

# KIC 006603043

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006603043-01	OBS	0368.01	110.321665	197.365196	7273.6	13.383	1659.0	1564.1	2.02	9244	18.66	79.26
006603043-02	OBS	No	110.332275	152.113893	29.3	10.021	8.3	7.0	2.02	9244	1.25	79.25

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006603043-01	OBS	FP	0.00	0	1	0	0	HAS_SEC_TCE—CENT_SATURATED
006603043-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_SATURATED

**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.

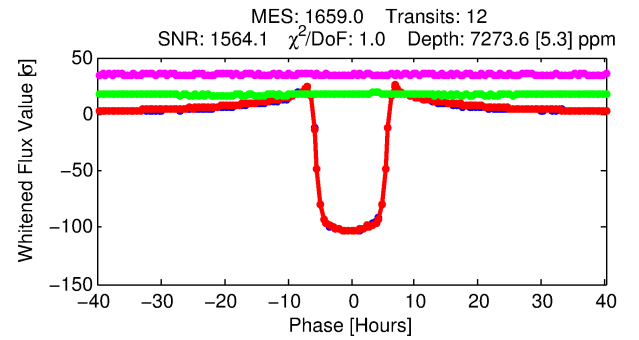
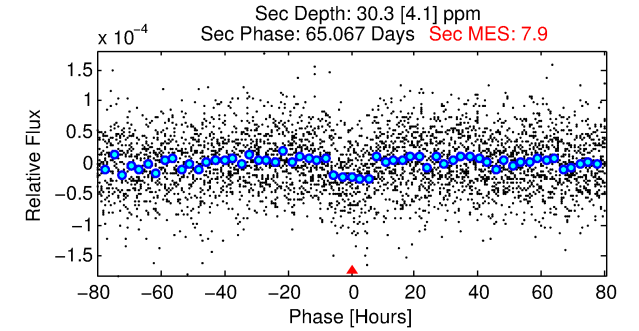
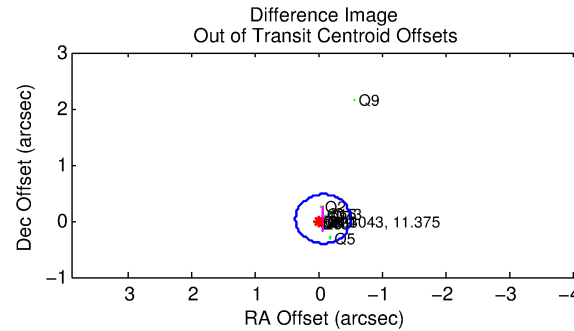
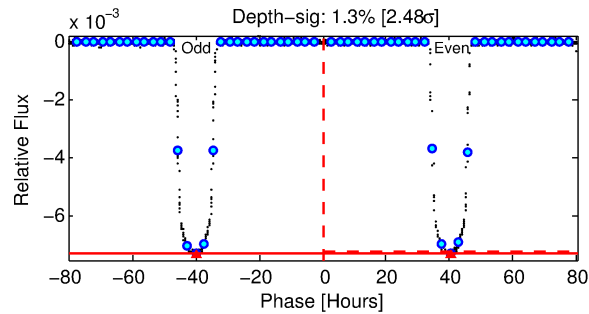
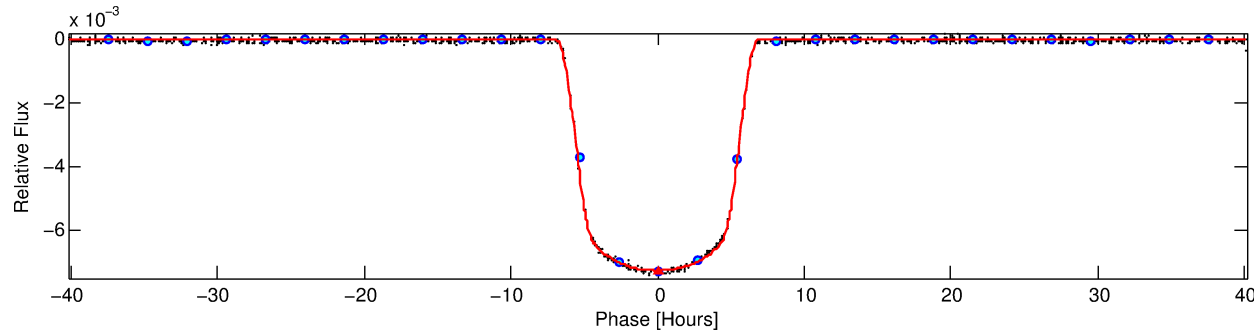
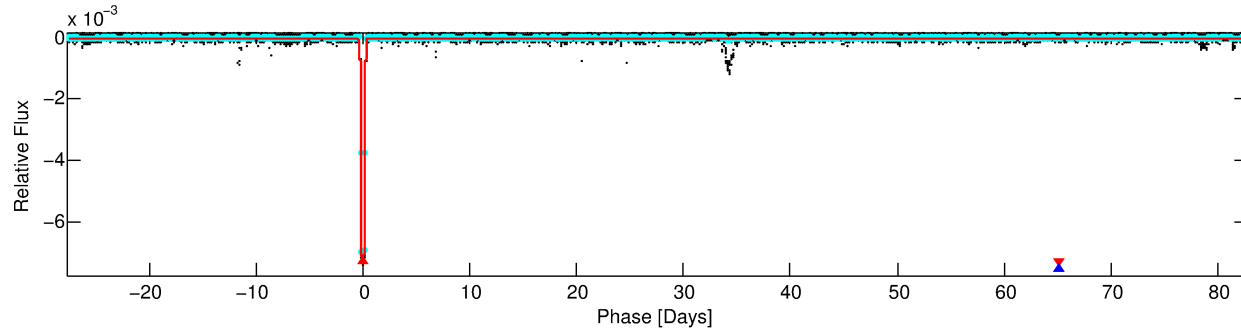
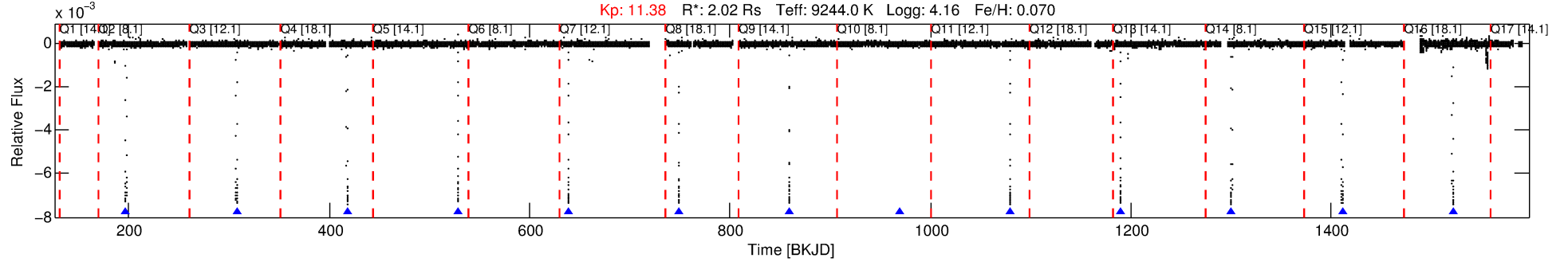
## Ephemeris Match Information For 006603043-01

No Significant Match Found

# DV One-Page Summary

KIC: 6603043 Candidate: 1 of 2 Period: 110.322 d

KOI: K00368.01 Corr: 0.998



## DV Fit Results:

Period = 110.32167 [0.00002] d  
Epoch = 197.3652 [0.0001] BKJD  
Rp/R\* = 0.0844 [0.0000]  
a/R\* = 50.80 [0.11]  
b = 0.72 [0.00]  
Seff = 79.26 [34.57]  
Teq = 761 [83] K  
Rp = 18.66 [7.27] Re  
a = 0.5818 [0.1737] AU  
Ag = 16.19 [6.73] [2.26 $\sigma$ ]  
Teffp = 2359 [137] K [9.96 $\sigma$ ]

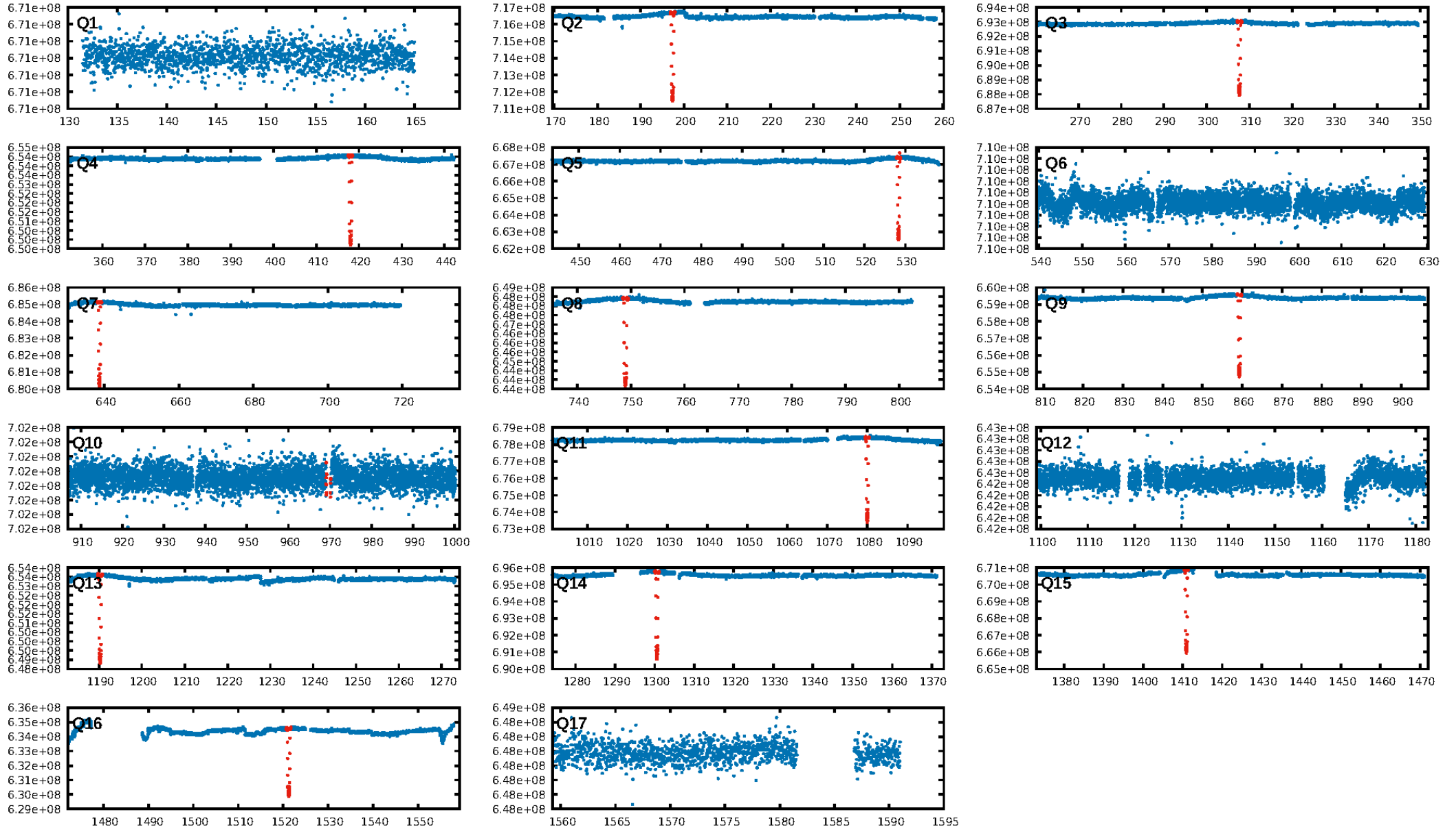
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 1.2% [0.02 $\sigma$ ]  
ModelChiSquare2-sig: 32.2%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: 31.22  
Centroid-sig: 0.3%  
Centroid-so: 0.129 arcsec [13.93 $\sigma$ ]  
OotOffset-rm: 0.070 arcsec [0.48 $\sigma$ ]  
KicOffset-rm: 0.155 arcsec [0.94 $\sigma$ ]  
OotOffset-st: 2/4/3/3 [12]  
KicOffset-st: 2/4/3/3 [12]  
DiffImageQuality-fgm: 1.00 [12/12]  
DiffImageOverlap-fno: 1.00 [12/12]

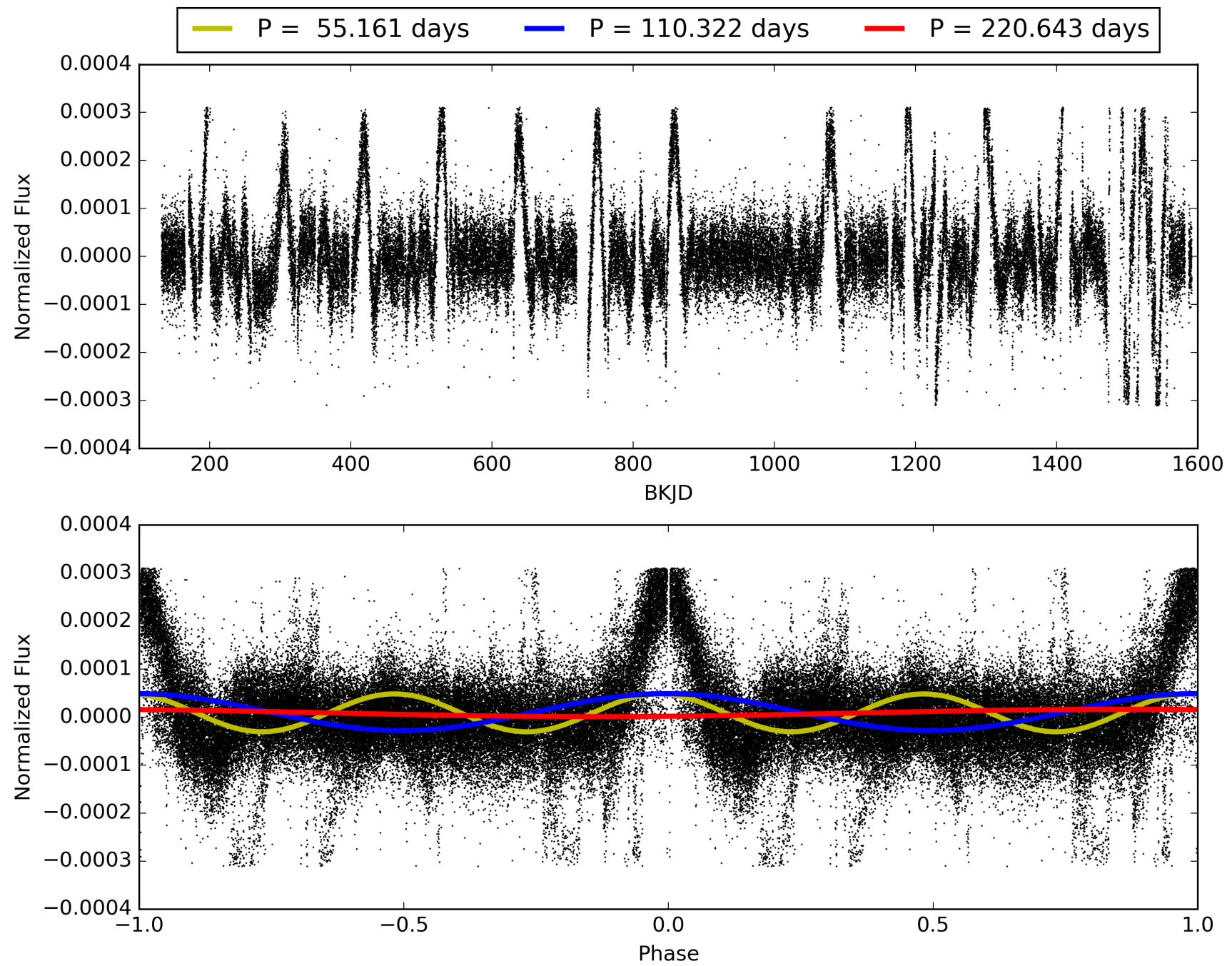
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:08:44 Z

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

# TCE 006603043-01, PDC Light Curves

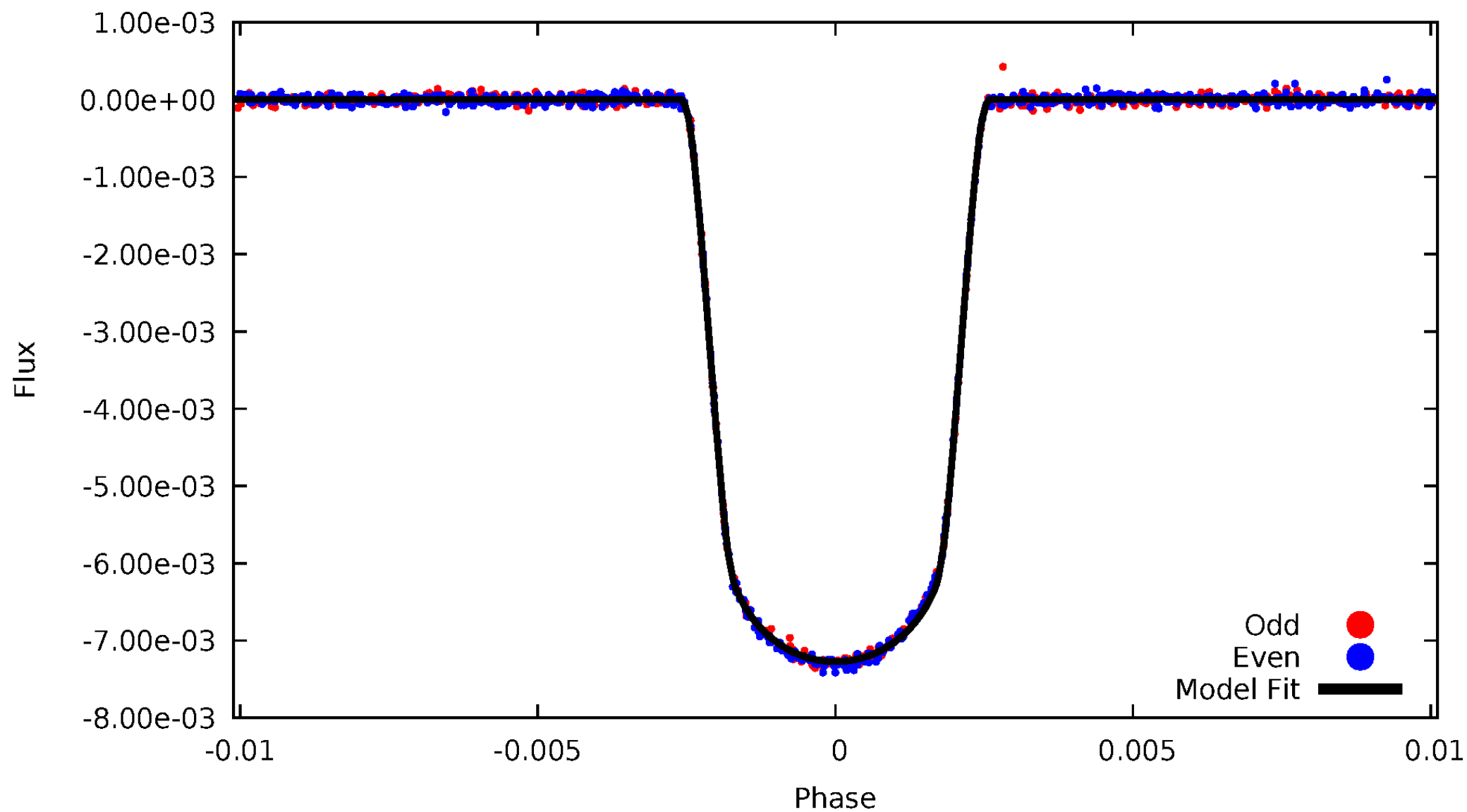


TCE 006603043-01



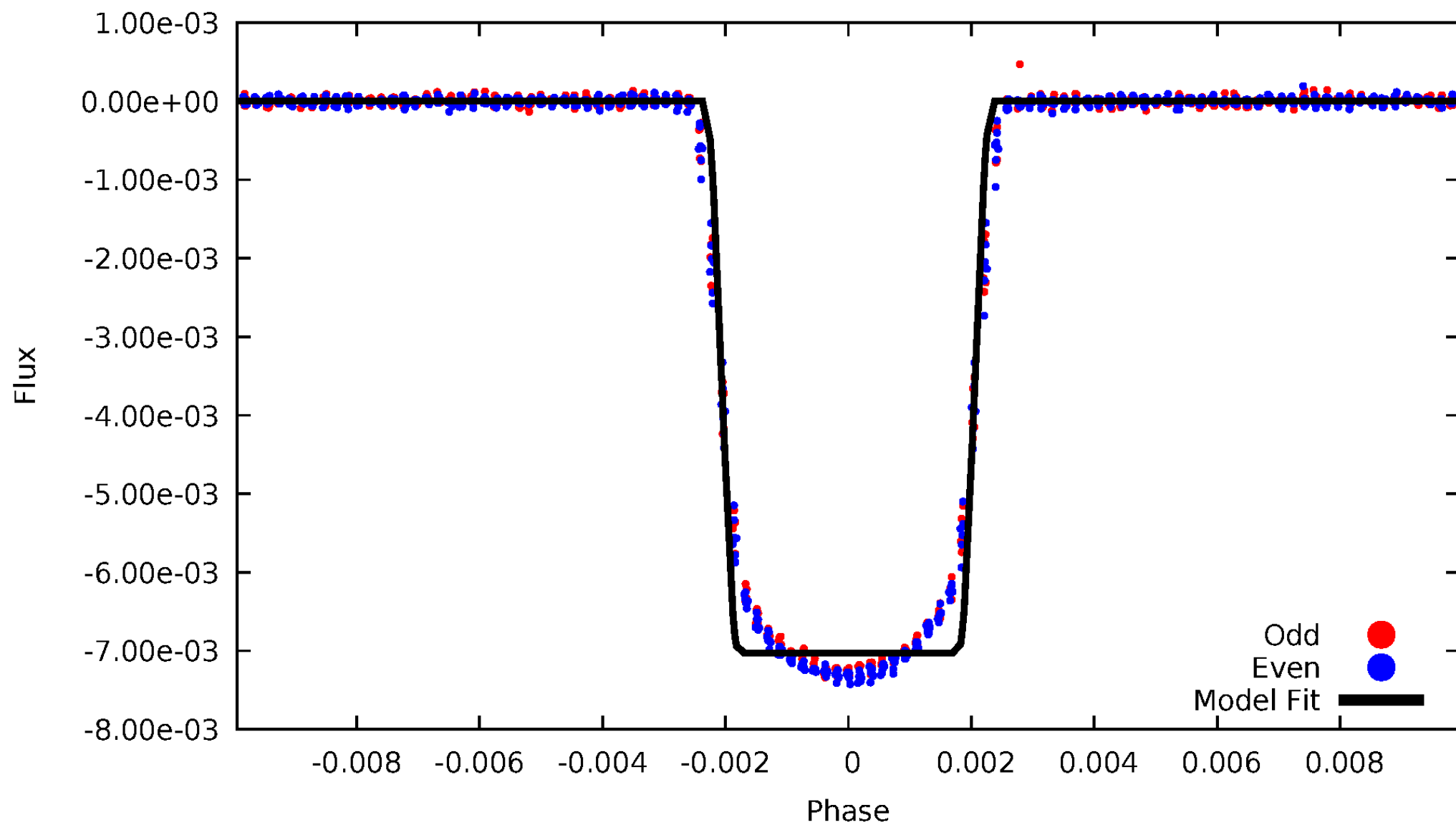
# DV Odd/Even

TCE 006603043-01



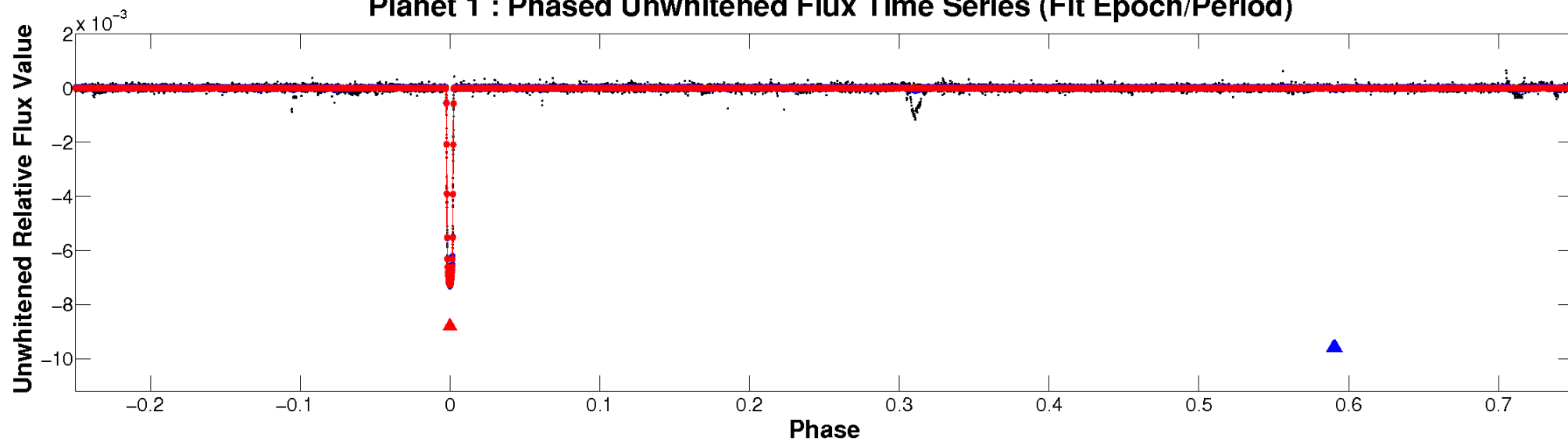
# ALT Odd/Even

TCE 006603043-01

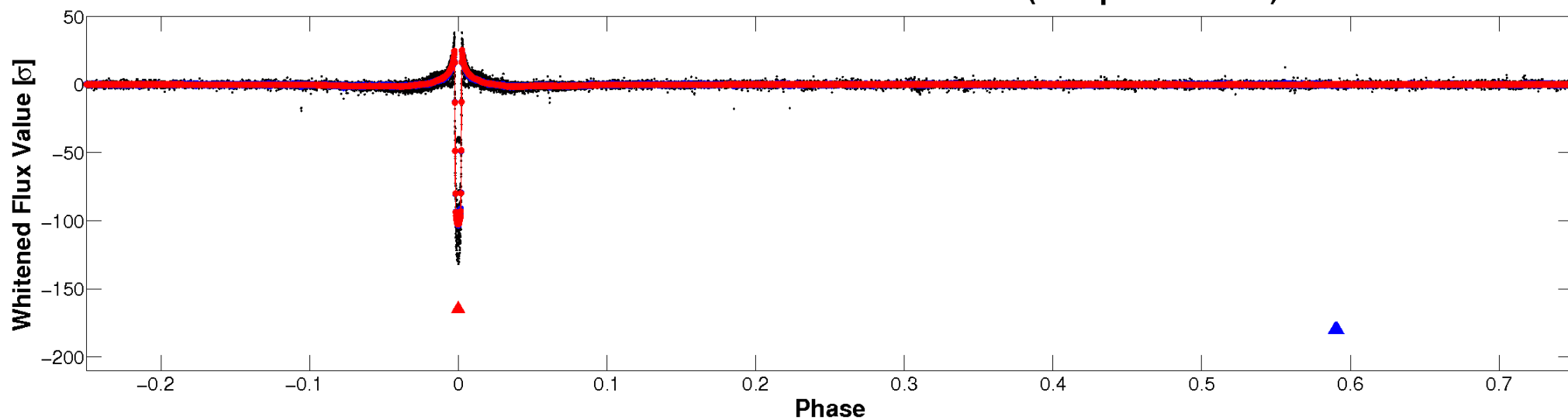


# Non-Whitened Vs. Whitened Light Curve

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

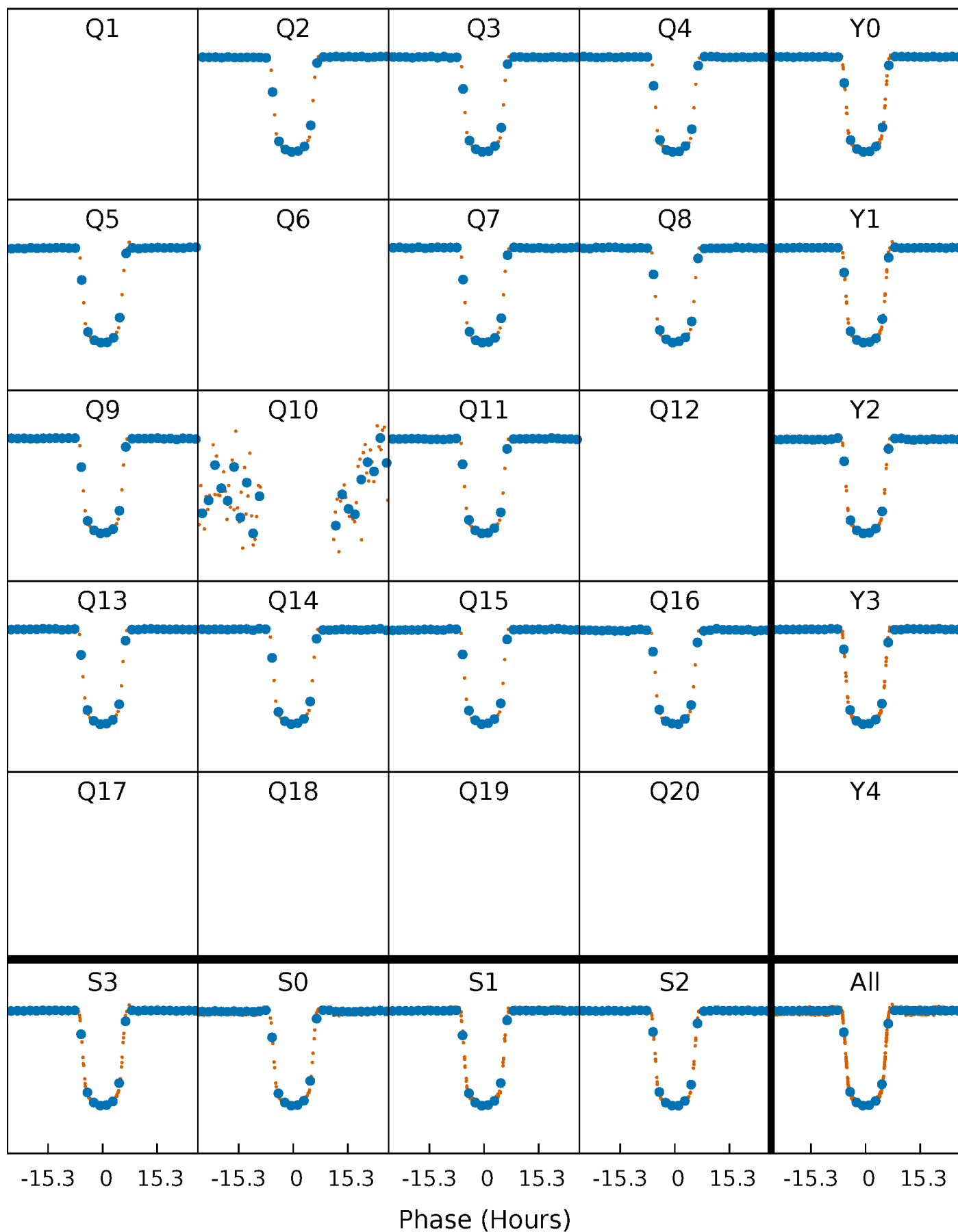


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

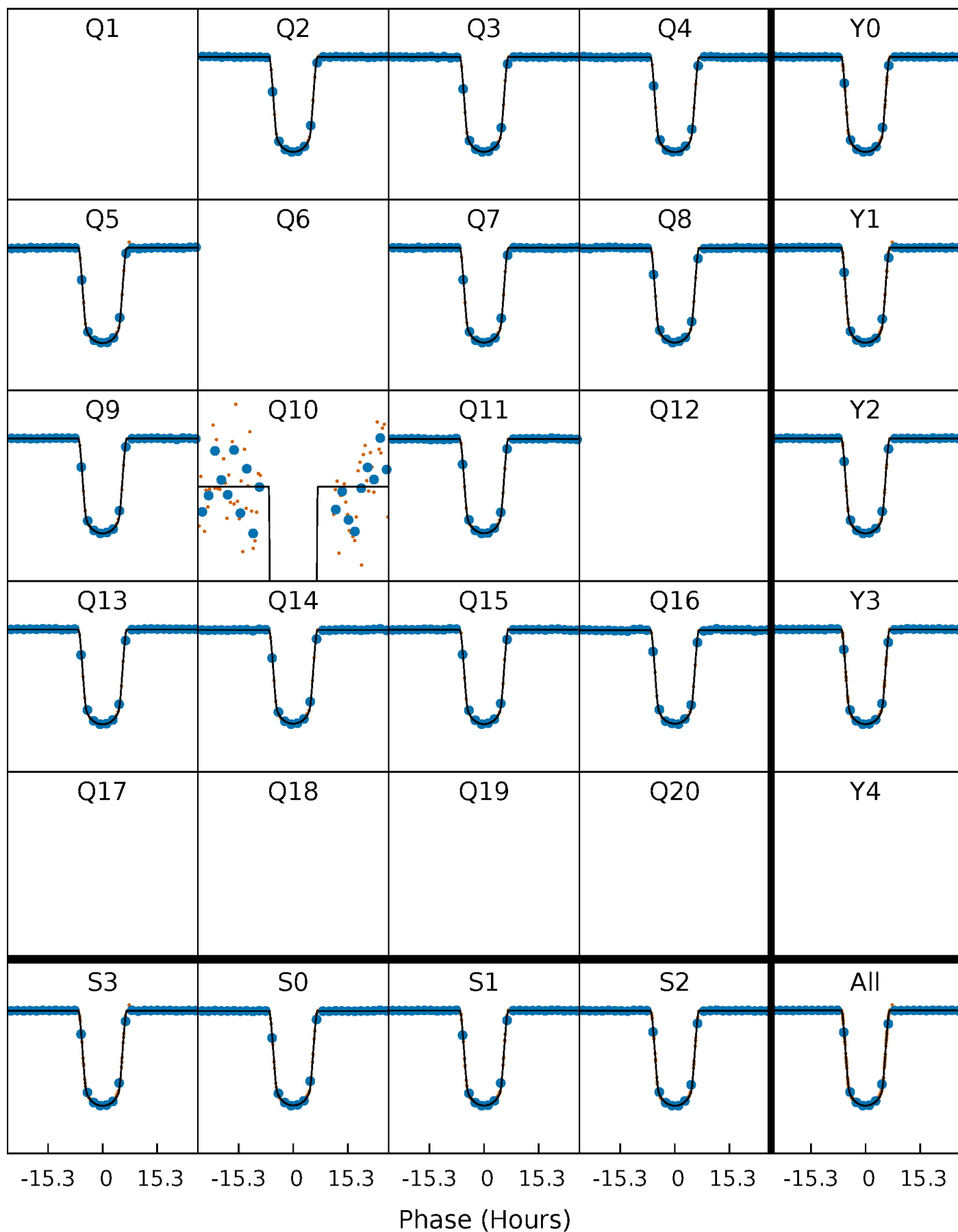
TCE 006603043-01 P=110.321665 Days  $T_0=197.365196$  (BKJD)





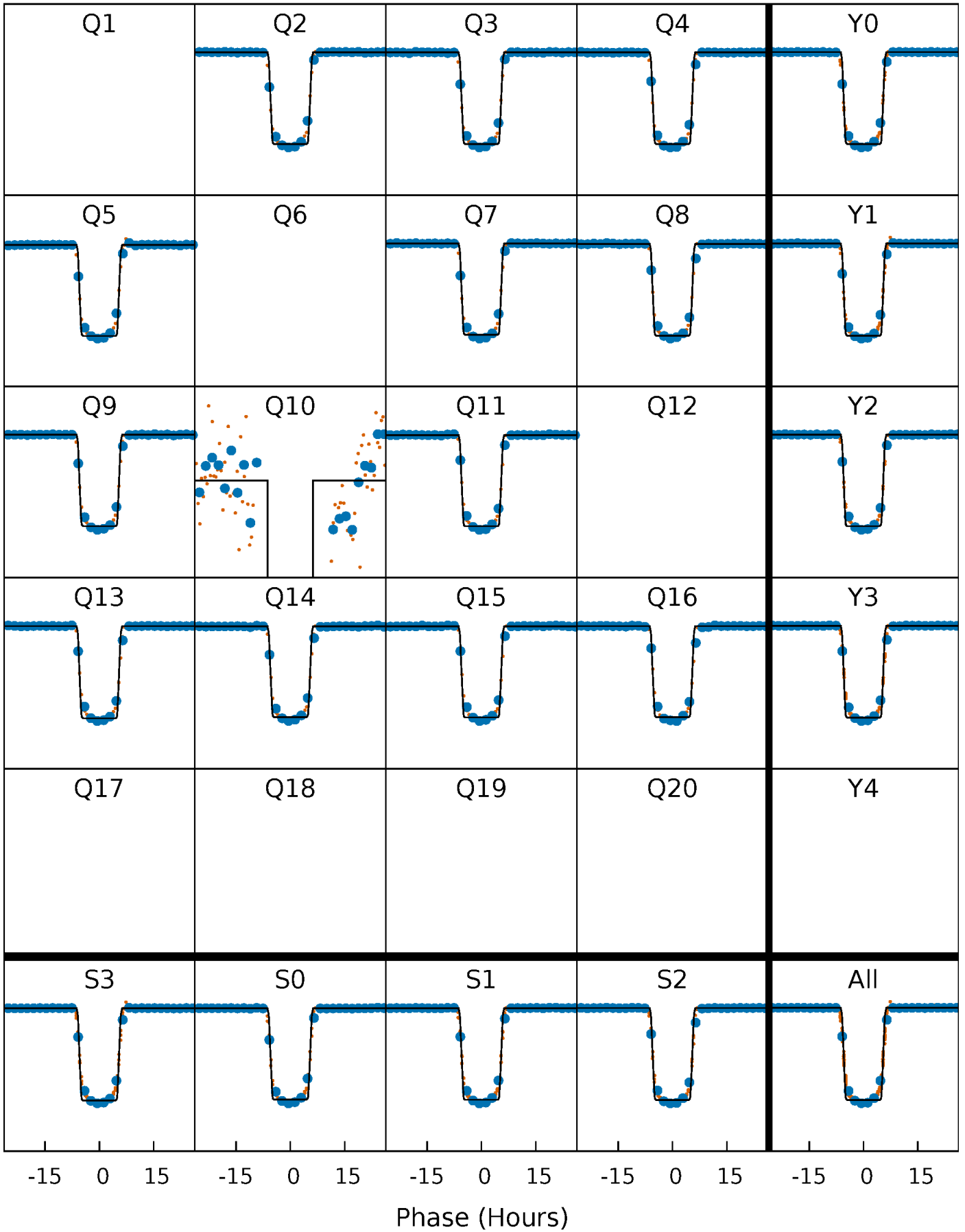
# DV Quarter-Phased Transit Curves

TCE 006603043-01 P=110.321665 Days  $T_0=197.365196$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

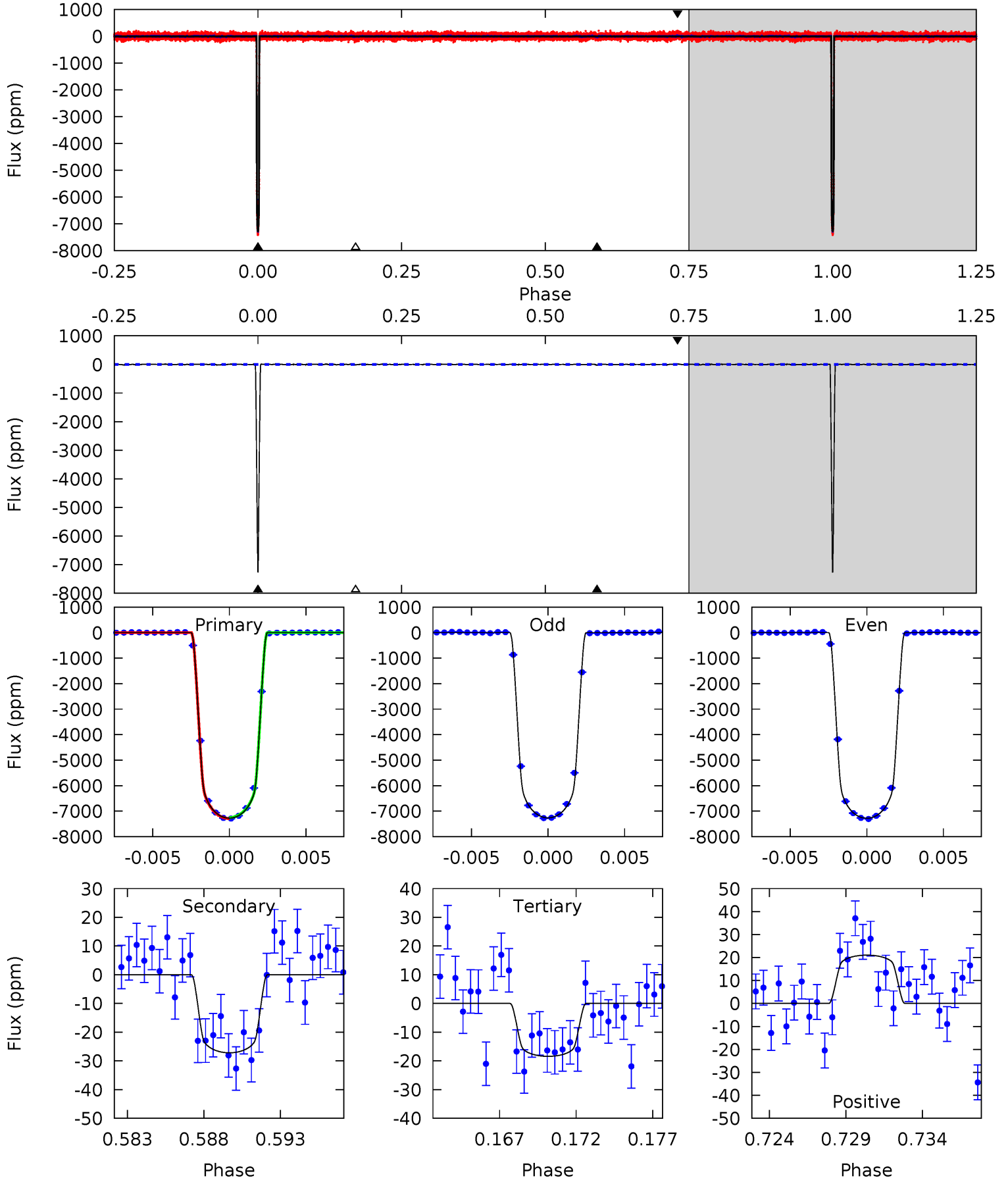
TCE 006603043-01 P=110.320790 Days  $T_0=197.370294$  (BKJD)



# DV Model-Shift Uniqueness Test

006603043-01, P = 110.321665 Days, E = 87.043531 Days

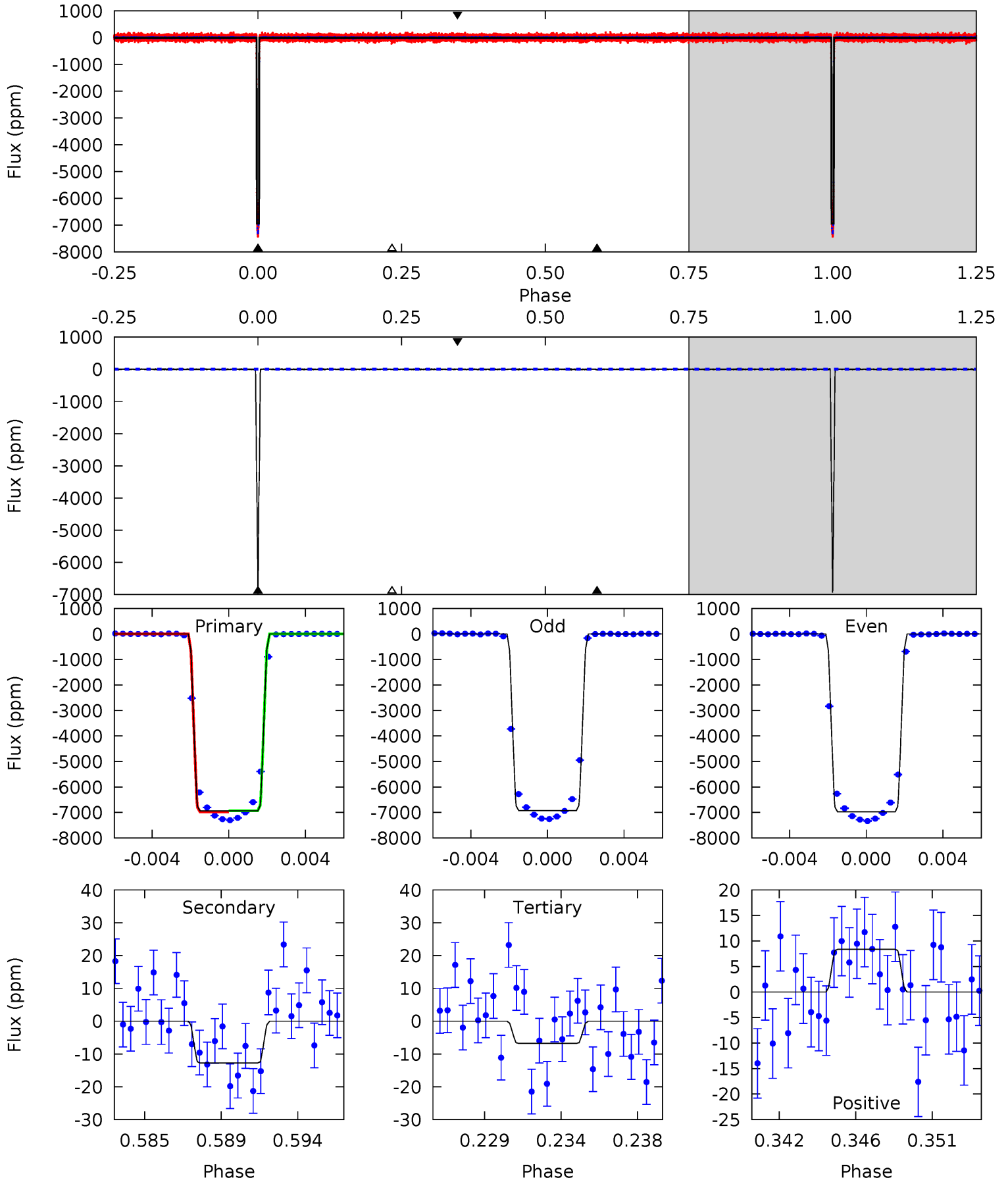
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2768	10.3	7.01	8.01	5.15	2.79	1.89	2761	2760	3.34	2.34	3.47	1.00	0.00	7.30



# Alt Model-Shift Uniqueness Test

006603043-01, P = 110.320790 Days, E = 87.049504 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
2424	4.45	2.36	2.92	5.18	2.84	0.78	2422	2421	2.09	1.53	8.04	1.00	0.00	7.94



### Stellar Parameters For KIC 006603043

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9244^{+255}_{-438}$	$4.159^{+0.128}_{-0.192}$	$0.070^{+0.150}_{-0.650}$	$2.025^{+0.789}_{-0.485}$	$2.158^{+0.426}_{-0.521}$	$0.366^{+0.247}_{-0.195}$
	+3%/-5%	+3%/-5%	+214%/-929%	+39%/-24%	+20%/-24%	+67%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 006603043-01 / KOI 0368.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-27 \pm 3$	$18.66^{+3.53}_{-2.25}$	$1067^{+83}_{-75}$	$2864^{+53}_{-66}$	$14^{+4}_{-4}$
Alt.	$-13 \pm 3$	$18.61^{+3.58}_{-2.13}$	$1070^{+91}_{-77}$	$2585^{+82}_{-88}$	$6.375^{+2.686}_{-2.040}$

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

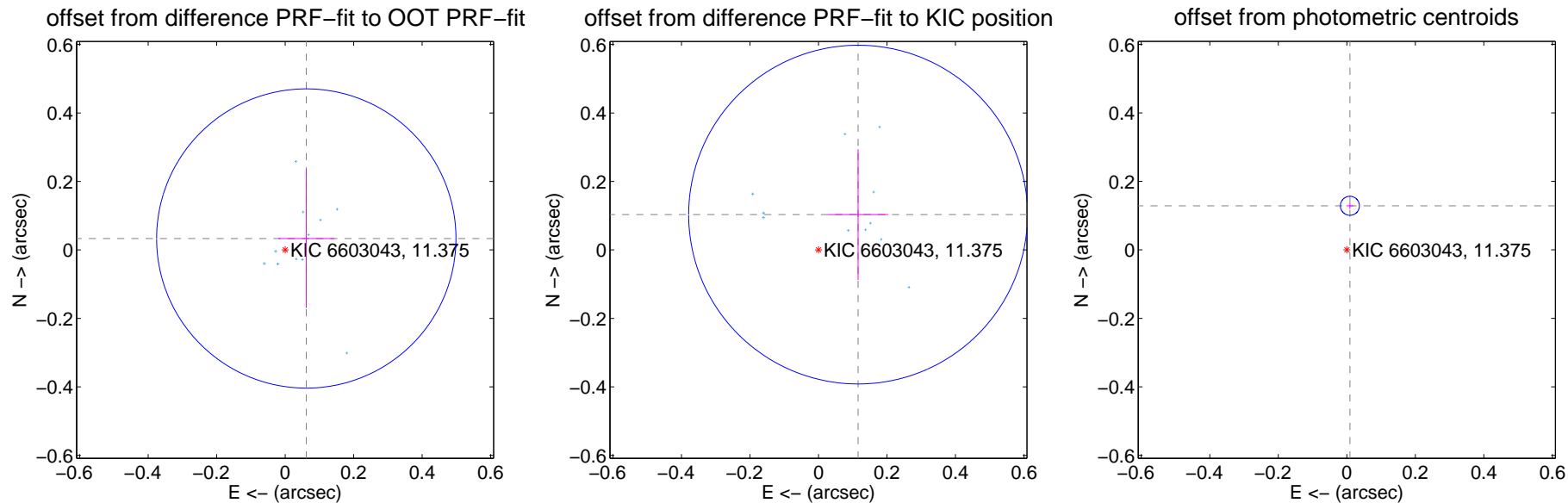
## DV Centroid Data

Supplemental centroid analysis for 006603043-01. **Kepler magnitude: 11.38.** Transit SNR 1564.10

There are 12 quarters with good PRF difference image offsets

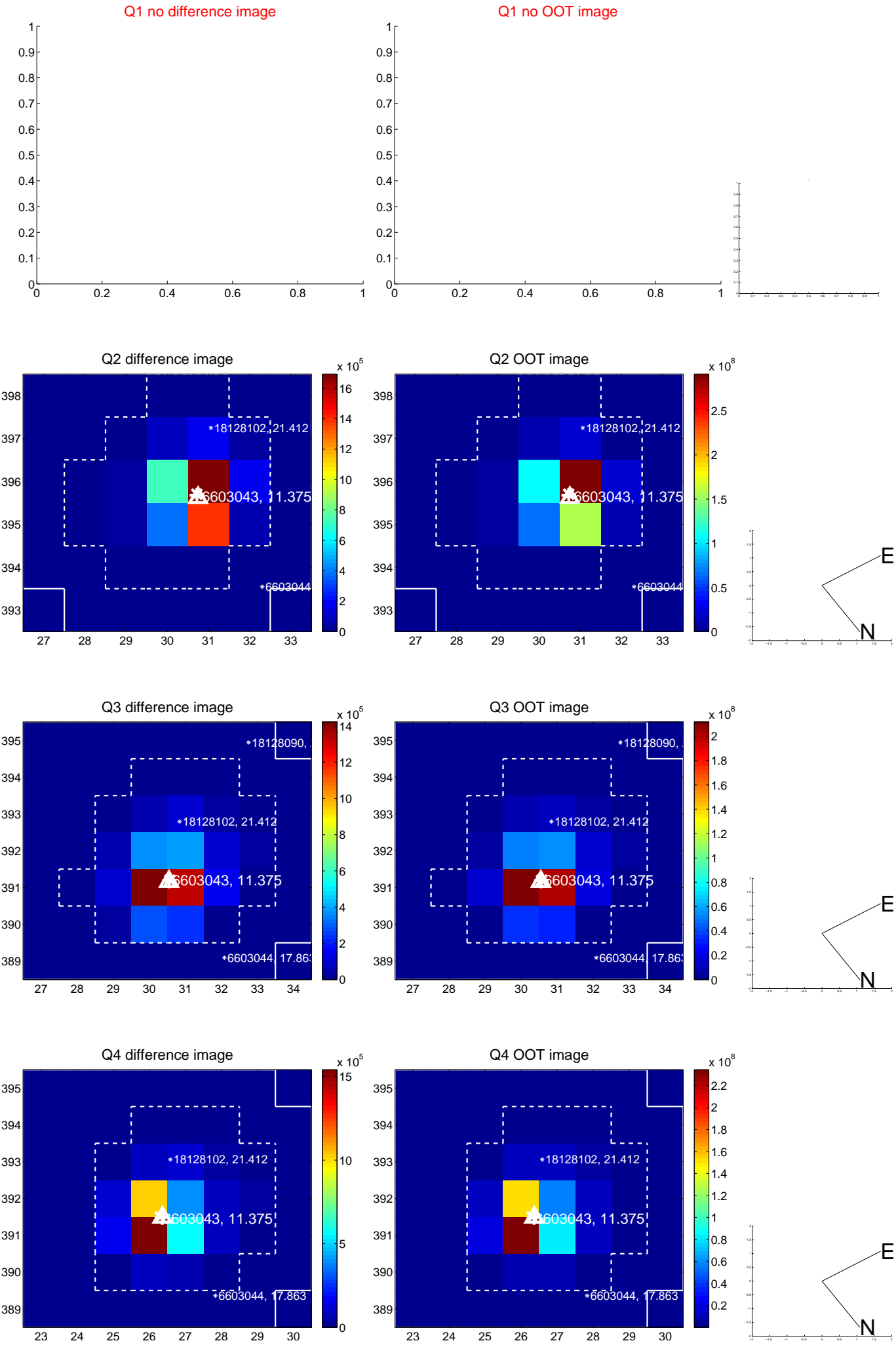
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.070 \pm 0.146$	0.48	$-0.062 \pm 0.082$	$0.033 \pm 0.203$
PRF-fit source offset from KIC position	$0.155 \pm 0.165$	0.94	$-0.116 \pm 0.088$	$0.103 \pm 0.191$
photometric centroid source offset	<b><math>0.13 \pm 0.01</math></b>	<b>13.93</b>	$-0.01 \pm 0.01$	$0.13 \pm 0.01$

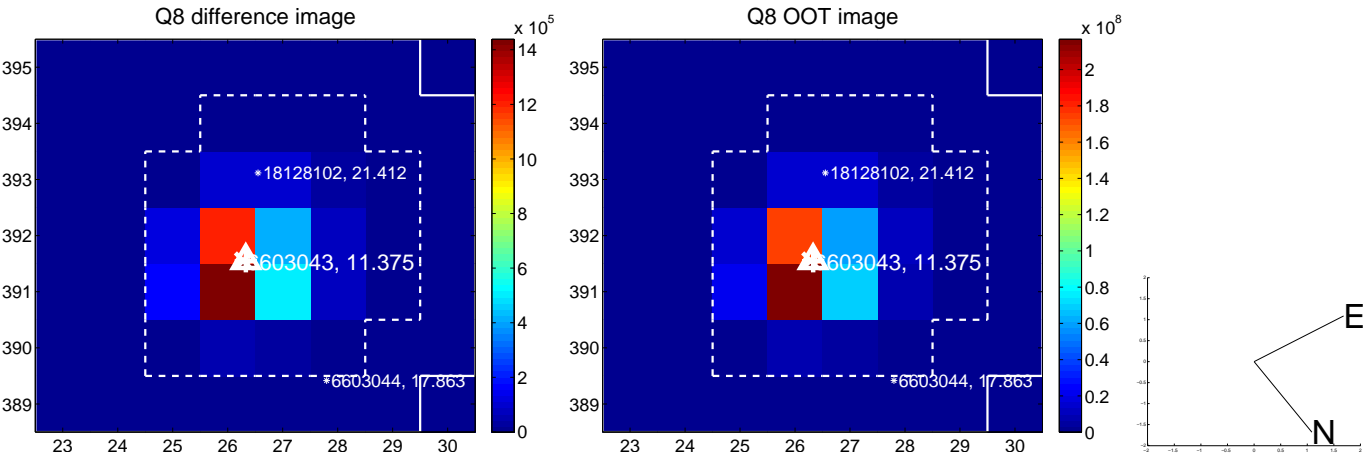
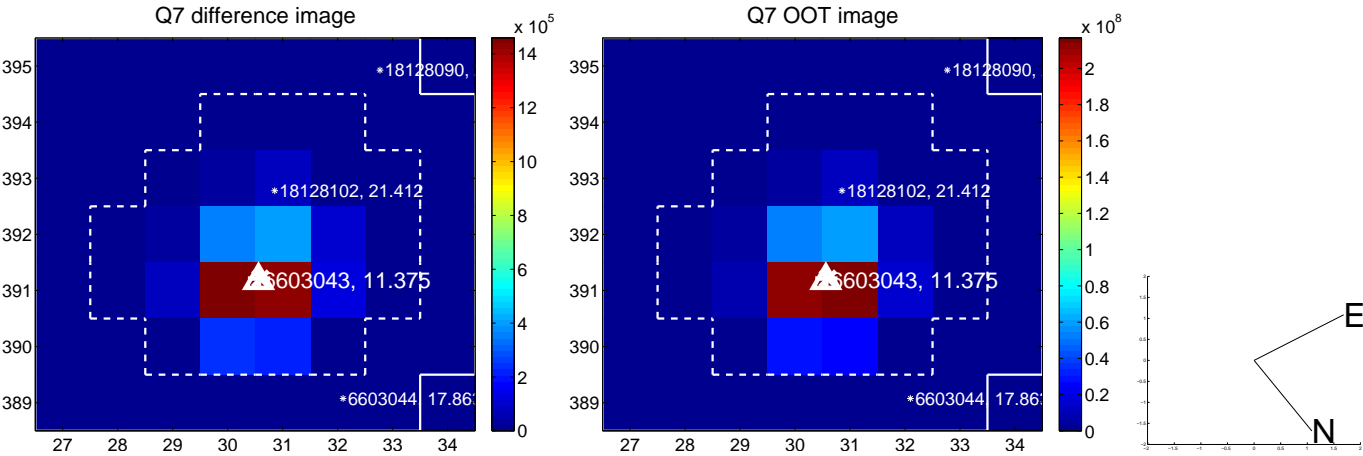
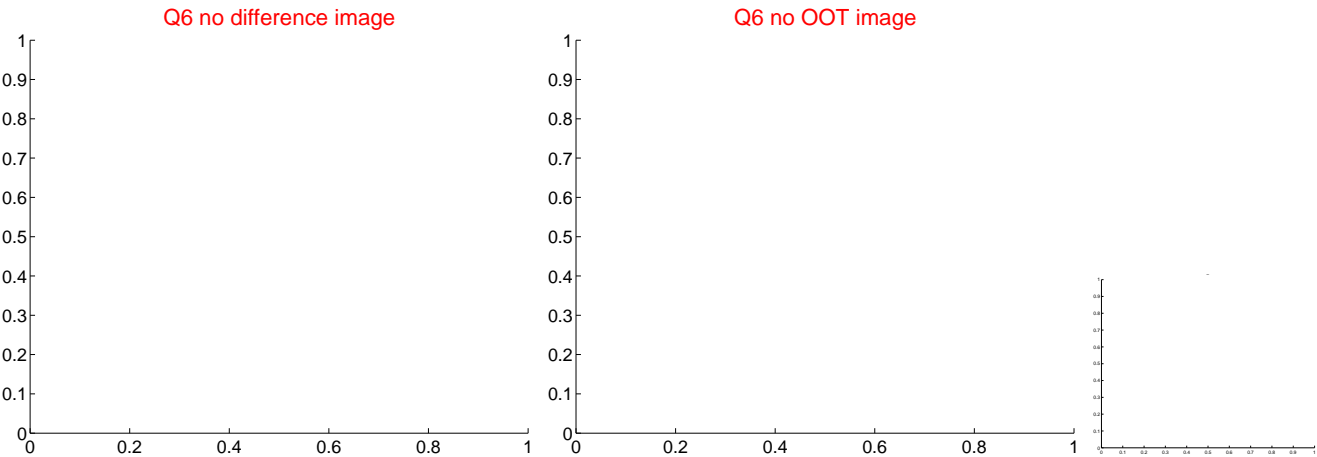
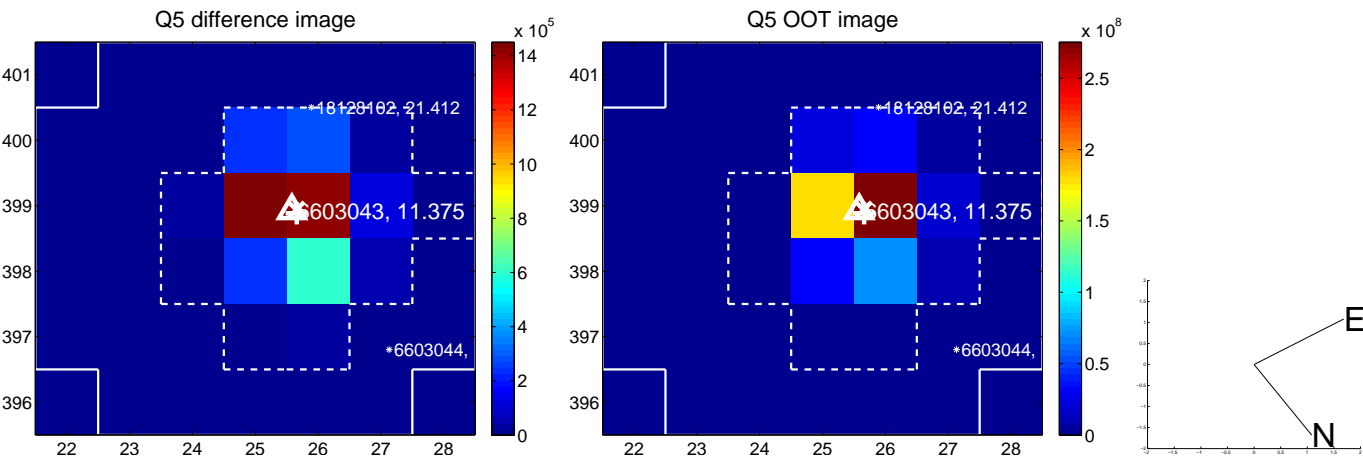


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

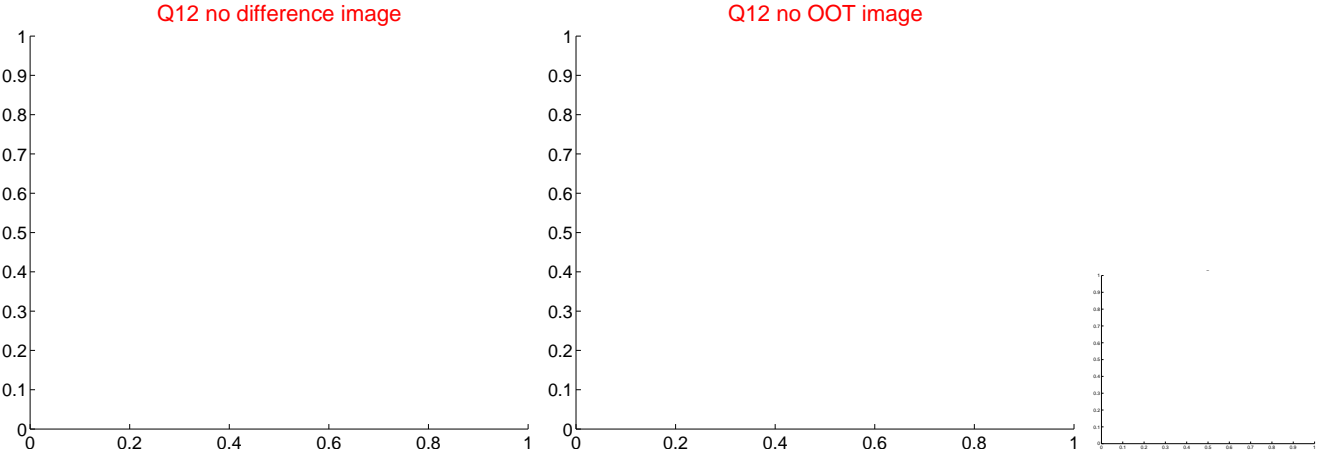
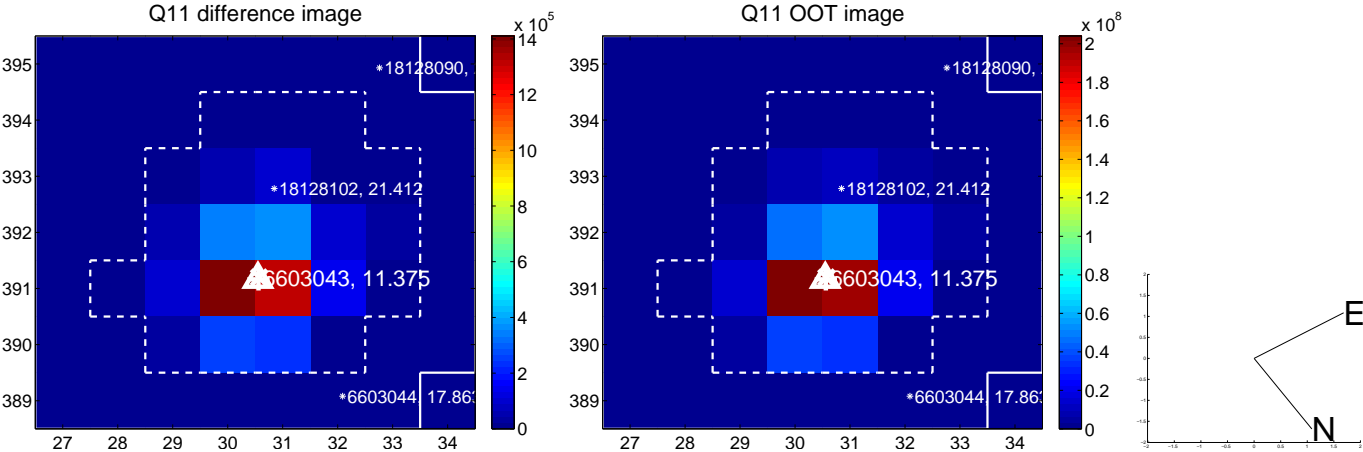
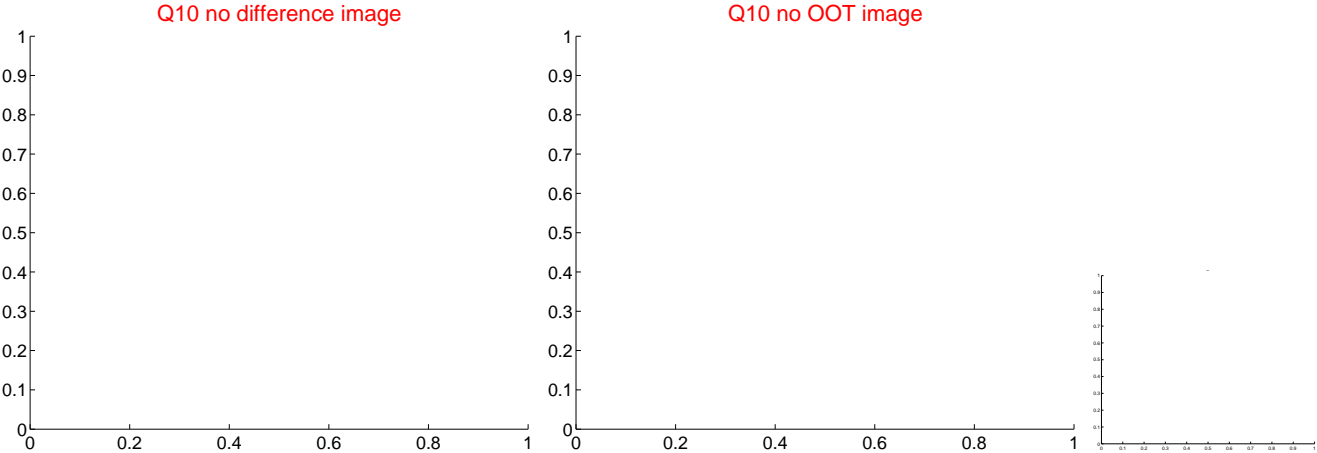
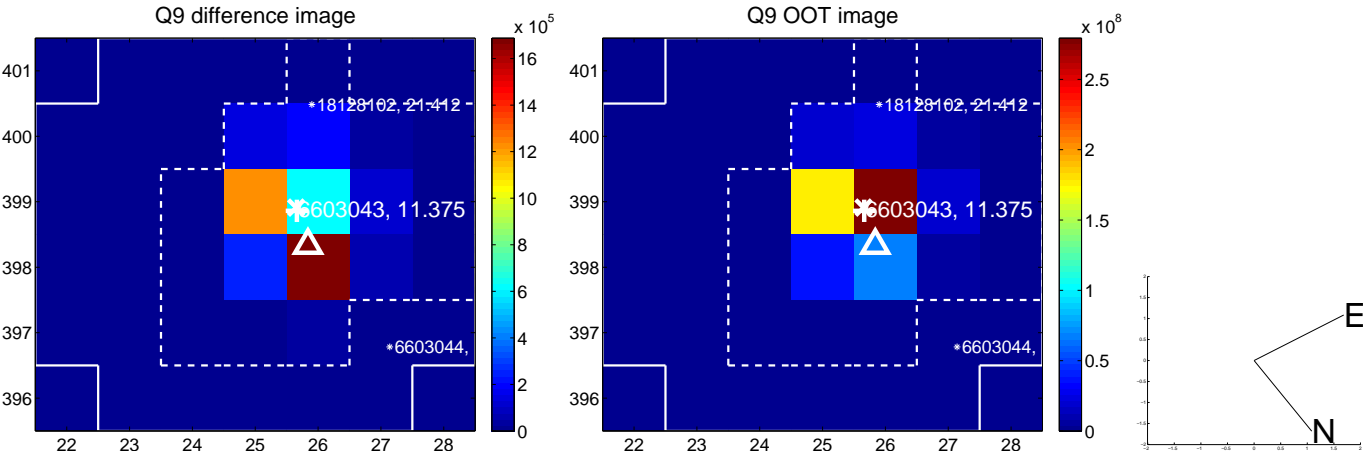


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

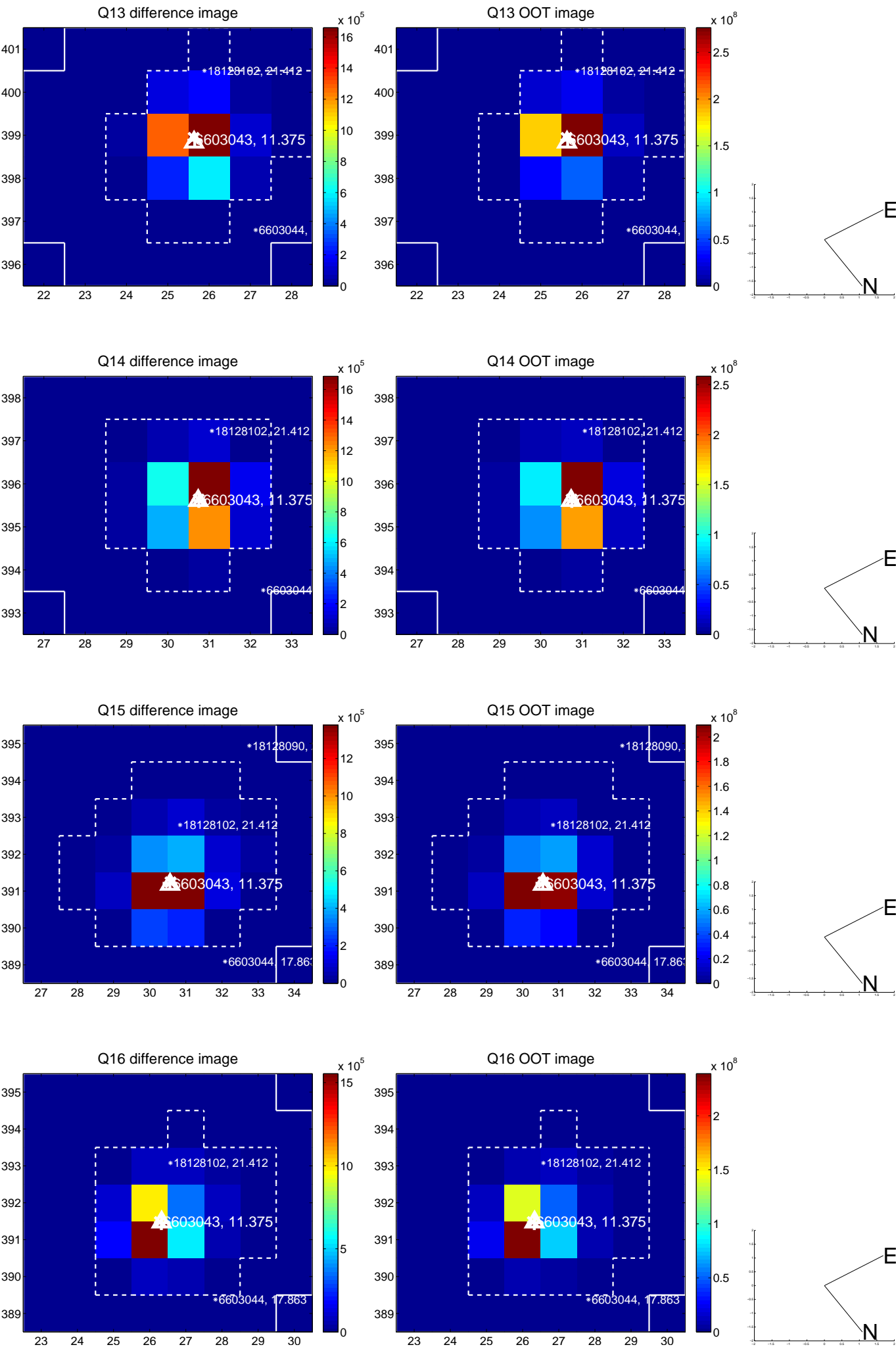




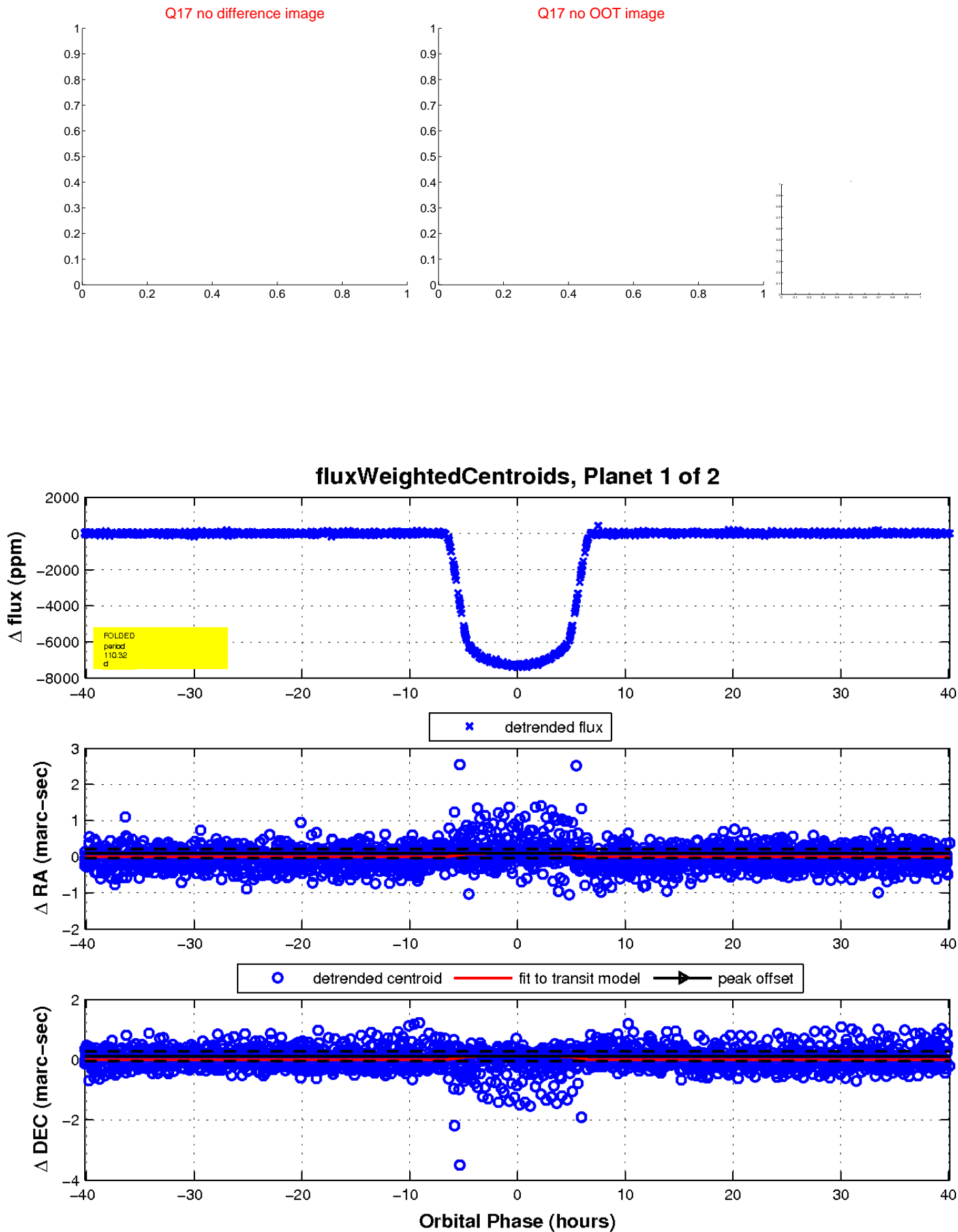
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



# KIC 006603043

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006603043-01	OBS	0368.01	110.321665	197.365196	7273.6	13.383	1659.0	1564.1	2.02	9244	18.66	79.26
006603043-02	OBS	No	110.332275	152.113893	29.3	10.021	8.3	7.0	2.02	9244	1.25	79.25

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006603043-01	OBS	FP	0.00	0	1	0	0	HAS_SEC_TCE—CENT_SATURATED
006603043-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_SATURATED

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

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

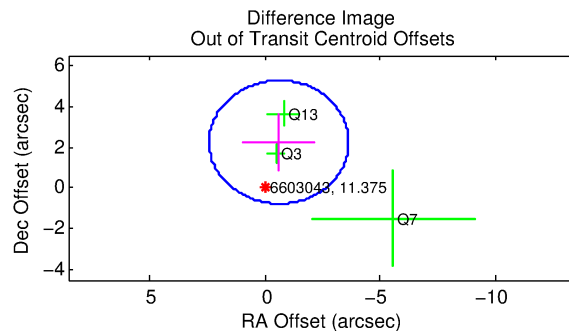
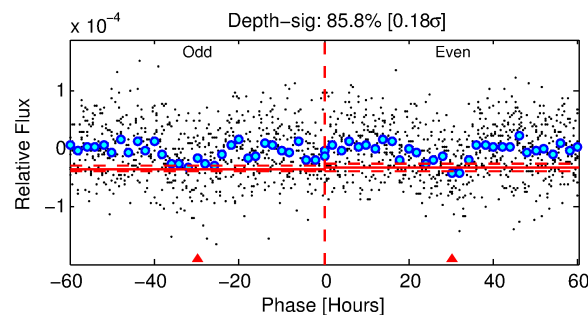
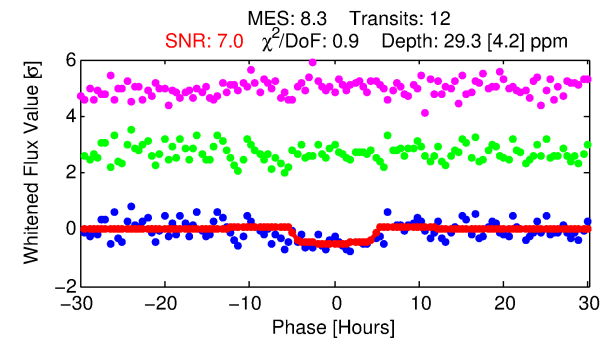
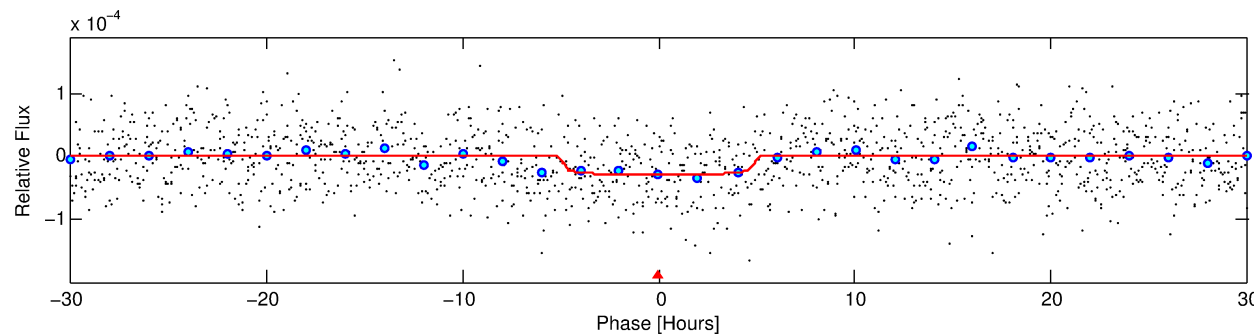
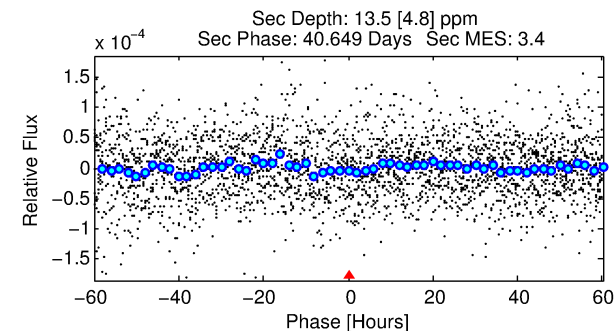
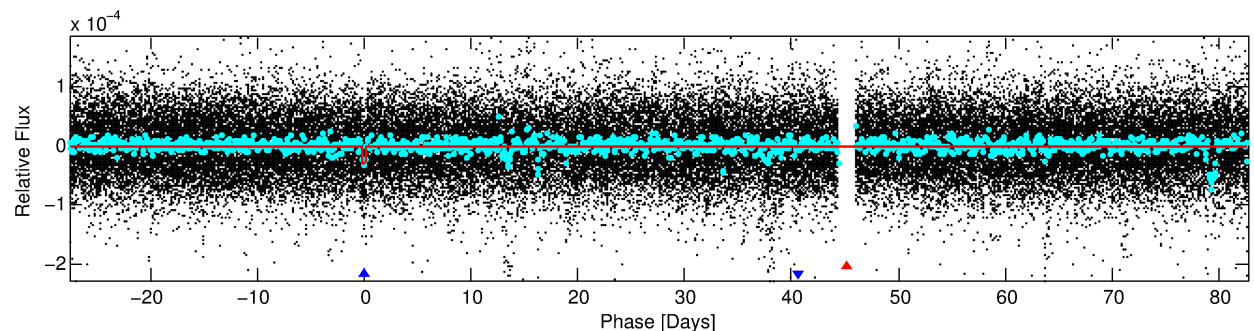
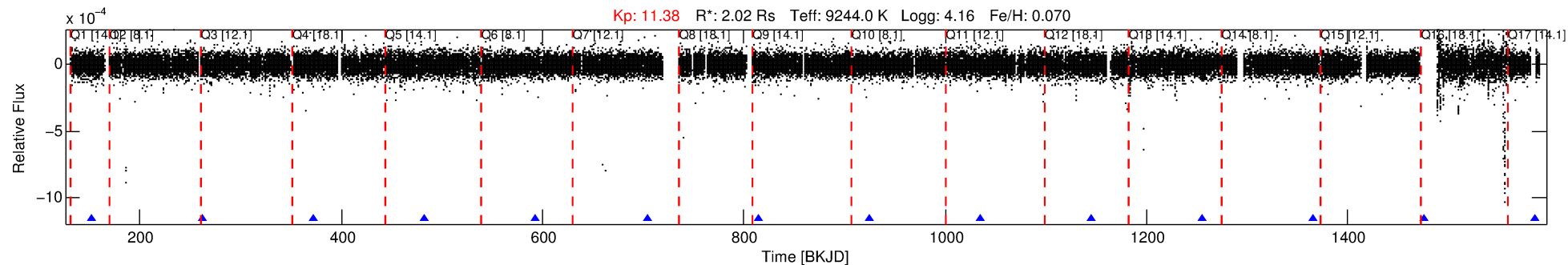
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006603043-02

No Significant Match Found

# DV One-Page Summary

KIC: 6603043 Candidate: 2 of 2 Period: 110.332 d  
KOI: K00368 Corr: No Ephemeris Match



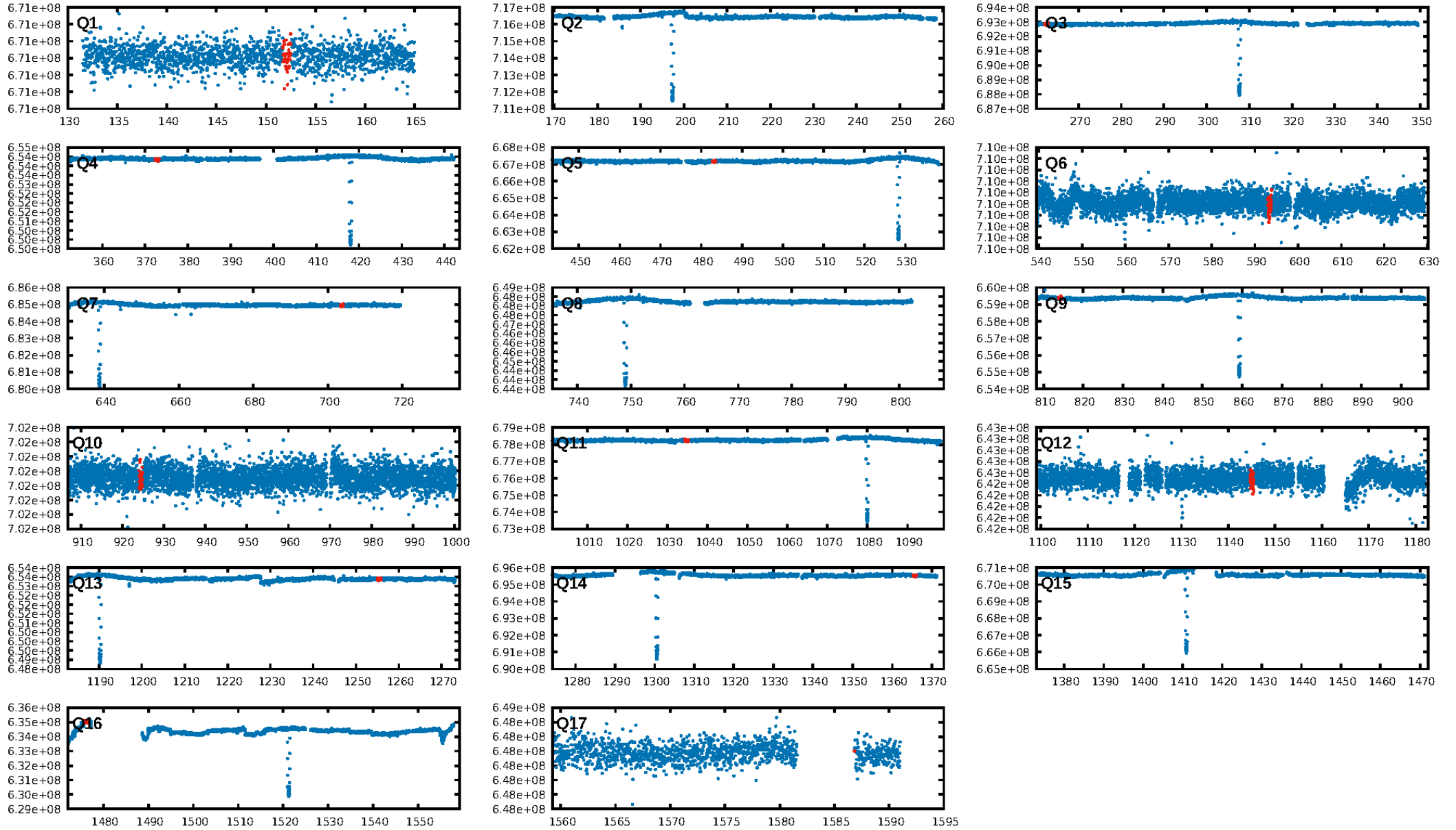
## DV Fit Results:

Period = 110.33227 [0.00277] d  
Epoch = 152.1139 [0.0185] BKJD  
Rp/R\* = 0.0057 [0.0013]  
a/R\* = 38.91 [60.57]  
b = 0.89 [0.36]  
Seff = 79.25 [34.57]  
Teq = 761 [83] K  
Rp = 1.26 [0.56] Re  
a = 0.5818 [0.1738] AU  
Ag = 1595.15 [1107.55] [1.44σ]  
Teffp = 7434 [1121] K [5.94σ]

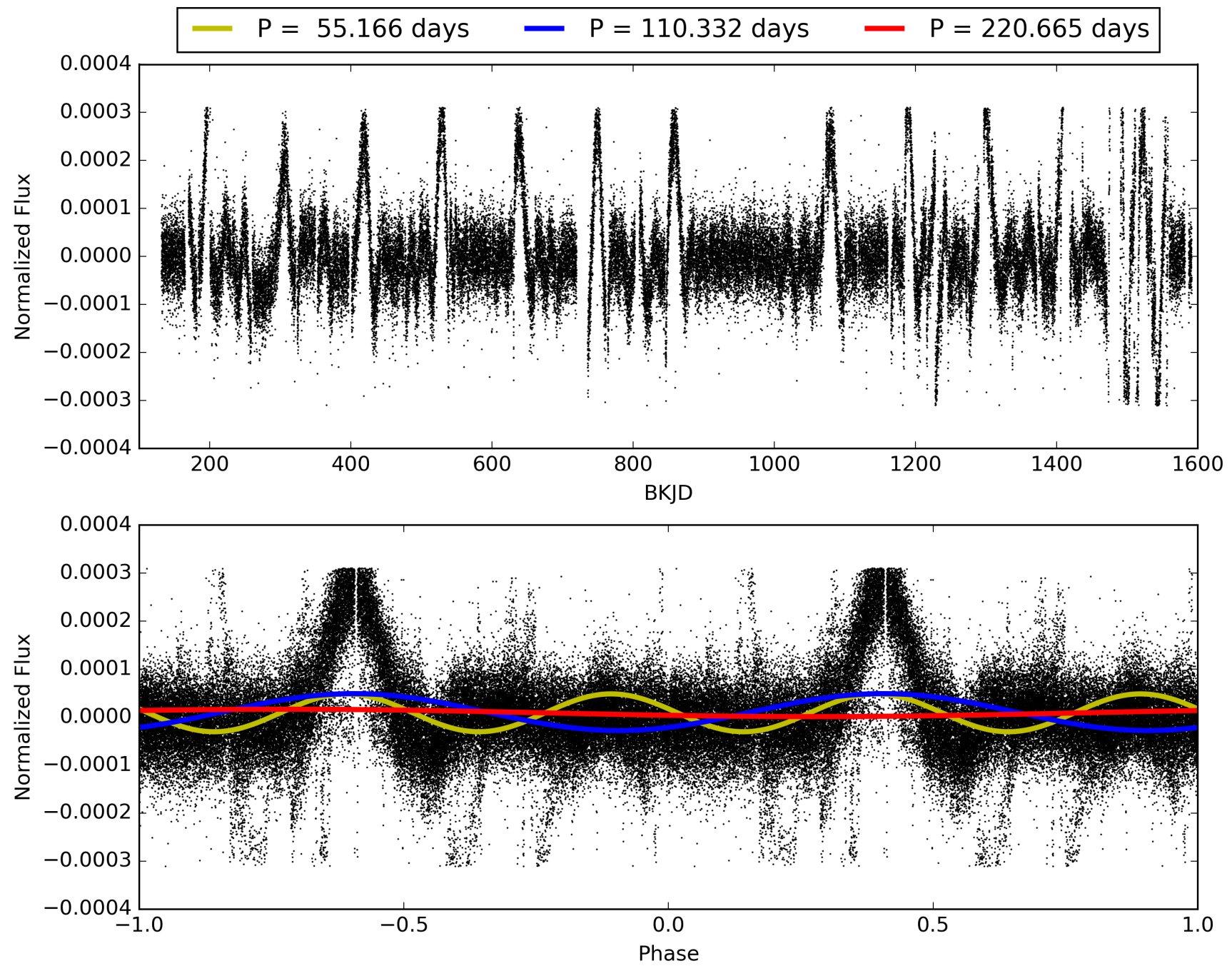
## DV Diagnostic Results:

ShortPeriod-sig: 1.2% [0.02σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.21e-13  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: -2.558  
Centroid-sig: 18.0%  
Centroid-so: 2.205 arcsec [1.08σ]  
OotOffset-rm: 2.331 arcsec [2.32σ]  
KicOffset-rm: 2.482 arcsec [2.38σ]  
OotOffset-st: 0/2/0/1 [3]  
KicOffset-st: 0/2/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [11/11]

# TCE 006603043-02, PDC Light Curves



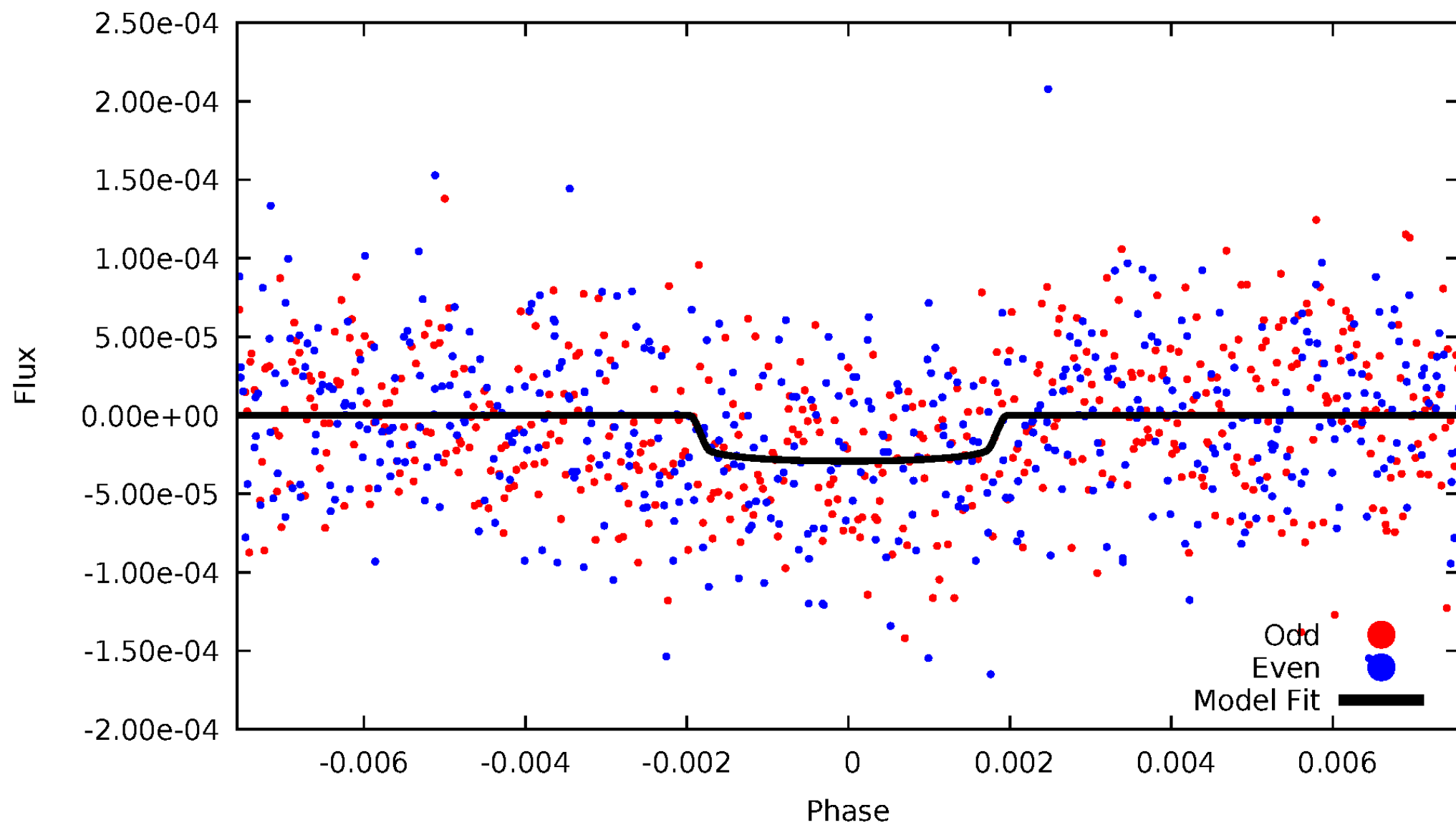
TCE 006603043-02





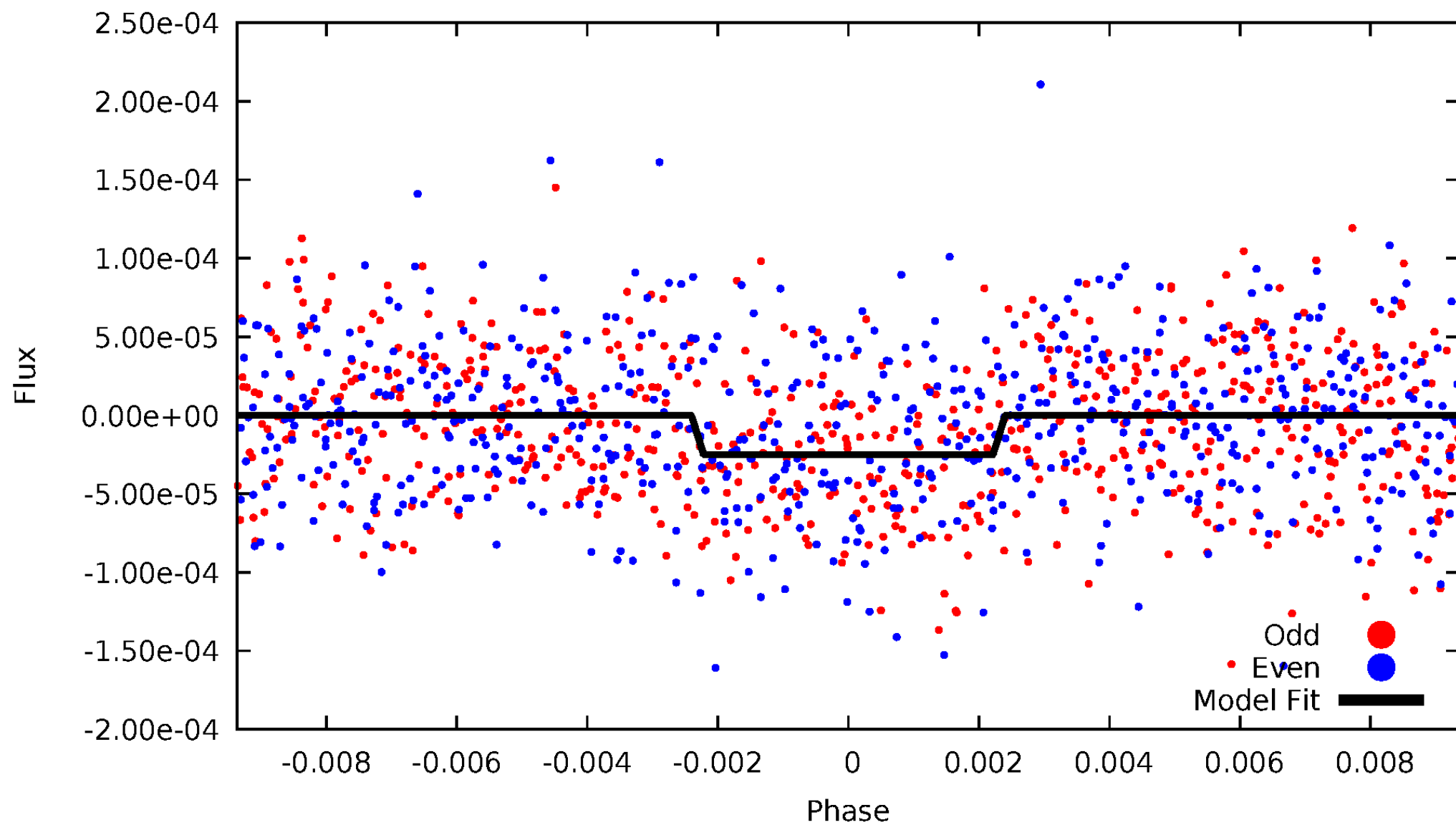
# DV Odd/Even

TCE 006603043-02



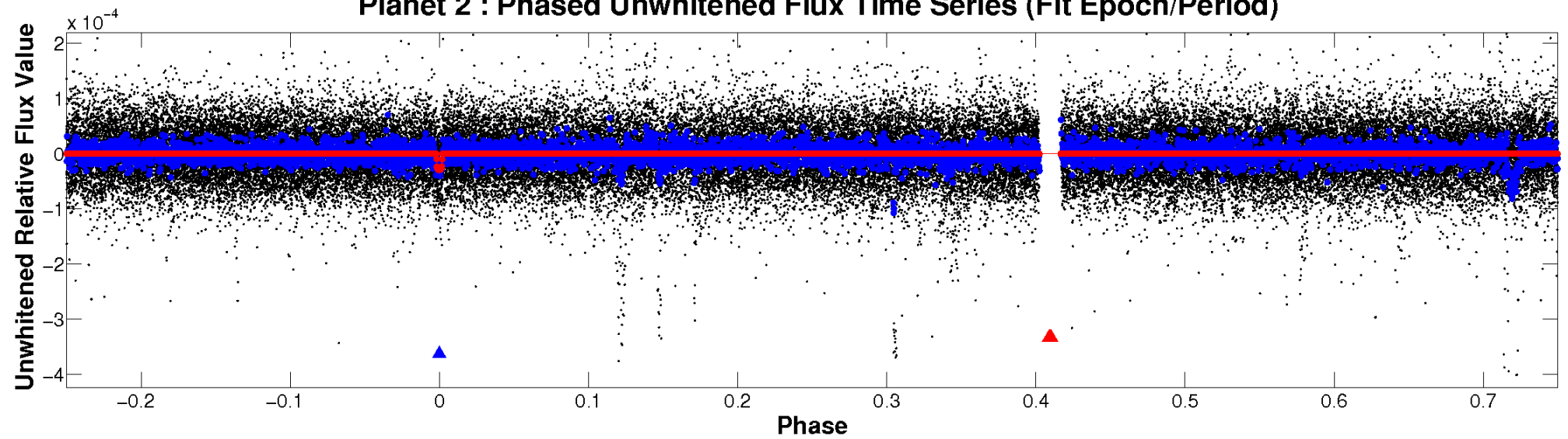
# ALT Odd/Even

TCE 006603043-02

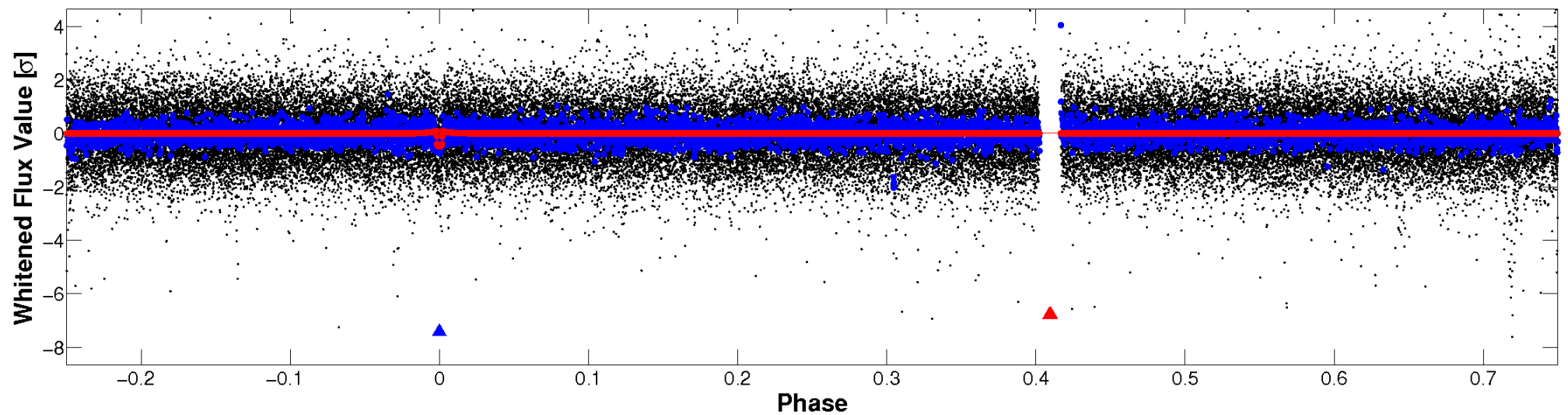


# Non-Whitened Vs. Whitened Light Curve

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

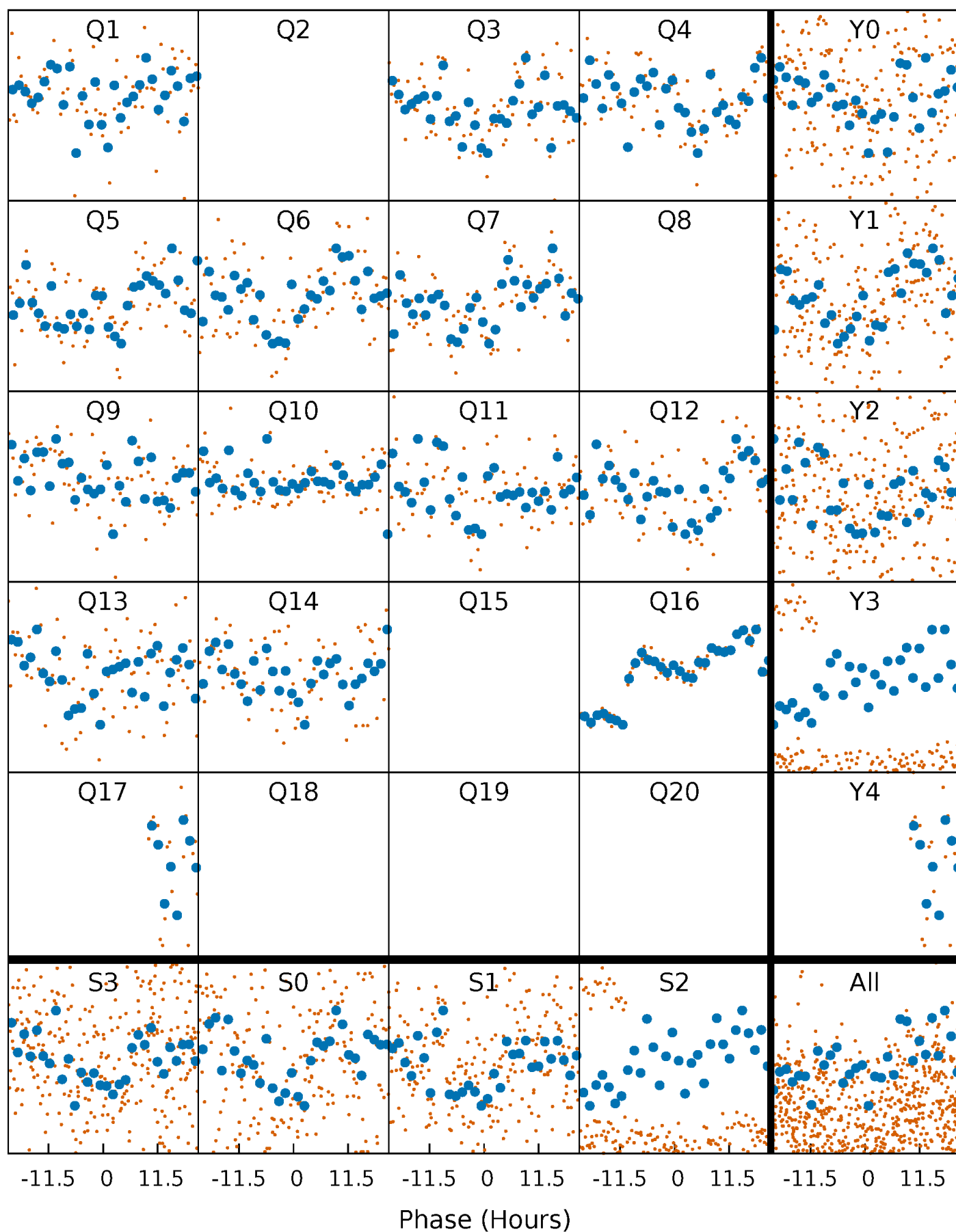


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



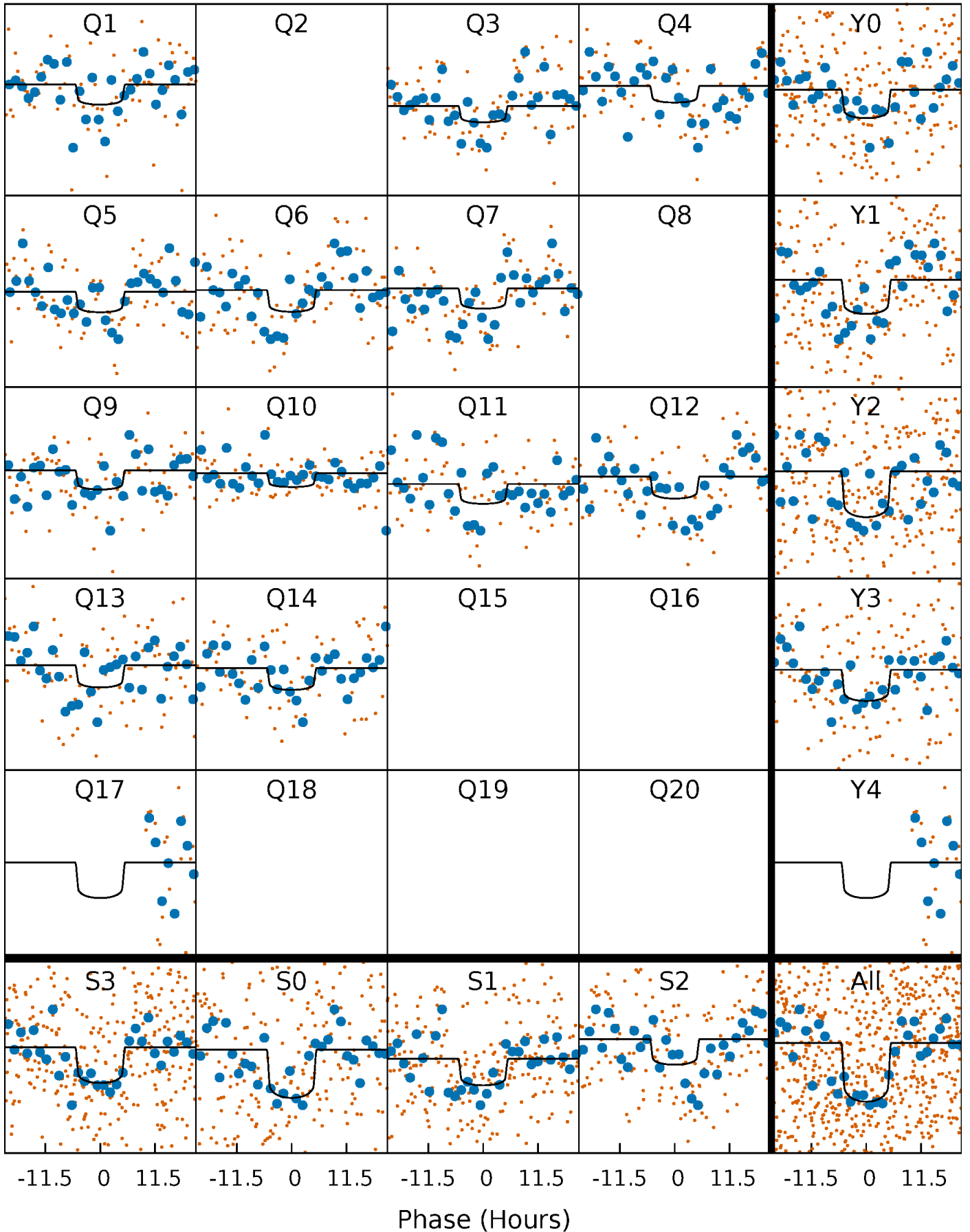
## PDC Quarter-Phased Transit Curves

TCE 006603043-02    P=110.332275 Days     $T_0=152.113893$  (BKJD)



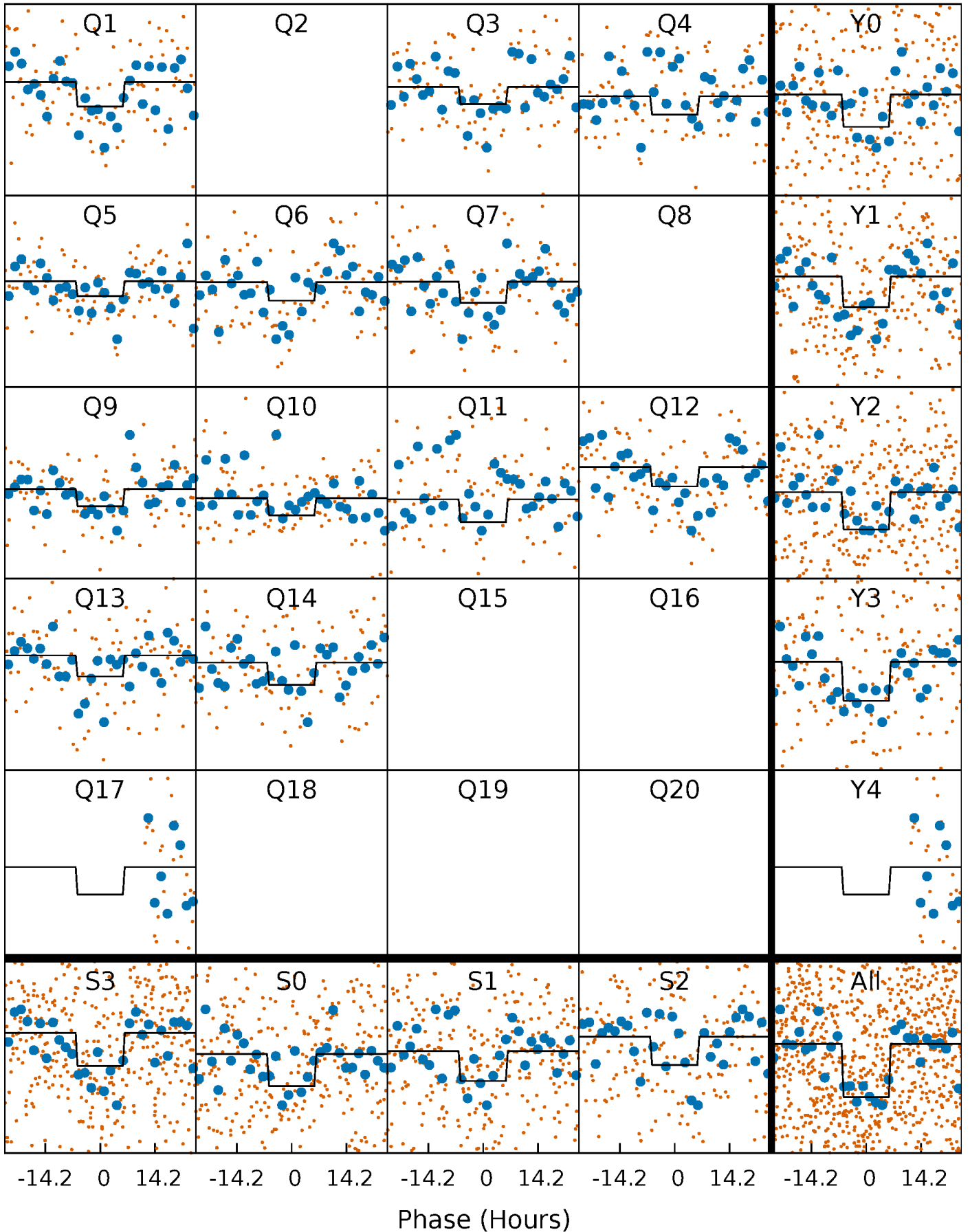
# DV Quarter-Phased Transit Curves

TCE 006603043-02 P=110.332275 Days  $T_0=152.113893$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

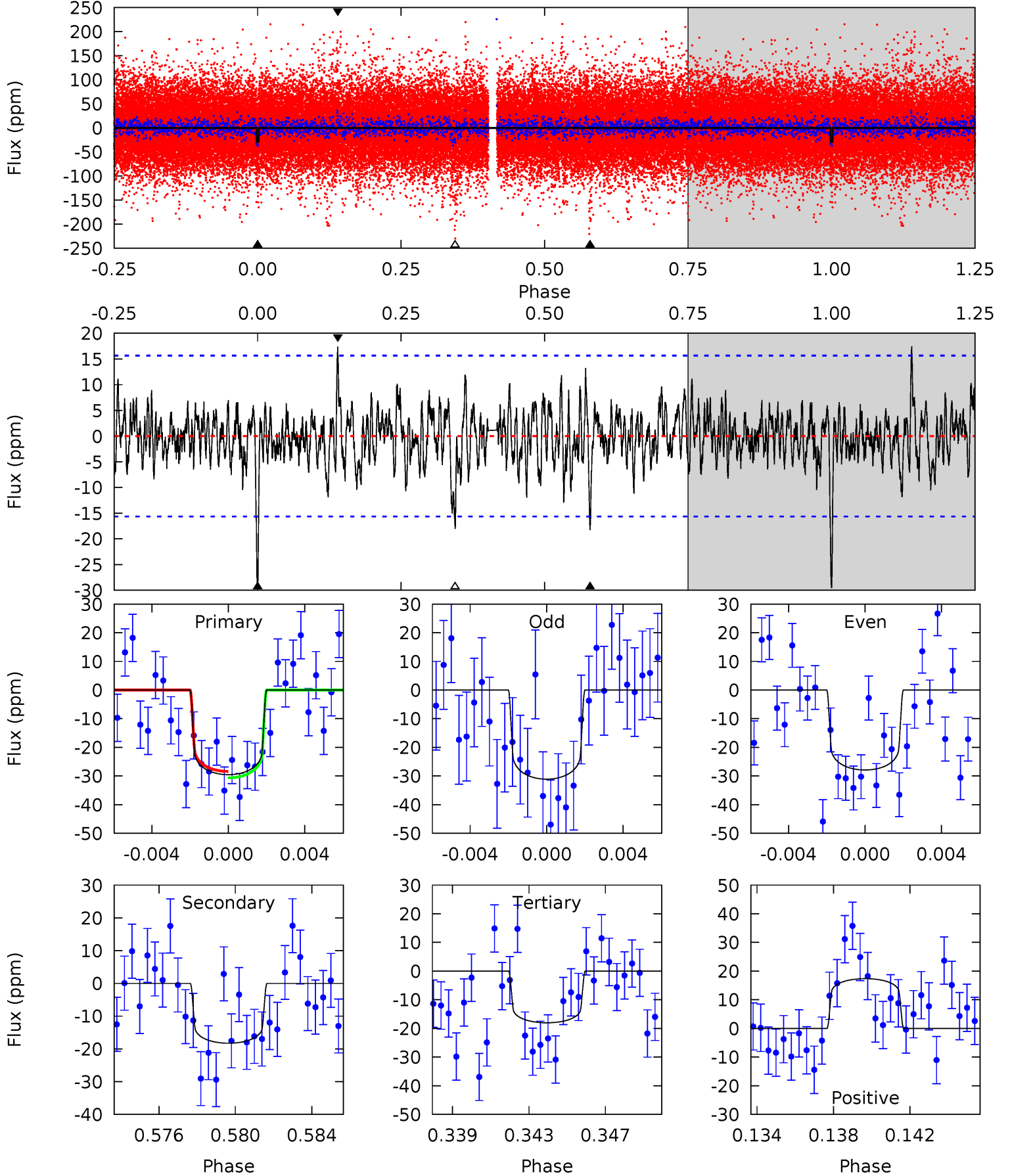
TCE 006603043-02 P=110.327602 Days  $T_0=152.089809$  (BKJD)



# DV Model-Shift Uniqueness Test

006603043-02, P = 110.332275 Days, E = 41.781618 Days

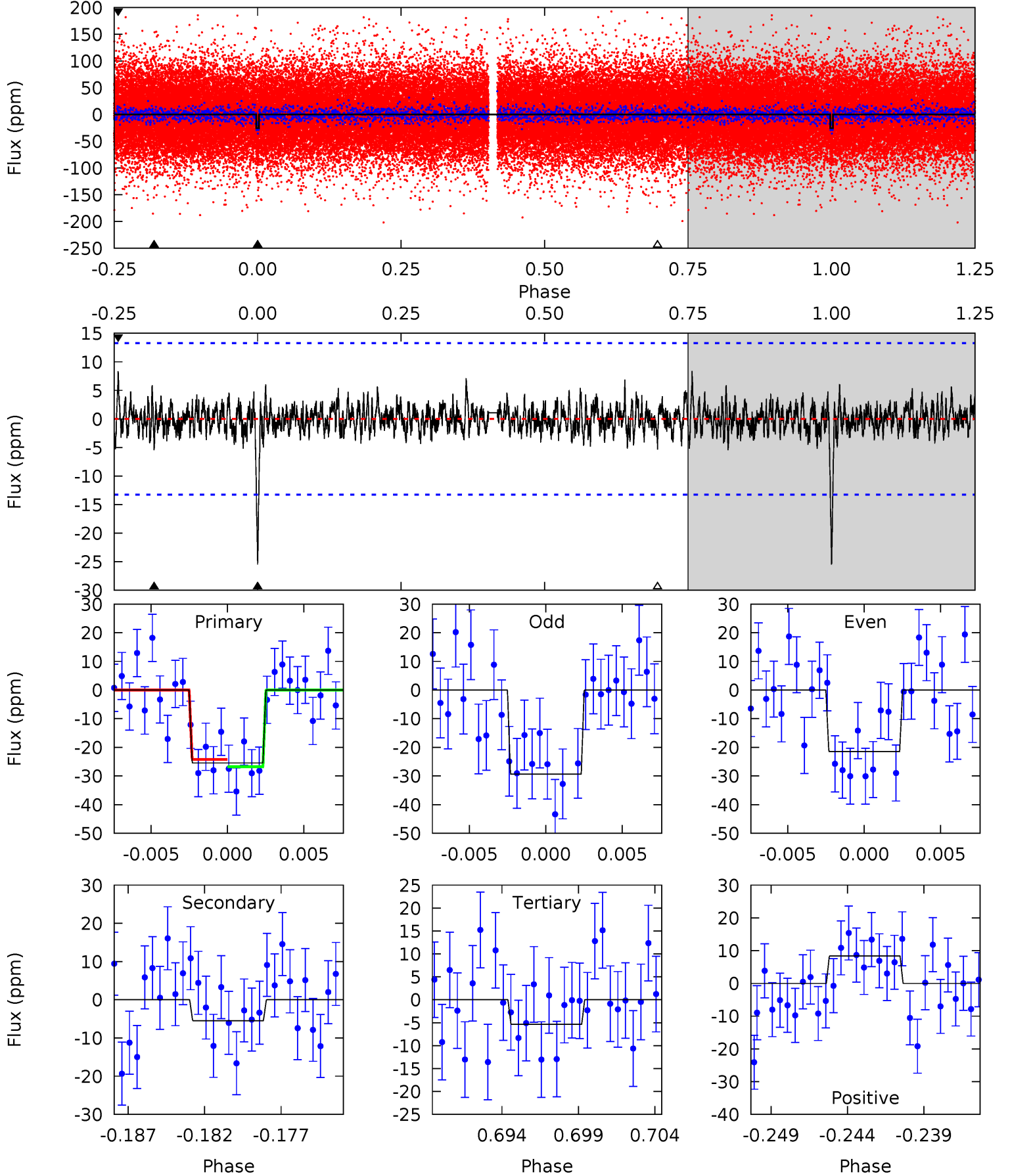
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.82	6.07	6.00	5.77	5.20	2.88	1.45	3.83	4.05	0.08	0.30	0.53	0.90	0.37	0.37



# Alt Model-Shift Uniqueness Test

006603043-02, P = 110.327602 Days, E = 41.762207 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
9.91	2.12	2.08	3.25	5.17	2.82	0.73	7.83	6.66	0.04	-1.13	1.53	0.79	0.25	0.49





### Stellar Parameters For KIC 006603043

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9244^{+255}_{-438}$	$4.159^{+0.128}_{-0.192}$	$0.070^{+0.150}_{-0.650}$	$2.025^{+0.789}_{-0.485}$	$2.158^{+0.426}_{-0.521}$	$0.366^{+0.247}_{-0.195}$
	+3%/-5%	+3%/-5%	+214%/-929%	+39%/-24%	+20%/-24%	+67%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 006603043-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-18 \pm 3$	$1.27^{+0.38}_{-0.33}$	$1067^{+88}_{-77}$	$7679^{+1485}_{-992}$	$2079^{+1669}_{-866}$
Alt.	$-5 \pm 3$	$1.10^{+0.39}_{-0.28}$	$1063^{+96}_{-70}$	$5883^{+1103}_{-961}$	$746^{+807}_{-404}$

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

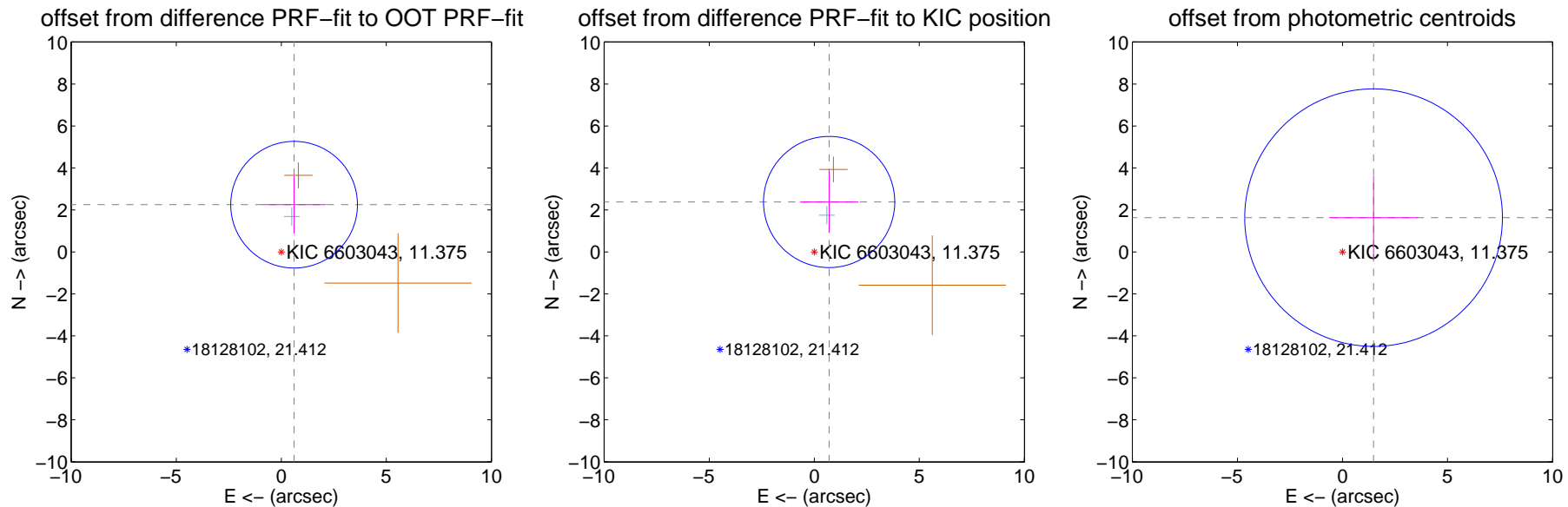
## DV Centroid Data

Supplemental centroid analysis for 006603043-02. **Kepler magnitude: 11.38.** Transit SNR 6.97

**There are 1 quarters with good PRF difference image offsets**

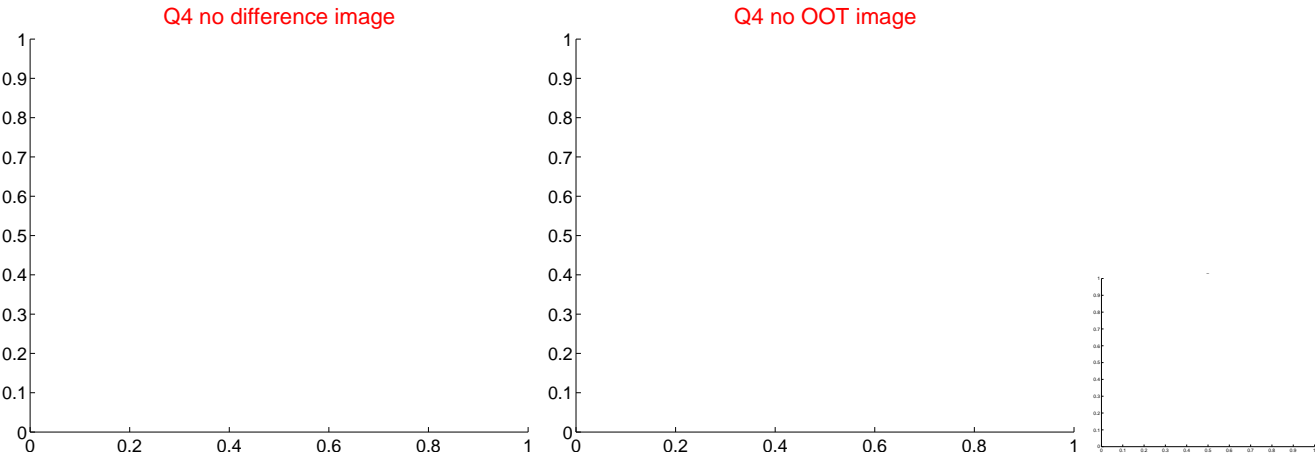
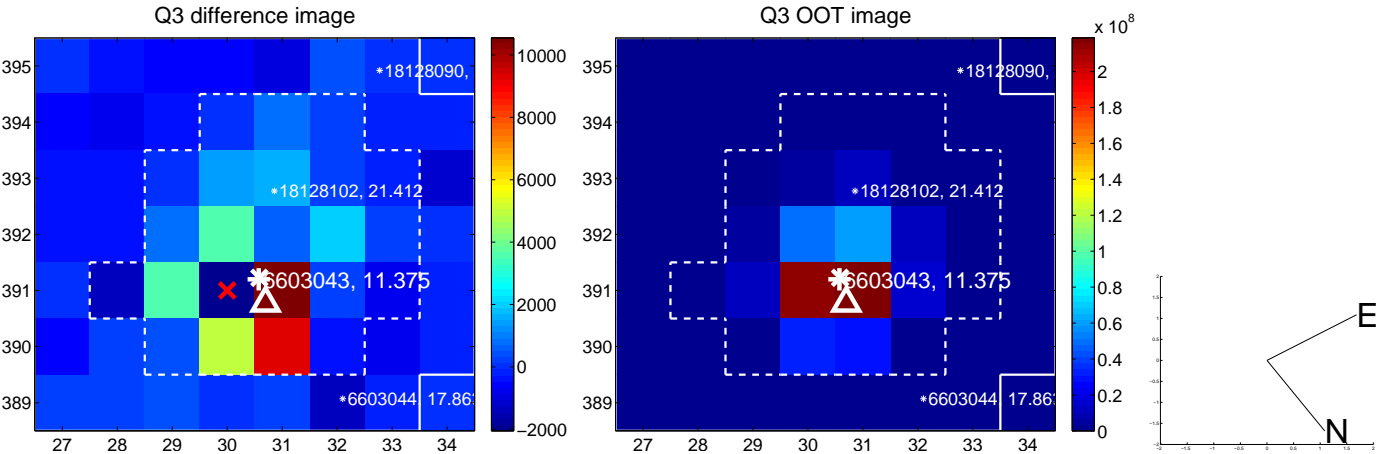
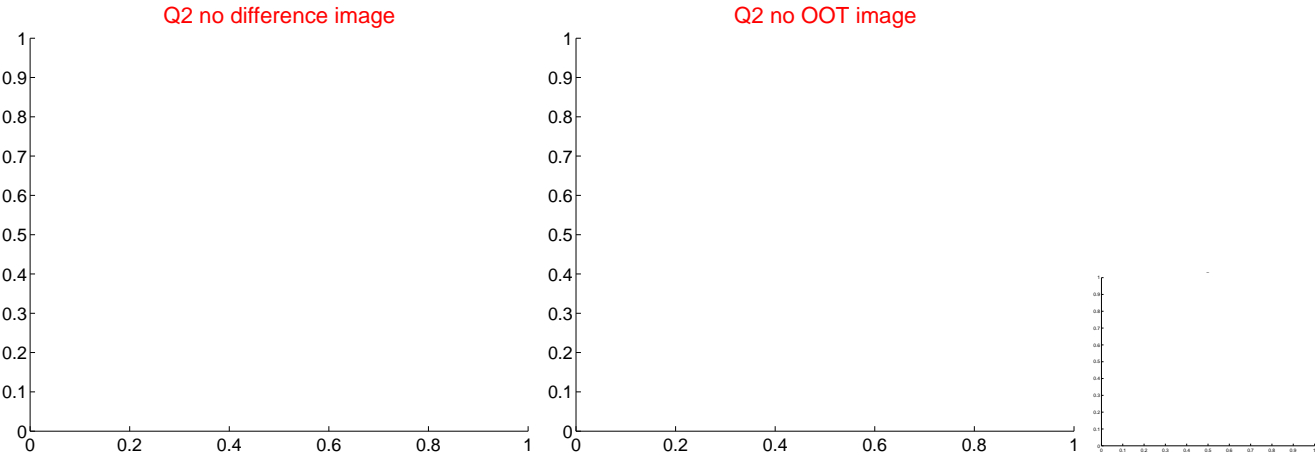
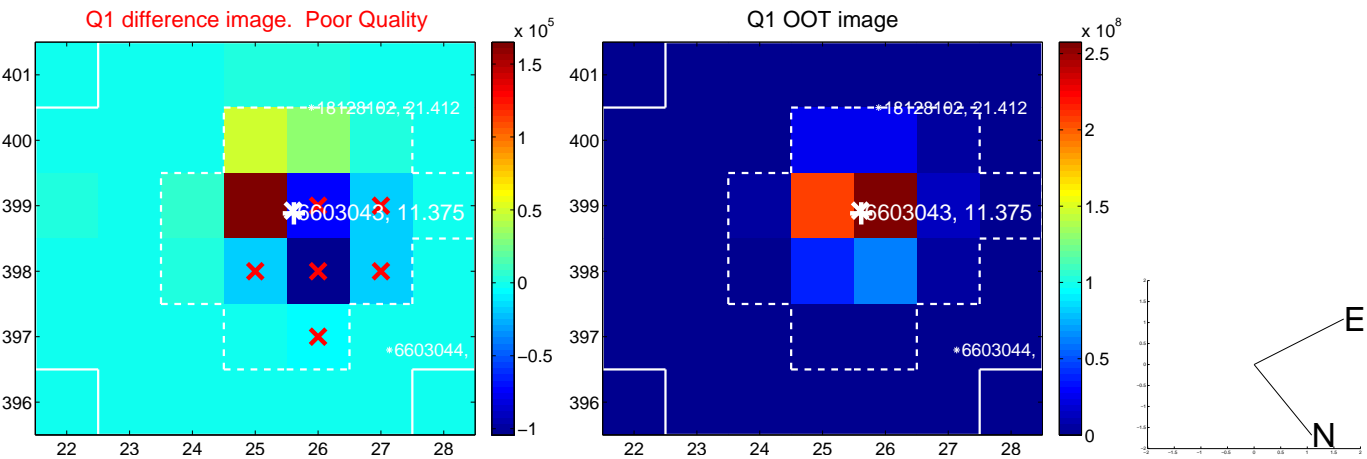
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.331 \pm 1.006$	2.32	$-0.610 \pm 1.527$	$2.250 \pm 1.383$
PRF-fit source offset from KIC position	$2.482 \pm 1.042$	2.38	$-0.708 \pm 1.393$	$2.379 \pm 1.460$
photometric centroid source offset	$2.20 \pm 2.05$	1.08	$-1.48 \pm 2.12$	$1.63 \pm 1.98$

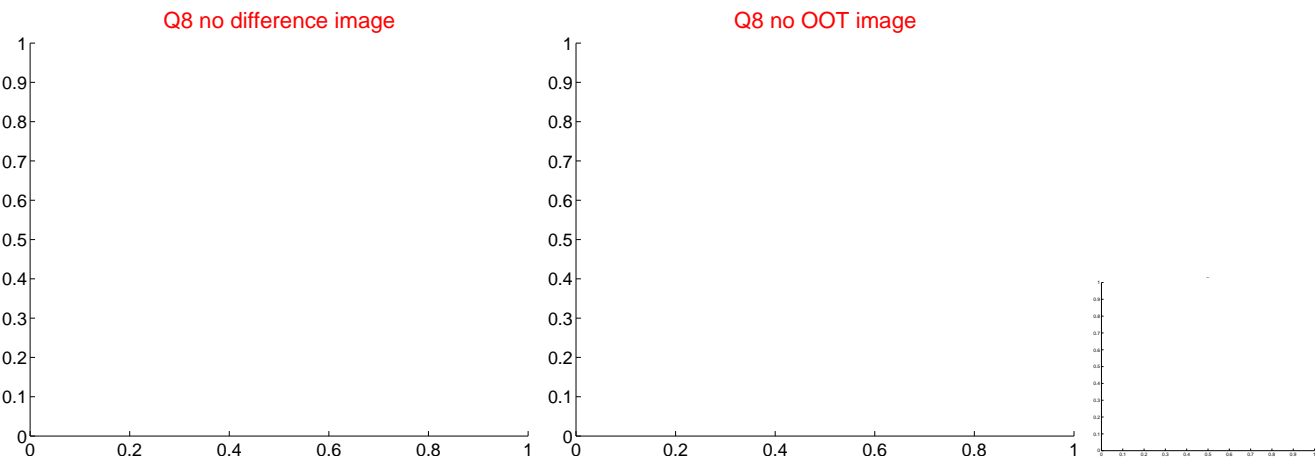
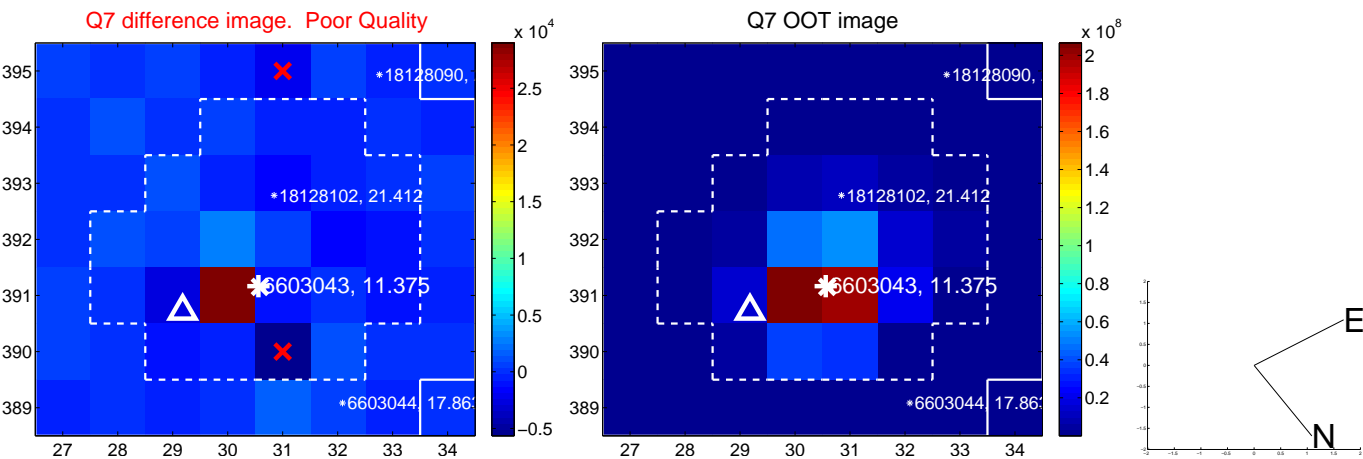
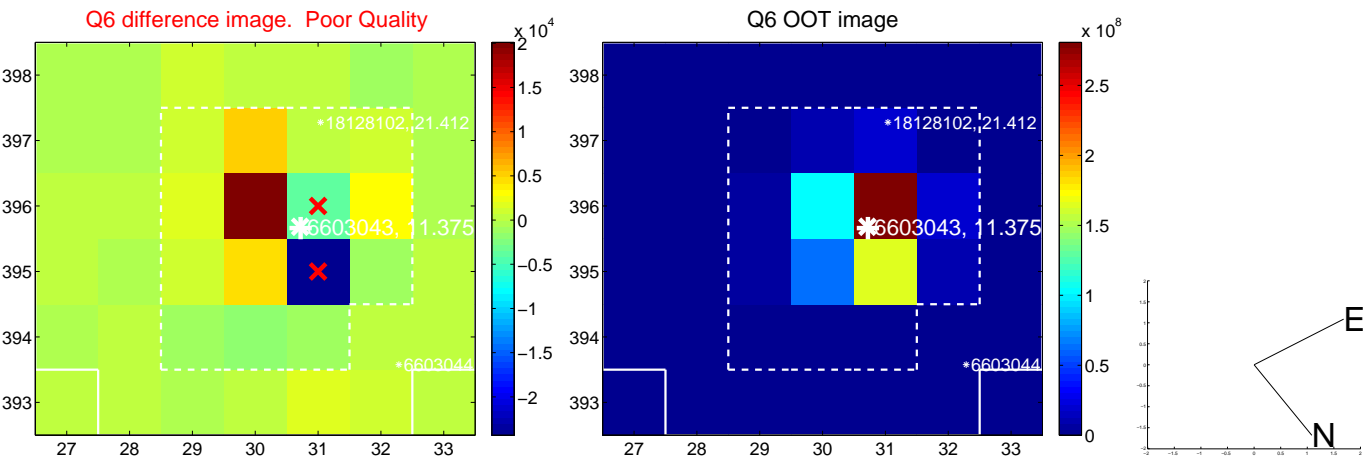
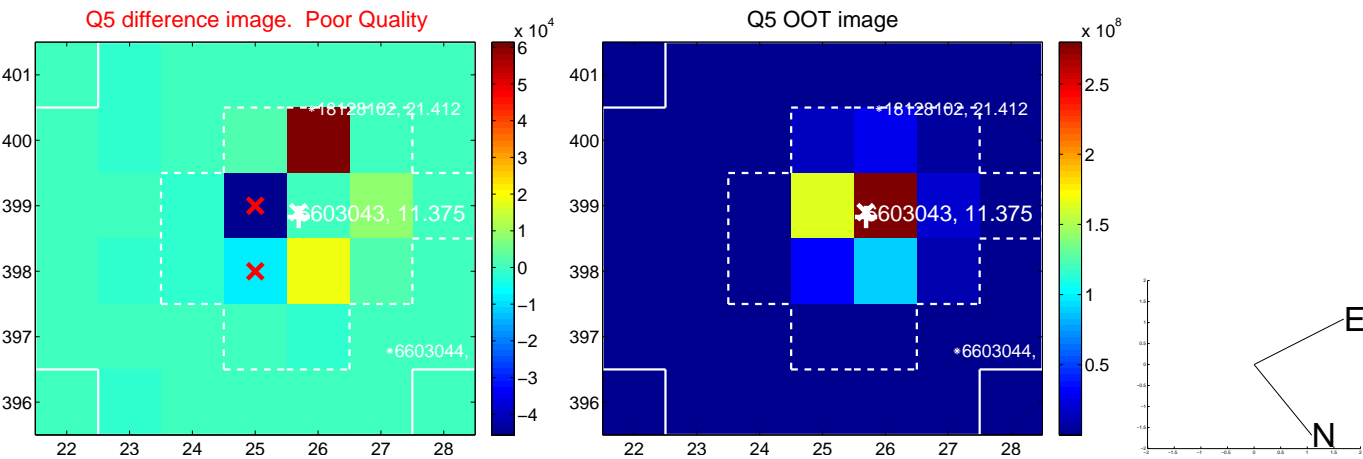


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

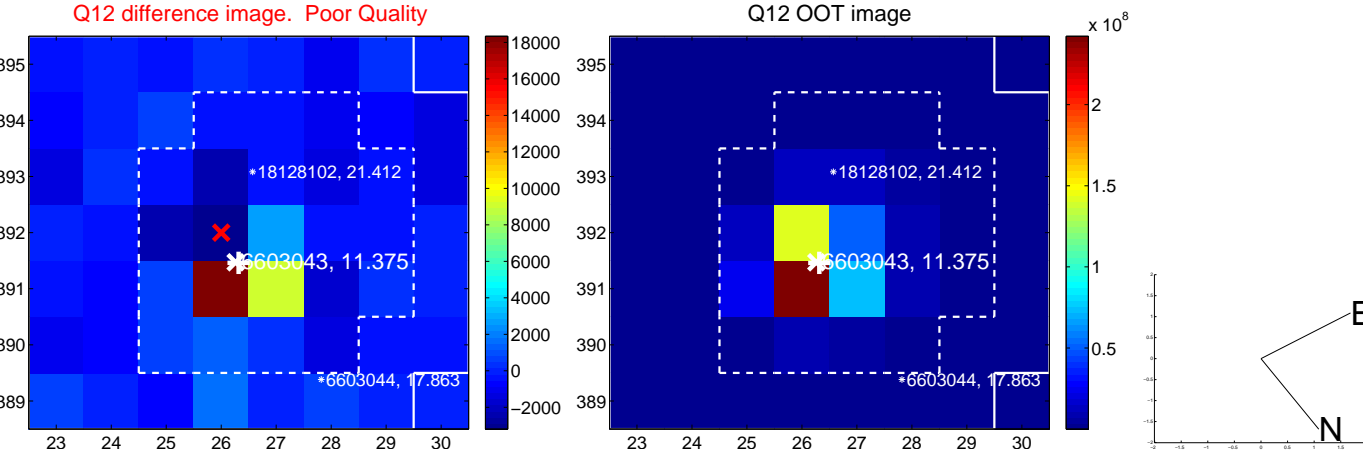
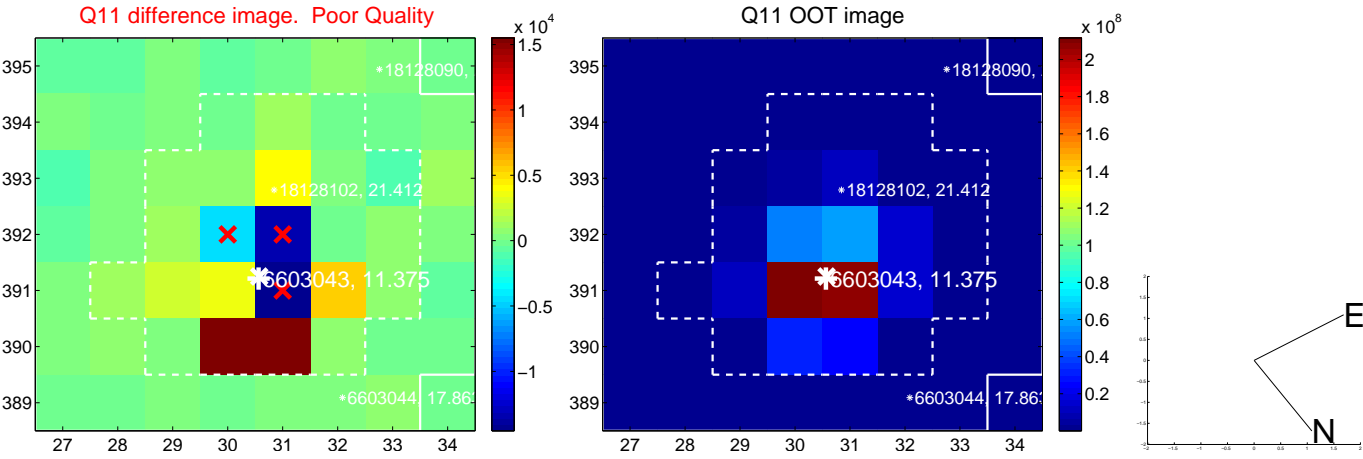
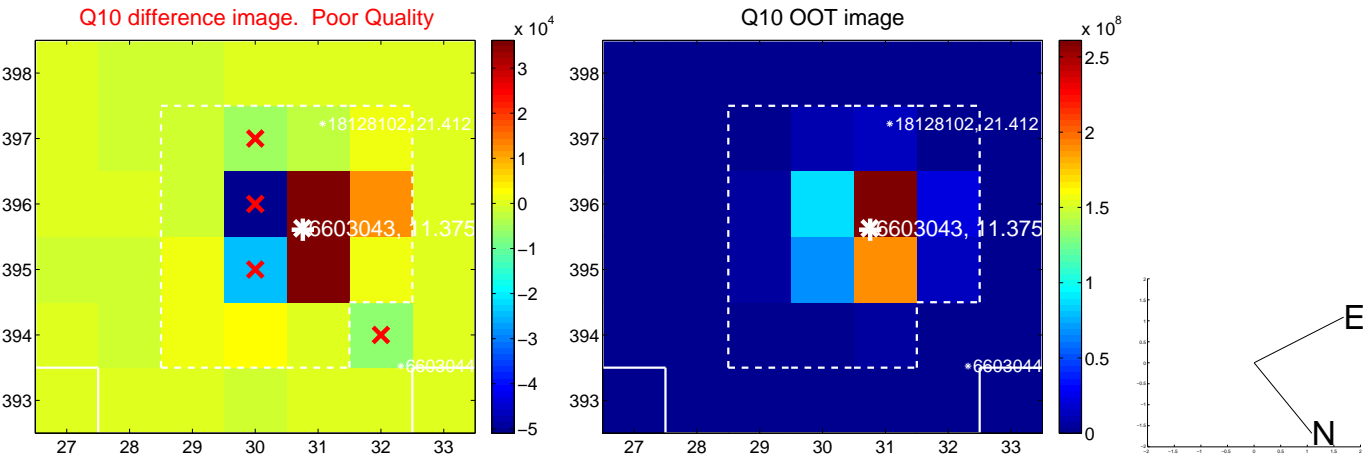
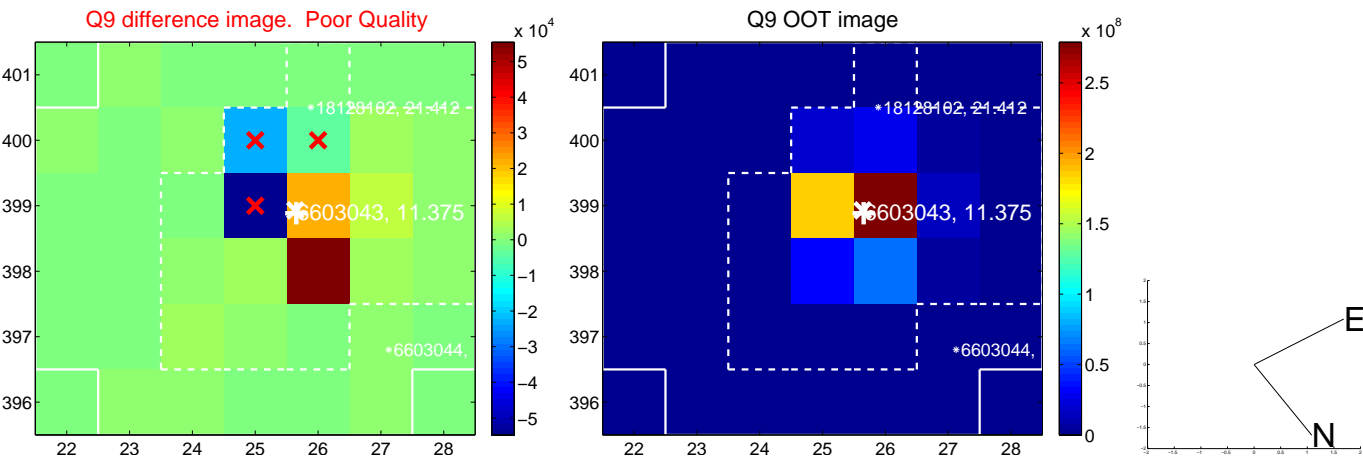
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



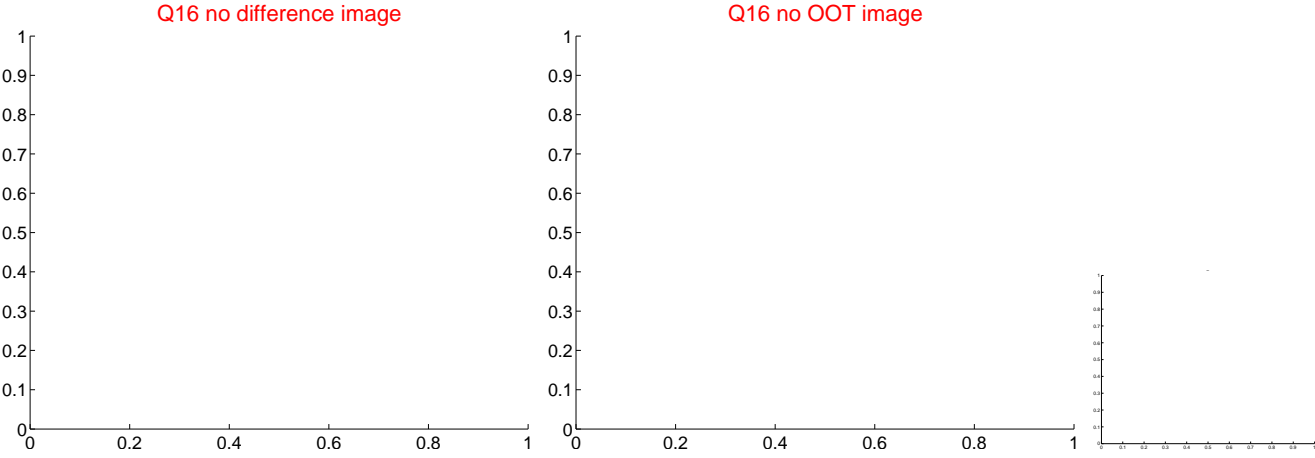
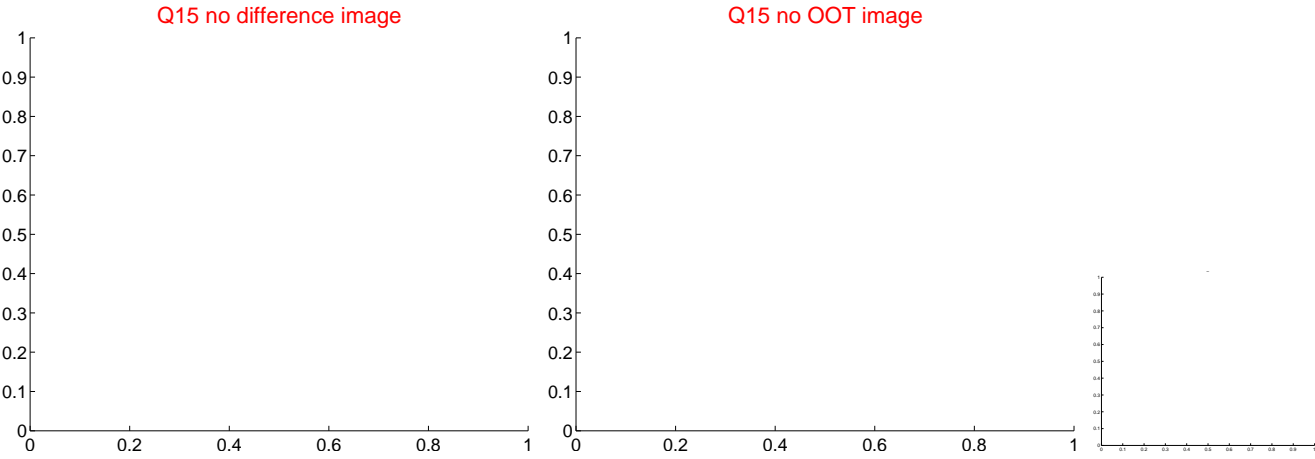
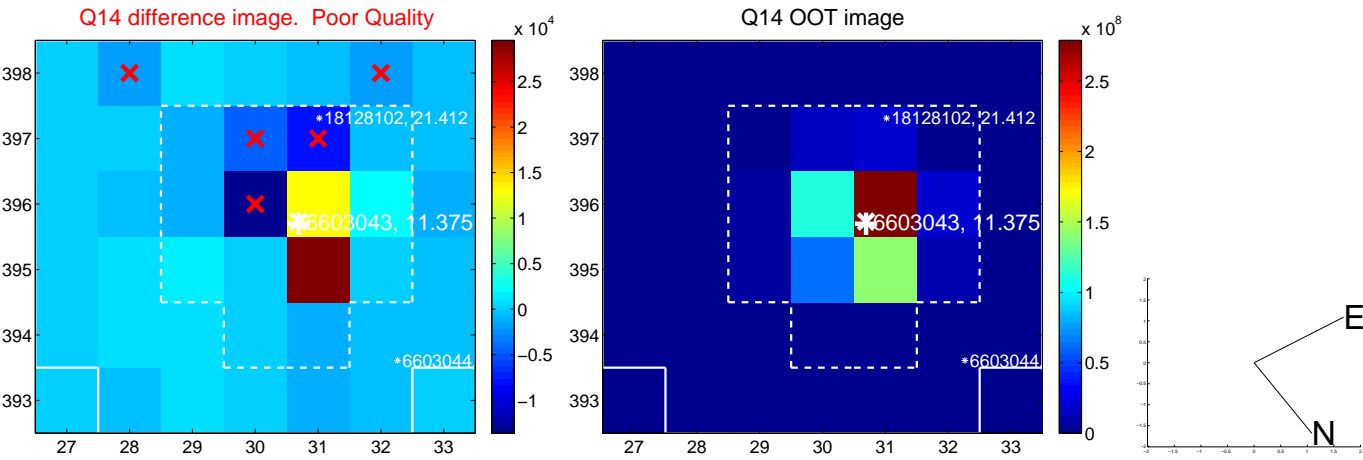
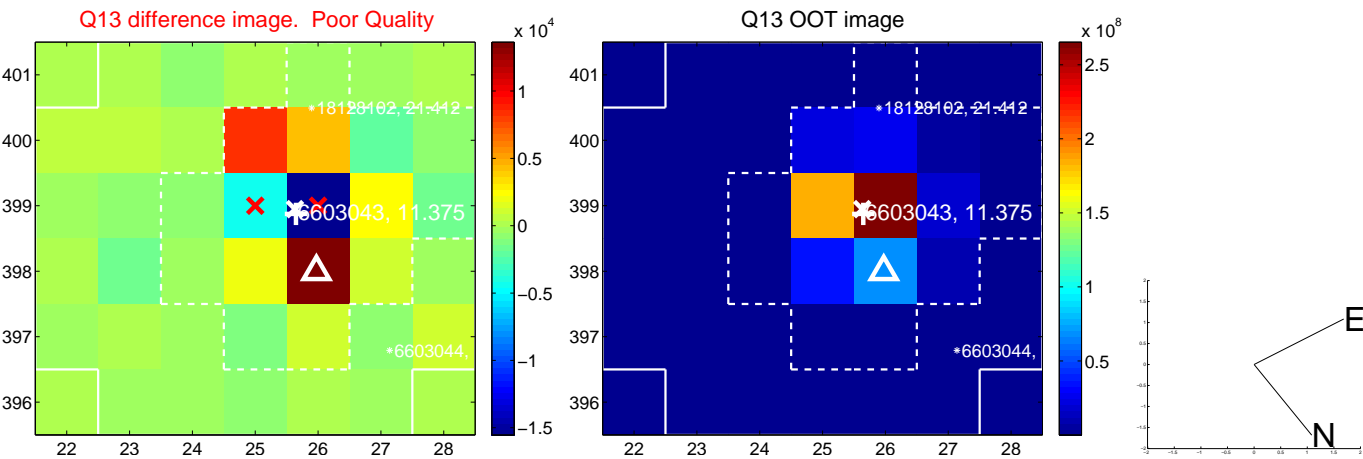
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



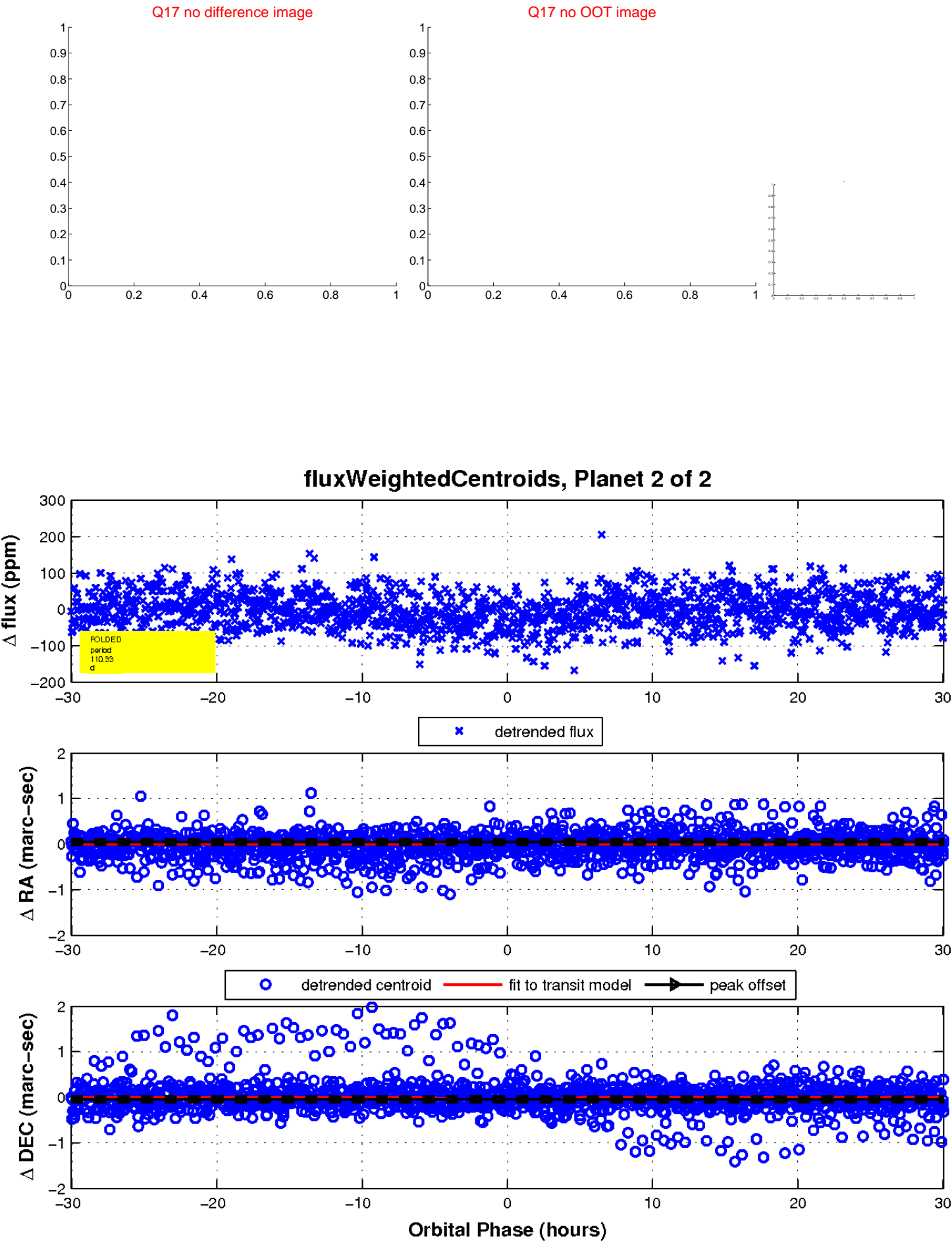
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

