

# KIC 008773015

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008773015-01	OBS	4301.01	15.604798	131.999442	69.2	4.673	13.7	13.8	1.71	6254	1.65	249.17
008773015-02	OBS	No	444.257689	231.573405	181.9	13.774	10.0	10.6	1.71	6254	2.54	2.87
008773015-03	OBS	4301.02	6.319110	134.152065	30.6	3.637	8.2	8.7	1.71	6254	1.08	831.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008773015-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008773015-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008773015-03	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

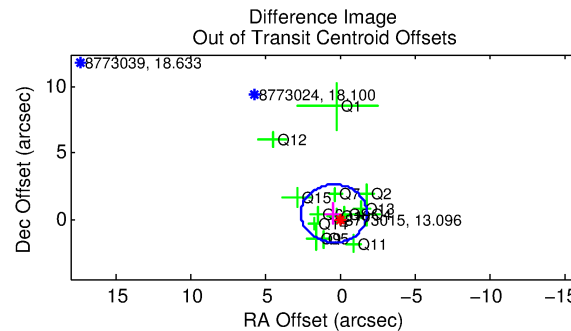
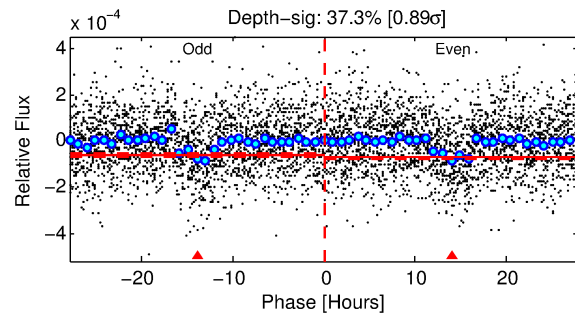
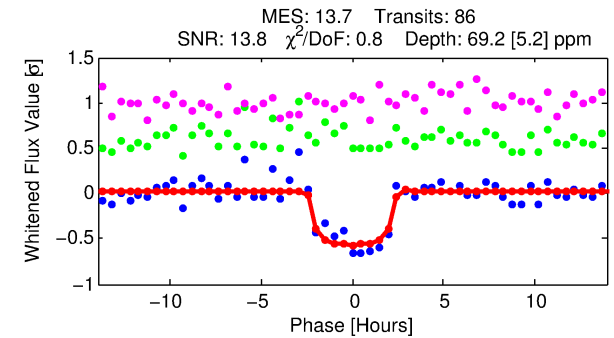
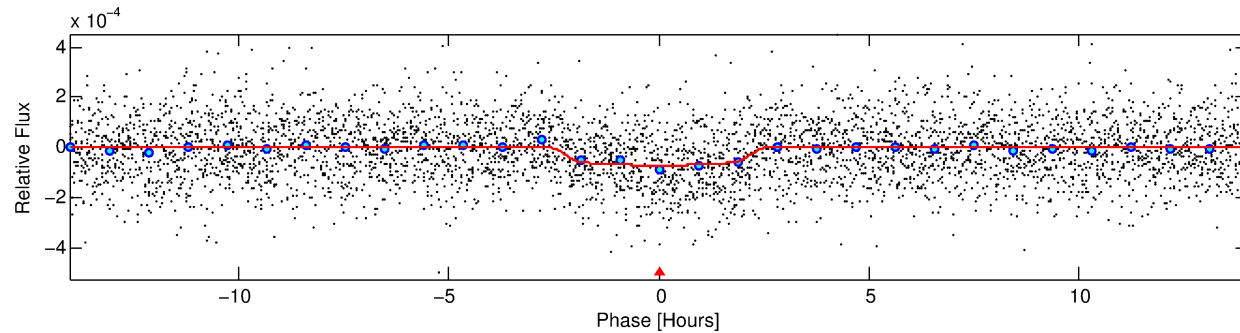
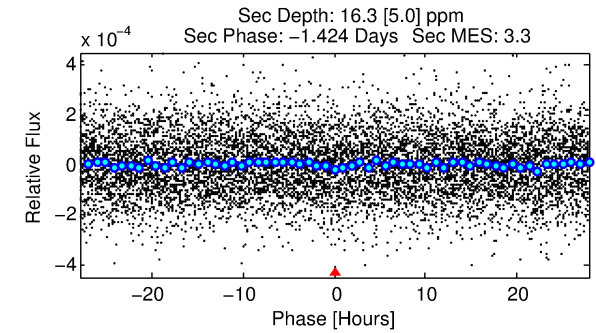
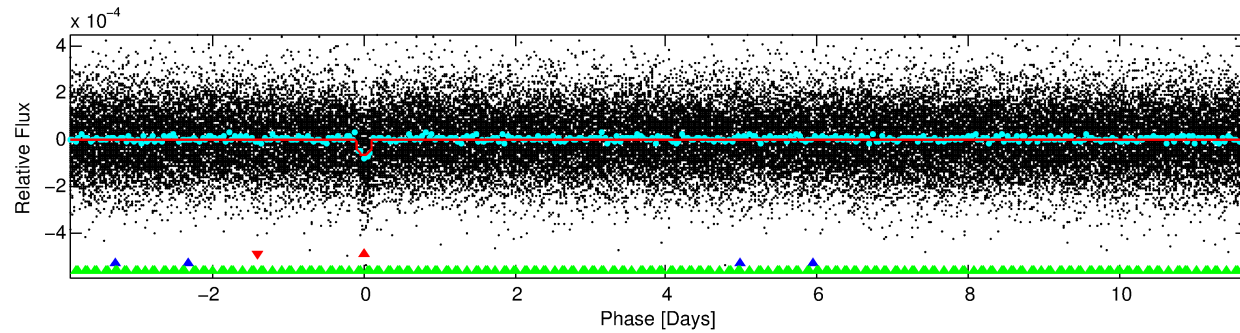
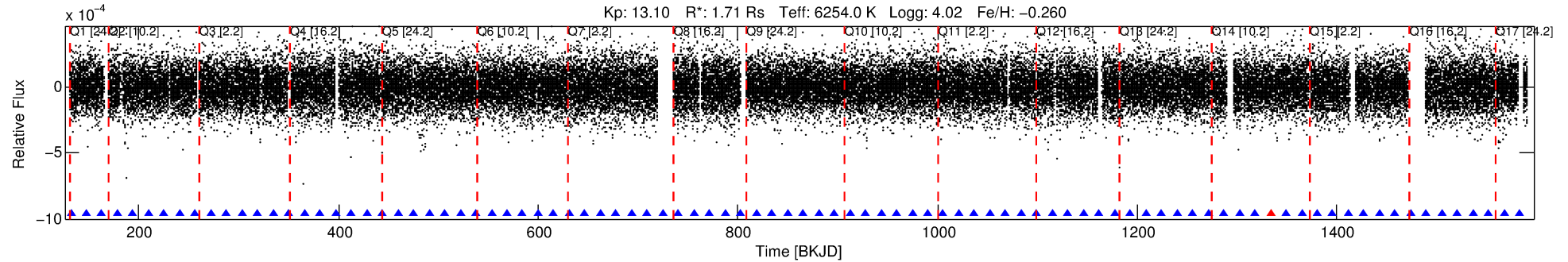
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008773015-01

No Significant Match Found

# DV One-Page Summary

KIC: 8773015 Candidate: 1 of 3 Period: 15.605 d  
KOI: K04301.01 Corr: 0.981



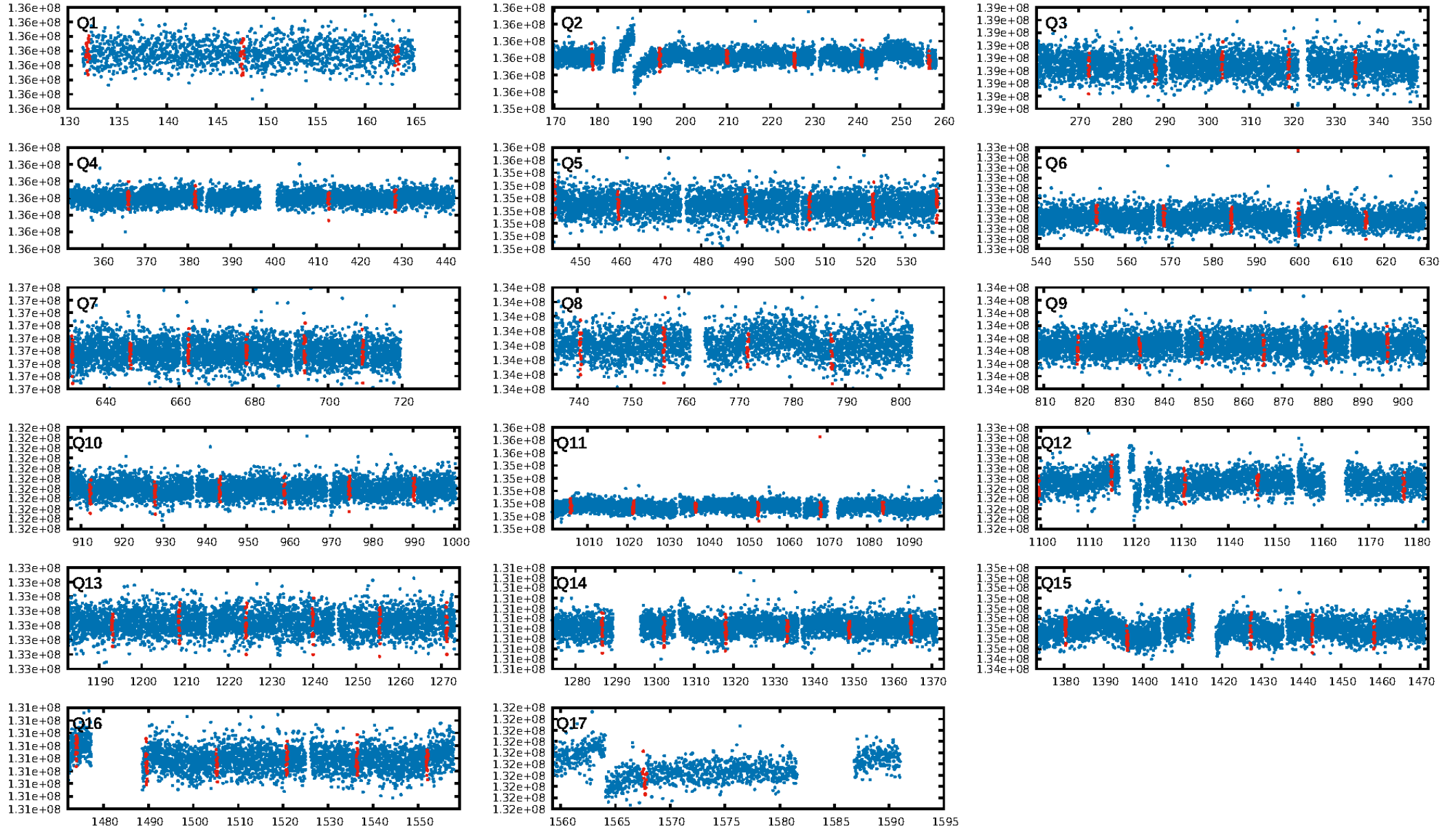
## DV Fit Results:

Period = 15.60480 [0.00013] d  
Epoch = 131.9994 [0.0068] BKJD  
Rp/R\* = 0.0089 [0.0031]  
a/R\* = 11.99 [22.69]  
b = 0.89 [0.44]  
Seff = 249.17 [118.73]  
Teq = 1013 [121] K  
Rp = 1.65 [0.76] Re  
a = 0.1265 [0.0366] AU  
Ag = 52.44 [46.22] [1.11σ]  
Teffp = 4215 [807] K [3.92σ]

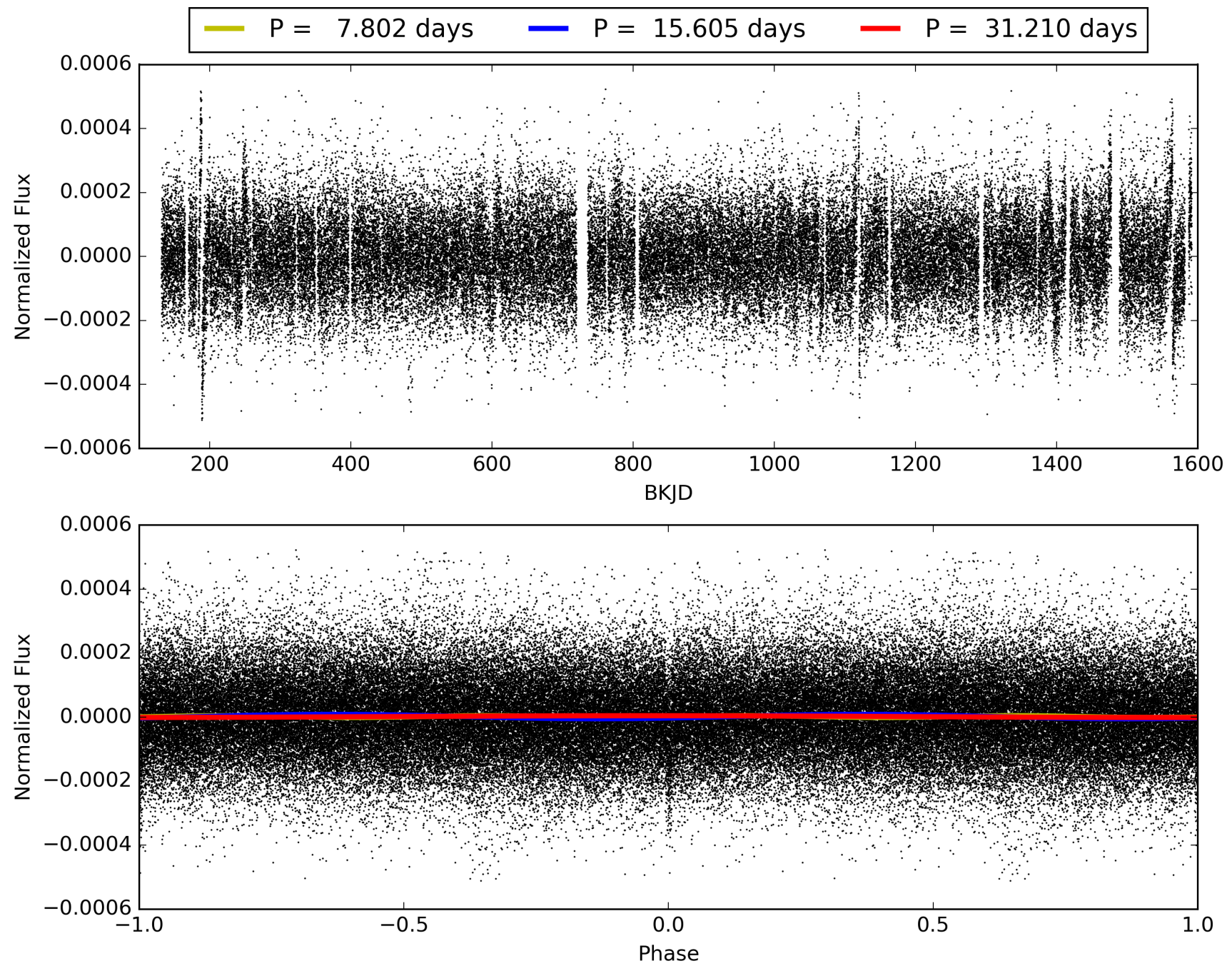
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.63σ]  
LongPeriod-sig: 100.0% [707.28σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.47e-41  
RollingBand-fgt: 0.99 [81/82]  
GhostDiagnostic-chr: -6.853  
Centroid-sig: 51.6%  
Centroid-so: 0.589 arcsec [0.52σ]  
OotOffset-rm: 0.597 arcsec [0.82σ]  
KicOffset-rm: 0.710 arcsec [0.99σ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 0.79 [11/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008773015-01, PDC Light Curves



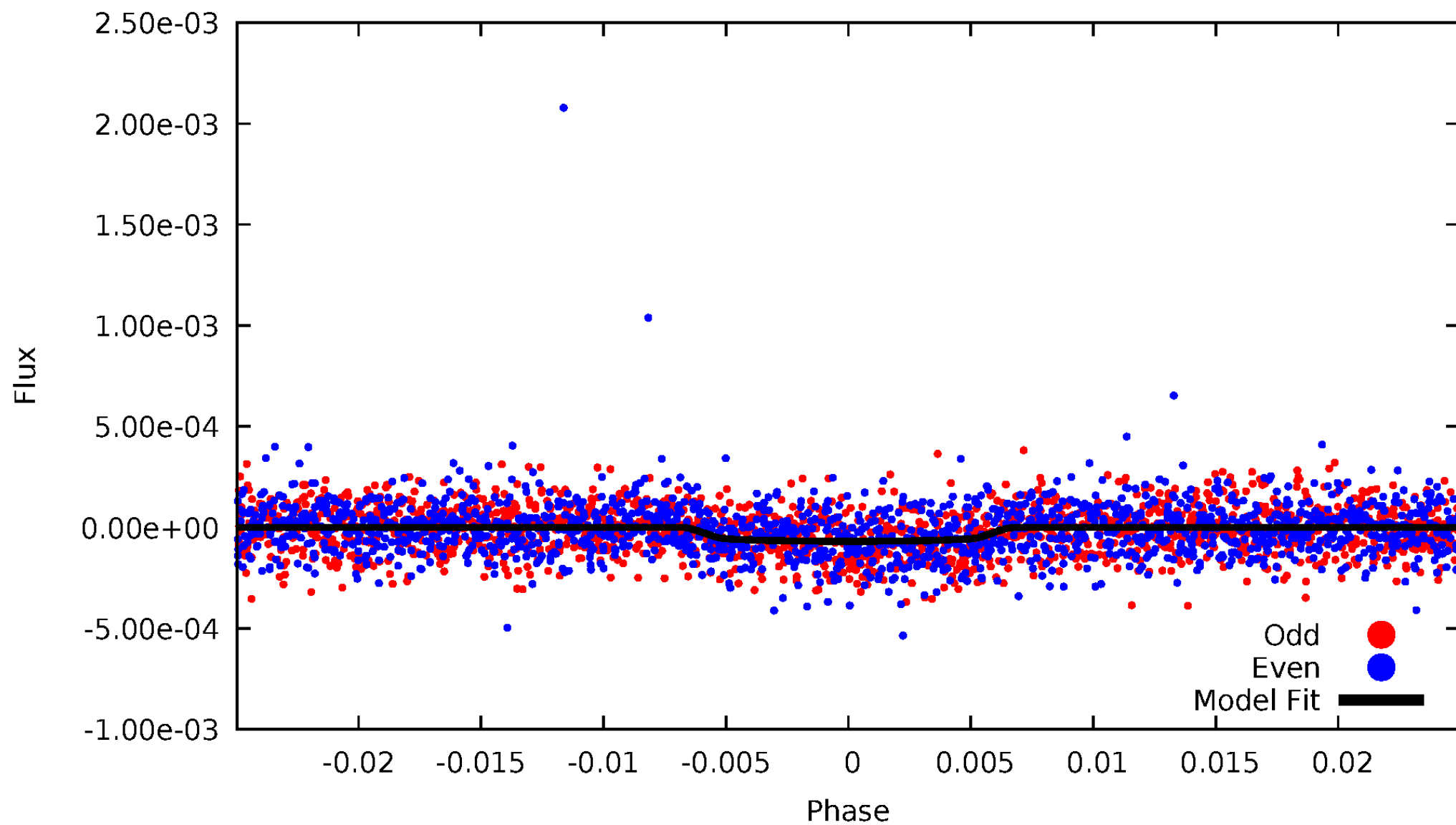
TCE 008773015-01





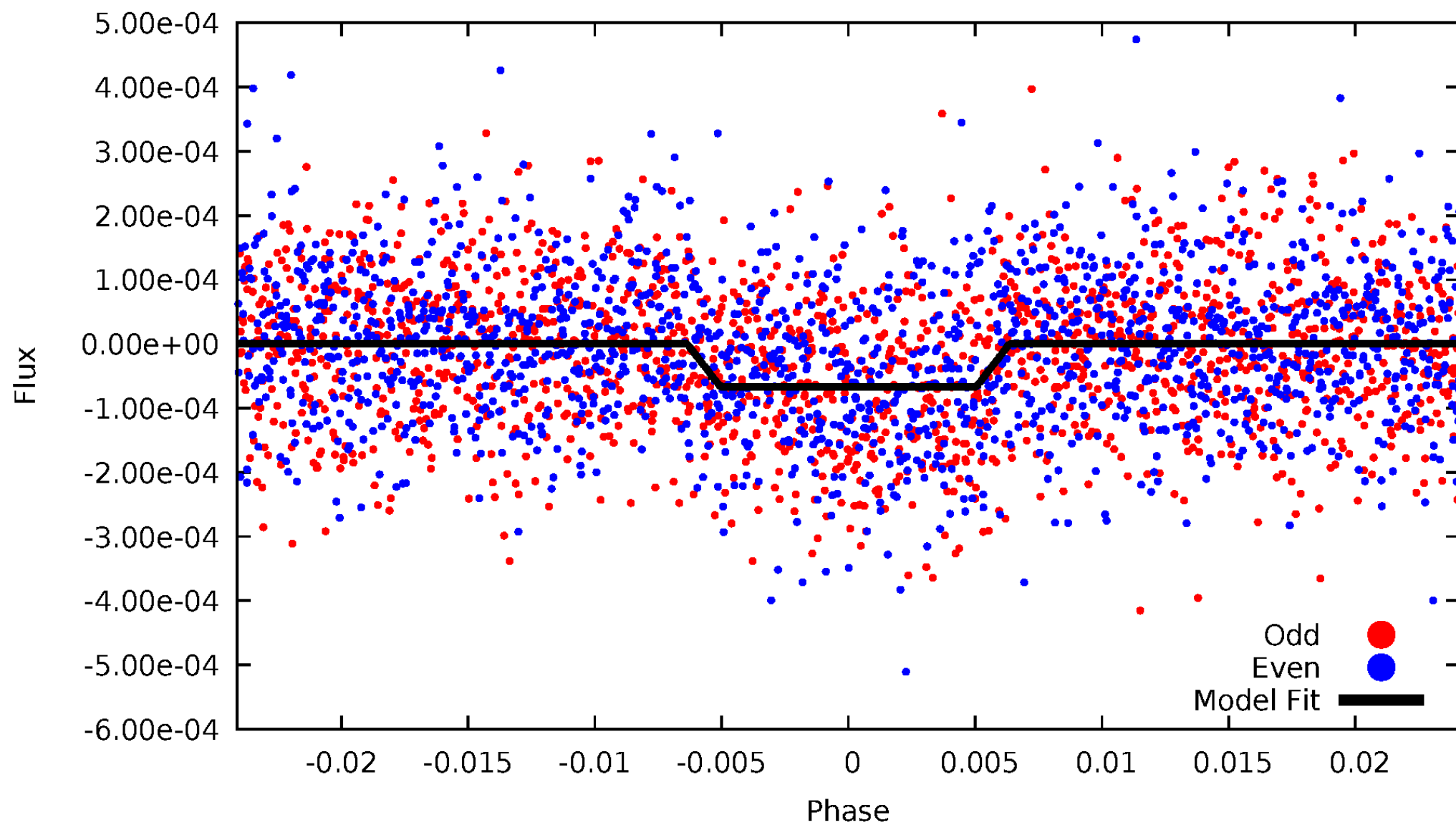
# DV Odd/Even

TCE 008773015-01

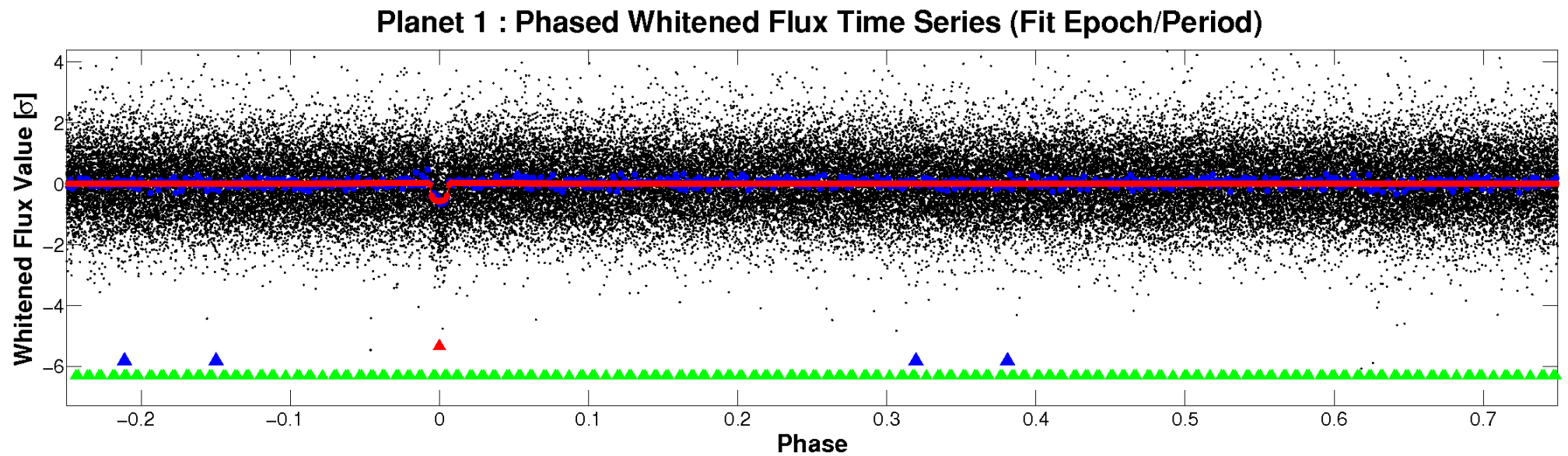
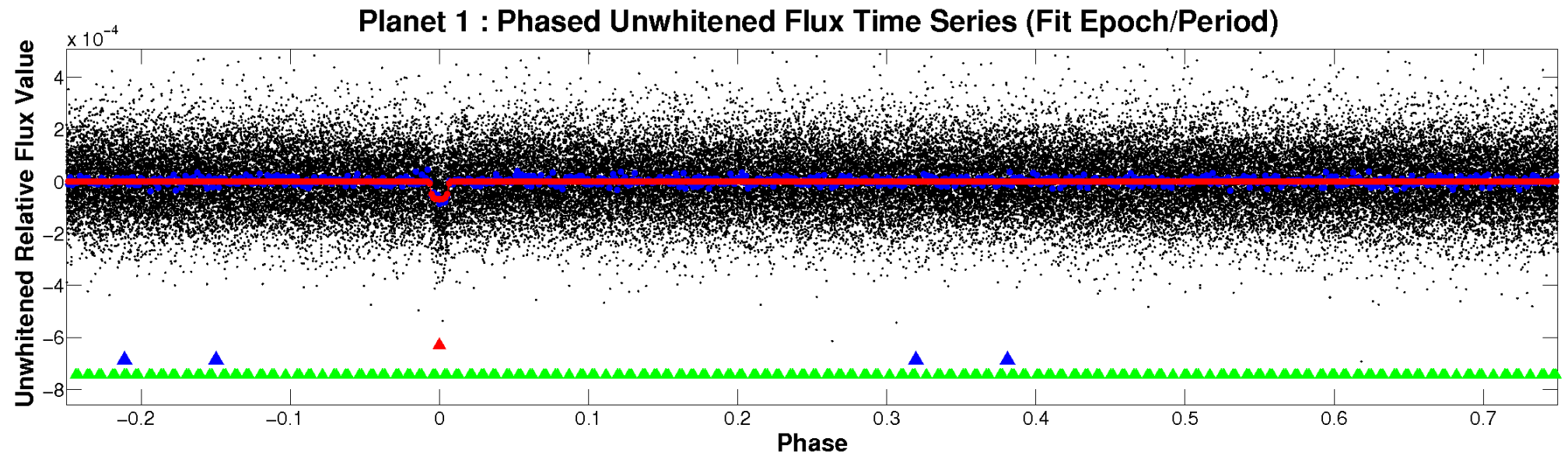


# ALT Odd/Even

TCE 008773015-01

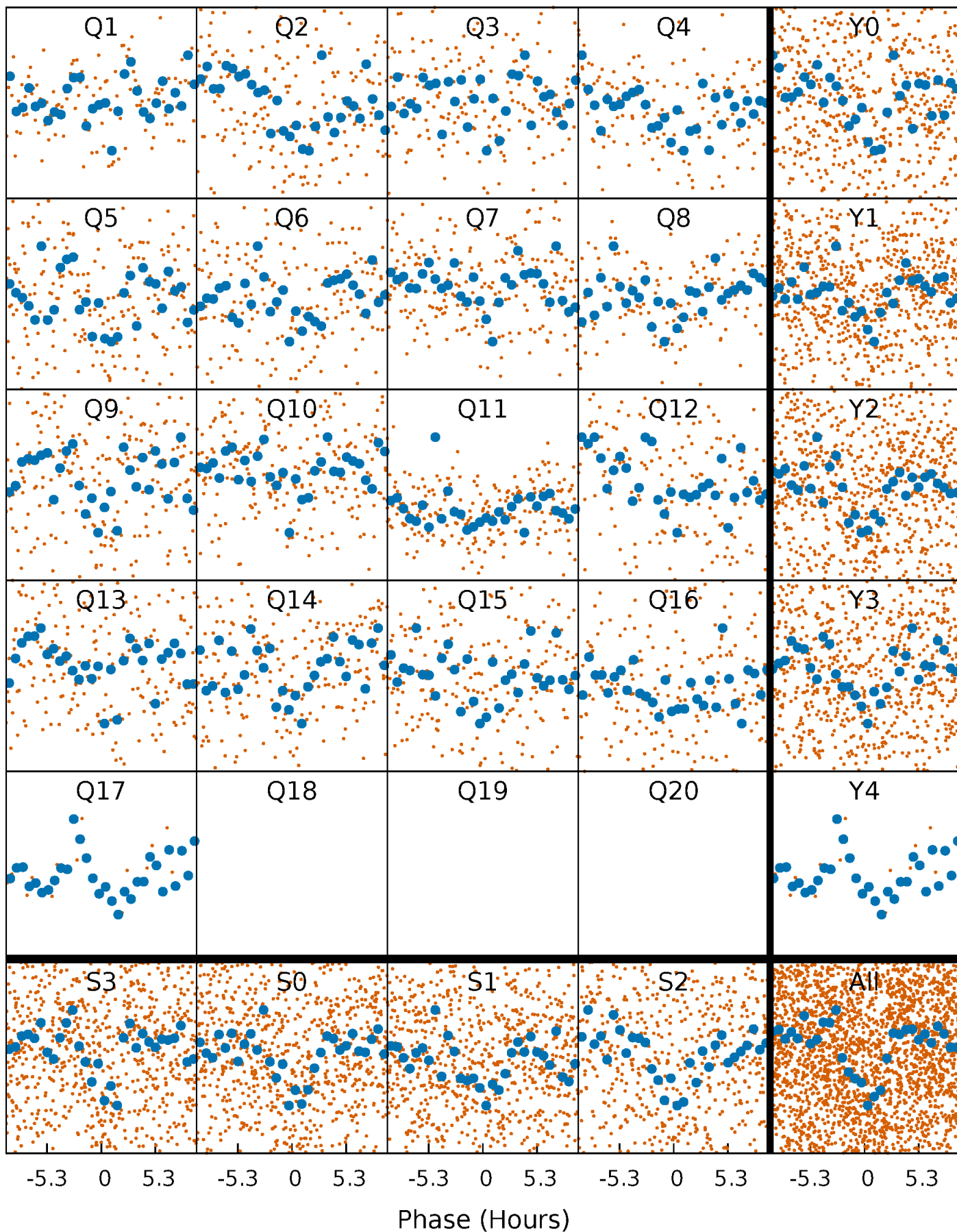


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

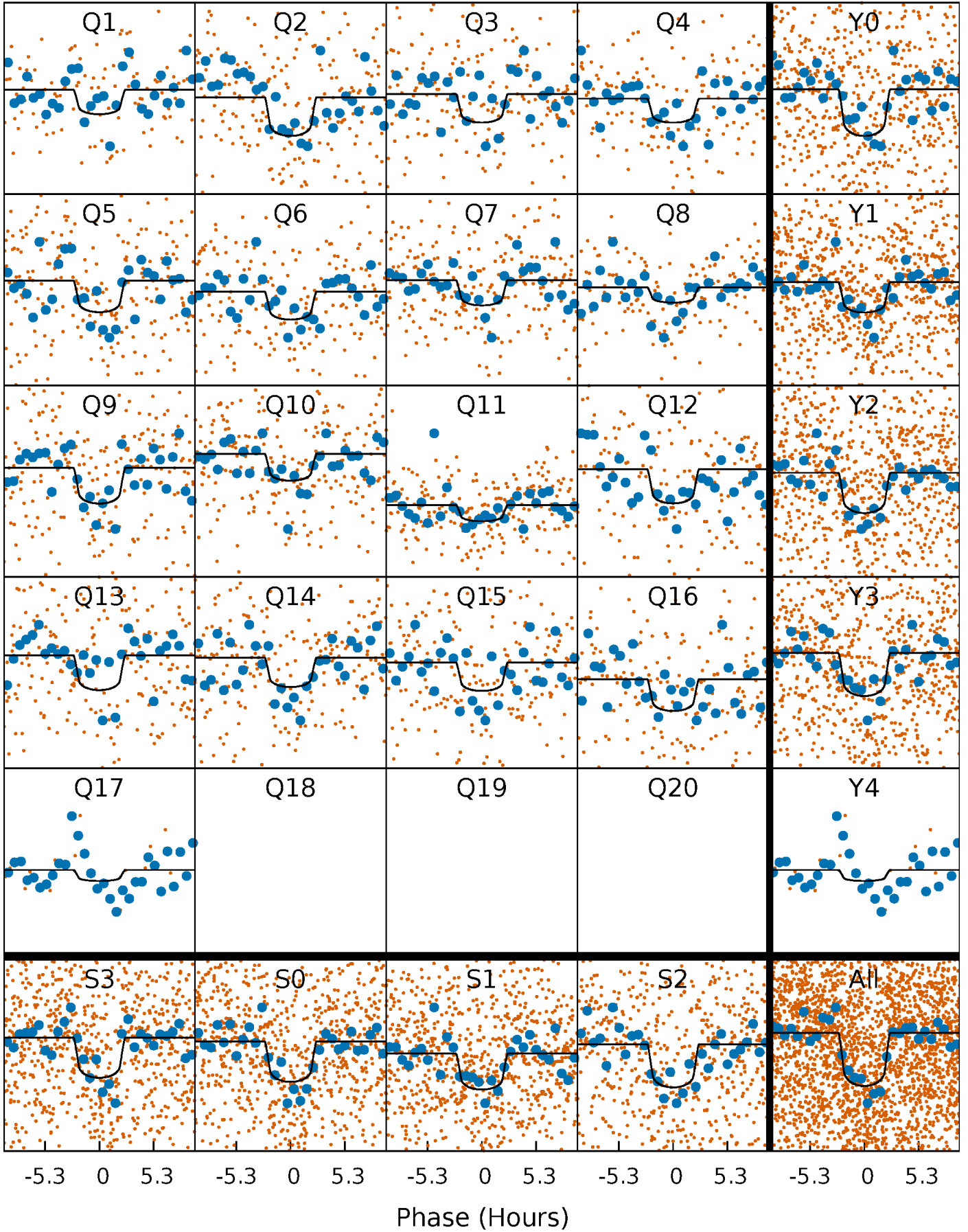
TCE 008773015-01 P= 15.604798 Days  $T_0=131.999442$  (BKJD)





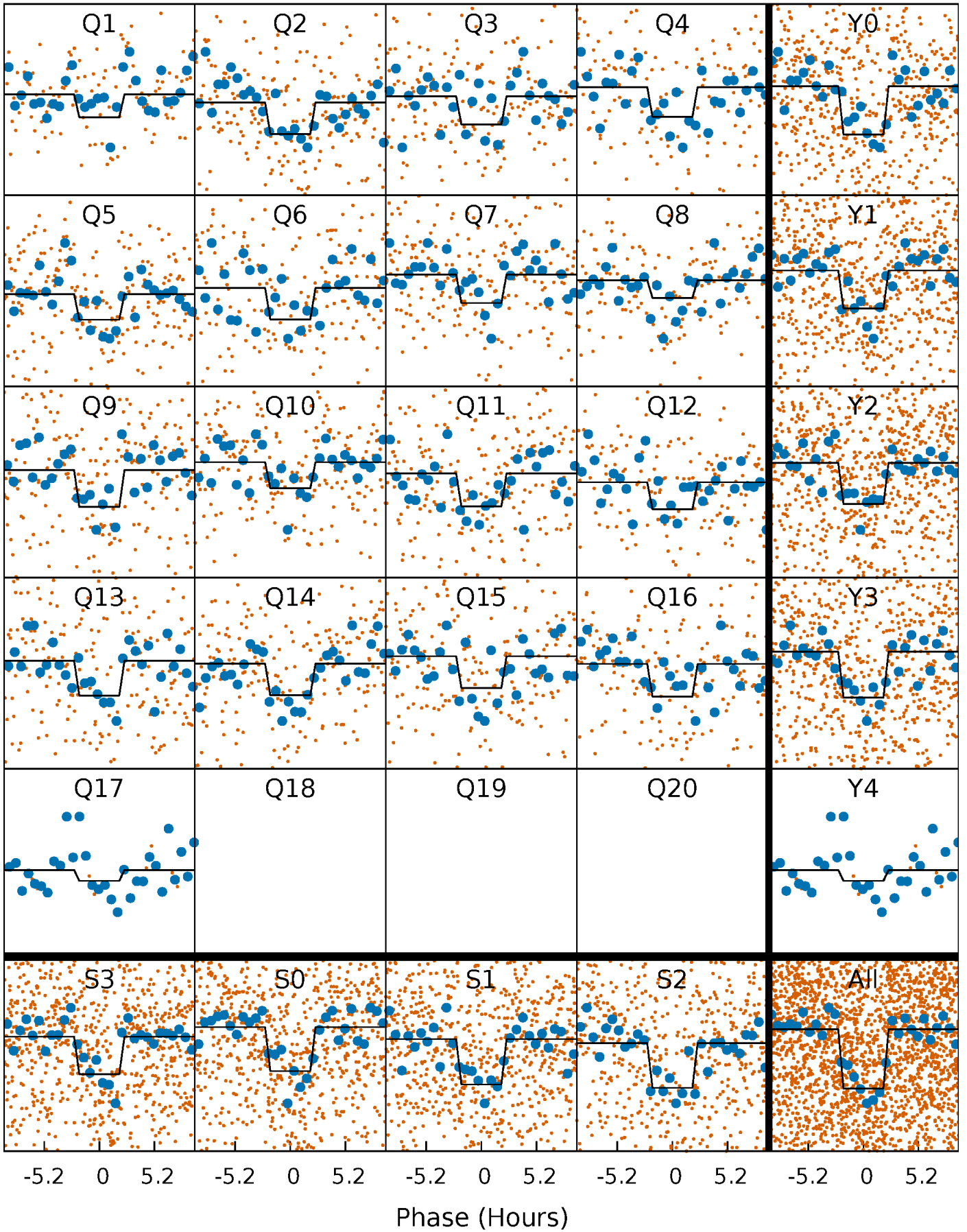
# DV Quarter-Phased Transit Curves

TCE 008773015-01   P= 15.604798 Days    $T_0=131.999442$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

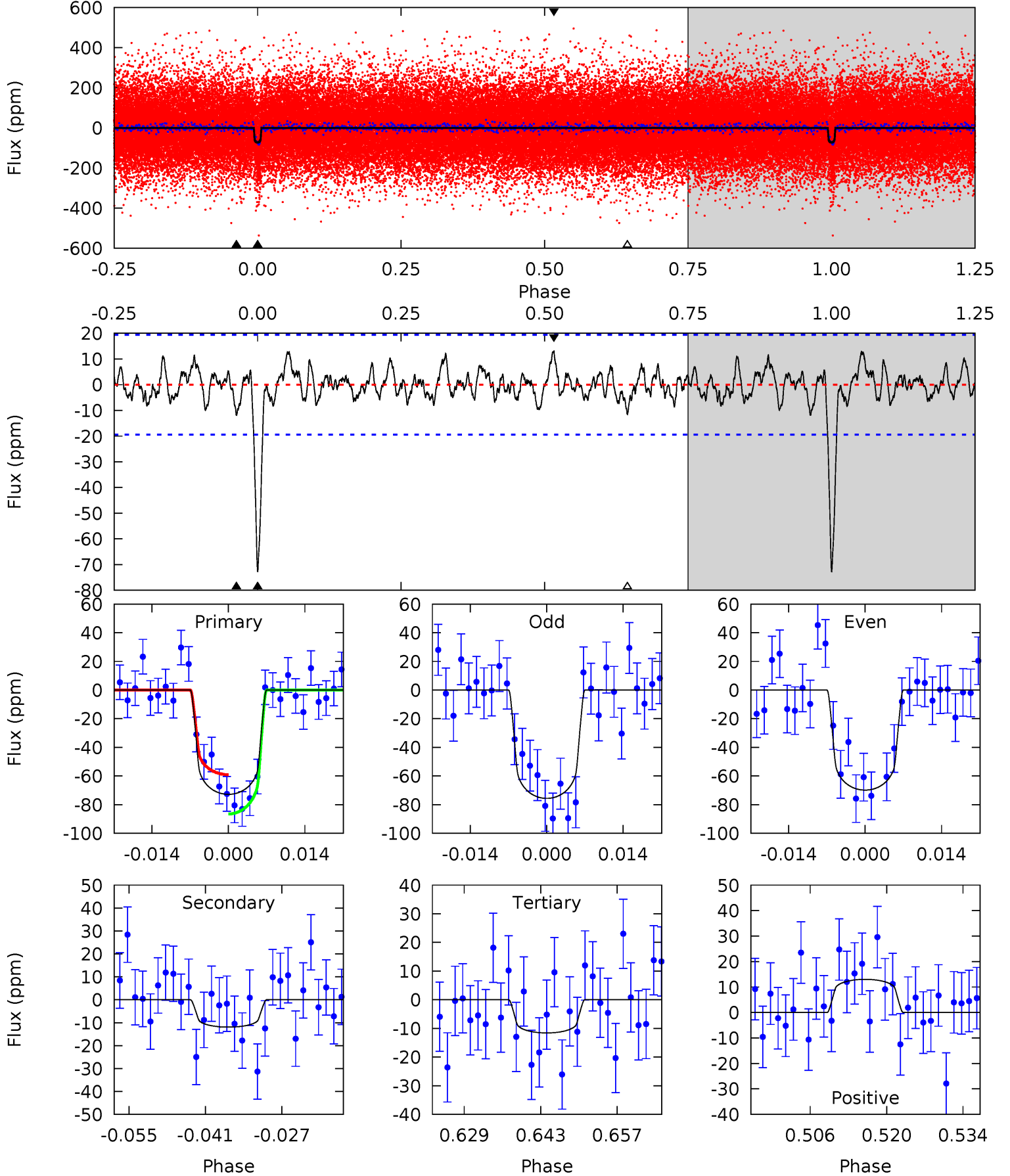
TCE 008773015-01 P= 15.604836 Days  $T_0=131.998161$  (BKJD)



# DV Model-Shift Uniqueness Test

008773015-01, P = 15.604798 Days, E = 116.394644 Days

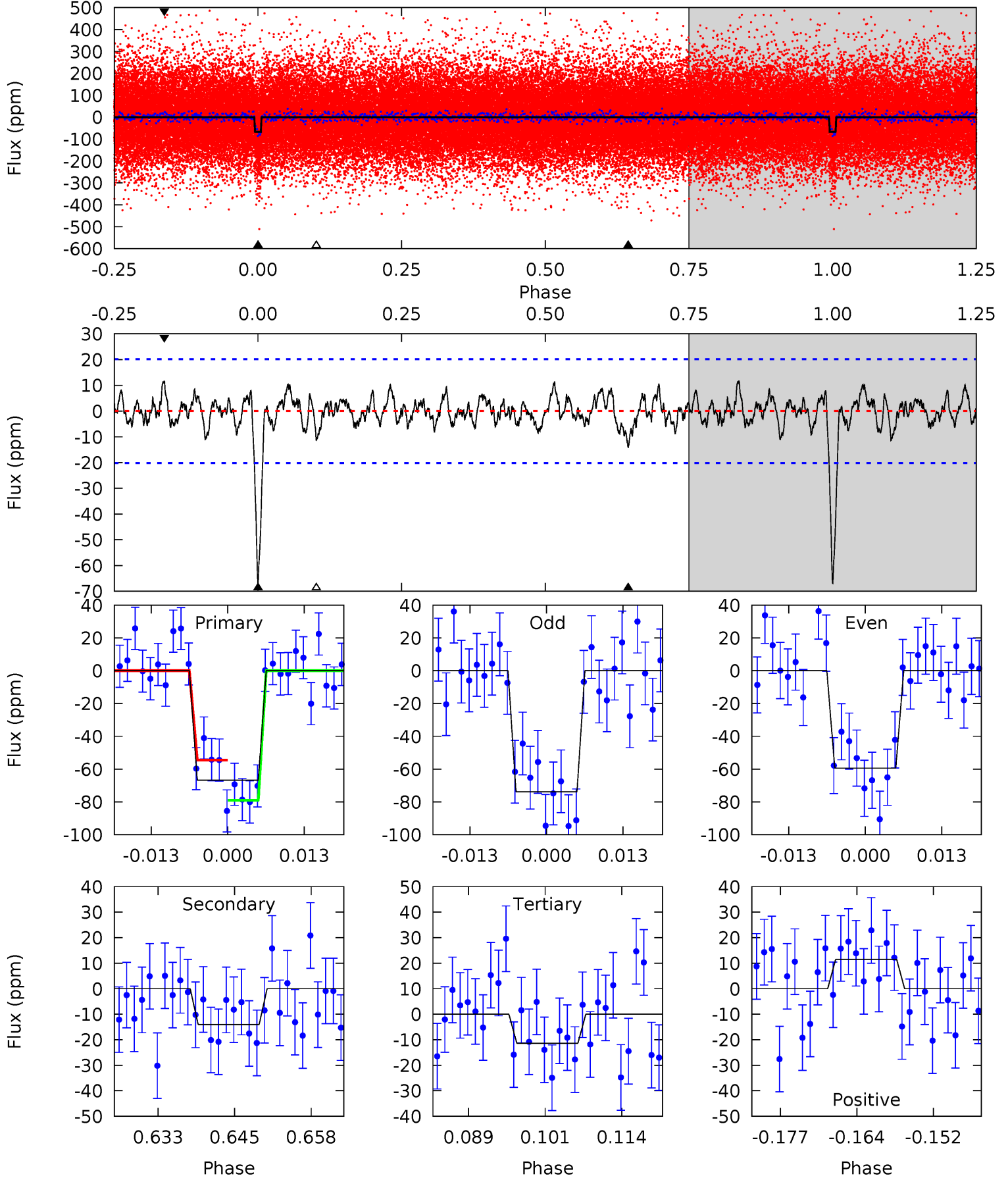
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.6	3.05	2.96	3.33	4.97	2.47	1.15	15.7	15.3	0.09	-0.28	0.74	1.00	0.15	3.51



# Alt Model-Shift Uniqueness Test

008773015-01,  $P = 15.604836$  Days,  $E = 116.393325$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.5	3.47	2.82	2.84	4.98	2.49	1.05	13.7	13.7	0.65	0.63	1.78	0.96	0.15	3.03





### Stellar Parameters For KIC 008773015

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6254^{+174}_{-212}$	$4.019^{+0.266}_{-0.114}$	$-0.260^{+0.300}_{-0.300}$	$1.706^{+0.349}_{-0.524}$	$1.110^{+0.195}_{-0.160}$	$0.315^{+0.471}_{-0.108}$
	+3%/-3%	+7%/-3%	+115%/-115%	+20%/-31%	+18%/-14%	+150%/-34%
Source	PHO1	FLK73	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 008773015-01 / KOI 4301.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-12 \pm 4$	$1.58^{+0.62}_{-0.56}$	$1389^{+92}_{-121}$	$4105^{+788}_{-460}$	$41^{+62}_{-21}$
Alt.	$-14 \pm 4$	$1.46^{+0.54}_{-0.61}$	$1396^{+95}_{-123}$	$4414^{+1092}_{-543}$	$59^{+117}_{-32}$

$T_{\text{max}}$  = 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

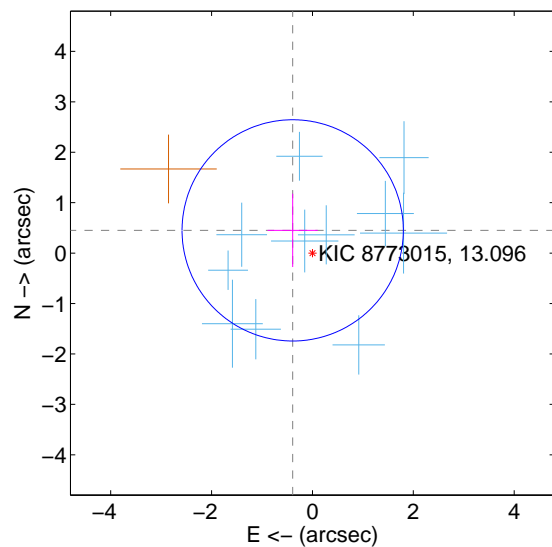
Supplemental centroid analysis for 008773015-01. Kepler magnitude: 13.10. Transit SNR 13.84

There are 11 quarters with good PRF difference image offsets

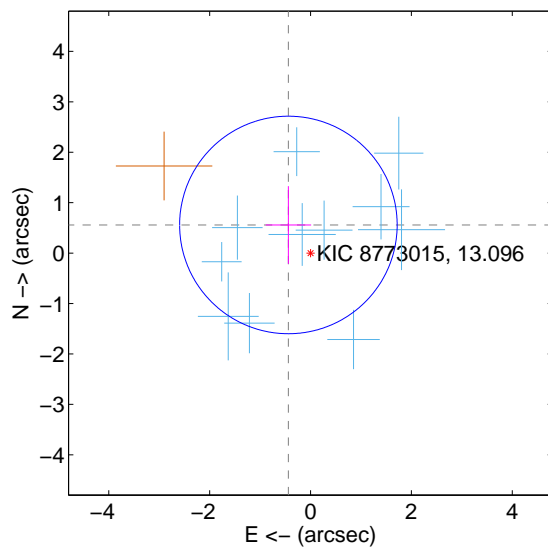
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.597 \pm 0.731$	0.82	$0.392 \pm 0.497$	$0.450 \pm 0.727$
PRF-fit source offset from KIC position	$0.710 \pm 0.719$	0.99	$0.439 \pm 0.451$	$0.558 \pm 0.770$
photometric centroid source offset	$0.59 \pm 1.14$	0.52	$-0.44 \pm 1.20$	$-0.39 \pm 1.04$

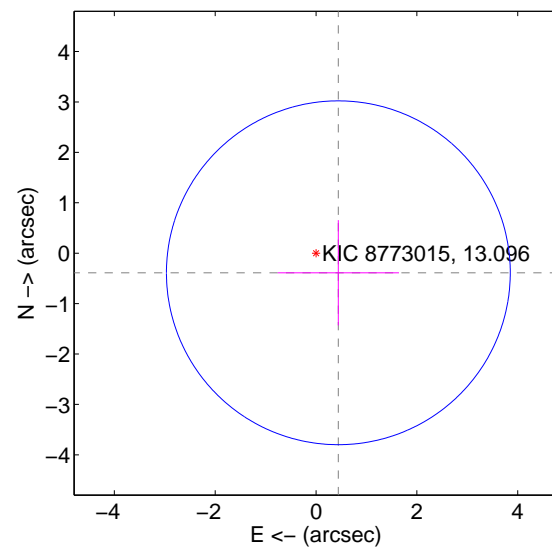
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

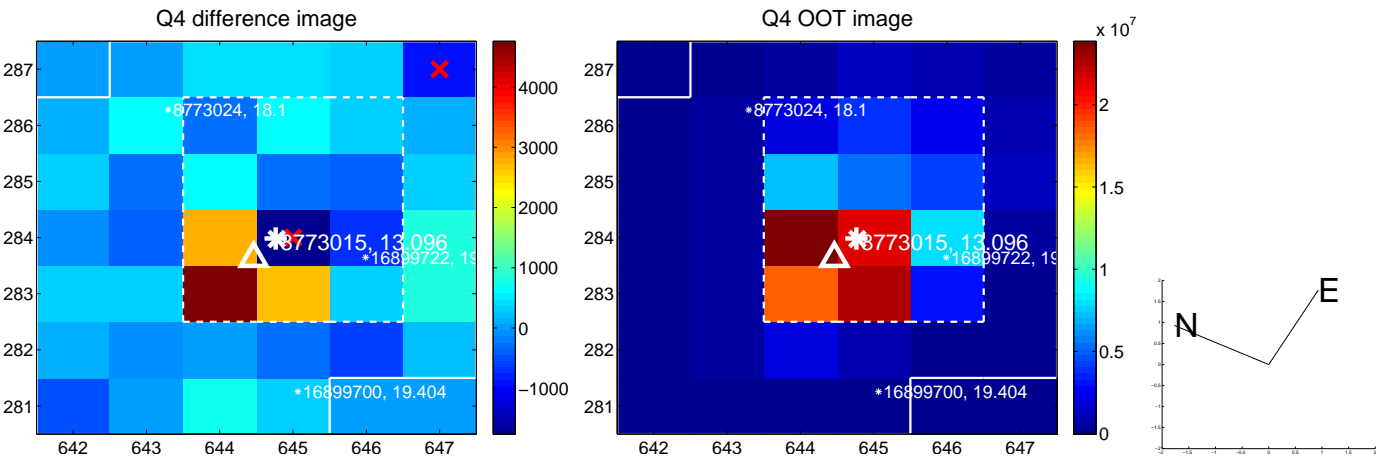
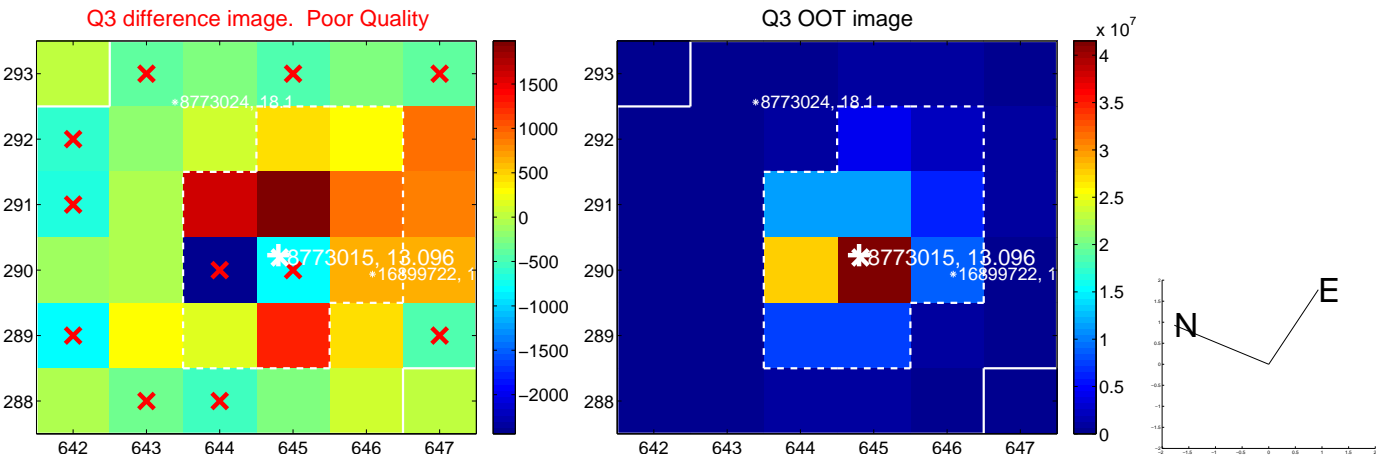
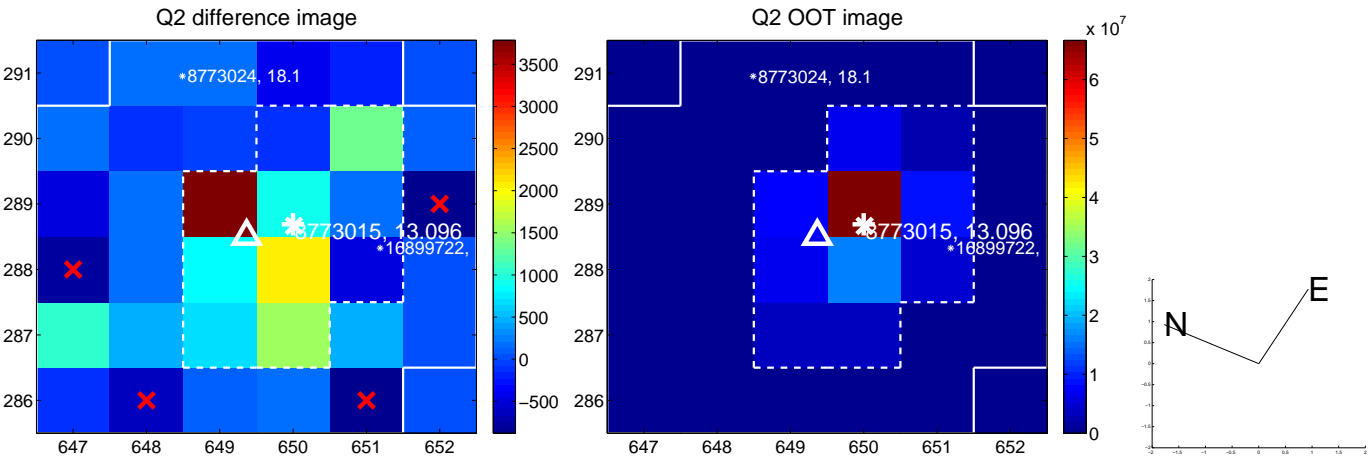
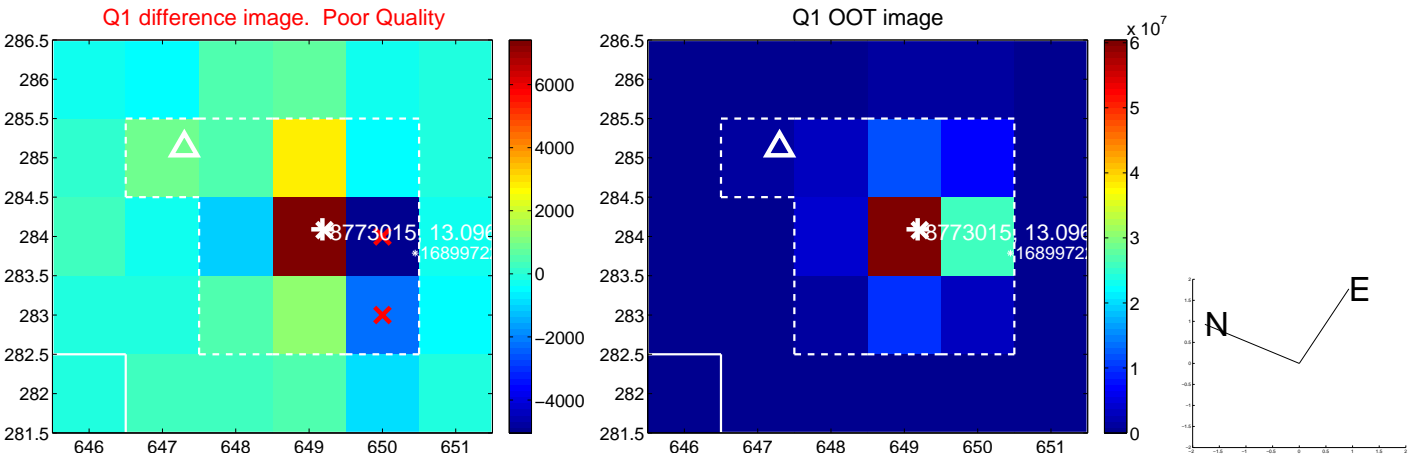


offset from photometric centroids

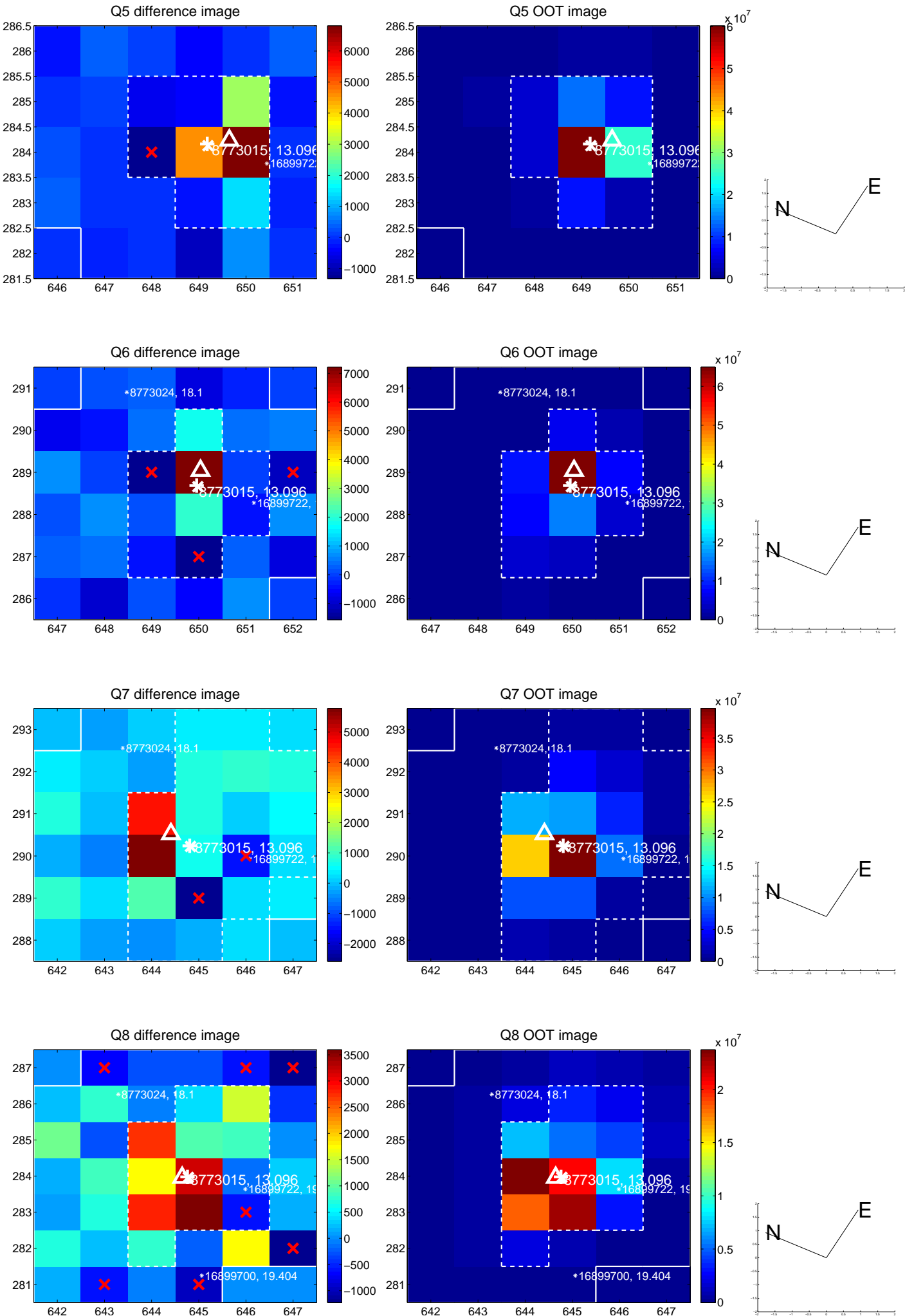


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

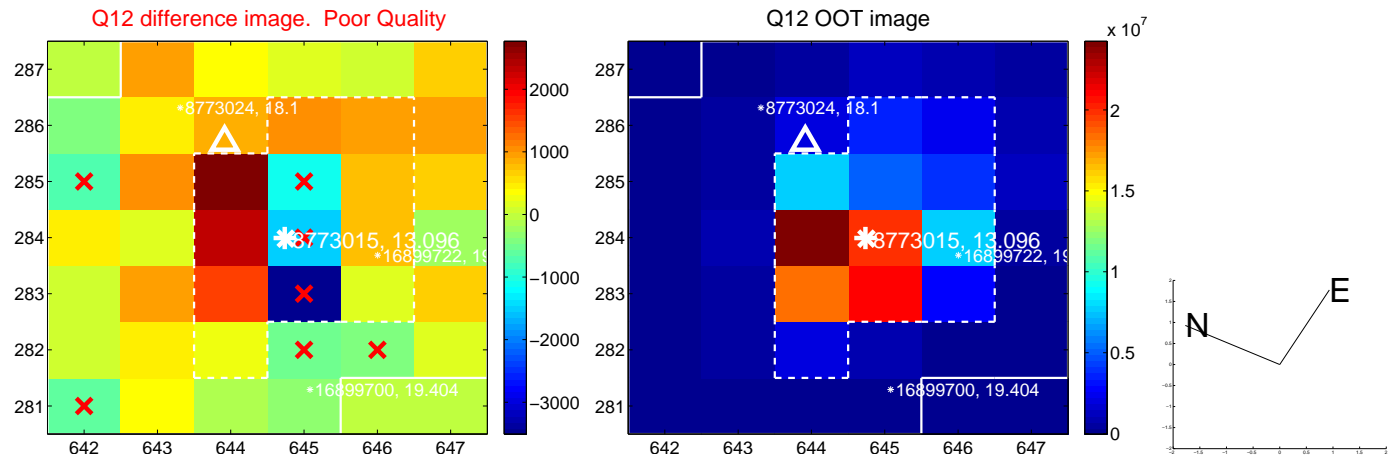
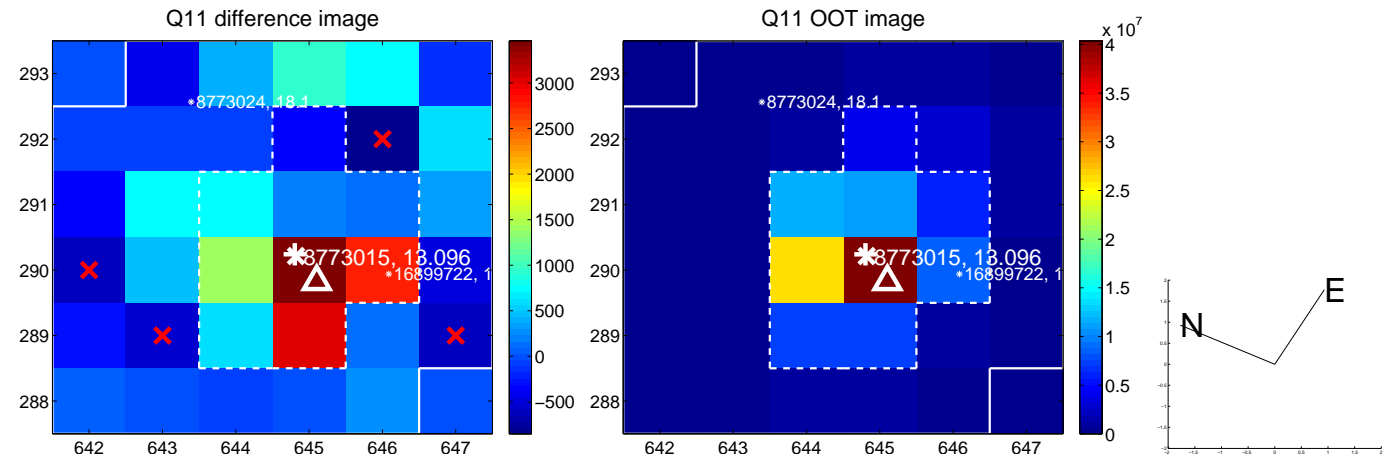
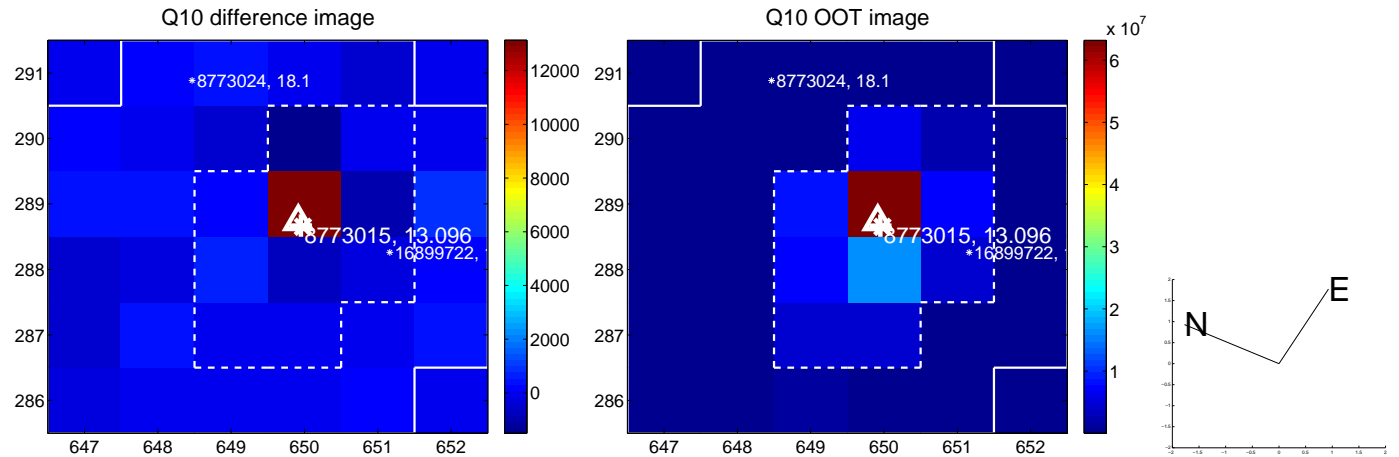
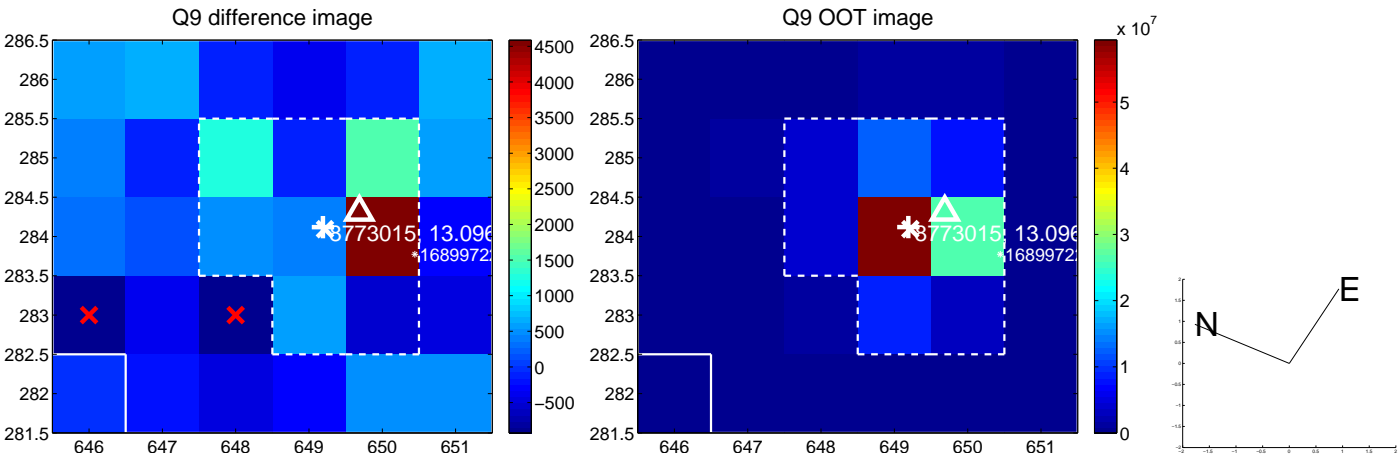


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

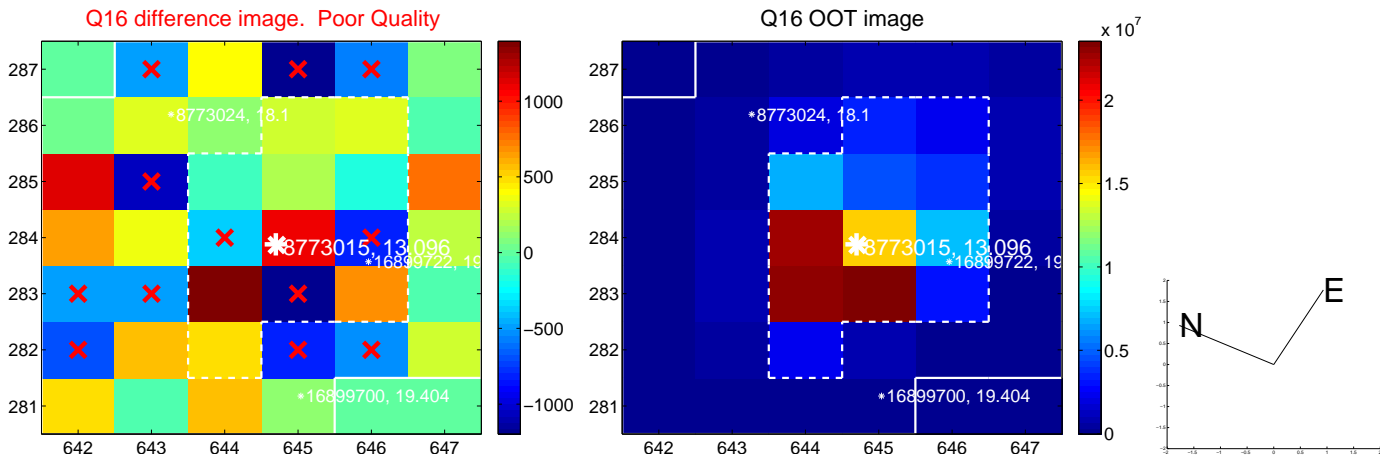
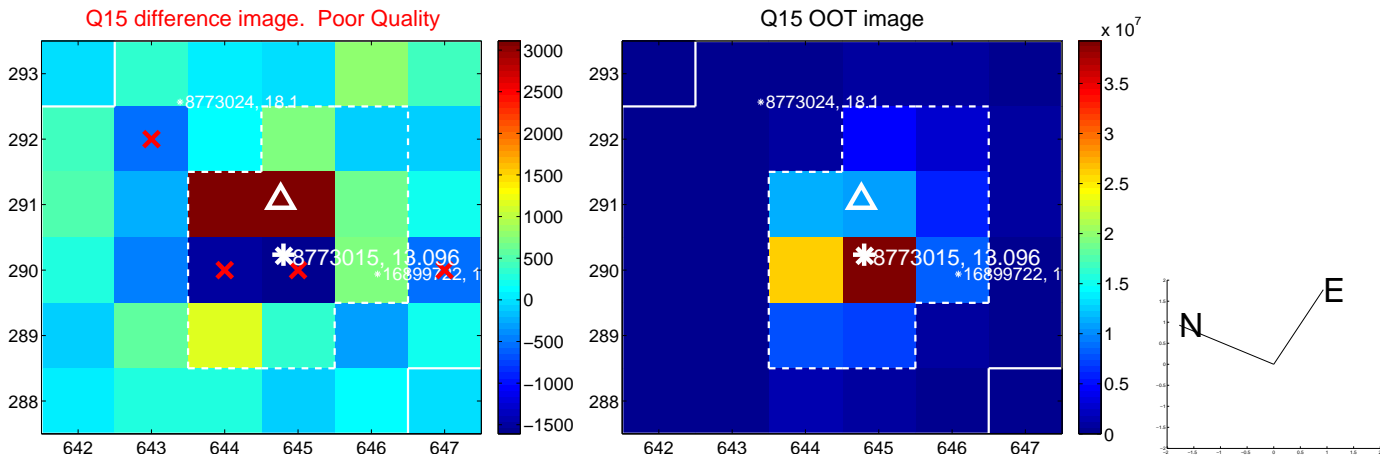
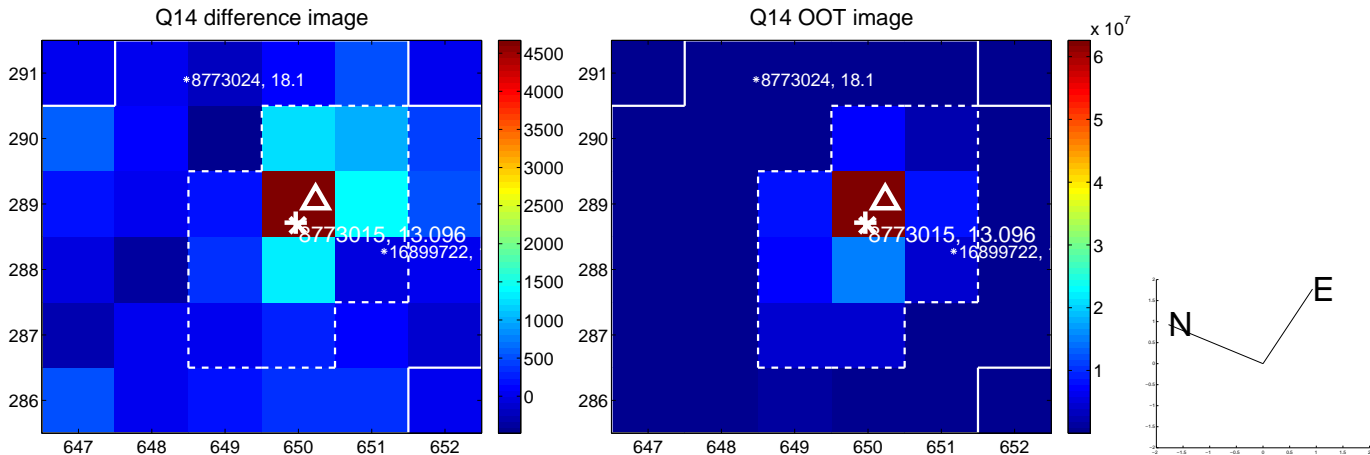
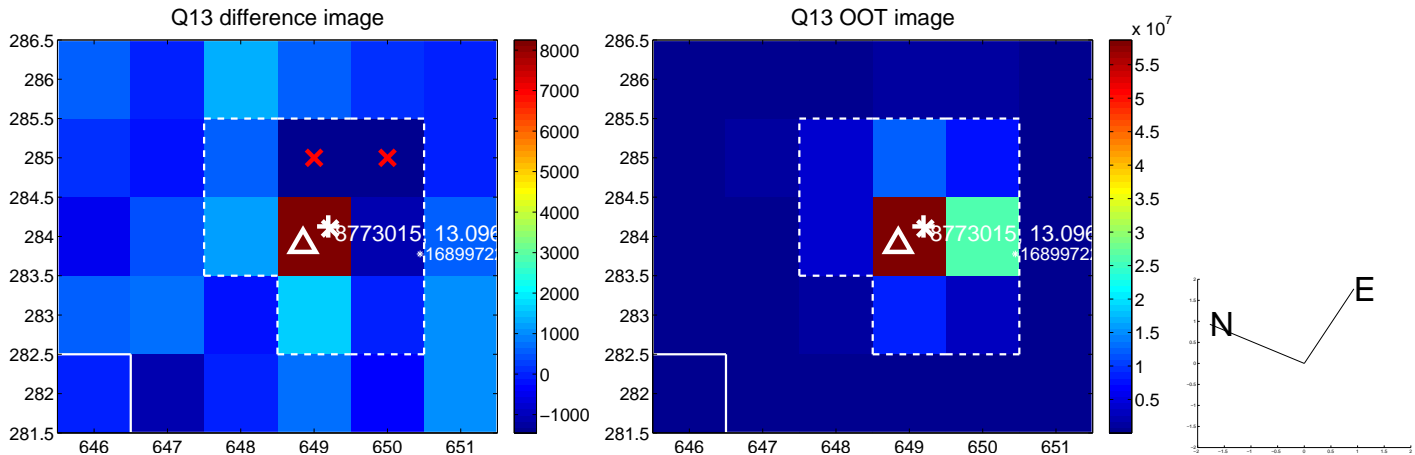




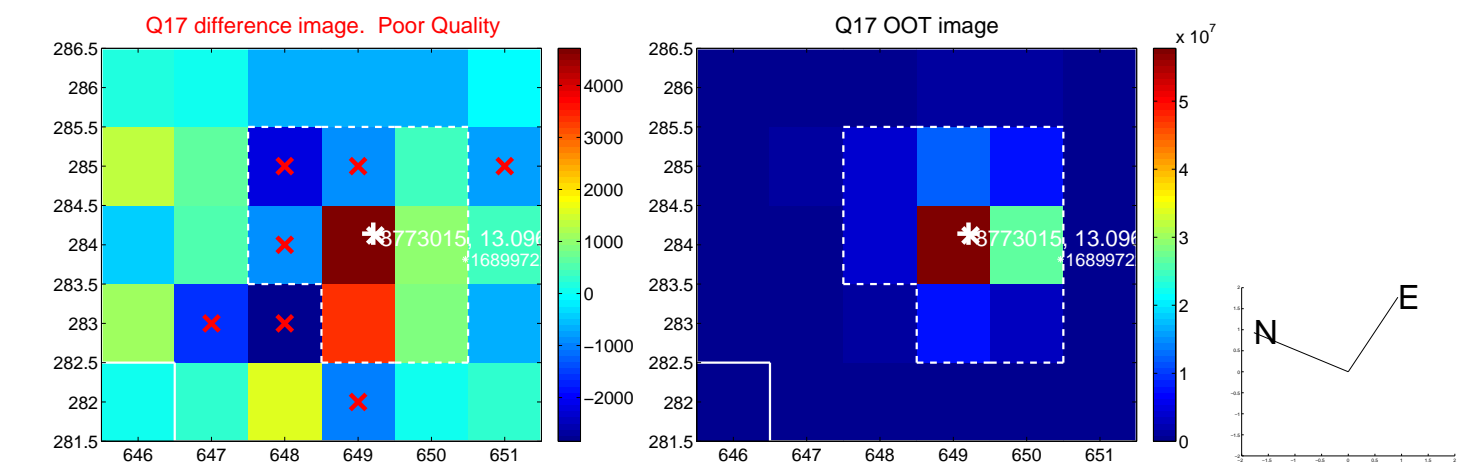
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



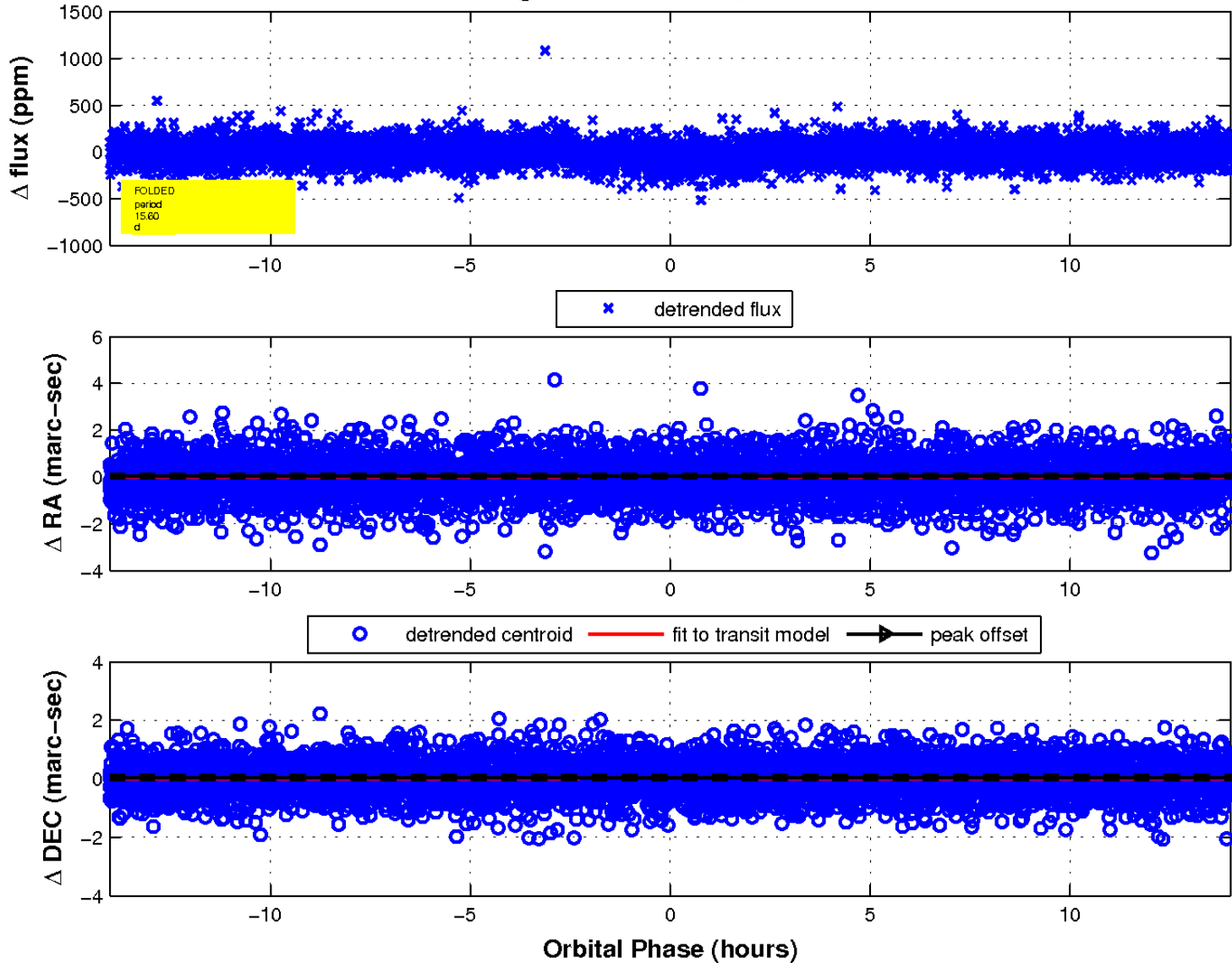
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

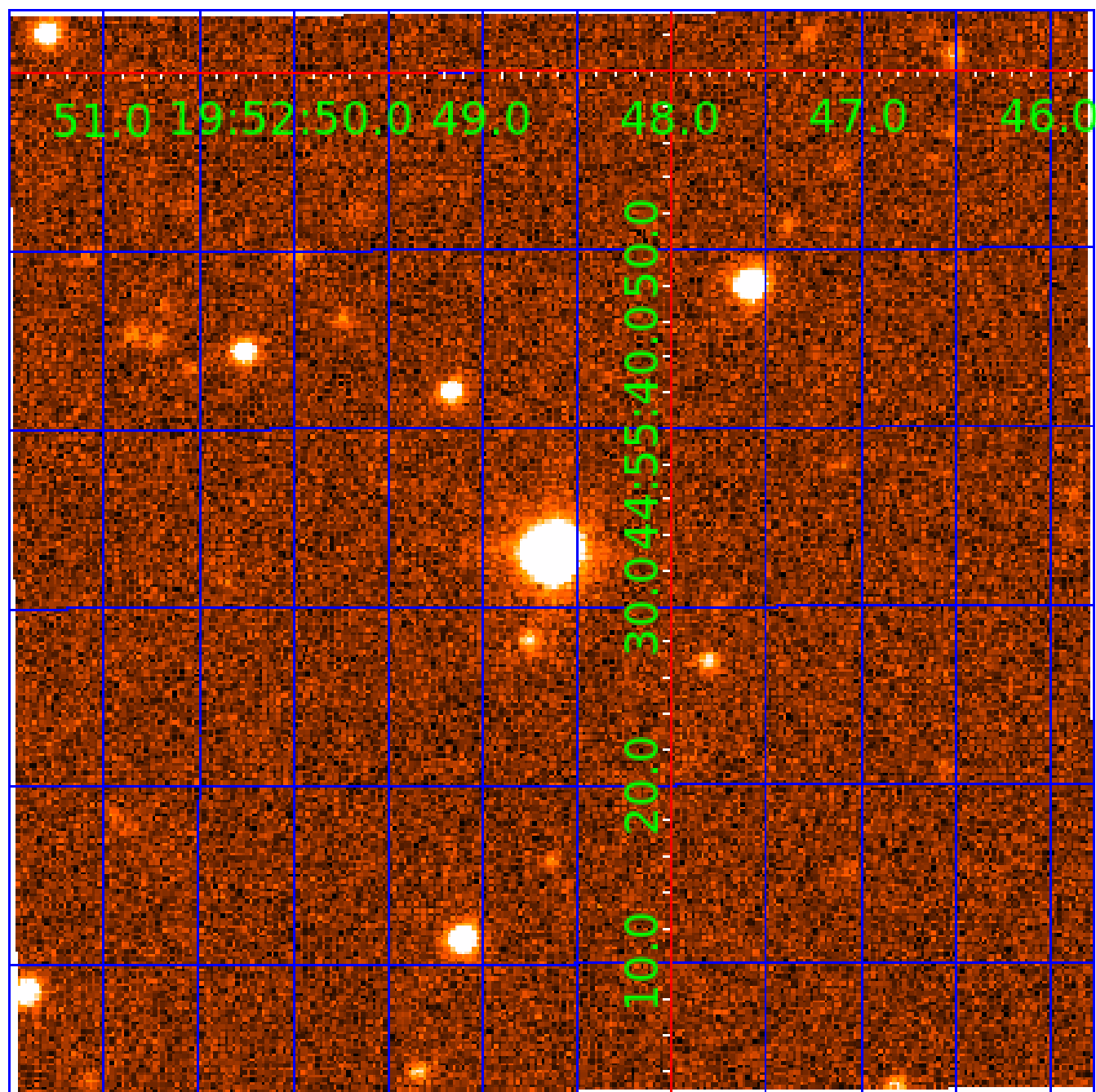


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 008773015

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008773015-01	OBS	4301.01	15.604798	131.999442	69.2	4.673	13.7	13.8	1.71	6254	1.65	249.17
008773015-02	OBS	No	444.257689	231.573405	181.9	13.774	10.0	10.6	1.71	6254	2.54	2.87
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008773015-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008773015-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008773015-03	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

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

## Ephemeris Match Information For 008773015-02

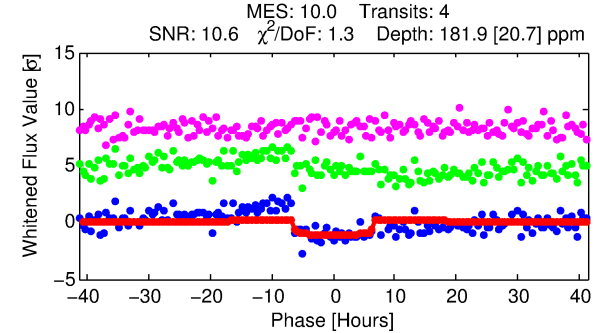
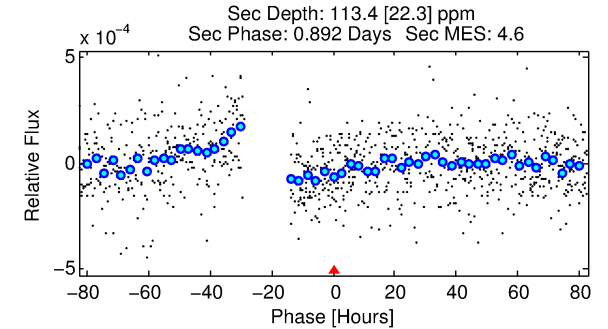
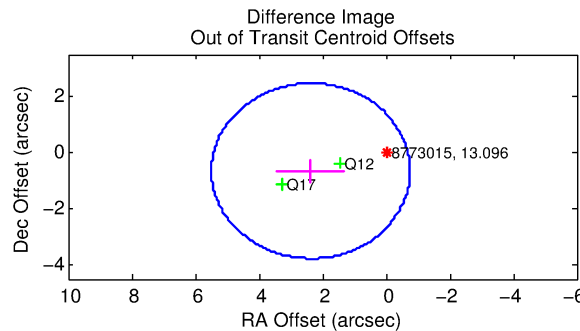
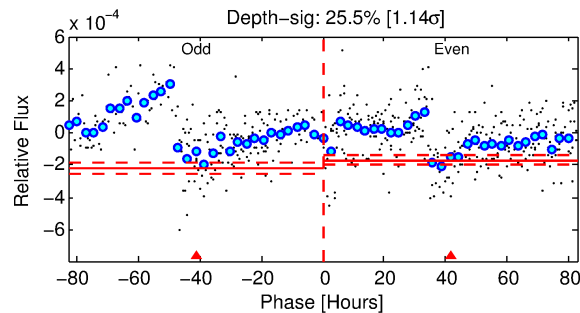
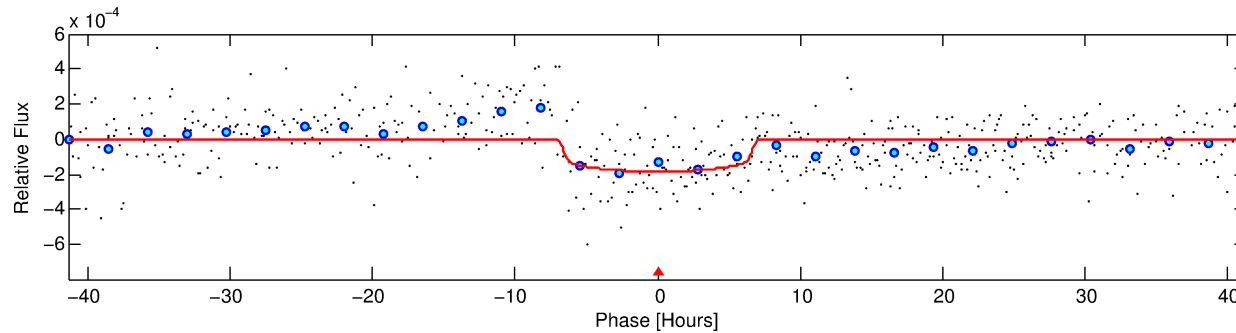
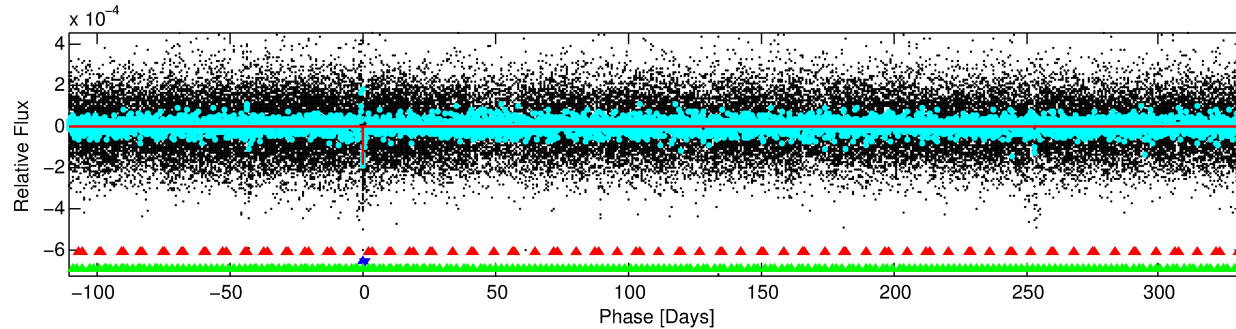
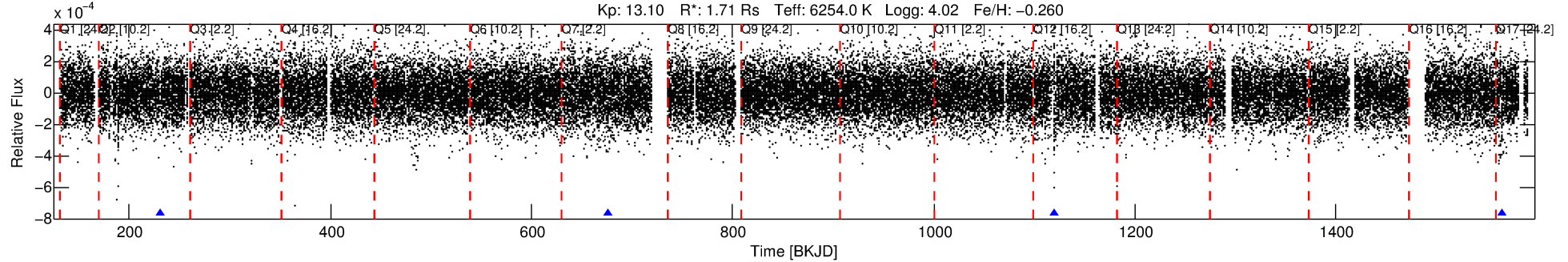
No Significant Match Found

# DV One-Page Summary

KIC: 8773015 Candidate: 2 of 3 Period: 444.258 d

KOI: K04301 Corr: No Ephemeris Match

Kp: 13.10 R\*: 1.71 Rs Teff: 6254.0 K Logg: 4.02 Fe/H: -0.260



## DV Fit Results:

Period = 444.25769 [0.01172] d  
Epoch = 231.5734 [0.0224] BKJD  
Rp/R\* = 0.0136 [0.0043]  
a/R\* = 155.27 [256.39]  
b = 0.79 [0.77]  
Seff = 2.87 [1.37]  
Teq = 332 [40] K  
Rp = 2.54 [1.11] Re  
a = 1.1797 [0.3411] AU  
Ag = 13492.40 [10791.97] [1.25σ]  
Teffp = 5529 [927] K [5.60σ]

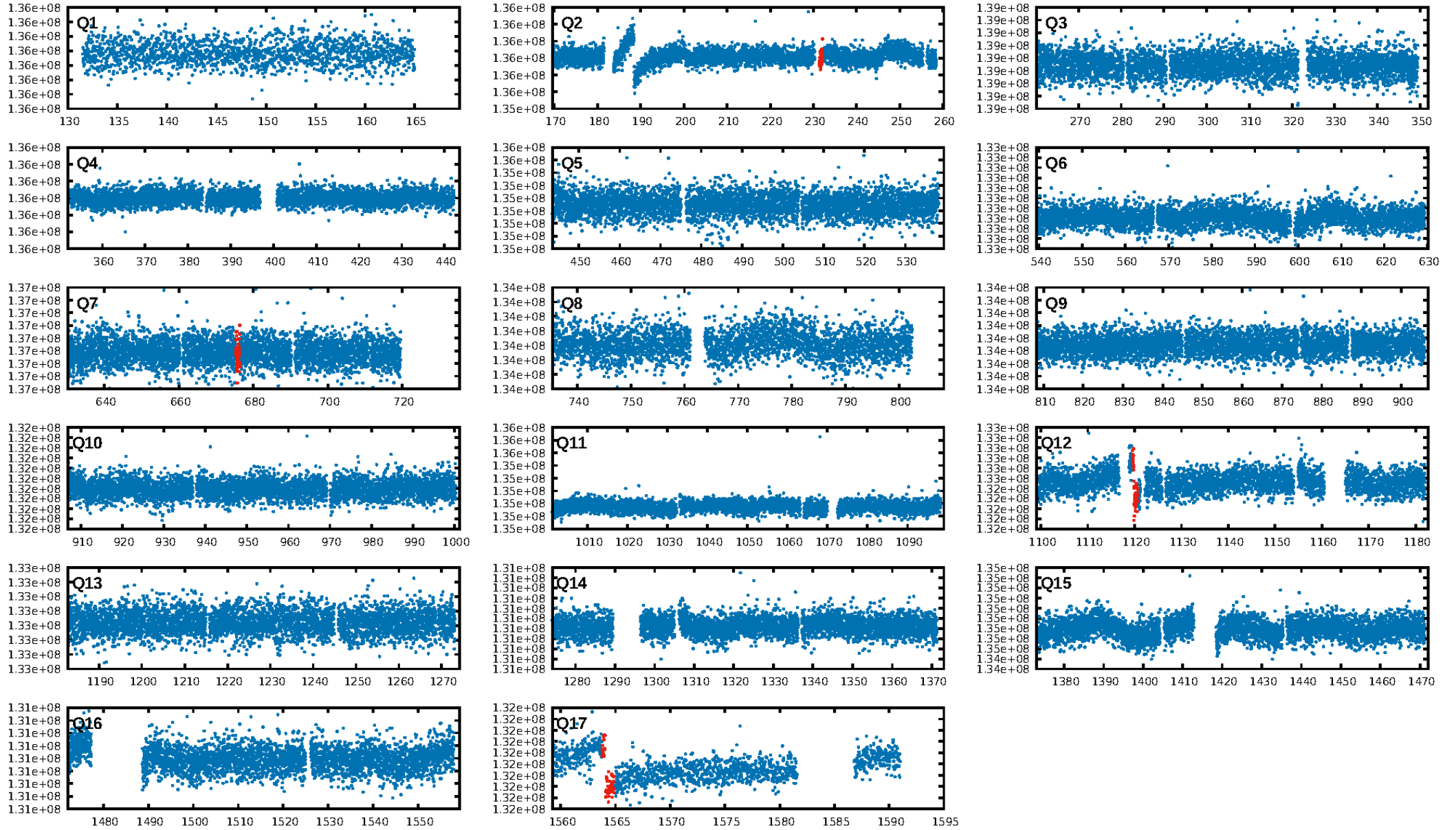
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [707.28σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 69.7%  
Bootstrap-pfa: 1.48e-24  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.461  
Centroid-sig: 0.2%  
Centroid-so: 2.045 arcsec [1.69σ]  
OotOffset-rm: 2.458 arcsec [2.36σ]  
KicOffset-rm: 2.465 arcsec [2.35σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.67 [2/3]

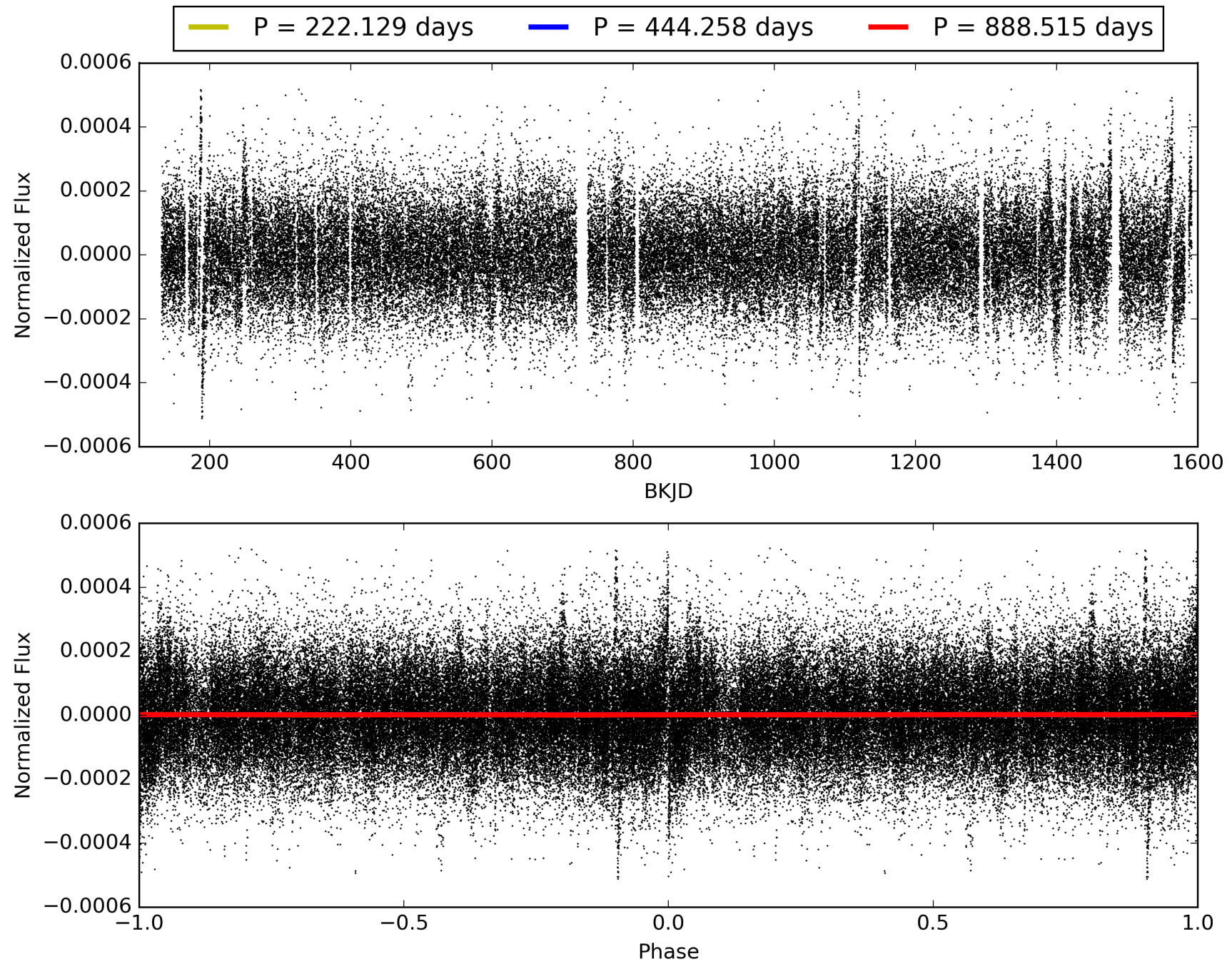
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:42:31 Z

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

# TCE 008773015-02, PDC Light Curves

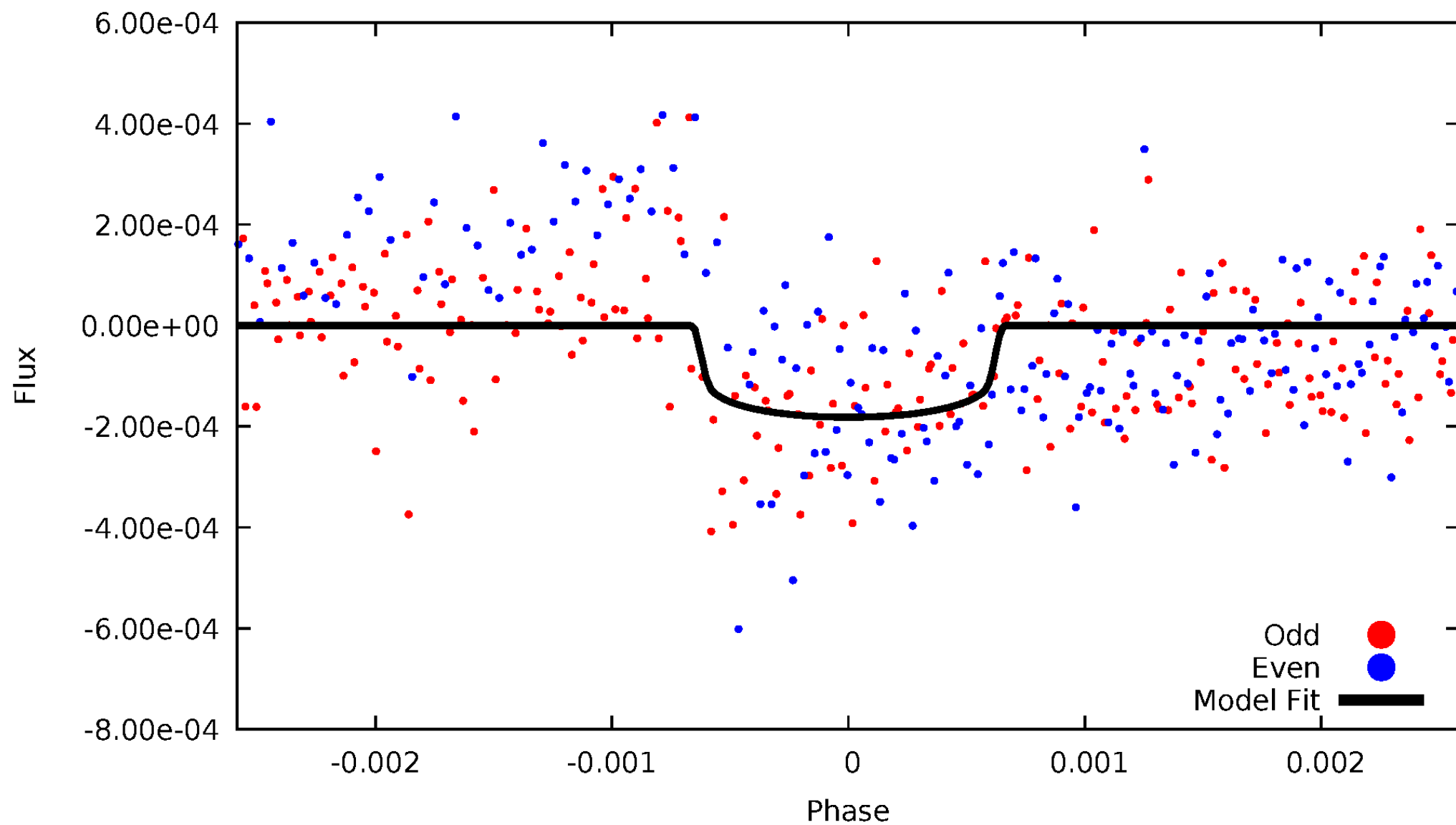


TCE 008773015-02



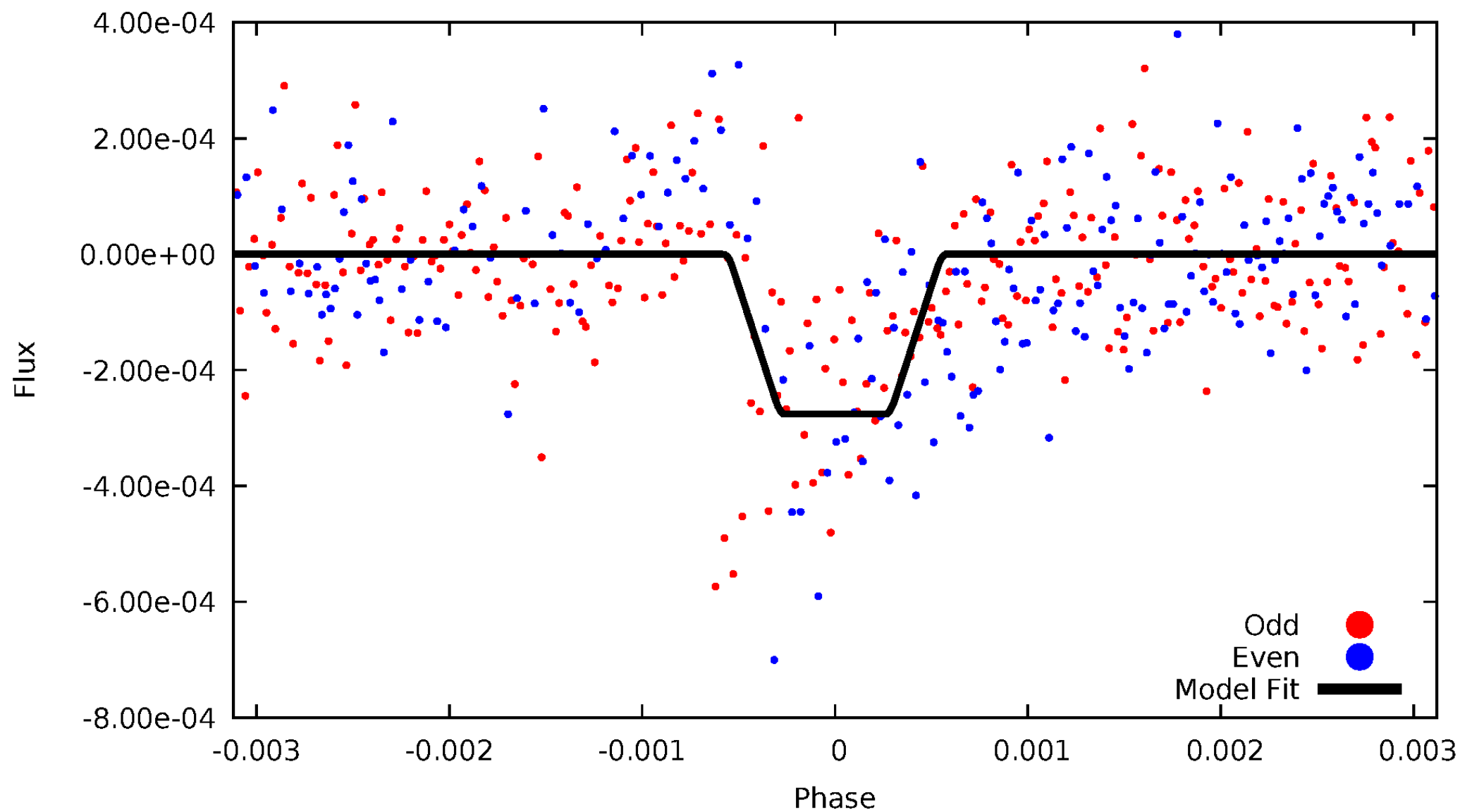
# DV Odd/Even

TCE 008773015-02



# ALT Odd/Even

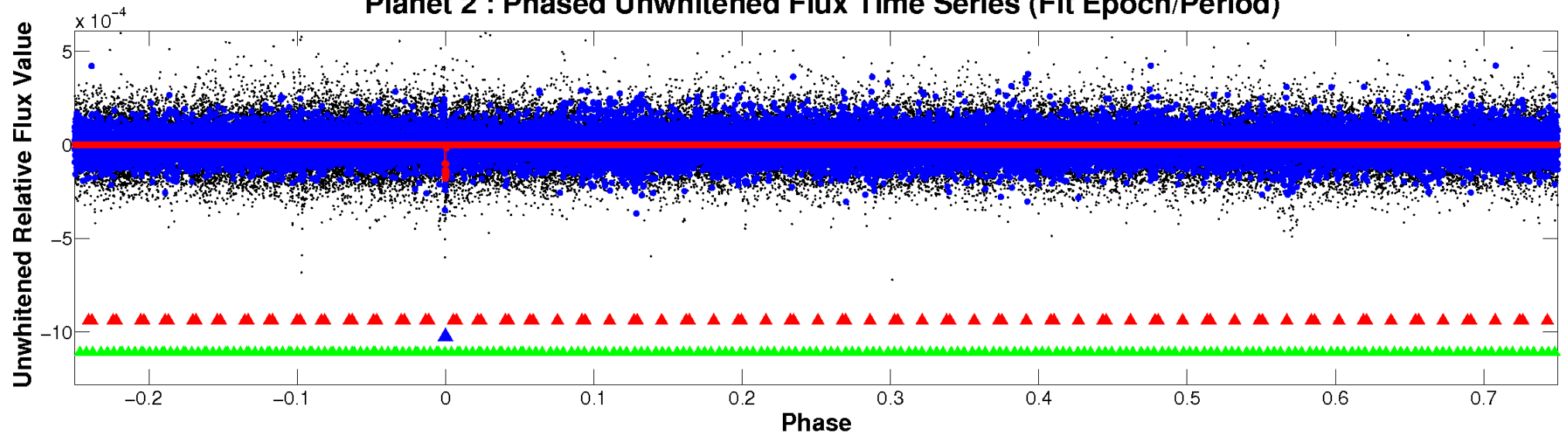
TCE 008773015-02



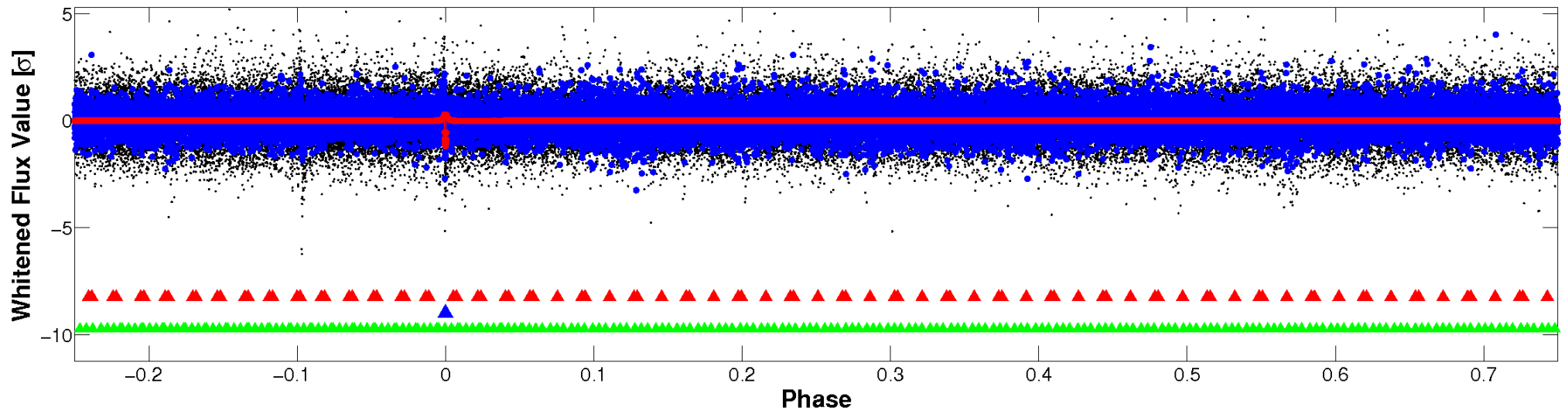


# Non-Whitened Vs. Whitened Light Curve

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



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



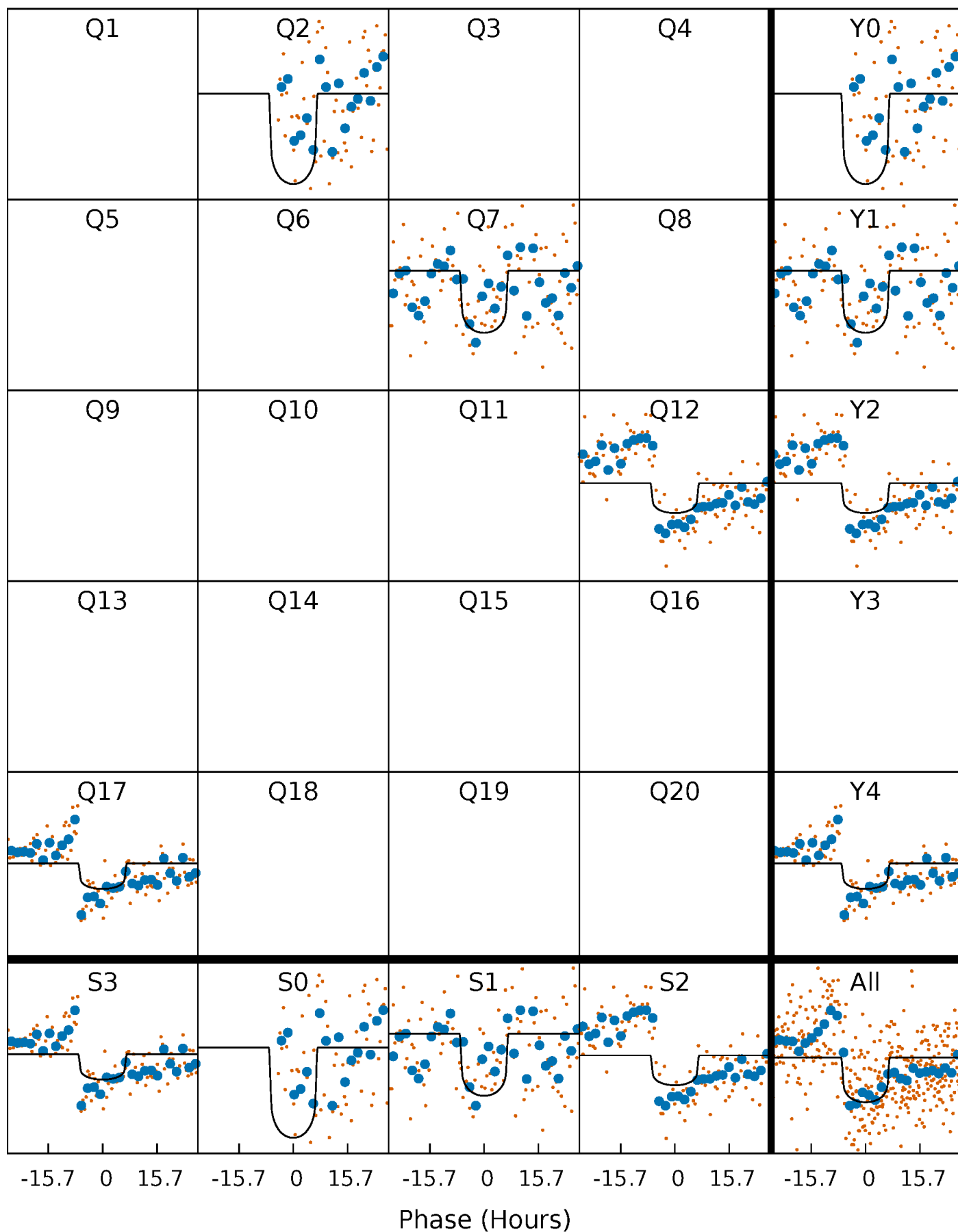
# PDC Quarter-Phased Transit Curves

TCE 008773015-02 P=444.257689 Days  $T_0=231.573405$  (BKJD)



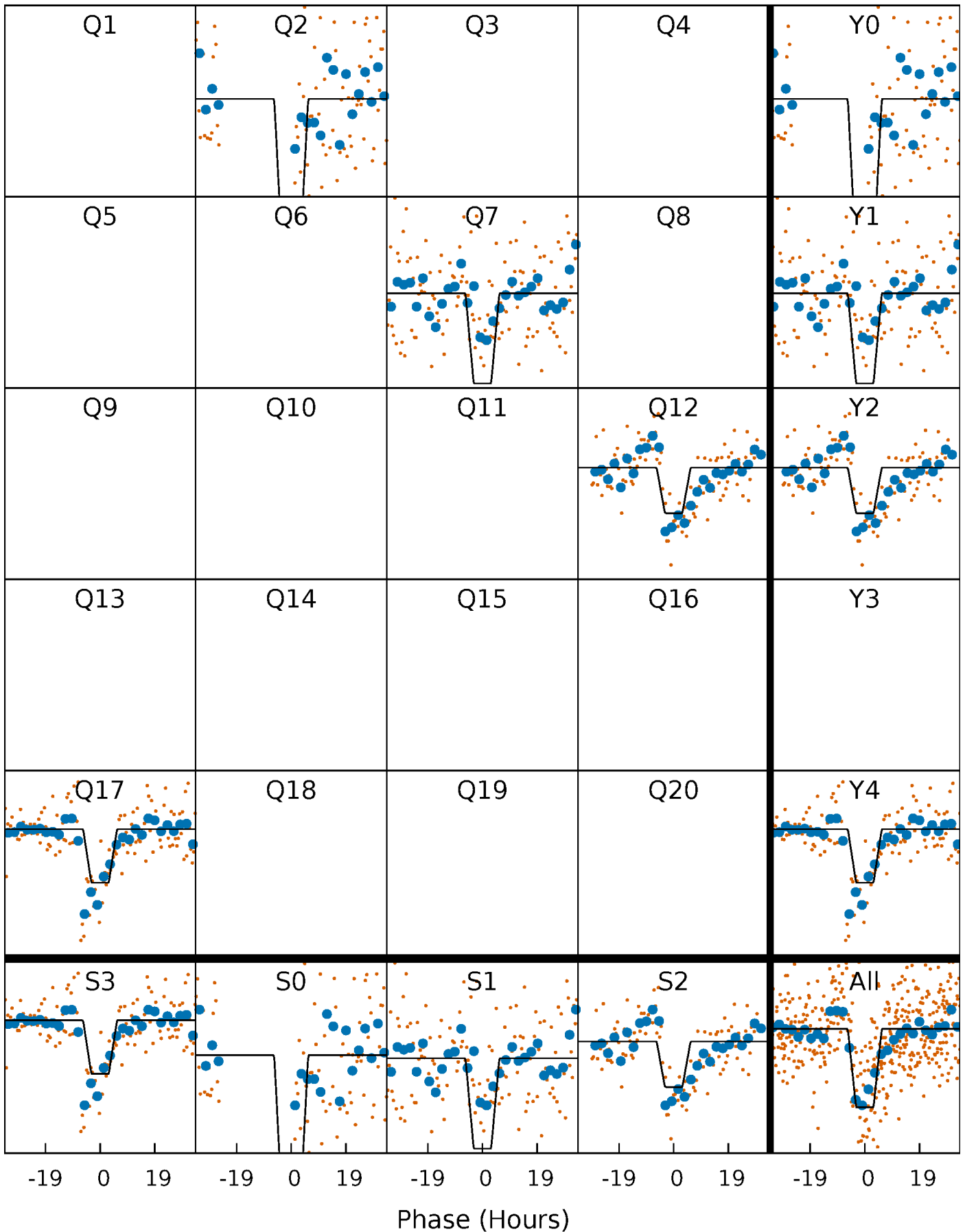
# DV Quarter-Phased Transit Curves

TCE 008773015-02     $P=444.257689$  Days     $T_0=231.573405$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

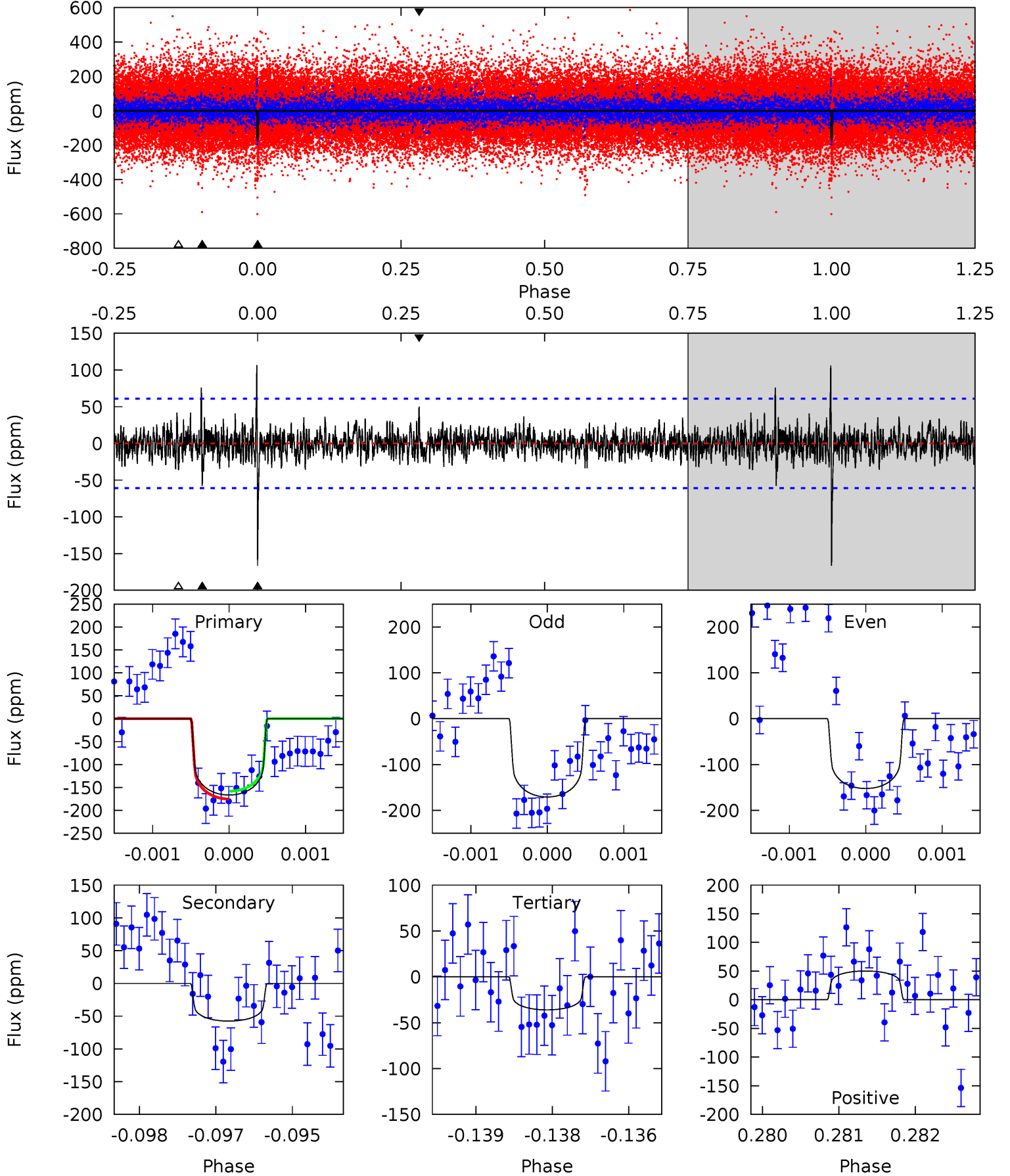
TCE 008773015-02     $P=444.341385$  Days     $T_0=231.340217$  (BKJD)



# DV Model-Shift Uniqueness Test

008773015-02, P = 444.257689 Days, E = 231.573405 Days

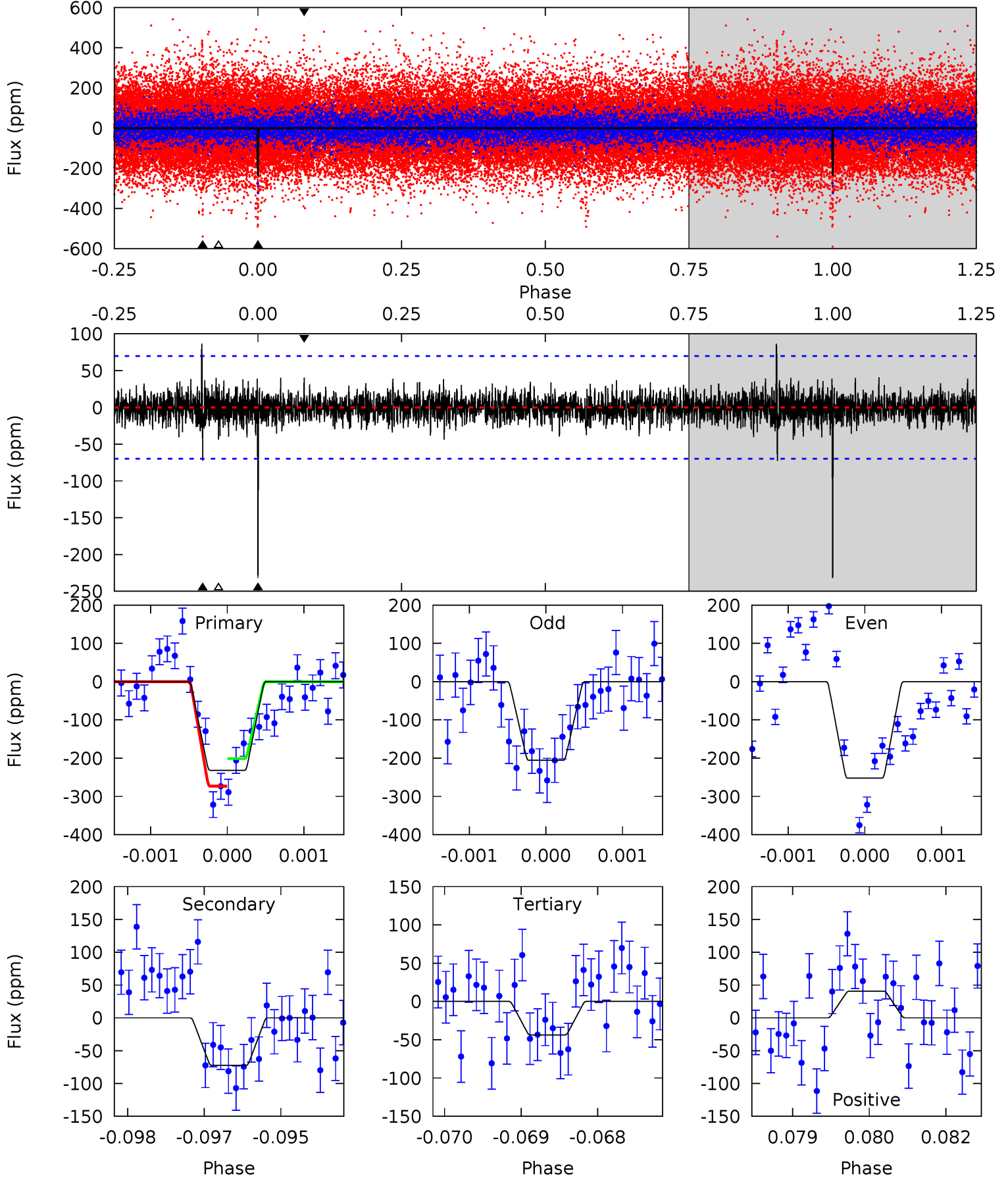
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	5.10	3.19	4.44	5.40	3.21	1.16	11.5	10.3	1.91	0.66	0.81	0.95	0.39	0.76



# Alt Model-Shift Uniqueness Test

008773015-02, P = 444.341385 Days, E = 231.340217 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
18.0	5.62	3.40	3.16	5.43	3.25	0.99	14.6	14.8	2.22	2.46	1.81	0.99	0.27	2.77



### Stellar Parameters For KIC 008773015

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6254^{+174}_{-212}$	$4.019^{+0.266}_{-0.114}$	$-0.260^{+0.300}_{-0.300}$	$1.706^{+0.349}_{-0.524}$	$1.110^{+0.195}_{-0.160}$	$0.315^{+0.471}_{-0.108}$
	+3%/-3%	+7%/-3%	+115%/-115%	+20%/-31%	+18%/-14%	+150%/-34%
Source	PHO1	FLK73	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 008773015-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-58 \pm 11$	$2.44^{+0.93}_{-0.82}$	$458^{+29}_{-34}$	$4771^{+919}_{-533}$	$7411^{+9356}_{-3609}$
Alt.	$-72 \pm 13$	$3.12^{+0.83}_{-0.95}$	$455^{+30}_{-34}$	$4579^{+579}_{-406}$	$5931^{+5757}_{-2438}$

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



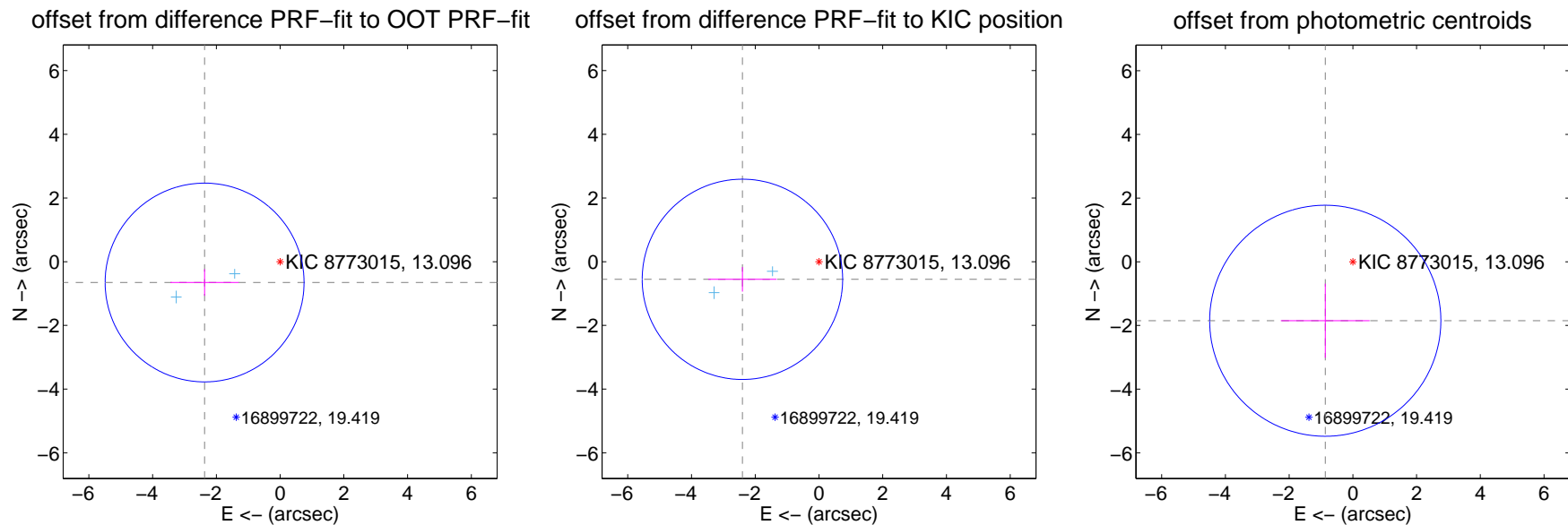
## DV Centroid Data

Supplemental centroid analysis for 008773015-02. Kepler magnitude: 13.10. Transit SNR 10.63

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.458 \pm 1.040$	2.36	$2.369 \pm 1.073$	$-0.653 \pm 0.418$
PRF-fit source offset from KIC position	$2.465 \pm 1.048$	2.35	$2.402 \pm 1.072$	$-0.554 \pm 0.385$
photometric centroid source offset	$2.05 \pm 1.21$	1.69	$0.87 \pm 1.39$	$-1.85 \pm 1.17$

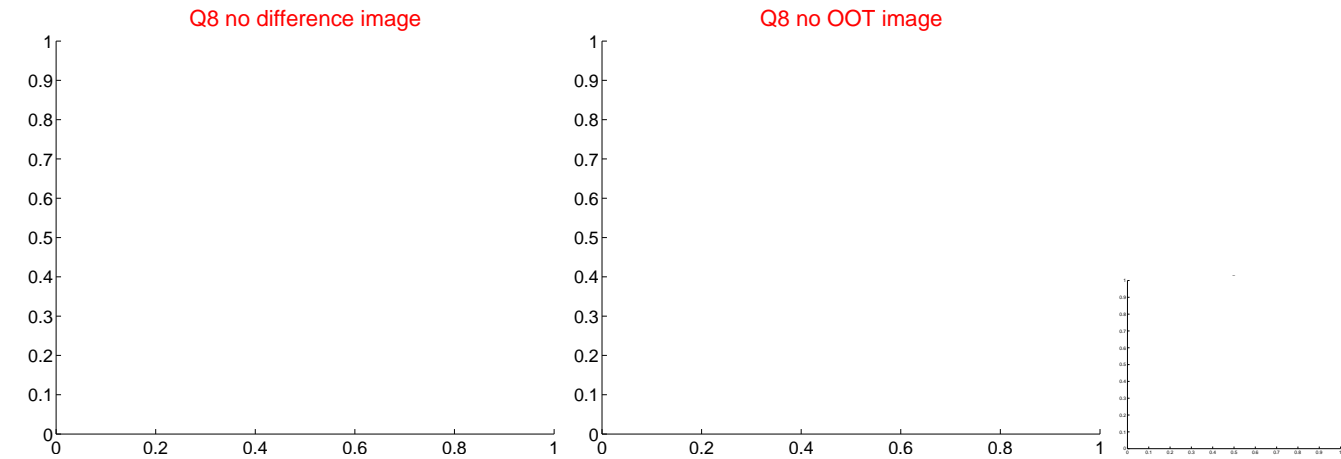
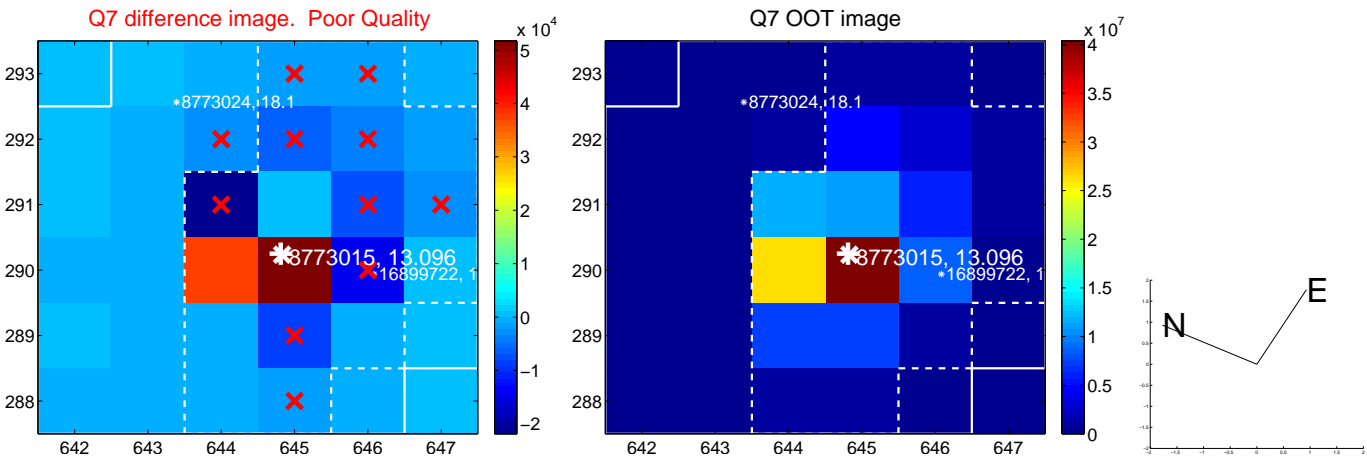
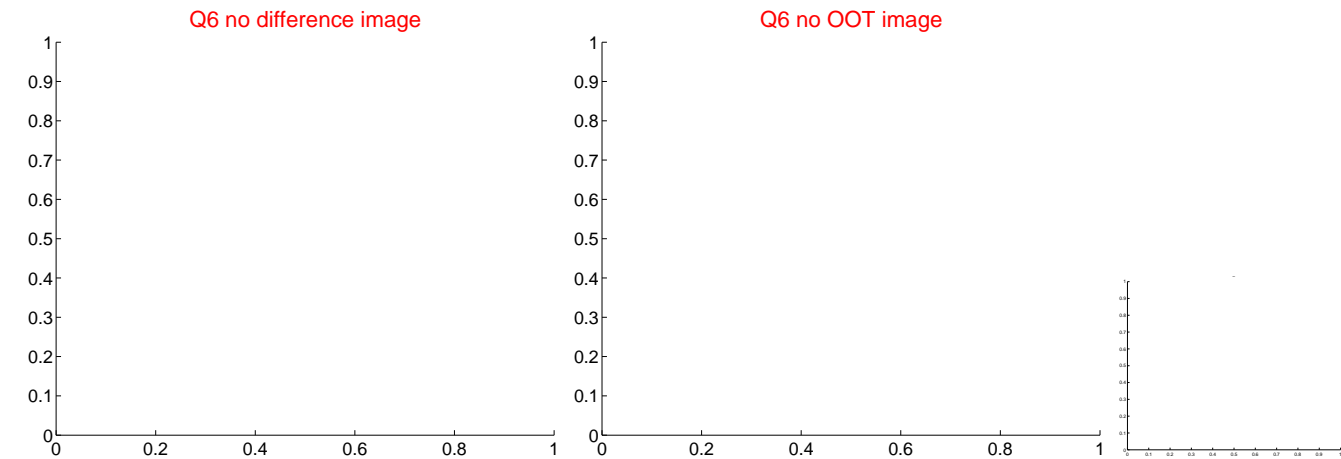
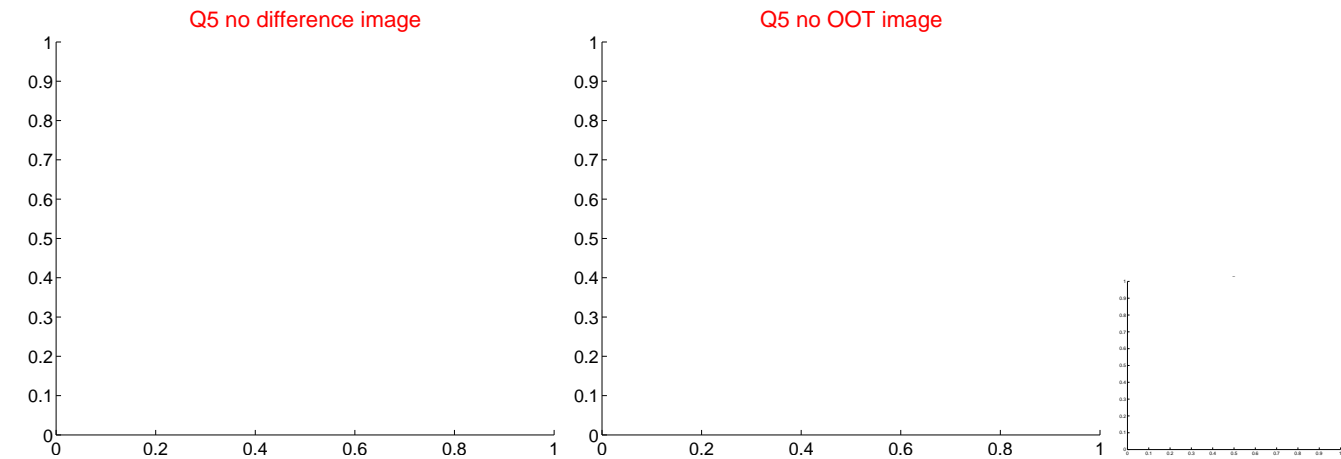


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

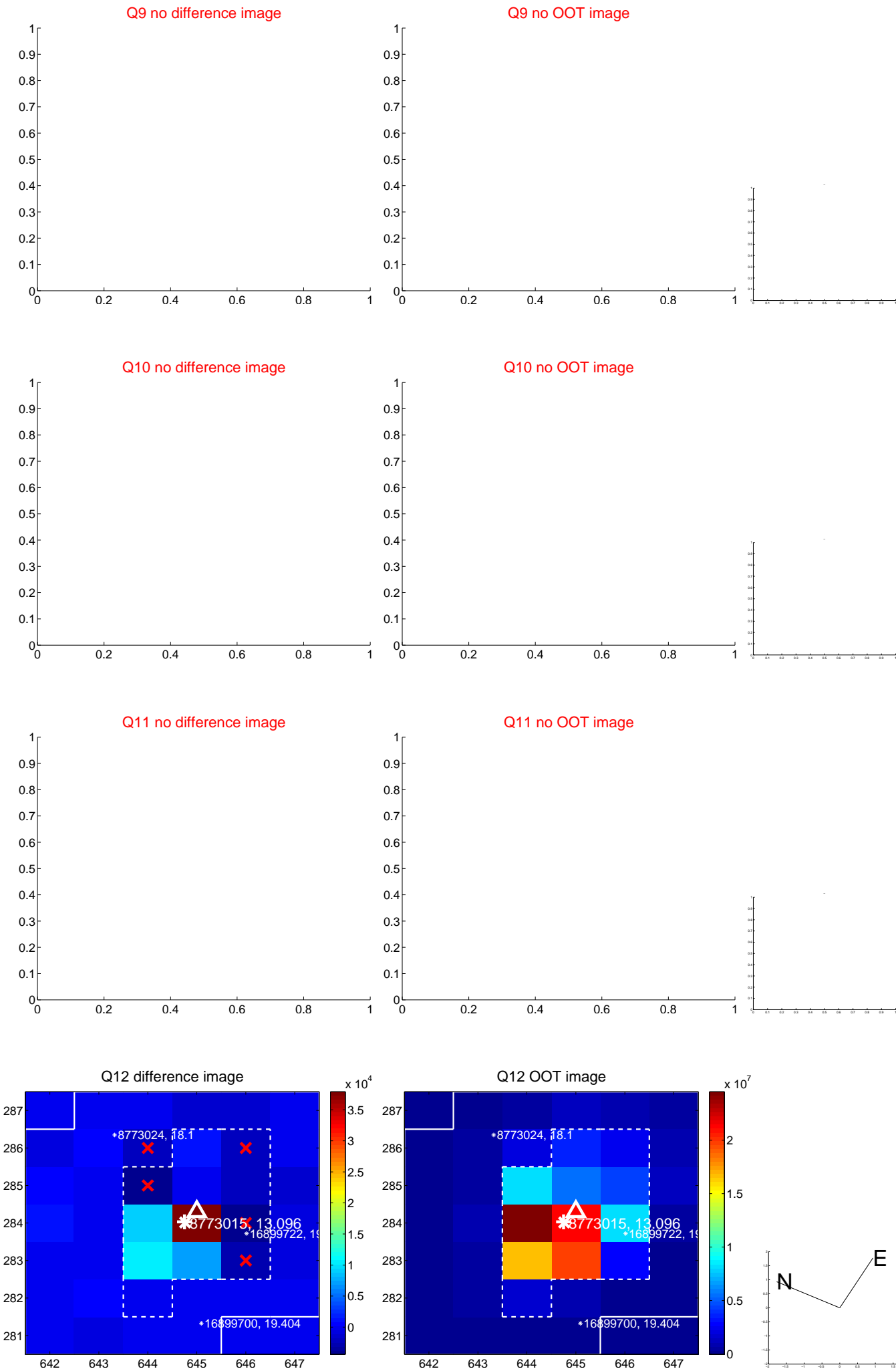
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



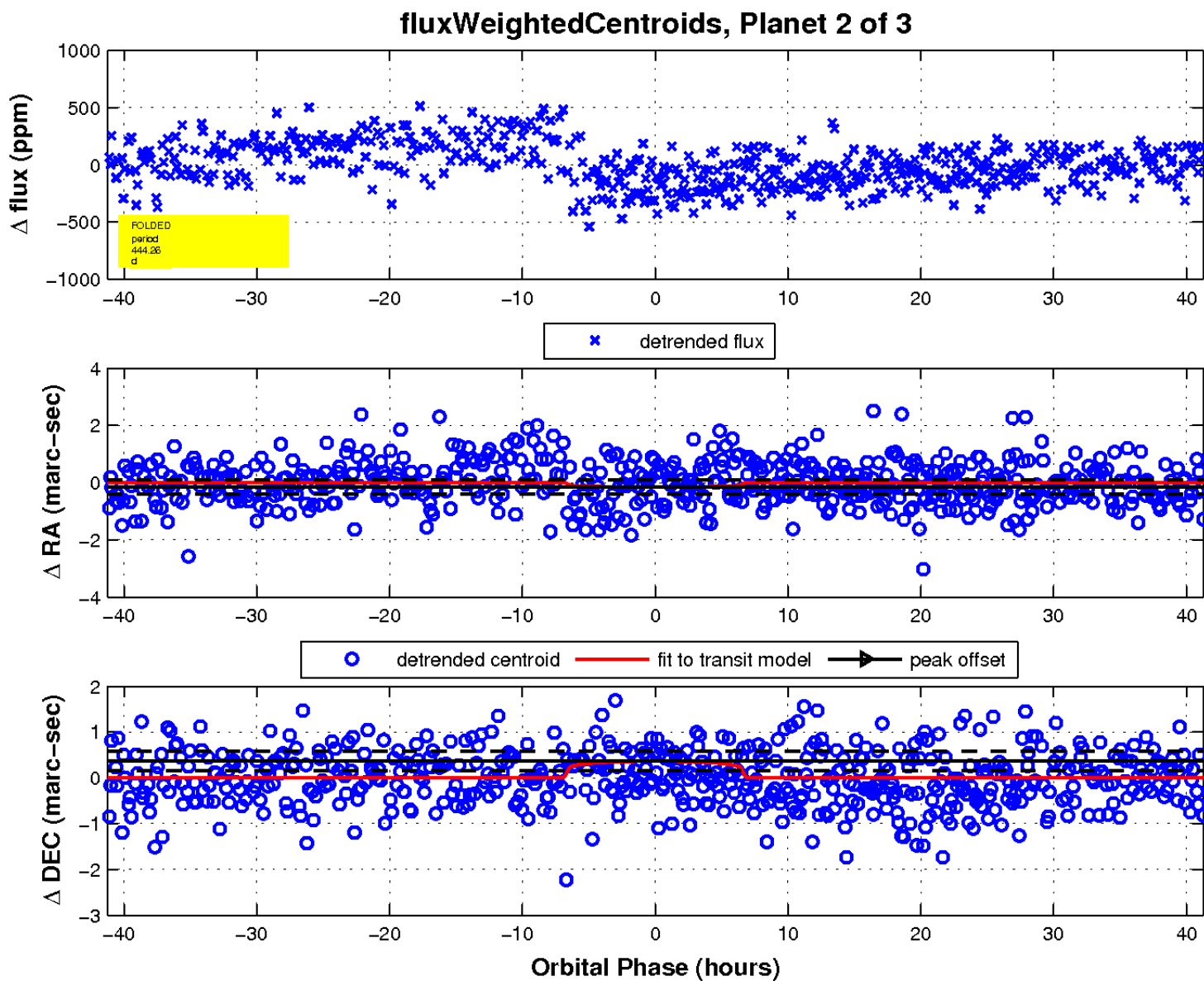
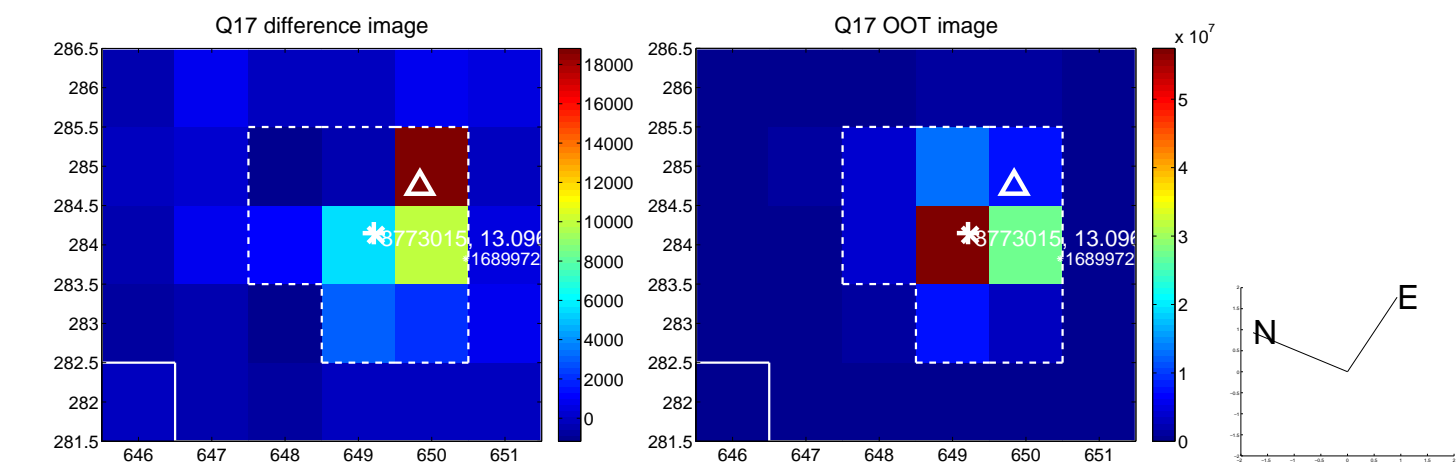
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



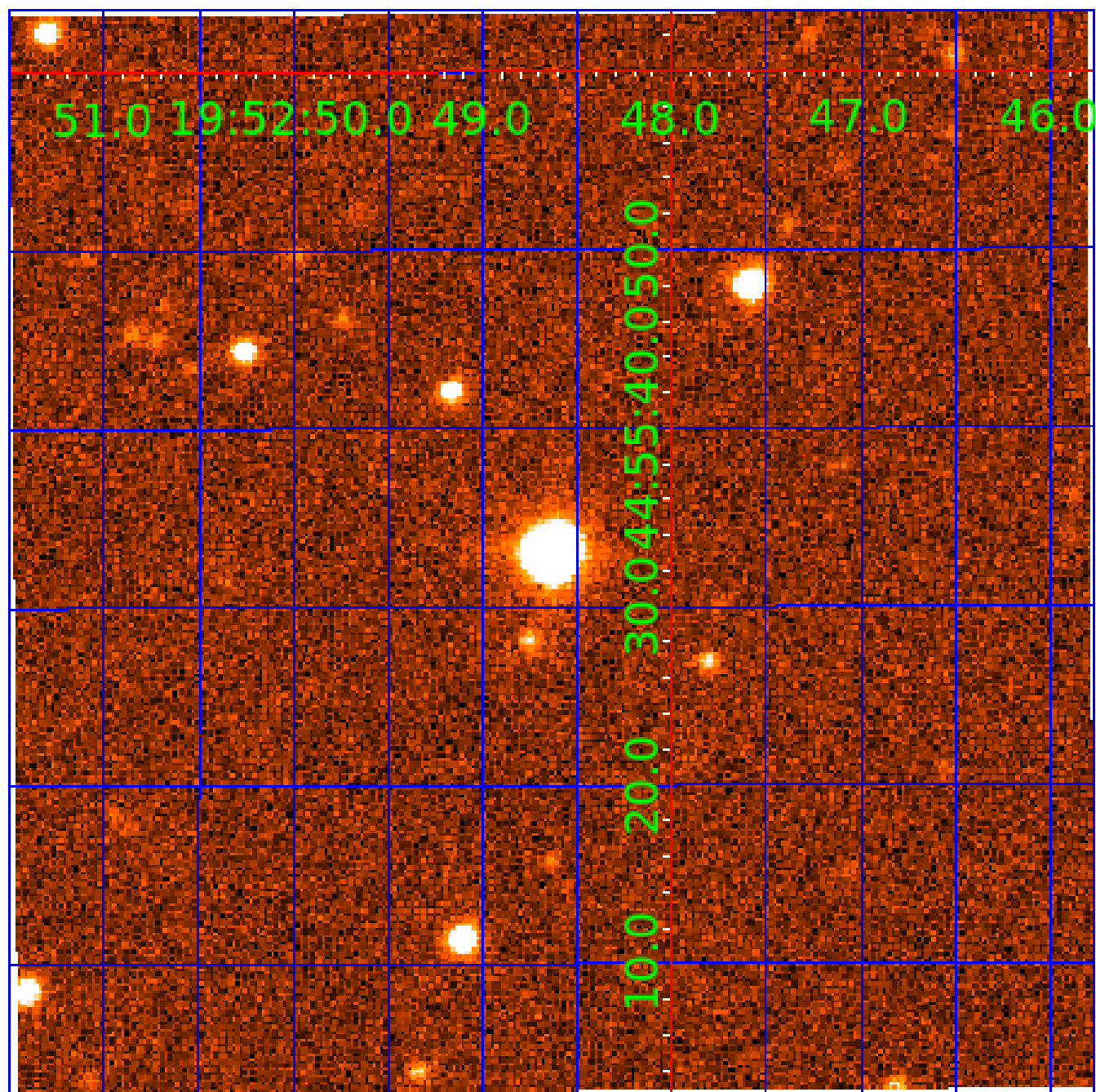
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 008773015

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008773015-01	OBS	4301.01	15.604798	131.999442	69.2	4.673	13.7	13.8	1.71	6254	1.65	249.17
008773015-02	OBS	No	444.257689	231.573405	181.9	13.774	10.0	10.6	1.71	6254	2.54	2.87
008773015-03	OBS	4301.02	6.319110	134.152065	30.6	3.637	8.2	8.7	1.71	6254	1.08	831.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008773015-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008773015-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008773015-03	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

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

## Ephemeris Match Information For 008773015-03

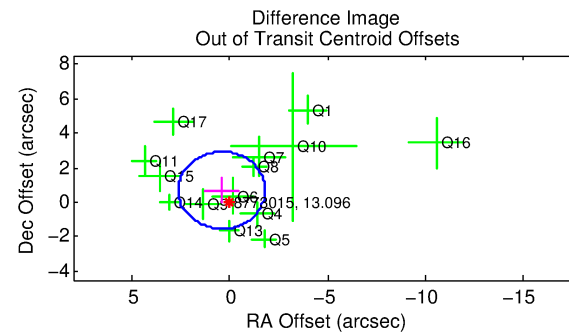
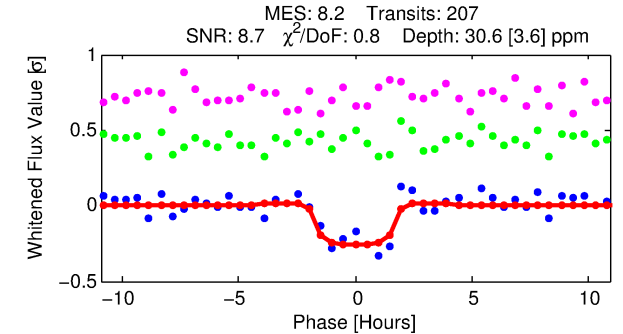
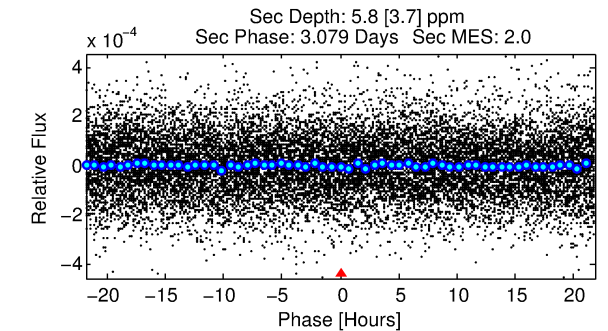
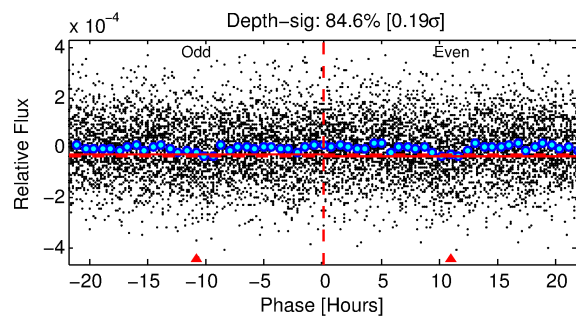
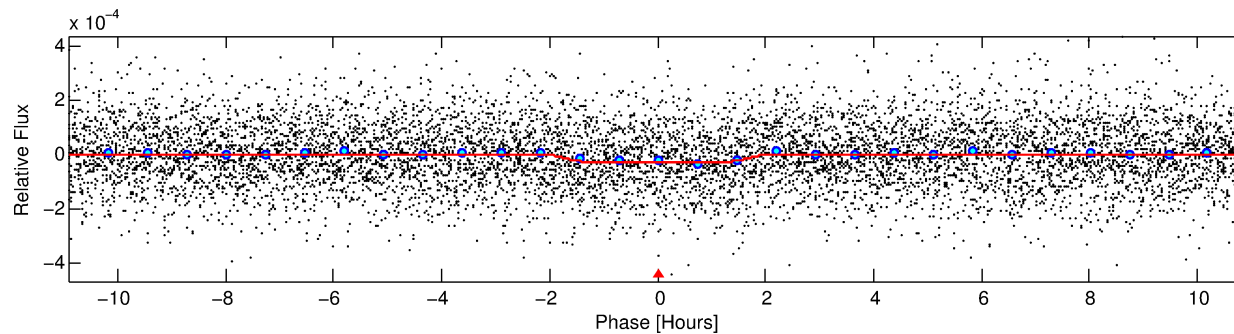
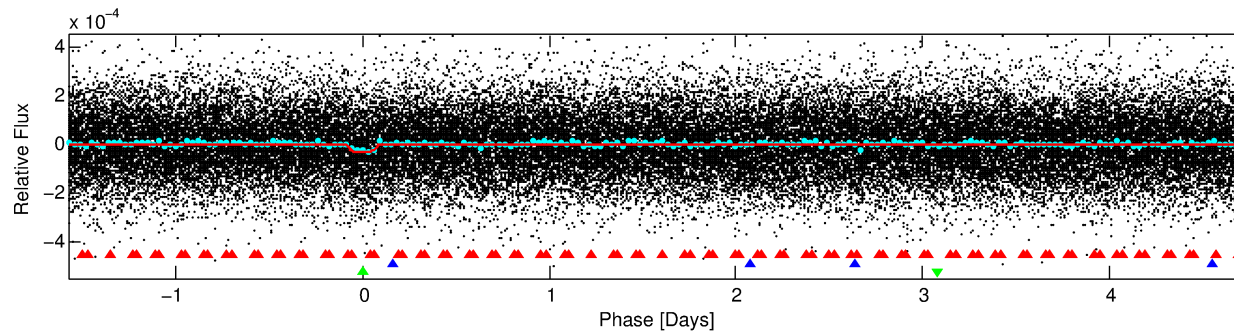
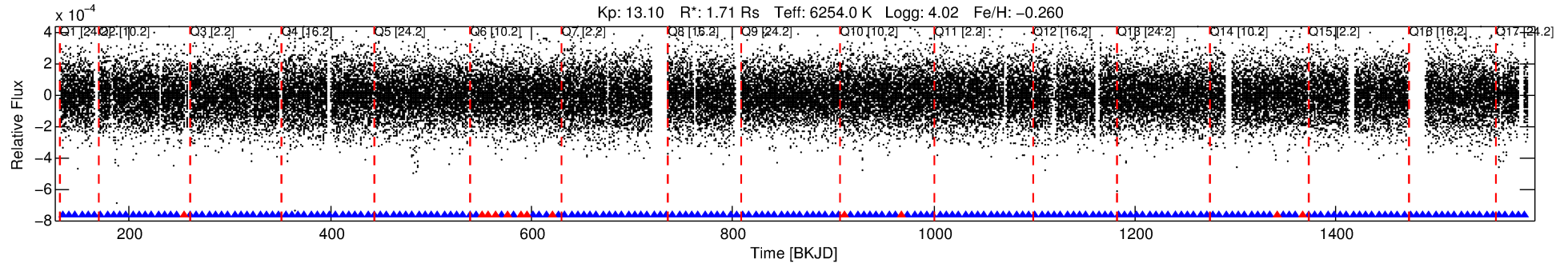
No Significant Match Found

# DV One-Page Summary

KIC: 8773015 Candidate: 3 of 3 Period: 6.319 d

KOI: K04301.02 Corr: 0.990

Kp: 13.10 R\*: 1.71 Rs Teff: 6254.0 K Logg: 4.02 Fe/H: -0.260



## DV Fit Results:

Period = 6.31911 [0.00006] d  
Epoch = 134.1521 [0.0076] BKJD  
Rp/R\* = 0.0058 [0.0021]  
a/R\* = 6.83 [13.51]  
b = 0.87 [0.59]  
Seff = 831.71 [396.30]  
Teq = 1369 [163] K  
Rp = 1.08 [0.52] Re  
a = 0.0693 [0.0200] AU  
Ag = 13.05 [14.10] [0.86σ]  
Teff = 4024 [994] K [2.64σ]

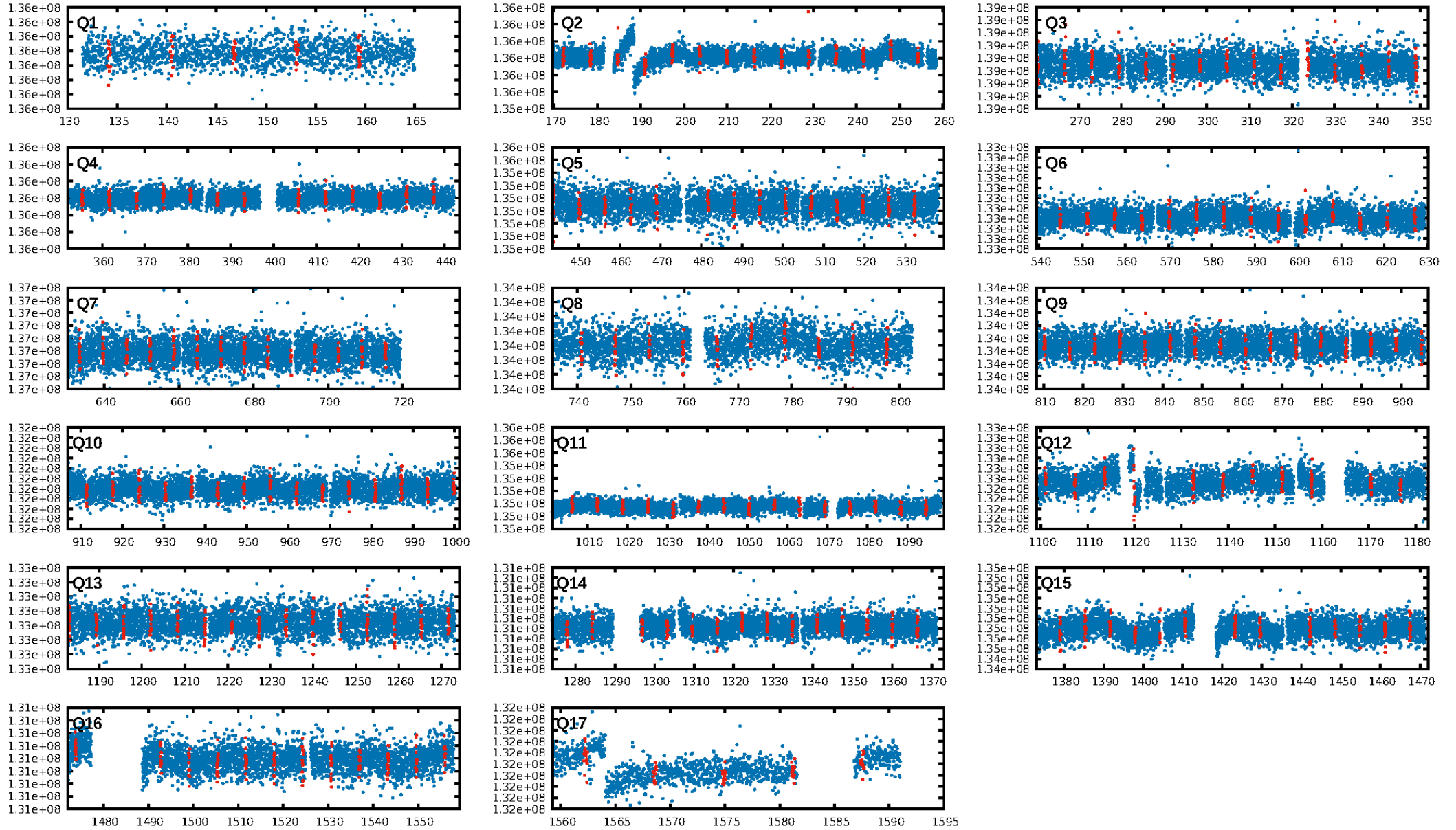
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [37.63σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.68e-16  
RollingBand-fgt: 0.94 [185/197]  
**GhostDiagnostic-chr: 0.6435**  
Centroid-sig: 9.3%  
Centroid-so: 2.044 arcsec [1.22σ]  
OotOffset-rm: 0.797 arcsec [1.07σ]  
KicOffset-rm: 0.920 arcsec [1.25σ]  
OotOffset-st: 3/3/3/5 [14]  
KicOffset-st: 3/3/3/5 [14]  
DiffImageQuality-fgm: 0.43 [6/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:42:41 Z

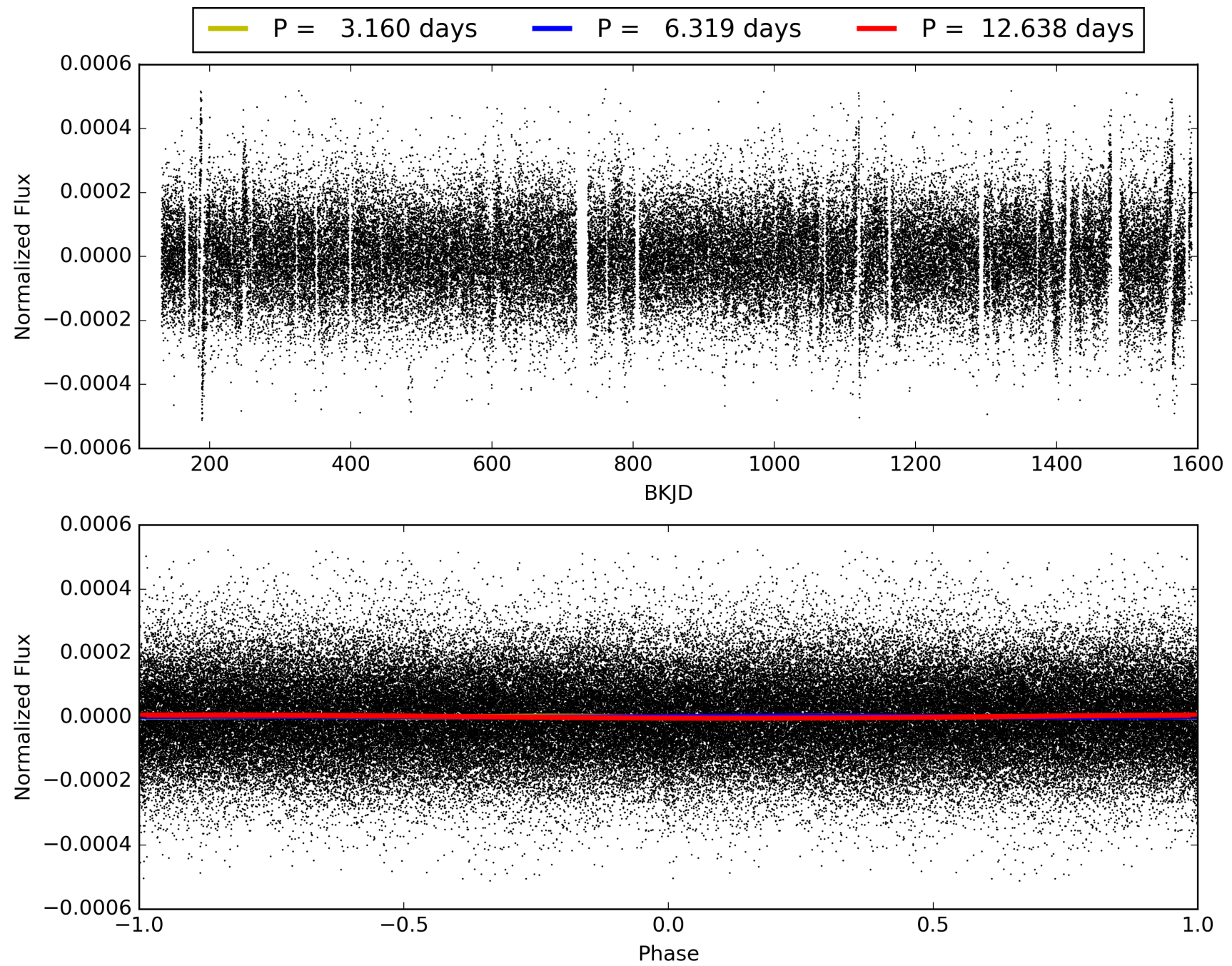
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008773015-03, PDC Light Curves



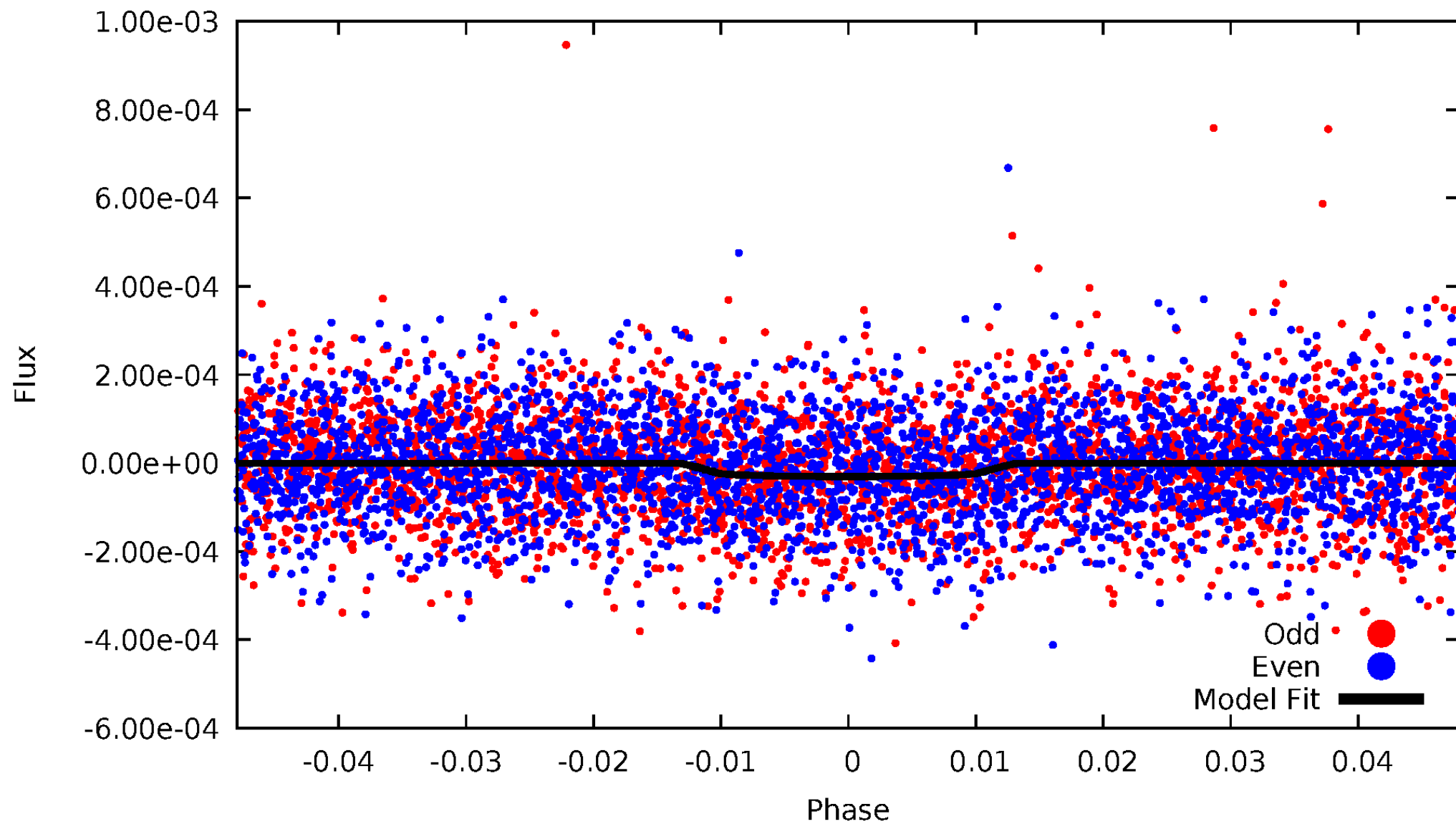


TCE 008773015-03



# DV Odd/Even

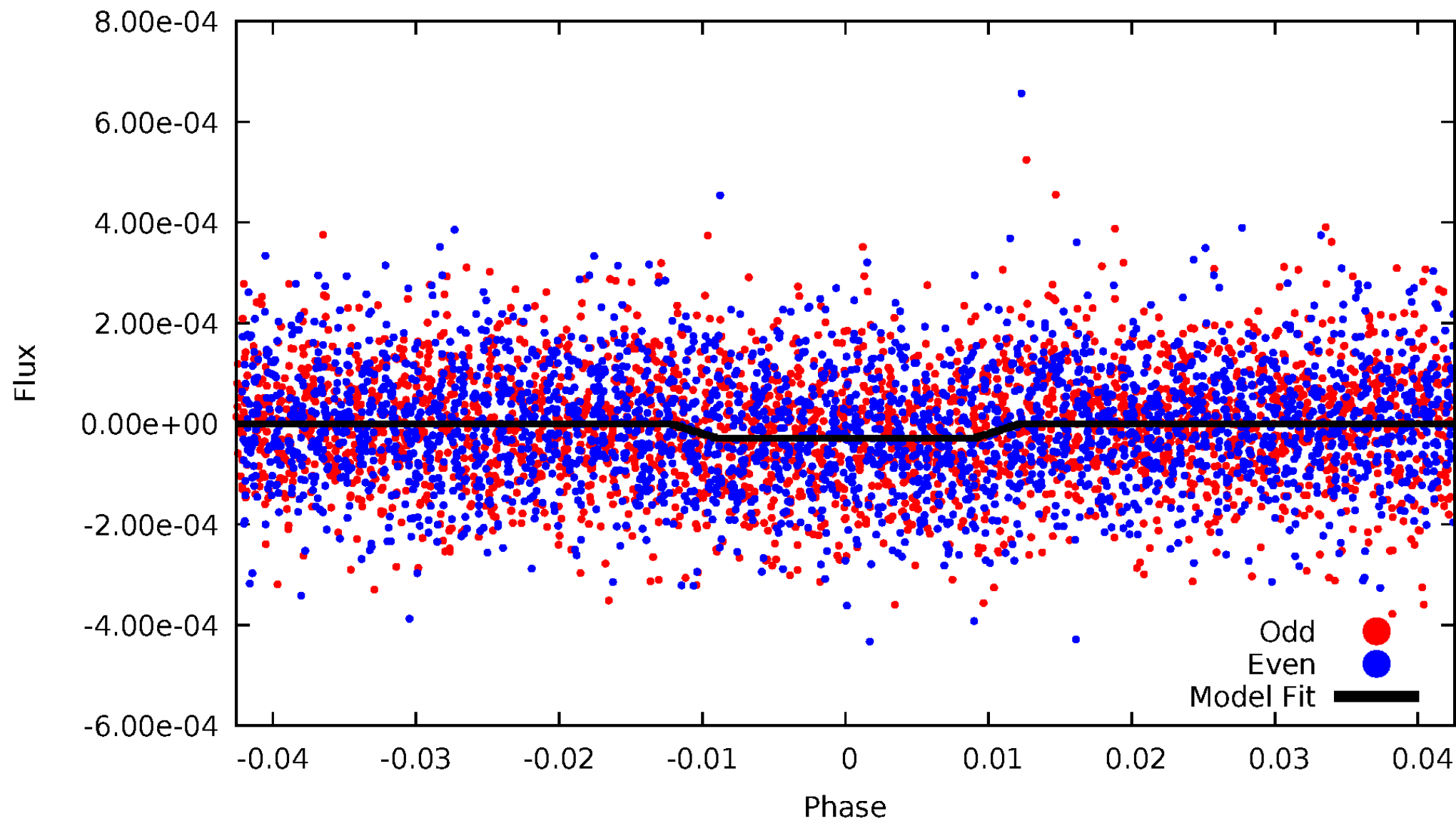
TCE 008773015-03





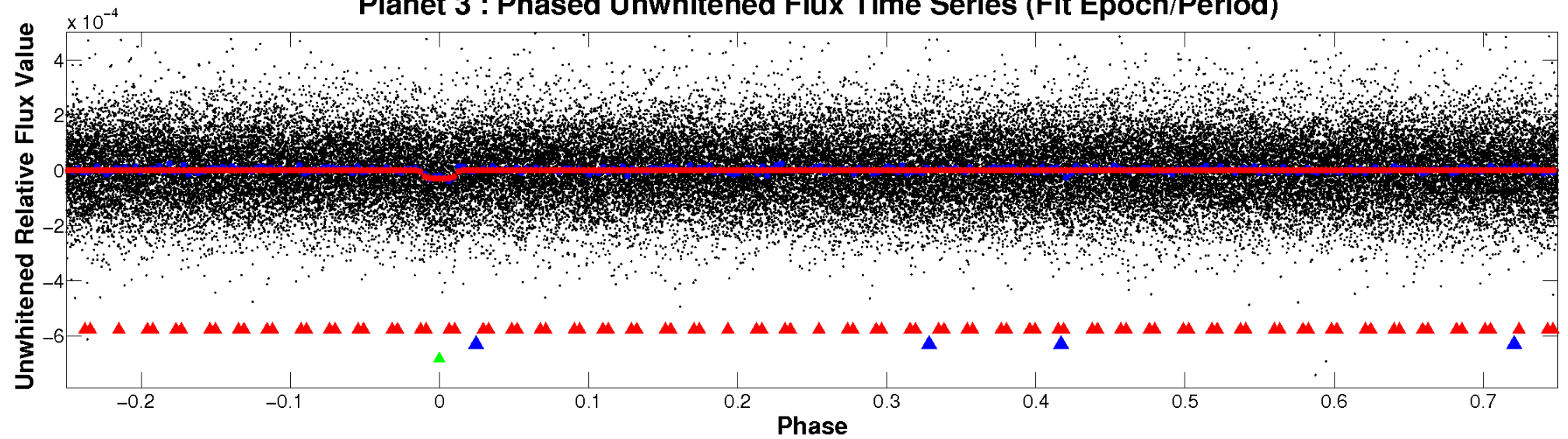
# ALT Odd/Even

TCE 008773015-03

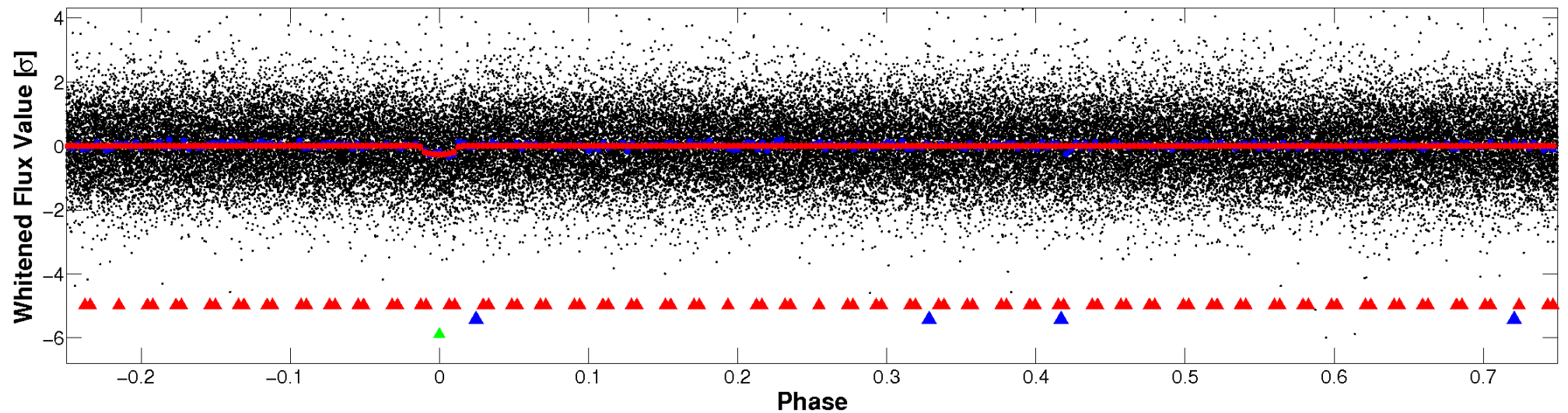


# Non-Whitened Vs. Whitened Light Curve

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

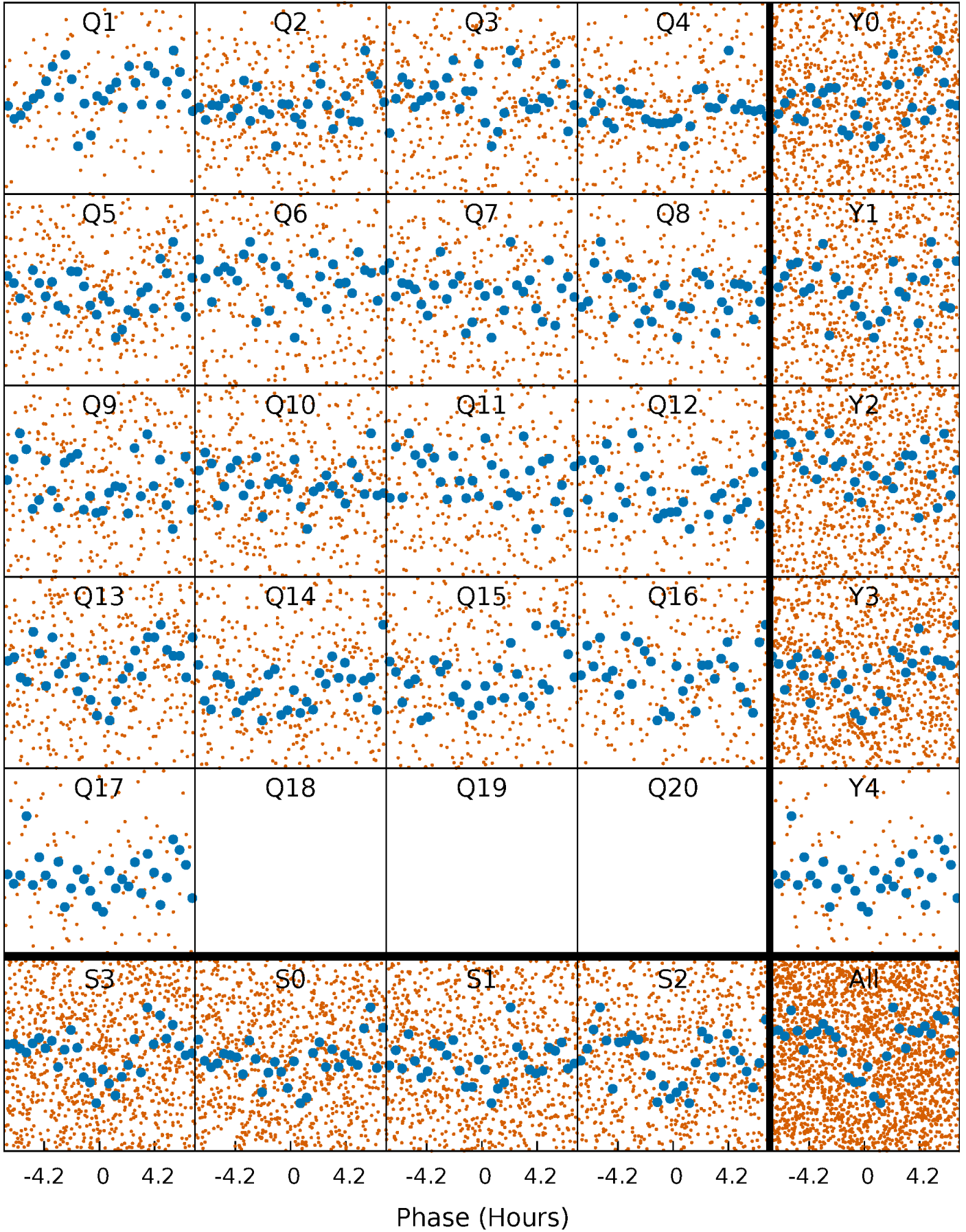


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



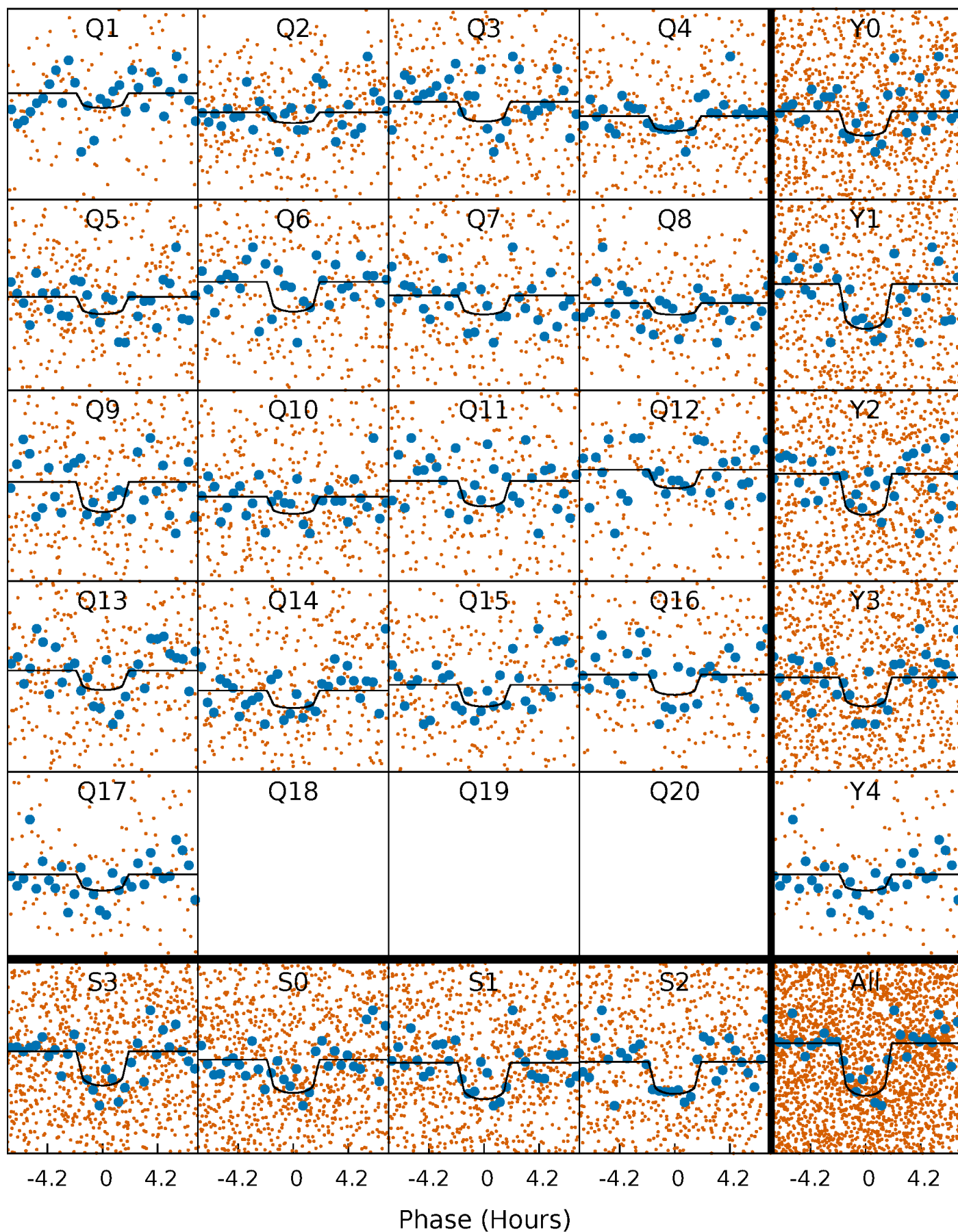
# PDC Quarter-Phased Transit Curves

TCE 008773015-03 P= 6.319110 Days  $T_0=134.152065$  (BKJD)



# DV Quarter-Phased Transit Curves

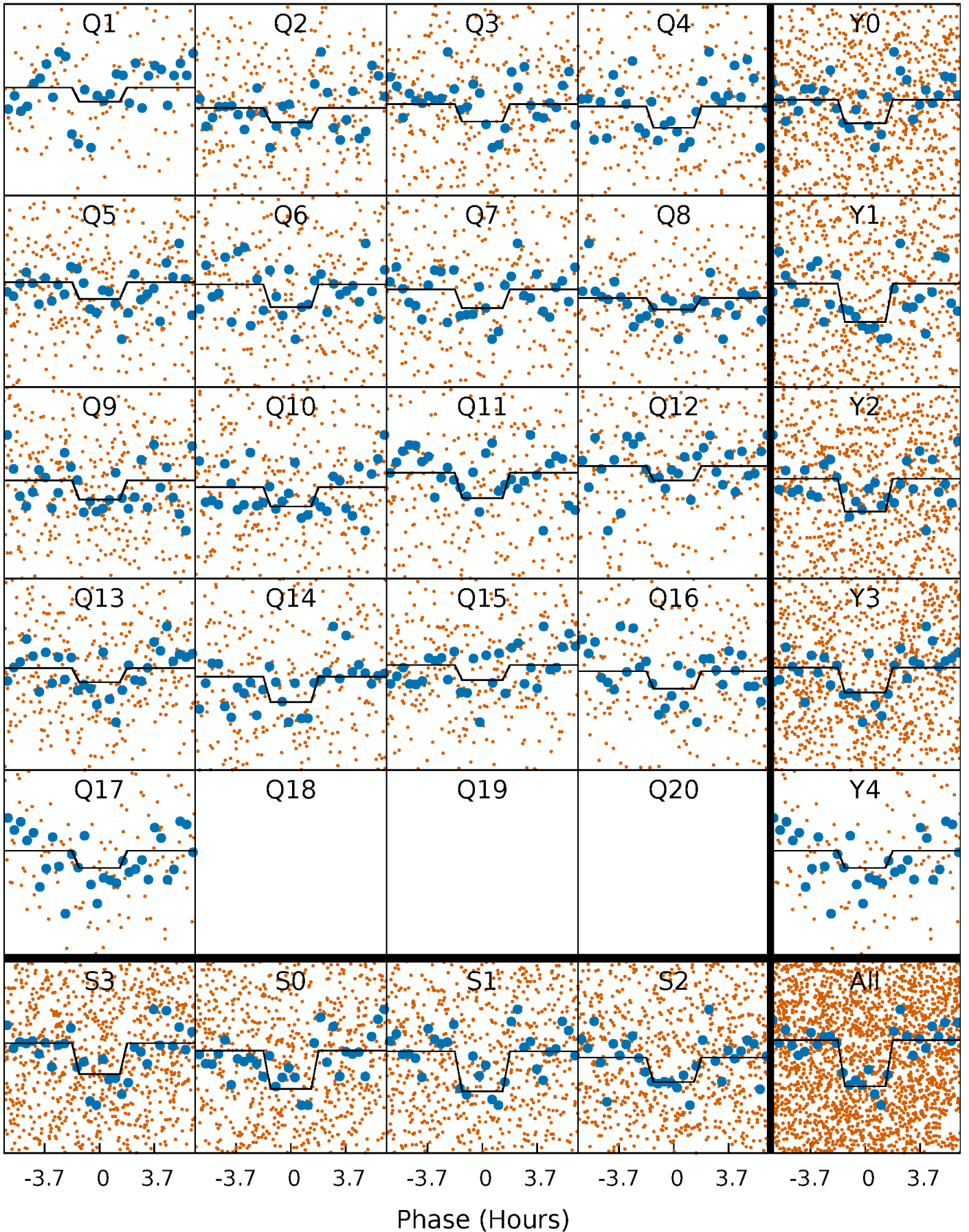
TCE 008773015-03 P= 6.319110 Days  $T_0=134.152065$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

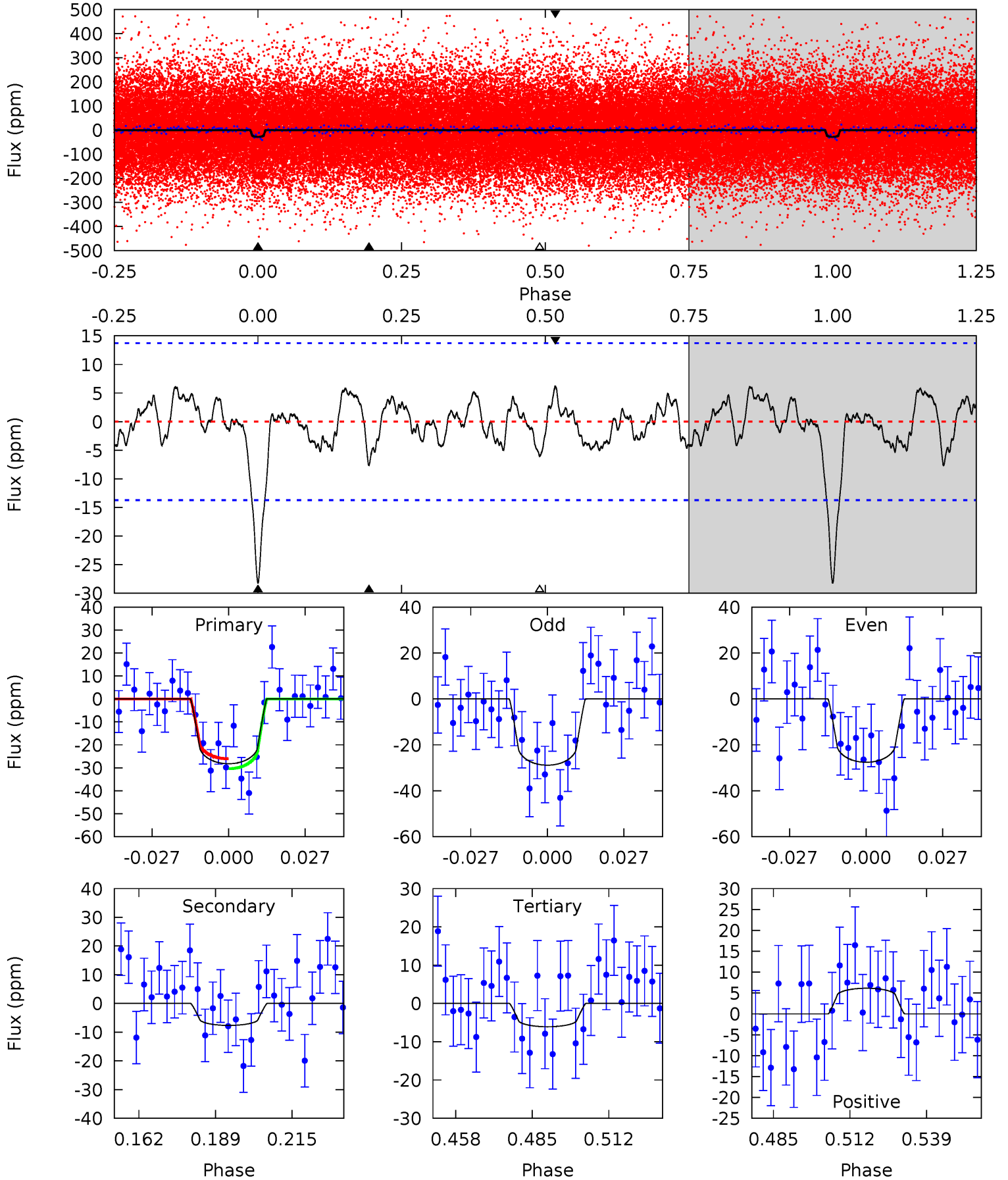
TCE 008773015-03 P= 6.319102 Days  $T_0=134.153681$  (BKJD)



# DV Model-Shift Uniqueness Test

008773015-03, P = 6.319110 Days, E = 127.832955 Days

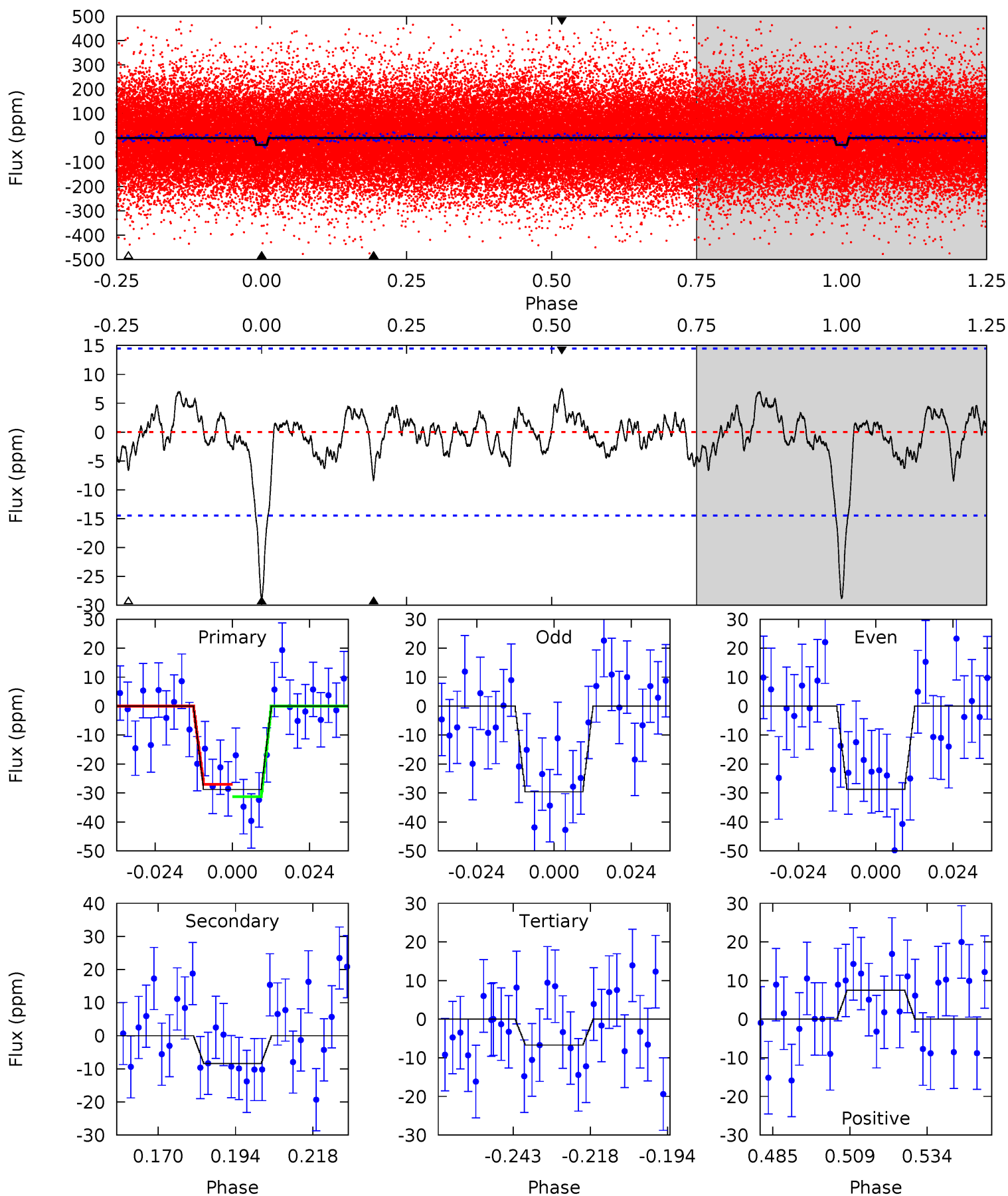
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.93	2.69	2.14	2.16	4.83	2.21	1.01	7.79	7.77	0.55	0.53	0.23	1.17	0.18	0.76



# Alt Model-Shift Uniqueness Test

008773015-03, P = 6.319102 Days, E = 127.834579 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
9.65	2.82	2.24	2.52	4.85	2.25	0.92	7.41	7.13	0.57	0.30	0.15	1.18	0.21	0.72





### Stellar Parameters For KIC 008773015

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6254^{+174}_{-212}$	$4.019^{+0.266}_{-0.114}$	$-0.260^{+0.300}_{-0.300}$	$1.706^{+0.349}_{-0.524}$	$1.110^{+0.195}_{-0.160}$	$0.315^{+0.471}_{-0.108}$
	+3%/-3%	+7%/-3%	+115%/-115%	+20%/-31%	+18%/-14%	+150%/-34%
Source	PHO1	FLK73	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 008773015-03 / KOI 4301.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-8 \pm 3$	$1.01^{+0.45}_{-0.37}$	$1872^{+133}_{-158}$	$4424^{+1061}_{-588}$	$19^{+34}_{-10}$
Alt.	$-8 \pm 3$	$0.96^{+0.47}_{-0.40}$	$1878^{+123}_{-147}$	$4653^{+1317}_{-687}$	$24^{+51}_{-15}$

$T_{\text{max}}$  = 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

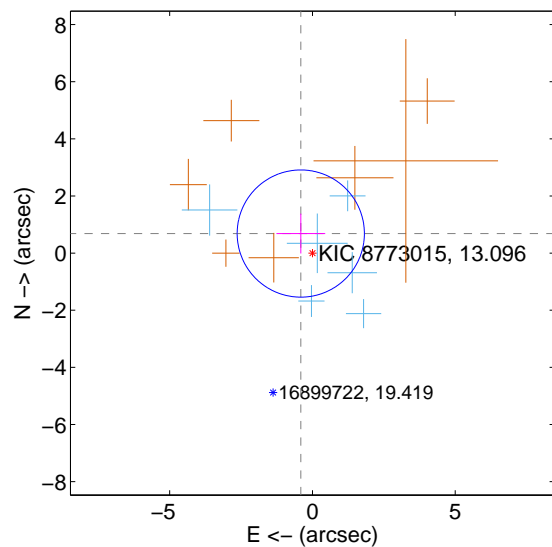
Supplemental centroid analysis for 008773015-03. Kepler magnitude: 13.10. Transit SNR 8.65

There are 6 quarters with good PRF difference image offsets

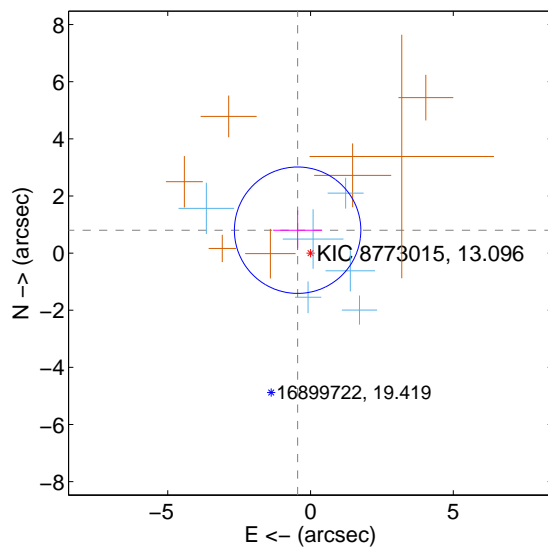
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.797 \pm 0.742$	1.07	$0.409 \pm 0.854$	$0.684 \pm 0.698$
PRF-fit source offset from KIC position	$0.920 \pm 0.738$	1.25	$0.452 \pm 0.858$	$0.801 \pm 0.695$
photometric centroid source offset	$2.04 \pm 1.67$	1.22	$-0.32 \pm 1.90$	$2.02 \pm 1.67$

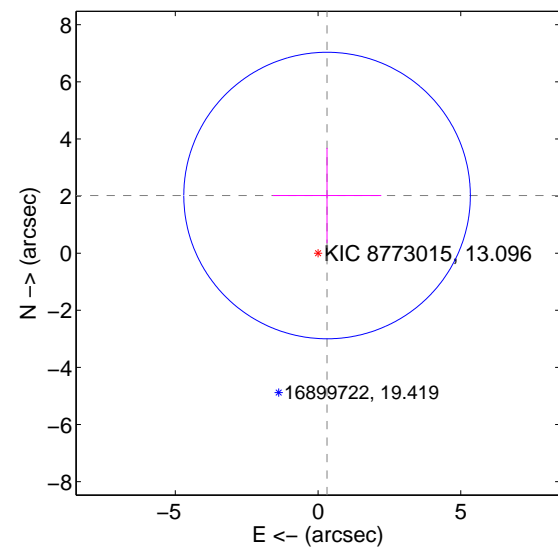
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

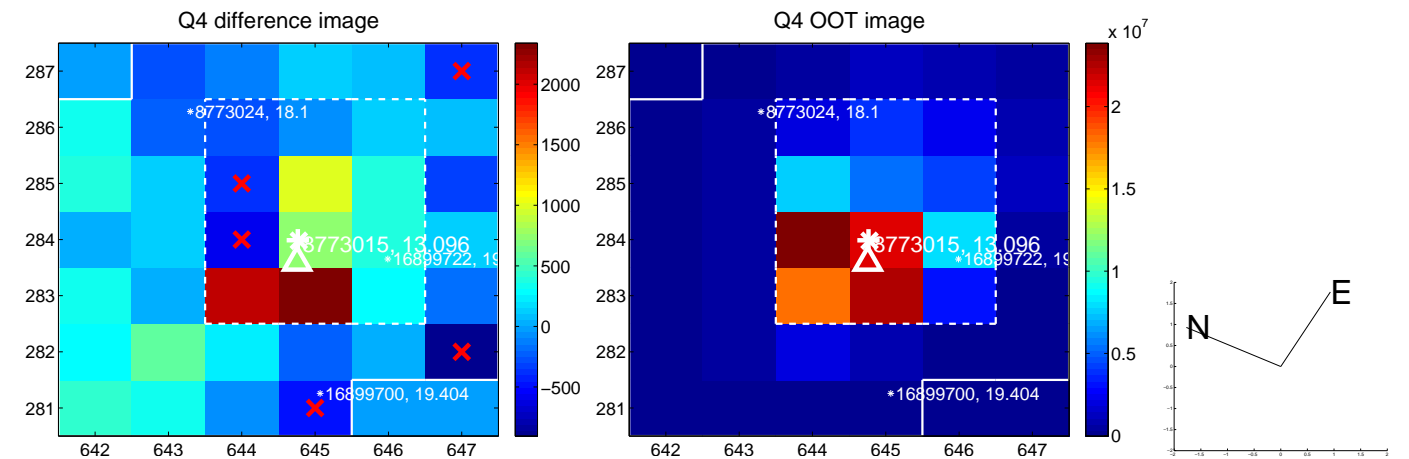
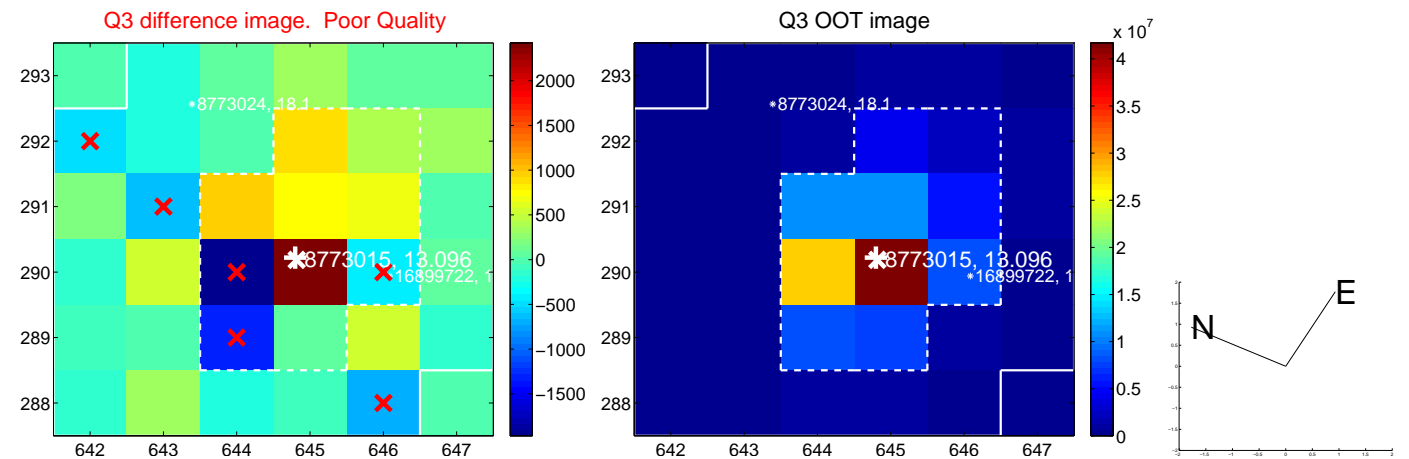
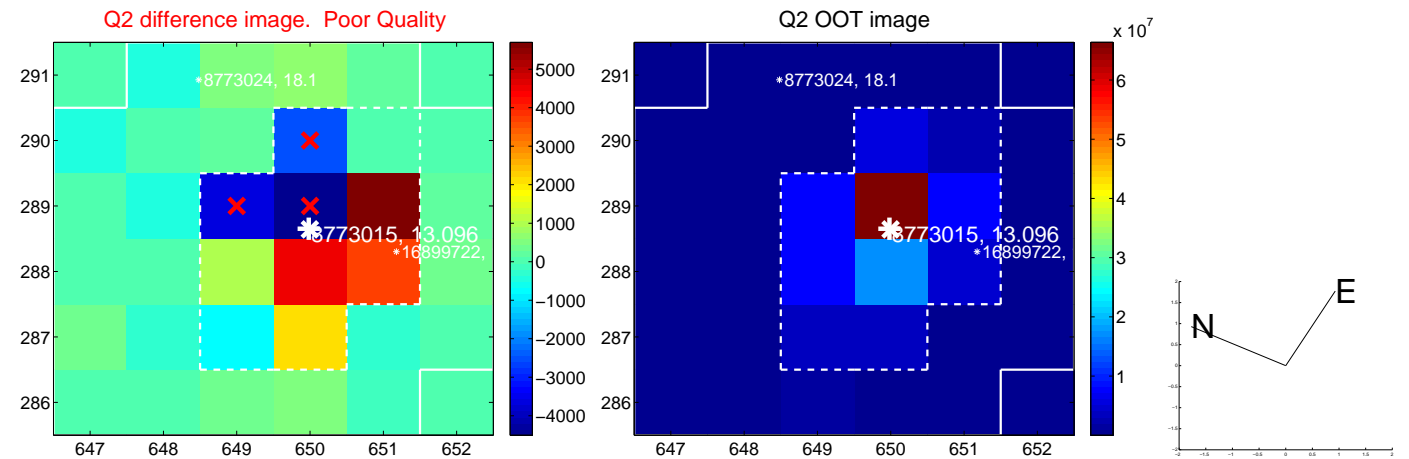
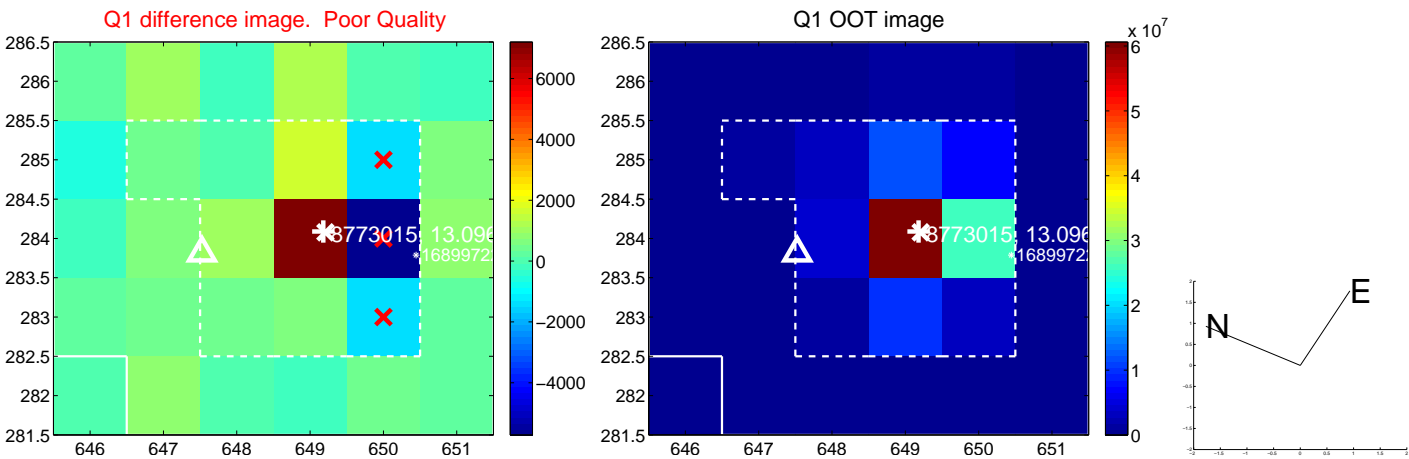


offset from photometric centroids

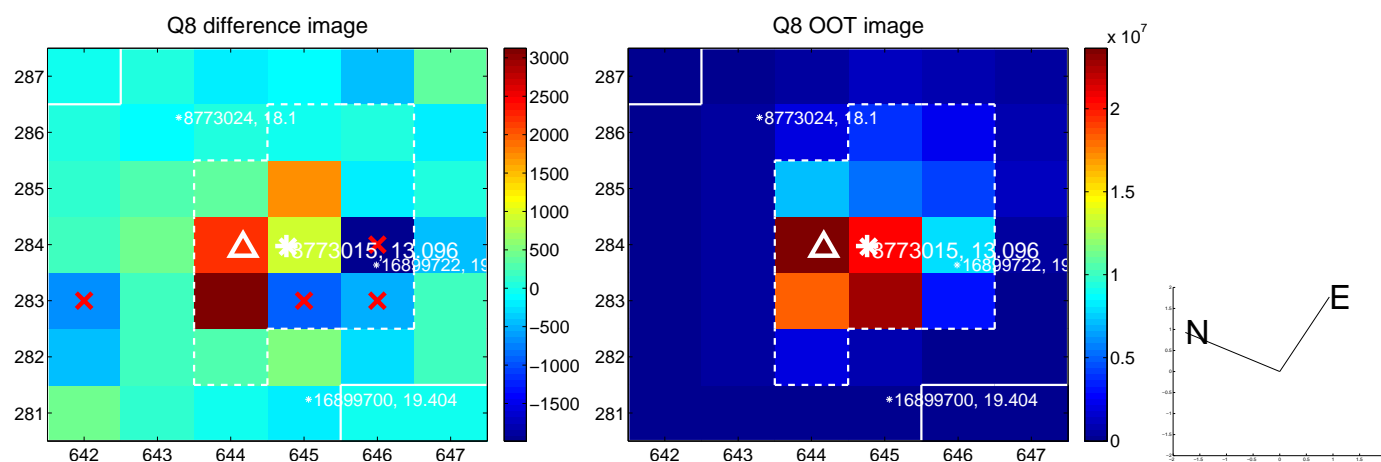
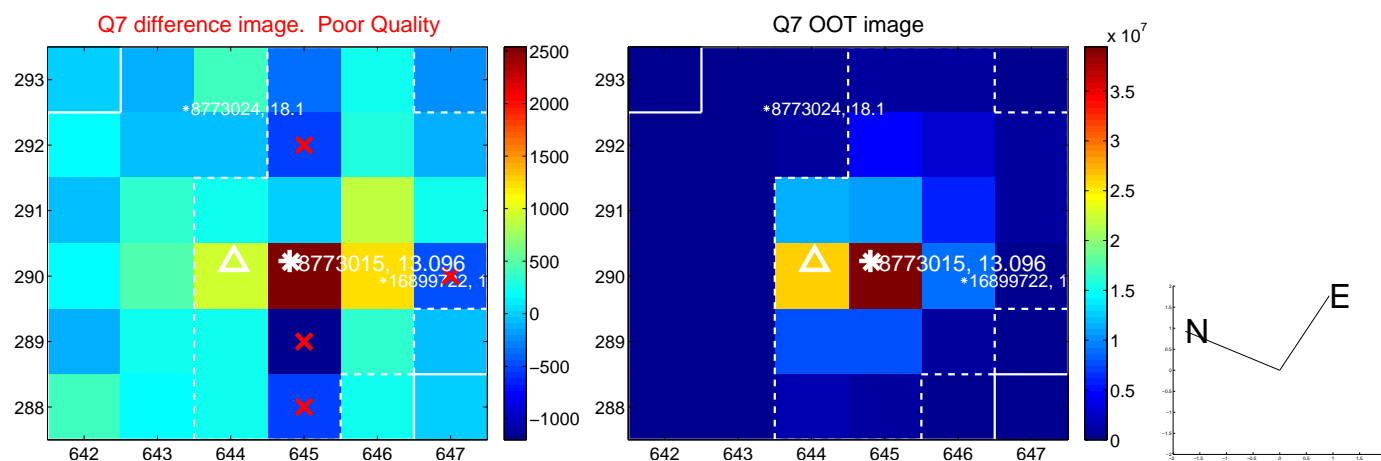
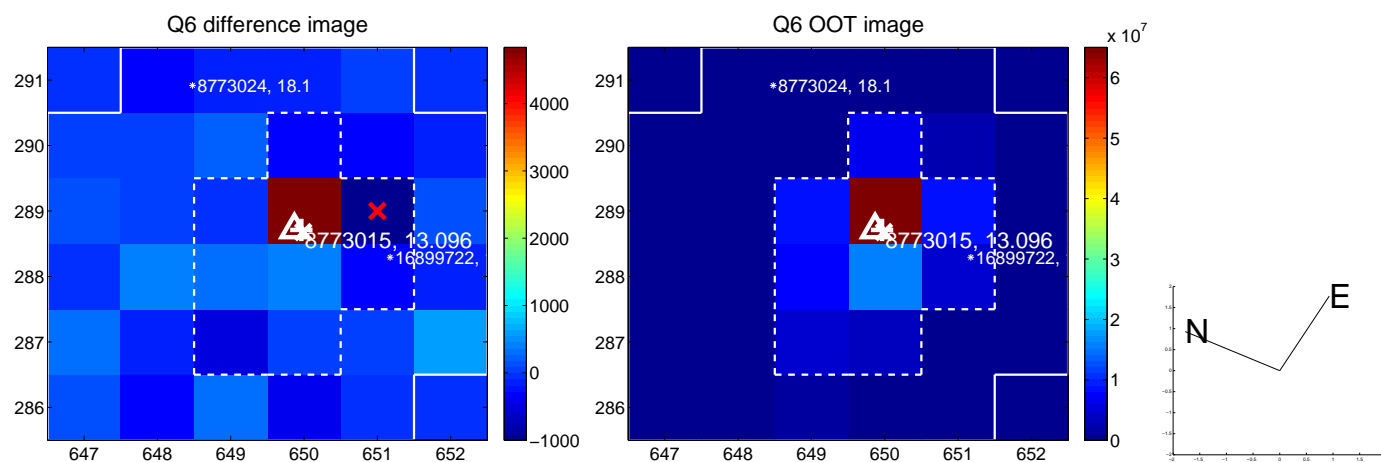
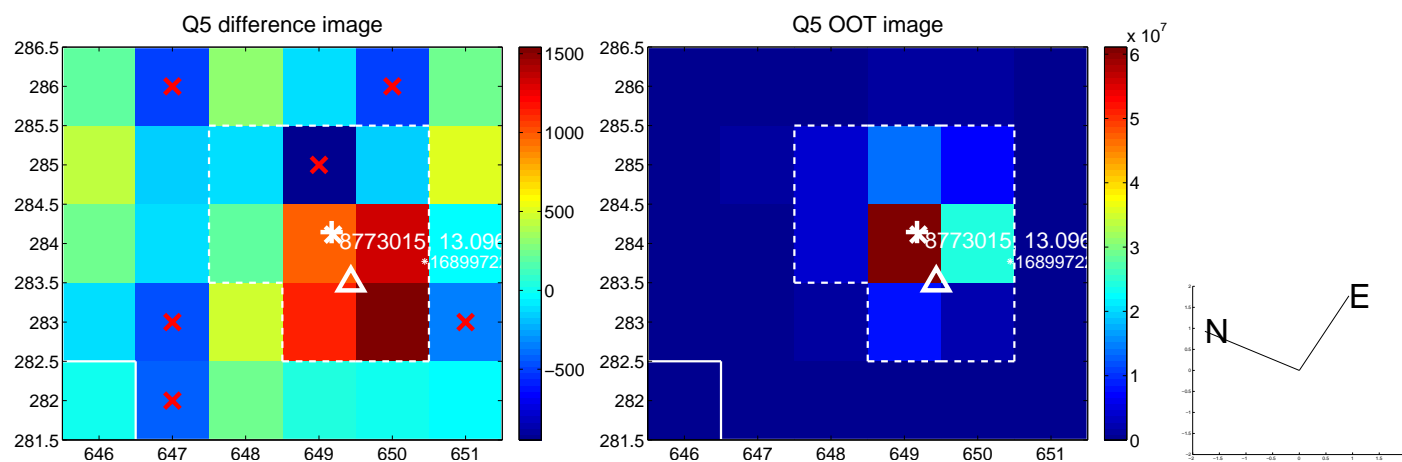


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

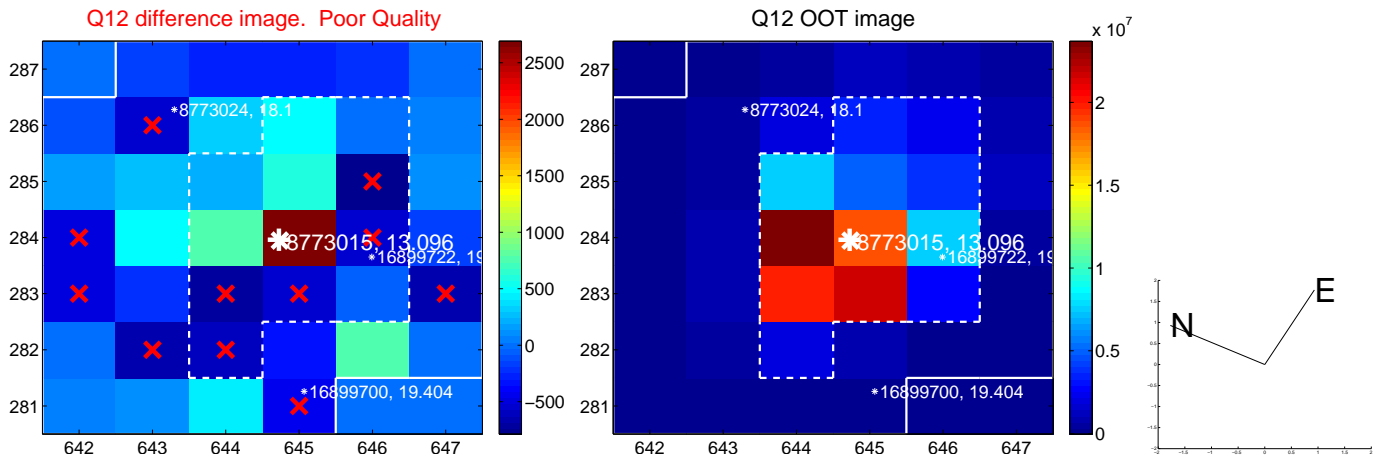
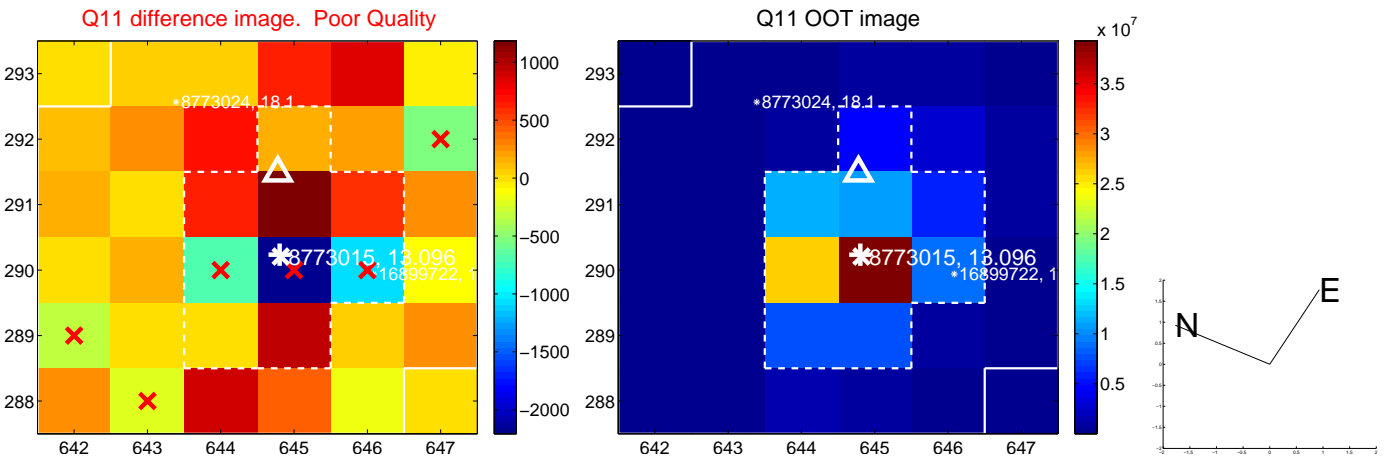
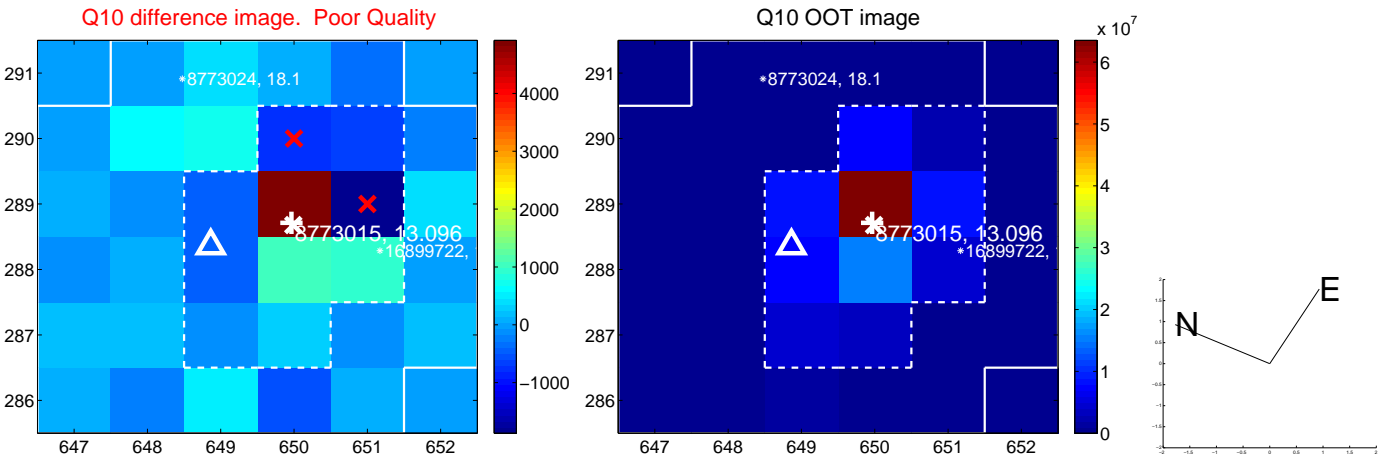
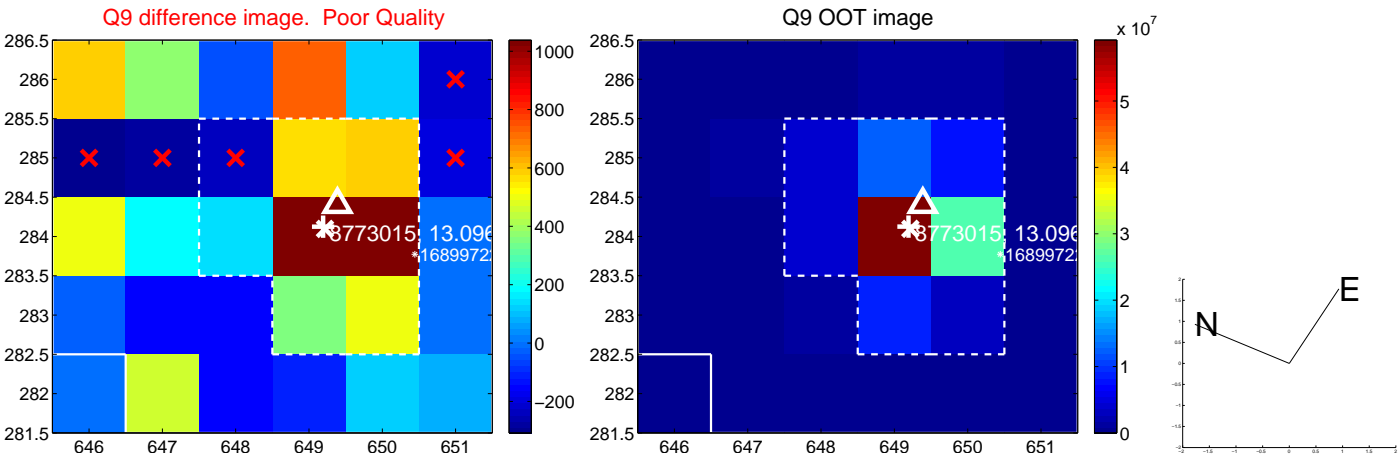
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



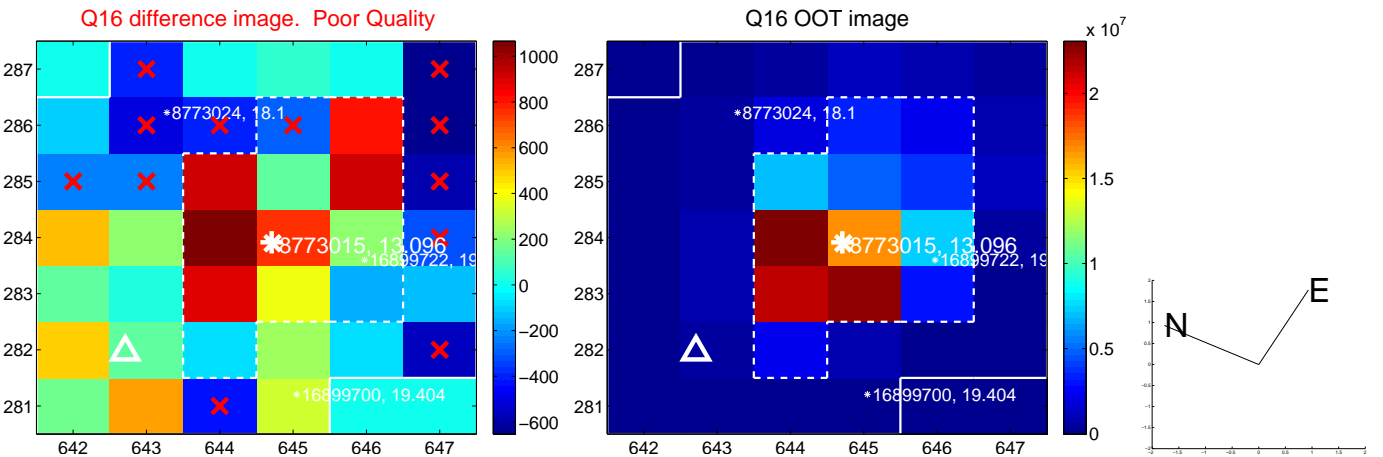
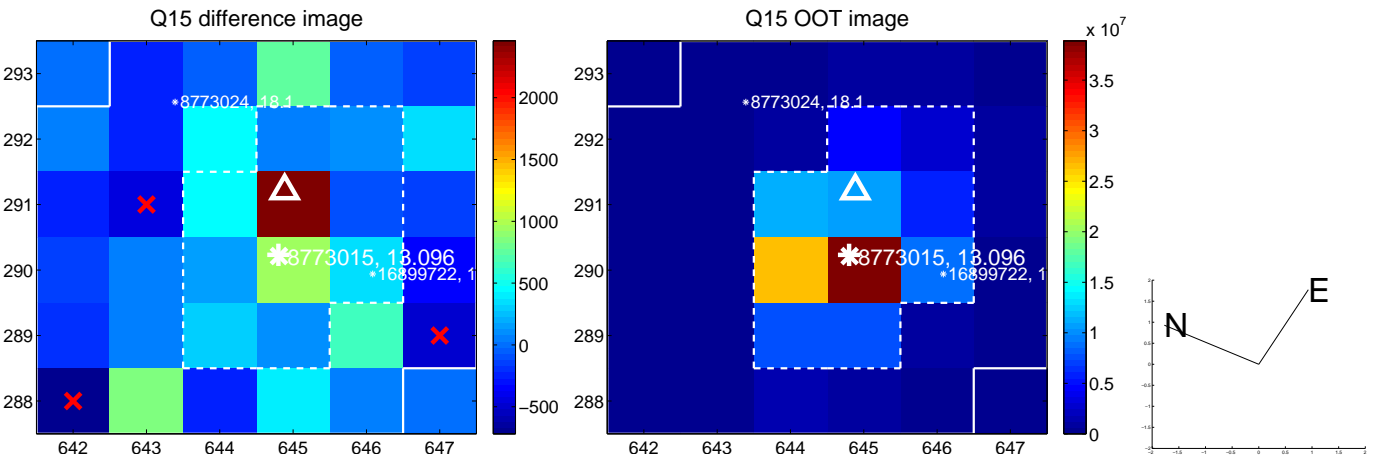
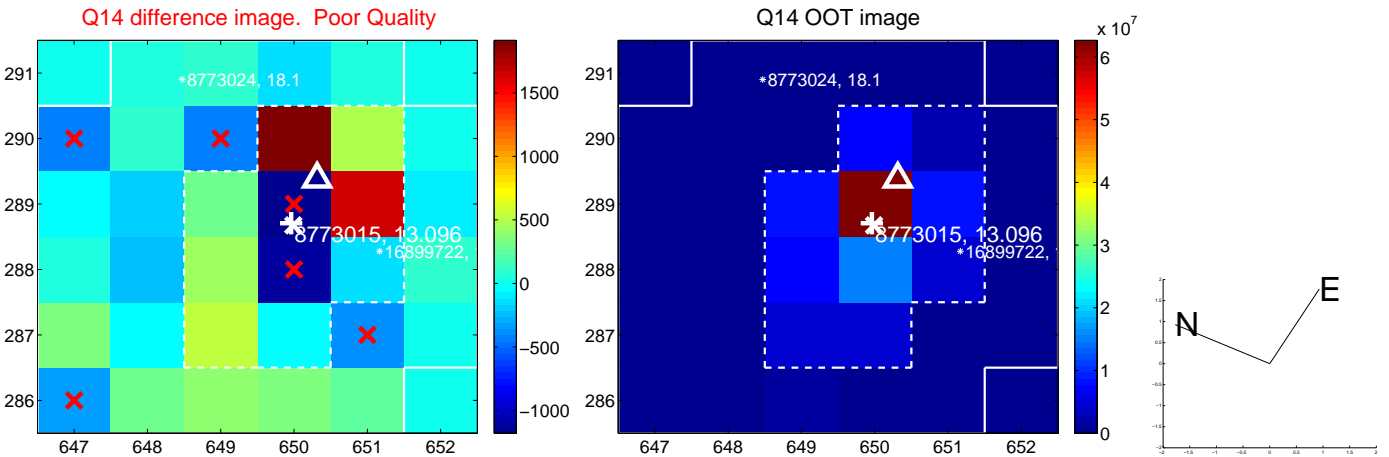
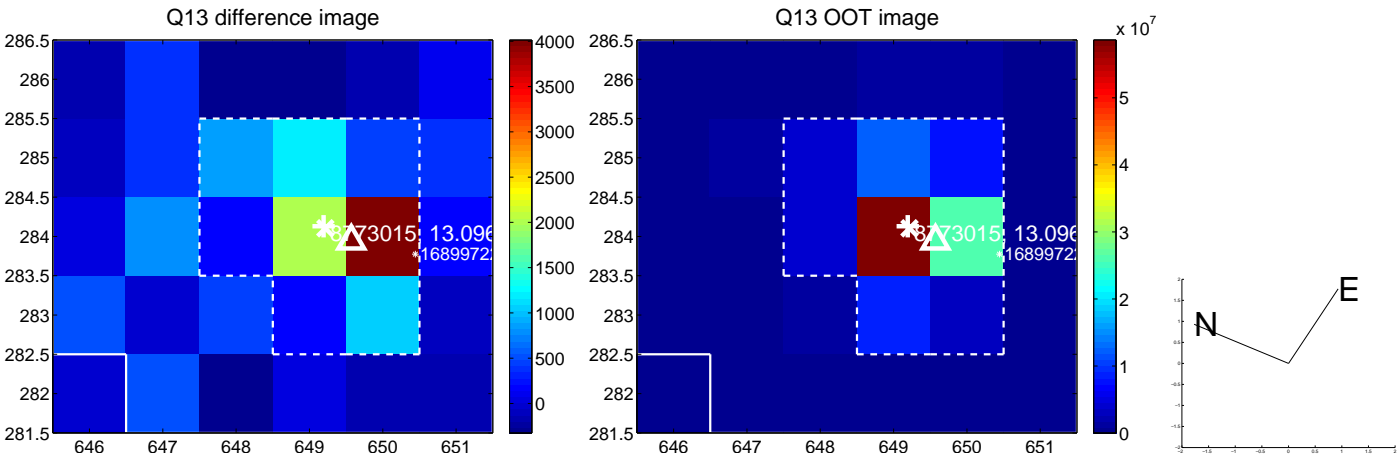
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



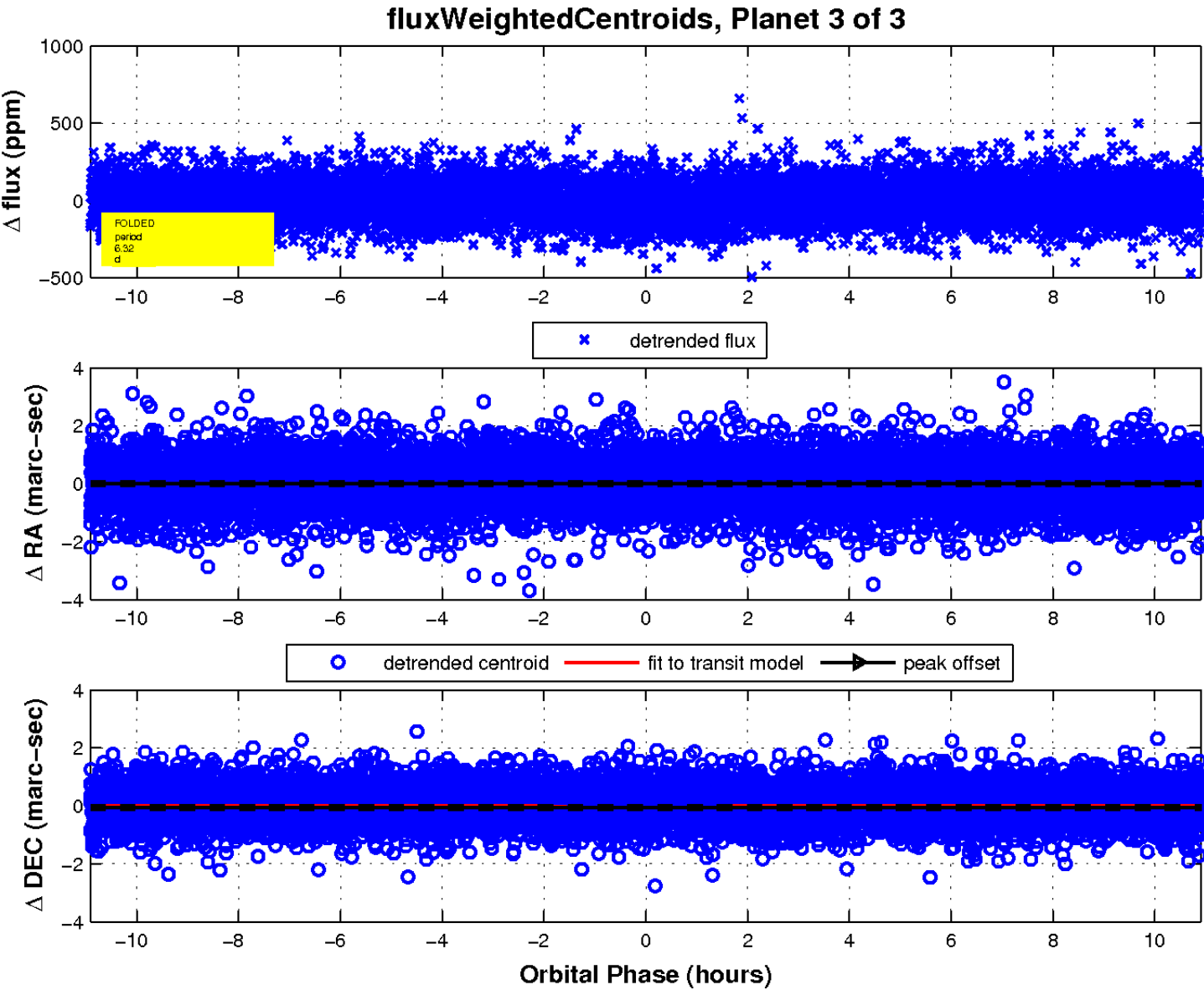
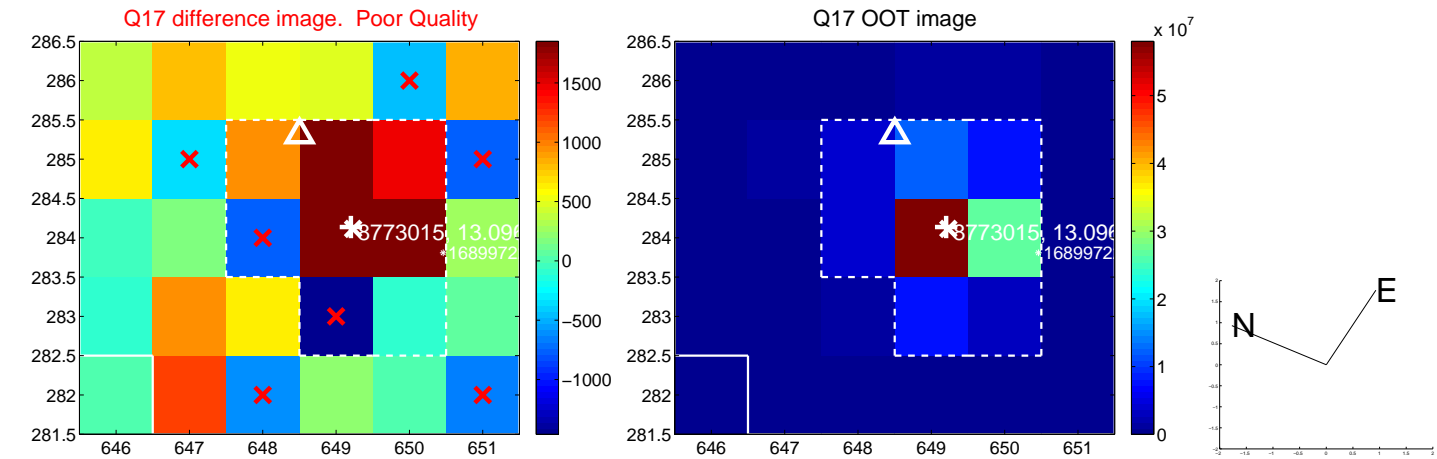
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

