

# KIC 004762283

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004762283-01	OBS	7706.01	42.049525	167.346149	636.4	2.071	7.5	6.8	0.48	4281	1.32	2.00
004762283-02	OBS	No	236.528471	331.336084	2232.8	4.207	9.9	7.0	0.48	4281	2.41	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004762283-01	OBS	PC	0.84	0	0	0	0	NO_COMMENT
004762283-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—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.

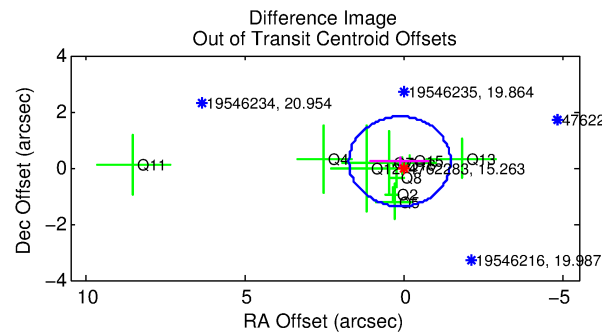
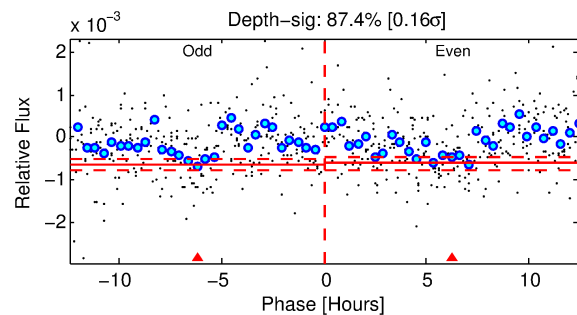
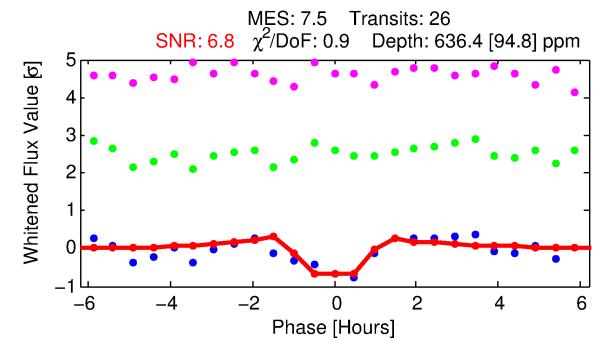
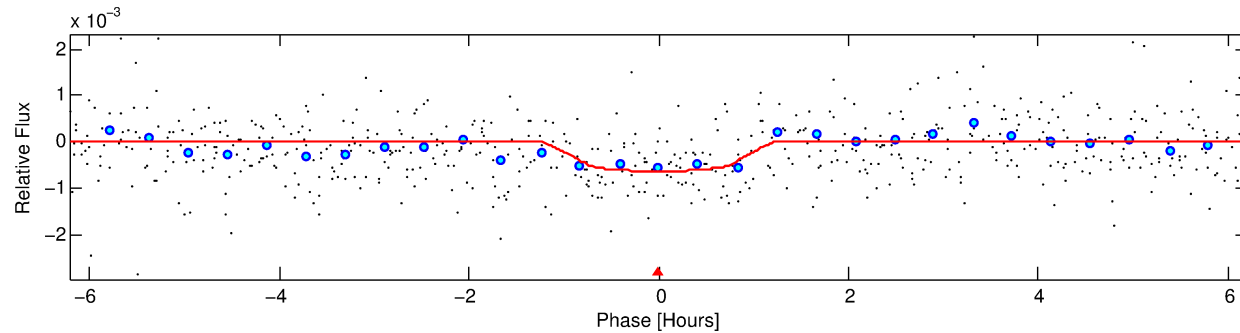
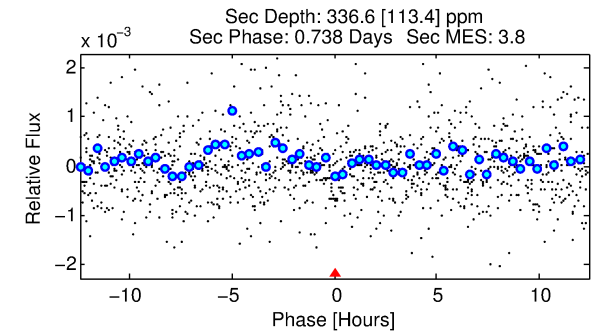
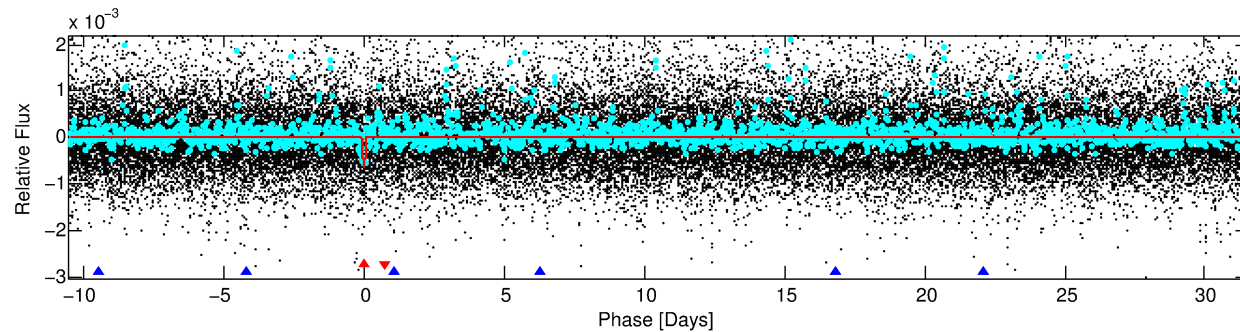
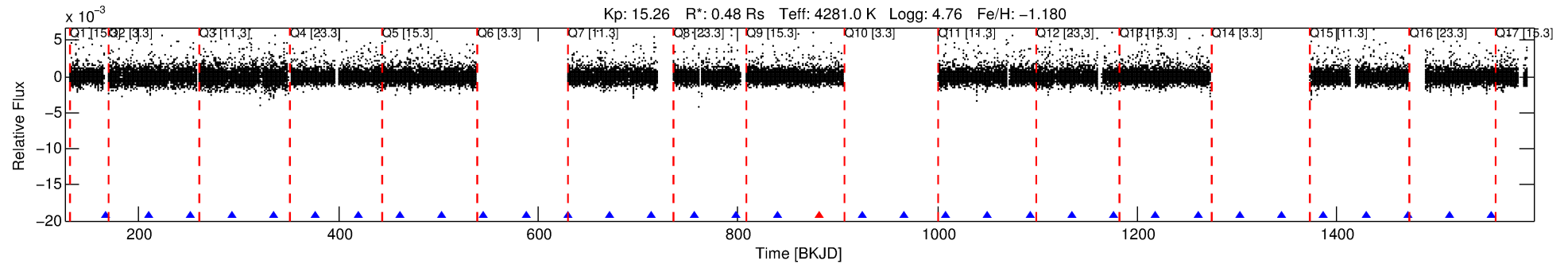
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004762283-01

No Significant Match Found

# DV One-Page Summary

KIC: 4762283 Candidate: 1 of 2 Period: 42.050 d



## DV Fit Results:

Period = 42.04952 [0.00031] d  
Epoch = 167.3461 [0.0064] BKJD  
Rp/R\* = 0.0252 [0.0278]  
a/R\* = 108.46 [559.16]  
b = 0.75 [3.05]  
Seff = 2.01 [0.40]  
Teq = 303 [15] K  
Rp = 1.32 [1.47] Re  
a = 0.1859 [0.0198] AU  
Ag = 3683.76 [8245.58] [0.45σ]  
Teffp = 3655 [2044] K [1.64σ]

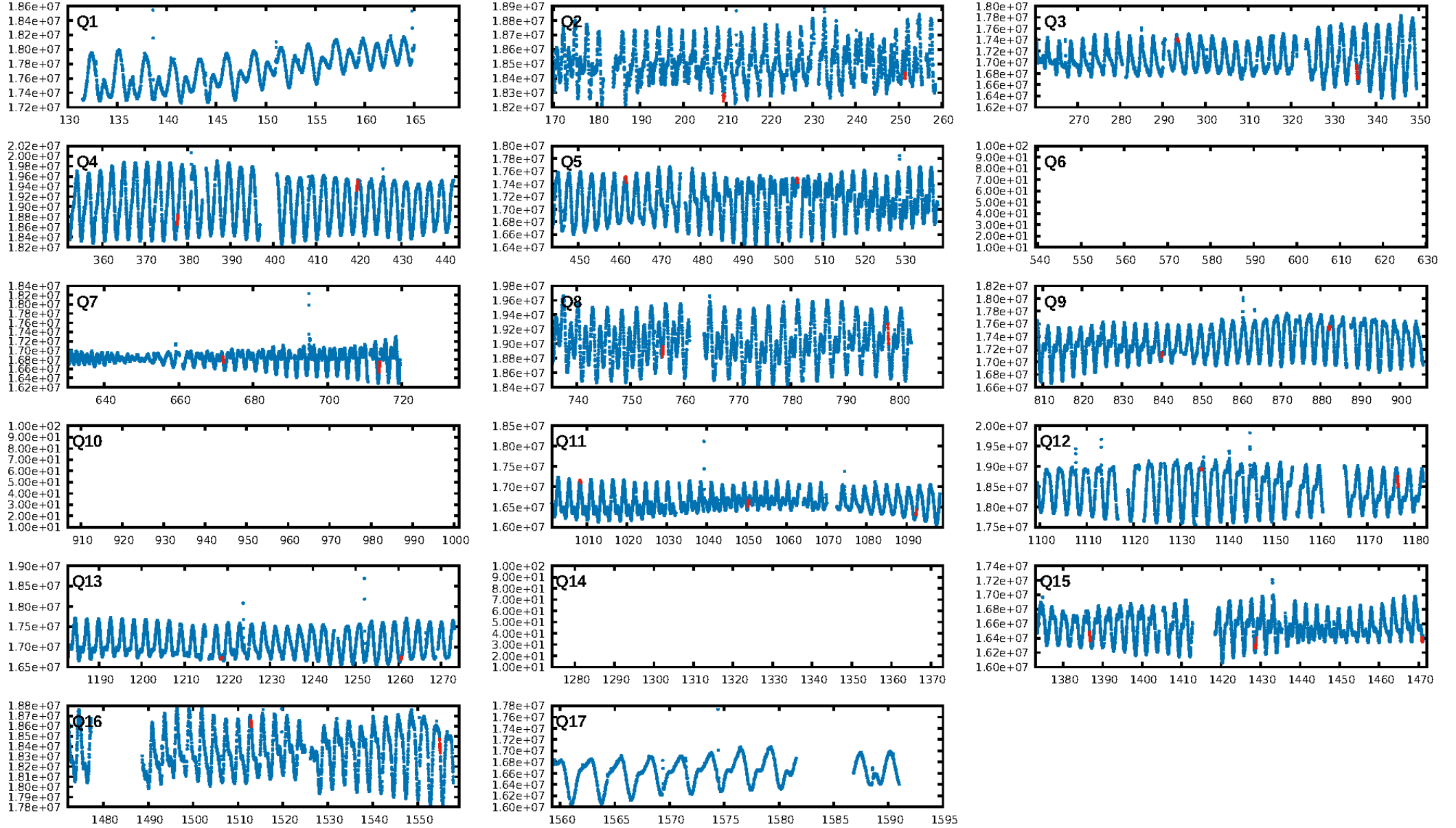
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [995.47σ]  
ModelChiSquare2-sig: 79.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 4.36e-09**  
RollingBand-fgt: 0.96 [25/26]  
GhostDiagnostic-chr: -3.825  
Centroid-sig: 0.4%  
Centroid-so: 2.339 arcsec [1.61σ]  
OotOffset-rm: 0.262 arcsec [0.49σ]  
KicOffset-rm: 0.341 arcsec [1.20σ]  
OotOffset-st: 1/3/4/2 [10]  
KicOffset-st: 1/3/4/2 [10]  
DiffImageQuality-fgm: 0.50 [5/10]  
DiffImageOverlap-fno: 1.00 [12/12]

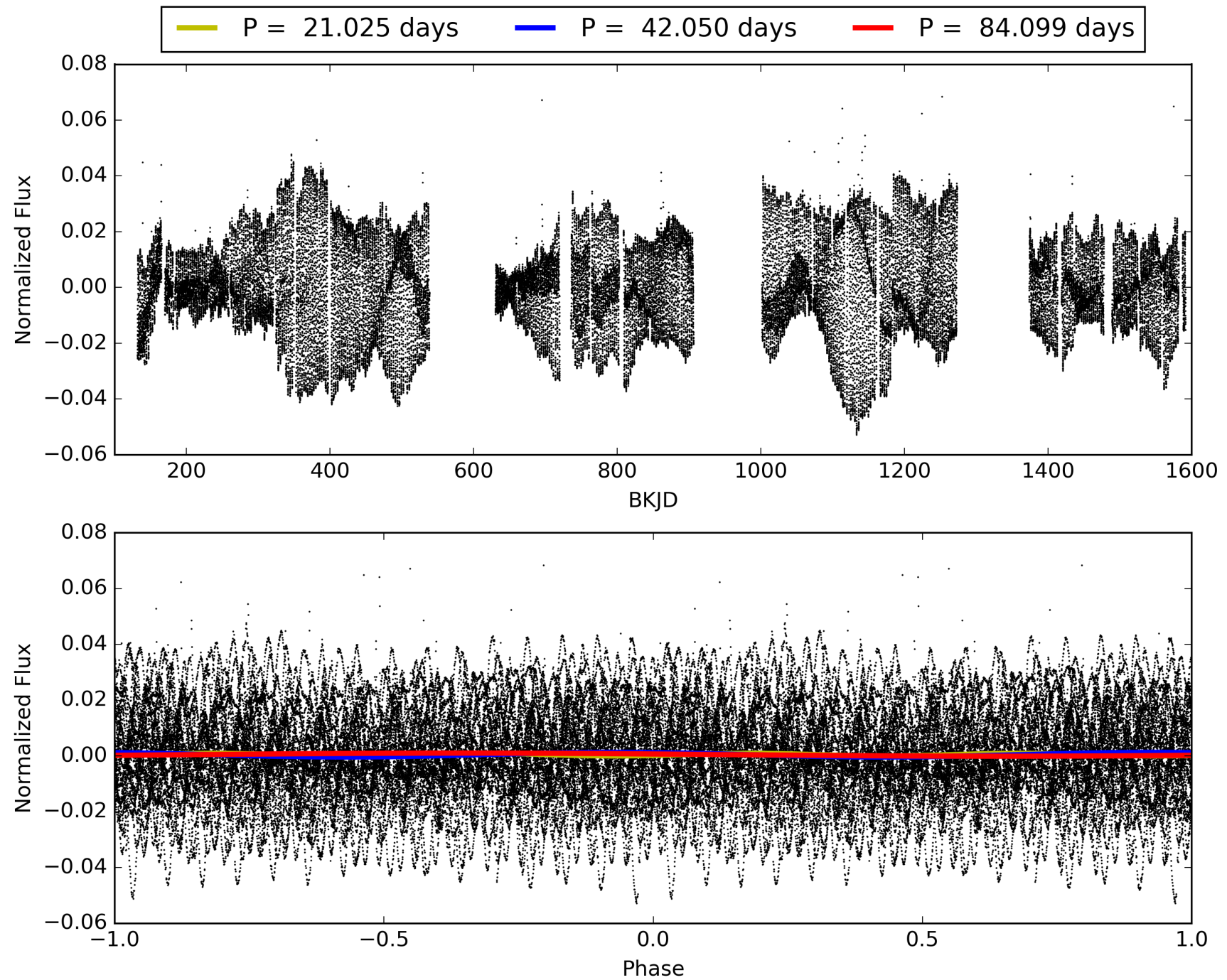
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:51:27 Z

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

# TCE 004762283-01, PDC Light Curves

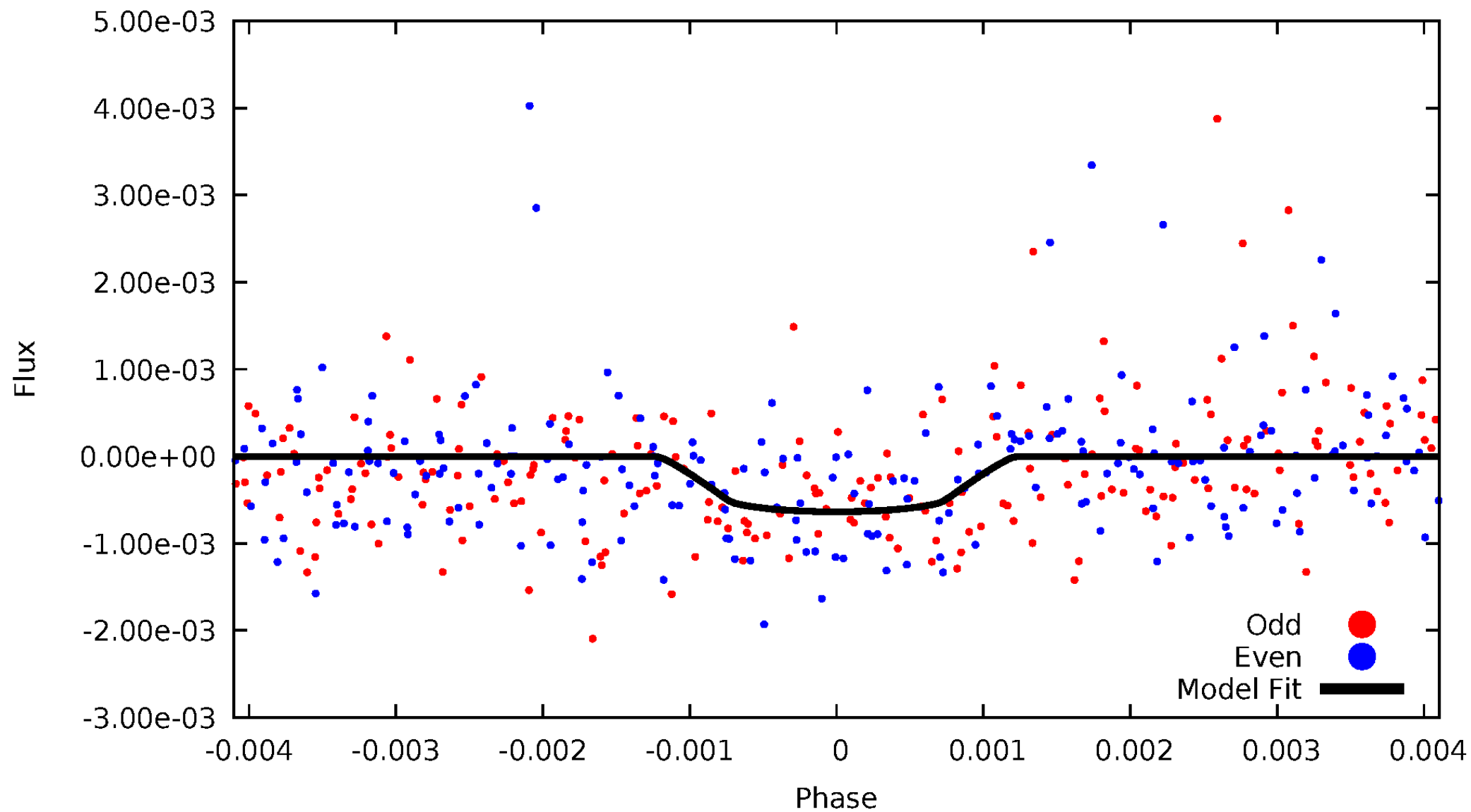


TCE 004762283-01



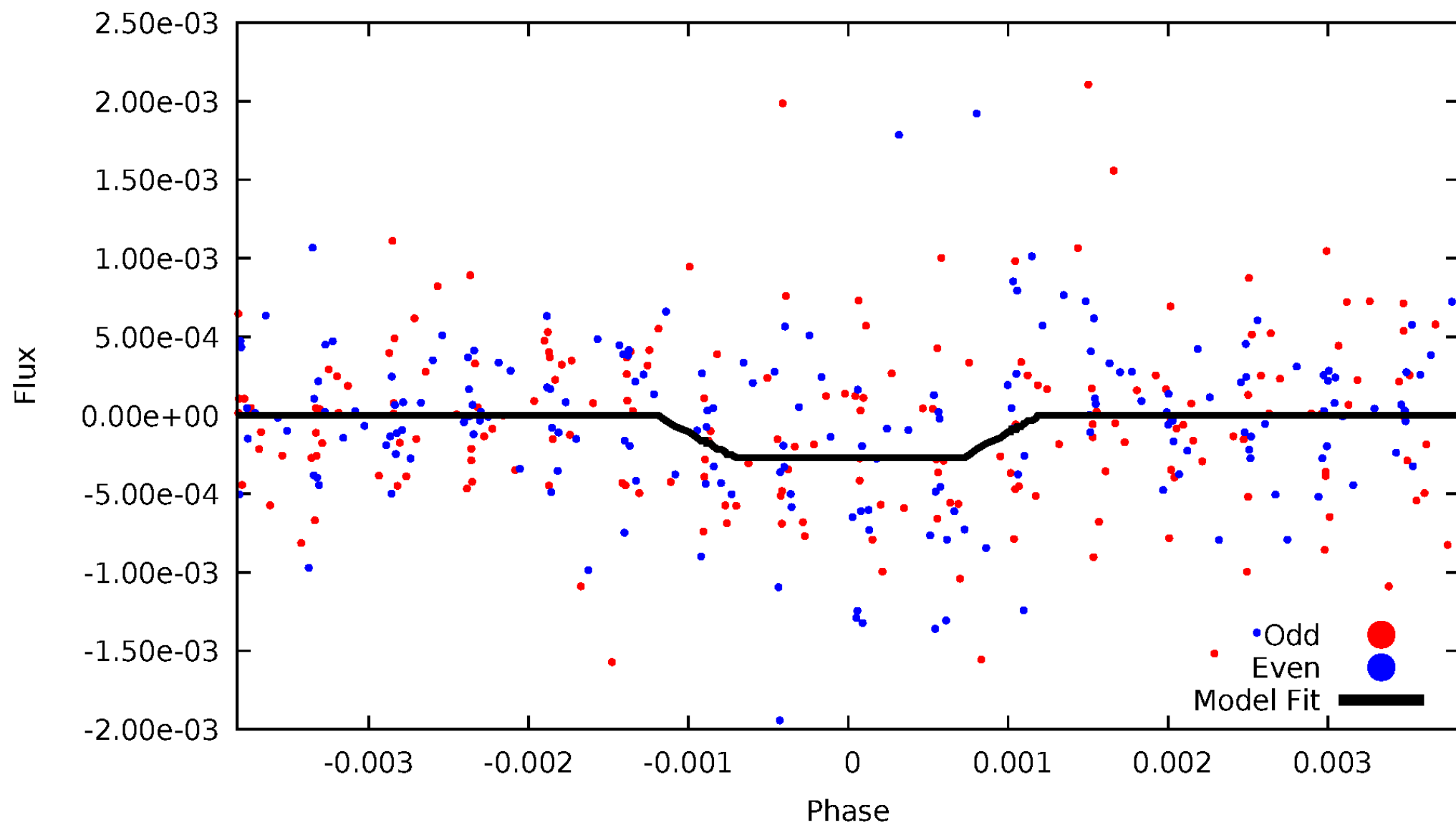
# DV Odd/Even

TCE 004762283-01



# ALT Odd/Even

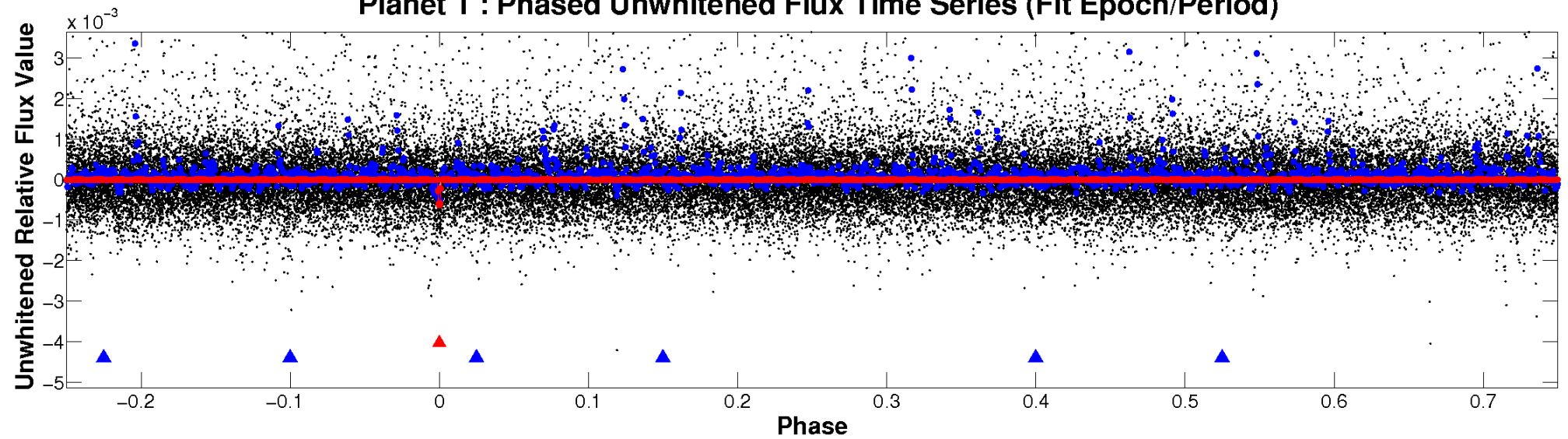
TCE 004762283-01



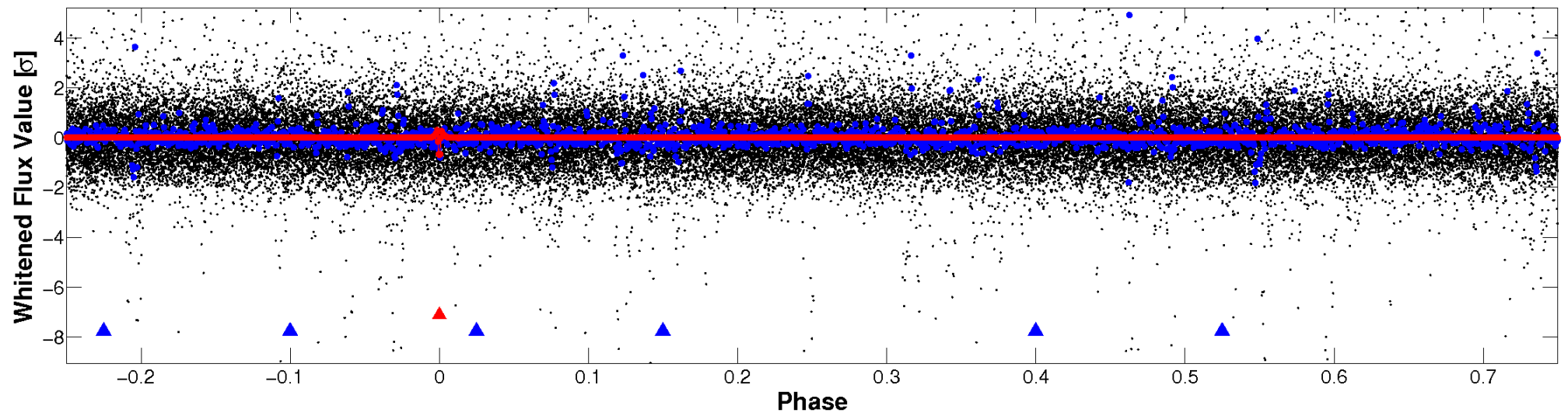


# Non-Whitened Vs. Whitened Light Curve

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

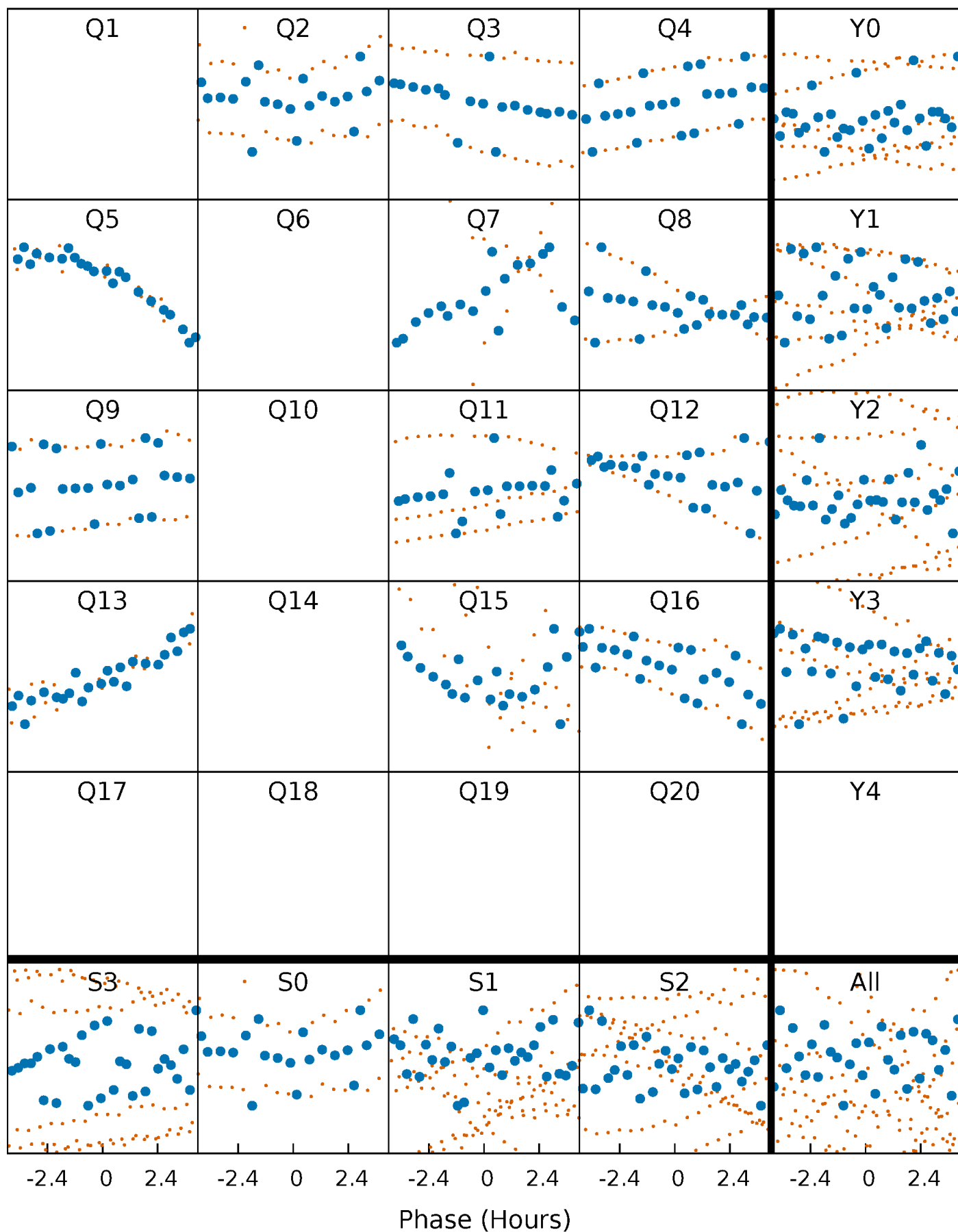


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

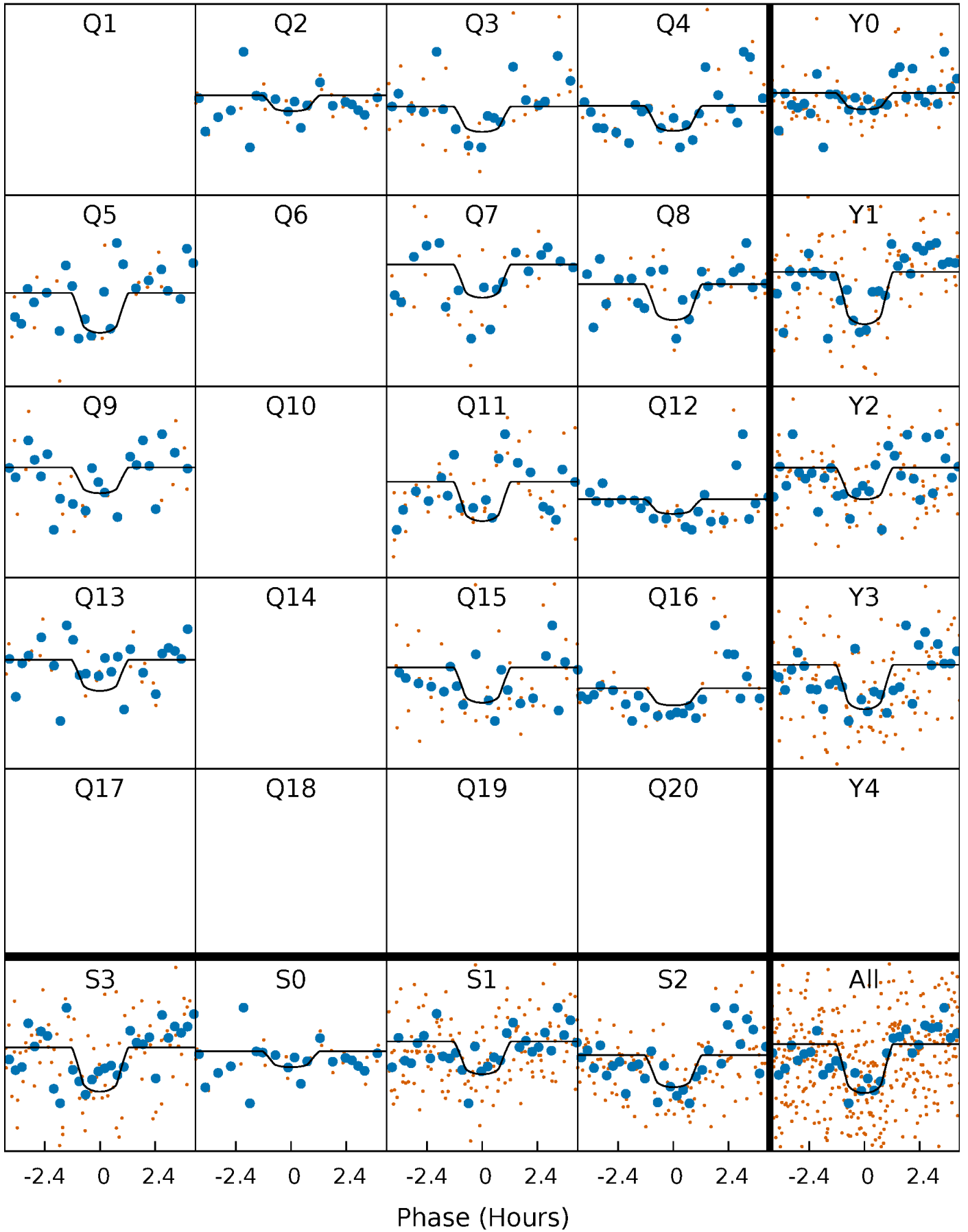
TCE 004762283-01 P= 42.049525 Days  $T_0=167.346149$  (BKJD)





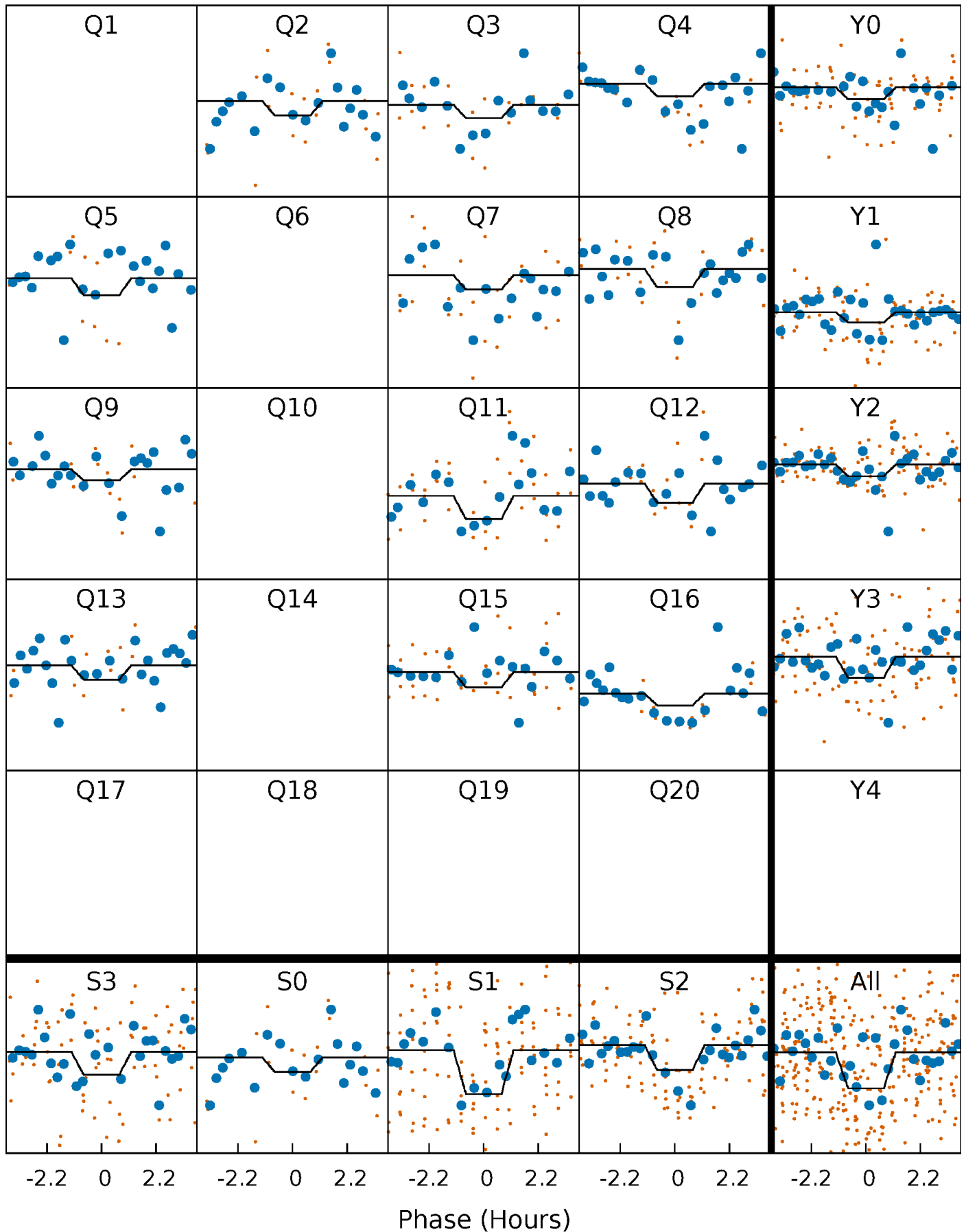
# DV Quarter-Phased Transit Curves

TCE 004762283-01   P= 42.049525 Days    $T_0=167.346149$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

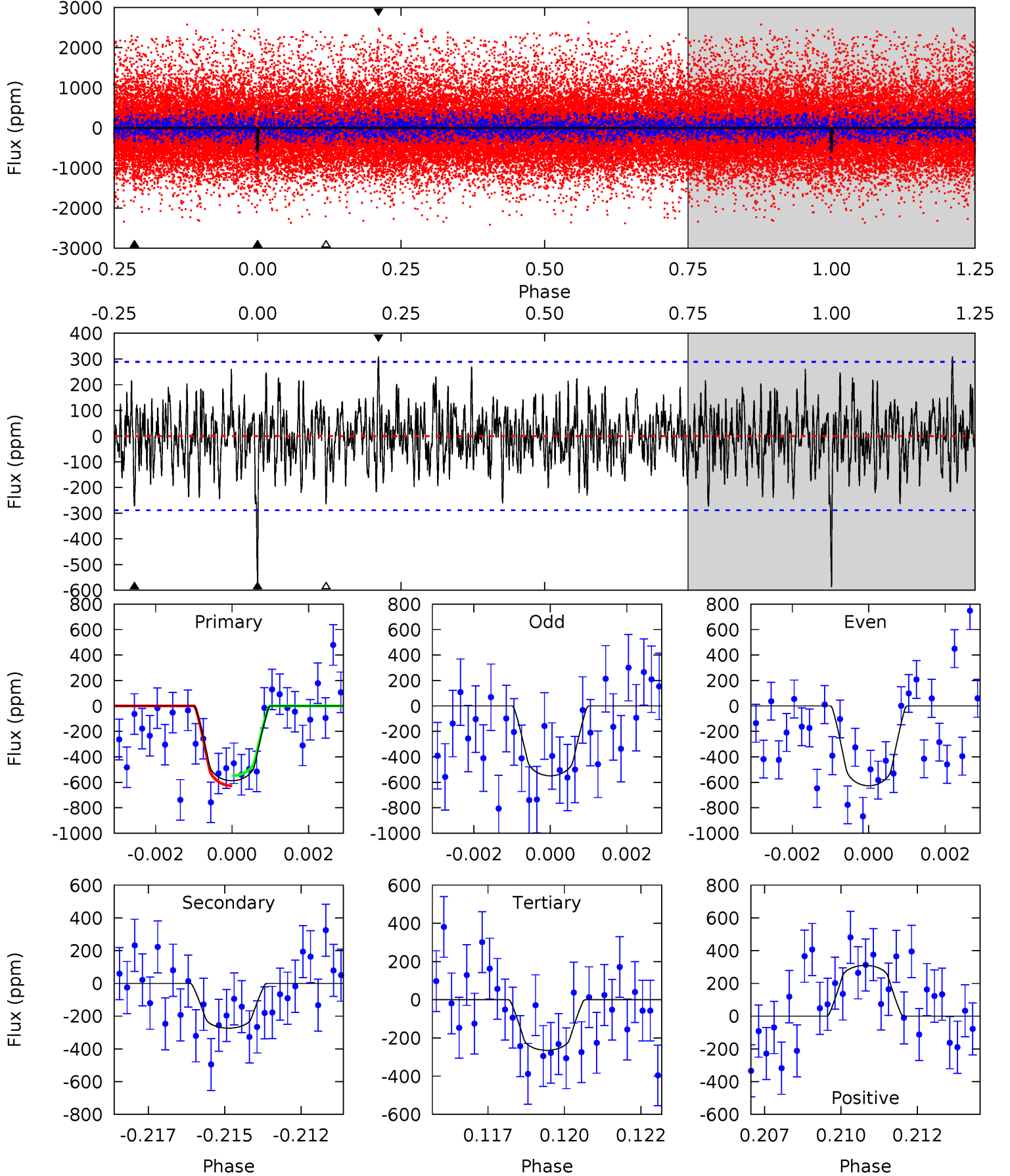
TCE 004762283-01 P= 42.049974 Days  $T_0=167.338046$  (BKJD)



# DV Model-Shift Uniqueness Test

004762283-01,  $P = 42.049525$  Days,  $E = 125.296624$  Days

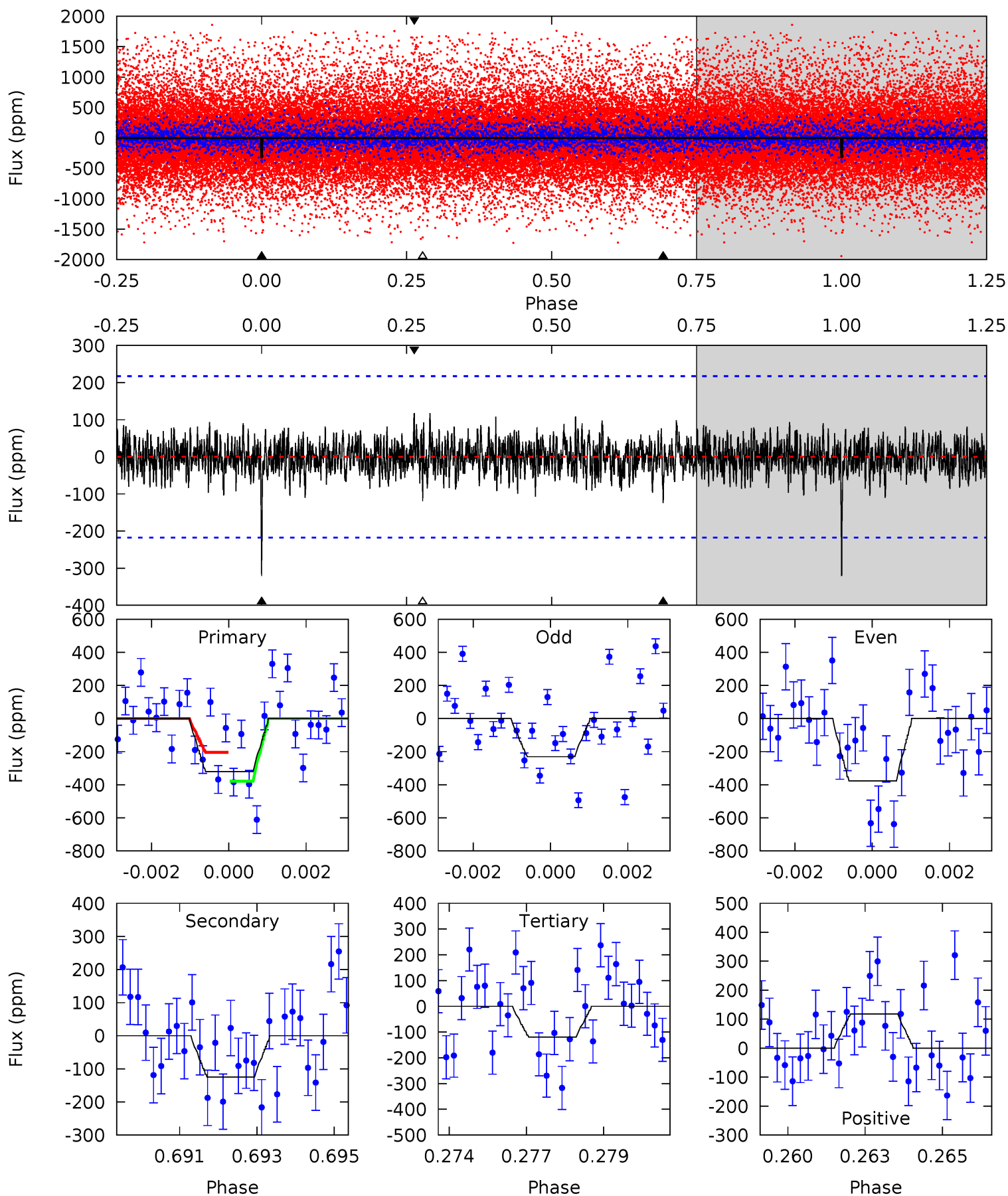
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	5.01	4.84	5.67	5.29	3.02	1.62	5.91	5.08	0.16	-0.66	0.72	1.08	0.35	0.73



# Alt Model-Shift Uniqueness Test

004762283-01, P = 42.049974 Days, E = 125.288072 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
7.81	3.03	2.92	2.87	5.30	3.05	0.86	4.90	4.94	0.11	0.16	1.78	1.01	0.27	2.10



### Stellar Parameters For KIC 004762283

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4281^{+115}_{-140}$	$4.761^{+0.077}_{-0.033}$	$-1.180^{+0.300}_{-0.350}$	$0.480^{+0.034}_{-0.064}$	$0.485^{+0.037}_{-0.046}$	$6.177^{+2.348}_{-0.797}$
	+3%/-3%	+2%/-1%	+25%/-30%	+7%/-13%	+8%/-9%	+38%/-13%
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 004762283-01 / KOI 7706.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-273 \pm 55$	$1.63^{+1.34}_{-1.06}$	$421^{+14}_{-16}$	$3416^{+1590}_{-547}$	$1885^{+13488}_{-1287}$
Alt.	$-124 \pm 41$	$1.34^{+1.25}_{-0.86}$	$420^{+16}_{-17}$	$3214^{+1307}_{-576}$	$1268^{+9184}_{-954}$

$T_{\text{max}}$  = 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

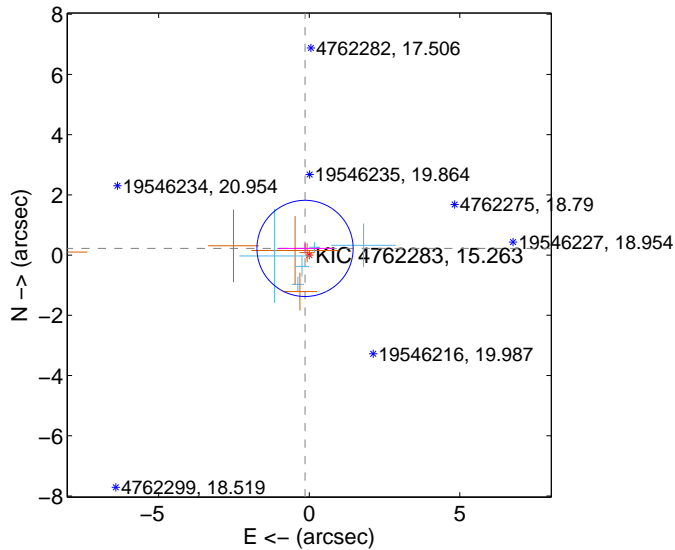
Supplemental centroid analysis for 004762283-01. Kepler magnitude: 15.26. Transit SNR 6.77

There are 5 quarters with good PRF difference image offsets

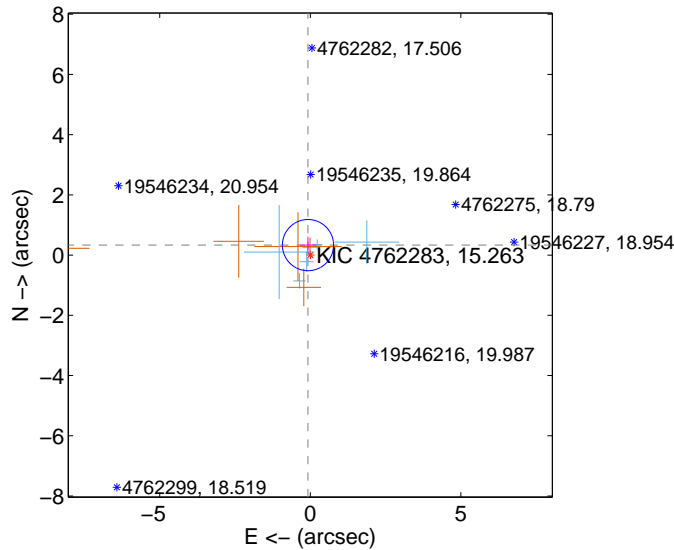
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.262 \pm 0.532$	0.49	$0.139 \pm 0.925$	$0.222 \pm 0.172$
PRF-fit source offset from KIC position	$0.341 \pm 0.283$	1.20	$0.076 \pm 0.276$	$0.332 \pm 0.284$
photometric centroid source offset	$2.34 \pm 1.45$	1.61	$1.46 \pm 1.20$	$-1.82 \pm 1.59$

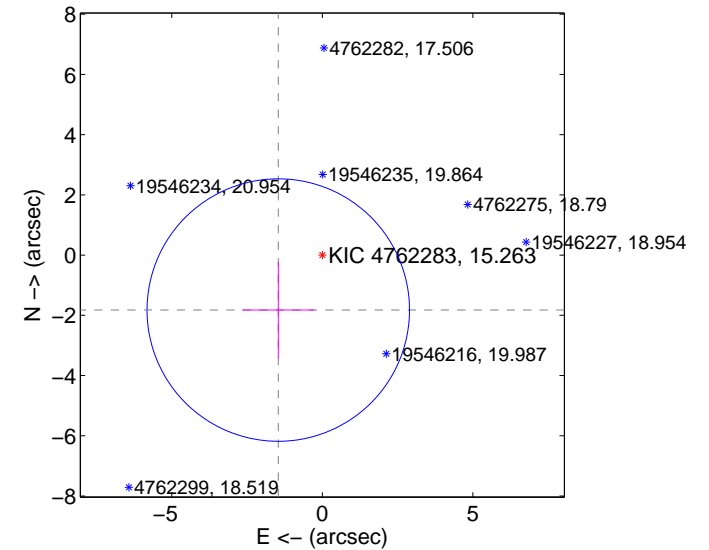
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

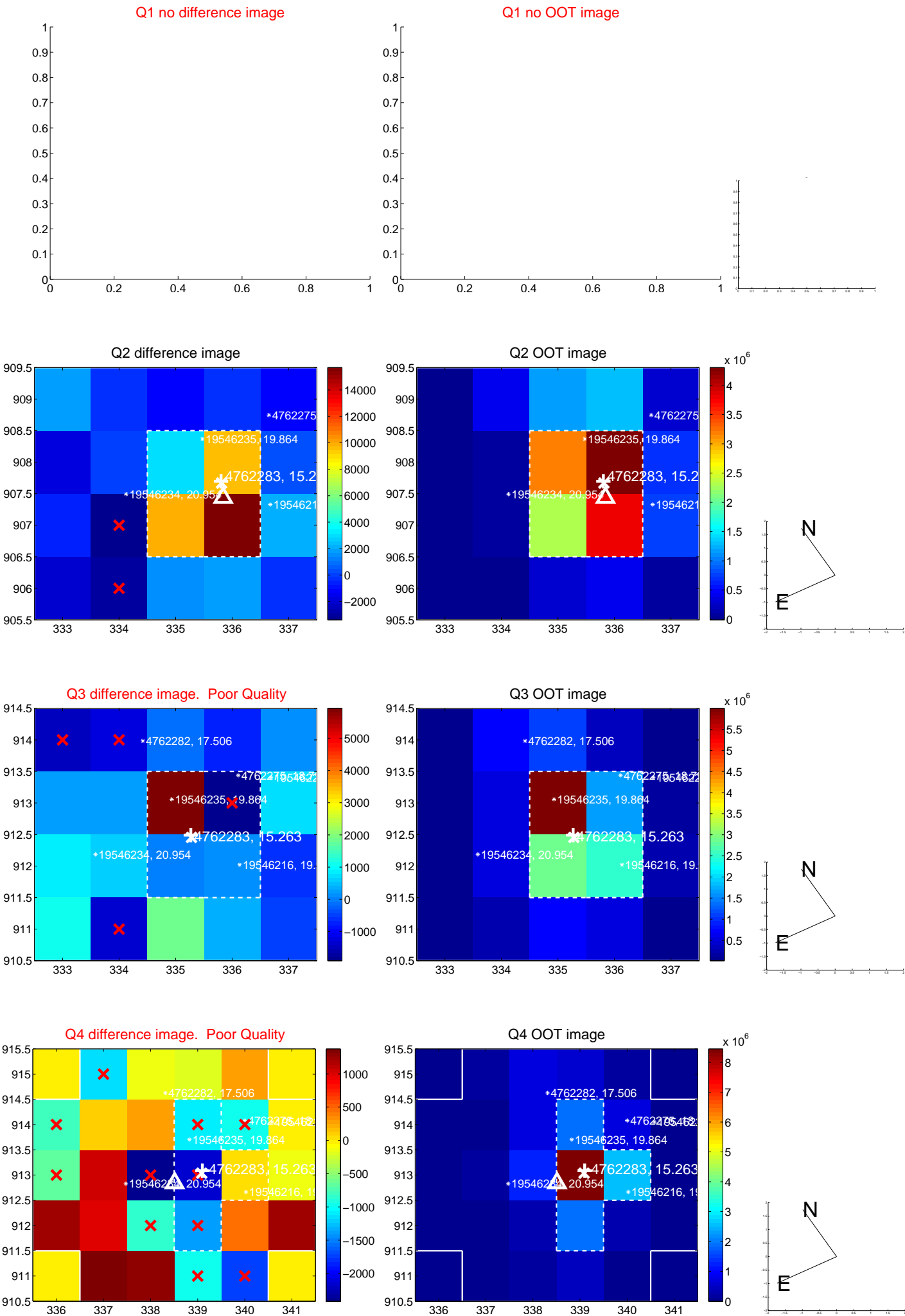


offset from photometric centroids



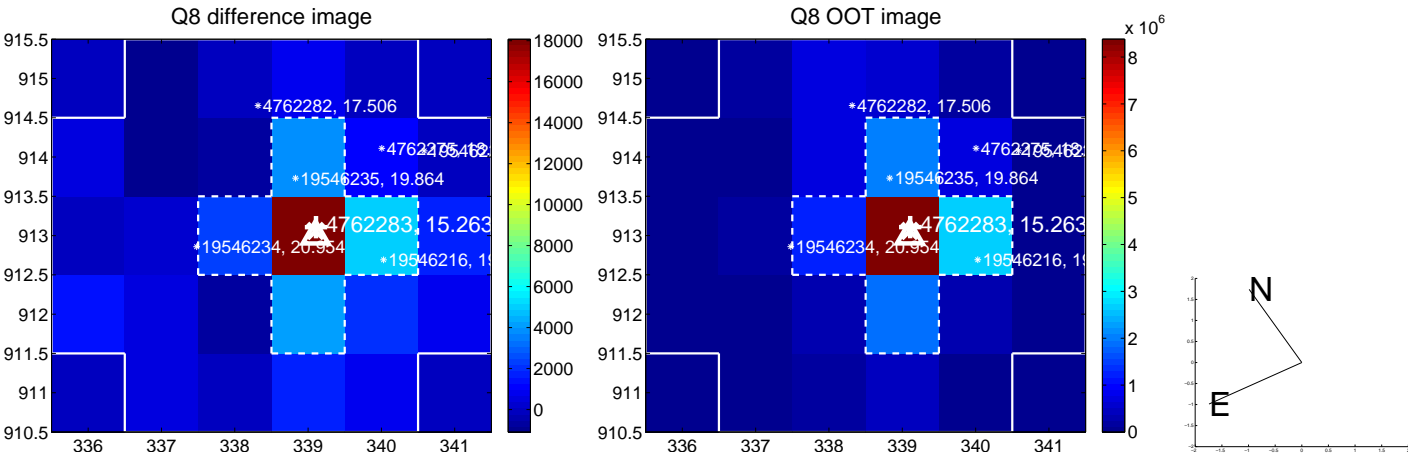
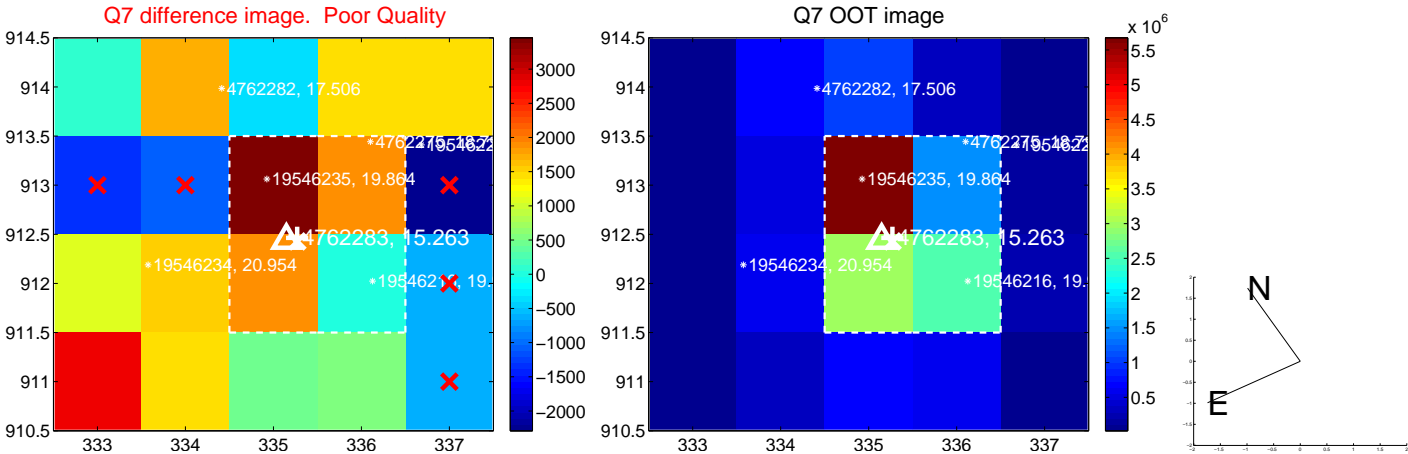
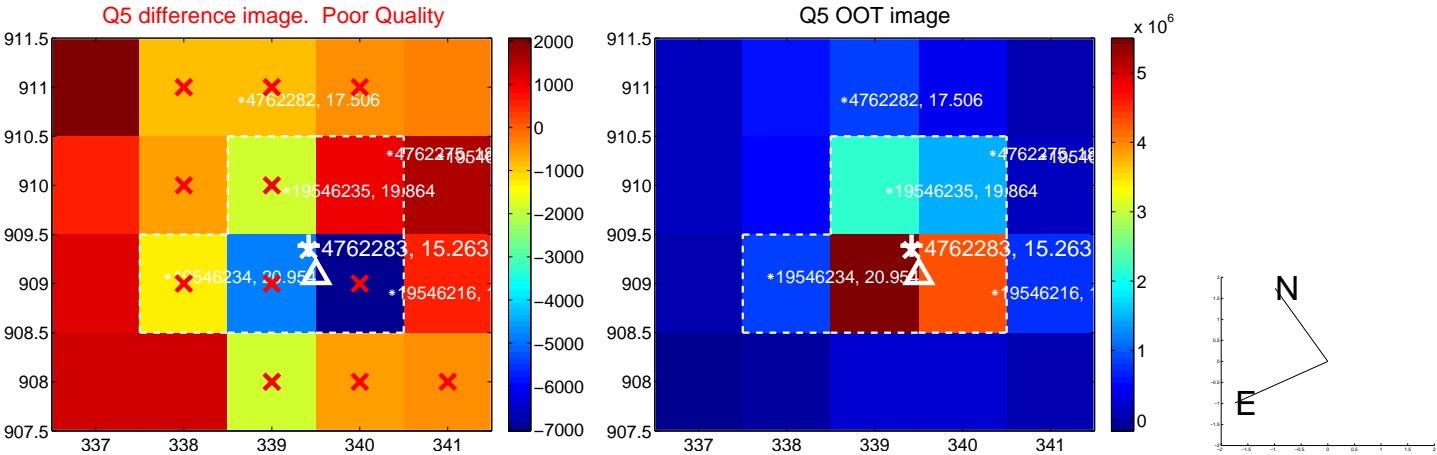
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

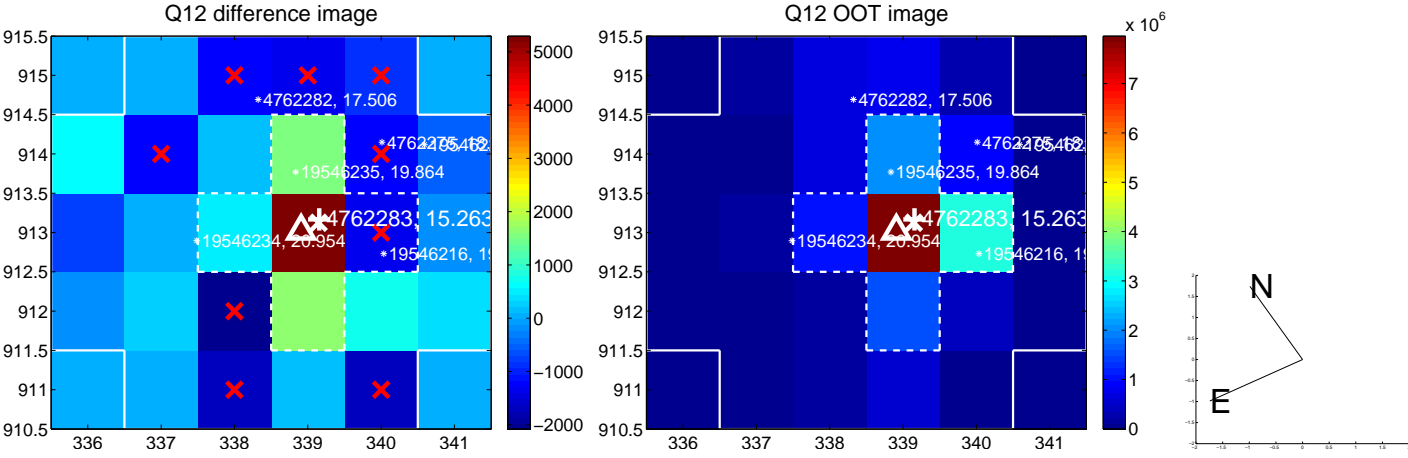
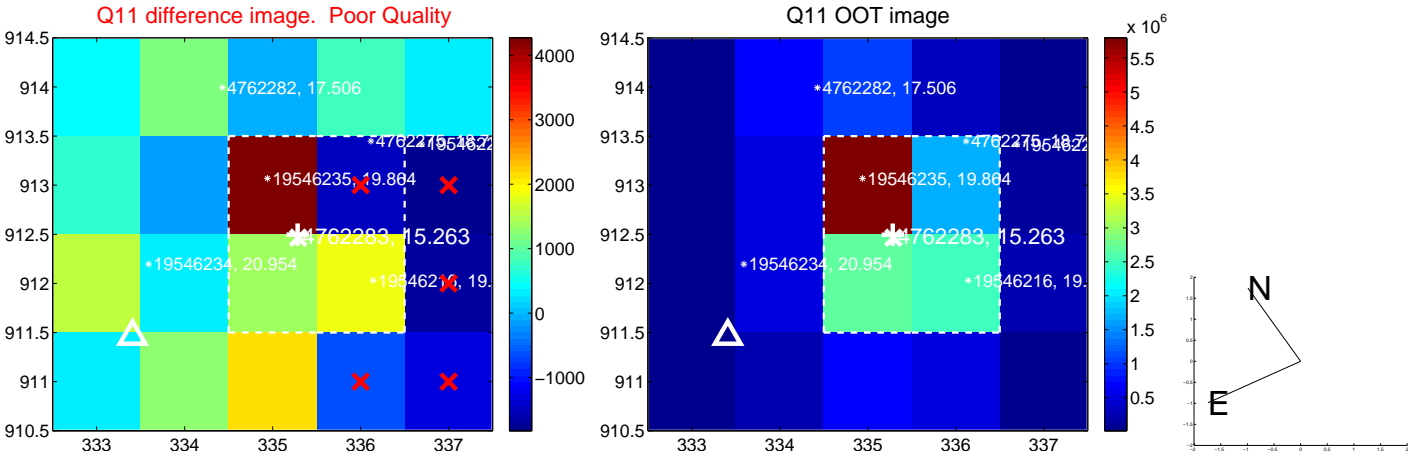
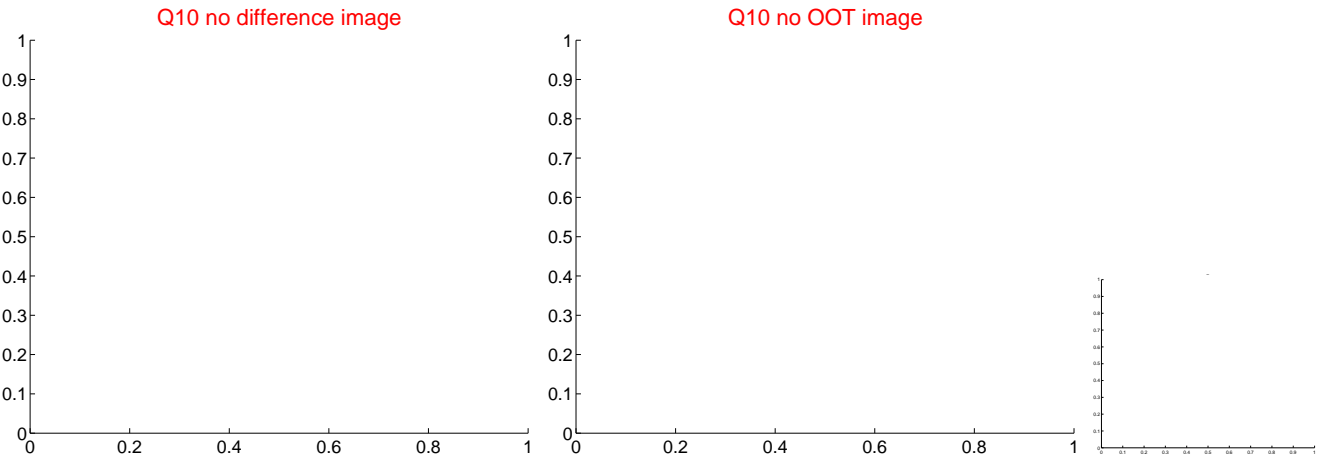
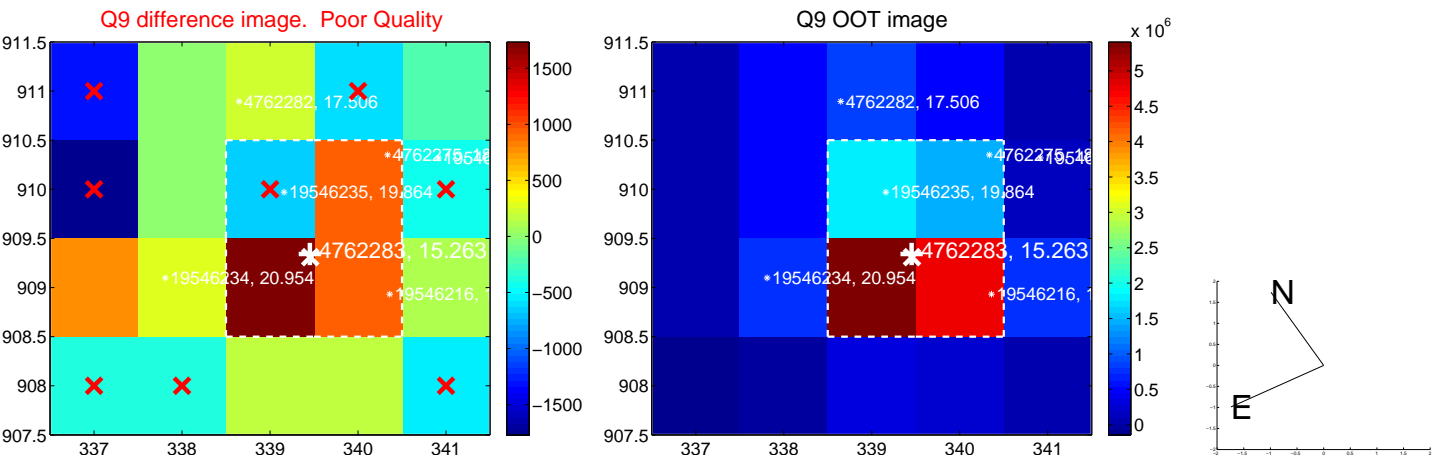




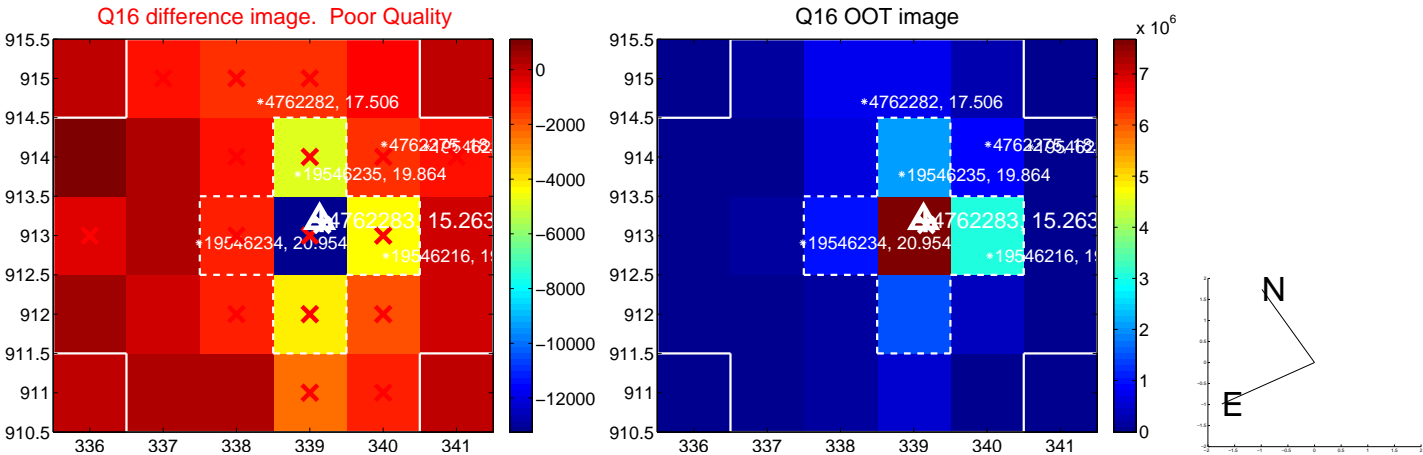
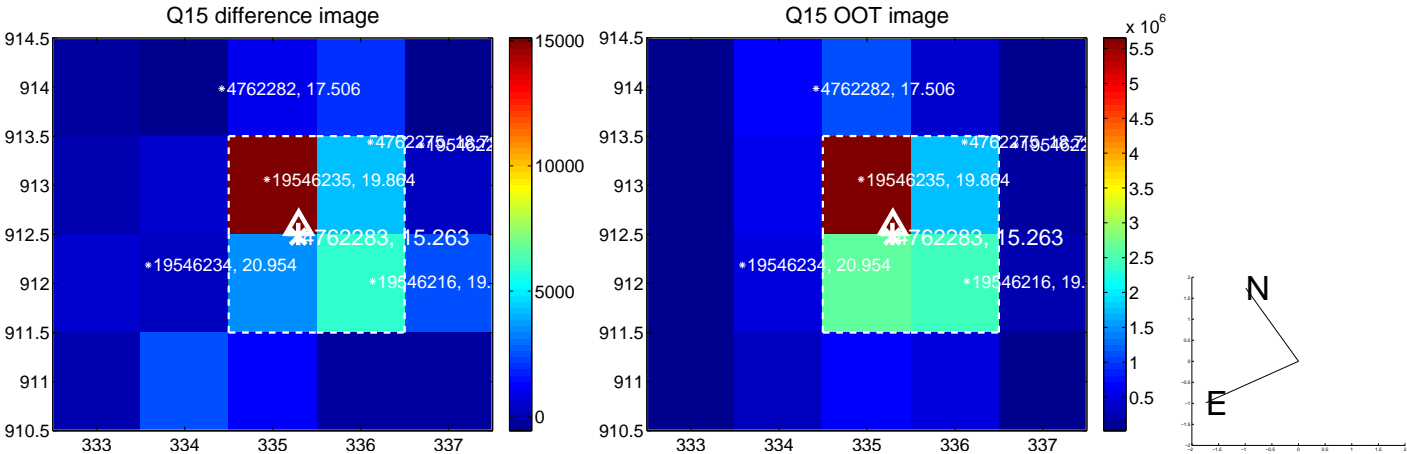
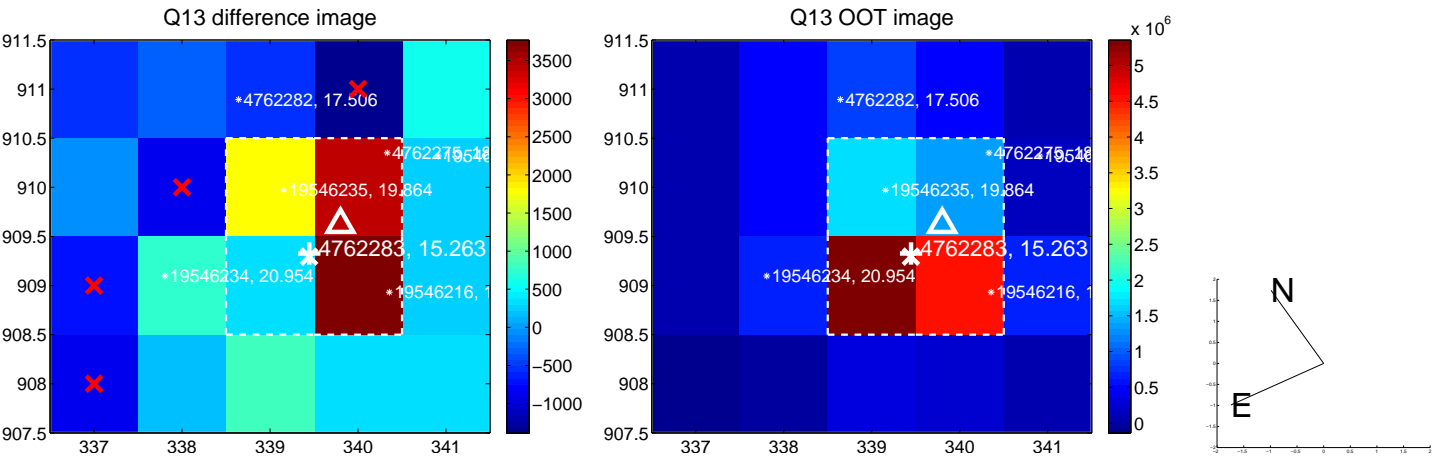
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



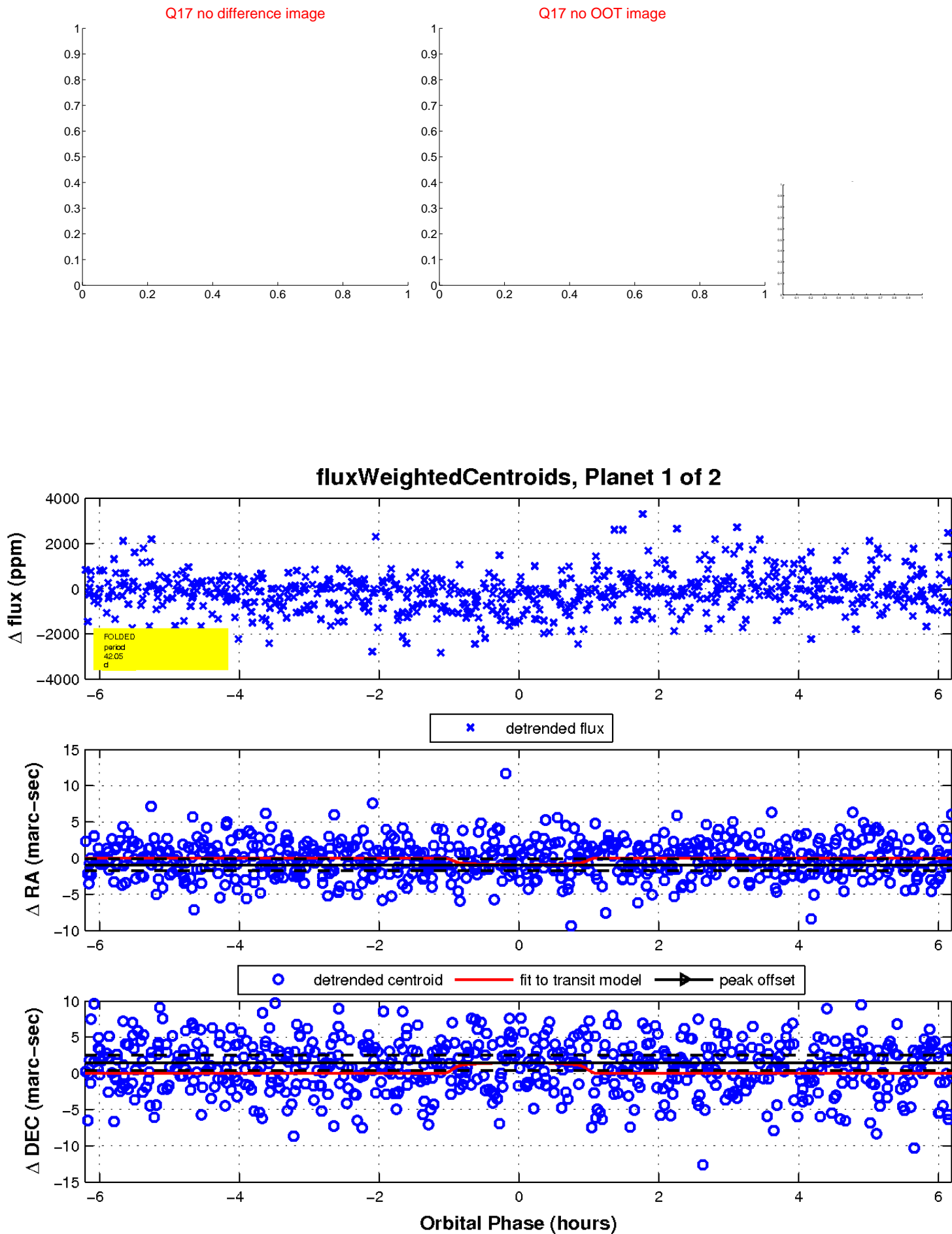
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

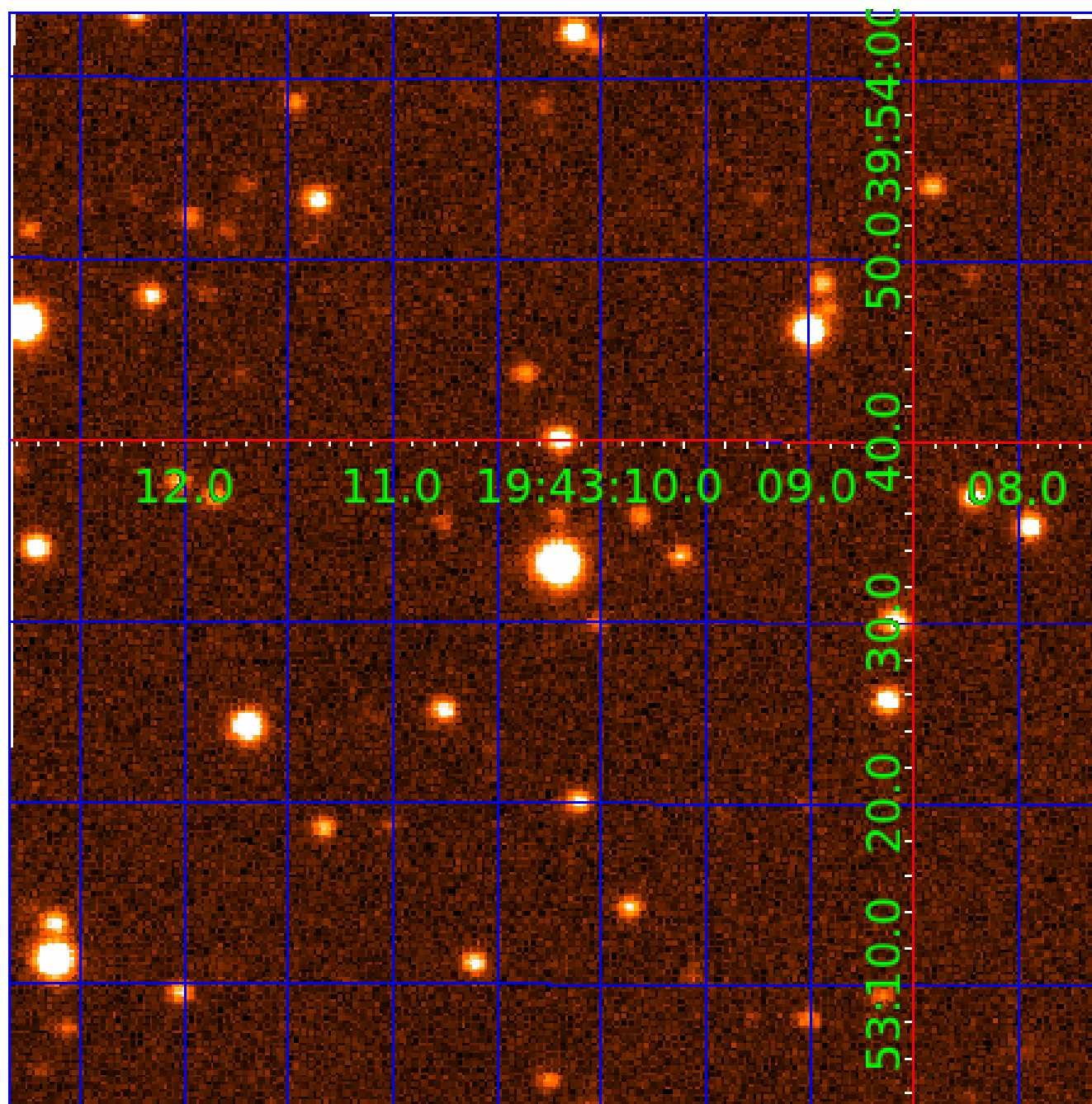


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 004762283

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004762283-01	OBS	7706.01	42.049525	167.346149	636.4	2.071	7.5	6.8	0.48	4281	1.32	2.00
004762283-02	OBS	No	236.528471	331.336084	2232.8	4.207	9.9	7.0	0.48	4281	2.41	0.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004762283-01	OBS	PC	0.84	0	0	0	0	NO_COMMENT
004762283-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—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.

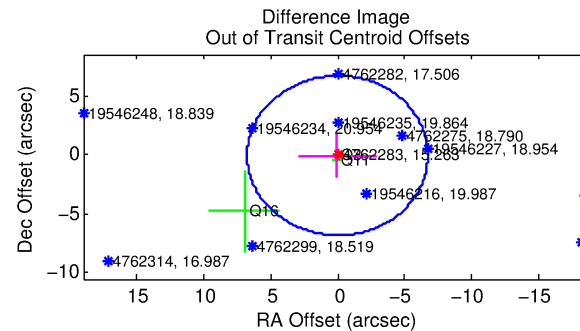
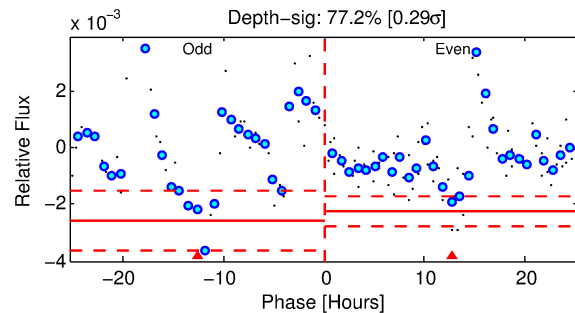
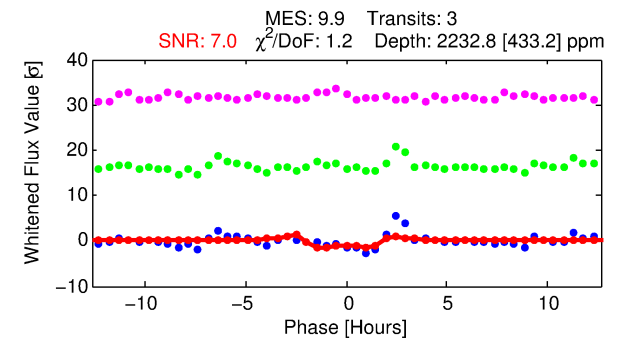
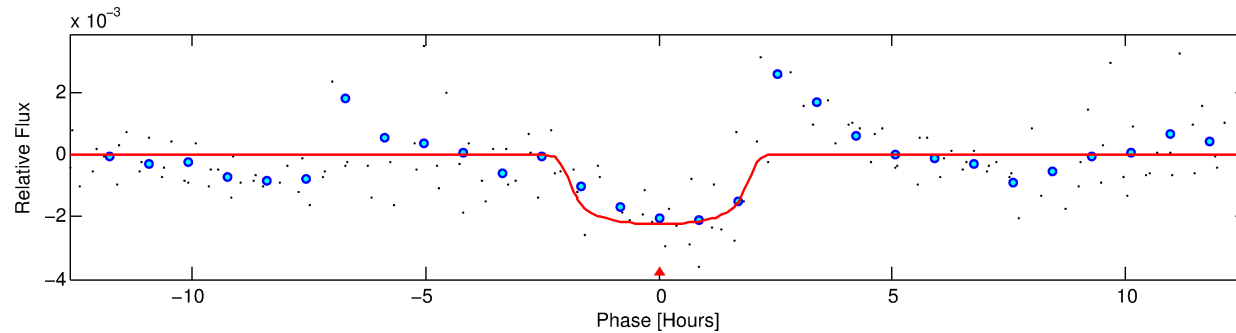
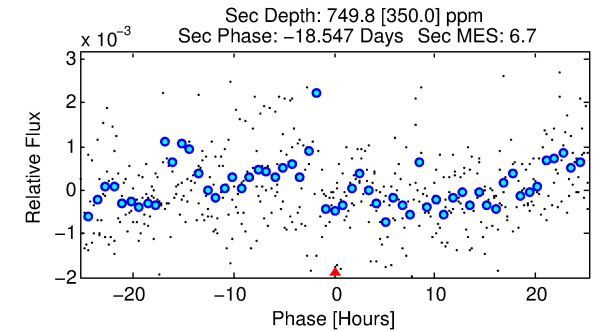
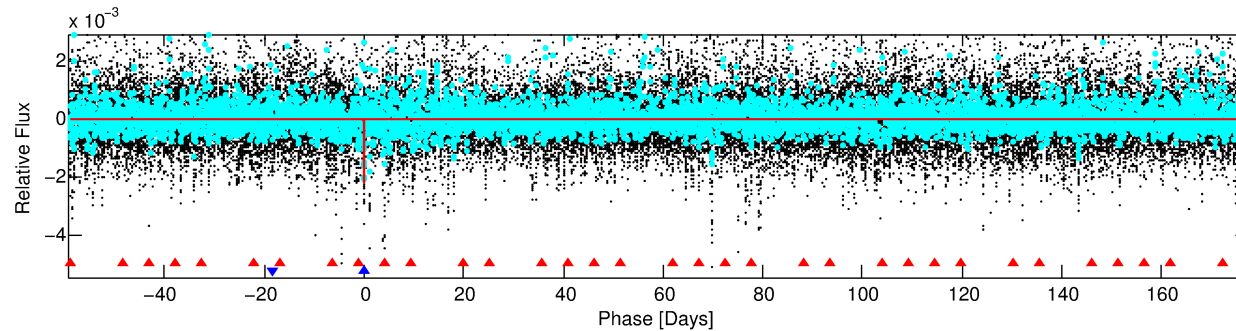
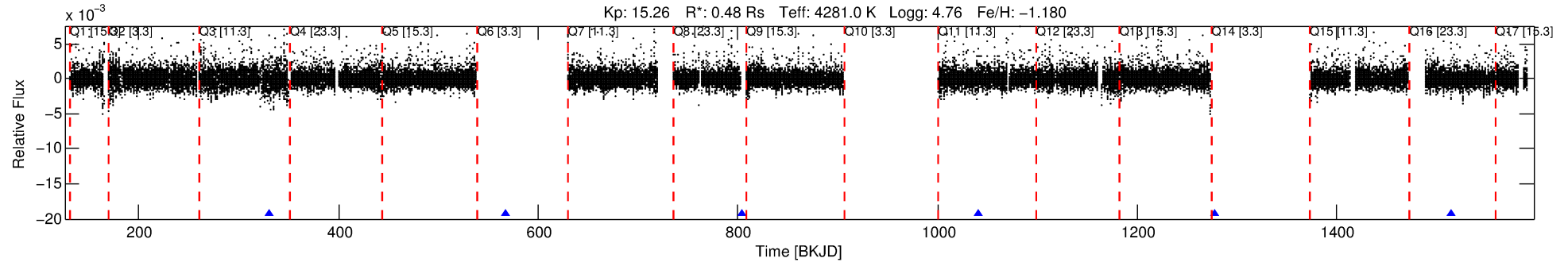
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004762283-02

No Significant Match Found

# DV One-Page Summary

KIC: 4762283 Candidate: 2 of 2 Period: 236.528 d



## DV Fit Results:

Period = 236.52847 [0.00263] d  
Epoch = 331.3361 [0.0095] BKJD  
Rp/R\* = 0.0460 [0.0190]  
a/R\* = 344.30 [590.60]  
b = 0.67 [1.41]  
Seff = 0.20 [0.04]  
Teq = 171 [8] K  
Rp = 2.41 [1.05] Re  
a = 0.5881 [0.0628] AU  
Ag = 24622.56 [23700.20] [1.04 $\sigma$ ]  
Teffp = 3305 [793] K [3.95 $\sigma$ ]

## DV Diagnostic Results:

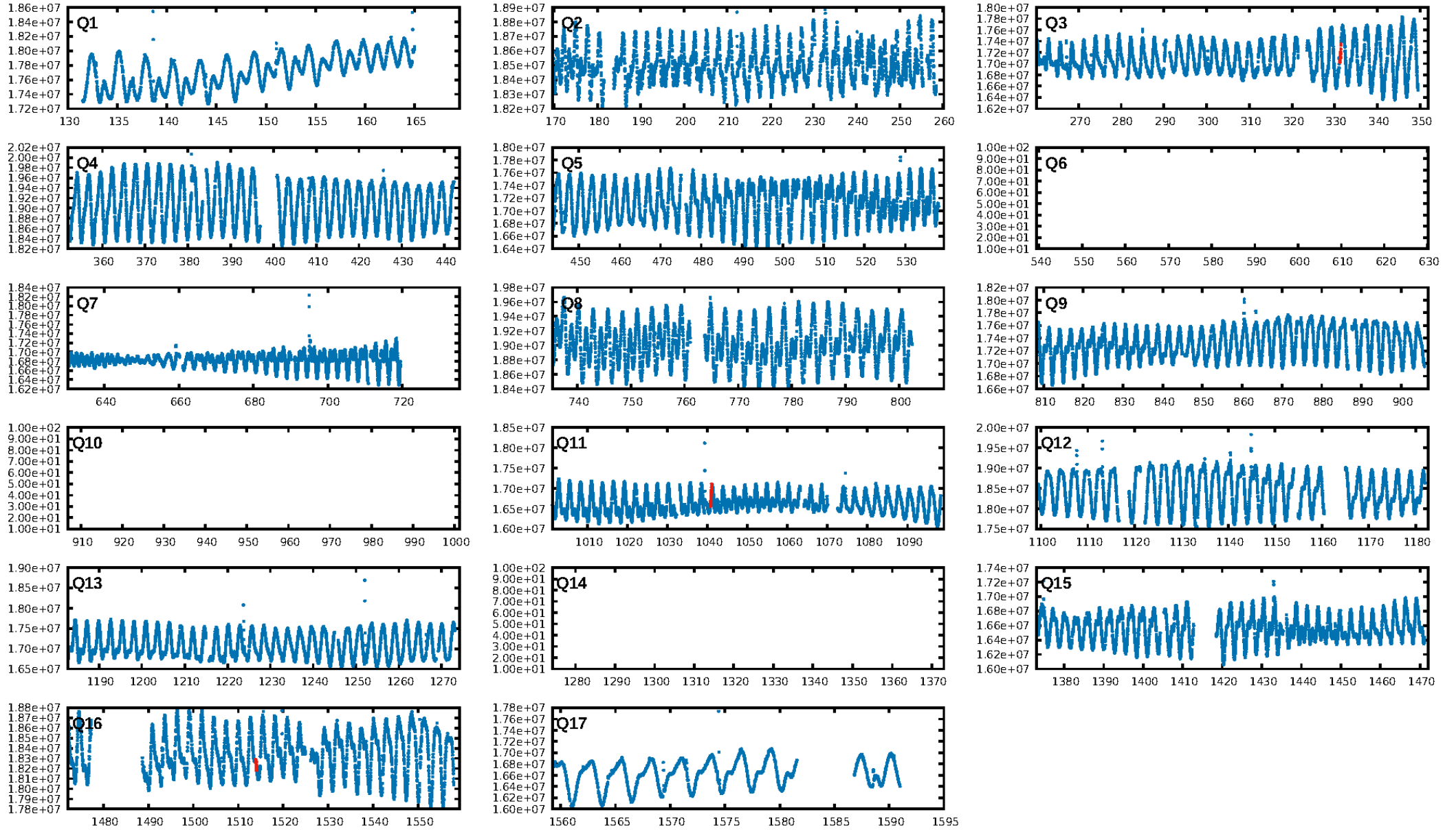
ShortPeriod-sig: 100.0% [995.47 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 54.5%  
ModelChiSquareGof-sig: 79.9%  
Bootstrap-pfa: 4.88e-10  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.442  
Centroid-sig: 3.6%  
Centroid-so: 0.844 arcsec [0.89 $\sigma$ ]  
OotOffset-rm: 0.061 arcsec [0.03 $\sigma$ ]  
OotOffset-st: 0/2/1/0 [3]  
KicOffset-rm: 0.106 arcsec [0.09 $\sigma$ ]  
KicOffset-st: 0/2/1/0 [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: 30-Jan-2016 04:51:36 Z

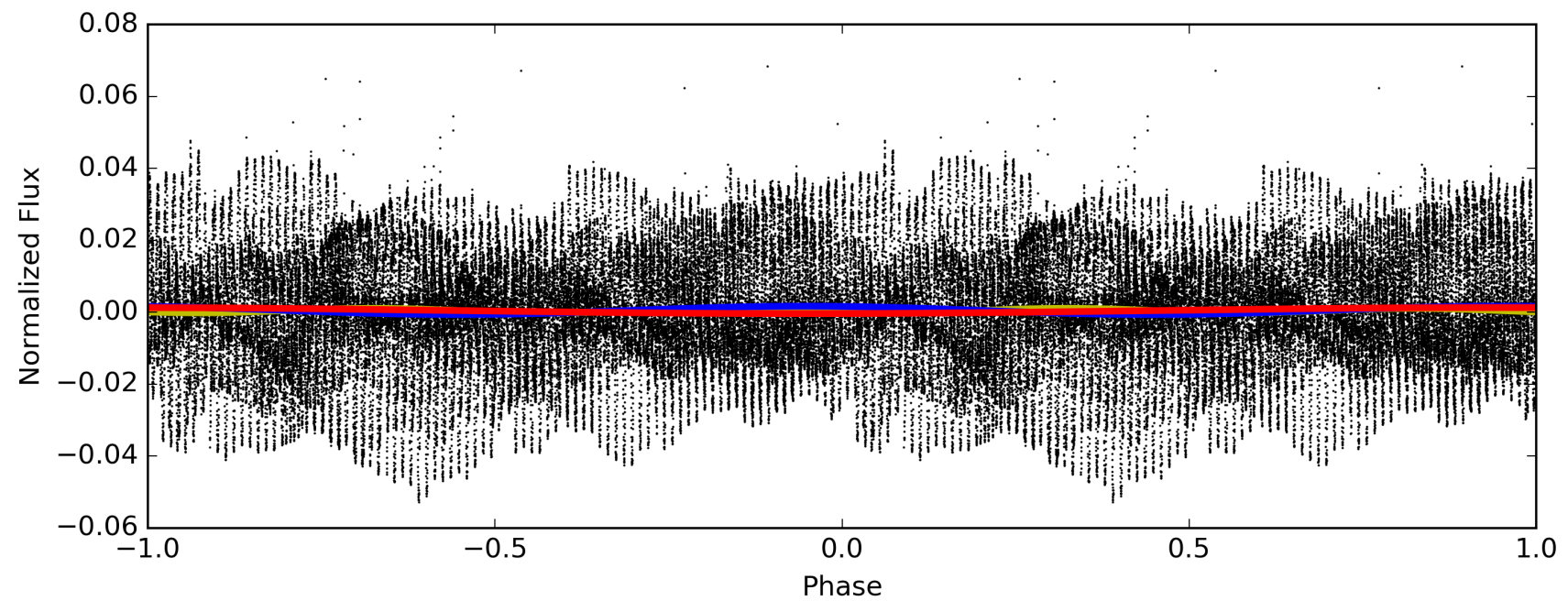
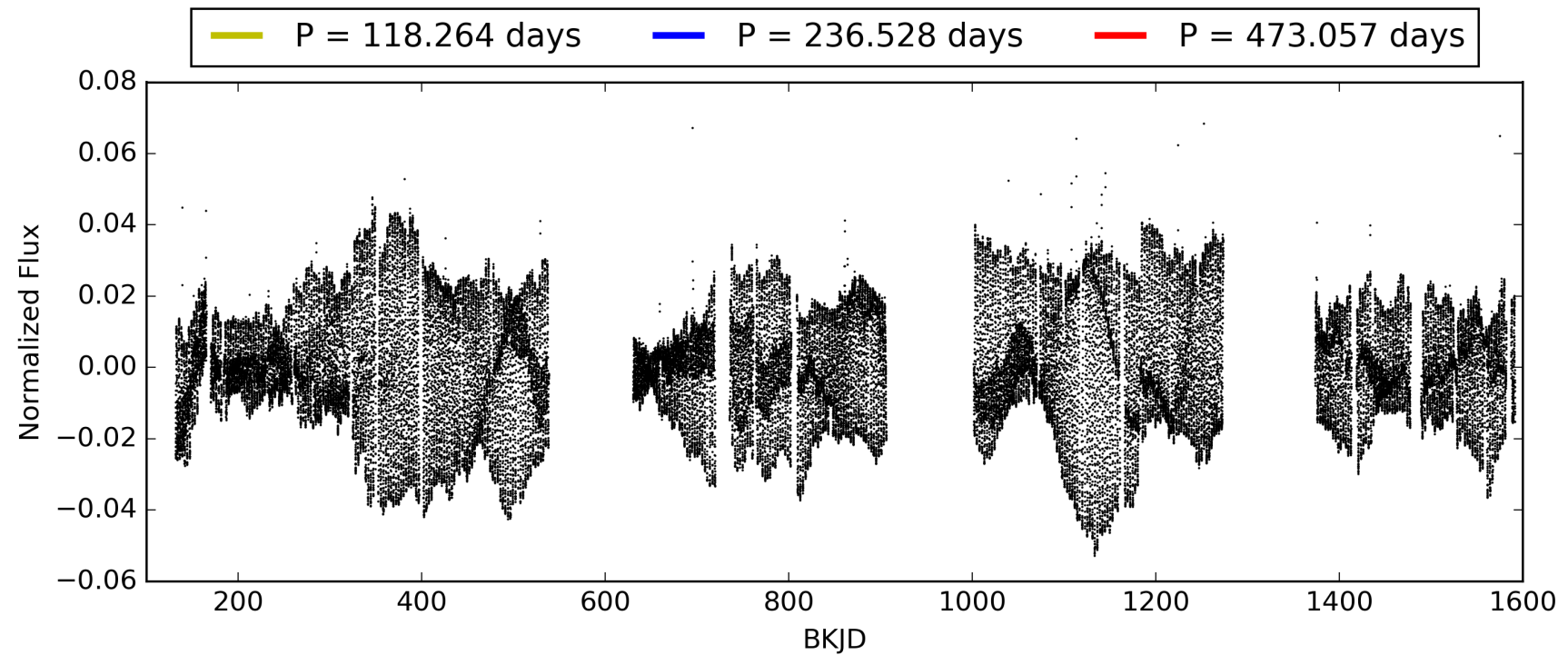
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 004762283-02, PDC Light Curves

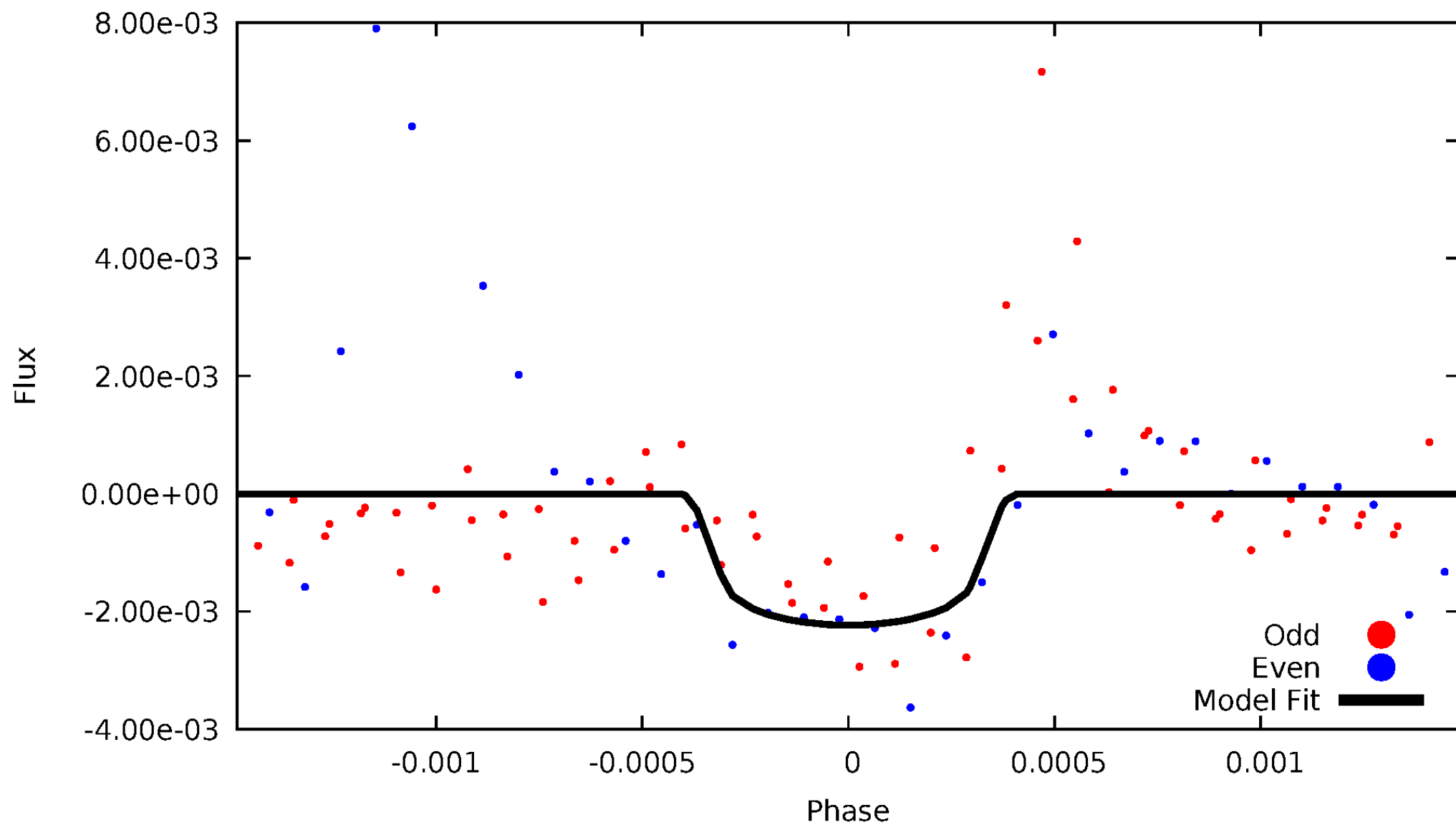


TCE 004762283-02



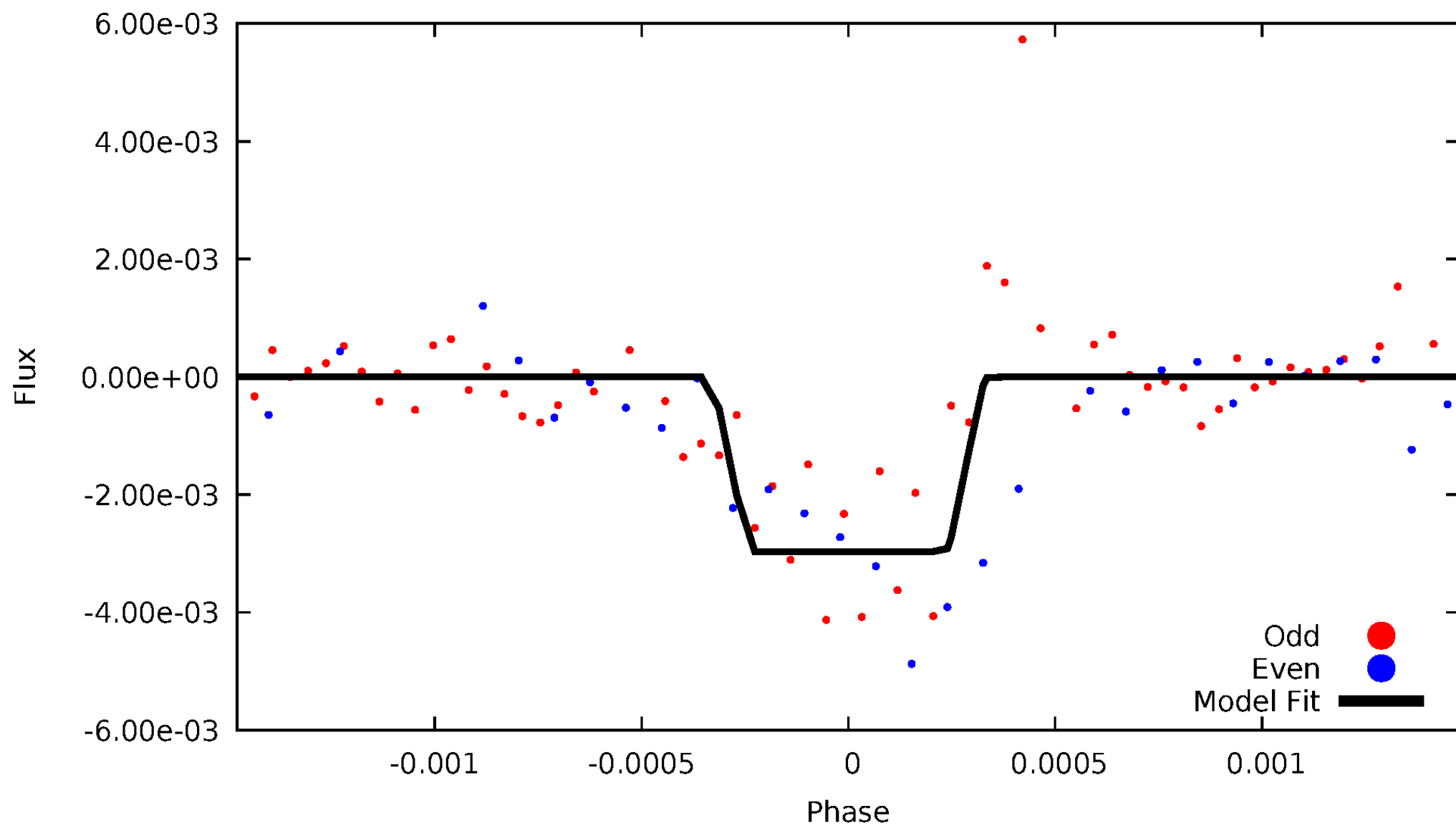
# DV Odd/Even

TCE 004762283-02



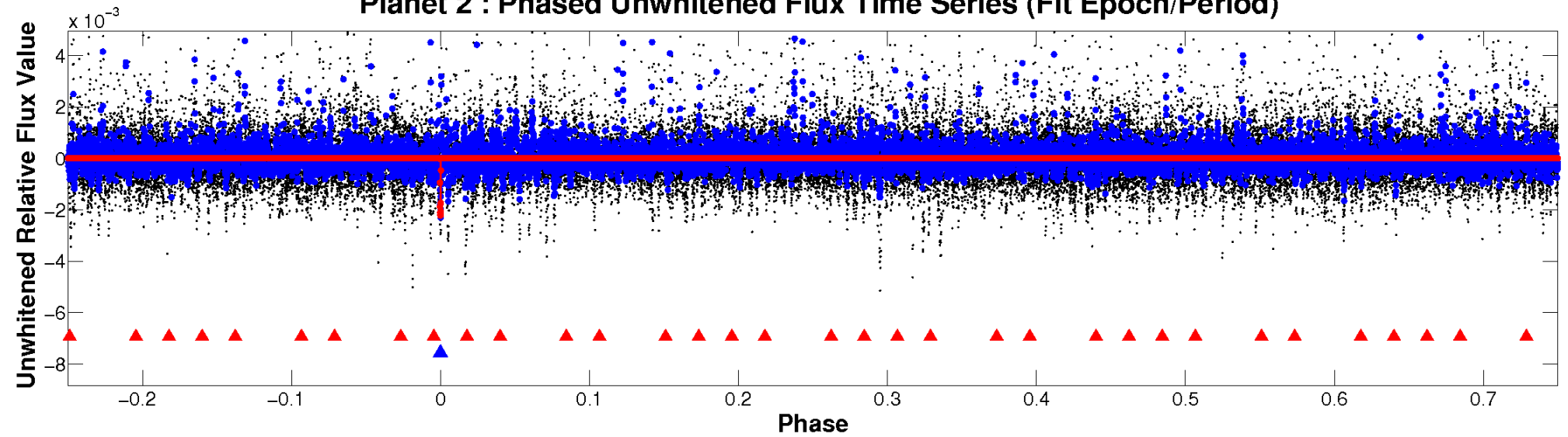
# ALT Odd/Even

TCE 004762283-02

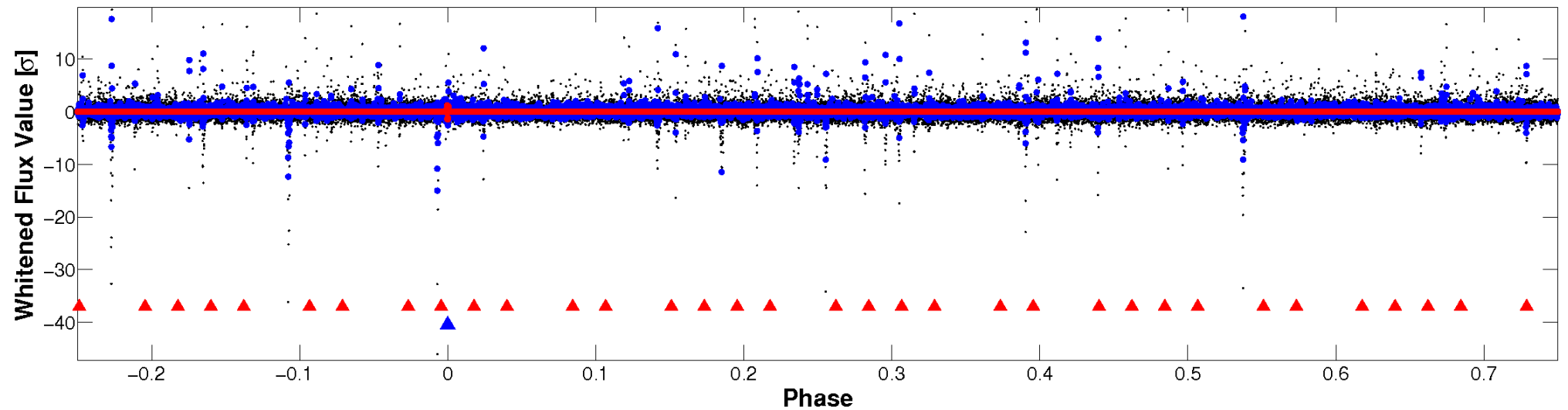


# Non-Whitened Vs. Whitened Light Curve

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

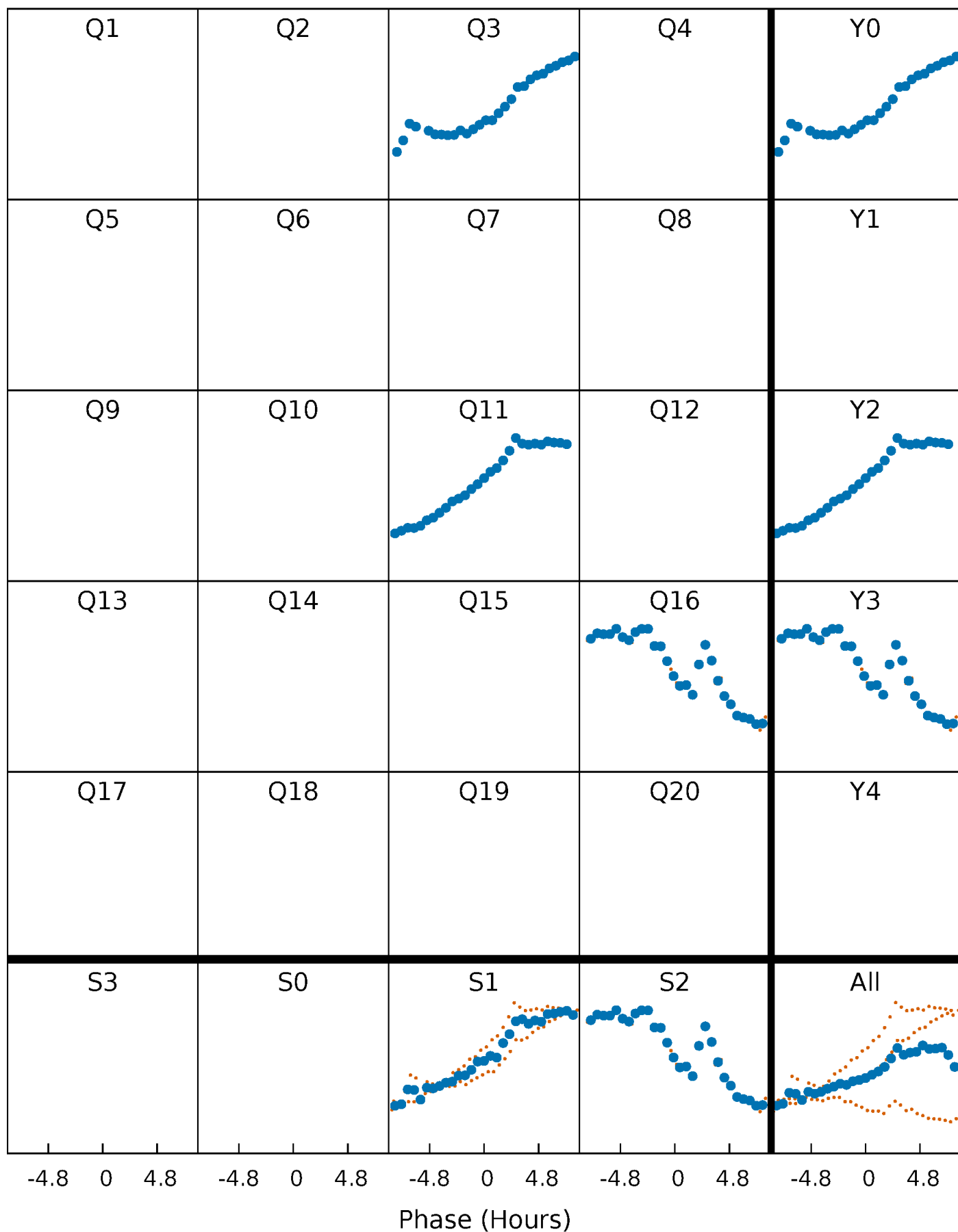


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



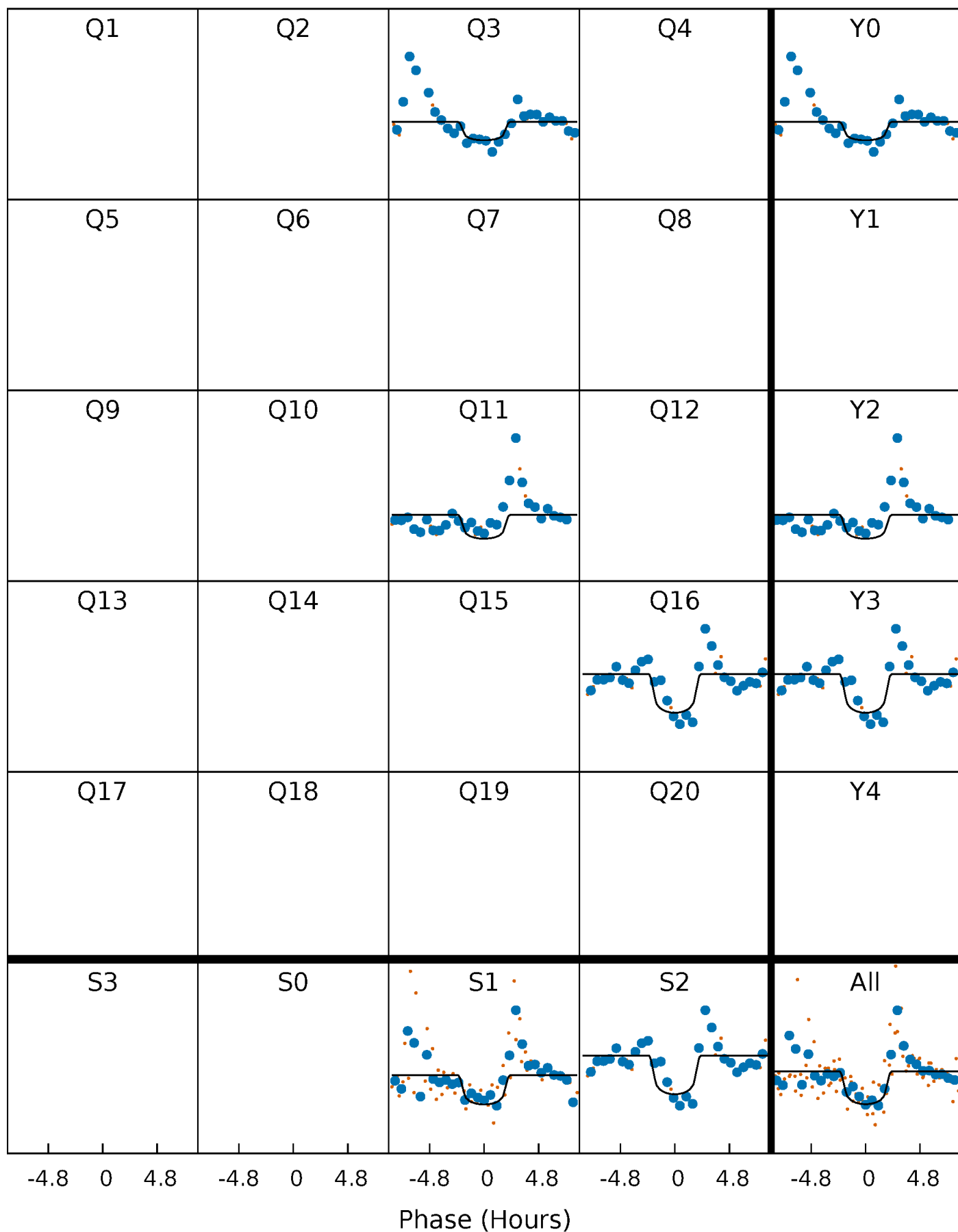
# PDC Quarter-Phased Transit Curves

TCE 004762283-02     $P=236.528470$  Days     $T_0=331.336084$  (BKJD)



# DV Quarter-Phased Transit Curves

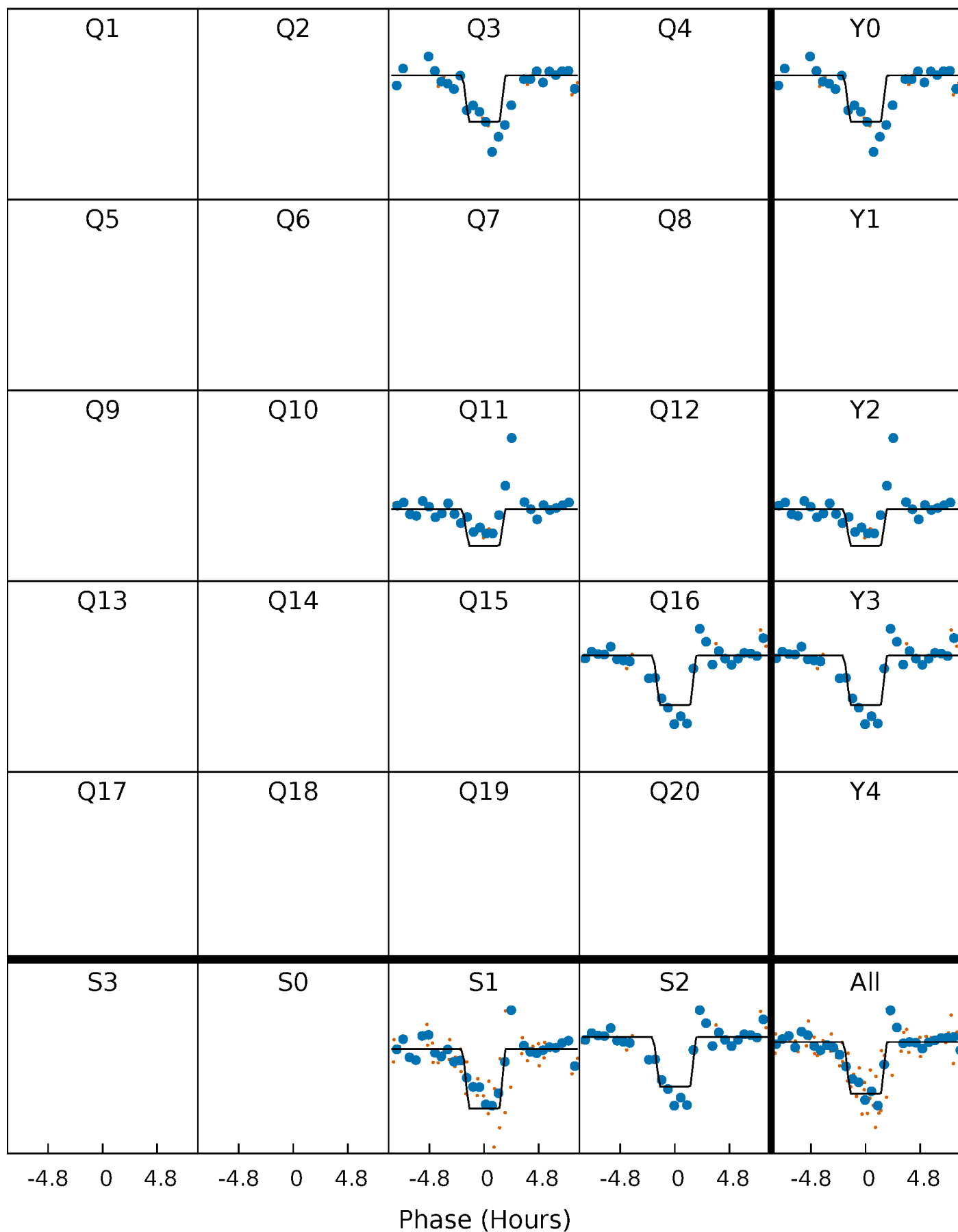
TCE 004762283-02     $P=236.528470$  Days     $T_0=331.336084$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

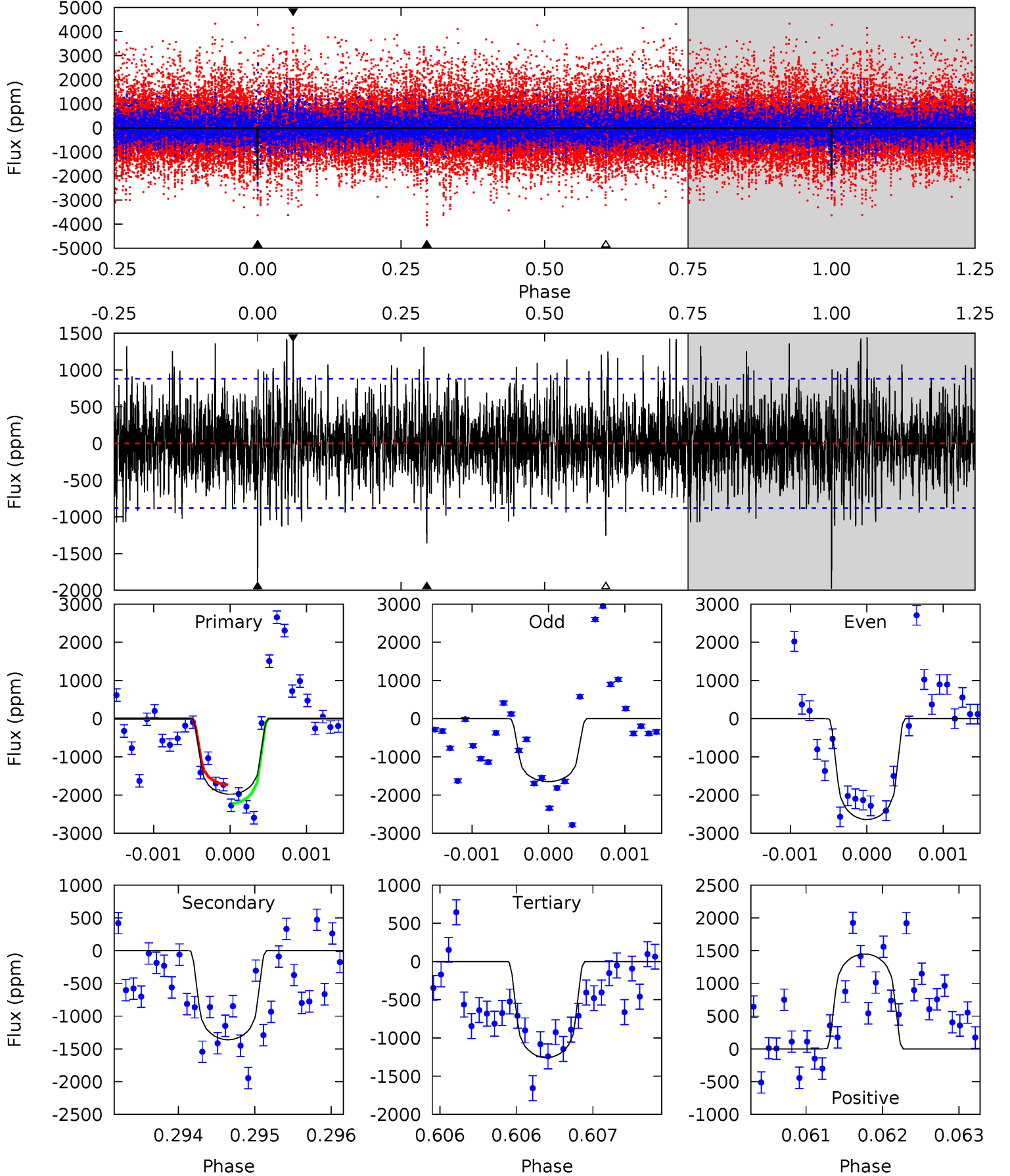
TCE 004762283-02     $P=236.532383$  Days     $T_0=331.335591$  (BKJD)



# DV Model-Shift Uniqueness Test

004762283-02, P = 236.528470 Days, E = 94.807614 Days

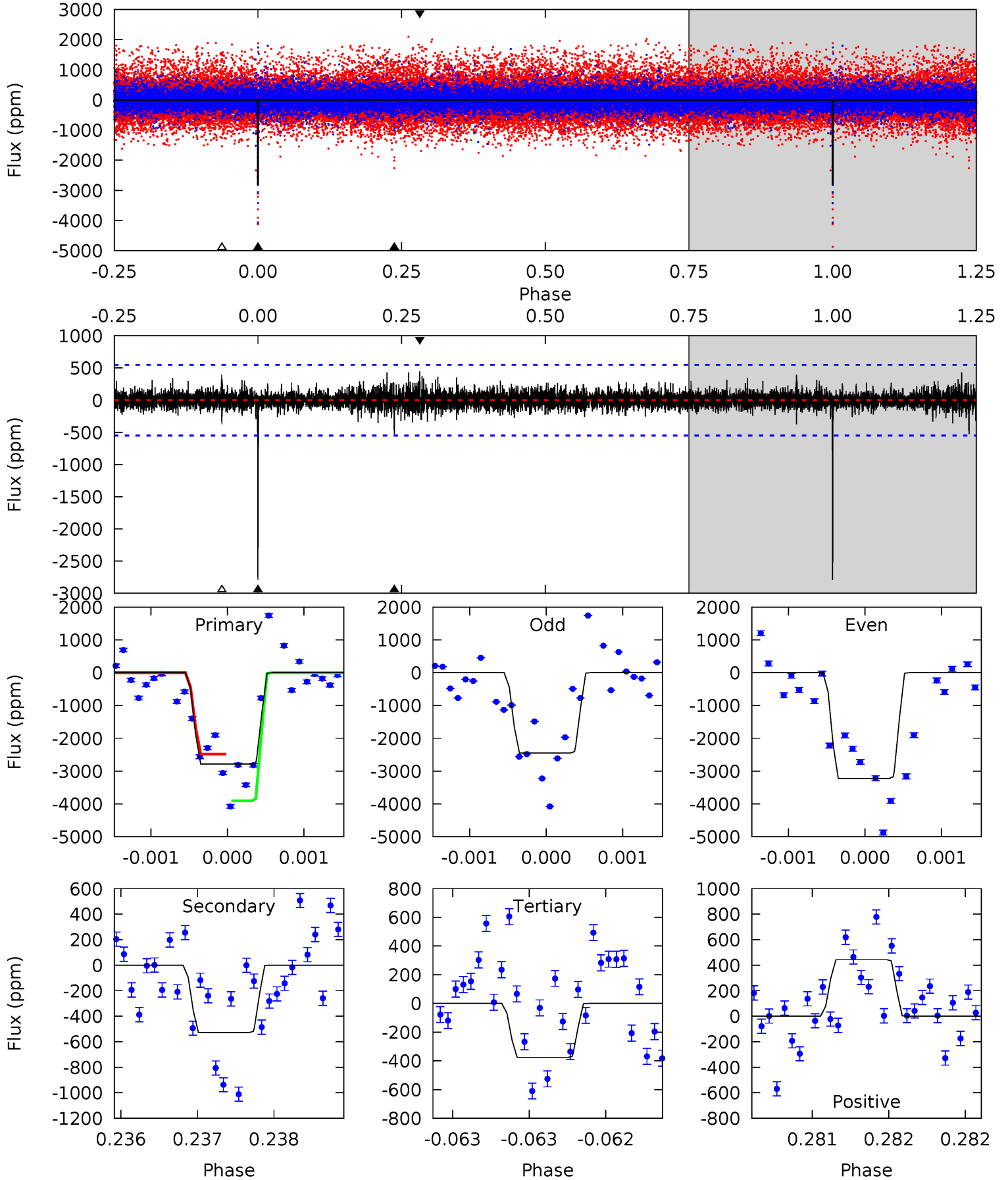
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	8.46	7.81	9.01	5.49	3.35	2.20	4.48	3.29	0.64	-0.55	2.76	0.90	0.42	1.54



# Alt Model-Shift Uniqueness Test

004762283-02, P = 236.532383 Days, E = 94.803208 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
28.0	5.31	3.78	4.45	5.53	3.41	0.85	24.3	23.6	1.53	0.86	3.85	0.87	0.14	6.51



### Stellar Parameters For KIC 004762283

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4281^{+115}_{-140}$	$4.761^{+0.077}_{-0.033}$	$-1.180^{+0.300}_{-0.350}$	$0.480^{+0.034}_{-0.064}$	$0.485^{+0.037}_{-0.046}$	$6.177^{+2.348}_{-0.797}$
	+3%/-3%	+2%/-1%	+25%/-30%	+7%/-13%	+8%/-9%	+38%/-13%
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 004762283-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1359 \pm 161$	$2.36^{+1.09}_{-1.00}$	$237^{+9}_{-10}$	$3948^{+943}_{-454}$	$45553^{+96003}_{-23425}$
Alt.	$-528 \pm 99$	$2.82^{+0.98}_{-1.01}$	$236^{+8}_{-9}$	$3195^{+464}_{-294}$	$12500^{+17578}_{-6115}$

$T_{\text{max}}$  = 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

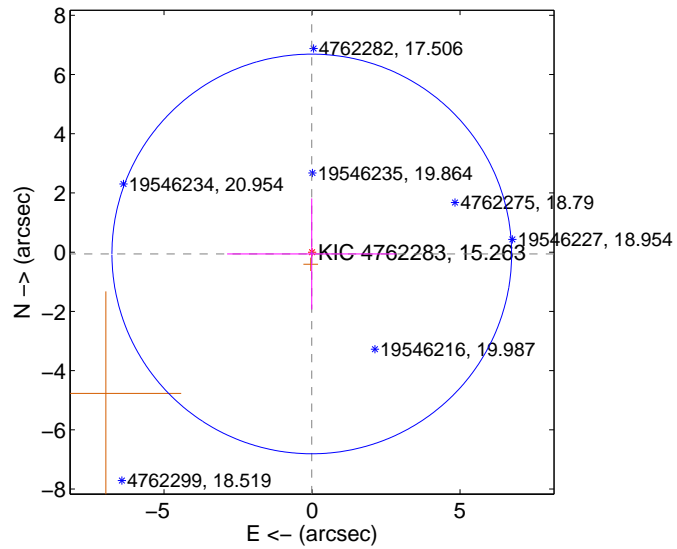
Supplemental centroid analysis for 004762283-02. Kepler magnitude: 15.26. Transit SNR 7.00

There are 1 quarters with good PRF difference image offsets

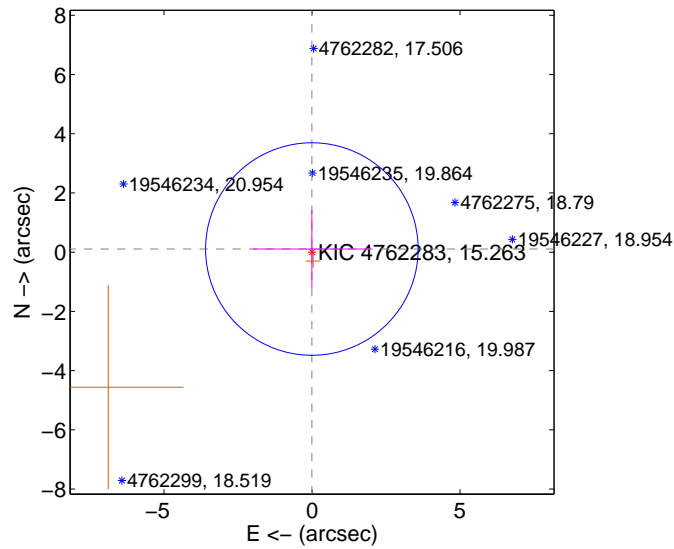
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.061 \pm 2.249$	0.03	$0.008 \pm 2.858$	$-0.061 \pm 1.876$
PRF-fit source offset from KIC position	$0.106 \pm 1.196$	0.09	$0.006 \pm 1.990$	$0.106 \pm 1.317$
photometric centroid source offset	$0.84 \pm 0.95$	0.89	$-0.46 \pm 0.74$	$-0.71 \pm 1.03$

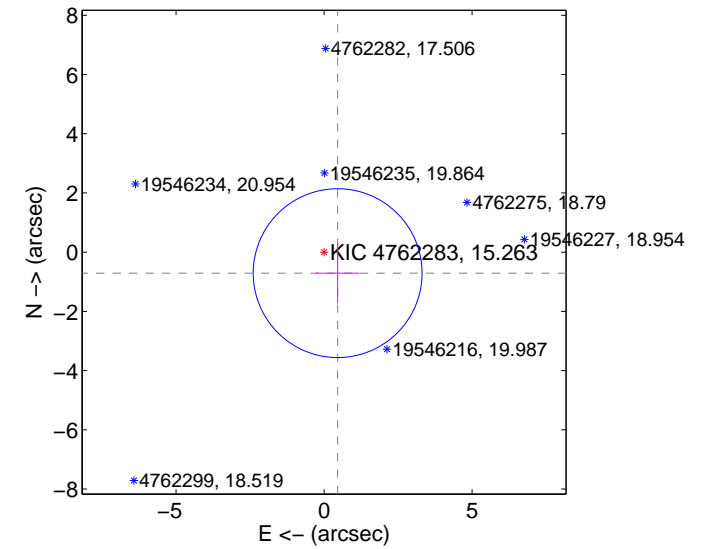
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

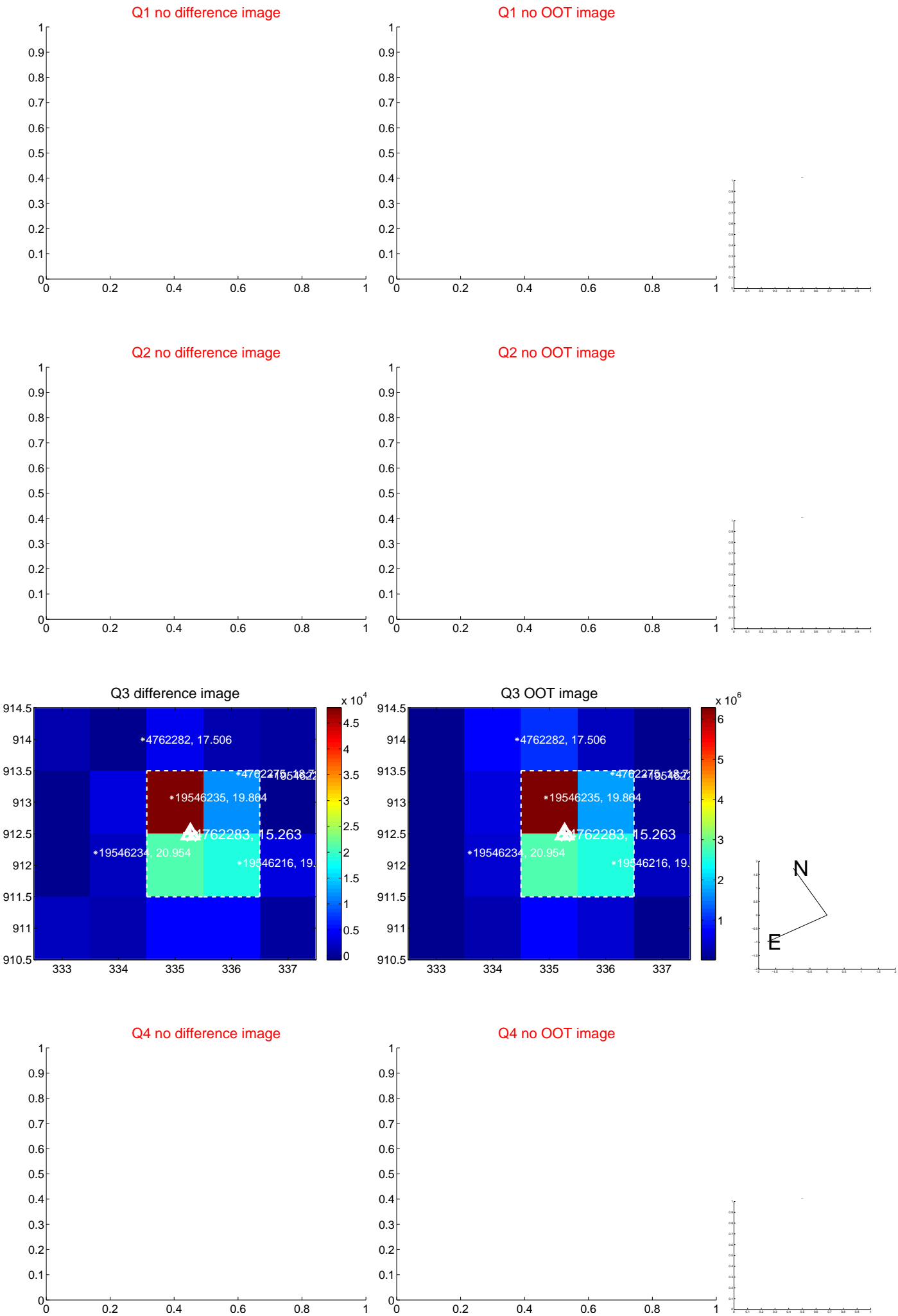


offset from photometric centroids

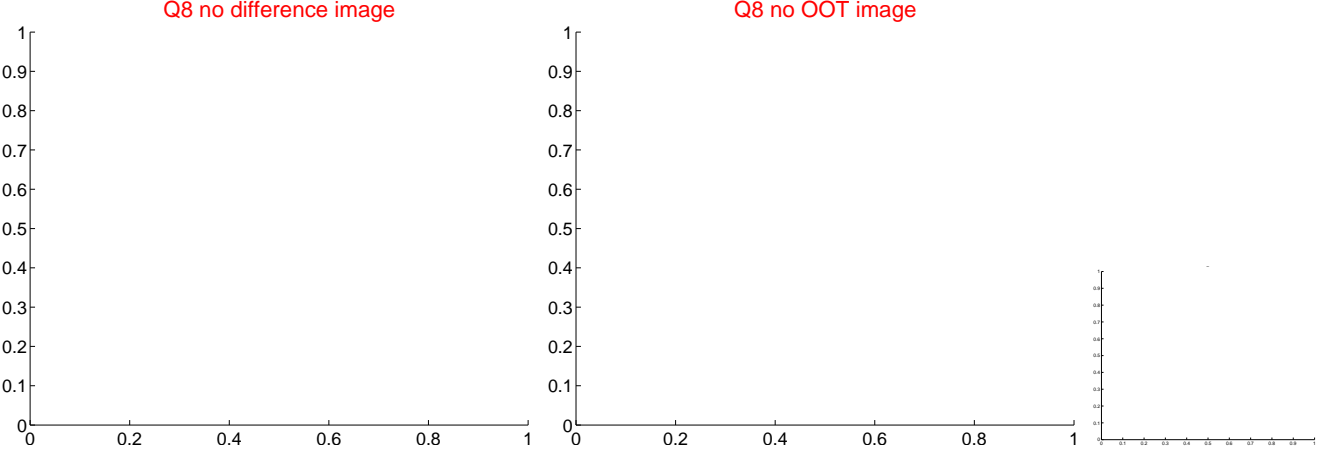
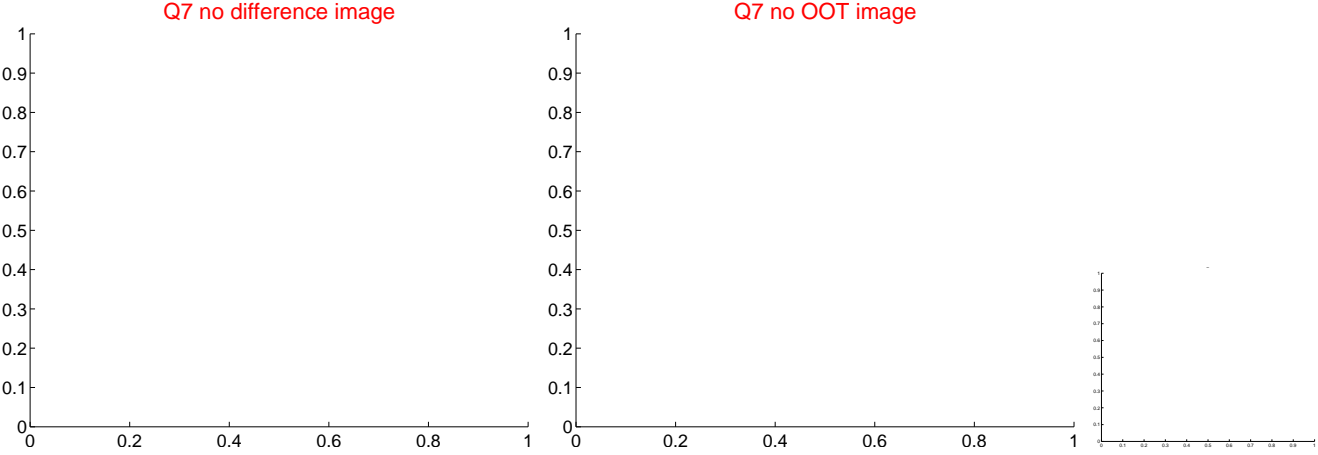
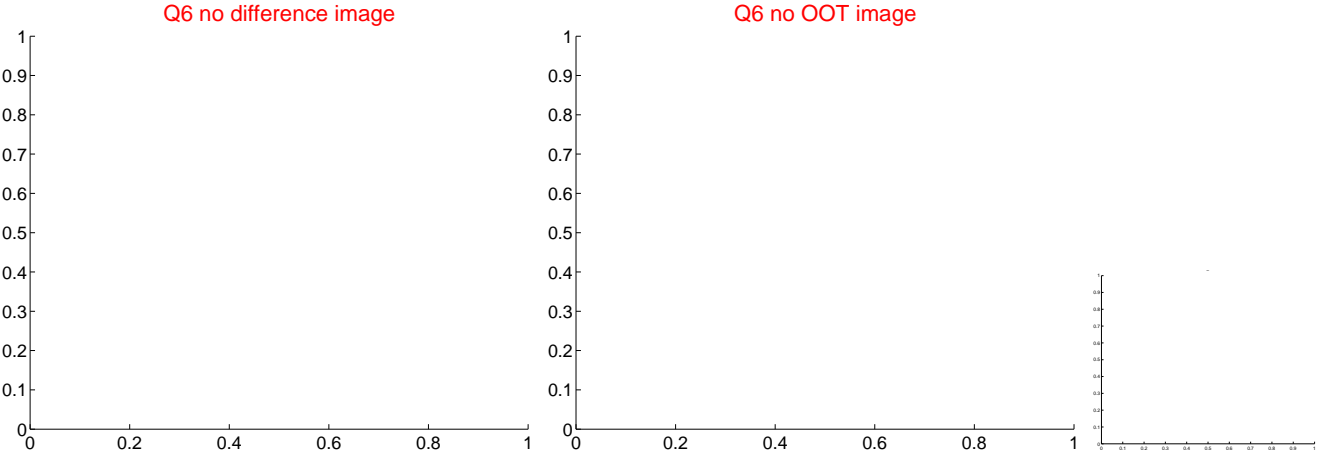
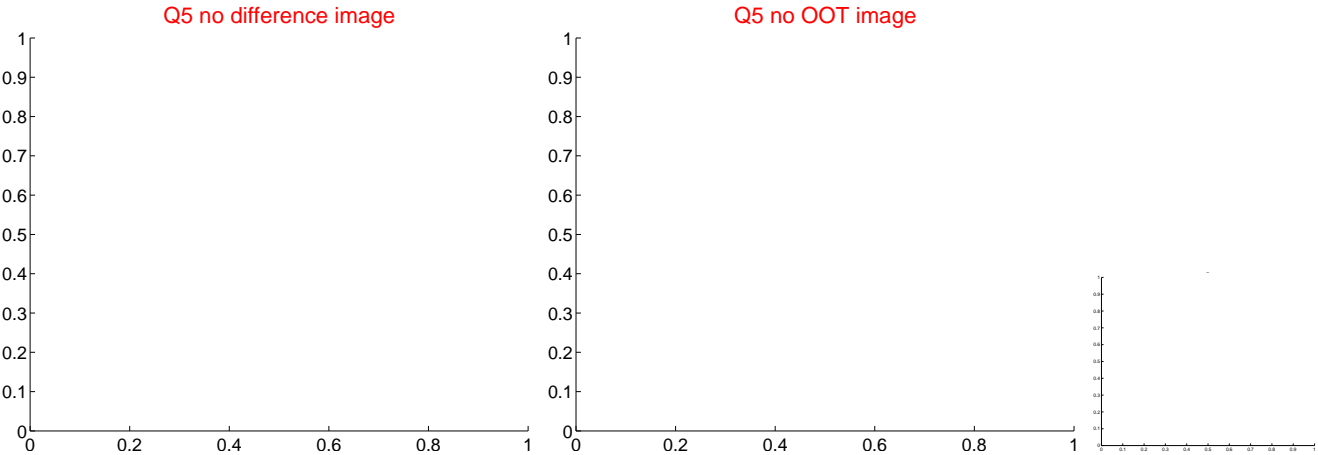


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



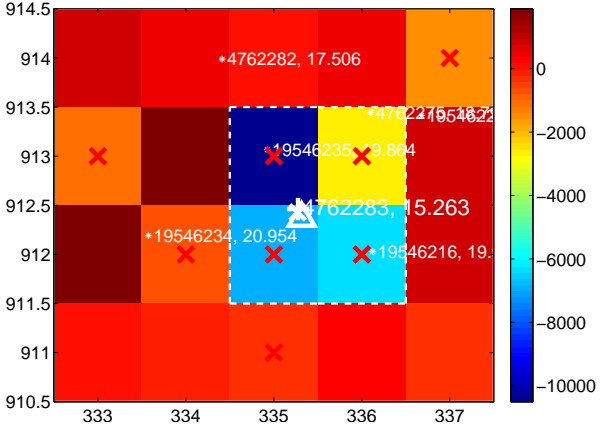
Q10 no difference image



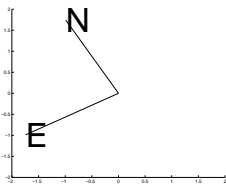
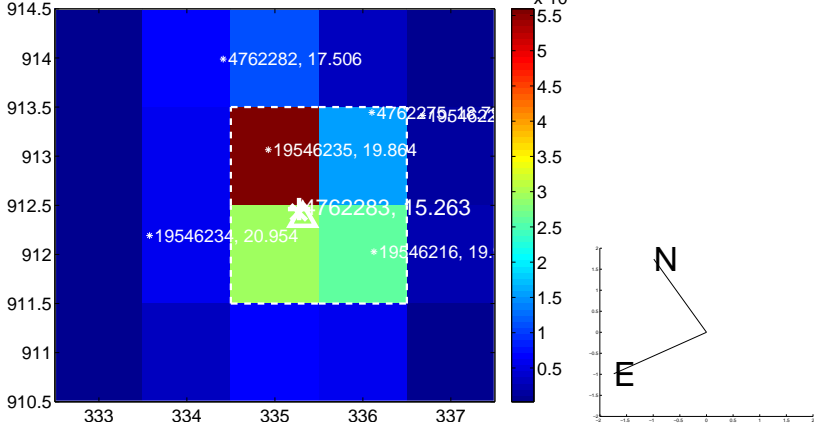
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



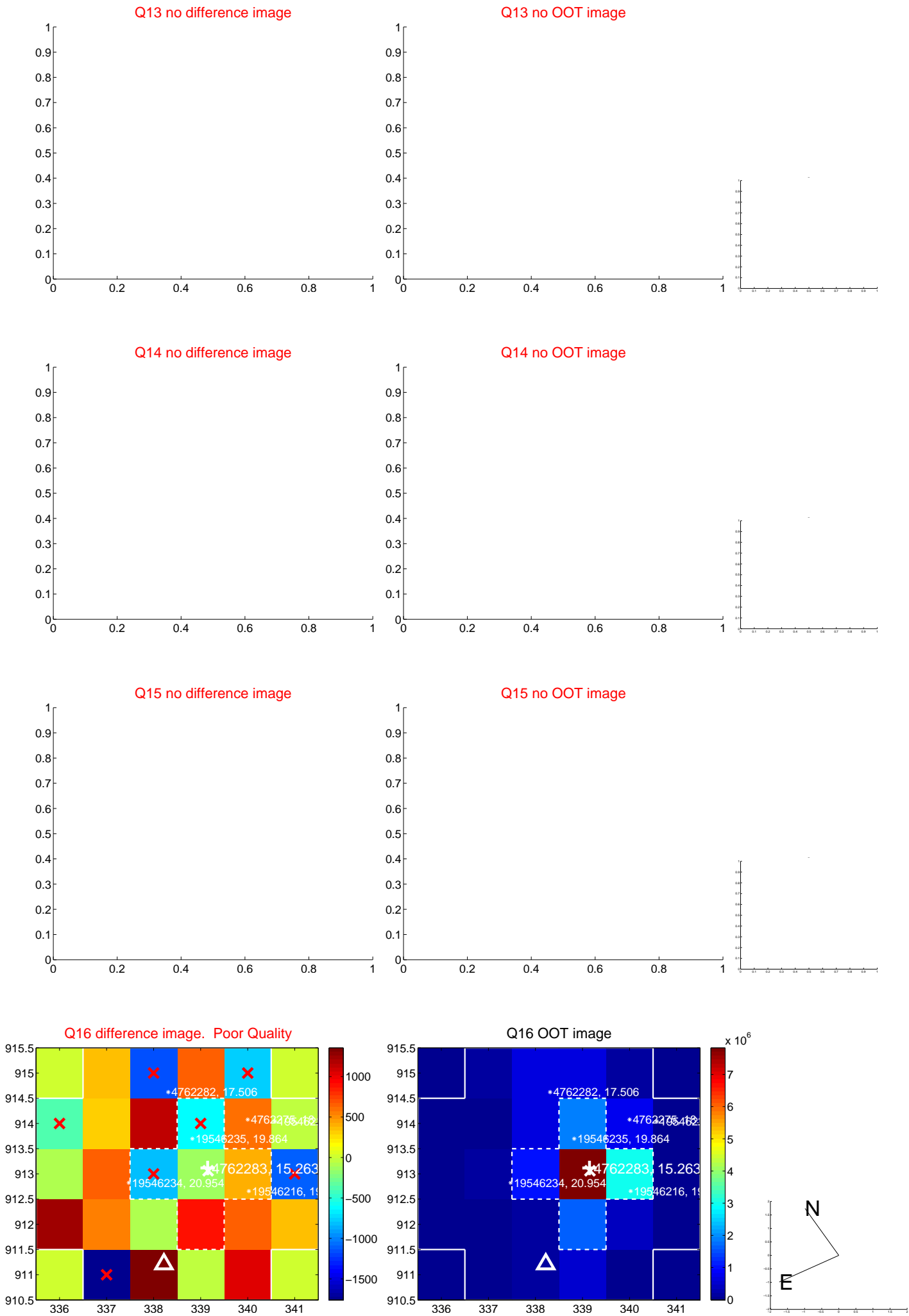
Q12 no difference image



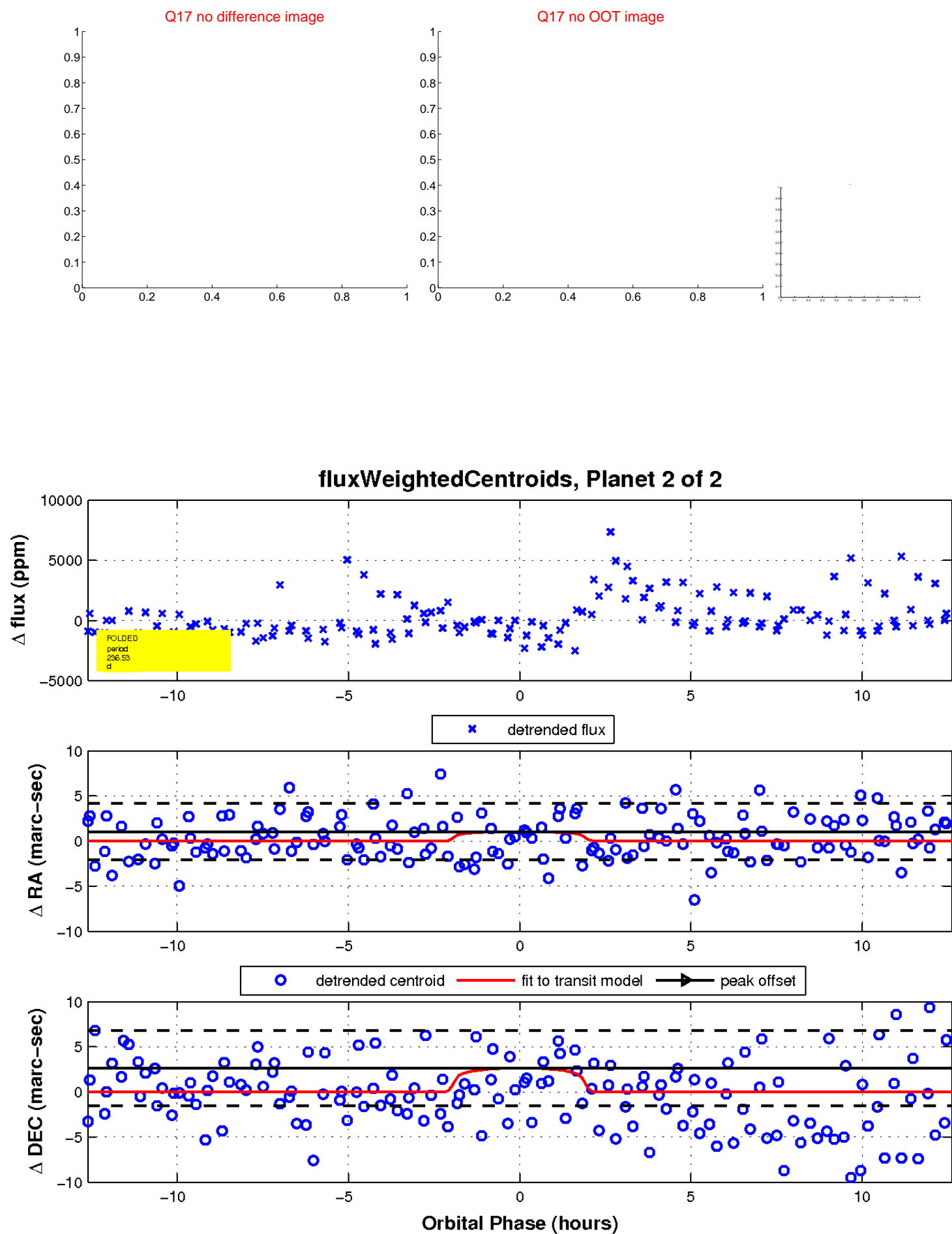
Q12 no OOT image



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

