

# KIC 010259029

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010259029-01	OBS	3630.01	7.061154	134.557816	130147.6	3.384	1151.7	841.6	0.80	5585	41.87	119.08
010259029-02	OBS	No	7.061104	131.639097	16073.7	3.224	151.5	142.9	0.80	5585	13.15	119.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010259029-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_KIC_POS
010259029-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

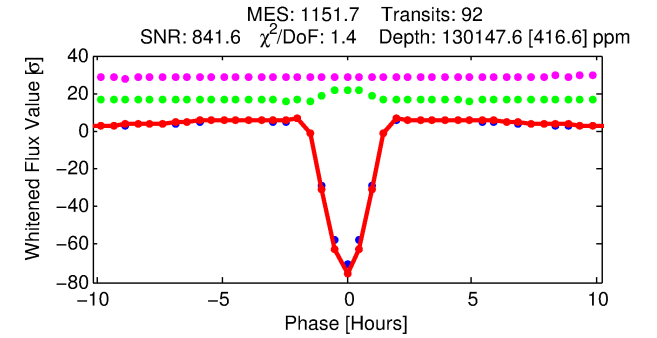
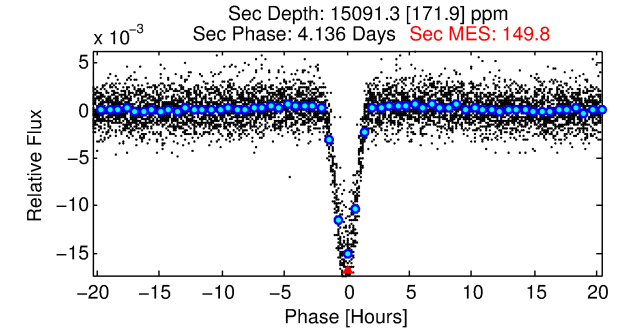
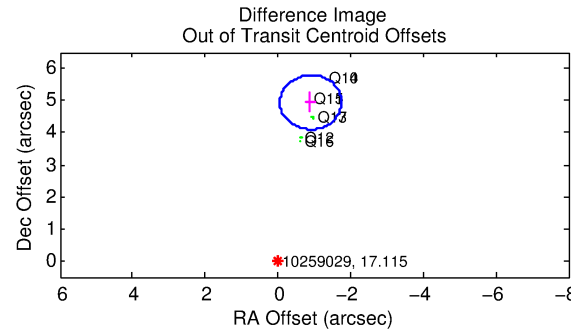
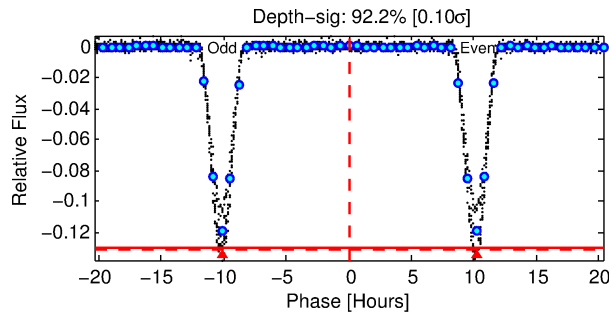
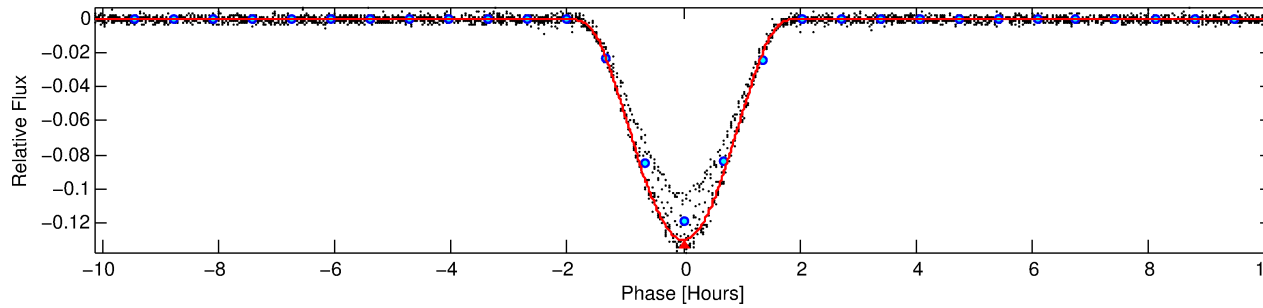
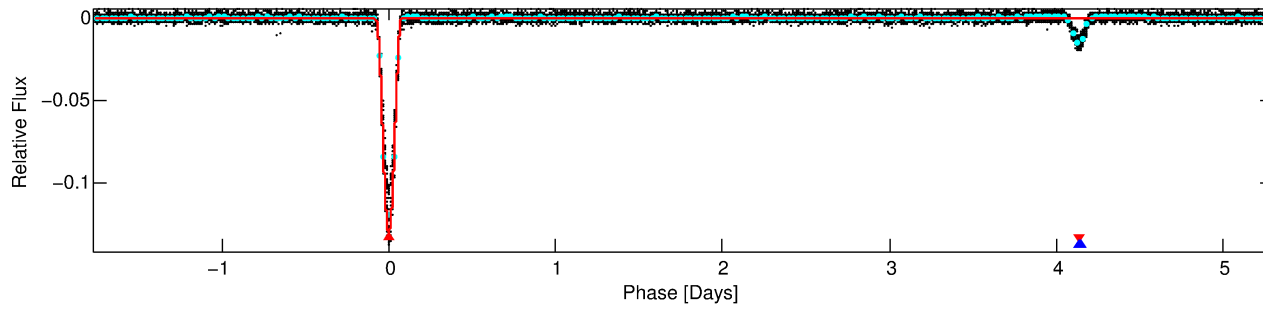
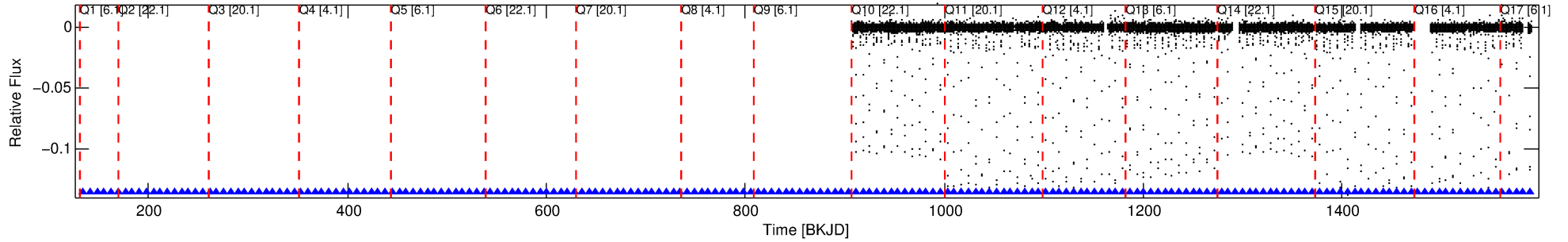
## Ephemeris Match Information For 010259029-01

No Significant Match Found

# DV One-Page Summary

KIC: 10259029 Candidate: 1 of 2 Period: 7.061 d  
KOI: K03630.01 Corr: 0.996

Kp: 17.11 R\*: 0.80 Rs Teff: 5585.0 K Logg: 4.56 Fe/H: -0.280



## DV Fit Results:

Period = 7.06115 [0.00000] d  
Epoch = 134.5578 [0.0002] BKJD  
Rp/R\* = 0.4809 [0.1367]  
a/R\* = 18.95 [0.36]  
b = 0.89 [0.20]  
Seff = 119.08 [36.99]  
Teq = 842 [65] K  
Rp = 41.87 [15.60] Re  
a = 0.0683 [0.0135] AU  
Ag = 22.08 [14.00] [1.51σ]  
Teffp = 2823 [412] K [4.75σ]

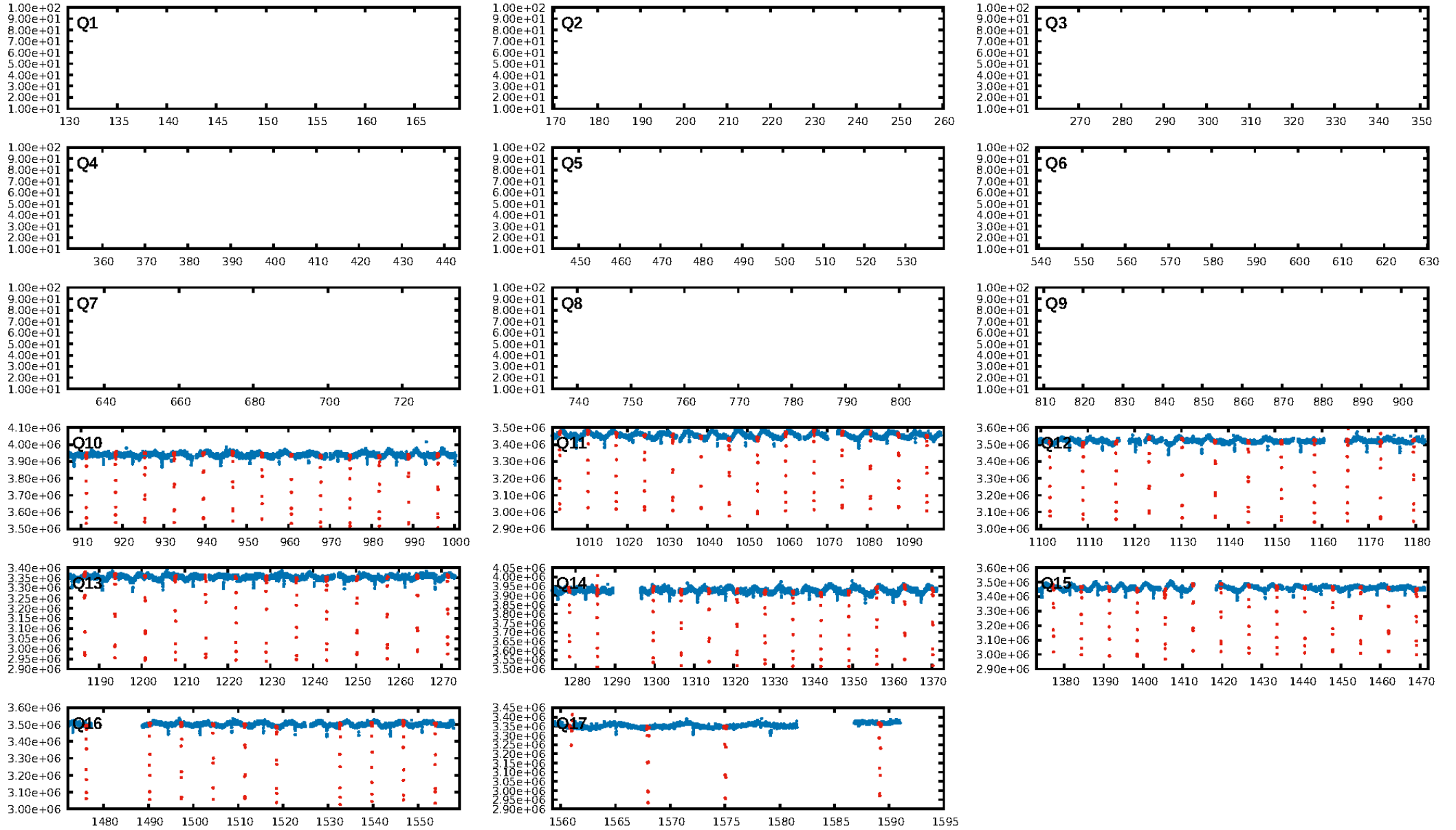
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [88/88]  
GhostDiagnostic-chr: 1.369  
Centroid-sig: 0.0%  
Centroid-so: 2.698 arcsec [578.45σ]  
OotOffset-rm: 5.024 arcsec [17.84σ]  
KicOffset-rm: 0.549 arcsec [7.95σ]  
OotOffset-st: 2/2/2/2 [8]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

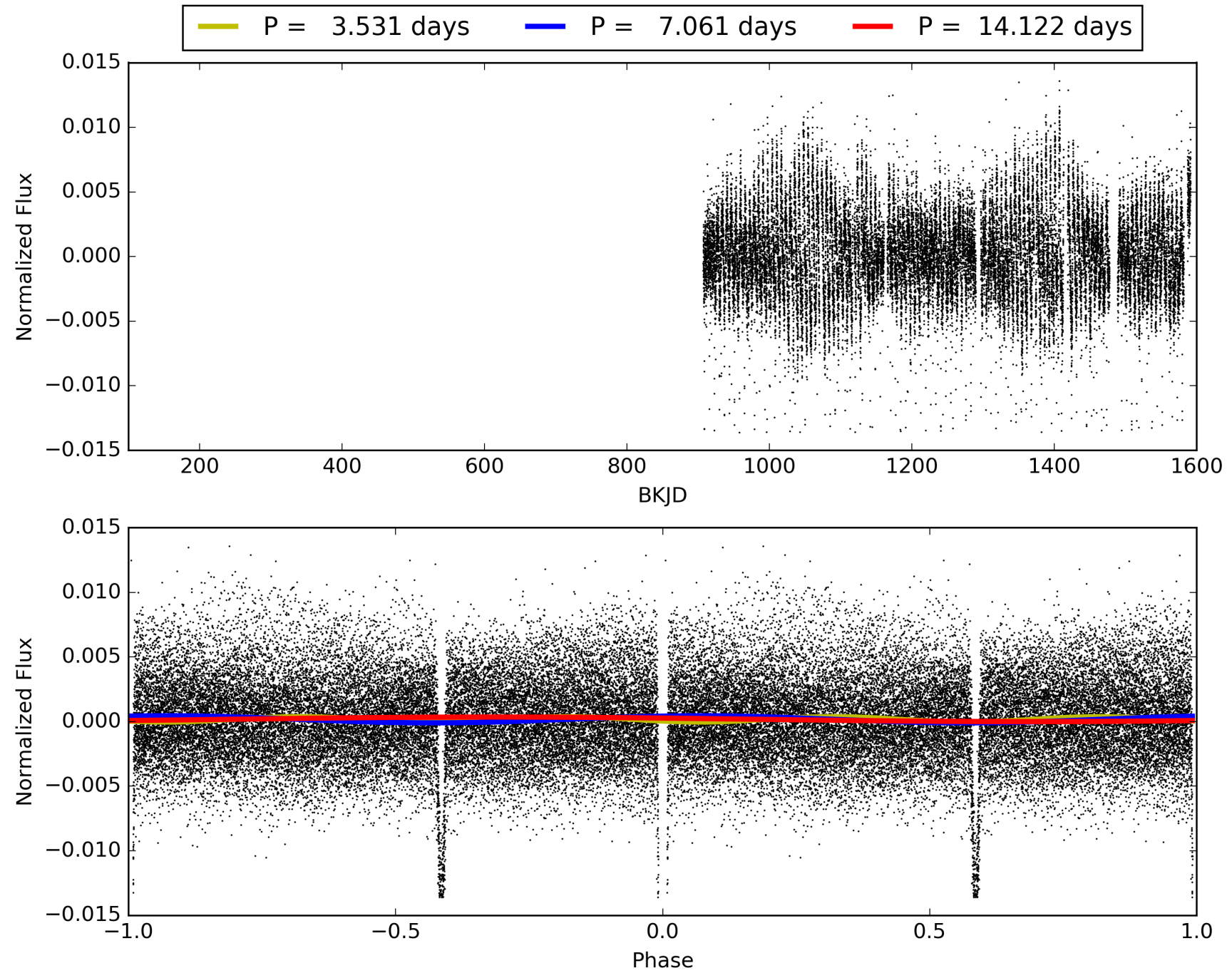
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:07:04 Z

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

# TCE 010259029-01, PDC Light Curves

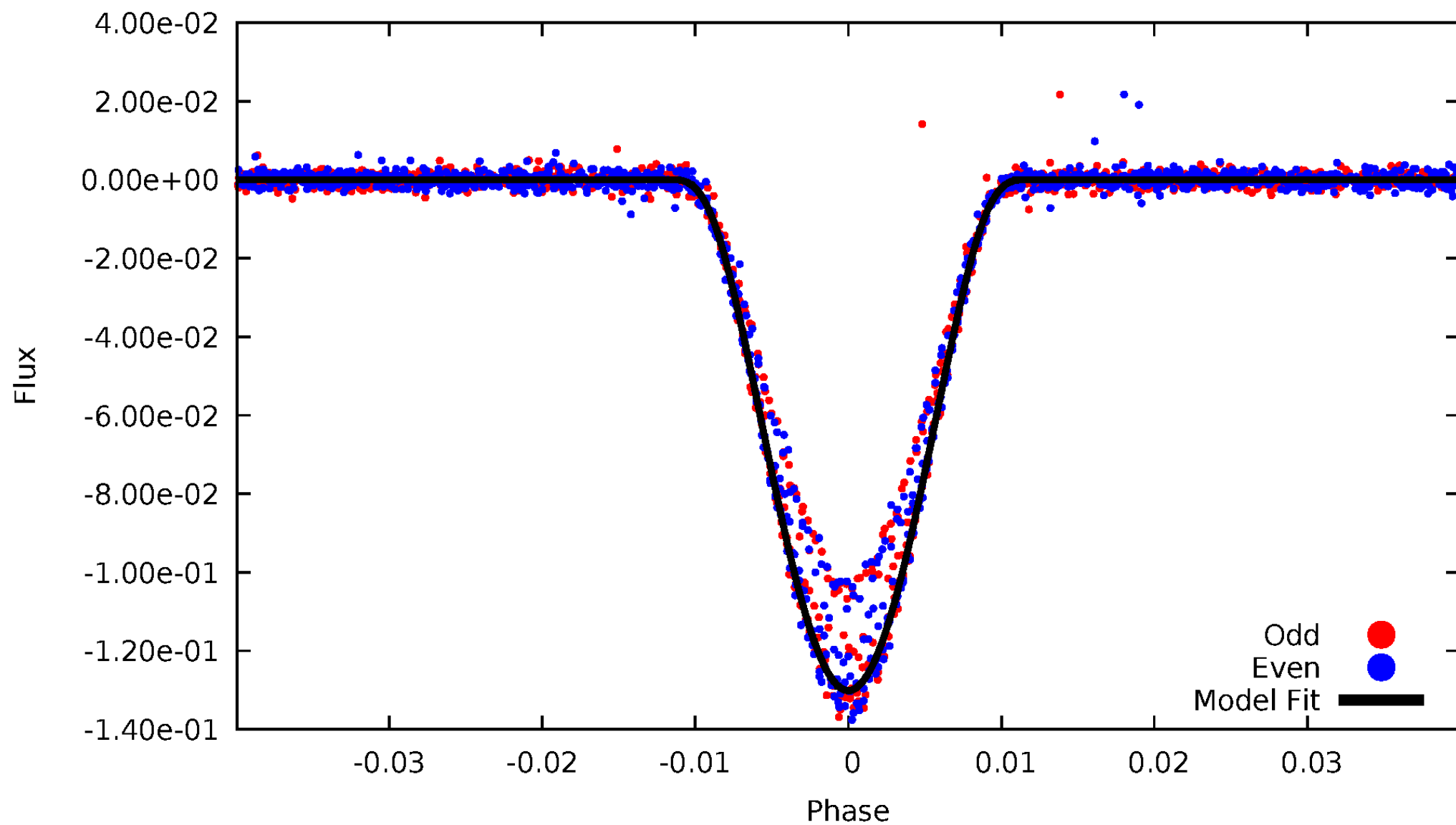


# TCE 010259029-01



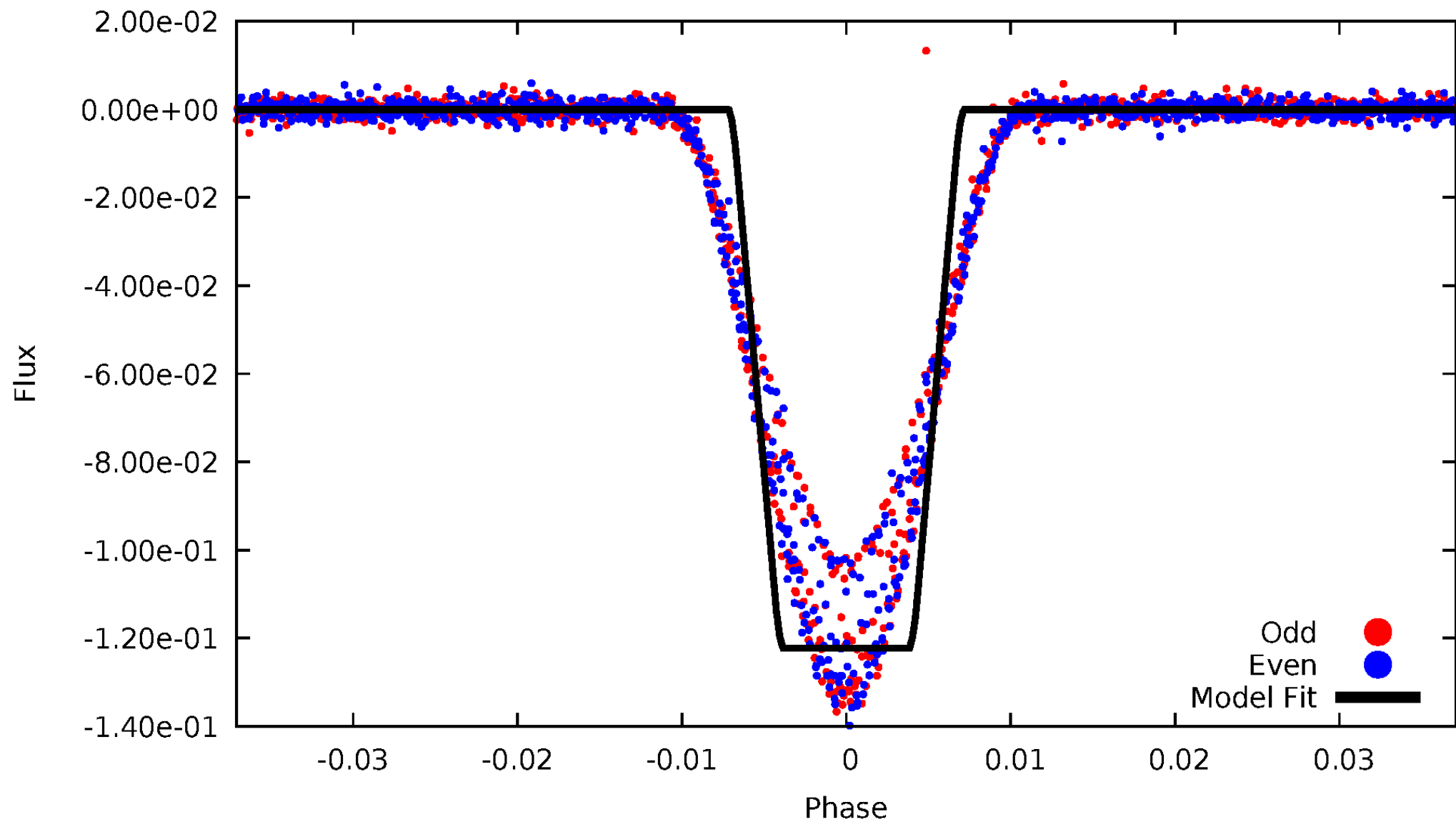
# DV Odd/Even

TCE 010259029-01



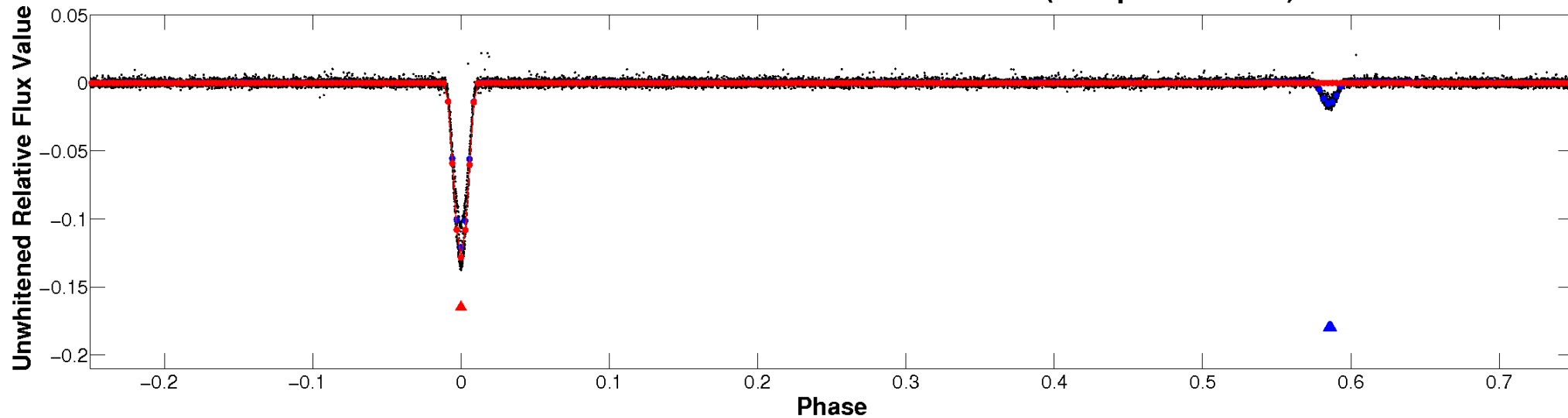
# ALT Odd/Even

TCE 010259029-01

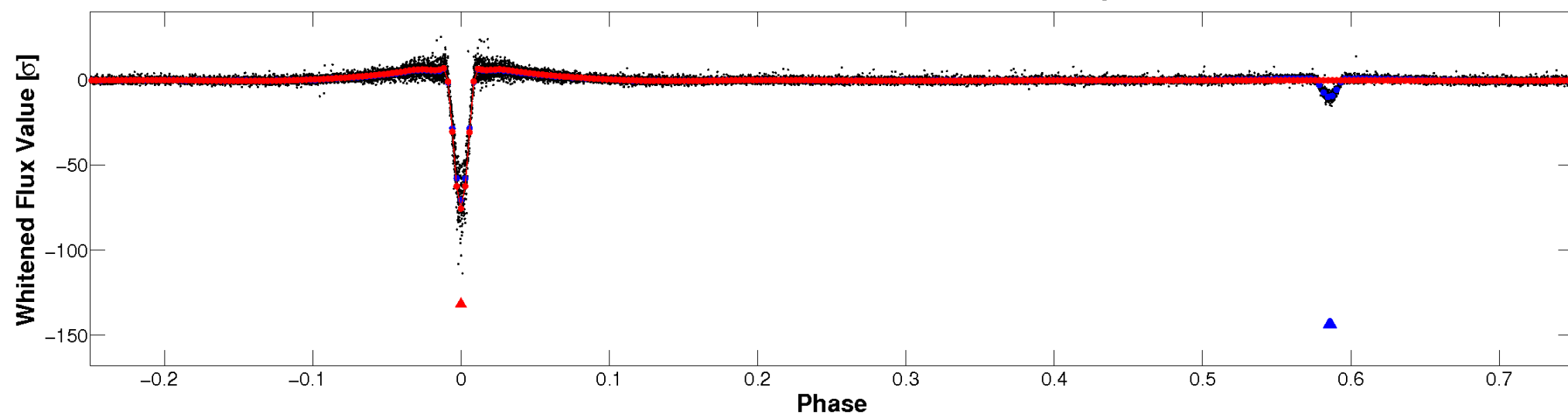


# Non-Whitened Vs. Whitened Light Curve

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

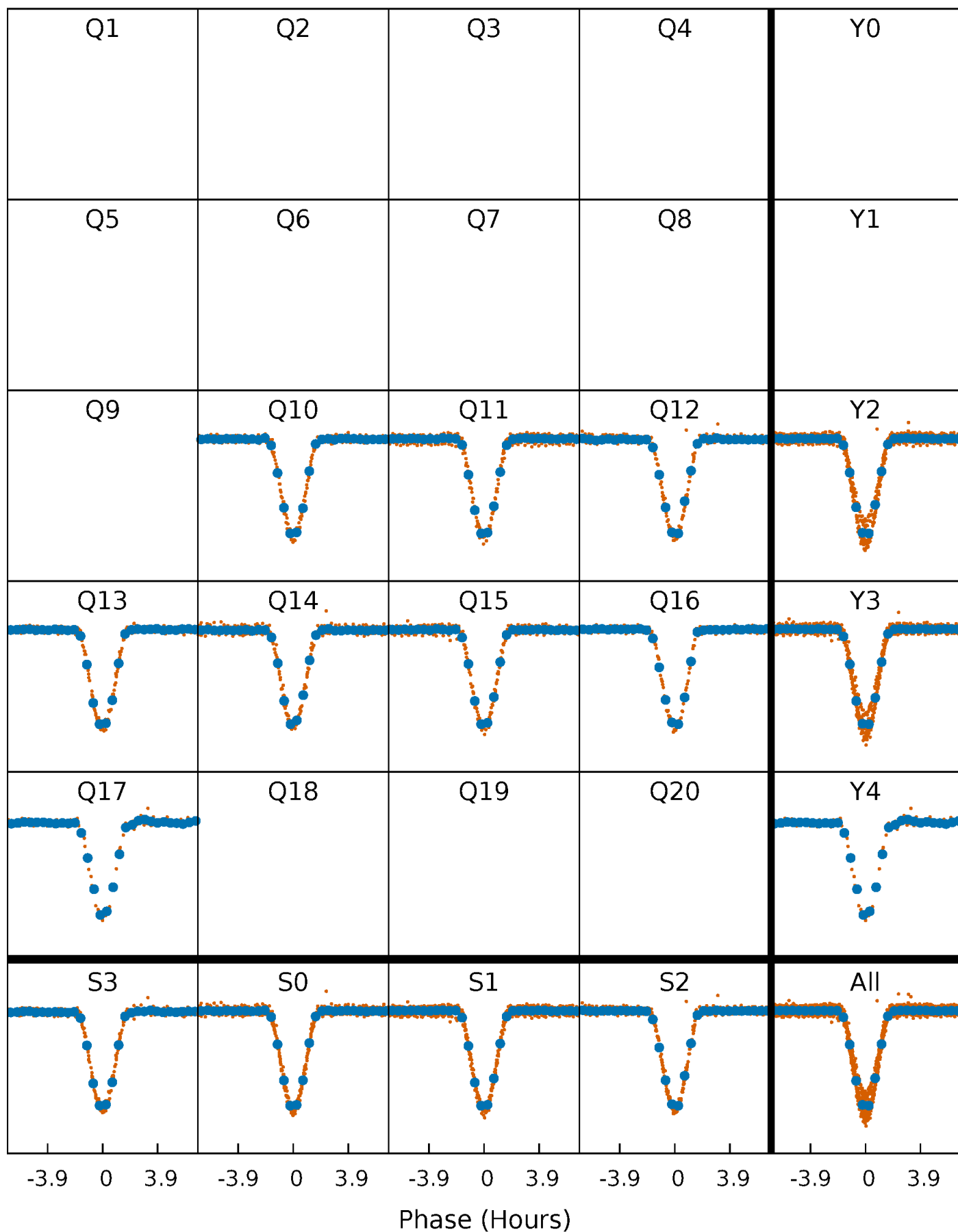


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

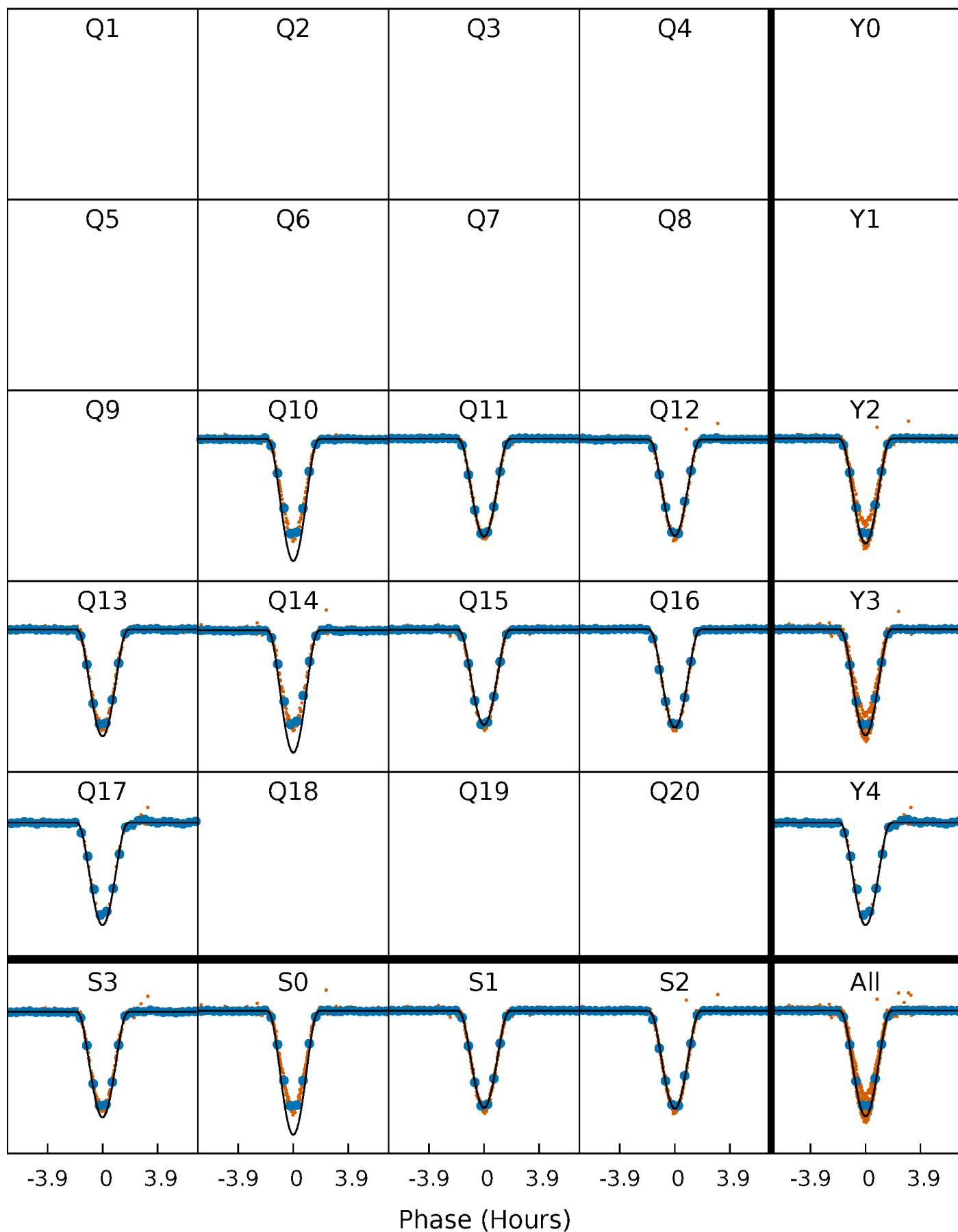
TCE 010259029-01 P= 7.061154 Days  $T_0=134.557816$  (BKJD)





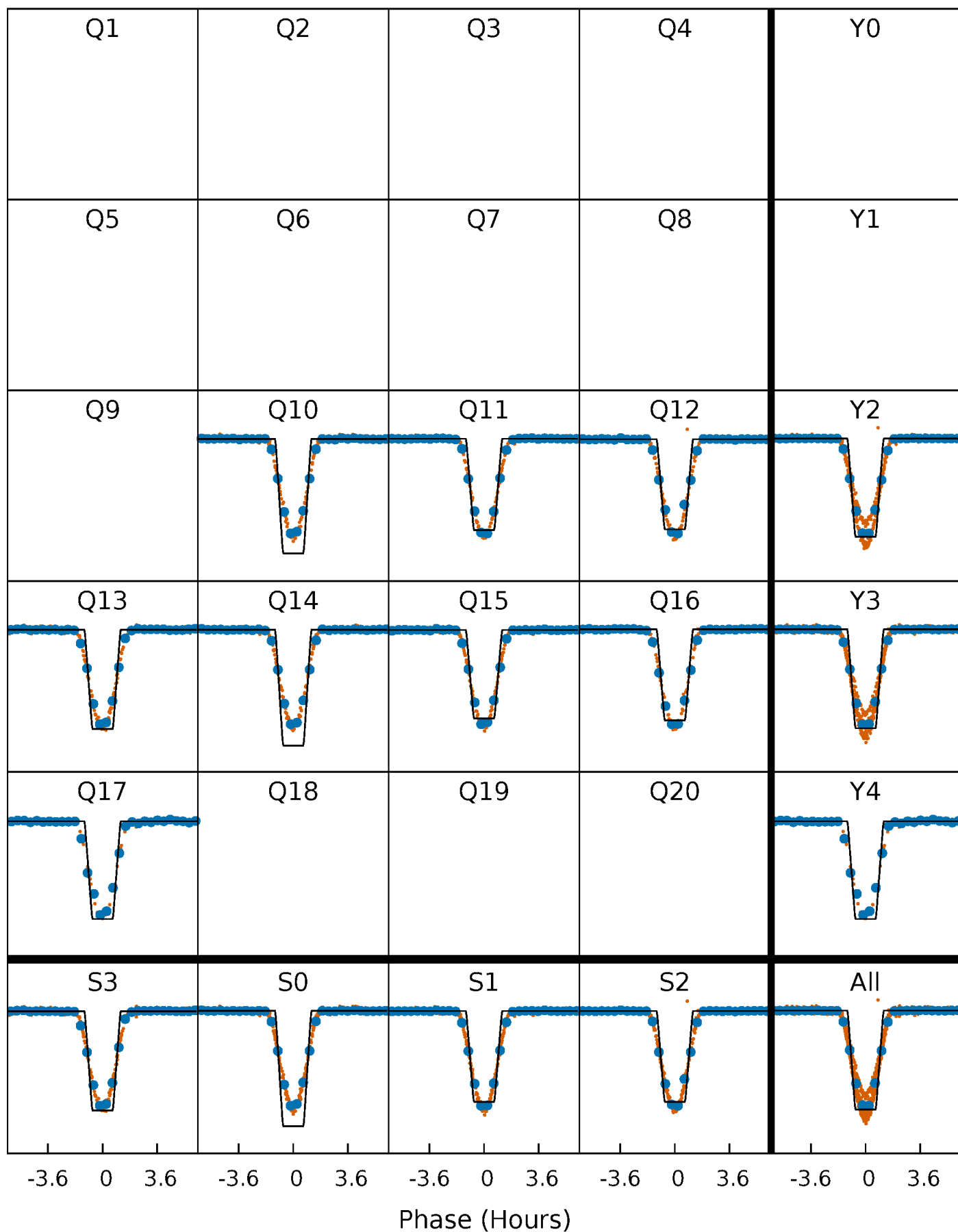
# DV Quarter-Phased Transit Curves

TCE 010259029-01 P= 7.061154 Days  $T_0=134.557816$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

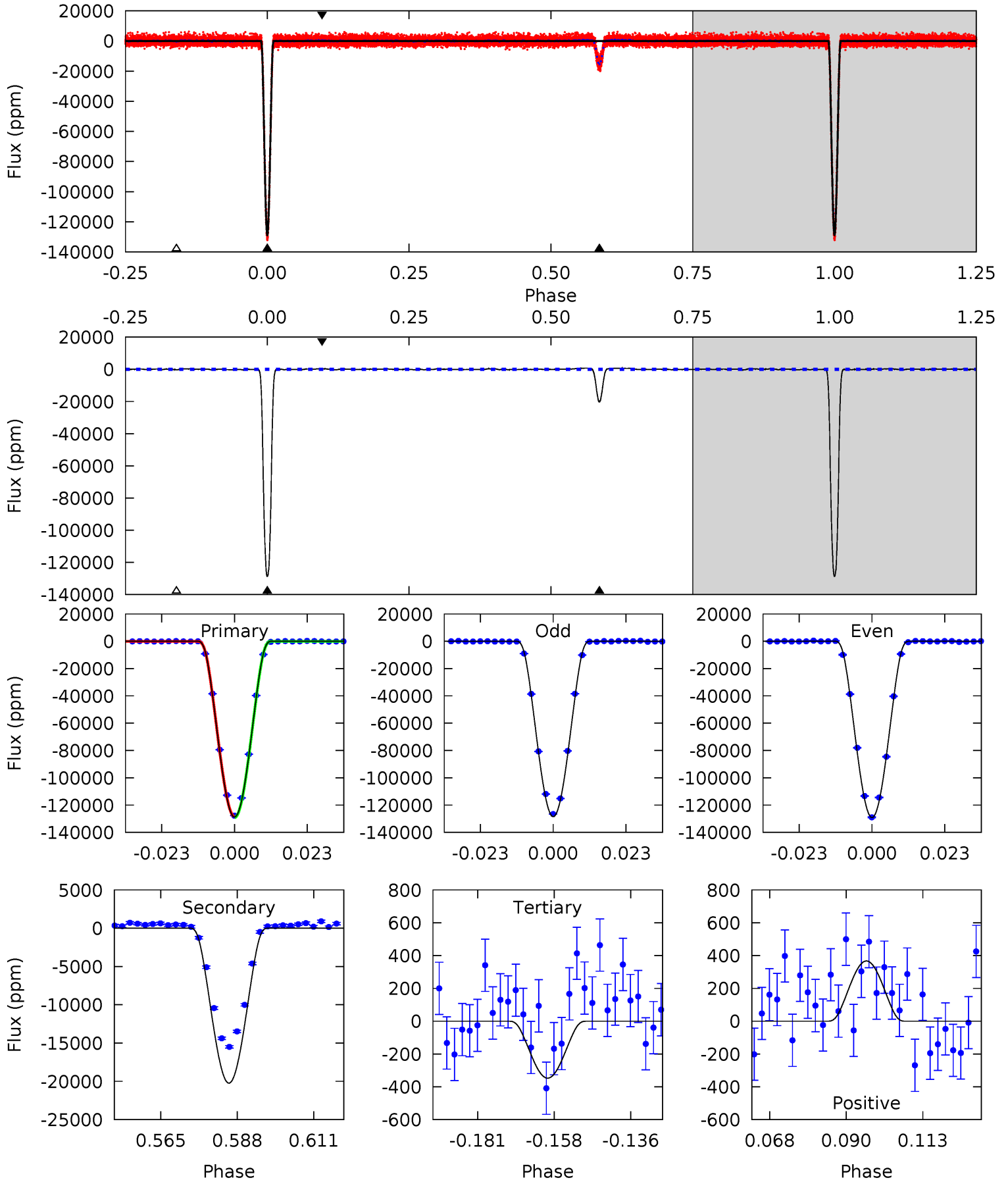
TCE 010259029-01 P= 7.061170 Days  $T_0=134.555315$  (BKJD)



# DV Model-Shift Uniqueness Test

010259029-01, P = 7.061154 Days, E = 134.557816 Days

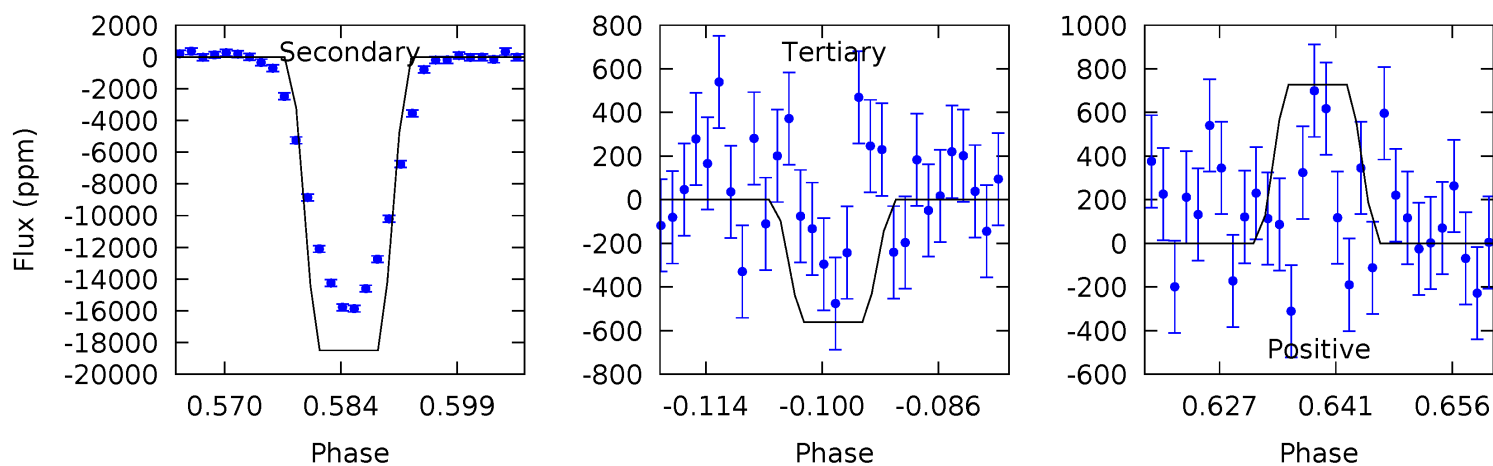
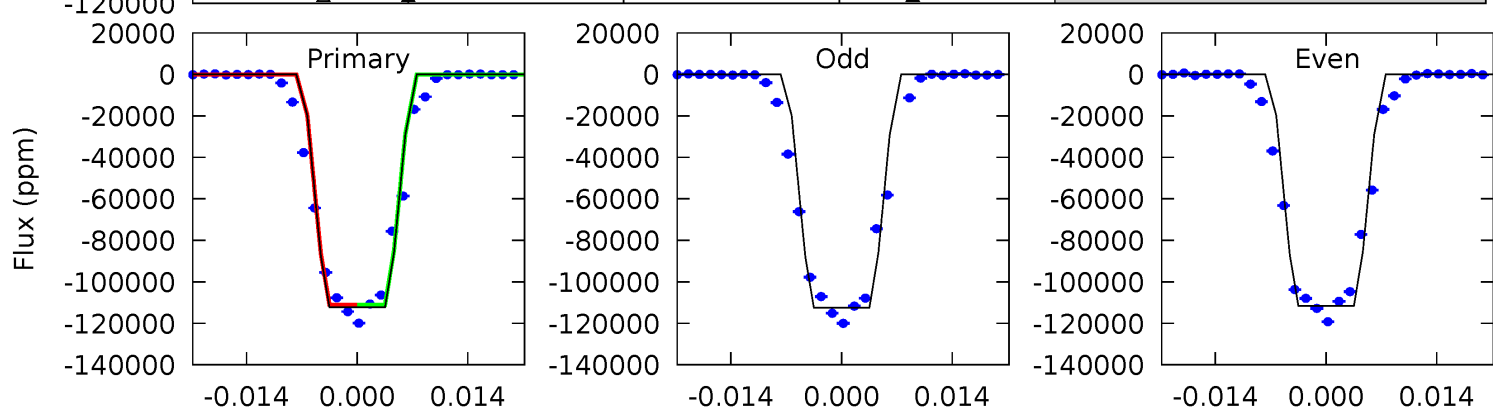
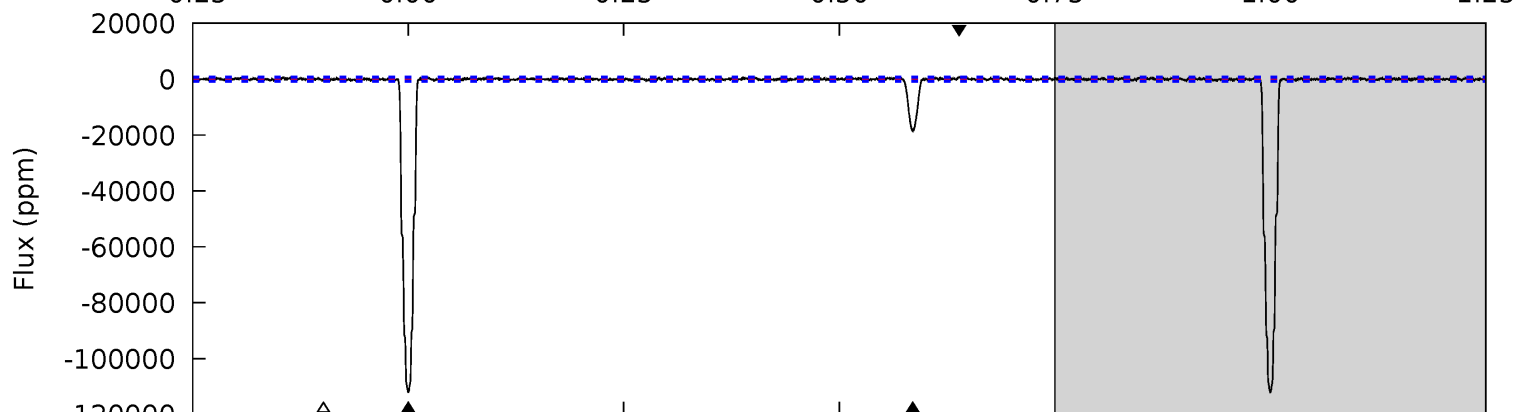
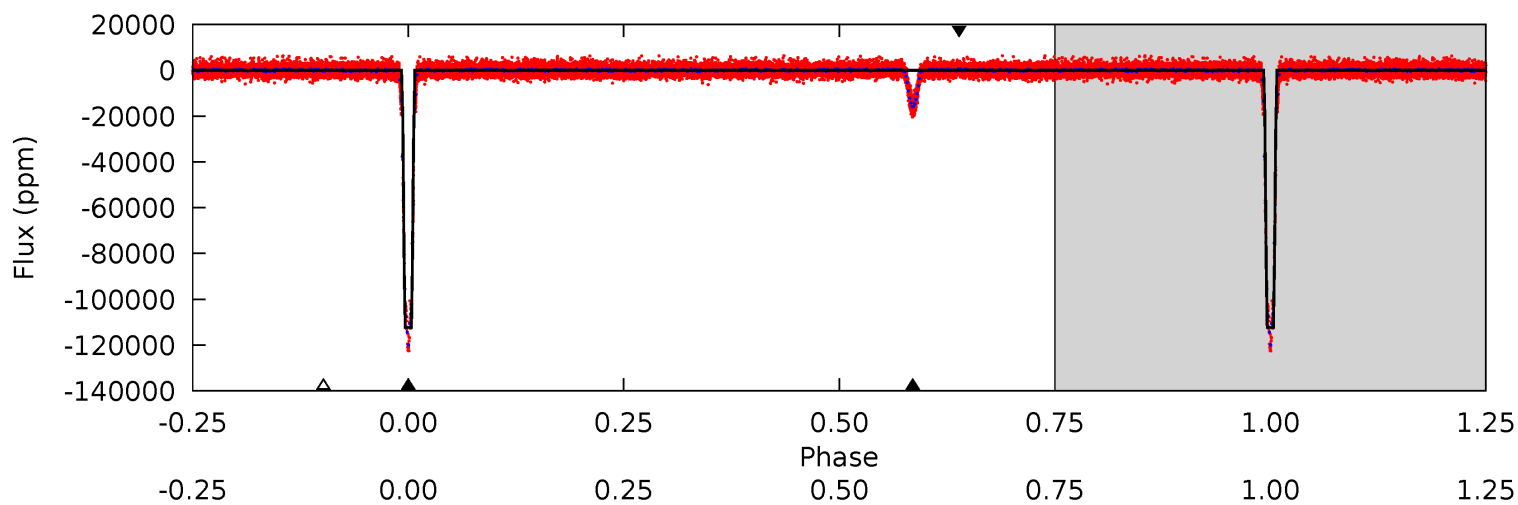
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1934	304.1	5.22	5.51	4.87	2.28	2.98	1929	1929	298.9	298.6	5.00	0.96	0.01	0



# Alt Model-Shift Uniqueness Test

010259029-01, P = 7.061170 Days, E = 134.555315 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
779.0	128.3	3.89	5.05	4.96	2.45	1.24	775.1	773.9	124.4	123.3	3.26	0.96	0.01	0



### Stellar Parameters For KIC 010259029

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5585^{+186}_{-186}$	$4.564^{+0.050}_{-0.150}$	$-0.280^{+0.300}_{-0.300}$	$0.798^{+0.192}_{-0.082}$	$0.852^{+0.097}_{-0.089}$	$2.360^{+0.494}_{-1.027}$
	+3%/-3%	+1%/-3%	+107%/-107%	+24%/-10%	+11%/-10%	+21%/-44%
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 010259029-01 / KOI 3630.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-20240 \pm 67$	$43.20^{+12.57}_{-12.37}$	$1192^{+66}_{-57}$	$3516^{+386}_{-276}$	$29^{+26}_{-12}$
Alt.	$-18496 \pm 144$	$32.01^{+12.75}_{-12.30}$	$1196^{+76}_{-58}$	$3830^{+717}_{-393}$	$47^{+74}_{-23}$

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

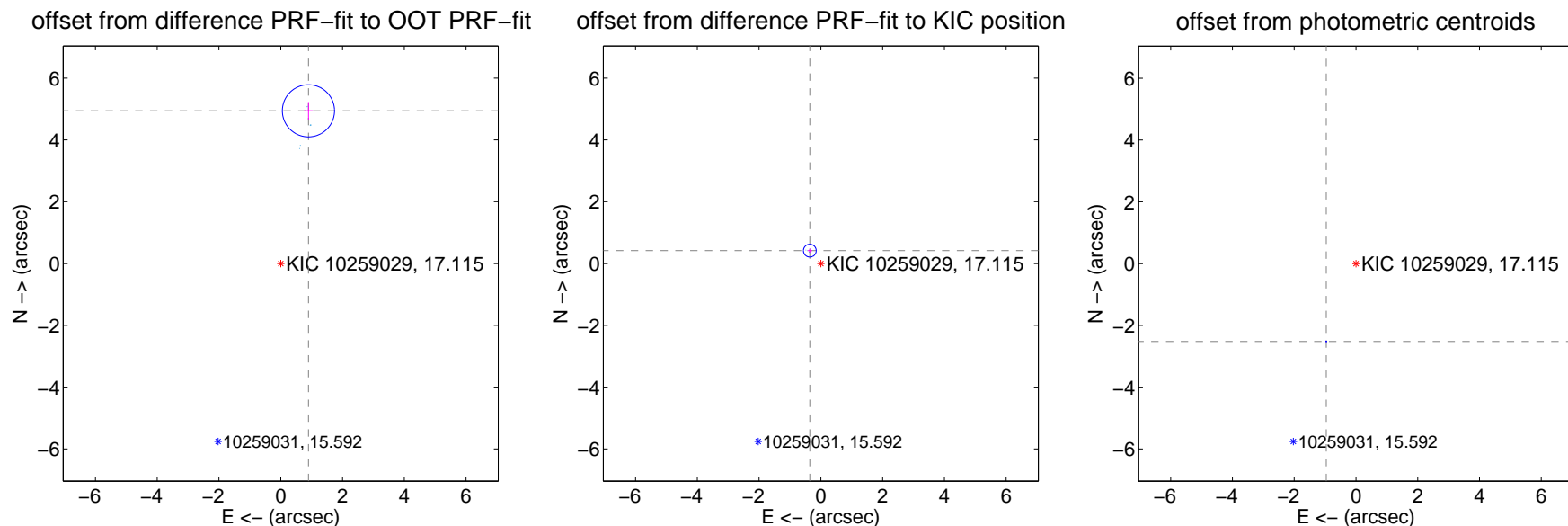
## DV Centroid Data

Supplemental centroid analysis for 010259029-01. Kepler magnitude: 17.11. Transit SNR 841.61

There are 8 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 4.32 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.024 \pm 0.282$	17.84	$-0.897 \pm 0.140$	$4.944 \pm 0.285$
PRF-fit source offset from KIC position	$0.549 \pm 0.069$	7.95	$0.357 \pm 0.069$	$0.417 \pm 0.068$
photometric centroid source offset	$2.70 \pm 0.00$	578.45	$0.96 \pm 0.00$	$-2.52 \pm 0.00$

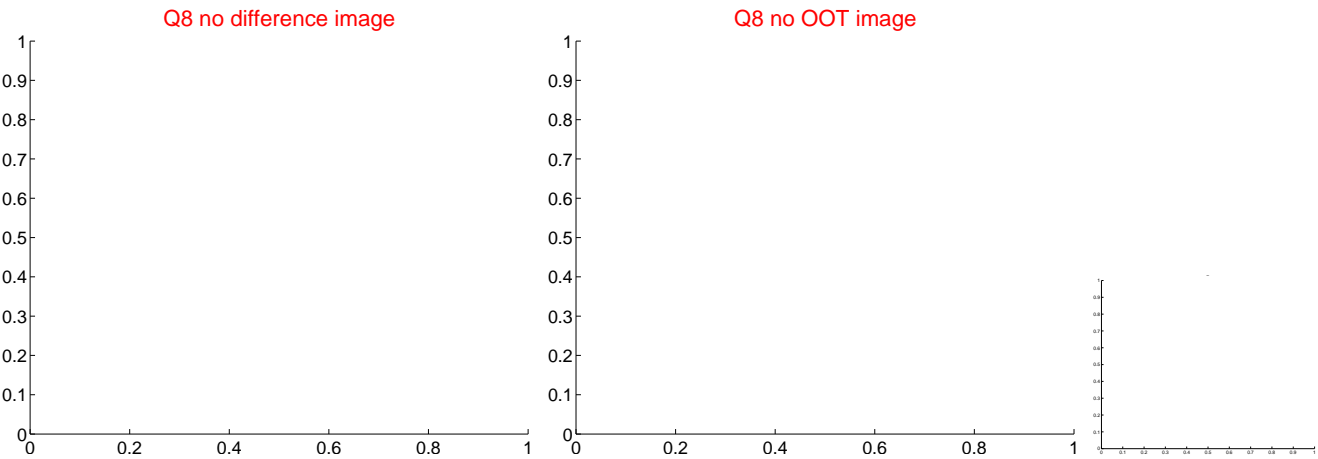
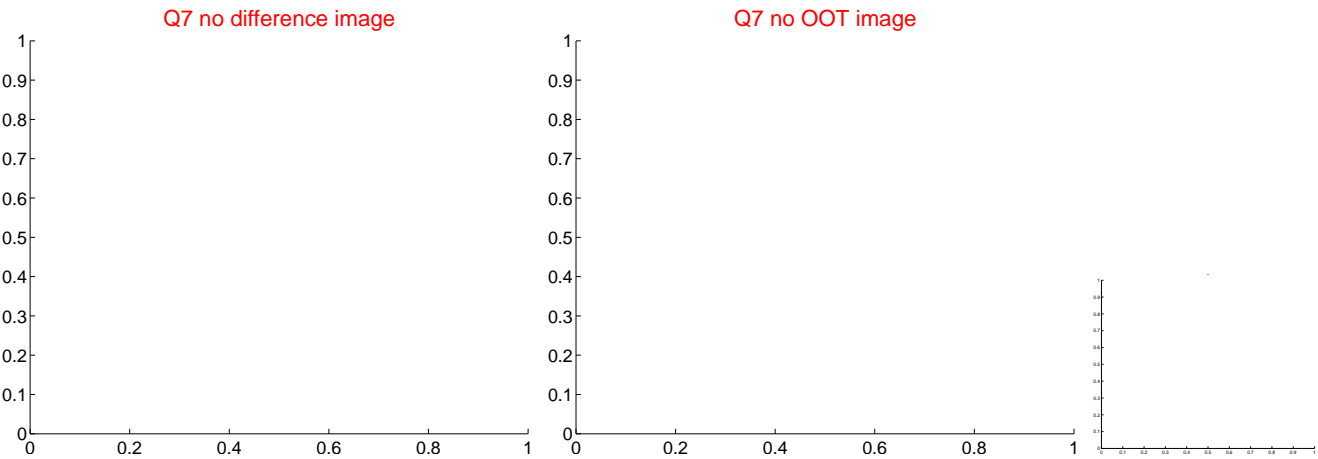
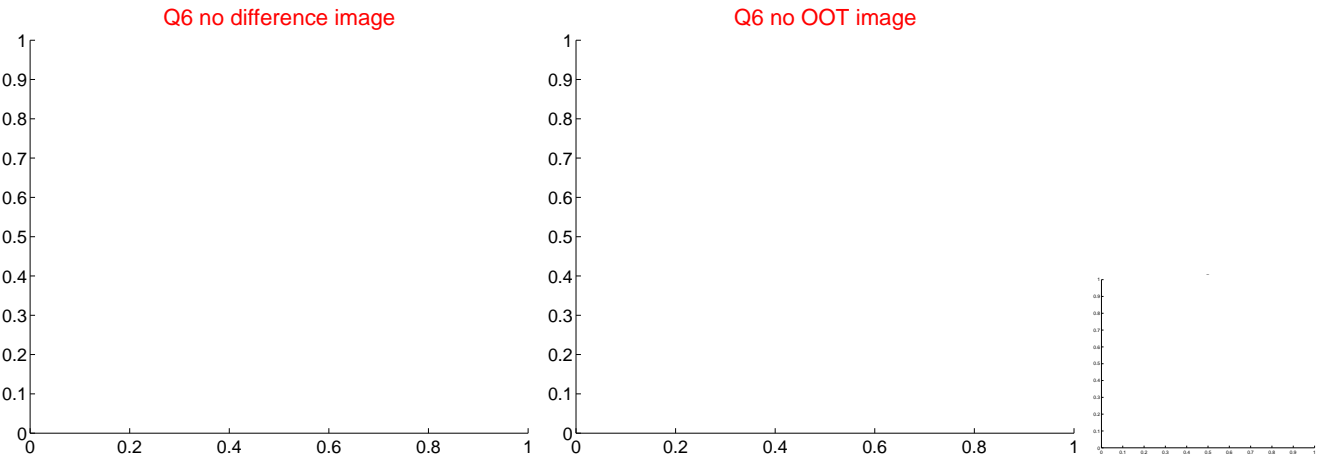
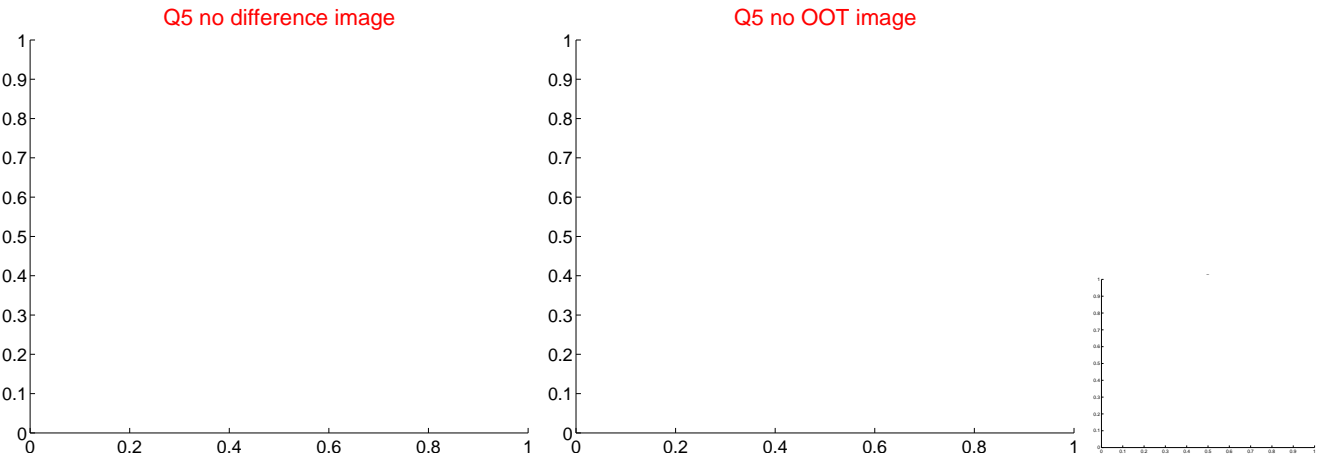


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

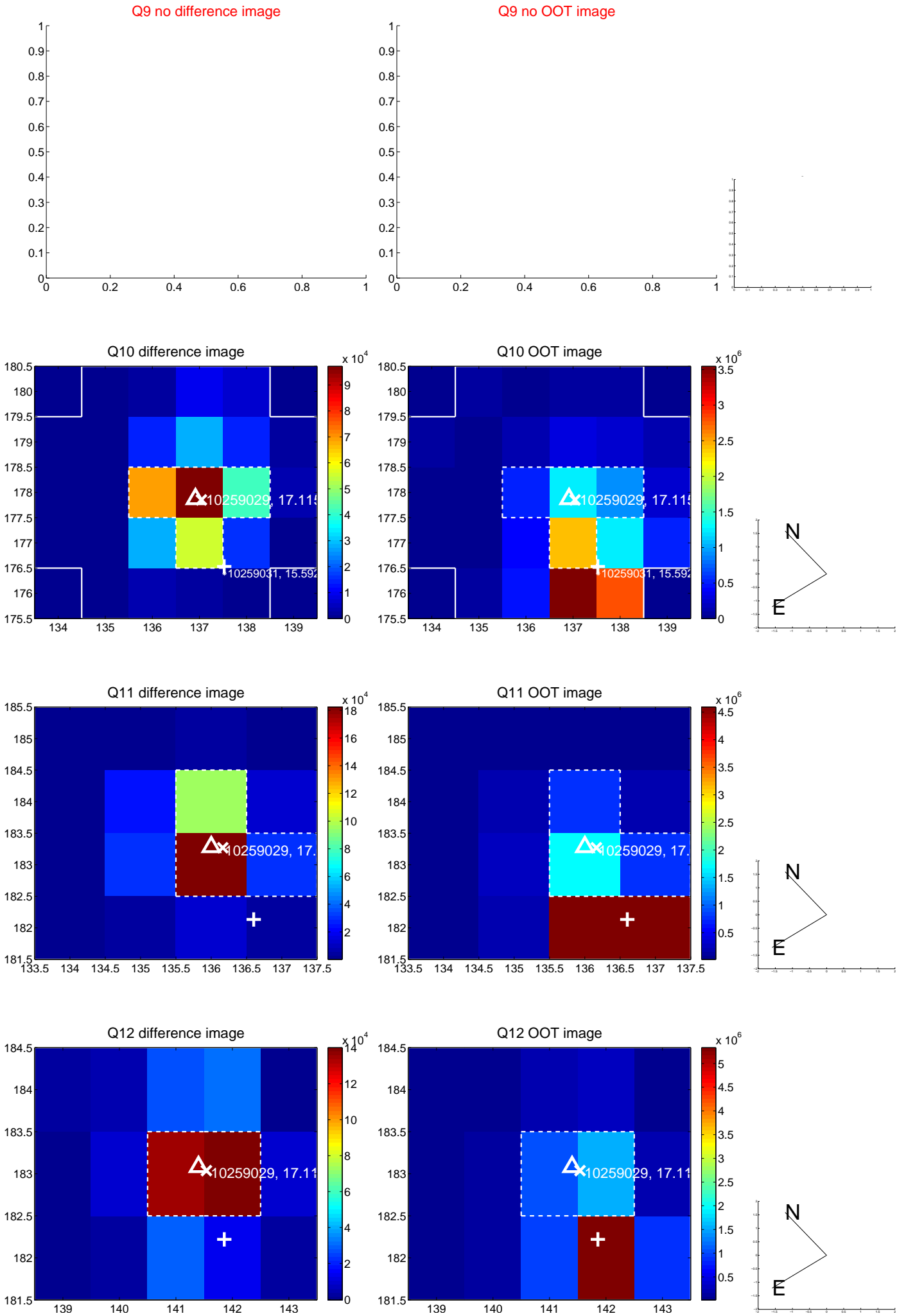


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

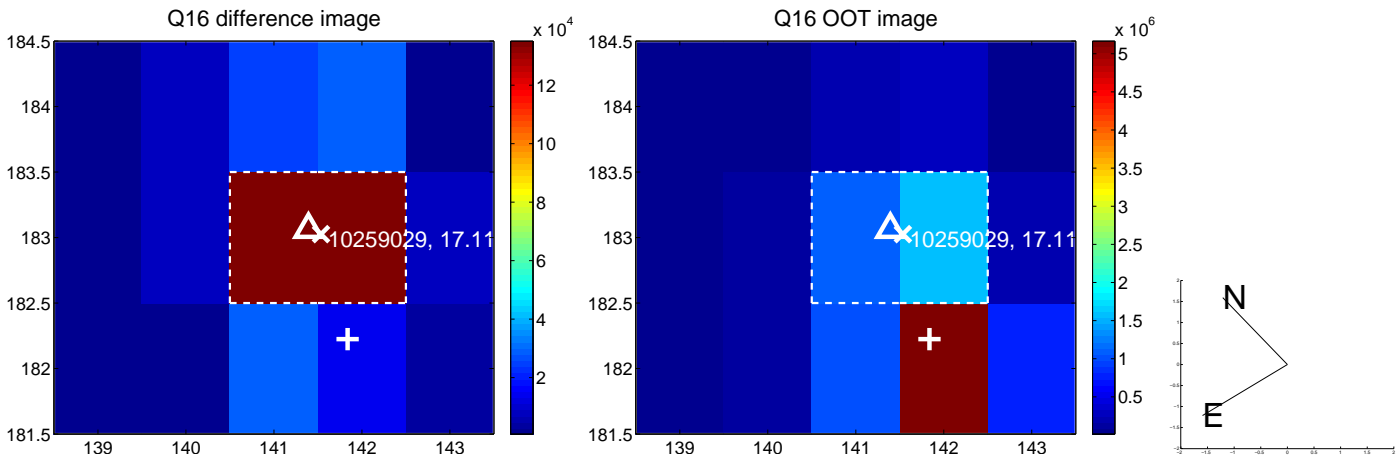
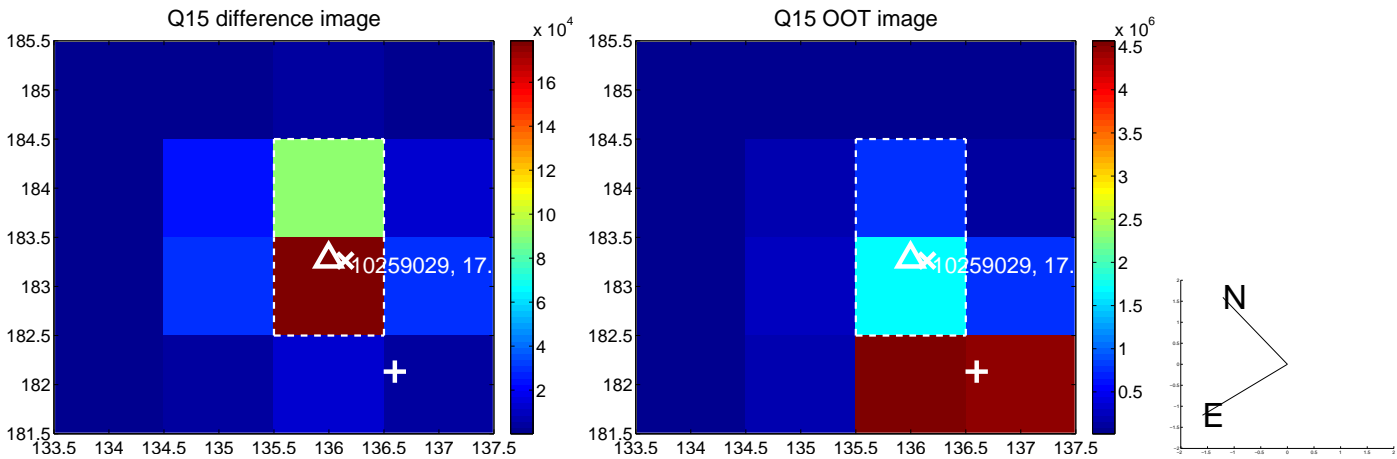
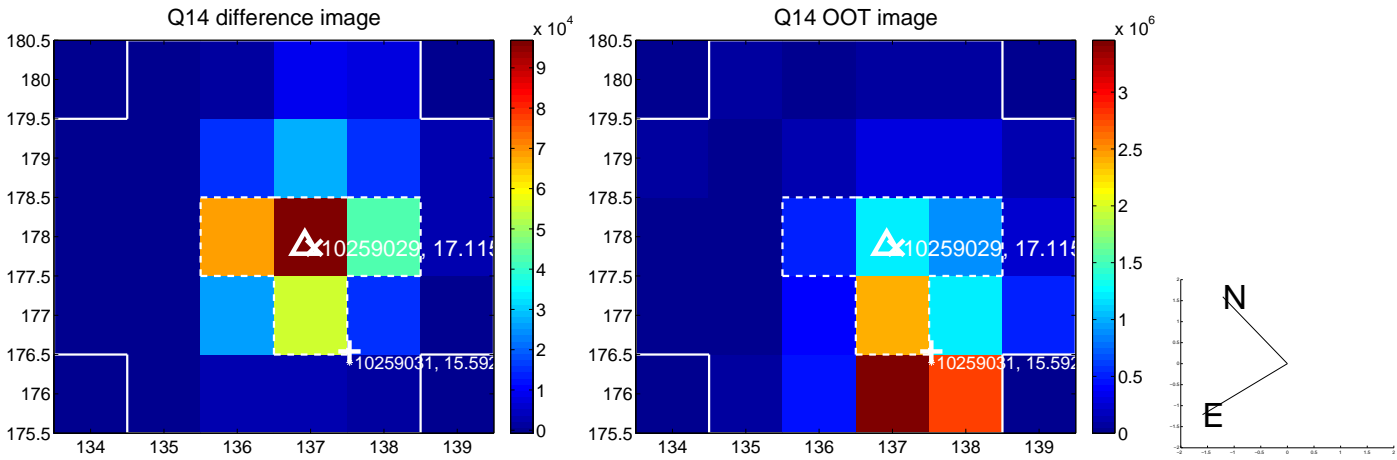
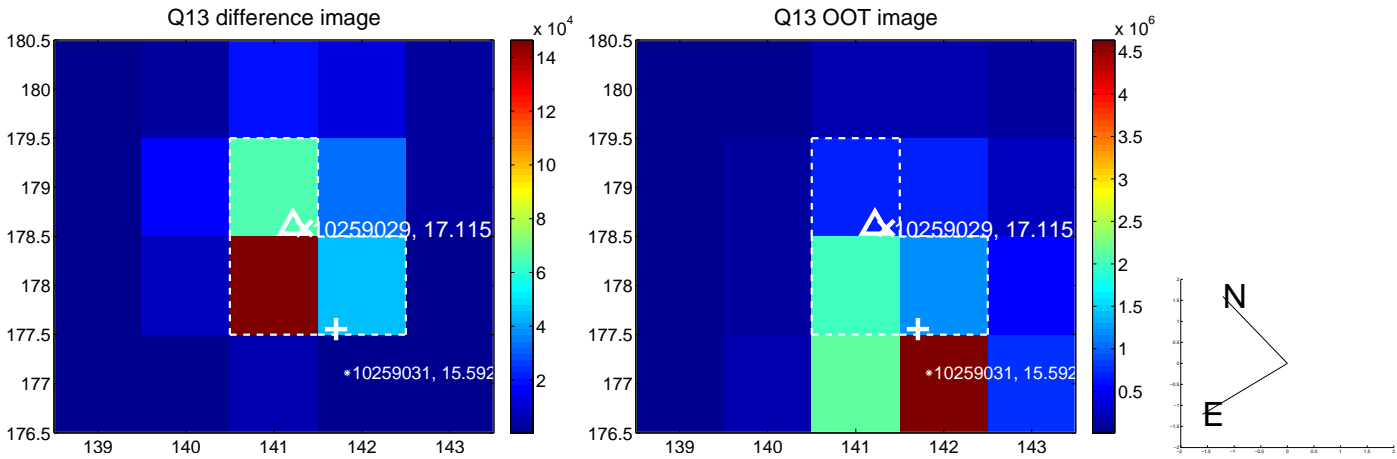




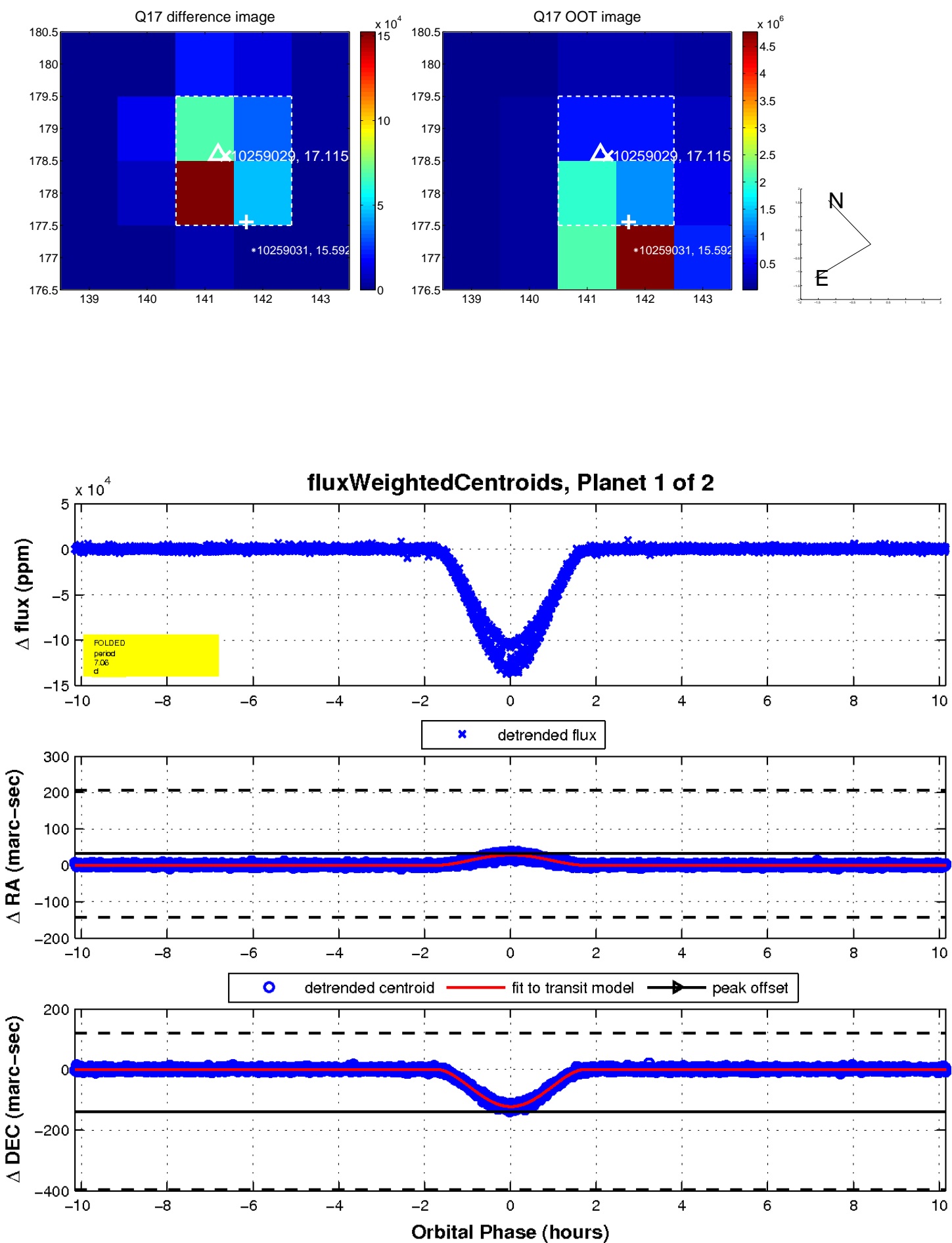
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

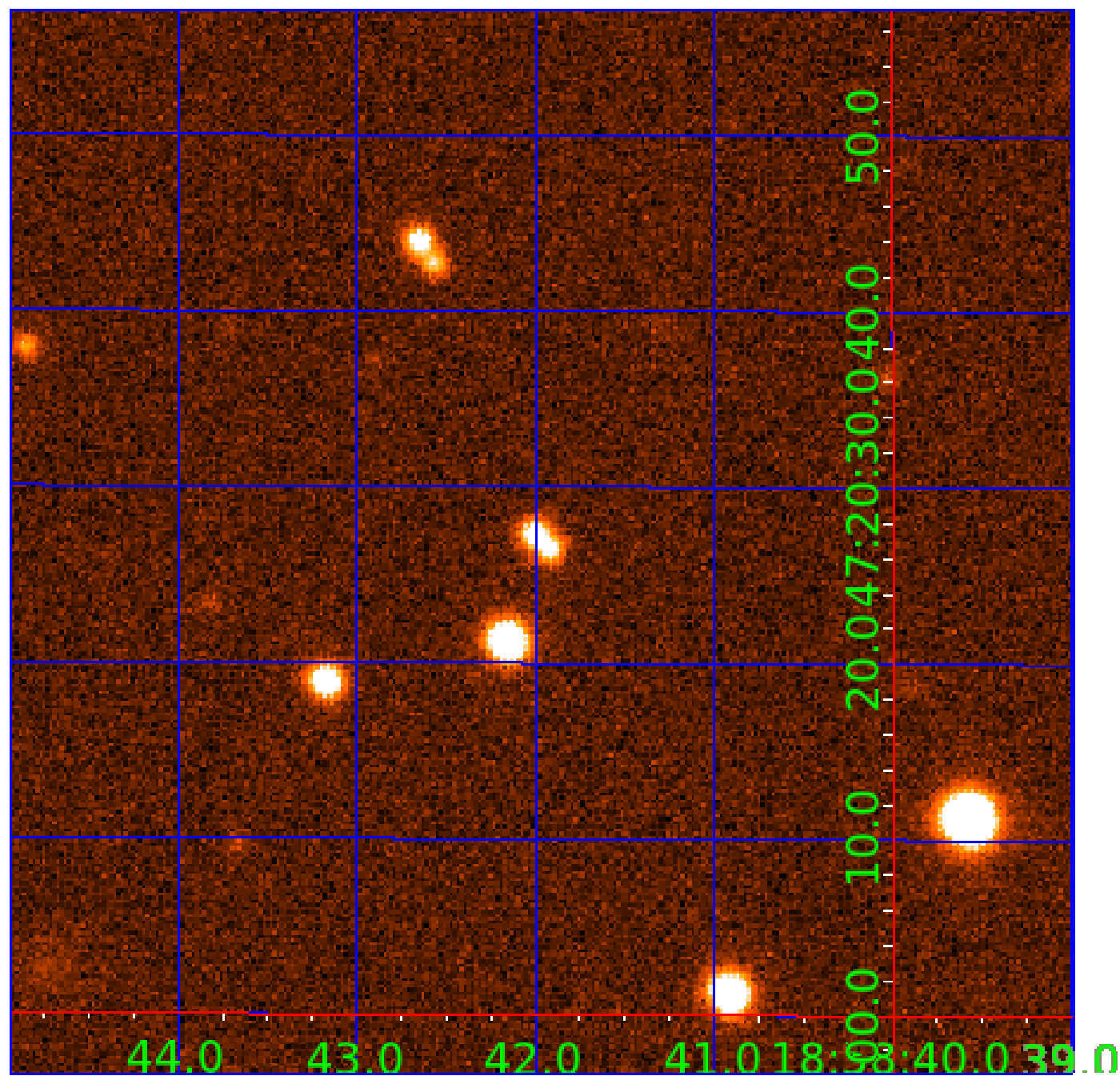


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010259029

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010259029-01	OBS	3630.01	7.061154	134.557816	130147.6	3.384	1151.7	841.6	0.80	5585	41.87	119.08
010259029-02	OBS	No	7.061104	131.639097	16073.7	3.224	151.5	142.9	0.80	5585	13.15	119.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010259029-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_KIC_POS
010259029-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

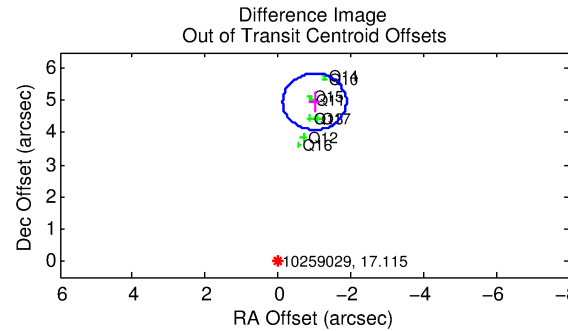
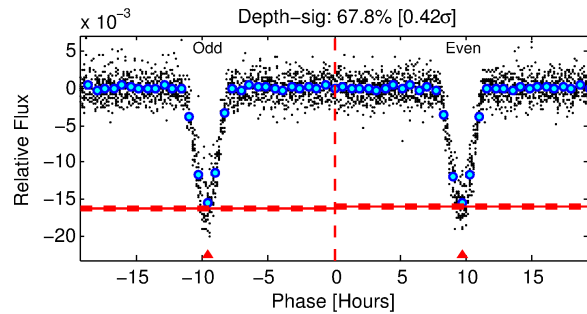
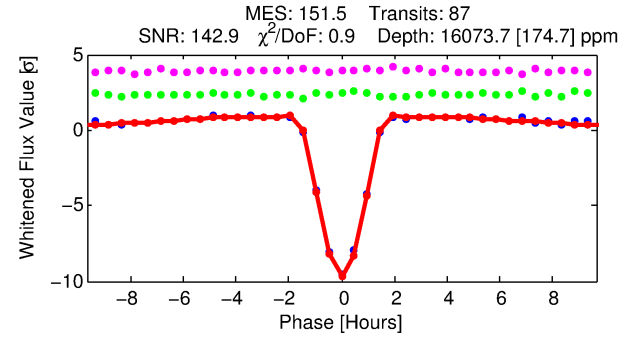
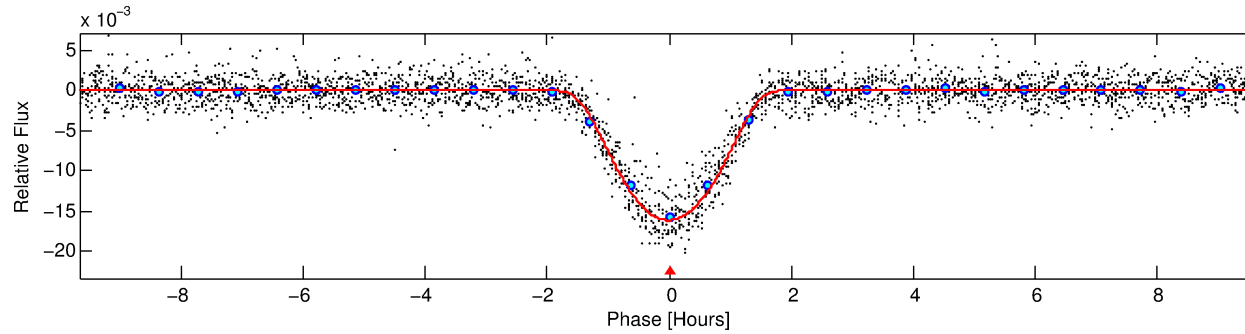
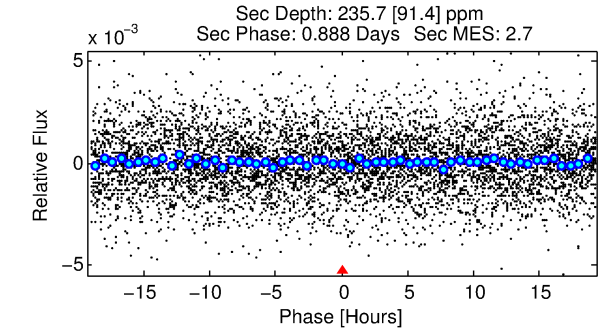
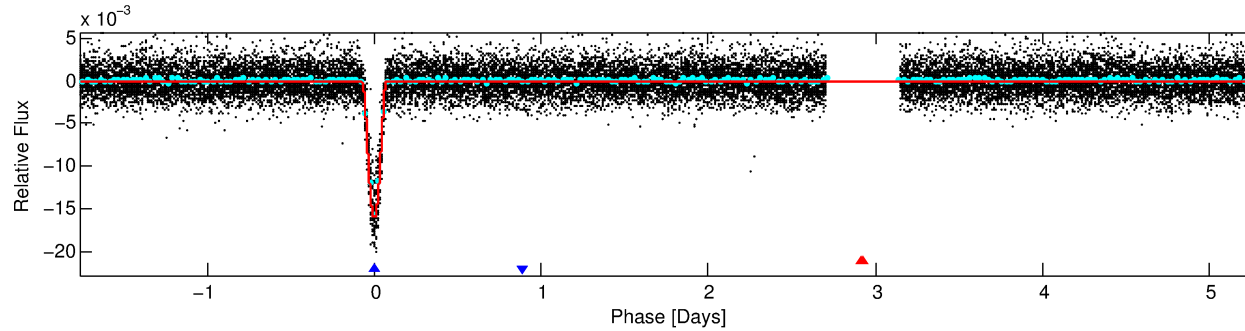
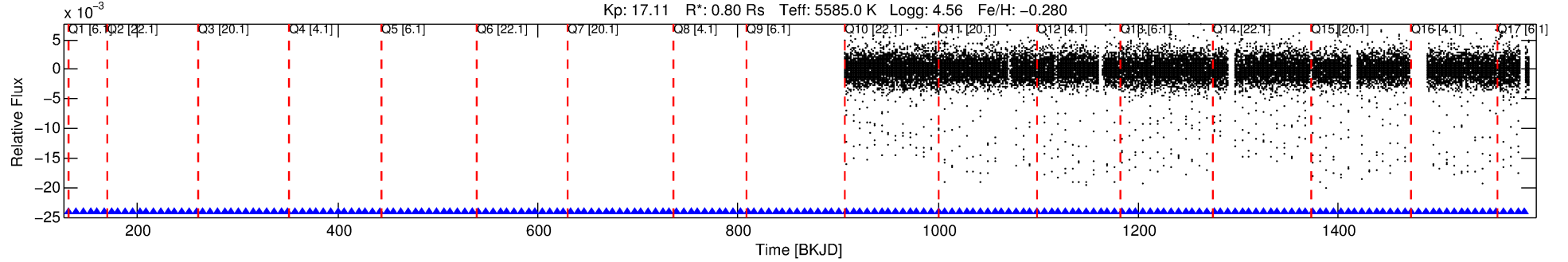
## Ephemeris Match Information For 010259029-02

No Significant Match Found

# DV One-Page Summary

KIC: 10259029 Candidate: 2 of 2 Period: 7.061 d  
KOI: K03630 Corr: No Ephemeris Match

Kp: 17.11 R\*: 0.80 Rs Teff: 5585.0 K Logg: 4.56 Fe/H: -0.280



## DV Fit Results:

Period = 7.06110 [0.00001] d  
Epoch = 131.6391 [0.0011] BKJD  
Rp/R\* = 0.1510 [0.0130]  
a/R\* = 11.93 [0.40]  
b = 0.91 [0.03]  
Seff = 119.08 [36.99]  
Teff = 842 [65] K  
Rp = 13.15 [3.36] Re  
a = 0.0683 [0.0135] AU  
Ag = 3.50 [1.78] [1.40σ]  
Teffp = 1781 [198] K [4.50σ]

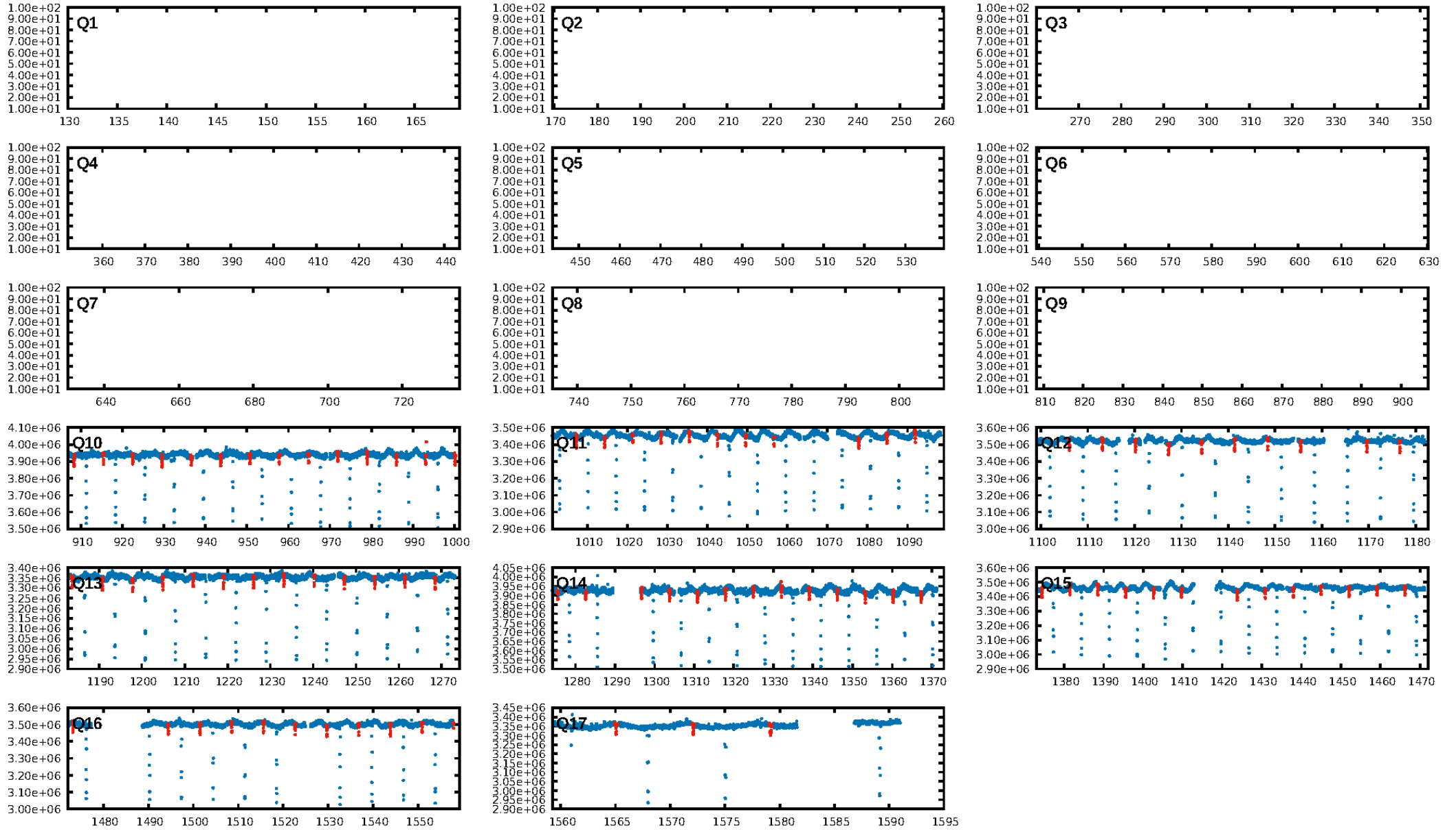
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [84/84]  
GhostDiagnostic-chr: 2.037  
Centroid-sig: 0.0%  
Centroid-so: 2.663 arcsec [73.77σ]  
OotOffset-rm: 5.062 arcsec [17.30σ]  
KicOffset-rm: 0.561 arcsec [7.80σ]  
OotOffset-st: 2/2/2/2 [8]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

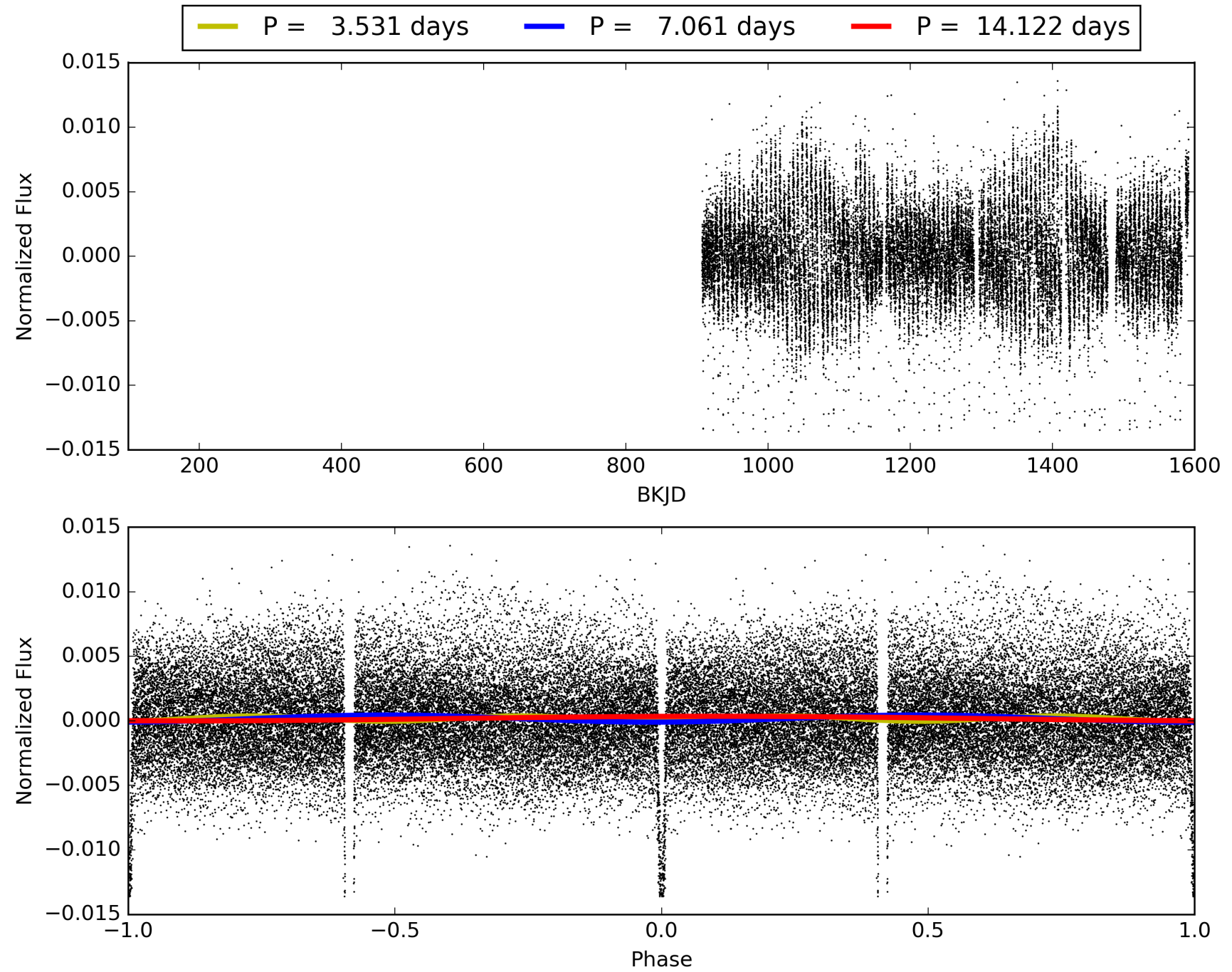
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:07:08 Z

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

# TCE 010259029-02, PDC Light Curves



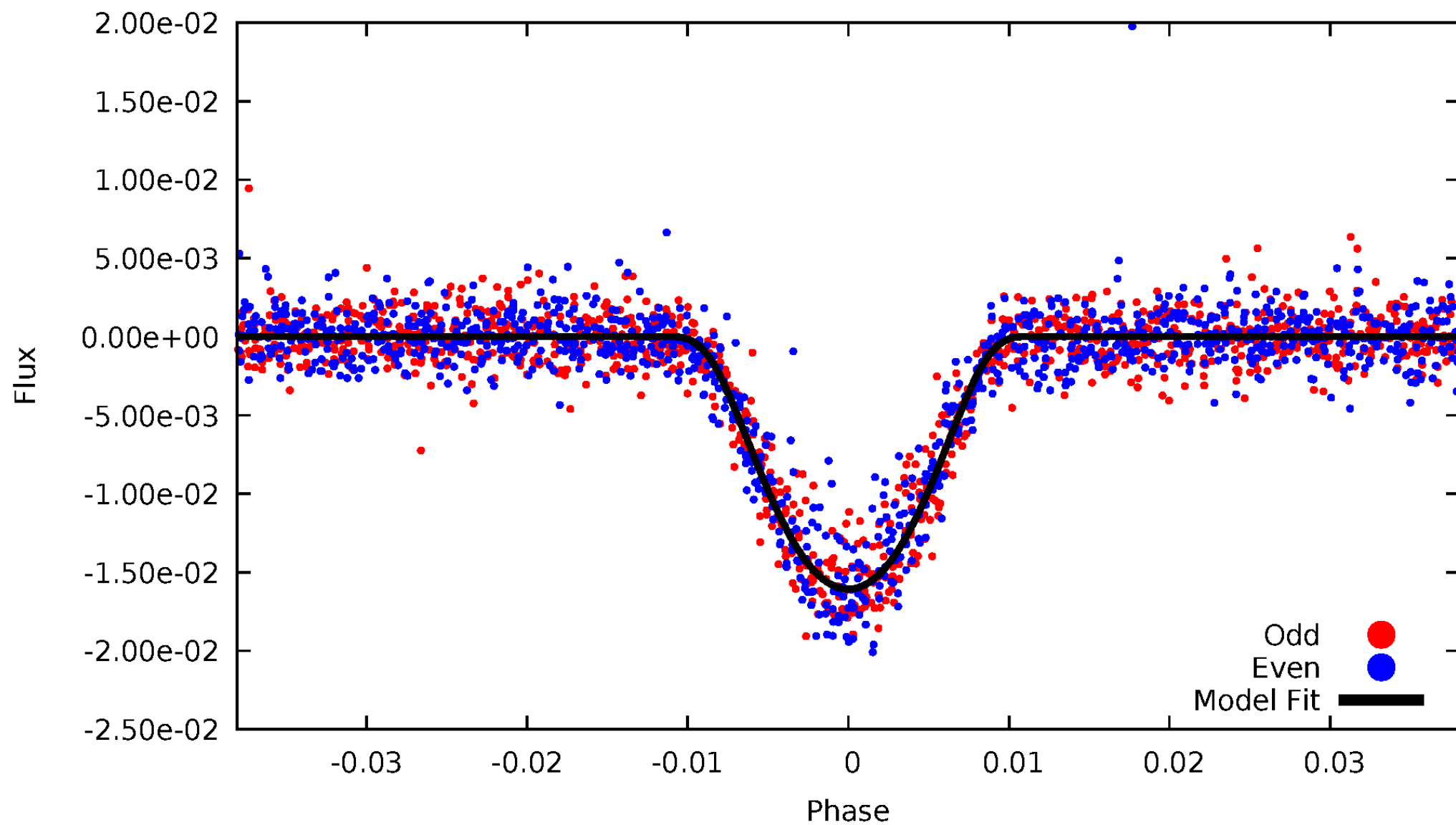
# TCE 010259029-02





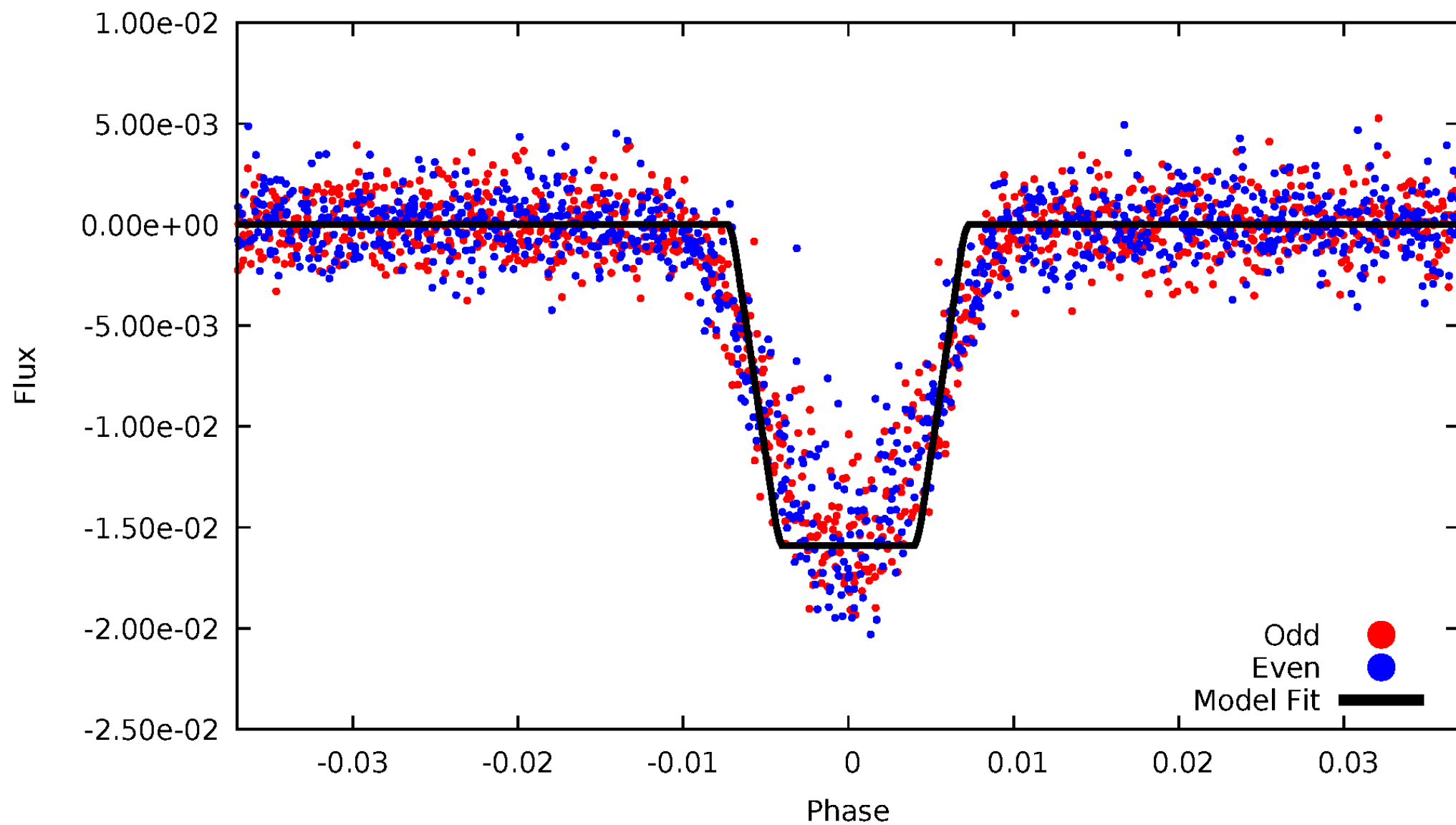
# DV Odd/Even

TCE 010259029-02



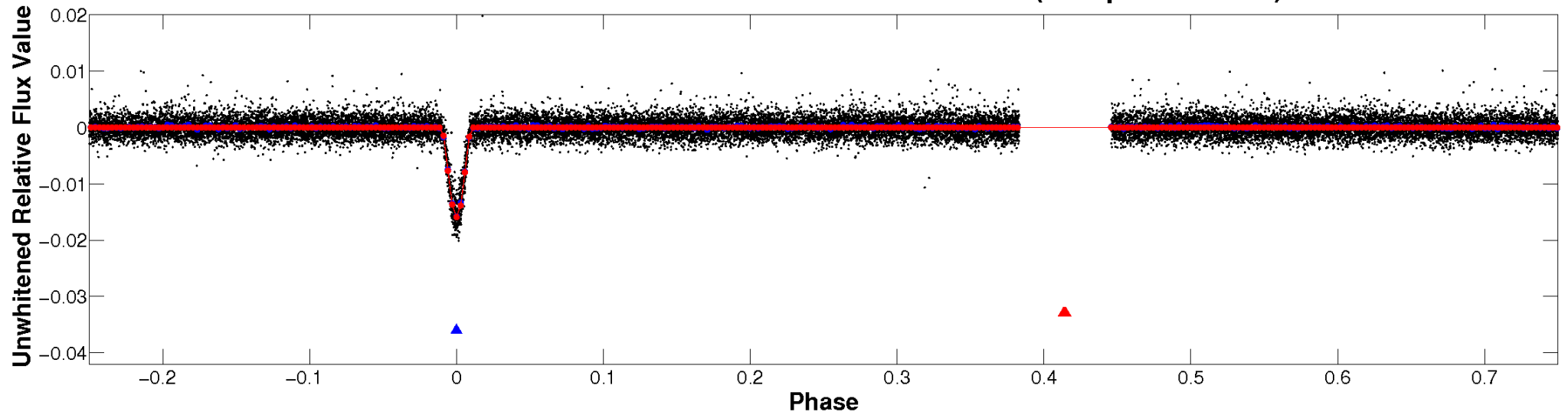
# ALT Odd/Even

TCE 010259029-02

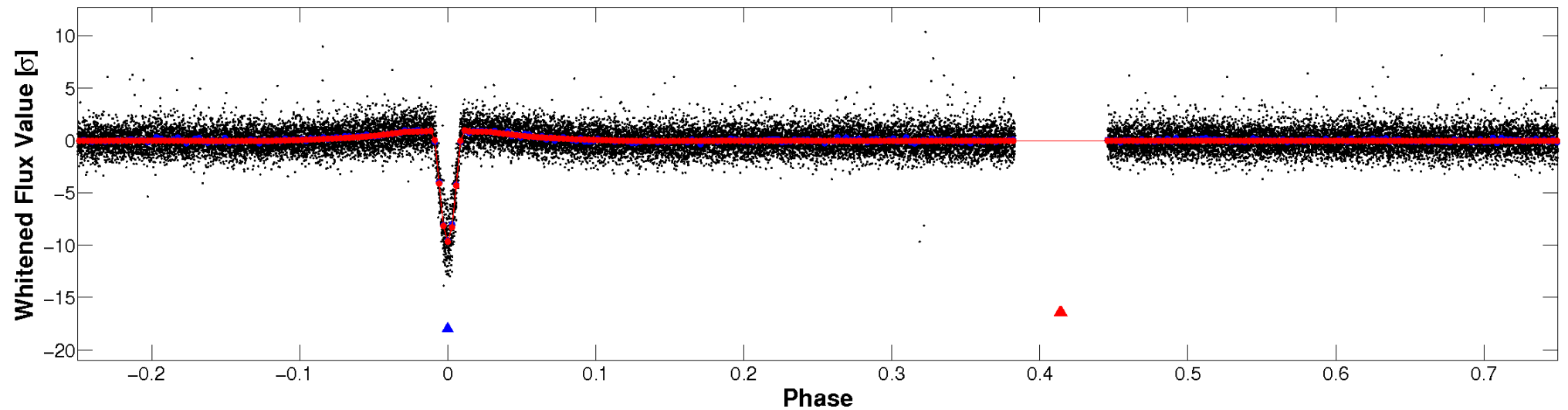


# Non-Whitened Vs. Whitened Light Curve

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

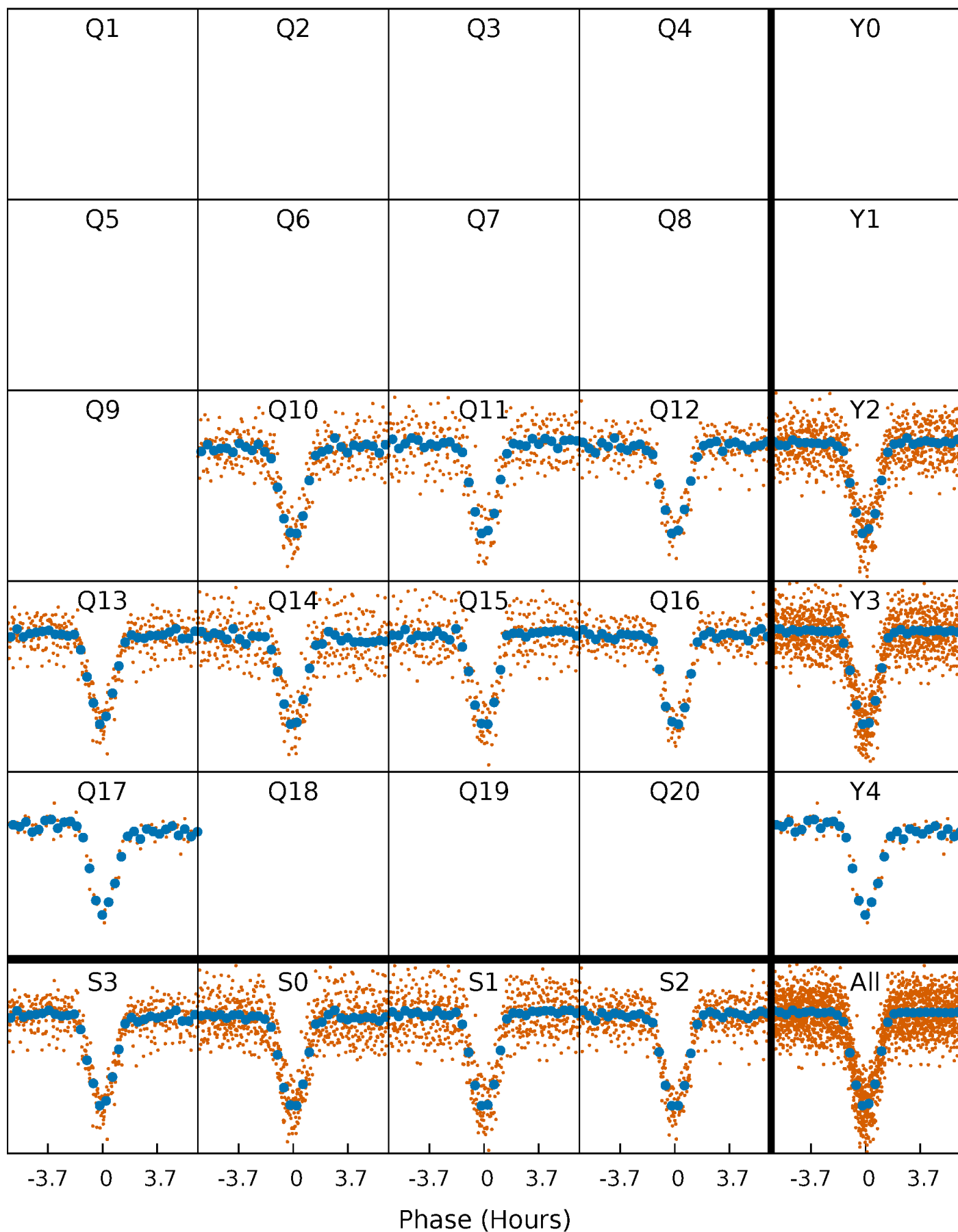


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



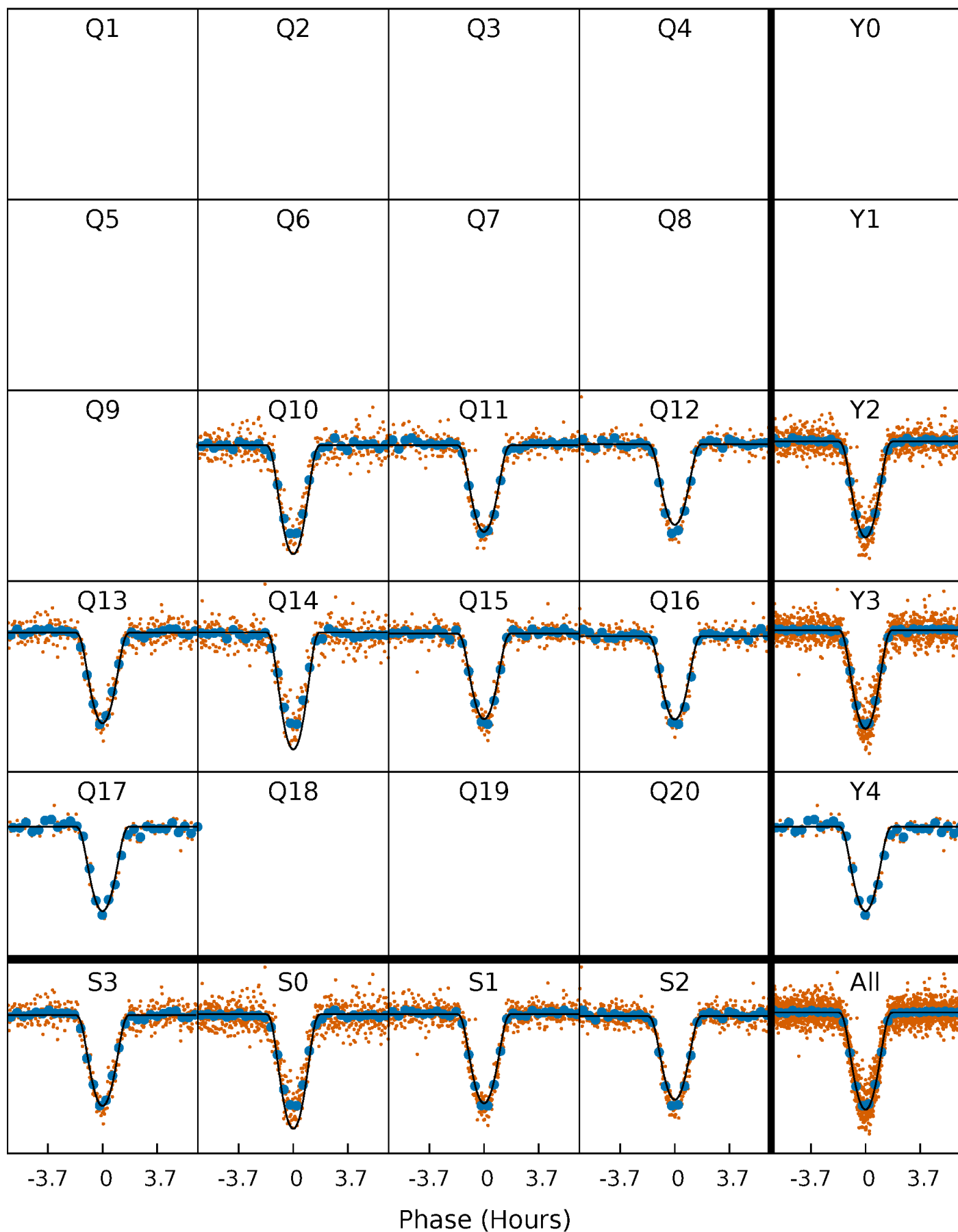
# PDC Quarter-Phased Transit Curves

TCE 010259029-02   P= 7.061104 Days    $T_0=131.639097$  (BKJD)



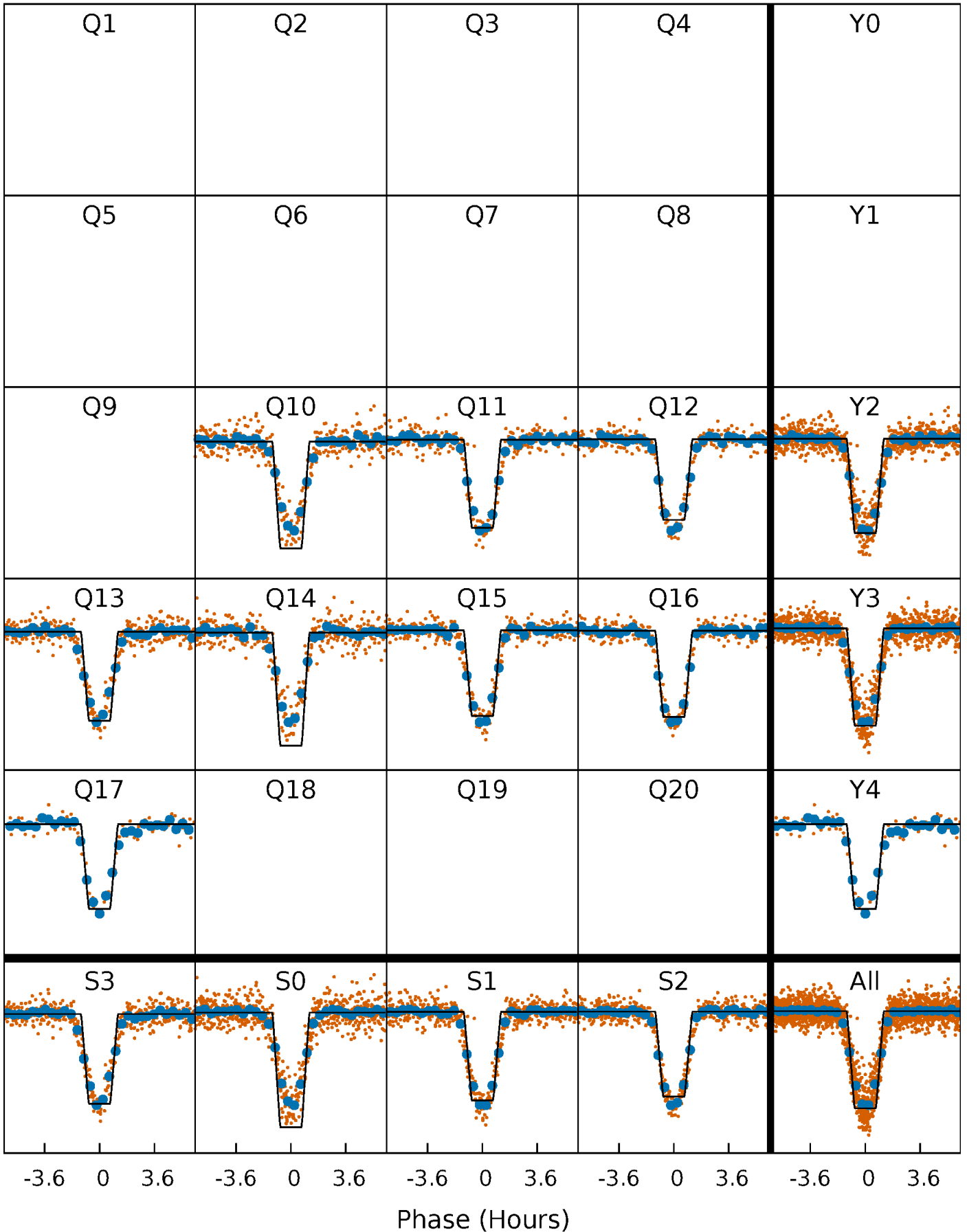
# DV Quarter-Phased Transit Curves

TCE 010259029-02   P= 7.061104 Days    $T_0=131.639097$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

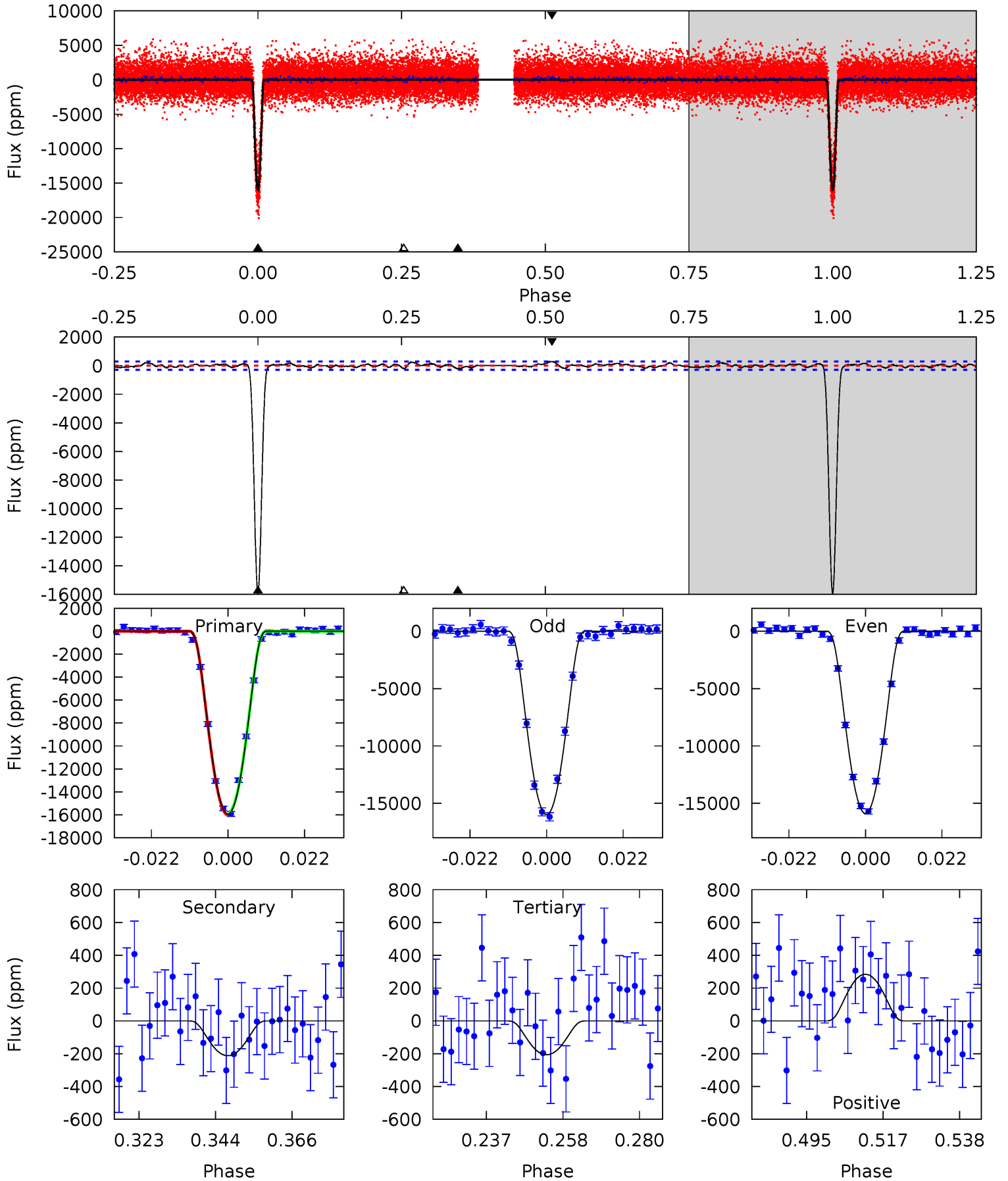
TCE 010259029-02   P= 7.061170 Days    $T_0=131.628512$  (BKJD)



# DV Model-Shift Uniqueness Test

010259029-02, P = 7.061104 Days, E = 131.639097 Days

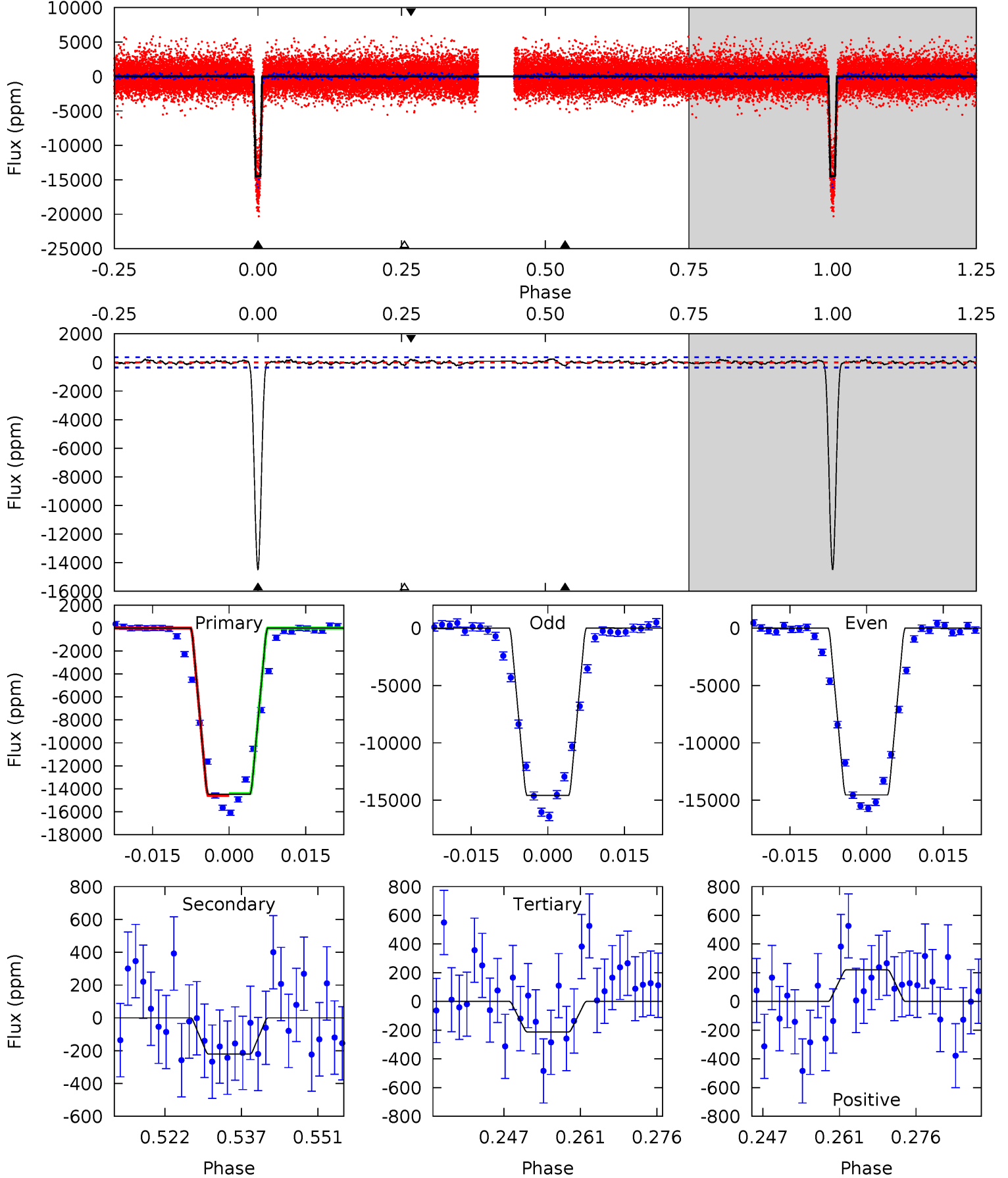
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
268.4	3.57	3.48	4.79	4.88	2.30	1.56	264.9	263.6	0.10	-1.21	0.84	0.96	0.02	1.41



# Alt Model-Shift Uniqueness Test

010259029-02, P = 7.061170 Days, E = 131.628512 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
200.9	3.07	2.94	3.05	4.95	2.44	1.15	198.0	197.9	0.13	0.01	0.23	0.96	0.02	1.16





### Stellar Parameters For KIC 010259029

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5585^{+186}_{-186}$	$4.564^{+0.050}_{-0.150}$	$-0.280^{+0.300}_{-0.300}$	$0.798^{+0.192}_{-0.082}$	$0.852^{+0.097}_{-0.089}$	$2.360^{+0.494}_{-1.027}$
	+3%/-3%	+1%/-3%	+107%/-107%	+24%/-10%	+11%/-10%	+21%/-44%
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 010259029-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-212 \pm 59$	$13.61^{+1.85}_{-1.59}$	$1195^{+71}_{-55}$	$2520^{+120}_{-134}$	$2.864^{+1.184}_{-0.988}$
Alt.	$-221 \pm 72$	$11.40^{+1.66}_{-1.46}$	$1201^{+72}_{-55}$	$2670^{+138}_{-152}$	$4.269^{+2.031}_{-1.511}$

$T_{\text{max}}$  = 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

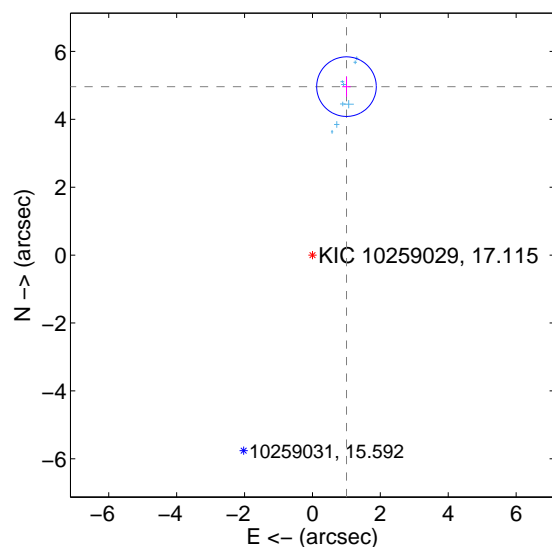
Supplemental centroid analysis for 010259029-02. Kepler magnitude: 17.11. Transit SNR 142.91

There are 8 quarters with good PRF difference image offsets

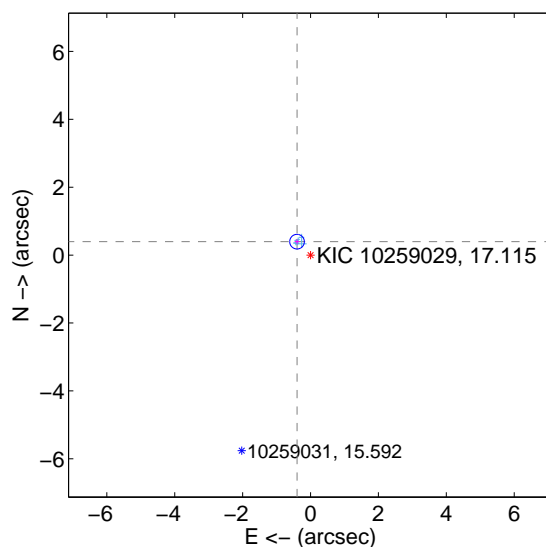
The OOT PRF centroid is offset from the target star catalog position by about 4.32 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.062 \pm 0.293$	17.30	$-1.002 \pm 0.126$	$4.962 \pm 0.297$
PRF-fit source offset from KIC position	$0.561 \pm 0.072$	7.80	$0.398 \pm 0.072$	$0.395 \pm 0.072$
photometric centroid source offset	$2.66 \pm 0.04$	73.78	$0.97 \pm 0.03$	$-2.48 \pm 0.04$

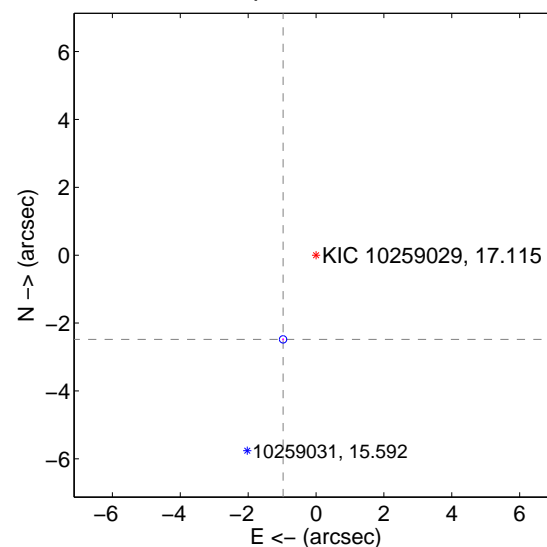
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

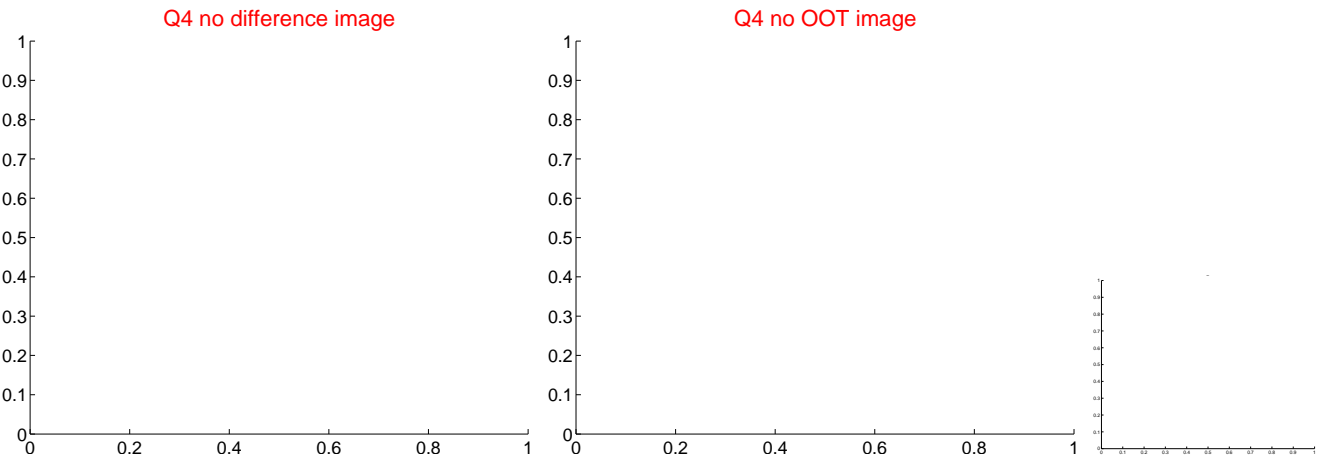
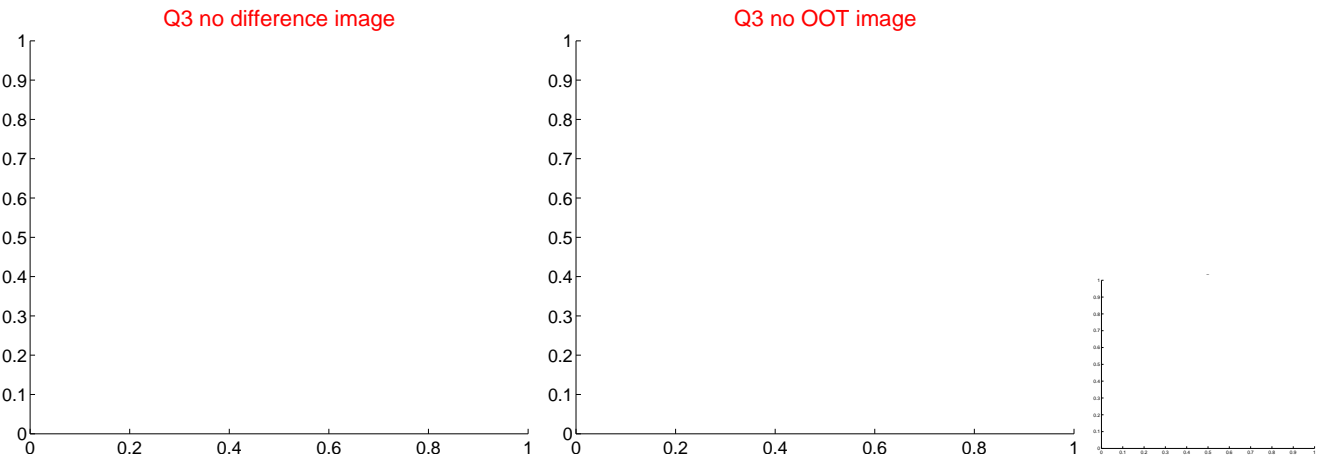
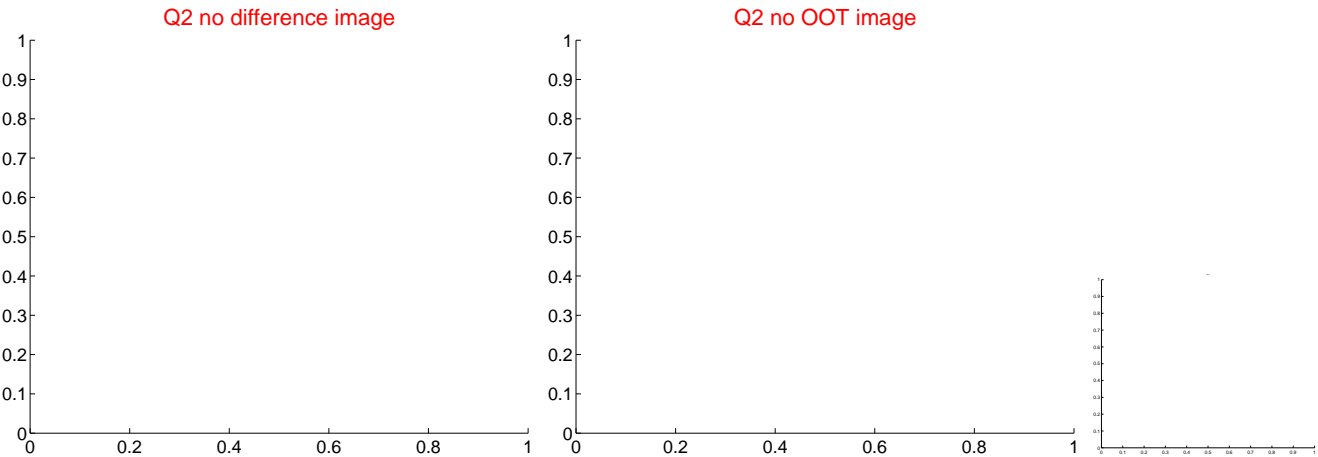
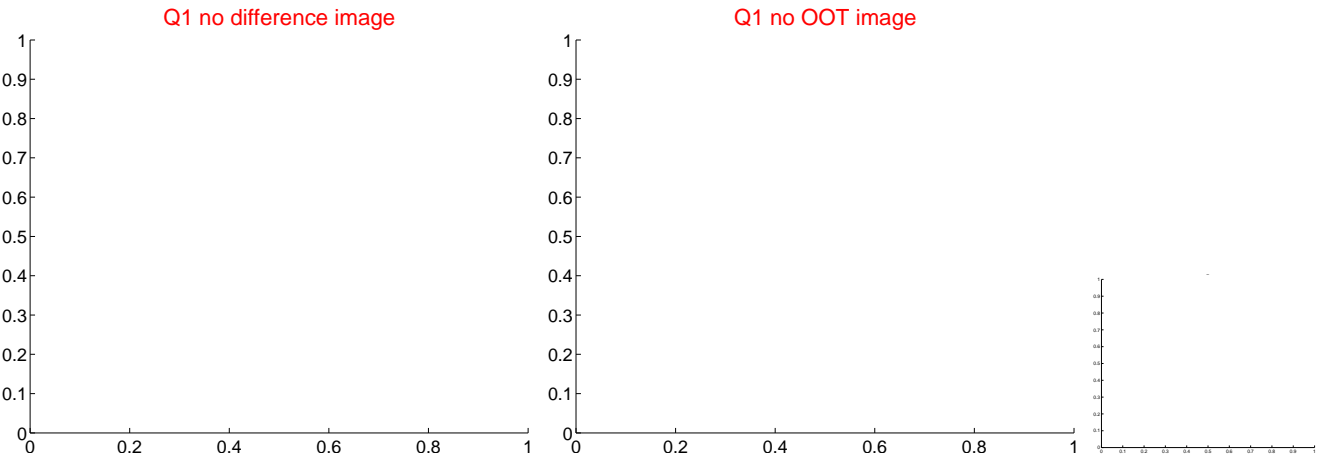


offset from photometric centroids

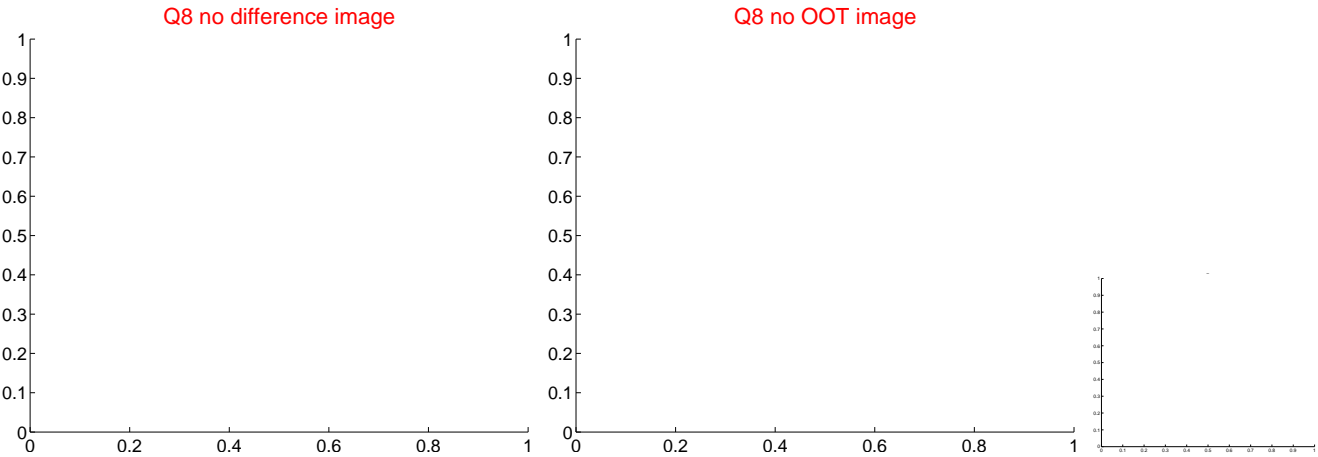
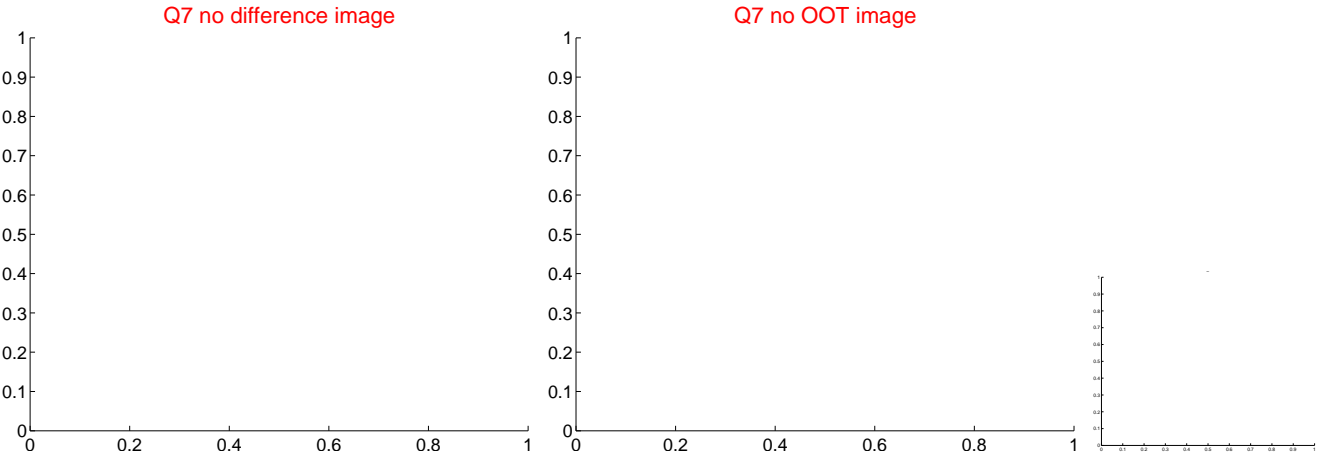
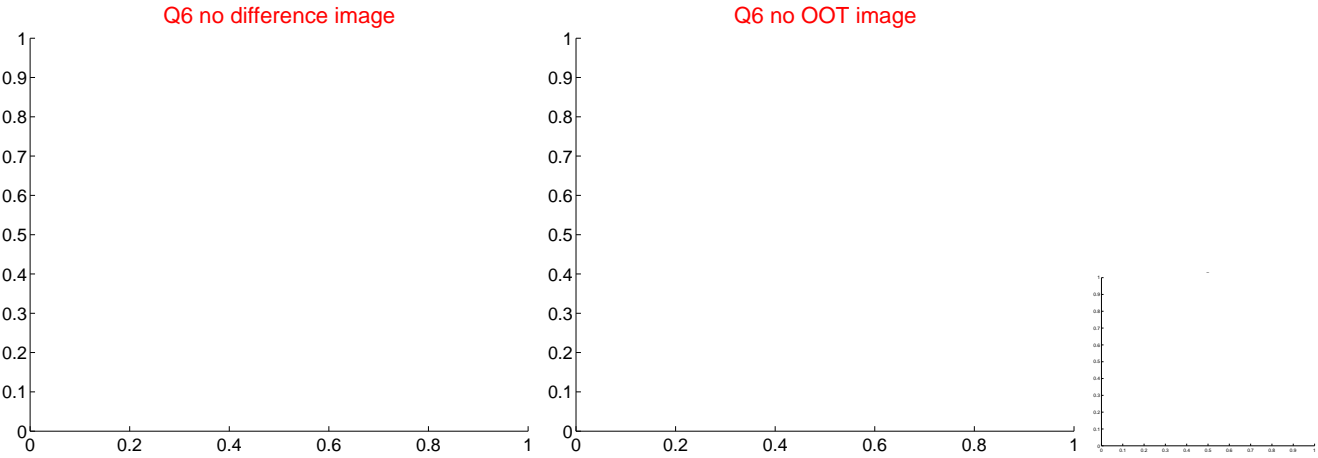
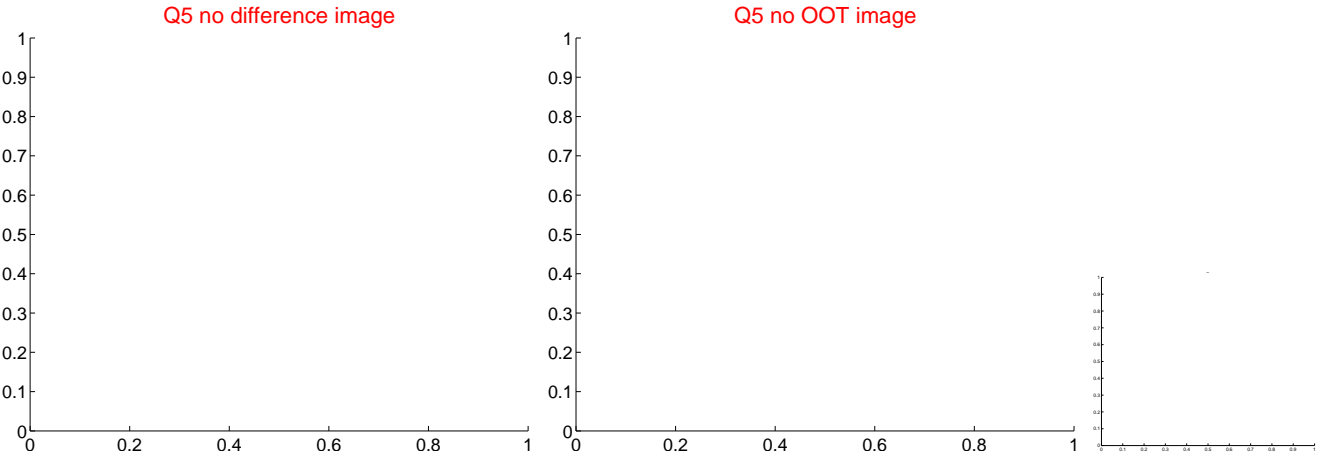


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

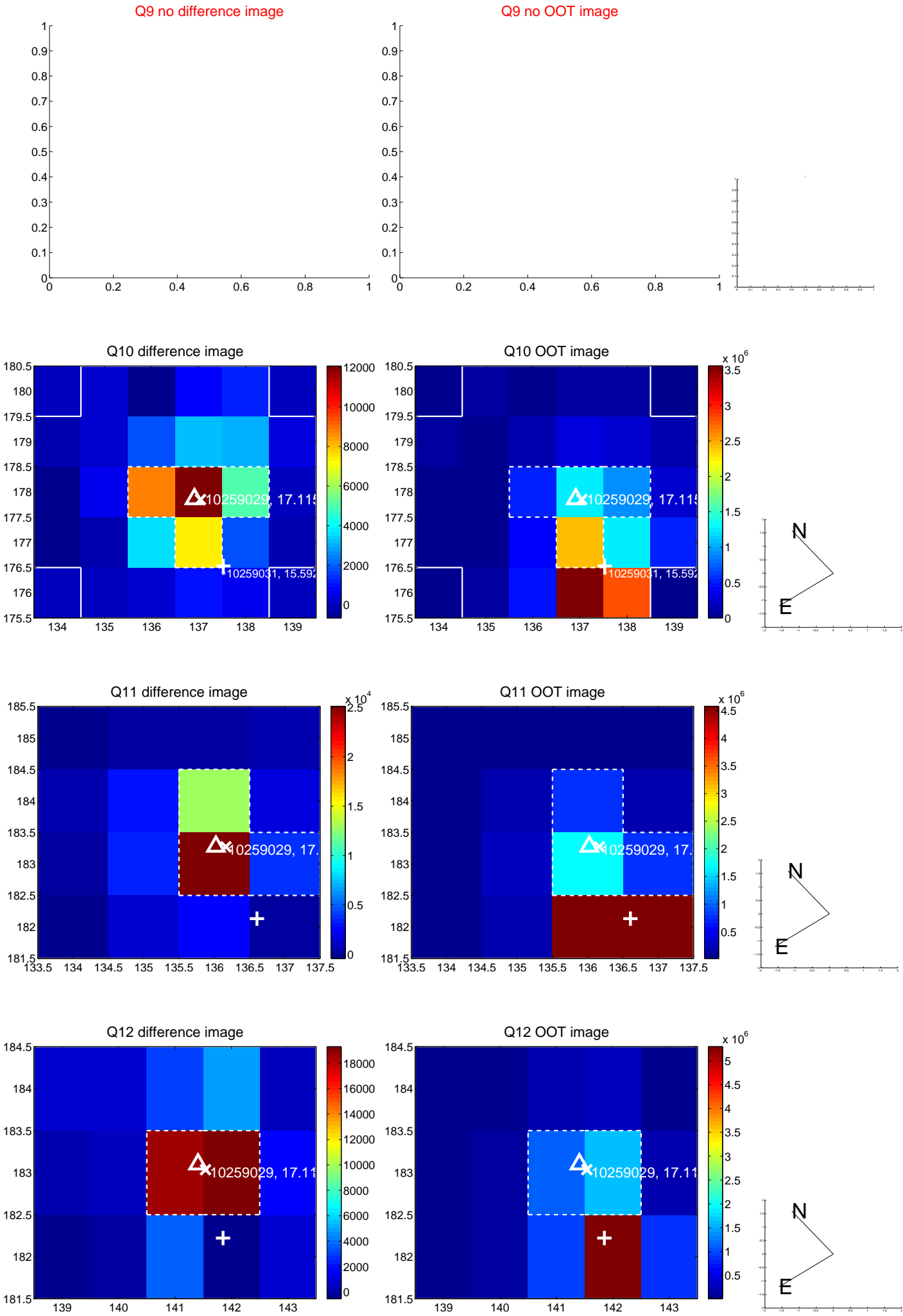
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



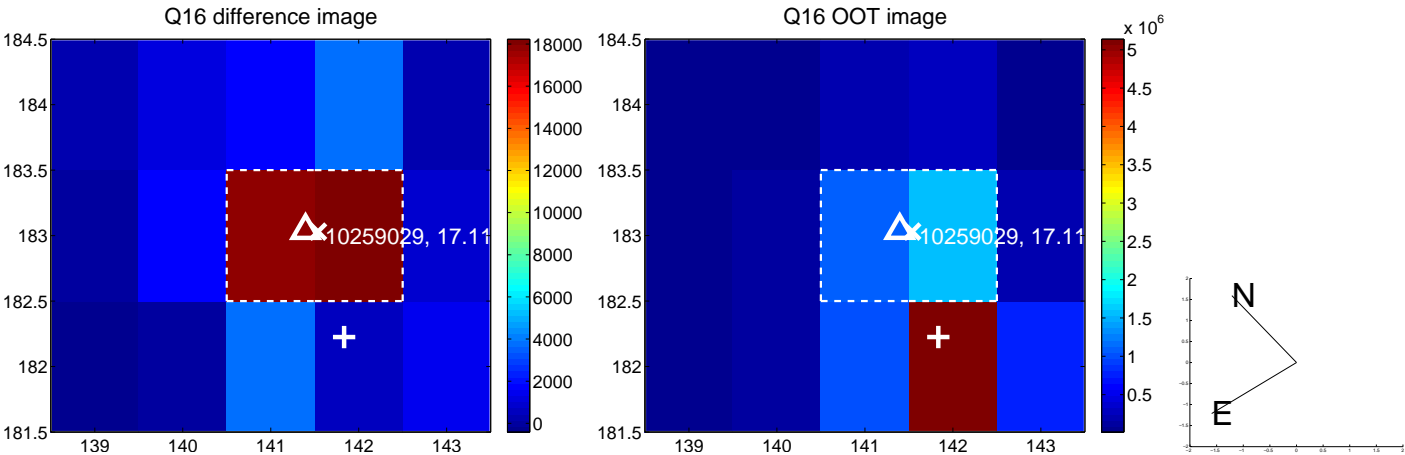
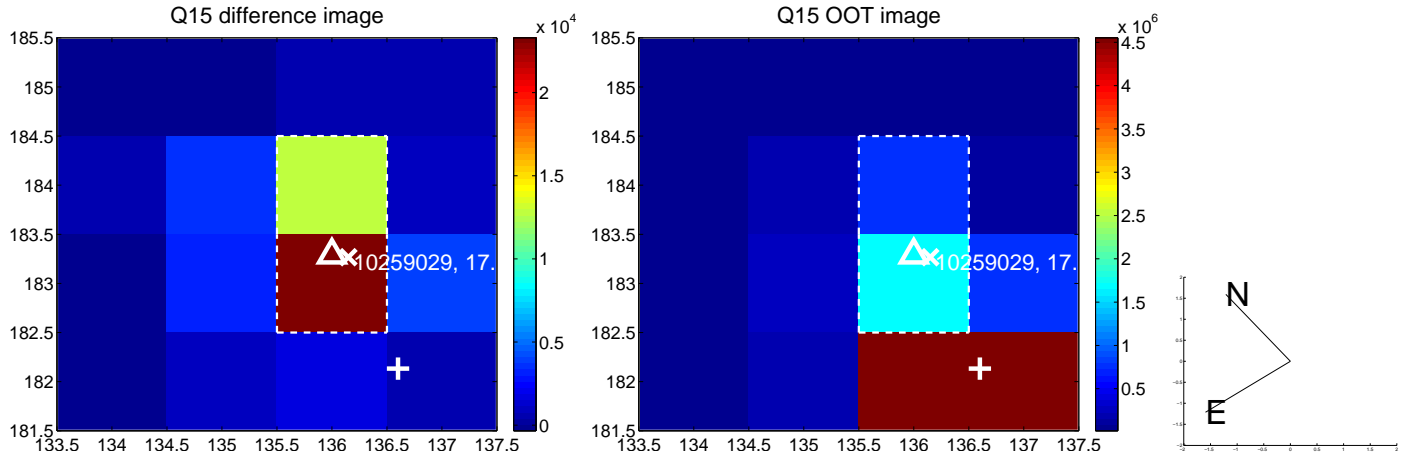
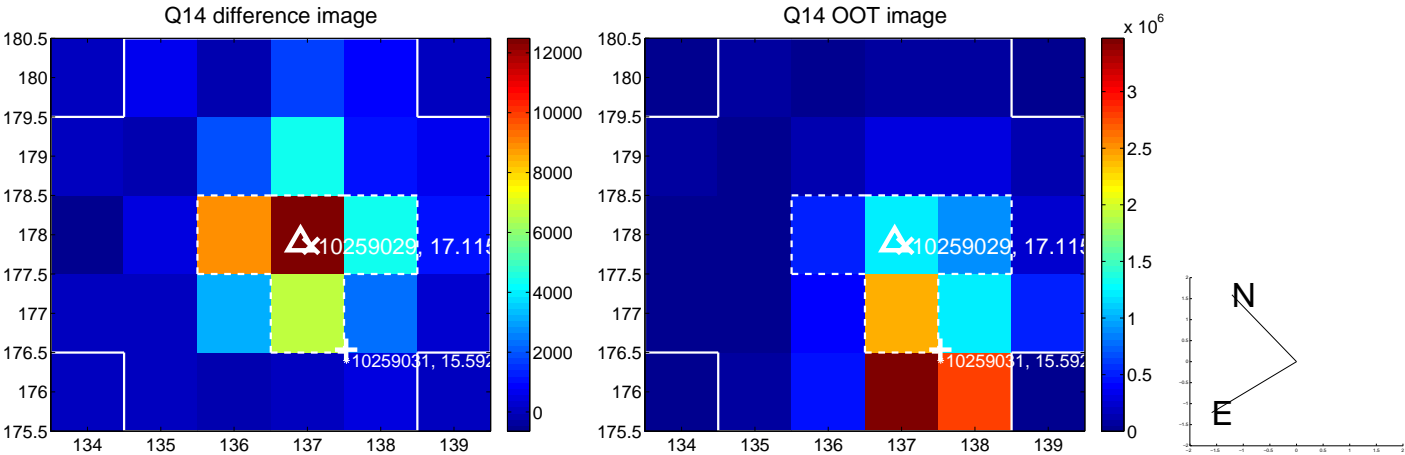
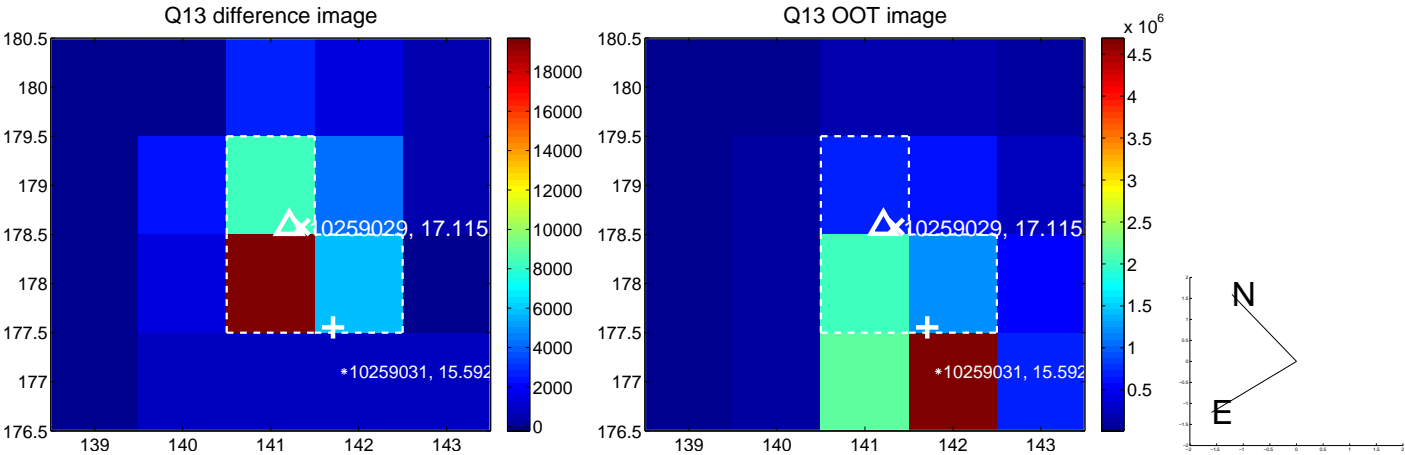
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



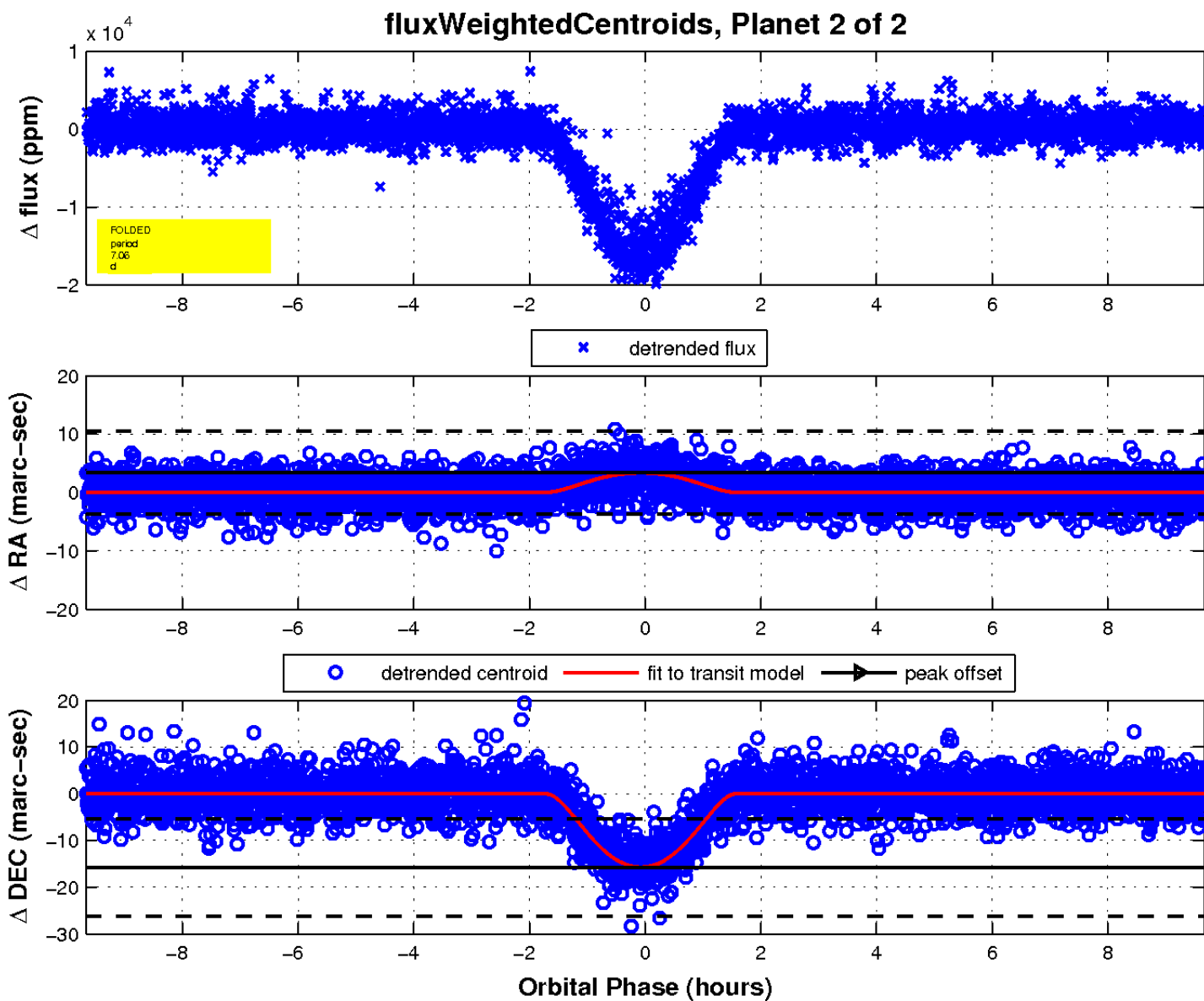
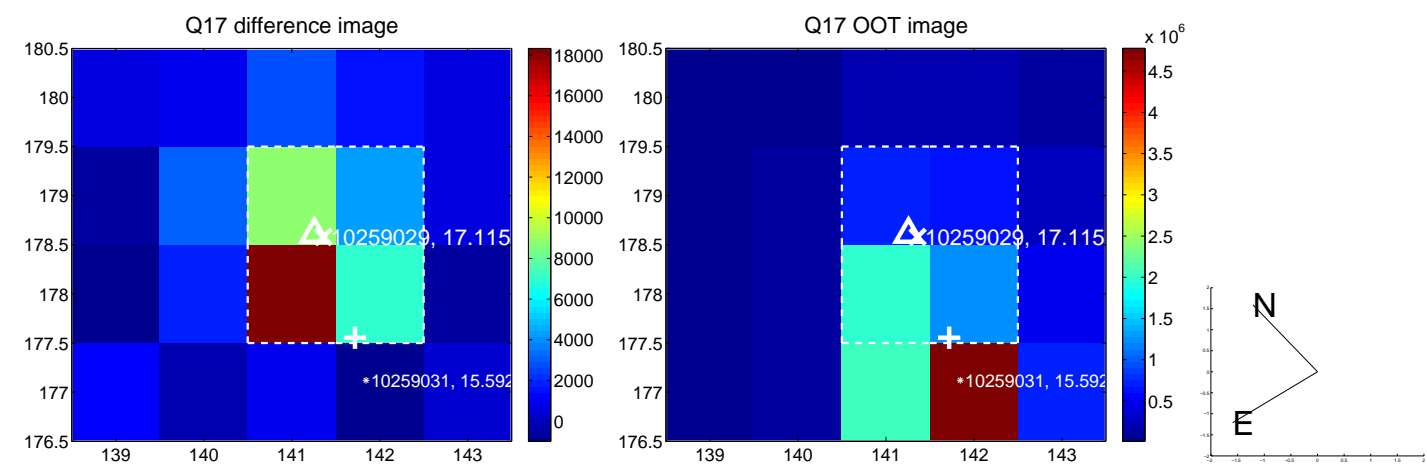
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

