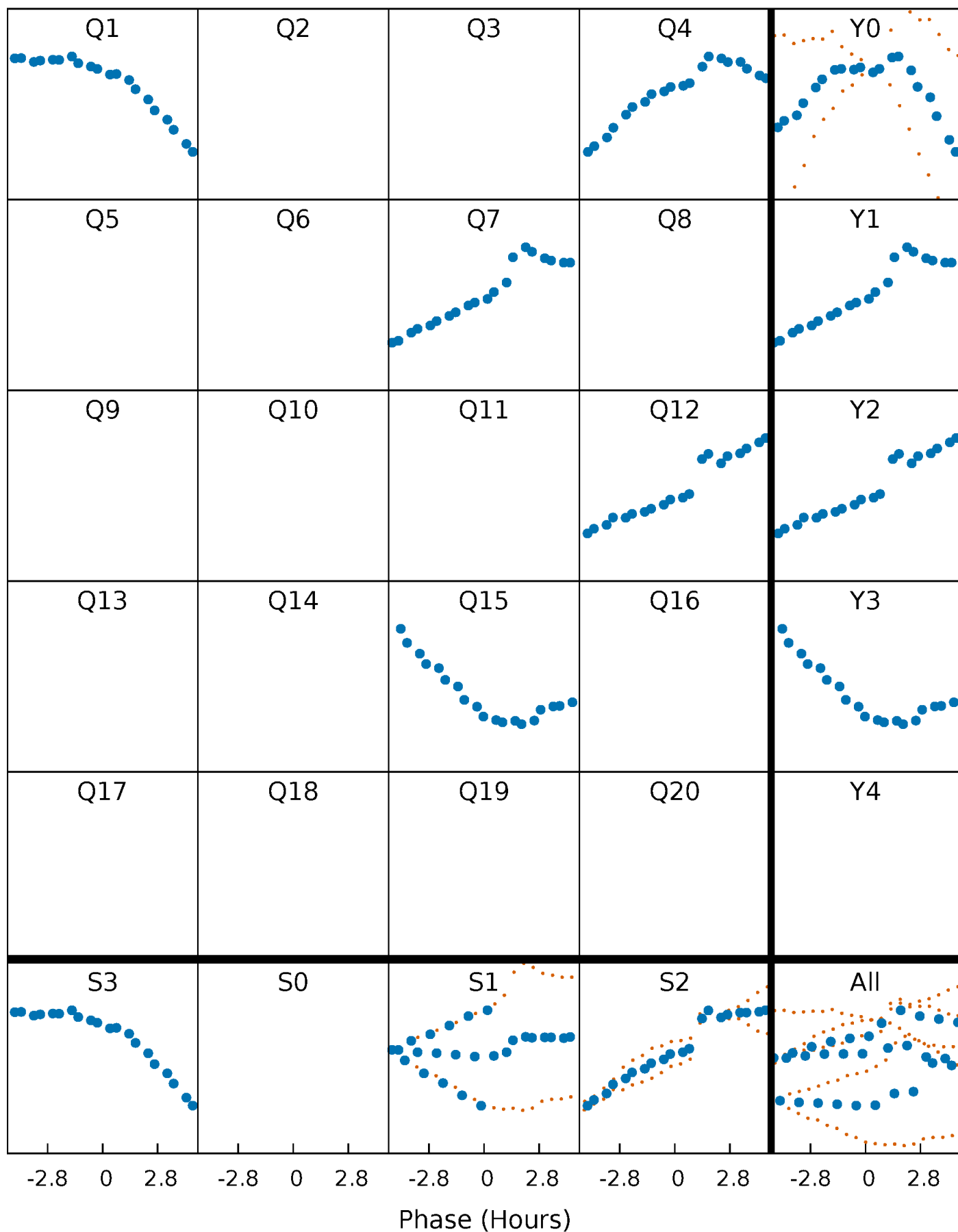


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



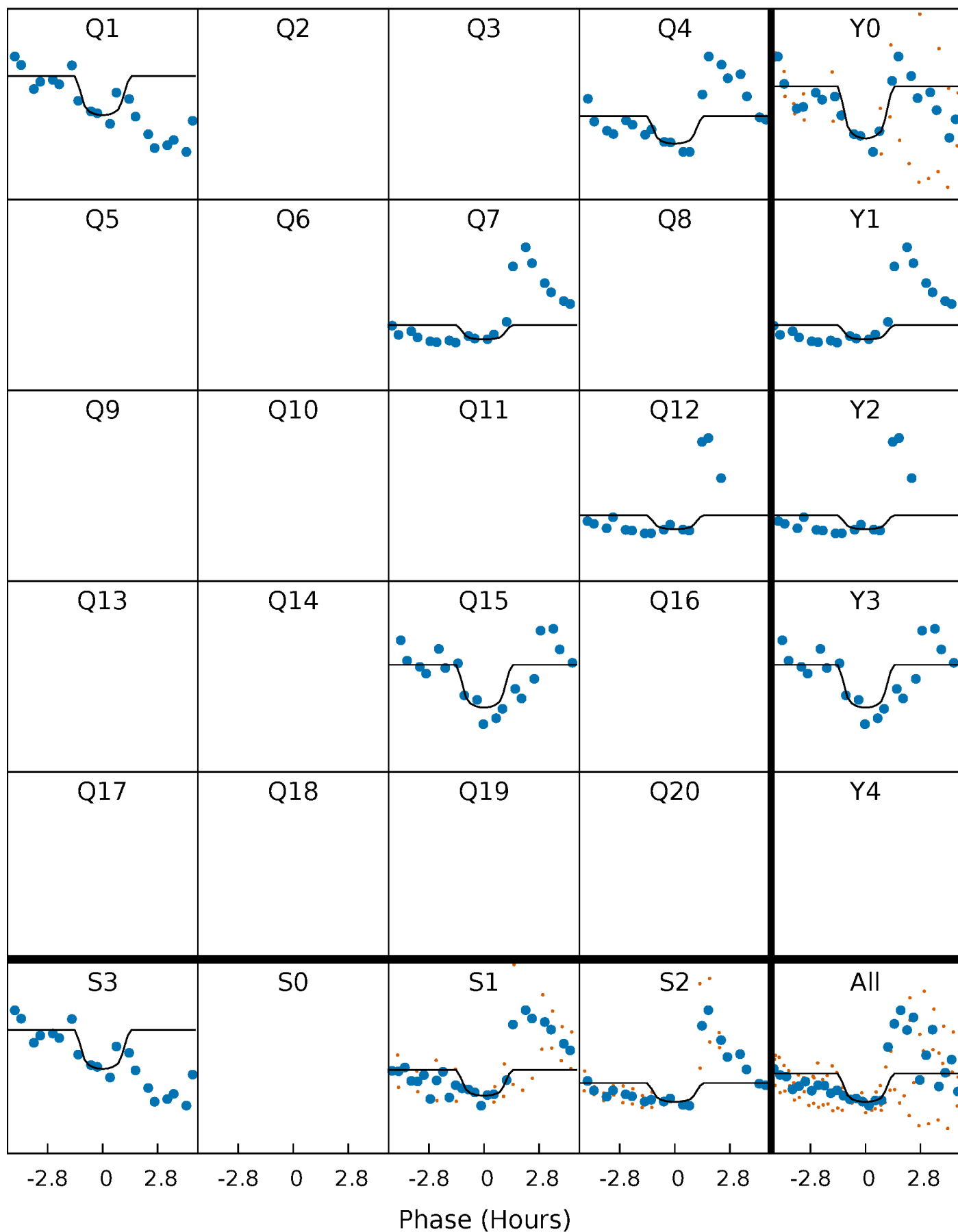
# PDC Quarter-Phased Transit Curves

TCE 005460828-02 P=253.840139 Days  $T_0=163.276760$  (BKJD)



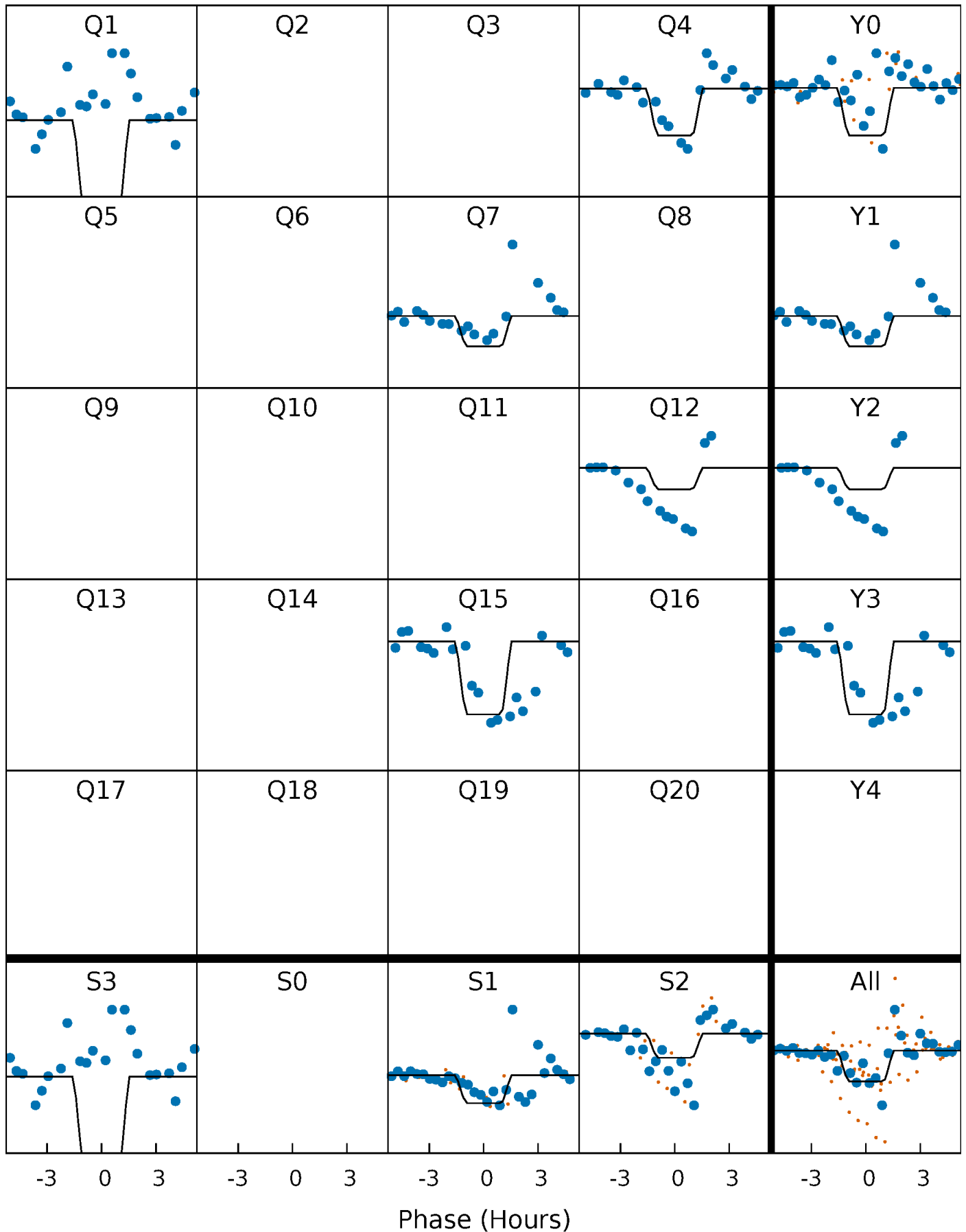
# DV Quarter-Phased Transit Curves

TCE 005460828-02     $P=253.840139$  Days     $T_0=163.276760$  (BKJD)



### Alt. Detrend Quarter-Phased Transit Curves

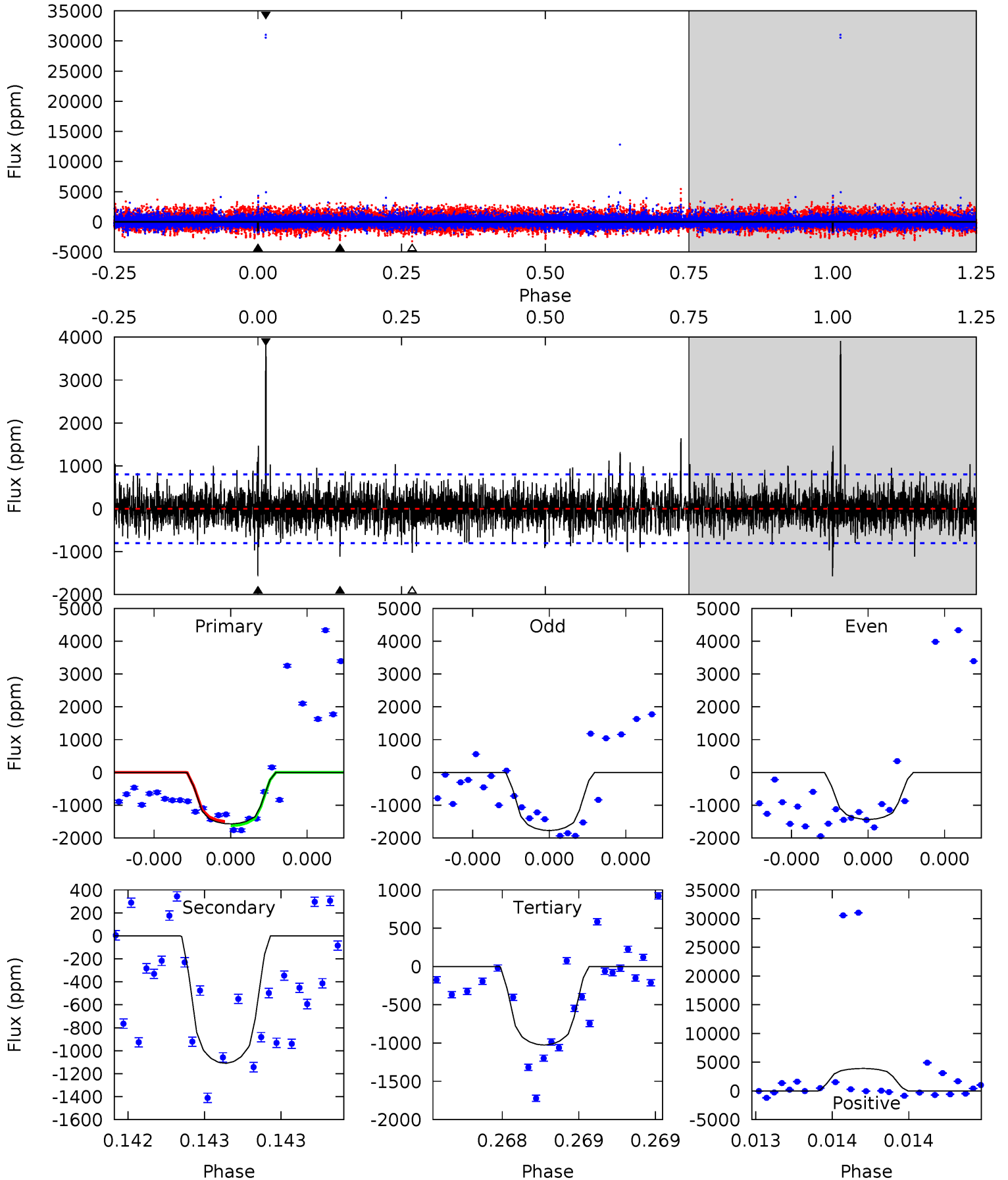
TCE 005460828-02 P=253.836494 Days  $T_0=163.280182$  (BKJD)



# DV Model-Shift Uniqueness Test

005460828-02, P = 253.840139 Days, E = 163.276760 Days

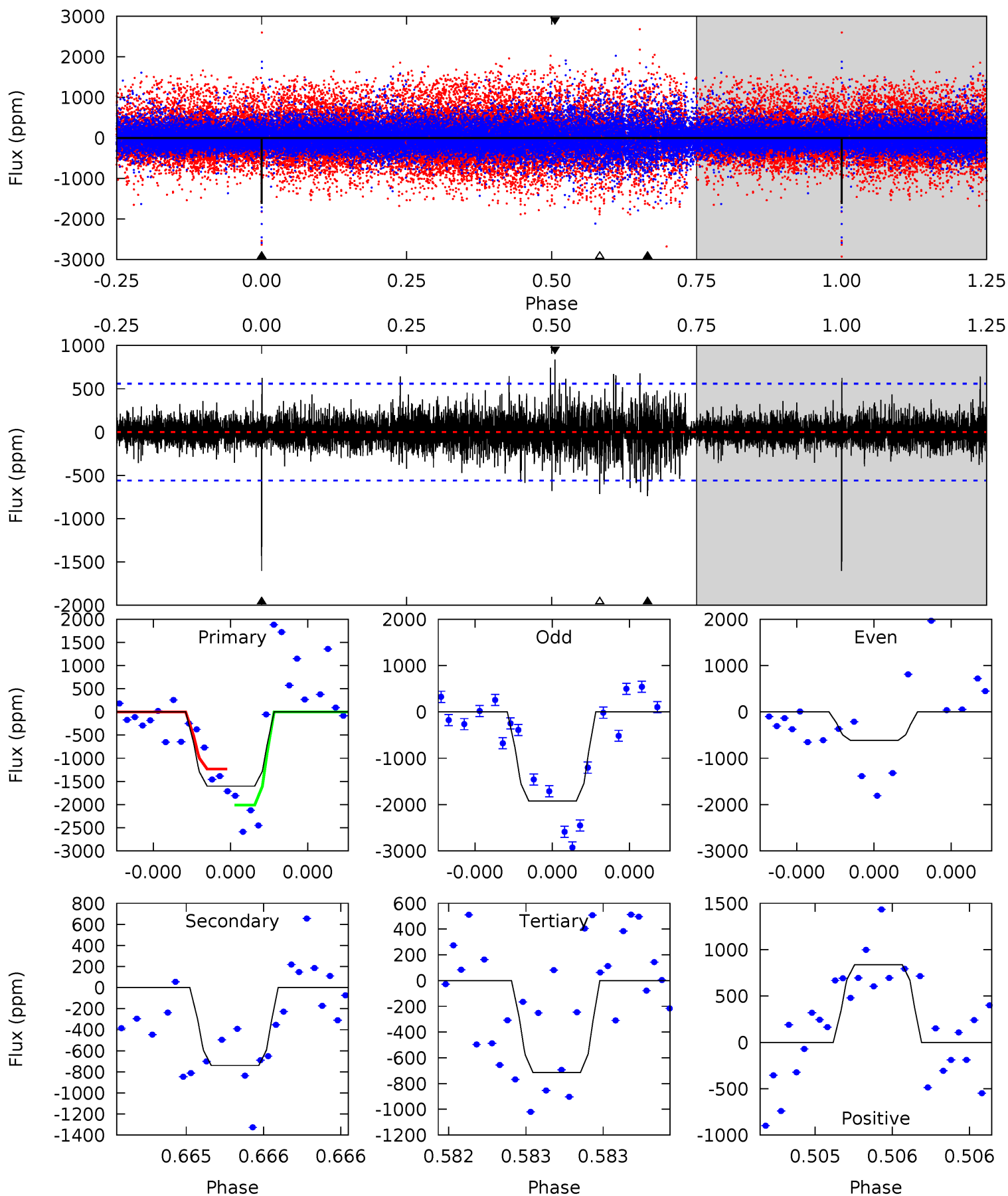
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	7.78	7.19	27.4	5.61	3.53	1.97	3.81	-16.4	0.59	-19.6	0.54	1.01	0.71	0.46



# Alt Model-Shift Uniqueness Test

005460828-02, P = 253.836494 Days, E = 163.280182 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
16.0	7.38	7.12	8.37	5.59	3.51	1.38	8.88	7.63	0.26	-0.99	5.86	1.07	0.34	3.88





### Stellar Parameters For KIC 005460828

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4321^{+118}_{-145}$	$4.759^{+0.077}_{-0.033}$	$-1.220^{+0.300}_{-0.350}$	$0.484^{+0.036}_{-0.059}$	$0.489^{+0.035}_{-0.043}$	$6.092^{+2.160}_{-0.741}$
	+3%/-3%	+2%/-1%	+25%/-29%	+7%/-12%	+7%/-9%	+35%/-12%
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 005460828-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1109 \pm 143$	$3.58^{+3.10}_{-2.46}$	$234^{+9}_{-10}$	$3366^{+1662}_{-574}$	$18461^{+162491}_{-13362}$
Alt.	$-739 \pm 100$	$3.78^{+3.54}_{-2.58}$	$233^{+8}_{-10}$	$3121^{+1425}_{-525}$	$10747^{+93094}_{-7852}$

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

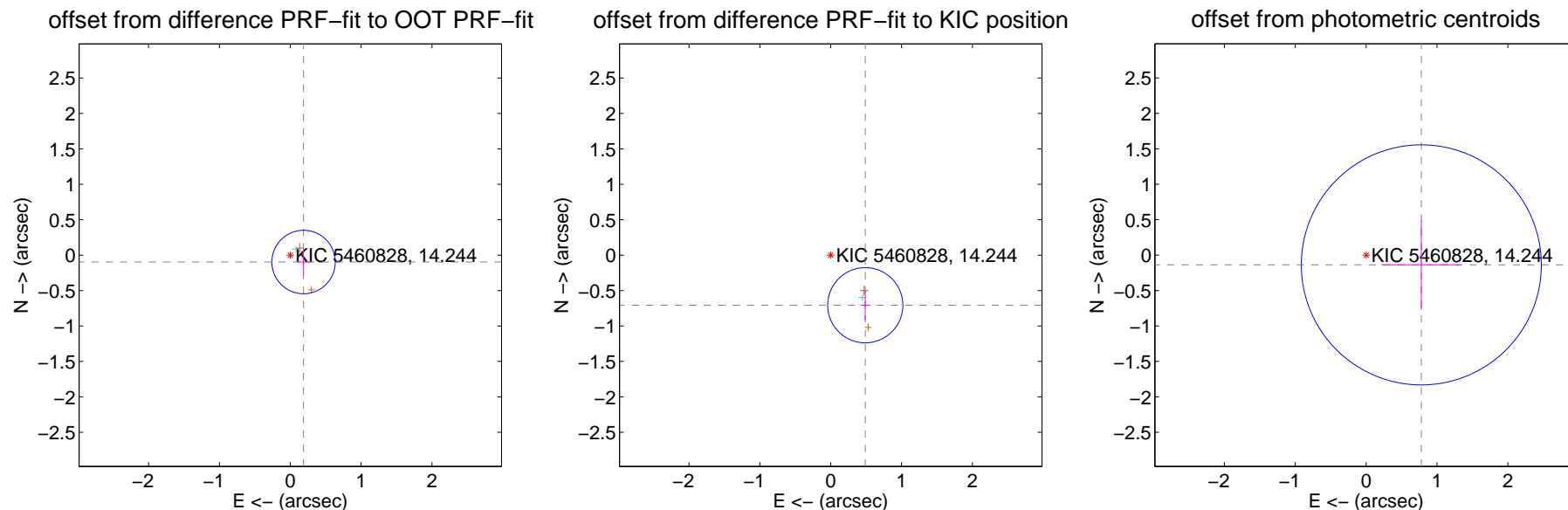
## DV Centroid Data

Supplemental centroid analysis for 005460828-02. Kepler magnitude: 14.24. Transit SNR 6.70

There are 1 quarters with good PRF difference image offsets

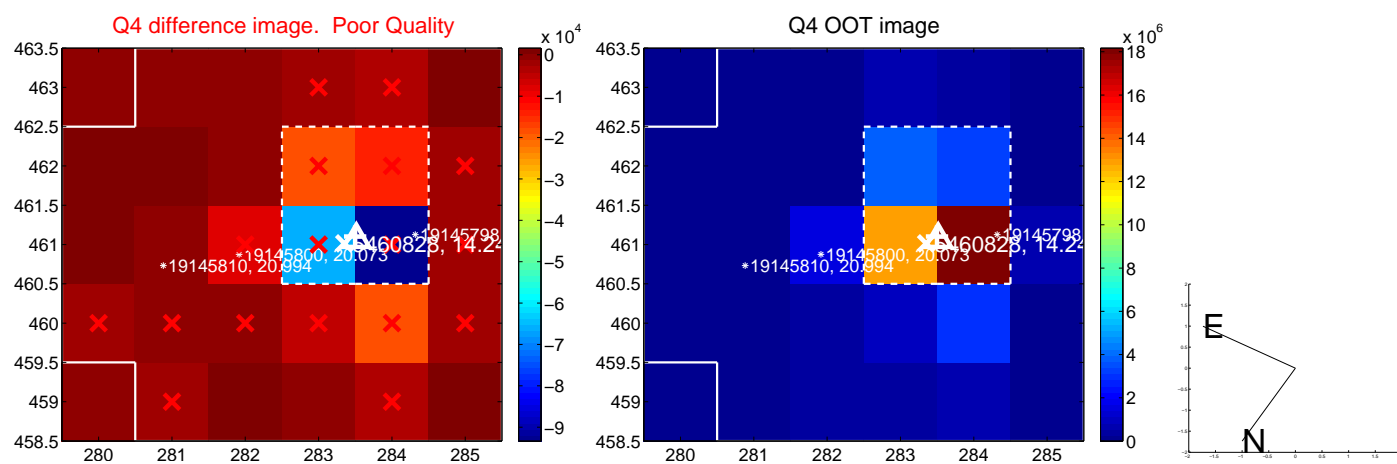
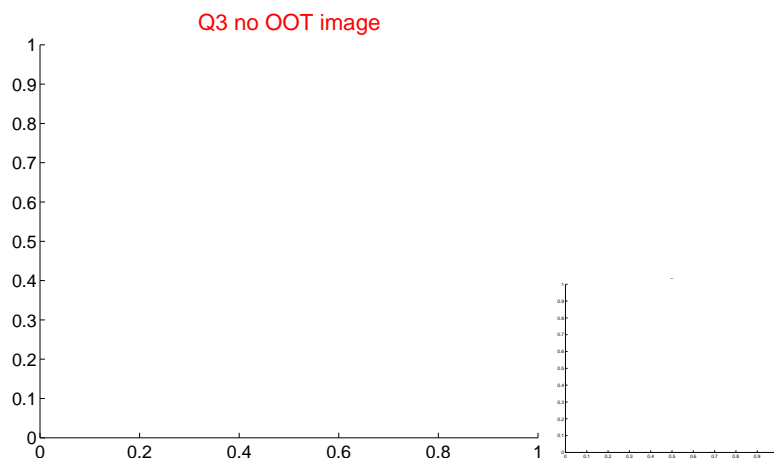
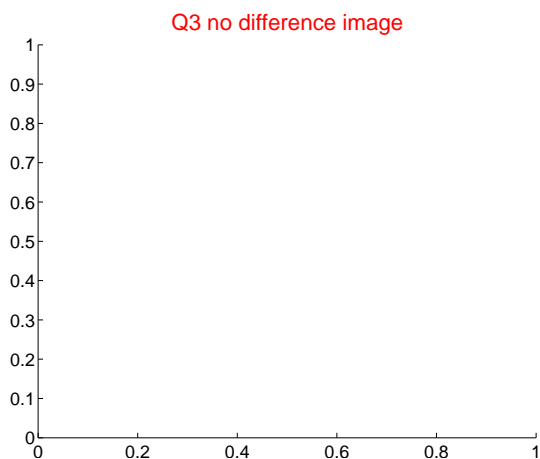
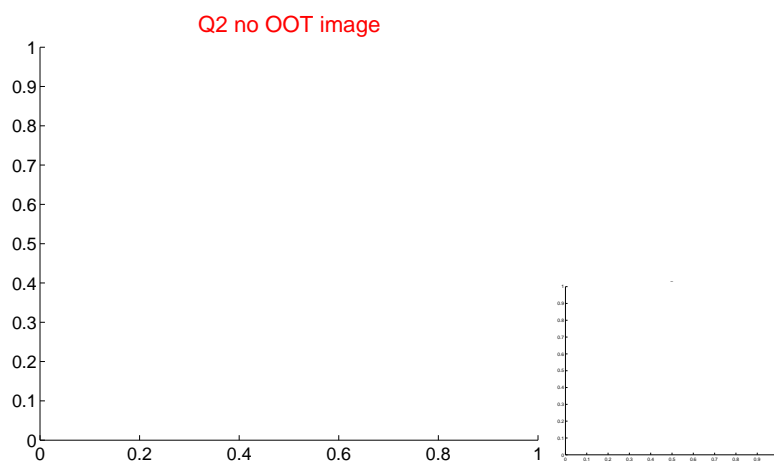
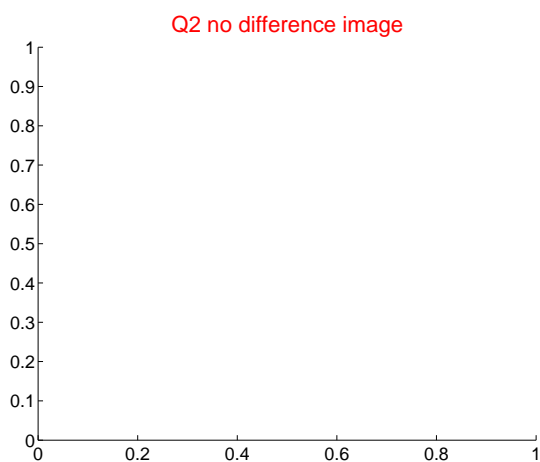
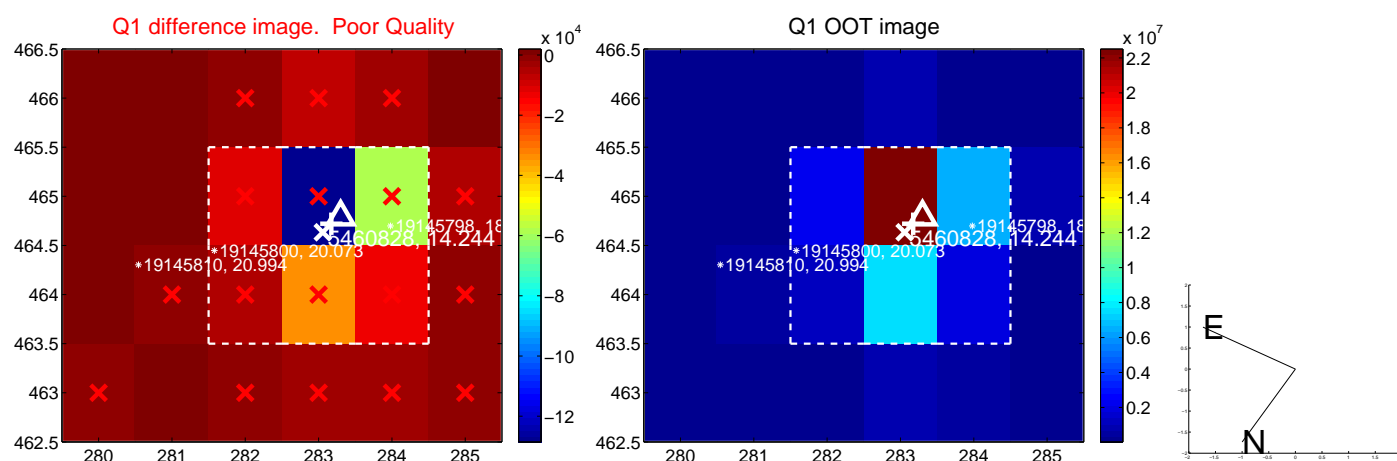
The direct PRF centroid is offset from the target star catalog position by about 0.77 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.211 \pm 0.149$	1.42	$-0.188 \pm 0.092$	$-0.097 \pm 0.182$
PRF-fit source offset from KIC position	<b><math>0.859 \pm 0.177</math></b>	<b>4.85</b>	$-0.488 \pm 0.072$	$-0.707 \pm 0.209$
photometric centroid source offset	$0.79 \pm 0.56$	1.40	$-0.78 \pm 0.56$	$-0.14 \pm 0.63$

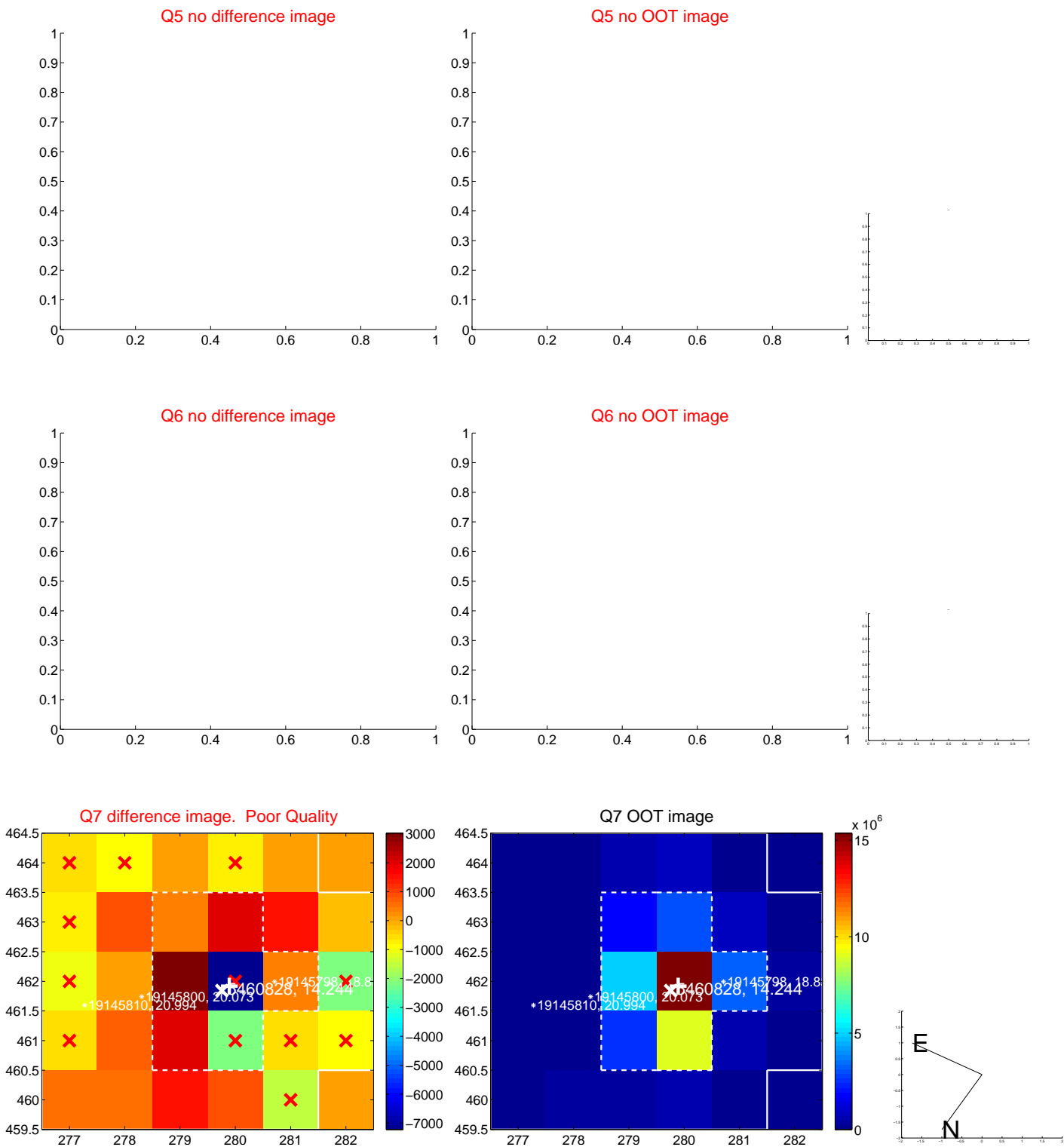


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



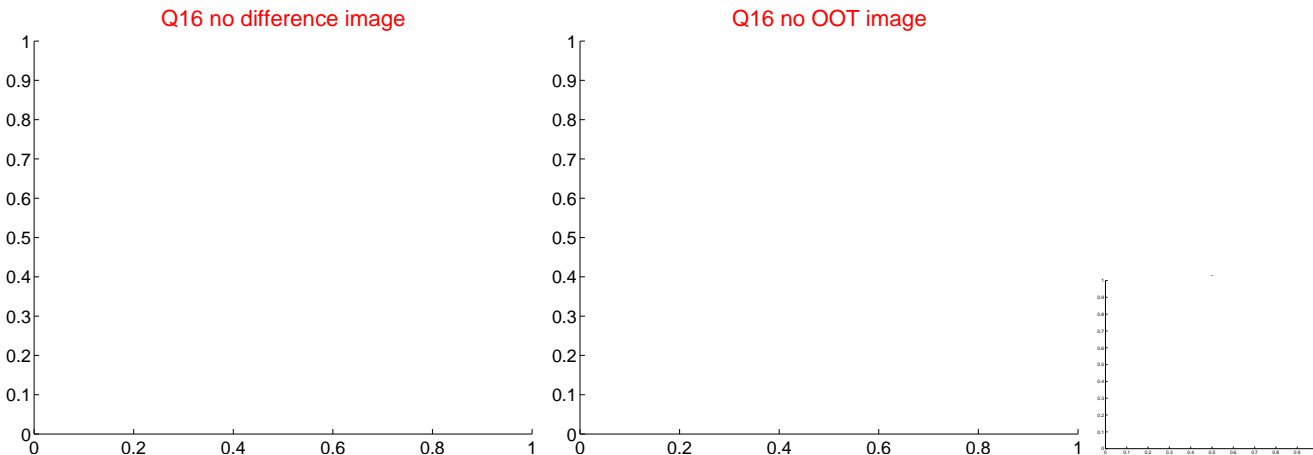
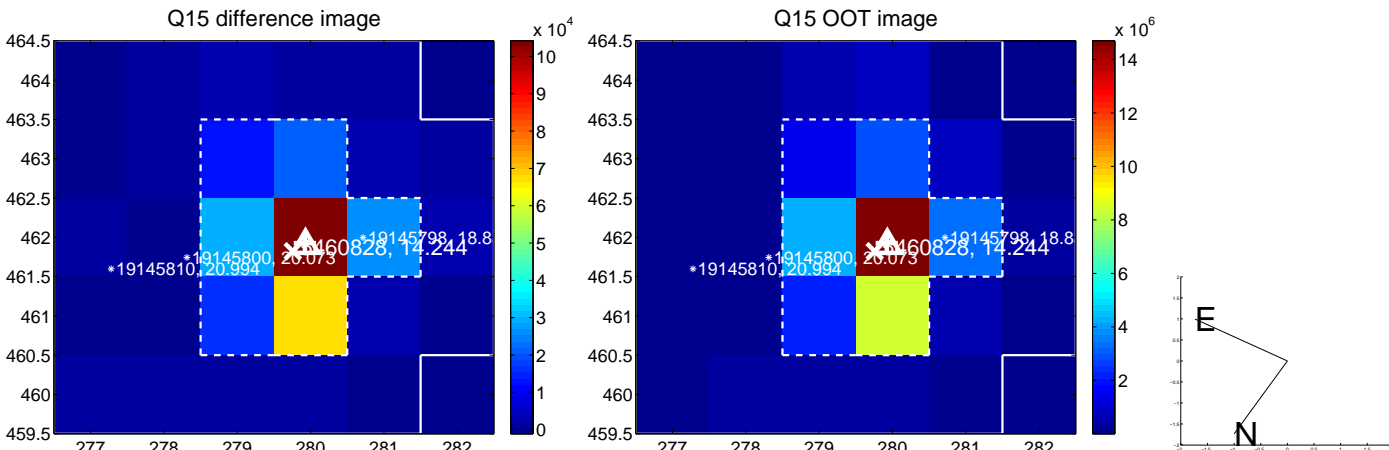
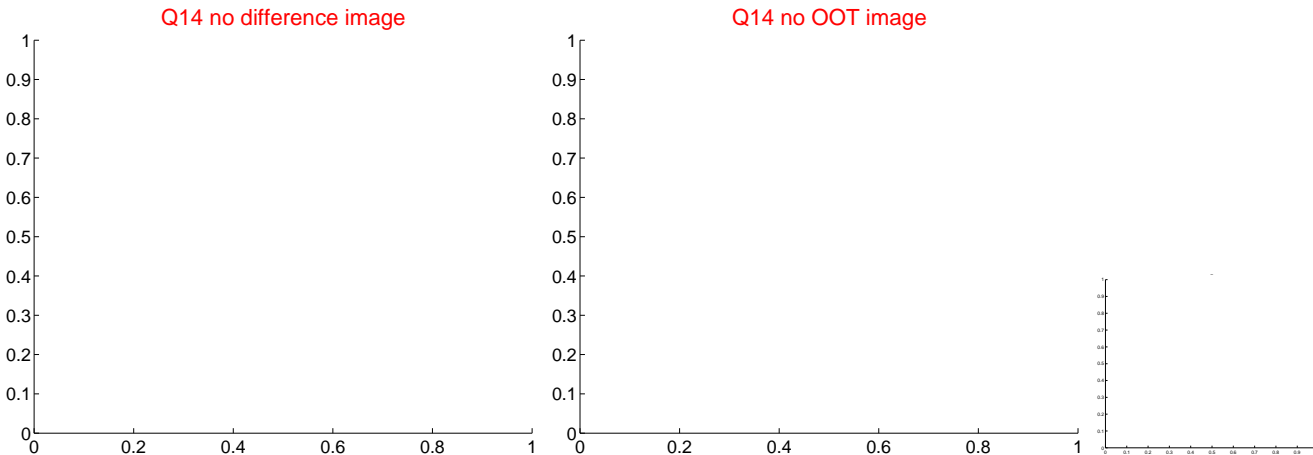
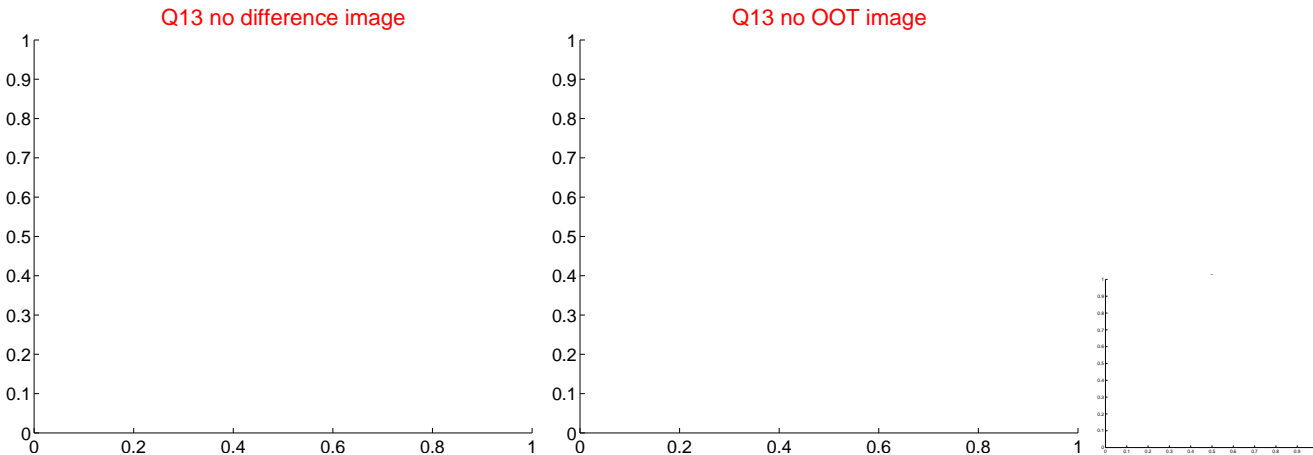
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



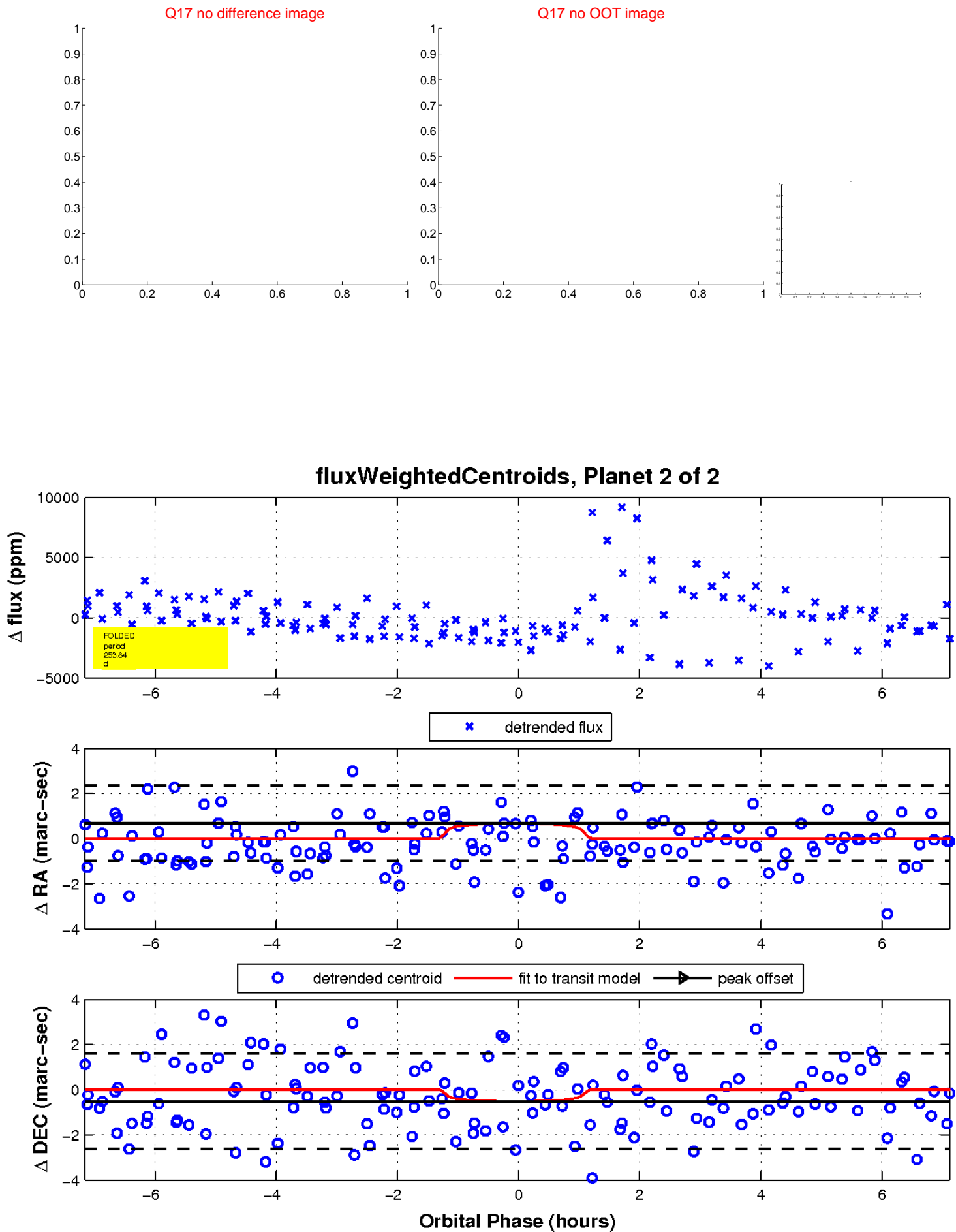
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

