

# KIC 010618475

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010618475-01	OBS	No	2.138412	131.524616	523.1	7.500	8.9	-1.0	0.87	5285	1.94	521.15
010618475-02	OBS	No	373.863806	238.147947	1566.1	23.606	32.6	8.9	0.87	5285	6.85	0.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010618475-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_NOFITS
010618475-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

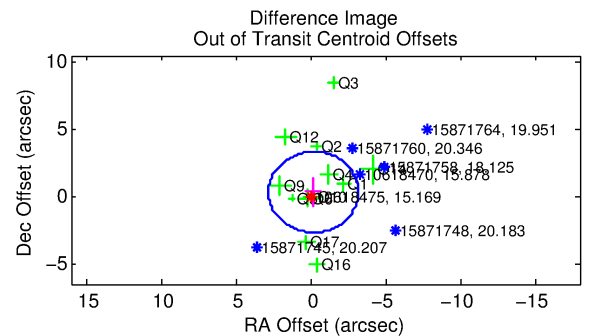
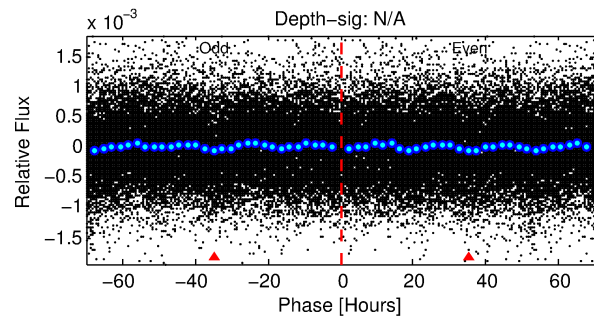
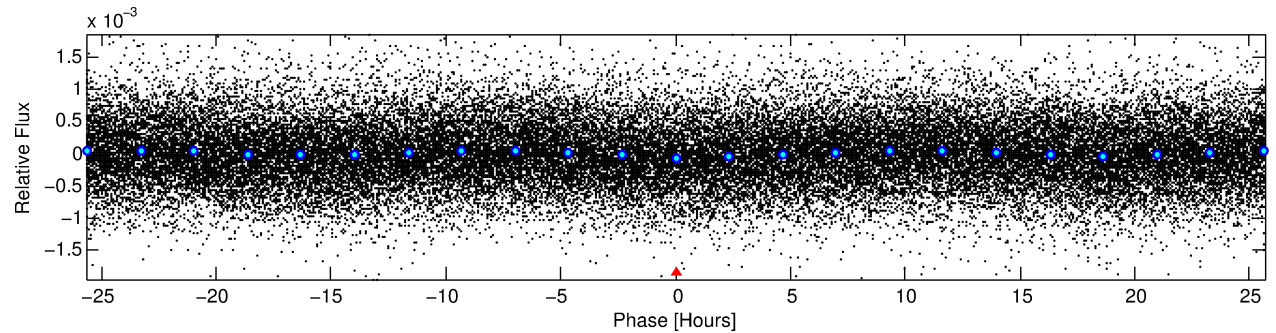
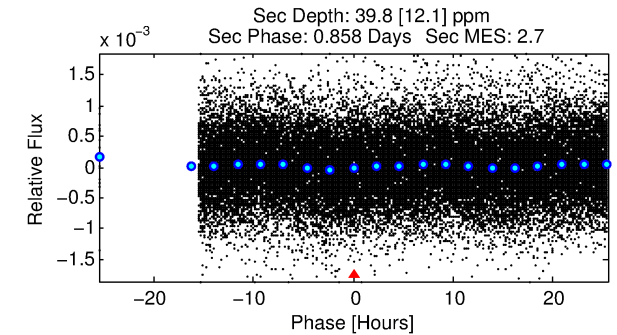
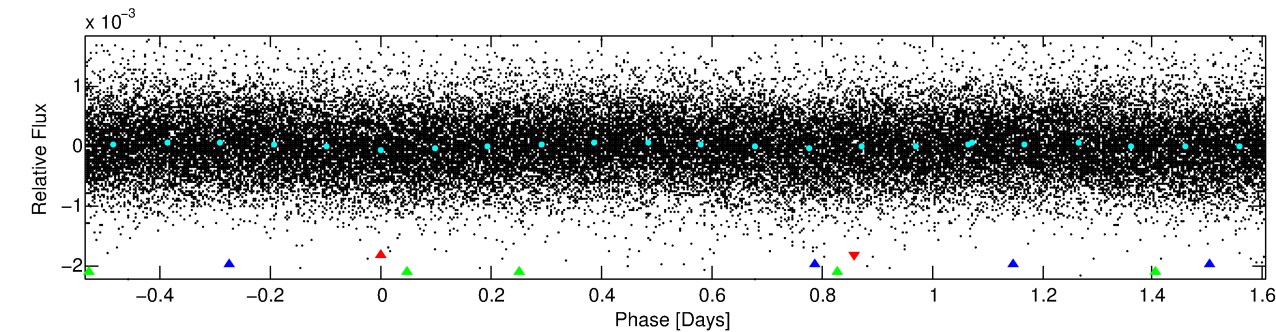
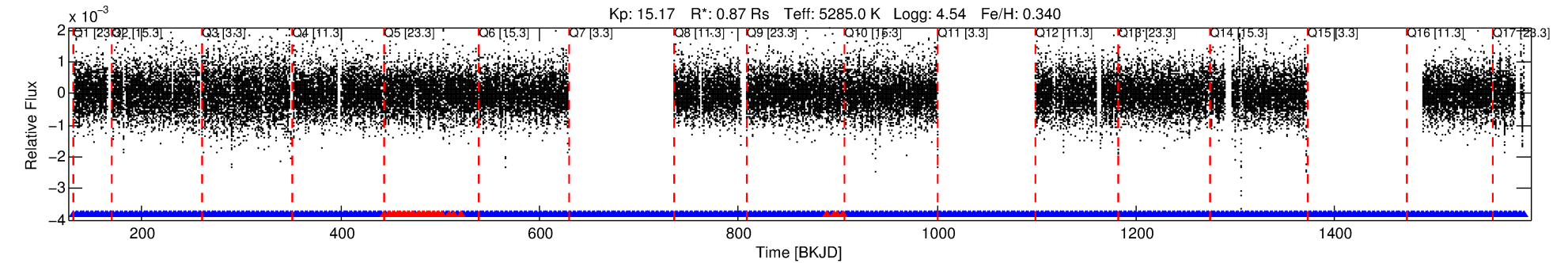
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010618475-01

No Significant Match Found

# DV One-Page Summary

KIC: 10618475 Candidate: 1 of 3 Period: 2.138 d



## TPS TCE Results:

Period = 2.13841 d  
Epoch = 131.5246 BKJD

DV fit results are unavailable

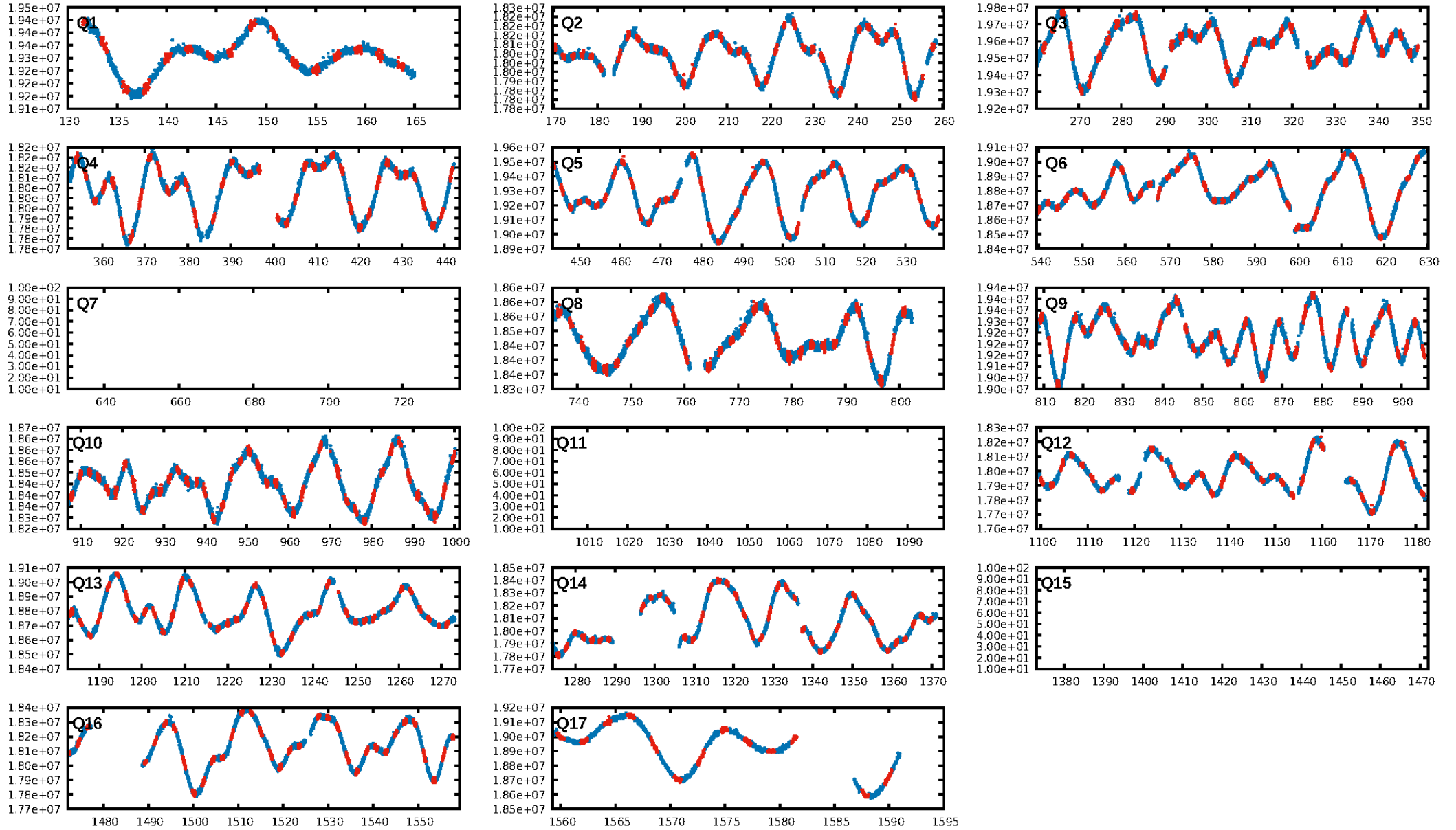
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [883.76σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.29e-16  
RollingBand-fgt: 0.93 [444/477]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.388 arcsec [0.39σ]  
KicOffset-rm: 0.430 arcsec [0.60σ]  
OotOffset-st: 4/1/3/4 [12]  
KicOffset-st: 4/1/3/4 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 1.00 [14/14]

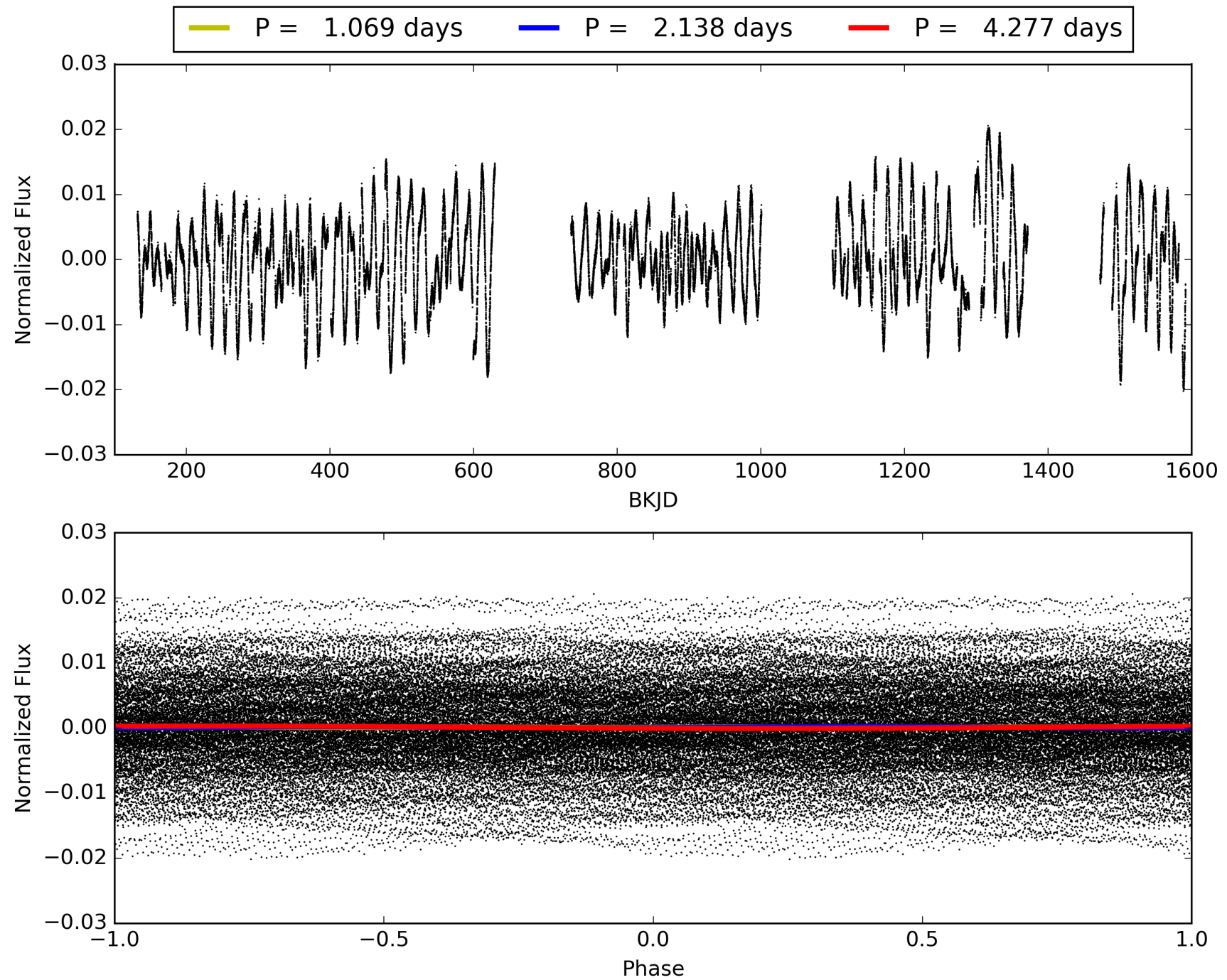
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:41:48 Z

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

# TCE 010618475-01, PDC Light Curves

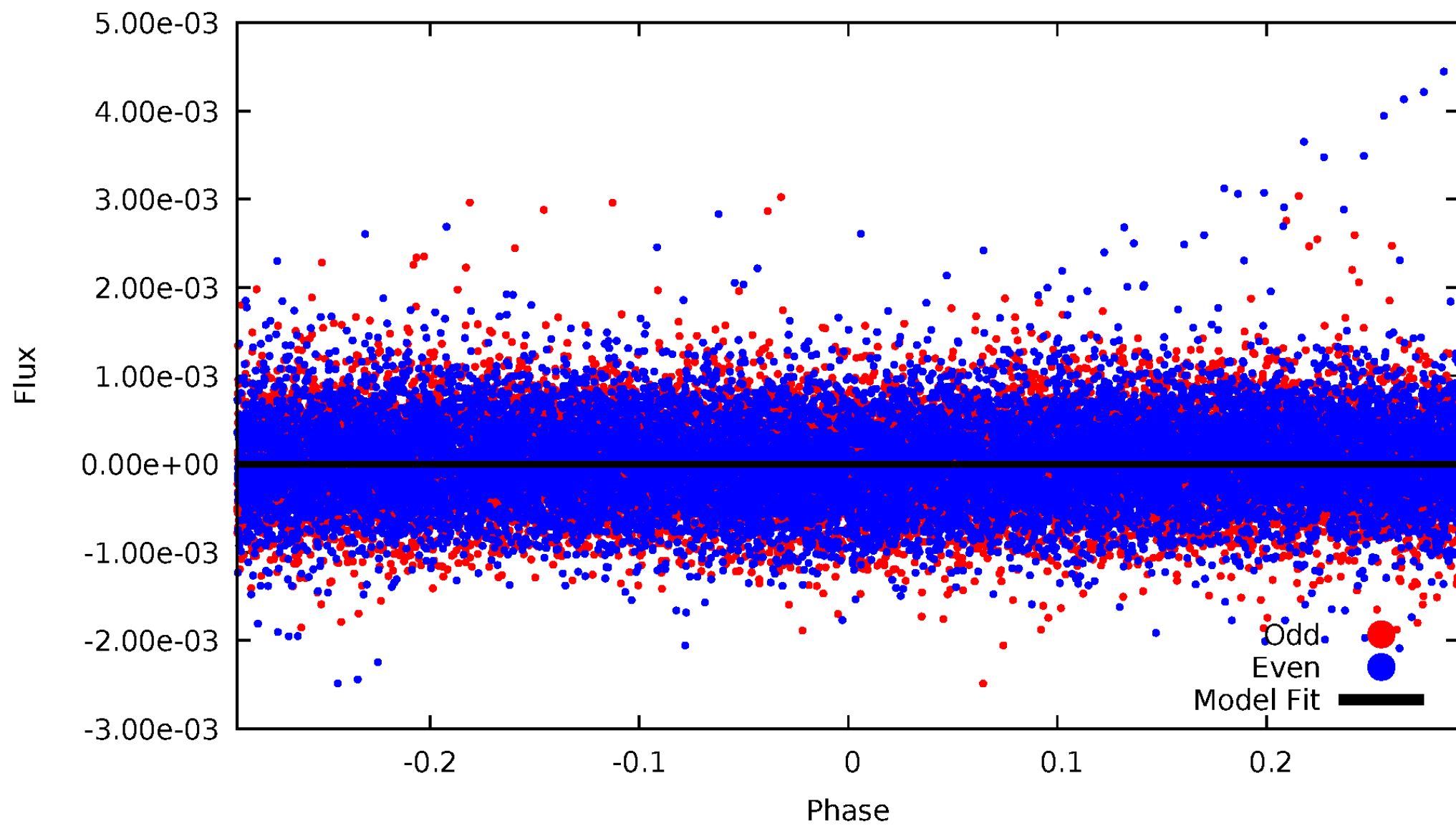


# TCE 010618475-01



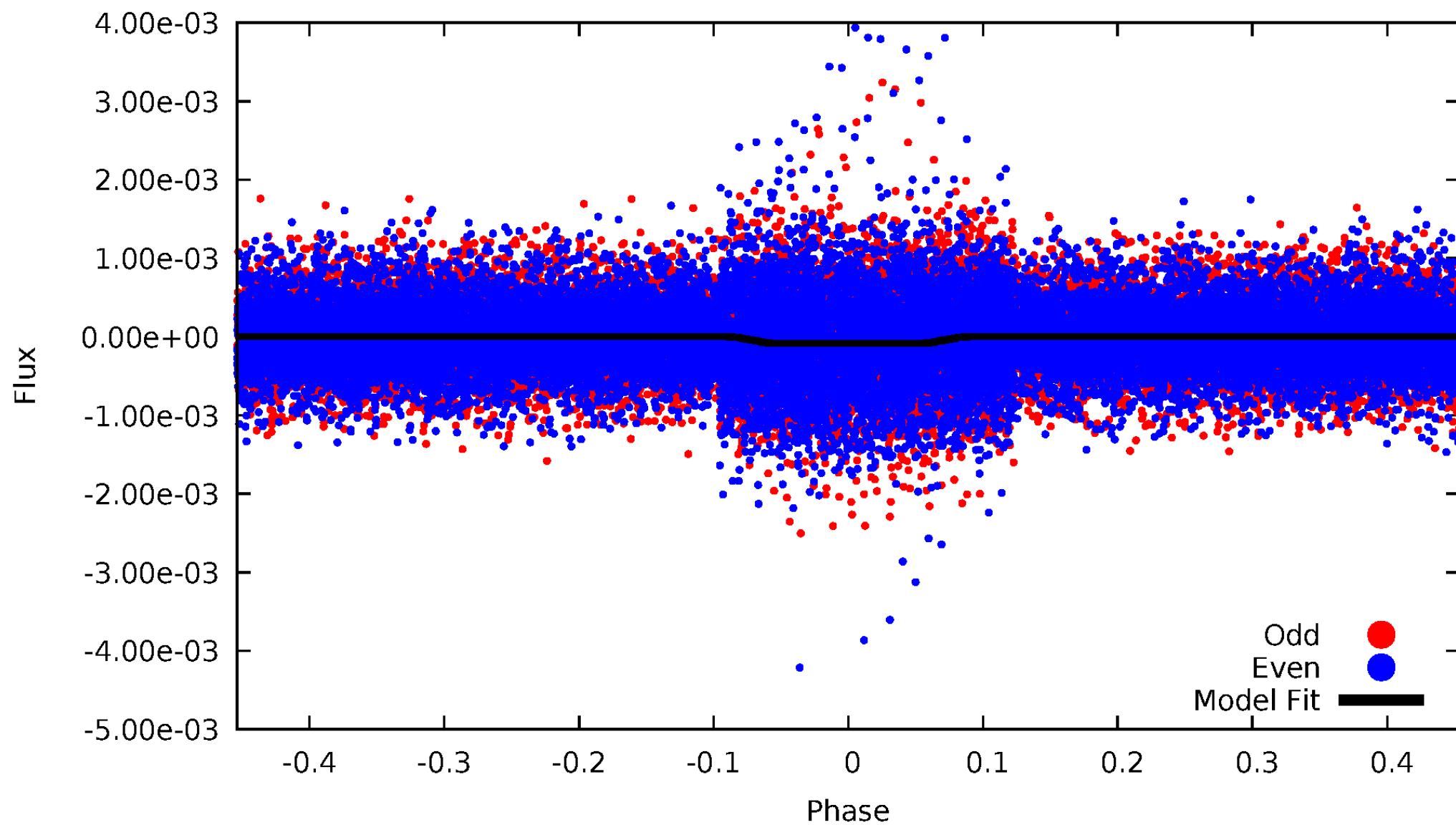
# DV Odd/Even

TCE 010618475-01



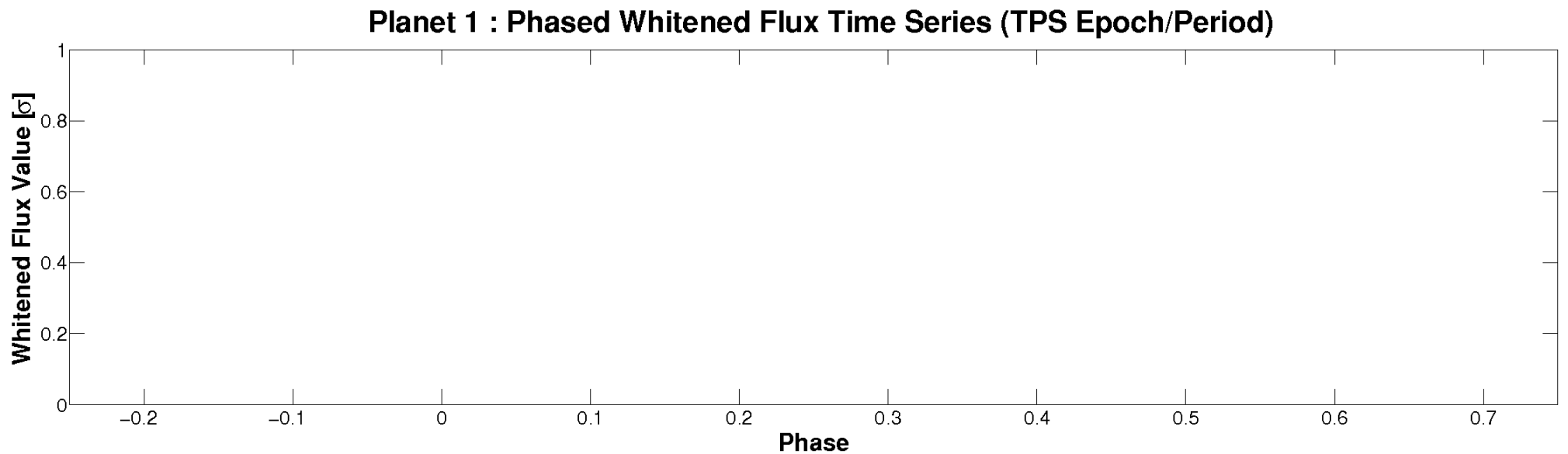
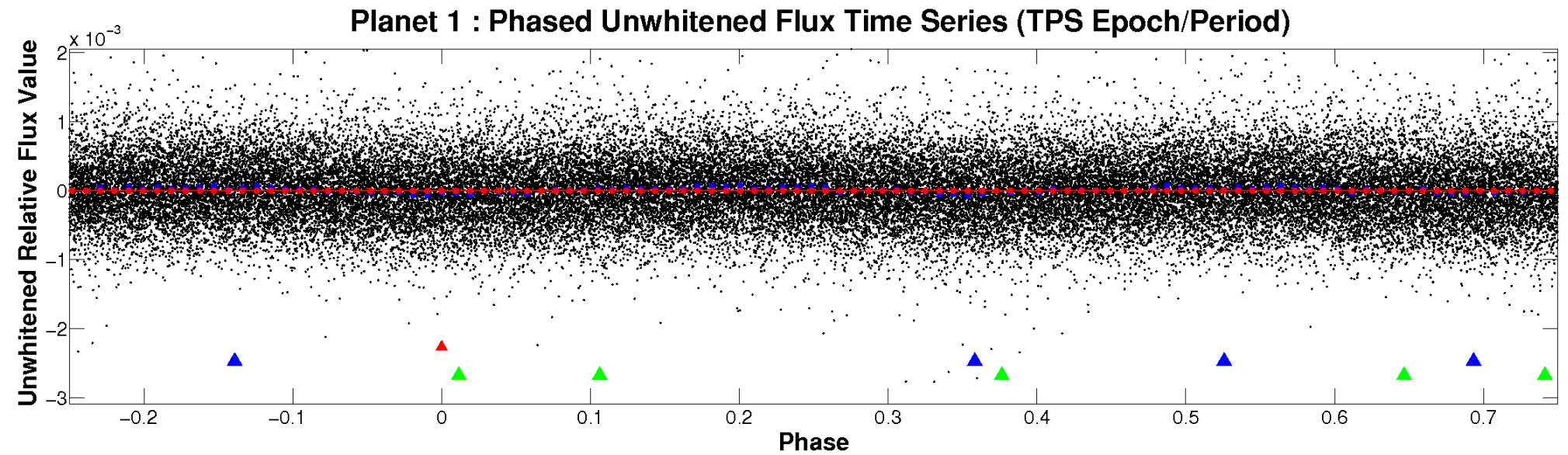
# ALT Odd/Even

TCE 010618475-01



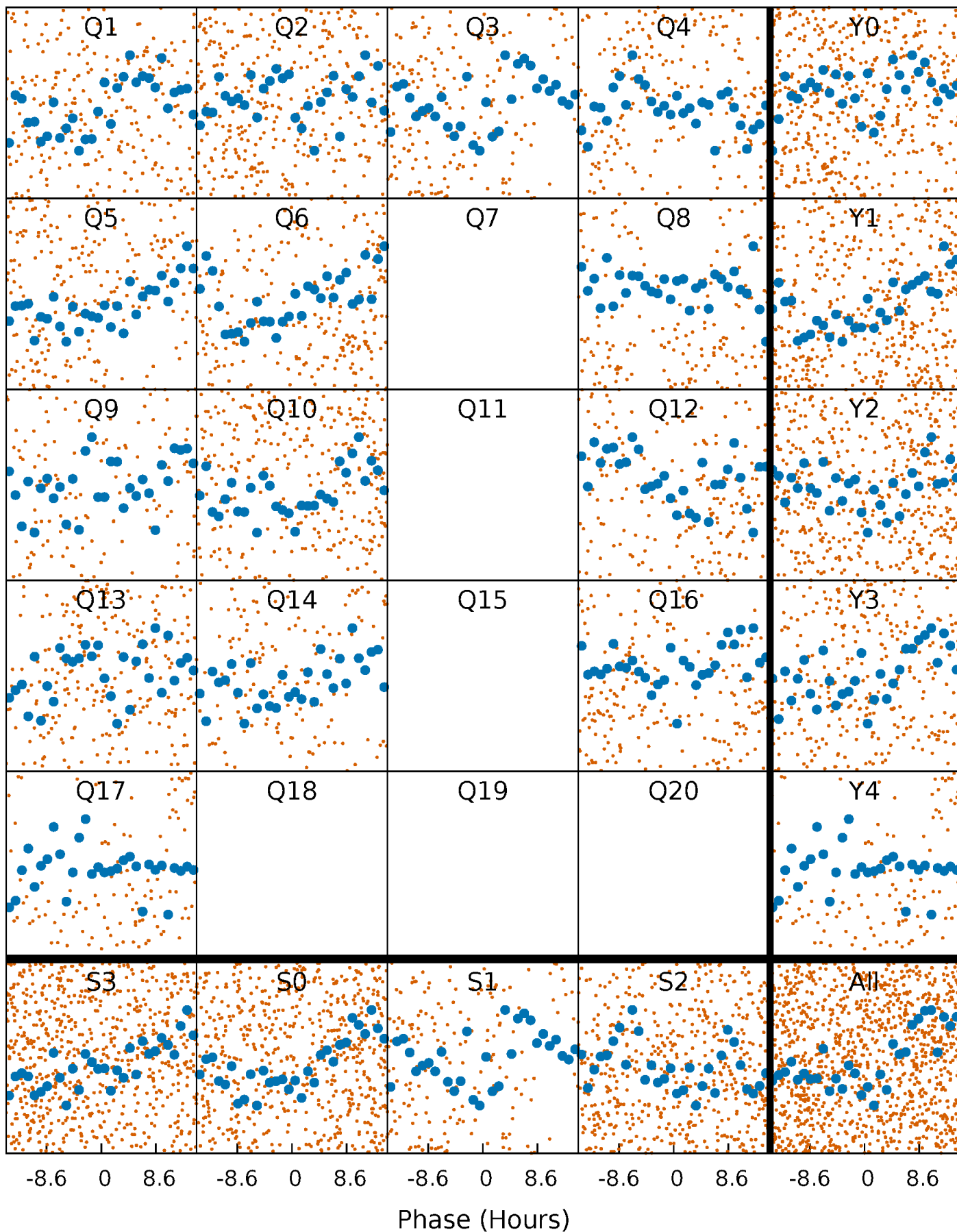


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

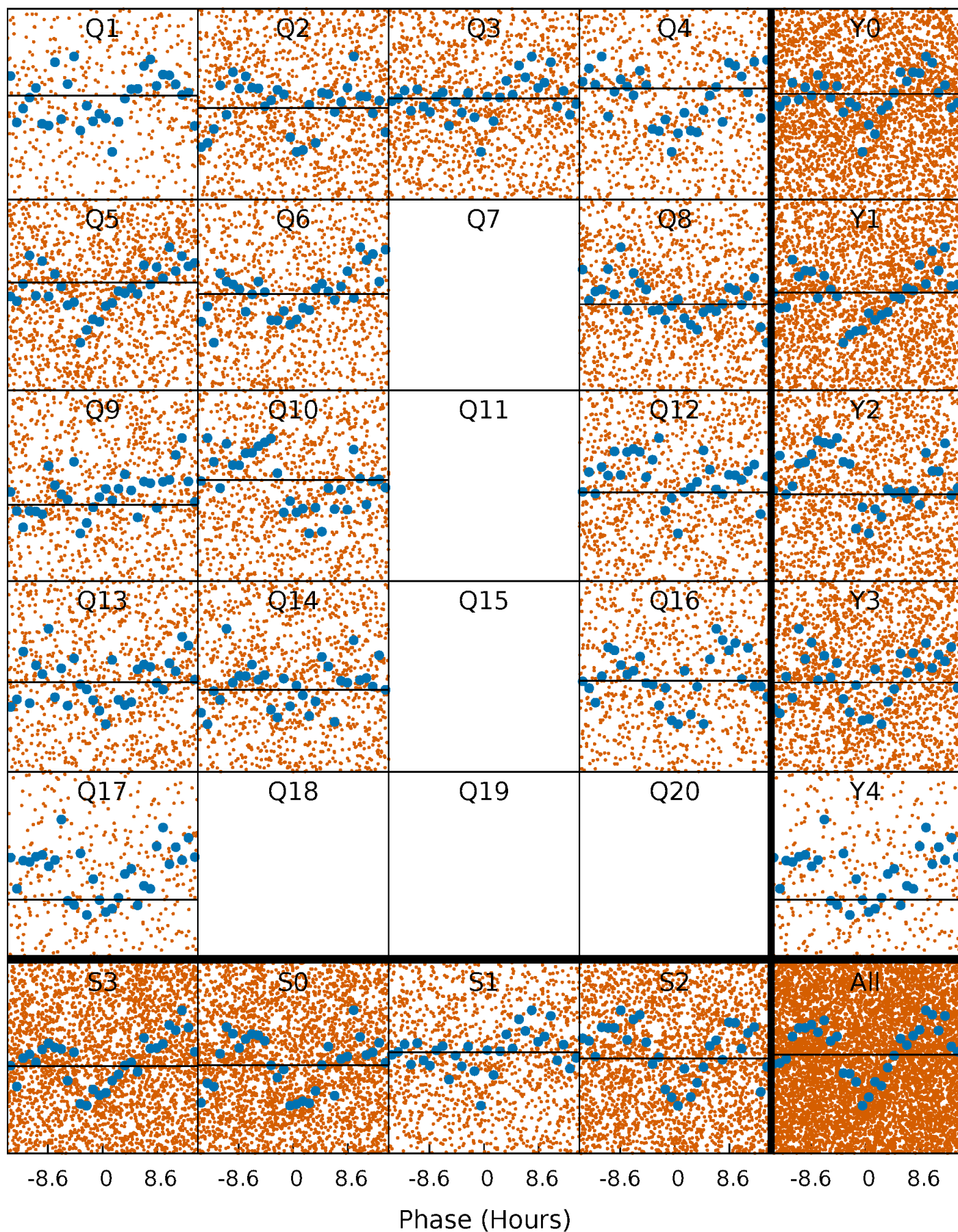
TCE 010618475-01 P= 2.138412 Days  $T_0=131.524616$  (BKJD)





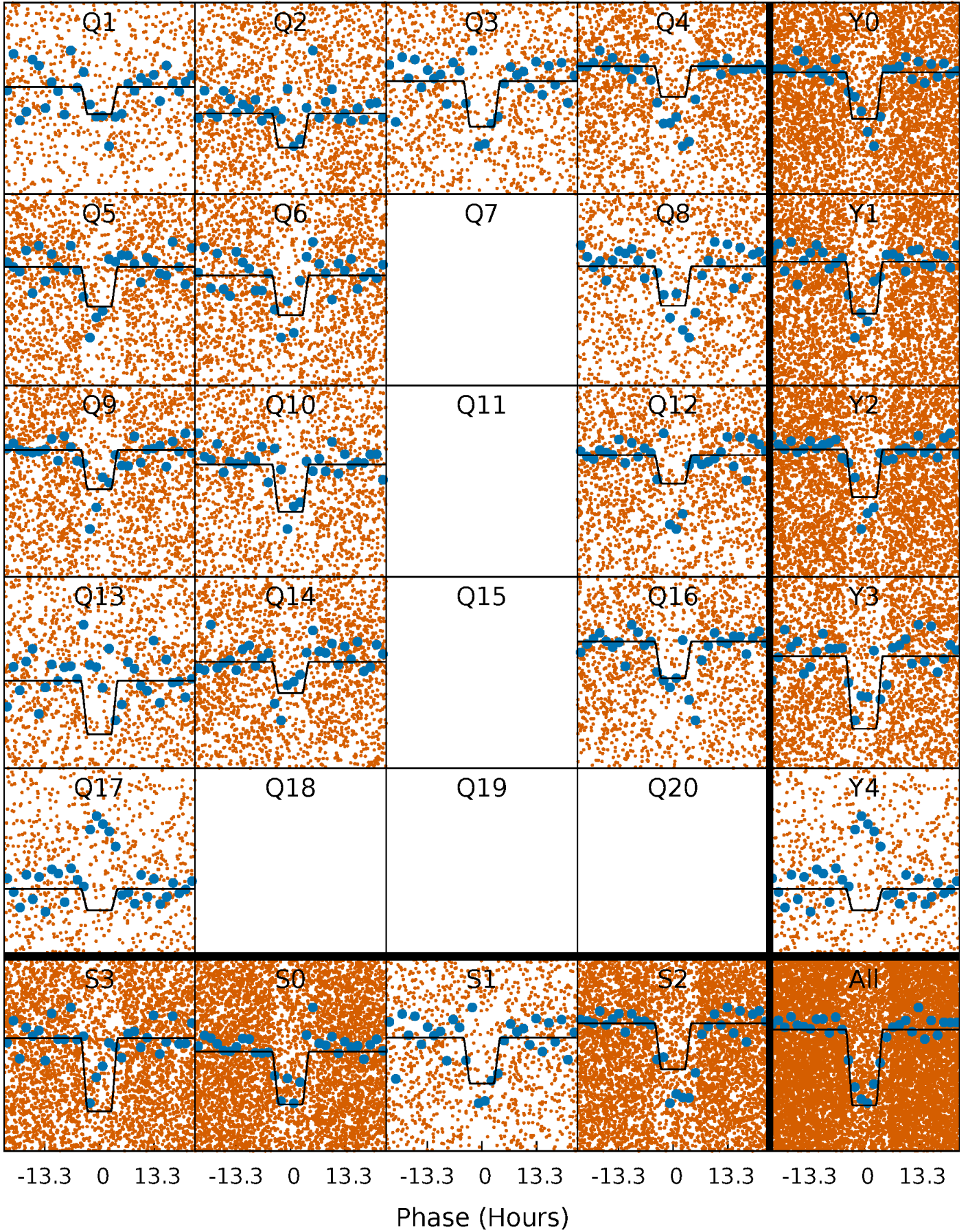
# DV Quarter-Phased Transit Curves

TCE 010618475-01 P= 2.138412 Days  $T_0=131.524616$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

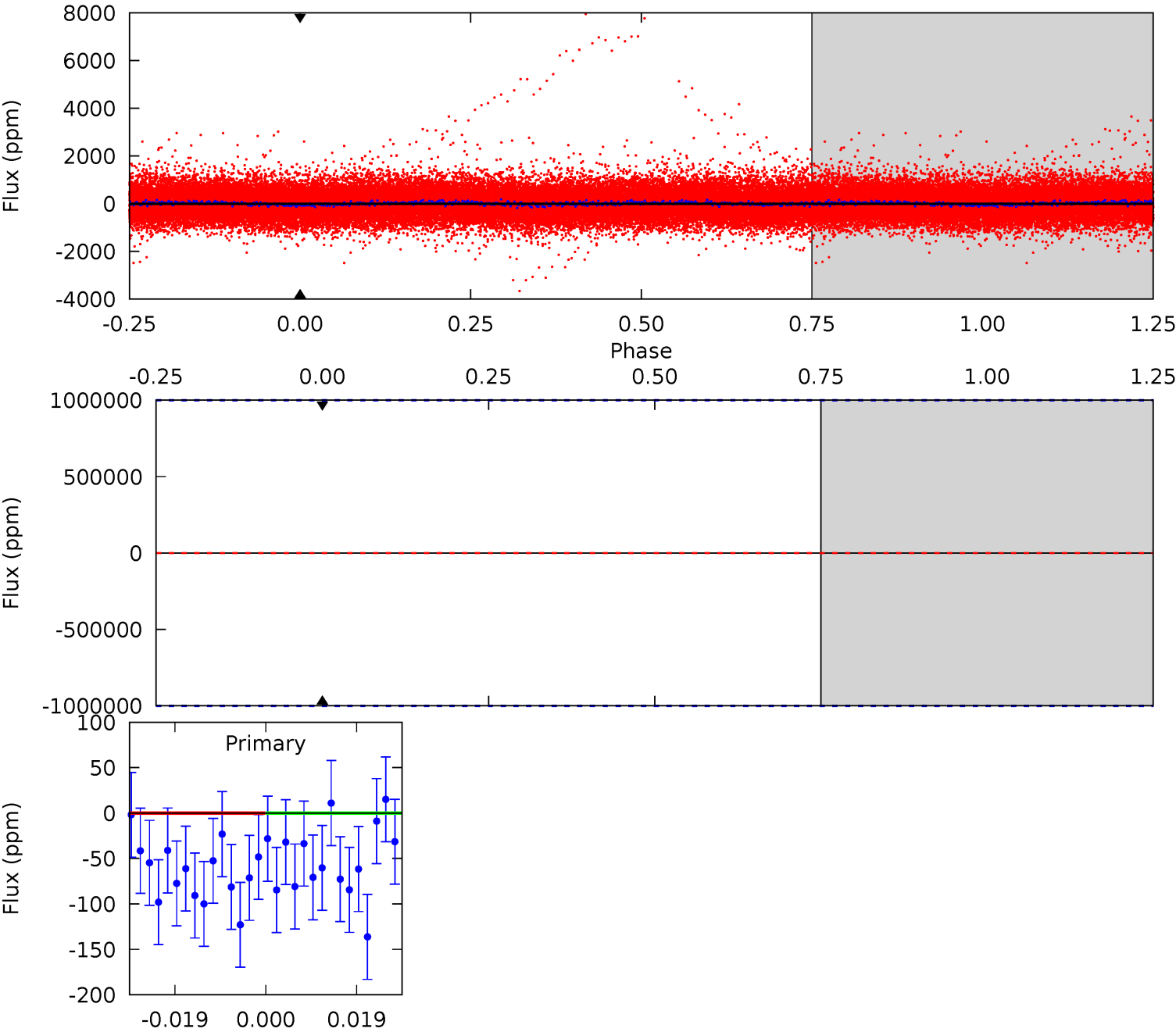
TCE 010618475-01 P= 2.138412 Days  $T_0=131.502170$  (BKJD)



DV Model-Shift Uniqueness Test

010618475-01, P = 2.138412 Days, E = 129.386204 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	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0

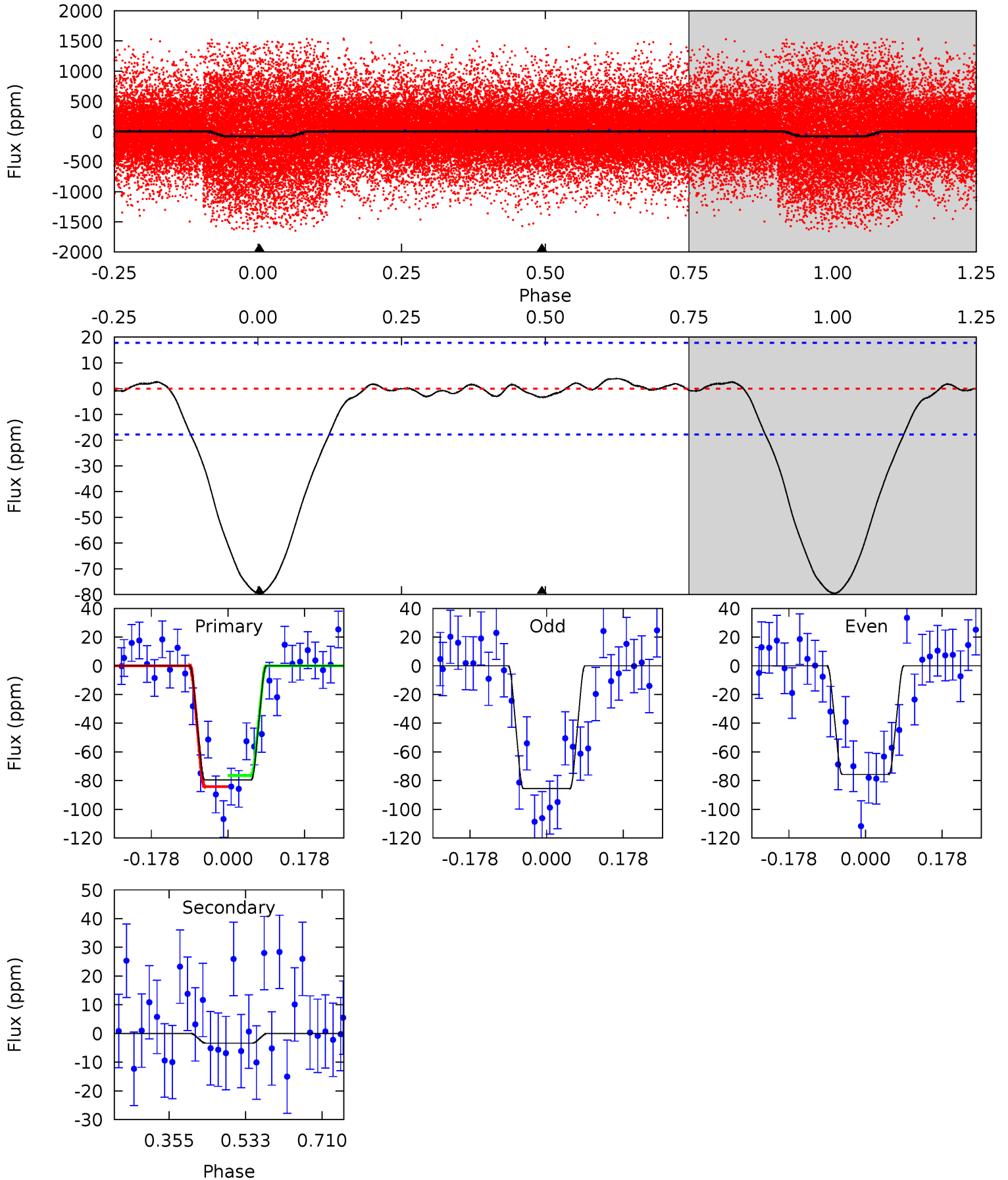




# Alt Model-Shift Uniqueness Test

010618475-01, P = 2.138412 Days, E = 131.502170 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
19.8	0.84	0	0	4.44	1.35	0.33	19.8	19.8	0.84	0.84	1.21	1.20	0.05	0.97



### Stellar Parameters For KIC 010618475

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5285^{+159}_{-159}$	$4.535^{+0.034}_{-0.128}$	$0.340^{+0.100}_{-0.300}$	$0.873^{+0.150}_{-0.069}$	$0.951^{+0.047}_{-0.094}$	$2.016^{+0.336}_{-0.744}$
	+3%/-3%	+1%/-3%	+29%/-88%	+17%/-8%	+5%/-10%	+17%/-37%
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 010618475-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$7.51^{+7.55}_{-5.43}$	$1729^{+80}_{-66}$	$-3015^{+20322}_{-13048}$	$-1.674^{+1896.614}_{-1590.801}$
Alt.	$-3 \pm 4$	$6.99^{+7.75}_{-4.74}$	$1724^{+81}_{-65}$	$-2277^{+4063}_{-78}$	$0.026^{+0.299}_{-0.030}$

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

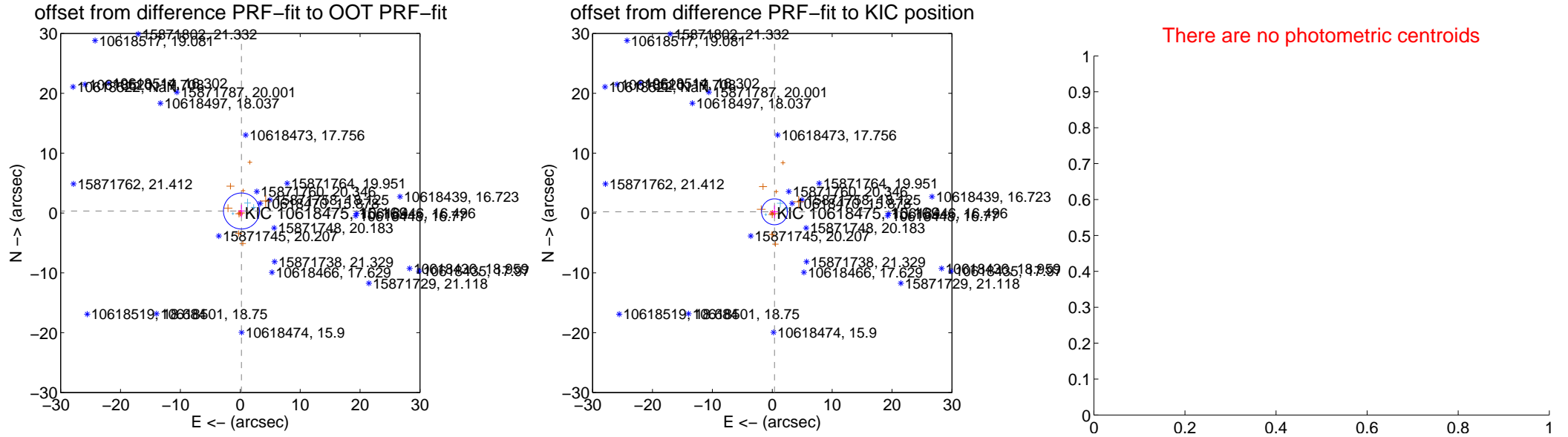
## DV Centroid Data

Supplemental centroid analysis for 010618475-01. Kepler magnitude: 15.17. Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

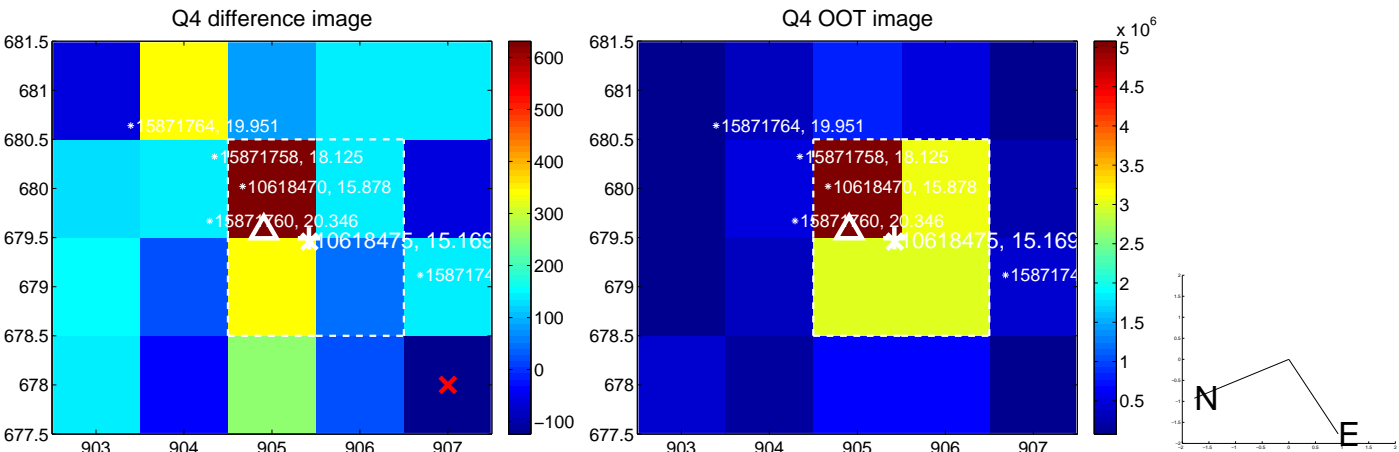
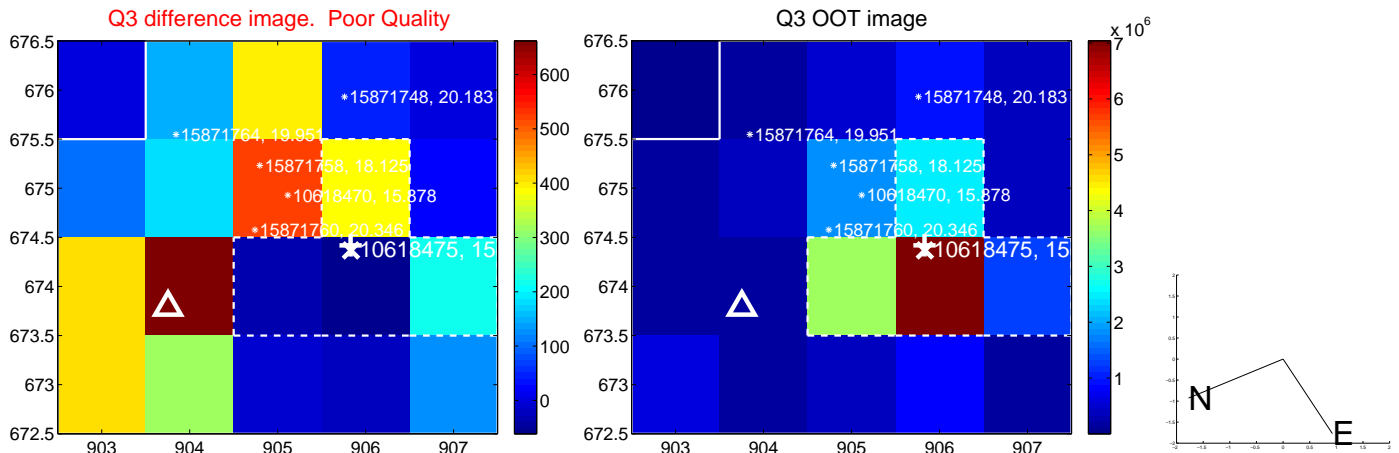
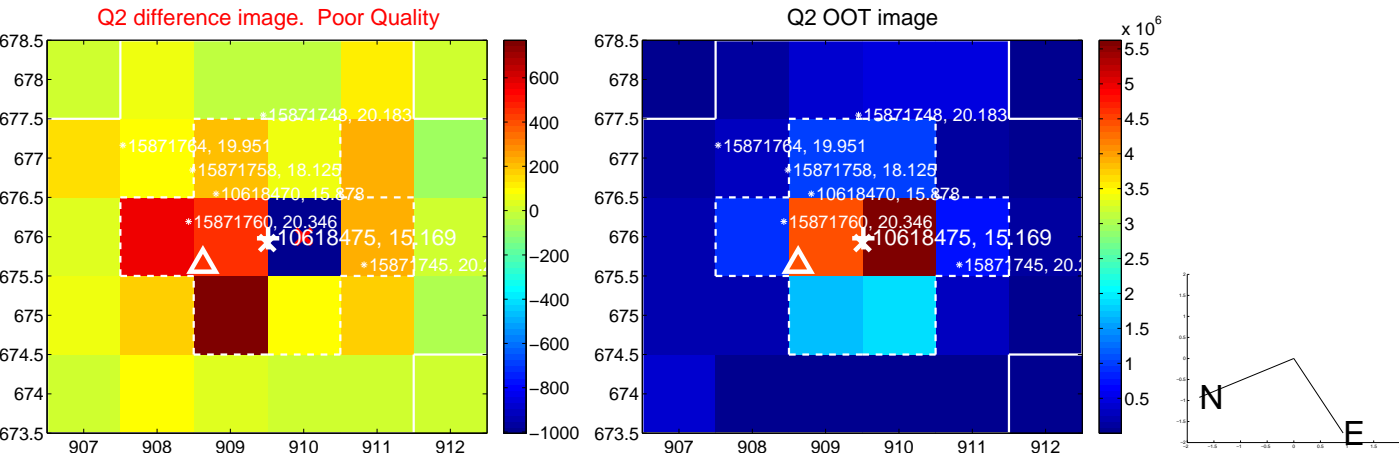
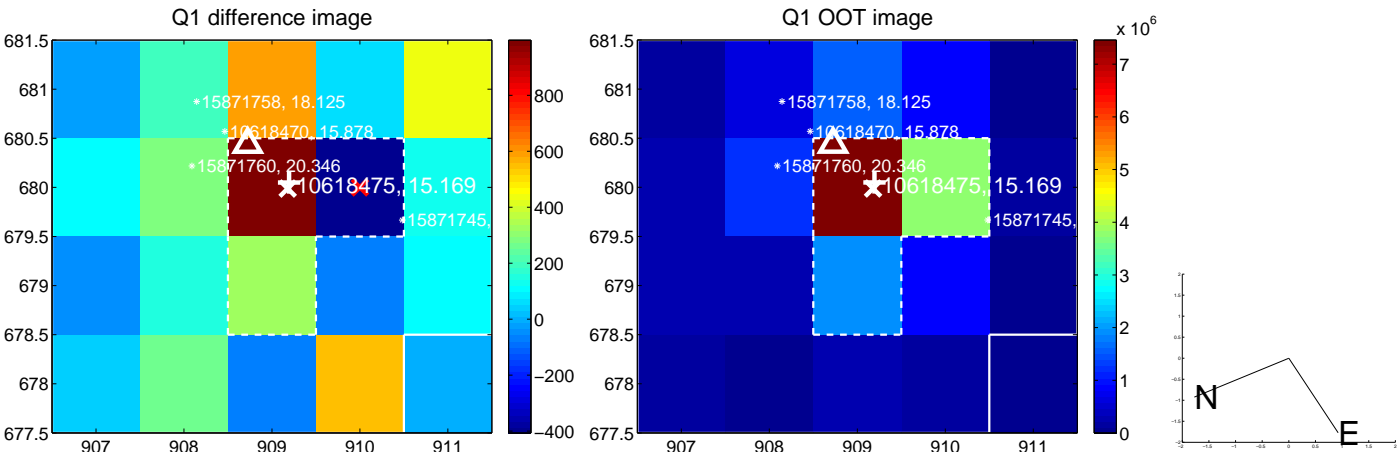
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.388 \pm 1.003$	0.39	$-0.199 \pm 0.501$	$0.334 \pm 1.038$
PRF-fit source offset from KIC position	$0.430 \pm 0.722$	0.60	$-0.379 \pm 0.506$	$0.204 \pm 1.062$
photometric centroid source offset	—	—	—	—



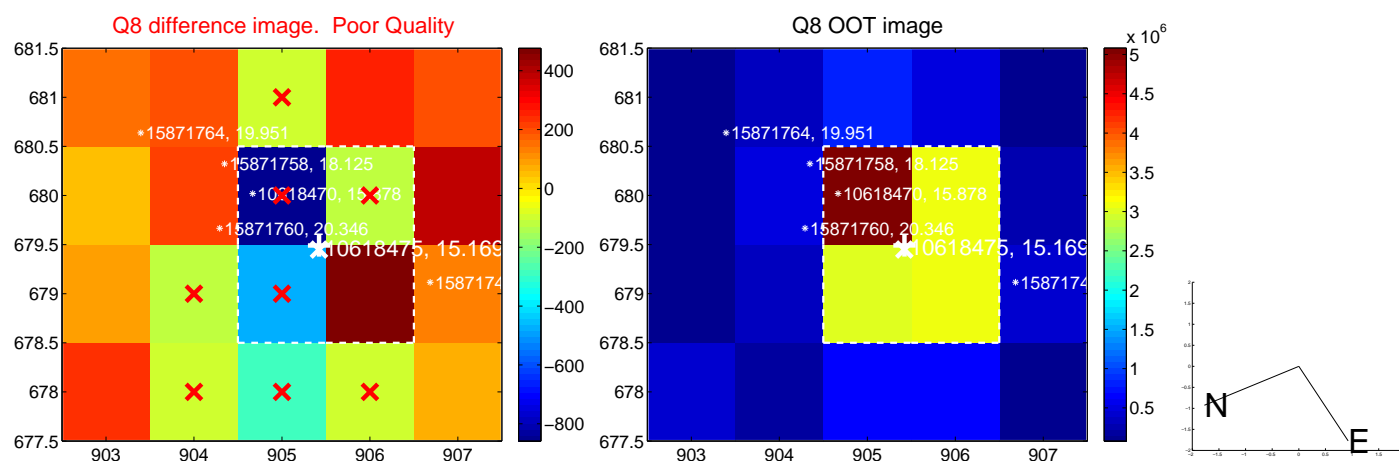
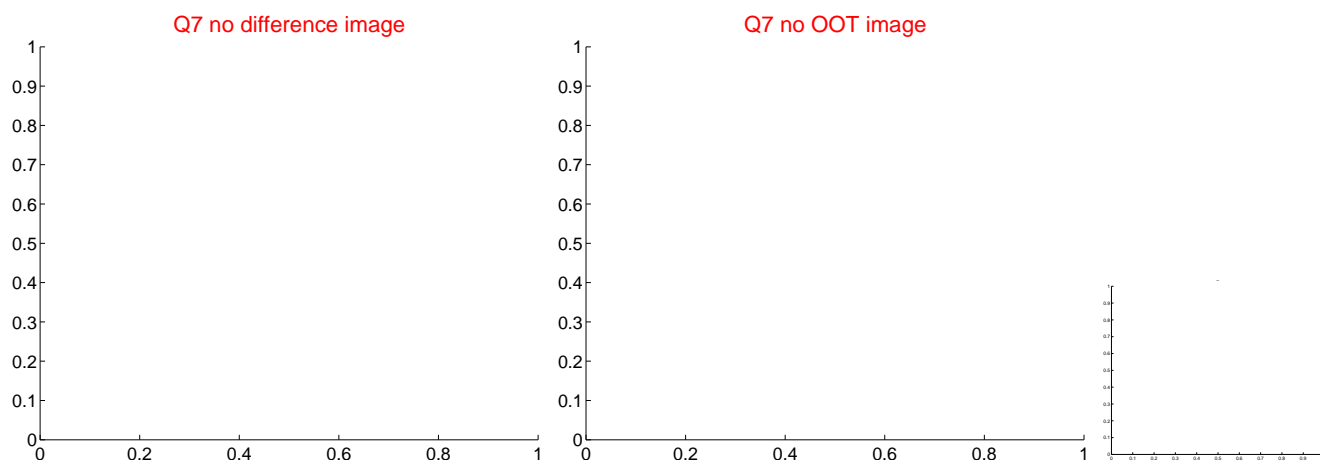
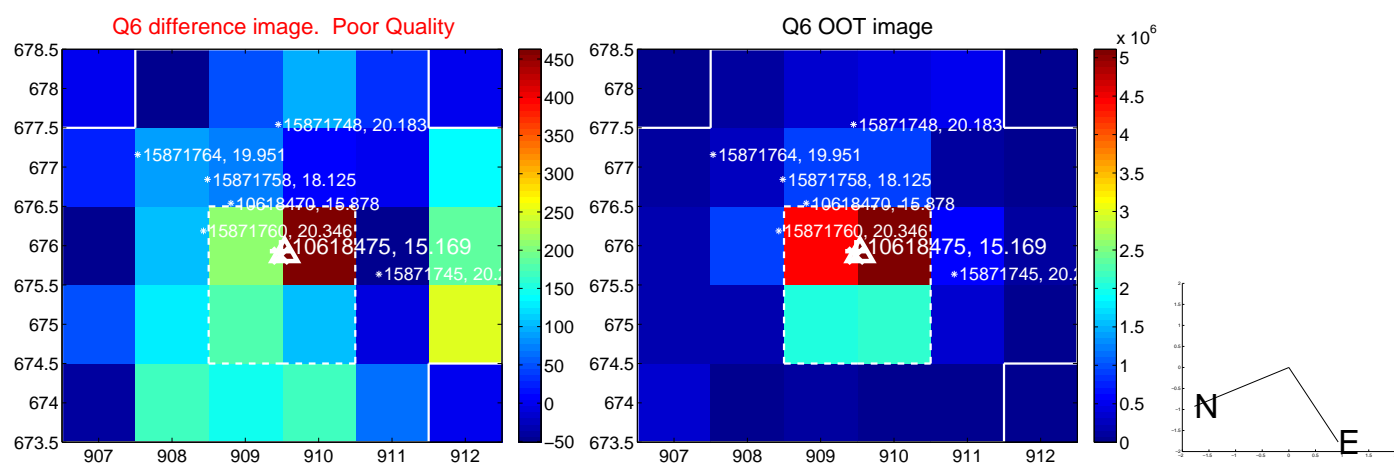
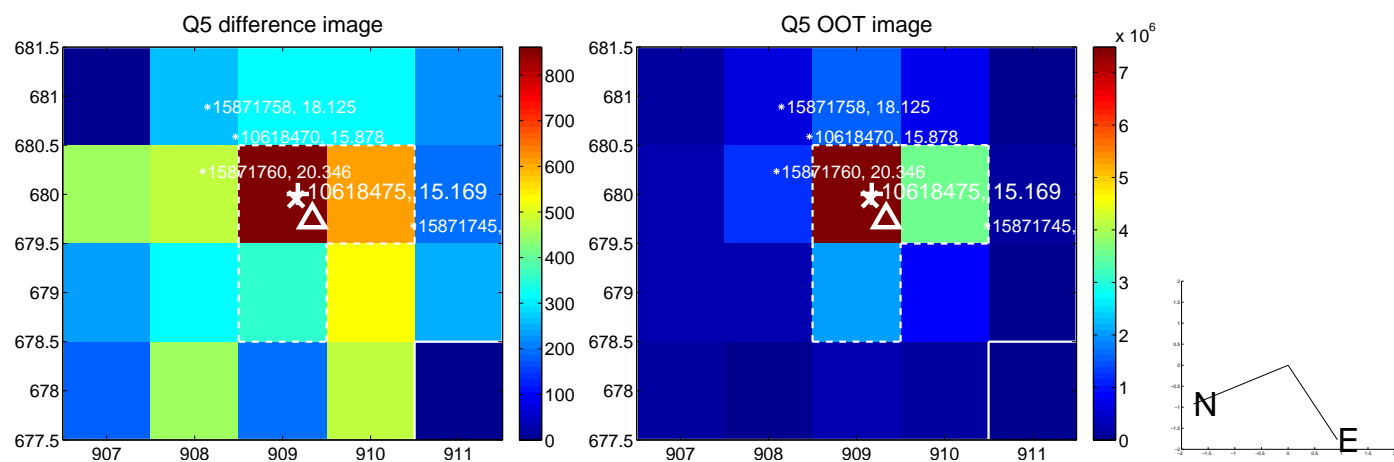
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



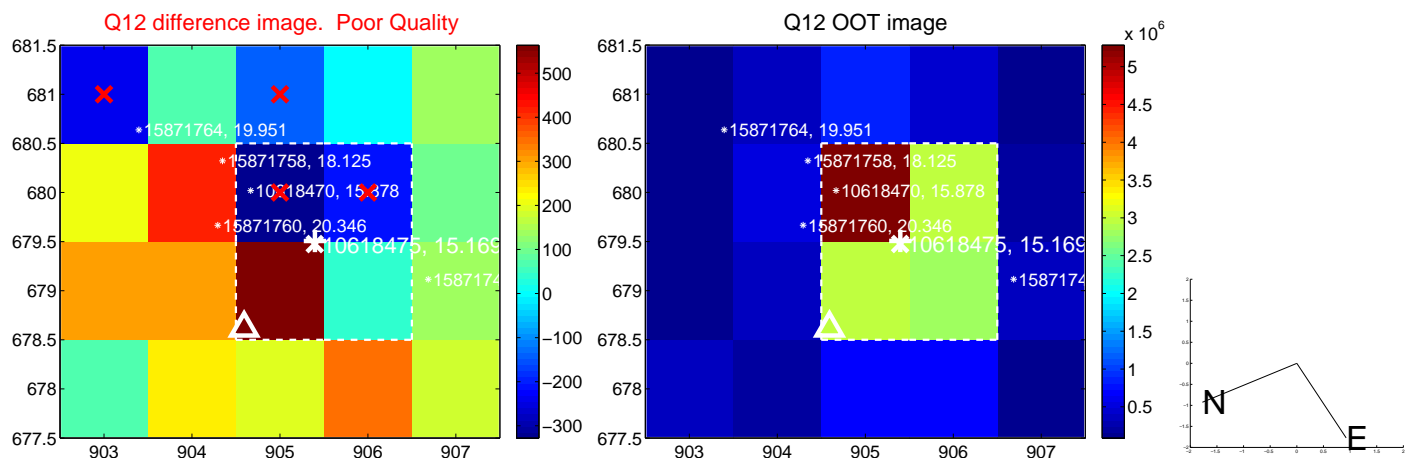
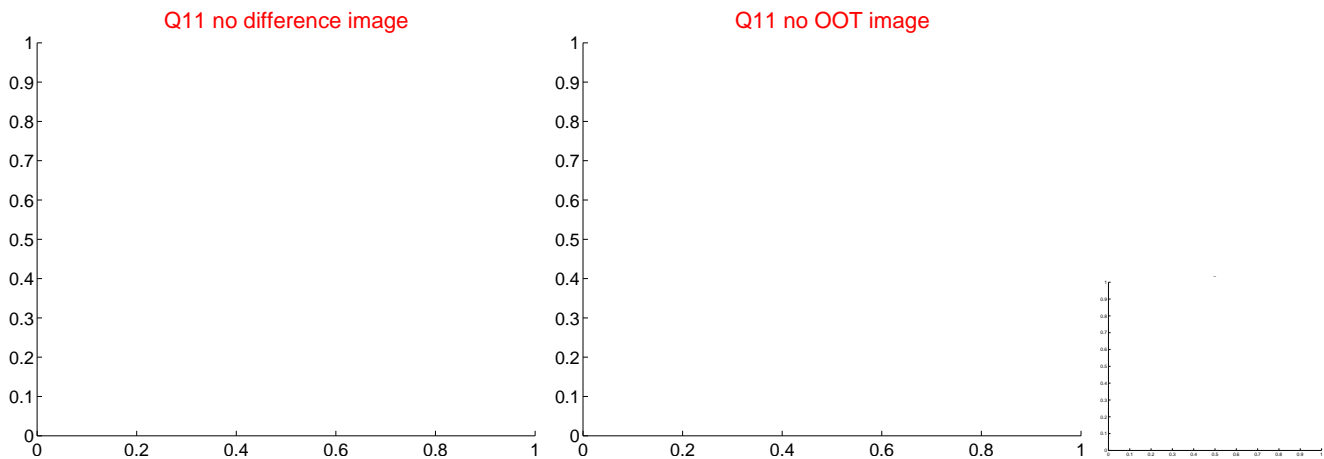
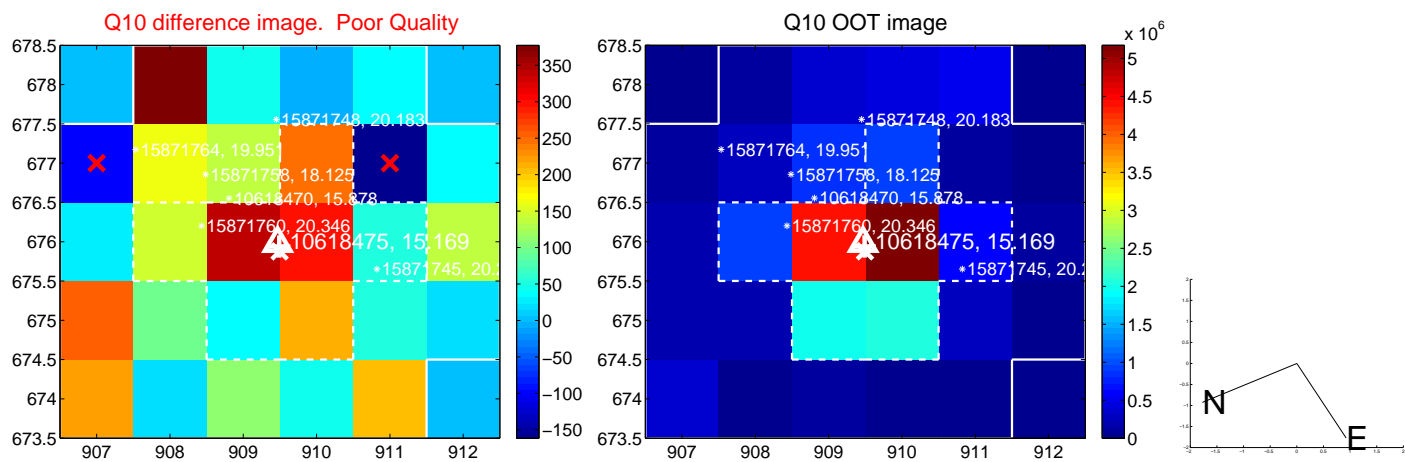
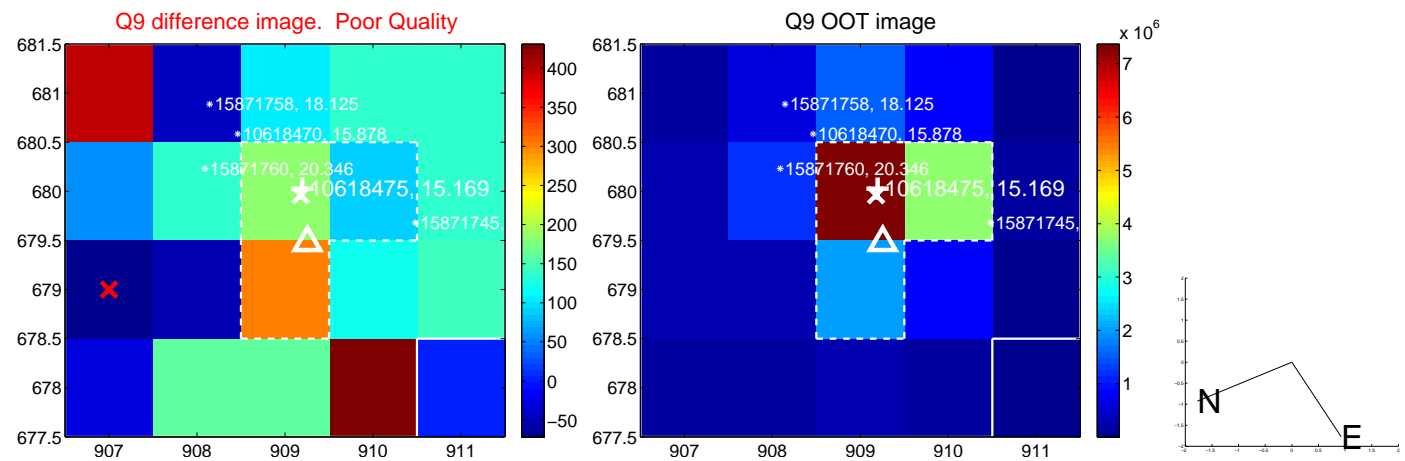
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



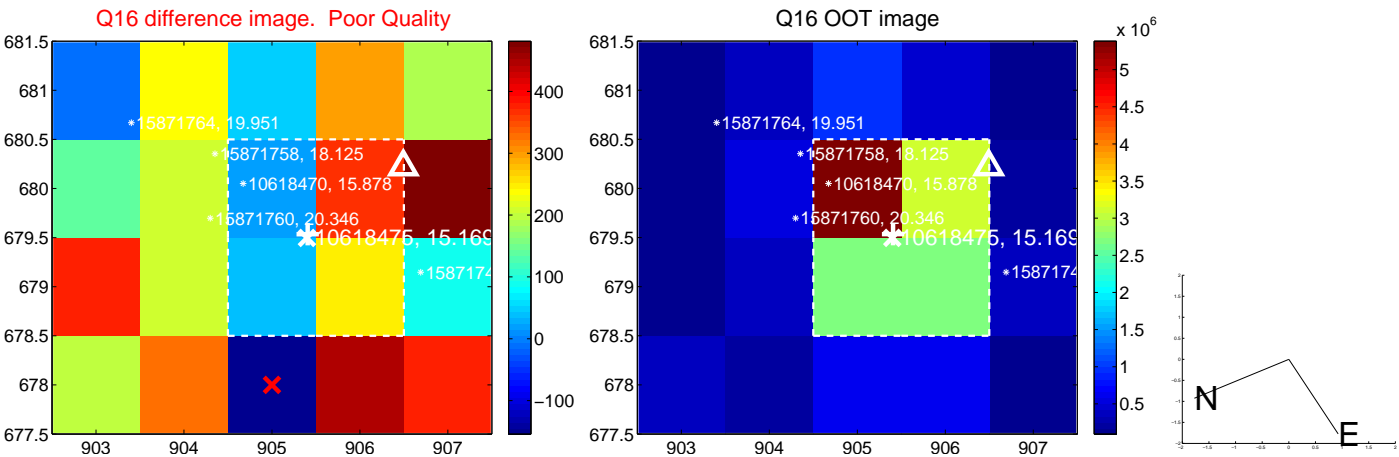
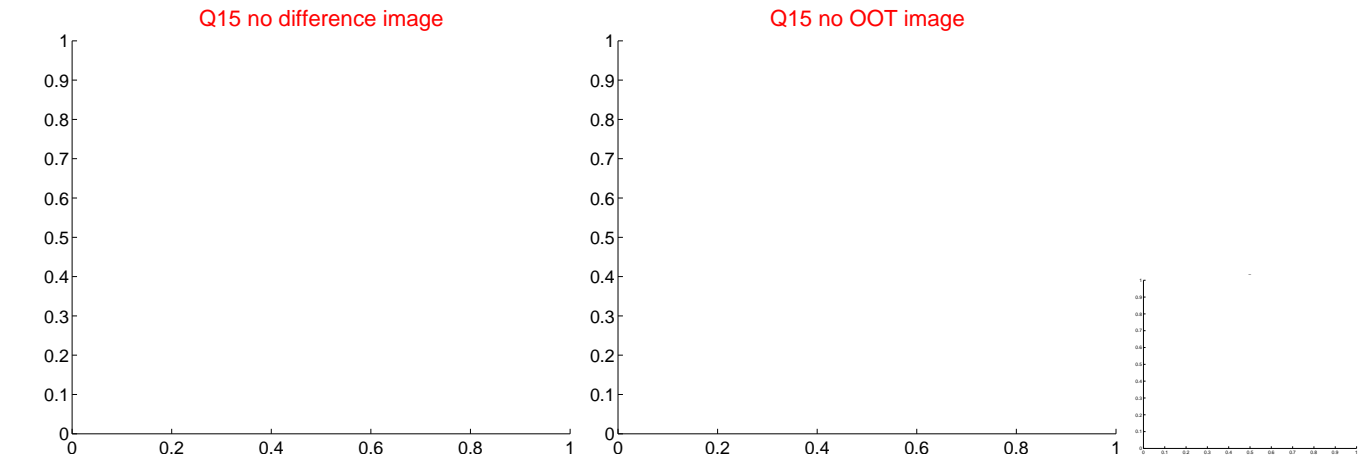
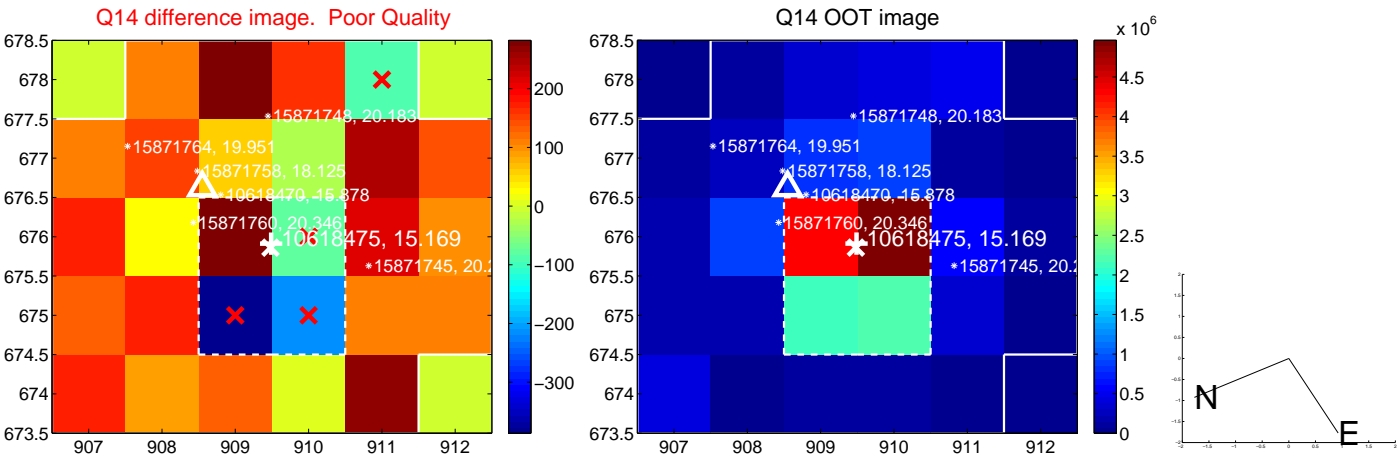
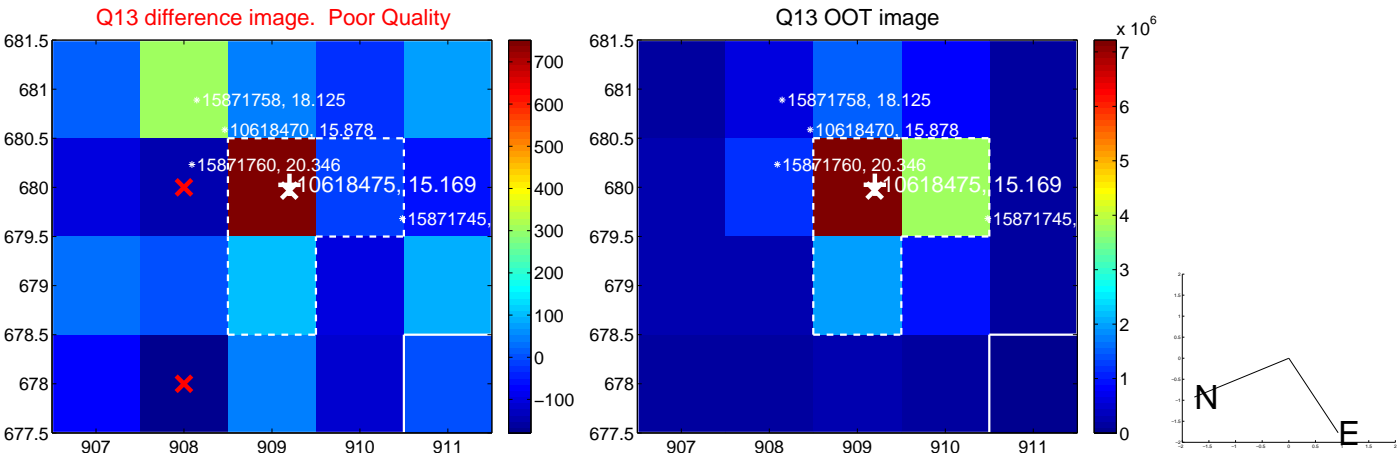
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



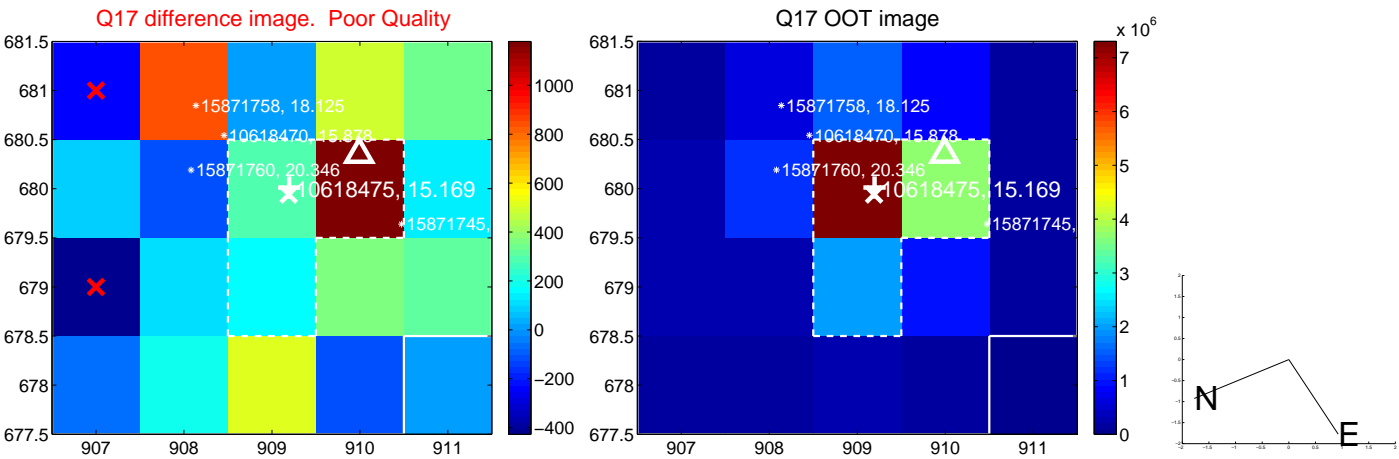
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



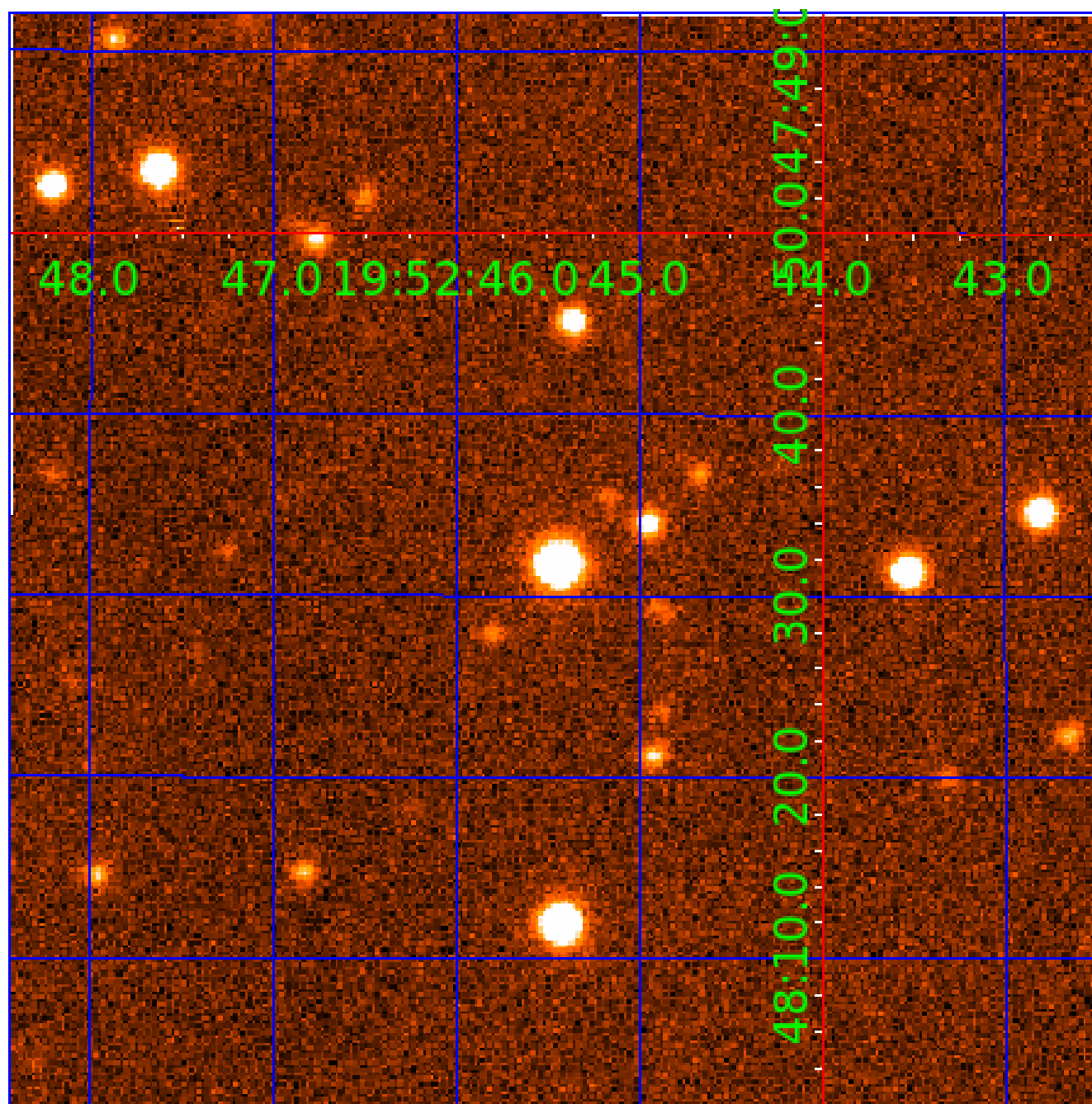
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination





# KIC 010618475

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010618475-01	OBS	No	2.138412	131.524616	523.1	7.500	8.9	-1.0	0.87	5285	1.94	521.15
010618475-02	OBS	No	373.863806	238.147947	1566.1	23.606	32.6	8.9	0.87	5285	6.85	0.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010618475-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_NOFITS
010618475-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

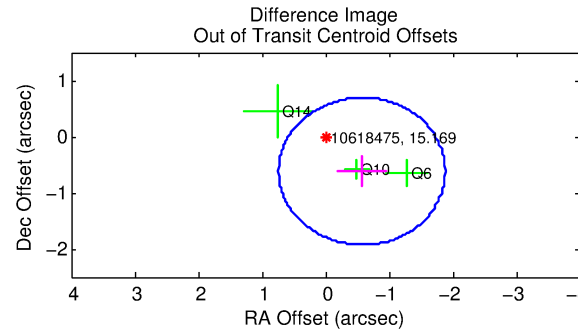
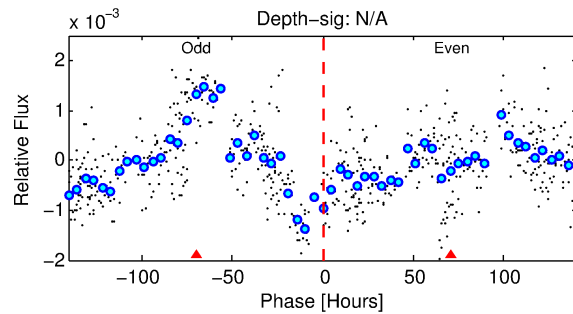
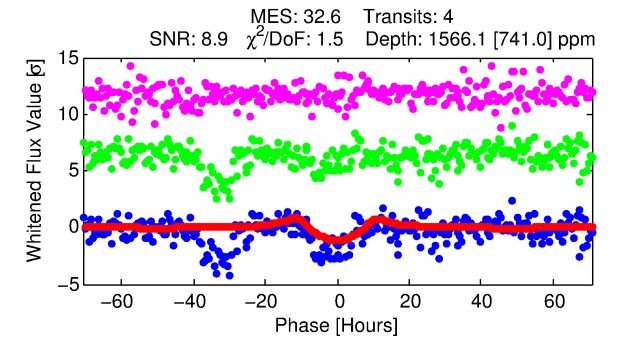
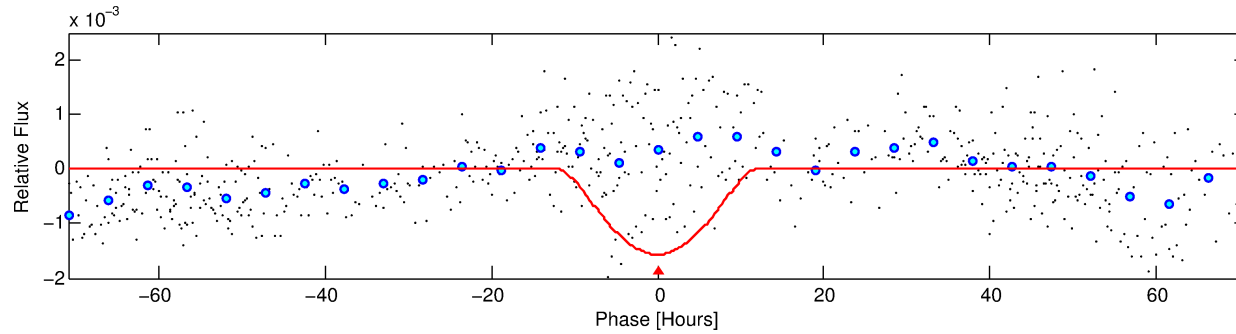
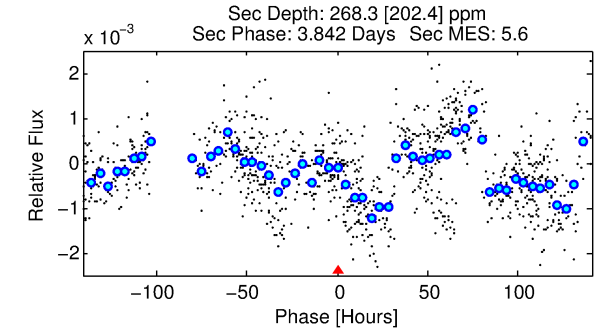
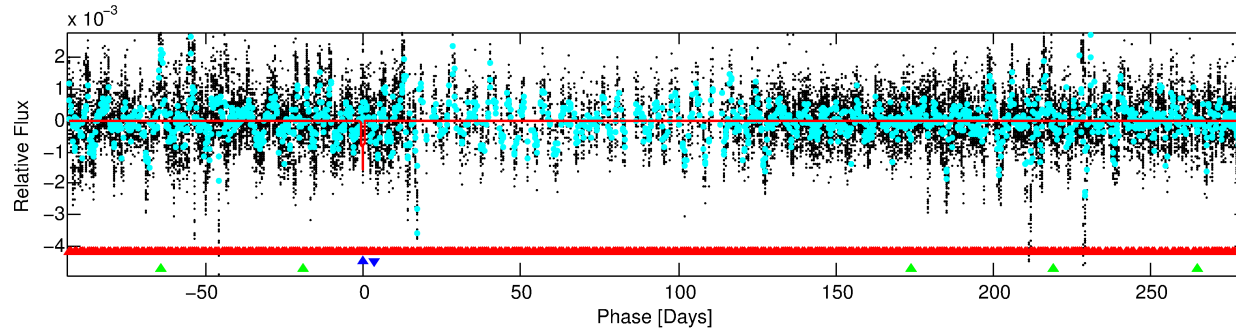
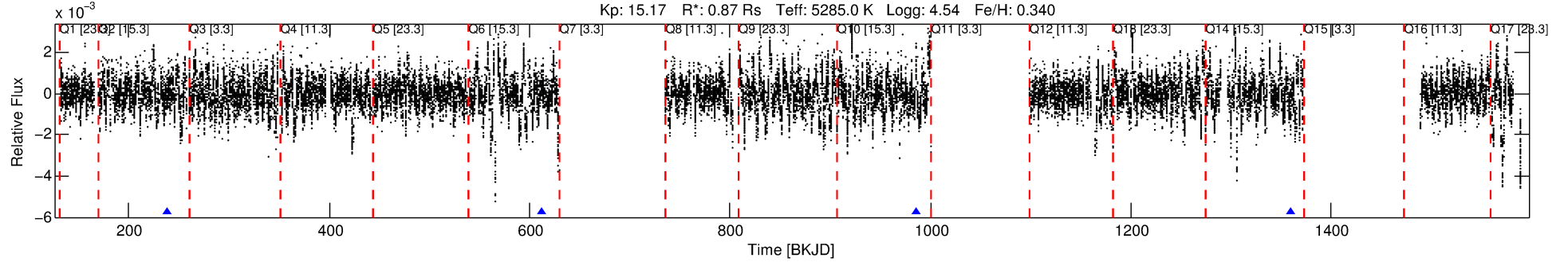
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010618475-02

No Significant Match Found

# DV One-Page Summary

KIC: 10618475 Candidate: 2 of 3 Period: 373.864 d



## DV Fit Results:

Period = 373.86381 [0.03200] d  
Epoch = 238.1479 [0.0624] BKJD  
Rp/R\* = 0.0719 [0.1834]  
a/R\* = 46.73 [26.02]  
b = 1.00 [0.28]  
Seff = 0.53 [0.14]  
Teq = 218 [14] K  
Rp = 6.85 [17.51] Re  
a = 0.9997 [0.1509] AU  
Ag = 3144.29 [16230.40] [0.19σ]  
Teffp = 2523 [3253] K [0.71σ]

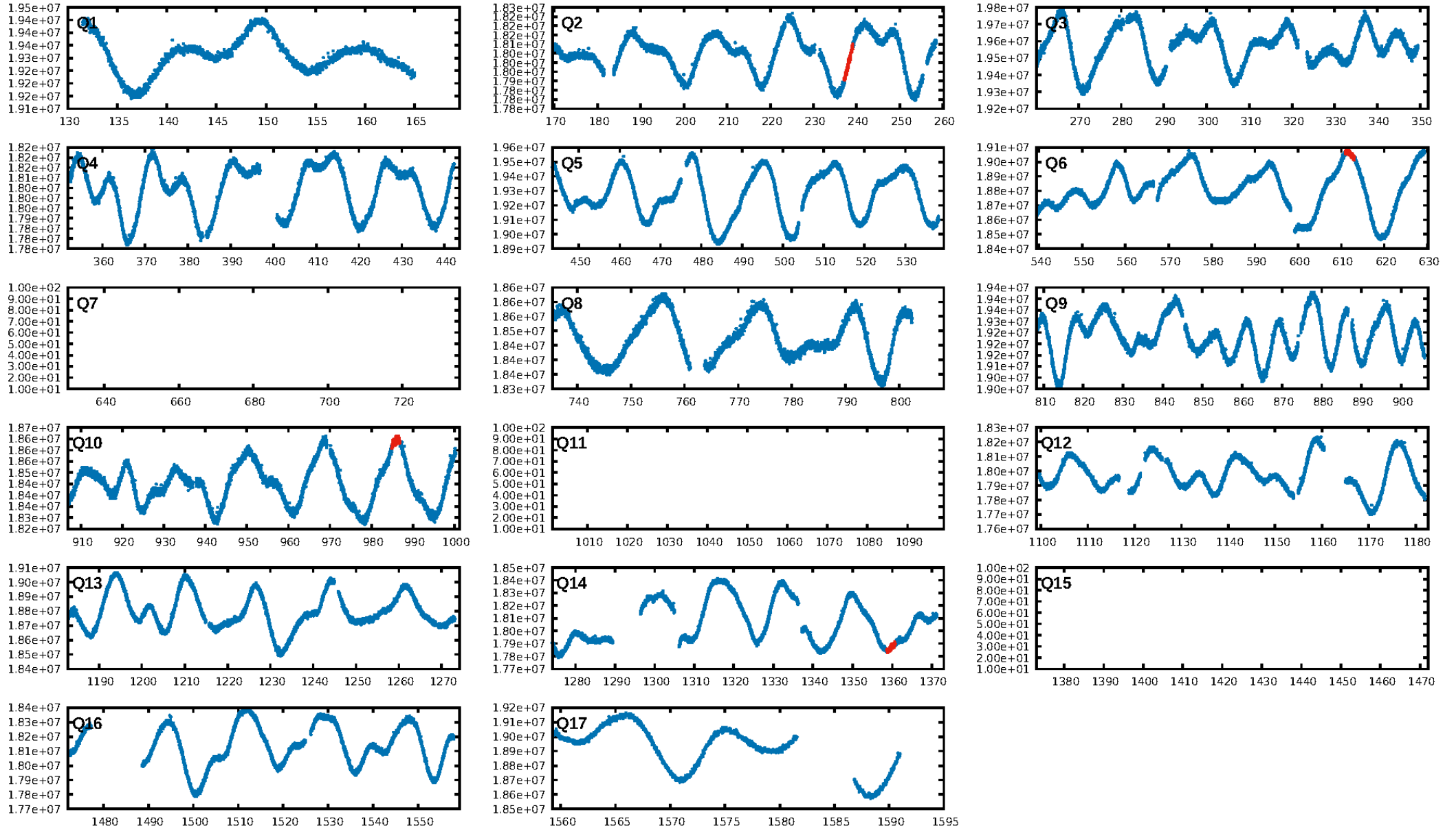
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [45.19σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: 2.46e-37  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -8.066  
Centroid-sig: 50.4%  
Centroid-so: 0.543 arcsec [0.90σ]  
OotOffset-rm: 0.843 arcsec [1.93σ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 1.046 arcsec [2.09σ]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.00 [0/4]

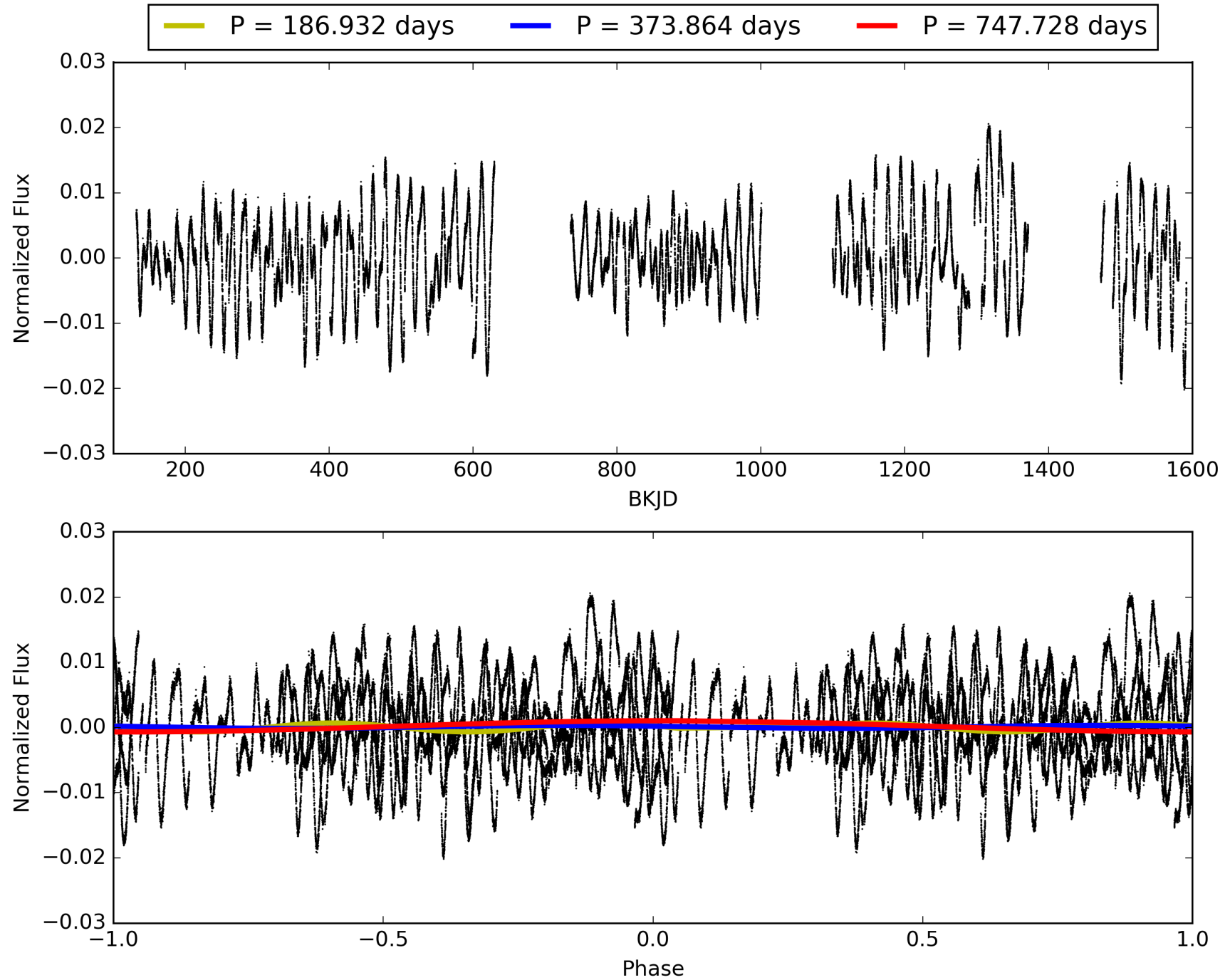
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:42:00 Z

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

# TCE 010618475-02, PDC Light Curves

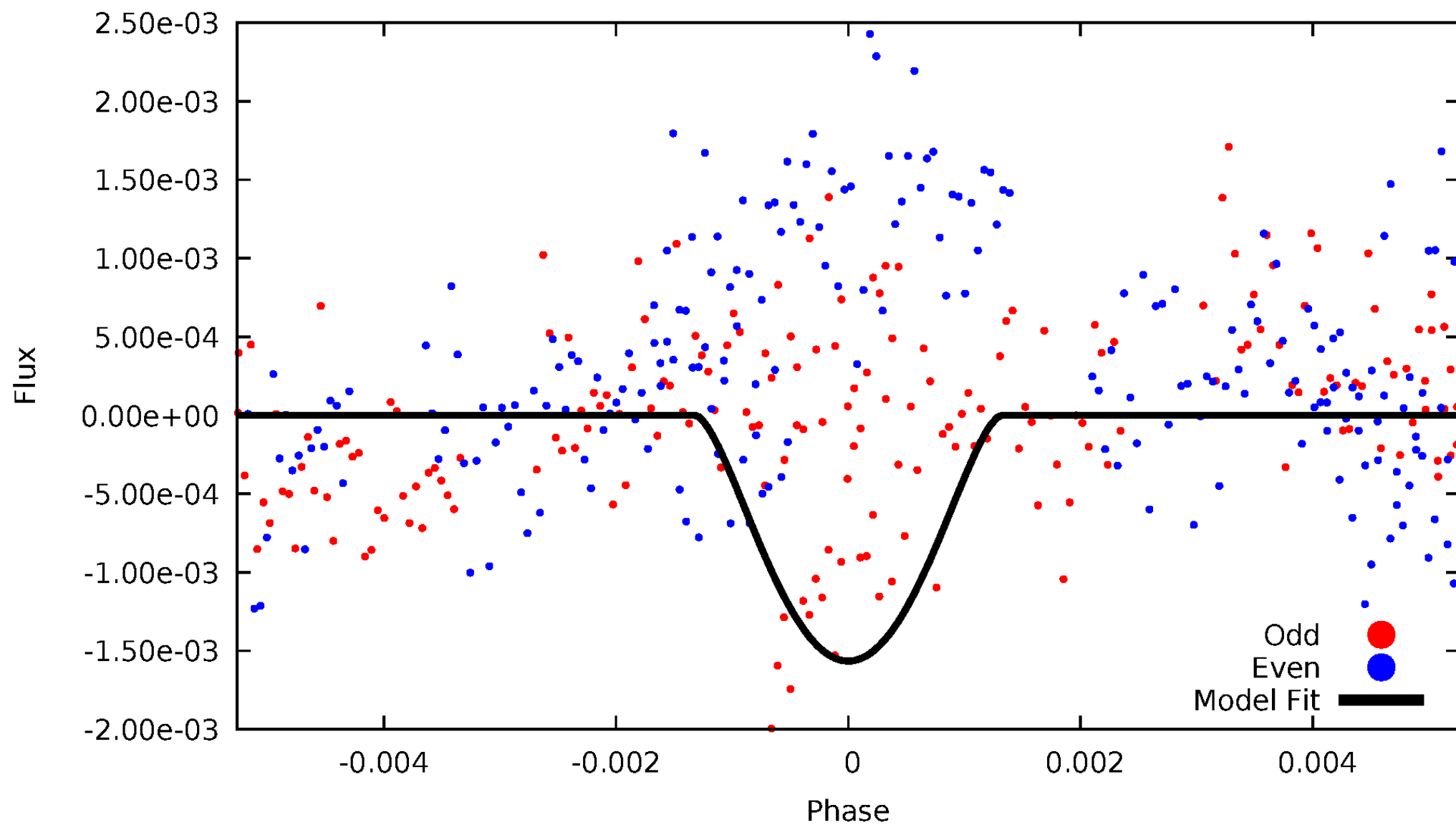


# TCE 010618475-02



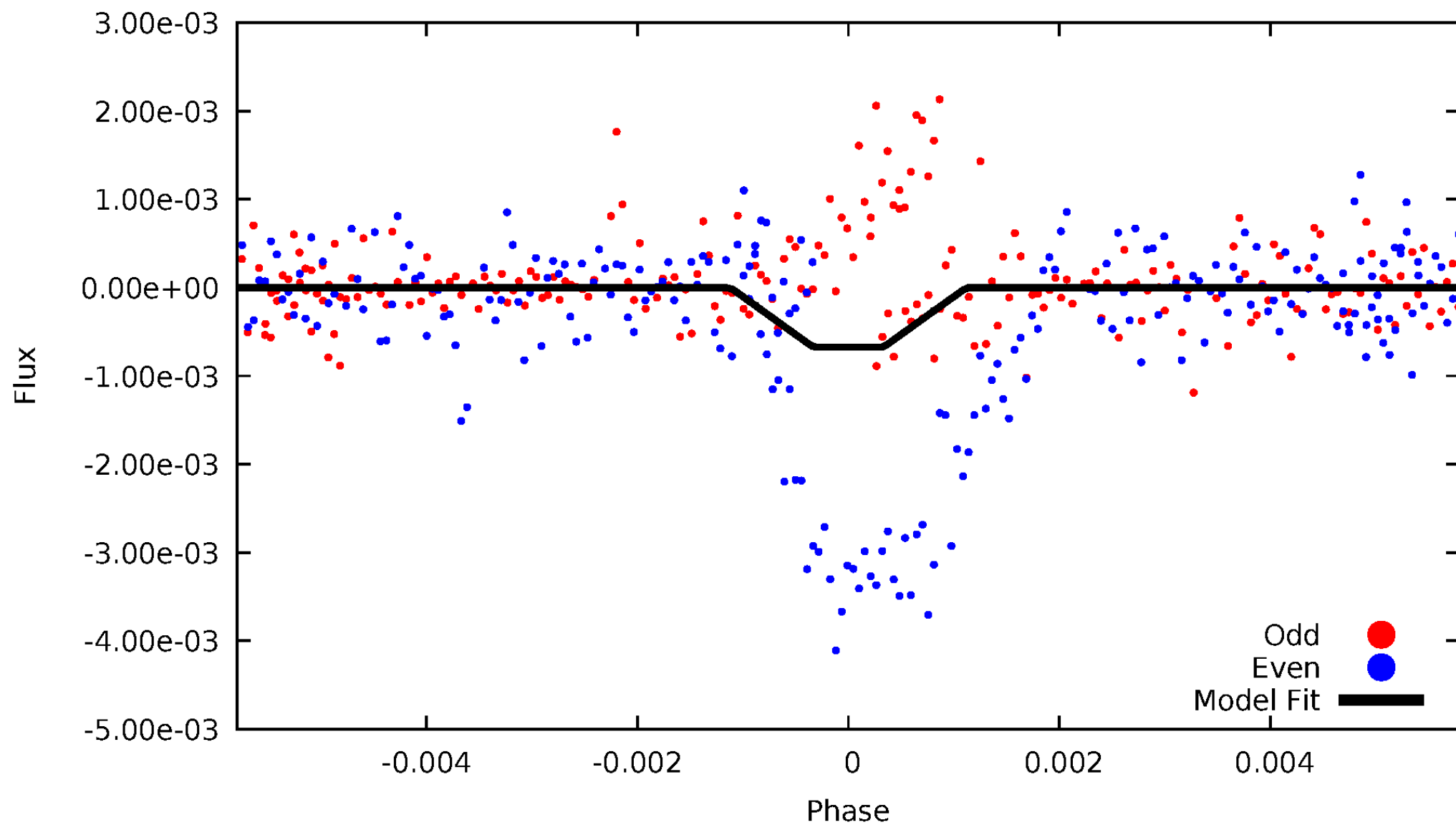
# DV Odd/Even

TCE 010618475-02



# ALT Odd/Even

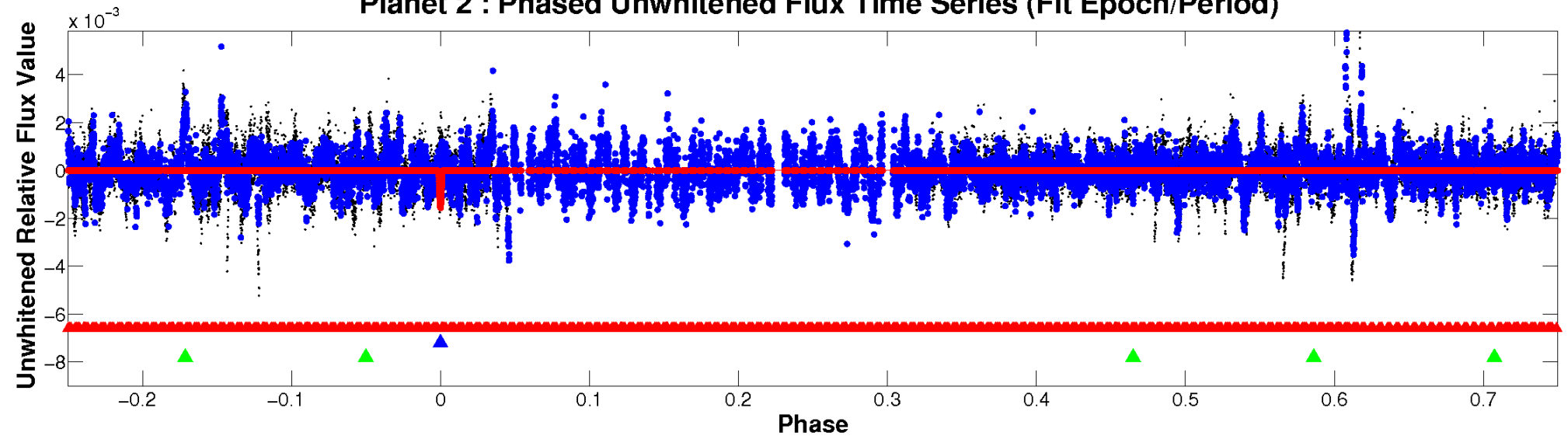
TCE 010618475-02



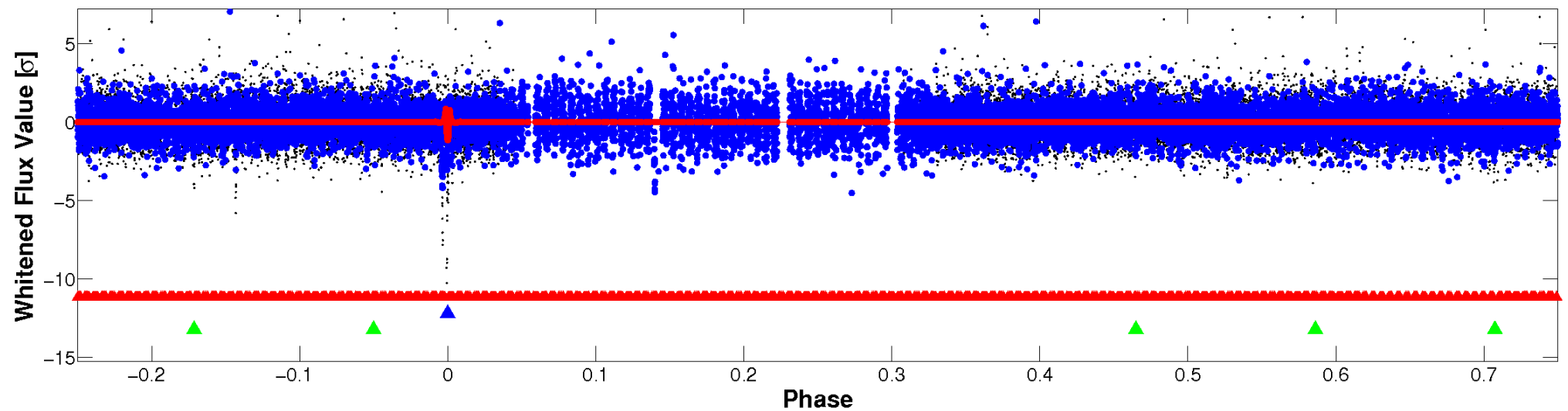


# Non-Whitened Vs. Whitened Light Curve

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

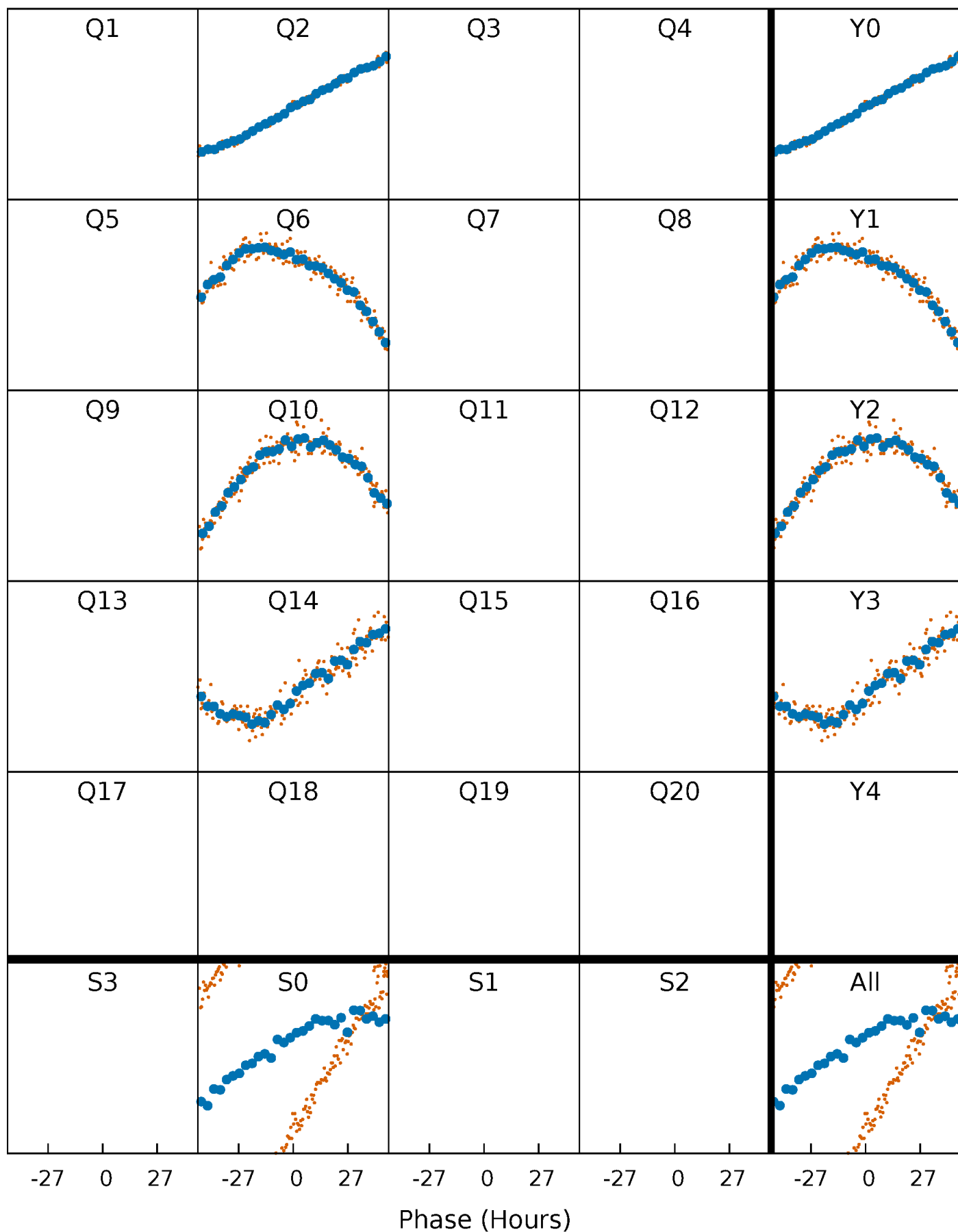


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



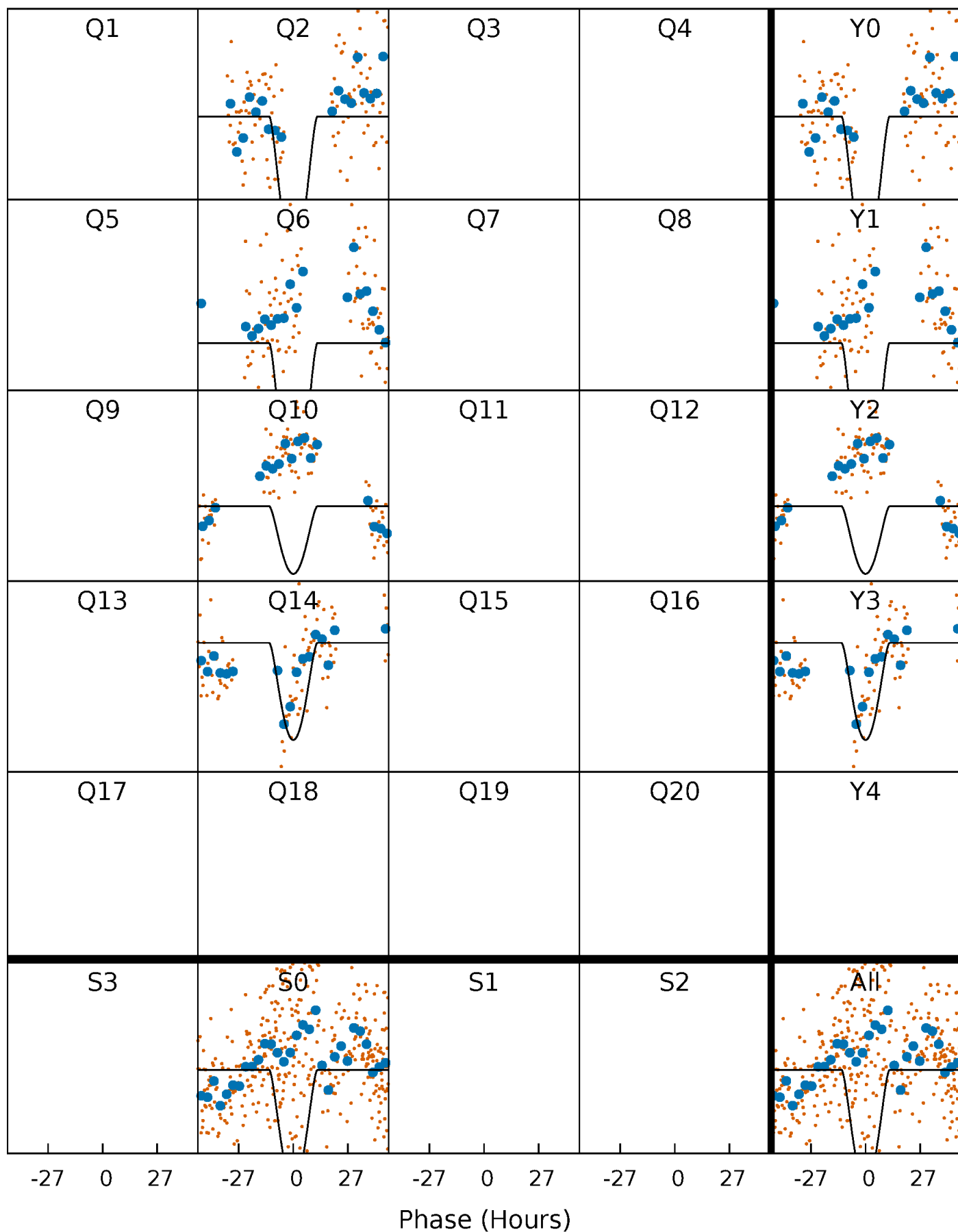
# PDC Quarter-Phased Transit Curves

TCE 010618475-02     $P=373.863806$  Days     $T_0=238.147947$  (BKJD)



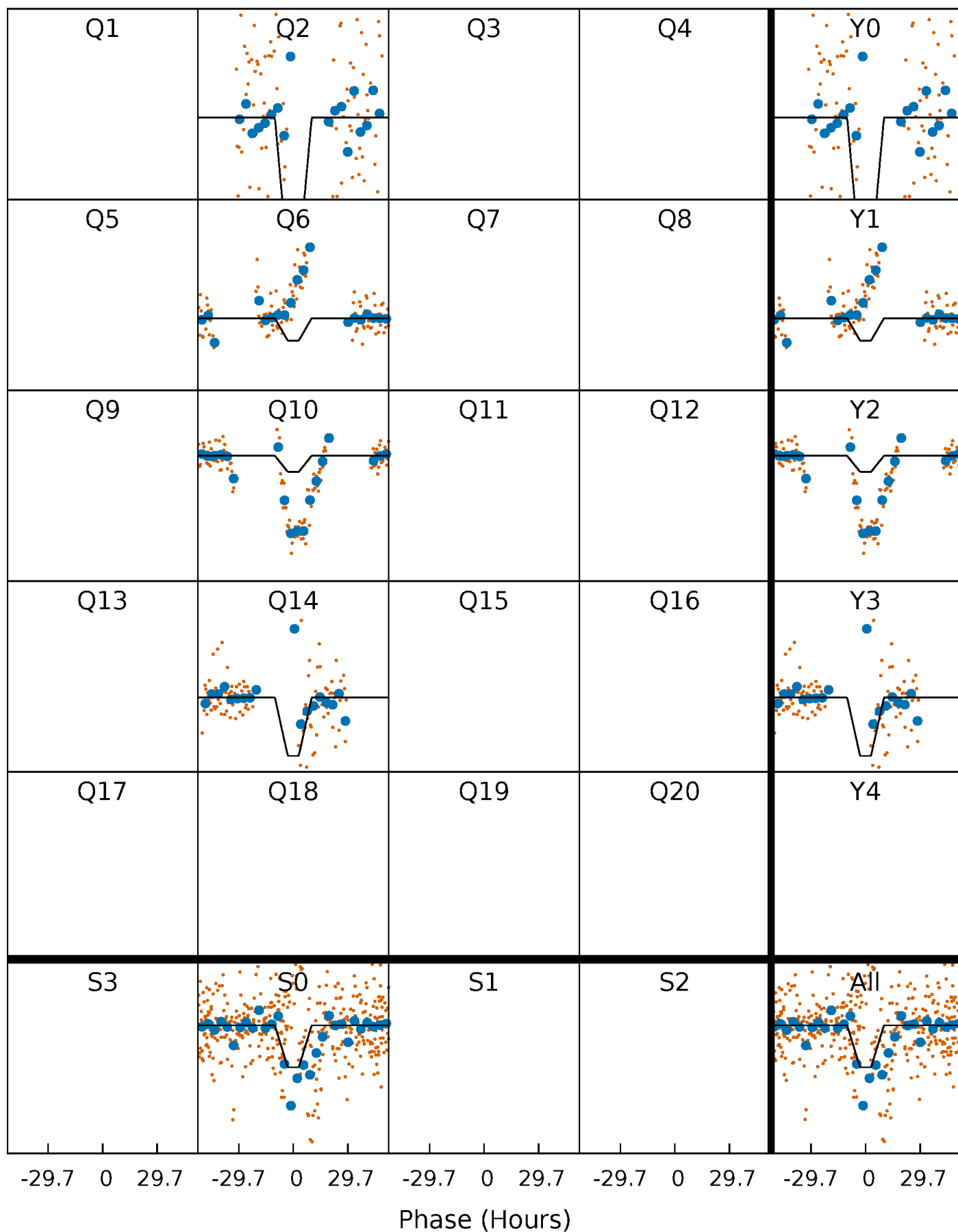
# DV Quarter-Phased Transit Curves

TCE 010618475-02 P=373.863806 Days  $T_0=238.147947$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

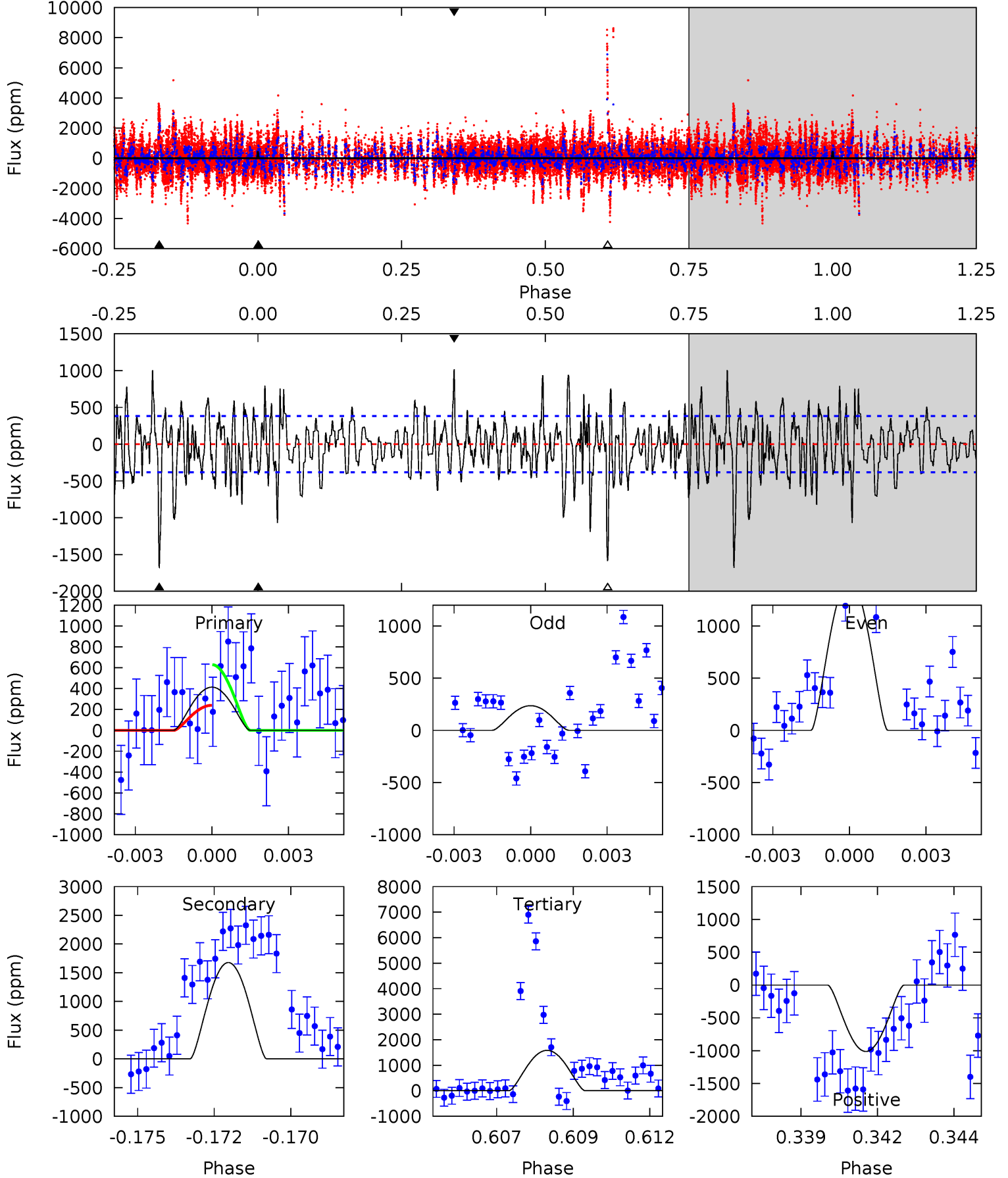
TCE 010618475-02 P=373.770680 Days  $T_0=238.079543$  (BKJD)



# DV Model-Shift Uniqueness Test

010618475-02, P = 373.863806 Days, E = 238.147947 Days

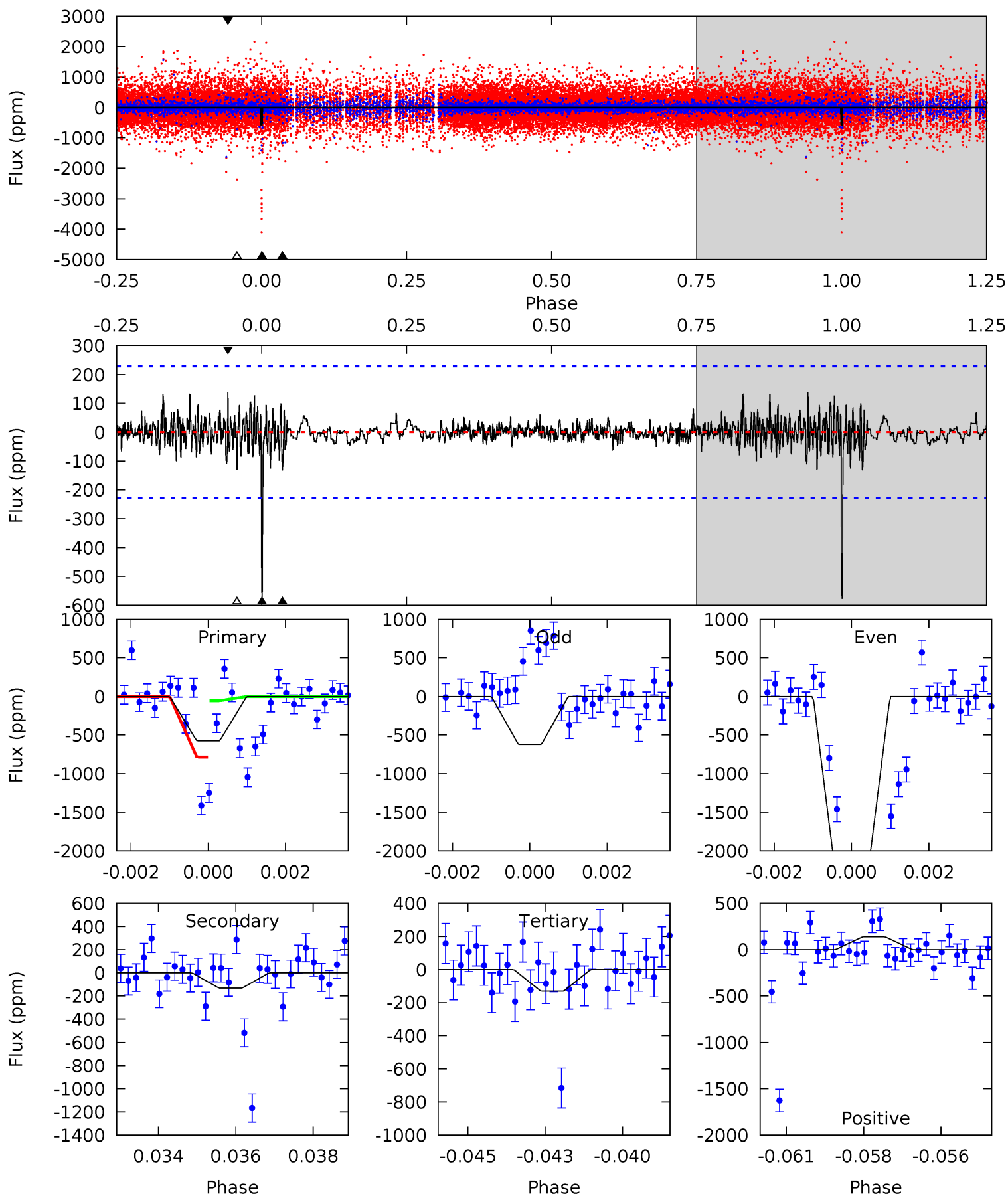
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.71	23.2	21.9	14.0	5.28	3.01	4.60	-16.1	-8.26	1.30	9.19	8.10	5.71	0.38	2.79



# Alt Model-Shift Uniqueness Test

010618475-02, P = 373.770680 Days, E = 238.079543 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
13.4	3.09	3.04	3.21	5.31	3.06	0.67	10.4	10.2	0.04	-0.12	28.3	6.16	0.19	8.14





### Stellar Parameters For KIC 010618475

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5285^{+159}_{-159}$	$4.535^{+0.034}_{-0.128}$	$0.340^{+0.100}_{-0.300}$	$0.873^{+0.150}_{-0.069}$	$0.951^{+0.047}_{-0.094}$	$2.016^{+0.336}_{-0.744}$
	+3%/-3%	+1%/-3%	+29%/-88%	+17%/-8%	+5%/-10%	+17%/-37%
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 010618475-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1678 \pm 72$	$14.89^{+14.63}_{-9.95}$	$309^{+15}_{-12}$	$3287^{+1694}_{-563}$	$4146^{+33349}_{-3131}$
Alt.	$-132 \pm 43$	$12.82^{+13.85}_{-9.13}$	$309^{+16}_{-12}$	$2413^{+939}_{-364}$	$411^{+4196}_{-318}$

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

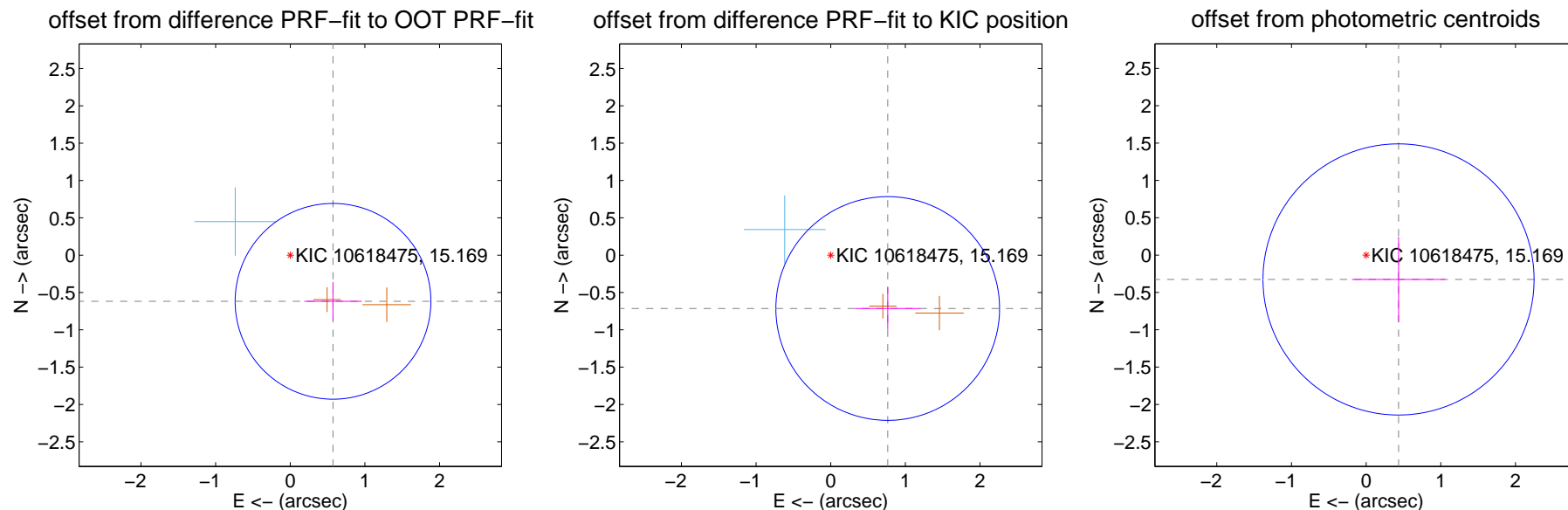
## DV Centroid Data

Supplemental centroid analysis for 010618475-02. Kepler magnitude: 15.17. Transit SNR 8.89

There are 1 quarters with good PRF difference image offsets

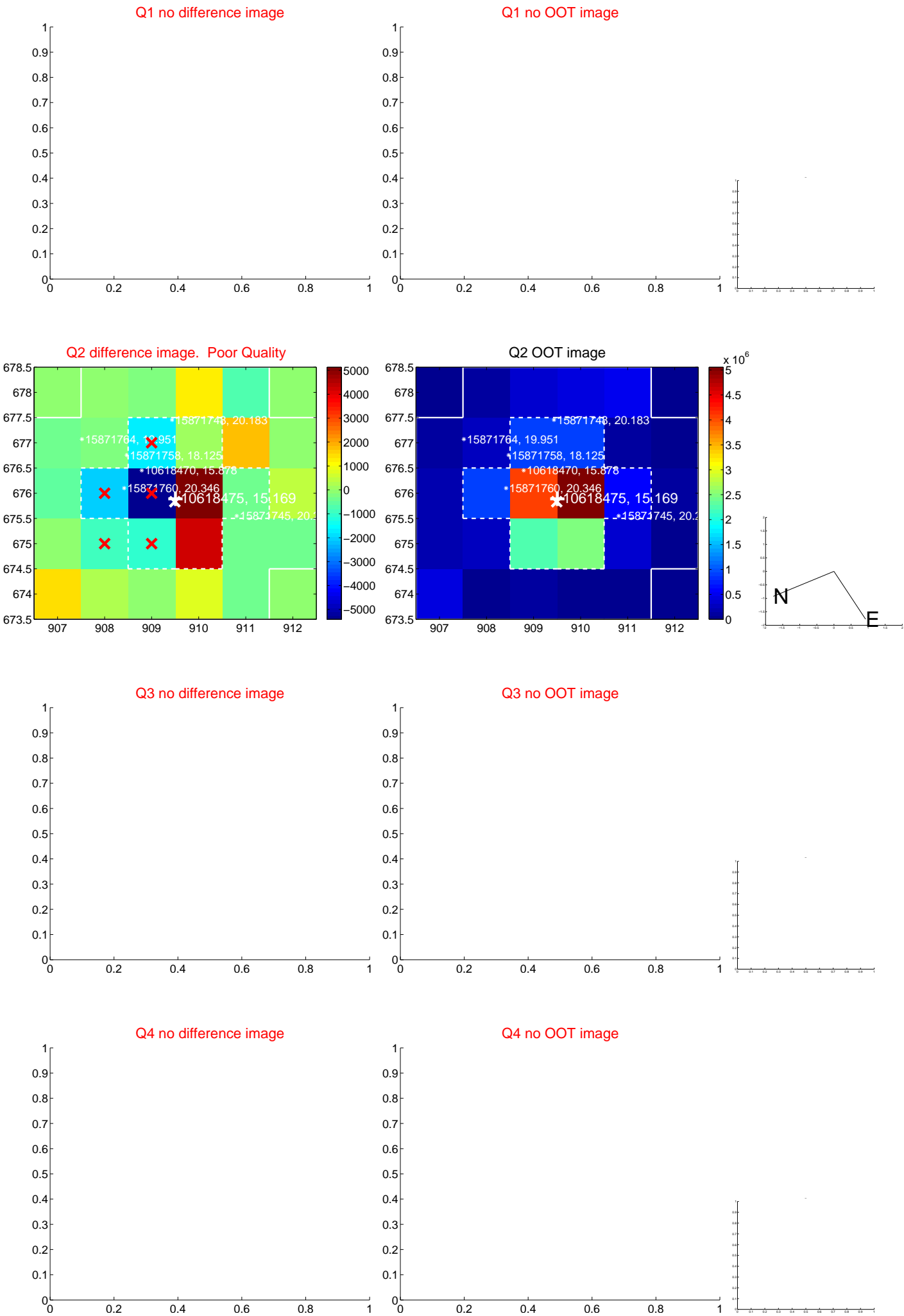
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.843 \pm 0.437$	1.93	$-0.573 \pm 0.384$	$-0.618 \pm 0.259$
PRF-fit source offset from KIC position	$1.046 \pm 0.500$	2.09	$-0.764 \pm 0.438$	$-0.715 \pm 0.282$
photometric centroid source offset	$0.54 \pm 0.61$	0.90	$-0.43 \pm 0.62$	$-0.33 \pm 0.57$

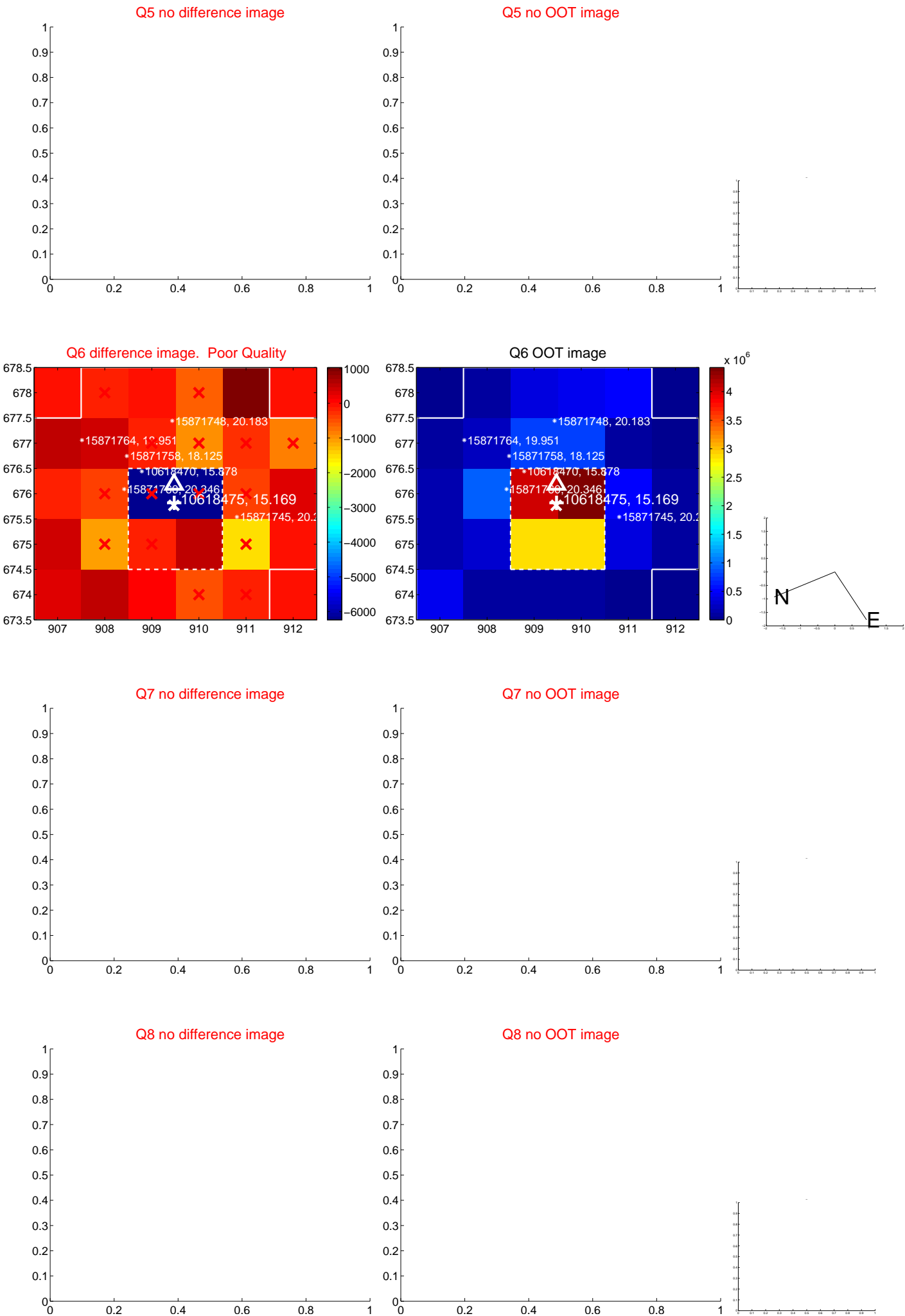


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

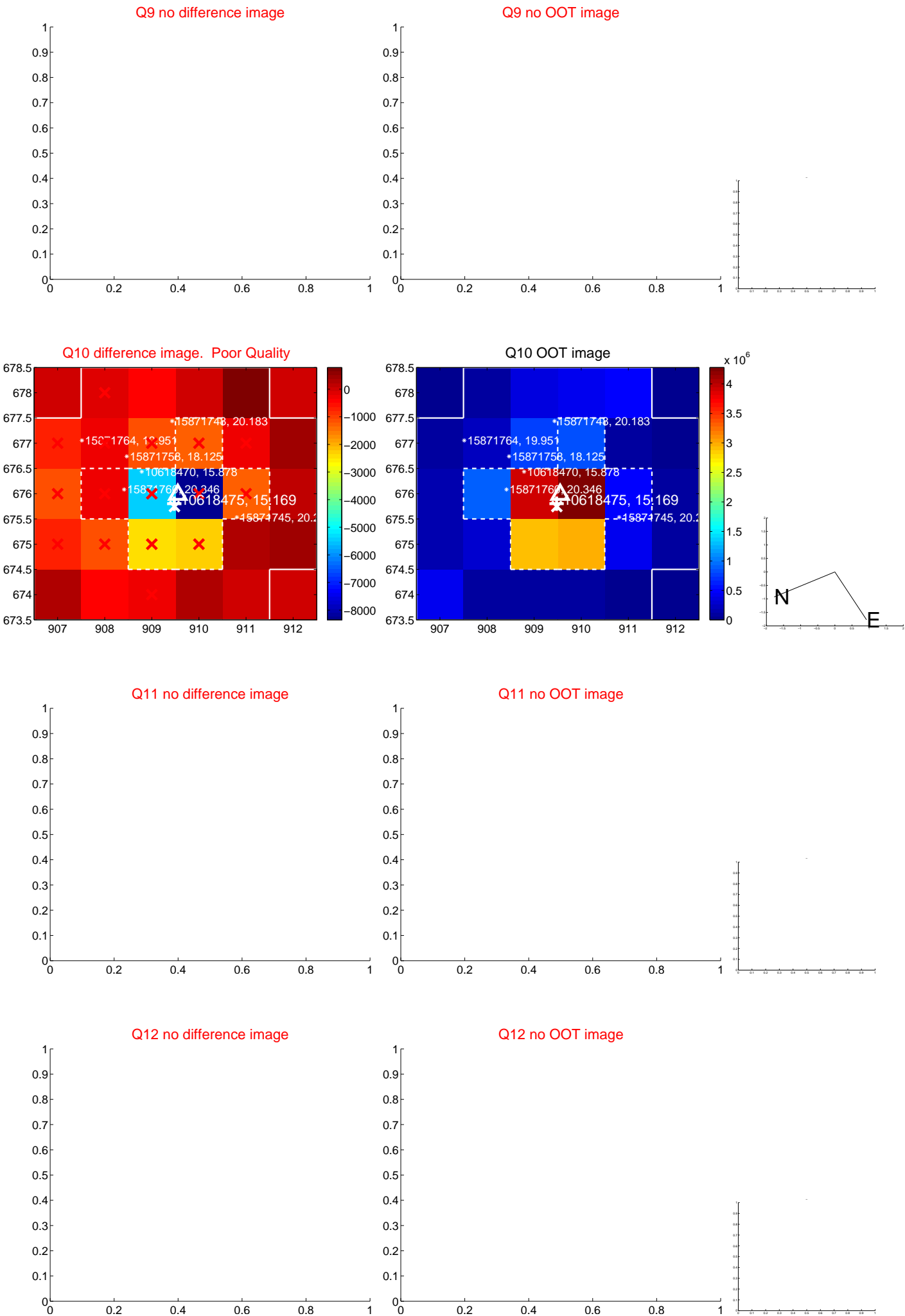
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

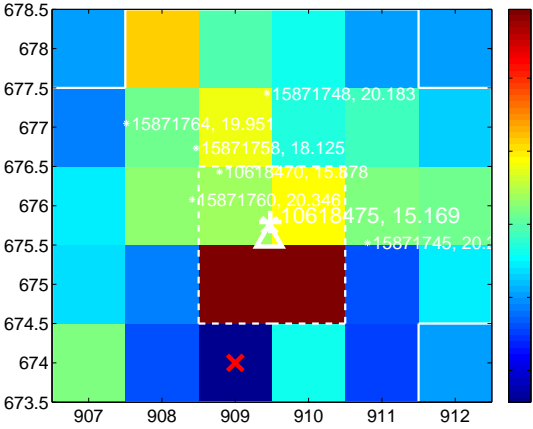
Q13 no difference image



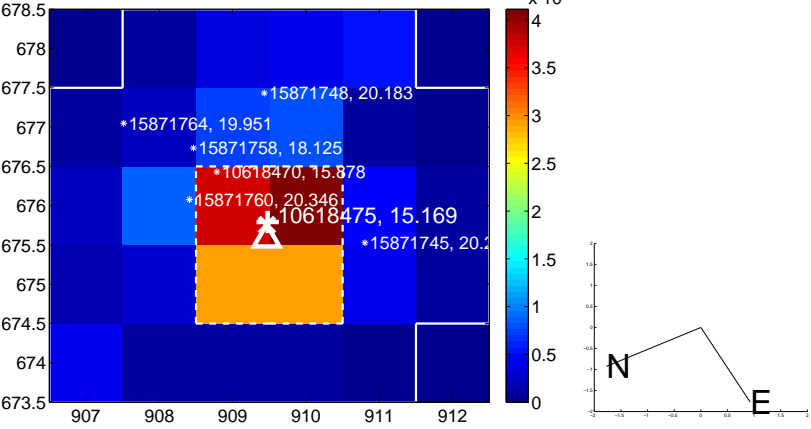
Q13 no OOT image



Q14 difference image



Q14 OOT image



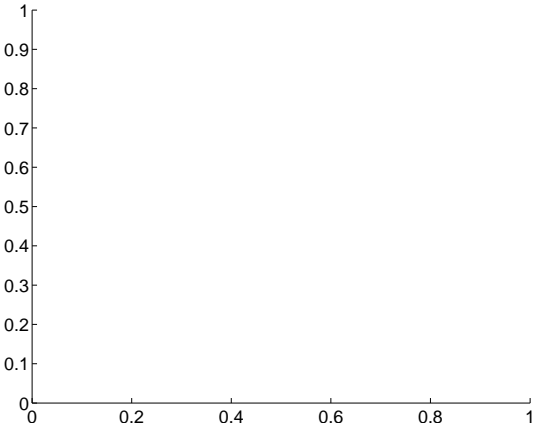
Q15 no difference image



Q15 no OOT image



Q16 no difference image

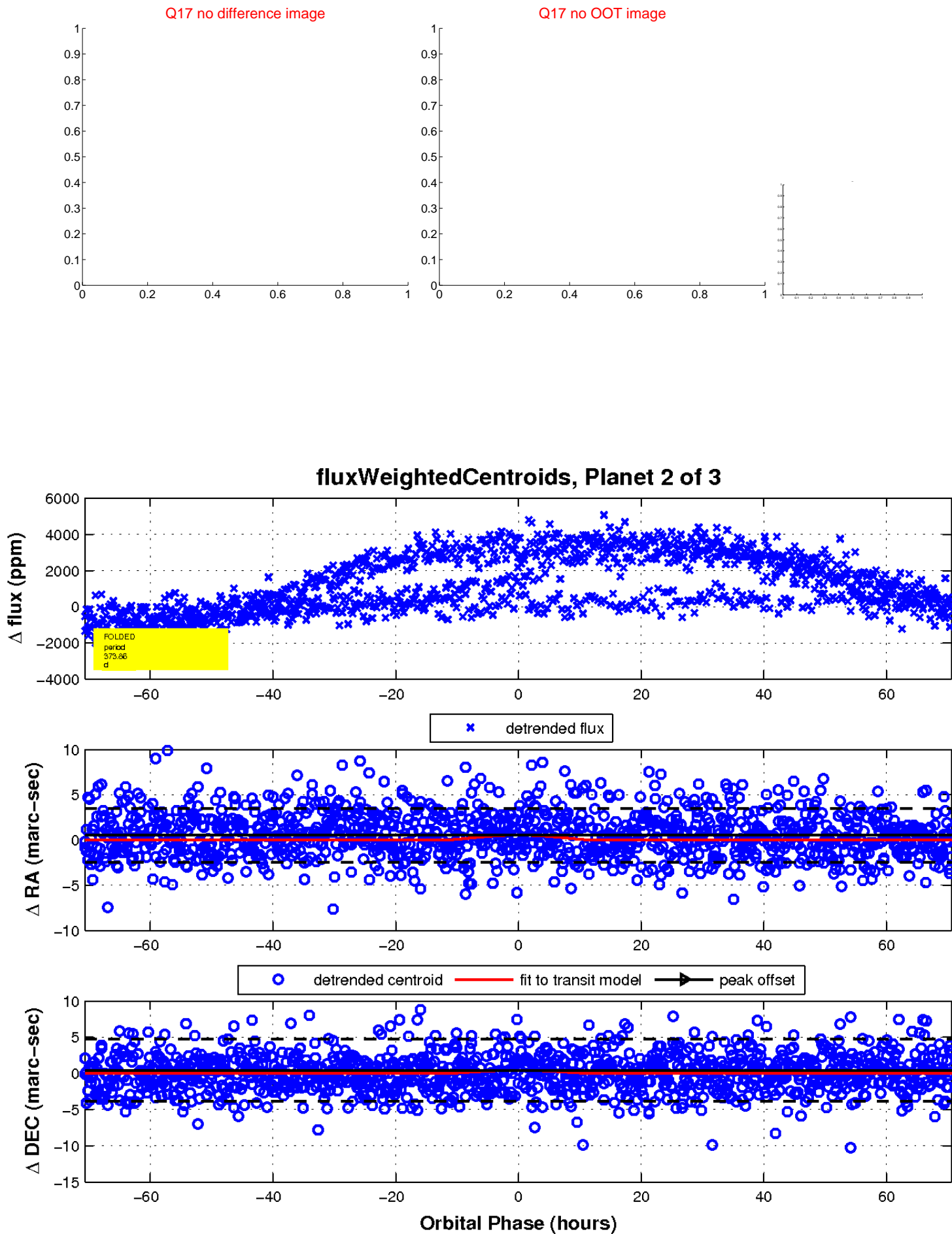


Q16 no OOT image





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



UKIRT Image

Declination

