

# KIC 006073006

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006073006-01	OBS	No	1.344753	131.611789	0.0	7.116	9.7	0.0	1.67	6770	0.01	7450.81
006073006-02	OBS	No	1.345455	131.722106	28.9	3.269	9.3	8.7	1.67	6770	0.97	7445.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006073006-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006073006-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT

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

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

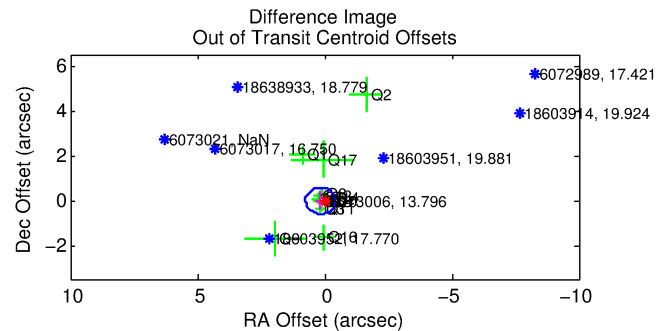
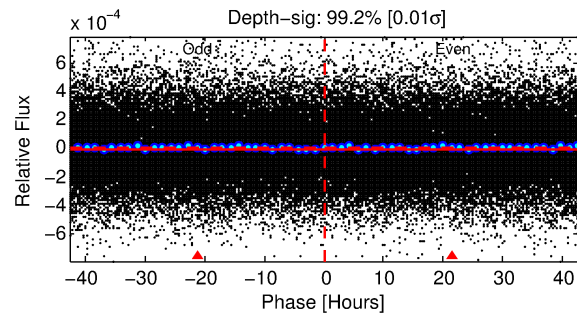
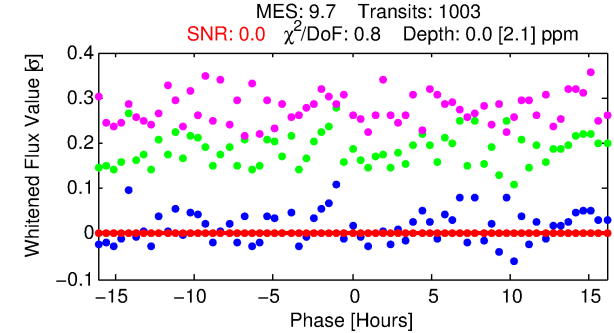
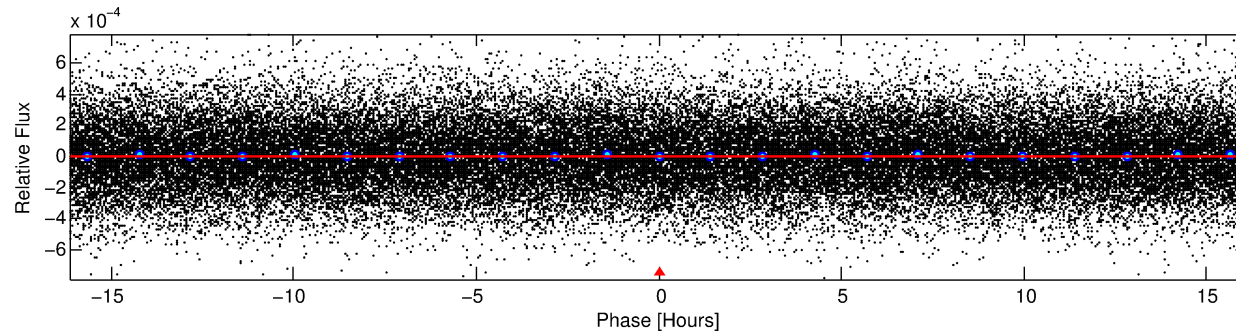
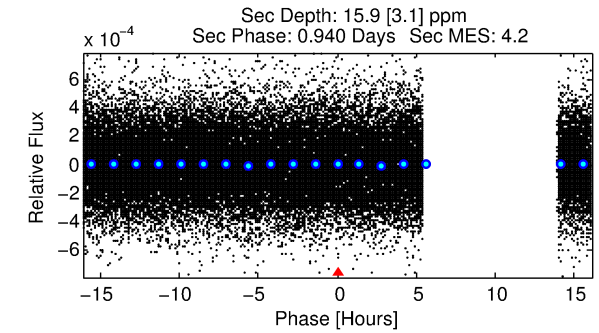
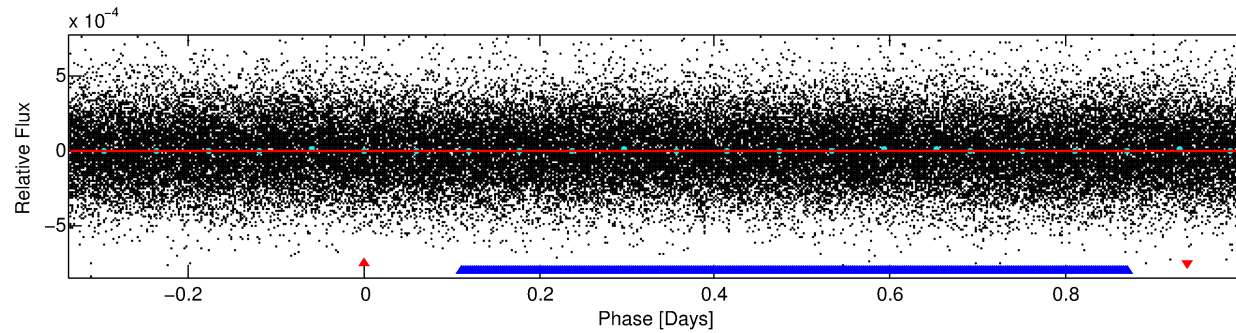
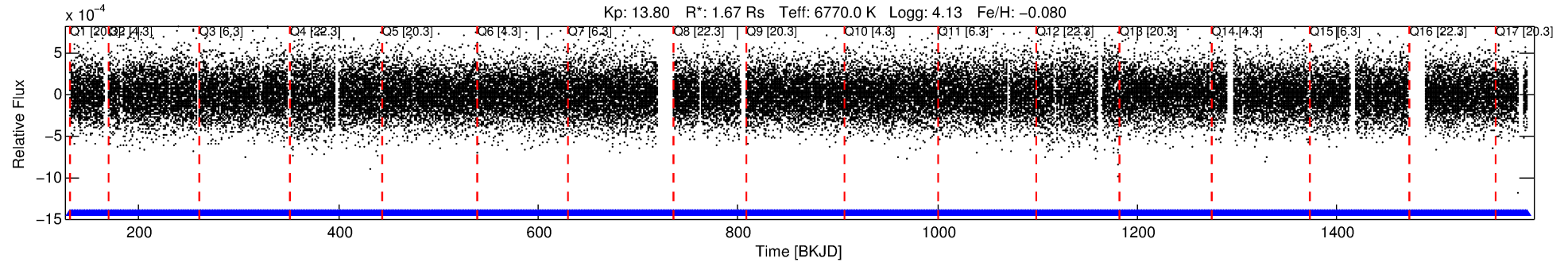
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006073006-01

No Significant Match Found

# DV One-Page Summary

KIC: 6073006 Candidate: 1 of 2 Period: 1.345 d



## DV Fit Results:

Period = 1.34475 [0.42061] d  
Epoch = 131.6118 [146.0572] BKJD  
Rp/R\* = 0.0000 [0.0375]  
a/R\* = 1.11 [84.51]  
b = 0.91 [127.87]  
Seff = 7450.81 [4264.78]  
Teq = 2369 [339] K  
Rp = 0.01 [6.84] Re  
a = 0.0265 [0.0086] AU  
Ag = 163558.96 [364298219.68] [0.00σ]  
Teffp = 73661 [41018882] K [0.00σ]

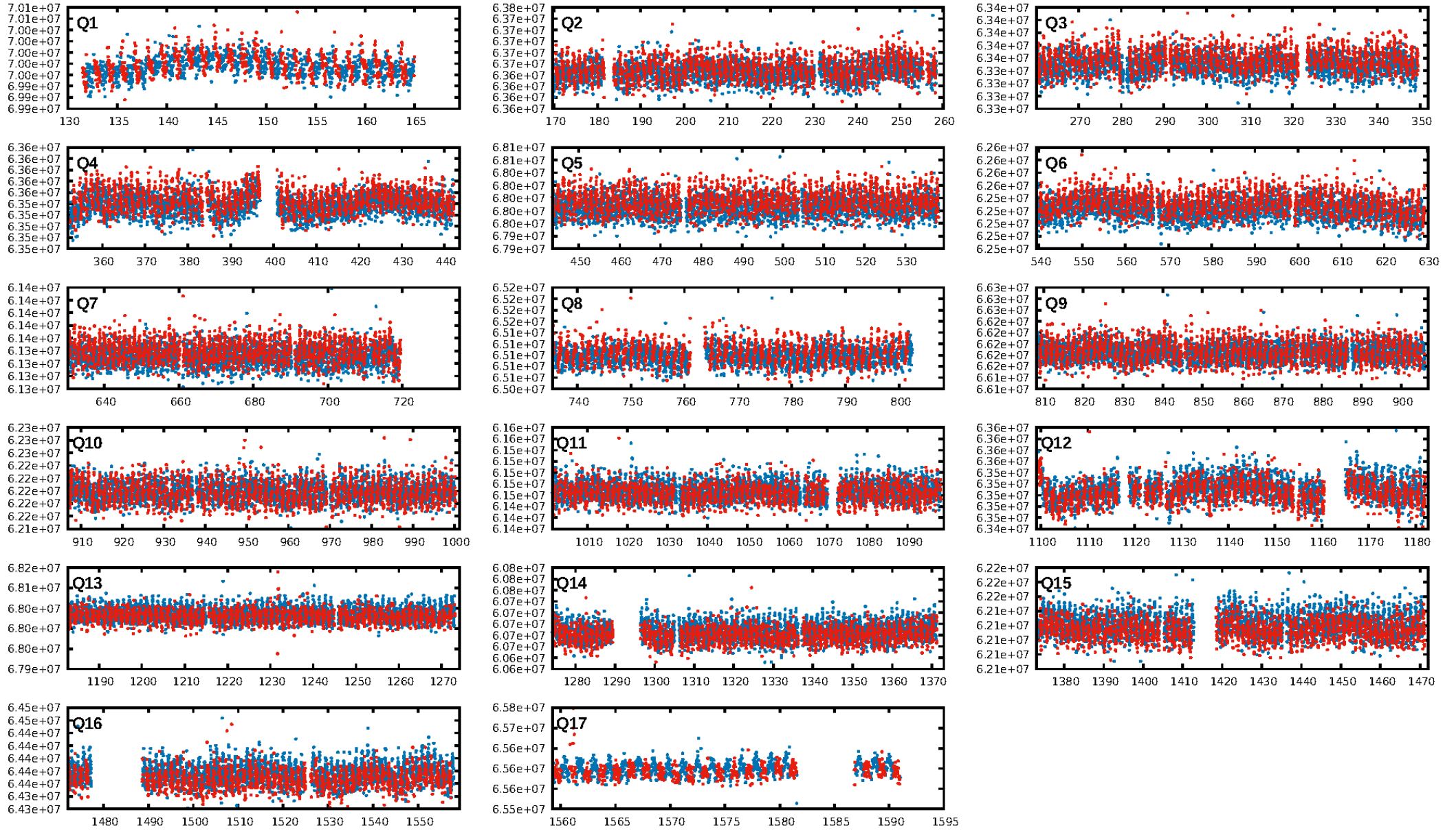
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.2% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.03e-19  
RollingBand-fgt: 1.00 [958/958]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.161 arcsec [0.82σ]  
KicOffset-rm: 0.172 arcsec [0.45σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.44 [7/16]  
DiffImageOverlap-fno: 0.12 [2/17]

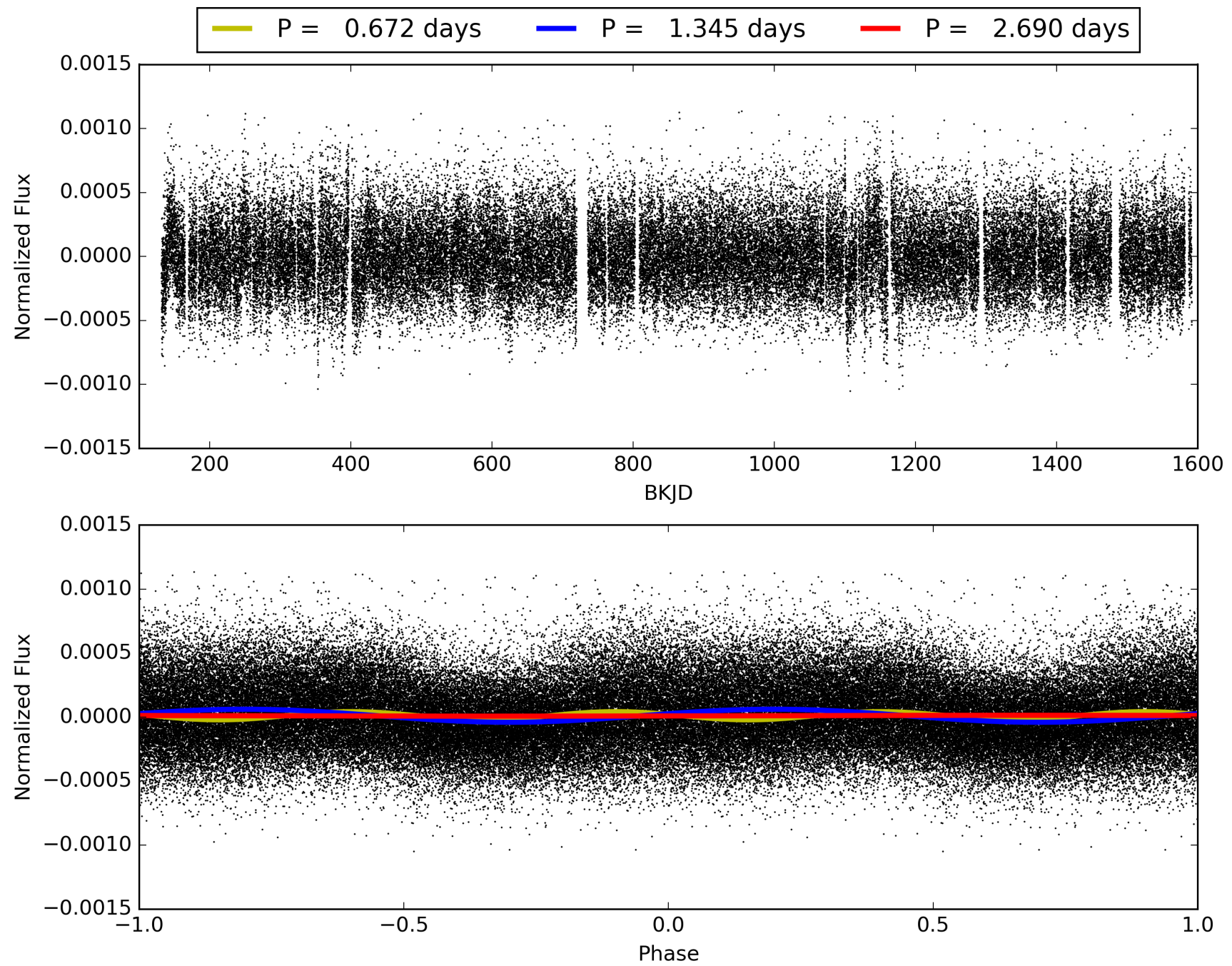
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 17:38:16 Z

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

# TCE 006073006-01, PDC Light Curves



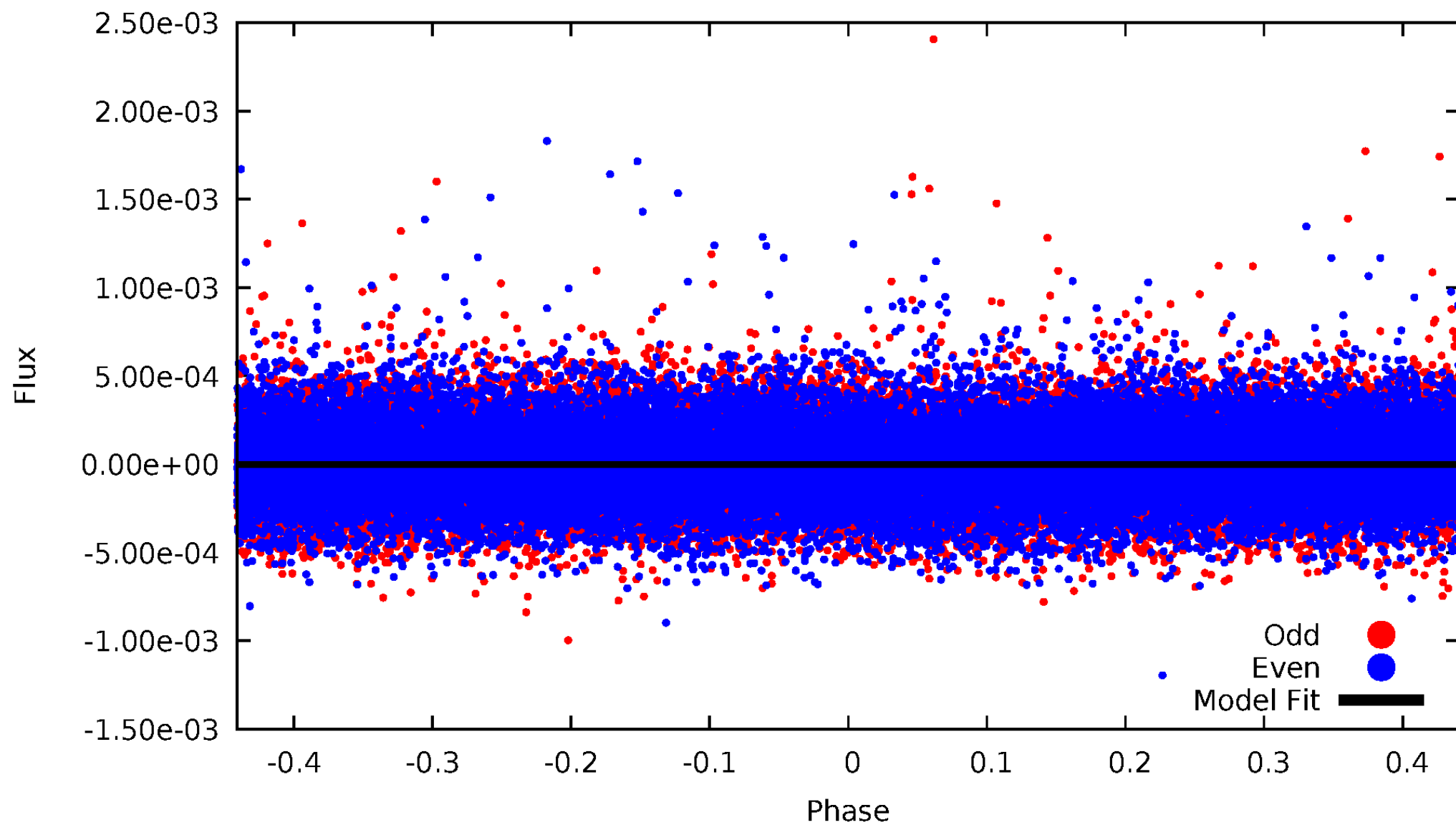
TCE 006073006-01





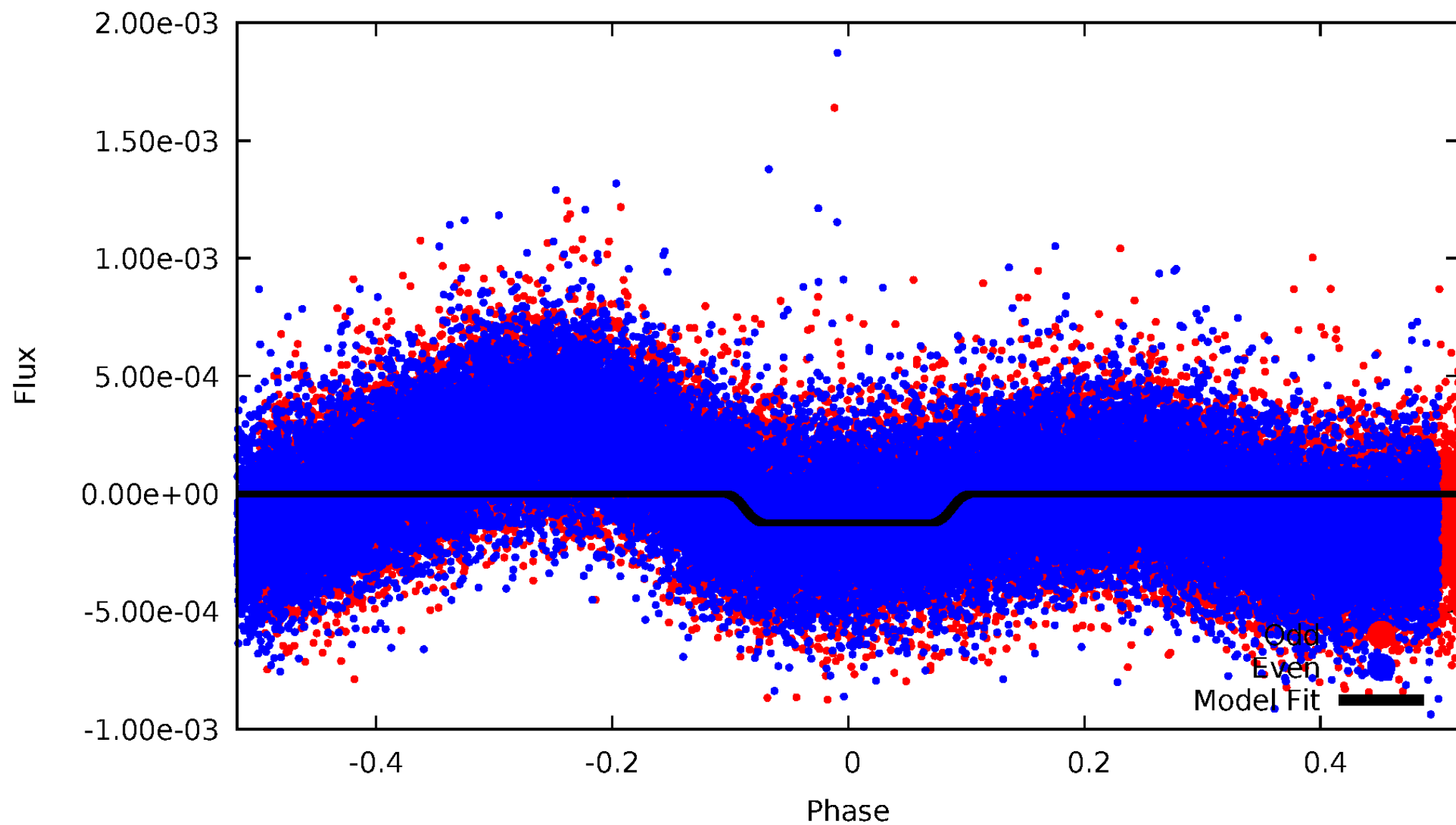
# DV Odd/Even

TCE 006073006-01



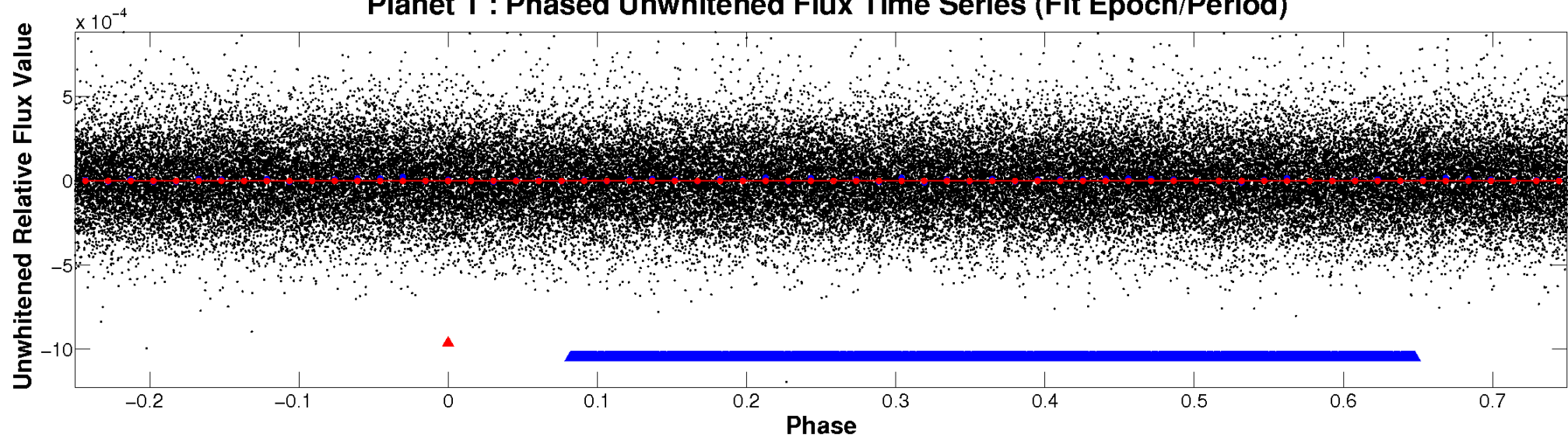
# ALT Odd/Even

TCE 006073006-01

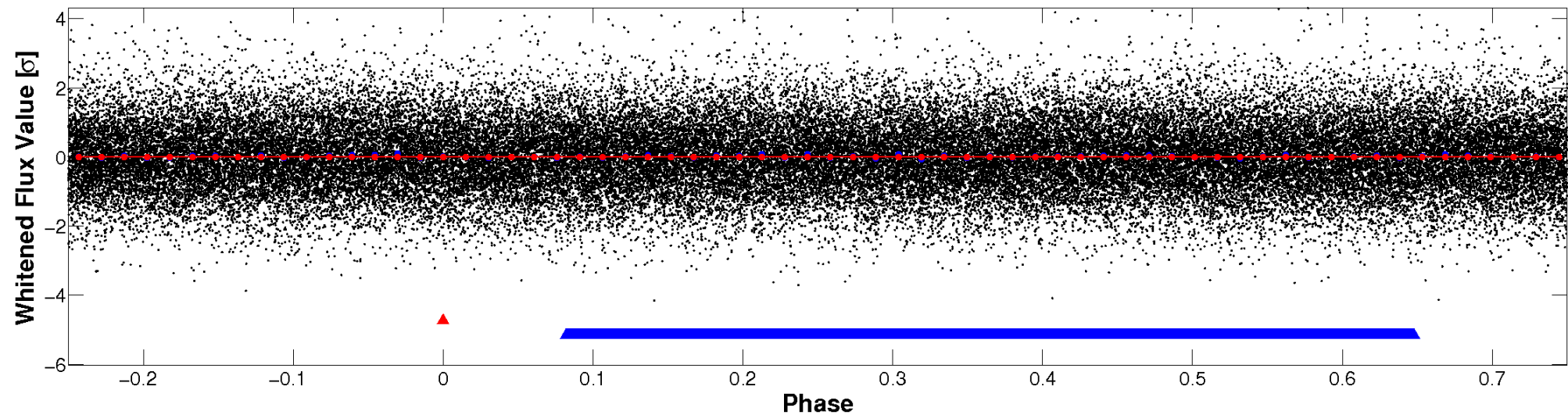


# Non-Whitened Vs. Whitened Light Curve

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

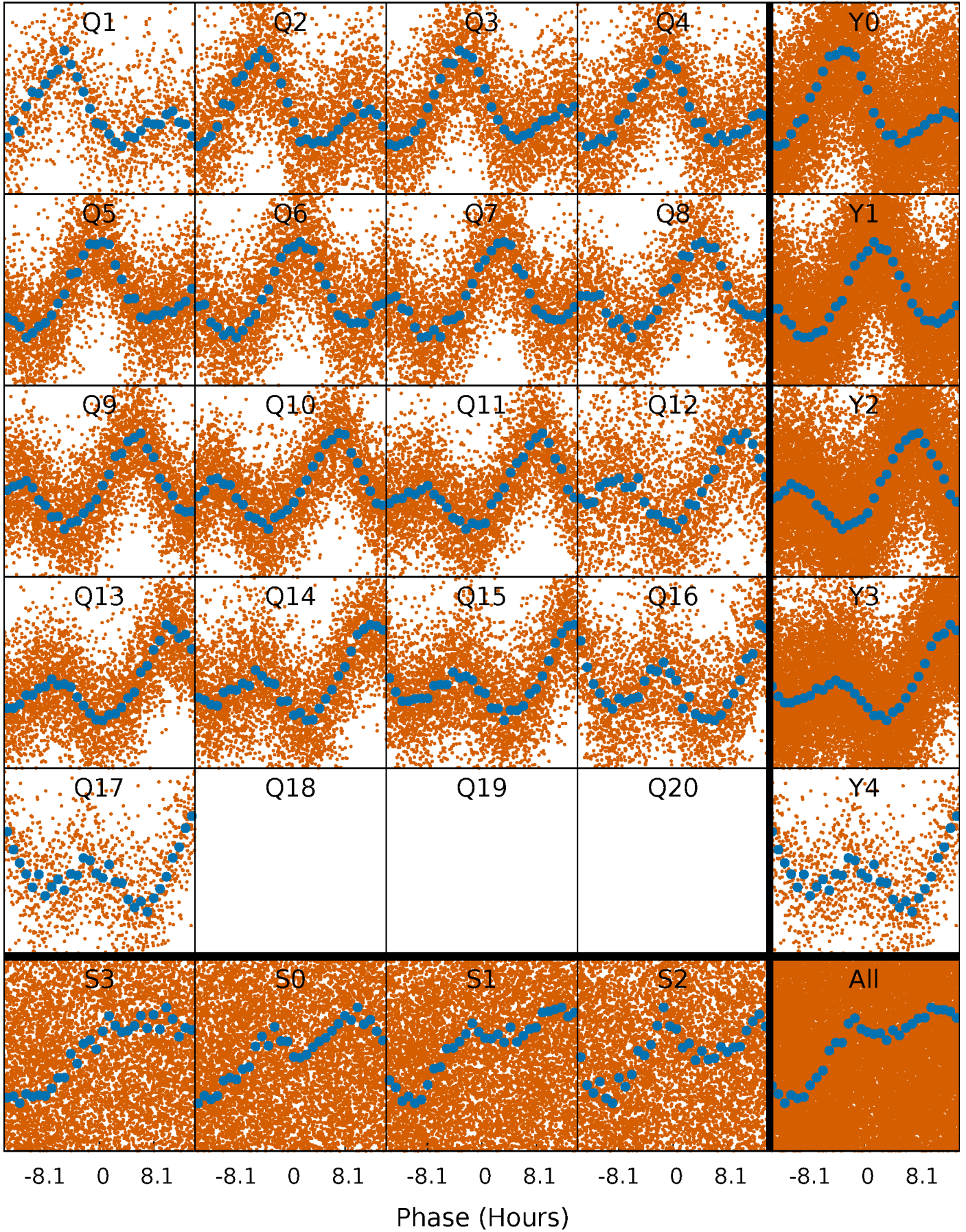


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

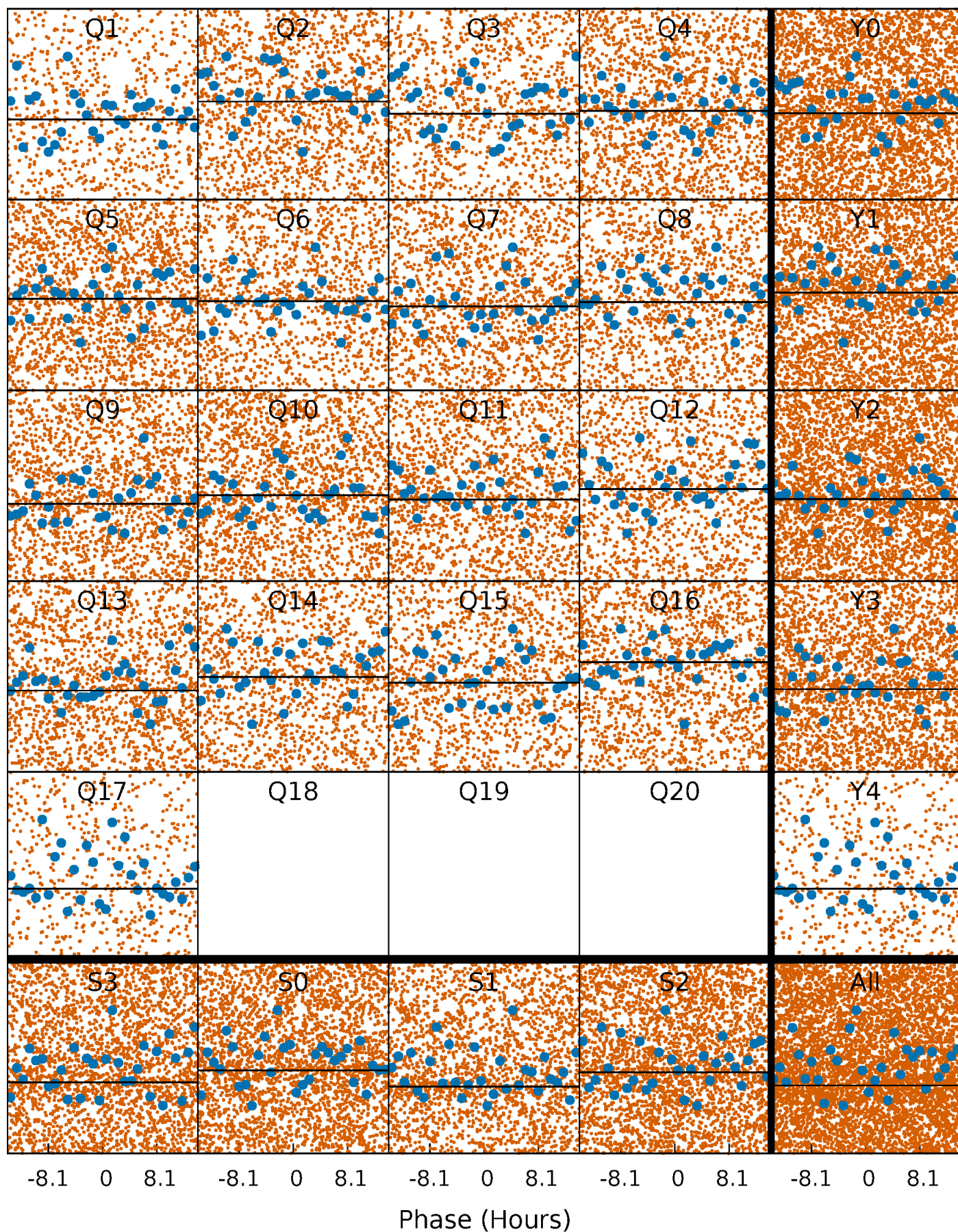
TCE 006073006-01 P= 1.344753 Days  $T_0=131.611789$  (BKJD)





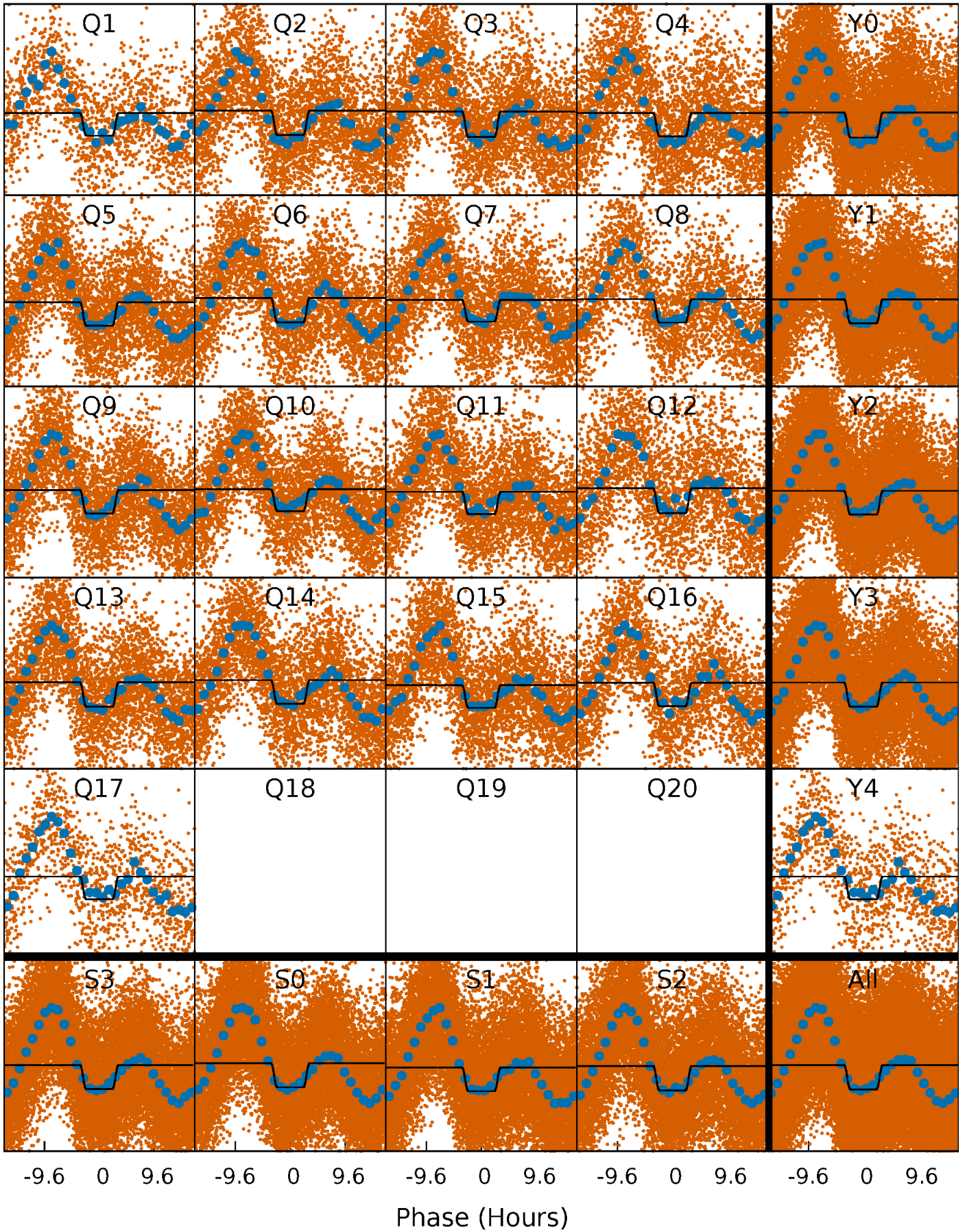
# DV Quarter-Phased Transit Curves

TCE 006073006-01 P= 1.344753 Days  $T_0=131.611789$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006073006-01 P= 1.345579 Days  $T_0=131.733847$  (BKJD)

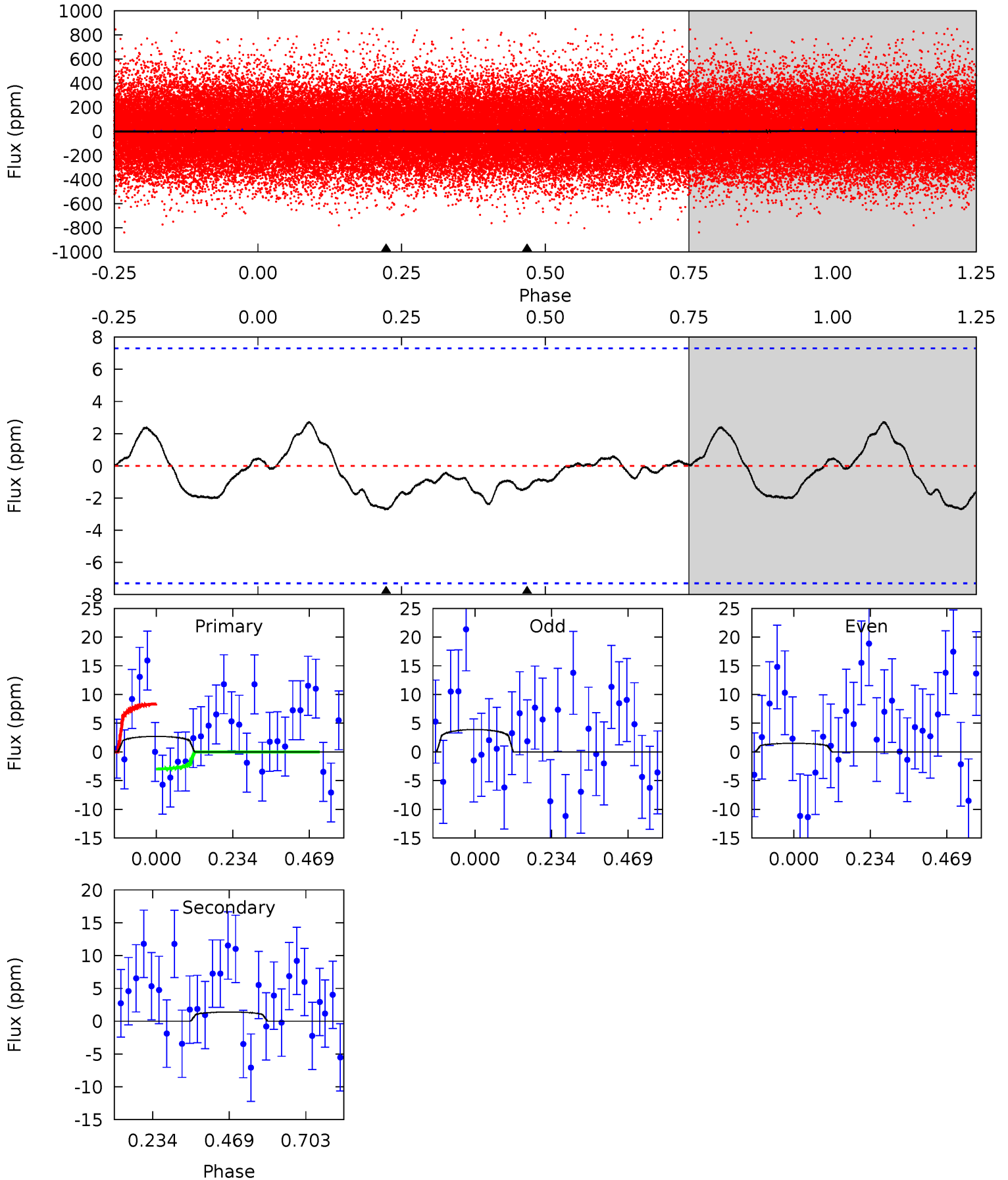




# DV Model-Shift Uniqueness Test

006073006-01, P = 1.344753 Days, E = 130.267036 Days

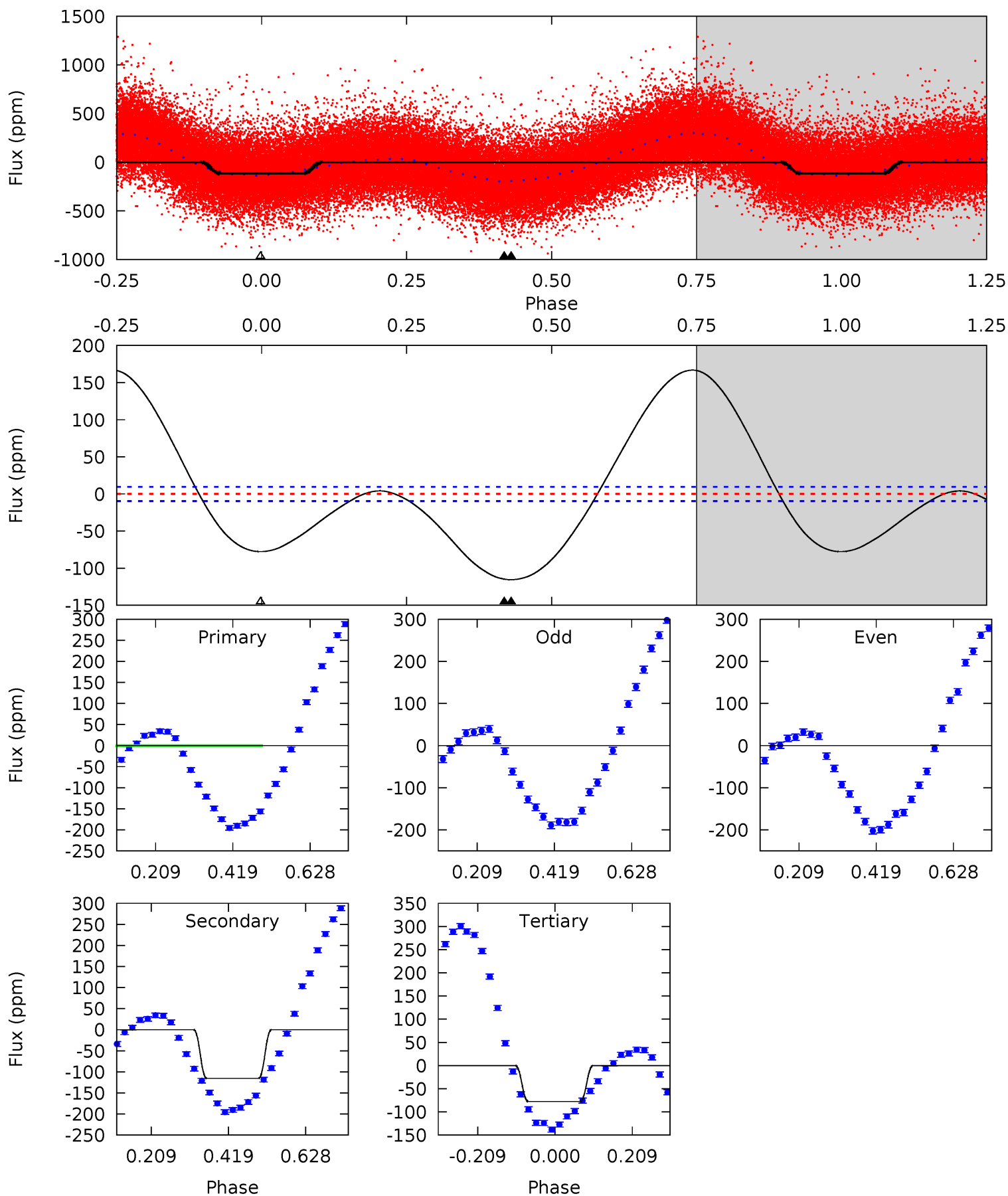
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.62	0.84	0	0	4.38	1.19	0.78	1.62	1.62	0.84	0.84	0.72	1.64	0.50	1.64



# Alt Model-Shift Uniqueness Test

006073006-01, P = 1.345579 Days, E = 130.388268 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
52.4	52.8	35.5	0	4.41	1.26	39.7	16.9	52.4	17.3	52.8	0.64	1.01	0.59	3.04





### Stellar Parameters For KIC 006073006

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6770^{+189}_{-307}$	$4.132^{+0.185}_{-0.185}$	$-0.080^{+0.250}_{-0.300}$	$1.670^{+0.502}_{-0.411}$	$1.385^{+0.196}_{-0.239}$	$0.419^{+0.420}_{-0.208}$
	+3%/-5%	+4%/-4%	+312%/-375%	+30%/-25%	+14%/-17%	+100%/-50%
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 006073006-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1 \pm 2$	$3.98^{+5.93}_{-2.75}$	$3316^{+509}_{-404}$	$-3171^{+681}_{-352}$	$0.019^{+0.231}_{-0.020}$
Alt.	$-116 \pm 2$	$5.30^{+6.11}_{-3.56}$	$3320^{+507}_{-361}$	$4144^{+2862}_{-2252}$	$1.525^{+12.490}_{-1.223}$

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

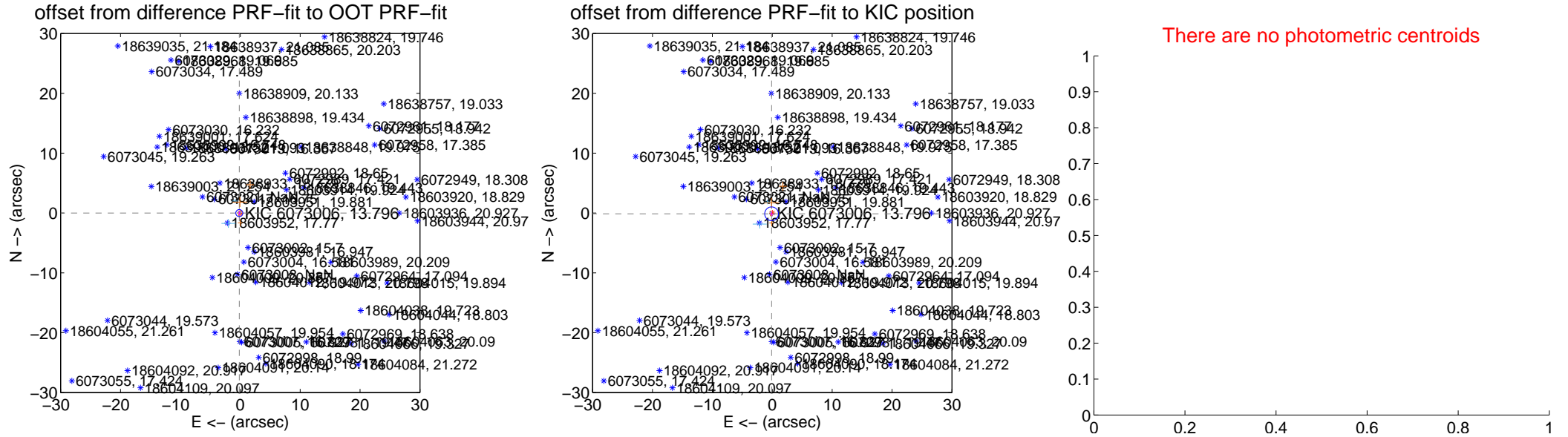
# DV Centroid Data

Supplemental centroid analysis for 006073006-01. Kepler magnitude: 13.80. Transit SNR 0.00

There are 7 quarters with good PRF difference image offsets

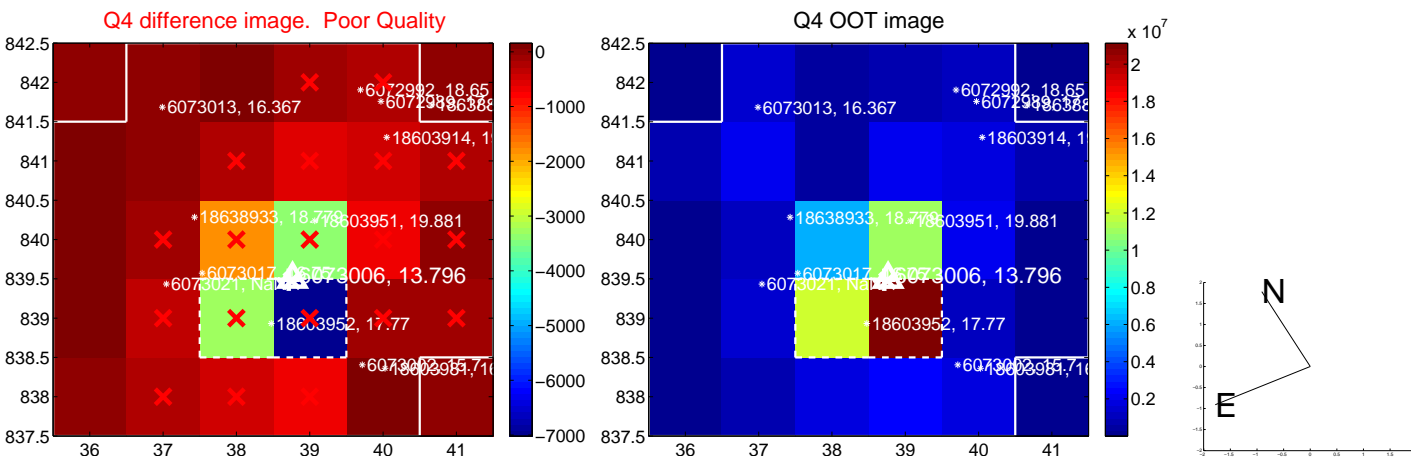
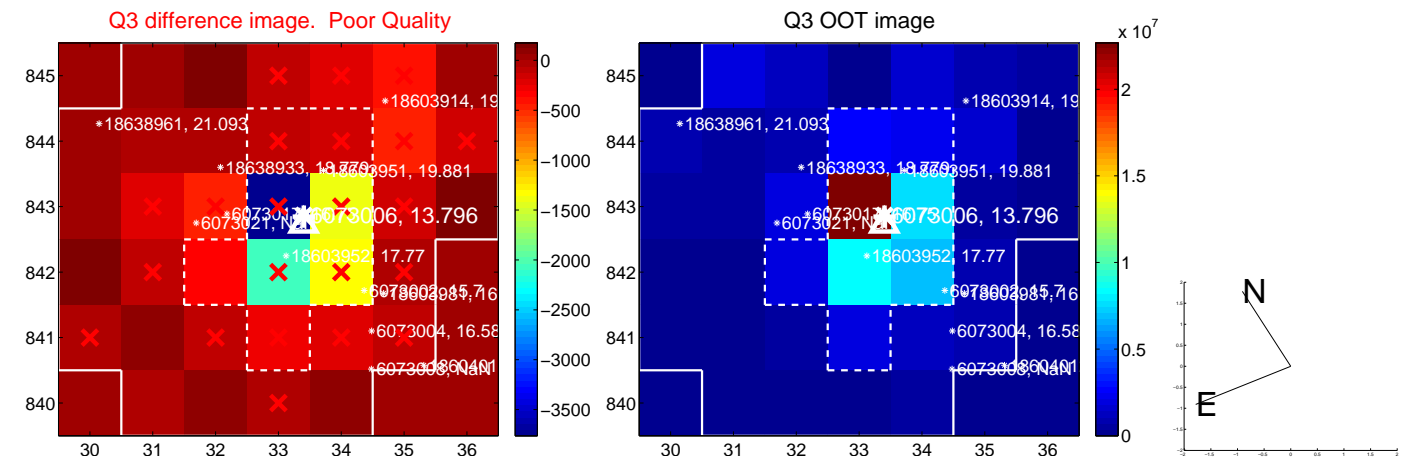
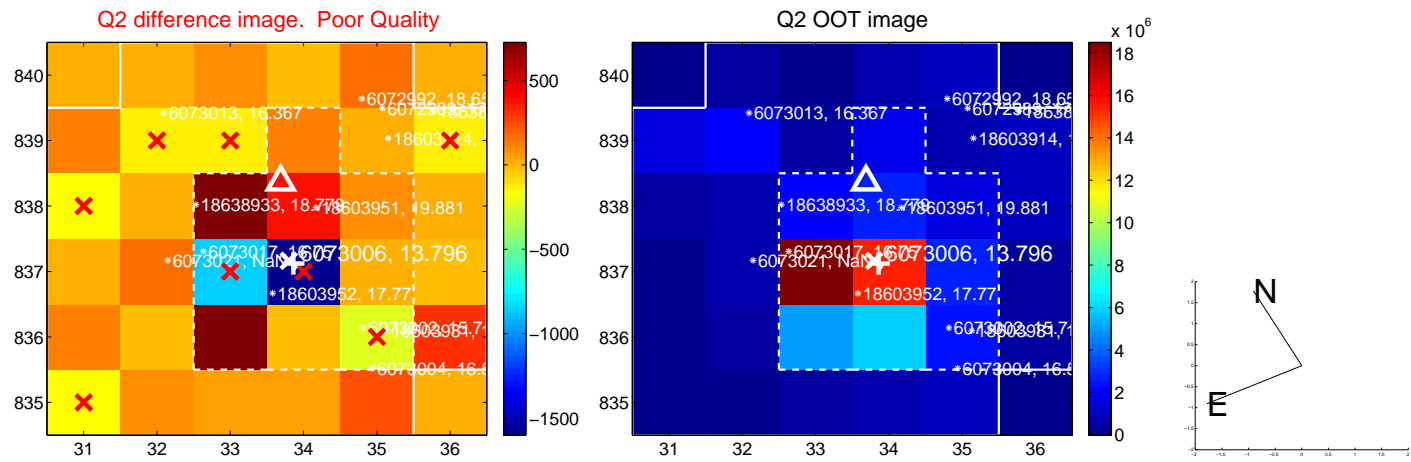
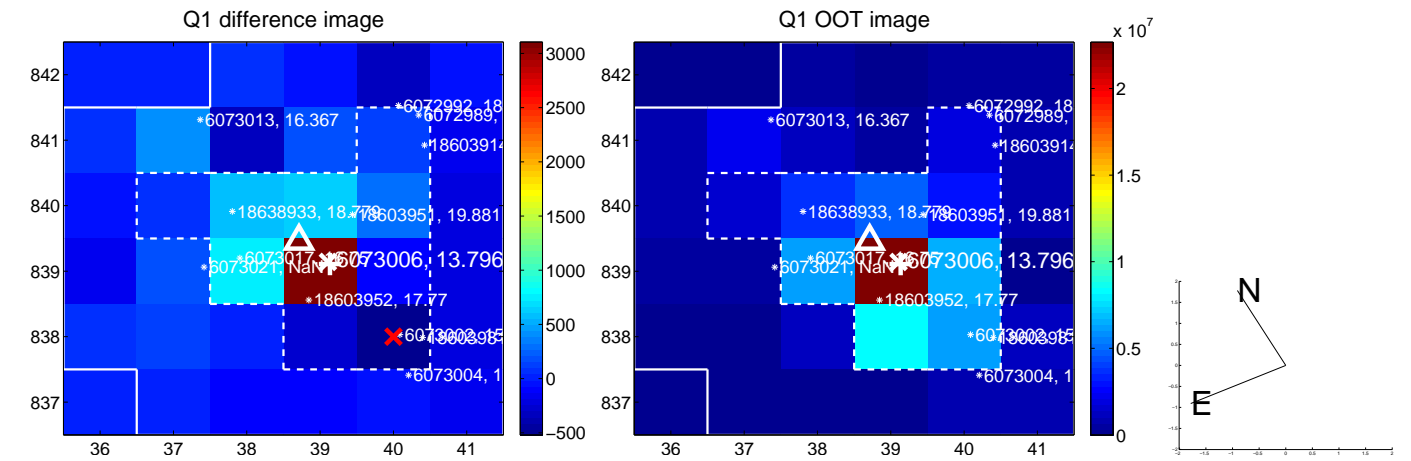
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.161 \pm 0.196$	0.82	$0.161 \pm 0.180$	$-0.013 \pm 0.354$
PRF-fit source offset from KIC position	$0.172 \pm 0.383$	0.45	$0.112 \pm 0.197$	$-0.131 \pm 0.380$
photometric centroid source offset	—	—	—	—

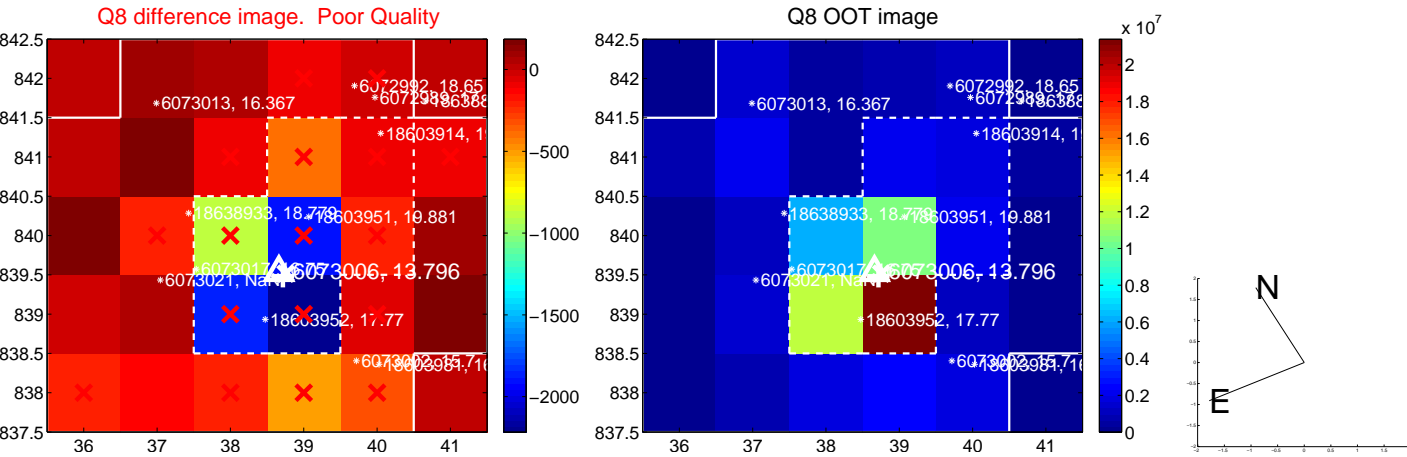
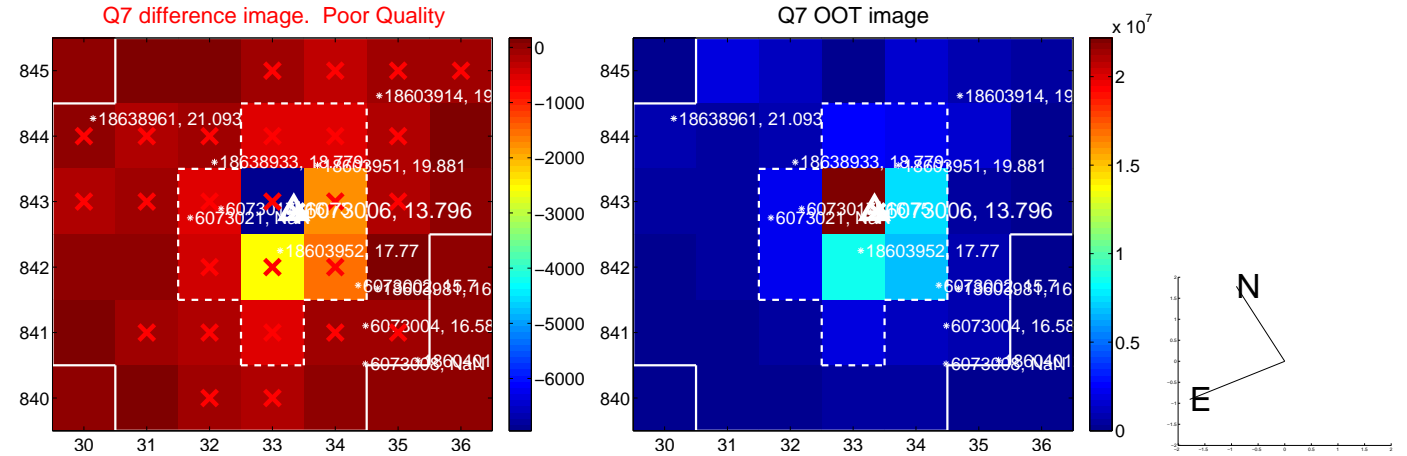
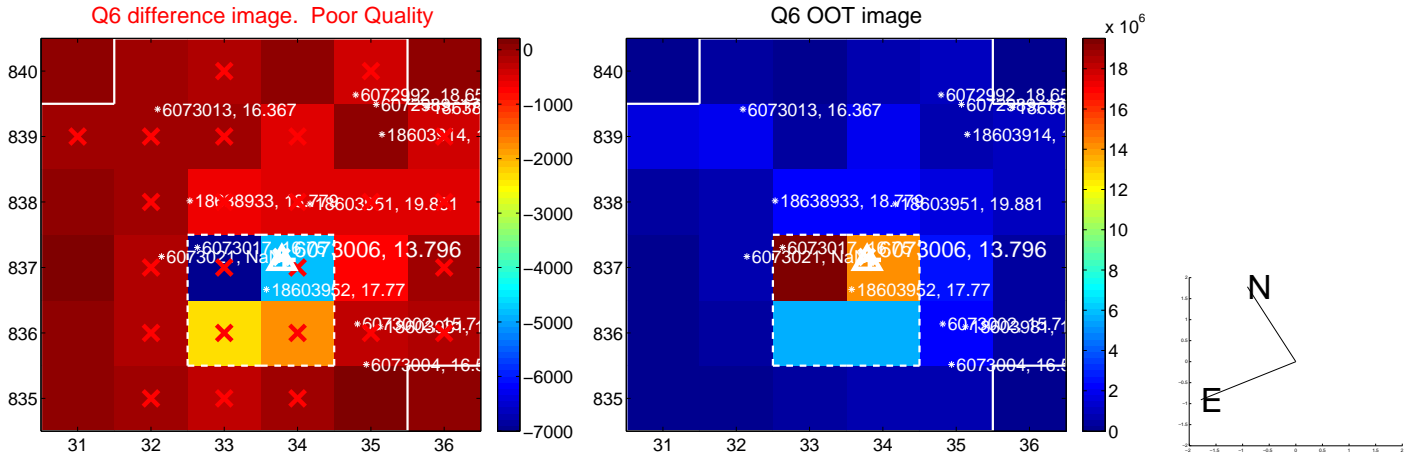
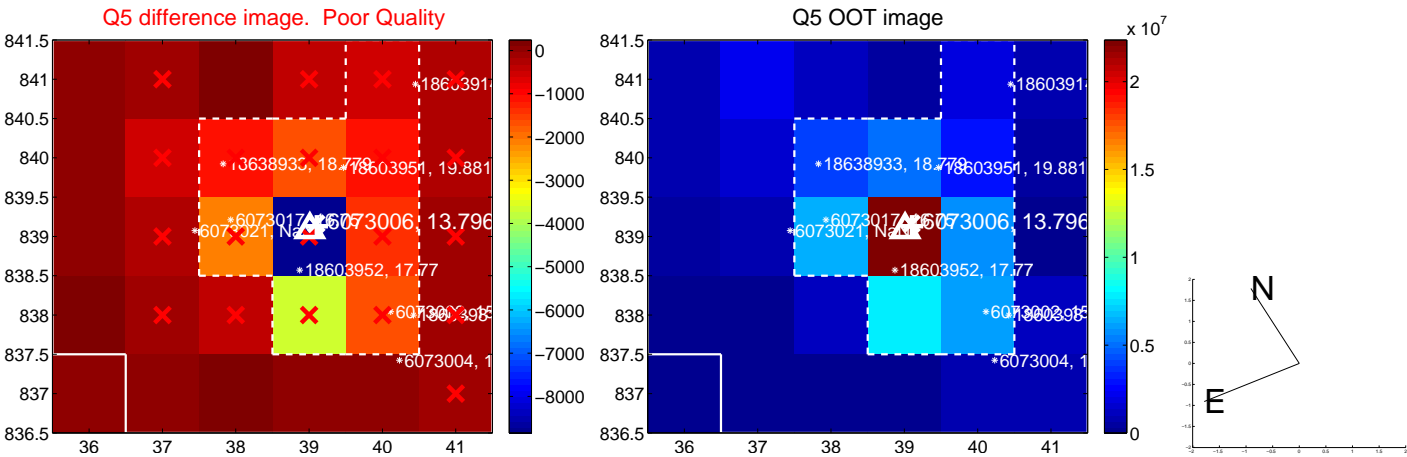


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

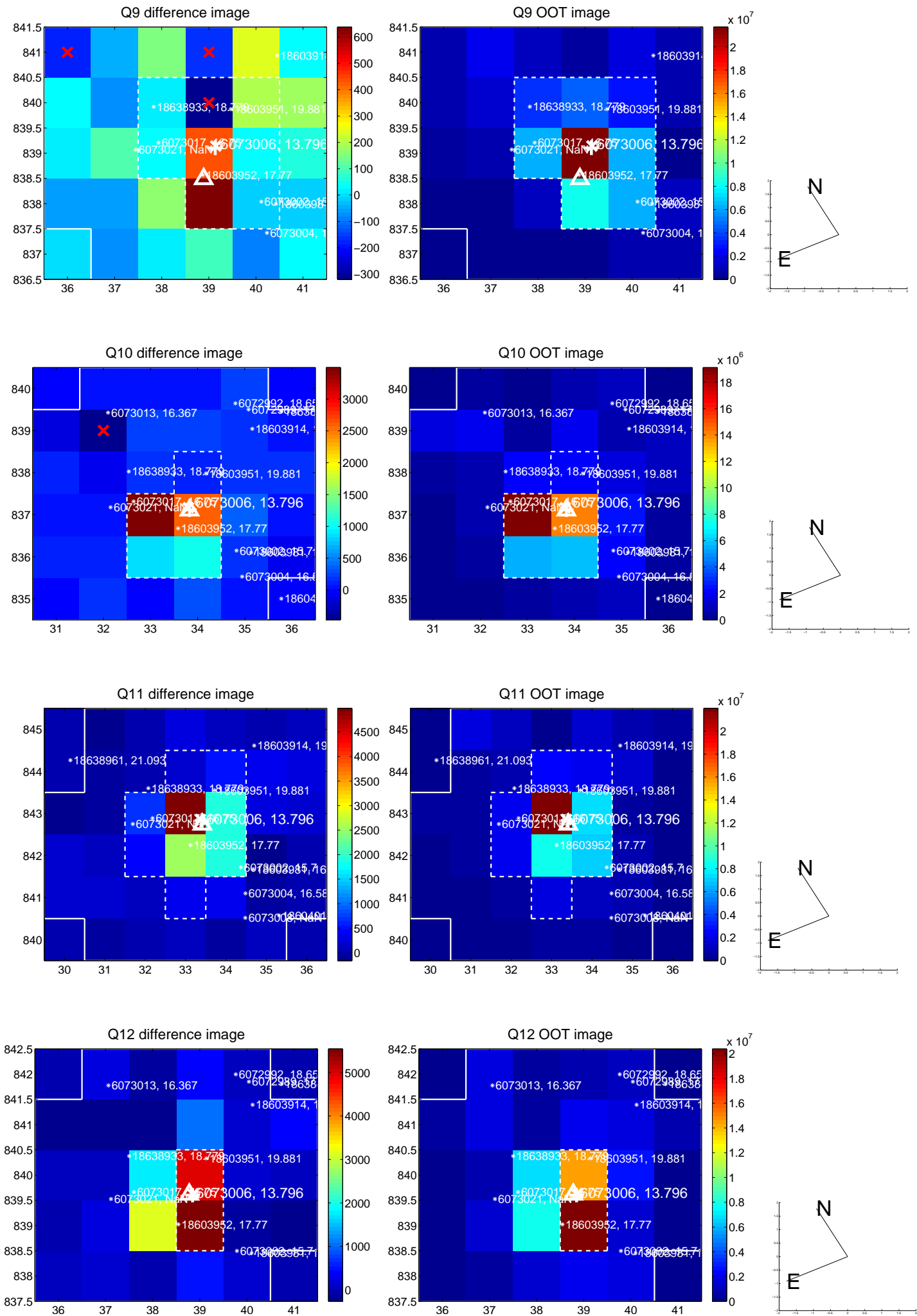


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

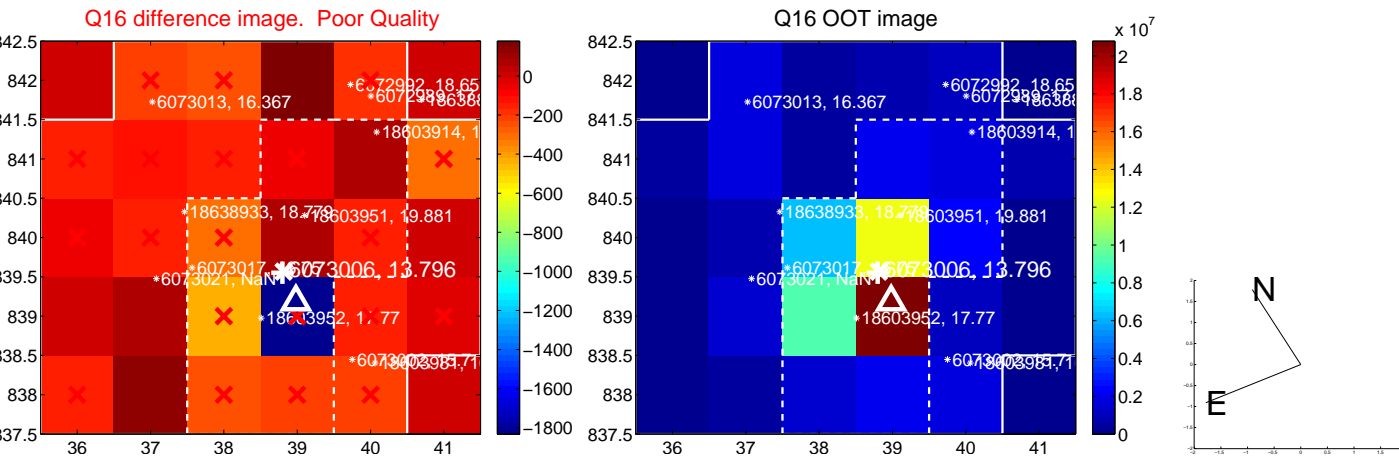
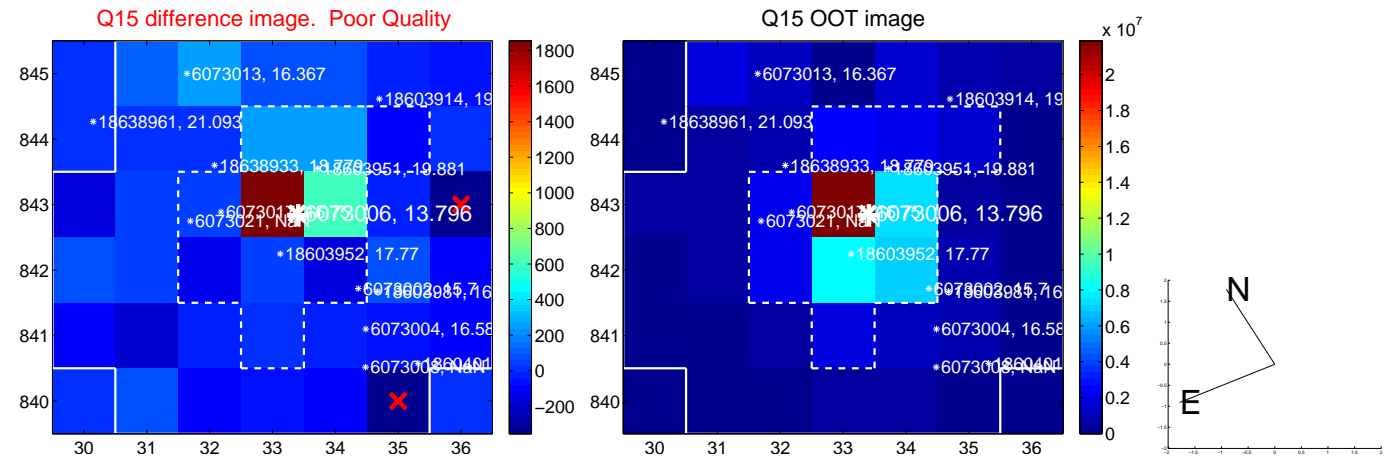
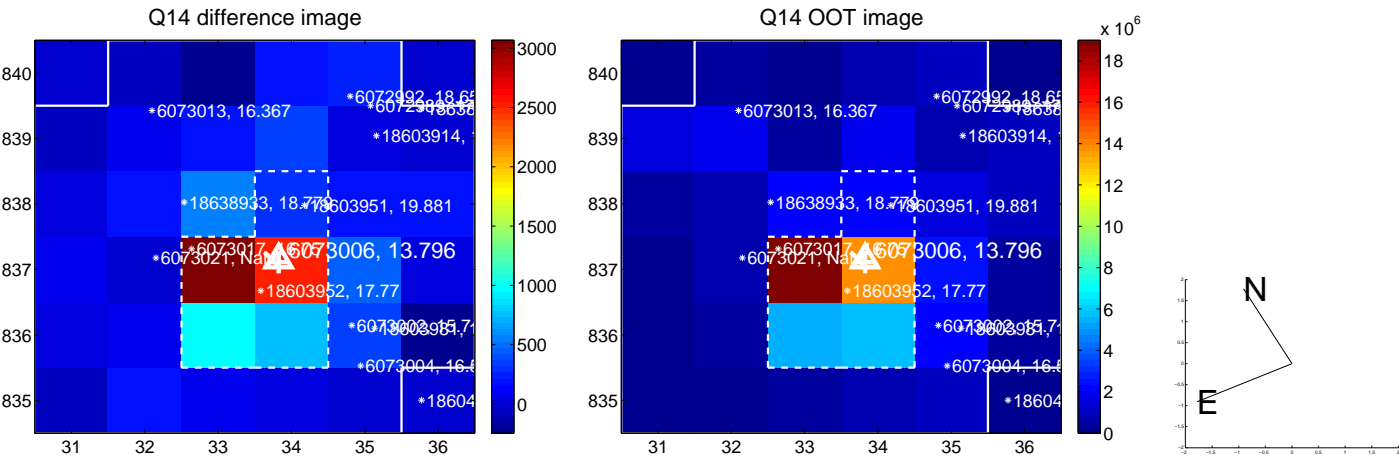
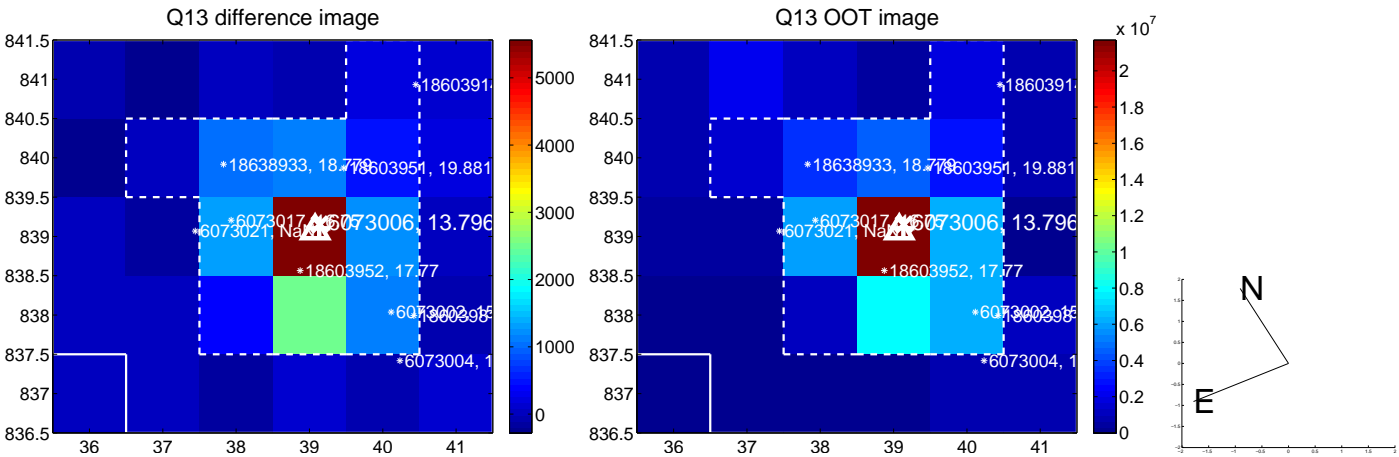




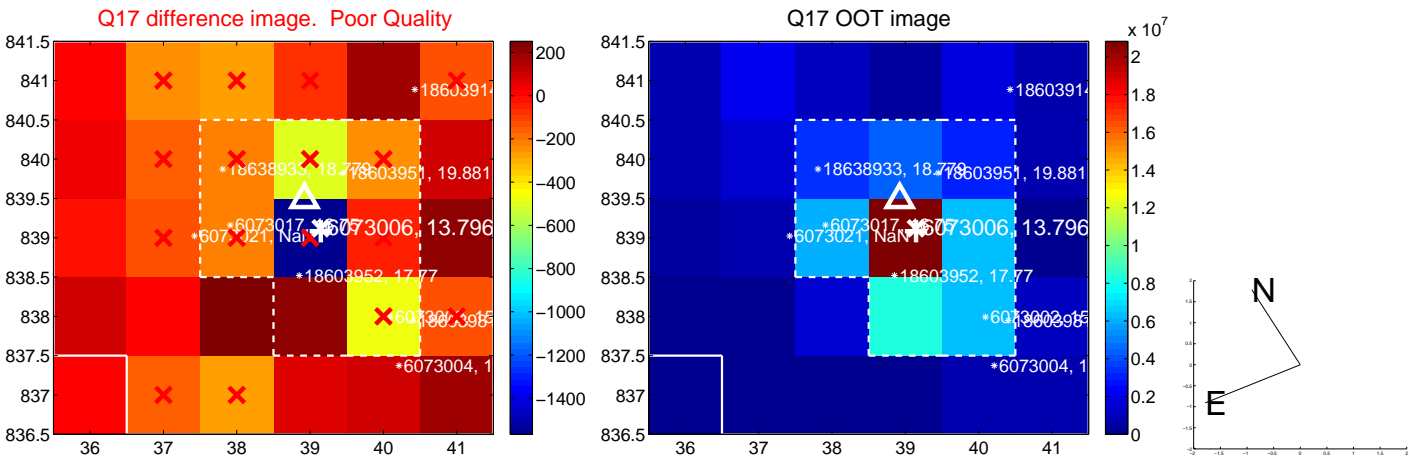
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

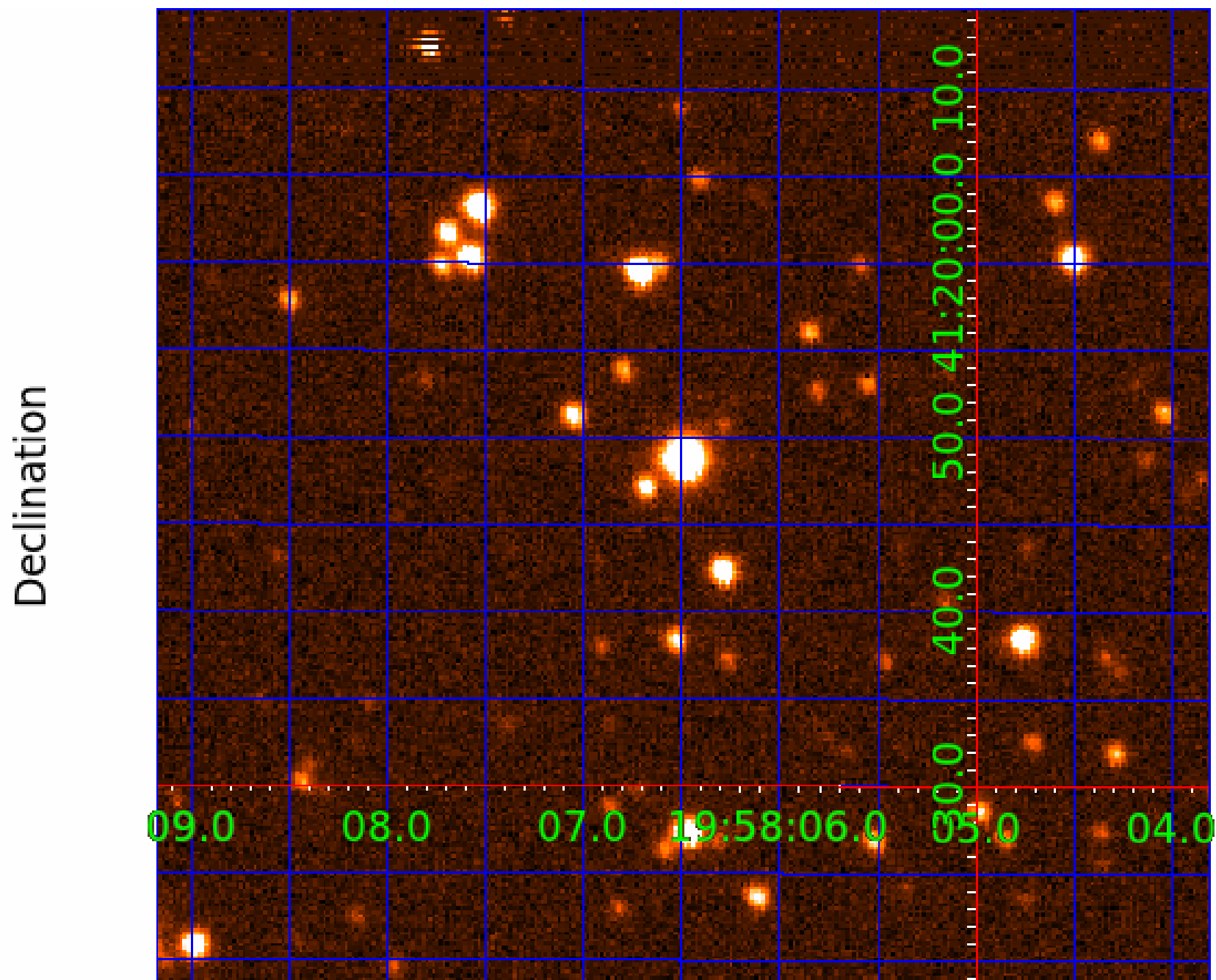


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image





# KIC 006073006

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006073006-01	OBS	No	1.344753	131.611789	0.0	7.116	9.7	0.0	1.67	6770	0.01	7450.81
006073006-02	OBS	No	1.345455	131.722106	28.9	3.269	9.3	8.7	1.67	6770	0.97	7445.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006073006-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006073006-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT

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

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

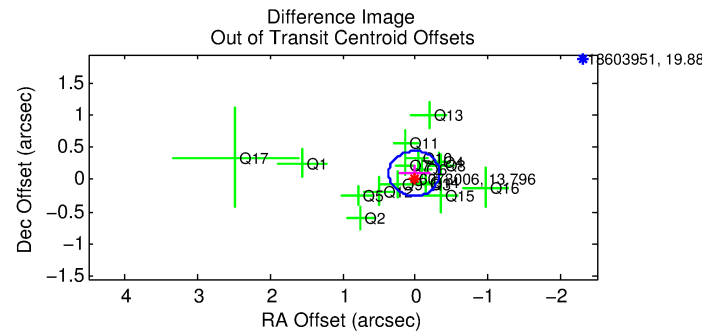
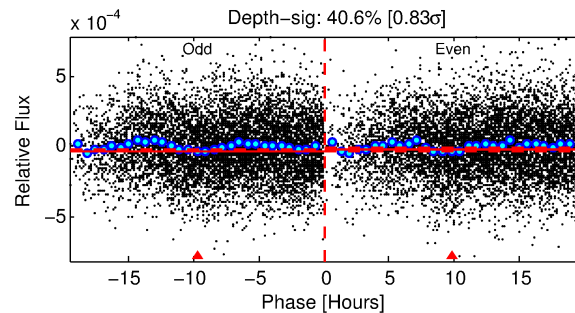
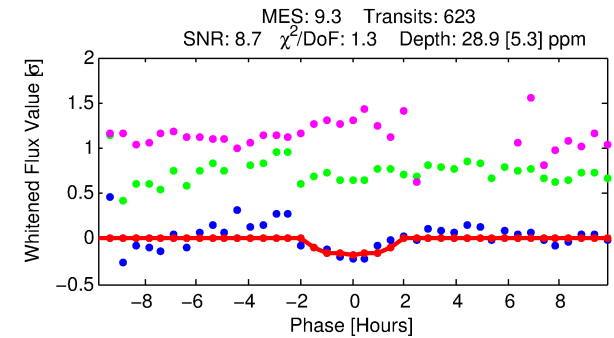
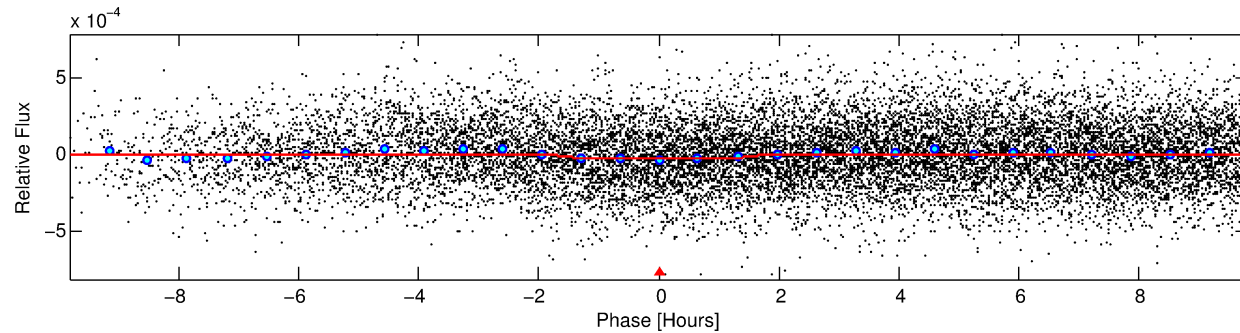
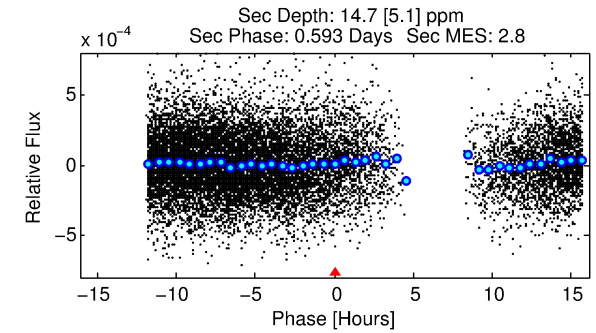
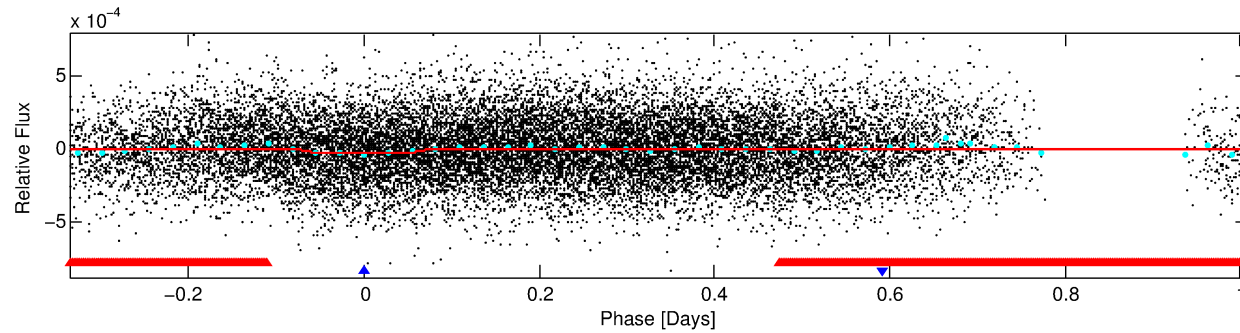
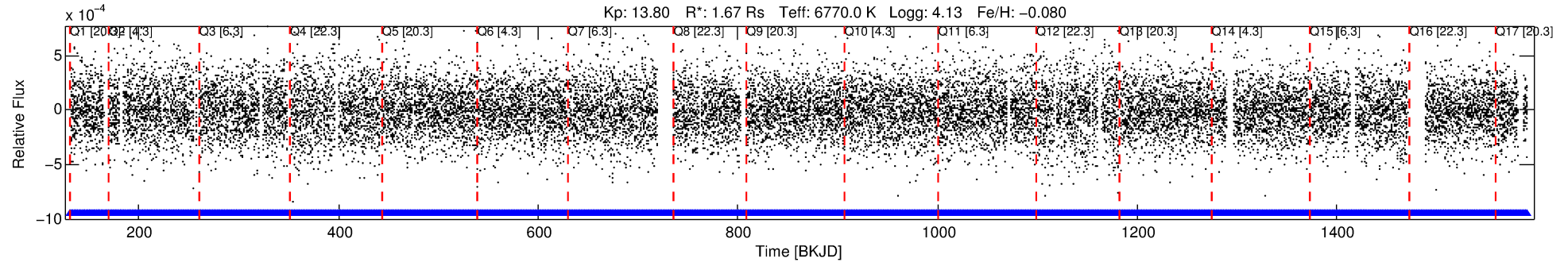
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006073006-02

No Significant Match Found

# DV One-Page Summary

KIC: 6073006 Candidate: 2 of 2 Period: 1.345 d



## DV Fit Results:

Period = 1.34545 [0.00002] d  
Epoch = 131.7221 [0.0063] BKJD  
Rp/R\* = 0.0053 [0.0018]  
a/R\* = 2.30 [3.49]  
b = 0.74 [1.16]  
Seff = 7445.63 [2919.12]  
Teq = 2369 [232] K  
Rp = 0.97 [0.44] Re  
a = 0.0266 [0.0065] AU  
Ag = 6.04 [5.04] [1.00σ]  
Teffp = 5742 [1120] K [2.95σ]

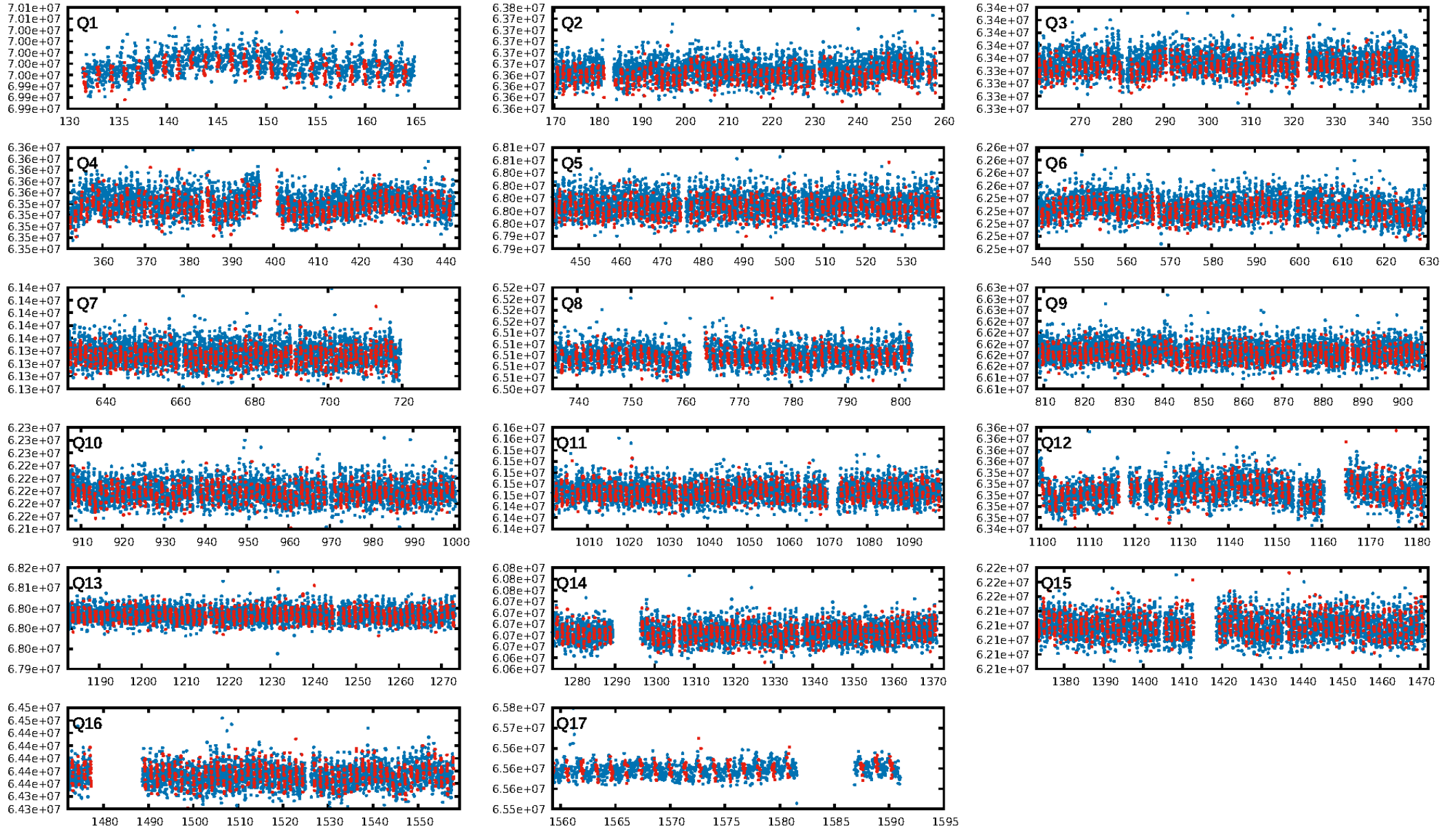
## DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.70e-17  
RollingBand-fgt: 1.00 [603/603]  
GhostDiagnostic-chr: 1.452  
Centroid-sig: 1.6%  
Centroid-so: 2.995 arcsec [2.25σ]  
OotOffset-rm: 0.093 arcsec [0.79σ]  
KicOffset-rm: 0.010 arcsec [0.05σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.53 [9/17]

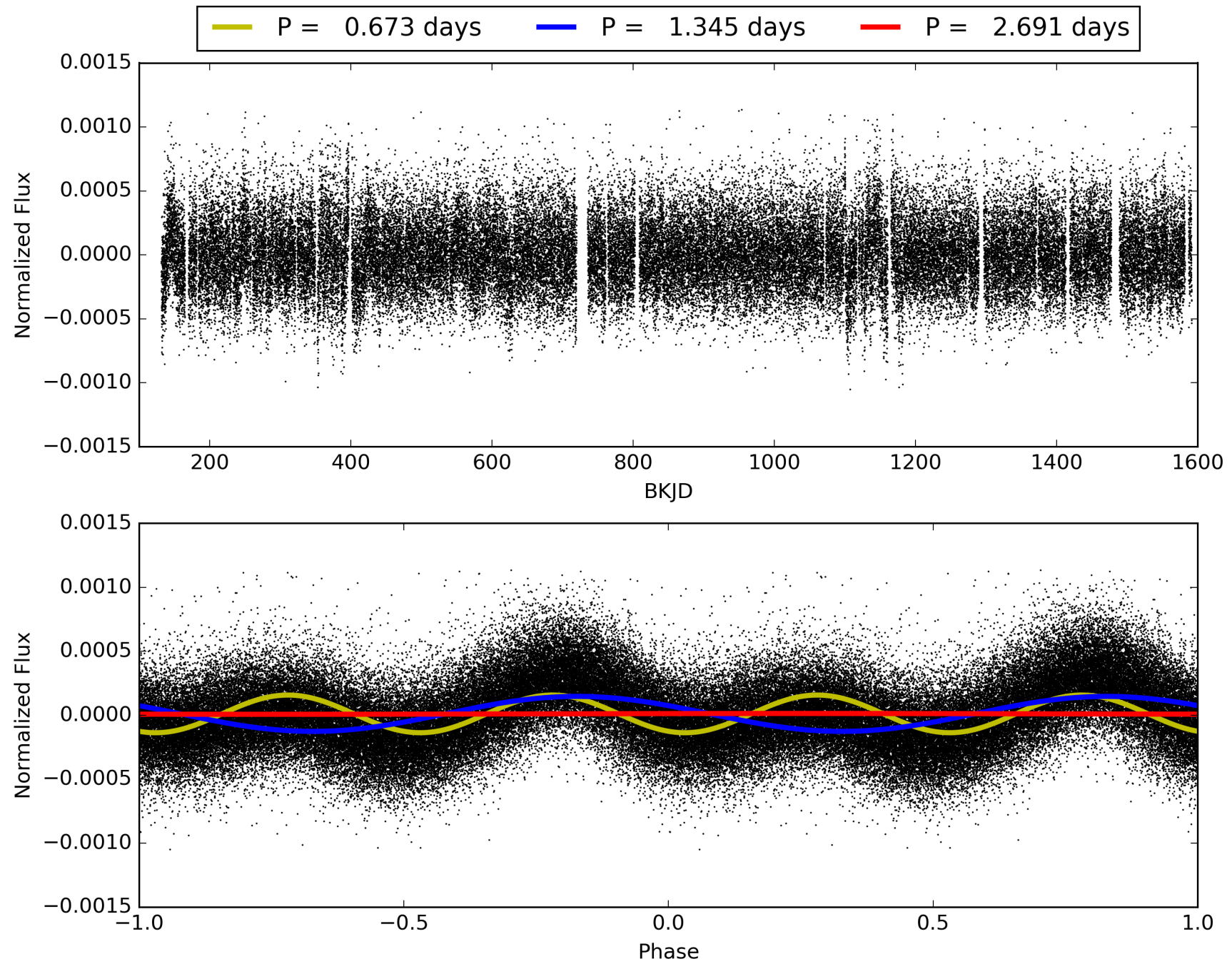
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 17:38:29 Z

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

# TCE 006073006-02, PDC Light Curves



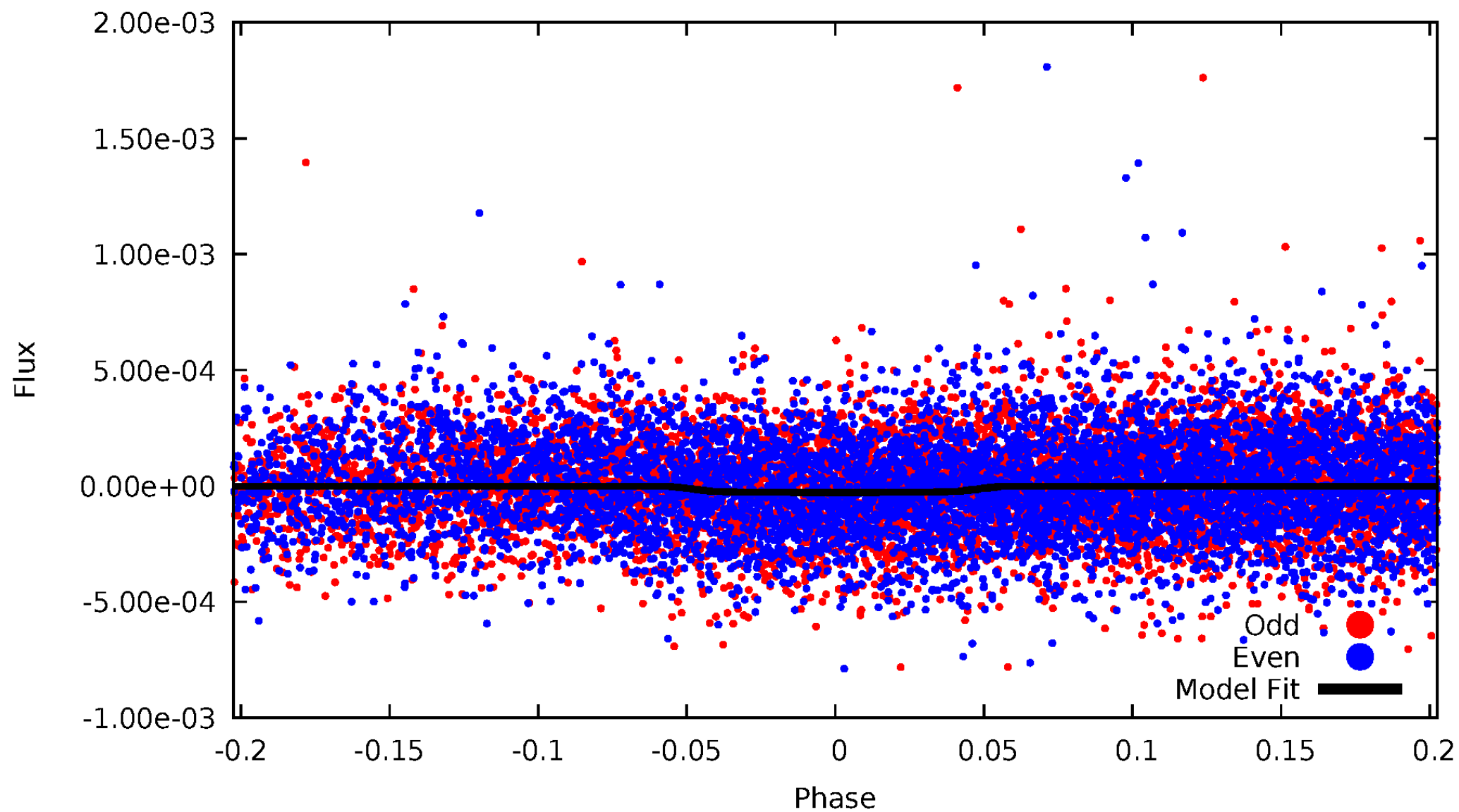
TCE 006073006-02





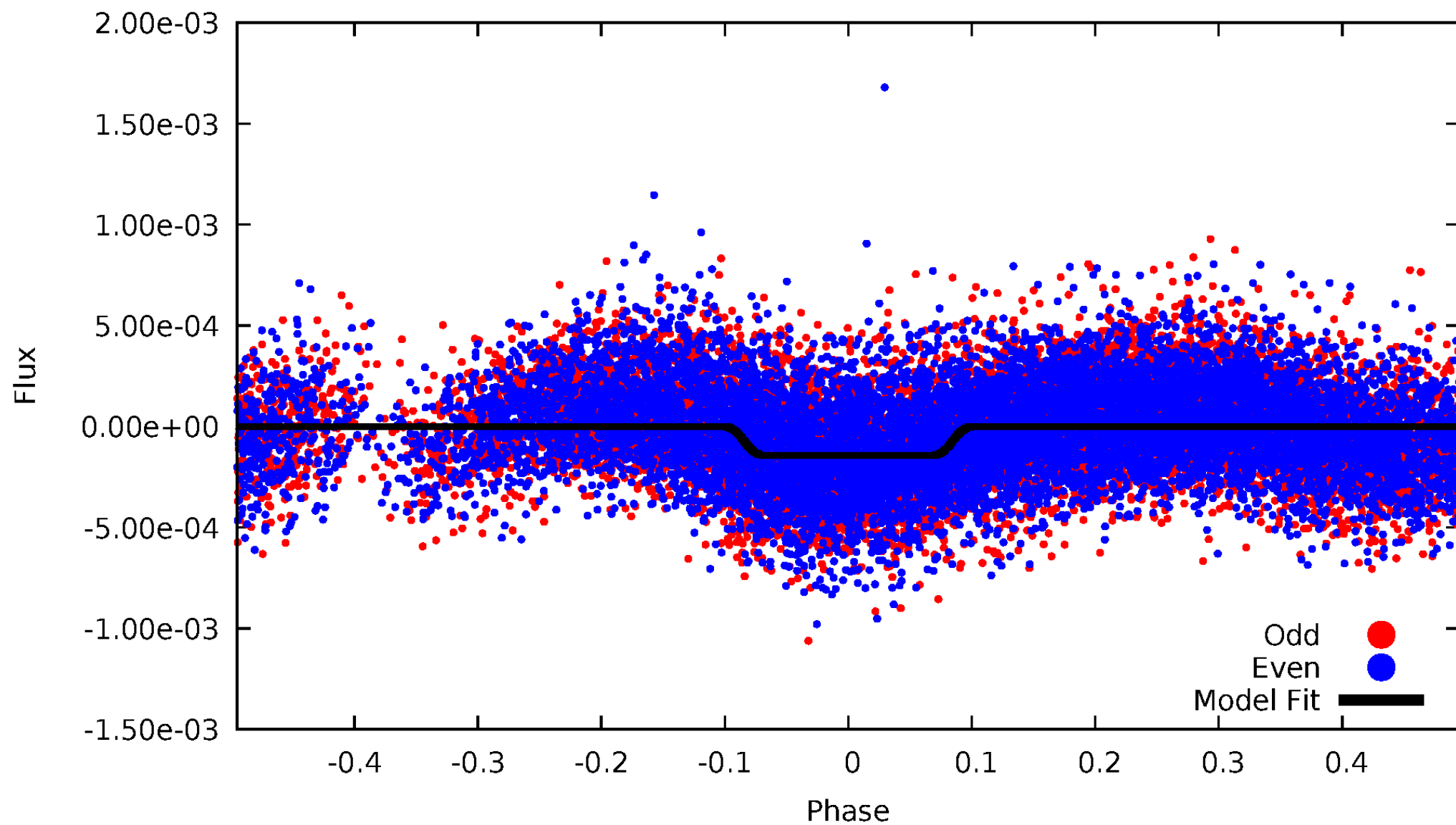
# DV Odd/Even

TCE 006073006-02



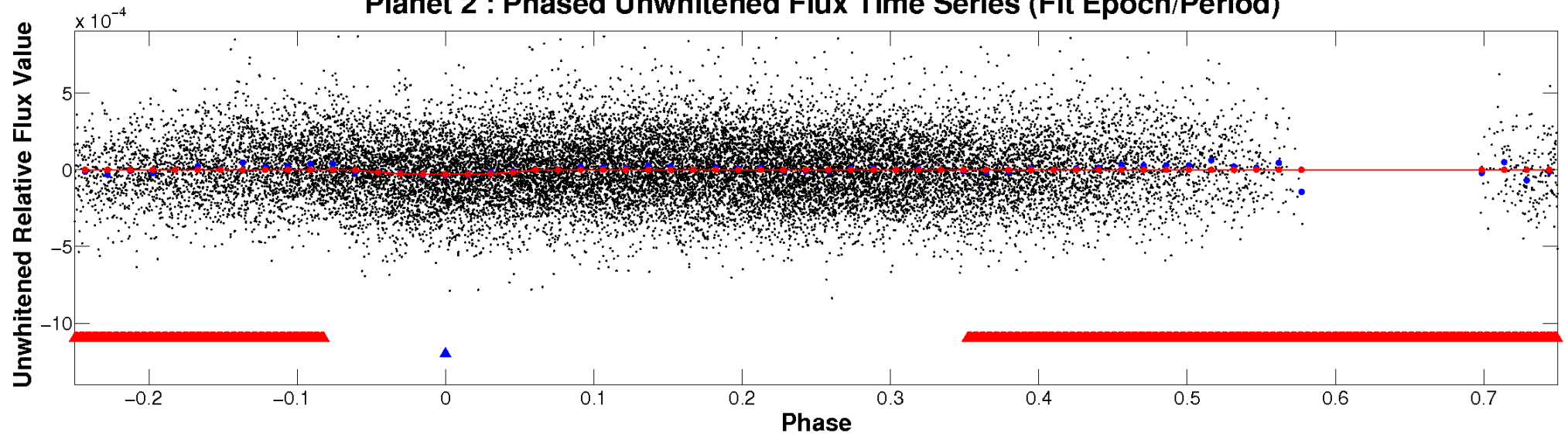
# ALT Odd/Even

TCE 006073006-02

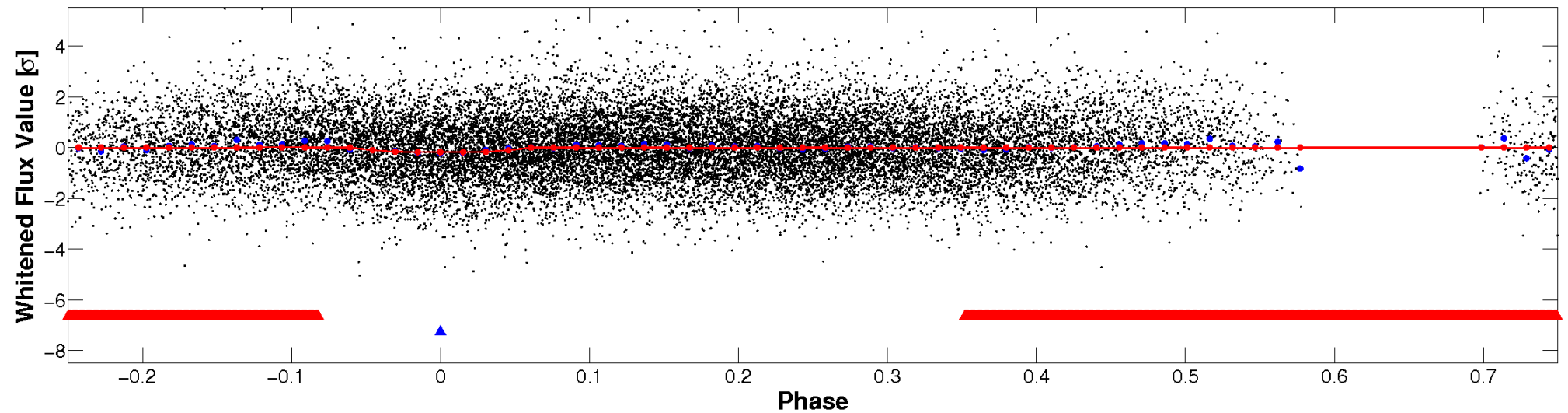


# Non-Whitened Vs. Whitened Light Curve

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

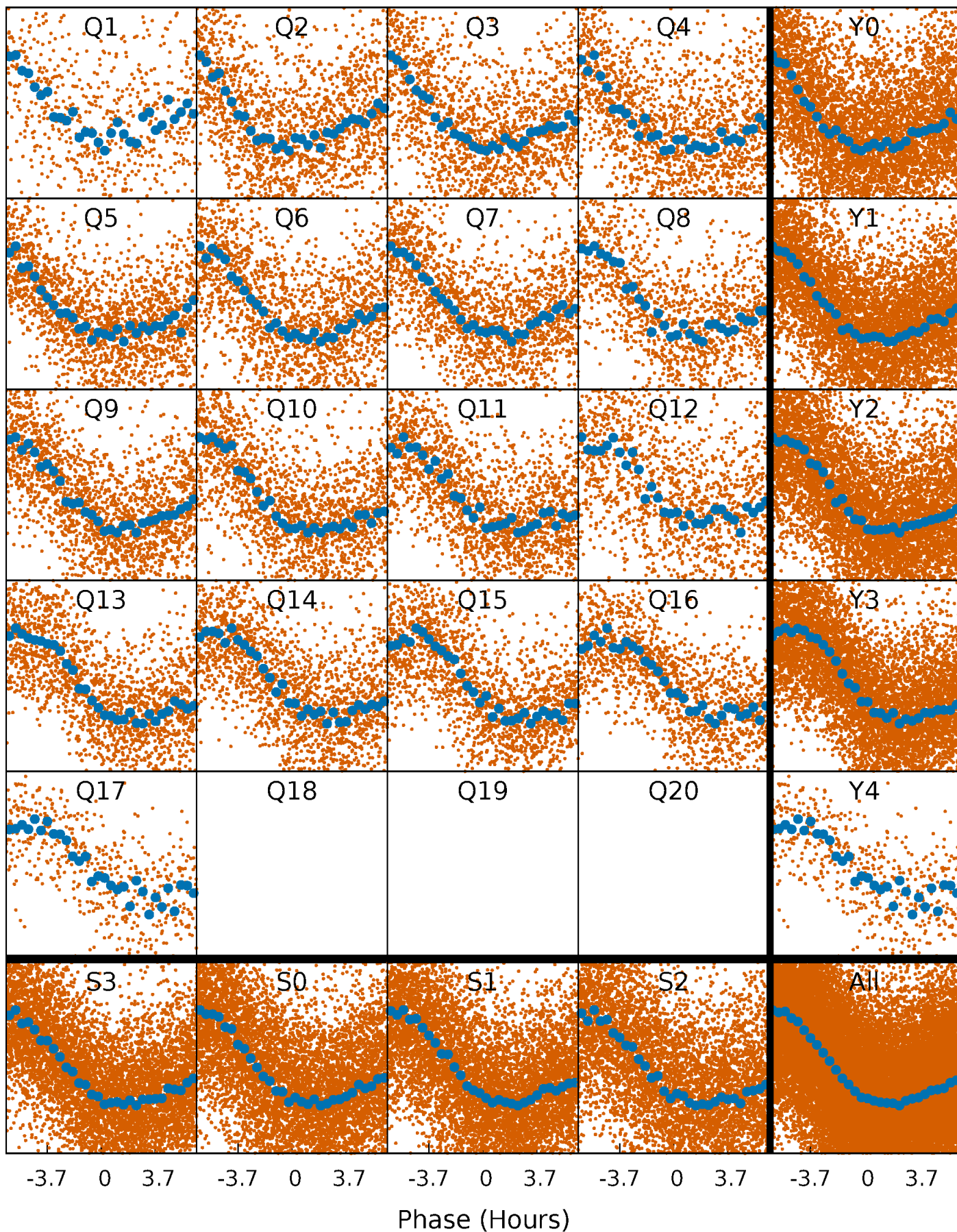


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

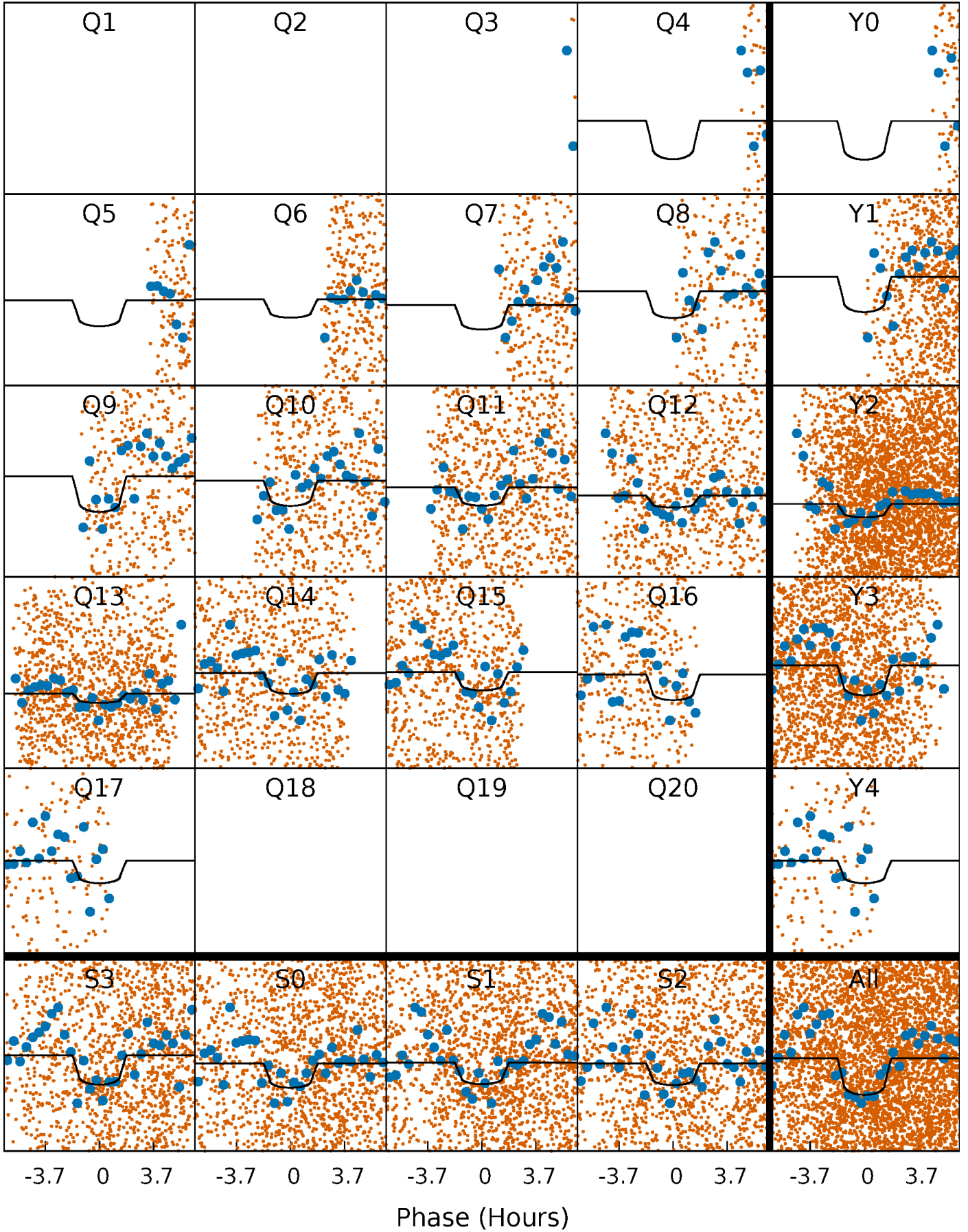
TCE 006073006-02   P= 1.345455 Days    $T_0=131.722106$  (BKJD)





# DV Quarter-Phased Transit Curves

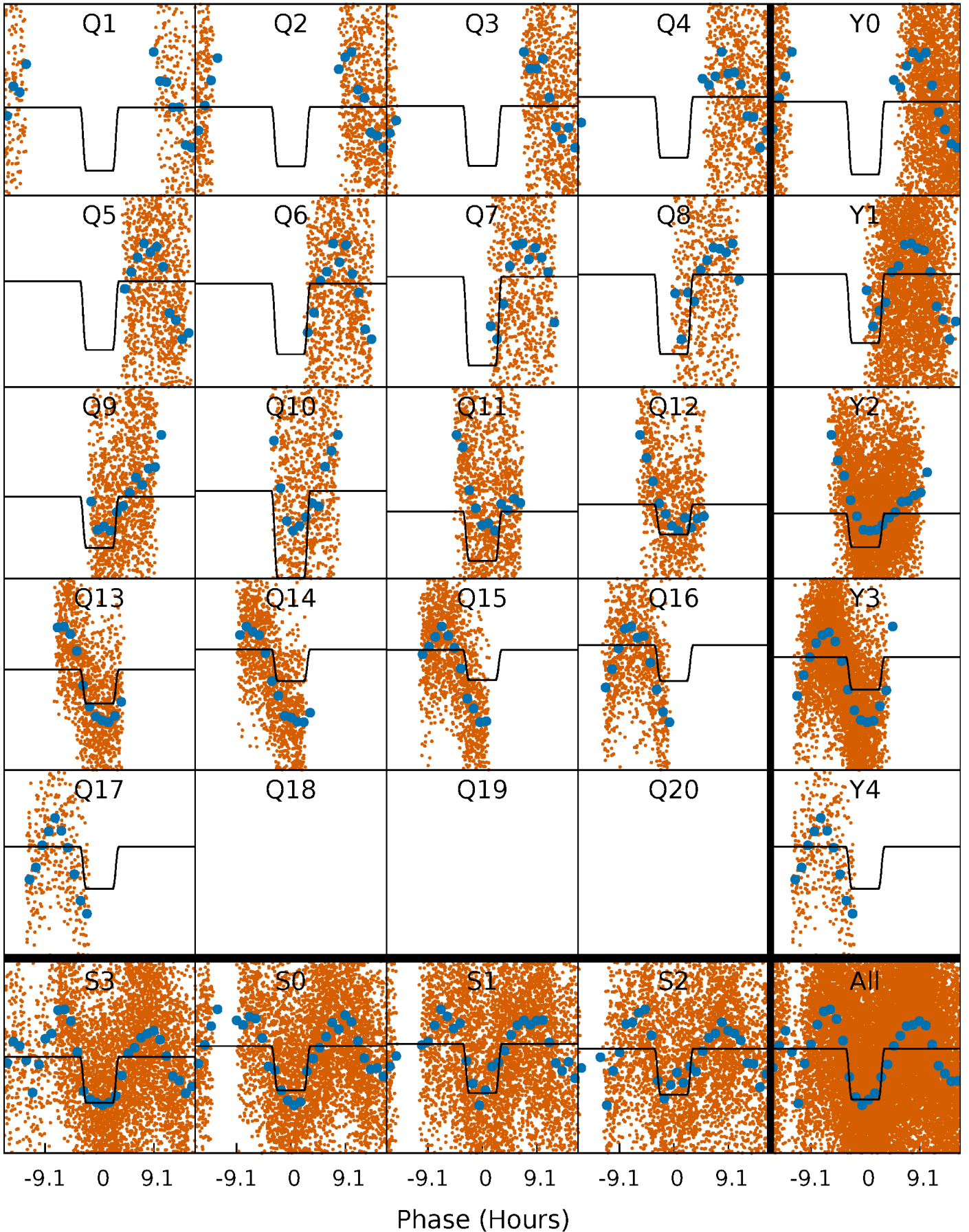
TCE 006073006-02     $P = 1.345455$  Days     $T_0 = 131.722106$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

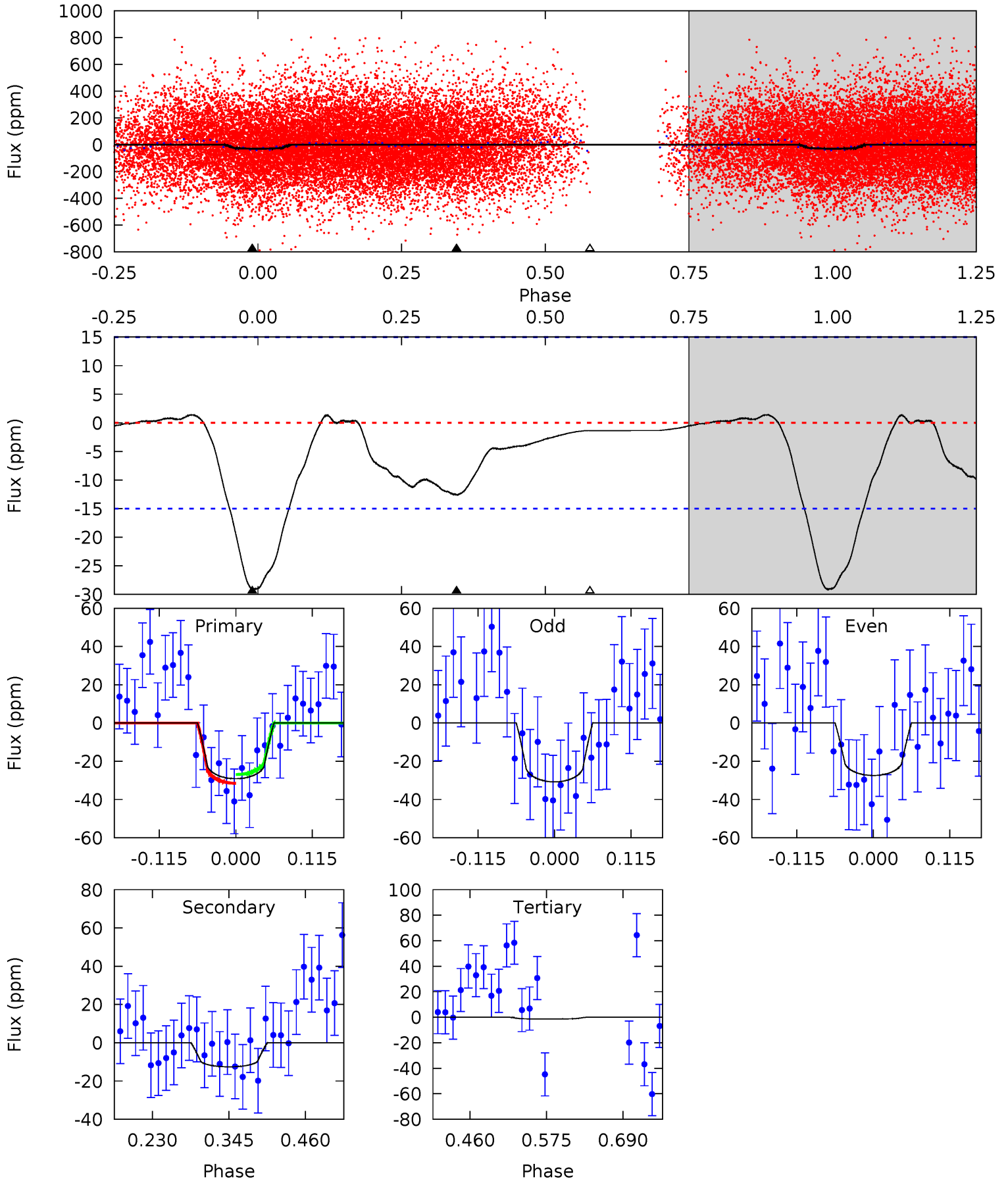
TCE 006073006-02 P= 1.345606 Days  $T_0=131.661120$  (BKJD)



# DV Model-Shift Uniqueness Test

006073006-02, P = 1.345455 Days, E = 131.722106 Days

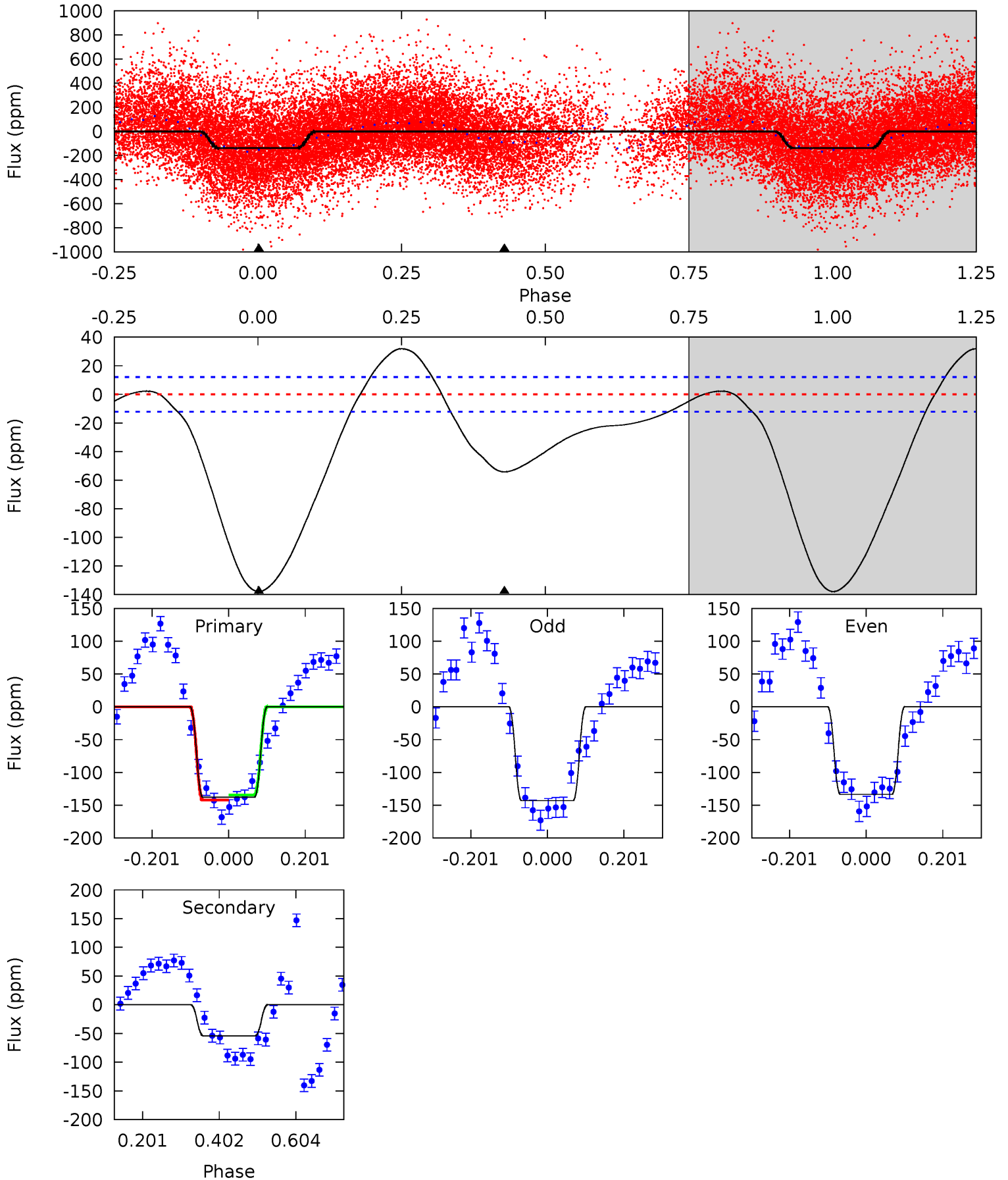
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.80	3.81	0.41	0	4.54	1.58	0.92	8.39	8.80	3.40	3.81	0.51	0.92	0.05	0.72



# Alt Model-Shift Uniqueness Test

006073006-02, P = 1.345606 Days, E = 131.661120 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
50.3	19.8	0	0	4.42	1.28	5.51	50.3	50.3	19.8	19.8	1.74	1.20	0.19	1.43



### Stellar Parameters For KIC 006073006

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6770^{+189}_{-307}$	$4.132^{+0.185}_{-0.185}$	$-0.080^{+0.250}_{-0.300}$	$1.670^{+0.502}_{-0.411}$	$1.385^{+0.196}_{-0.239}$	$0.419^{+0.420}_{-0.208}$
	+3%/-5%	+4%/-4%	+312%/-375%	+30%/-25%	+14%/-17%	+100%/-50%
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 006073006-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-13 \pm 3$	$0.96^{+0.38}_{-0.32}$	$3291^{+275}_{-248}$	$5383^{+1368}_{-754}$	$5.079^{+7.743}_{-2.692}$
Alt.	$-54 \pm 3$	$2.17^{+0.51}_{-0.44}$	$3284^{+268}_{-234}$	$5238^{+454}_{-392}$	$4.528^{+2.343}_{-1.592}$

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

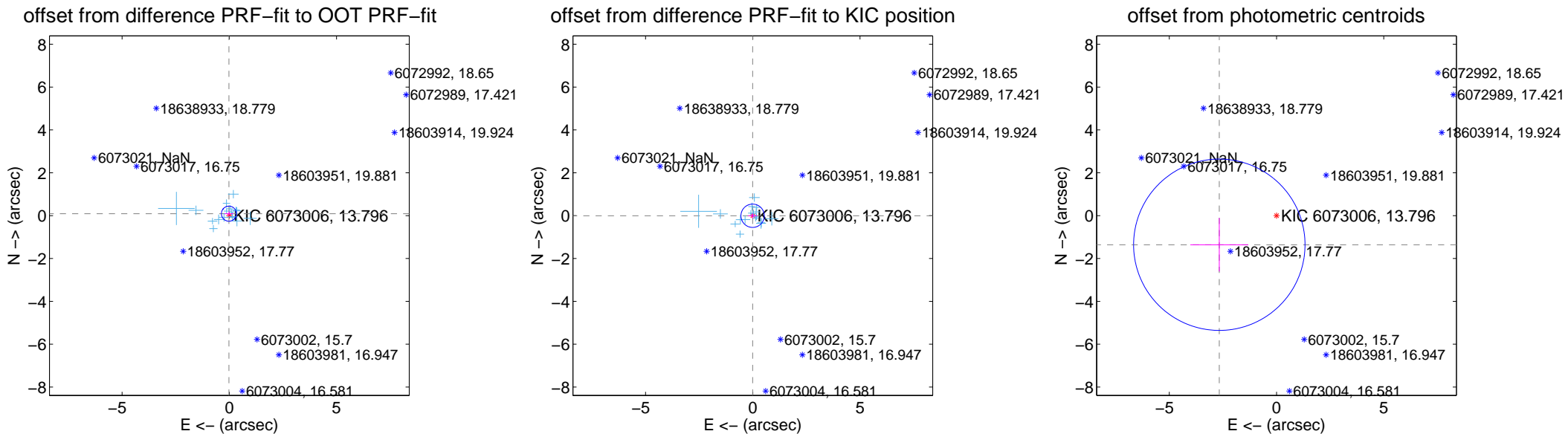
## DV Centroid Data

Supplemental centroid analysis for 006073006-02. Kepler magnitude: 13.80. Transit SNR 8.74

There are 17 quarters with good PRF difference image offsets

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

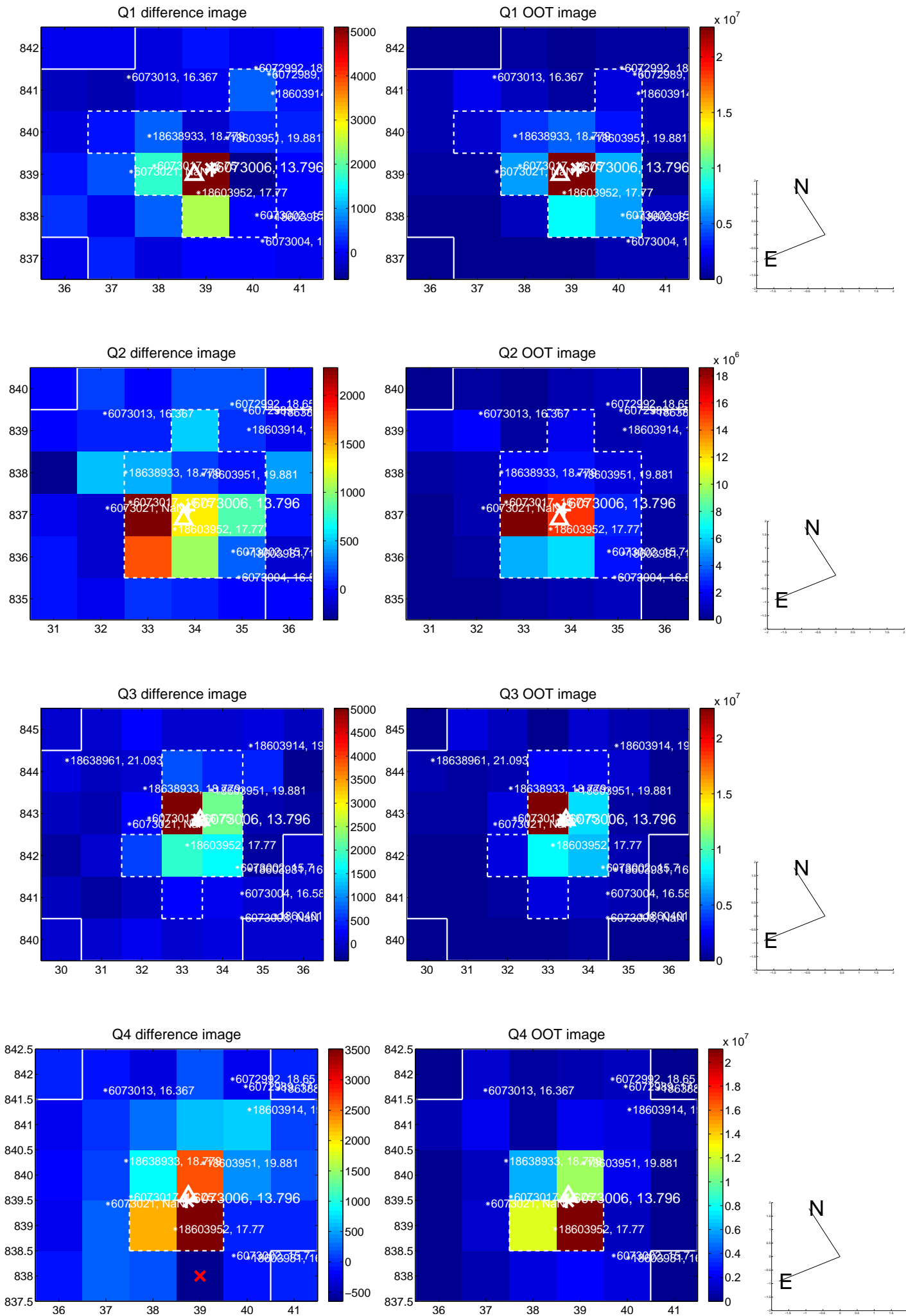
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.093 \pm 0.117$	0.79	$0.018 \pm 0.206$	$0.091 \pm 0.110$
PRF-fit source offset from KIC position	$0.010 \pm 0.181$	0.05	$0.008 \pm 0.210$	$-0.006 \pm 0.112$
photometric centroid source offset	$2.99 \pm 1.33$	2.25	$2.67 \pm 1.35$	$-1.36 \pm 1.25$



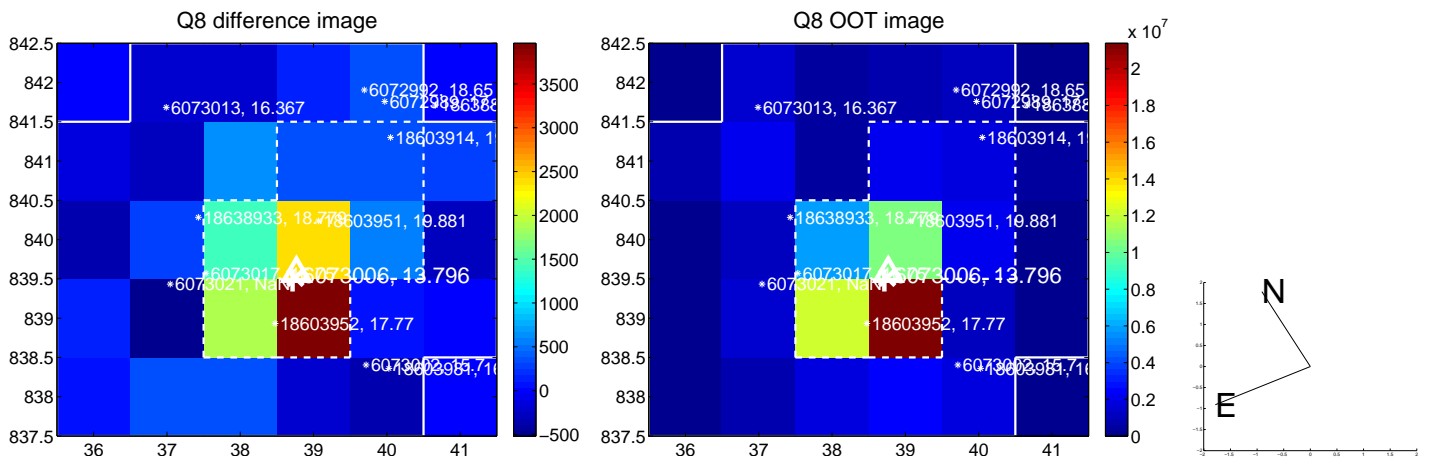
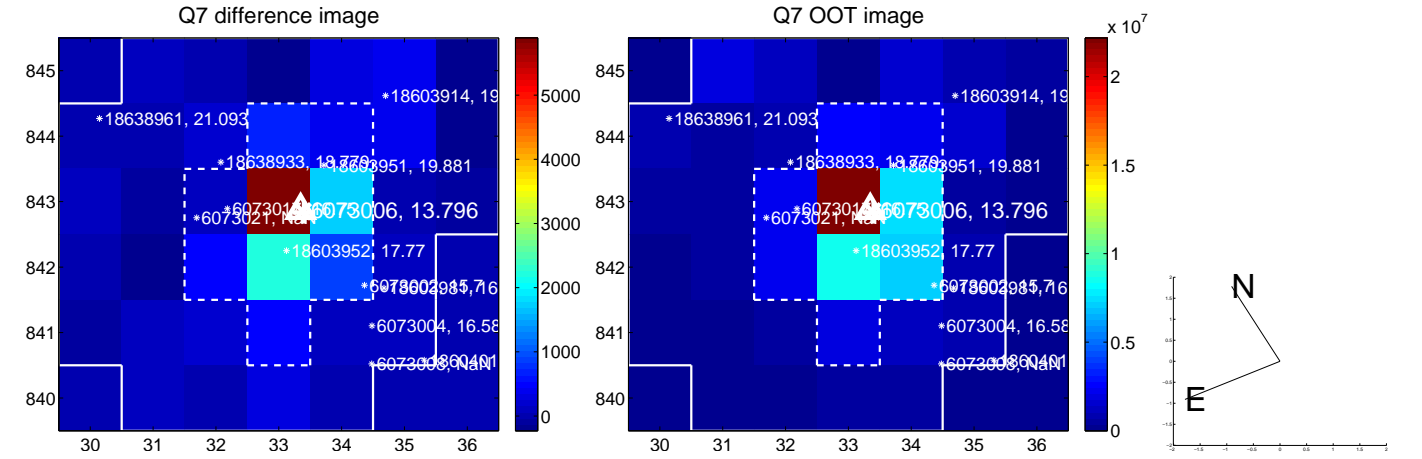
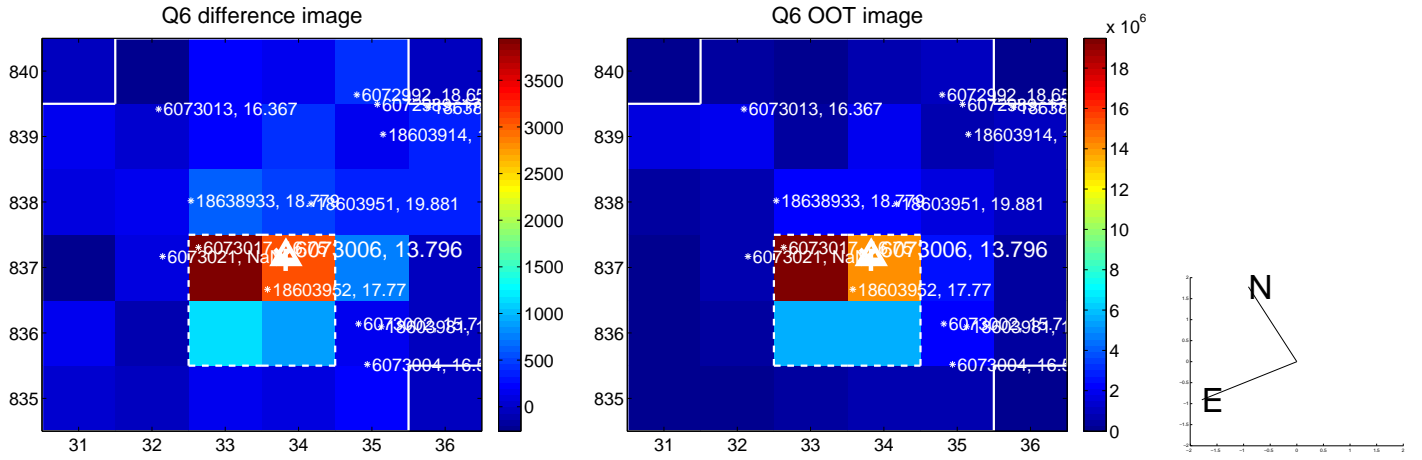
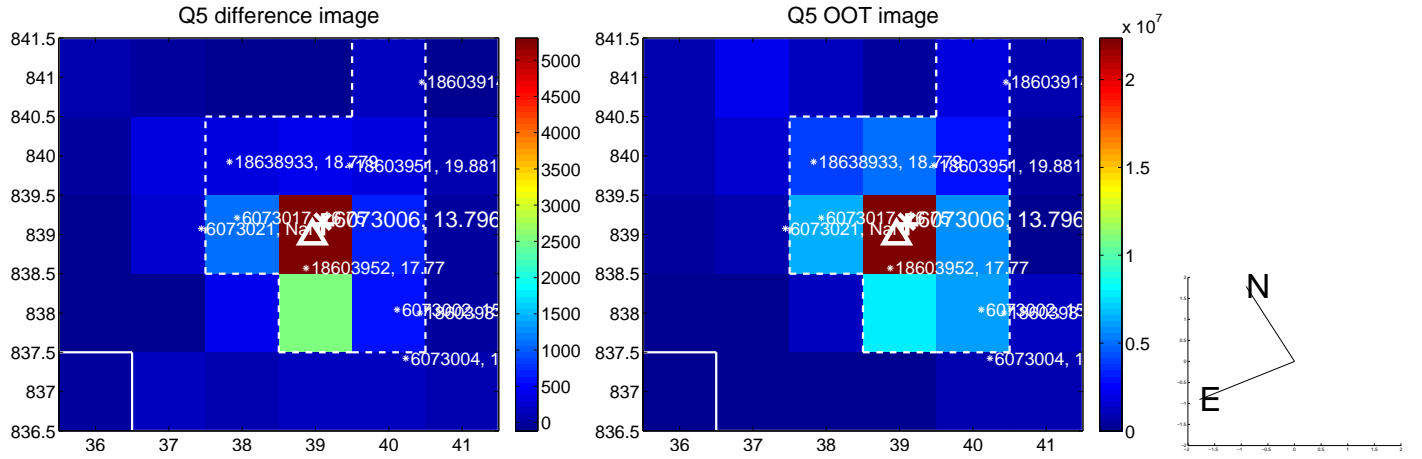
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



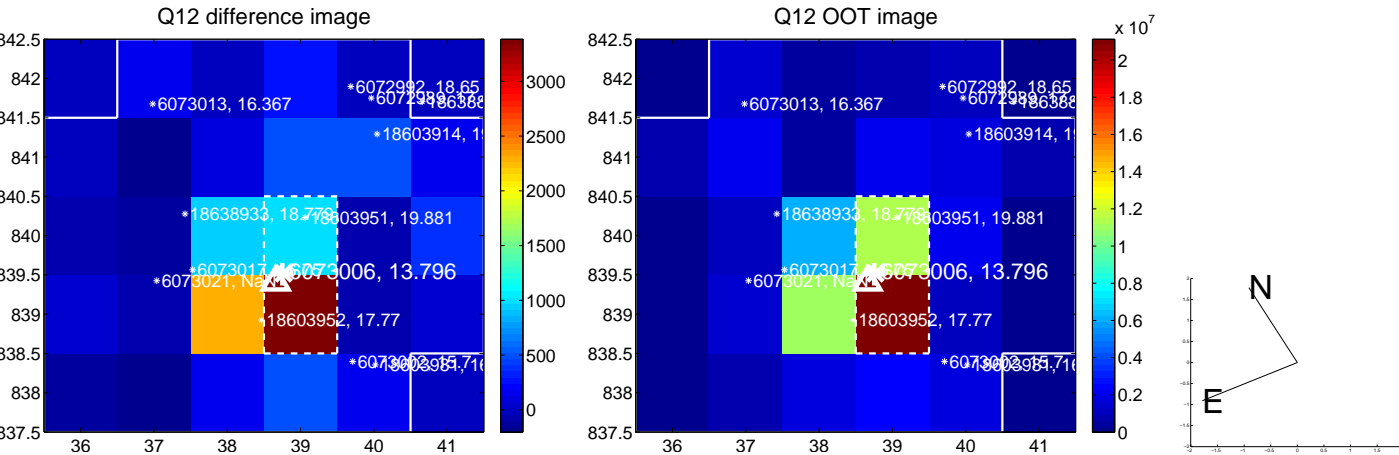
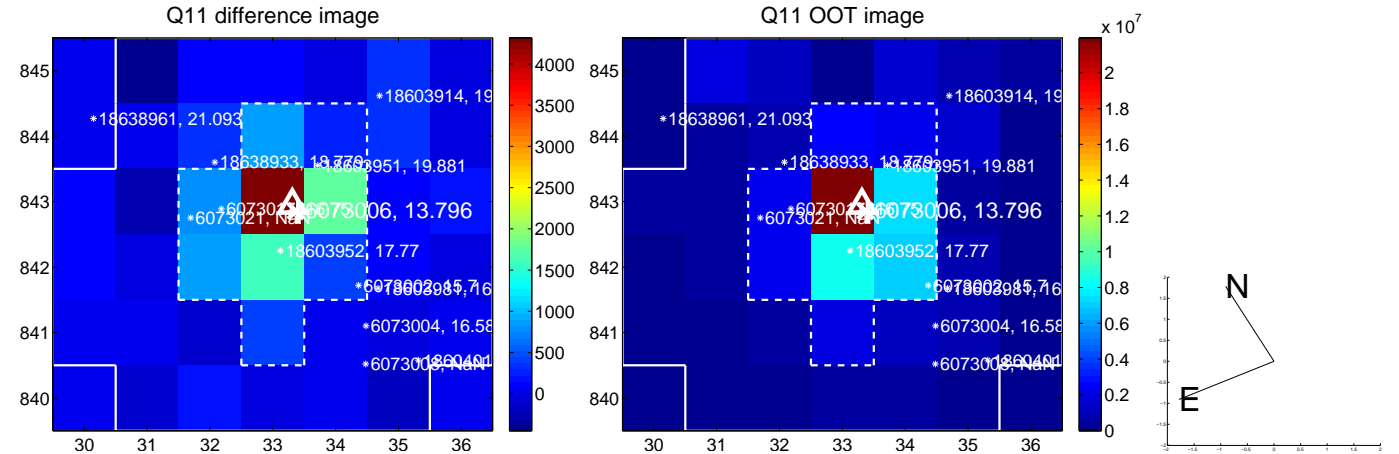
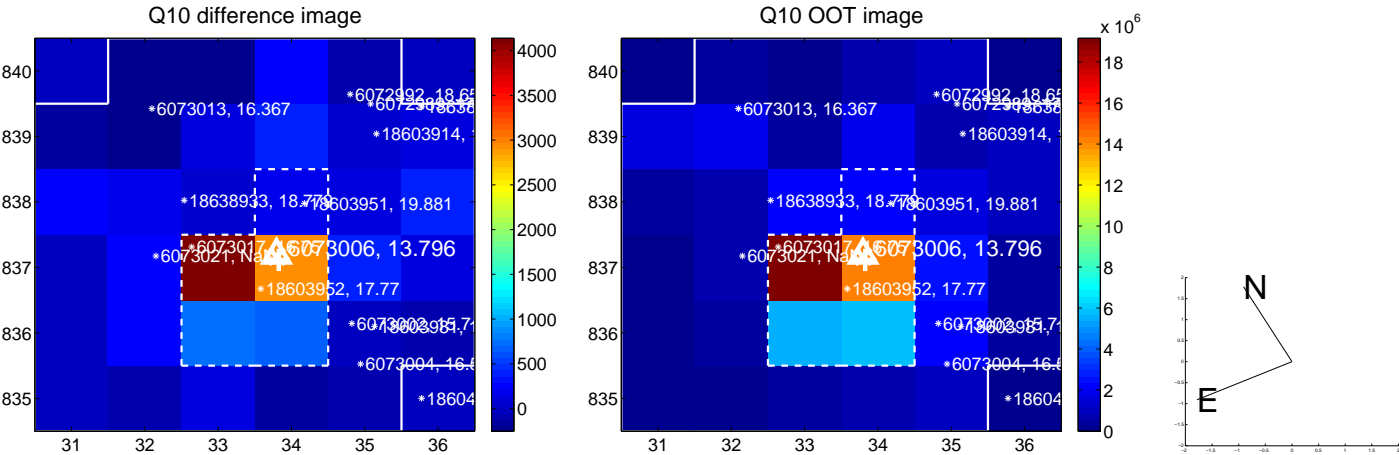
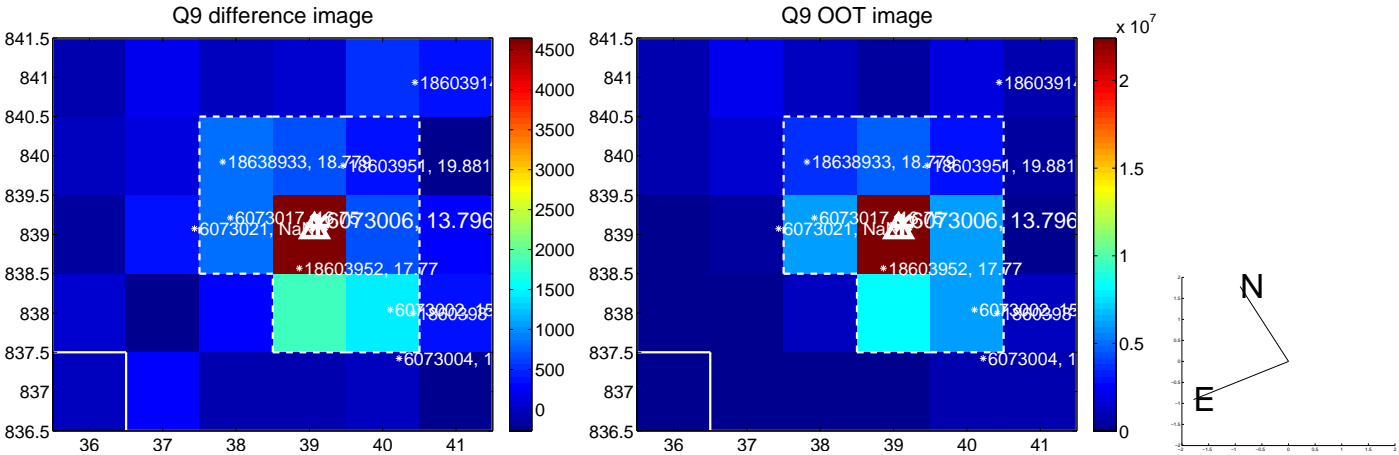
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



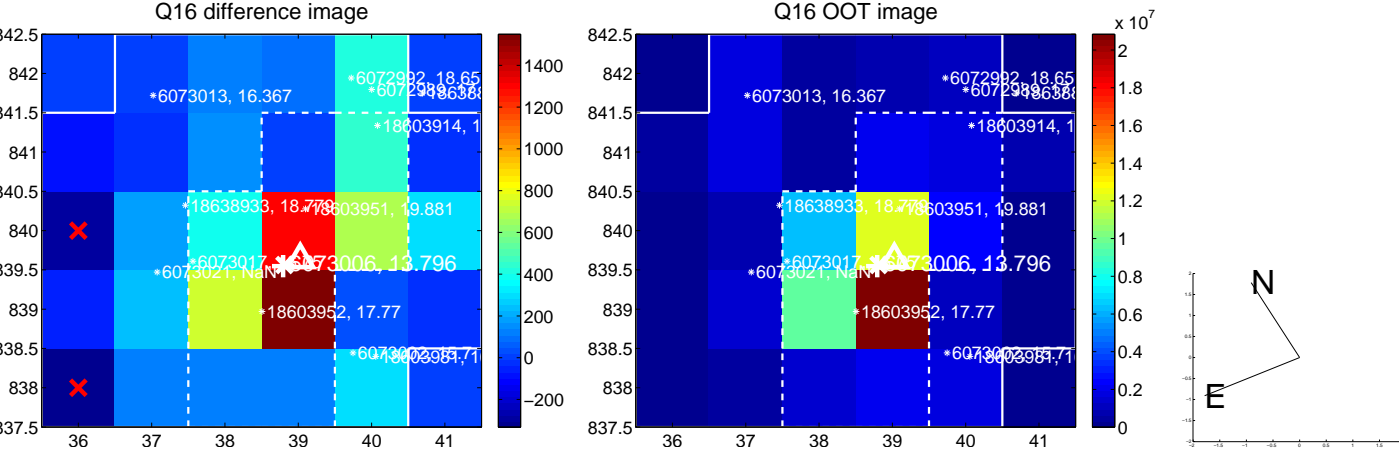
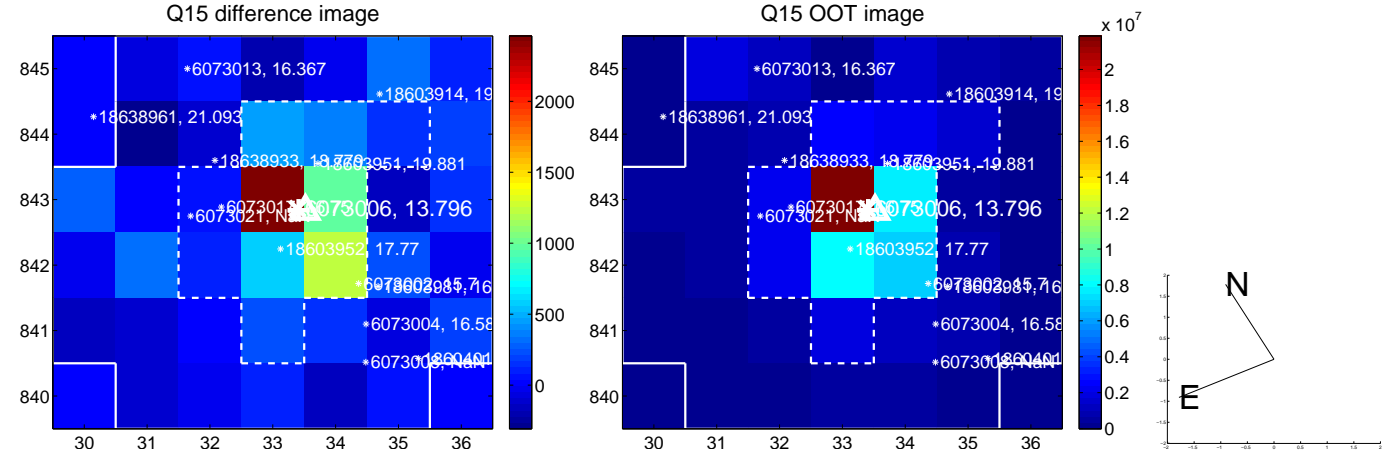
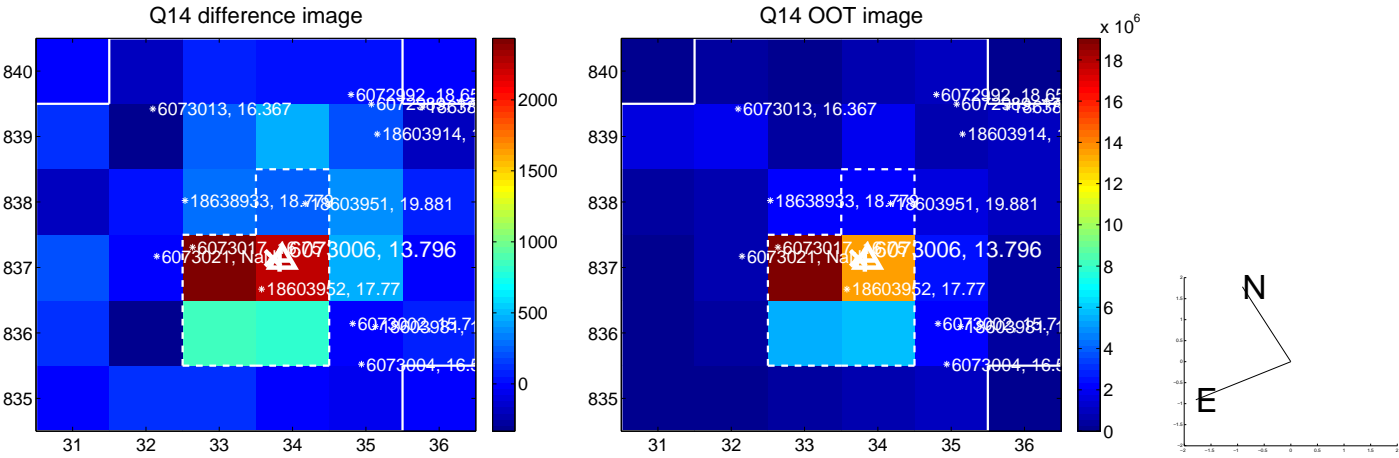
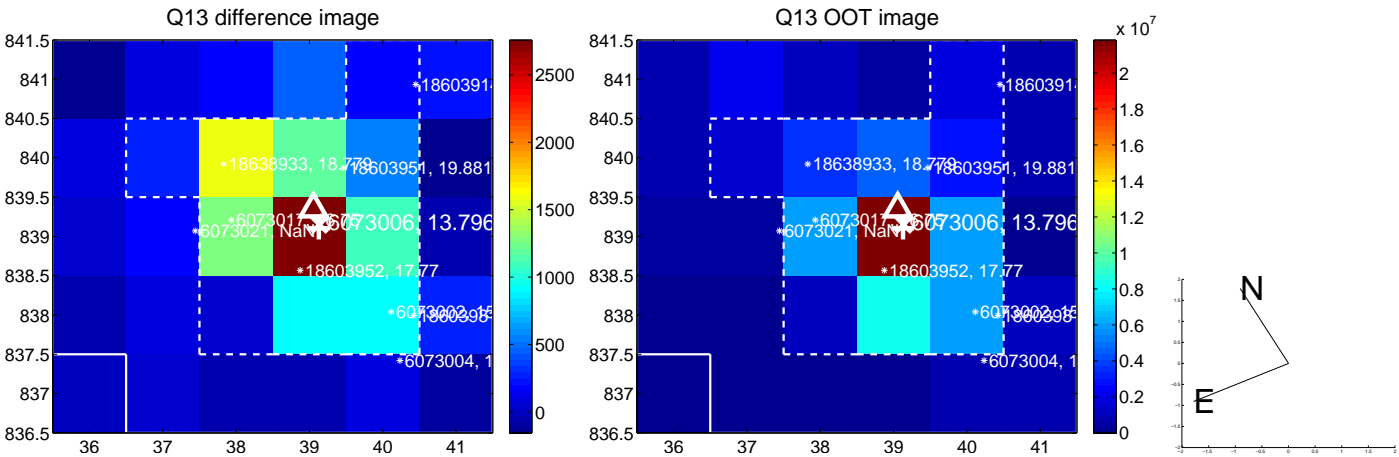
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

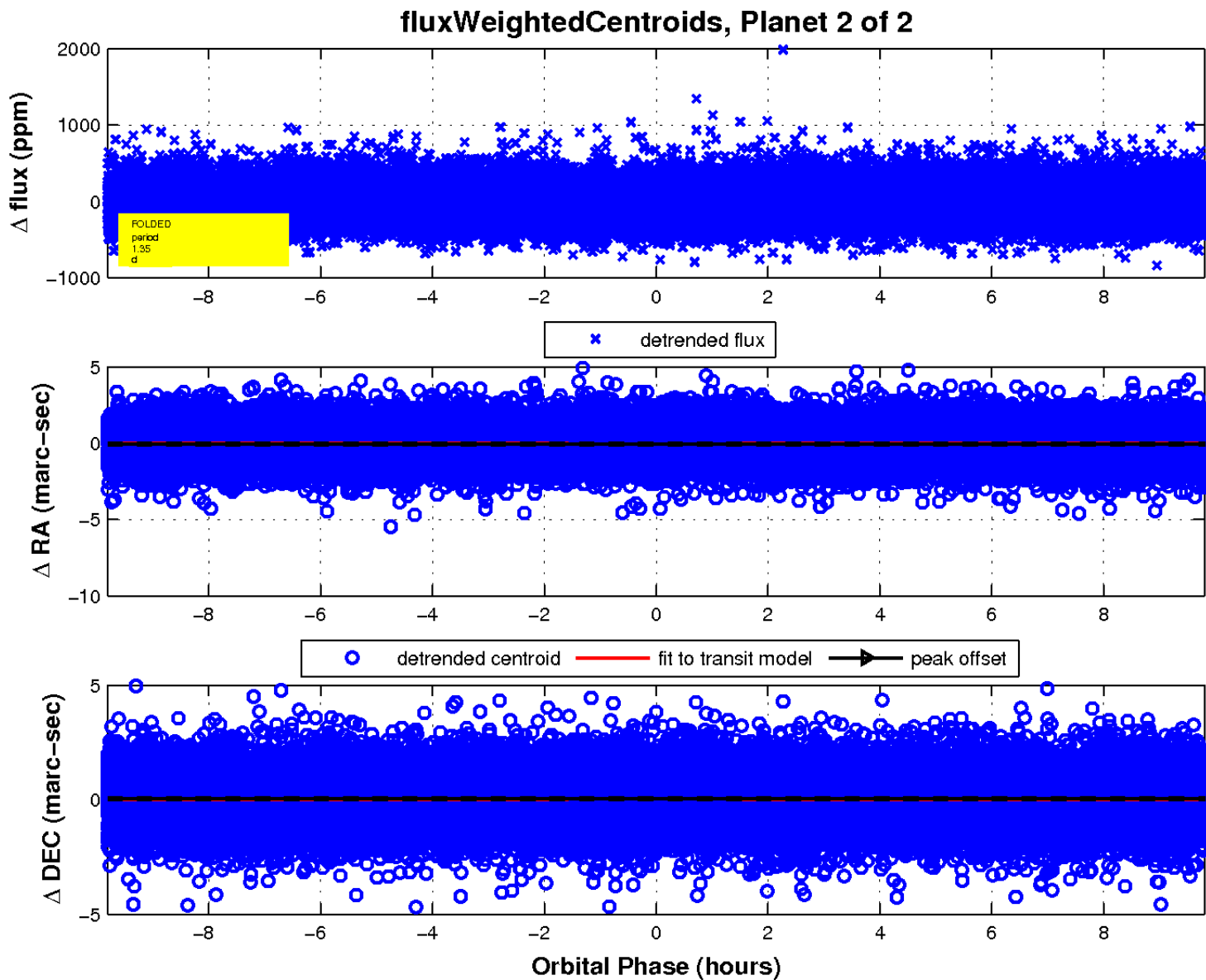
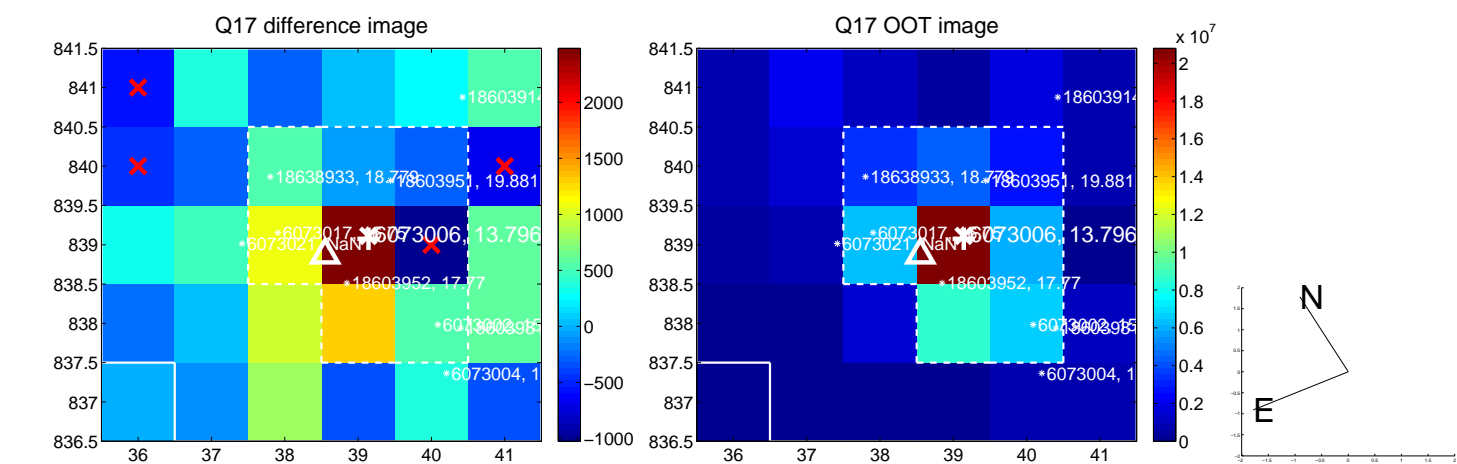


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

