

# KIC 007765528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007765528-01	OBS	1840.01	7.039311	133.856456	810.4	3.355	39.7	45.2	1.24	5846	4.50	298.70
007765528-02	OBS	1840.02	9.388922	134.408091	171.5	3.290	7.7	9.0	1.24	5846	1.94	203.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007765528-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007765528-02	OBS	PC	0.84	0	0	0	0	NO_COMMENT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

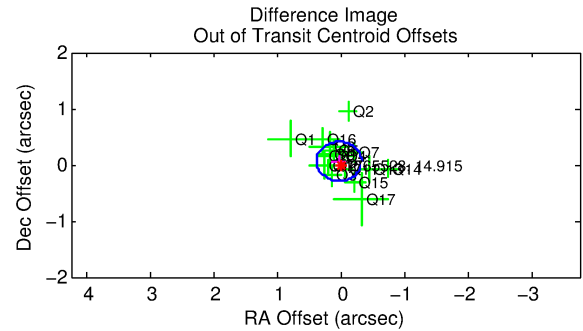
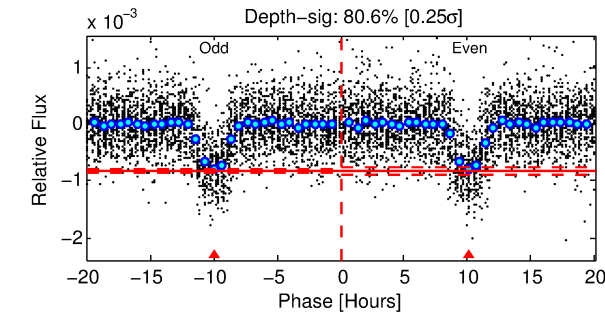
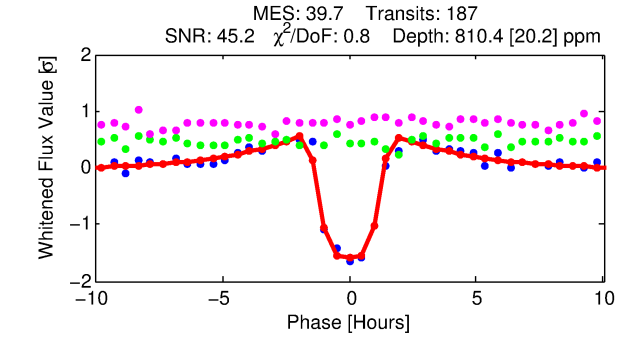
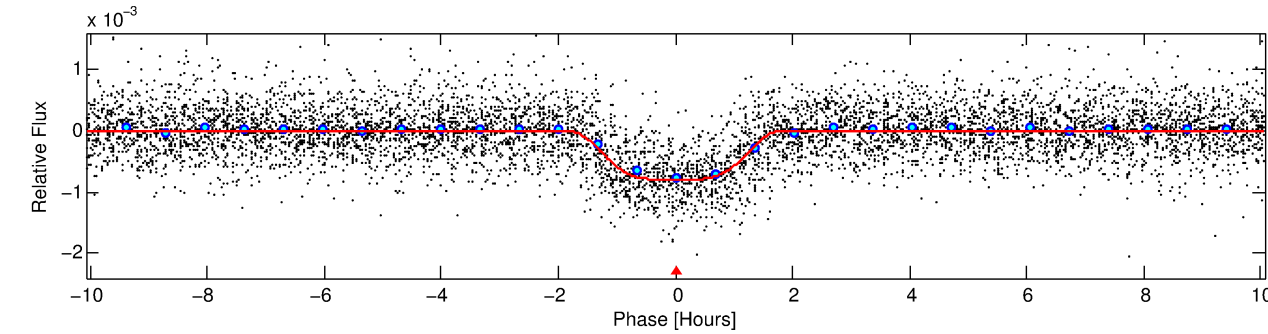
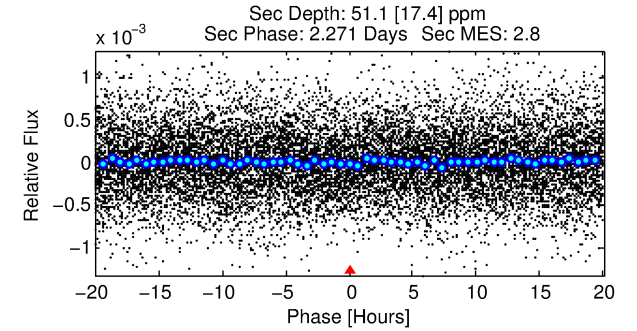
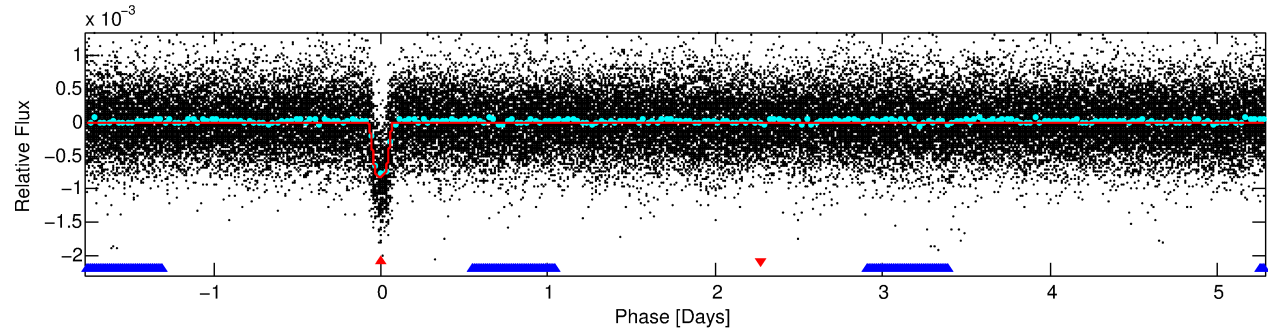
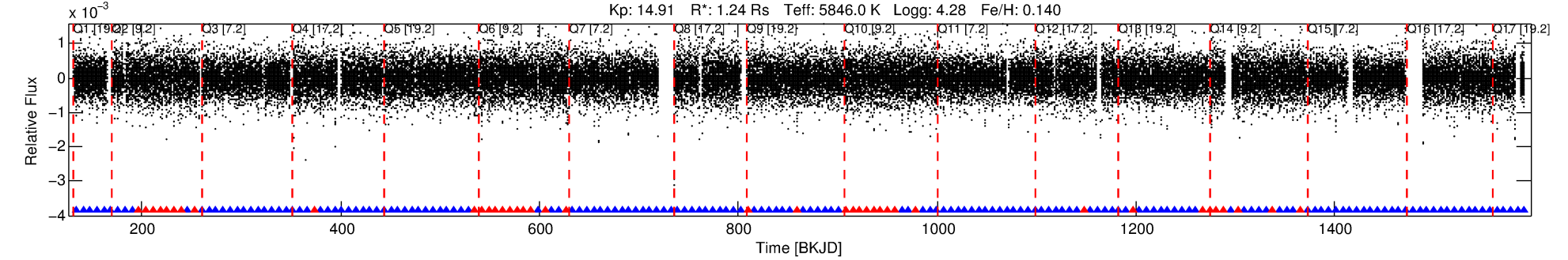
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007765528-01

No Significant Match Found

# DV One-Page Summary

KIC: 7765528 Candidate: 1 of 2 Period: 7.039 d  
KOI: K01840.01 Corr: 0.986



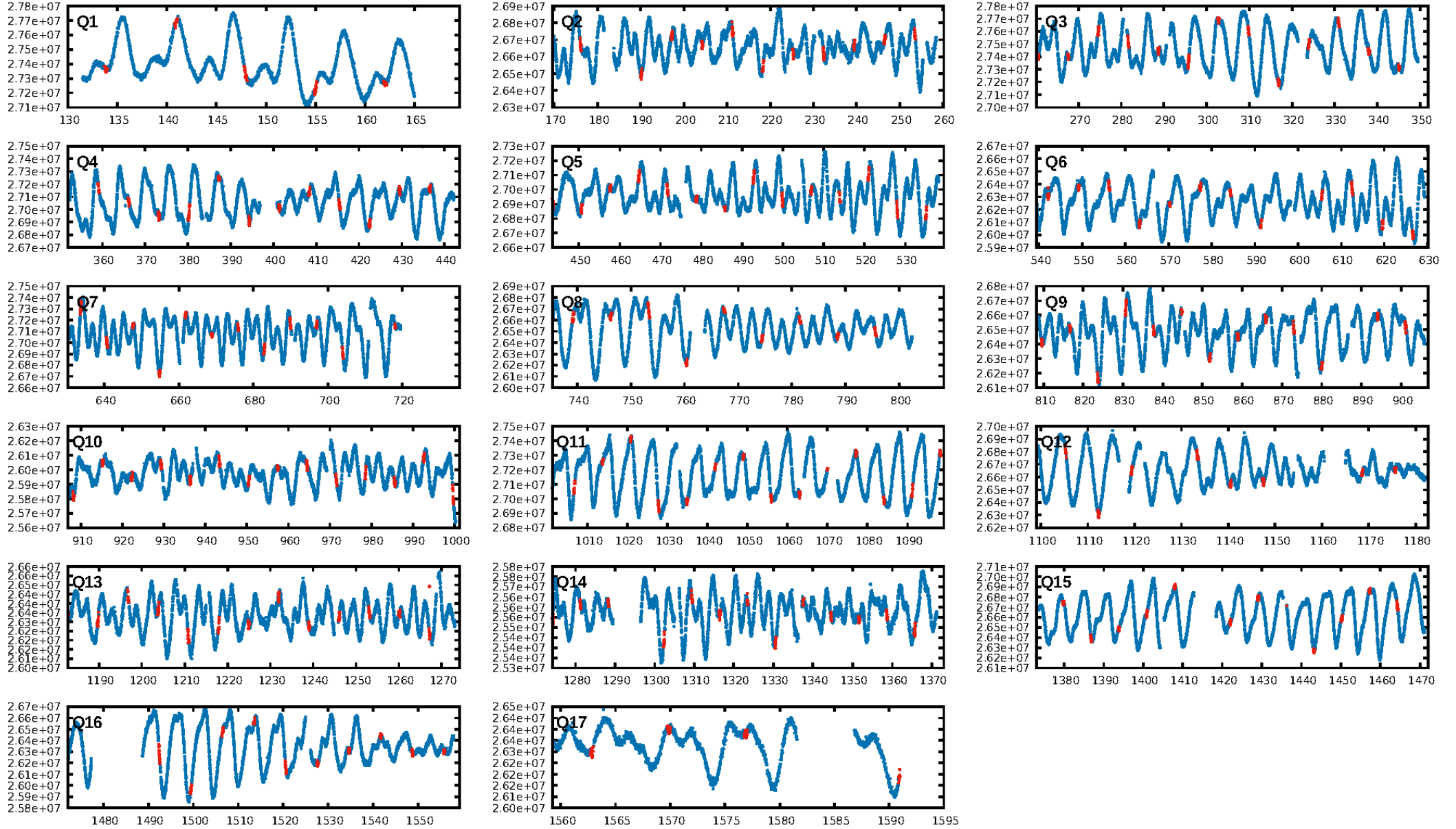
## DV Fit Results:

Period = 7.03931 [0.00001] d  
Epoch = 133.8565 [0.0013] BKJD  
Rp/R\* = 0.0332 [0.0007]  
a/R\* = 6.58 [0.38]  
b = 0.95 [0.01]  
Seff = 298.70 [71.37]  
Teq = 1060 [63] K  
Rp = 4.50 [0.78] Re  
a = 0.0734 [0.0112] AU  
Ag = 7.48 [3.10] [2.09 $\sigma$ ]  
Teffp = 2711 [235] K [6.78 $\sigma$ ]

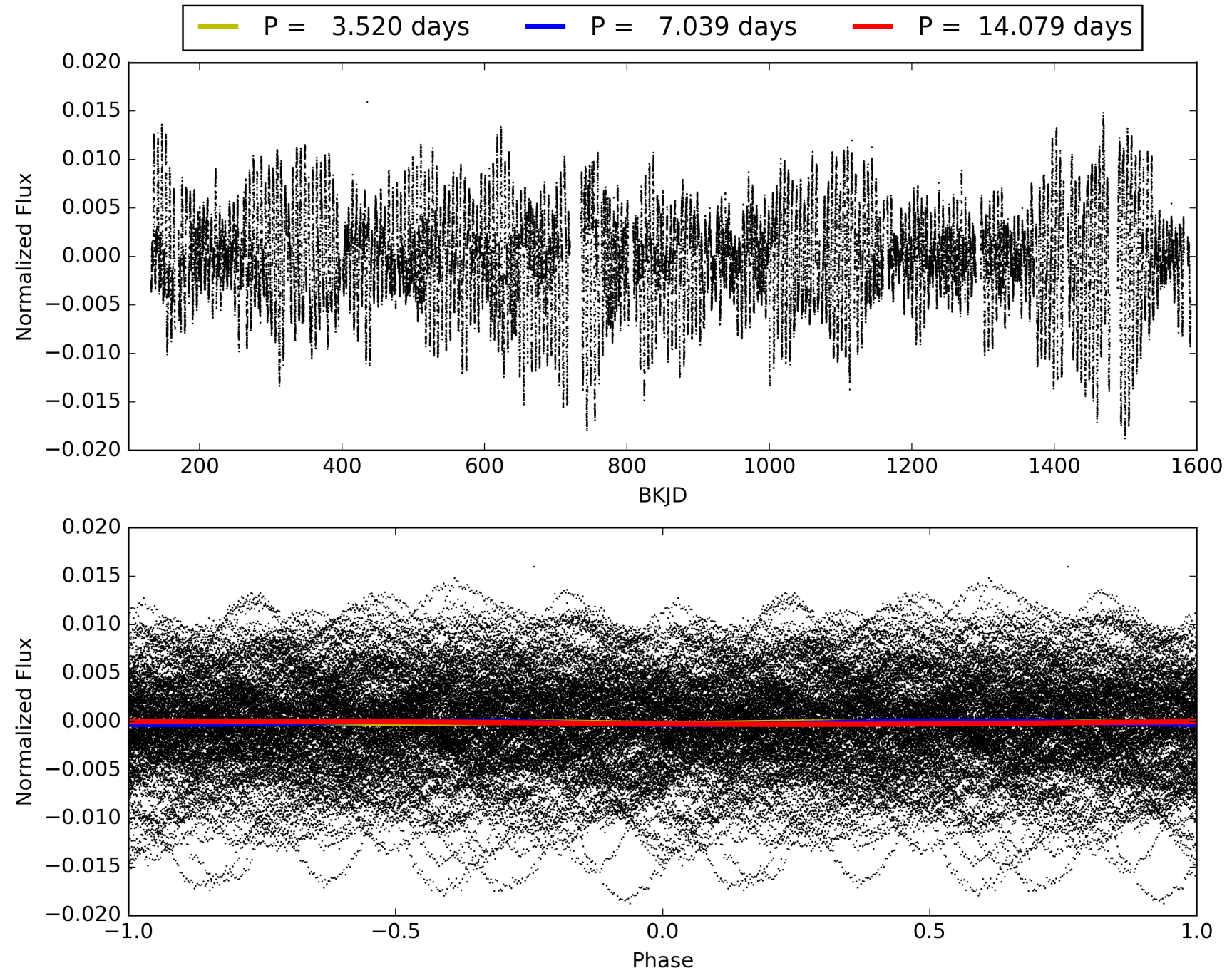
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [12.00 $\sigma$ ]  
ModelChiSquare2-sig: 95.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.78 [138/178]  
GhostDiagnostic-chr: 11.76  
Centroid-sig: 0.2%  
Centroid-so: 0.614 arcsec [2.67 $\sigma$ ]  
OotOffset-rm: 0.069 arcsec [0.59 $\sigma$ ]  
KicOffset-rm: 0.116 arcsec [1.06 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007765528-01, PDC Light Curves

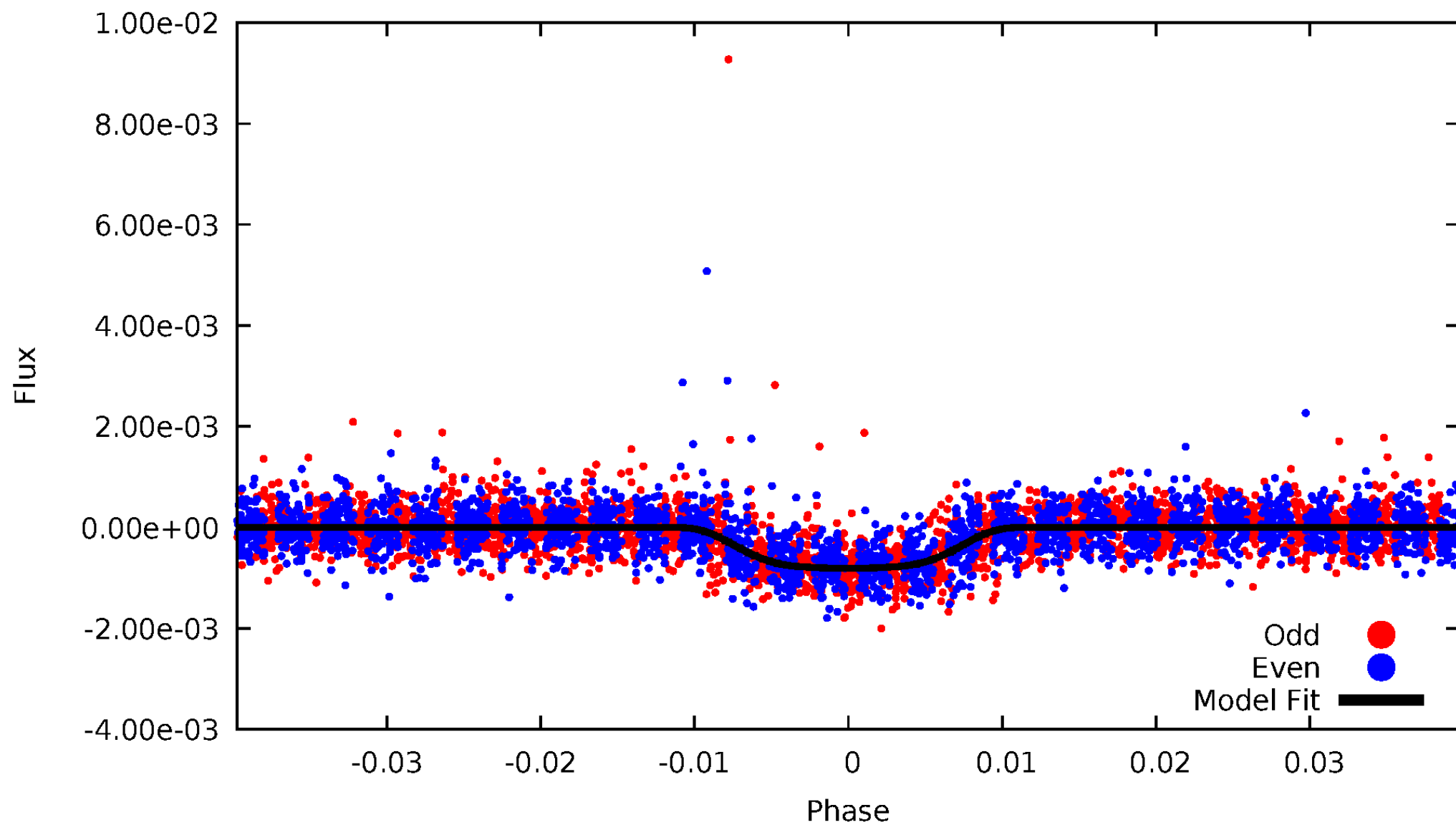


TCE 007765528-01



# DV Odd/Even

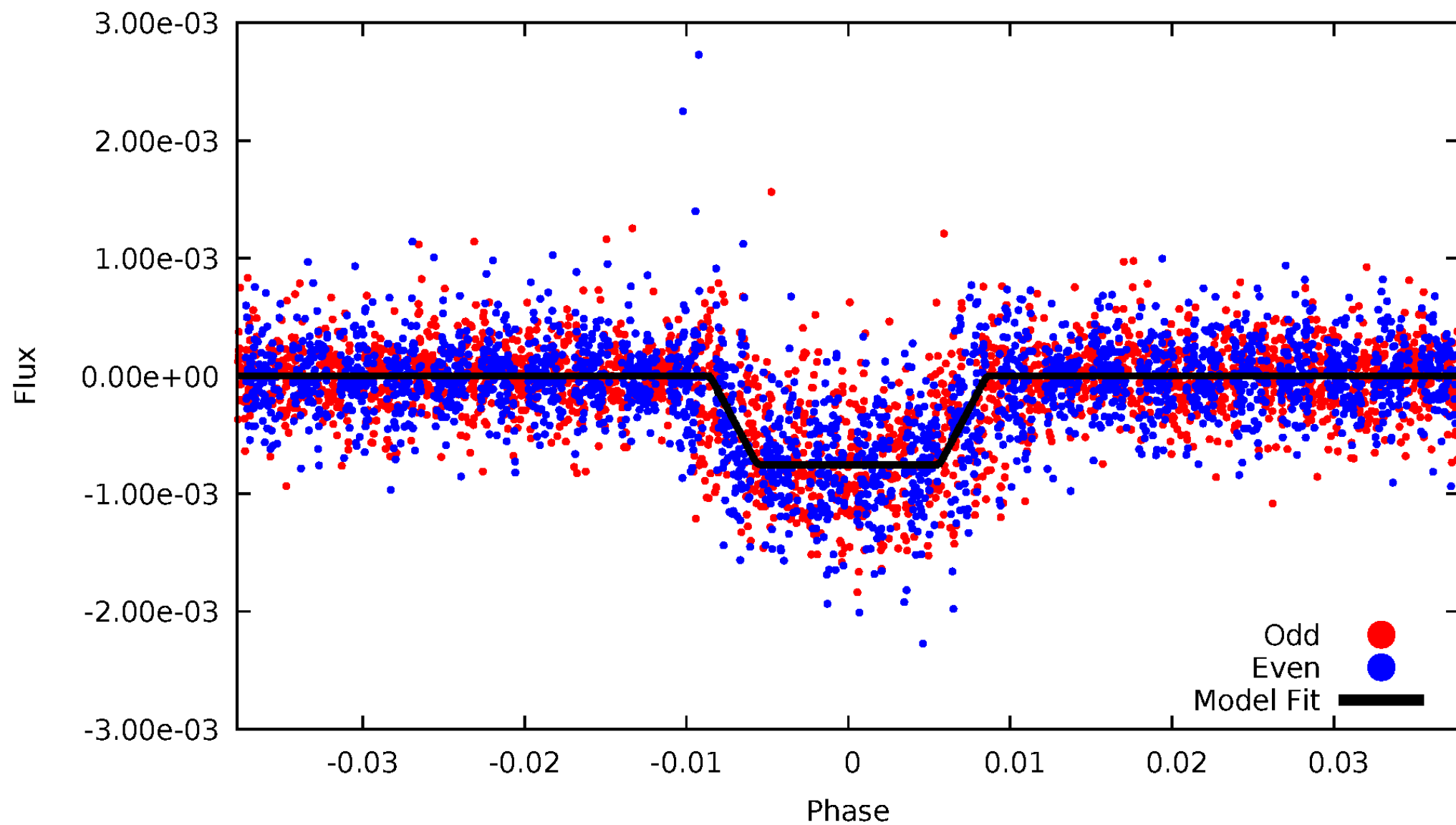
TCE 007765528-01





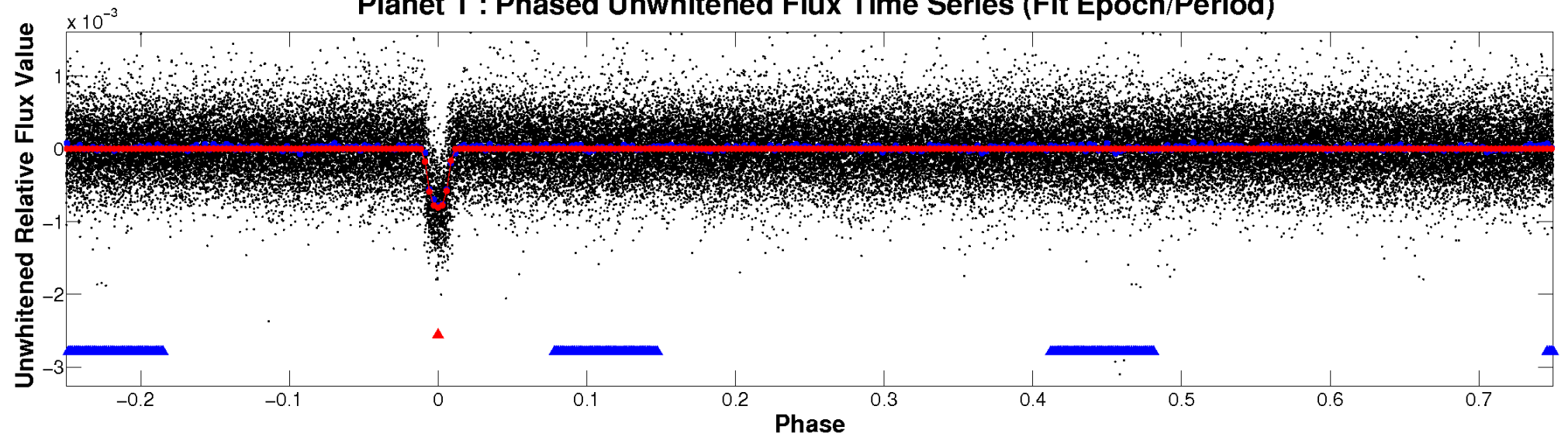
# ALT Odd/Even

TCE 007765528-01

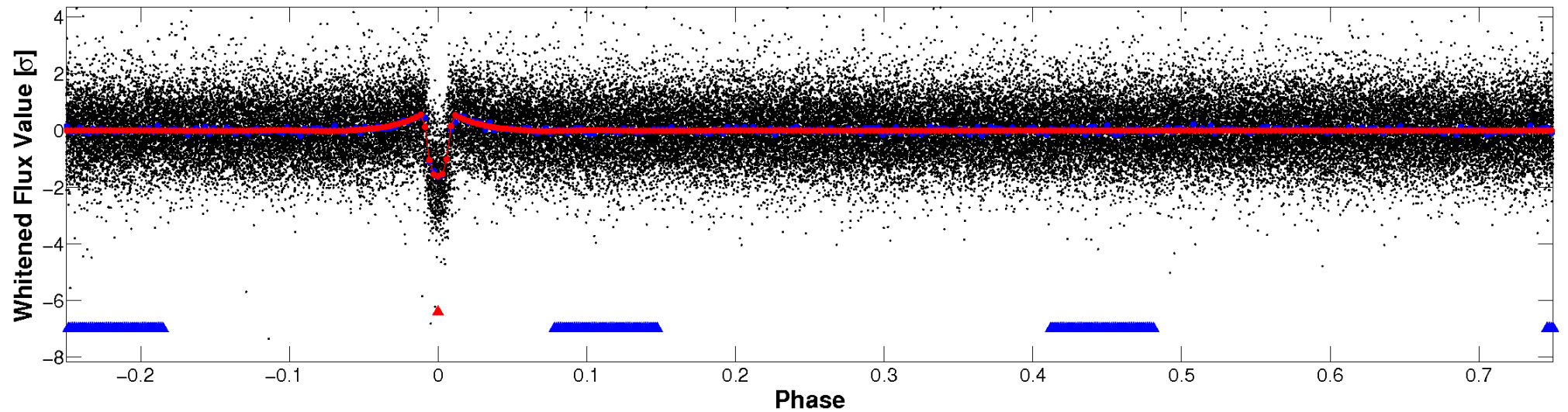


# Non-Whitened Vs. Whitened Light Curve

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

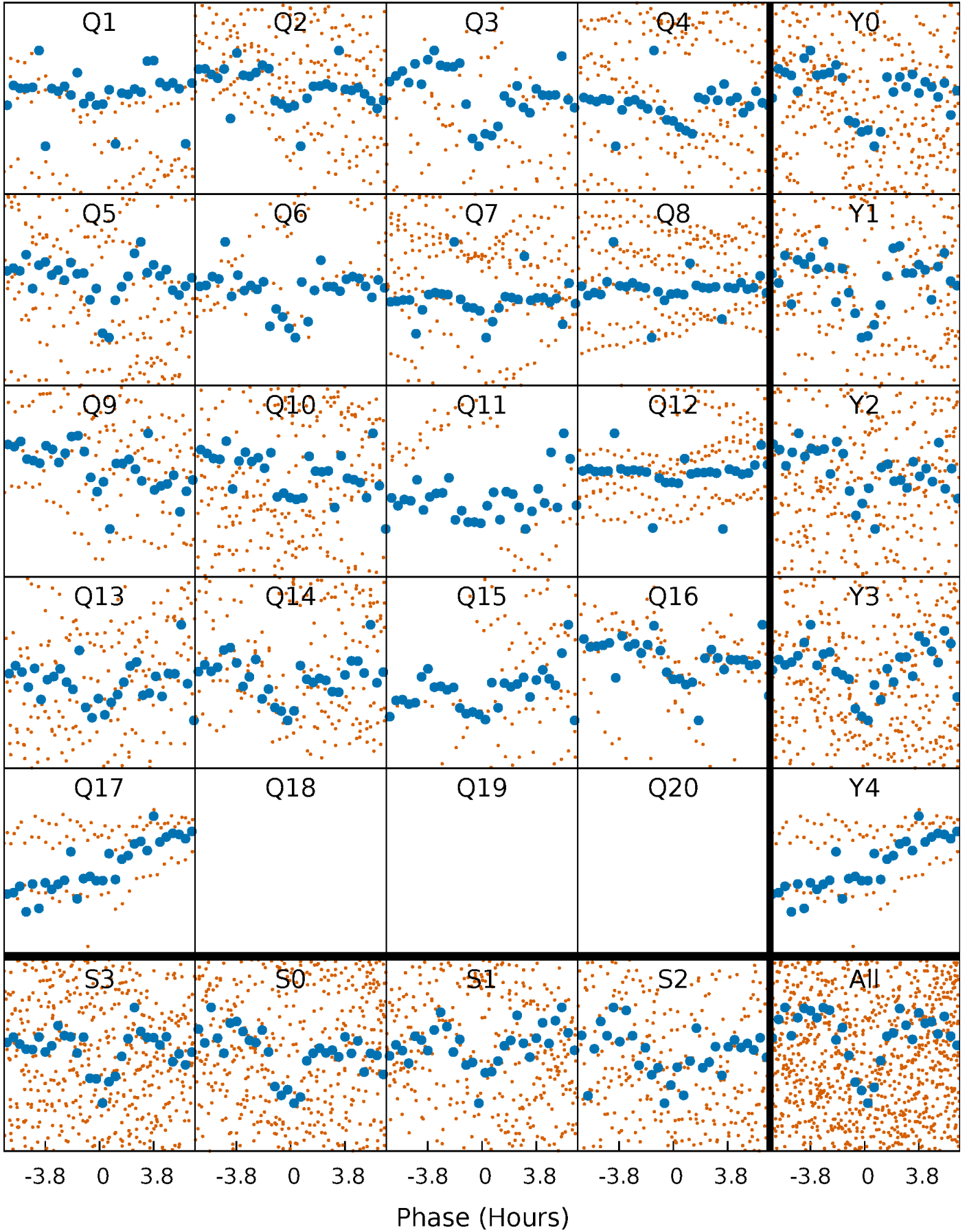


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

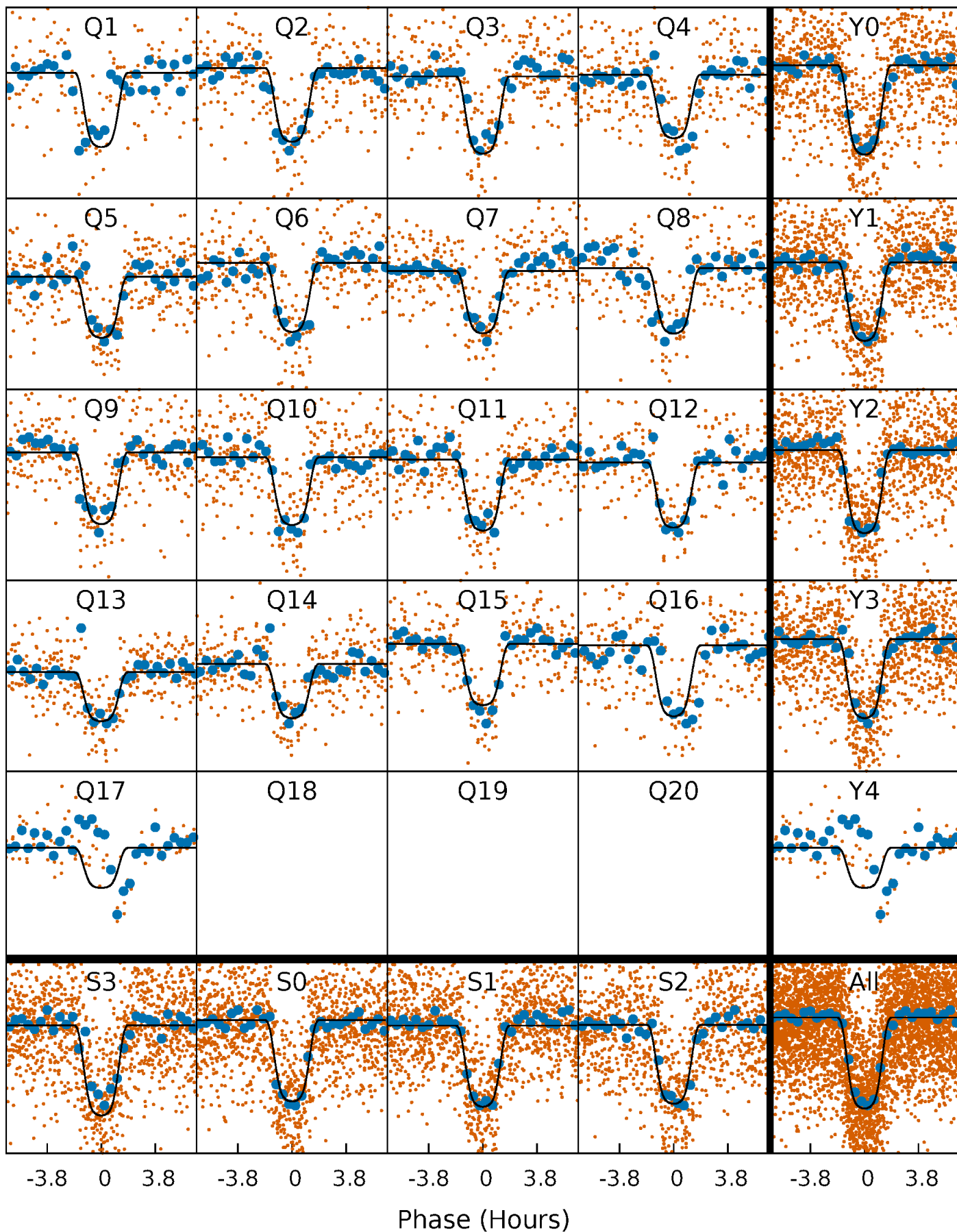
TCE 007765528-01 P= 7.039311 Days  $T_0=133.856456$  (BKJD)





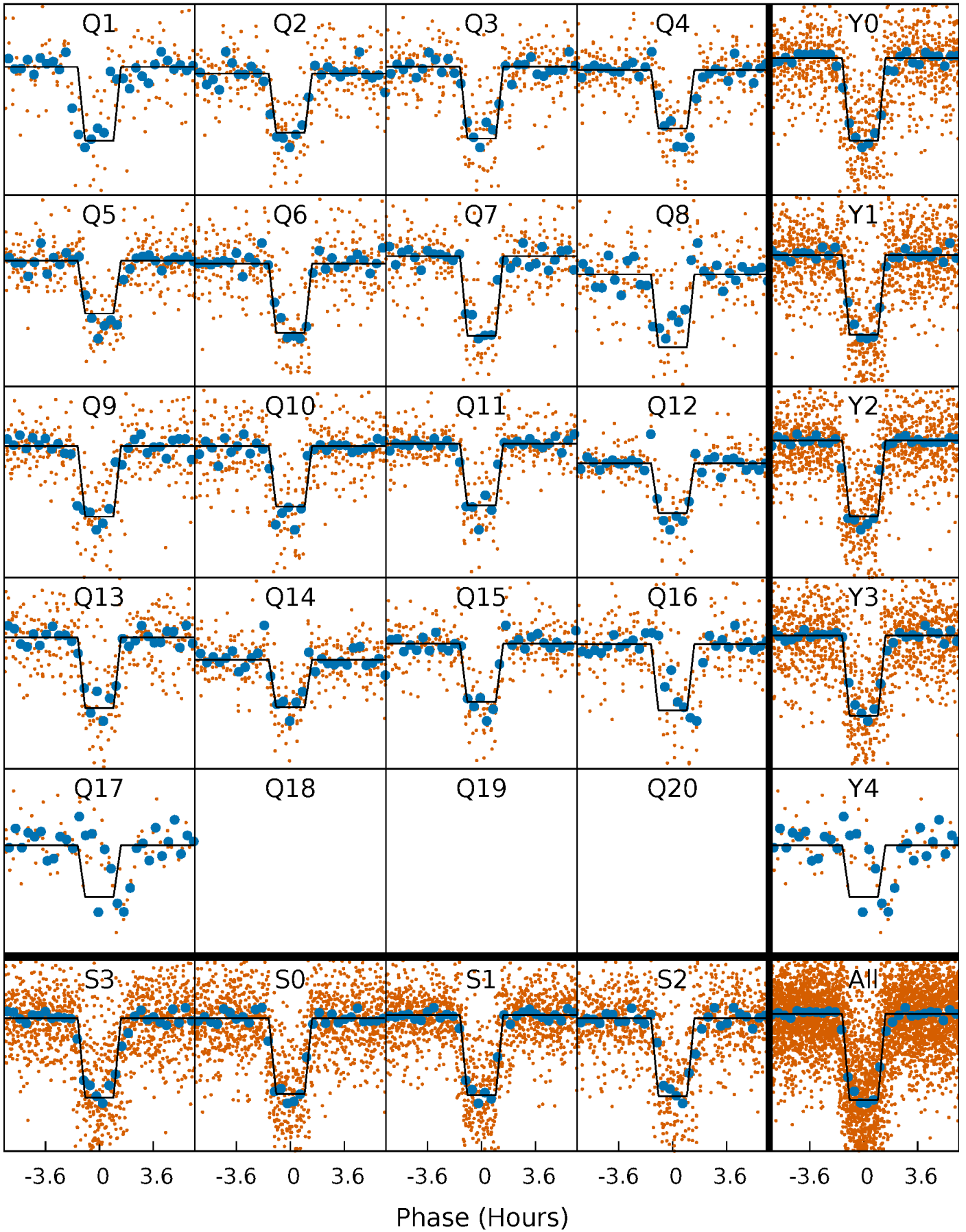
# DV Quarter-Phased Transit Curves

TCE 007765528-01 P= 7.039311 Days  $T_0=133.856456$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

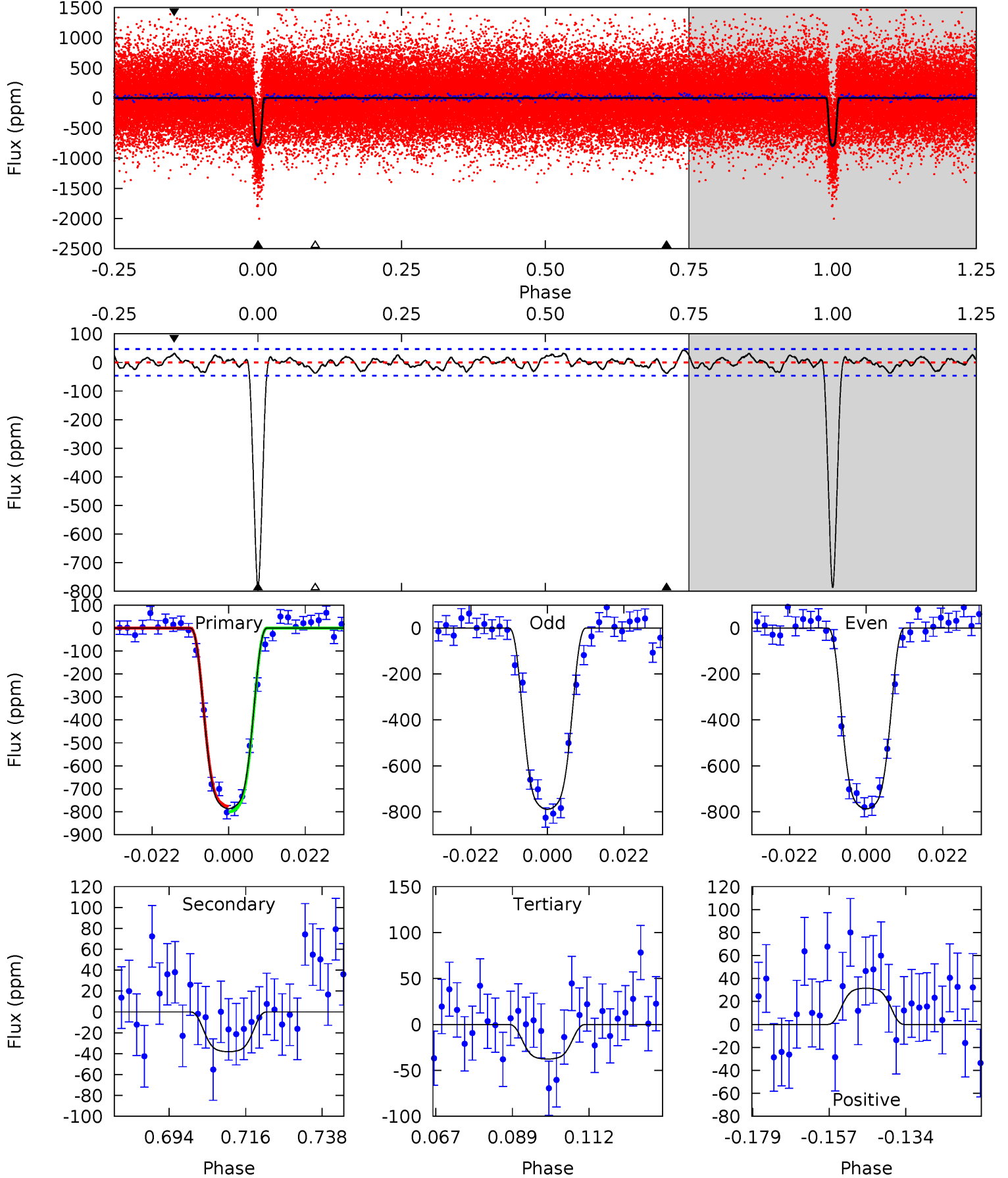
TCE 007765528-01 P= 7.039303 Days  $T_0=133.857858$  (BKJD)



# DV Model-Shift Uniqueness Test

007765528-01, P = 7.039311 Days, E = 126.817145 Days

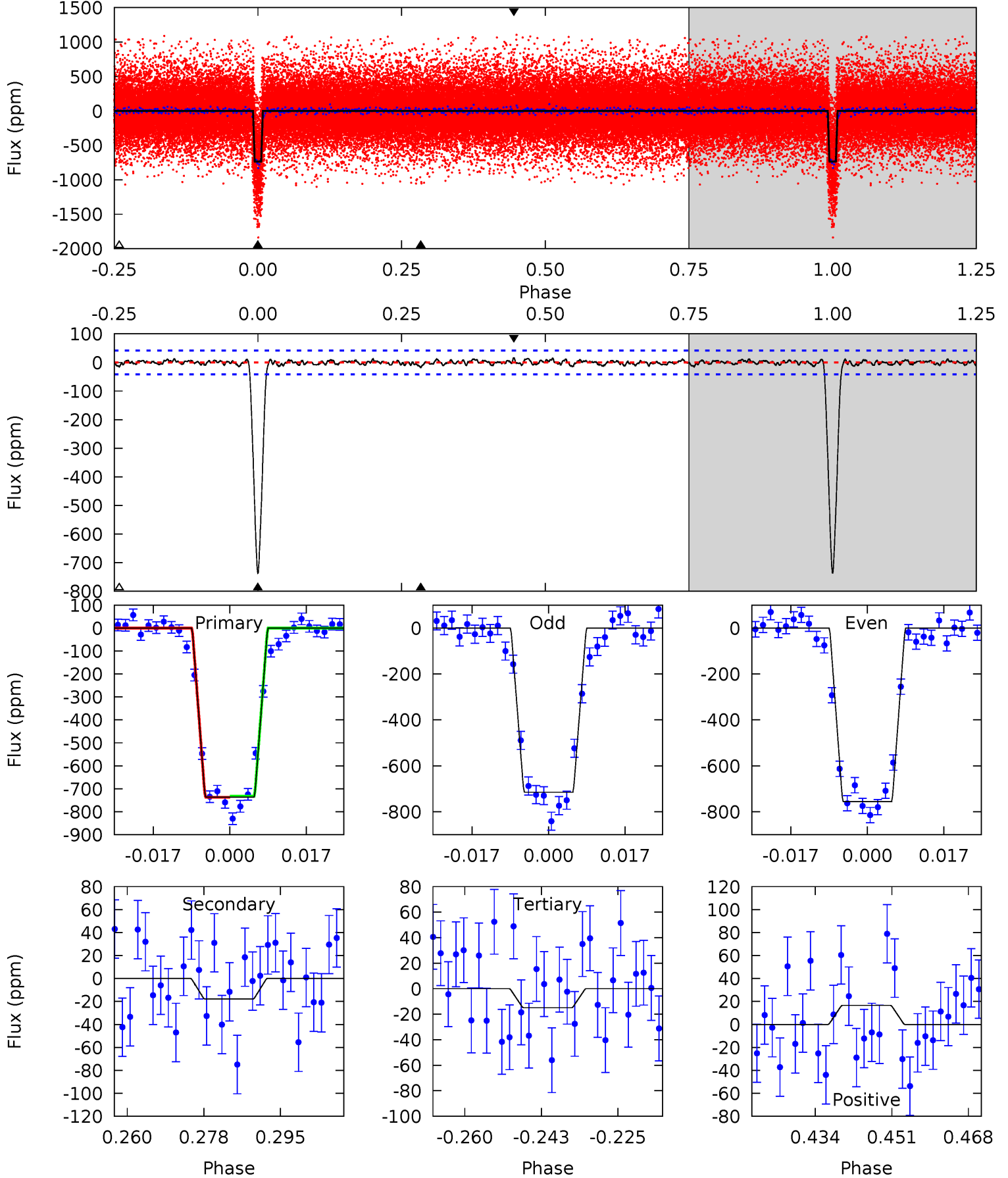
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.2	3.99	3.94	3.30	4.87	2.28	1.60	78.3	78.9	0.05	0.69	0.11	0.97	0.05	1.26



# Alt Model-Shift Uniqueness Test

007765528-01, P = 7.039303 Days, E = 126.818555 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
87.0	2.12	1.77	1.96	4.92	2.38	0.67	85.2	85.0	0.35	0.16	2.41	0.99	0.02	0.30



### Stellar Parameters For KIC 007765528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5846^{+79}_{-79}$	$4.278^{+0.132}_{-0.108}$	$0.140^{+0.150}_{-0.150}$	$1.240^{+0.213}_{-0.194}$	$1.064^{+0.078}_{-0.070}$	$0.786^{+0.439}_{-0.284}$
	+1%/-1%	+3%/-3%	+107%/-107%	+17%/-16%	+7%/-7%	+56%/-36%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 007765528-01 / KOI 1840.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-38 \pm 10$	$4.47^{+0.43}_{-0.37}$	$1477^{+63}_{-61}$	$3106^{+119}_{-128}$	$5.585^{+1.835}_{-1.609}$
Alt.	$-18 \pm 8$	$3.69^{+0.35}_{-0.33}$	$1474^{+63}_{-63}$	$2939^{+186}_{-251}$	$3.925^{+2.040}_{-1.792}$

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



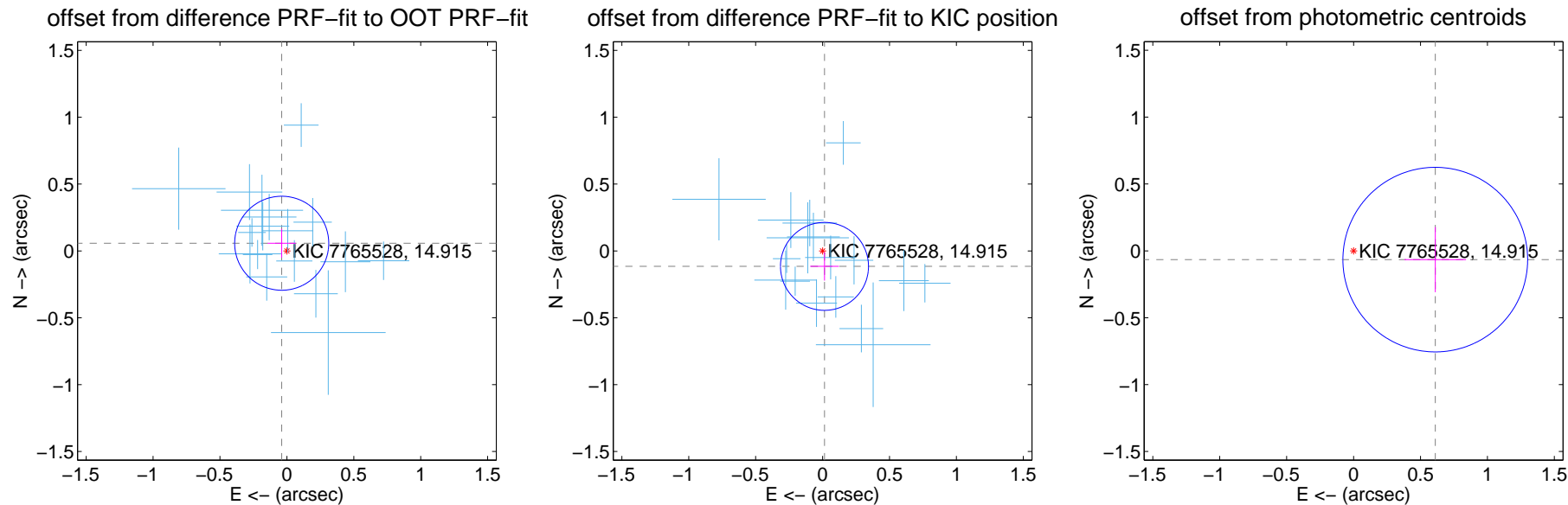
## DV Centroid Data

Supplemental centroid analysis for 007765528-01. Kepler magnitude: 14.91. Transit SNR 45.23

There are 17 quarters with good PRF difference image offsets

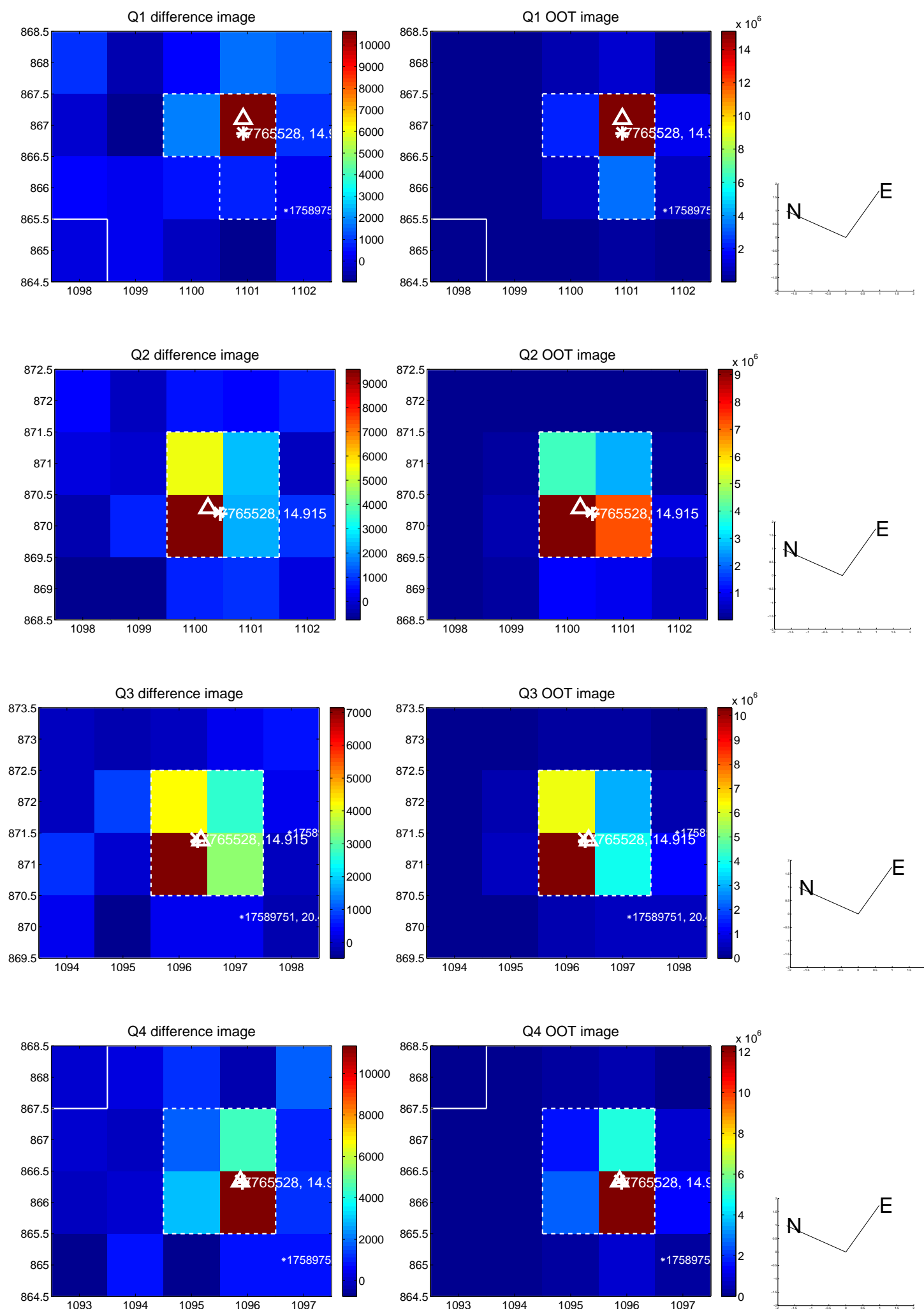
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.069 \pm 0.117$	0.59	$0.039 \pm 0.105$	$0.057 \pm 0.108$
PRF-fit source offset from KIC position	$0.116 \pm 0.110$	1.06	$-0.014 \pm 0.107$	$-0.115 \pm 0.106$
photometric centroid source offset	$0.61 \pm 0.23$	2.67	$-0.61 \pm 0.23$	$-0.07 \pm 0.24$

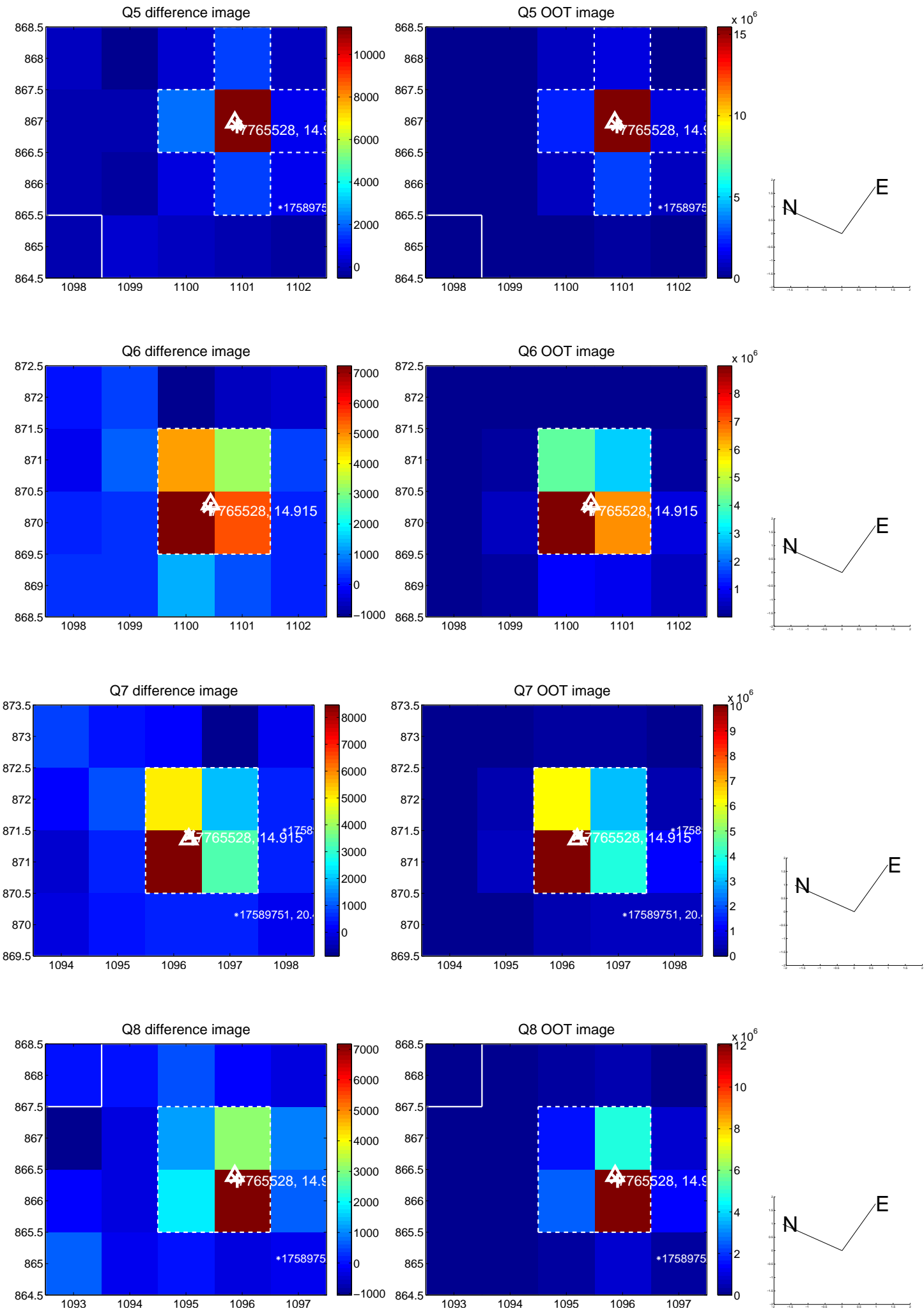


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

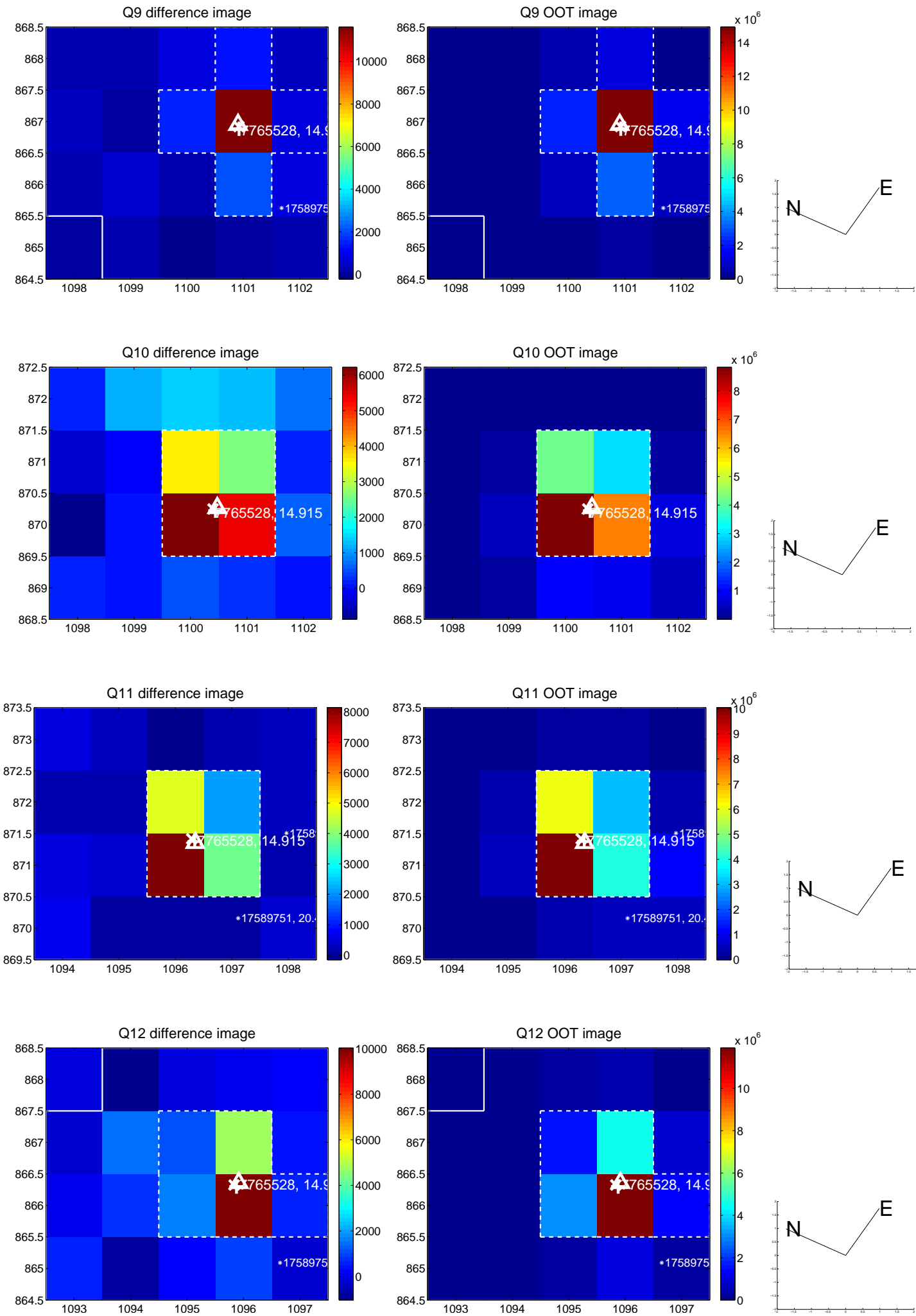
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



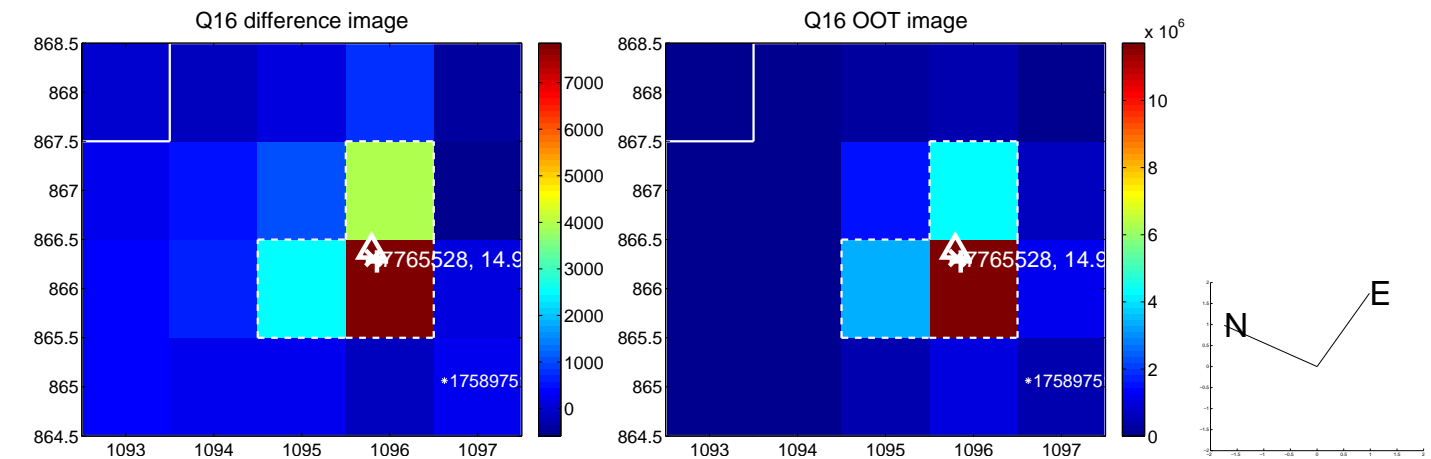
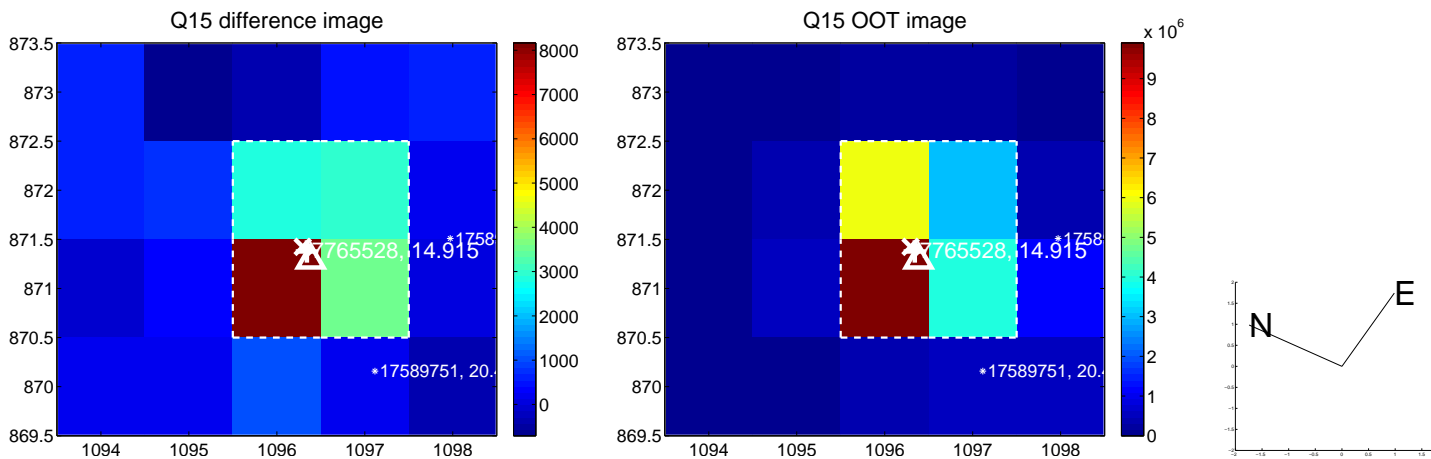
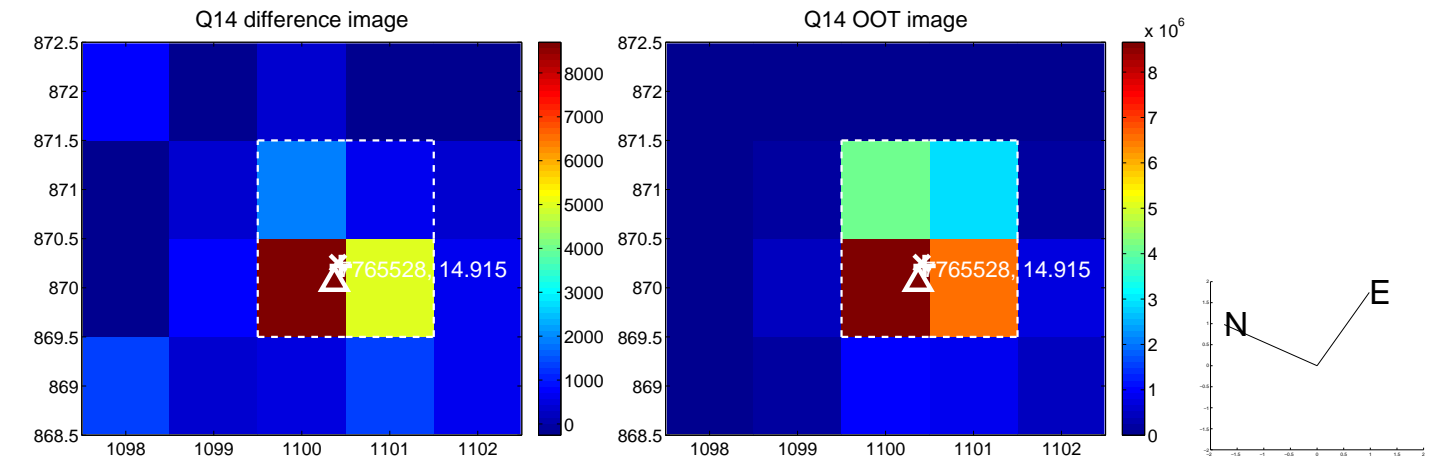
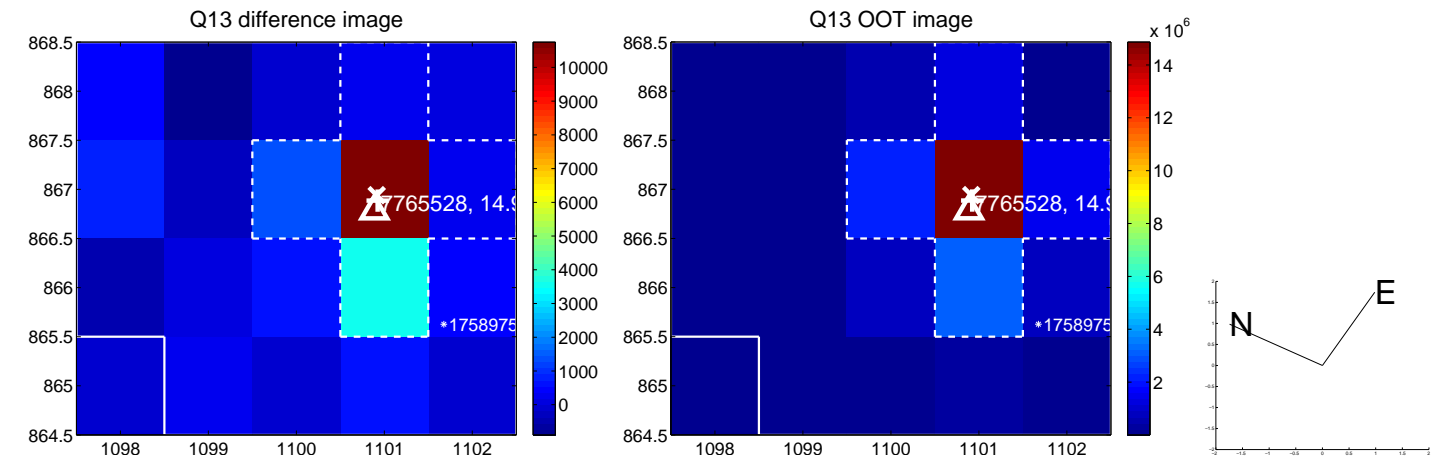
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

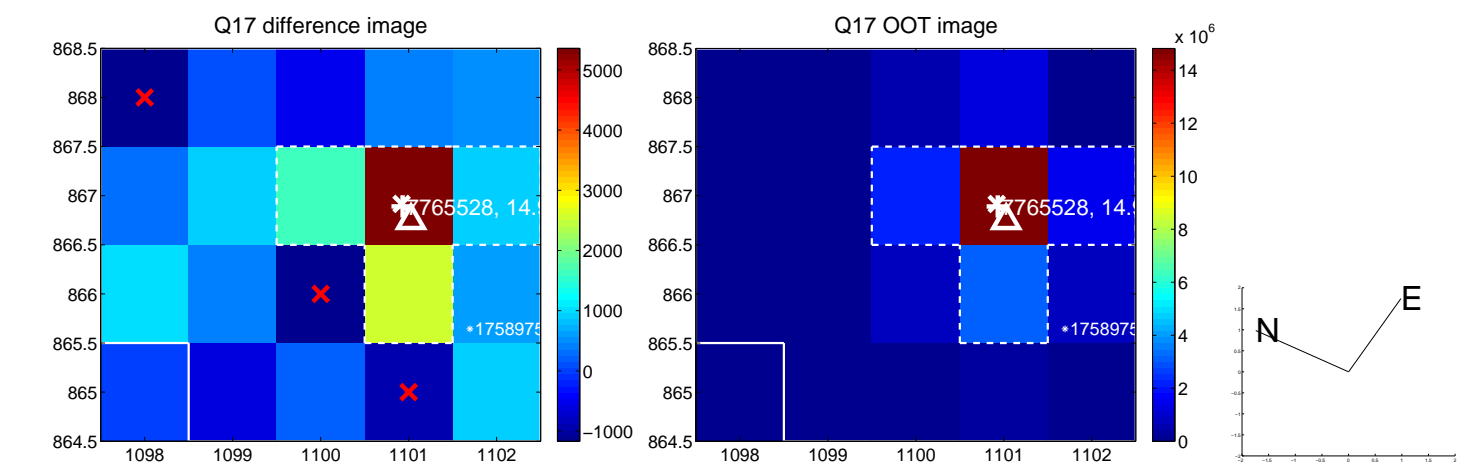


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

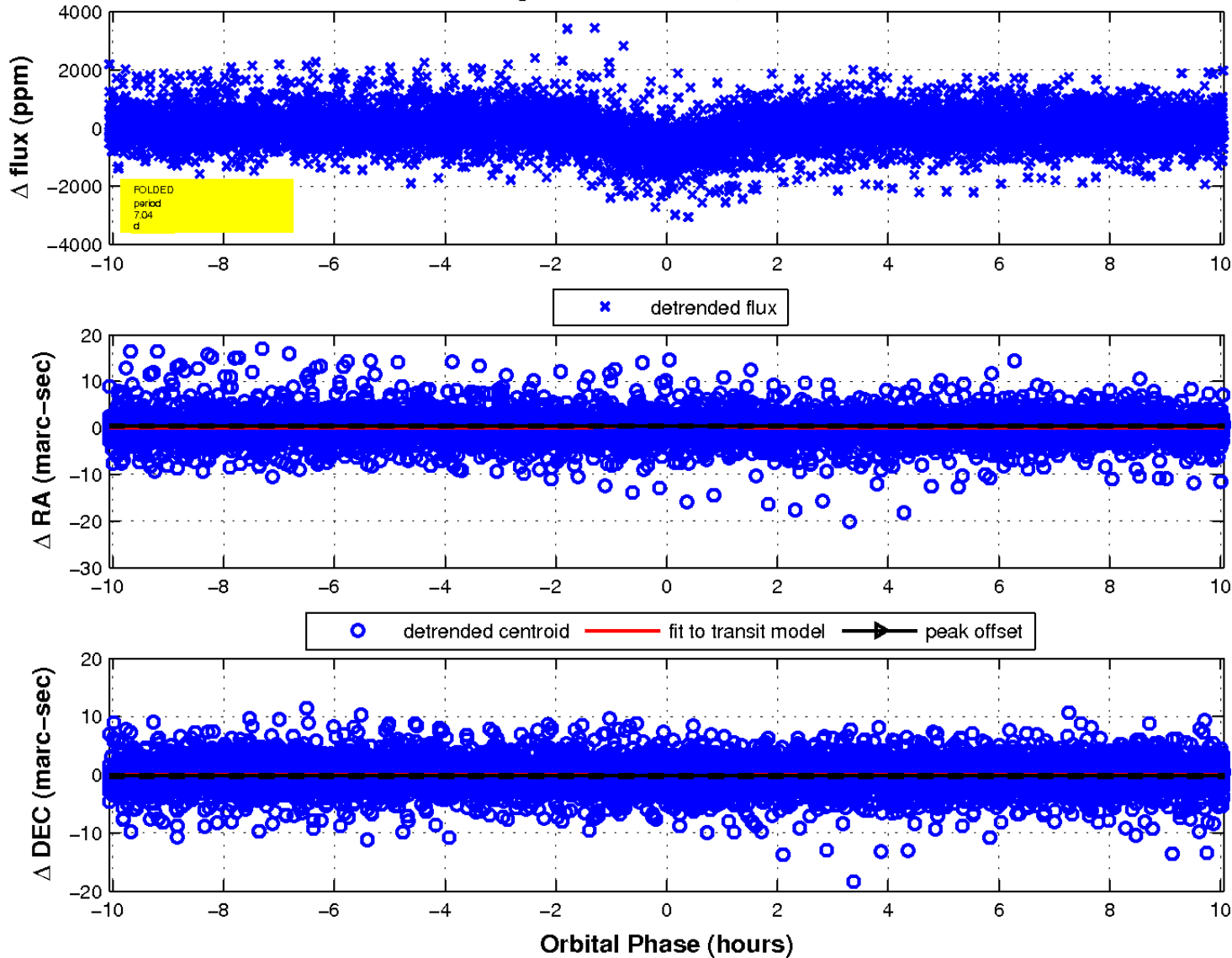




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

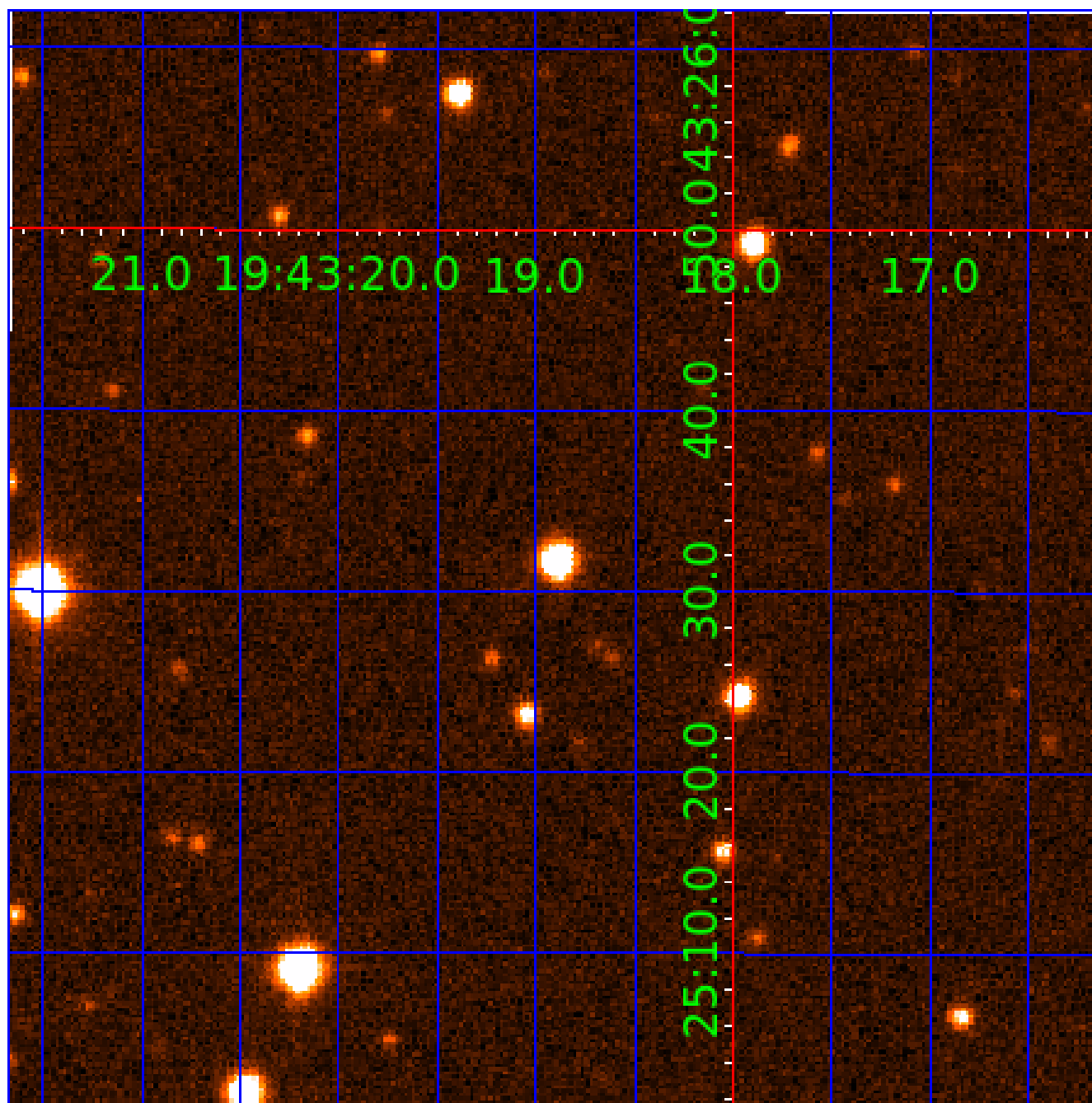


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 007765528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007765528-01	OBS	1840.01	7.039311	133.856456	810.4	3.355	39.7	45.2	1.24	5846	4.50	298.70
007765528-02	OBS	1840.02	9.388922	134.408091	171.5	3.290	7.7	9.0	1.24	5846	1.94	203.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007765528-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007765528-02	OBS	PC	0.84	0	0	0	0	NO_COMMENT

**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 007765528-02

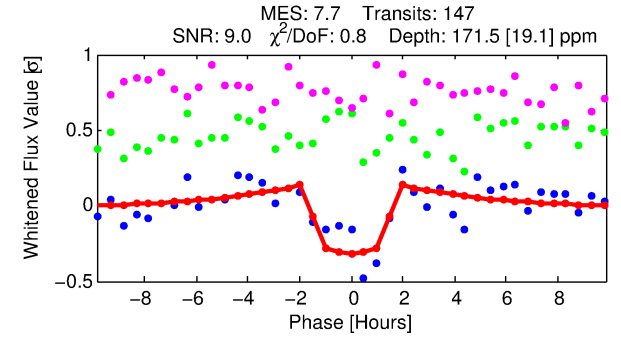
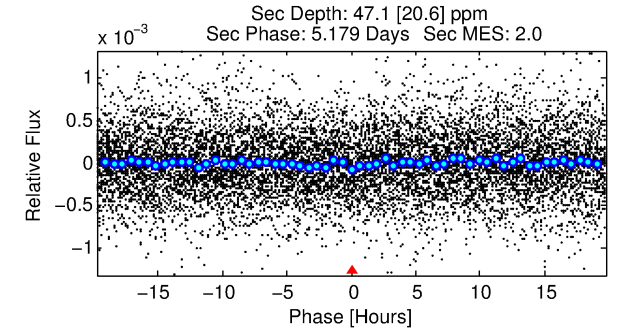
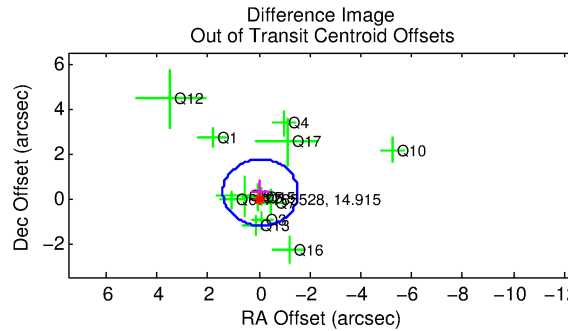
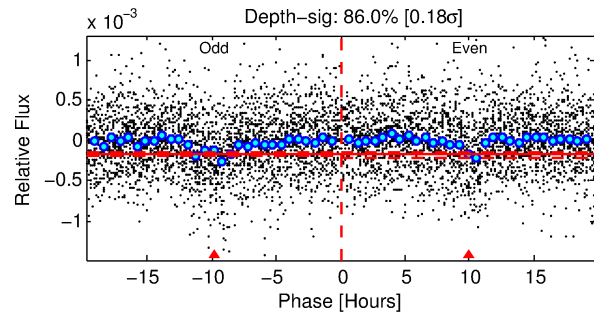
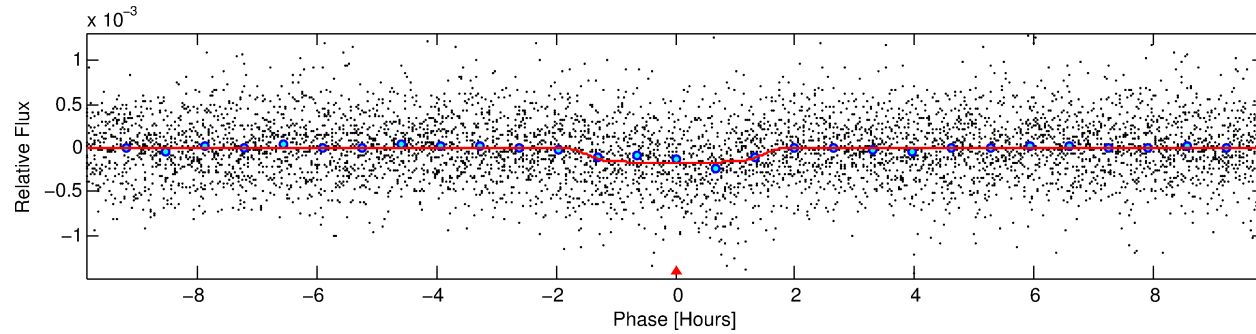
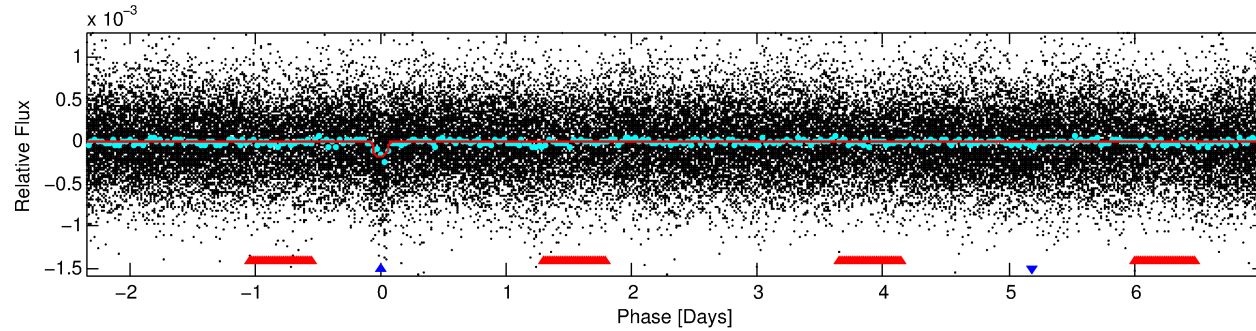
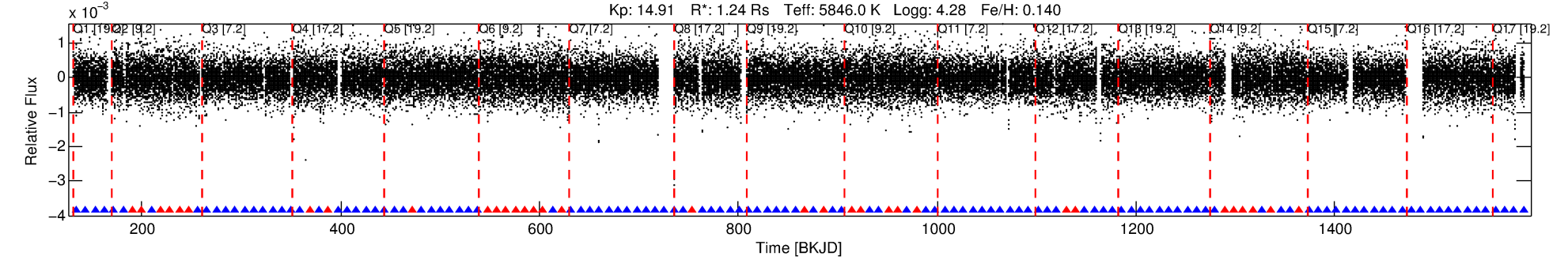
No Significant Match Found

# DV One-Page Summary

KIC: 7765528 Candidate: 2 of 2 Period: 9.389 d

KOI: K01840 Corr: No Ephemeris Match

Kp: 14.91 R\*: 1.24 Rs Teff: 5846.0 K Logg: 4.28 Fe/H: 0.140



## DV Fit Results:

Period = 9.38892 [0.00007] d  
Epoch = 134.4081 [0.0054] BKJD  
Rp/R\* = 0.0144 [0.0056]  
a/R\* = 9.95 [18.26]  
b = 0.91 [0.37]  
Seff = 203.45 [48.61]  
Teff = 963 [58] K  
Rp = 1.94 [0.83] Re  
a = 0.0889 [0.0136] AU  
Ag = 54.22 [50.13] [1.06σ]  
Teffp = 4040 [905] K [3.39σ]

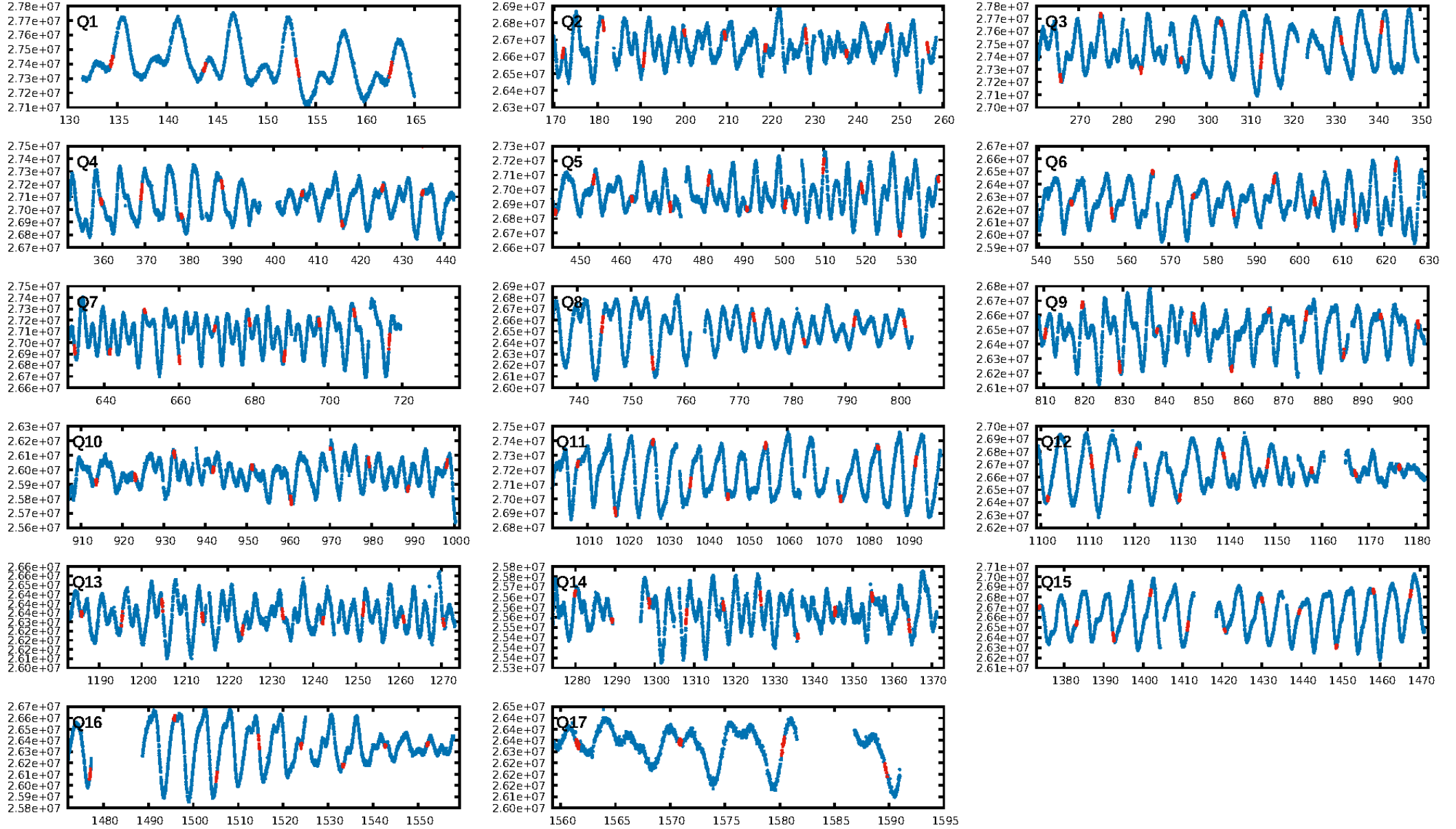
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.88e-14  
RollingBand-fgt: 0.76 [106/139]  
GhostDiagnostic-chr: 2.214  
Centroid-sig: 9.8%  
Centroid-so: 1.287 arcsec [1.14σ]  
OotOffset-rm: 0.268 arcsec [0.55σ]  
KicOffset-rm: 0.180 arcsec [0.40σ]  
OotOffset-st: 2/3/3/5 [13]  
KicOffset-st: 2/3/3/5 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:55:07 Z

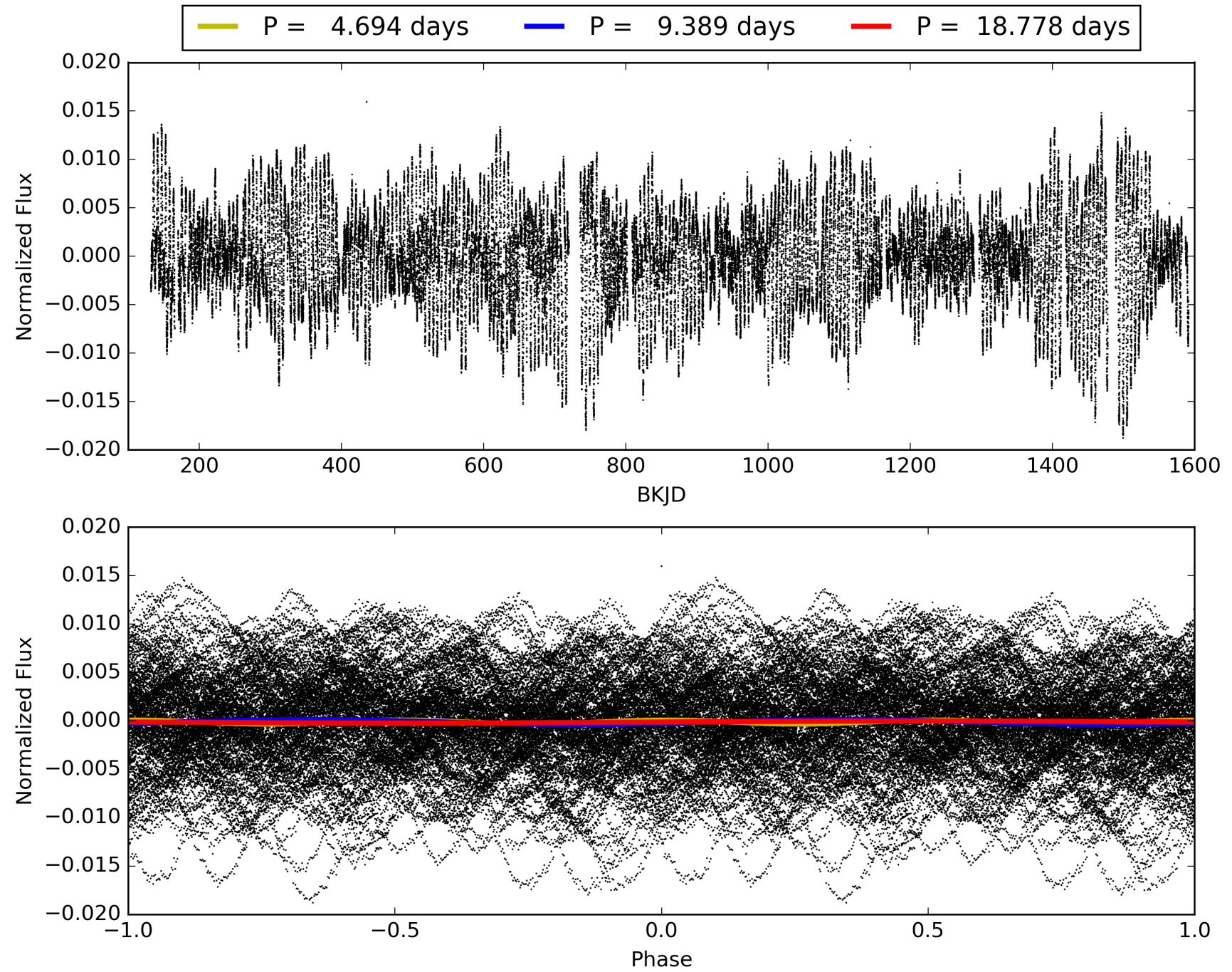
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007765528-02, PDC Light Curves



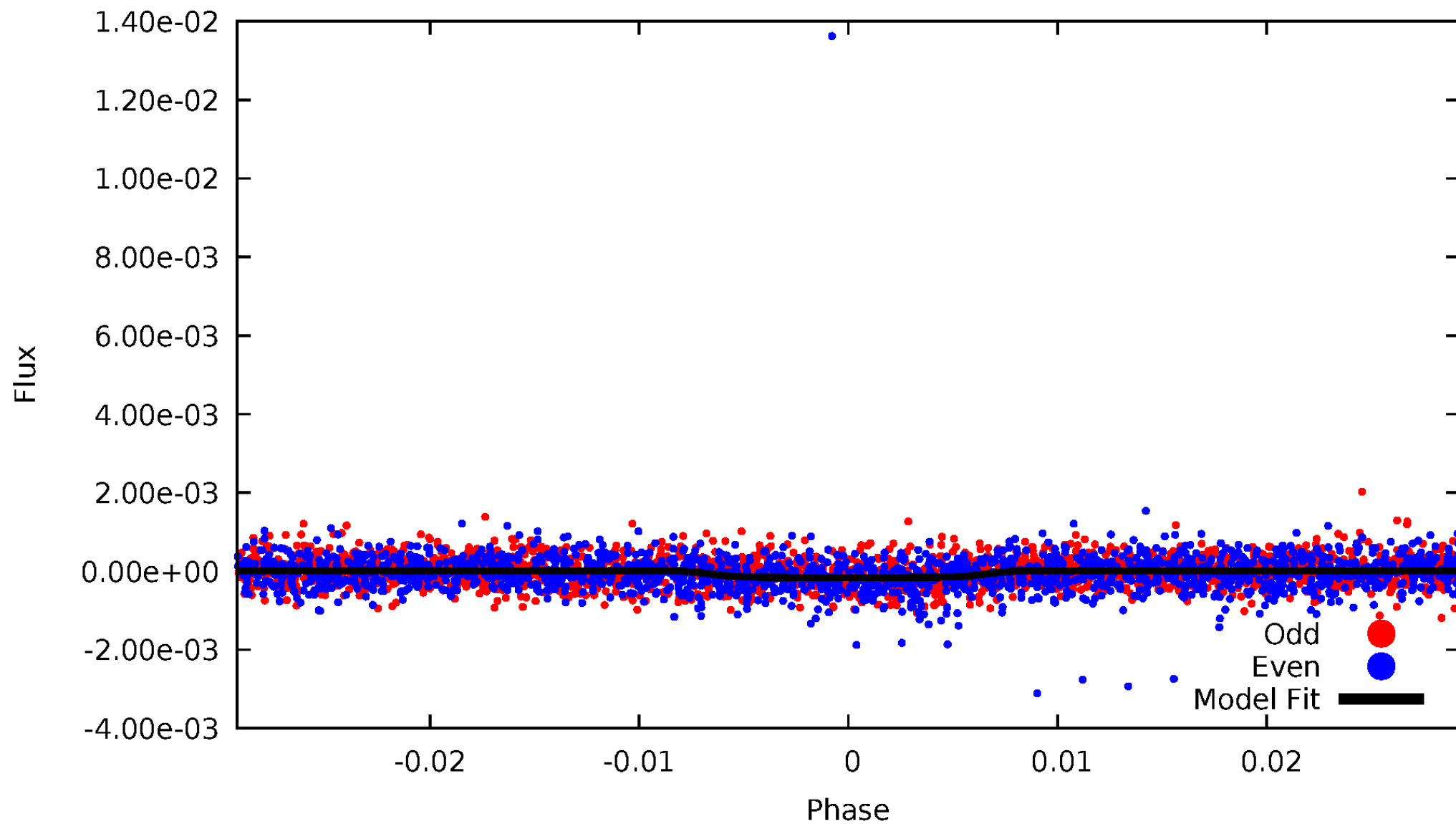


# TCE 007765528-02



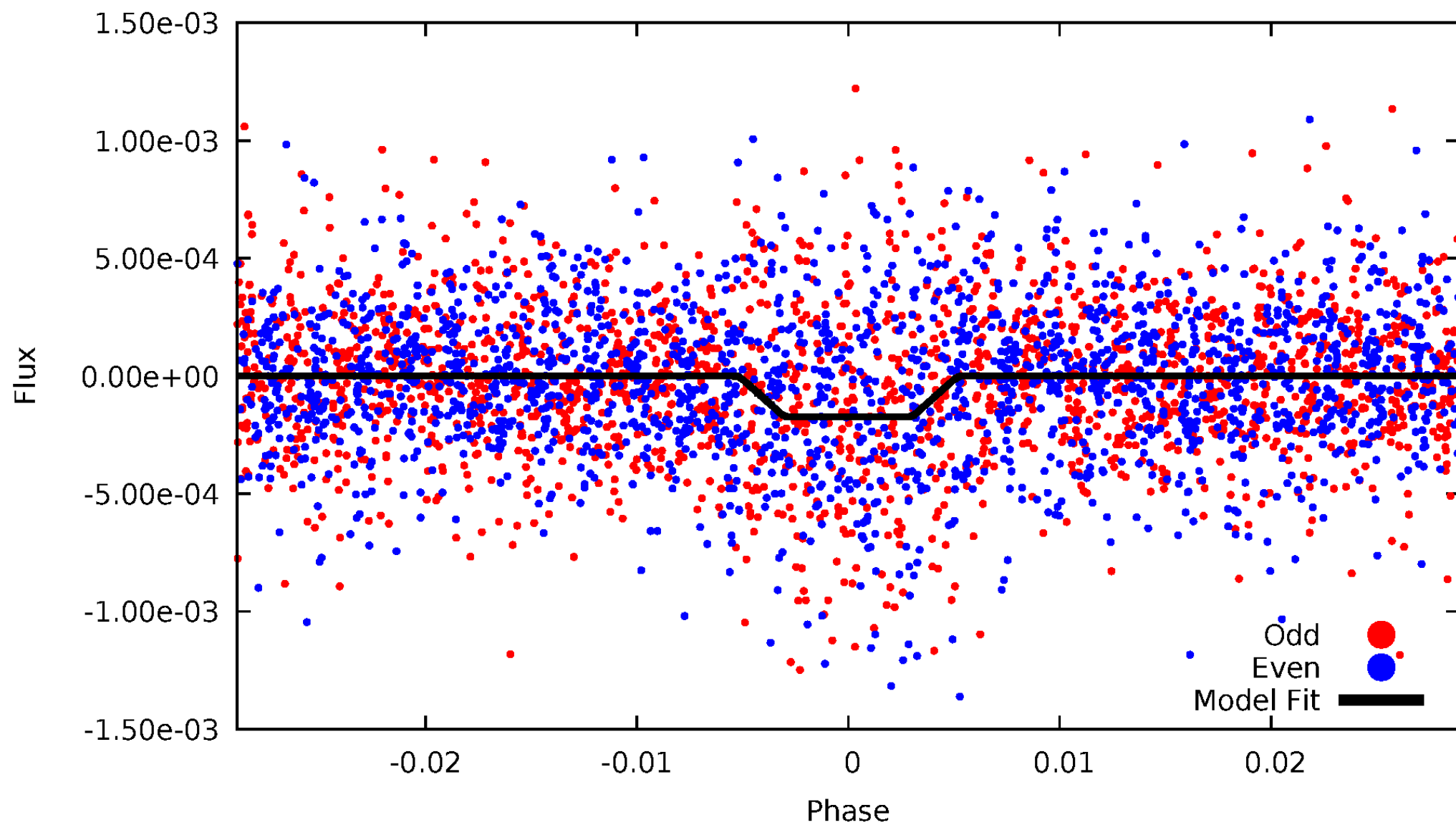
# DV Odd/Even

TCE 007765528-02



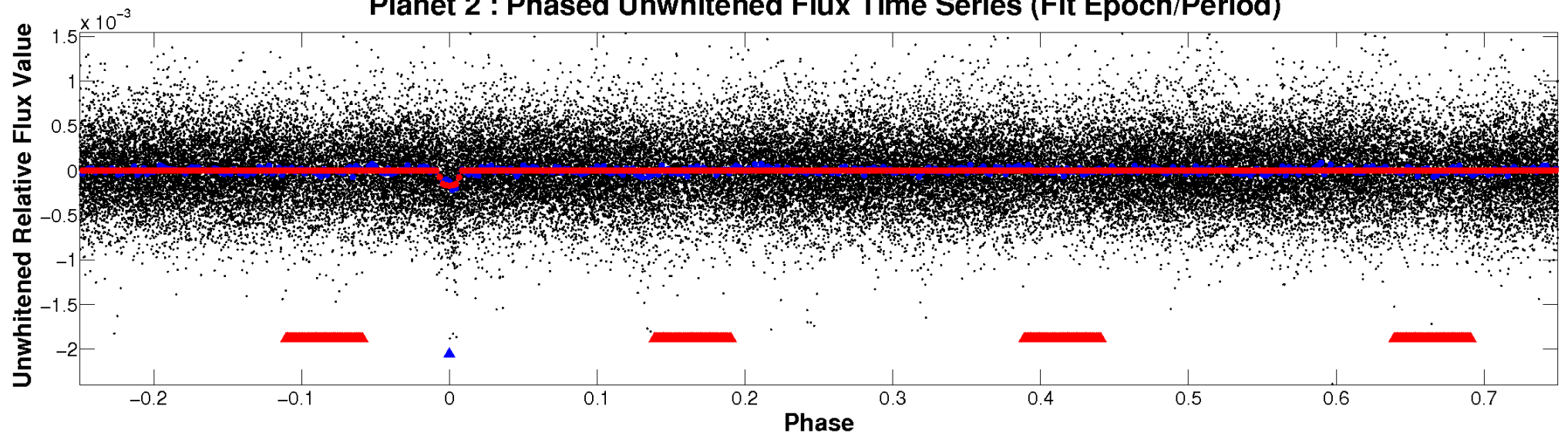
# ALT Odd/Even

TCE 007765528-02

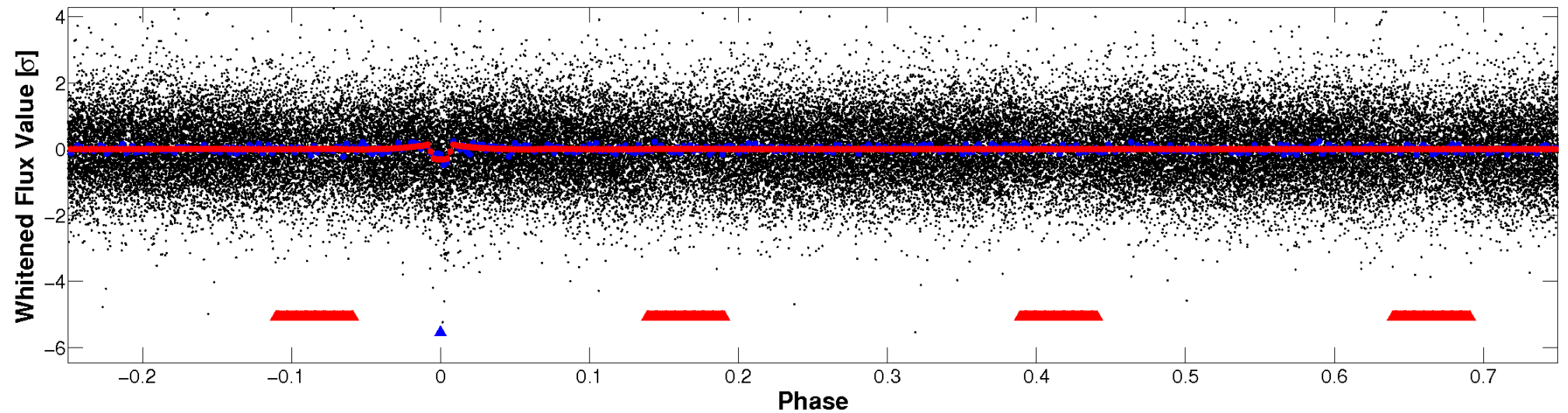


# Non-Whitened Vs. Whitened Light Curve

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

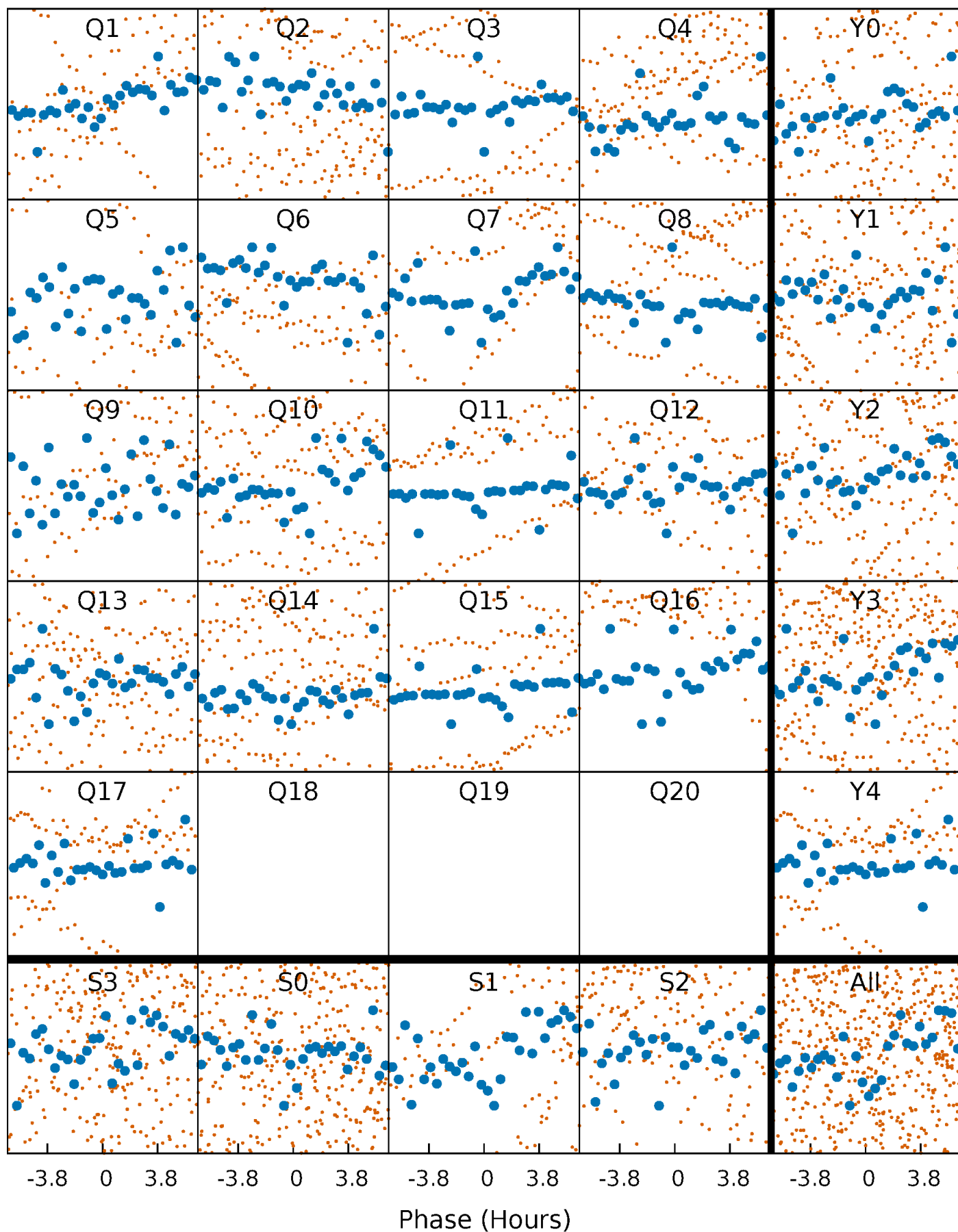


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

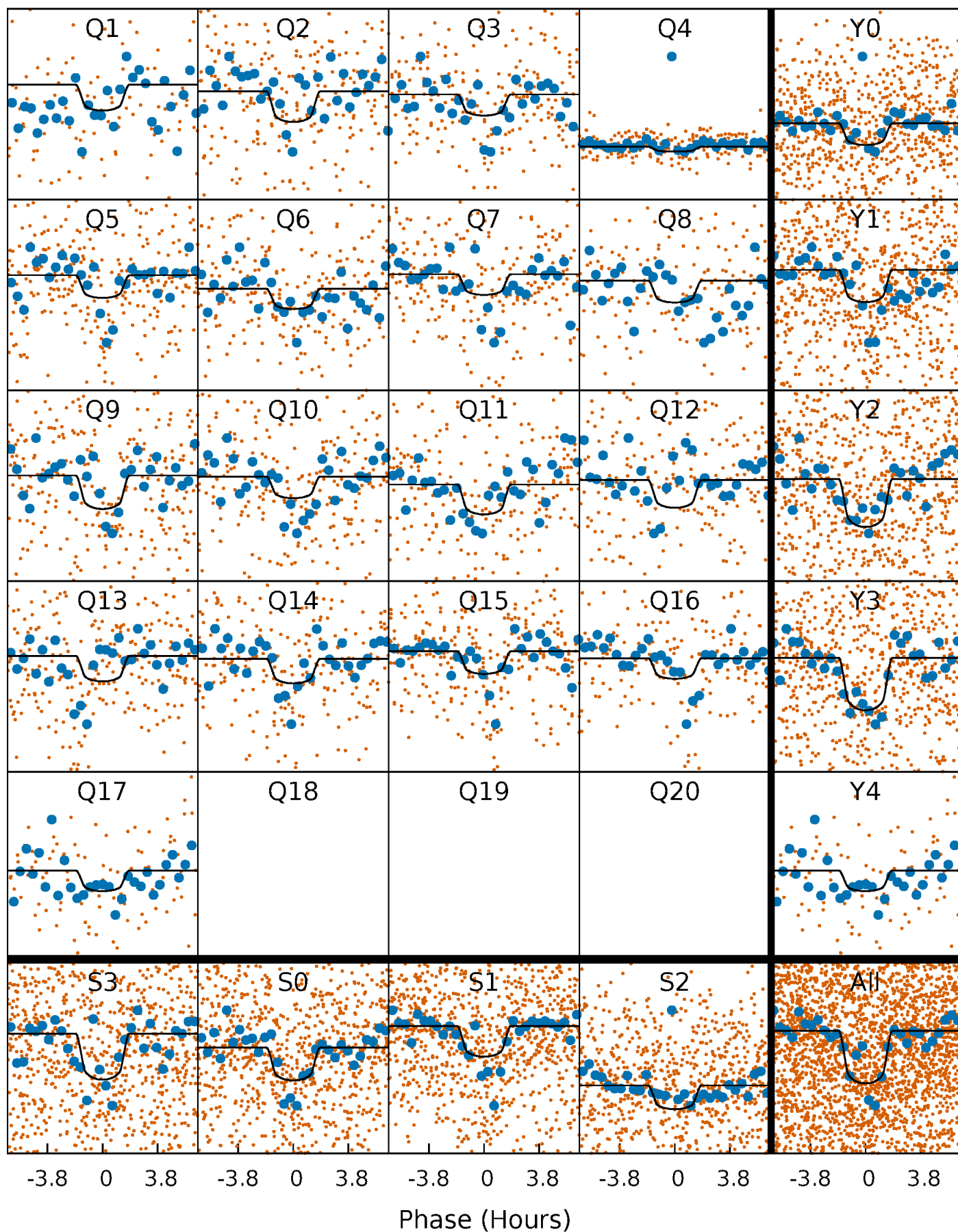
TCE 007765528-02 P= 9.388922 Days  $T_0=134.408091$  (BKJD)





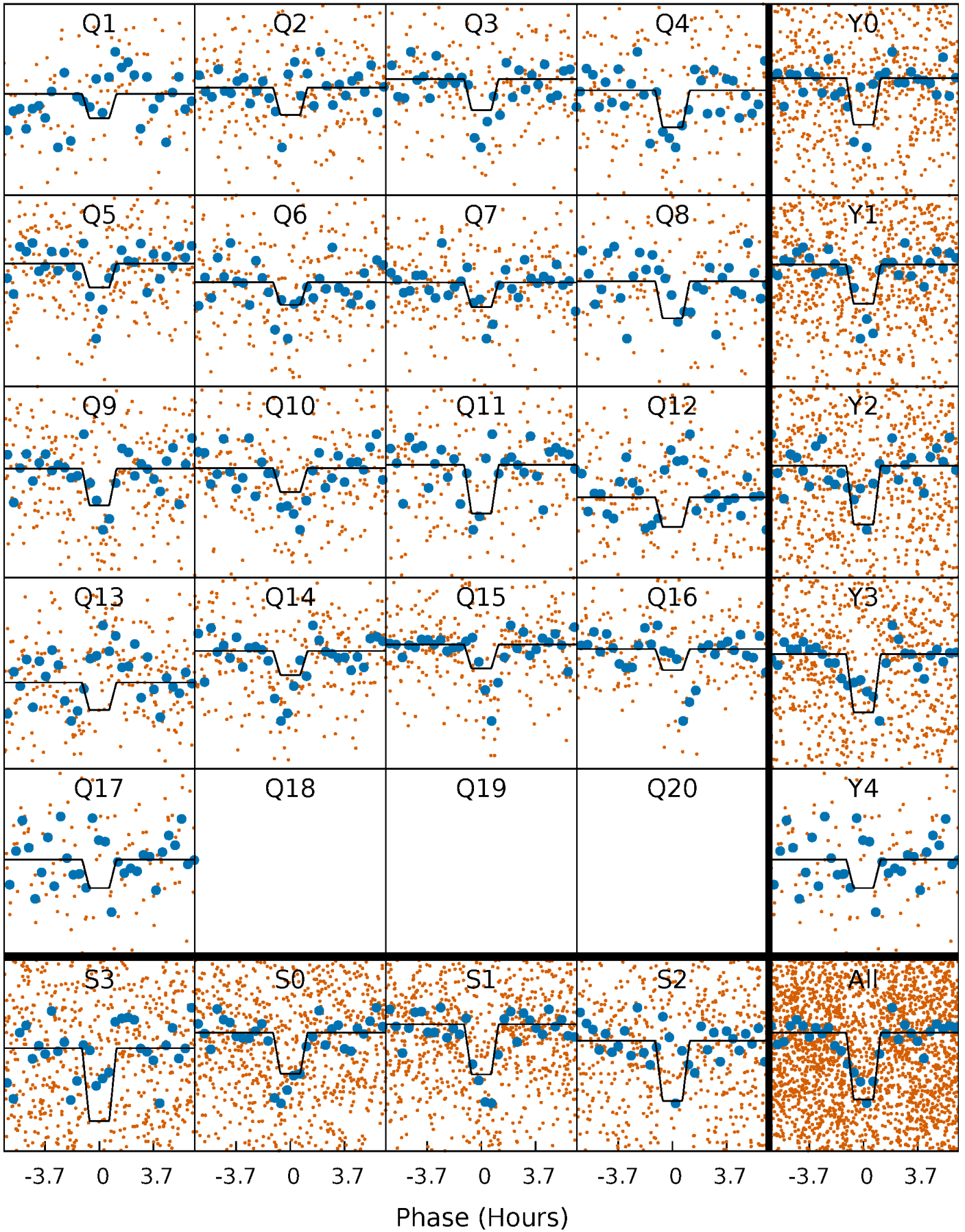
# DV Quarter-Phased Transit Curves

TCE 007765528-02   P= 9.388922 Days    $T_0=134.408091$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

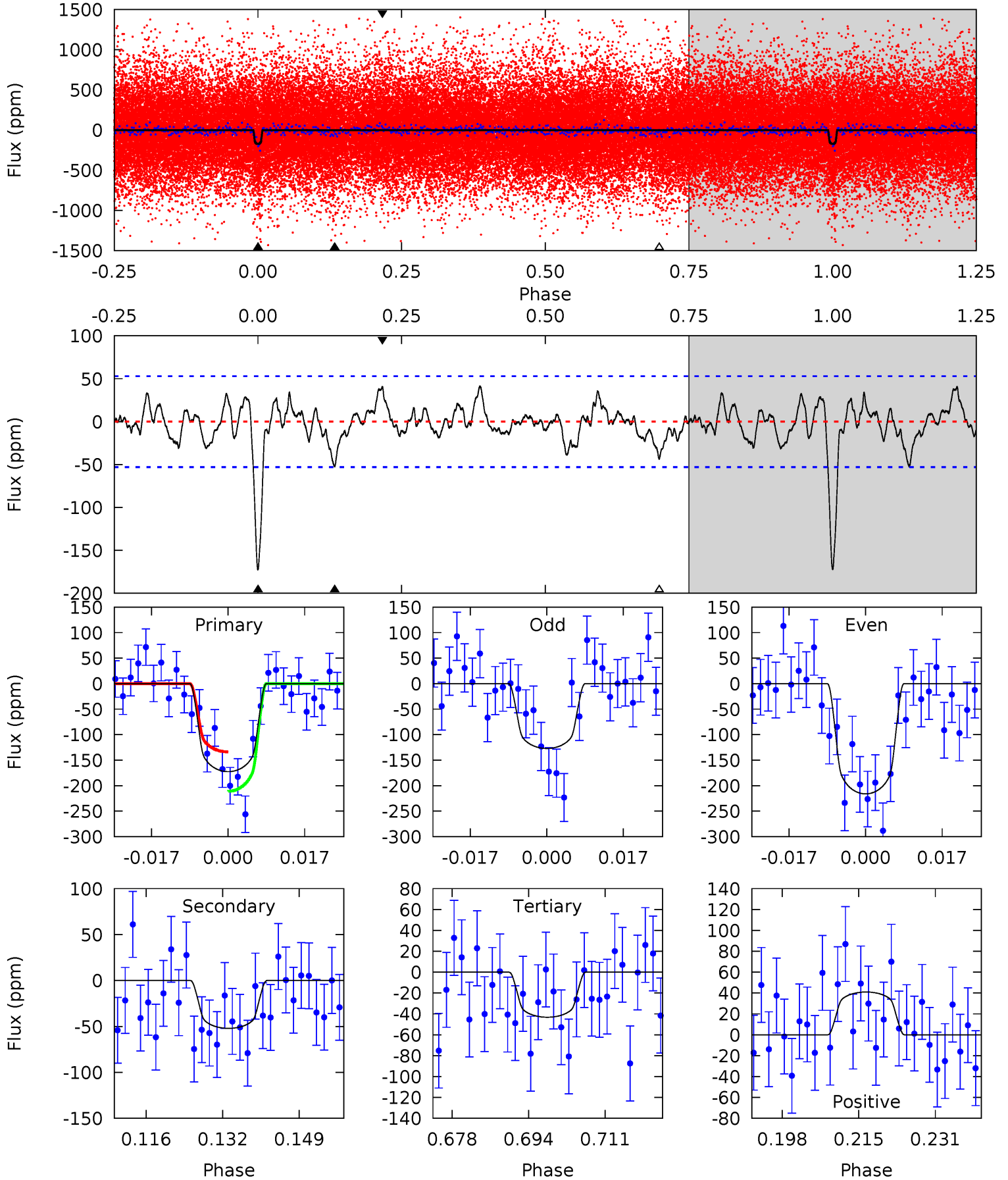
TCE 007765528-02 P= 9.388769 Days  $T_0=134.430649$  (BKJD)



# DV Model-Shift Uniqueness Test

007765528-02, P = 9.388922 Days, E = 125.019169 Days

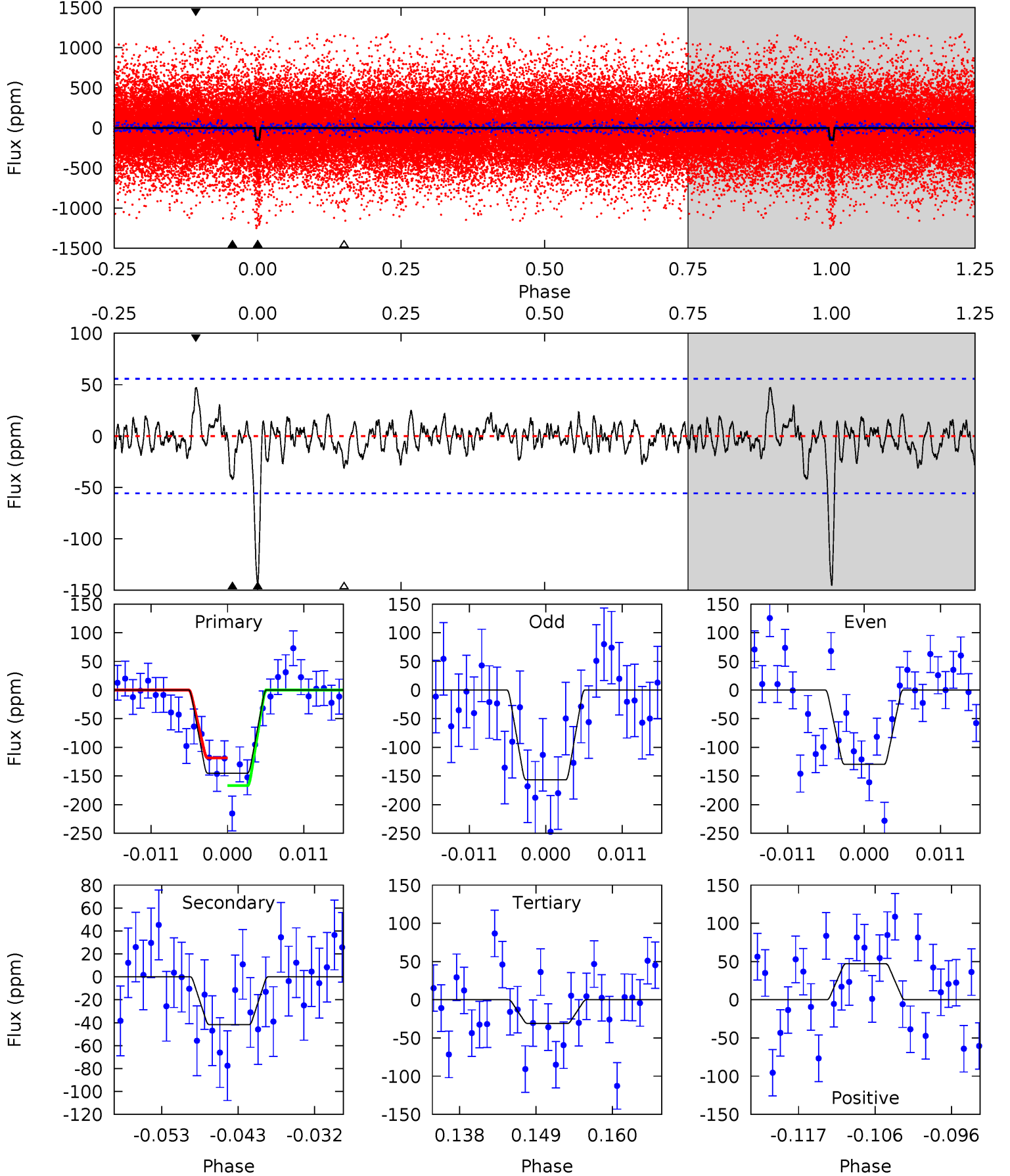
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	4.84	4.02	3.81	4.93	2.40	1.42	12.0	12.2	0.83	1.04	4.14	1.00	0.19	3.59



# Alt Model-Shift Uniqueness Test

007765528-02, P = 9.388769 Days, E = 125.041880 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.1	3.76	2.79	4.24	5.01	2.55	0.98	10.3	8.81	0.97	-0.48	1.22	0.93	0.25	2.17



### Stellar Parameters For KIC 007765528

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5846^{+79}_{-79}$	$4.278^{+0.132}_{-0.108}$	$0.140^{+0.150}_{-0.150}$	$1.240^{+0.213}_{-0.194}$	$1.064^{+0.078}_{-0.070}$	$0.786^{+0.439}_{-0.284}$
	+1%/-1%	+3%/-3%	+107%/-107%	+17%/-16%	+7%/-7%	+56%/-36%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 007765528-02 / KOI 1840.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-52 \pm 11$	$1.93^{+0.76}_{-0.72}$	$1342^{+61}_{-59}$	$4341^{+967}_{-495}$	$60^{+104}_{-30}$
Alt.	$-42 \pm 11$	$1.82^{+0.79}_{-0.79}$	$1343^{+64}_{-59}$	$4295^{+1065}_{-555}$	$56^{+117}_{-31}$

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

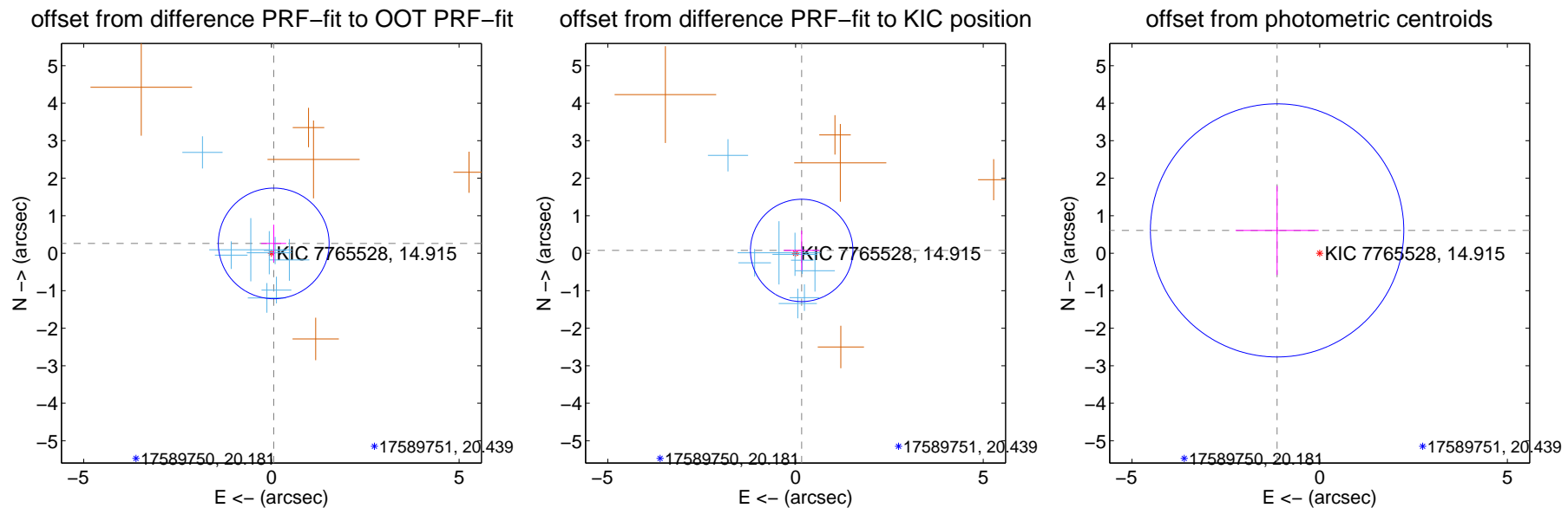
## DV Centroid Data

Supplemental centroid analysis for 007765528-02. Kepler magnitude: 14.91. Transit SNR 9.03

There are 8 quarters with good PRF difference image offsets

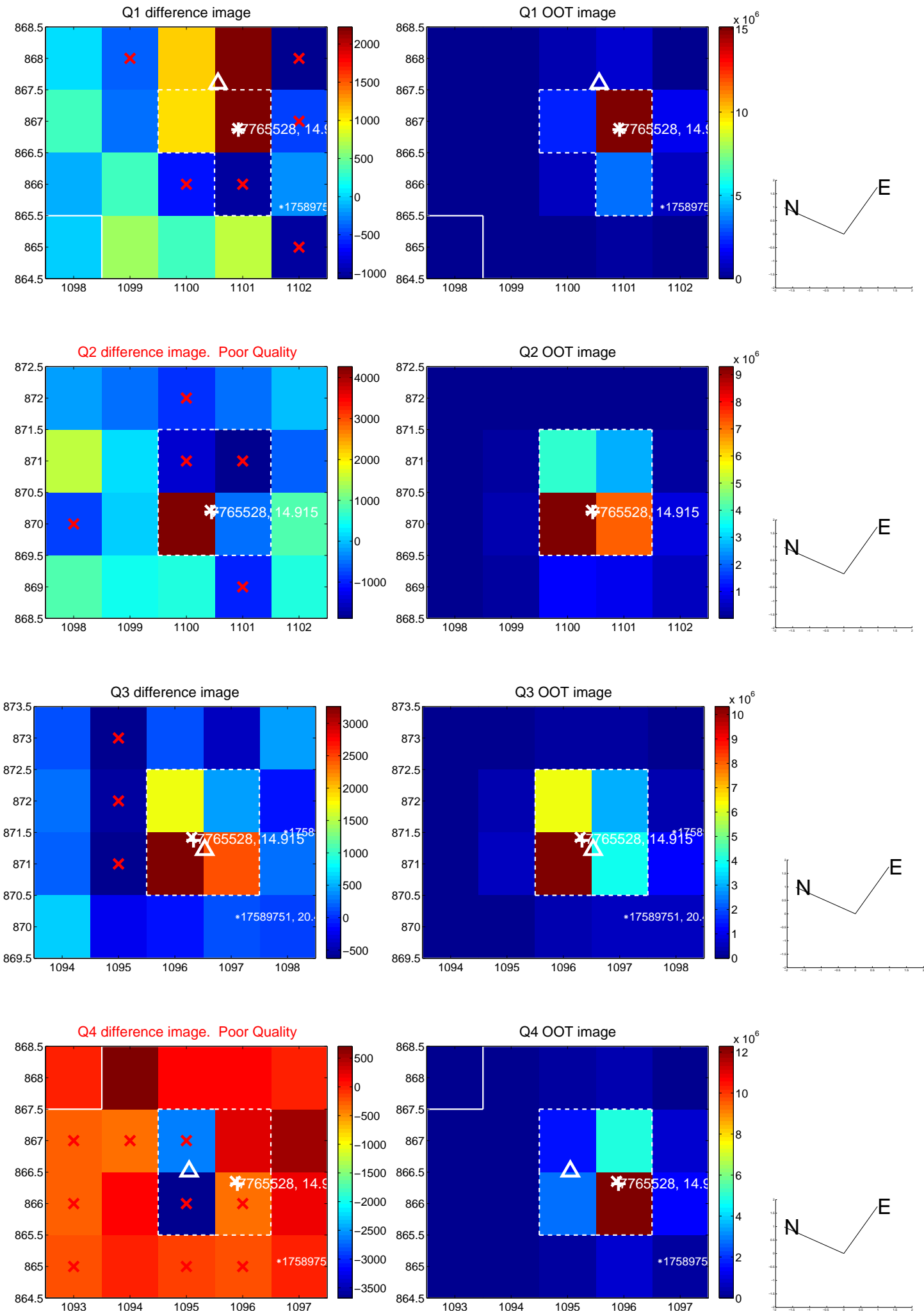
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.268 \pm 0.492$	0.55	$-0.061 \pm 0.332$	$0.261 \pm 0.499$
PRF-fit source offset from KIC position	$0.180 \pm 0.455$	0.40	$-0.164 \pm 0.474$	$0.075 \pm 0.529$
photometric centroid source offset	$1.29 \pm 1.13$	1.14	$1.13 \pm 1.11$	$0.61 \pm 1.19$



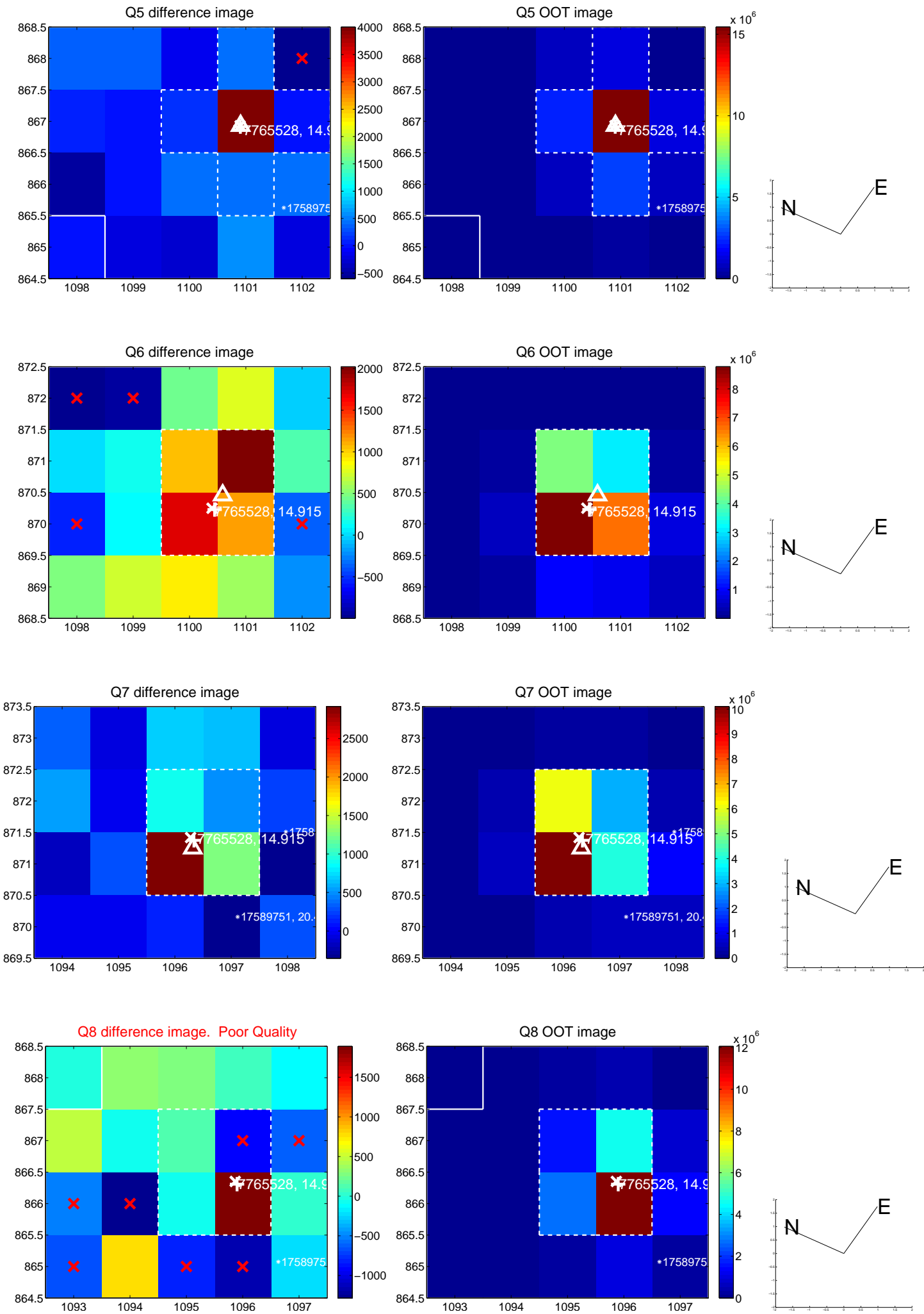
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

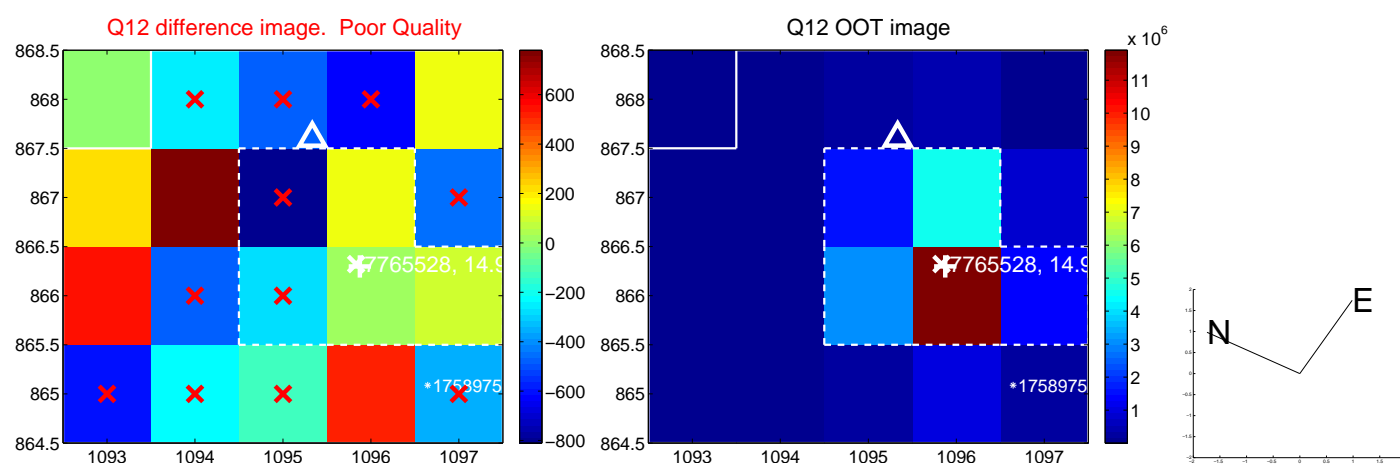
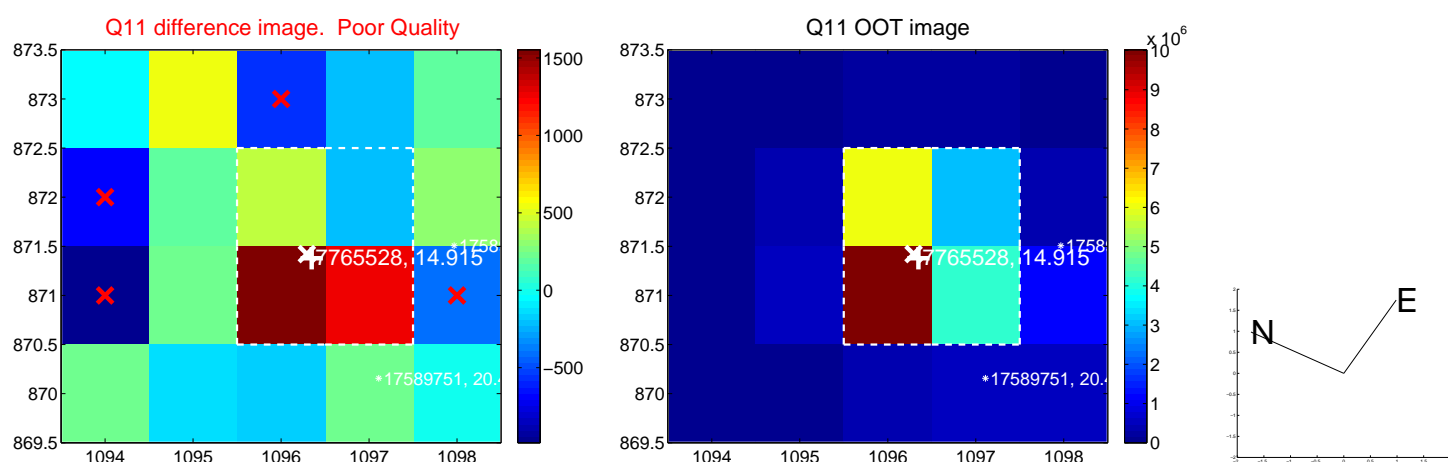
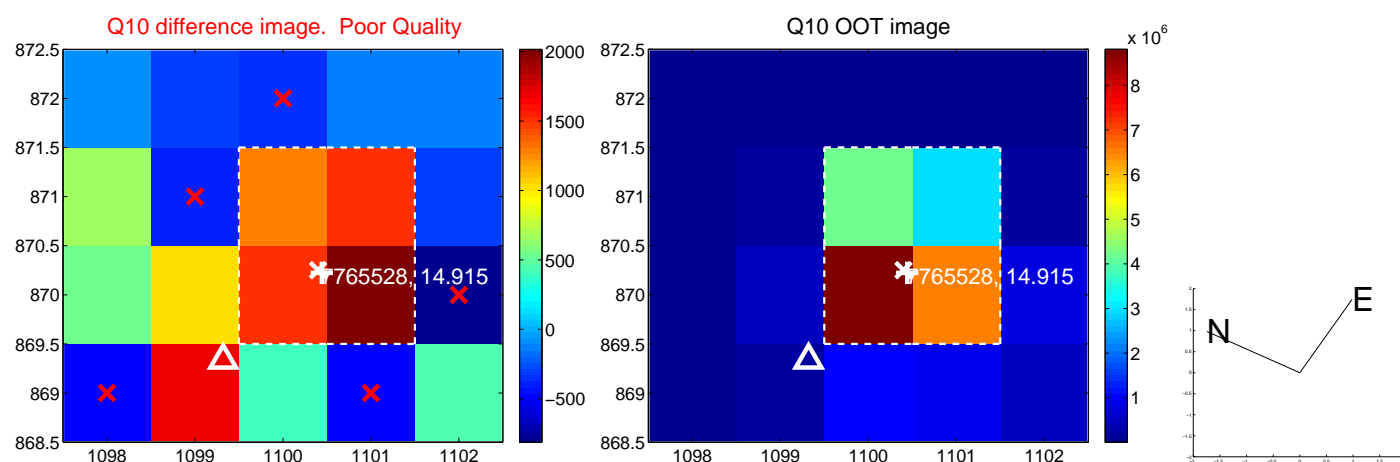
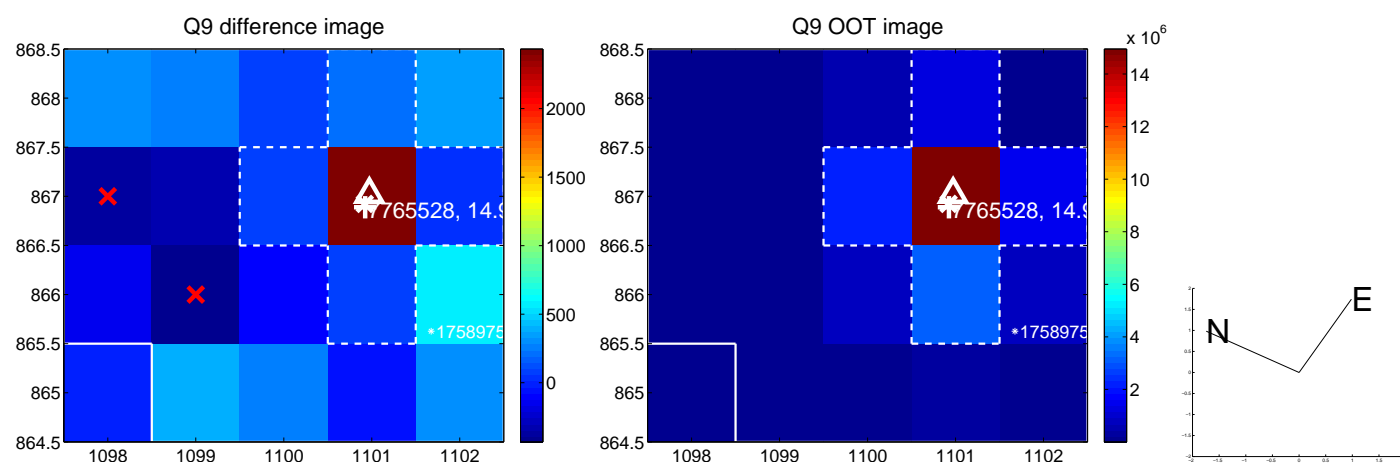




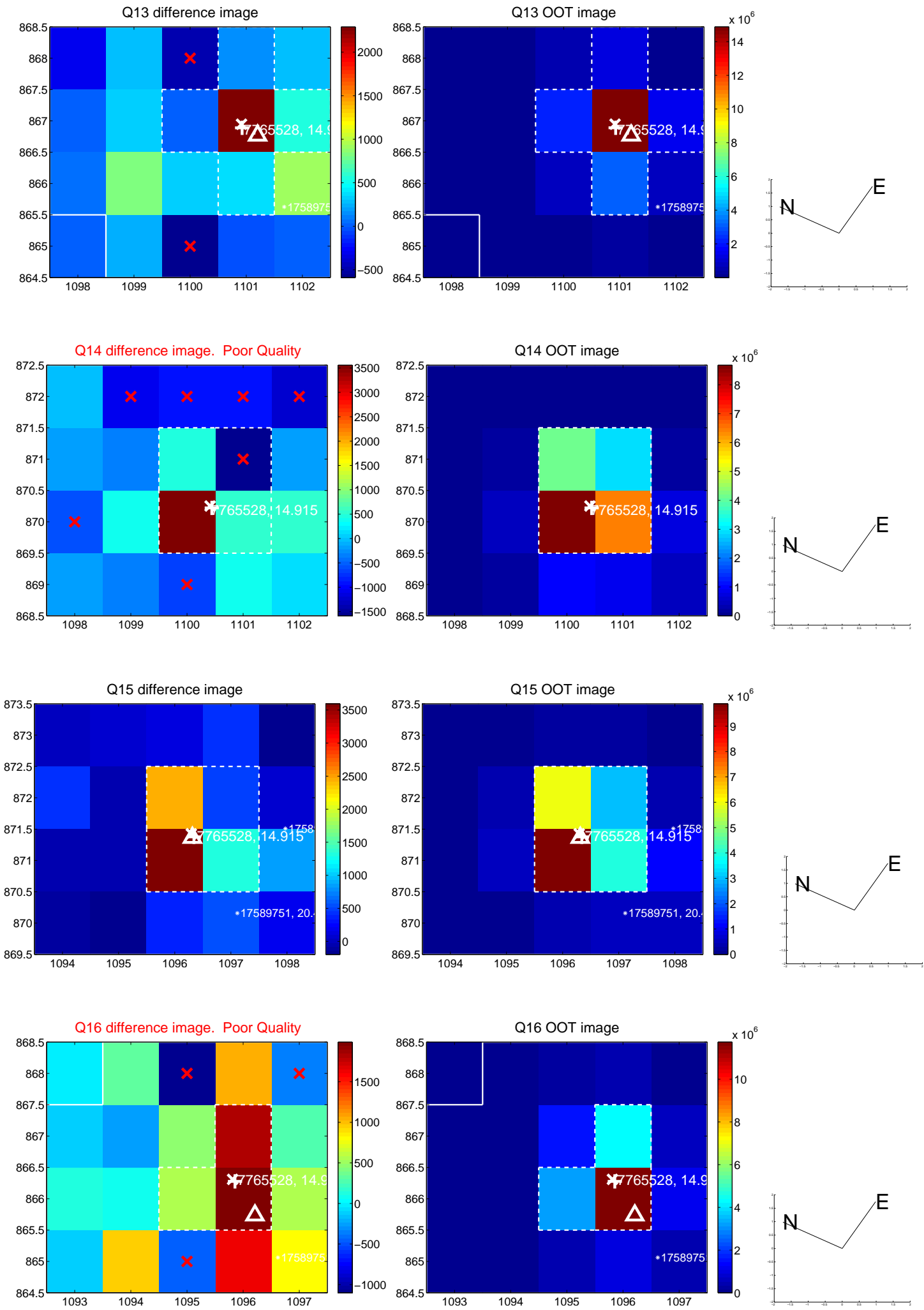
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



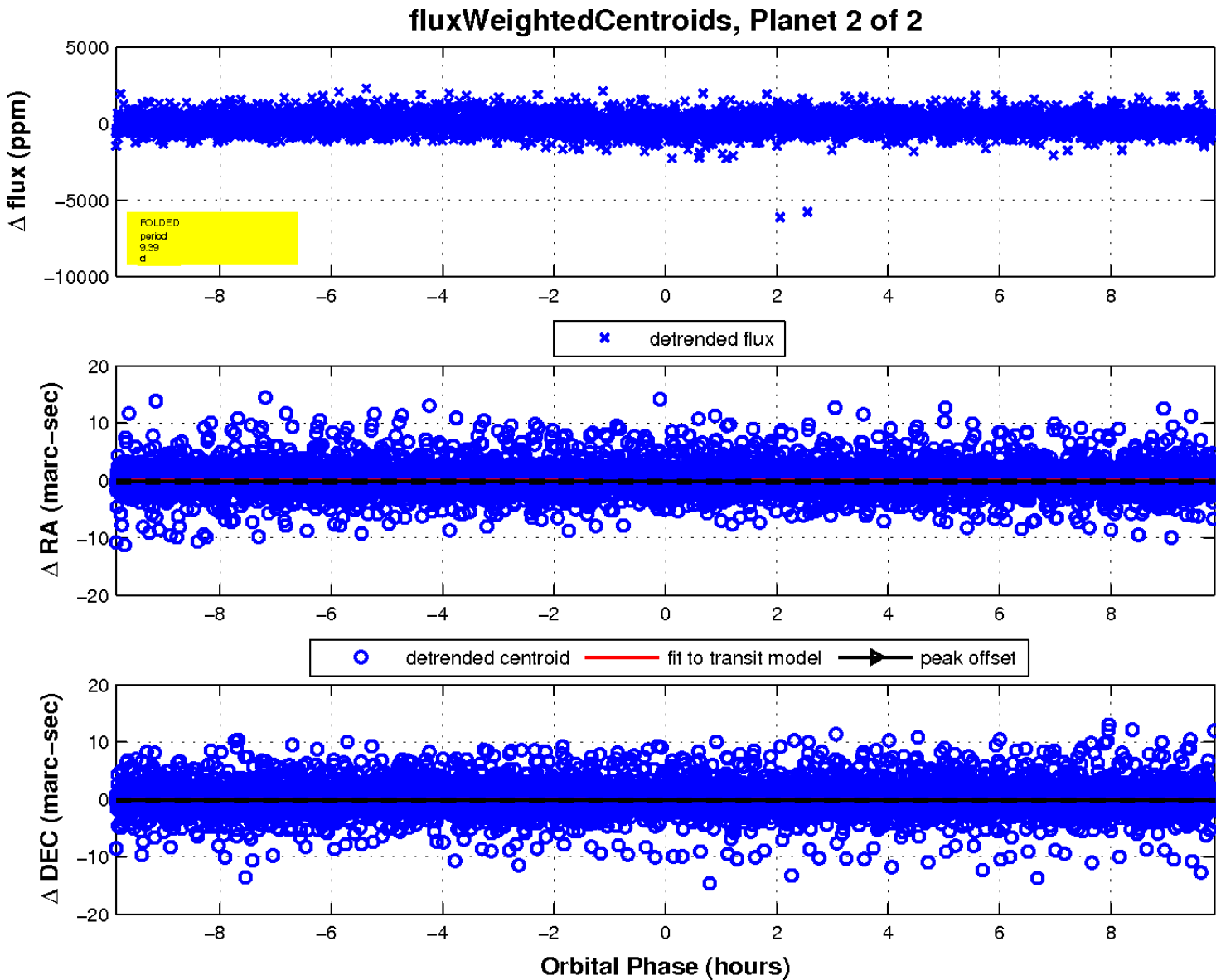
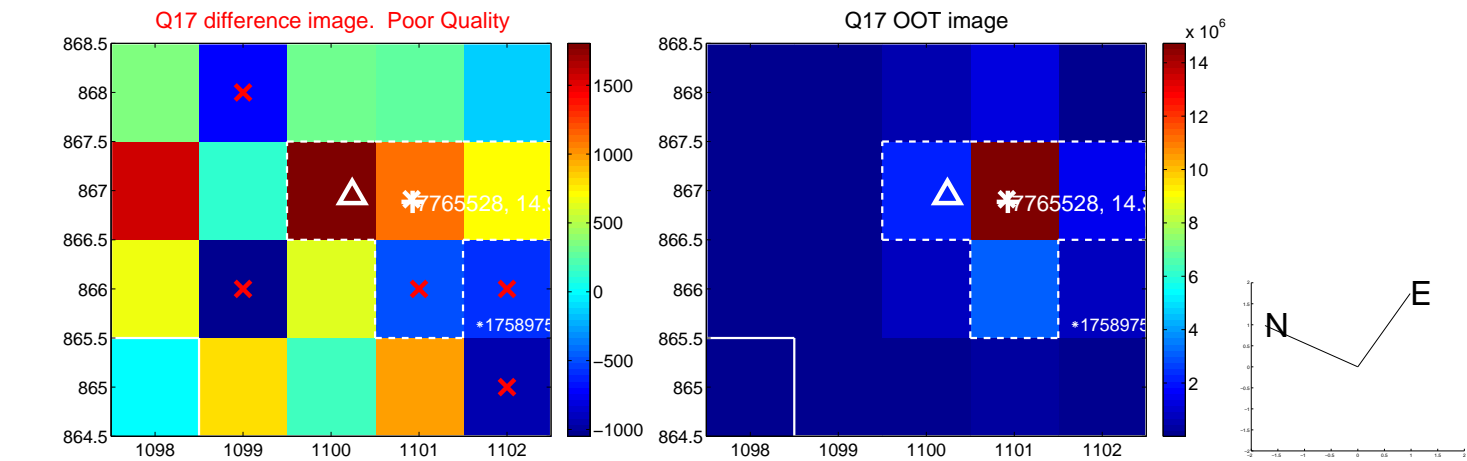
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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



UKIRT Image

Declination

