

# KIC 003352751

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003352751-01	OBS	6330.01	3.495461	132.083887	106138.5	6.375	2549.2	2365.6	1.56	8529	61.48	4189.79
003352751-02	OBS	No	3.495457	133.832756	7421.8	5.998	177.5	216.3	1.56	8529	23.57	4189.80

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003352751-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
003352751-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

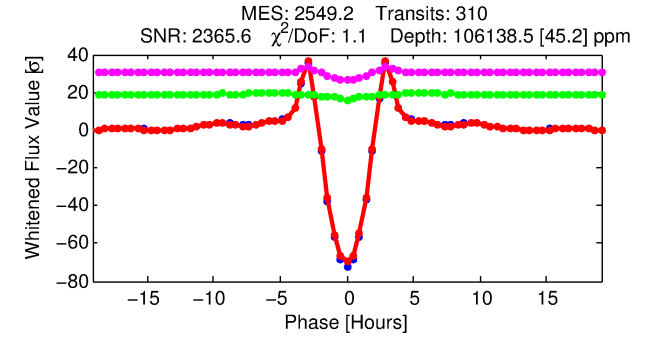
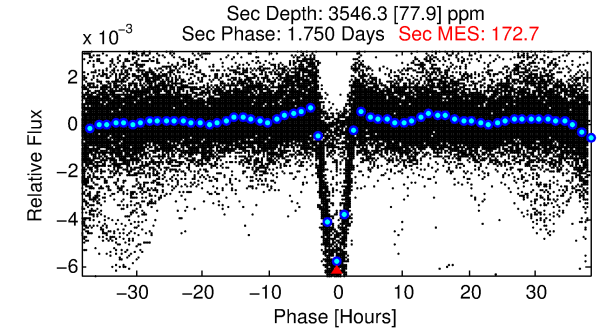
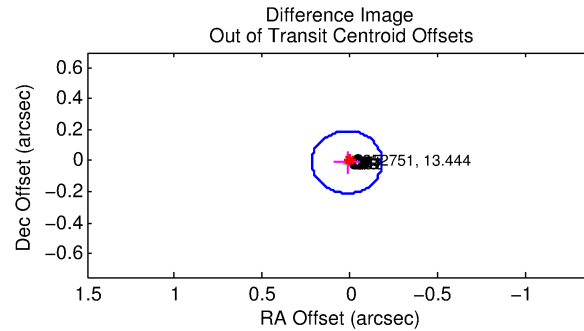
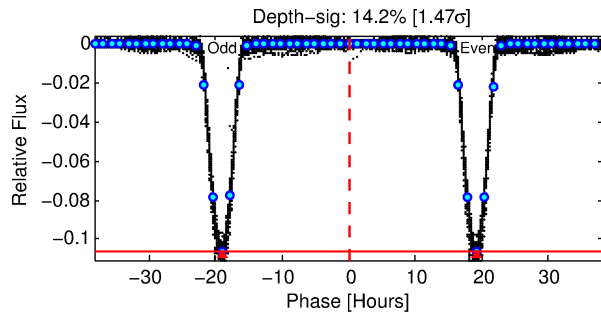
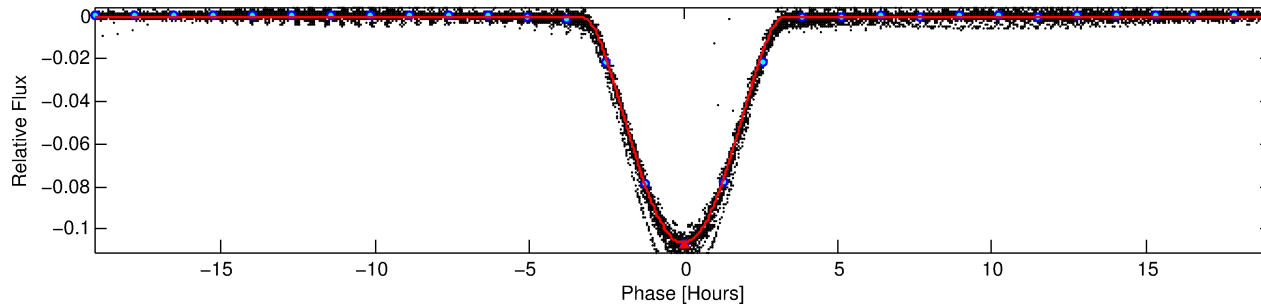
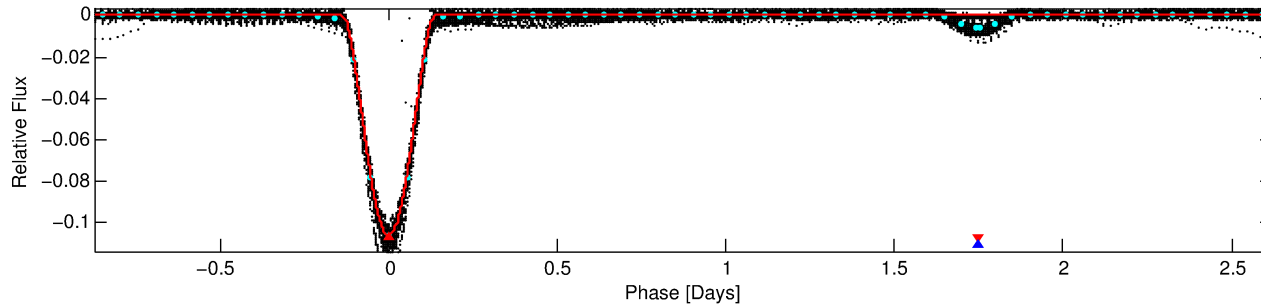
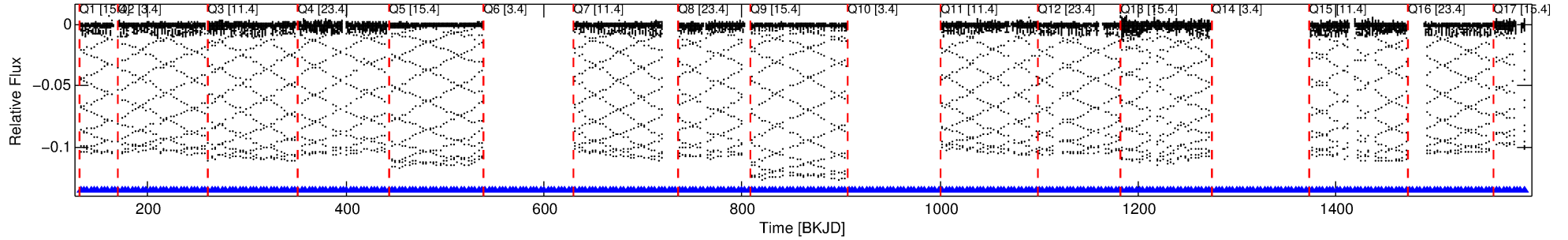
## Ephemeris Match Information For 003352751-01

No Significant Match Found

# DV One-Page Summary

KIC: 3352751 Candidate: 1 of 2 Period: 3.495 d  
KOI: K06330.01 Corr: 0.970

Kp: 13.44 R\*: 1.56 Rs Teff: 8529.0 K Logg: 4.25 Fe/H: -0.420



## DV Fit Results:

Period = 3.49546 [0.00000] d  
Epoch = 132.0839 [0.0000] BKJD  
Rp/R\* = 0.3616 [0.0006]  
a/R\* = 4.78 [0.00]  
b = 0.78 [0.00]  
Seff = 4189.79 [862.15]  
Teq = 2052 [106] K  
Rp = 61.48 [10.50] Re  
a = 0.0524 [0.0074] AU  
Ag = 1.42 [0.29] [1.46σ]  
Teffp = 3461 [42] K [12.40σ]

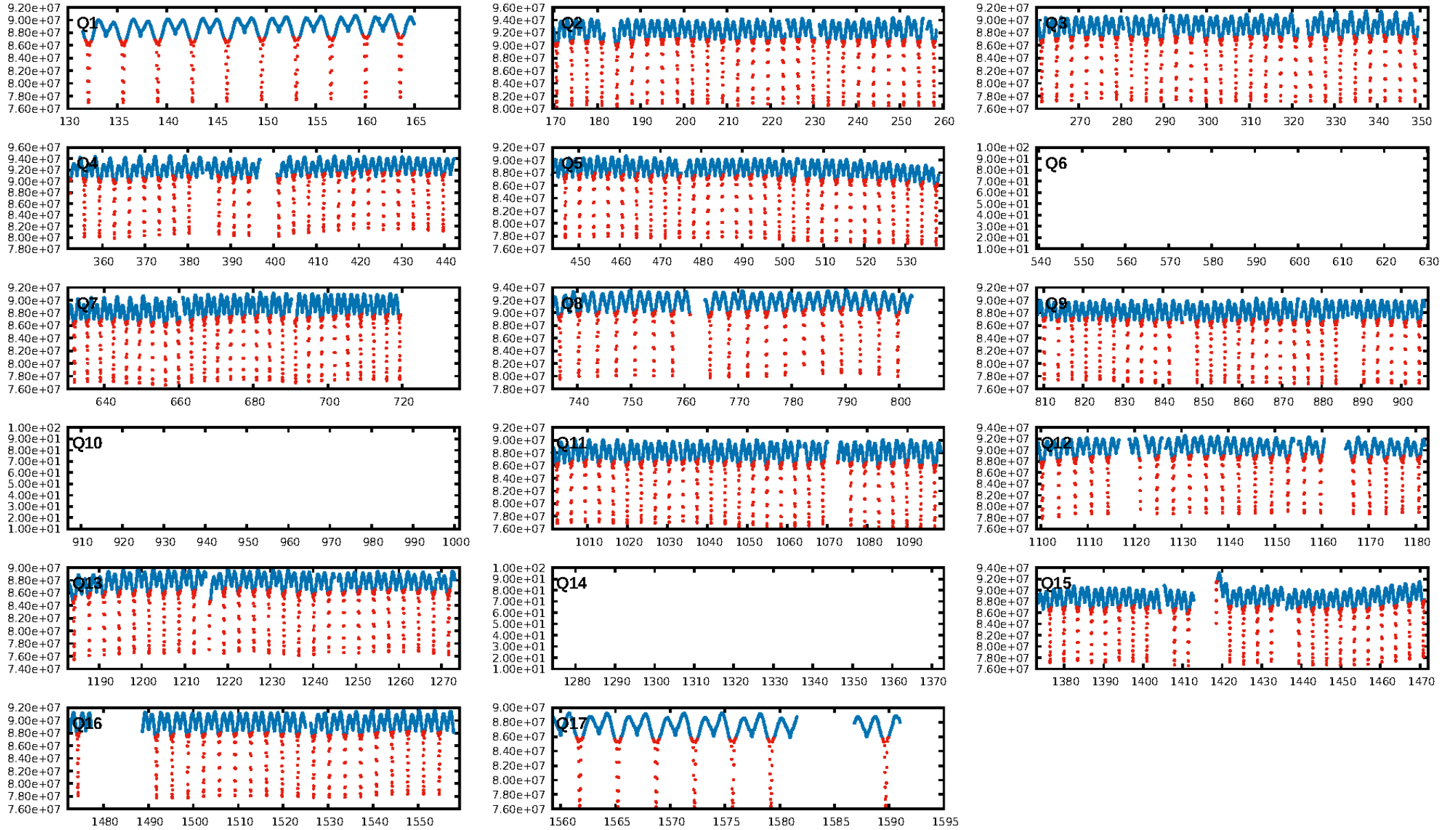
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [293/293]  
GhostDiagnostic-chr: 1.465  
Centroid-sig: 0.0%  
Centroid-so: 0.262 arcsec [224.02σ]  
OotOffset-rm: 0.020 arcsec [0.30σ]  
KicOffset-rm: 0.041 arcsec [0.59σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

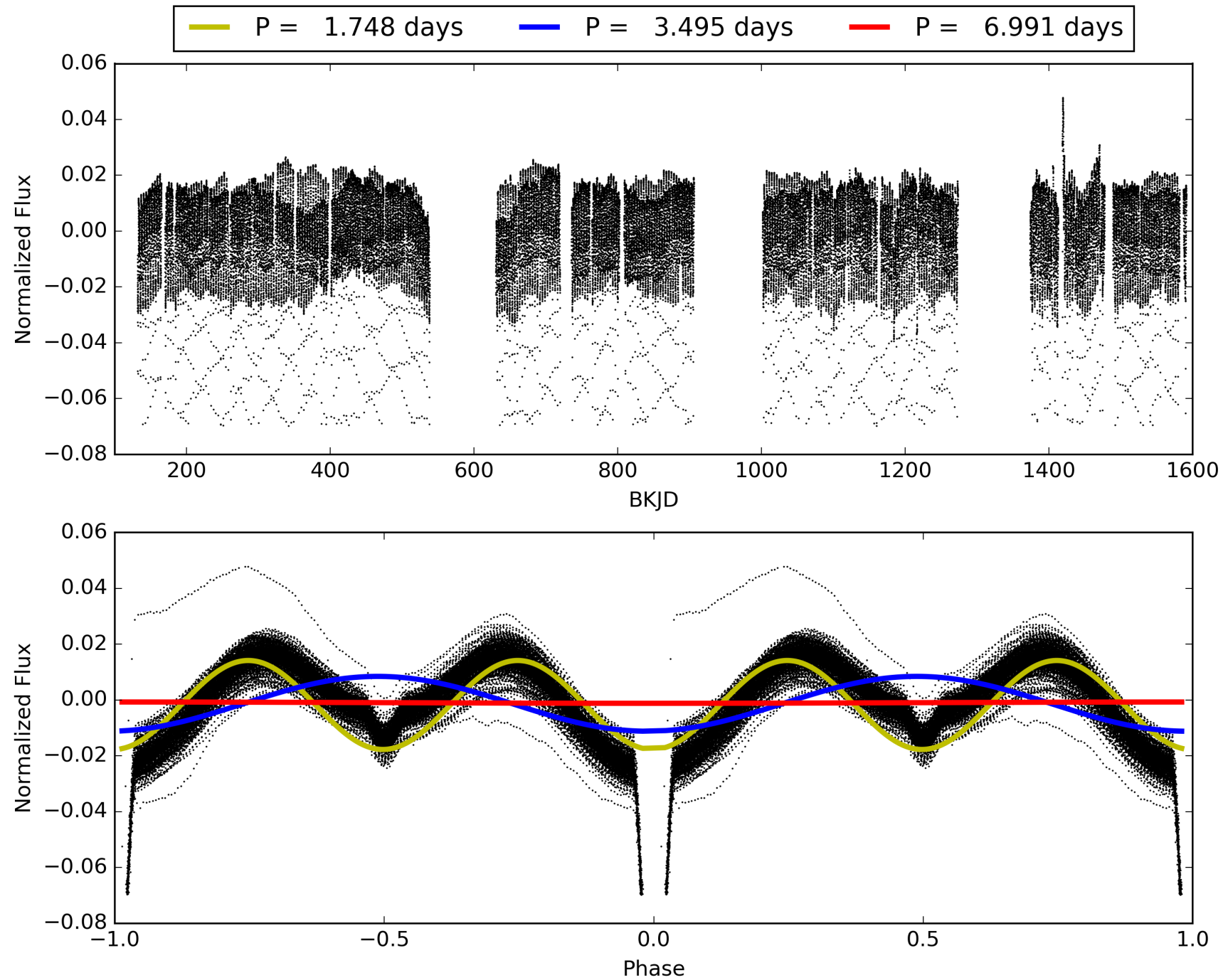
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:42:51 Z

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

# TCE 003352751-01, PDC Light Curves

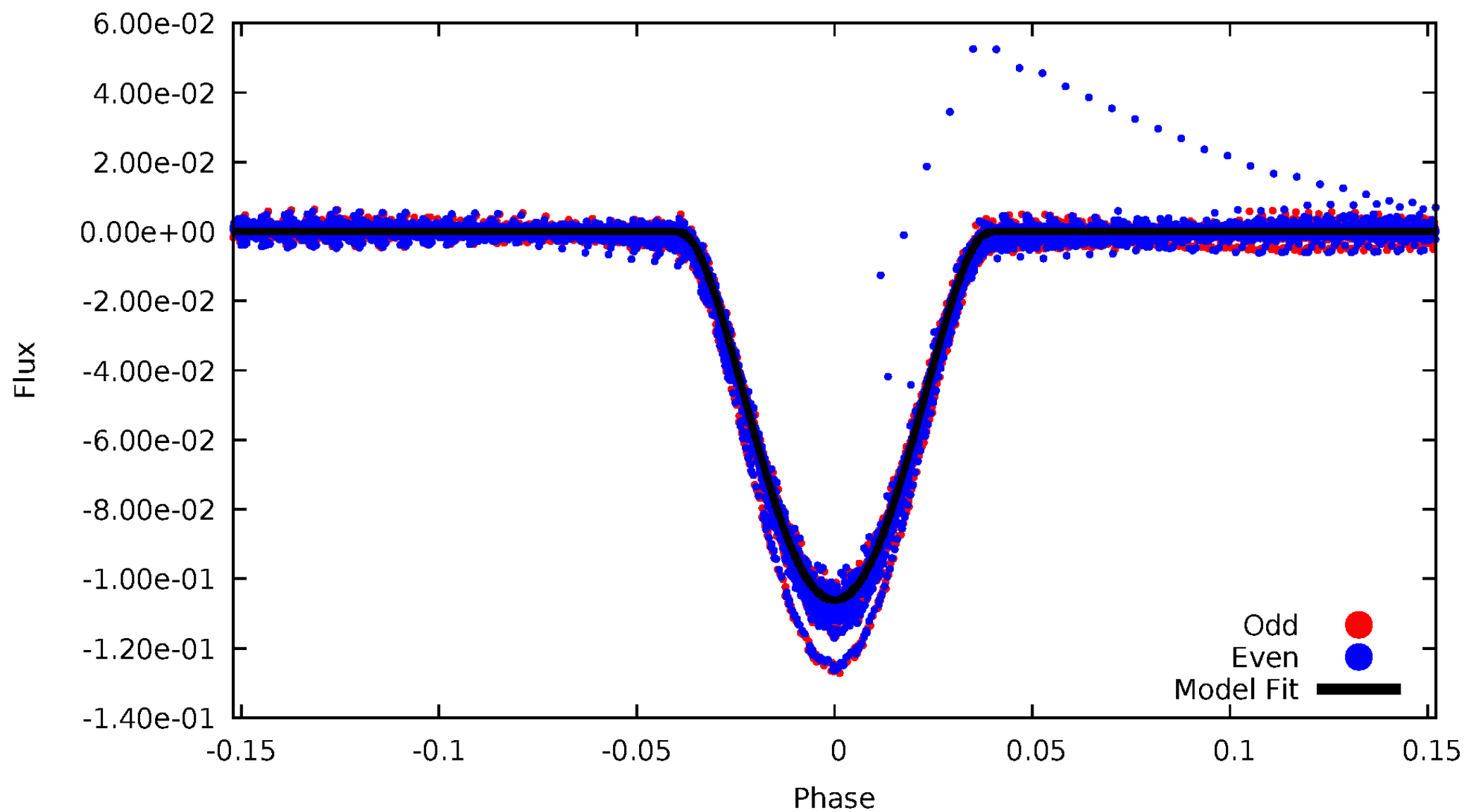


TCE 003352751-01



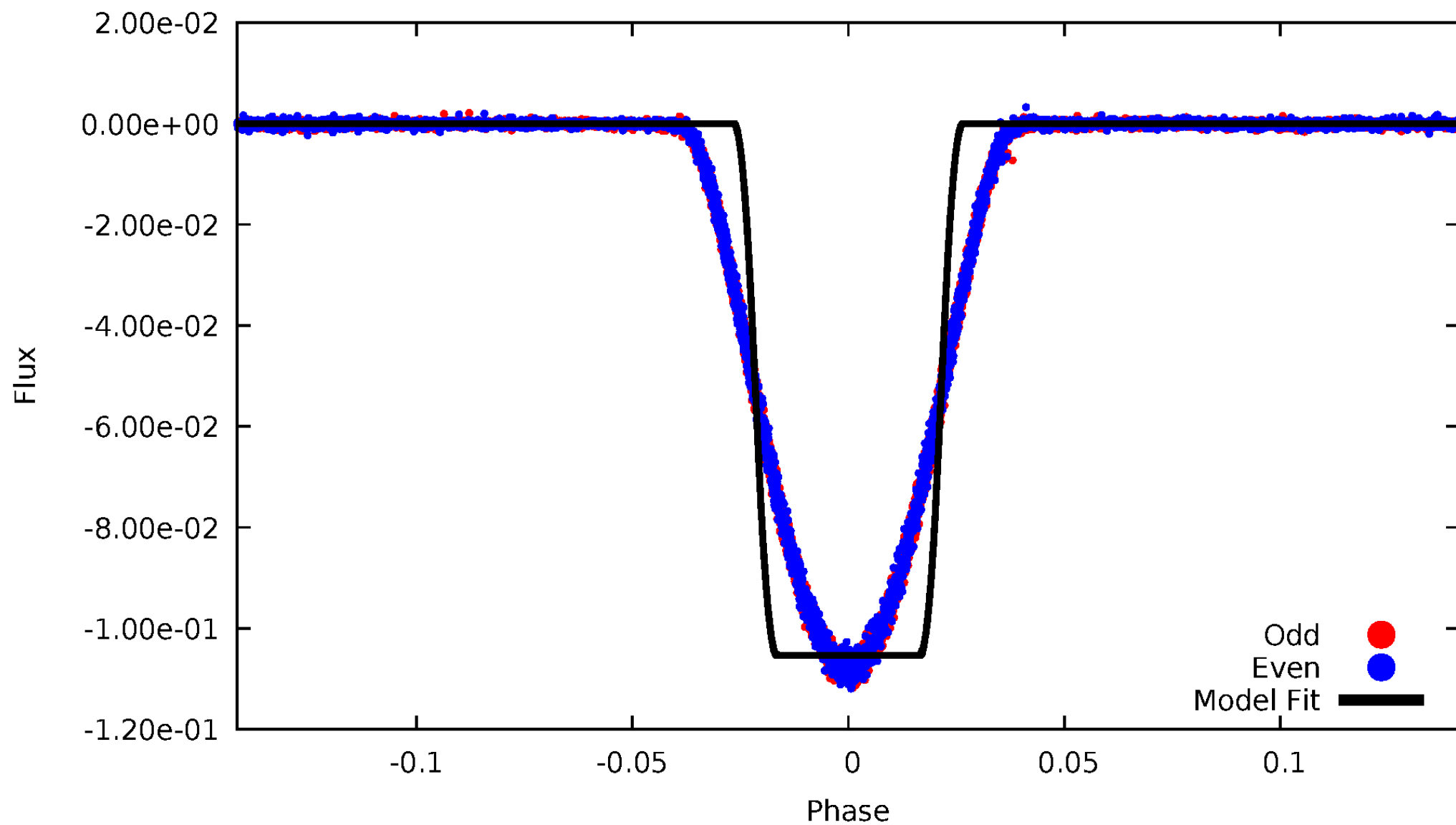
# DV Odd/Even

TCE 003352751-01



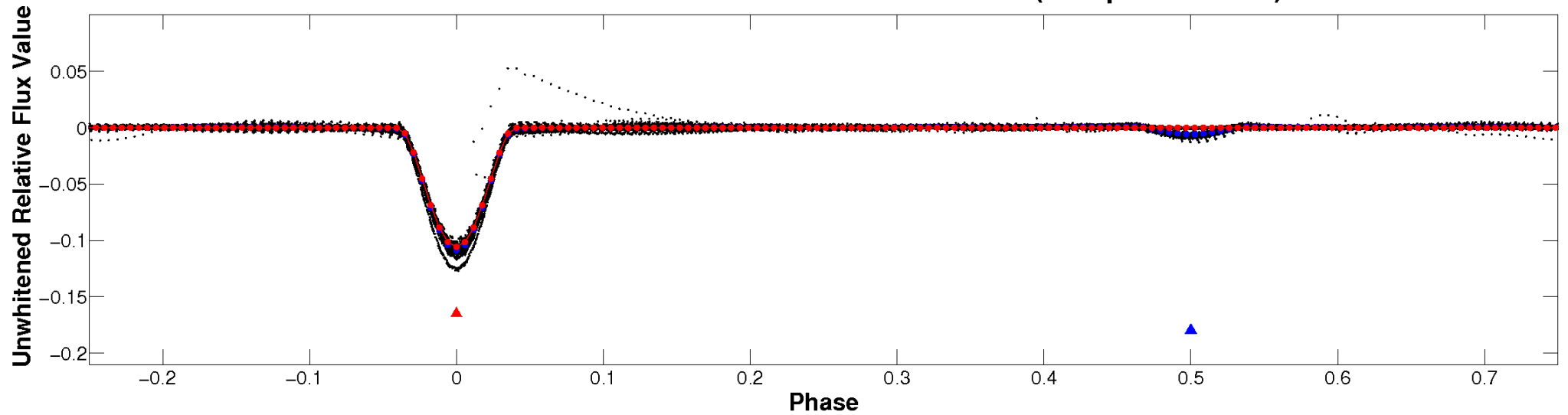
# ALT Odd/Even

TCE 003352751-01

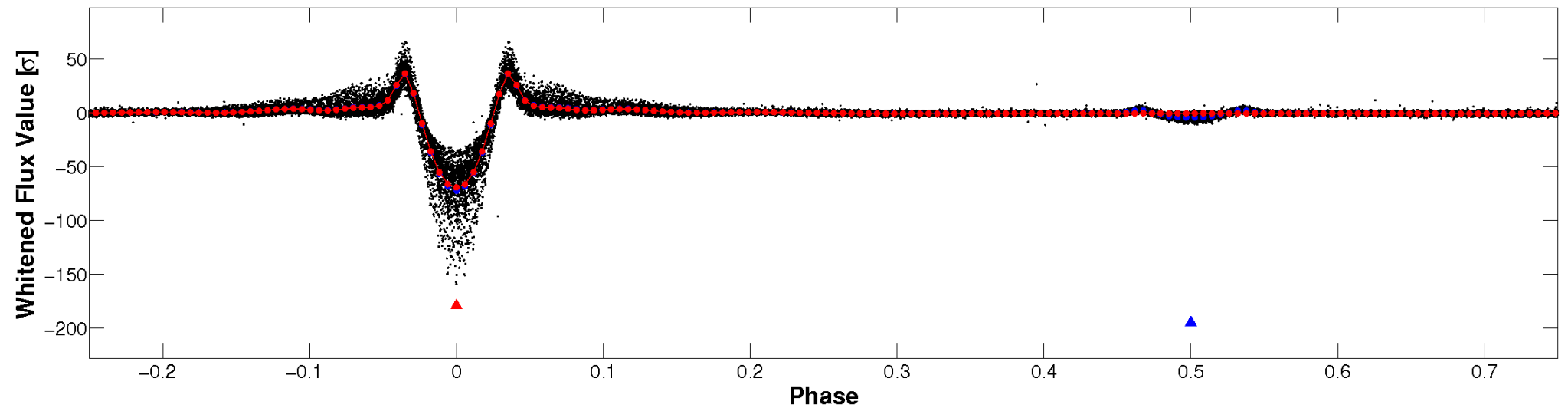


# Non-Whitened Vs. Whitened Light Curve

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

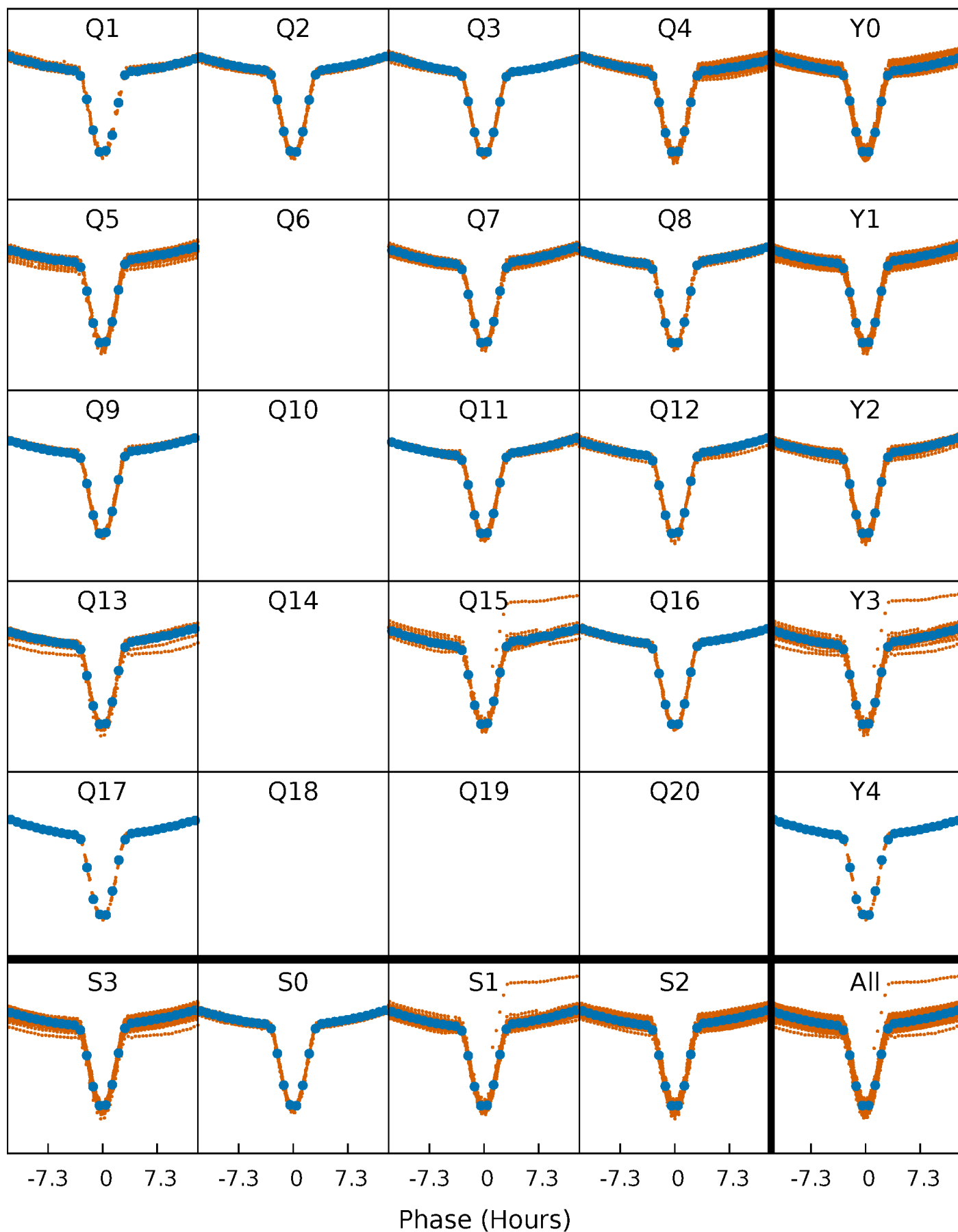


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

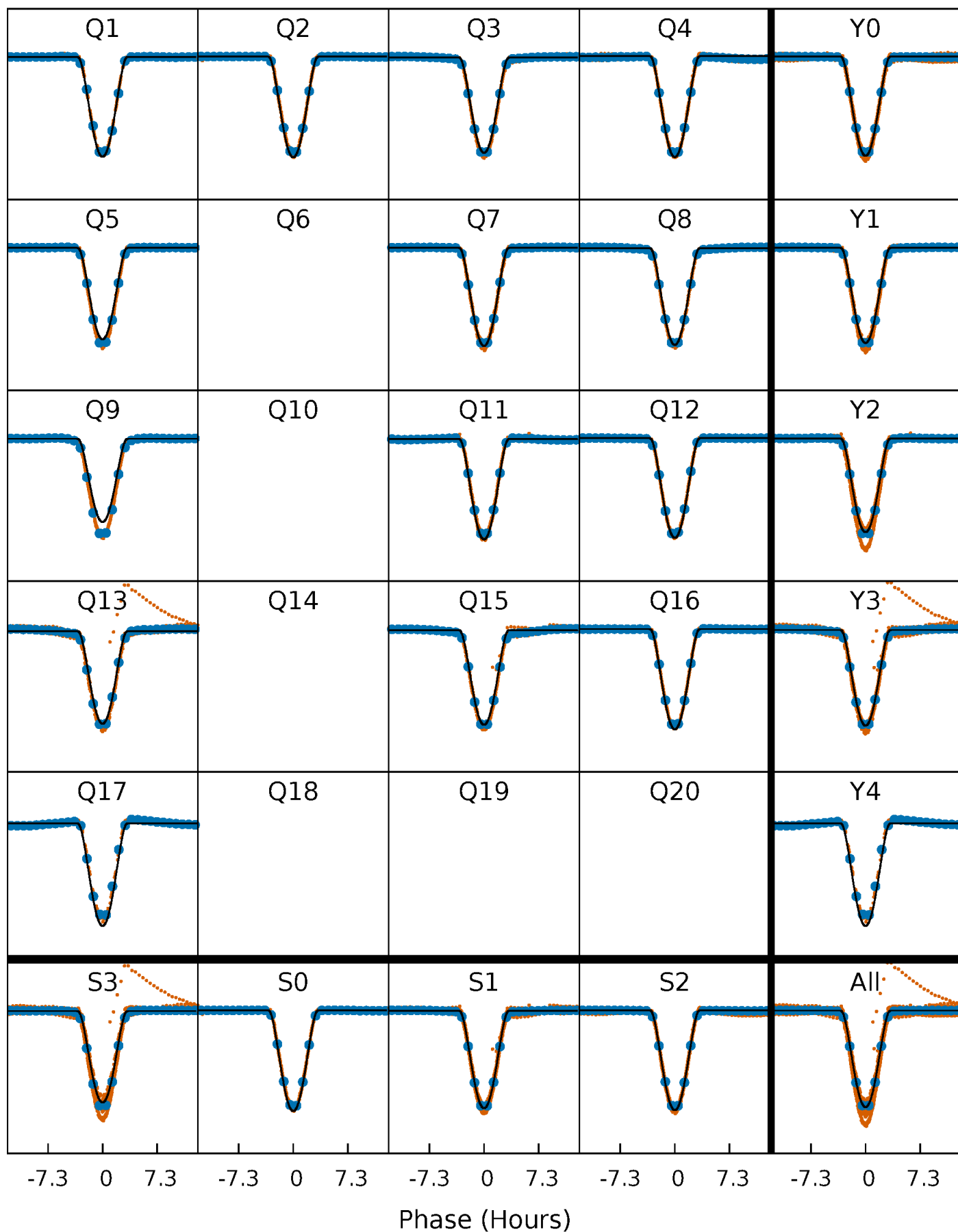
TCE 003352751-01   P= 3.495461 Days    $T_0=132.083887$  (BKJD)





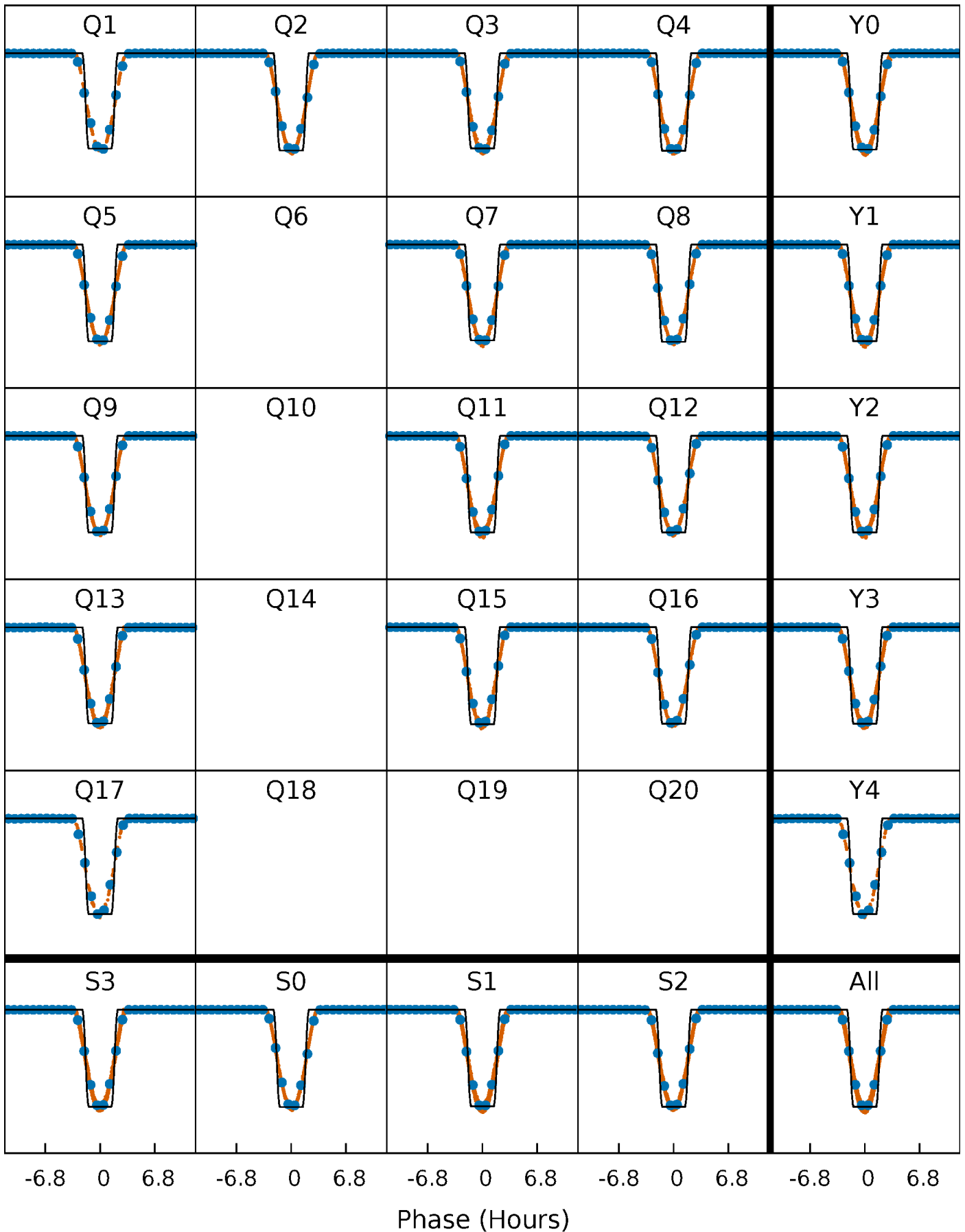
# DV Quarter-Phased Transit Curves

TCE 003352751-01 P= 3.495461 Days  $T_0=132.083887$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

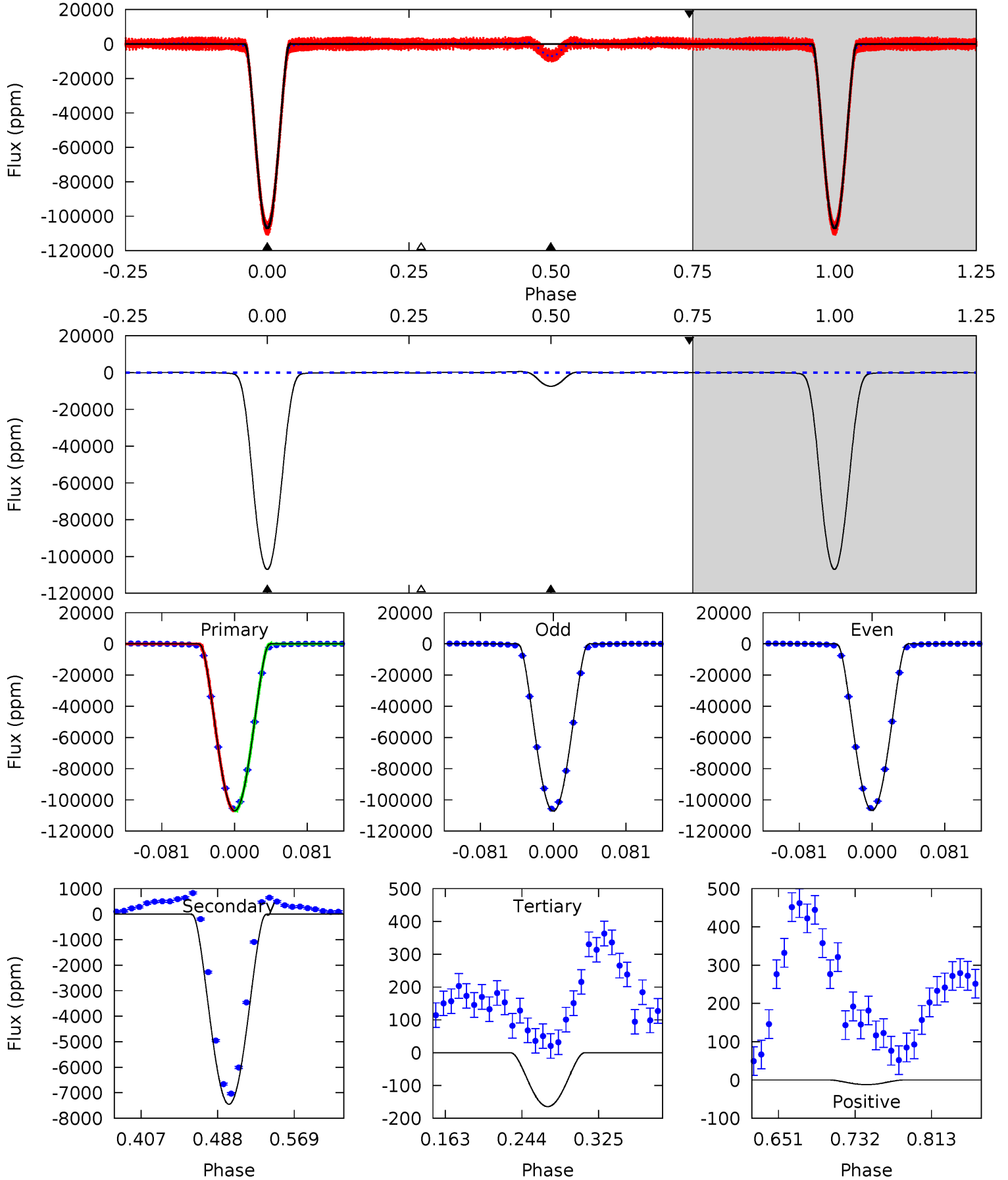
TCE 003352751-01   P= 3.495475 Days    $T_0=132.081264$  (BKJD)



# DV Model-Shift Uniqueness Test

003352751-01, P = 3.495461 Days, E = 128.588426 Days

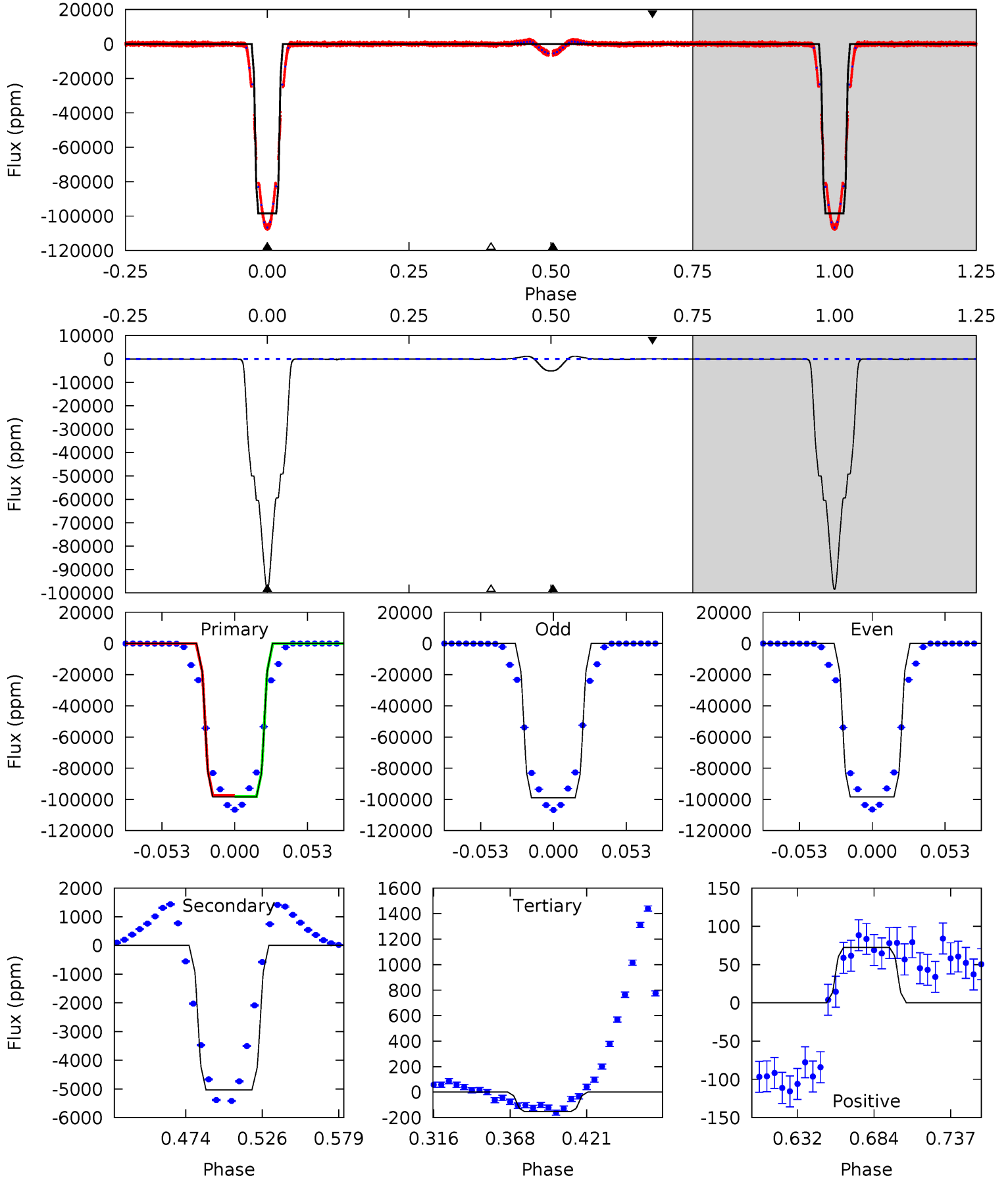
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6456	449.5	9.92	-0.73	4.61	1.74	7.93	6446	6457	439.5	450.2	14.6	1.01	0.01	0



# Alt Model-Shift Uniqueness Test

003352751-01, P = 3.495475 Days, E = 128.585789 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
9297	475.6	14.5	6.85	4.70	1.94	11.8	9283	9290	461.1	468.8	23.0	1.00	0.01	0



### Stellar Parameters For KIC 003352751

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$8529^{+76}_{-93}$	$4.249^{+0.063}_{-0.108}$	$-0.420^{+0.100}_{-0.200}$	$1.558^{+0.266}_{-0.143}$	$1.572^{+0.117}_{-0.085}$	$0.585^{+0.174}_{-0.203}$
	+1%/-1%	+1%/-3%	+24%/-48%	+17%/-9%	+7%/-5%	+30%/-35%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 003352751-01 / KOI 6330.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-7450 \pm 17$	$62.03^{+5.67}_{-3.40}$	$2880^{+116}_{-79}$	$4175^{+26}_{-30}$	$2.943^{+0.329}_{-0.413}$
Alt.	$-5036 \pm 11$	$55.51^{+5.13}_{-2.86}$	$2878^{+118}_{-88}$	$4025^{+26}_{-28}$	$2.469^{+0.287}_{-0.350}$

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

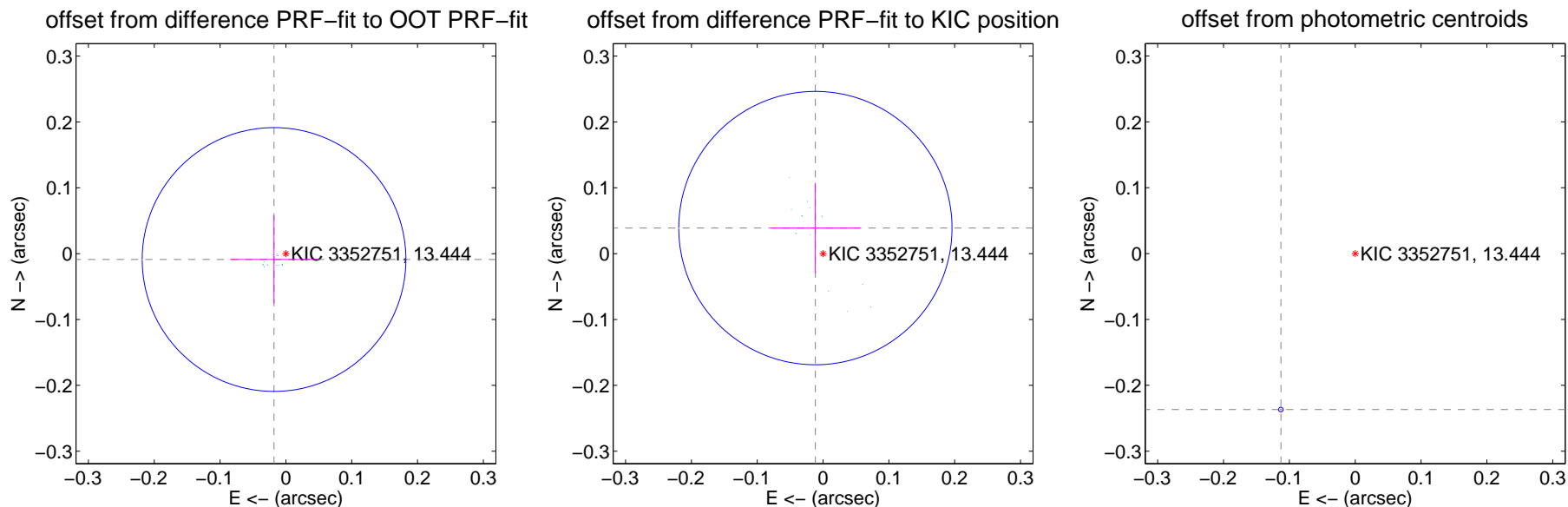
## DV Centroid Data

Supplemental centroid analysis for 003352751-01. Kepler magnitude: 13.44. Transit SNR 2365.61

There are 14 quarters with good PRF difference image offsets

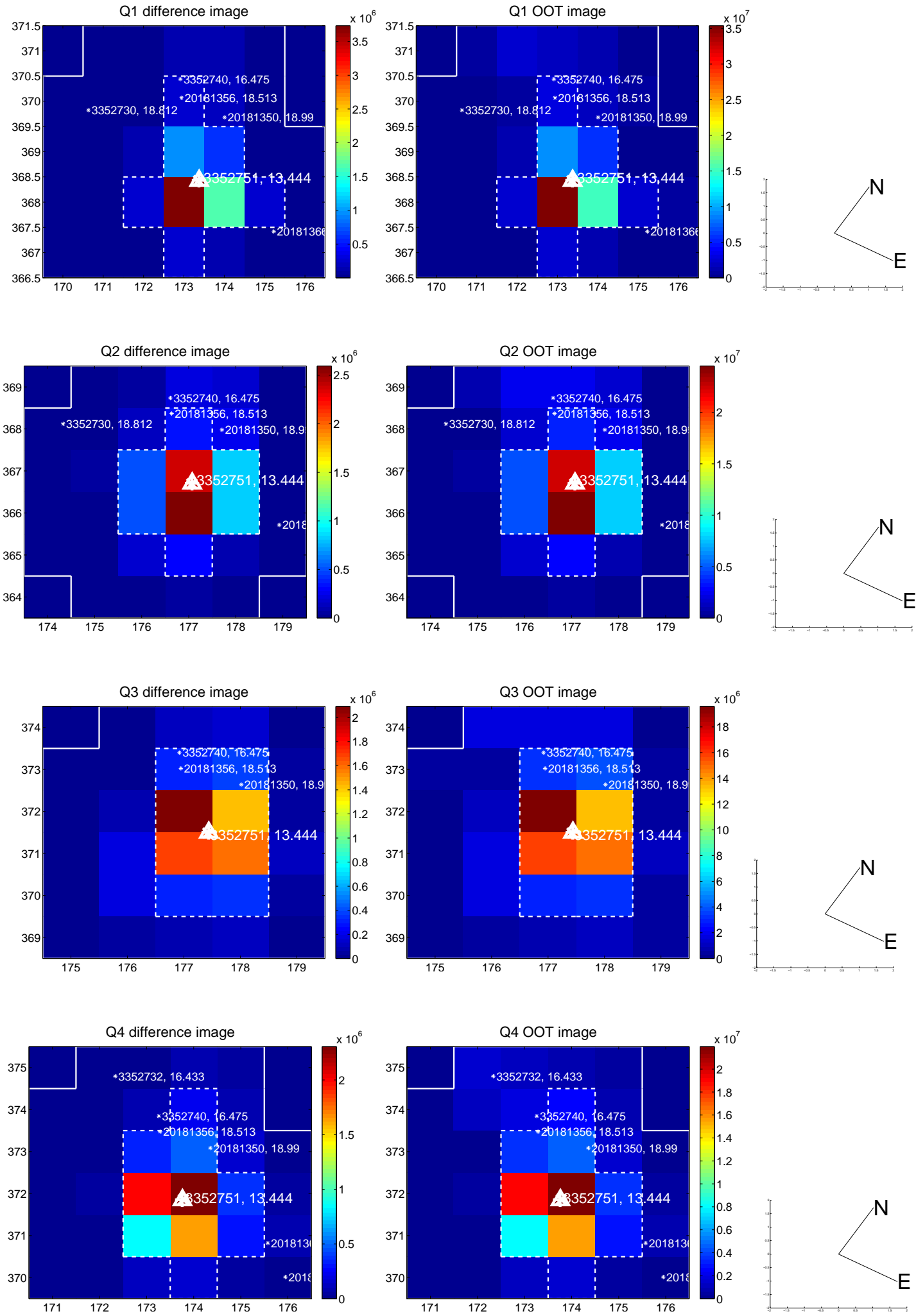
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.020 \pm 0.067$	0.30	$0.018 \pm 0.067$	$-0.009 \pm 0.067$
PRF-fit source offset from KIC position	$0.041 \pm 0.069$	0.59	$0.012 \pm 0.067$	$0.039 \pm 0.069$
photometric centroid source offset	$0.26 \pm 0.00$	224.02	$0.11 \pm 0.00$	$-0.24 \pm 0.00$



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

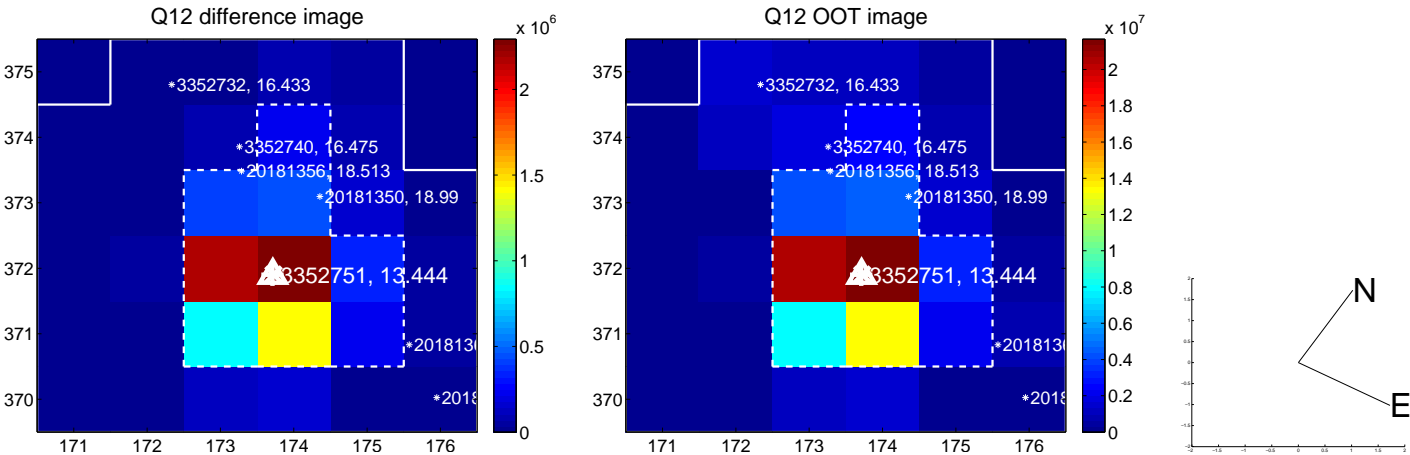
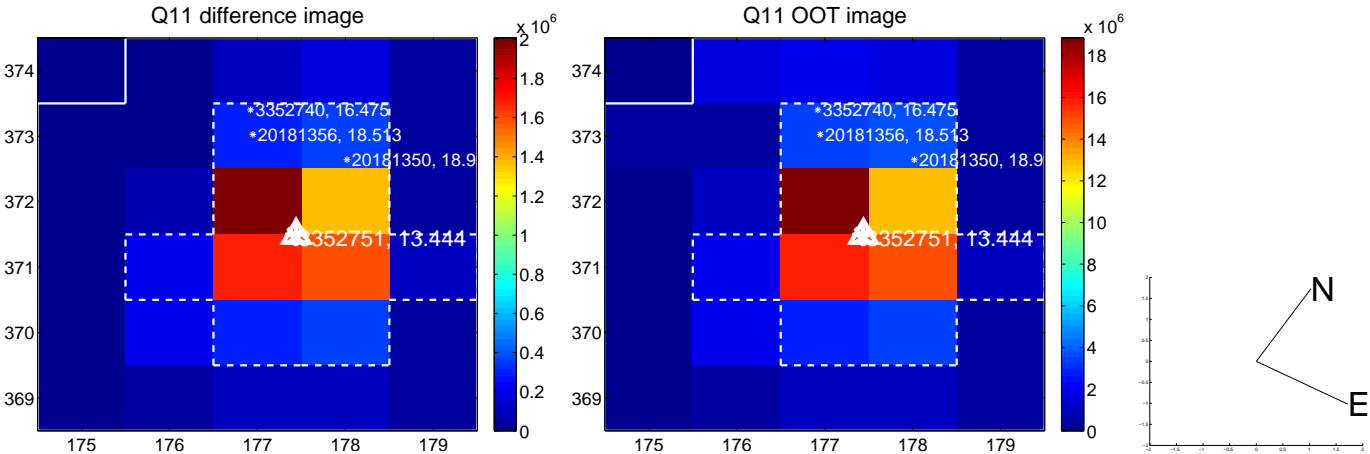
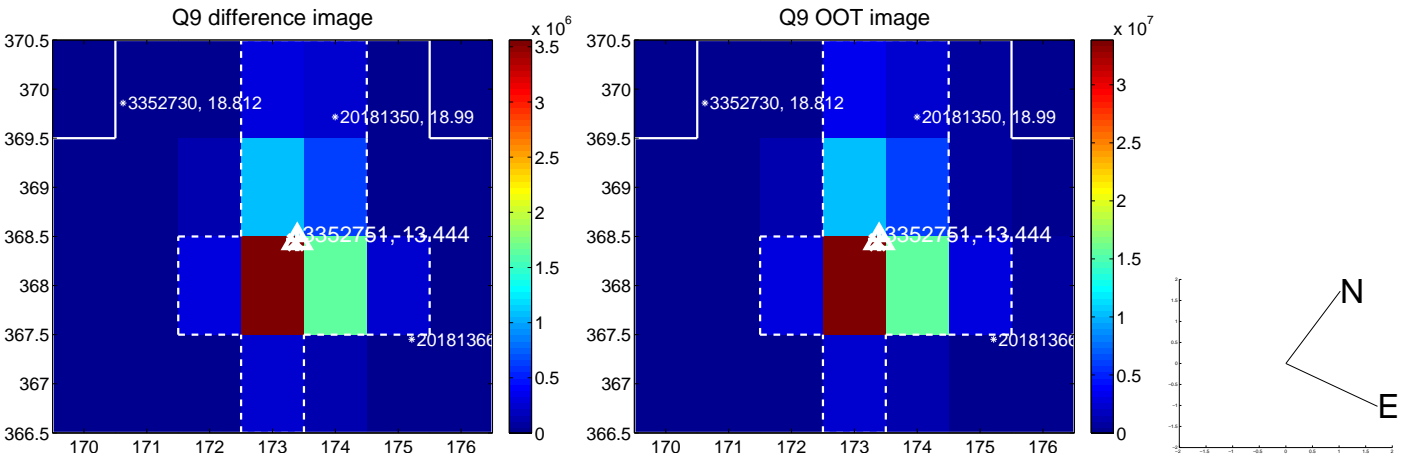
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



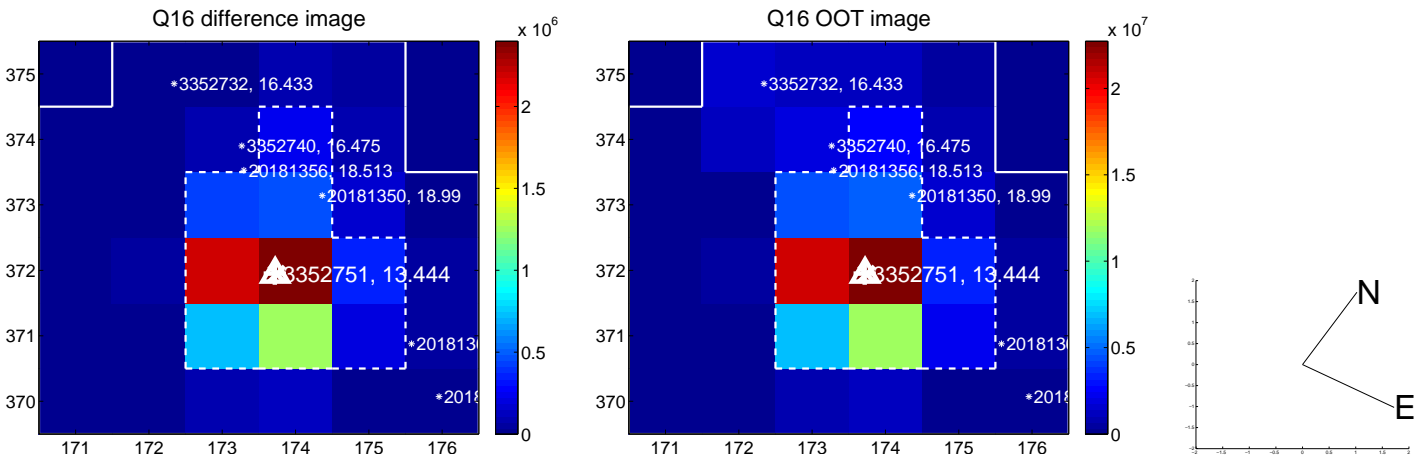
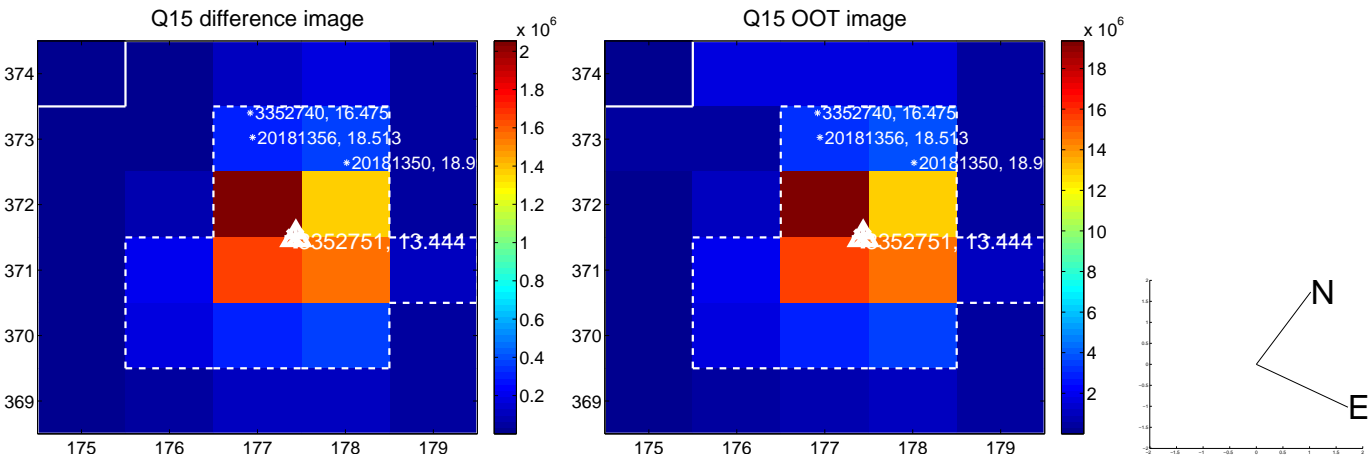
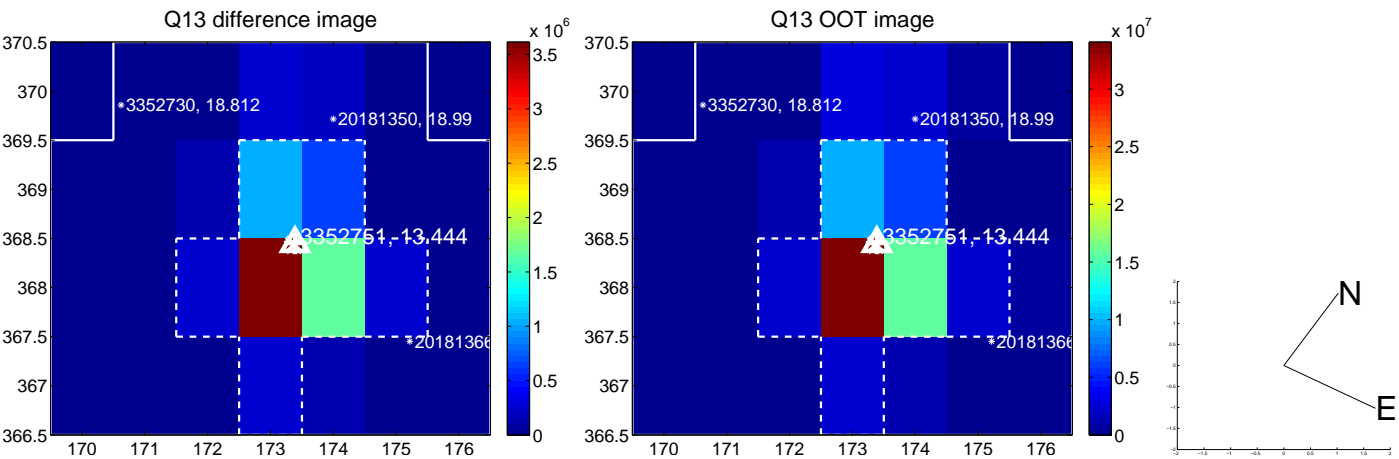




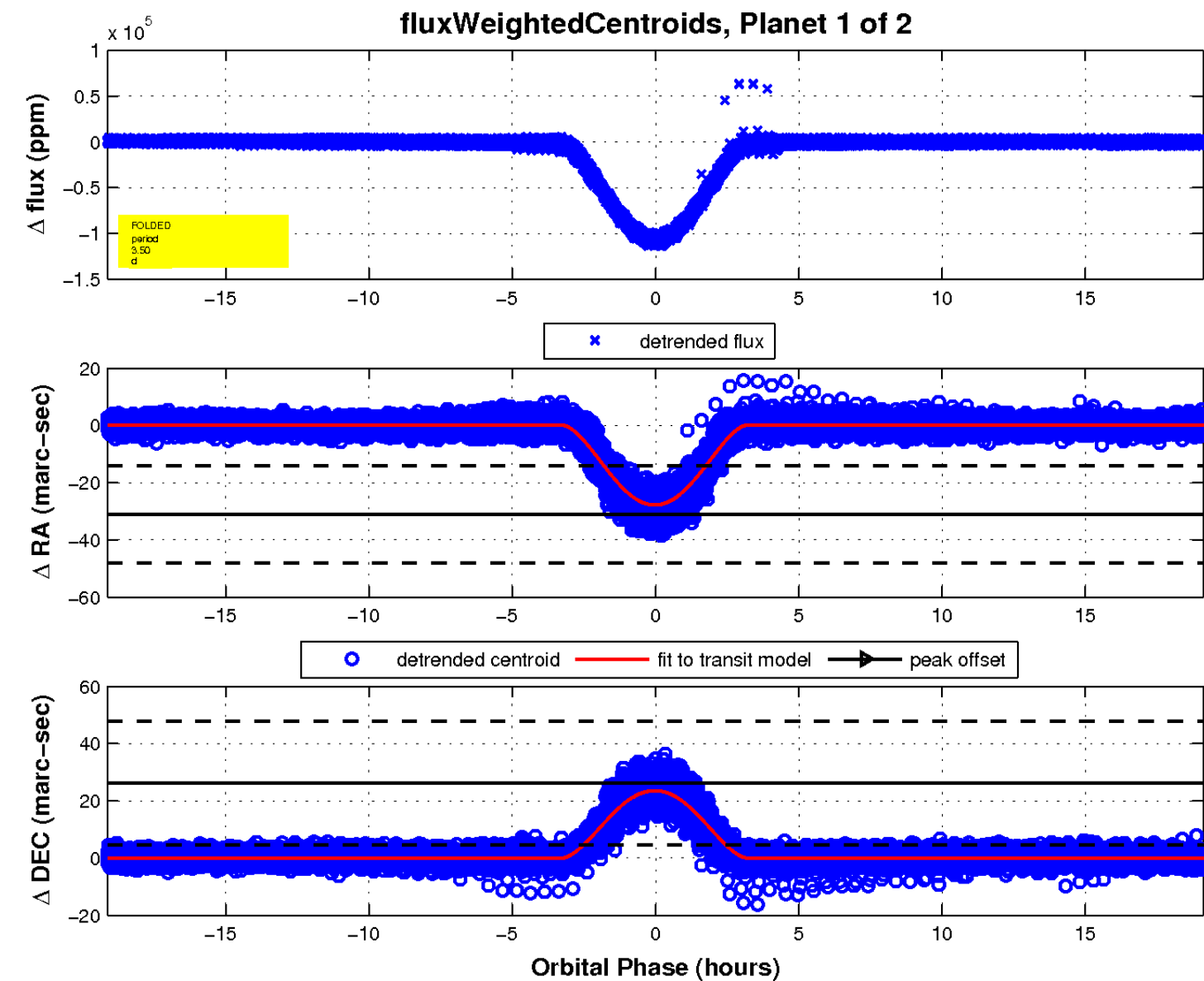
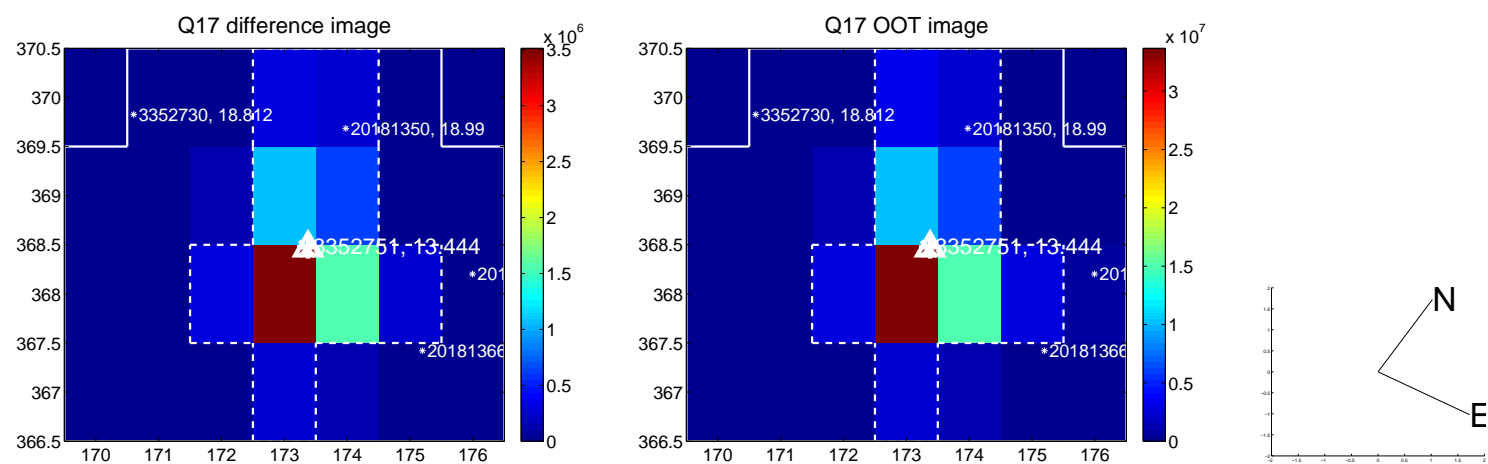
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

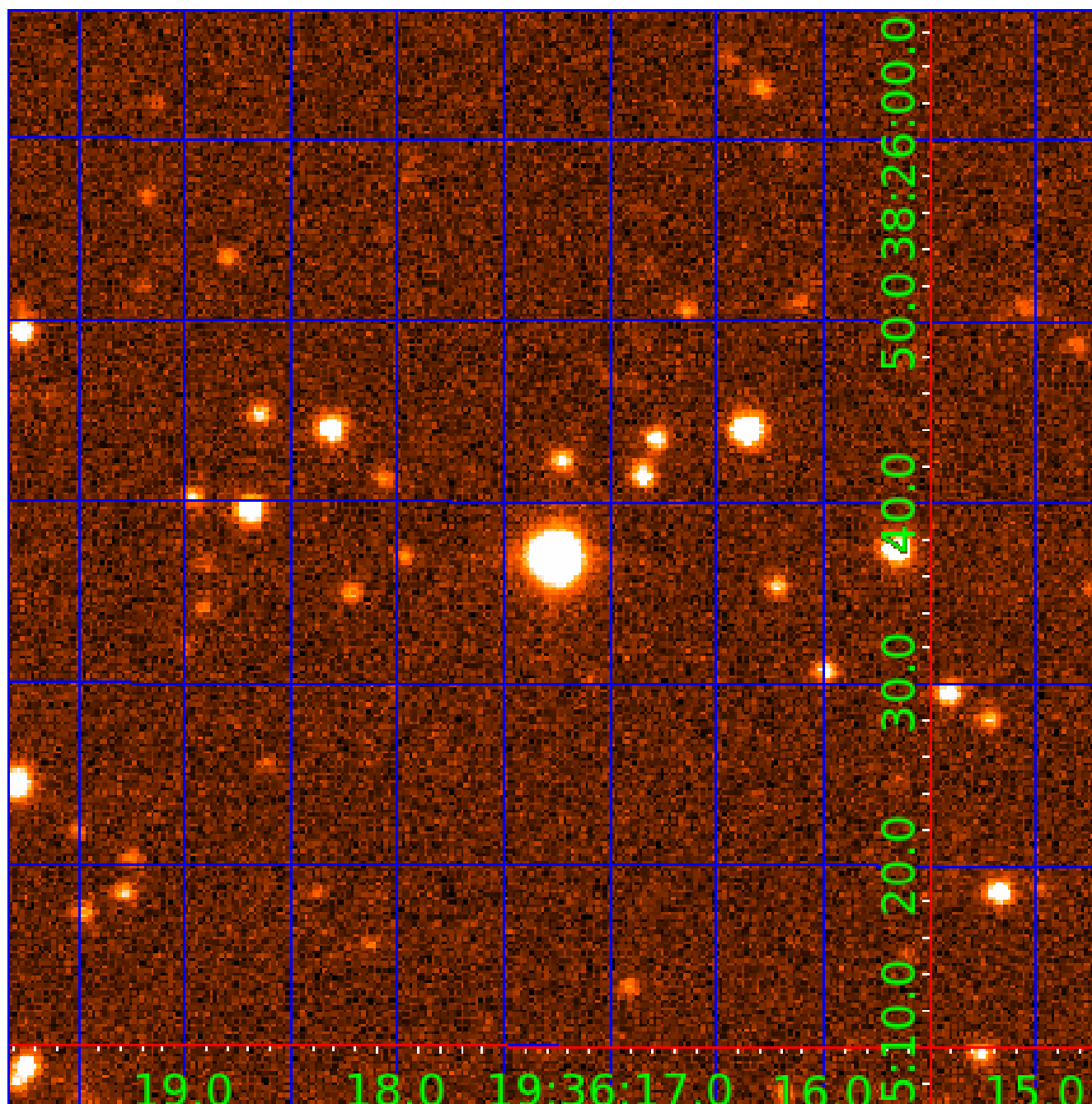


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003352751

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003352751-01	OBS	6330.01	3.495461	132.083887	106138.5	6.375	2549.2	2365.6	1.56	8529	61.48	4189.79
003352751-02	OBS	No	3.495457	133.832756	7421.8	5.998	177.5	216.3	1.56	8529	23.57	4189.80

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003352751-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
003352751-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

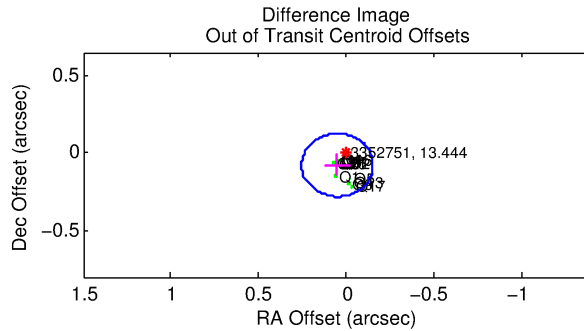
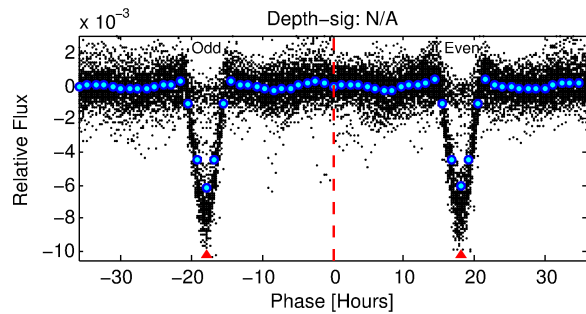
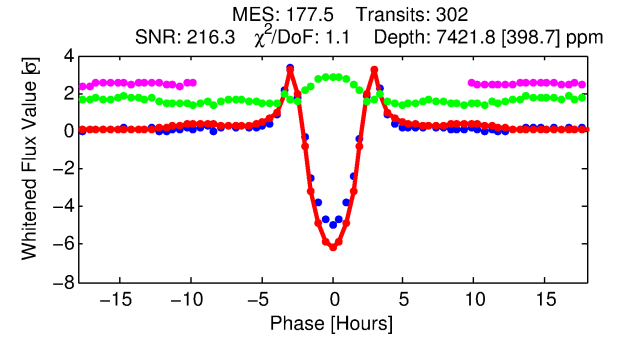
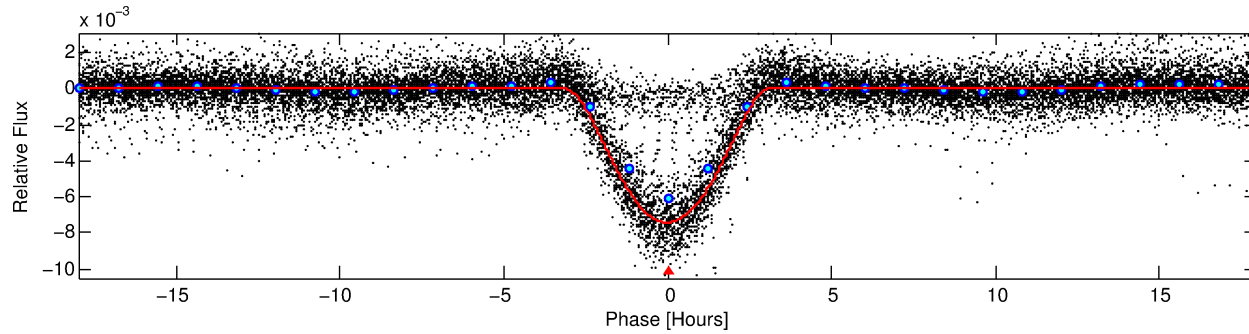
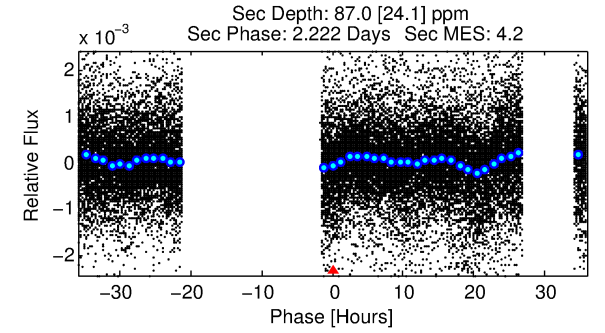
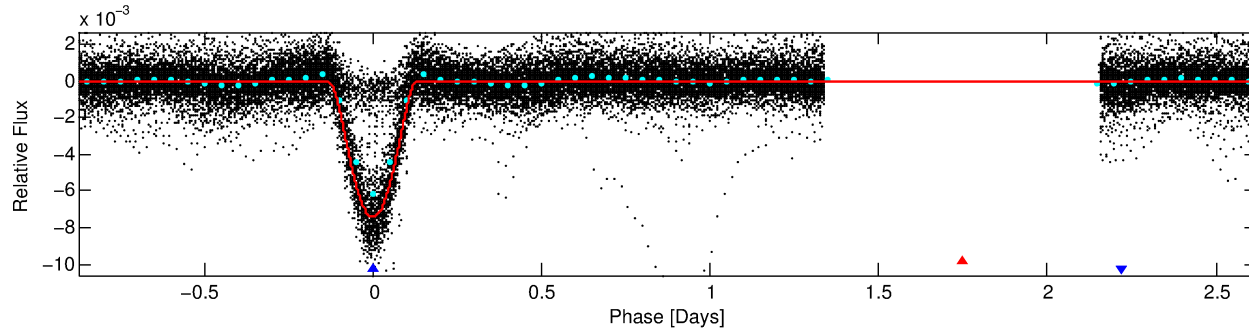
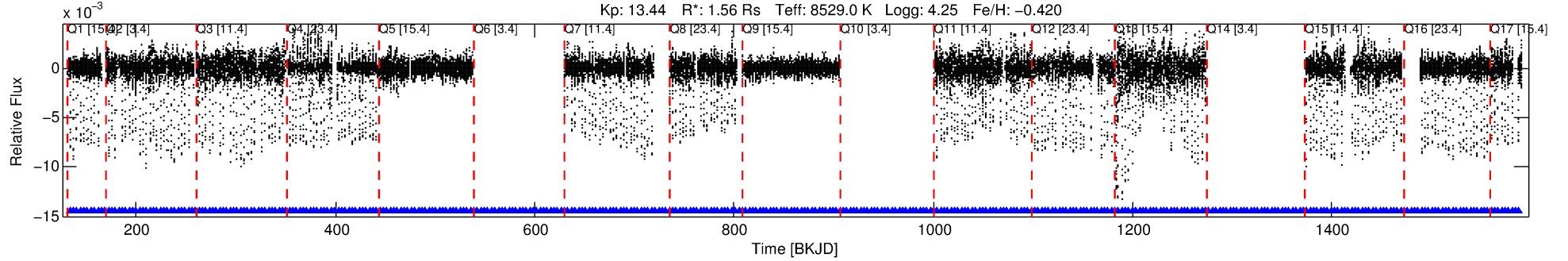
## Ephemeris Match Information For 003352751-02

No Significant Match Found

# DV One-Page Summary

KIC: 3352751 Candidate: 2 of 2 Period: 3.495 d  
KOI: K06330 Corr: No Ephemeris Match

Kp: 13.44 R\*: 1.56 Rs Teff: 8529.0 K Logg: 4.25 Fe/H: -0.420



## DV Fit Results:

Period = 3.49546 [0.00000] d  
Epoch = 133.8328 [0.0003] BKJD  
Rp/R\* = 0.1386 [0.0084]  
a/R\* = 2.64 [0.02]  
b = 1.00 [0.02]  
Seff = 4189.80 [862.15]  
Teq = 2052 [106] K  
Rp = 23.57 [4.27] Re  
a = 0.0524 [0.0074] AU  
Ag = 0.24 [0.09] [-8.87σ]  
Teffp = 2212 [169] K [0.80σ]

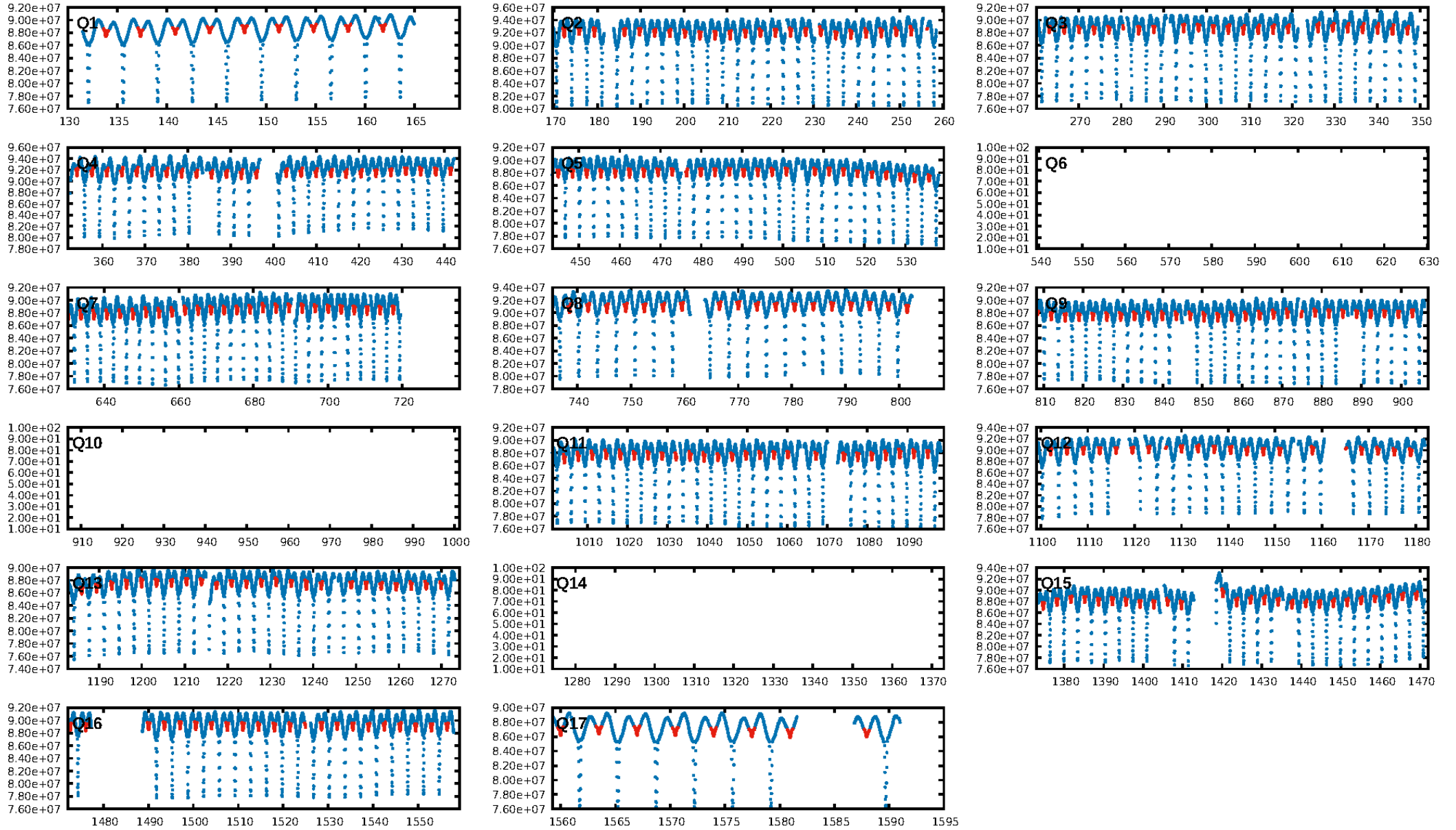
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [285/285]  
GhostDiagnostic-chr: 1.174  
Centroid-sig: 0.0%  
Centroid-so: 0.291 arcsec [18.02σ]  
OotOffset-rm: 0.094 arcsec [1.38σ]  
KicOffset-rm: 0.064 arcsec [0.94σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

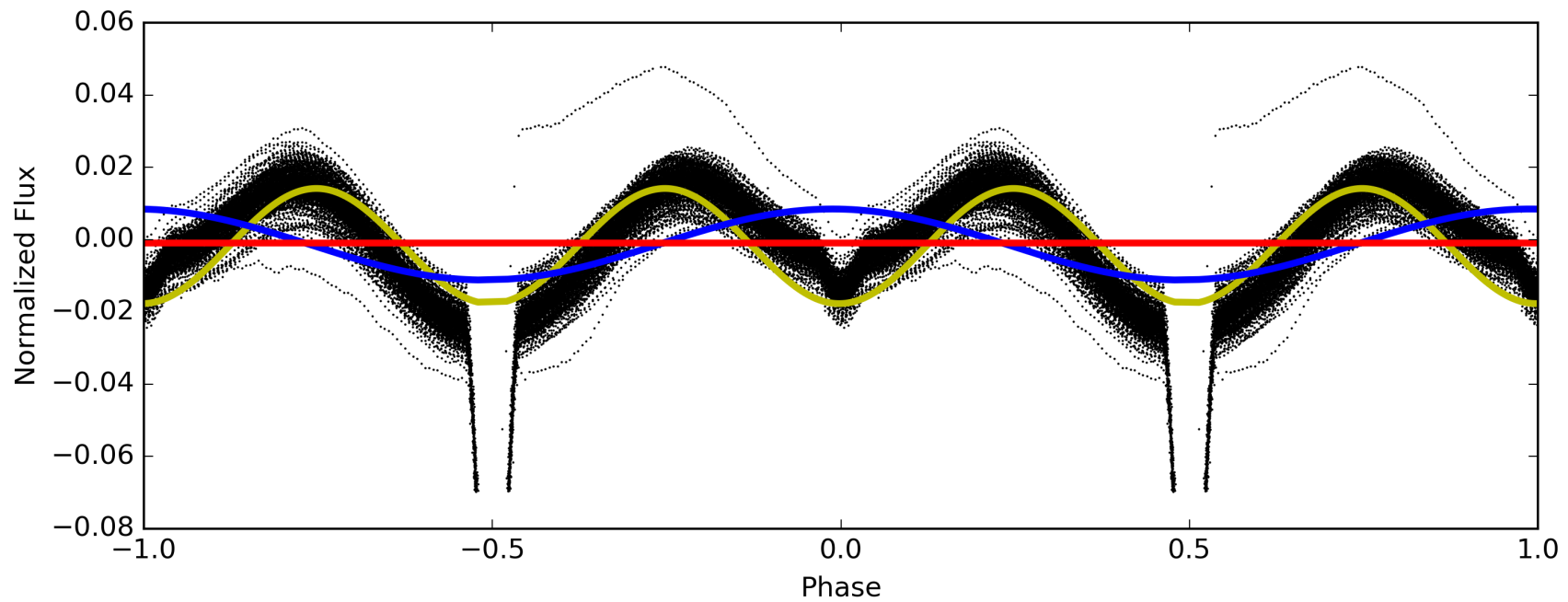
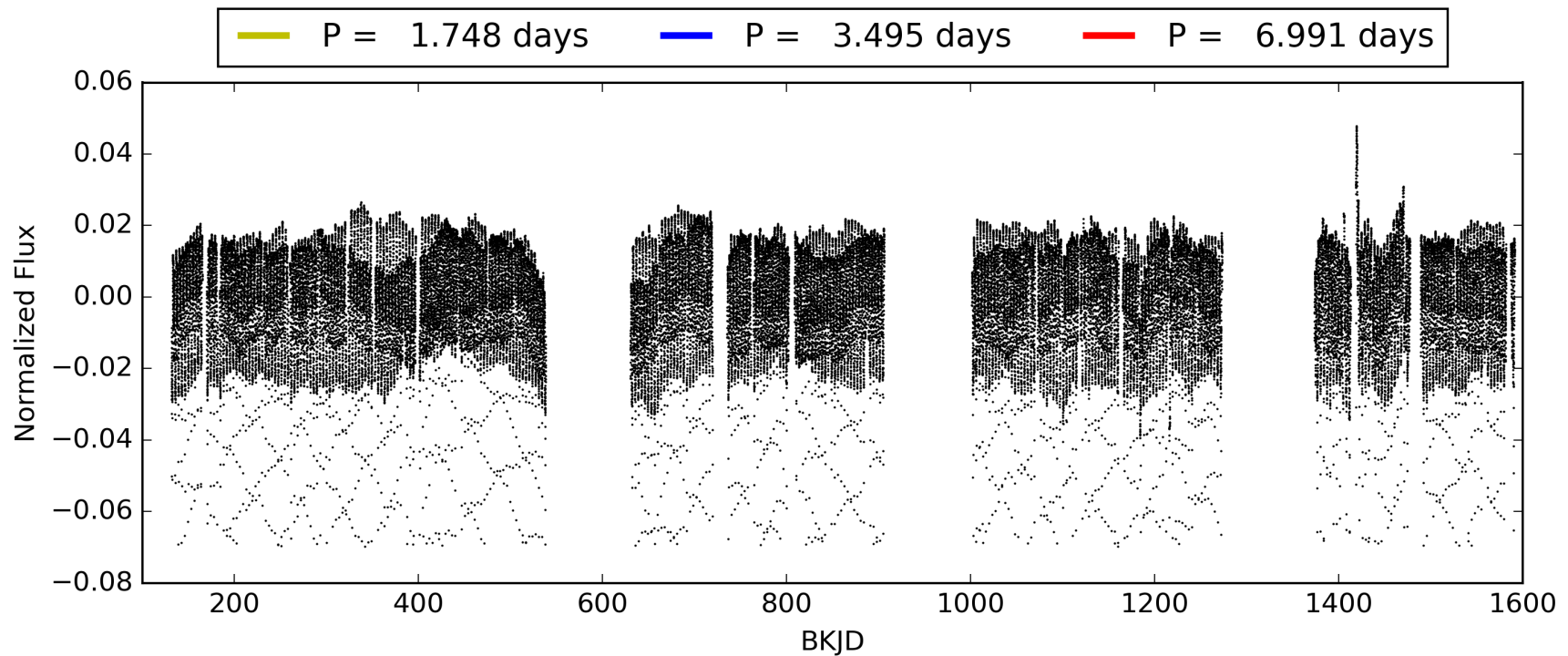
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:42:58 Z

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

# TCE 003352751-02, PDC Light Curves



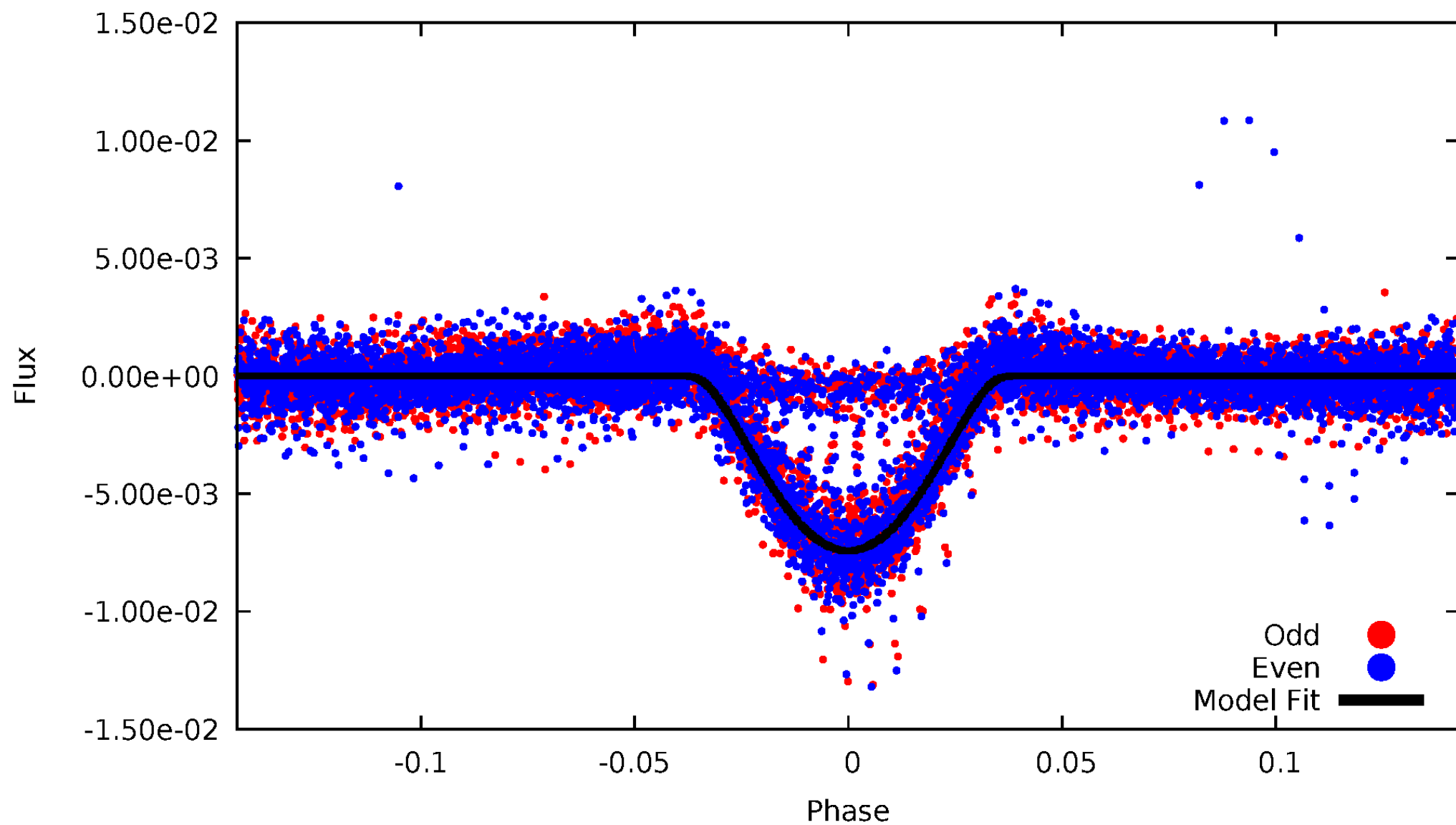
TCE 003352751-02





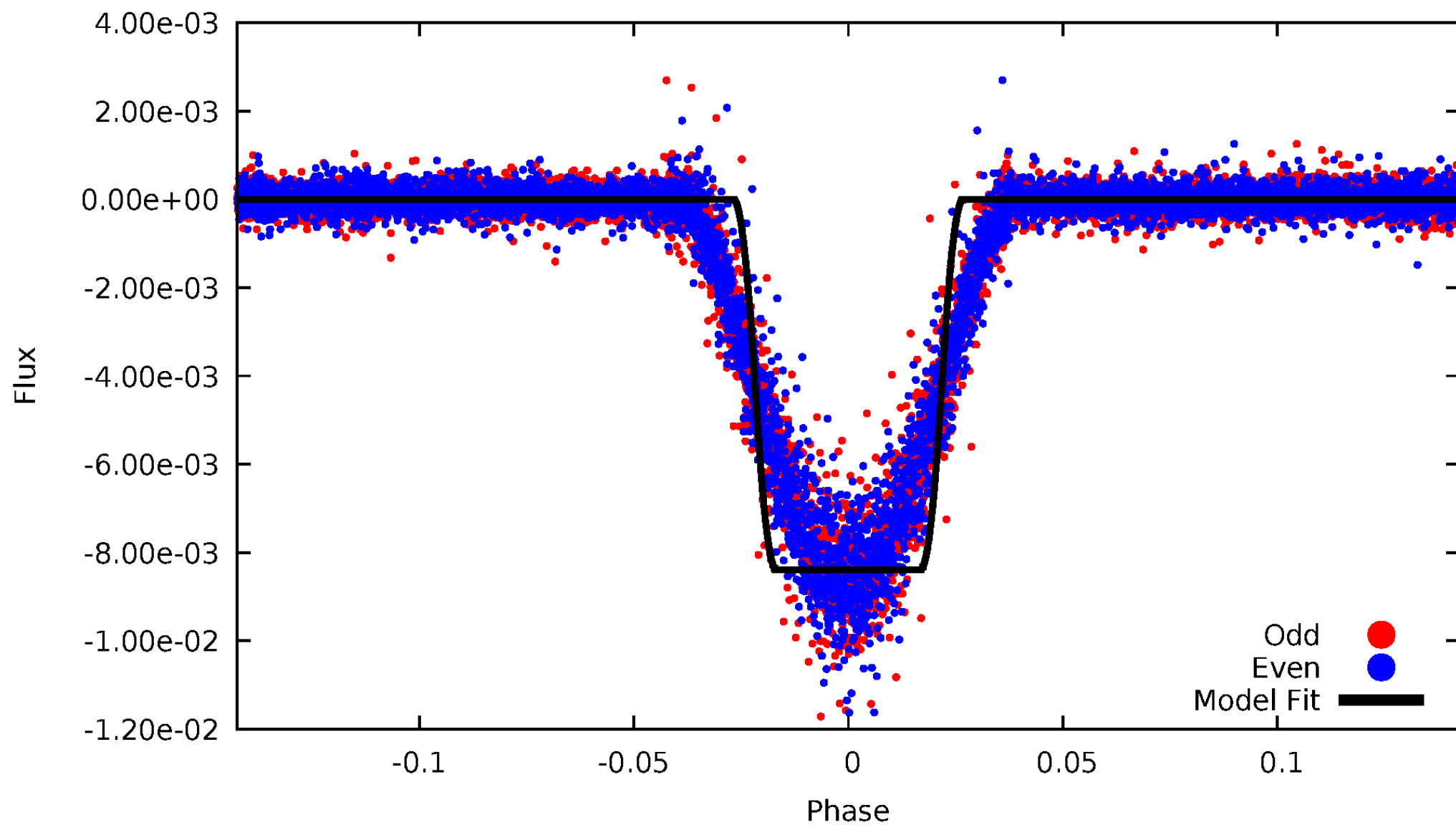
# DV Odd/Even

TCE 003352751-02



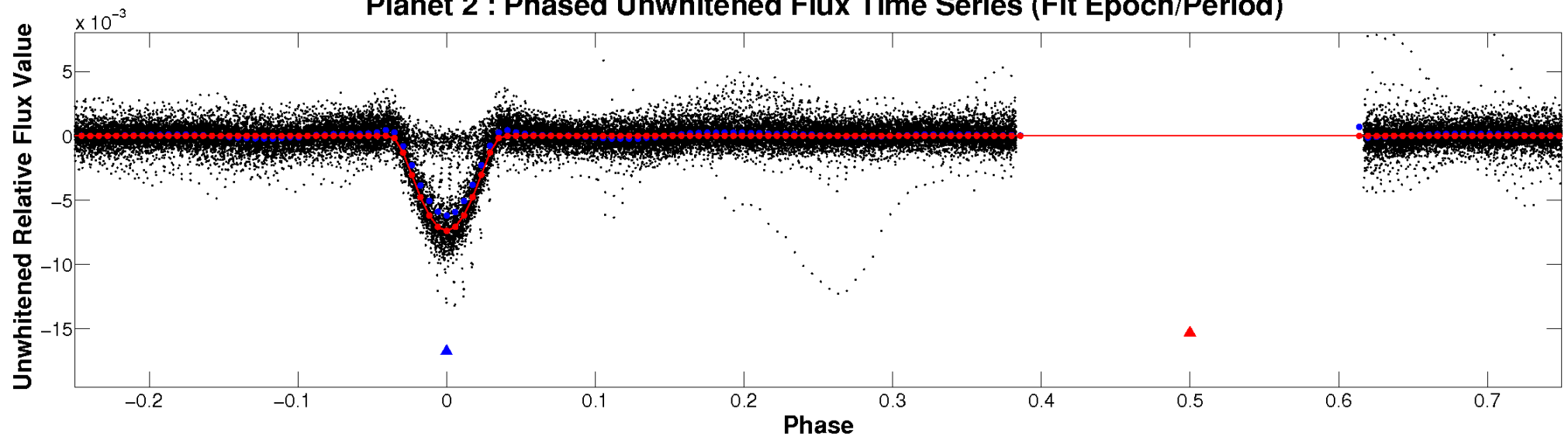
# ALT Odd/Even

TCE 003352751-02

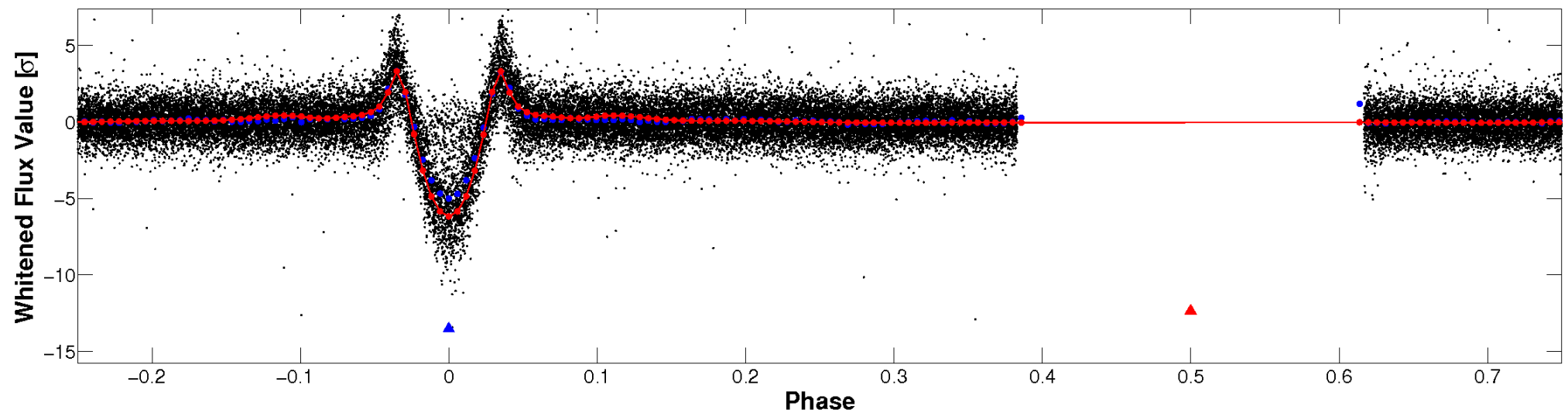


# Non-Whitened Vs. Whitened Light Curve

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

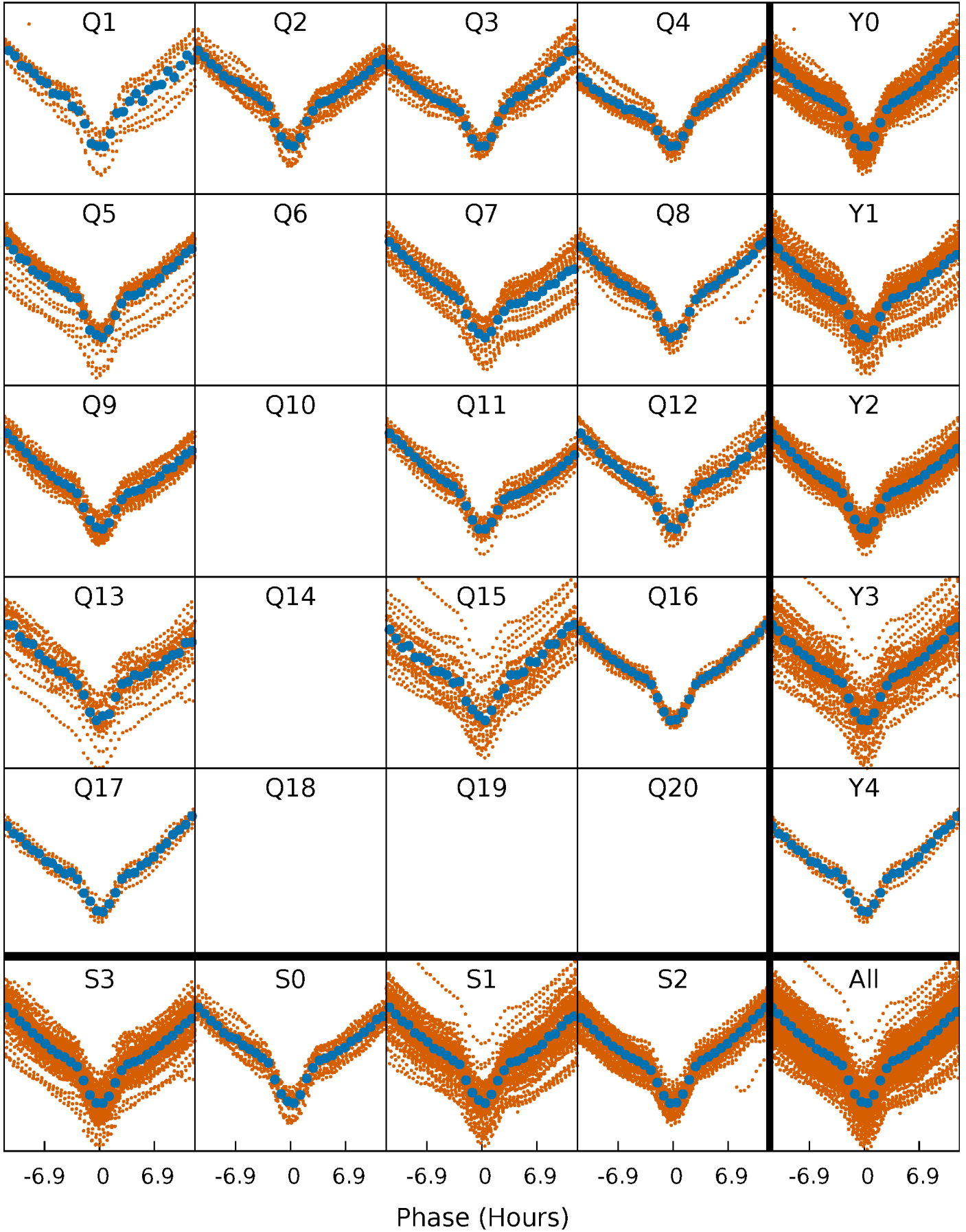


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



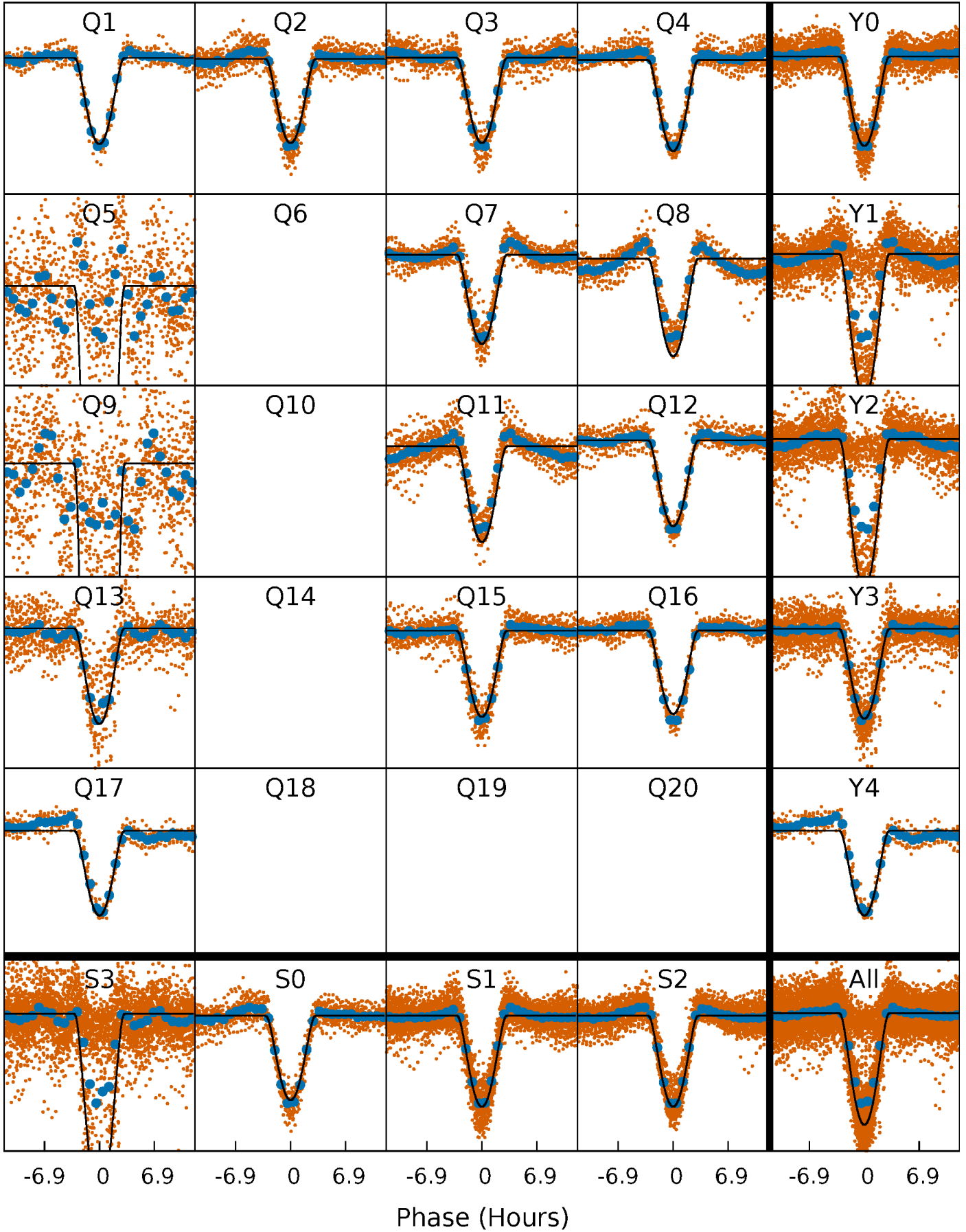
# PDC Quarter-Phased Transit Curves

TCE 003352751-02   P= 3.495457 Days    $T_0=133.832756$  (BKJD)



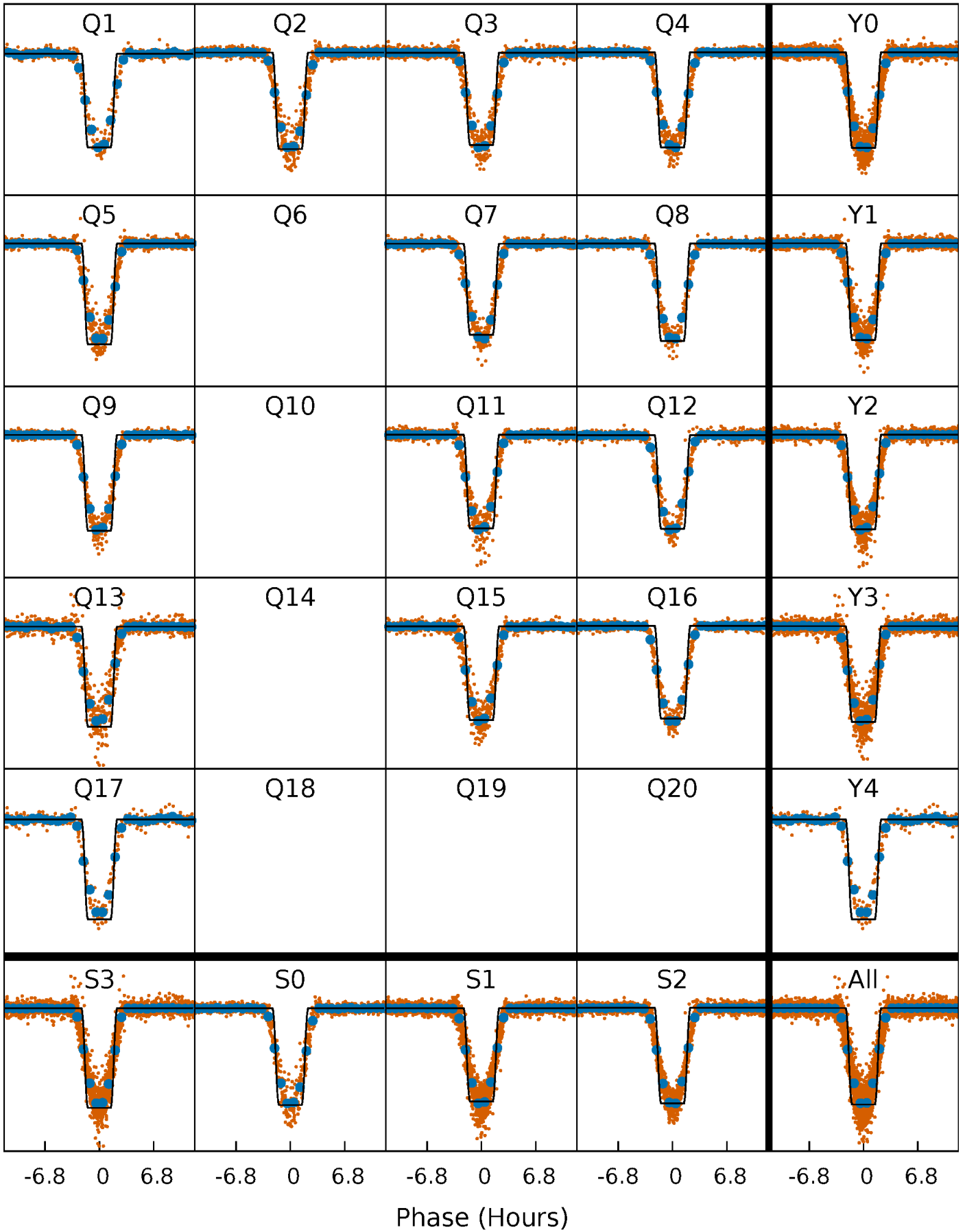
# DV Quarter-Phased Transit Curves

TCE 003352751-02   P= 3.495457 Days    $T_0=133.832756$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

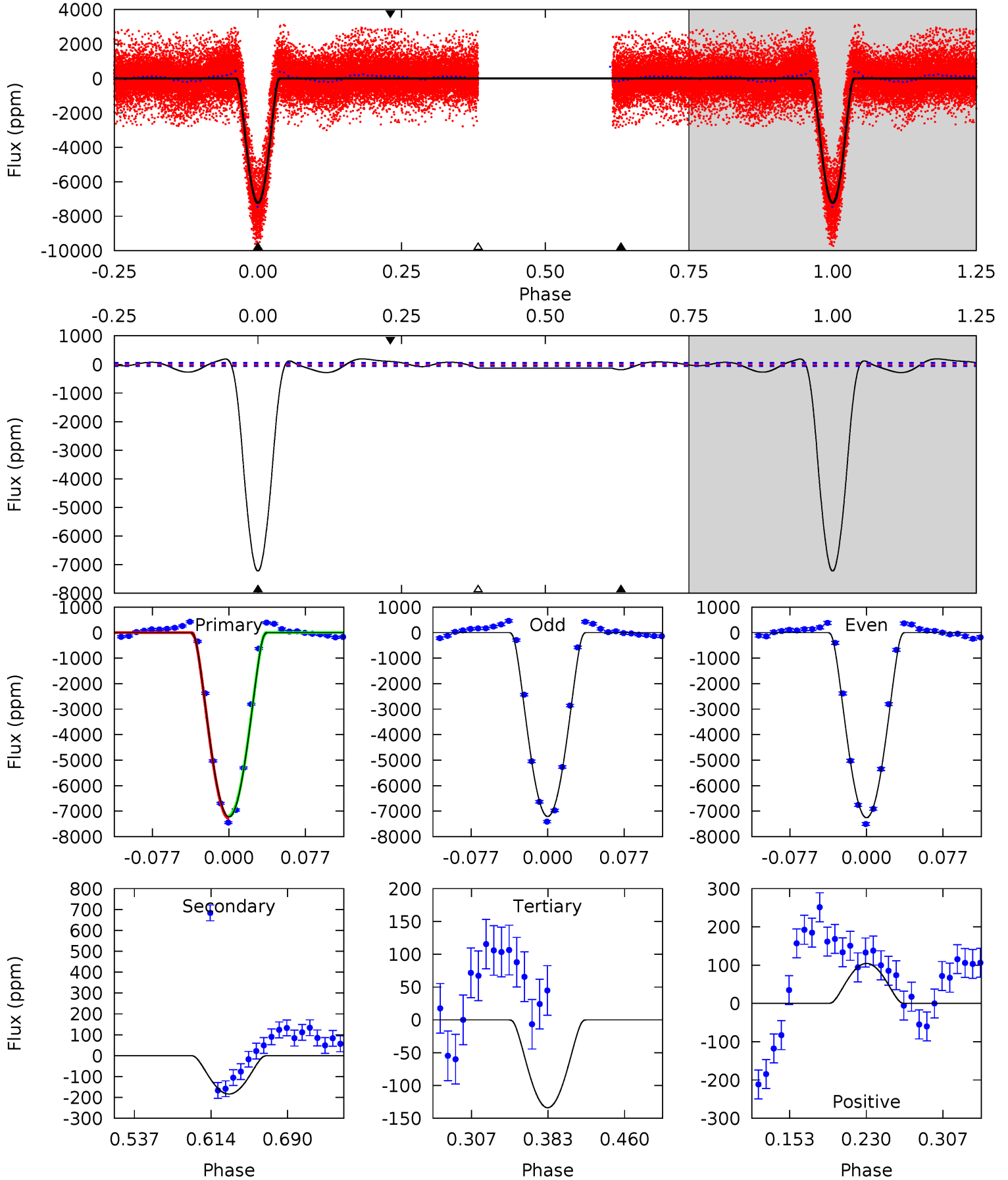
TCE 003352751-02     $P = 3.495475$  Days     $T_0 = 133.829505$  (BKJD)



# DV Model-Shift Uniqueness Test

003352751-02, P = 3.495457 Days, E = 130.337299 Days

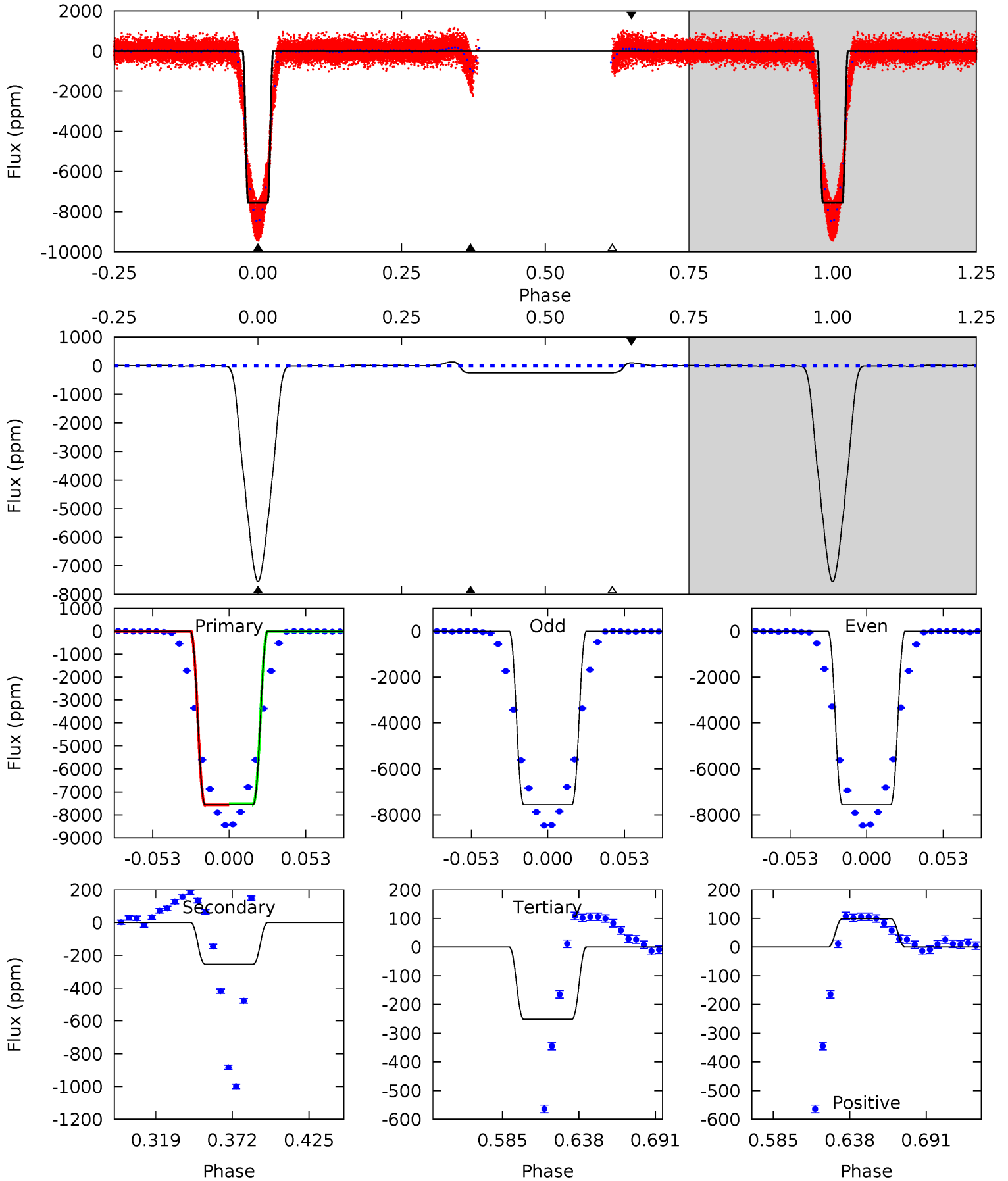
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
564.0	14.4	10.5	8.16	4.62	1.77	9.78	553.5	555.8	3.90	6.20	1.98	0.87	0.03	3.32



# Alt Model-Shift Uniqueness Test

003352751-02, P = 3.495475 Days, E = 130.334030 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
1398	46.9	46.5	18.4	4.70	1.93	6.80	1351	1380	0.38	28.6	0.77	1.00	0.02	0





### Stellar Parameters For KIC 003352751

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$8529^{+76}_{-93}$	$4.249^{+0.063}_{-0.108}$	$-0.420^{+0.100}_{-0.200}$	$1.558^{+0.266}_{-0.143}$	$1.572^{+0.117}_{-0.085}$	$0.585^{+0.174}_{-0.203}$
	+1%/-1%	+1%/-3%	+24%/-48%	+17%/-9%	+7%/-5%	+30%/-35%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 003352751-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-184 \pm 13$	$23.90^{+2.24}_{-1.93}$	$2876^{+112}_{-81}$	$2762^{+148}_{-170}$	$0.482^{+0.102}_{-0.081}$
Alt.	$-254 \pm 5$	$15.68^{+2.02}_{-1.68}$	$2873^{+112}_{-80}$	$3662^{+155}_{-135}$	$1.552^{+0.388}_{-0.309}$

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

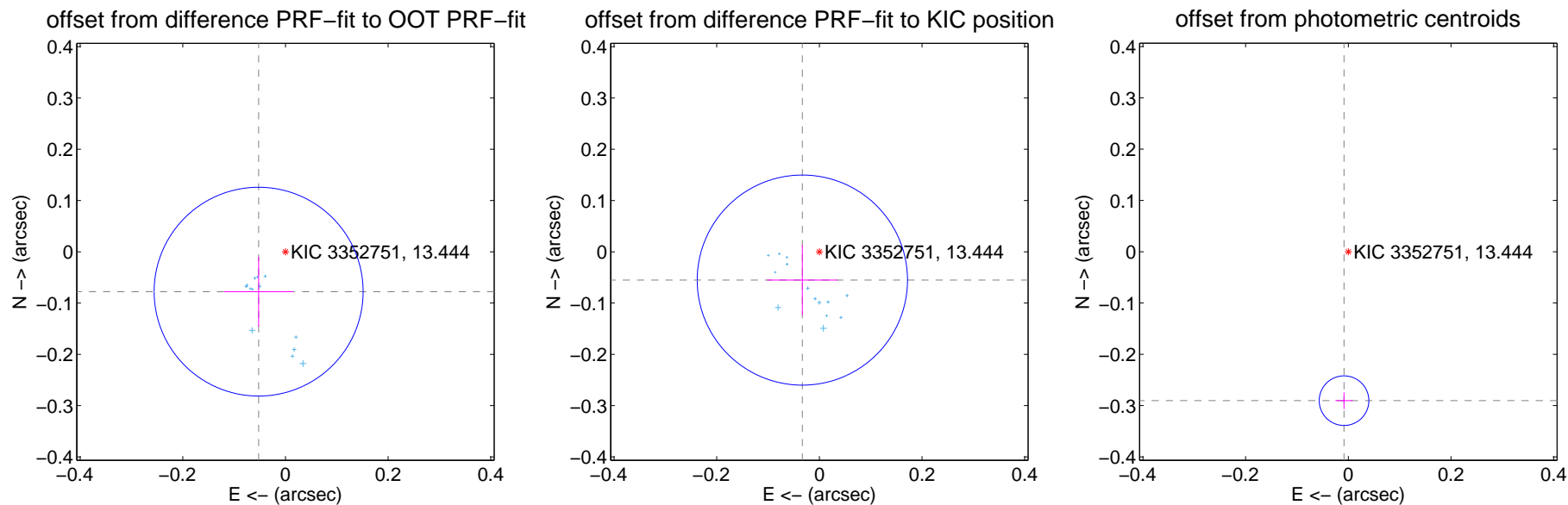
## DV Centroid Data

Supplemental centroid analysis for 003352751-02. Kepler magnitude: 13.44. Transit SNR 216.28

There are 14 quarters with good PRF difference image offsets

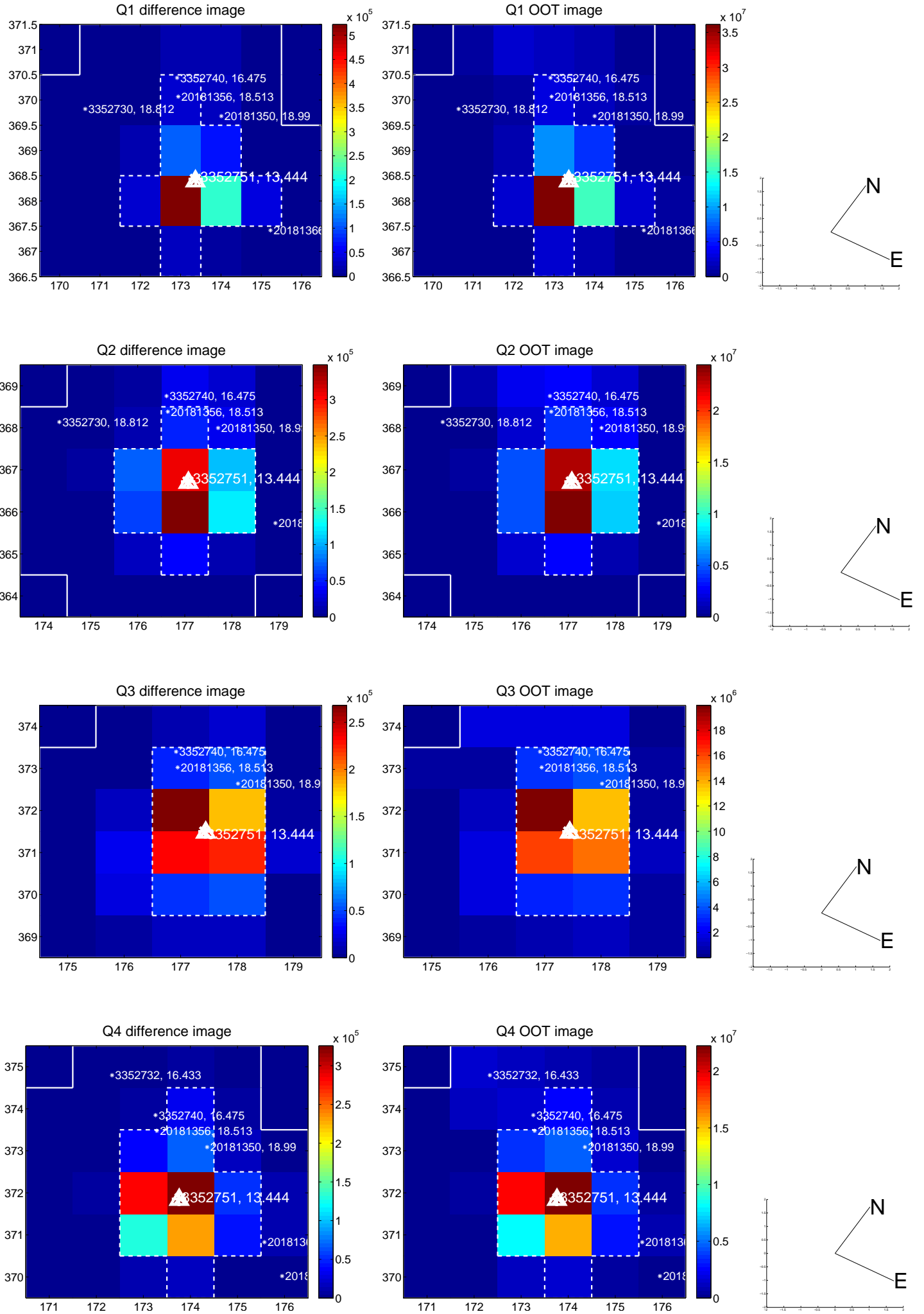
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.094 \pm 0.068$	1.38	$0.052 \pm 0.067$	$-0.078 \pm 0.068$
PRF-fit source offset from KIC position	$0.064 \pm 0.068$	0.94	$0.033 \pm 0.068$	$-0.055 \pm 0.068$
photometric centroid source offset	$0.29 \pm 0.02$	18.02	$0.01 \pm 0.02$	$-0.29 \pm 0.02$

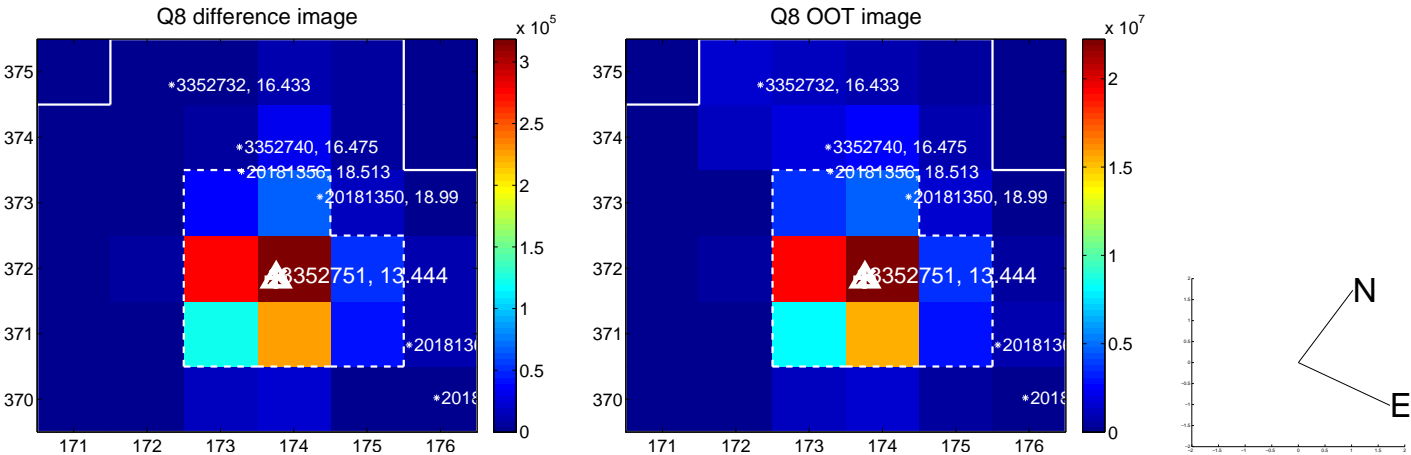
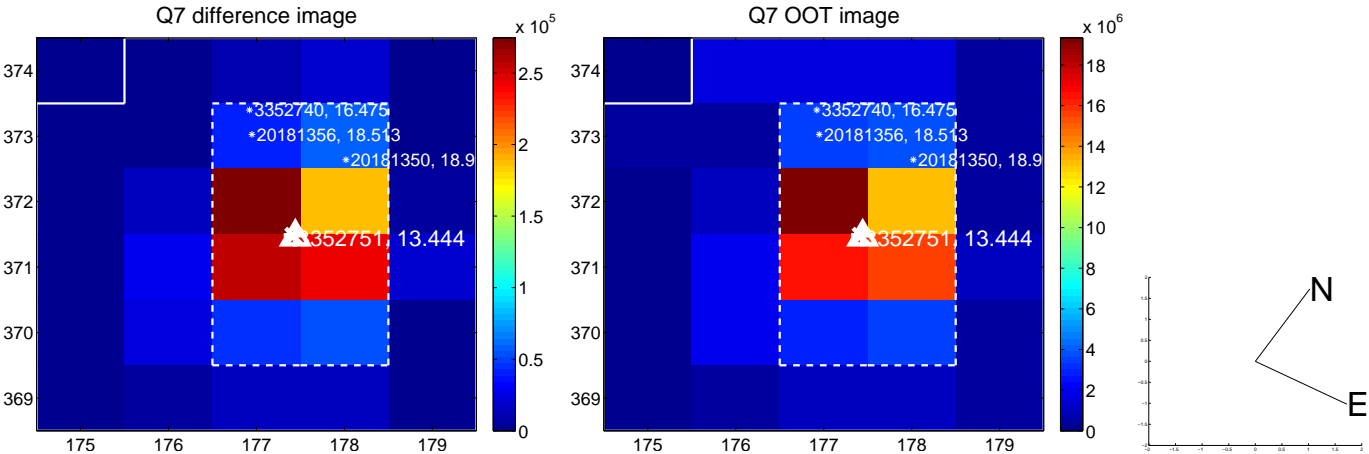
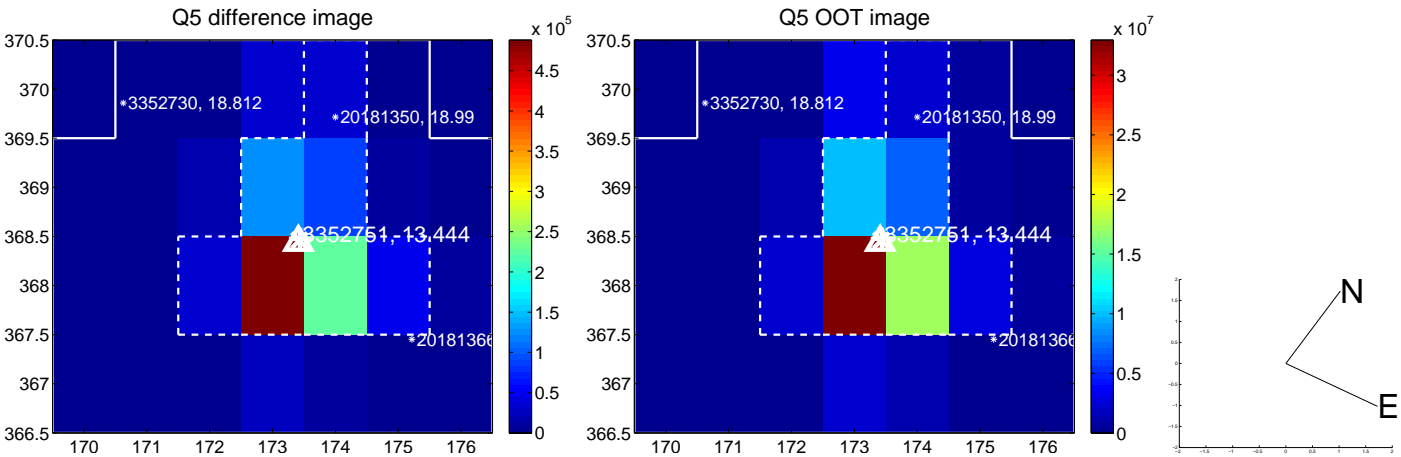


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

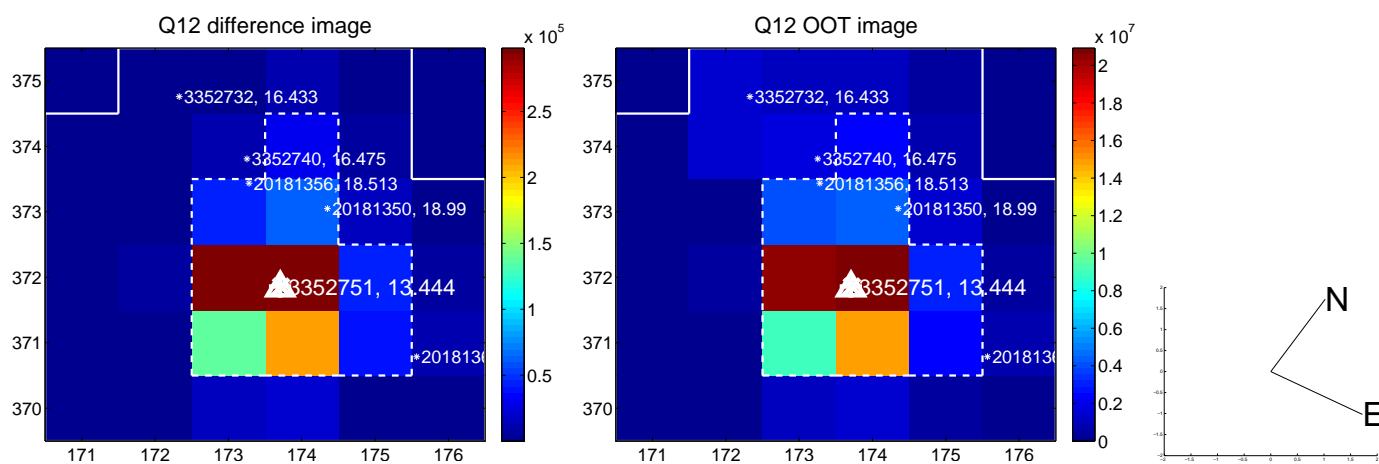
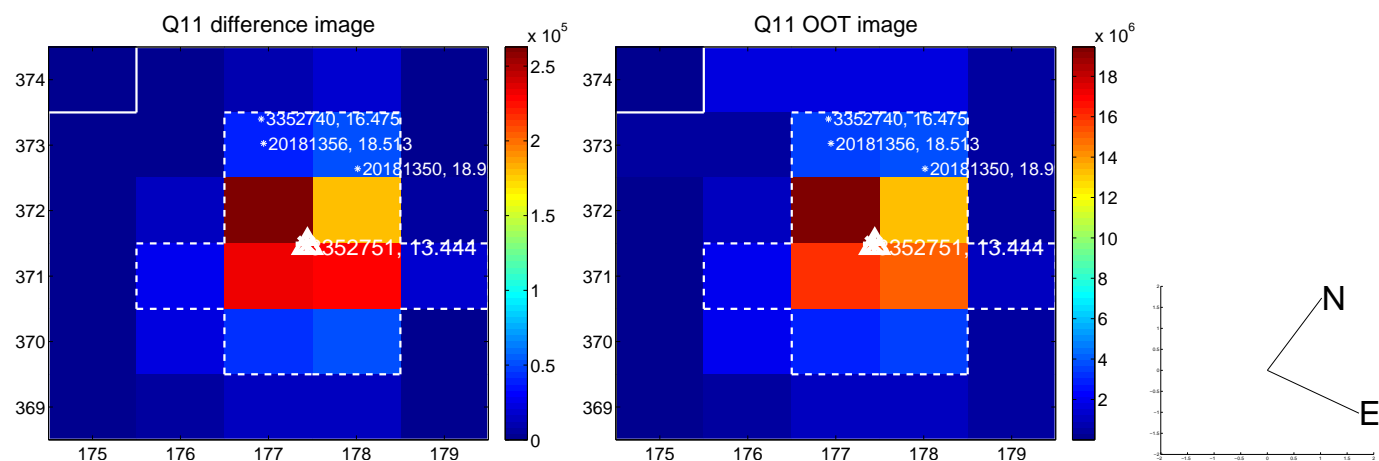
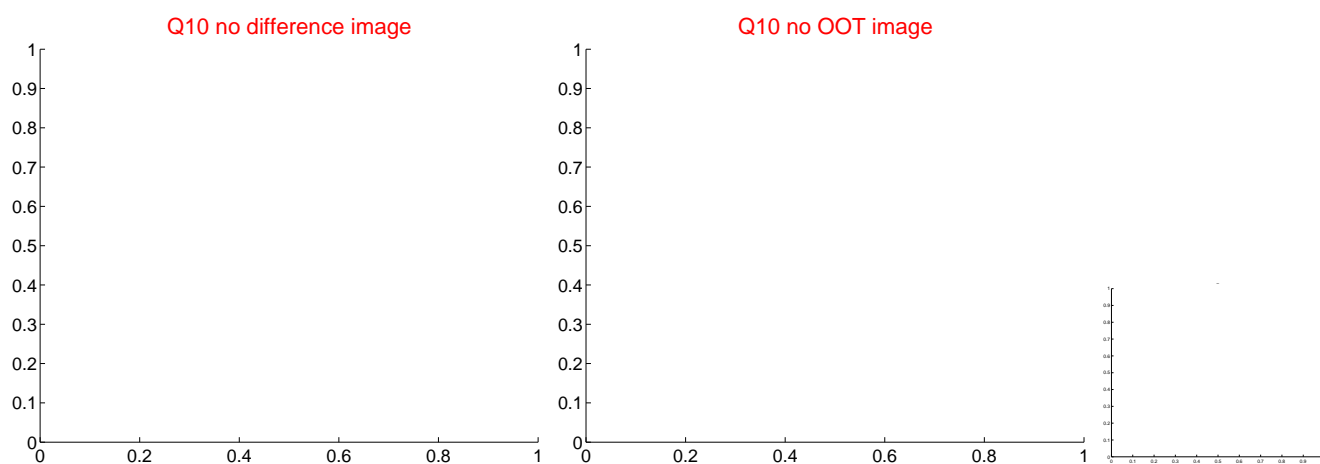
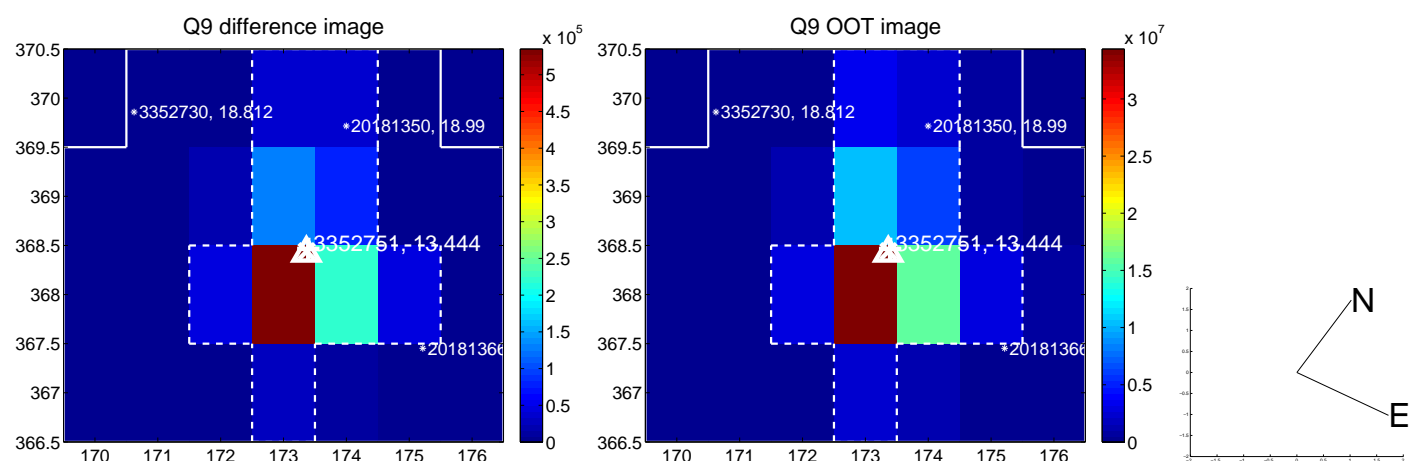
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



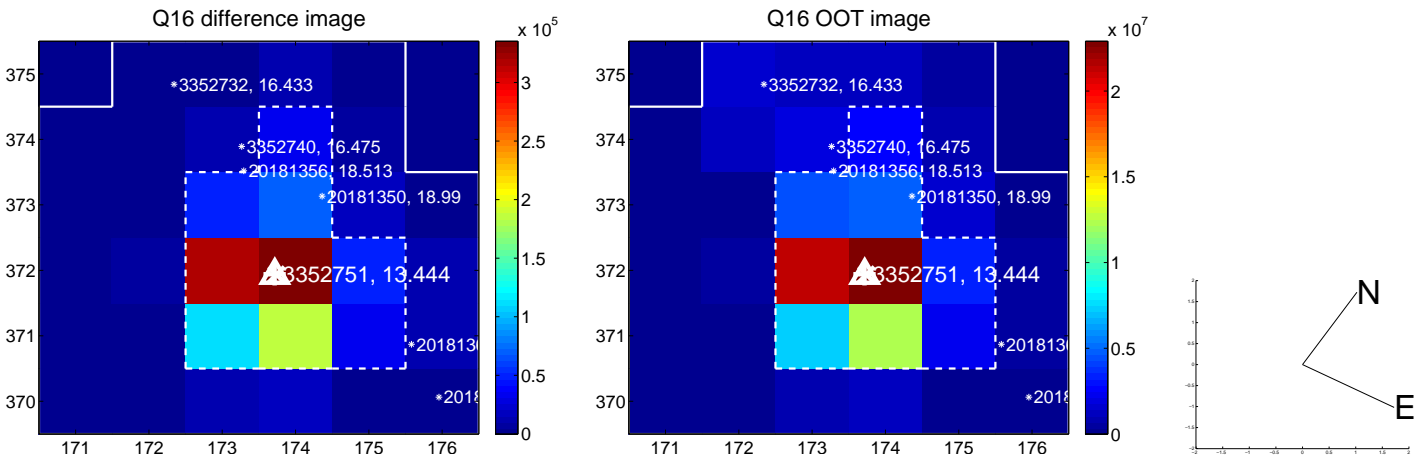
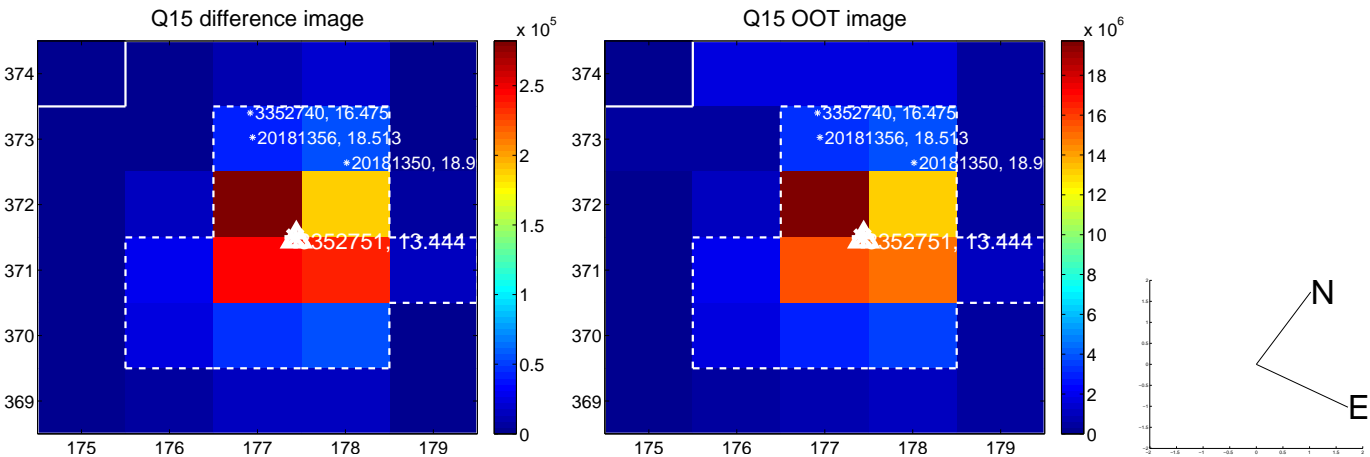
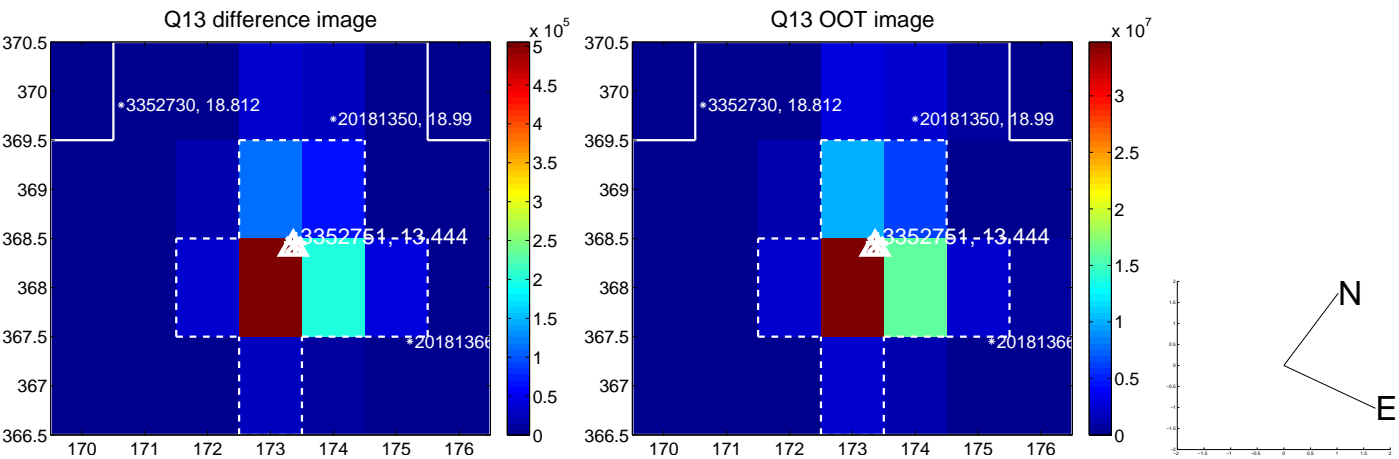
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



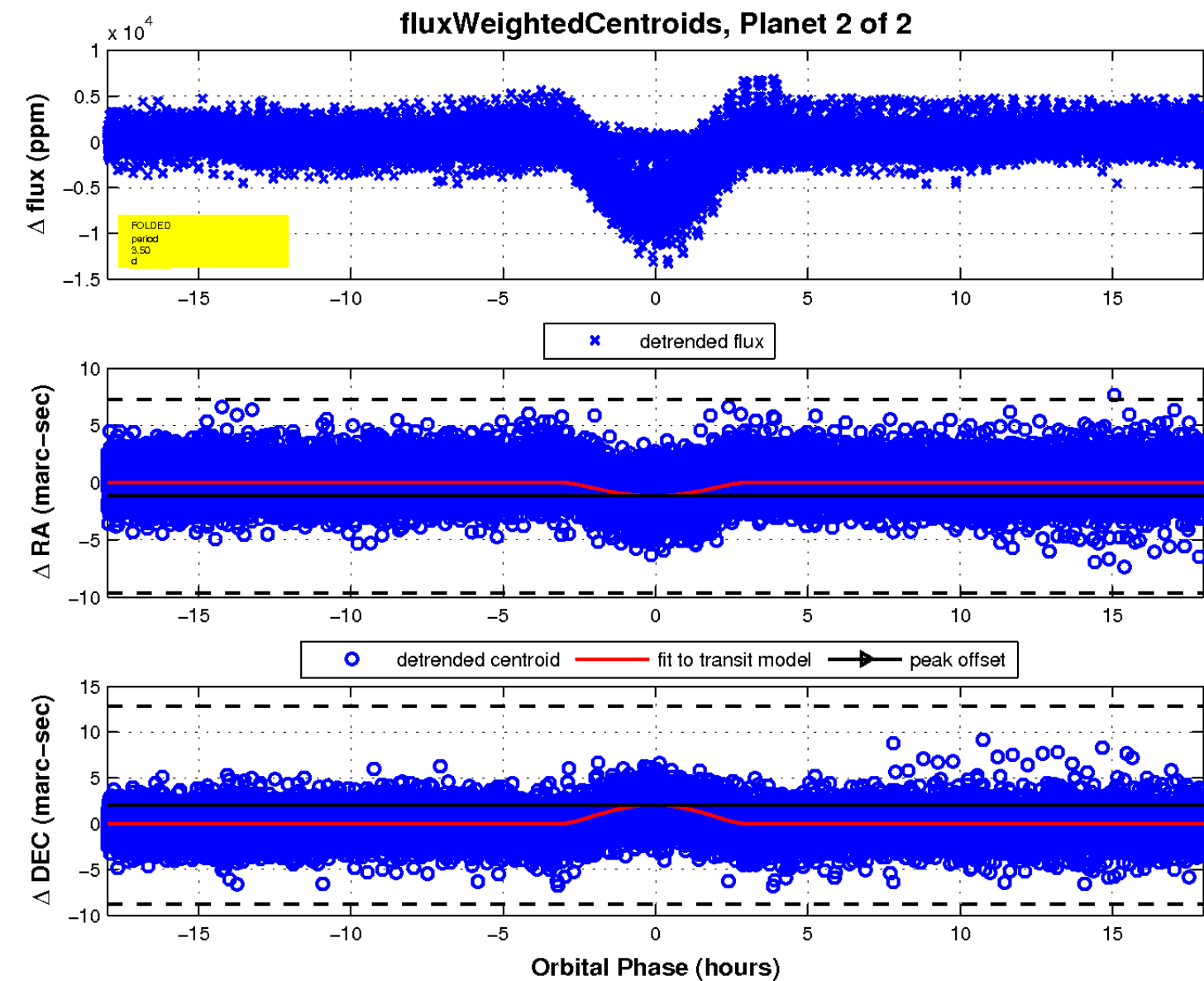
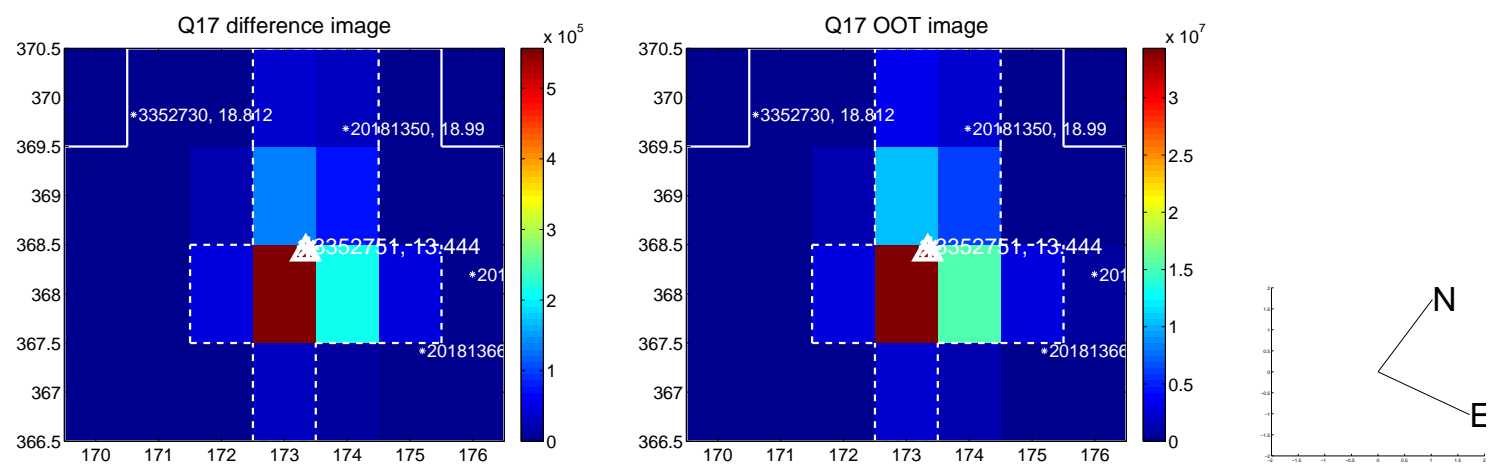
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

