

# KIC 007596224

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007596224-01	OBS	No	0.844314	131.598576	57.0	4.646	10.2	10.2	1.03	6108	0.79	3984.53
007596224-02	OBS	No	193.271225	164.359206	901.6	4.714	7.6	8.0	1.03	6108	3.83	2.85

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007596224-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
007596224-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

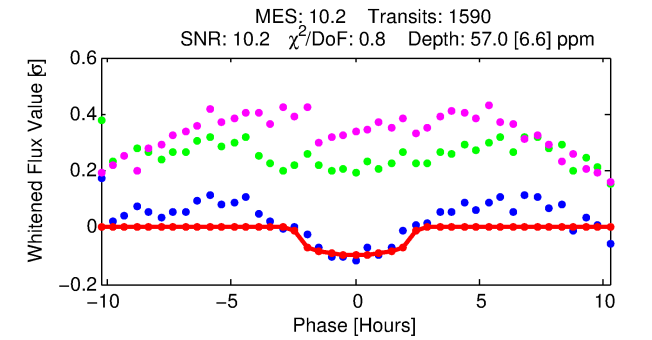
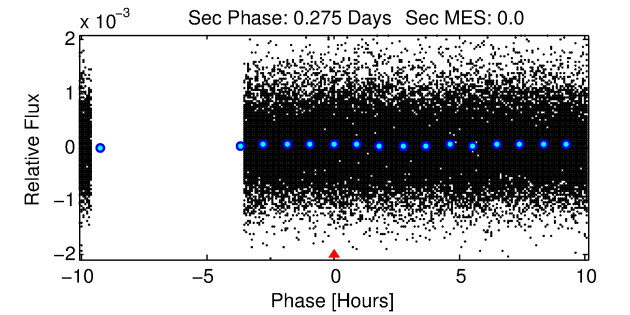
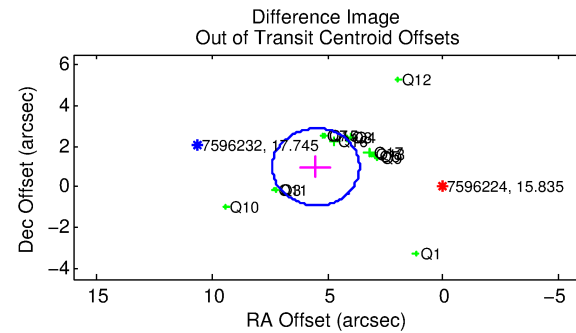
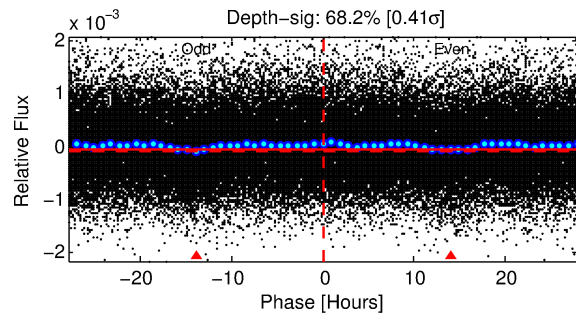
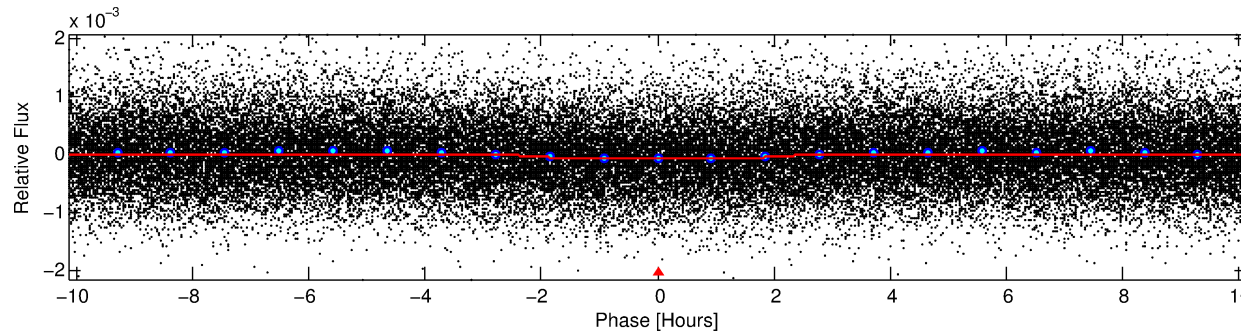
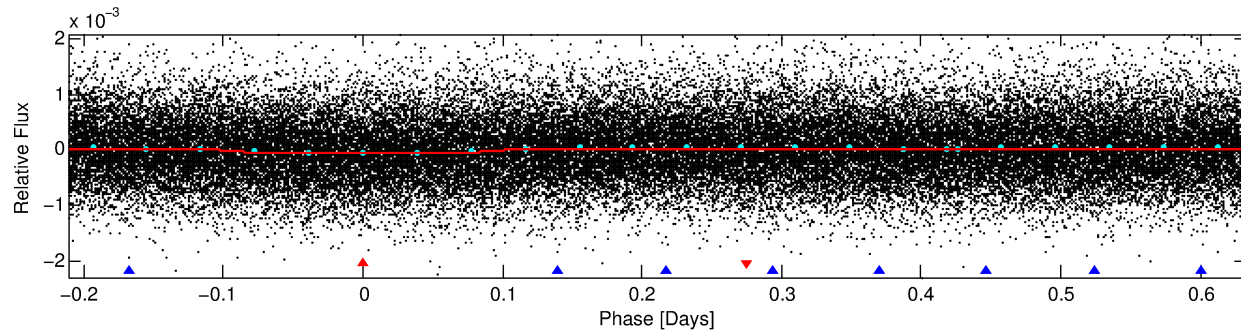
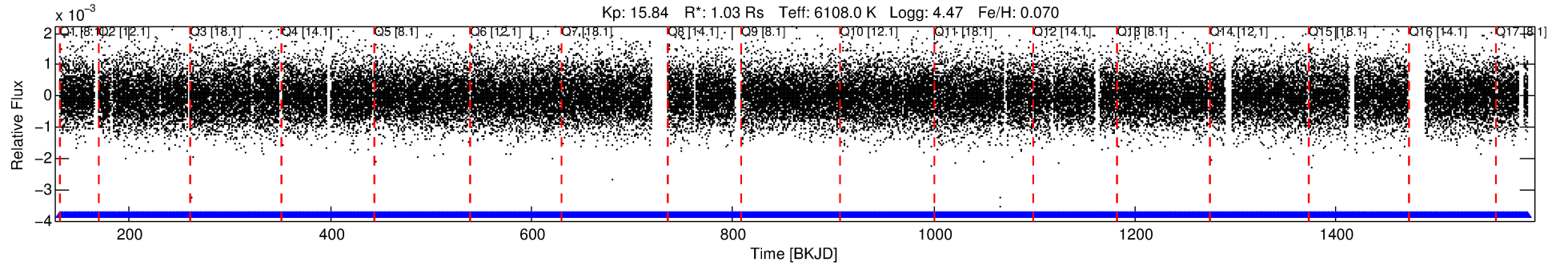
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007596224-01

No Significant Match Found

# DV One-Page Summary

KIC: 7596224 Candidate: 1 of 2 Period: 0.844 d



## DV Fit Results:

Period = 0.84431 [0.00001] d  
Epoch = 131.5986 [0.0052] BKJD  
Rp/R\* = 0.0071 [0.0079]  
a/R\* = 1.44 [3.94]  
b = 0.45 [9.59]  
Seff = 3984.53 [1386.99]  
Teq = 2026 [176] K  
Rp = 0.79 [0.91] Re  
a = 0.0182 [0.0039] AU  
Ag = N/A  
Teffp = N/A

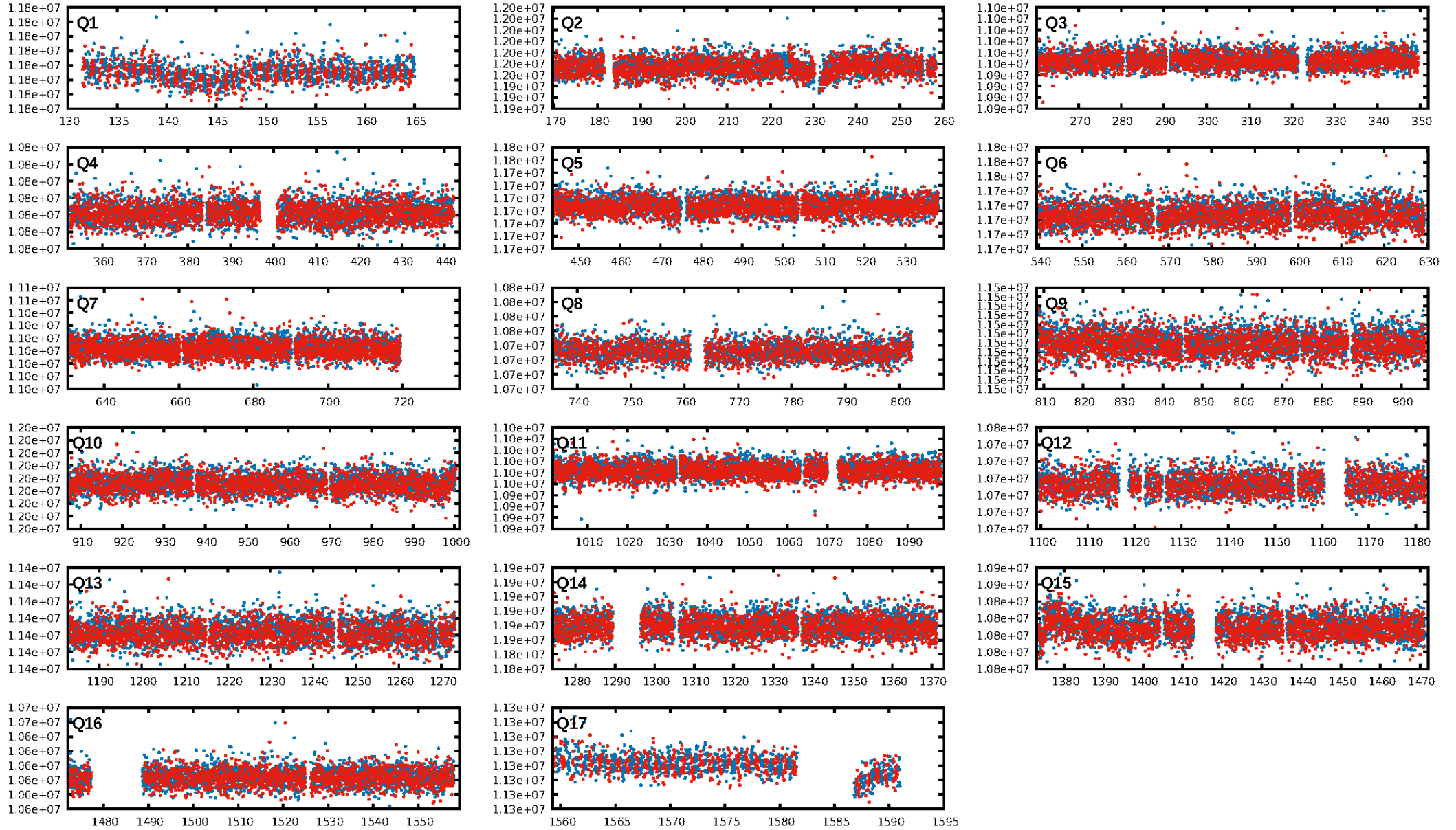
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [697.79 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.04e-19  
RollingBand-fgt: 1.00 [1518/1518]  
GhostDiagnostic-chr: -1.387  
Centroid-sig: 0.0%  
Centroid-so: 7.020 arcsec [4.90 $\sigma$ ]  
OotOffset-rm: 5.589 arcsec [8.90 $\sigma$ ]  
KicOffset-rm: 5.576 arcsec [8.91 $\sigma$ ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 0.21 [3/14]  
DiffImageOverlap-fno: 1.00 [17/17]

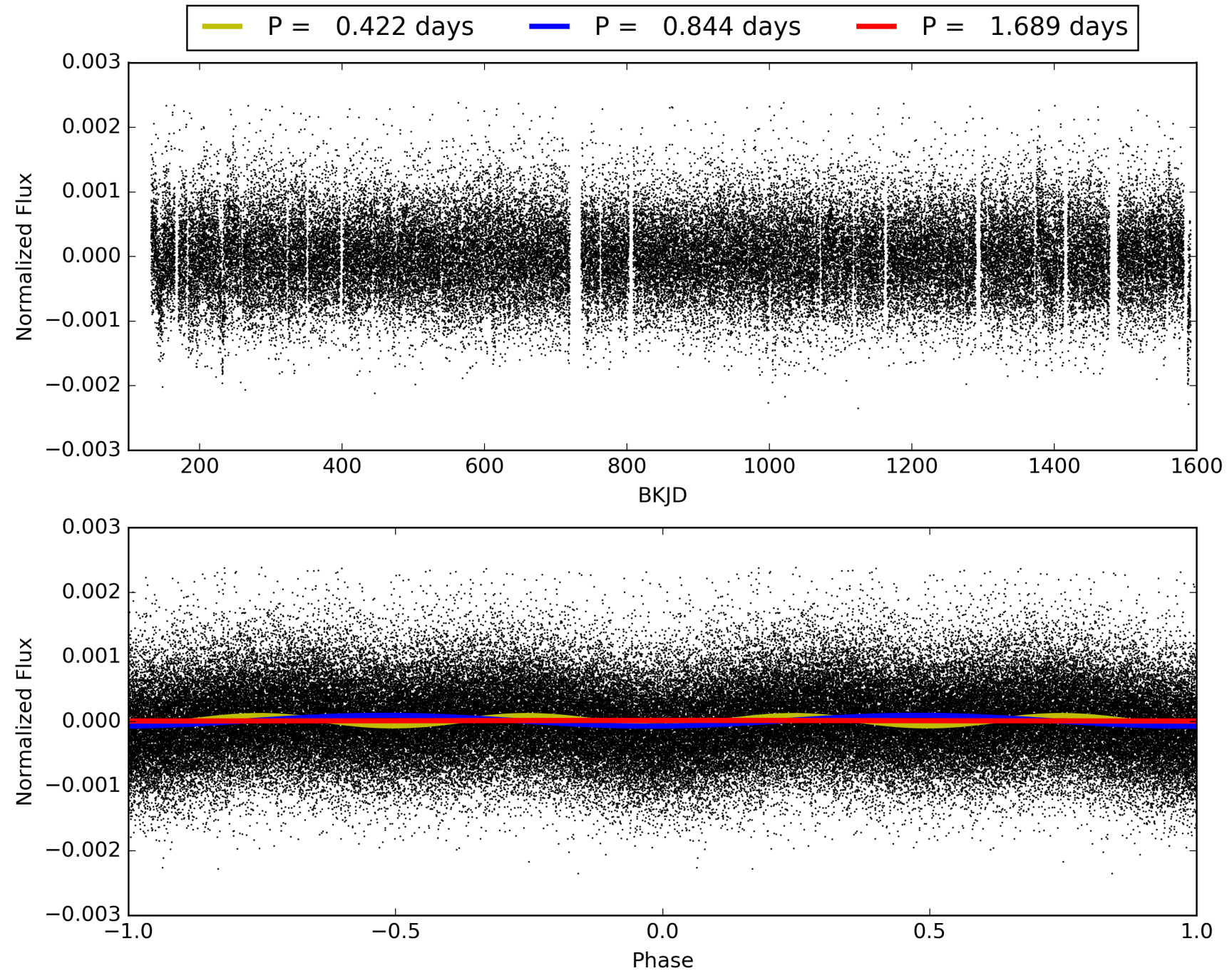
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 07:06:53 Z

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

# TCE 007596224-01, PDC Light Curves



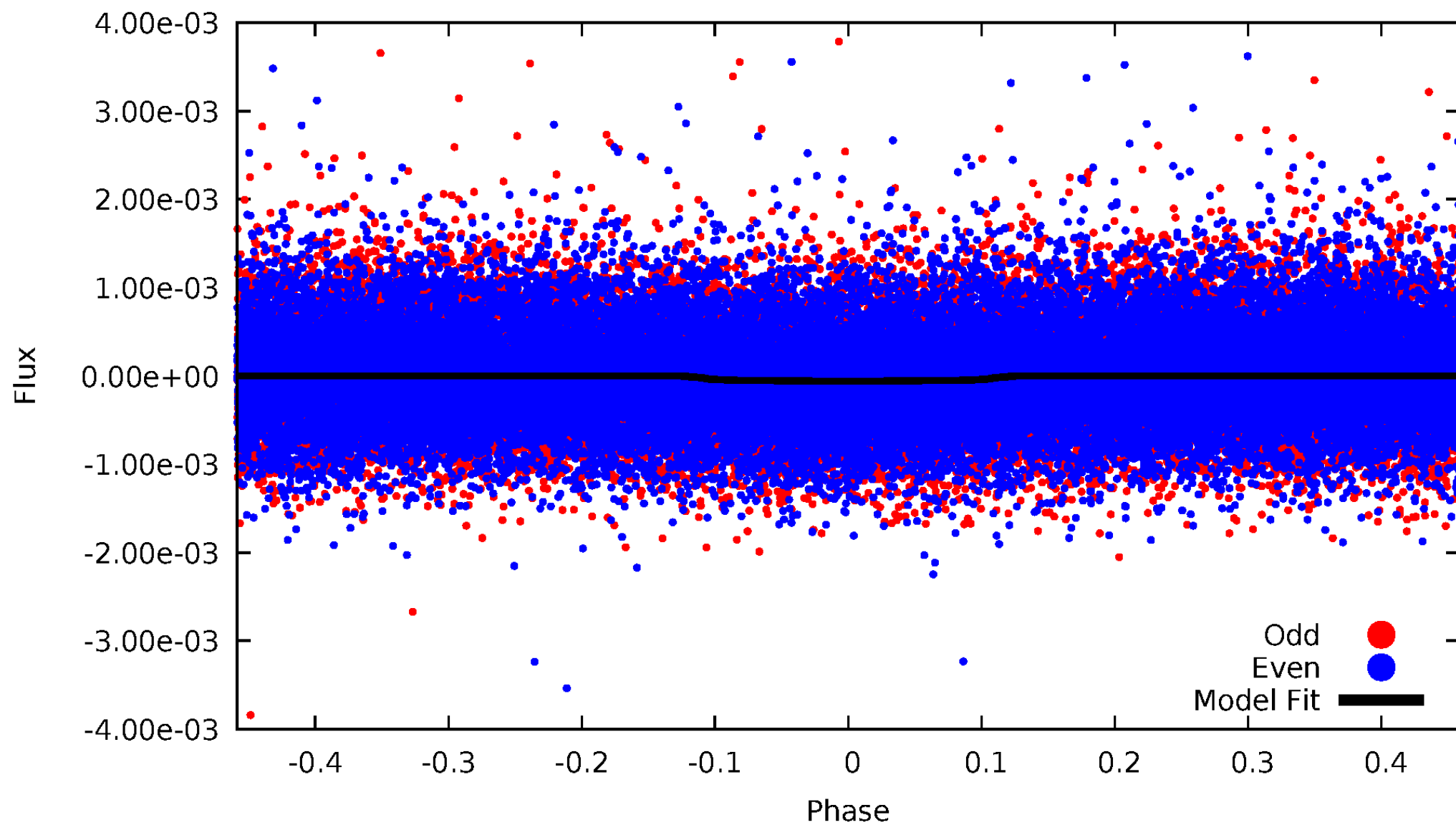
TCE 007596224-01





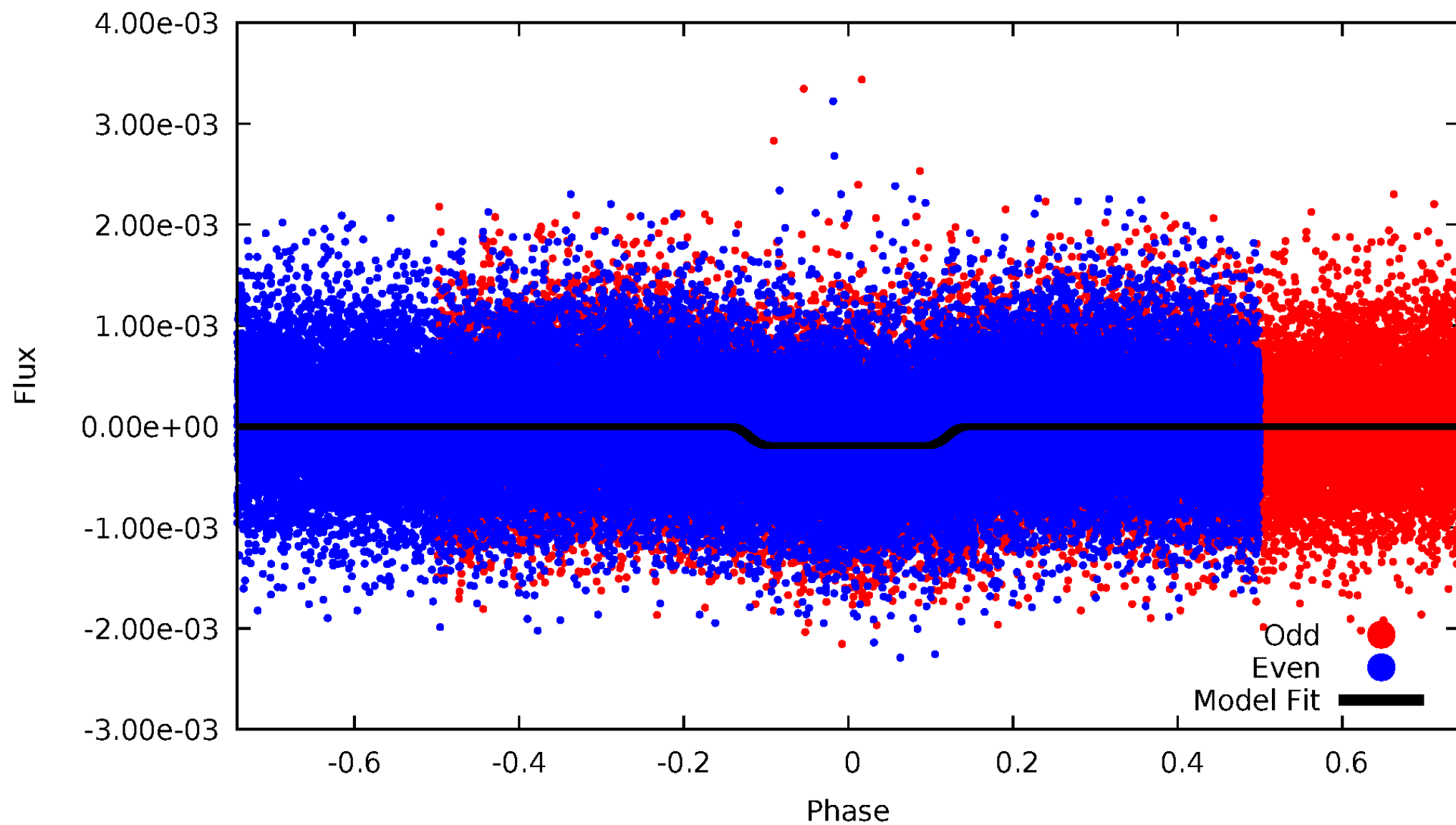
# DV Odd/Even

TCE 007596224-01



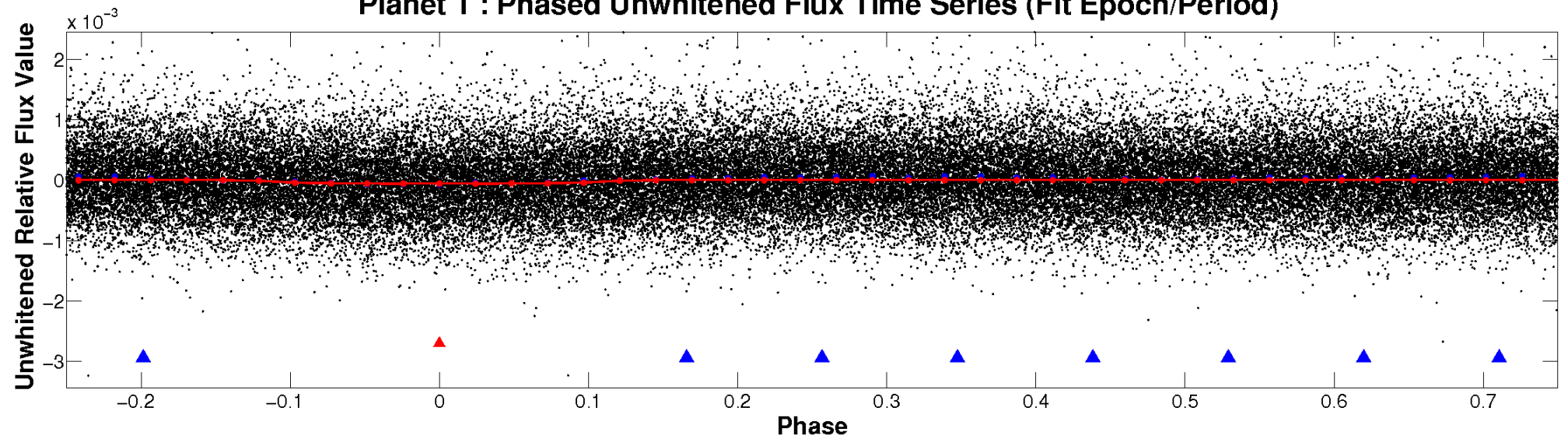
# ALT Odd/Even

TCE 007596224-01

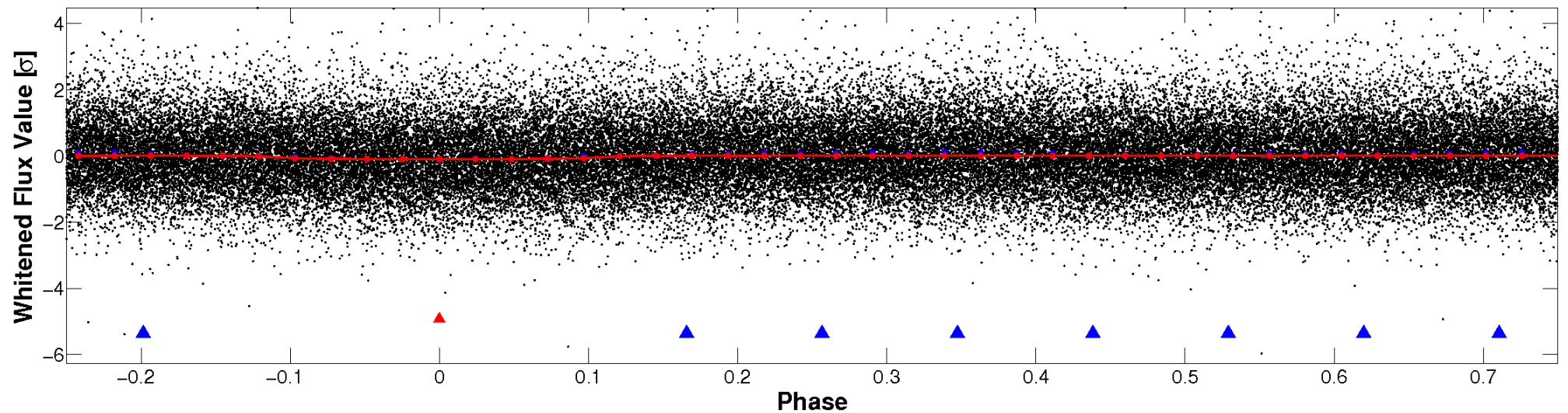


# Non-Whitened Vs. Whitened Light Curve

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

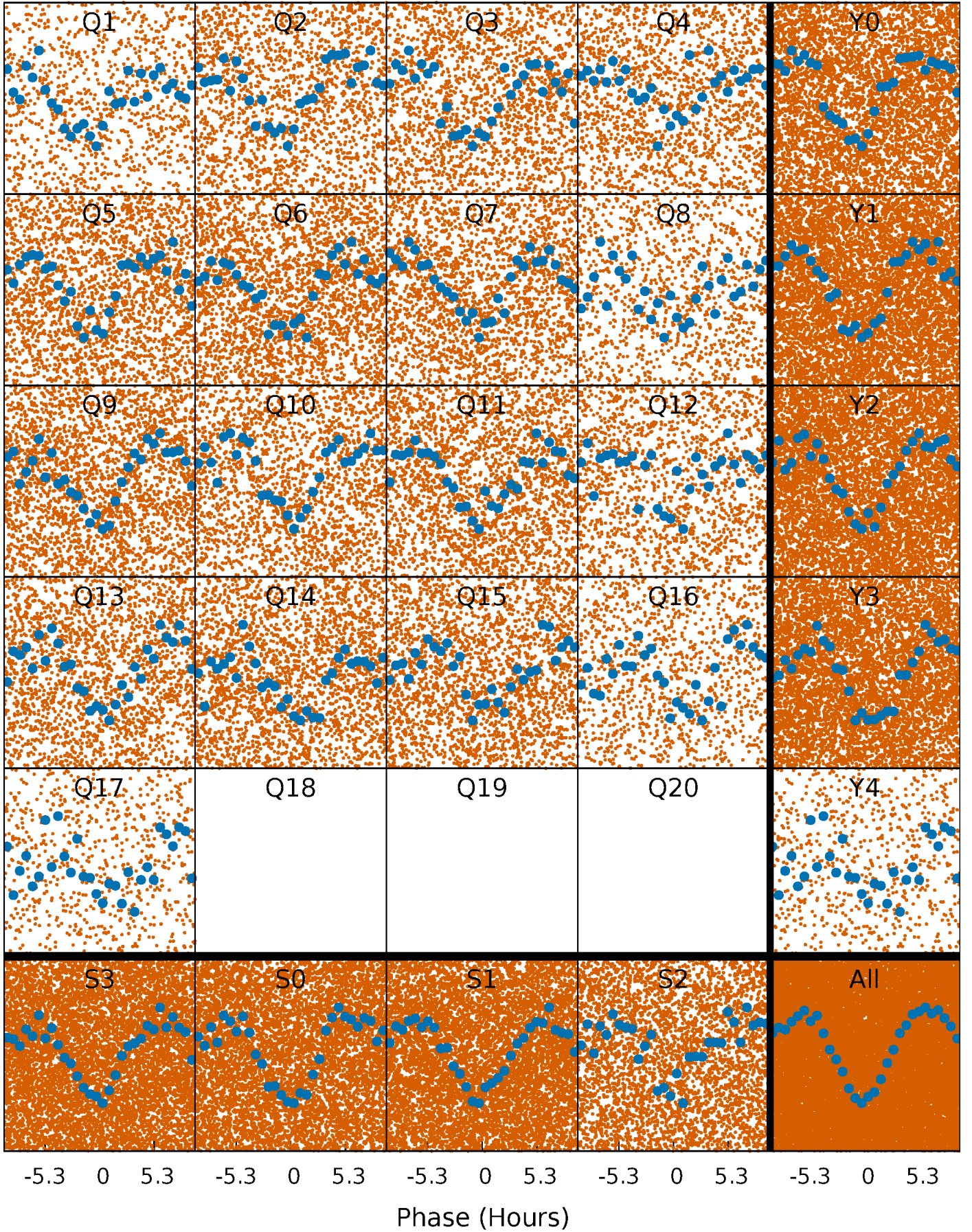


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

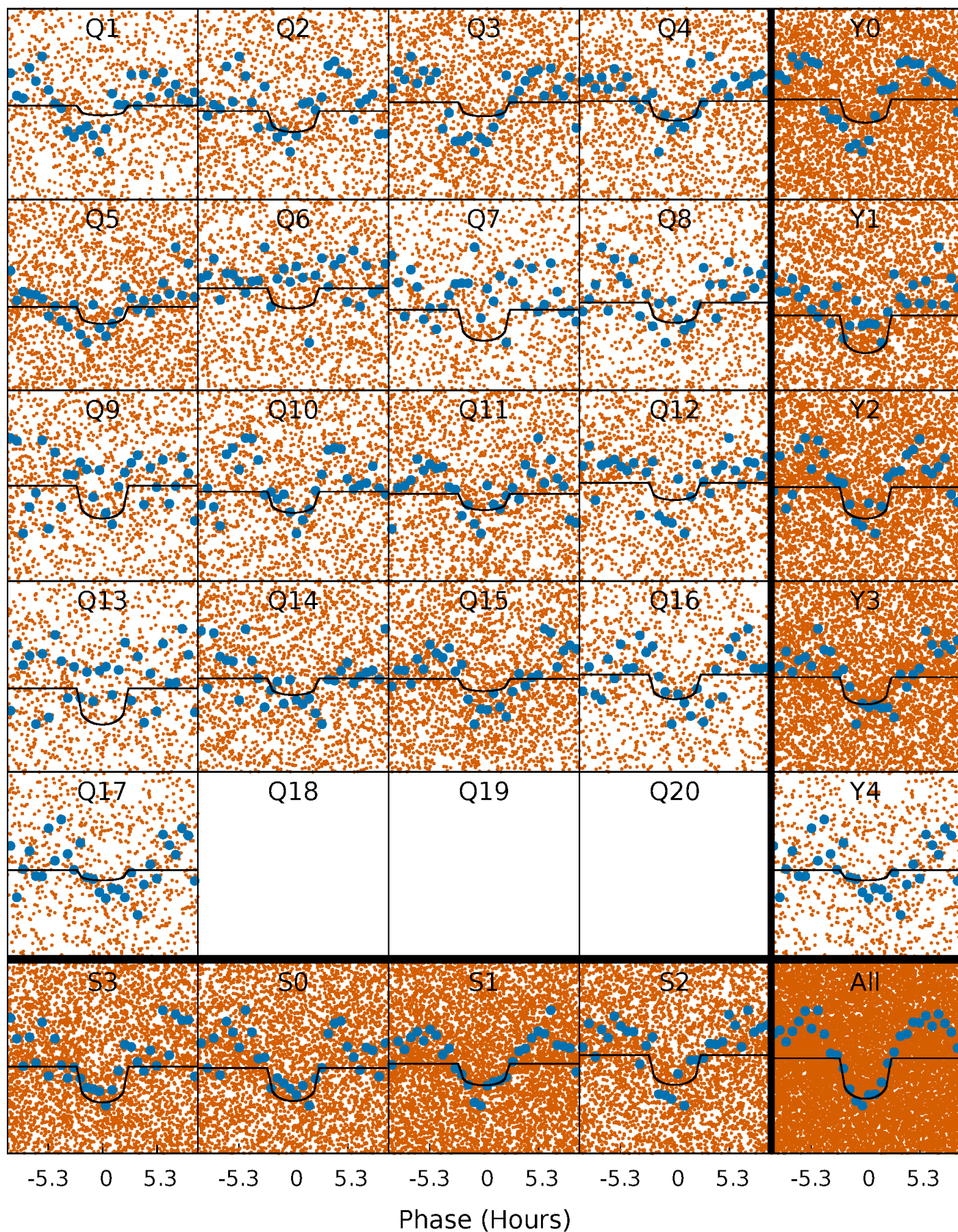
TCE 007596224-01   P= 0.844314 Days    $T_0=131.598576$  (BKJD)





# DV Quarter-Phased Transit Curves

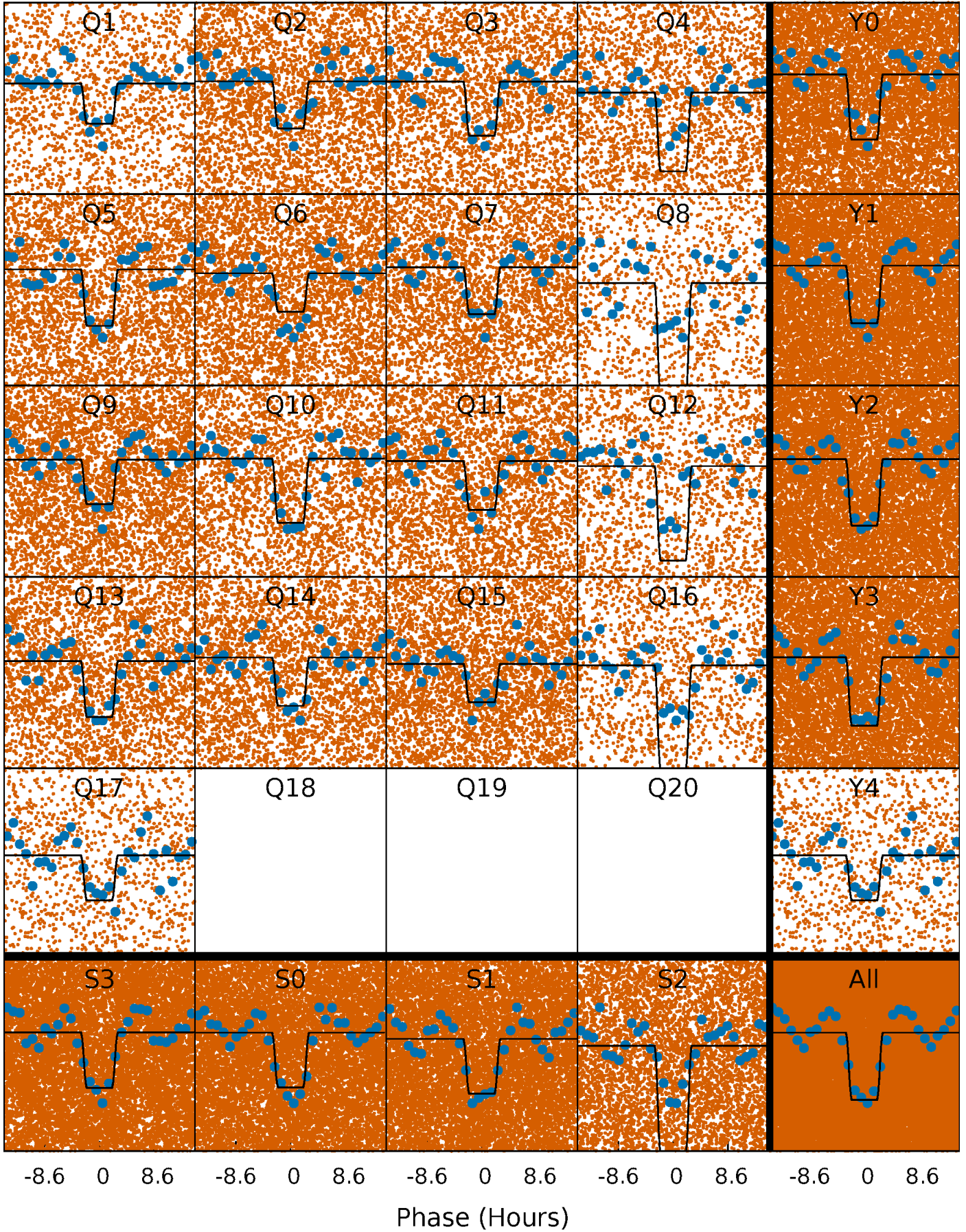
TCE 007596224-01 P= 0.844314 Days  $T_0=131.598576$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

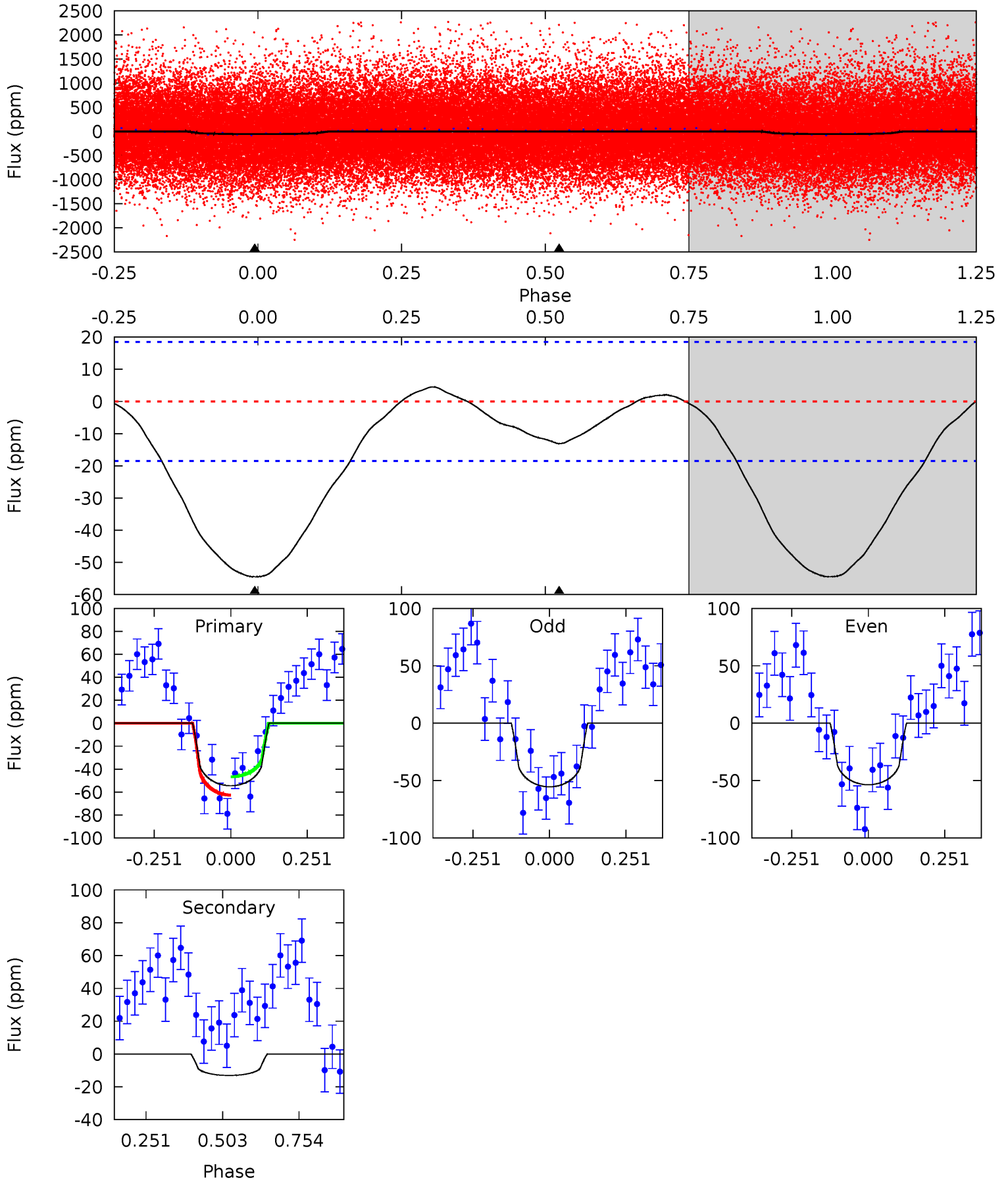
TCE 007596224-01   P= 0.844367 Days    $T_0=131.544571$  (BKJD)



# DV Model-Shift Uniqueness Test

007596224-01, P = 0.844314 Days, E = 130.754262 Days

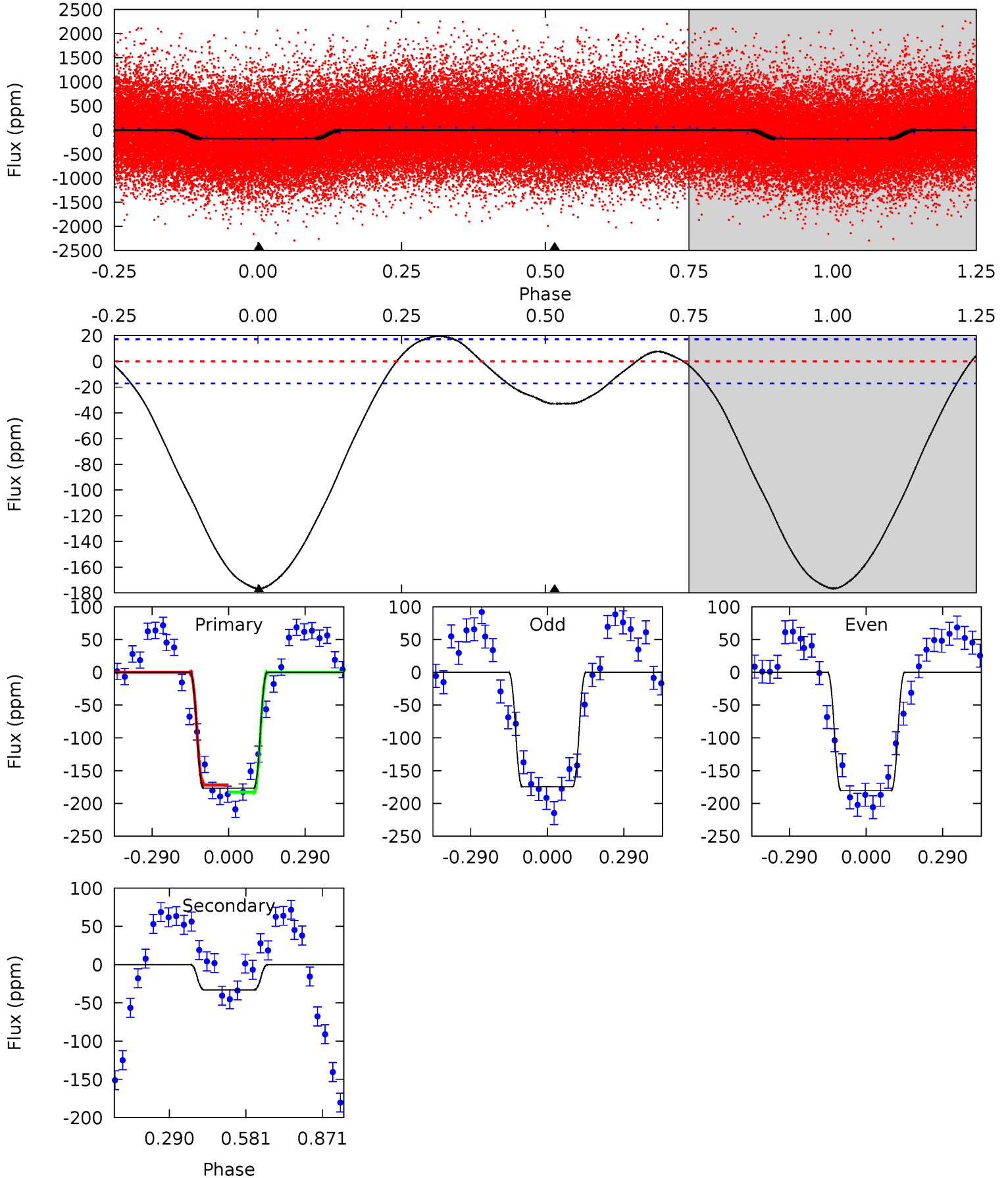
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	3.10	0	0	4.37	1.15	0.62	12.9	12.9	3.10	3.10	0.21	1.00	0.08	1.86



# Alt Model-Shift Uniqueness Test

007596224-01, P = 0.844367 Days, E = 130.700204 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
44.6	8.33	0	0	4.34	1.06	2.46	44.6	44.6	8.33	8.33	0.71	1.01	0.10	1.37





### Stellar Parameters For KIC 007596224

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6108^{+171}_{-214}$	$4.466^{+0.055}_{-0.176}$	$0.070^{+0.250}_{-0.350}$	$1.030^{+0.261}_{-0.112}$	$1.132^{+0.109}_{-0.164}$	$1.457^{+0.406}_{-0.666}$
	+3%/-4%	+1%/-4%	+357%/-500%	+25%/-11%	+10%/-14%	+28%/-46%
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 007596224-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-13 \pm 4$	$1.02^{+0.86}_{-0.64}$	$2882^{+170}_{-141}$	$4081^{+2134}_{-994}$	$2.187^{+13.575}_{-1.543}$
Alt.	$-33 \pm 4$	$1.60^{+0.98}_{-0.80}$	$2891^{+167}_{-135}$	$4051^{+1490}_{-704}$	$2.219^{+7.158}_{-1.338}$

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

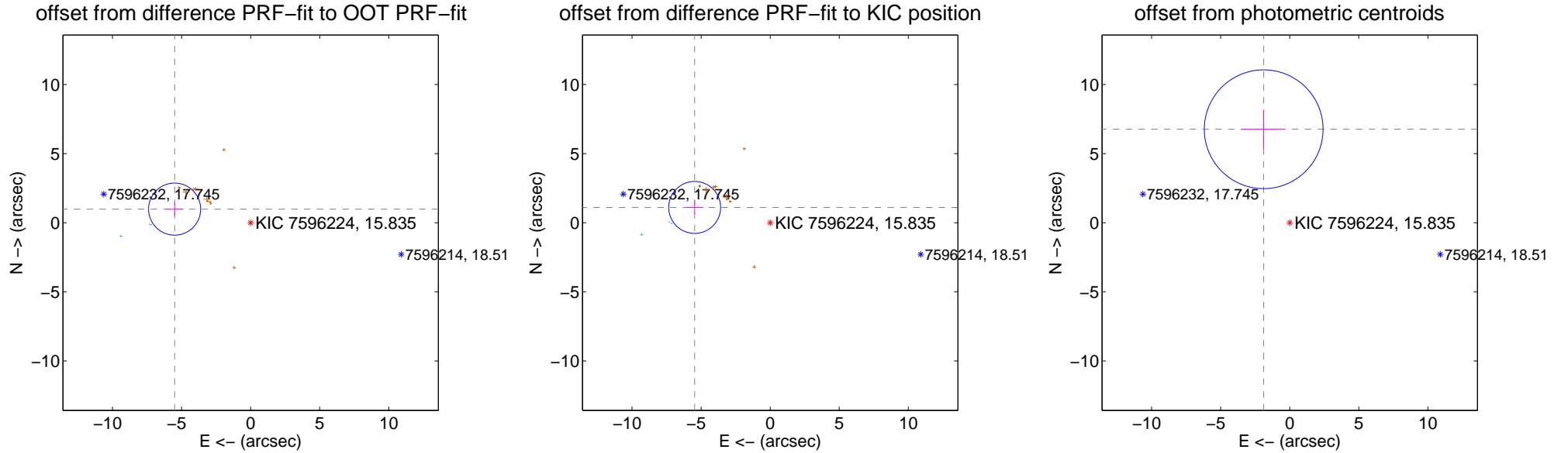
## DV Centroid Data

Supplemental centroid analysis for 007596224-01. Kepler magnitude: 15.84. Transit SNR 10.23

There are 3 quarters with good PRF difference image offsets

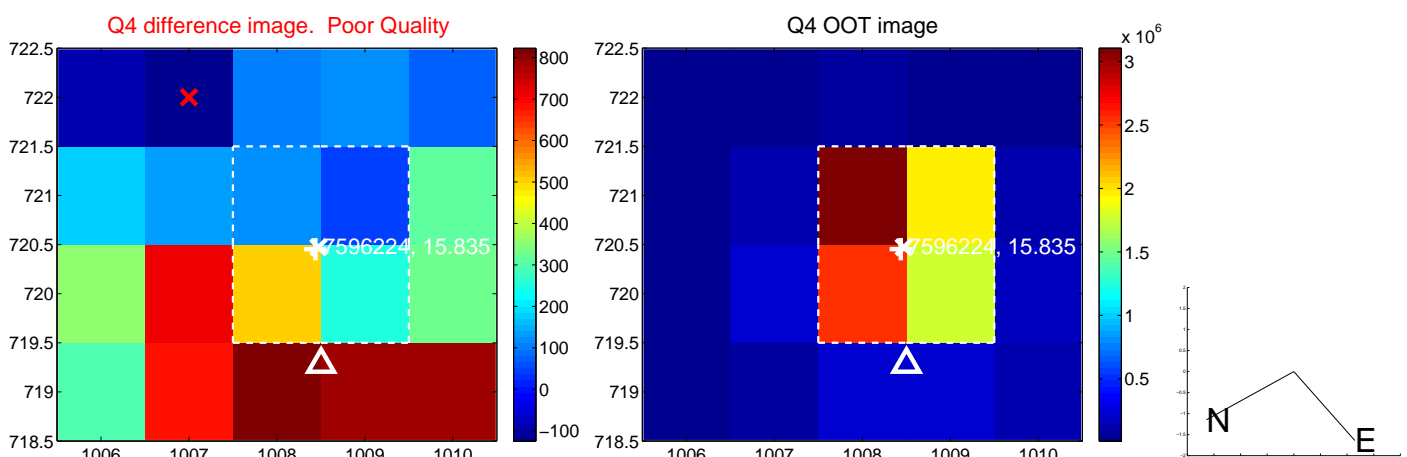
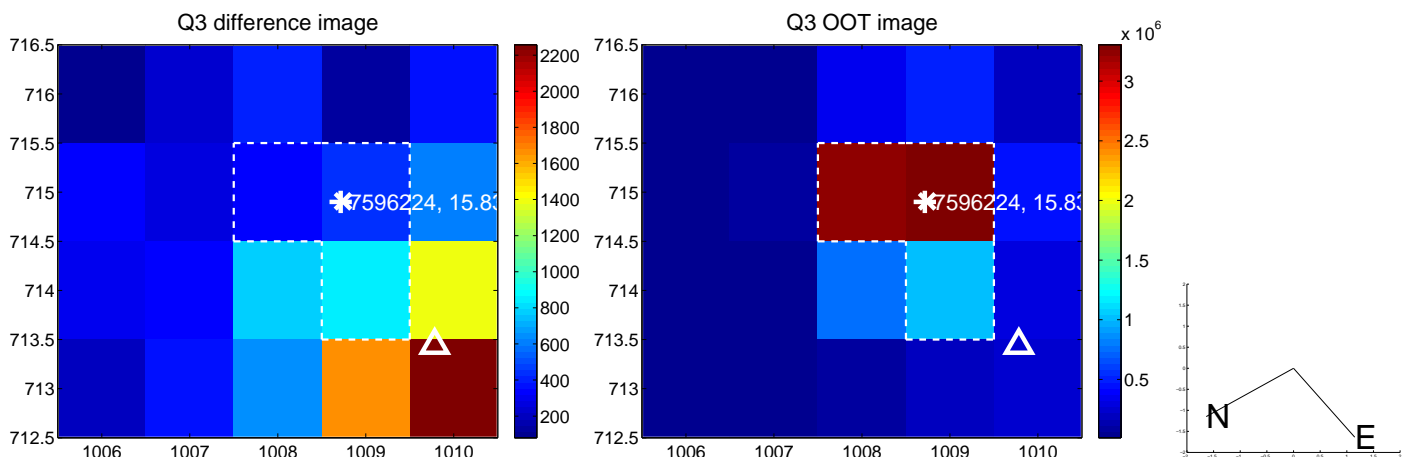
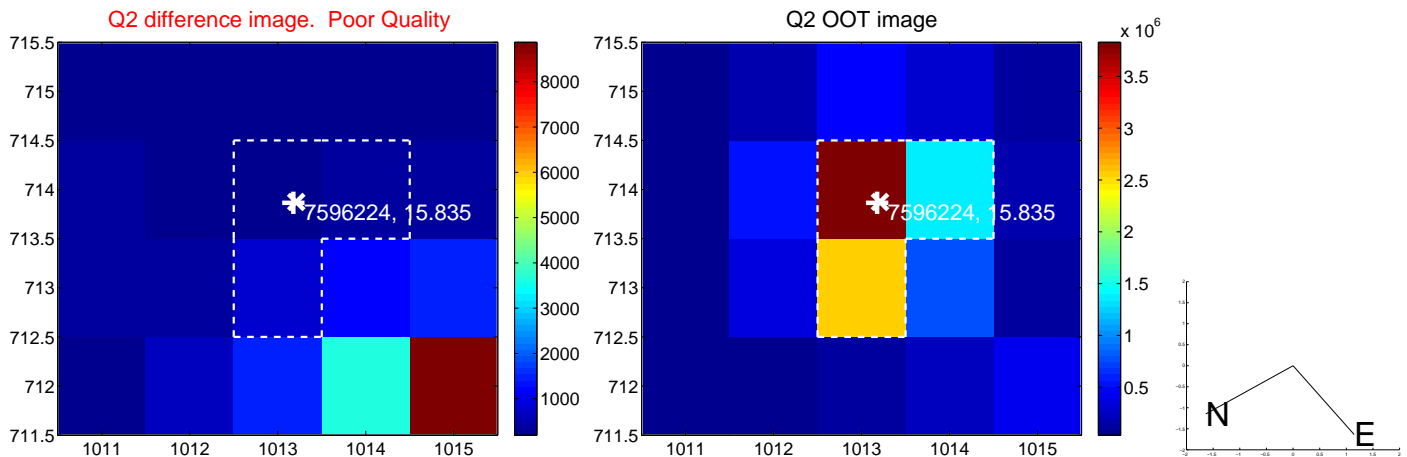
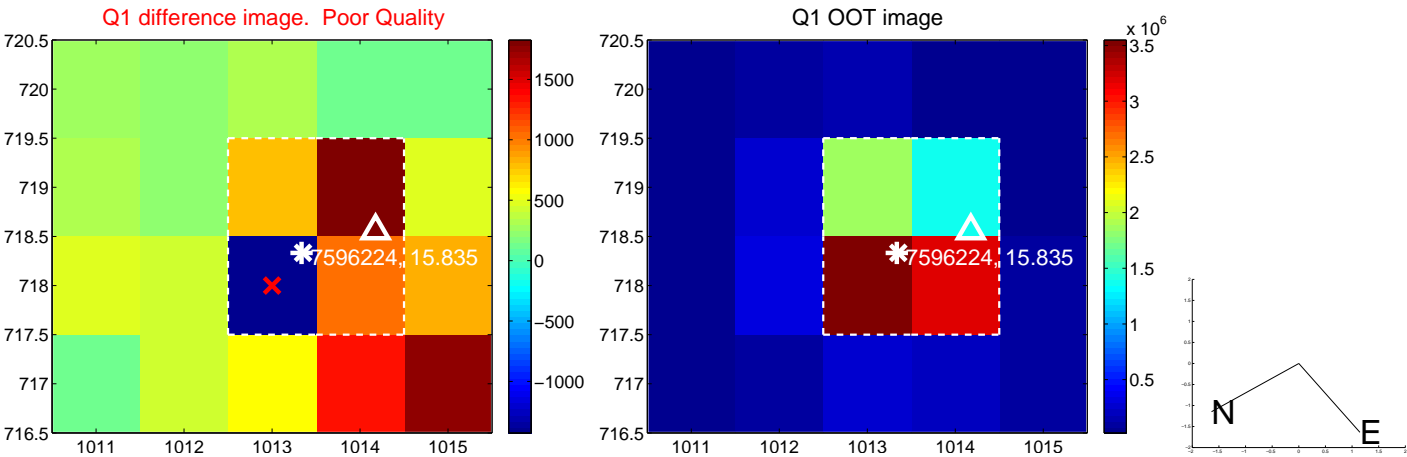
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.589 \pm 0.628$	8.90	$5.502 \pm 0.632$	$0.982 \pm 0.495$
PRF-fit source offset from KIC position	$5.576 \pm 0.626$	8.91	$5.466 \pm 0.631$	$1.105 \pm 0.494$
photometric centroid source offset	$7.02 \pm 1.43$	4.90	$1.89 \pm 1.55$	$6.76 \pm 1.42$

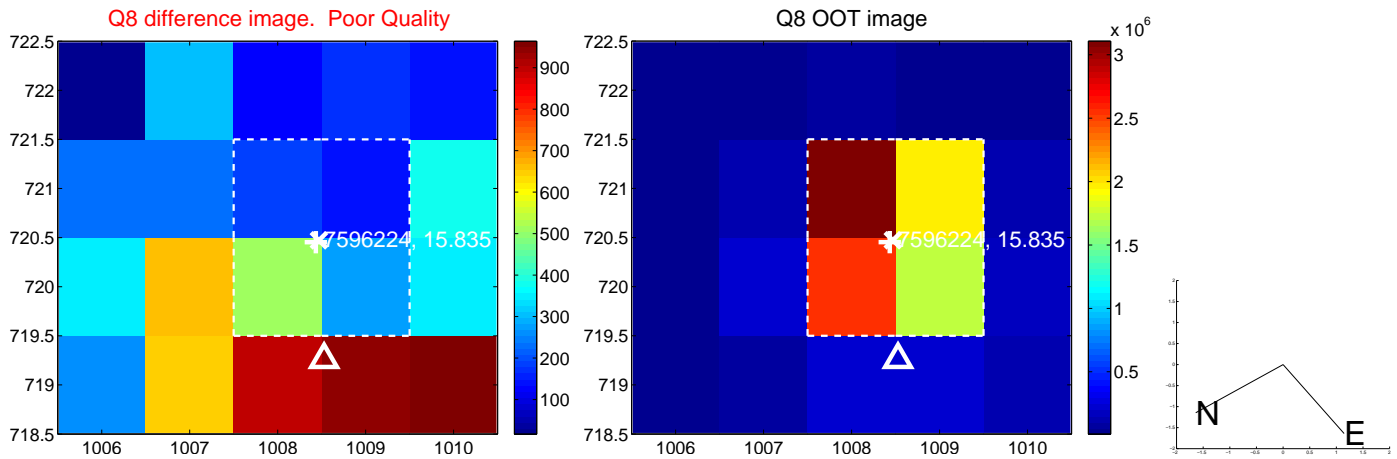
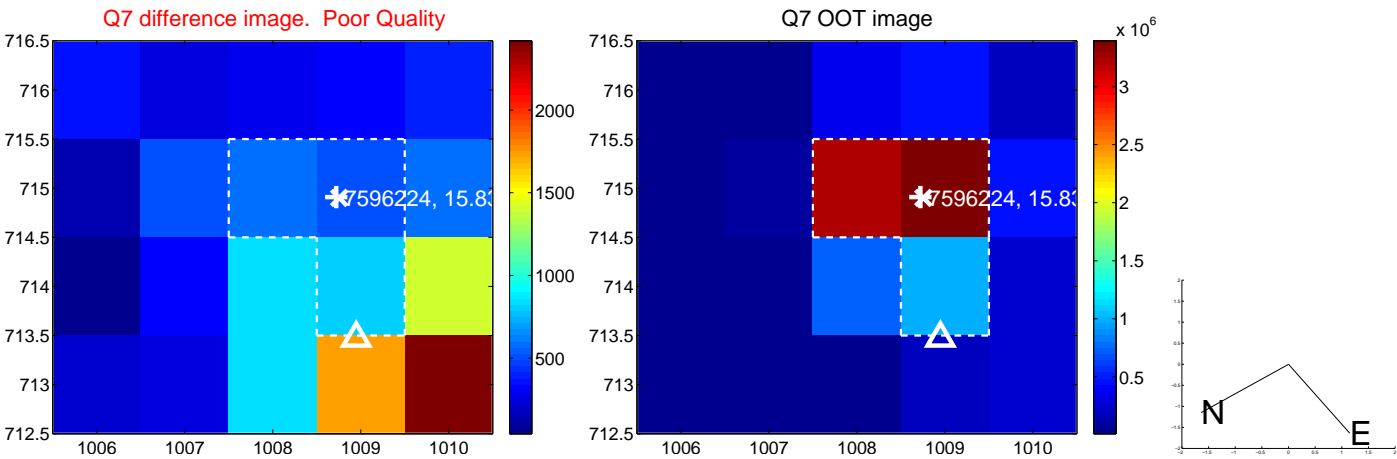
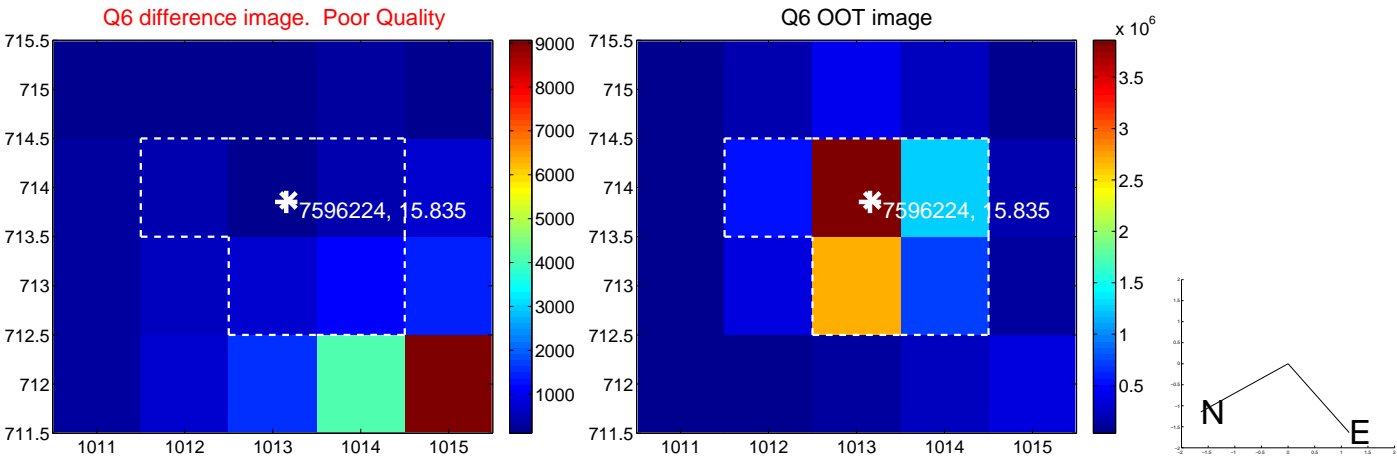
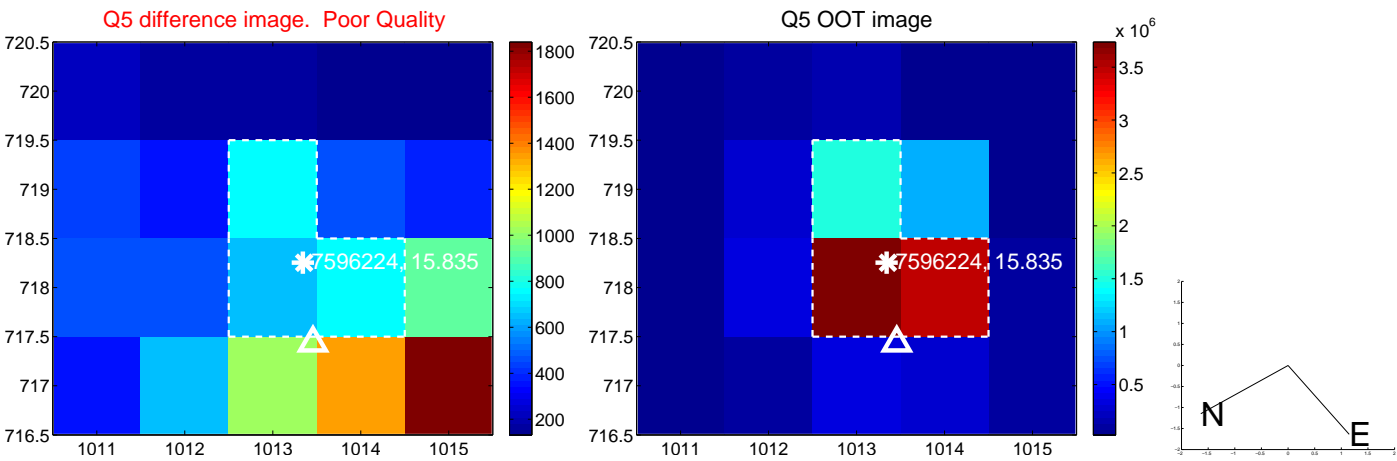


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

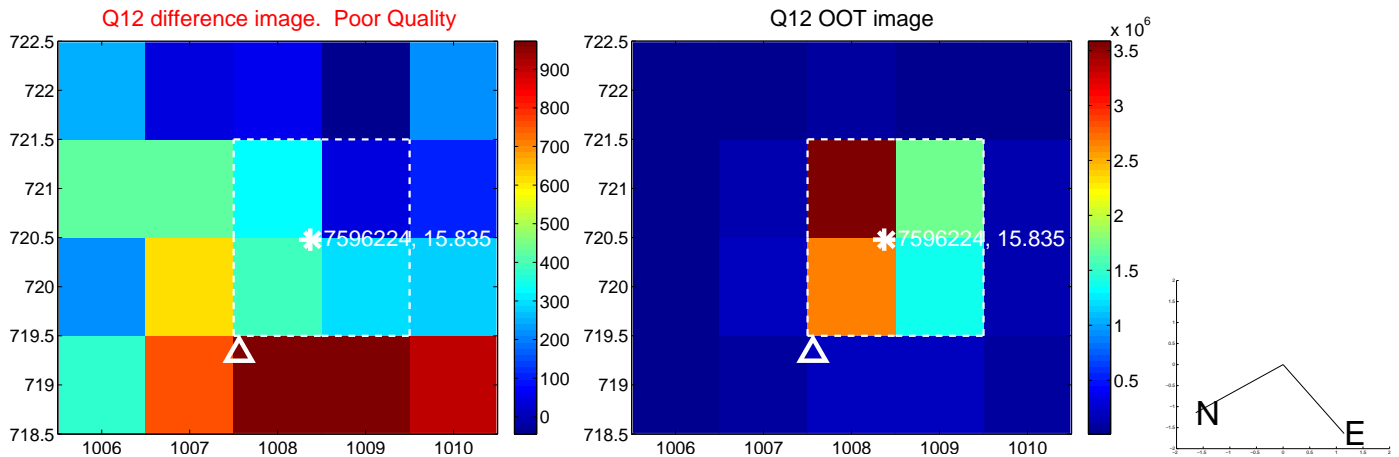
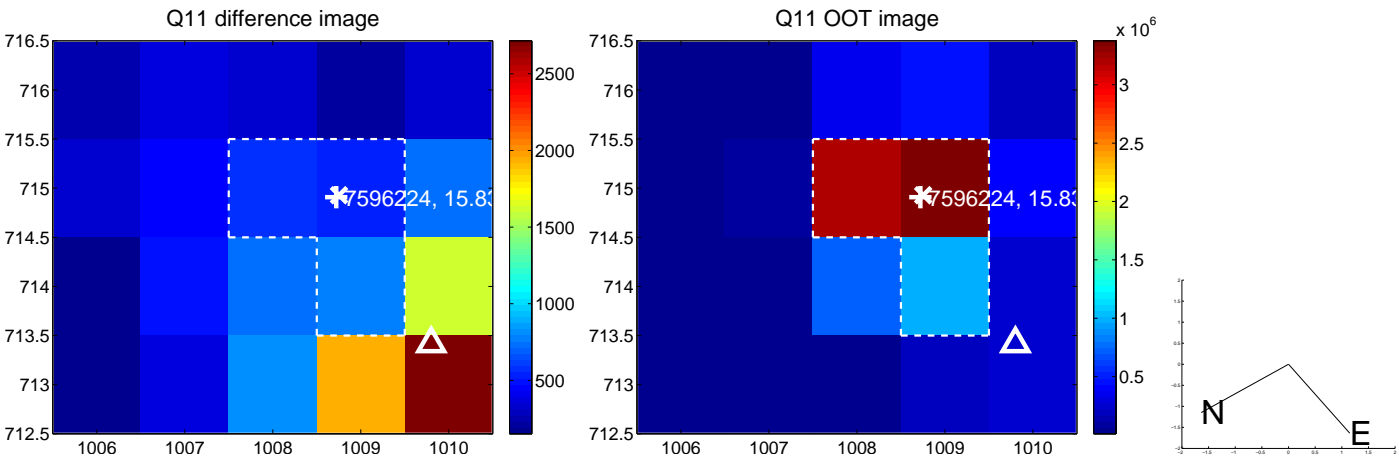
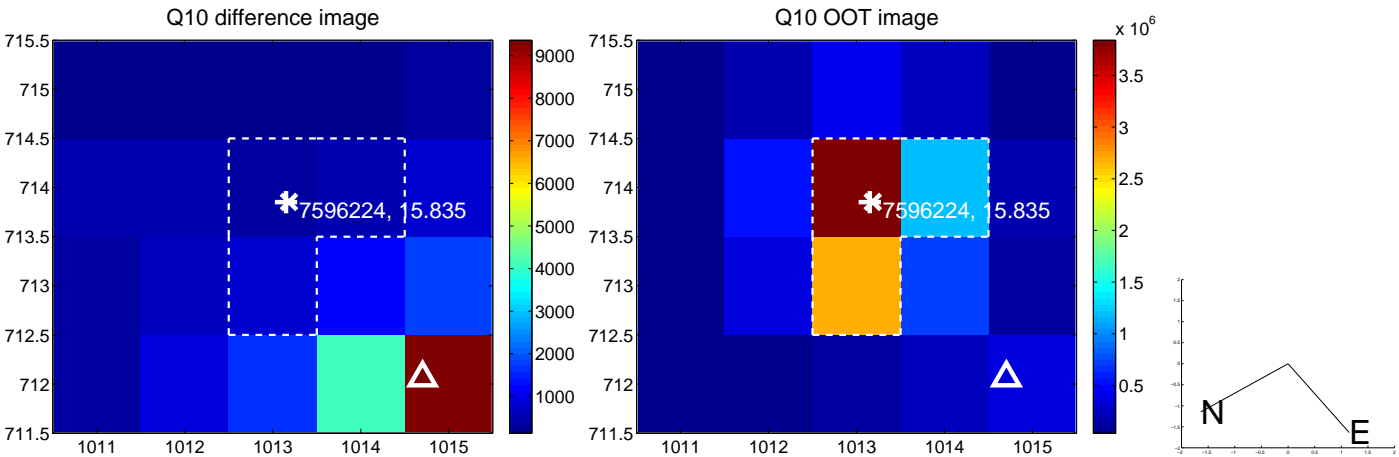
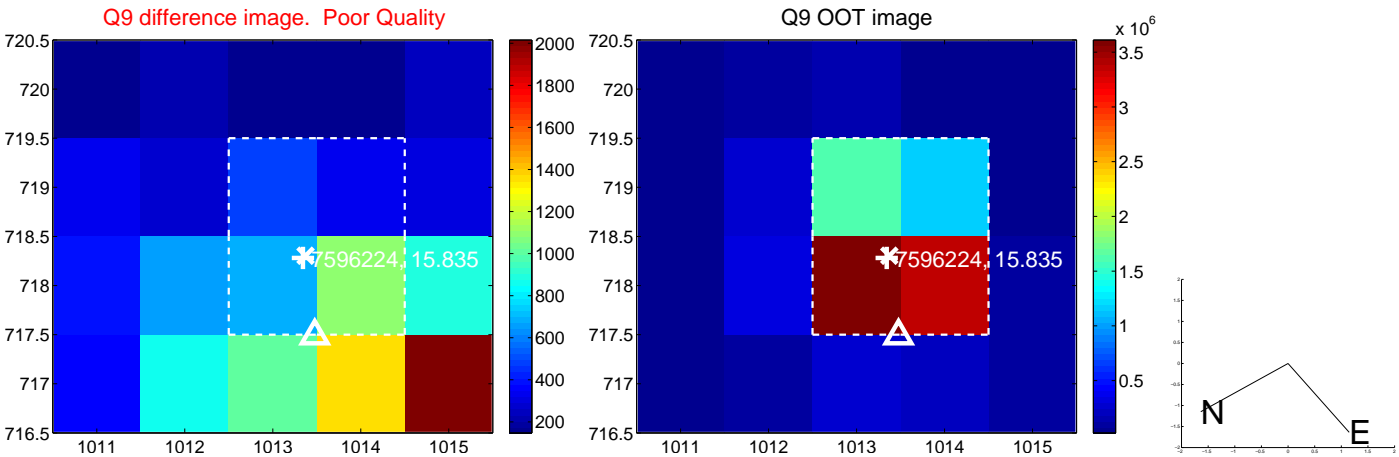


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

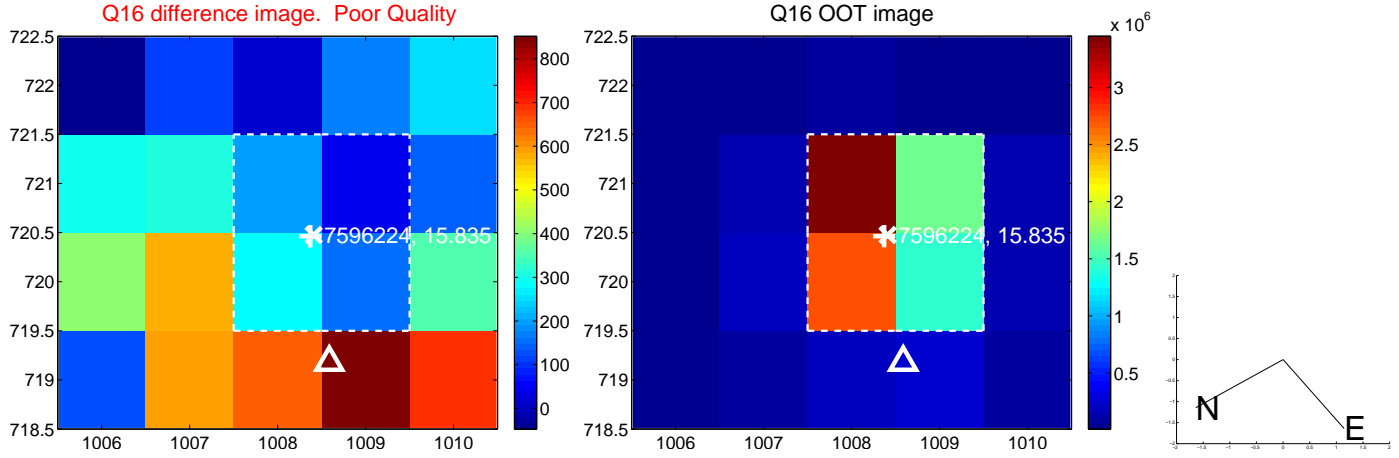
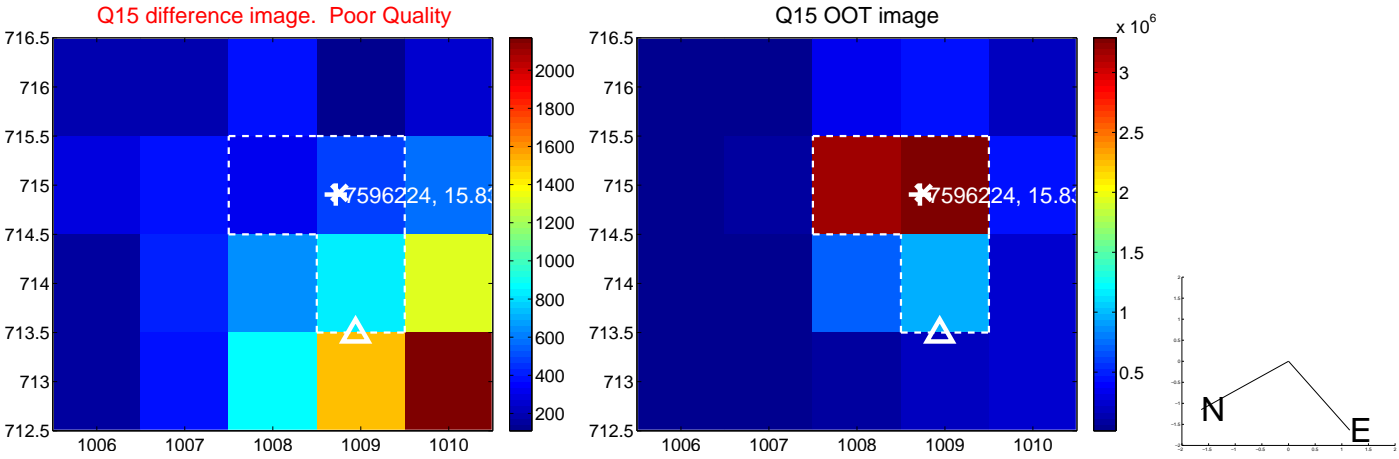
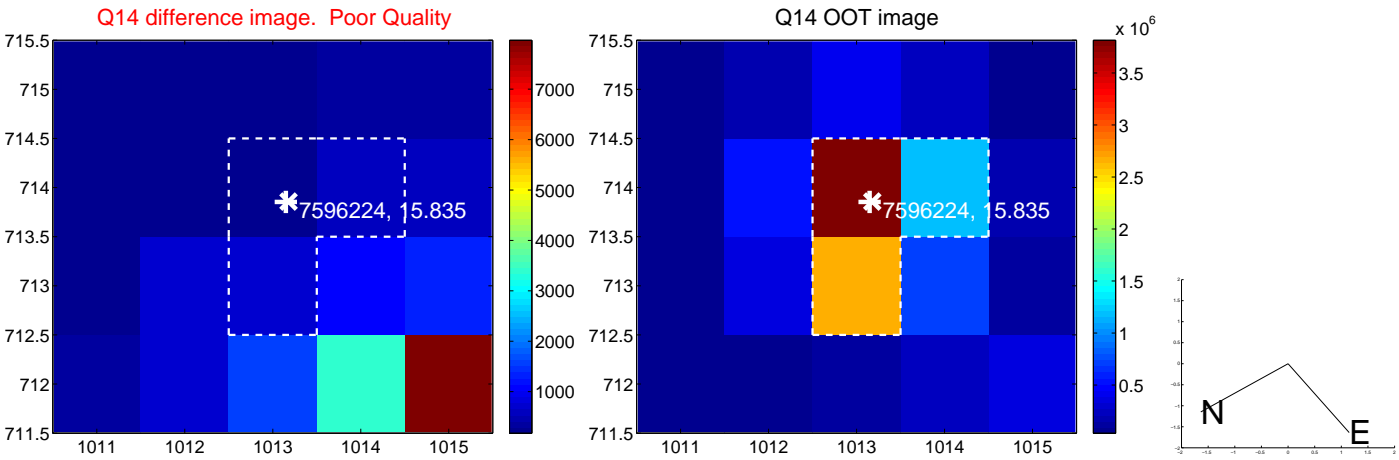
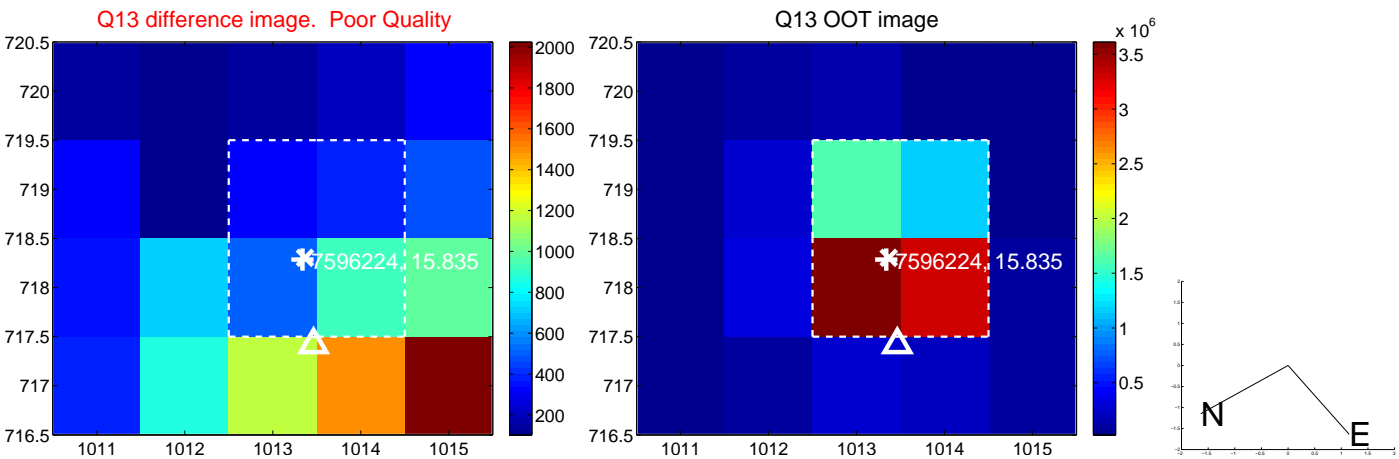




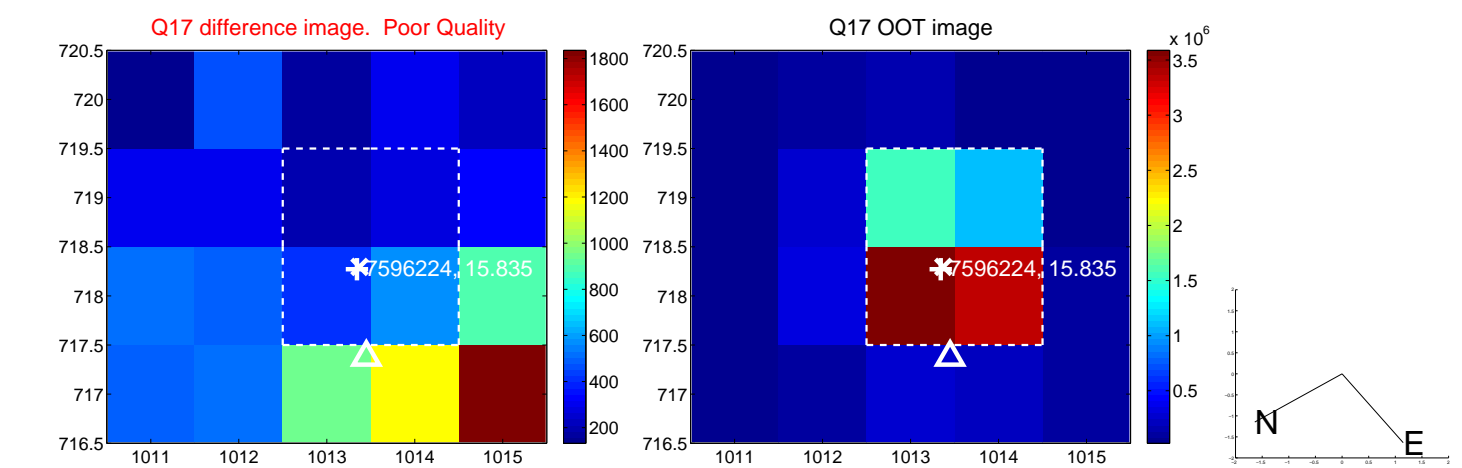
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



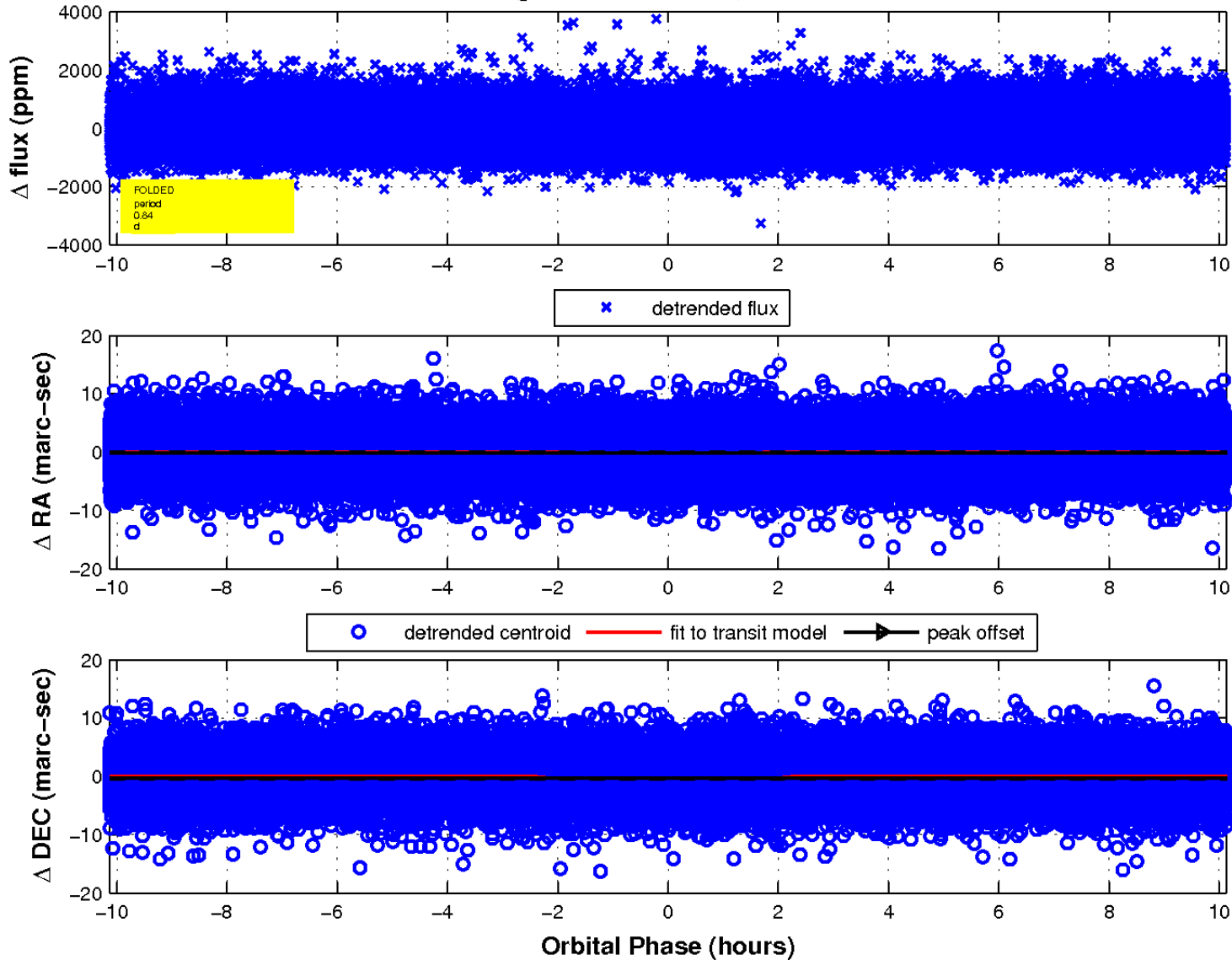
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

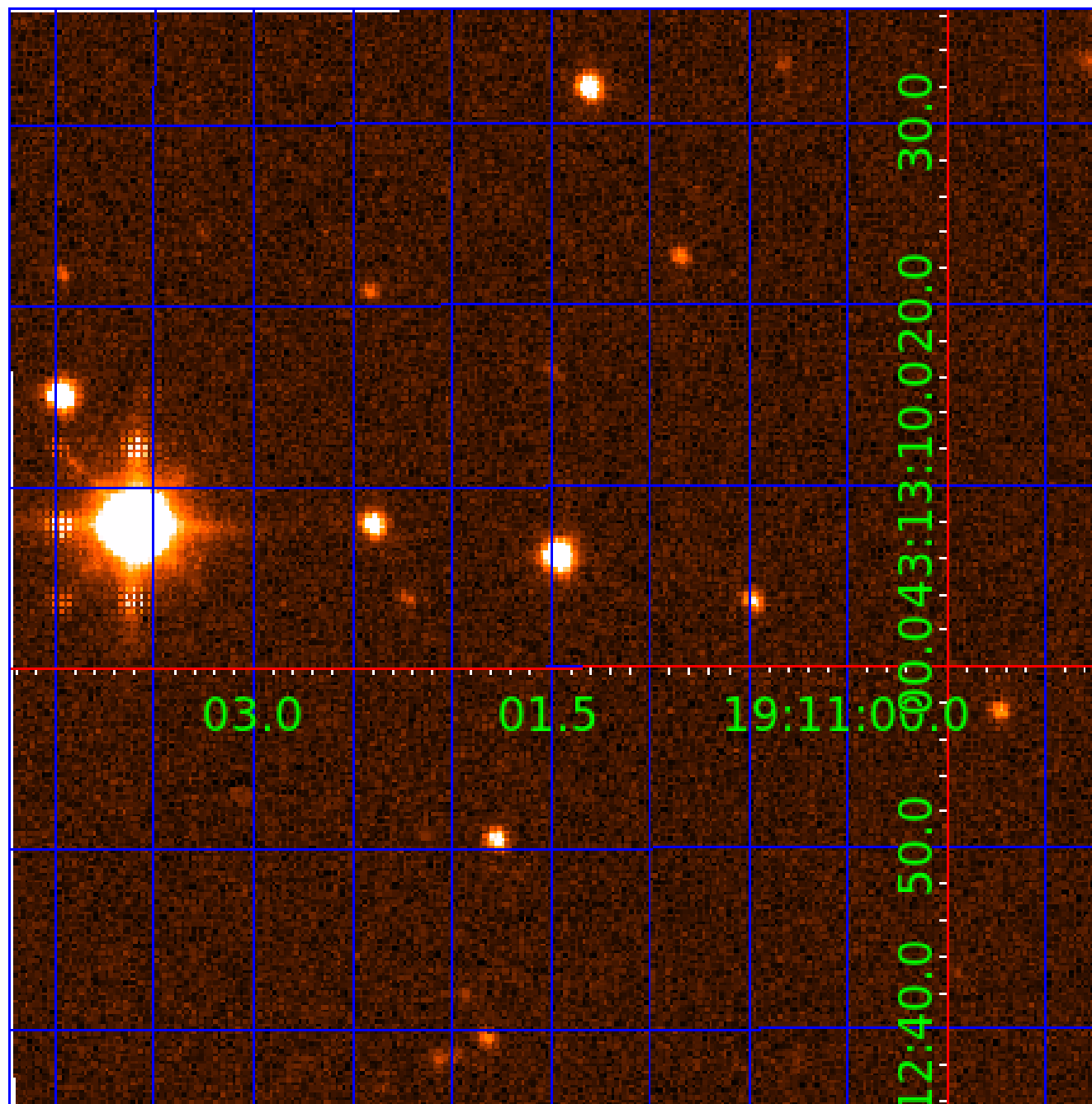


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 007596224

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007596224-01	OBS	No	0.844314	131.598576	57.0	4.646	10.2	10.2	1.03	6108	0.79	3984.53
007596224-02	OBS	No	193.271225	164.359206	901.6	4.714	7.6	8.0	1.03	6108	3.83	2.85

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007596224-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
007596224-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

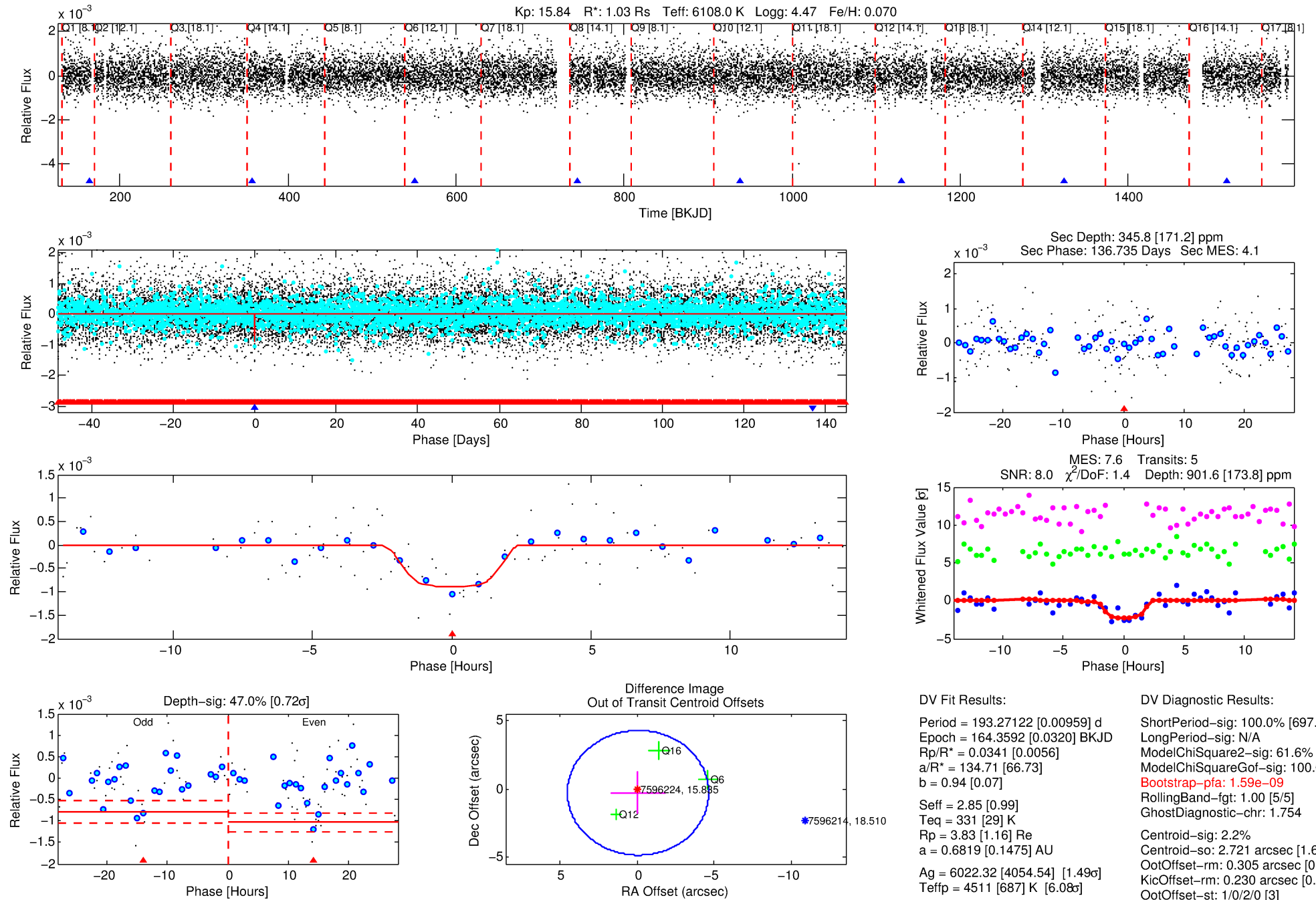
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007596224-02

No Significant Match Found

# DV One-Page Summary

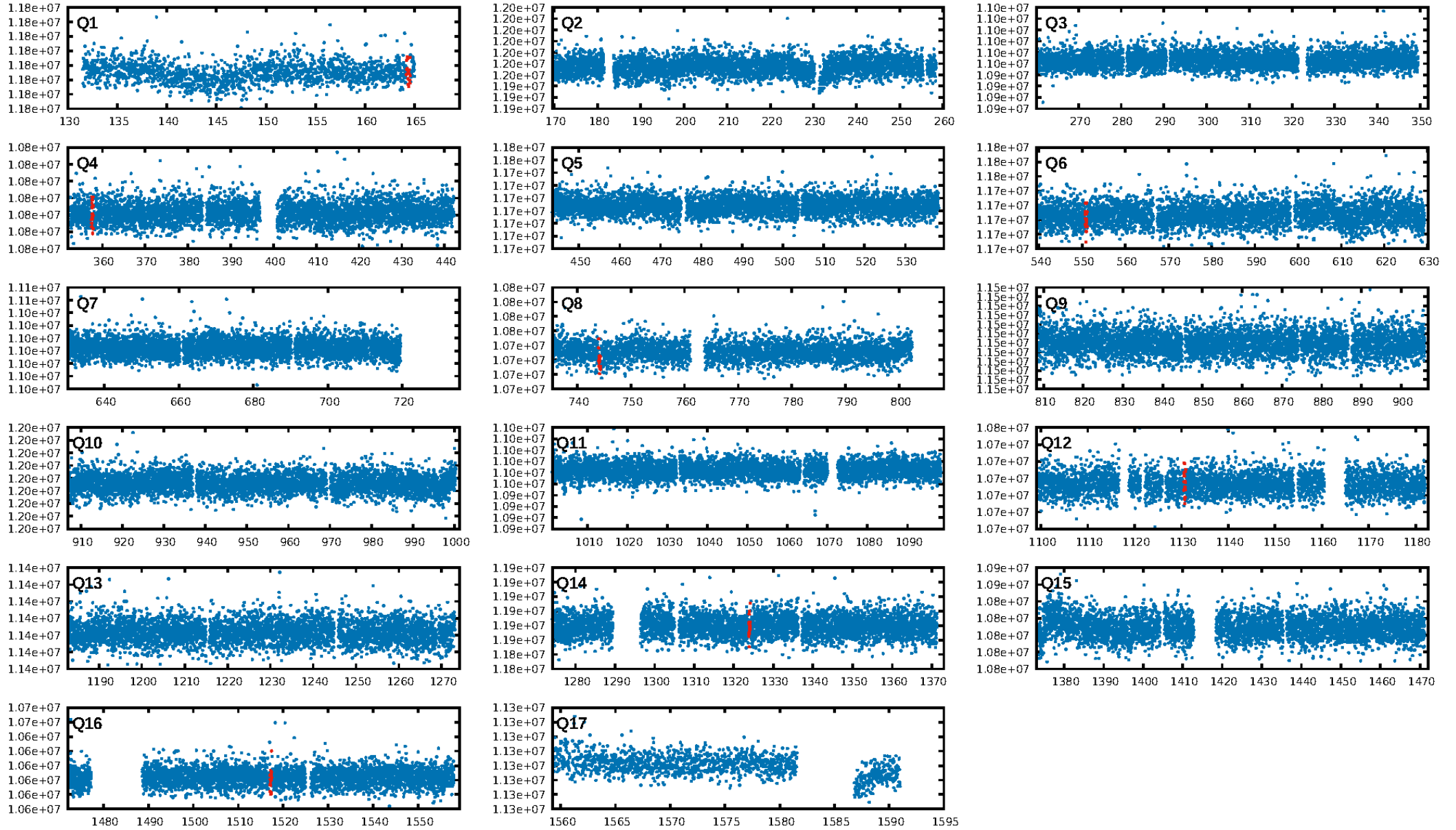
KIC: 7596224 Candidate: 2 of 2 Period: 193.271 d



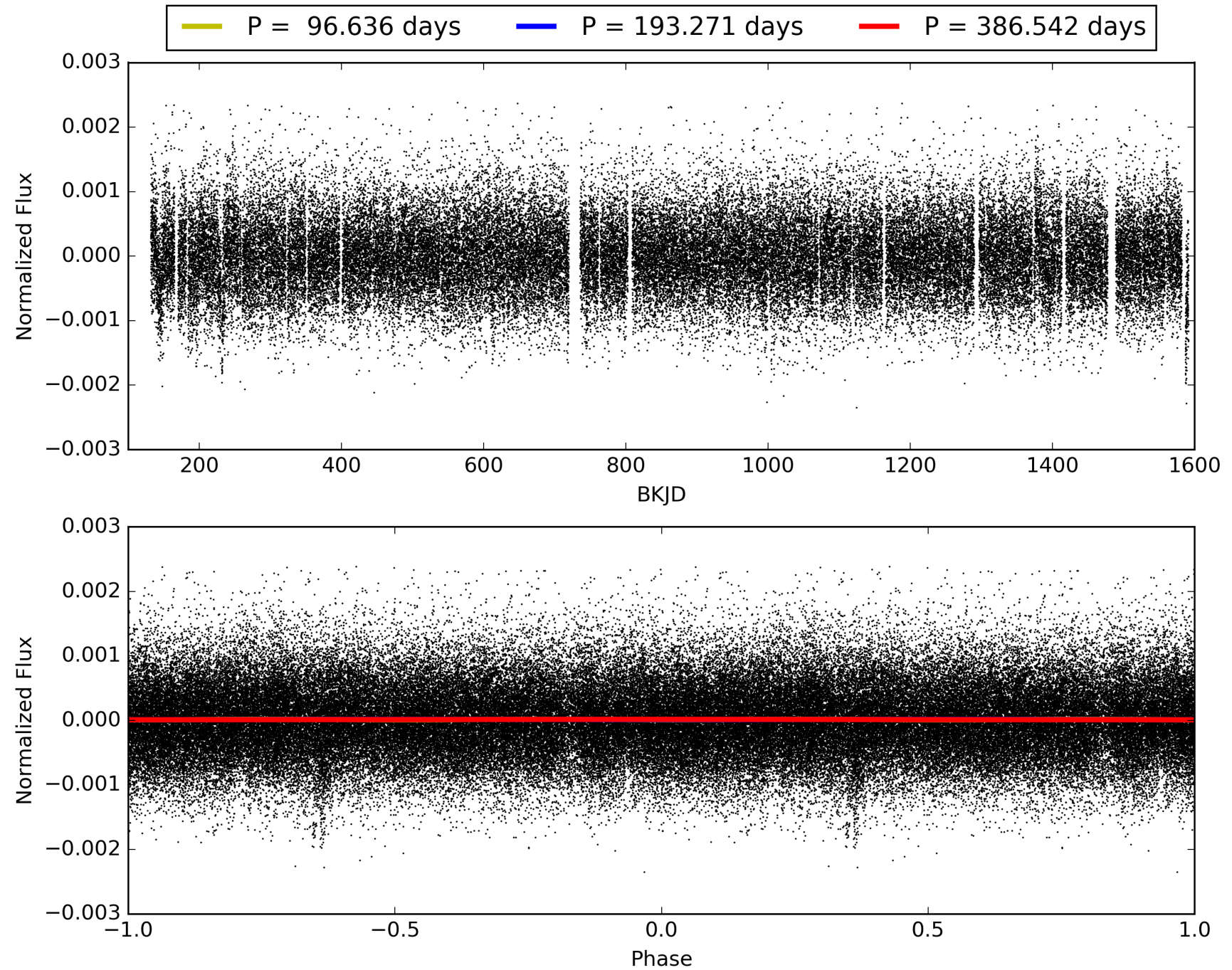
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 07:07:05 Z

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

# TCE 007596224-02, PDC Light Curves



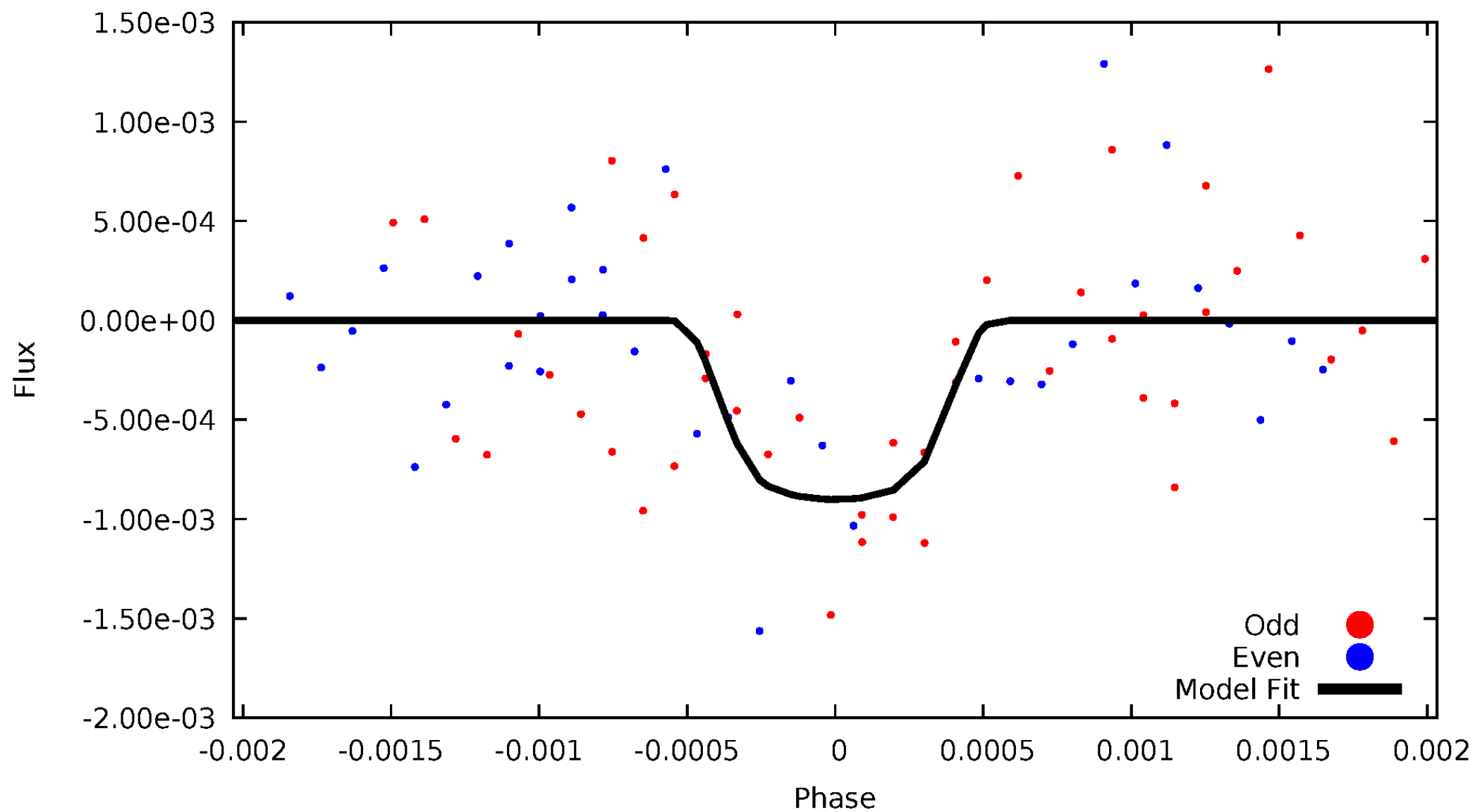
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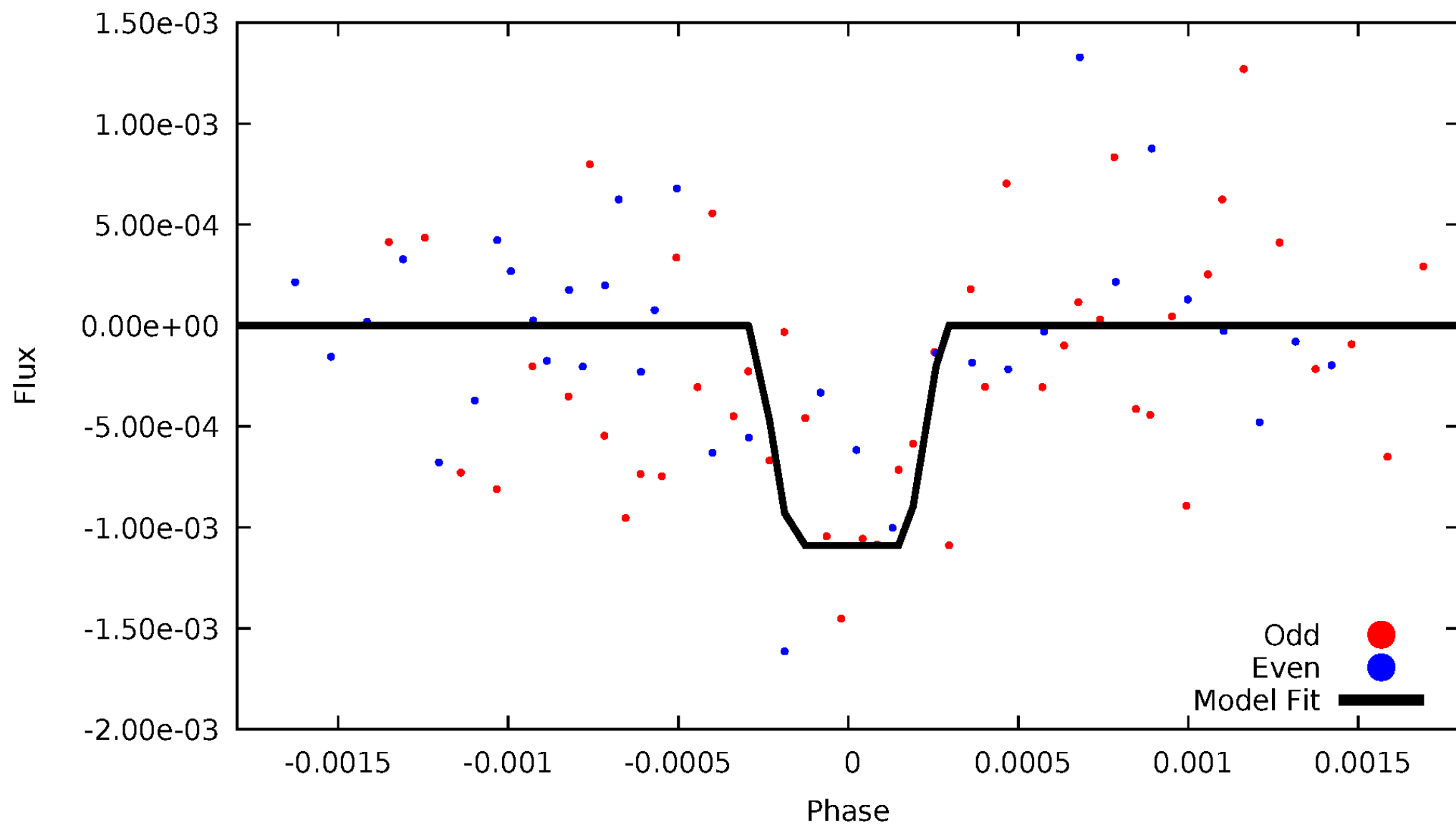
# DV Odd/Even

TCE 007596224-02



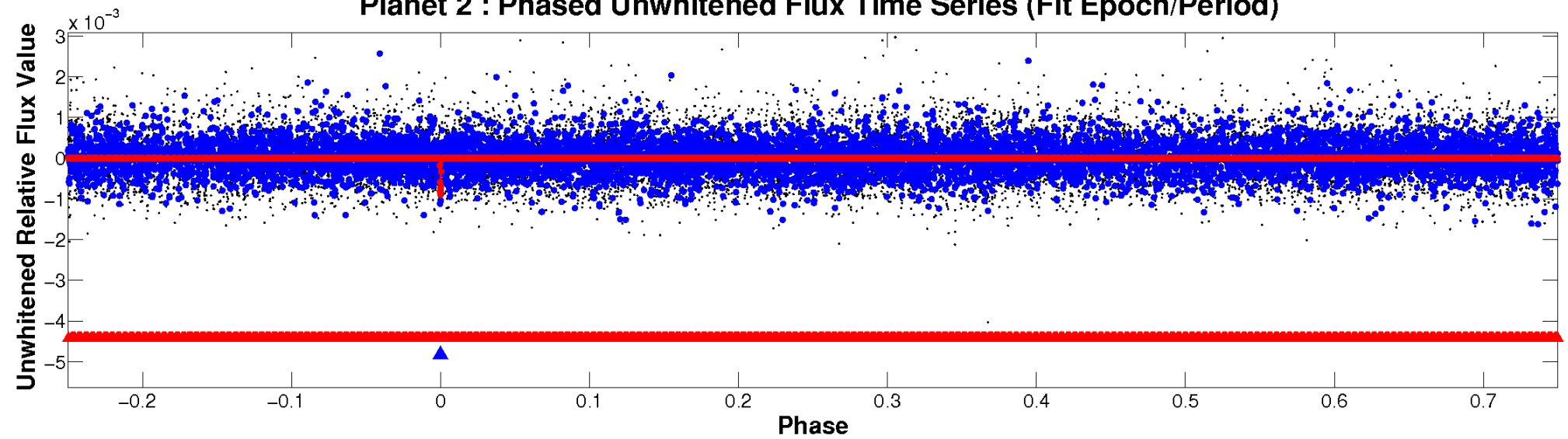
# ALT Odd/Even

TCE 007596224-02

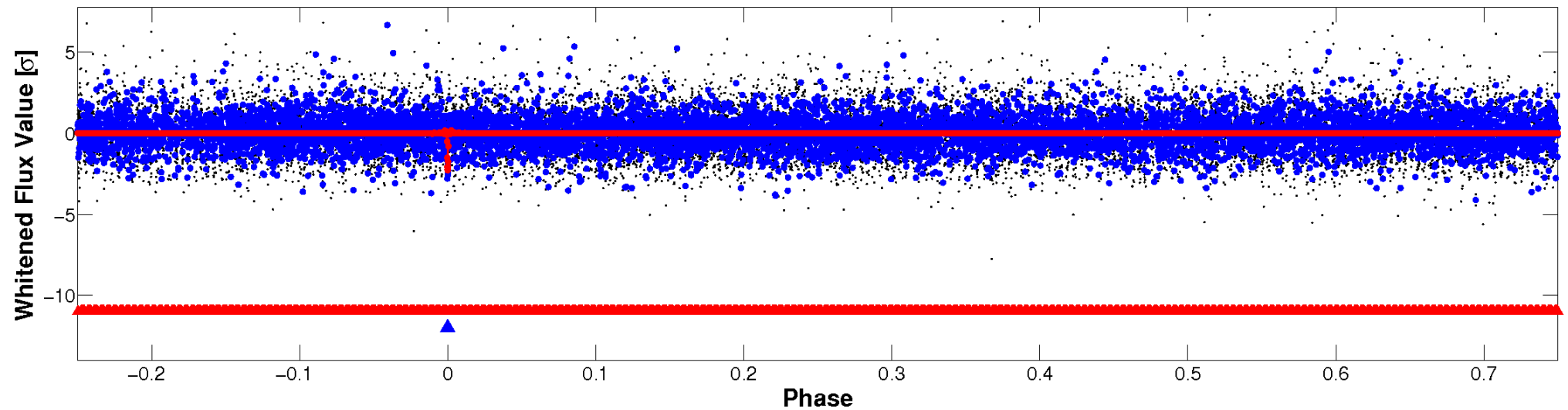


# Non-Whitened Vs. Whitened Light Curve

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

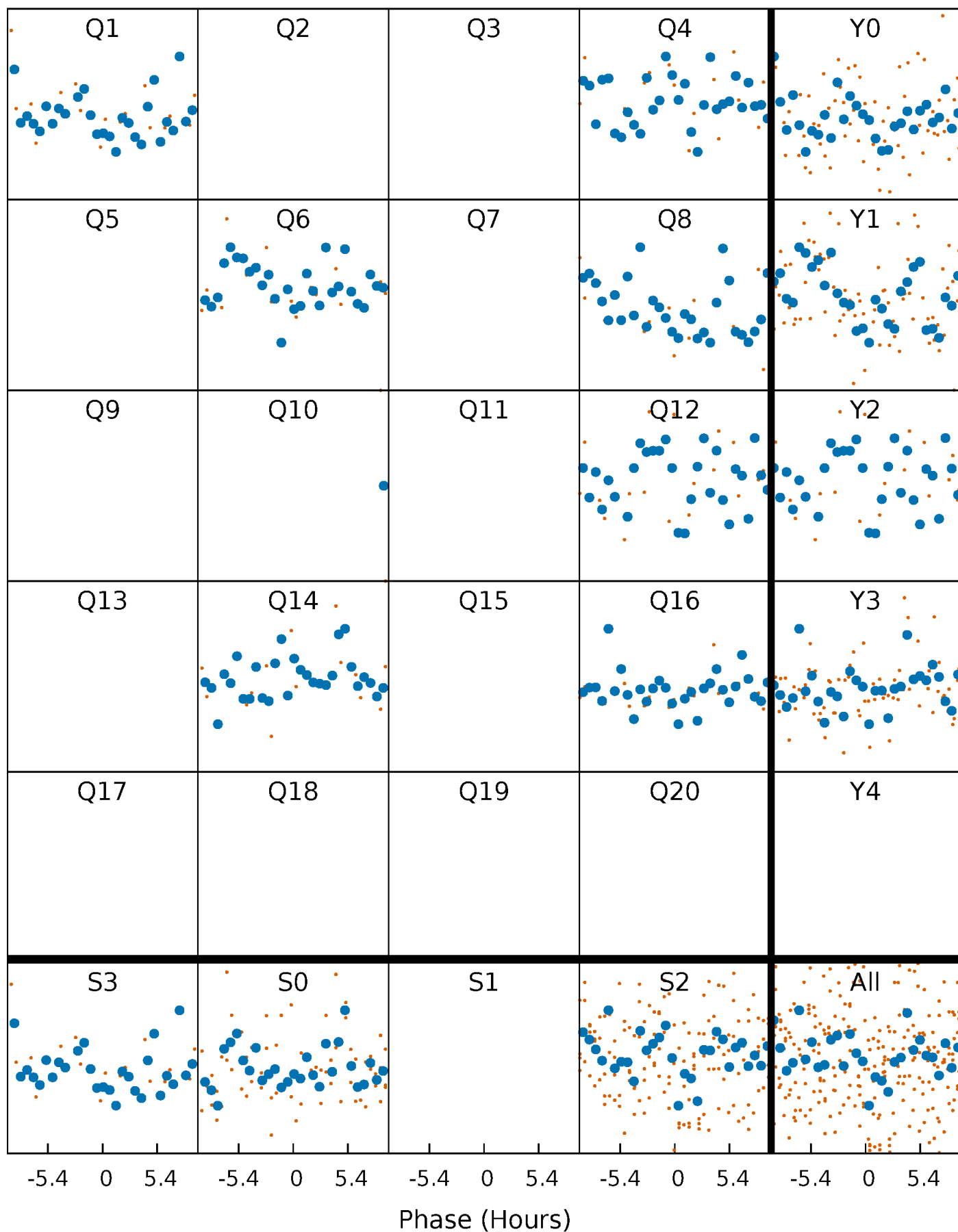


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



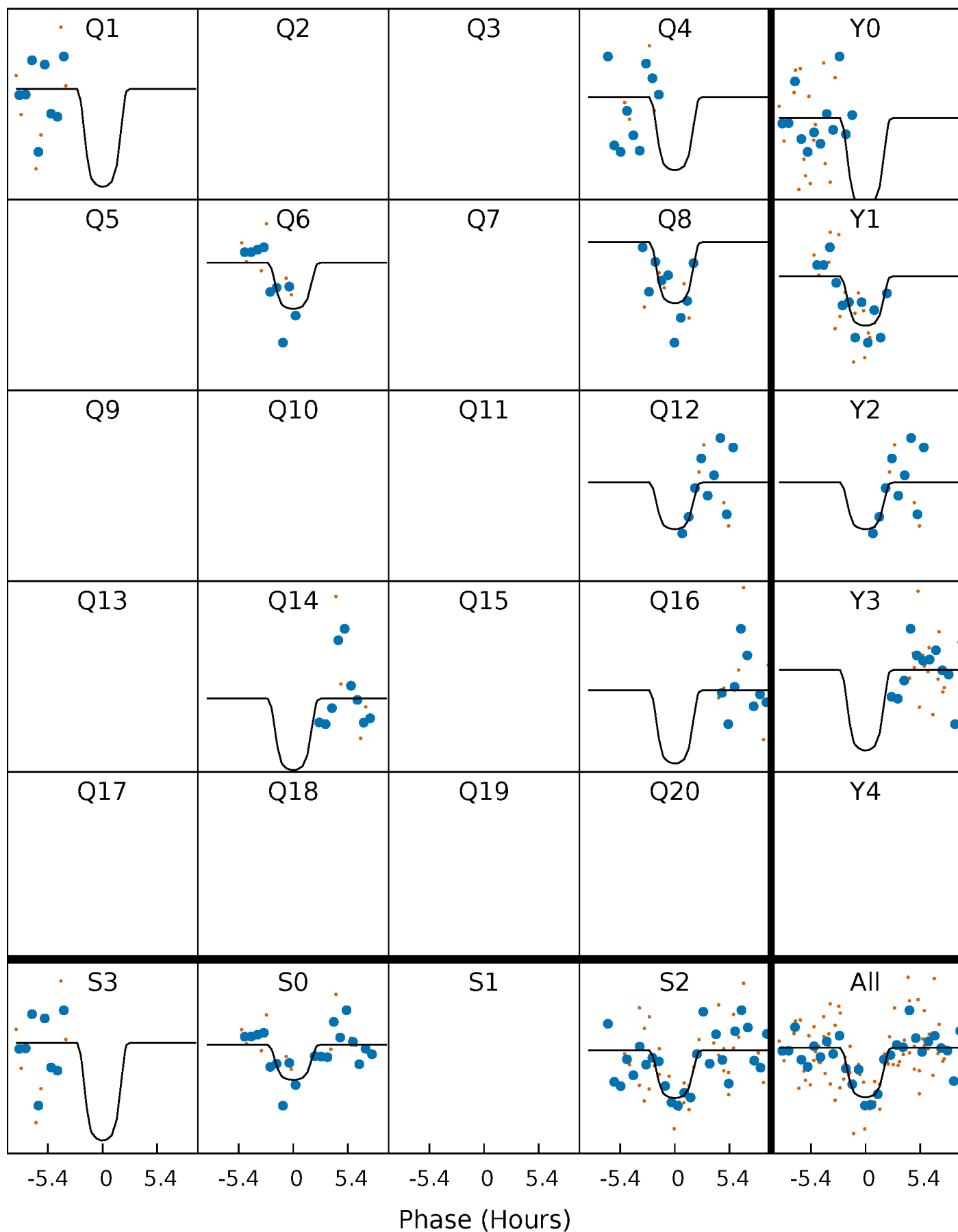
# PDC Quarter-Phased Transit Curves

TCE 007596224-02   P=193.271225 Days    $T_0=164.359206$  (BKJD)



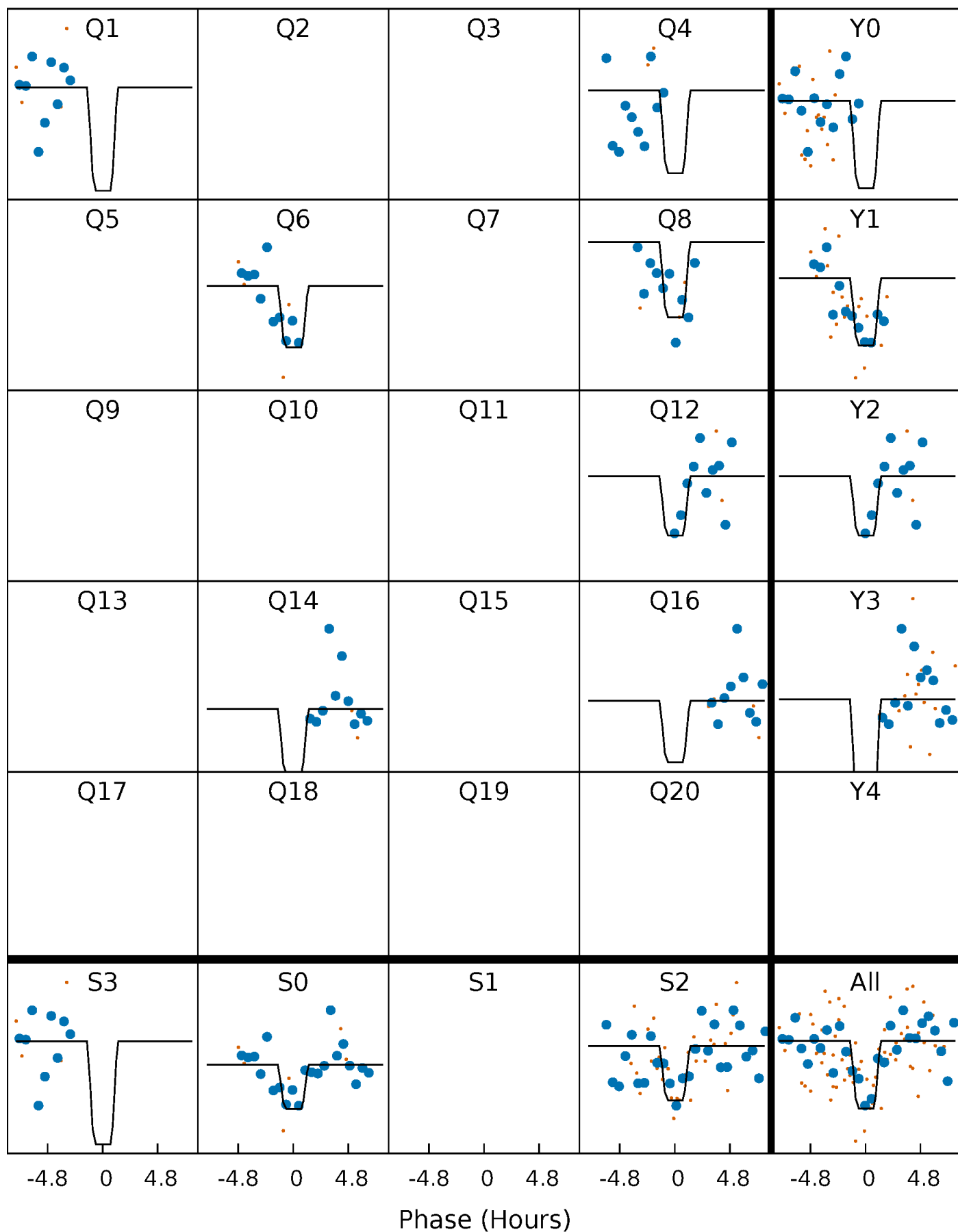
# DV Quarter-Phased Transit Curves

TCE 007596224-02 P=193.271225 Days  $T_0=164.359206$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007596224-02 P=193.285498 Days  $T_0=164.317518$  (BKJD)

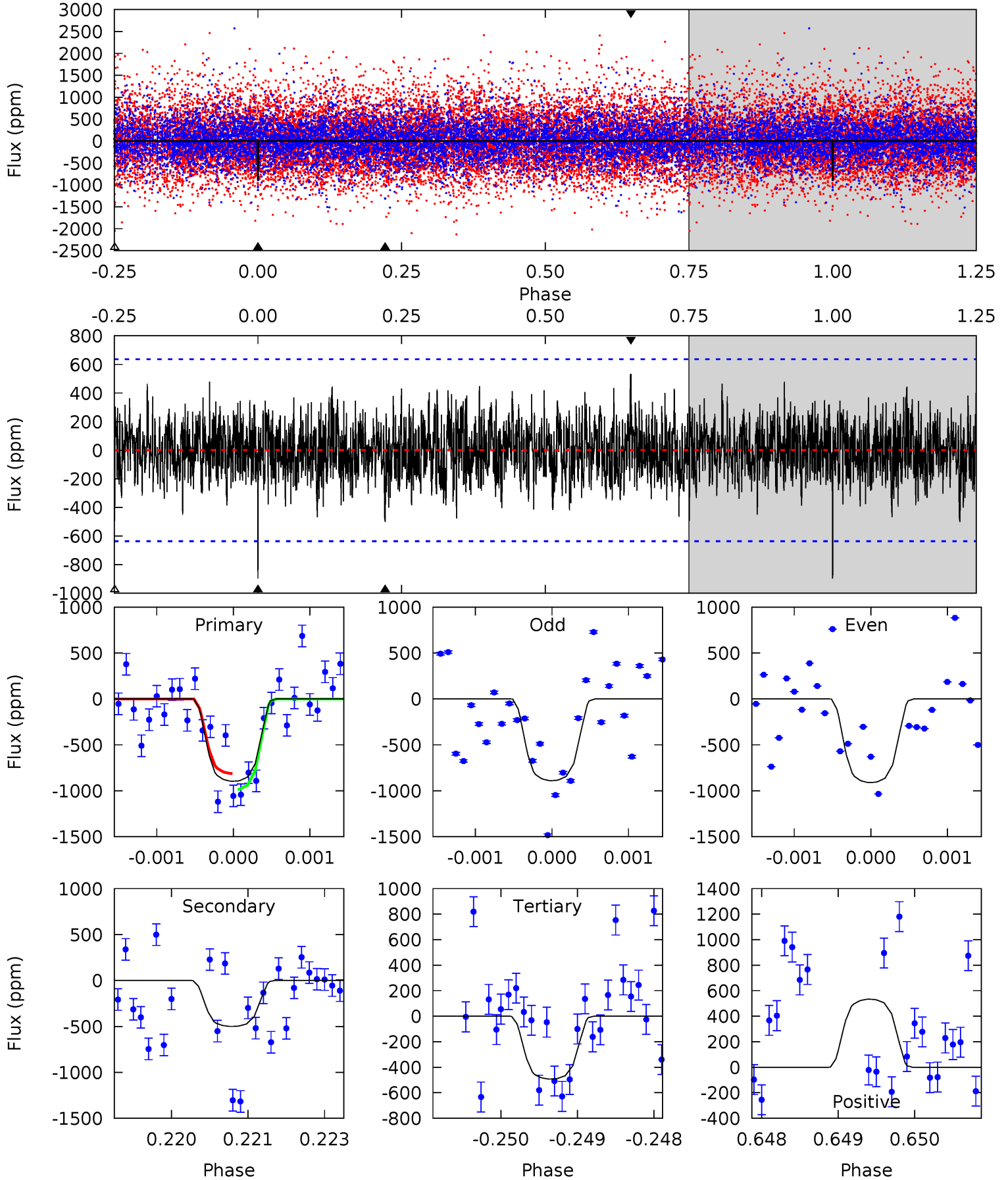




# DV Model-Shift Uniqueness Test

007596224-02, P = 193.271225 Days, E = 164.359206 Days

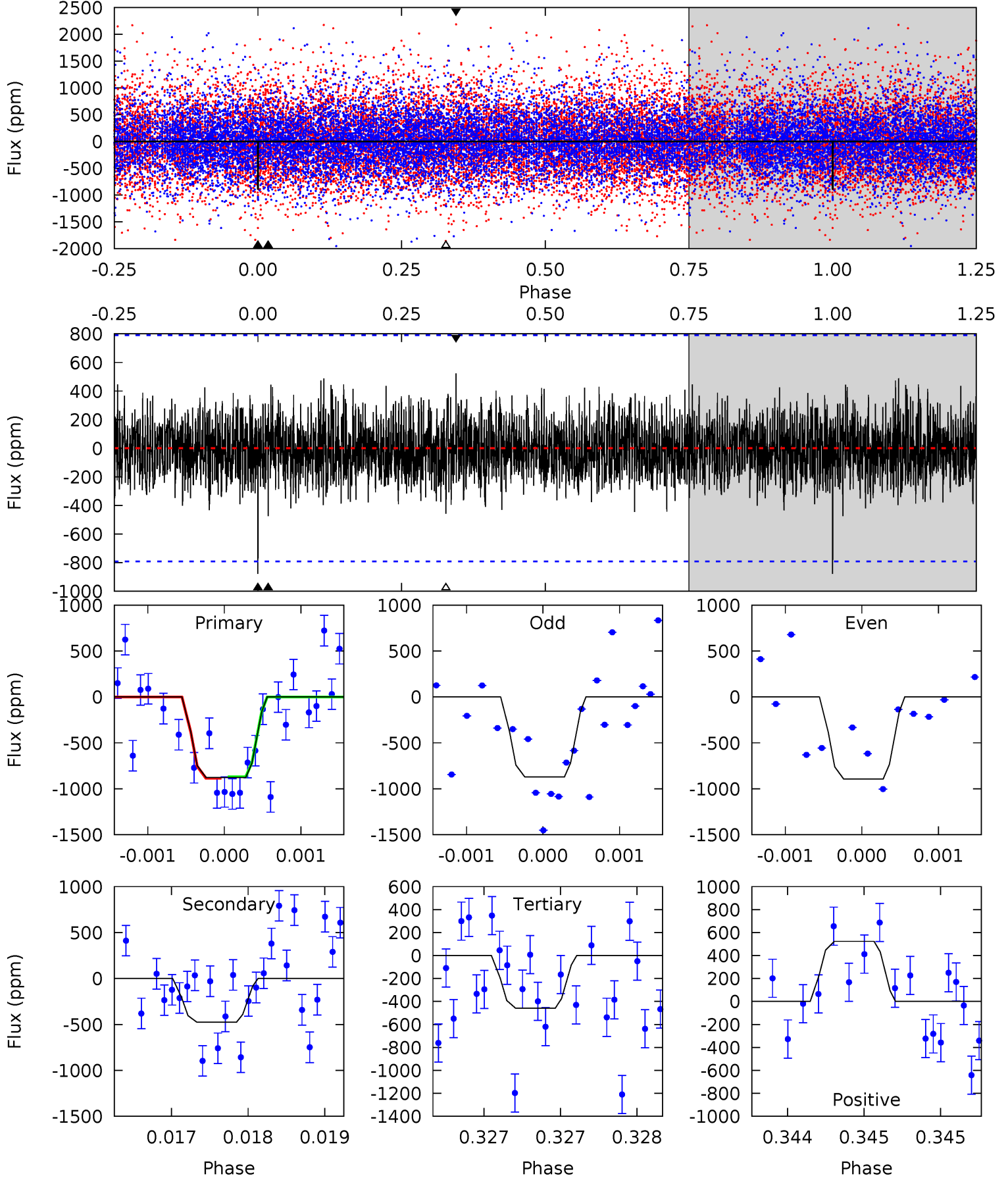
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.67	4.28	4.21	4.56	5.44	3.28	1.29	3.46	3.11	0.06	-0.28	0.08	0.77	0.37	0.74



# Alt Model-Shift Uniqueness Test

007596224-02, P = 193.285498 Days, E = 164.317518 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
6.17	3.34	3.22	3.68	5.56	3.47	0.98	2.95	2.49	0.12	-0.34	0.07	1.00	0.37	0.06



### Stellar Parameters For KIC 007596224

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6108^{+171}_{-214}$	$4.466^{+0.055}_{-0.176}$	$0.070^{+0.250}_{-0.350}$	$1.030^{+0.261}_{-0.112}$	$1.132^{+0.109}_{-0.164}$	$1.457^{+0.406}_{-0.666}$
	+3%/-4%	+1%/-4%	+357%/-500%	+25%/-11%	+10%/-14%	+28%/-46%
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 007596224-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-500 \pm 117$	$3.91^{+0.81}_{-0.69}$	$470^{+30}_{-21}$	$5012^{+519}_{-410}$	$7859^{+4679}_{-2767}$
Alt.	$-475 \pm 142$	$3.81^{+0.75}_{-0.70}$	$469^{+28}_{-23}$	$5011^{+537}_{-456}$	$7906^{+4717}_{-3072}$

$T_{max}$  = 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

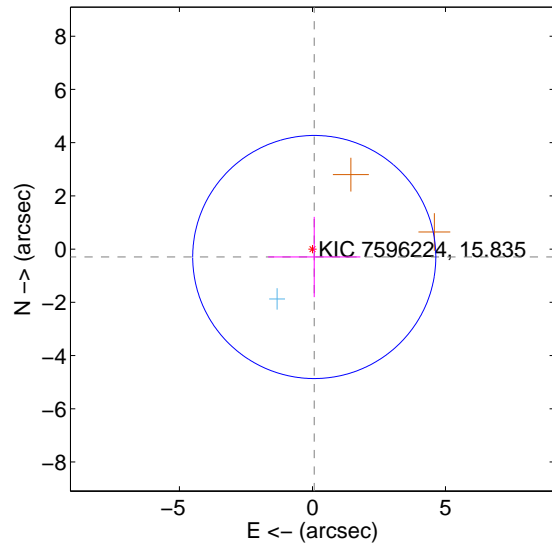
Supplemental centroid analysis for 007596224-02. Kepler magnitude: 15.84. Transit SNR 8.04

There are 1 quarters with good PRF difference image offsets

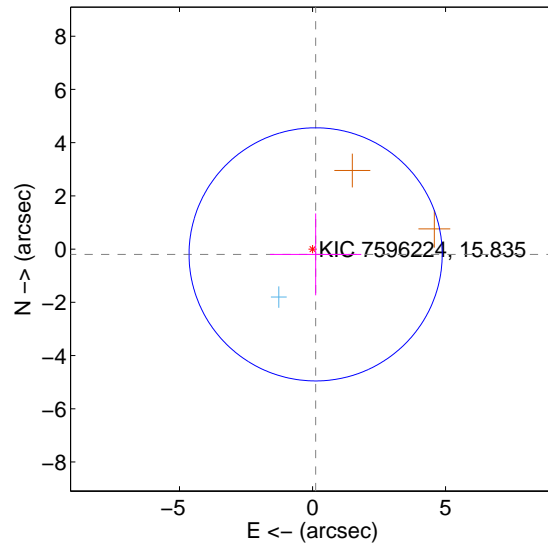
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.305 \pm 1.522$	0.20	$-0.068 \pm 1.733$	$-0.297 \pm 1.510$
PRF-fit source offset from KIC position	$0.230 \pm 1.585$	0.15	$-0.116 \pm 1.716$	$-0.198 \pm 1.538$
photometric centroid source offset	$2.72 \pm 1.62$	1.68	$-2.63 \pm 1.63$	$-0.69 \pm 1.52$

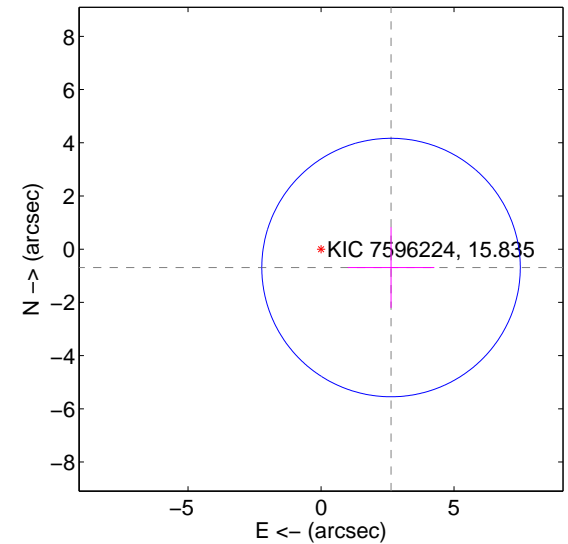
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

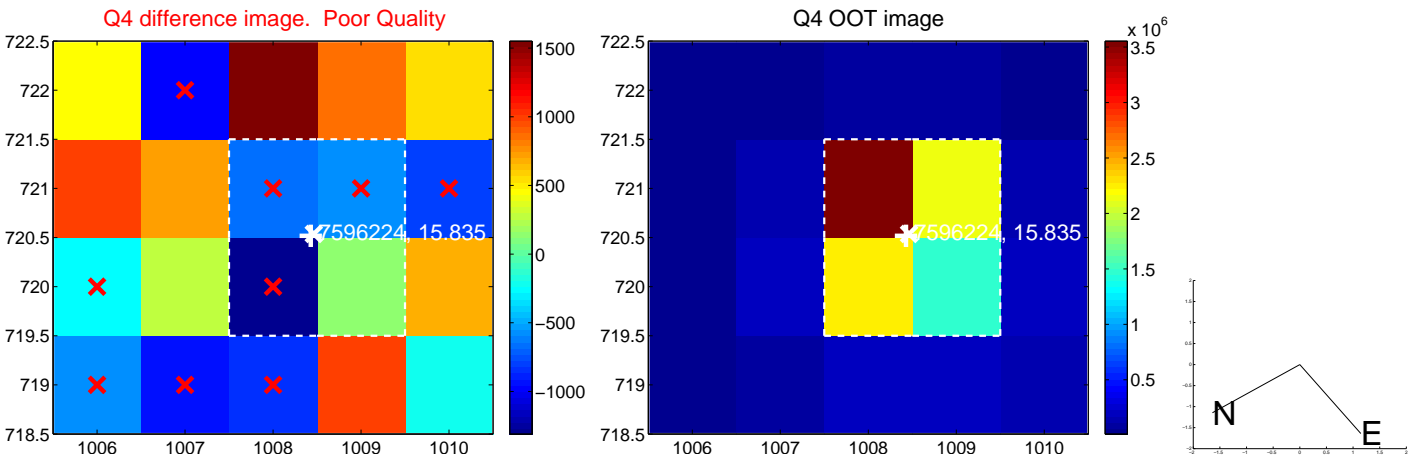
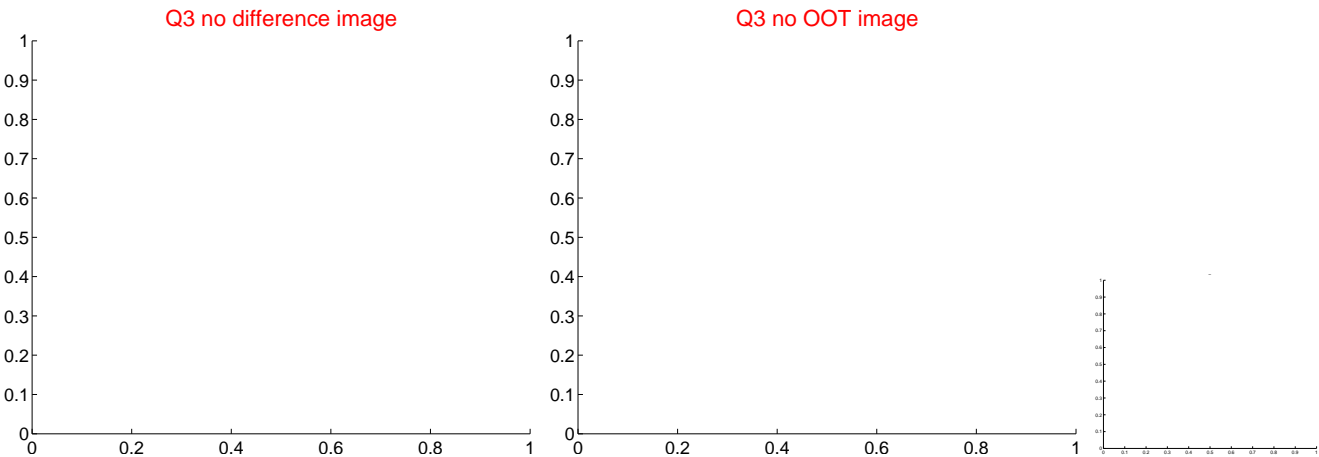
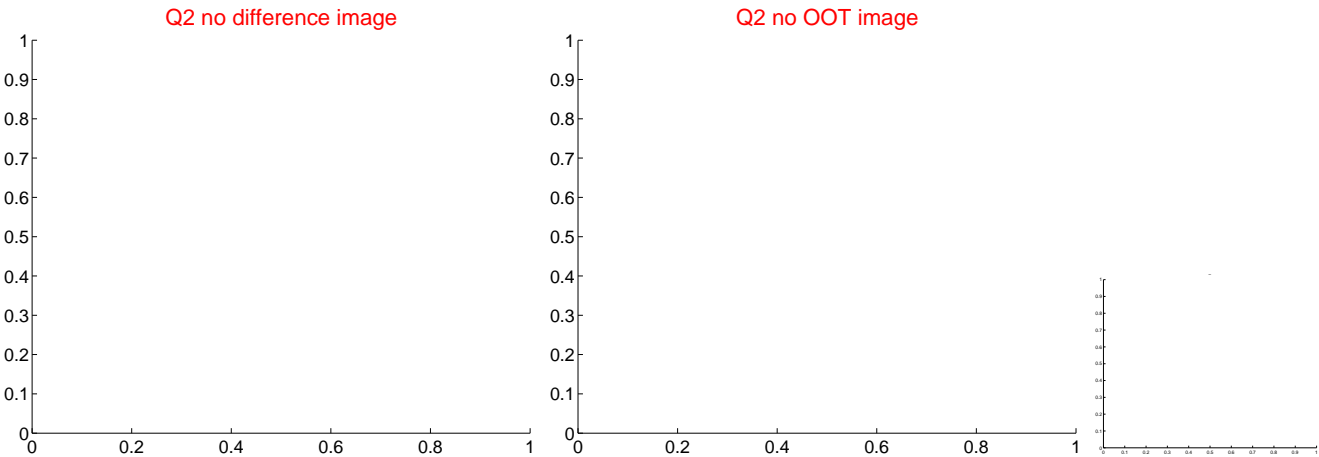
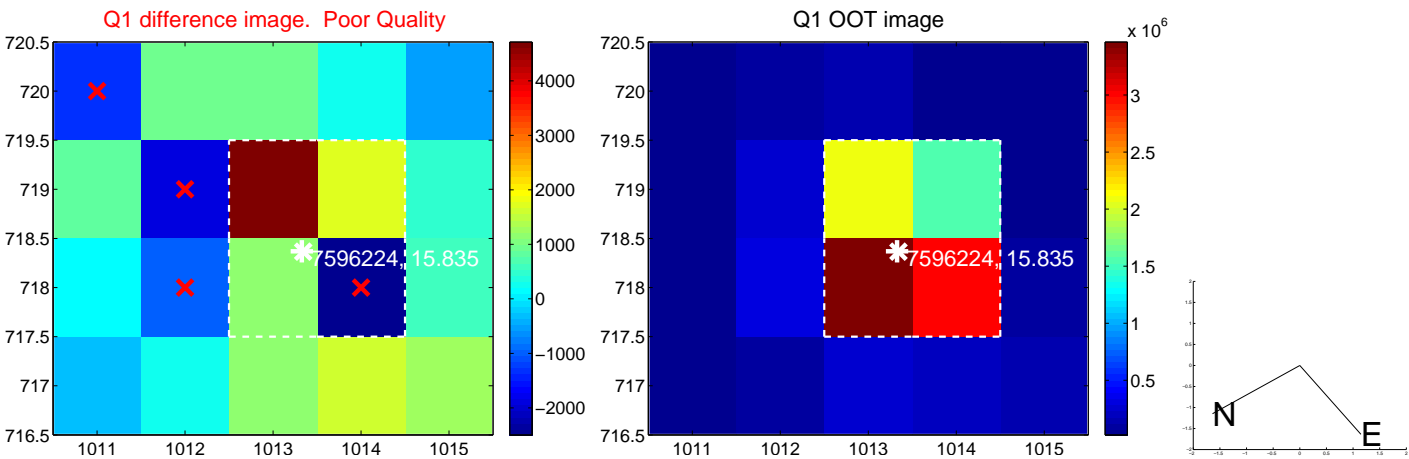


offset from photometric centroids

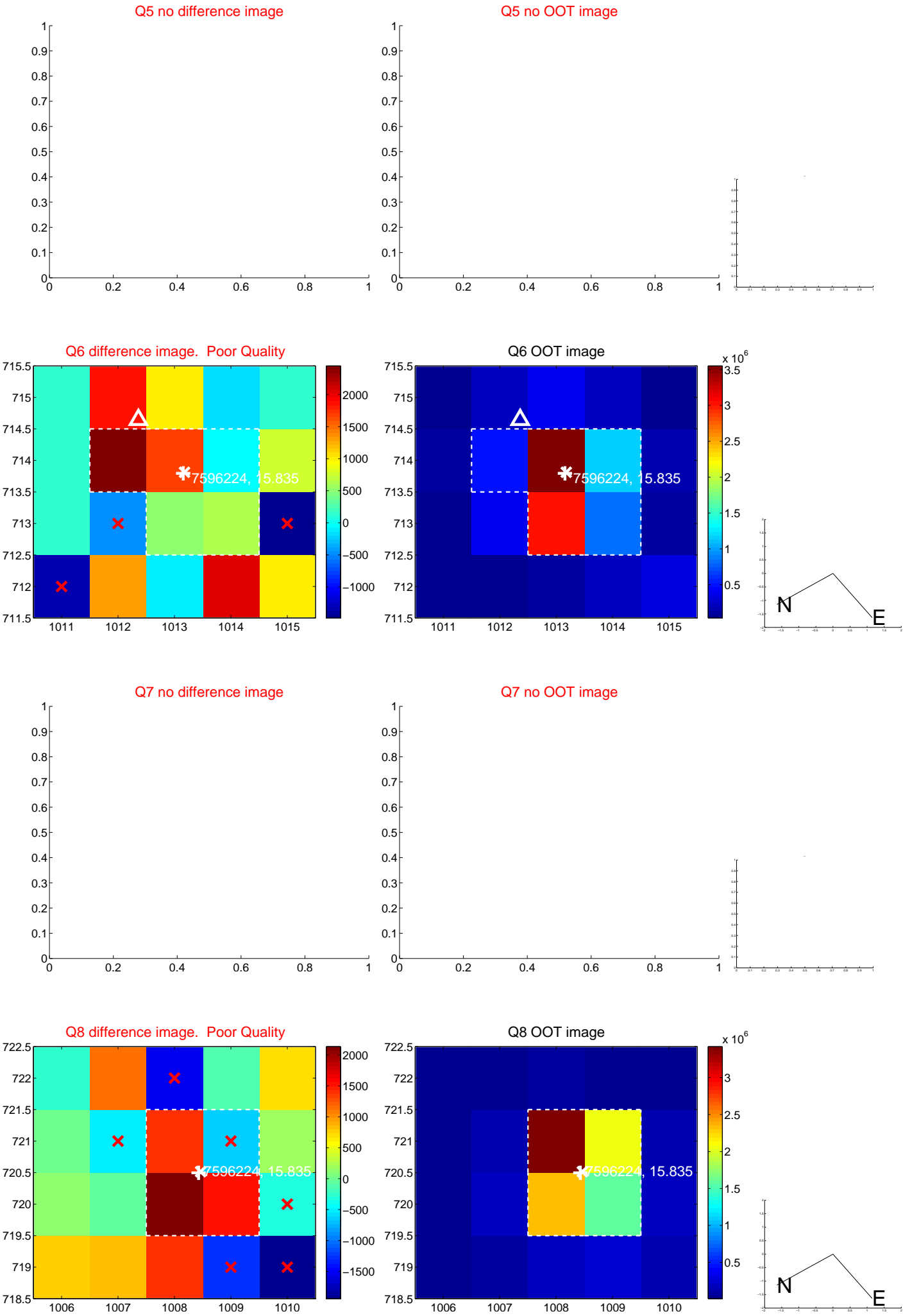


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

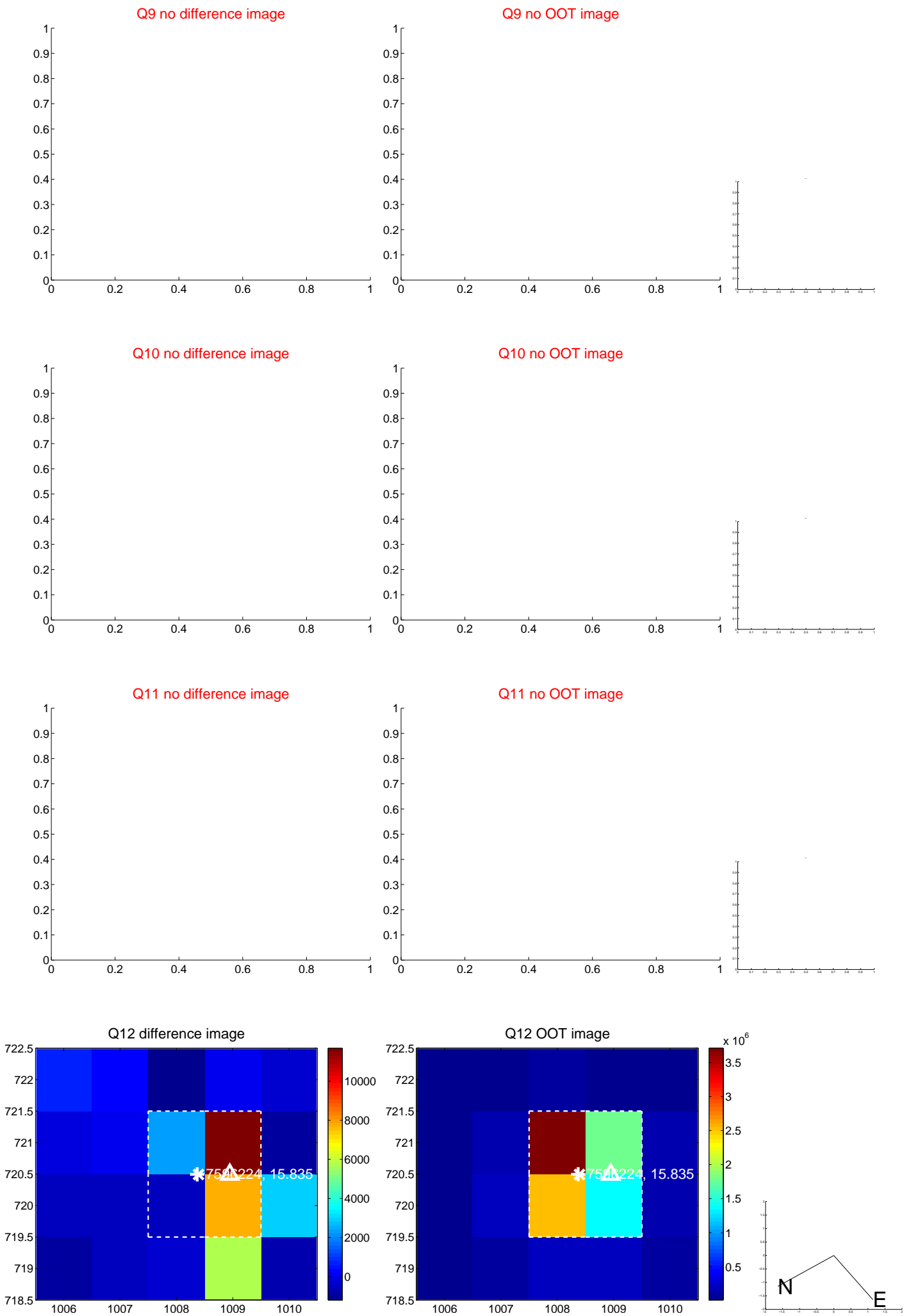


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

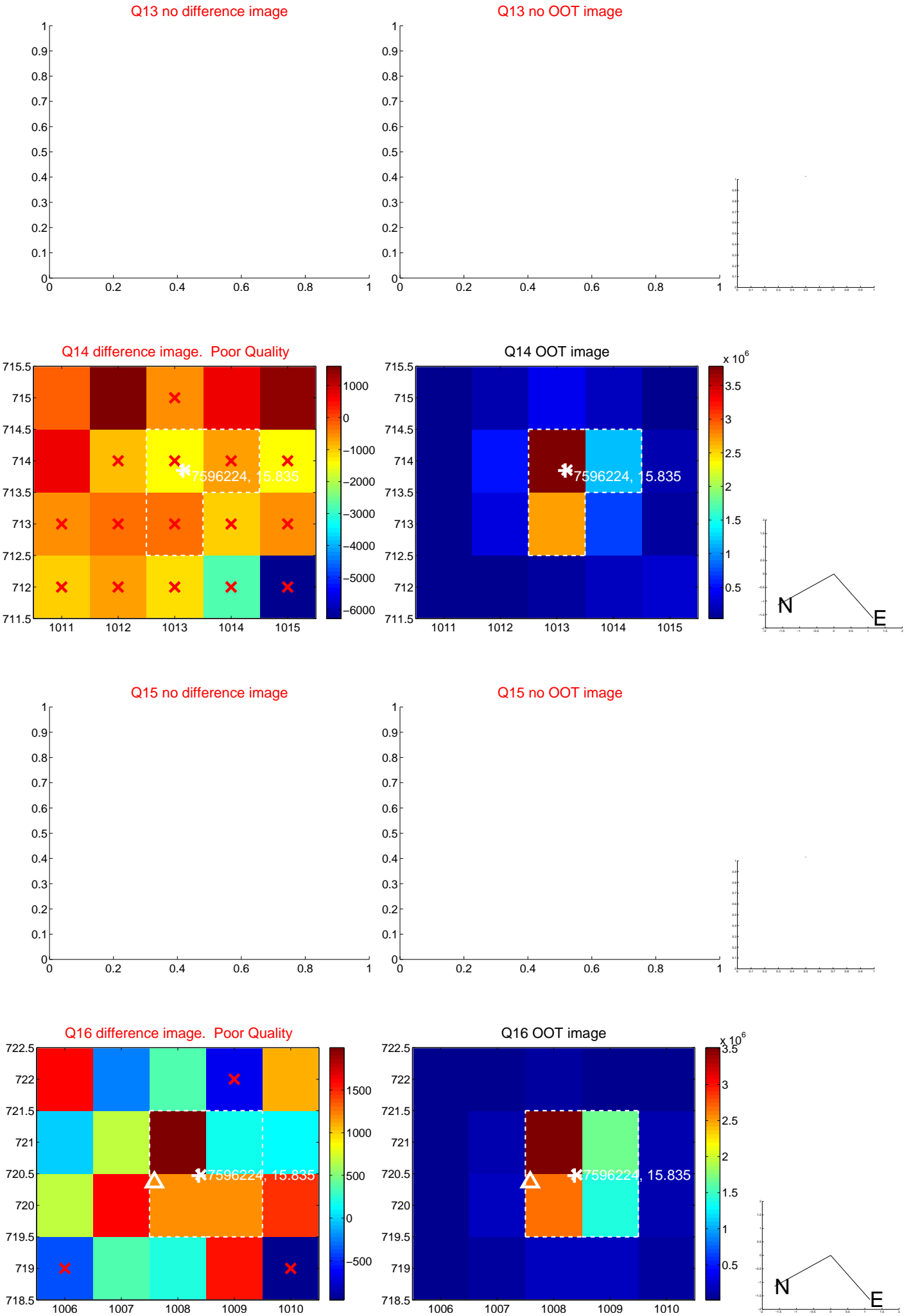




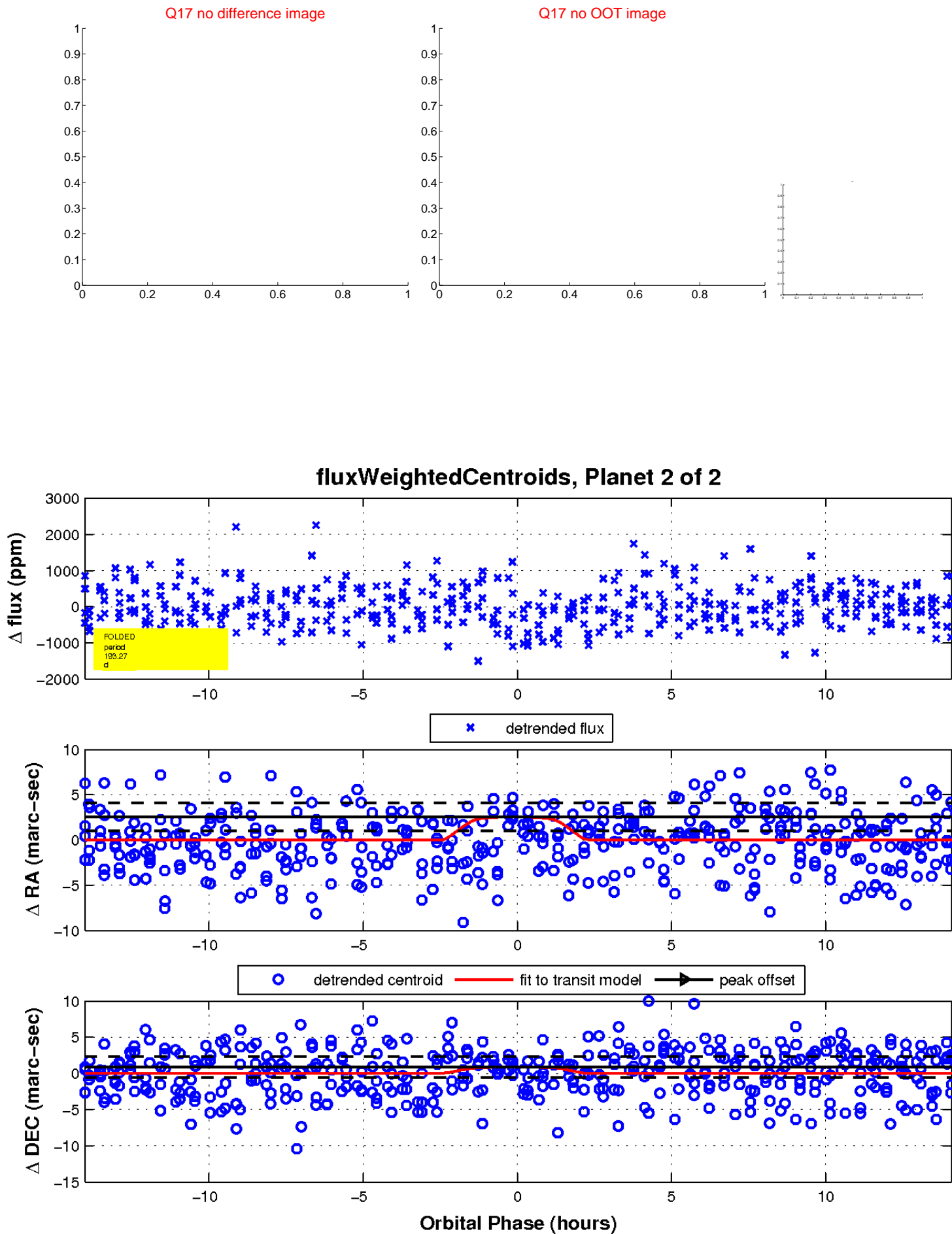
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

