

# KIC 006195999

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006195999-01	OBS	No	480.137372	162.278986	1411.7	3.904	12.2	8.2	0.76	5386	2.83	0.38
006195999-02	OBS	No	415.544924	524.873497	856.1	4.983	14.7	4.3	0.76	5386	2.40	0.46
006195999-03	OBS	No	443.358308	299.265939	1429.0	3.065	14.1	7.7	0.76	5386	3.18	0.43
006195999-04	OBS	No	463.014527	408.208646	838.0	4.998	12.1	4.9	0.76	5386	2.33	0.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006195999-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006195999-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
006195999-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
006195999-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—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.

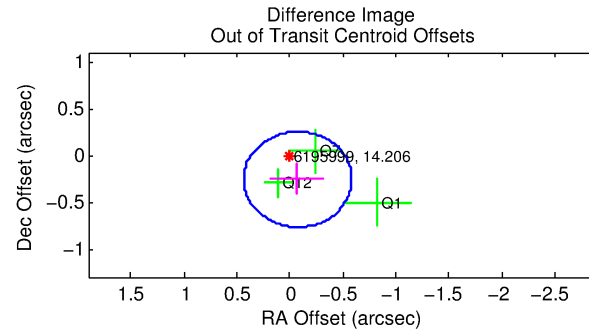
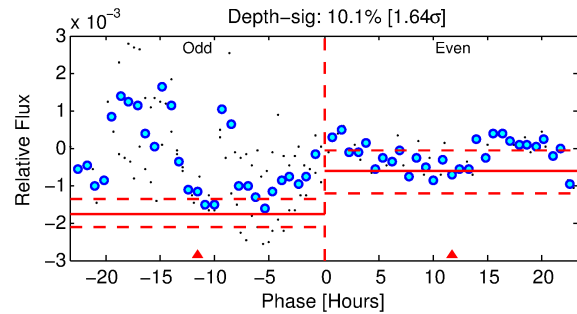
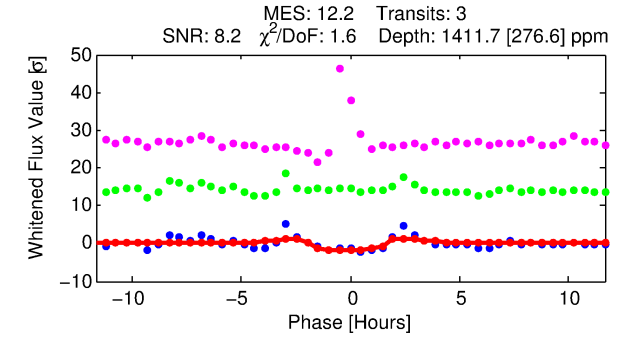
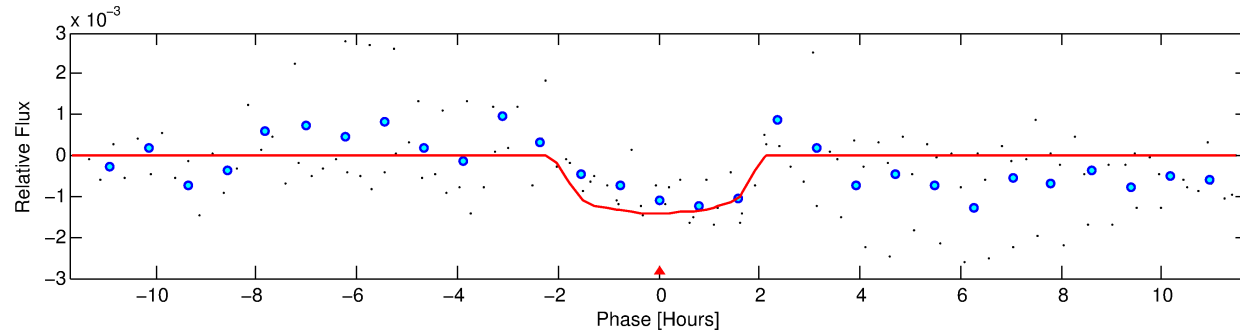
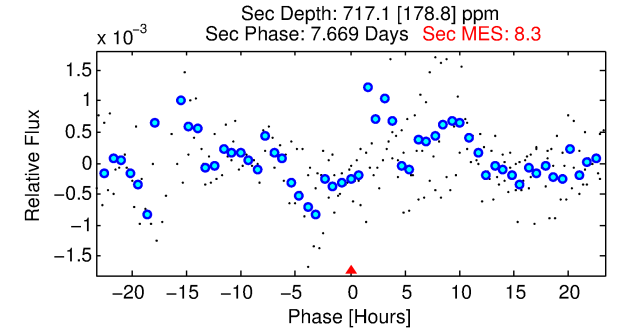
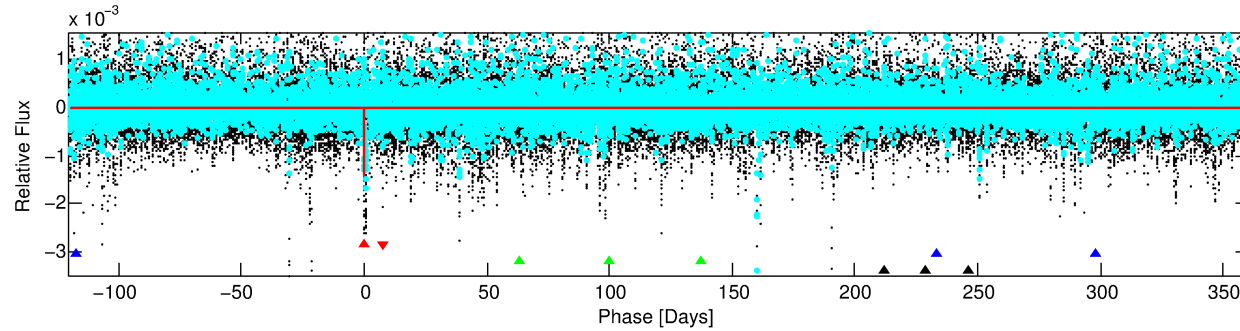
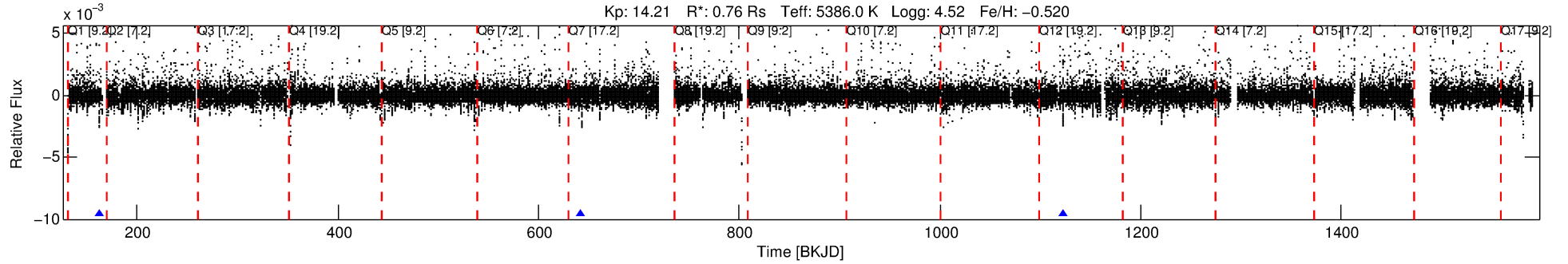
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006195999-01

No Significant Match Found

# DV One-Page Summary

KIC: 6195999 Candidate: 1 of 4 Period: 480.137 d



## DV Fit Results:

Period = 480.13737 [0.00613] d  
Epoch = 162.2790 [0.0080] BKJD  
Rp/R\* = 0.0340 [0.0831]  
a/R\* = 962.35 [9871.82]  
b = 0.14 [71.14]  
Seff = 0.38 [0.08]  
Teq = 201 [11] K  
Rp = 2.83 [6.93] Re  
a = 1.0706 [0.1254] AU  
Ag = 56282.37 [275327.80] [0.20 $\sigma$ ]  
Teffp = 4777 [5840] K [0.78 $\sigma$ ]

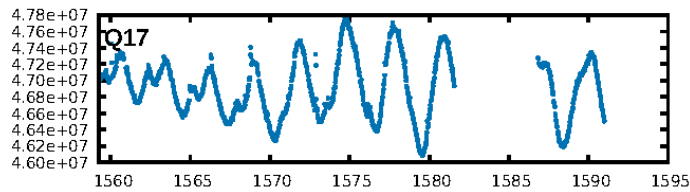
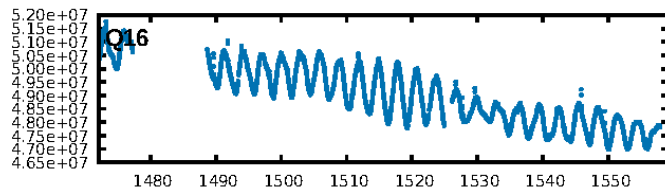
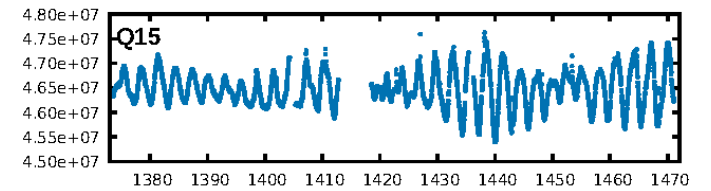
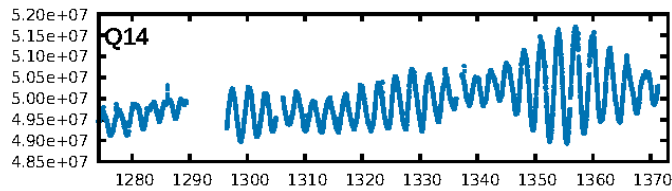
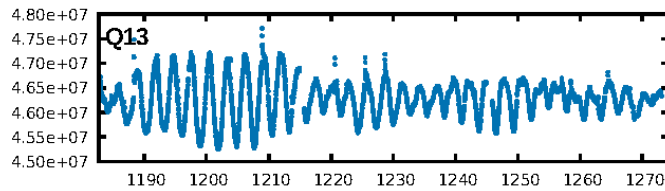
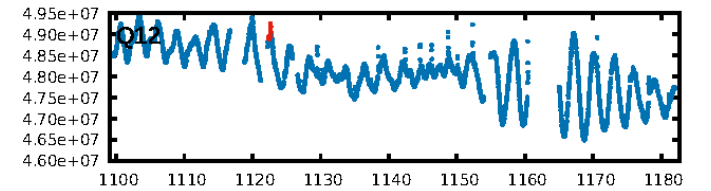
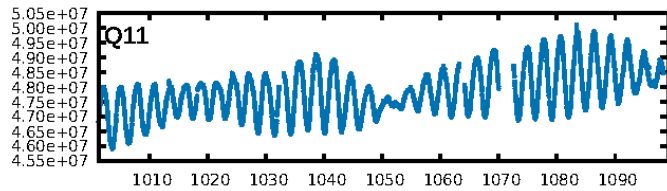
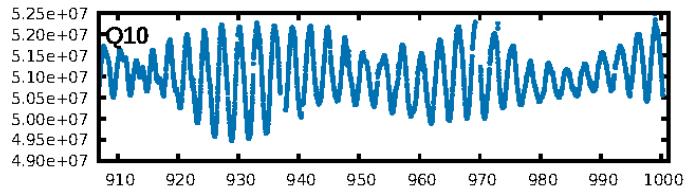
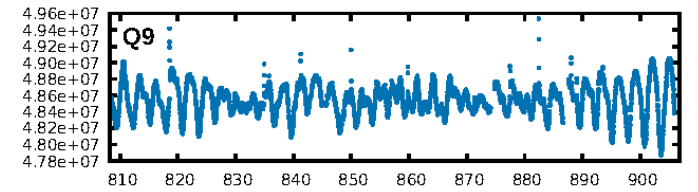
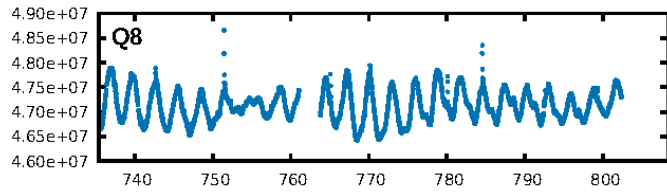
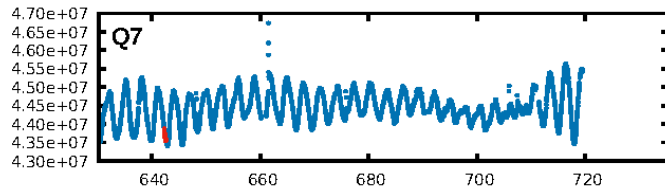
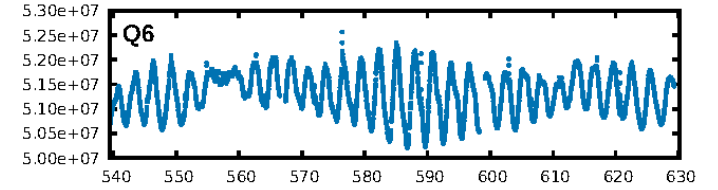
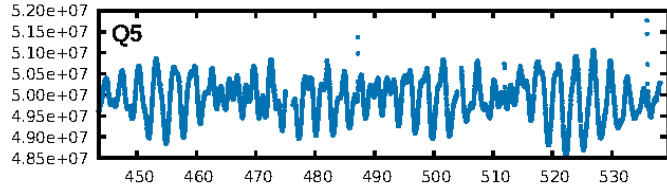
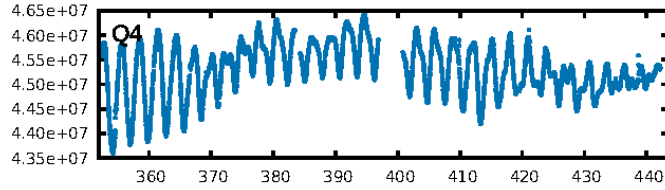
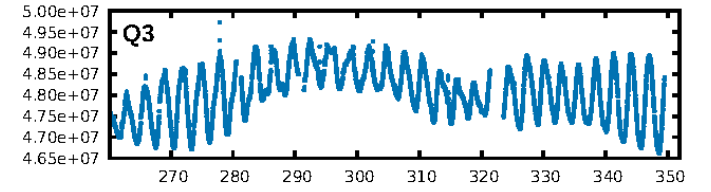
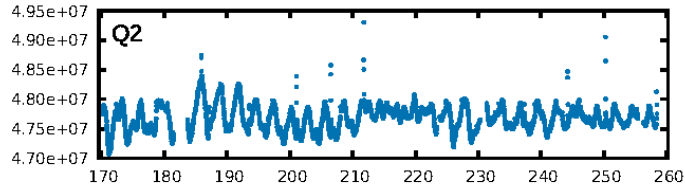
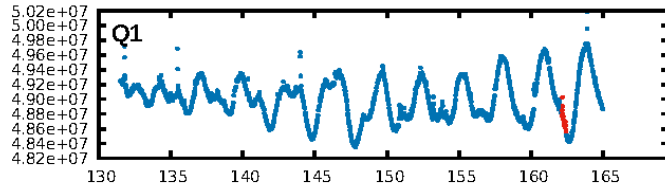
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [64.80 $\sigma$ ]  
LongPeriod-sig: N/A  
**ModelChiSquare2-sig: 0.2%**  
ModelChiSquareGof-sig: 60.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -0.5604  
Centroid-sig: 11.5%  
Centroid-so: 1.824 arcsec [2.19 $\sigma$ ]  
OotOffset-rm: 0.269 arcsec [1.58 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-rm: 0.040 arcsec [0.17 $\sigma$ ]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

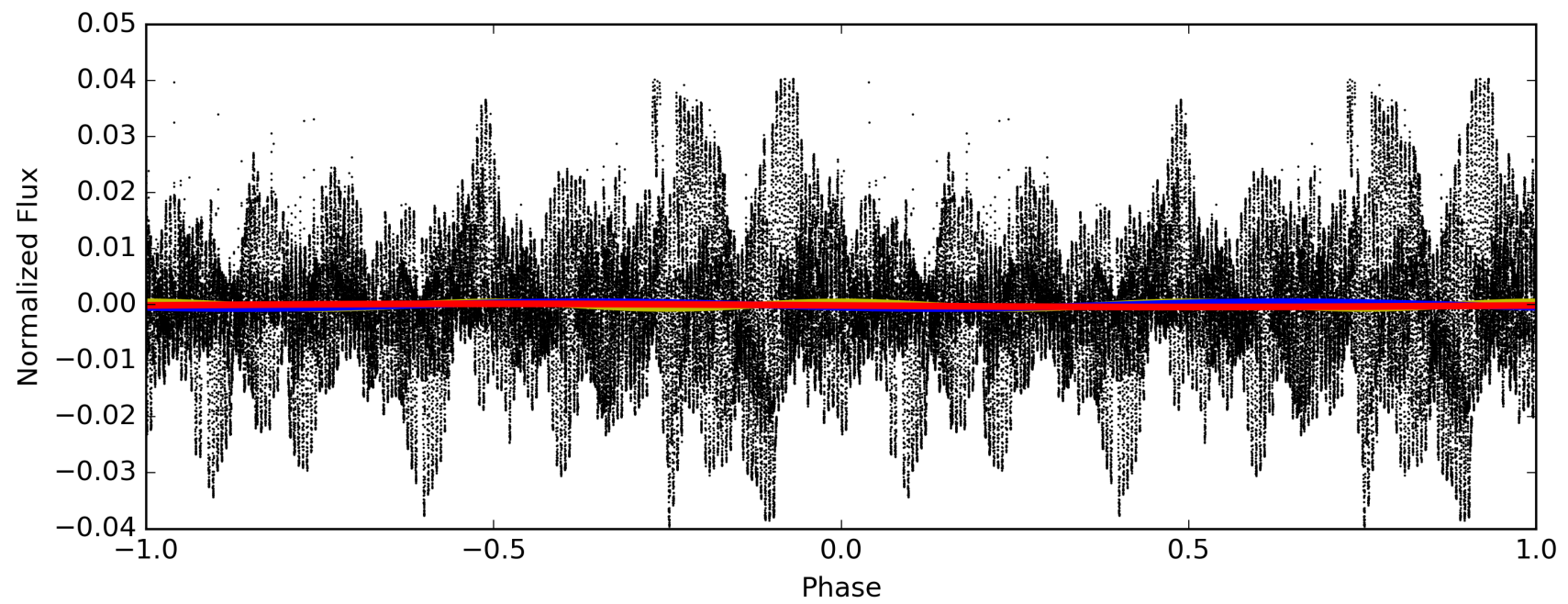
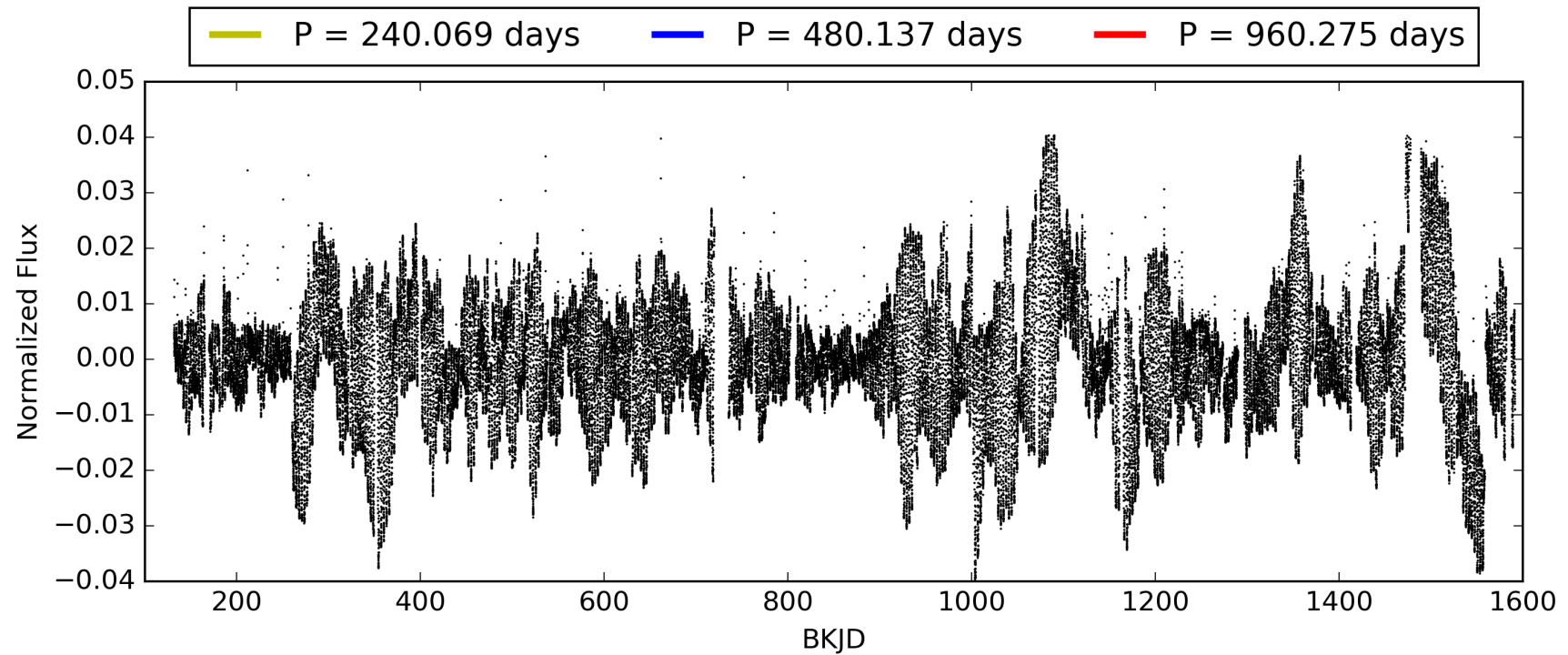
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:54:09 Z

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

# TCE 006195999-01, PDC Light Curves



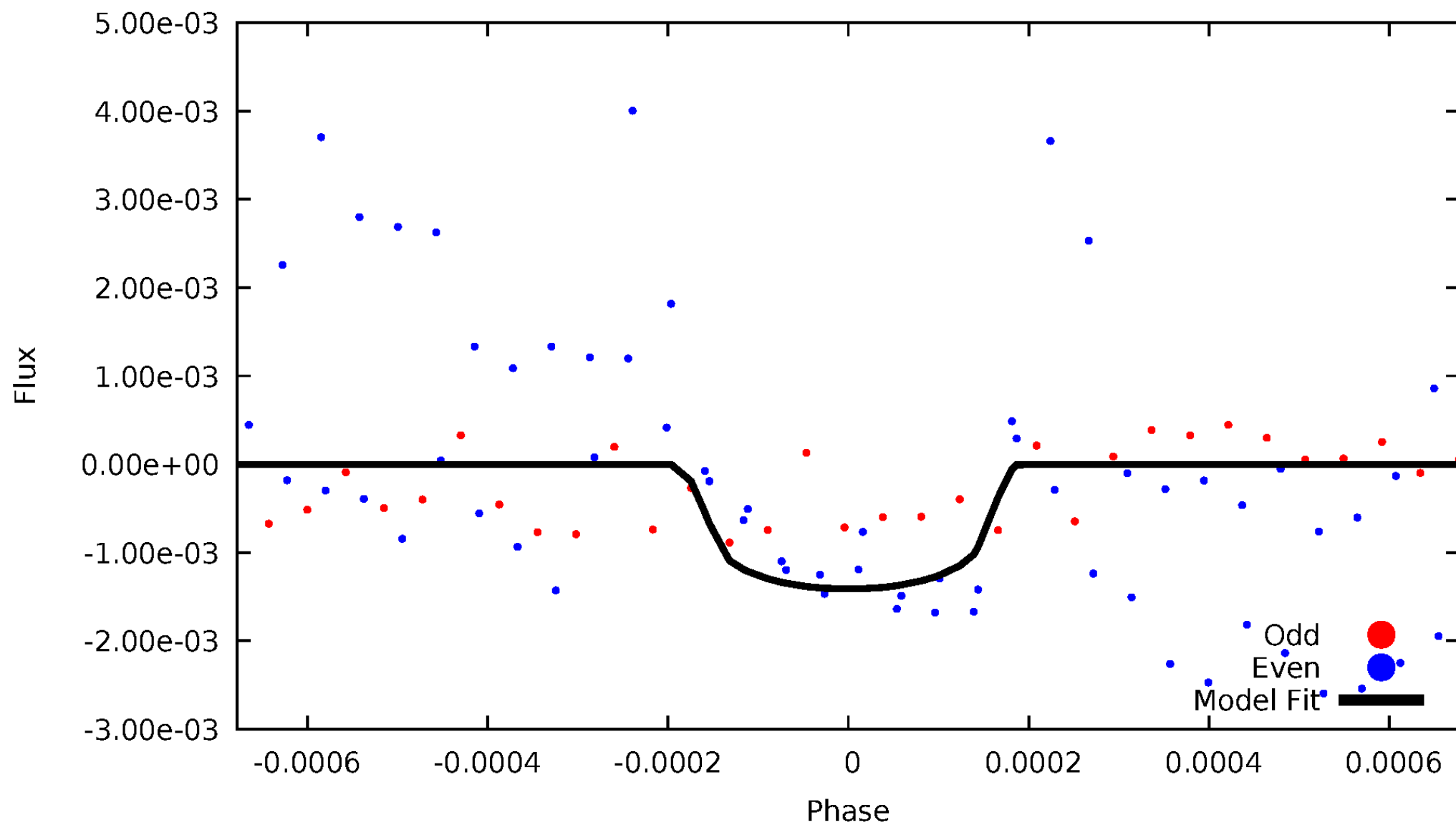
TCE 006195999-01





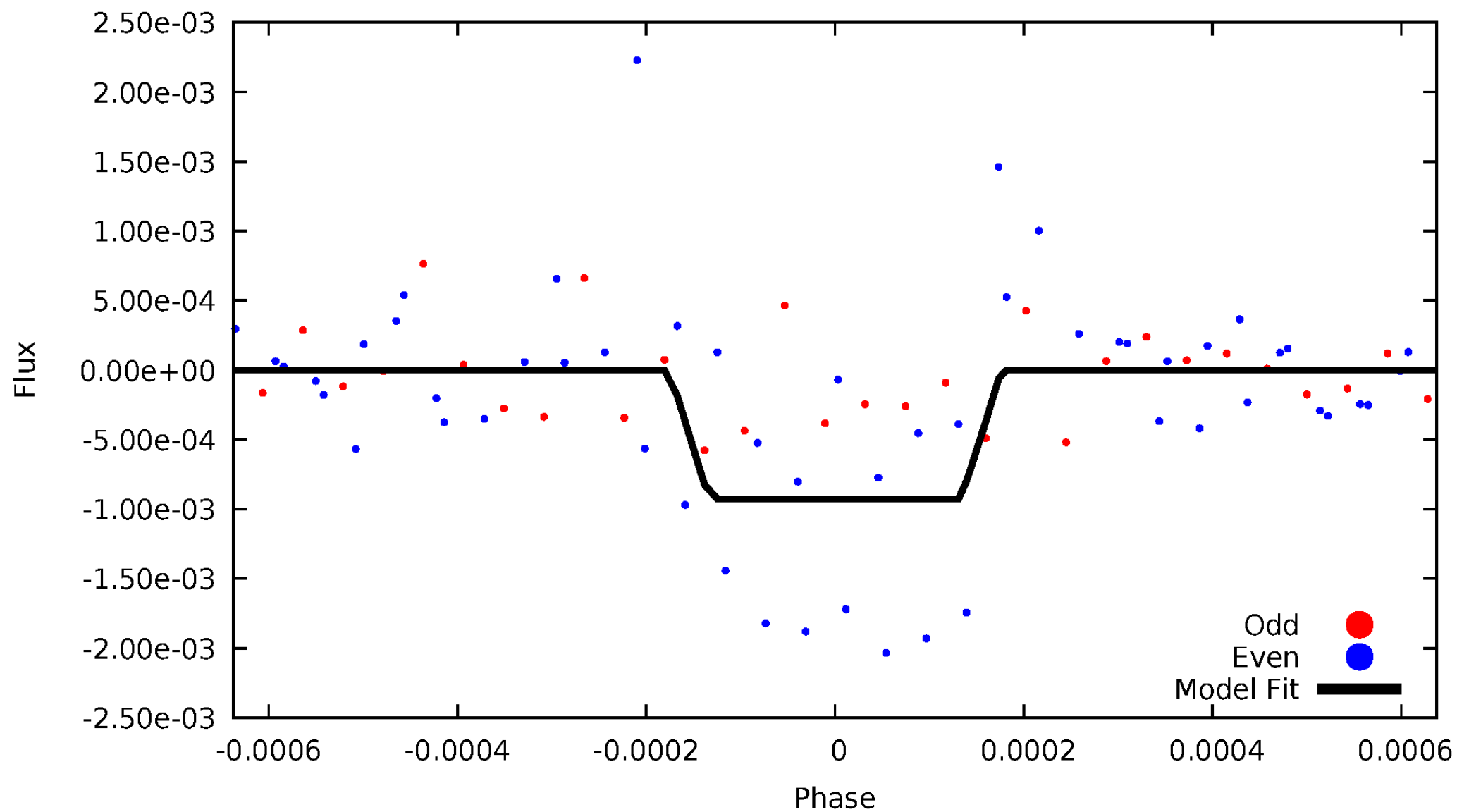
# DV Odd/Even

TCE 006195999-01



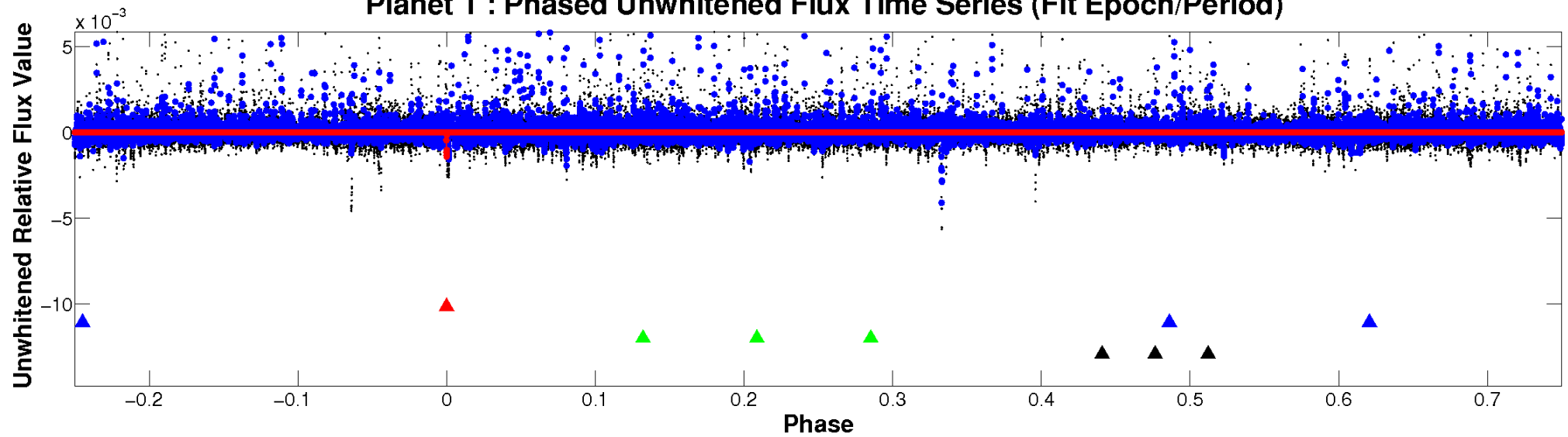
# ALT Odd/Even

TCE 006195999-01

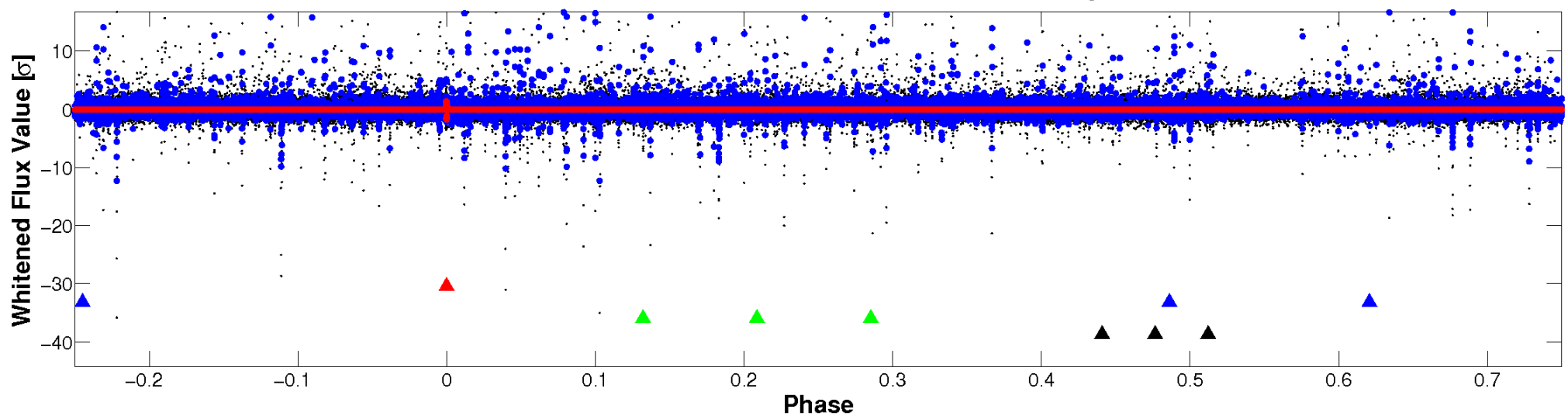


# Non-Whitened Vs. Whitened Light Curve

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

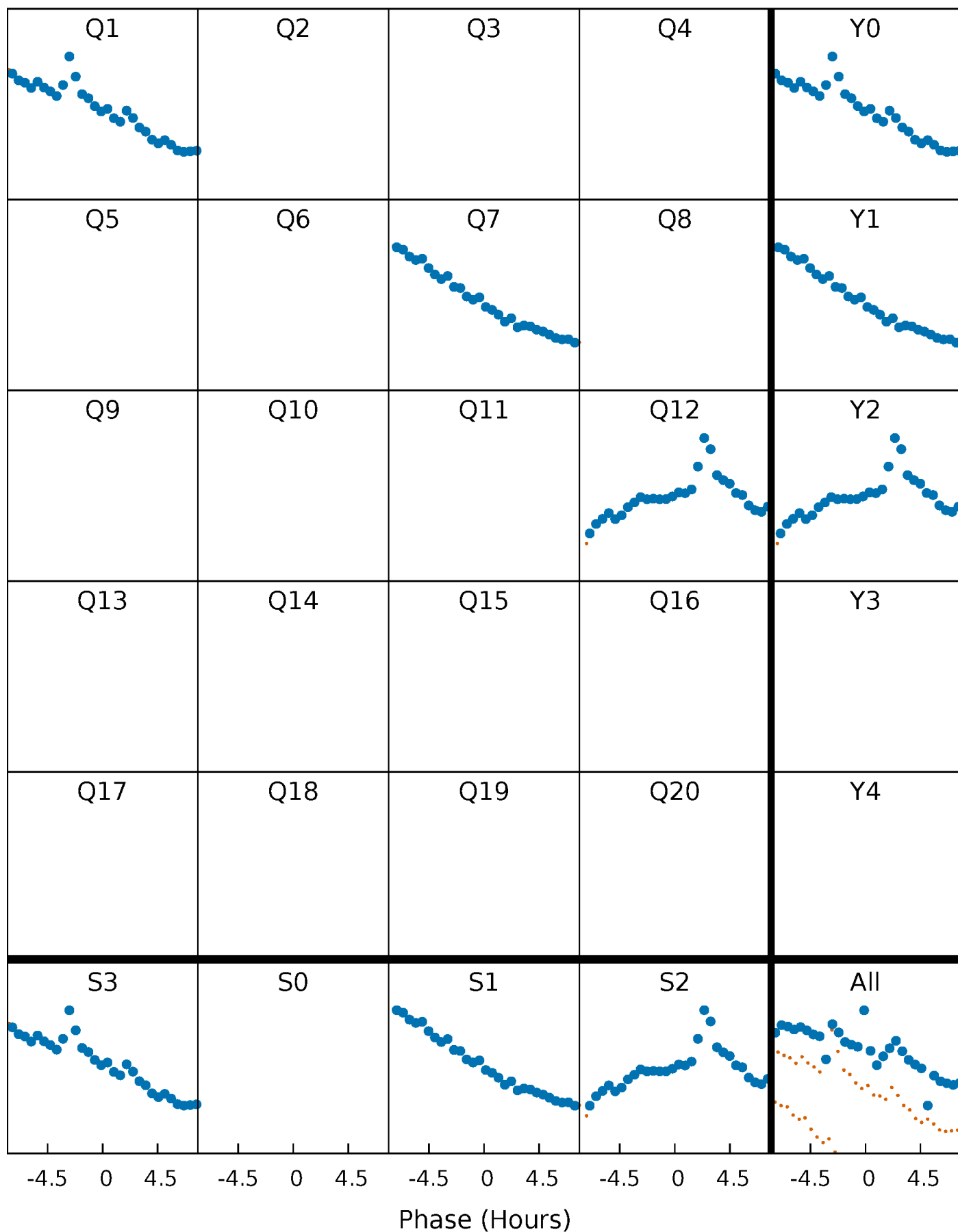


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



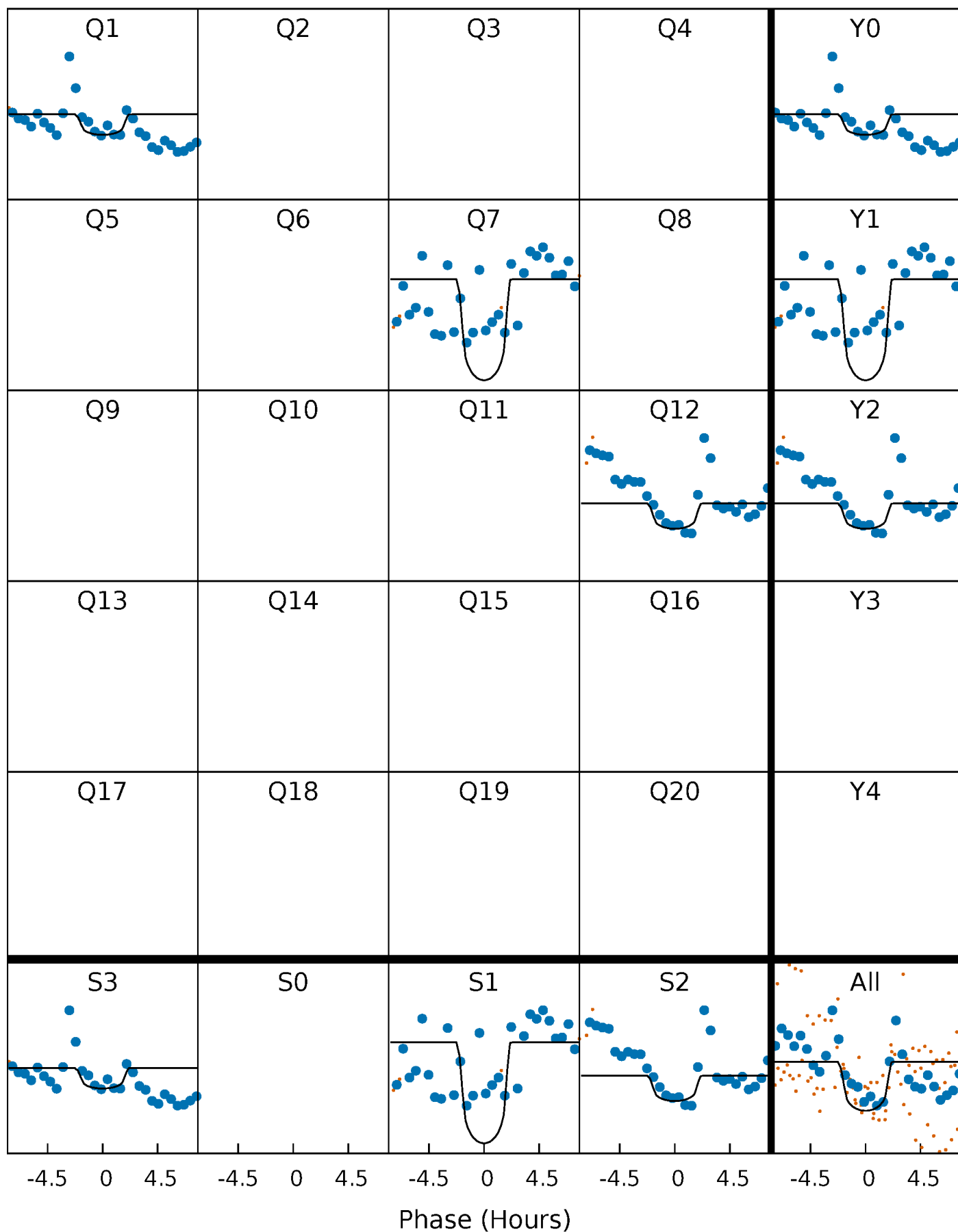
# PDC Quarter-Phased Transit Curves

TCE 006195999-01 P=480.137372 Days  $T_0=162.278986$  (BKJD)



# DV Quarter-Phased Transit Curves

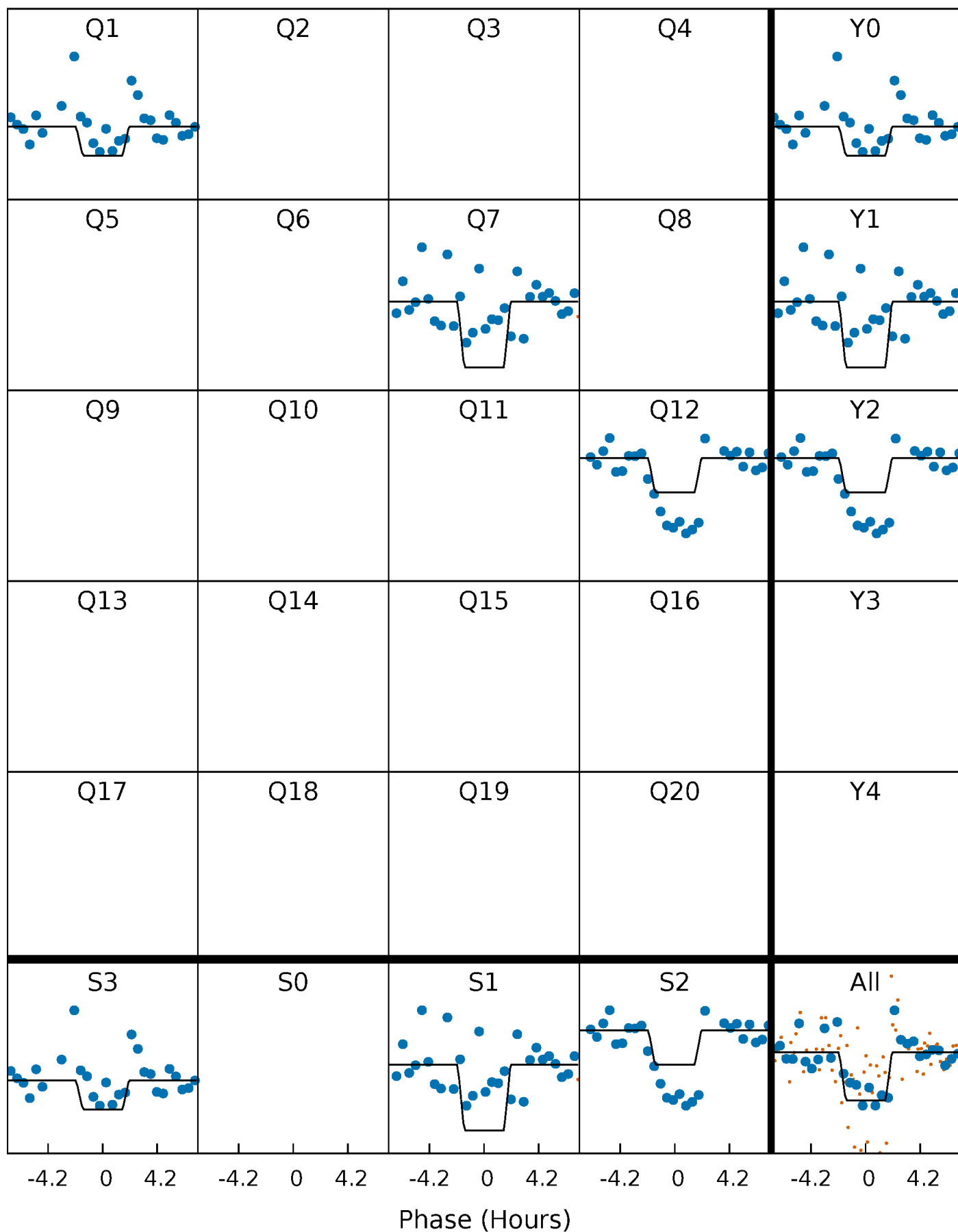
TCE 006195999-01 P=480.137372 Days  $T_0=162.278986$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

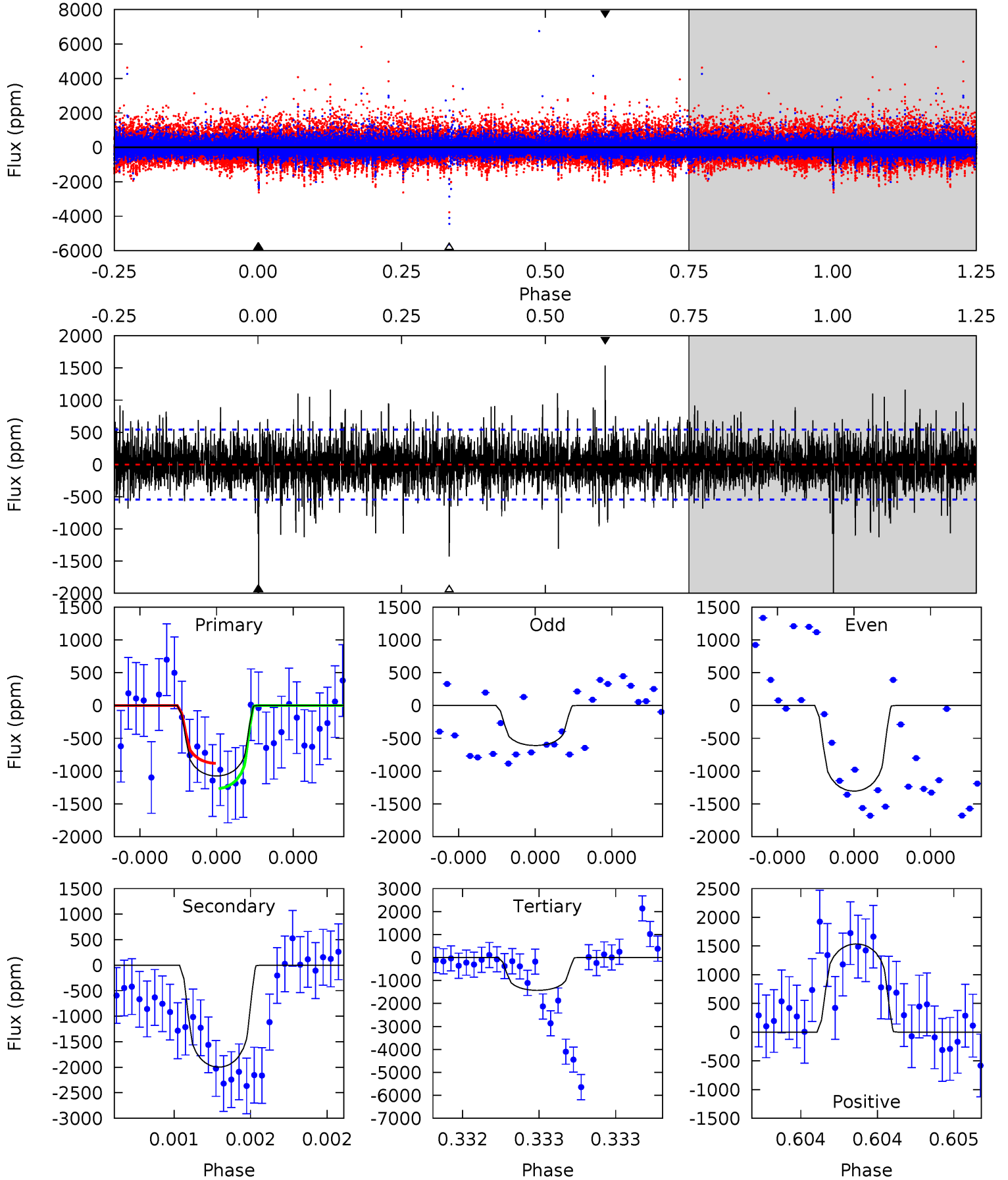
TCE 006195999-01 P=480.134170 Days  $T_0=162.285217$  (BKJD)



# DV Model-Shift Uniqueness Test

006195999-01, P = 480.137372 Days, E = 162.278986 Days

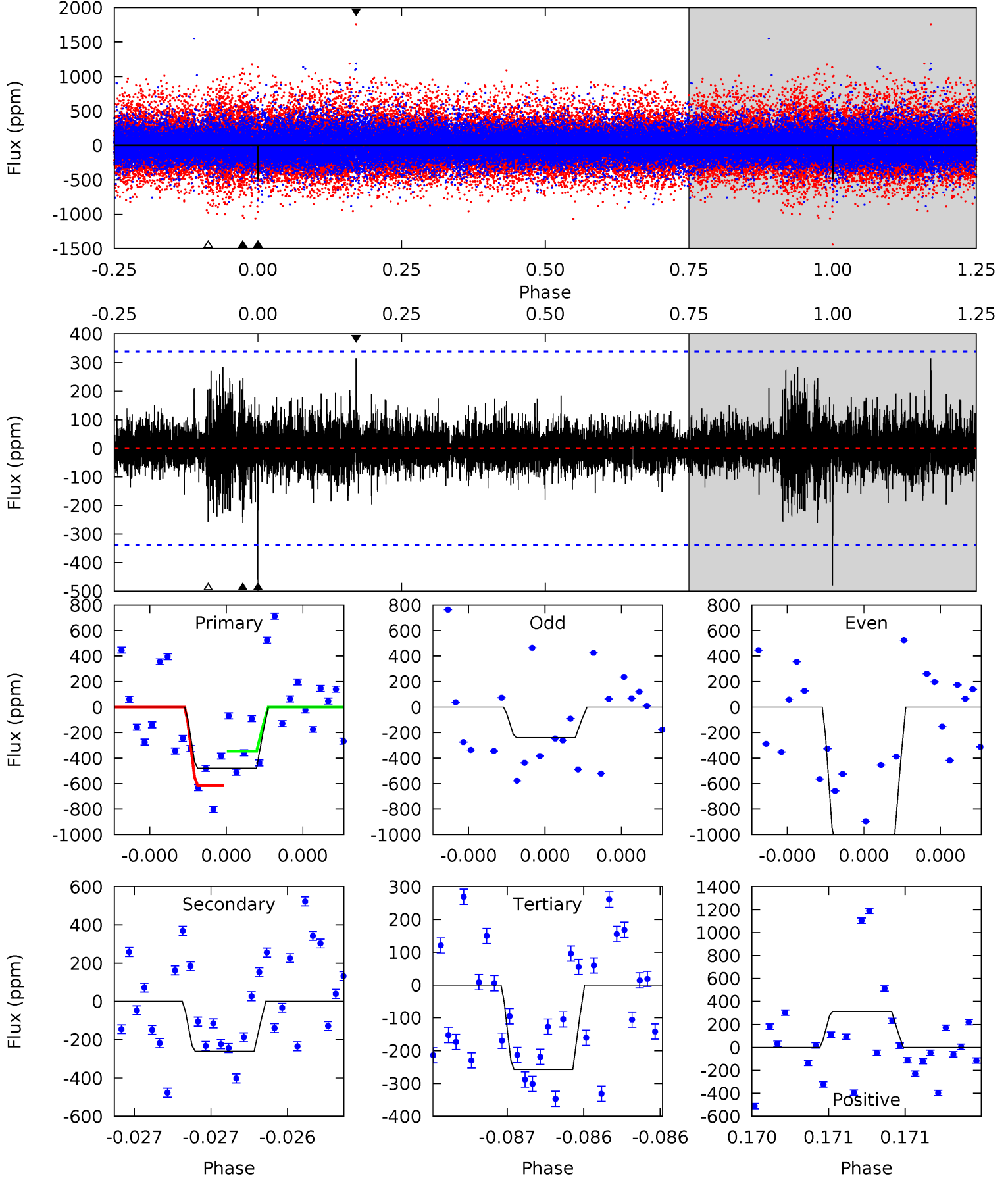
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	20.6	14.8	15.9	5.62	3.55	2.51	-3.67	-4.77	5.87	4.77	2.65	0.87	0.43	2.00



# Alt Model-Shift Uniqueness Test

006195999-01, P = 480.134170 Days, E = 162.285217 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
7.99	4.35	4.30	5.24	5.64	3.59	0.76	3.70	2.75	0.05	-0.90	7.50	2.13	0.40	2.25



### Stellar Parameters For KIC 006195999

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5386^{+162}_{-162}$	$4.524^{+0.099}_{-0.081}$	$-0.520^{+0.300}_{-0.300}$	$0.763^{+0.102}_{-0.092}$	$0.710^{+0.097}_{-0.045}$	$2.248^{+0.956}_{-0.565}$
	+3%/-3%	+2%/-2%	+58%/-58%	+13%/-12%	+14%/-6%	+43%/-25%
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 006195999-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1998 \pm 97$	$5.57^{+5.99}_{-3.83}$	$280^{+12}_{-12}$	$4575^{+3402}_{-1036}$	$41696^{+391222}_{-31829}$
Alt.	$-260 \pm 60$	$5.71^{+5.63}_{-3.90}$	$280^{+12}_{-13}$	$3177^{+1495}_{-565}$	$4987^{+42455}_{-3818}$

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

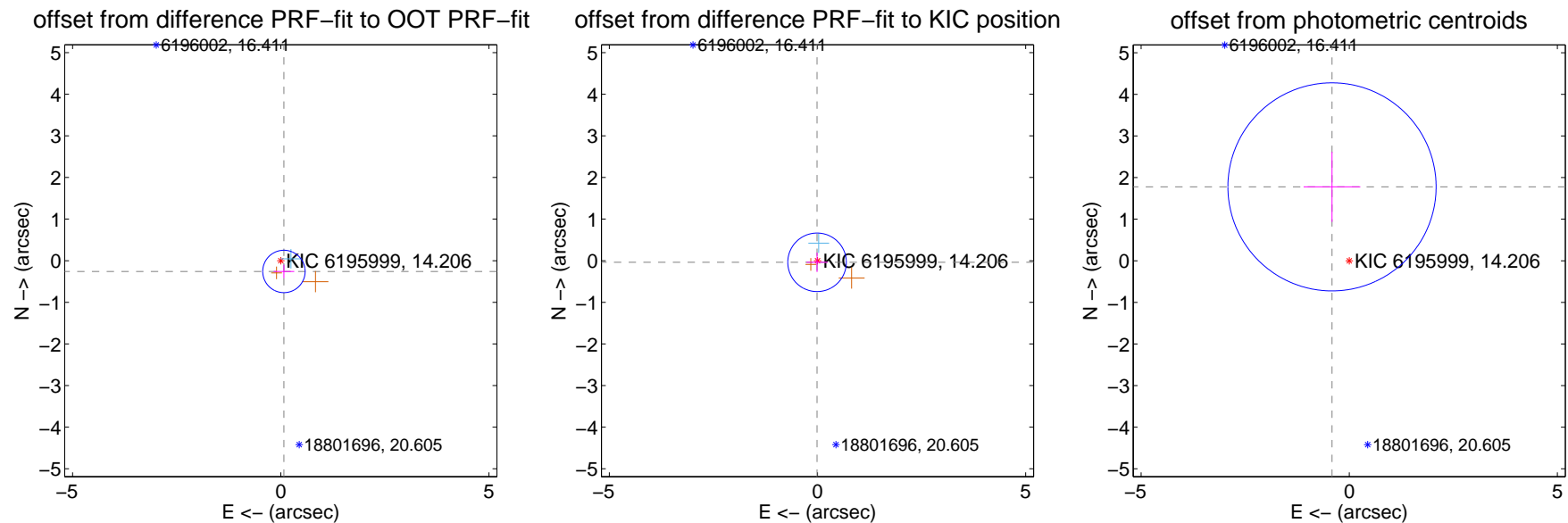
## DV Centroid Data

Supplemental centroid analysis for 006195999-01. Kepler magnitude: 14.21. Transit SNR 8.21

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

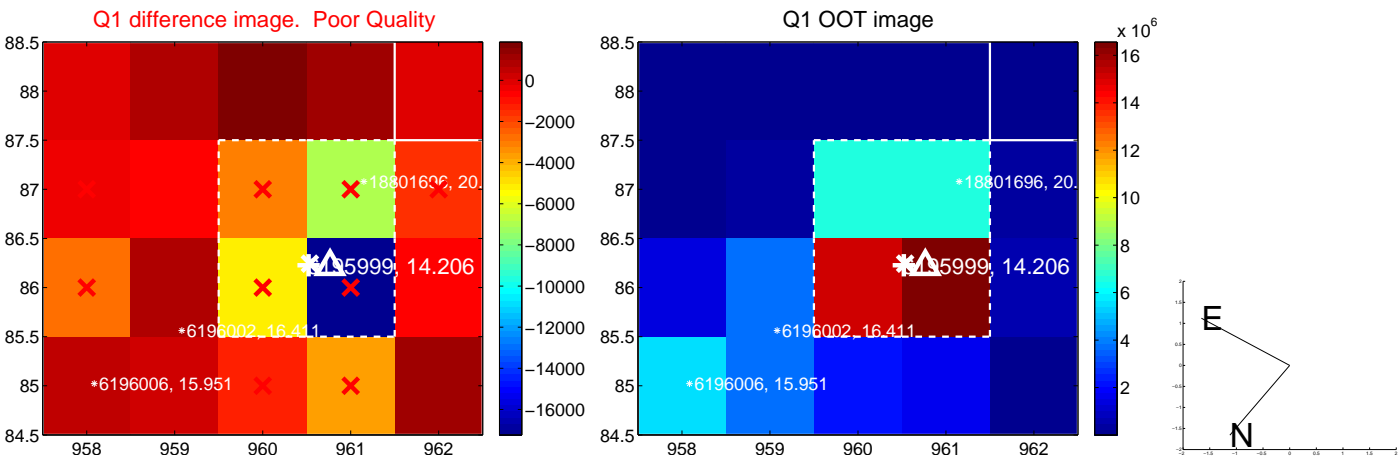
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.269 \pm 0.170$	1.58	$-0.076 \pm 0.247$	$-0.258 \pm 0.161$
PRF-fit source offset from KIC position	$0.040 \pm 0.234$	0.17	$0.011 \pm 0.252$	$-0.039 \pm 0.233$
photometric centroid source offset	$1.82 \pm 0.83$	2.19	$0.41 \pm 0.68$	$1.78 \pm 0.84$



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.

Q5 no difference image



Q5 no OOT image



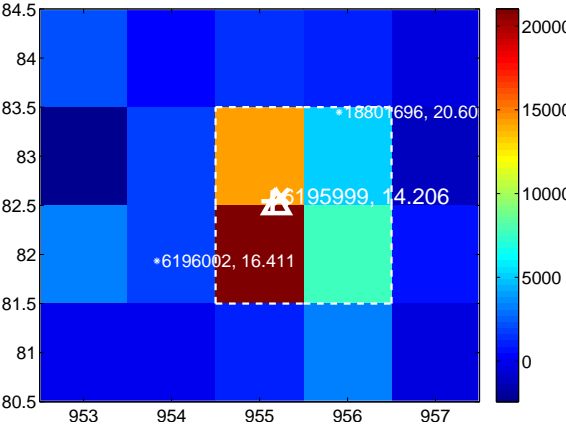
Q6 no difference image



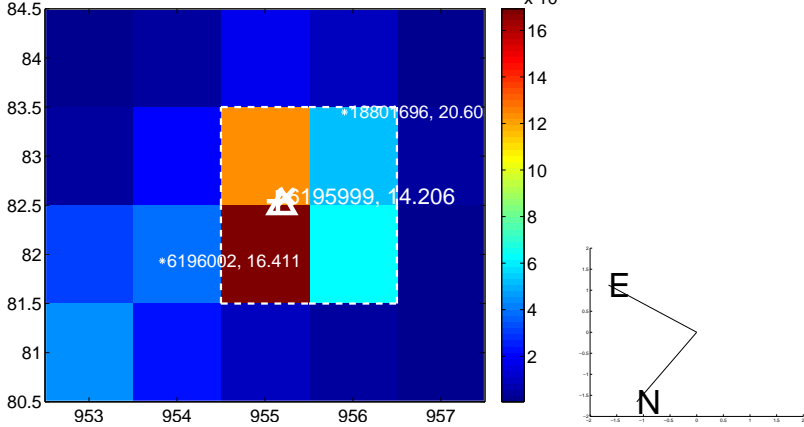
Q6 no OOT image



Q7 difference image



Q7 OOT image



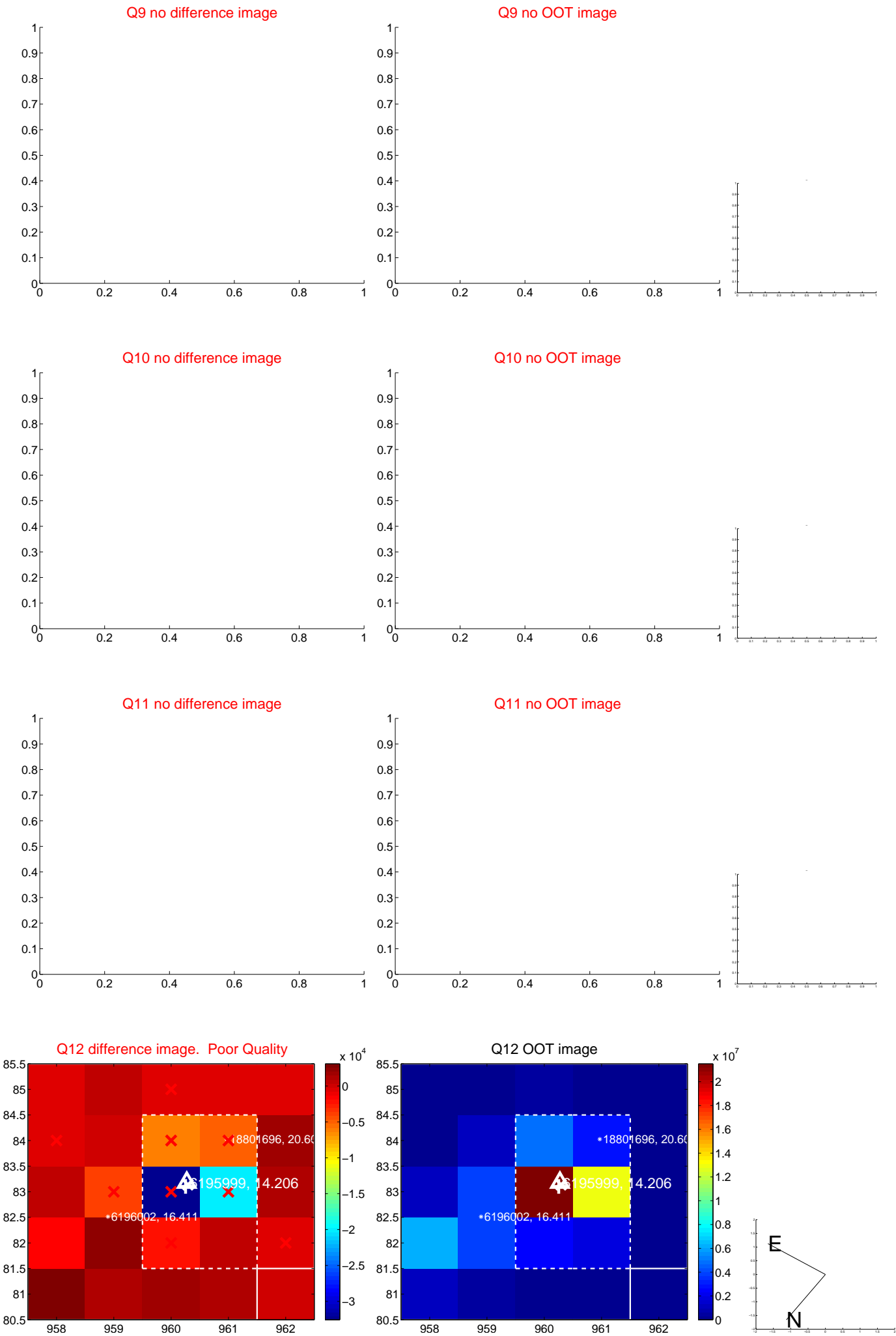
Q8 no difference image



Q8 no OOT image



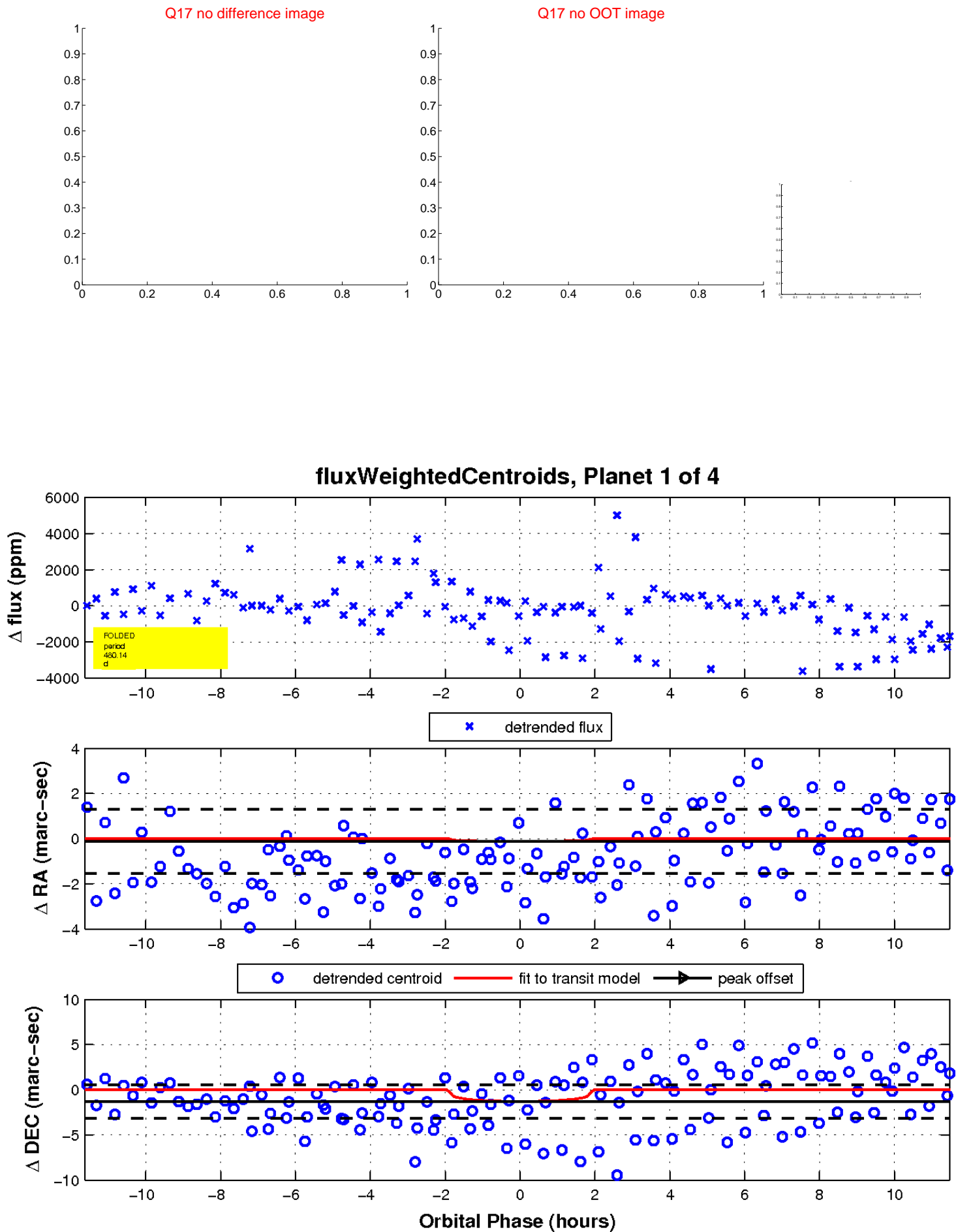
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



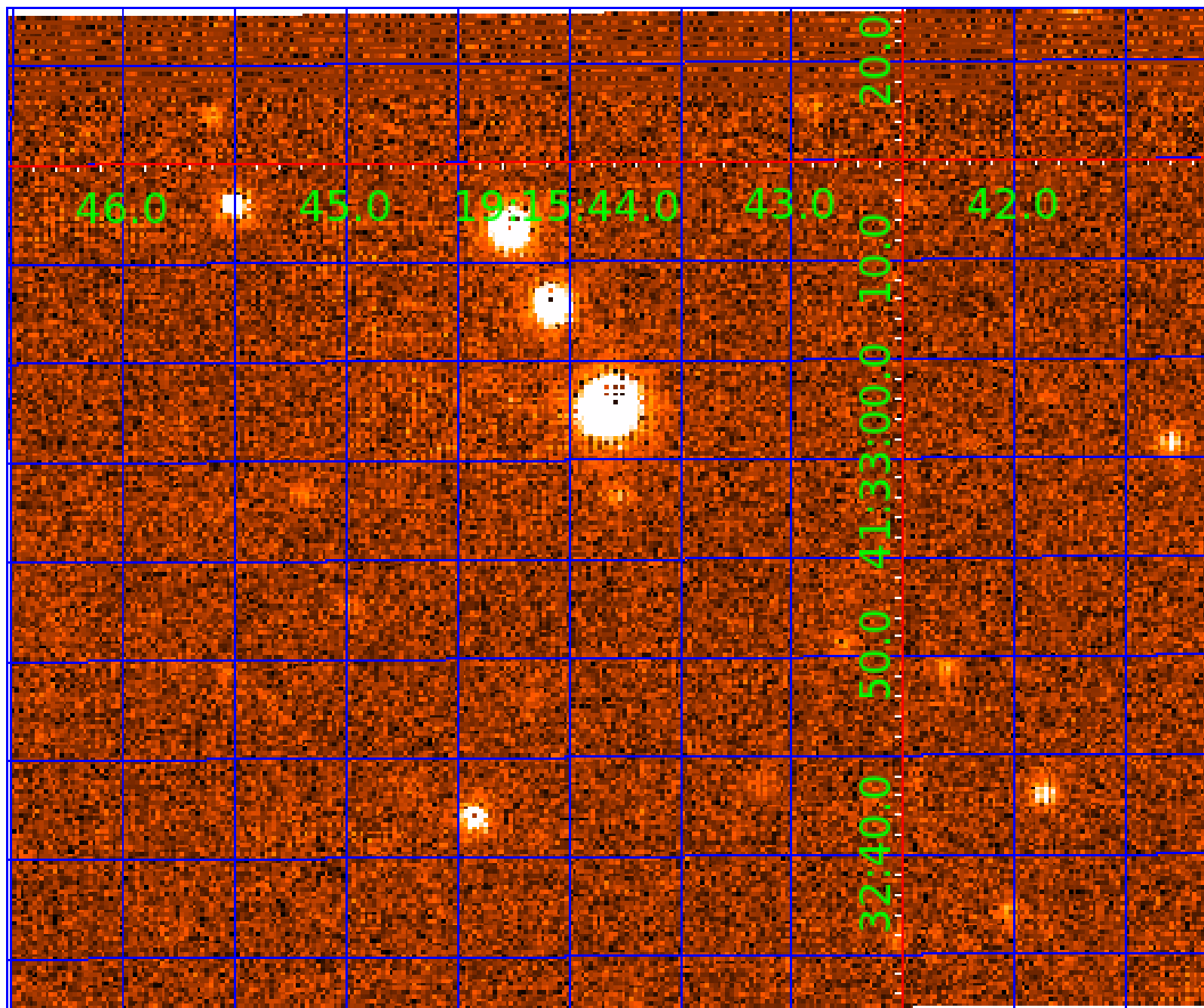
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 006195999

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006195999-01	OBS	No	480.137372	162.278986	1411.7	3.904	12.2	8.2	0.76	5386	2.83	0.38
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006195999-04	OBS	No	463.014527	408.208646	838.0	4.998	12.1	4.9	0.76	5386	2.33	0.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006195999-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006195999-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
006195999-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
006195999-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—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.

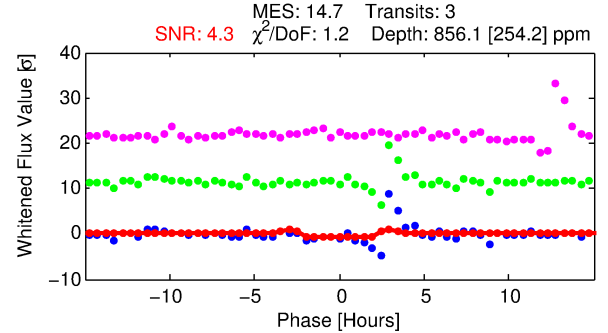
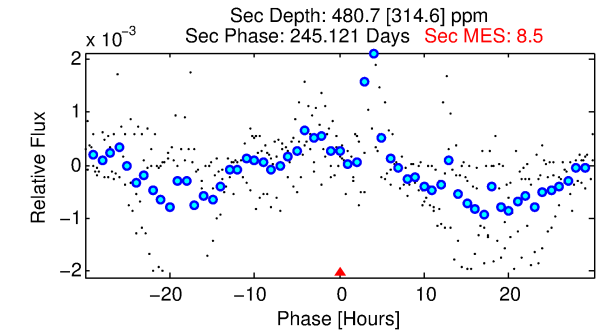
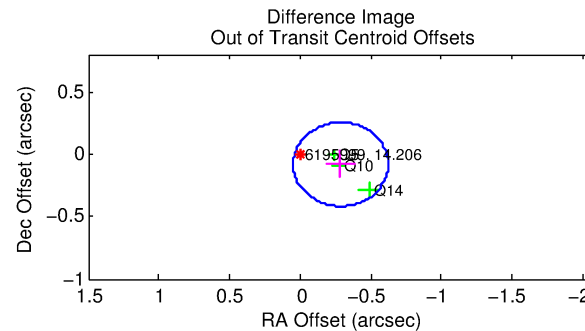
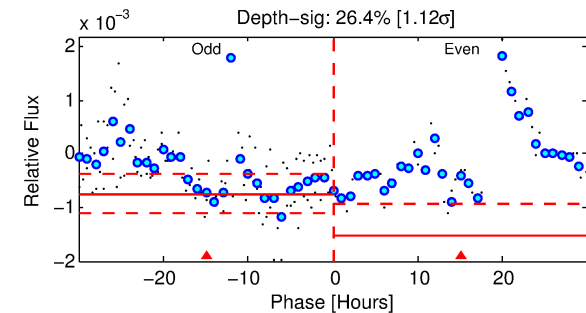
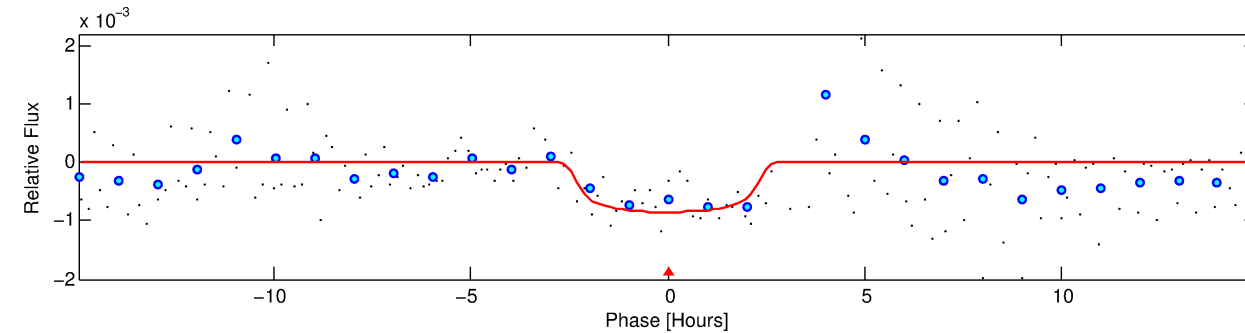
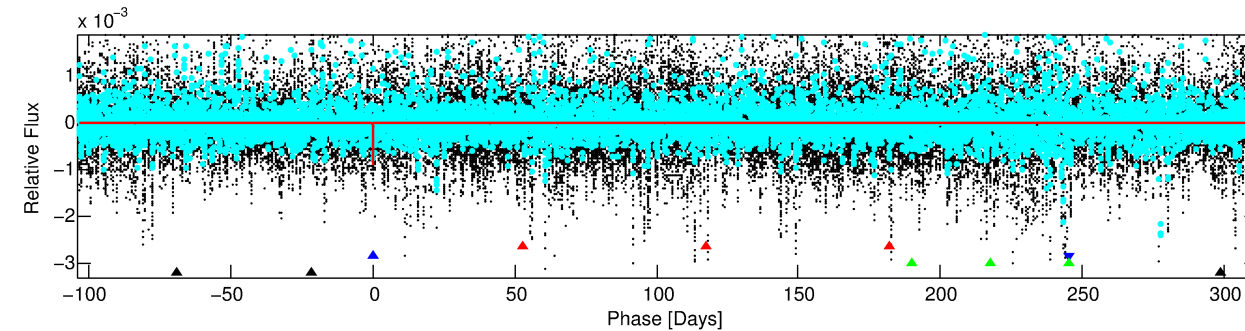
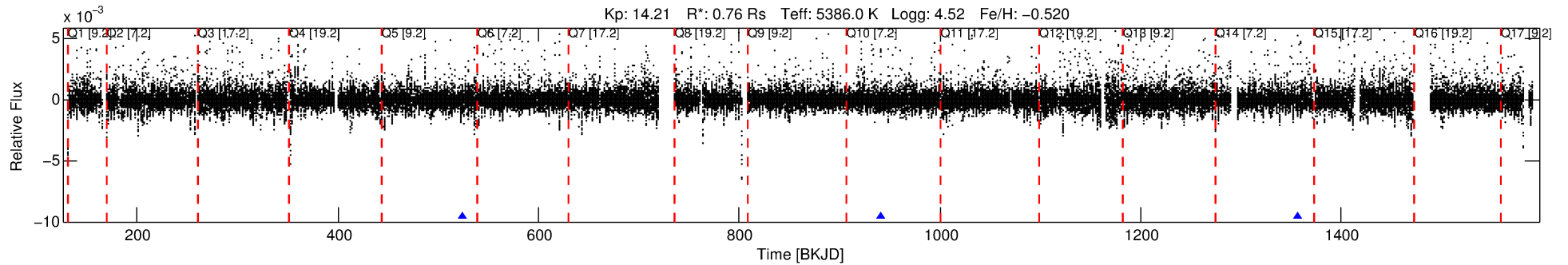
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006195999-02

No Significant Match Found

# DV One-Page Summary

KIC: 6195999 Candidate: 2 of 4 Period: 415.545 d



## DV Fit Results:

Period = 415.54492 [0.00881] d  
Epoch = 524.8735 [0.0117] BKJD  
Rp/R\* = 0.0288 [0.0202]  
a/R\* = 469.10 [1299.20]  
b = 0.72 [1.88]  
Seff = 0.46 [0.10]  
Teq = 210 [11] K  
Rp = 2.40 [1.71] Re  
a = 0.9723 [0.1139] AU  
Ag = 43504.09 [67675.69] [0.64 $\sigma$ ]  
Teffp = 4700 [1822] K [2.46 $\sigma$ ]

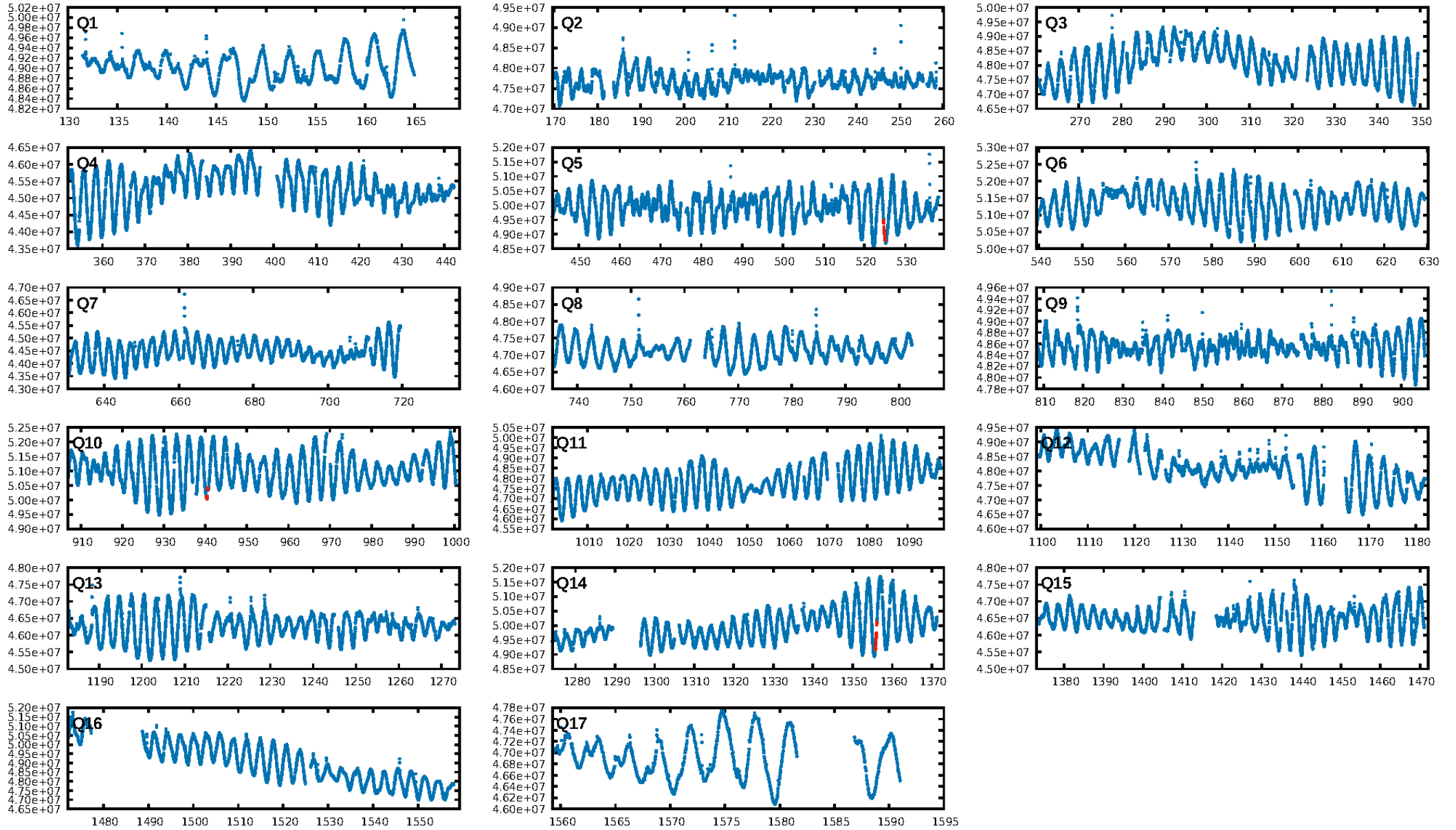
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [114.10 $\sigma$ ]  
ModelChiSquare2-sig: 18.6%  
ModelChiSquareGof-sig: 82.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.584  
Centroid-sig: 50.0%  
Centroid-so: 0.987 arcsec [0.96 $\sigma$ ]  
OotOffset-rm: 0.297 arcsec [2.65 $\sigma$ ]  
**KicOffset-rm: 0.262 arcsec [3.23 $\sigma$ ]**  
OotOffset-st: 2/0/0/1 [3]  
KicOffset-st: 2/0/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

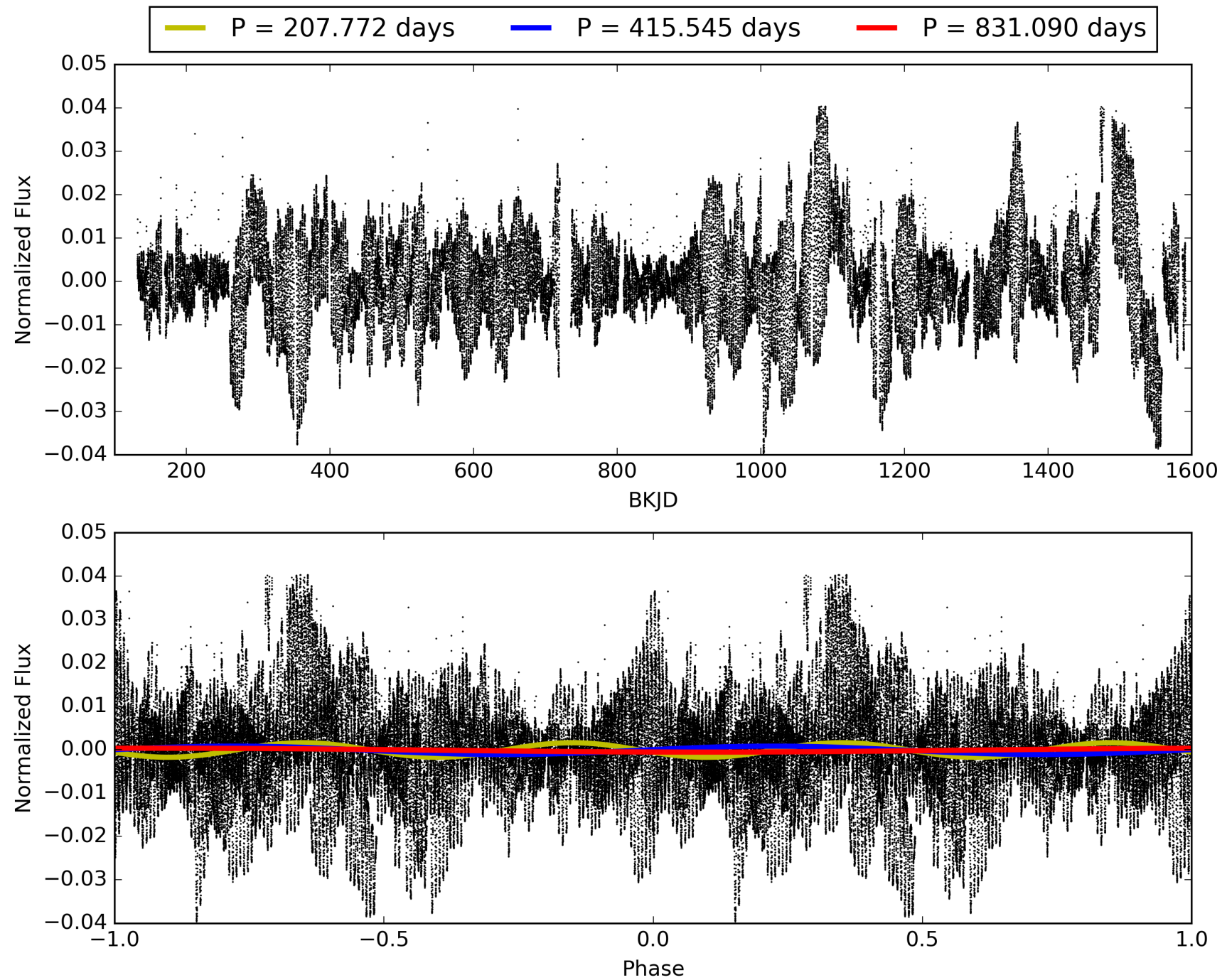
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:54:23 Z

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

# TCE 006195999-02, PDC Light Curves



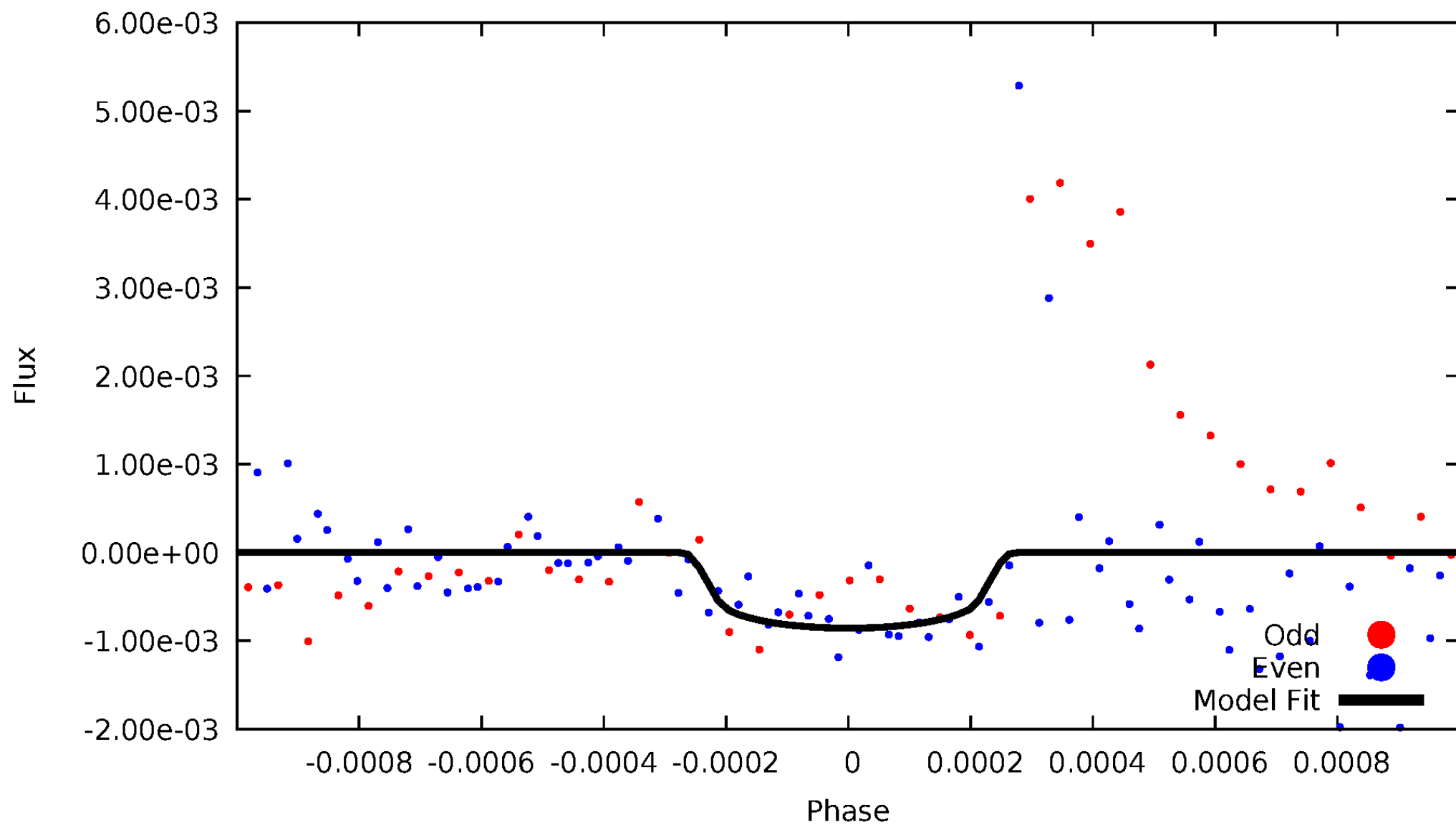
TCE 006195999-02





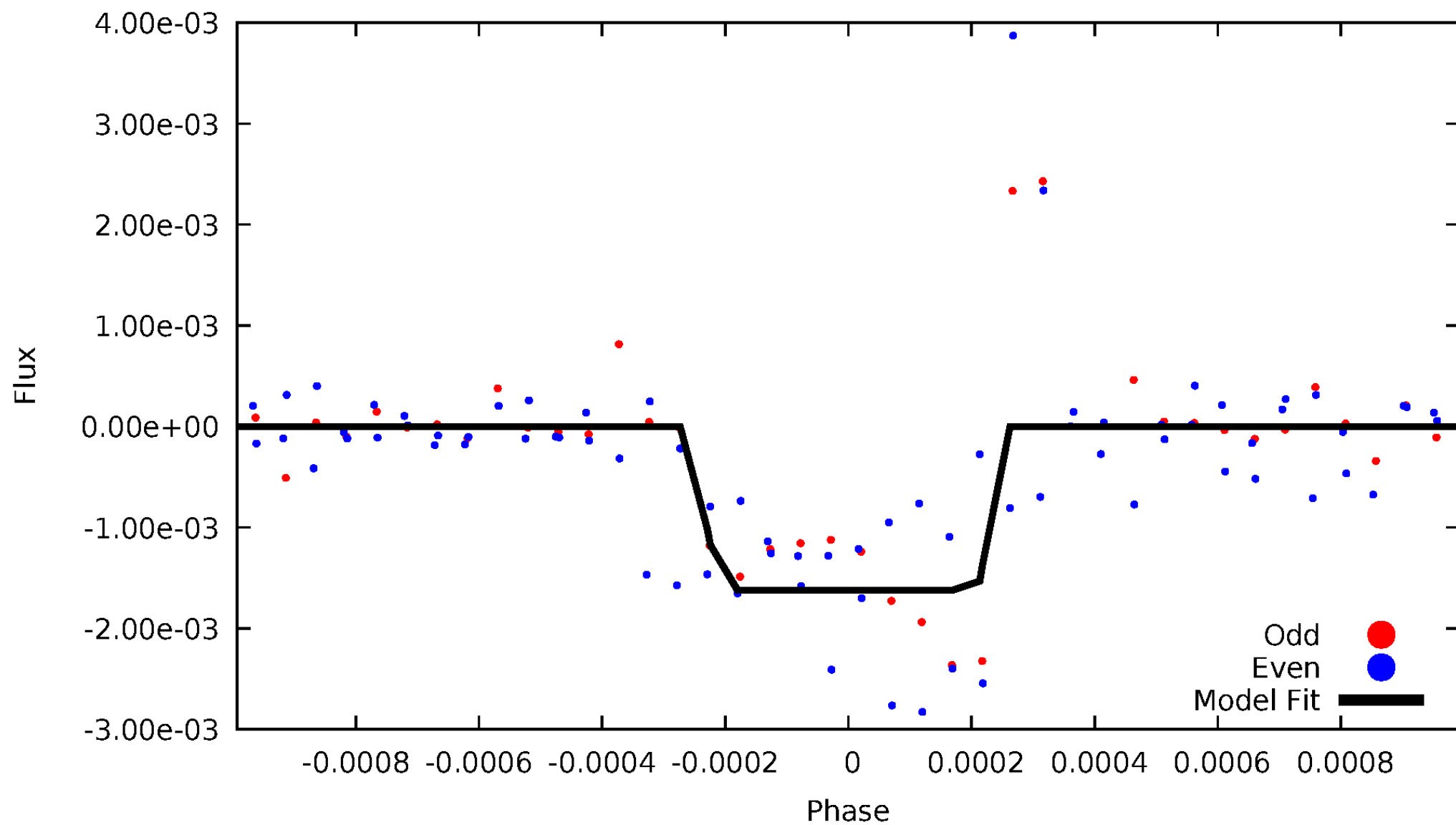
# DV Odd/Even

TCE 006195999-02



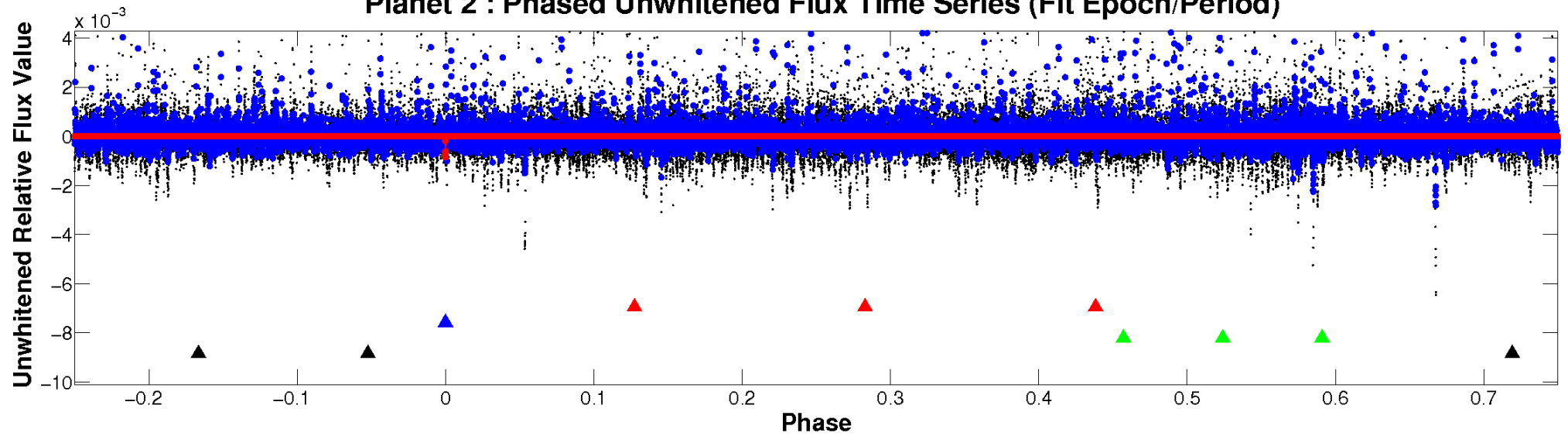
# ALT Odd/Even

TCE 006195999-02

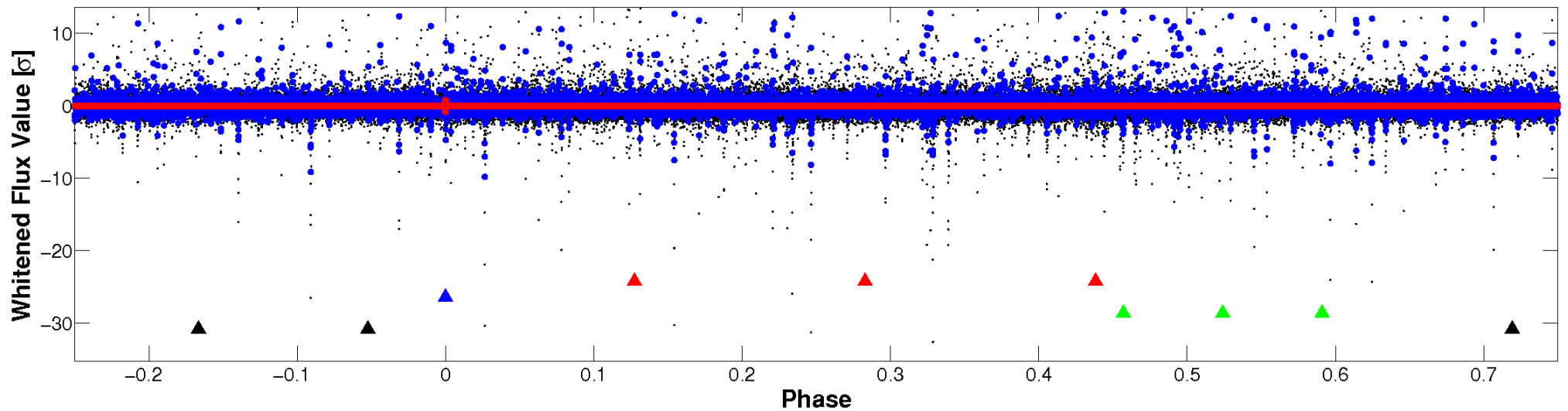


# Non-Whitened Vs. Whitened Light Curve

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

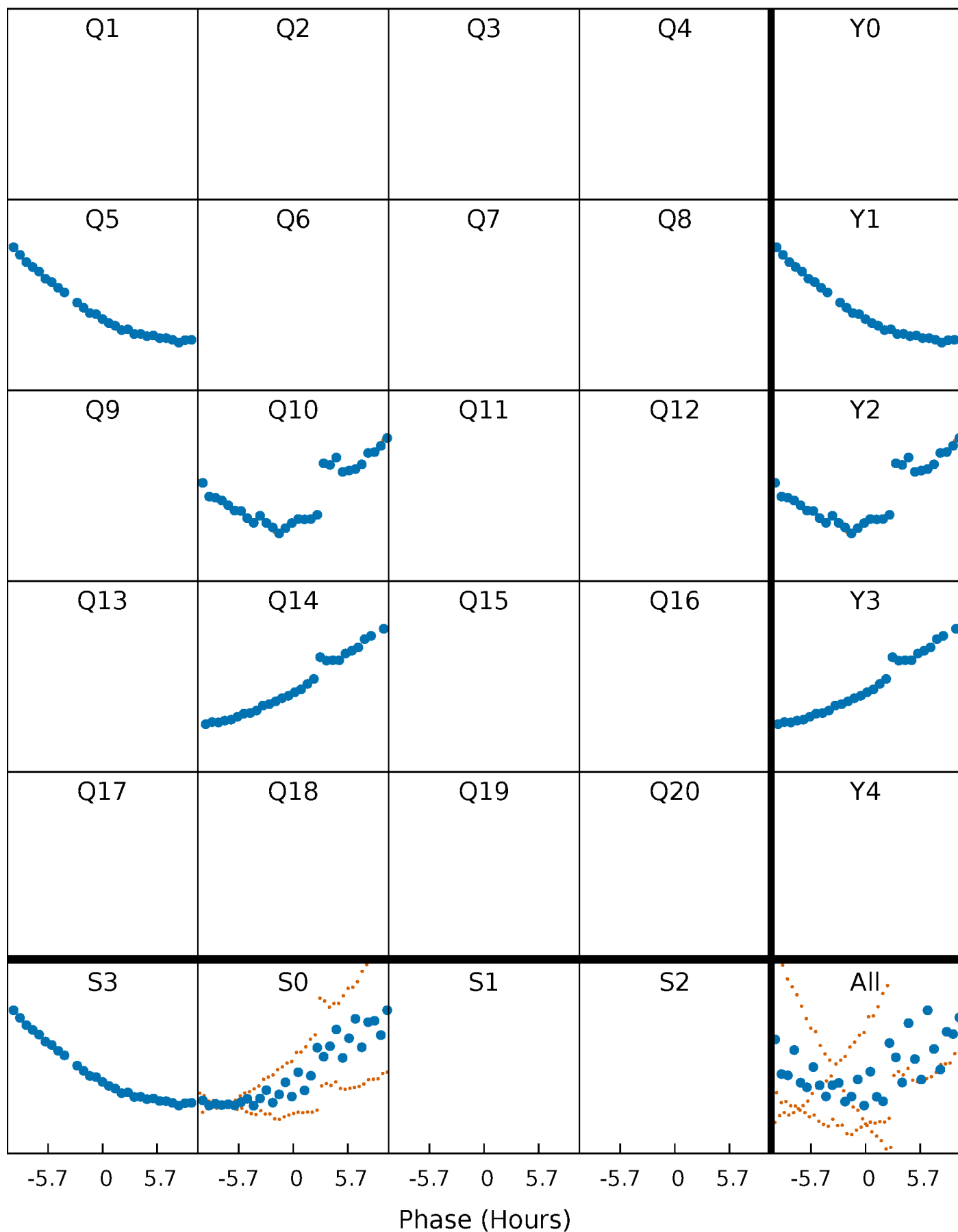


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



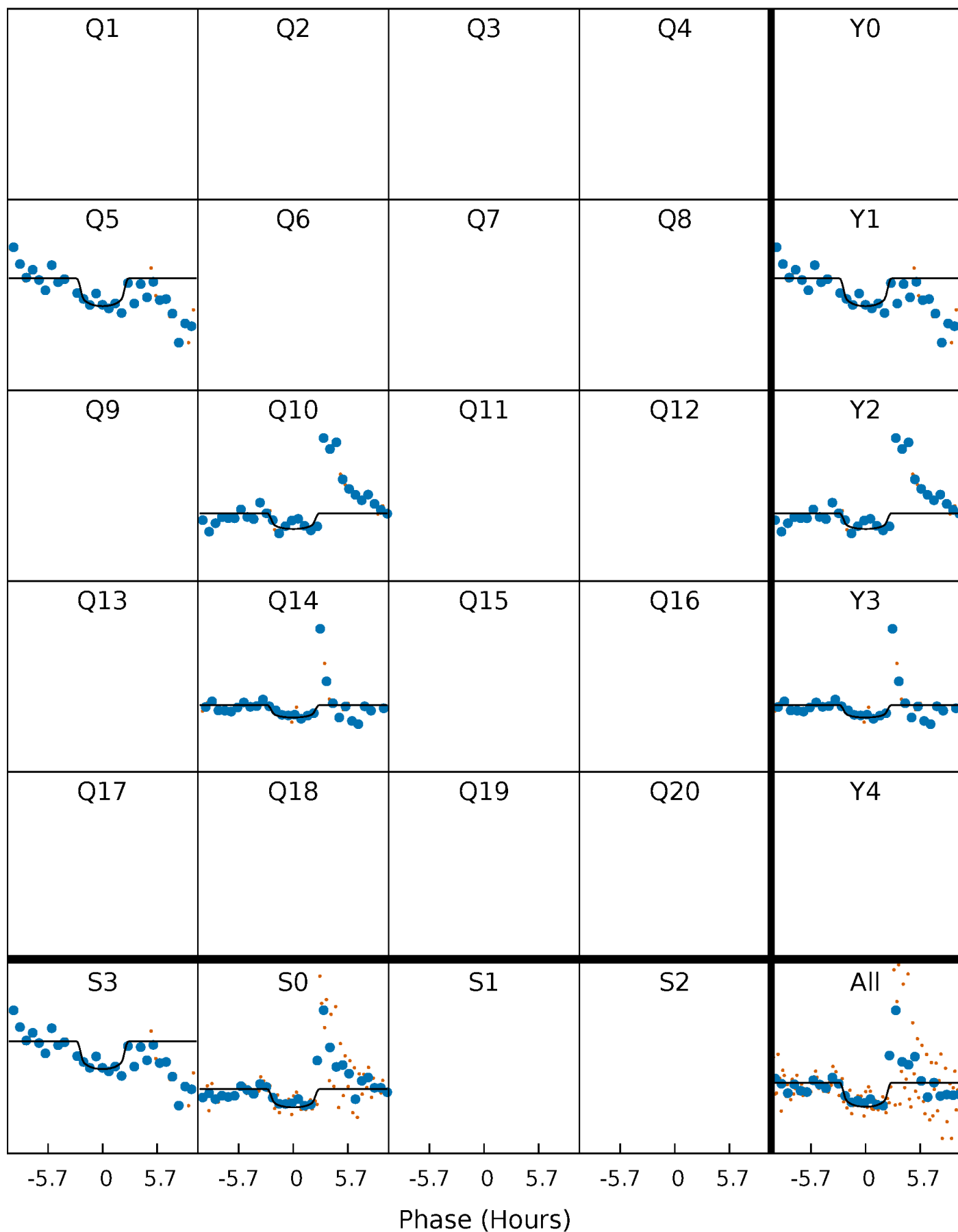
# PDC Quarter-Phased Transit Curves

TCE 006195999-02     $P=415.544924$  Days     $T_0=524.873497$  (BKJD)



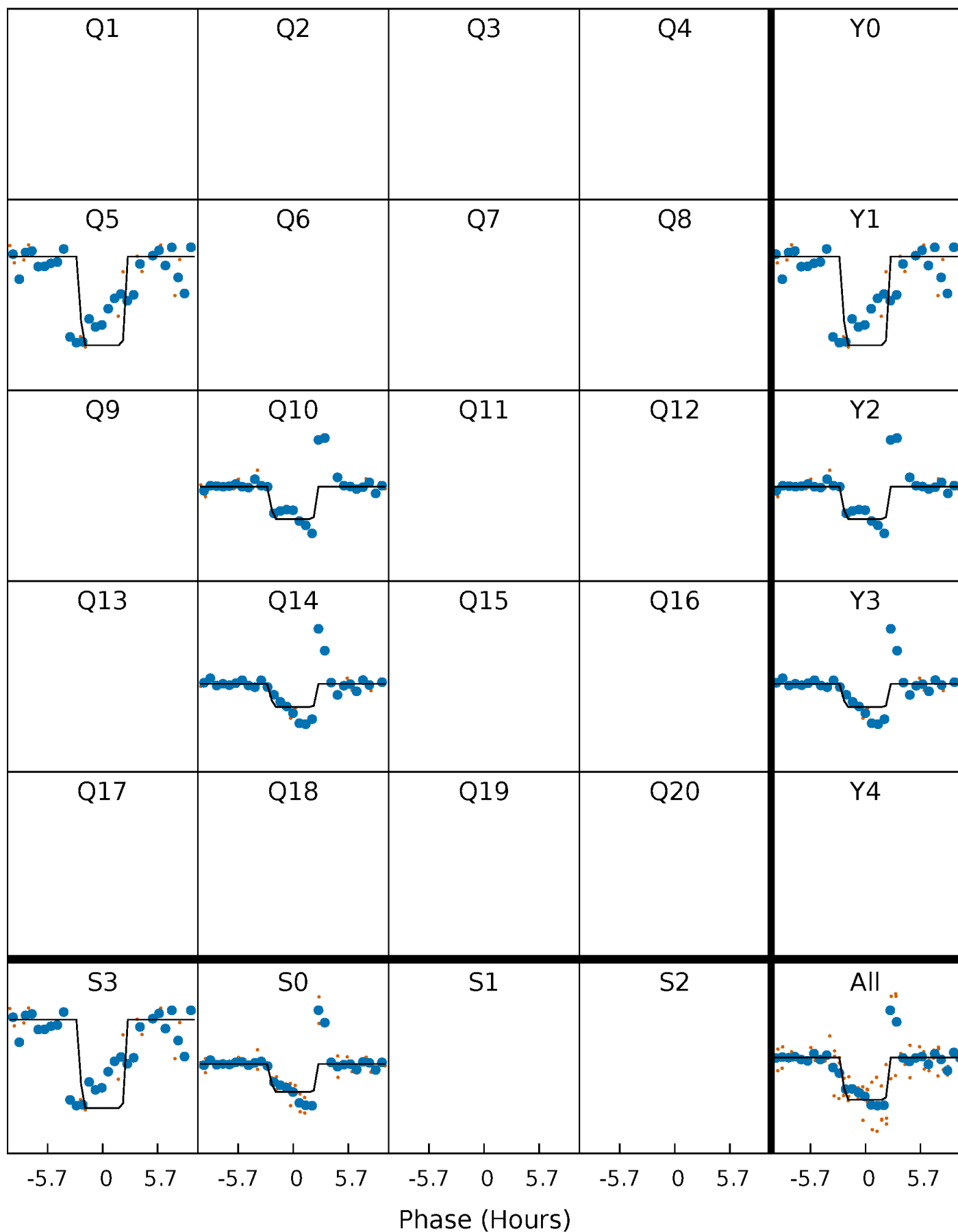
# DV Quarter-Phased Transit Curves

TCE 006195999-02     $P=415.544924$  Days     $T_0=524.873497$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

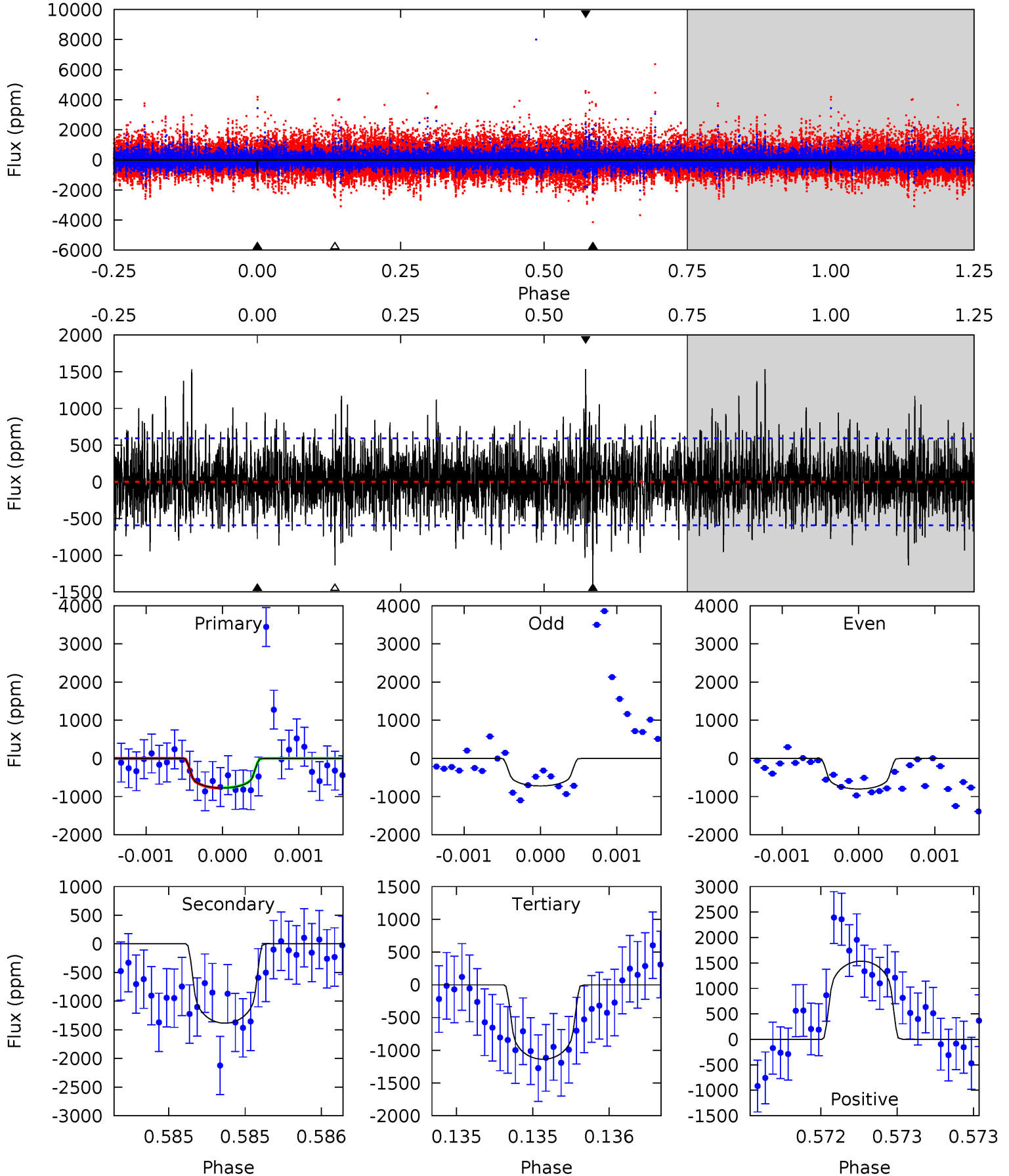
TCE 006195999-02     $P=415.536876$  Days     $T_0=524.894228$  (BKJD)



# DV Model-Shift Uniqueness Test

006195999-02, P = 415.544924 Days, E = 109.328573 Days

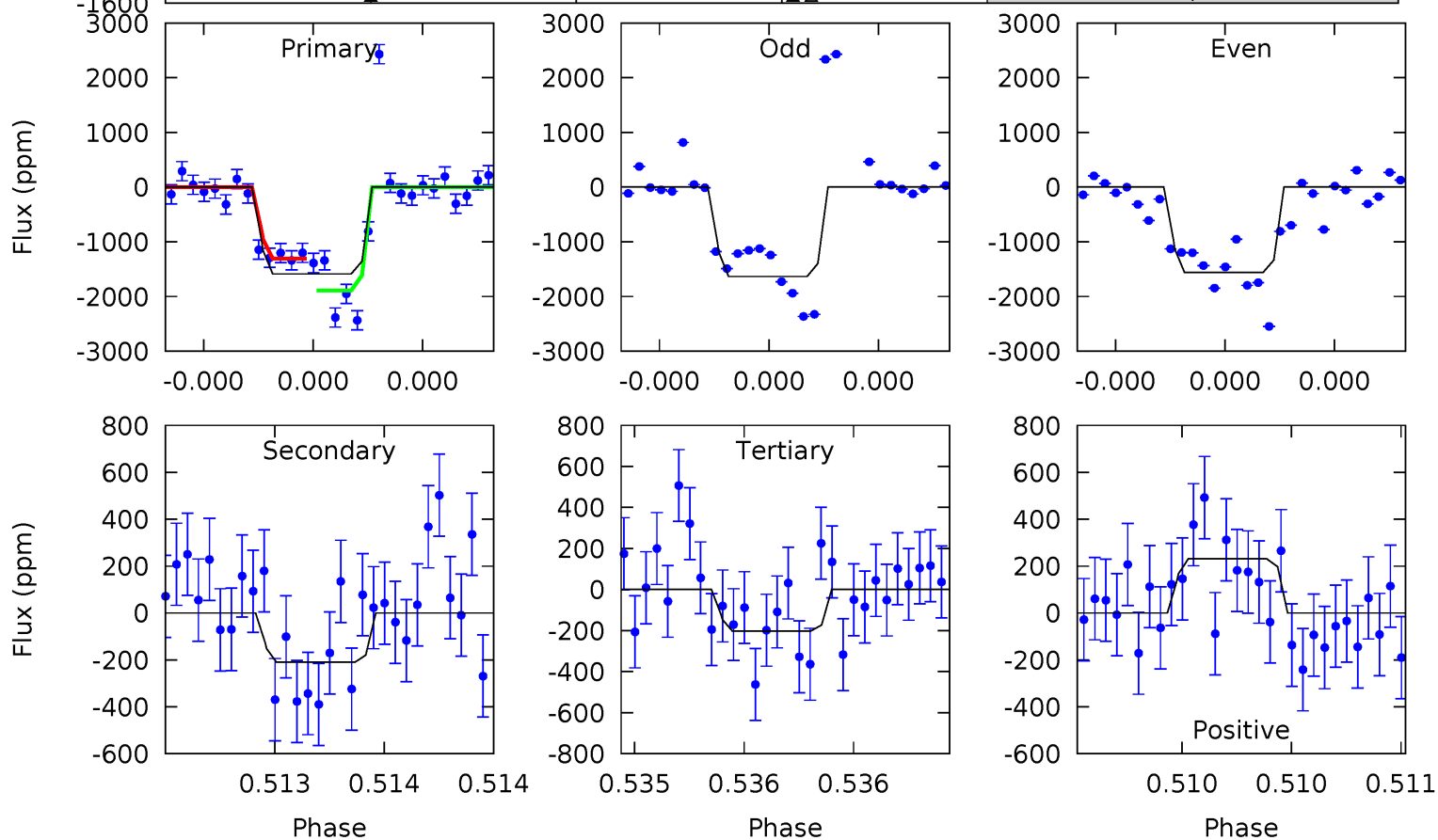
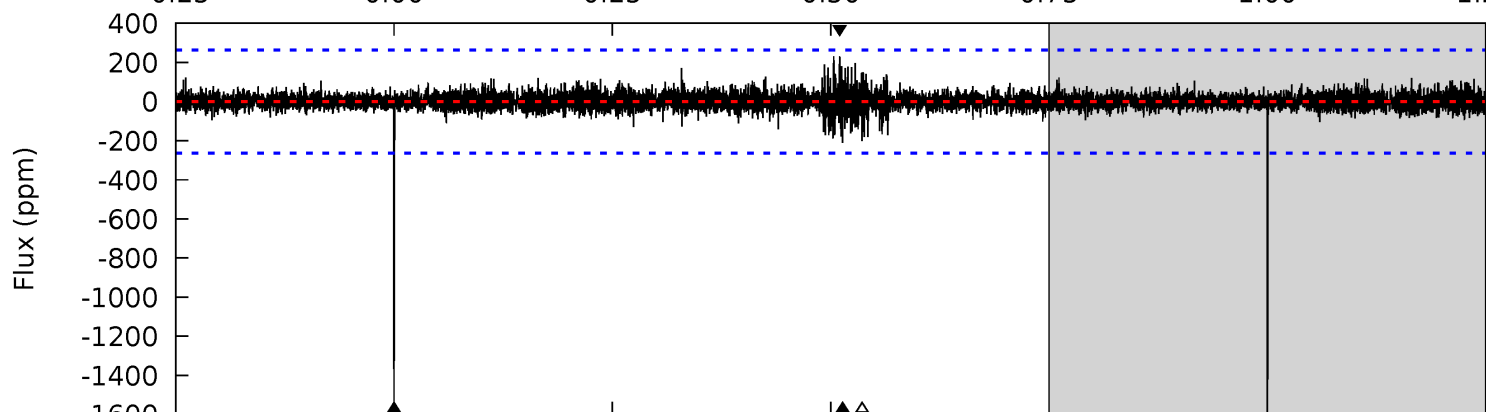
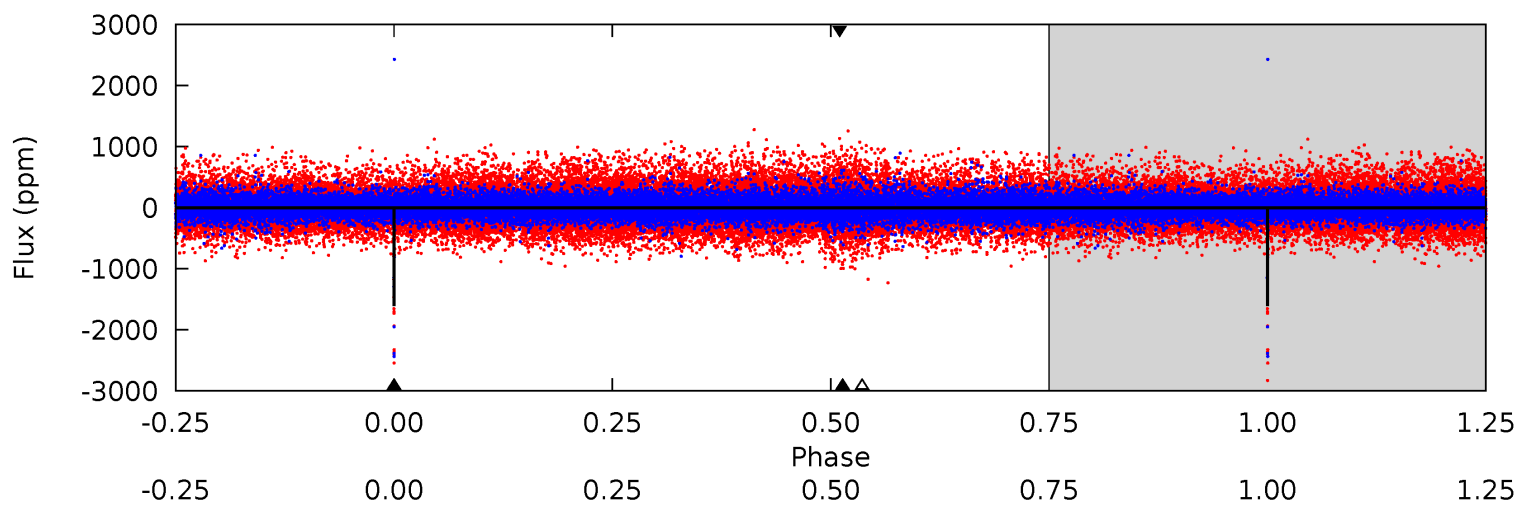
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.27	13.0	10.7	14.4	5.56	3.46	2.82	-3.40	-7.15	2.32	-1.43	0.31	1.05	0.53	0.05



# Alt Model-Shift Uniqueness Test

006195999-02, P = 415.536876 Days, E = 109.357352 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
33.6	4.44	4.28	4.88	5.58	3.49	0.69	29.3	28.7	0.16	-0.44	0.74	0.97	0.13	0





### Stellar Parameters For KIC 006195999

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5386^{+162}_{-162}$	$4.524^{+0.099}_{-0.081}$	$-0.520^{+0.300}_{-0.300}$	$0.763^{+0.102}_{-0.092}$	$0.710^{+0.097}_{-0.045}$	$2.248^{+0.956}_{-0.565}$
	+3%/-3%	+2%/-2%	+58%/-58%	+13%/-12%	+14%/-6%	+43%/-25%
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 006195999-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1384 \pm 107$	$2.60^{+1.60}_{-1.49}$	$293^{+14}_{-14}$	$5833^{+3644}_{-1119}$	$108685^{+472301}_{-68109}$
Alt.	$-210 \pm 47$	$3.39^{+1.69}_{-1.72}$	$294^{+13}_{-13}$	$3624^{+1030}_{-441}$	$9360^{+30624}_{-5307}$

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

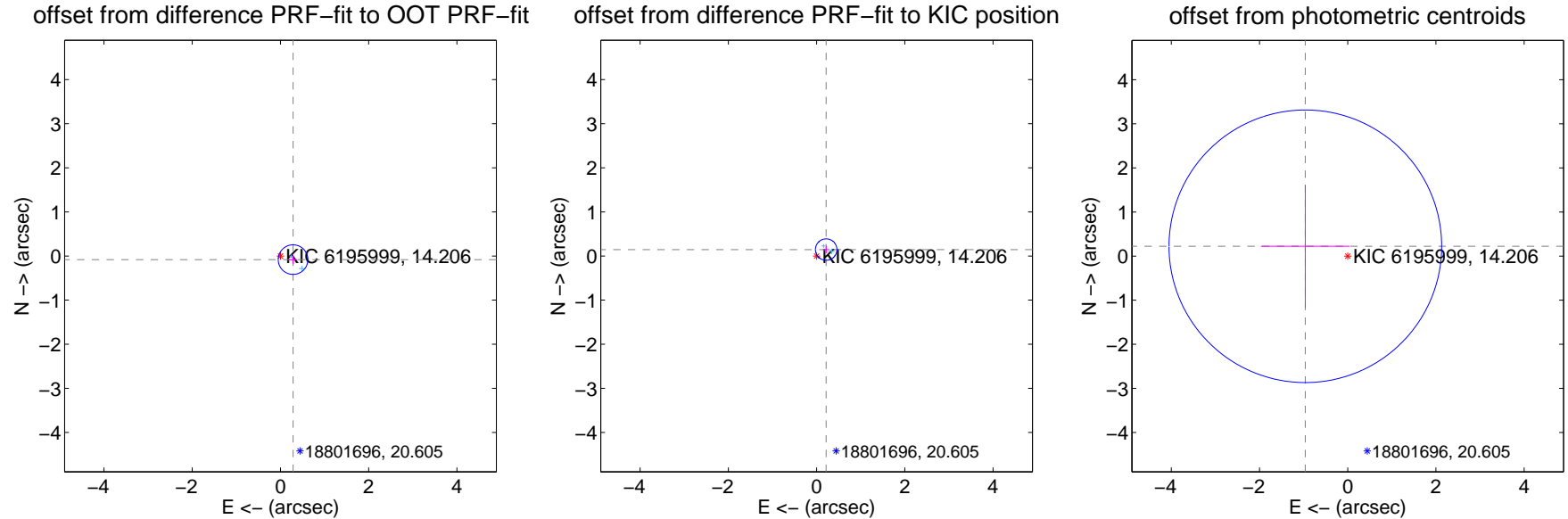
## DV Centroid Data

Supplemental centroid analysis for 006195999-02. Kepler magnitude: 14.21. Transit SNR 4.28

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.42 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.297 \pm 0.112$	2.65	$-0.286 \pm 0.098$	$-0.081 \pm 0.102$
PRF-fit source offset from KIC position	<b><math>0.262 \pm 0.081</math></b>	<b>3.23</b>	$-0.217 \pm 0.081$	$0.146 \pm 0.082$
photometric centroid source offset	$0.99 \pm 1.03$	0.96	$0.96 \pm 1.01$	$0.22 \pm 1.40$

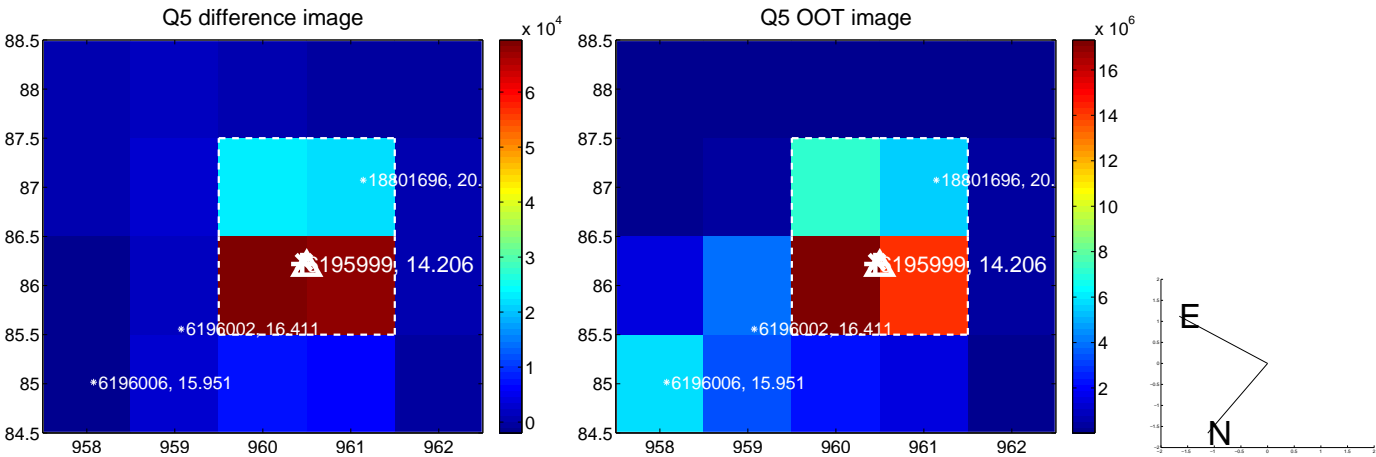


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

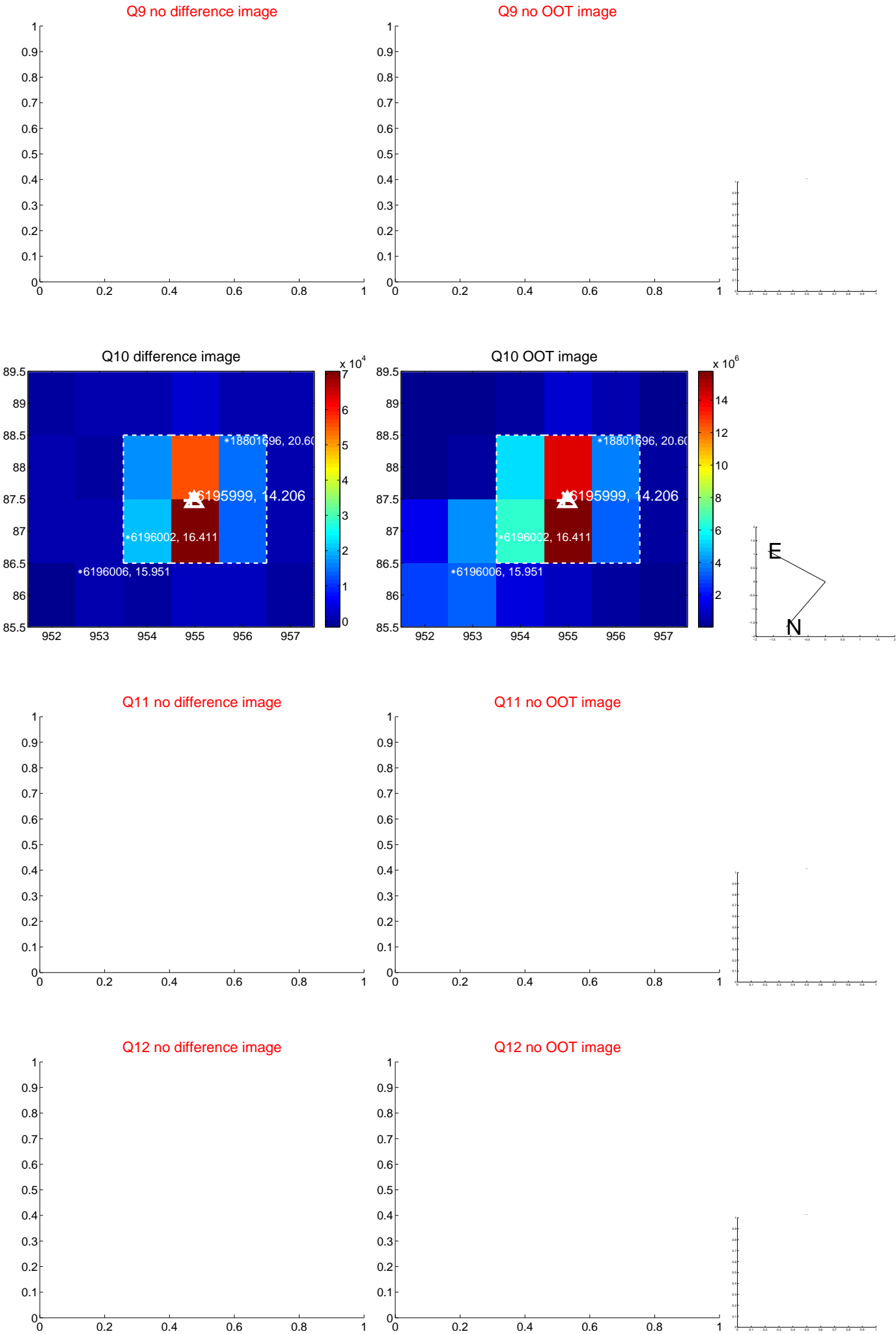
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



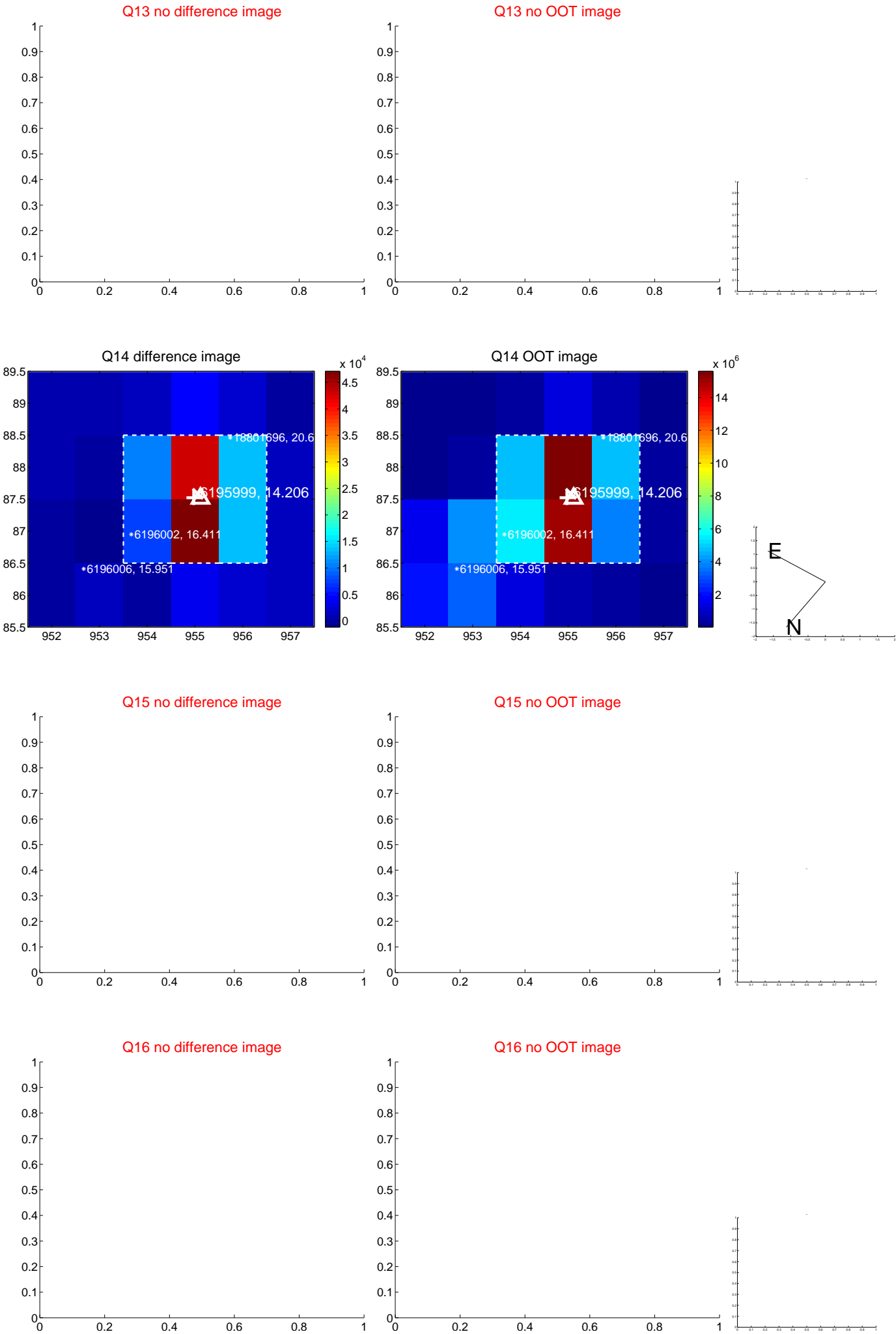
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



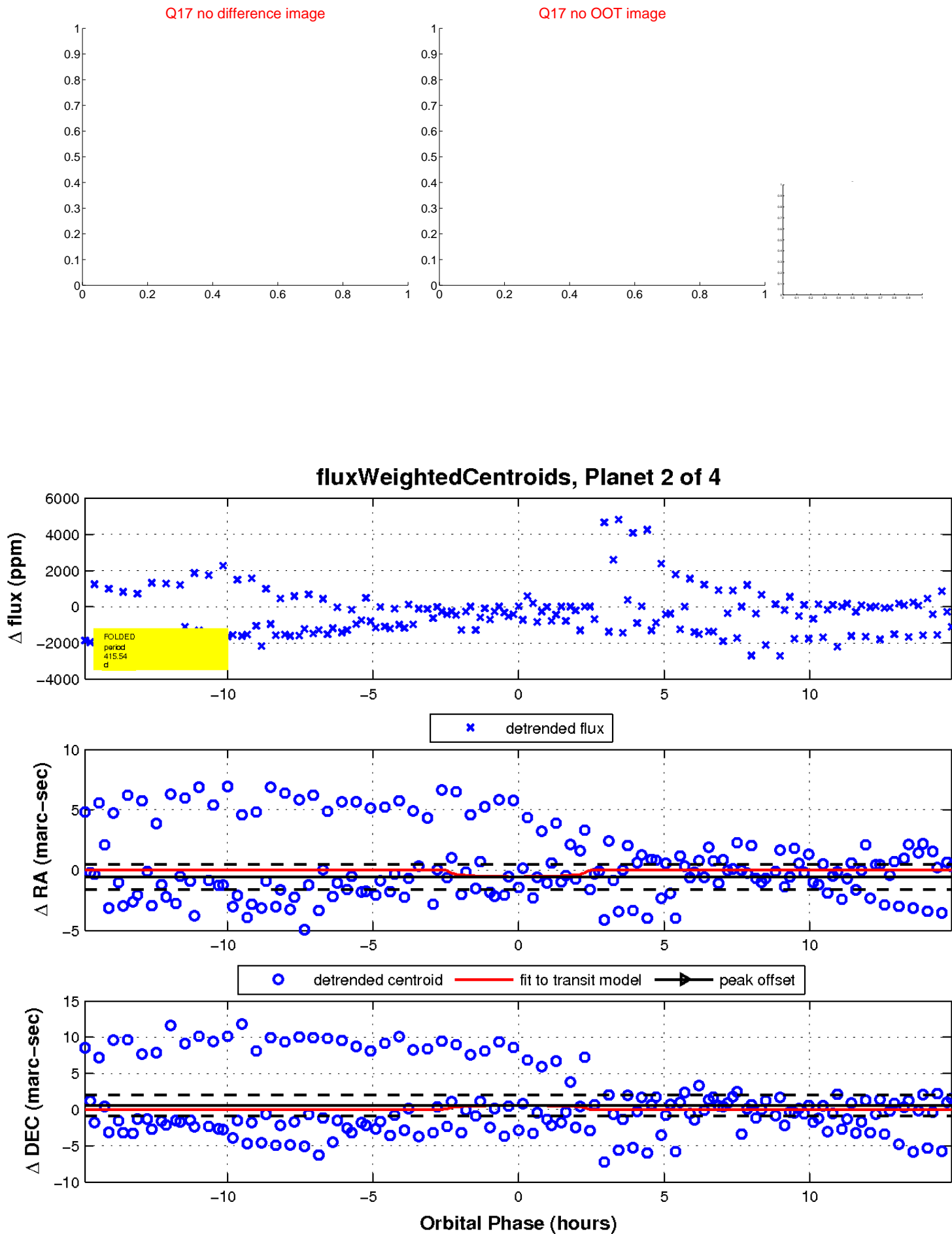
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

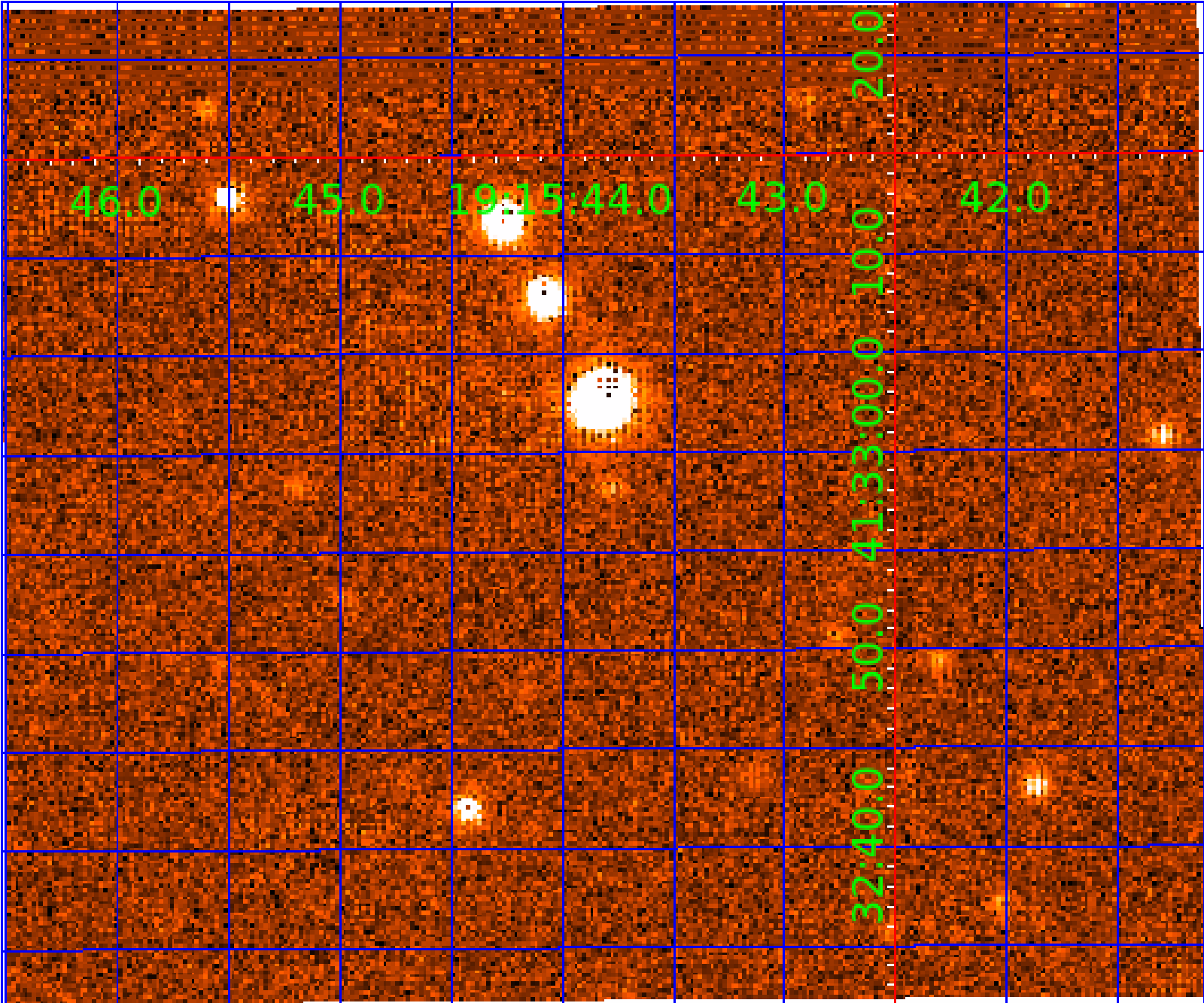


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006195999

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006195999-01	OBS	No	480.137372	162.278986	1411.7	3.904	12.2	8.2	0.76	5386	2.83	0.38
006195999-02	OBS	No	415.544924	524.873497	856.1	4.983	14.7	4.3	0.76	5386	2.40	0.46
006195999-03	OBS	No	443.358308	299.265939	1429.0	3.065	14.1	7.7	0.76	5386	3.18	0.43
006195999-04	OBS	No	463.014527	408.208646	838.0	4.998	12.1	4.9	0.76	5386	2.33	0.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006195999-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006195999-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
006195999-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
006195999-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—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.

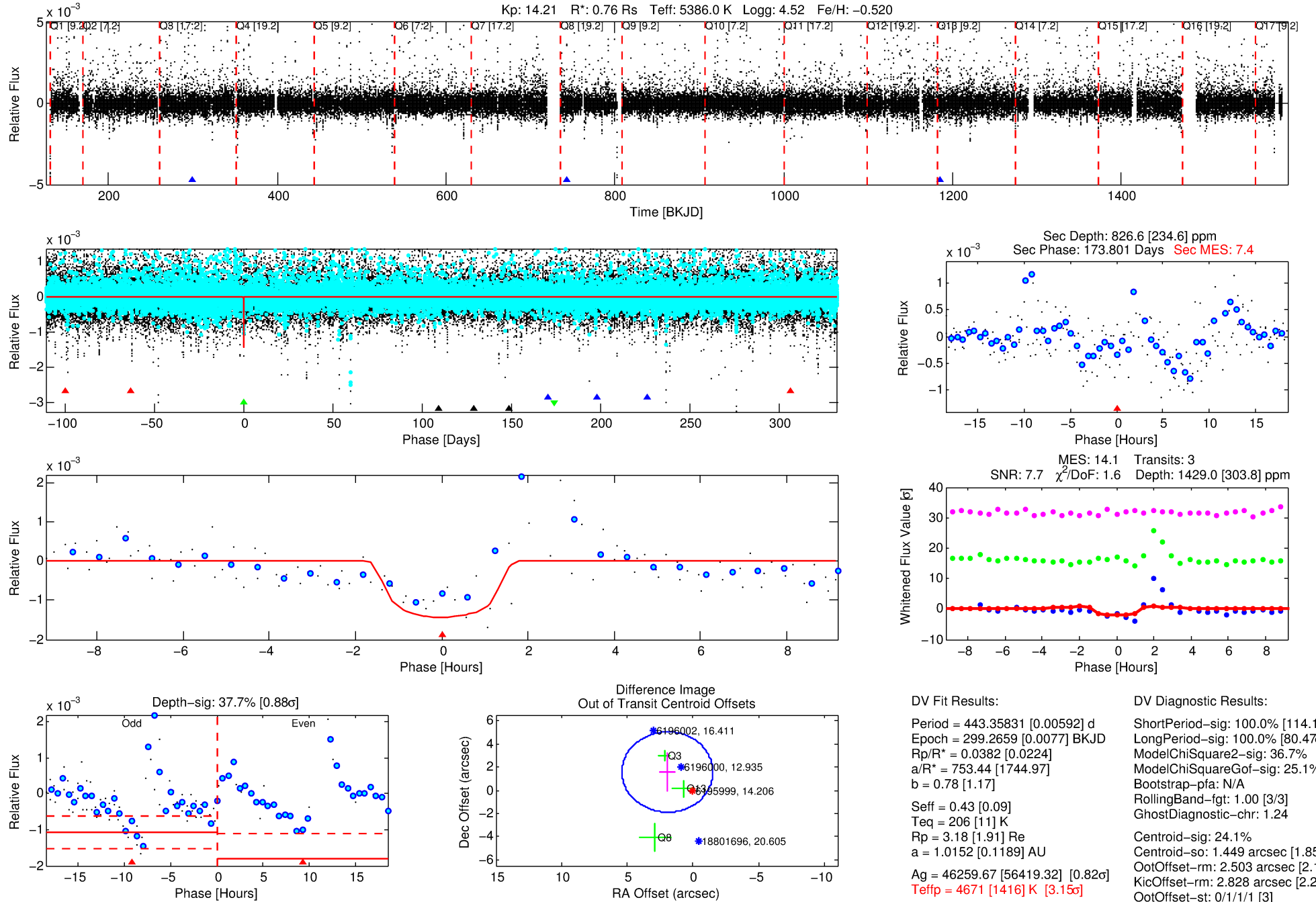
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006195999-03

No Significant Match Found

# DV One-Page Summary

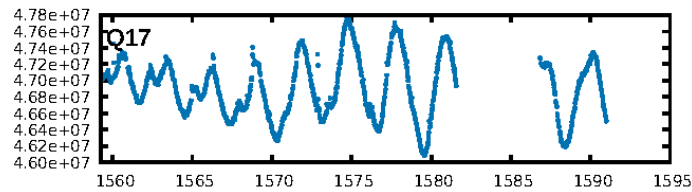
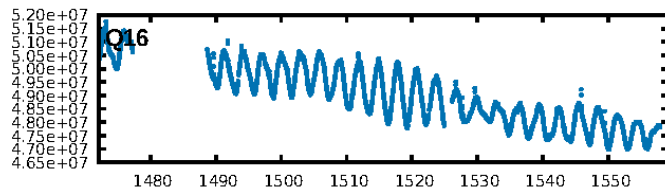
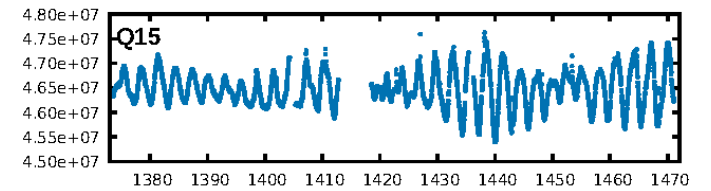
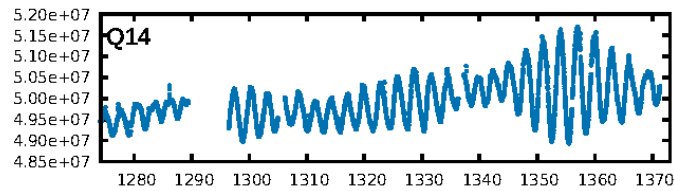
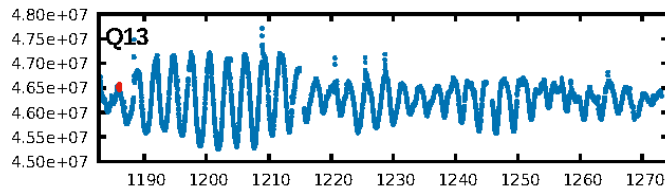
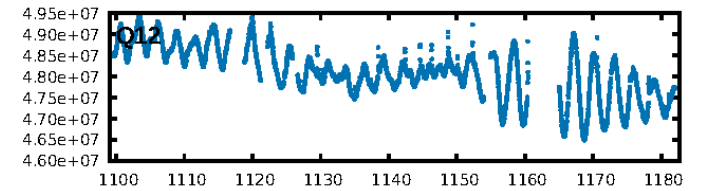
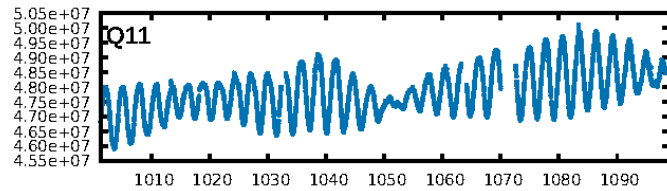
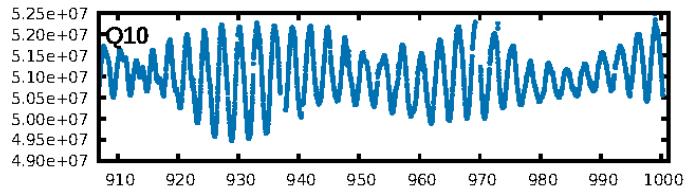
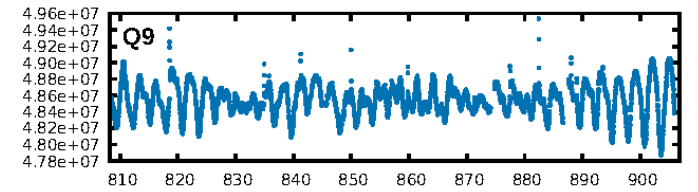
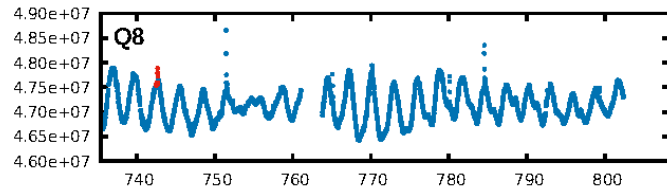
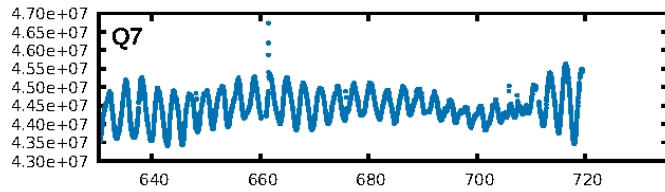
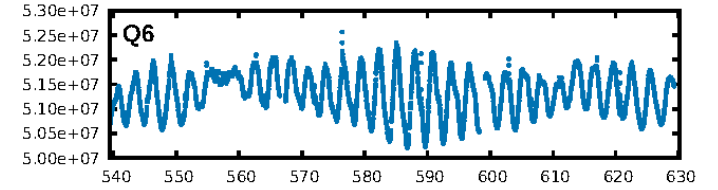
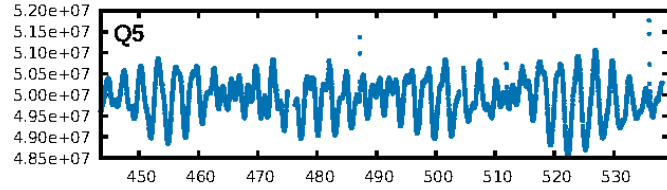
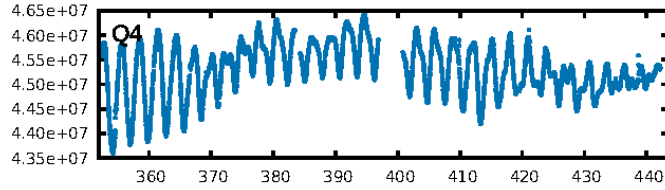
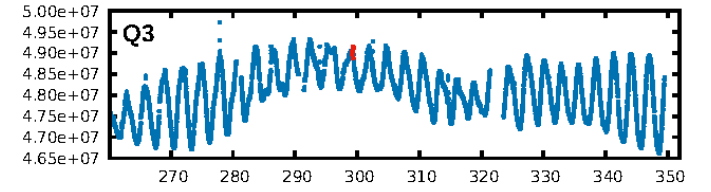
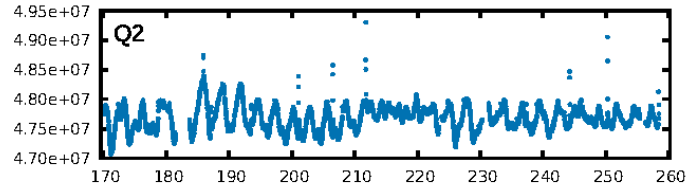
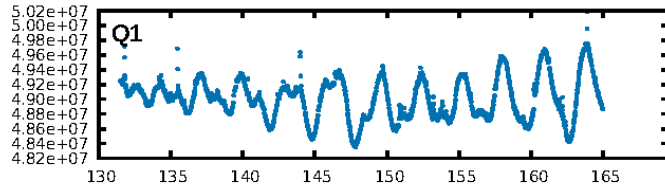
KIC: 6195999 Candidate: 3 of 4 Period: 443.358 d



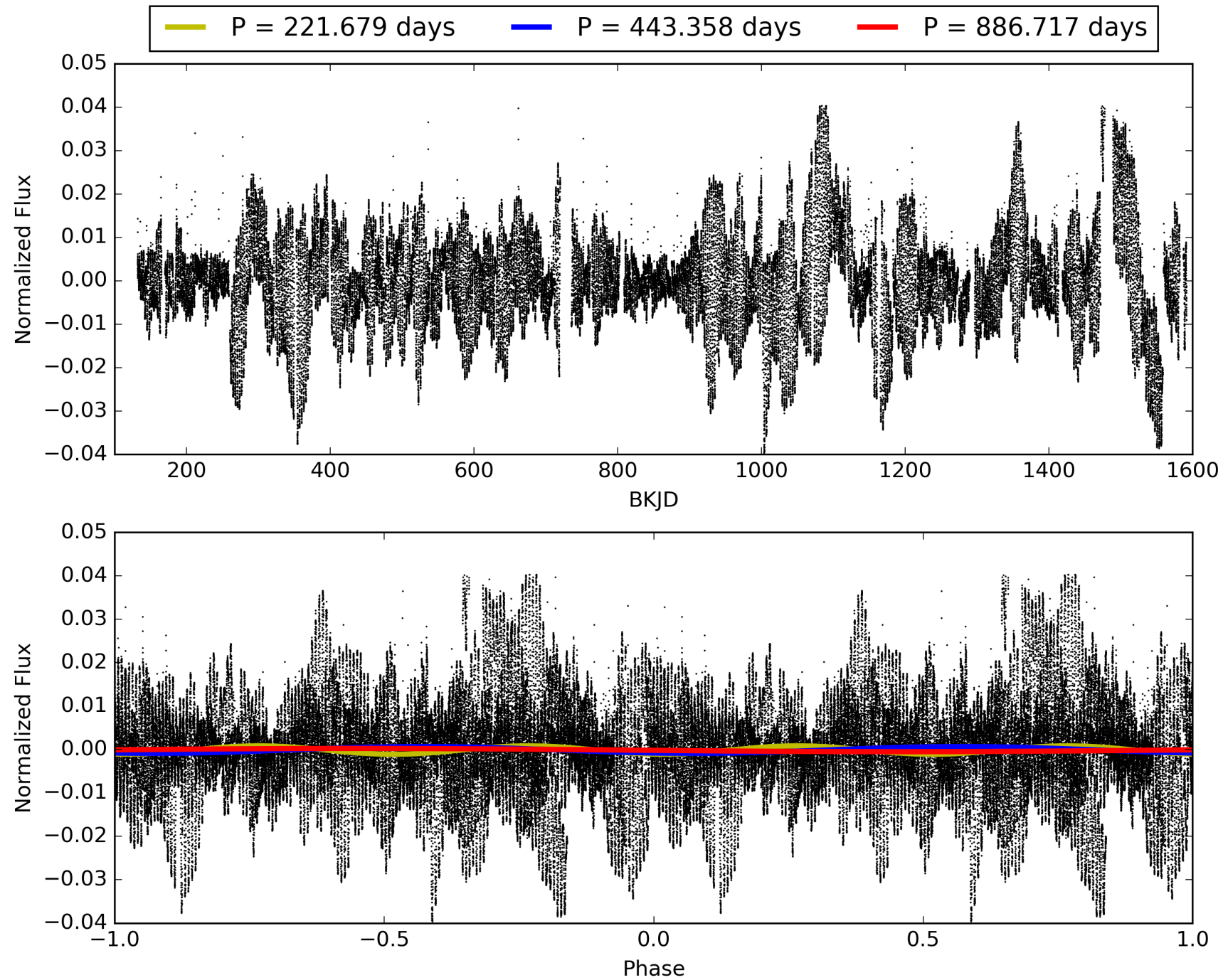
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:54:44 Z

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

# TCE 006195999-03, PDC Light Curves

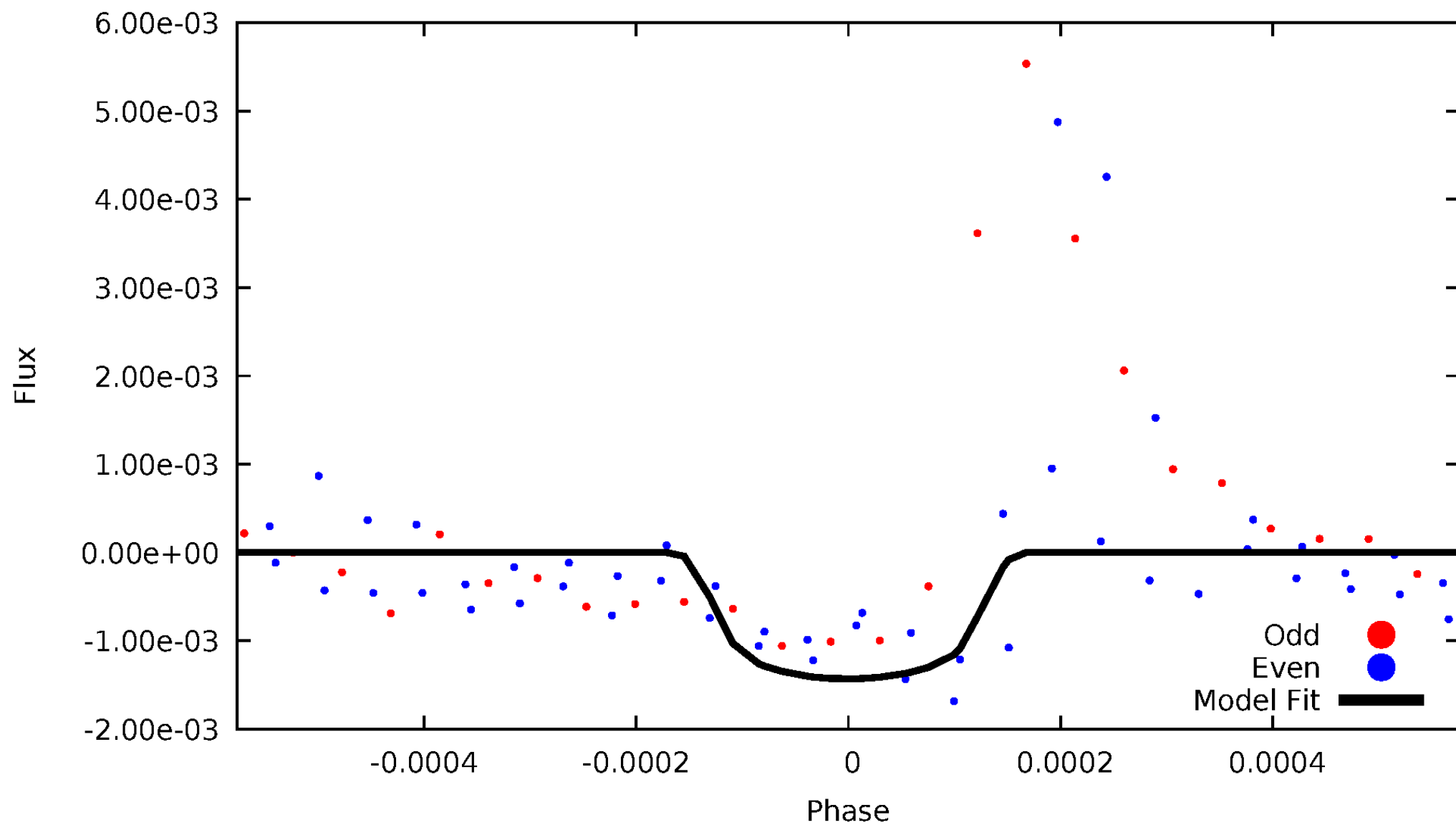


TCE 006195999-03



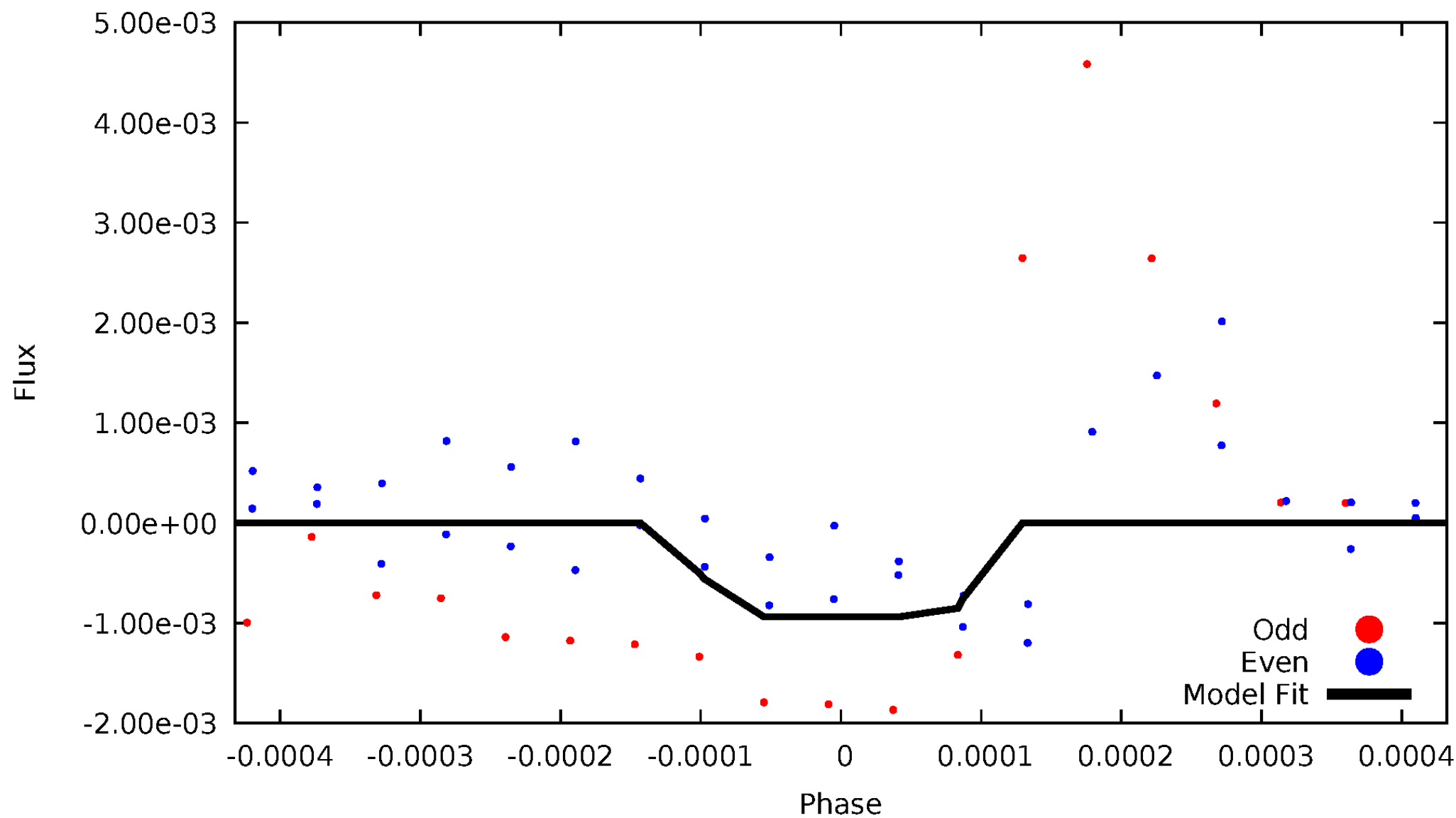
# DV Odd/Even

TCE 006195999-03



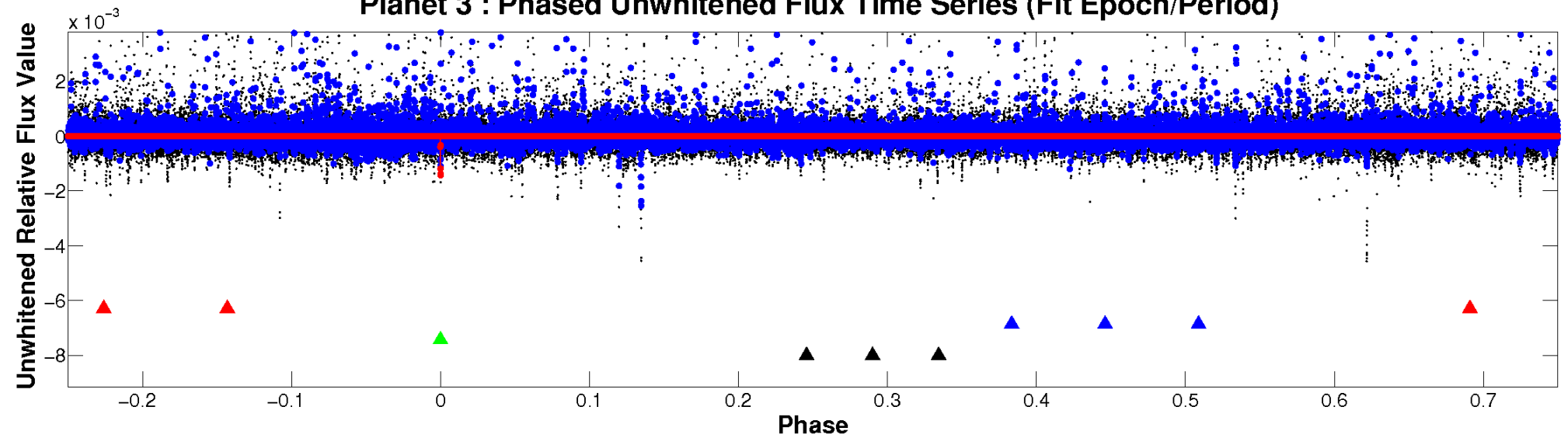
# ALT Odd/Even

TCE 006195999-03

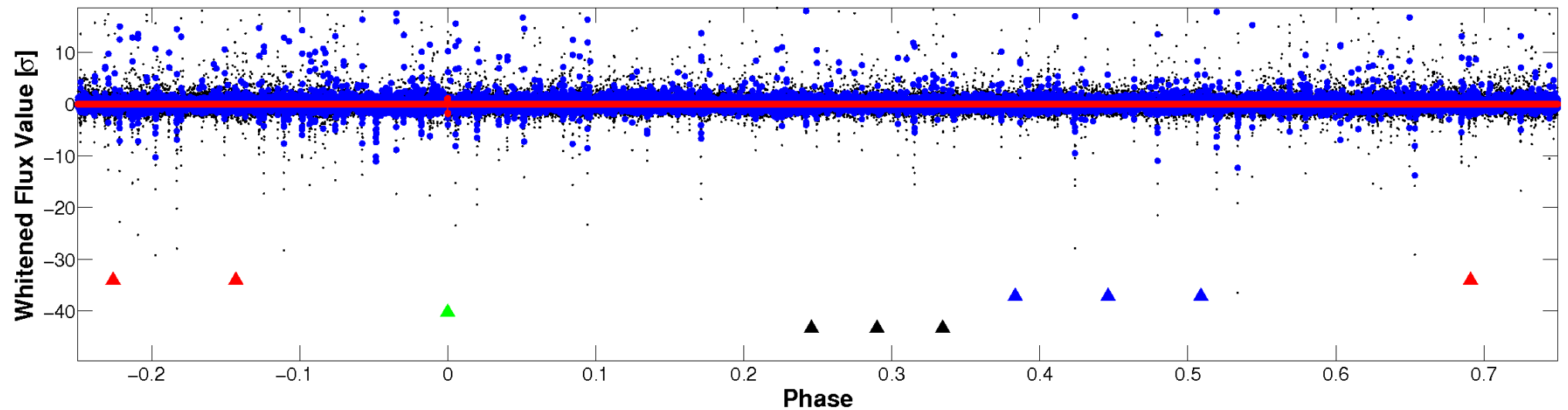


# Non-Whitened Vs. Whitened Light Curve

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

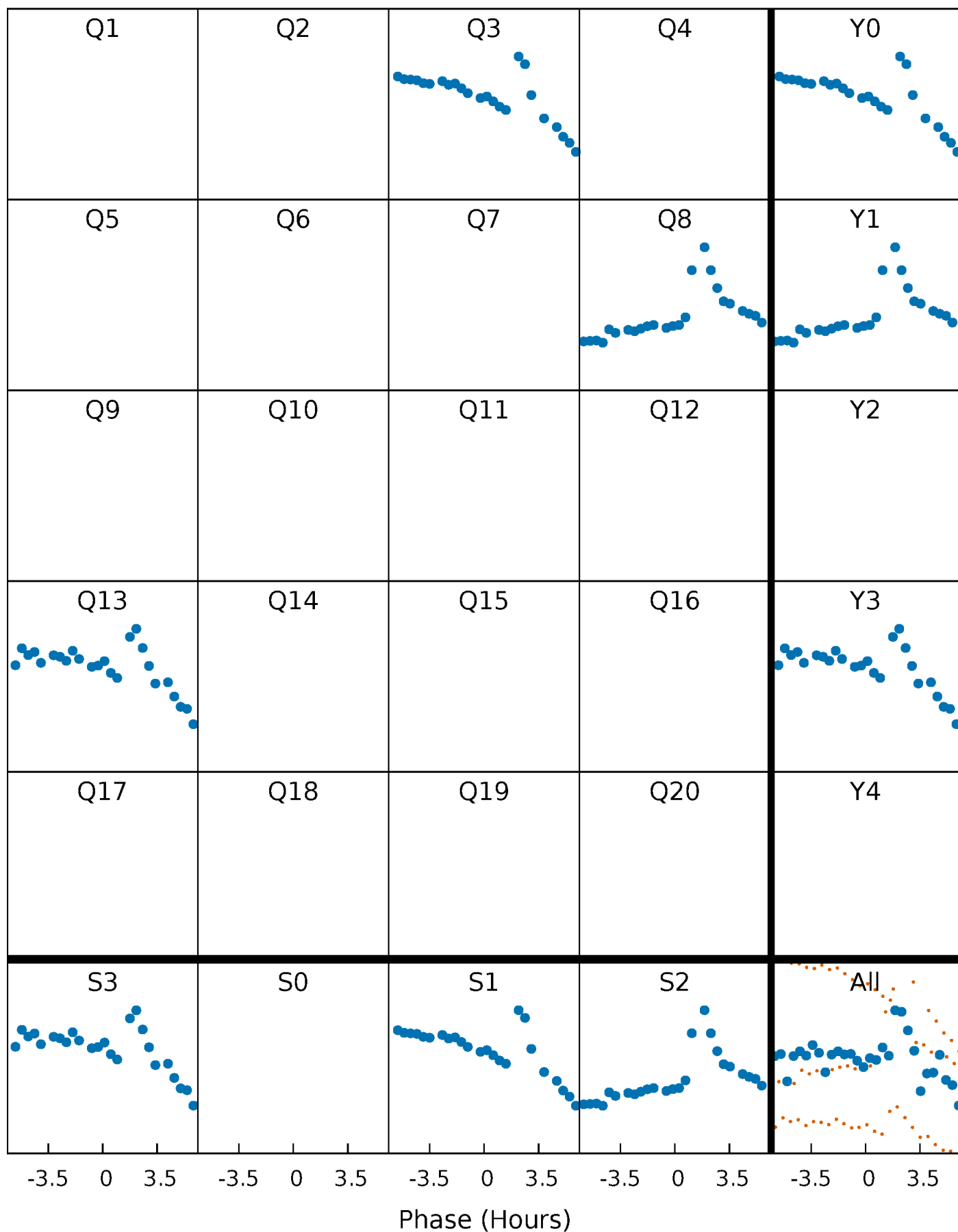


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

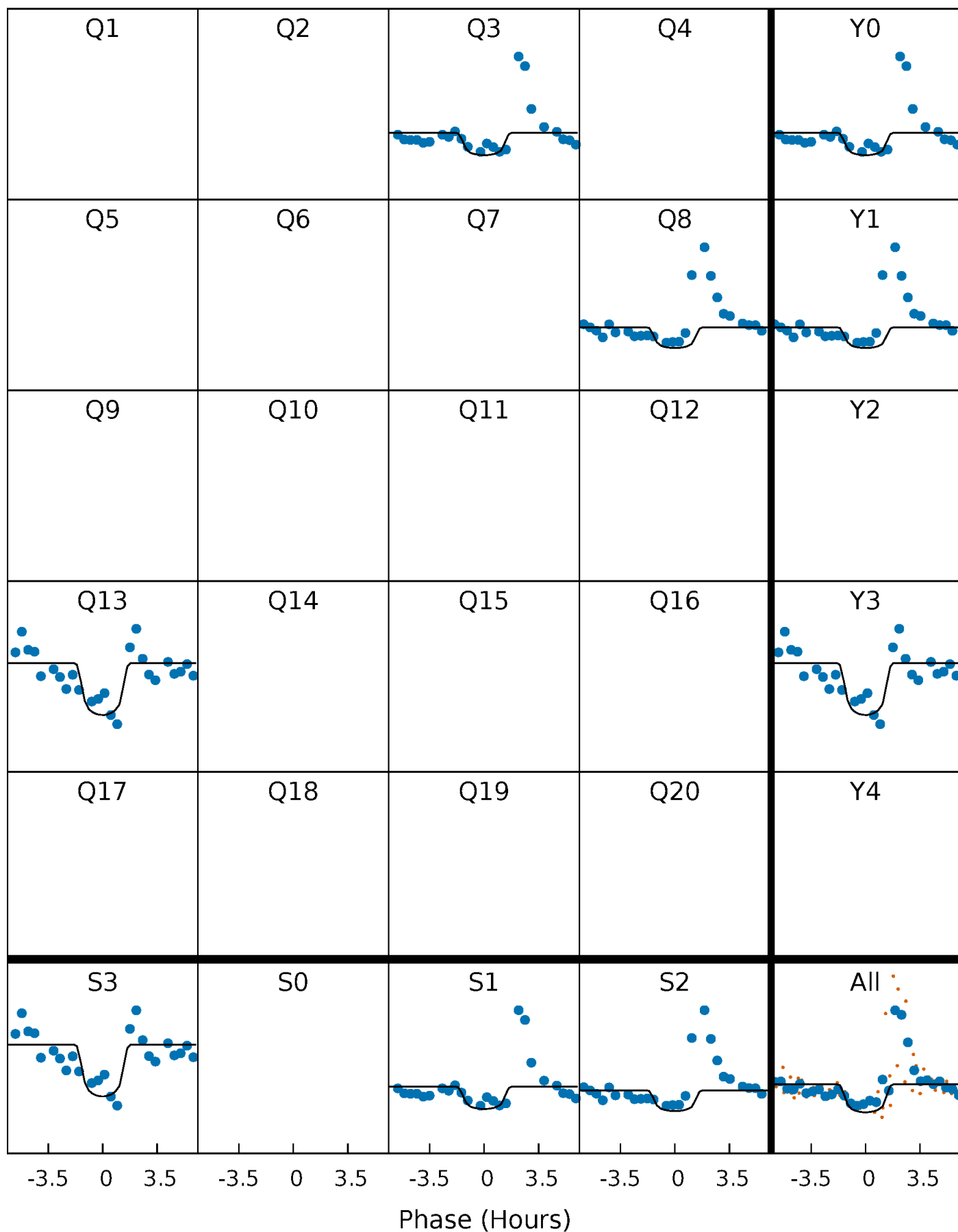
TCE 006195999-03     $P=443.358308$  Days     $T_0=299.265939$  (BKJD)





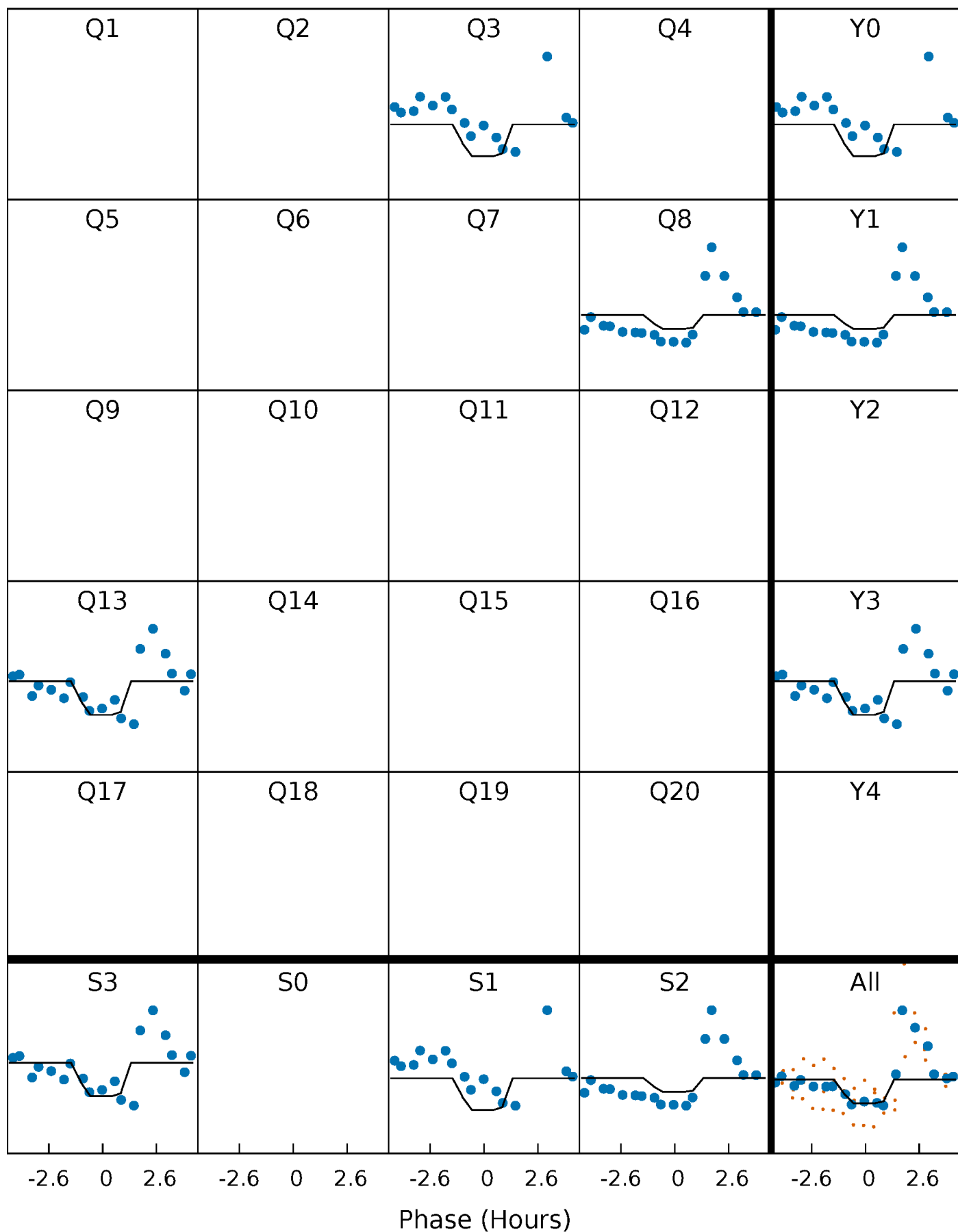
# DV Quarter-Phased Transit Curves

TCE 006195999-03     $P=443.358308$  Days     $T_0=299.265939$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

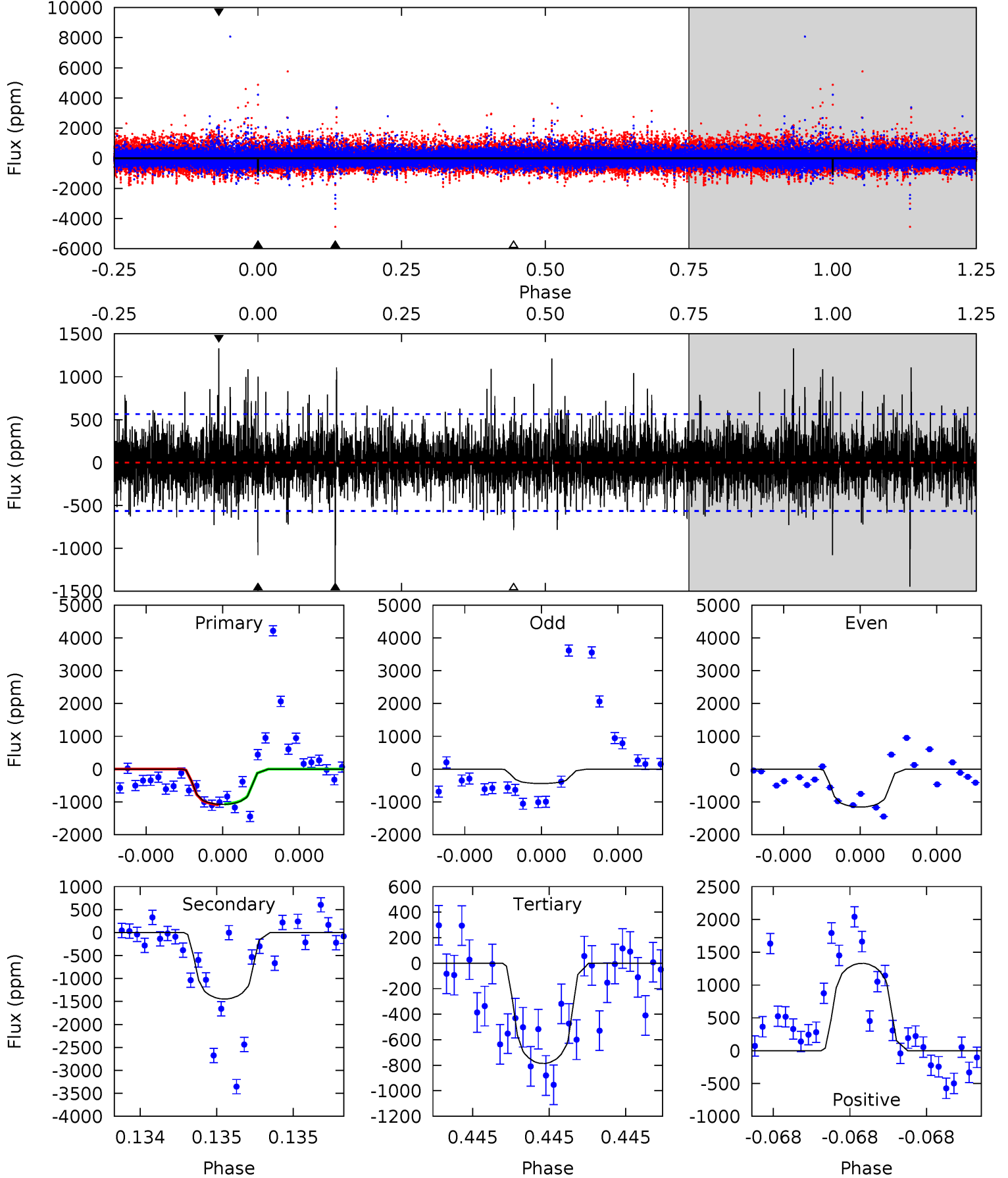
TCE 006195999-03 P=443.346951 Days  $T_0=299.273827$  (BKJD)



# DV Model-Shift Uniqueness Test

006195999-03, P = 443.358308 Days, E = 299.265939 Days

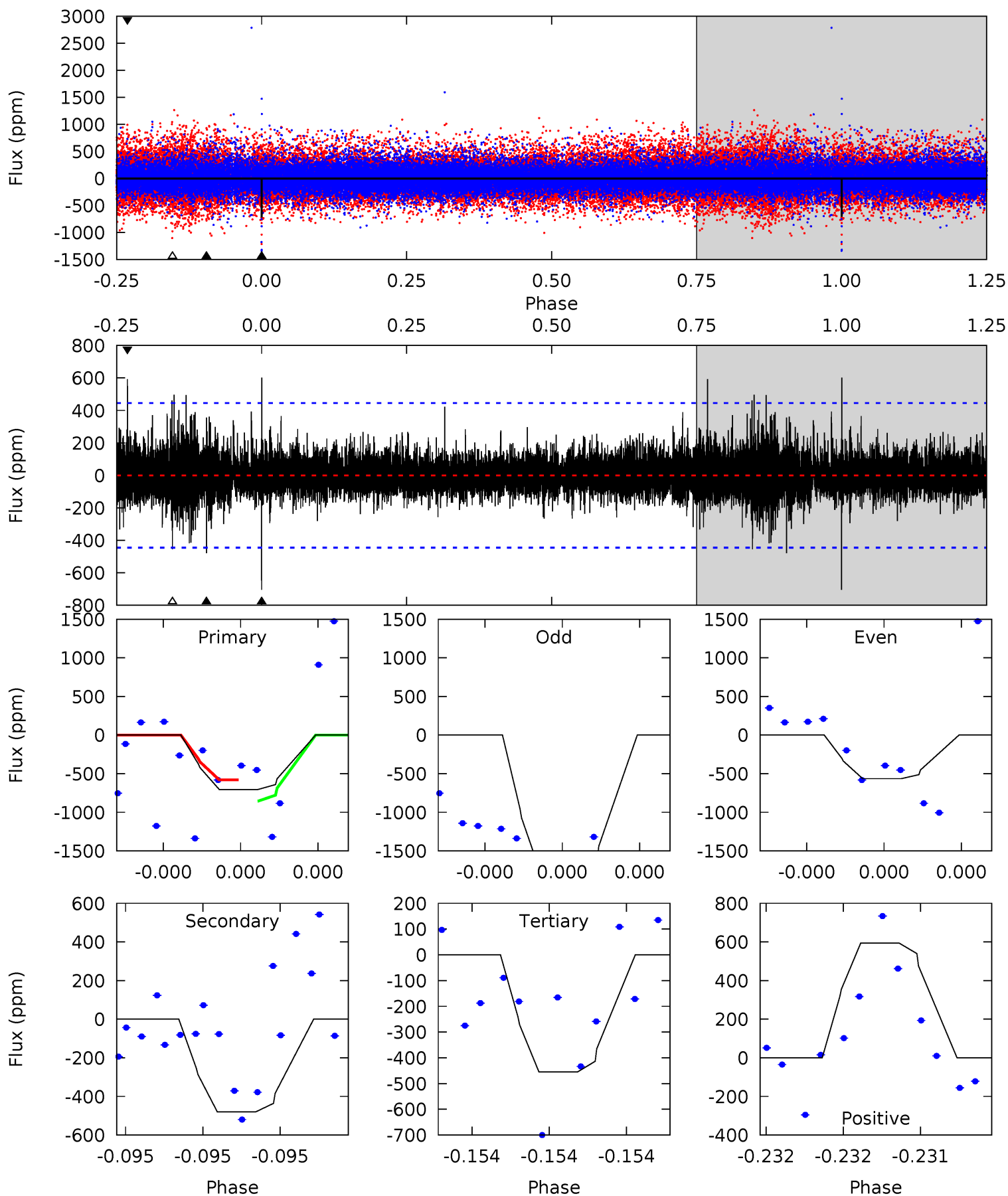
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	14.5	7.87	13.3	5.65	3.60	1.96	2.92	-2.53	6.60	1.16	2.68	0.88	0.48	0.12



# Alt Model-Shift Uniqueness Test

006195999-03, P = 443.346951 Days, E = 299.273827 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
9.09	6.18	5.87	7.65	5.74	3.74	0.98	3.23	1.44	0.32	-1.47	8.12	1.22	0.46	1.79



### Stellar Parameters For KIC 006195999

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5386^{+162}_{-162}$	$4.524^{+0.099}_{-0.081}$	$-0.520^{+0.300}_{-0.300}$	$0.763^{+0.102}_{-0.092}$	$0.710^{+0.097}_{-0.045}$	$2.248^{+0.956}_{-0.565}$
	+3%/-3%	+2%/-2%	+58%/-58%	+13%/-12%	+14%/-6%	+43%/-25%
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 006195999-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1446 \pm 100$	$3.41^{+1.68}_{-1.67}$	$287^{+13}_{-13}$	$5217^{+2177}_{-810}$	$71484^{+213719}_{-39463}$
Alt.	$-479 \pm 78$	$2.81^{+1.69}_{-1.65}$	$288^{+13}_{-14}$	$4525^{+2111}_{-748}$	$35180^{+171166}_{-21962}$

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

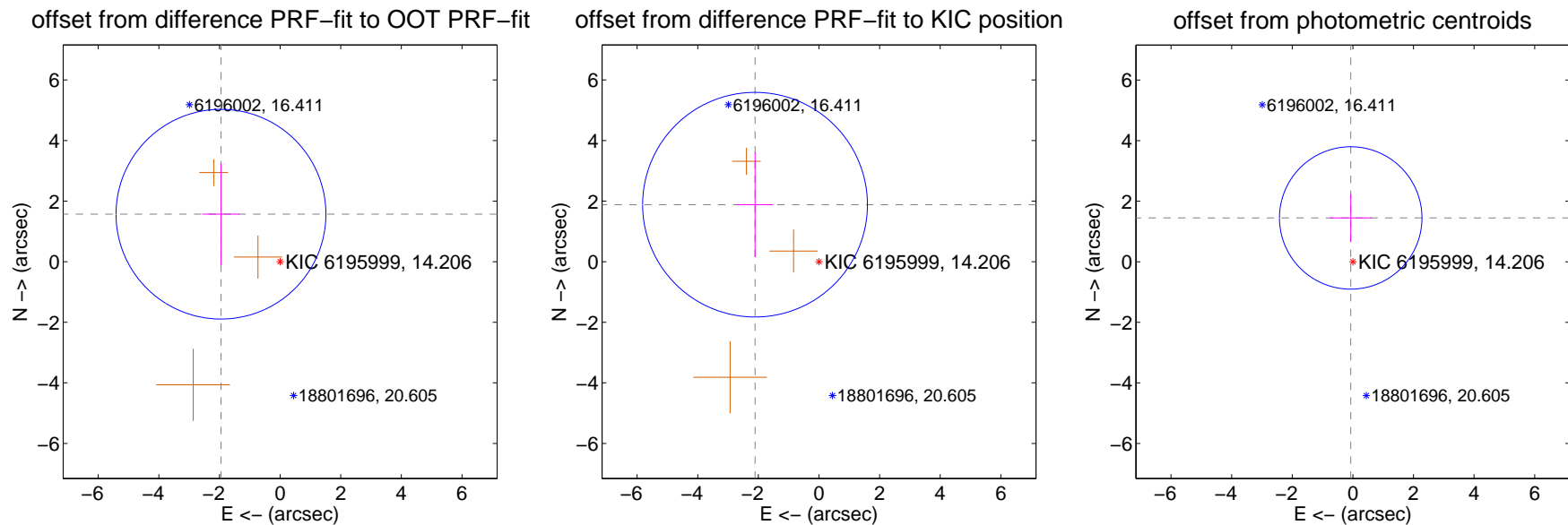
## DV Centroid Data

Supplemental centroid analysis for 006195999-03. Kepler magnitude: 14.21. Transit SNR 7.71

There are 0 quarters with good PRF difference image offsets

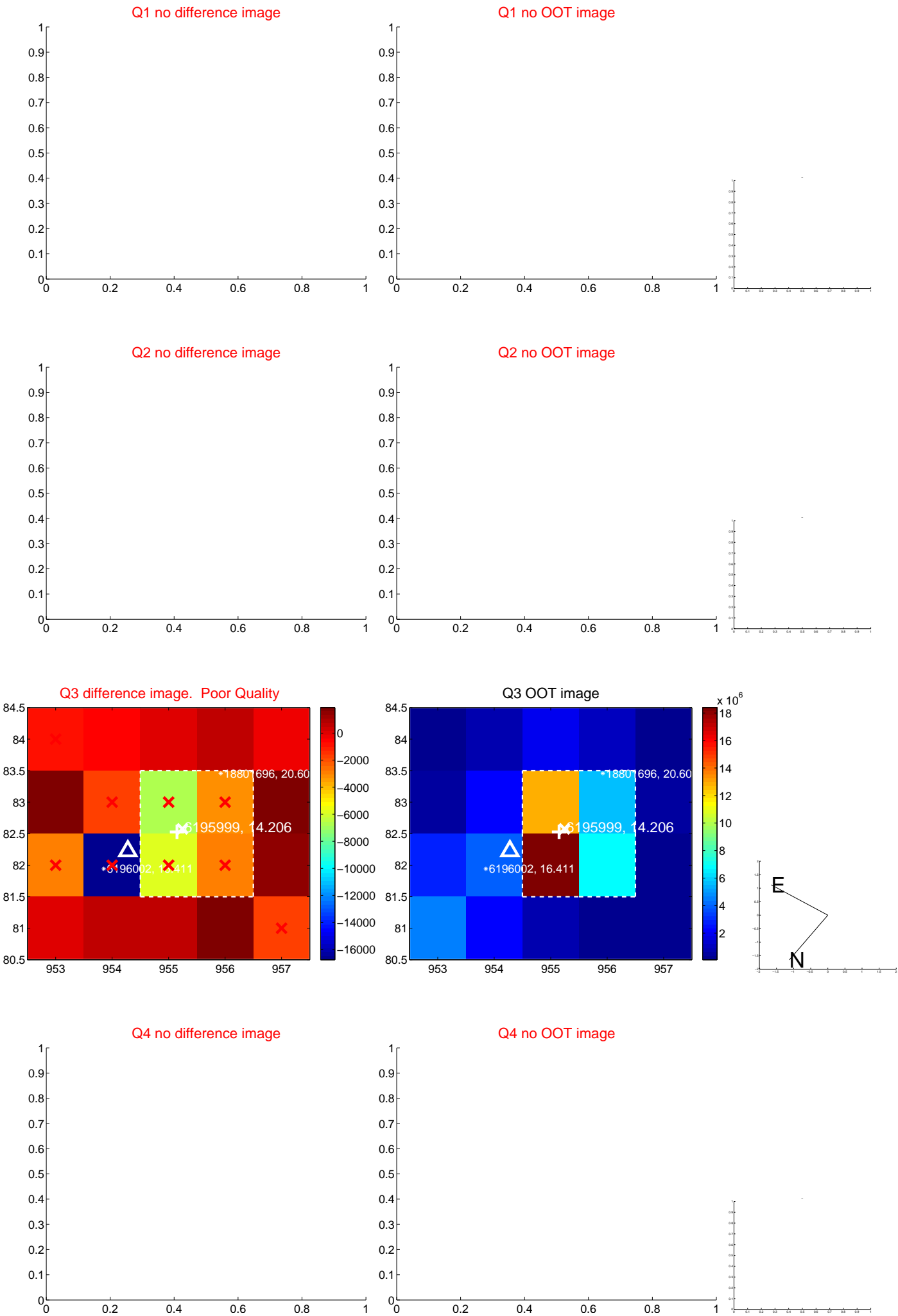
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.503 \pm 1.154$	2.17	$1.951 \pm 0.614$	$1.569 \pm 1.676$
PRF-fit source offset from KIC position	$2.828 \pm 1.236$	2.29	$2.110 \pm 0.597$	$1.882 \pm 1.732$
photometric centroid source offset	$1.45 \pm 0.78$	1.85	$0.07 \pm 0.70$	$1.45 \pm 0.78$

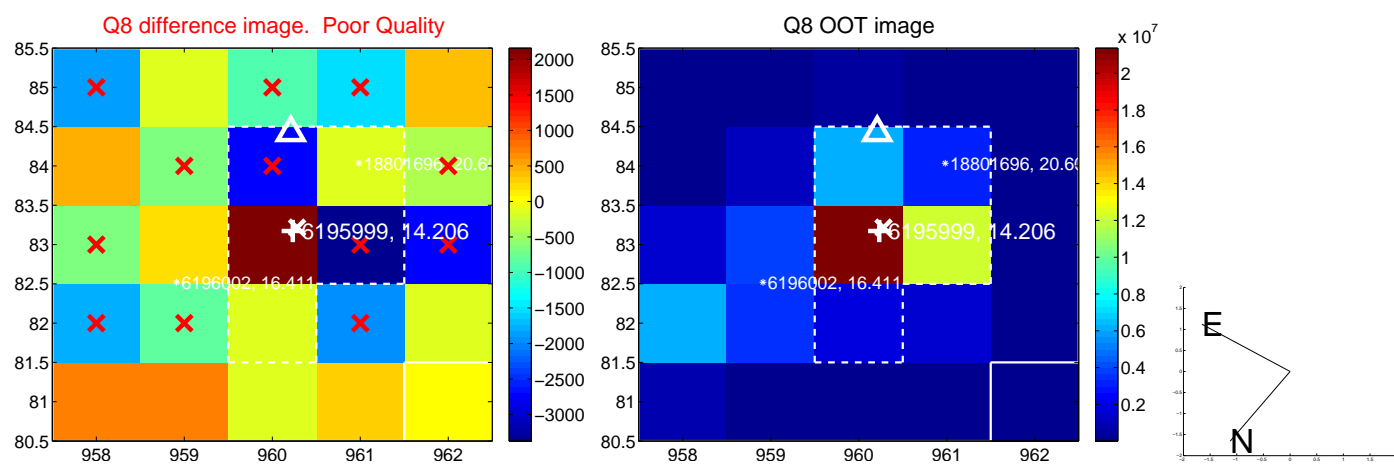
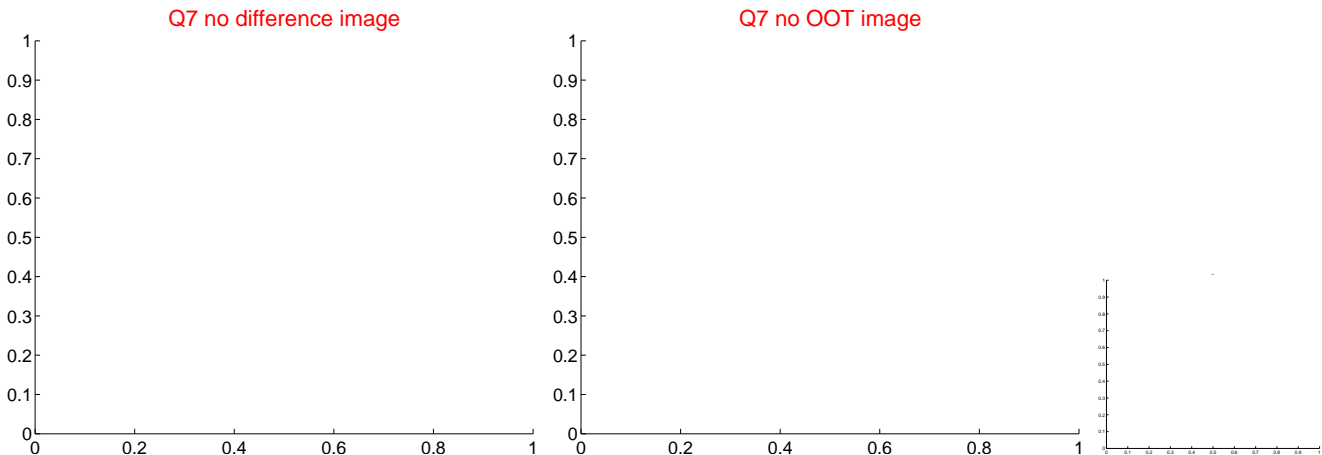
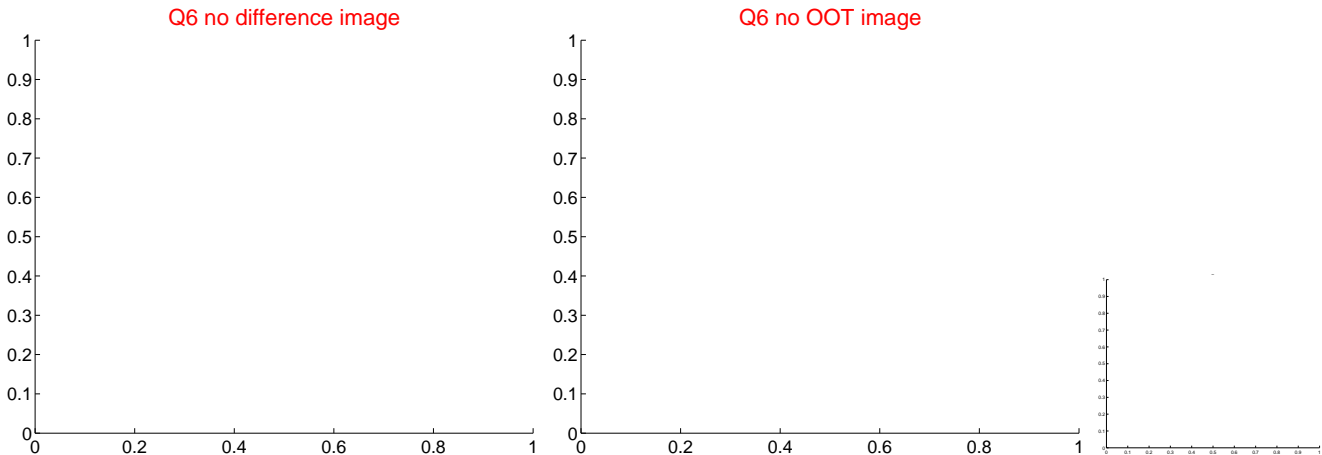
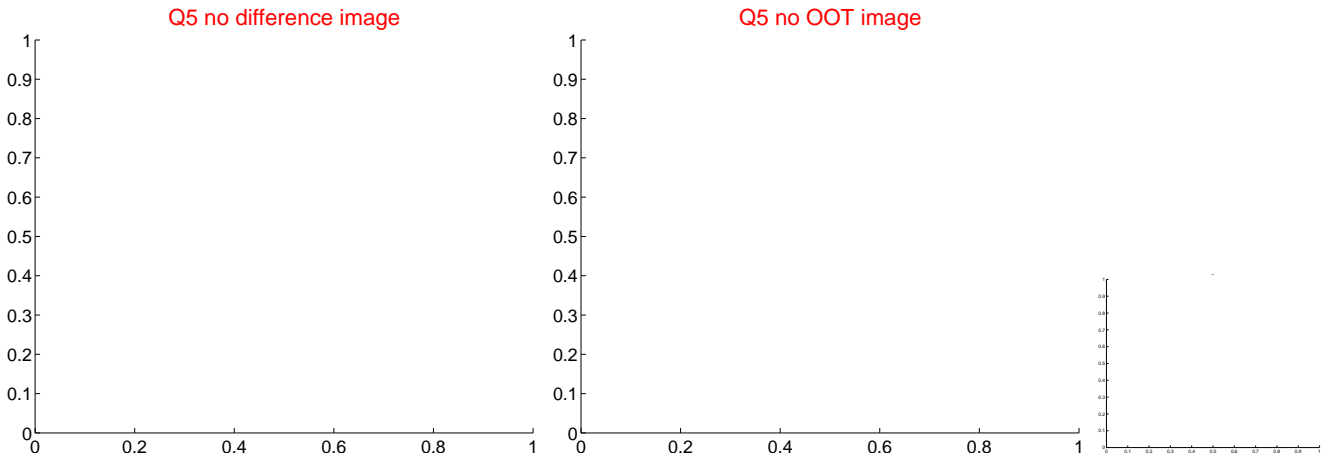


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

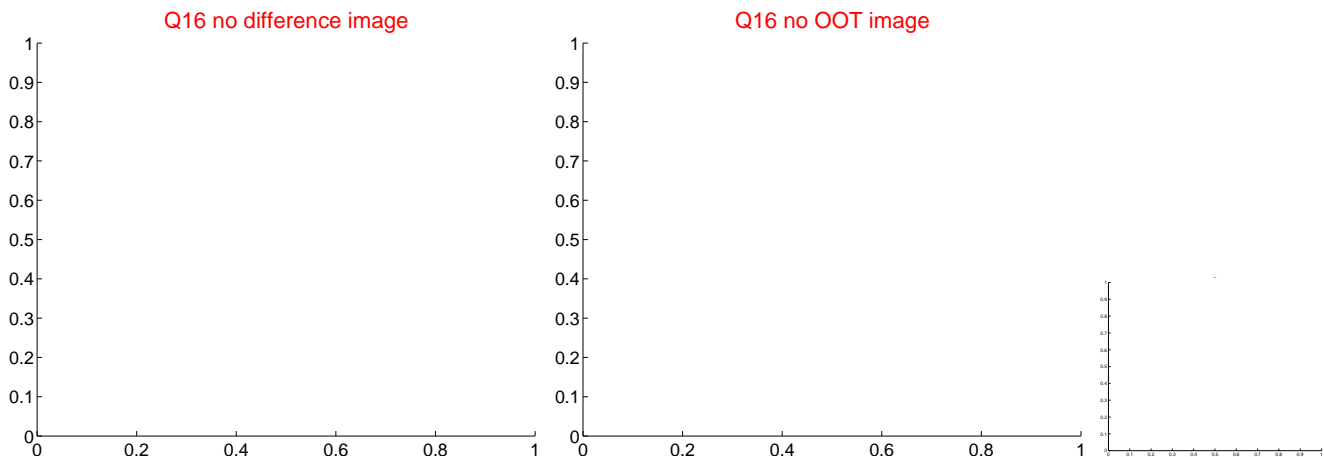
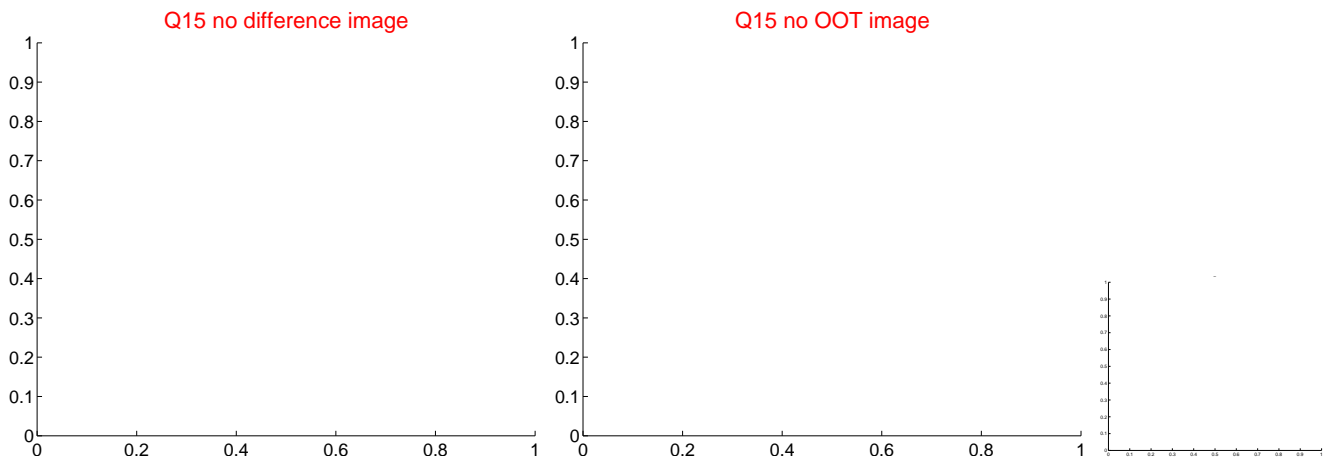
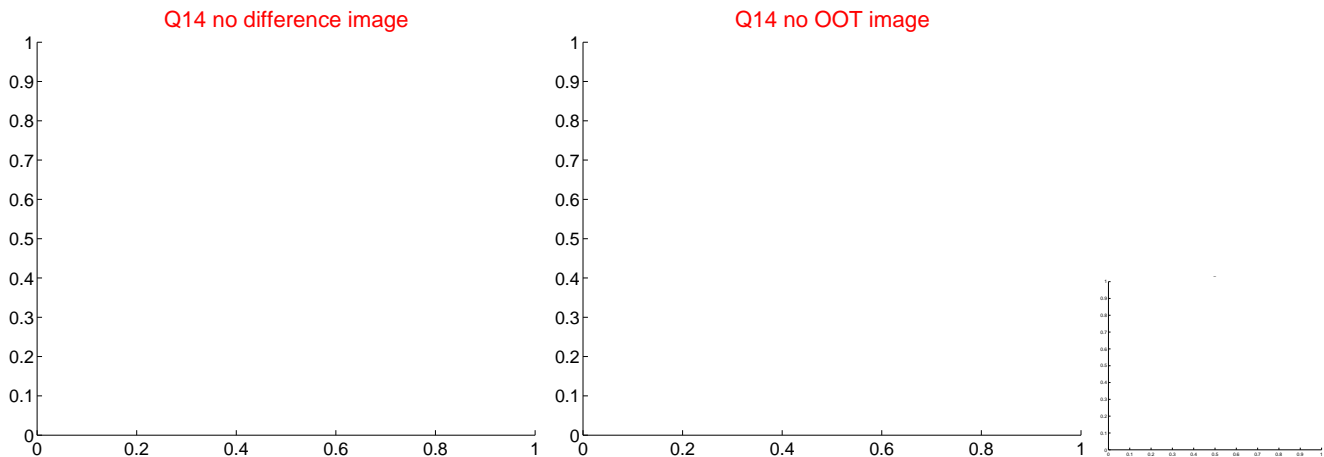
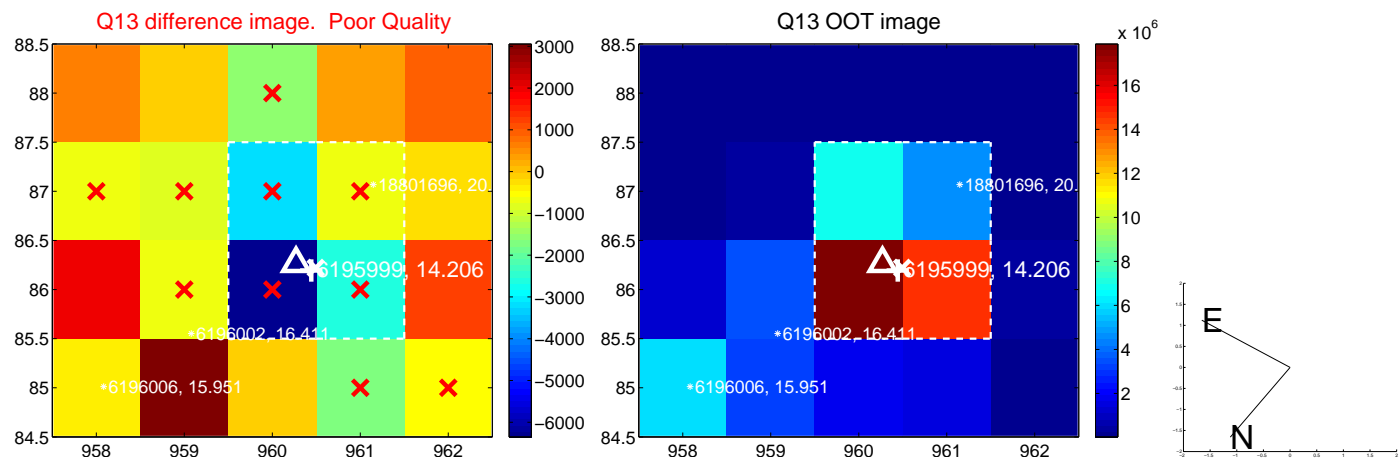




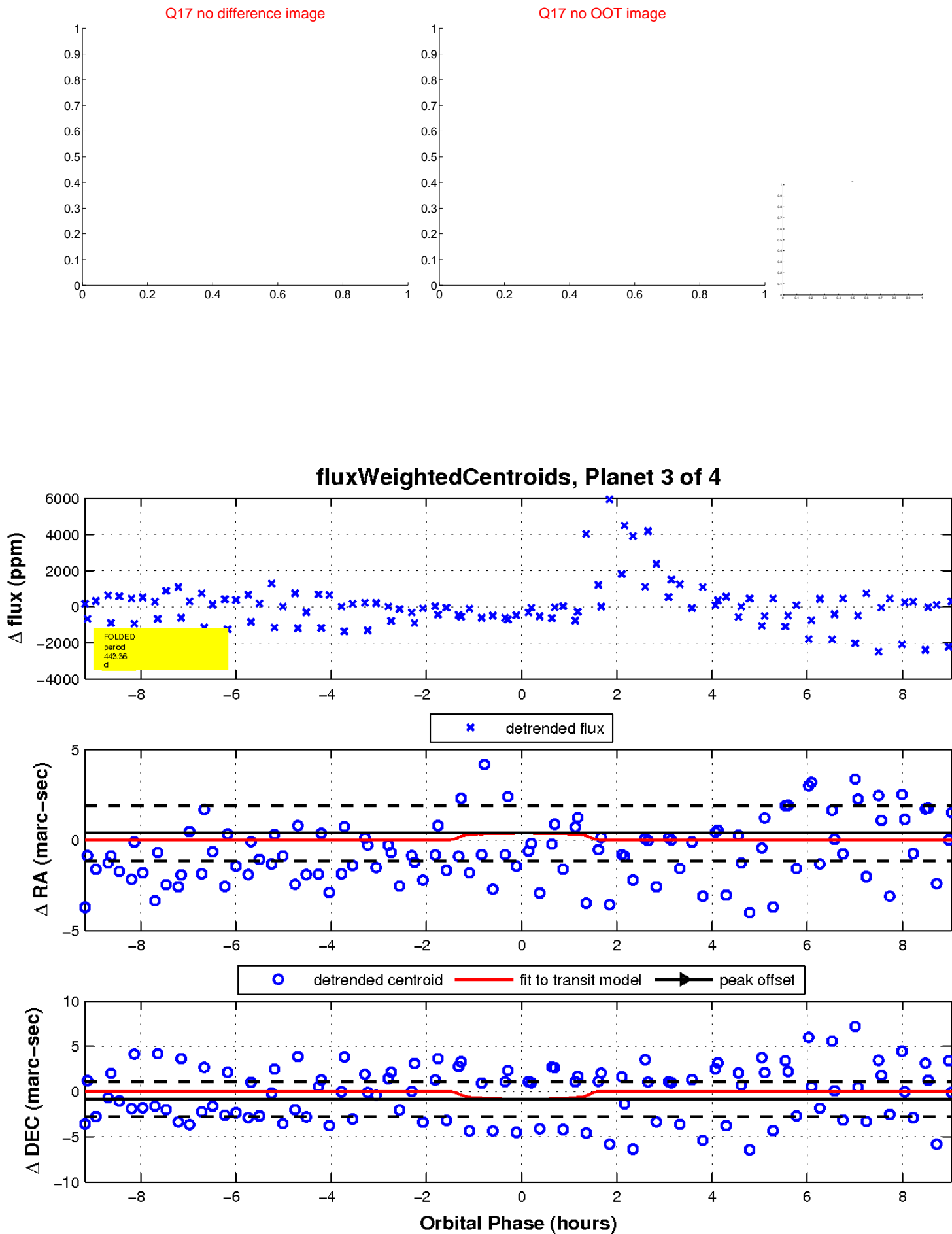
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

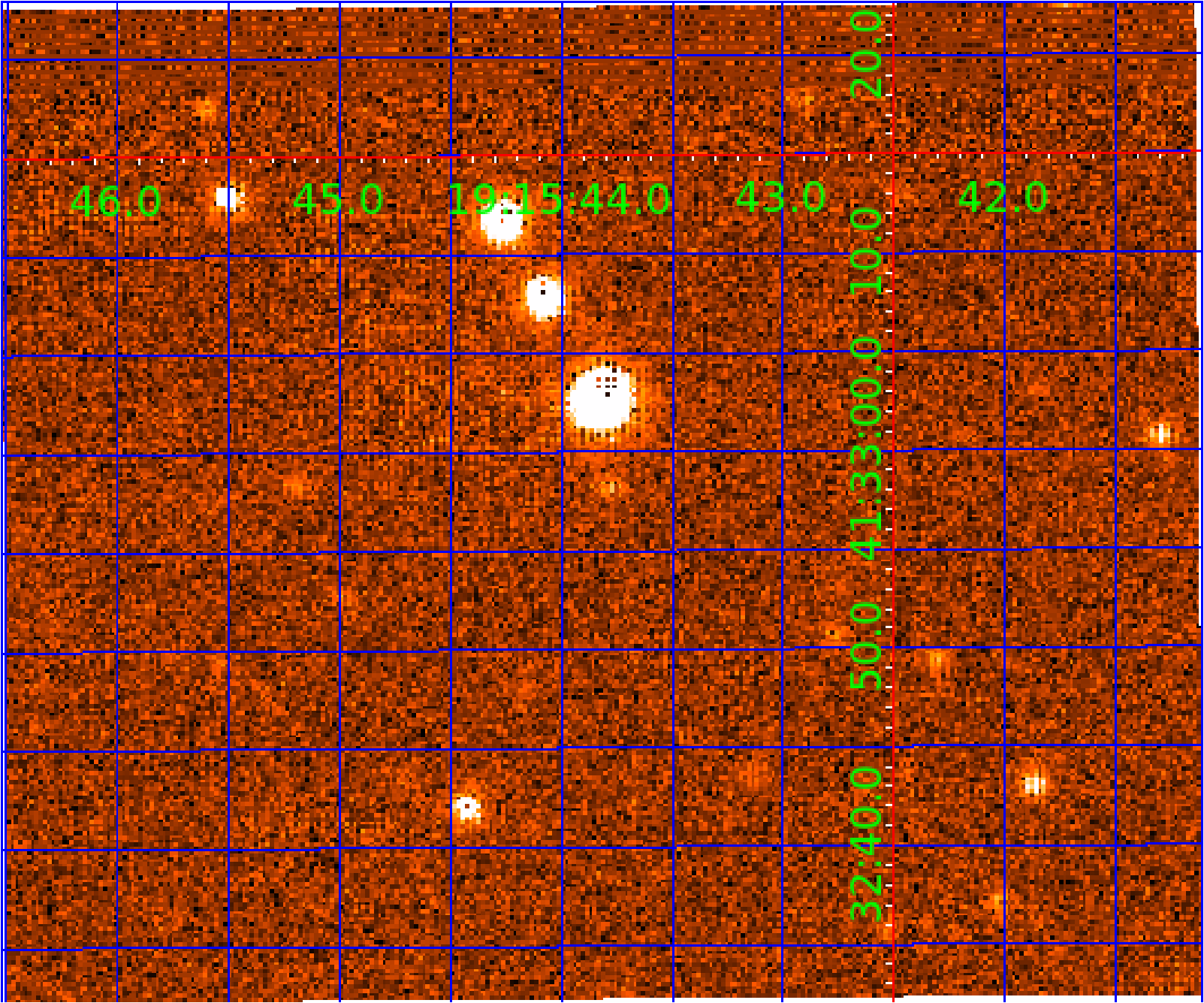


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006195999

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006195999-01	OBS	No	480.137372	162.278986	1411.7	3.904	12.2	8.2	0.76	5386	2.83	0.38
006195999-02	OBS	No	415.544924	524.873497	856.1	4.983	14.7	4.3	0.76	5386	2.40	0.46
006195999-03	OBS	No	443.358308	299.265939	1429.0	3.065	14.1	7.7	0.76	5386	3.18	0.43
006195999-04	OBS	No	463.014527	408.208646	838.0	4.998	12.1	4.9	0.76	5386	2.33	0.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006195999-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006195999-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
006195999-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
006195999-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—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.

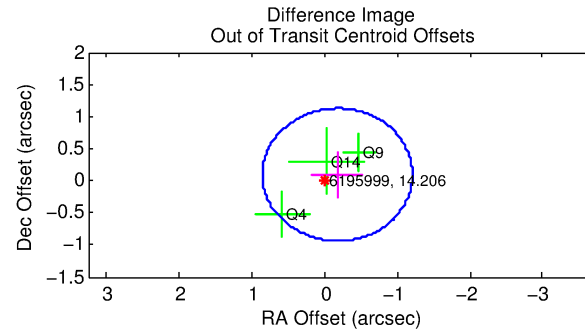
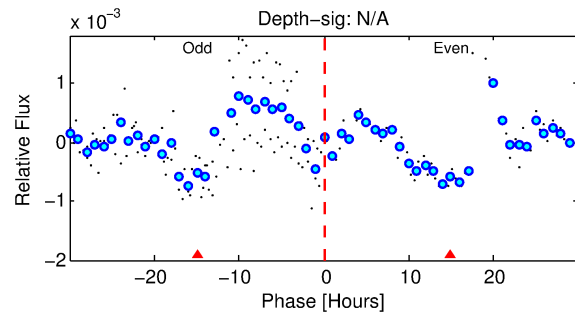
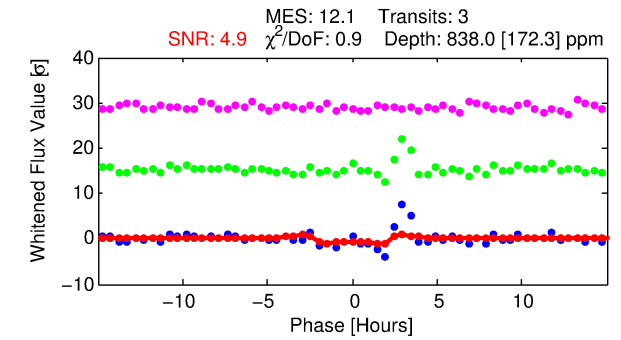
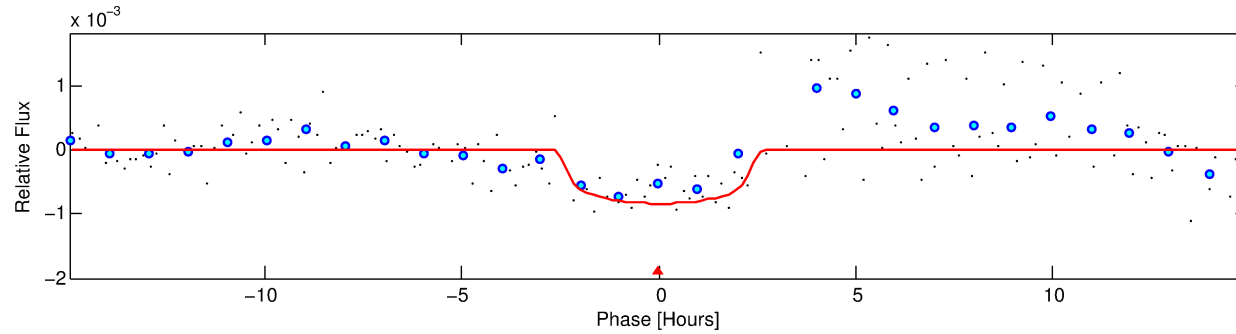
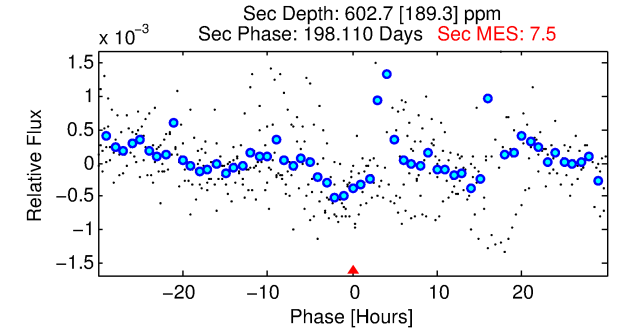
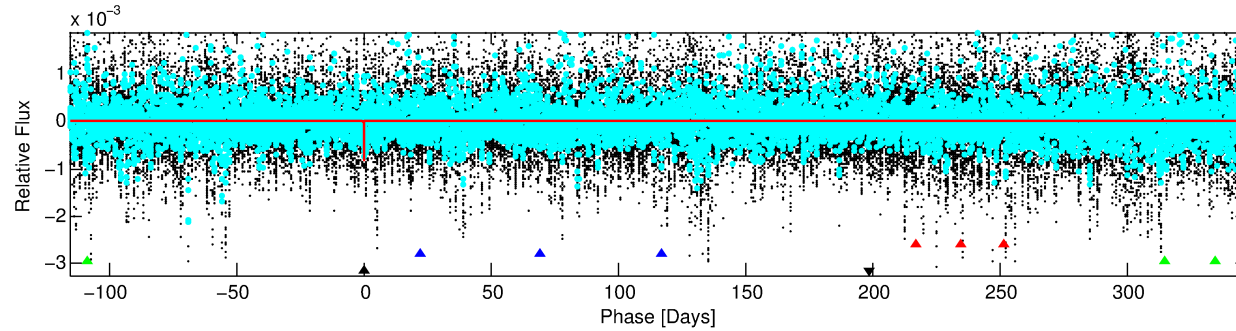
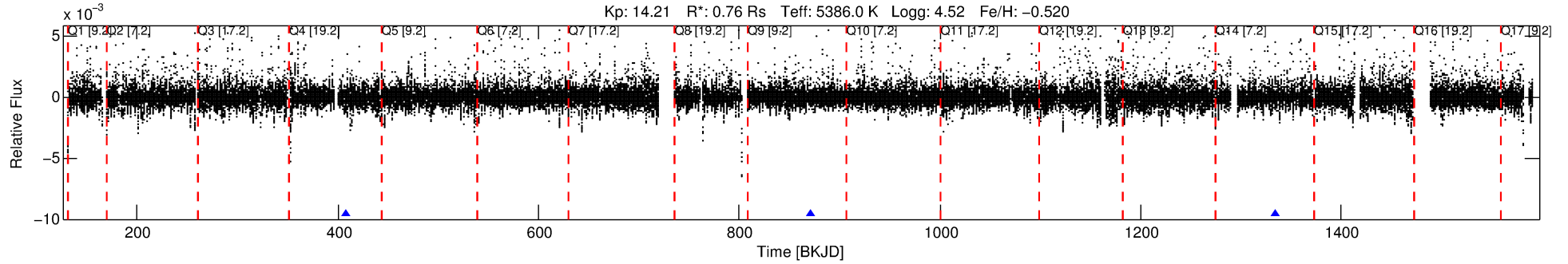
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006195999-04

No Significant Match Found

# DV One-Page Summary

KIC: 6195999 Candidate: 4 of 4 Period: 463.015 d



## DV Fit Results:

Period = 463.01453 [0.00575] d  
Epoch = 408.2086 [0.0084] BKJD  
Rp/R\* = 0.0280 [0.0214]  
a/R\* = 553.48 [1737.37]  
b = 0.67 [2.63]  
Seff = 0.40 [0.09]  
Teq = 203 [11] K  
Rp = 2.33 [1.80] Re  
a = 1.0450 [0.1224] AU  
Ag = 66466.27 [104044.34] [0.64σ]  
Teffp = 5040 [1966] K [2.46σ]

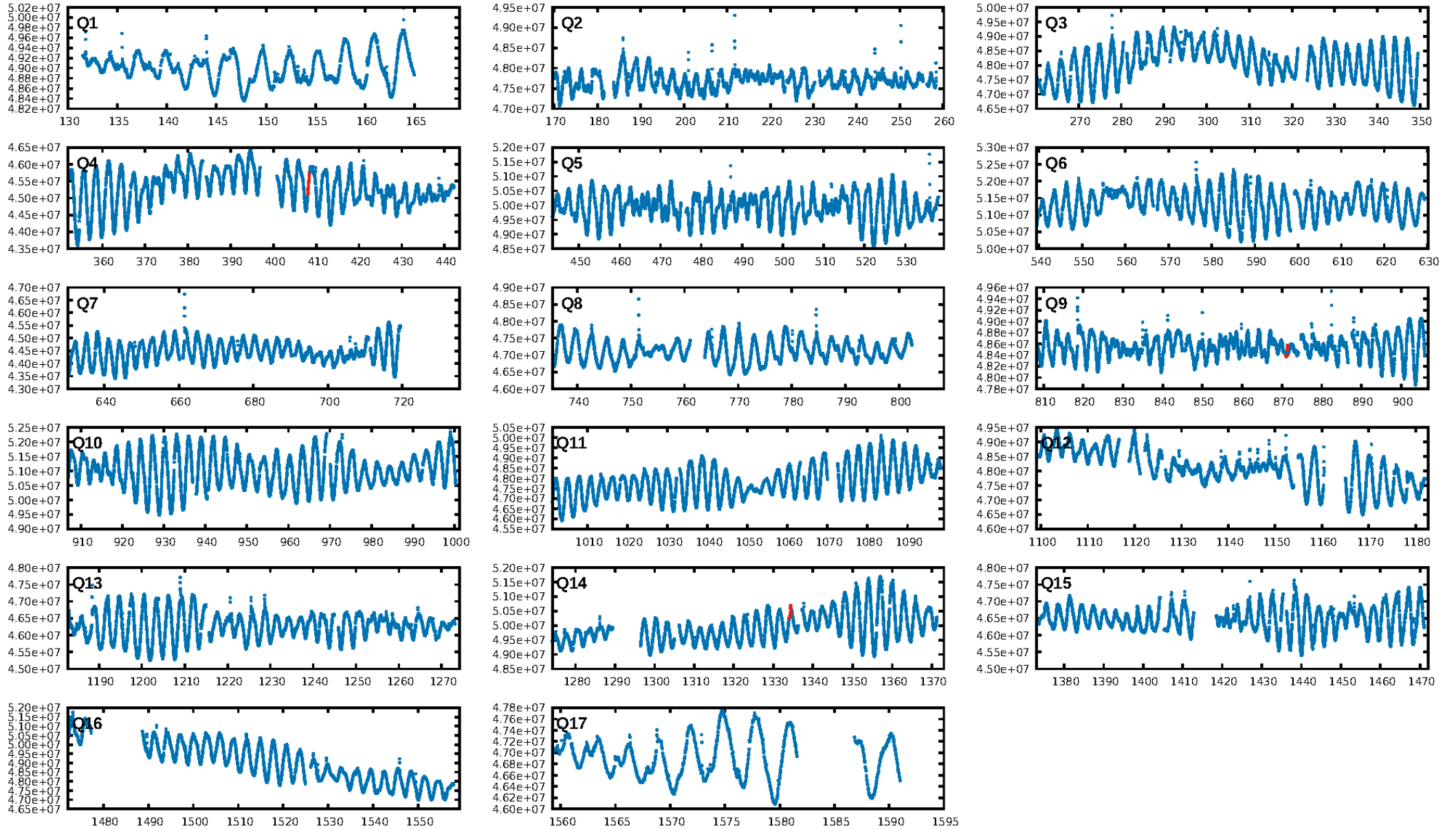
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [80.47σ]  
LongPeriod-sig: 100.0% [64.80σ]  
ModelChiSquare2-sig: 67.3%  
ModelChiSquareGof-sig: 96.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -2.92  
Centroid-sig: 0.5%  
Centroid-so: 2.296 arcsec [2.24σ]  
OotOffset-rm: 0.200 arcsec [0.58σ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-rm: 0.355 arcsec [1.06σ]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

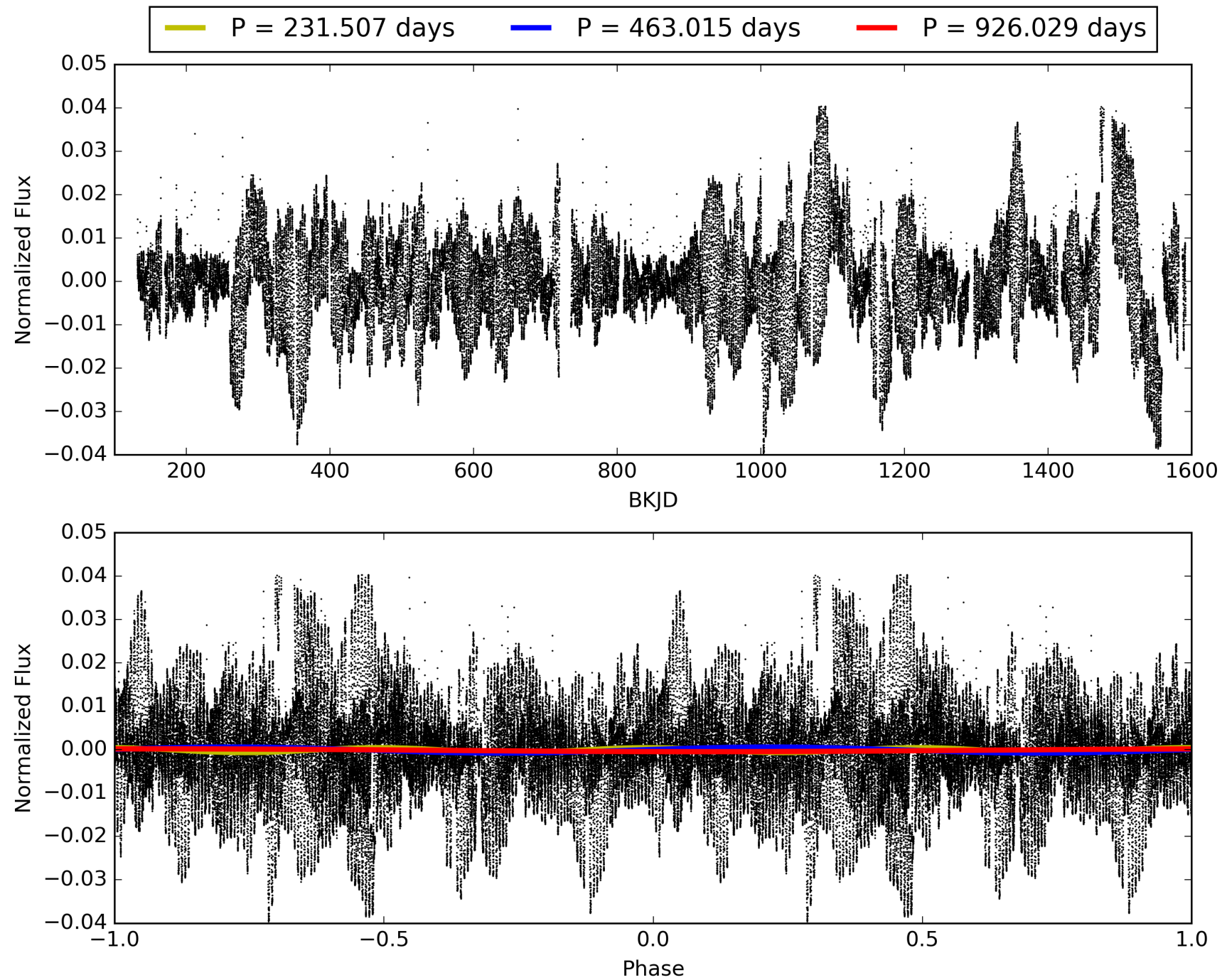
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:54:59 Z

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

# TCE 006195999-04, PDC Light Curves



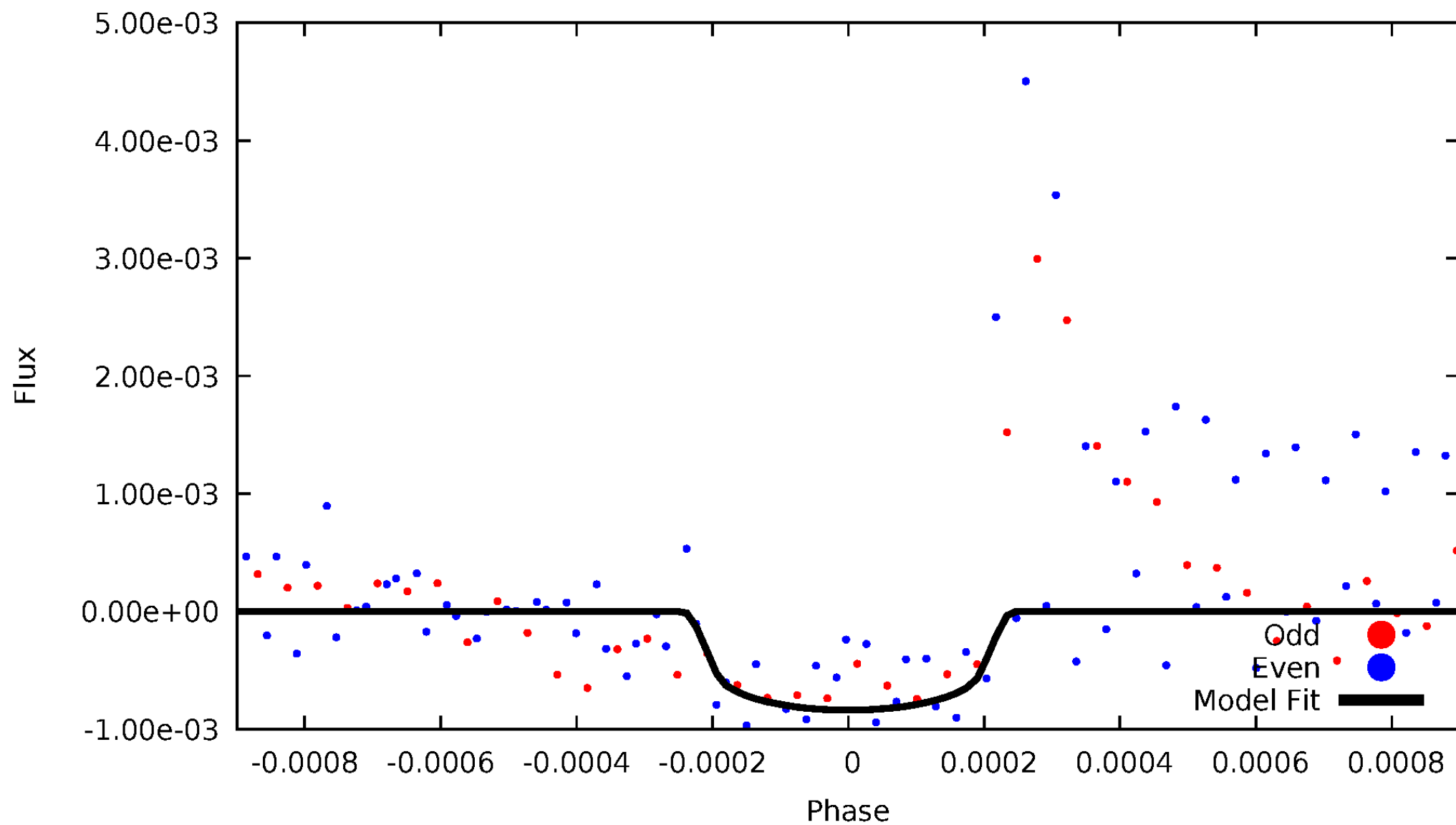
TCE 006195999-04





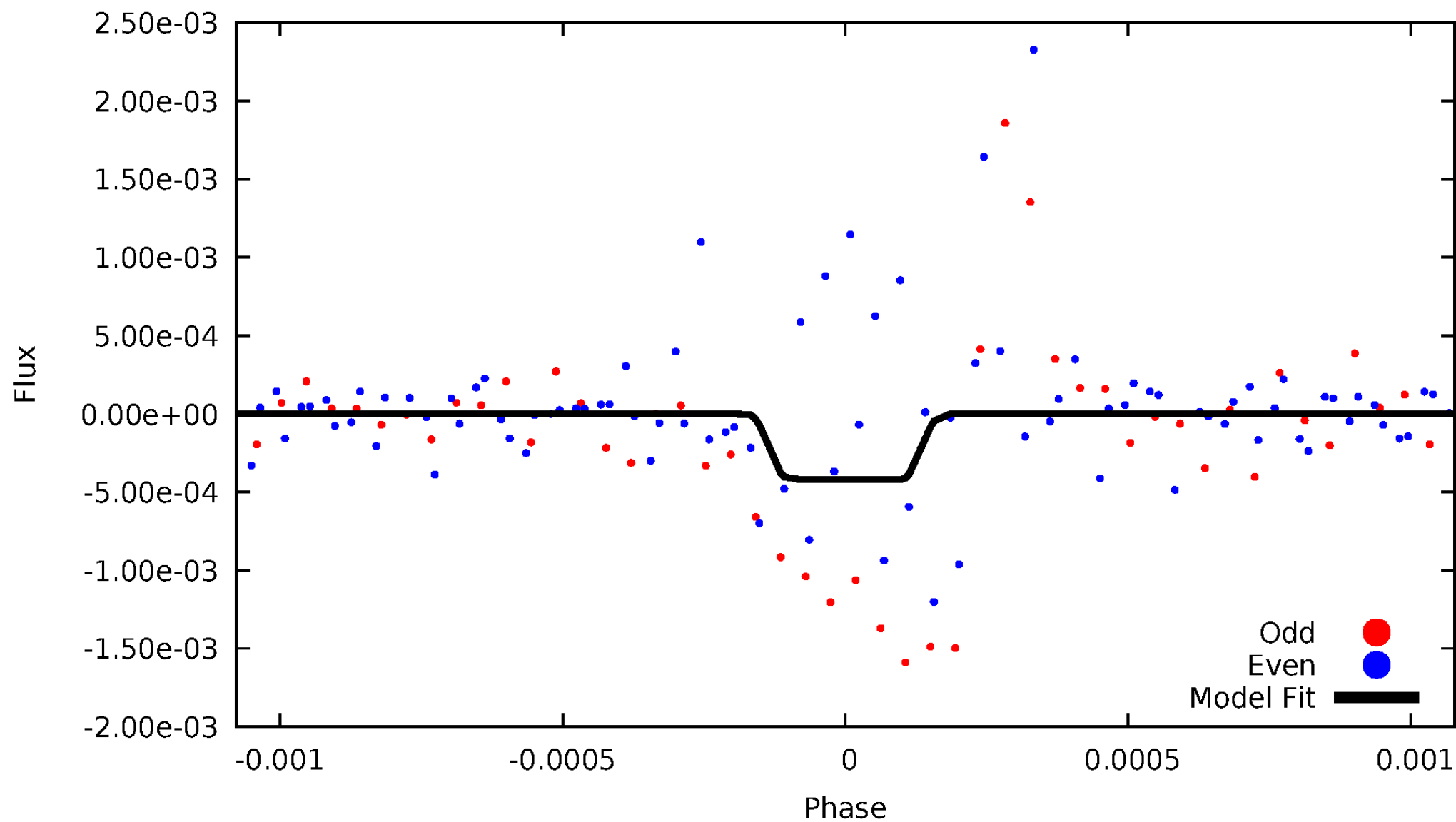
# DV Odd/Even

TCE 006195999-04



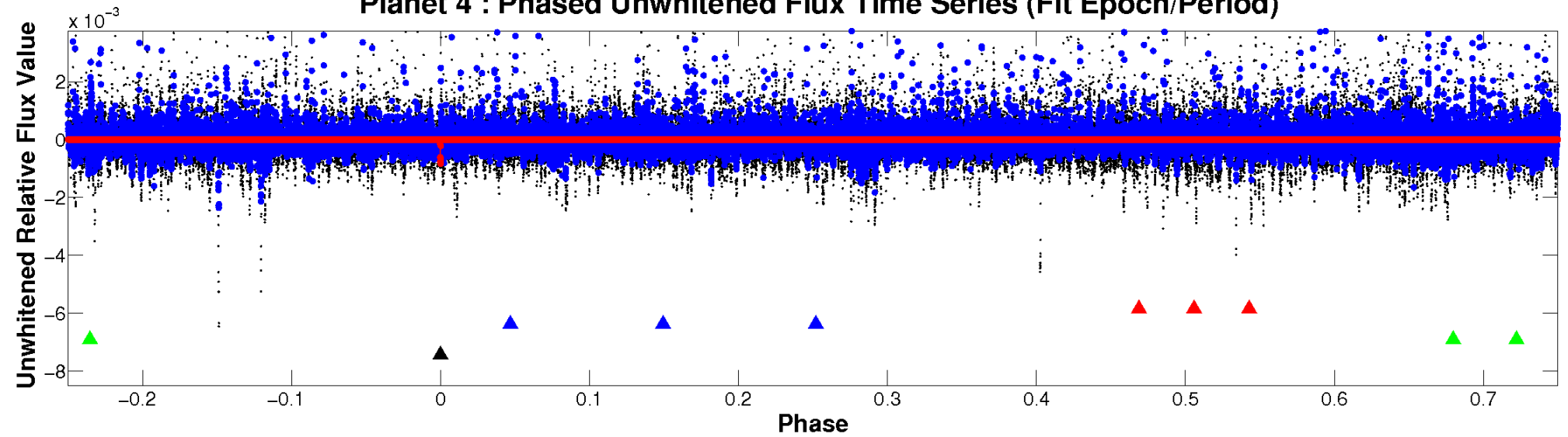
# ALT Odd/Even

TCE 006195999-04

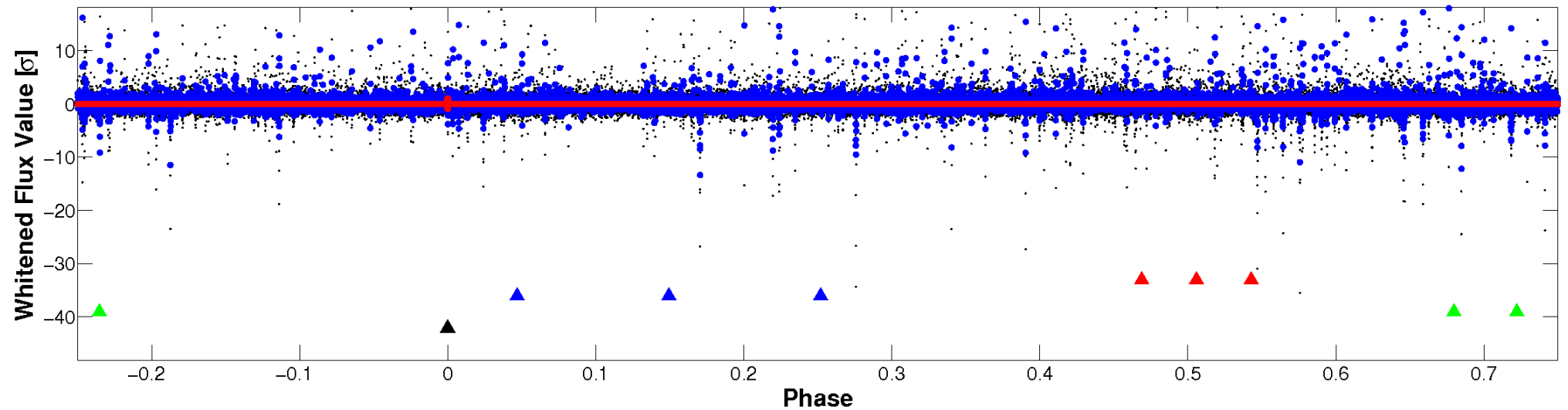


# Non-Whitened Vs. Whitened Light Curve

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

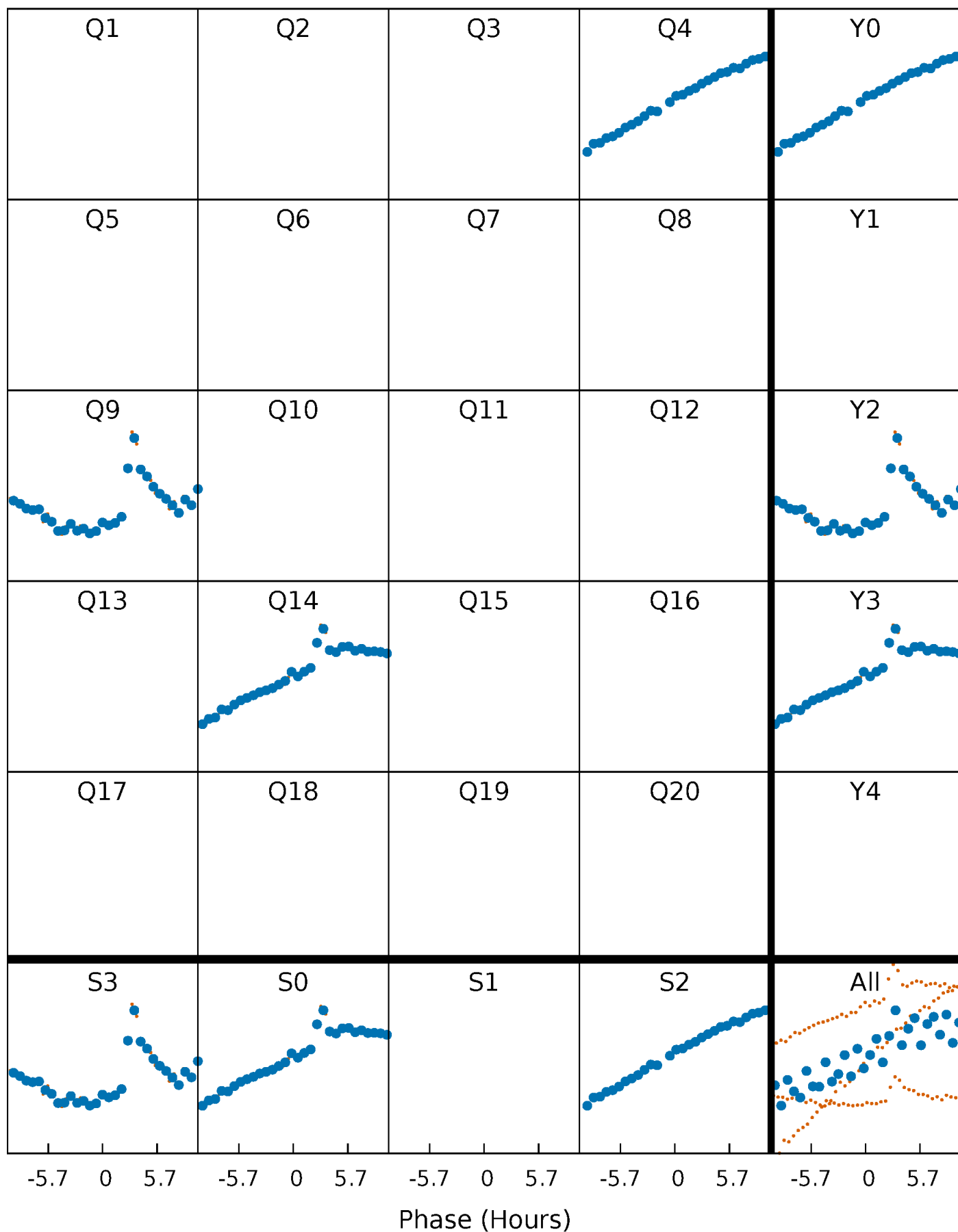


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



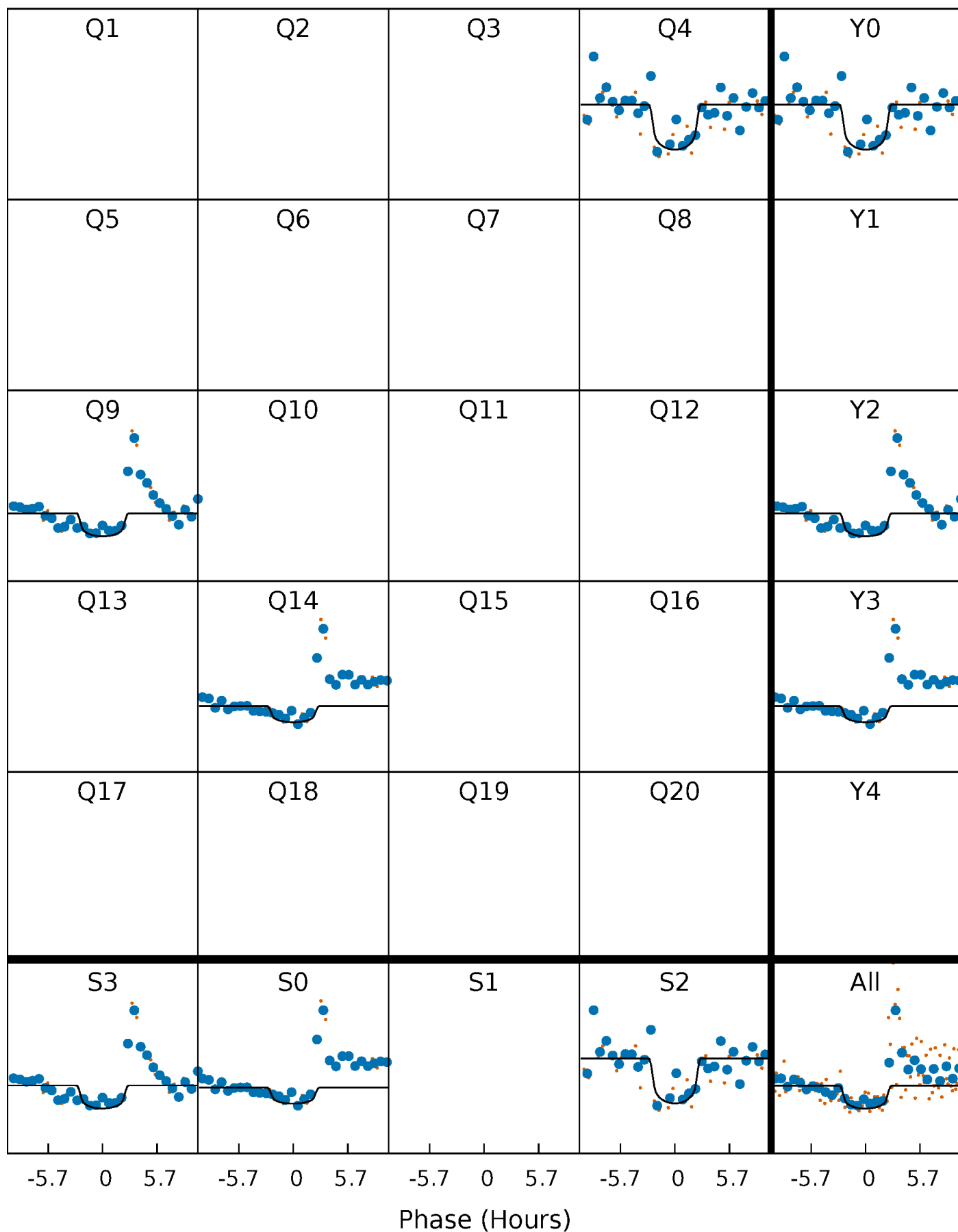
# PDC Quarter-Phased Transit Curves

TCE 006195999-04 P=463.014527 Days  $T_0=408.208646$  (BKJD)



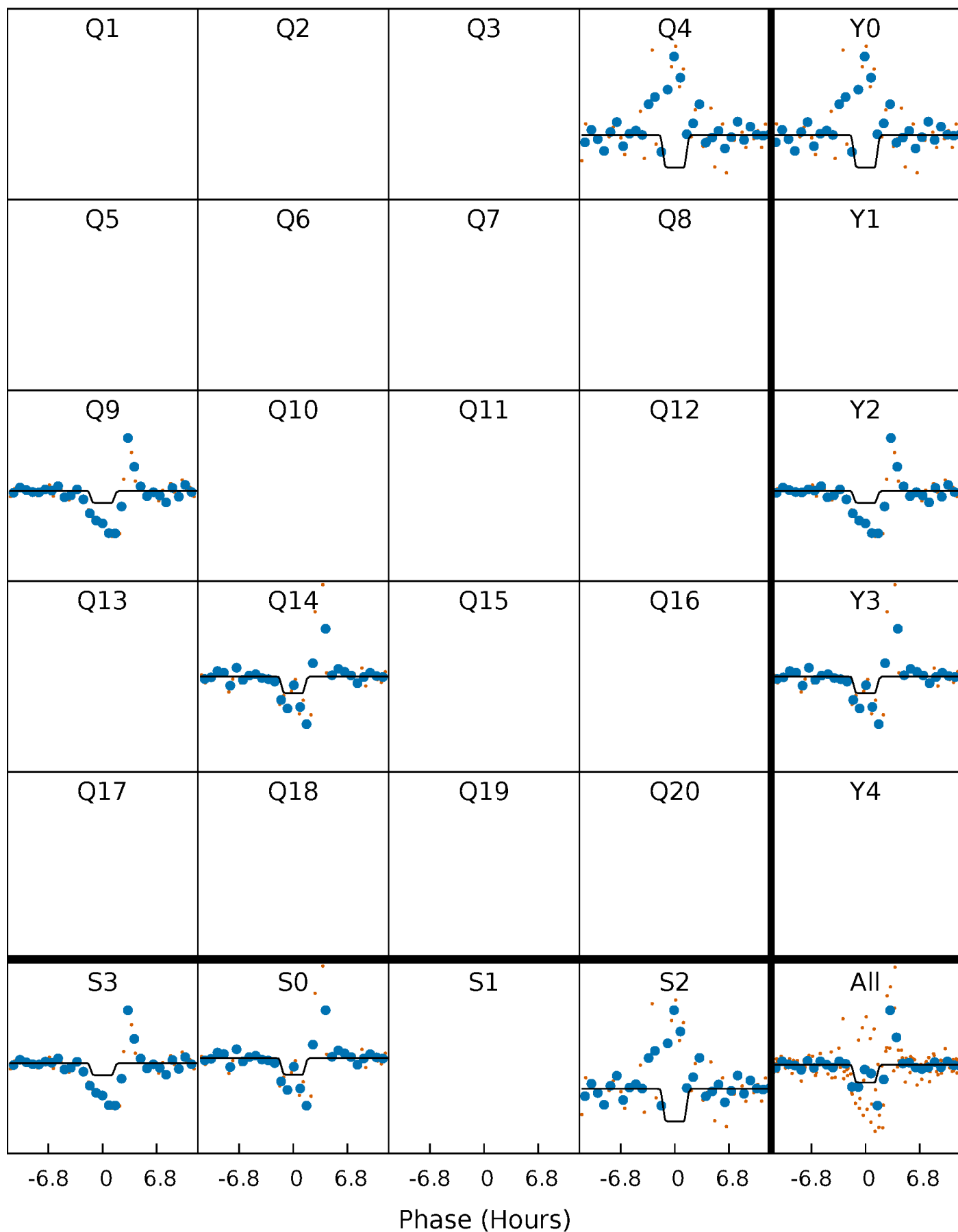
# DV Quarter-Phased Transit Curves

TCE 006195999-04 P=463.014527 Days  $T_0=408.208646$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

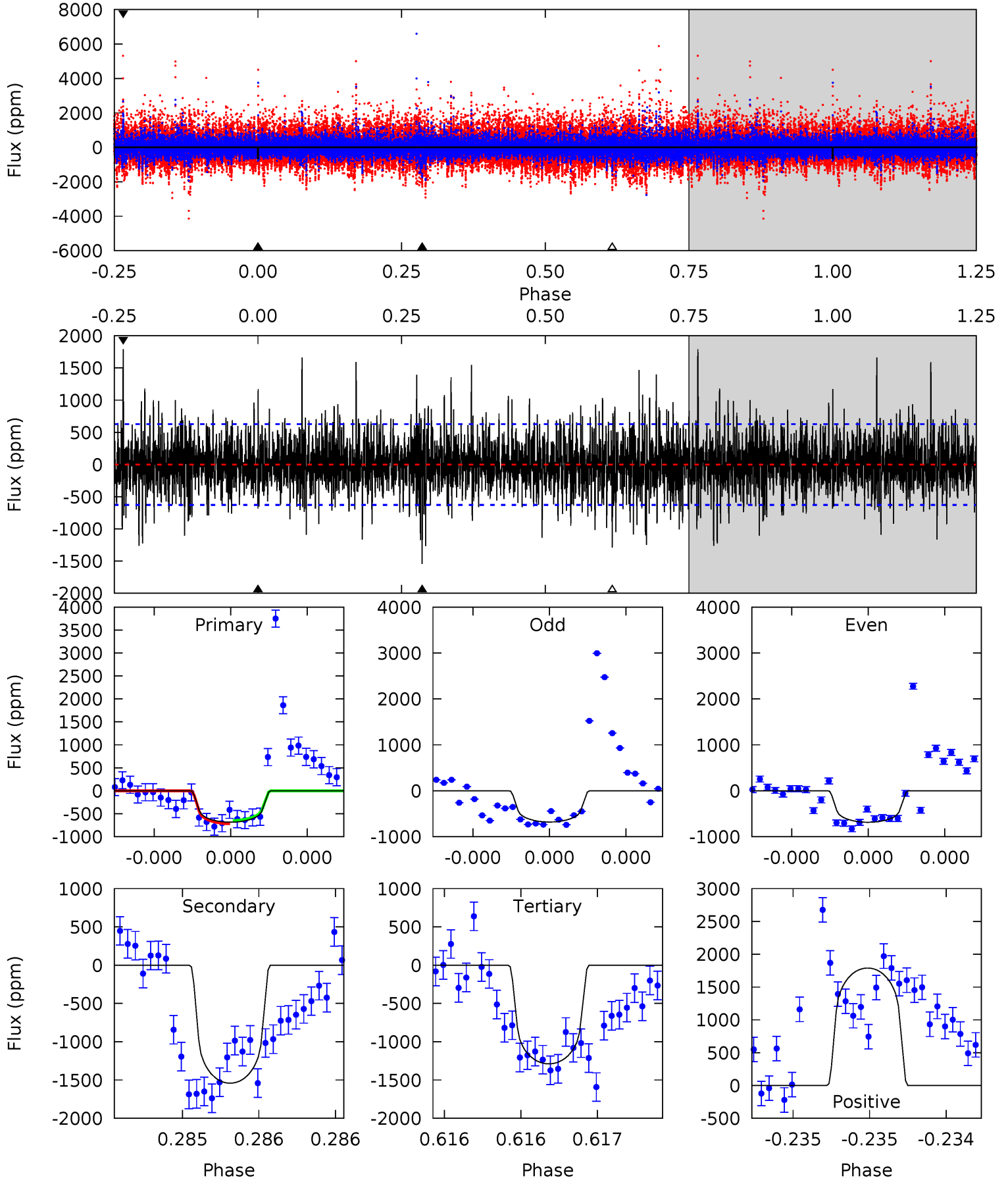
TCE 006195999-04 P=463.004036 Days  $T_0=408.216860$  (BKJD)



# DV Model-Shift Uniqueness Test

006195999-04, P = 463.014527 Days, E = 408.208646 Days

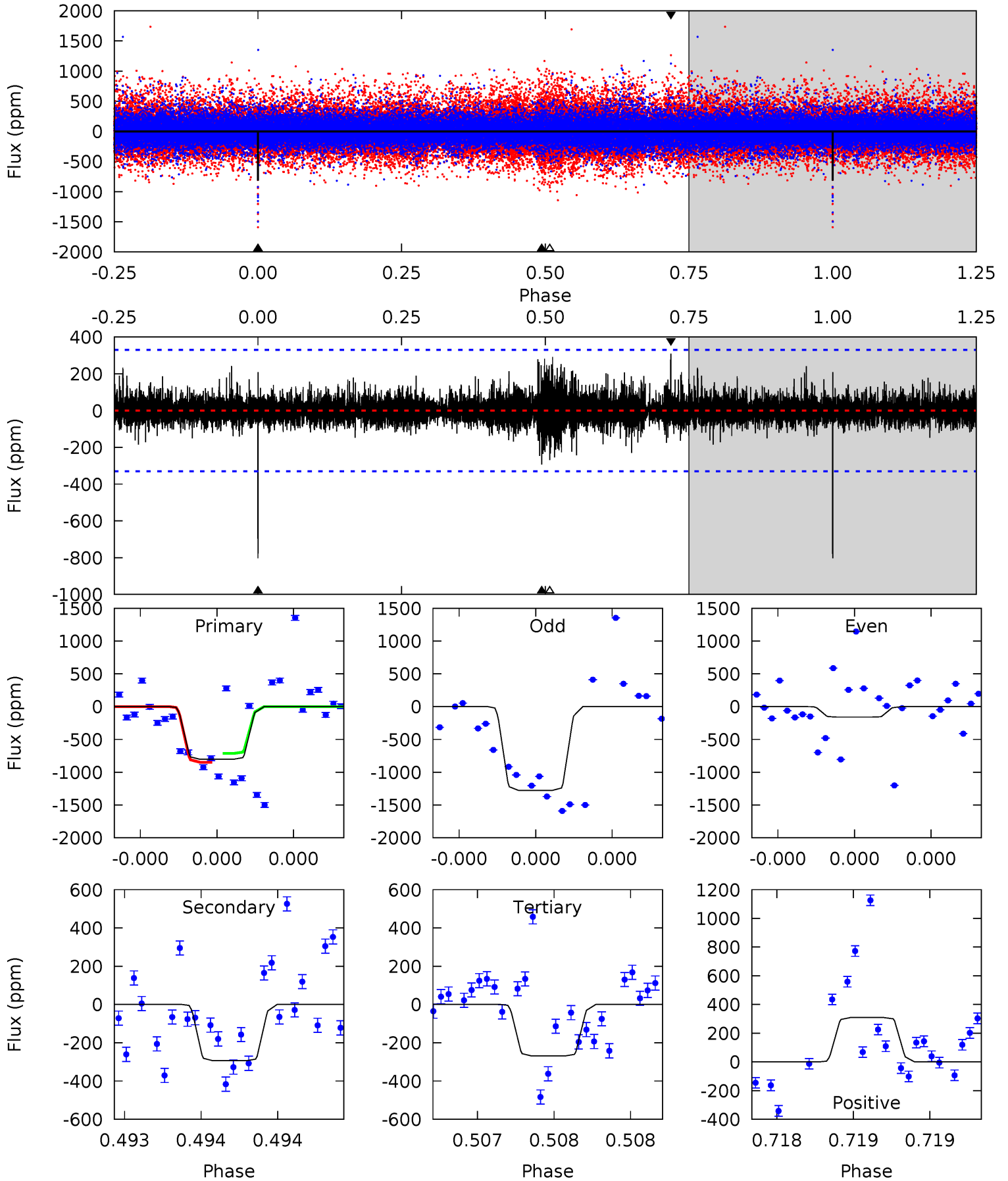
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.07	13.7	11.4	15.9	5.58	3.50	2.98	-5.37	-9.82	2.25	-2.20	0.02	0.97	0.54	0.32



# Alt Model-Shift Uniqueness Test

006195999-04, P = 463.004036 Days, E = 408.216860 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
13.7	5.04	4.60	5.29	5.65	3.60	0.84	9.14	8.45	0.43	-0.26	9.60	0.60	0.28	1.10





### Stellar Parameters For KIC 006195999

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5386^{+162}_{-162}$	$4.524^{+0.099}_{-0.081}$	$-0.520^{+0.300}_{-0.300}$	$0.763^{+0.102}_{-0.092}$	$0.710^{+0.097}_{-0.045}$	$2.248^{+0.956}_{-0.565}$
	+3%/-3%	+2%/-2%	+58%/-58%	+13%/-12%	+14%/-6%	+43%/-25%
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 006195999-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1542 \pm 113$	$2.57^{+1.86}_{-1.45}$	$283^{+12}_{-13}$	$5992^{+3877}_{-1204}$	$138837^{+626929}_{-90503}$
Alt.	$-294 \pm 58$	$2.02^{+1.73}_{-1.23}$	$283^{+13}_{-12}$	$4666^{+2698}_{-933}$	$45304^{+239789}_{-32779}$

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

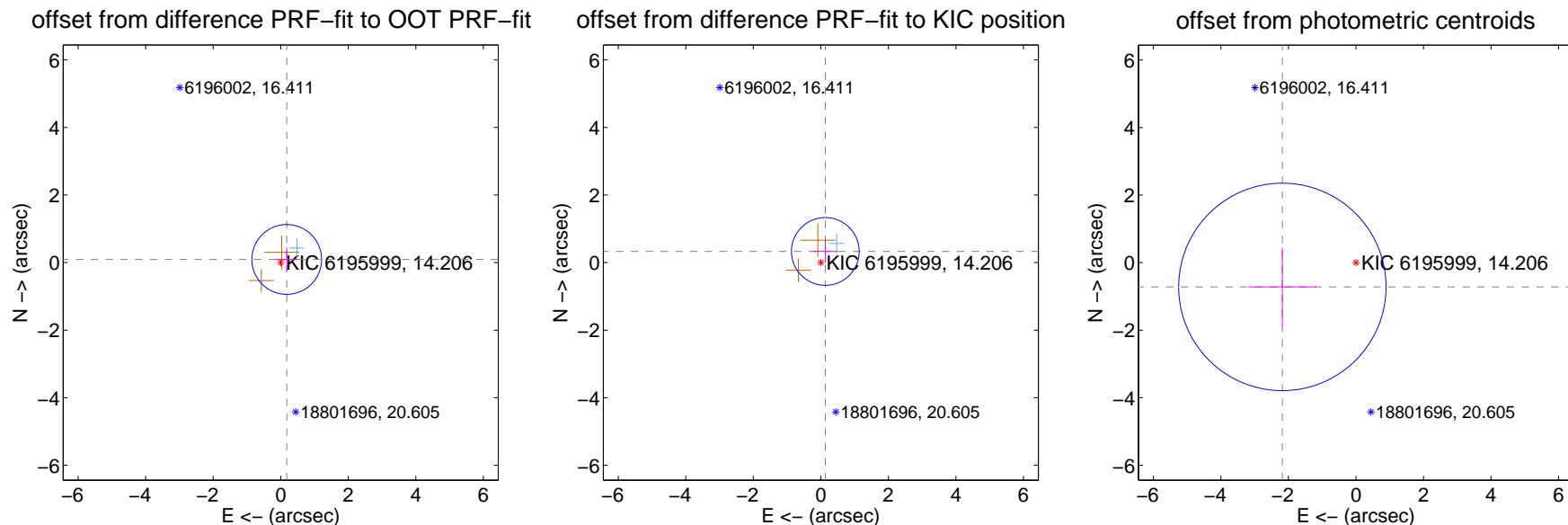
## DV Centroid Data

Supplemental centroid analysis for 006195999-04. Kepler magnitude: 14.21. Transit SNR 4.86

There are 1 quarters with good PRF difference image offsets

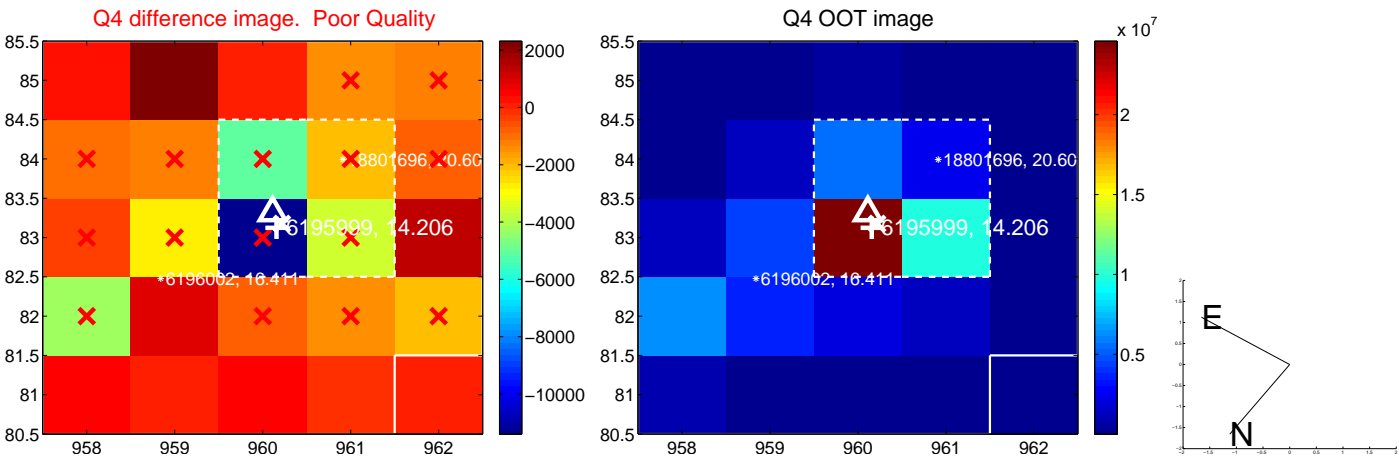
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.200 \pm 0.344$	0.58	$-0.177 \pm 0.342$	$0.093 \pm 0.353$
PRF-fit source offset from KIC position	$0.355 \pm 0.334$	1.06	$-0.132 \pm 0.370$	$0.330 \pm 0.328$
photometric centroid source offset	$2.30 \pm 1.02$	2.24	$2.18 \pm 1.01$	$-0.72 \pm 1.16$



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.

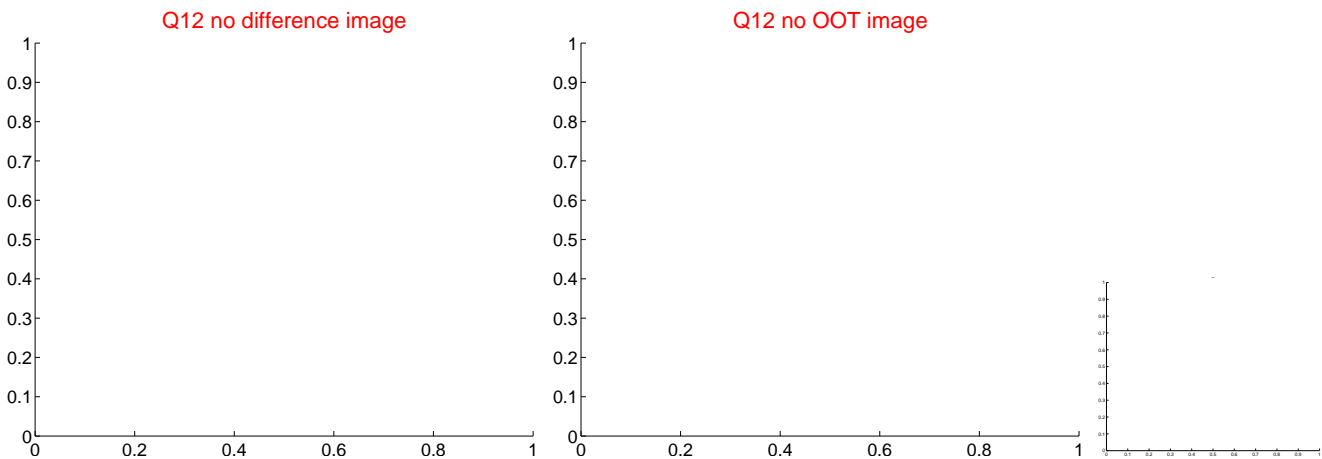
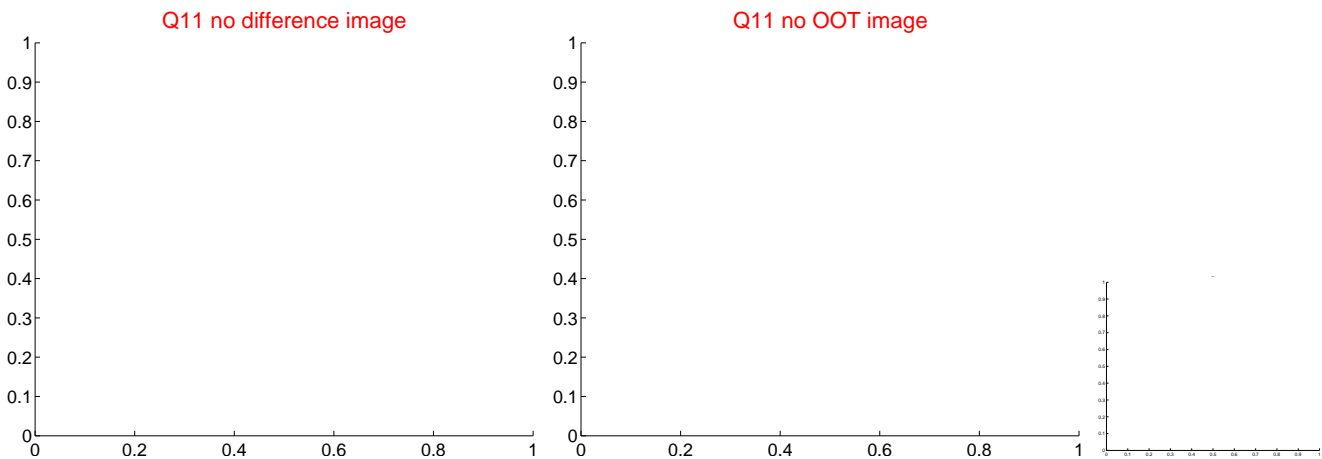
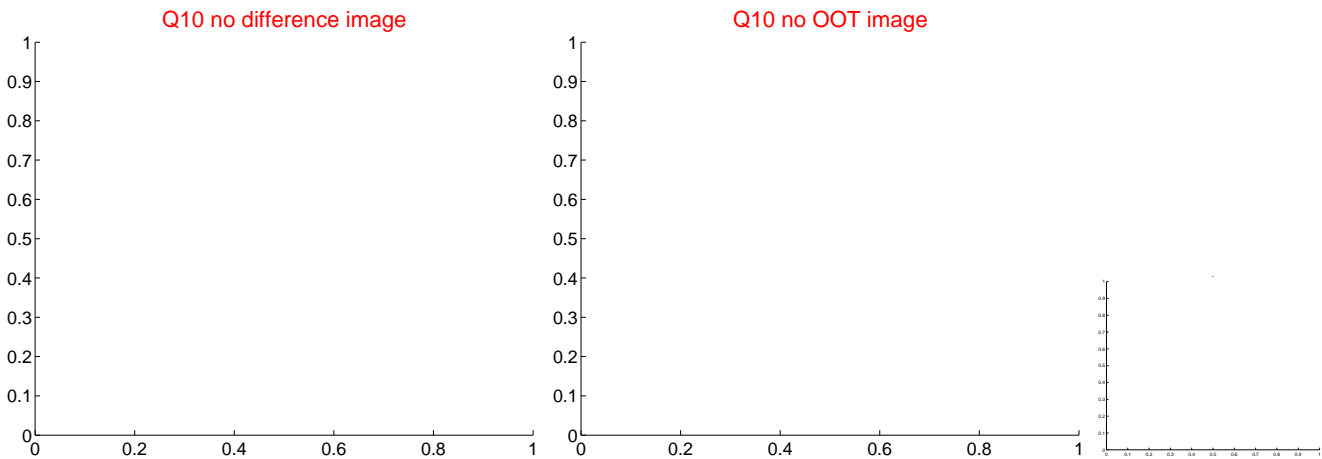
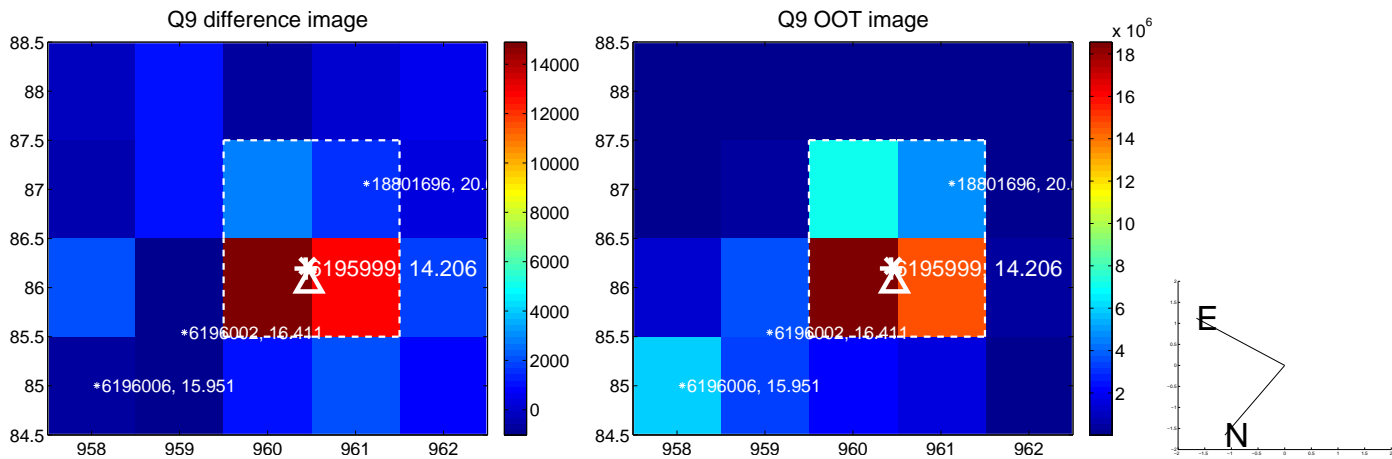
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

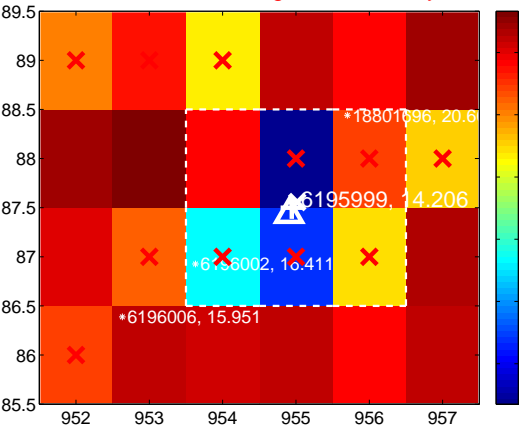
Q13 no difference image



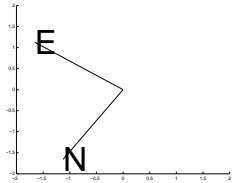
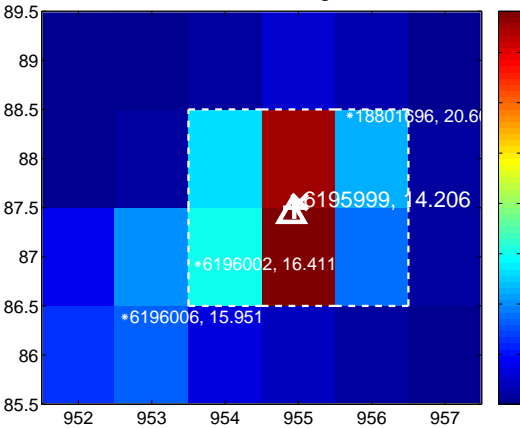
Q13 no OOT image



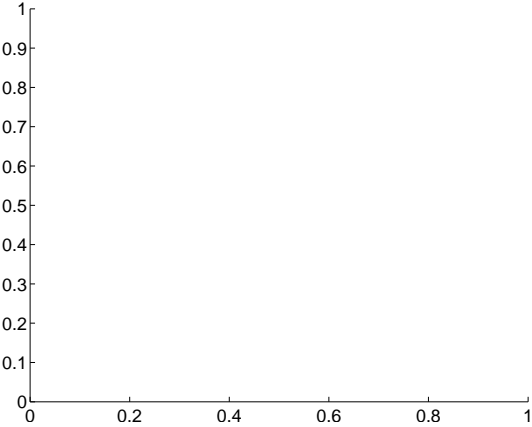
Q14 difference image. Poor Quality



Q14 OOT image



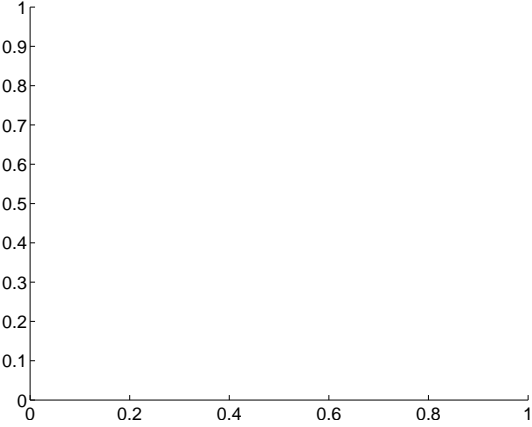
Q15 no difference image



Q15 no OOT image



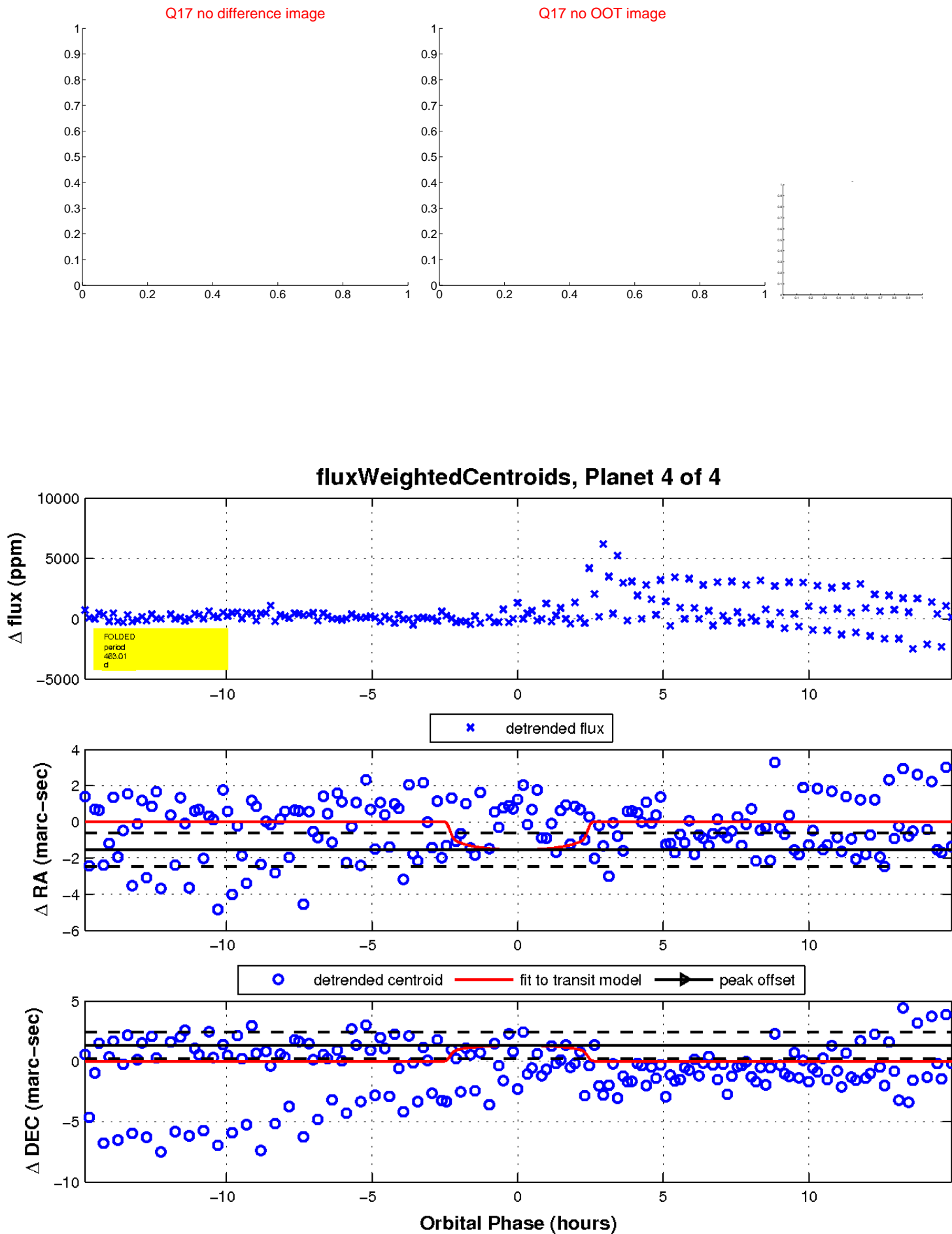
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

