

# KIC 007021681

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007021681-01	OBS	0255.01	27.521986	134.779581	2312.2	4.119	85.0	85.0	0.51	3780	2.55	2.29
007021681-02	OBS	0255.02	13.603189	140.397351	200.3	2.658	8.3	9.4	0.51	3780	0.79	5.86
007021681-03	OBS	0255.03	7.733262	133.593654	124.3	3.007	7.3	8.0	0.51	3780	0.68	12.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007021681-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007021681-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007021681-03	OBS	FP	0.12	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

**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.

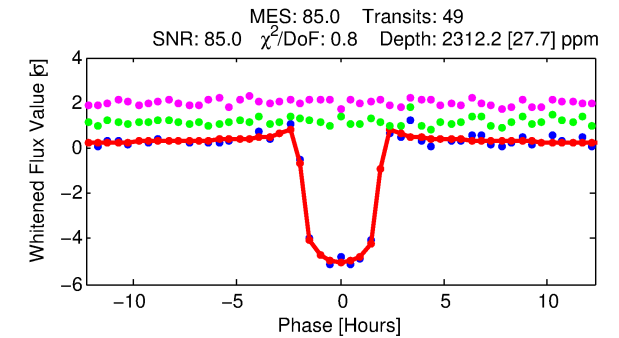
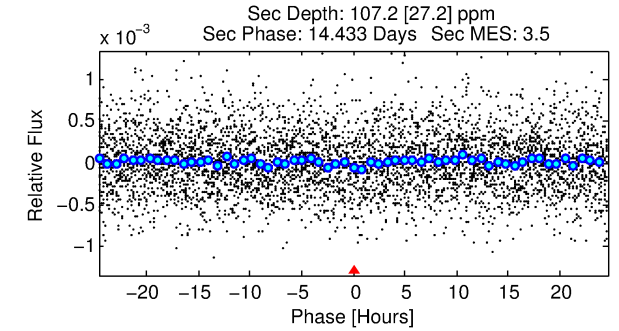
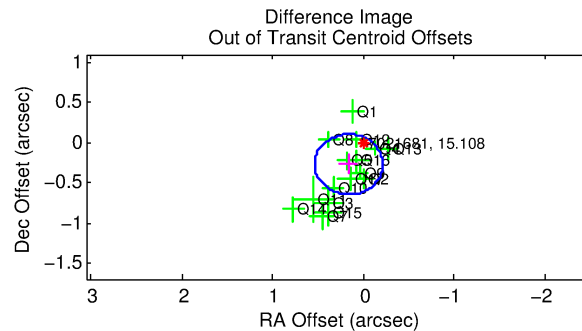
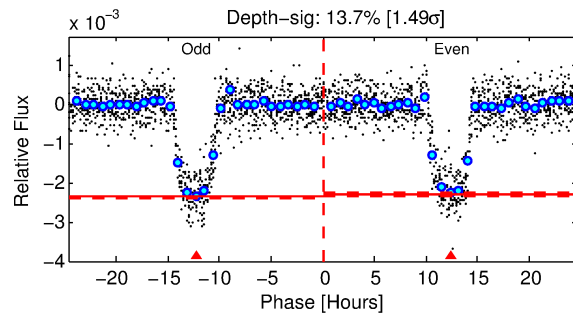
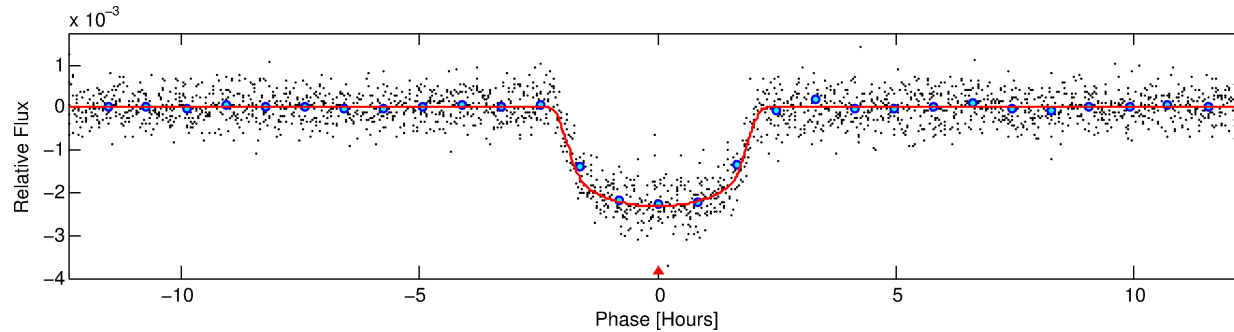
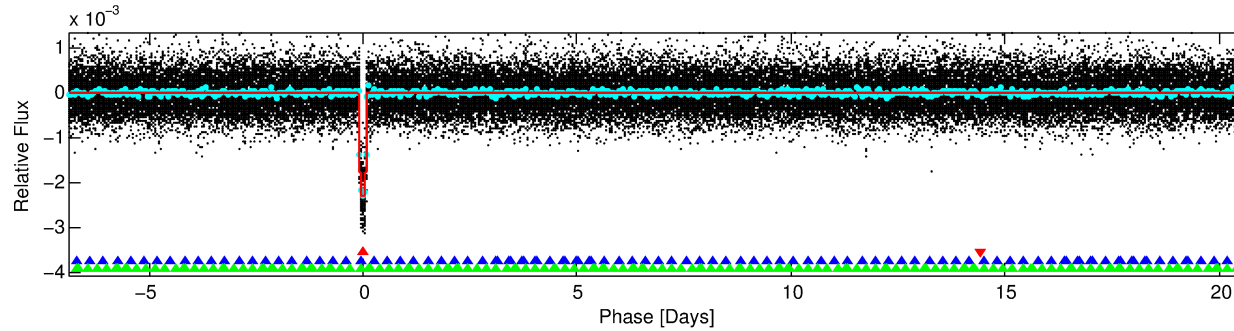
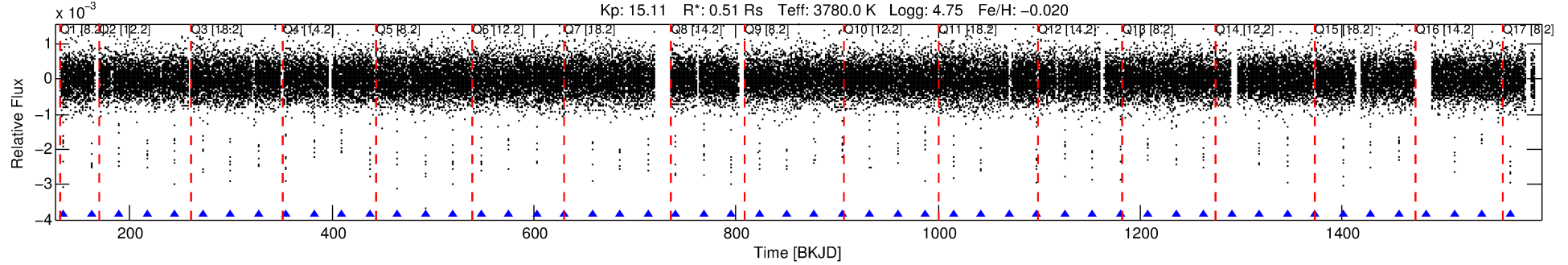
Ephemeris Match Information For 007021681-01

No Significant Match Found

# DV One-Page Summary

KIC: 7021681 Candidate: 1 of 3 Period: 27.522 d  
KOI: K00255.01 Corr: 0.990

Kp: 15.11 R\*: 0.51 Rs Teff: 3780.0 K Logg: 4.75 Fe/H: -0.020



## DV Fit Results:

Period = 27.52199 [0.00003] d  
Epoch = 134.7796 [0.0009] BKJD  
Rp/R\* = 0.0457 [0.0033]  
a/R\* = 43.94 [13.12]  
b = 0.59 [0.33]  
Seff = 2.29 [0.28]  
Teq = 314 [10] K  
Rp = 2.55 [0.28] Re  
a = 0.1445 [0.0093] AU  
Ag = 189.39 [57.52] [3.28σ]  
Teffp = 1799 [137] K [10.82σ]

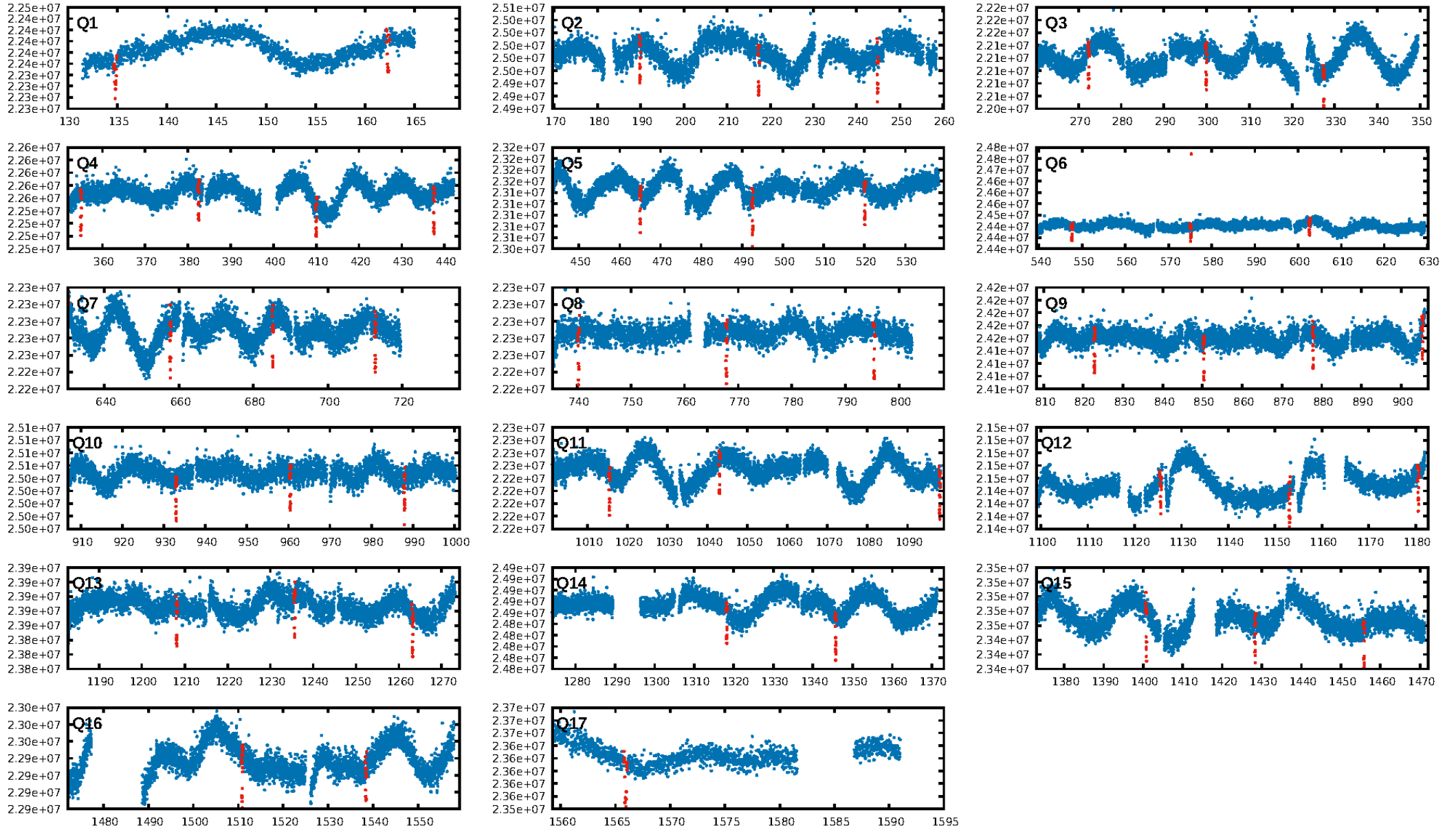
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [68.15σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [46/46]  
GhostDiagnostic-chr: 4.804  
Centroid-sig: 0.2%  
Centroid-so: 0.584 arcsec [4.49σ]  
OotOffset-rm: 0.317 arcsec [2.53σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-rm: 0.353 arcsec [4.17σ]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

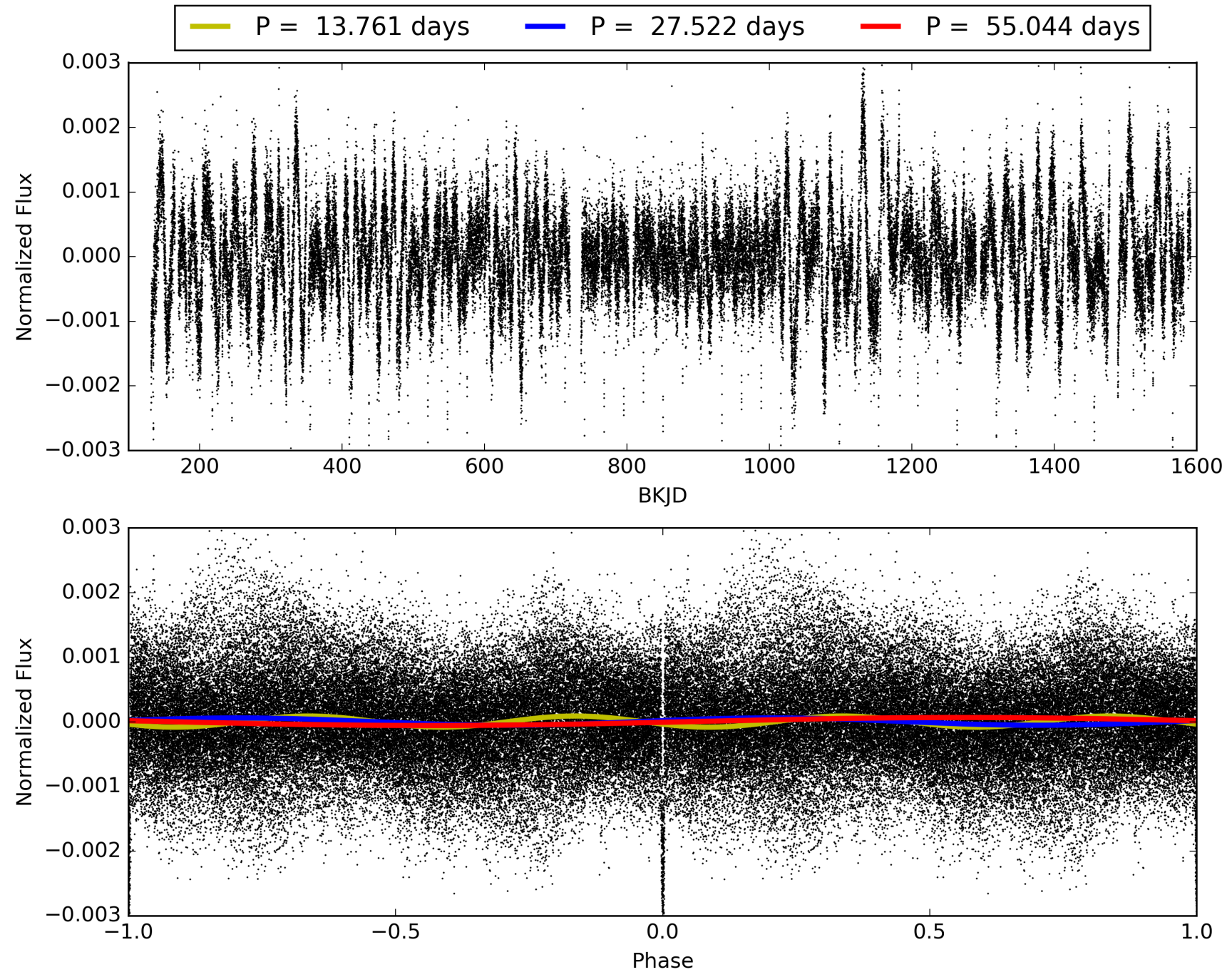
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:15:28 Z

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

# TCE 007021681-01, PDC Light Curves



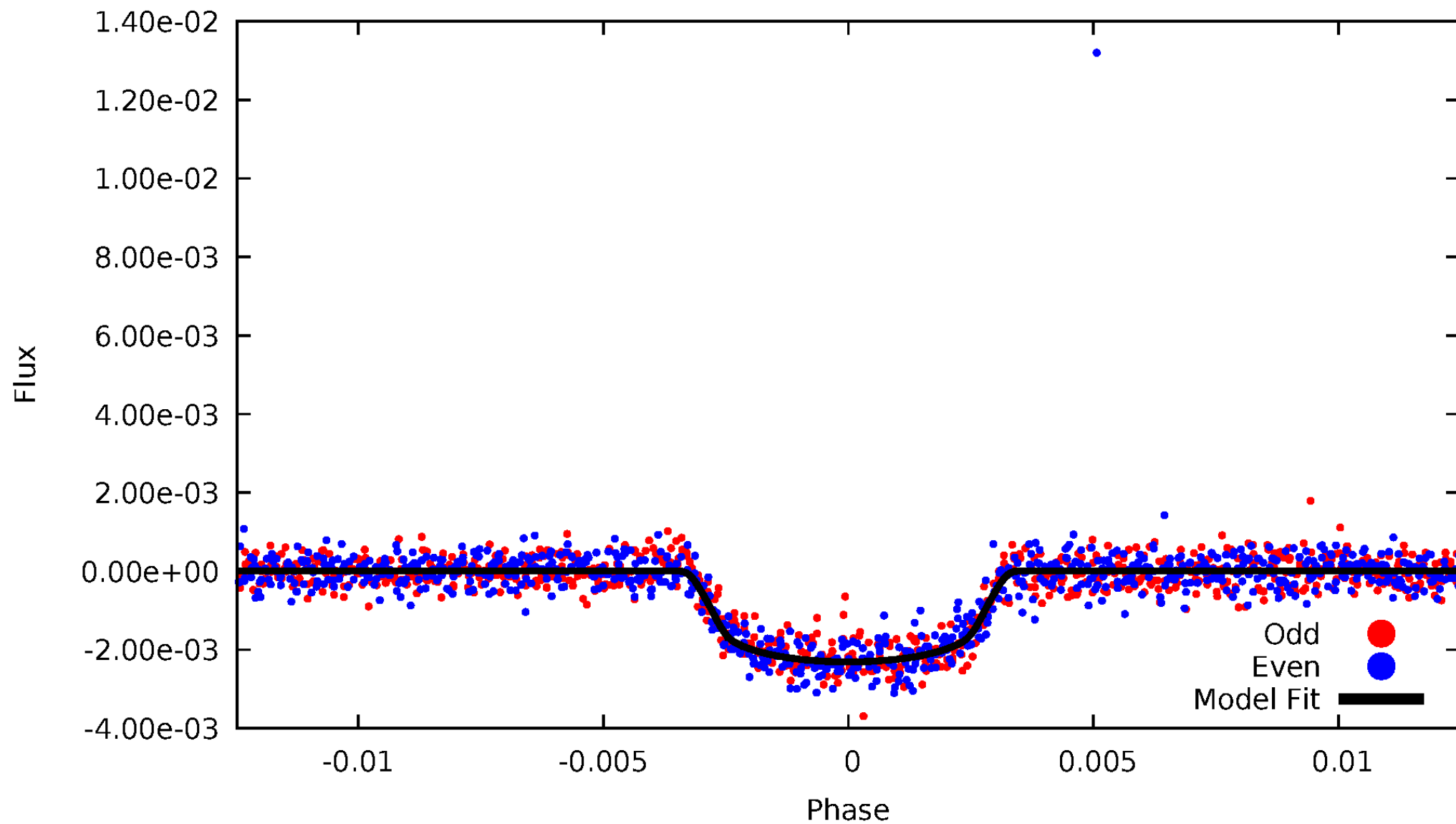
TCE 007021681-01





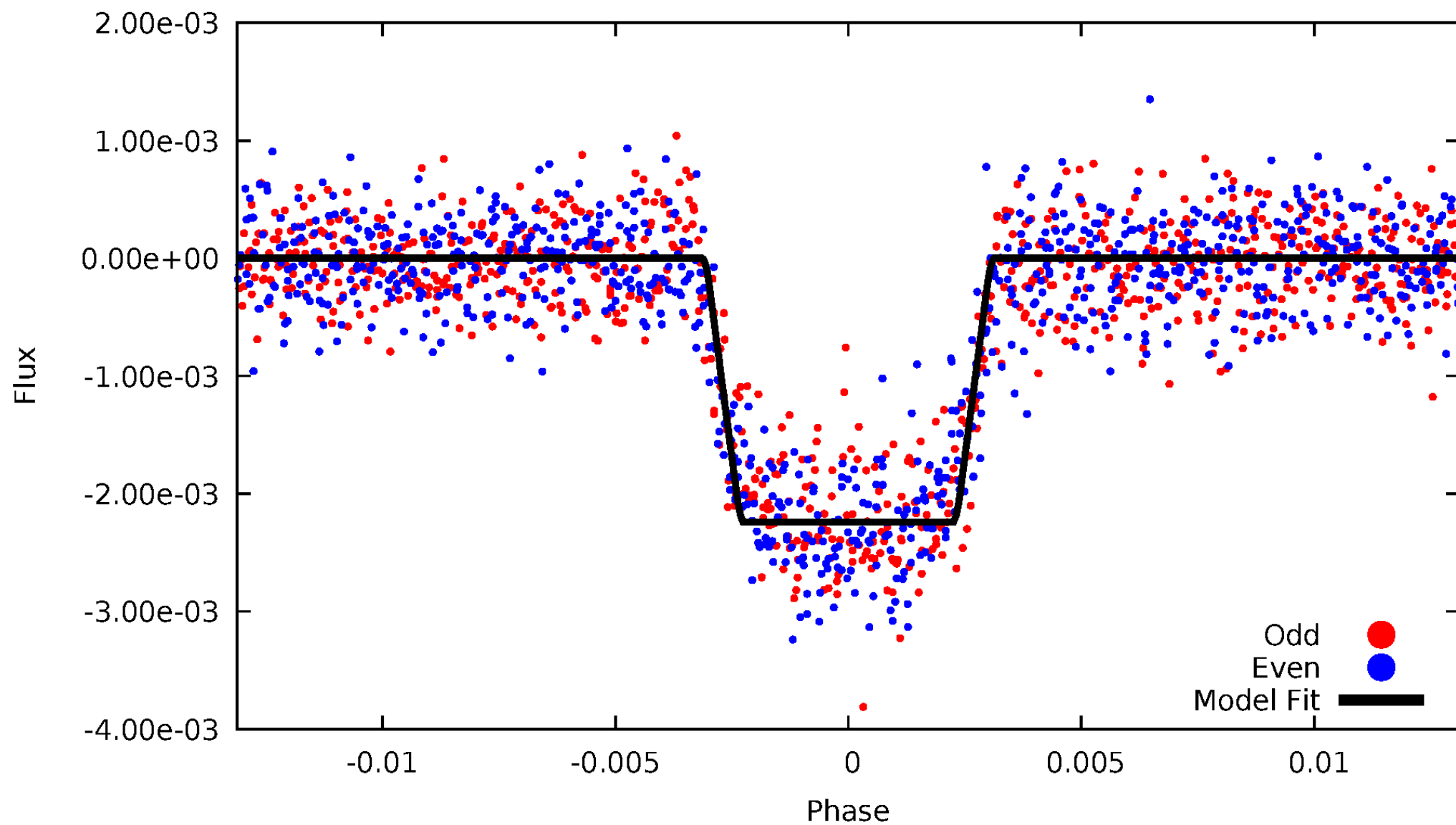
# DV Odd/Even

TCE 007021681-01



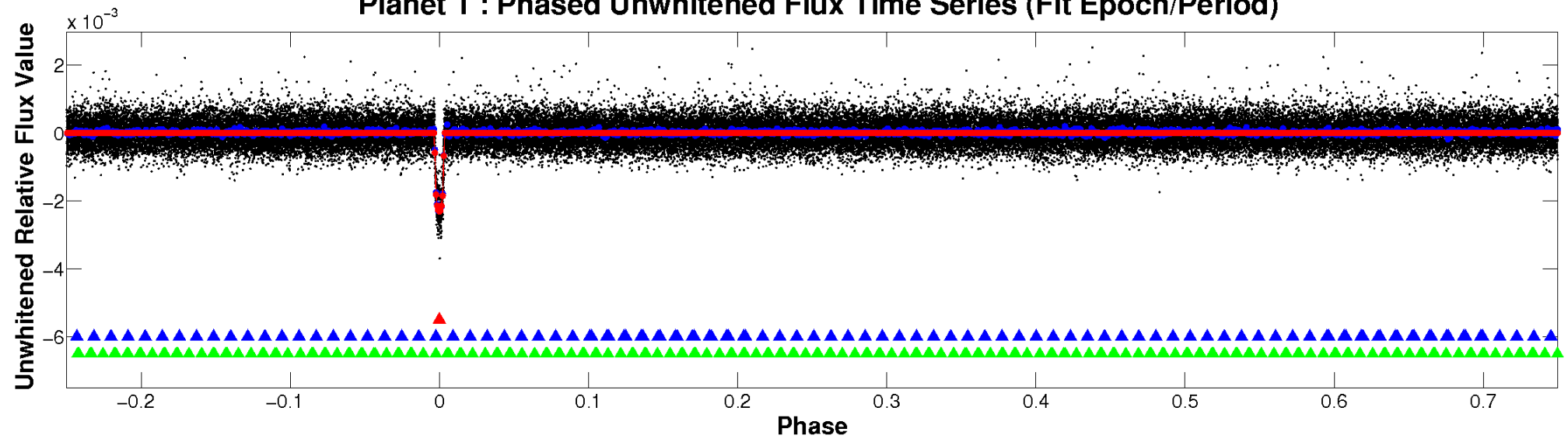
# ALT Odd/Even

TCE 007021681-01

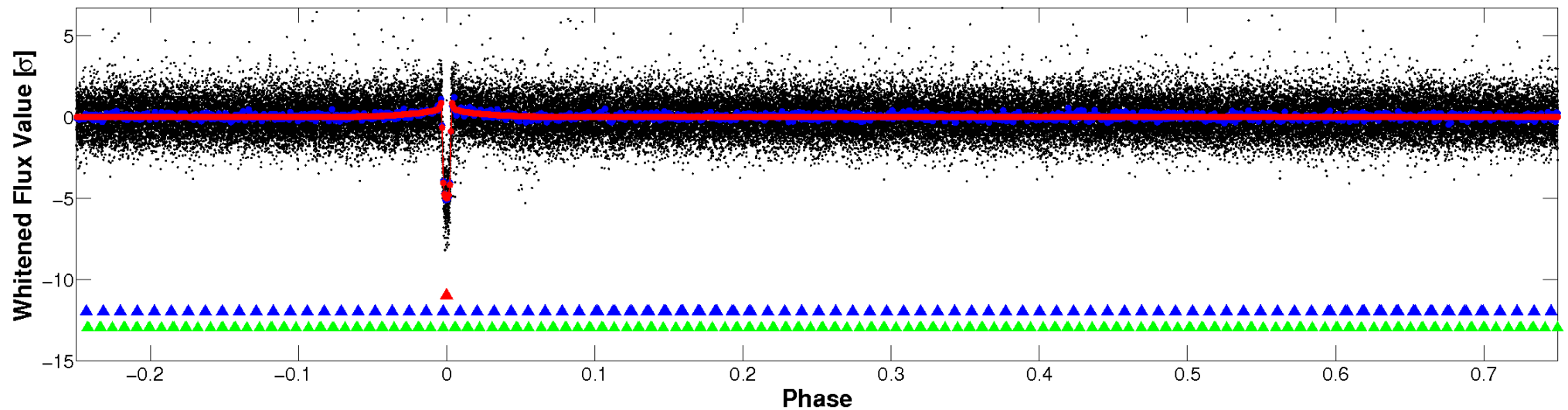


# Non-Whitened Vs. Whitened Light Curve

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

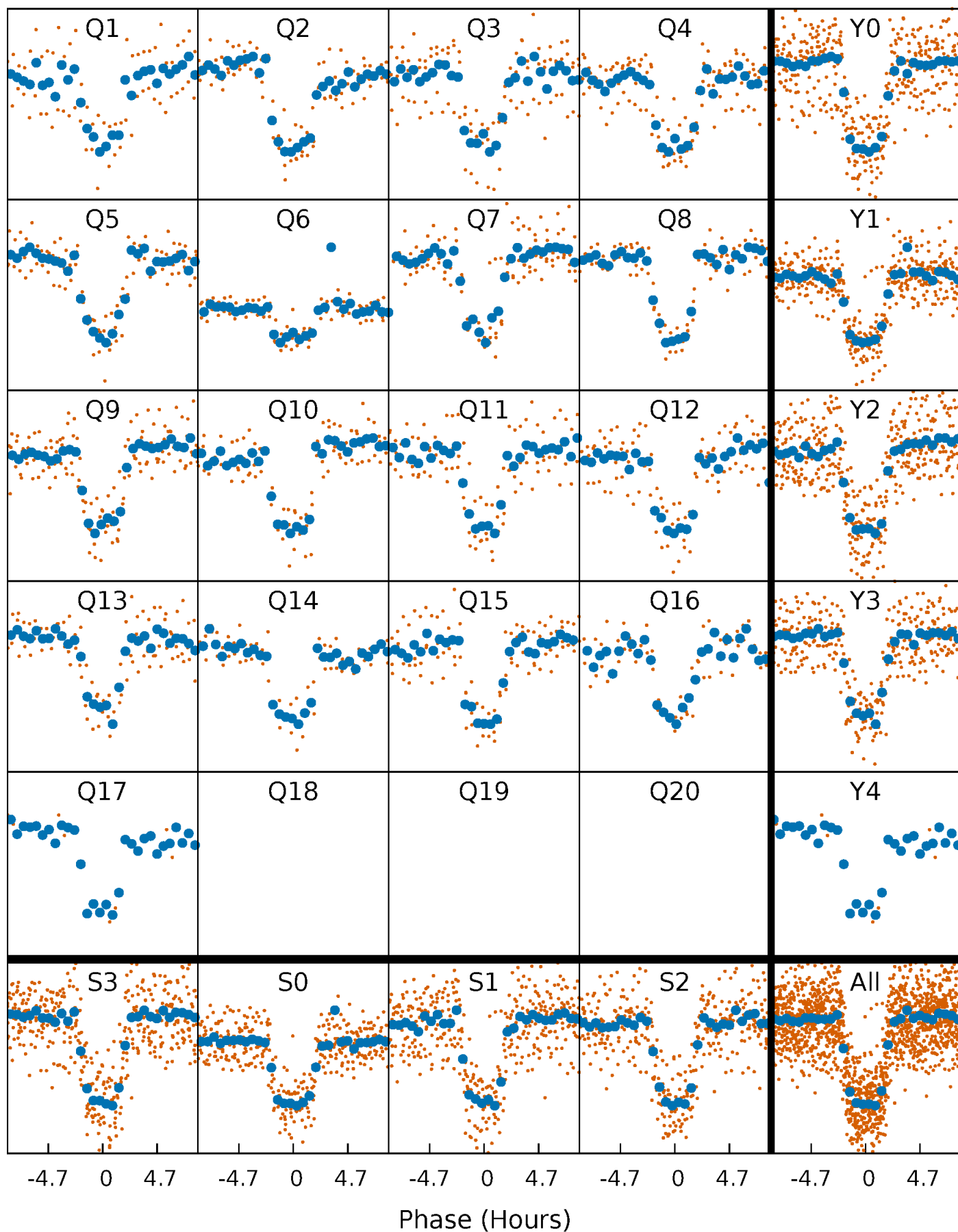


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

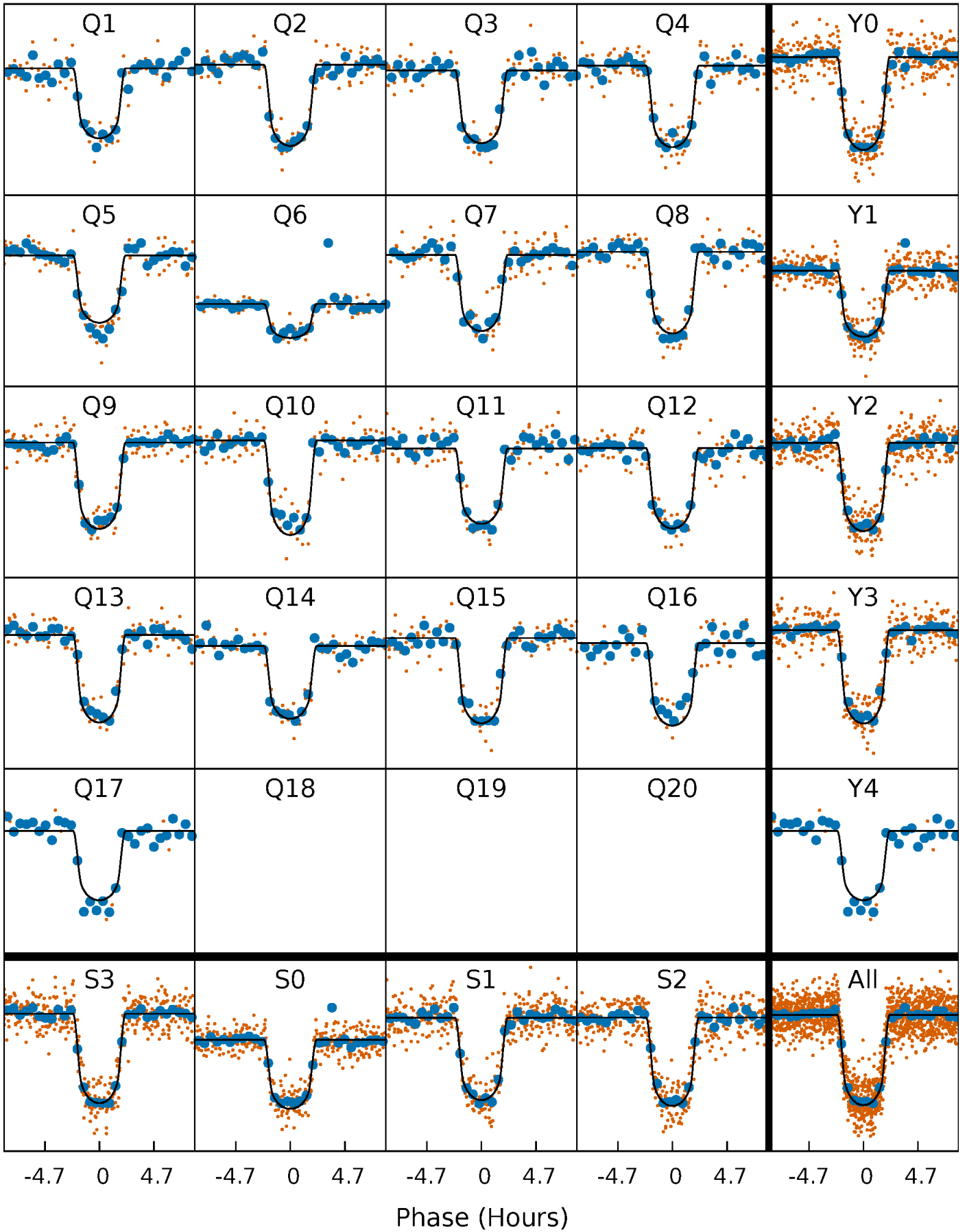
TCE 007021681-01 P= 27.521986 Days  $T_0=134.779581$  (BKJD)





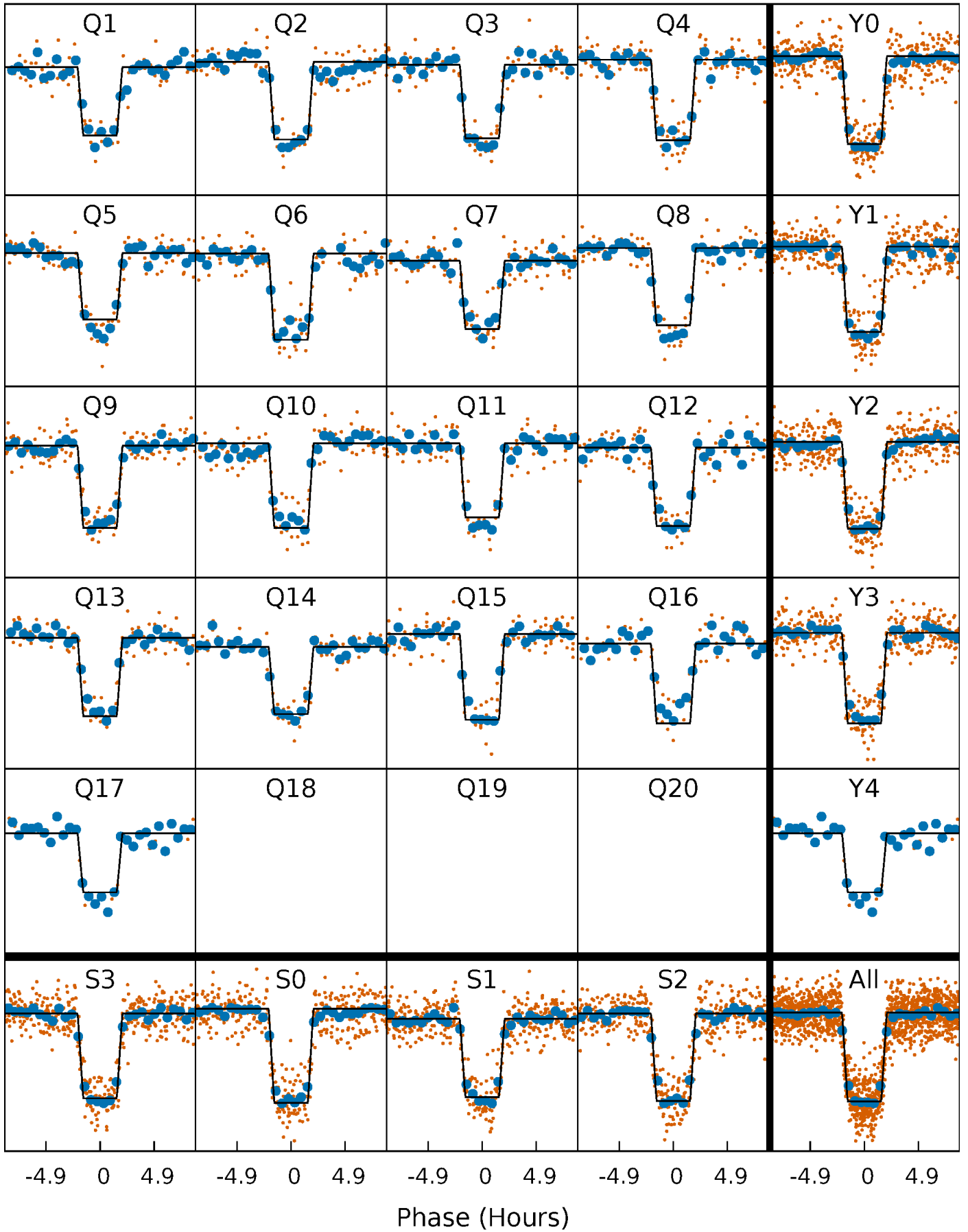
# DV Quarter-Phased Transit Curves

TCE 007021681-01 P= 27.521986 Days  $T_0=134.779581$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

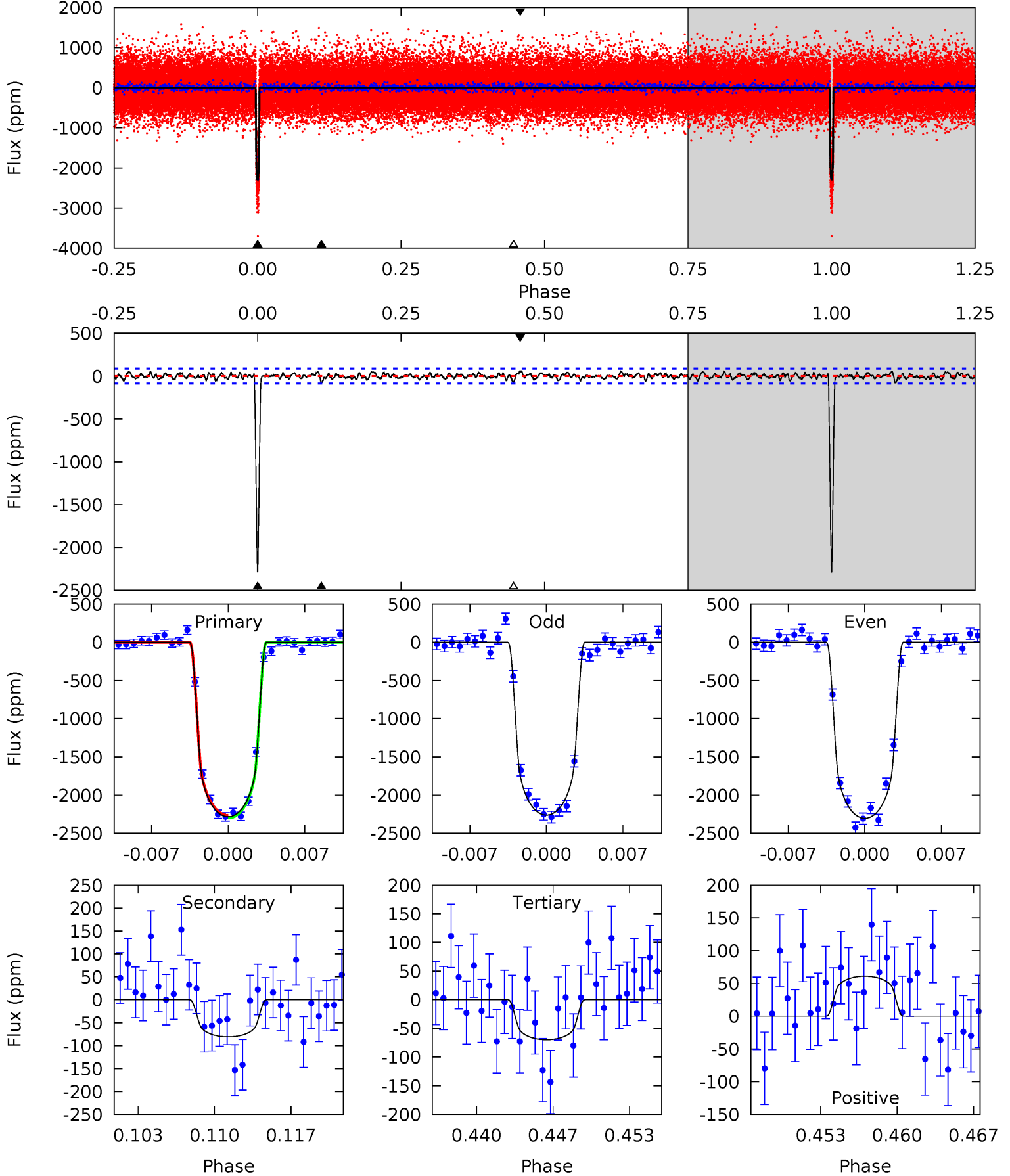
TCE 007021681-01 P= 27.522024 Days  $T_0=134.778821$  (BKJD)



# DV Model-Shift Uniqueness Test

007021681-01,  $P = 27.521986$  Days,  $E = 107.257595$  Days

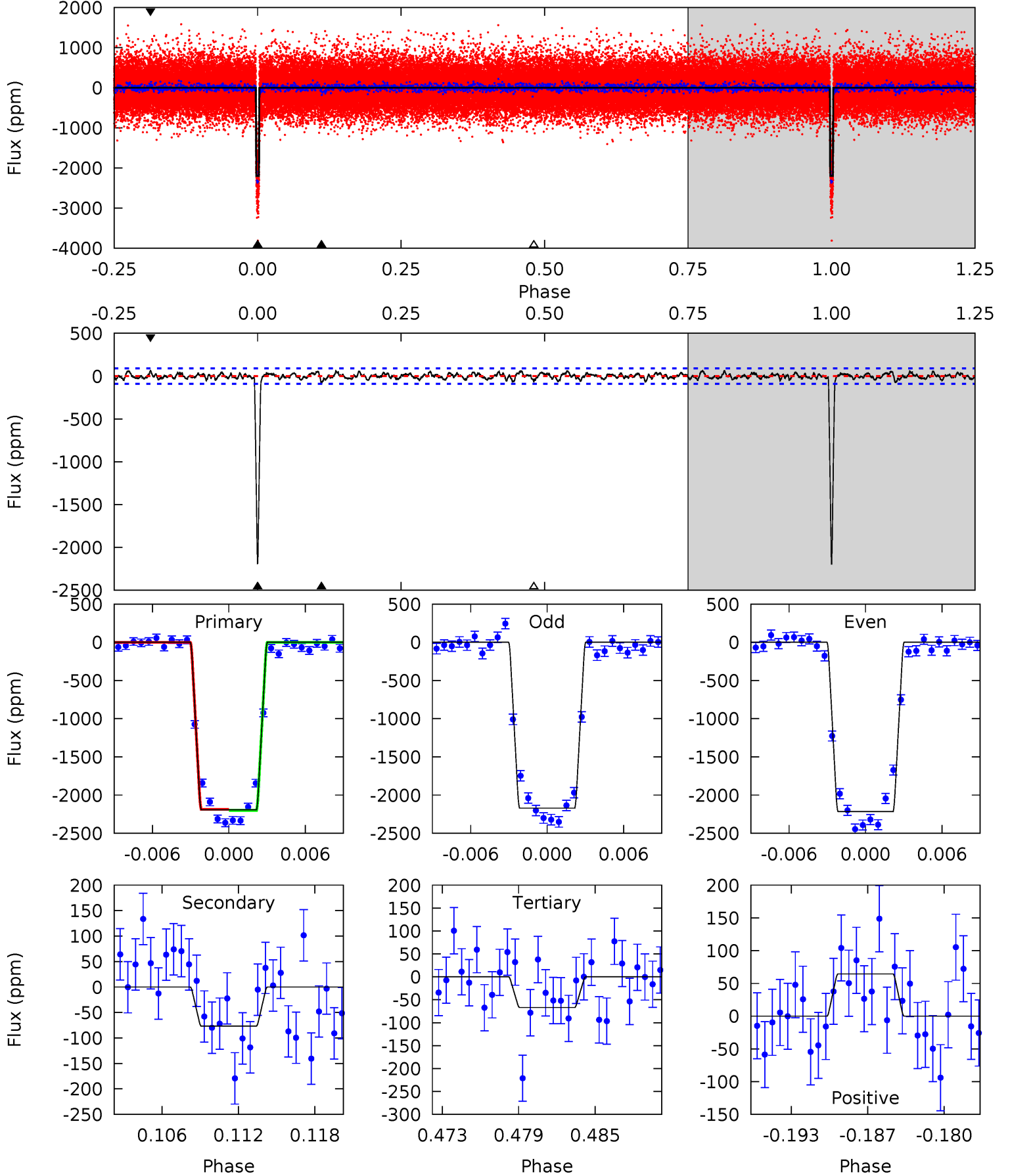
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
135.1	4.79	4.13	3.61	5.10	2.70	1.27	131.0	131.5	0.66	1.18	1.25	0.99	0.03	1.02



# Alt Model-Shift Uniqueness Test

007021681-01, P = 27.522024 Days, E = 107.256797 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
123.9	4.34	3.78	3.64	5.12	2.74	1.37	120.1	120.3	0.56	0.70	1.24	0.98	0.03	0.38





### Stellar Parameters For KIC 007021681

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3780^{+76}_{-83}$	$4.746^{+0.042}_{-0.031}$	$-0.020^{+0.150}_{-0.150}$	$0.511^{+0.036}_{-0.043}$	$0.531^{+0.034}_{-0.042}$	$5.600^{+1.082}_{-0.675}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-8%	+6%/-8%	+19%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 007021681-01 / KOI 0255.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-81 \pm 17$	$2.55^{+0.20}_{-0.21}$	$437^{+11}_{-12}$	$2395^{+78}_{-83}$	$144^{+42}_{-36}$
Alt.	$-77 \pm 18$	$2.63^{+0.20}_{-0.21}$	$437^{+11}_{-12}$	$2357^{+83}_{-84}$	$127^{+40}_{-35}$

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

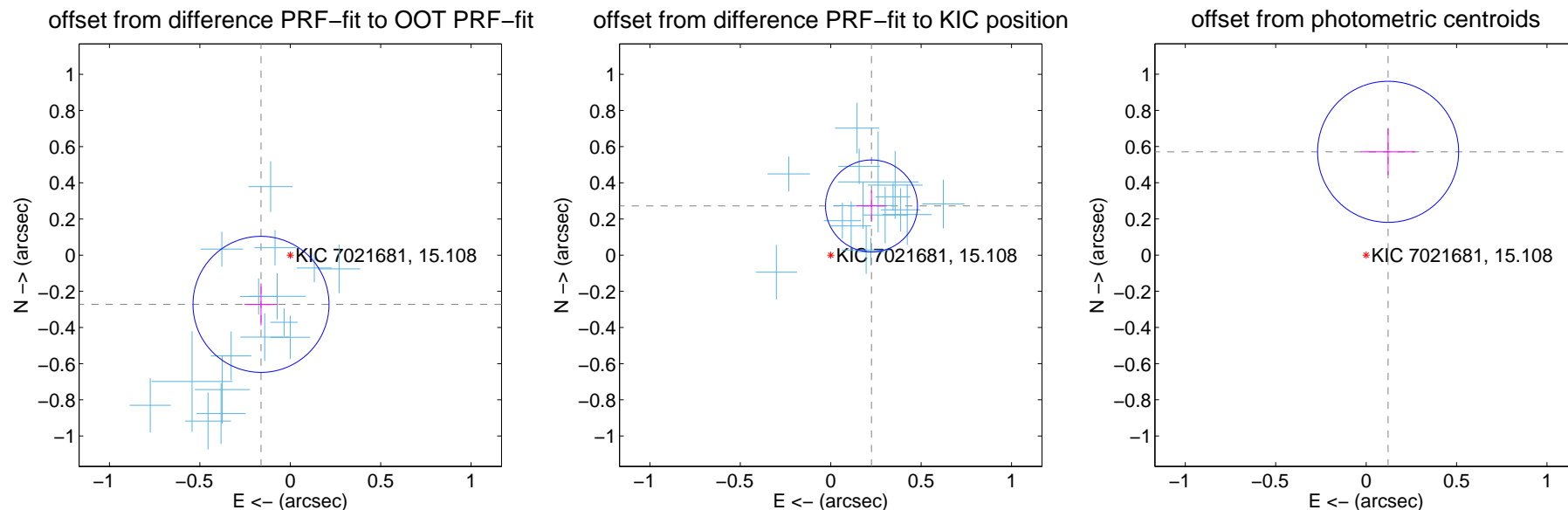
## DV Centroid Data

Supplemental centroid analysis for 007021681-01. Kepler magnitude: 15.11. Transit SNR 84.97

There are 16 quarters with good PRF difference image offsets

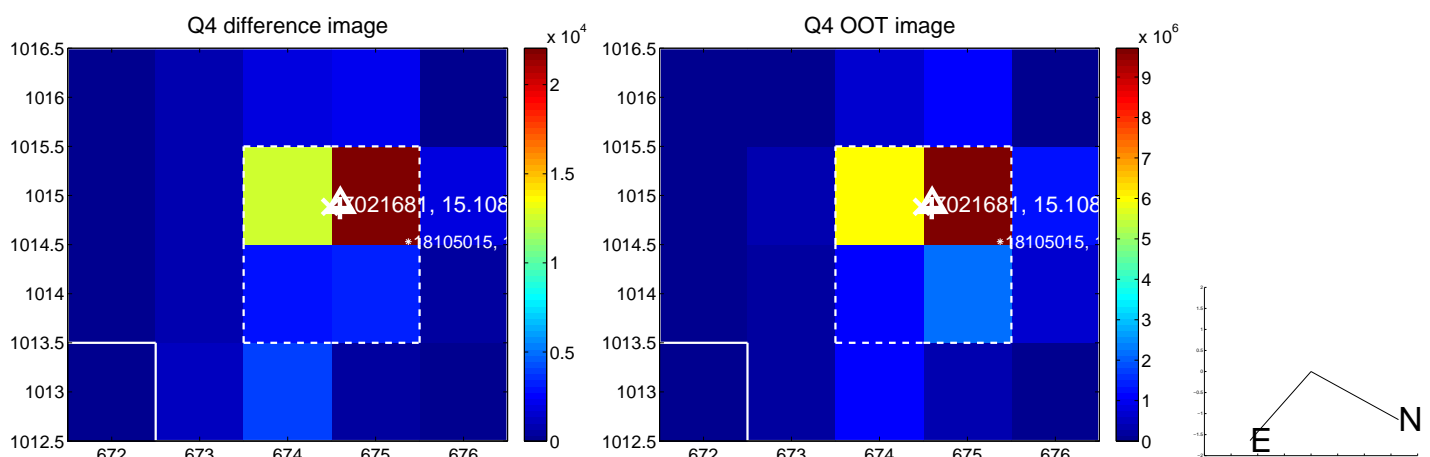
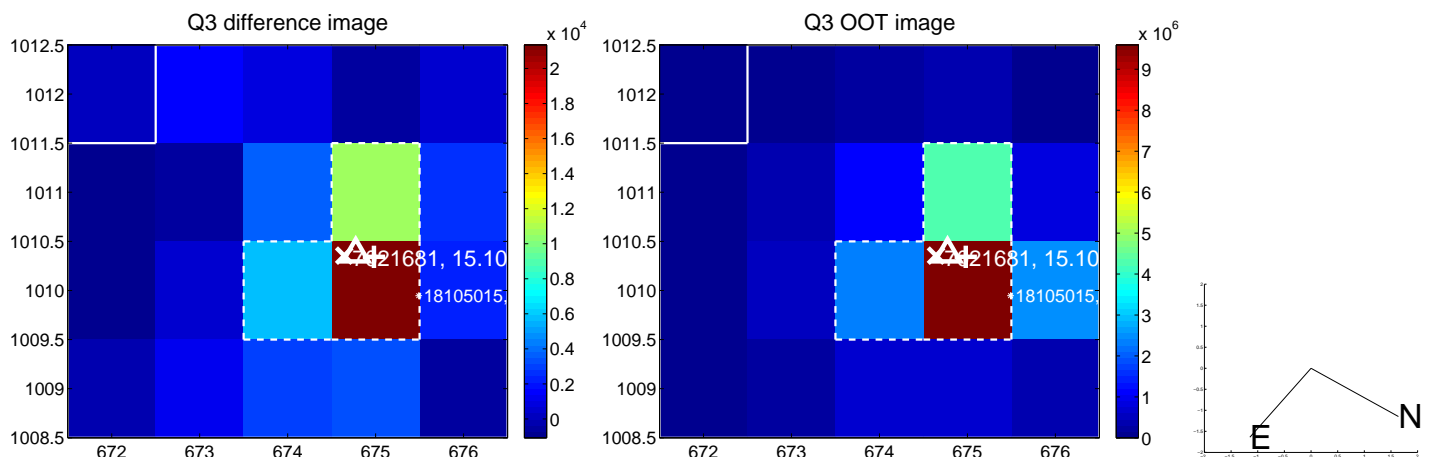
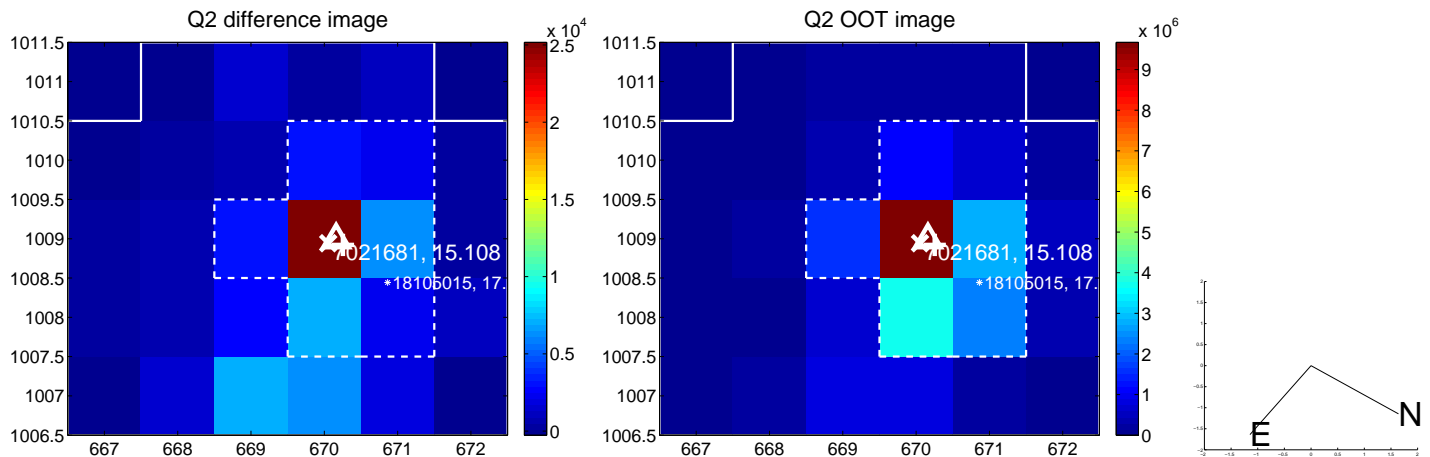
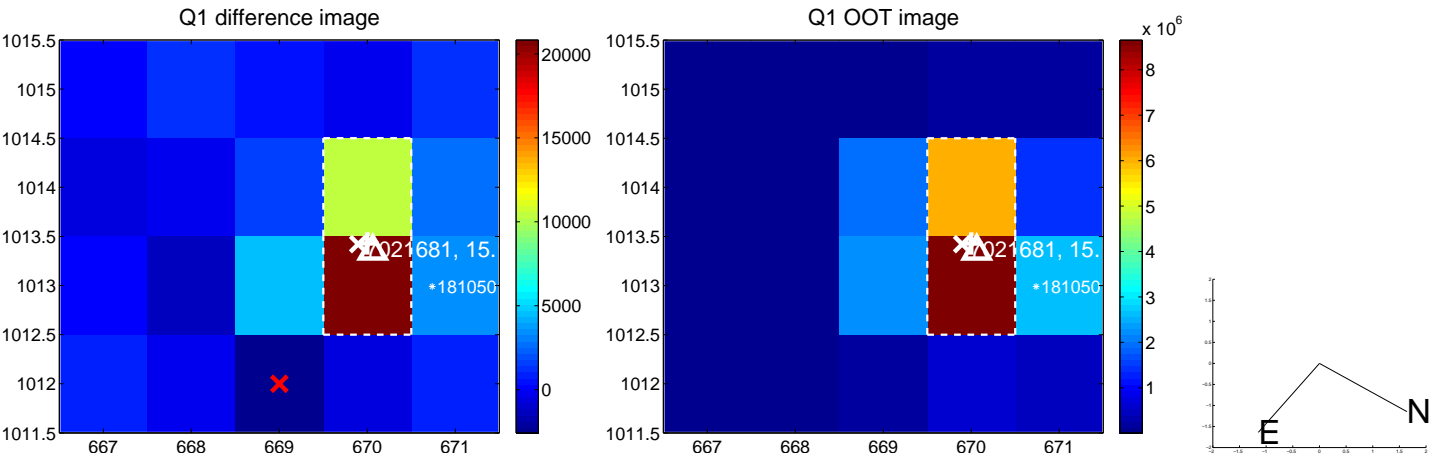
The direct PRF centroid is offset from the target star catalog position by about 0.59 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.317 \pm 0.125$	2.53	$0.162 \pm 0.091$	$-0.272 \pm 0.117$
PRF-fit source offset from KIC position	$0.353 \pm 0.085$	4.17	$-0.225 \pm 0.084$	$0.272 \pm 0.085$
photometric centroid source offset	$0.58 \pm 0.13$	4.49	$-0.12 \pm 0.15$	$0.57 \pm 0.13$

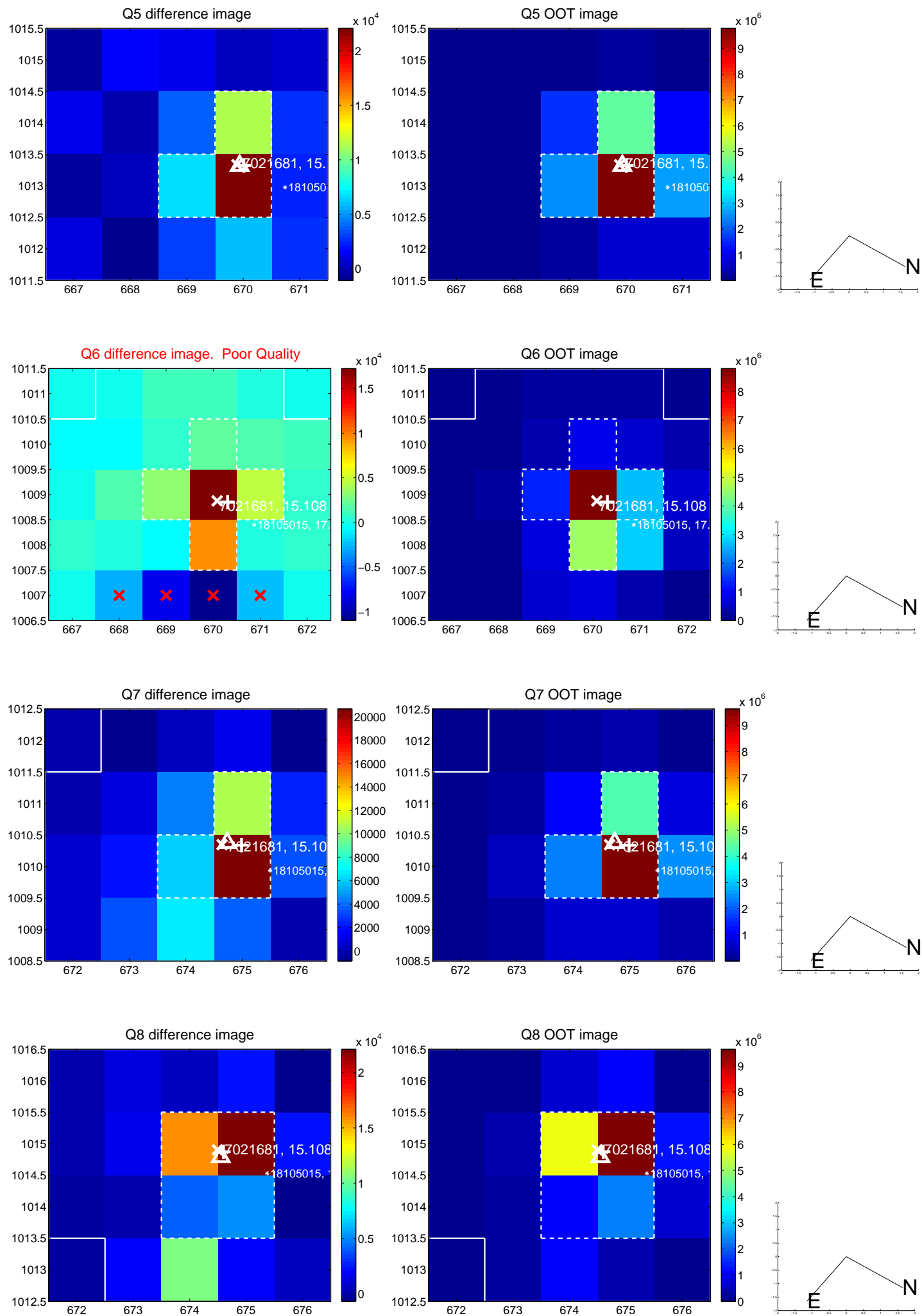


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

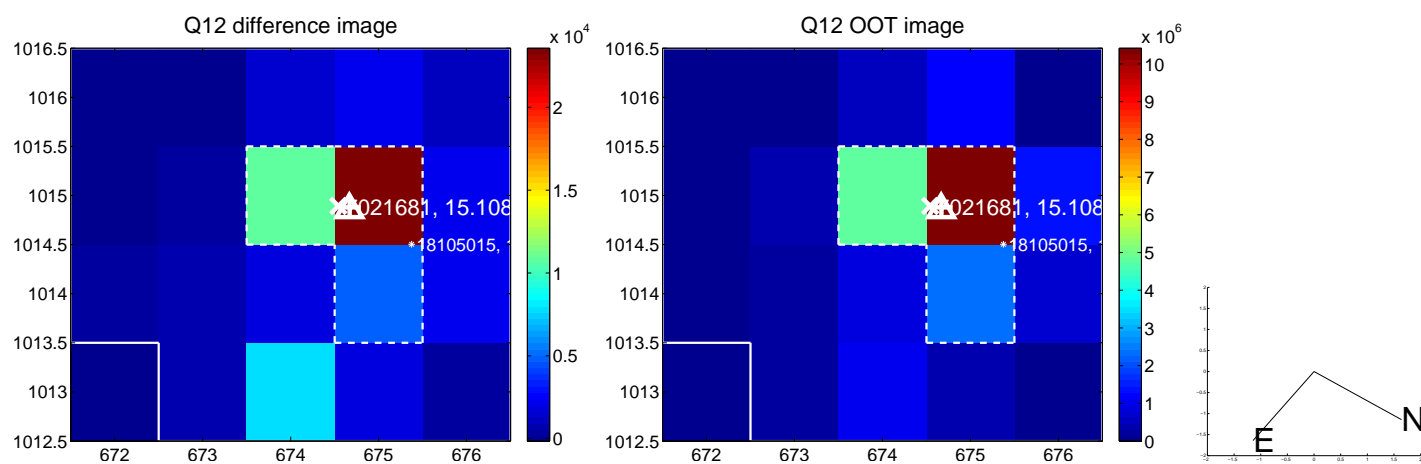
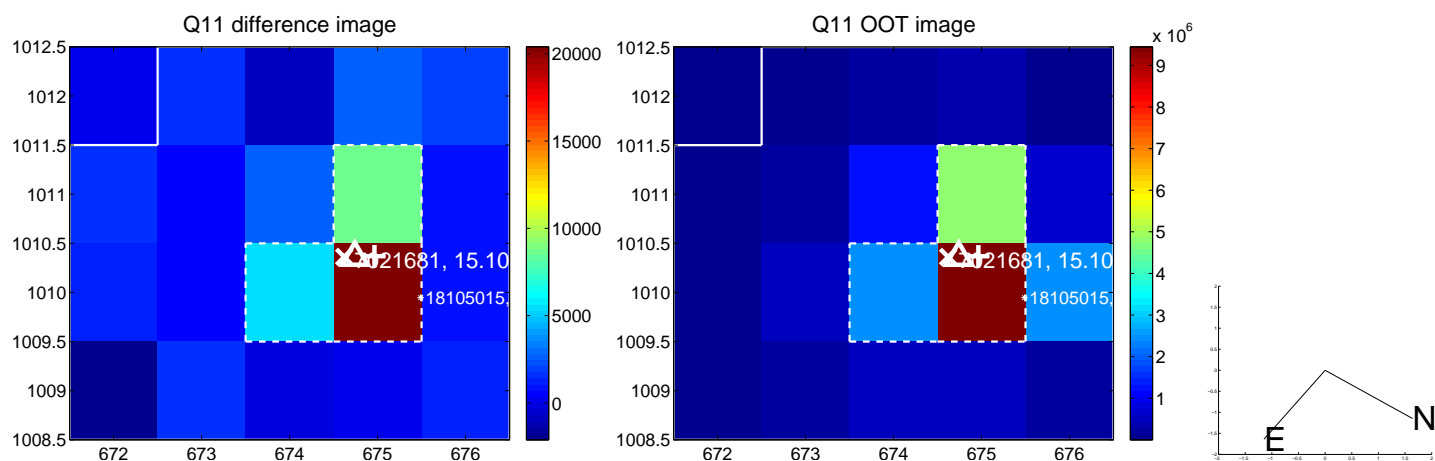
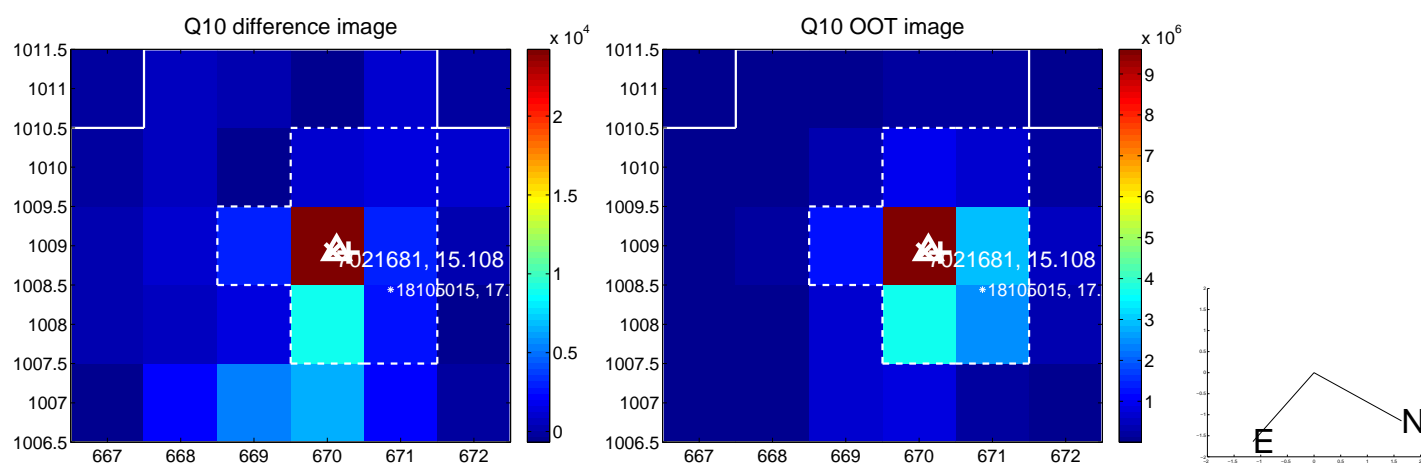
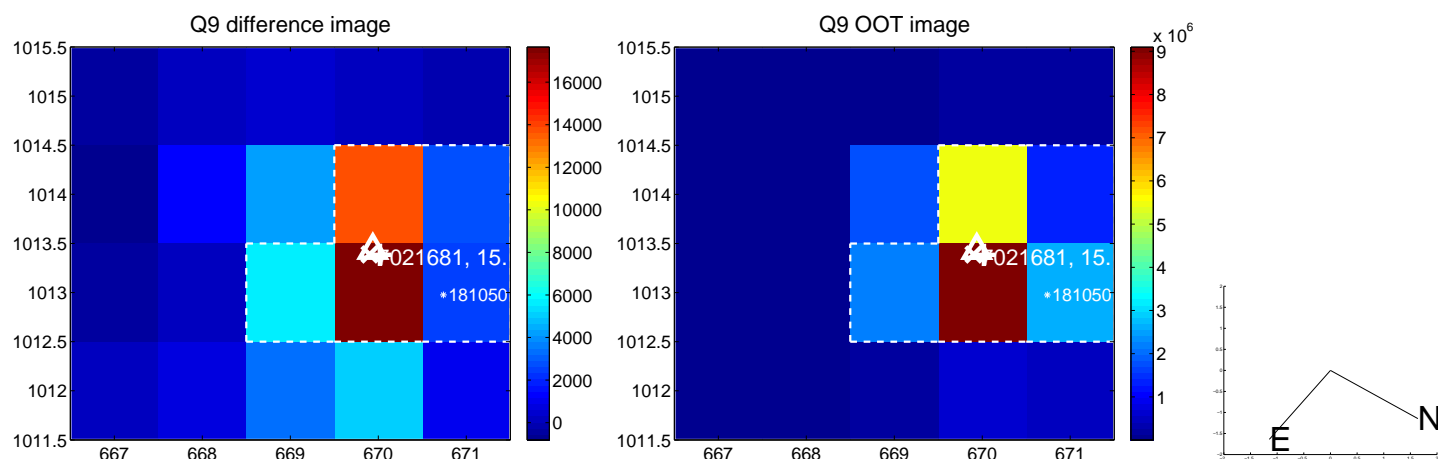


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

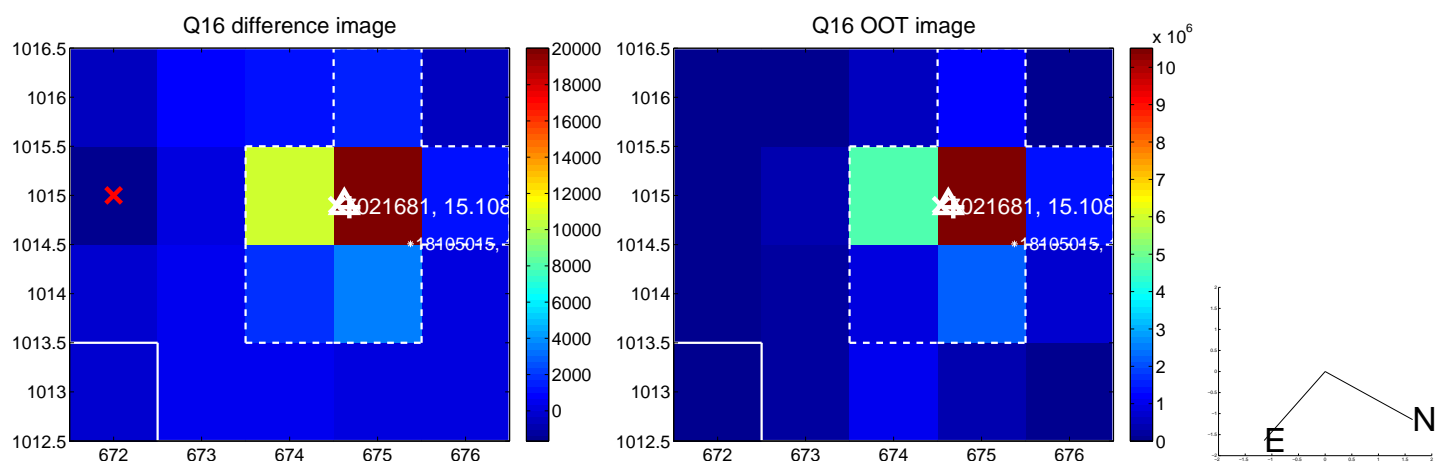
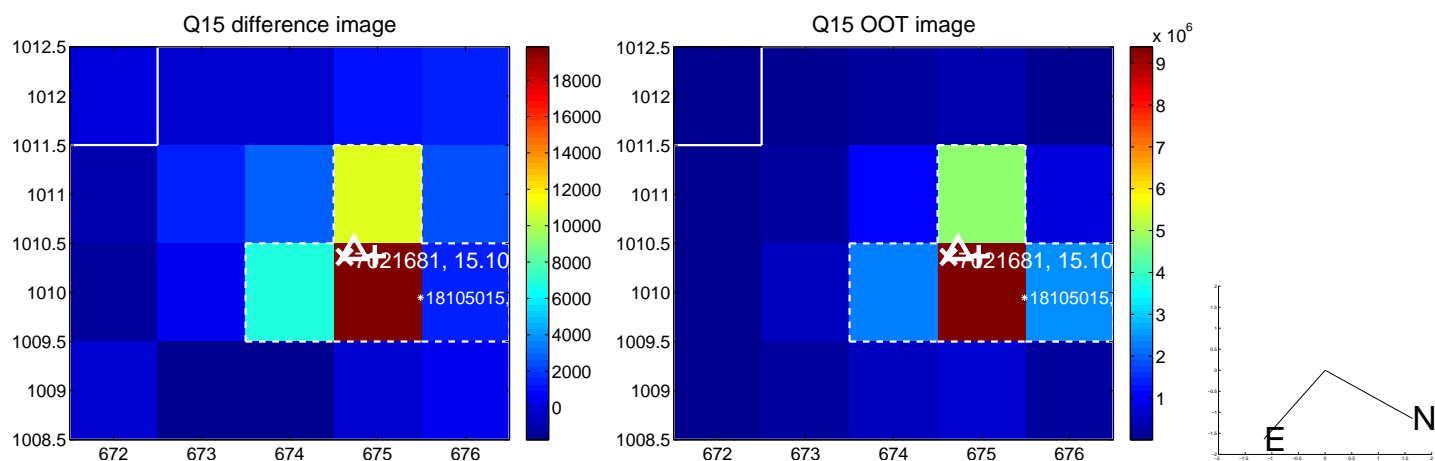
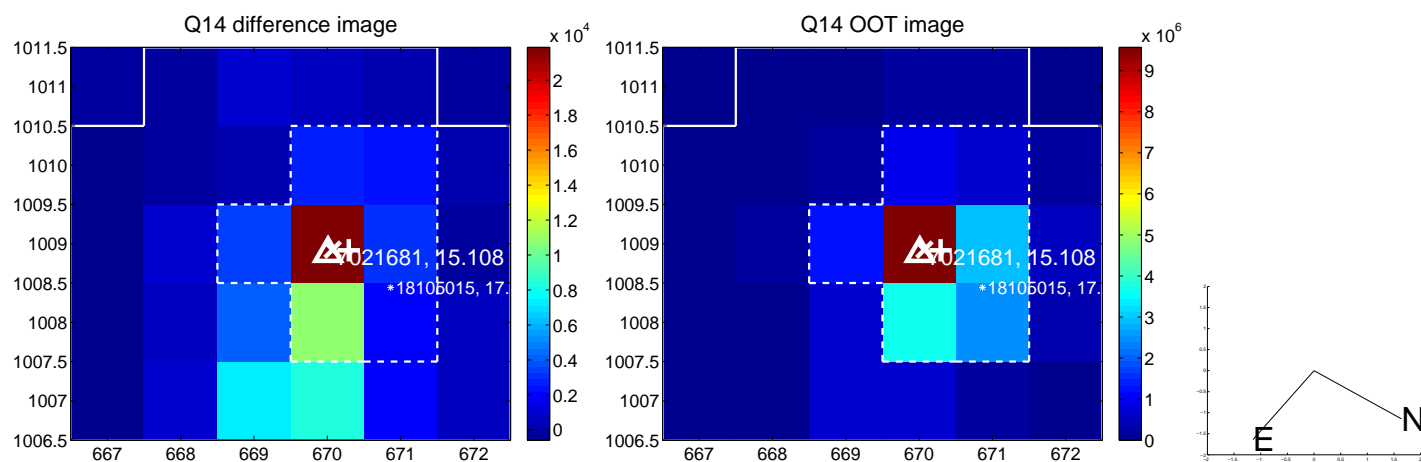
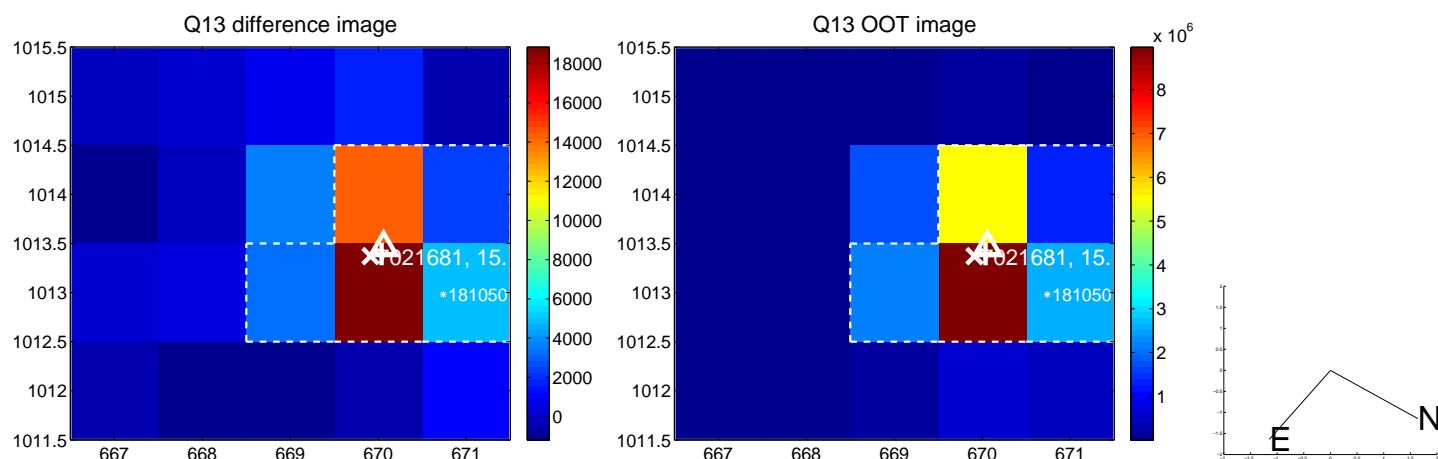




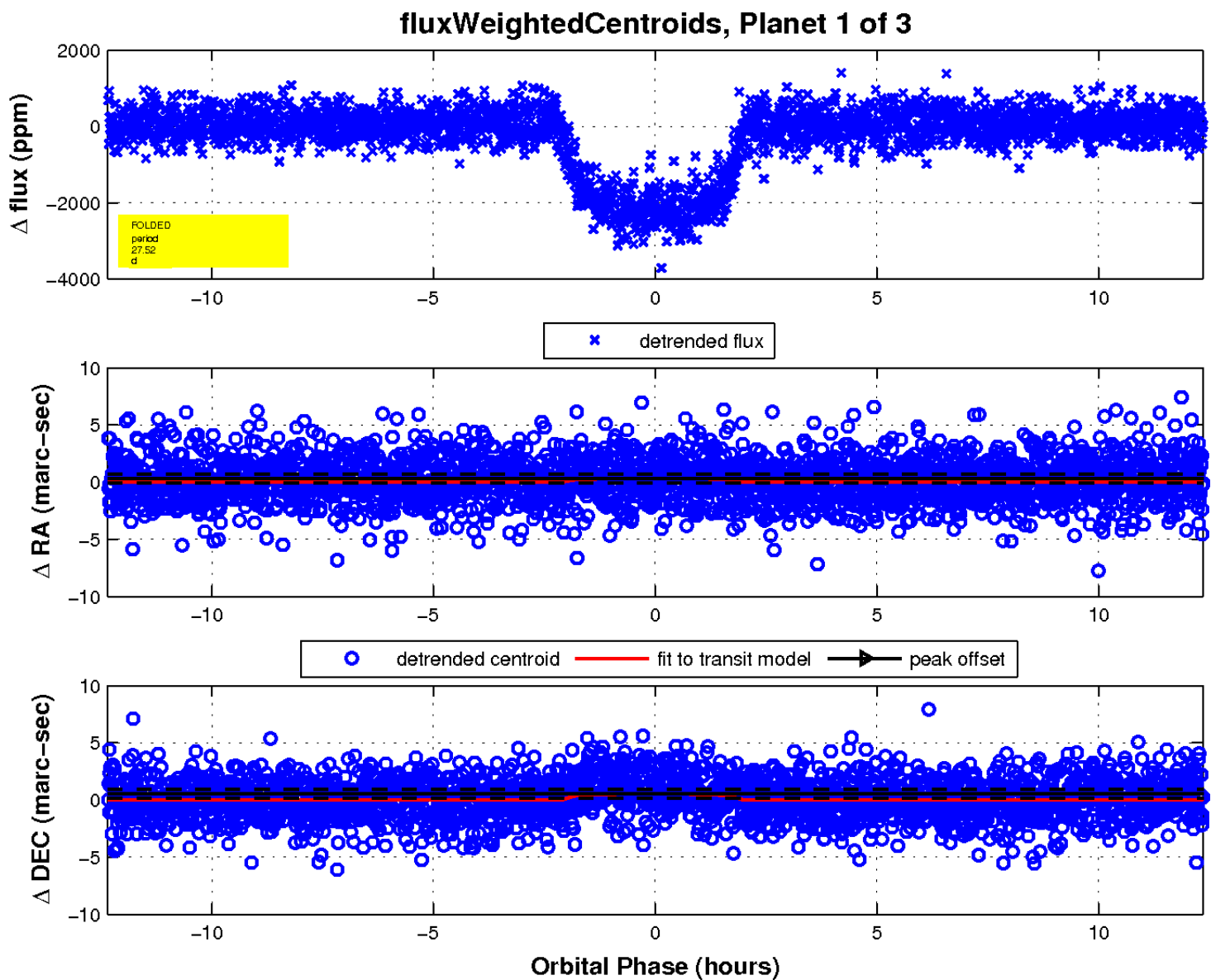
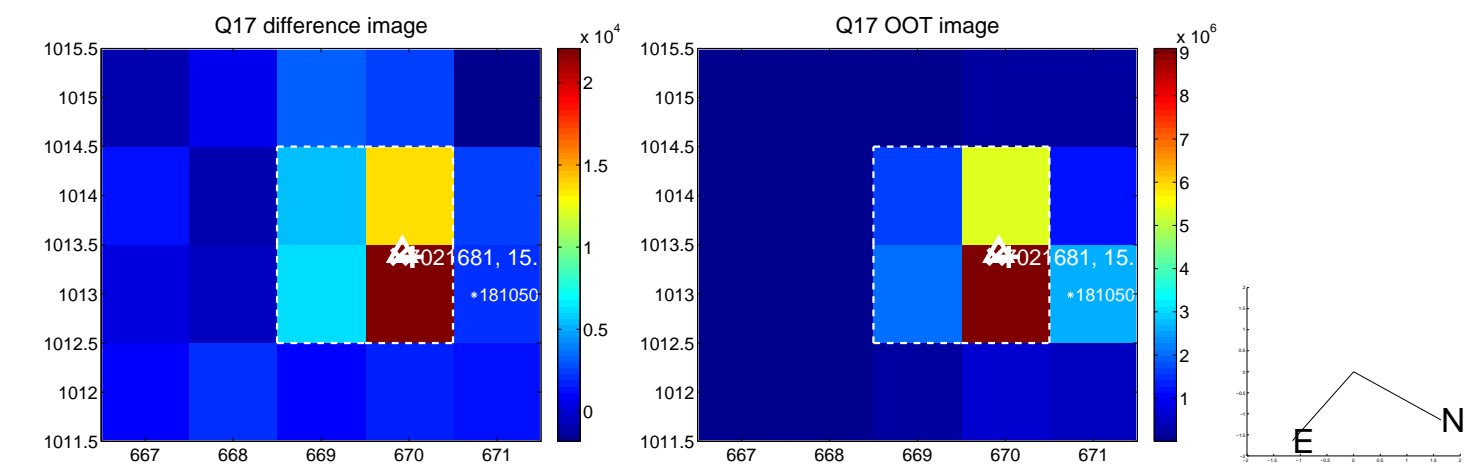
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

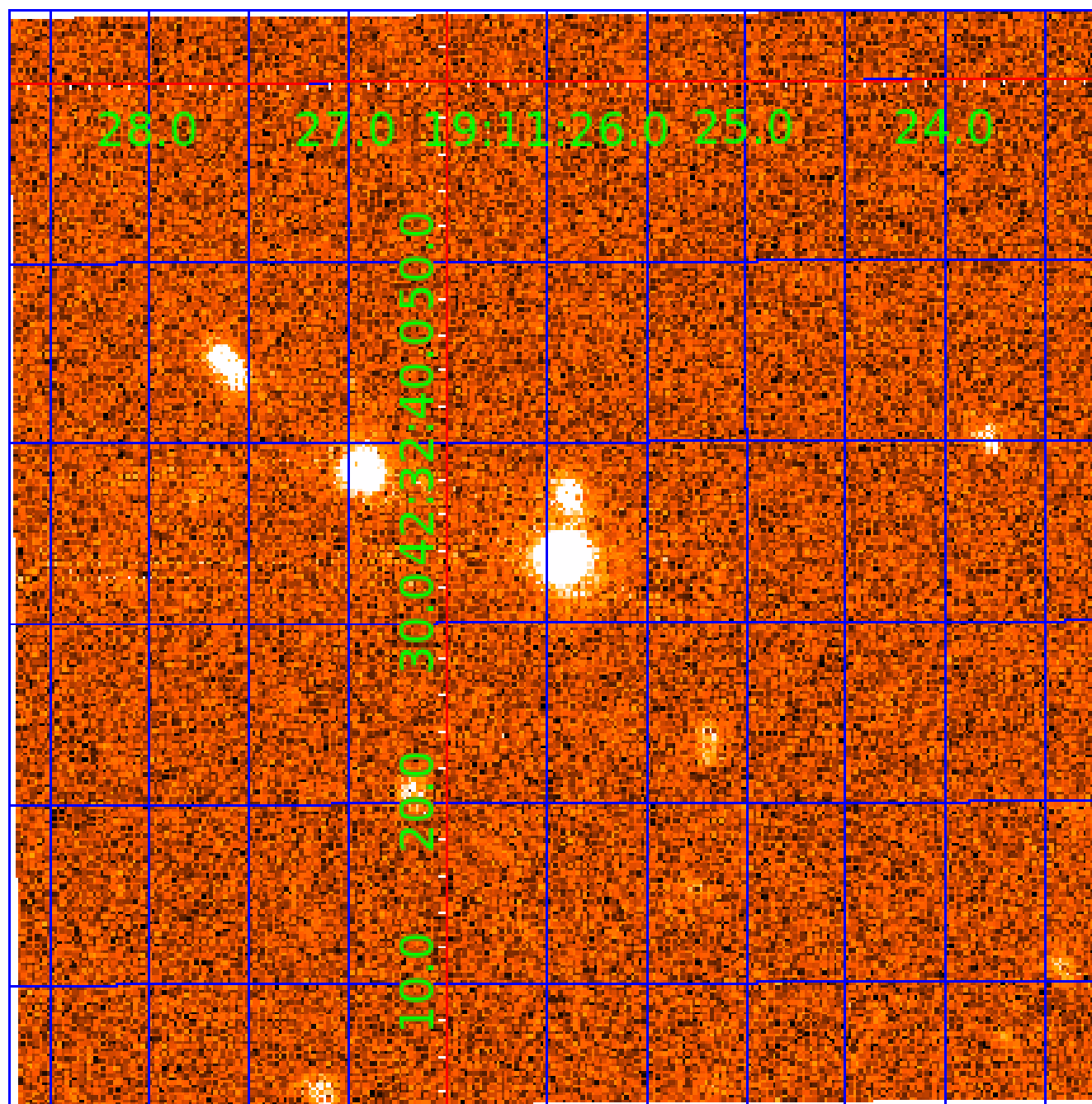


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007021681

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007021681-01	OBS	0255.01	27.521986	134.779581	2312.2	4.119	85.0	85.0	0.51	3780	2.55	2.29
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007021681-03	OBS	0255.03	7.733262	133.593654	124.3	3.007	7.3	8.0	0.51	3780	0.68	12.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007021681-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007021681-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007021681-03	OBS	FP	0.12	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

**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.

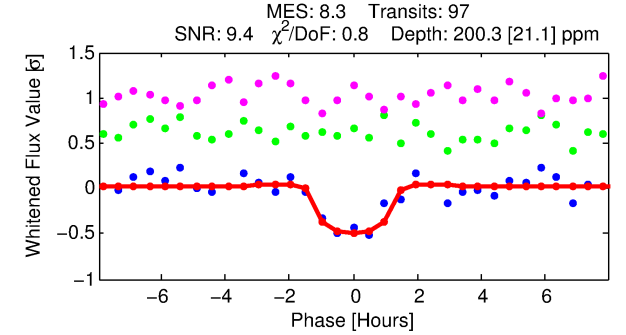
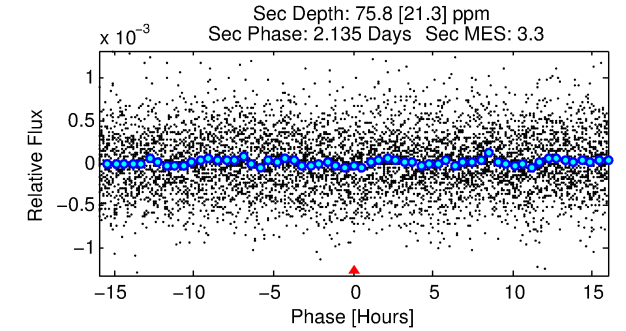
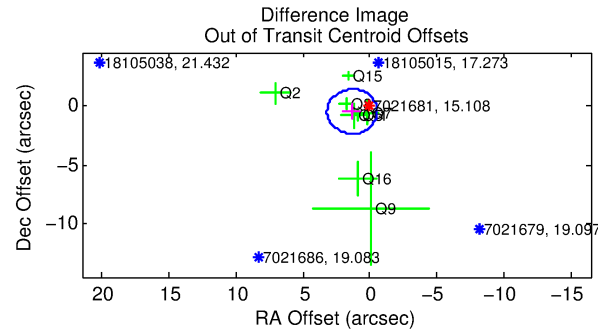
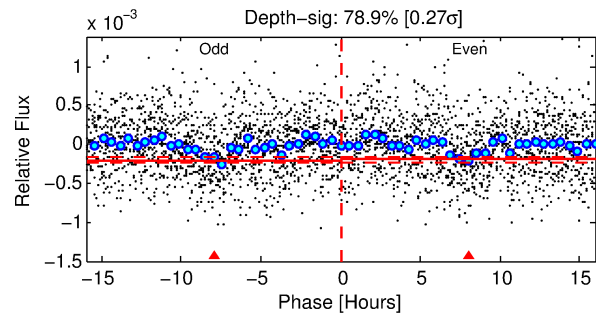
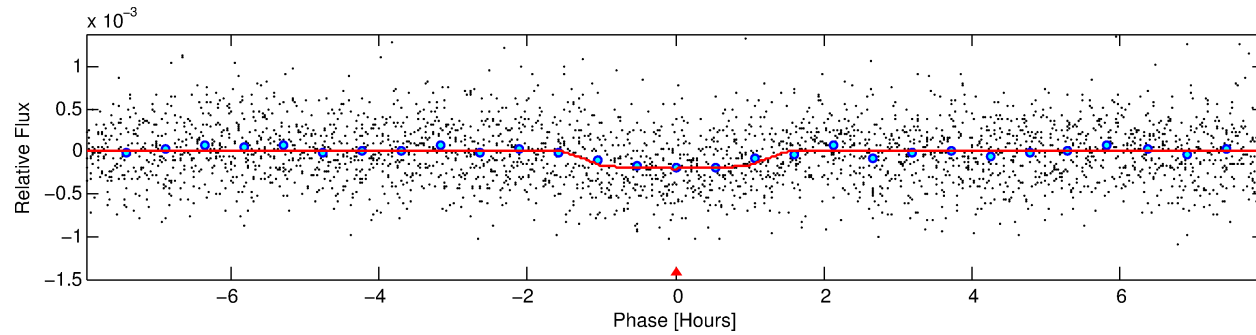
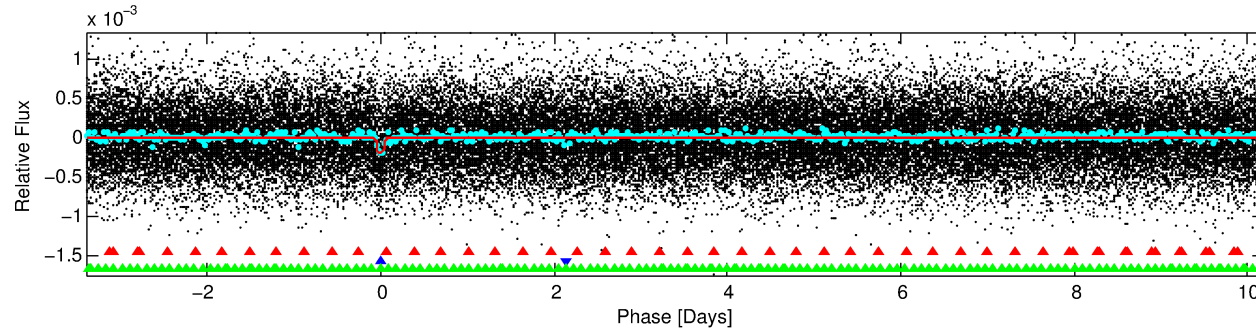
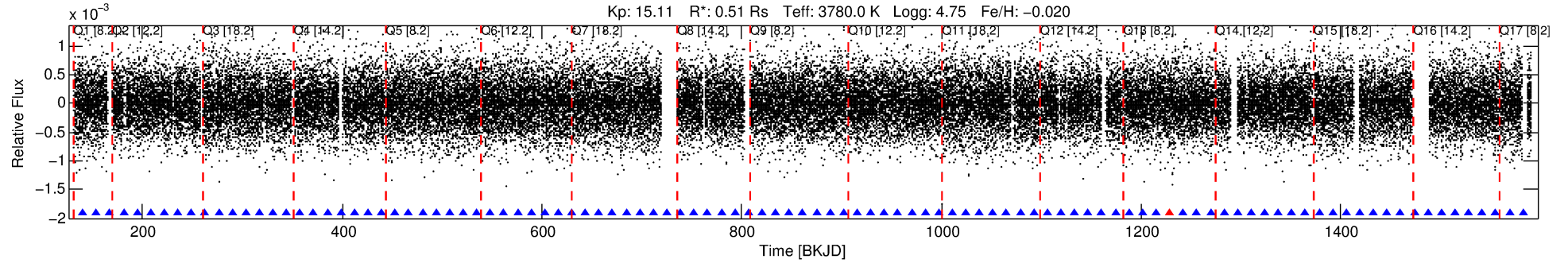
## Ephemeris Match Information For 007021681-02

No Significant Match Found

# DV One-Page Summary

KIC: 7021681 Candidate: 2 of 3 Period: 13.603 d

KOI: K00255.02 Corr: 0.967



## DV Fit Results:

Period = 13.60319 [0.00011] d  
Epoch = 140.3974 [0.0062] BKJD  
Rp/R\* = 0.0142 [0.0142]  
a/R\* = 26.20 [113.25]  
b = 0.76 [2.41]  
Seff = 5.86 [0.72]  
Teq = 397 [12] K  
Rp = 0.79 [0.79] Re  
a = 0.0903 [0.0058] AU  
Ag = 546.42 [1104.65] [0.49 $\sigma$ ]  
Teffp = 2965 [1499] K [1.71 $\sigma$ ]

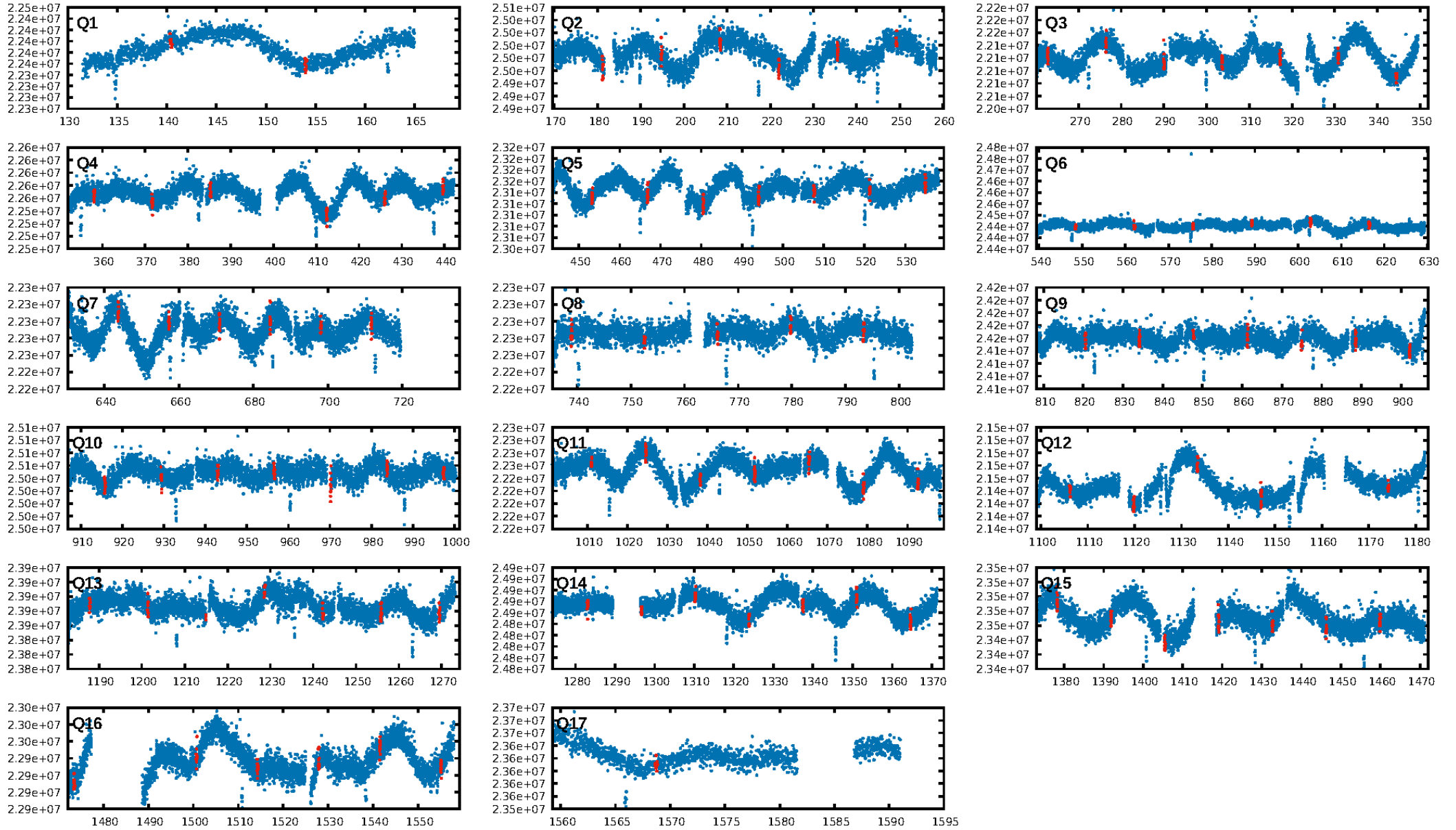
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.10 $\sigma$ ]  
LongPeriod-sig: 100.0% [68.15 $\sigma$ ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.16e-16  
RollingBand-fgt: 0.99 [93/94]  
GhostDiagnostic-chr: 2.438  
Centroid-sig: 3.6%  
Centroid-so: 2.622 arcsec [1.84 $\sigma$ ]  
OotOffset-rm: 1.418 arcsec [2.26 $\sigma$ ]  
KicOffset-rm: 0.629 arcsec [0.71 $\sigma$ ]  
OotOffset-st: 1/3/2/2 [8]  
KicOffset-st: 1/3/2/2 [8]  
DiffImageQuality-fgm: 0.62 [5/8]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:15:35 Z

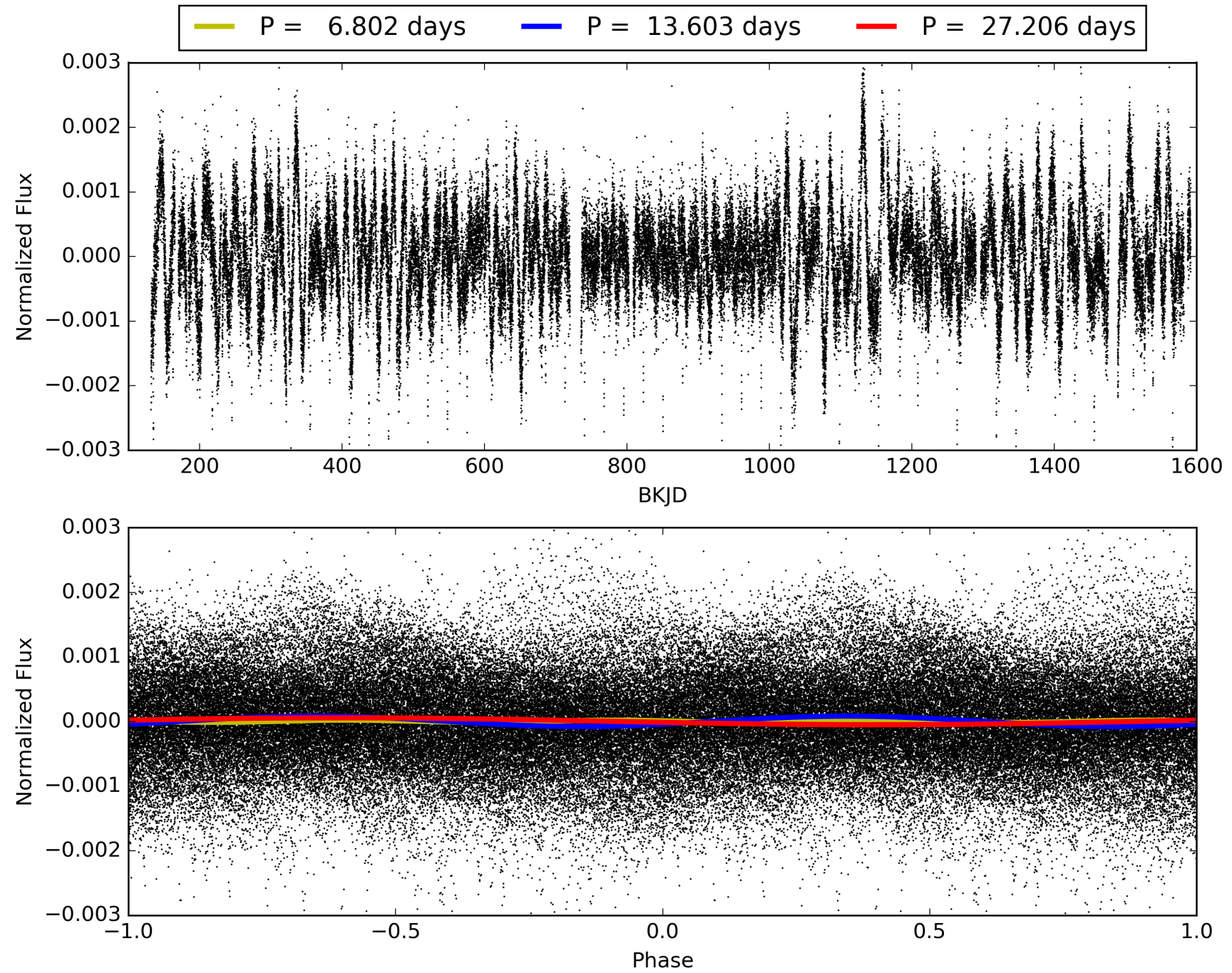
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007021681-02, PDC Light Curves





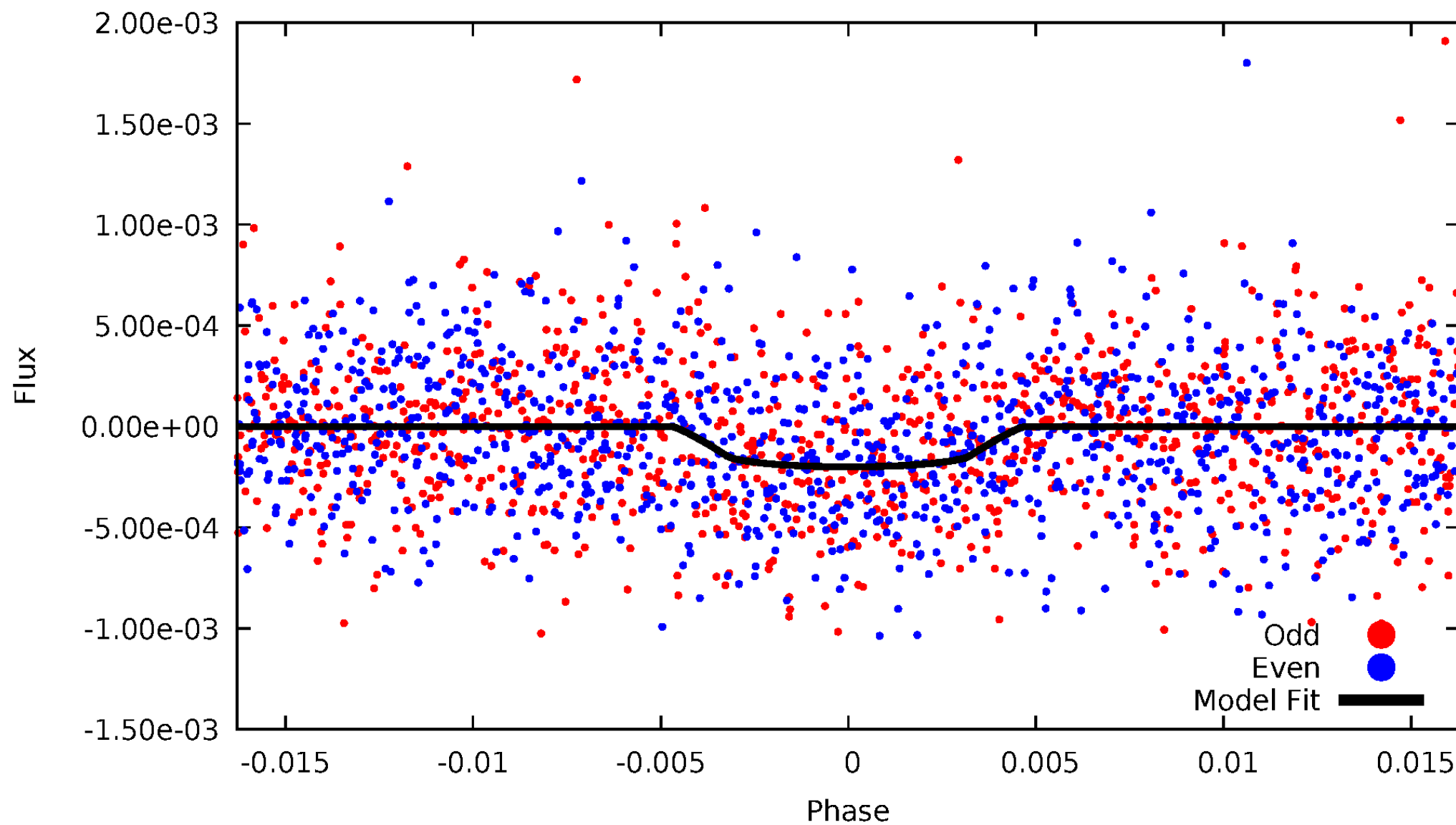
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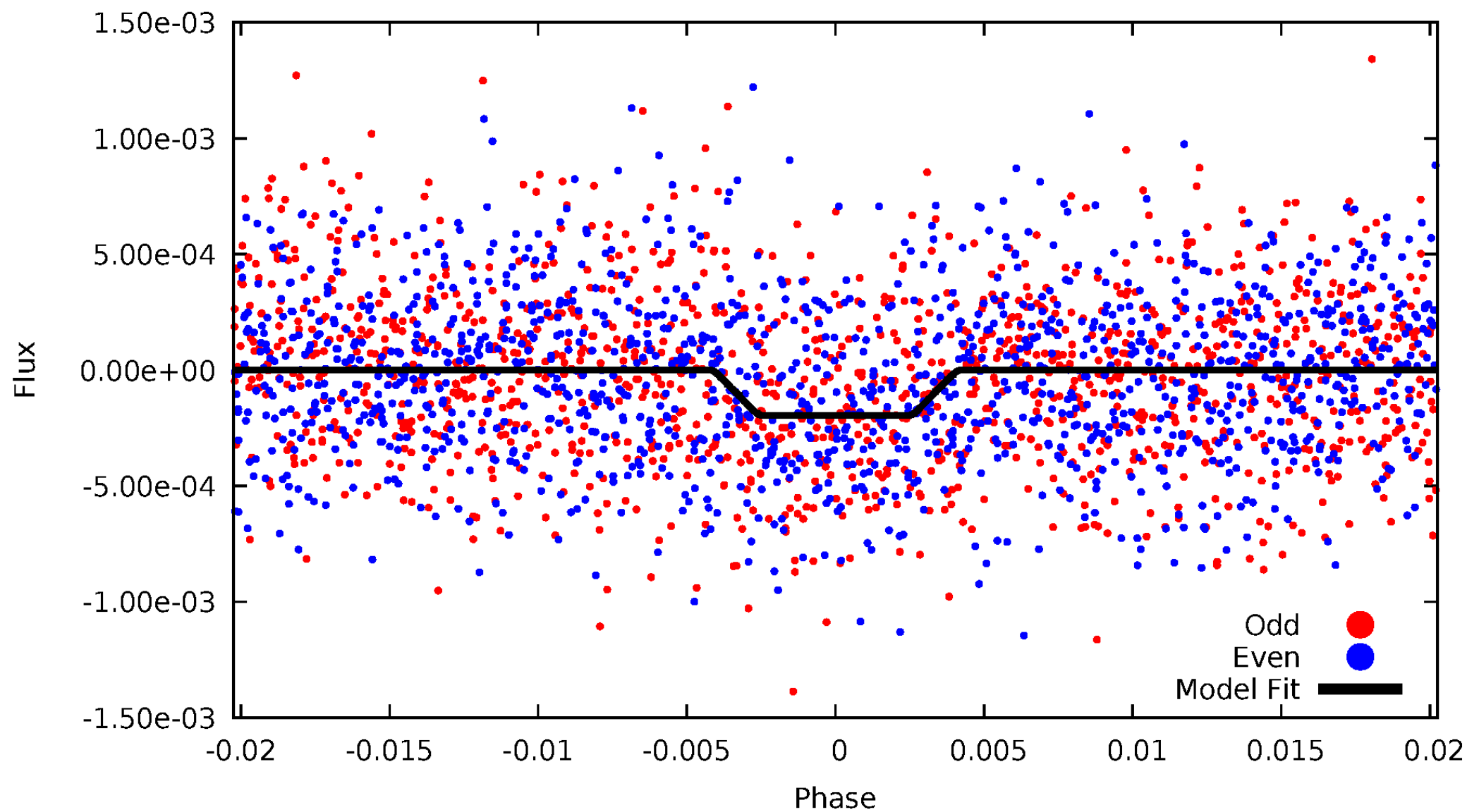
# DV Odd/Even

TCE 007021681-02



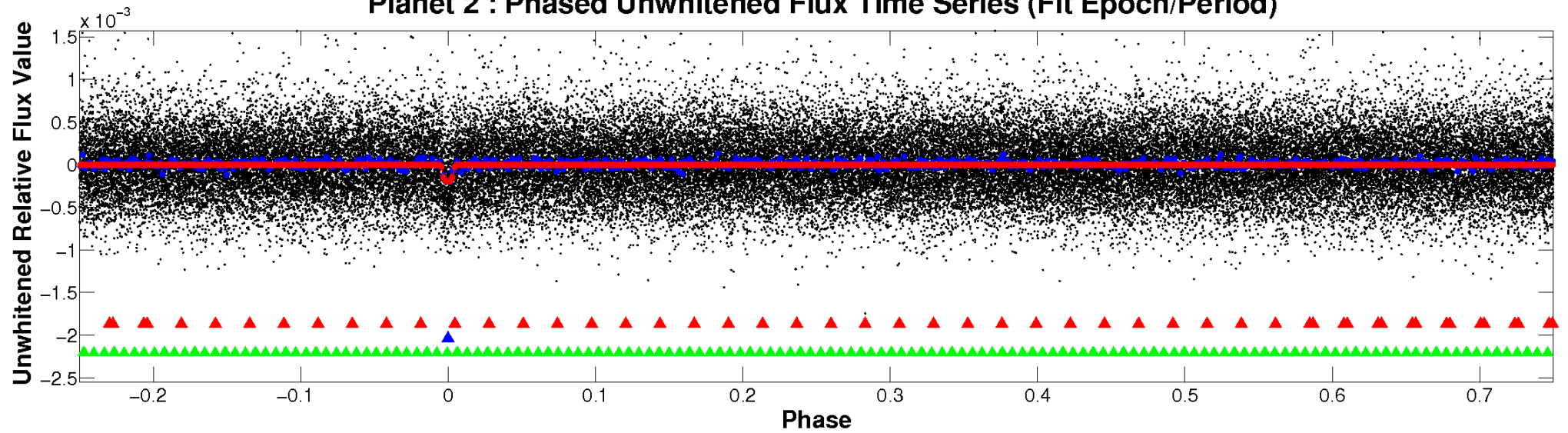
# ALT Odd/Even

TCE 007021681-02

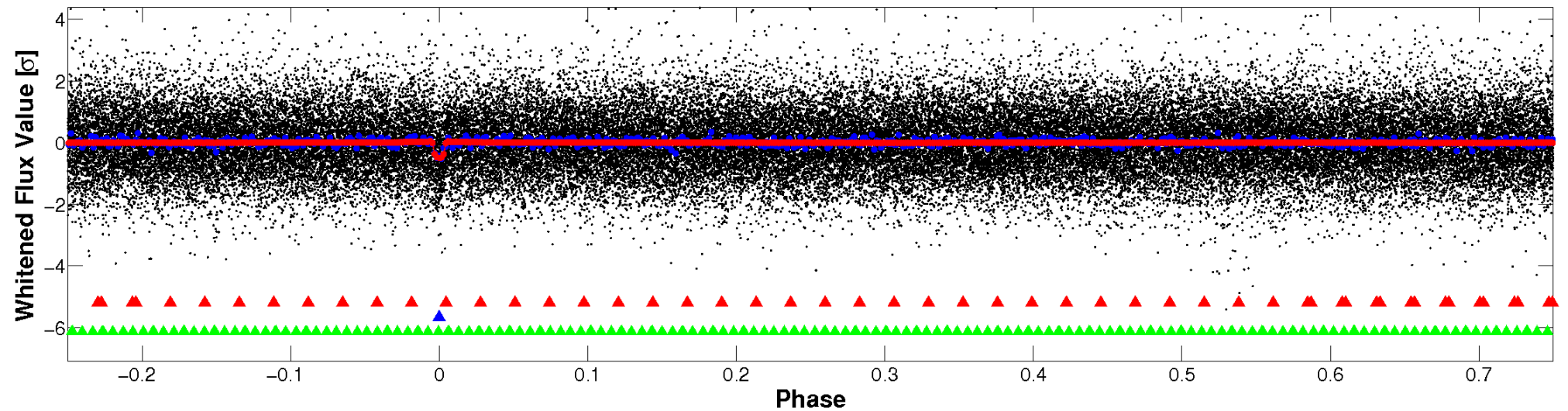


# Non-Whitened Vs. Whitened Light Curve

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

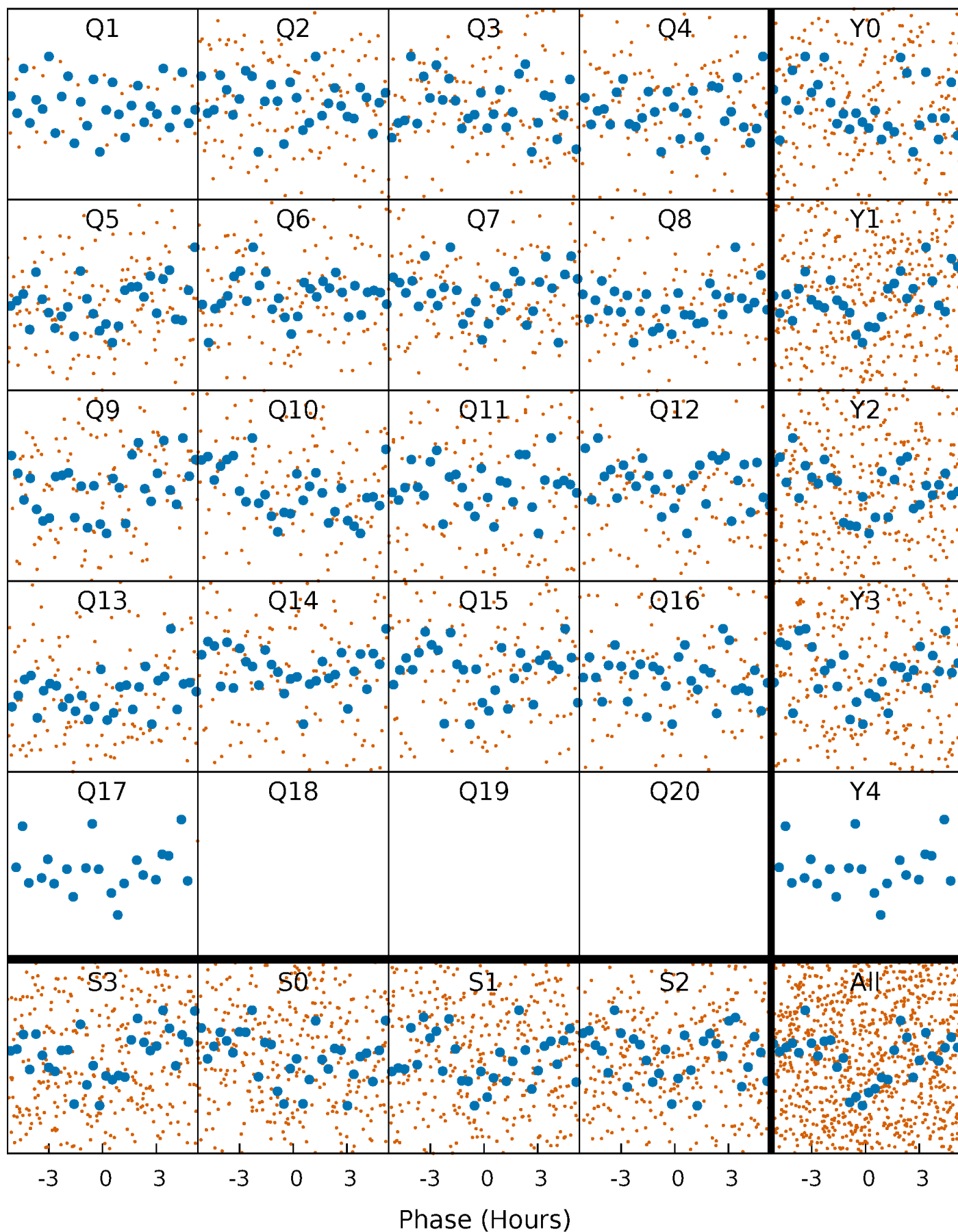


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



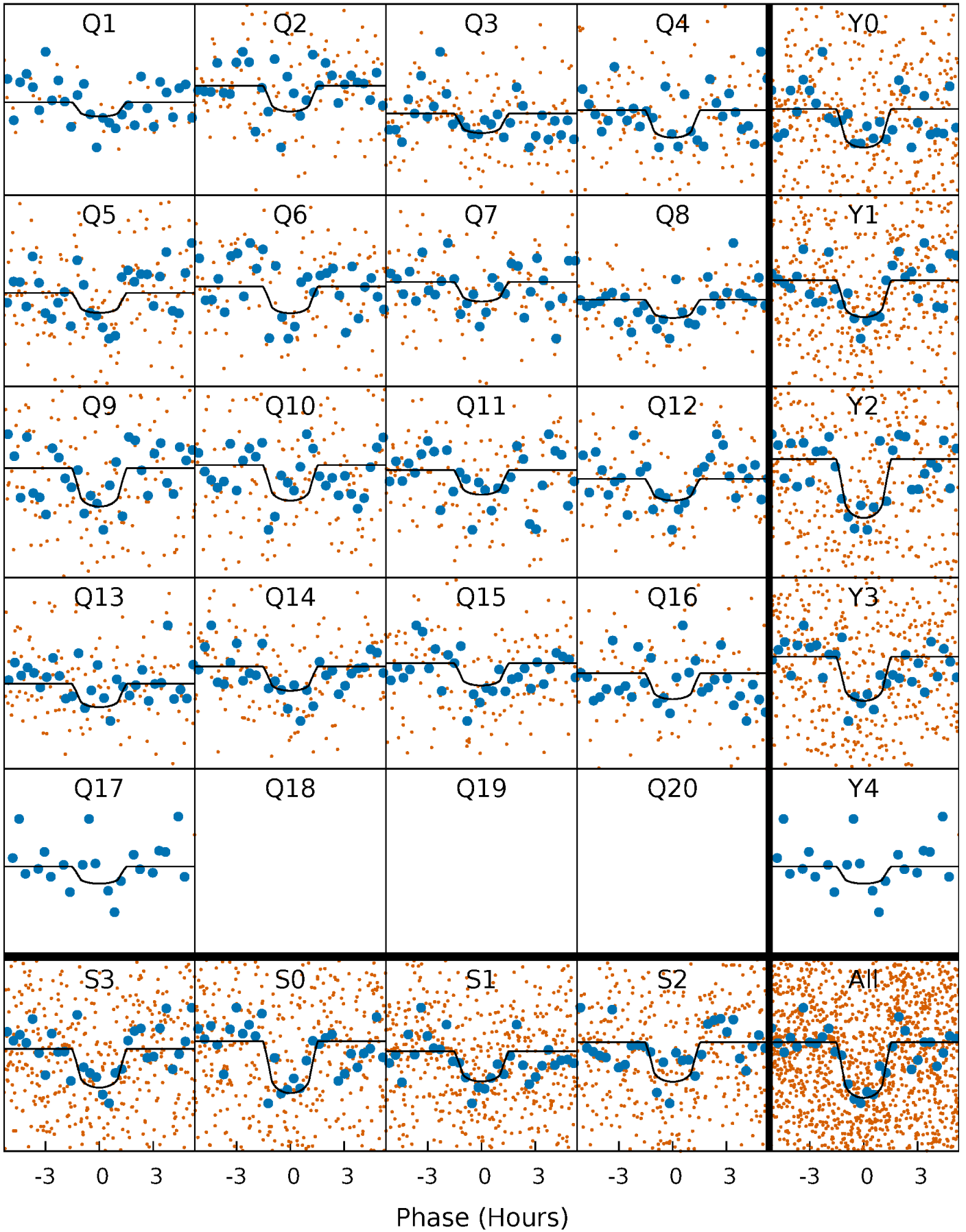
# PDC Quarter-Phased Transit Curves

TCE 007021681-02 P= 13.603189 Days  $T_0=140.397351$  (BKJD)



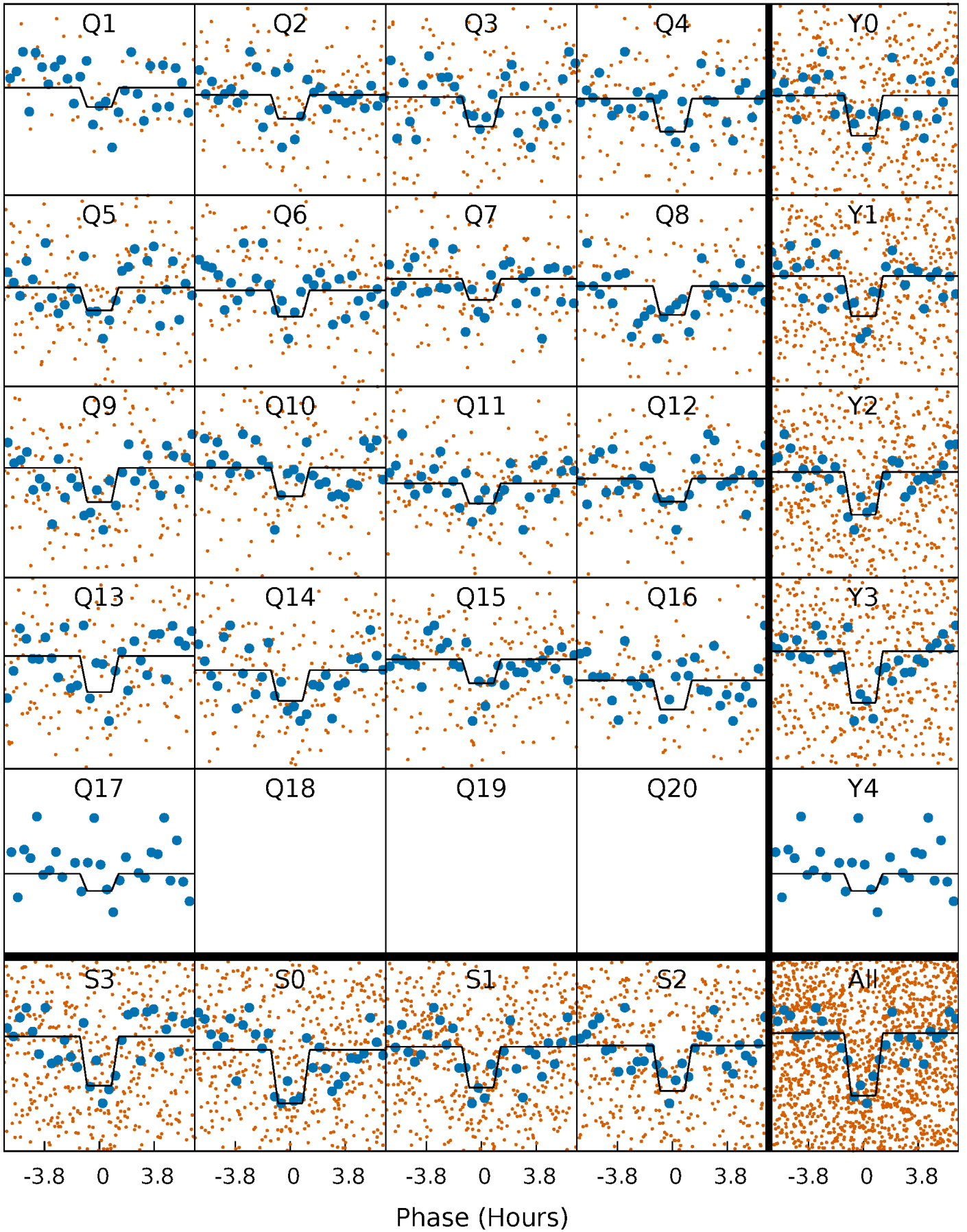
# DV Quarter-Phased Transit Curves

TCE 007021681-02 P= 13.603189 Days  $T_0=140.397351$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007021681-02 P= 13.603078 Days  $T_0=140.401977$  (BKJD)

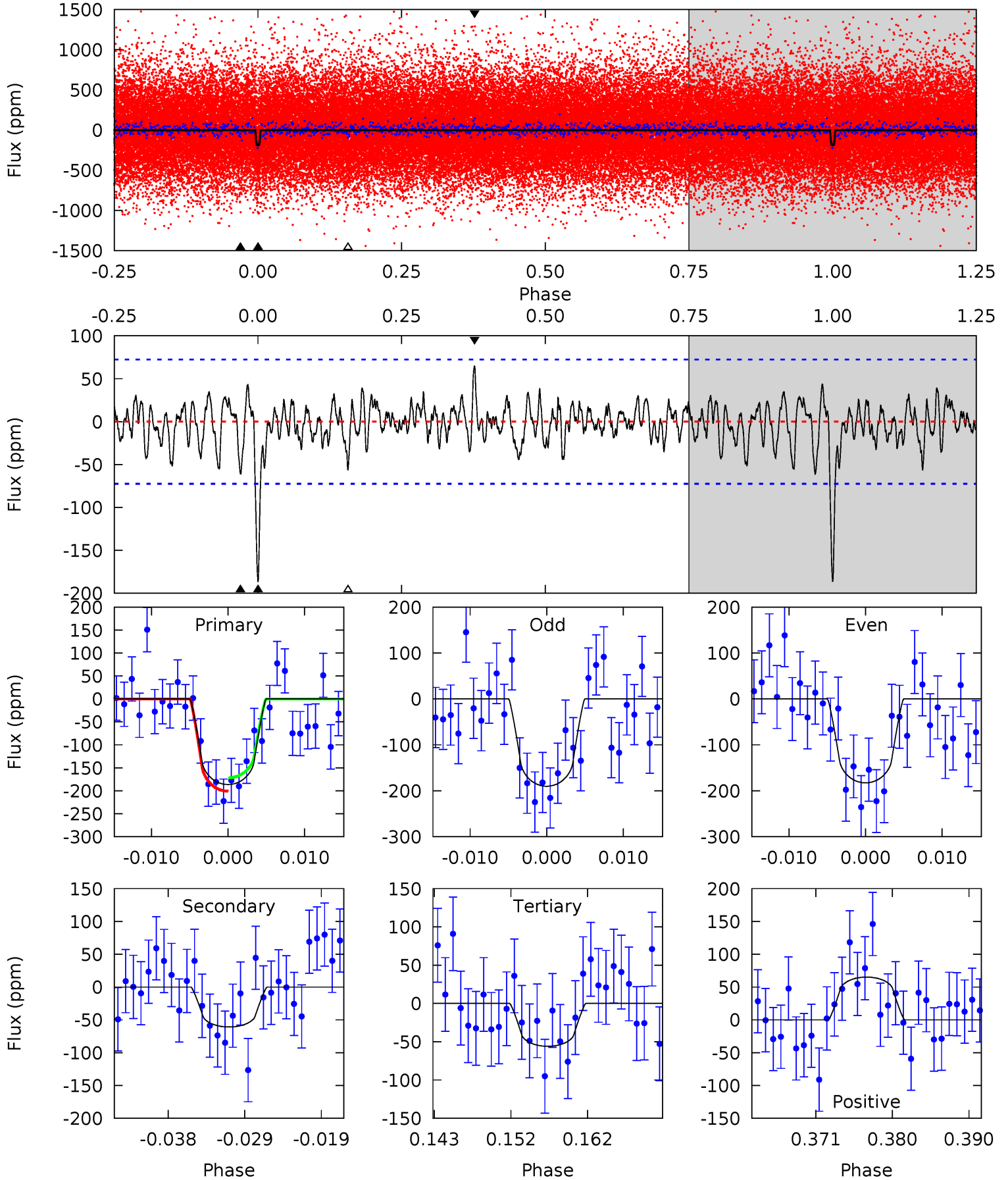




# DV Model-Shift Uniqueness Test

007021681-02, P = 13.603189 Days, E = 126.794162 Days

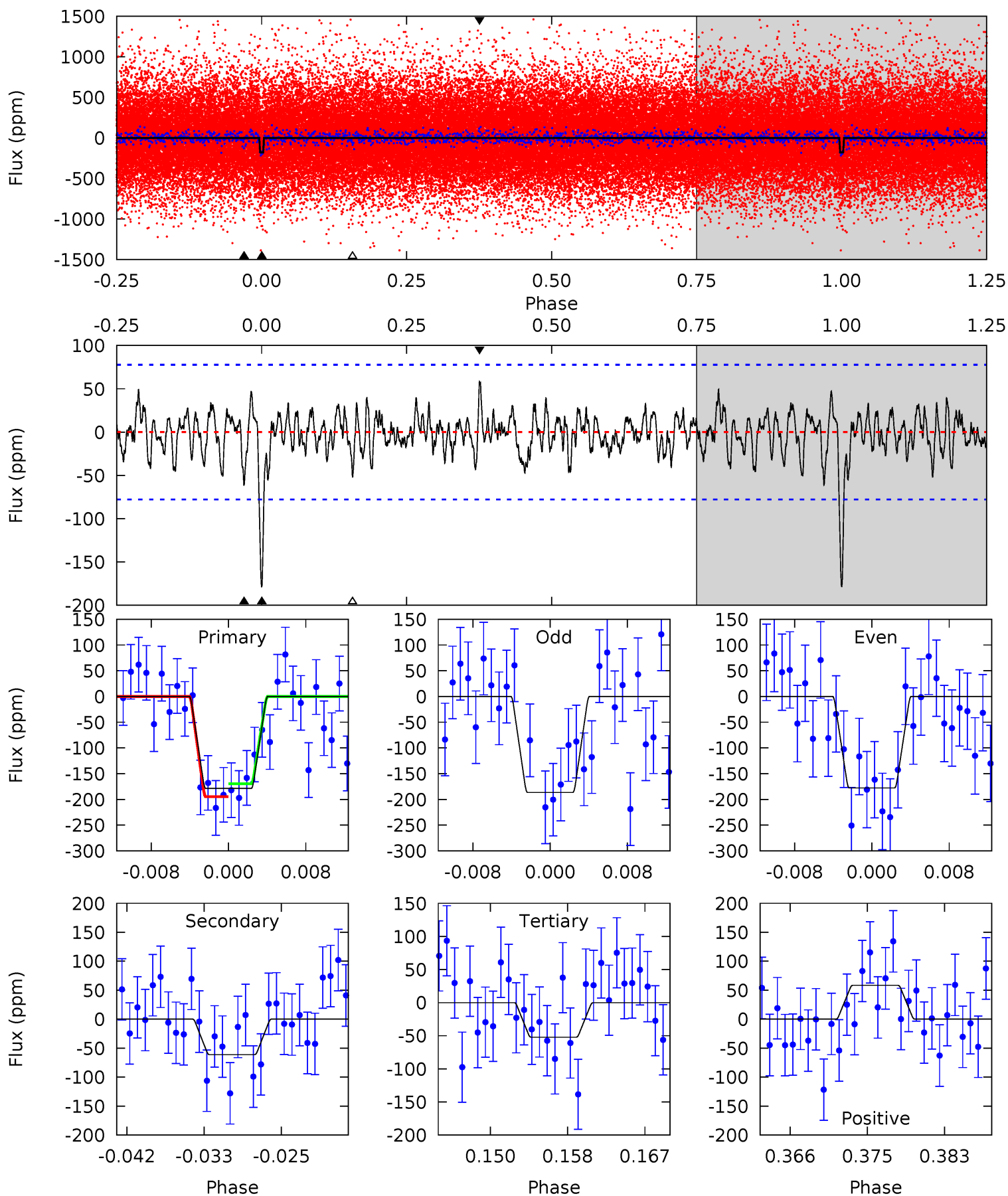
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	4.23	3.89	4.53	5.04	2.59	1.28	9.07	8.43	0.34	-0.30	0.26	0.99	0.26	1.01



# Alt Model-Shift Uniqueness Test

007021681-02, P = 13.603078 Days, E = 126.798899 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
11.6	3.99	3.40	3.81	5.06	2.64	1.21	8.25	7.83	0.59	0.18	0.28	0.97	0.25	0.83





### Stellar Parameters For KIC 007021681

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3780^{+76}_{-83}$	$4.746^{+0.042}_{-0.031}$	$-0.020^{+0.150}_{-0.150}$	$0.511^{+0.036}_{-0.043}$	$0.531^{+0.034}_{-0.042}$	$5.600^{+1.082}_{-0.675}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-8%	+6%/-8%	+19%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 007021681-02 / KOI 0255.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-61 \pm 14$	$0.92^{+0.69}_{-0.59}$	$554^{+12}_{-15}$	$2995^{+1139}_{-441}$	$329^{+1998}_{-232}$
Alt.	$-61 \pm 15$	$0.90^{+0.70}_{-0.56}$	$553^{+14}_{-14}$	$3011^{+1091}_{-434}$	$329^{+2039}_{-228}$

$T_{max}$  = 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

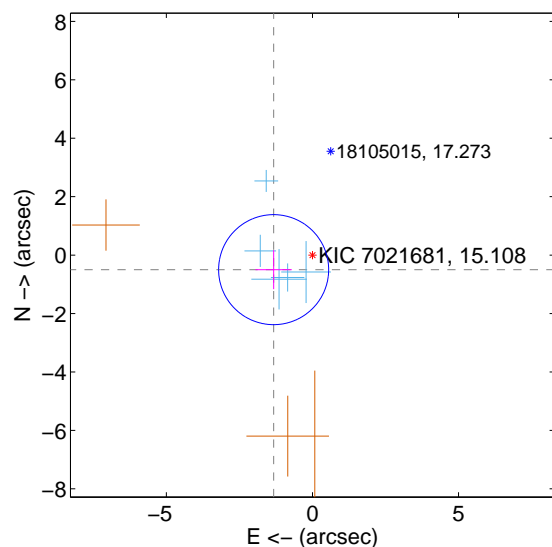
Supplemental centroid analysis for 007021681-02. Kepler magnitude: 15.11. Transit SNR 9.44

There are 5 quarters with good PRF difference image offsets

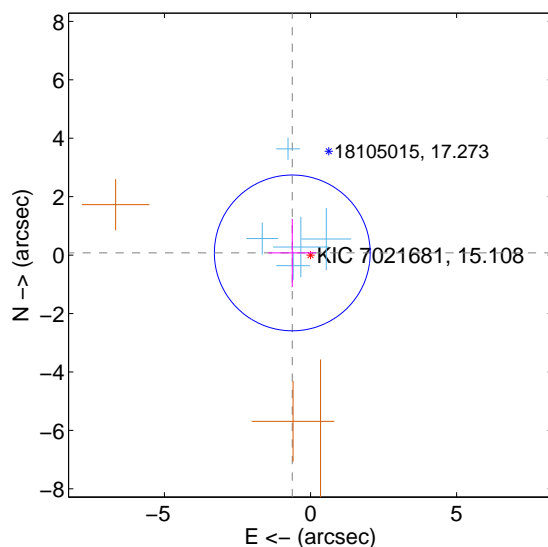
The direct PRF centroid is offset from the target star catalog position by about 0.56 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.418 \pm 0.628$	2.26	$1.328 \pm 0.622$	$-0.498 \pm 0.667$
PRF-fit source offset from KIC position	$0.629 \pm 0.889$	0.71	$0.625 \pm 0.820$	$0.075 \pm 1.166$
photometric centroid source offset	$2.62 \pm 1.43$	1.84	$-2.60 \pm 1.43$	$0.33 \pm 1.27$

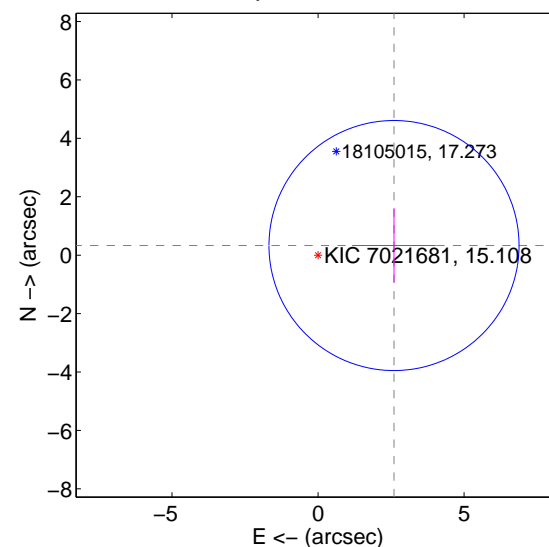
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

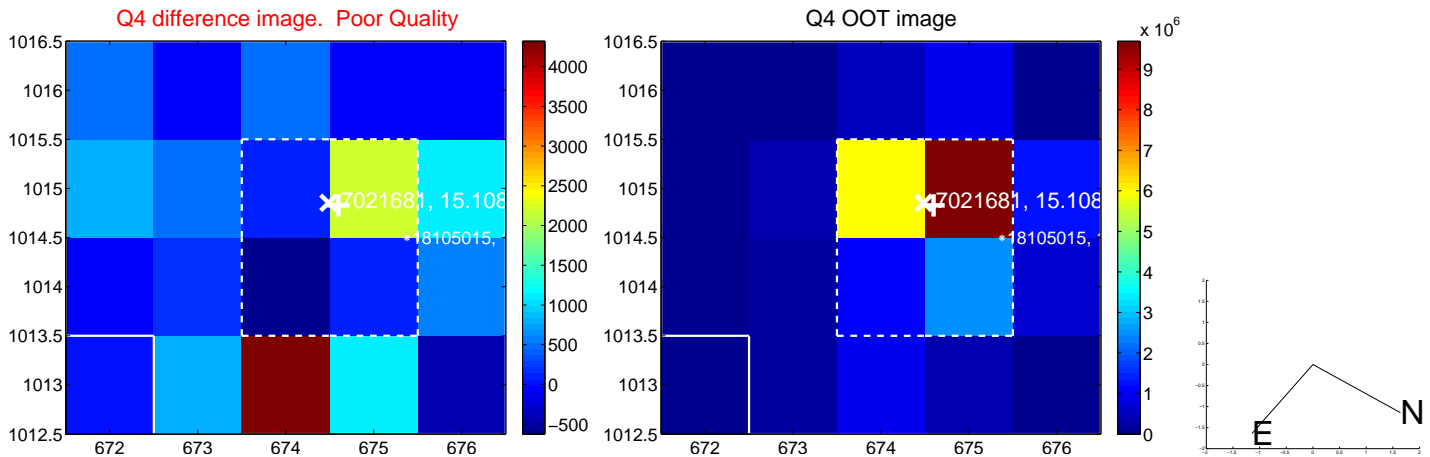
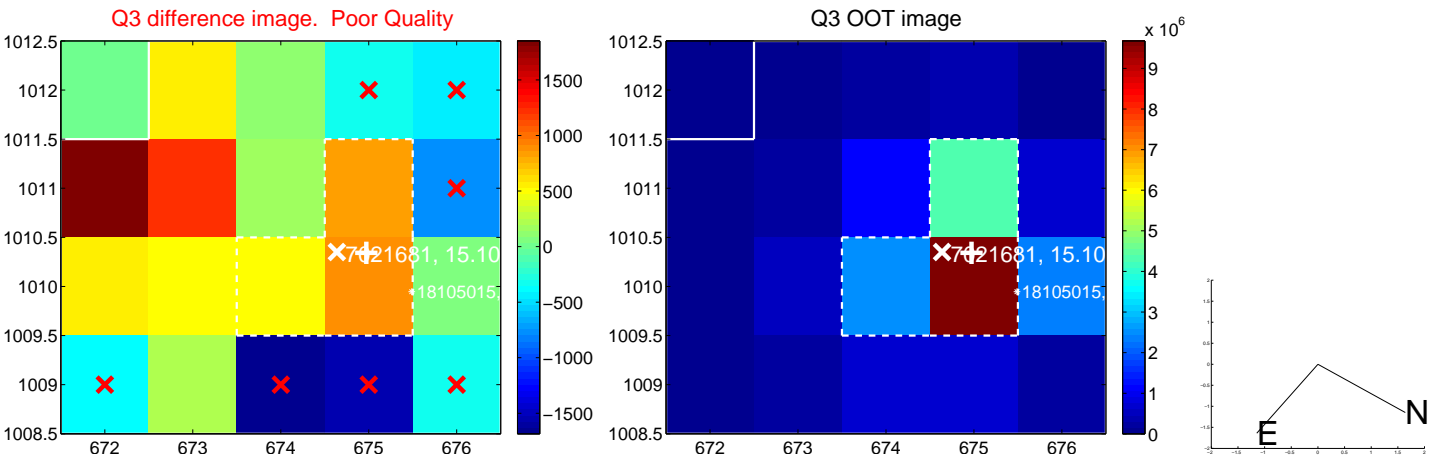
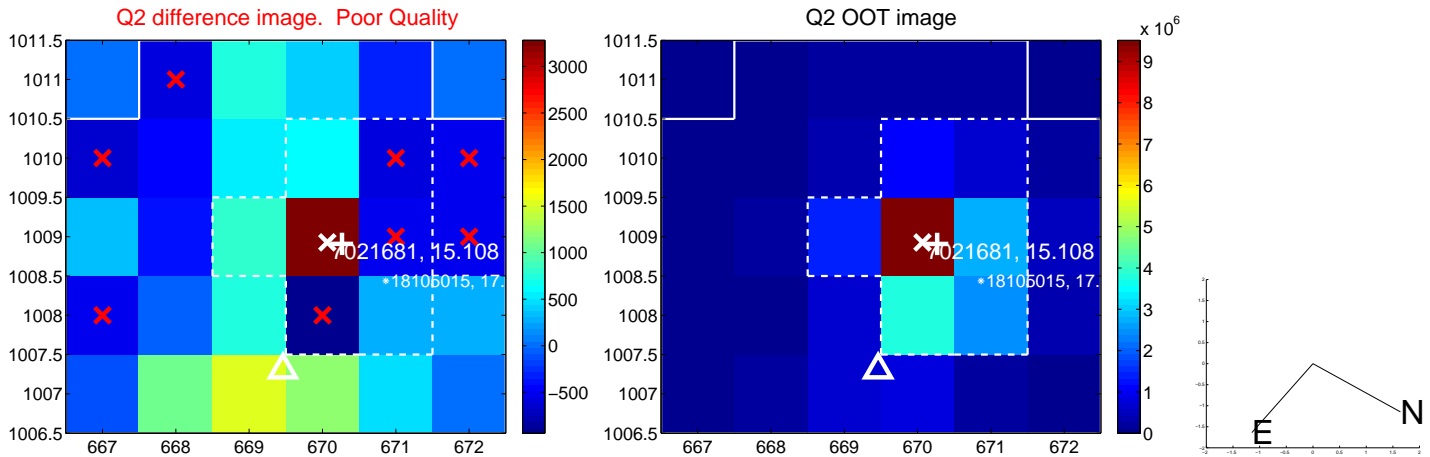
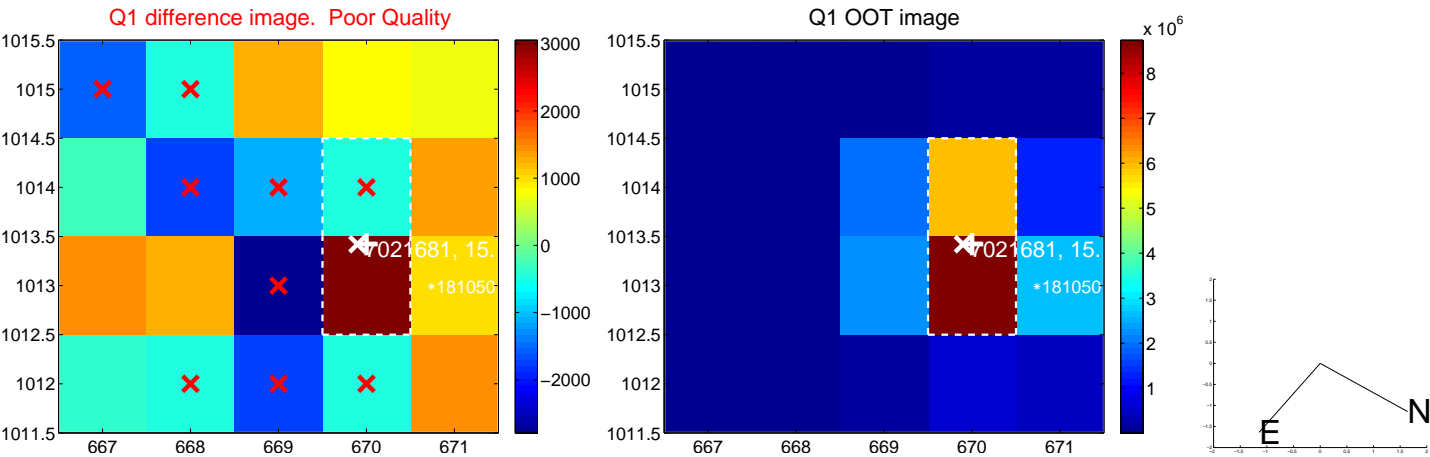


offset from photometric centroids

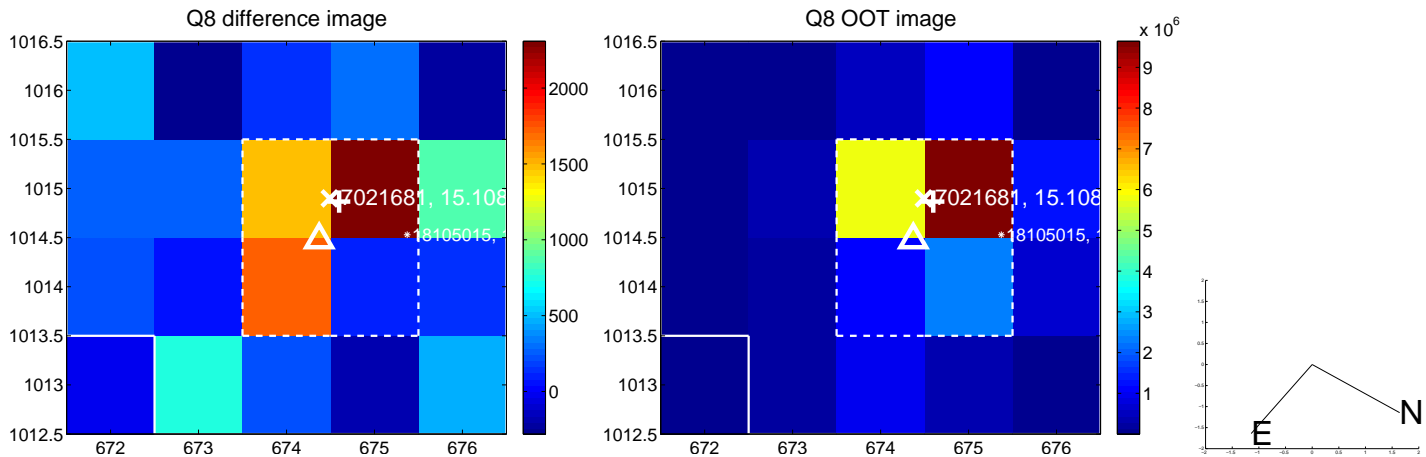
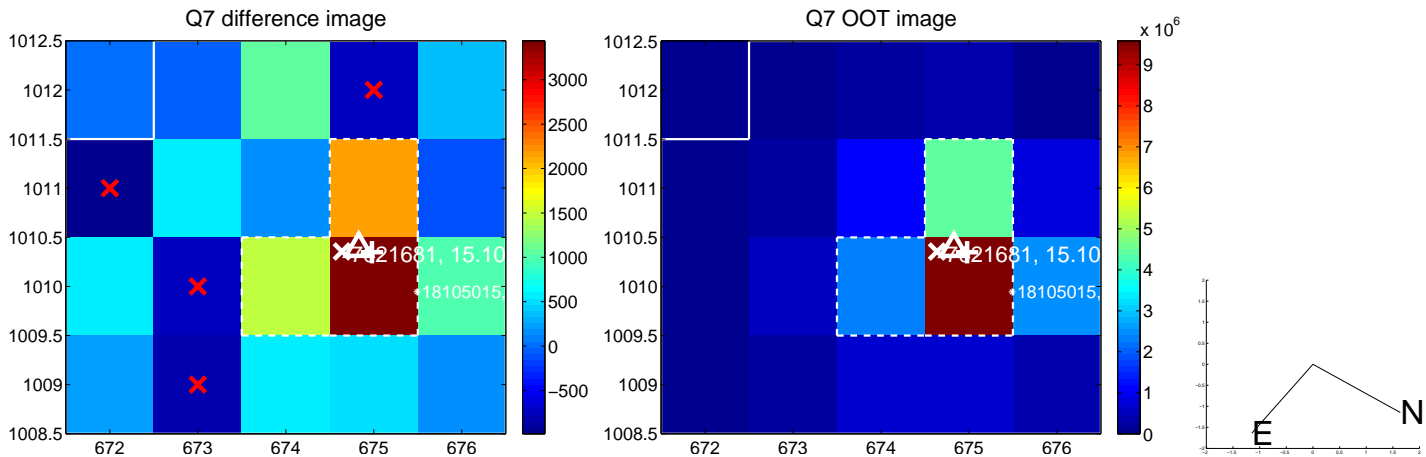
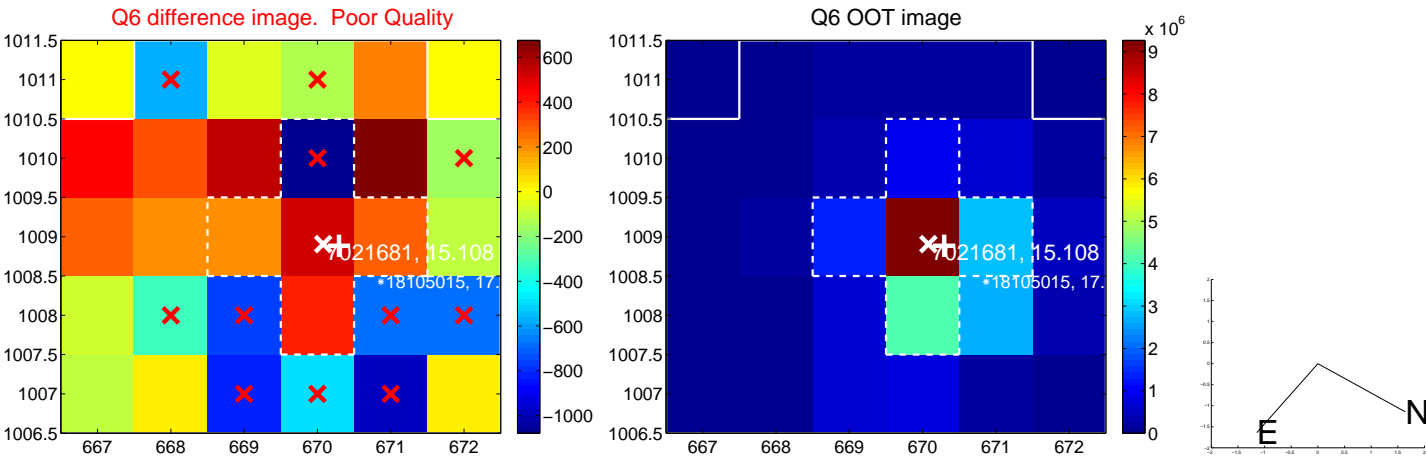
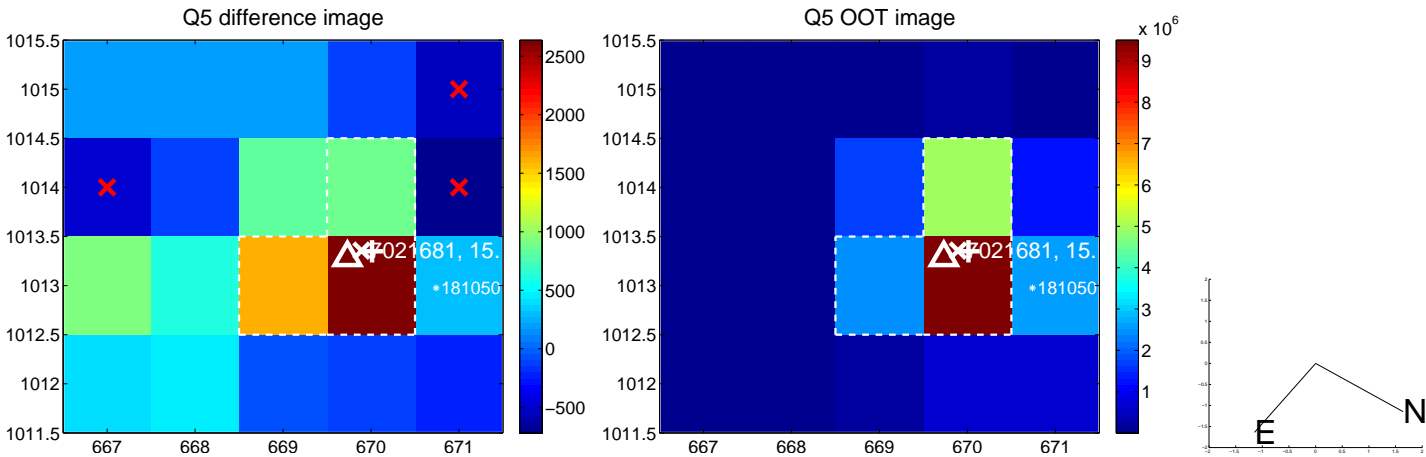


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

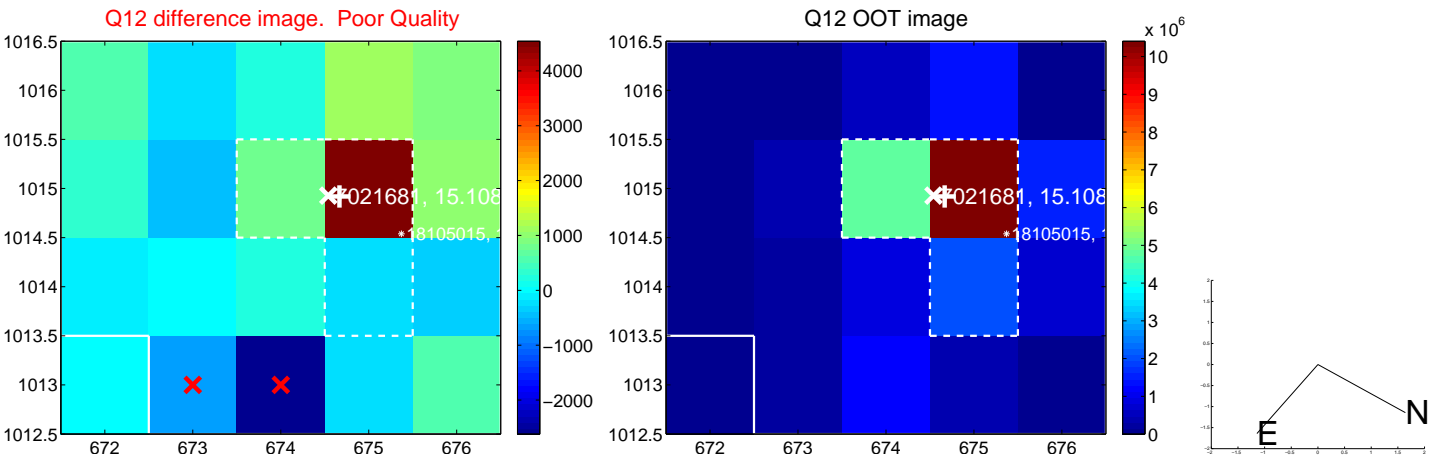
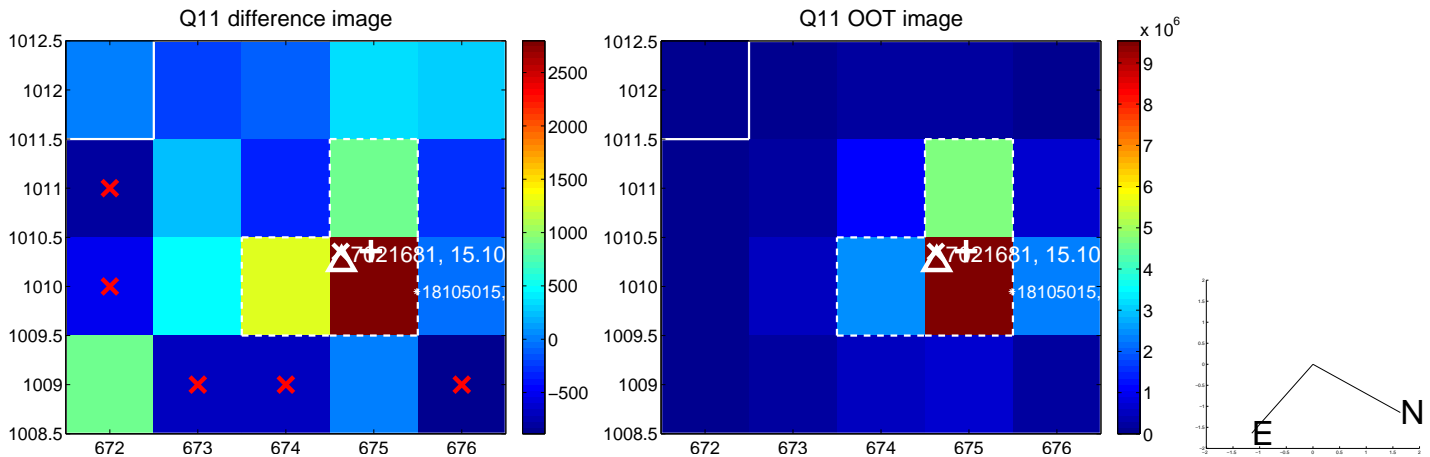
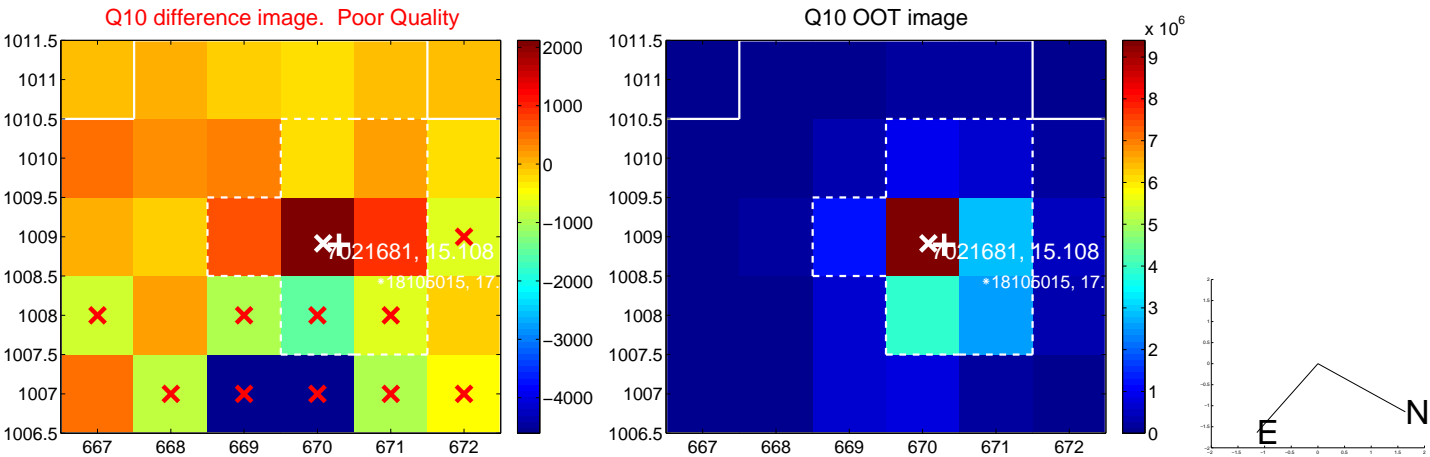
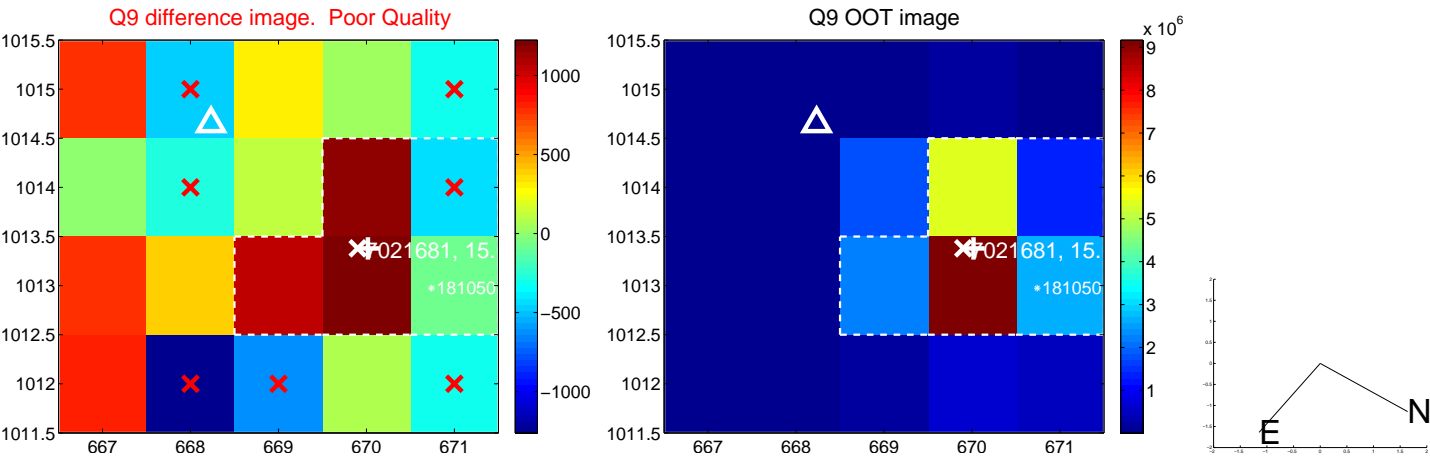
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



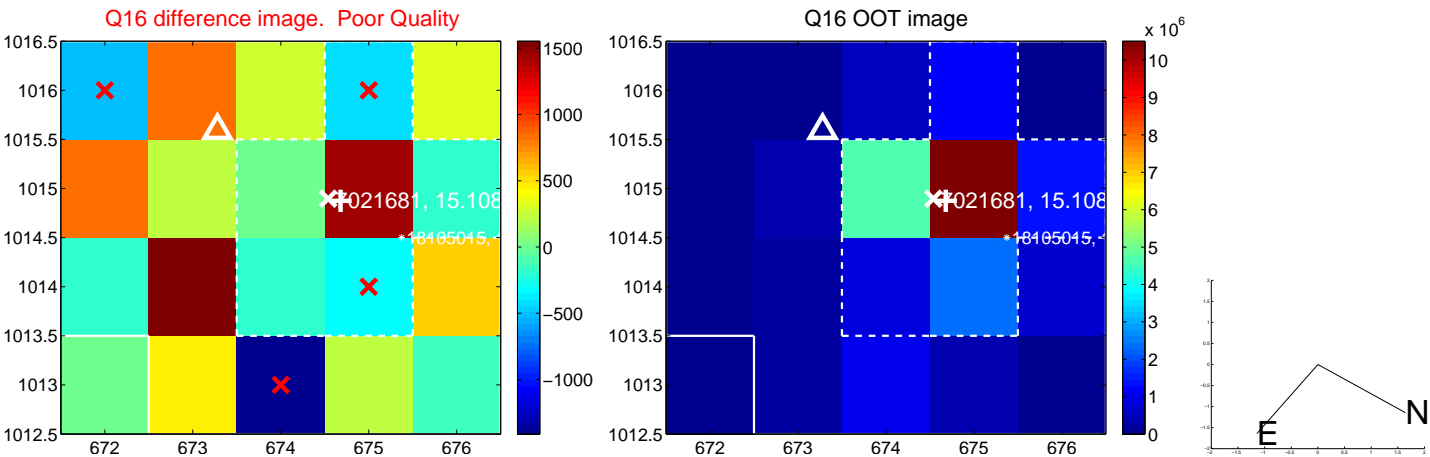
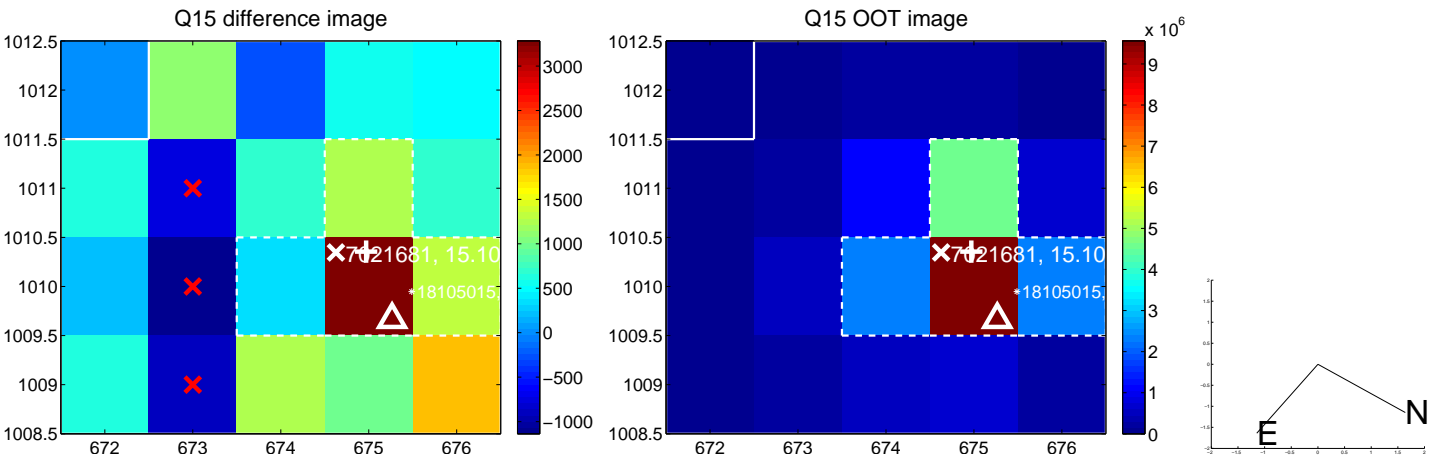
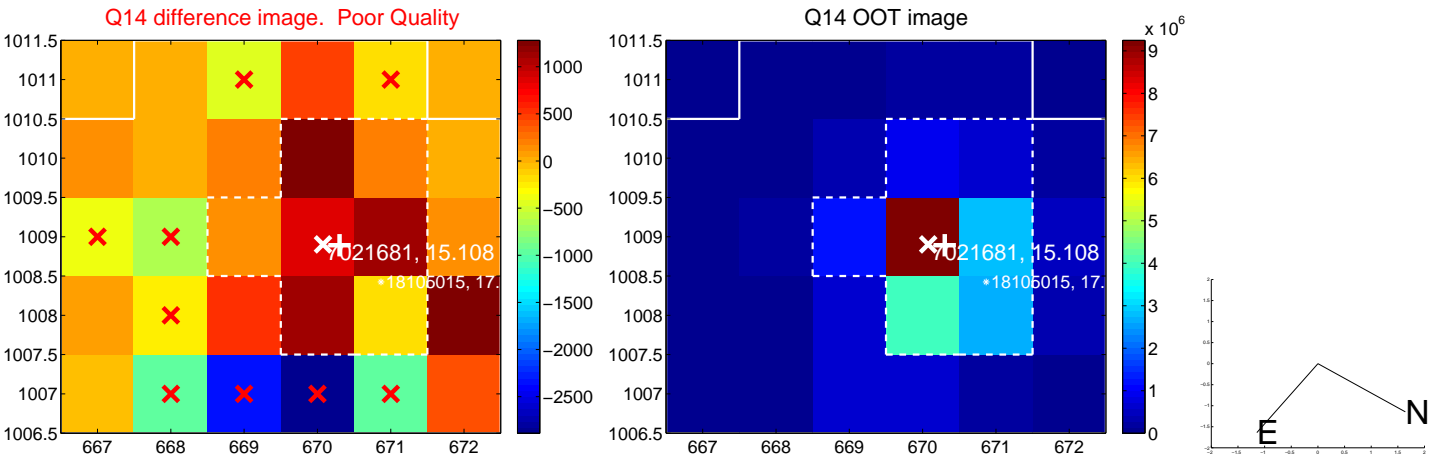
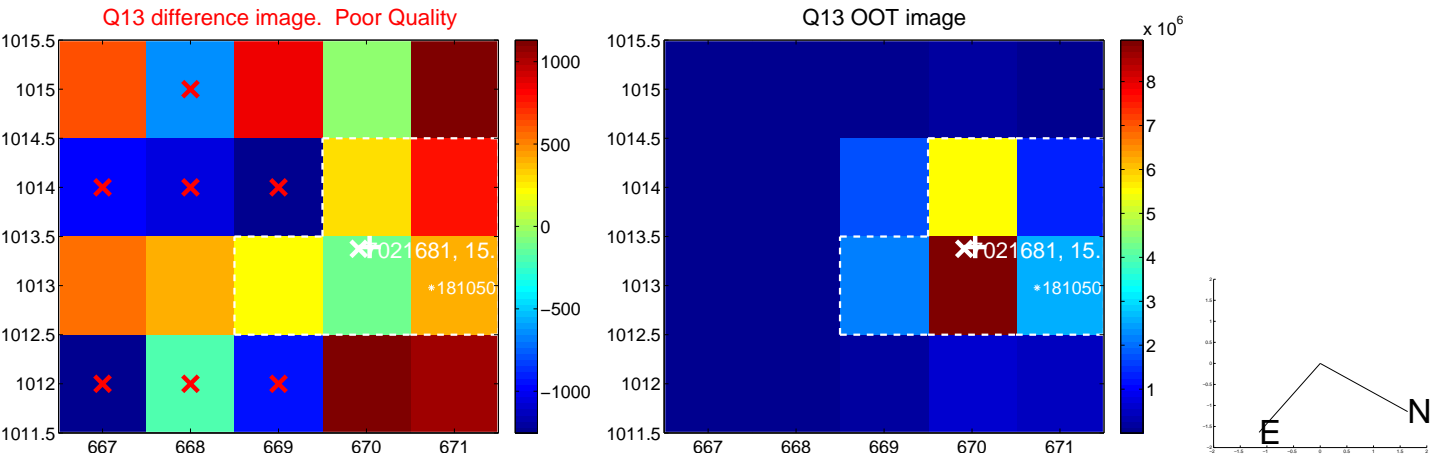
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



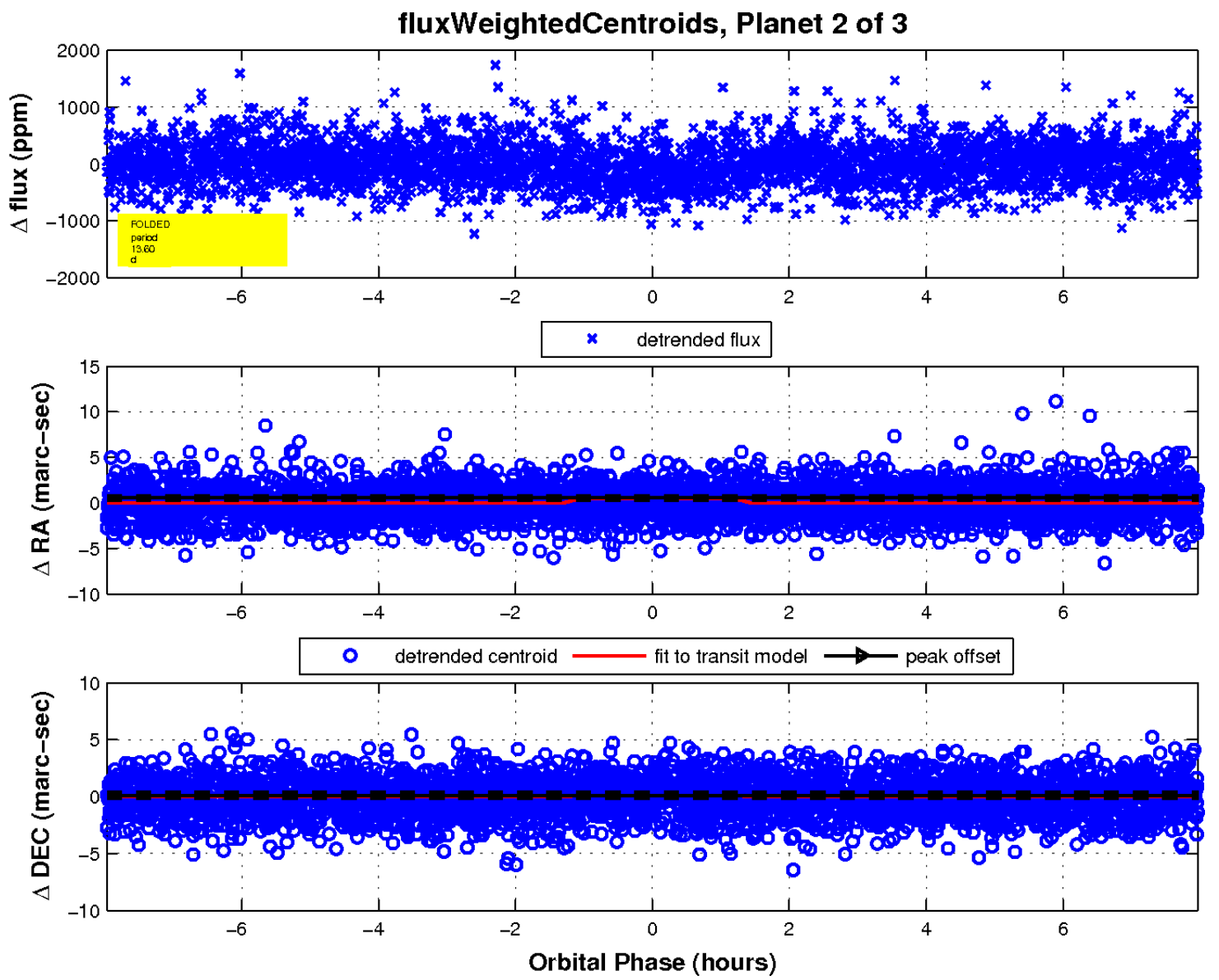
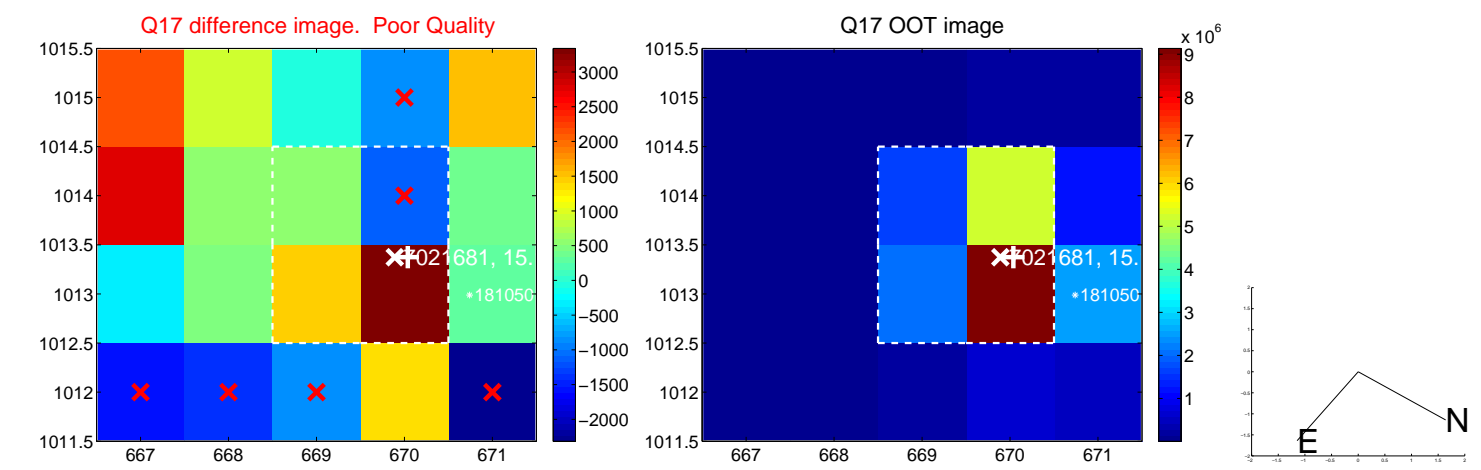
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

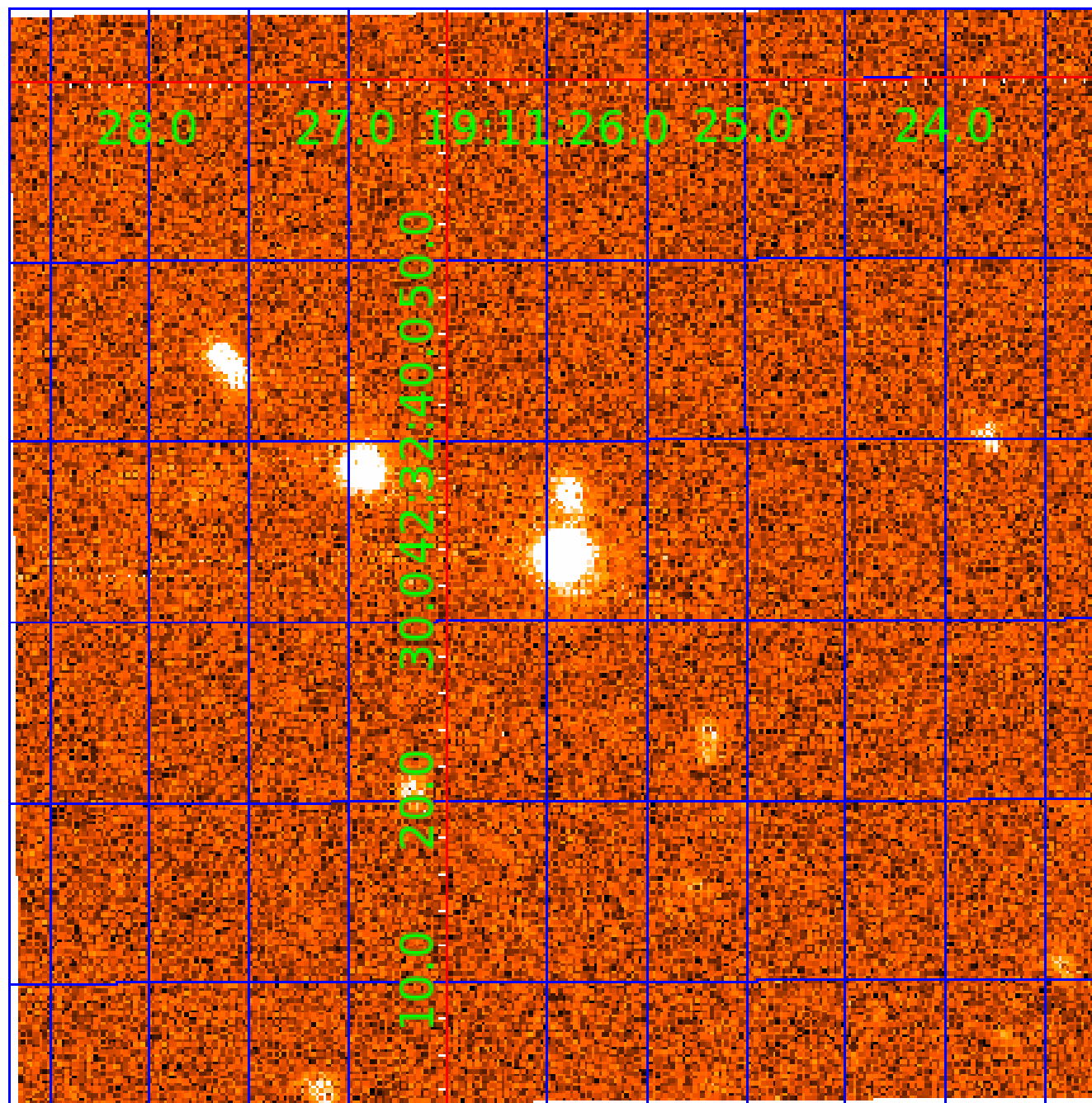


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007021681

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007021681-01	OBS	0255.01	27.521986	134.779581	2312.2	4.119	85.0	85.0	0.51	3780	2.55	2.29
007021681-02	OBS	0255.02	13.603189	140.397351	200.3	2.658	8.3	9.4	0.51	3780	0.79	5.86
007021681-03	OBS	0255.03	7.733262	133.593654	124.3	3.007	7.3	8.0	0.51	3780	0.68	12.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007021681-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007021681-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007021681-03	OBS	FP	0.12	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

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

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

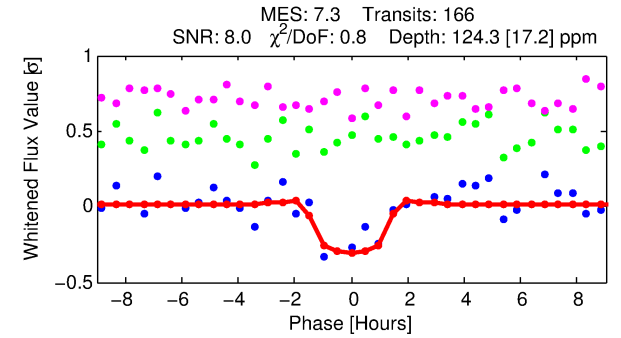
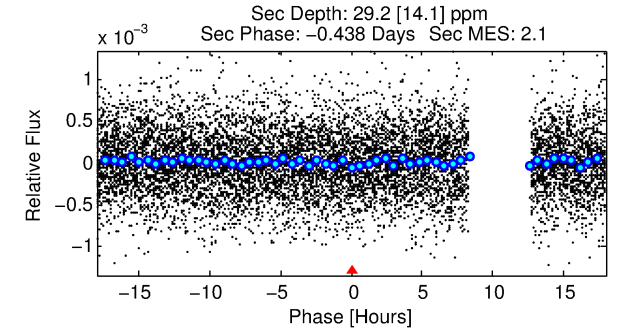
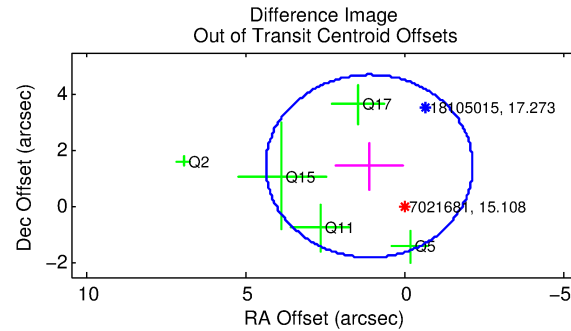
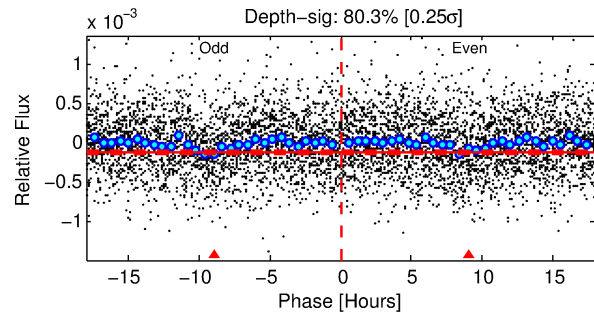
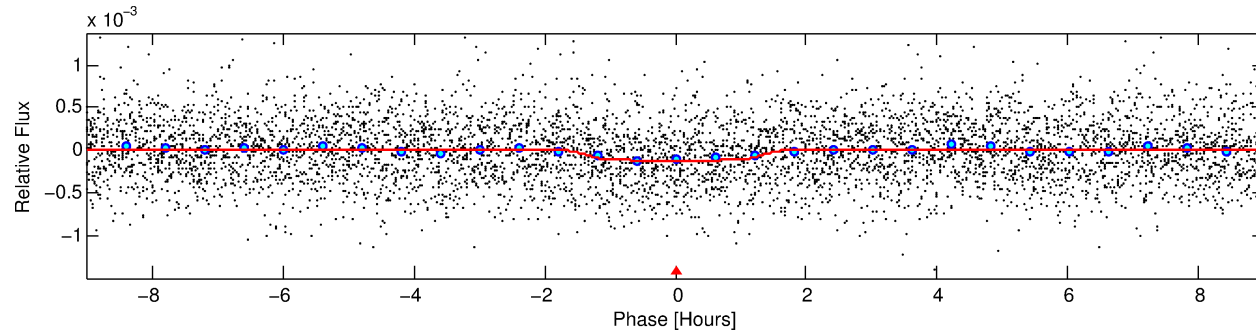
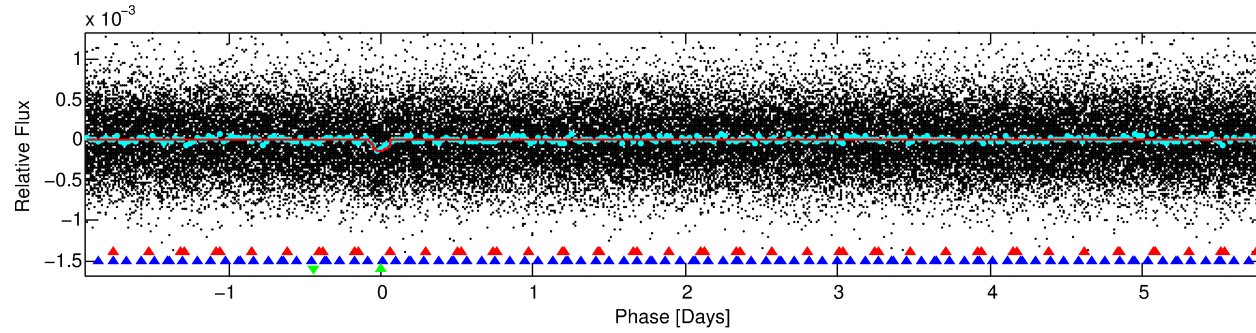
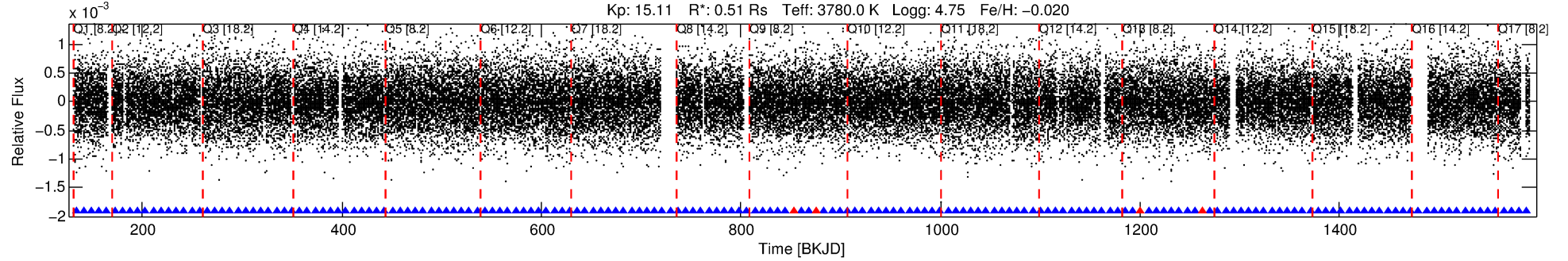
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007021681-03

No Significant Match Found

# DV One-Page Summary

KIC: 7021681 Candidate: 3 of 3 Period: 7.733 d  
KOI: K00255 Corr: No Ephemeris Match



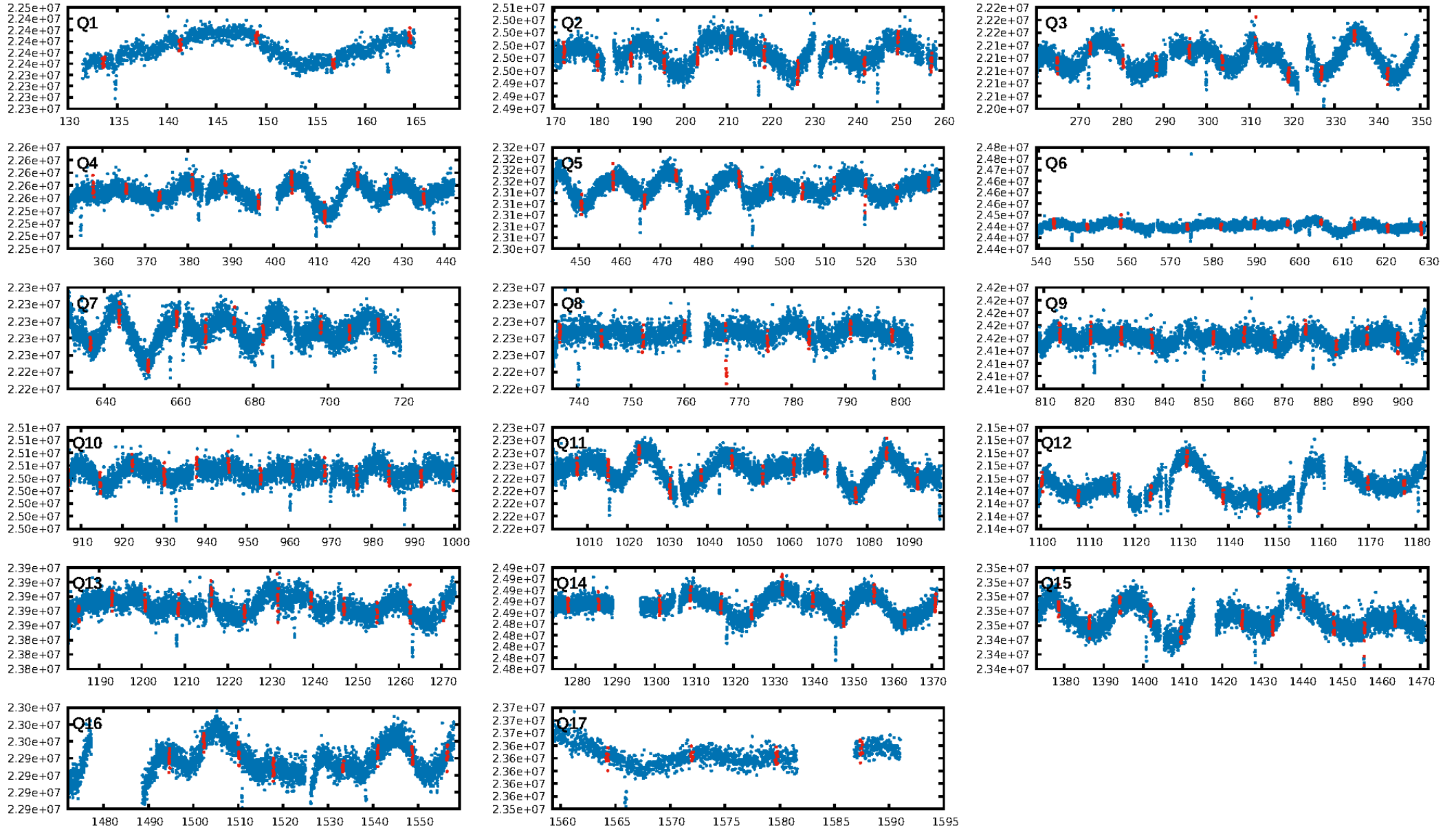
## DV Fit Results:

Period = 7.73326 [0.00007] d  
Epoch = 133.5937 [0.0071] BKJD  
Rp/R\* = 0.0122 [0.0101]  
a/R\* = 9.15 [33.61]  
b = 0.90 [0.80]  
Seff = 12.44 [1.52]  
Teff = 479 [15] K  
Rp = 0.68 [0.57] Re  
a = 0.0620 [0.0040] AU  
Ag = 133.65 [231.49] [0.57 $\sigma$ ]  
Teffp = 2517 [1090] K [1.87 $\sigma$ ]

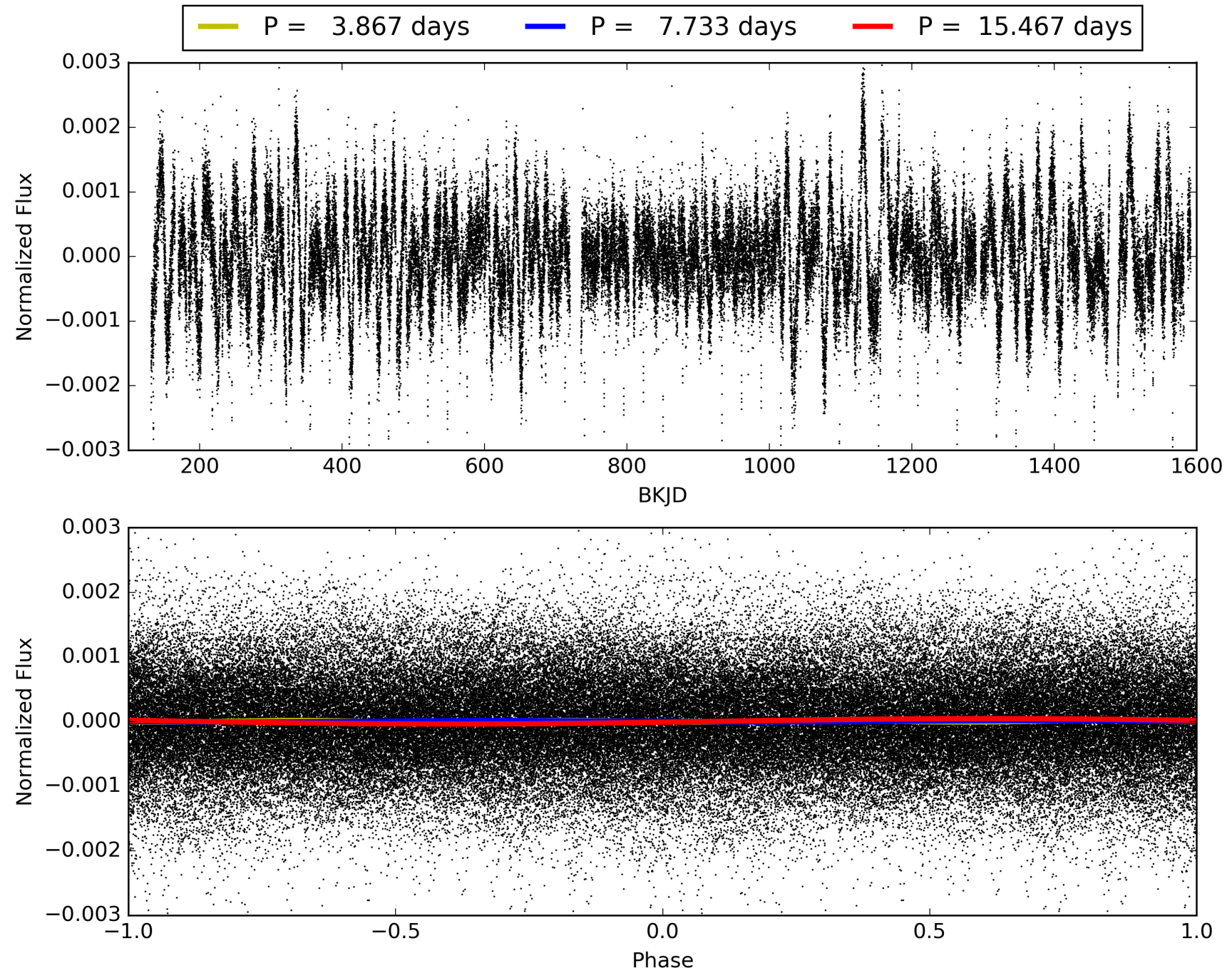
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [35.10 $\sigma$ ]  
ModelChiSquare2-sig: 99.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.23e-13  
RollingBand-fgt: 0.97 [153/157]  
GhostDiagnostic-chr: -42.38  
Centroid-sig: 60.8%  
Centroid-so: 1.119 arcsec [0.69 $\sigma$ ]  
OotOffset-rm: 1.831 arcsec [1.69 $\sigma$ ]  
KicOffset-rm: 2.259 arcsec [2.13 $\sigma$ ]  
OotOffset-st: 1/2/0/2 [5]  
KicOffset-st: 1/2/0/2 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007021681-03, PDC Light Curves



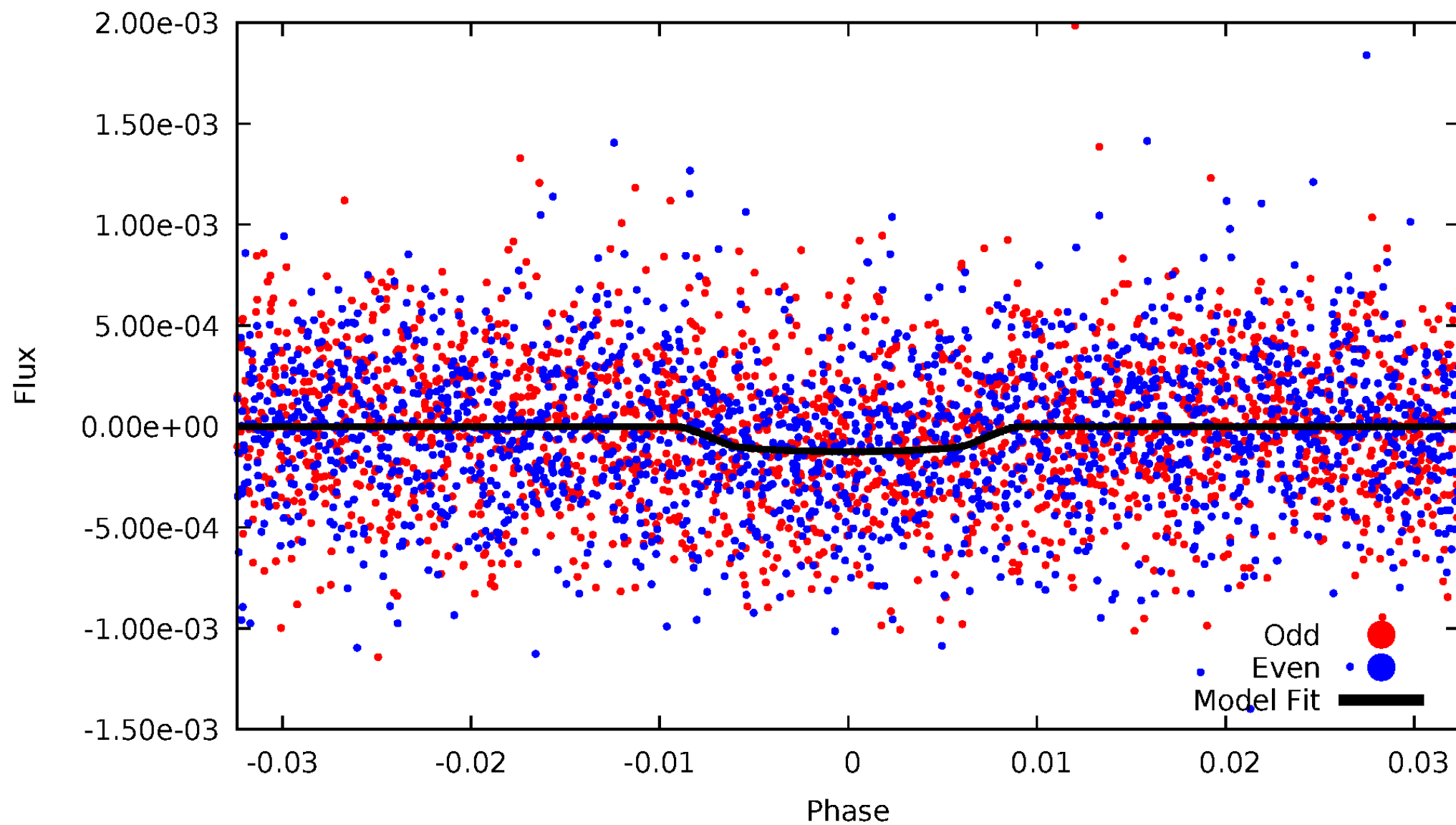
TCE 007021681-03





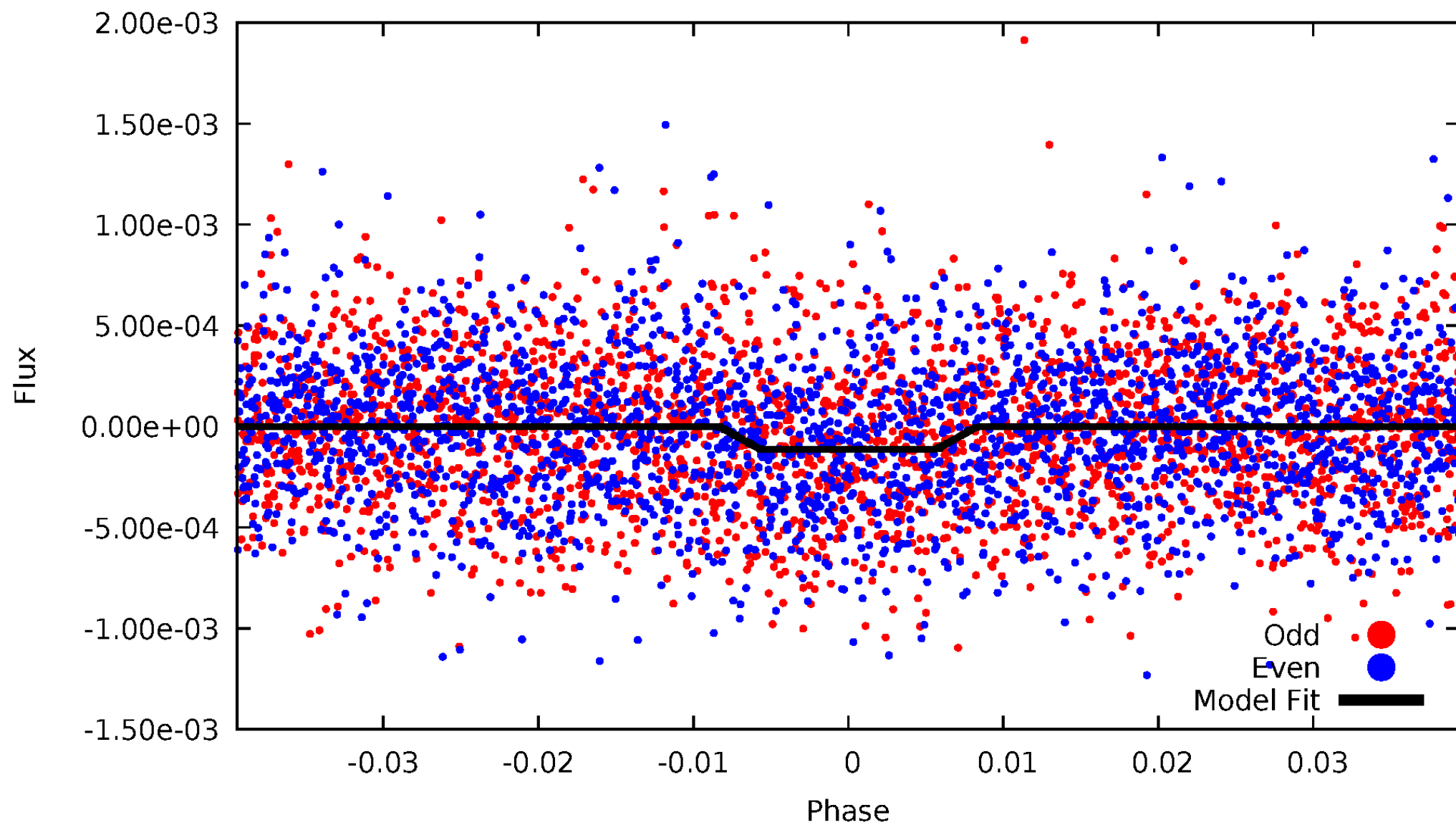
# DV Odd/Even

TCE 007021681-03



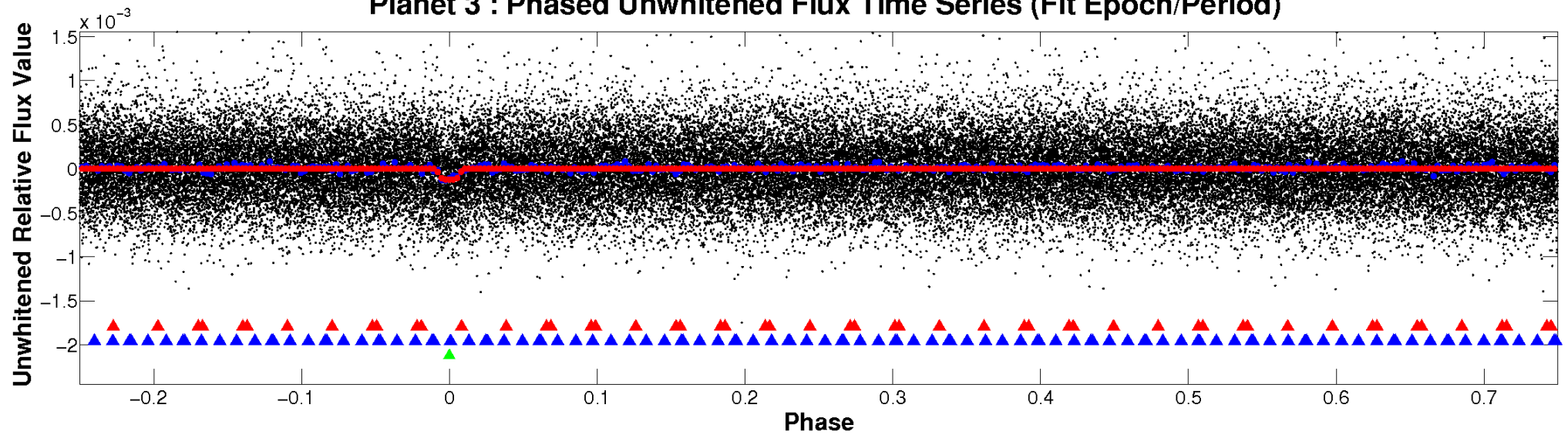
# ALT Odd/Even

TCE 007021681-03

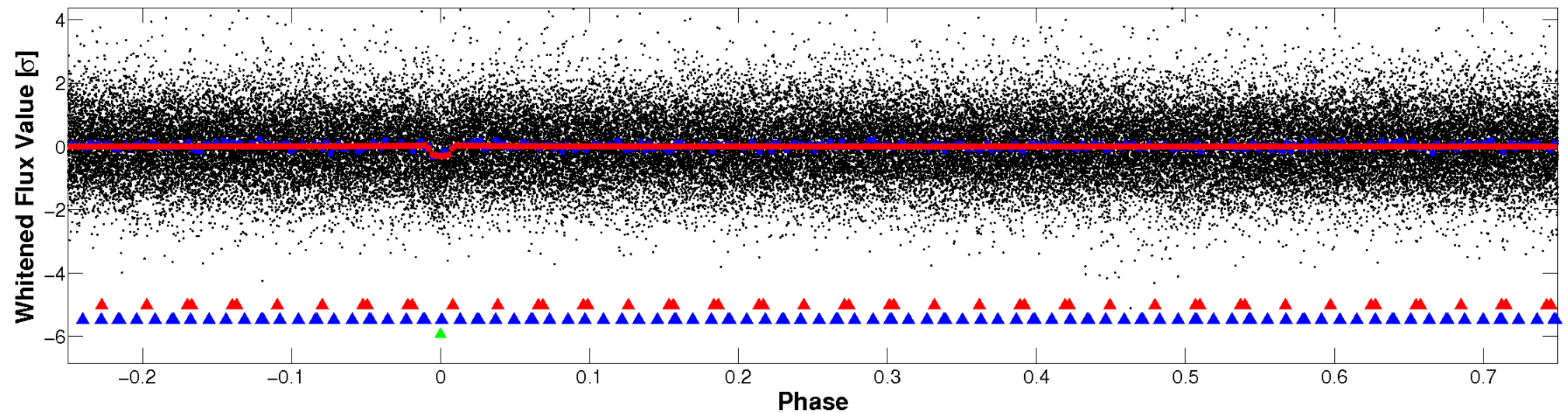


# Non-Whitened Vs. Whitened Light Curve

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

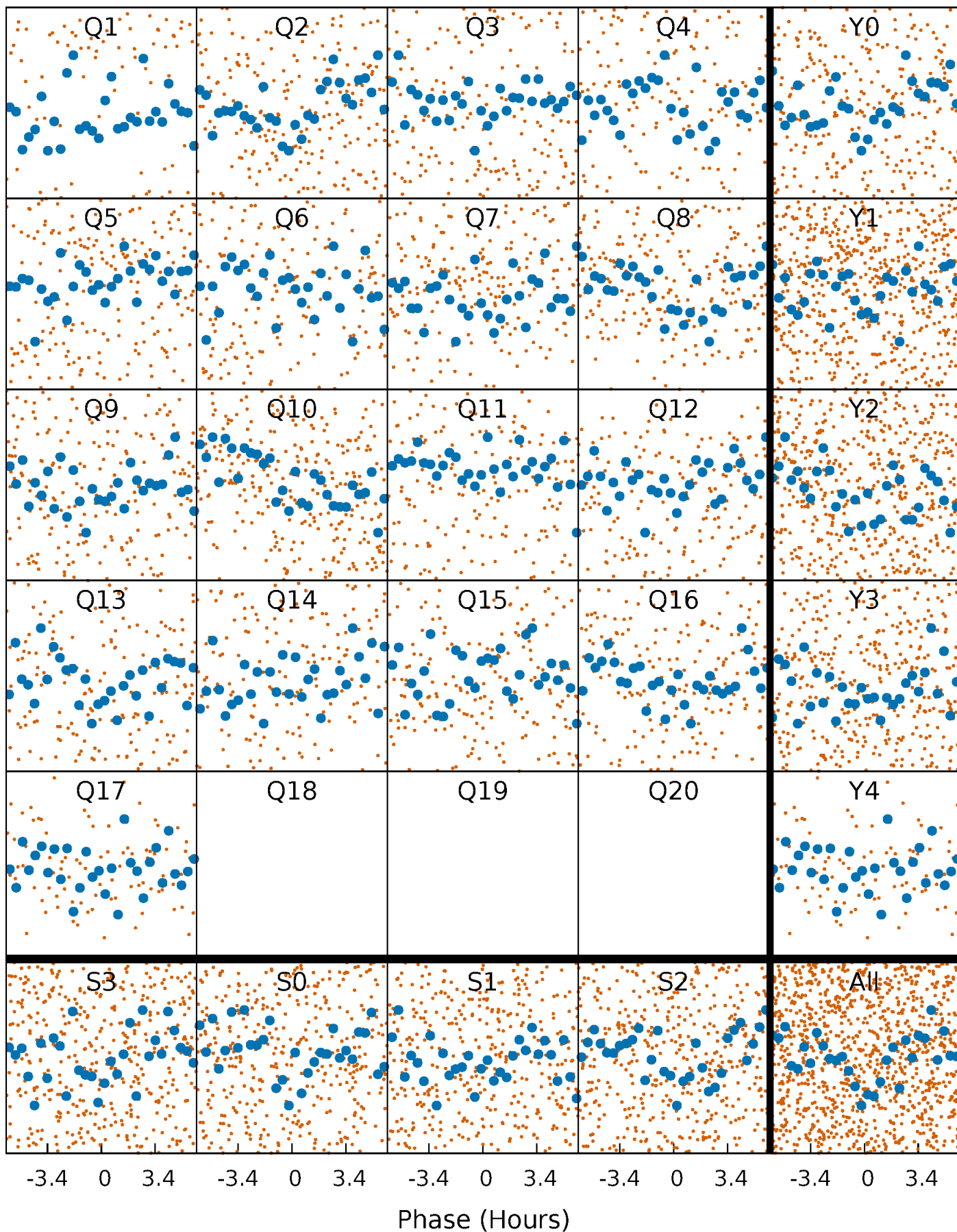


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

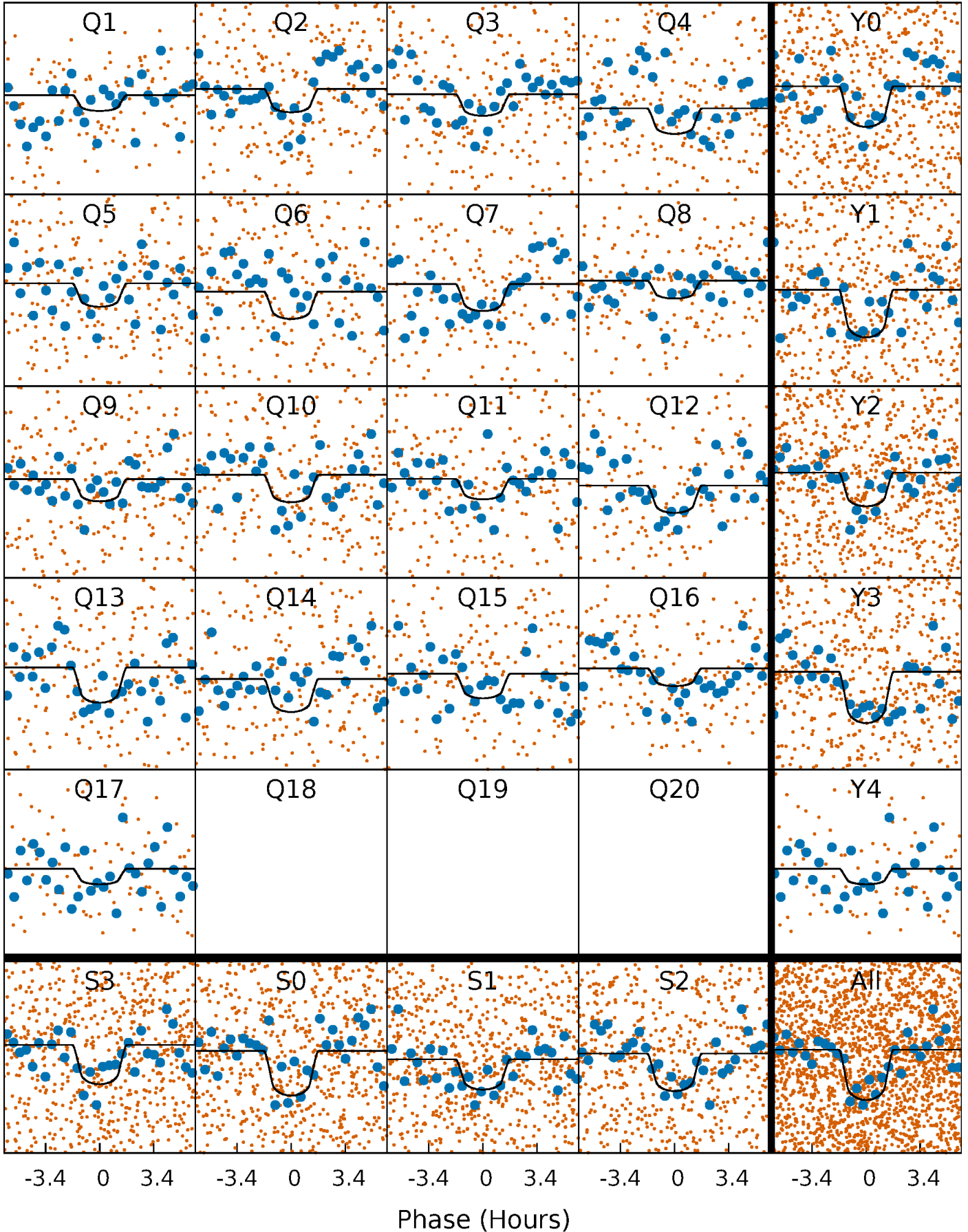
TCE 007021681-03 P= 7.733262 Days  $T_0=133.593655$  (BKJD)





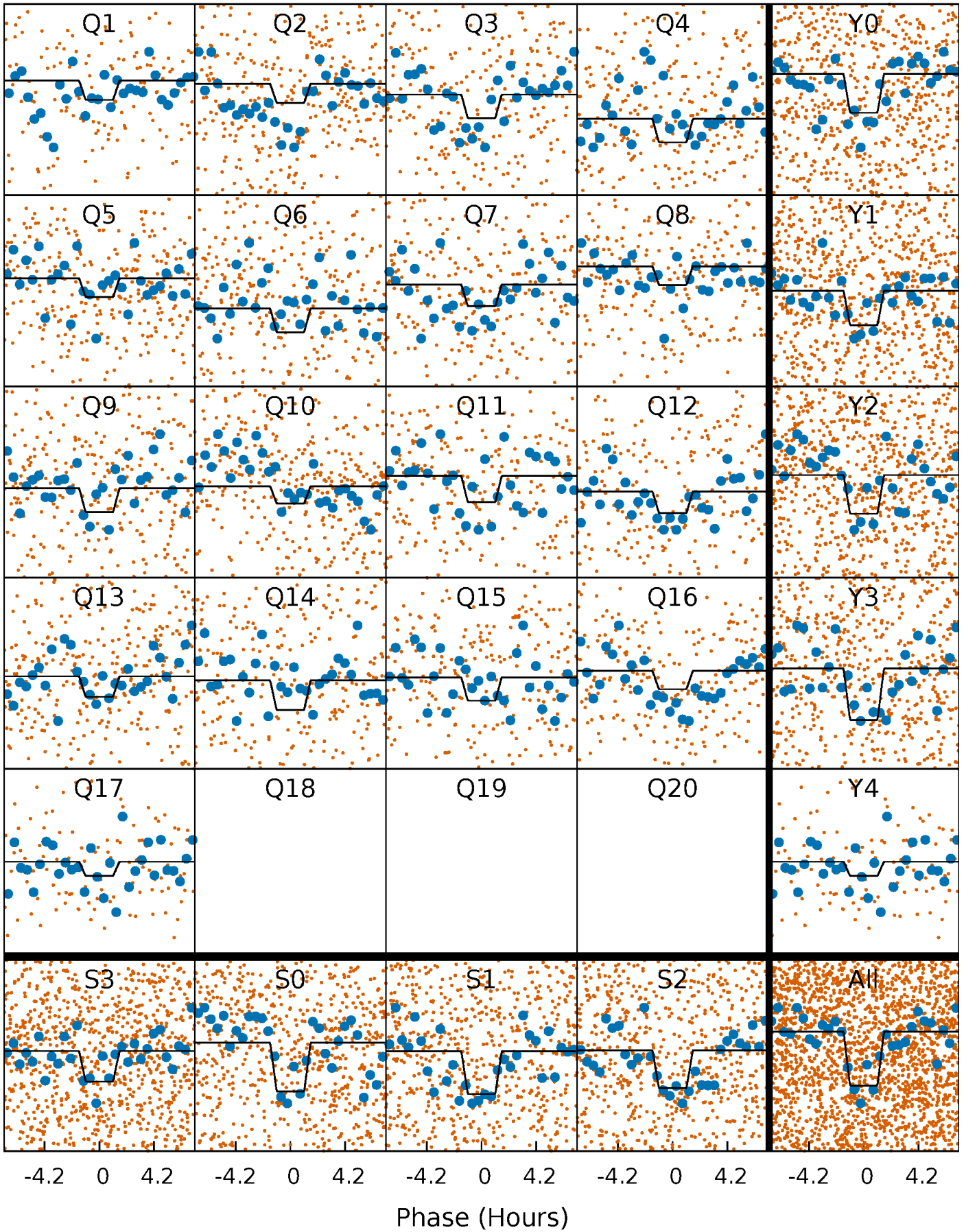
# DV Quarter-Phased Transit Curves

TCE 007021681-03   P= 7.733262 Days    $T_0=133.593655$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

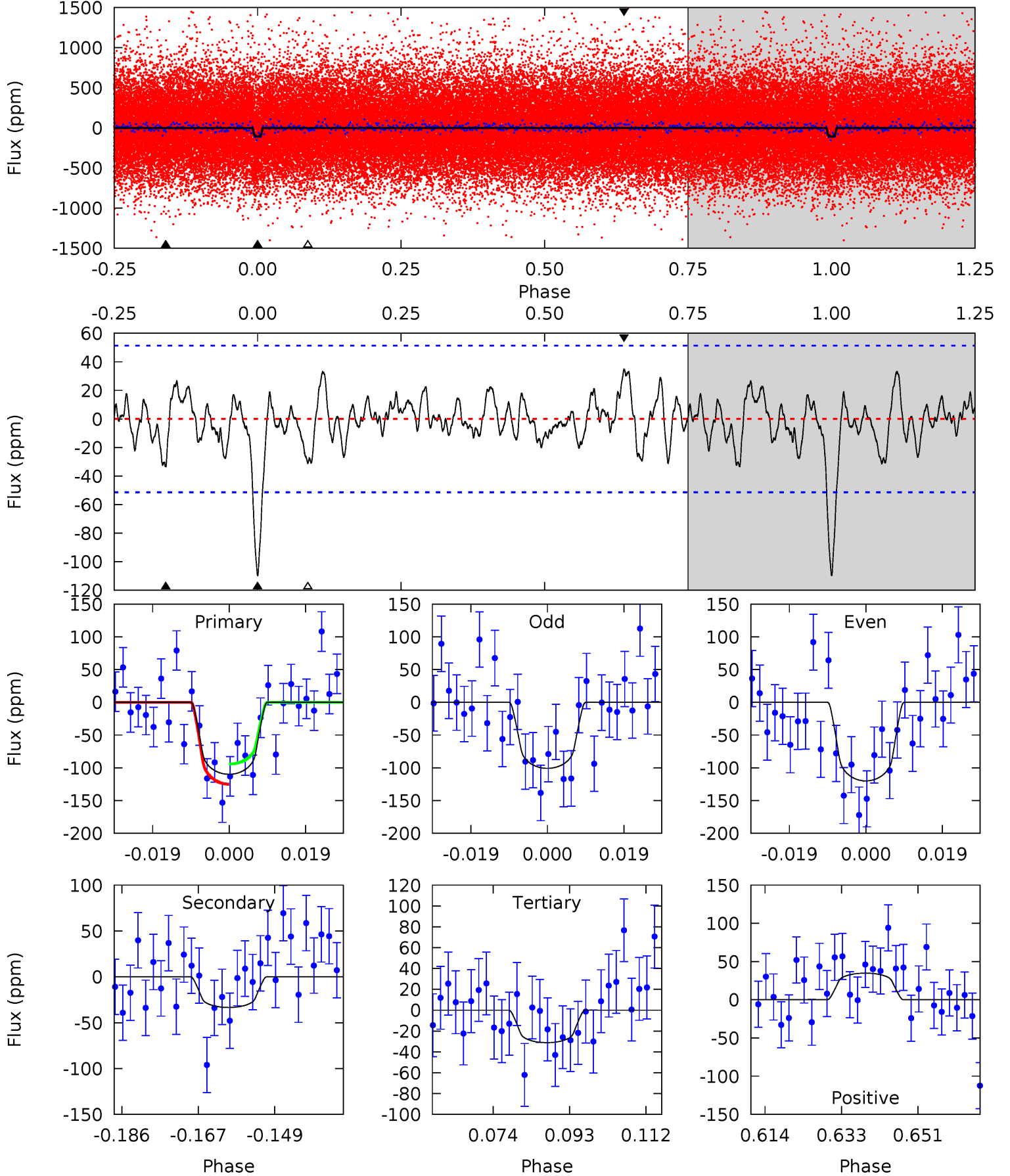
TCE 007021681-03 P= 7.733180 Days  $T_0=133.600766$  (BKJD)



# DV Model-Shift Uniqueness Test

007021681-03, P = 7.733262 Days, E = 125.860393 Days

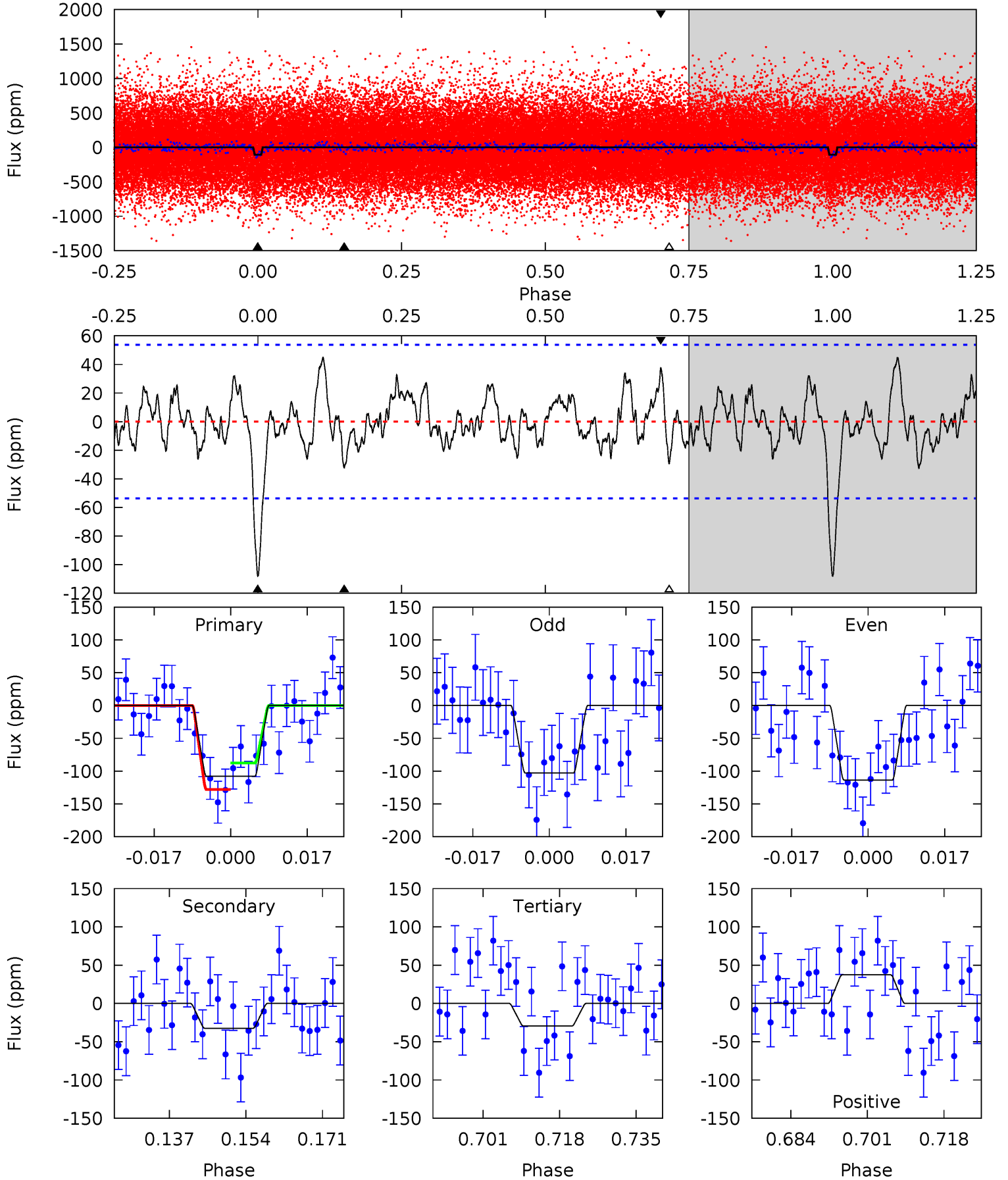
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	3.20	2.98	3.33	4.91	2.35	1.21	7.53	7.18	0.21	-0.13	0.92	0.98	0.24	1.47



# Alt Model-Shift Uniqueness Test

007021681-03, P = 7.733180 Days, E = 125.867586 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
9.90	2.97	2.70	3.43	4.92	2.38	1.29	7.19	6.46	0.27	-0.46	0.50	1.04	0.29	1.86



### Stellar Parameters For KIC 007021681

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3780^{+76}_{-83}$	$4.746^{+0.042}_{-0.031}$	$-0.020^{+0.150}_{-0.150}$	$0.511^{+0.036}_{-0.043}$	$0.531^{+0.034}_{-0.042}$	$5.600^{+1.082}_{-0.675}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-8%	+6%/-8%	+19%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 007021681-03 / KOI 0255.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-33 \pm 10$	$0.75^{+0.54}_{-0.43}$	$668^{+17}_{-17}$	$2911^{+899}_{-414}$	$125^{+594}_{-86}$
Alt.	$-32 \pm 11$	$0.70^{+0.52}_{-0.45}$	$668^{+16}_{-18}$	$2942^{+1208}_{-432}$	$136^{+1020}_{-96}$

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

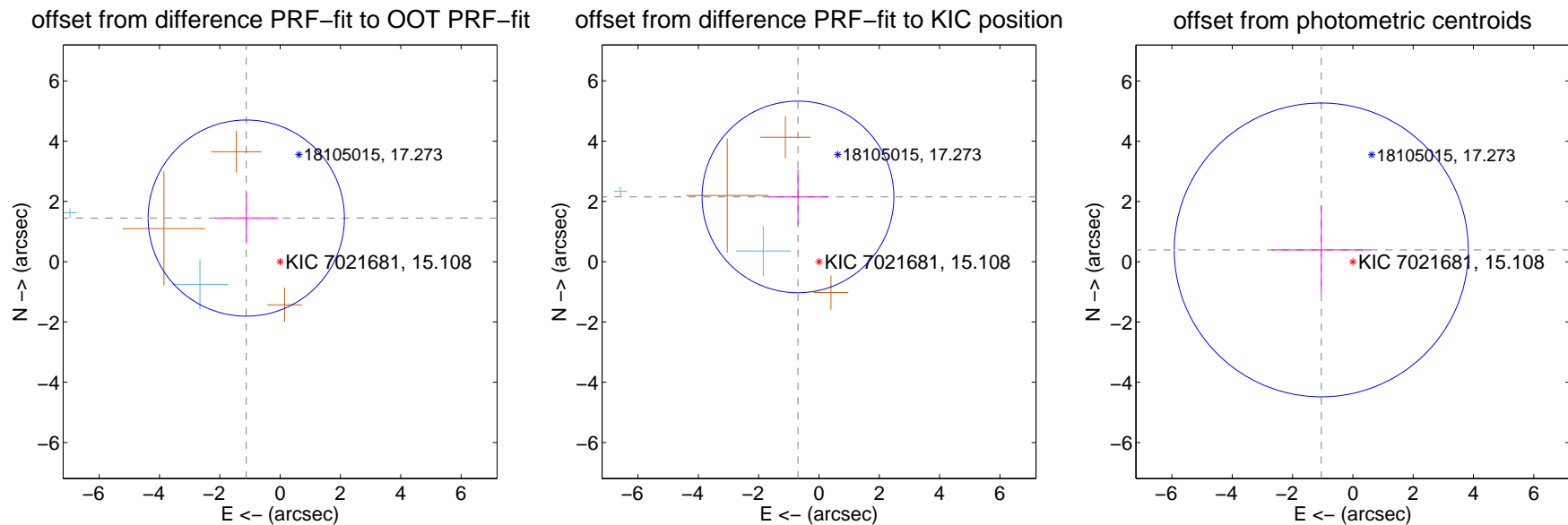
## DV Centroid Data

Supplemental centroid analysis for 007021681-03. Kepler magnitude: 15.11. Transit SNR 8.00

There are 2 quarters with good PRF difference image offsets

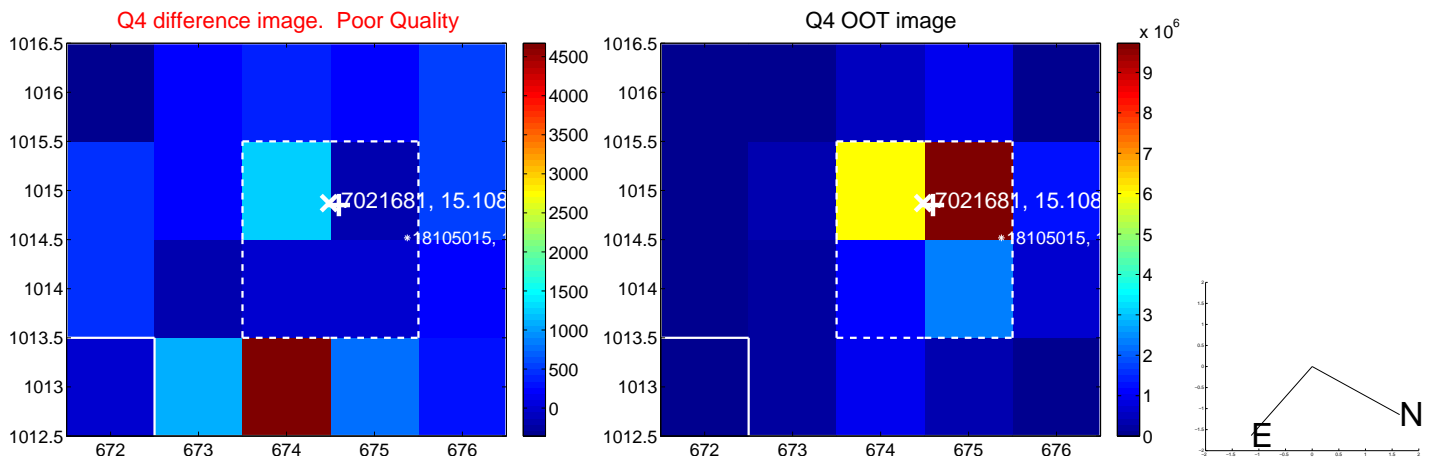
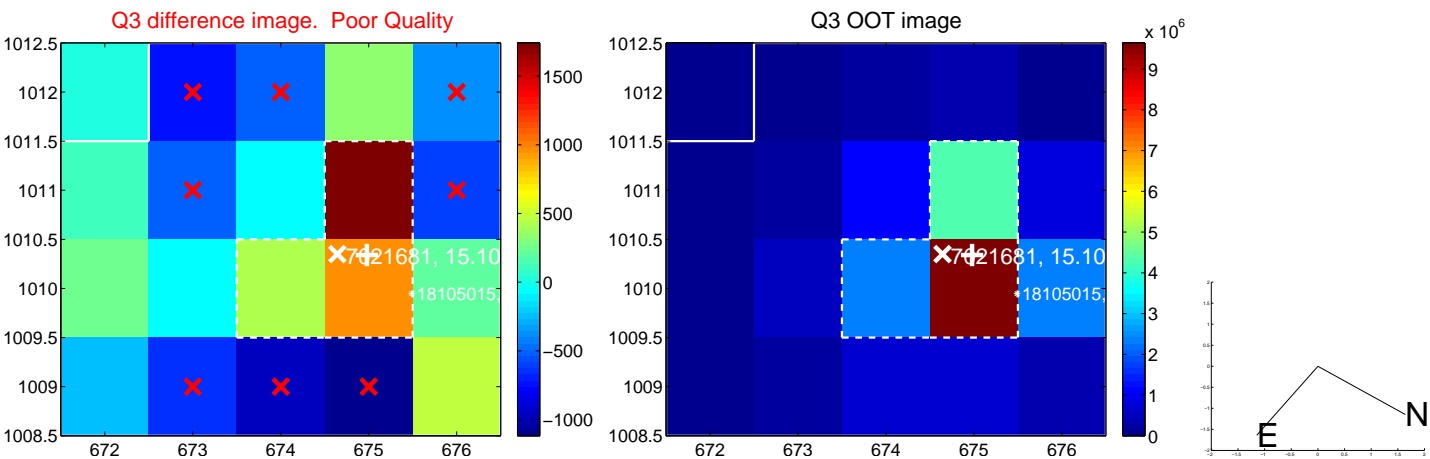
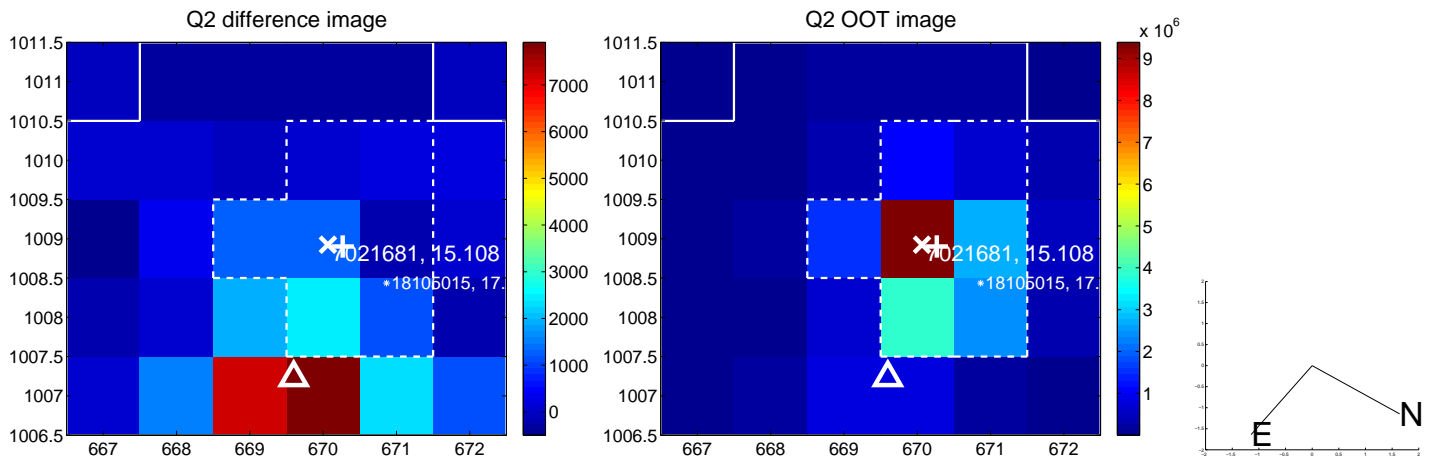
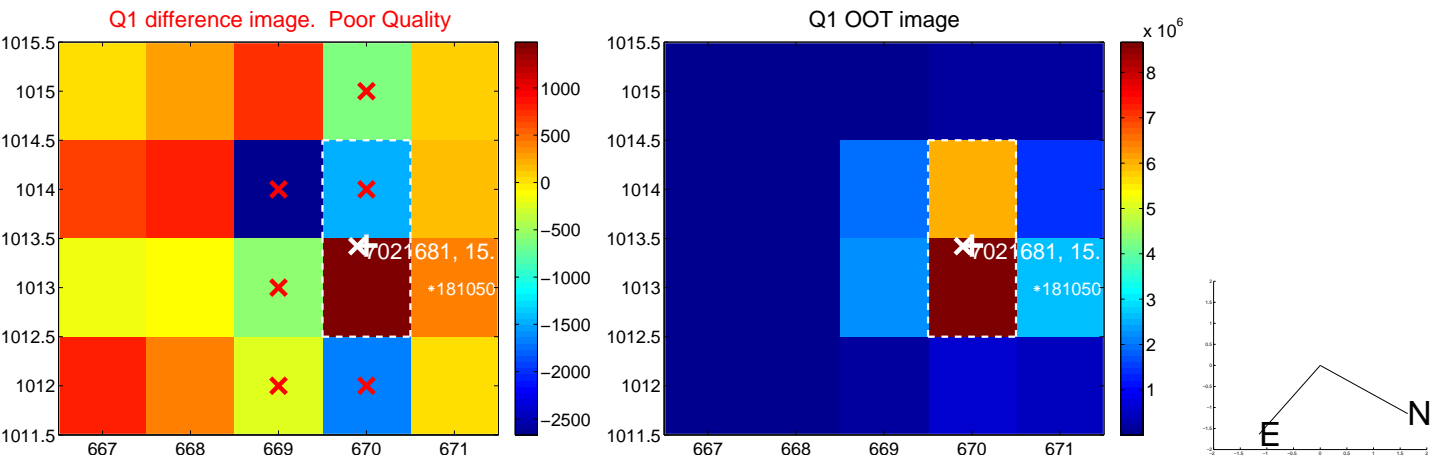
The direct PRF centroid is offset from the target star catalog position by about 0.59 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.831 \pm 1.085$	1.69	$1.122 \pm 1.048$	$1.447 \pm 0.831$
PRF-fit source offset from KIC position	$2.259 \pm 1.060$	2.13	$0.697 \pm 0.994$	$2.148 \pm 0.916$
photometric centroid source offset	$1.12 \pm 1.63$	0.69	$1.05 \pm 1.65$	$0.39 \pm 1.47$



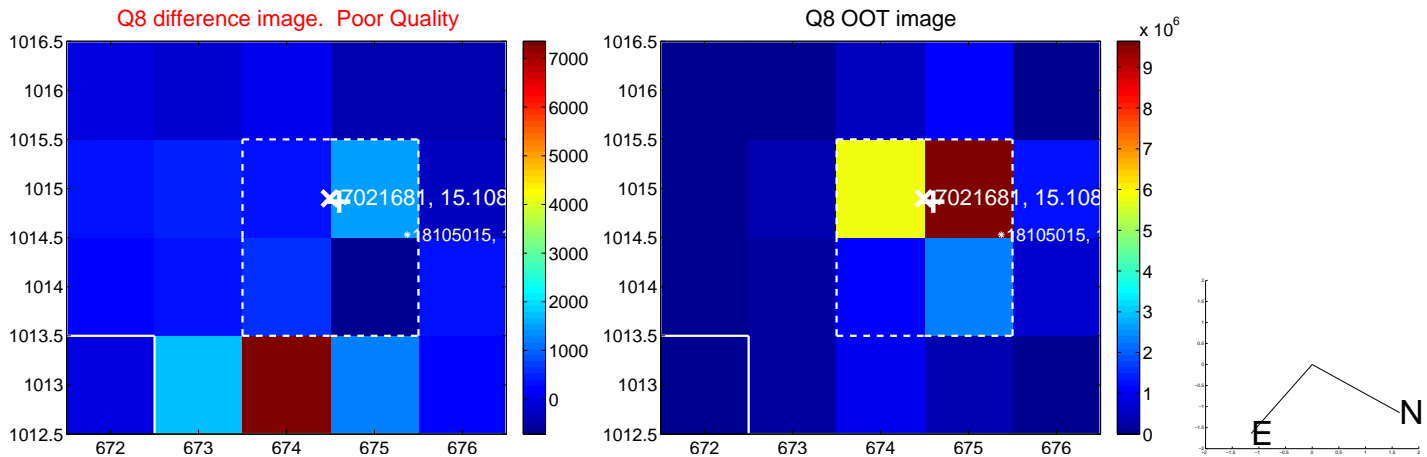
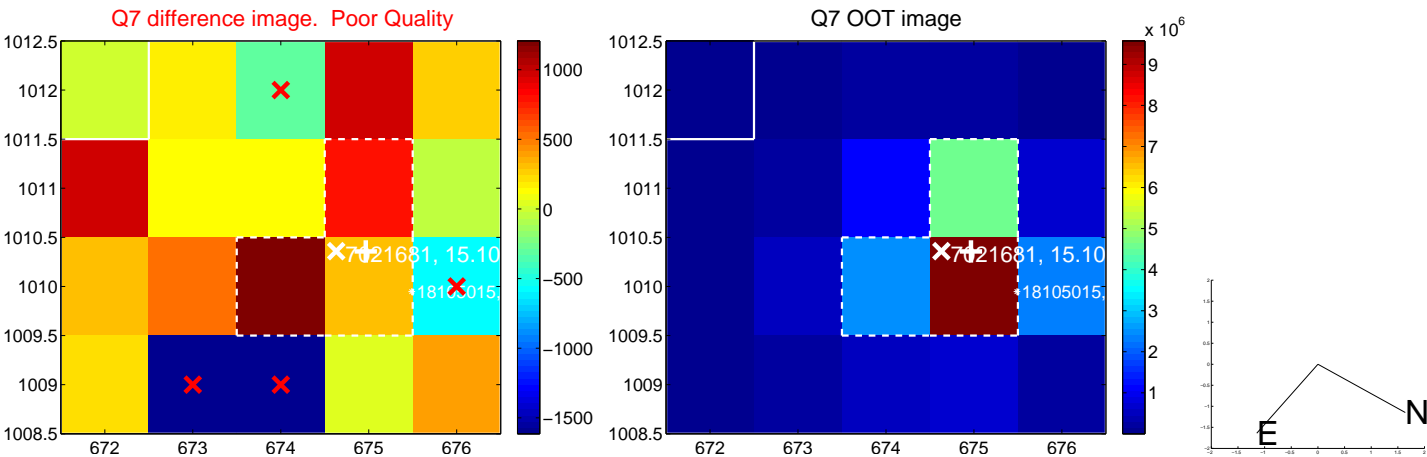
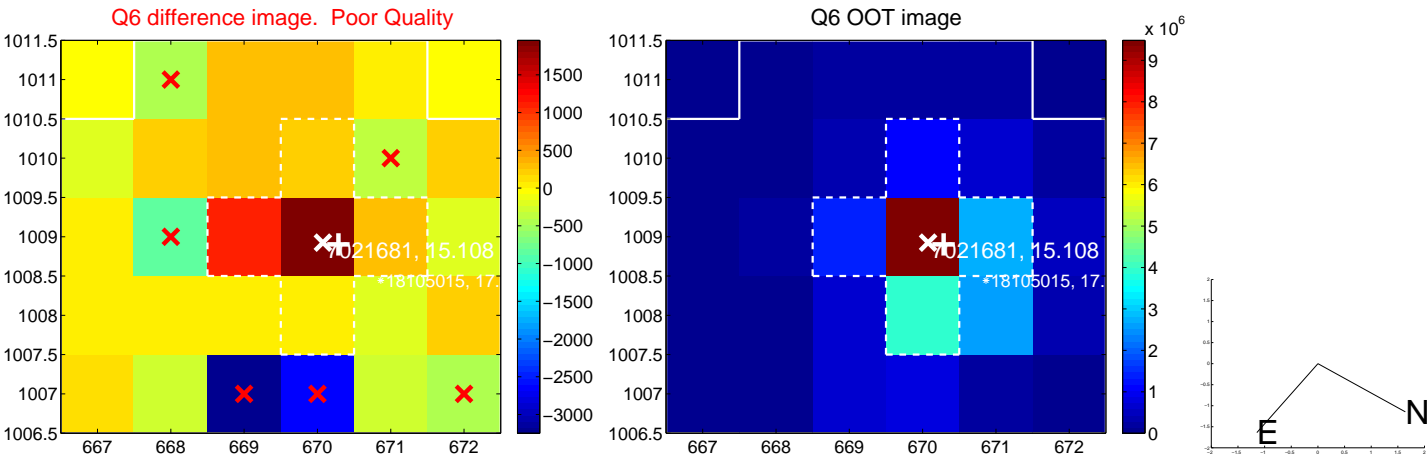
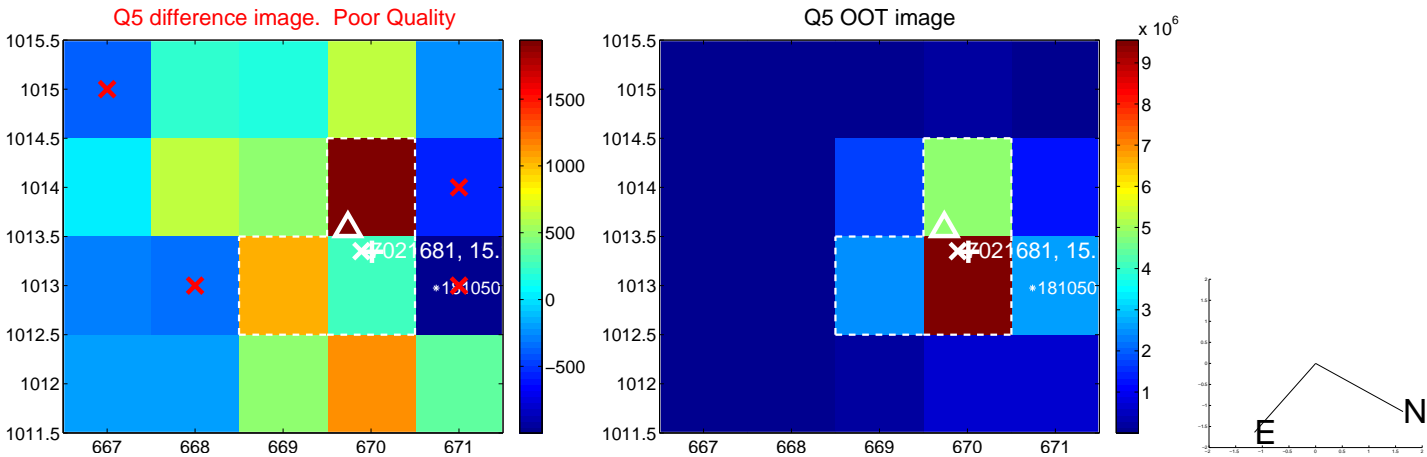
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

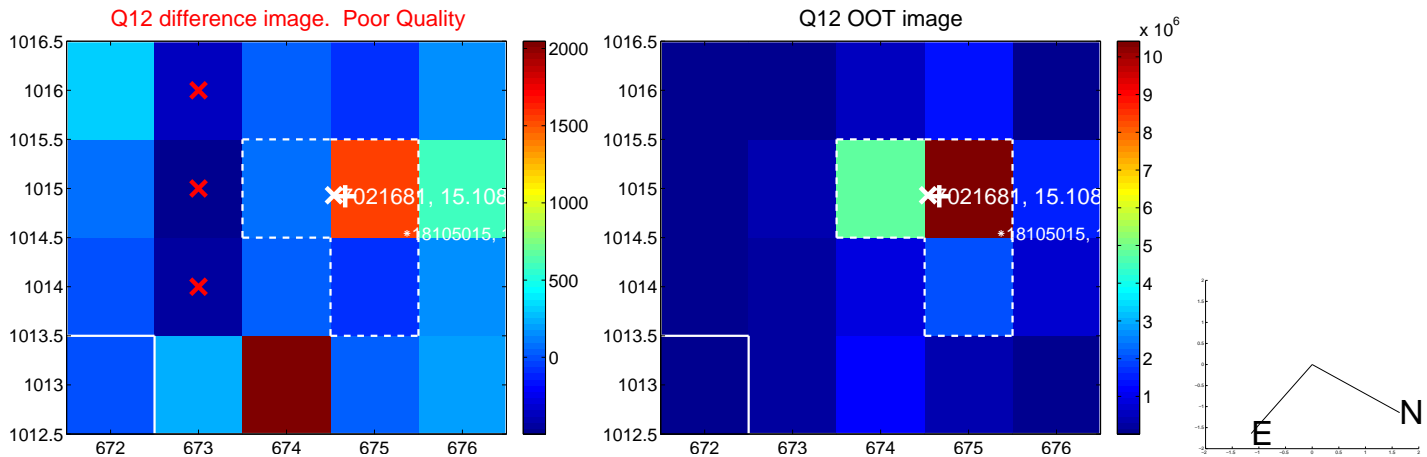
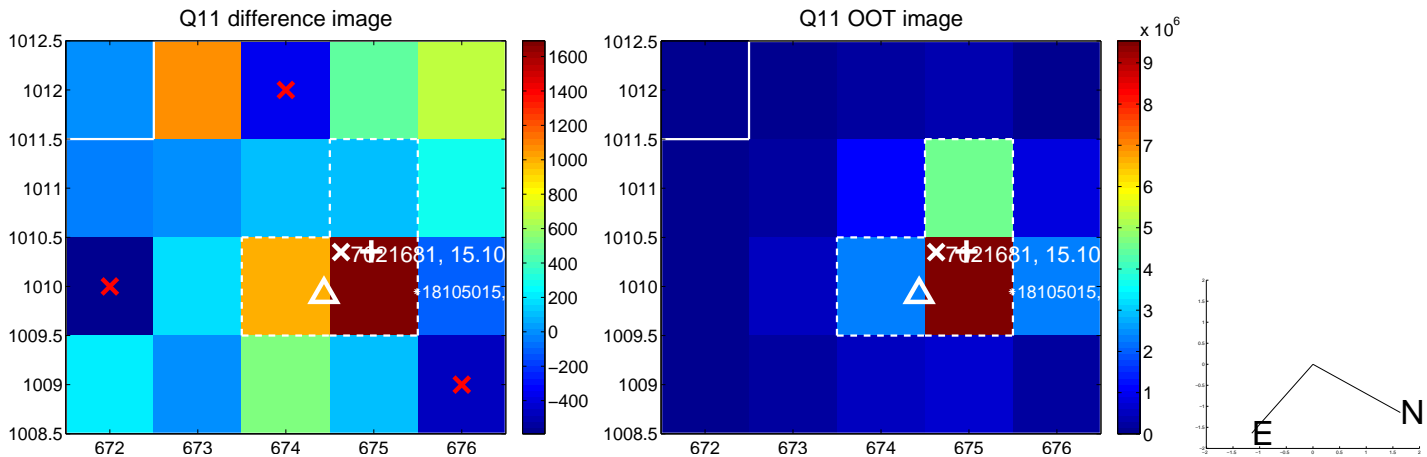
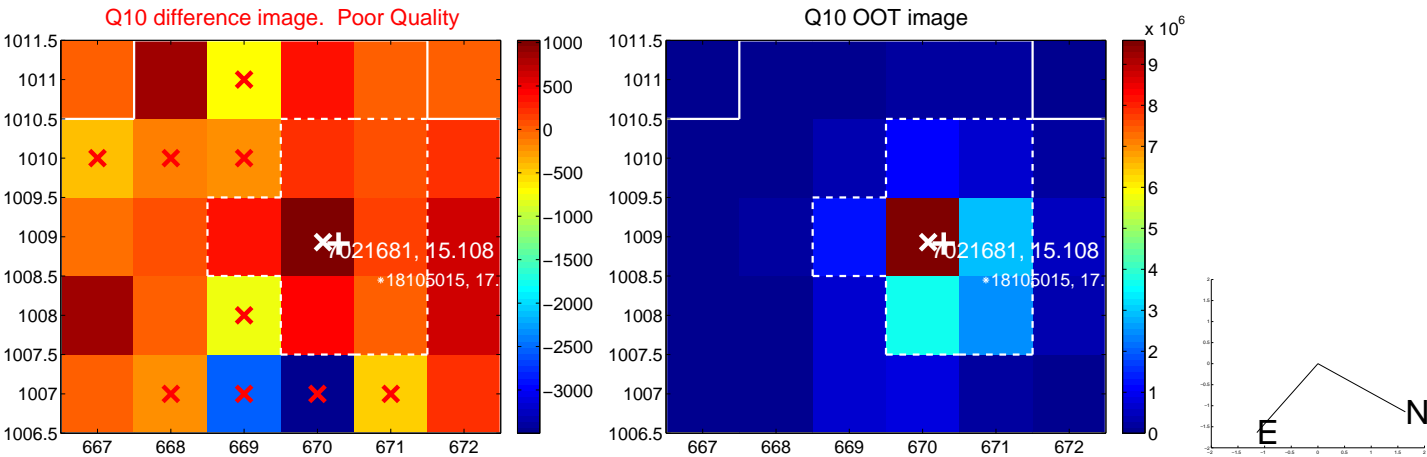
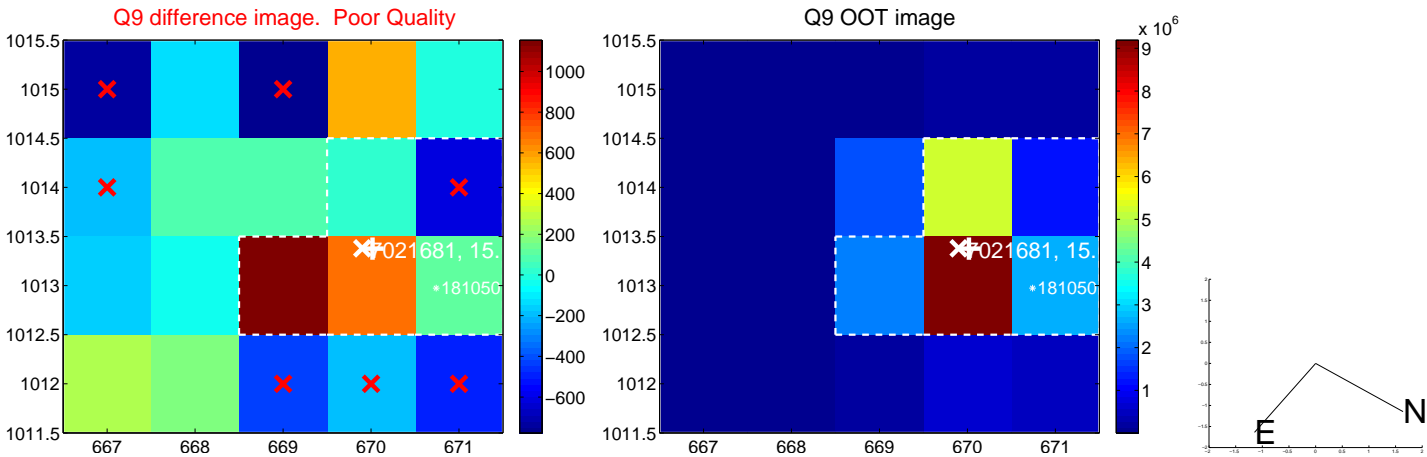




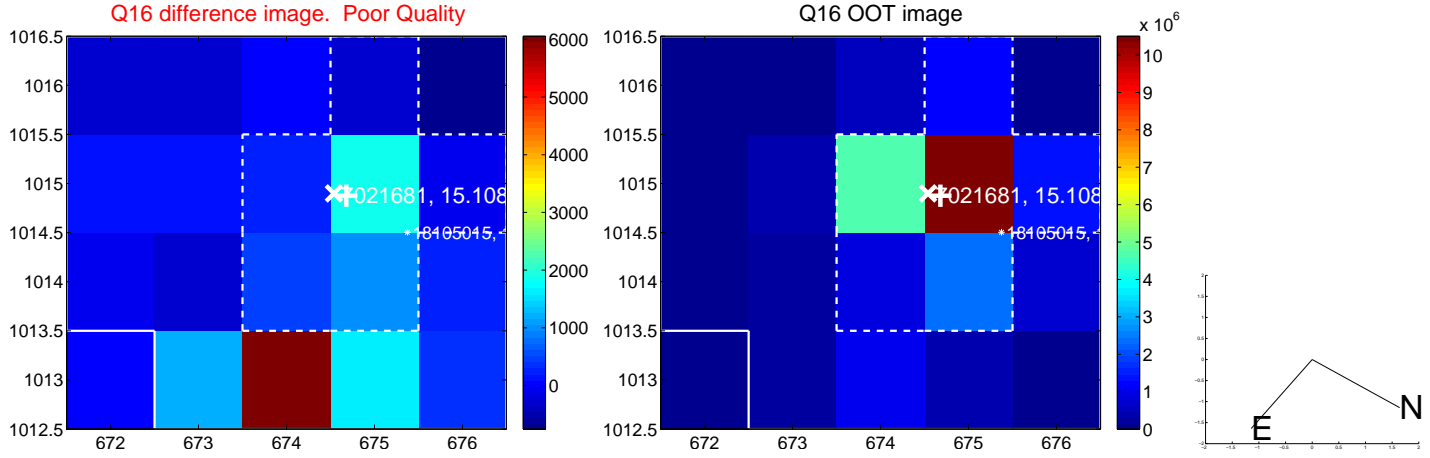
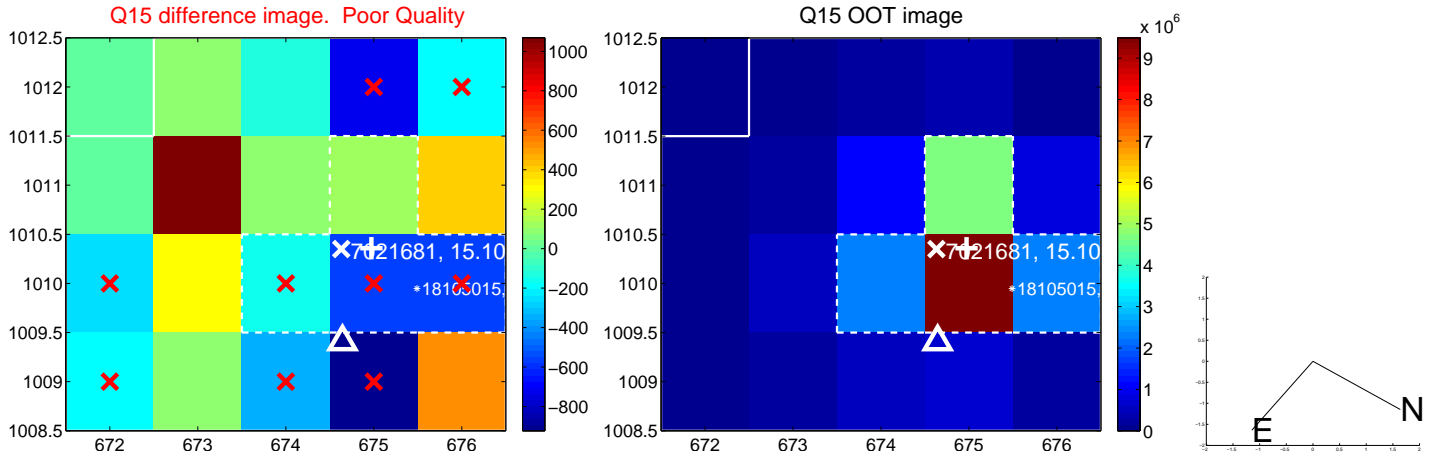
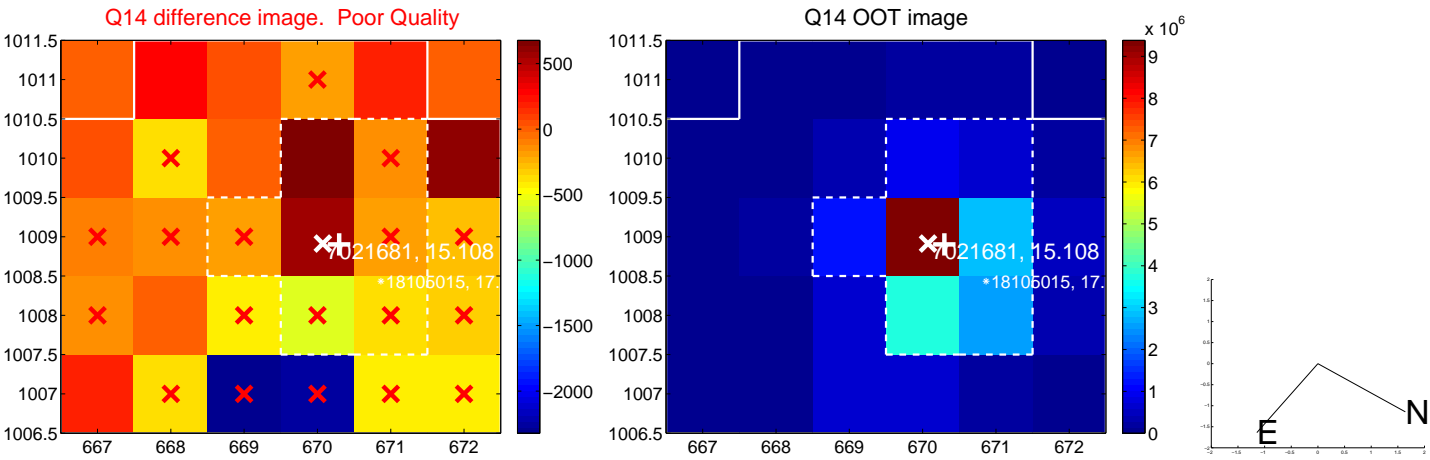
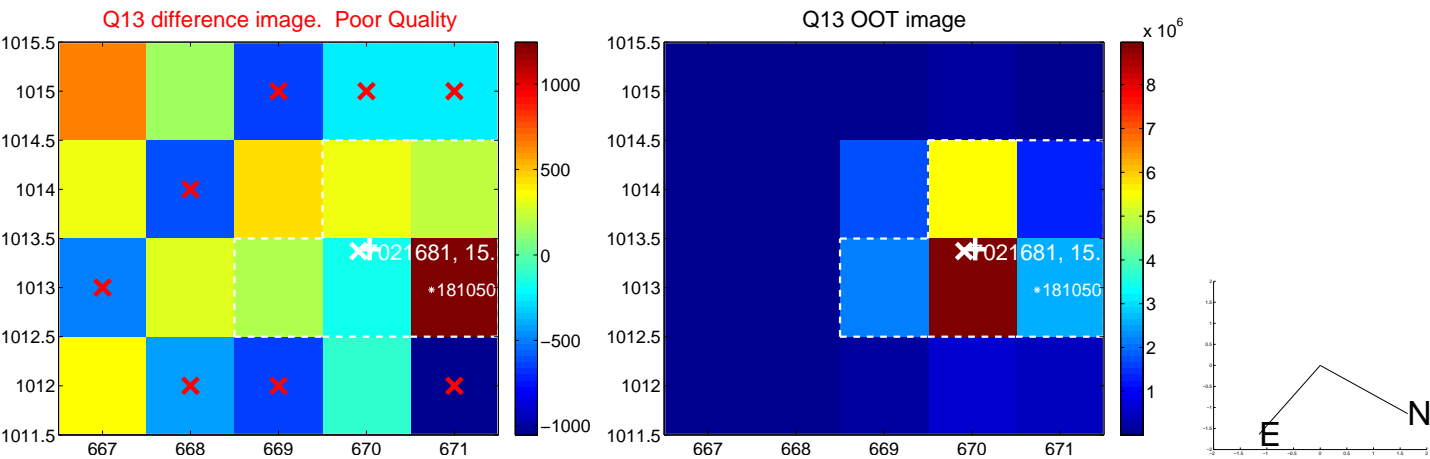
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



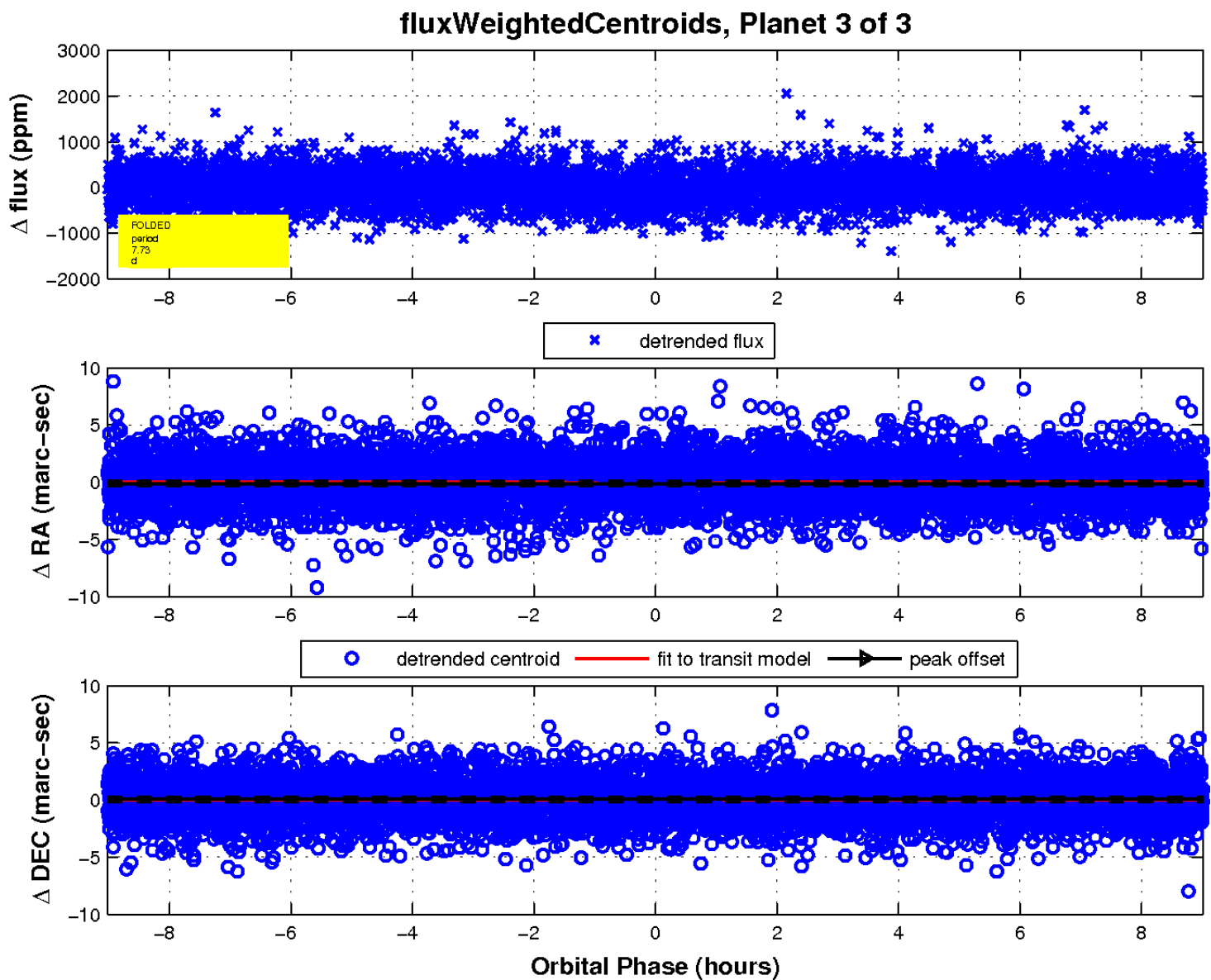
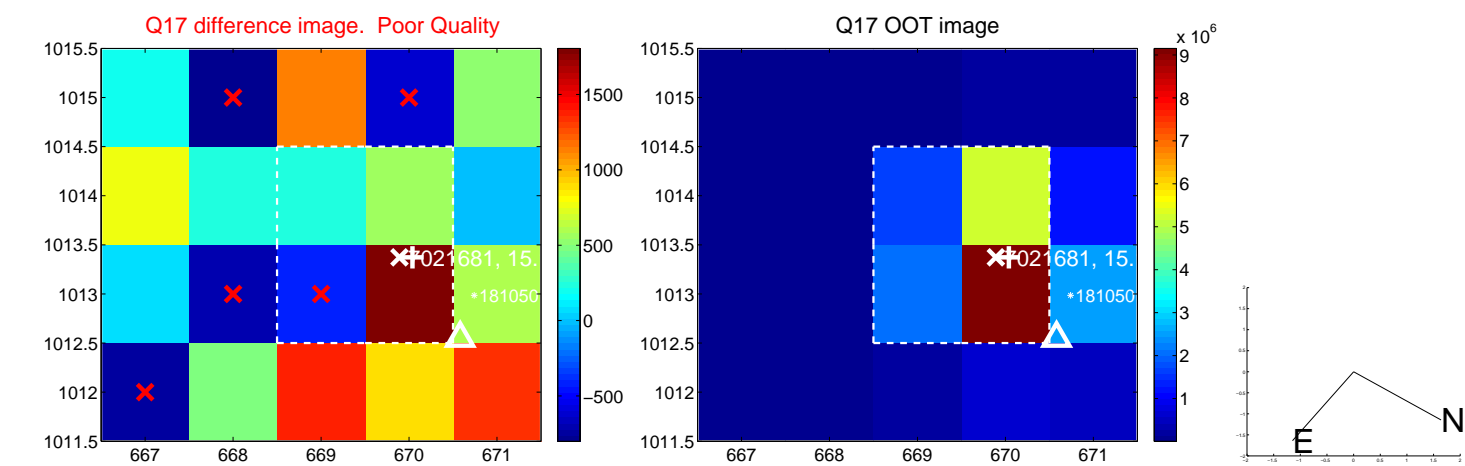
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

