

# KIC 005253199

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005253199-01	OBS	No	56.115623	175.150452	23123.2	9.040	20.1	9.9	1.86	7318	48.48	82.58
005253199-02	OBS	No	71.951040	169.191862	9434.7	5.483	14.1	10.0	1.86	7318	24.00	59.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005253199-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
005253199-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—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.

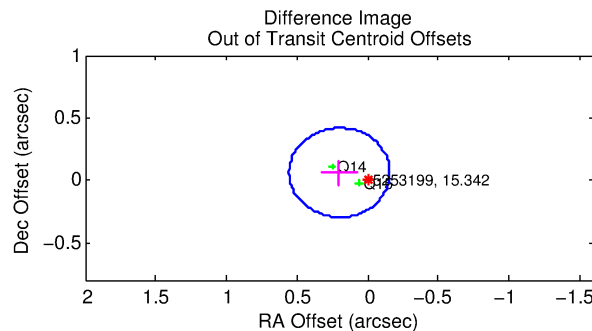
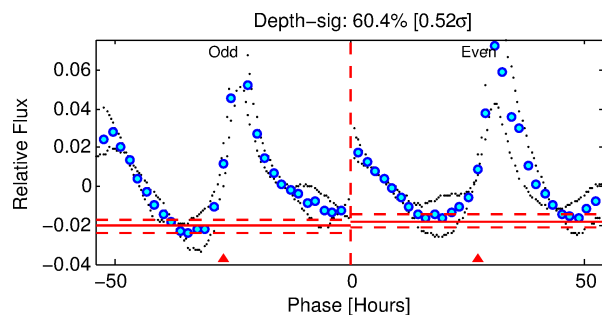
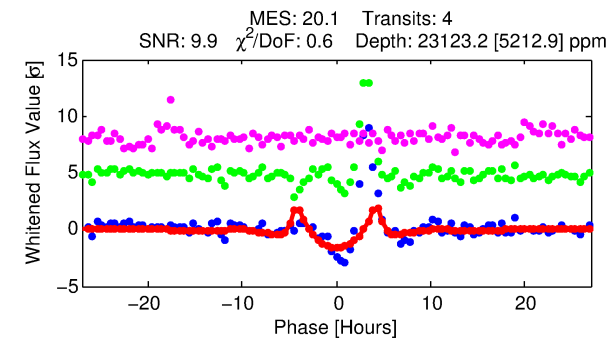
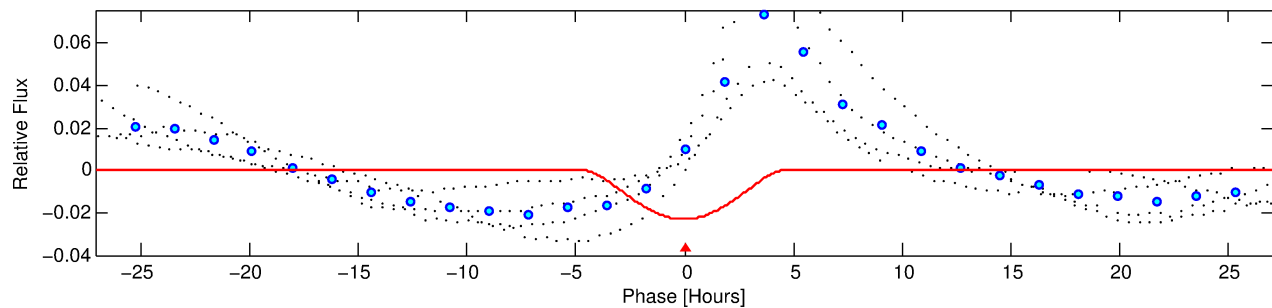
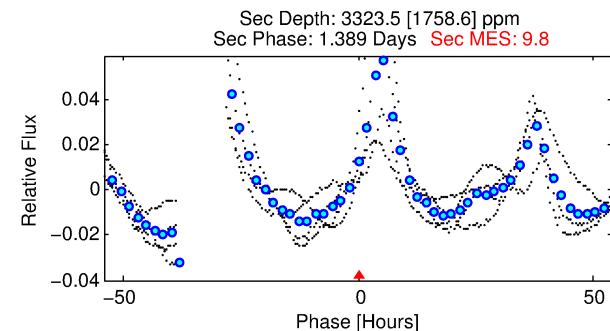
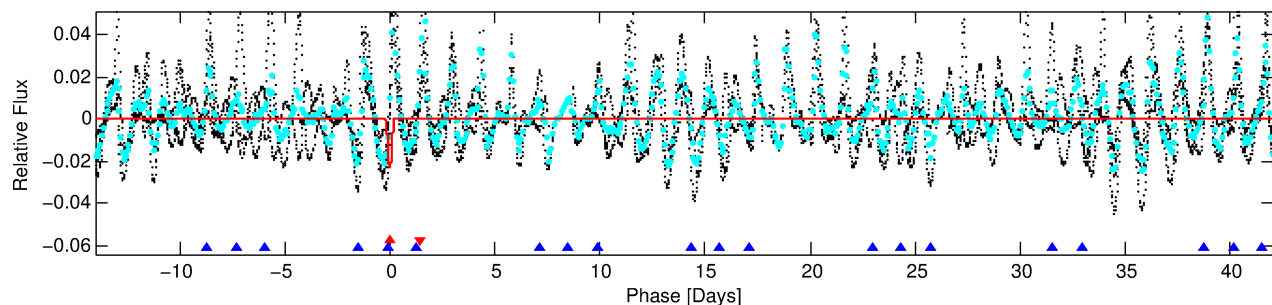
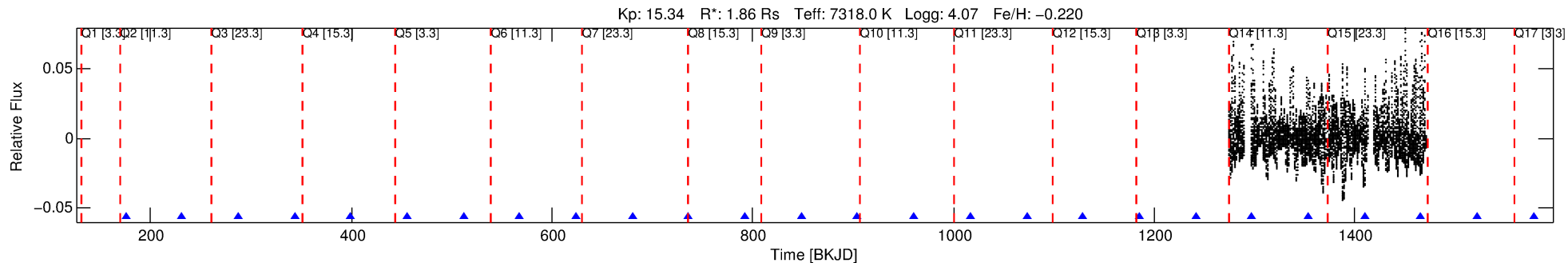
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005253199-01

No Significant Match Found

# DV One-Page Summary

KIC: 5253199 Candidate: 1 of 2 Period: 56.116 d



## DV Fit Results:

Period = 56.11562 [0.00249] d  
Epoch = 175.1505 [0.0540] BKJD  
Rp/R\* = 0.2393 [0.1617]  
a/R\* = 34.73 [2.13]  
b = 1.00 [0.26]  
Seff = 82.58 [33.10]  
Teq = 769 [77] K  
**Rp = 48.48 [35.85] Re**  
a = 0.3276 [0.0824] AU  
Ag = 83.46 [124.88] [0.66σ]  
Teffp = 3592 [1312] K [2.15σ]

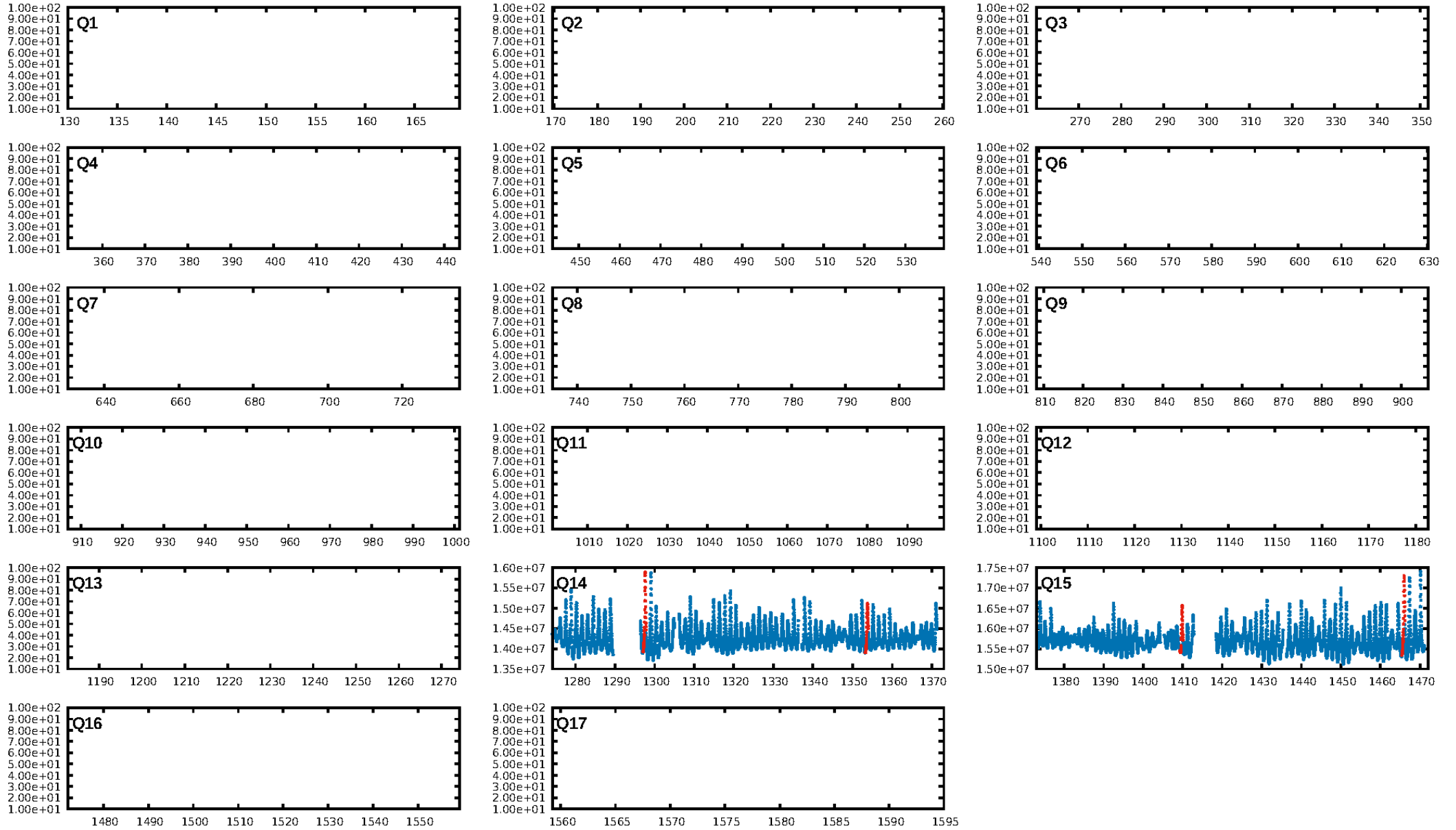
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [35.95σ]  
ModelChiSquare2-sig: 86.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.92e-27  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 0.03642**  
Centroid-sig: 16.3%  
Centroid-so: 0.149 arcsec [1.79σ]  
OotOffset-rm: 0.210 arcsec [1.76σ]  
KicOffset-rm: 0.310 arcsec [2.21σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

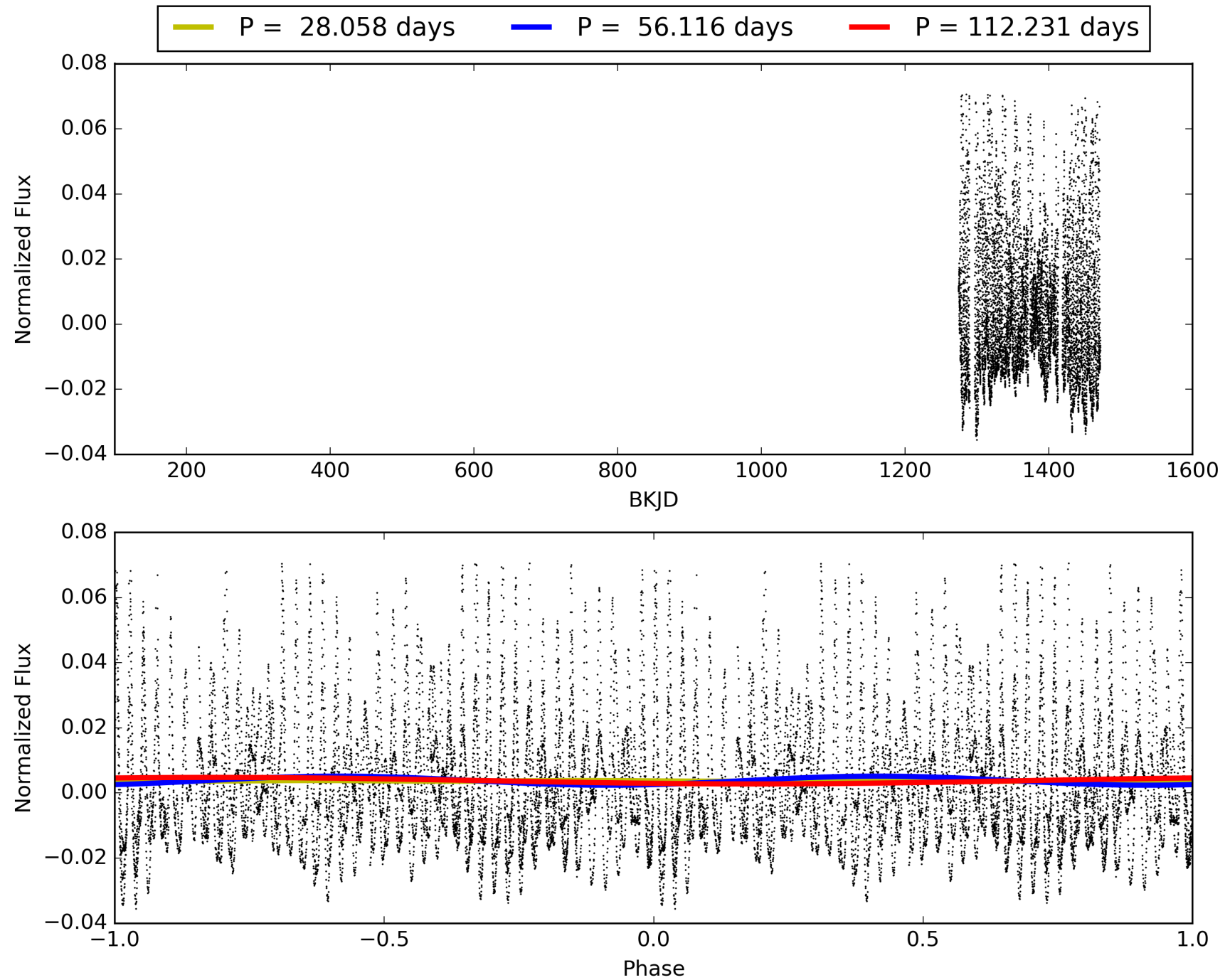
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:28:10 Z

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

# TCE 005253199-01, PDC Light Curves

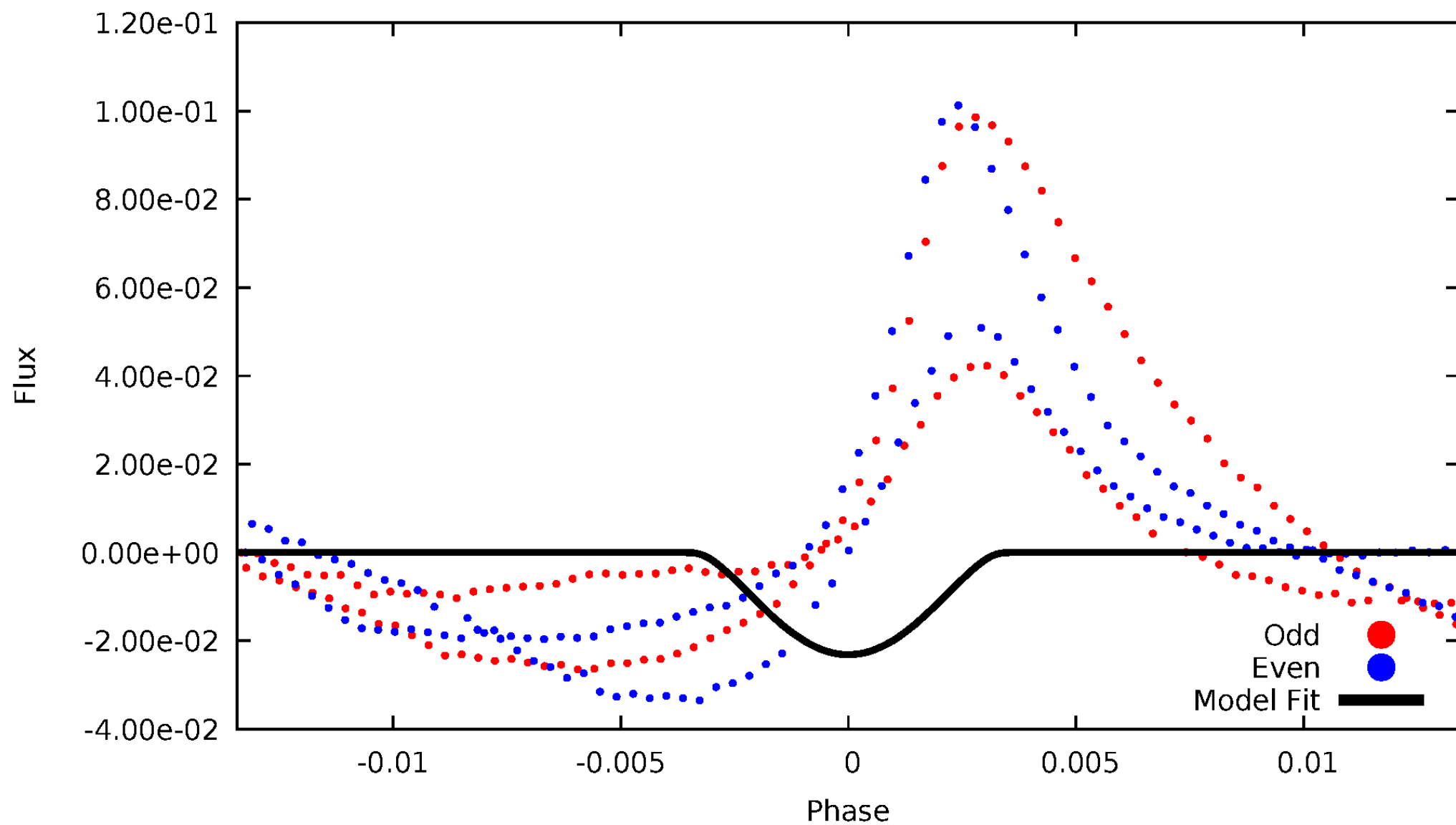


# TCE 005253199-01



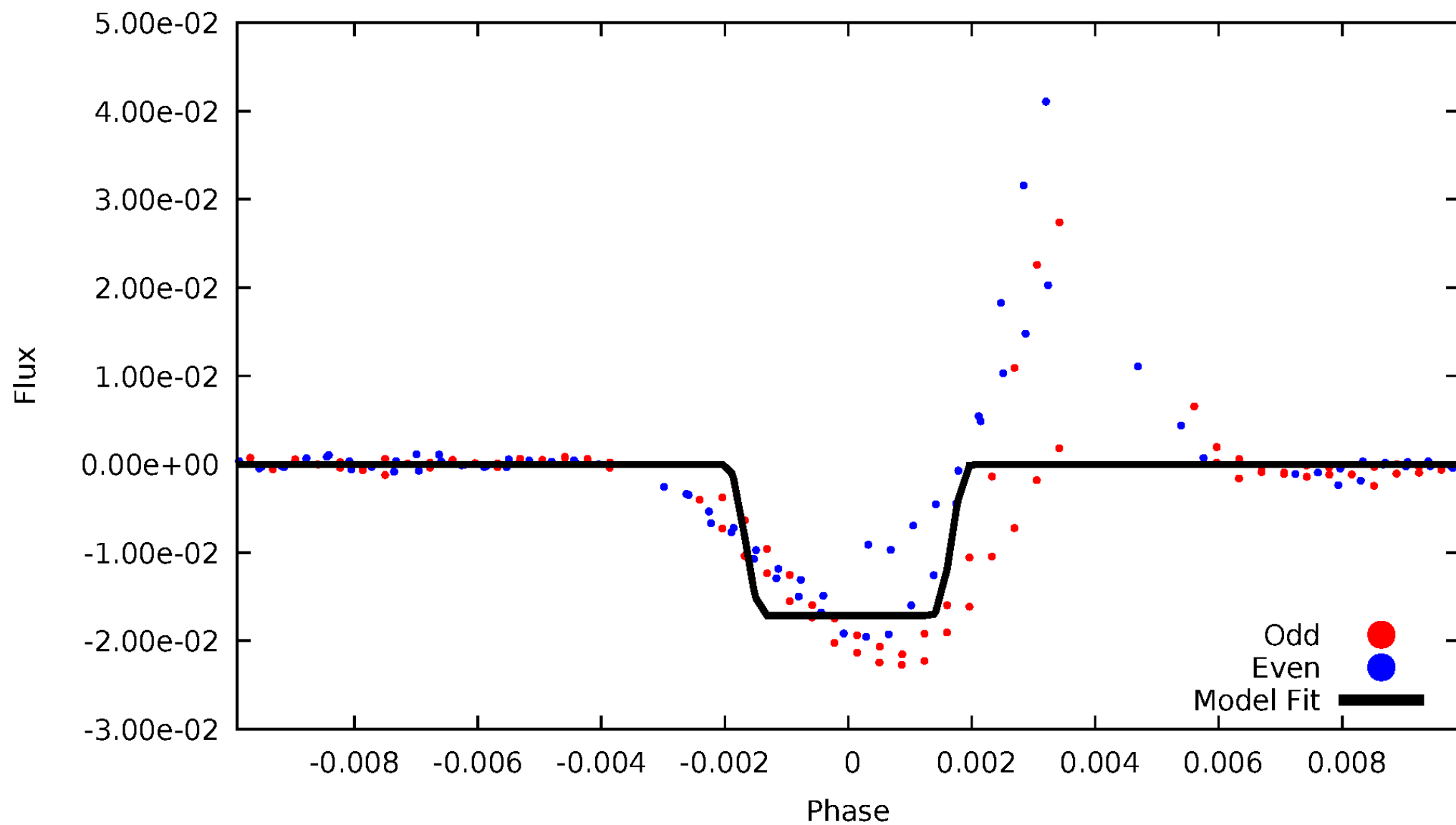
# DV Odd/Even

TCE 005253199-01



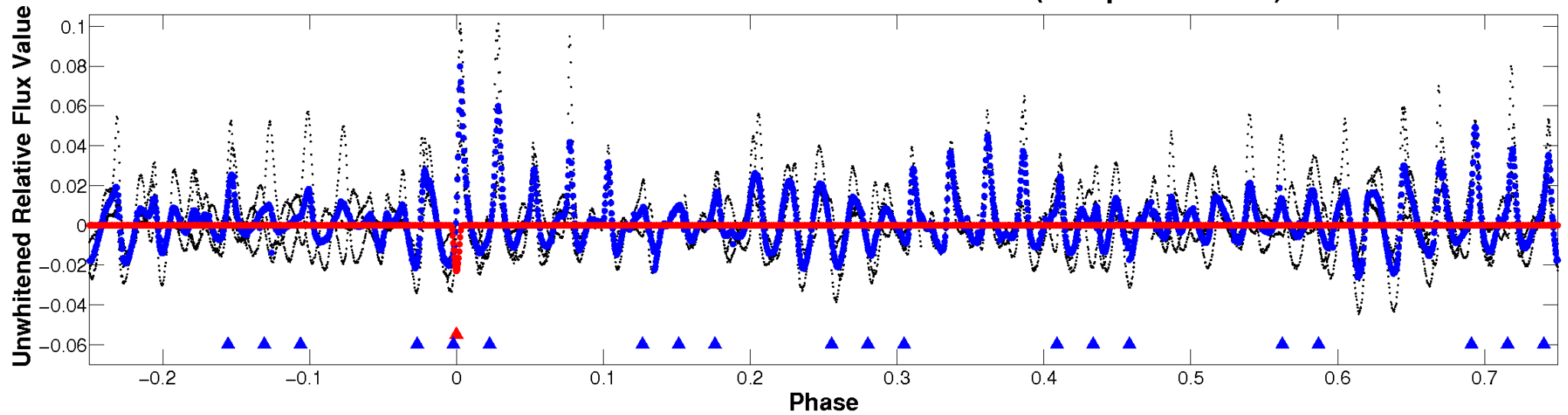
# ALT Odd/Even

TCE 005253199-01

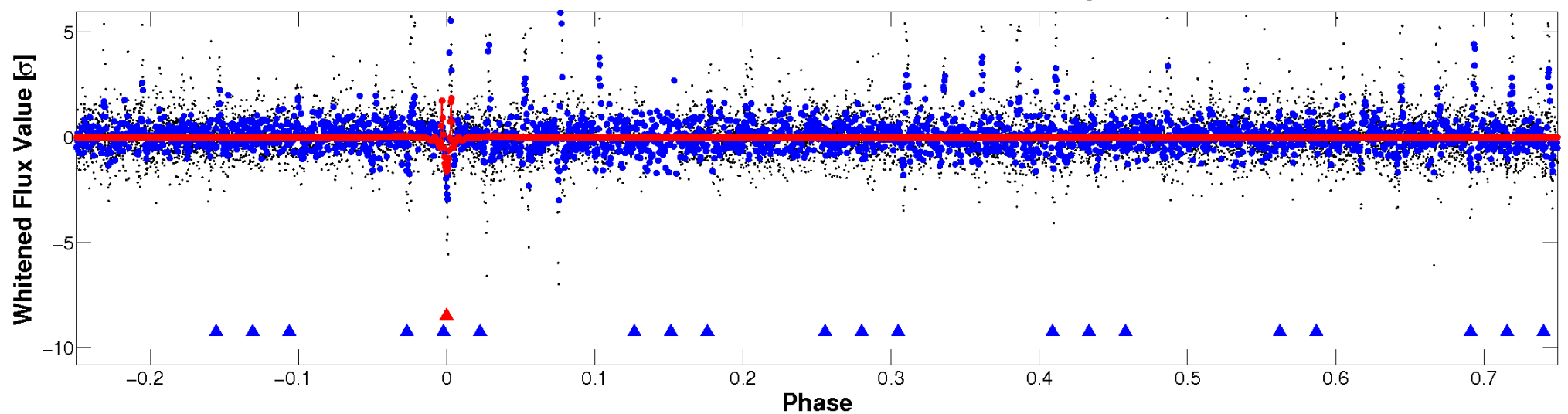


# Non-Whitened Vs. Whitened Light Curve

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

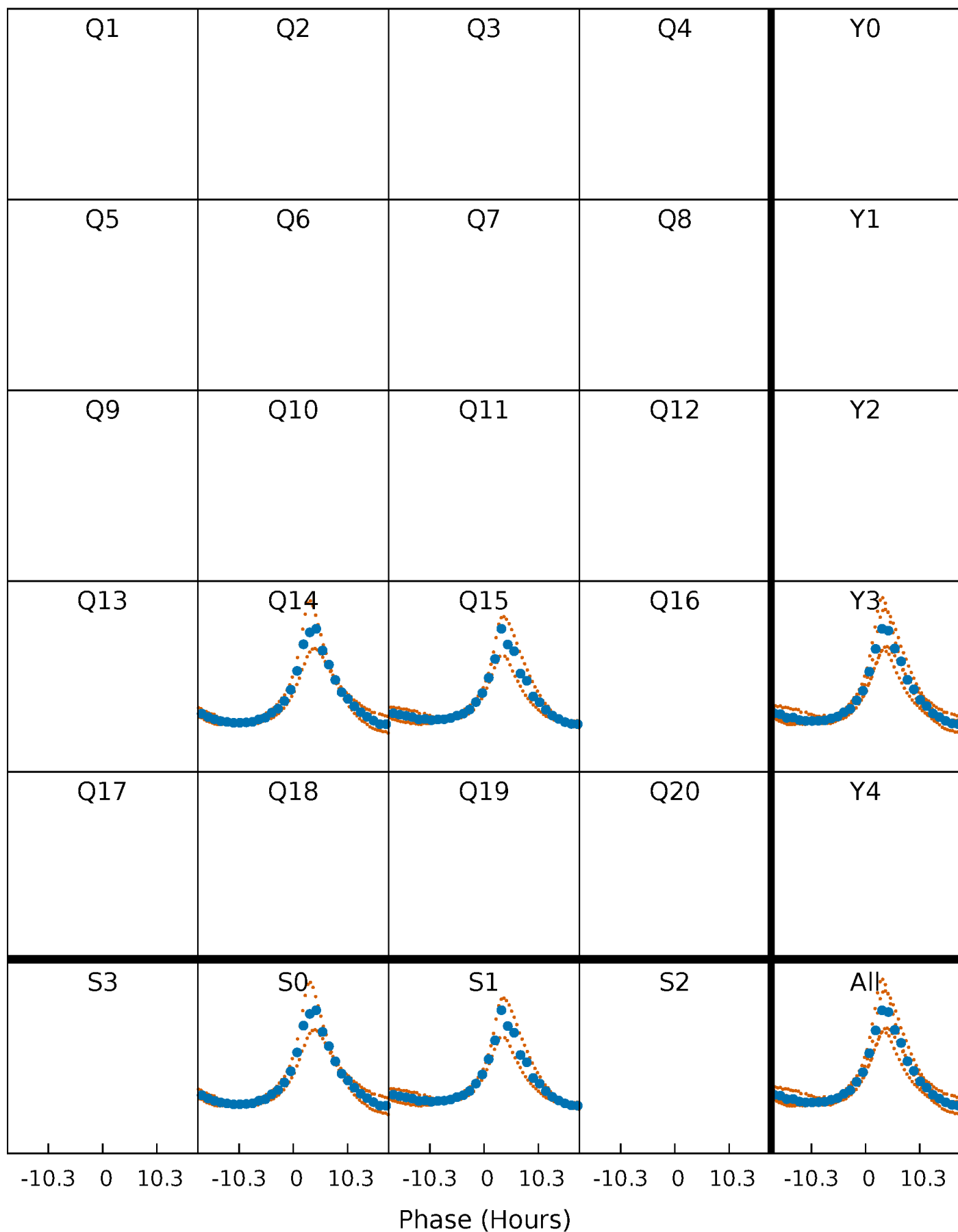


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

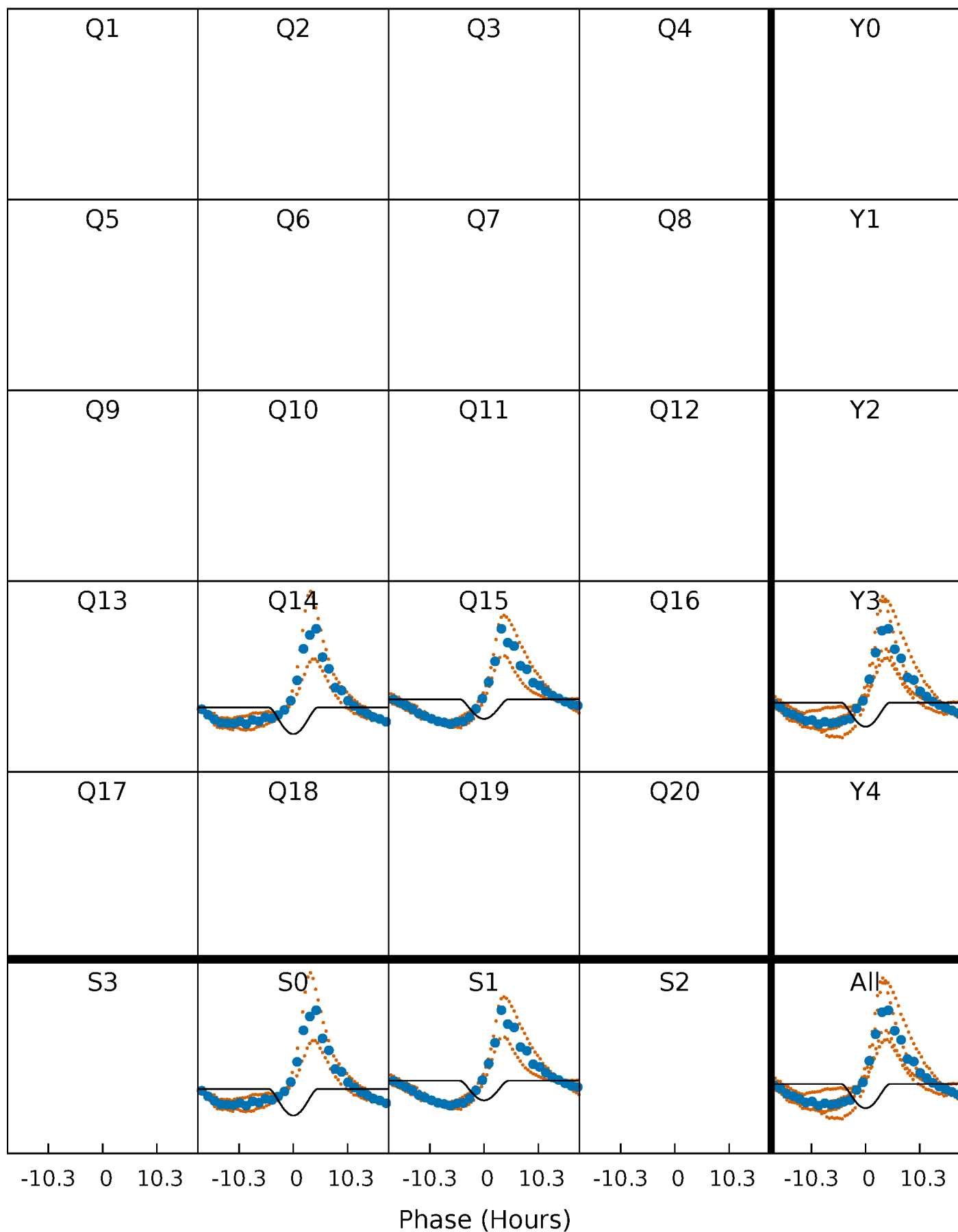
TCE 005253199-01 P= 56.115623 Days  $T_0=175.150452$  (BKJD)





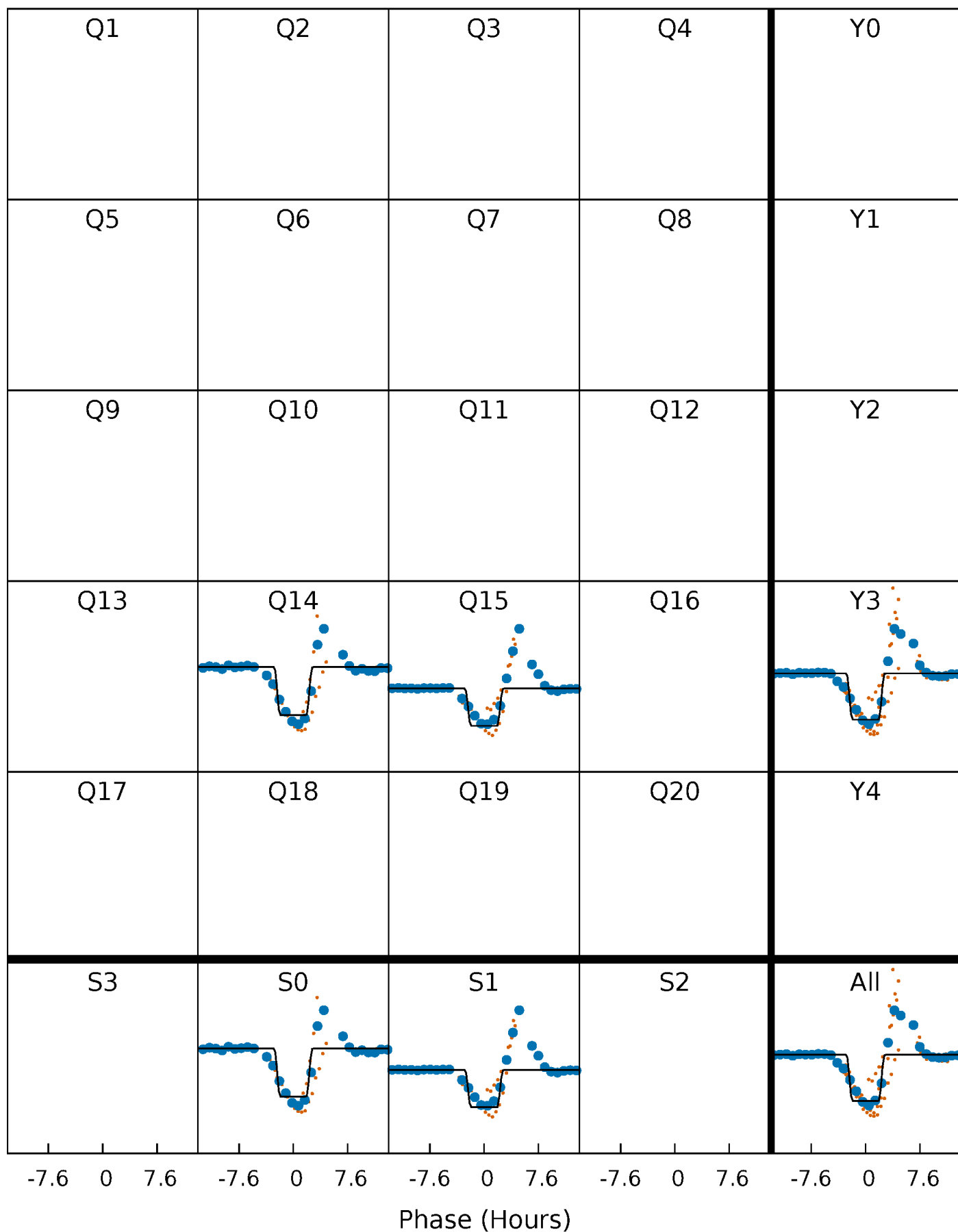
# DV Quarter-Phased Transit Curves

TCE 005253199-01 P= 56.115623 Days  $T_0=175.150452$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

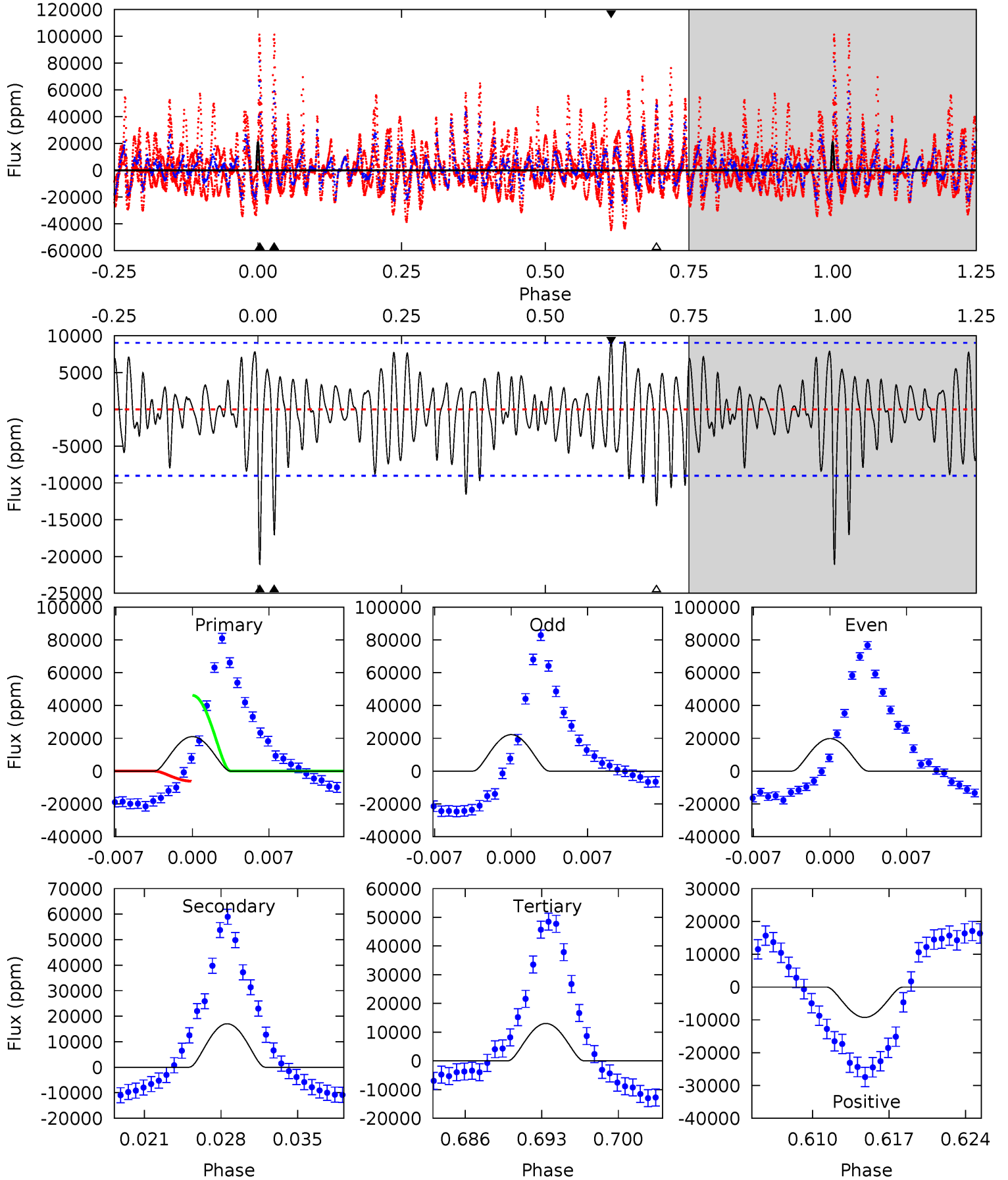
TCE 005253199-01 P= 56.118595 Days  $T_0=175.026505$  (BKJD)



# DV Model-Shift Uniqueness Test

005253199-01, P = 56.115623 Days, E = 175.150452 Days

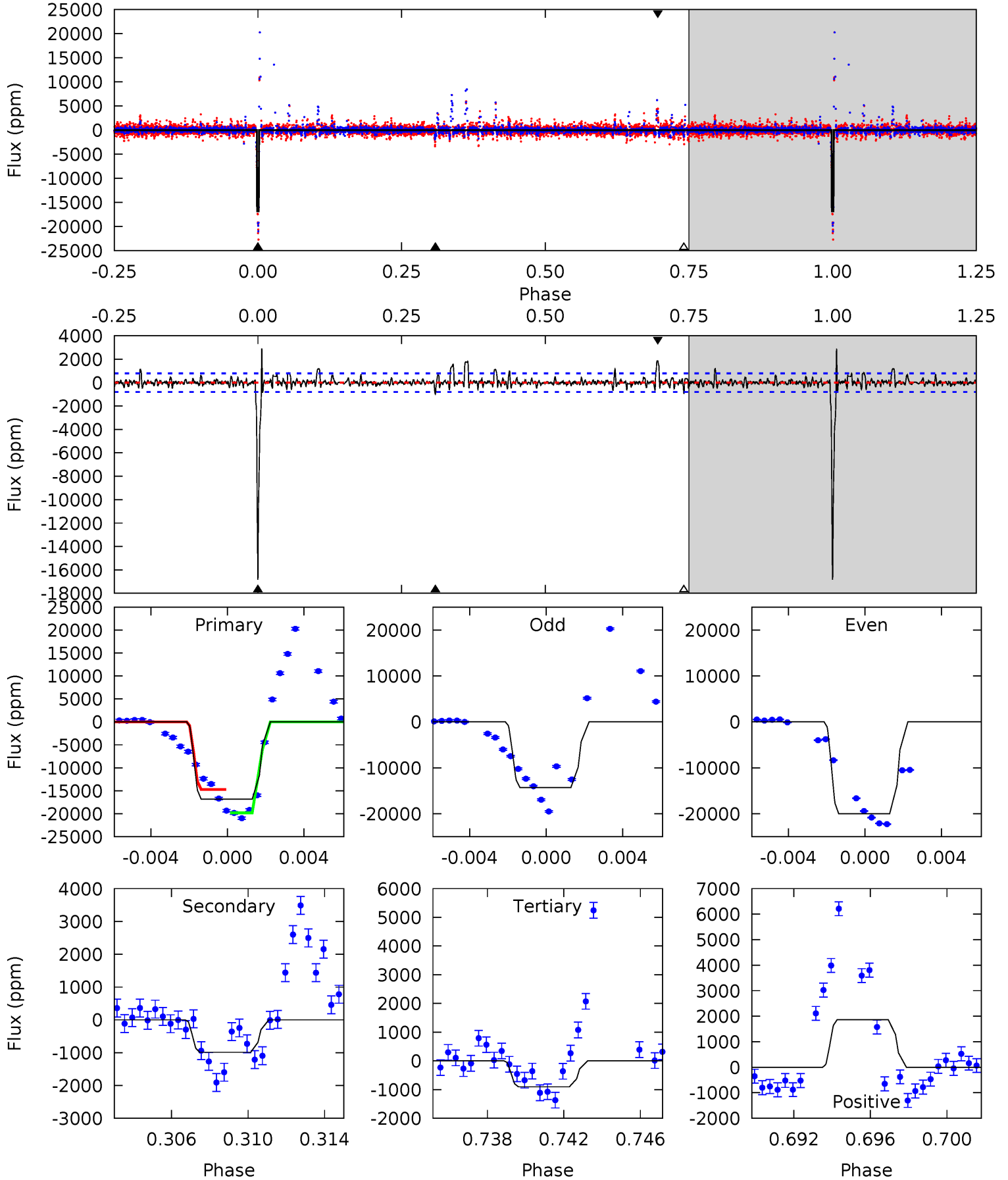
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	9.62	7.36	5.23	5.10	2.70	2.16	4.51	6.64	2.27	4.39	0.67	1.04	0.31	11.5



# Alt Model-Shift Uniqueness Test

005253199-01, P = 56.118595 Days, E = 175.026505 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
110.3	6.49	5.92	12.2	5.21	2.89	1.73	104.4	98.1	0.57	-5.74	18.0	0.95	0.15	14.0



### Stellar Parameters For KIC 005253199

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.198}_{-0.162}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.558}_{-0.456}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.366}_{-0.149}$
	+3%/-4%	+5%/-4%	+114%/-159%	+30%/-25%	+14%/-17%	+112%/-45%
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 005253199-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-17048 \pm 1772$	$50.07^{+36.20}_{-27.17}$	$1064^{+81}_{-77}$	$5205^{+2645}_{-897}$	$404^{+1580}_{-264}$
Alt.	$-989 \pm 153$	$33.28^{+28.46}_{-21.17}$	$1060^{+83}_{-75}$	$3564^{+1665}_{-586}$	$50^{+368}_{-36}$

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

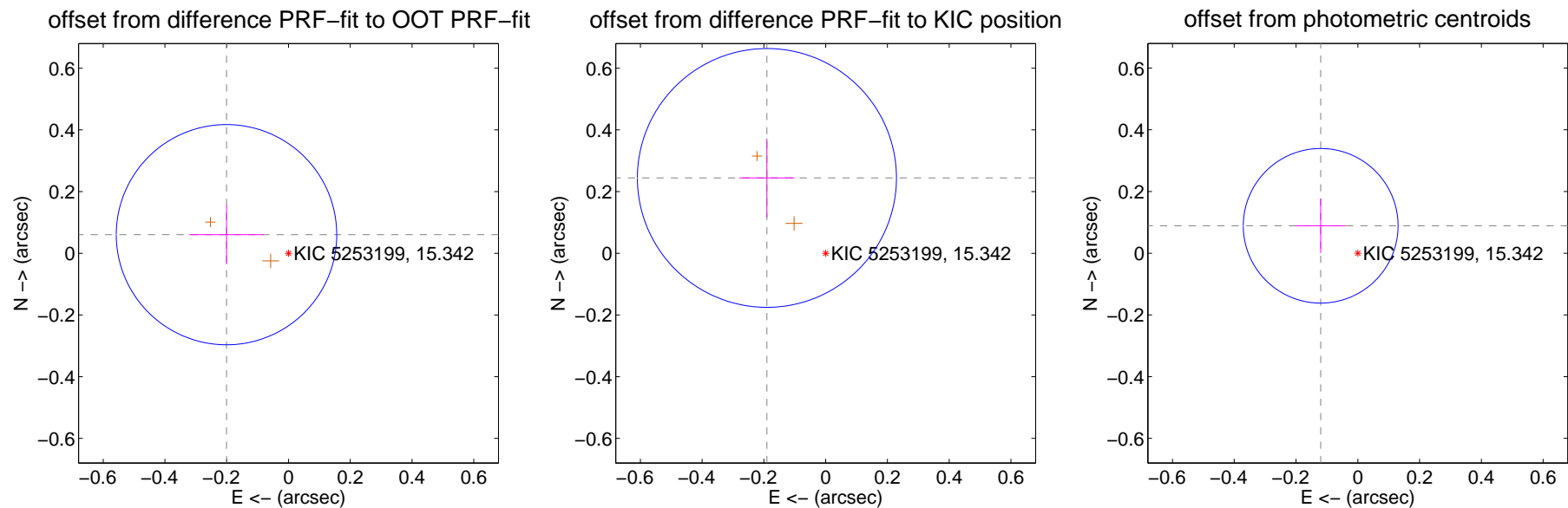
## DV Centroid Data

Supplemental centroid analysis for 005253199-01. Kepler magnitude: 15.34. Transit SNR 9.88

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.210 \pm 0.119$	1.76	$0.201 \pm 0.121$	$0.060 \pm 0.096$
PRF-fit source offset from KIC position	$0.310 \pm 0.140$	2.21	$0.190 \pm 0.090$	$0.244 \pm 0.128$
photometric centroid source offset	$0.15 \pm 0.08$	1.79	$0.12 \pm 0.08$	$0.09 \pm 0.09$



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.

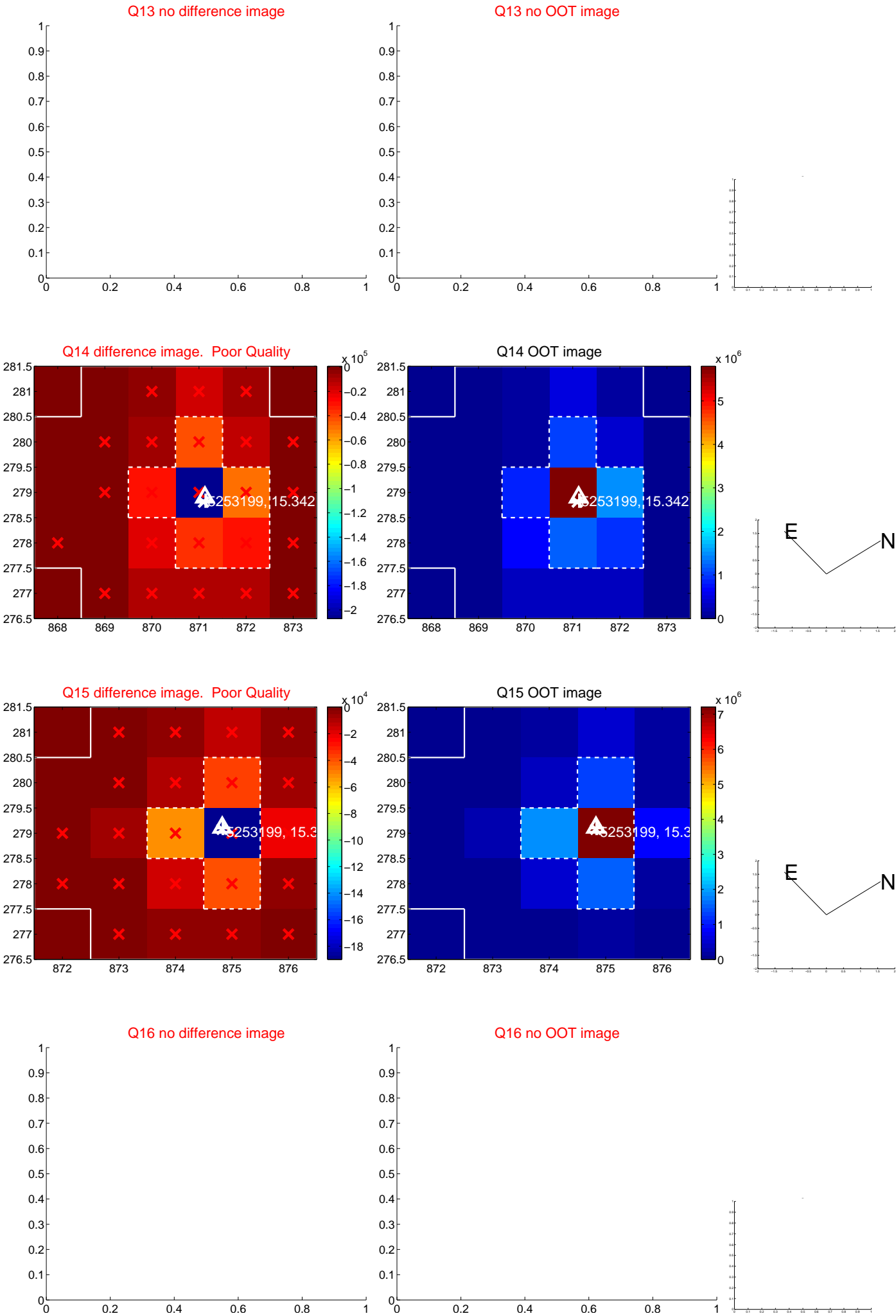




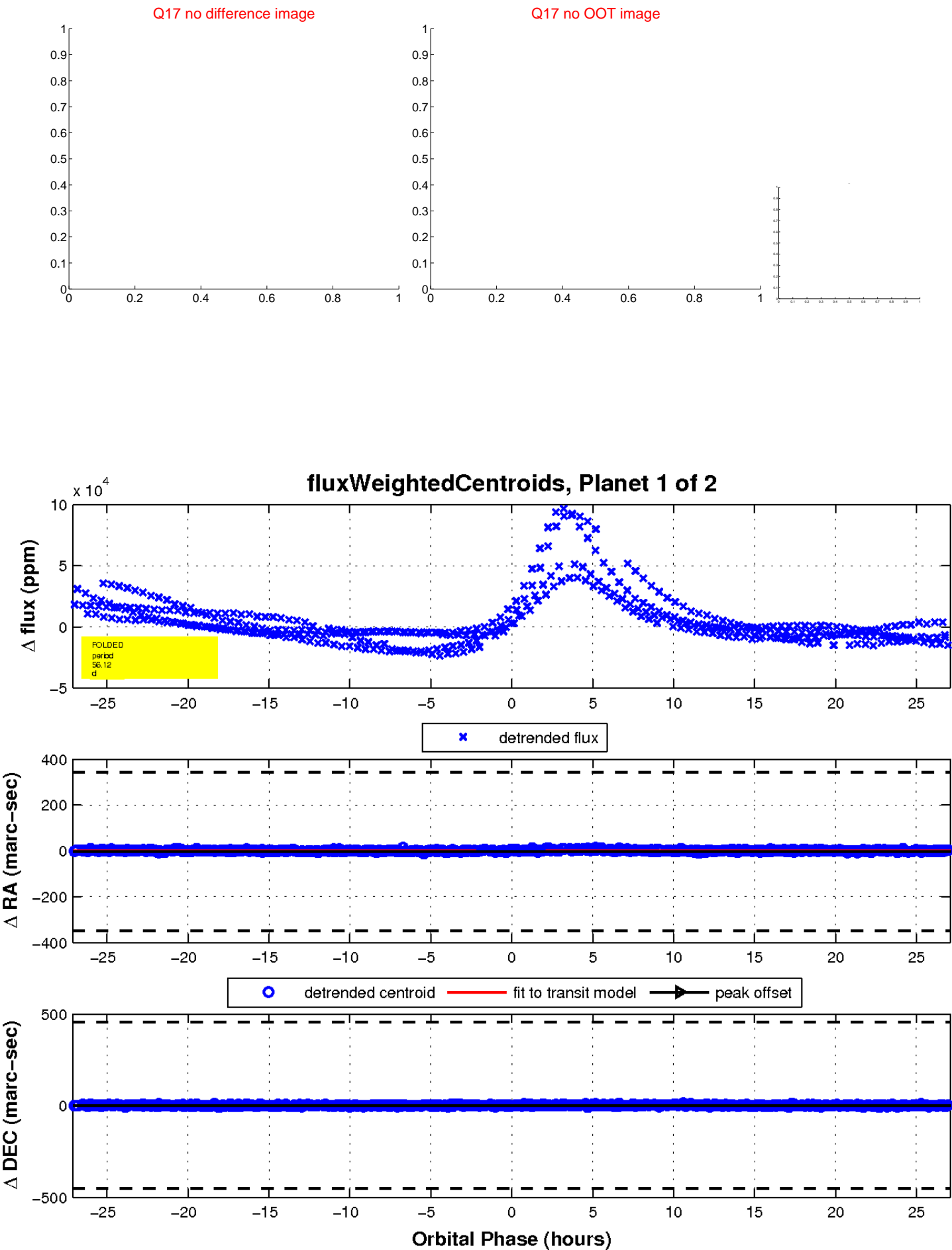
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

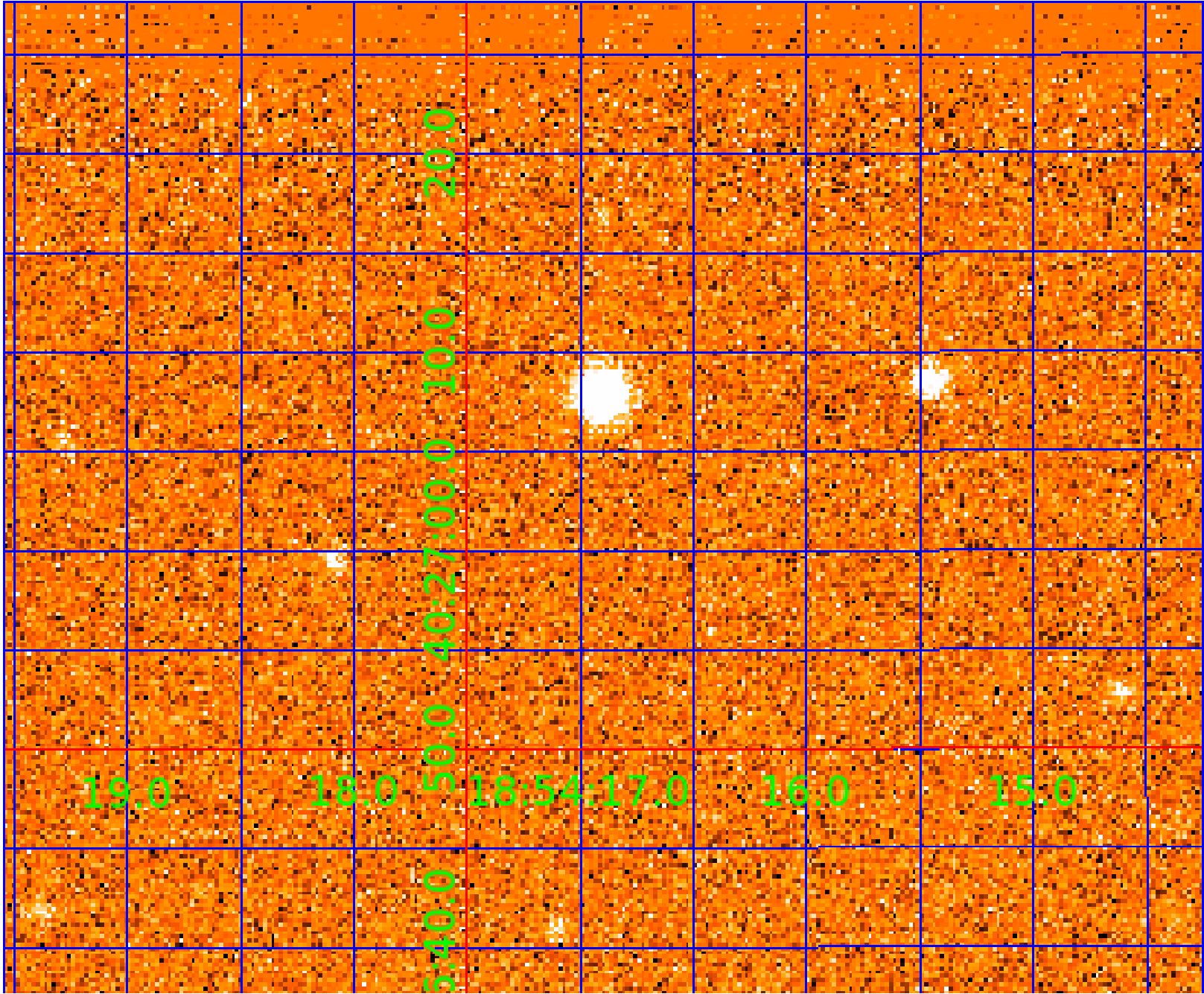


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005253199

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005253199-01	OBS	No	56.115623	175.150452	23123.2	9.040	20.1	9.9	1.86	7318	48.48	82.58
005253199-02	OBS	No	71.951040	169.191862	9434.7	5.483	14.1	10.0	1.86	7318	24.00	59.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005253199-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
005253199-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—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.

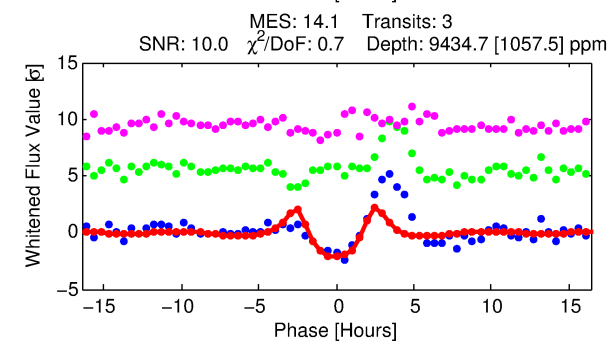
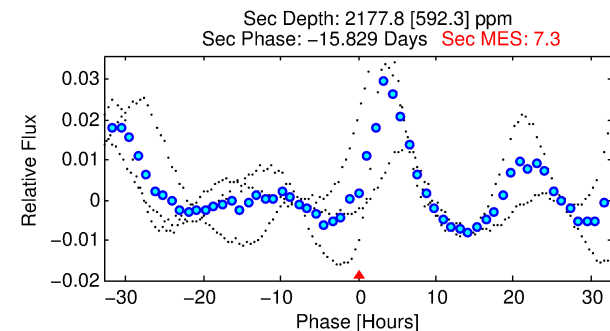
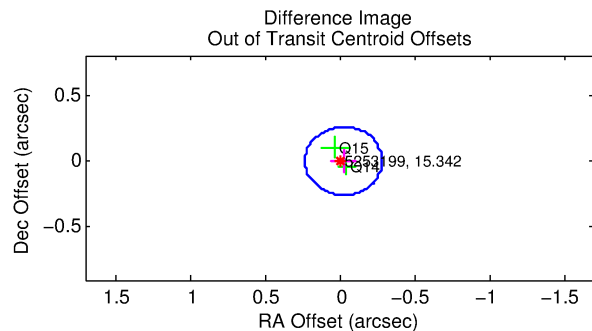
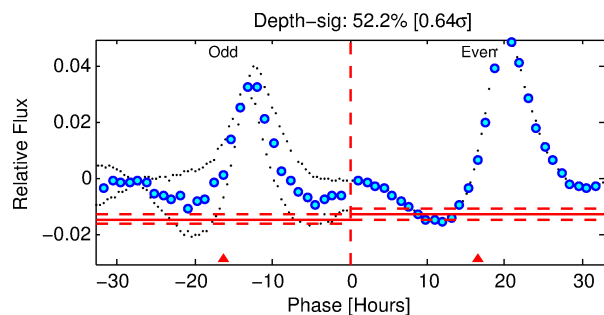
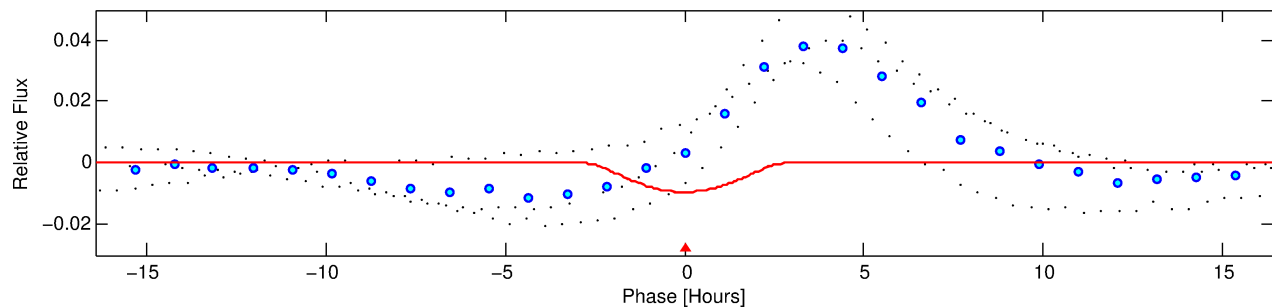
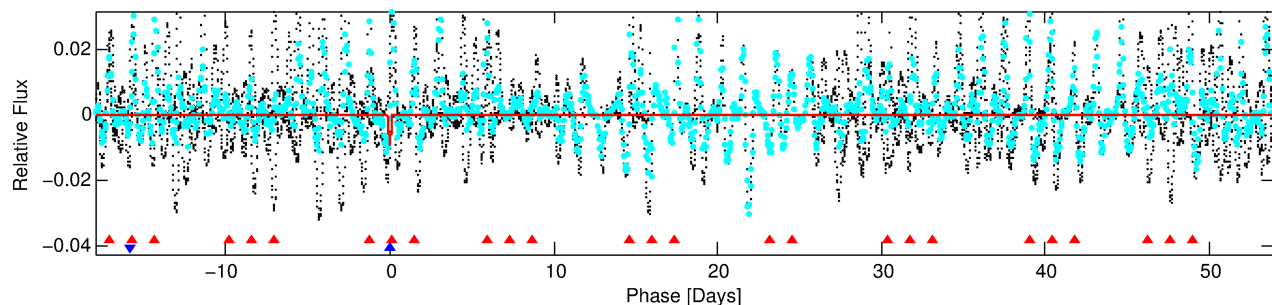
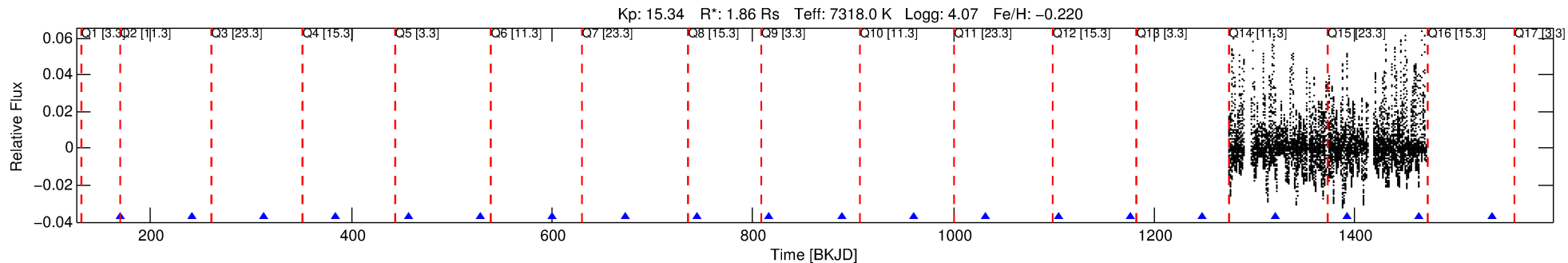
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005253199-02

No Significant Match Found

# DV One-Page Summary

KIC: 5253199 Candidate: 2 of 2 Period: 71.951 d



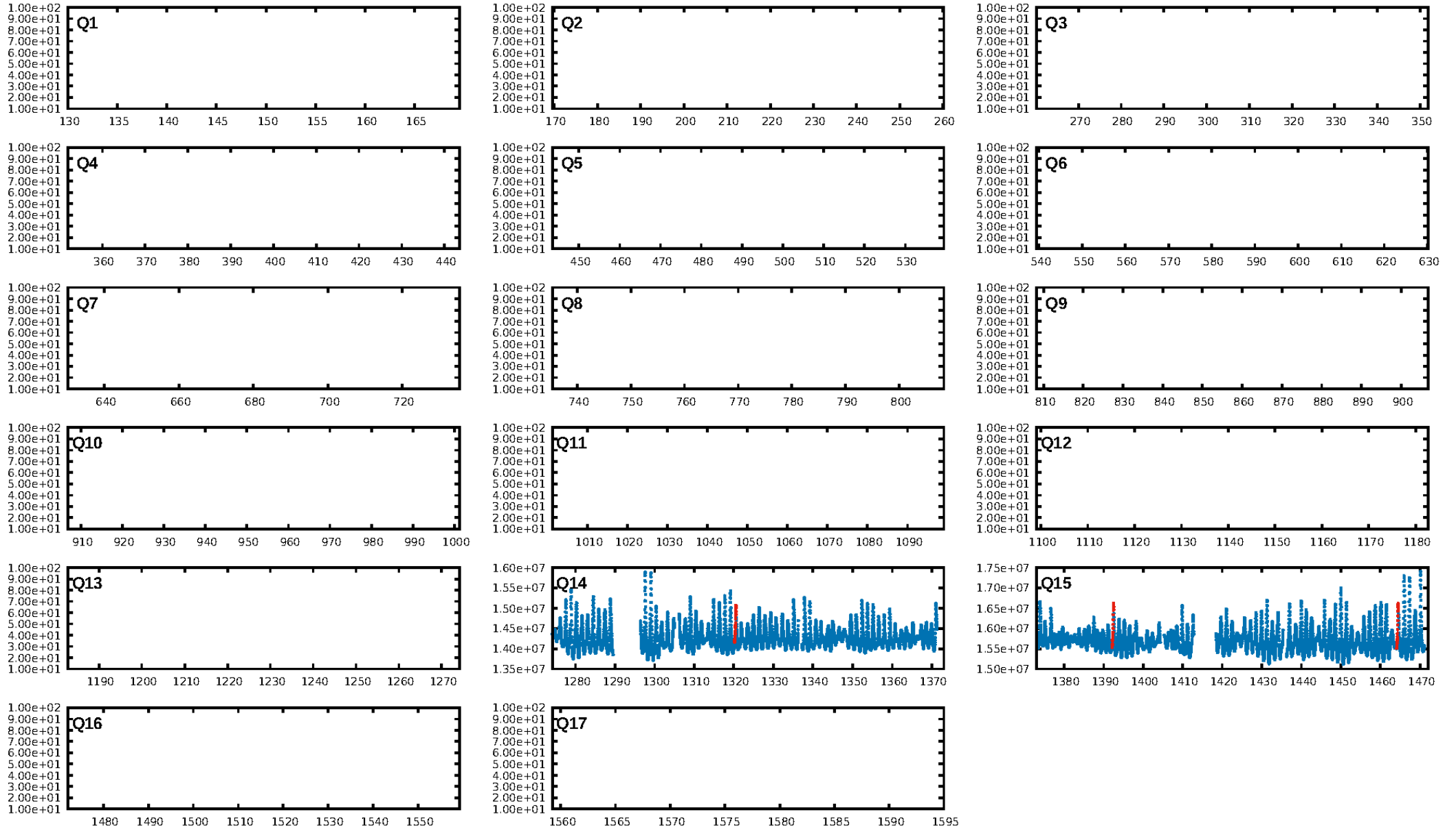
## DV Fit Results:

Period = 71.95104 [0.00321] d  
Epoch = 169.1919 [0.0558] BKJD  
Rp/R\* = 0.1184 [0.0376]  
a/R\* = 61.20 [7.42]  
b = 0.94 [0.07]  
Seff = 59.29 [23.76]  
Teq = 708 [71] K  
Rp = 24.00 [10.50] Re  
a = 0.3866 [0.0972] AU  
Ag = 310.83 [242.85] [1.28 $\sigma$ ]  
Teffp = 4593 [817] K [4.74 $\sigma$ ]

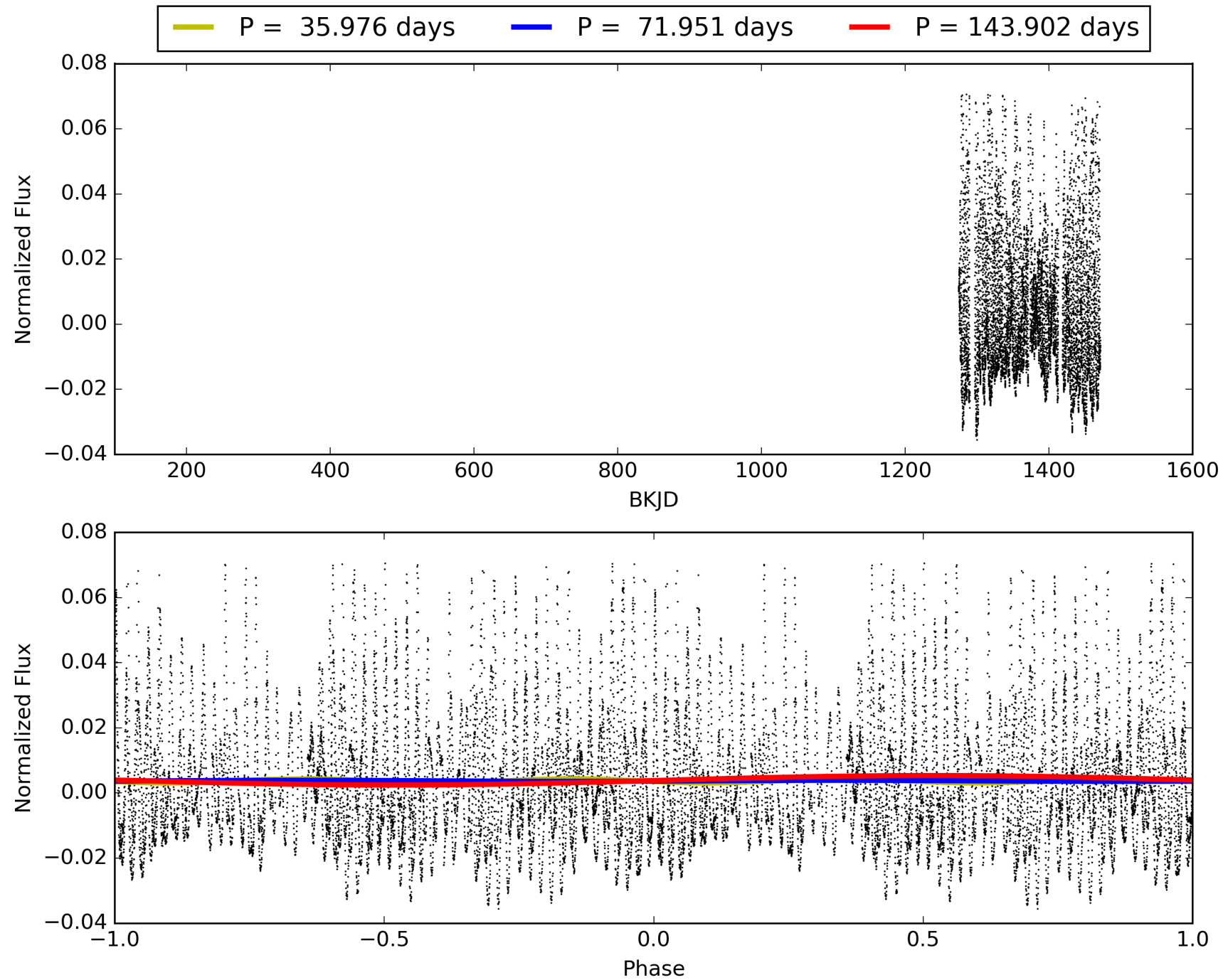
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.95 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 29.4%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: 1.17e-17  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.3863  
Centroid-sig: 80.3%  
Centroid-so: 0.194 arcsec [0.75 $\sigma$ ]  
OotOffset-rm: 0.026 arcsec [0.30 $\sigma$ ]  
KicOffset-rm: 0.190 arcsec [2.27 $\sigma$ ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 005253199-02, PDC Light Curves



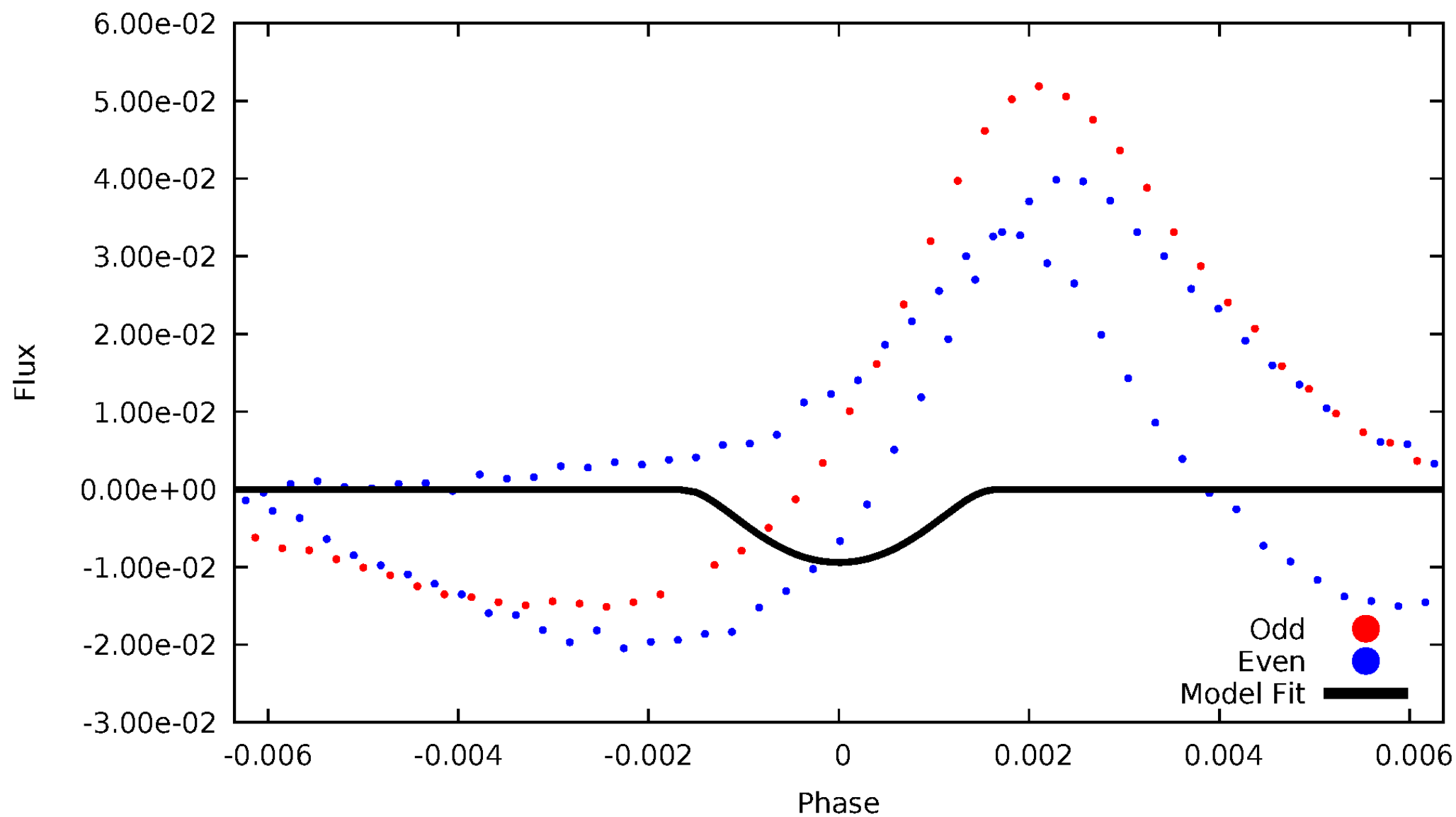
# TCE 005253199-02





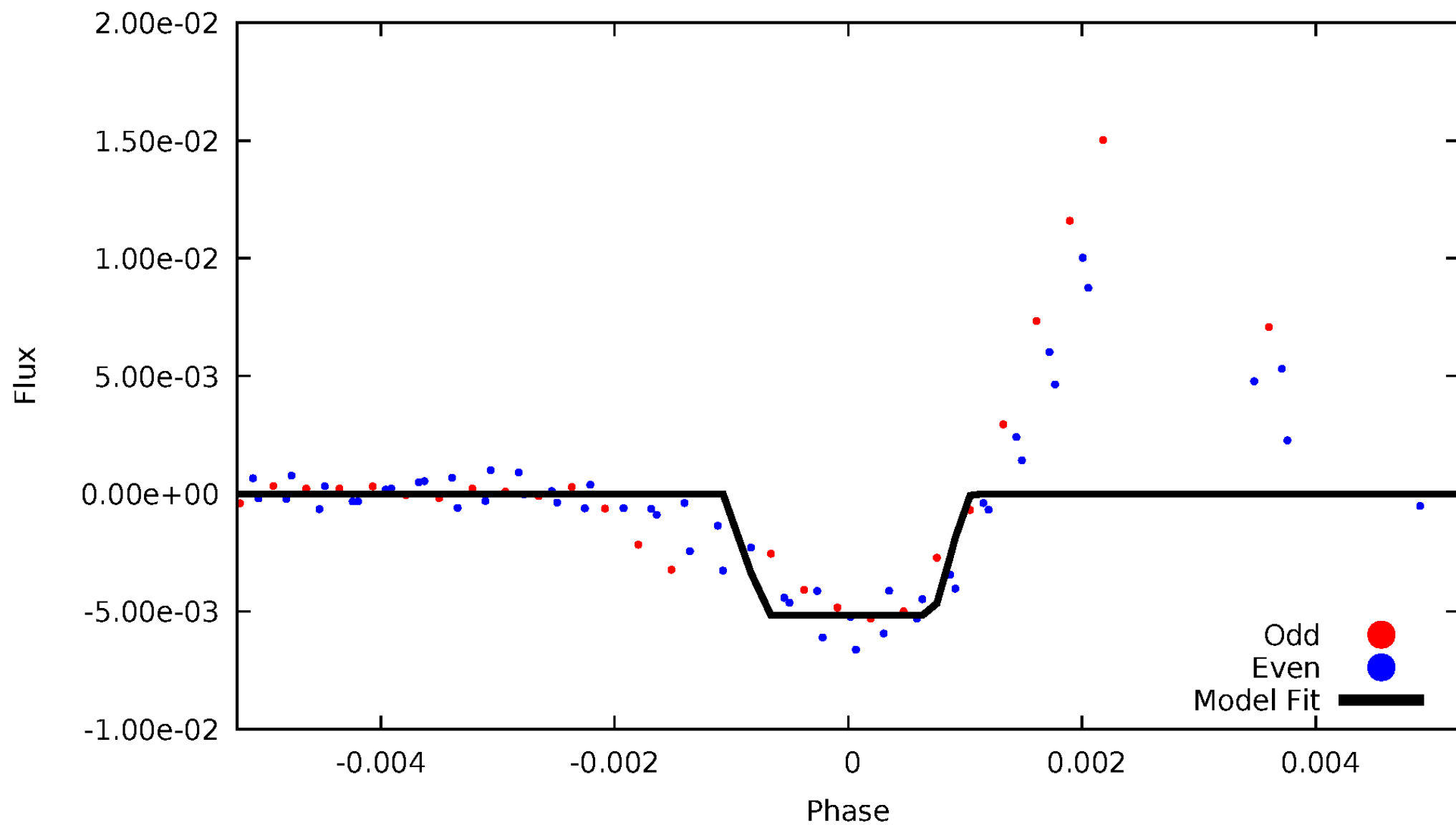
# DV Odd/Even

TCE 005253199-02



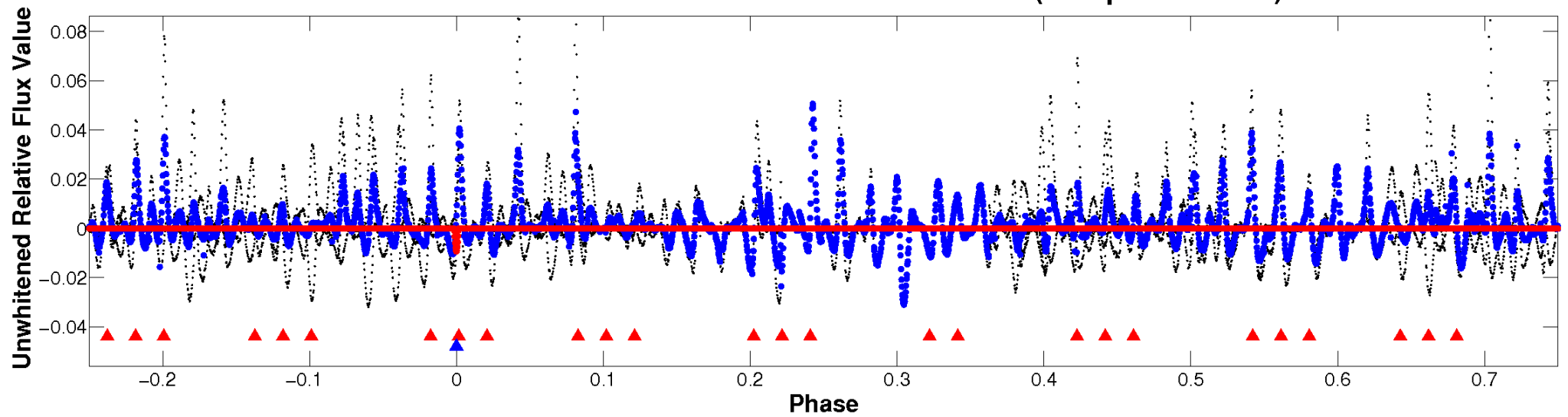
# ALT Odd/Even

TCE 005253199-02

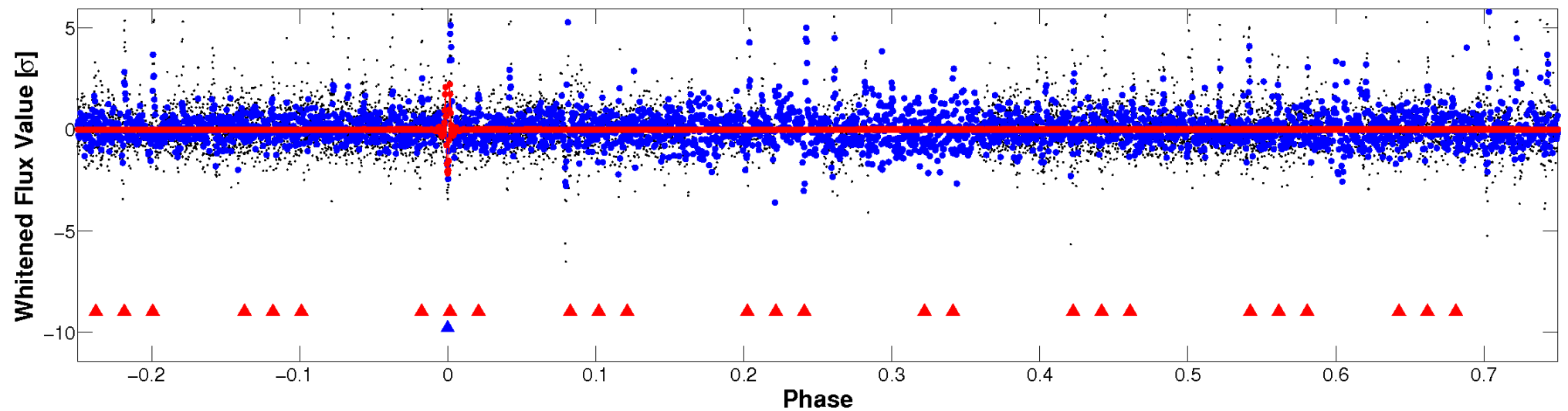


# Non-Whitened Vs. Whitened Light Curve

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

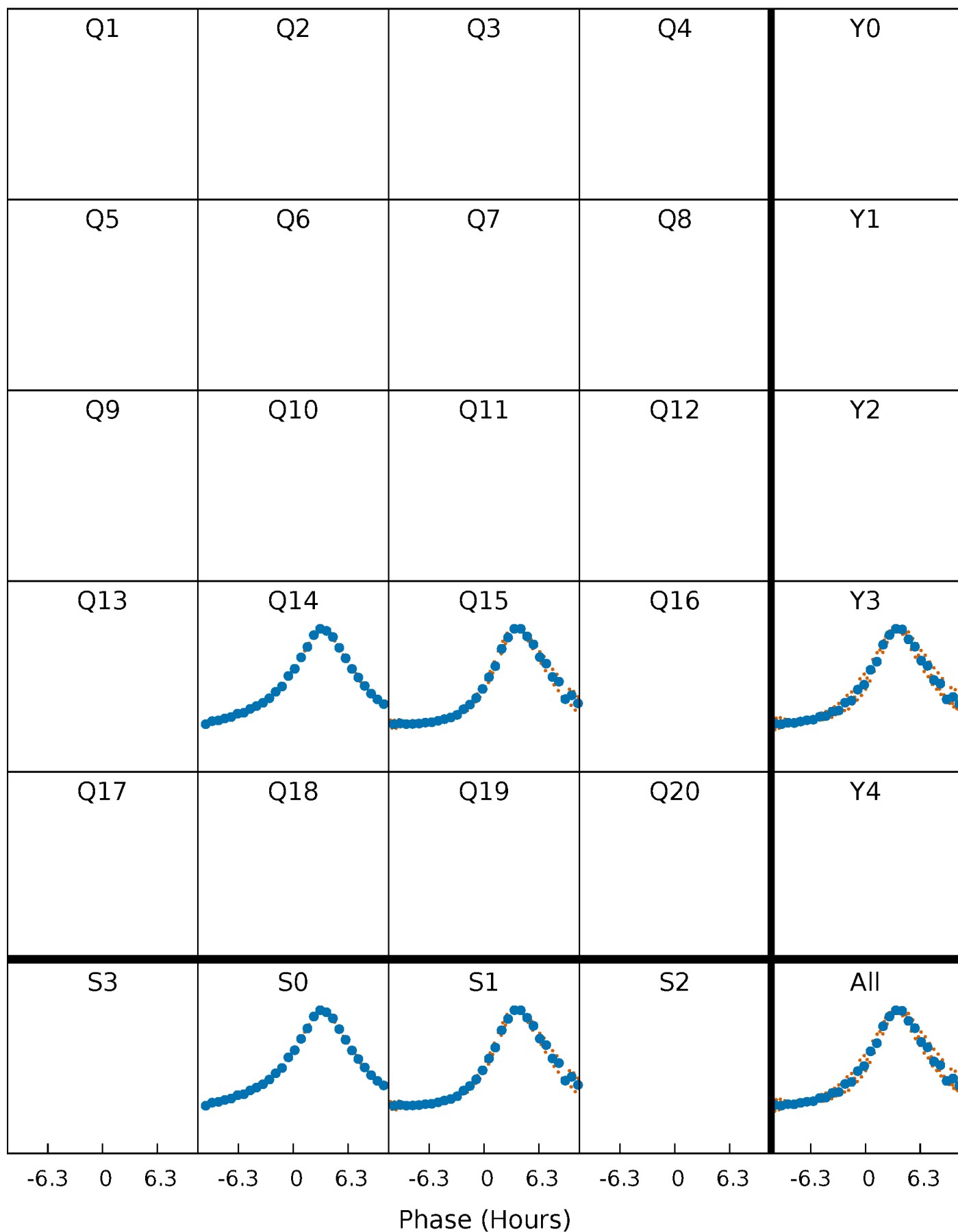


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



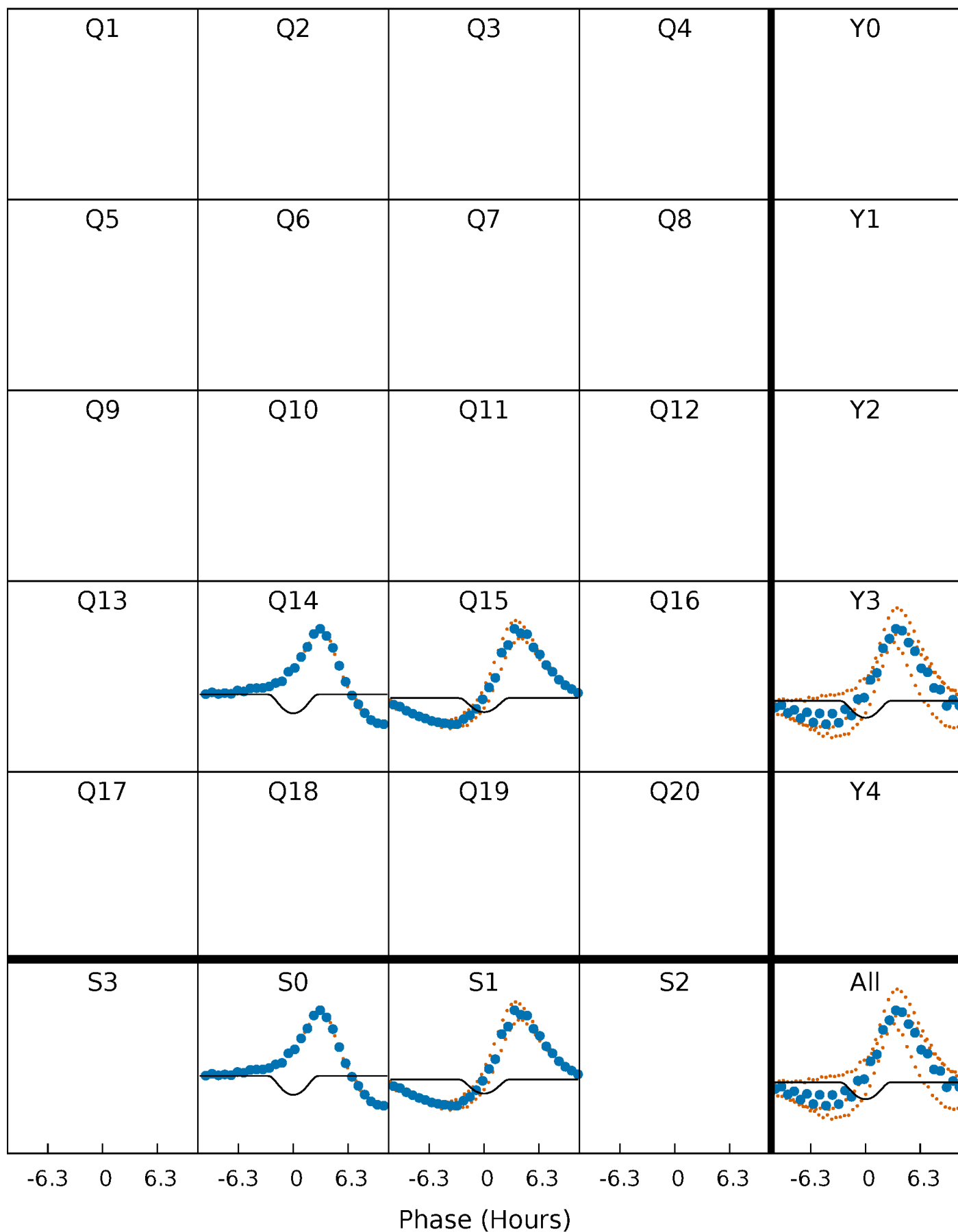
# PDC Quarter-Phased Transit Curves

TCE 005253199-02 P= 71.951040 Days  $T_0=169.191862$  (BKJD)



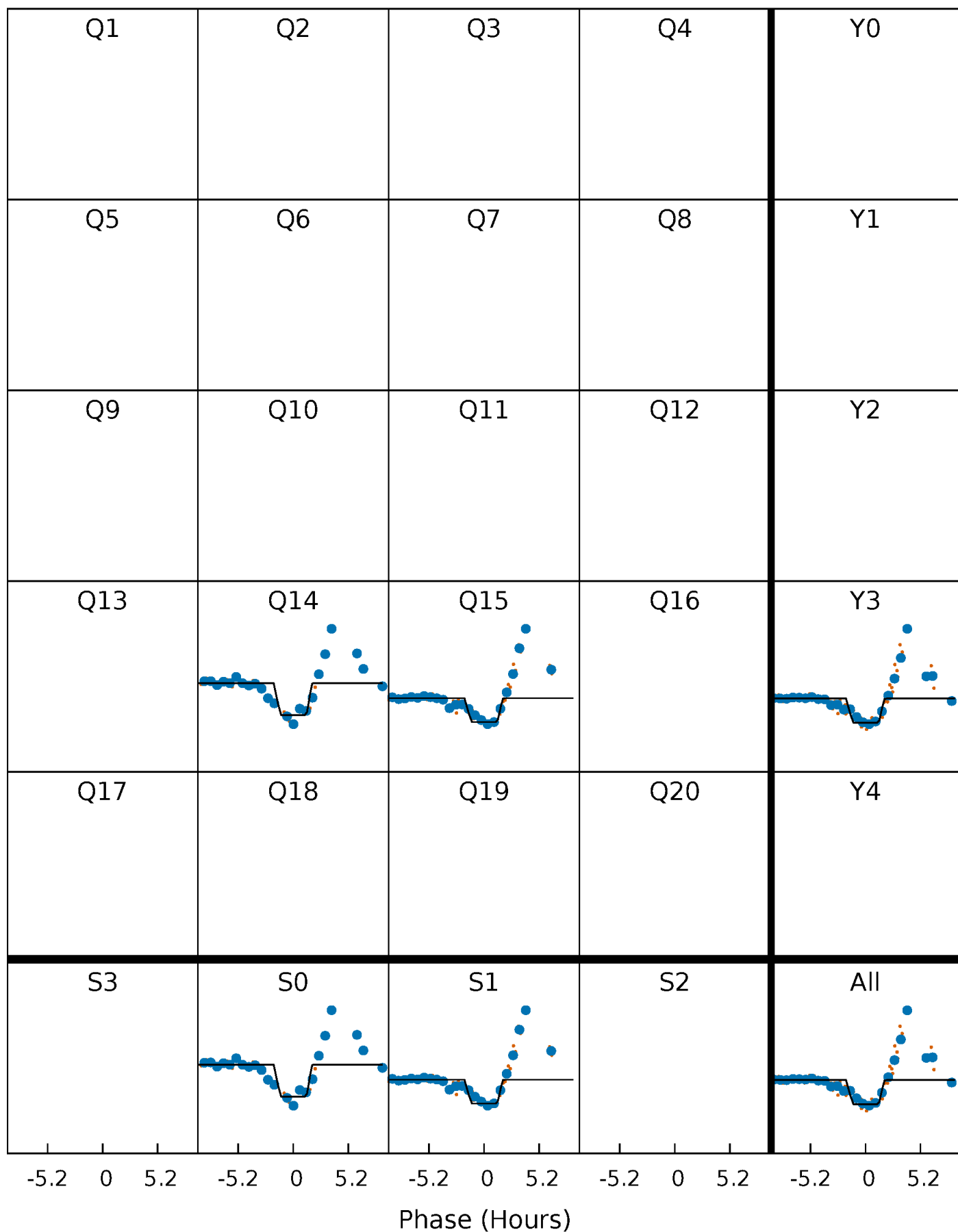
# DV Quarter-Phased Transit Curves

TCE 005253199-02    P= 71.951040 Days     $T_0=169.191862$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

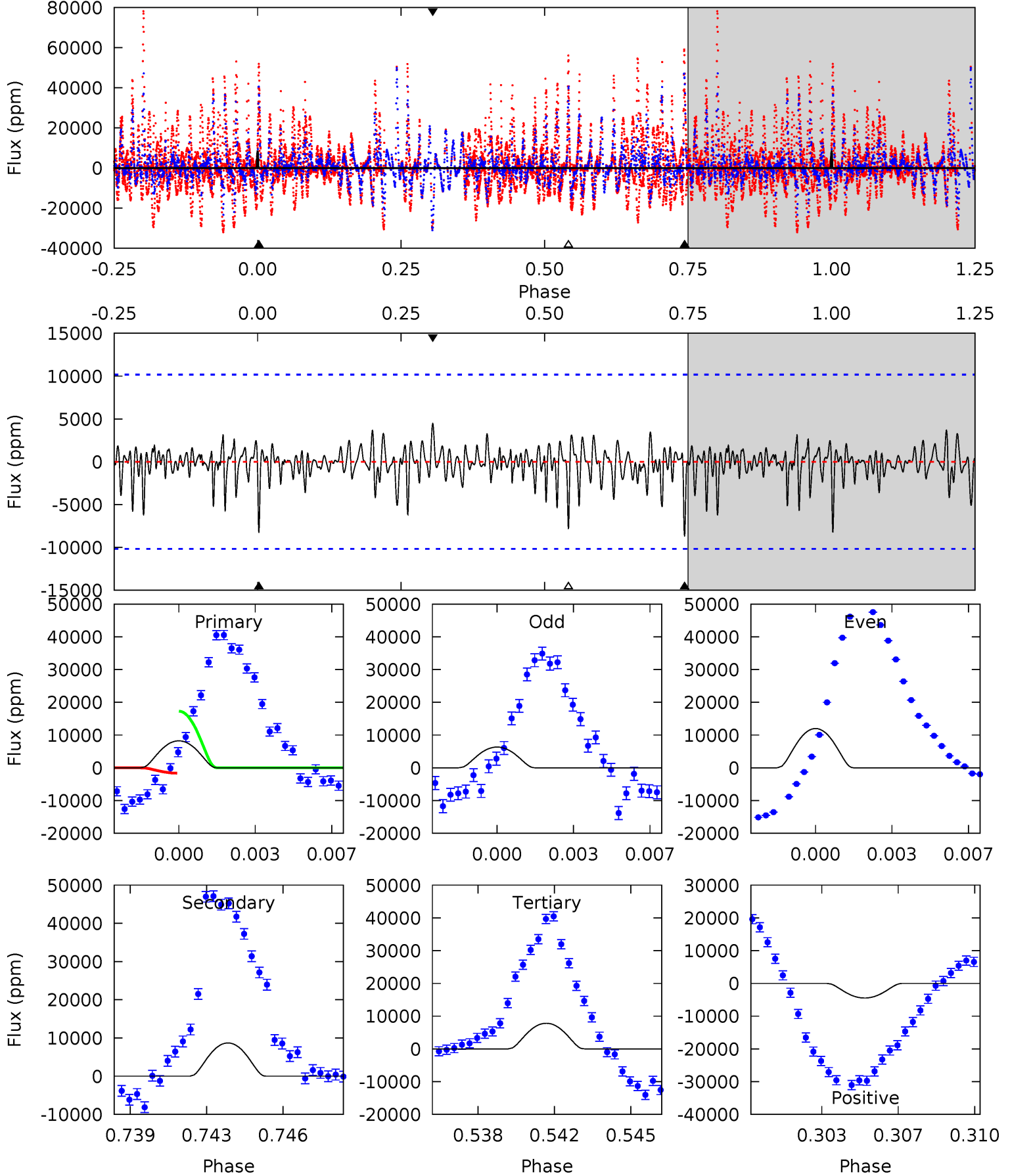
TCE 005253199-02     $P = 71.956118$  Days     $T_0 = 169.059176$  (BKJD)



# DV Model-Shift Uniqueness Test

005253199-02, P = 71.951040 Days, E = 169.191862 Days

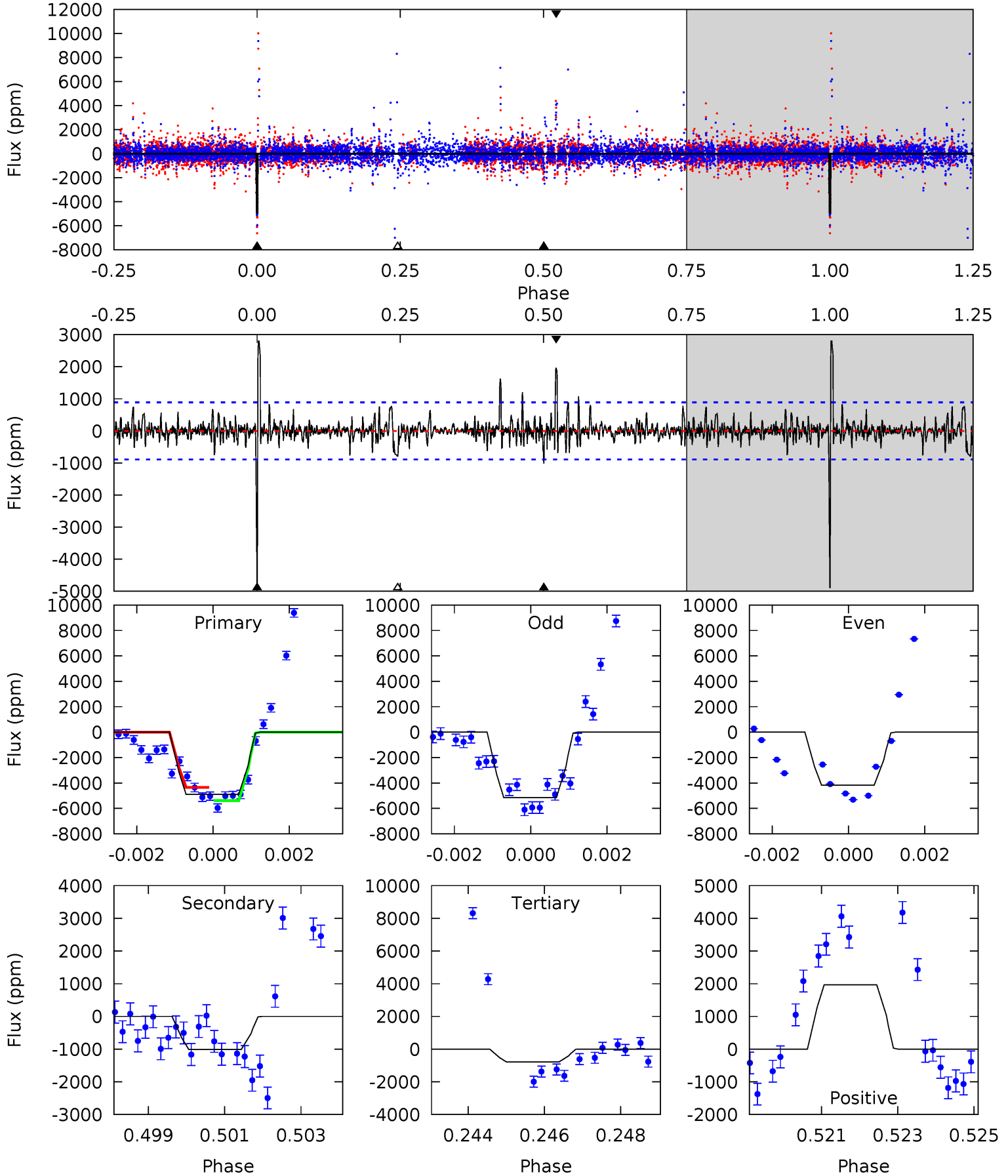
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.24	4.47	4.03	2.30	5.23	2.93	0.79	0.21	1.94	0.45	2.17	1.25	0.68	0.34	4.04



# Alt Model-Shift Uniqueness Test

005253199-02, P = 71.956118 Days, E = 169.059176 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
29.4	6.07	4.73	11.8	5.34	3.11	1.42	24.7	17.6	1.34	-5.74	2.44	0.97	0.36	3.20





### Stellar Parameters For KIC 005253199

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7318^{+230}_{-307}$	$4.073^{+0.198}_{-0.162}$	$-0.220^{+0.250}_{-0.350}$	$1.857^{+0.558}_{-0.456}$	$1.486^{+0.209}_{-0.255}$	$0.327^{+0.366}_{-0.149}$
	+3%/-4%	+5%/-4%	+114%/-159%	+30%/-25%	+14%/-17%	+112%/-45%
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 005253199-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-8699 \pm 1945$	$23.97^{+8.22}_{-8.04}$	$979^{+70}_{-73}$	$6331^{+1551}_{-827}$	$1253^{+1546}_{-609}$
Alt.	$-1010 \pm 166$	$14.60^{+7.98}_{-7.76}$	$980^{+73}_{-72}$	$4840^{+2031}_{-749}$	$390^{+1322}_{-236}$

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

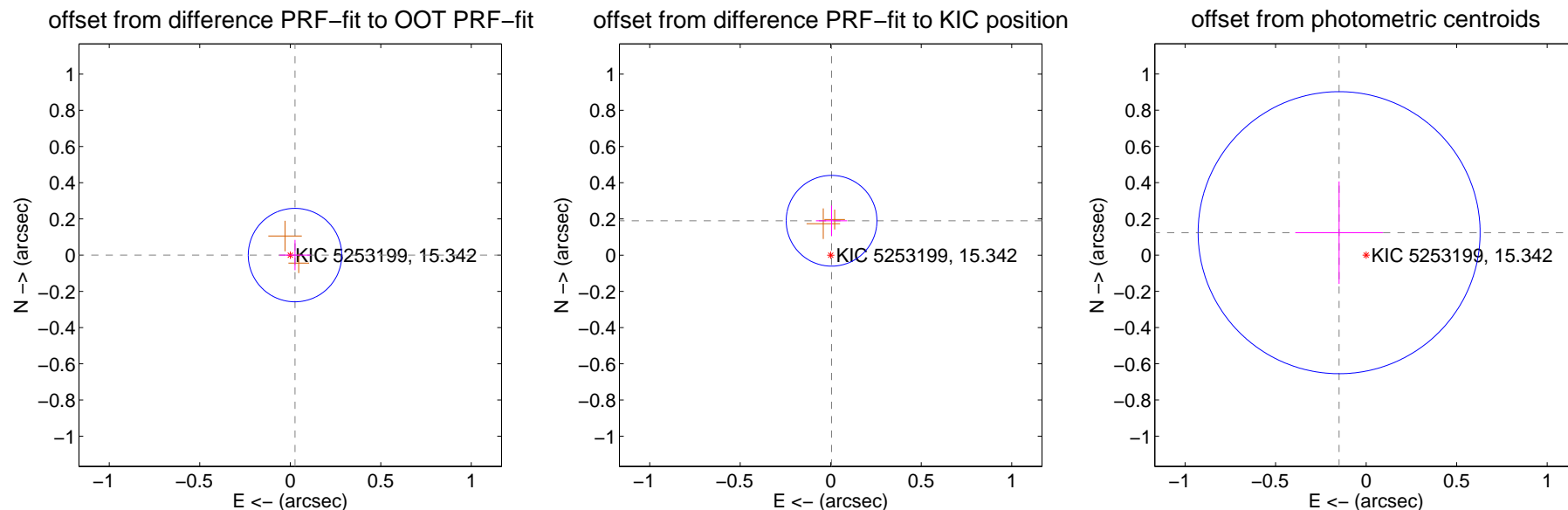
## DV Centroid Data

Supplemental centroid analysis for 005253199-02. Kepler magnitude: 15.34. Transit SNR 9.97

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.026 \pm 0.086$	0.30	$-0.026 \pm 0.086$	$0.000 \pm 0.084$
PRF-fit source offset from KIC position	$0.190 \pm 0.084$	2.27	$-0.005 \pm 0.086$	$0.190 \pm 0.084$
photometric centroid source offset	$0.19 \pm 0.26$	0.75	$0.15 \pm 0.24$	$0.12 \pm 0.28$



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.



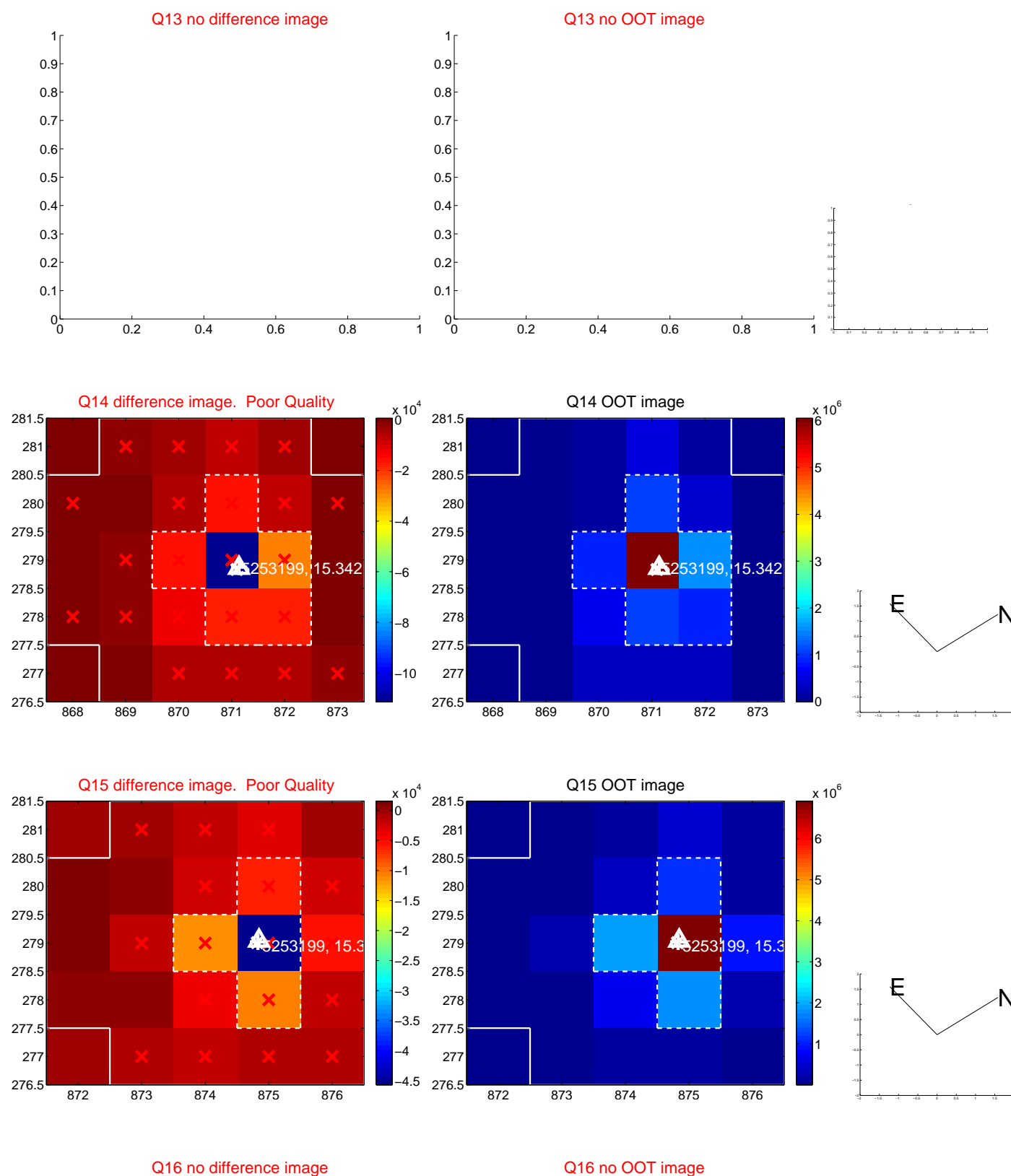
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



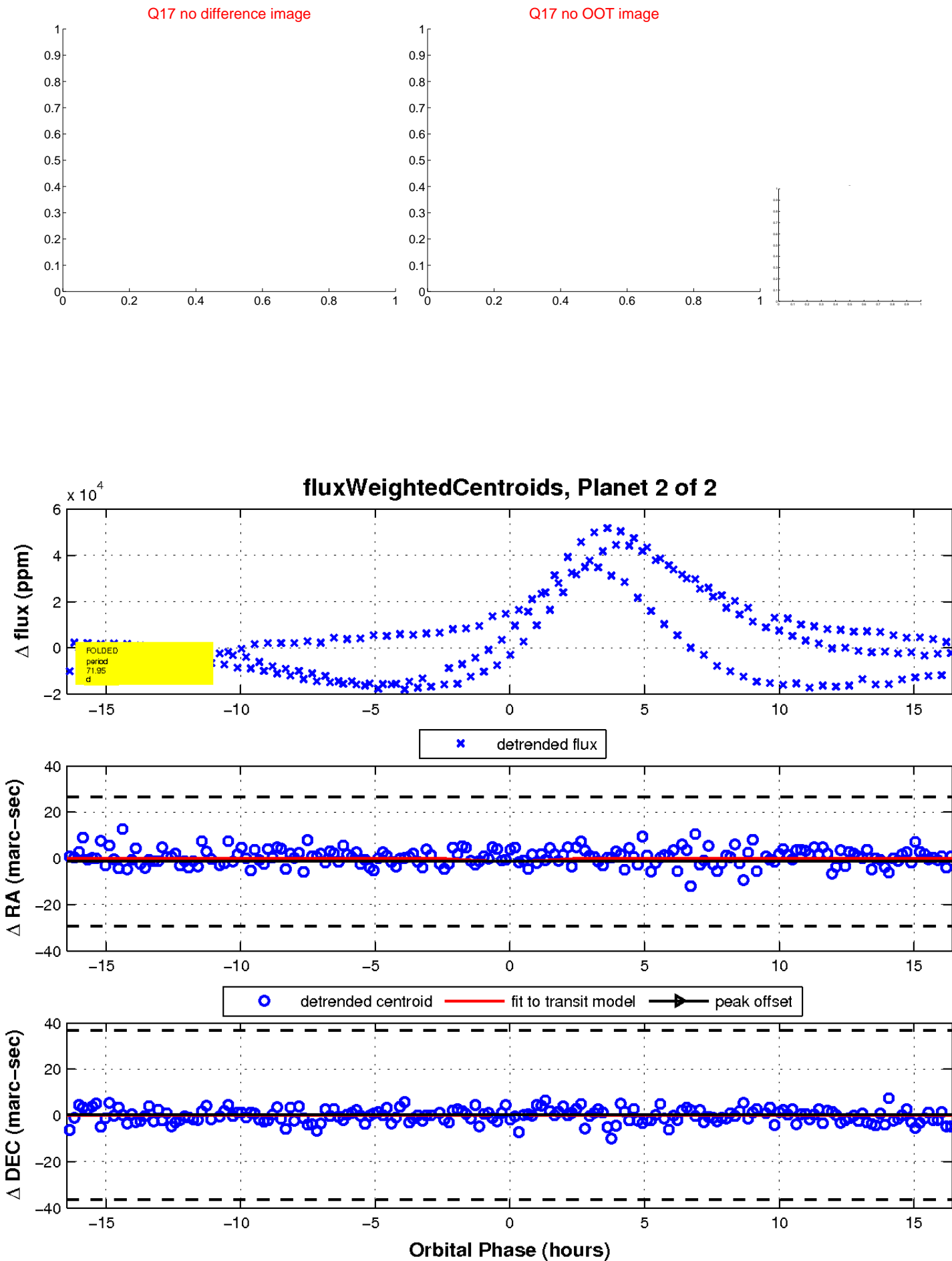
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

