

# KIC 010351767

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010351767-01	OBS	1153.01	1.270169	132.741374	25059.9	2.062	751.7	655.1	1.06	6340	22.03	2869.19
010351767-02	OBS	No	1.270138	132.110994	23938.8	1.500	1353.1	-1.0	1.06	6340	16.52	2869.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010351767-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010351767-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

**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.

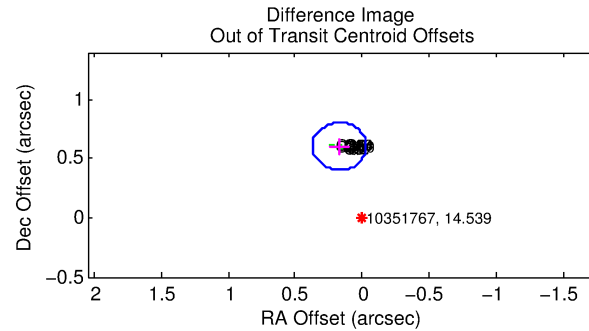
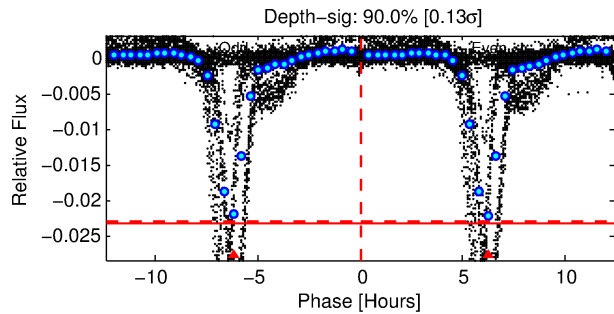
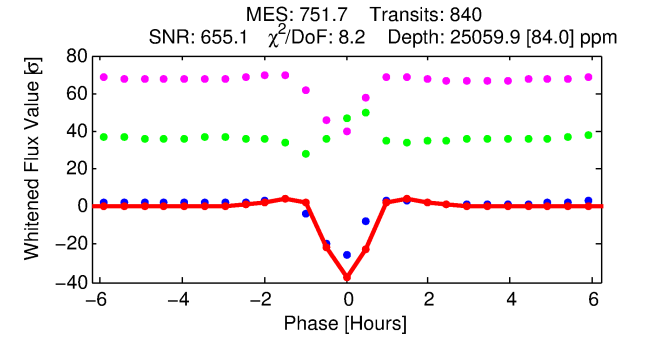
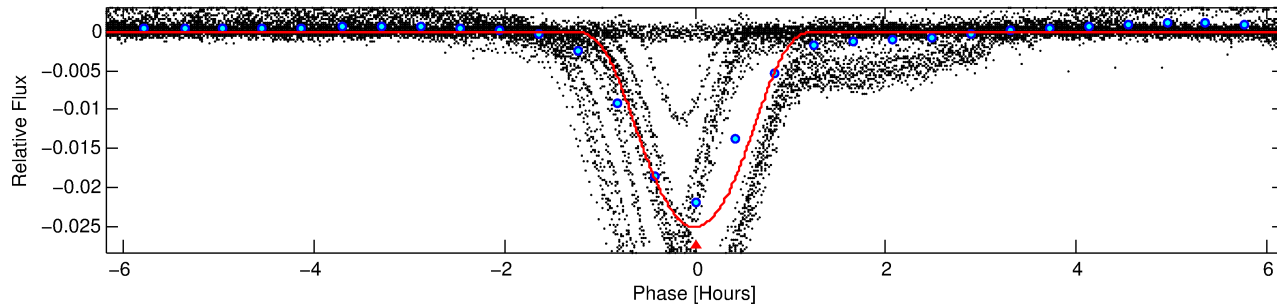
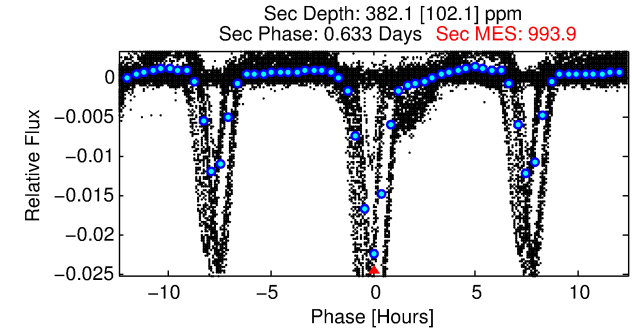
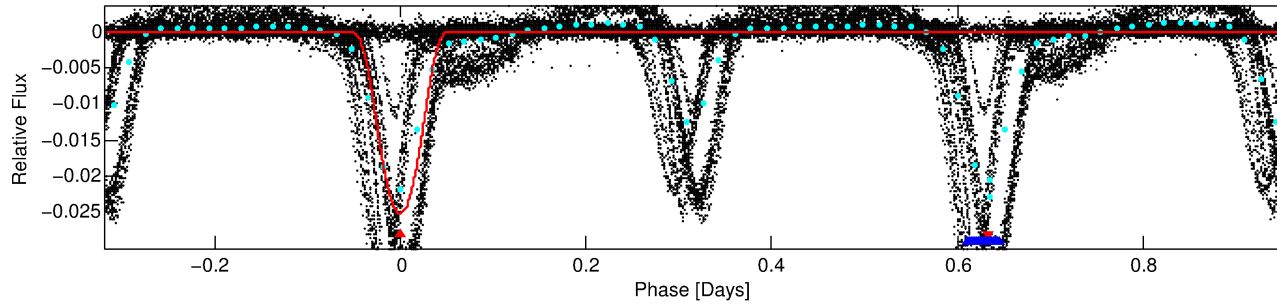
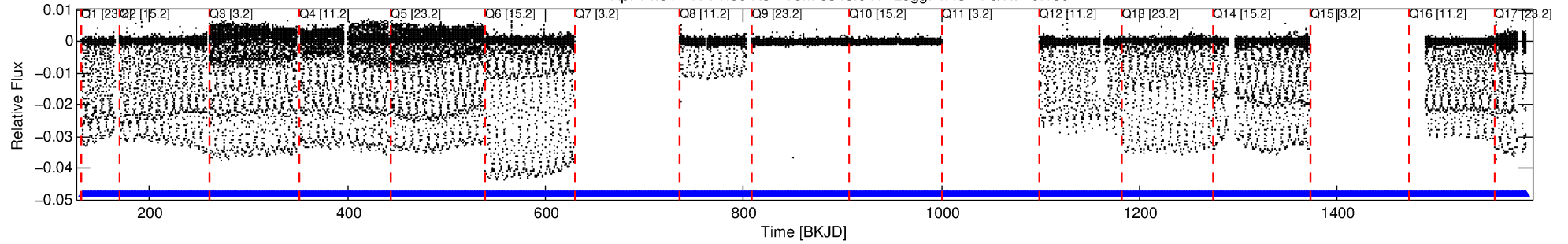
## Ephemeris Match Information For 010351767-01

No Significant Match Found

# DV One-Page Summary

KIC: 10351767 Candidate: 1 of 2 Period: 1.270 d  
KOI: K01153 Corr: No Ephemeris Match

Kp: 14.54 R\*: 1.06 Rs Teff: 6340.0 K Logg: 4.43 Fe/H: -0.180



## DV Fit Results:

Period = 1.27017 [0.00000] d  
Epoch = 132.7414 [0.0000] BKJD  
Rp/R\* = 0.1908 [0.0072]  
a/R\* = 3.82 [0.04]  
b = 0.90 [0.01]  
Seff = 2869.19 [1187.83]  
Teq = 1866 [193] K  
Rp = 22.03 [7.03] Re  
a = 0.0238 [0.0064] AU  
Ag = 0.24 [0.12] [-6.42σ]  
Teff = 2029 [156] K [0.66σ]

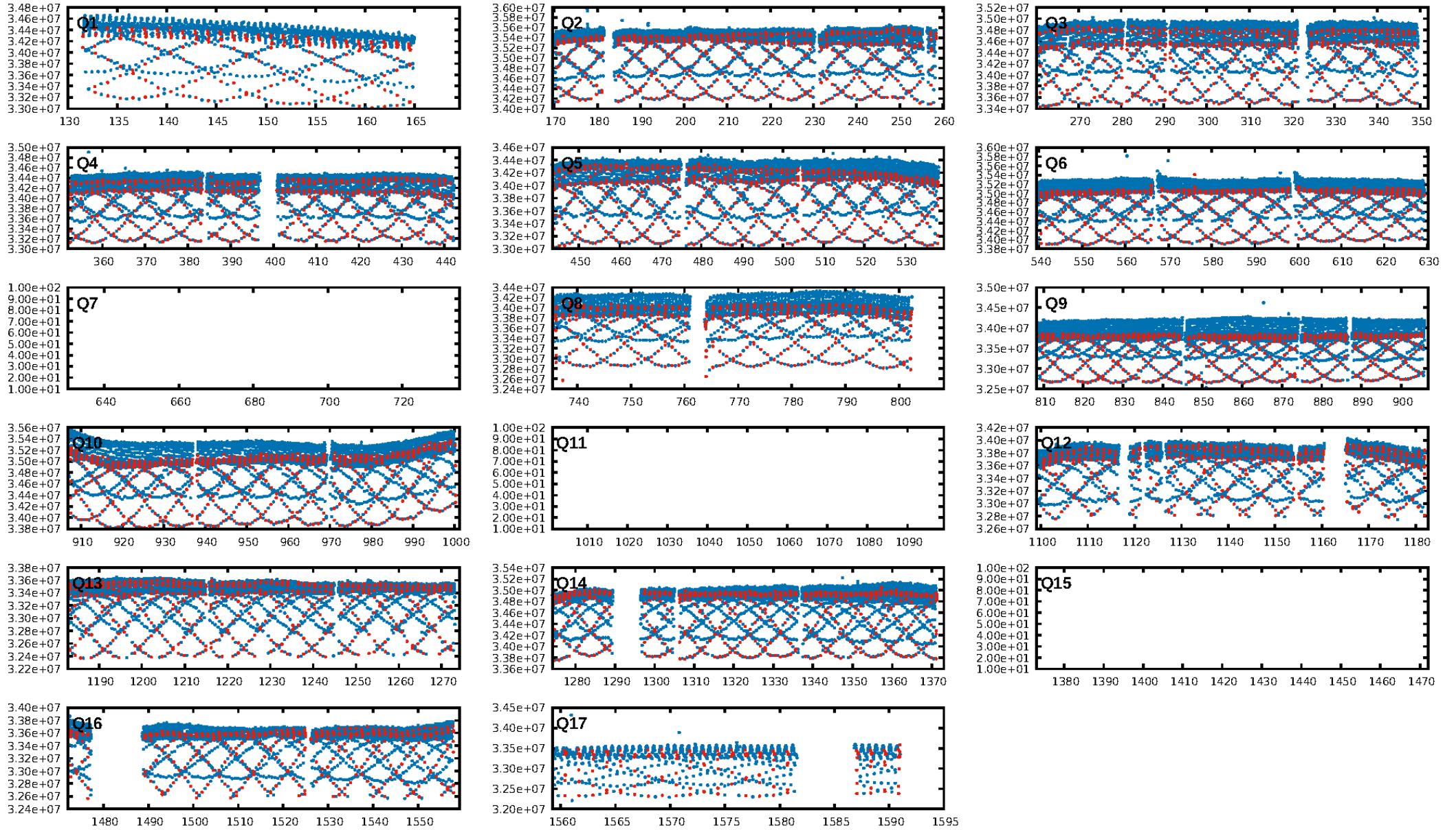
## DV Diagnostic Results:

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 [792/792]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 0.367 arcsec [76.31σ]  
OotOffset-rm: 0.628 arcsec [9.39σ]  
KicOffset-rm: 0.502 arcsec [7.39σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

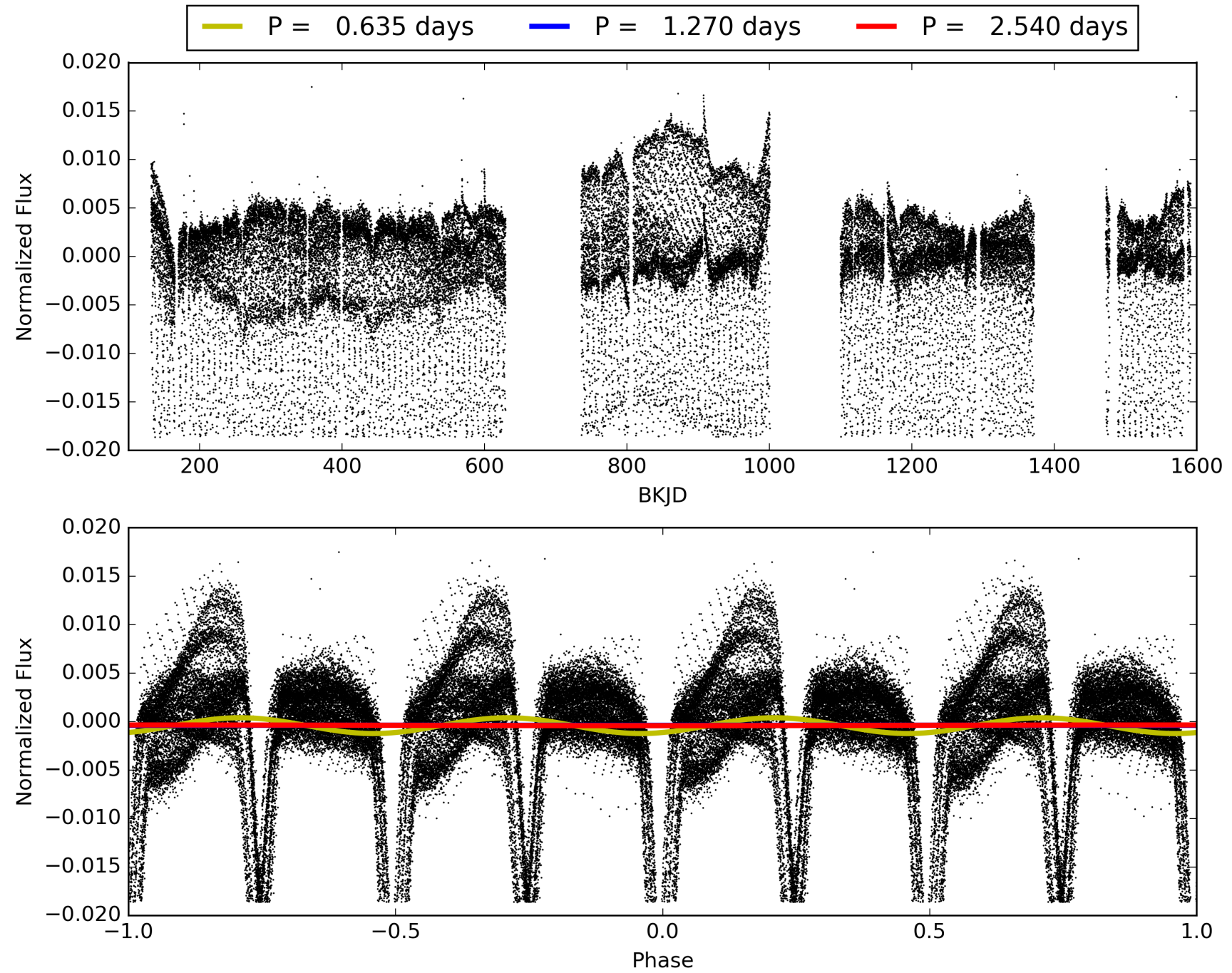
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:03:43 Z

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

# TCE 010351767-01, PDC Light Curves

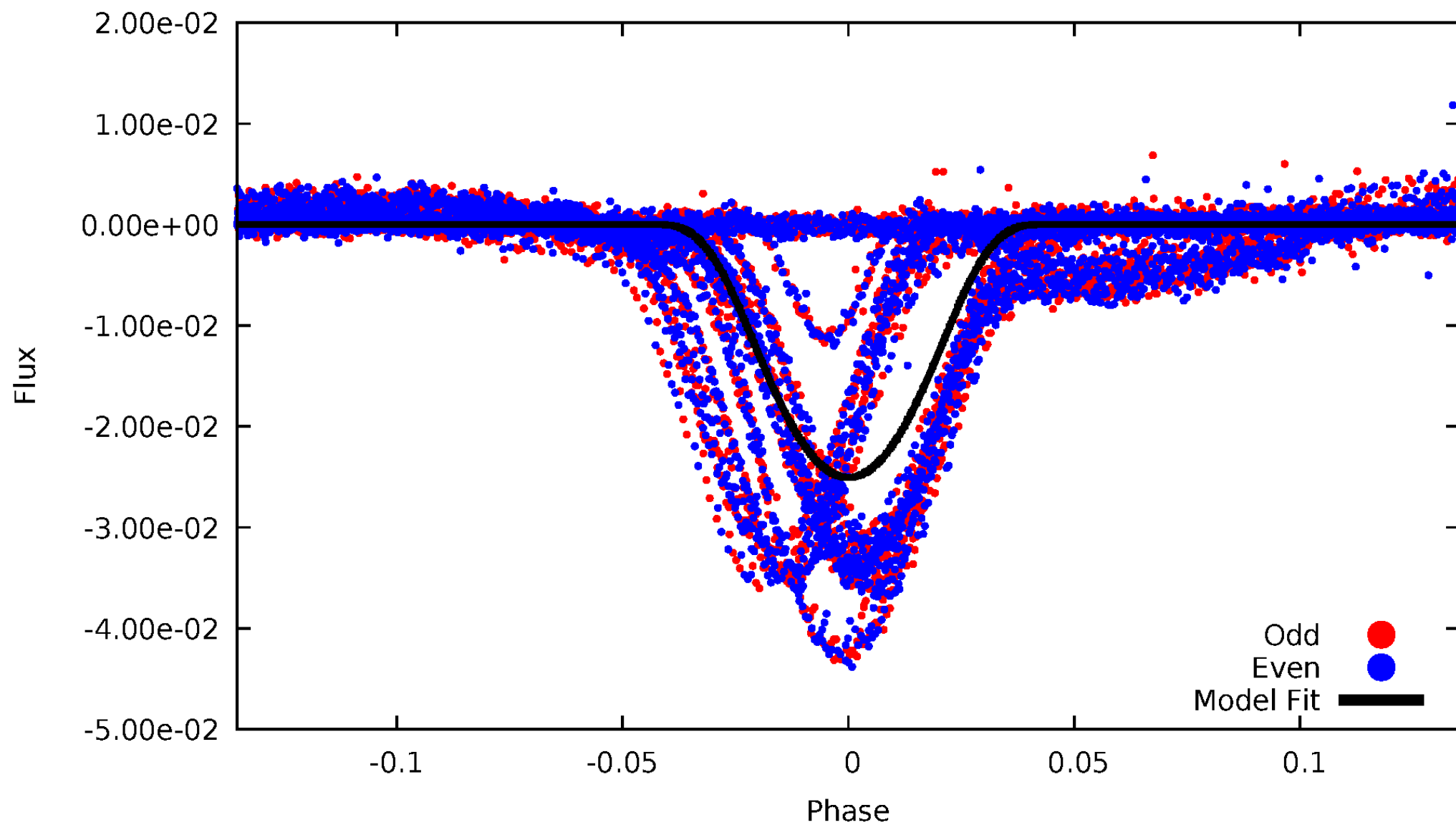


TCE 010351767-01



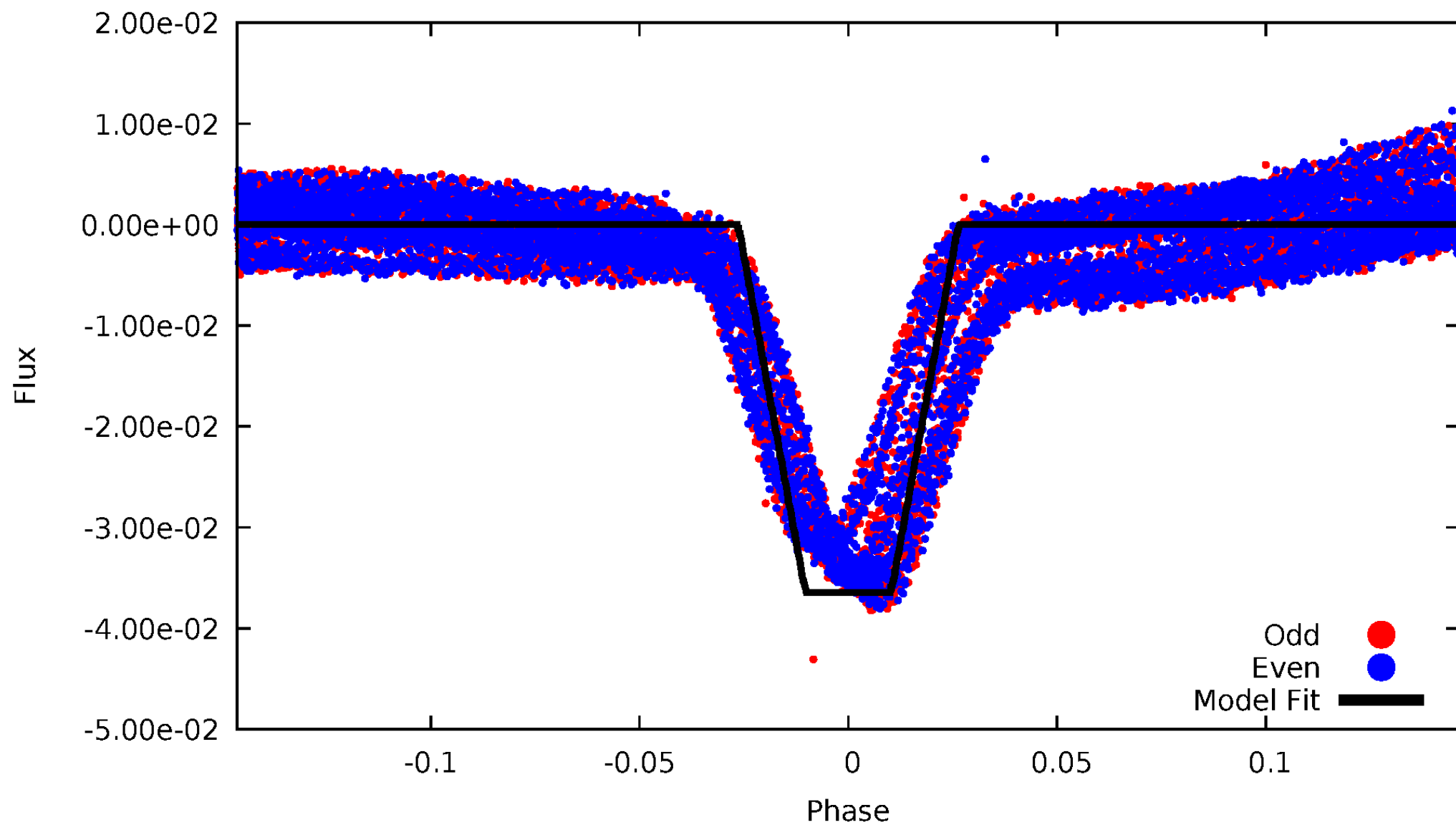
# DV Odd/Even

TCE 010351767-01



# ALT Odd/Even

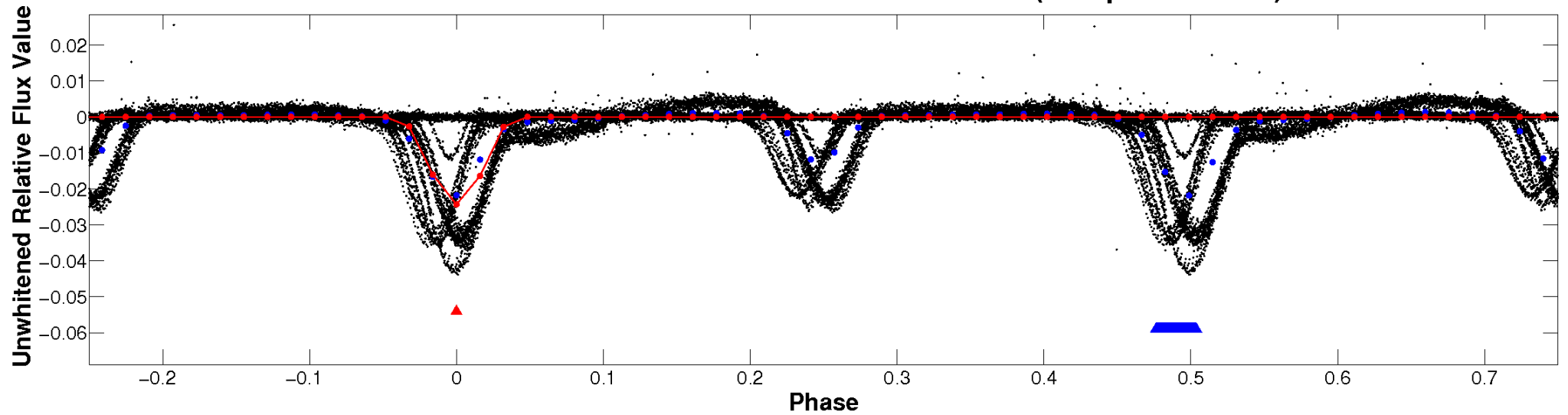
TCE 010351767-01



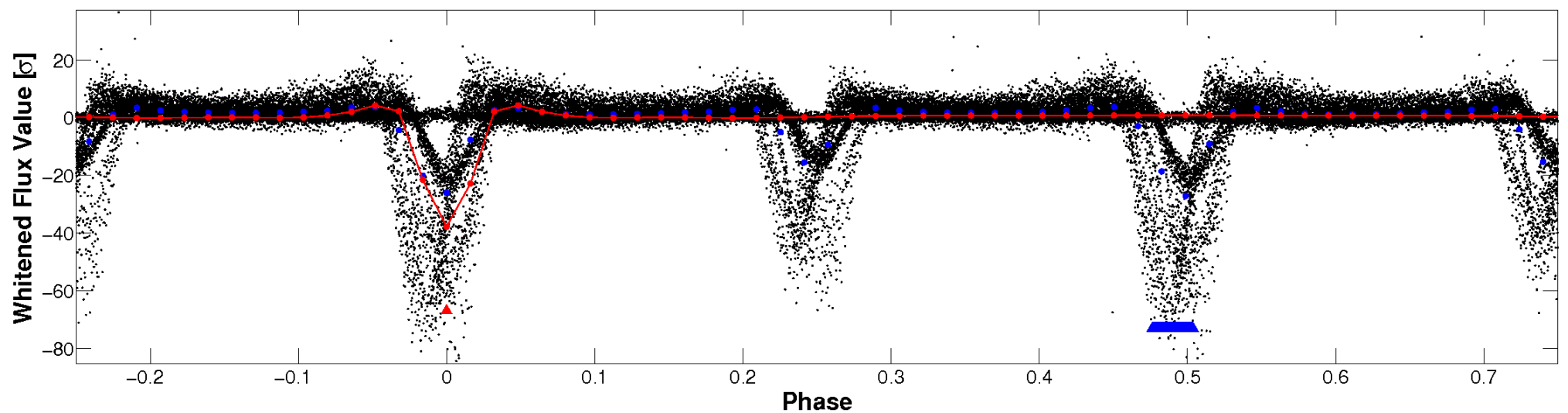


# Non-Whitened Vs. Whitened Light Curve

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

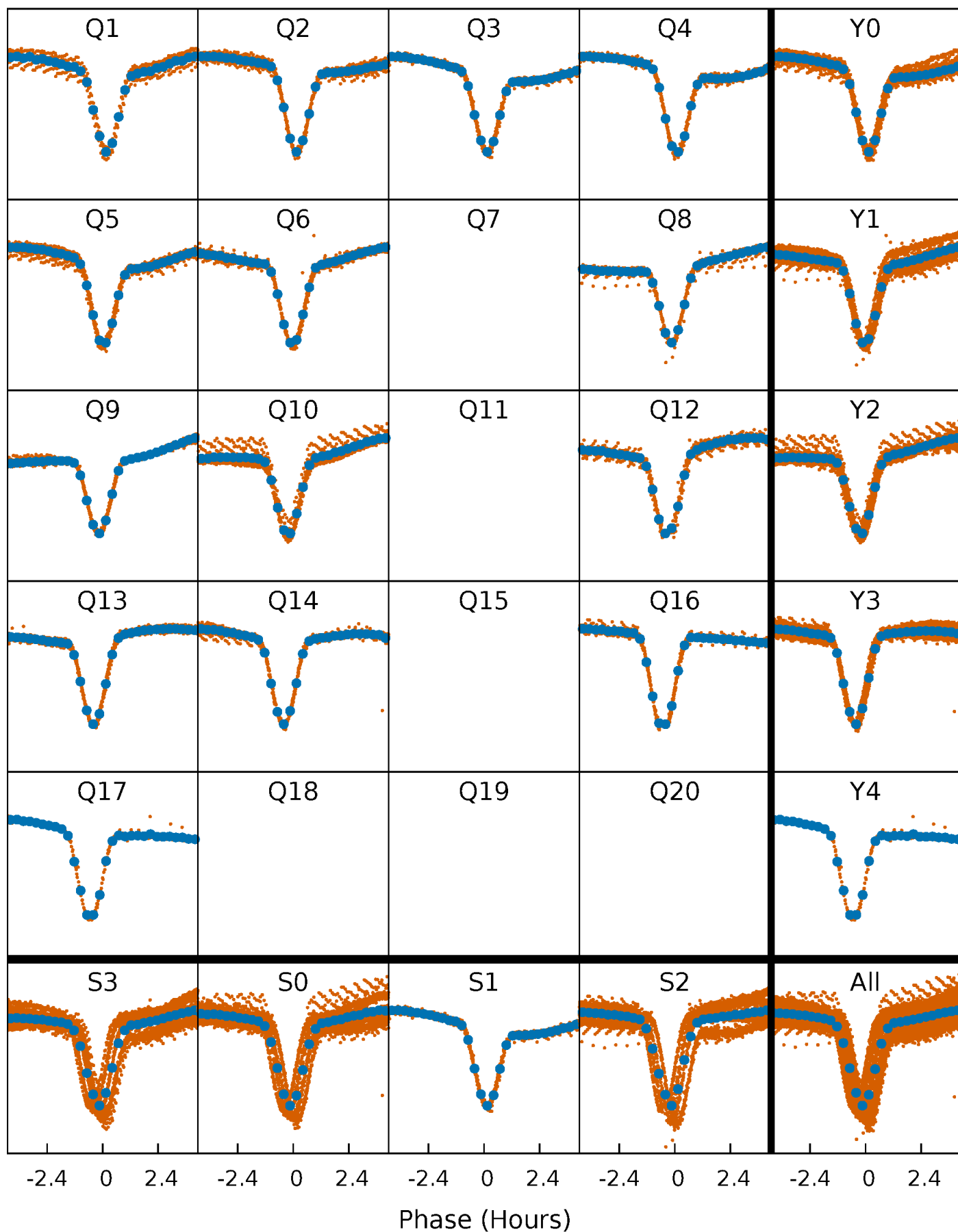


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

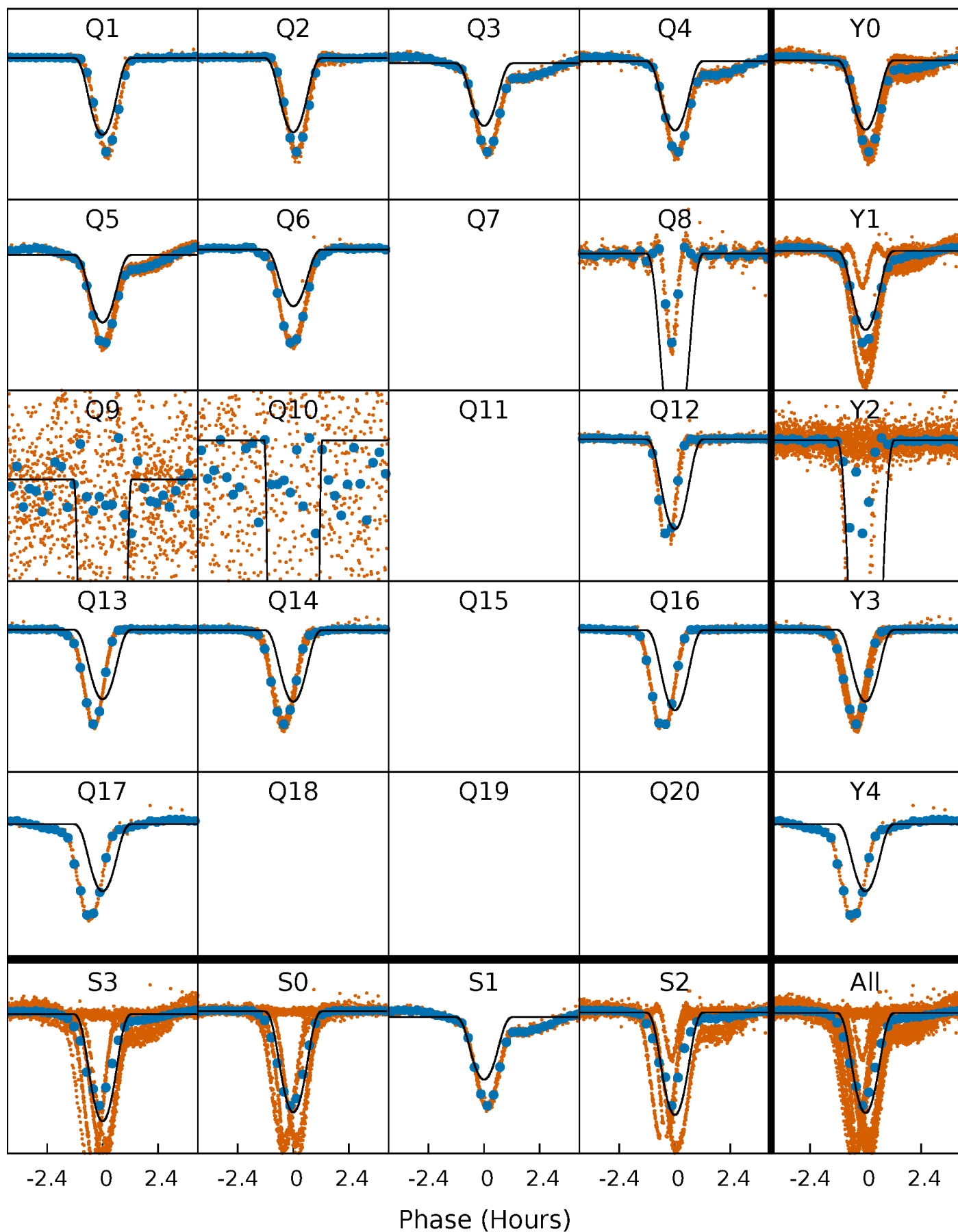
TCE 010351767-01   P= 1.270169 Days    $T_0=132.741374$  (BKJD)





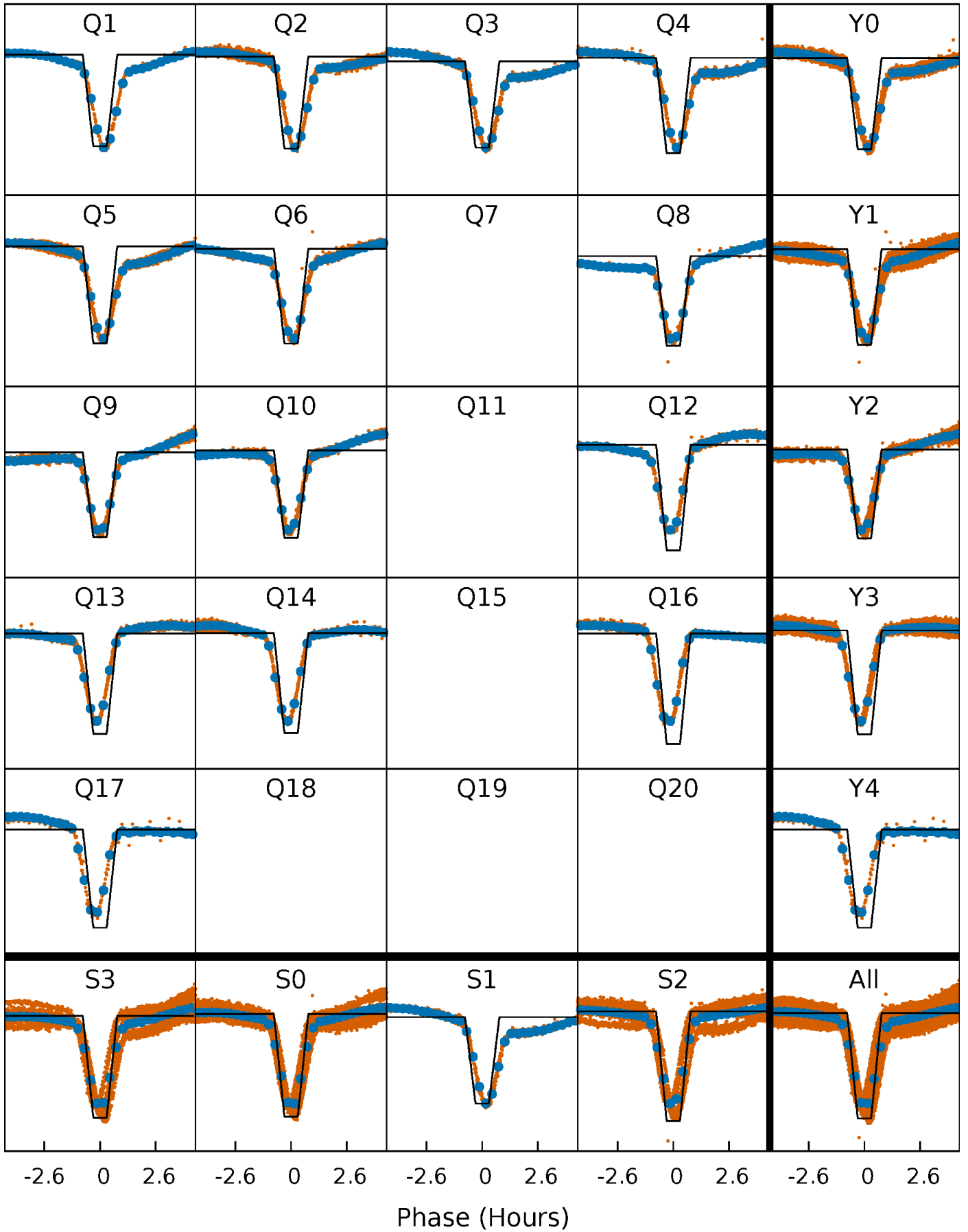
# DV Quarter-Phased Transit Curves

TCE 010351767-01 P= 1.270169 Days  $T_0=132.741374$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

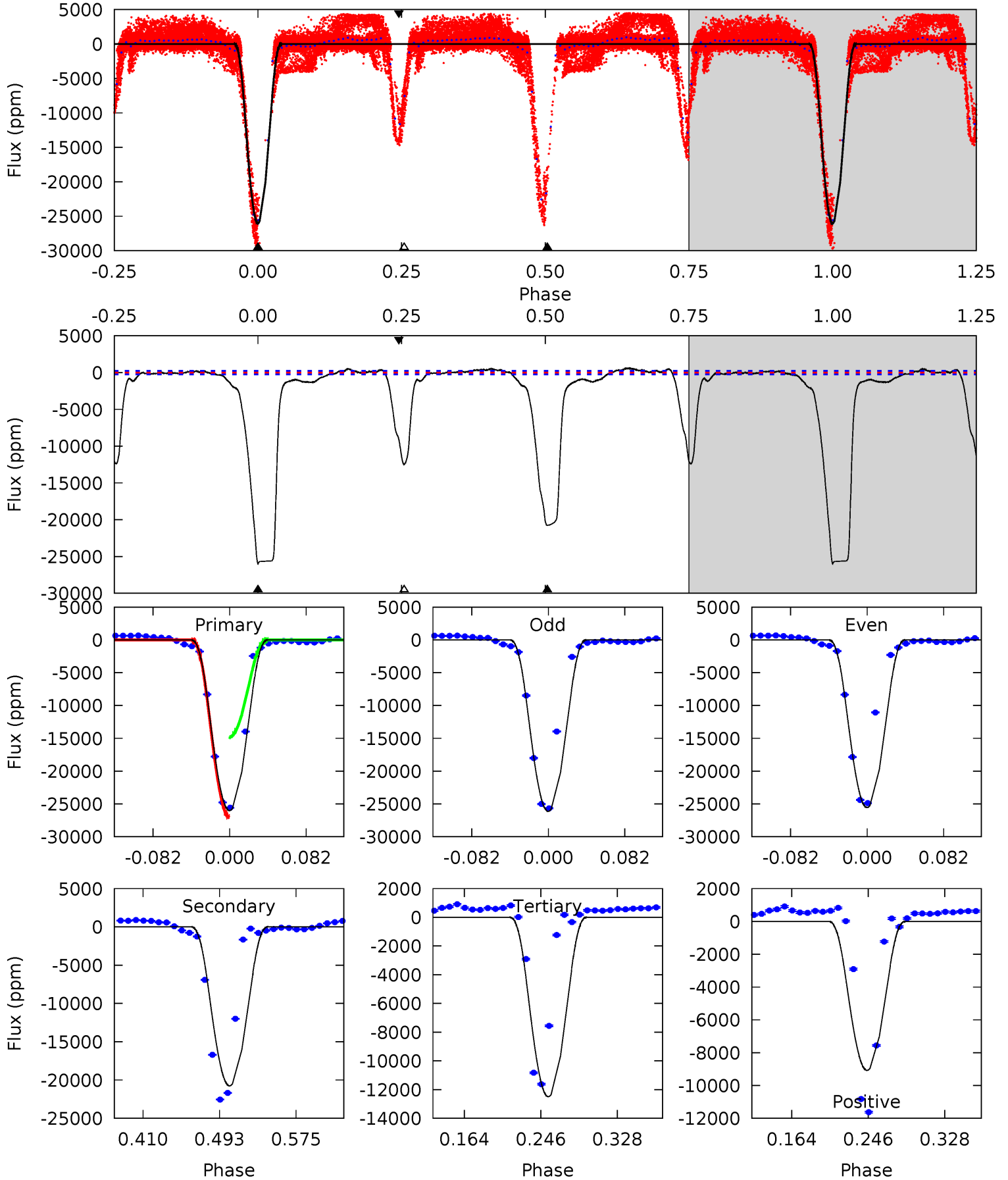
TCE 010351767-01 P= 1.270159 Days  $T_0=132.740039$  (BKJD)



# DV Model-Shift Uniqueness Test

010351767-01, P = 1.270169 Days, E = 131.471205 Days

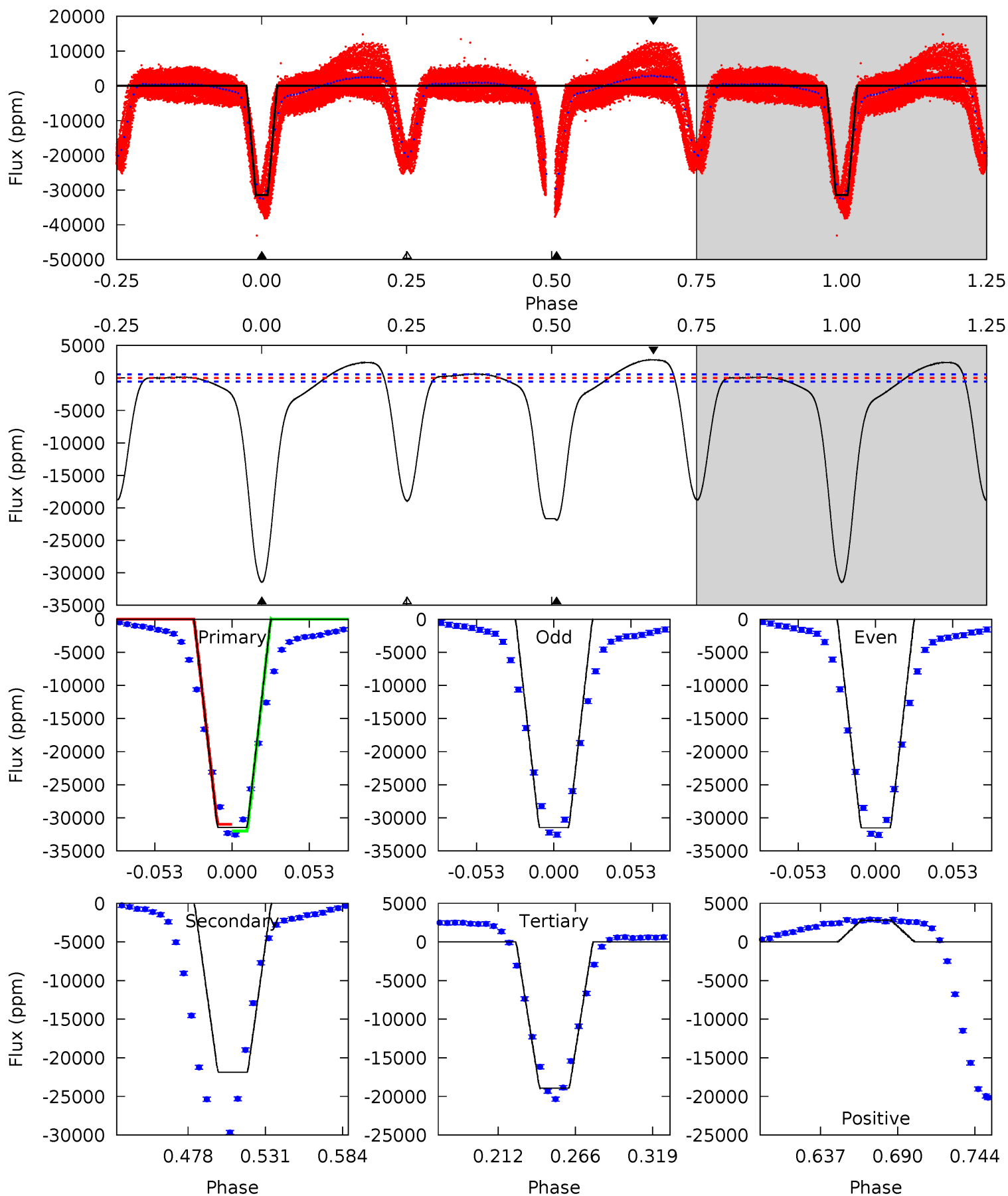
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
480.5	383.4	230.7	-167.6	4.61	1.74	34.8	249.8	648.2	152.7	551.0	5.40	0.86	0.02	0



# Alt Model-Shift Uniqueness Test

010351767-01, P = 1.270159 Days, E = 131.469880 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
262.9	182.7	158.2	23.5	4.70	1.93	43.4	104.7	239.5	24.5	159.3	0.19	0.98	0.08	4.16



### Stellar Parameters For KIC 010351767

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6340^{+150}_{-206}$	$4.434^{+0.054}_{-0.216}$	$-0.180^{+0.250}_{-0.300}$	$1.058^{+0.335}_{-0.112}$	$1.106^{+0.158}_{-0.144}$	$1.316^{+0.372}_{-0.693}$
	+2%/-3%	+1%/-5%	+139%/-167%	+32%/-11%	+14%/-13%	+28%/-53%
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 010351767-01 / KOI 1153.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-20764 \pm 54$	$22.60^{+3.83}_{-1.95}$	$2663^{+193}_{-135}$	$5523^{+159}_{-185}$	$13^{+2}_{-3}$
Alt.	$-21859 \pm 120$	$22.75^{+4.04}_{-2.05}$	$2667^{+198}_{-137}$	$5584^{+156}_{-180}$	$13^{+2}_{-3}$

$T_{\text{max}}$  = 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

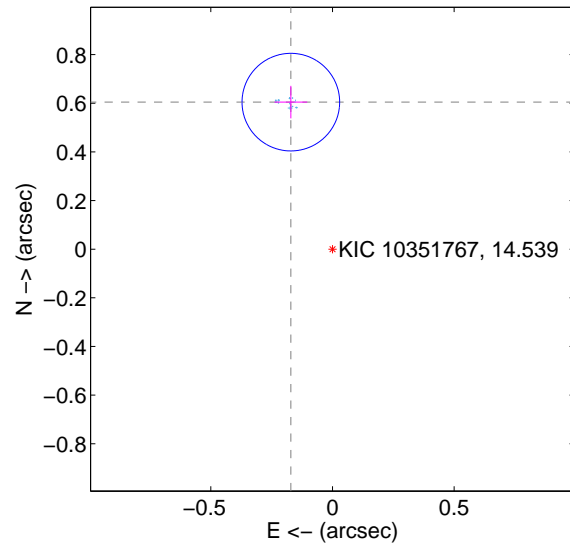
Supplemental centroid analysis for 010351767-01. Kepler magnitude: 14.54. Transit SNR 655.15

There are 14 quarters with good PRF difference image offsets

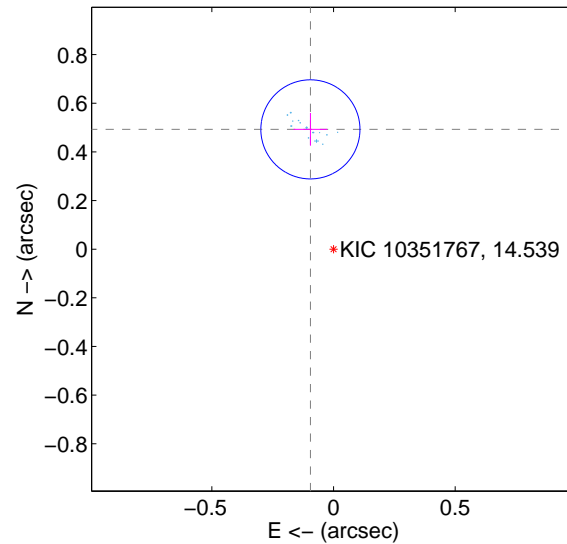
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>0.628 <math>\pm</math> 0.067</b>	<b>9.39</b>	0.171 $\pm$ 0.067	0.604 $\pm$ 0.067
PRF-fit source offset from KIC position	<b>0.502 <math>\pm</math> 0.068</b>	<b>7.39</b>	0.095 $\pm$ 0.069	0.493 $\pm$ 0.067
photometric centroid source offset	<b>0.37 <math>\pm</math> 0.00</b>	<b>76.31</b>	-0.20 $\pm$ 0.00	0.31 $\pm$ 0.00

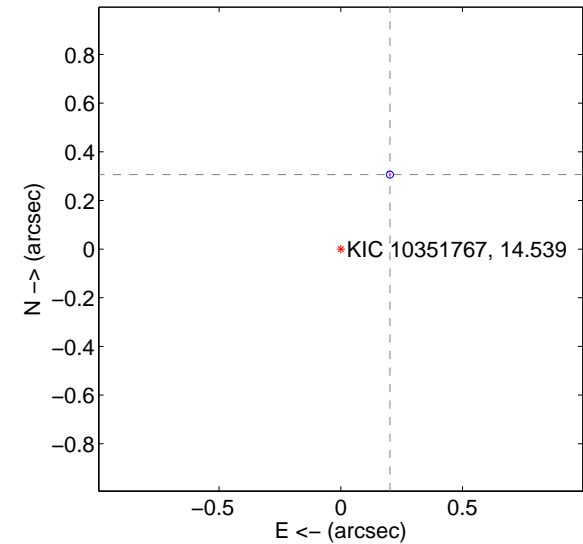
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



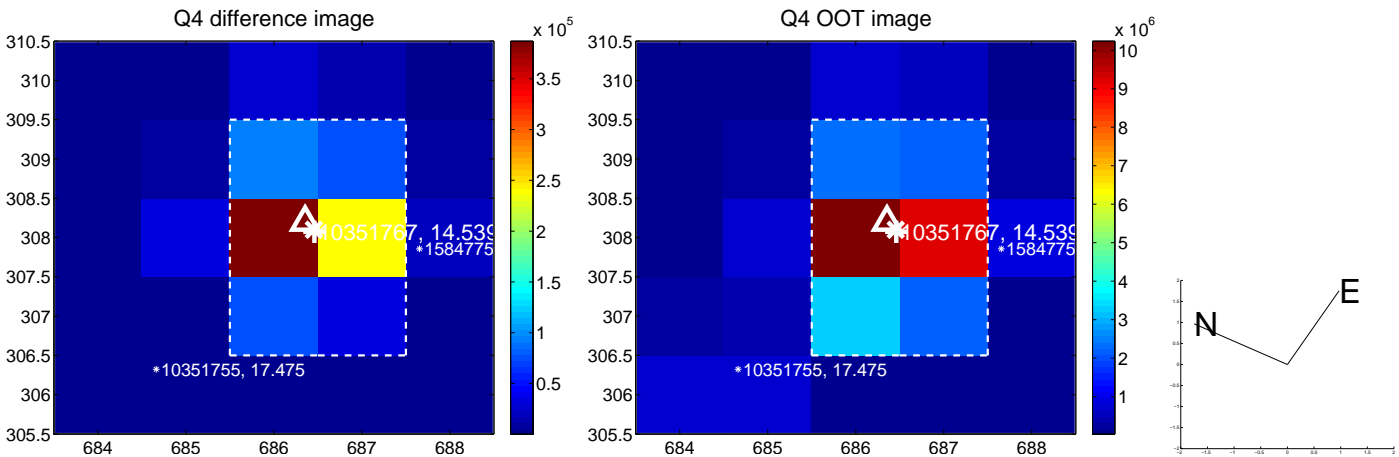
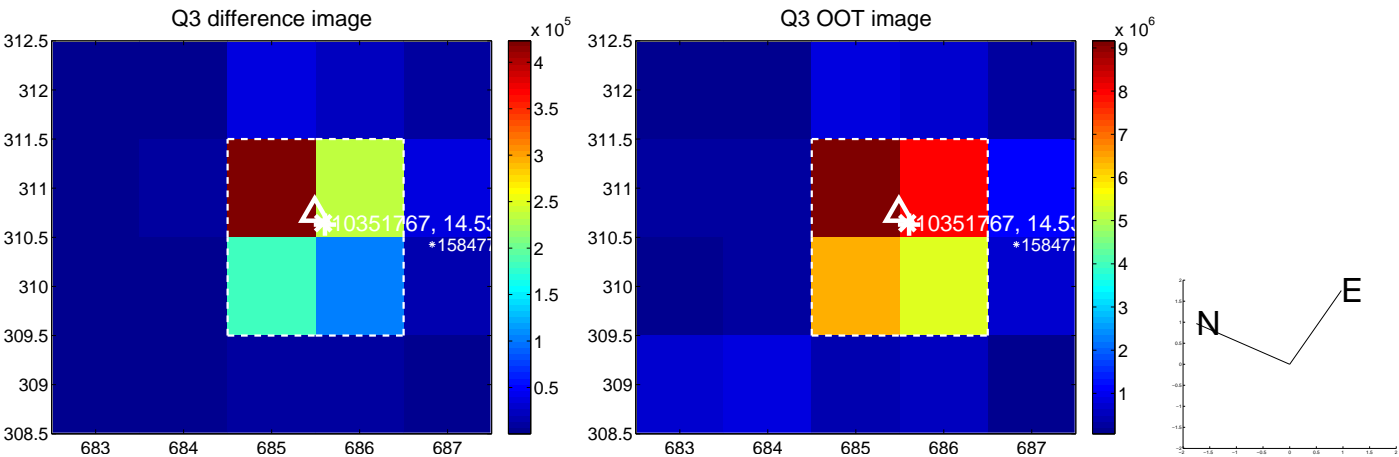
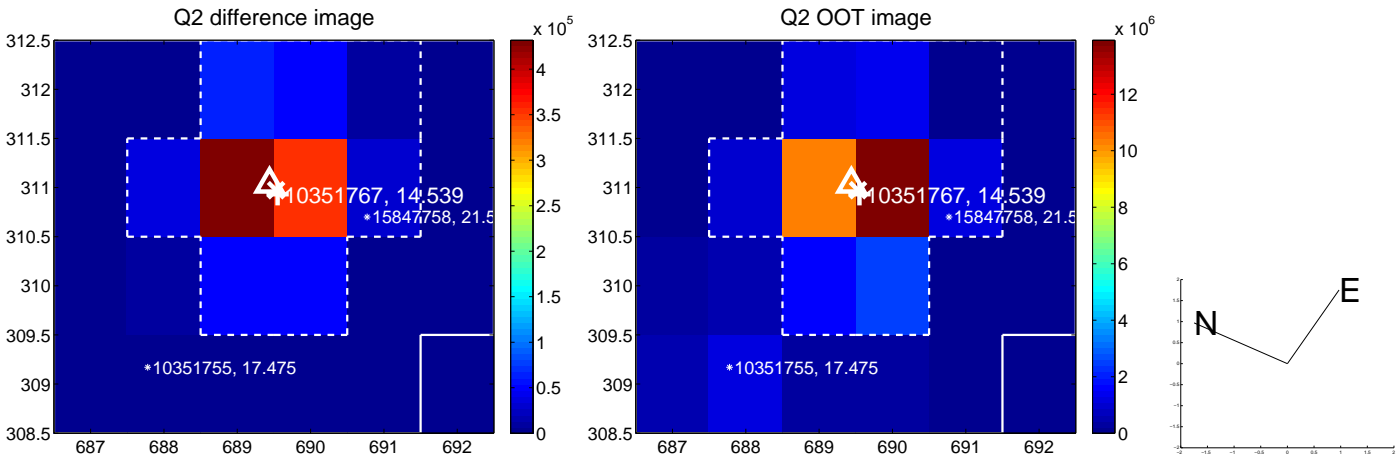
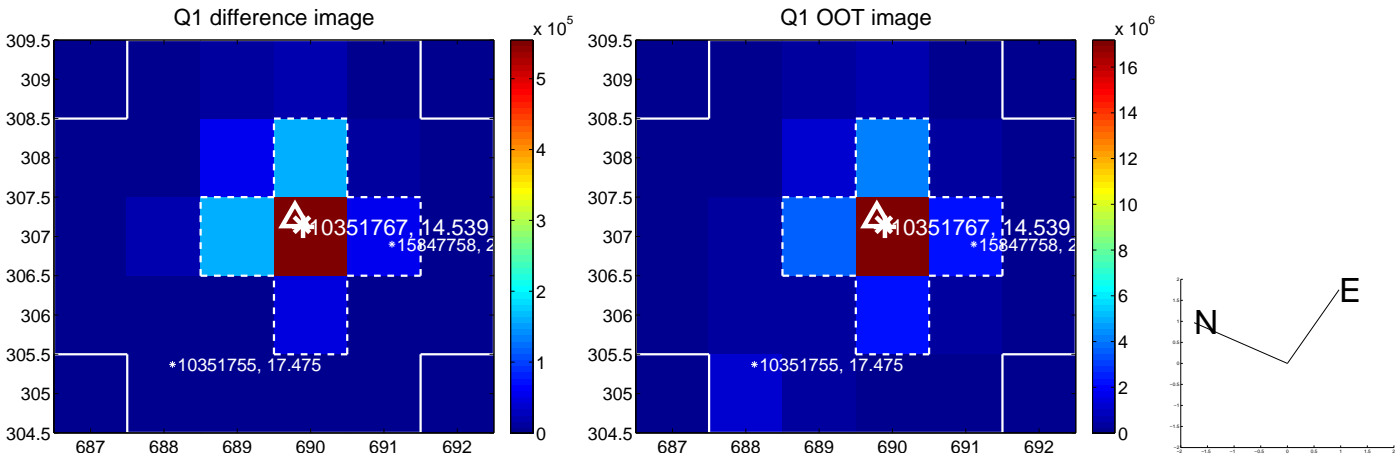
offset from photometric centroids



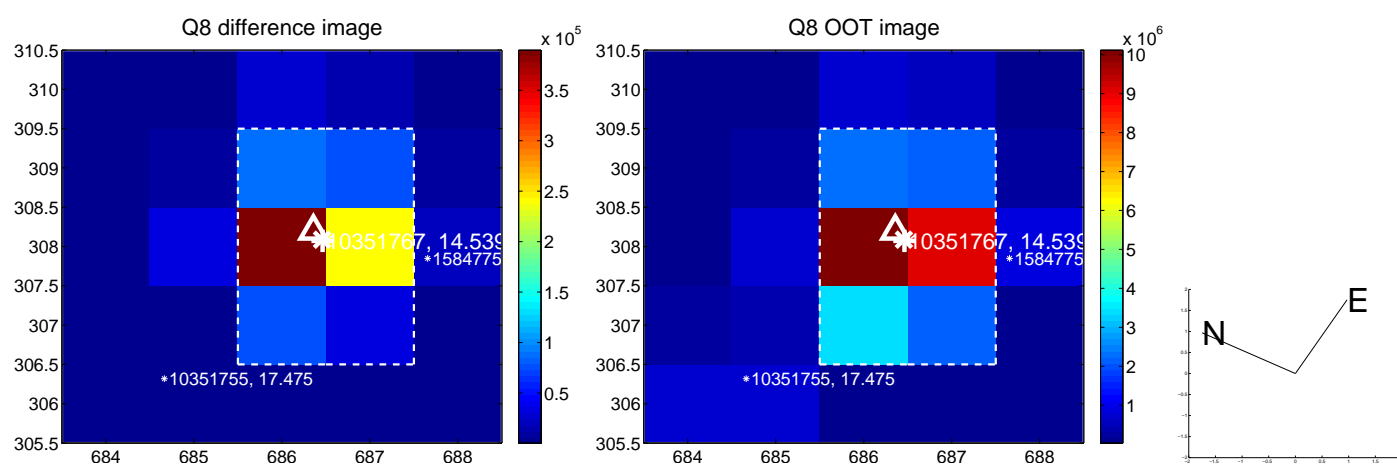
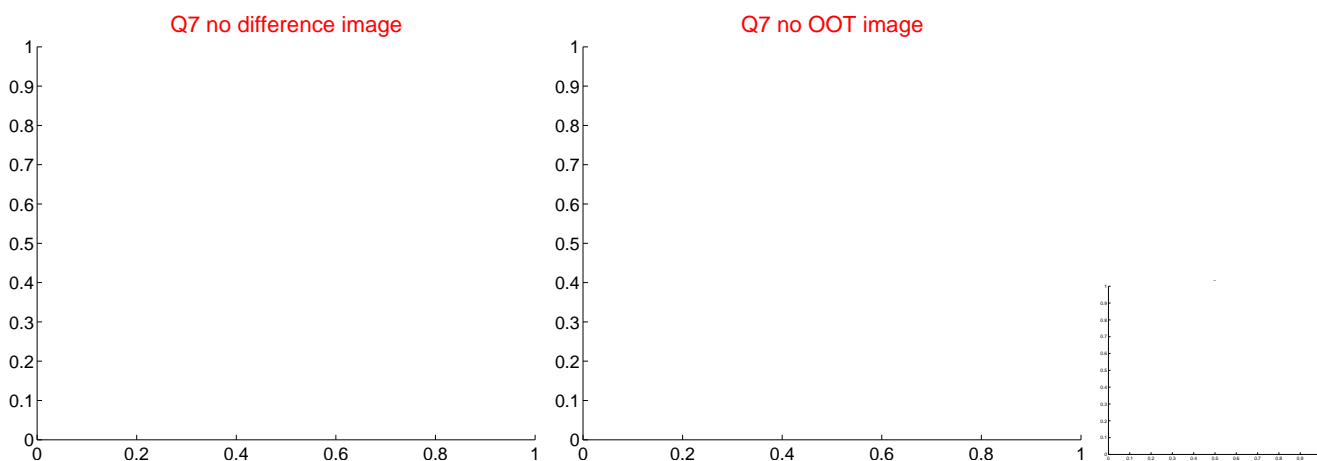
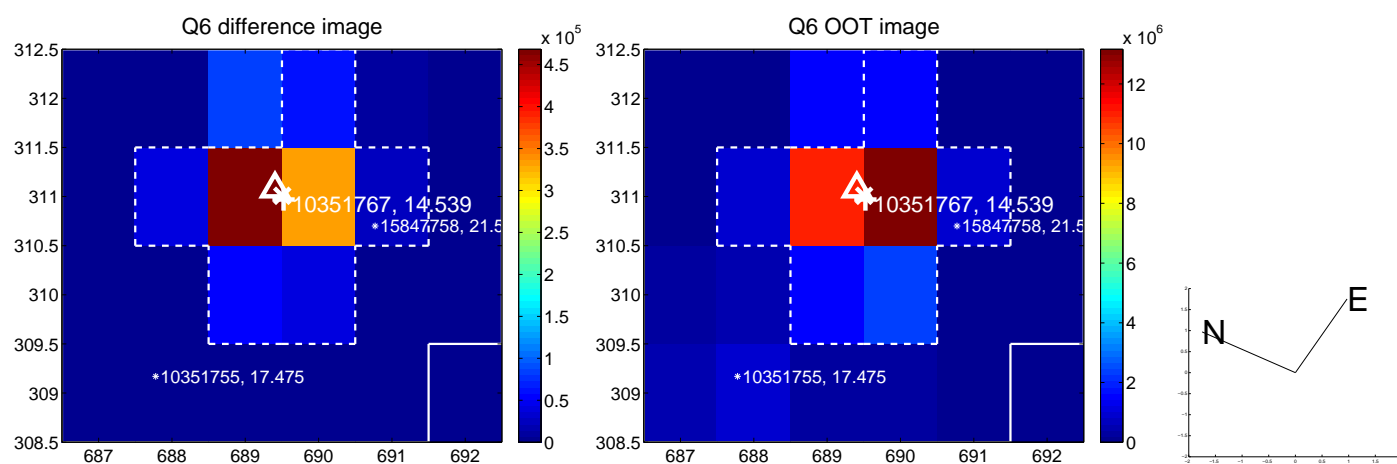
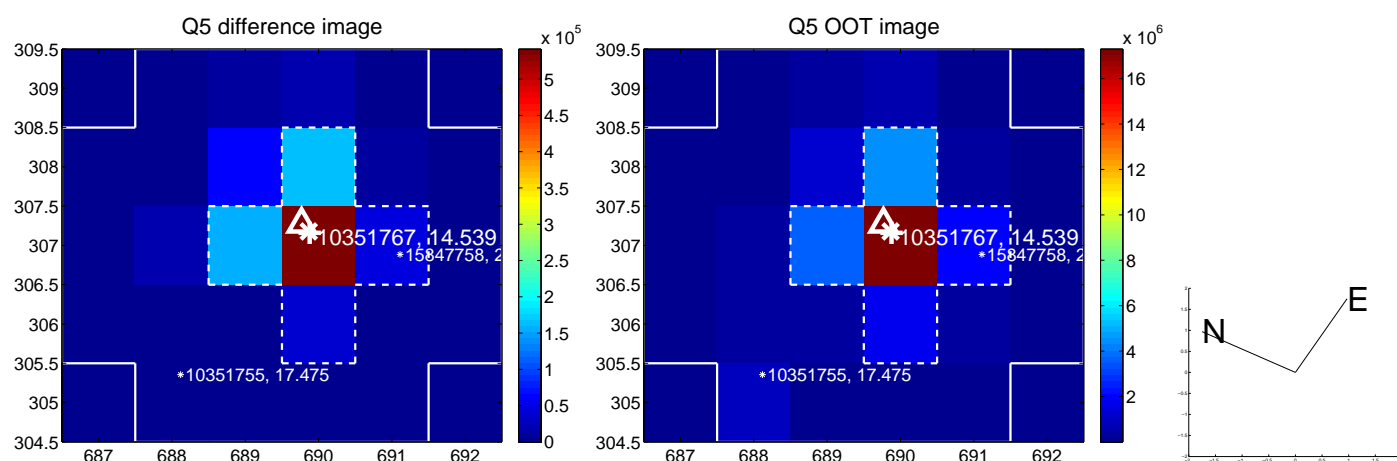
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



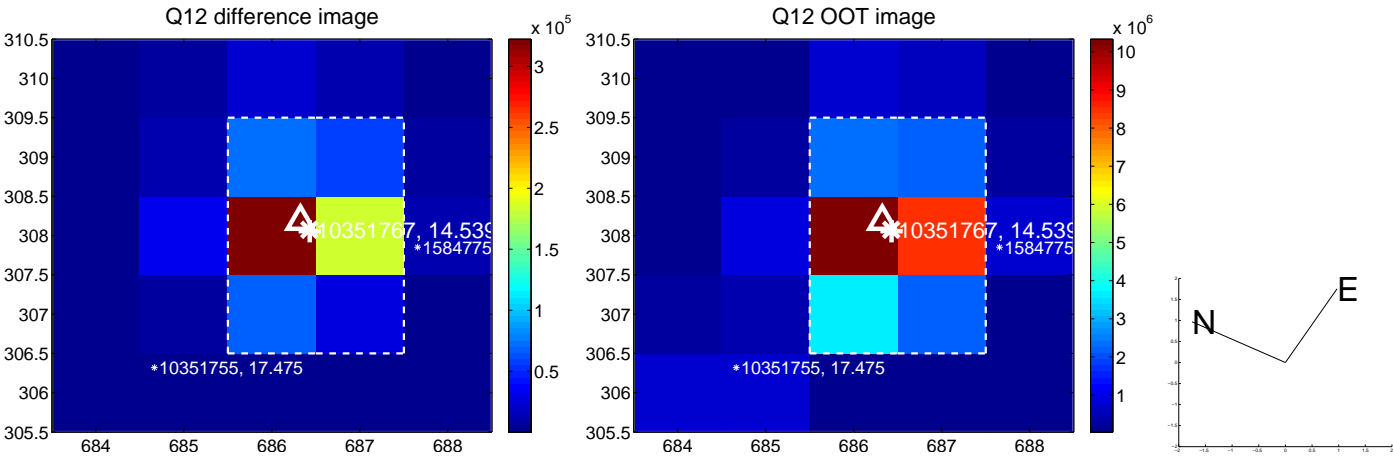
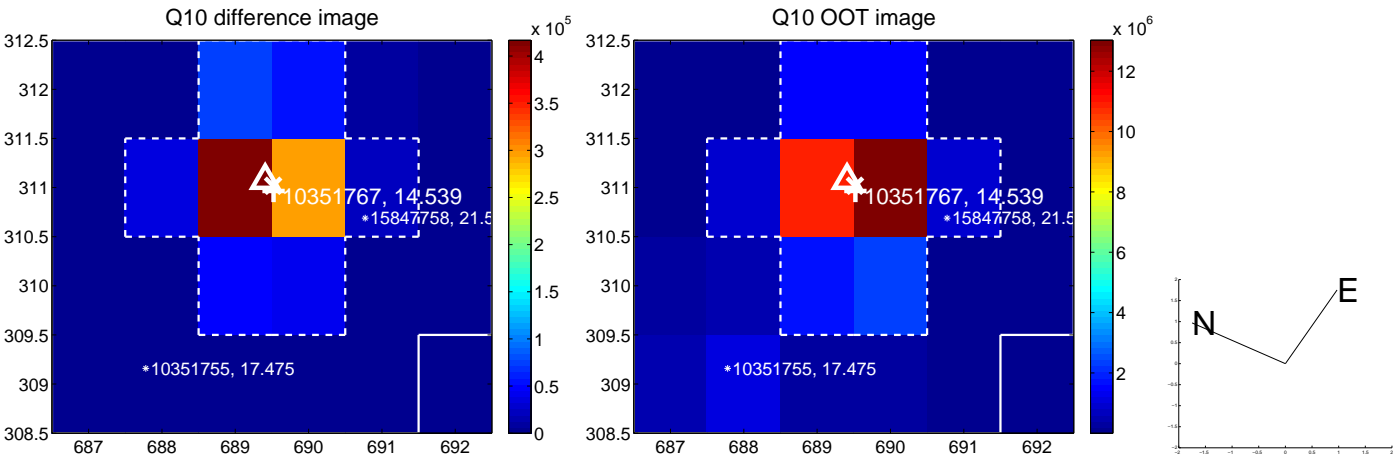
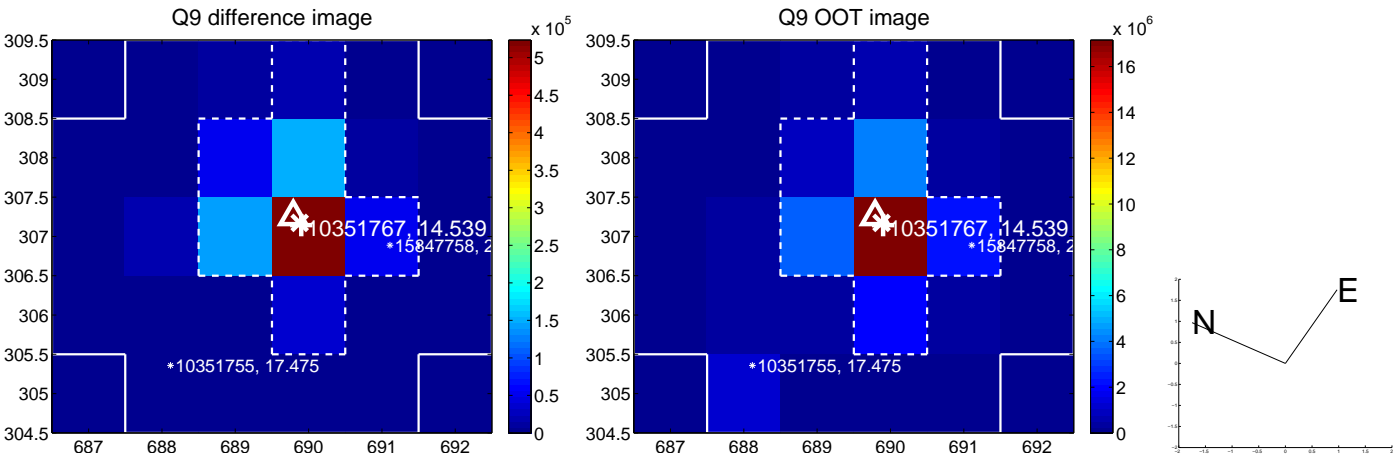
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



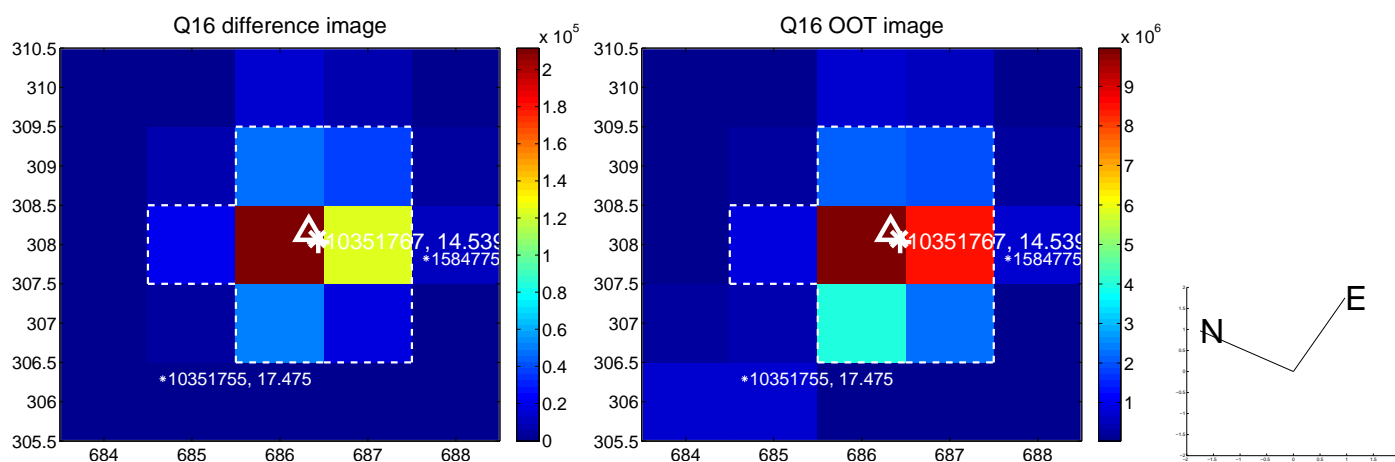
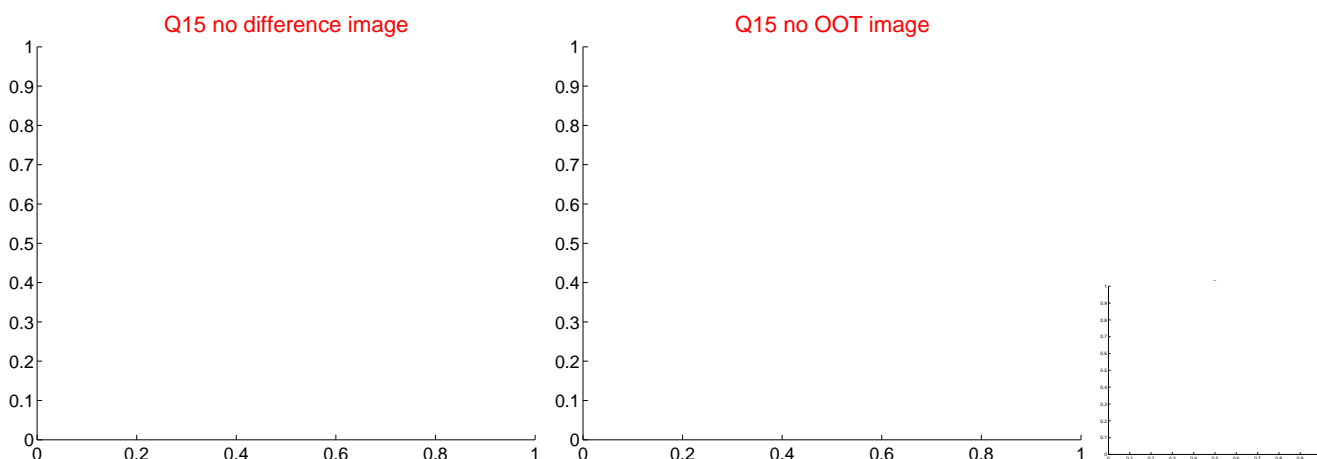
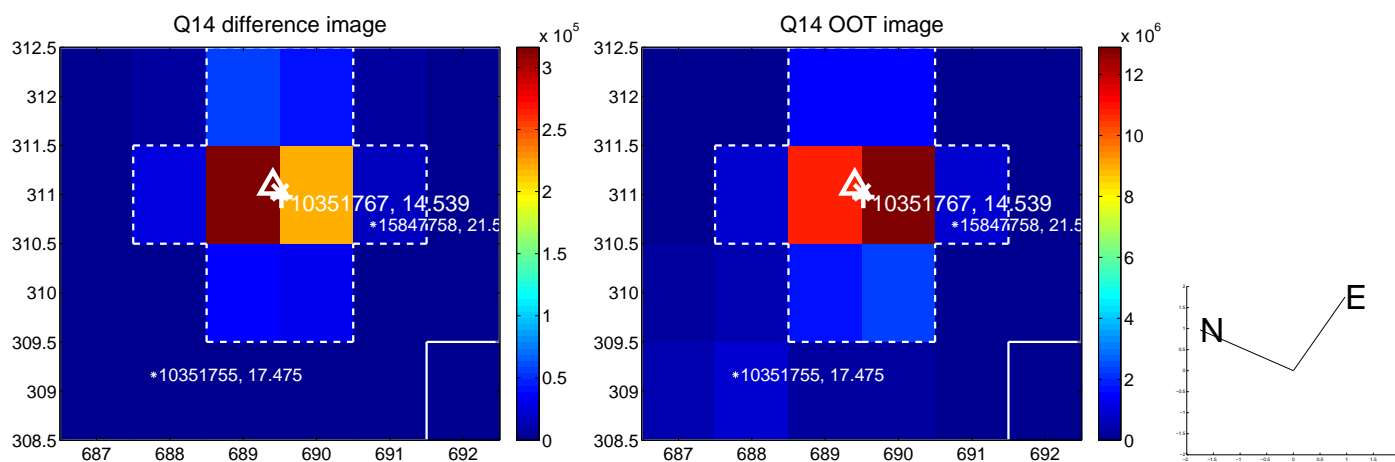
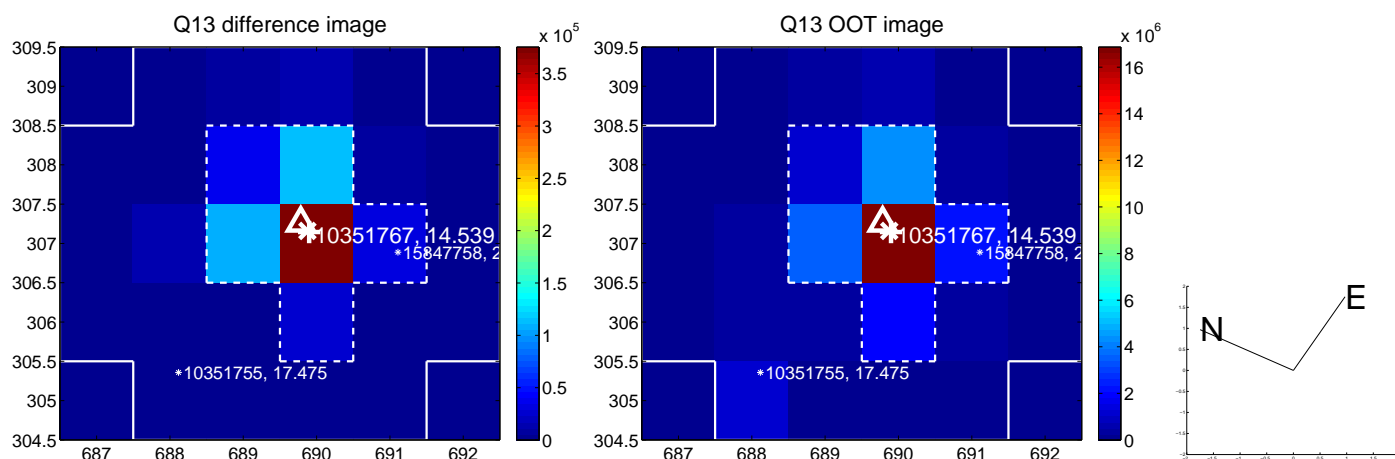
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



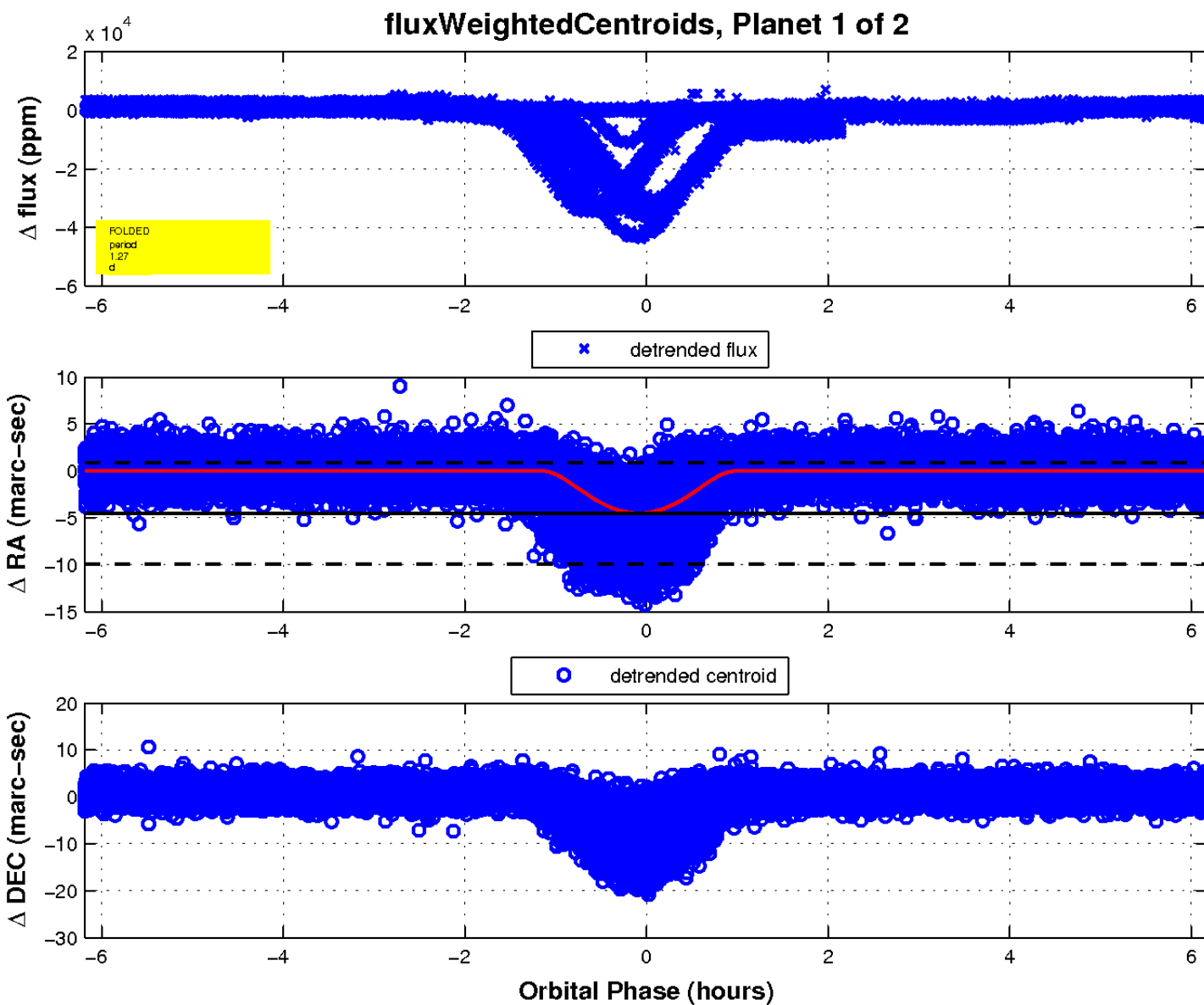
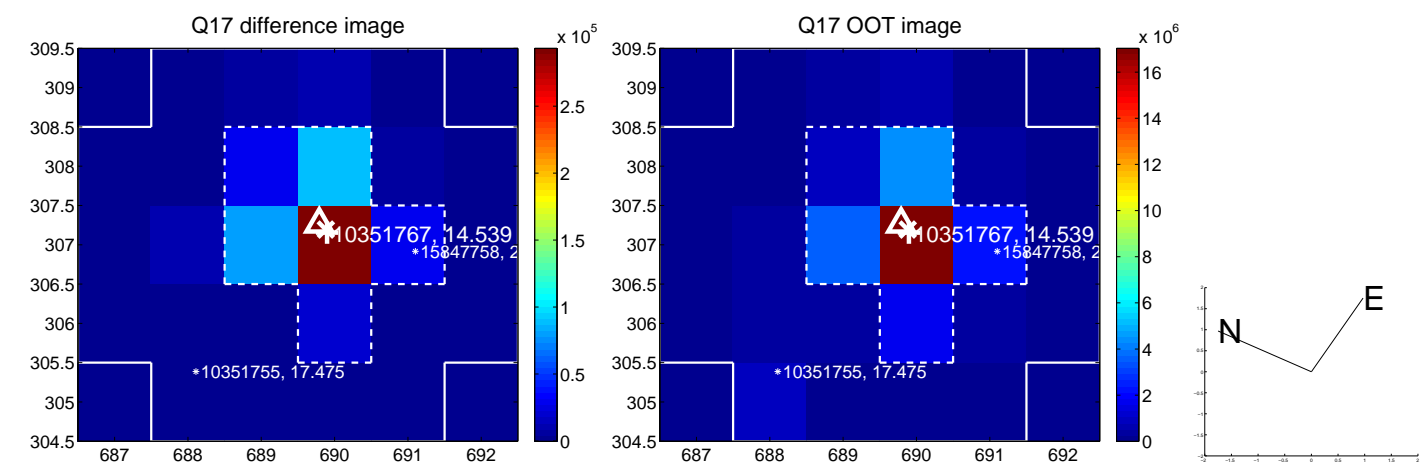
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

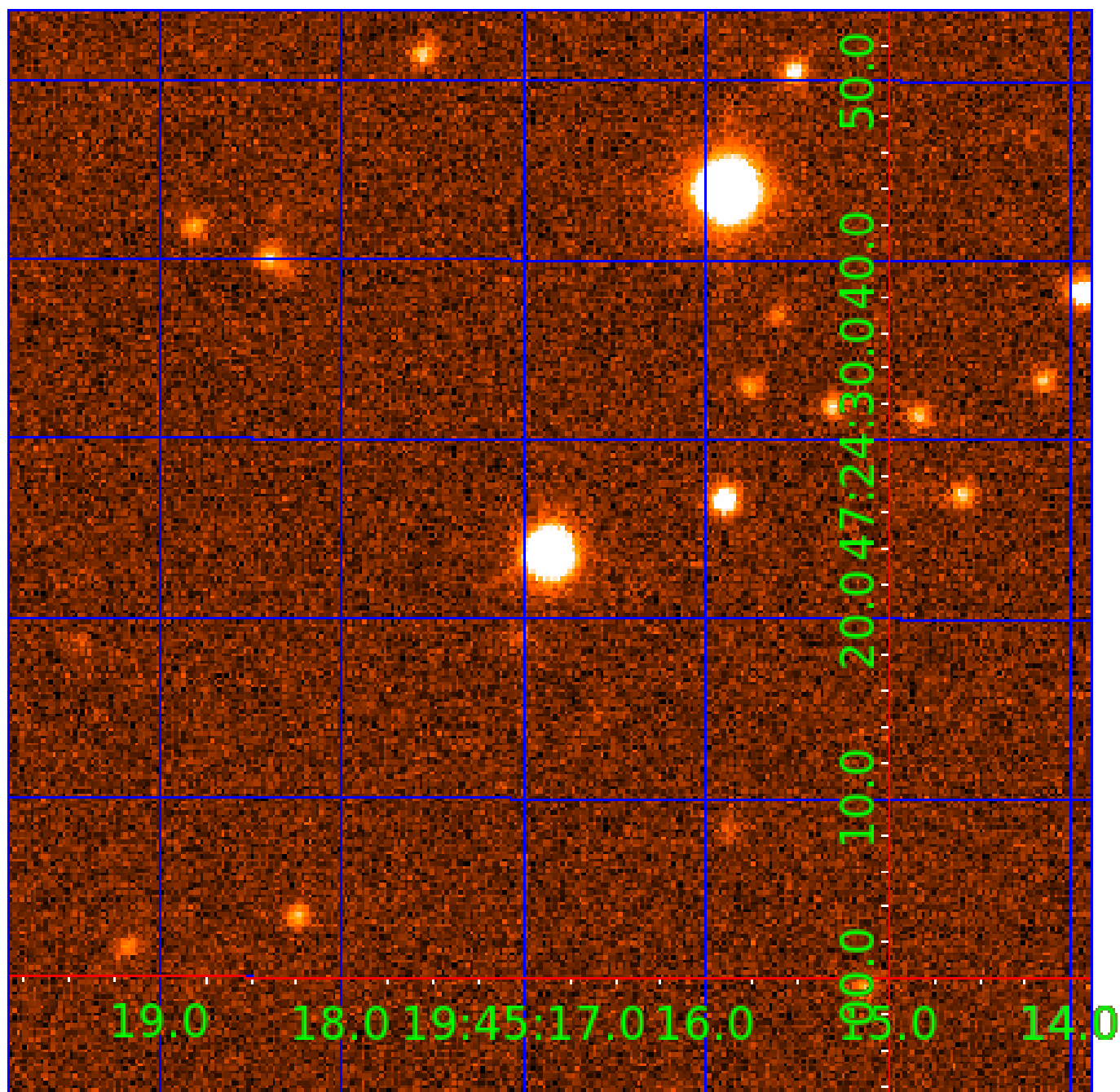


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010351767

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010351767-01	OBS	1153.01	1.270169	132.741374	25059.9	2.062	751.7	655.1	1.06	6340	22.03	2869.19
010351767-02	OBS	No	1.270138	132.110994	23938.8	1.500	1353.1	-1.0	1.06	6340	16.52	2869.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010351767-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010351767-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

**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.

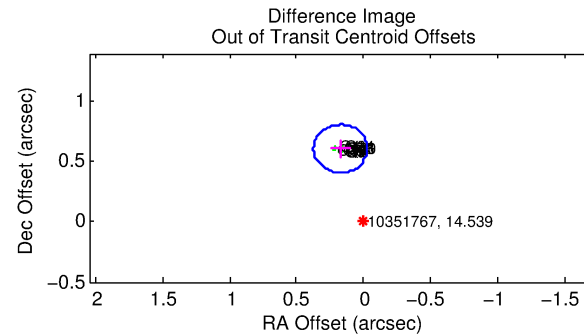
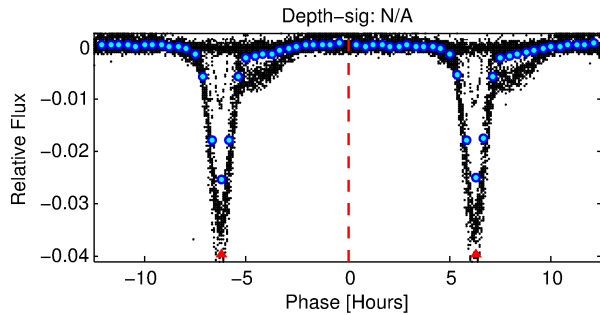
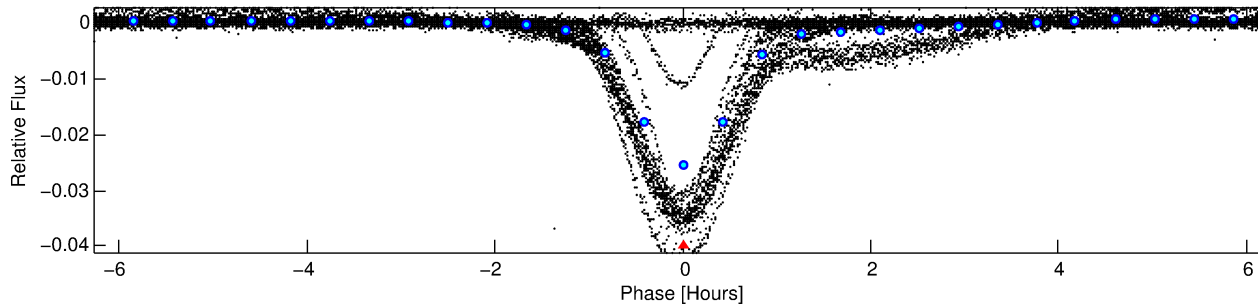
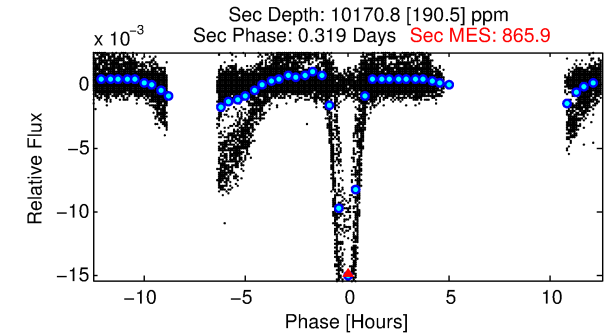
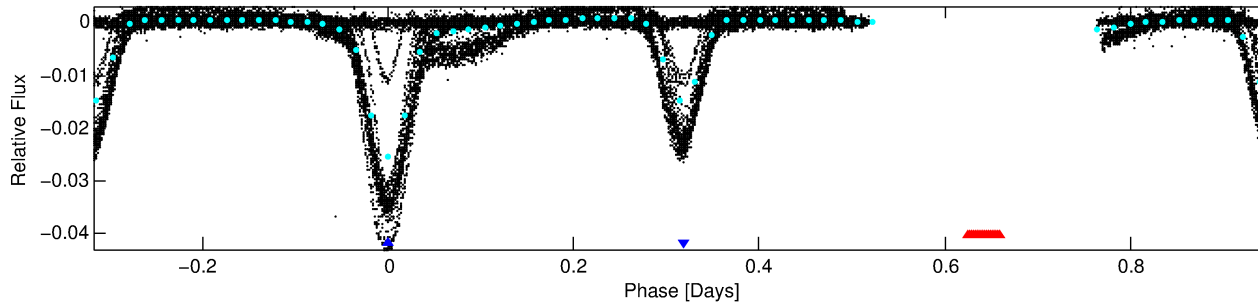
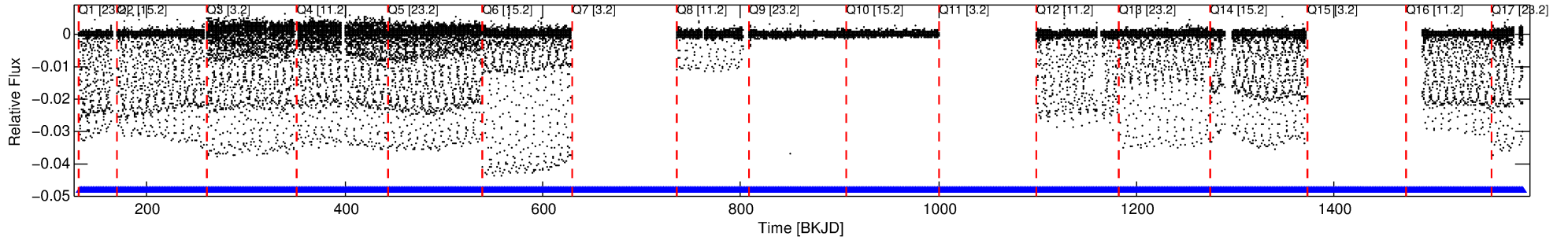
## Ephemeris Match Information For 010351767-02

No Significant Match Found

# DV One-Page Summary

KIC: 10351767 Candidate: 2 of 2 Period: 1.270 d  
KOI: K01153 Corr: No Ephemeris Match

Kp: 14.54 R\*: 1.06 Rs Teff: 6340.0 K Logg: 4.43 Fe/H: -0.180



## TPS TCE Results:

Period = 1.27014 d  
Epoch = 132.1110 BKJD

DV fit results are unavailable

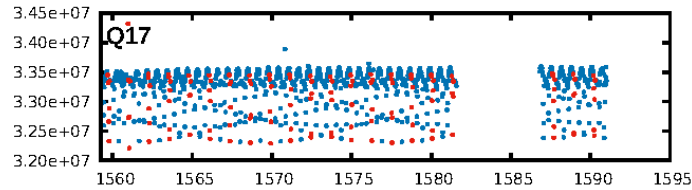
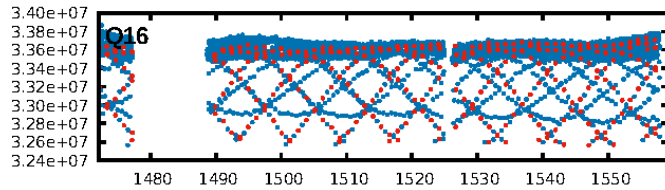
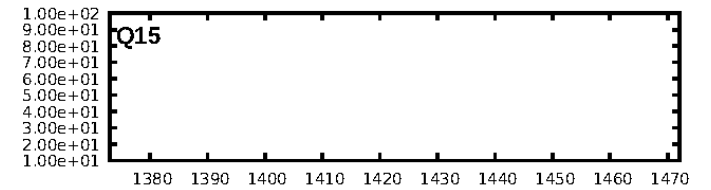
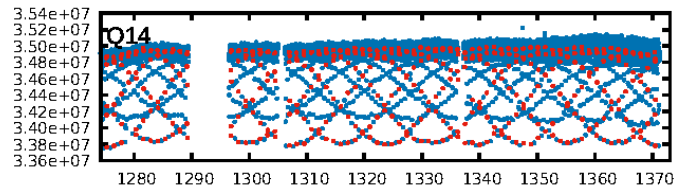
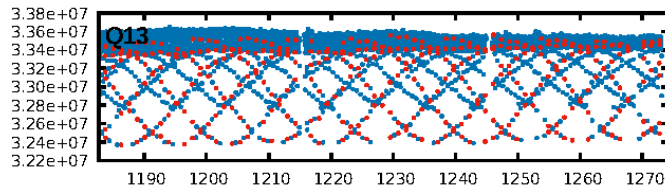
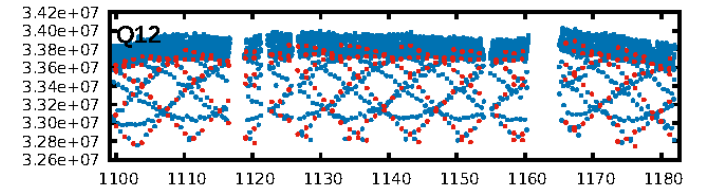
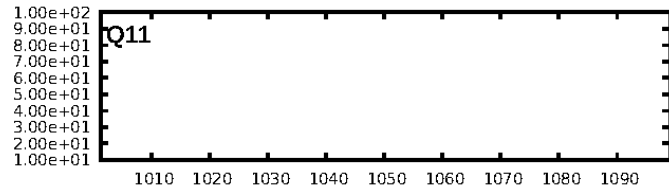
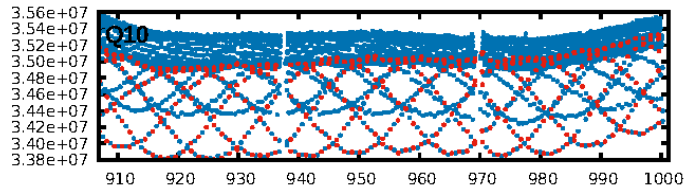
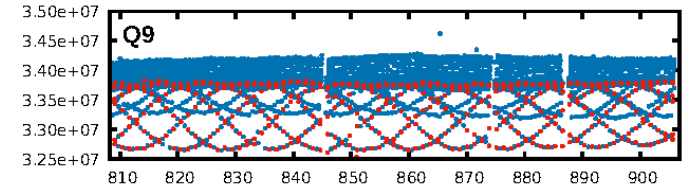
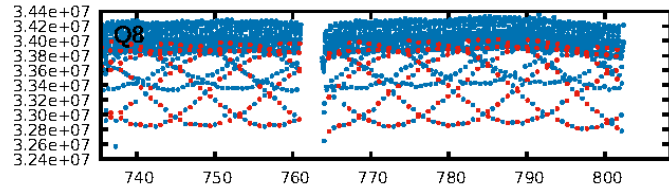
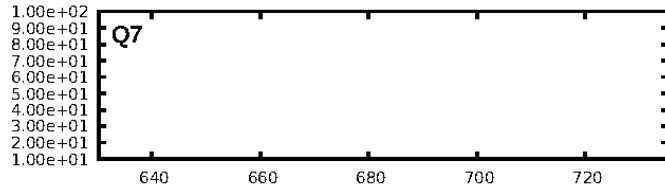
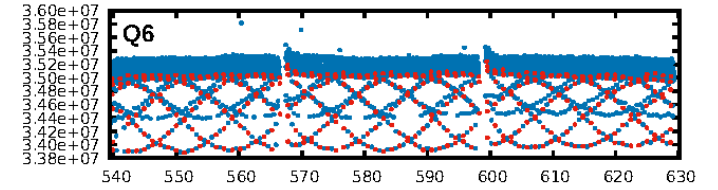
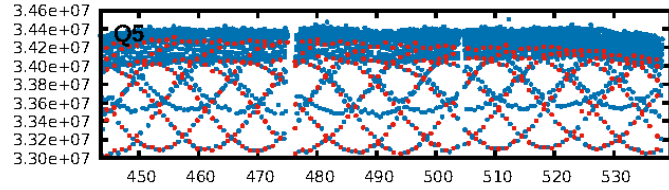
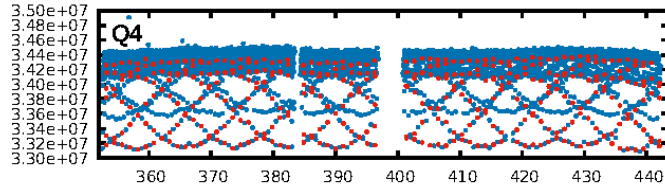
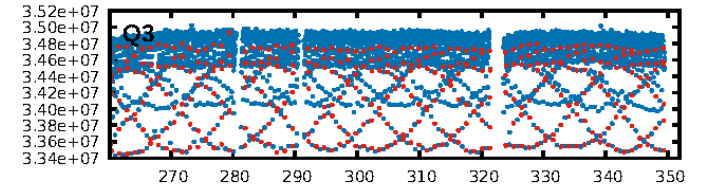
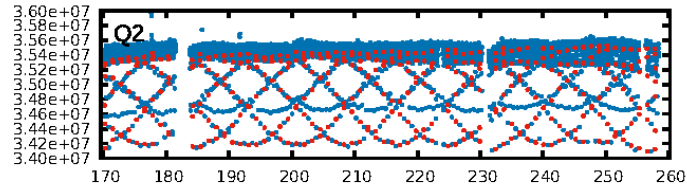
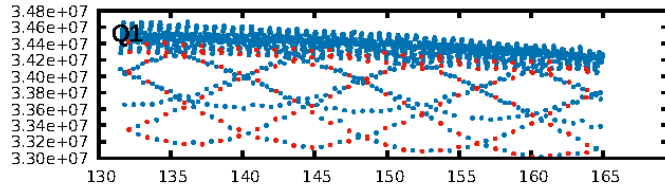
## DV Diagnostic Results:

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 [795/795]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 0.290 arcsec [96.93σ]  
OotOffset-rm: 0.633 arcsec [9.46σ]  
KicOffset-rm: 0.503 arcsec [7.42σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

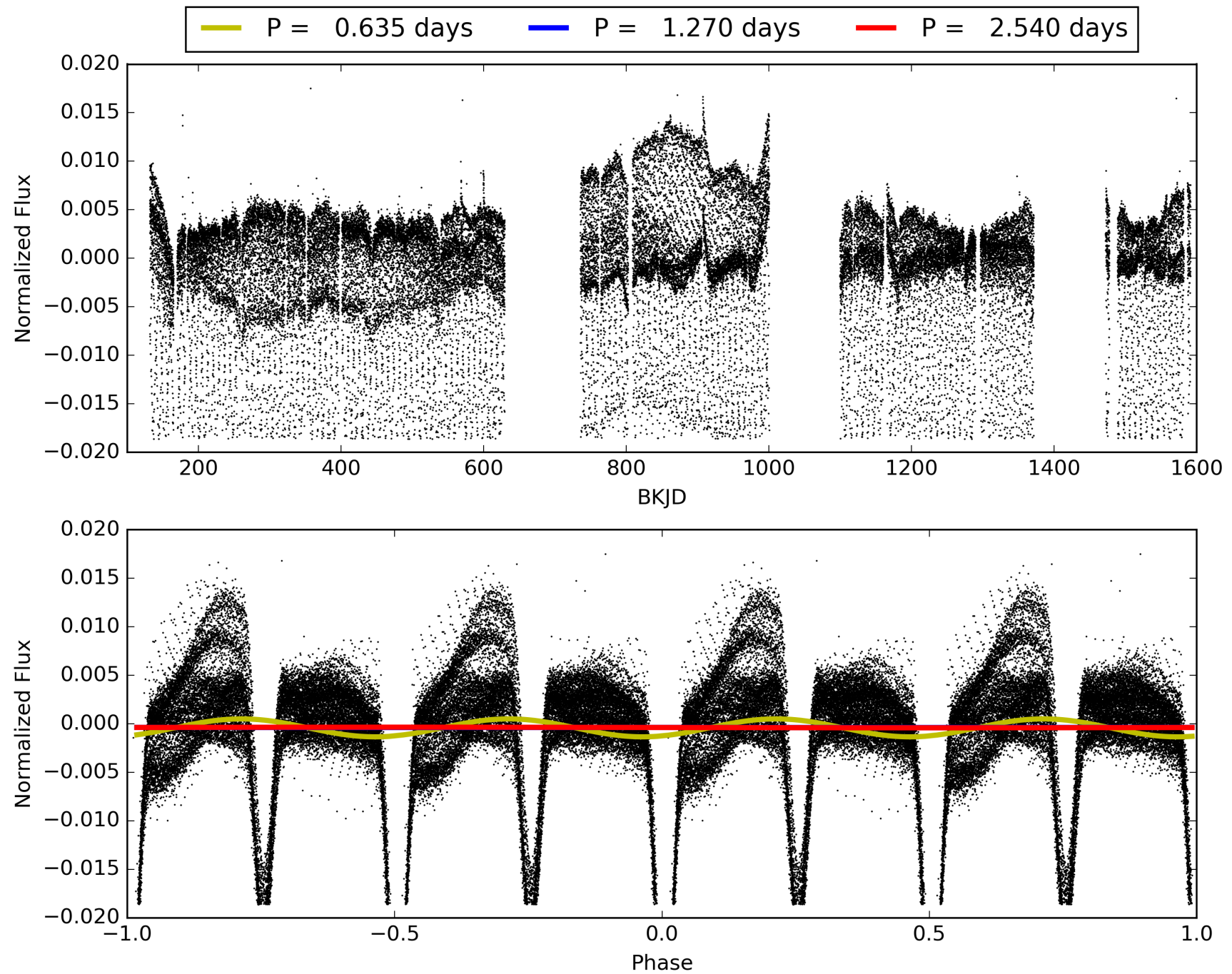
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:03:50 Z

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

## TCE 010351767-02, PDC Light Curves

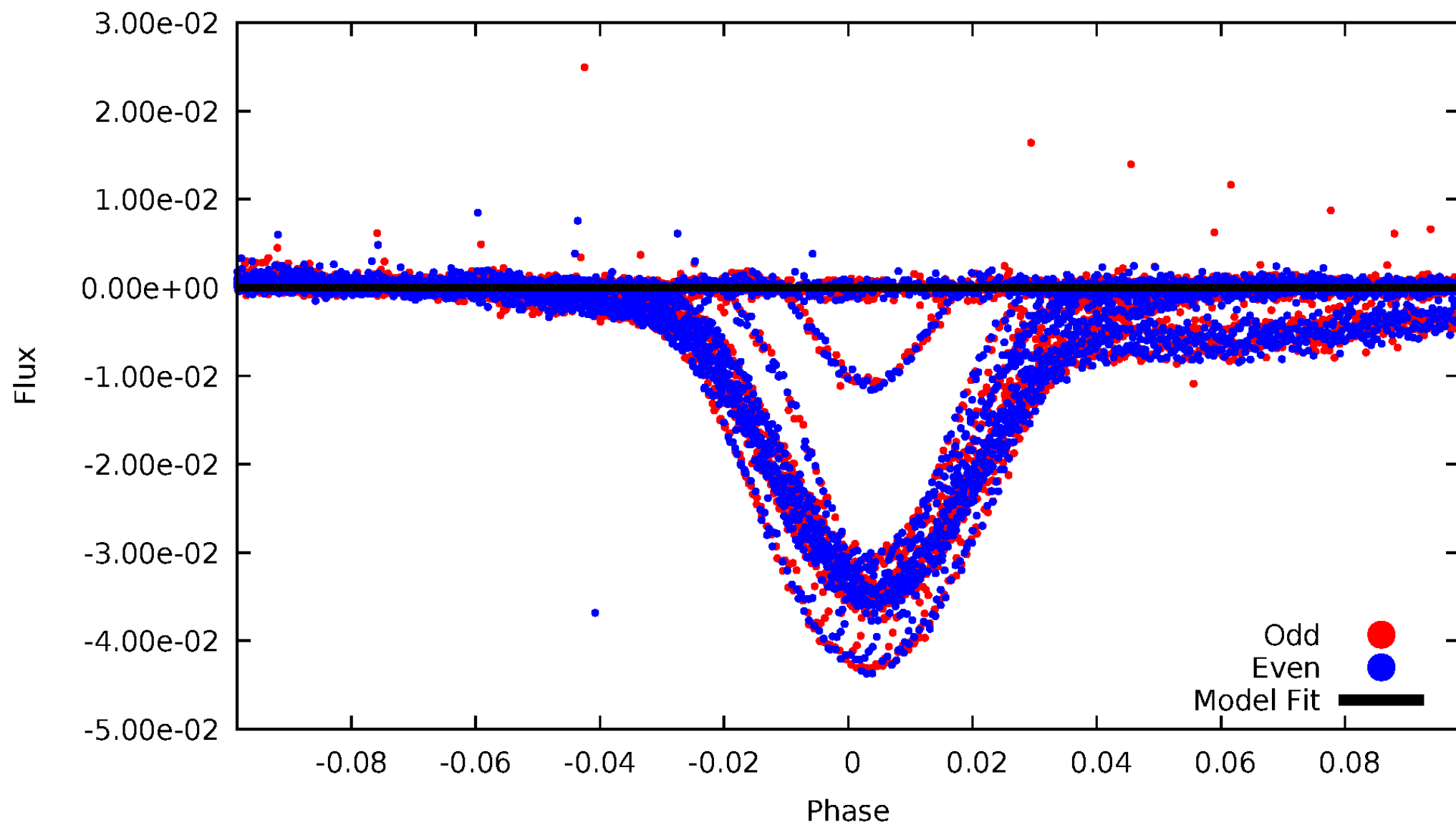


# TCE 010351767-02



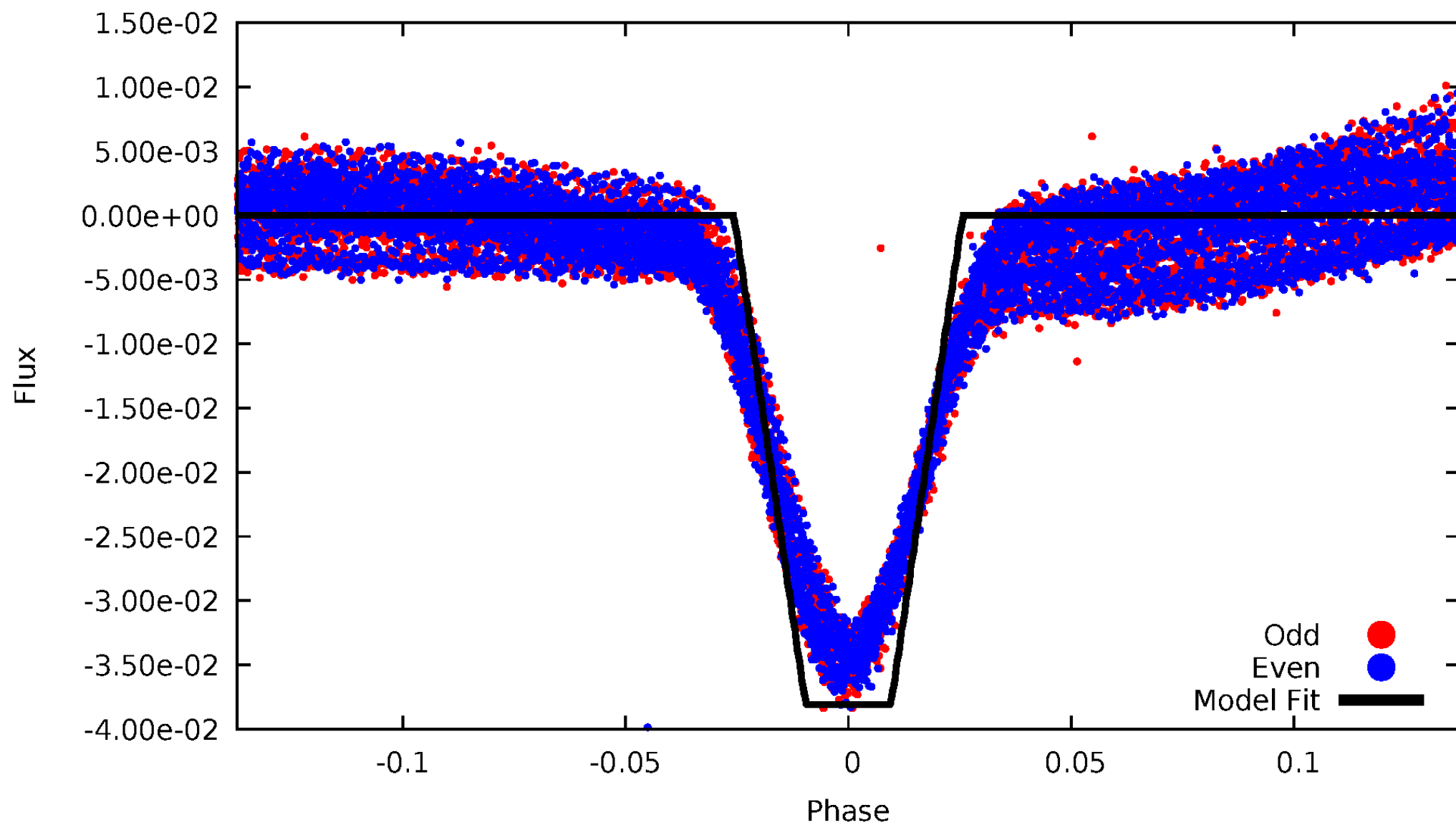
# DV Odd/Even

TCE 010351767-02



# ALT Odd/Even

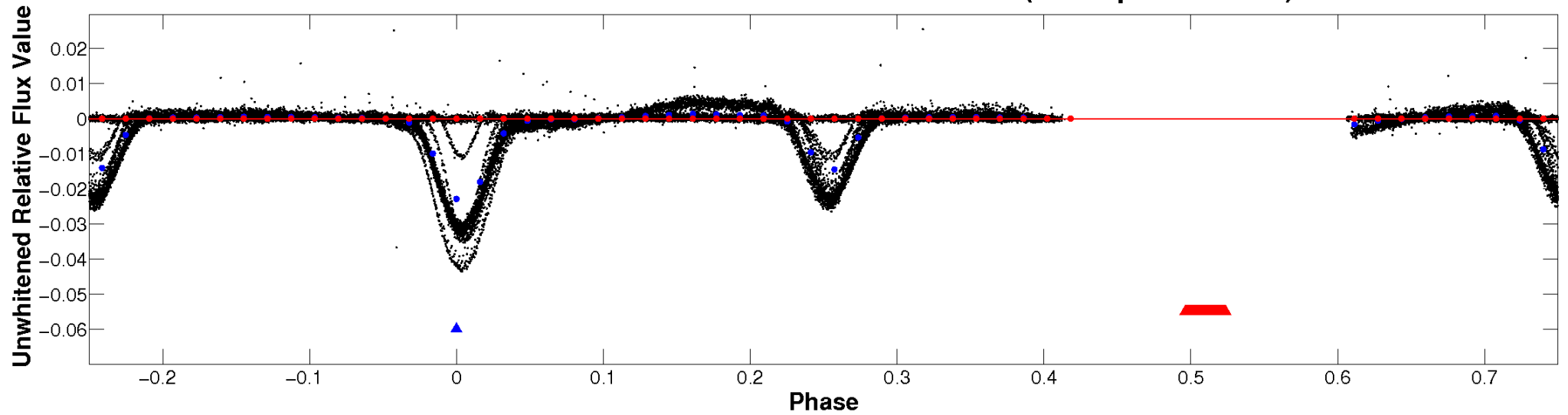
TCE 010351767-02



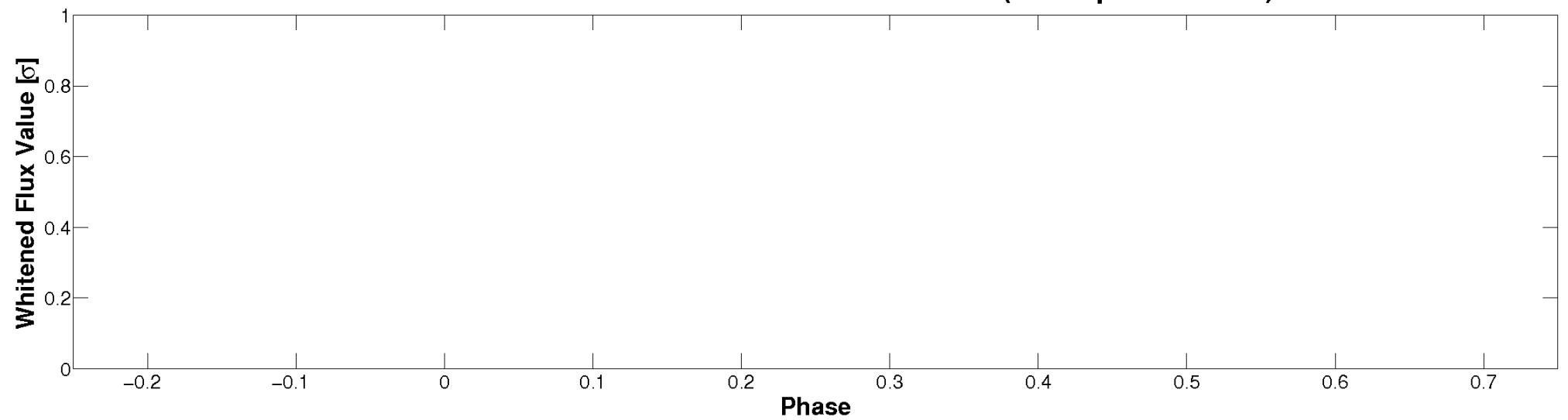


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

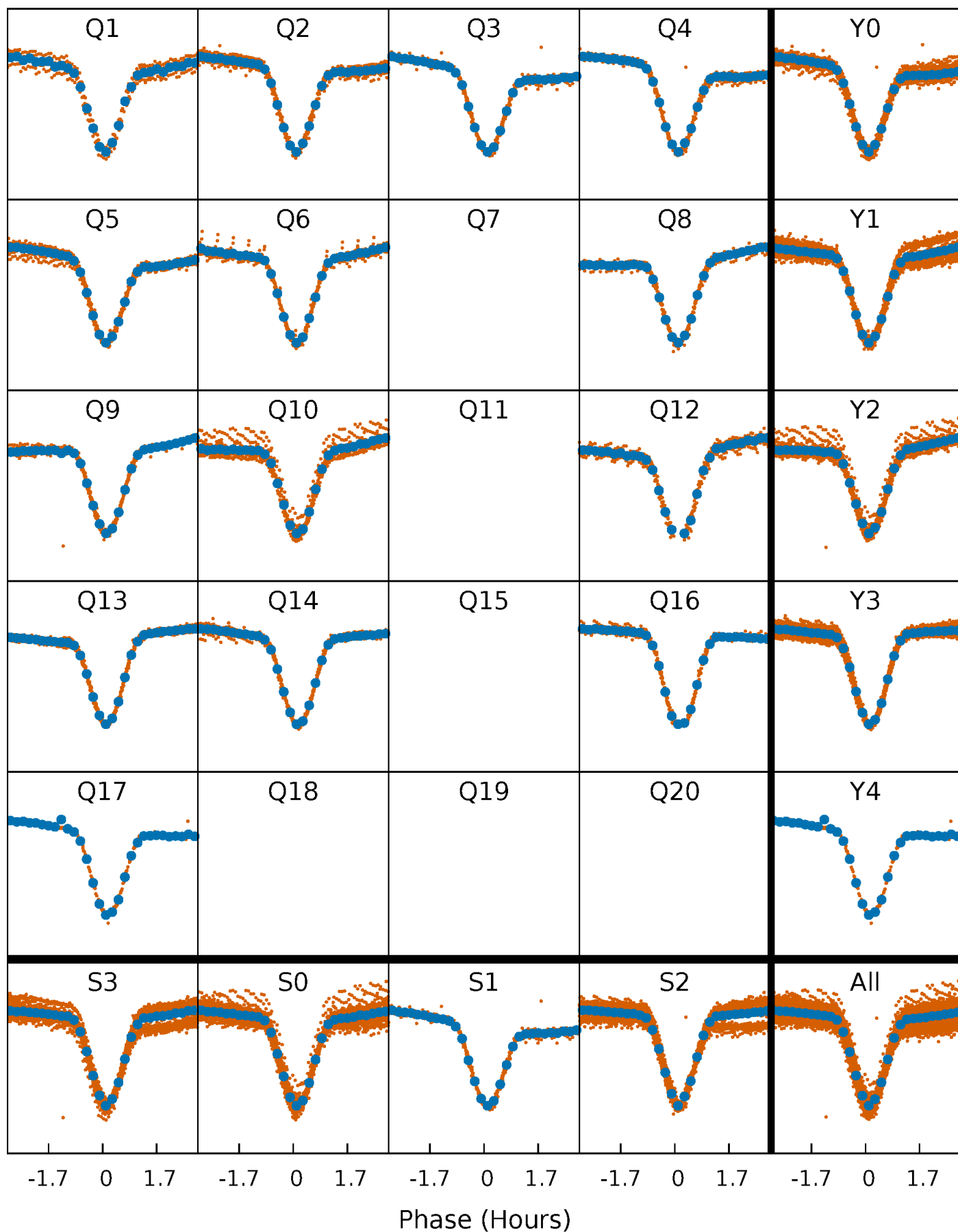


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



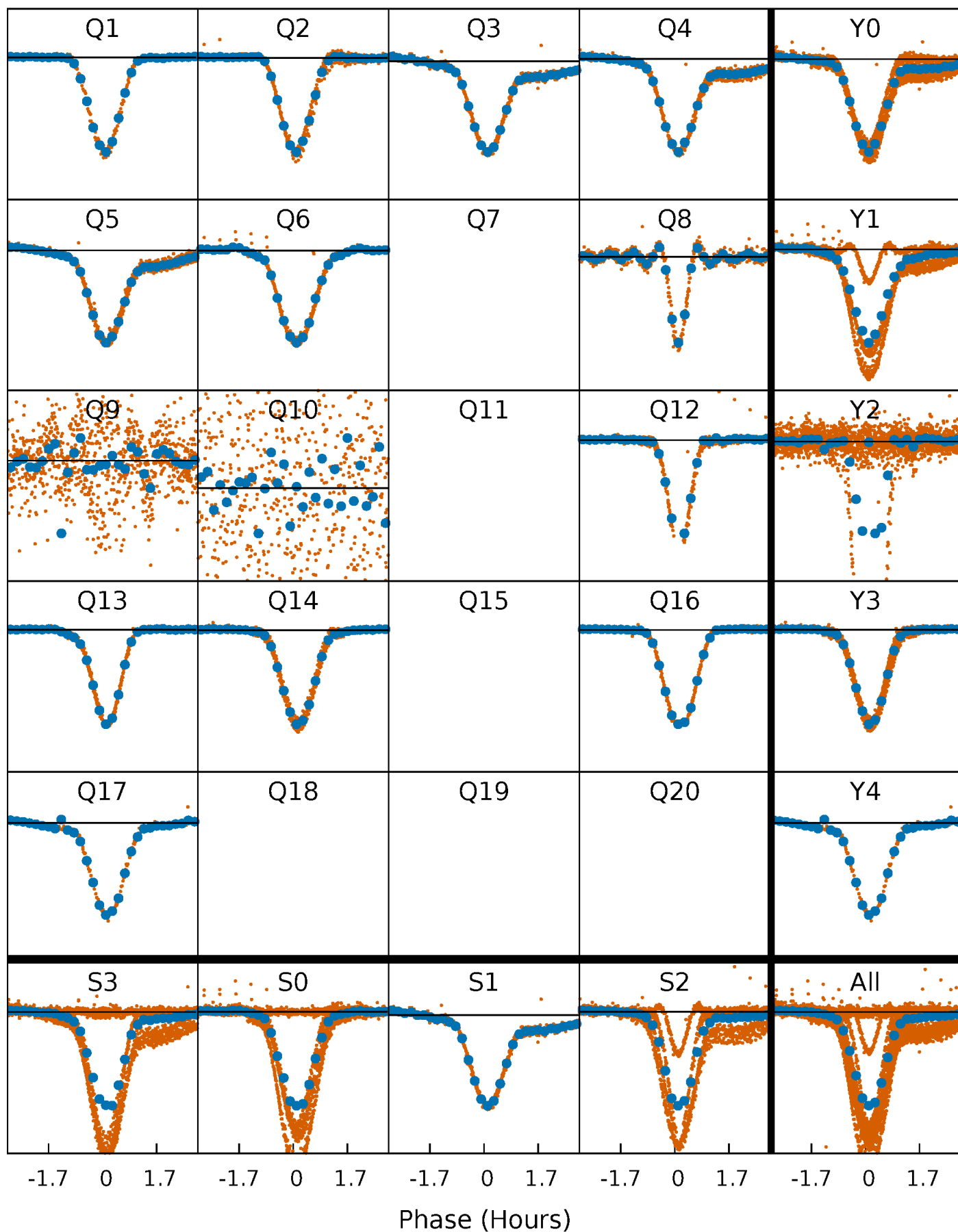
# PDC Quarter-Phased Transit Curves

TCE 010351767-02 P= 1.270138 Days  $T_0=132.110994$  (BKJD)



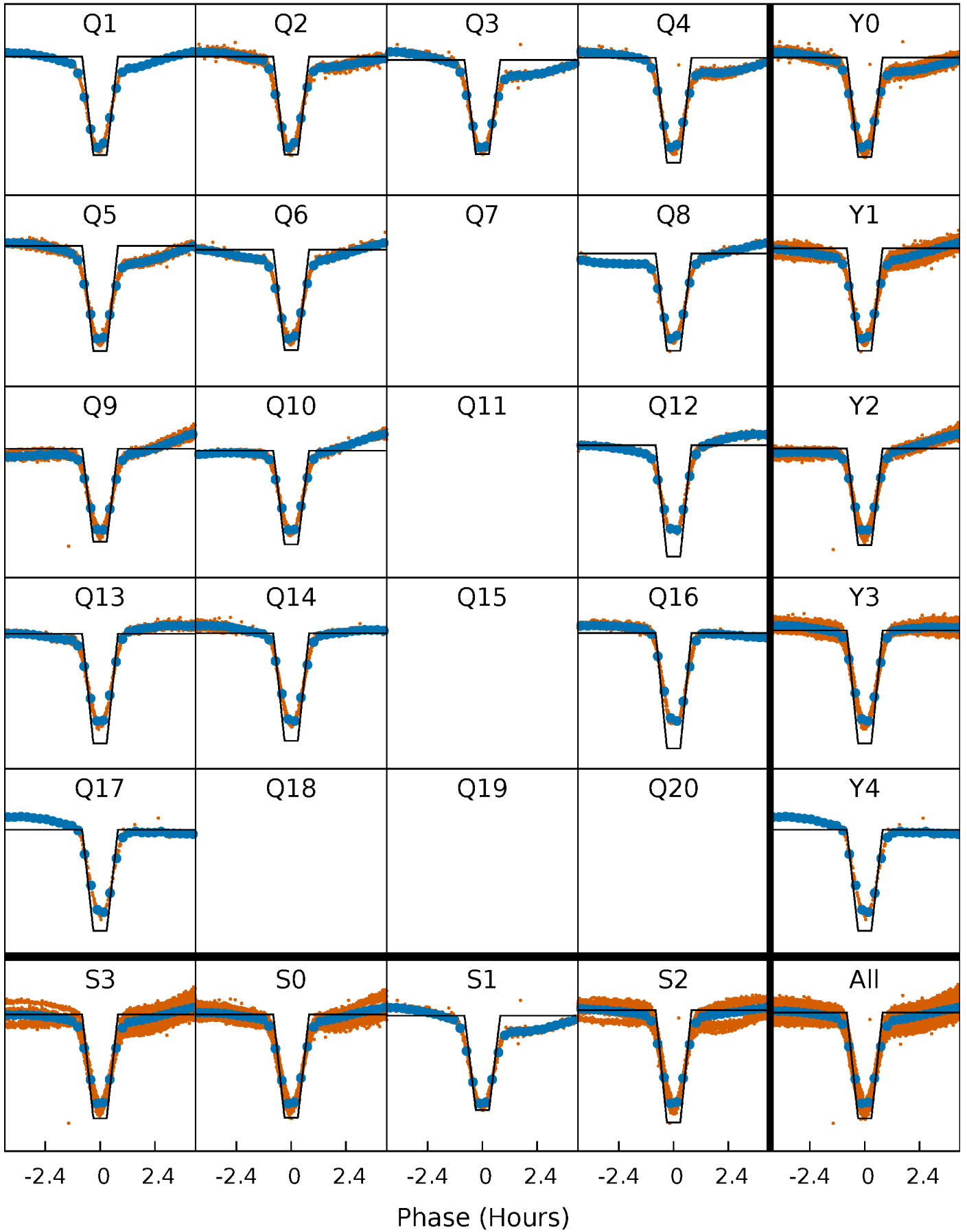
# DV Quarter-Phased Transit Curves

TCE 010351767-02 P= 1.270138 Days  $T_0=132.110994$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

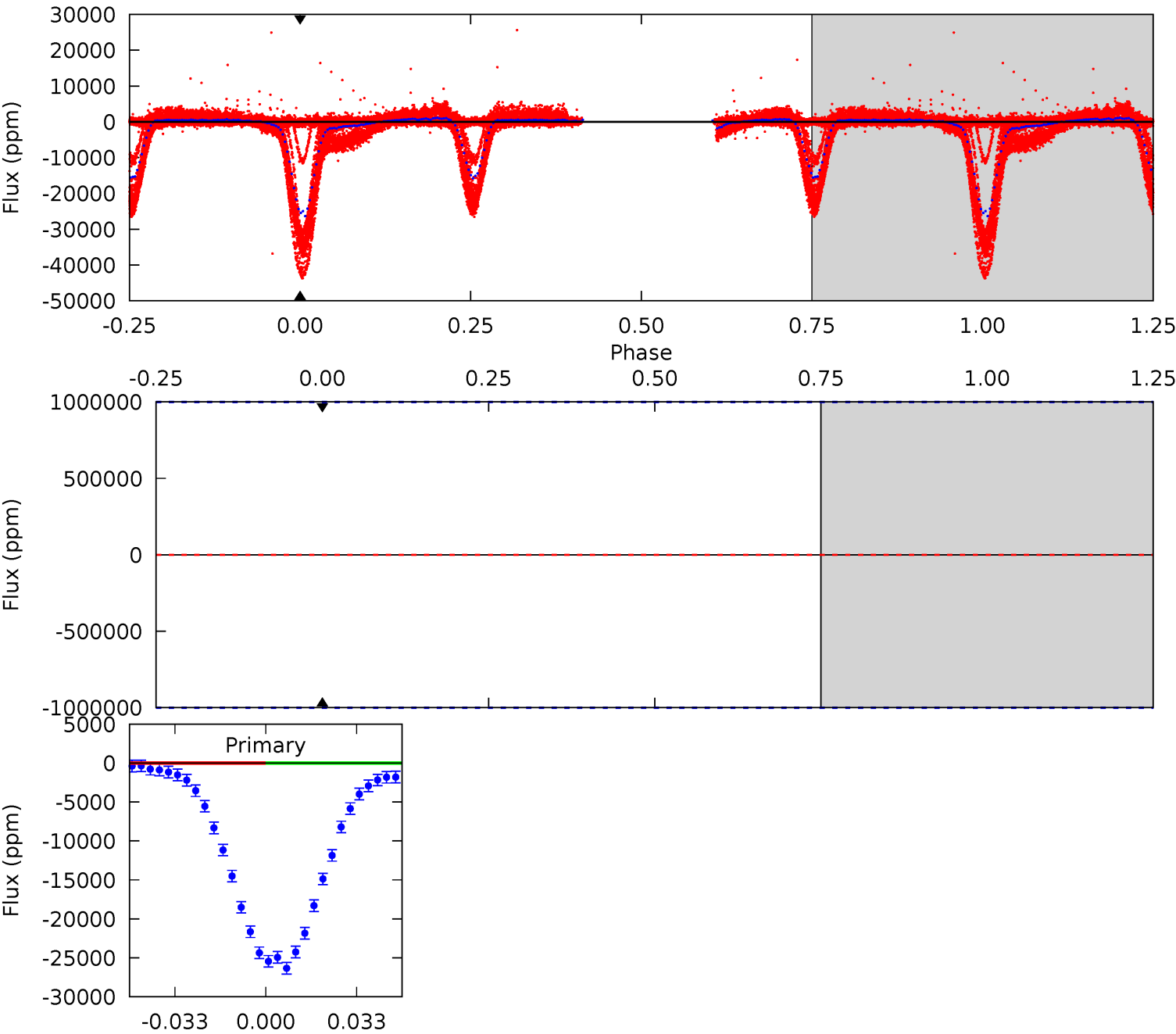
TCE 010351767-02     $P = 1.270138$  Days     $T_0 = 132.116394$  (BKJD)



# DV Model-Shift Uniqueness Test

010351767-02, P = 1.270138 Days, E = 130.840856 Days

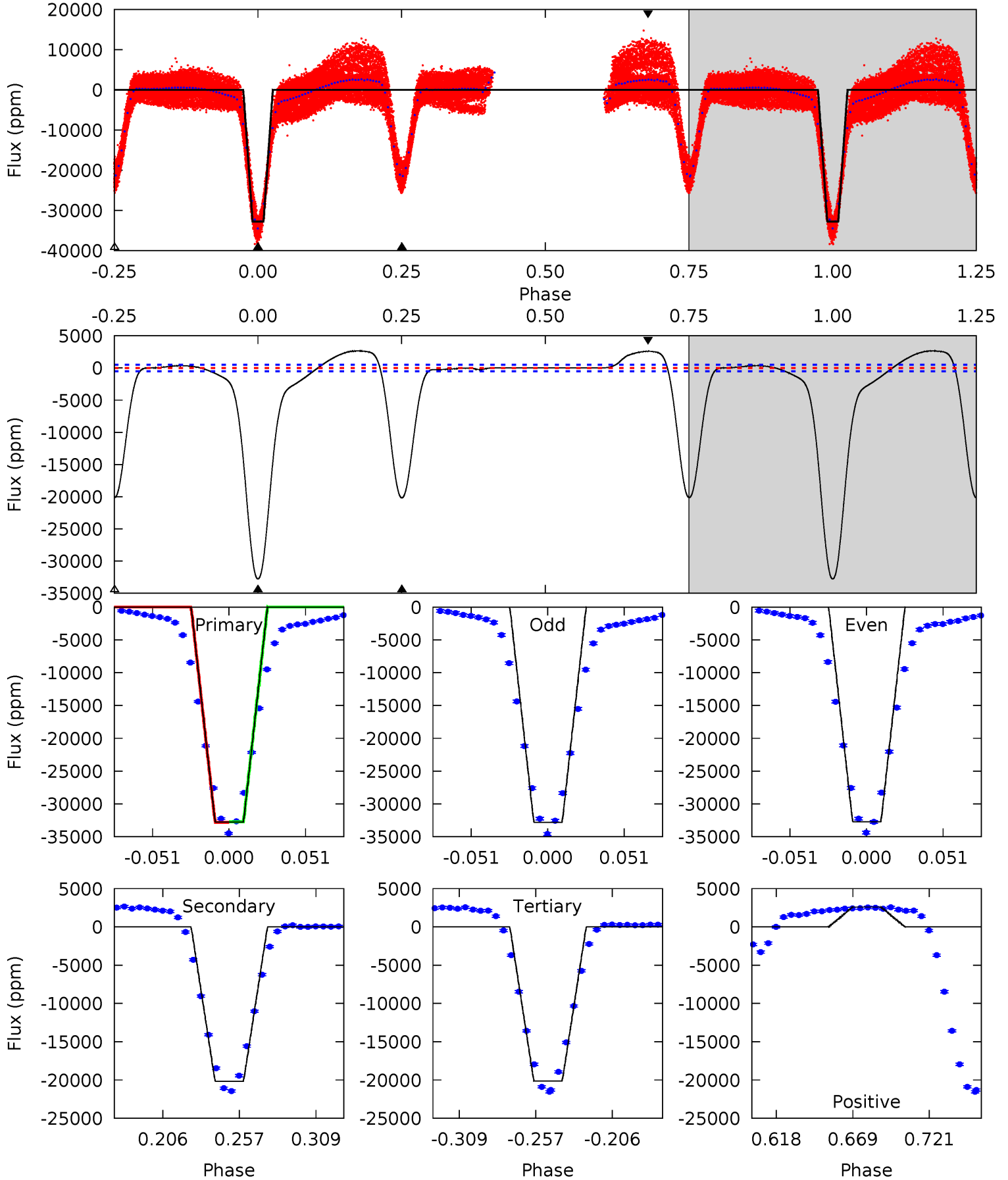
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010351767-02, P = 1.270138 Days, E = 130.846256 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
307.9	189.6	189.2	24.4	4.70	1.95	44.5	118.7	283.5	0.36	165.2	0.42	1.00	0.08	0.35





### Stellar Parameters For KIC 010351767

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6340^{+150}_{-206}$	$4.434^{+0.054}_{-0.216}$	$-0.180^{+0.250}_{-0.300}$	$1.058^{+0.335}_{-0.112}$	$1.106^{+0.158}_{-0.144}$	$1.316^{+0.372}_{-0.693}$
	+2%/-3%	+1%/-5%	+139%/-167%	+32%/-11%	+14%/-13%	+28%/-53%
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 010351767-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$18.56^{+12.45}_{-10.62}$	$2663^{+193}_{-137}$	$4638^{+7053}_{-15641}$	$4.652^{+141.355}_{-118.013}$
Alt.	$-20177 \pm 106$	$23.26^{+12.90}_{-10.64}$	$2673^{+204}_{-131}$	$5431^{+2118}_{-865}$	$12^{+26}_{-7}$

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

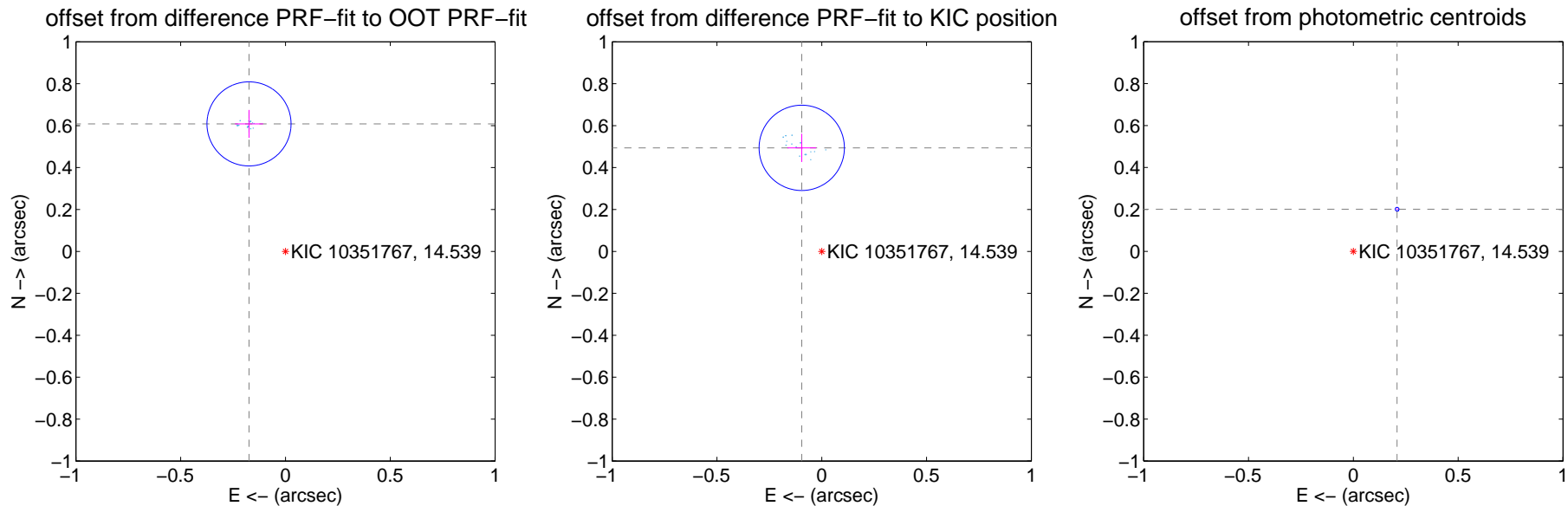
## DV Centroid Data

Supplemental centroid analysis for 010351767-02. Kepler magnitude: 14.54. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

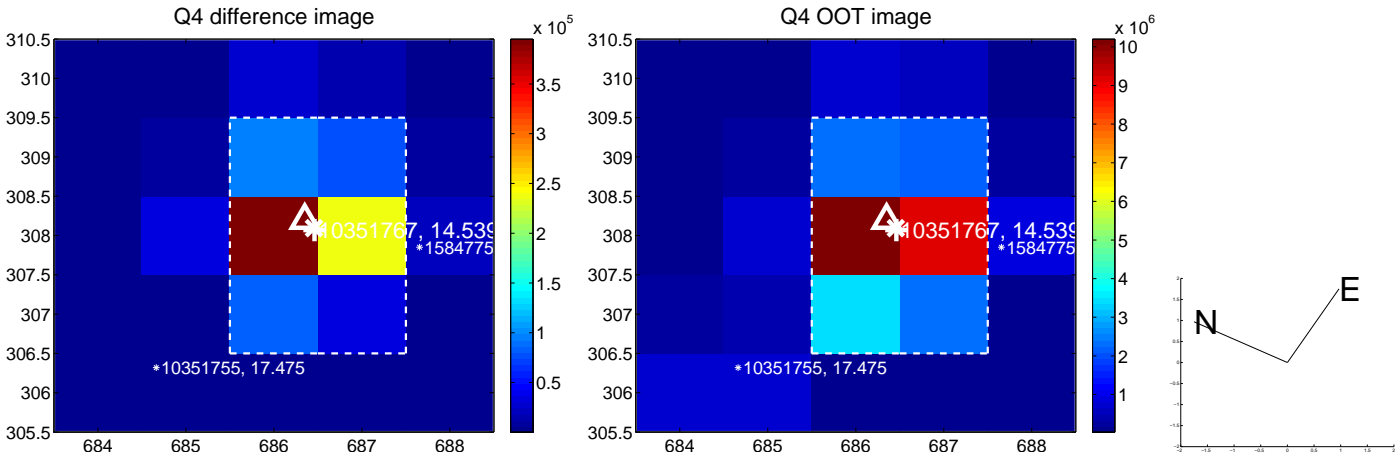
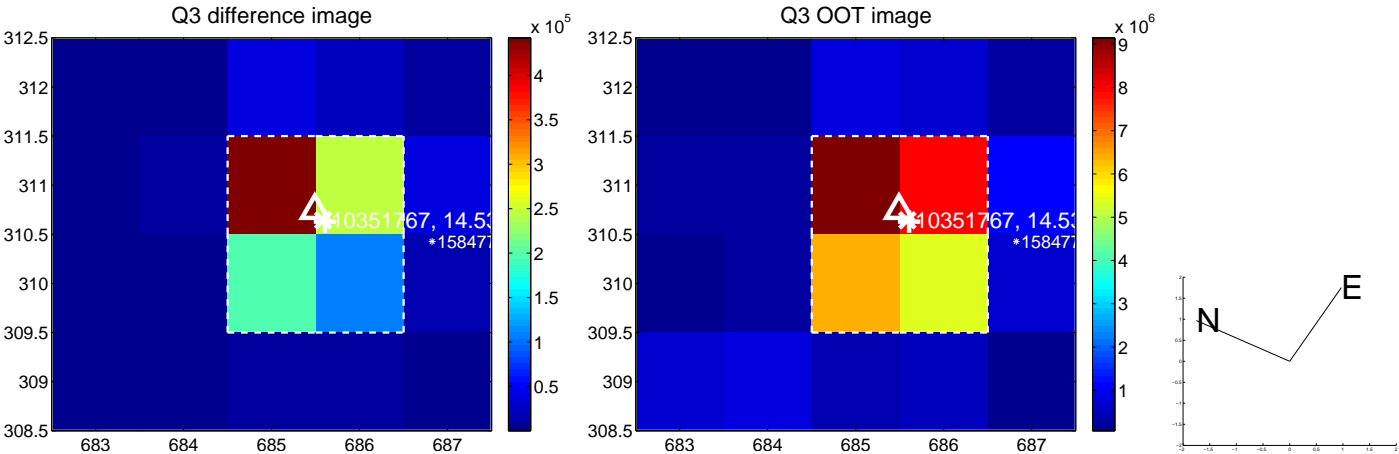
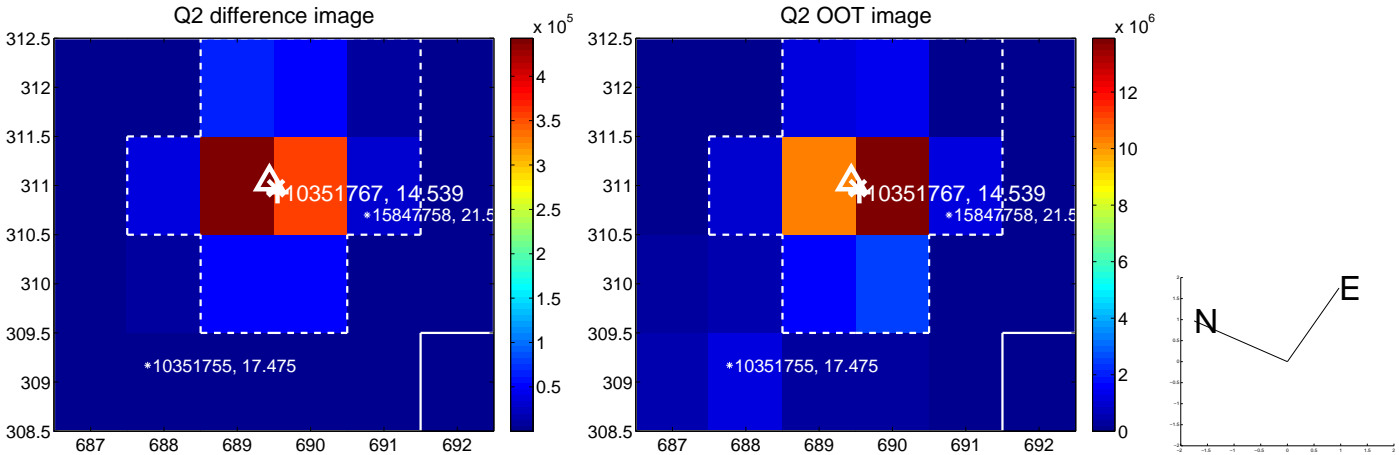
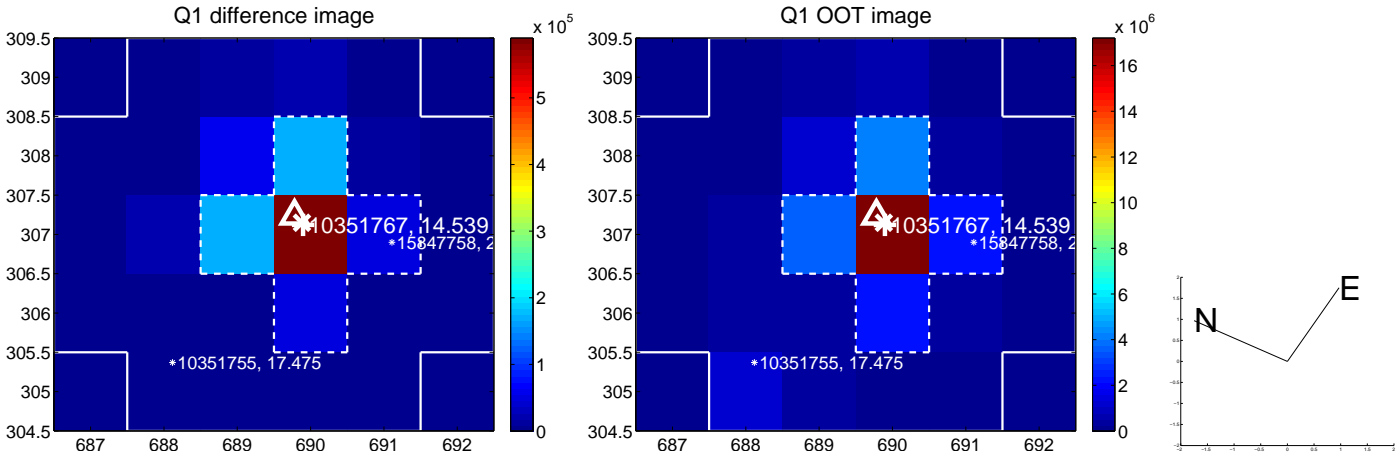
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>0.633 <math>\pm</math> 0.067</b>	<b>9.46</b>	0.174 $\pm$ 0.067	0.608 $\pm$ 0.067
PRF-fit source offset from KIC position	<b>0.503 <math>\pm</math> 0.068</b>	<b>7.42</b>	0.095 $\pm$ 0.069	0.494 $\pm$ 0.067
photometric centroid source offset	<b>0.29 <math>\pm</math> 0.00</b>	<b>96.93</b>	-0.21 $\pm$ 0.00	0.20 $\pm$ 0.00

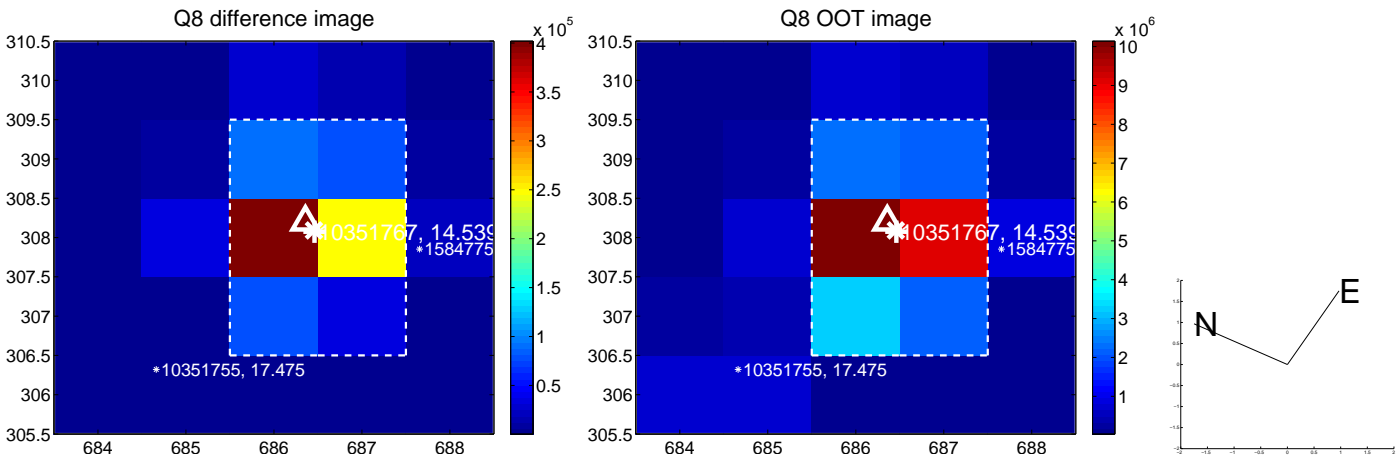
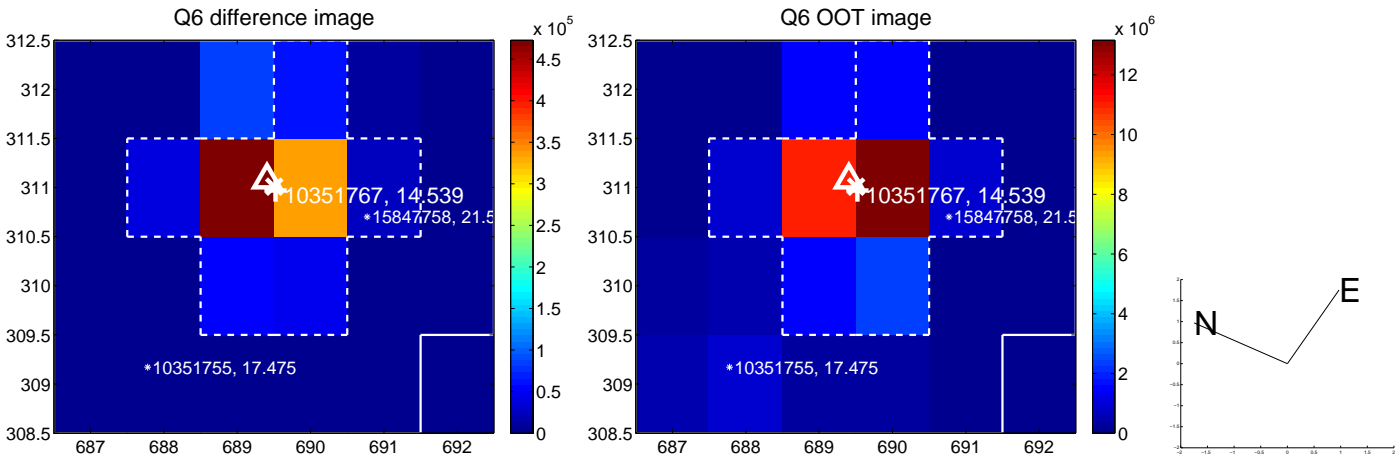
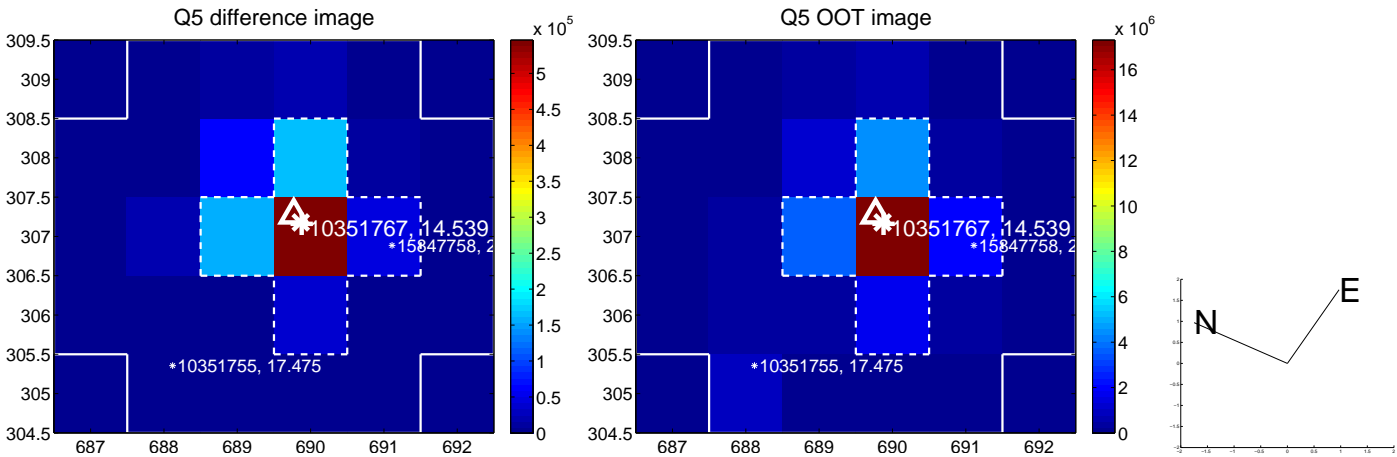


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

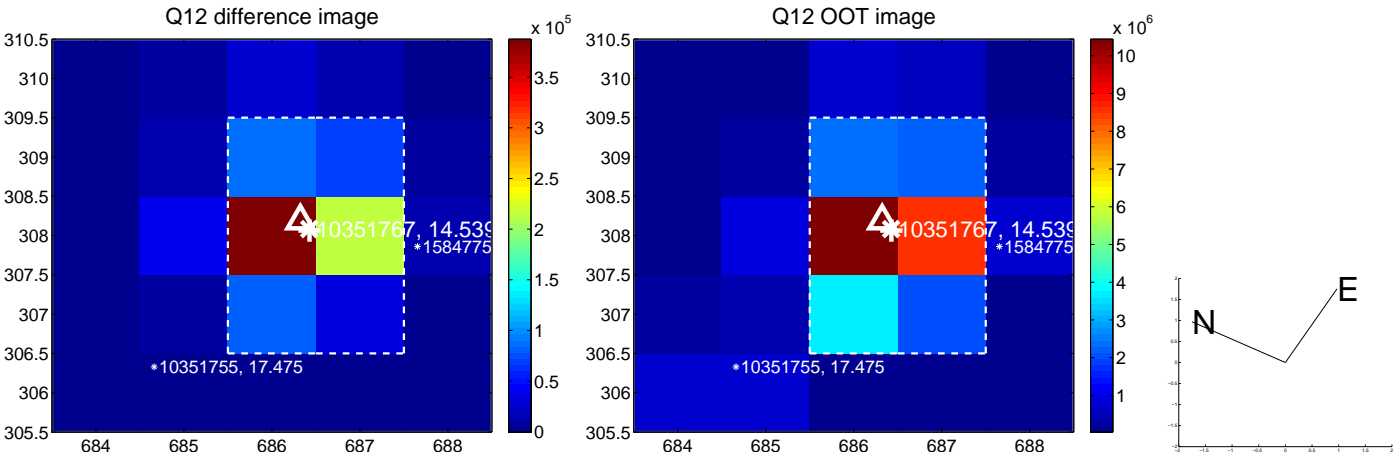
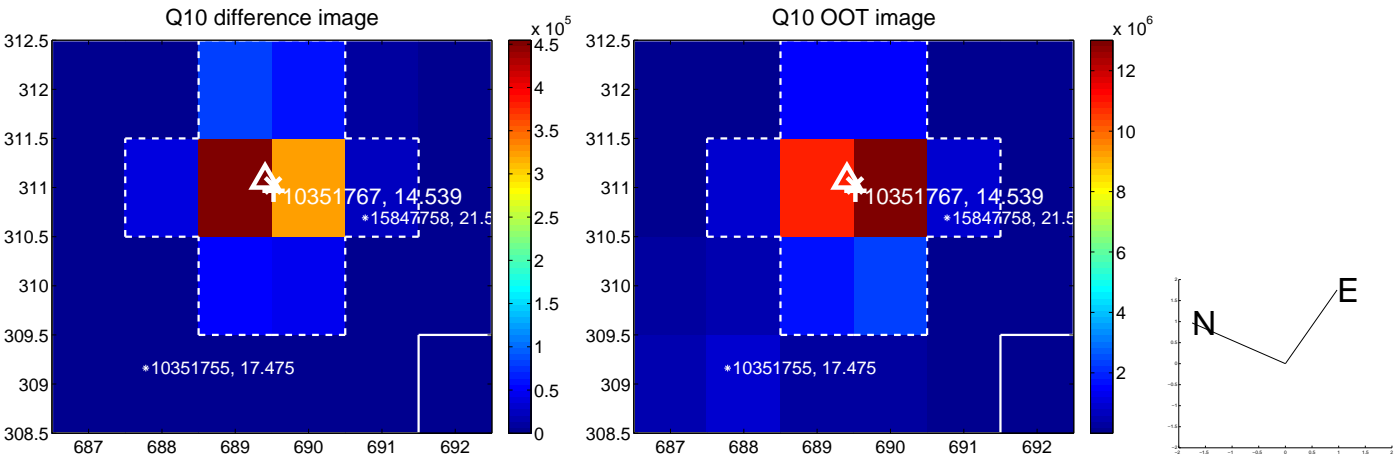
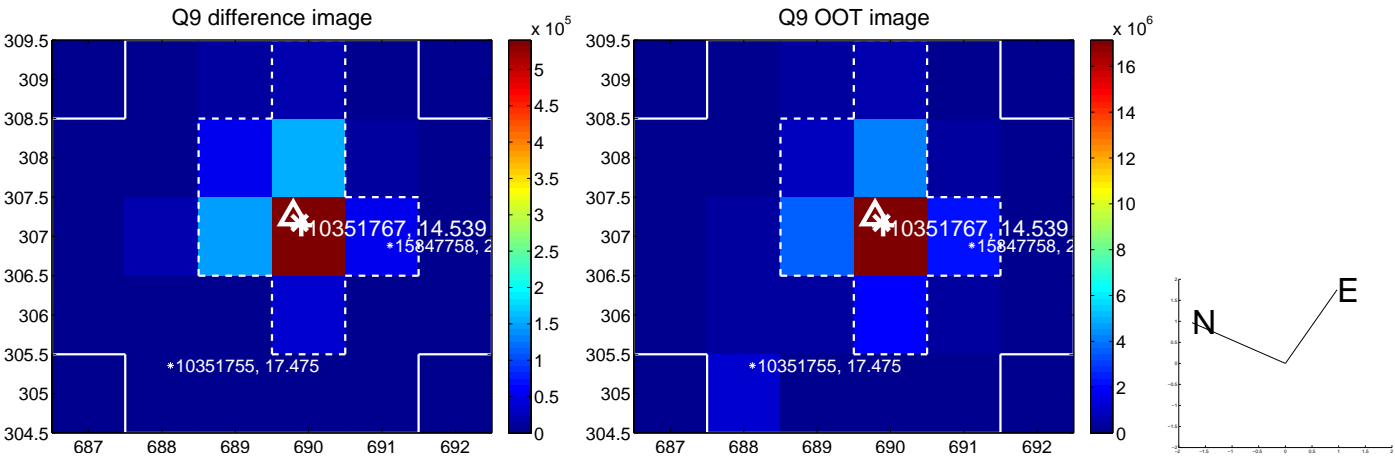
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



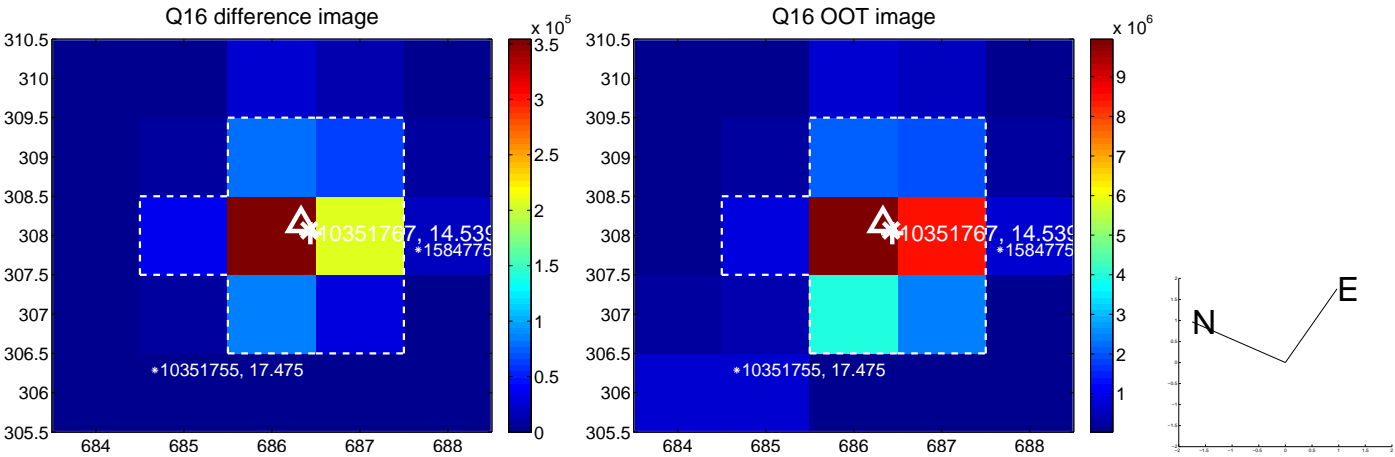
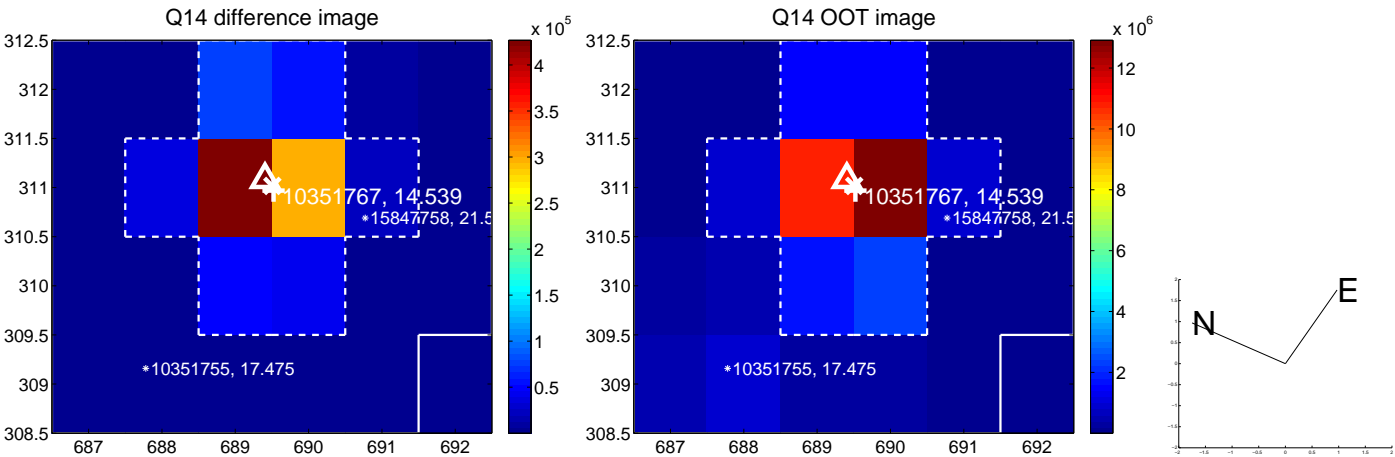
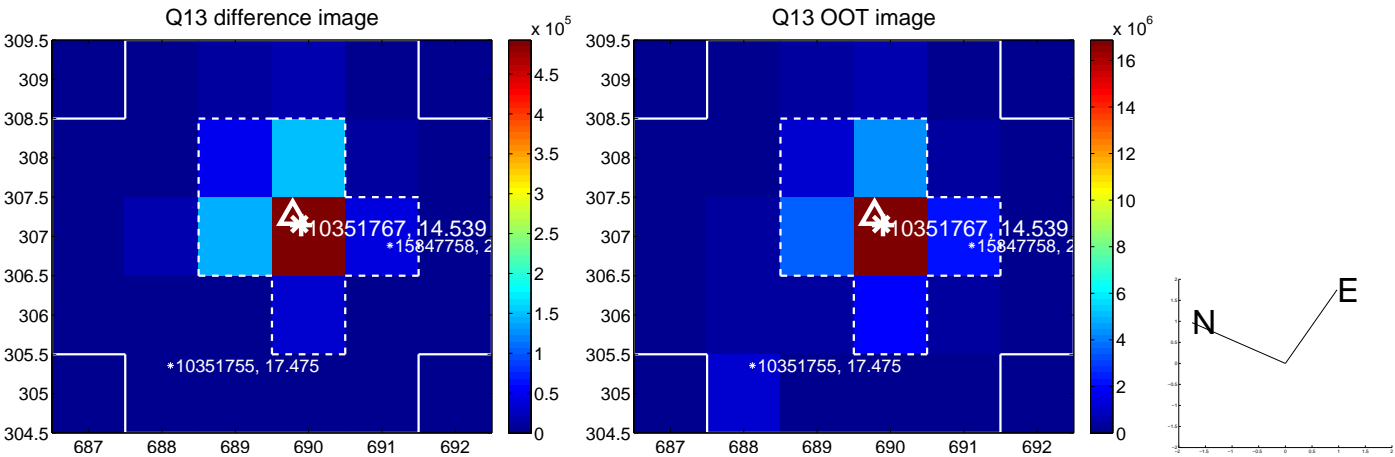
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



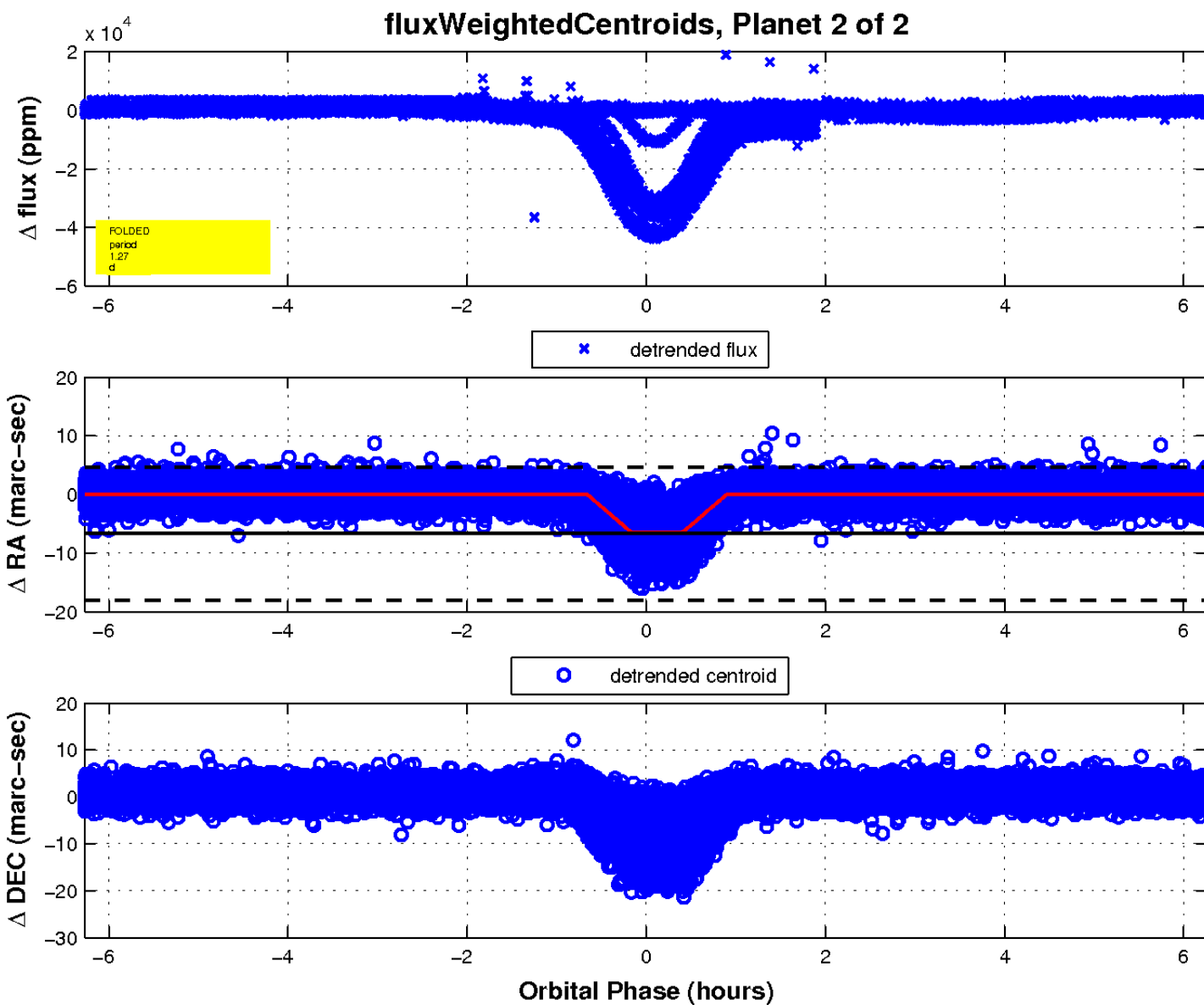
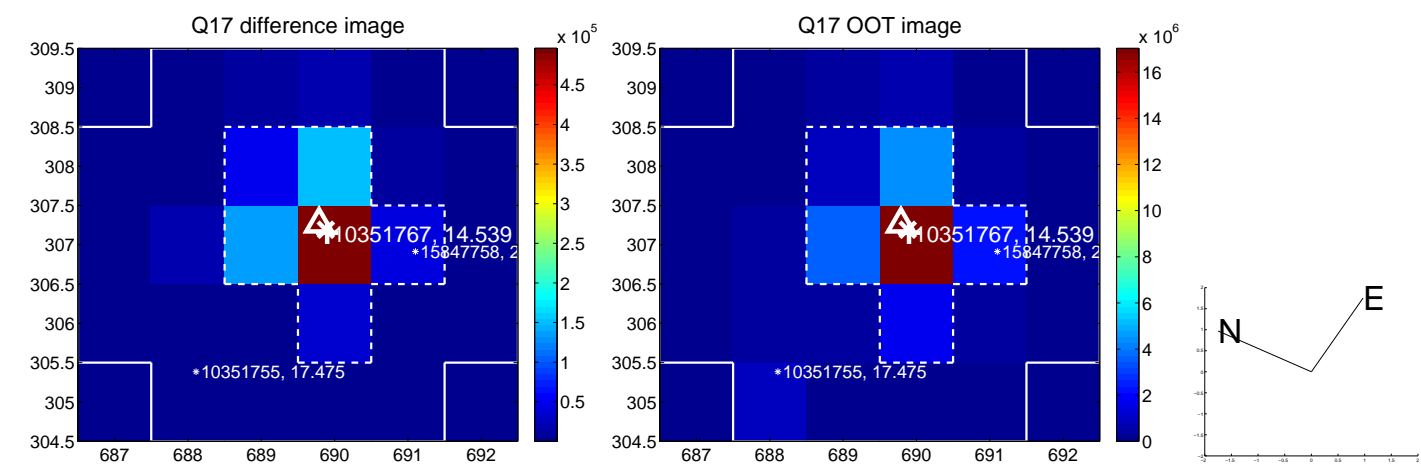
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

