

# KIC 005016873

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005016873-01	OBS	No	229.115358	217.153118	579.3	2.166	18.5	3.2	2.26	5112	5.53	6.57
005016873-02	OBS	No	358.197786	424.212466	711.1	3.682	12.6	3.2	2.26	5112	6.18	3.62
005016873-03	OBS	No	1.298725	132.793799	115.6	3.629	9.8	9.5	2.26	5112	2.92	6503.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005016873-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
005016873-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005016873-03	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV

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

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

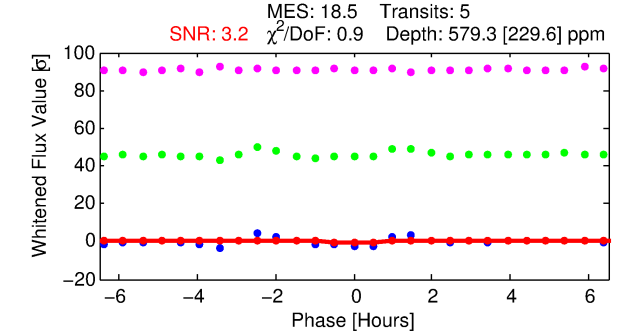
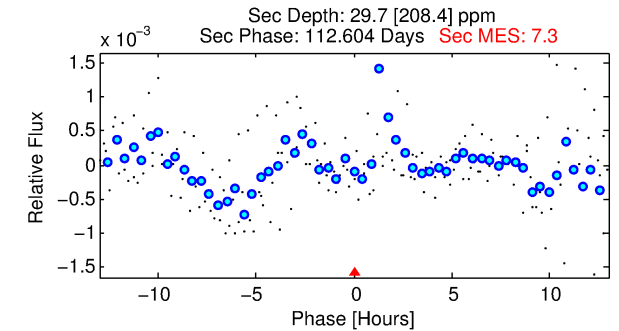
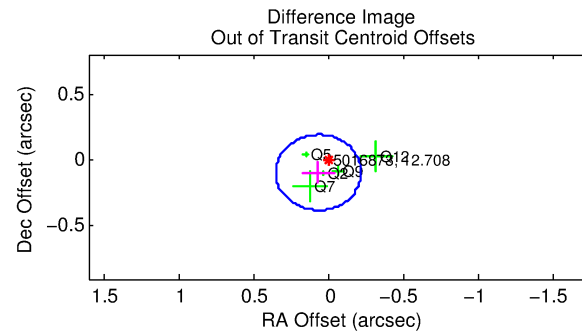
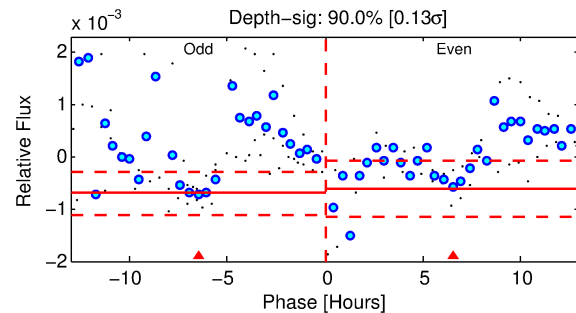
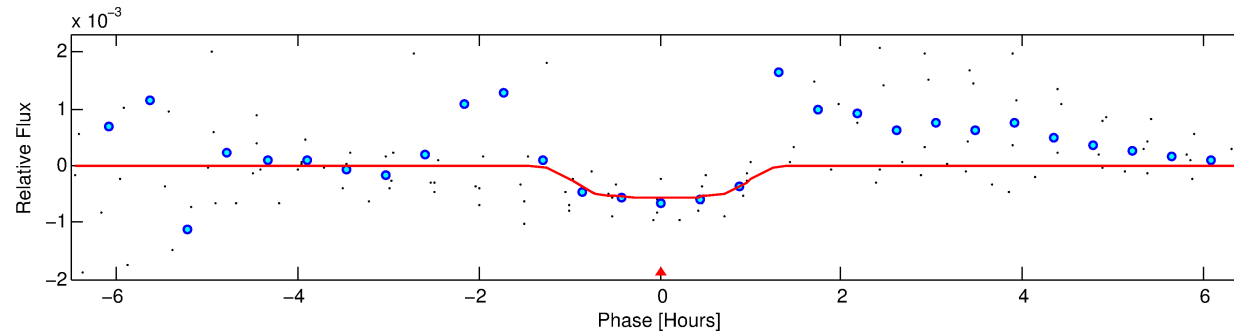
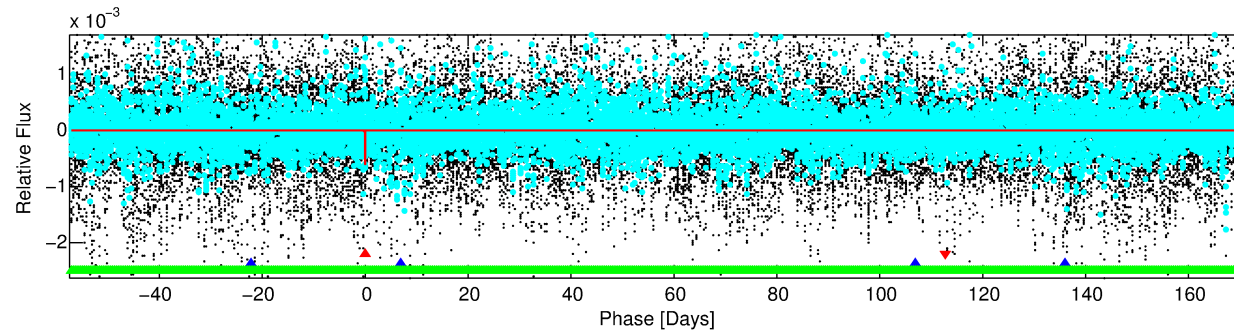
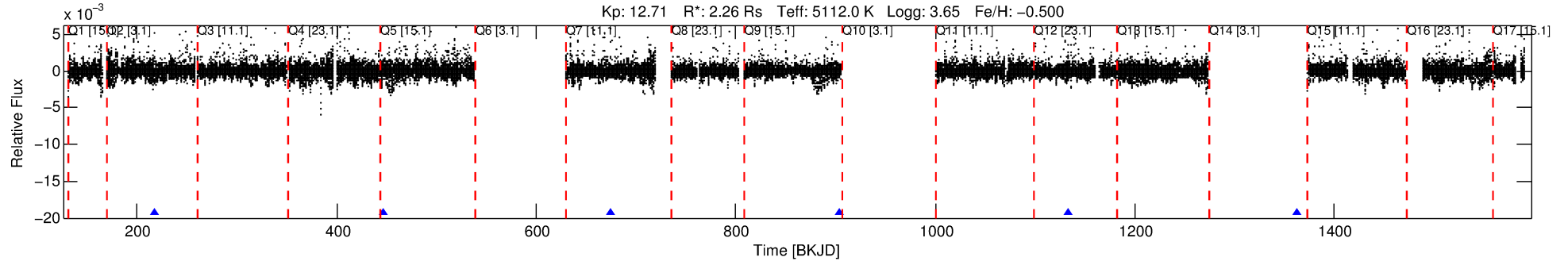
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005016873-01

No Significant Match Found

# DV One-Page Summary

KIC: 5016873 Candidate: 1 of 3 Period: 229.115 d



## DV Fit Results:

Period = 229.11536 [0.00500] d  
Epoch = 217.1531 [0.0173] BKJD  
Rp/R\* = 0.0224 [0.1989]  
a/R\* = 719.77 [24374.19]  
b = 0.50 [51.24]  
Seff = 6.57 [10.44]  
Teq = 408 [162] K  
Rp = 5.53 [49.20] Re  
a = 0.6892 [0.6178] AU  
Ag = 253.78 [4857.60] [0.05 $\sigma$ ]  
Teffp = 2520 [12016] K [0.18 $\sigma$ ]

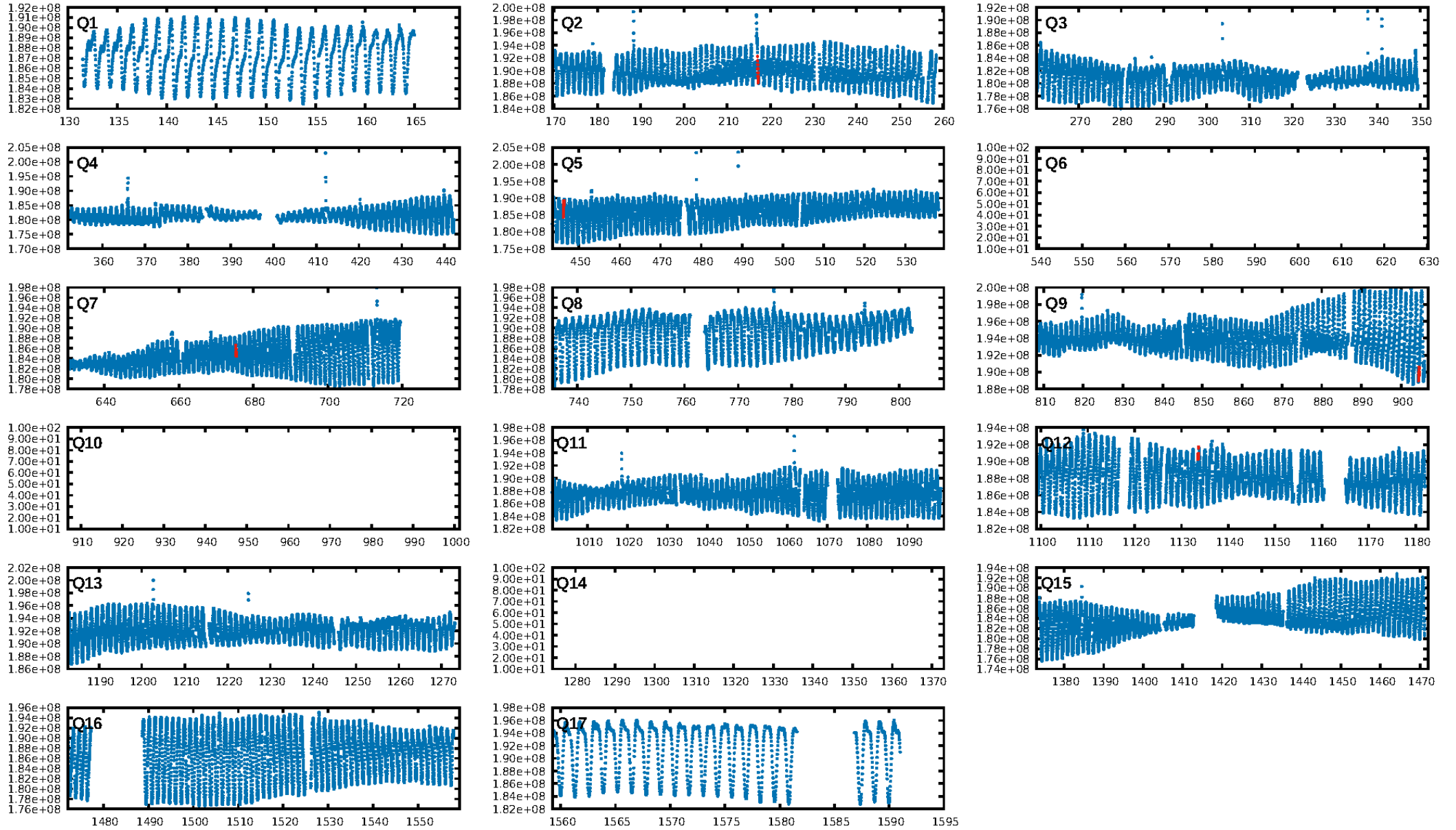
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1293.65 $\sigma$ ]  
LongPeriod-sig: 100.0% [725.21 $\sigma$ ]  
ModelChiSquare2-sig: 33.8%  
ModelChiSquareGof-sig: 99.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 0.2393  
Centroid-sig: 59.3%  
Centroid-so: 0.402 arcsec [0.59 $\sigma$ ]  
OotOffset-rm: 0.114 arcsec [1.20 $\sigma$ ]  
OotOffset-st: 1/1/1/2 [5]  
KicOffset-rm: 0.117 arcsec [1.07 $\sigma$ ]  
KicOffset-st: 1/1/1/2 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 0.40 [2/5]

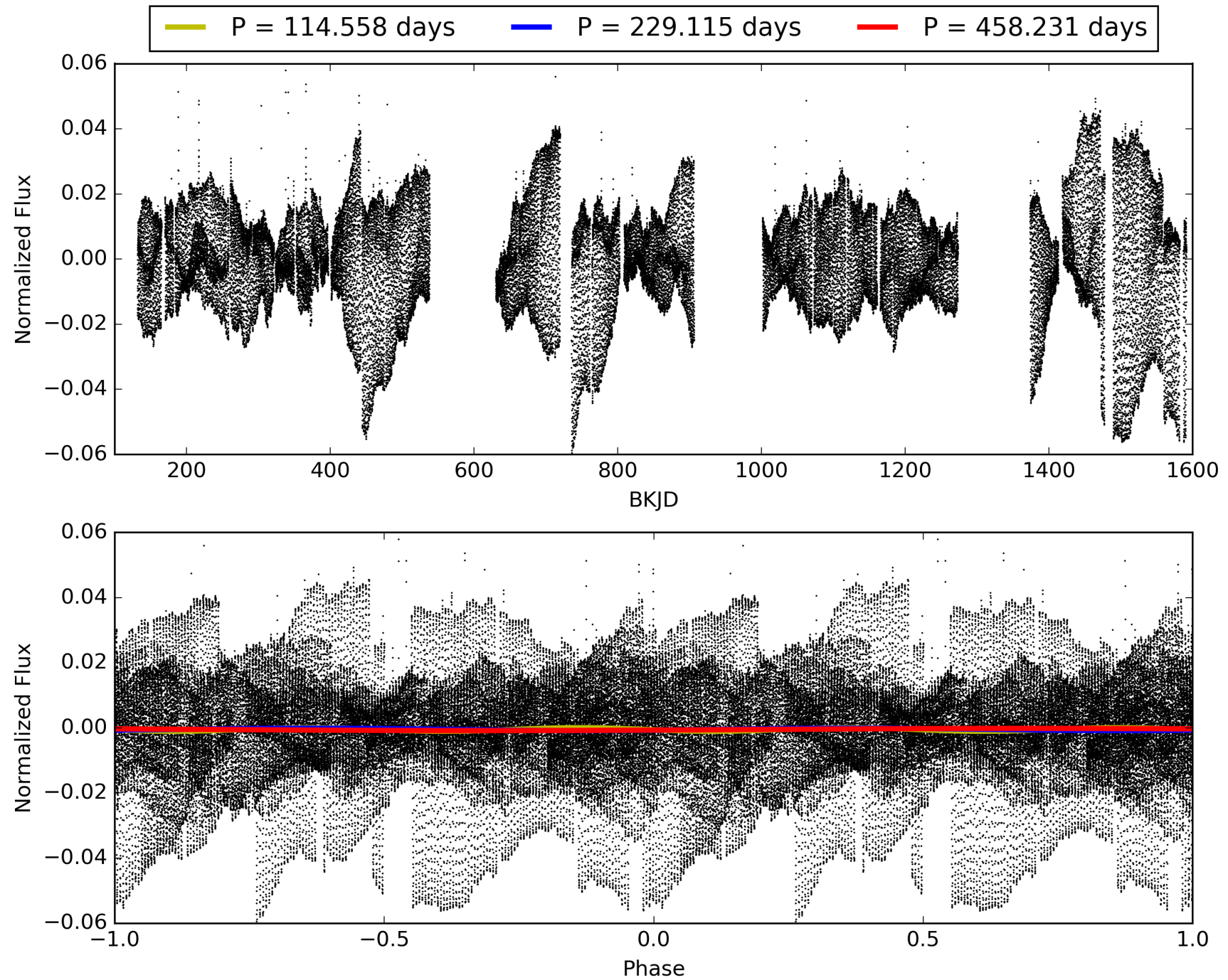
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:53:50 Z

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

# TCE 005016873-01, PDC Light Curves

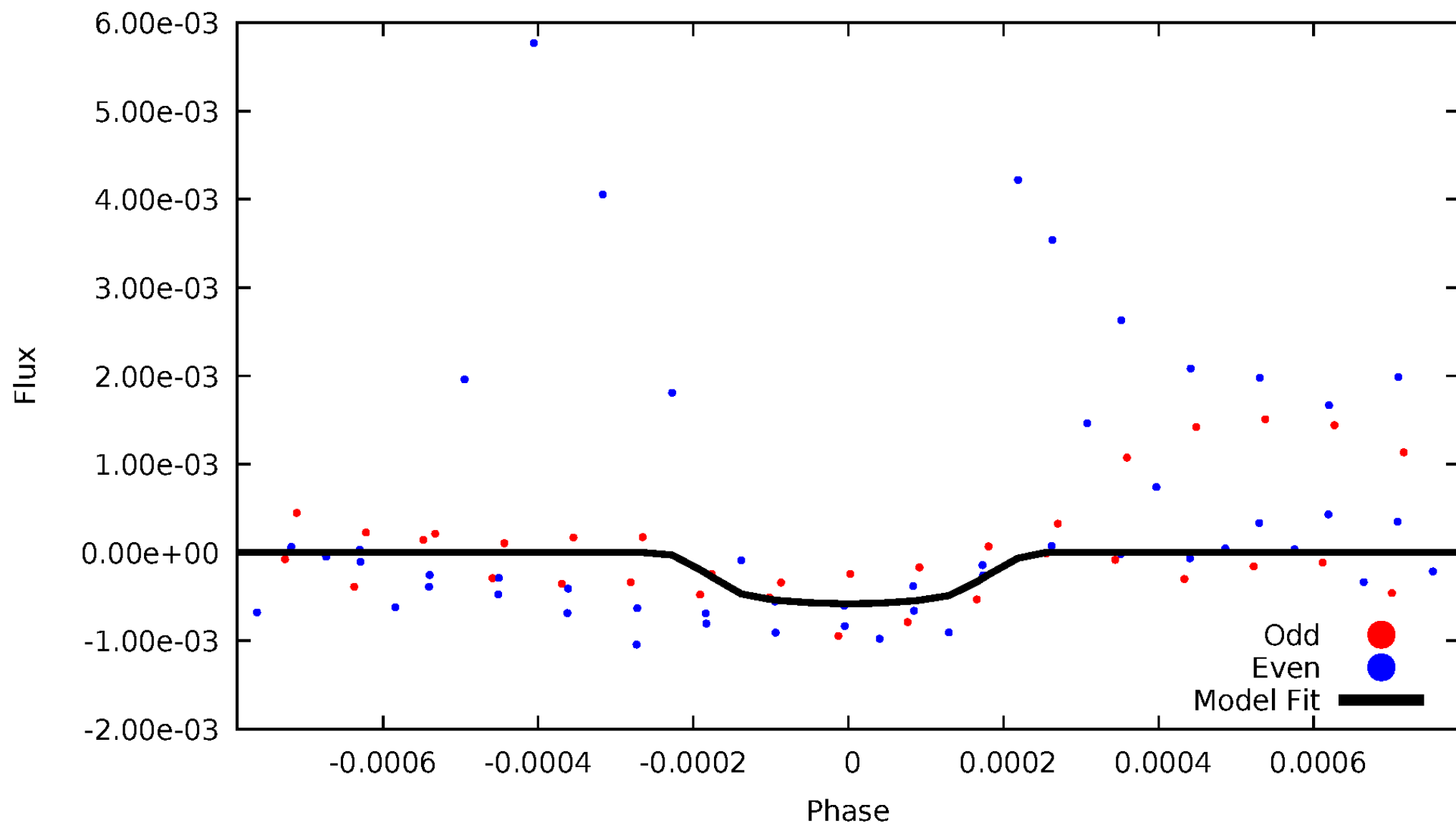


TCE 005016873-01



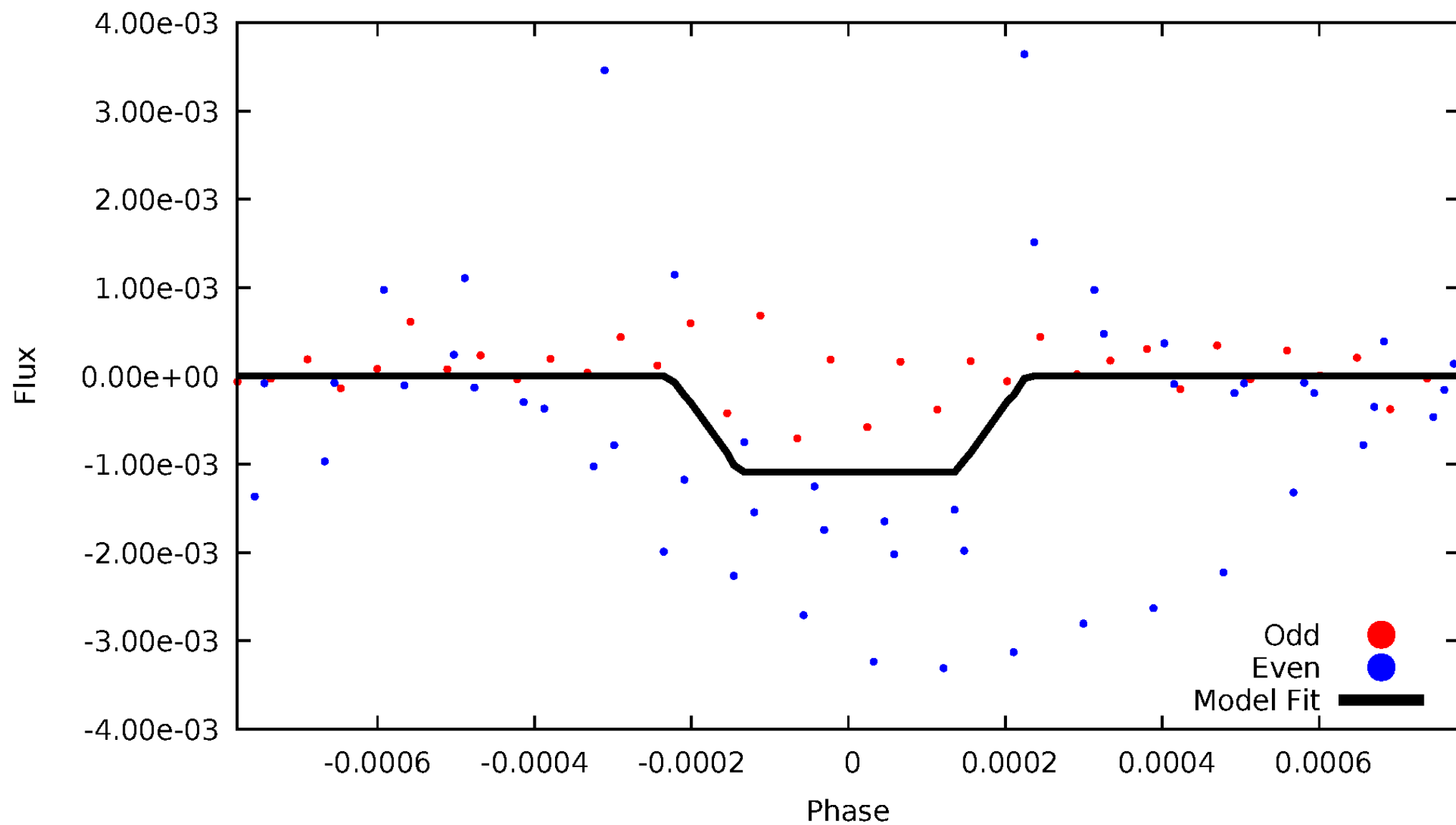
# DV Odd/Even

TCE 005016873-01



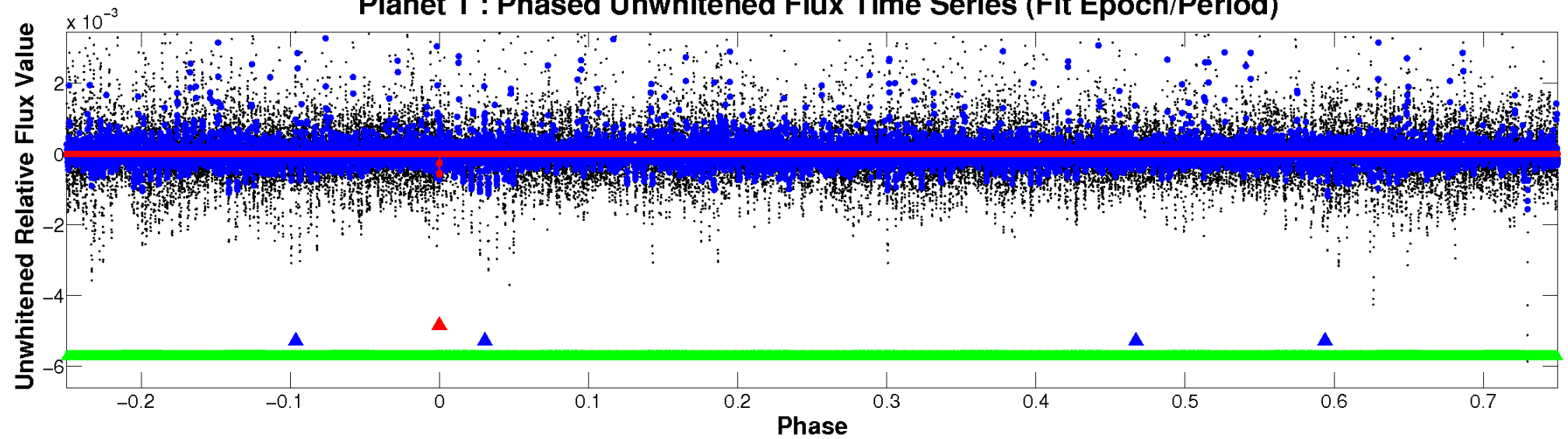
# ALT Odd/Even

TCE 005016873-01

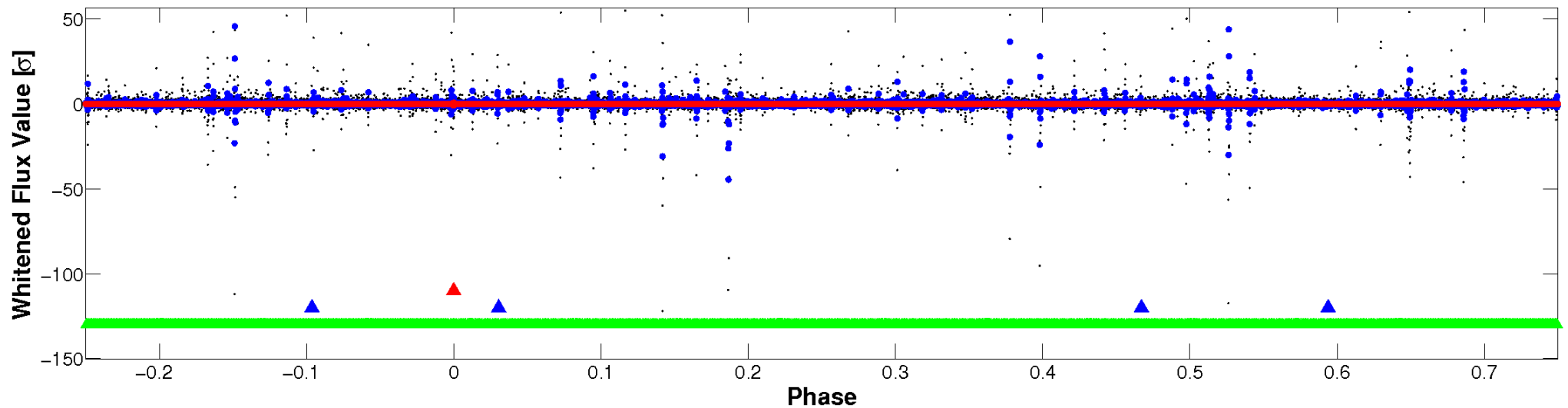


# Non-Whitened Vs. Whitened Light Curve

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



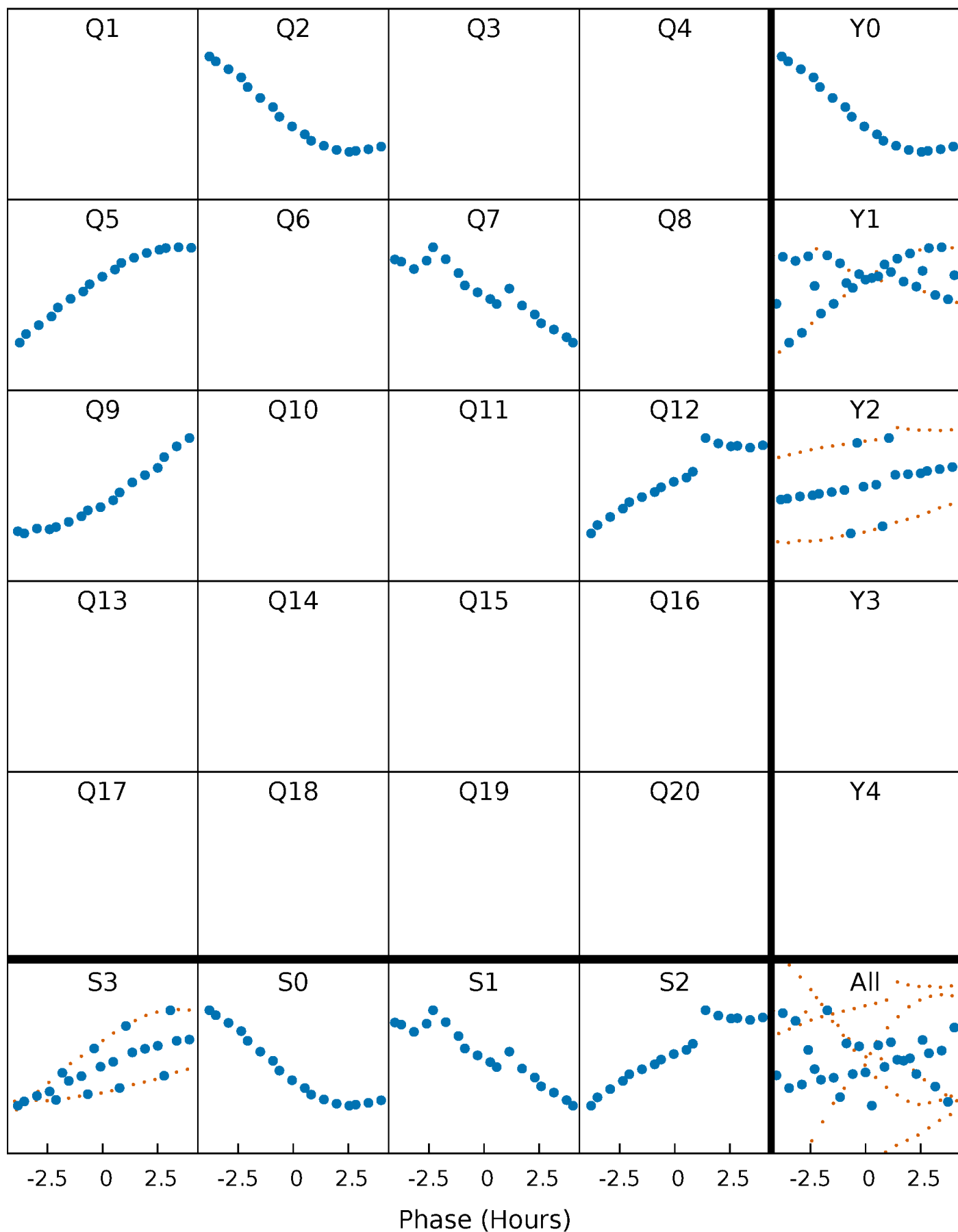
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

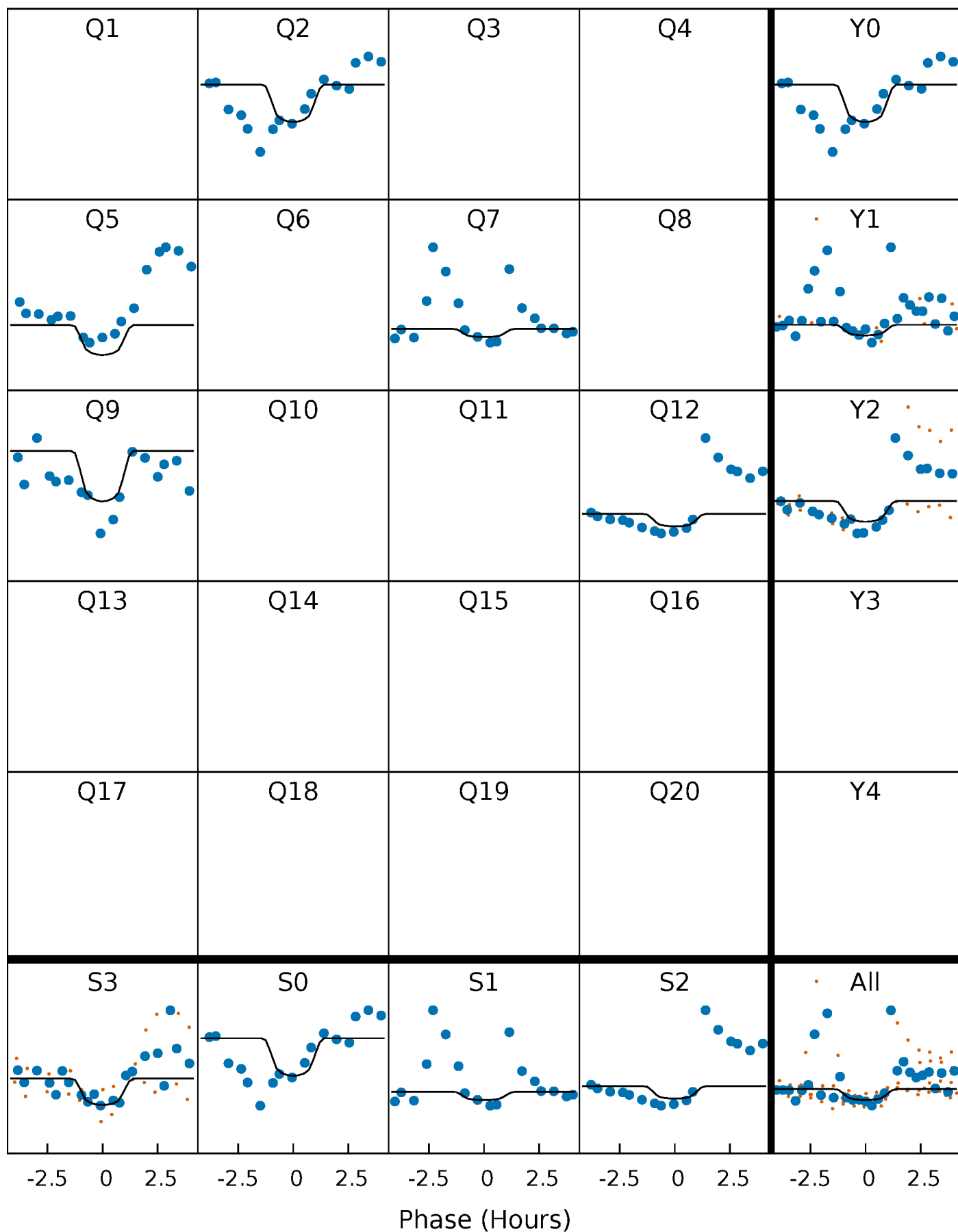
TCE 005016873-01 P=229.115358 Days  $T_0=217.153118$  (BKJD)





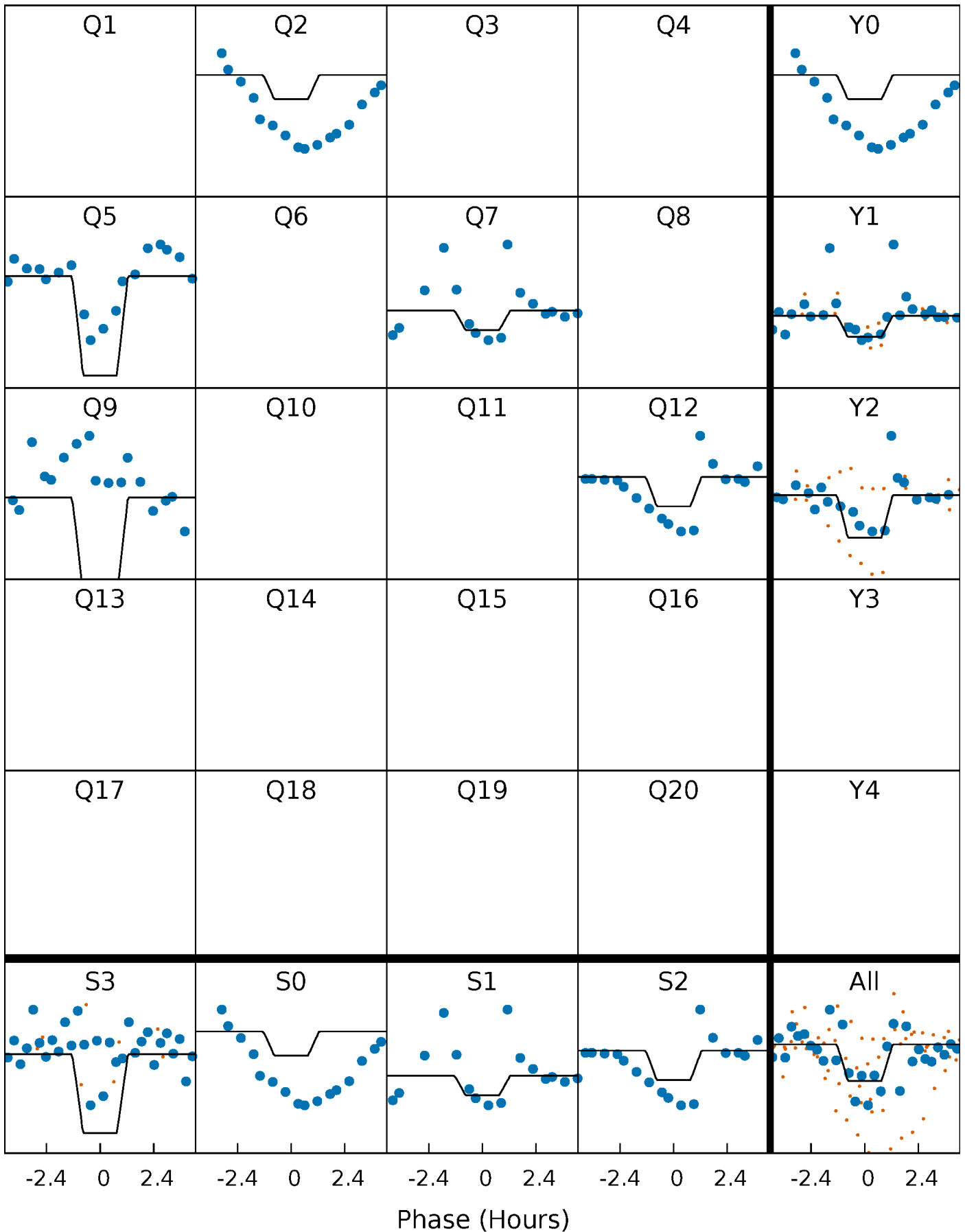
# DV Quarter-Phased Transit Curves

TCE 005016873-01 P=229.115358 Days  $T_0=217.153118$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

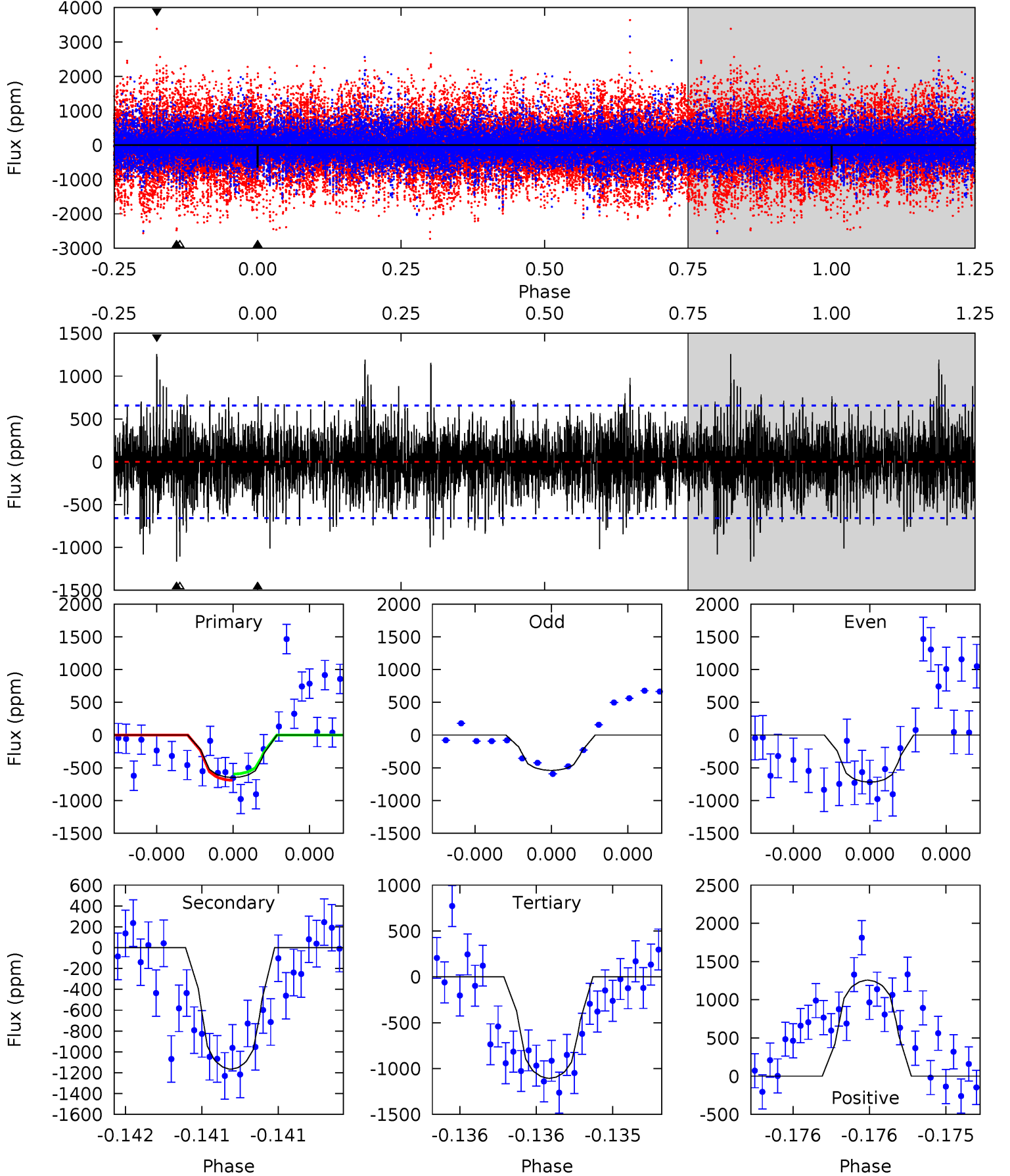
TCE 005016873-01 P=229.119007 Days  $T_0=217.144491$  (BKJD)



# DV Model-Shift Uniqueness Test

005016873-01, P = 229.115358 Days, E = 217.153118 Days

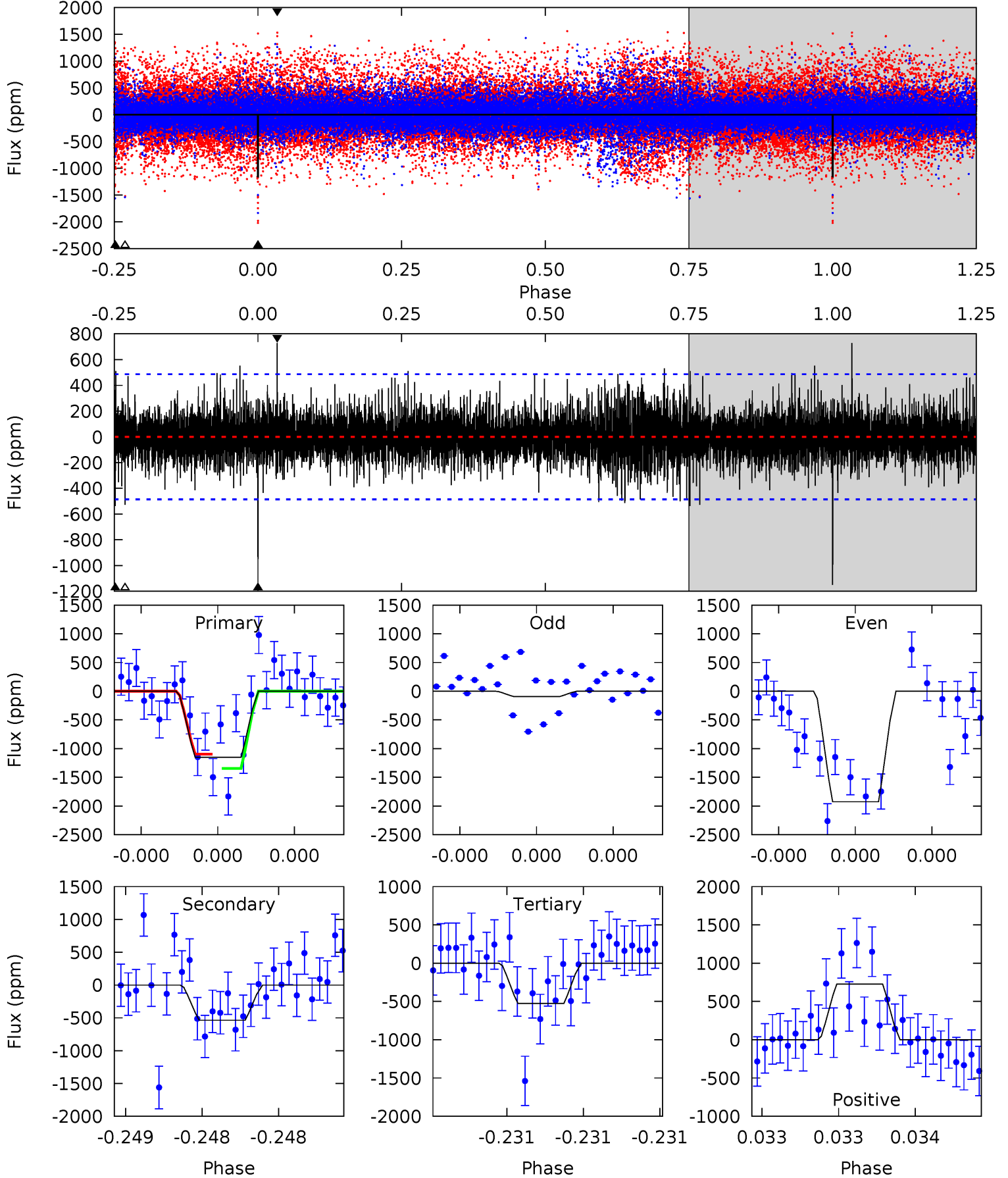
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.52	9.93	9.42	10.7	5.59	3.51	2.24	-3.90	-5.18	0.51	-0.77	0.67	1.06	0.52	0.41



# Alt Model-Shift Uniqueness Test

005016873-01, P = 229.119007 Days, E = 217.144491 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
13.2	6.18	6.07	8.37	5.59	3.51	1.53	7.18	4.88	0.11	-2.20	11.8	1.03	0.39	0



### Stellar Parameters For KIC 005016873

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5112^{+138}_{-123}$	$3.650^{+0.983}_{-0.328}$	$-0.500^{+0.300}_{-0.250}$	$2.259^{+1.342}_{-1.640}$	$0.831^{+0.257}_{-0.150}$	$0.102^{+2.917}_{-0.085}$
	+3%/-2%	+27%/-9%	+60%/-50%	+59%/-73%	+31%/-18%	+2874%/-84%
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 005016873-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1166 \pm 117$	$29.56^{+42.29}_{-21.76}$	$554^{+93}_{-113}$	$3151^{+1550}_{-590}$	$369^{+4961}_{-308}$
Alt.	$-536 \pm 87$	$31.37^{+44.67}_{-23.11}$	$559^{+91}_{-120}$	$2771^{+1324}_{-454}$	$150^{+1857}_{-126}$

$T_{max}$  = 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

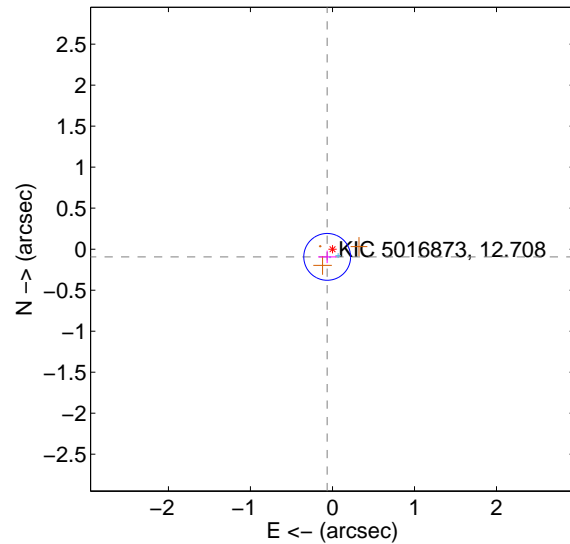
Supplemental centroid analysis for 005016873-01. Kepler magnitude: 12.71. Transit SNR 3.23

There are 2 quarters with good PRF difference image offsets

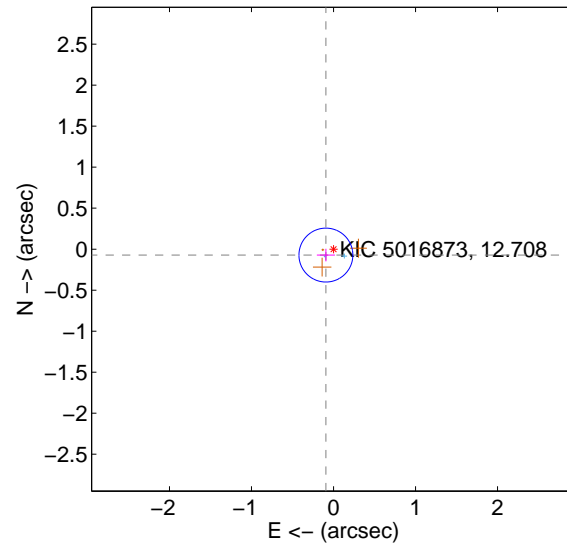
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.114 \pm 0.095$	1.20	$0.064 \pm 0.110$	$-0.094 \pm 0.076$
PRF-fit source offset from KIC position	$0.117 \pm 0.110$	1.07	$0.093 \pm 0.111$	$-0.072 \pm 0.077$
photometric centroid source offset	$0.40 \pm 0.69$	0.59	$-0.34 \pm 0.64$	$0.22 \pm 0.78$

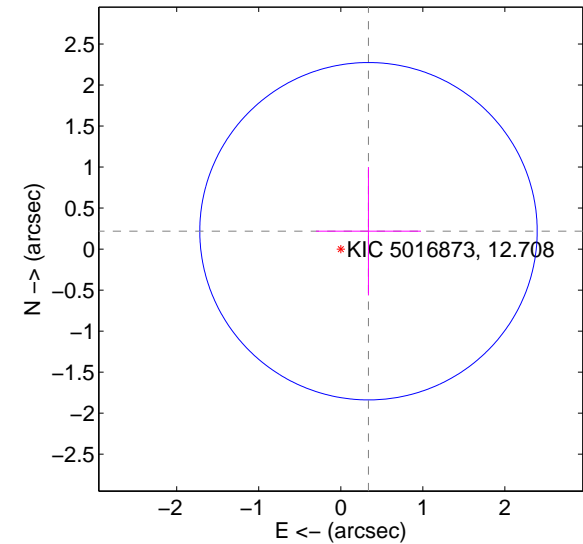
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

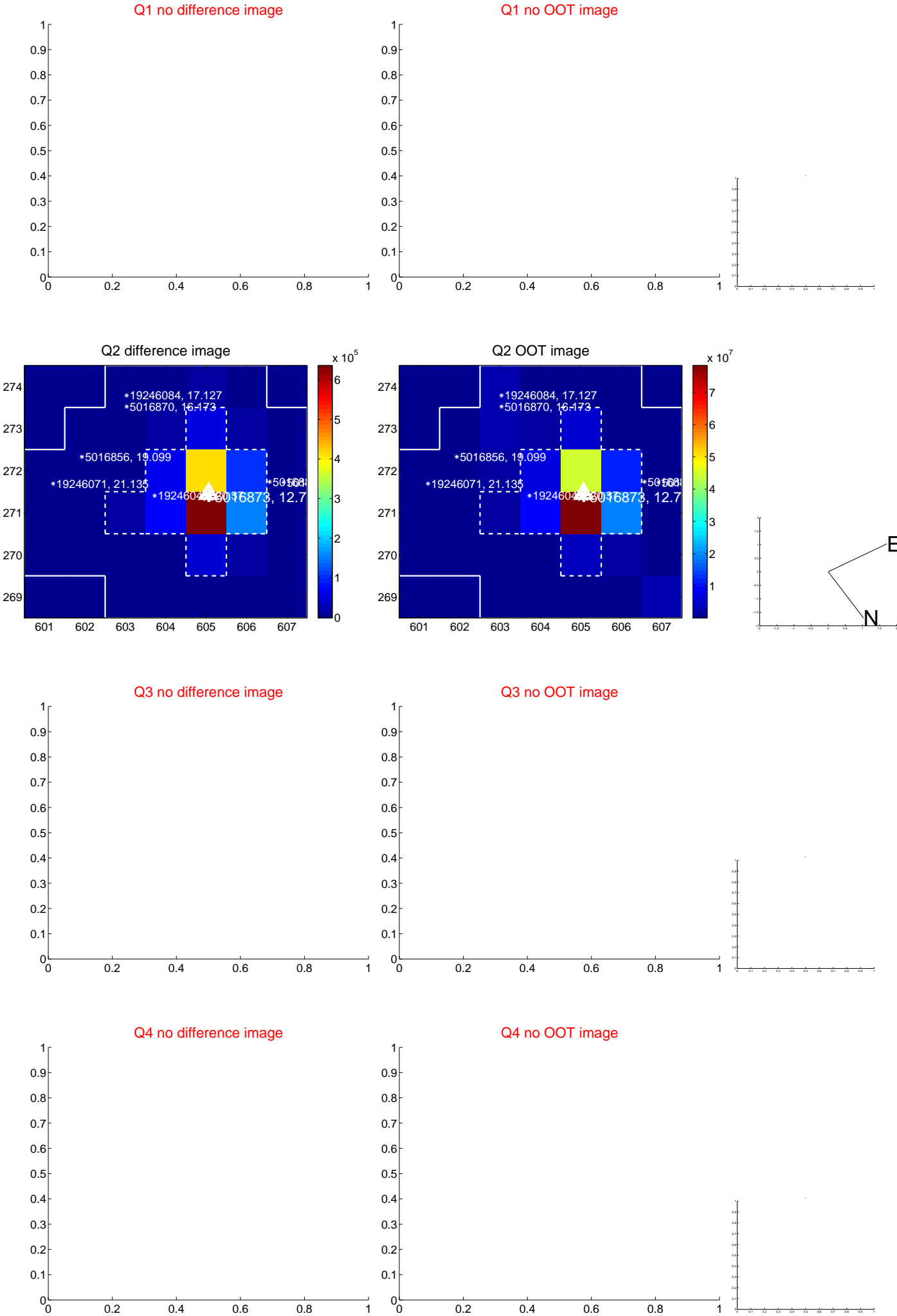


offset from photometric centroids



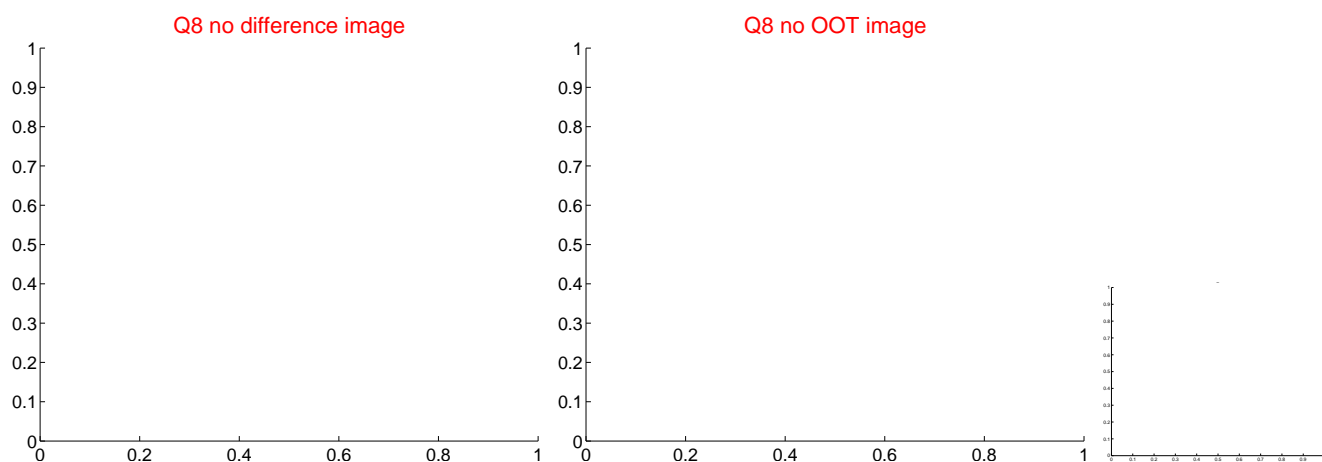
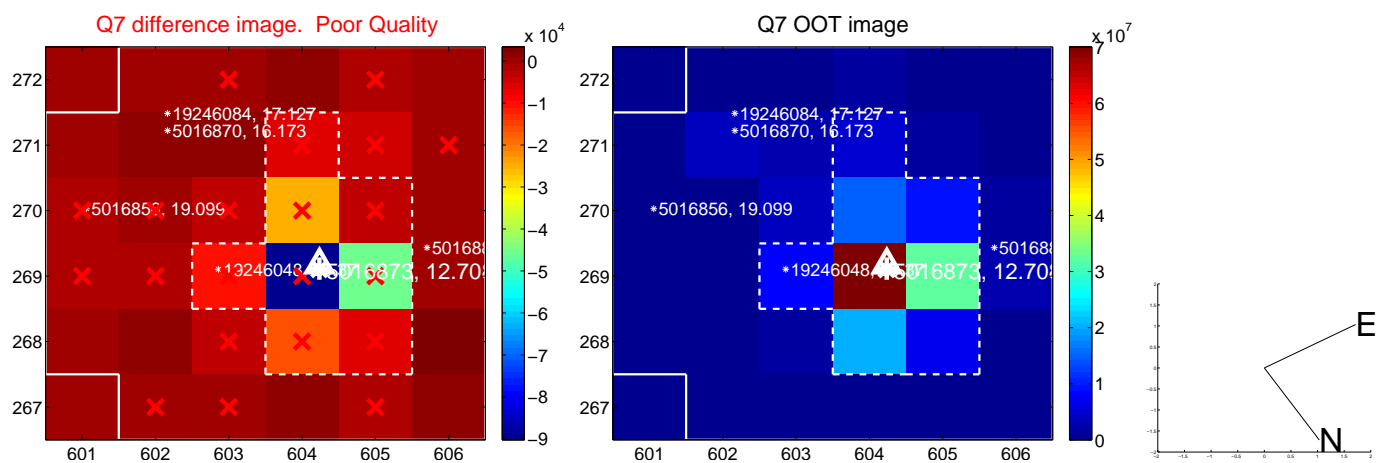
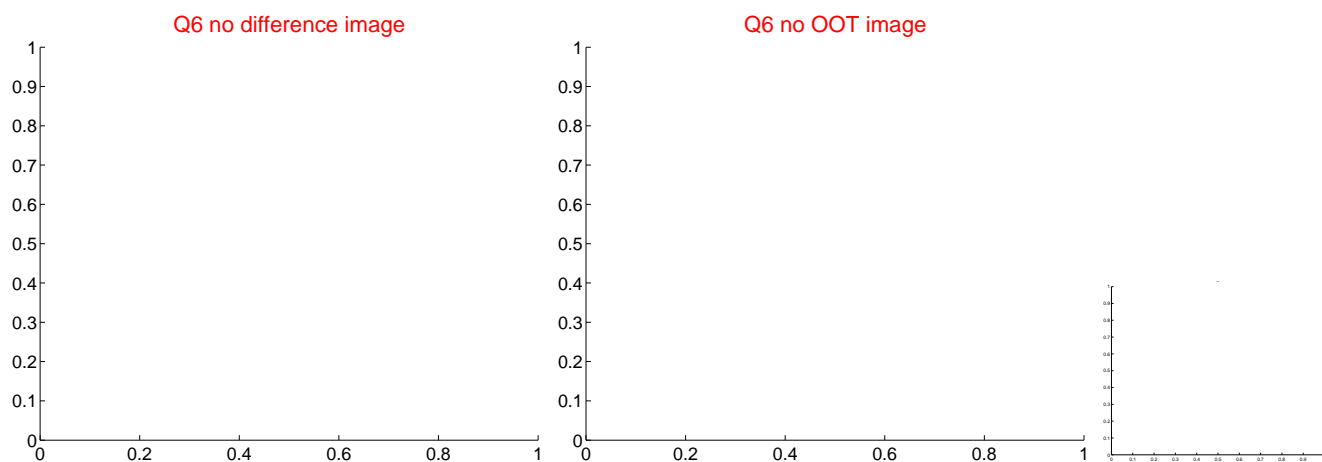
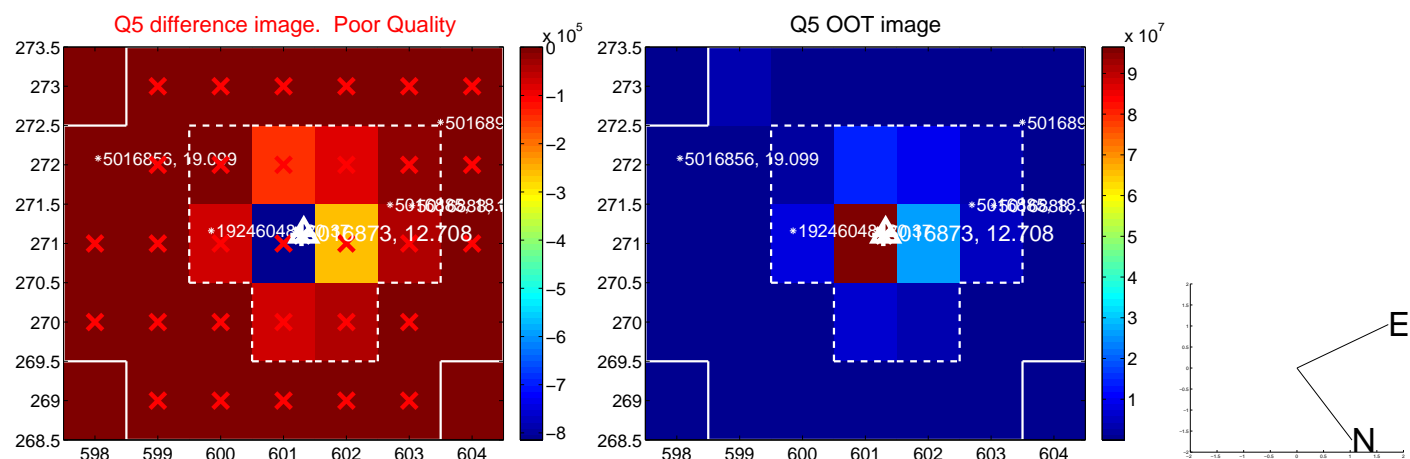
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

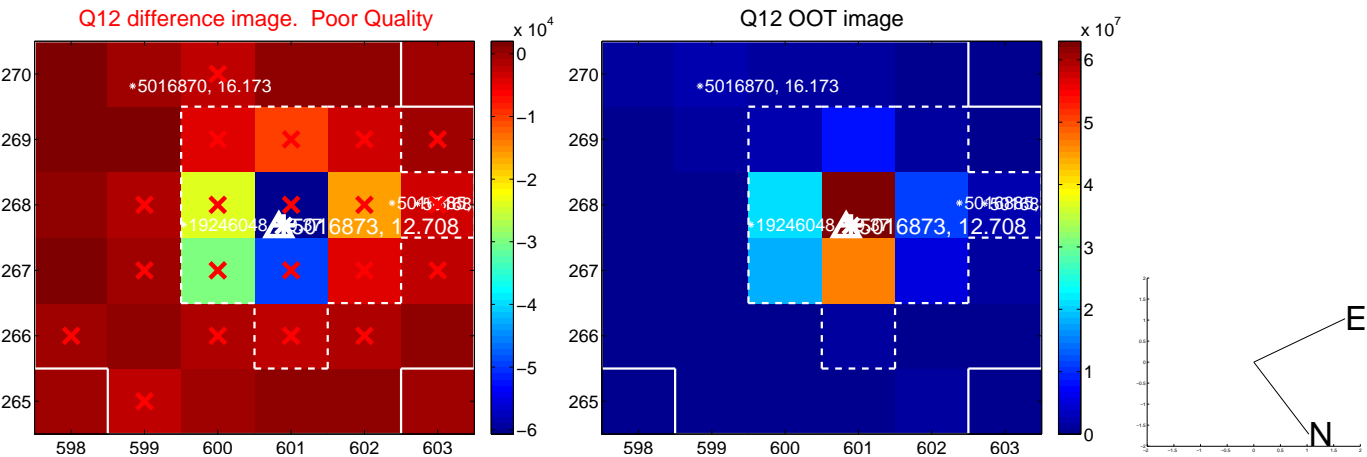
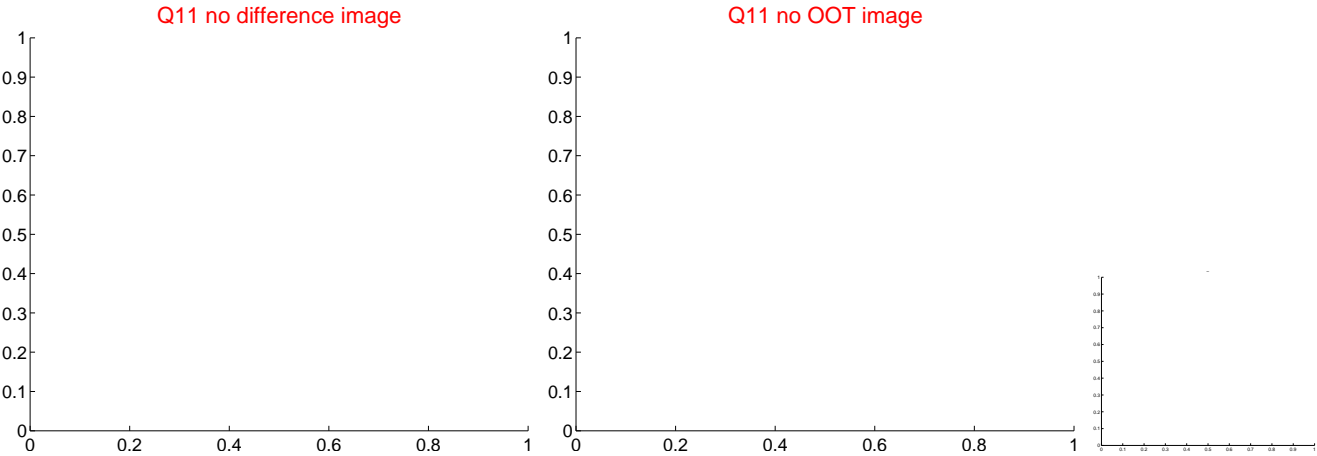
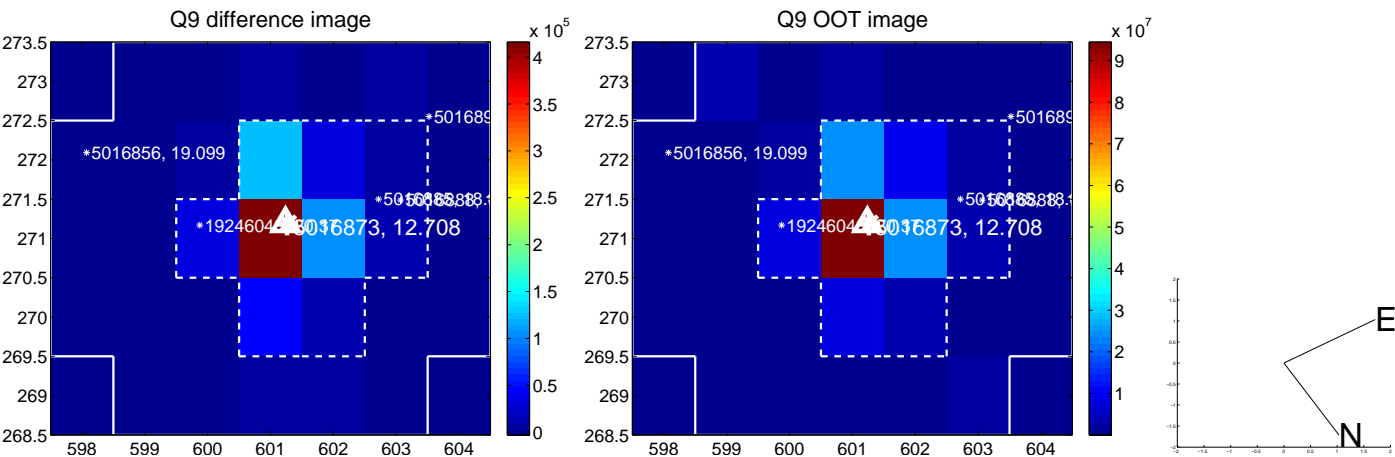




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



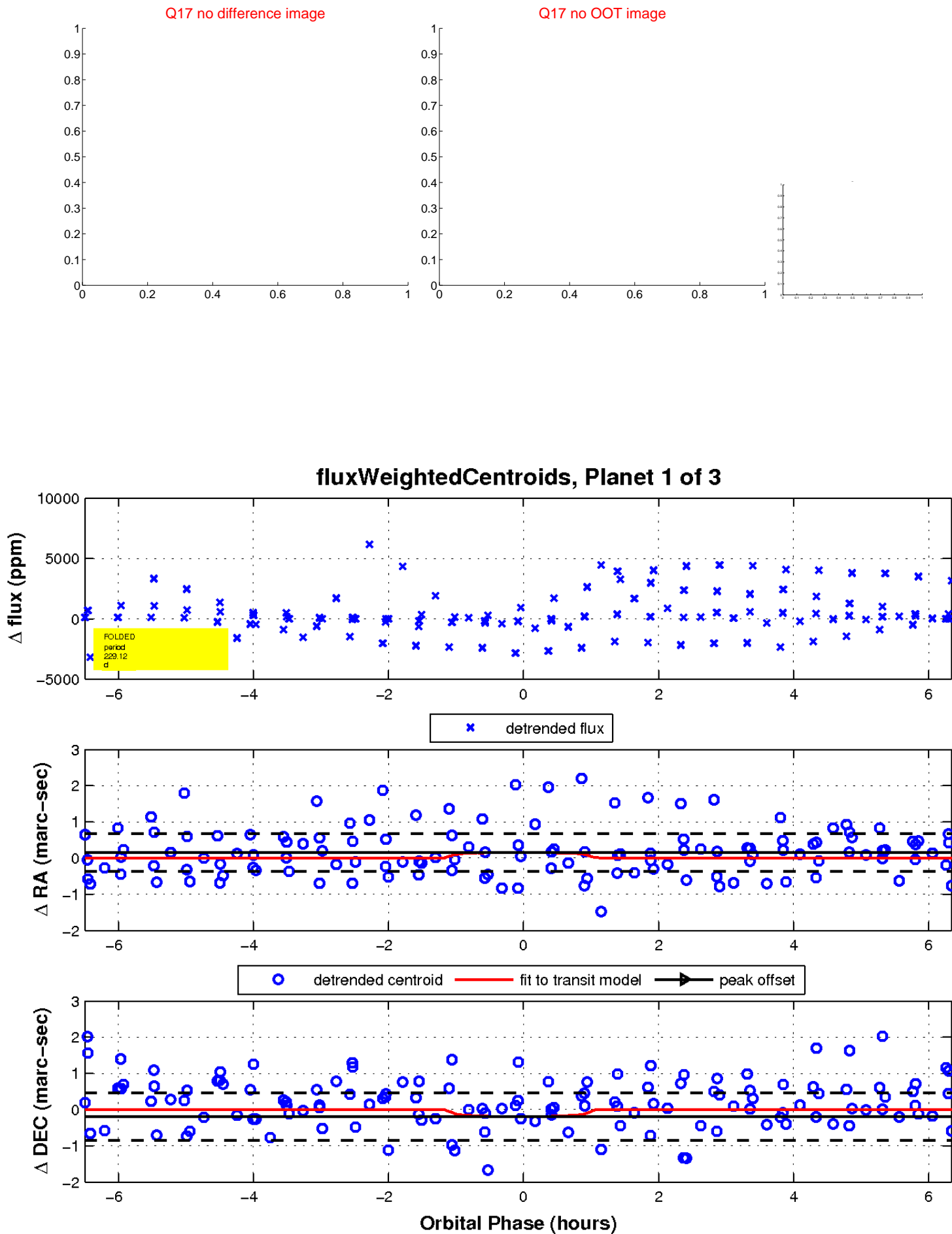
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

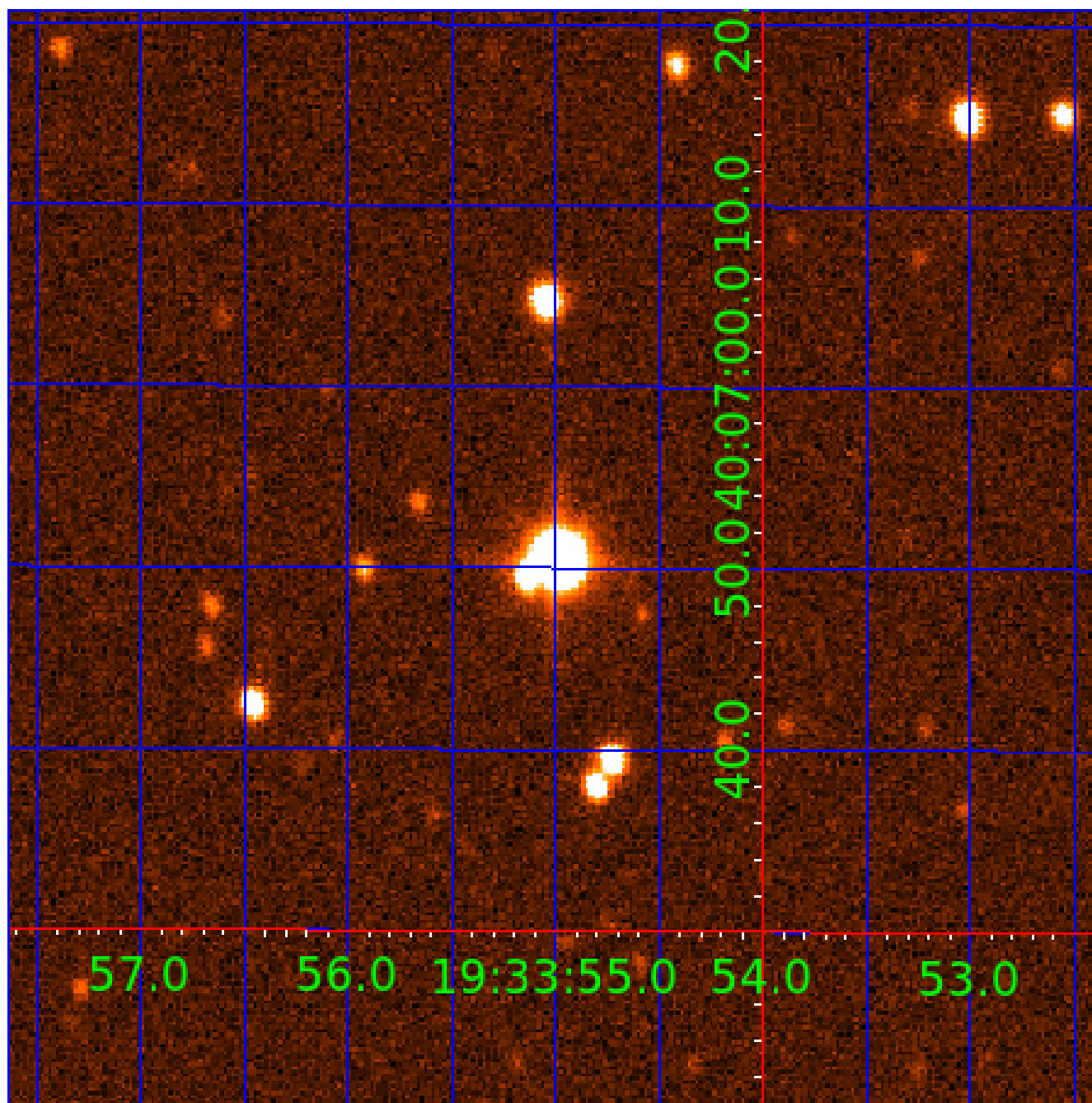


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005016873

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005016873-01	OBS	No	229.115358	217.153118	579.3	2.166	18.5	3.2	2.26	5112	5.53	6.57
005016873-02	OBS	No	358.197786	424.212466	711.1	3.682	12.6	3.2	2.26	5112	6.18	3.62
005016873-03	OBS	No	1.298725	132.793799	115.6	3.629	9.8	9.5	2.26	5112	2.92	6503.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005016873-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
005016873-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005016873-03	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV

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

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

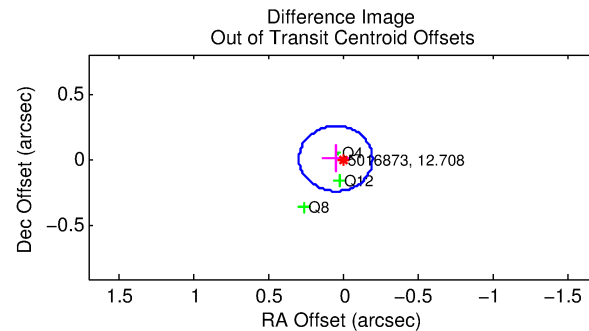
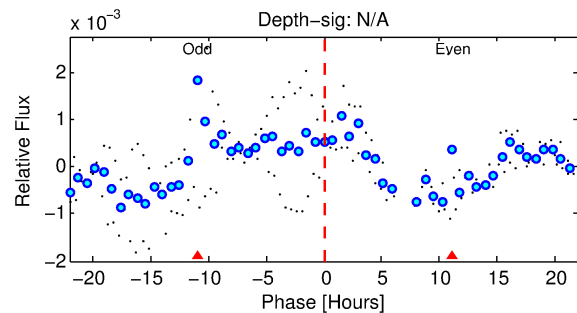
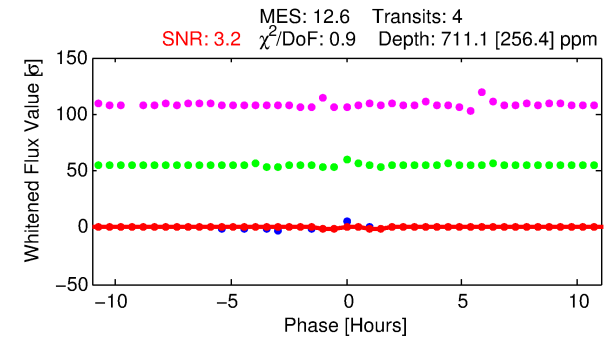
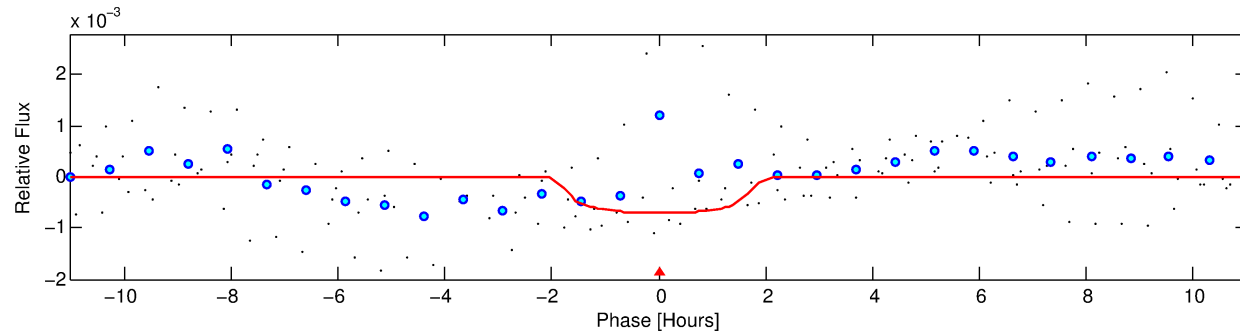
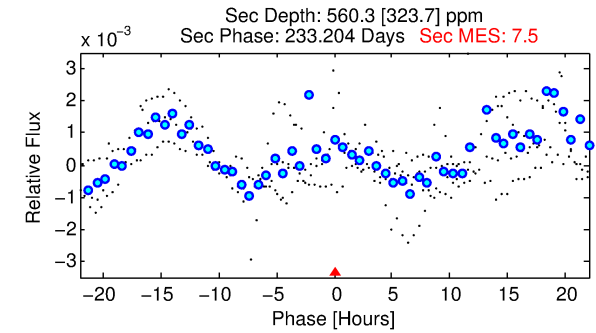
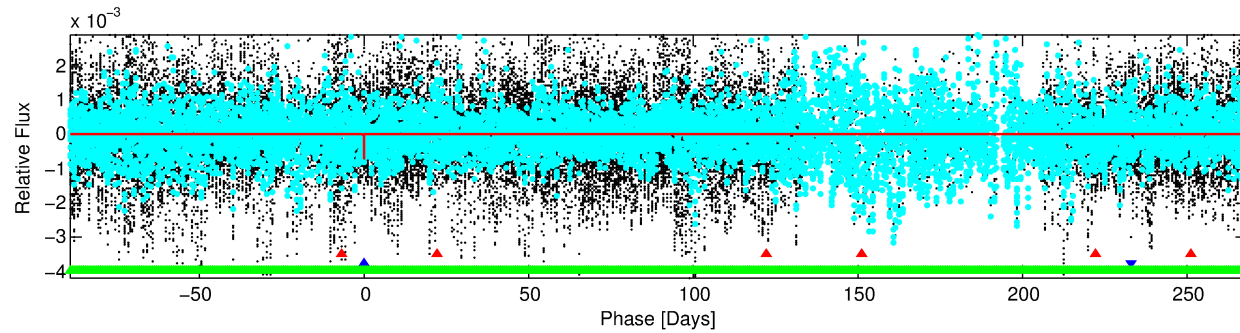
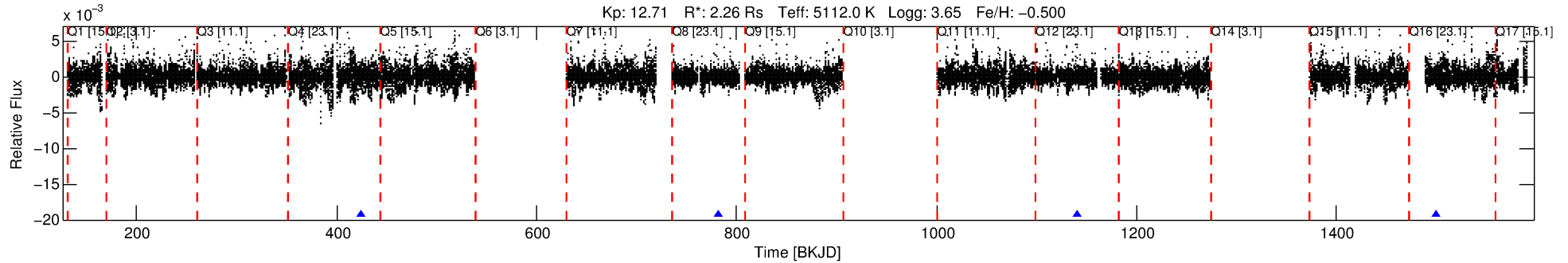
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005016873-02

No Significant Match Found

# DV One-Page Summary

KIC: 5016873 Candidate: 2 of 3 Period: 358.198 d



## DV Fit Results:

Period = 358.19779 [0.00502] d  
Epoch = 424.2125 [0.0091] BKJD  
Rp/R\* = 0.0251 [0.0536]  
a/R\* = 639.89 [5291.12]  
b = 0.56 [10.41]  
Seff = 3.62 [5.75]  
Teq = 352 [140] K  
Rp = 6.18 [13.96] Re  
a = 0.9284 [0.8322] AU  
Ag = 6952.01 [31952.01] [0.22] $\sigma$   
Teffp = 4967 [5358] K [0.86] $\sigma$

## DV Diagnostic Results:

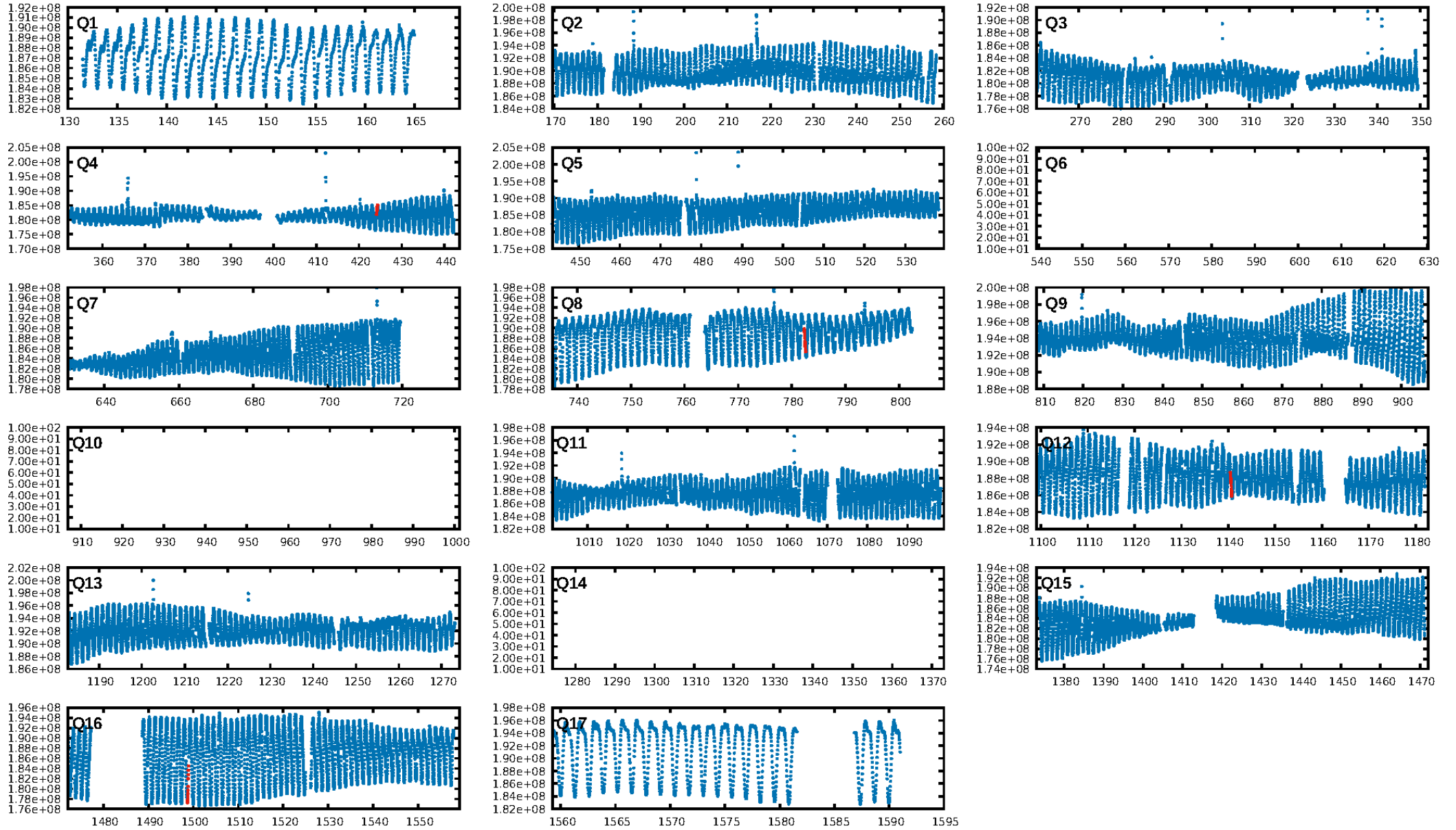
ShortPeriod-sig: 100.0% [725.21] $\sigma$   
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 33.8%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 4.075**  
Centroid-sig: 82.8%  
Centroid-so: 0.159 arcsec [0.22] $\sigma$   
OotOffset-rm: 0.047 arcsec [0.57] $\sigma$   
OotOffset-st: 0/0/3/0 [3]  
KicOffset-rm: 0.076 arcsec [0.96] $\sigma$   
KicOffset-st: 0/0/3/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.33 [1/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:54:03 Z

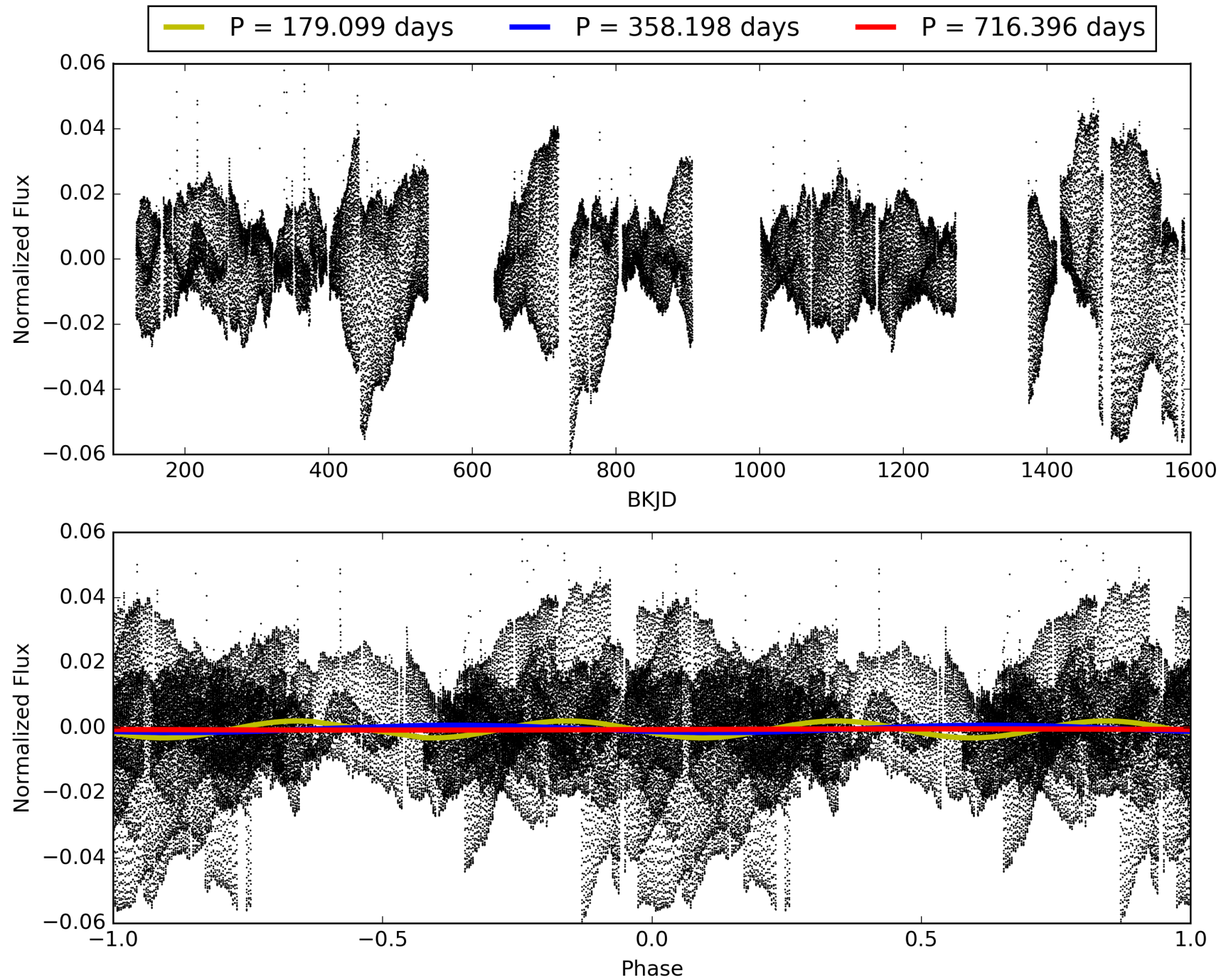
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005016873-02, PDC Light Curves

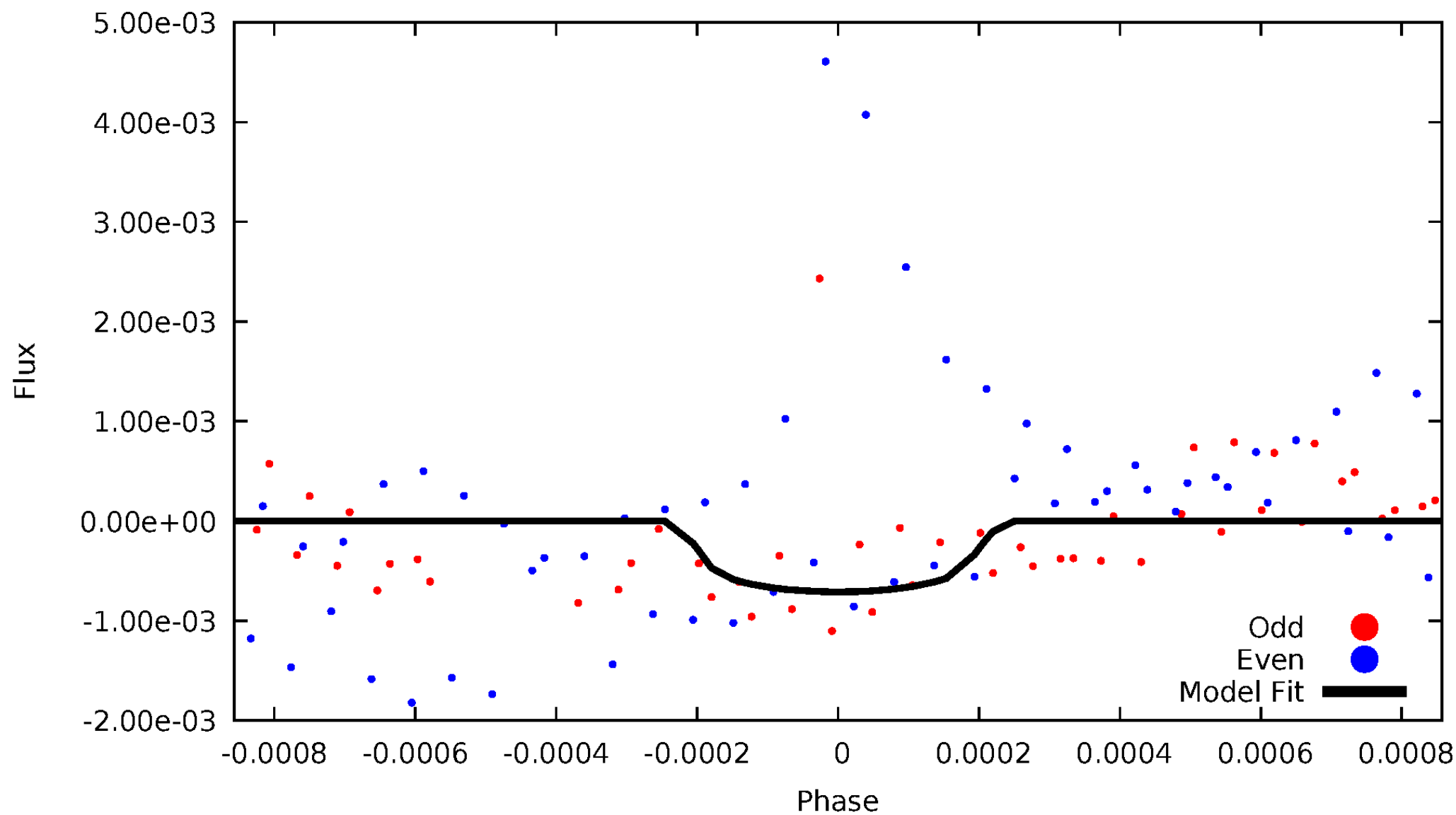


TCE 005016873-02



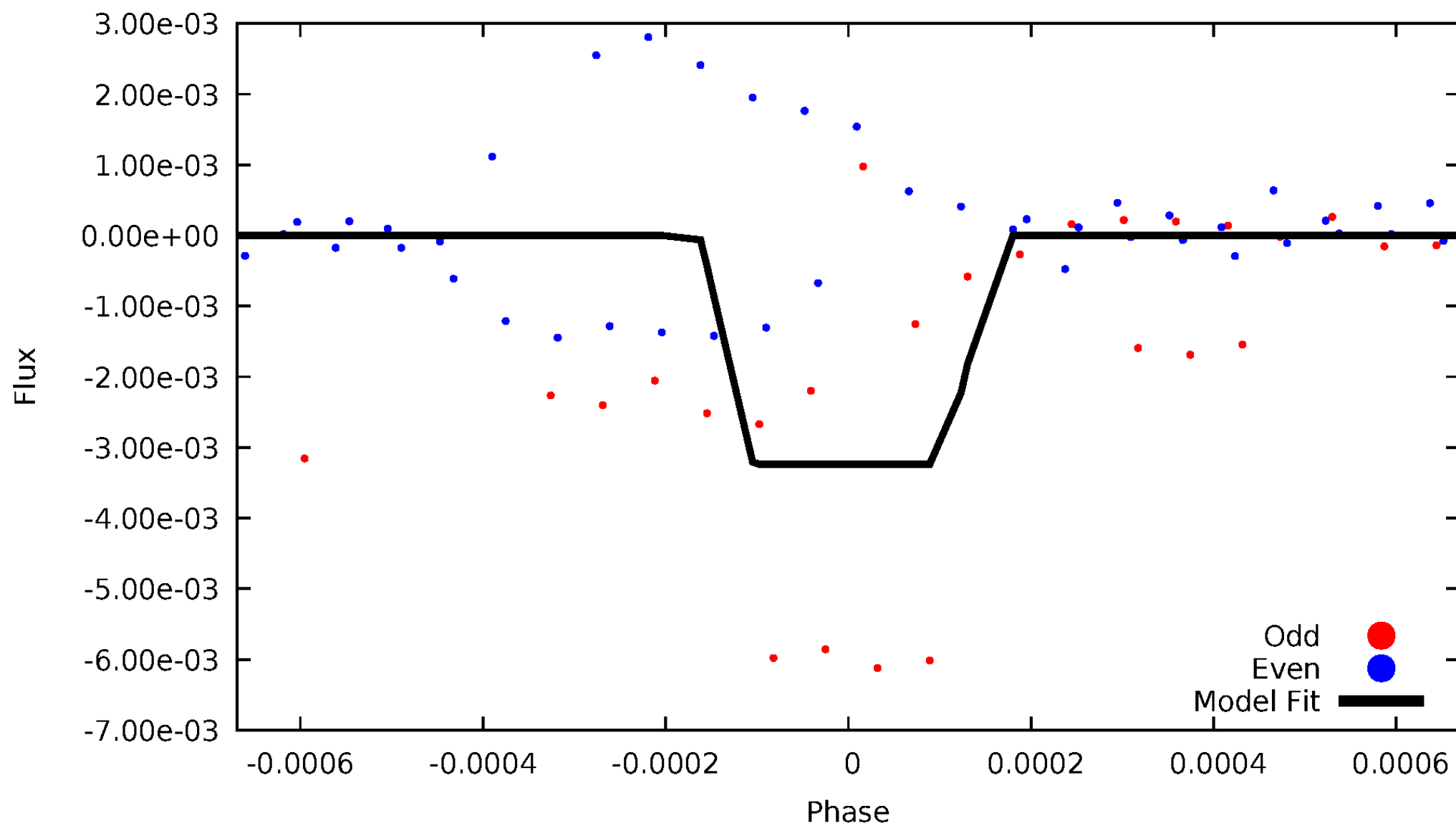
# DV Odd/Even

TCE 005016873-02



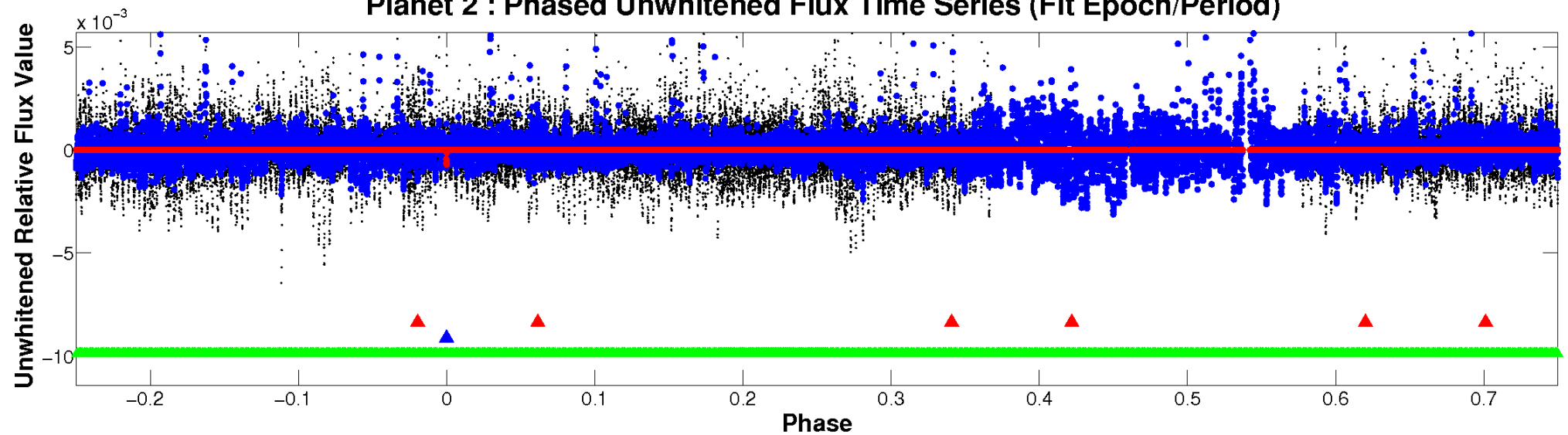
# ALT Odd/Even

TCE 005016873-02

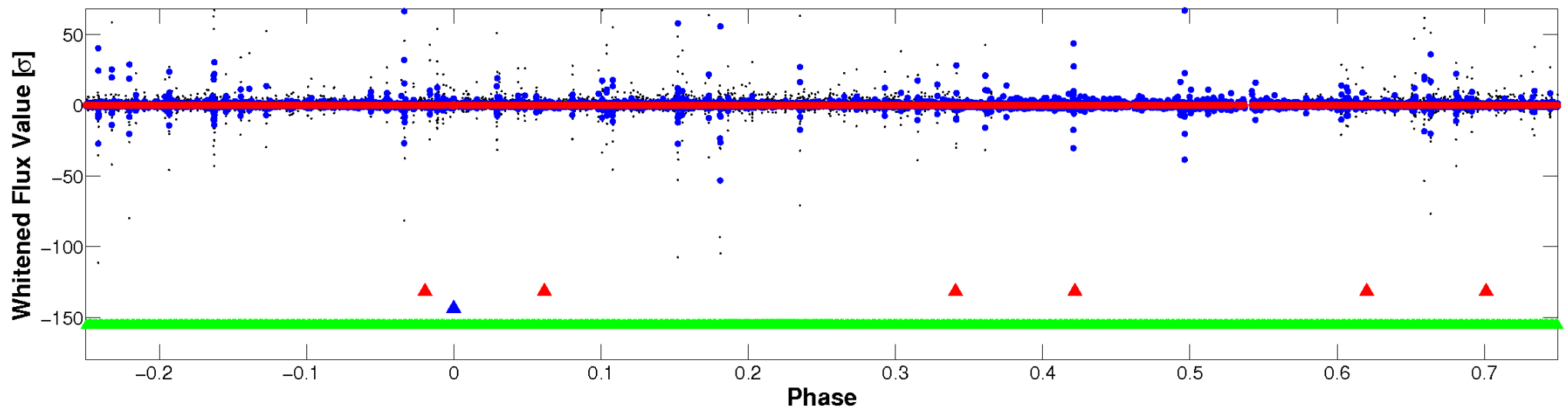


# Non-Whitened Vs. Whitened Light Curve

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

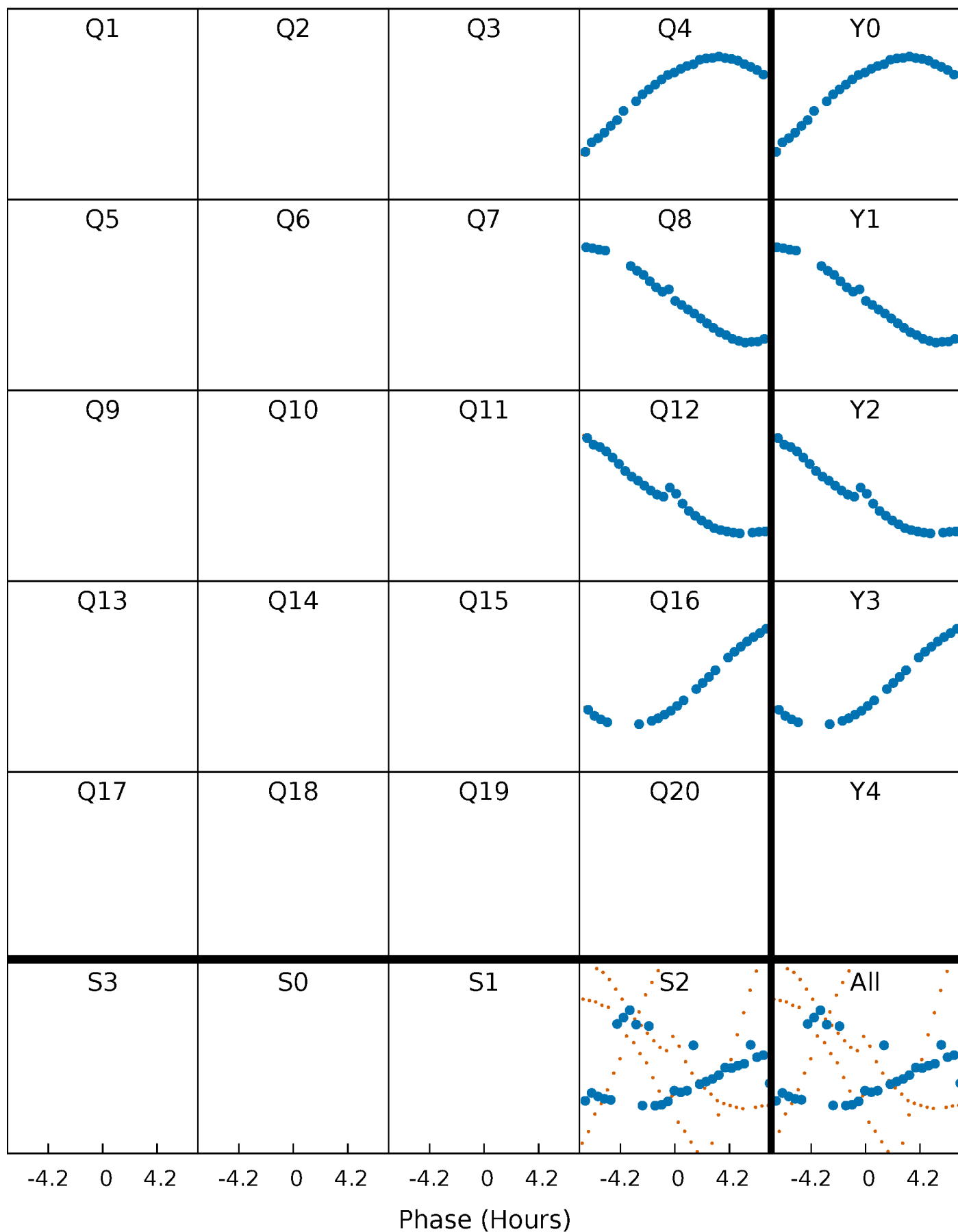


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



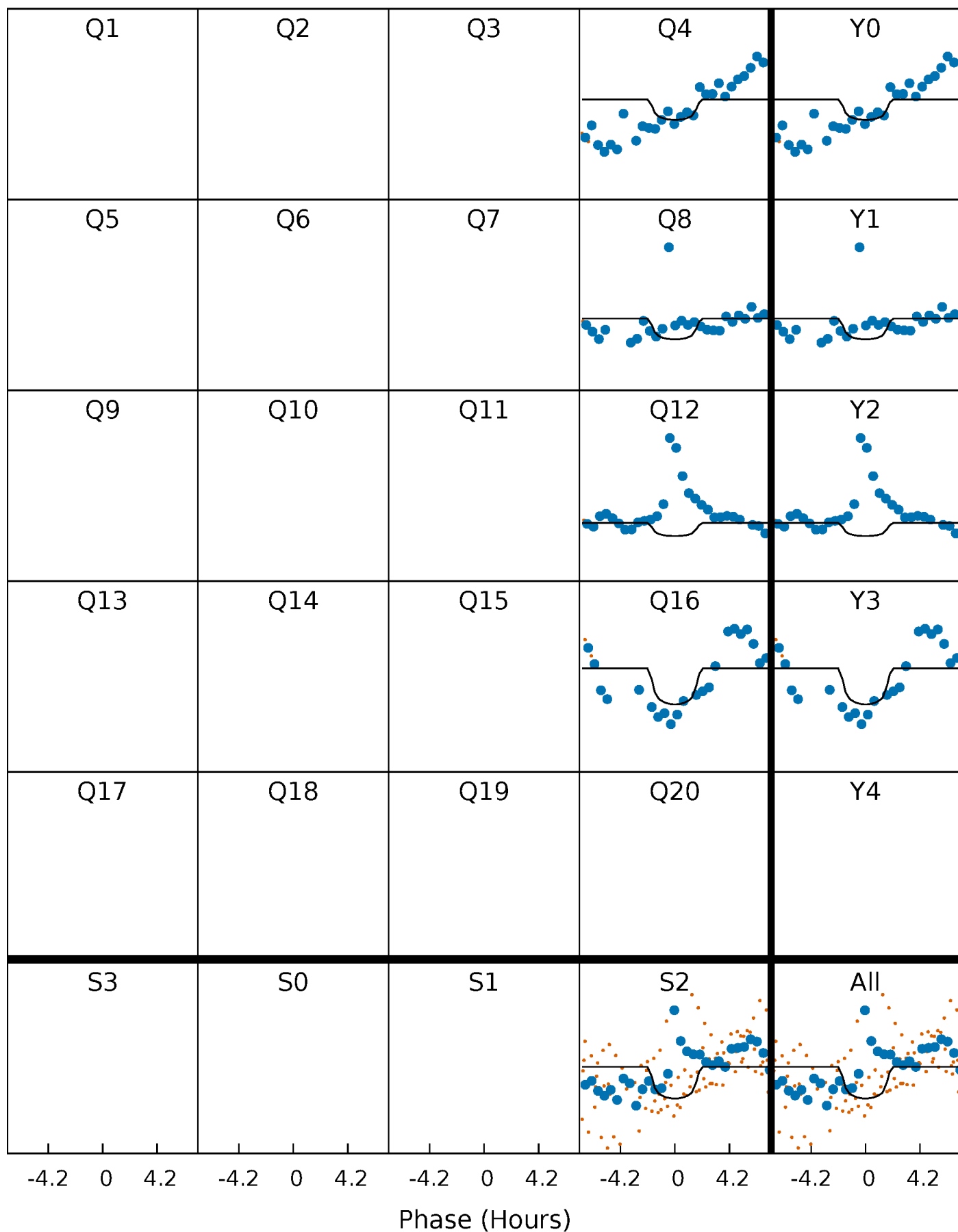
# PDC Quarter-Phased Transit Curves

TCE 005016873-02 P=358.197787 Days  $T_0=424.212466$  (BKJD)



# DV Quarter-Phased Transit Curves

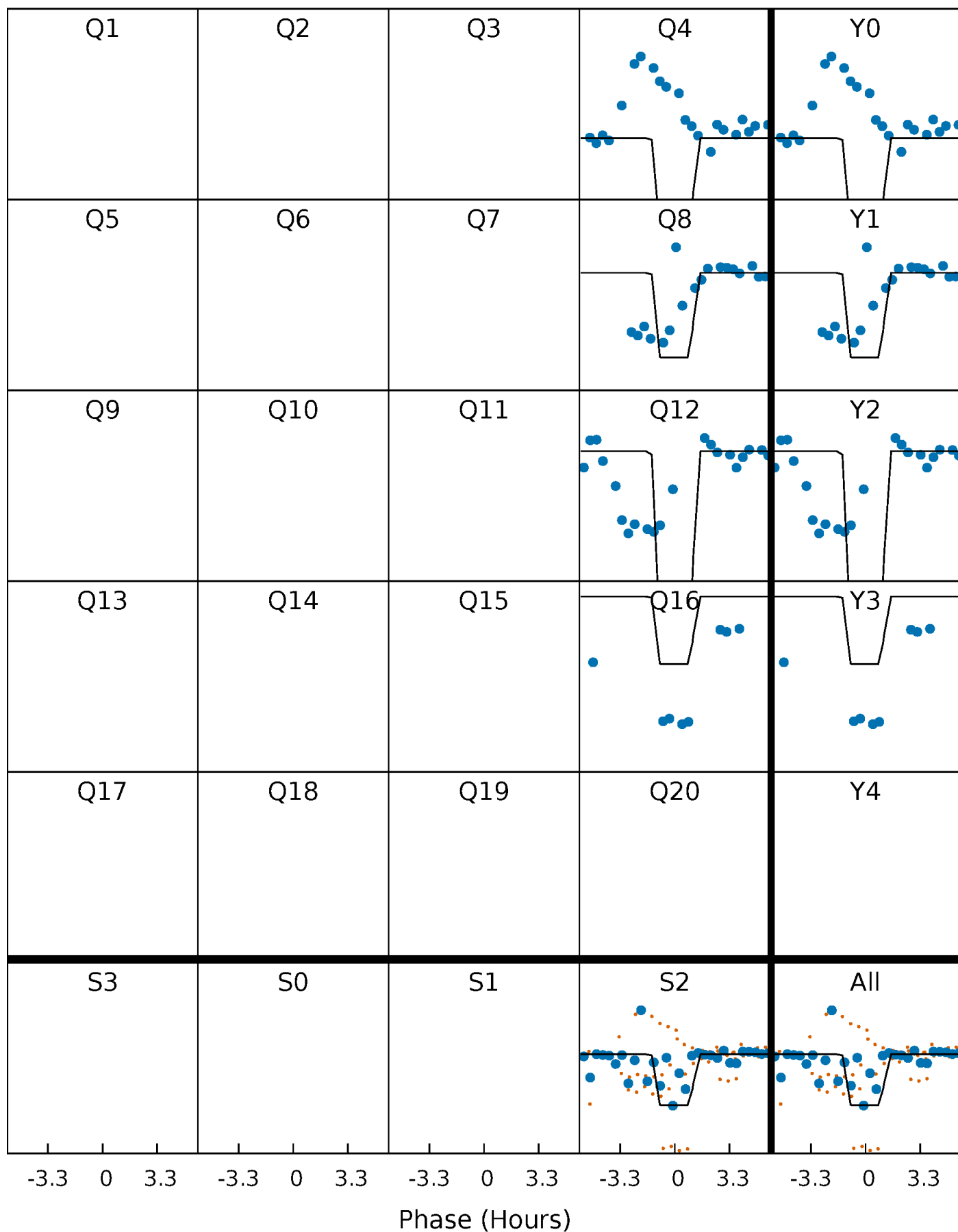
TCE 005016873-02 P=358.197787 Days  $T_0=424.212466$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

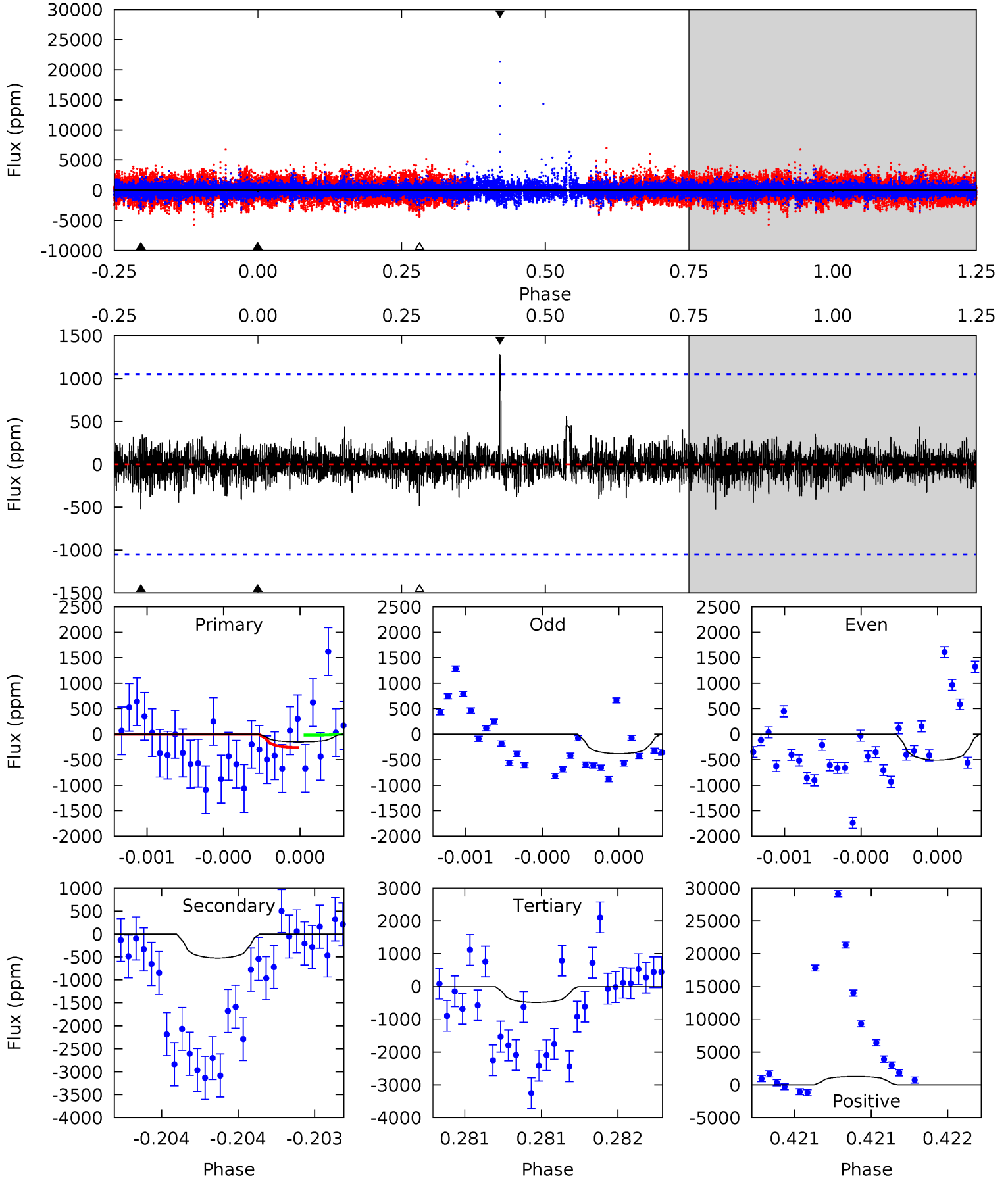
TCE 005016873-02 P=358.198185 Days  $T_0=424.196782$  (BKJD)



# DV Model-Shift Uniqueness Test

005016873-02,  $P = 358.197787$  Days,  $E = 66.014679$  Days

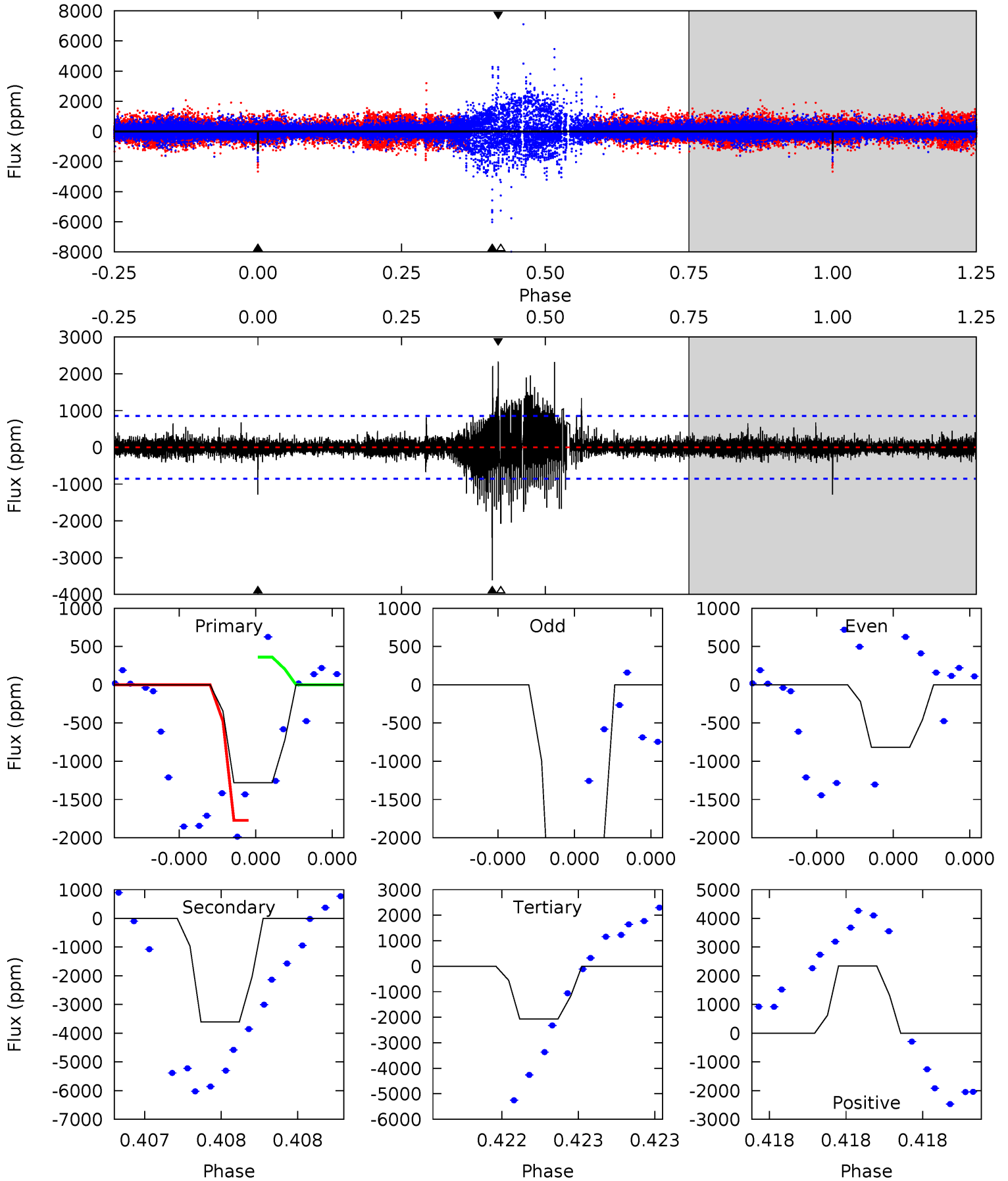
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.79	2.78	2.58	6.77	5.59	3.51	0.63	-1.79	-5.98	0.20	-3.99	0.32	-0.74	0.71	0.65



# Alt Model-Shift Uniqueness Test

005016873-02, P = 358.198185 Days, E = 65.998597 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
8.45	23.8	13.6	15.4	5.64	3.58	1.30	-5.19	-6.98	10.2	8.41	11.7	1.43	0.39	0



### Stellar Parameters For KIC 005016873

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5112^{+138}_{-123}$	$3.650^{+0.983}_{-0.328}$	$-0.500^{+0.300}_{-0.250}$	$2.259^{+1.342}_{-1.640}$	$0.831^{+0.257}_{-0.150}$	$0.102^{+2.917}_{-0.085}$
	+3%/-2%	+27%/-9%	+60%/-50%	+59%/-73%	+31%/-18%	+2874%/-84%
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 005016873-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-524 \pm 188$	$9.39^{+14.07}_{-6.31}$	$478^{+83}_{-108}$	$3852^{+2332}_{-759}$	$2681^{+23555}_{-2275}$
Alt.	$-3611 \pm 151$	$14.00^{+14.88}_{-8.91}$	$480^{+76}_{-95}$	$4924^{+2838}_{-967}$	$8928^{+57769}_{-6780}$

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

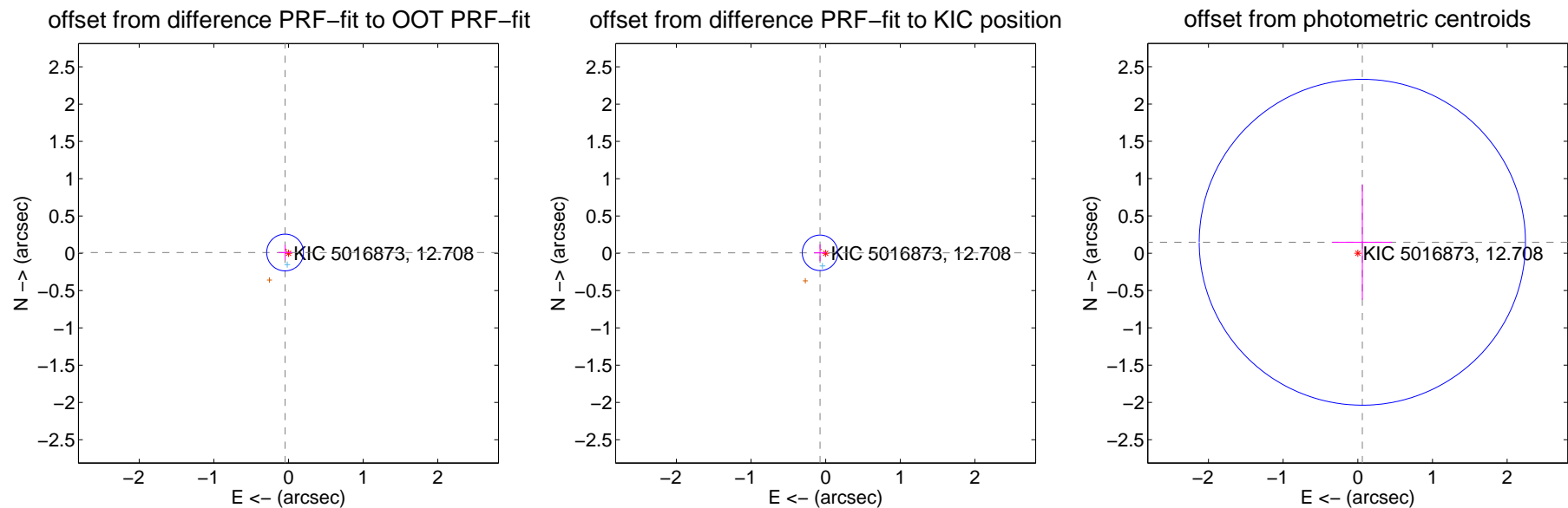
## DV Centroid Data

Supplemental centroid analysis for 005016873-02. Kepler magnitude: 12.71. Transit SNR 3.24

There are 1 quarters with good PRF difference image offsets

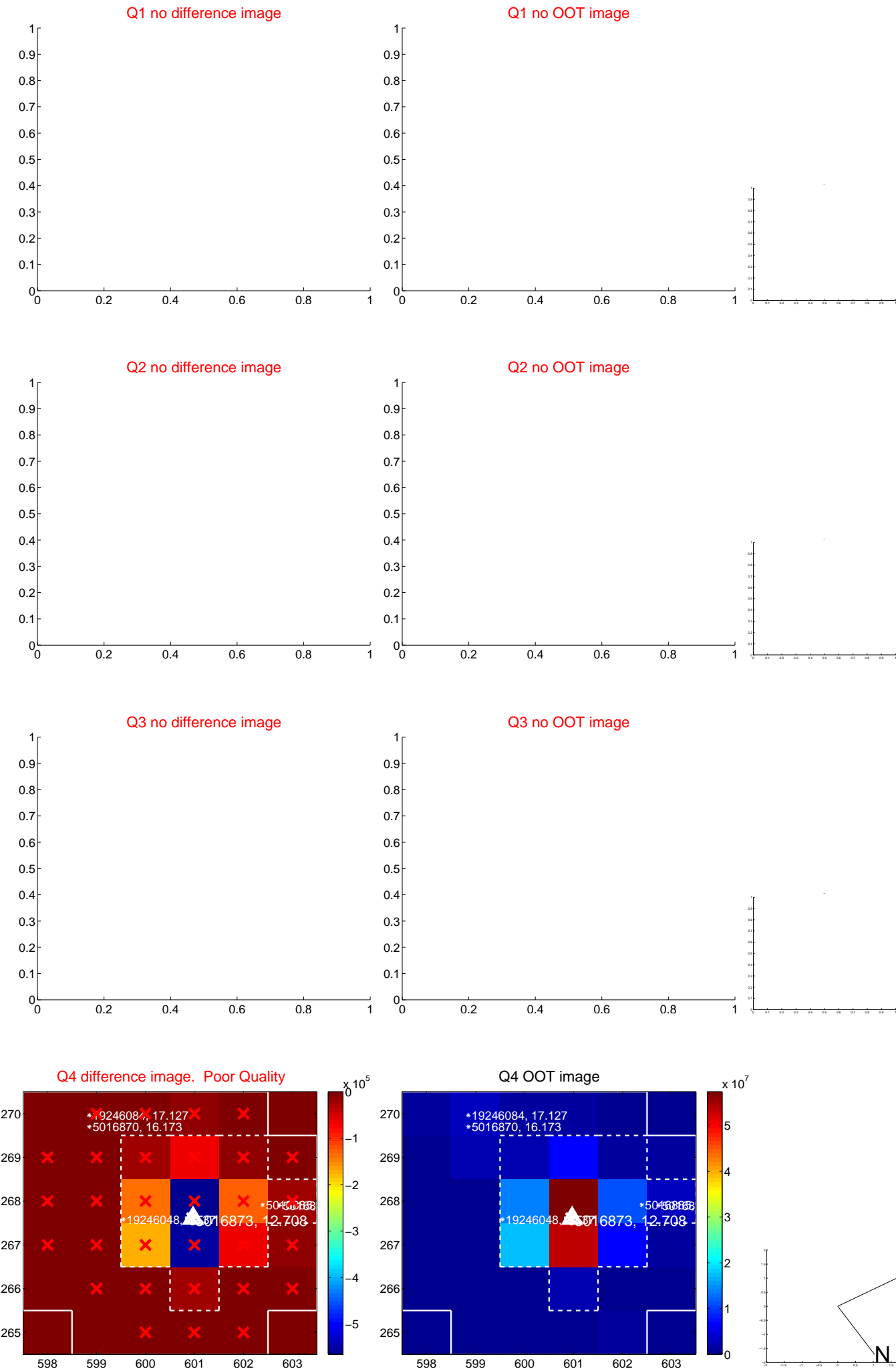
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.047 \pm 0.082$	0.57	$0.046 \pm 0.091$	$0.010 \pm 0.102$
PRF-fit source offset from KIC position	$0.076 \pm 0.079$	0.96	$0.076 \pm 0.079$	$0.006 \pm 0.112$
photometric centroid source offset	$0.16 \pm 0.73$	0.22	$-0.06 \pm 0.40$	$0.15 \pm 0.77$

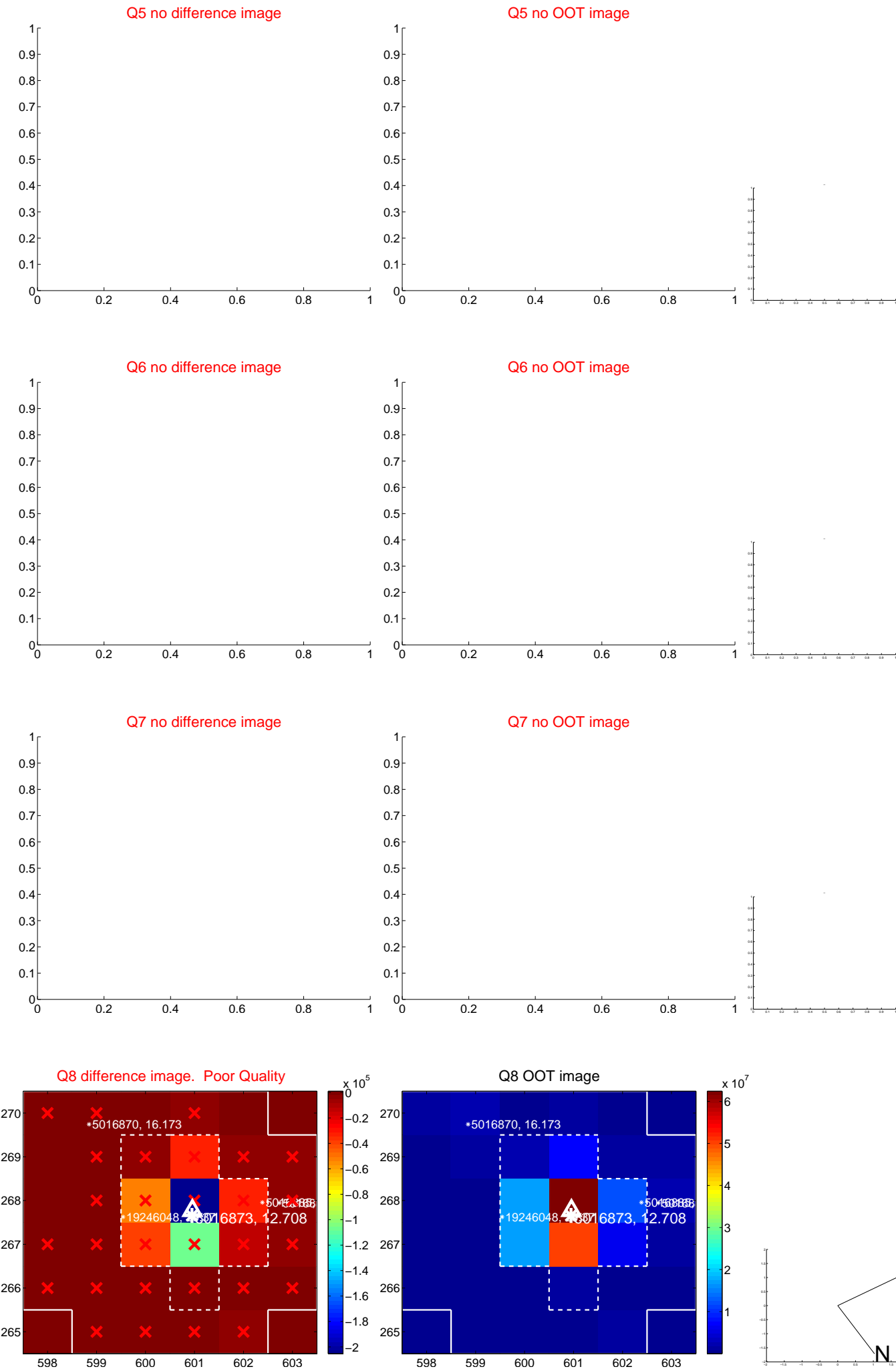


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

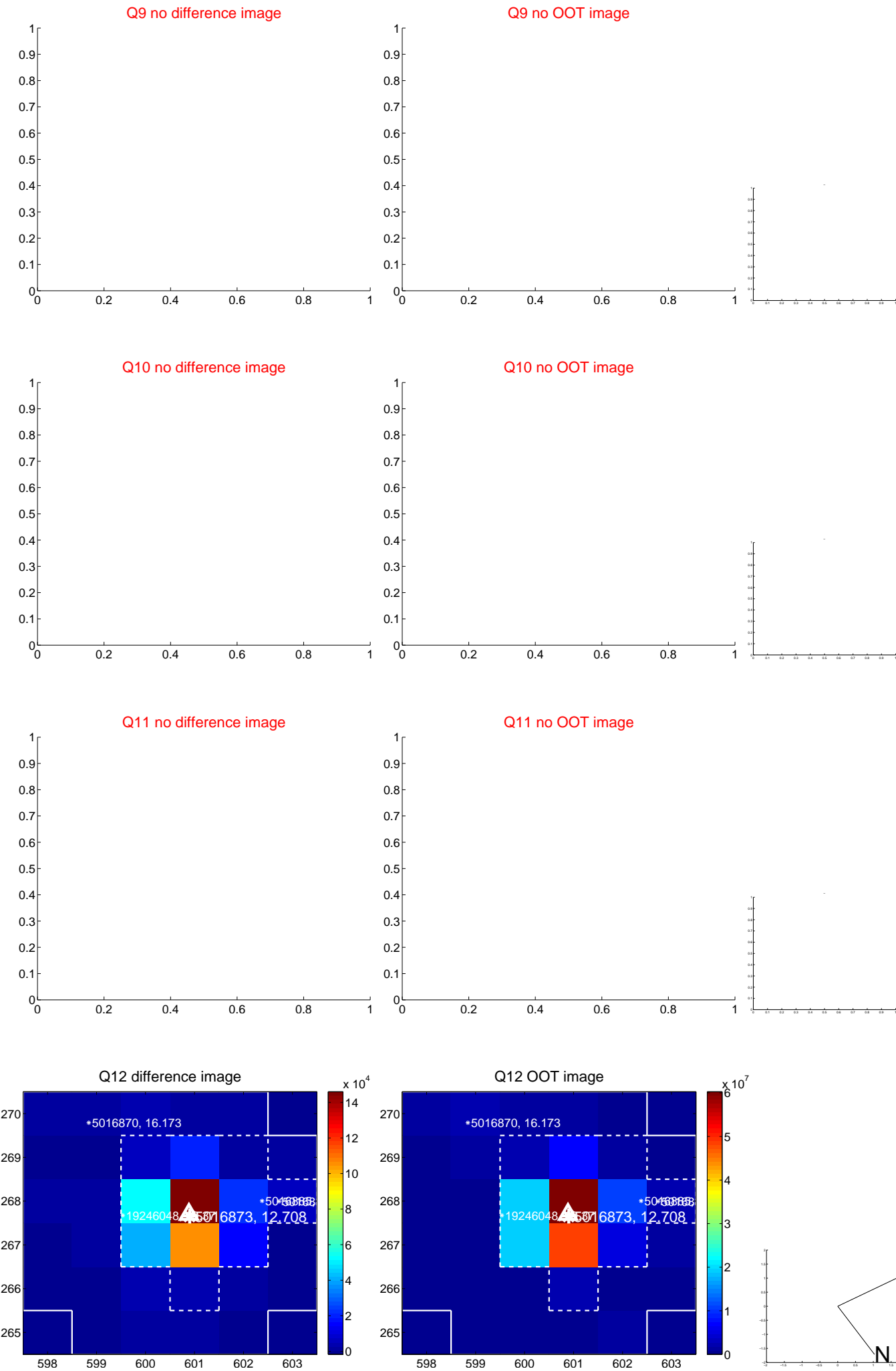


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





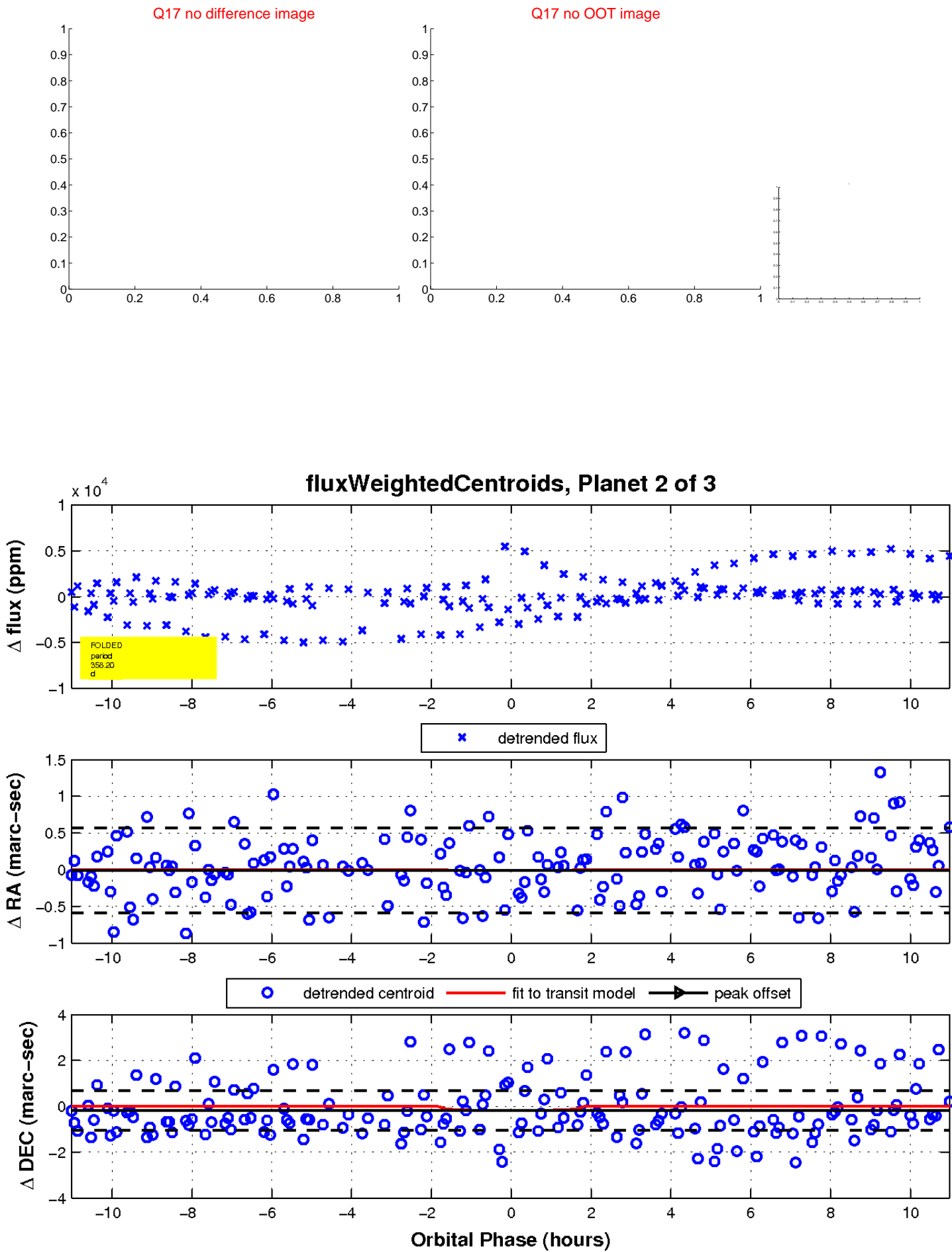
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

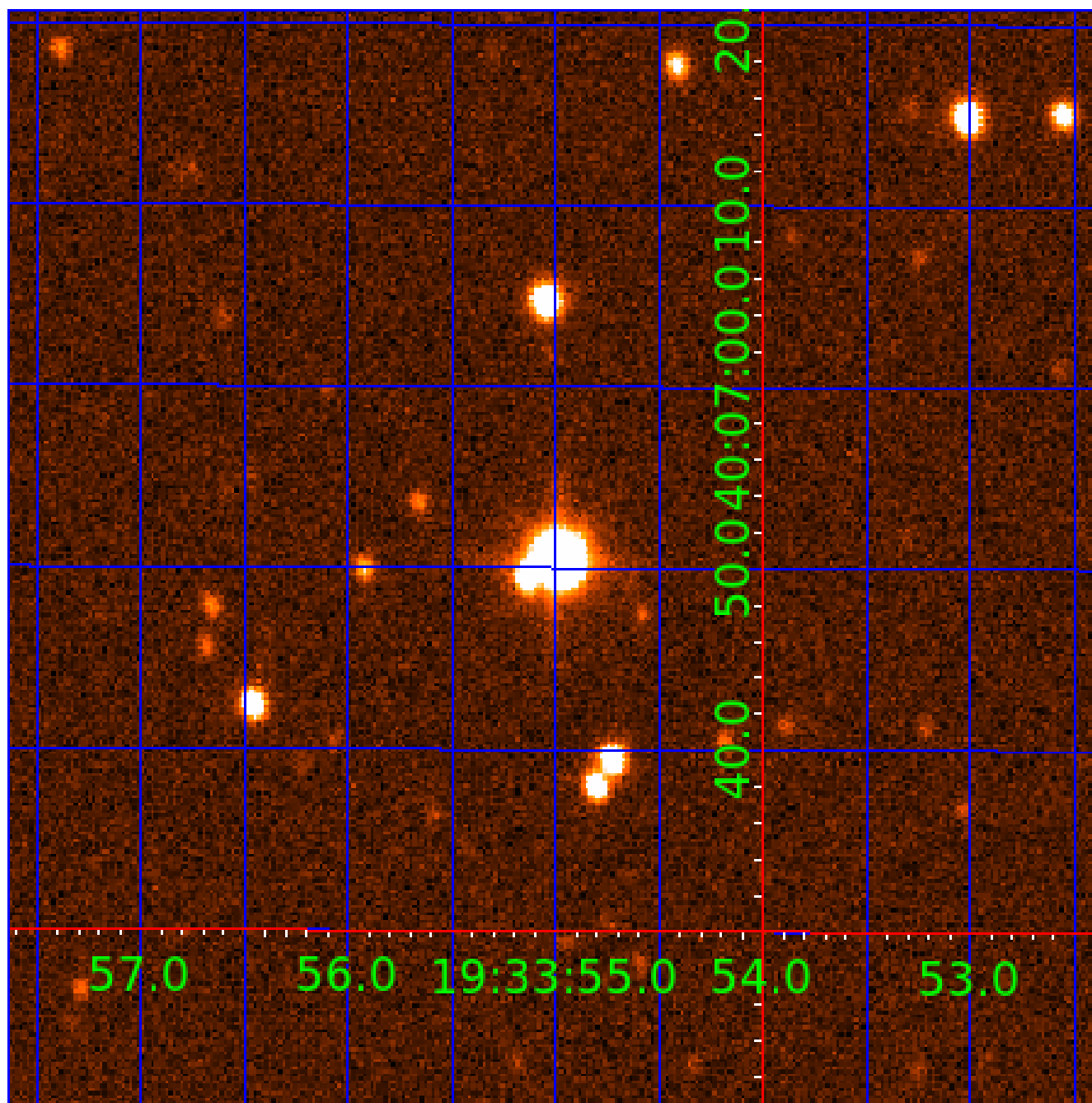


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005016873

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005016873-01	OBS	No	229.115358	217.153118	579.3	2.166	18.5	3.2	2.26	5112	5.53	6.57
005016873-02	OBS	No	358.197786	424.212466	711.1	3.682	12.6	3.2	2.26	5112	6.18	3.62
005016873-03	OBS	No	1.298725	132.793799	115.6	3.629	9.8	9.5	2.26	5112	2.92	6503.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005016873-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
005016873-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005016873-03	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV

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

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

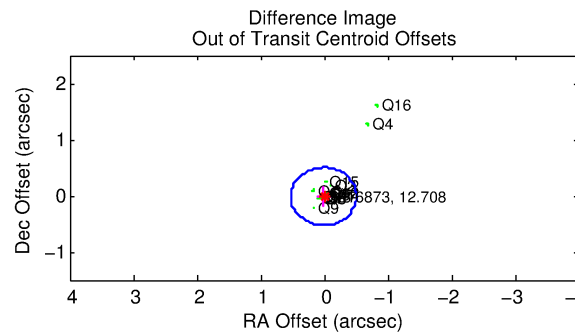
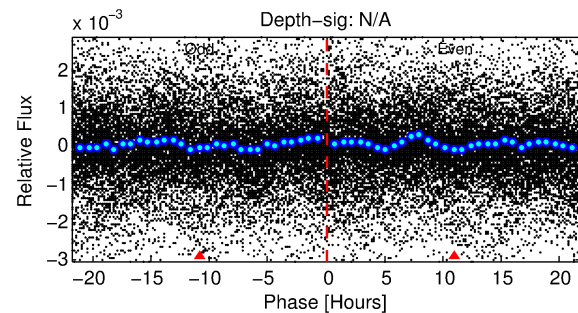
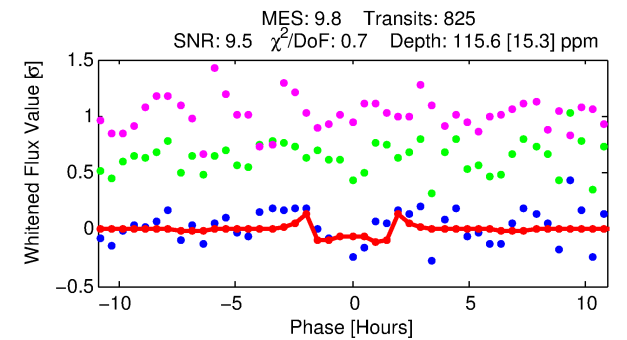
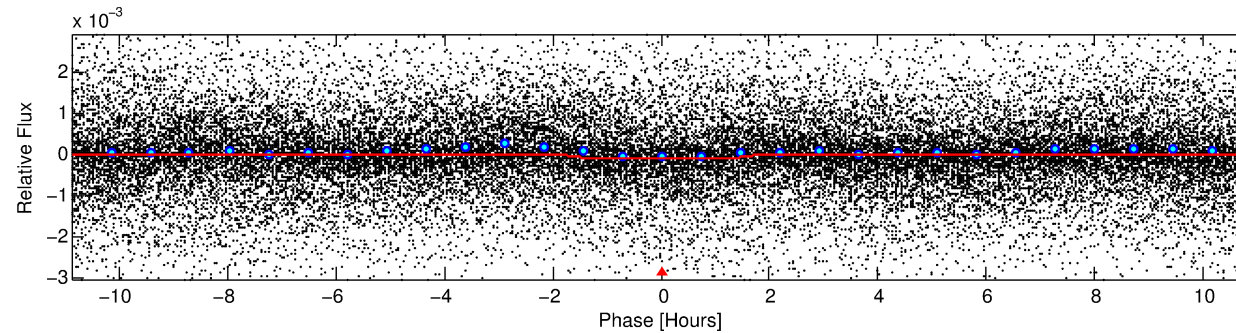
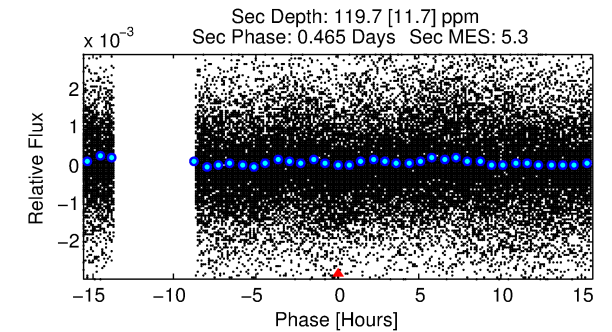
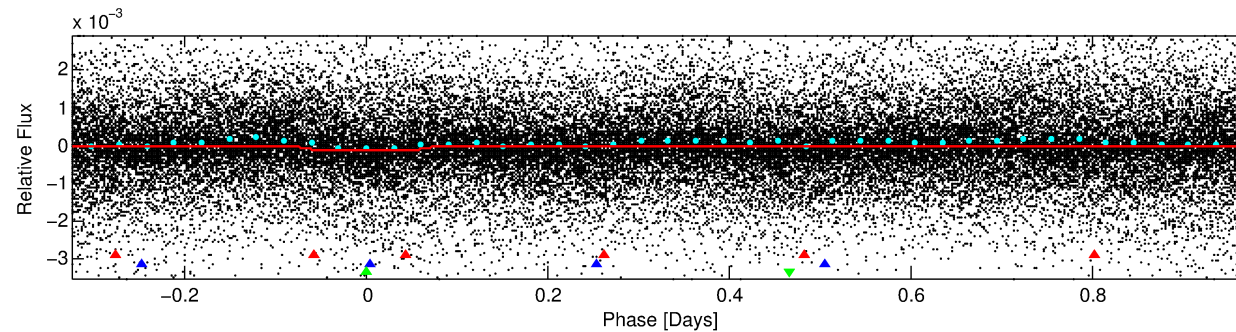
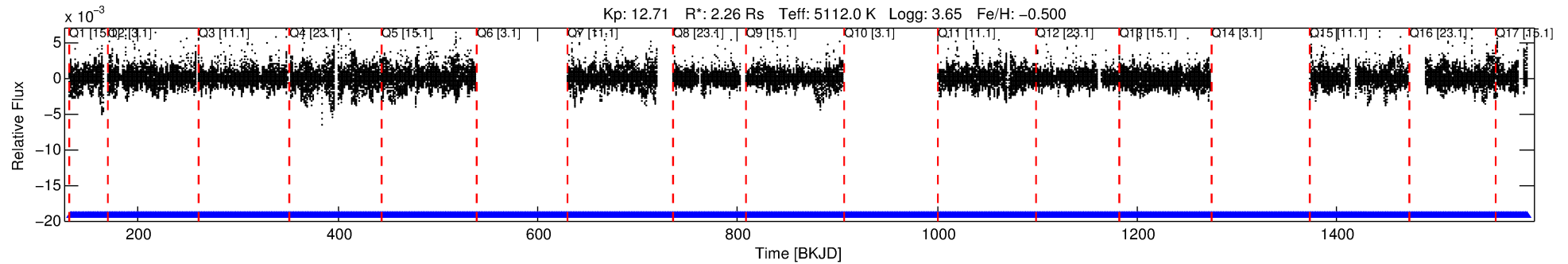
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005016873-03

No Significant Match Found

# DV One-Page Summary

KIC: 5016873 Candidate: 3 of 3 Period: 1.299 d



## DV Fit Results:

Period = 1.29872 [0.00001] d  
Epoch = 132.7938 [0.0013] BKJD  
Rp/R\* = 0.0119 [0.0021]  
a/R\* = 1.57 [0.65]  
b = 0.90 [0.15]  
Seff = 6503.98 [10330.62]  
Teq = 2290 [909] K  
Rp = 2.92 [2.19] Re  
a = 0.0219 [0.0196] AU  
Ag = 3.70 [6.01] [0.45σ]  
Teffp = 4909 [473] K [2.56σ]

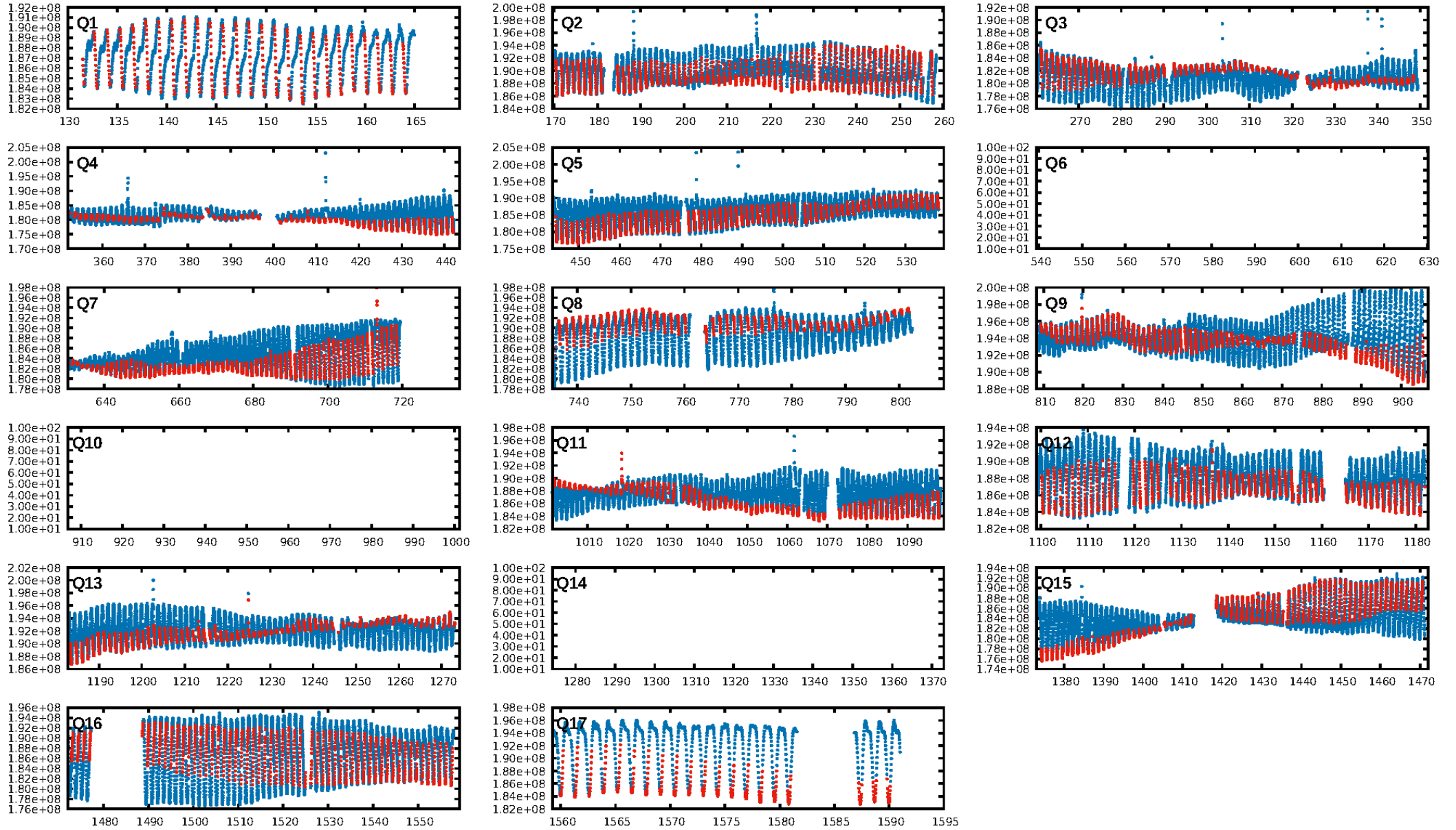
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1293.65σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [779/779]  
GhostDiagnostic-chr: 0.821  
Centroid-sig: 0.0%  
Centroid-so: 0.581 arcsec [3.30σ]  
OotOffset-rm: 0.017 arcsec [0.10σ]  
KicOffset-rm: 0.029 arcsec [0.18σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 0.86 [12/14]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:54:11 Z

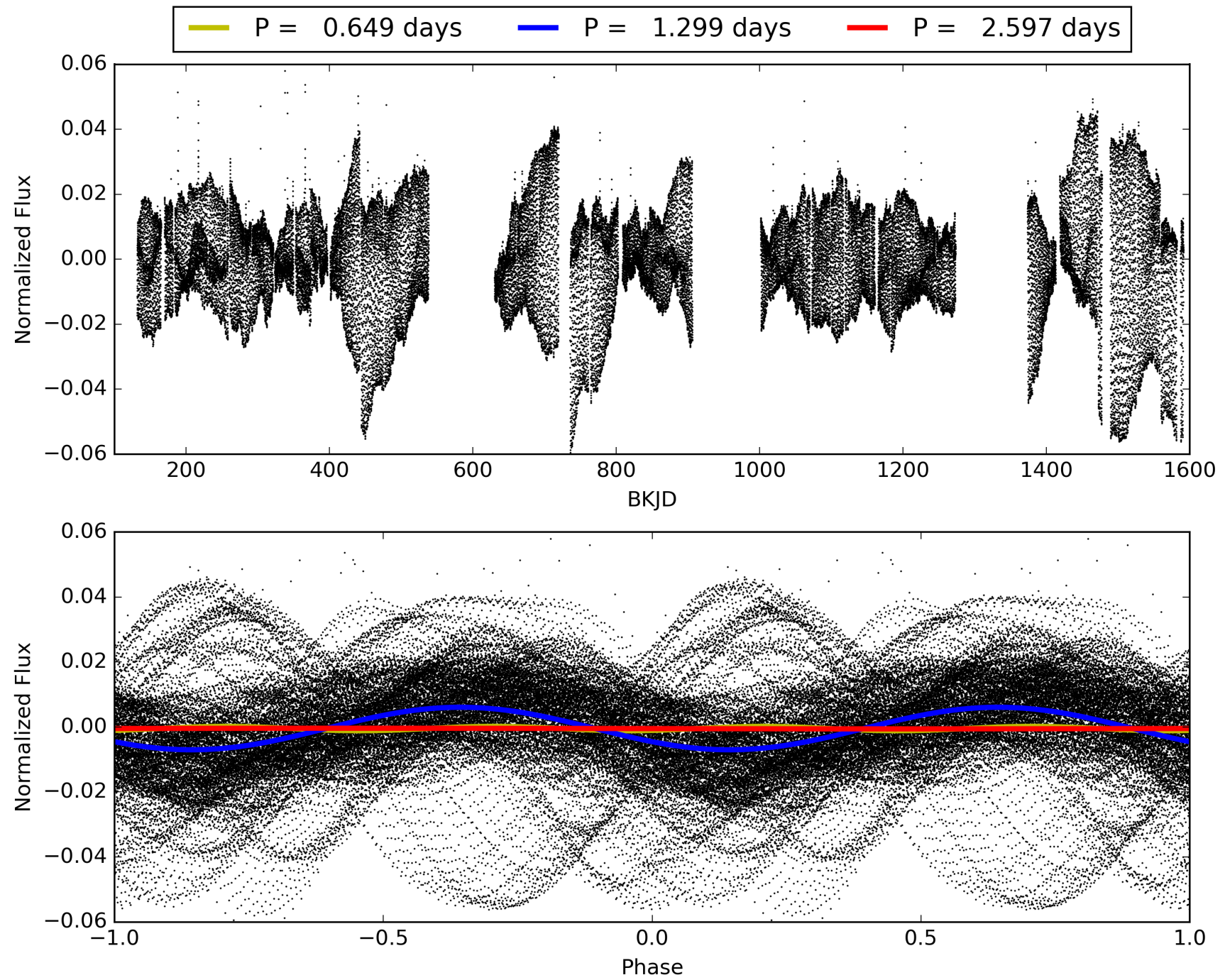
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005016873-03, PDC Light Curves





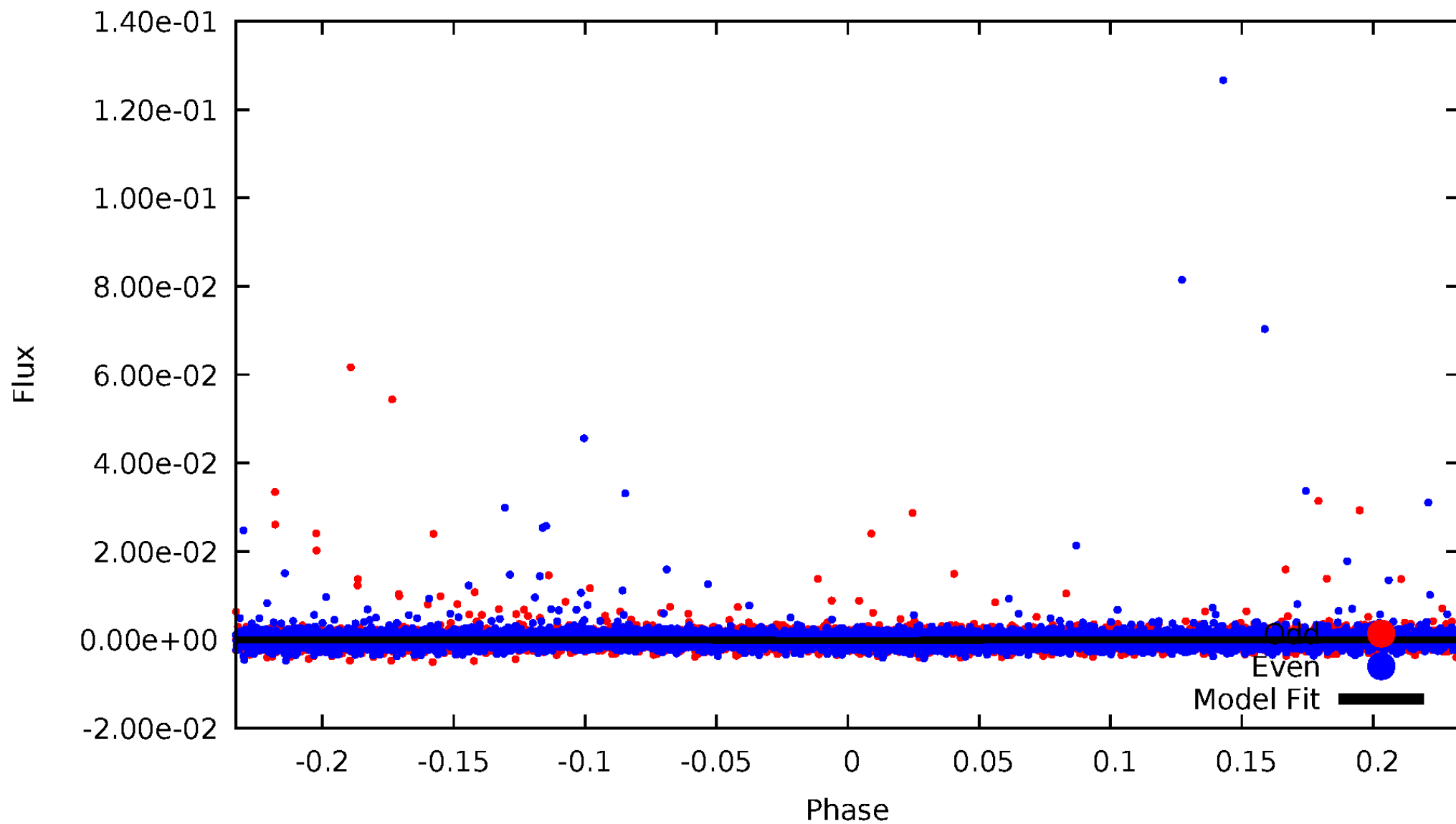
TCE 005016873-03





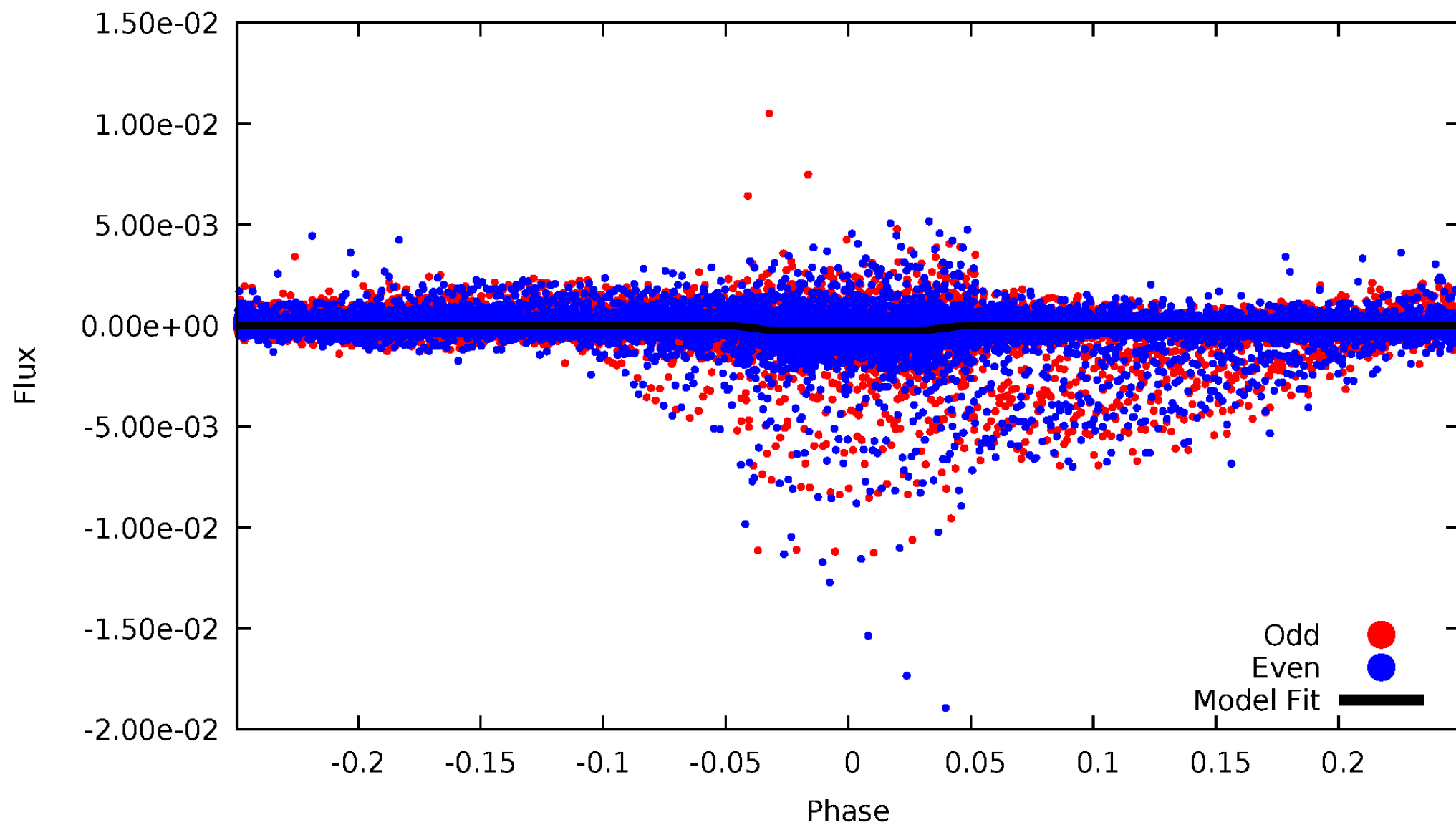
# DV Odd/Even

TCE 005016873-03



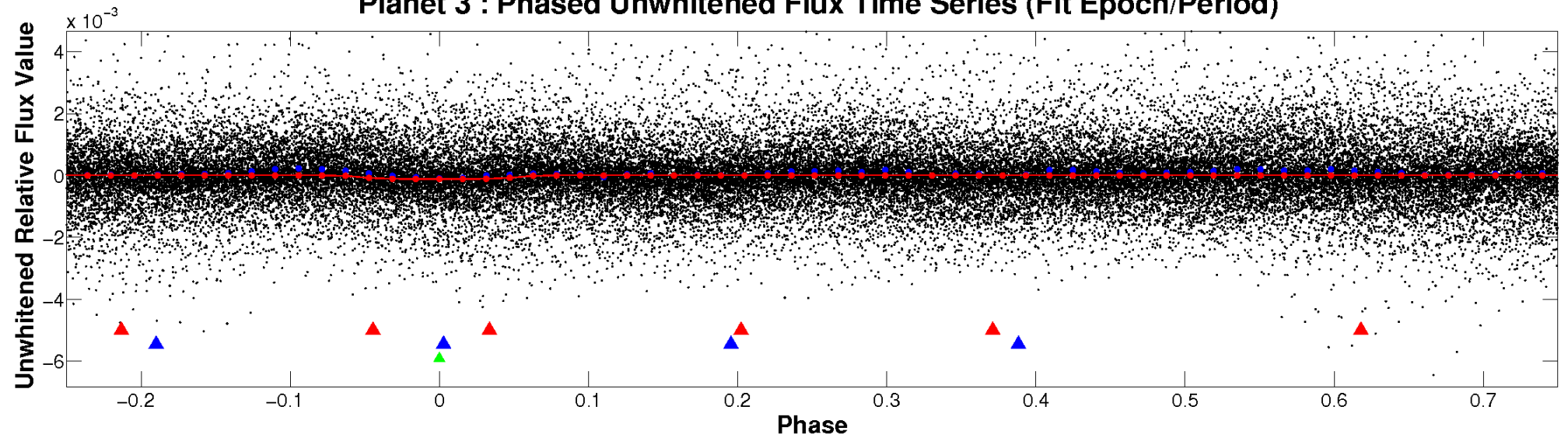
# ALT Odd/Even

TCE 005016873-03

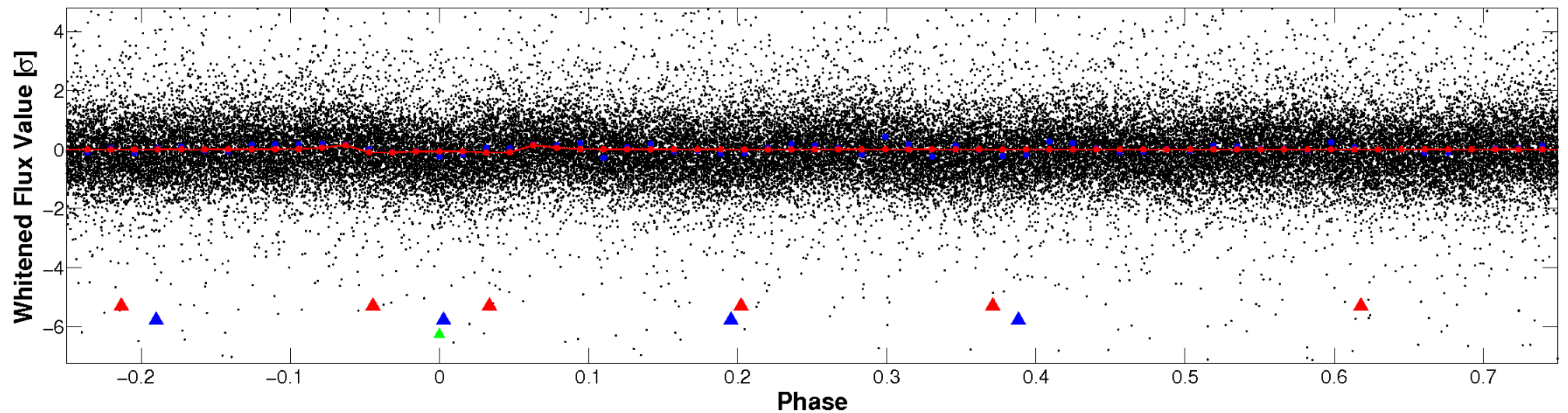


# Non-Whitened Vs. Whitened Light Curve

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

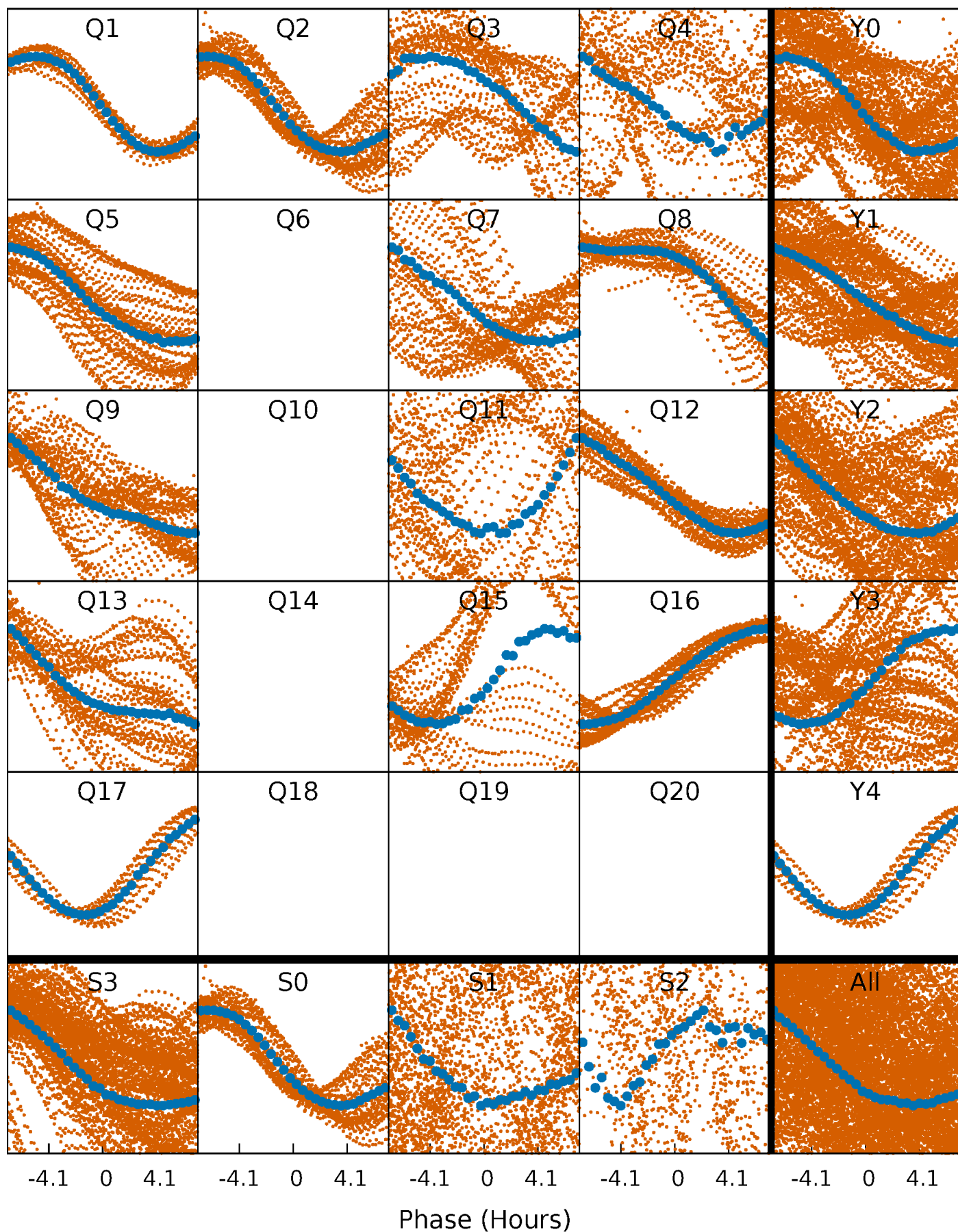


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

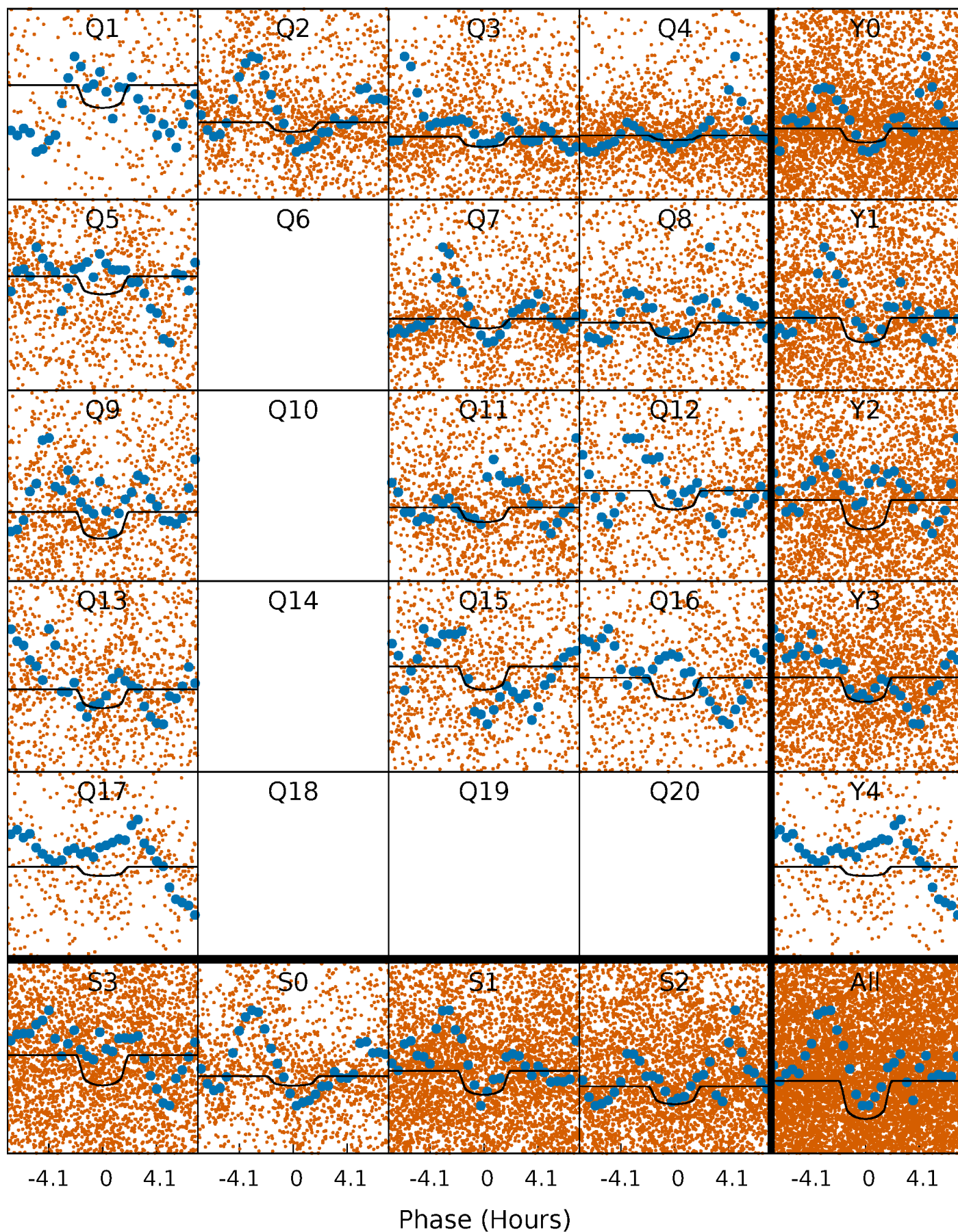
TCE 005016873-03 P= 1.298725 Days  $T_0=132.793799$  (BKJD)





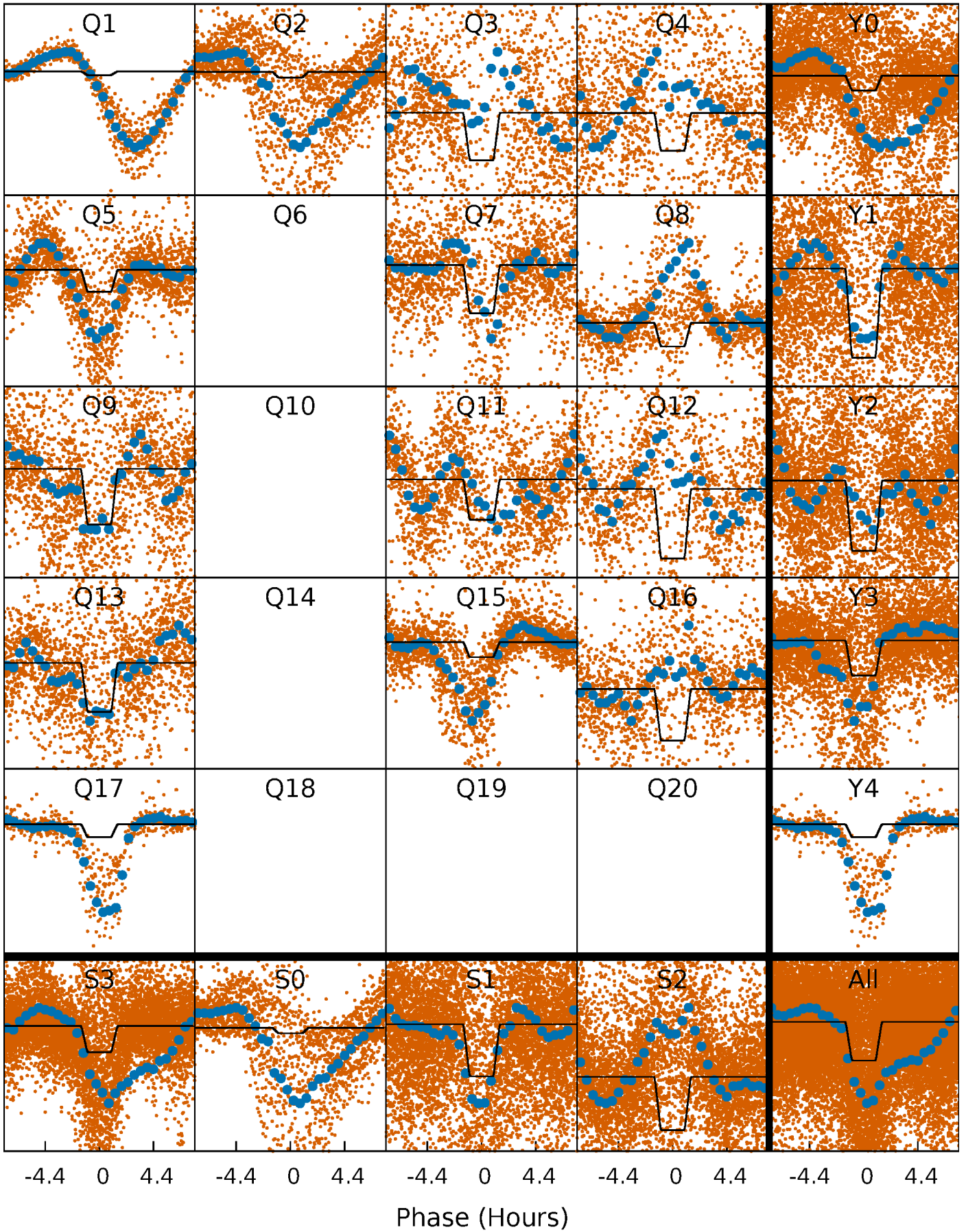
# DV Quarter-Phased Transit Curves

TCE 005016873-03 P= 1.298725 Days  $T_0=132.793799$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

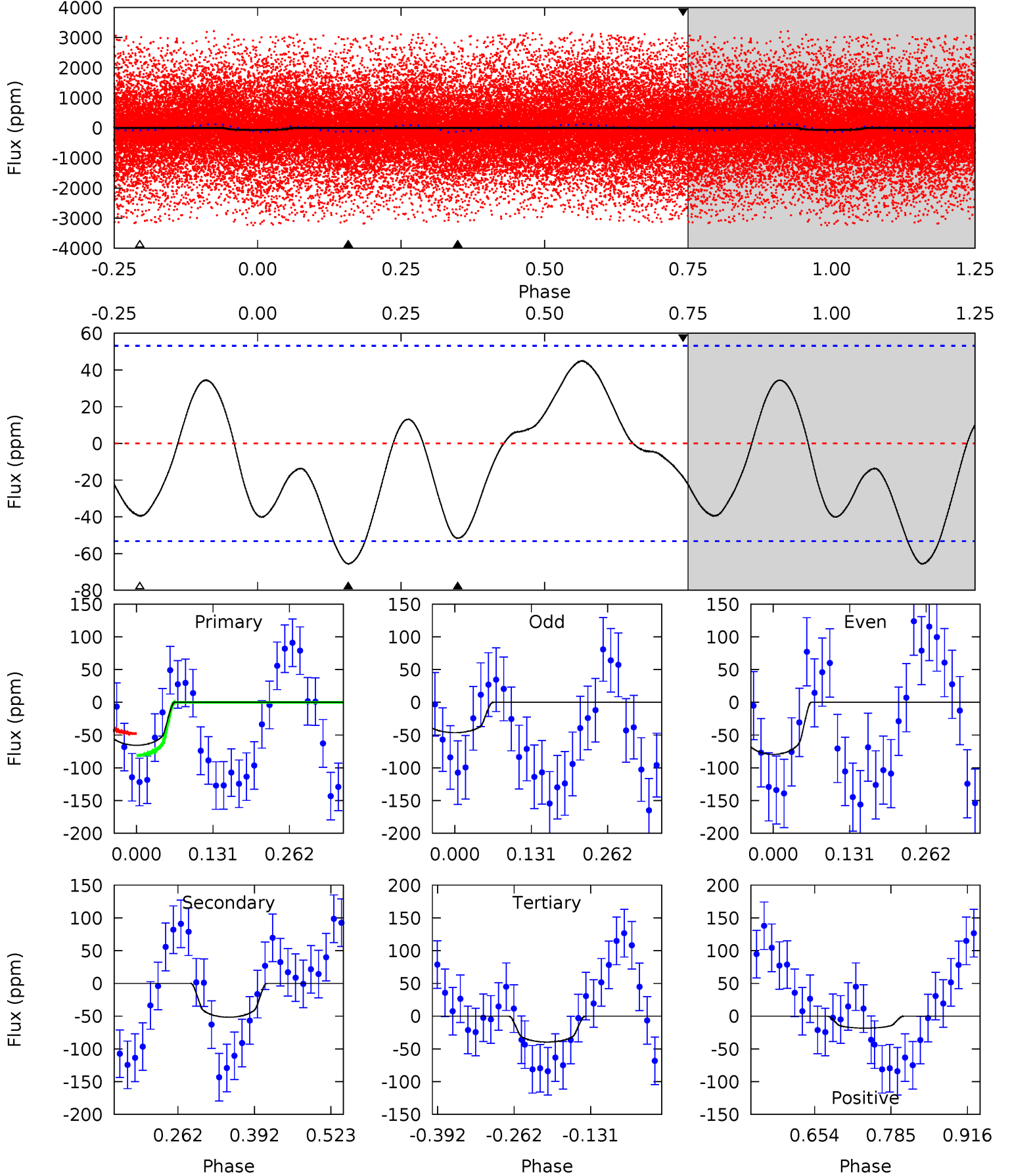
TCE 005016873-03 P= 1.298716 Days  $T_0=132.794627$  (BKJD)



# DV Model-Shift Uniqueness Test

005016873-03, P = 1.298725 Days, E = 131.495074 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
5.56	4.38	3.35	-1.55	4.51	1.51	2.27	2.21	7.12	1.03	5.93	1.42	0.47	0.41	1.45

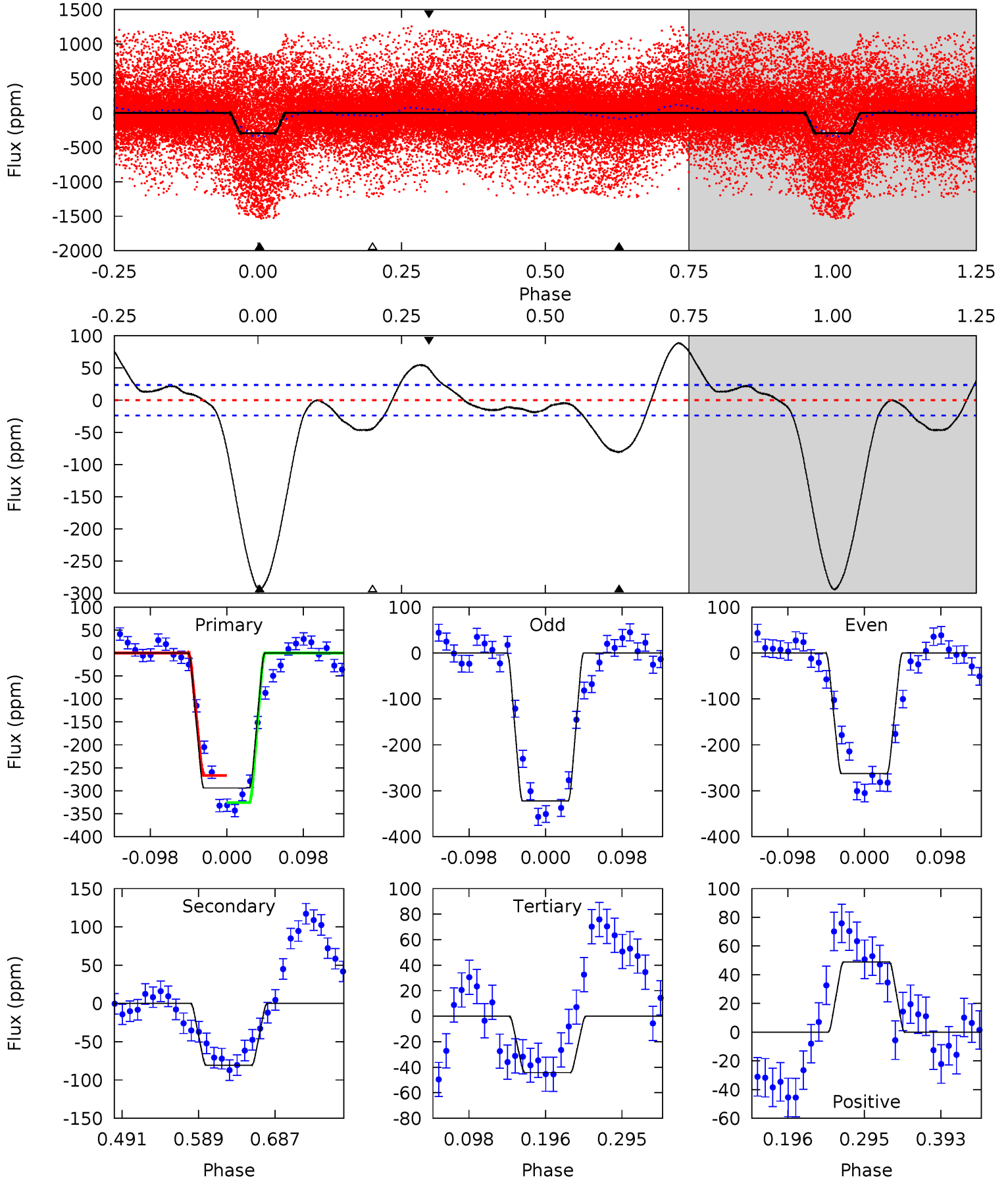




# Alt Model-Shift Uniqueness Test

005016873-03, P = 1.298716 Days, E = 131.495911 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
56.5	15.5	8.49	9.42	4.57	1.65	6.01	48.0	47.1	7.01	6.09	5.77	1.43	0.23	5.77





### Stellar Parameters For KIC 005016873

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5112^{+138}_{-123}$	$3.650^{+0.983}_{-0.328}$	$-0.500^{+0.300}_{-0.250}$	$2.259^{+1.342}_{-1.640}$	$0.831^{+0.257}_{-0.150}$	$0.102^{+2.917}_{-0.085}$
	+3%/-2%	+27%/-9%	+60%/-50%	+59%/-73%	+31%/-18%	+2874%/-84%
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 005016873-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-52 \pm 12$	$2.84^{+1.26}_{-1.18}$	$3133^{+533}_{-623}$	$4018^{+437}_{-405}$	$1.783^{+3.177}_{-0.971}$
Alt.	$-81 \pm 5$	$3.66^{+1.47}_{-1.36}$	$3163^{+493}_{-675}$	$3970^{+287}_{-292}$	$1.617^{+2.485}_{-0.785}$

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

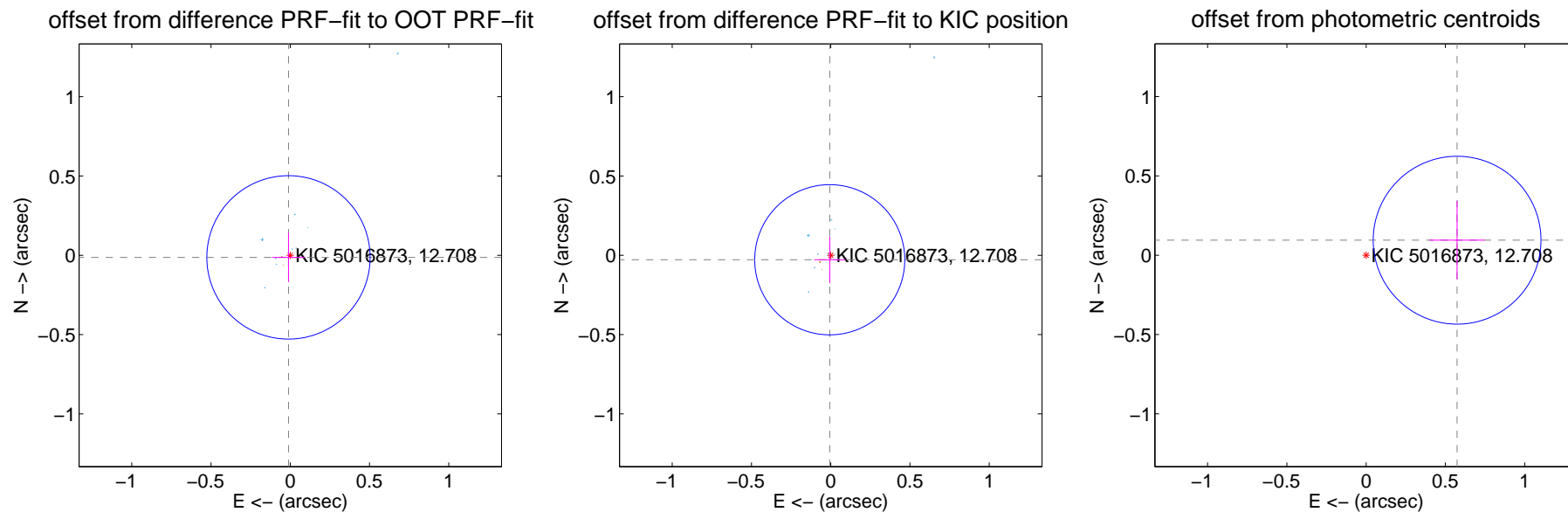
## DV Centroid Data

Supplemental centroid analysis for 005016873-03. Kepler magnitude: 12.71. Transit SNR 9.46

There are 12 quarters with good PRF difference image offsets

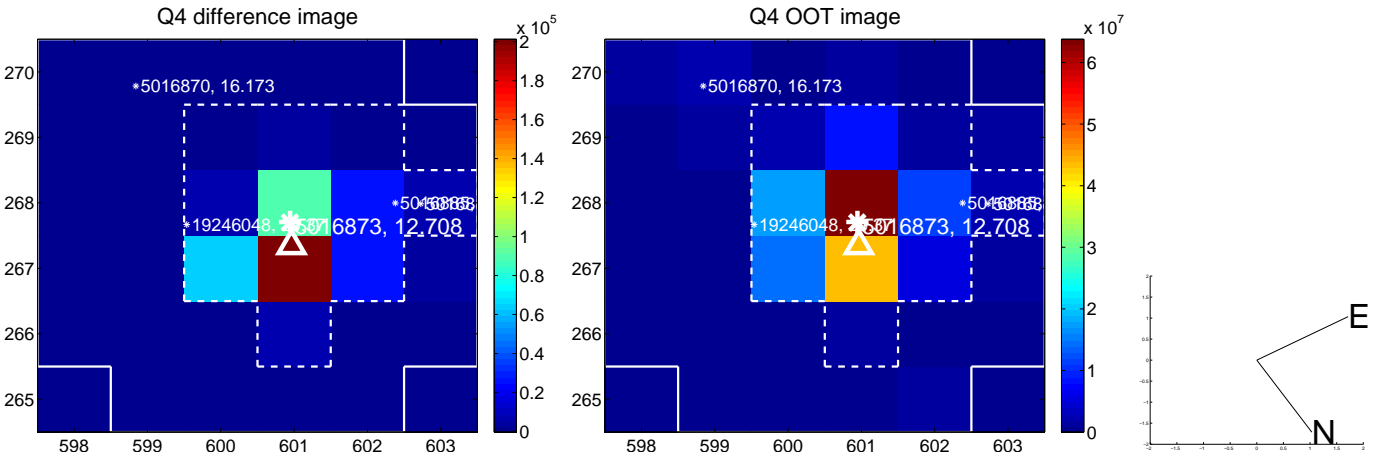
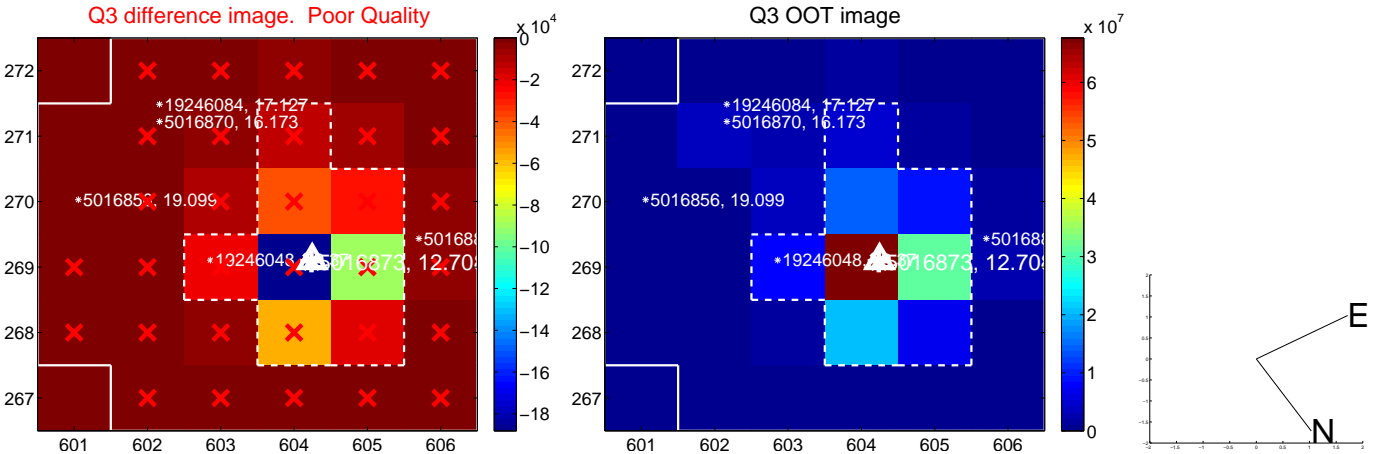
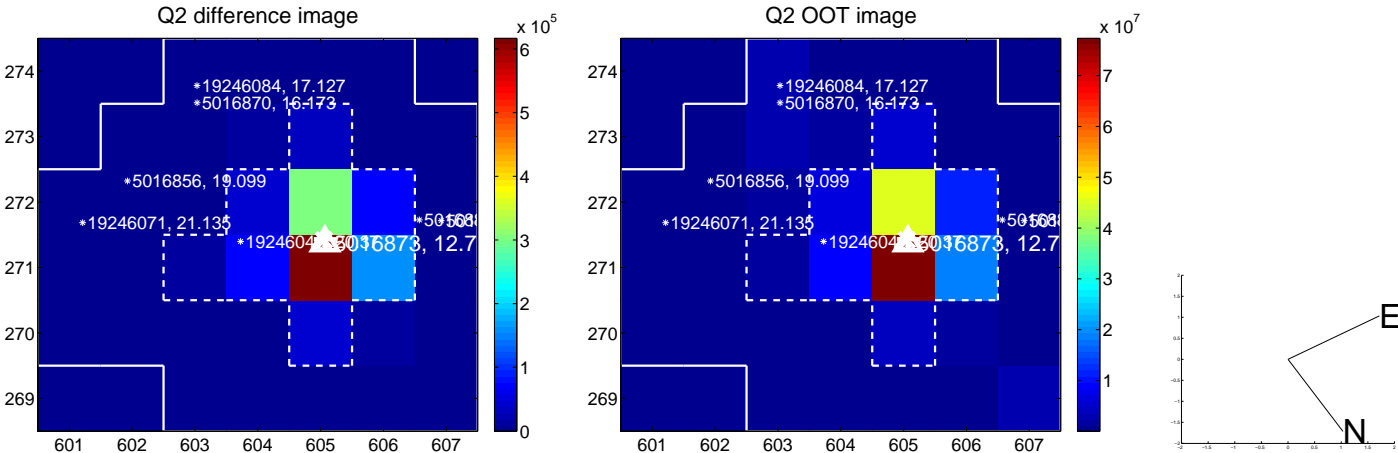
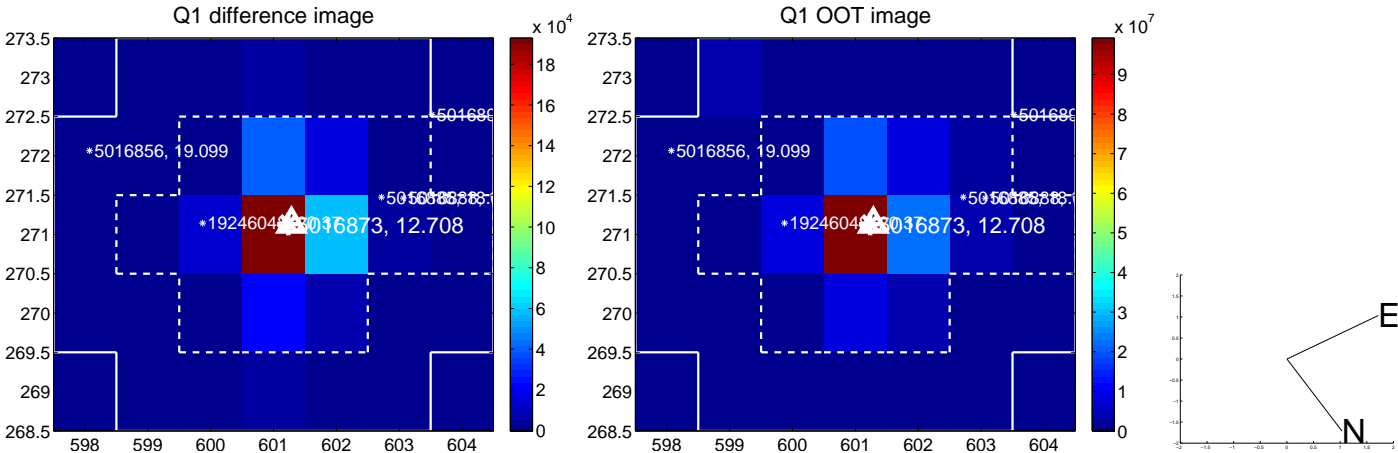
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.017 \pm 0.172$	0.10	$0.011 \pm 0.104$	$-0.013 \pm 0.156$
PRF-fit source offset from KIC position	$0.029 \pm 0.158$	0.18	$0.006 \pm 0.098$	$-0.028 \pm 0.147$
photometric centroid source offset	$0.58 \pm 0.18$	3.30	$-0.57 \pm 0.17$	$0.09 \pm 0.25$

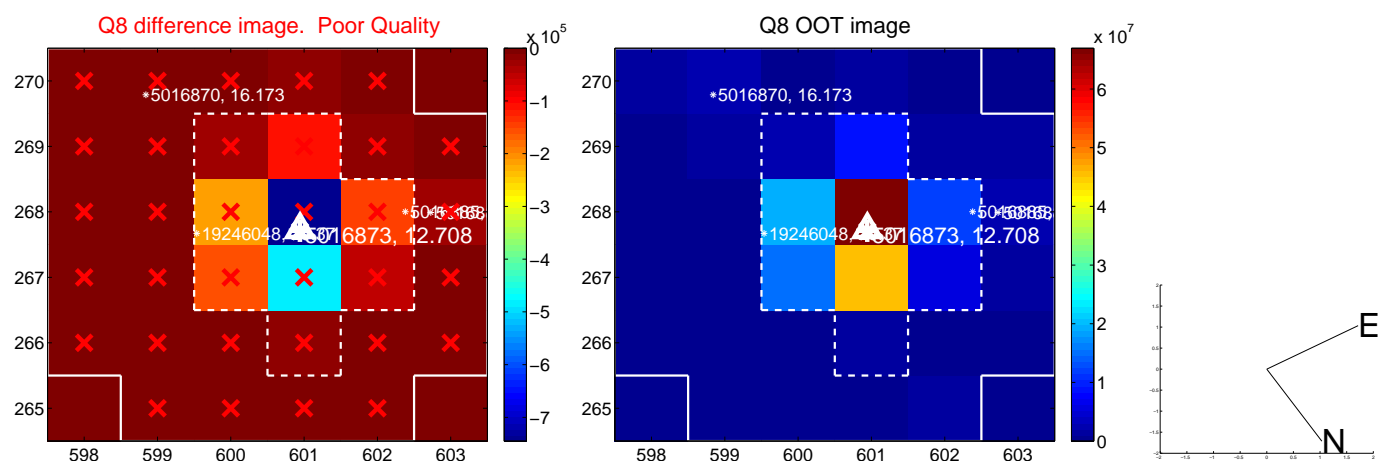
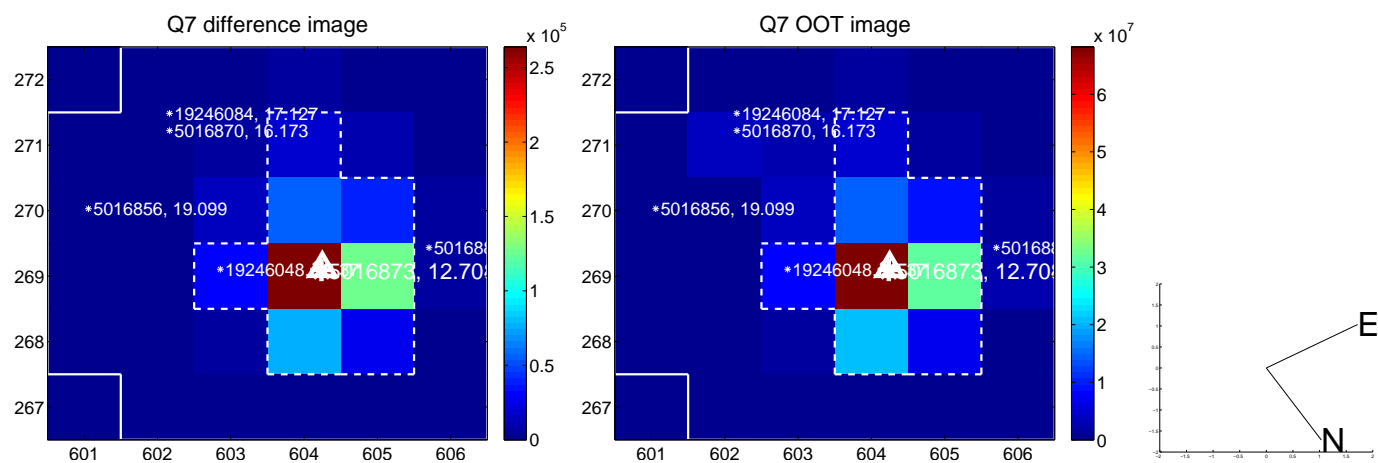
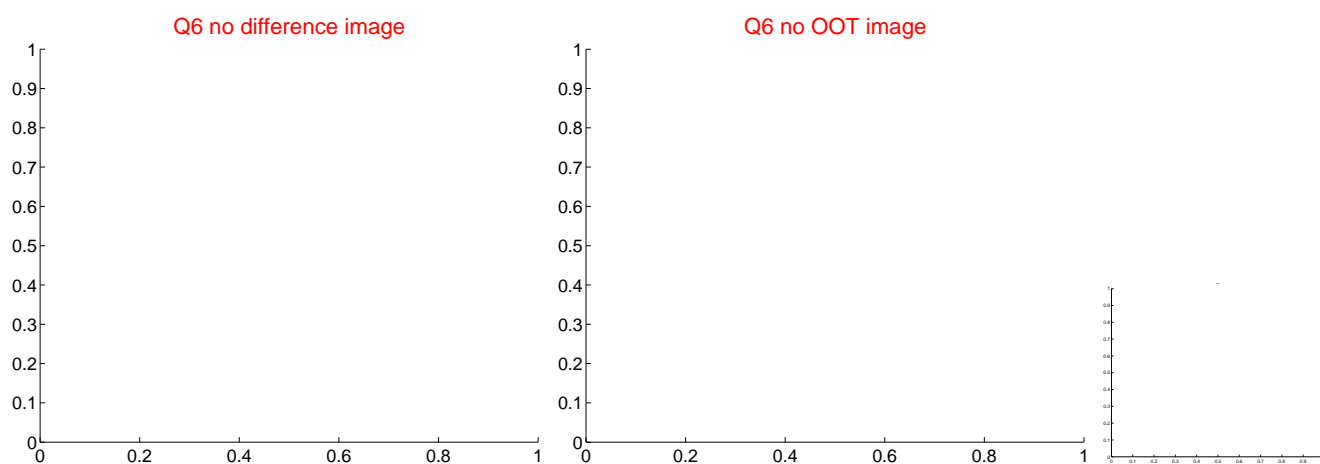
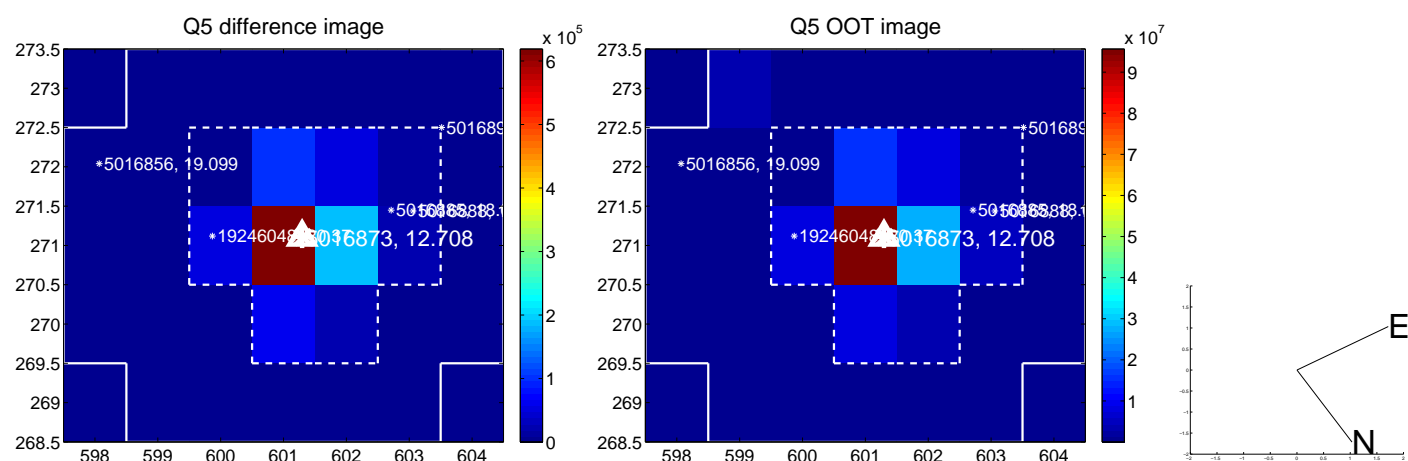


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

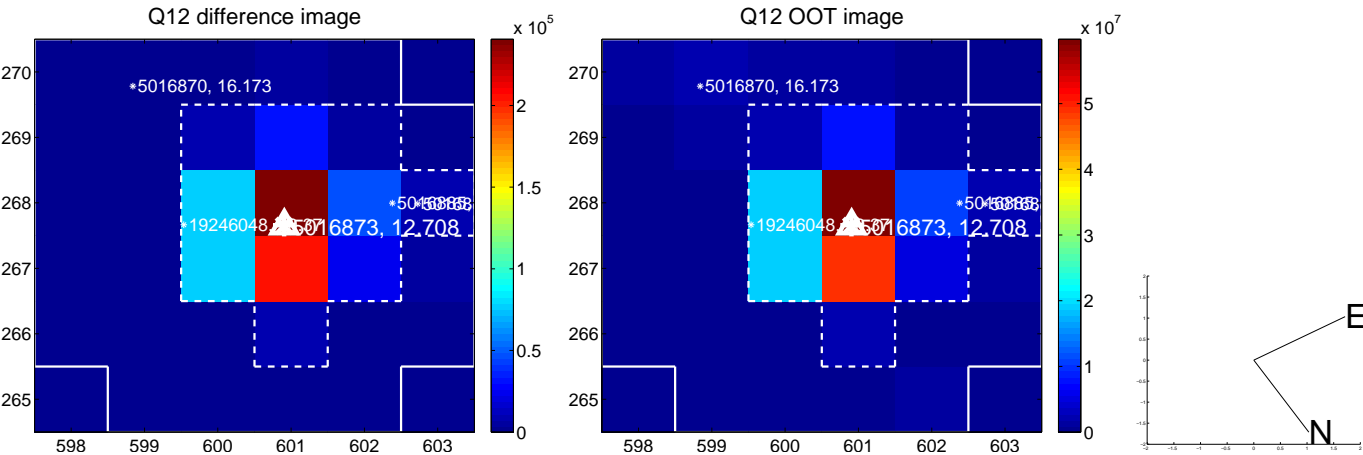
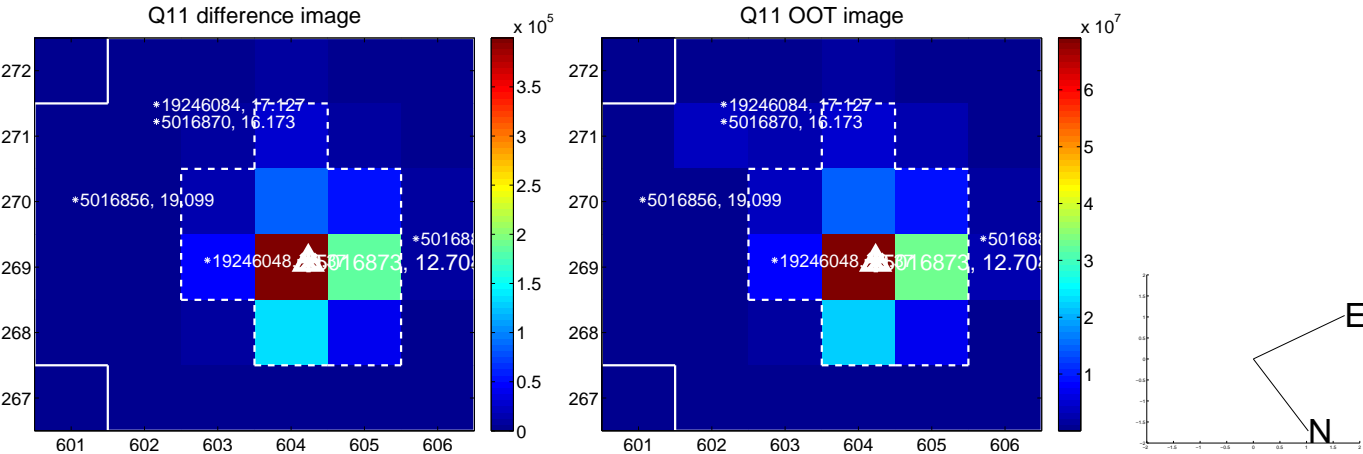
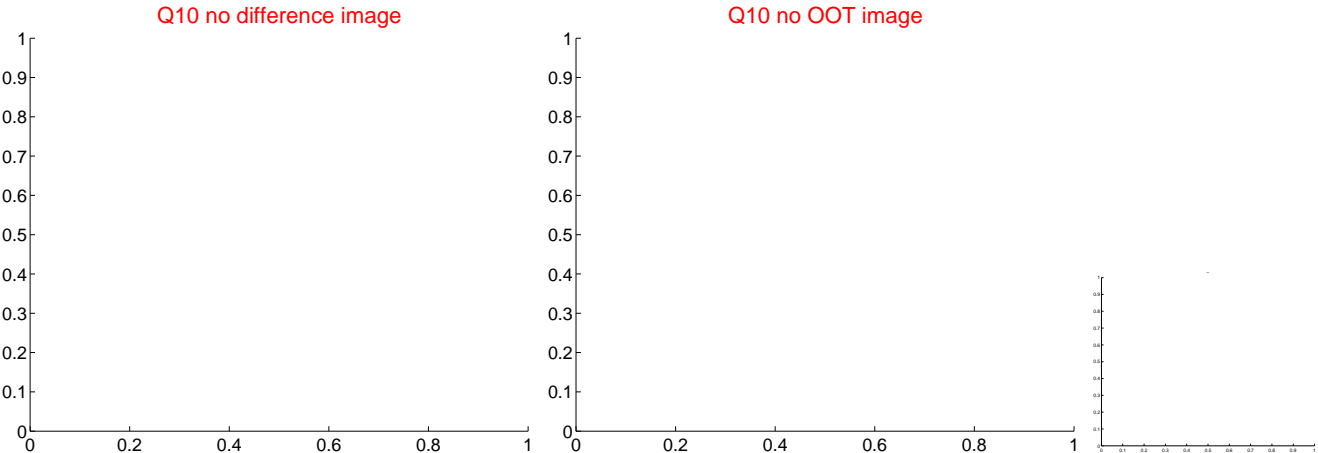
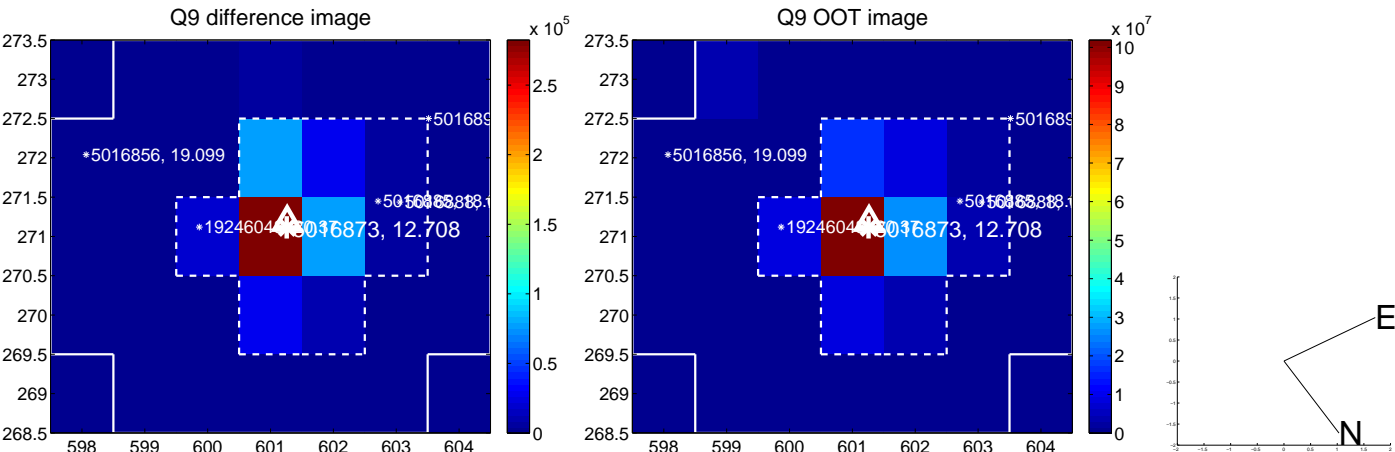
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



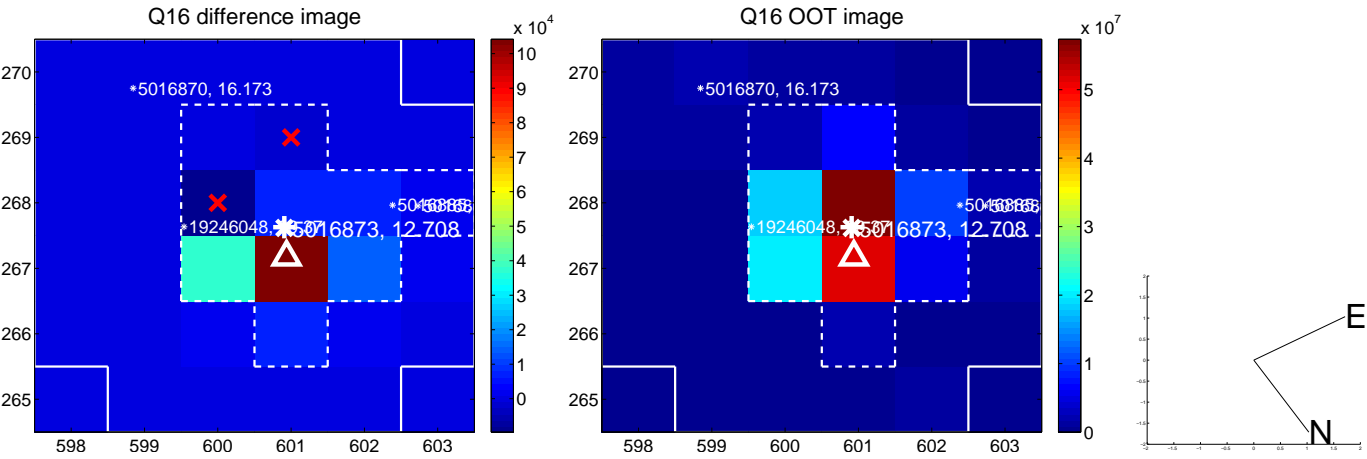
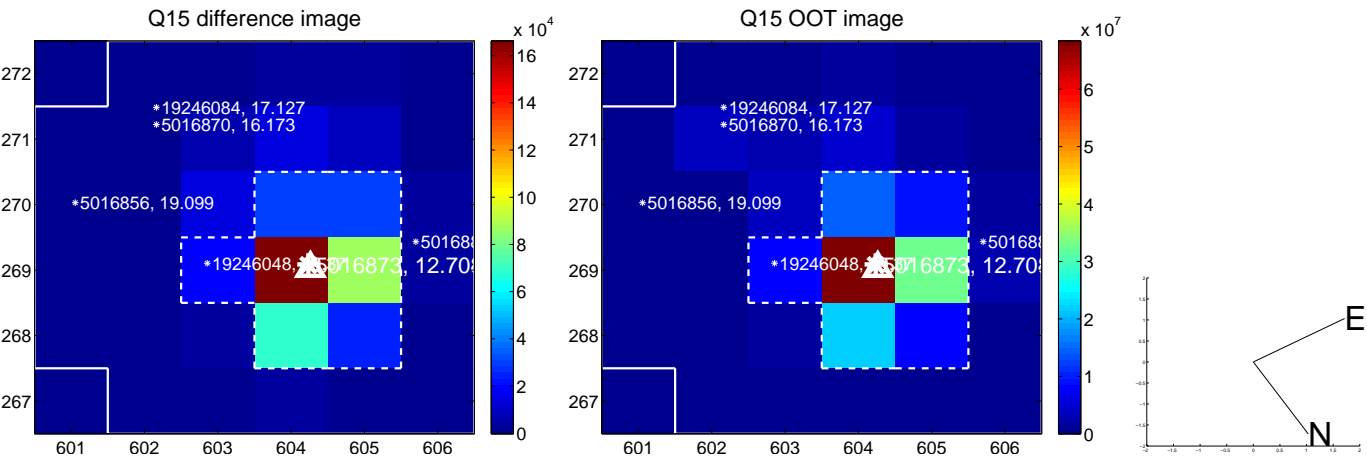
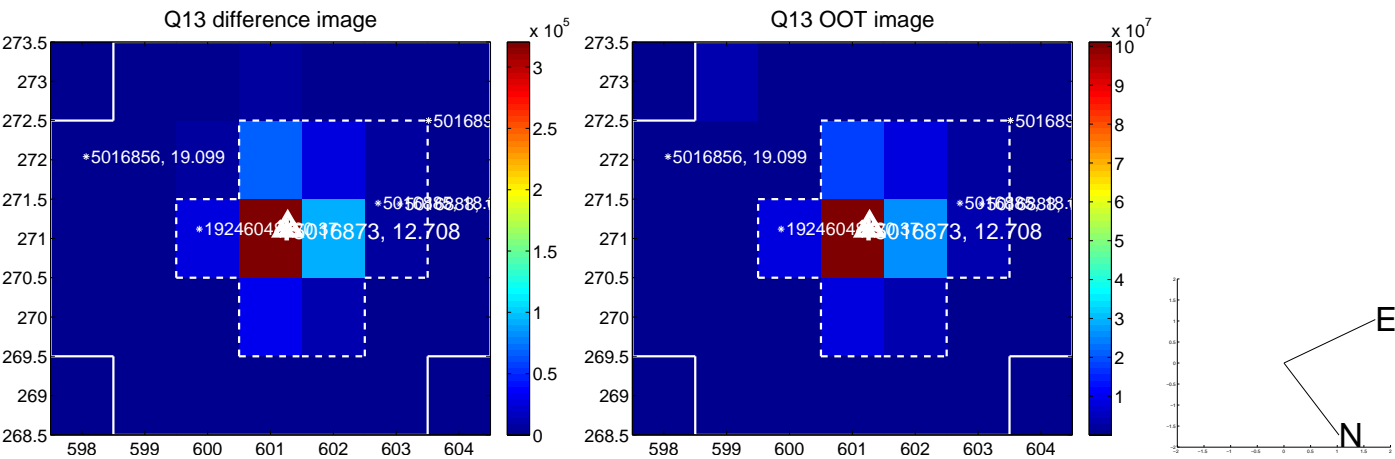
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



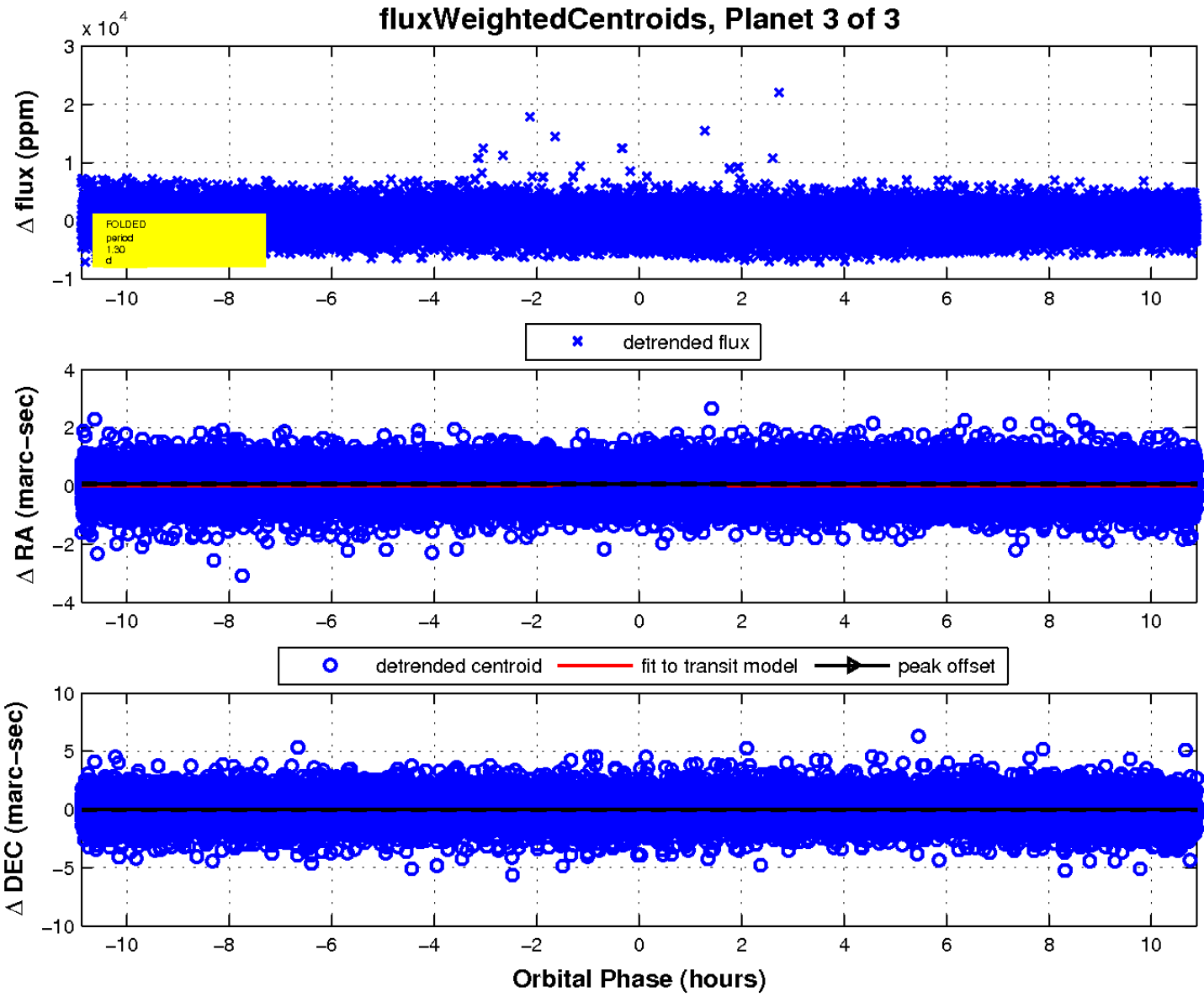
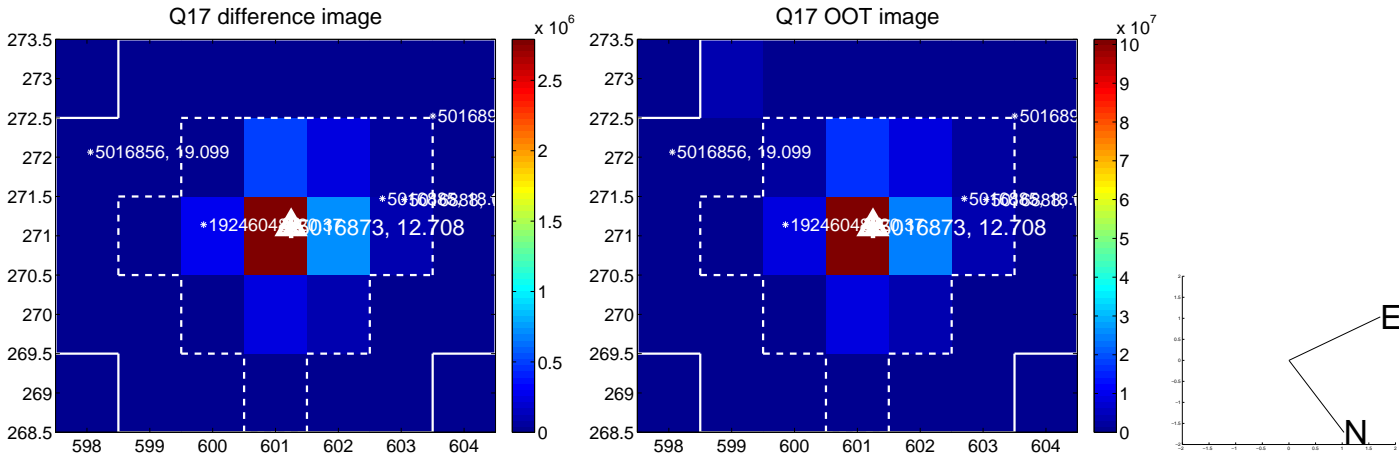
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

