

# KIC 007021177

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007021177-01	OBS	3452.01	18.645245	147.209114	436961.7	2.000	8837.9	-1.0	0.84	5931	46.10	43.77
007021177-02	OBS	No	18.645222	138.896131	252005.1	13.511	6043.8	4288.5	0.84	5931	52.35	43.77
007021177-03	OBS	No	4.661190	133.898642	2310.6	55.934	935.1	36.9	0.84	5931	4.84	277.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007021177-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
007021177-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
007021177-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

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

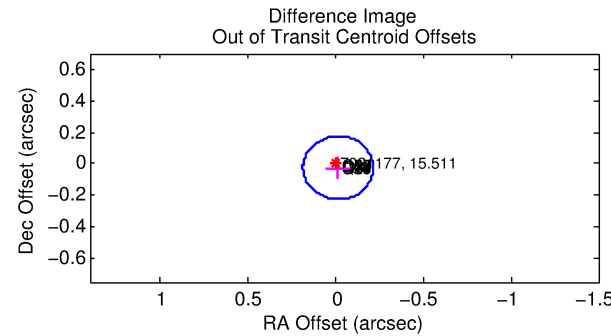
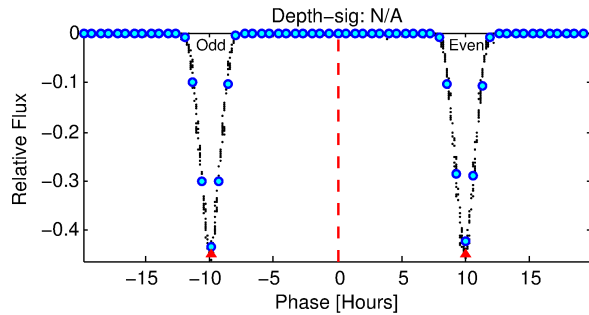
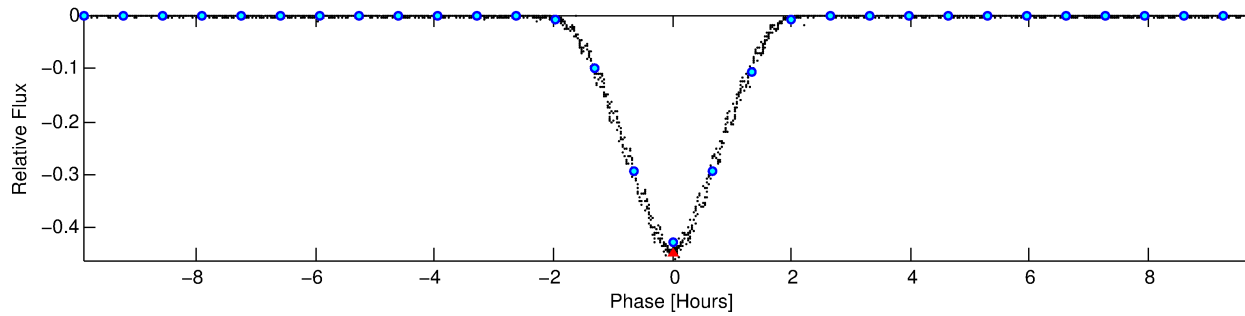
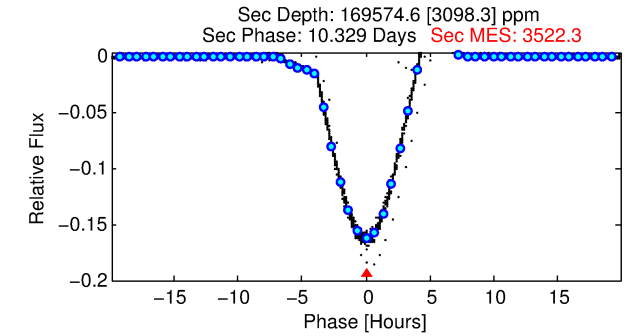
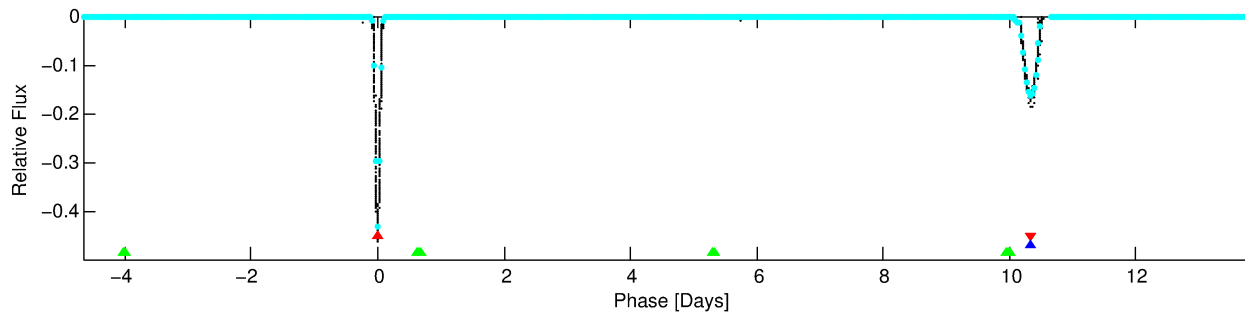
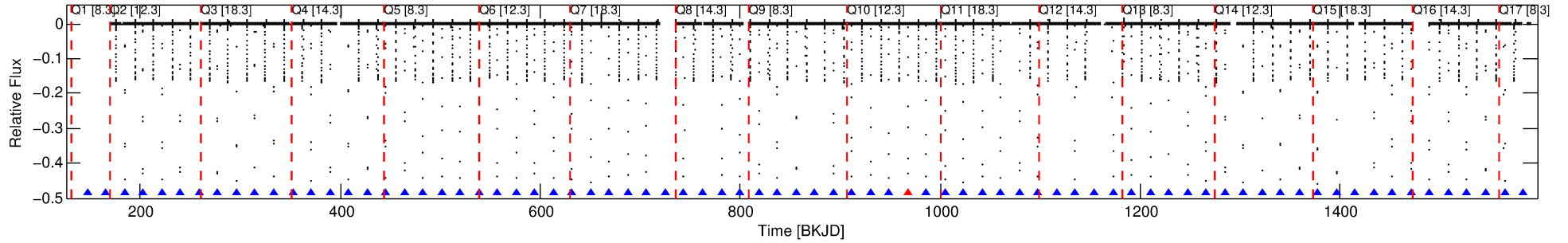
Ephemeris Match Information For 007021177-01

No Significant Match Found

# DV One-Page Summary

KIC: 7021177 Candidate: 1 of 3 Period: 18.645 d  
KOI: K03452 Corr: No Ephemeris Match

Kp: 15.51 R\*: 0.84 Rs Teff: 5931.0 K Logg: 4.55 Fe/H: -0.340



## TPS TCE Results:

Period = 18.64524 d  
Epoch = 147.2091 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

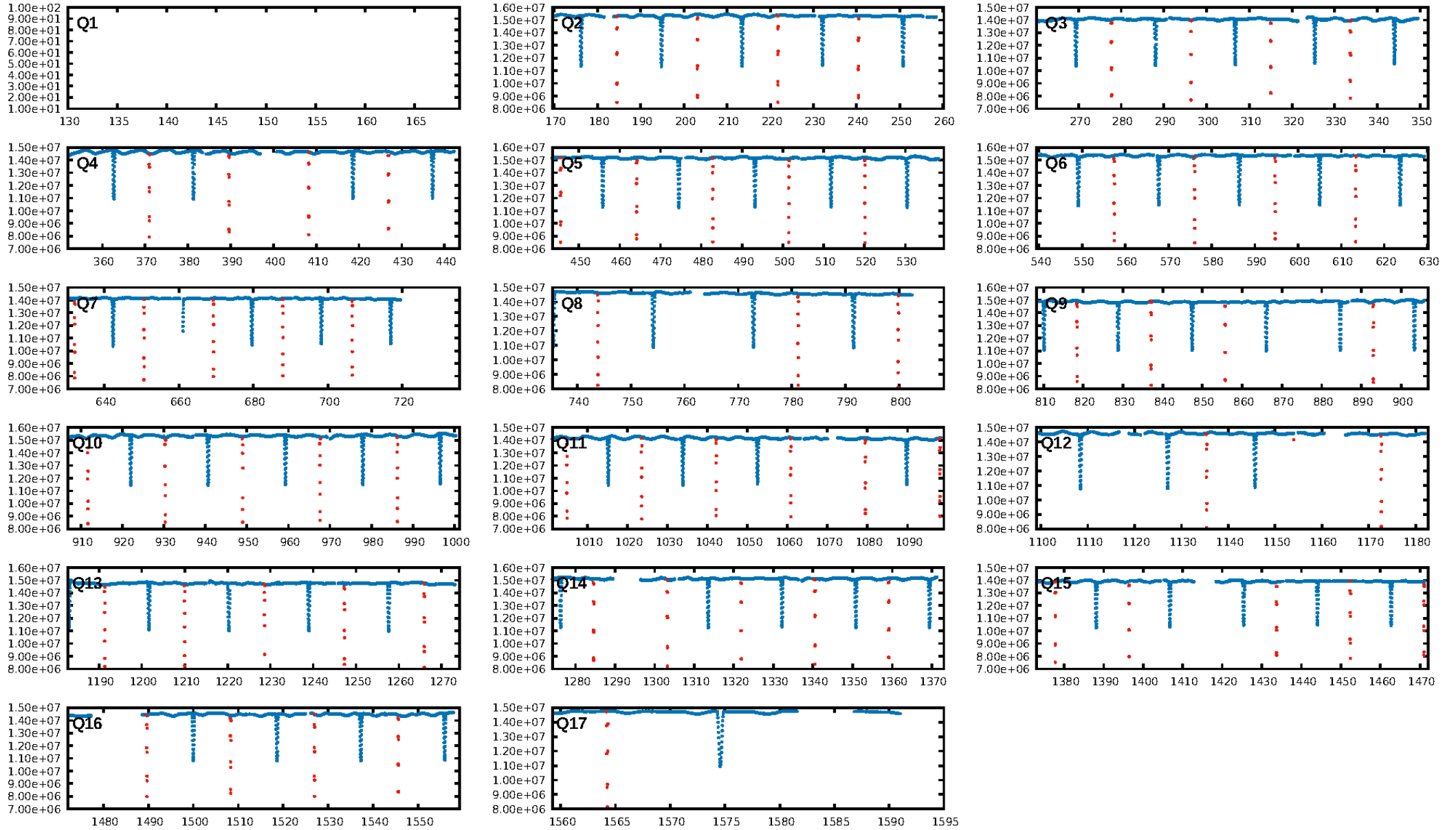
ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [65/66]  
GhostDiagnostic-chr: 2.033

Centroid-sig: 0.0%  
Centroid-so: 0.136 arcsec [106.38 $\sigma$ ]  
OotOffset-rm: 0.029 arcsec [0.44 $\sigma$ ]  
KicOffset-rm: 0.111 arcsec [1.59 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 0.00 [0/16]

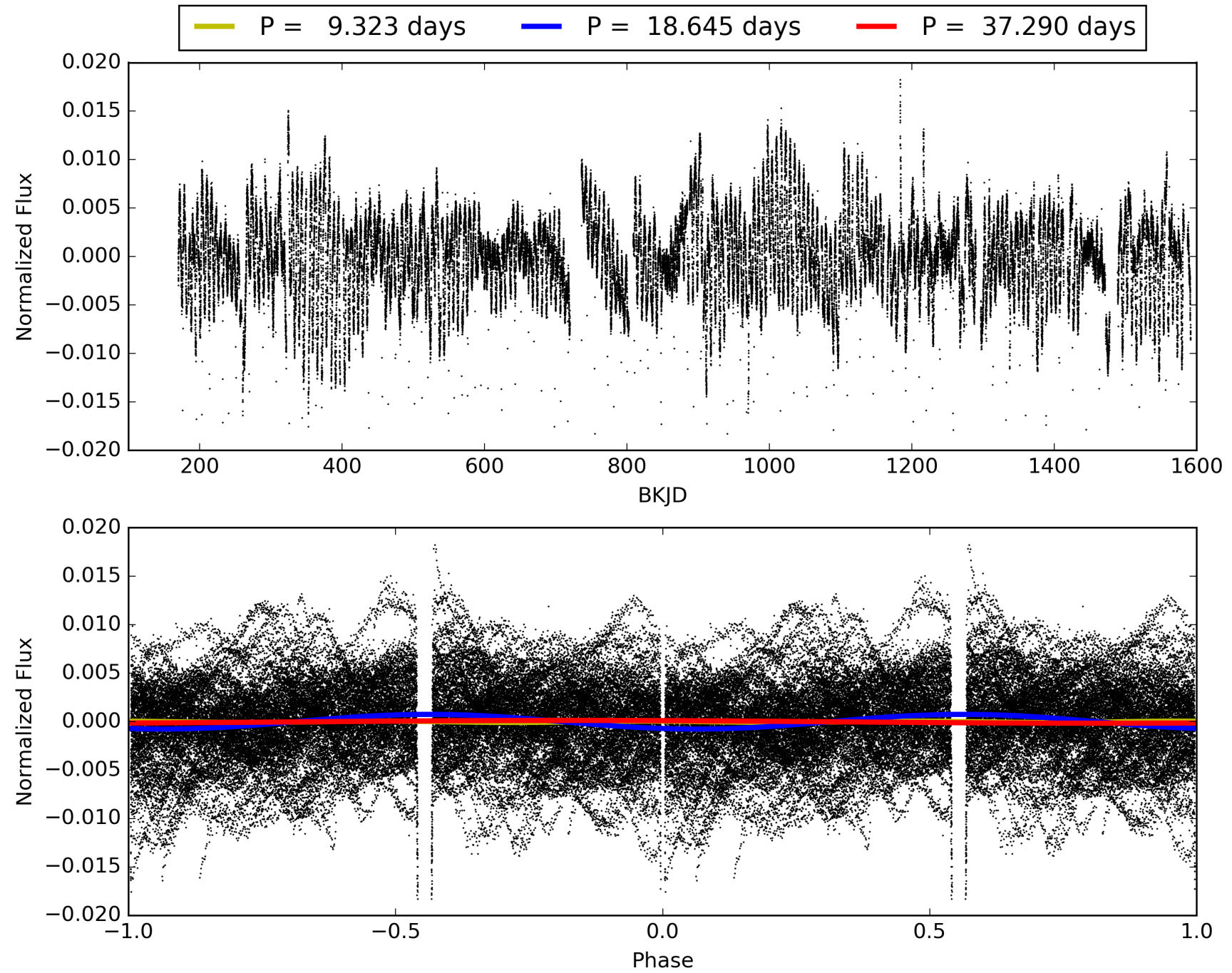
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:51:49 Z

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

# TCE 007021177-01, PDC Light Curves

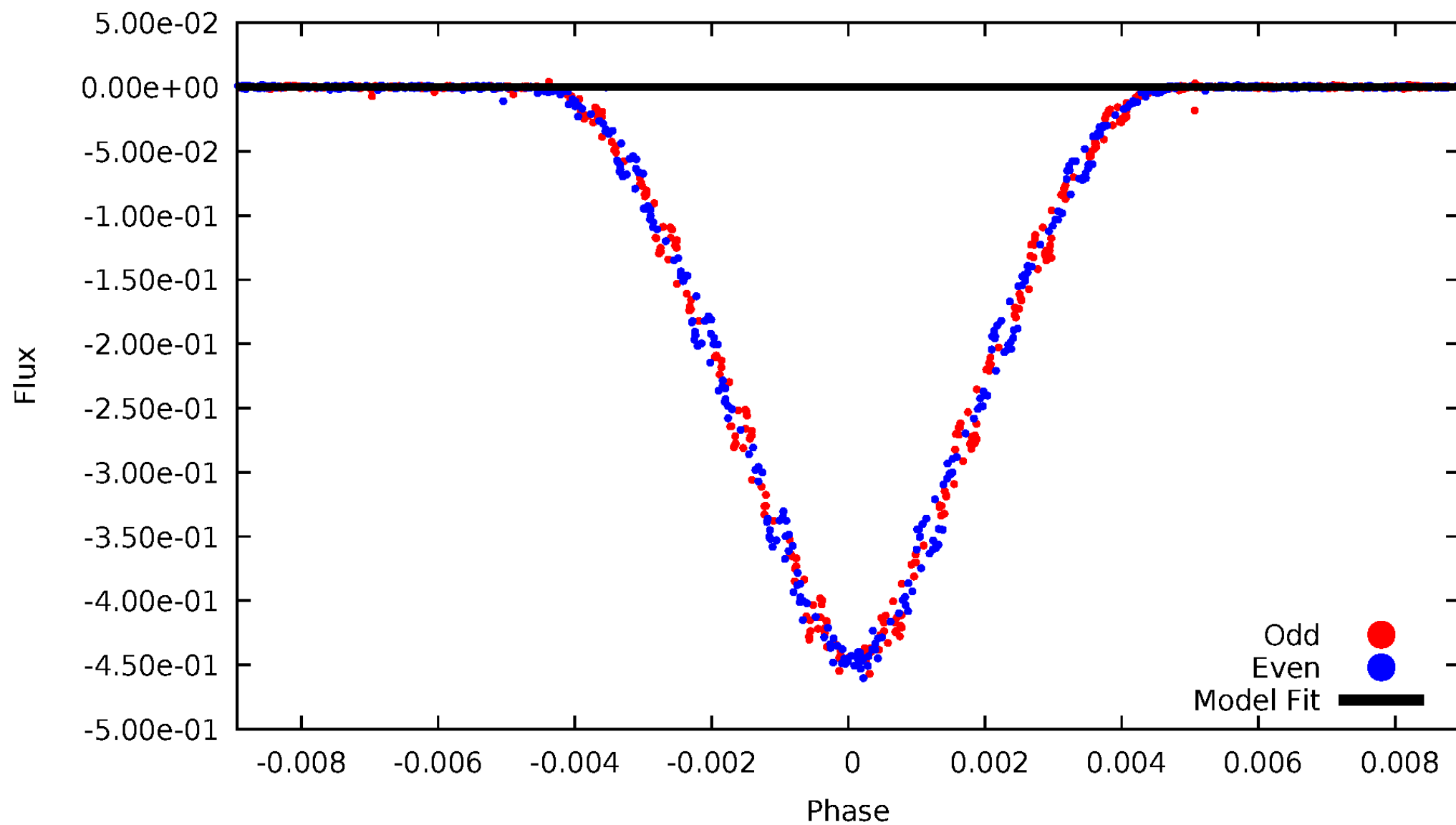


TCE 007021177-01



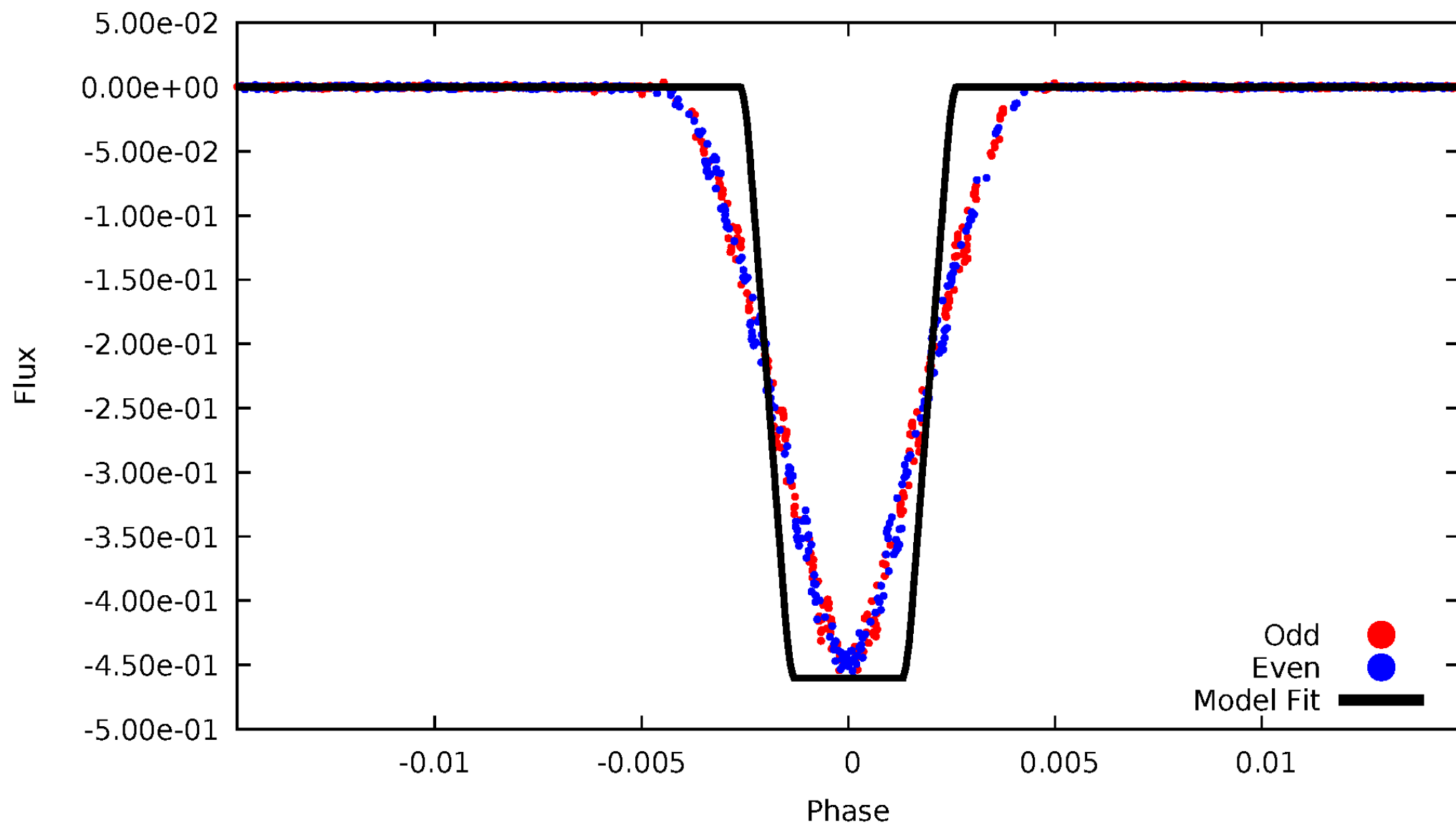
# DV Odd/Even

TCE 007021177-01



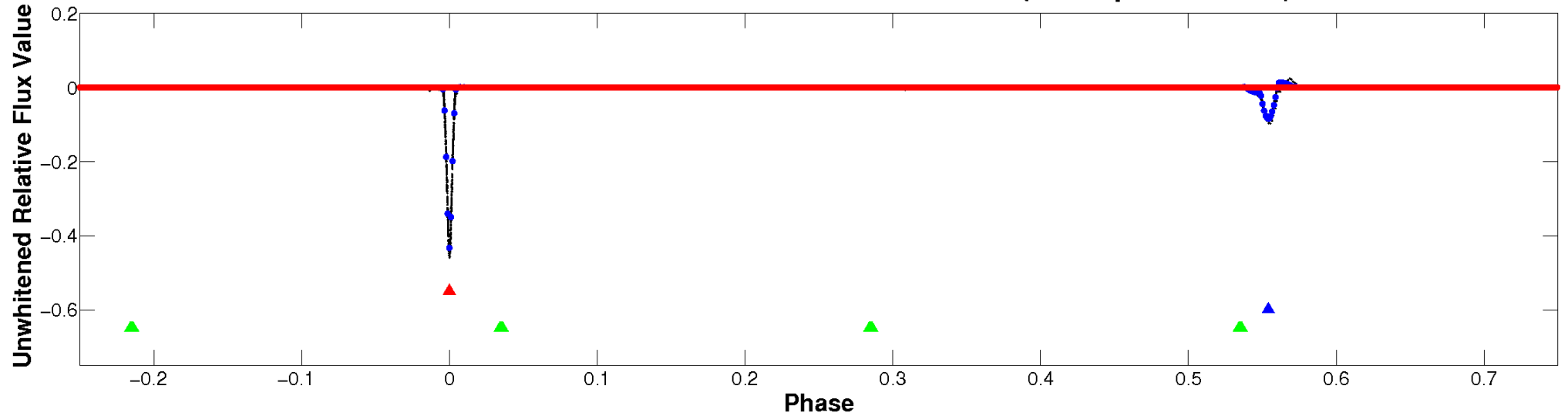
# ALT Odd/Even

TCE 007021177-01



# Non-Whitened Vs. Whitened Light Curve

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

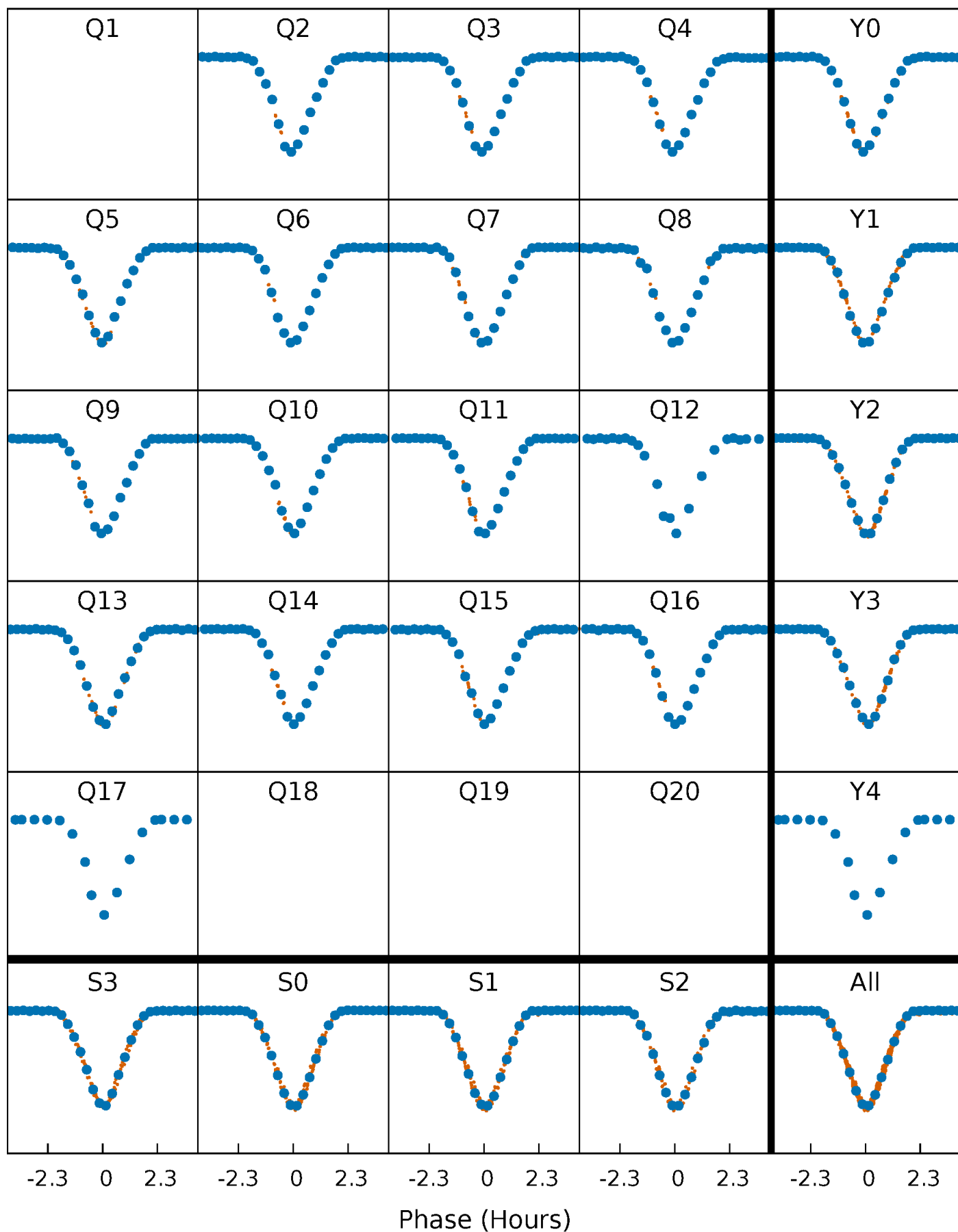


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

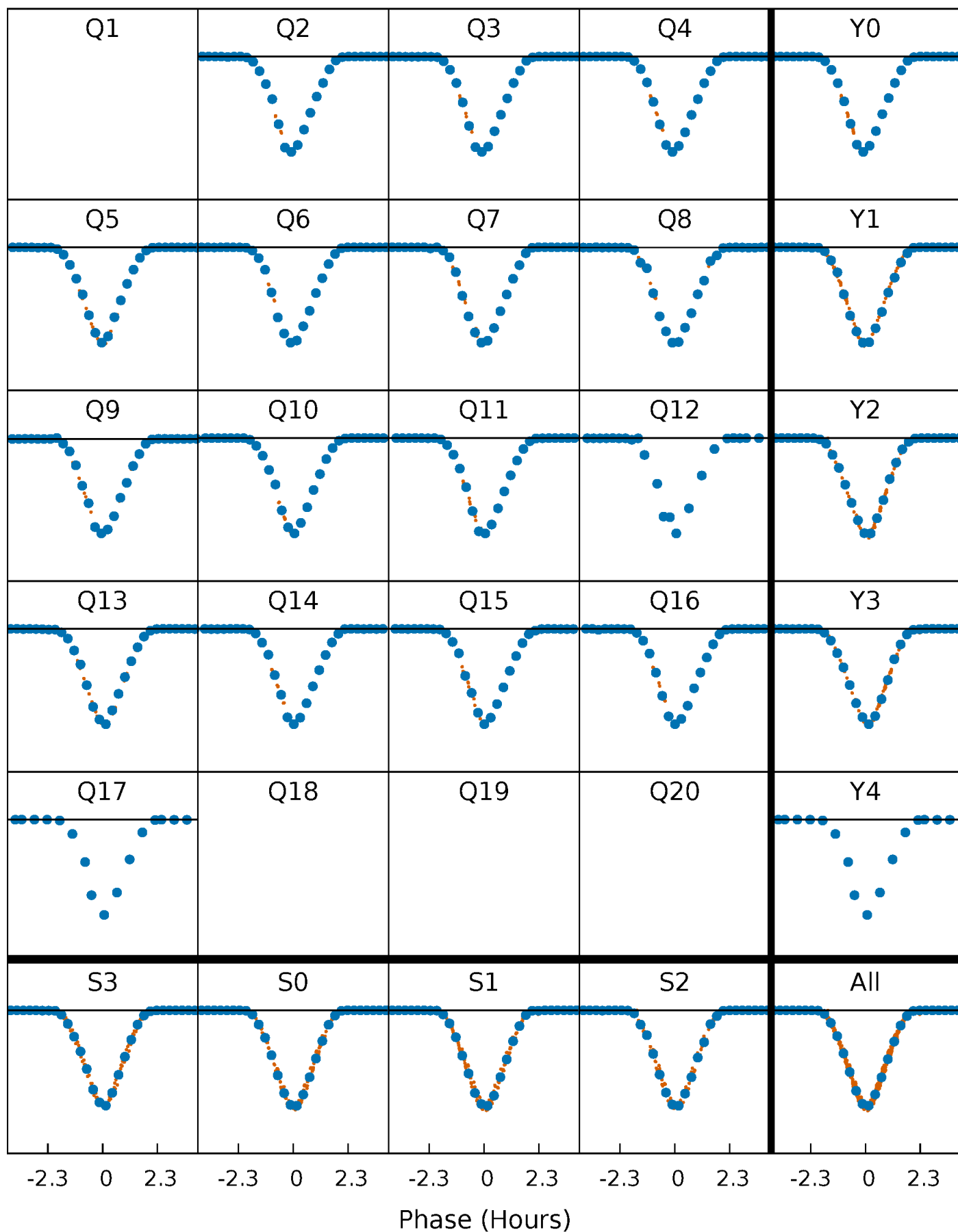
TCE 007021177-01 P= 18.645245 Days  $T_0=147.209114$  (BKJD)





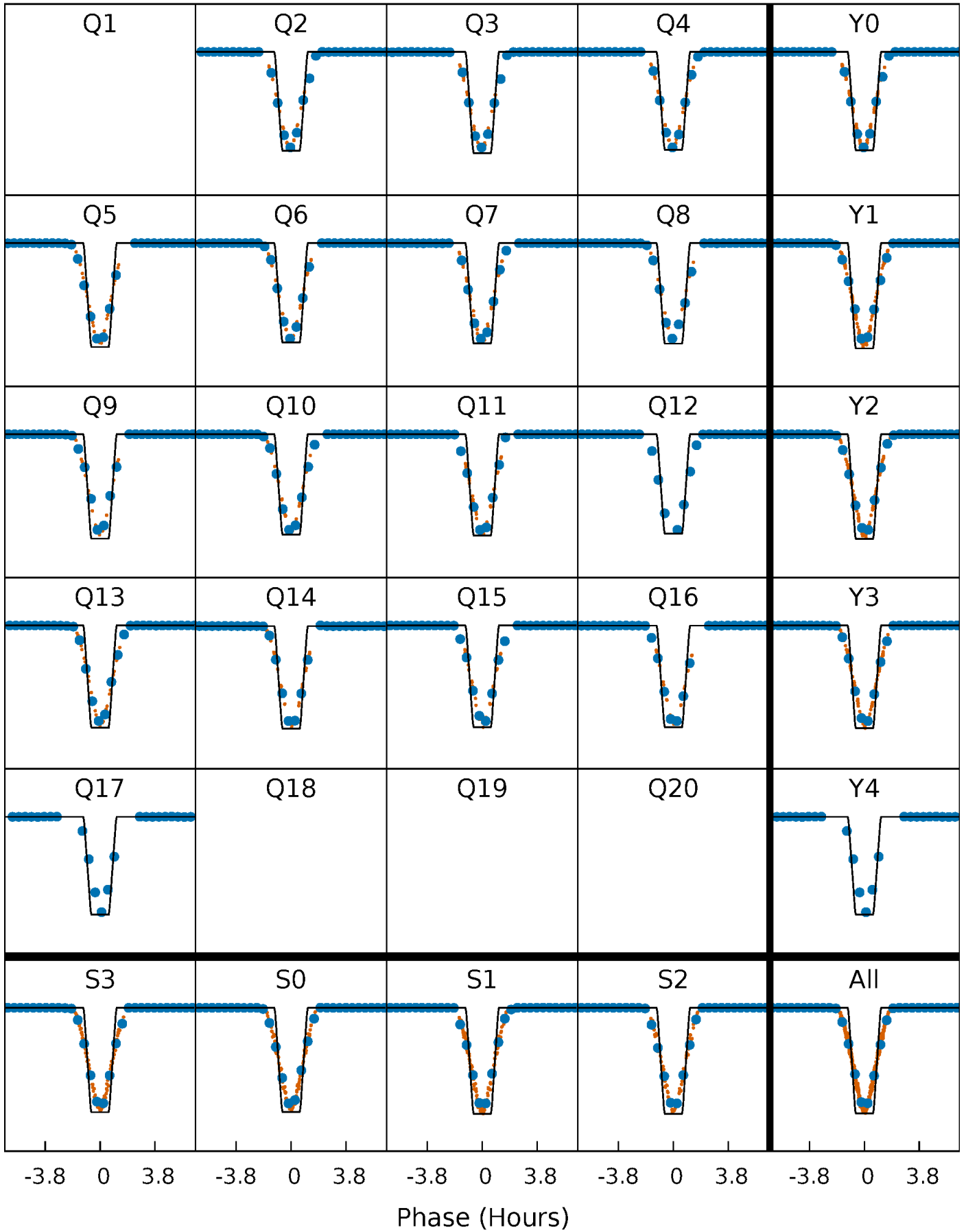
# DV Quarter-Phased Transit Curves

TCE 007021177-01 P= 18.645245 Days  $T_0=147.209114$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

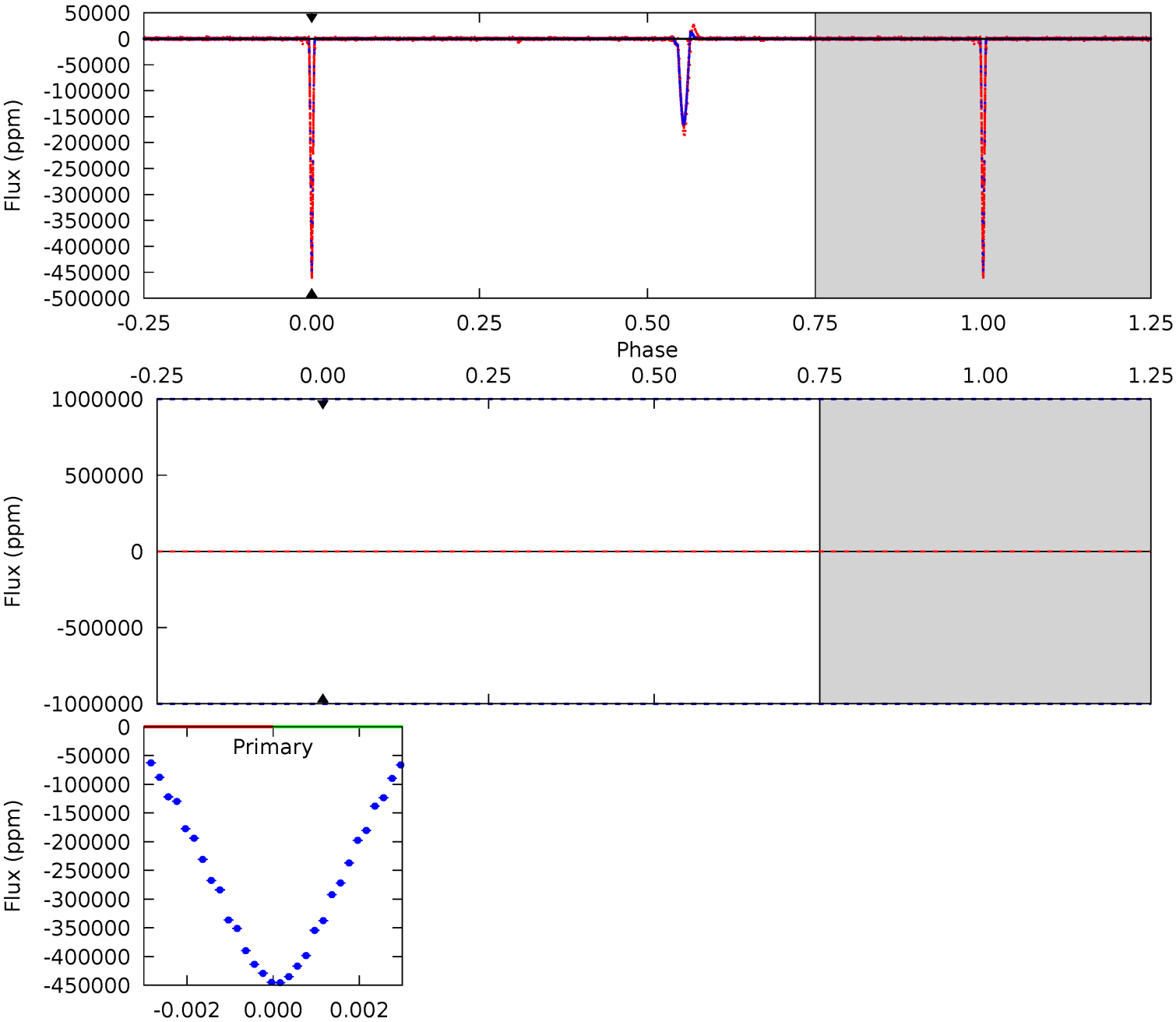
TCE 007021177-01 P= 18.645245 Days  $T_0=147.210718$  (BKJD)



# DV Model-Shift Uniqueness Test

007021177-01, P = 18.645245 Days, E = 147.209114 Days

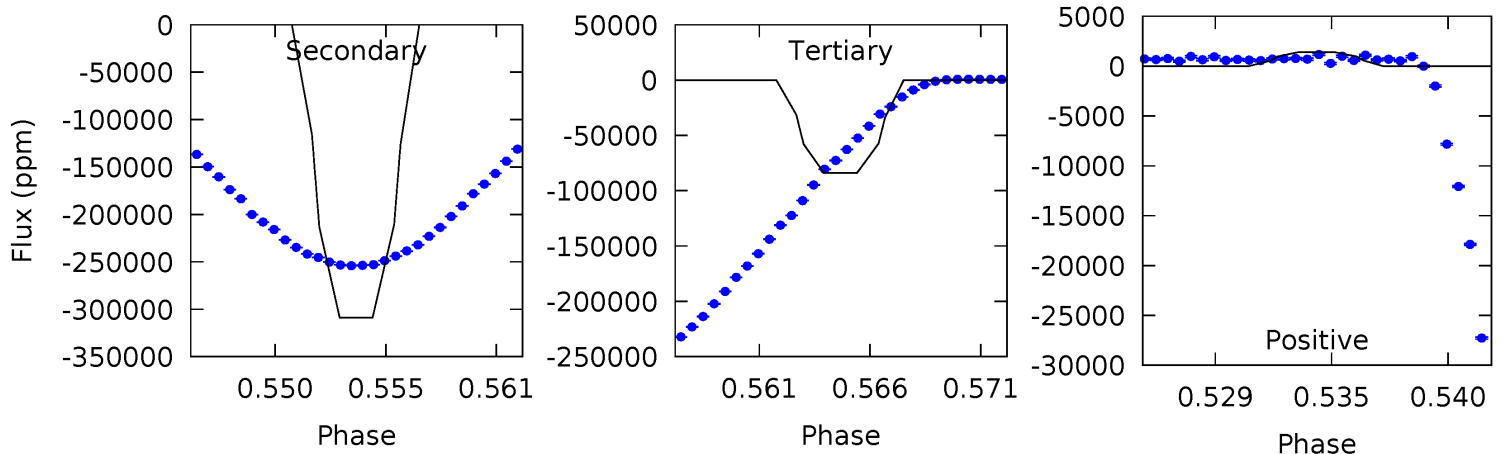
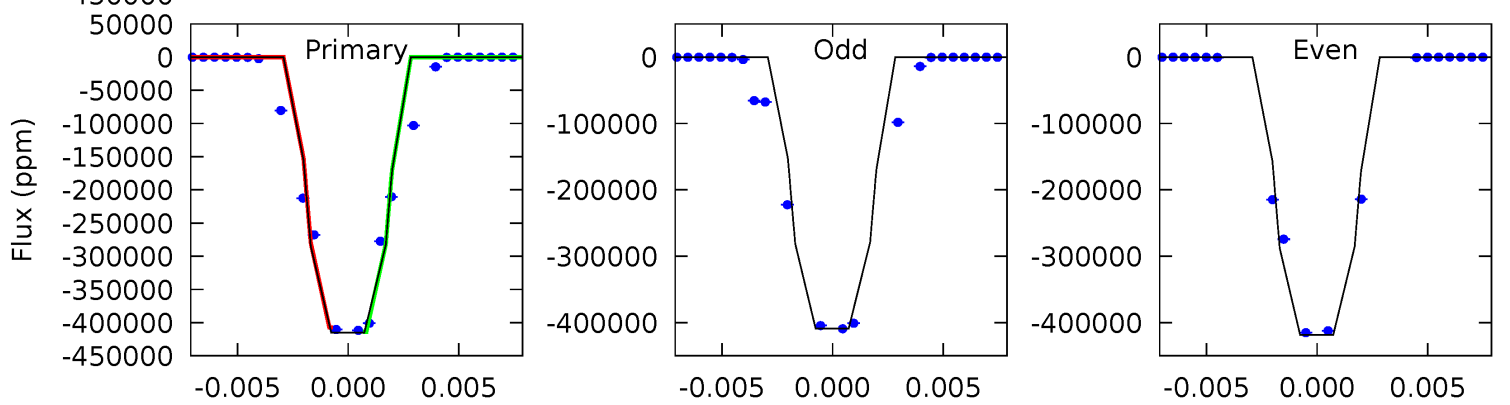
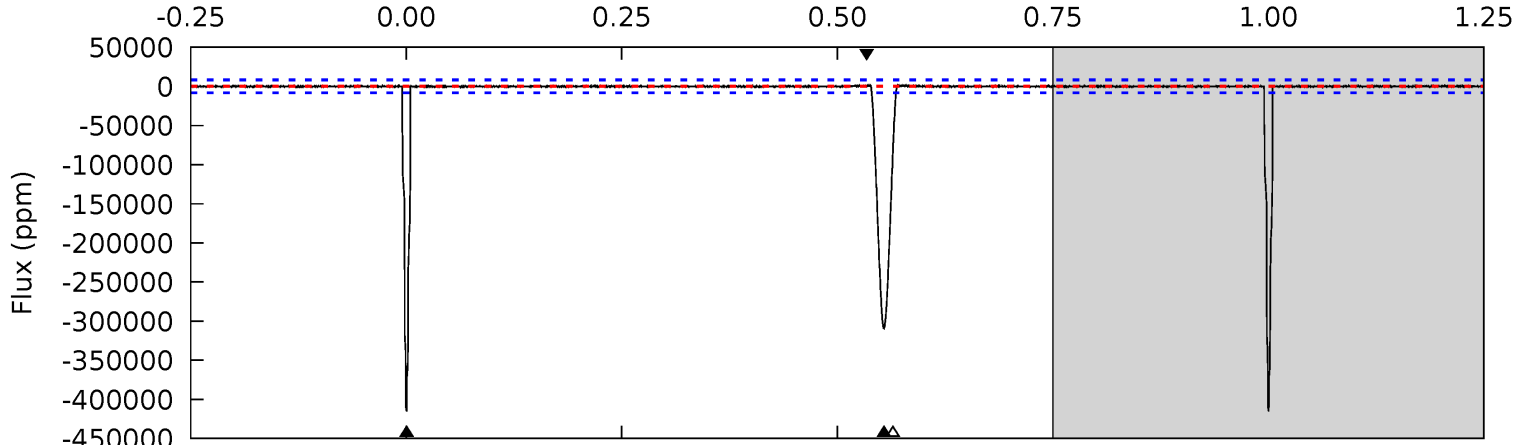
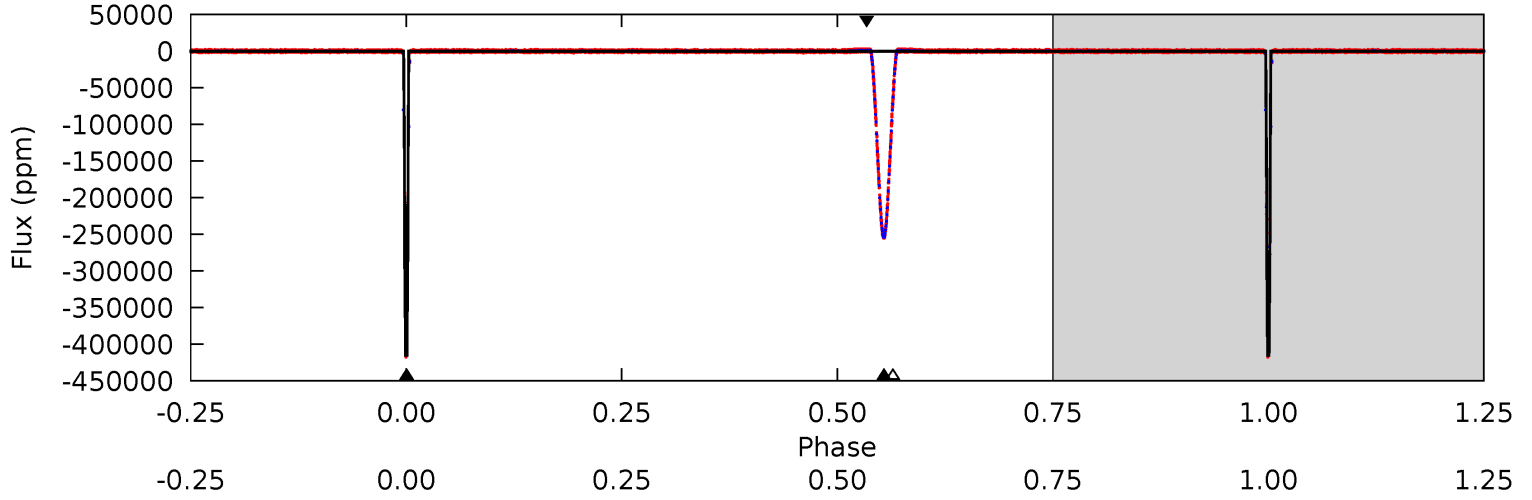
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007021177-01, P = 18.645245 Days, E = 147.210718 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
258.7	192.5	52.4	0.88	5.15	2.79	6.53	206.3	257.8	140.1	191.6	2.85	1.00	0.00	0



### Stellar Parameters For KIC 007021177

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5931^{+158}_{-175}$	$4.554^{+0.038}_{-0.200}$	$-0.340^{+0.300}_{-0.300}$	$0.845^{+0.251}_{-0.079}$	$0.933^{+0.108}_{-0.119}$	$2.182^{+0.445}_{-1.148}$
	+3%/-3%	+1%/-4%	+88%/-88%	+30%/-9%	+12%/-13%	+20%/-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 007021177-01 / KOI 3452.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$48.54^{+12.59}_{-10.75}$	$940^{+60}_{-44}$	$2450^{+2508}_{-7222}$	$5.225^{+476.777}_{-401.790}$
Alt.	$-308863 \pm 1605$	$66.43^{+12.62}_{-12.09}$	$941^{+63}_{-45}$	$5865^{+548}_{-394}$	$988^{+457}_{-278}$

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

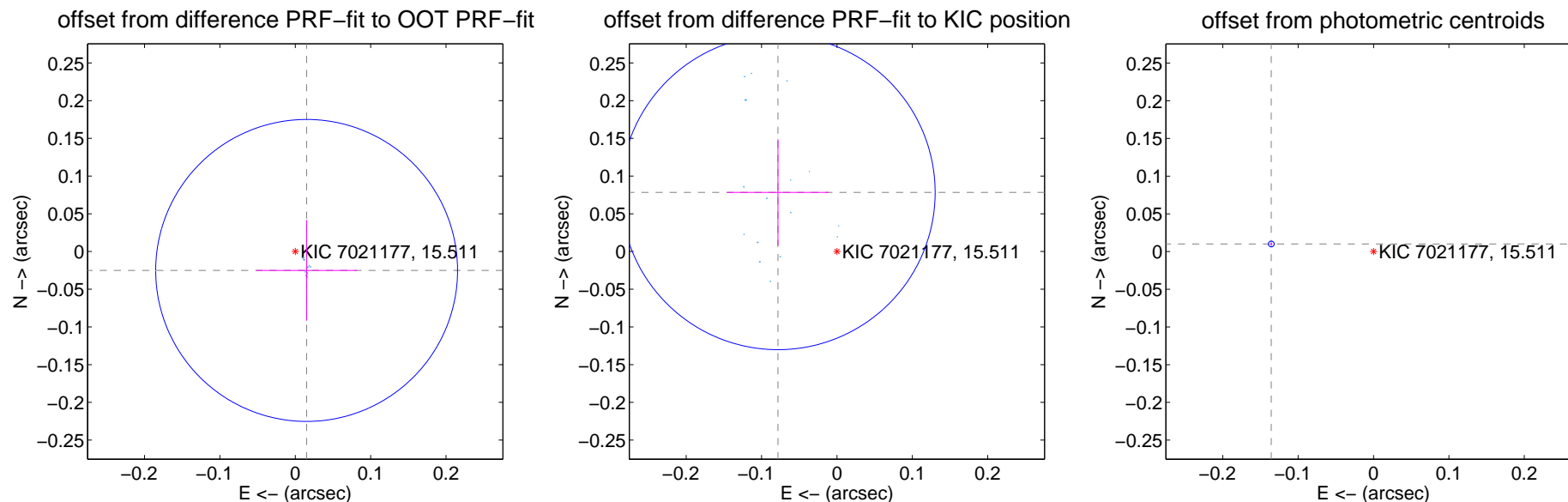
## DV Centroid Data

Supplemental centroid analysis for 007021177-01. Kepler magnitude: 15.51. Transit SNR -1.00

There are 16 quarters with good PRF difference image offsets

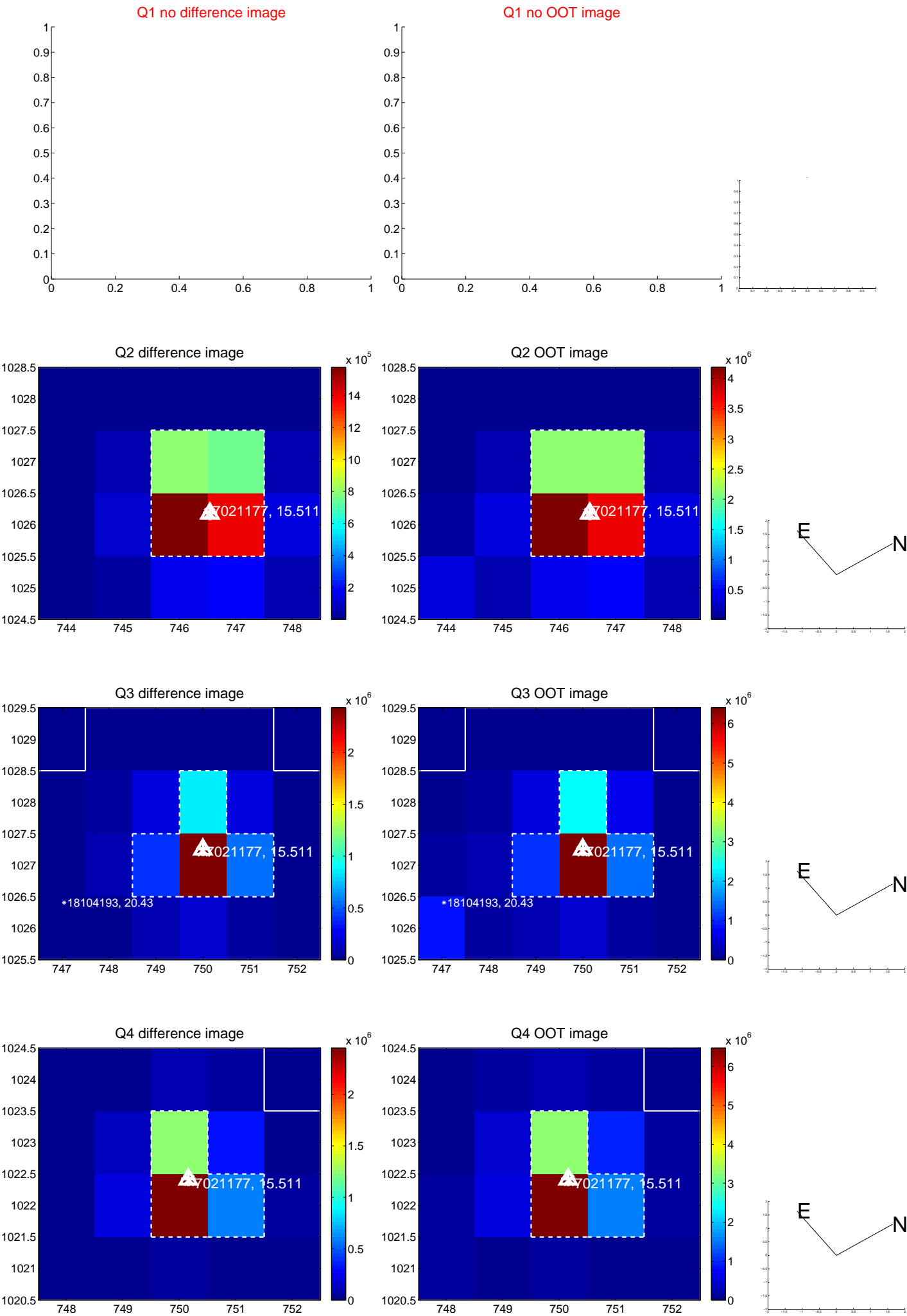
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.029 \pm 0.067$	0.44	$-0.015 \pm 0.067$	$-0.025 \pm 0.067$
PRF-fit source offset from KIC position	$0.111 \pm 0.069$	1.59	$0.078 \pm 0.067$	$0.078 \pm 0.071$
photometric centroid source offset	$0.14 \pm 0.00$	<b>106.38</b>	$0.14 \pm 0.00$	$0.01 \pm 0.00$

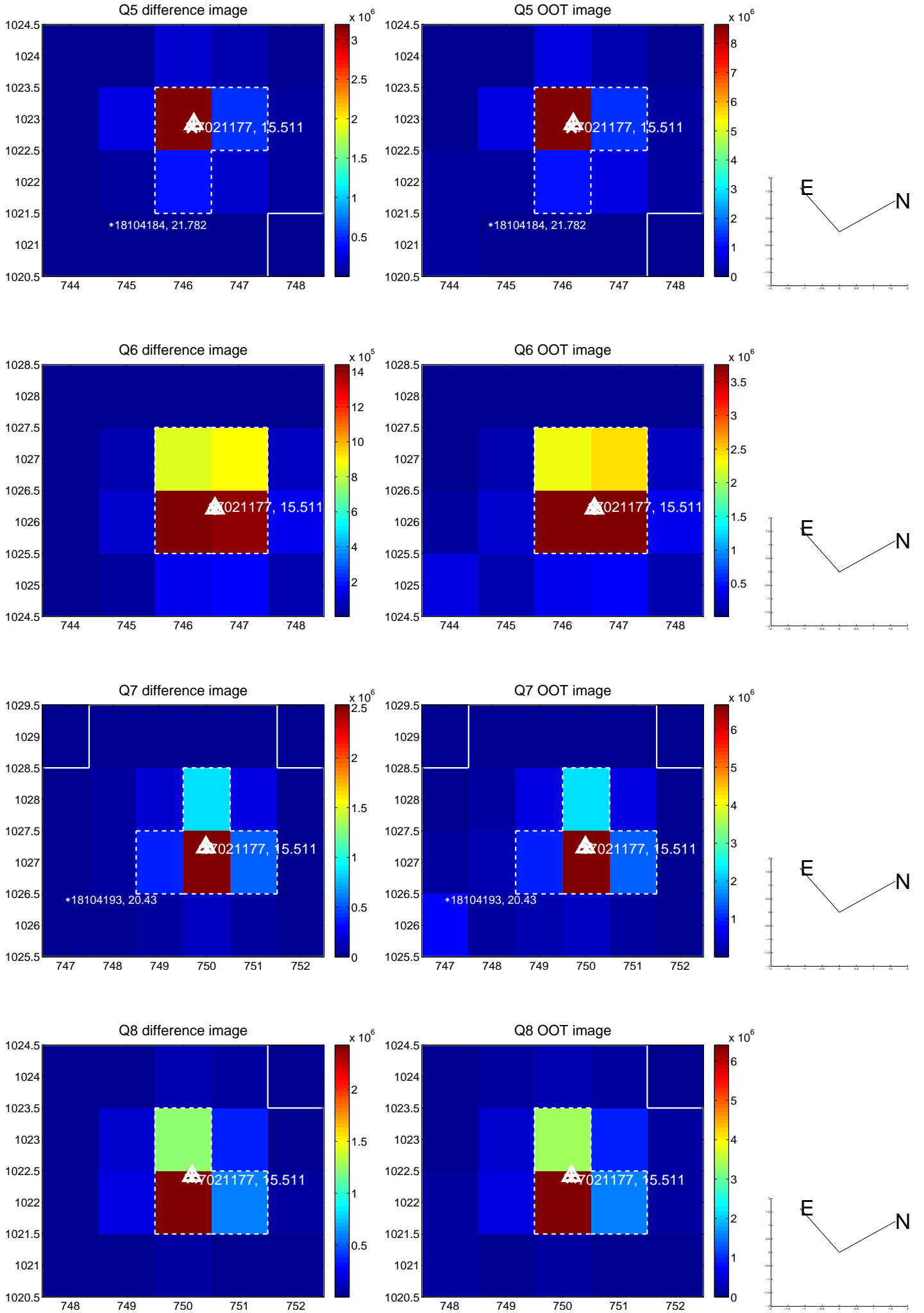


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

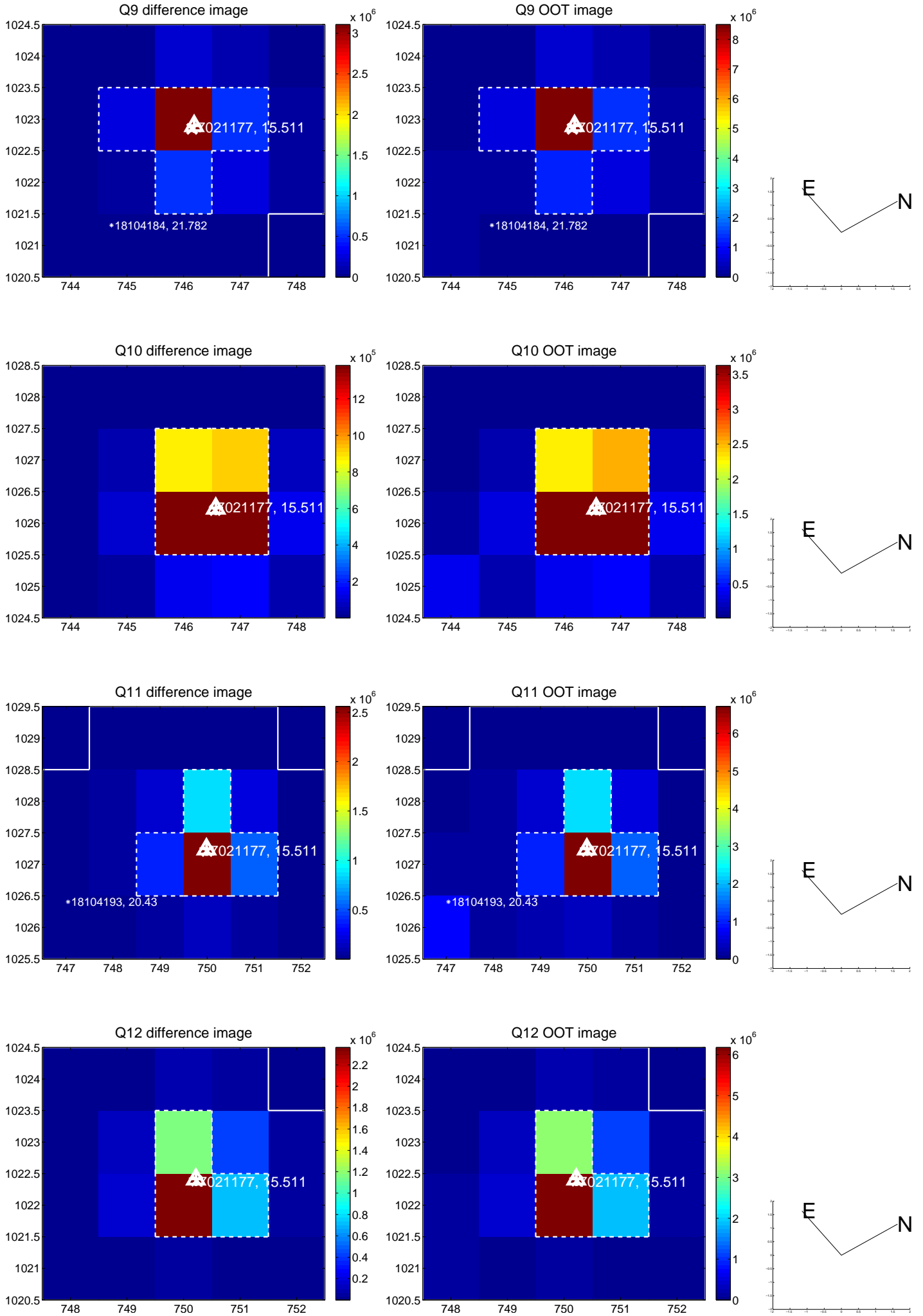


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

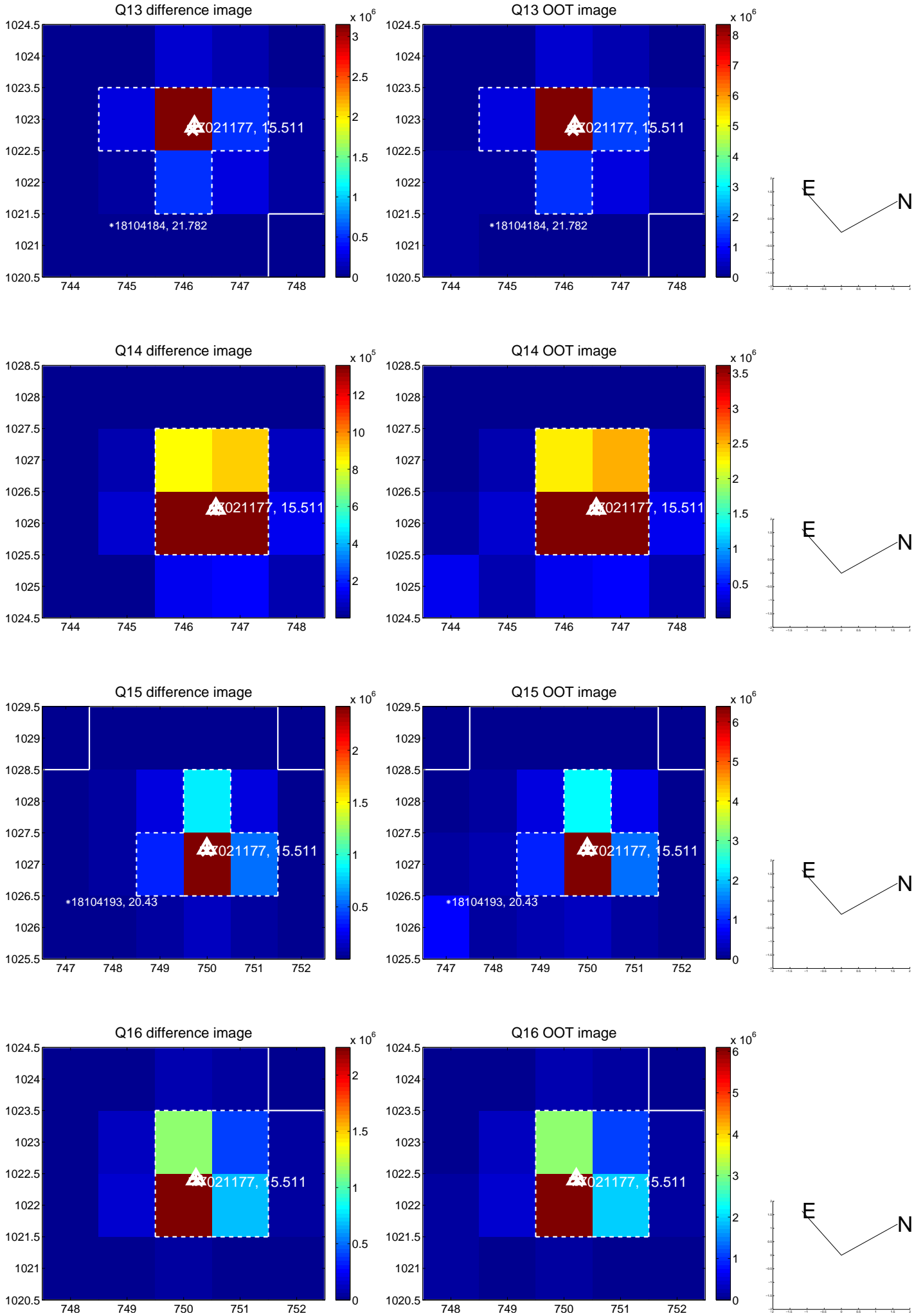




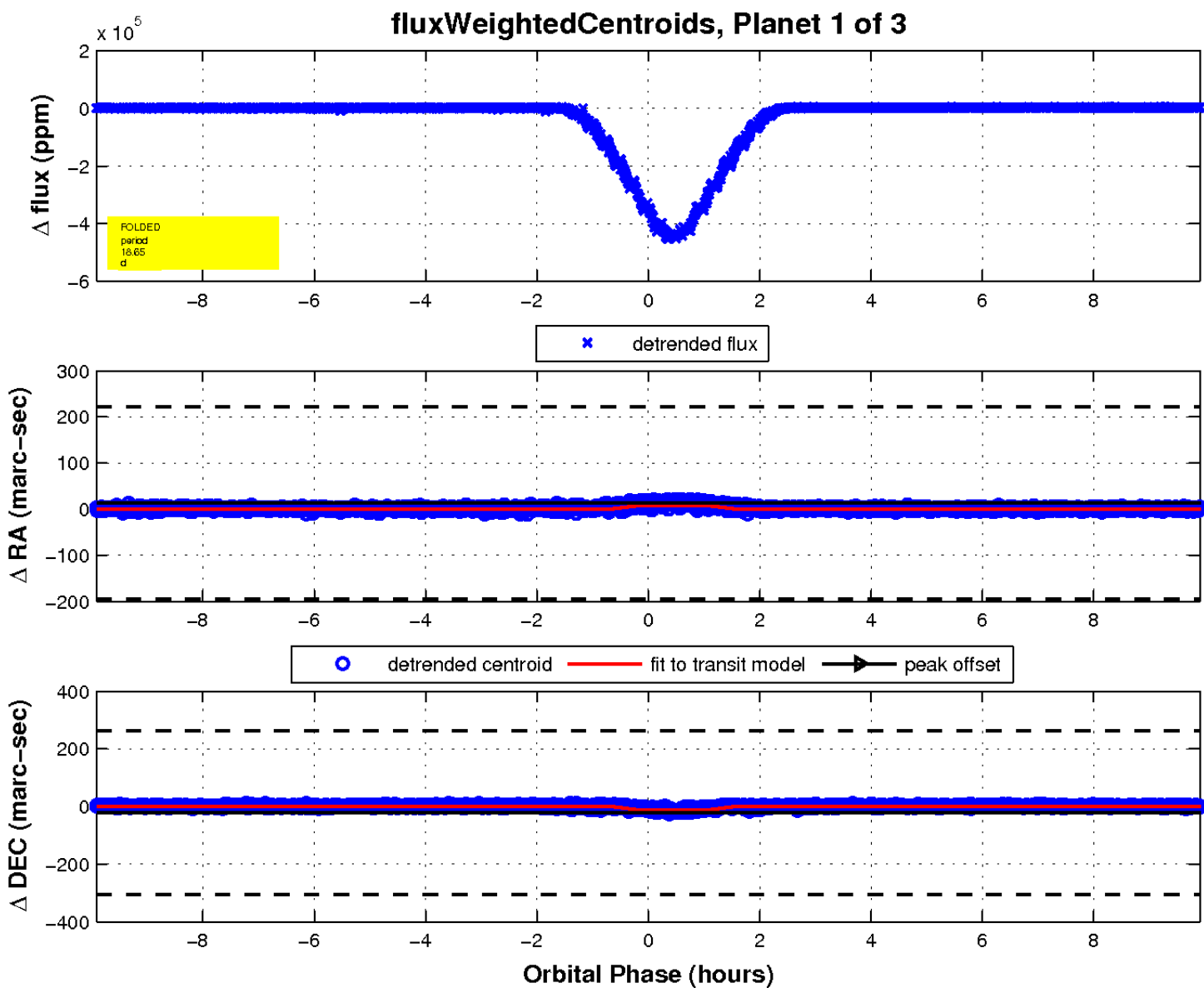
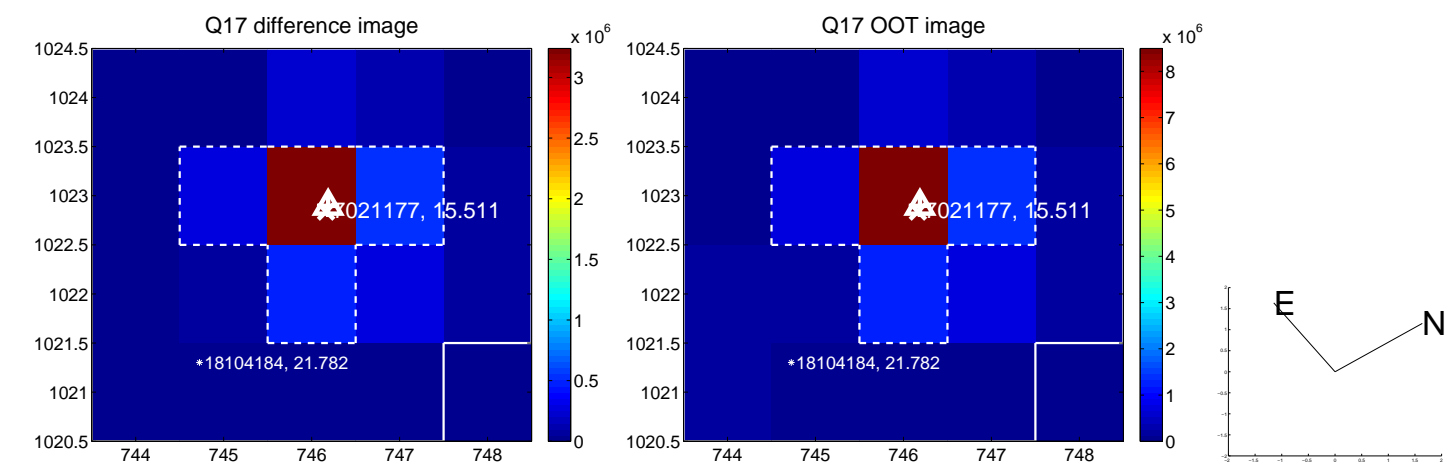
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

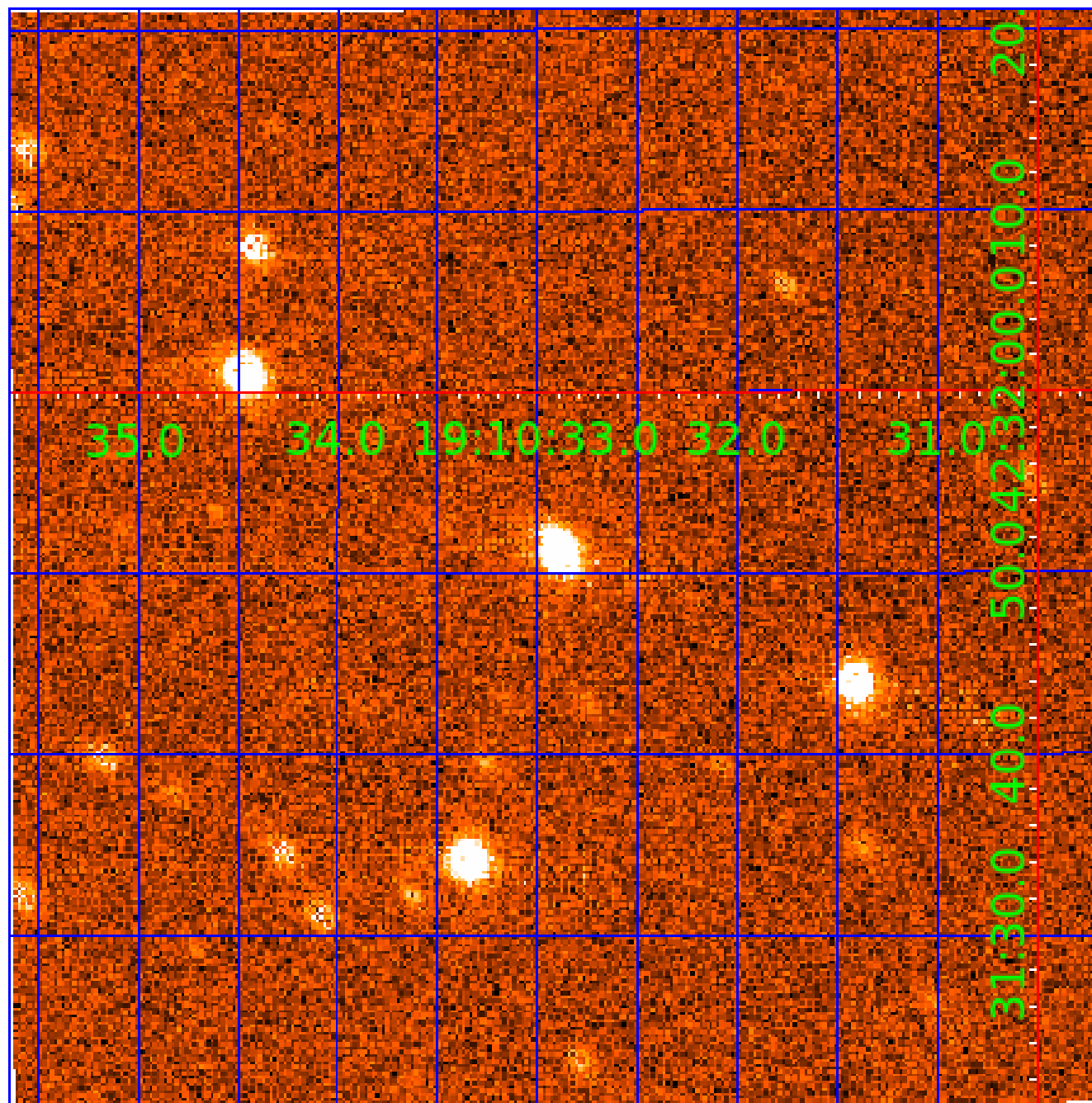


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007021177

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007021177-01	OBS	3452.01	18.645245	147.209114	436961.7	2.000	8837.9	-1.0	0.84	5931	46.10	43.77
007021177-02	OBS	No	18.645222	138.896131	252005.1	13.511	6043.8	4288.5	0.84	5931	52.35	43.77
007021177-03	OBS	No	4.661190	133.898642	2310.6	55.934	935.1	36.9	0.84	5931	4.84	277.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007021177-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
007021177-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
007021177-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

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

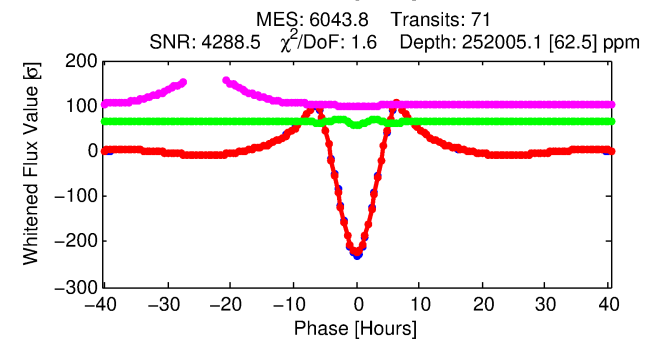
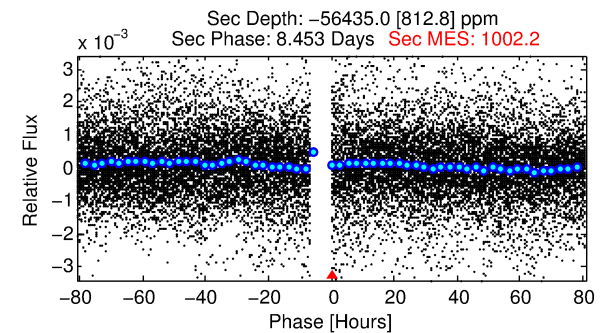
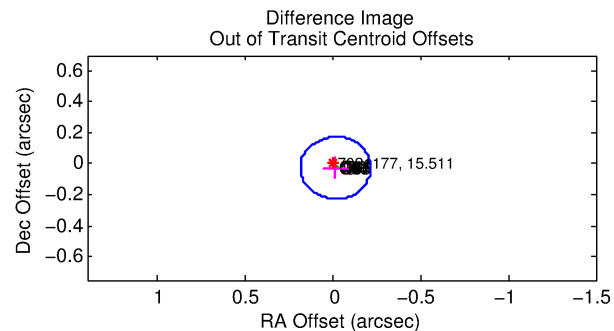
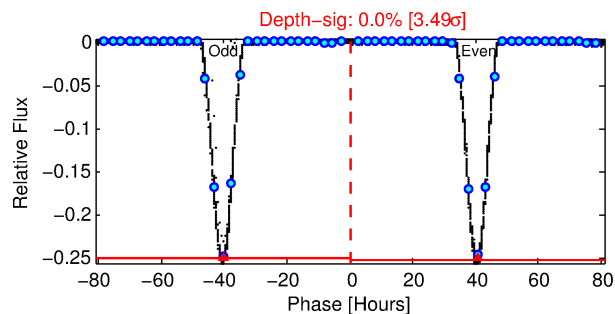
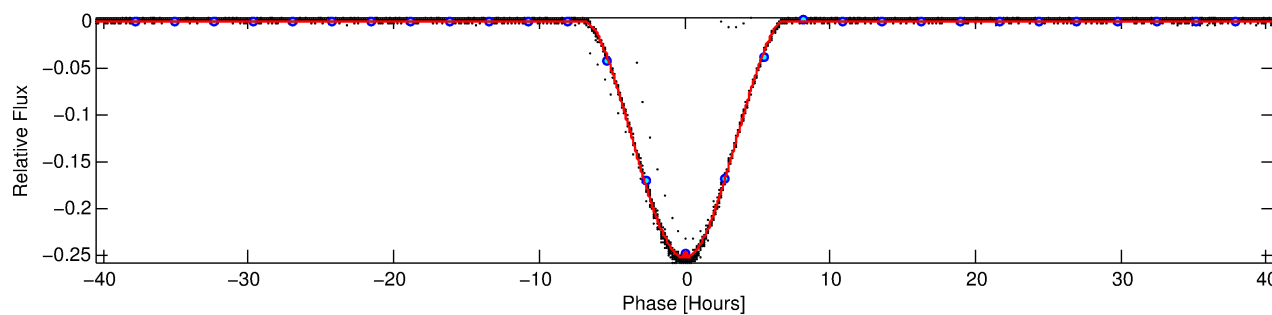
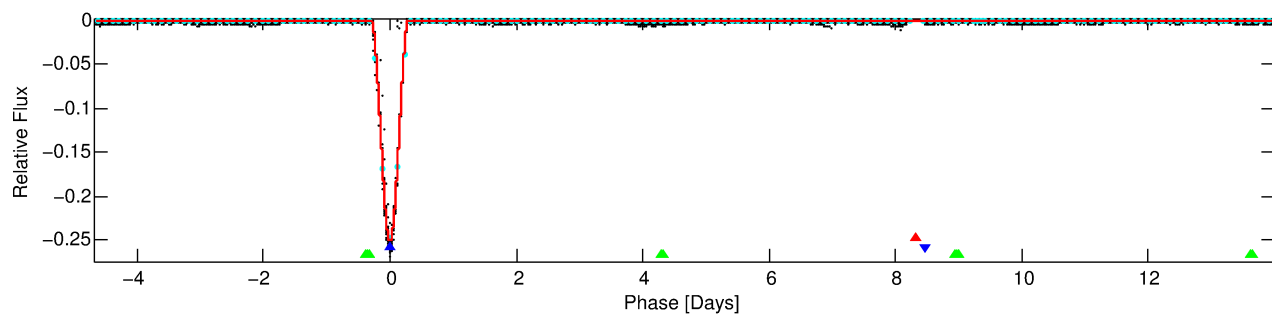
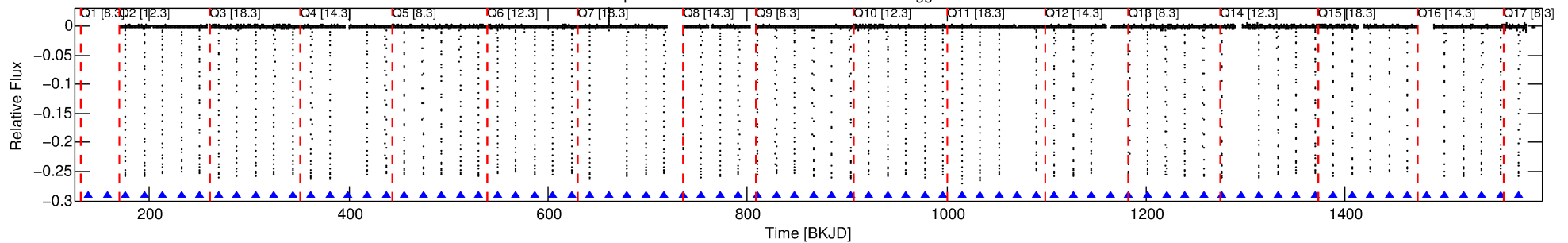
Ephemeris Match Information For 007021177-02

No Significant Match Found

# DV One-Page Summary

KIC: 7021177 Candidate: 2 of 3 Period: 18.645 d  
KOI: K03452 Corr: No Ephemeris Match

Kp: 15.51 R\*: 0.84 Rs Teff: 5931.0 K Logg: 4.55 Fe/H: -0.340



## DV Fit Results:

Period = 18.64522 [0.00000] d  
Epoch = 138.8961 [0.0001] BKJD  
Rp/R\* = 0.5677 [0.0117]  
a/R\* = 14.82 [0.04]  
b = 0.70 [0.02]  
Seff = 43.77 [16.81]  
Teq = 656 [63] K  
Rp = 52.35 [15.59] Re  
a = 0.1345 [0.0337] AU  
Ag = N/A  
Teffp = N/A

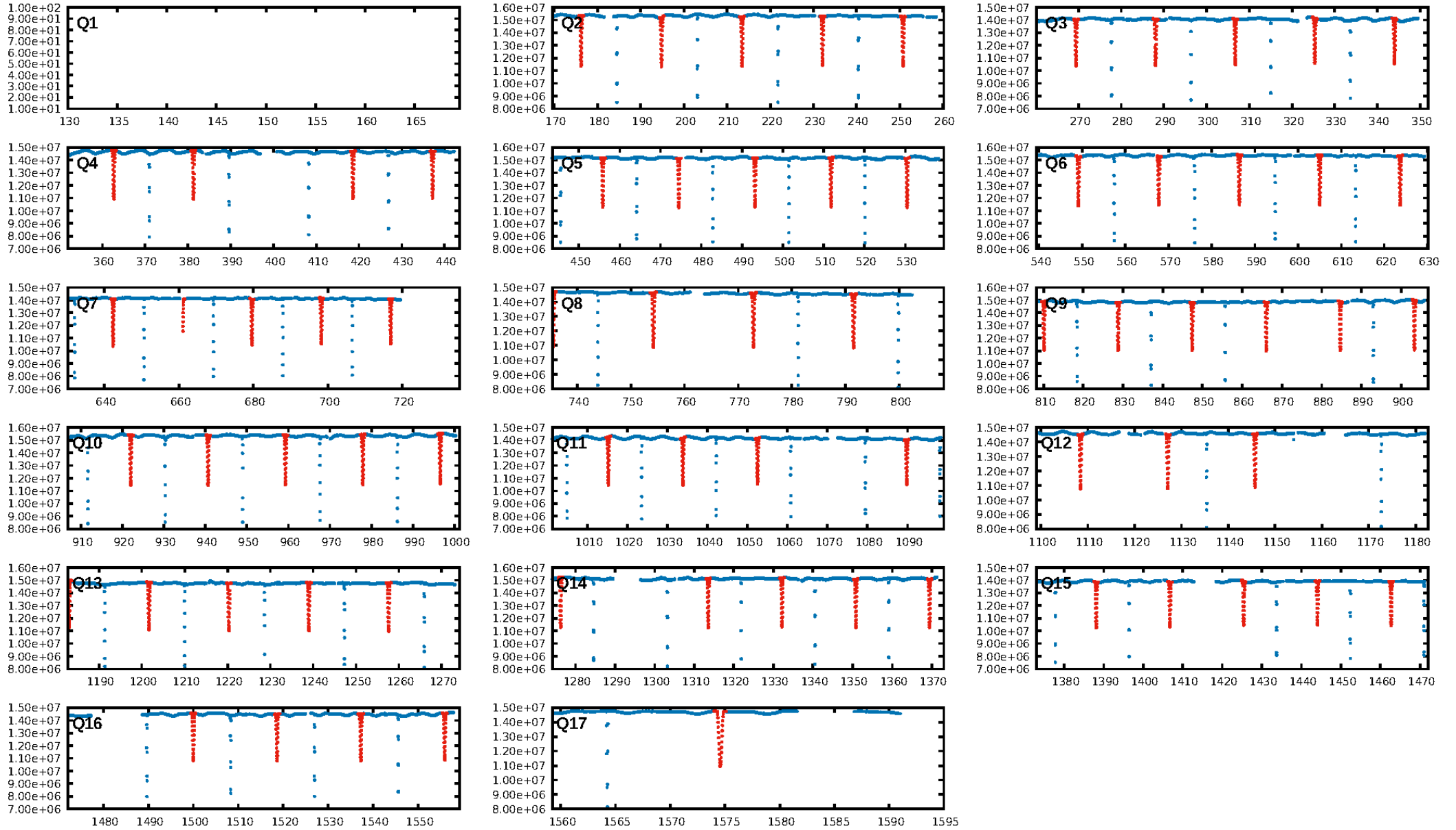
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.83σ]  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [70/70]  
GhostDiagnostic-chr: 2.873  
Centroid-sig: 0.0%  
Centroid-so: 0.129 arcsec [95.92σ]  
OotOffset-rm: 0.031 arcsec [0.47σ]  
KicOffset-rm: 0.100 arcsec [1.44σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 0.00 [0/16]

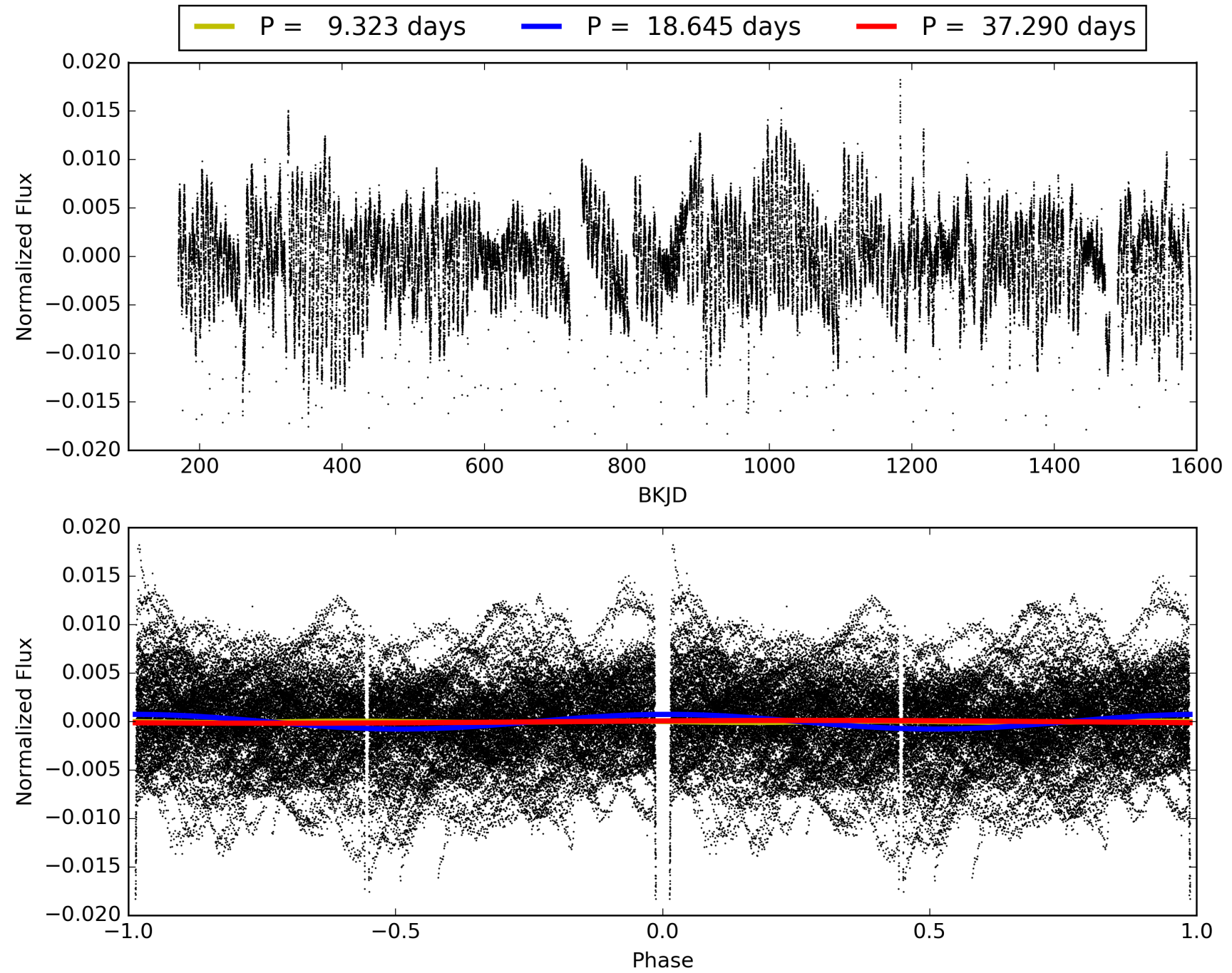
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:51:53 Z

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# TCE 007021177-02, PDC Light Curves



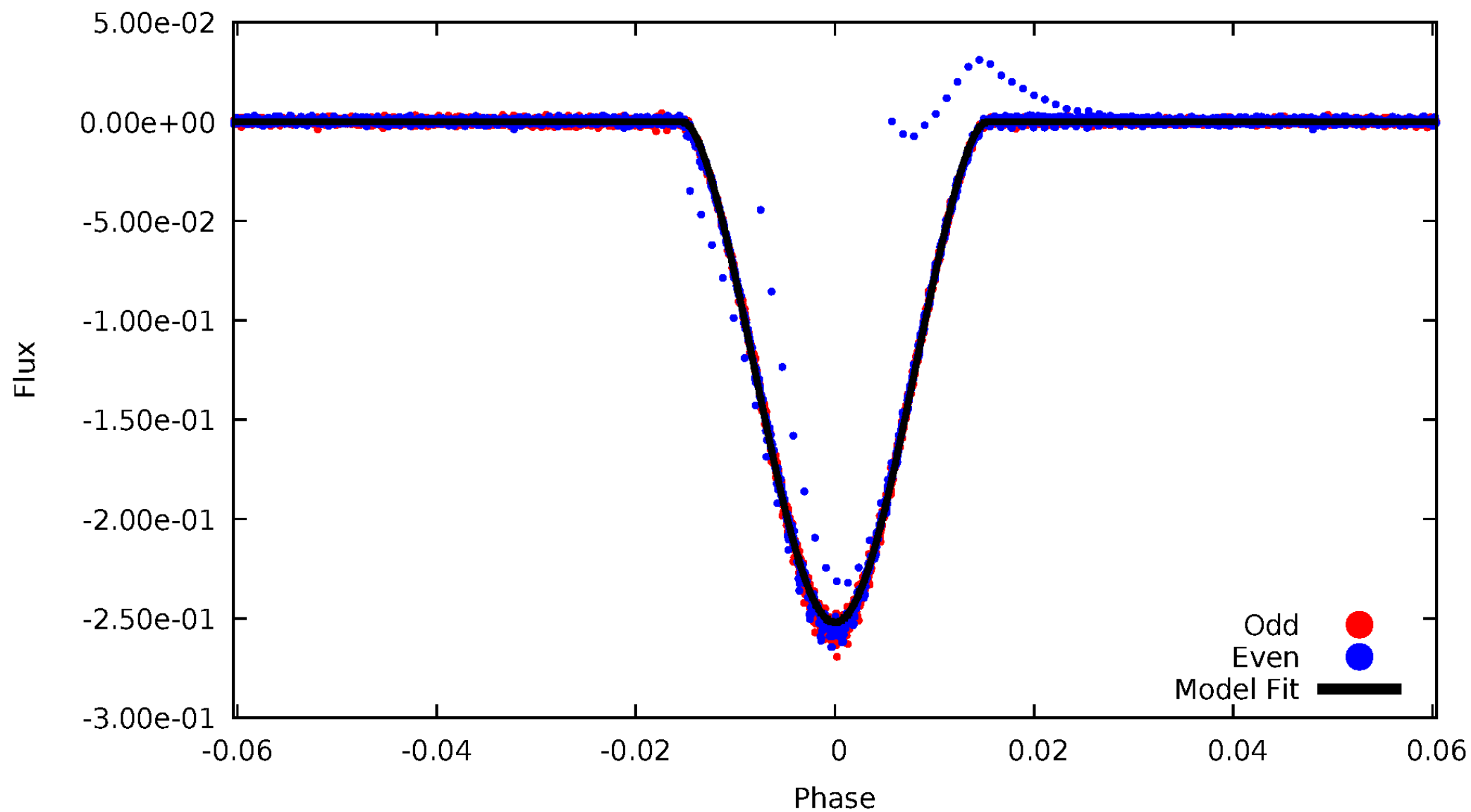
TCE 007021177-02





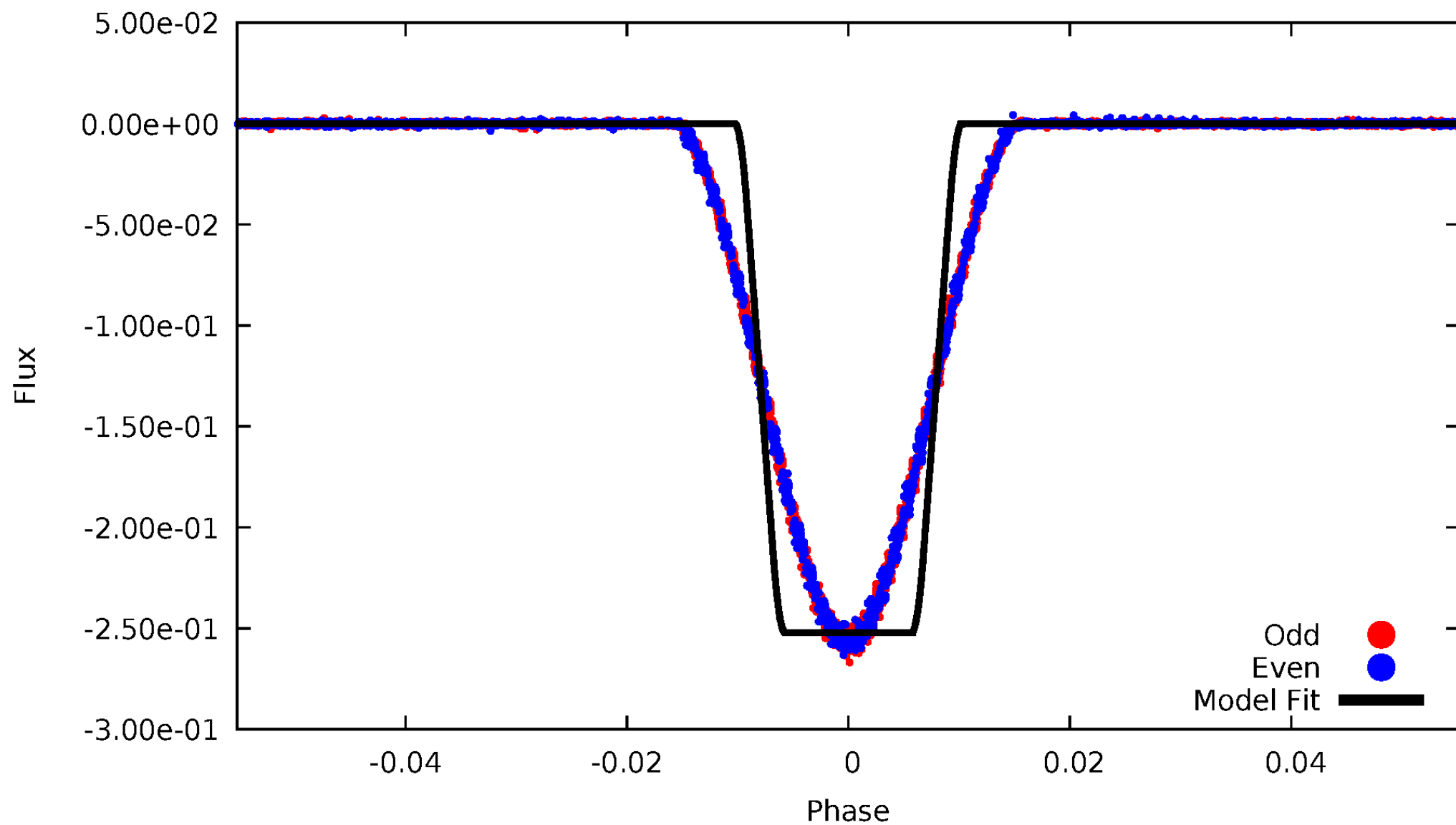
# DV Odd/Even

TCE 007021177-02



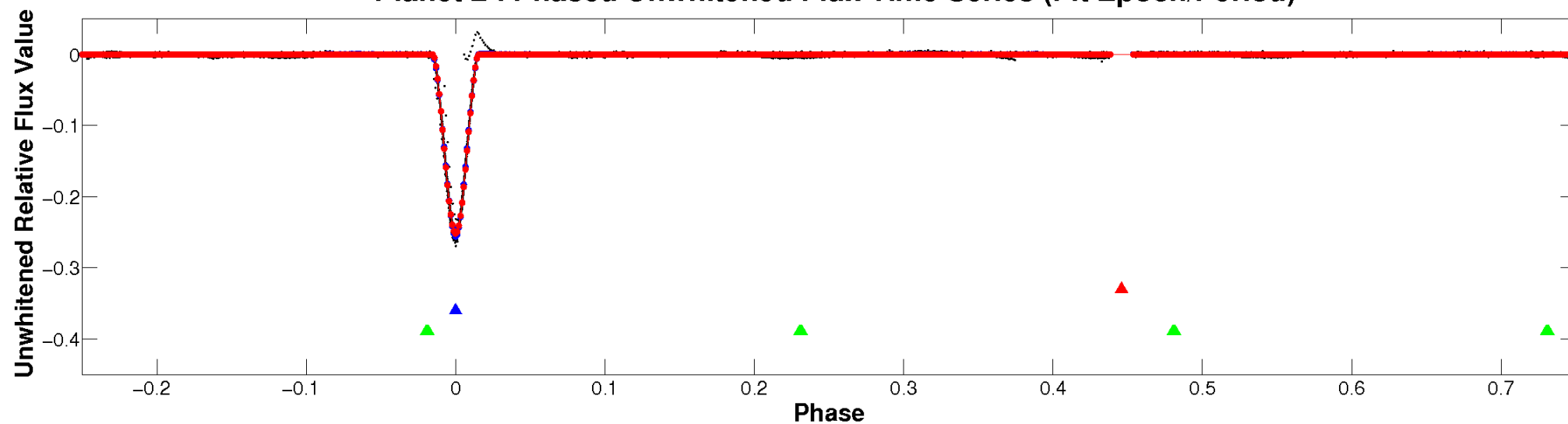
# ALT Odd/Even

TCE 007021177-02

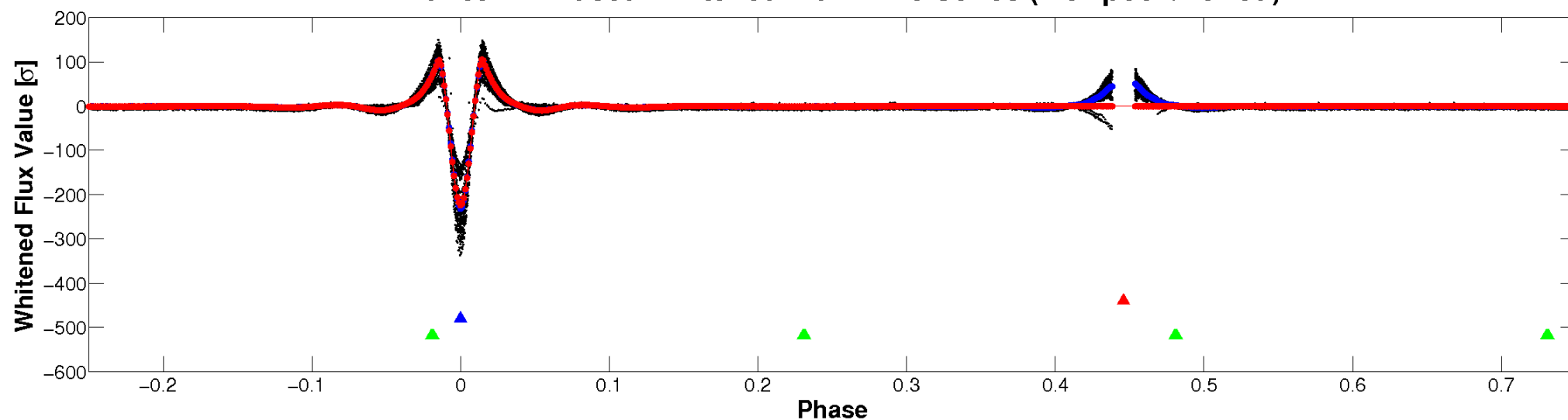


# Non-Whitened Vs. Whitened Light Curve

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

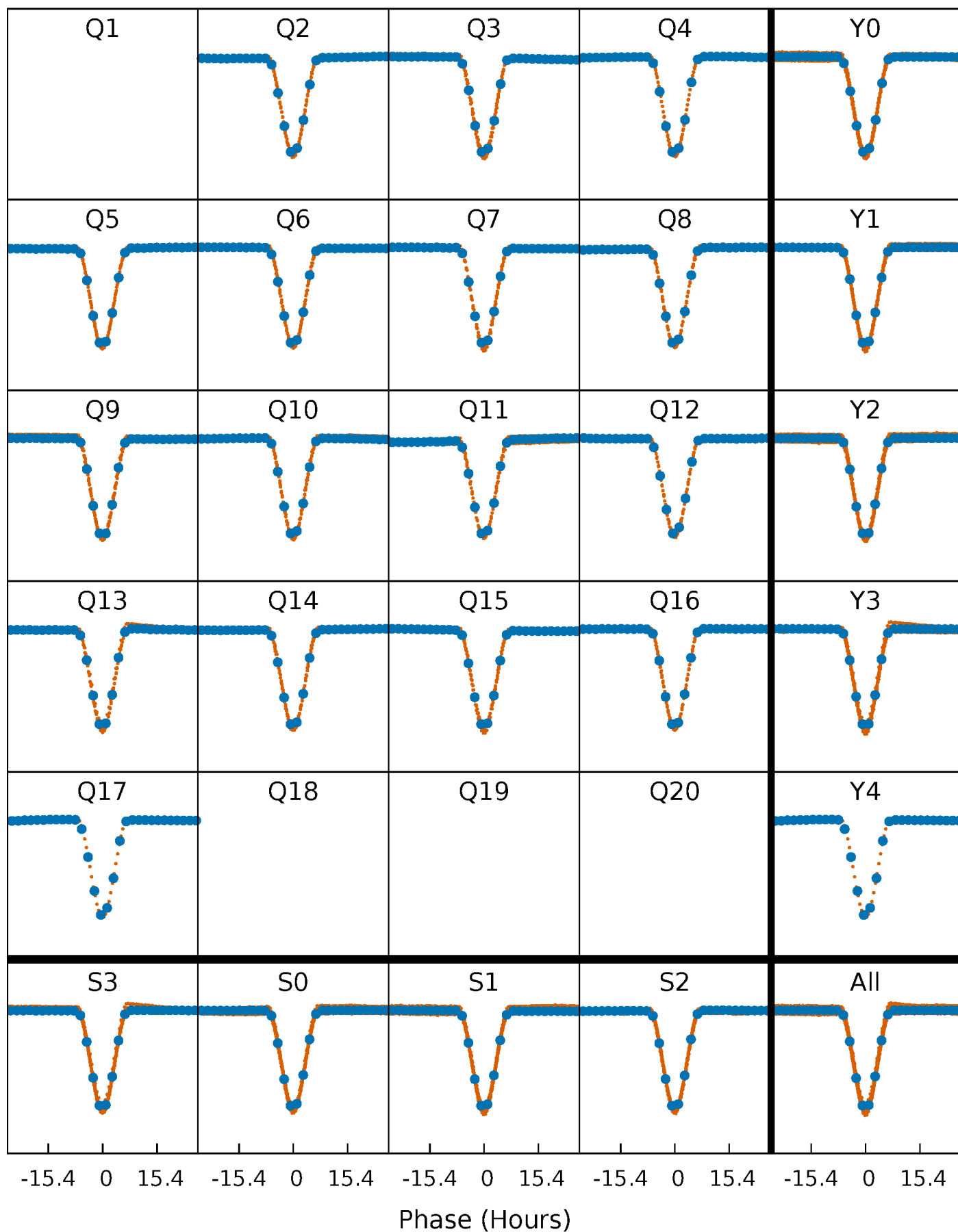


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



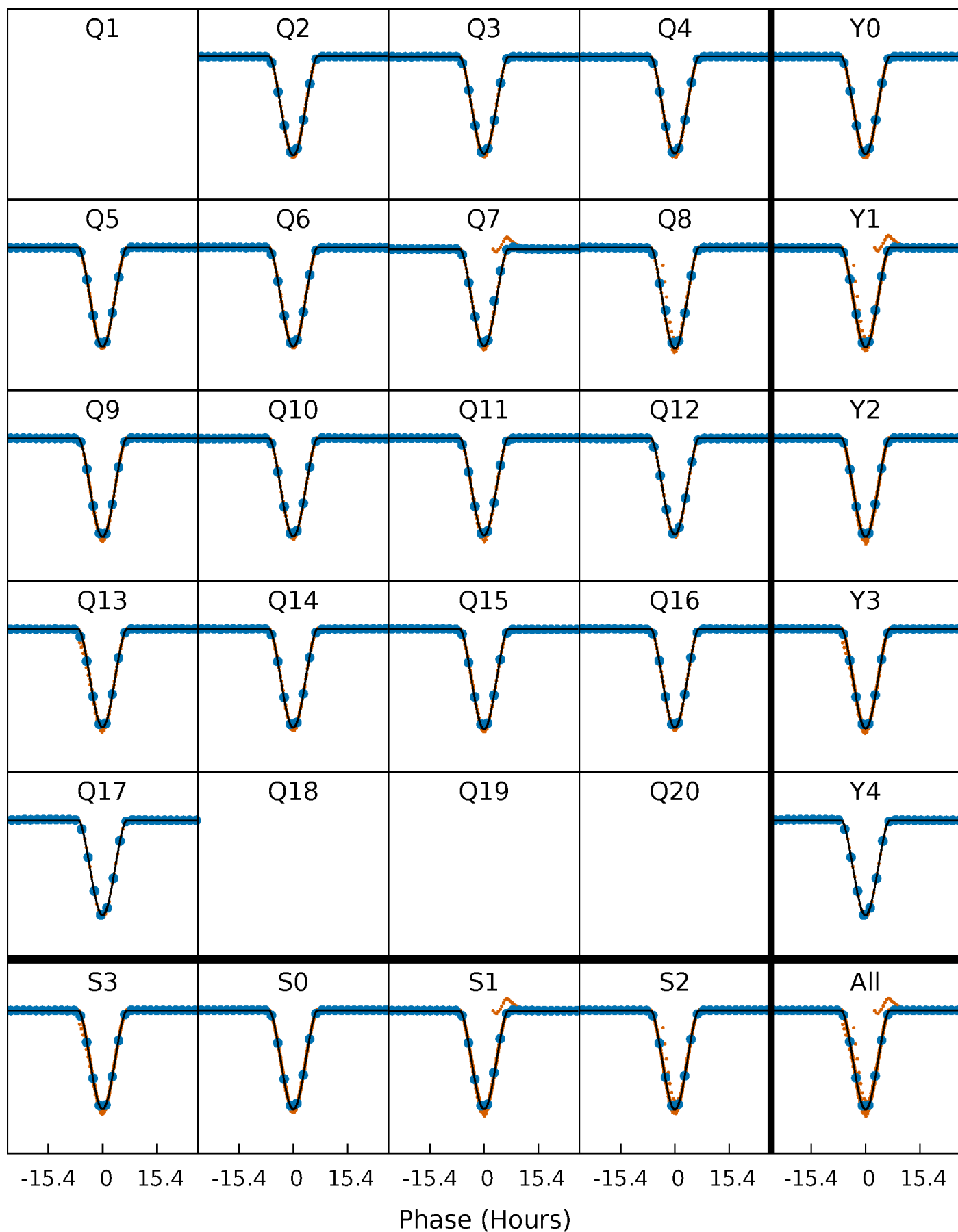
# PDC Quarter-Phased Transit Curves

TCE 007021177-02 P= 18.645222 Days  $T_0=138.896131$  (BKJD)



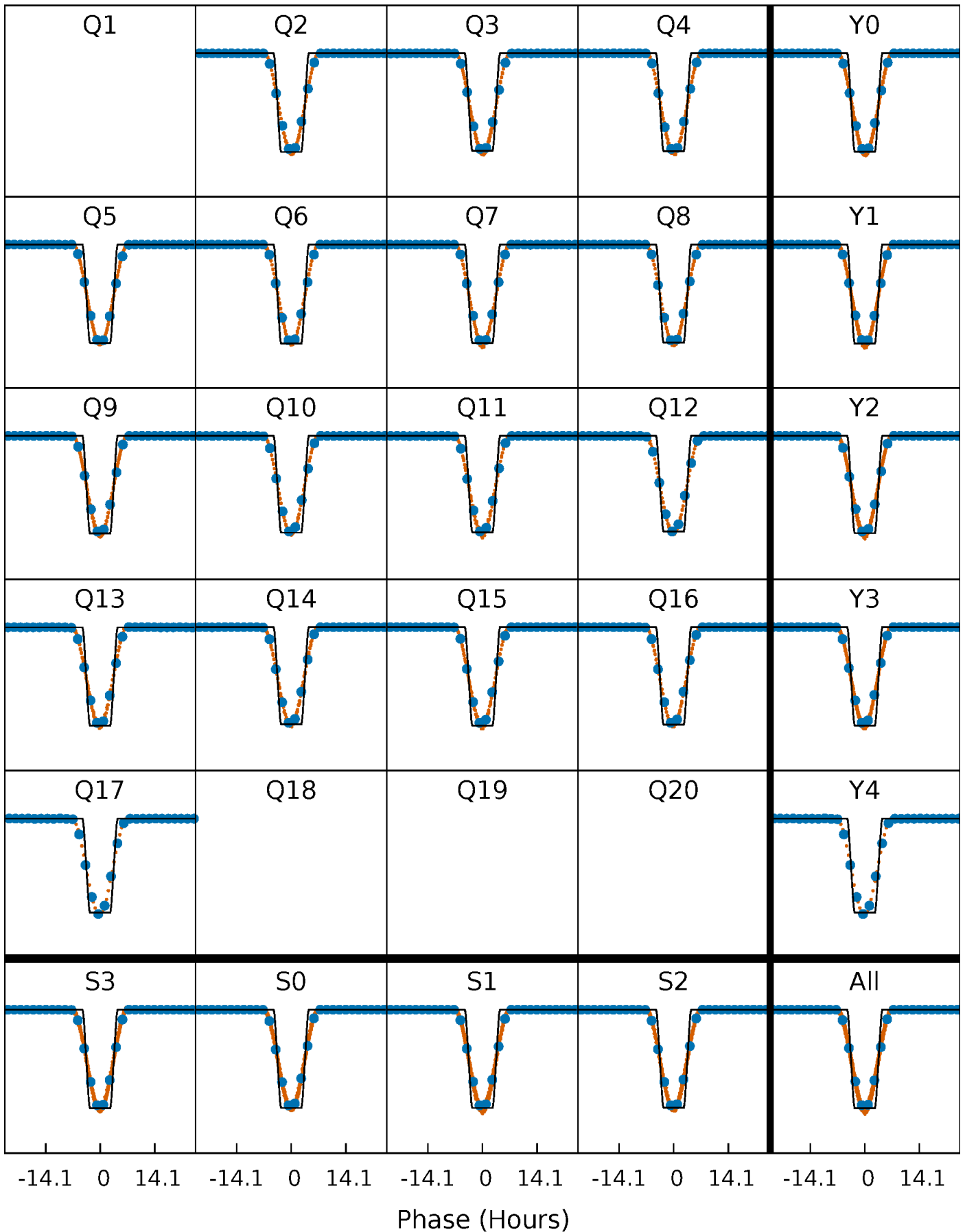
# DV Quarter-Phased Transit Curves

TCE 007021177-02 P= 18.645222 Days  $T_0=138.896131$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

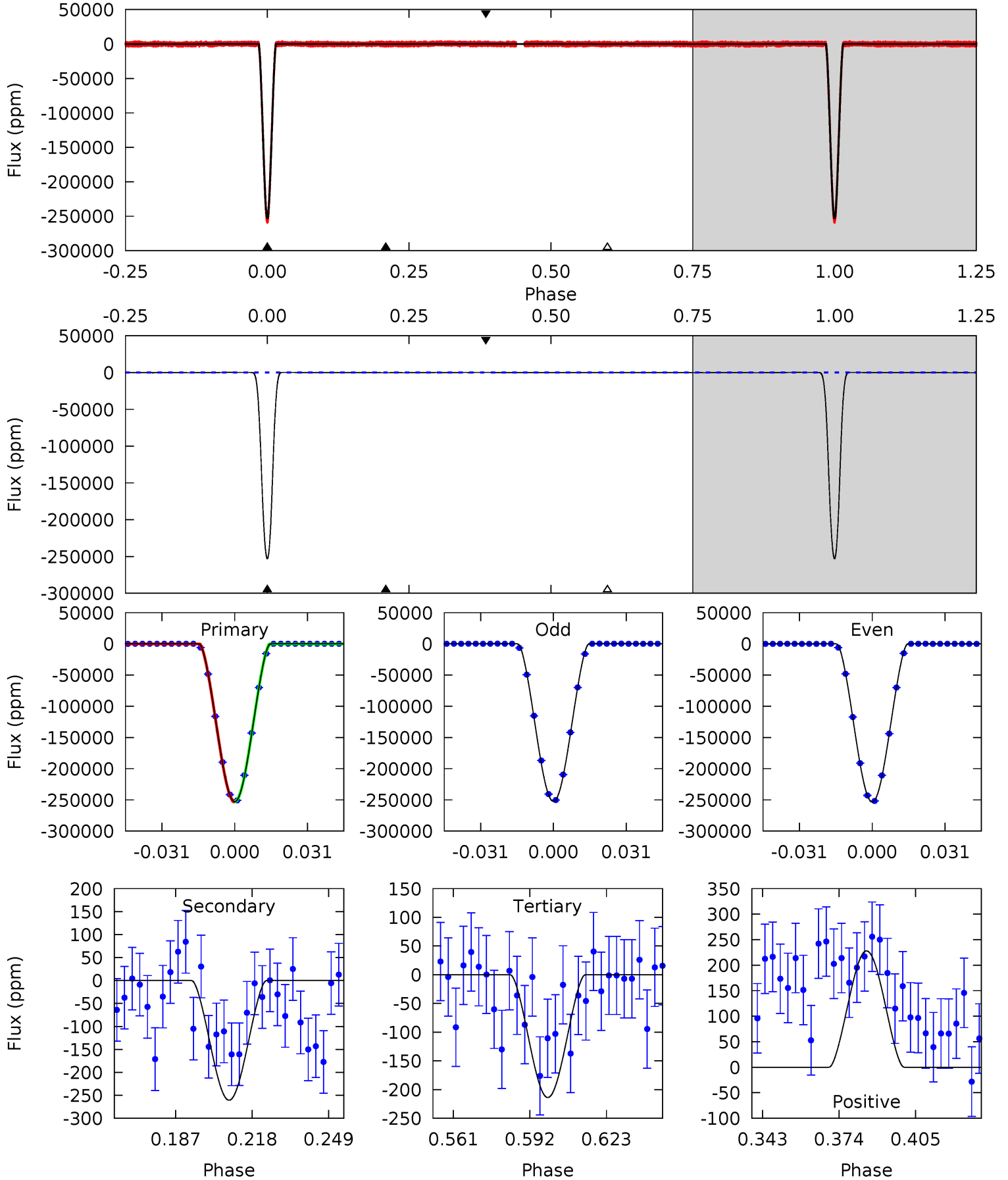
TCE 007021177-02 P= 18.645394 Days  $T_0=138.889658$  (BKJD)



# DV Model-Shift Uniqueness Test

007021177-02, P = 18.645222 Days, E = 138.896131 Days

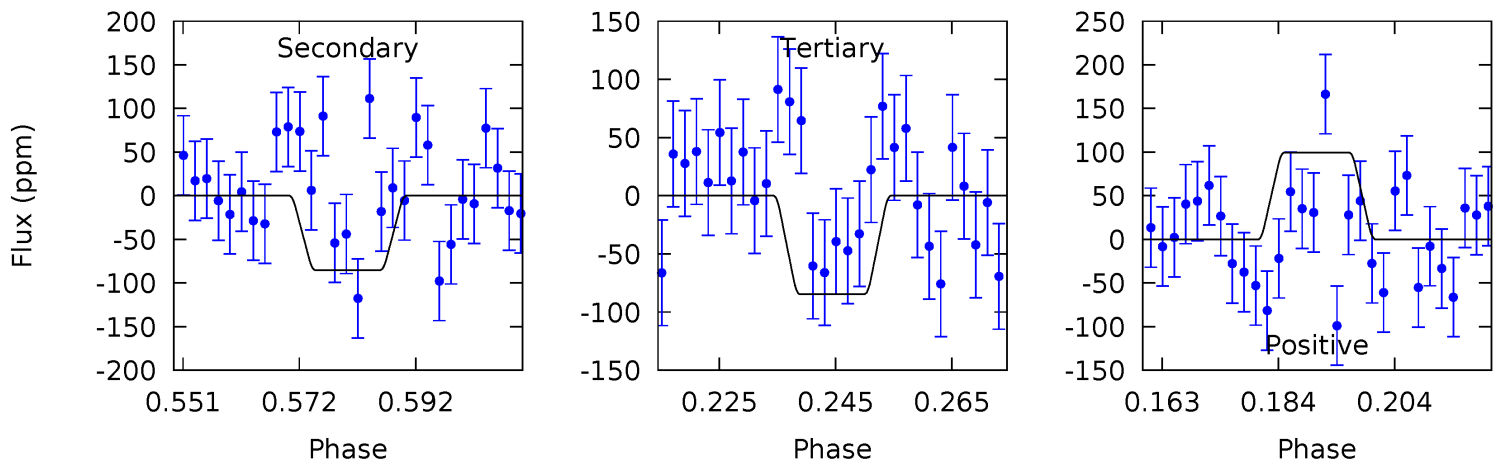
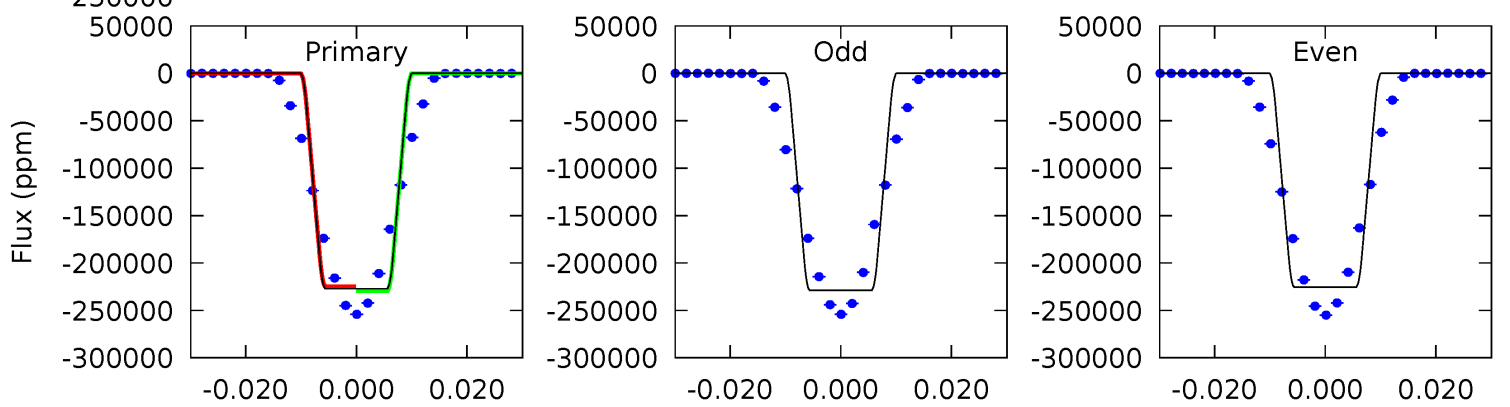
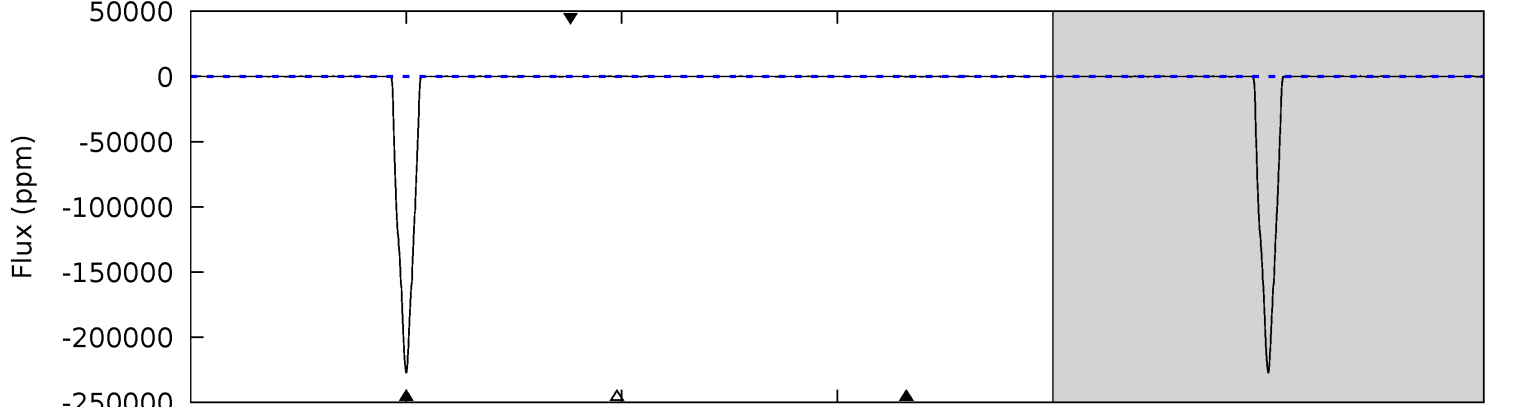
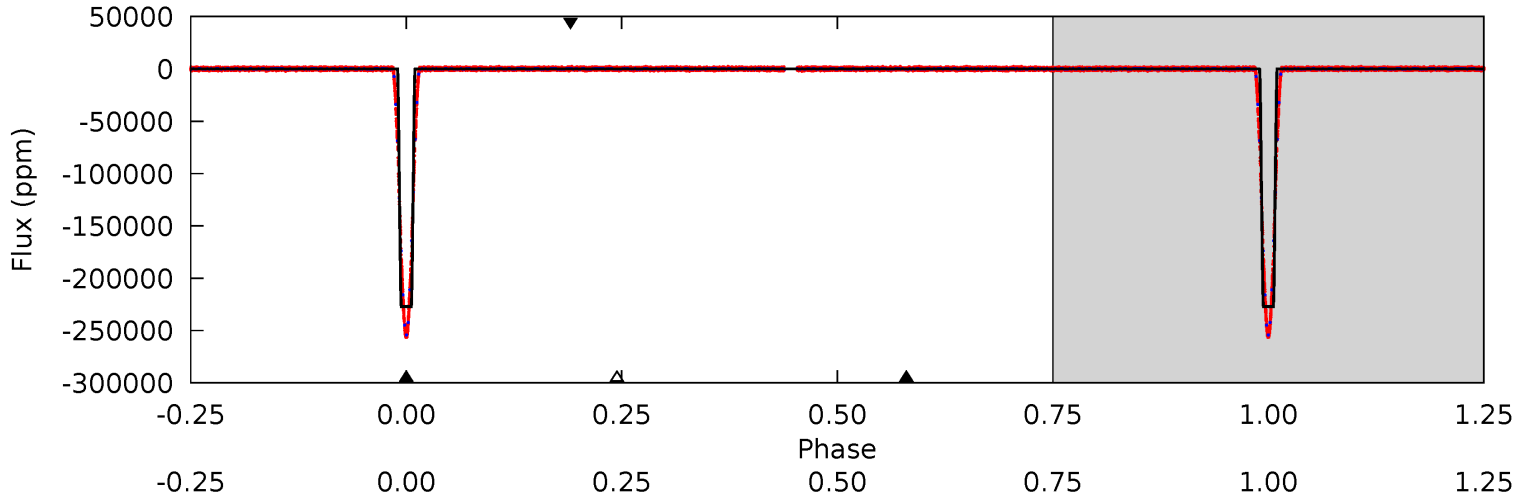
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10826	11.2	9.15	9.76	4.80	2.15	5.39	10817	10816	2.00	1.40	20.7	0.99	0.00	8.37



# Alt Model-Shift Uniqueness Test

007021177-02, P = 18.645394 Days, E = 138.889658 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
8645	3.25	3.22	3.79	4.89	2.32	1.10	8642	8642	0.03	-0.55	74.1	1.00	0.00	0





### Stellar Parameters For KIC 007021177

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5931^{+158}_{-175}$	$4.554^{+0.038}_{-0.200}$	$-0.340^{+0.300}_{-0.300}$	$0.845^{+0.251}_{-0.079}$	$0.933^{+0.108}_{-0.119}$	$2.182^{+0.445}_{-1.148}$
	+3%/-3%	+1%/-4%	+88%/-88%	+30%/-9%	+12%/-13%	+20%/-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 007021177-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-261 \pm 23$	$54.20^{+7.90}_{-4.15}$	$937^{+61}_{-40}$	$1913^{+44}_{-49}$	$0.864^{+0.162}_{-0.203}$
Alt.	$-85 \pm 26$	$48.05^{+7.75}_{-3.78}$	$941^{+65}_{-44}$	$1525^{+189}_{-3158}$	$0.341^{+0.140}_{-0.126}$

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

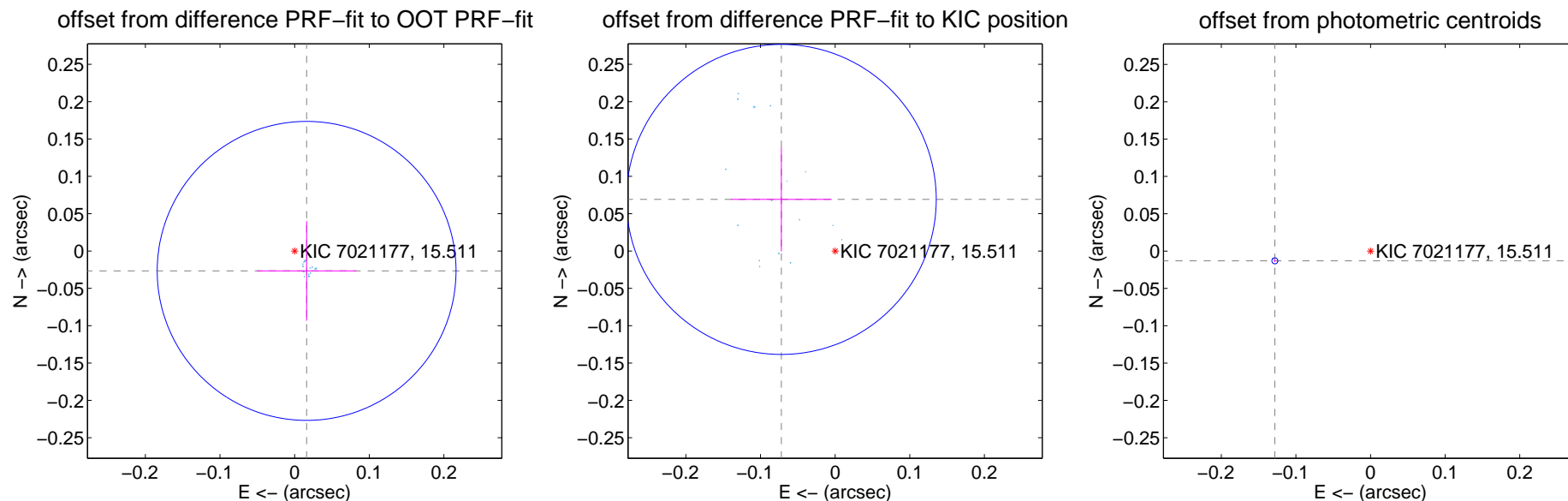
## DV Centroid Data

Supplemental centroid analysis for 007021177-02. Kepler magnitude: 15.51. Transit SNR 4288.55

There are 16 quarters with good PRF difference image offsets

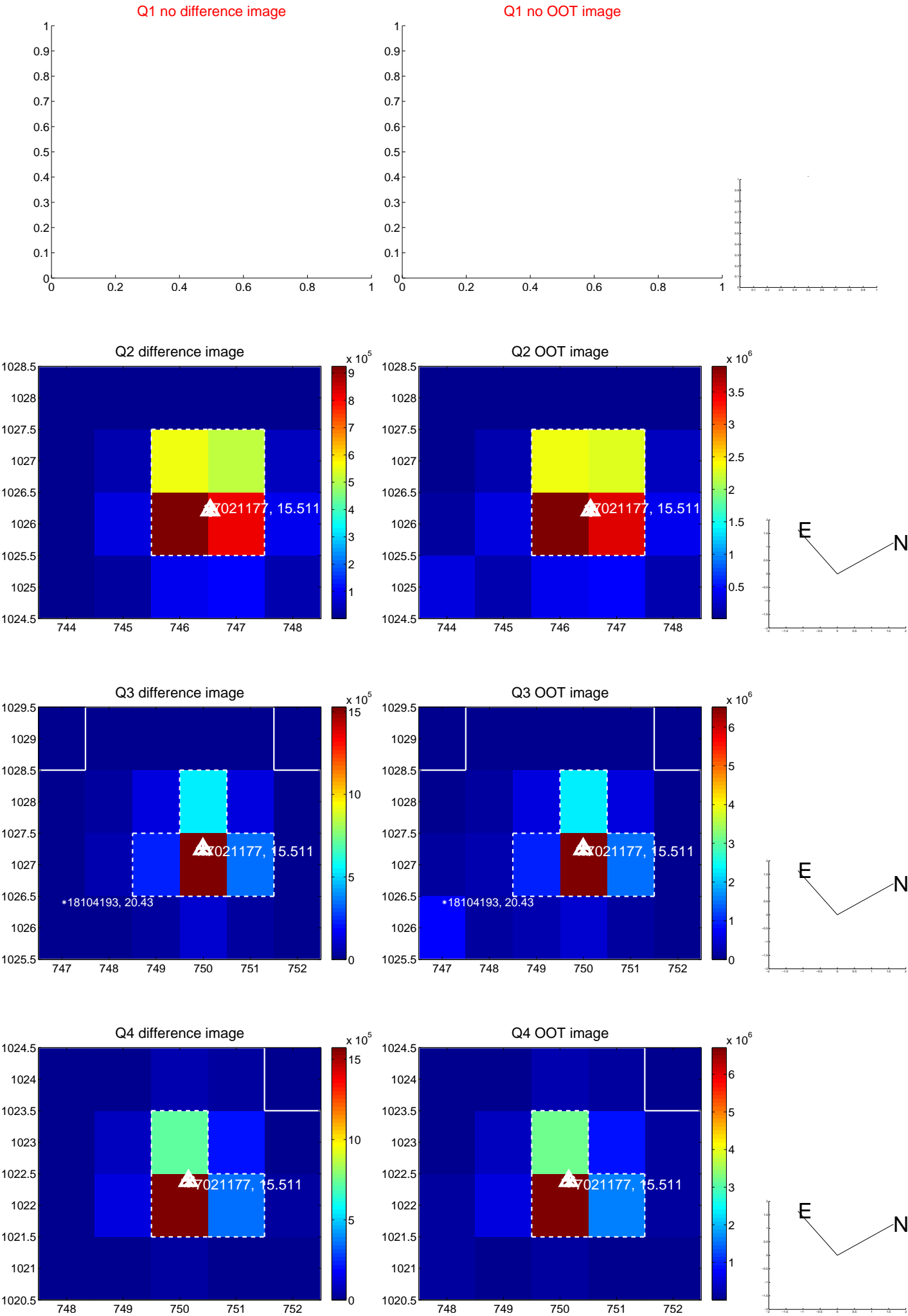
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.031 \pm 0.067$	0.47	$-0.016 \pm 0.067$	$-0.027 \pm 0.067$
PRF-fit source offset from KIC position	$0.100 \pm 0.069$	1.44	$0.072 \pm 0.068$	$0.069 \pm 0.070$
photometric centroid source offset	$0.13 \pm 0.00$	95.92	$0.13 \pm 0.00$	$-0.01 \pm 0.00$



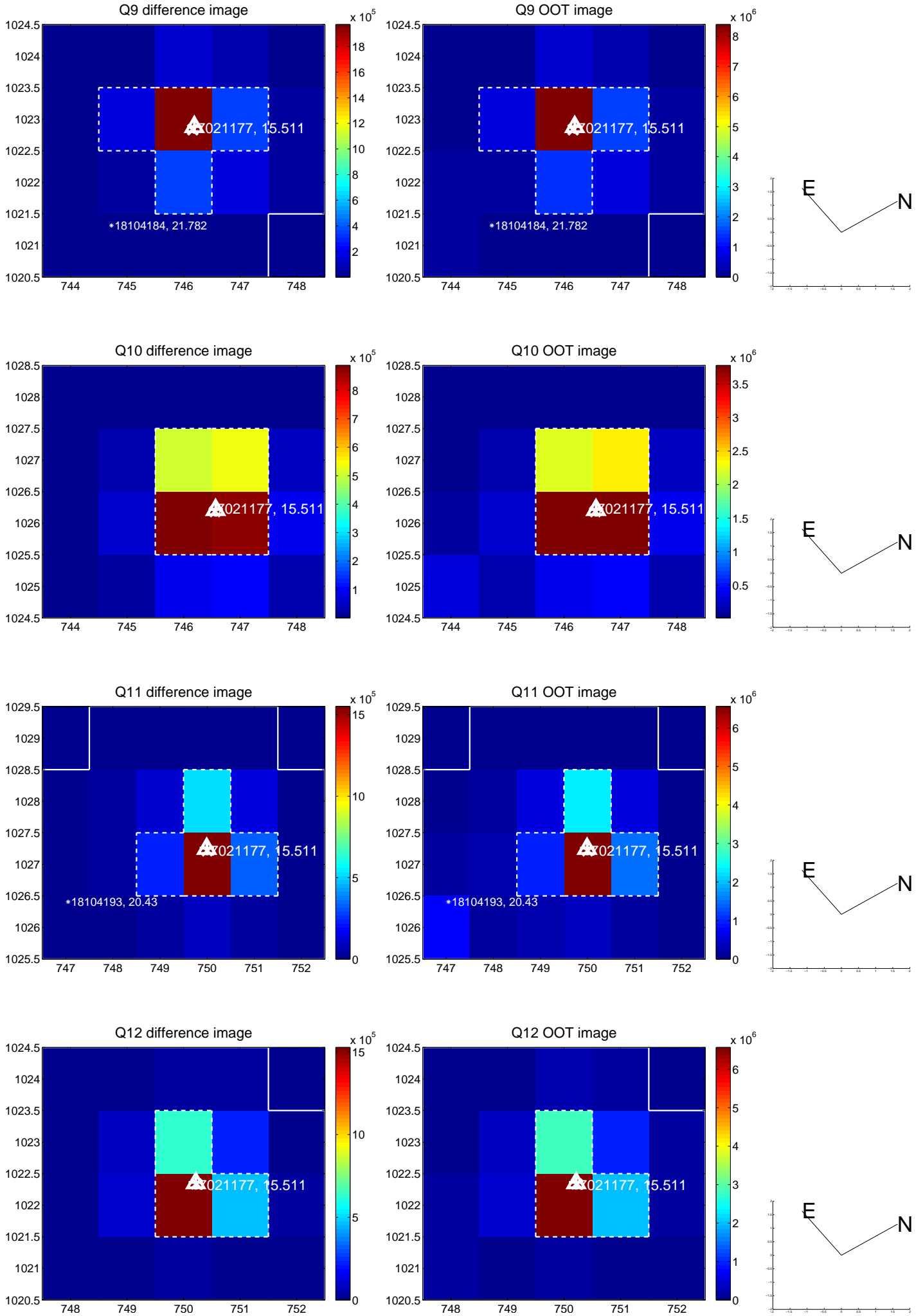
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

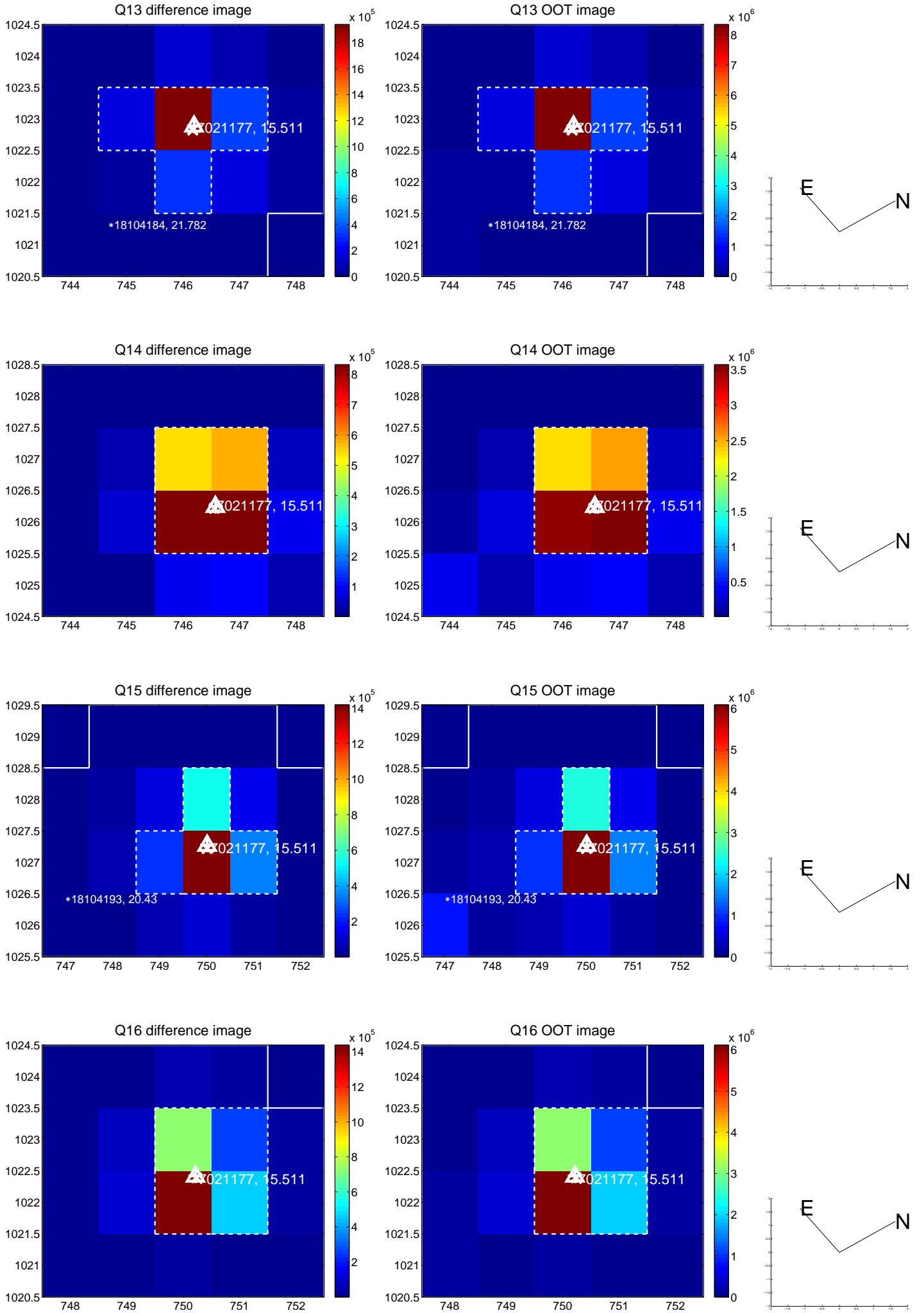




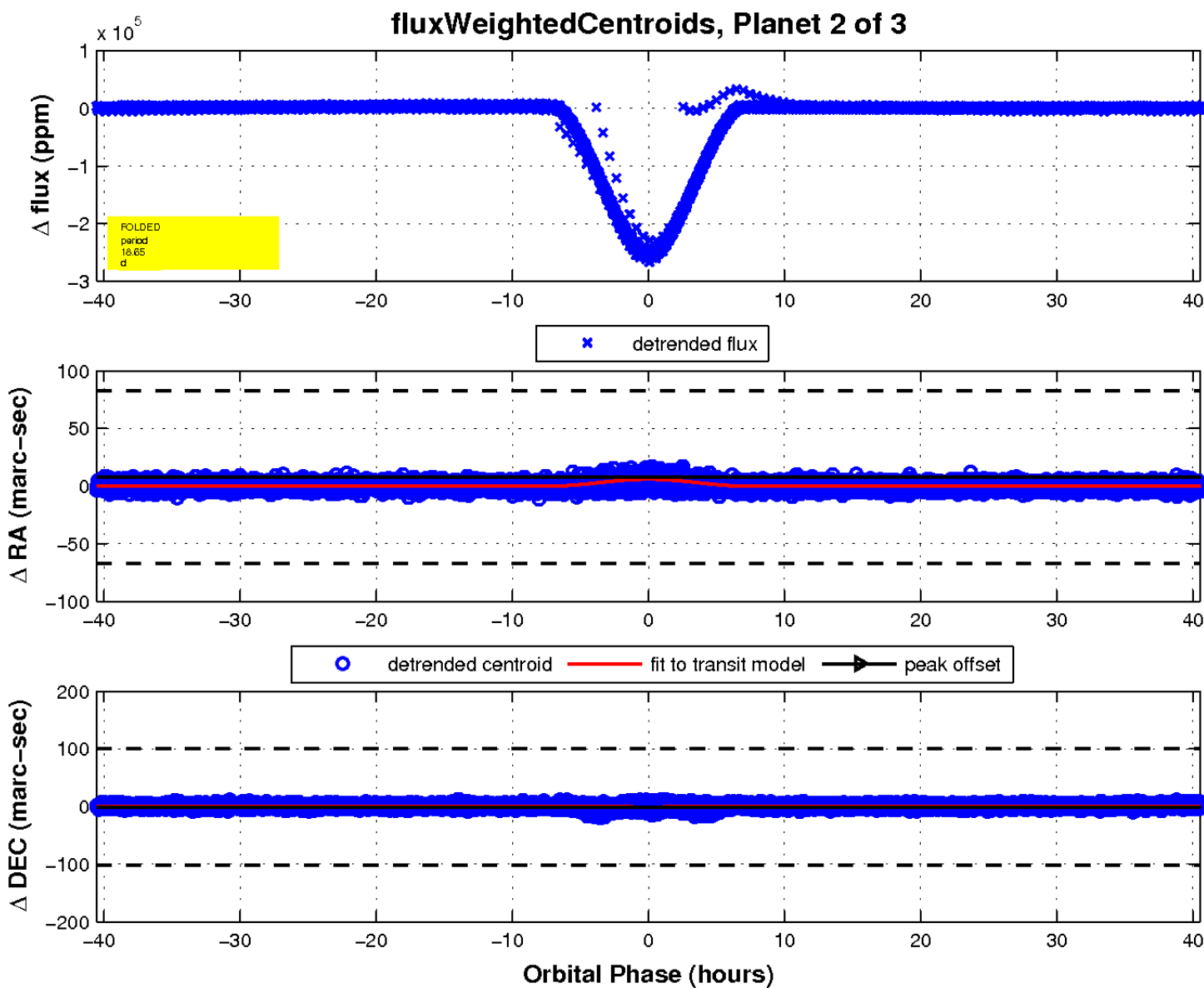
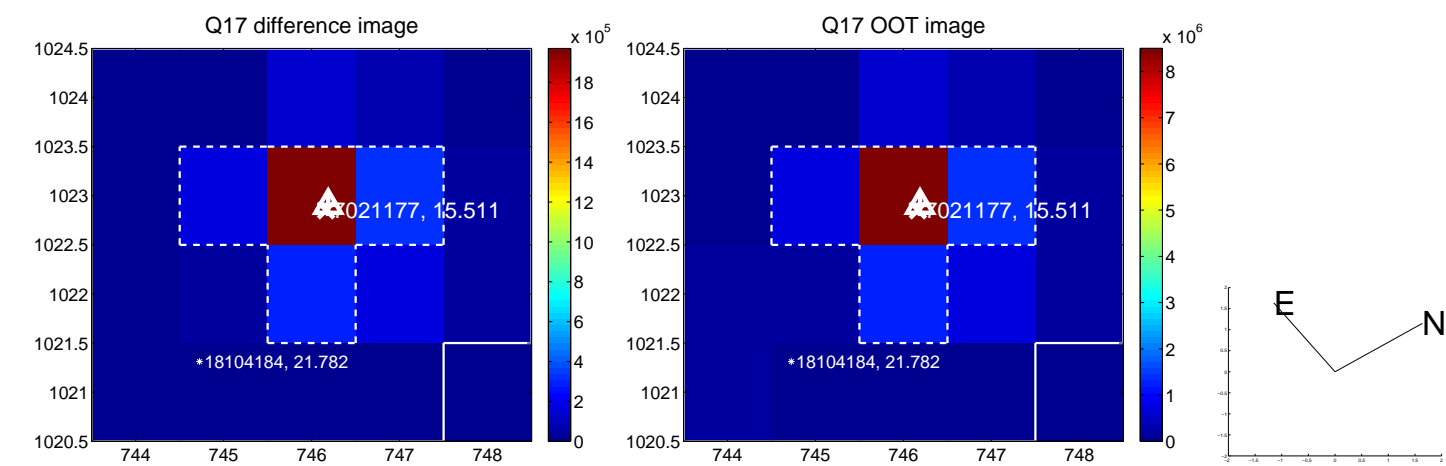
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

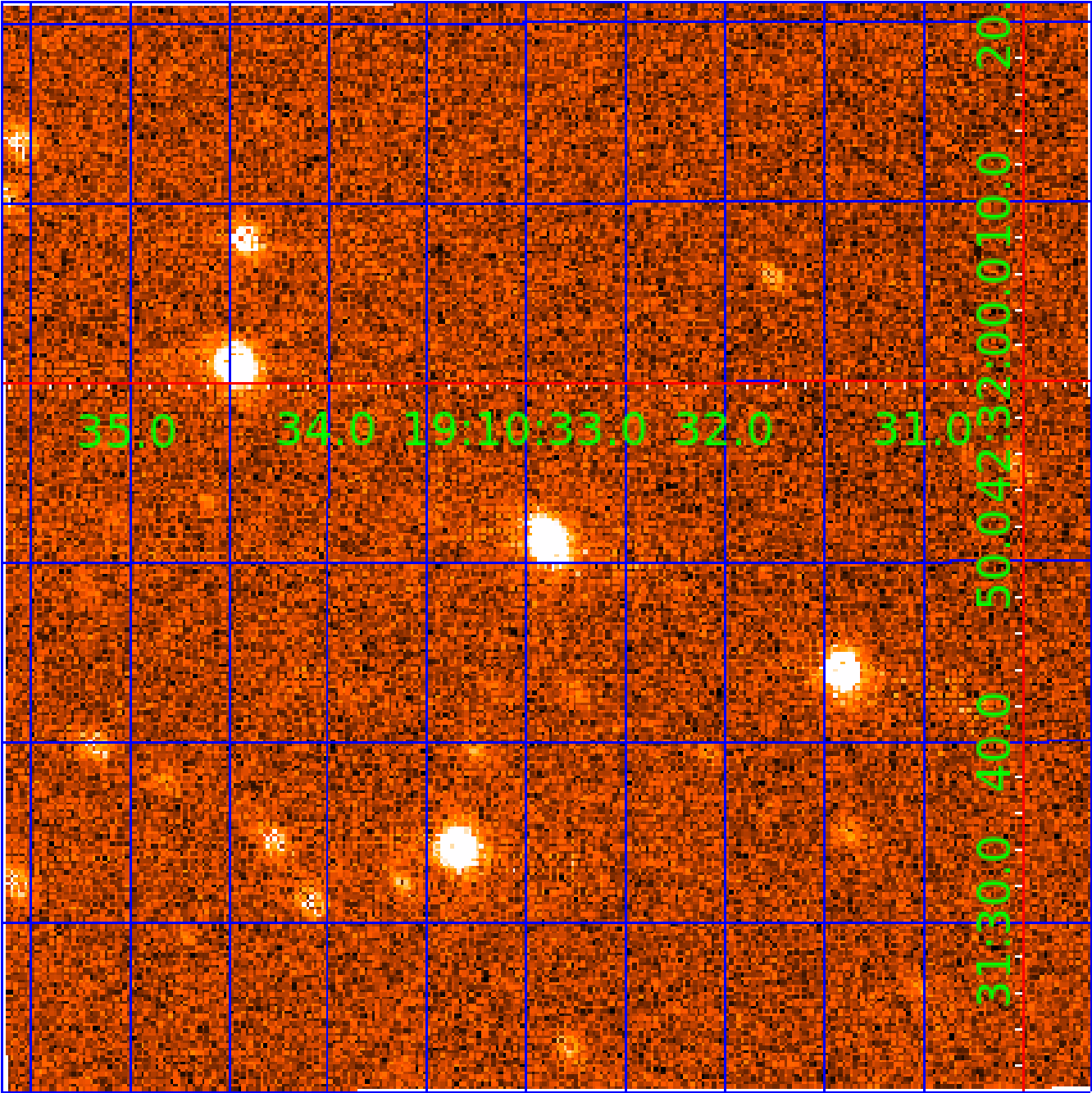


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007021177

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007021177-01	OBS	3452.01	18.645245	147.209114	436961.7	2.000	8837.9	-1.0	0.84	5931	46.10	43.77
007021177-02	OBS	No	18.645222	138.896131	252005.1	13.511	6043.8	4288.5	0.84	5931	52.35	43.77
007021177-03	OBS	No	4.661190	133.898642	2310.6	55.934	935.1	36.9	0.84	5931	4.84	277.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007021177-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
007021177-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
007021177-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

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

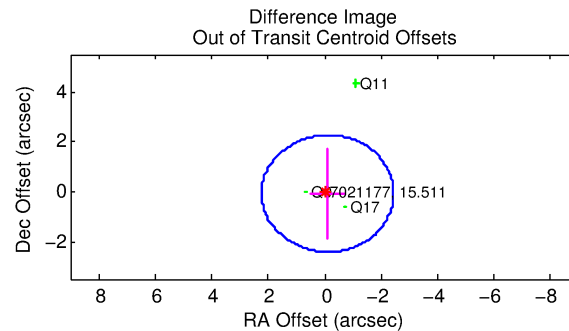
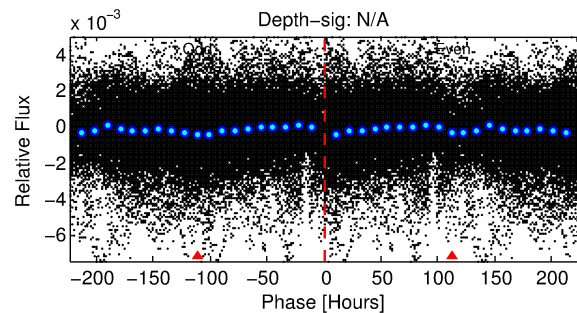
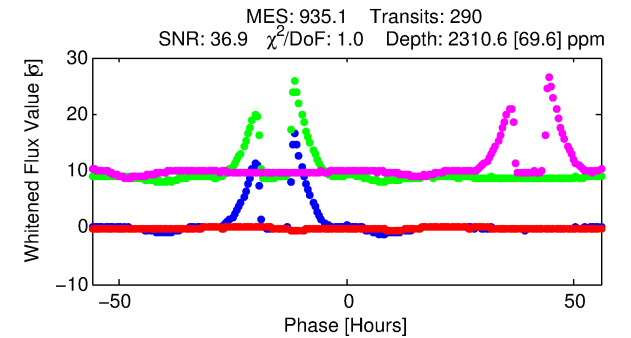
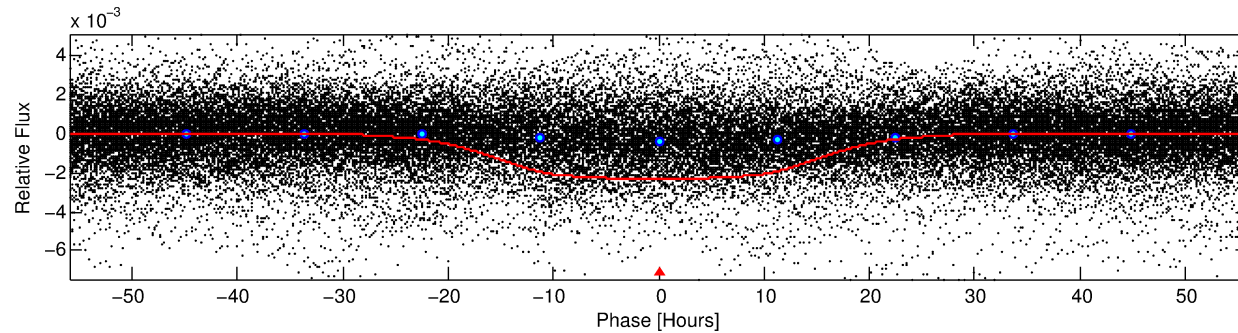
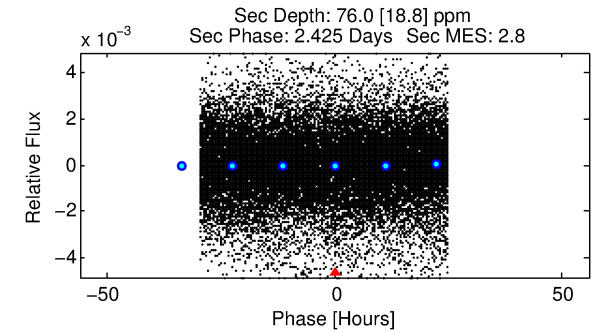
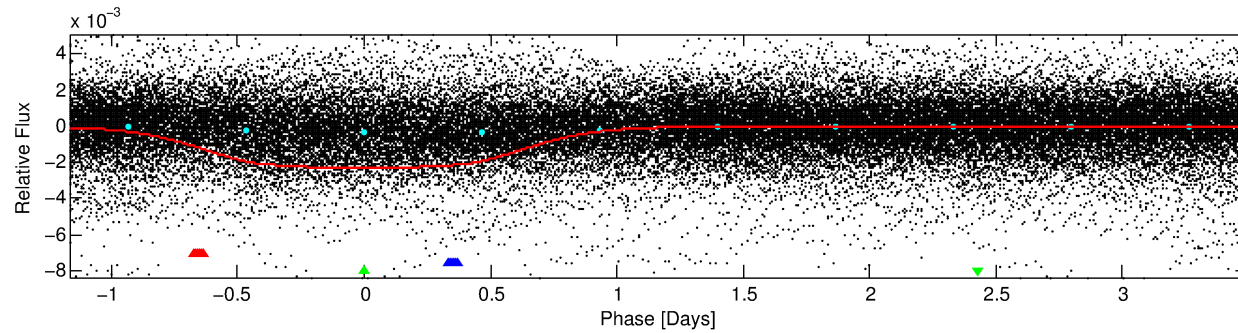
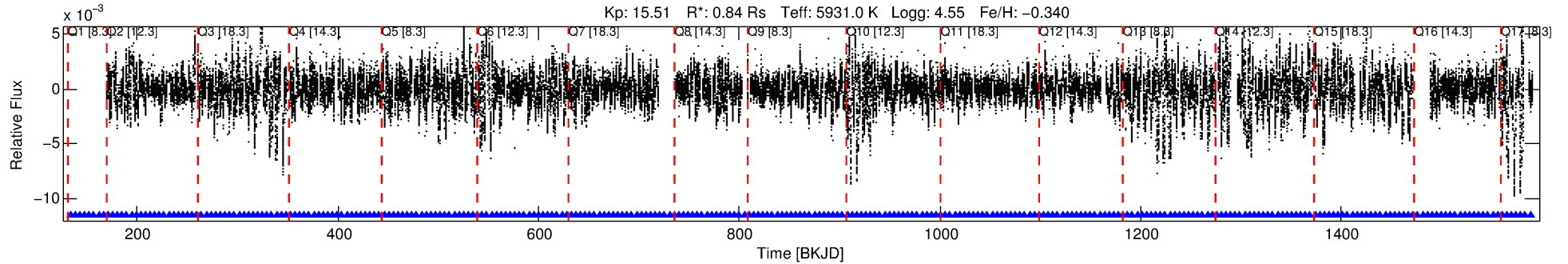
## Ephemeris Match Information For 007021177-03

No Significant Match Found

# DV One-Page Summary

KIC: 7021177 Candidate: 3 of 3 Period: 4.661 d  
KOI: K03452 Corr: No Ephemeris Match

Kp: 15.51 R\*: 0.84 Rs Teff: 5931.0 K Logg: 4.55 Fe/H: -0.340



## DV Fit Results:

Period = 4.66119 [0.00005] d  
Epoch = 133.8986 [0.0085] BKJD  
Rp/R\* = 0.0525 [0.0008]  
a/R\* = 1.04 [0.00]  
b = 0.91 [0.00]  
Seff = 277.96 [106.72]  
Teff = 1041 [100] K  
Rp = 4.84 [1.44] Re  
a = 0.0534 [0.0134] AU  
Ag = 5.09 [2.25] [1.82σ]  
Teffp = 2418 [167] K [7.08σ]

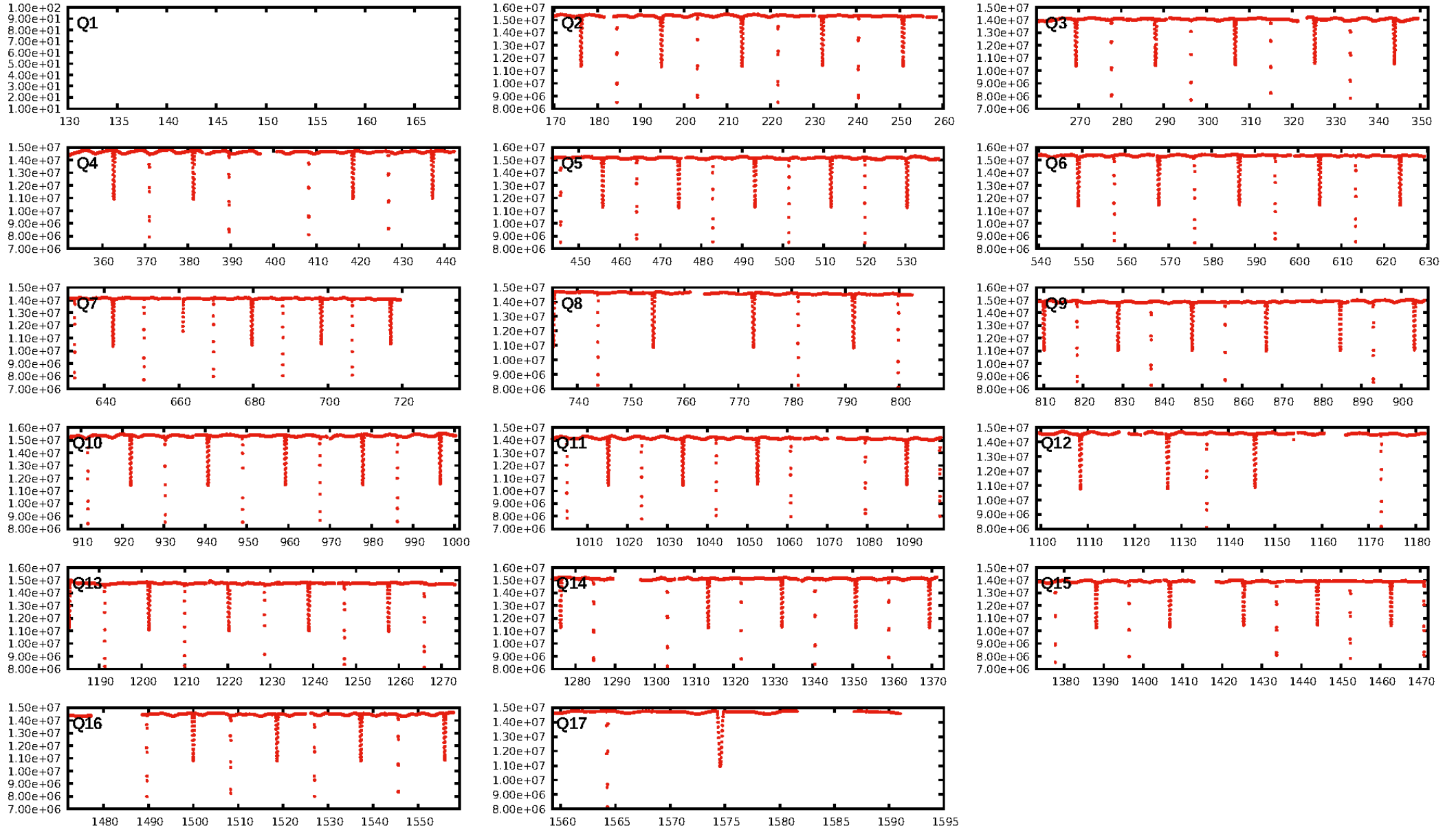
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [5.83σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [284/284]  
GhostDiagnostic-chr: 0.8441  
Centroid-sig: 29.5%  
Centroid-so: 0.185 arcsec [5.92σ]  
OotOffset-rm: 0.132 arcsec [0.17σ]  
KicOffset-rm: 0.149 arcsec [0.15σ]  
OotOffset-st: 0/1/0/2 [3]  
KicOffset-st: 0/1/0/2 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [16/16]

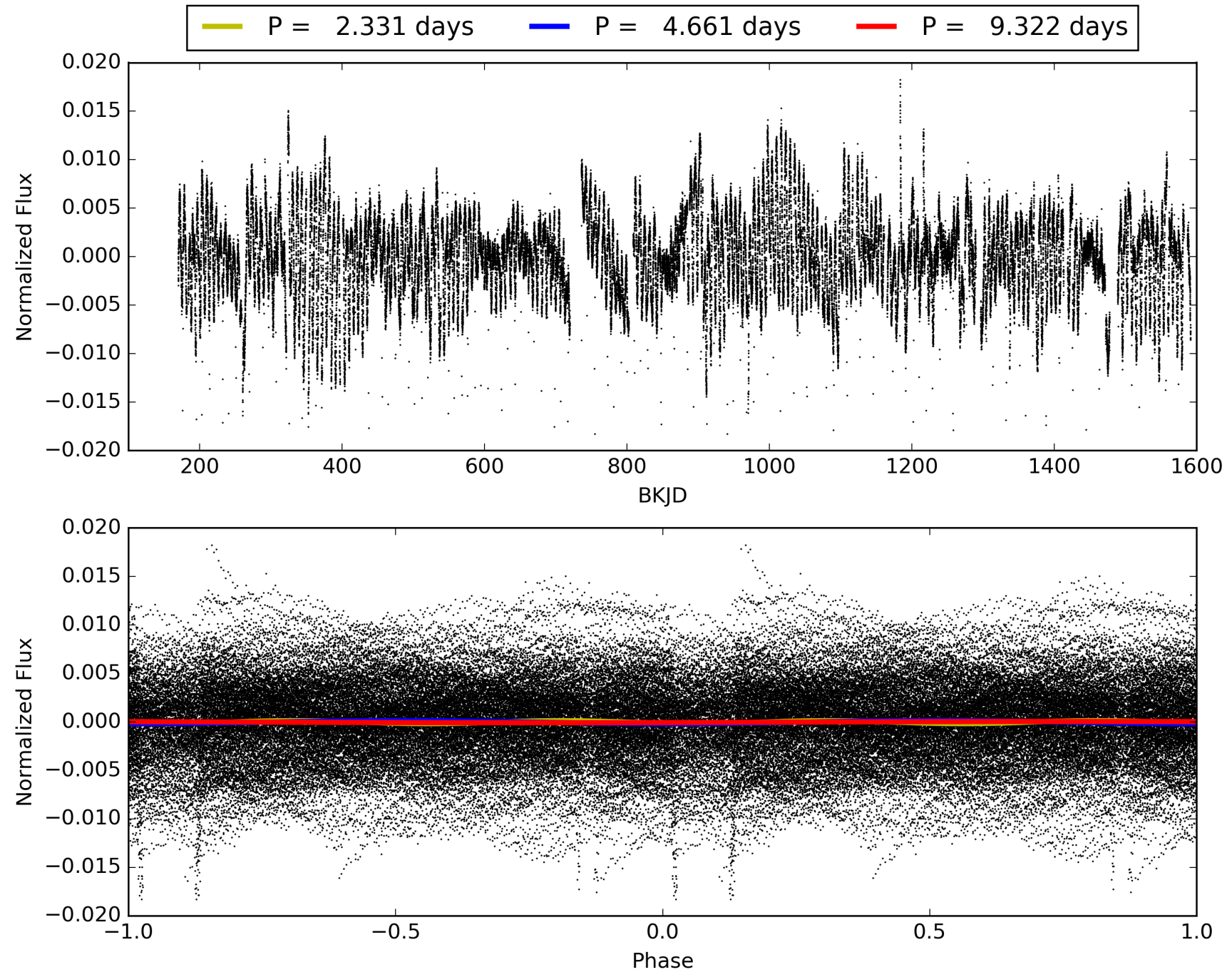
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:52:05 Z

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

# TCE 007021177-03, PDC Light Curves

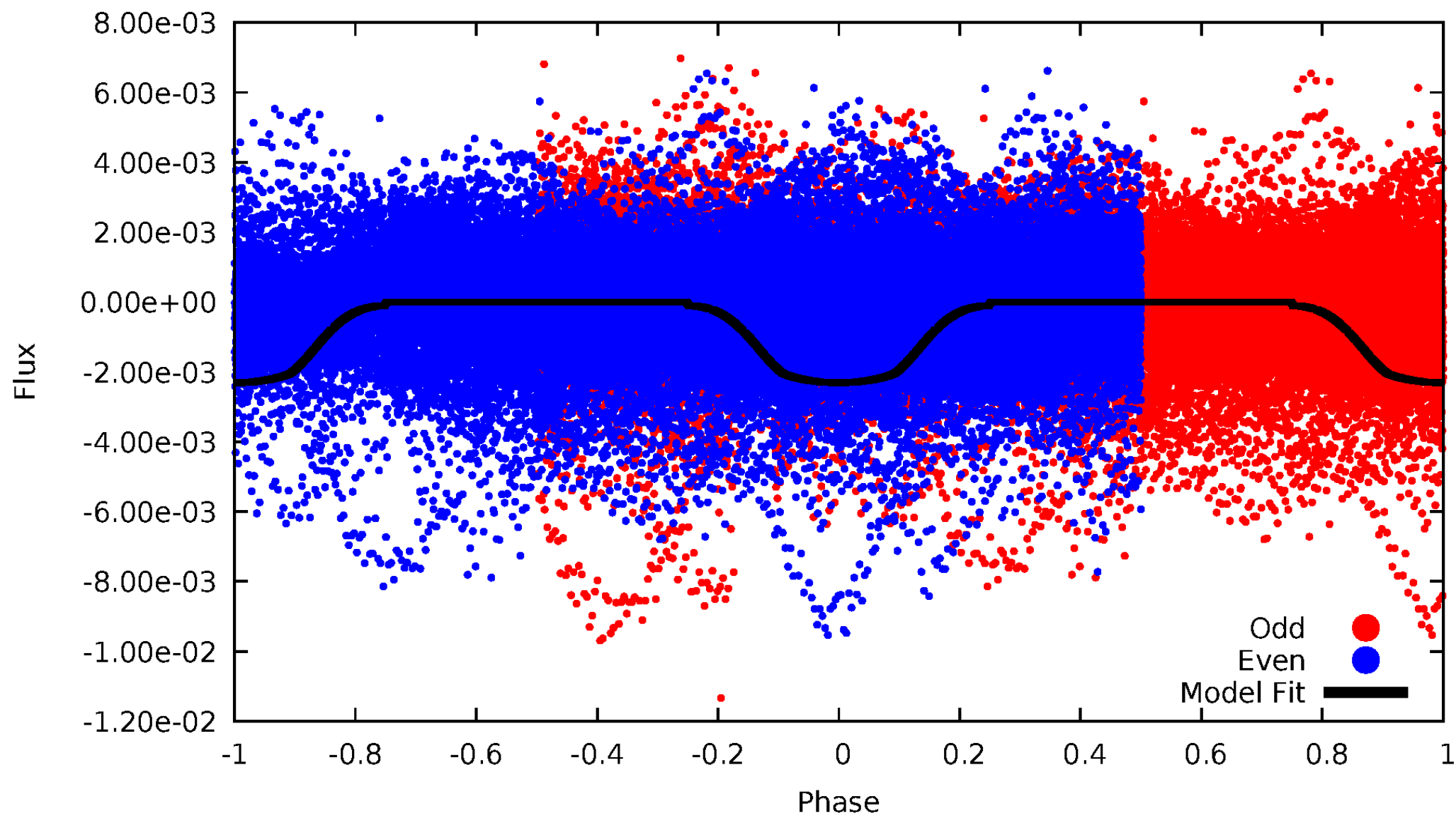


TCE 007021177-03



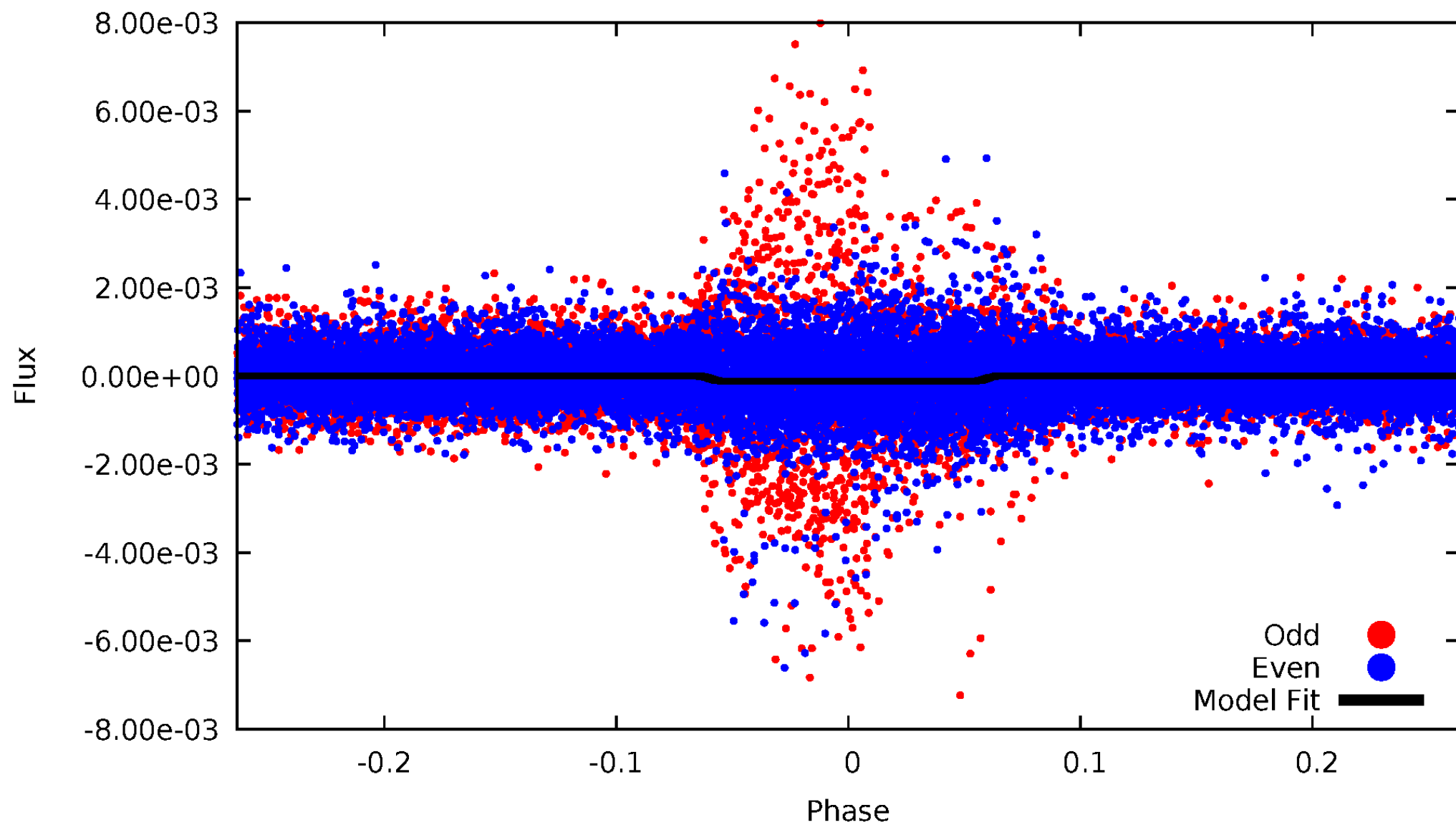
# DV Odd/Even

TCE 007021177-03



# ALT Odd/Even

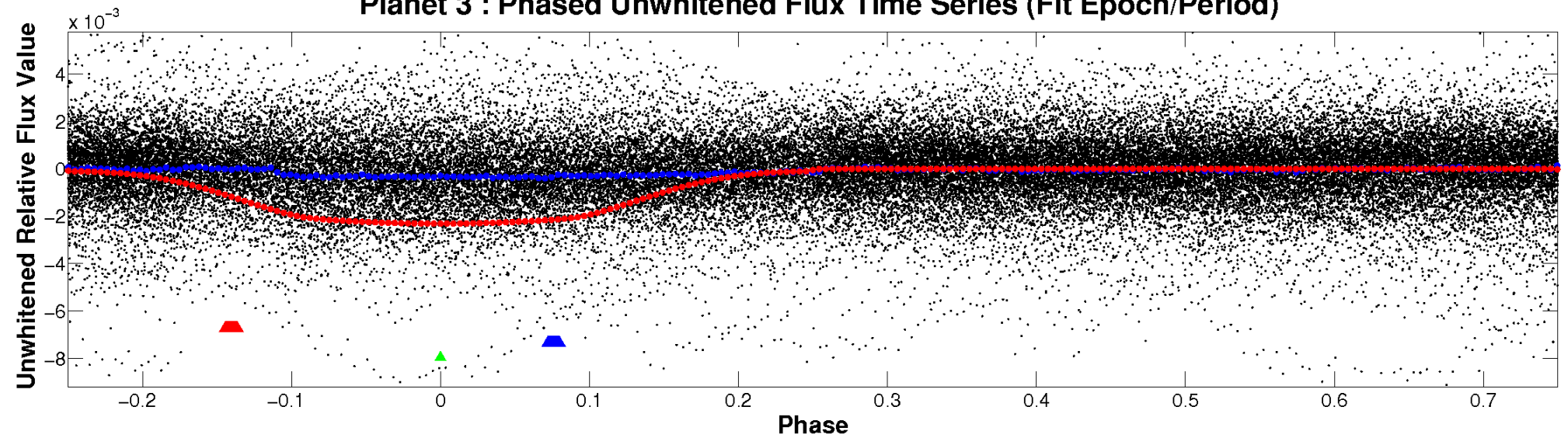
TCE 007021177-03



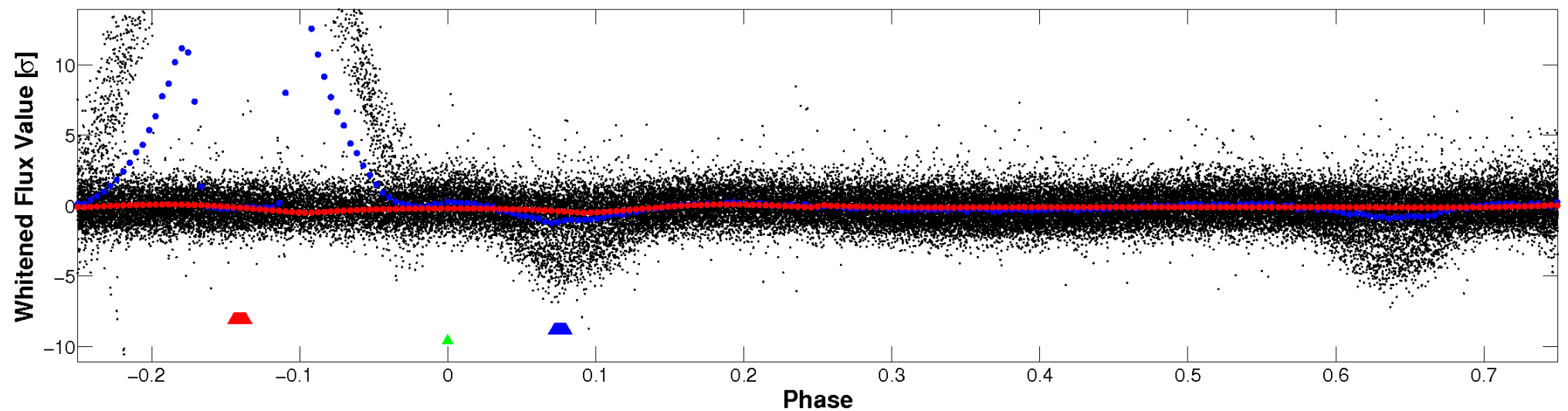


# Non-Whitened Vs. Whitened Light Curve

**Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

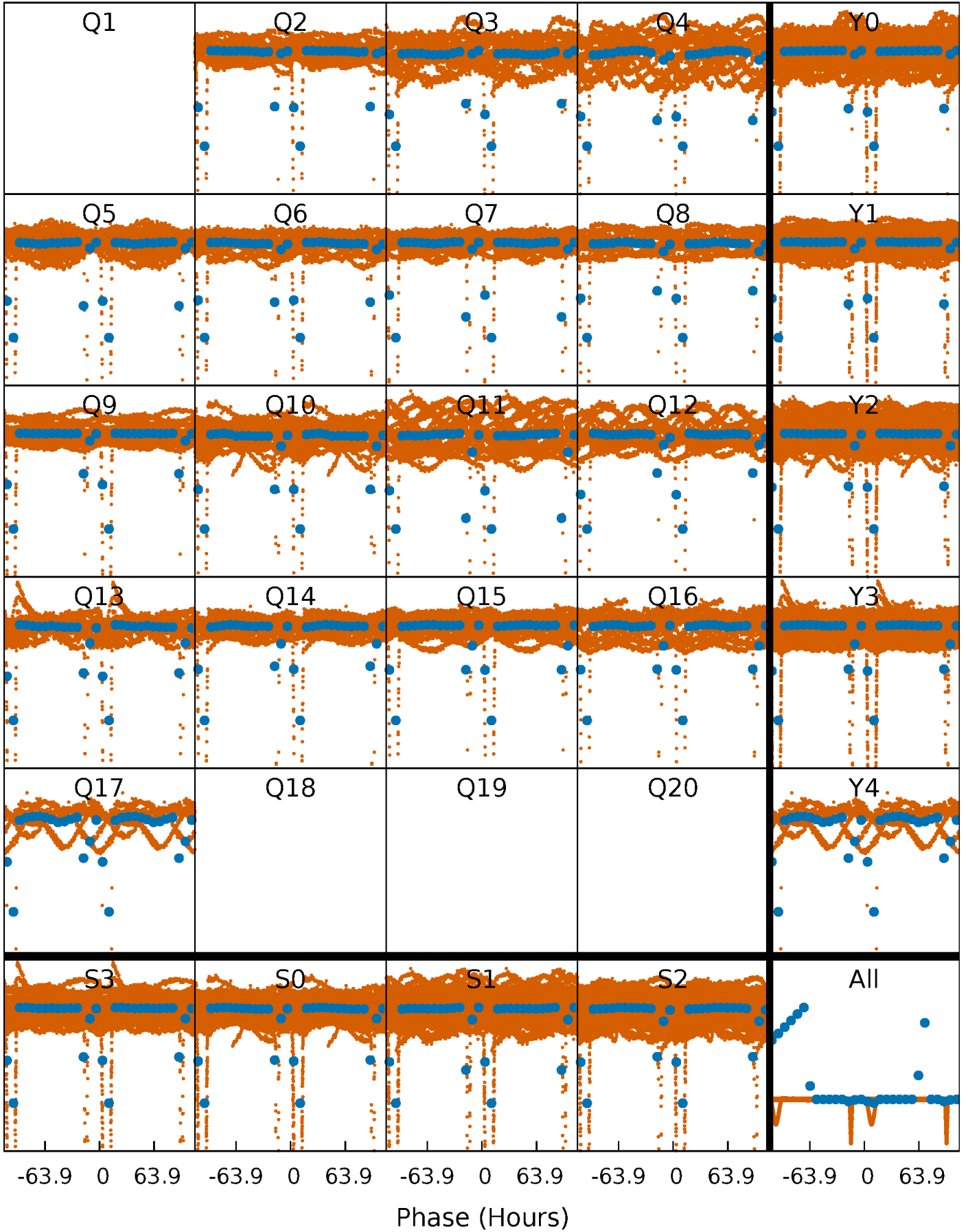


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

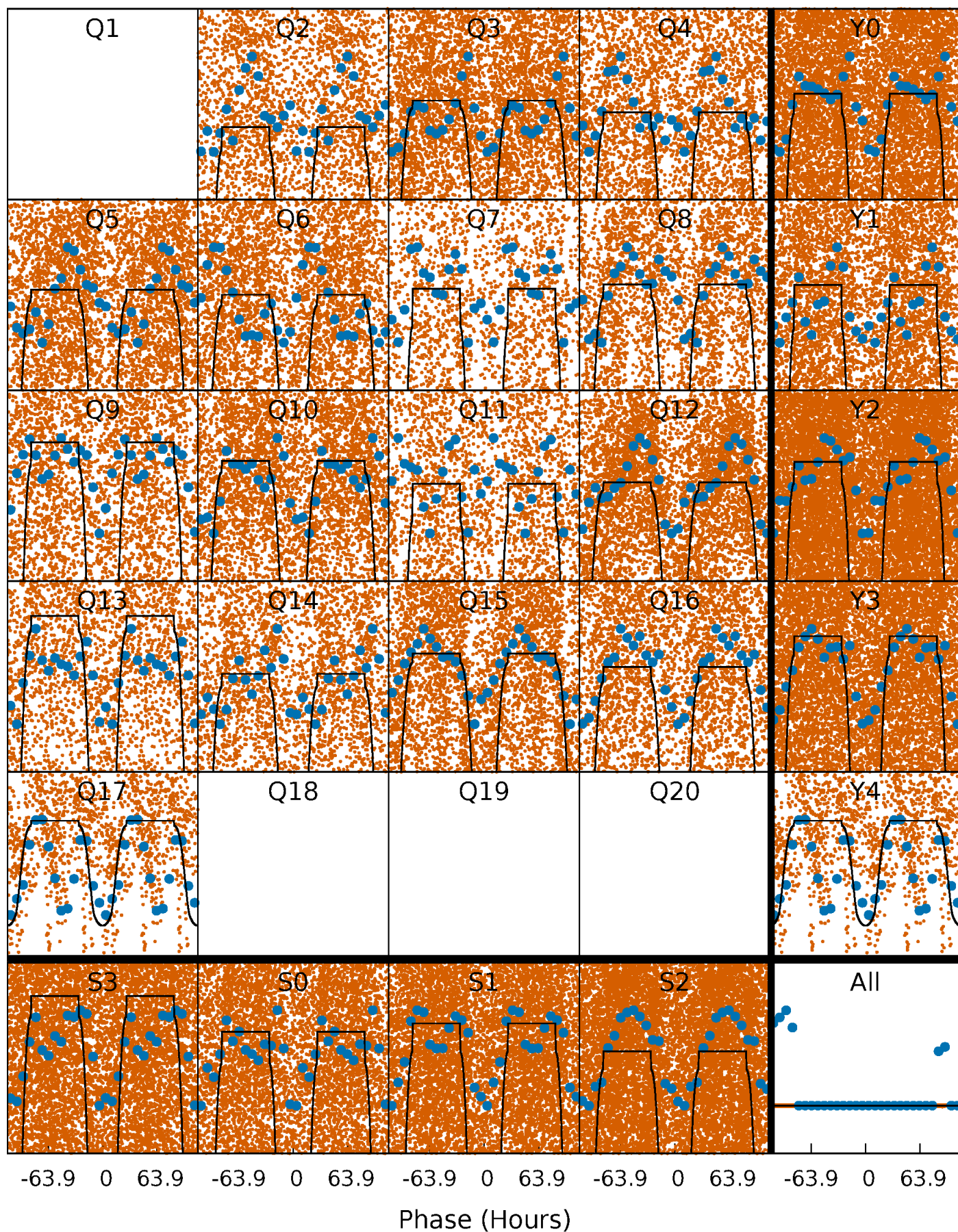
TCE 007021177-03 P= 4.661190 Days  $T_0=133.898642$  (BKJD)





# DV Quarter-Phased Transit Curves

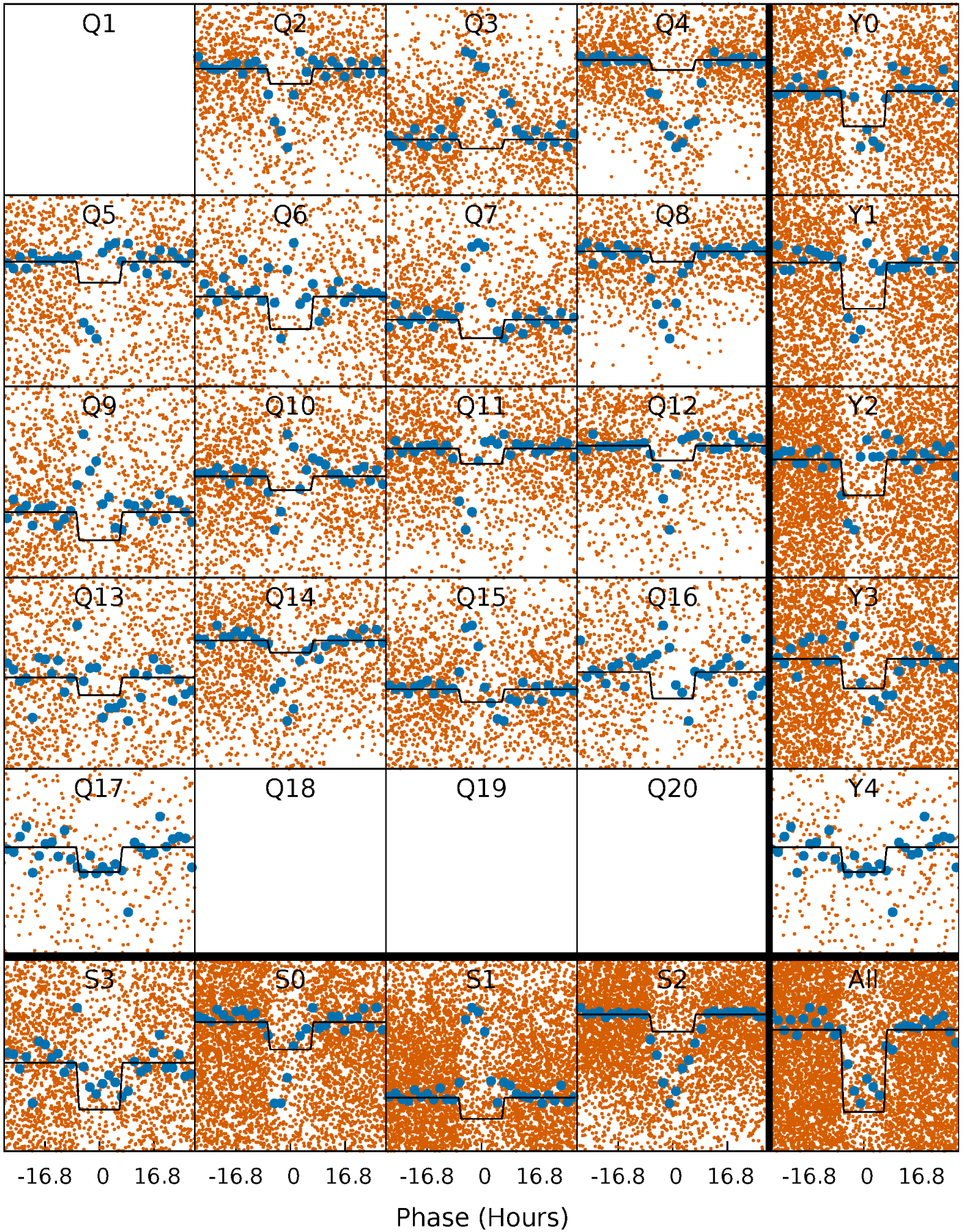
TCE 007021177-03 P= 4.661190 Days  $T_0=133.898642$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

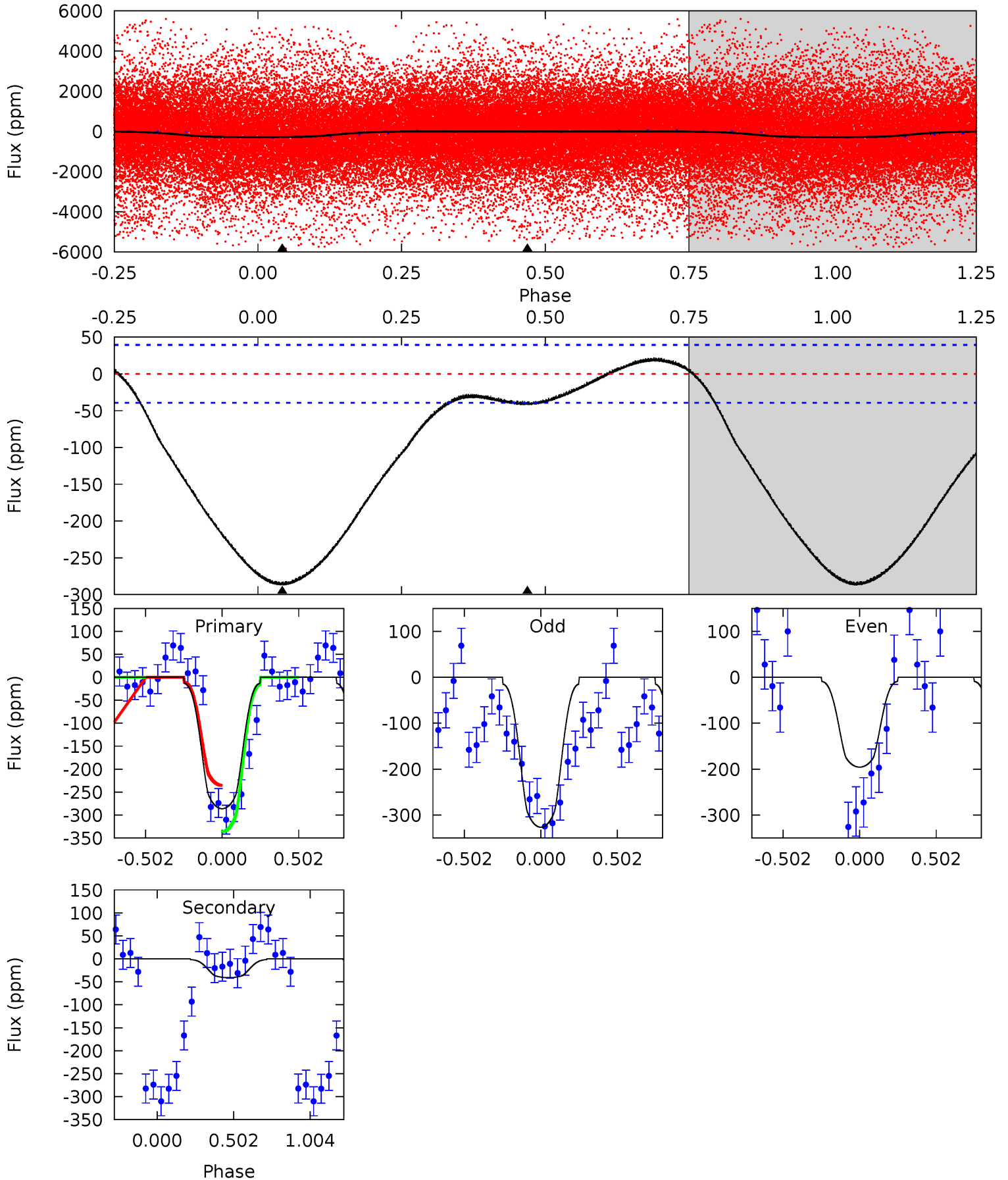
TCE 007021177-03 P= 4.661343 Days  $T_0=133.334411$  (BKJD)



# DV Model-Shift Uniqueness Test

007021177-03, P = 4.661190 Days, E = 133.898642 Days

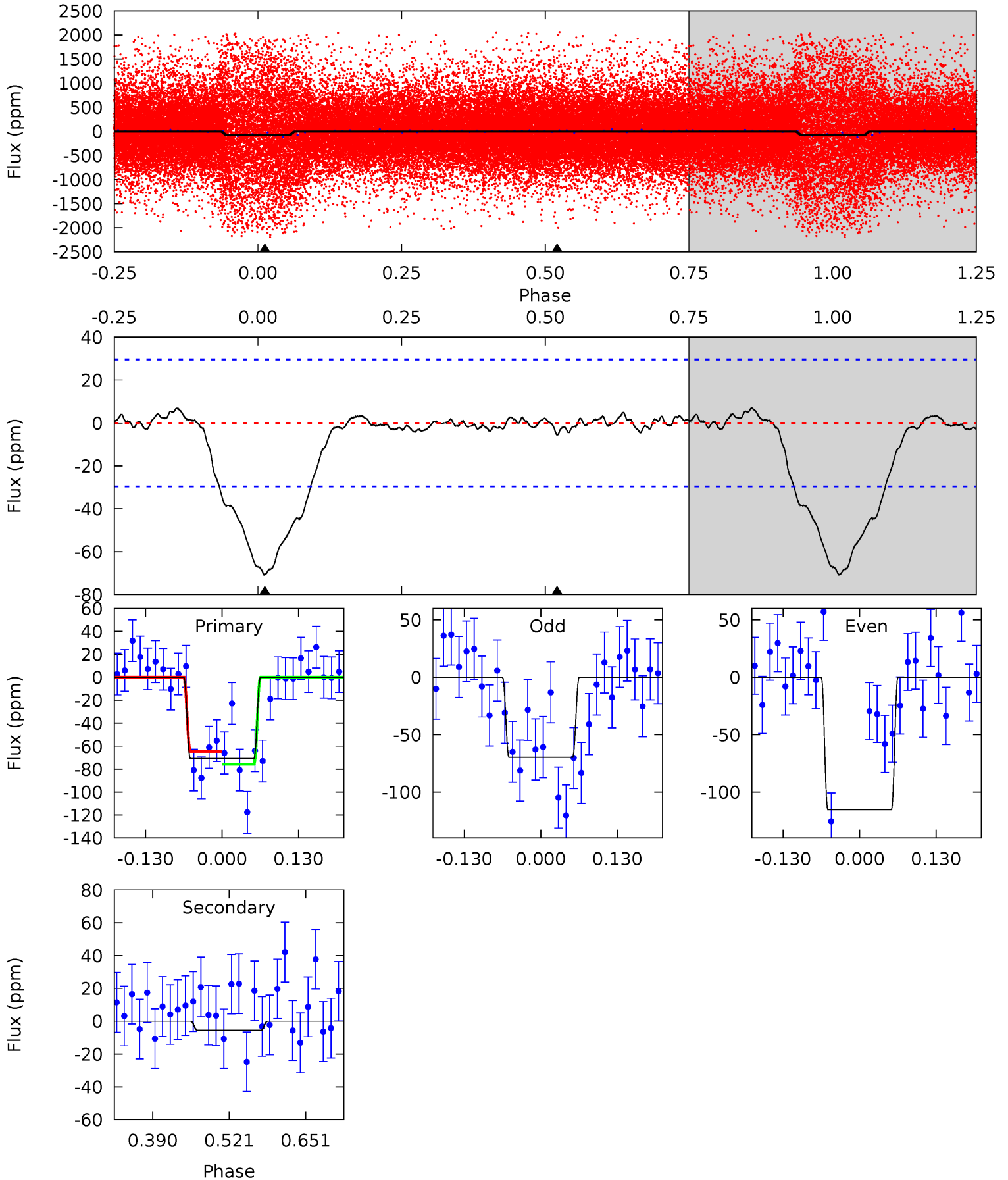
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.7	4.39	0	0	4.21	0.67	2.08	30.7	30.7	4.39	4.39	6.67	0.04	0.07	5.25



# Alt Model-Shift Uniqueness Test

007021177-03, P = 4.661343 Days, E = 133.334411 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
10.8	0.85	0	0	4.51	1.51	0.38	10.8	10.8	0.85	0.85	3.10	2.03	0.09	0.85



### Stellar Parameters For KIC 007021177

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5931^{+158}_{-175}$	$4.554^{+0.038}_{-0.200}$	$-0.340^{+0.300}_{-0.300}$	$0.845^{+0.251}_{-0.079}$	$0.933^{+0.108}_{-0.119}$	$2.182^{+0.445}_{-1.148}$
	+3%/-3%	+1%/-4%	+88%/-88%	+30%/-9%	+12%/-13%	+20%/-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 007021177-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-41 \pm 9$	$4.99^{+0.76}_{-0.40}$	$1487^{+98}_{-70}$	$2754^{+106}_{-118}$	$2.367^{+0.812}_{-0.645}$
Alt.	$-6 \pm 7$	$1.03^{+0.16}_{-0.12}$	$1492^{+102}_{-64}$	$3294^{+443}_{-6048}$	$7.454^{+9.791}_{-9.134}$

$T_{max}$  = 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

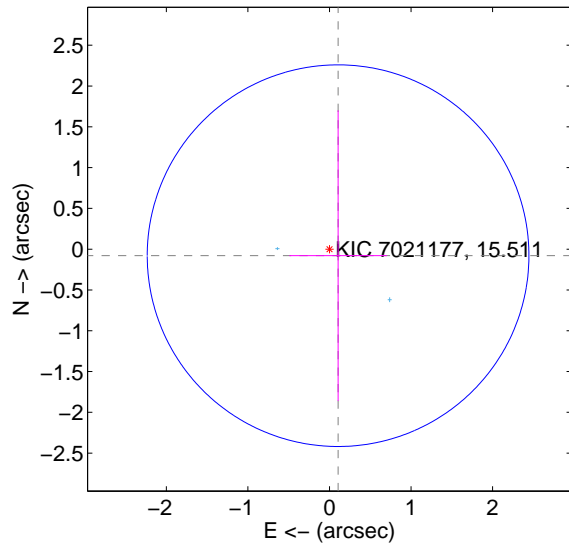
Supplemental centroid analysis for 007021177-03. Kepler magnitude: 15.51. Transit SNR 36.89

There are 2 quarters with good PRF difference image offsets

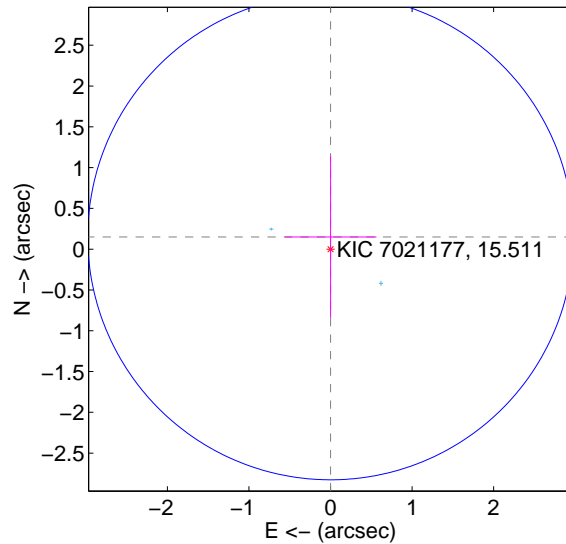
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.132 \pm 0.780$	0.17	$-0.106 \pm 0.598$	$-0.080 \pm 1.782$
PRF-fit source offset from KIC position	$0.149 \pm 0.992$	0.15	$-0.001 \pm 0.563$	$0.149 \pm 0.990$
photometric centroid source offset	$0.18 \pm 0.03$	5.92	$0.18 \pm 0.03$	$-0.03 \pm 0.03$

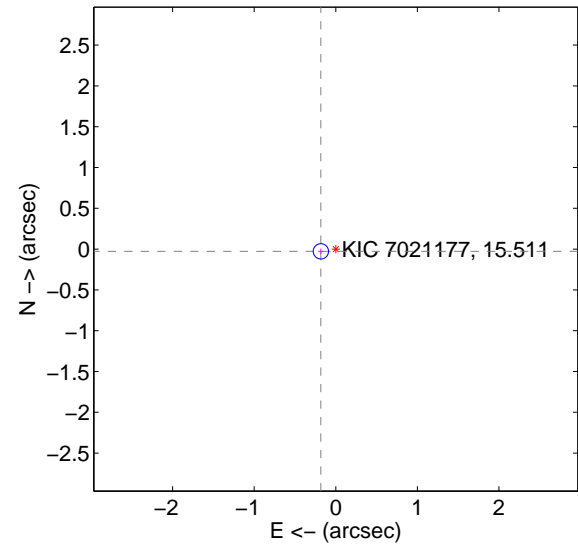
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

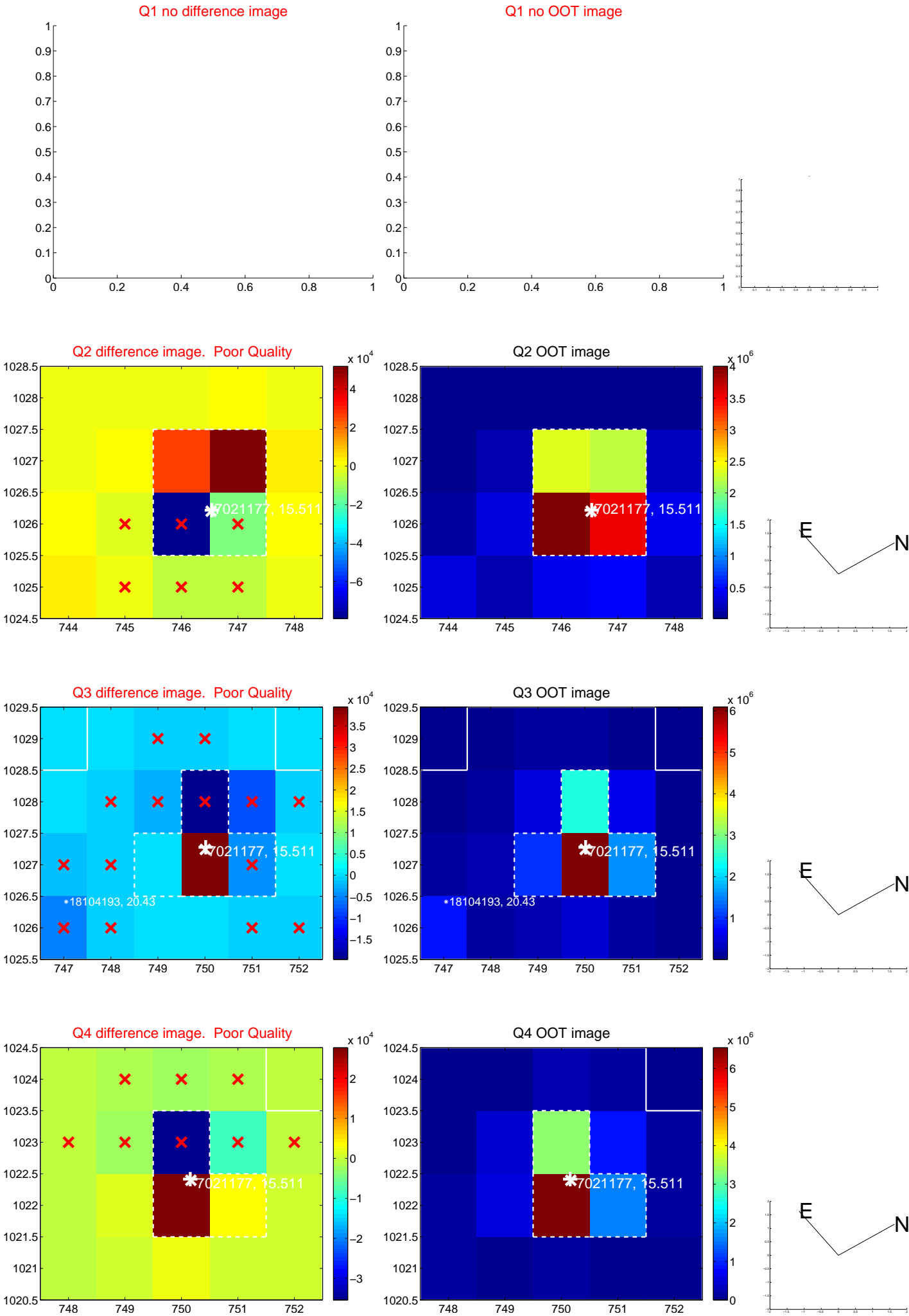


offset from photometric centroids



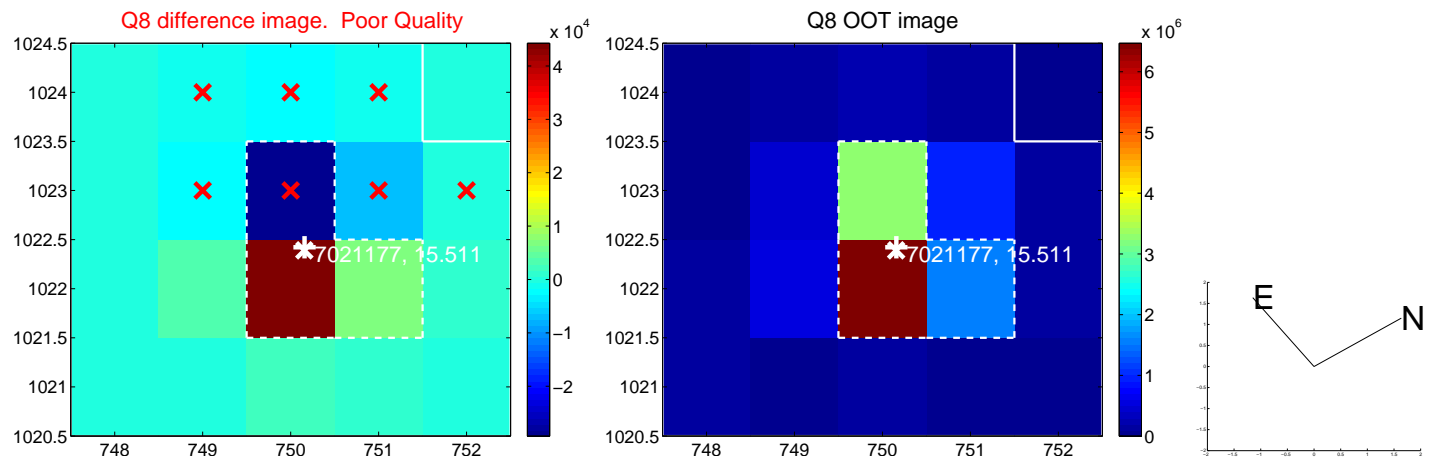
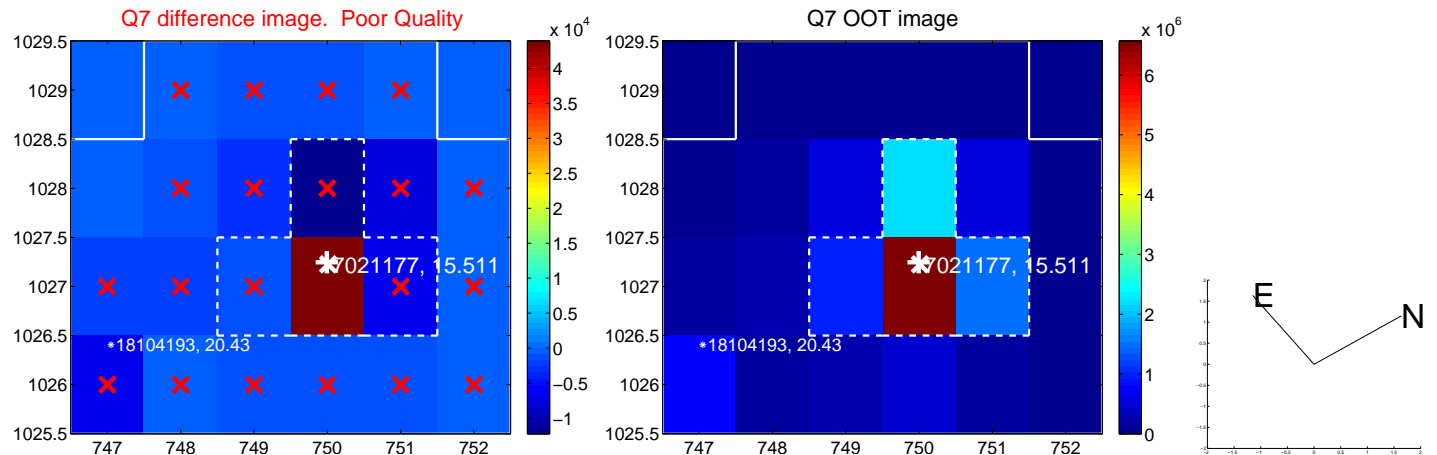
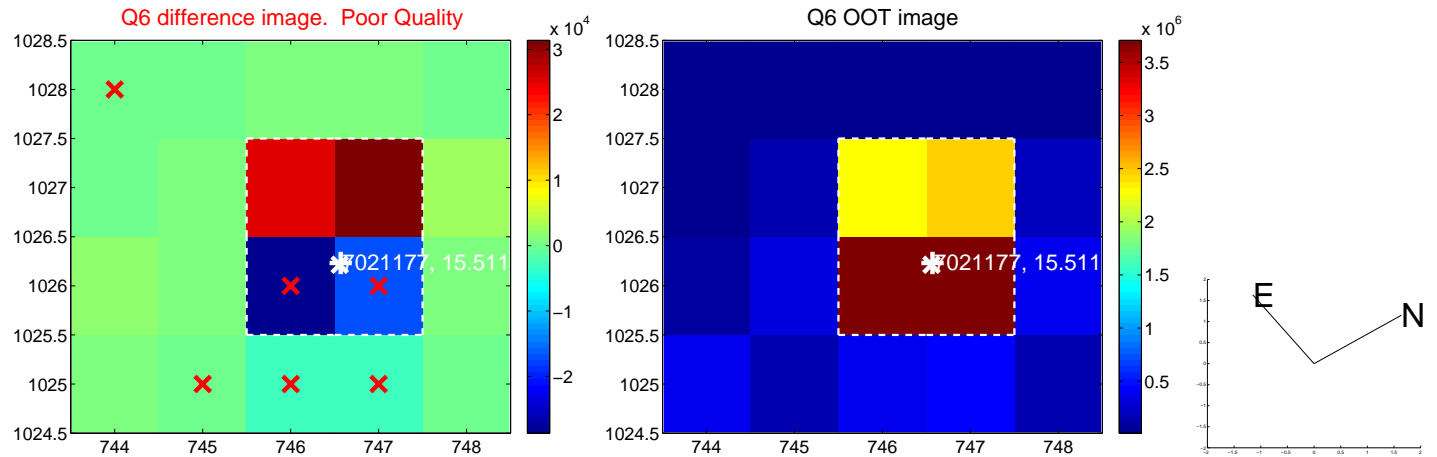
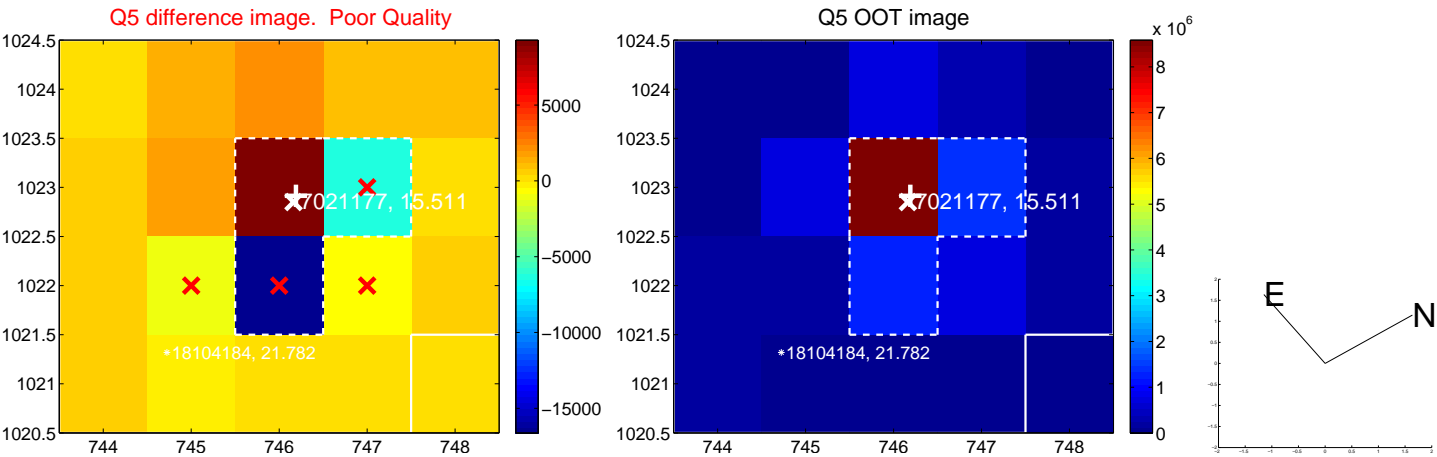
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



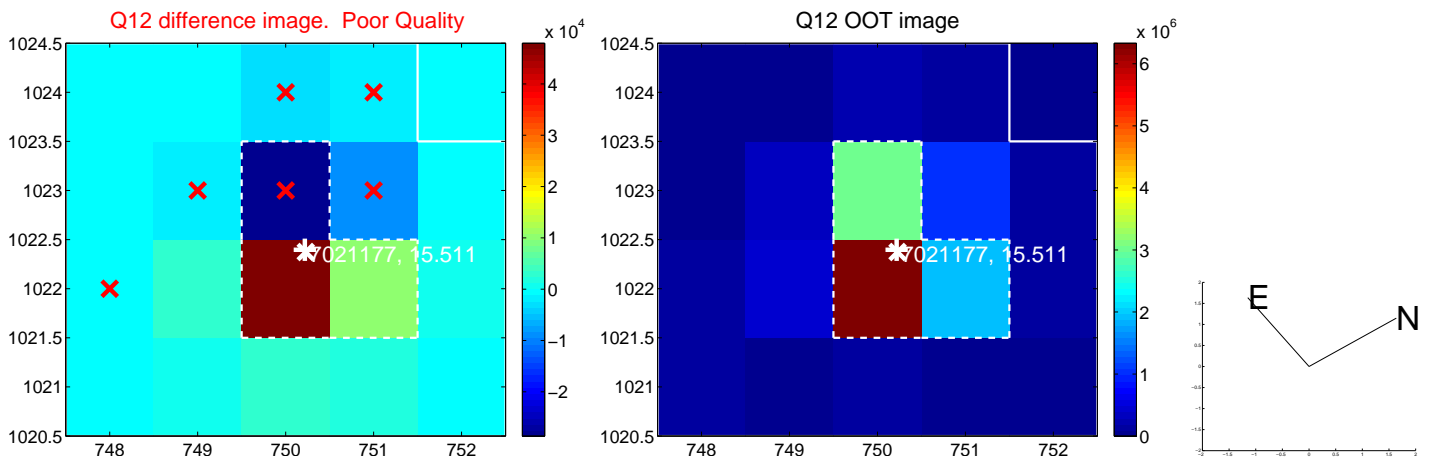
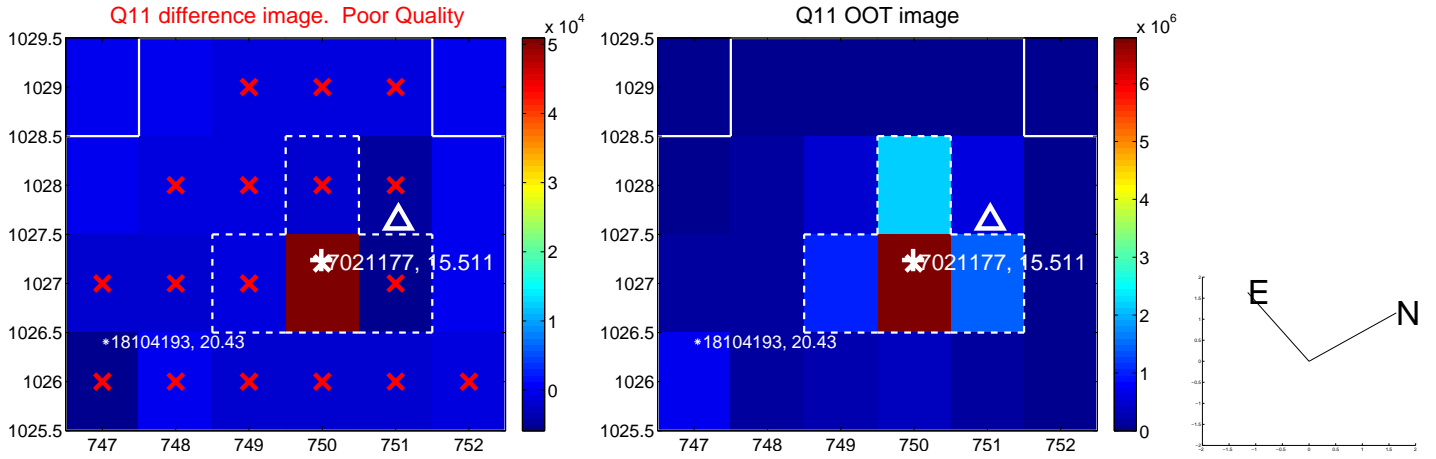
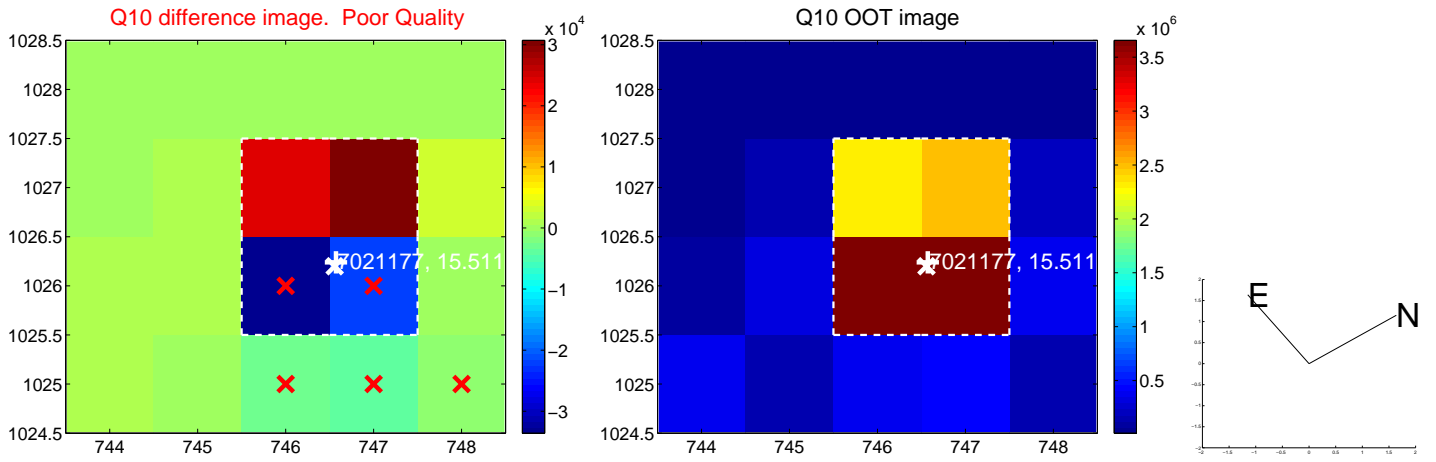
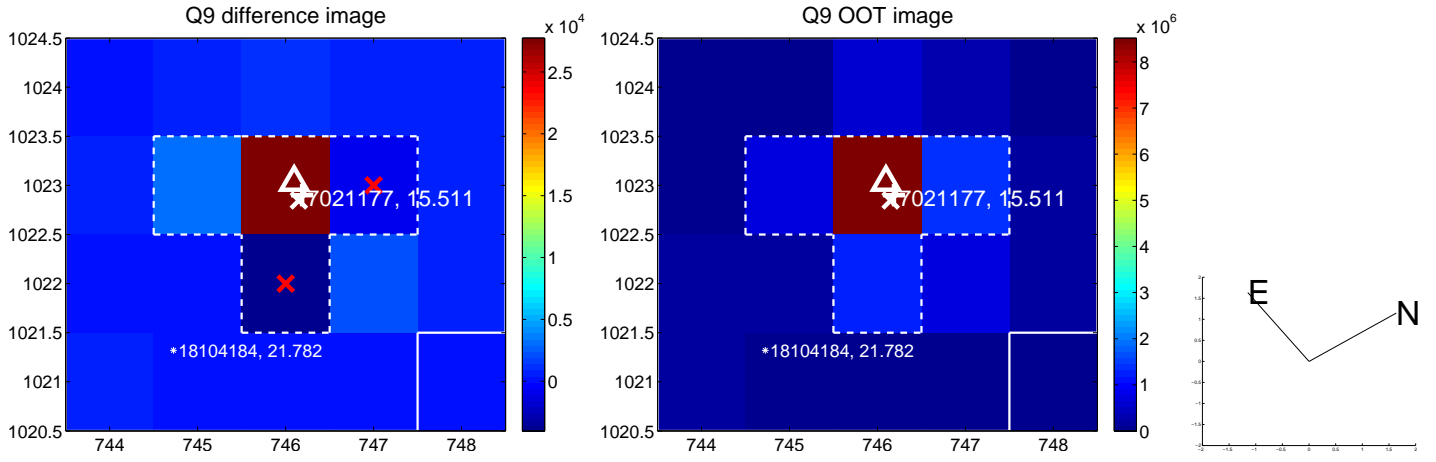


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

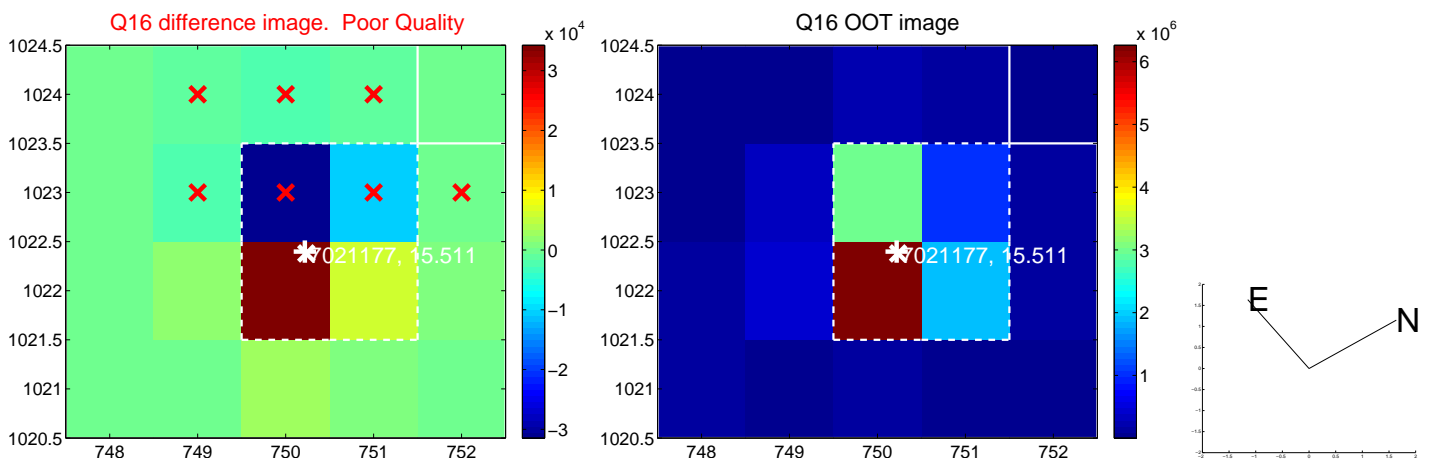
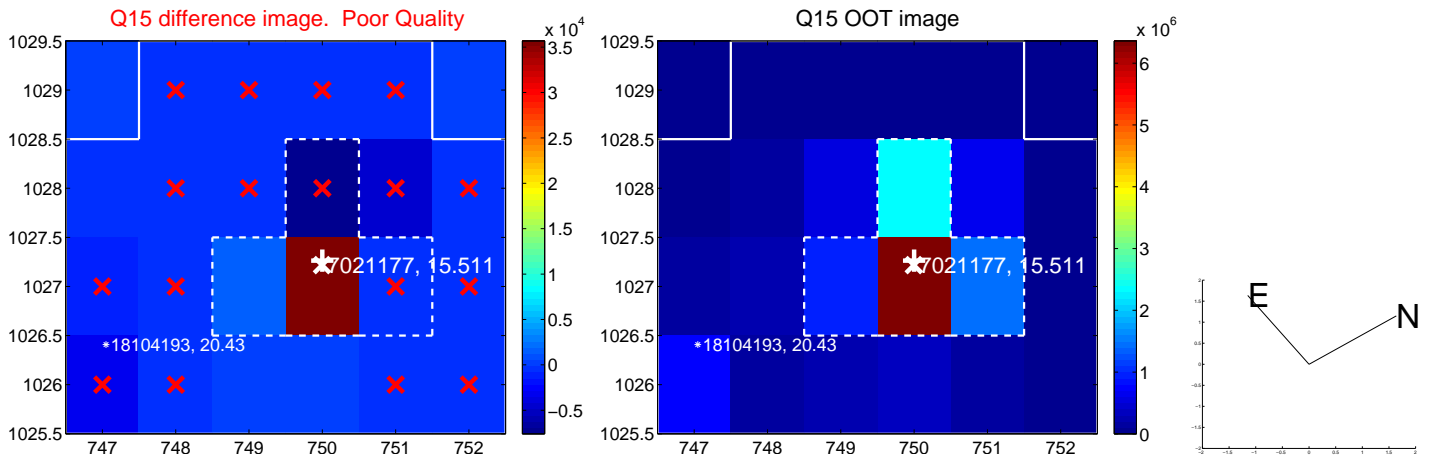
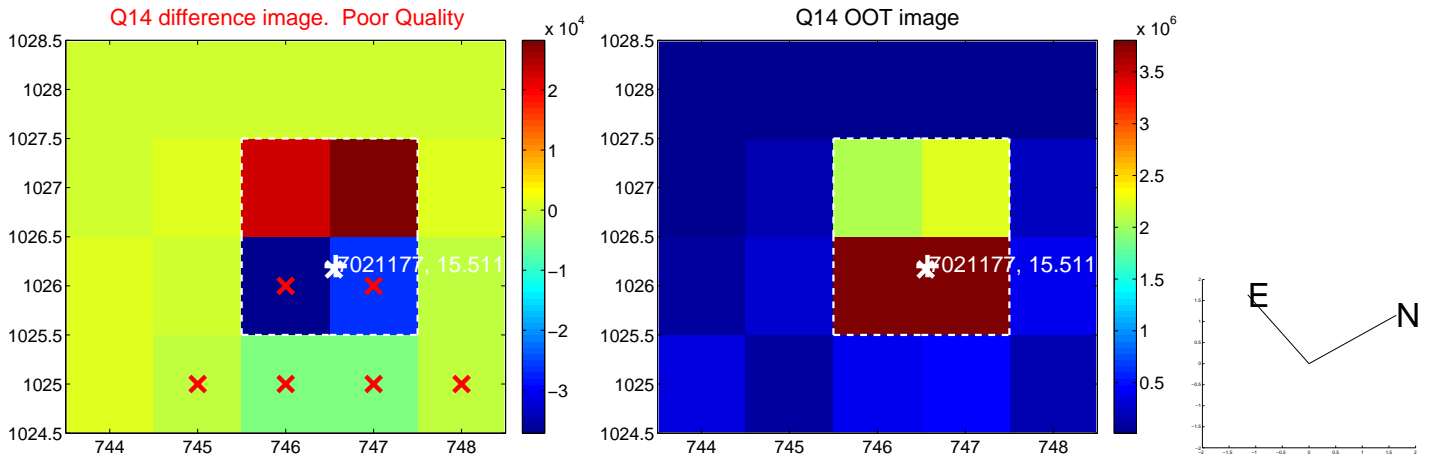
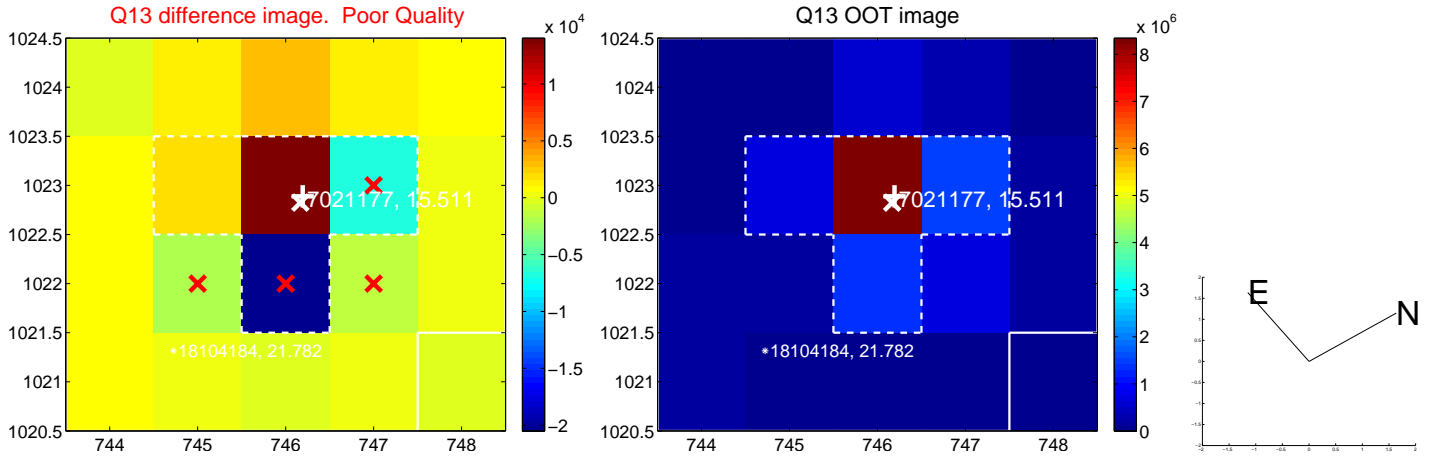




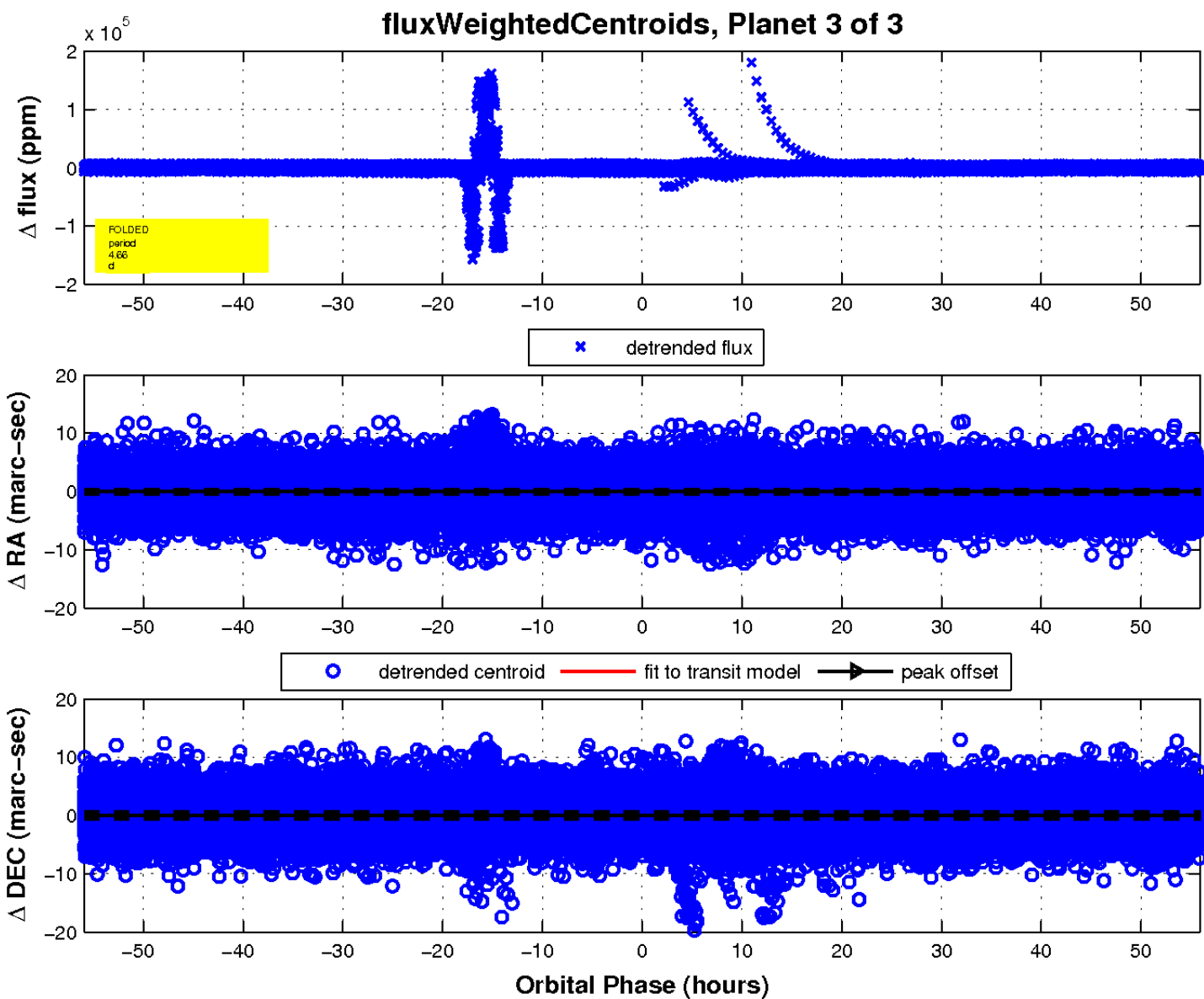
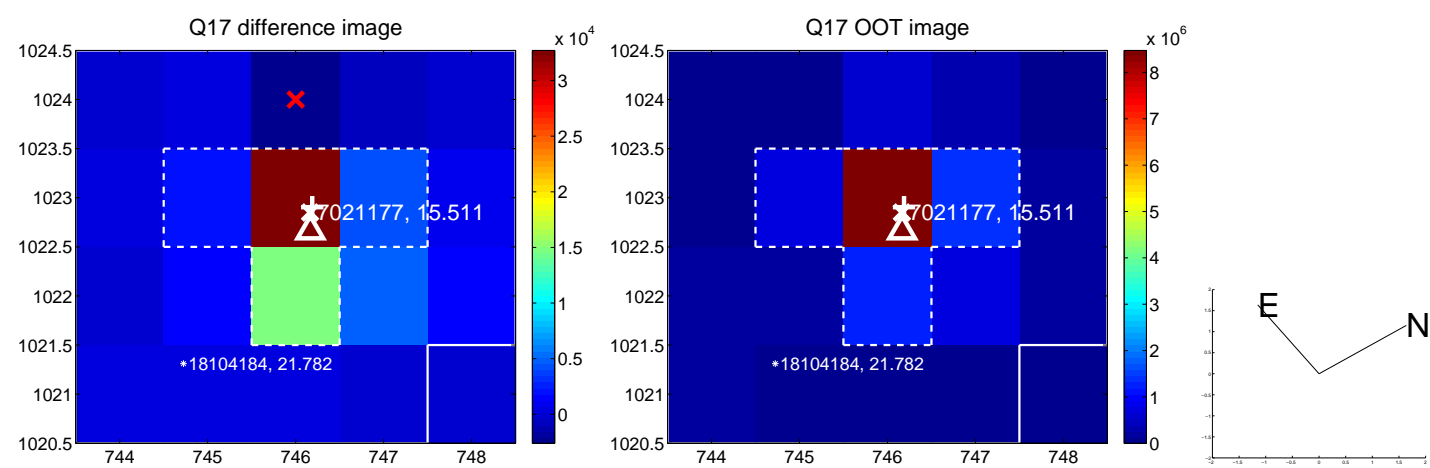
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

