

# KIC 005171493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005171493-01	OBS	No	0.842279	131.740175	20.0	3.852	8.6	8.2	3.89	6502	2.02	54319.88
005171493-02	OBS	No	187.004272	234.372257	311.3	13.713	7.7	6.0	3.89	6502	7.83	40.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005171493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005171493-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_UNCERTAIN

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

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

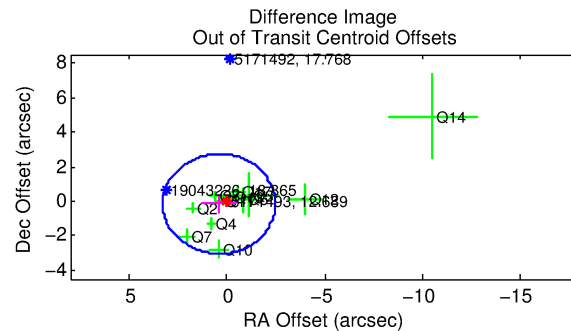
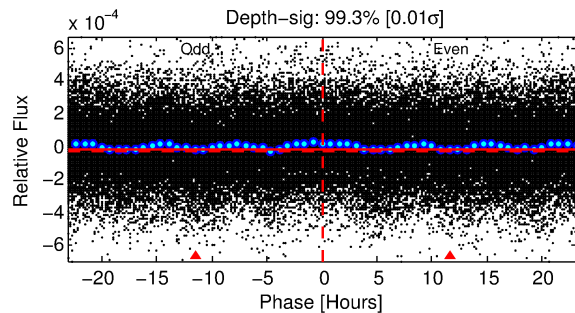
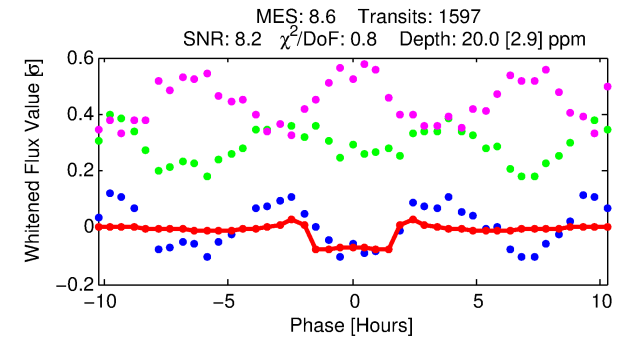
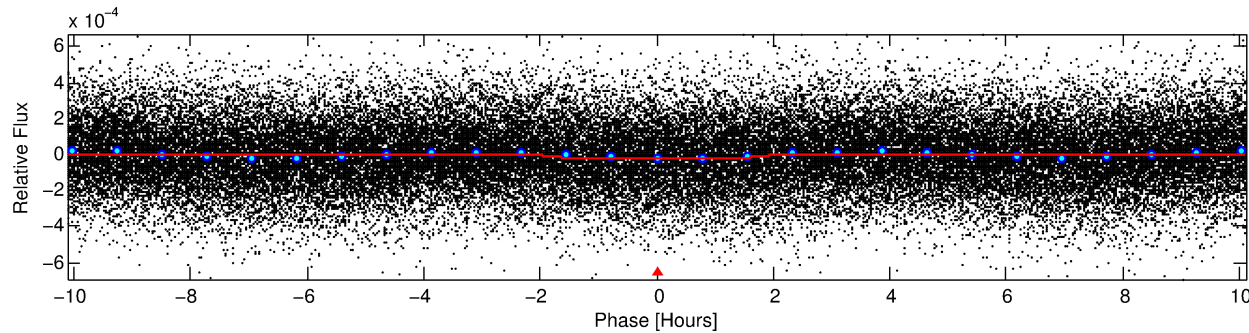
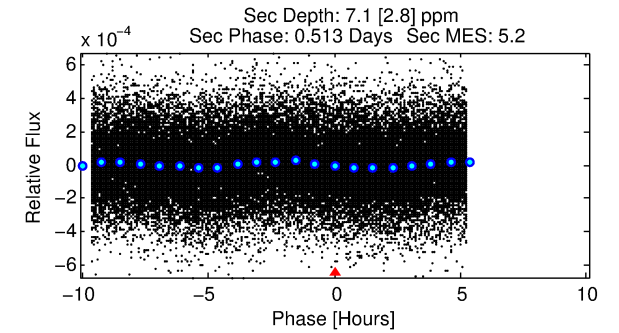
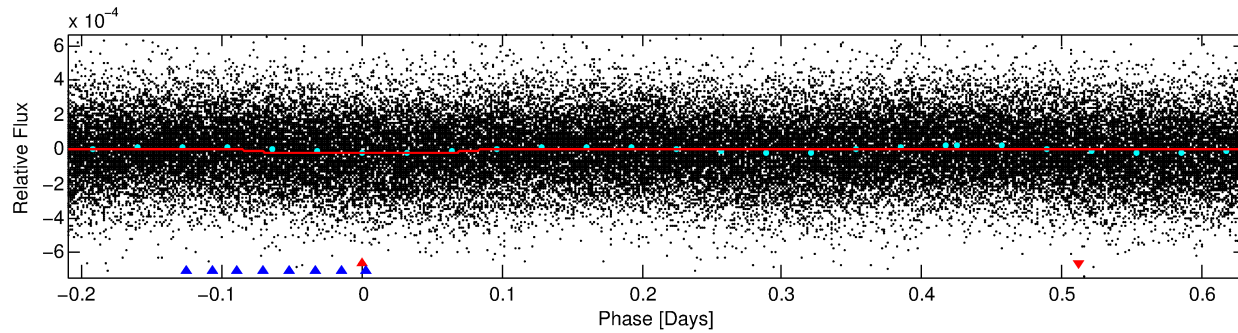
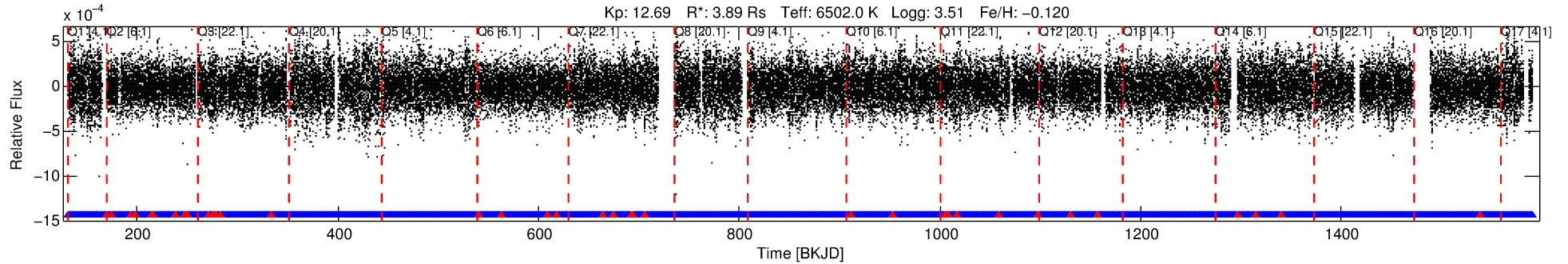
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005171493-01

No Significant Match Found

# DV One-Page Summary

KIC: 5171493 Candidate: 1 of 2 Period: 0.842 d



## DV Fit Results:

Period = 0.84228 [0.00001] d  
Epoch = 131.7402 [0.0030] BKJD  
Rp/R\* = 0.0048 [0.0016]  
a/R\* = 1.21 [0.76]  
b = 0.89 [0.46]  
Seff = 54319.87 [33779.05]  
Teq = 3893 [605] K  
Rp = 2.02 [1.05] Re  
a = 0.0211 [0.0081] AU  
Ag = 0.43 [0.42] [-1.36σ]  
Teffp = 4862 [958] K [0.86σ]

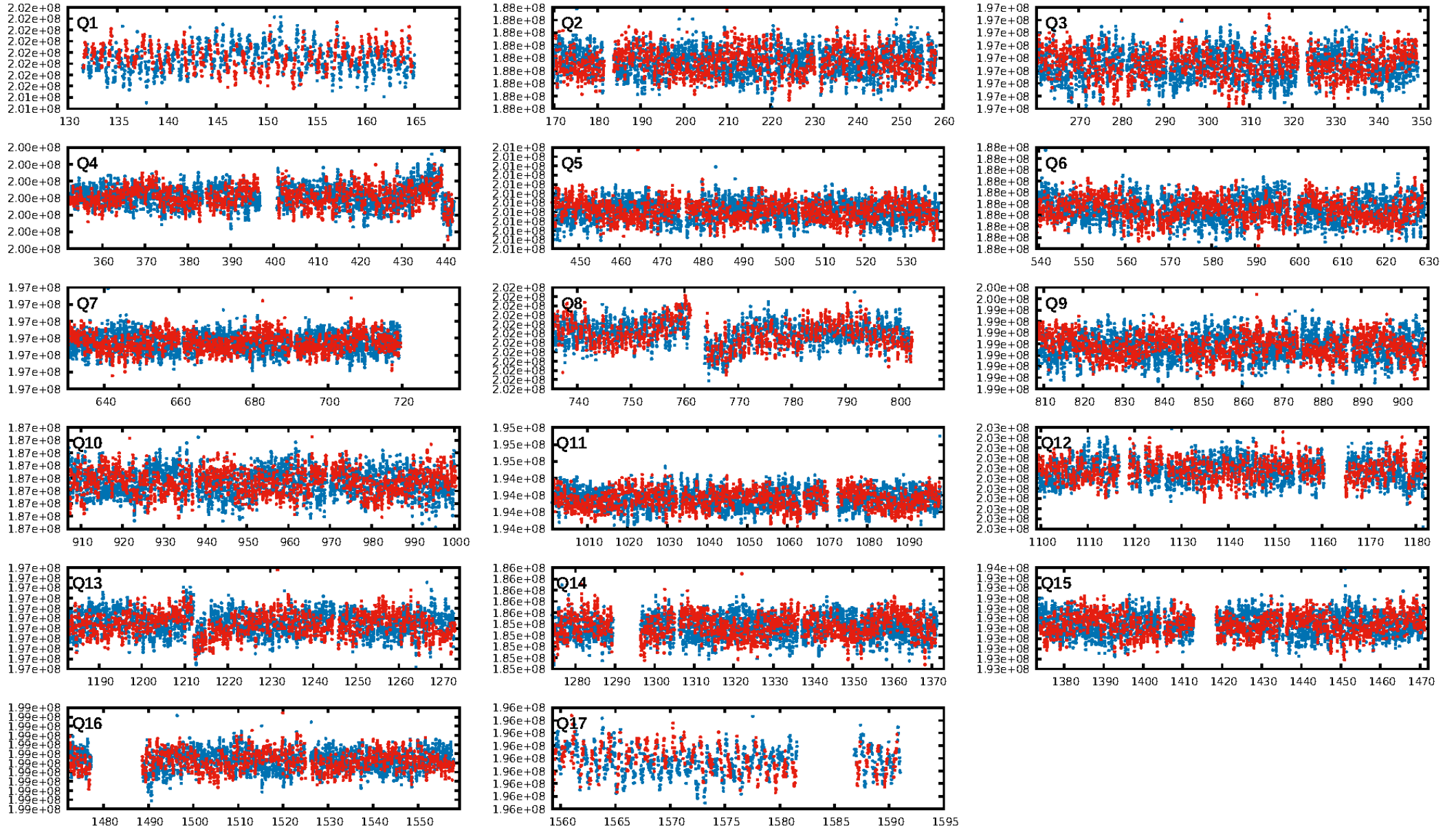
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [313.67σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 5.85e-12**  
RollingBand-fgt: 0.98 [1489/1525]  
GhostDiagnostic-chr: 11.29  
Centroid-sig: 71.4%  
Centroid-so: 0.373 arcsec [0.59σ]  
OotOffset-rm: 0.435 arcsec [0.45σ]  
OotOffset-st: 4/3/3/2 [12]  
KicOffset-rm: 0.546 arcsec [0.58σ]  
KicOffset-st: 4/3/3/2 [12]  
DiffImageQuality-fgm: 0.58 [7/12]  
DiffImageOverlap-fno: 1.00 [17/17]

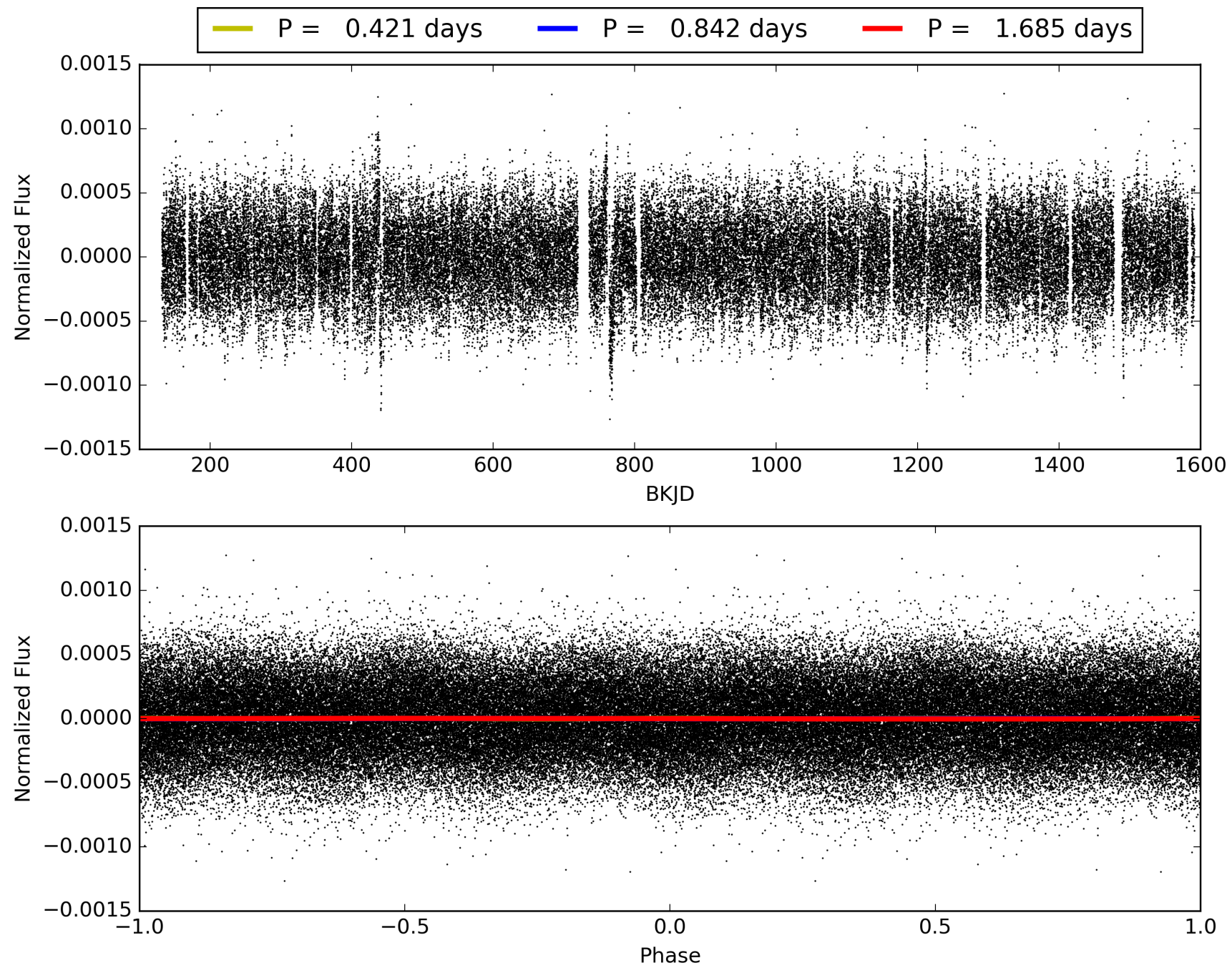
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:33:51 Z

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

# TCE 005171493-01, PDC Light Curves



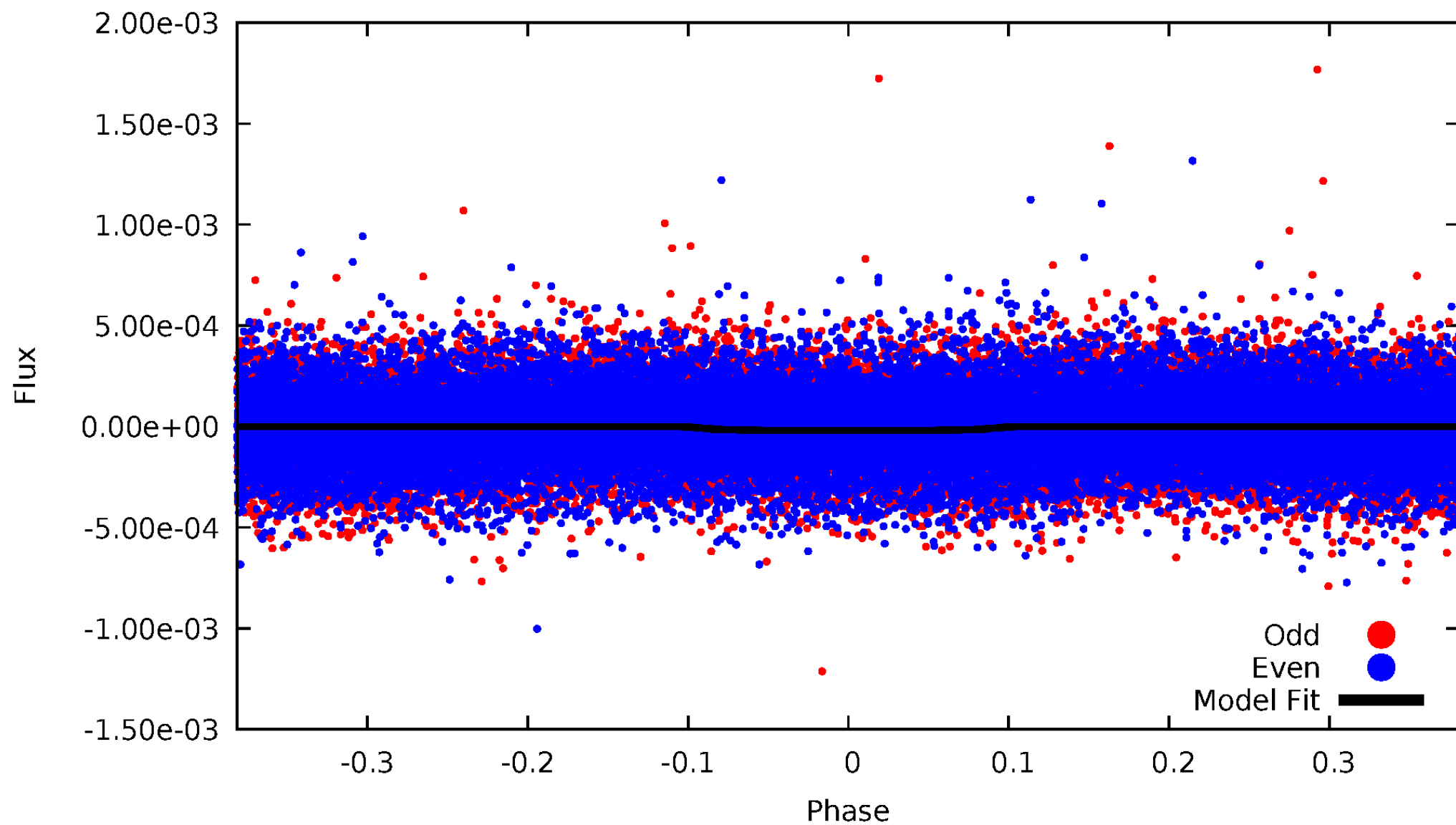
TCE 005171493-01





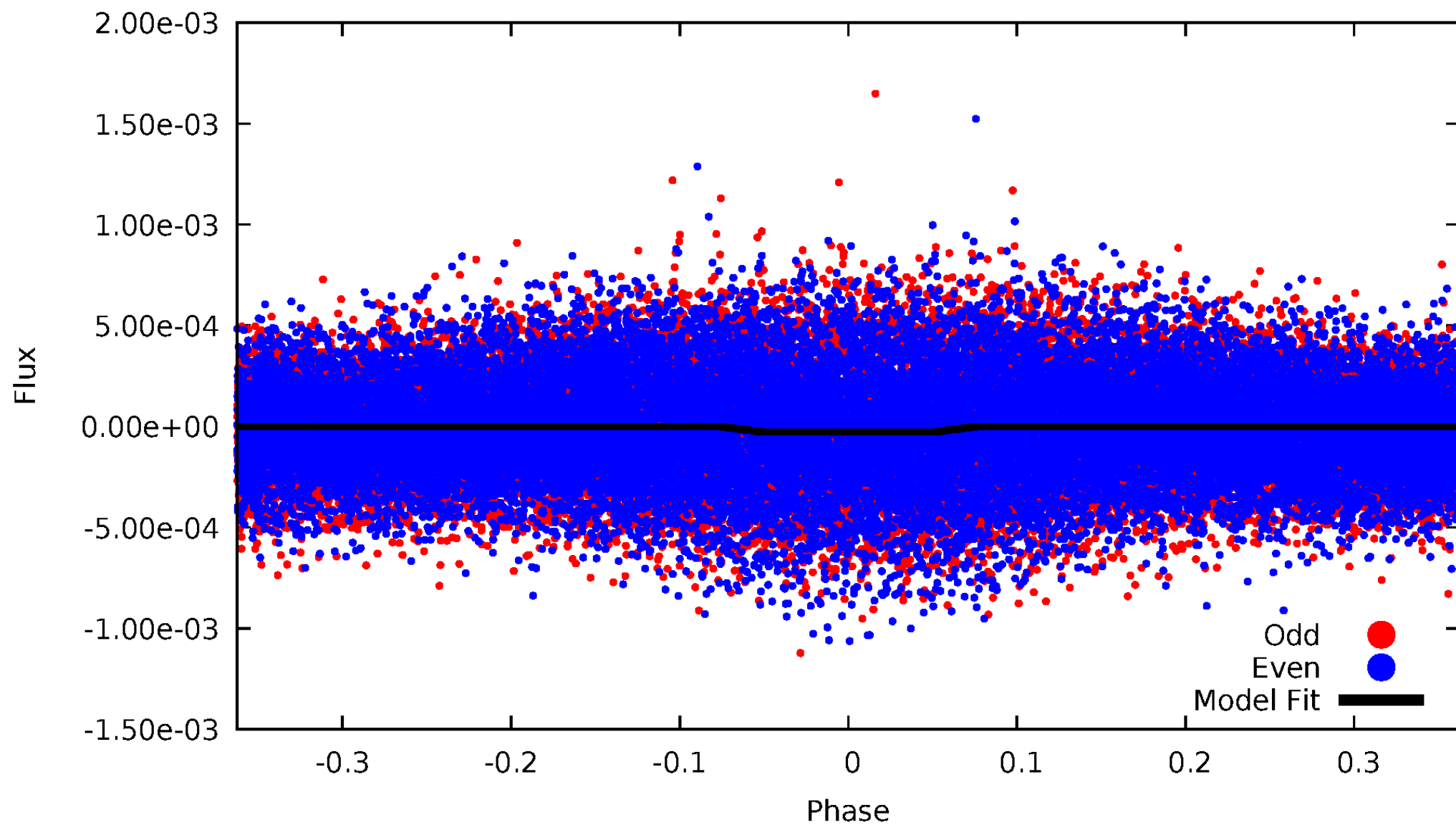
# DV Odd/Even

TCE 005171493-01



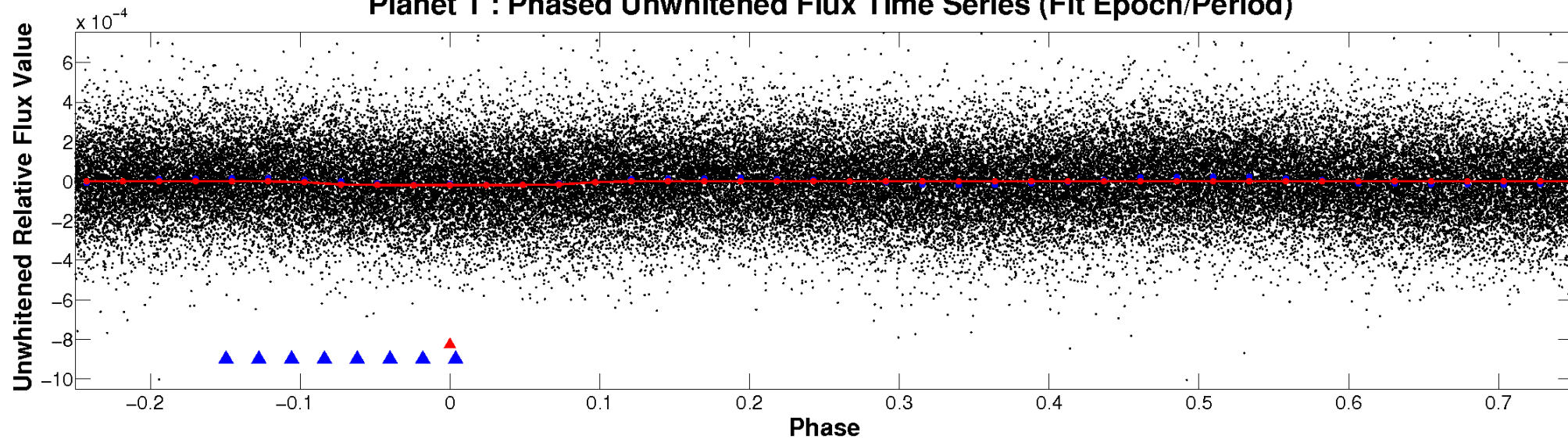
# ALT Odd/Even

TCE 005171493-01

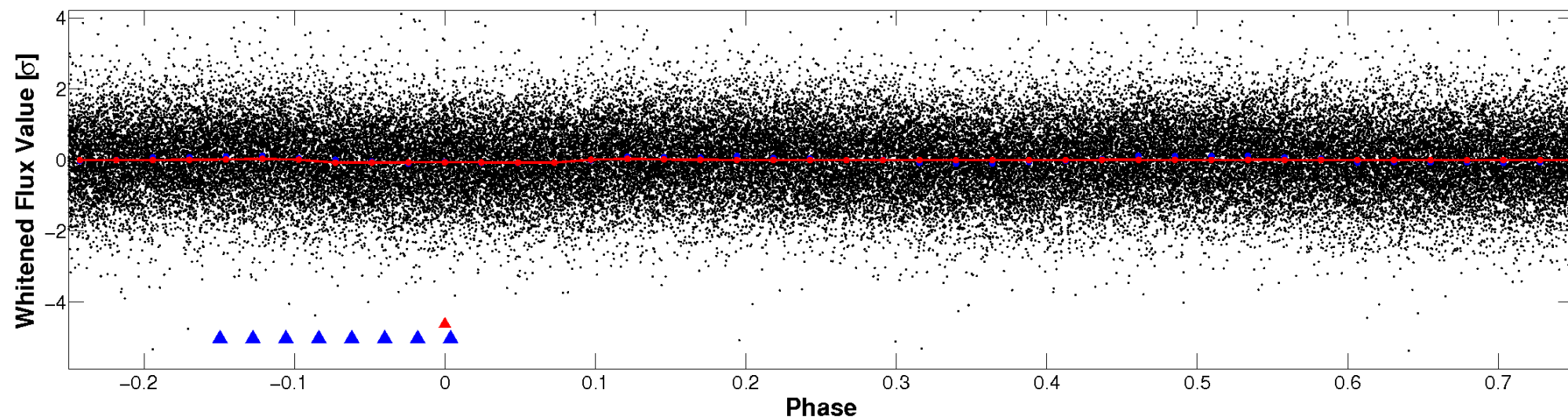


# Non-Whitened Vs. Whitened Light Curve

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

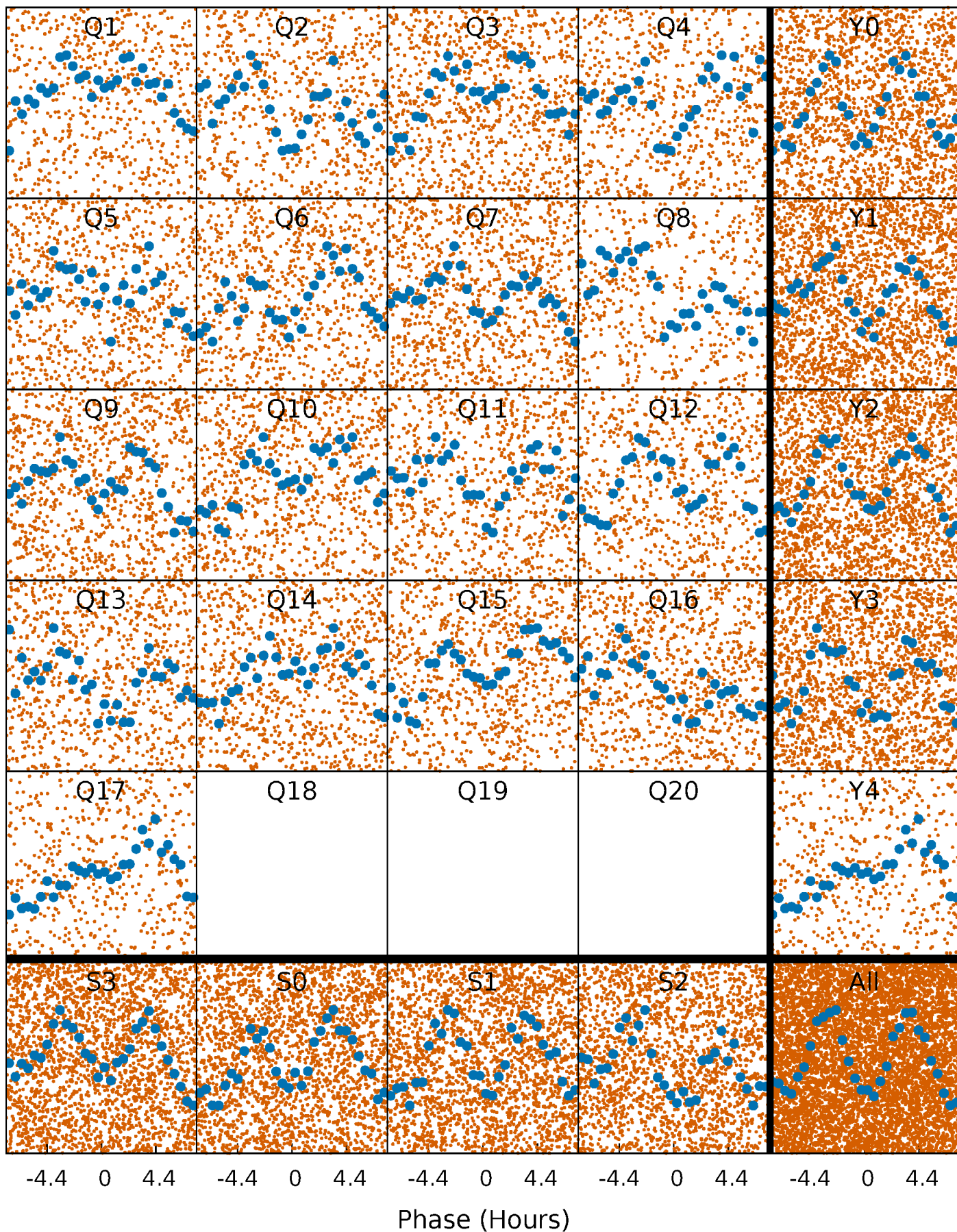


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

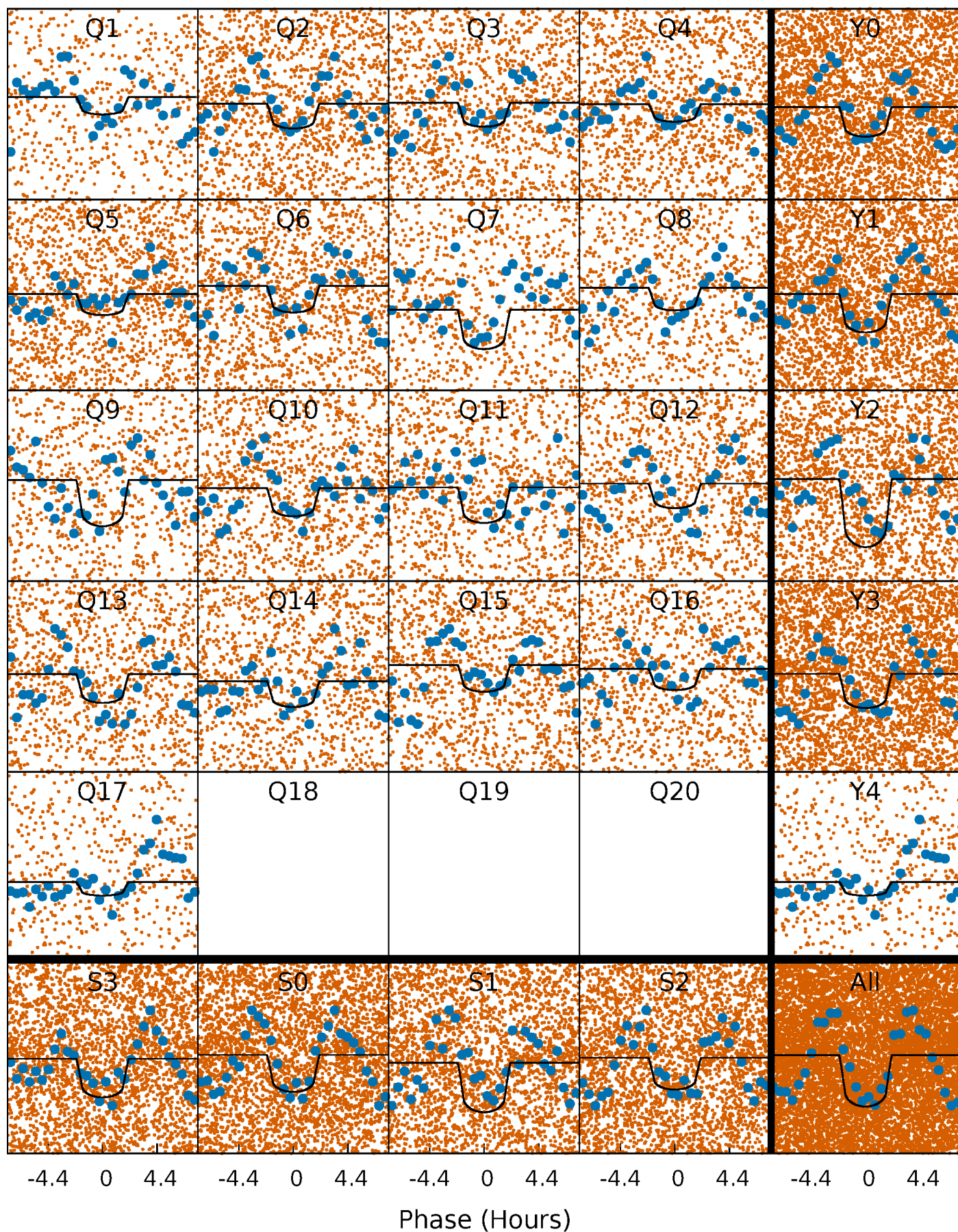
TCE 005171493-01 P= 0.842279 Days  $T_0=131.740175$  (BKJD)





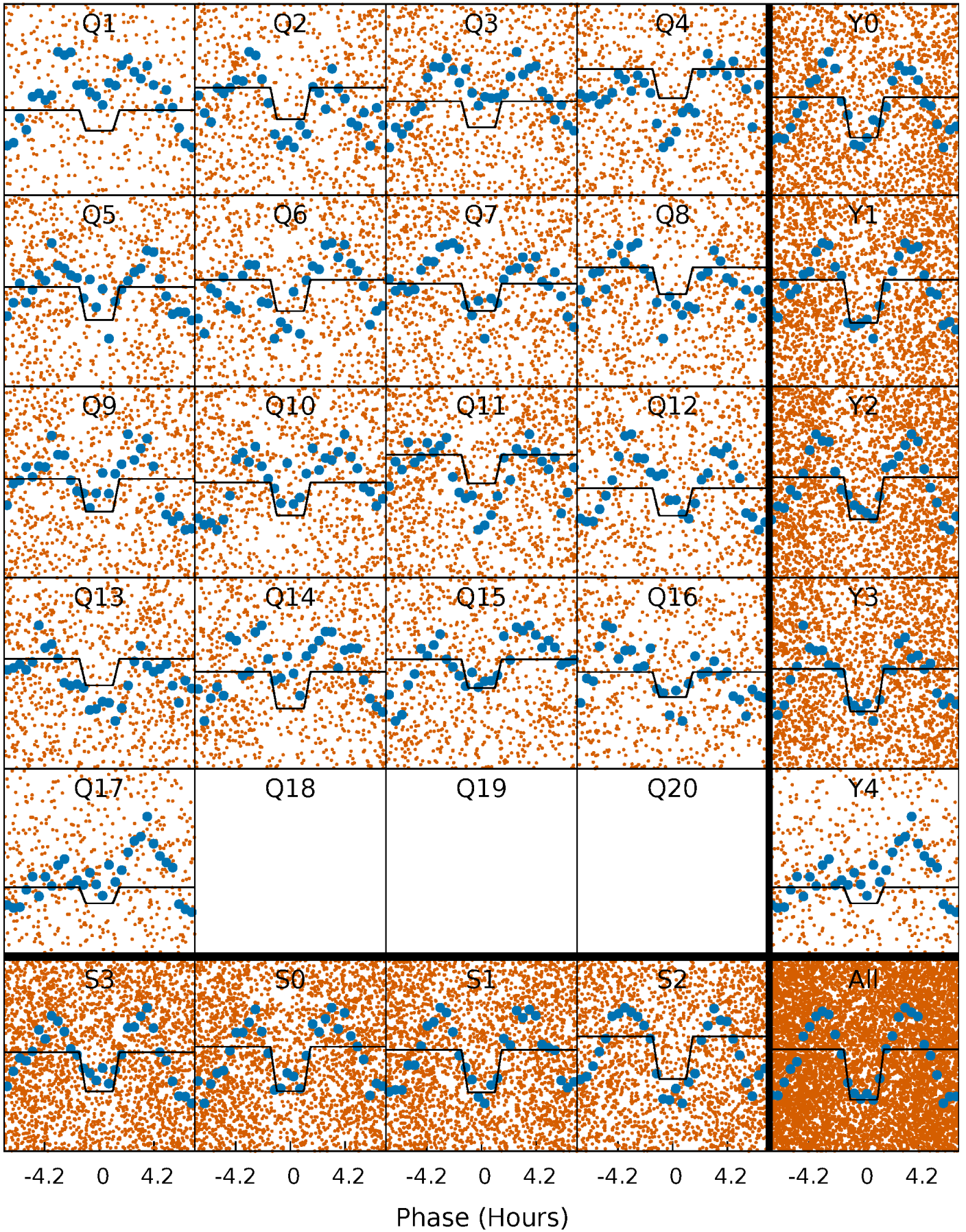
# DV Quarter-Phased Transit Curves

TCE 005171493-01 P= 0.842279 Days  $T_0=131.740175$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005171493-01 P= 0.842302 Days  $T_0=131.733285$  (BKJD)

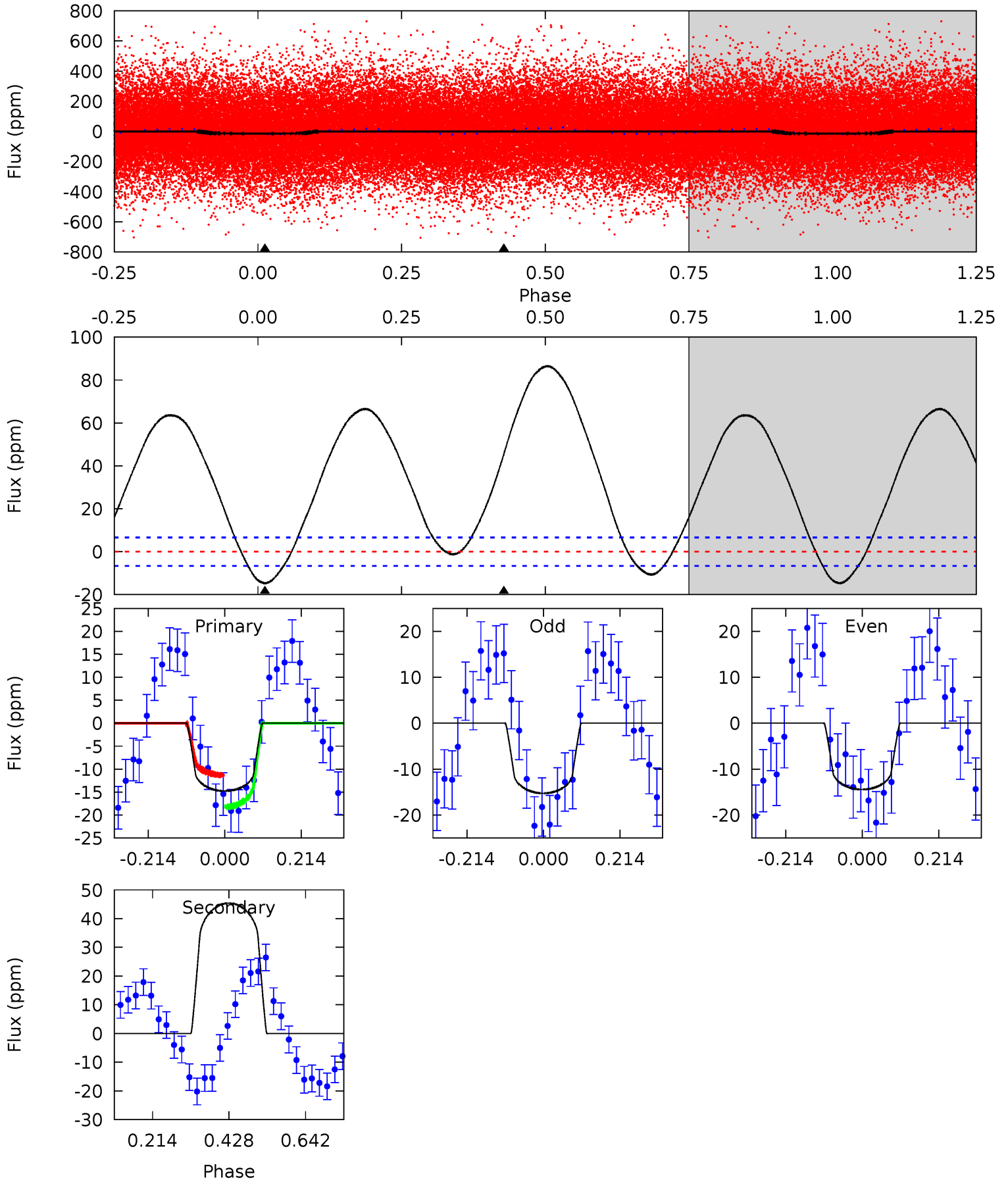




# DV Model-Shift Uniqueness Test

005171493-01, P = 0.842279 Days, E = 130.897896 Days

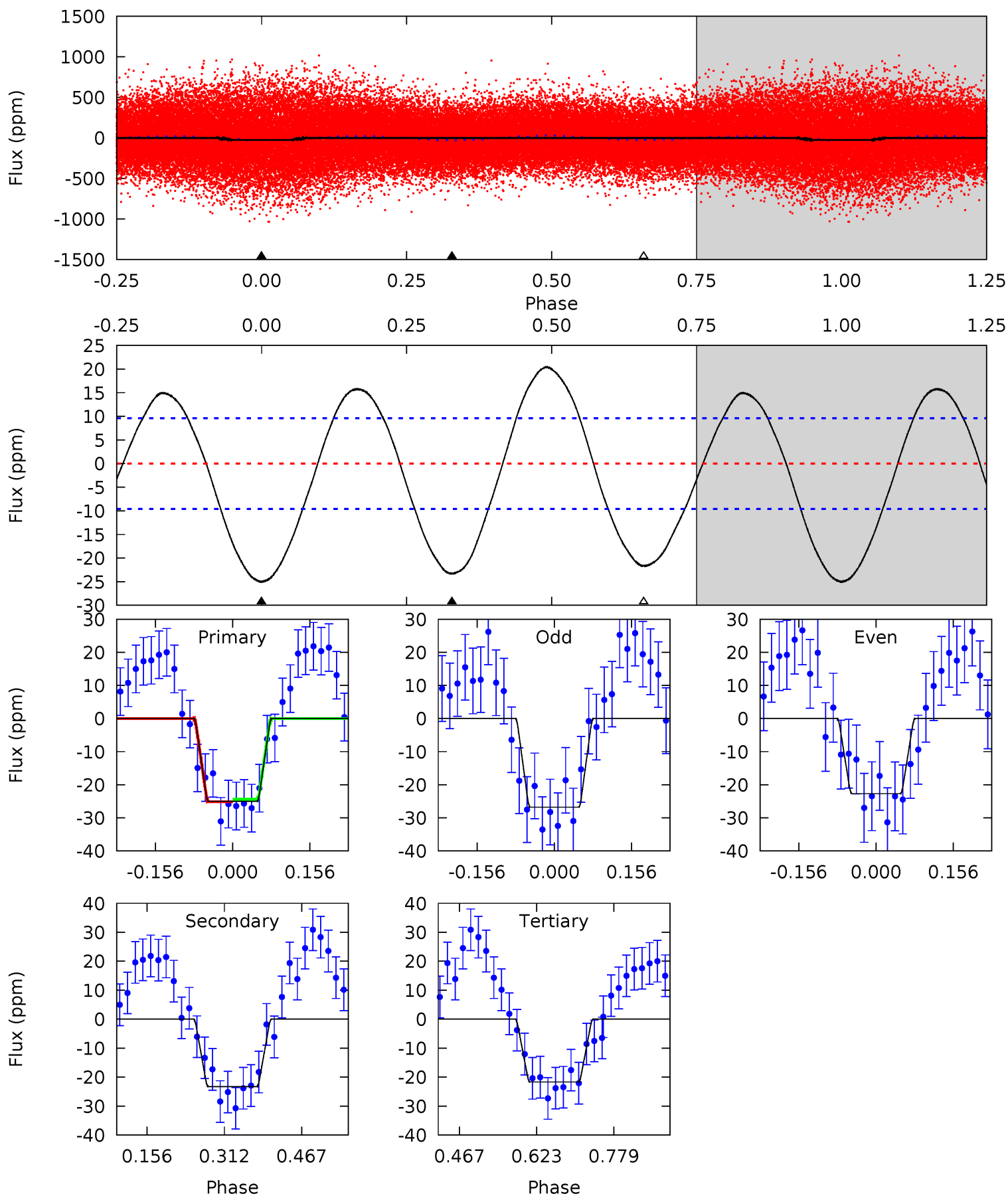
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.81	-30.1	0	0	4.40	1.24	12.0	9.81	9.81	-30.1	-30.1	0.28	1.00	0.85	2.34



# Alt Model-Shift Uniqueness Test

005171493-01, P = 0.842302 Days, E = 130.890983 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	10.8	10.1	0	4.47	1.42	6.65	1.55	11.6	0.75	10.8	0.86	0.79	0.45	0.15





### Stellar Parameters For KIC 005171493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6502^{+158}_{-177}$	$3.506^{+0.360}_{-0.090}$	$-0.120^{+0.350}_{-0.250}$	$3.888^{+0.384}_{-1.537}$	$1.769^{+0.189}_{-0.379}$	$0.042^{+0.122}_{-0.012}$
	+2%/-3%	+10%/-3%	+292%/-208%	+10%/-40%	+11%/-21%	+287%/-28%
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 005171493-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$45 \pm 2$	$1.81^{+0.82}_{-0.68}$	$5344^{+288}_{-492}$	$-8184^{+1188}_{-2425}$	$-3.363^{+1.743}_{-4.984}$
Alt.	$-23 \pm 2$	$2.00^{+0.83}_{-0.67}$	$5324^{+307}_{-498}$	$5925^{+1420}_{-1040}$	$1.386^{+1.726}_{-0.669}$

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

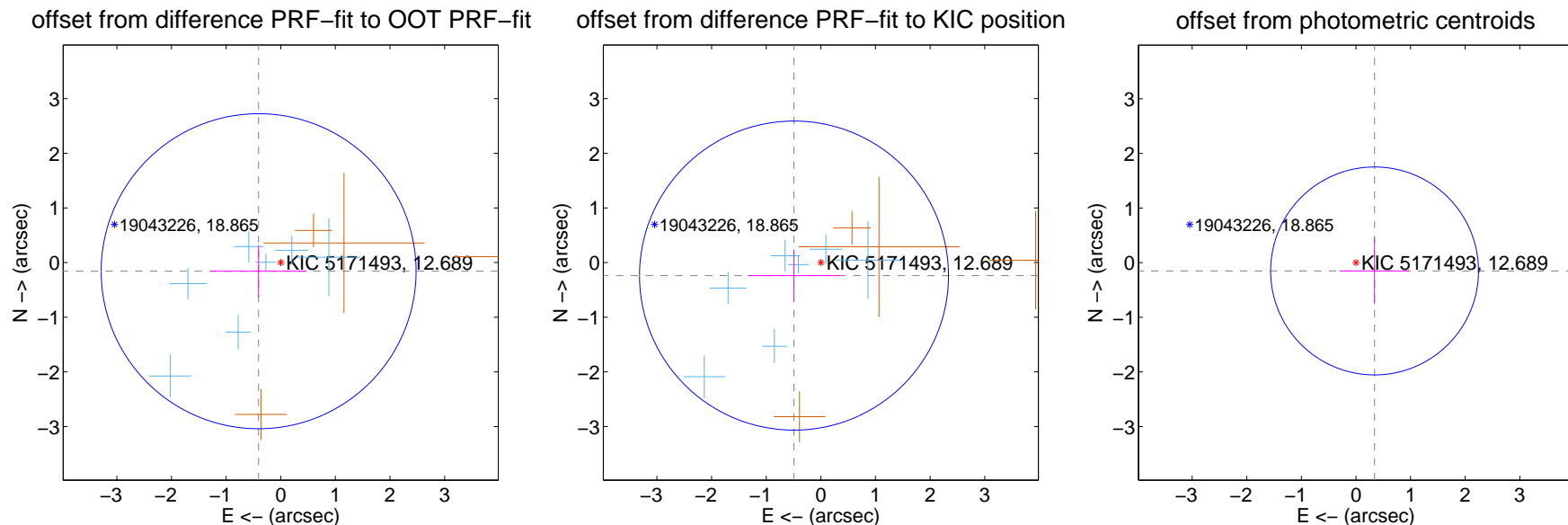
## DV Centroid Data

Supplemental centroid analysis for 005171493-01. Kepler magnitude: 12.69. Transit SNR 8.24

There are 7 quarters with good PRF difference image offsets

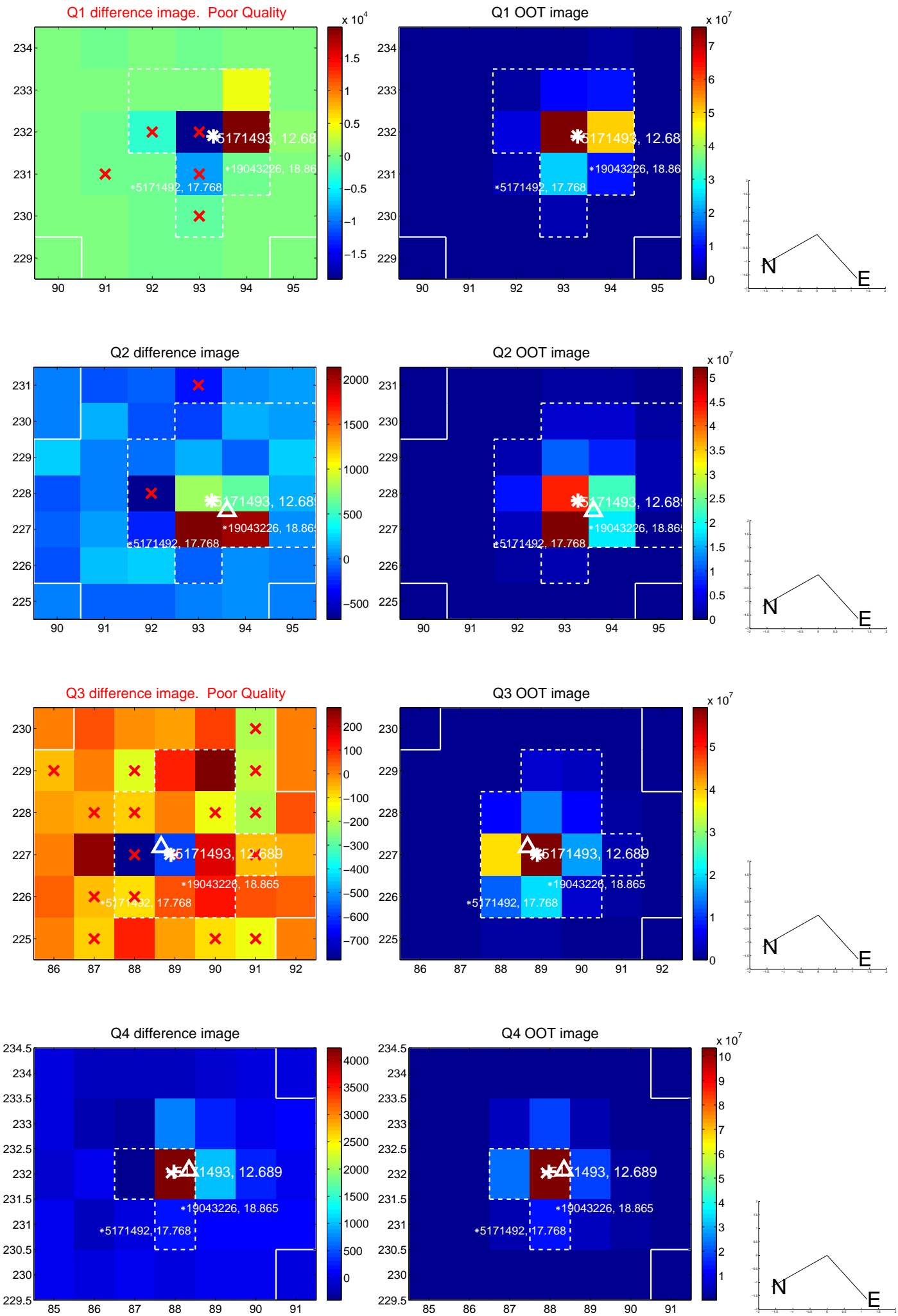
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.435 \pm 0.961$	0.45	$0.405 \pm 0.874$	$-0.158 \pm 0.477$
PRF-fit source offset from KIC position	$0.546 \pm 0.943$	0.58	$0.492 \pm 0.846$	$-0.238 \pm 0.477$
photometric centroid source offset	$0.37 \pm 0.63$	0.59	$-0.34 \pm 0.64$	$-0.15 \pm 0.61$

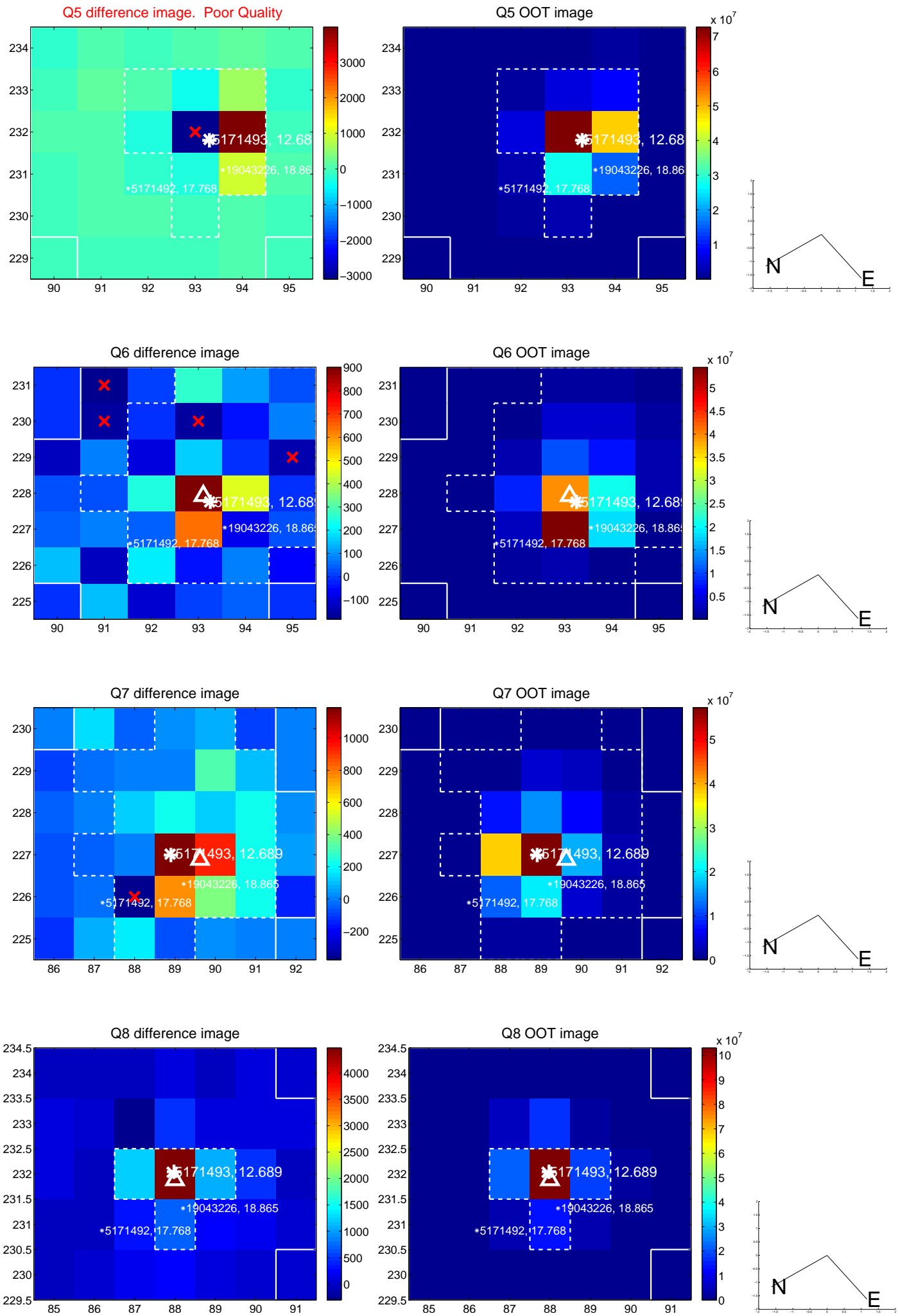


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

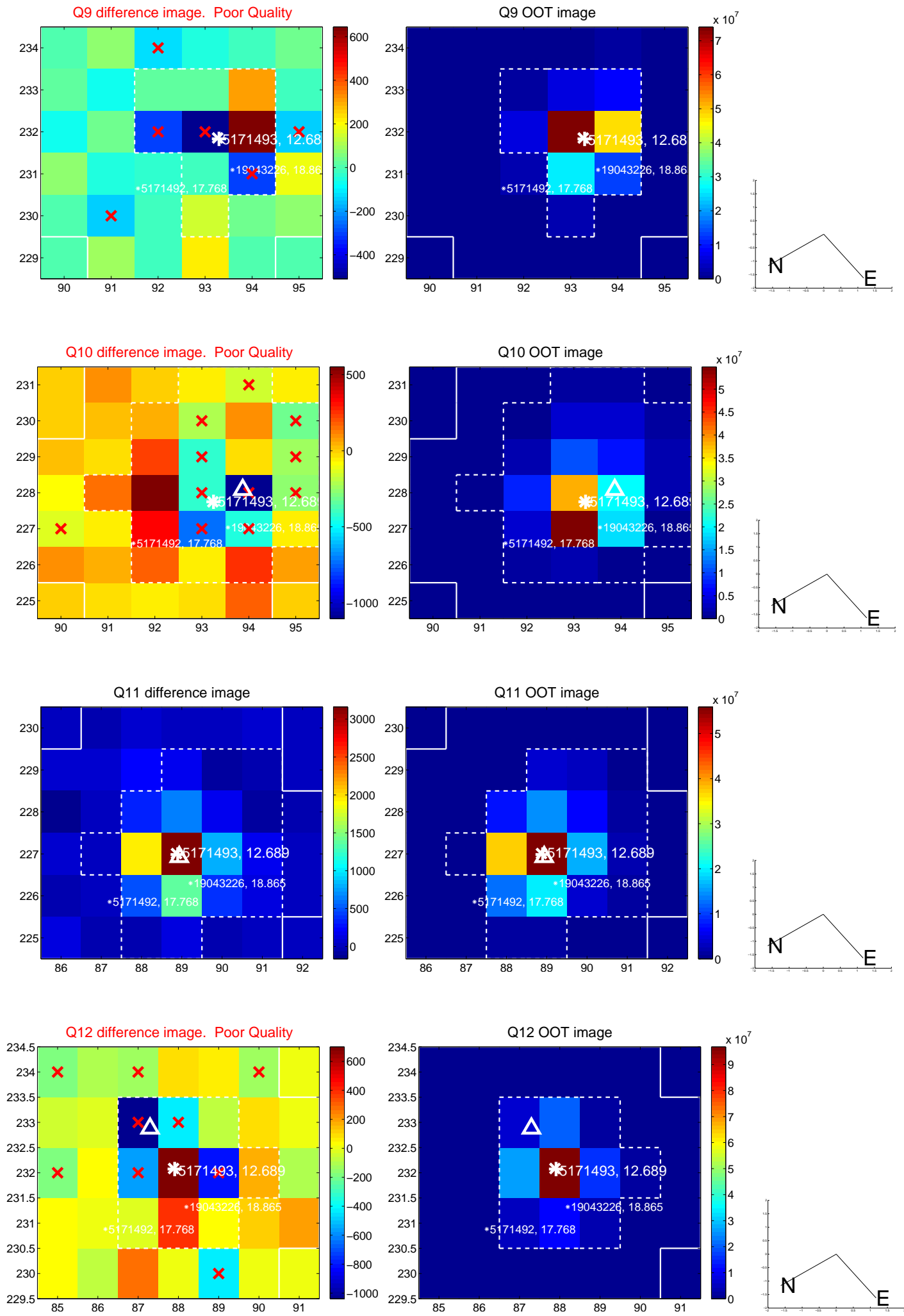


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

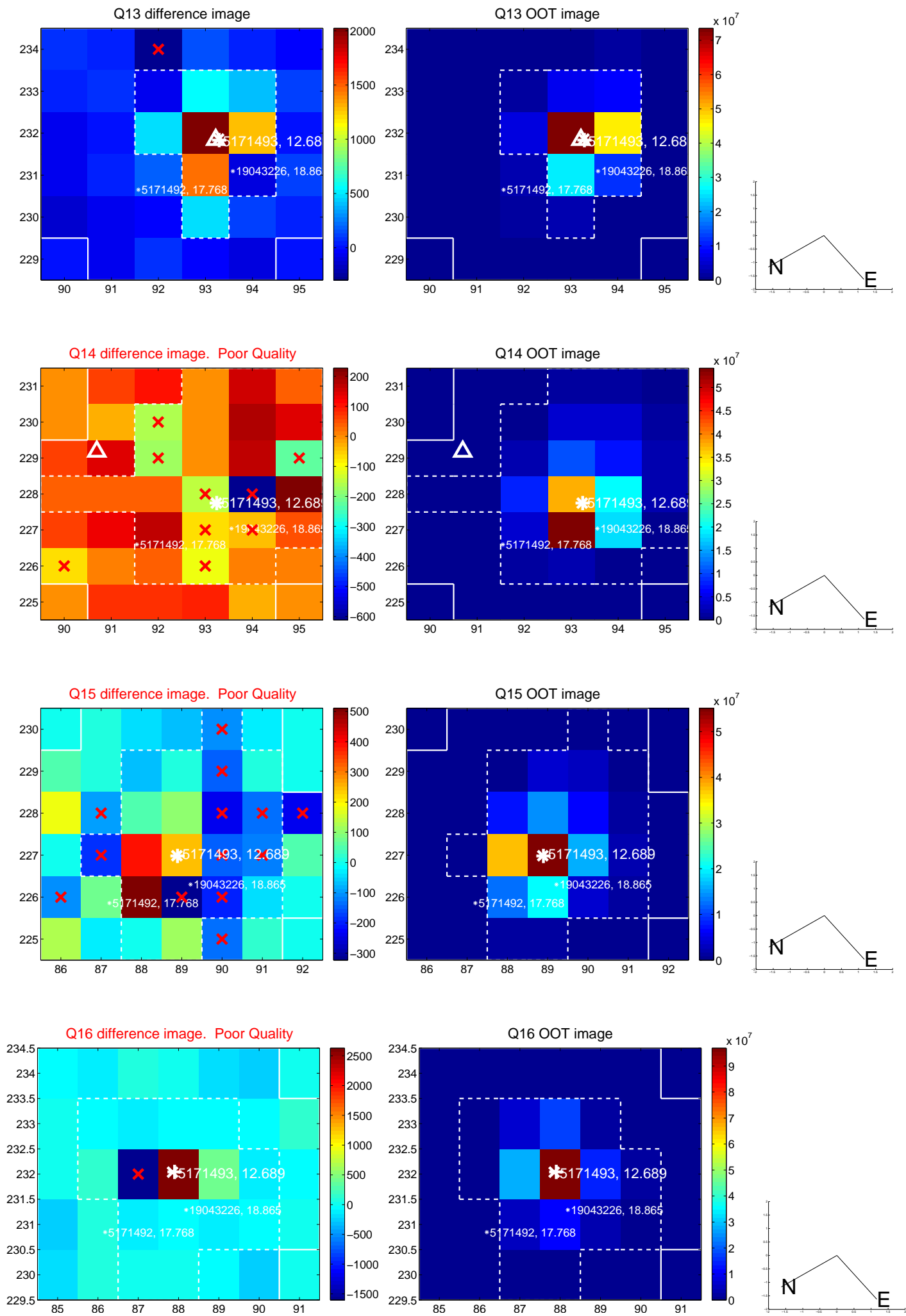




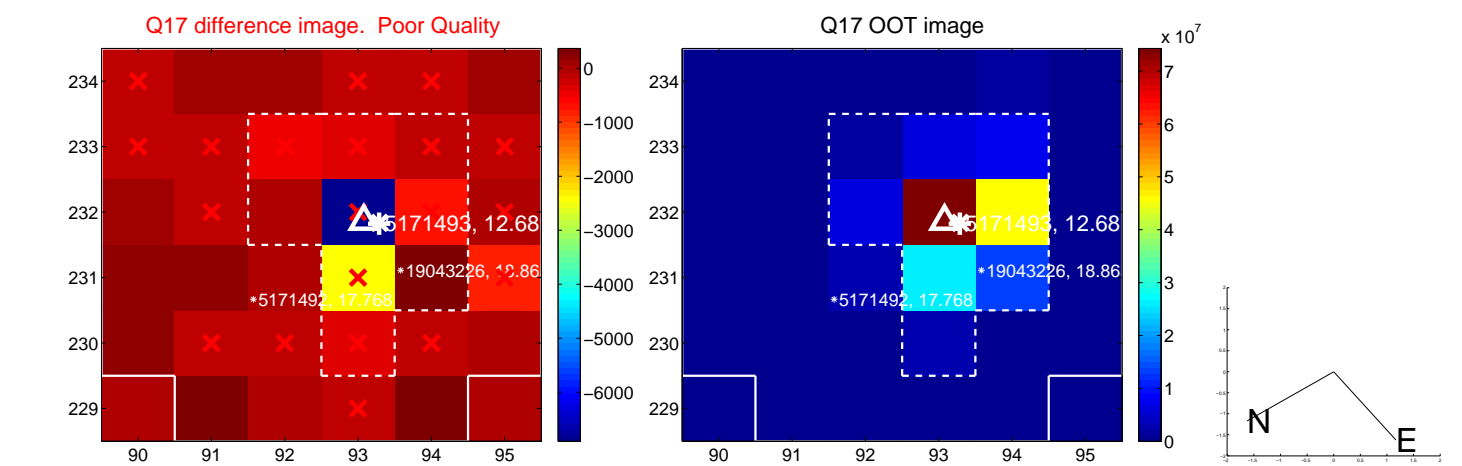
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



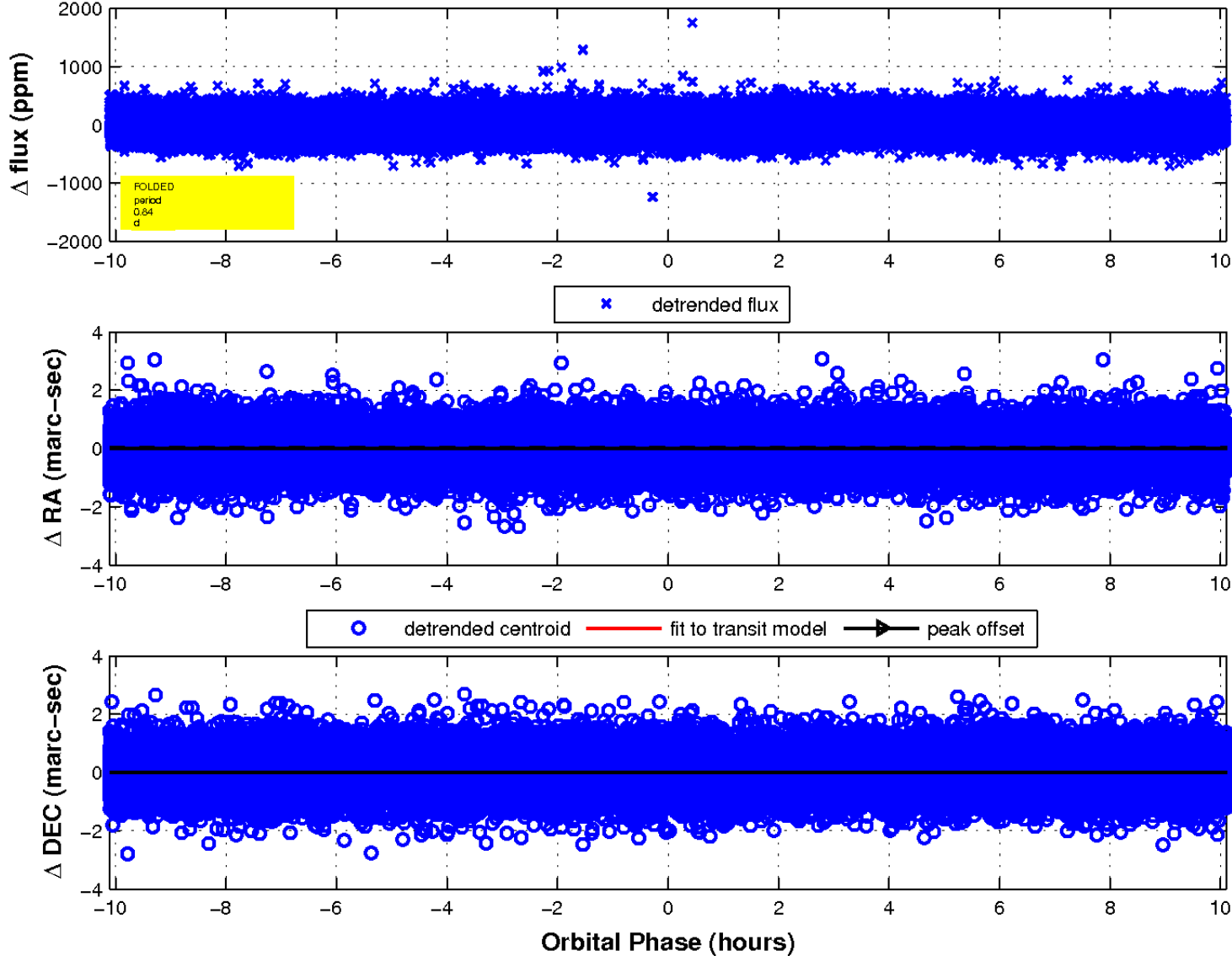
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

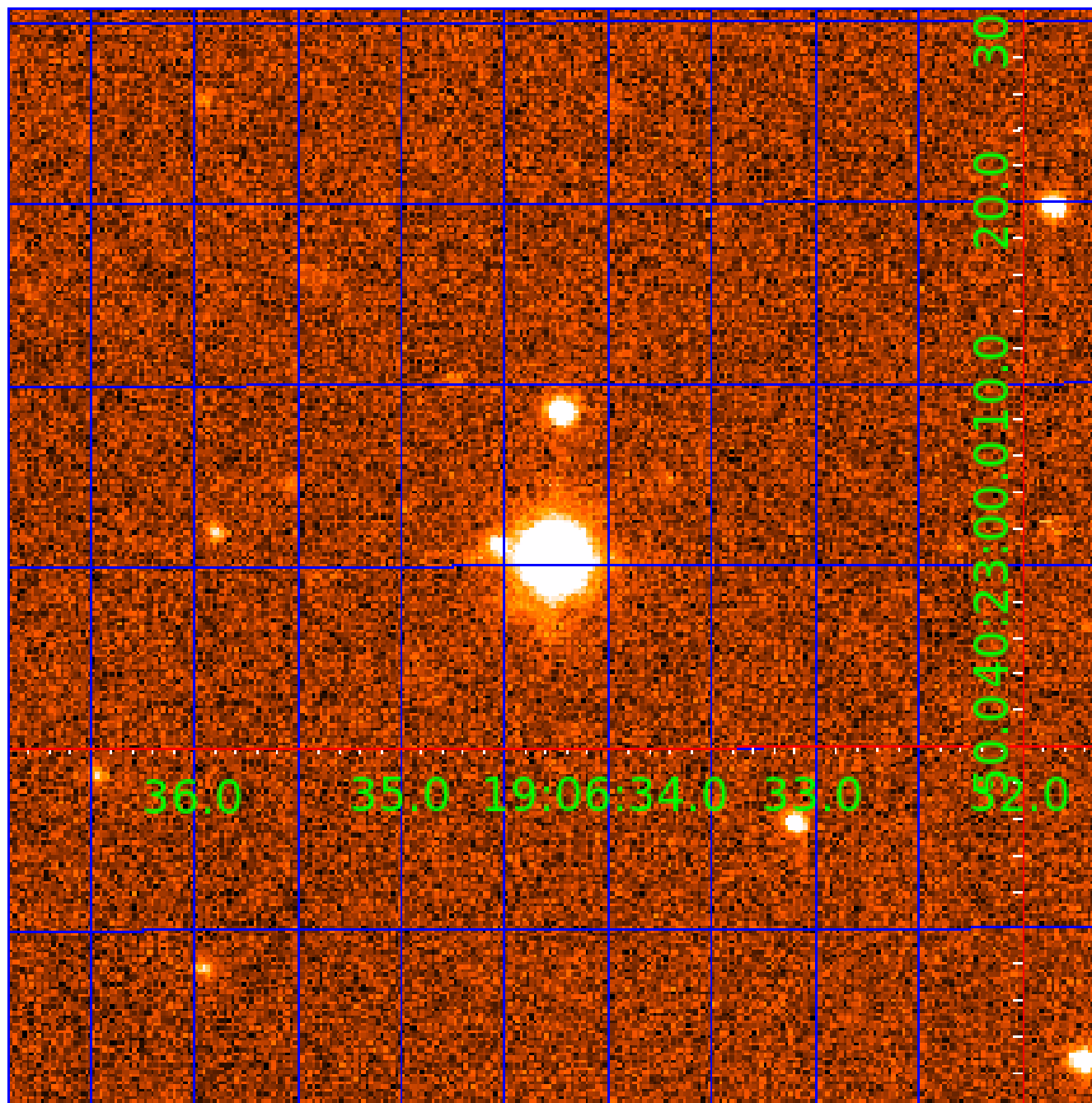


fluxWeightedCentroids, Planet 1 of 2



# UKIRT Image

Declination





# KIC 005171493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005171493-01	OBS	No	0.842279	131.740175	20.0	3.852	8.6	8.2	3.89	6502	2.02	54319.88
005171493-02	OBS	No	187.004272	234.372257	311.3	13.713	7.7	6.0	3.89	6502	7.83	40.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005171493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005171493-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_UNCERTAIN

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

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

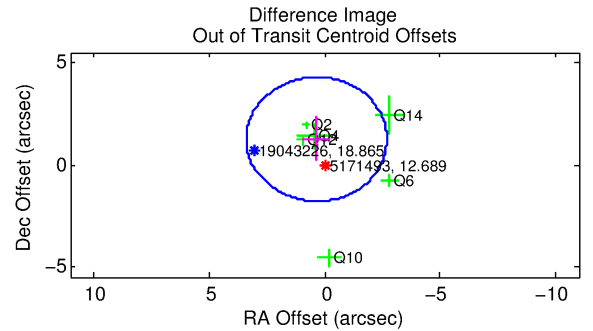
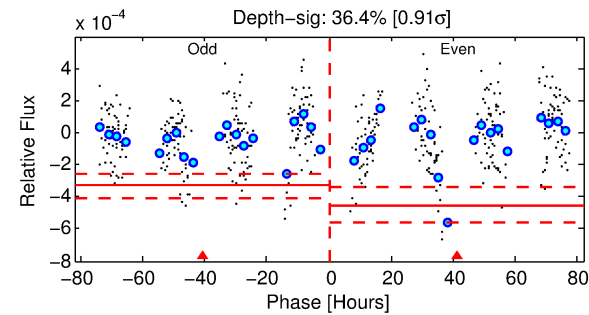
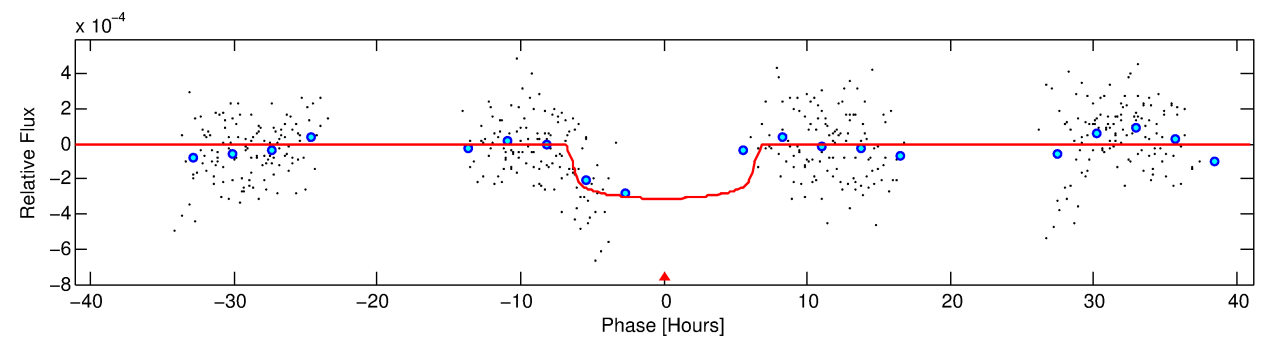
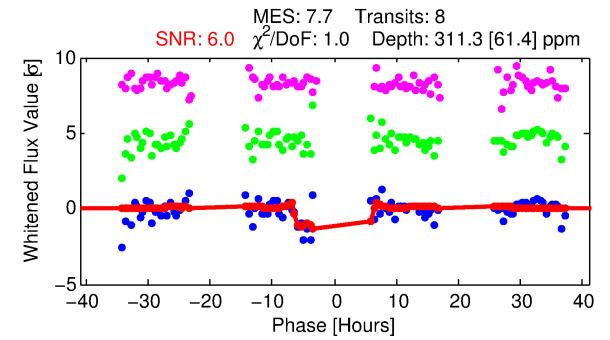
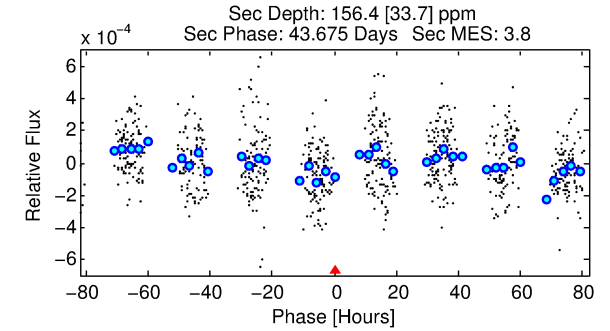
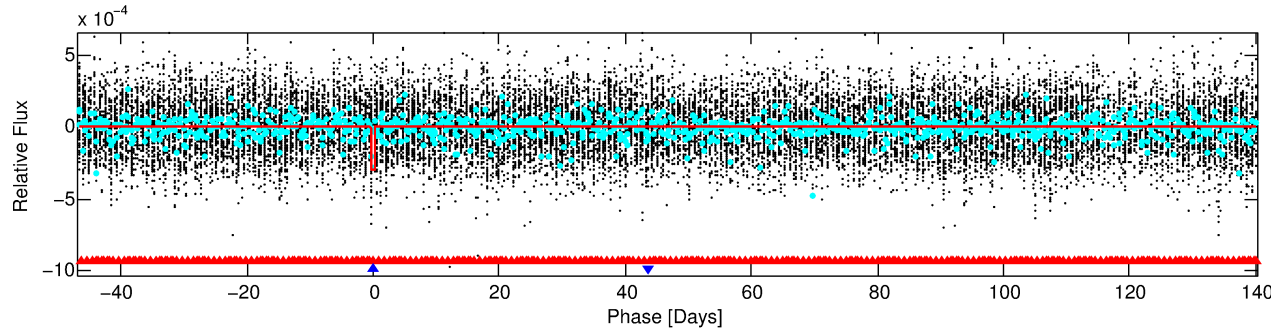
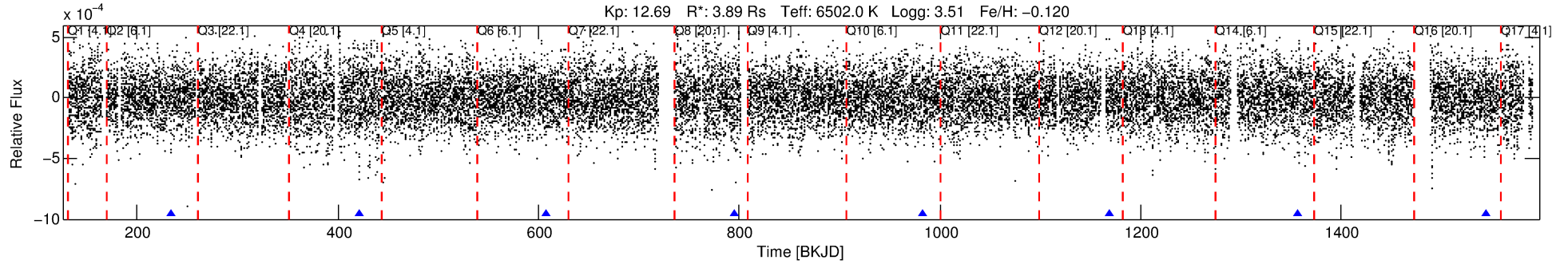
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005171493-02

No Significant Match Found

# DV One-Page Summary

KIC: 5171493 Candidate: 2 of 2 Period: 187.004 d



## DV Fit Results:

Period = 187.00427 [0.00317] d  
Epoch = 234.3723 [0.0189] BKJD  
Rp/R\* = 0.0184 [0.0025]  
a/R\* = 55.73 [21.85]  
b = 0.87 [0.12]  
Seff = 40.40 [25.13]  
Teq = 643 [100] K  
Rp = 7.82 [3.27] Re  
a = 0.7740 [0.2956] AU  
Ag = 842.04 [591.65] [1.42σ]  
Teffp = 5354 [484] K [9.53σ]

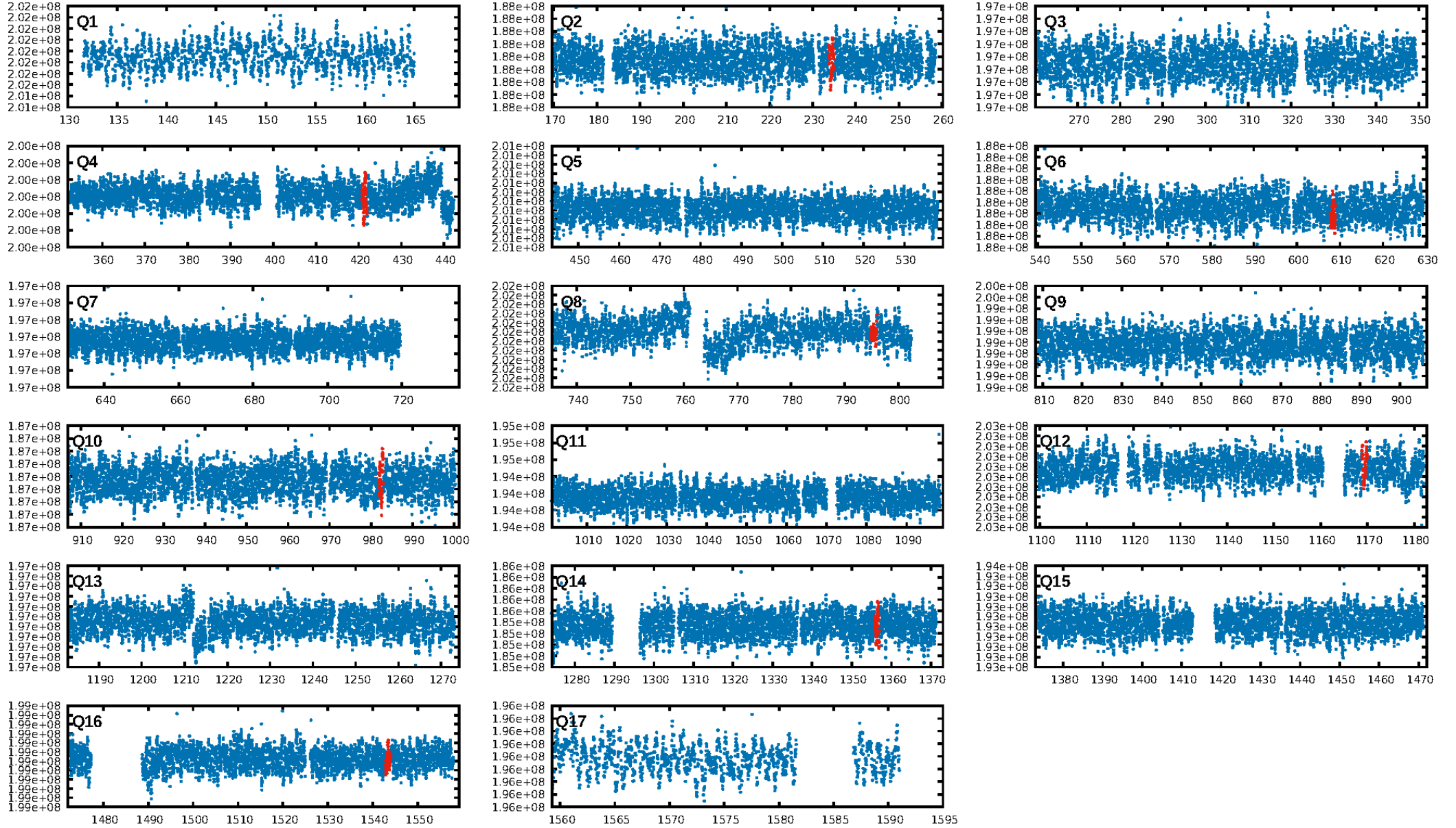
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [313.67σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 15.1%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 7.77e-10**  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -1.394  
Centroid-sig: 40.2%  
Centroid-so: 0.394 arcsec [1.03σ]  
OotOffset-rm: 1.294 arcsec [1.28σ]  
KicOffset-rm: 1.224 arcsec [1.57σ]  
OotOffset-st: 4/0/2/0 [6]  
KicOffset-st: 4/0/2/0 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 0.00 [0/8]

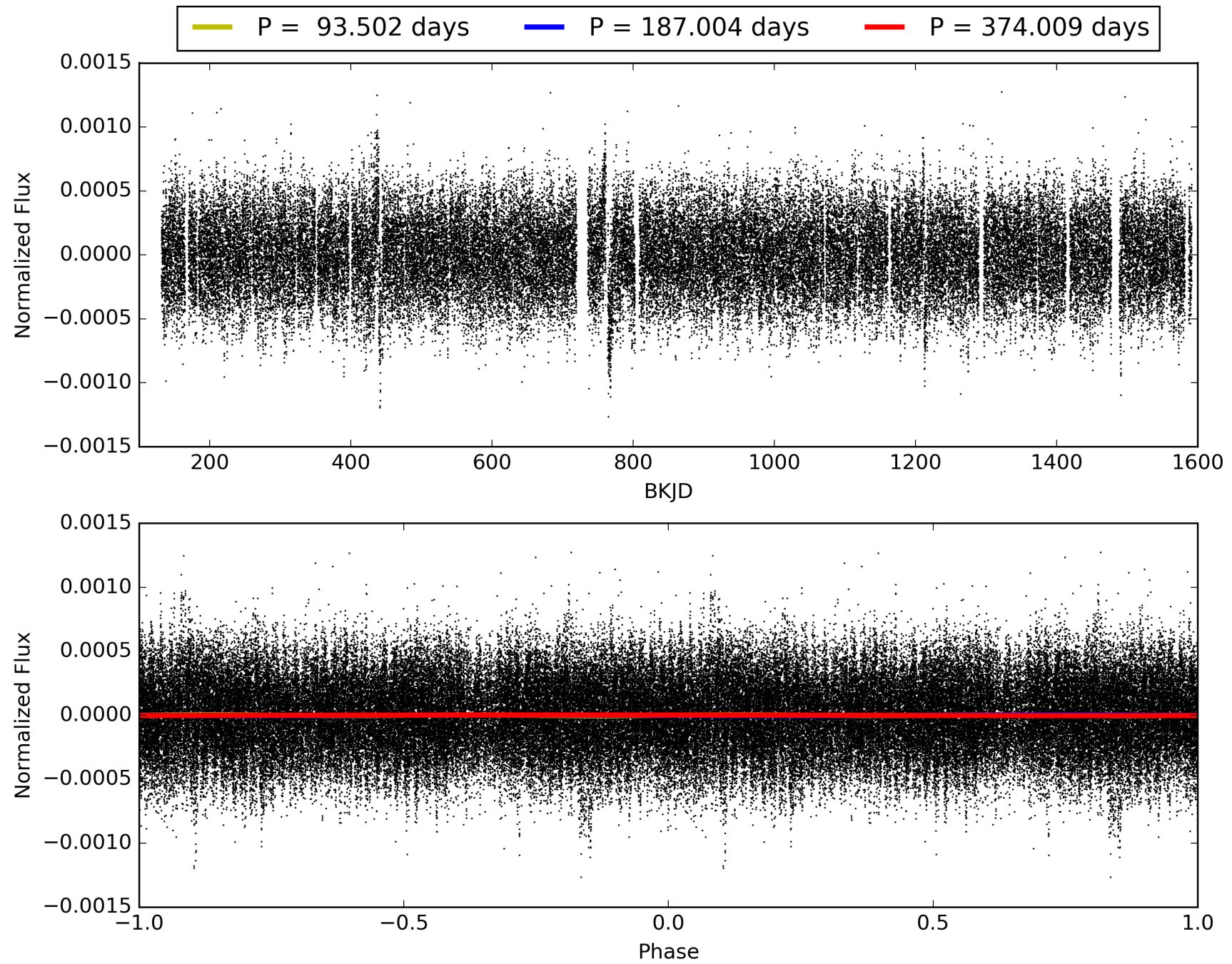
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:34:02 Z

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

# TCE 005171493-02, PDC Light Curves



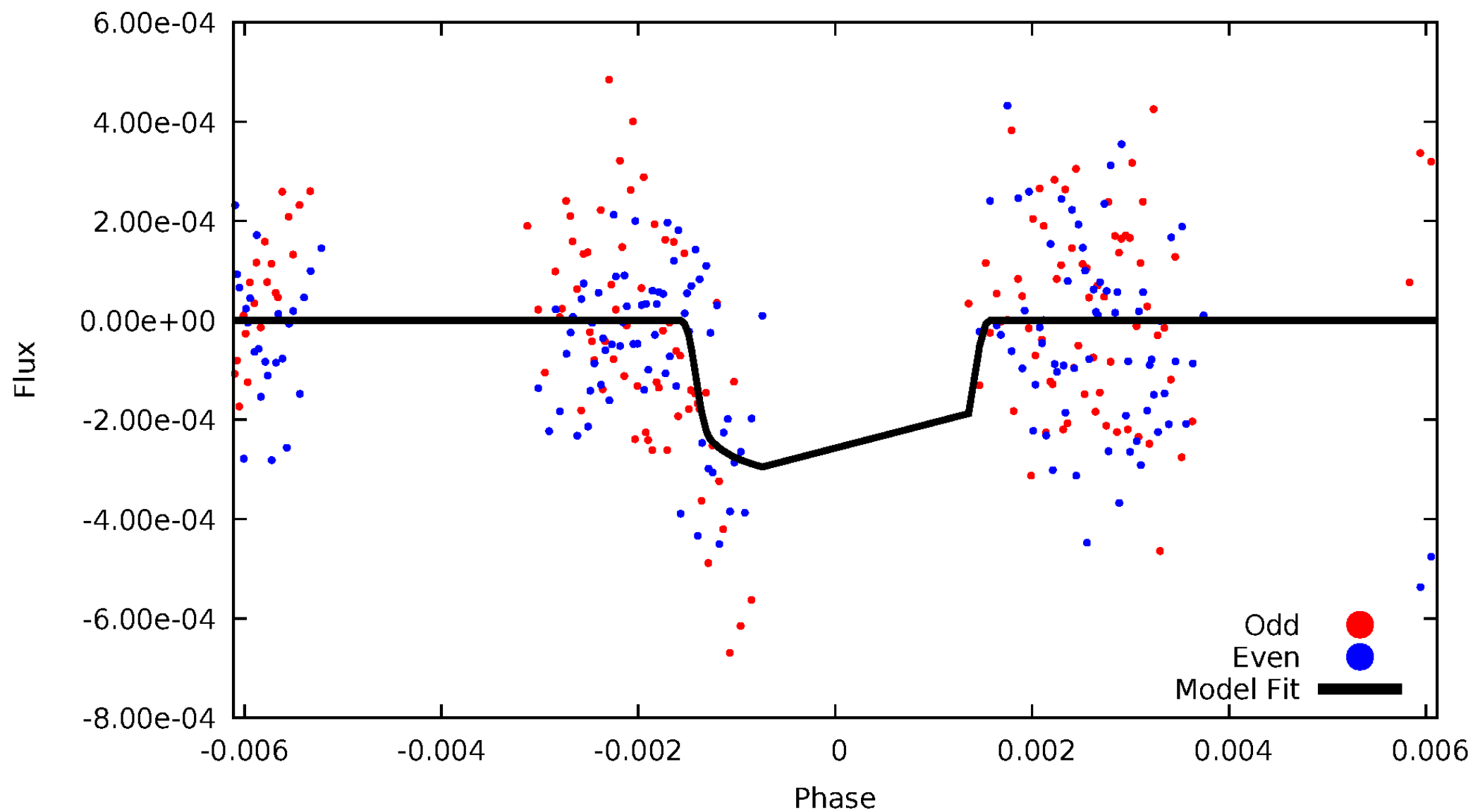
TCE 005171493-02





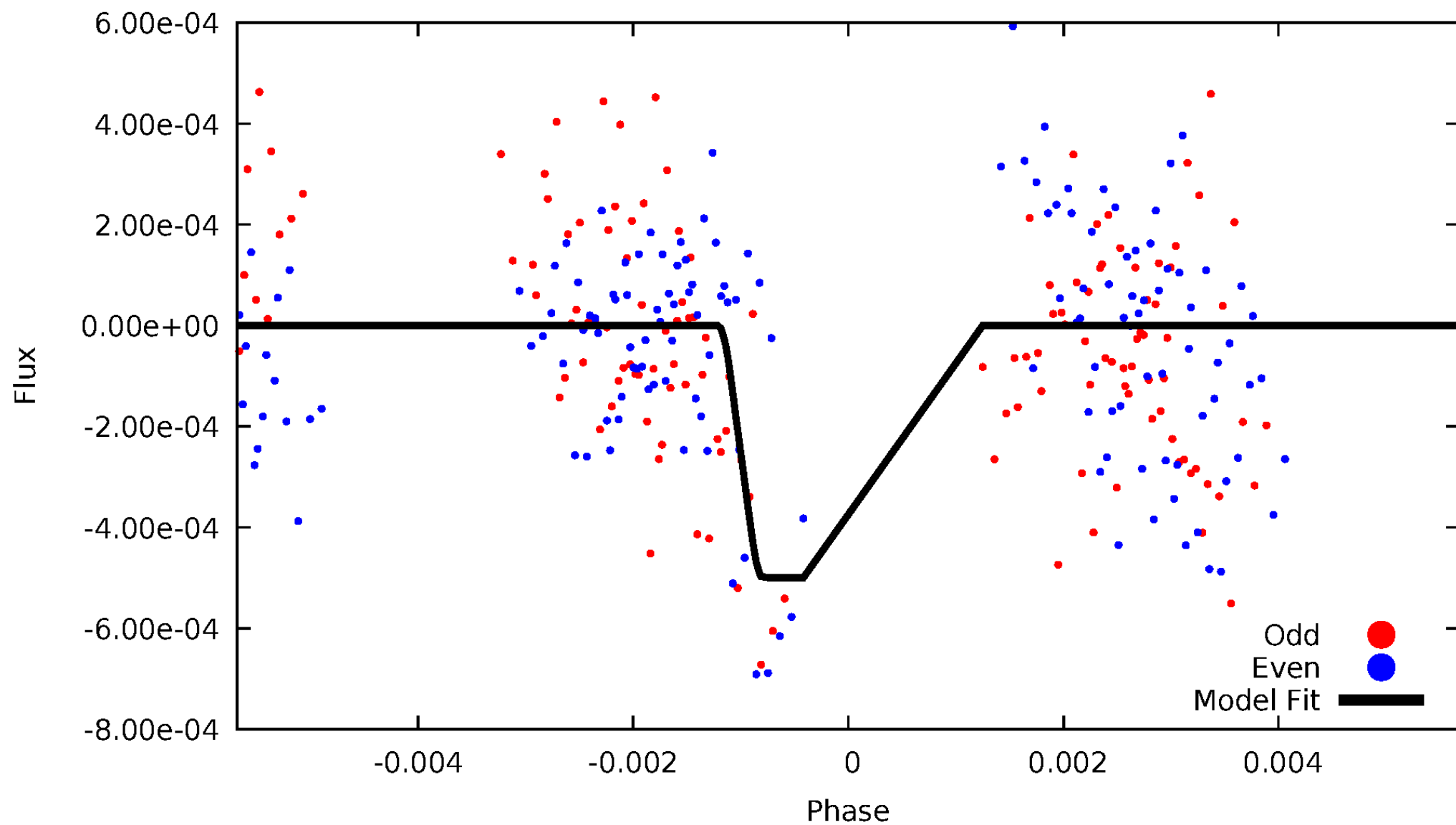
# DV Odd/Even

TCE 005171493-02



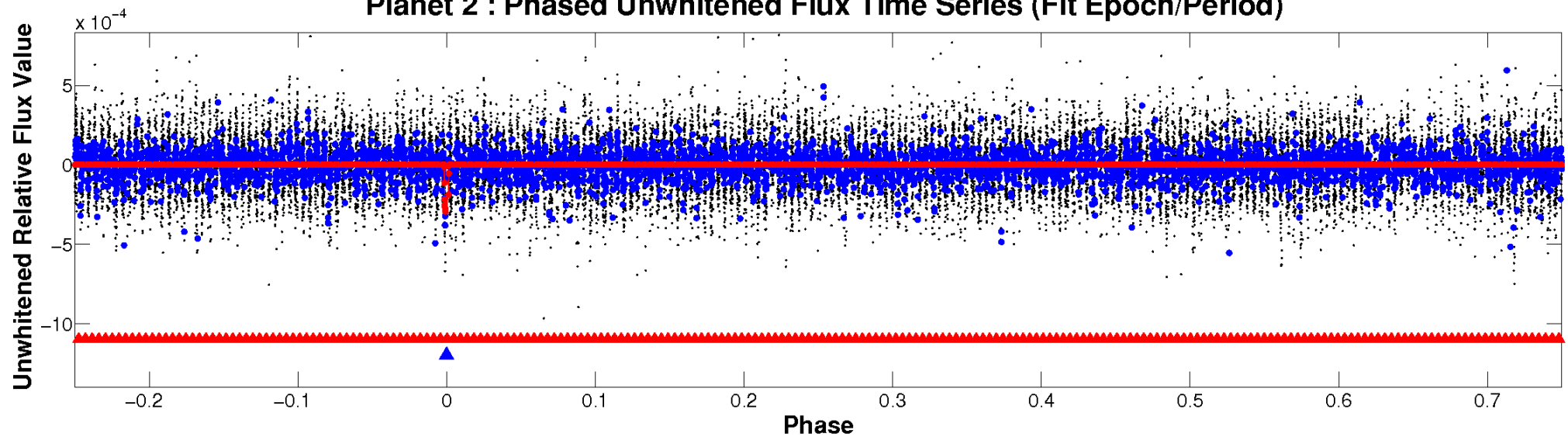
# ALT Odd/Even

TCE 005171493-02

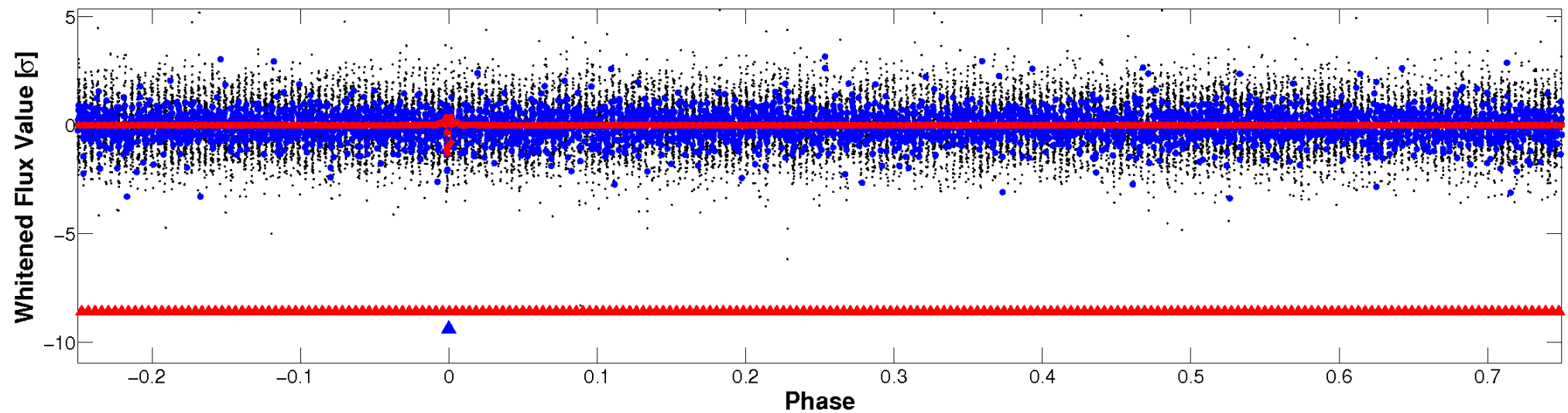


# Non-Whitened Vs. Whitened Light Curve

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

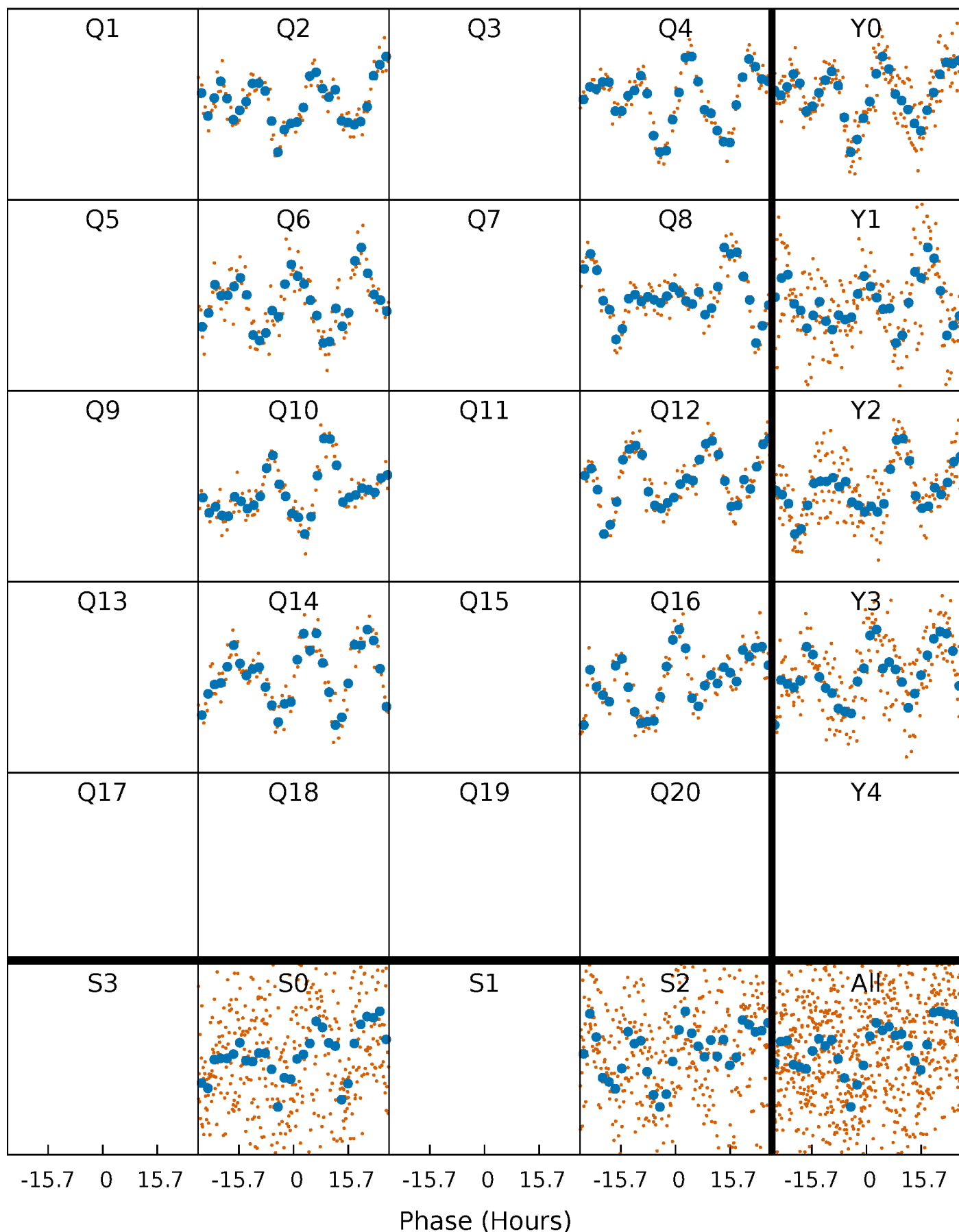


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



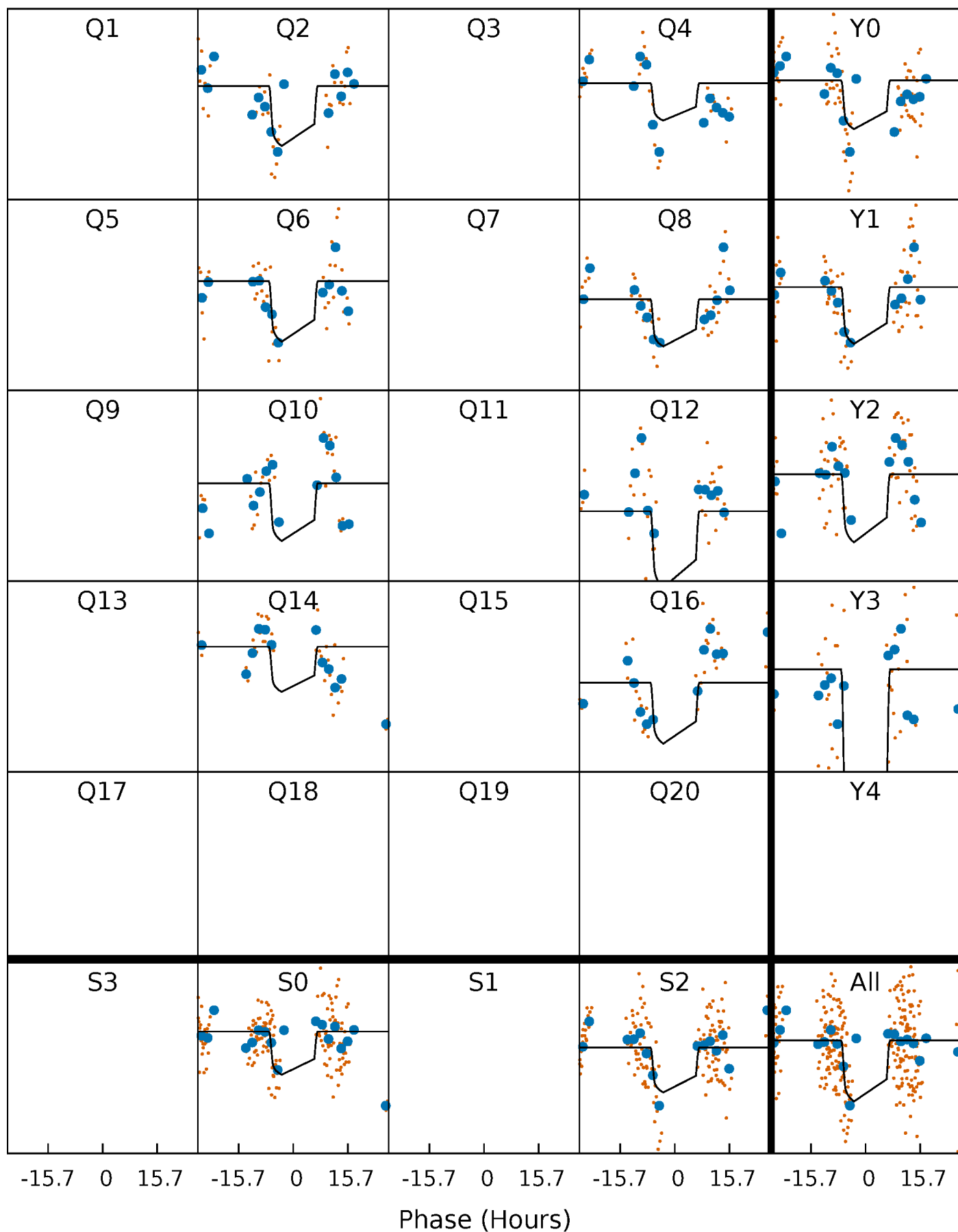
# PDC Quarter-Phased Transit Curves

TCE 005171493-02 P=187.004272 Days  $T_0=234.372257$  (BKJD)



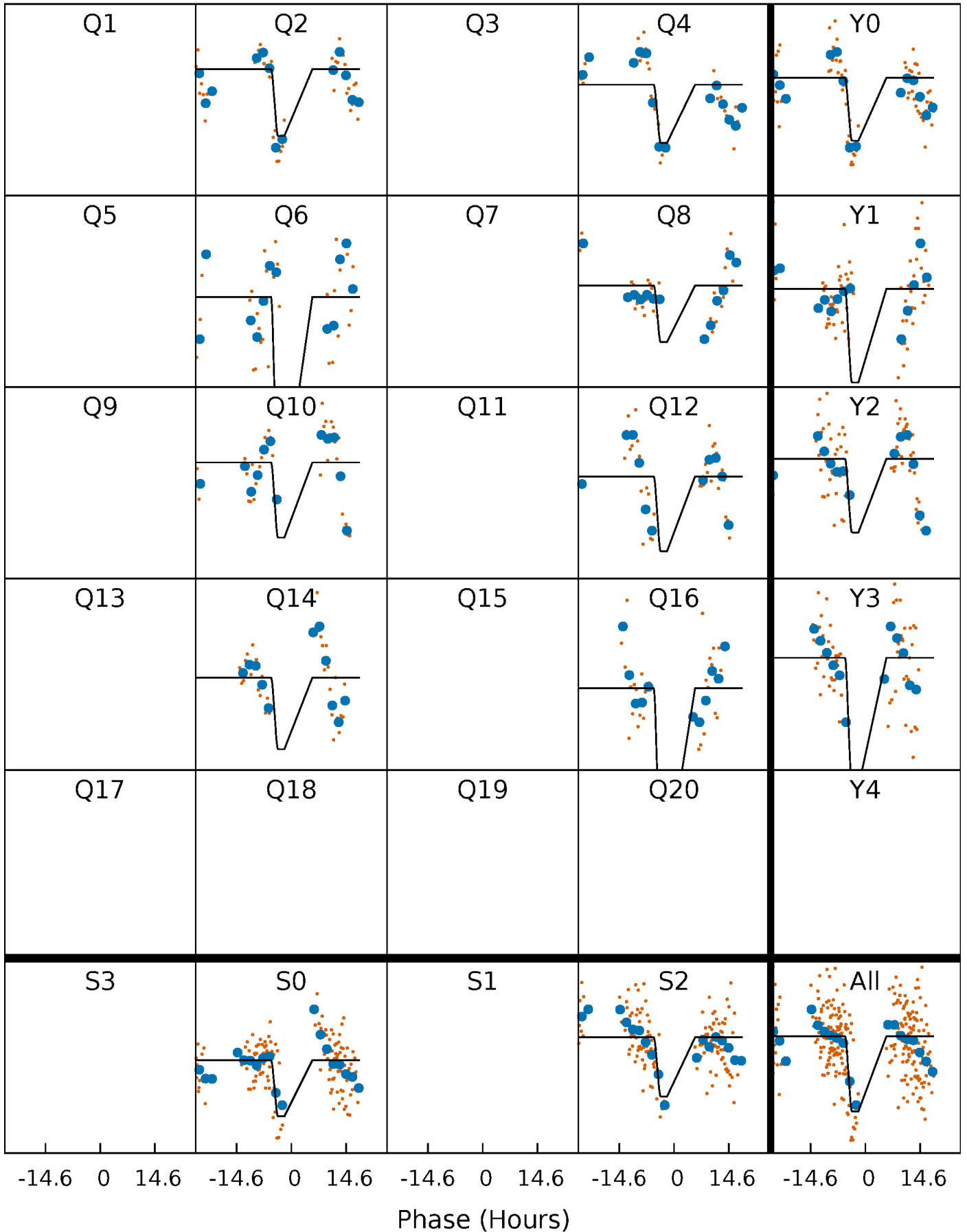
# DV Quarter-Phased Transit Curves

TCE 005171493-02 P=187.004272 Days  $T_0=234.372257$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005171493-02 P=187.015644 Days  $T_0=234.312176$  (BKJD)

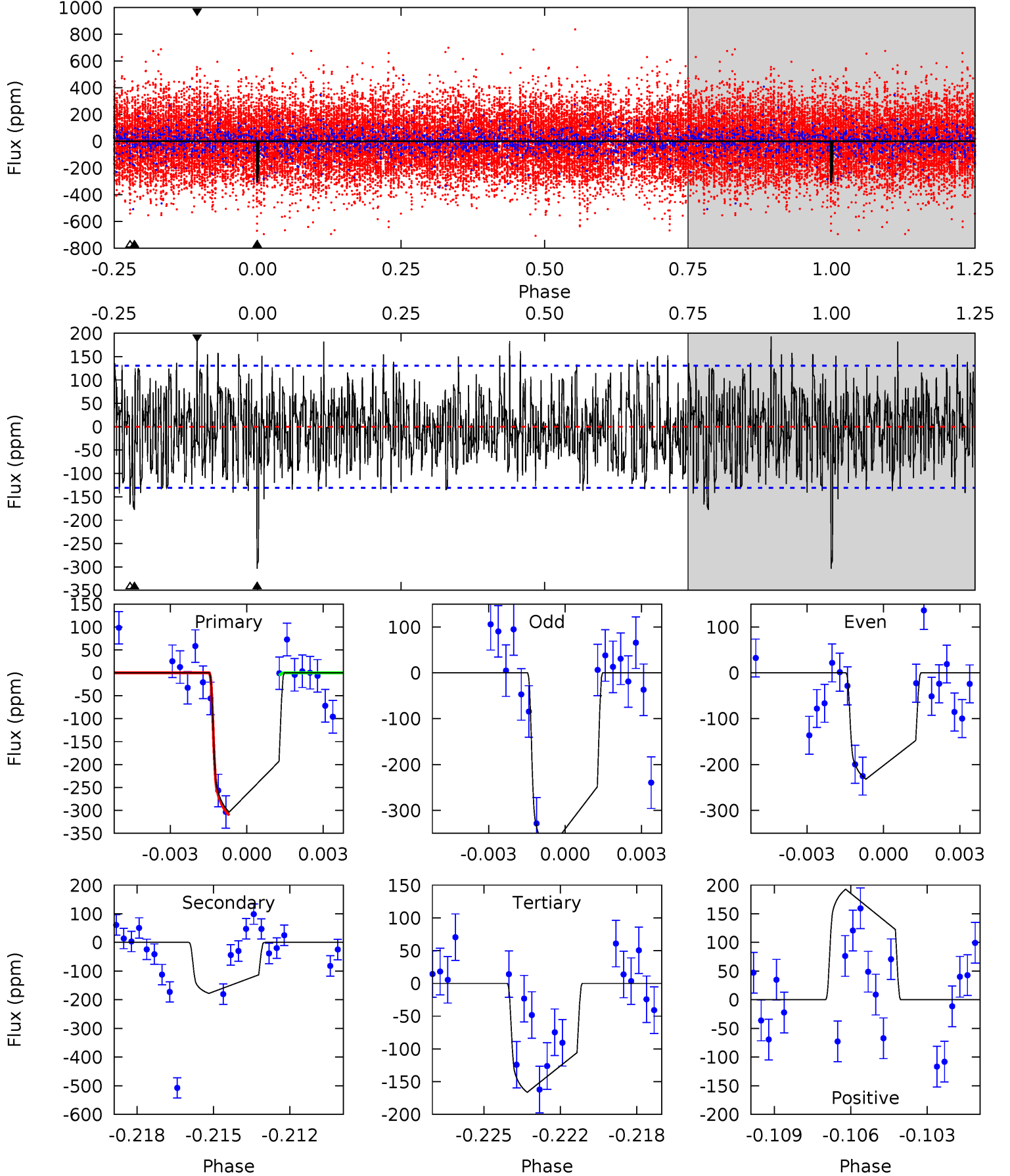




# DV Model-Shift Uniqueness Test

005171493-02,  $P = 187.004272$  Days,  $E = 47.367985$  Days

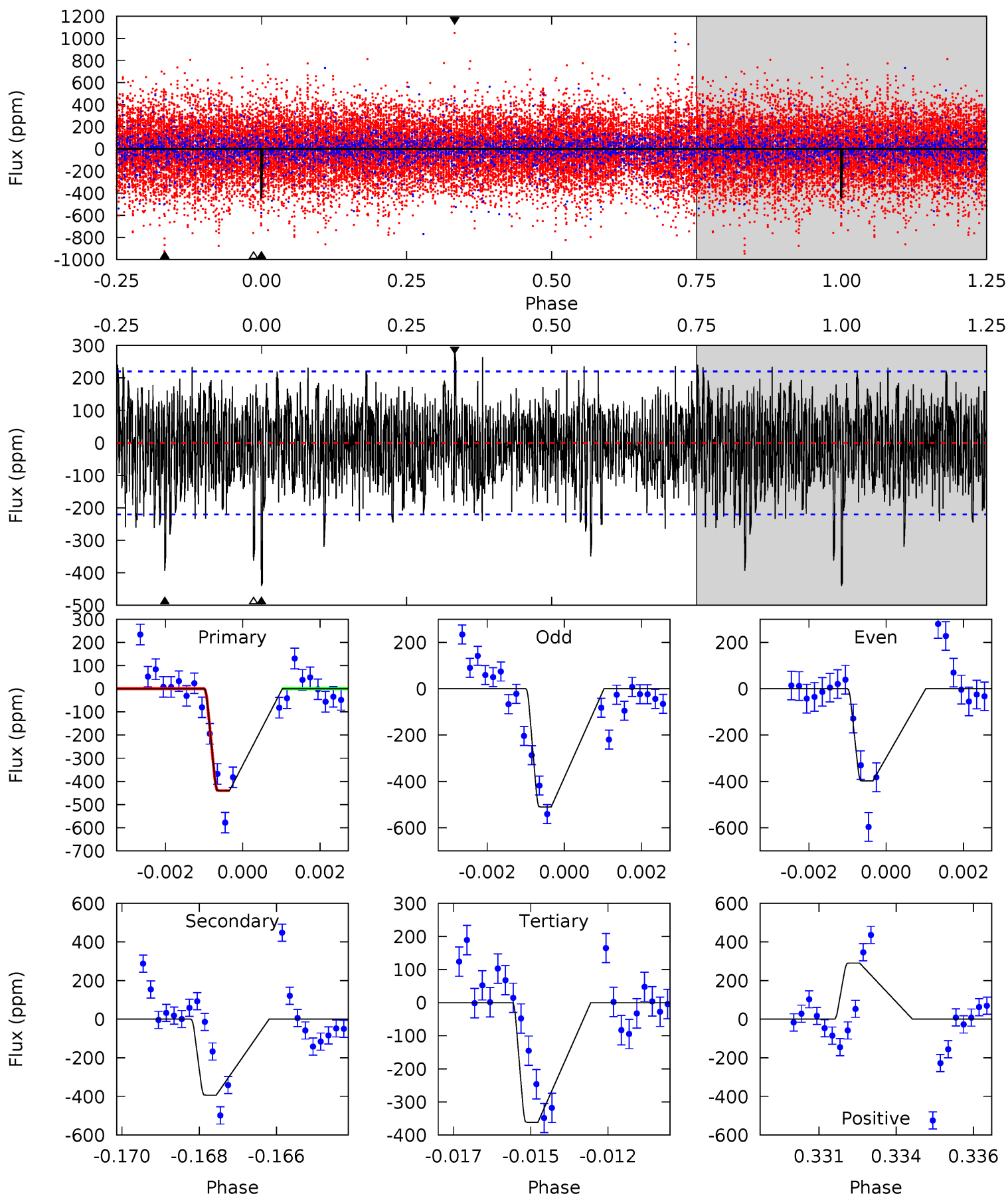
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	7.13	6.67	7.72	5.24	2.95	2.27	5.51	4.45	0.46	-0.60	3.17	0.97	0.39	4.15



# Alt Model-Shift Uniqueness Test

005171493-02, P = 187.015644 Days, E = 47.296532 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	9.46	8.70	6.98	5.29	3.03	1.84	1.87	3.59	0.76	2.48	1.31	0	0.40	0



### Stellar Parameters For KIC 005171493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6502^{+158}_{-177}$	$3.506^{+0.360}_{-0.090}$	$-0.120^{+0.350}_{-0.250}$	$3.888^{+0.384}_{-1.537}$	$1.769^{+0.189}_{-0.379}$	$0.042^{+0.122}_{-0.012}$
	+2%/-3%	+10%/-3%	+292%/-208%	+10%/-40%	+11%/-21%	+287%/-28%
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 005171493-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-178 \pm 25$	$7.43^{+1.37}_{-1.59}$	$888^{+42}_{-77}$	$5582^{+464}_{-390}$	$1100^{+580}_{-355}$
Alt.	$-394 \pm 42$	$9.12^{+1.52}_{-1.87}$	$884^{+48}_{-84}$	$6101^{+444}_{-380}$	$1557^{+873}_{-446}$

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

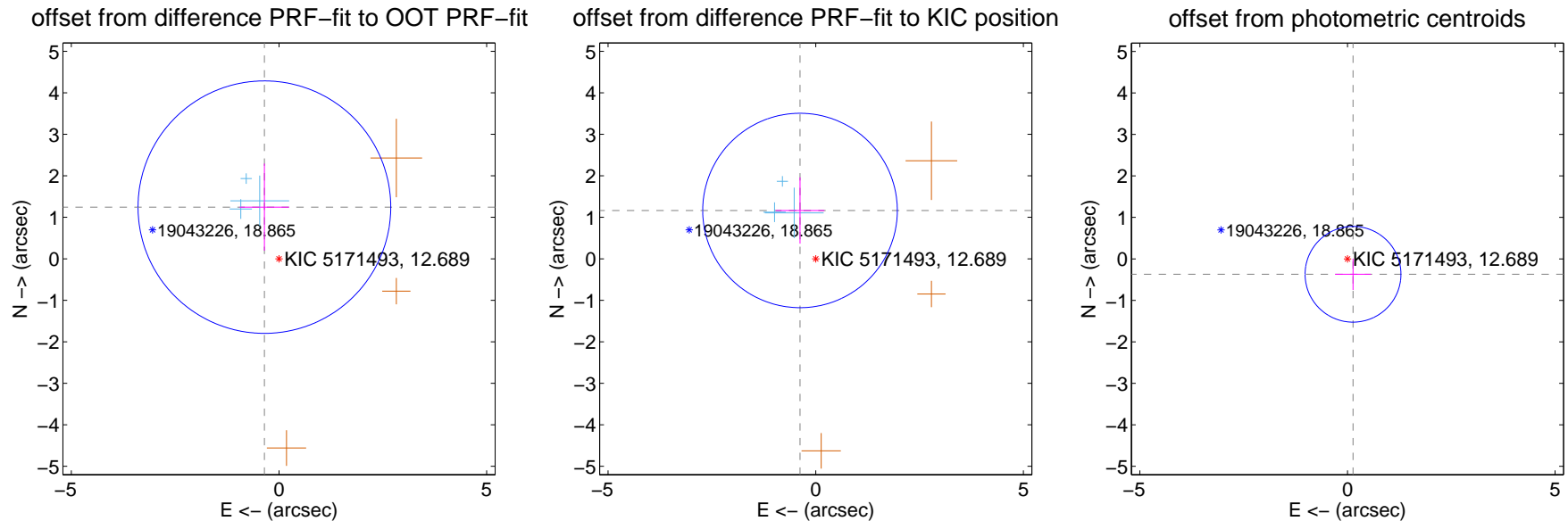
## DV Centroid Data

Supplemental centroid analysis for 005171493-02. Kepler magnitude: 12.69. Transit SNR 6.04

There are 3 quarters with good PRF difference image offsets

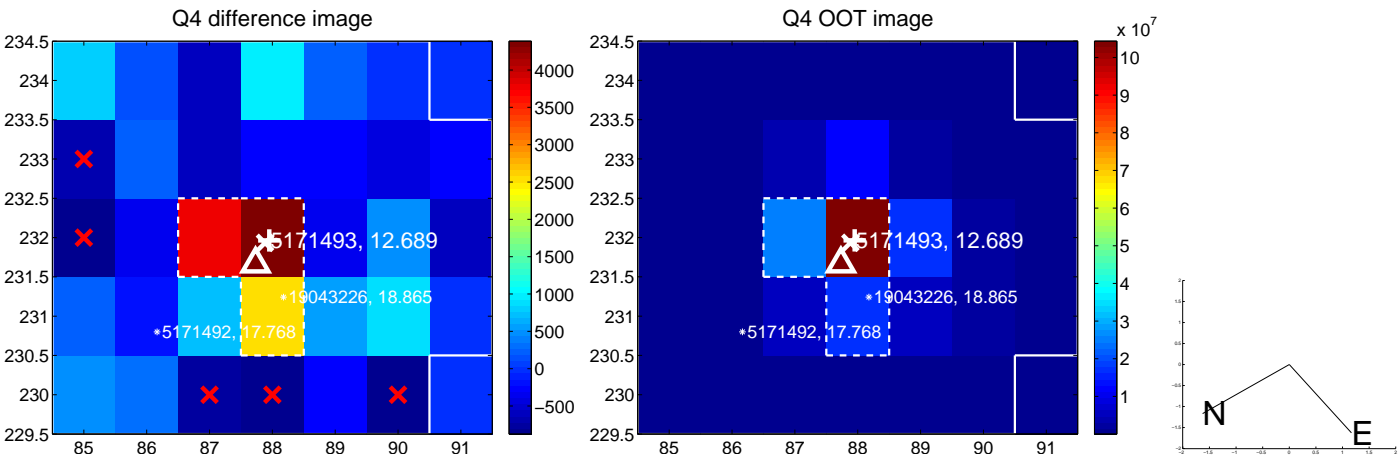
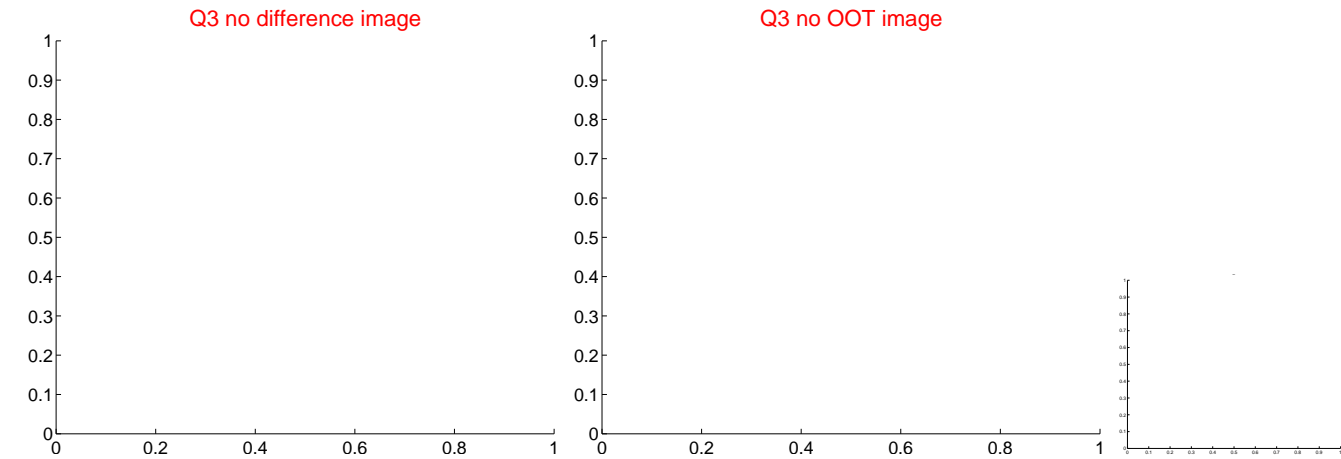
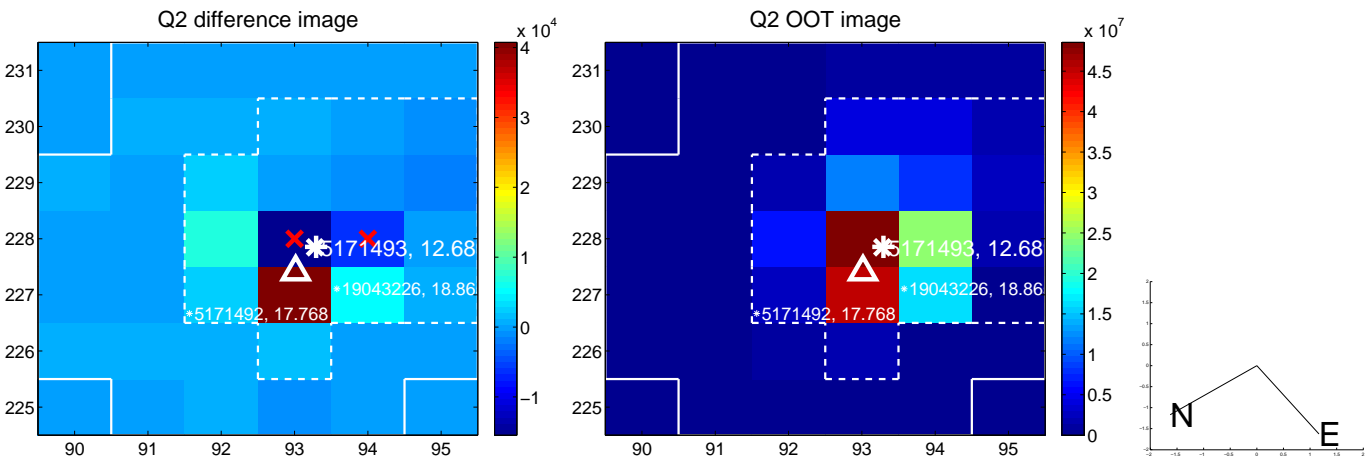
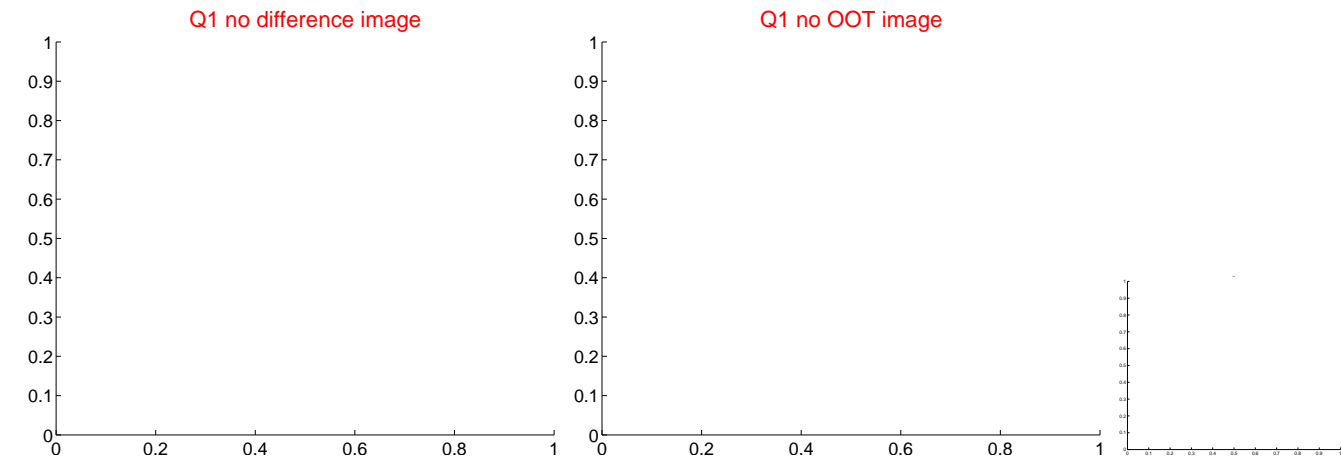
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.294 \pm 1.014$	1.28	$0.352 \pm 0.594$	$1.245 \pm 1.050$
PRF-fit source offset from KIC position	$1.224 \pm 0.781$	1.57	$0.378 \pm 0.585$	$1.164 \pm 0.799$
photometric centroid source offset	$0.39 \pm 0.38$	1.03	$-0.13 \pm 0.43$	$-0.37 \pm 0.38$

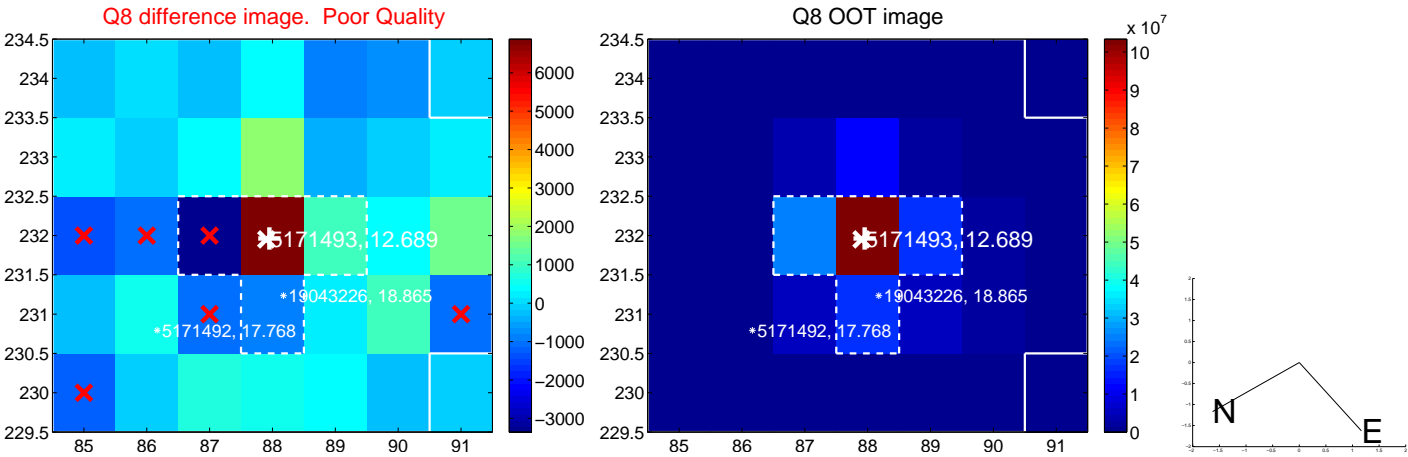
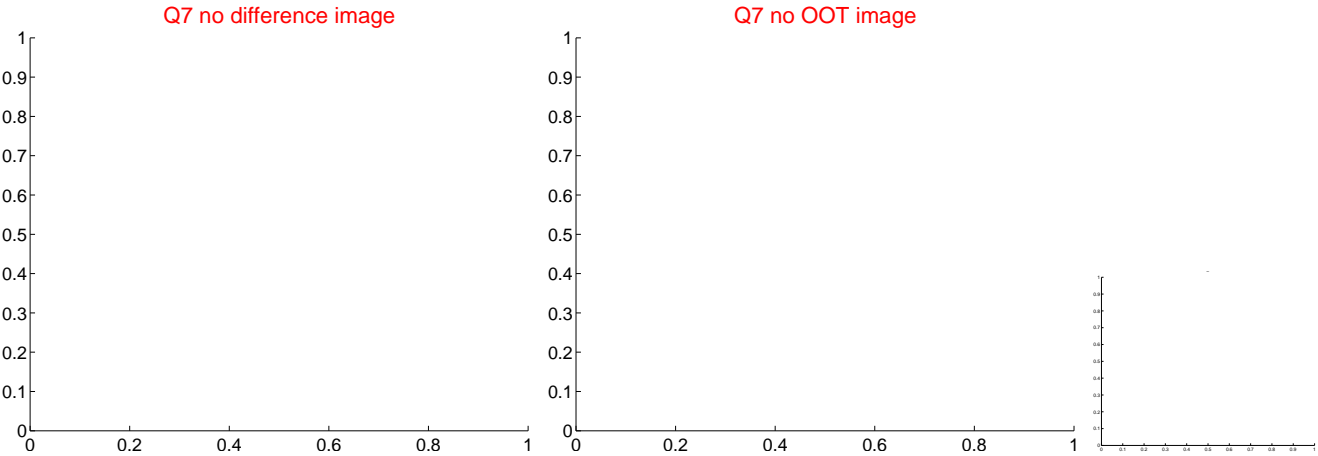
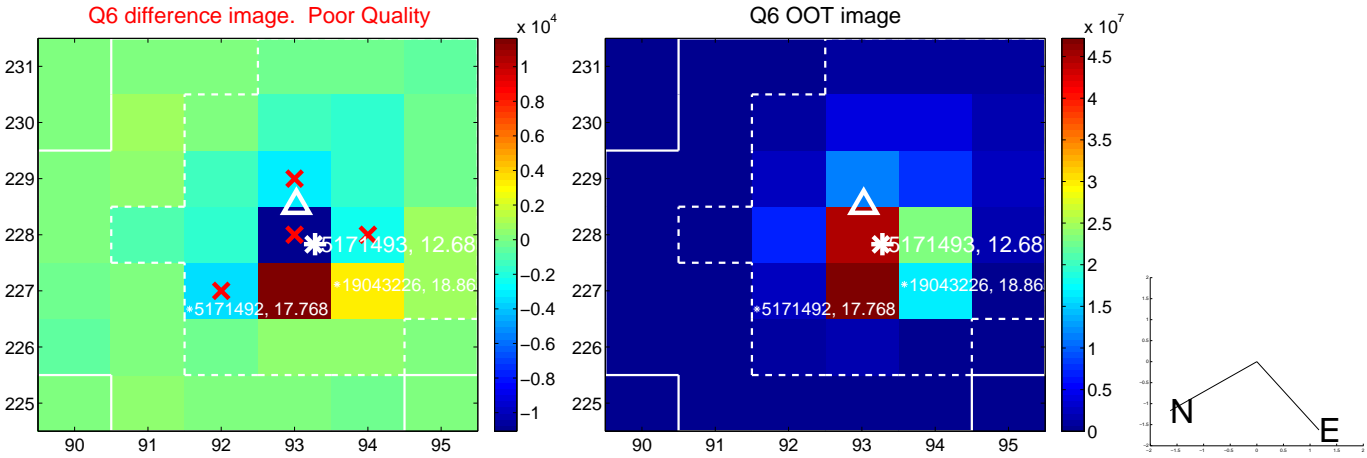
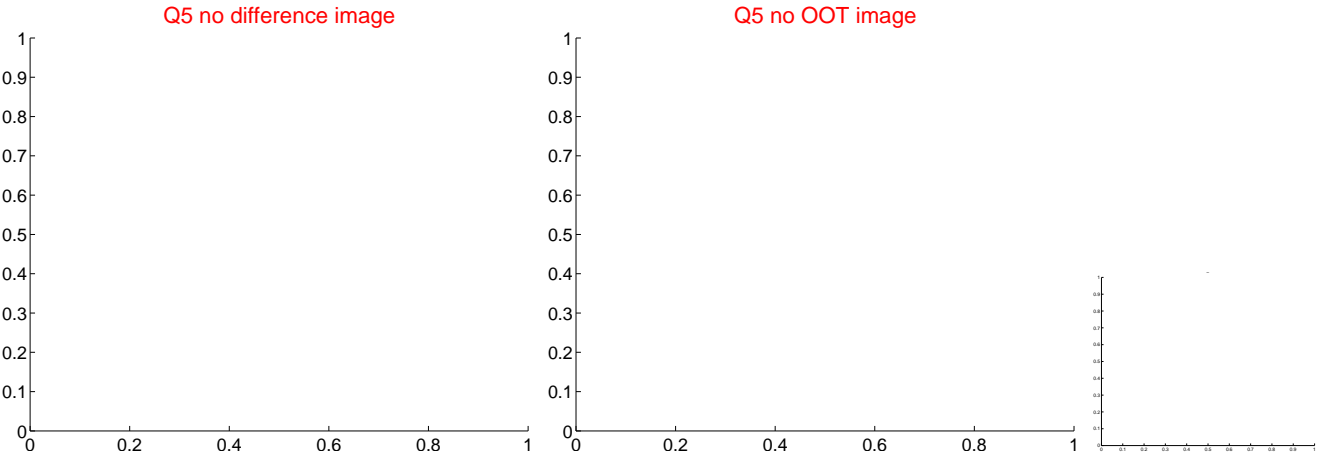


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

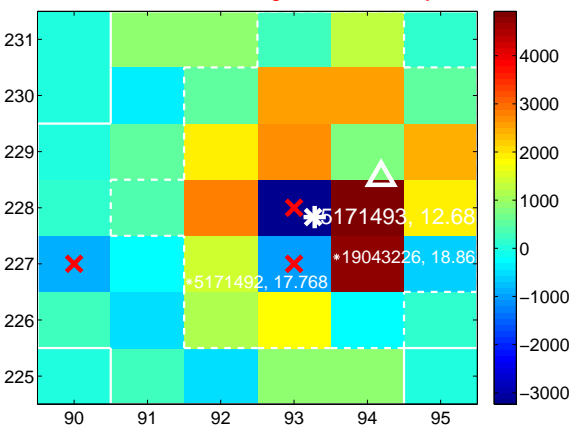
Q9 no difference image



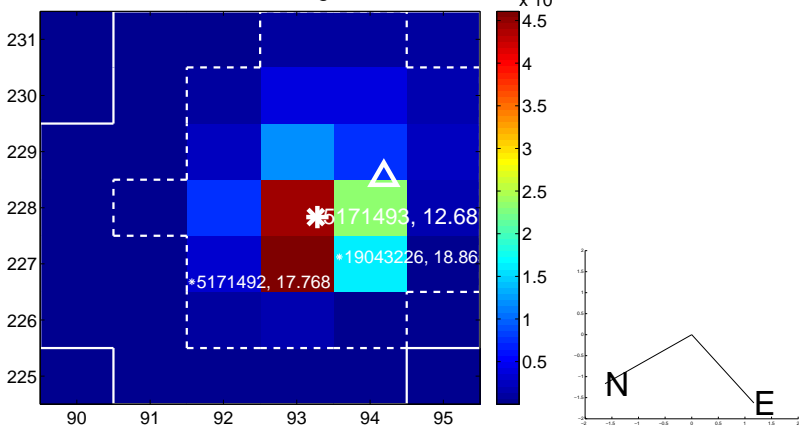
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



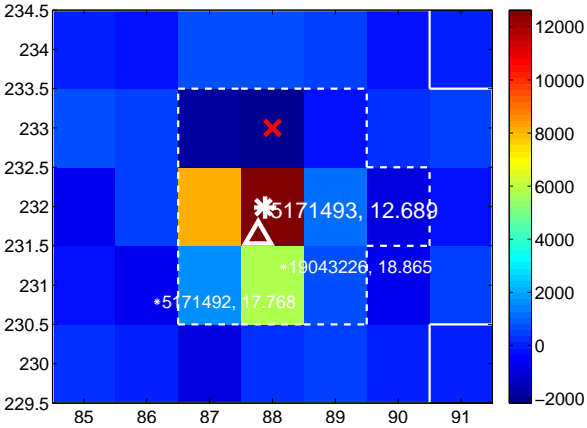
Q11 no difference image



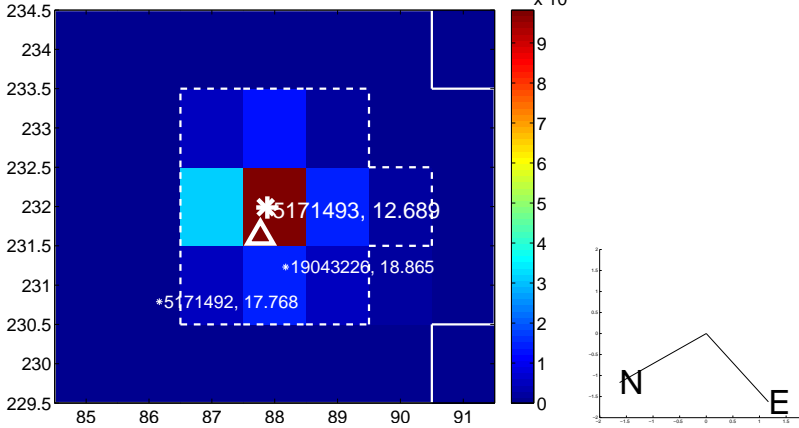
Q11 no OOT image



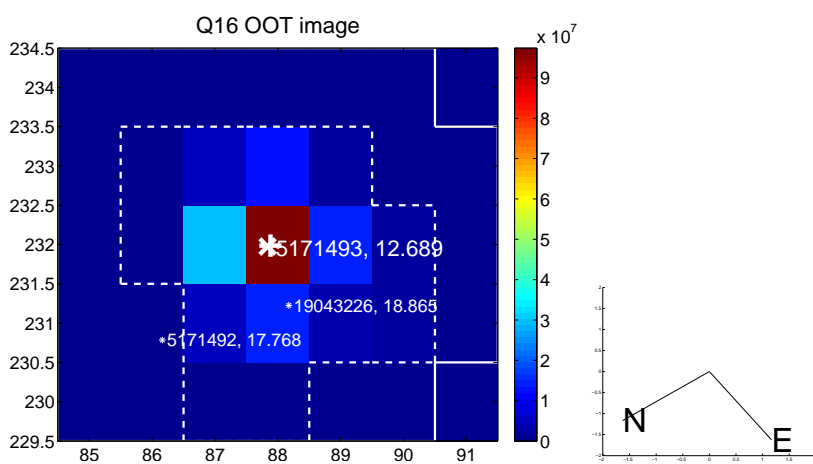
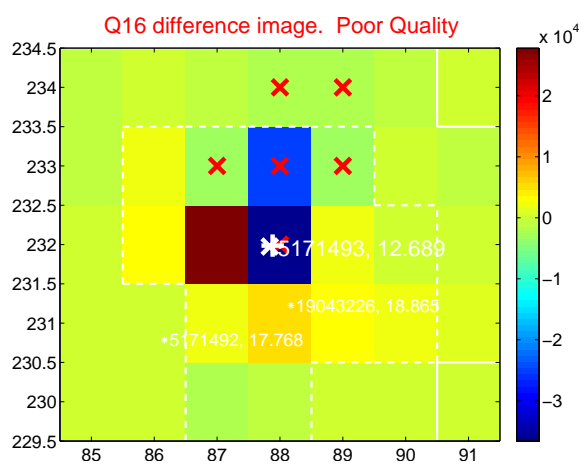
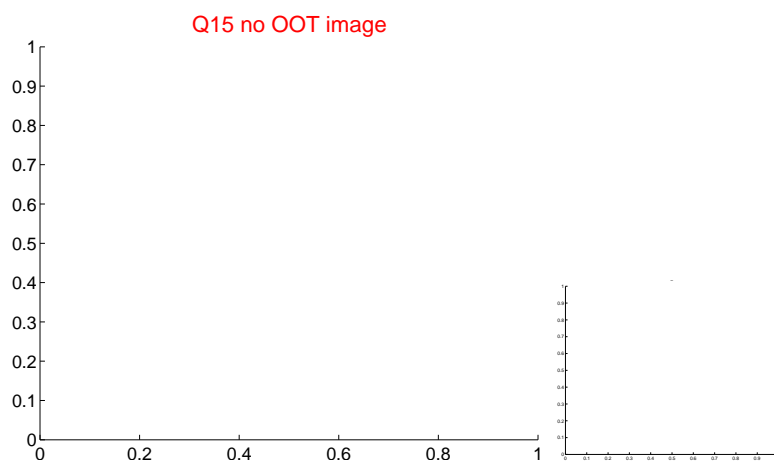
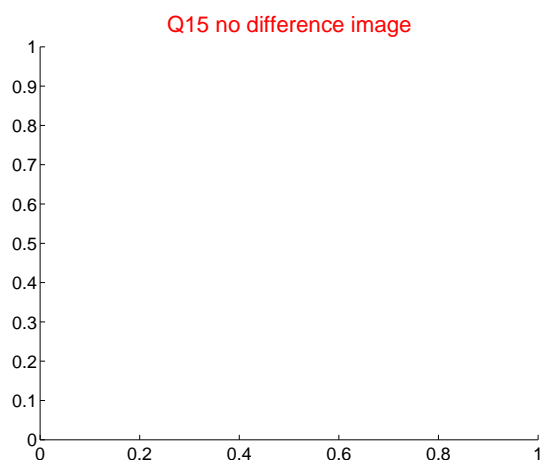
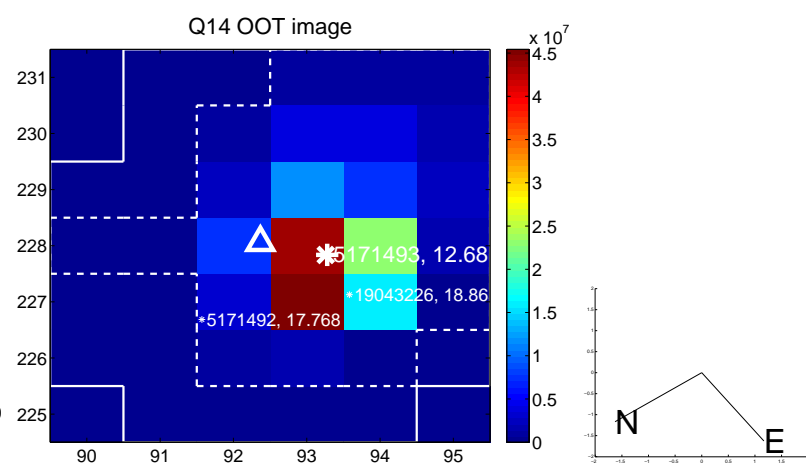
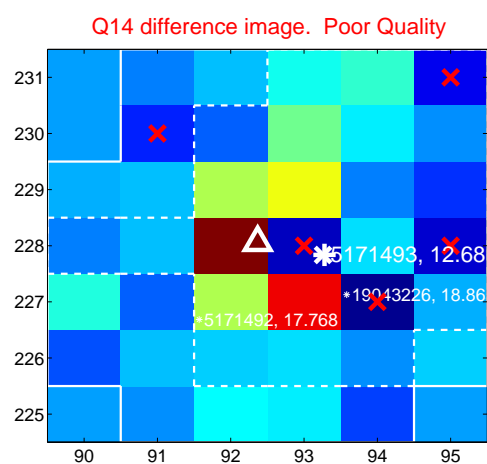
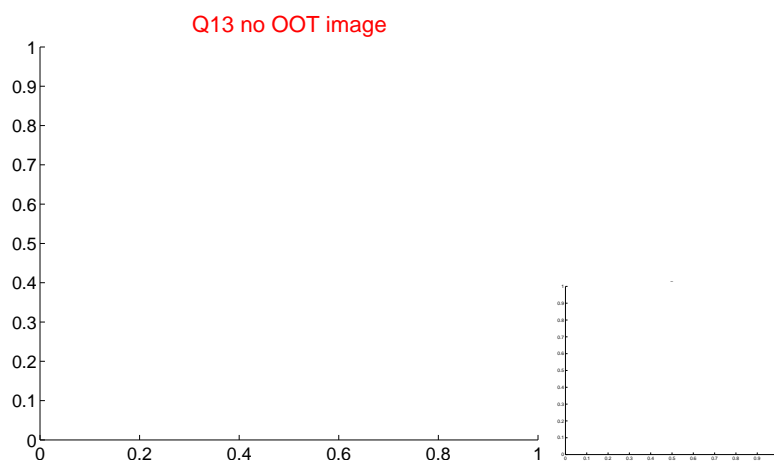
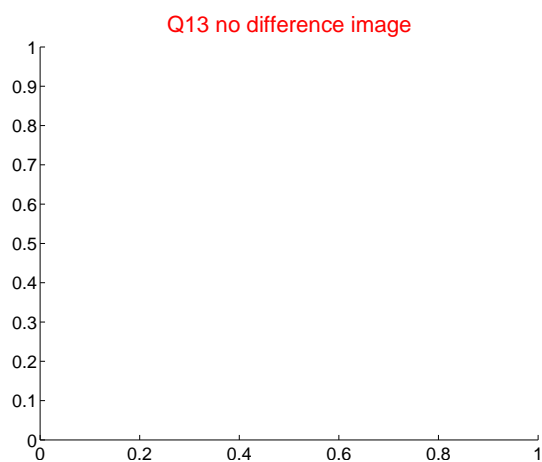
Q12 difference image



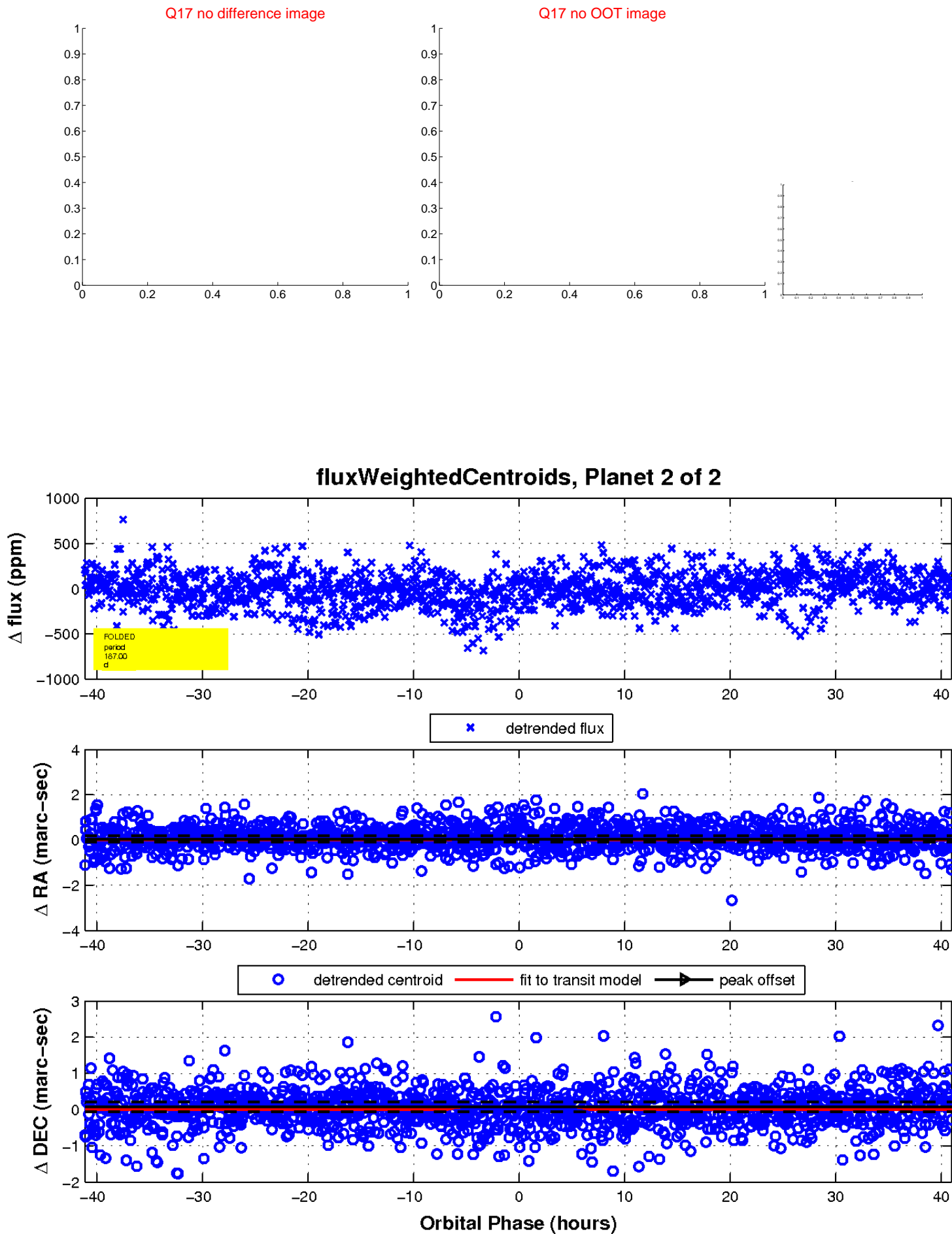
Q12 OOT image



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

