

# KIC 006042663

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006042663-01	OBS	6651.01	30.971771	151.532154	227587.1	8.289	5374.2	3798.9	0.83	5633	59.94	17.77
006042663-02	OBS	No	30.971778	134.548271	91349.4	4.943	1492.3	1414.3	0.83	5633	38.89	17.77
006042663-03	OBS	No	392.801348	257.225187	1272.0	36.784	18.2	9.4	0.83	5633	3.05	0.60
006042663-04	OBS	No	481.297044	222.517333	1771.9	12.925	17.7	15.4	0.83	5633	3.98	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006042663-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
006042663-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
006042663-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
006042663-04	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.

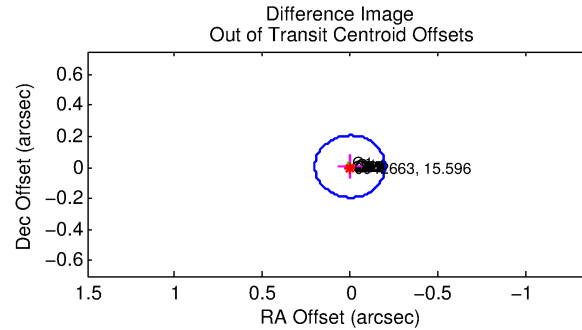
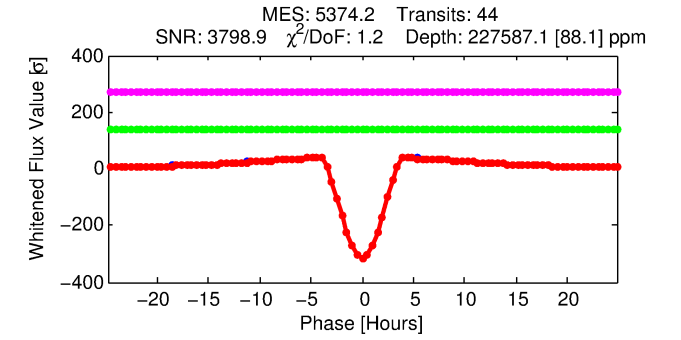
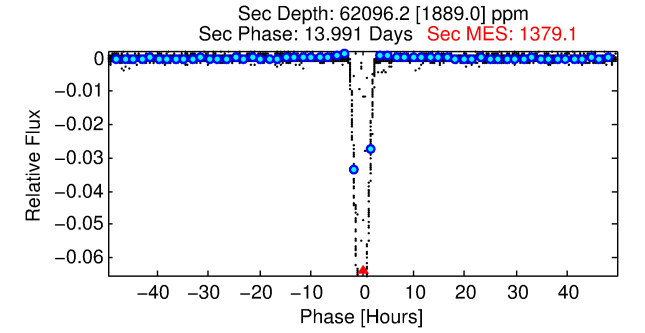
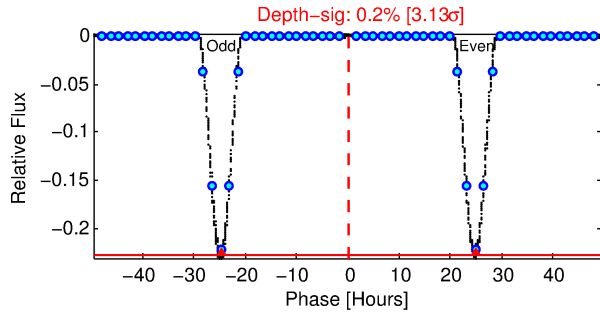
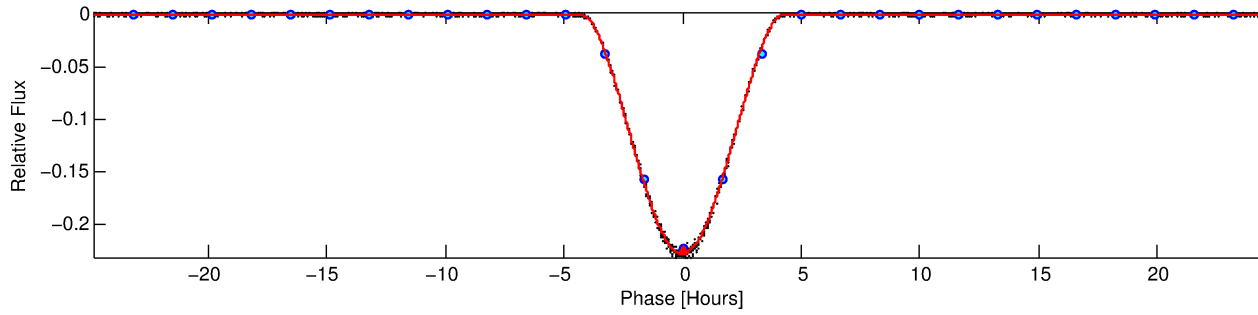
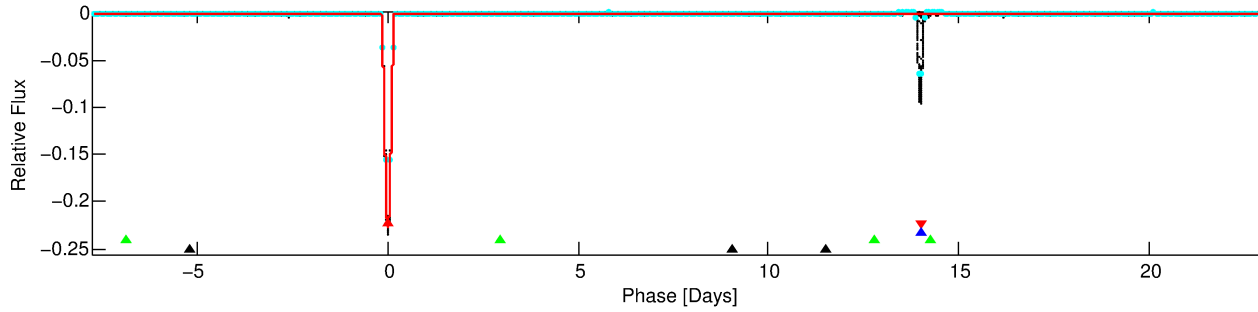
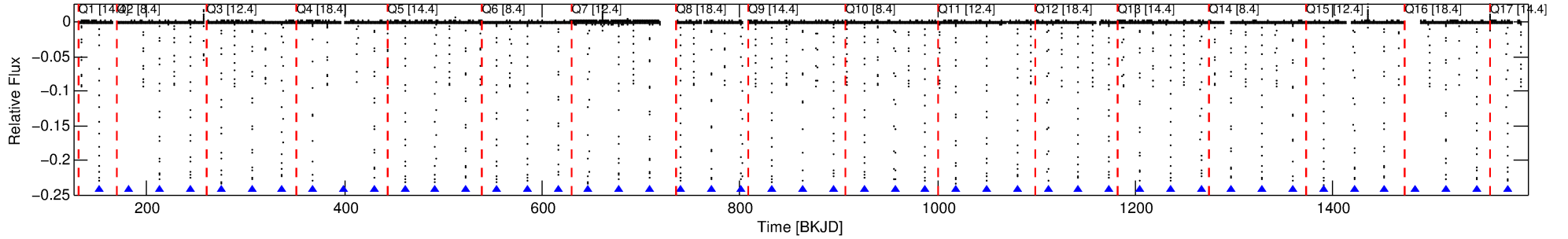
## Ephemeris Match Information For 006042663-01

No Significant Match Found

# DV One-Page Summary

KIC: 6042663 Candidate: 1 of 4 Period: 30.972 d  
KOI: K06651.01 Corr: 0.998

Kp: 15.60 R\*: 0.83 Rs Teff: 5633.0 K Logg: 4.56 Fe/H: -0.160



## DV Fit Results:

Period = 30.97177 [0.00000] d  
Epoch = 151.5322 [0.0000] BKJD  
Rp/R\* = 0.6626 [0.0085]  
a/R\* = 40.01 [0.10]  
b = 0.90 [0.01]  
Seff = 17.77 [5.95]  
Teq = 524 [44] K  
Rp = 59.94 [15.93] Re  
a = 0.1868 [0.0409] AU  
Ag = 331.80 [104.61] [3.16σ]  
Teffp = 3455 [109] K [24.91σ]

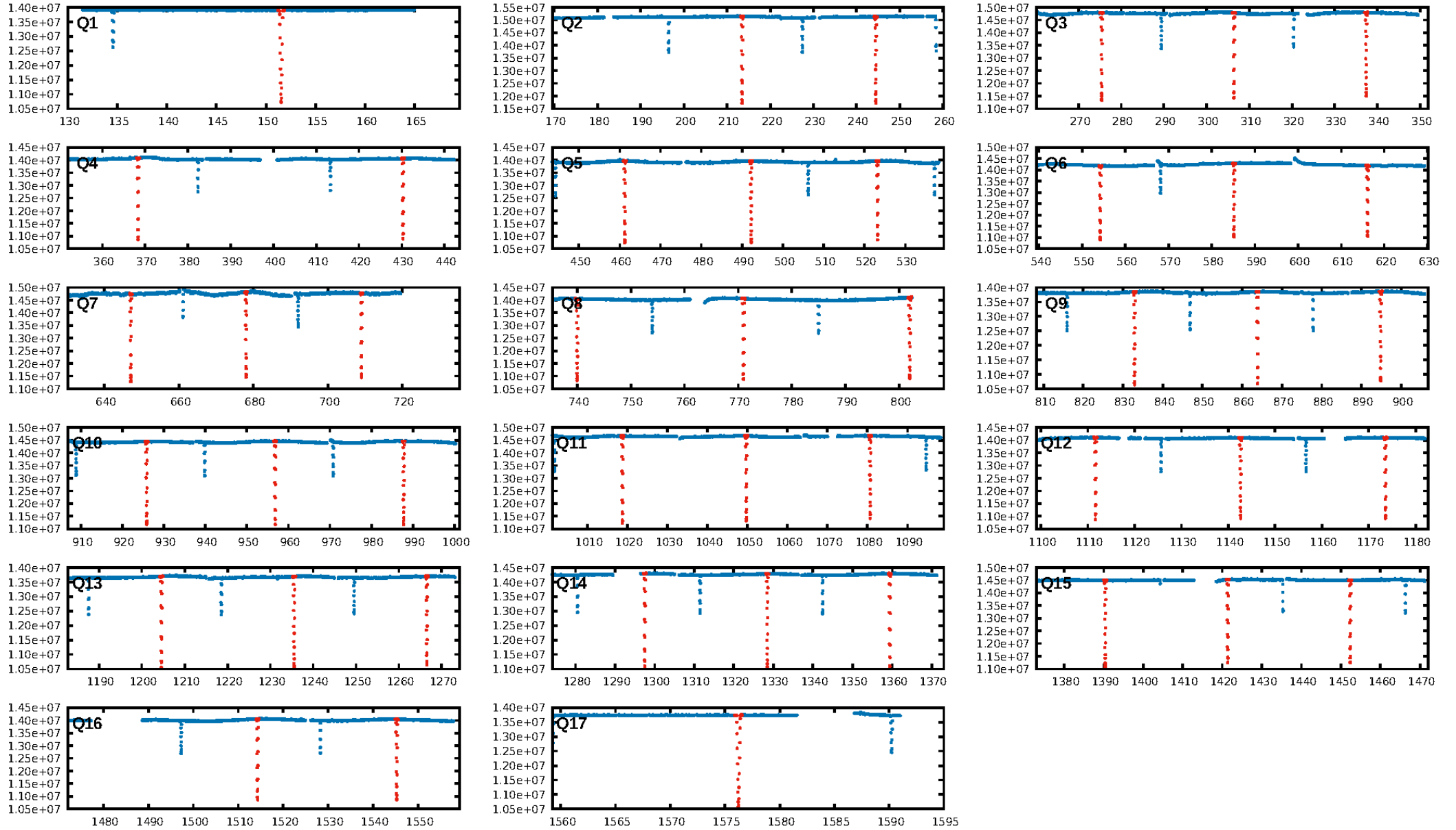
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [42/42]  
GhostDiagnostic-chr: 3.632  
Centroid-sig: 0.0%  
Centroid-so: 0.080 arcsec [39.60σ]  
OotOffset-rm: 0.007 arcsec [0.10σ]  
KicOffset-rm: 0.017 arcsec [0.24σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

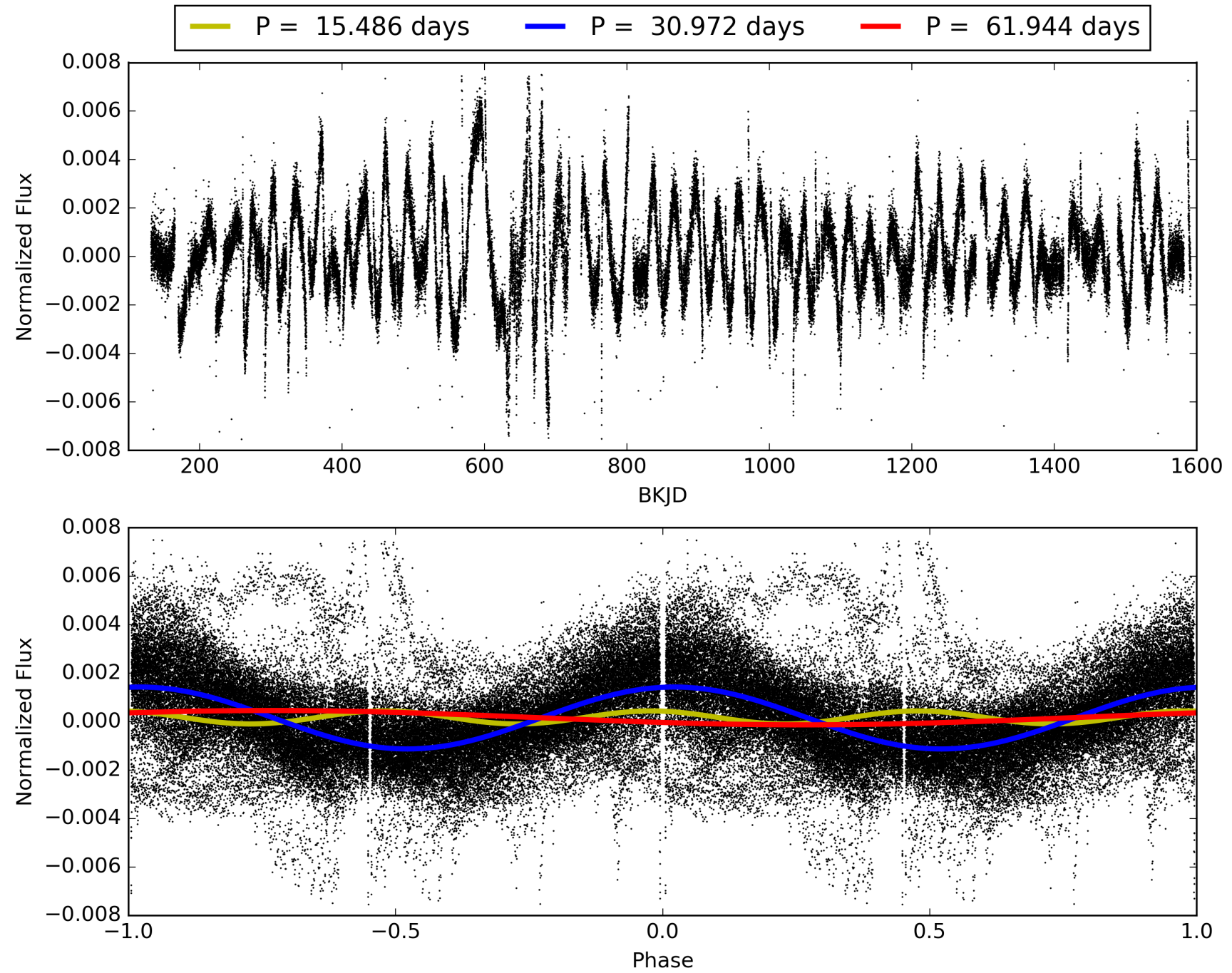
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:16:47 Z

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

# TCE 006042663-01, PDC Light Curves

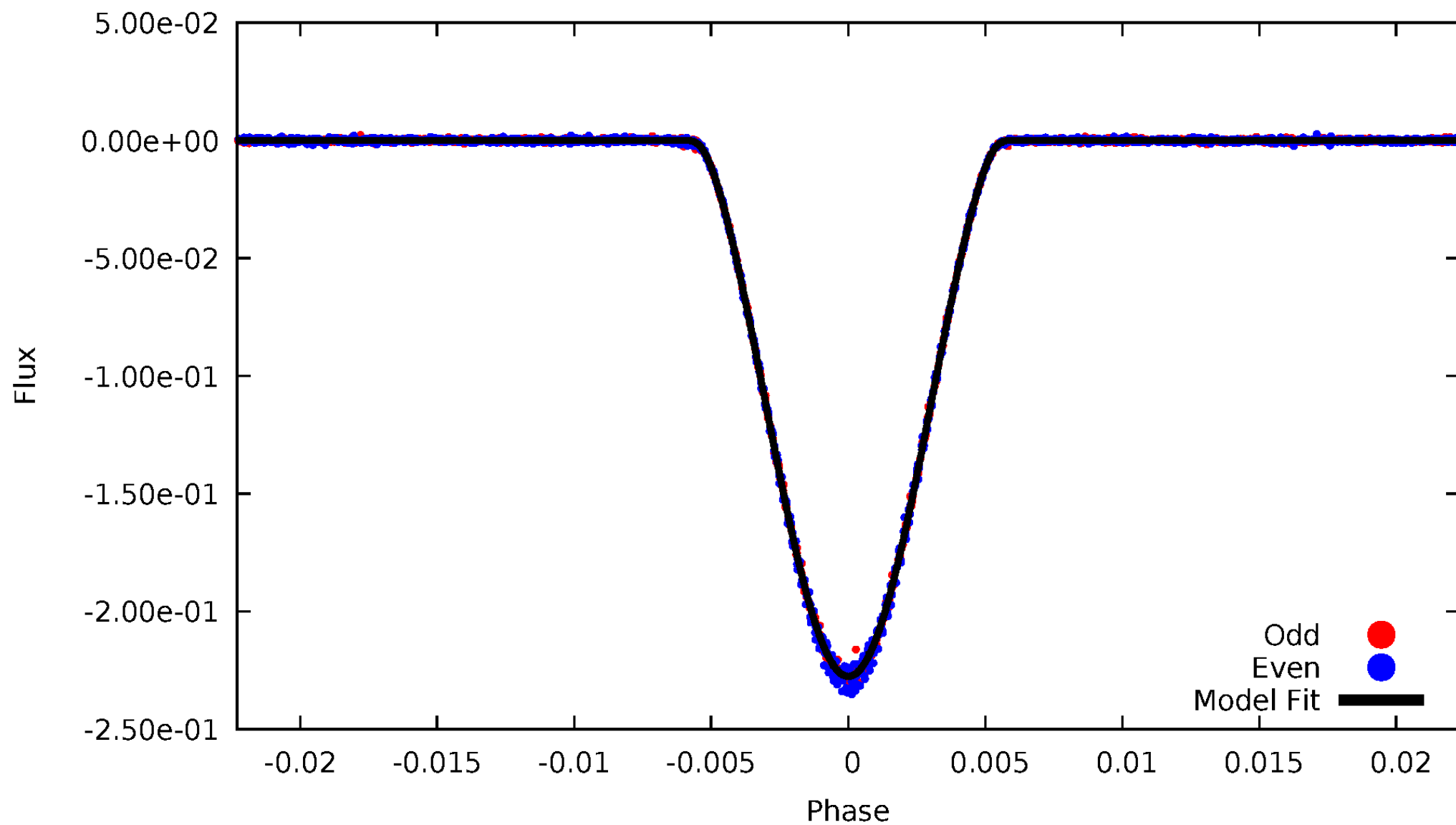


TCE 006042663-01



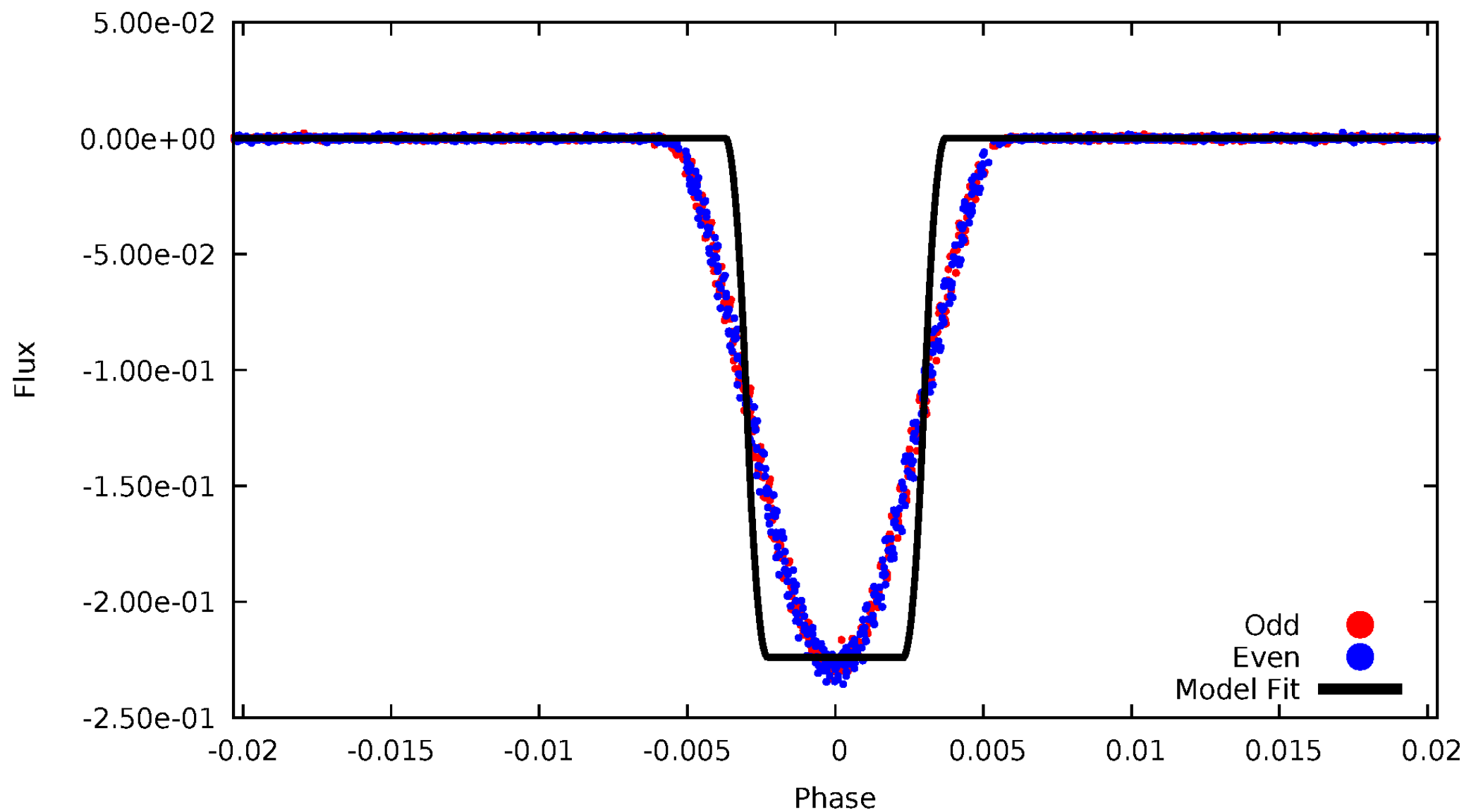
# DV Odd/Even

TCE 006042663-01



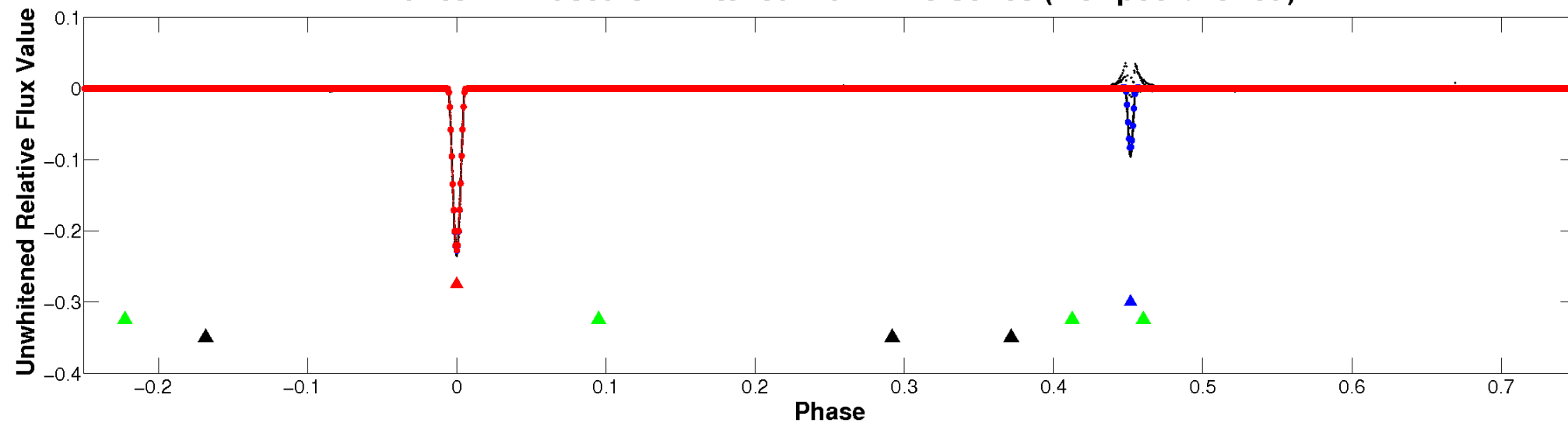
# ALT Odd/Even

TCE 006042663-01

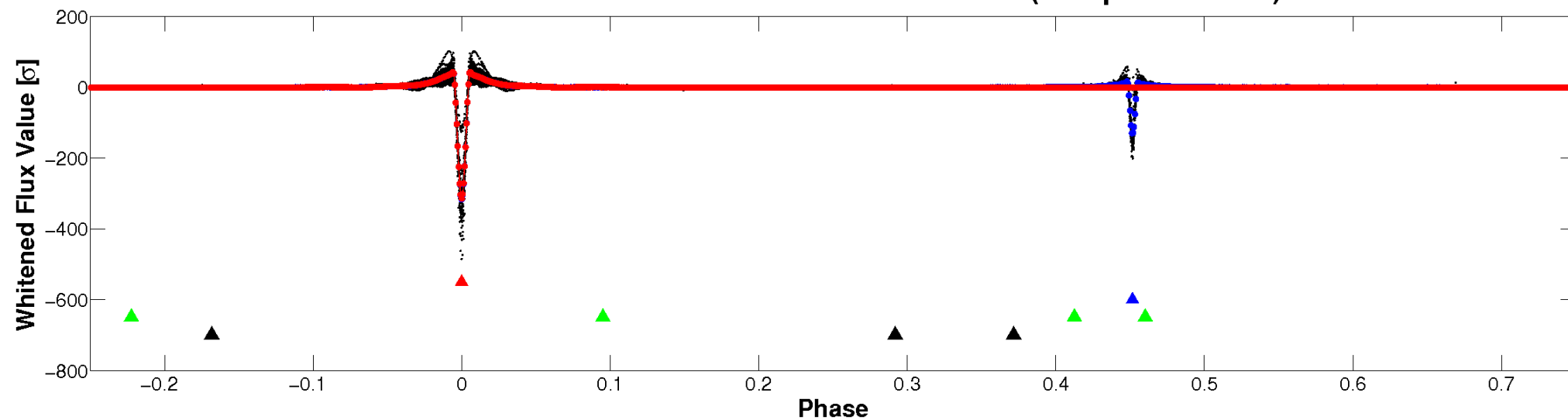


# Non-Whitened Vs. Whitened Light Curve

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

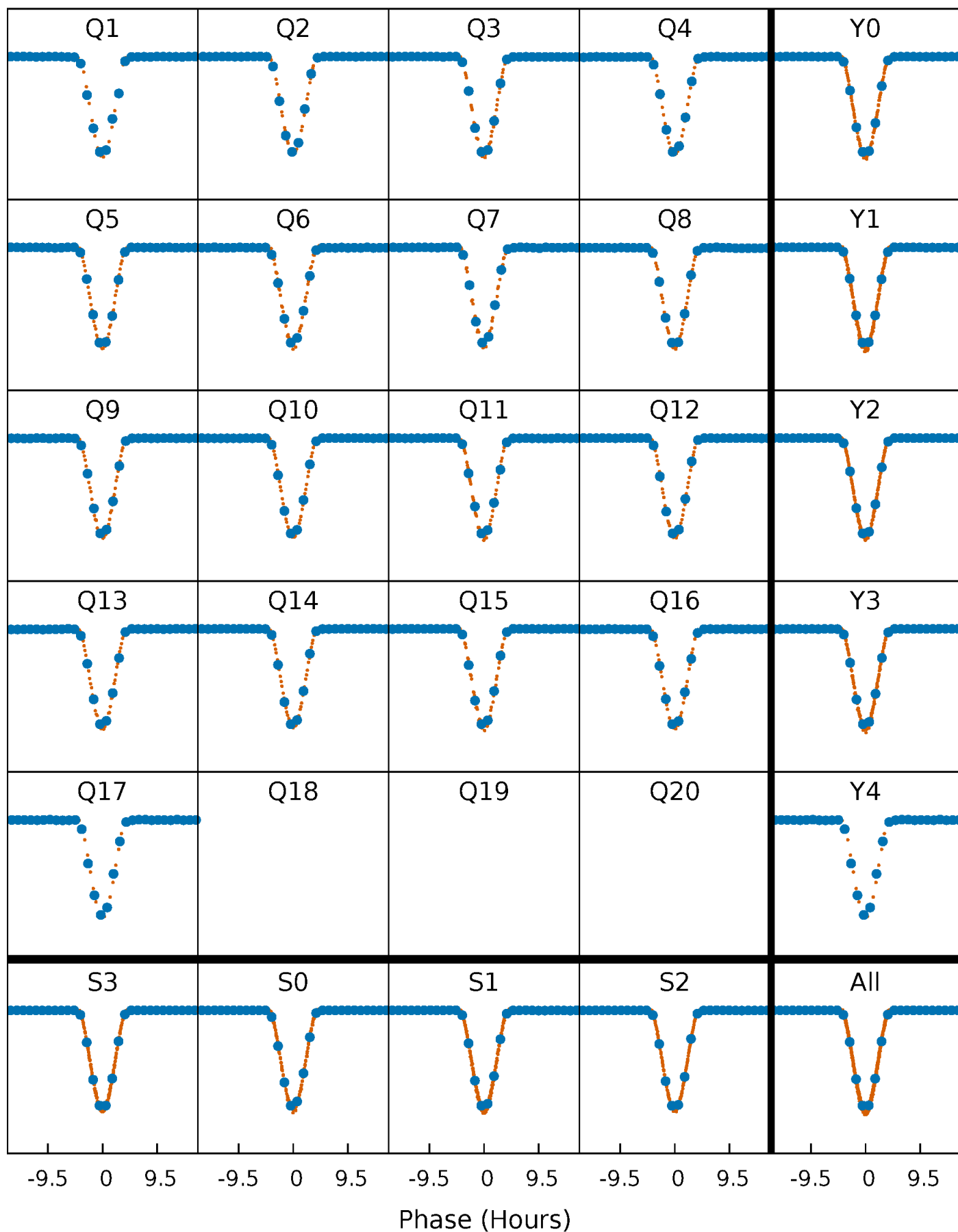


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

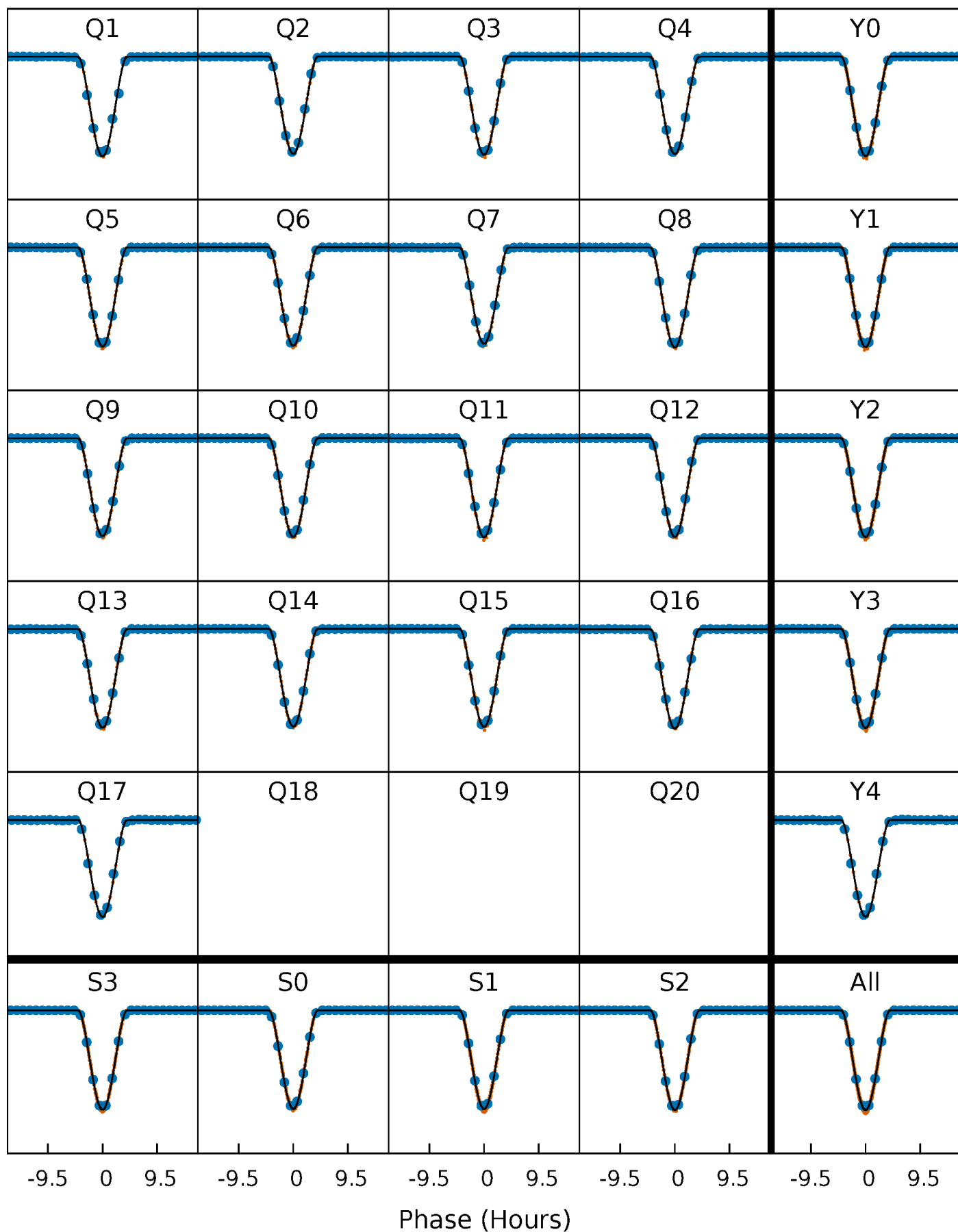
TCE 006042663-01 P= 30.971771 Days  $T_0=151.532154$  (BKJD)





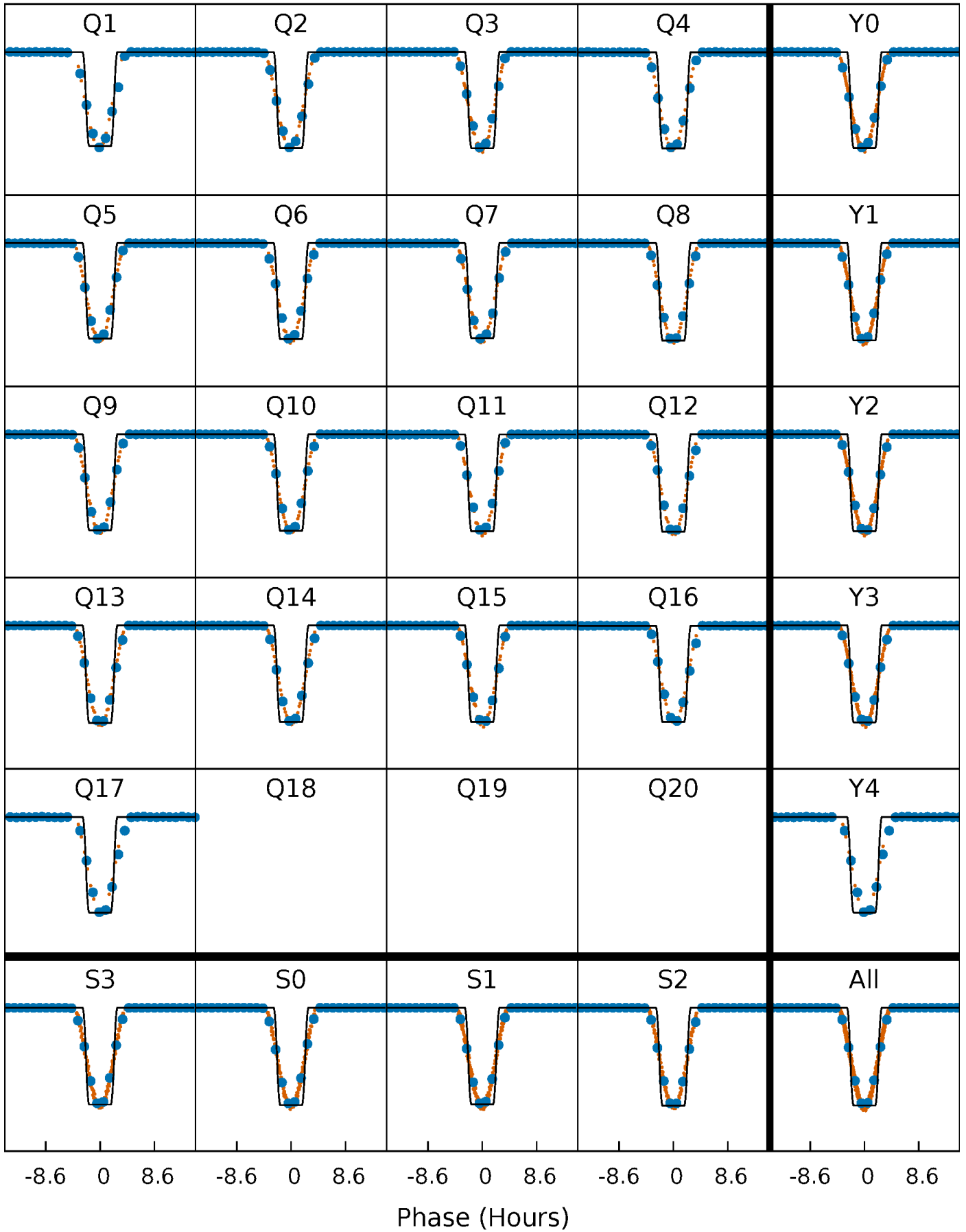
# DV Quarter-Phased Transit Curves

TCE 006042663-01 P= 30.971771 Days  $T_0=151.532154$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

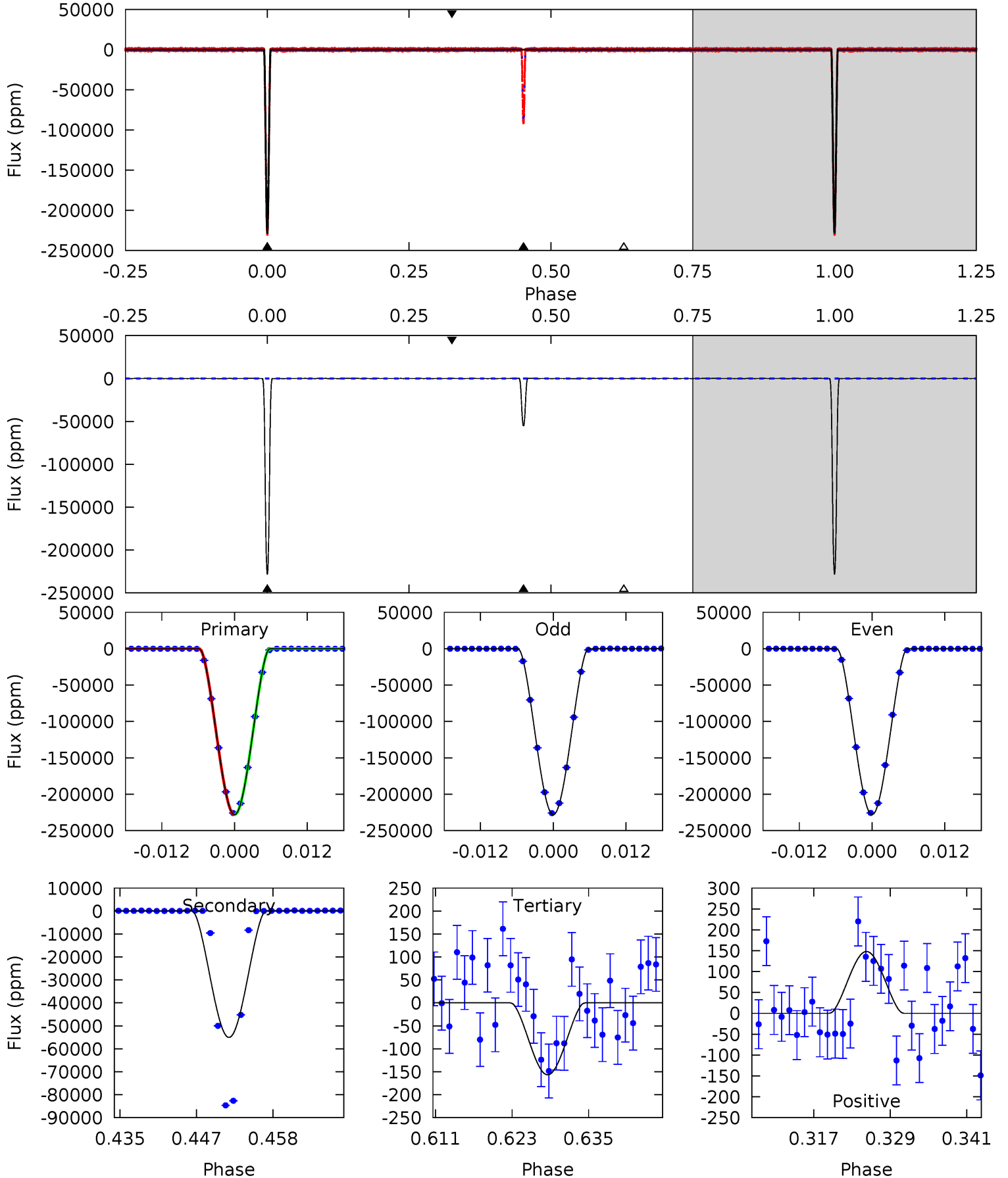
TCE 006042663-01 P= 30.971496 Days  $T_0=151.538527$  (BKJD)



# DV Model-Shift Uniqueness Test

006042663-01, P = 30.971771 Days, E = 120.560383 Days

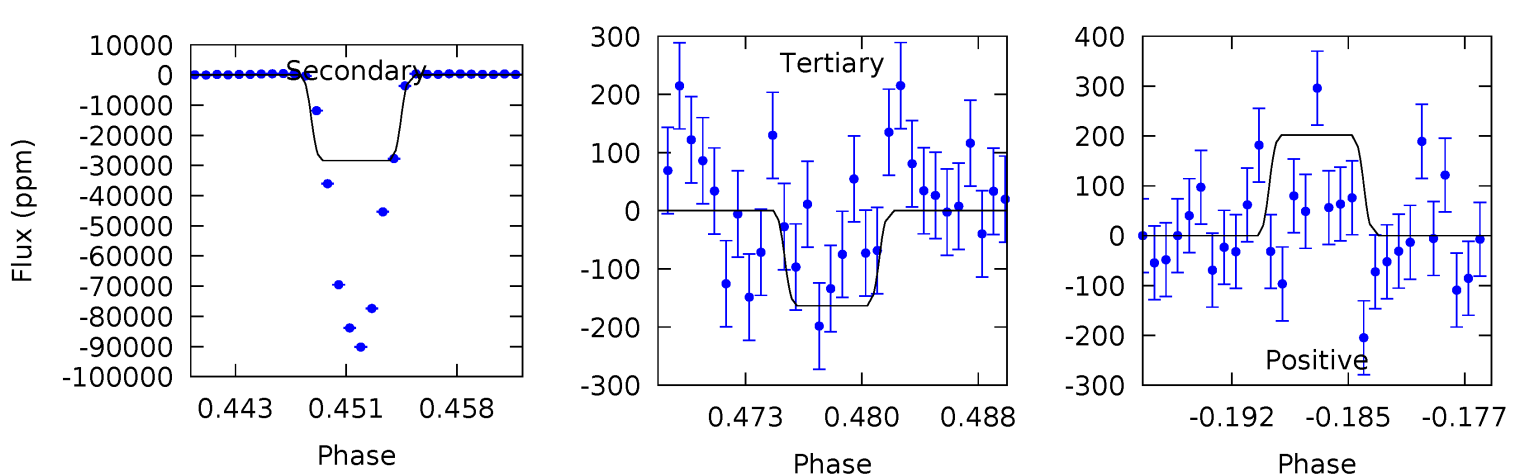
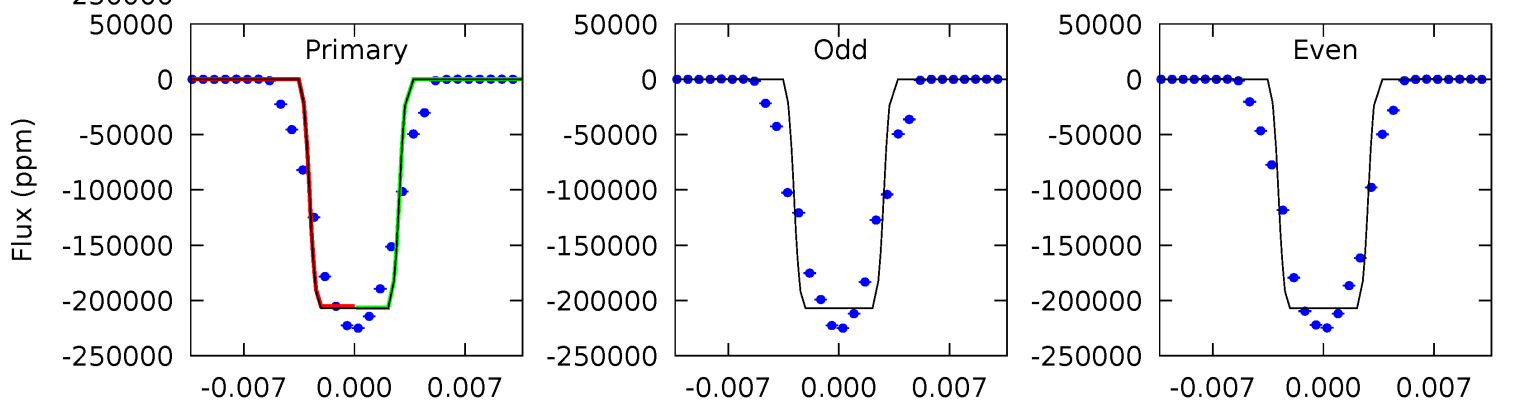
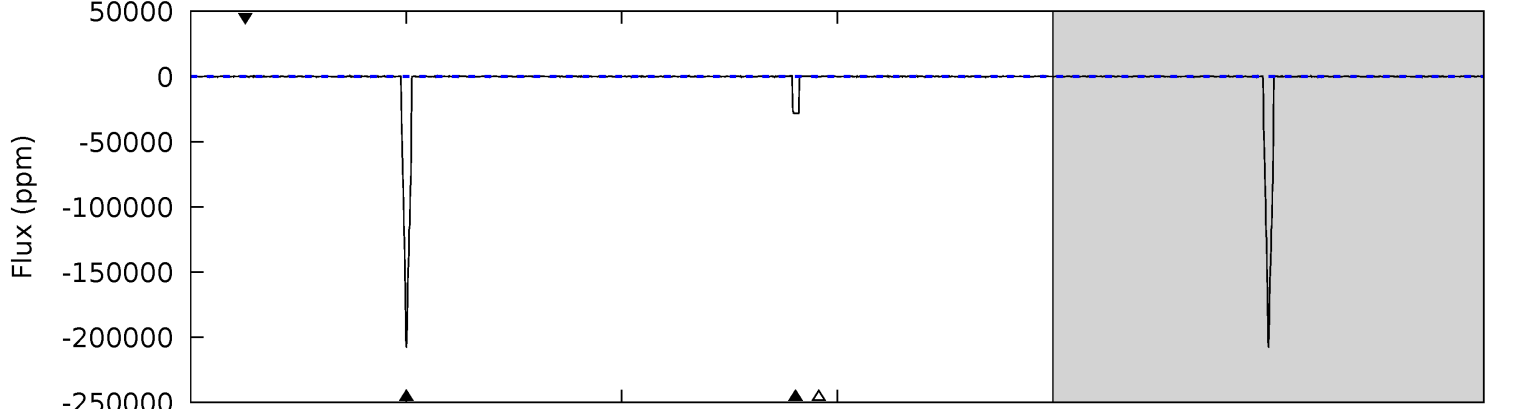
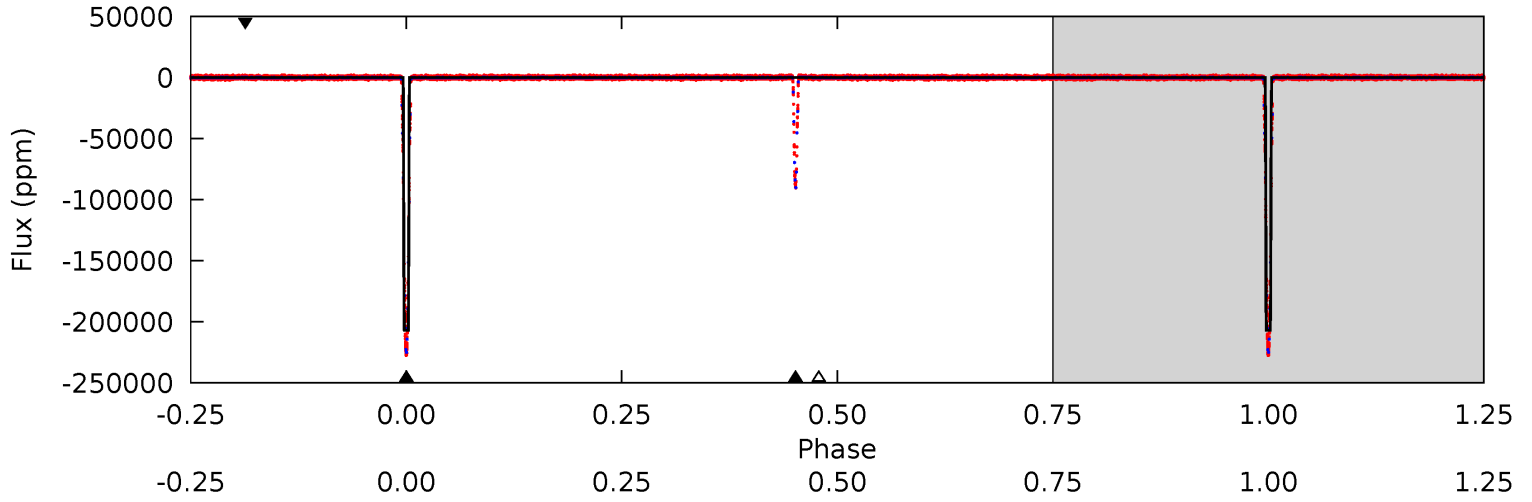
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10029	2421	6.89	6.52	5.00	2.52	2.53	10022	10022	2414	2415	2.81	1.00	0.00	0.83



# Alt Model-Shift Uniqueness Test

006042663-01, P = 30.971496 Days, E = 120.567031 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
4470	612.8	3.52	4.35	5.08	2.68	1.25	4466	4465	609.3	608.4	0.40	1.00	0.00	0



### Stellar Parameters For KIC 006042663

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5633^{+169}_{-169}$	$4.558^{+0.042}_{-0.168}$	$-0.160^{+0.300}_{-0.300}$	$0.829^{+0.220}_{-0.073}$	$0.906^{+0.095}_{-0.104}$	$2.237^{+0.493}_{-1.002}$
	+3%/-3%	+1%/-4%	+188%/-188%	+27%/-9%	+10%/-11%	+22%/-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 006042663-01 / KOI 6651.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-55051 \pm 23$	$61.29^{+8.21}_{-4.29}$	$746^{+43}_{-33}$	$3779^{+86}_{-81}$	$293^{+37}_{-59}$
Alt.	$-28383 \pm 46$	$43.59^{+5.63}_{-3.03}$	$747^{+42}_{-34}$	$3777^{+80}_{-89}$	$289^{+35}_{-55}$

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

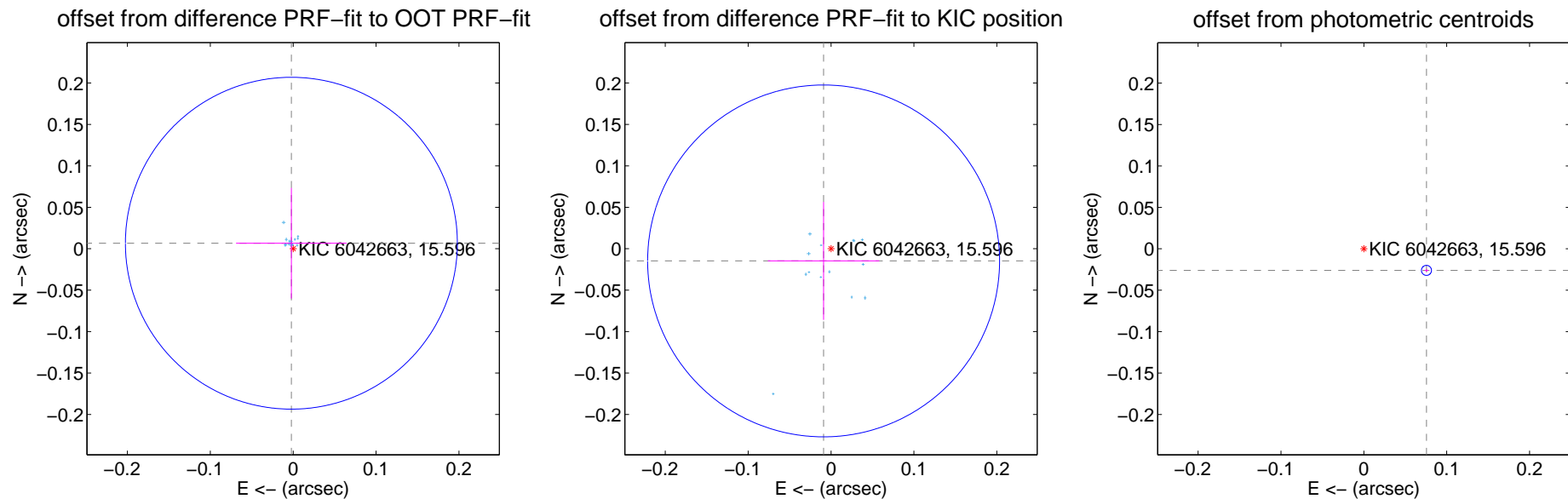
## DV Centroid Data

Supplemental centroid analysis for 006042663-01. Kepler magnitude: 15.60. Transit SNR 3798.90

There are 17 quarters with good PRF difference image offsets

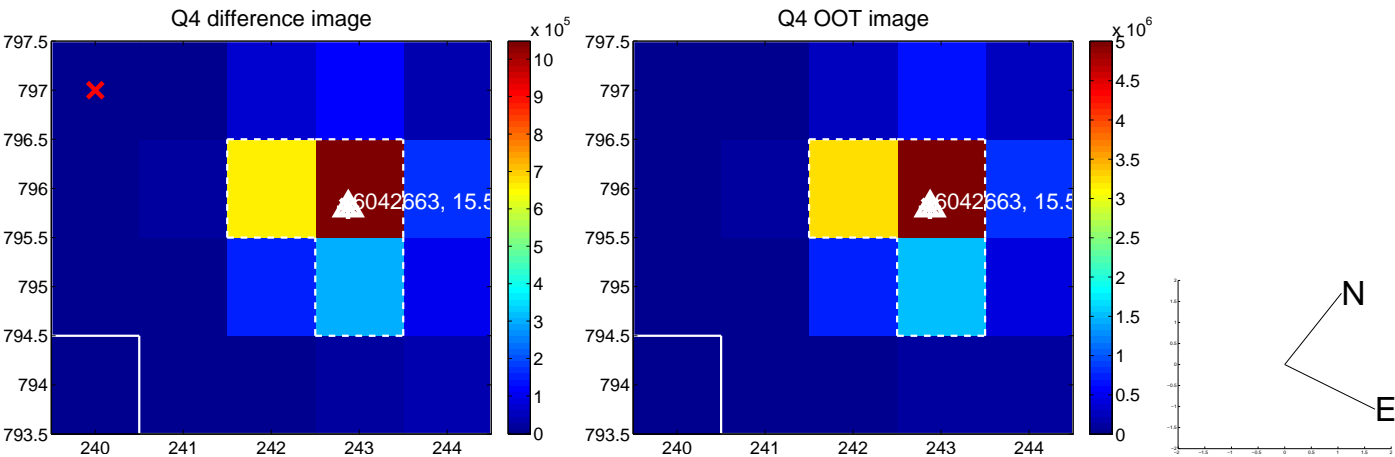
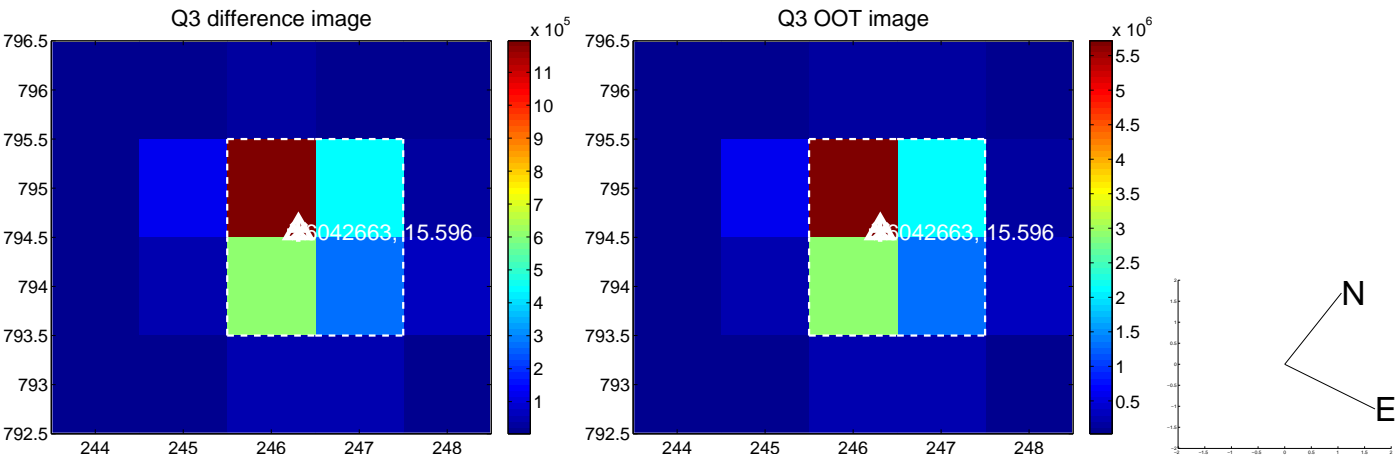
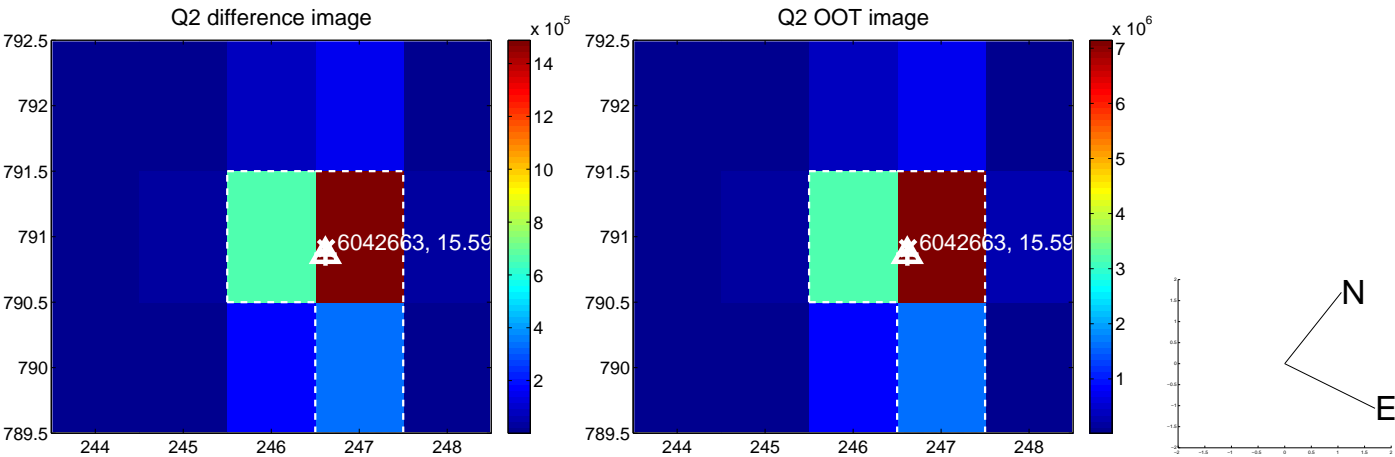
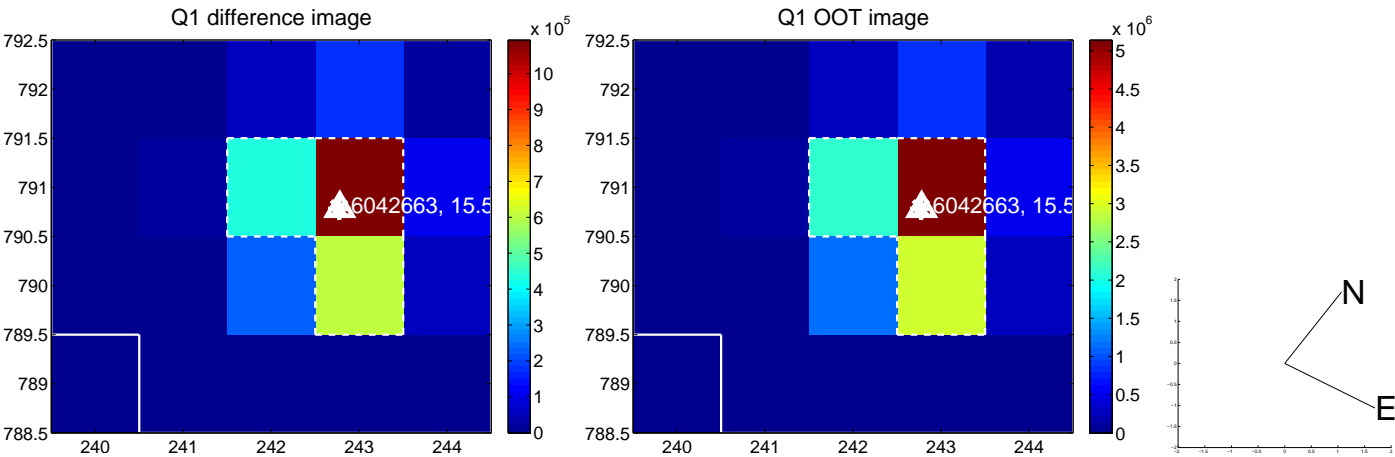
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.007 \pm 0.067$	0.10	$0.002 \pm 0.067$	$0.007 \pm 0.067$
PRF-fit source offset from KIC position	$0.017 \pm 0.071$	0.24	$0.009 \pm 0.067$	$-0.015 \pm 0.071$
photometric centroid source offset	$0.08 \pm 0.00$	39.60	$-0.08 \pm 0.00$	$-0.03 \pm 0.00$

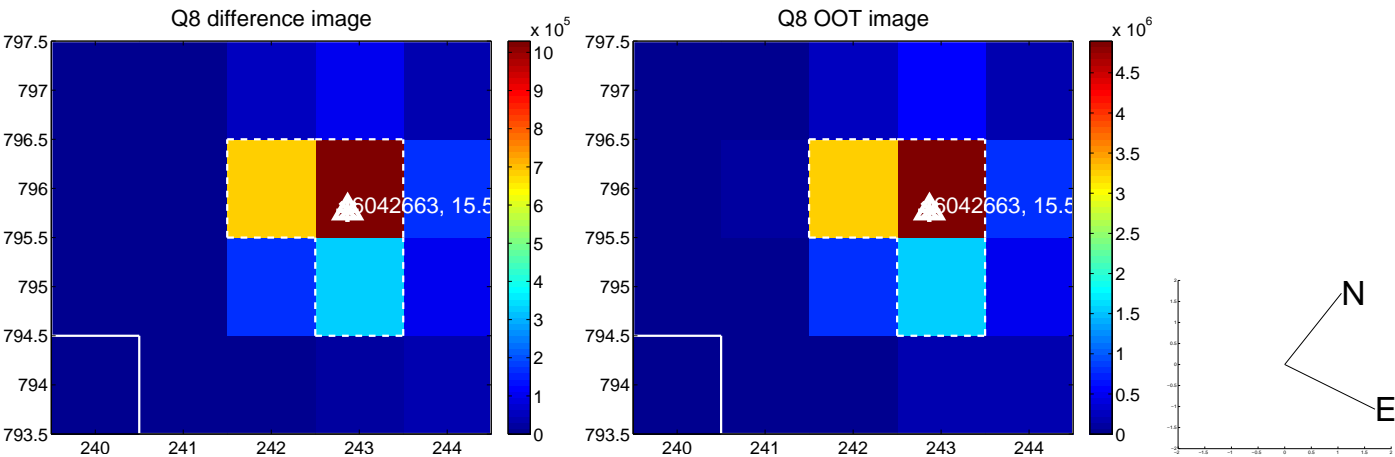
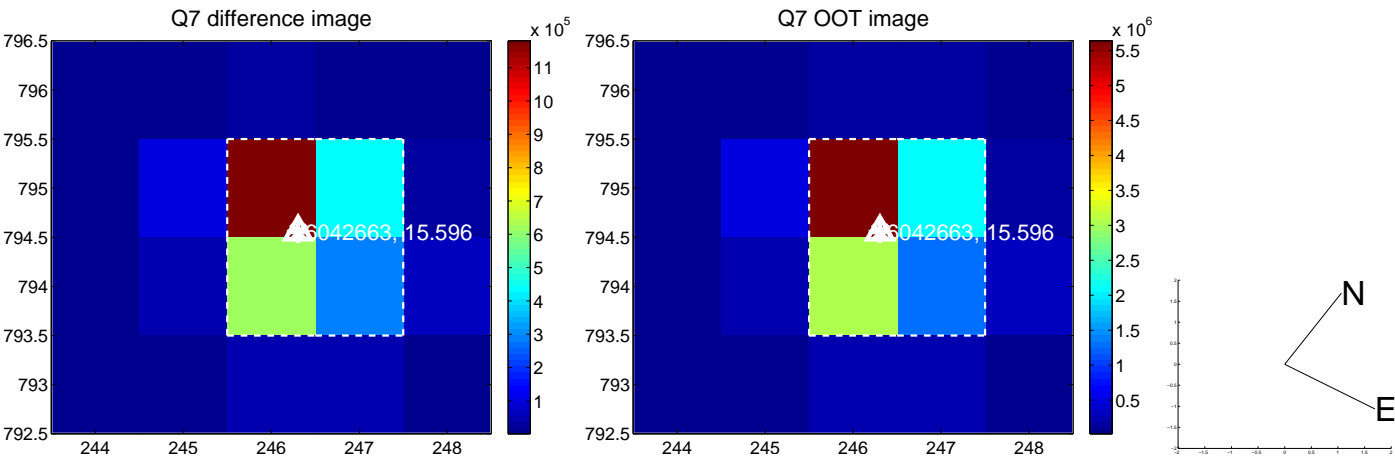
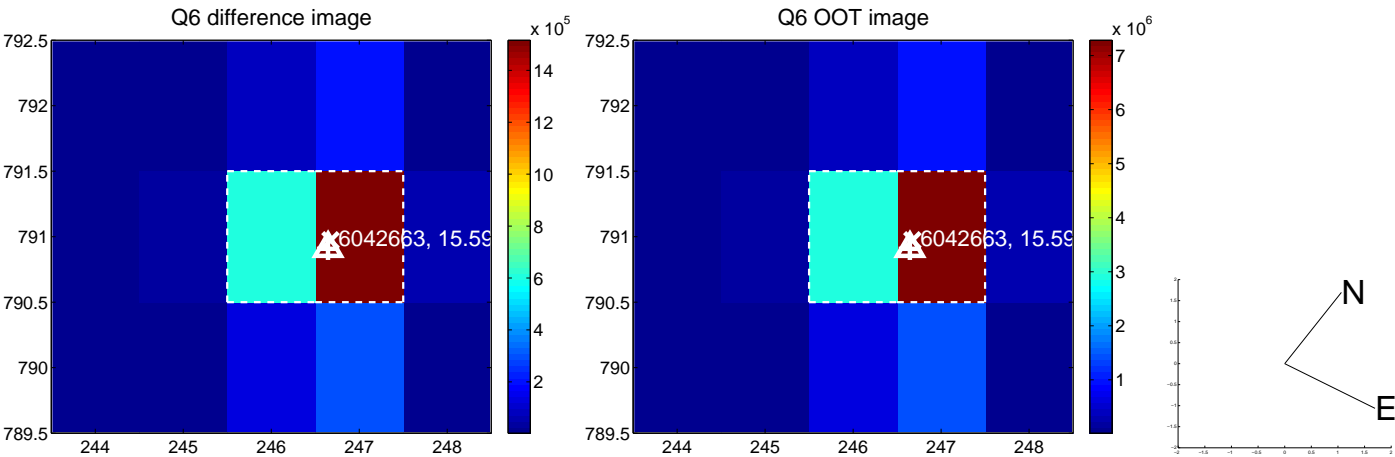
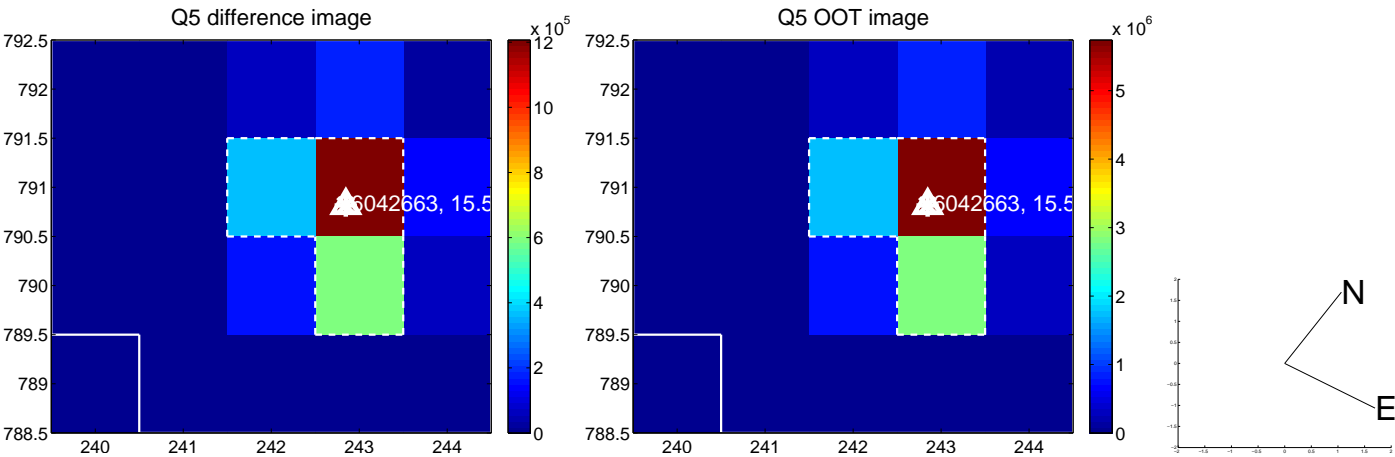


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

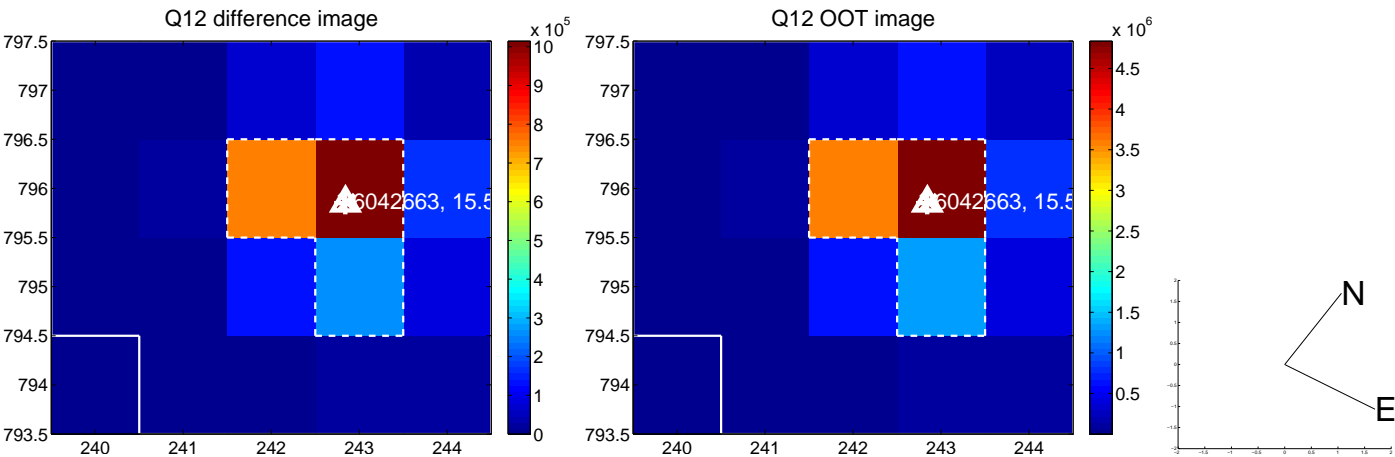
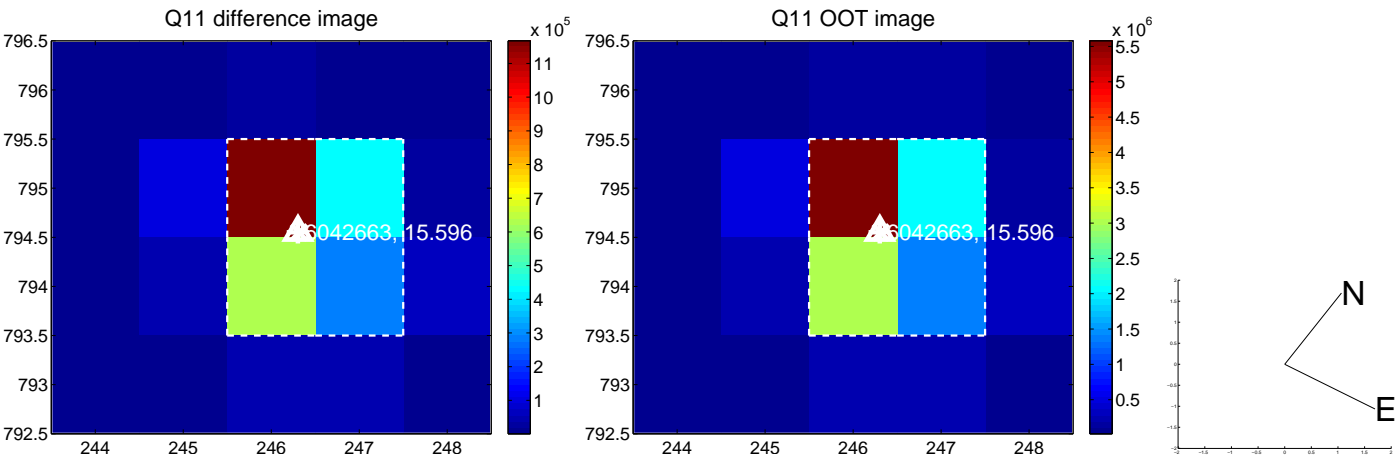
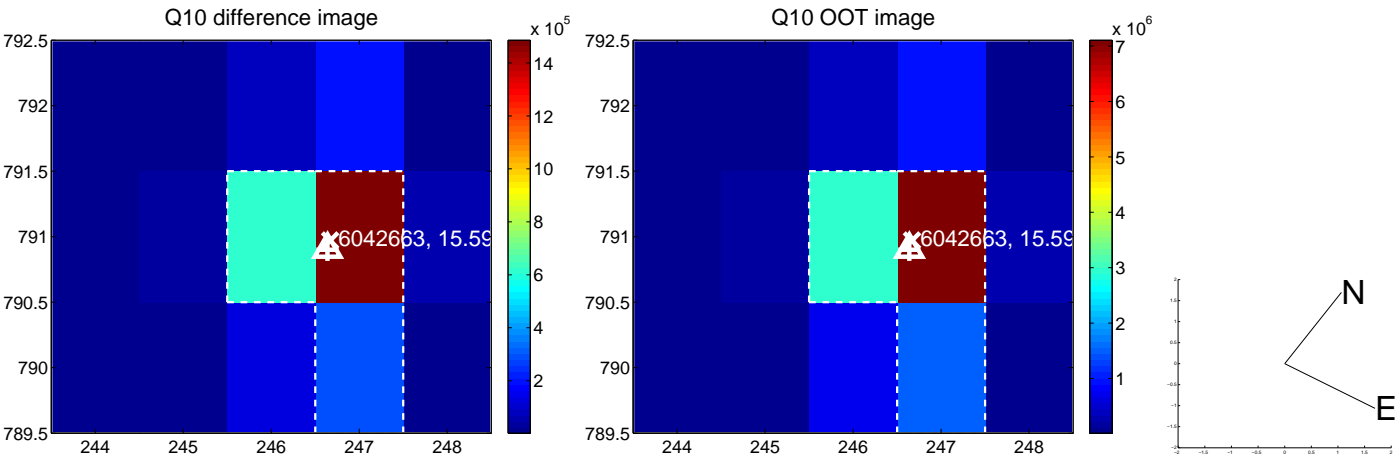
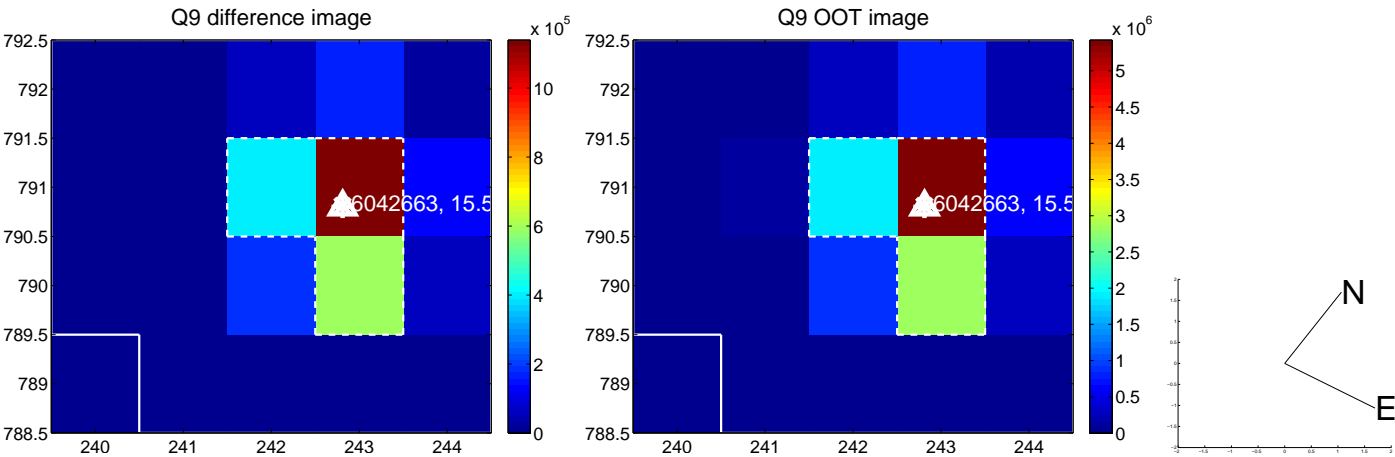


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

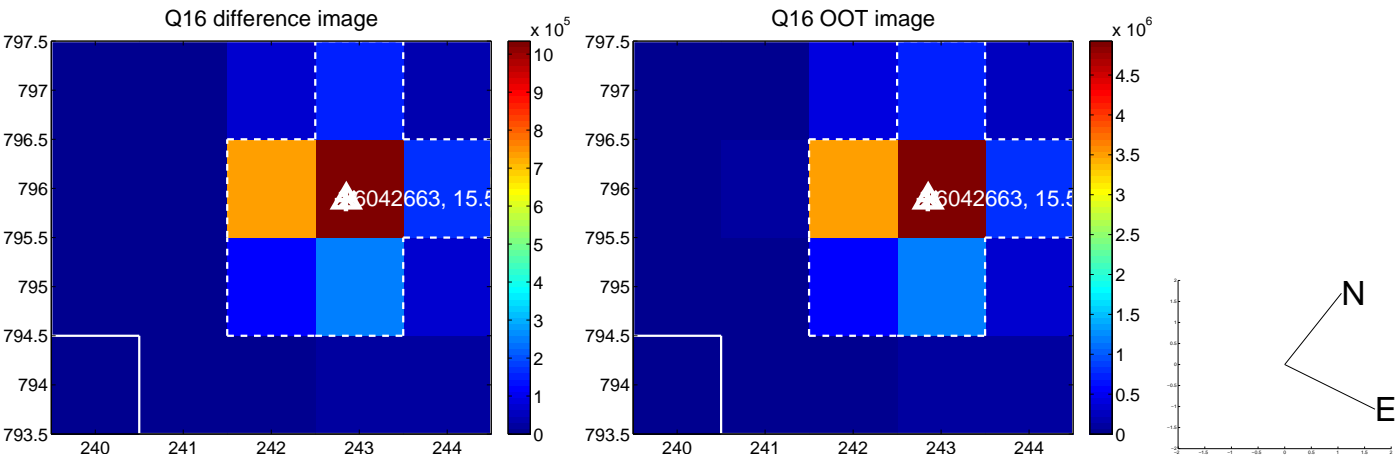
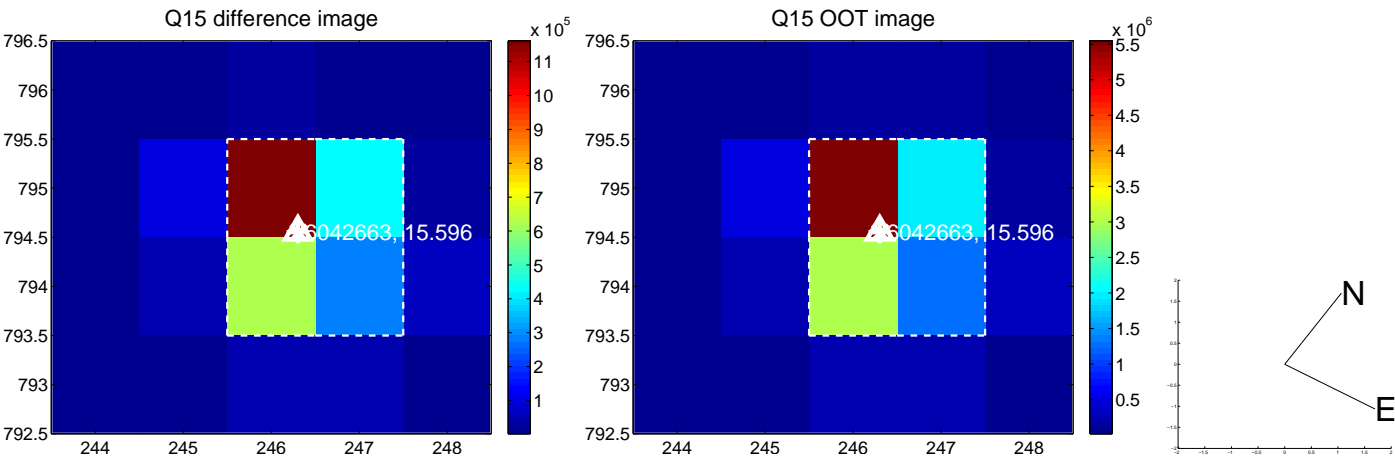
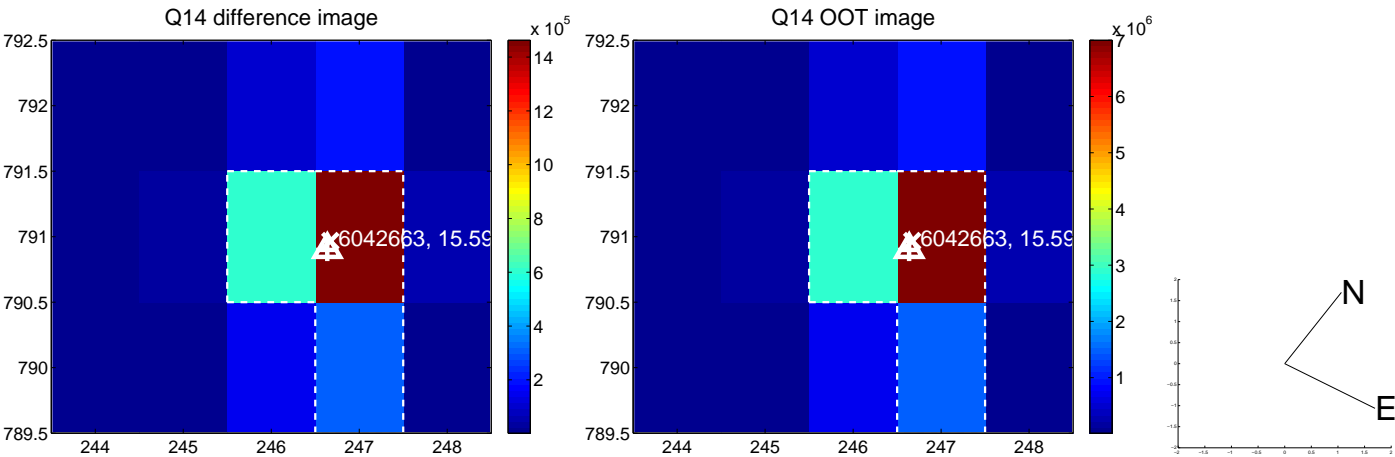
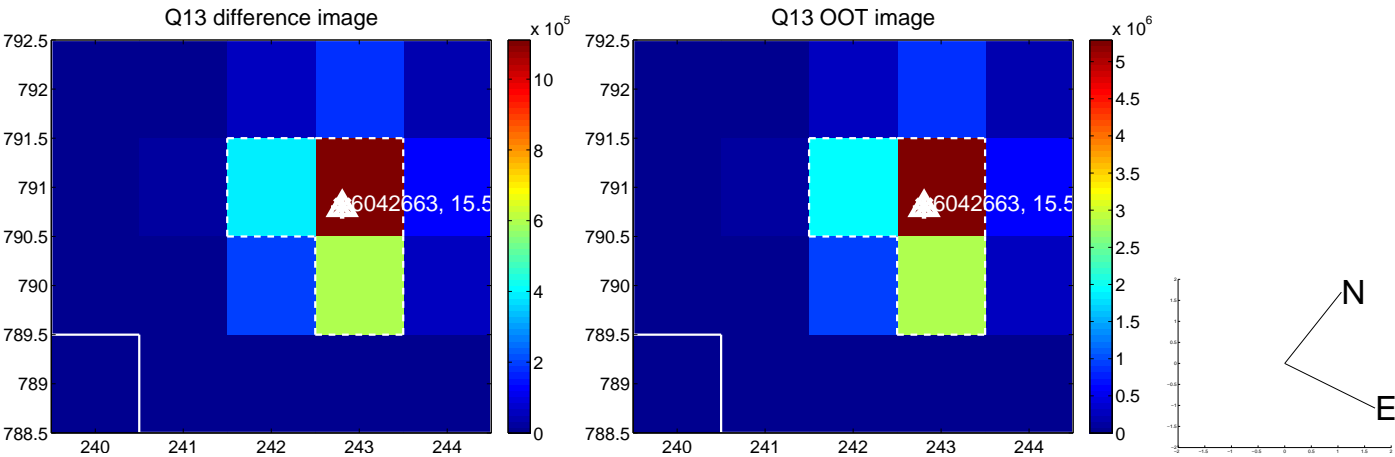




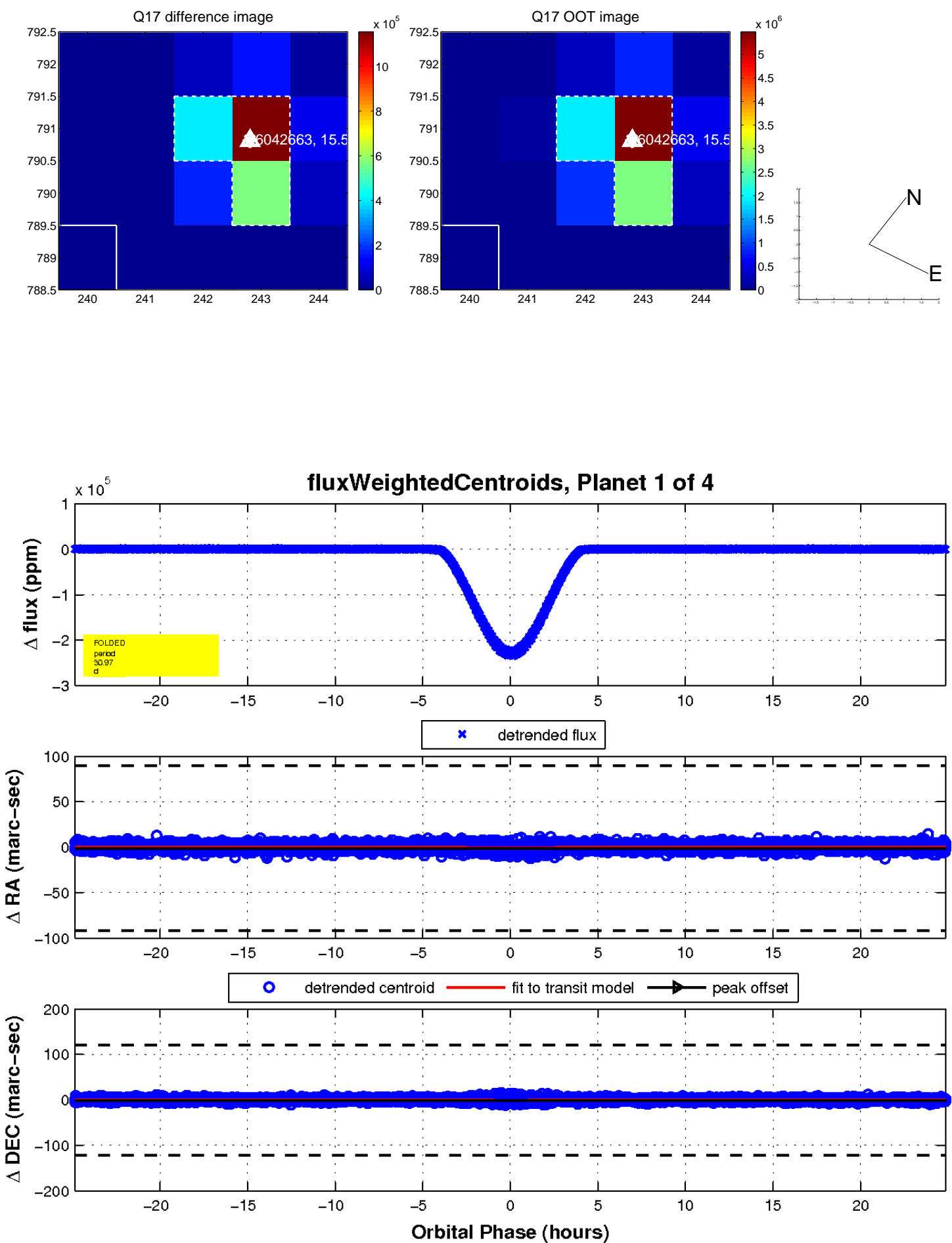
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

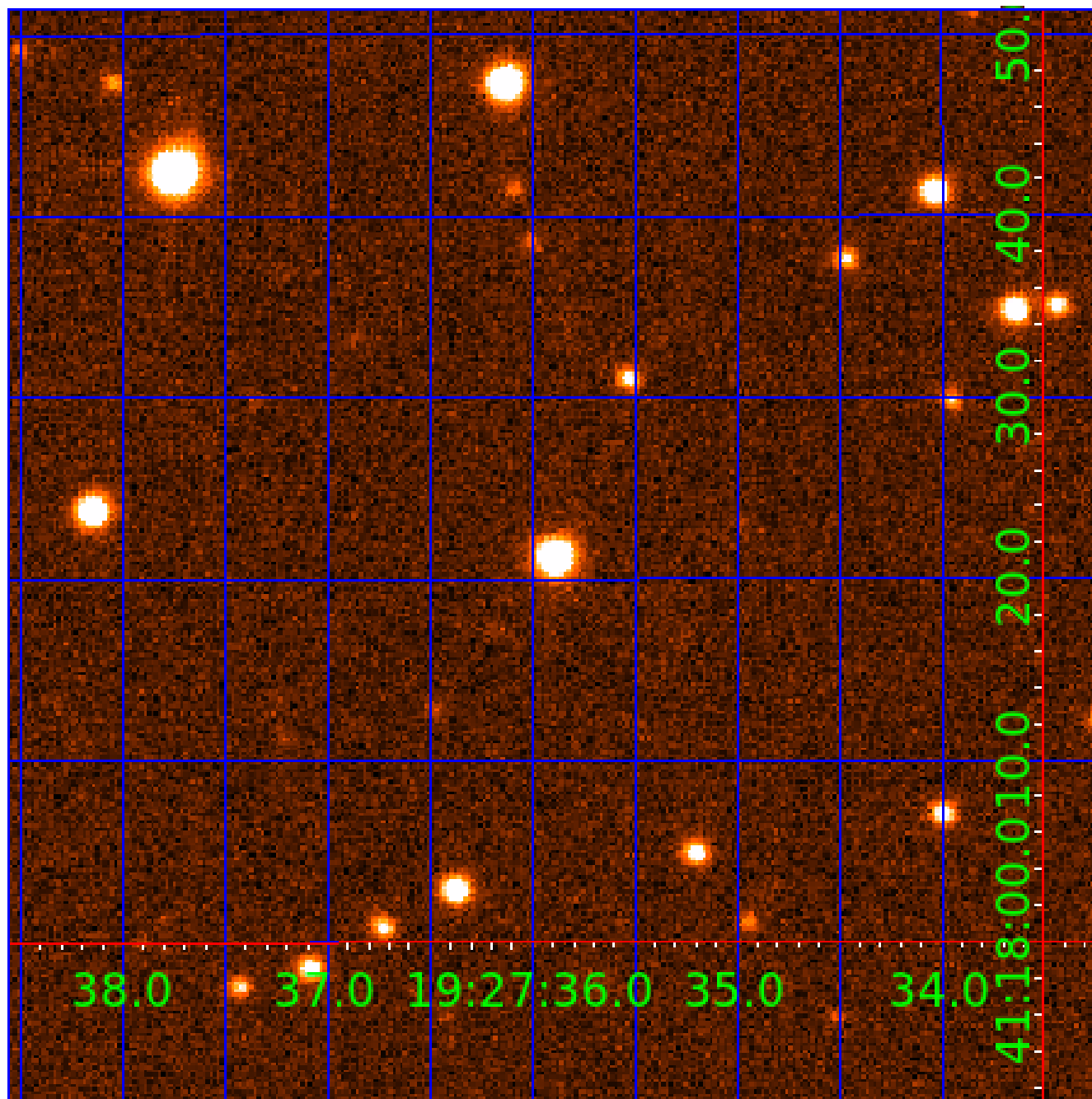


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006042663

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006042663-01	OBS	6651.01	30.971771	151.532154	227587.1	8.289	5374.2	3798.9	0.83	5633	59.94	17.77
006042663-02	OBS	No	30.971778	134.548271	91349.4	4.943	1492.3	1414.3	0.83	5633	38.89	17.77
006042663-03	OBS	No	392.801348	257.225187	1272.0	36.784	18.2	9.4	0.83	5633	3.05	0.60
006042663-04	OBS	No	481.297044	222.517333	1771.9	12.925	17.7	15.4	0.83	5633	3.98	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006042663-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
006042663-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
006042663-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
006042663-04	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.

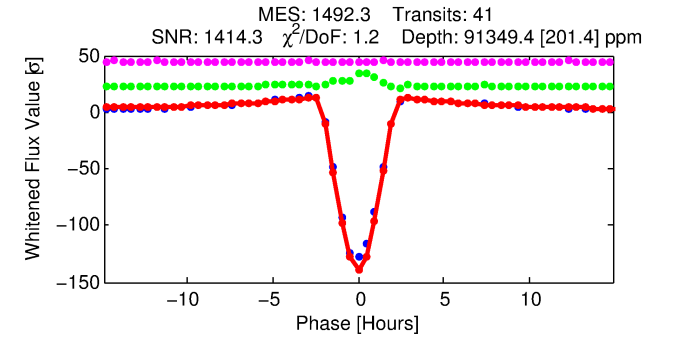
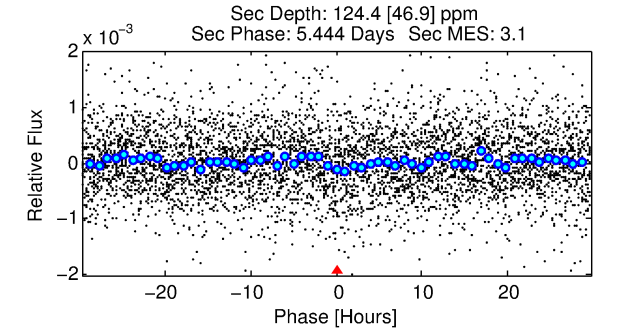
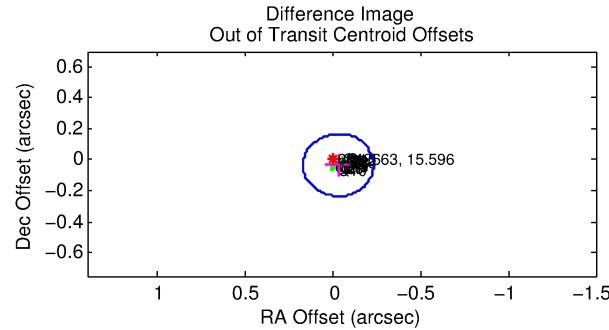
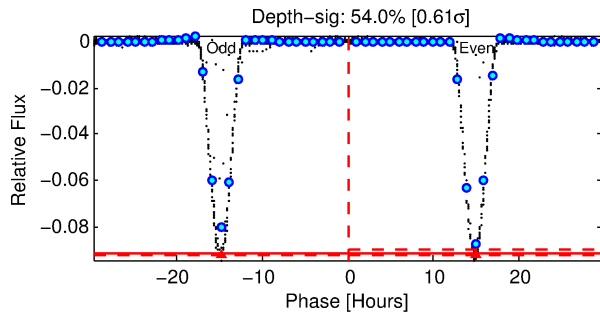
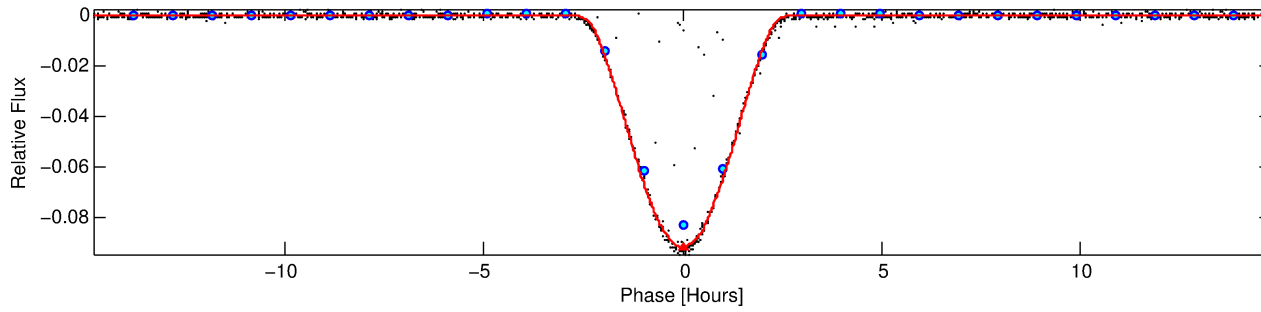
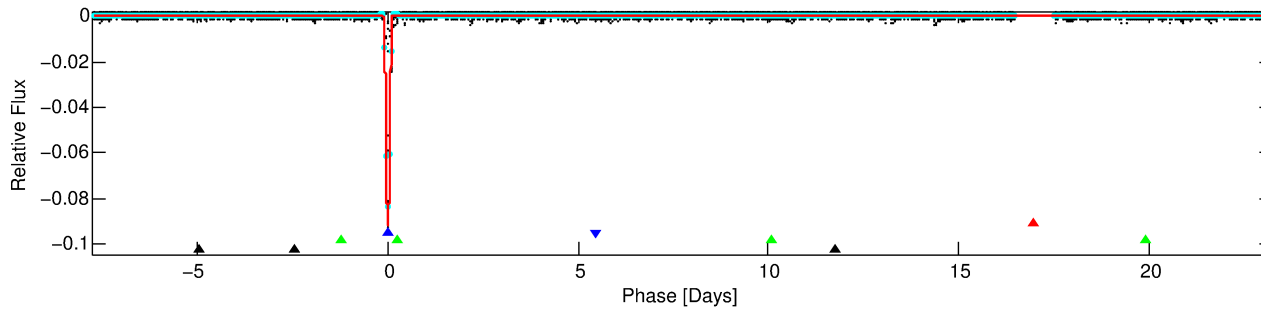
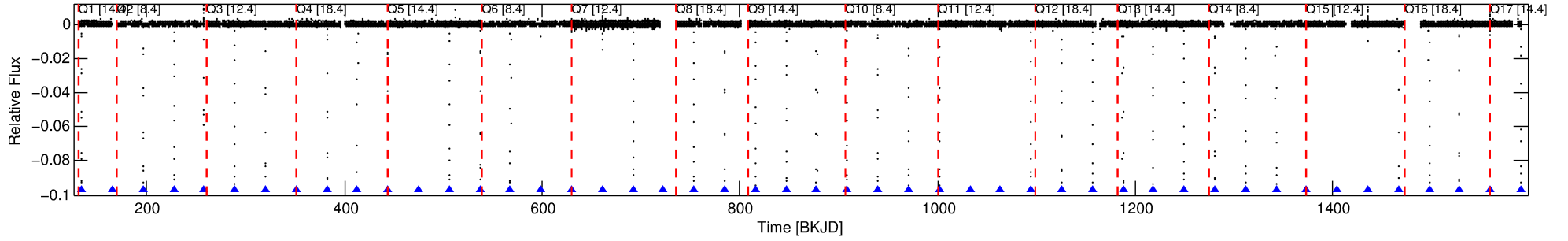
## Ephemeris Match Information For 006042663-02

No Significant Match Found

# DV One-Page Summary

KIC: 6042663 Candidate: 2 of 4 Period: 30.972 d  
KOI: K06651 Corr: No Ephemeris Match

Kp: 15.60 R\*: 0.83 Rs Teff: 5633.0 K Logg: 4.56 Fe/H: -0.160



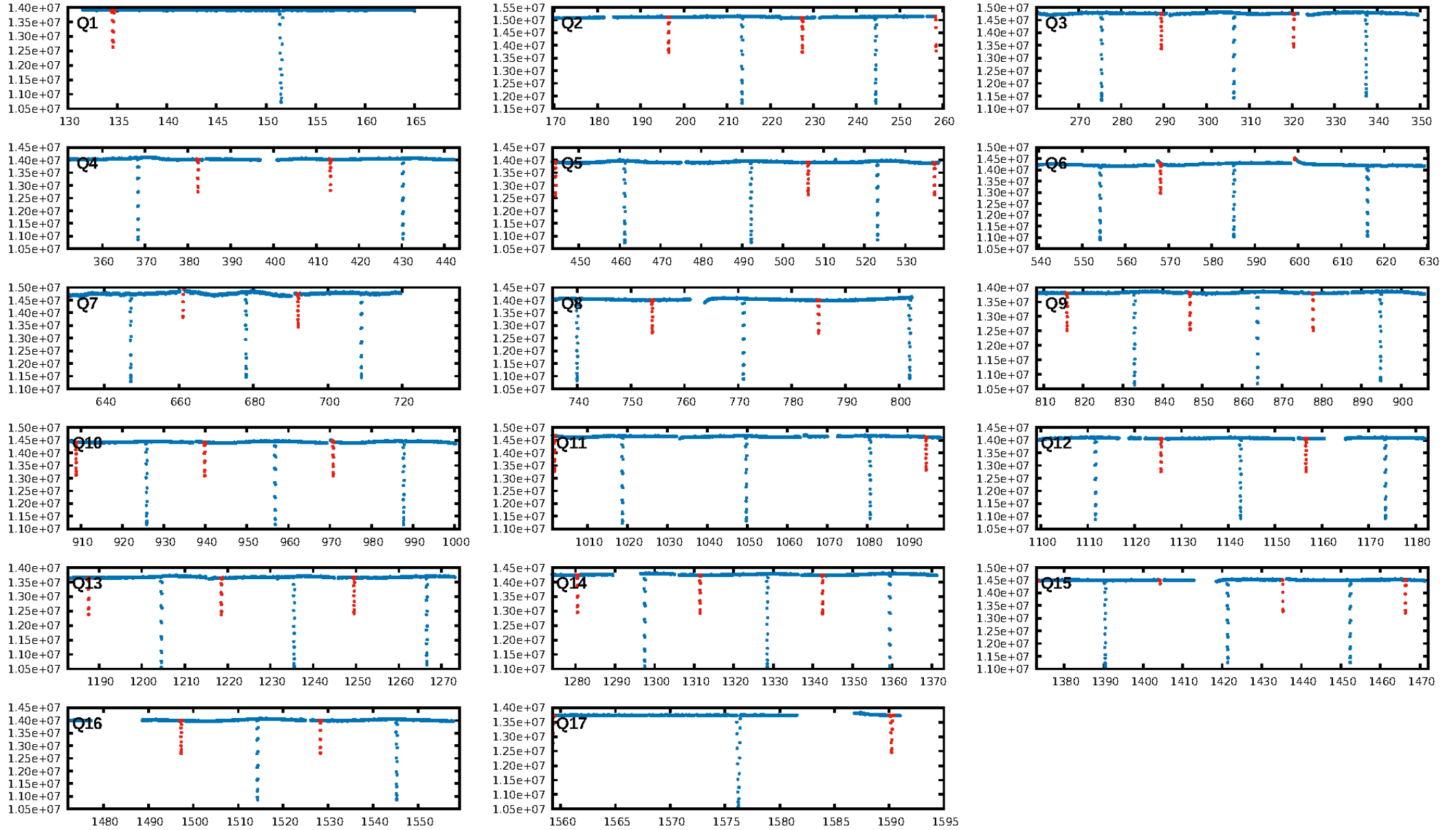
## DV Fit Results:

Period = 30.97178 [0.00000] d  
Epoch = 134.5483 [0.0001] BKJD  
Rp/R\* = 0.4299 [0.0655]  
a/R\* = 51.55 [0.28]  
b = 0.94 [0.09]  
Seff = 17.77 [5.95]  
Teq = 524 [44] K  
Rp = 38.89 [11.90] Re  
a = 0.1868 [0.0409] AU  
Ag = 1.58 [0.91] [0.64σ]  
Teffp = 907 [113] K [3.16σ]

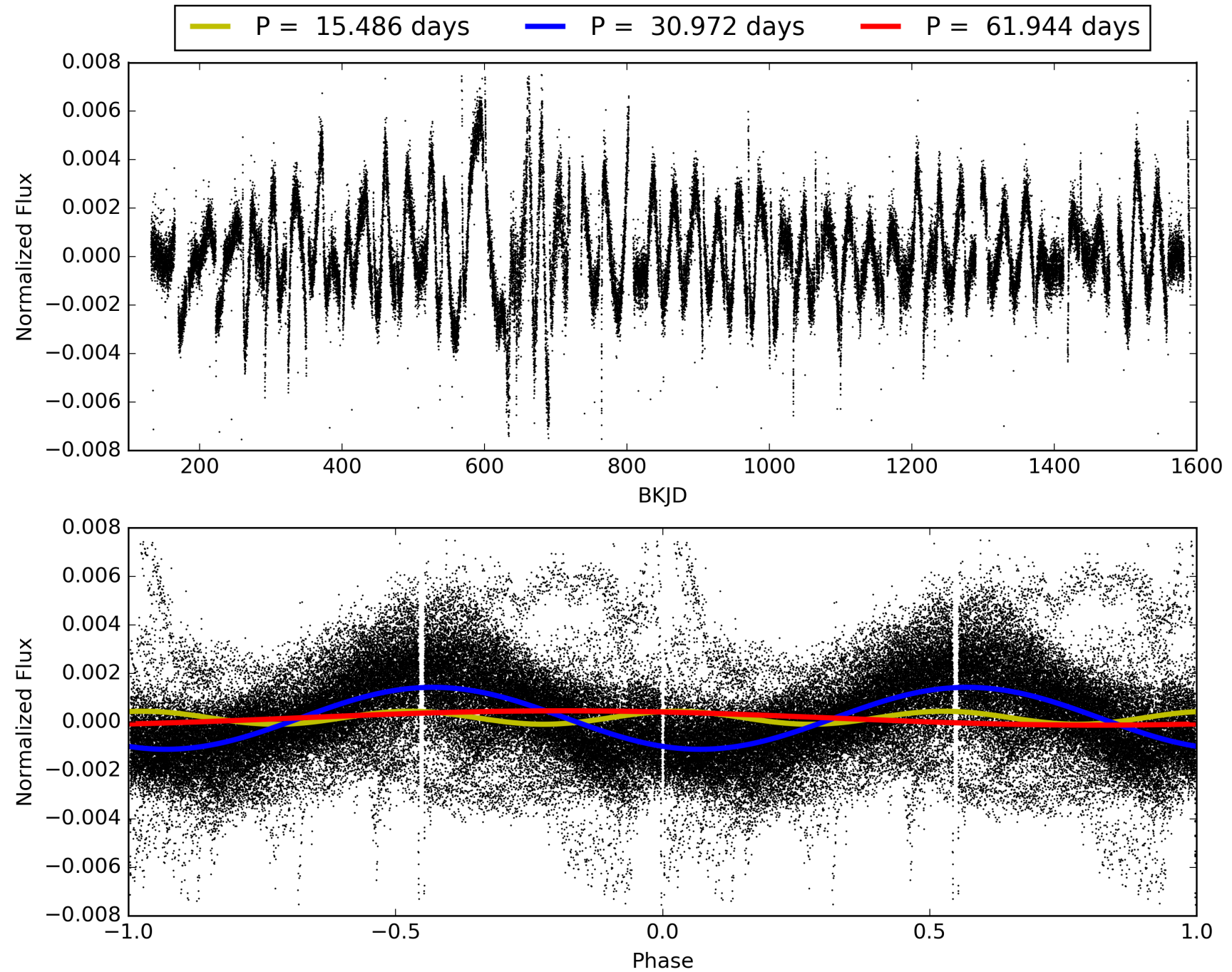
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 100.0% [233.98σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.6%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [38/38]  
GhostDiagnostic-chr: 3.288  
Centroid-sig: 0.0%  
Centroid-so: 0.121 arcsec [18.30σ]  
OotOffset-rm: 0.046 arcsec [0.69σ]  
KicOffset-rm: 0.073 arcsec [1.05σ]  
OotOffset-st: 3/3/4/5 [15]  
KicOffset-st: 3/3/4/5 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 1.00 [15/15]

# TCE 006042663-02, PDC Light Curves



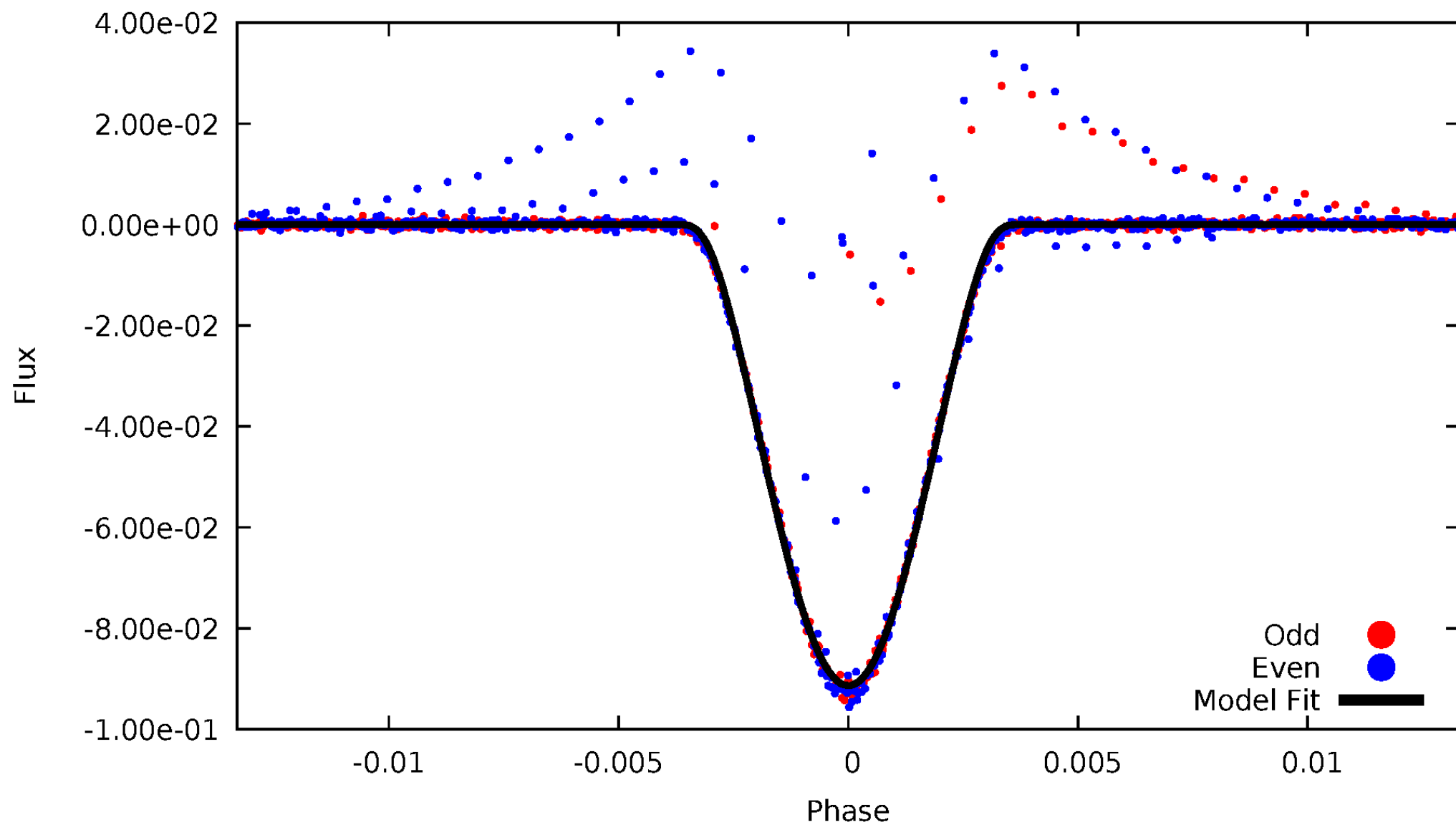
TCE 006042663-02





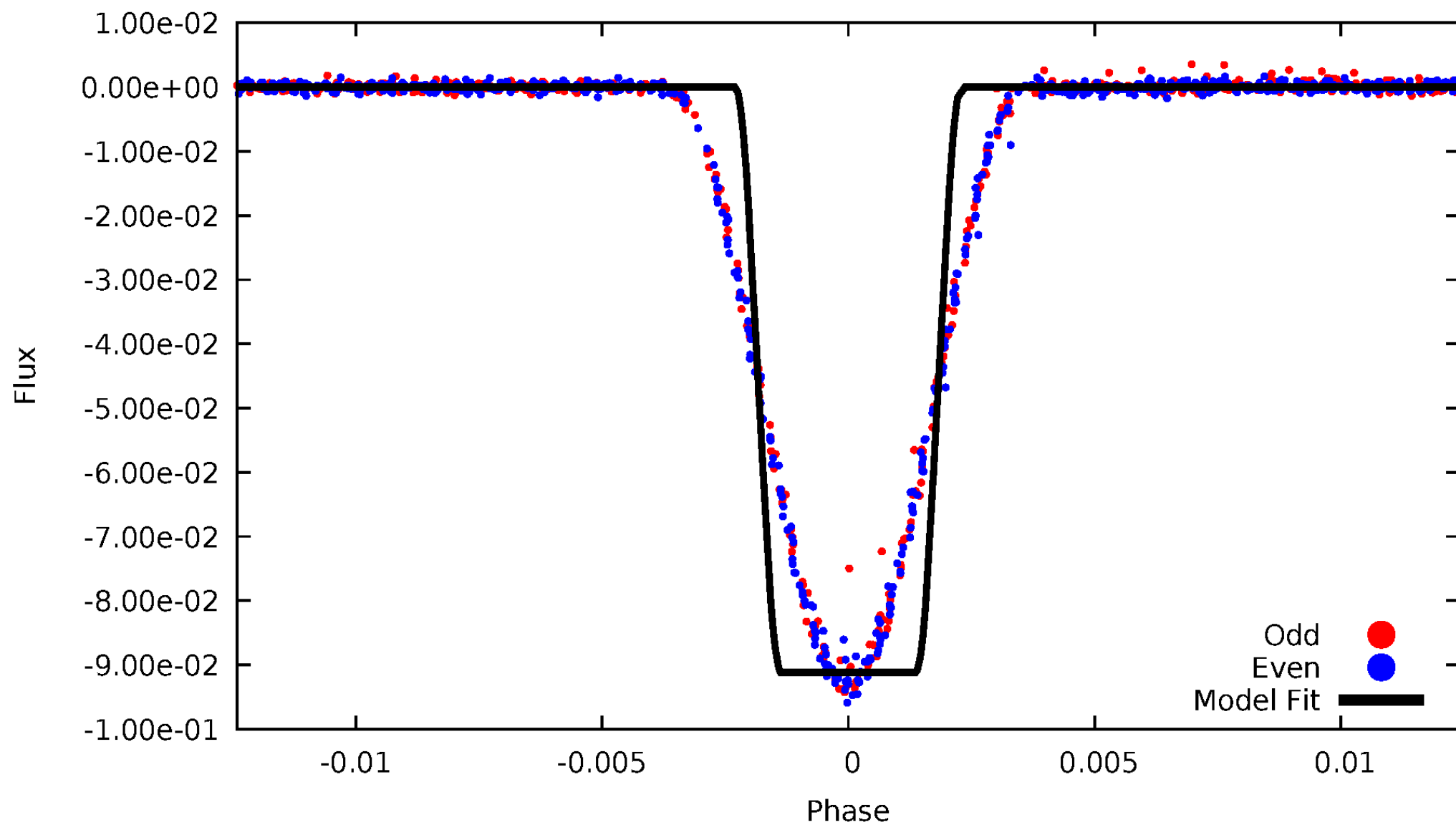
# DV Odd/Even

TCE 006042663-02



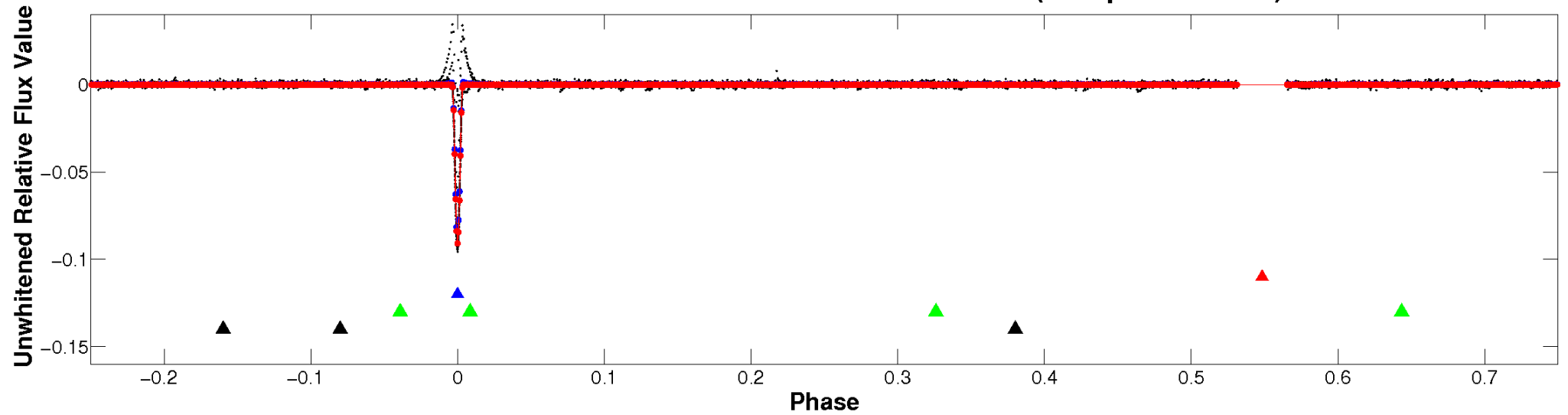
# ALT Odd/Even

TCE 006042663-02

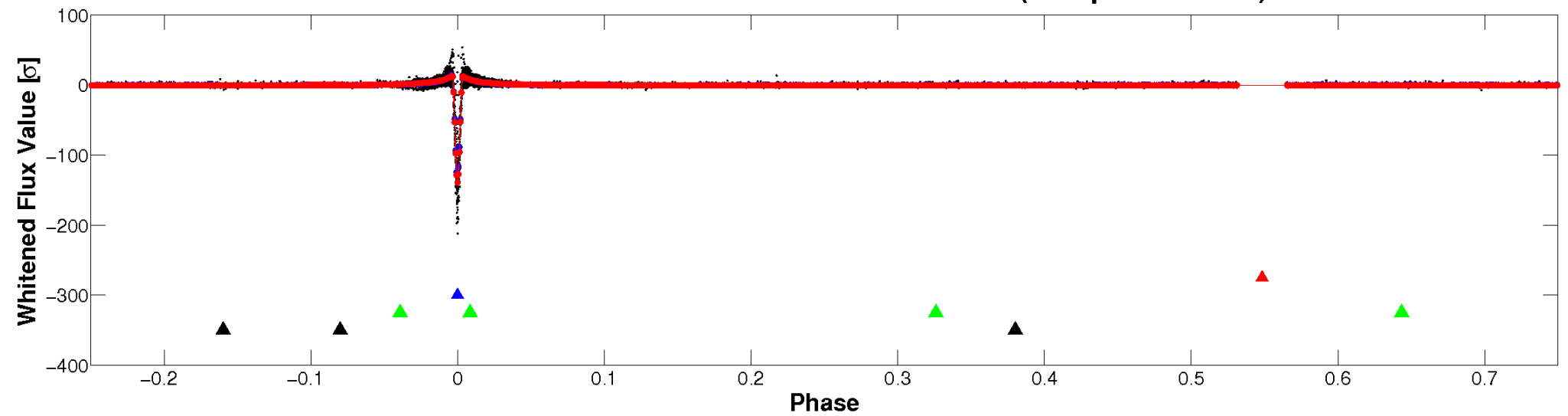


# Non-Whitened Vs. Whitened Light Curve

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

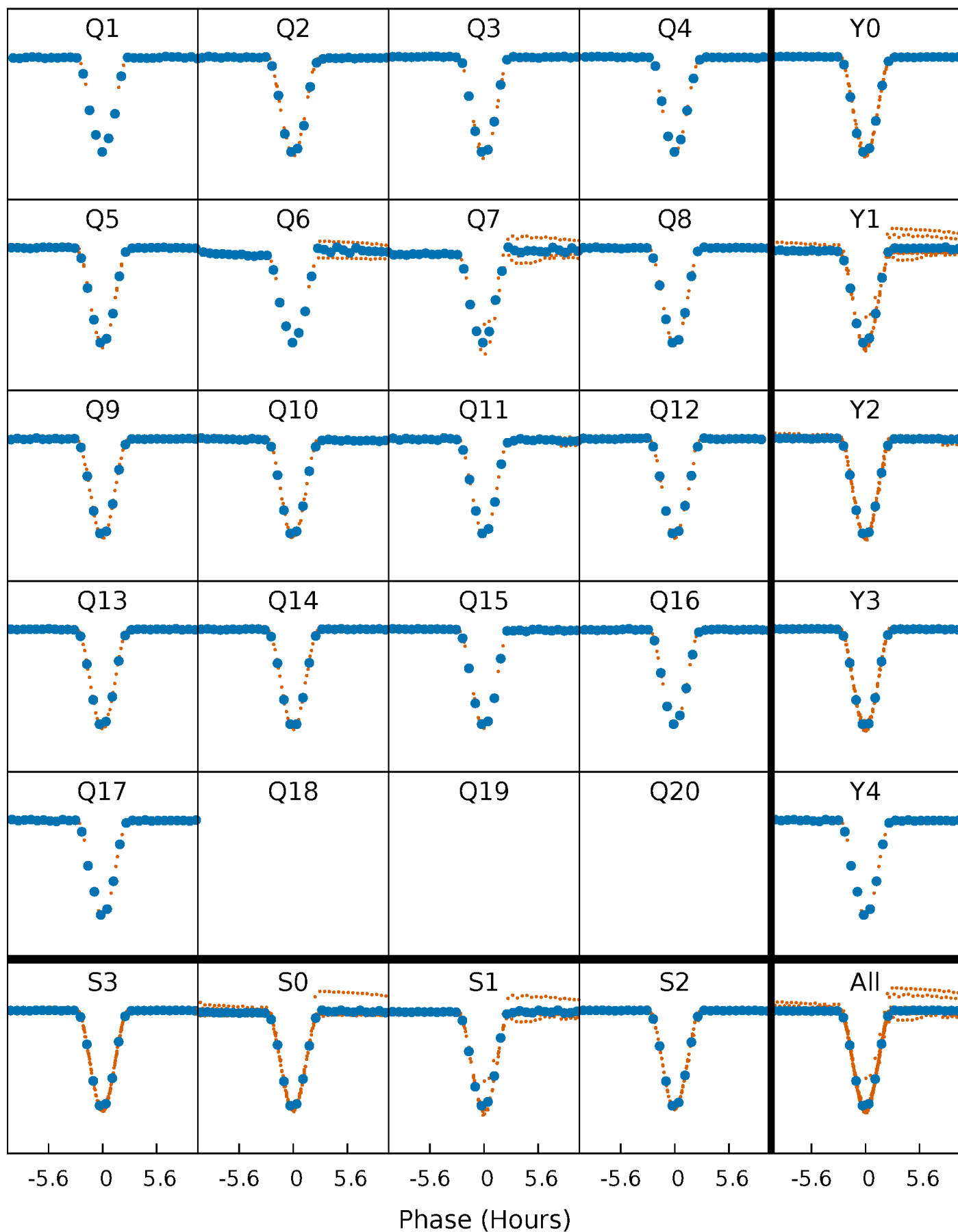


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



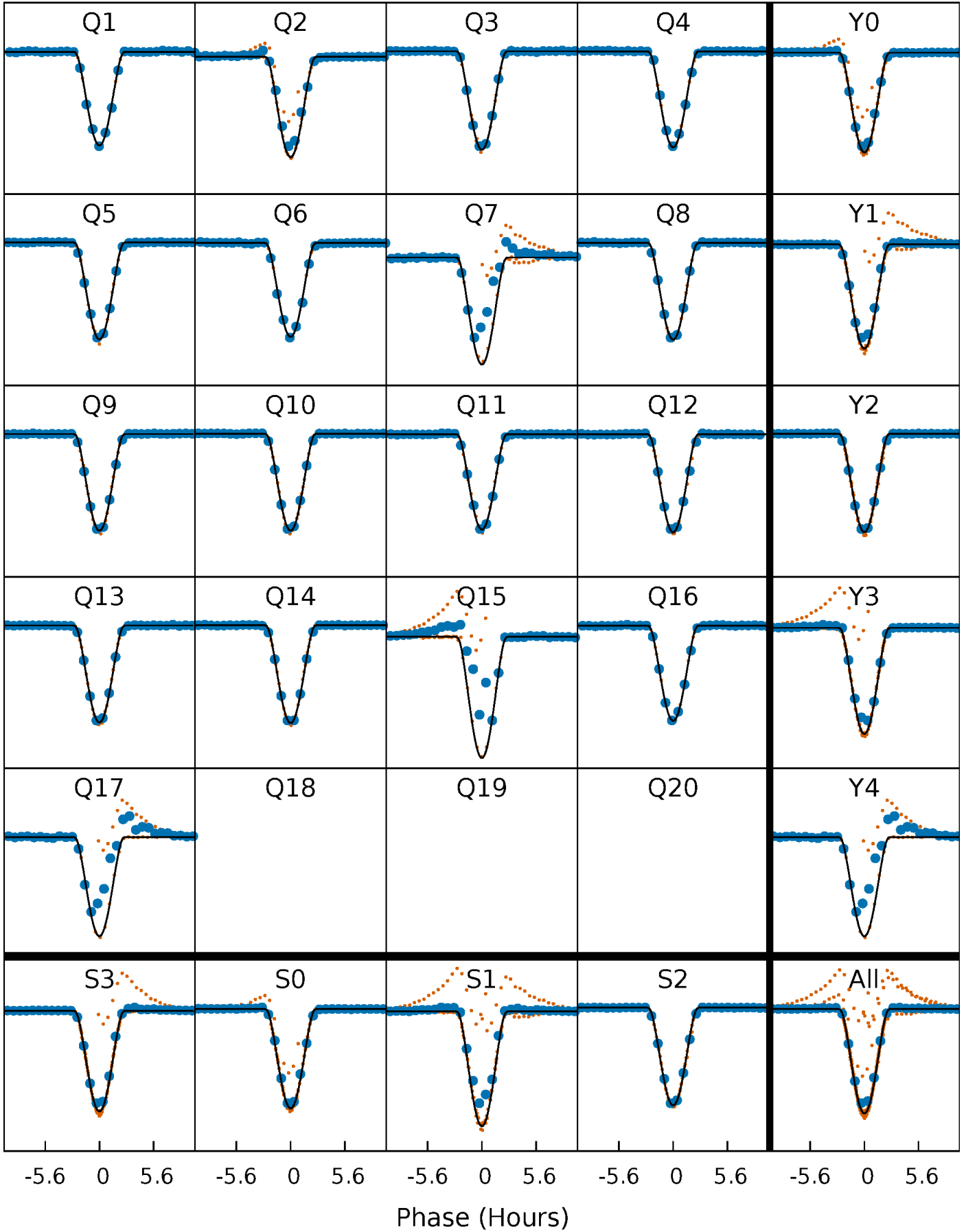
# PDC Quarter-Phased Transit Curves

TCE 006042663-02 P= 30.971778 Days  $T_0=134.548271$  (BKJD)



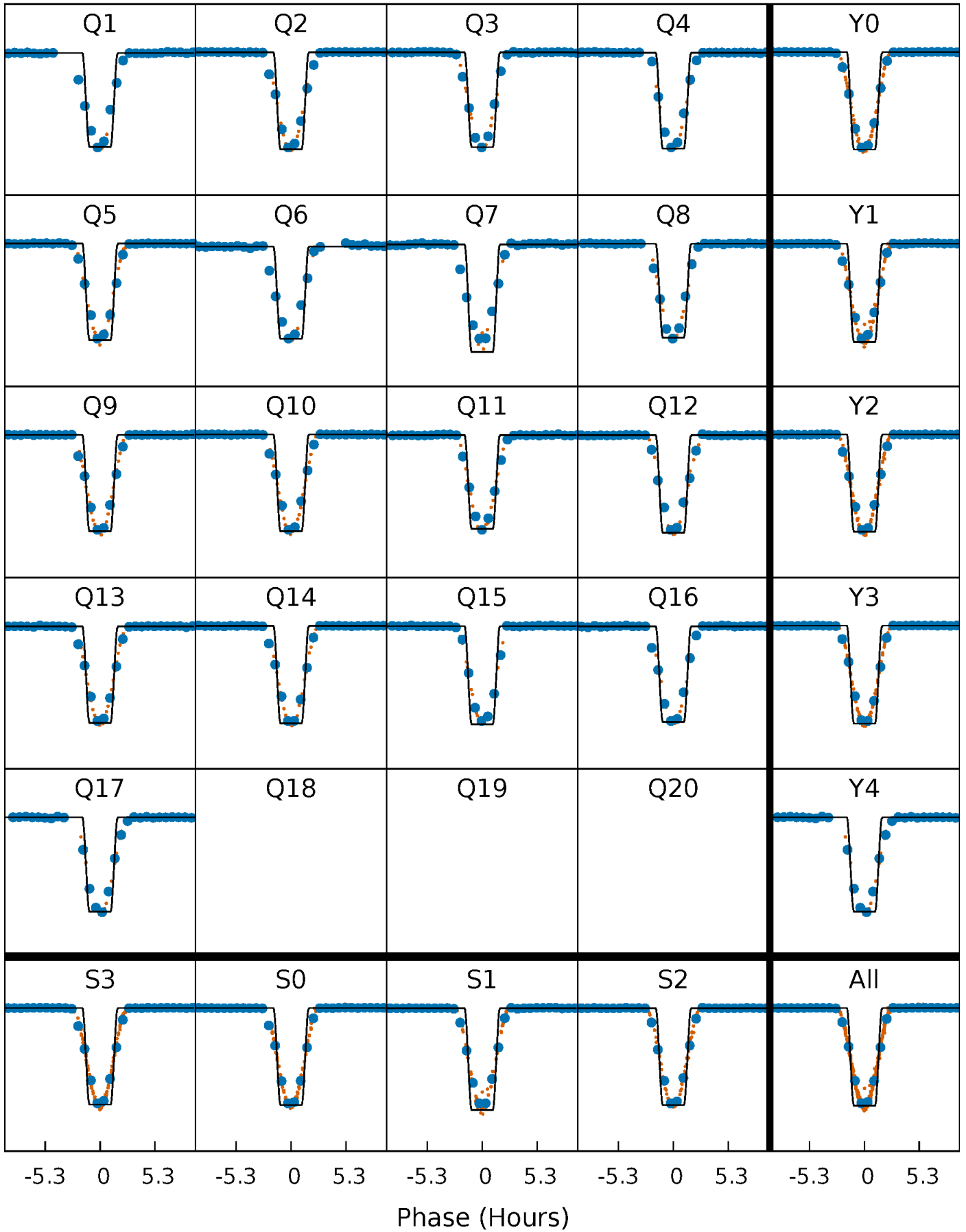
# DV Quarter-Phased Transit Curves

TCE 006042663-02 P= 30.971778 Days  $T_0=134.548271$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

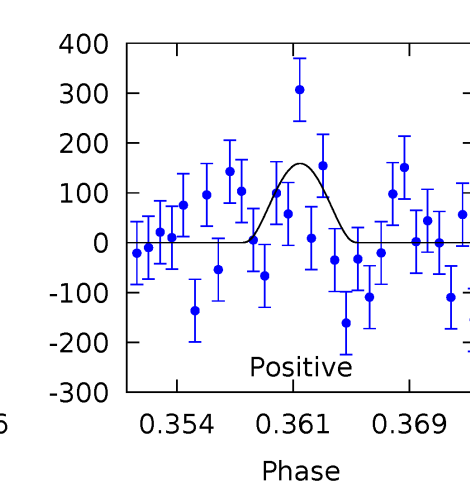
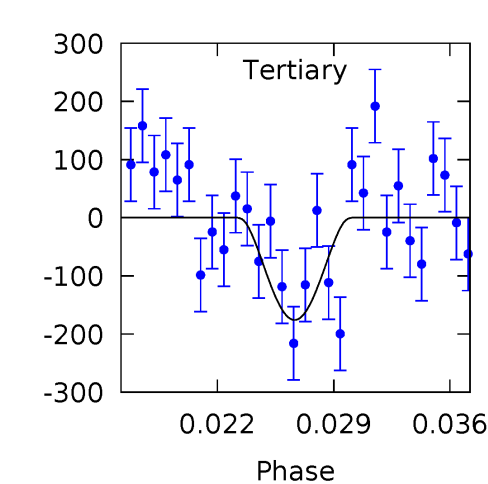
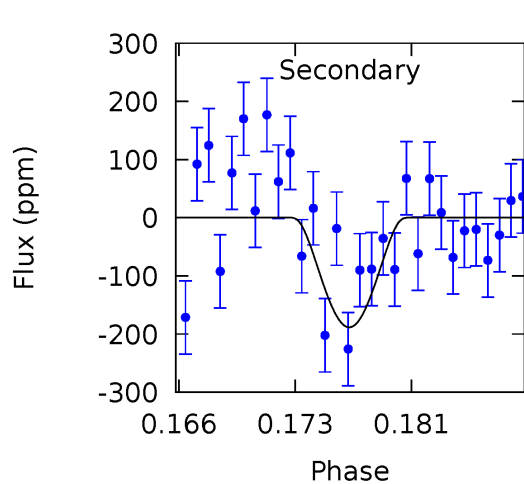
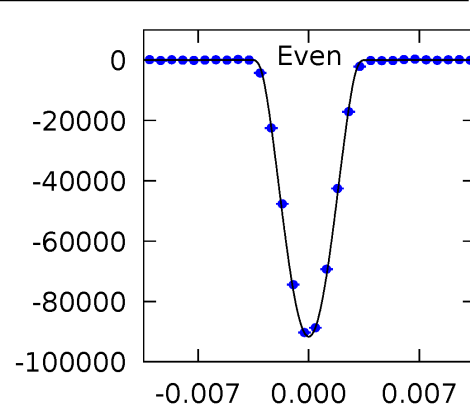
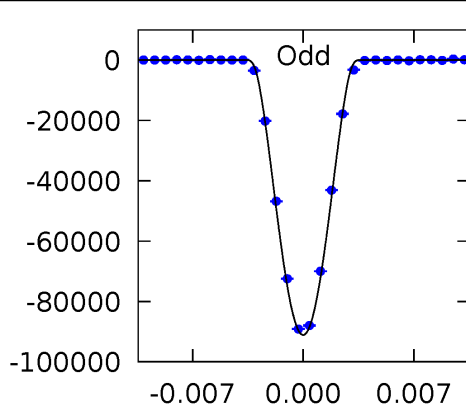
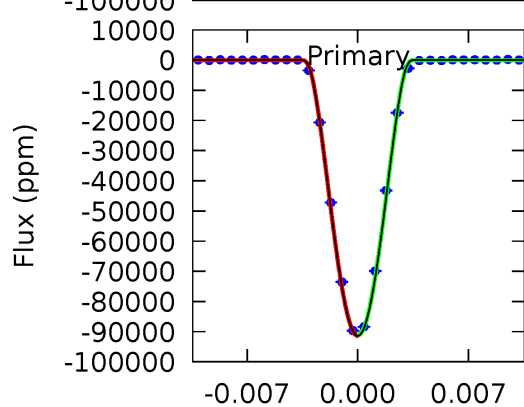
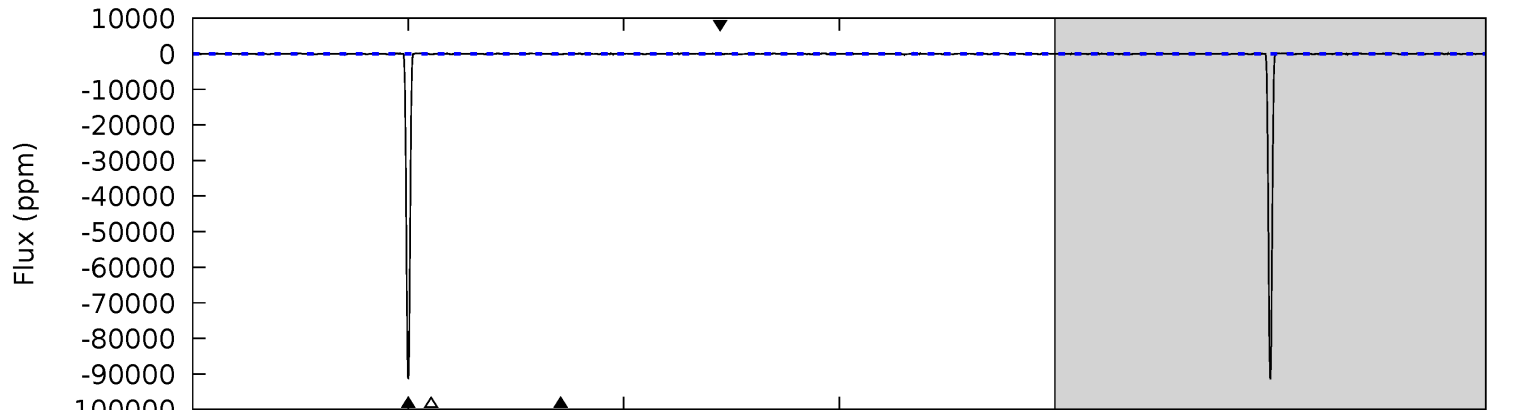
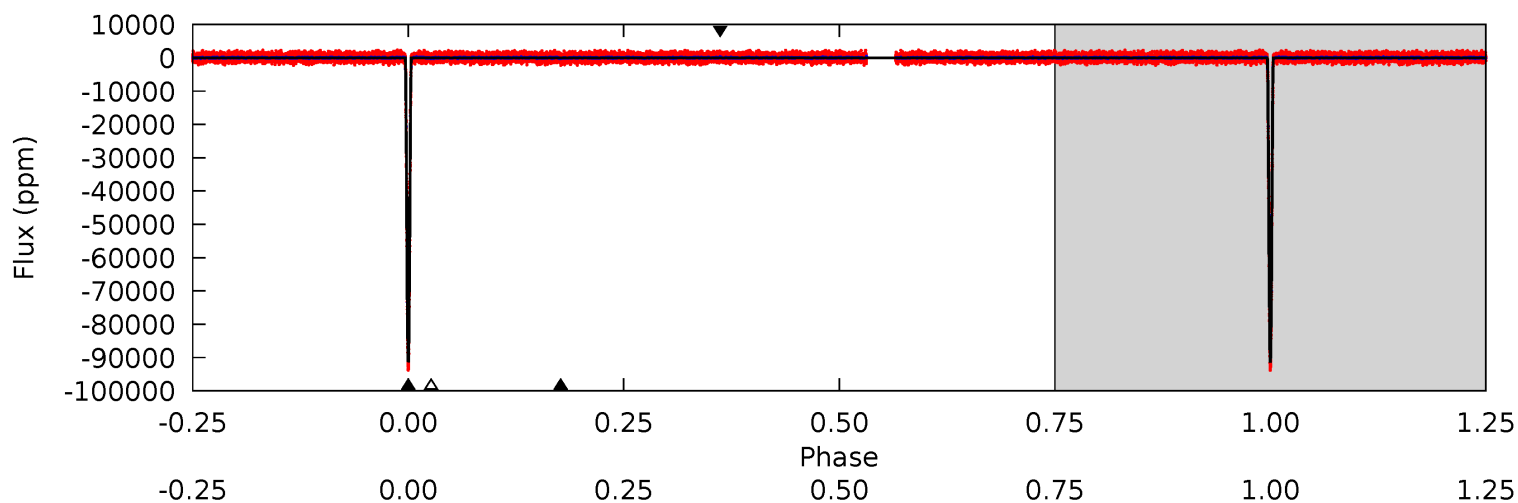
TCE 006042663-02 P= 30.971695 Days  $T_0=134.550320$  (BKJD)



# DV Model-Shift Uniqueness Test

006042663-02, P = 30.971778 Days, E = 103.576493 Days

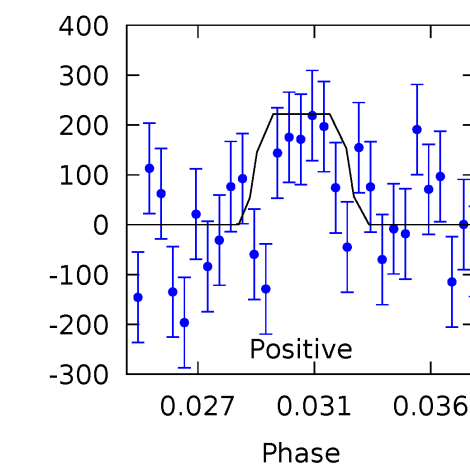
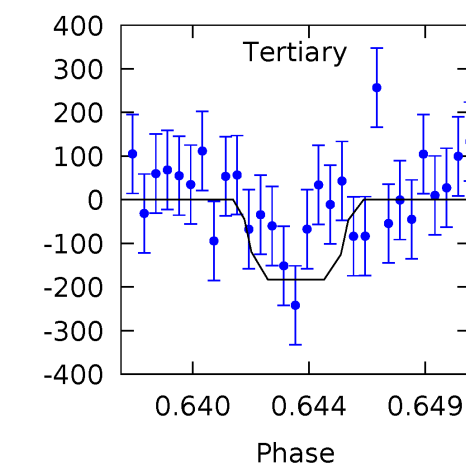
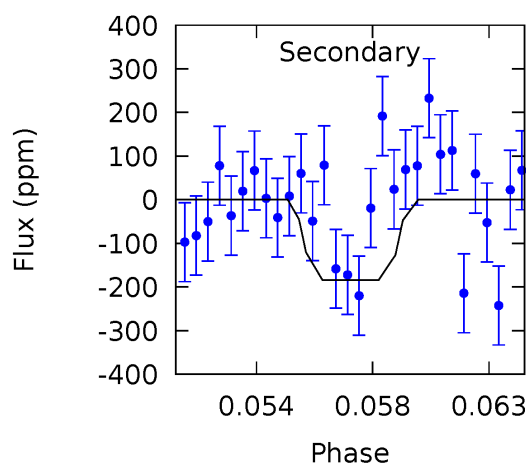
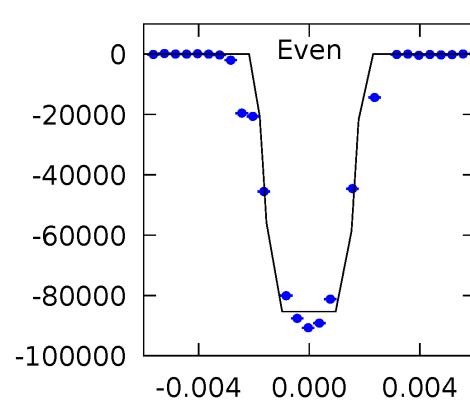
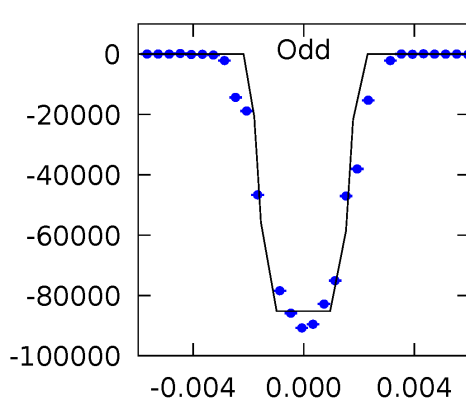
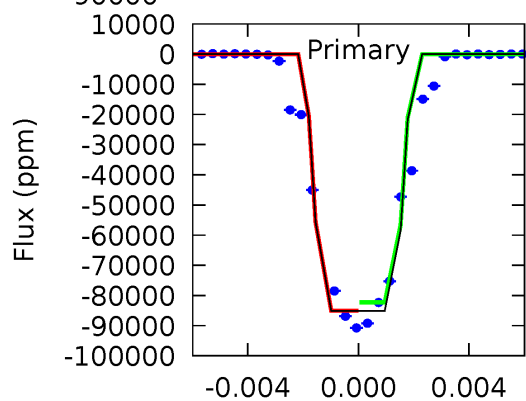
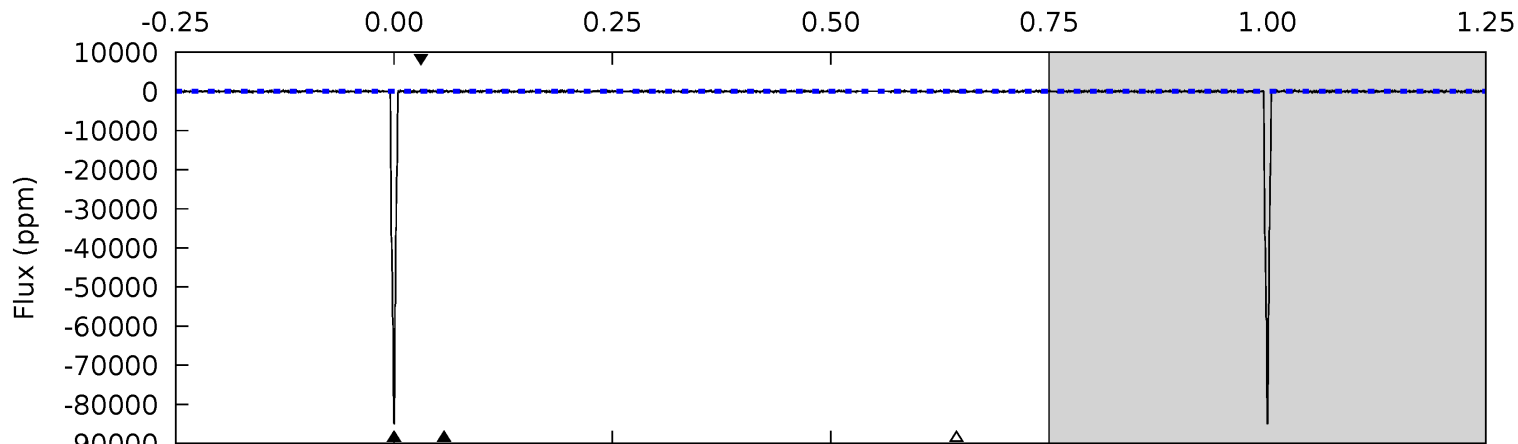
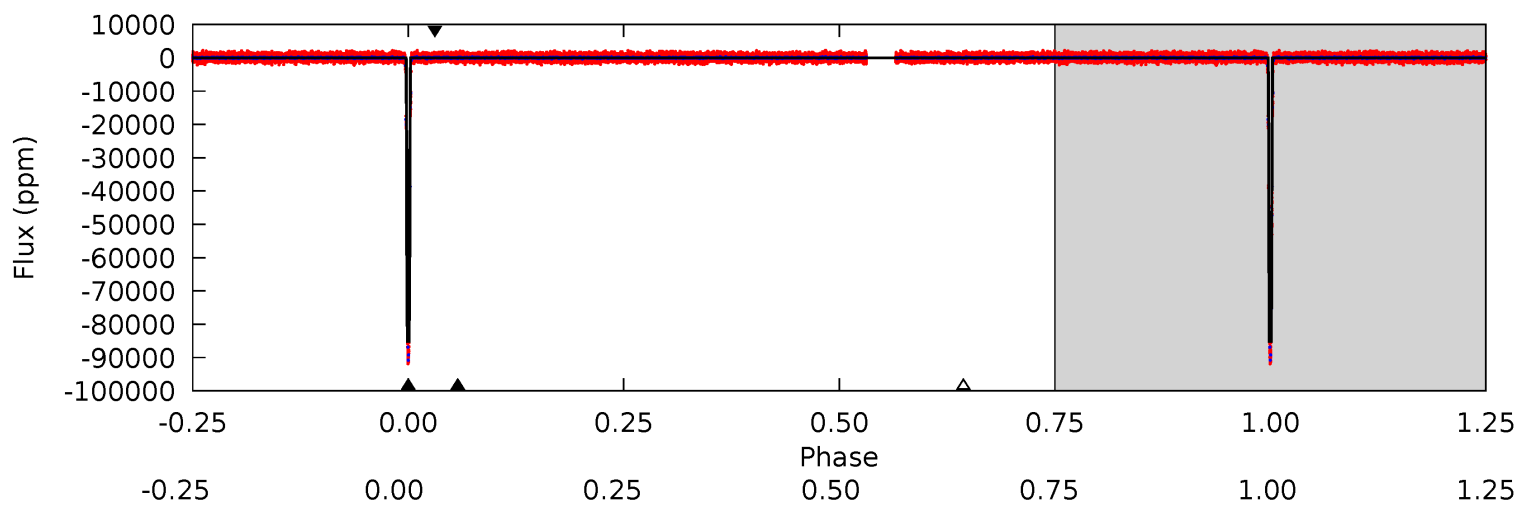
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3074	6.33	5.91	5.35	5.09	2.69	2.00	3069	3069	0.42	0.99	9.50	0.89	0.00	2.79



# Alt Model-Shift Uniqueness Test

006042663-02, P = 30.971695 Days, E = 103.578625 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
1733	3.75	3.72	4.53	5.18	2.84	1.19	1729	1728	0.02	-0.78	1.27	1.00	0.00	25.8





### Stellar Parameters For KIC 006042663

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5633^{+169}_{-169}$	$4.558^{+0.042}_{-0.168}$	$-0.160^{+0.300}_{-0.300}$	$0.829^{+0.220}_{-0.073}$	$0.906^{+0.095}_{-0.104}$	$2.237^{+0.493}_{-1.002}$
	+3%/-3%	+1%/-4%	+188%/-188%	+27%/-9%	+10%/-11%	+22%/-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 006042663-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-188 \pm 30$	$40.92^{+7.32}_{-7.14}$	$748^{+43}_{-37}$	$1974^{+88}_{-83}$	$2.151^{+1.031}_{-0.685}$
Alt.	$-184 \pm 49$	$28.15^{+7.48}_{-6.23}$	$744^{+43}_{-33}$	$2139^{+138}_{-130}$	$4.322^{+3.043}_{-1.797}$

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

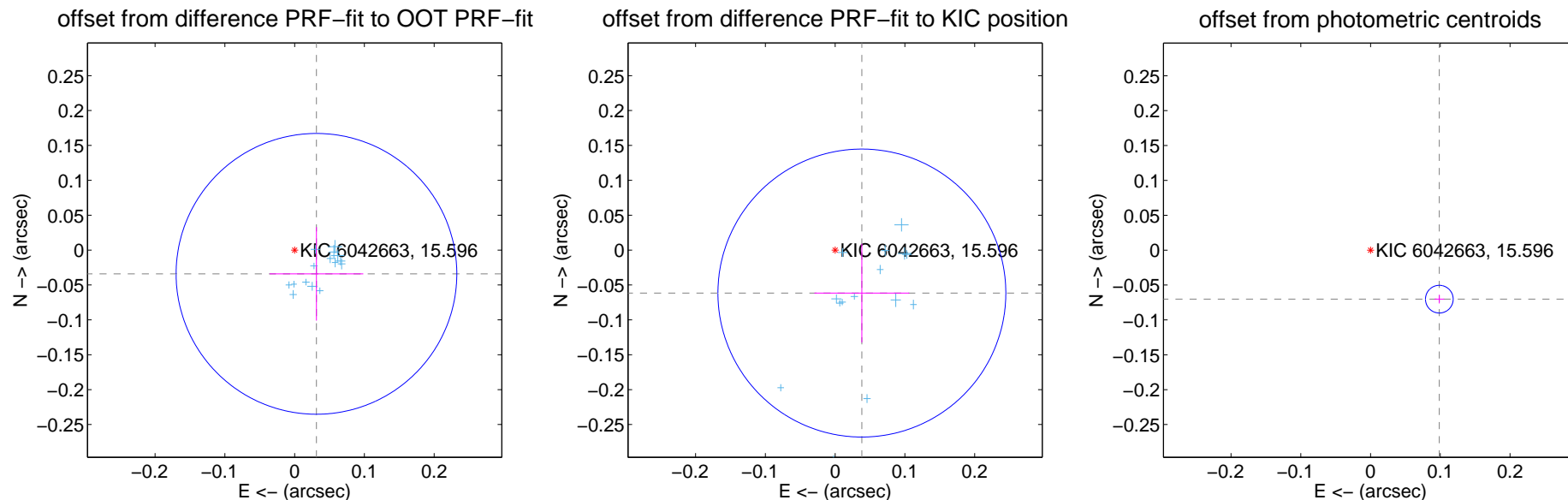
## DV Centroid Data

Supplemental centroid analysis for 006042663-02. Kepler magnitude: 15.60. Transit SNR 1414.27

There are 15 quarters with good PRF difference image offsets

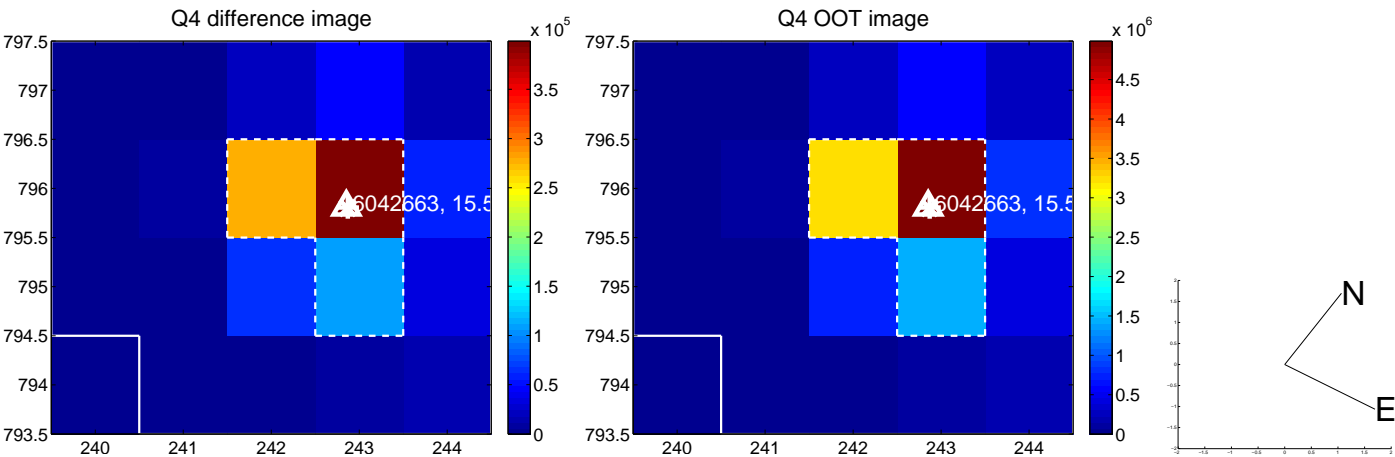
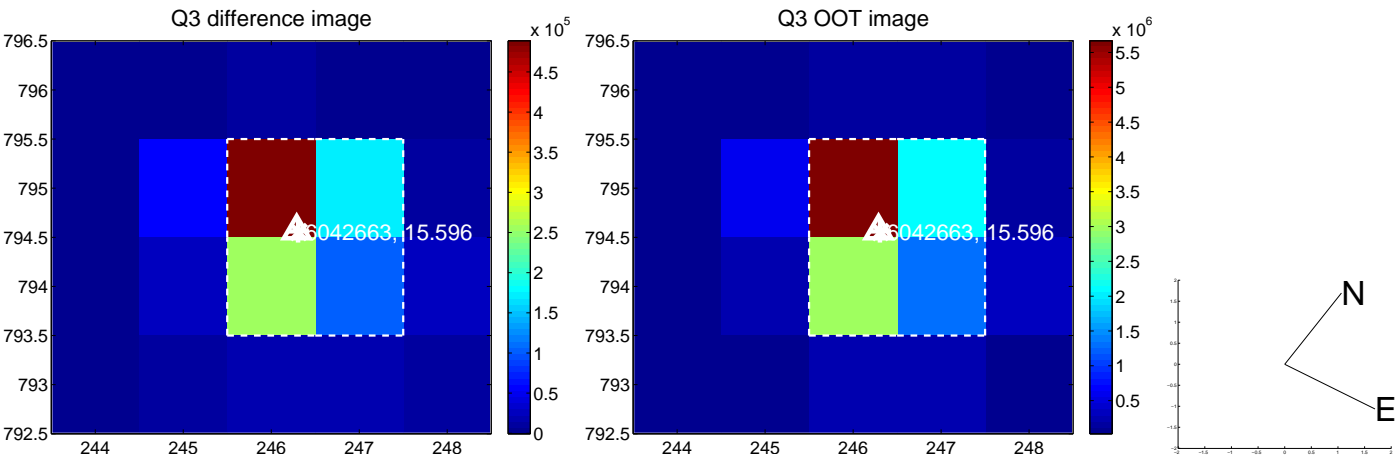
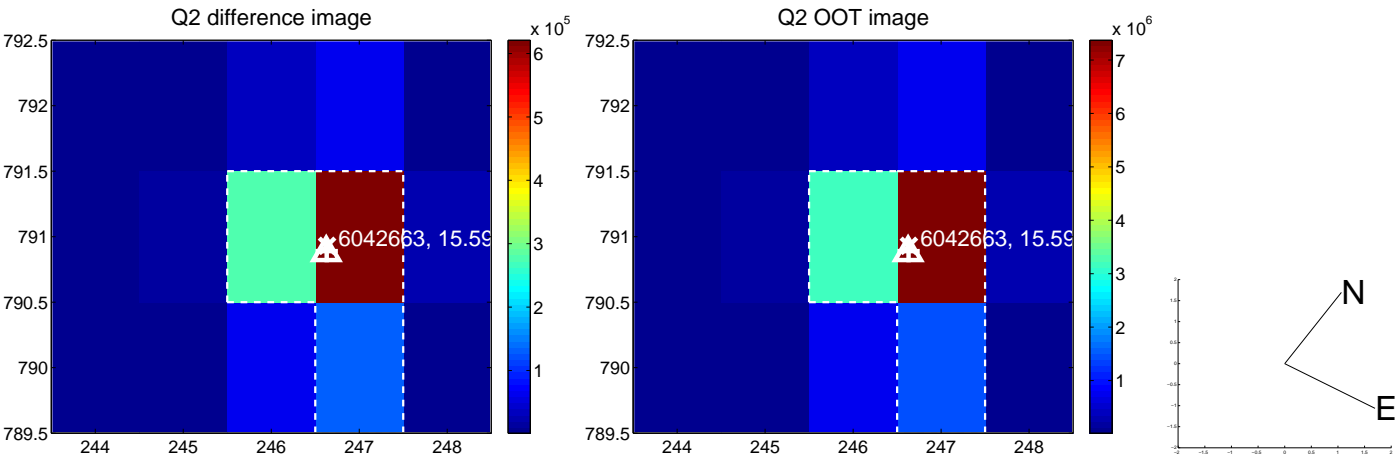
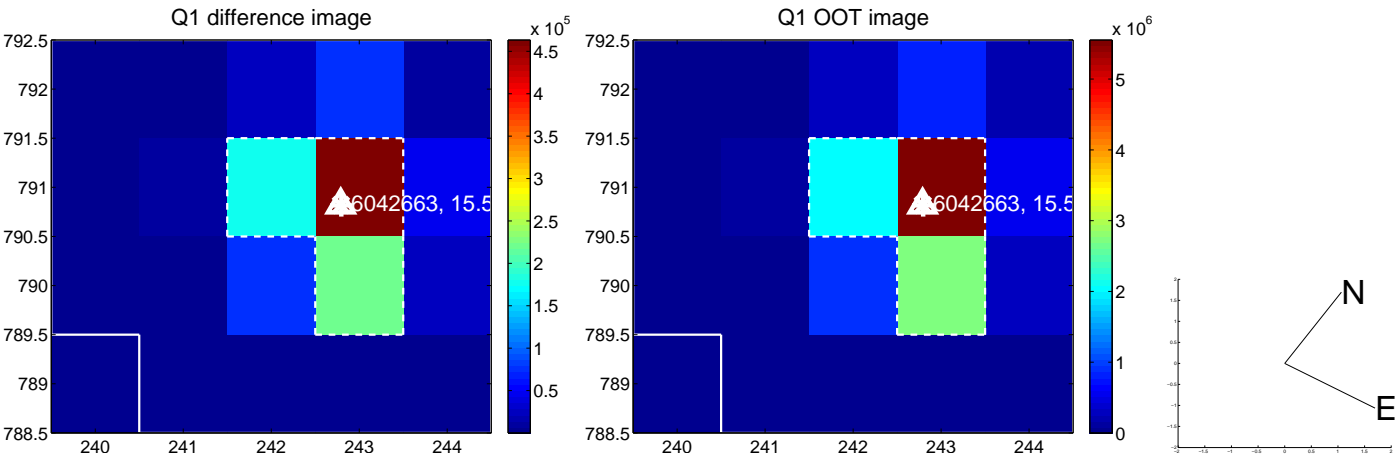
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.046 \pm 0.067$	0.69	$-0.031 \pm 0.067$	$-0.034 \pm 0.067$
PRF-fit source offset from KIC position	$0.073 \pm 0.069$	1.05	$-0.038 \pm 0.068$	$-0.062 \pm 0.071$
photometric centroid source offset	$0.12 \pm 0.01$	18.30	$-0.10 \pm 0.01$	$-0.07 \pm 0.01$

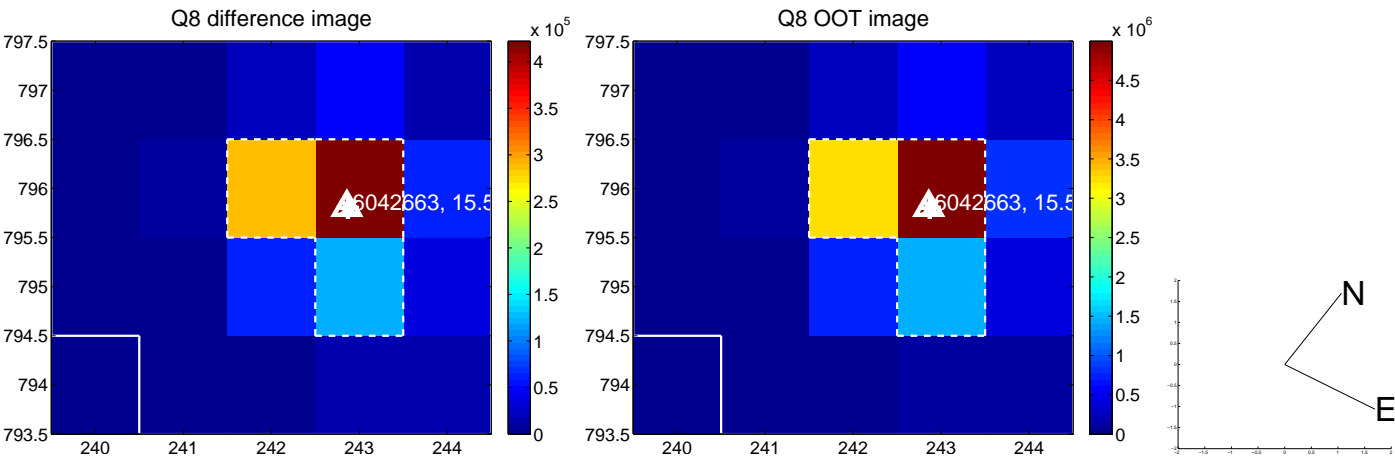
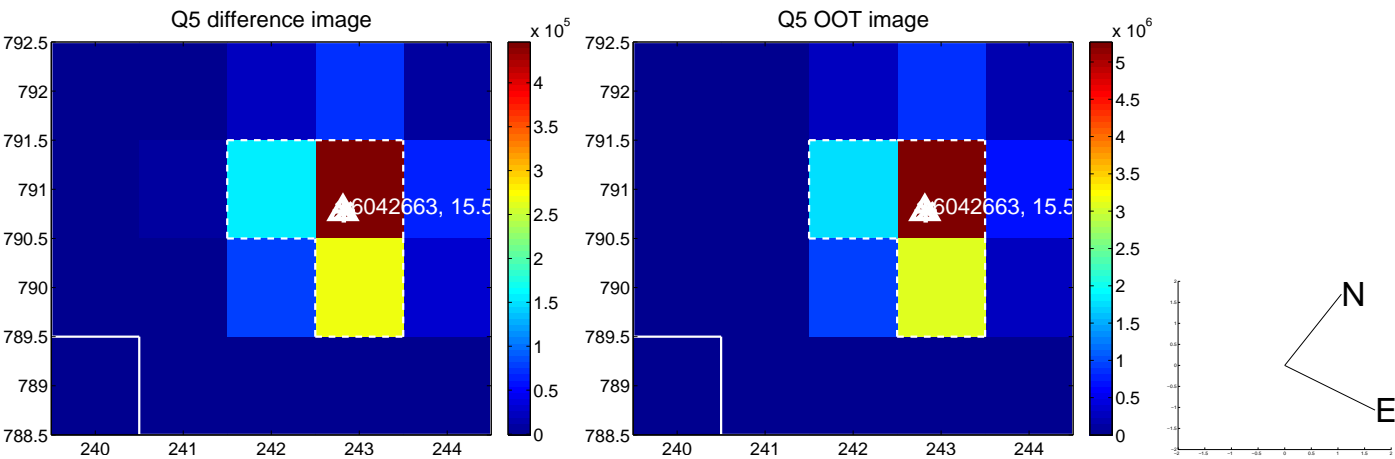


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

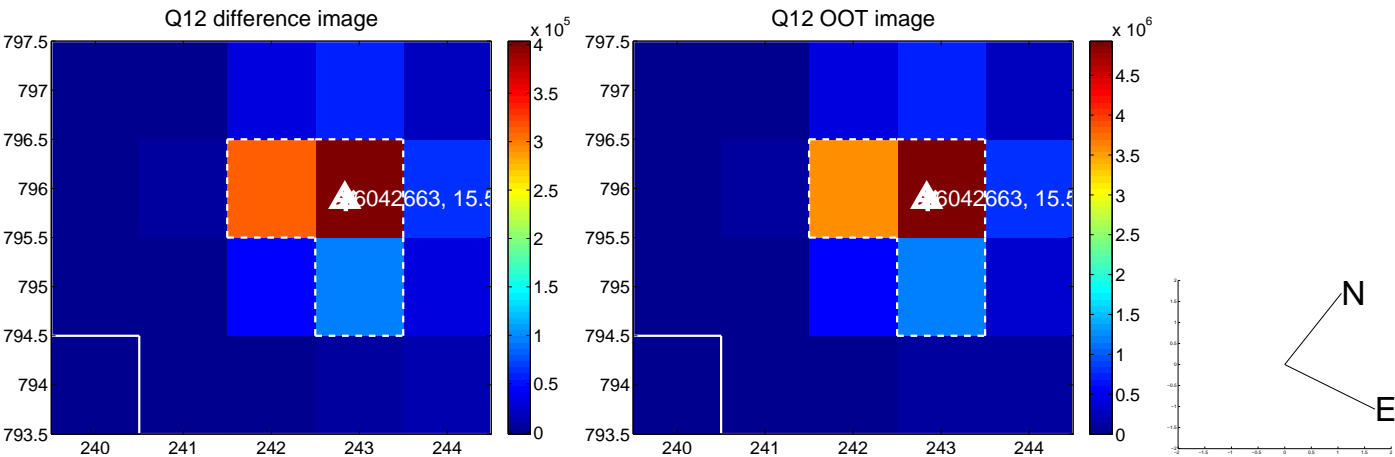
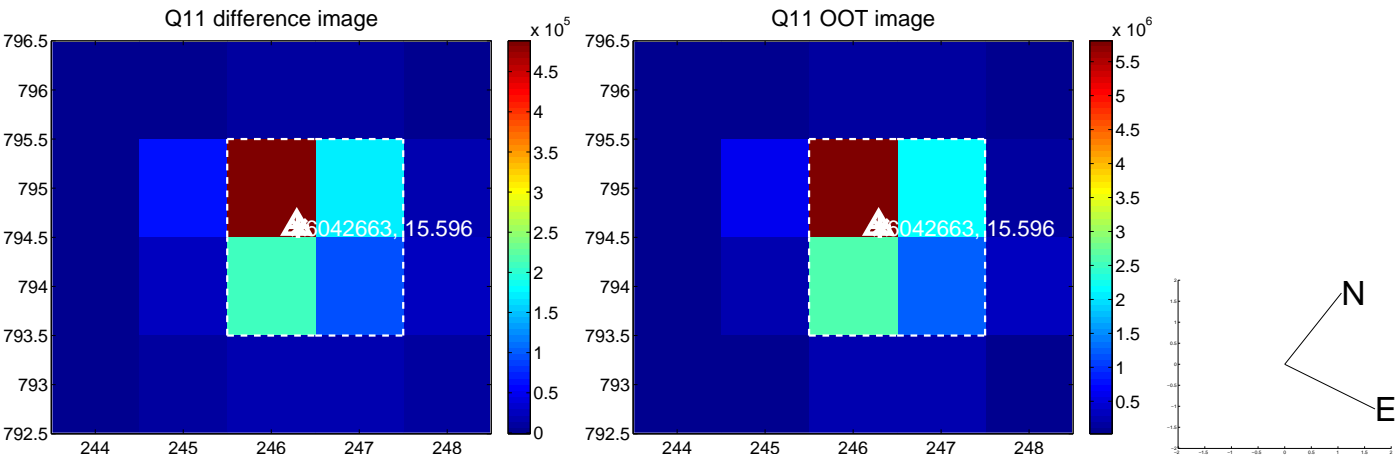
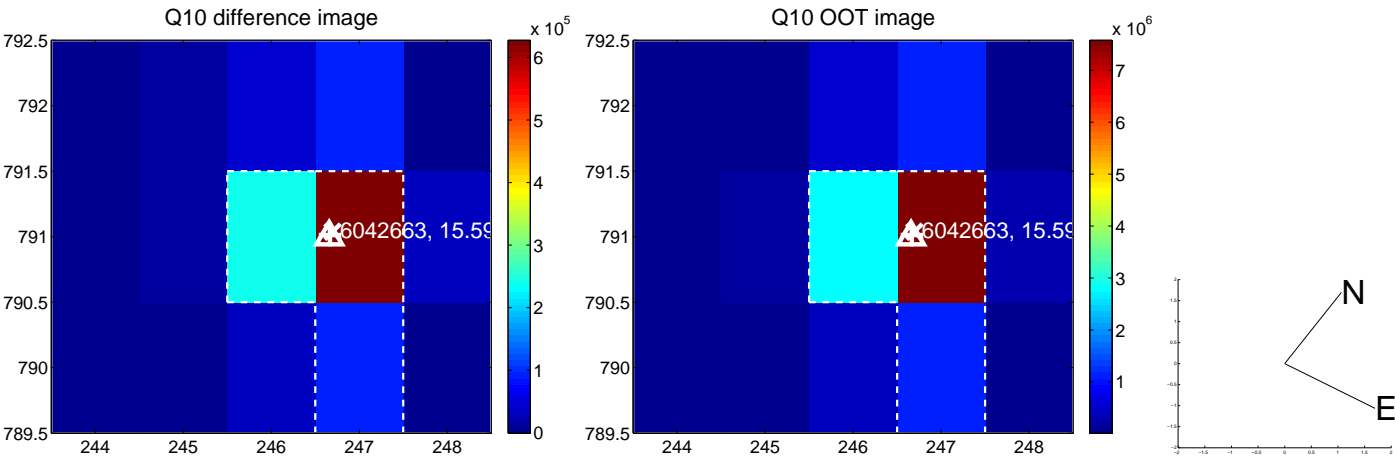
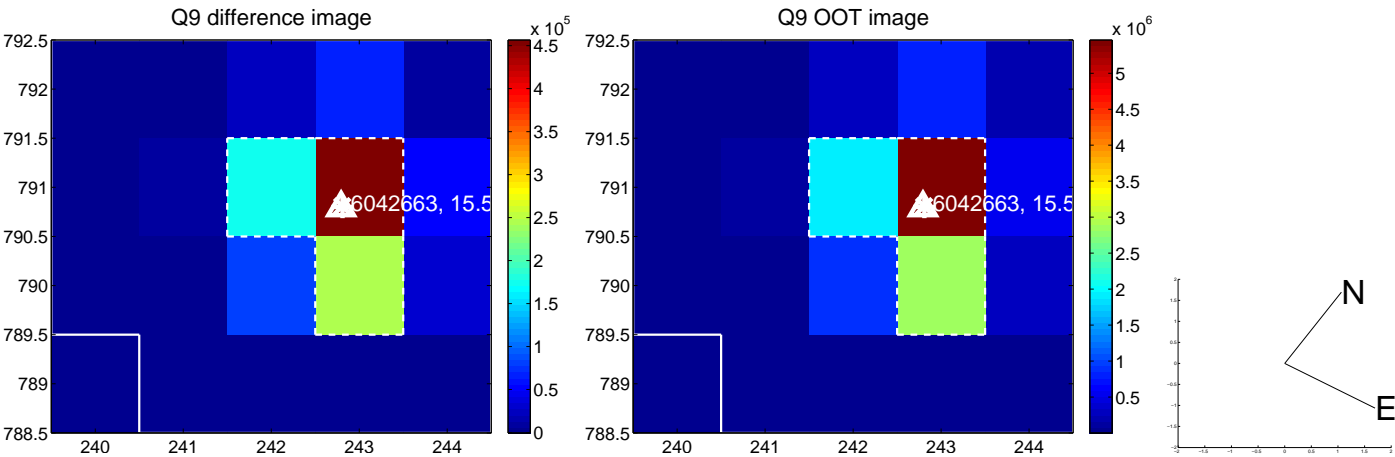
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



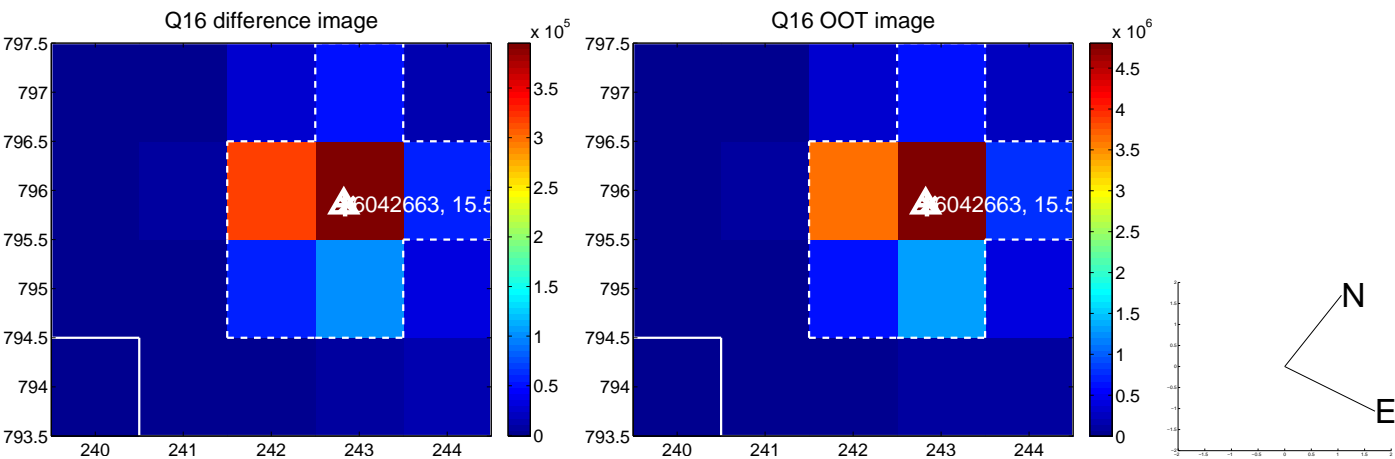
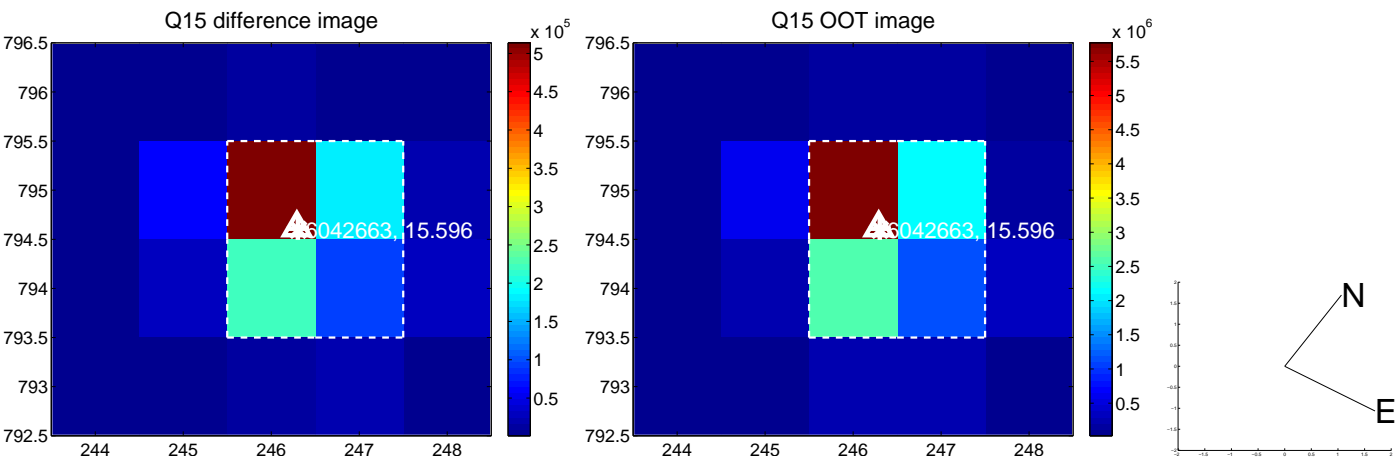
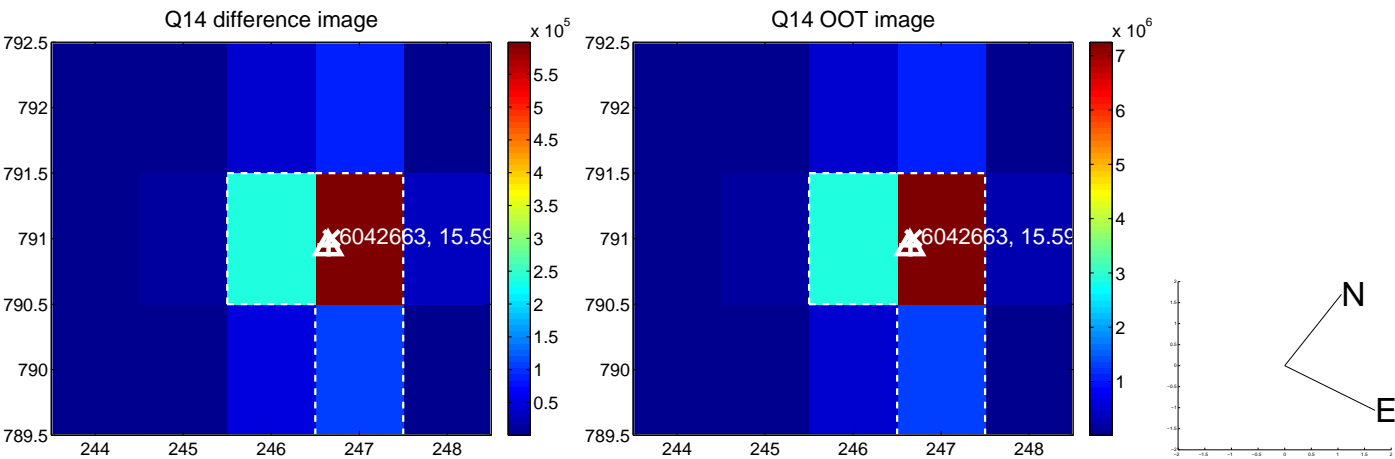
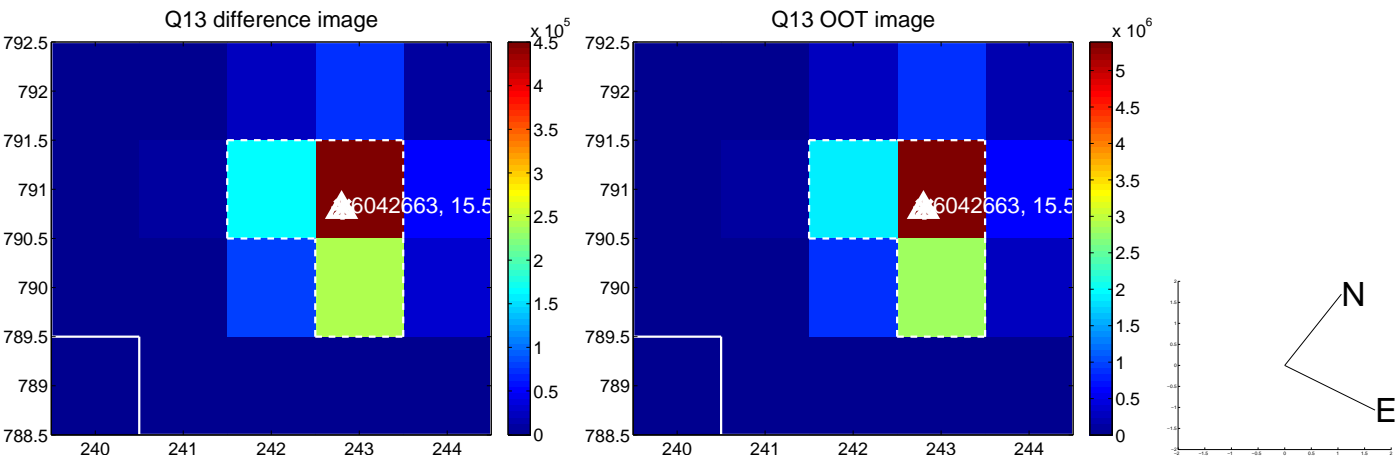
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



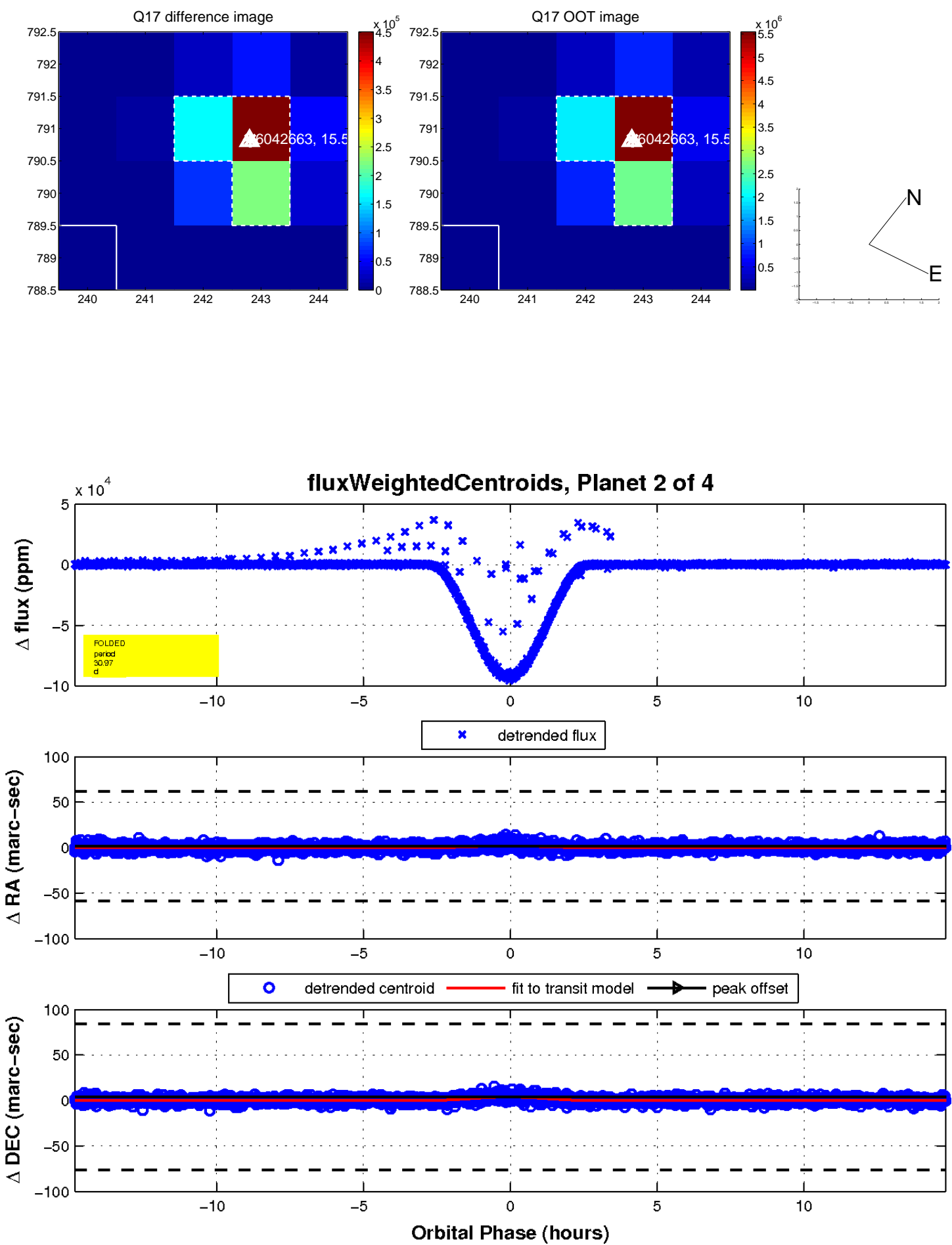
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

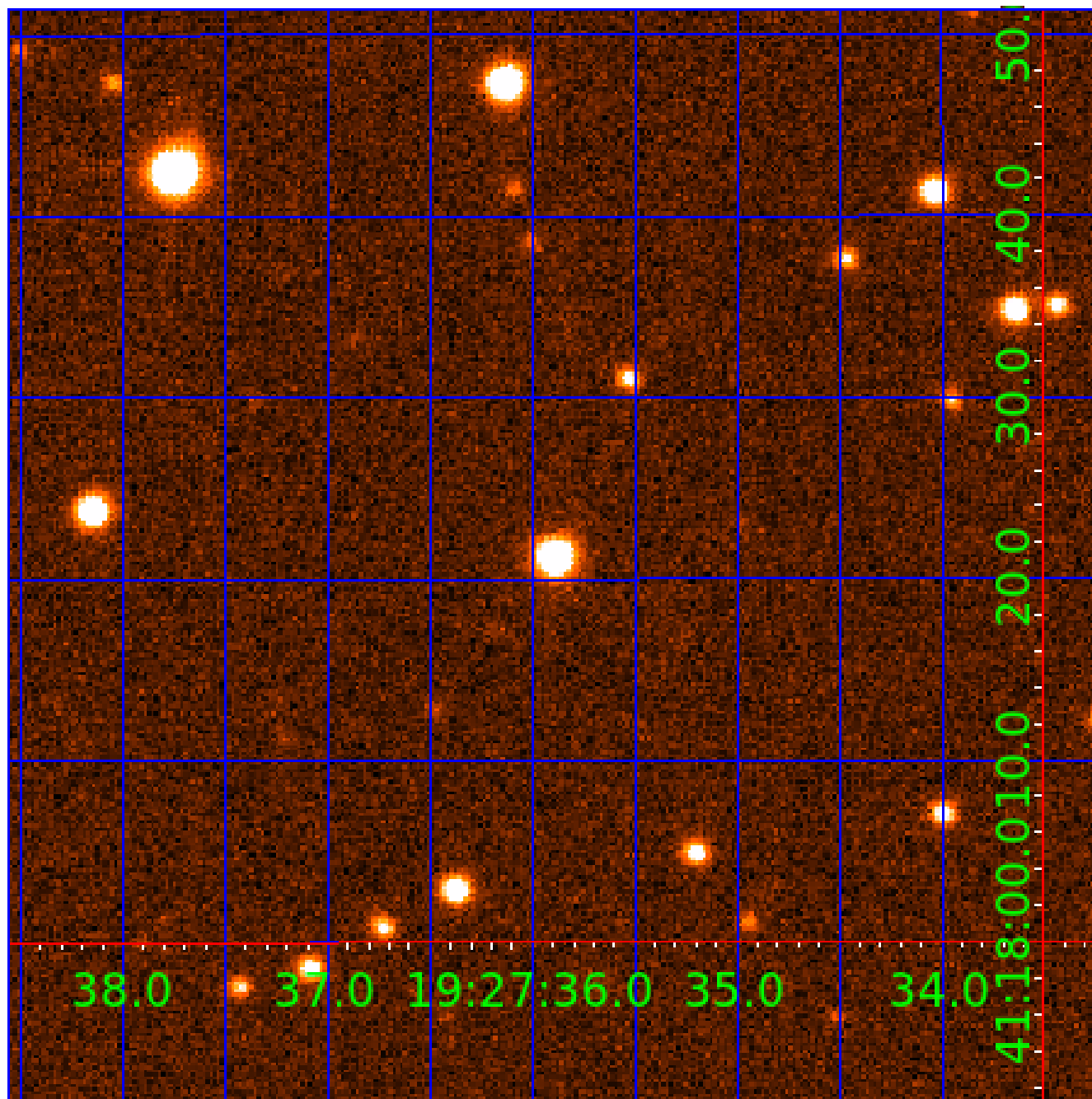


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006042663

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006042663-01	OBS	6651.01	30.971771	151.532154	227587.1	8.289	5374.2	3798.9	0.83	5633	59.94	17.77
006042663-02	OBS	No	30.971778	134.548271	91349.4	4.943	1492.3	1414.3	0.83	5633	38.89	17.77
006042663-03	OBS	No	392.801348	257.225187	1272.0	36.784	18.2	9.4	0.83	5633	3.05	0.60
006042663-04	OBS	No	481.297044	222.517333	1771.9	12.925	17.7	15.4	0.83	5633	3.98	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006042663-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
006042663-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
006042663-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006042663-04	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.

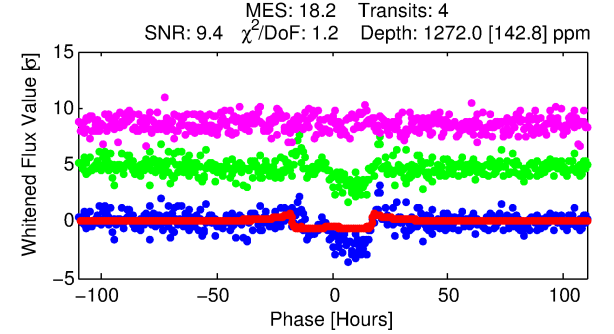
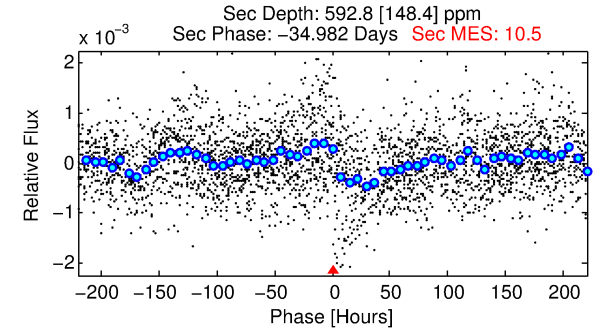
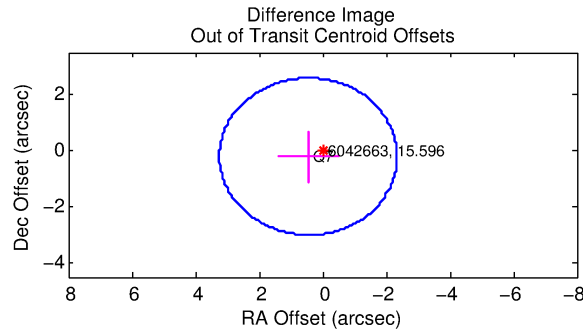
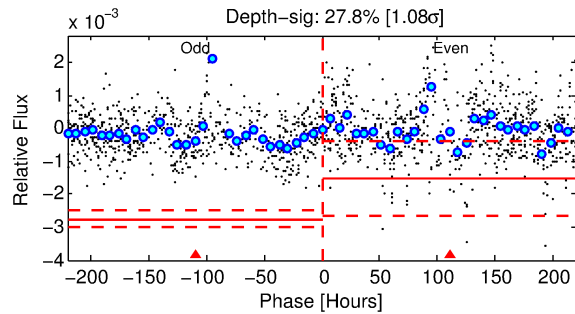
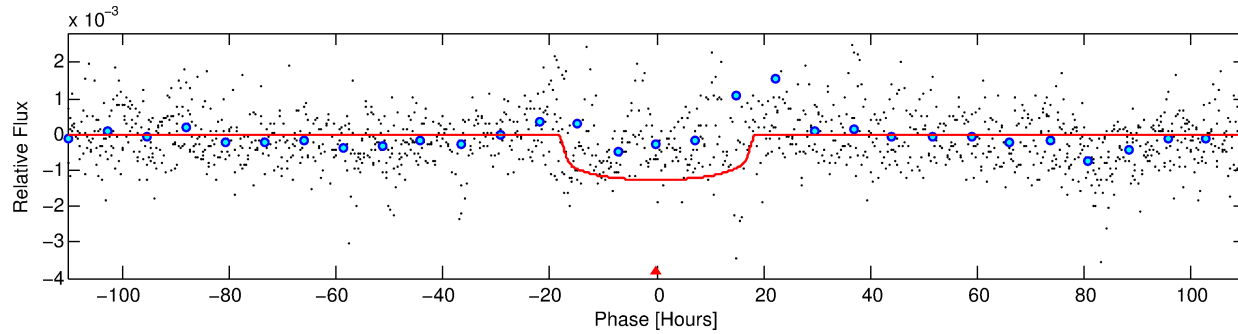
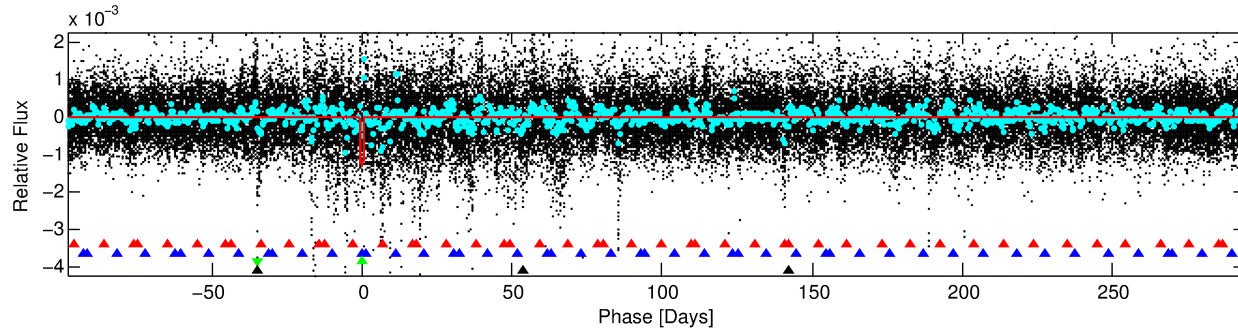
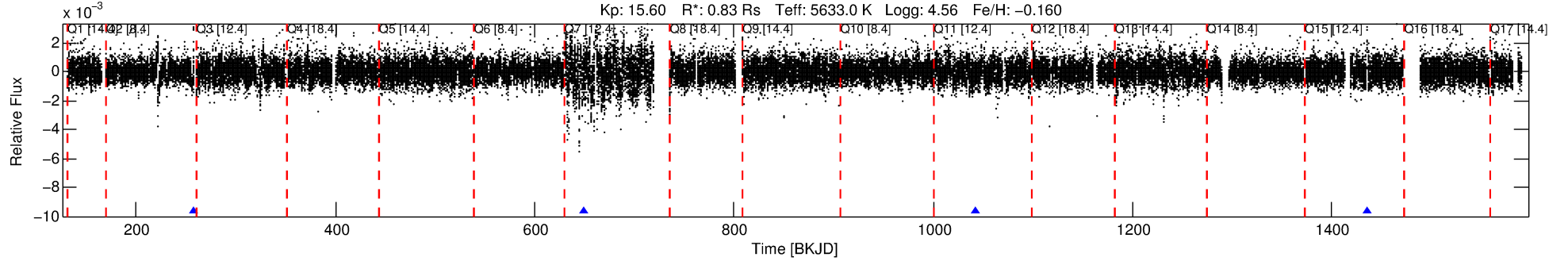
## Ephemeris Match Information For 006042663-03

No Significant Match Found

# DV One-Page Summary

KIC: 6042663 Candidate: 3 of 4 Period: 392.801 d  
KOI: K06651 Corr: No Ephemeris Match

Kp: 15.60 R\*: 0.83 Rs Teff: 5633.0 K Logg: 4.56 Fe/H: -0.160



## DV Fit Results:

Period = 392.80135 [0.01070] d  
Epoch = 257.2252 [0.0201] BKJD  
Rp/R\* = 0.0338 [0.0037]  
a/R\* = 70.44 [26.97]  
b = 0.57 [0.46]  
Seff = 0.60 [0.20]  
Teq = 224 [19] K  
Rp = 3.05 [0.88] Re  
a = 1.0159 [0.2224] AU  
Ag = 36105.53 [16500.15] [2.19σ]  
Teffp = 4784 [424] K [10.75σ]

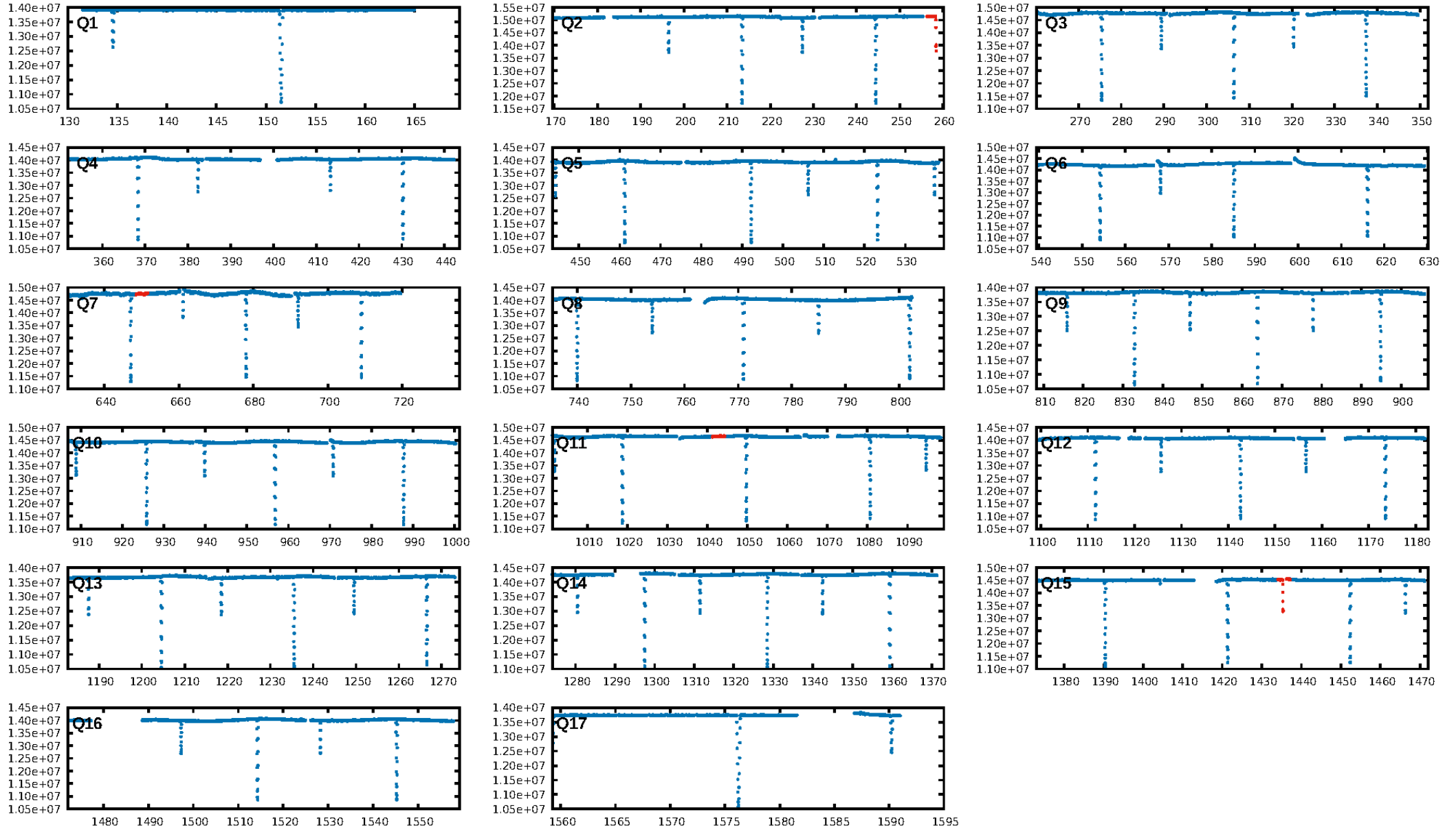
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [233.98σ]  
LongPeriod-sig: 100.0% [54.47σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.65e-43  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.3907  
Centroid-sig: 14.6%  
Centroid-so: 0.579 arcsec [1.13σ]  
OotOffset-rm: 0.498 arcsec [0.53σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-rm: 0.460 arcsec [0.49σ]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

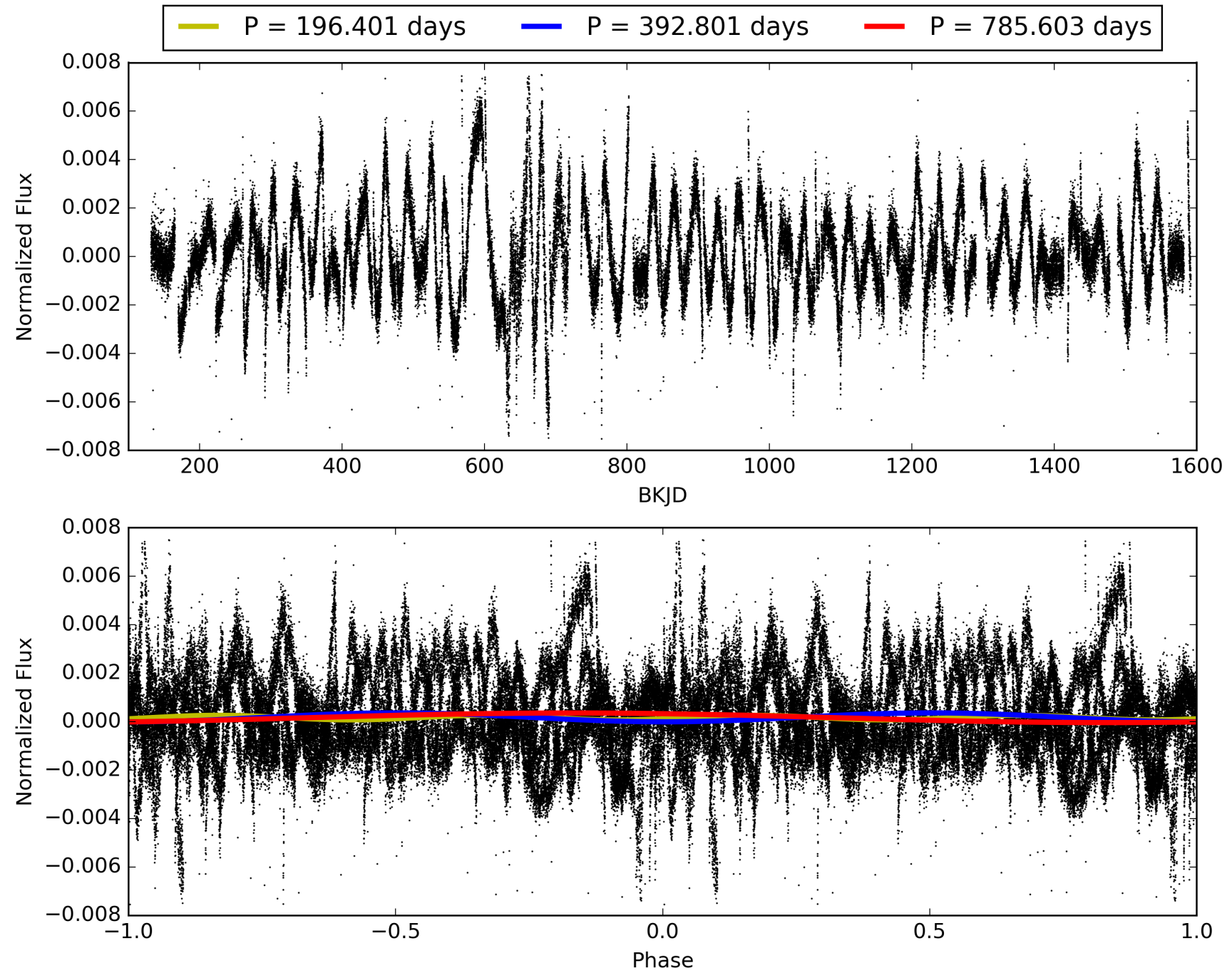
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:16:58 Z

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

# TCE 006042663-03, PDC Light Curves

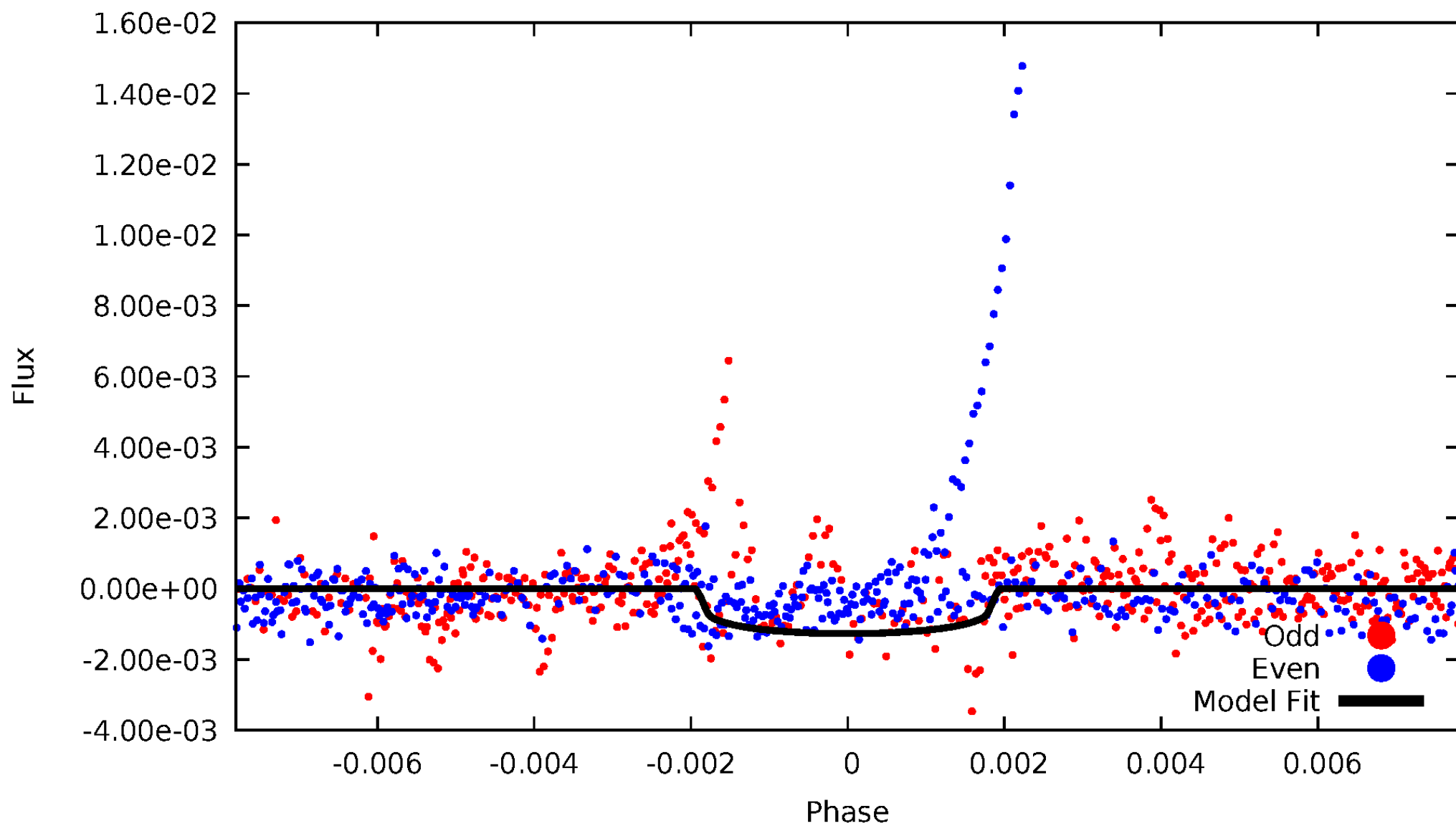


TCE 006042663-03



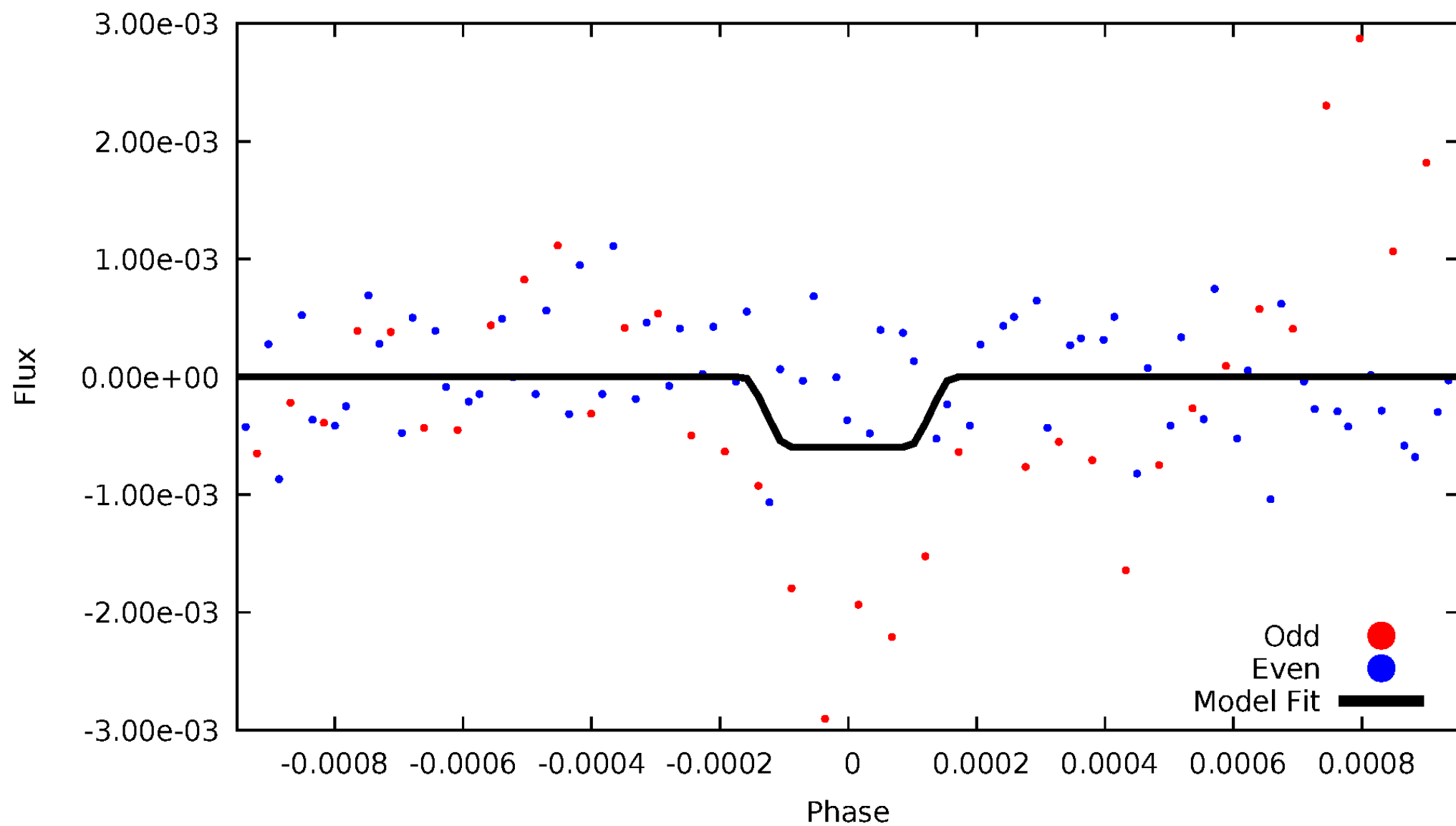
# DV Odd/Even

TCE 006042663-03



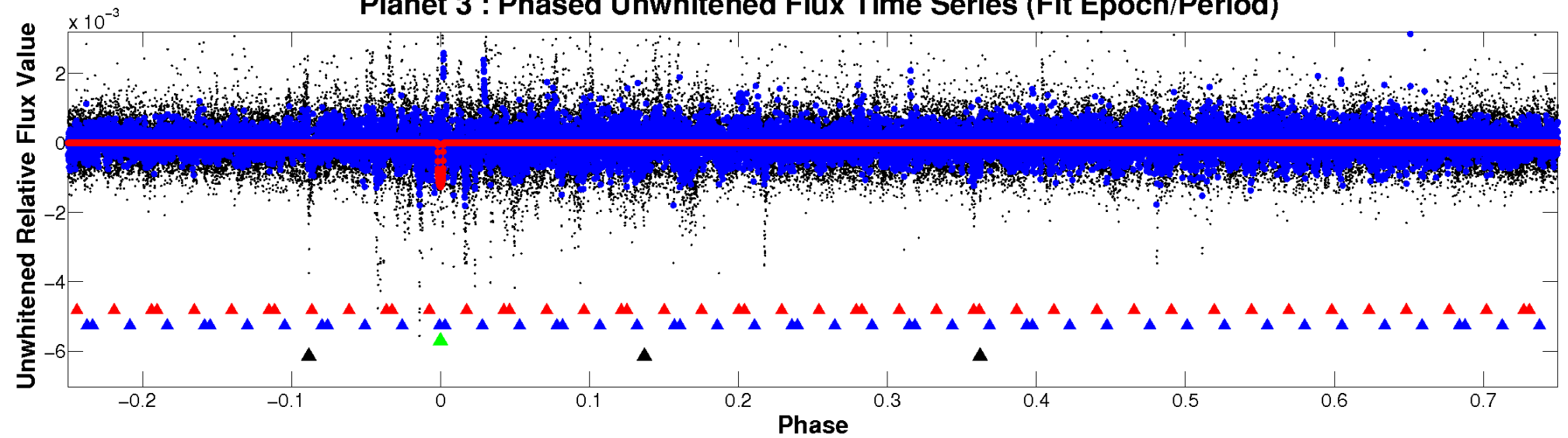
# ALT Odd/Even

TCE 006042663-03

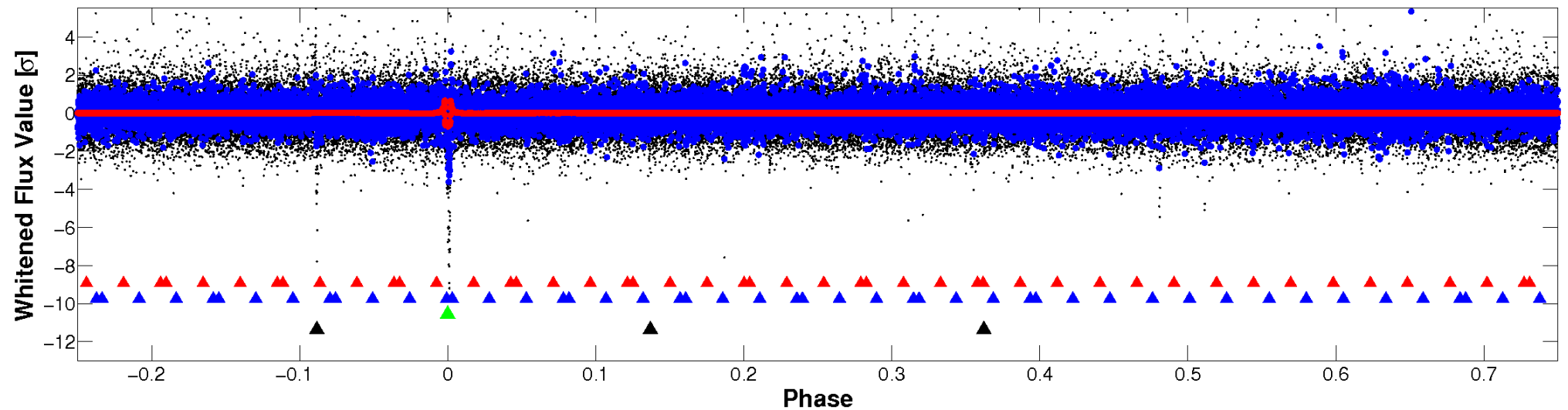


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

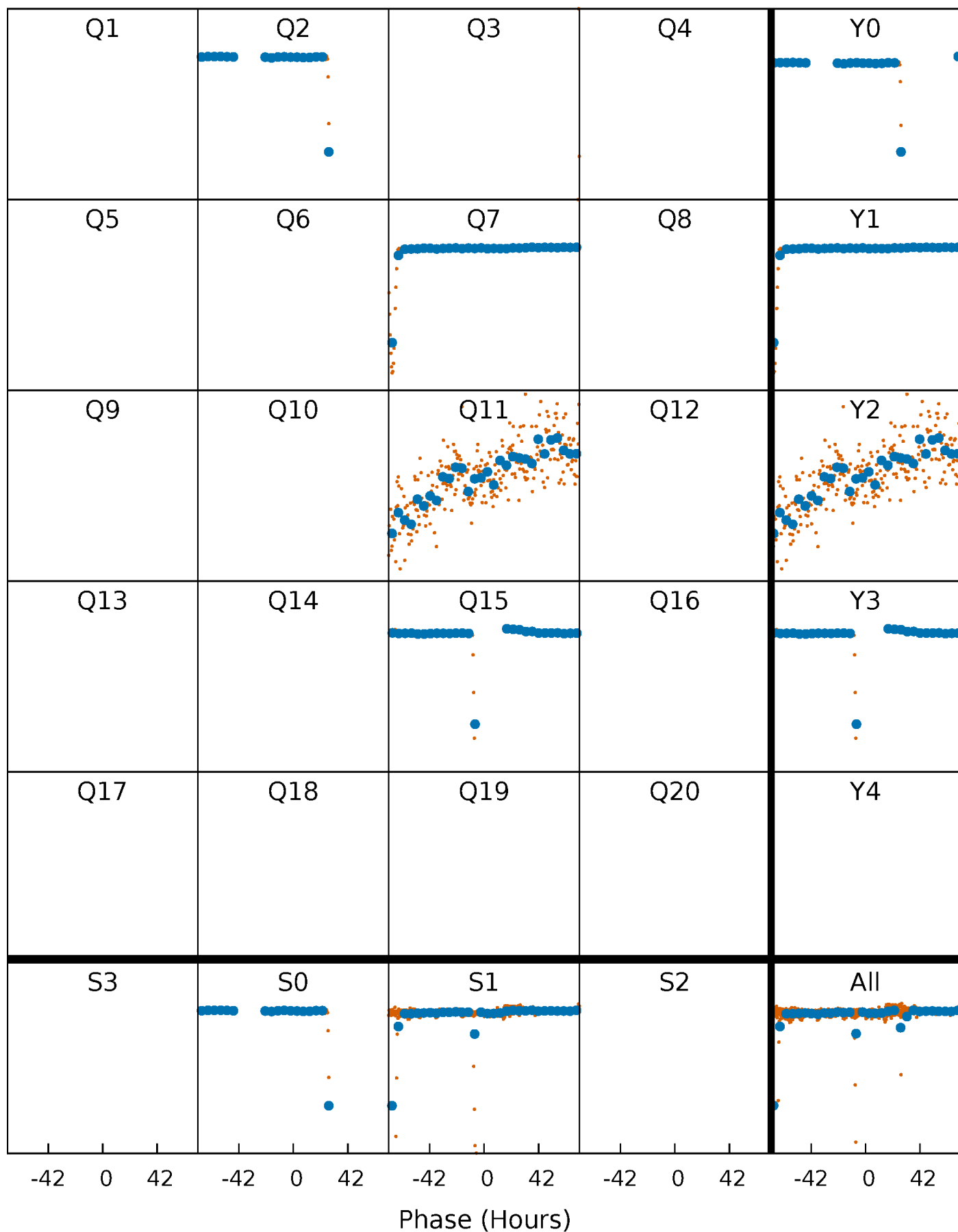


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

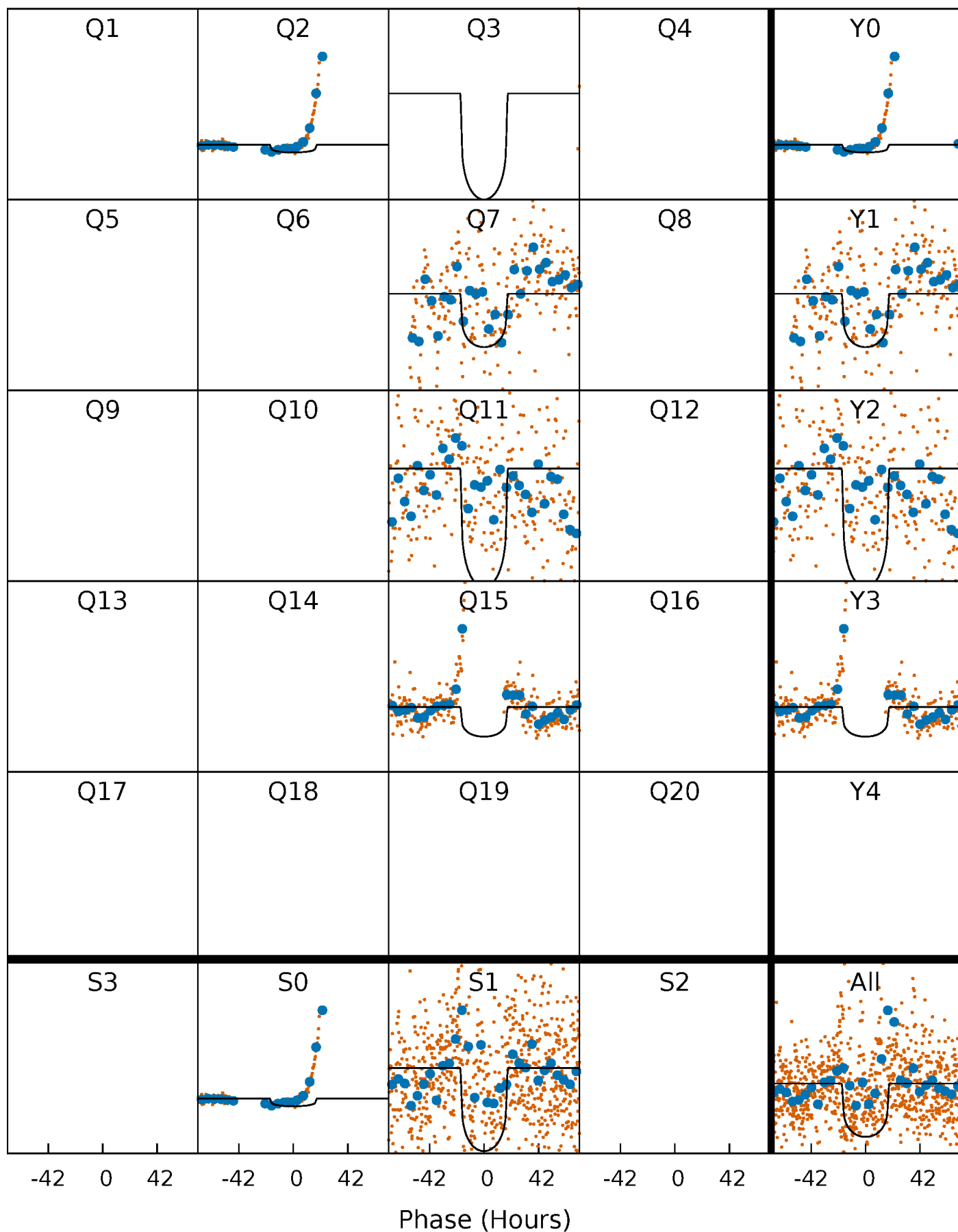
TCE 006042663-03 P=392.801348 Days  $T_0=257.225187$  (BKJD)





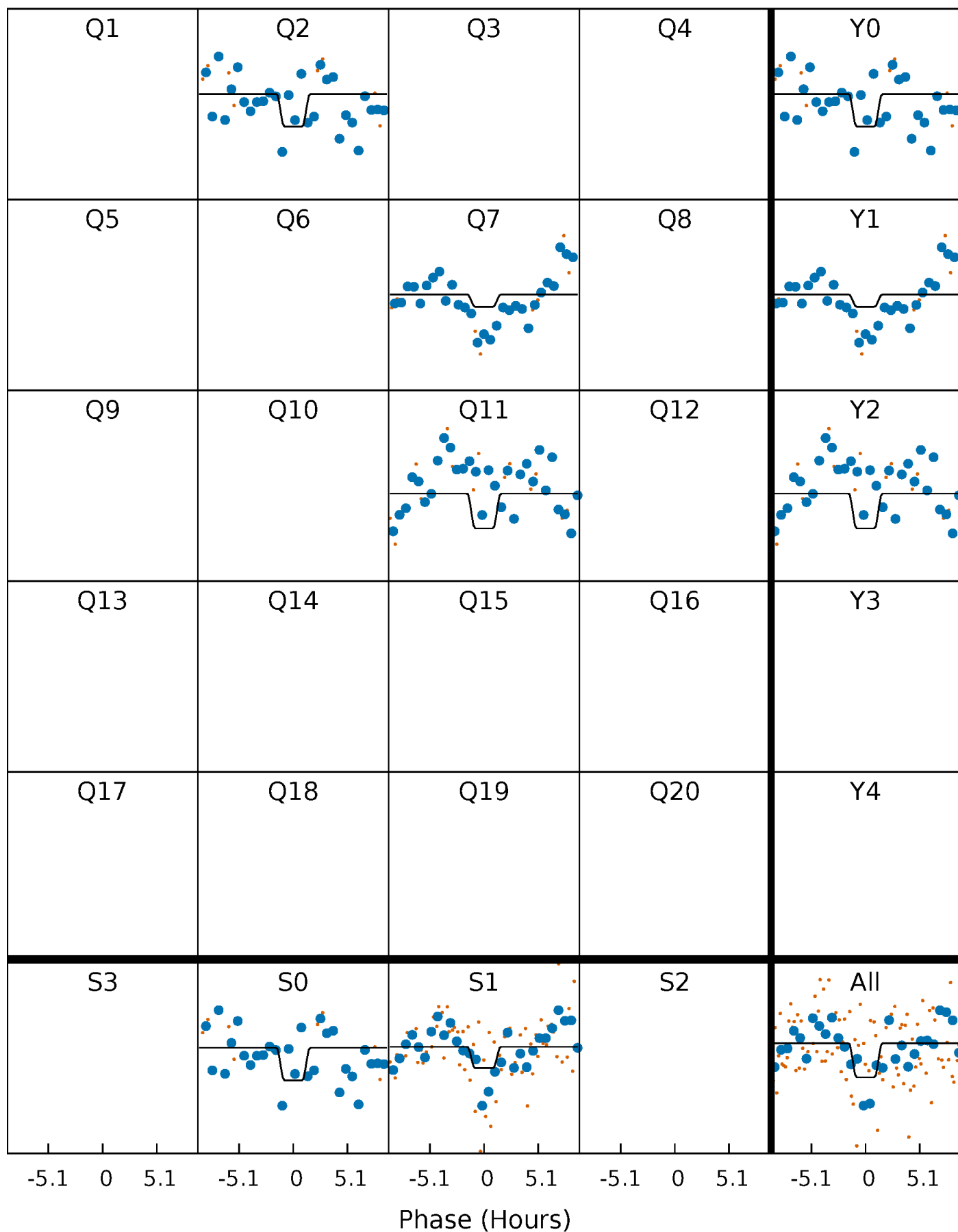
# DV Quarter-Phased Transit Curves

TCE 006042663-03 P=392.801348 Days  $T_0=257.225187$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

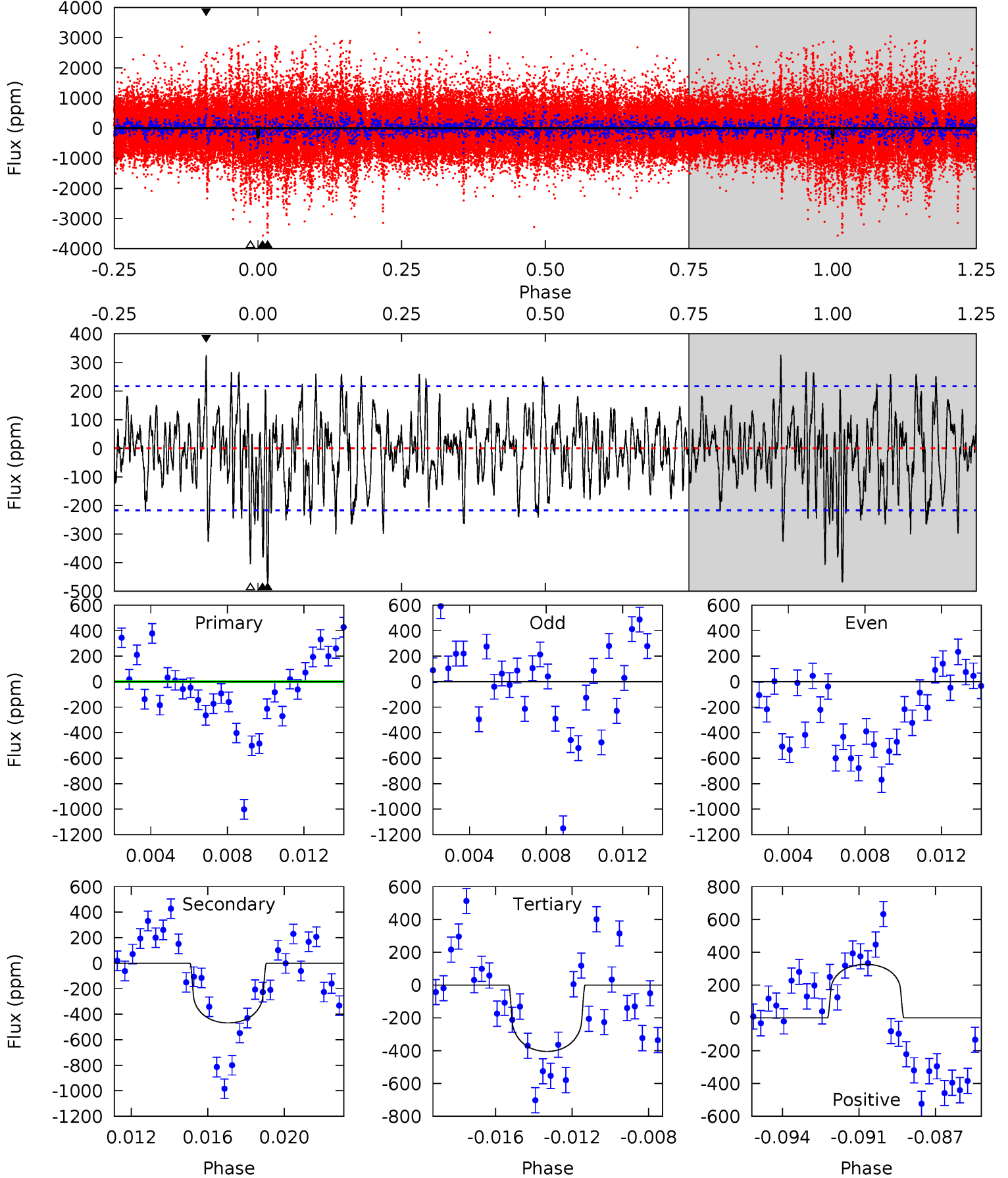
TCE 006042663-03 P=392.719401 Days  $T_0=257.330849$  (BKJD)



# DV Model-Shift Uniqueness Test

006042663-03, P = 392.801348 Days, E = 257.225187 Days

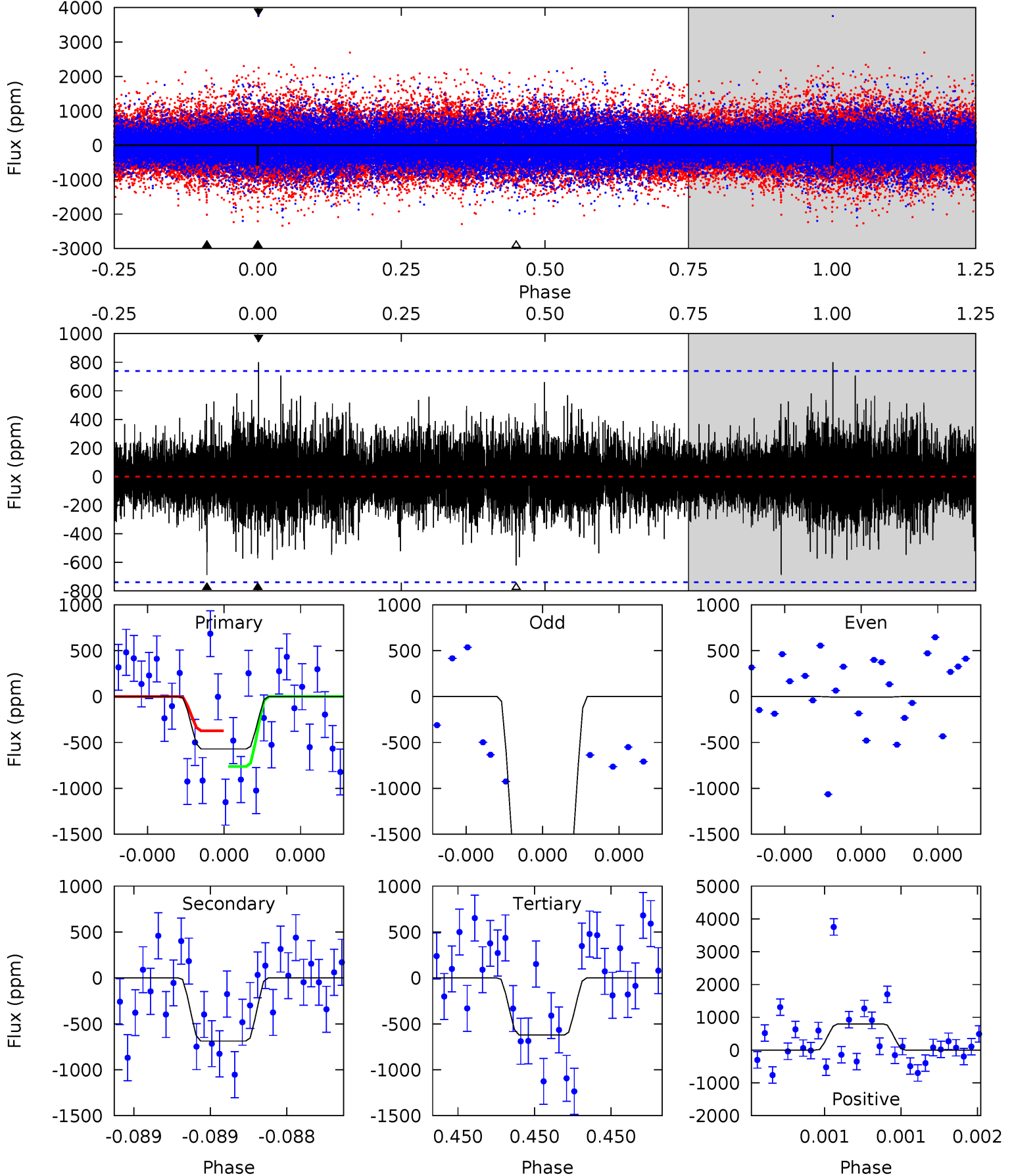
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.60	11.2	9.70	7.82	5.20	2.88	2.48	-2.10	-0.22	1.52	3.41	1.47	219.5	0.41	0.77



# Alt Model-Shift Uniqueness Test

006042663-03, P = 392.719401 Days, E = 257.330849 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
4.38	5.27	4.77	6.14	5.66	3.62	1.07	-0.39	-1.76	0.50	-0.87	8.11	3.50	0.54	1.50



### Stellar Parameters For KIC 006042663

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5633^{+169}_{-169}$	$4.558^{+0.042}_{-0.168}$	$-0.160^{+0.300}_{-0.300}$	$0.829^{+0.220}_{-0.073}$	$0.906^{+0.095}_{-0.104}$	$2.237^{+0.493}_{-1.002}$
	+3%/-3%	+1%/-4%	+188%/-188%	+27%/-9%	+10%/-11%	+22%/-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 006042663-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-468 \pm 42$	$3.12^{+0.56}_{-0.42}$	$320^{+20}_{-15}$	$4663^{+271}_{-254}$	$26563^{+8860}_{-7473}$
Alt.	$-688 \pm 130$	$2.31^{+0.43}_{-0.39}$	$319^{+21}_{-13}$	$5768^{+557}_{-461}$	$71213^{+33155}_{-23778}$

$T_{\text{max}}$  = 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

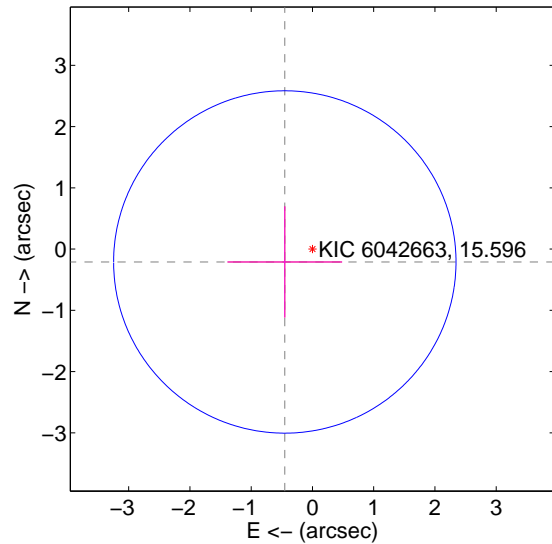
Supplemental centroid analysis for 006042663-03. Kepler magnitude: 15.60. Transit SNR 9.40

There are 0 quarters with good PRF difference image offsets

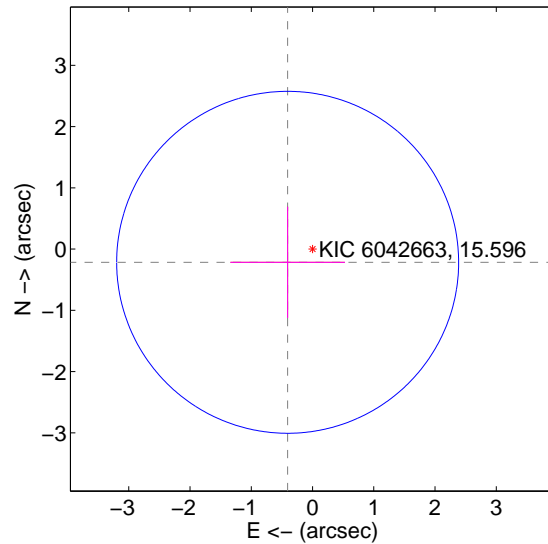
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.498 \pm 0.932$	0.53	$0.451 \pm 0.936$	$-0.210 \pm 0.909$
PRF-fit source offset from KIC position	$0.460 \pm 0.931$	0.49	$0.406 \pm 0.936$	$-0.216 \pm 0.909$
photometric centroid source offset	$0.58 \pm 0.51$	1.13	$0.37 \pm 0.45$	$-0.45 \pm 0.55$

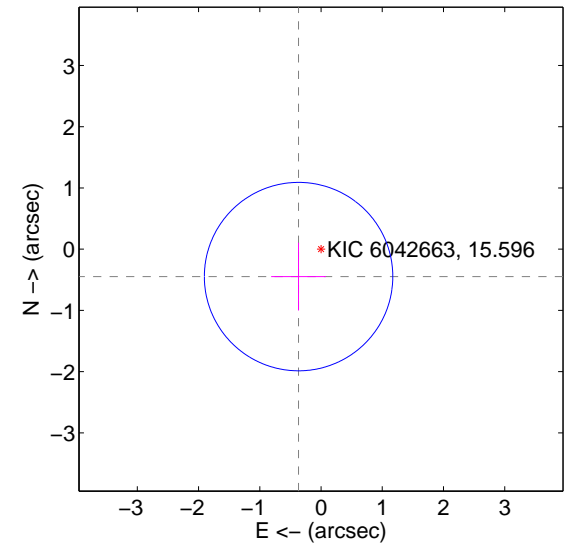
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

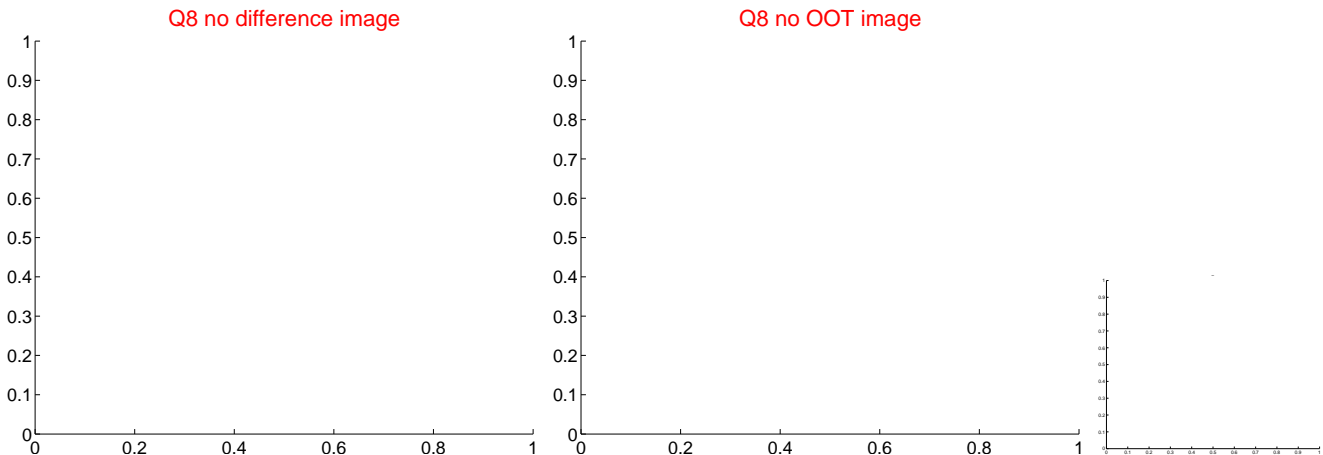
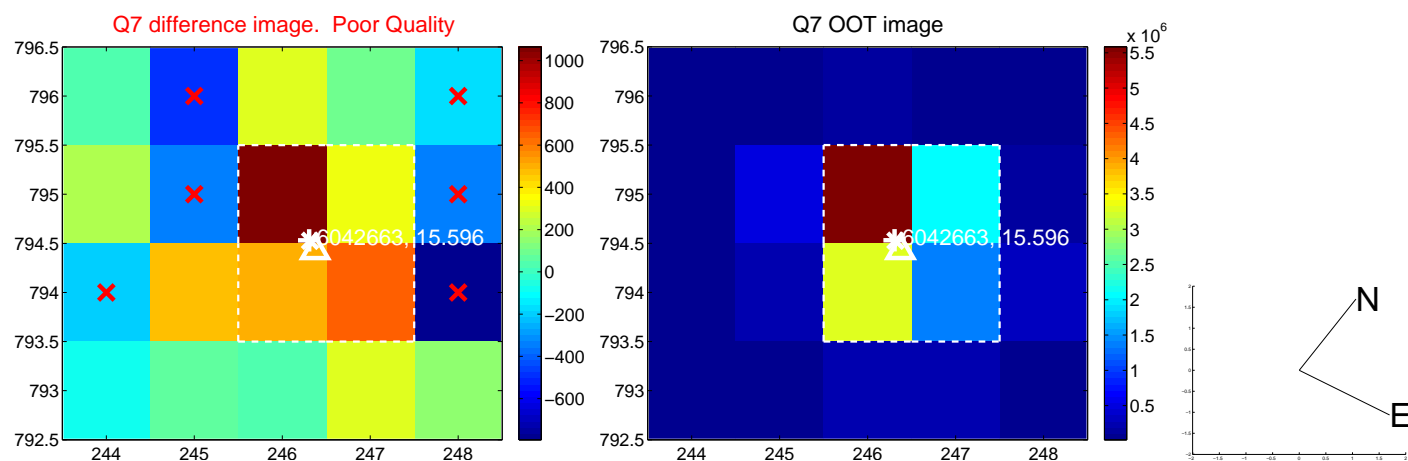


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

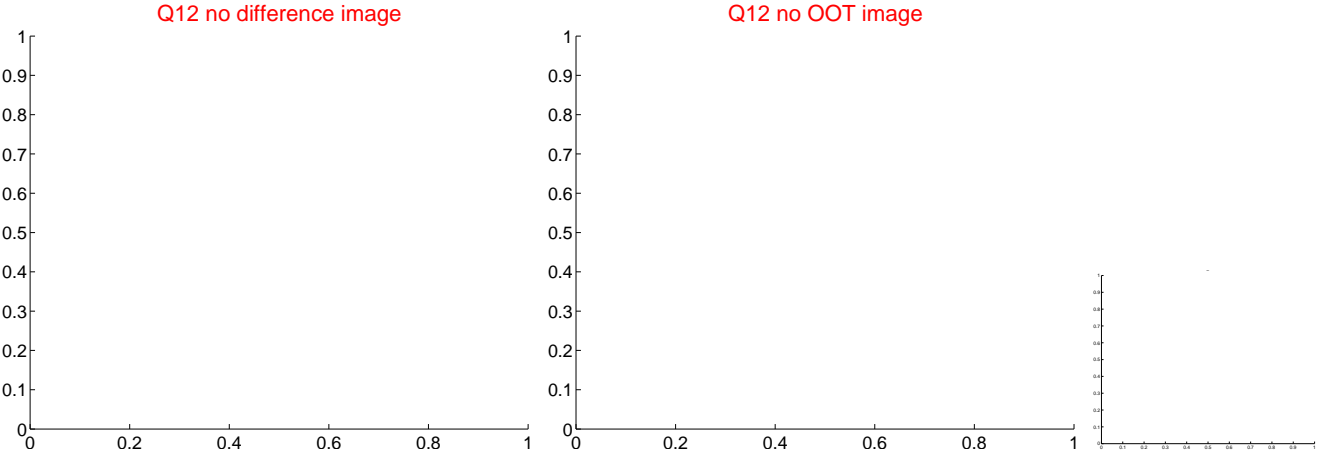
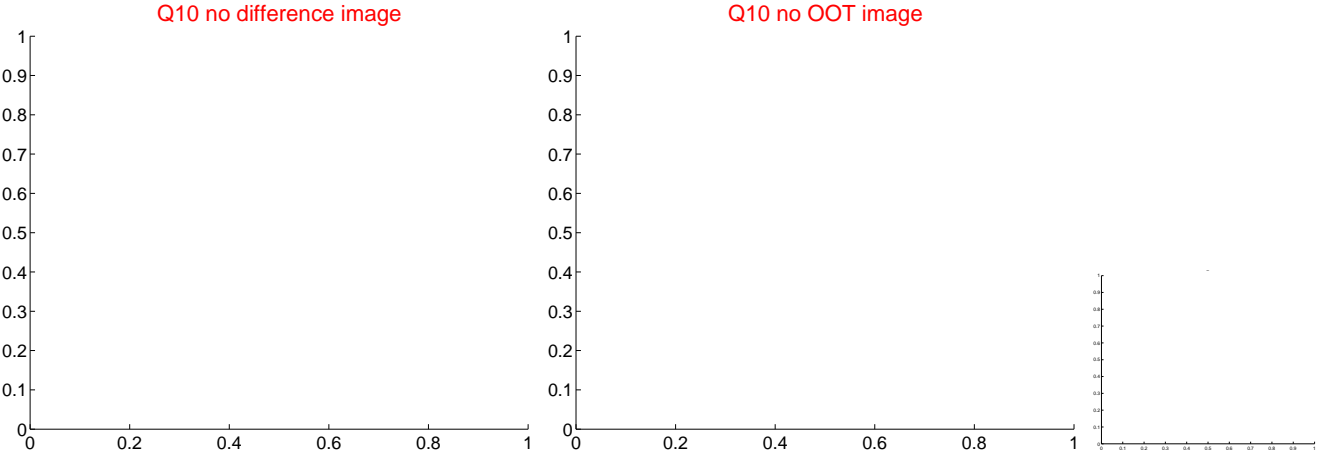


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value





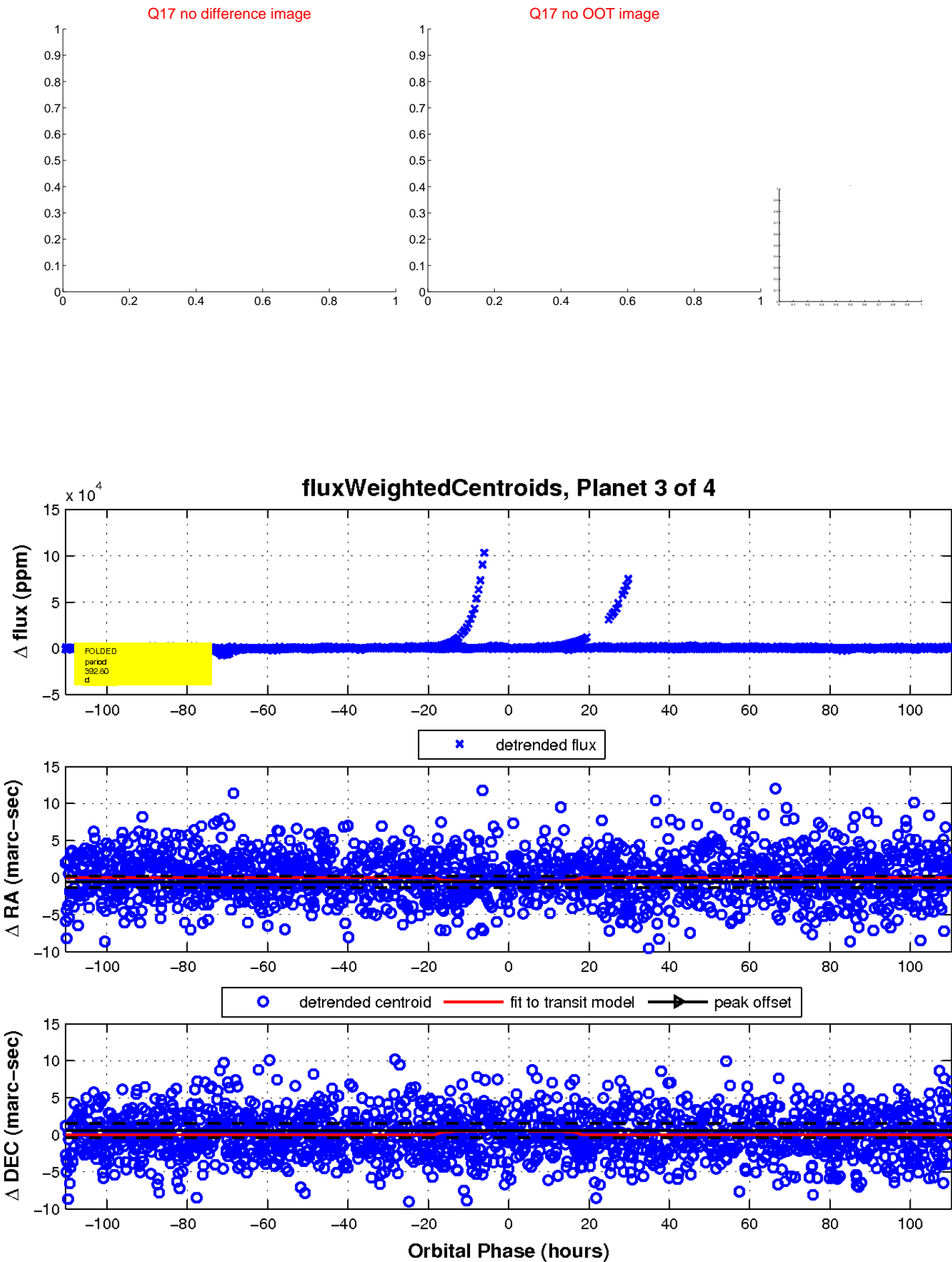
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

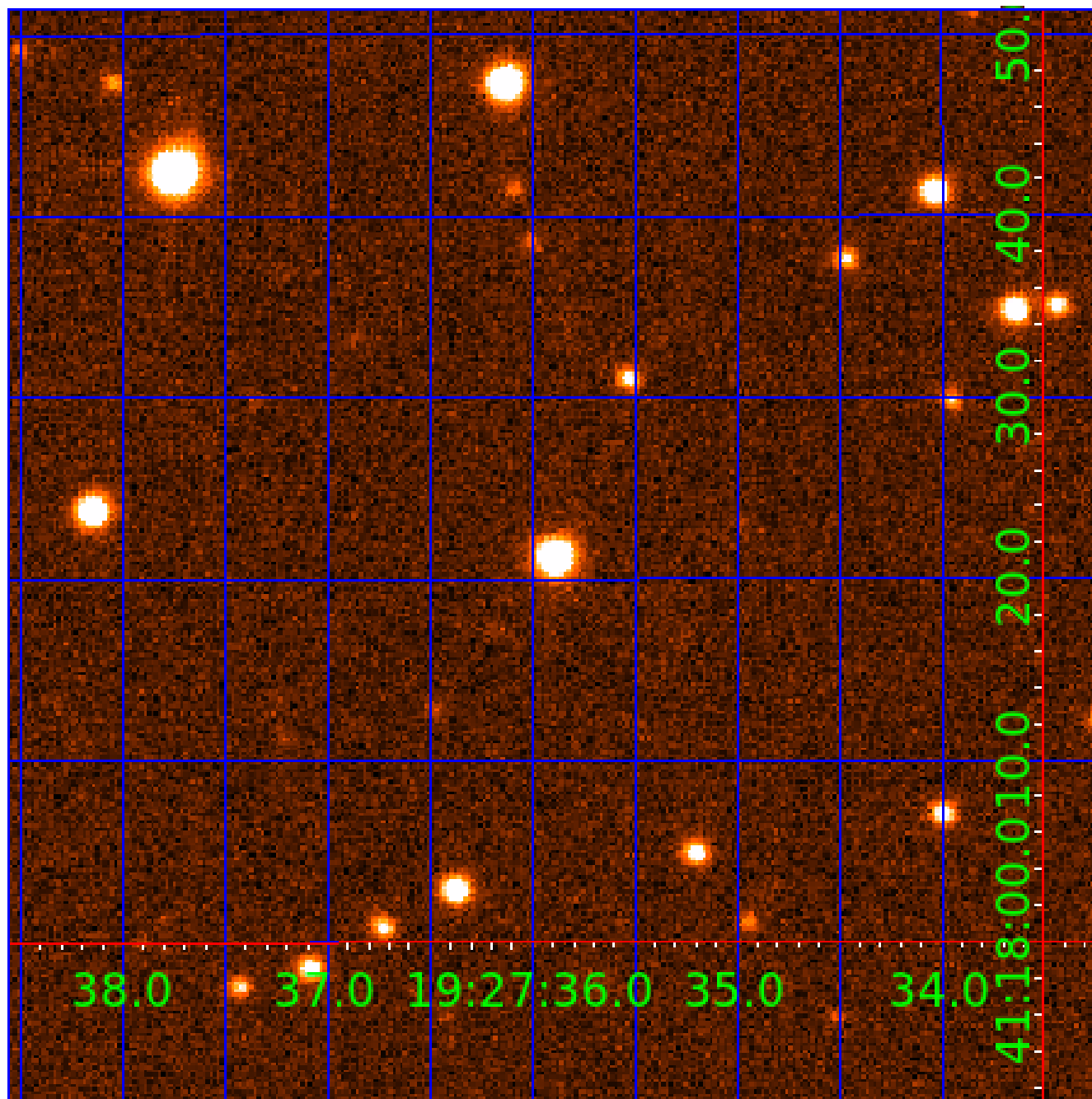


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006042663

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006042663-01	OBS	6651.01	30.971771	151.532154	227587.1	8.289	5374.2	3798.9	0.83	5633	59.94	17.77
006042663-02	OBS	No	30.971778	134.548271	91349.4	4.943	1492.3	1414.3	0.83	5633	38.89	17.77
006042663-03	OBS	No	392.801348	257.225187	1272.0	36.784	18.2	9.4	0.83	5633	3.05	0.60
006042663-04	OBS	No	481.297044	222.517333	1771.9	12.925	17.7	15.4	0.83	5633	3.98	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006042663-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
006042663-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
006042663-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
006042663-04	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.

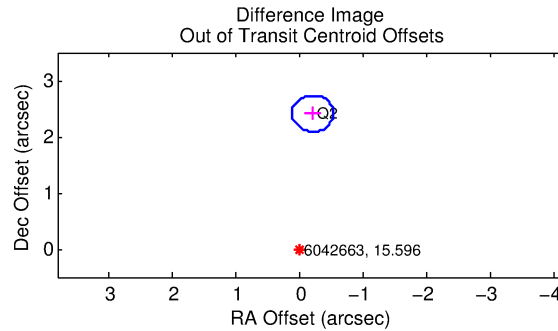
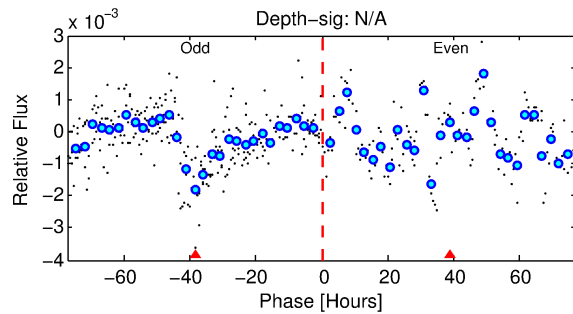
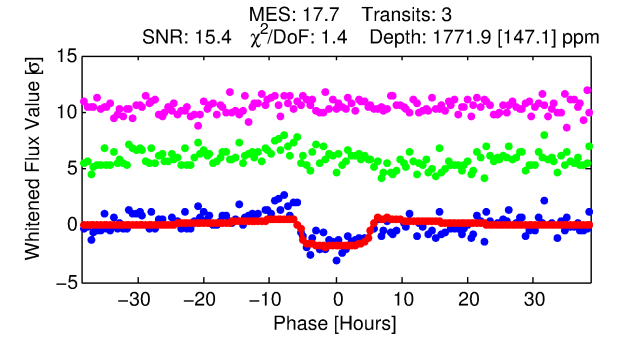
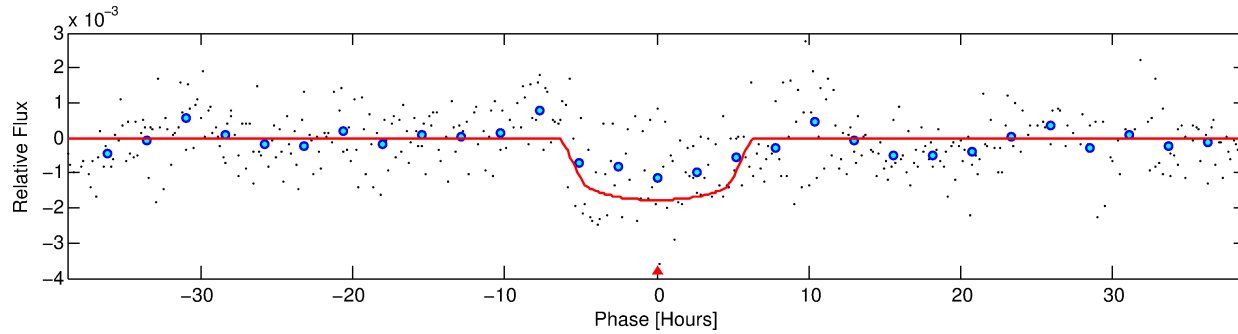
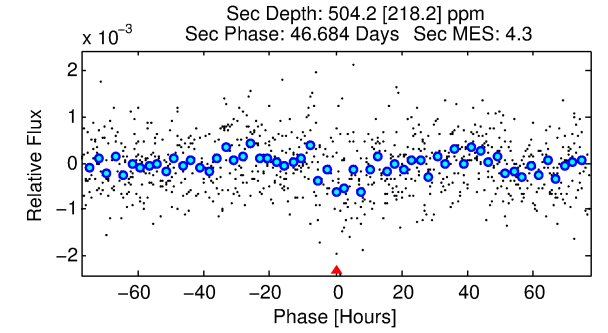
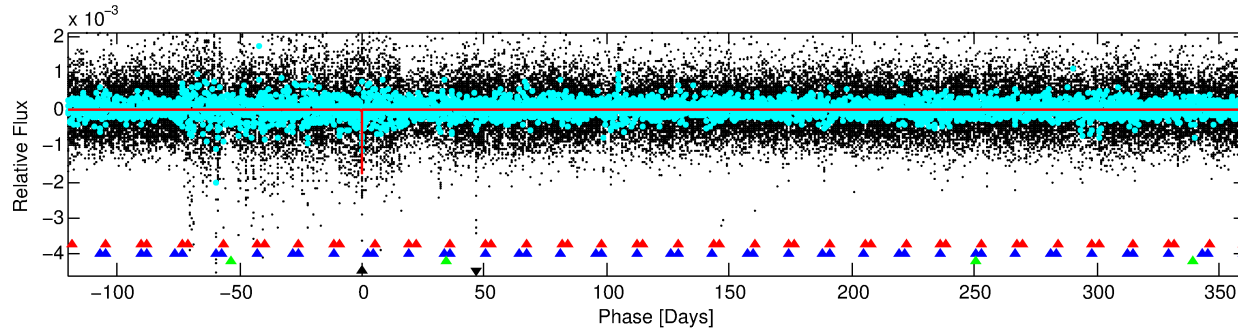
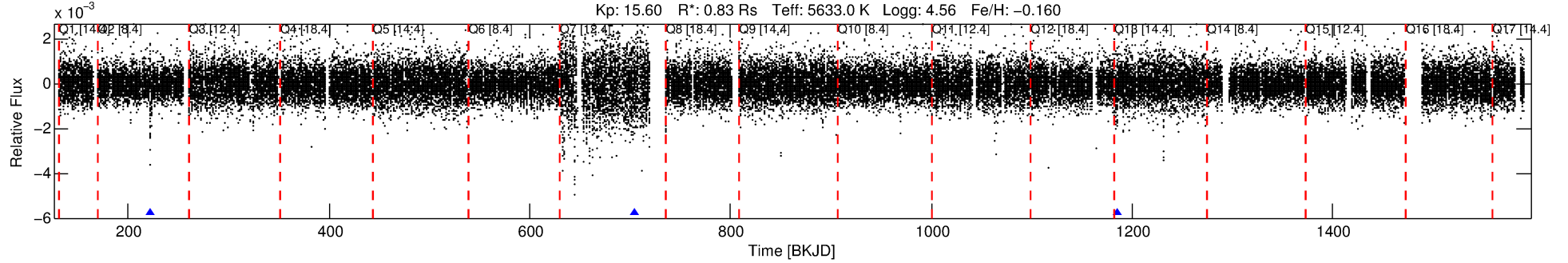
## Ephemeris Match Information For 006042663-04

No Significant Match Found

# DV One-Page Summary

KIC: 6042663 Candidate: 4 of 4 Period: 481.297 d  
KOI: K06651 Corr: No Ephemeris Match

Kp: 15.60 R\*: 0.83 Rs Teff: 5633.0 K Logg: 4.56 Fe/H: -0.160



## DV Fit Results:

Period = 481.29704 [0.01116] d  
Epoch = 222.5173 [0.0117] BKJD  
Rp/R\* = 0.0440 [0.0039]  
a/R\* = 174.16 [53.90]  
b = 0.85 [0.11]  
Seff = 0.46 [0.15]  
Teq = 210 [18] K  
Rp = 3.98 [1.11] Re  
a = 1.1633 [0.2547] AU  
Ag = 23684.48 [13314.70] [1.78σ]  
Teff = 4024 [485] K [7.86σ]

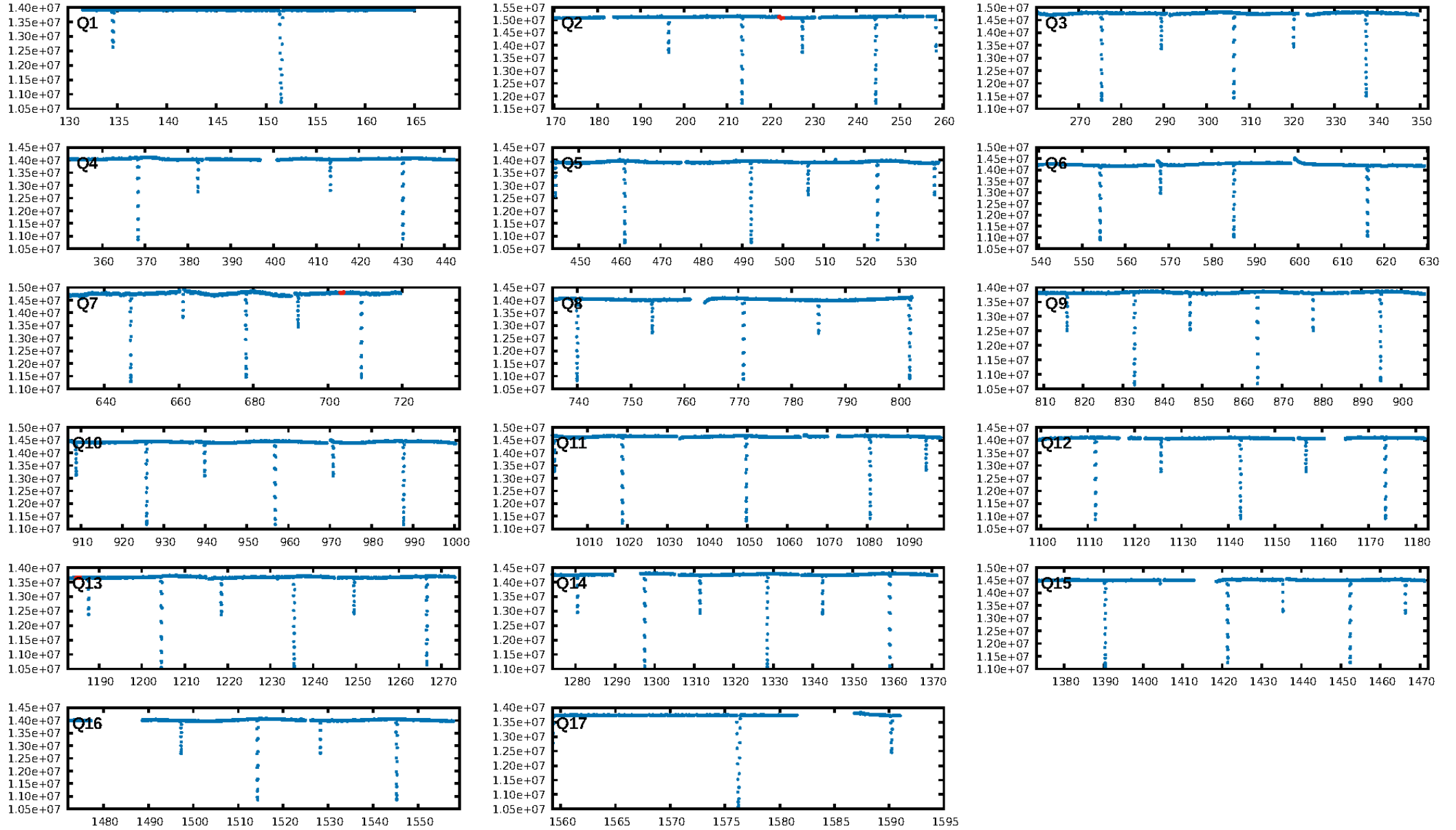
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.47σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGoF-sig: 72.1%  
Bootstrap-pfa: 1.04e-24  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -2.63  
Centroid-sig: 8.0%  
Centroid-so: 0.884 arcsec [1.38σ]  
OotOffset-rm: 2.419 arcsec [22.41σ]  
KicOffset-rm: 2.251 arcsec [20.87σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

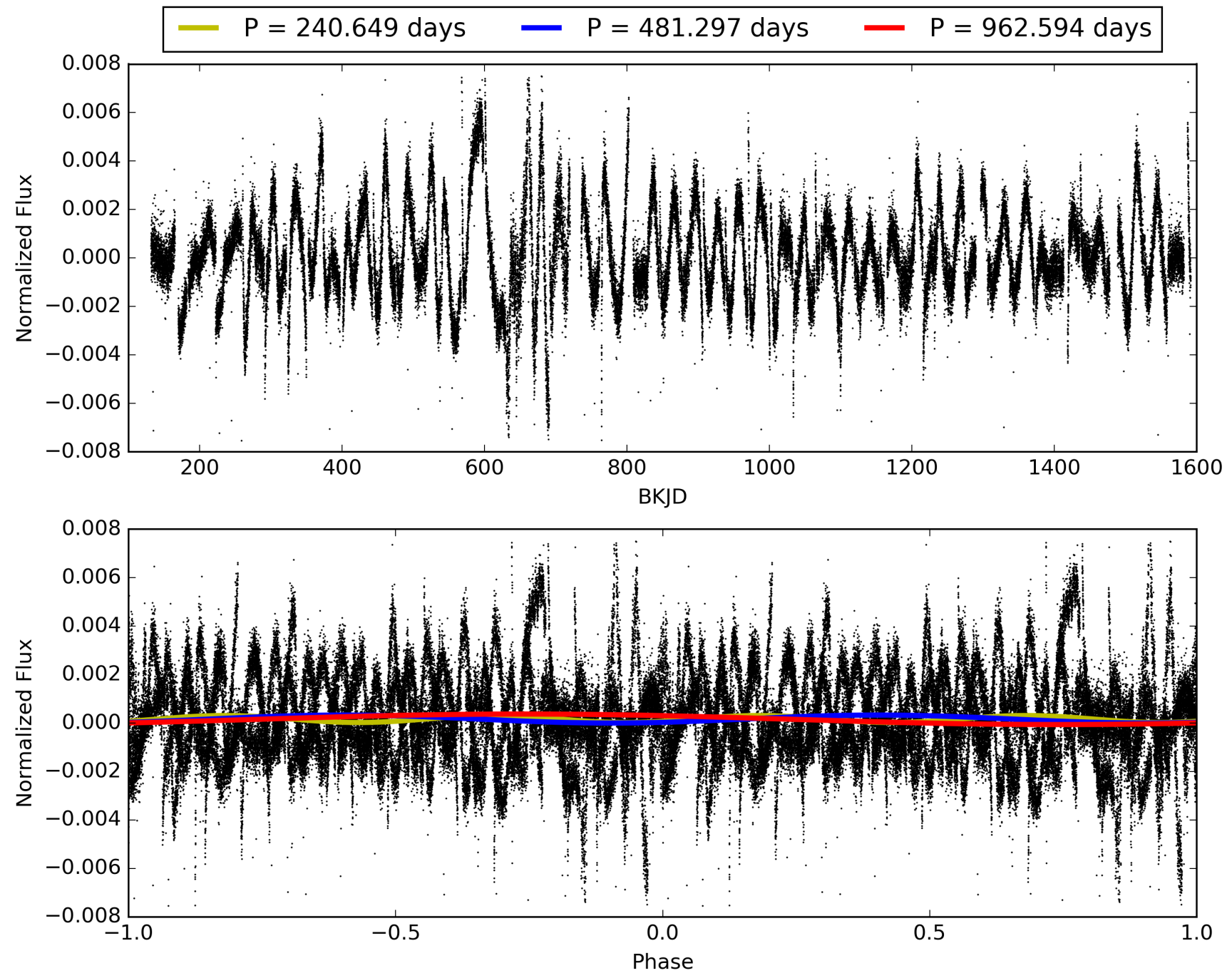
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:17:07 Z

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

# TCE 006042663-04, PDC Light Curves



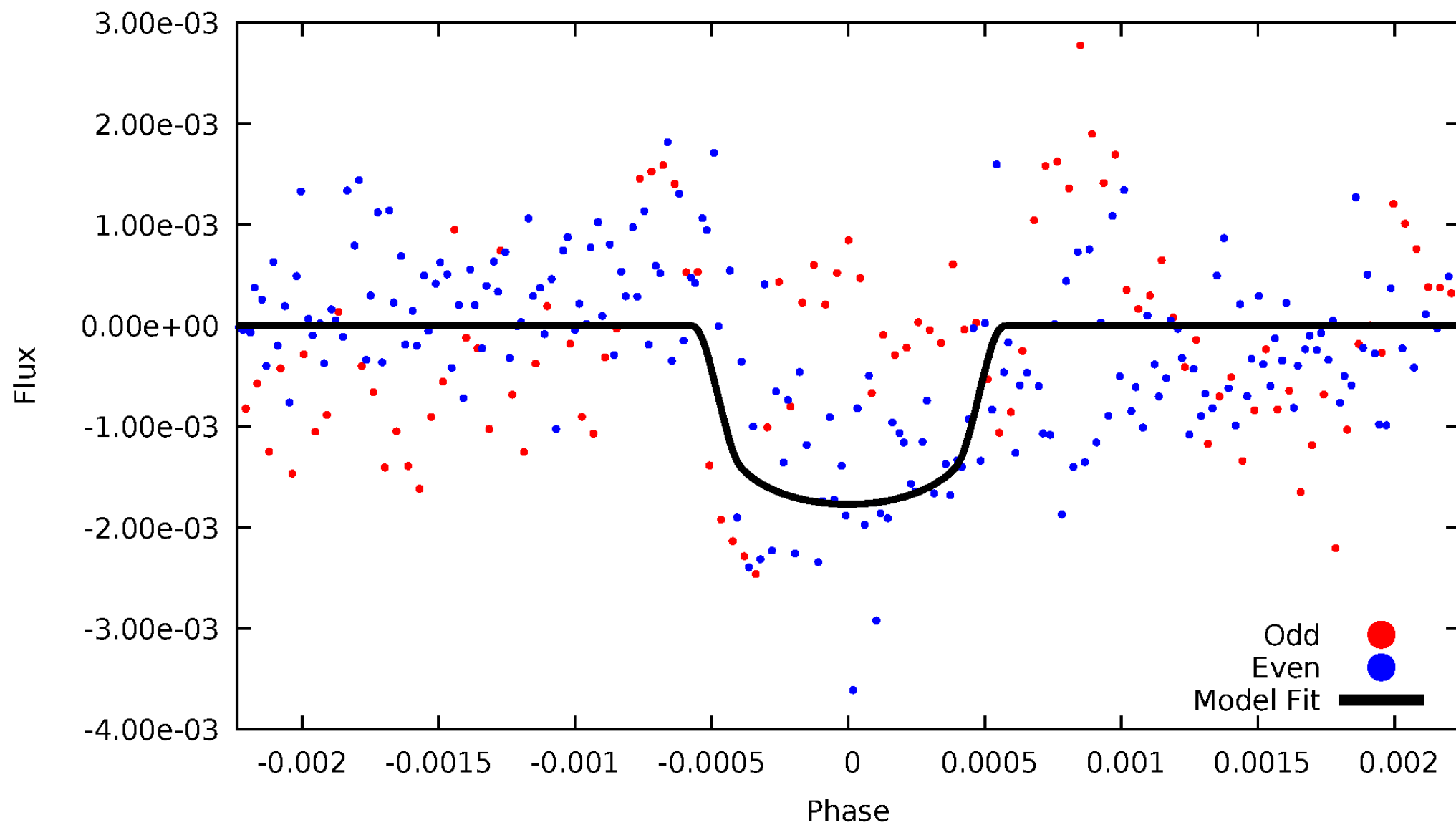
TCE 006042663-04





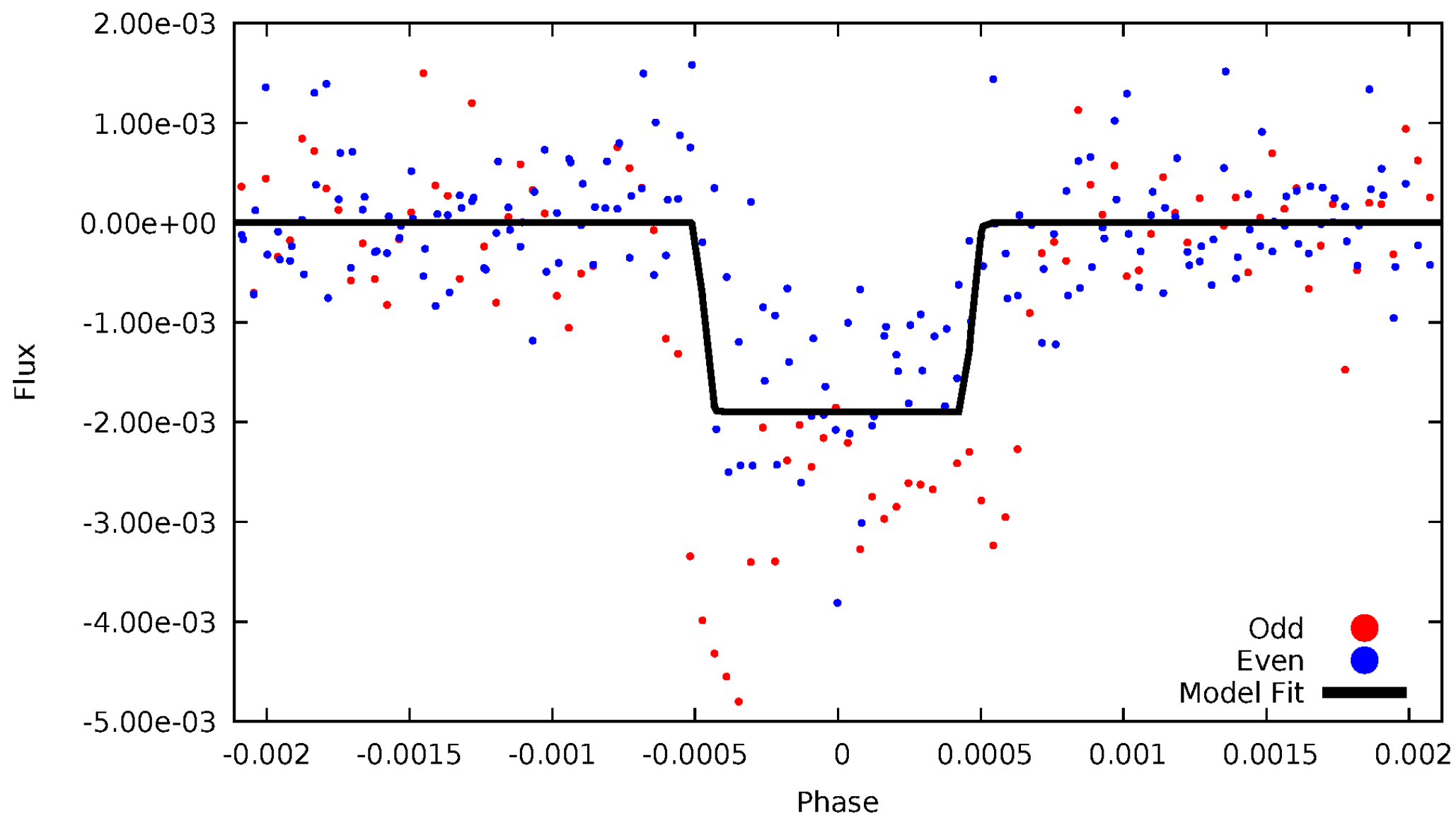
# DV Odd/Even

TCE 006042663-04



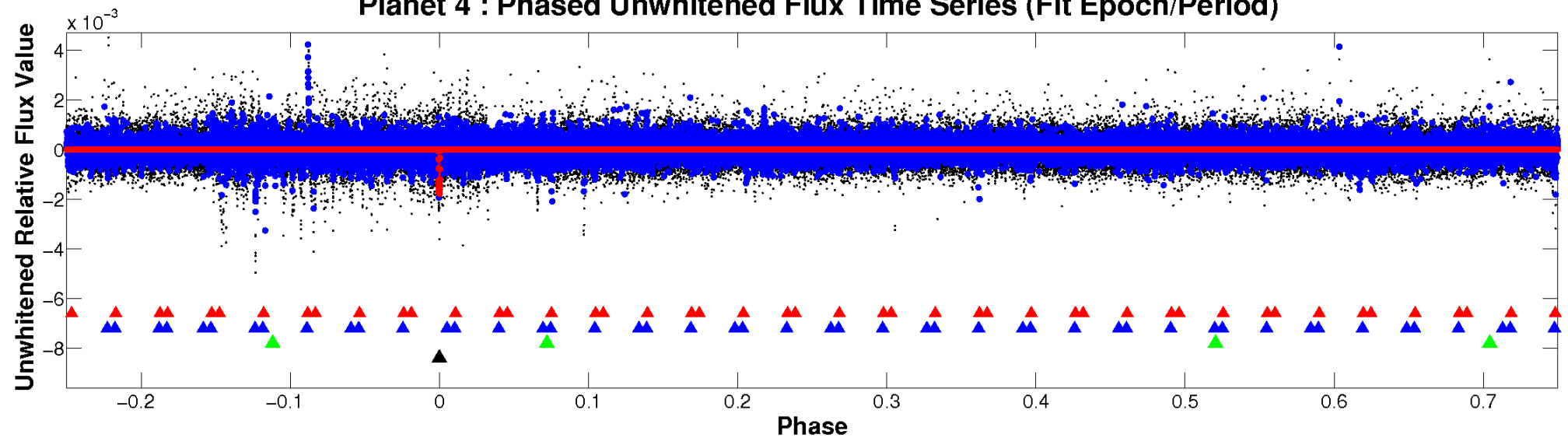
# ALT Odd/Even

TCE 006042663-04

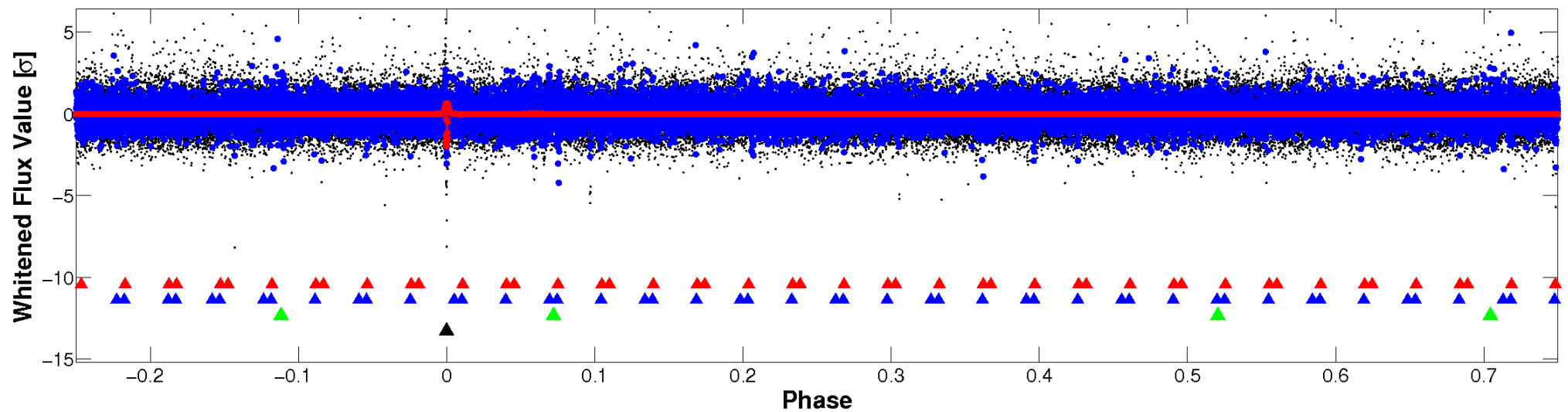


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

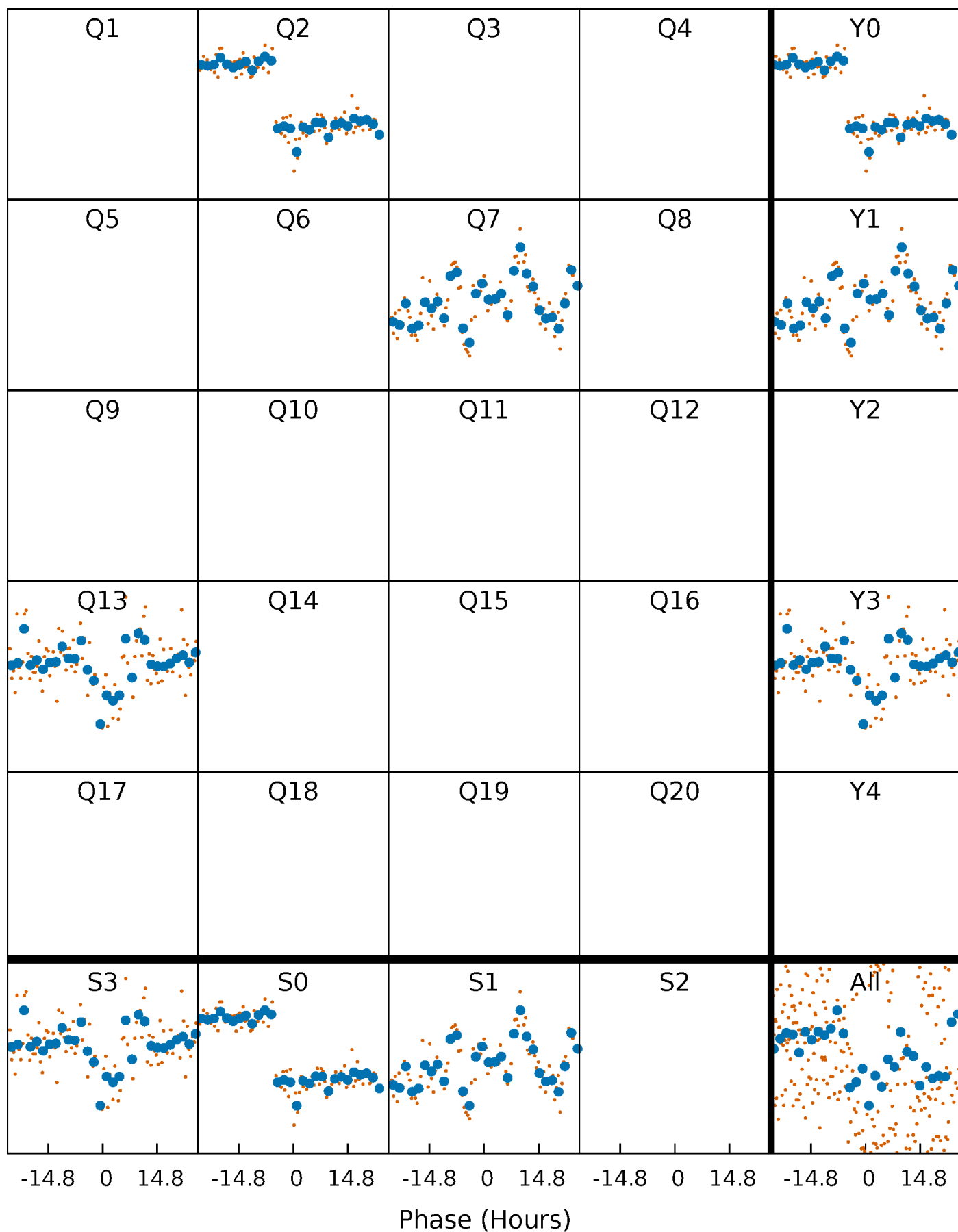


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



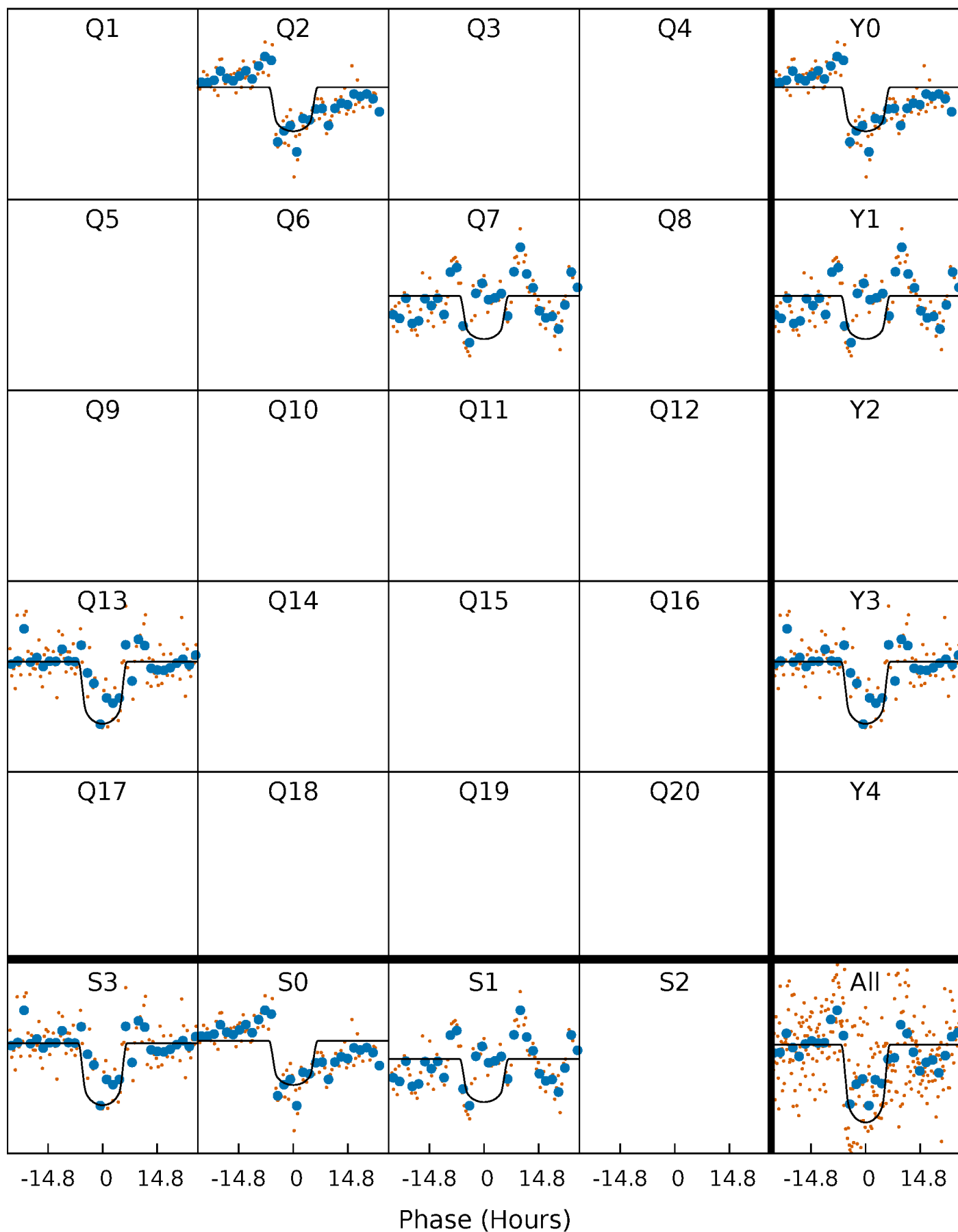
# PDC Quarter-Phased Transit Curves

TCE 006042663-04     $P=481.297044$  Days     $T_0=222.517333$  (BKJD)



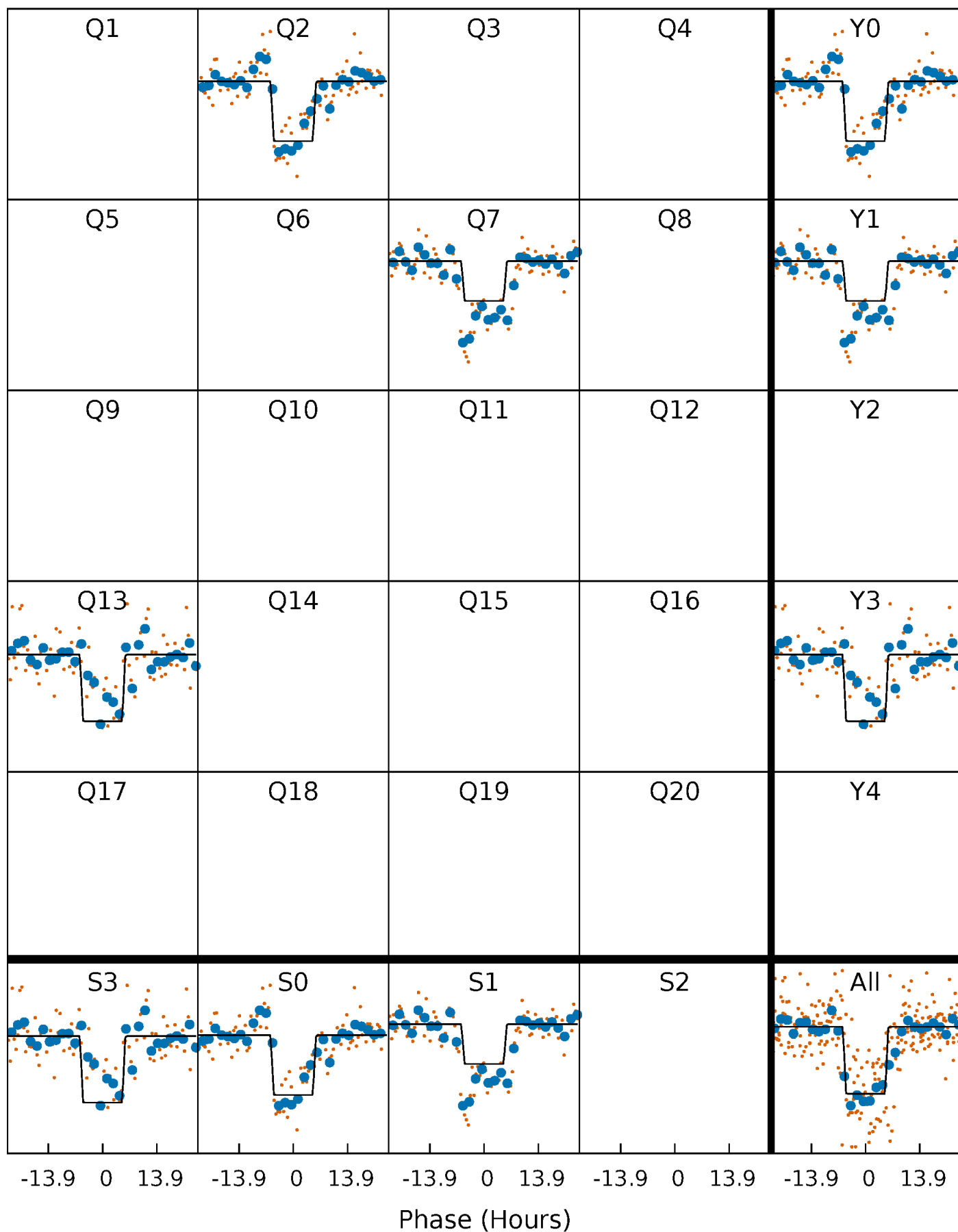
# DV Quarter-Phased Transit Curves

TCE 006042663-04     $P=481.297044$  Days     $T_0=222.517333$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

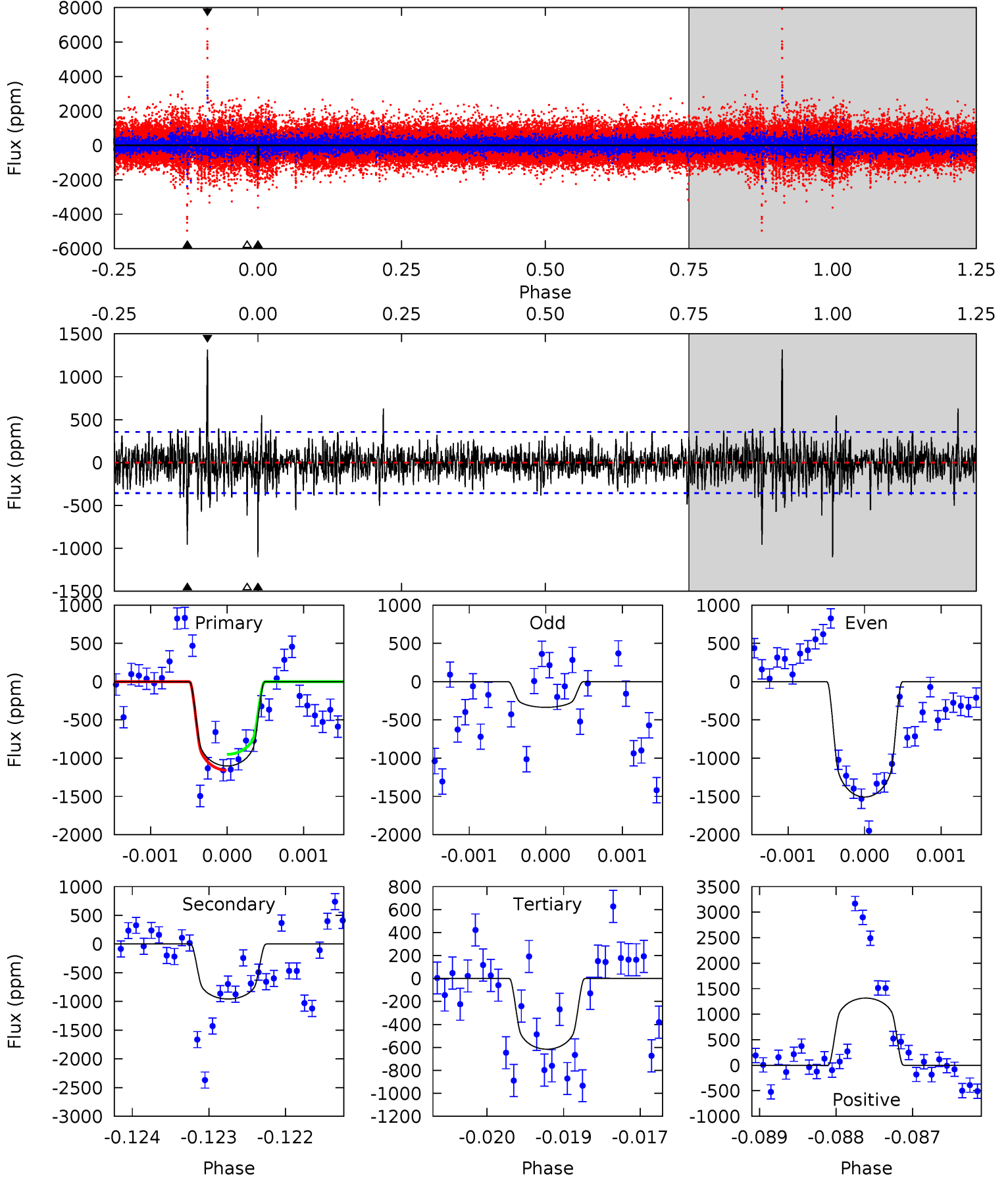
TCE 006042663-04     $P=481.292072$  Days     $T_0=222.526645$  (BKJD)



# DV Model-Shift Uniqueness Test

006042663-04, P = 481.297044 Days, E = 222.517333 Days

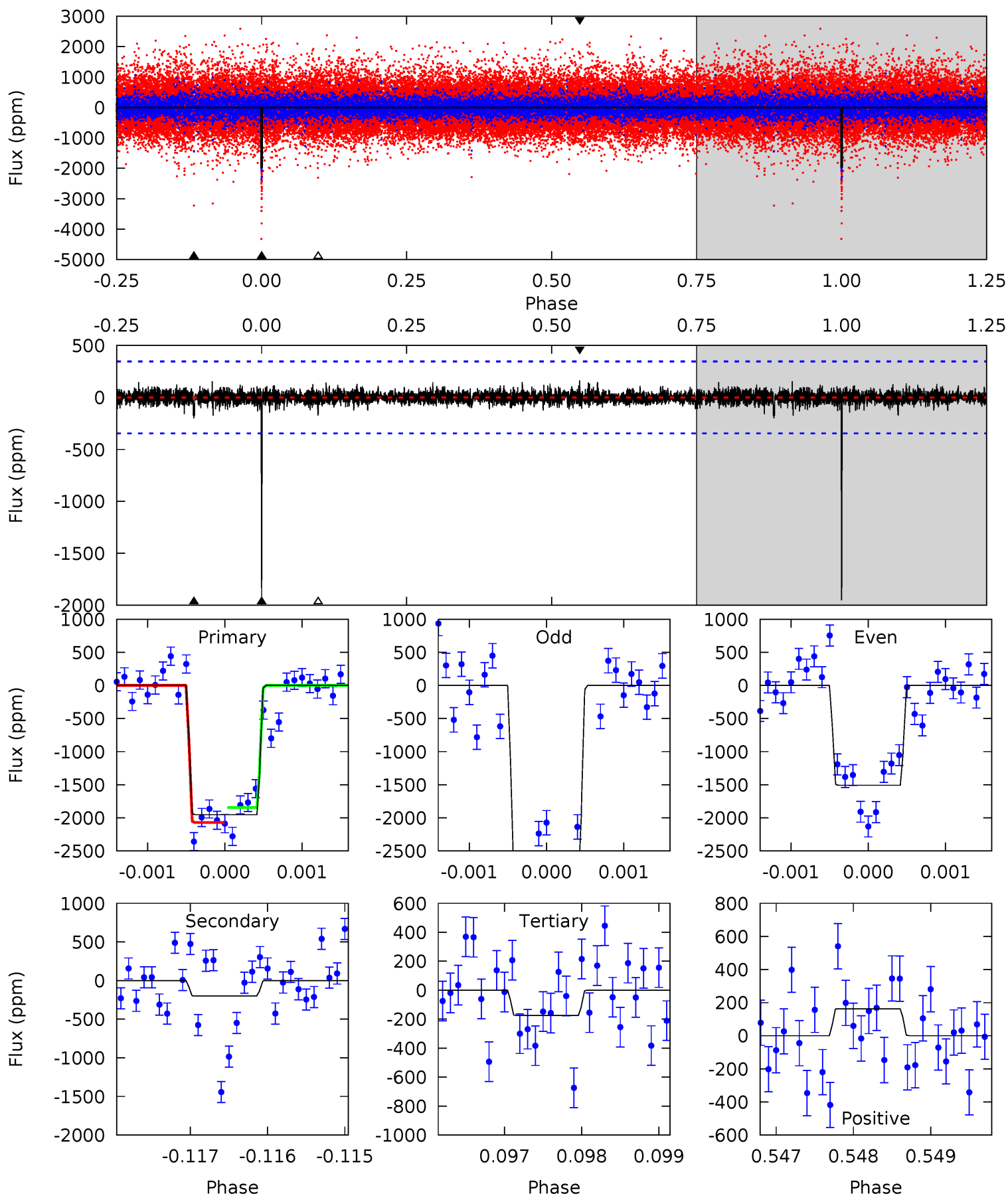
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.8	14.6	9.37	20.0	5.42	3.25	2.03	7.40	-3.25	5.19	-5.46	8.05	1.07	0.54	1.58



# Alt Model-Shift Uniqueness Test

006042663-04, P = 481.292072 Days, E = 222.526645 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
30.8	3.14	2.74	2.57	5.45	3.29	0.58	28.0	28.2	0.40	0.57	10.7	1.06	0.08	1.80





### Stellar Parameters For KIC 006042663

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5633^{+169}_{-169}$	$4.558^{+0.042}_{-0.168}$	$-0.160^{+0.300}_{-0.300}$	$0.829^{+0.220}_{-0.073}$	$0.906^{+0.095}_{-0.104}$	$2.237^{+0.493}_{-1.002}$
	+3%/-3%	+1%/-4%	+188%/-188%	+27%/-9%	+10%/-11%	+22%/-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 006042663-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-957 \pm 66$	$4.12^{+0.64}_{-0.49}$	$299^{+17}_{-14}$	$4822^{+238}_{-220}$	$40786^{+12077}_{-9781}$
Alt.	$-199 \pm 63$	$4.07^{+0.62}_{-0.44}$	$299^{+19}_{-12}$	$3624^{+229}_{-236}$	$8434^{+3939}_{-2945}$

$T_{max}$  = 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

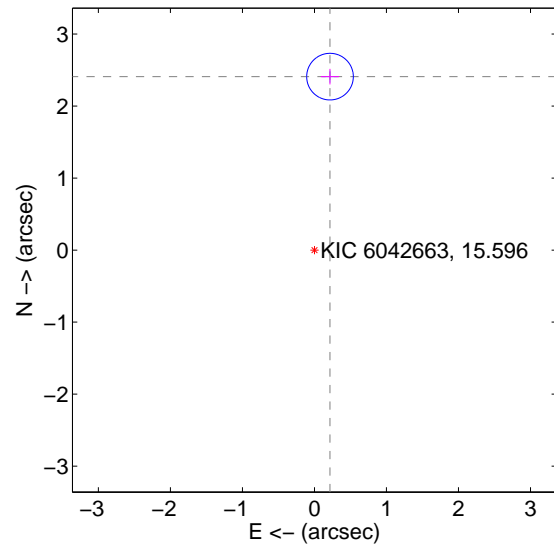
Supplemental centroid analysis for 006042663-04. Kepler magnitude: 15.60. Transit SNR 15.36

There are 1 quarters with good PRF difference image offsets

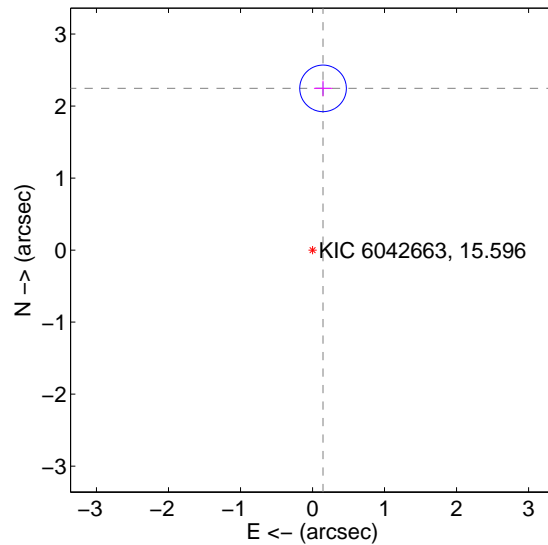
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.419 \pm 0.108$	22.41	$-0.216 \pm 0.127$	$2.409 \pm 0.108$
PRF-fit source offset from KIC position	$2.251 \pm 0.108$	20.87	$-0.146 \pm 0.127$	$2.246 \pm 0.108$
photometric centroid source offset	$0.88 \pm 0.64$	1.38	$-0.05 \pm 0.59$	$0.88 \pm 0.64$

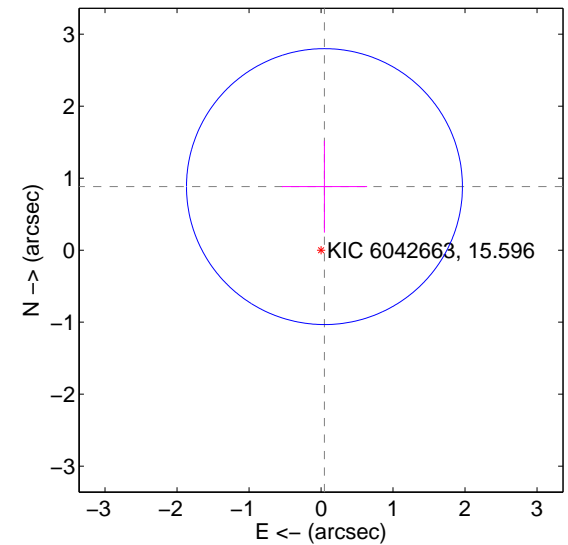
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

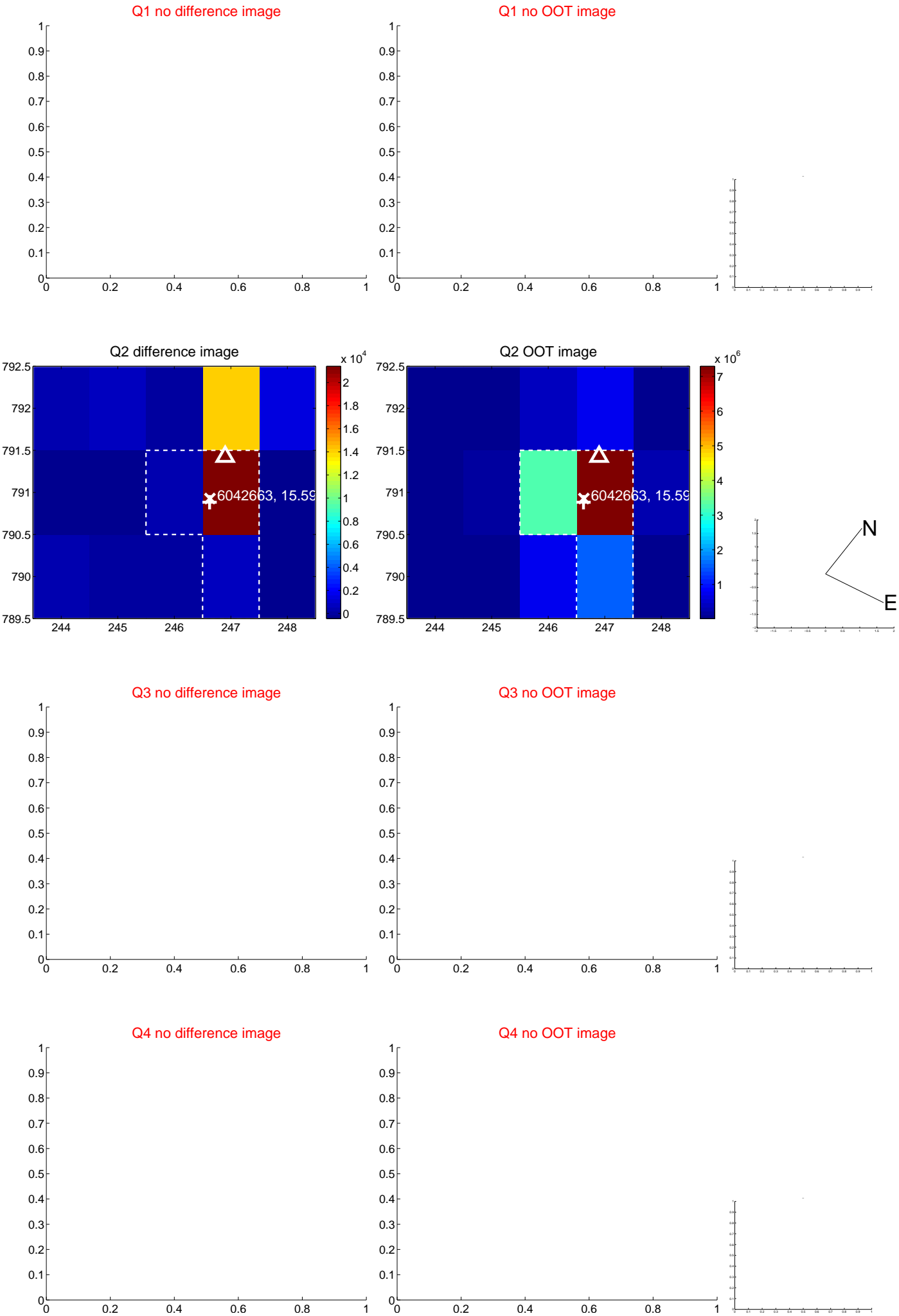


offset from photometric centroids

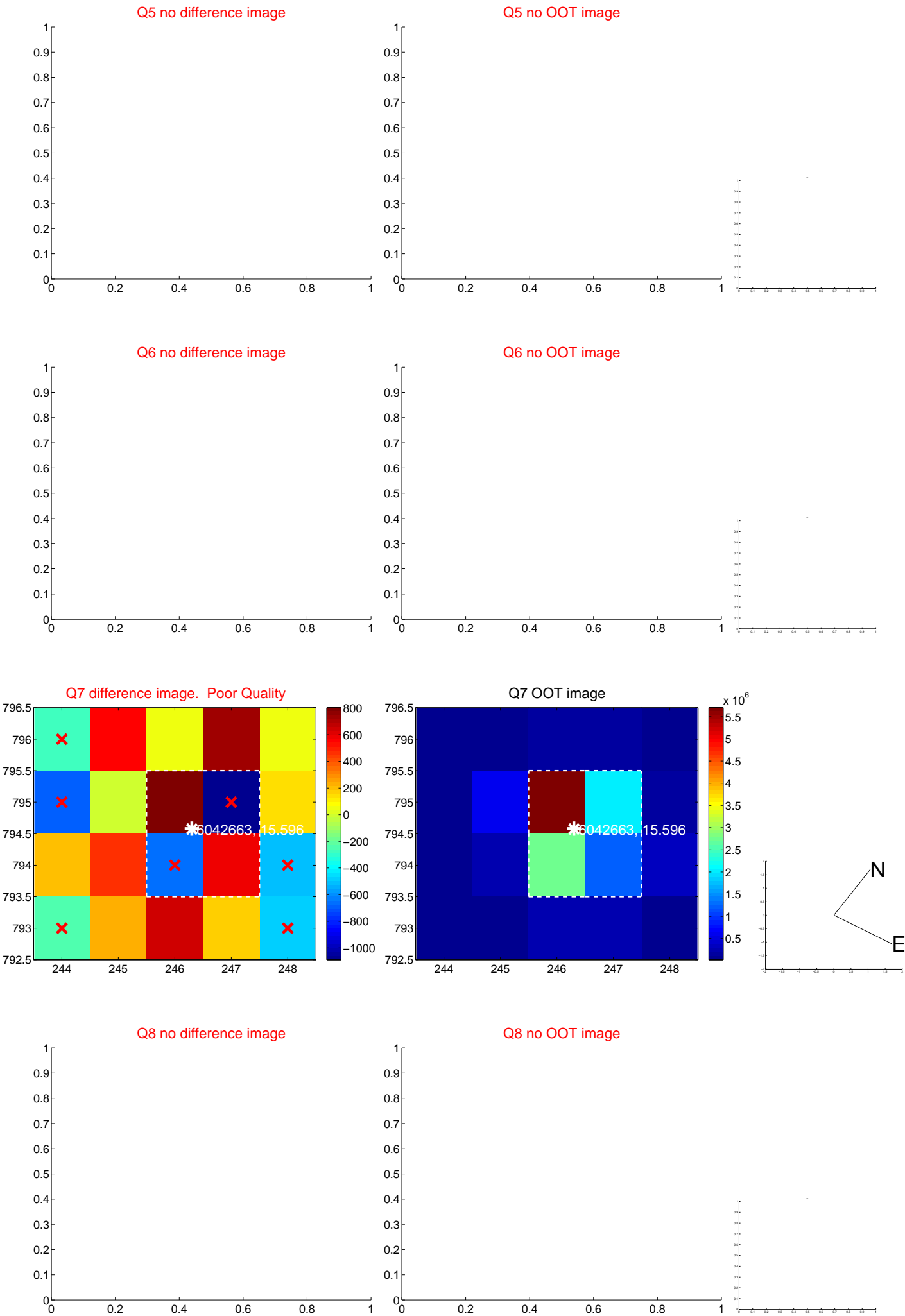


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



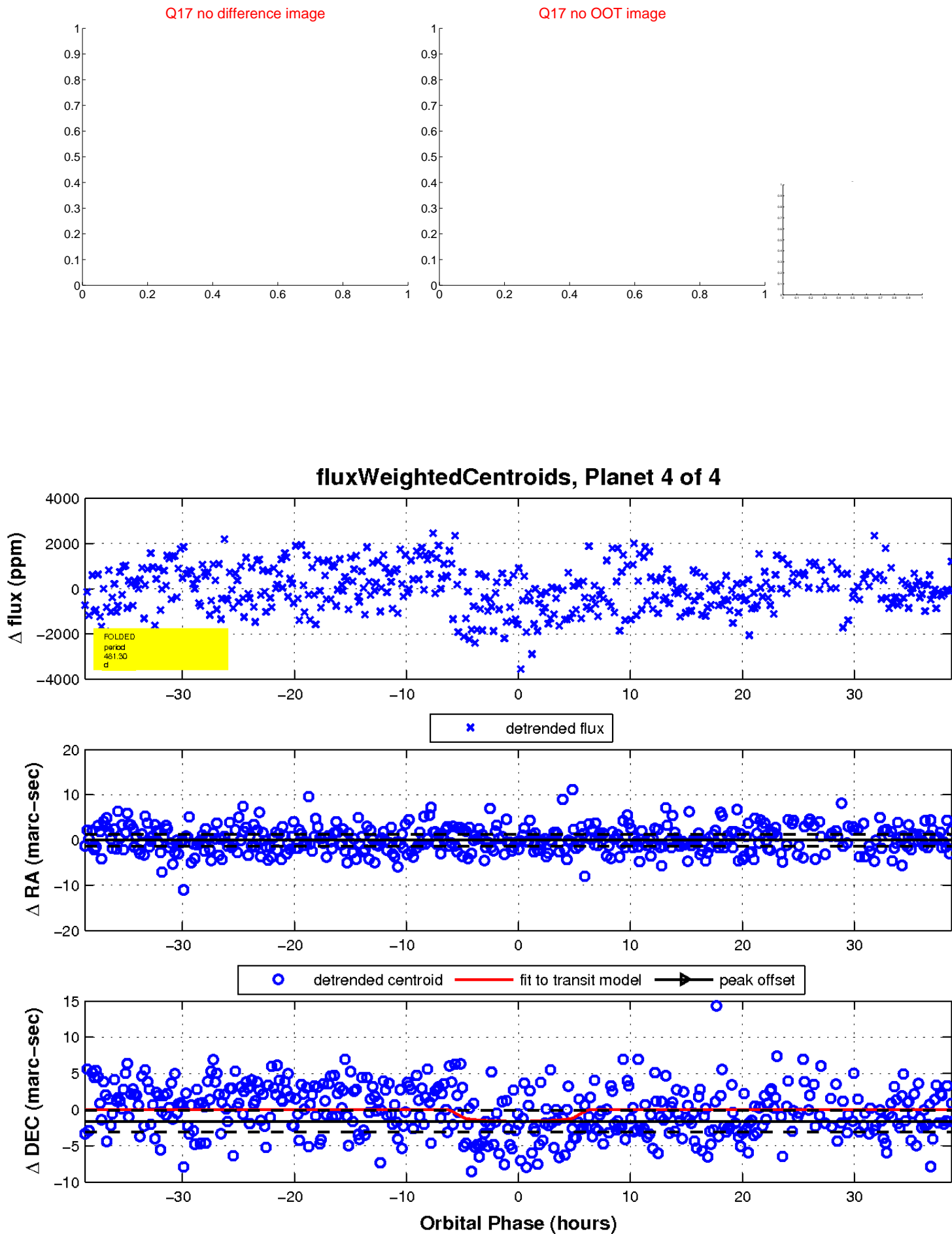
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

