

# KIC 011666104

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011666104-01	OBS	No	1.900160	132.491443	52.8	9.209	10.2	10.4	3.46	8235	3.37	29748.19
011666104-02	OBS	No	0.555751	131.828307	86.3	5.764	8.4	15.9	3.46	8235	3.27	153228.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011666104-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011666104-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

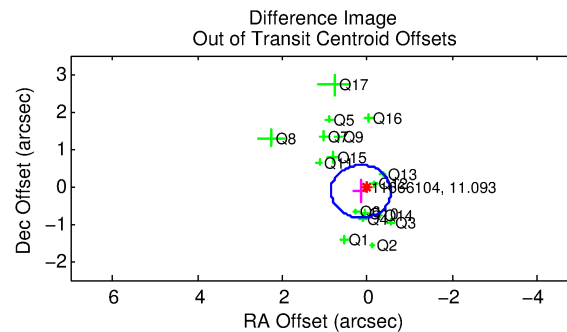
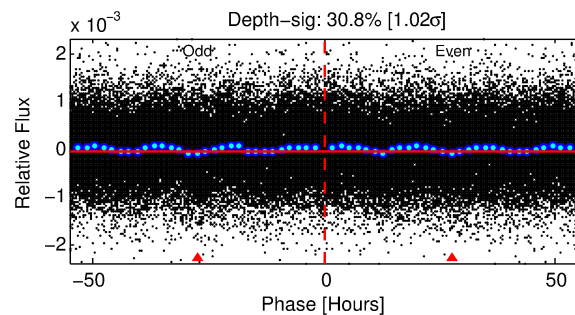
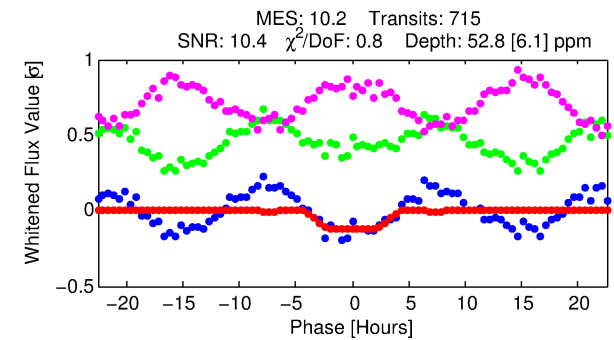
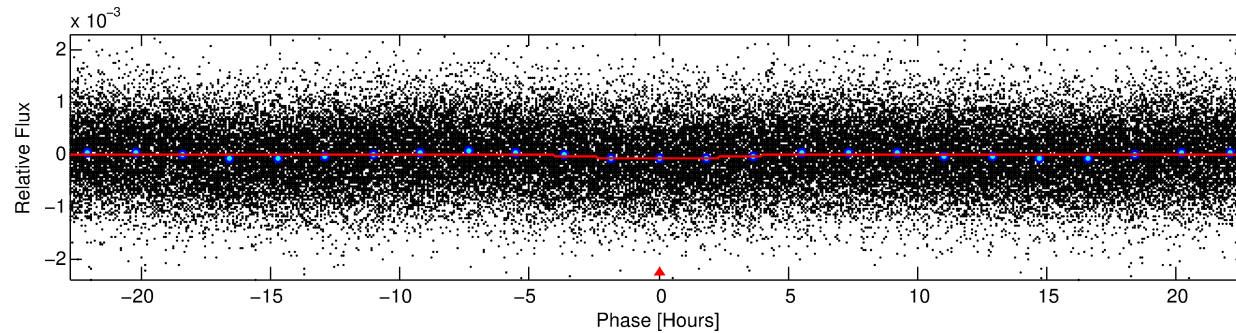
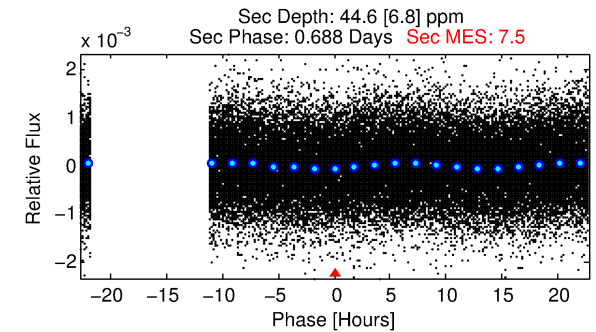
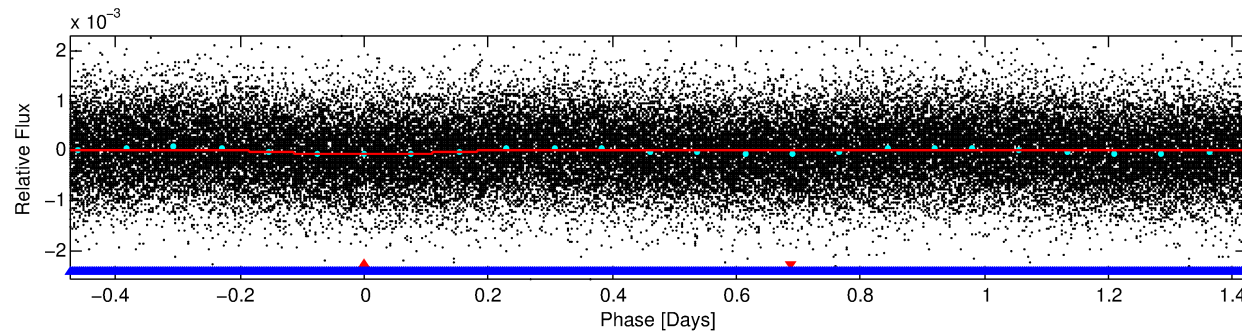
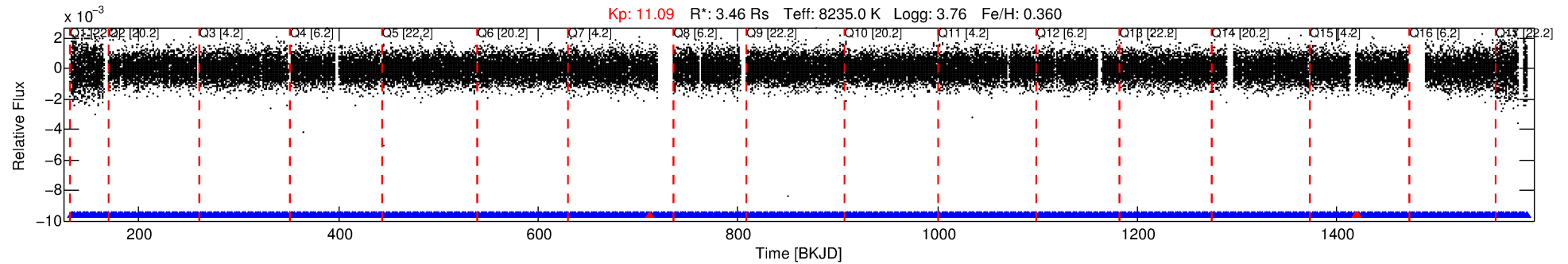
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011666104-01

No Significant Match Found

# DV One-Page Summary

KIC: 11666104 Candidate: 1 of 2 Period: 1.900 d



## DV Fit Results:

Period = 1.90016 [0.00004] d  
Epoch = 132.4914 [0.0159] BKJD  
Rp/R\* = 0.0089 [0.0006]  
a/R\* = 1.05 [0.02]  
b = 0.99 [0.01]  
Seff = 29748.19 [18373.67]  
Teq = 3349 [517] K  
Rp = 3.37 [1.45] Re  
a = 0.0407 [0.0156] AU  
Ag = 3.57 [2.24] [1.15σ]  
Teffp = 7119 [490] K [5.29σ]

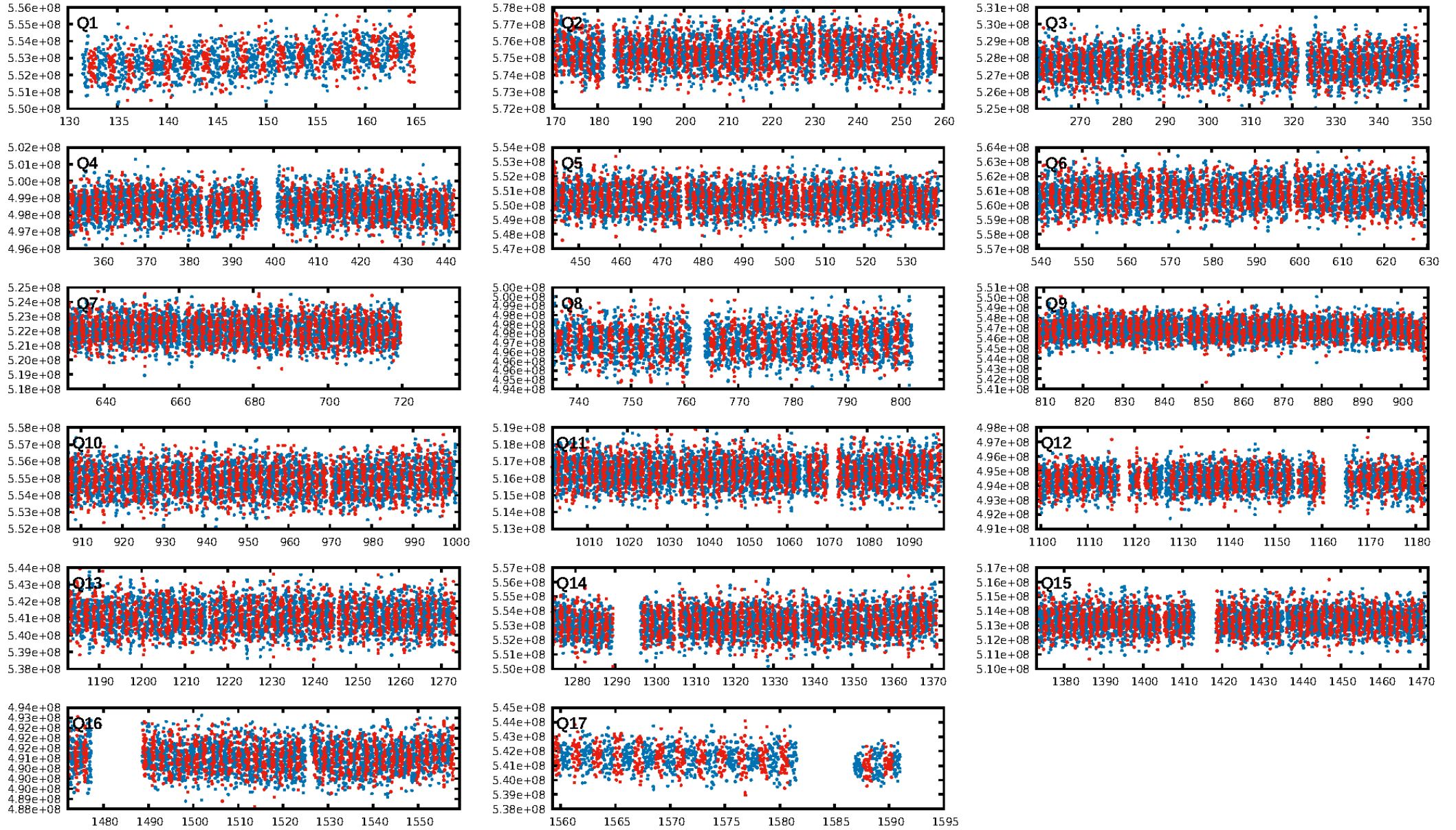
## DV Diagnostic Results:

ShortPeriod-sig: 99.7% [2.97σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [680/683]  
GhostDiagnostic-chr: 2.903  
Centroid-sig: 75.9%  
Centroid-so: 0.111 arcsec [0.56σ]  
OotOffset-rm: 0.200 arcsec [0.85σ]  
KicOffset-rm: 0.234 arcsec [1.00σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:19:57 Z

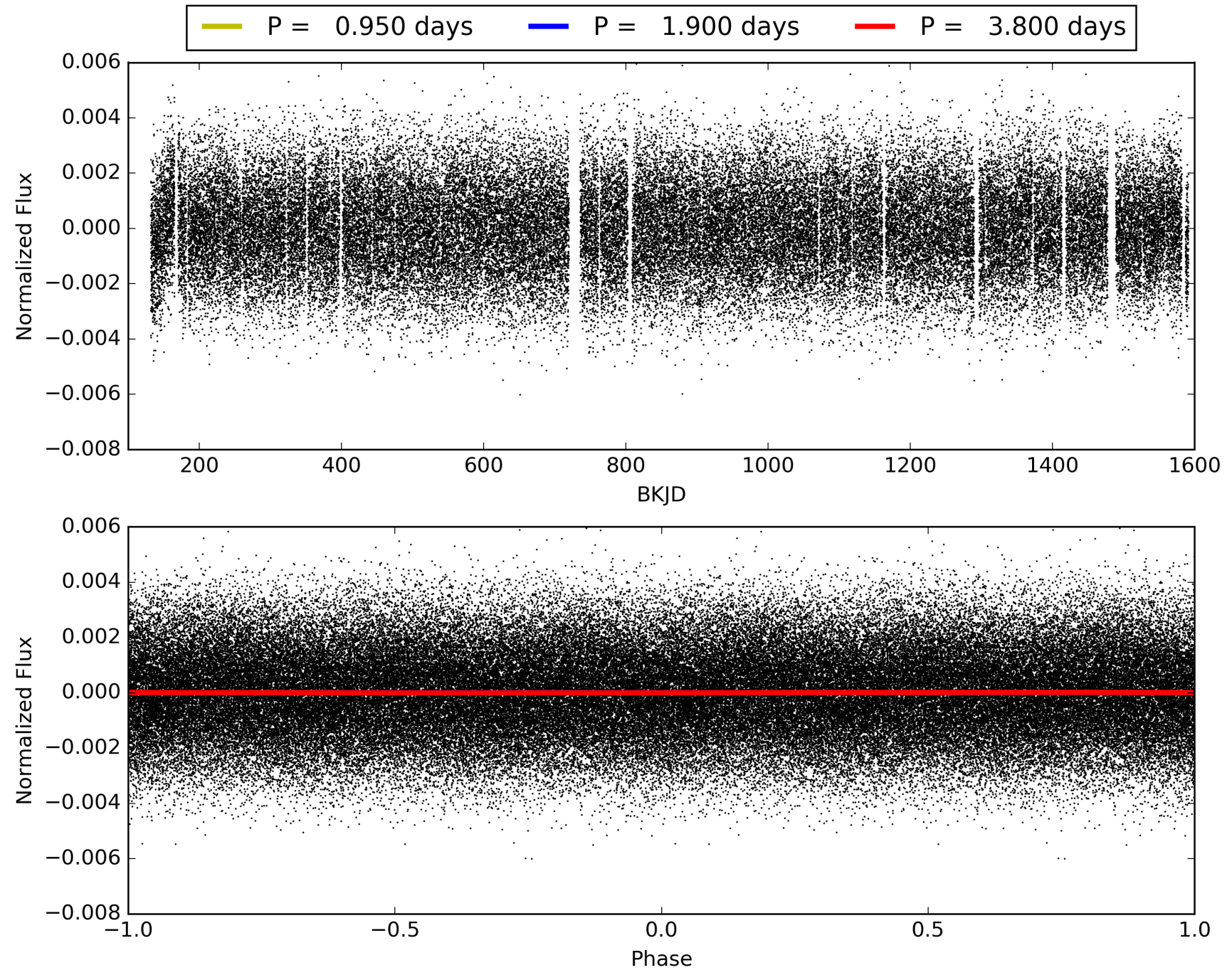
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011666104-01, PDC Light Curves



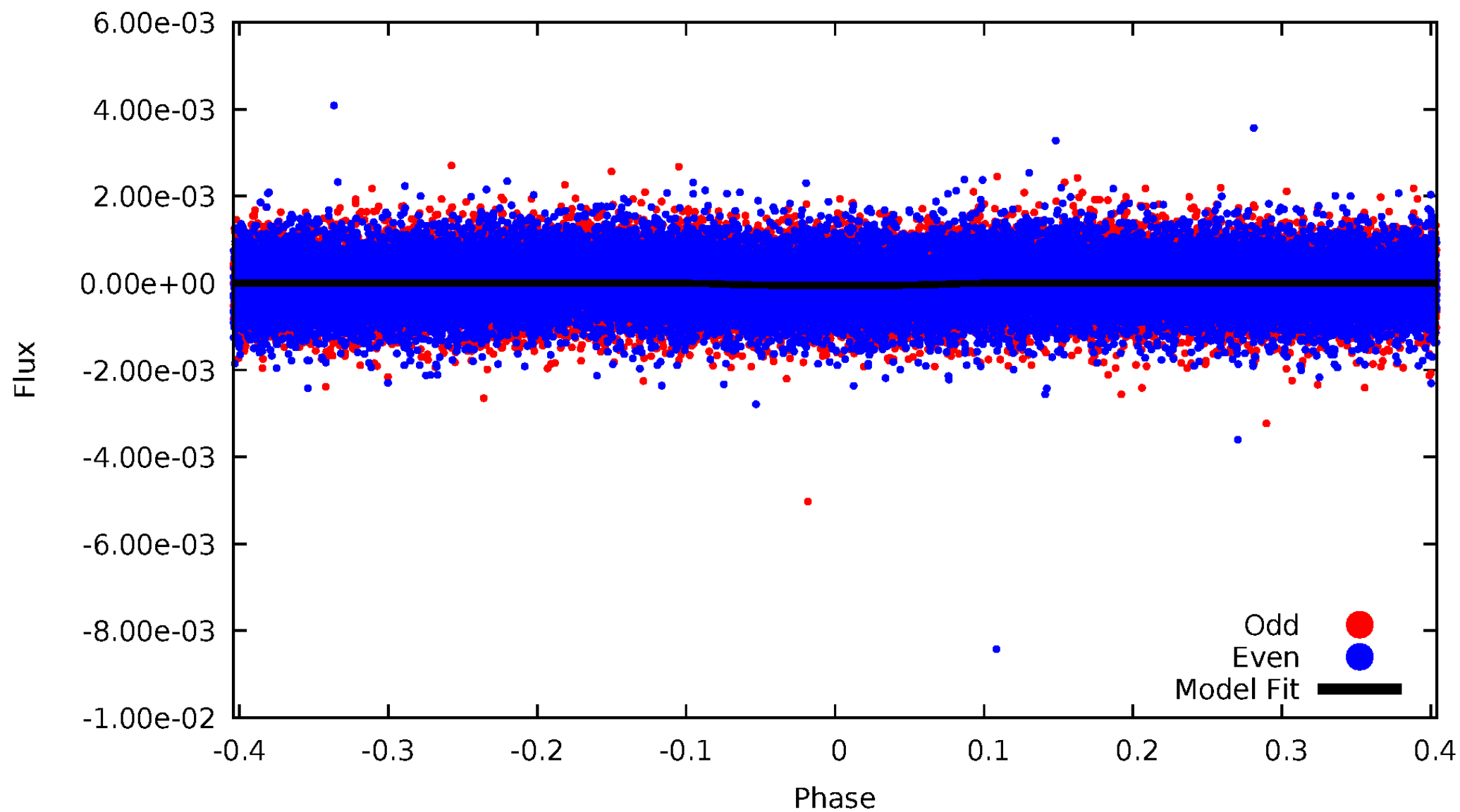


# TCE 011666104-01



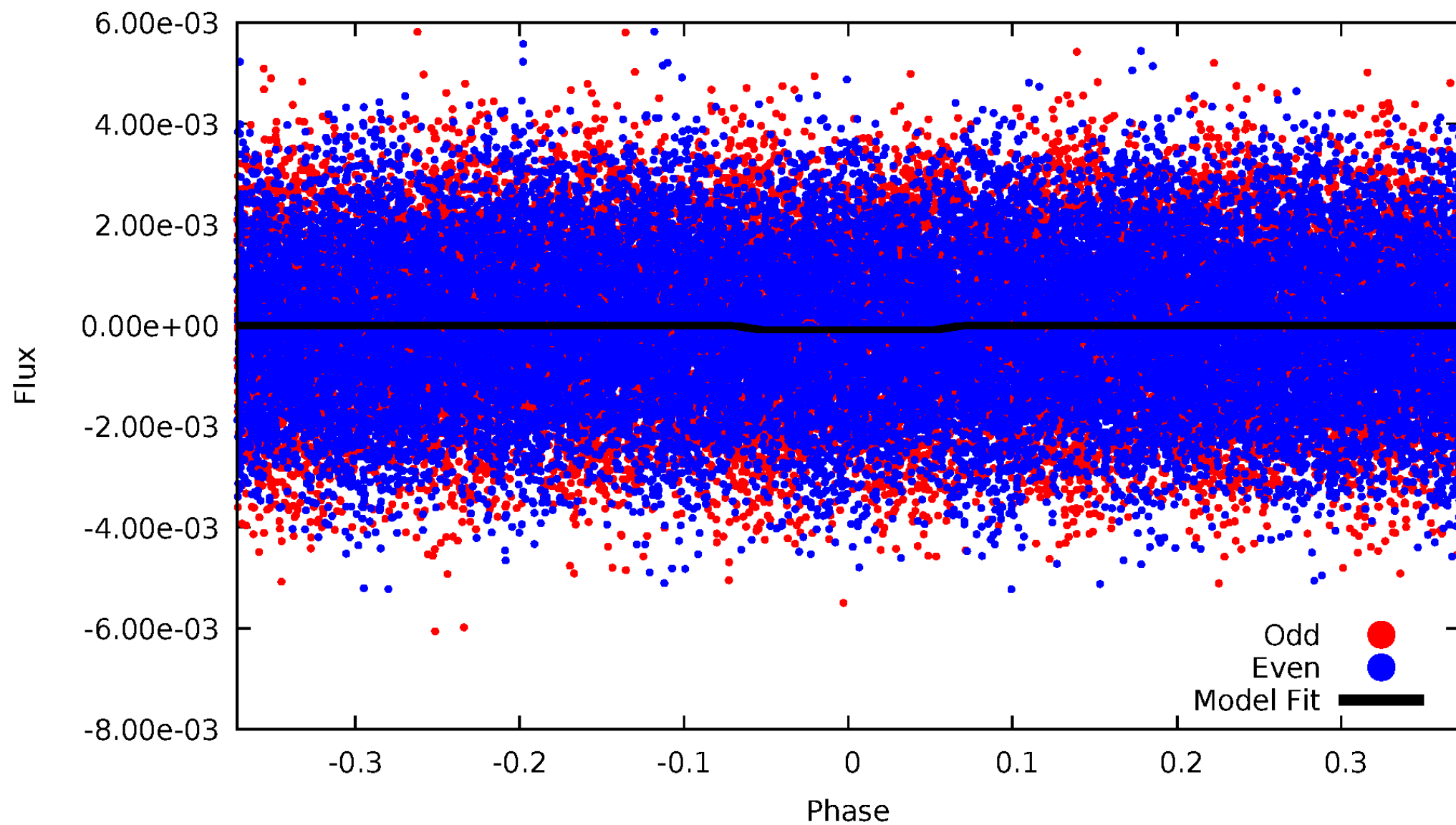
# DV Odd/Even

TCE 011666104-01

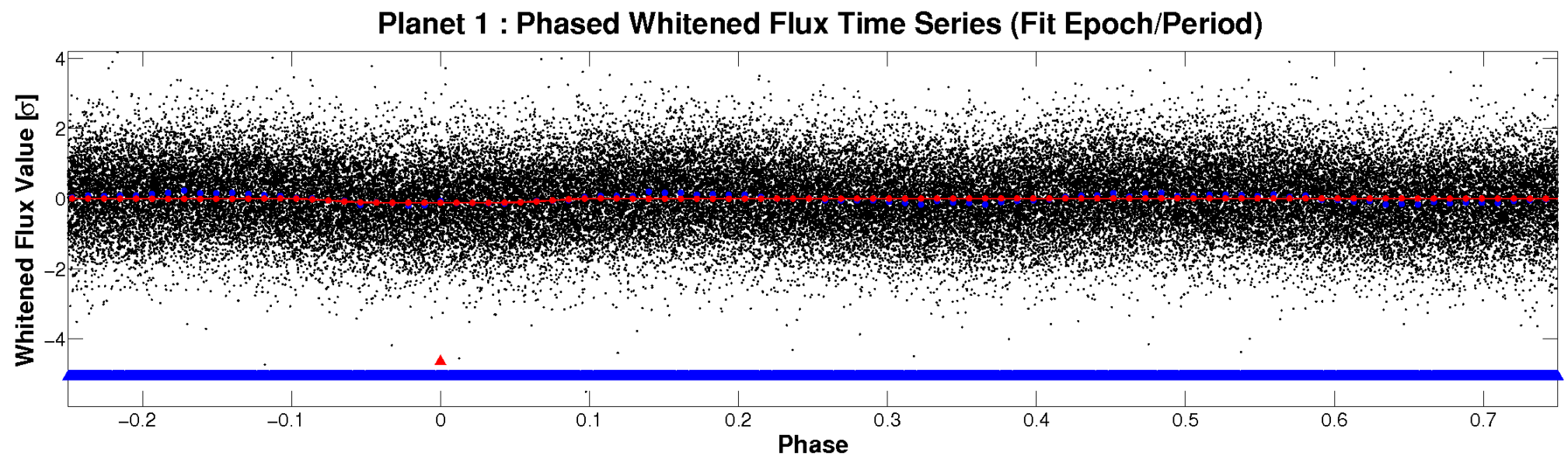
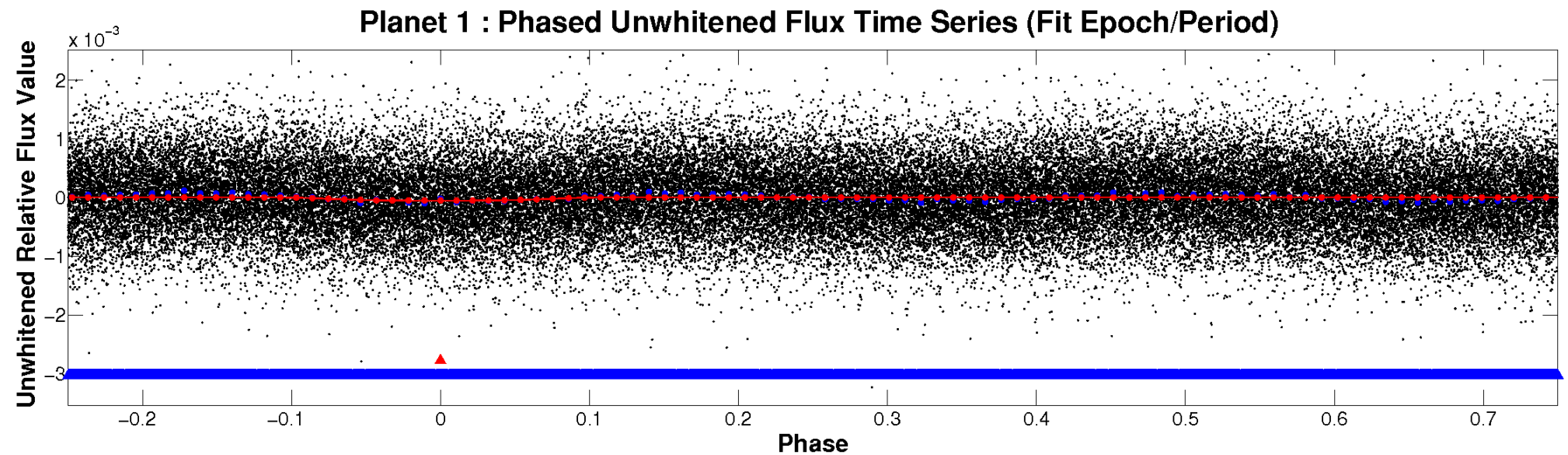


# ALT Odd/Even

TCE 011666104-01



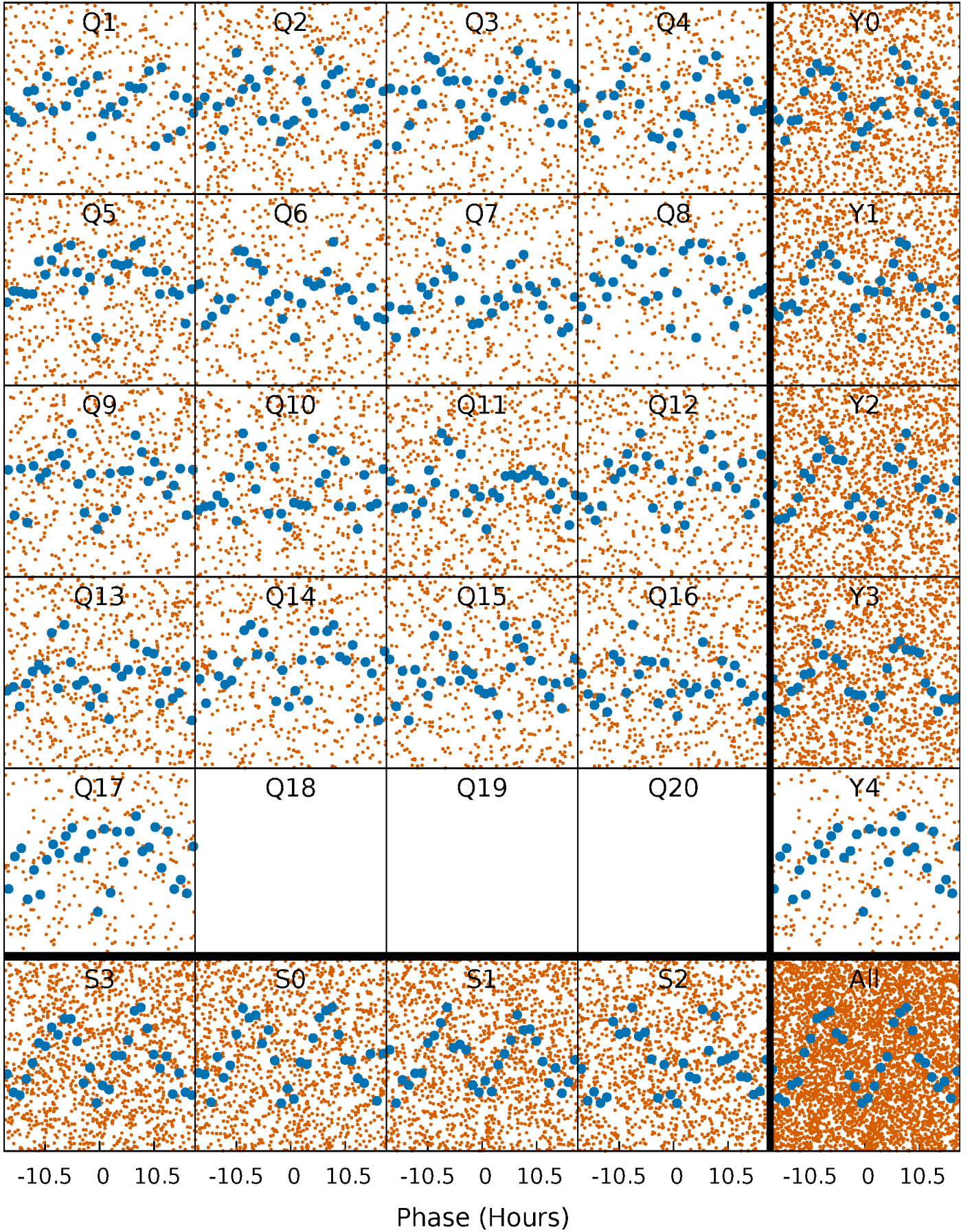
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

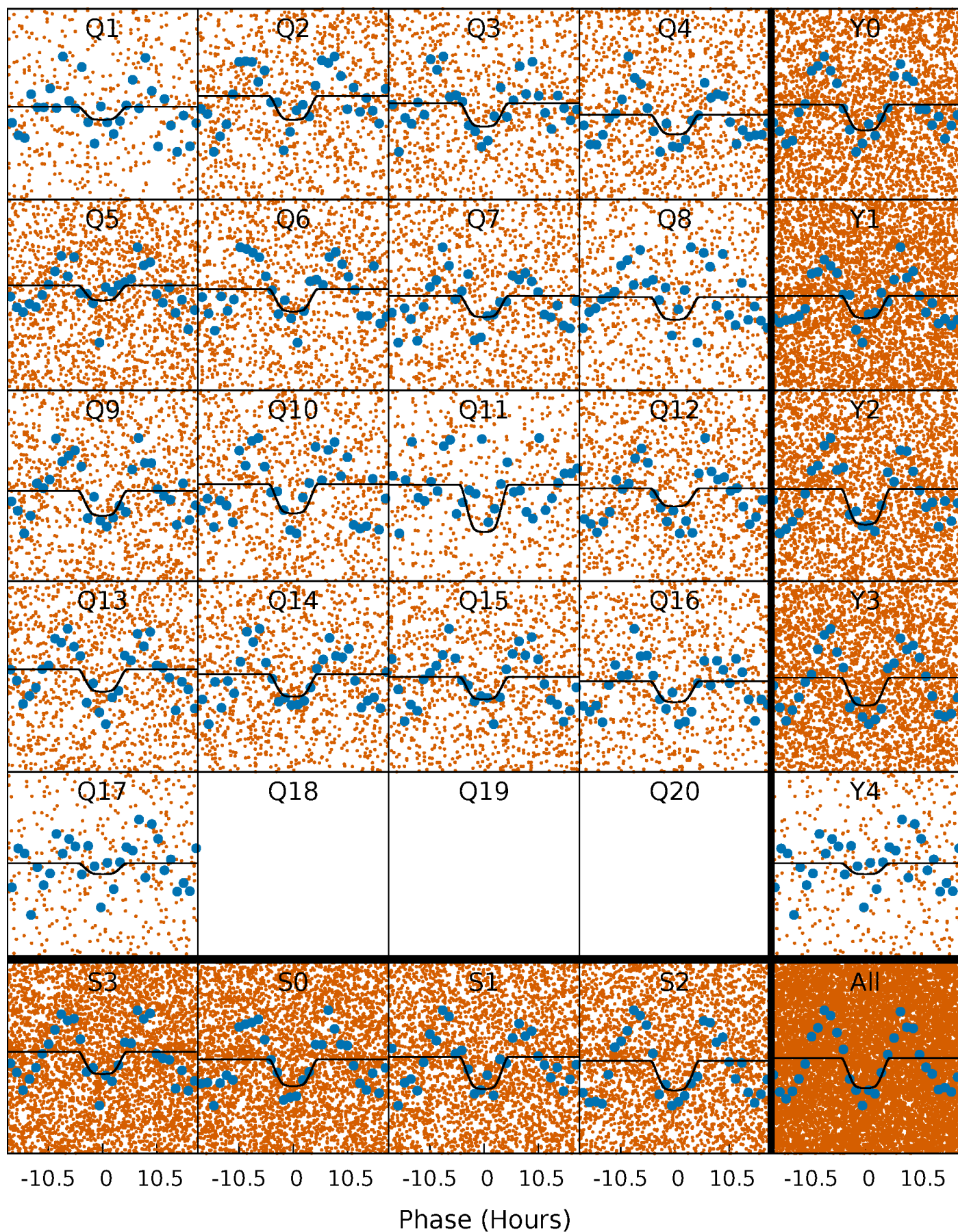
TCE 011666104-01 P= 1.900160 Days  $T_0=132.491443$  (BKJD)





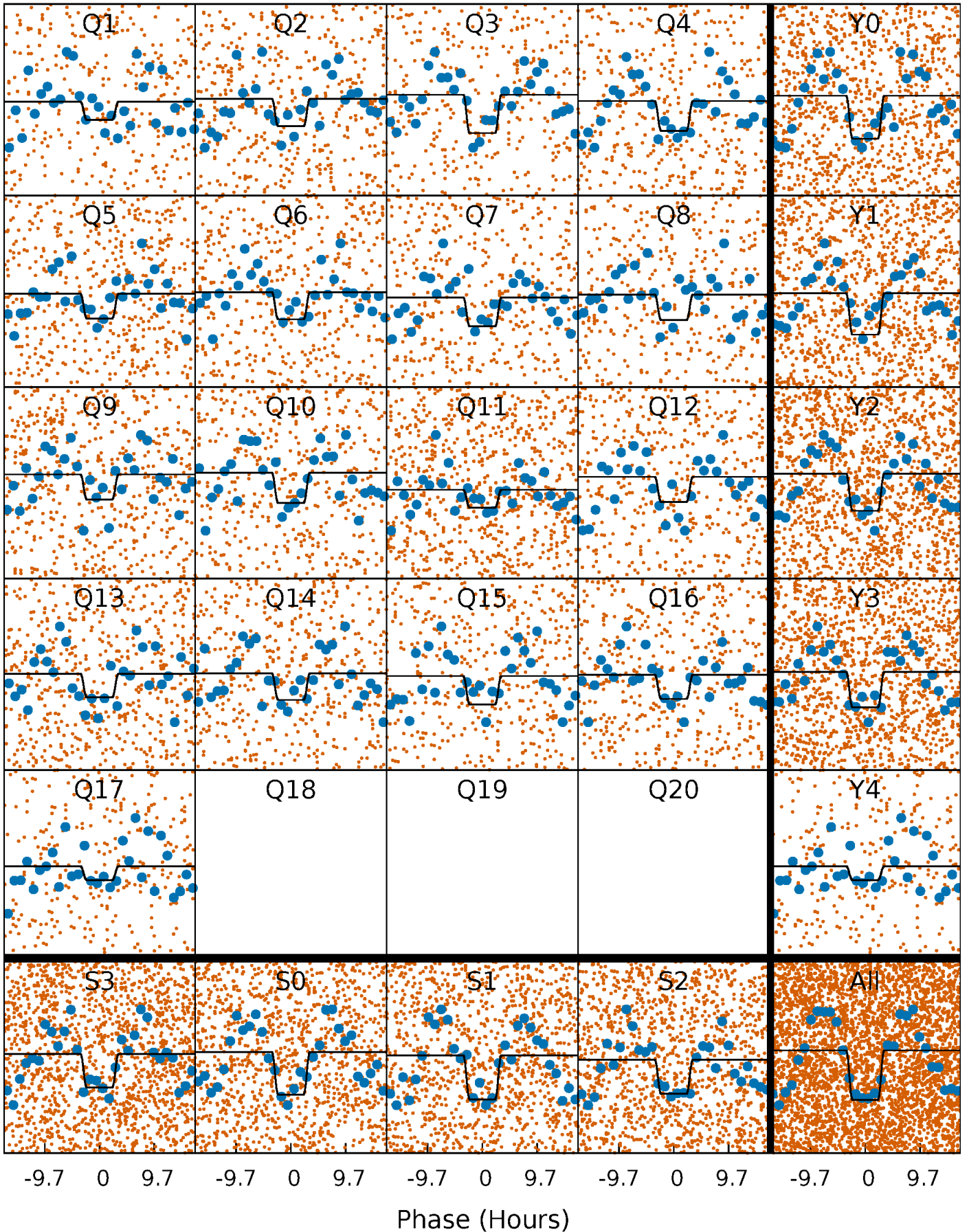
# DV Quarter-Phased Transit Curves

TCE 011666104-01 P= 1.900160 Days  $T_0=132.491443$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

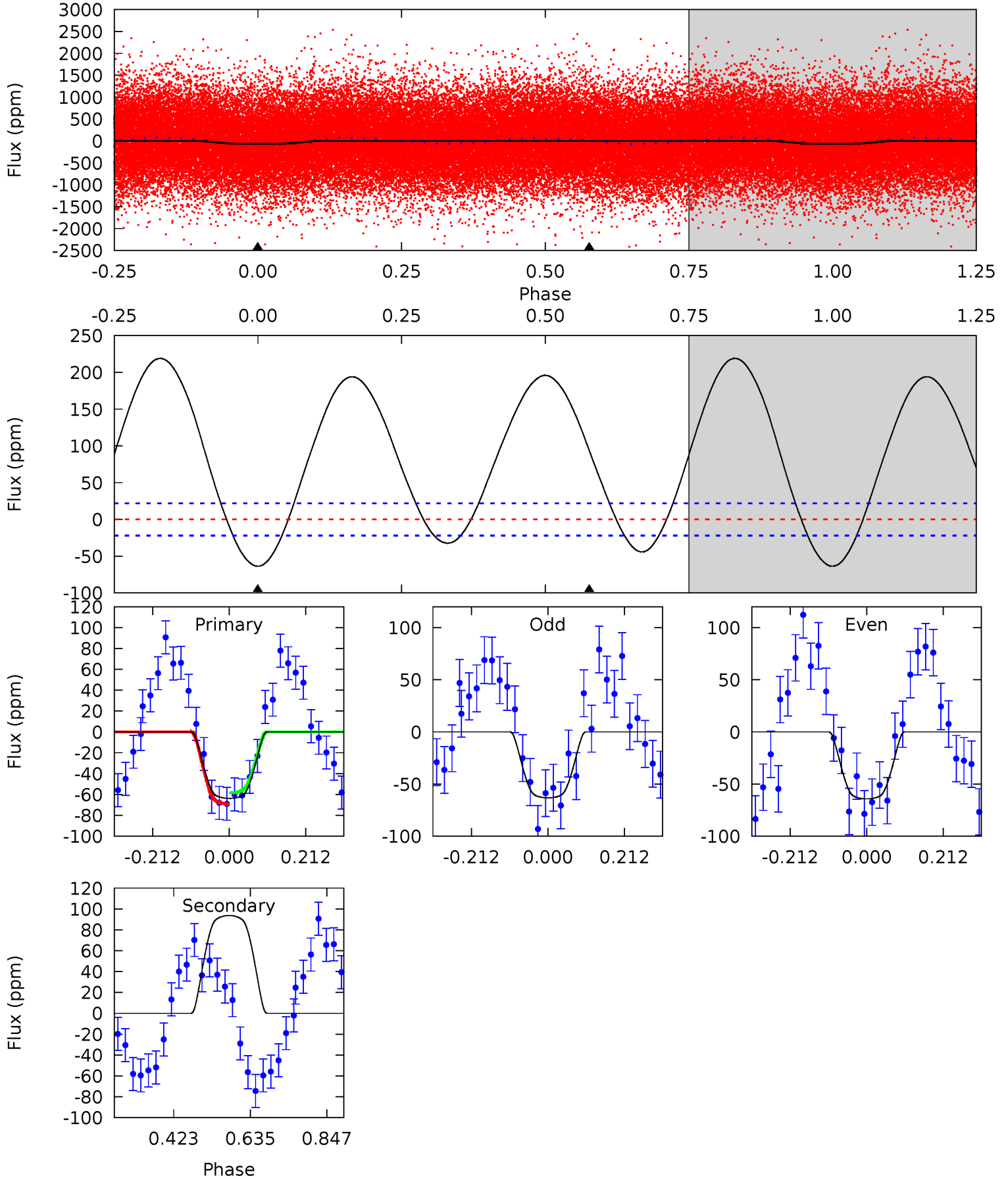
TCE 011666104-01 P= 1.900254 Days  $T_0=132.446979$  (BKJD)



# DV Model-Shift Uniqueness Test

011666104-01, P = 1.900160 Days, E = 130.591283 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
12.8	-18.8	0	0	4.40	1.25	11.5	12.8	12.8	-18.8	-18.8	0.10	1.24	0.77	1.07

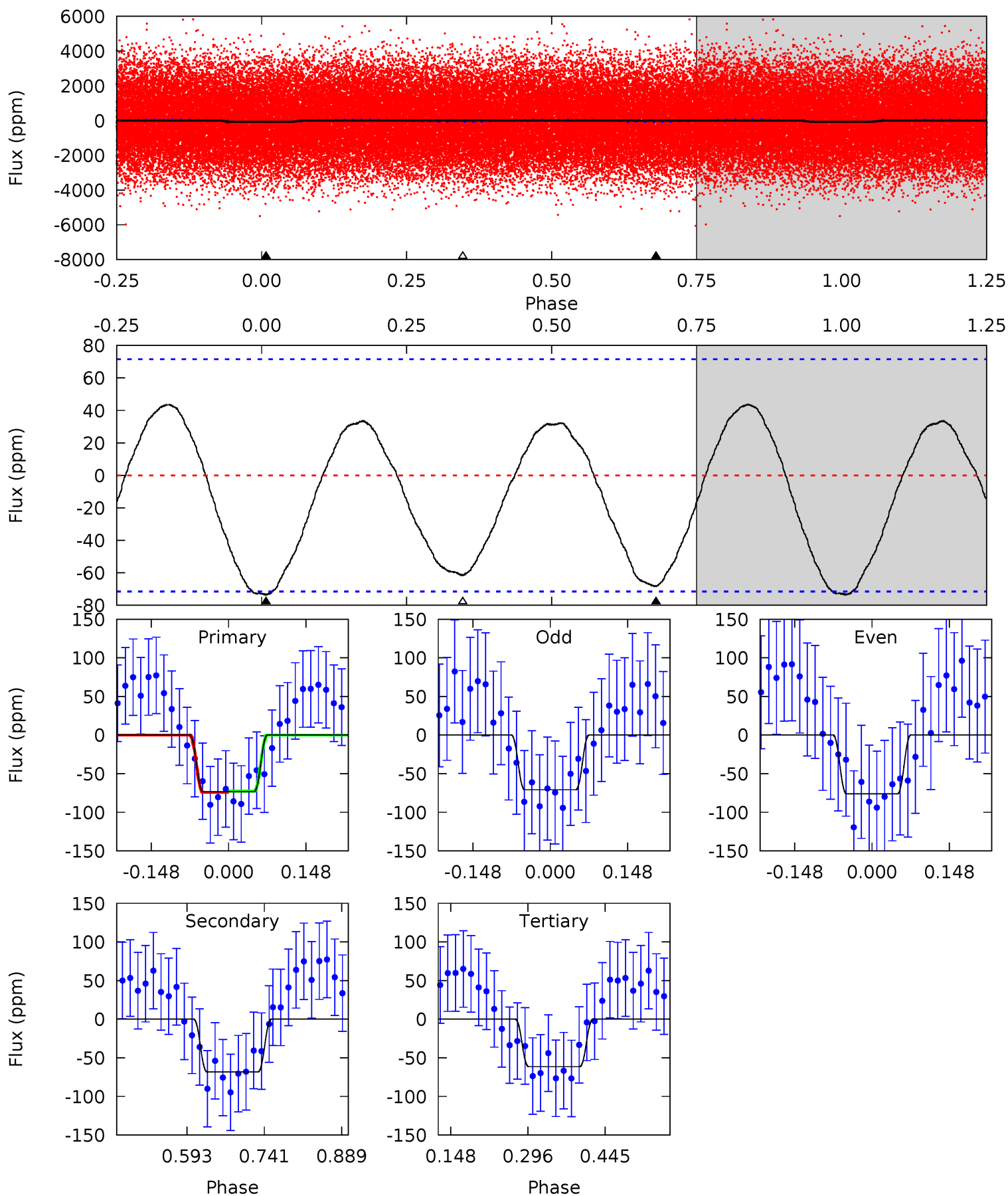




# Alt Model-Shift Uniqueness Test

011666104-01, P = 1.900254 Days, E = 130.546725 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
4.60	4.27	3.85	0	4.48	1.45	2.25	0.75	4.60	0.42	4.27	0.16	1.00	0.37	0.06





### Stellar Parameters For KIC 011666104

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8235^{+257}_{-371}$	$3.756^{+0.338}_{-0.182}$	$0.360^{+0.050}_{-0.450}$	$3.455^{+0.976}_{-1.464}$	$2.480^{+0.275}_{-0.641}$	$0.085^{+0.225}_{-0.043}$
	+3%/-5%	+9%/-5%	+14%/-125%	+28%/-42%	+11%/-26%	+265%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011666104-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$94 \pm 5$	$3.27^{+0.64}_{-0.72}$	$4607^{+432}_{-517}$	$-8718^{+533}_{-585}$	$-7.752^{+2.247}_{-4.376}$
Alt.	$-68 \pm 16$	$3.34^{+0.64}_{-0.74}$	$4612^{+402}_{-483}$	$7611^{+716}_{-748}$	$5.470^{+3.498}_{-1.950}$

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

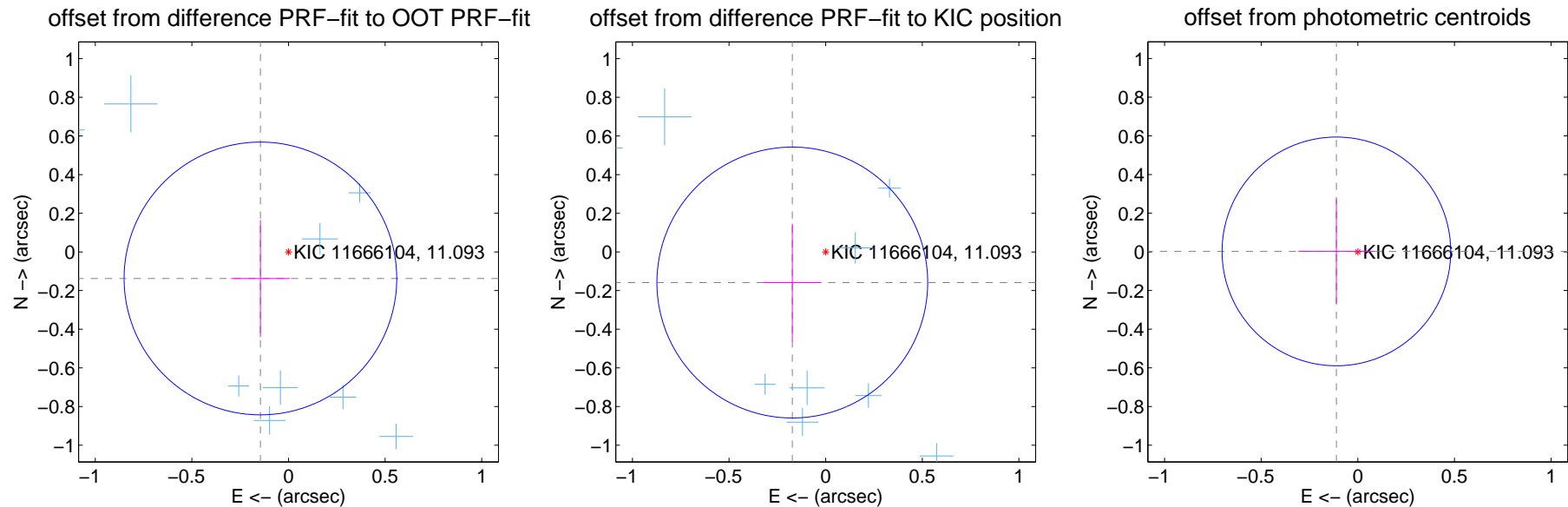
## DV Centroid Data

Supplemental centroid analysis for 011666104-01. **Kepler magnitude: 11.09.** Transit SNR 10.43

There are 17 quarters with good PRF difference image offsets

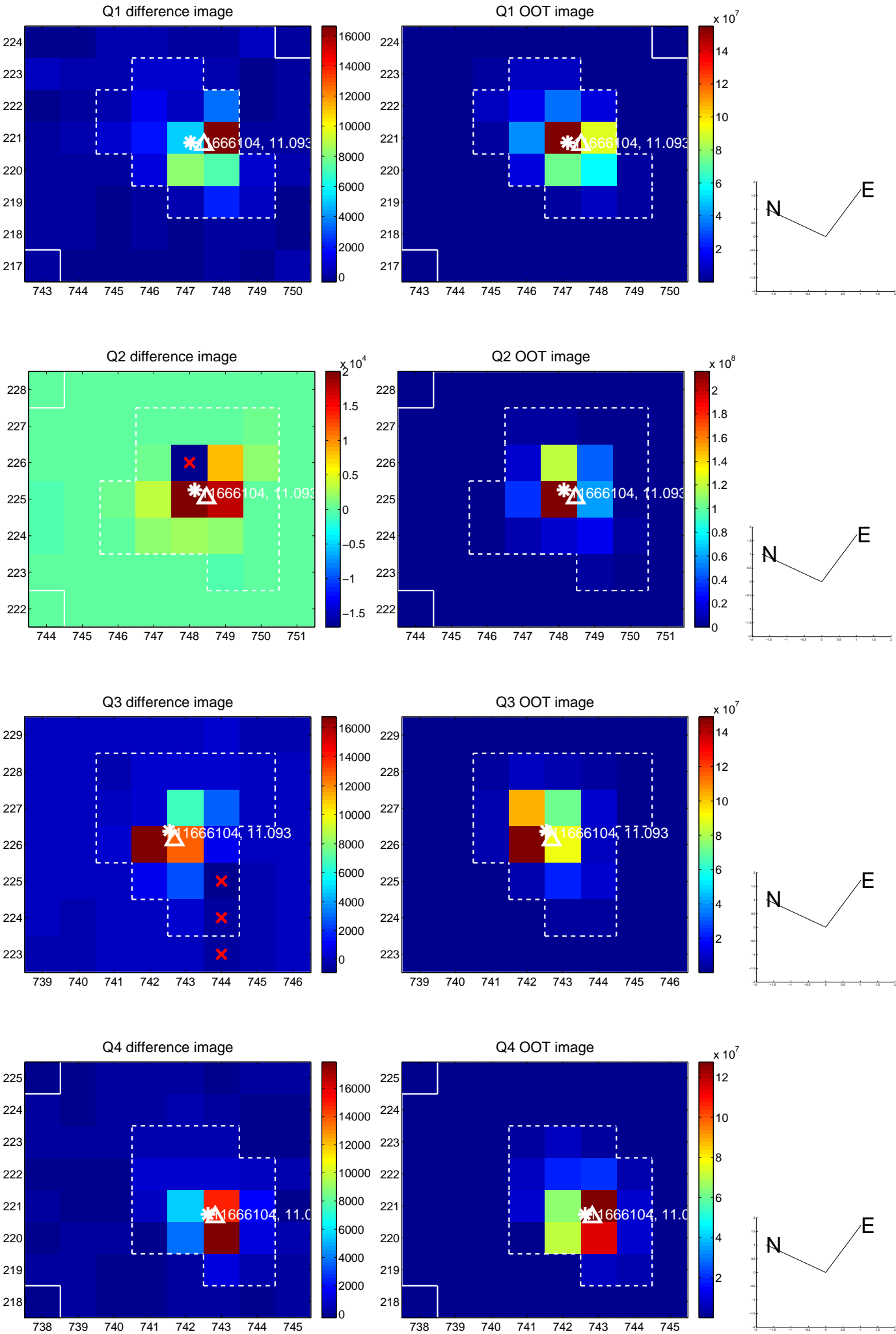
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.200 \pm 0.235$	0.85	$0.145 \pm 0.152$	$-0.137 \pm 0.302$
PRF-fit source offset from KIC position	$0.234 \pm 0.234$	1.00	$0.173 \pm 0.150$	$-0.158 \pm 0.304$
photometric centroid source offset	$0.11 \pm 0.20$	0.56	$0.11 \pm 0.20$	$0.00 \pm 0.27$

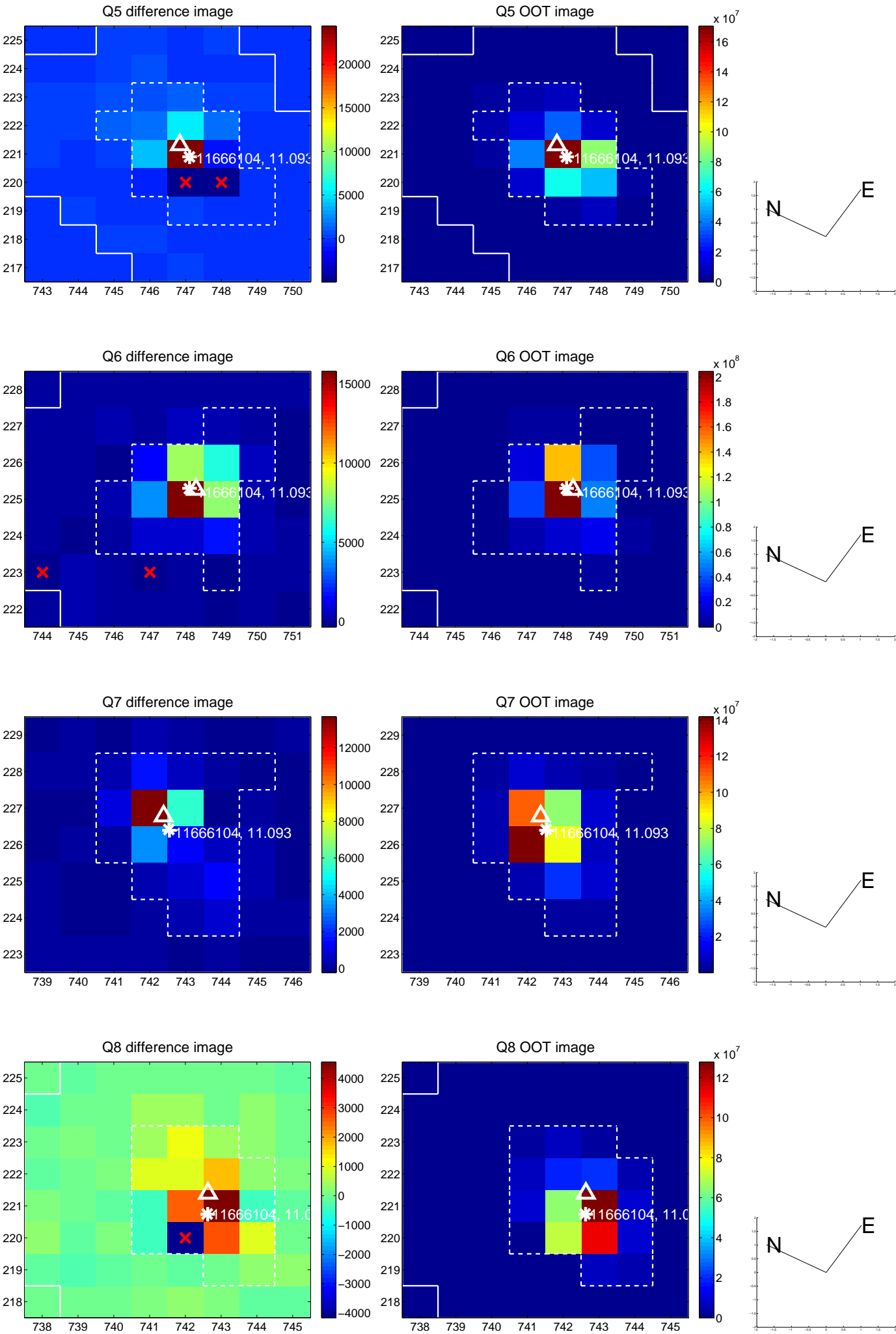


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

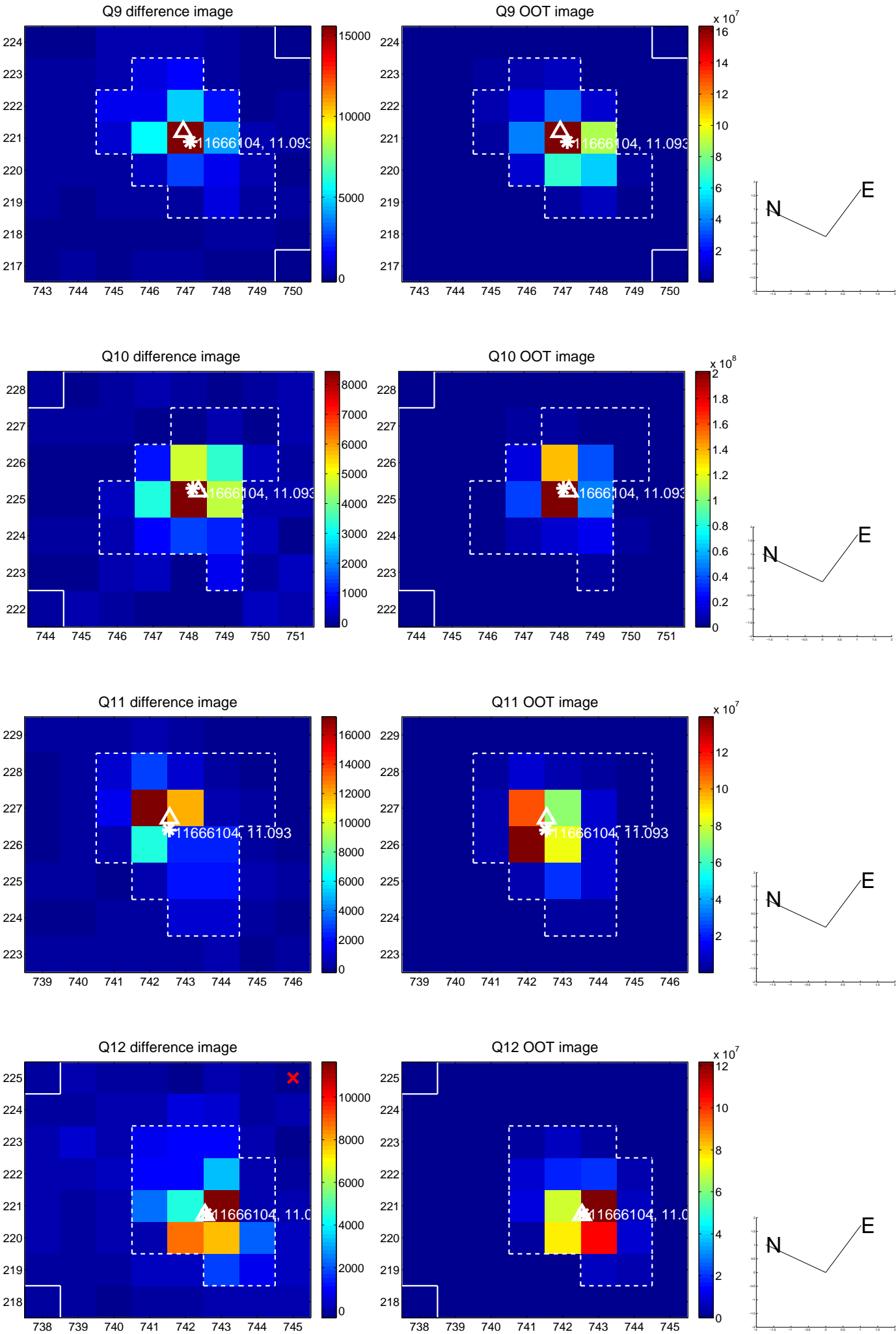


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

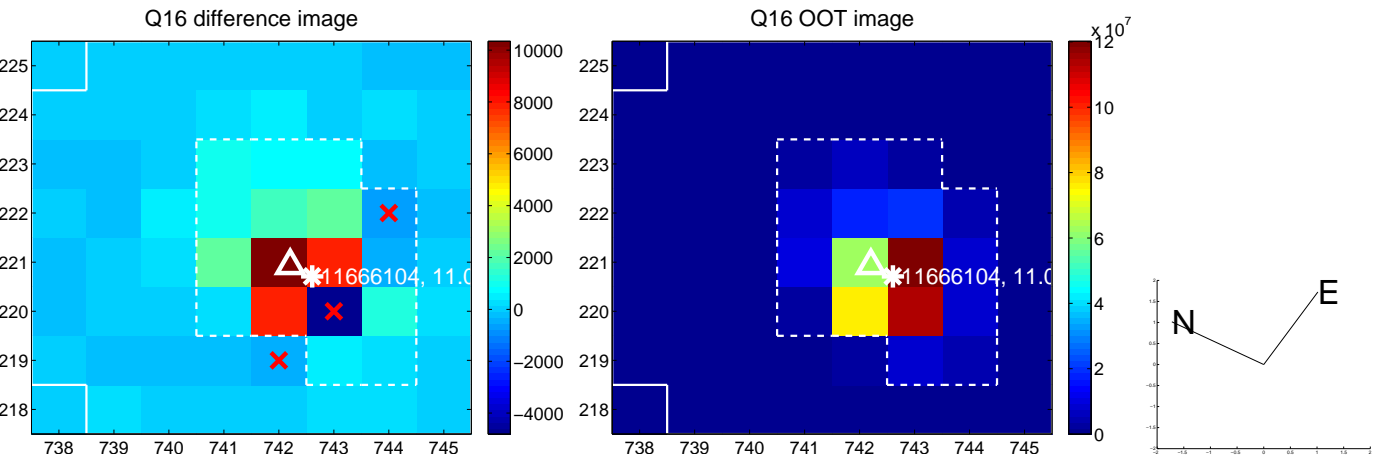
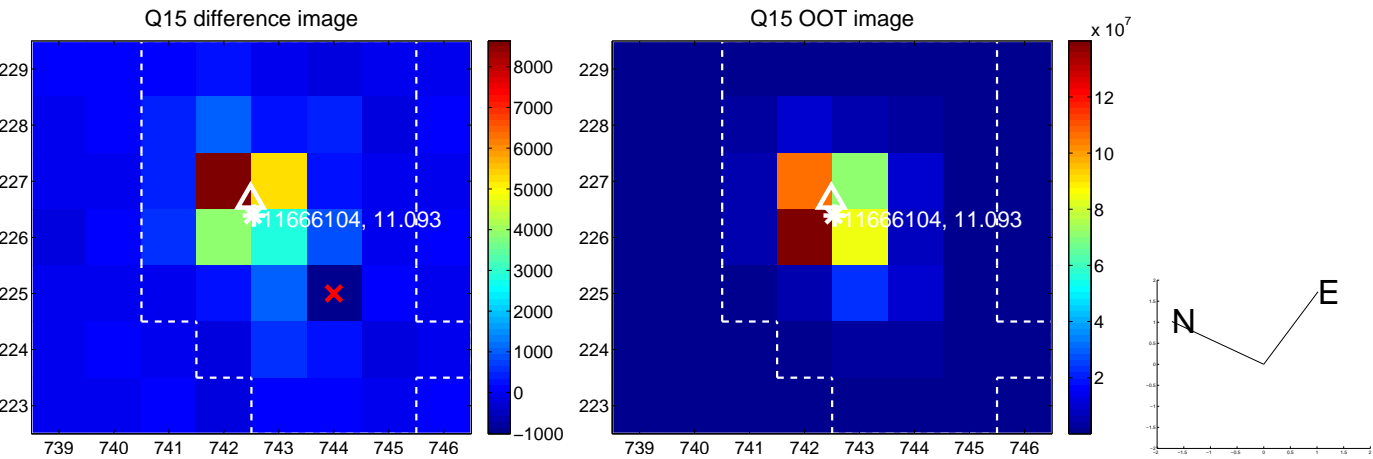
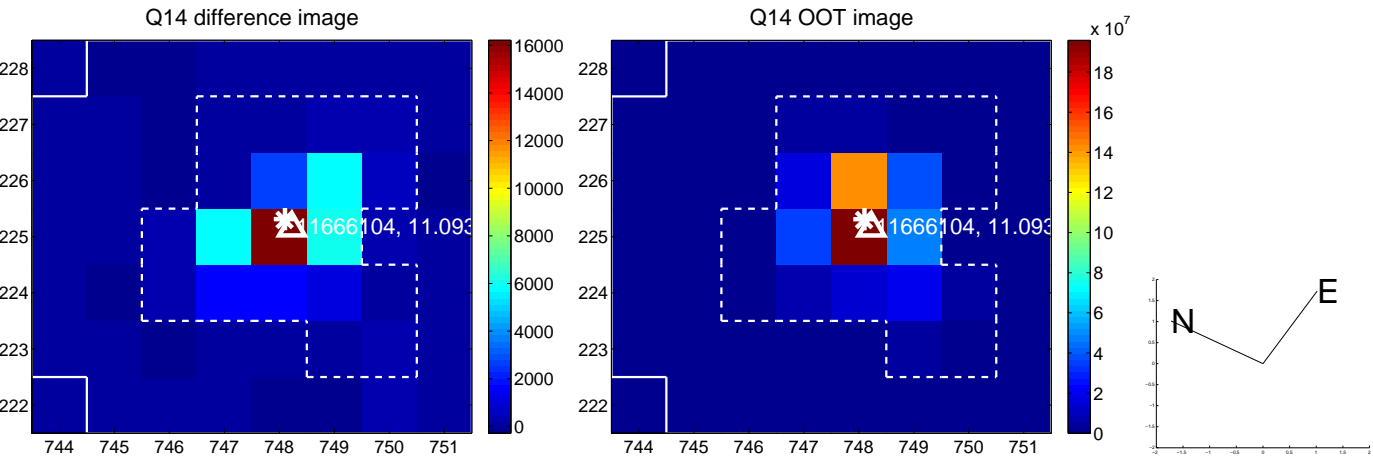
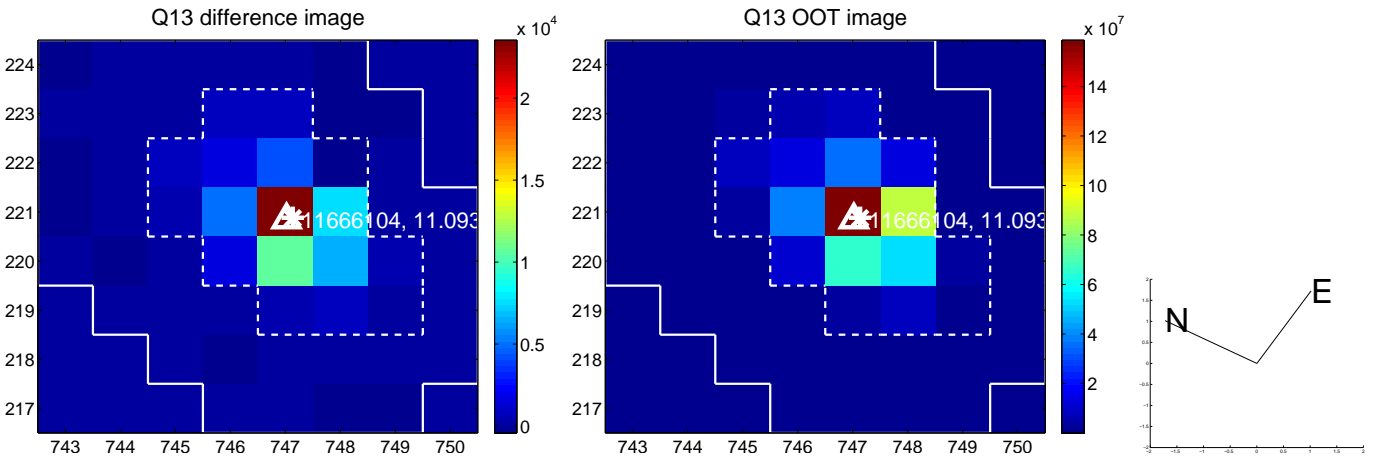




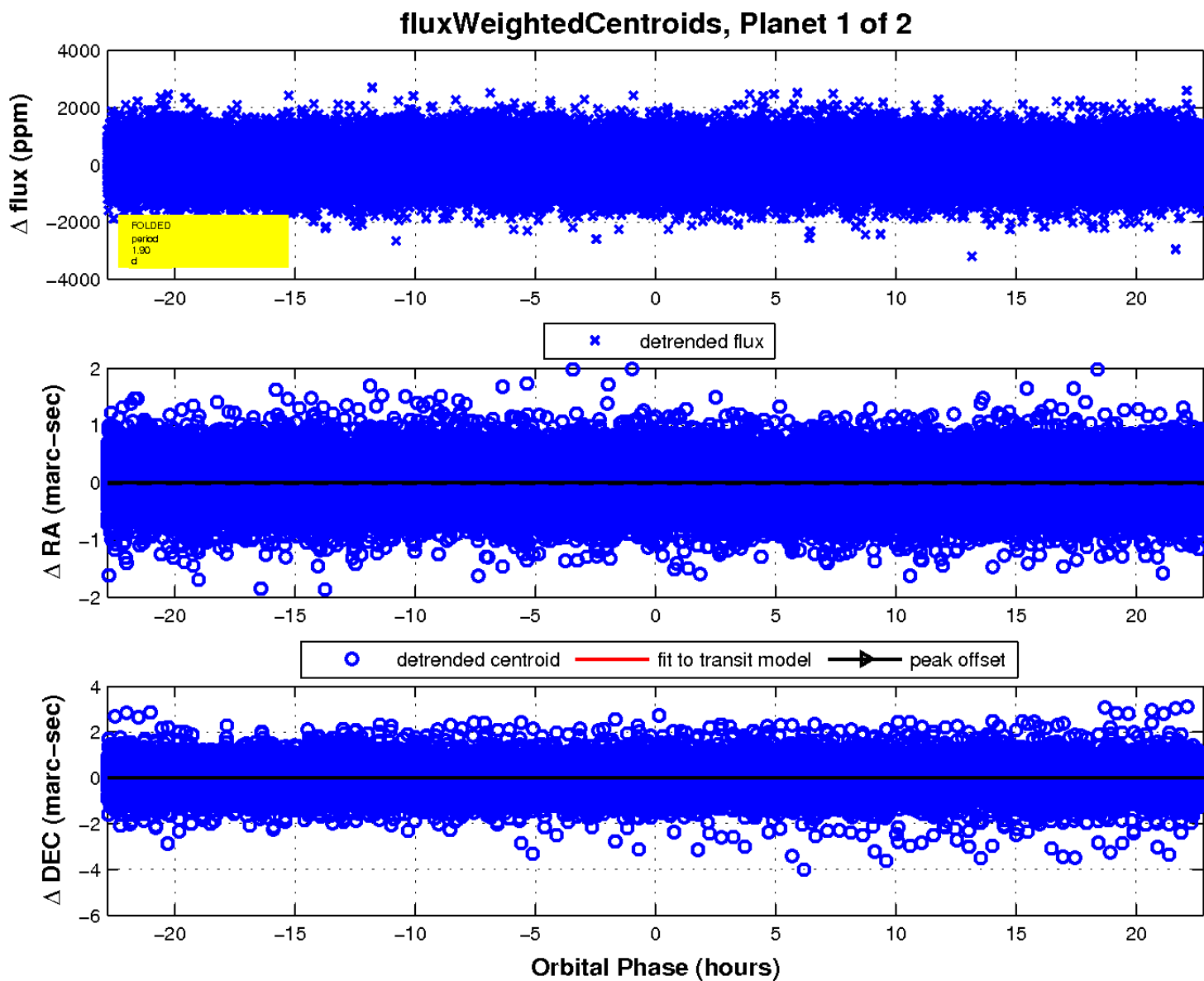
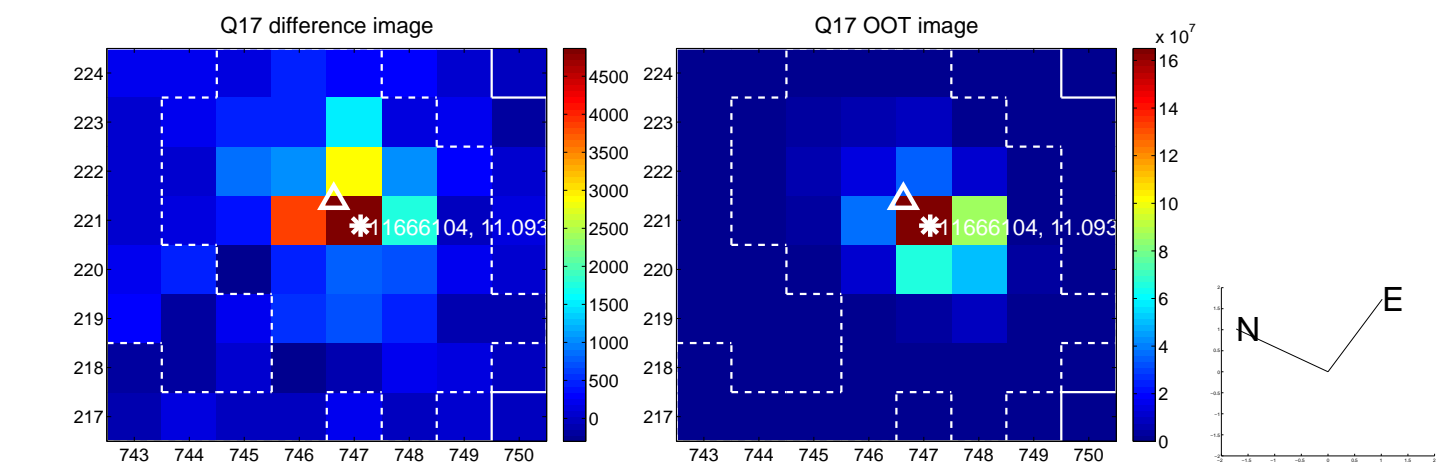
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

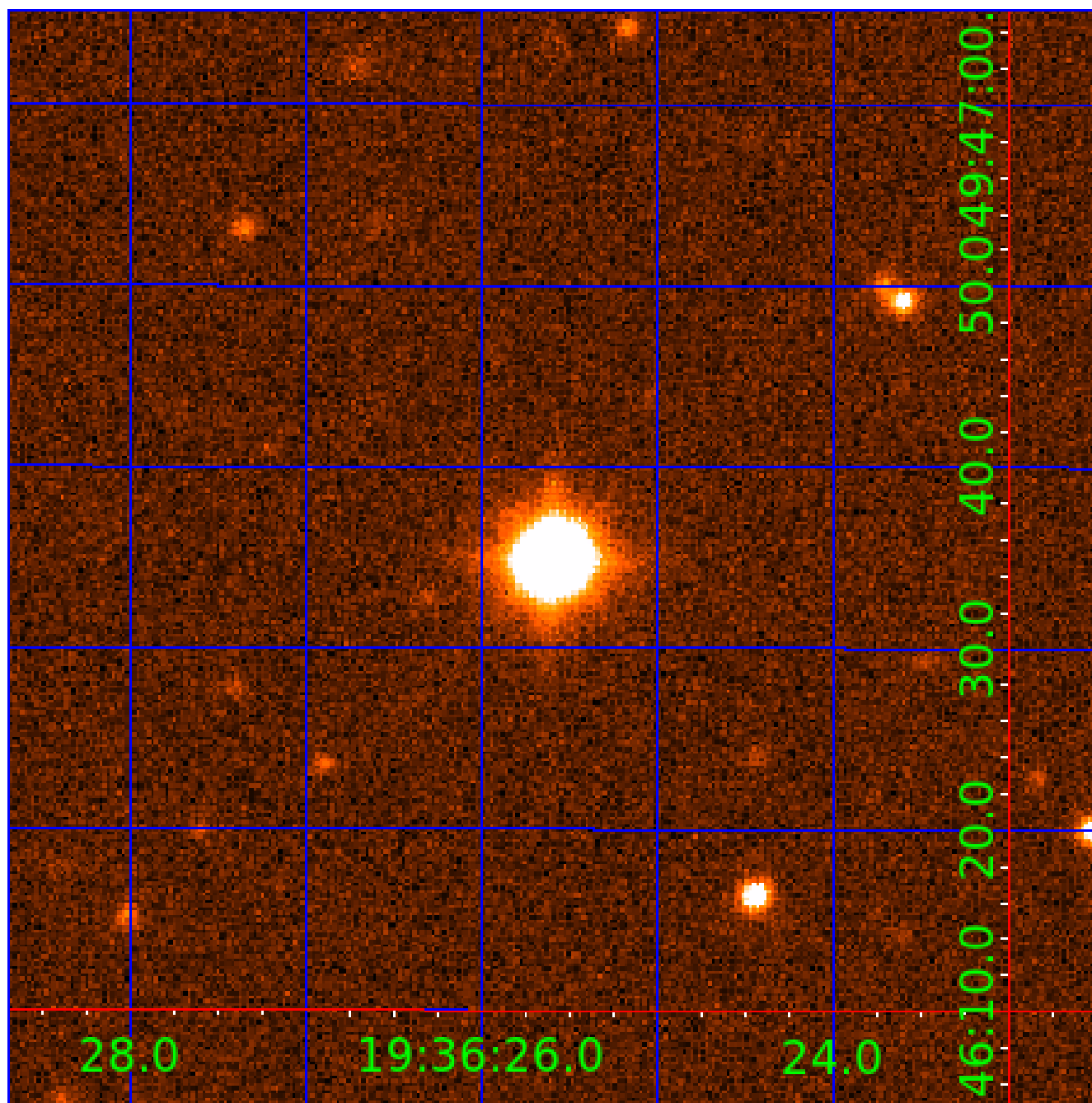


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011666104

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011666104-01	OBS	No	1.900160	132.491443	52.8	9.209	10.2	10.4	3.46	8235	3.37	29748.19
011666104-02	OBS	No	0.555751	131.828307	86.3	5.764	8.4	15.9	3.46	8235	3.27	153228.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011666104-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011666104-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

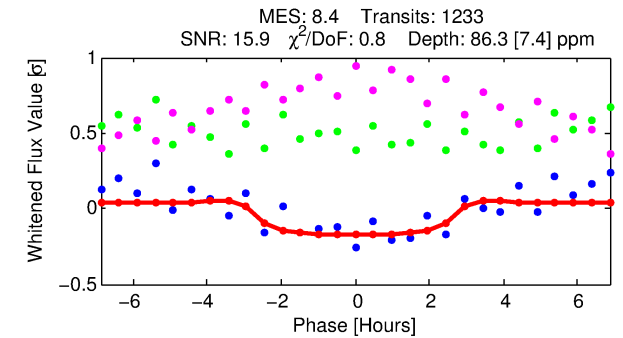
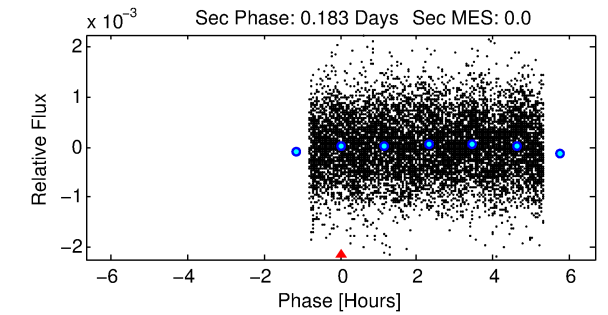
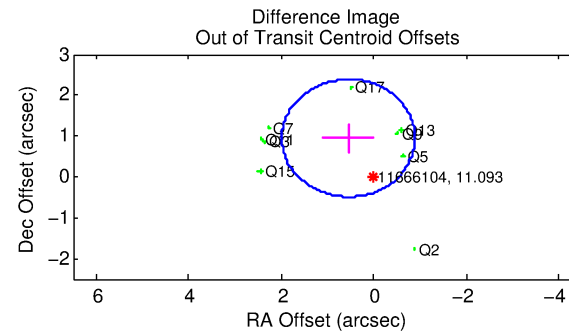
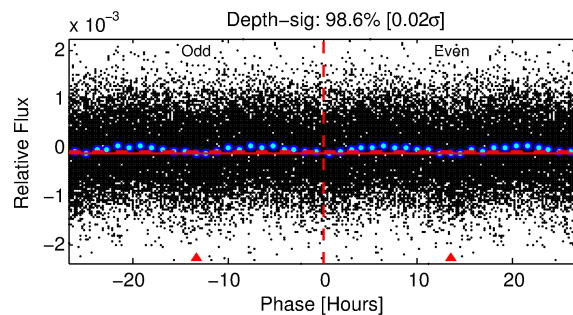
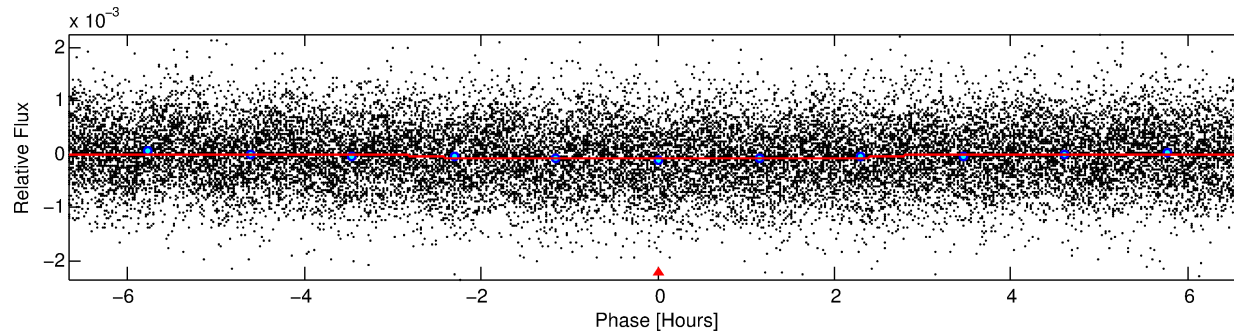
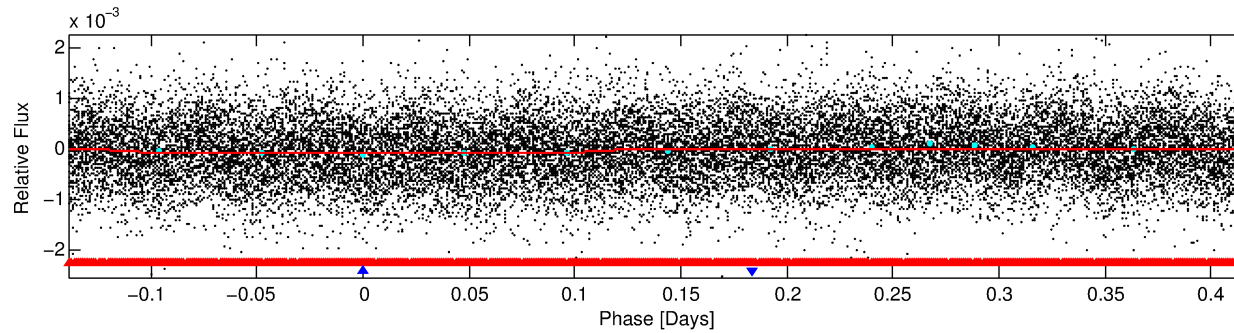
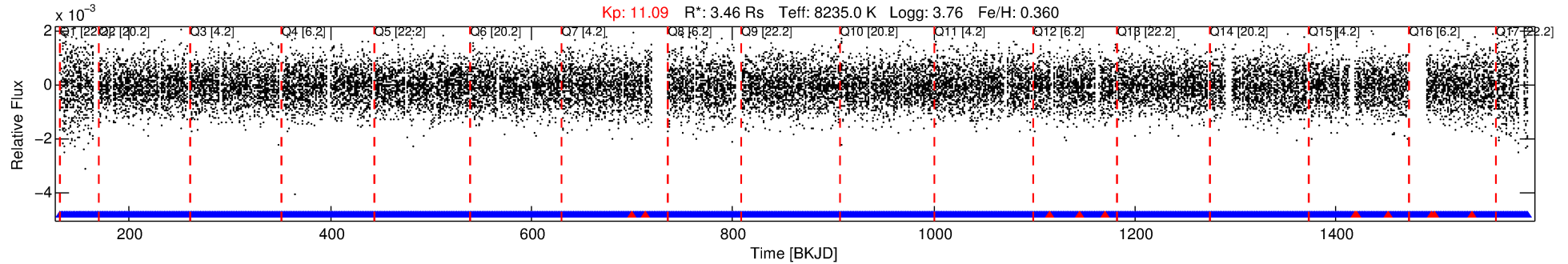
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011666104-02

No Significant Match Found

# DV One-Page Summary

KIC: 11666104 Candidate: 2 of 2 Period: 0.556 d



## DV Fit Results:

Period = 0.55575 [0.00001] d  
Epoch = 131.8283 [0.0038] BKJD  
Rp/R\* = 0.0087 [0.0068]  
a/R\* = 1.03 [0.25]  
b = 0.27 [15.38]  
Seff = 153228.67 [94640.13]  
Teq = 5045 [779] K  
Rp = 3.27 [2.90] Re  
a = 0.0179 [0.0069] AU  
Ag = N/A  
Teffp = N/A

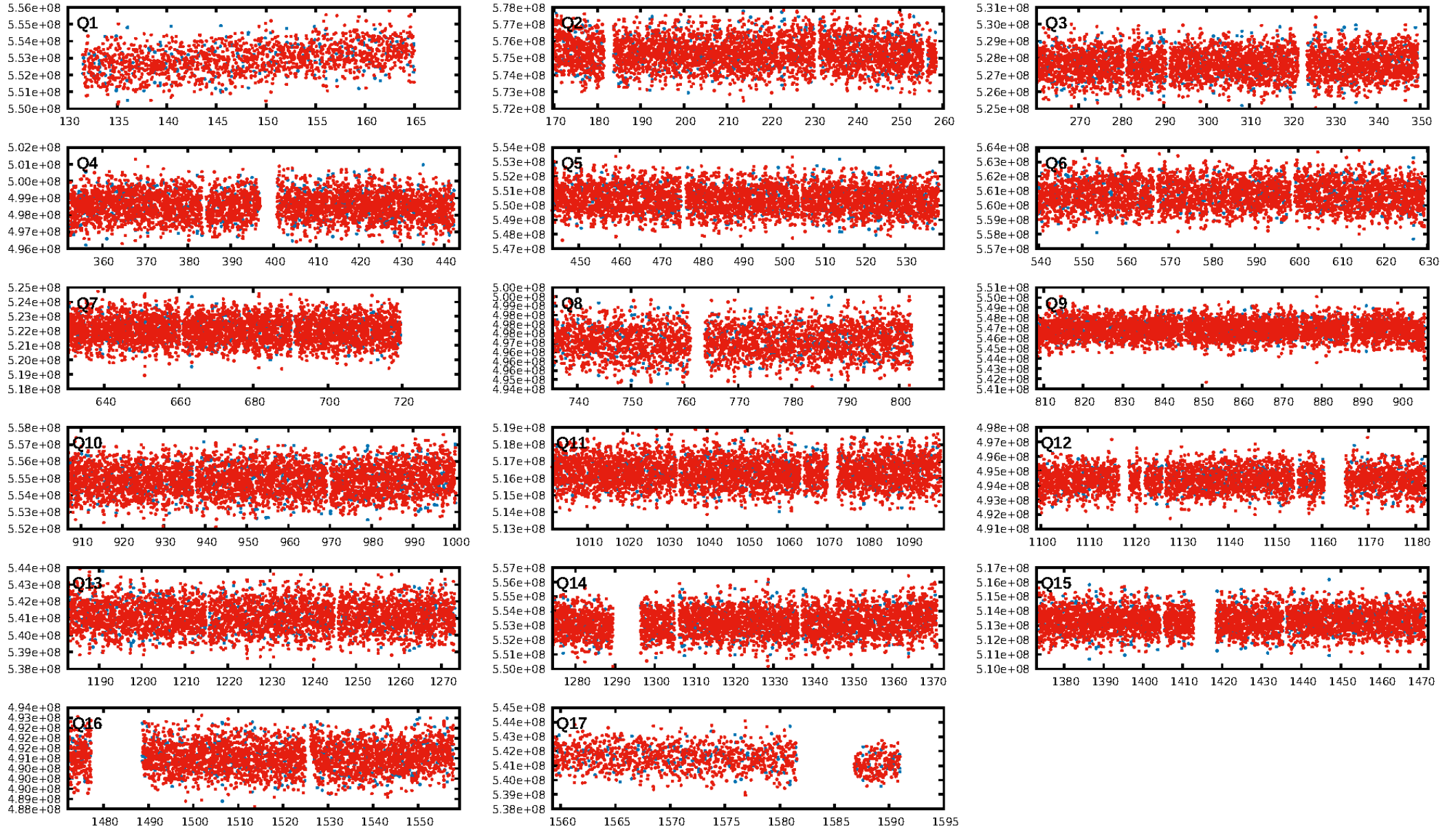
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.7% [2.97σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [1167/1178]  
GhostDiagnostic-chr: 2.228  
Centroid-sig: 1.6%  
Centroid-so: 0.141 arcsec [1.64σ]  
OotOffset-rm: 1.096 arcsec [2.28σ]  
KicOffset-rm: 1.018 arcsec [2.51σ]  
OotOffset-st: 1/4/0/4 [9]  
KicOffset-st: 1/4/0/4 [9]  
DiffImageQuality-fgm: 0.56 [5/9]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:20:13 Z

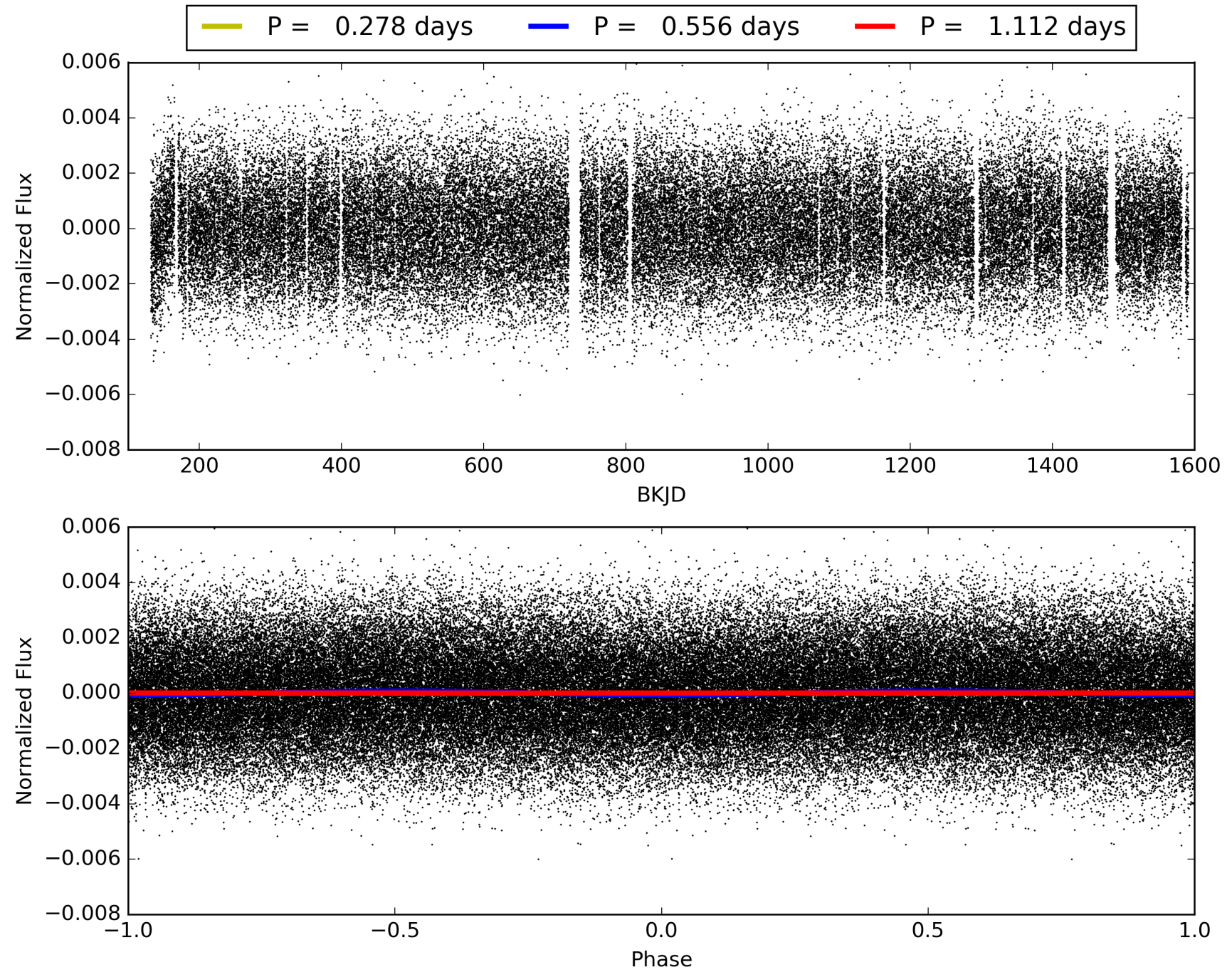
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011666104-02, PDC Light Curves



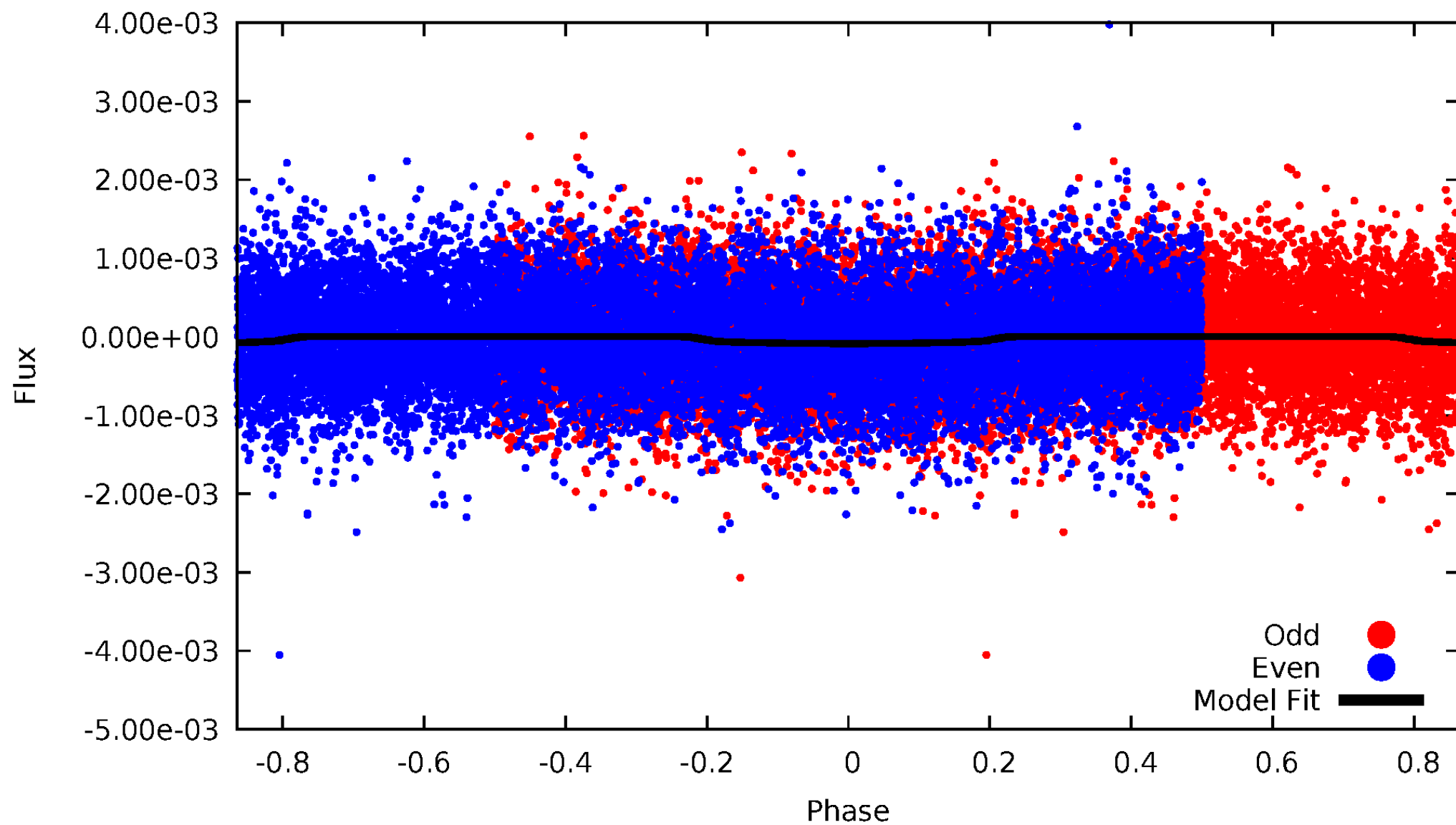


# TCE 011666104-02



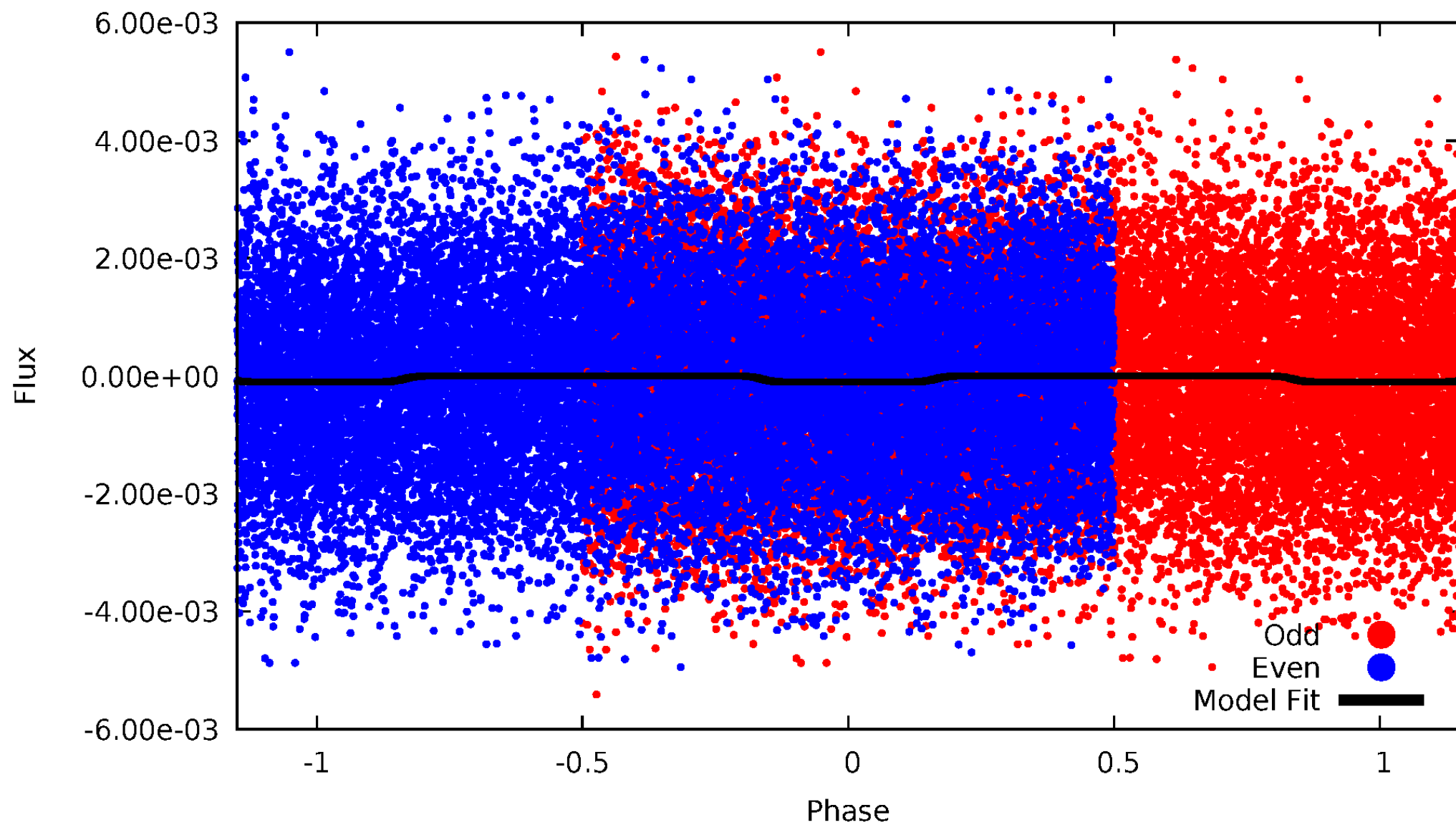
DV Odd/Even

TCE 011666104-02



# ALT Odd/Even

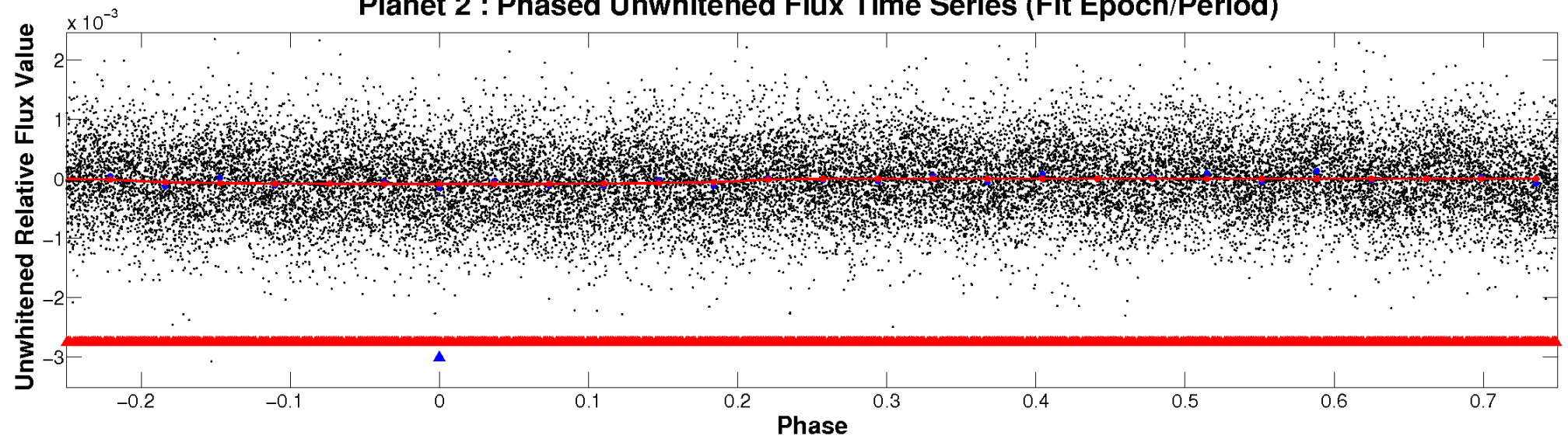
TCE 011666104-02



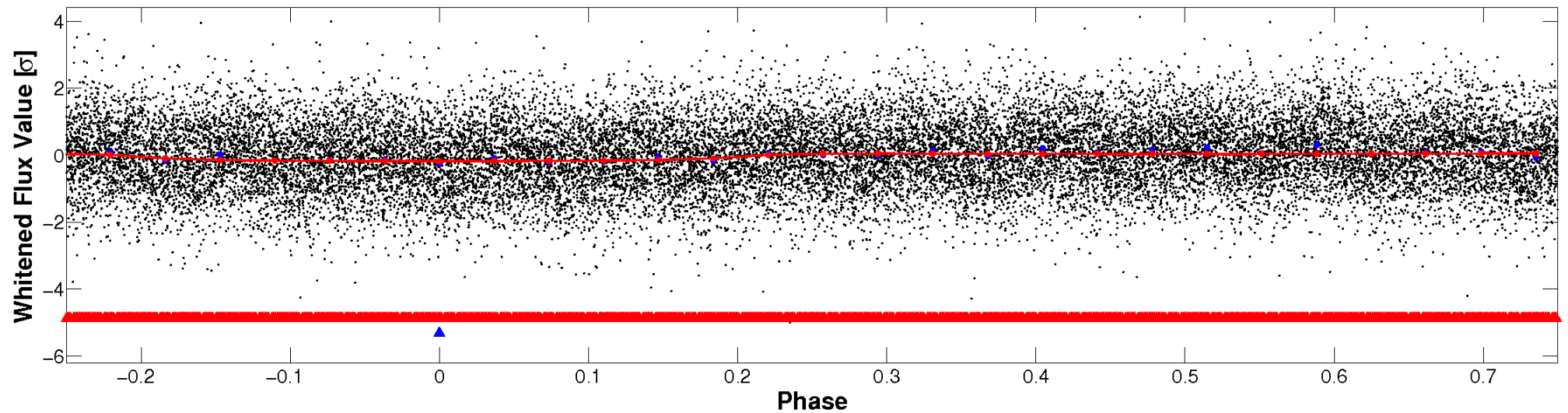


# Non-Whitened Vs. Whitened Light Curve

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

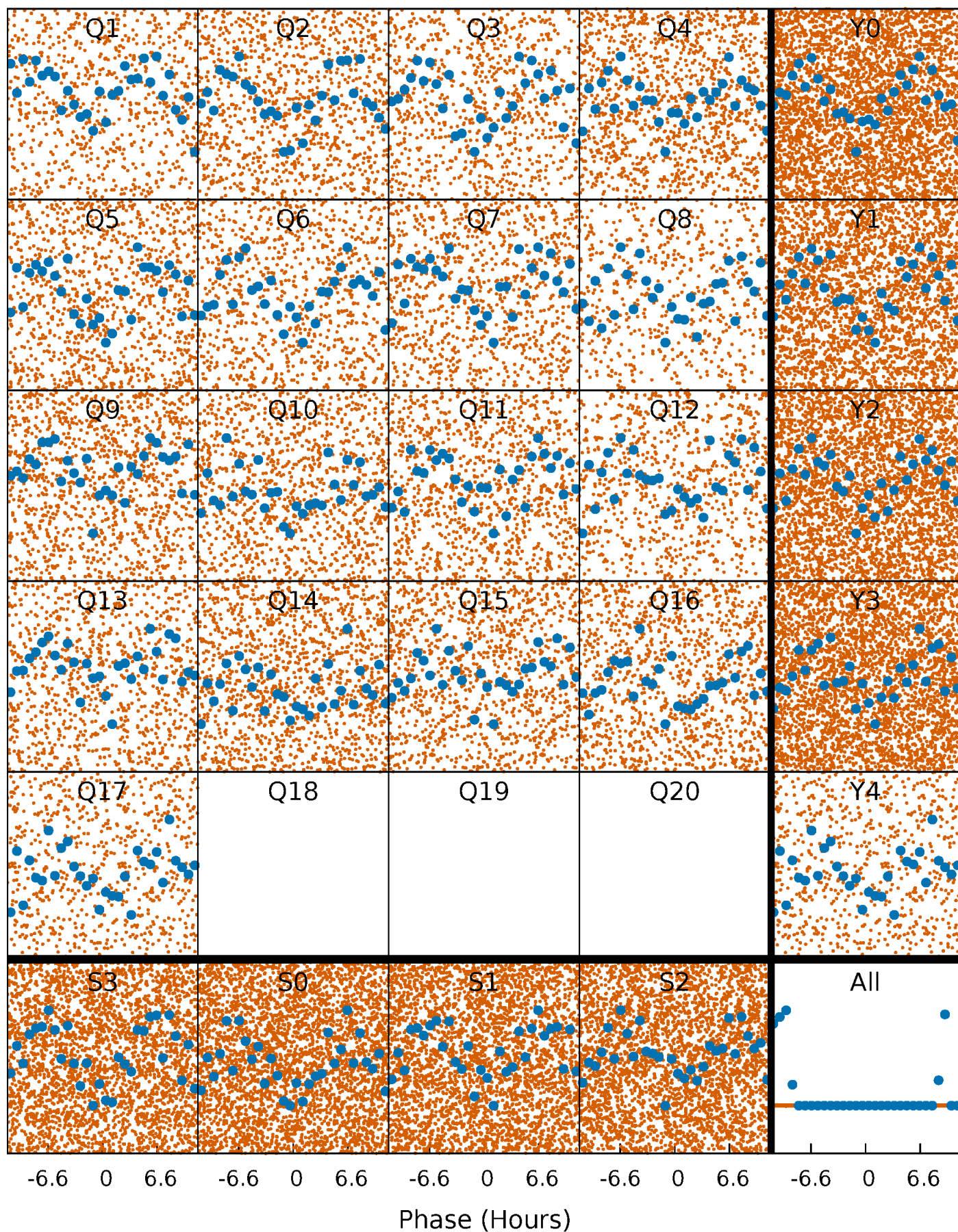


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

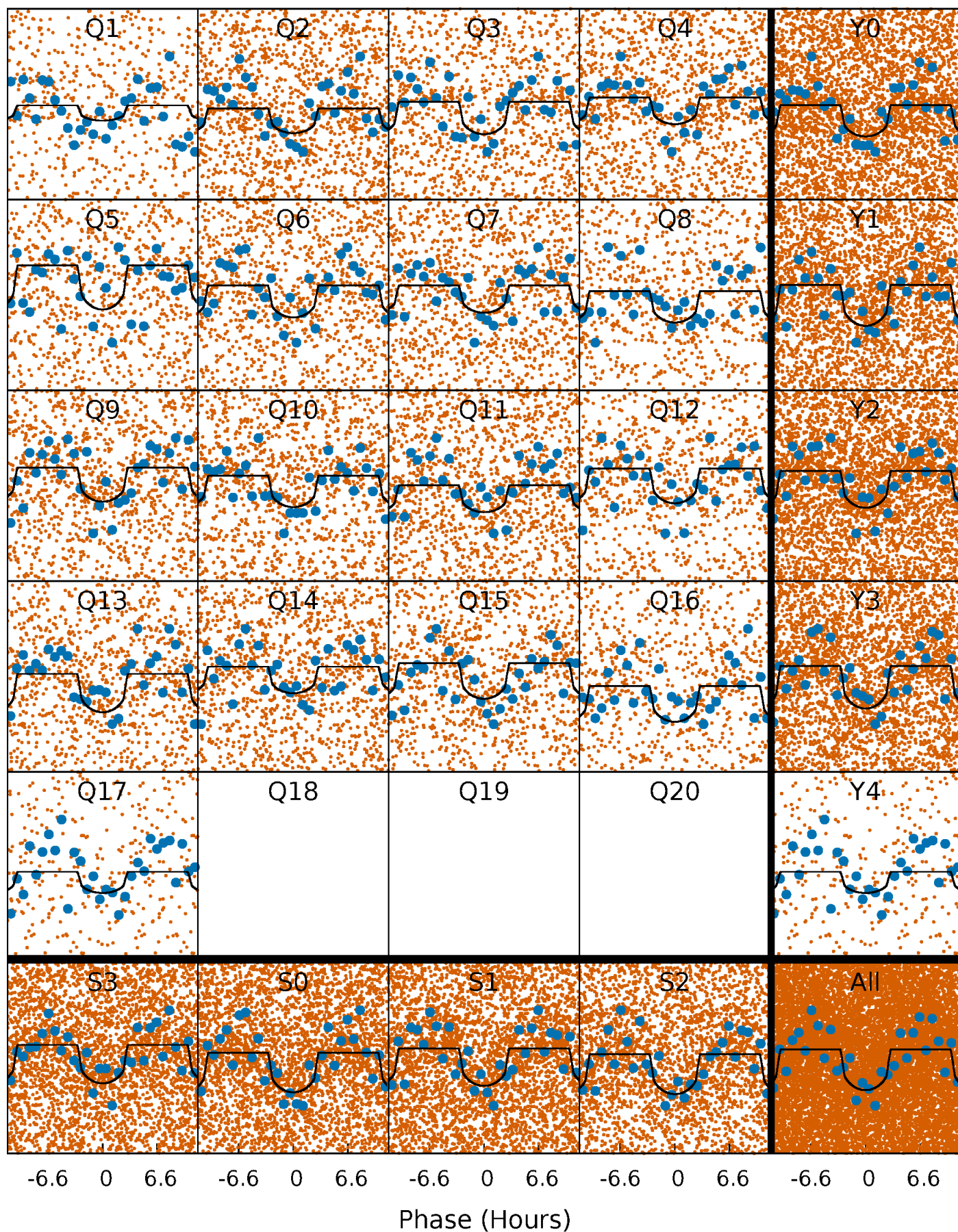
TCE 011666104-02 P= 0.555751 Days  $T_0=131.828307$  (BKJD)





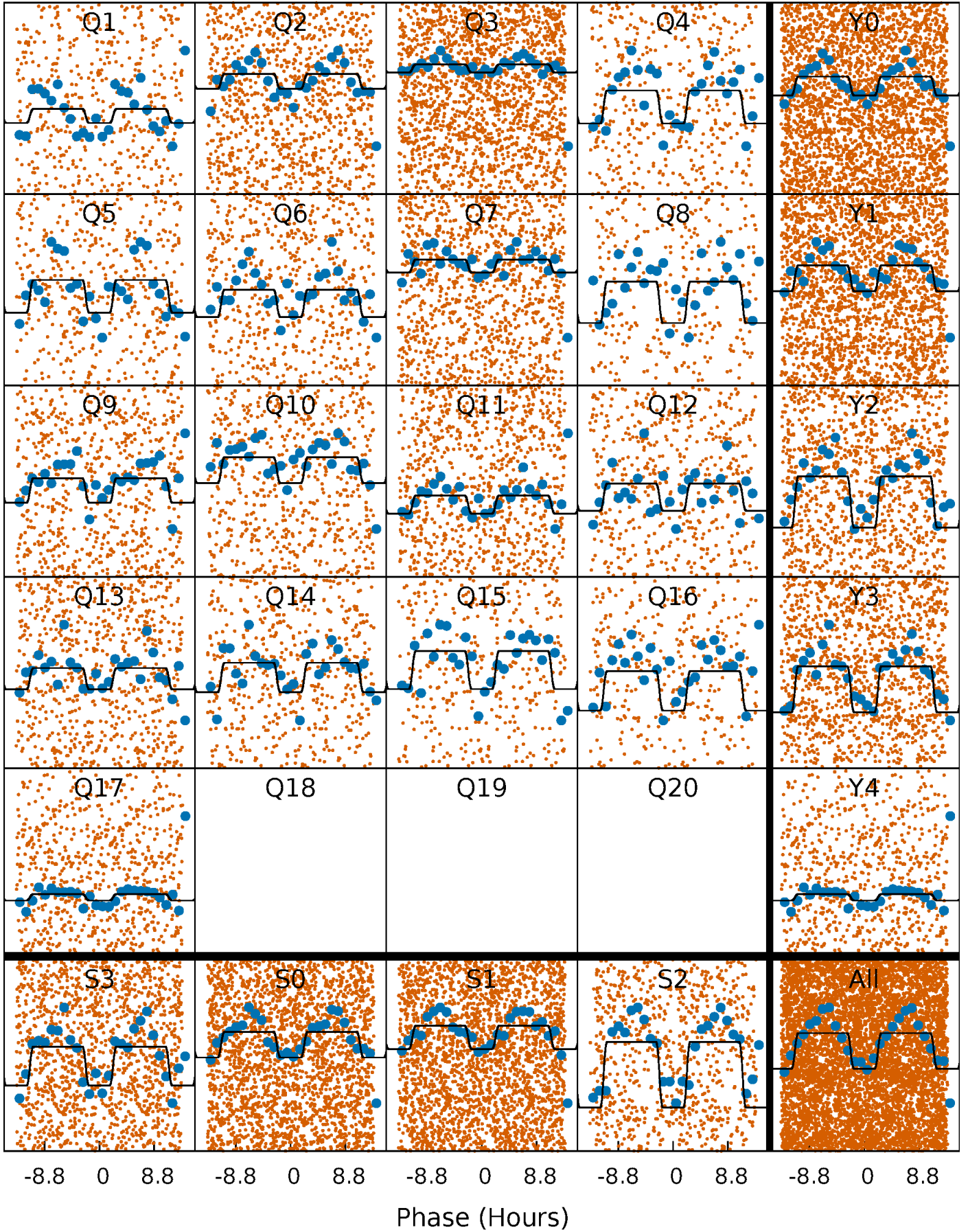
# DV Quarter-Phased Transit Curves

TCE 011666104-02 P= 0.555751 Days  $T_0=131.828307$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011666104-02   P= 0.555767 Days    $T_0=131.819814$  (BKJD)

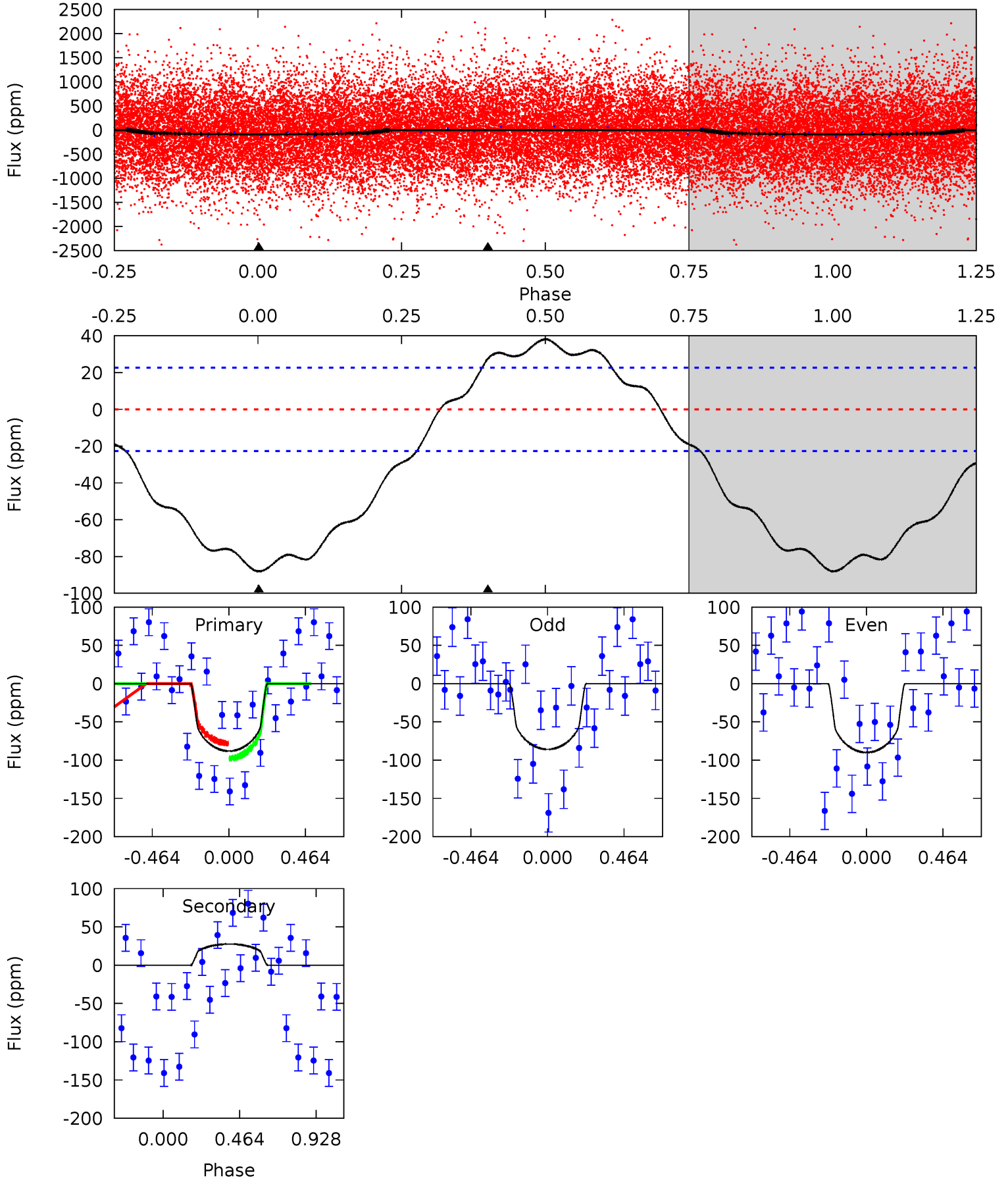




# DV Model-Shift Uniqueness Test

011666104-02, P = 0.555751 Days, E = 131.272556 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.5	-5.16	0	0	4.23	0.73	2.20	16.5	16.5	-5.16	-5.16	0.38	1.19	0.30	1.85

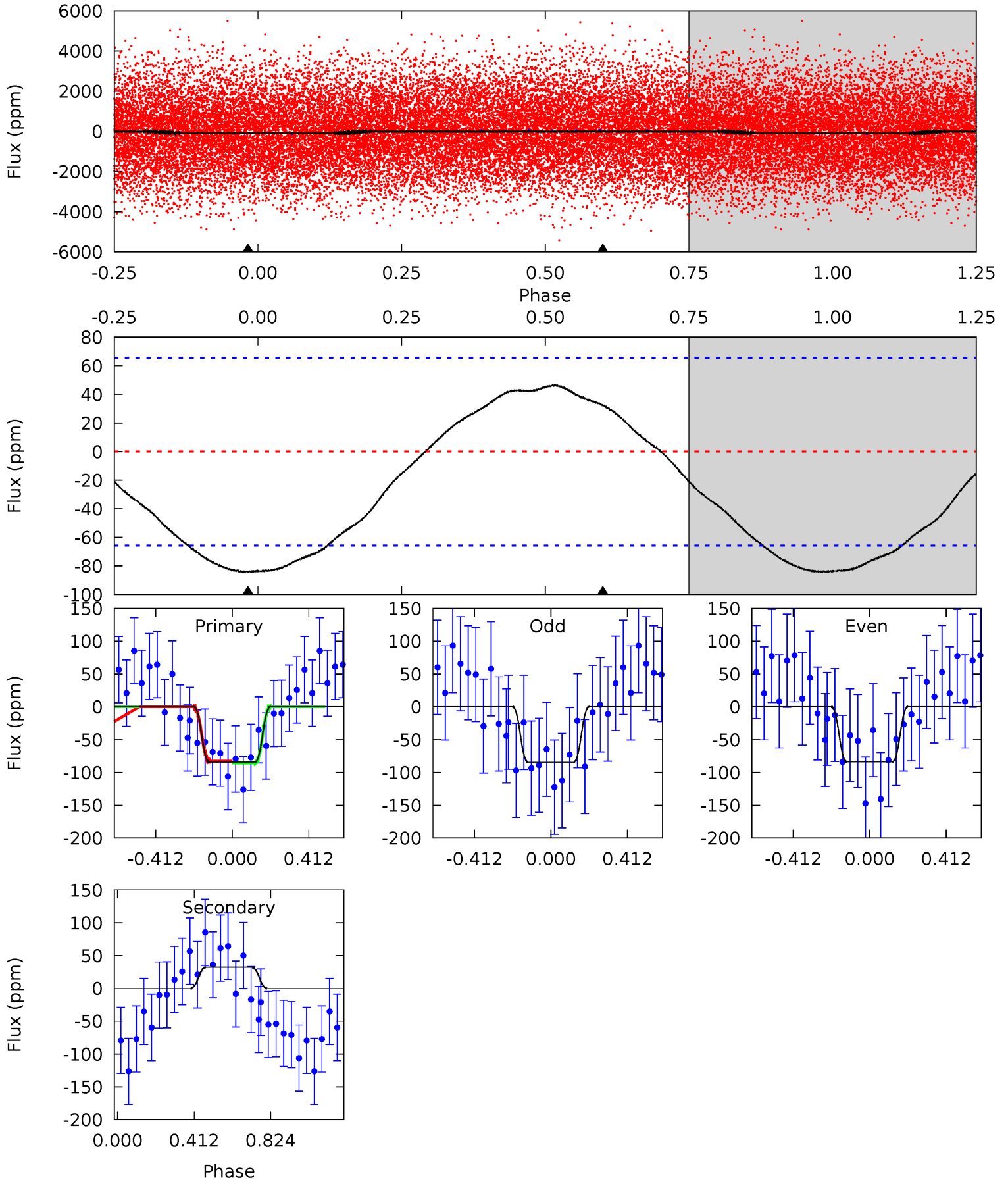




# Alt Model-Shift Uniqueness Test

011666104-02, P = 0.555767 Days, E = 131.264047 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
5.46	-2.09	0	0	4.26	0.82	0.71	5.46	5.46	-2.09	-2.09	0.01	1.04	0.36	0.10



### Stellar Parameters For KIC 011666104

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8235^{+257}_{-371}$	$3.756^{+0.338}_{-0.182}$	$0.360^{+0.050}_{-0.450}$	$3.455^{+0.976}_{-1.464}$	$2.480^{+0.275}_{-0.641}$	$0.085^{+0.225}_{-0.043}$
	+3%/-5%	+9%/-5%	+14%/-125%	+28%/-42%	+11%/-26%	+265%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011666104-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$28 \pm 5$	$3.51^{+2.49}_{-2.07}$	$6963^{+615}_{-758}$	$-6812^{+859}_{-3142}$	$-0.379^{+0.251}_{-1.842}$
Alt.	$32 \pm 15$	$3.74^{+2.68}_{-2.13}$	$6960^{+635}_{-780}$	$-6864^{+978}_{-2588}$	$-0.359^{+0.259}_{-1.737}$

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

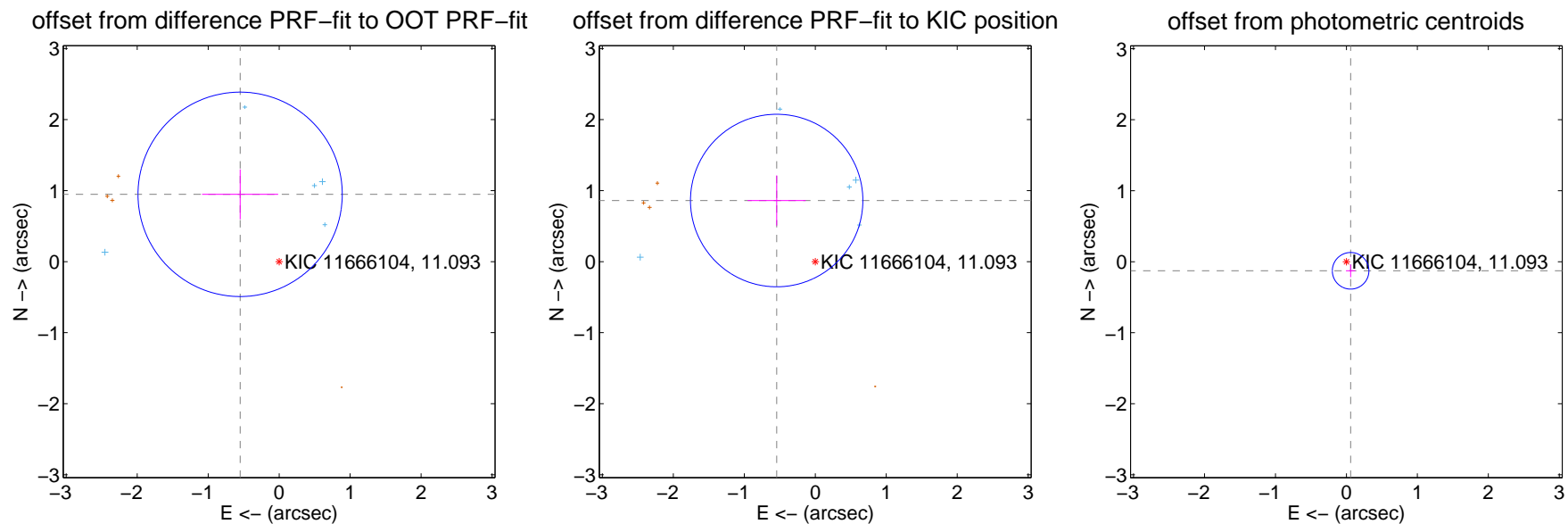
## DV Centroid Data

Supplemental centroid analysis for 011666104-02. **Kepler magnitude: 11.09.** Transit SNR 15.86

There are 5 quarters with good PRF difference image offsets

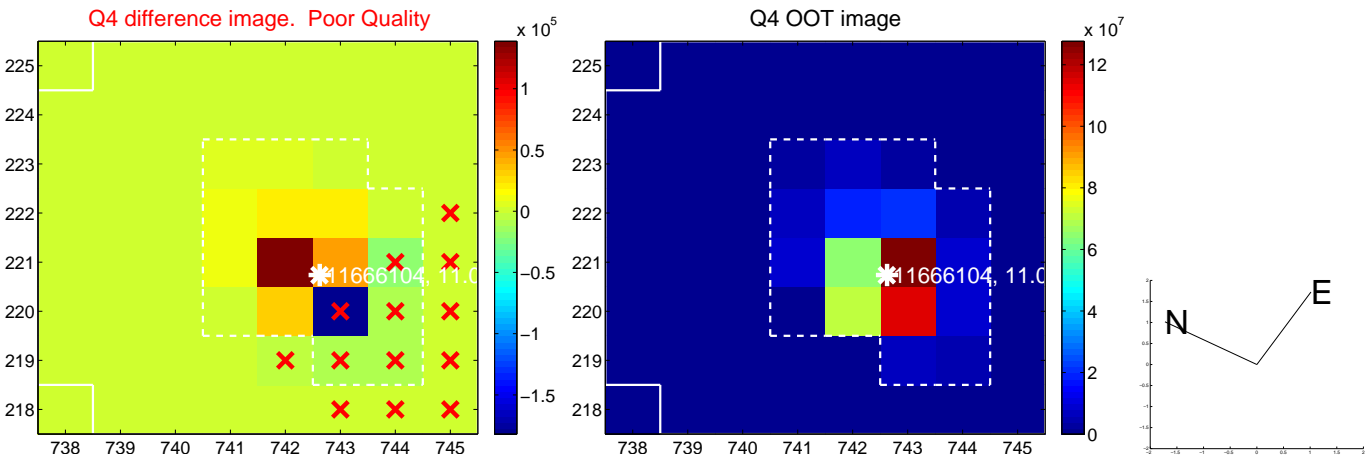
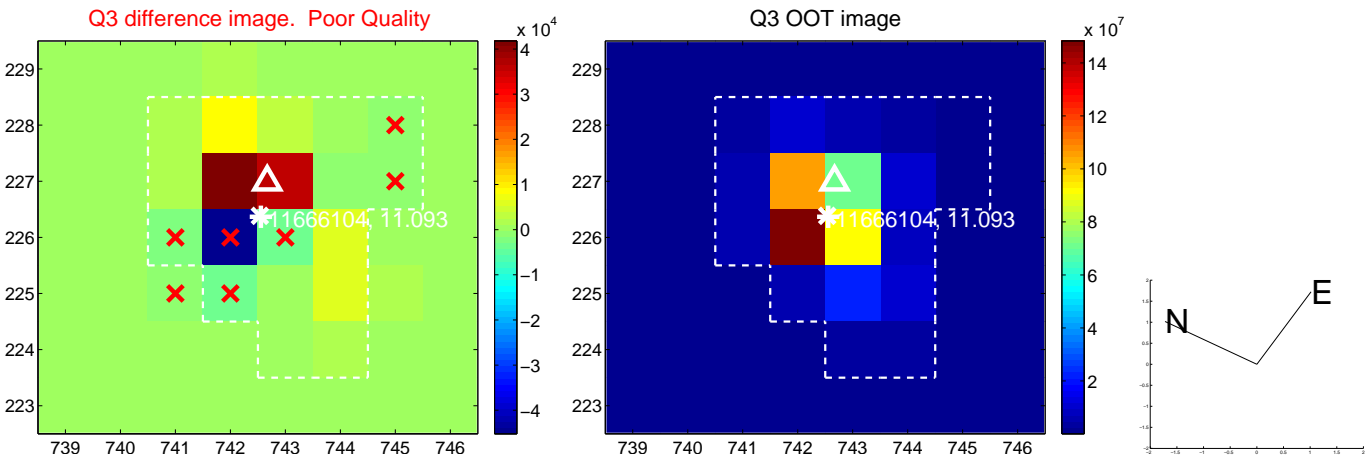
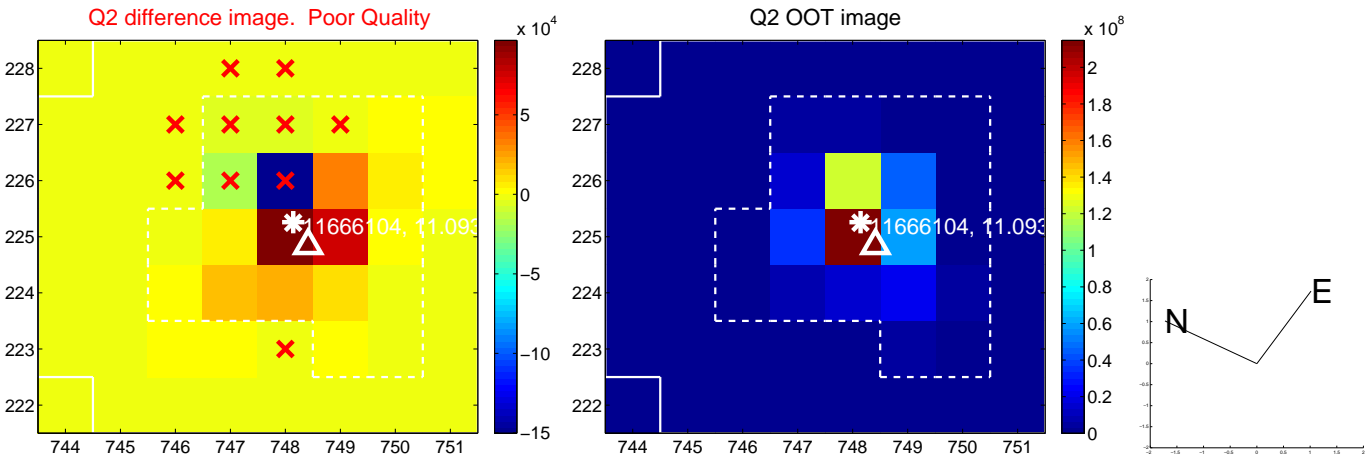
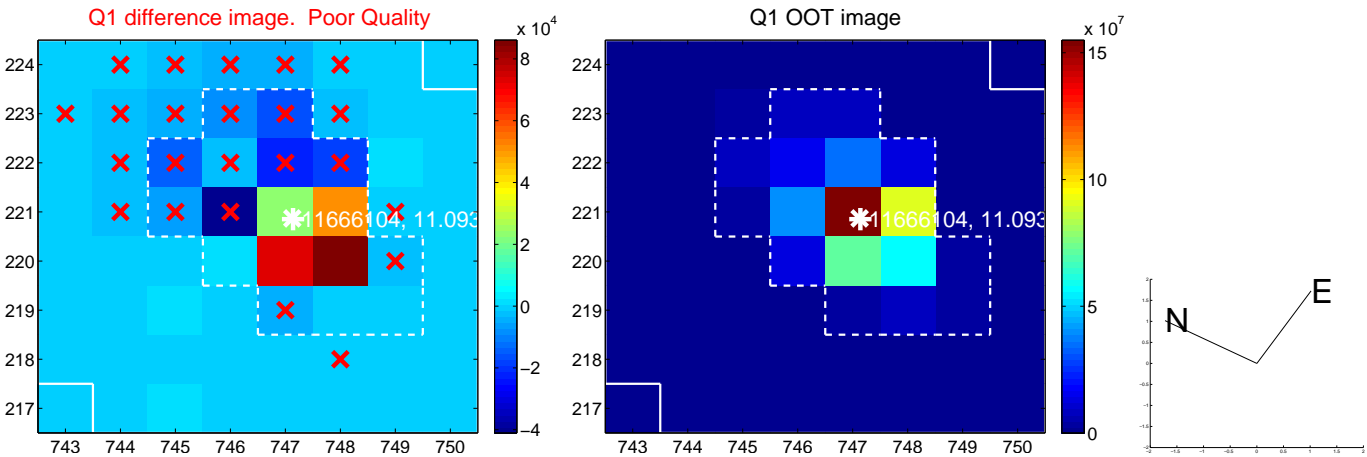
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.096 \pm 0.480$	2.28	$0.550 \pm 0.537$	$0.948 \pm 0.352$
PRF-fit source offset from KIC position	$1.018 \pm 0.405$	2.51	$0.544 \pm 0.410$	$0.860 \pm 0.353$
photometric centroid source offset	$0.14 \pm 0.09$	1.64	$-0.06 \pm 0.07$	$-0.13 \pm 0.09$

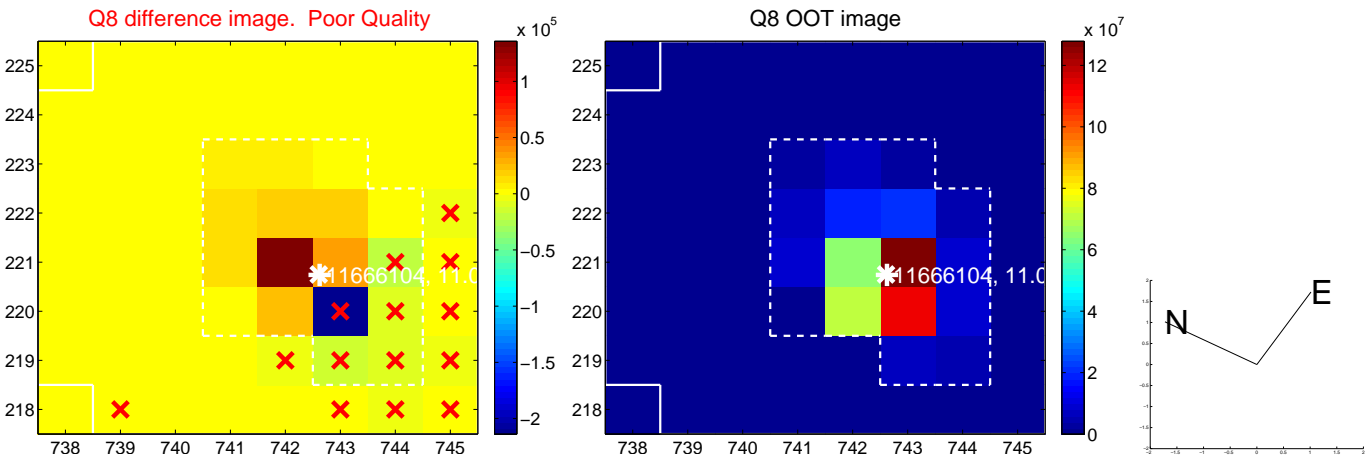
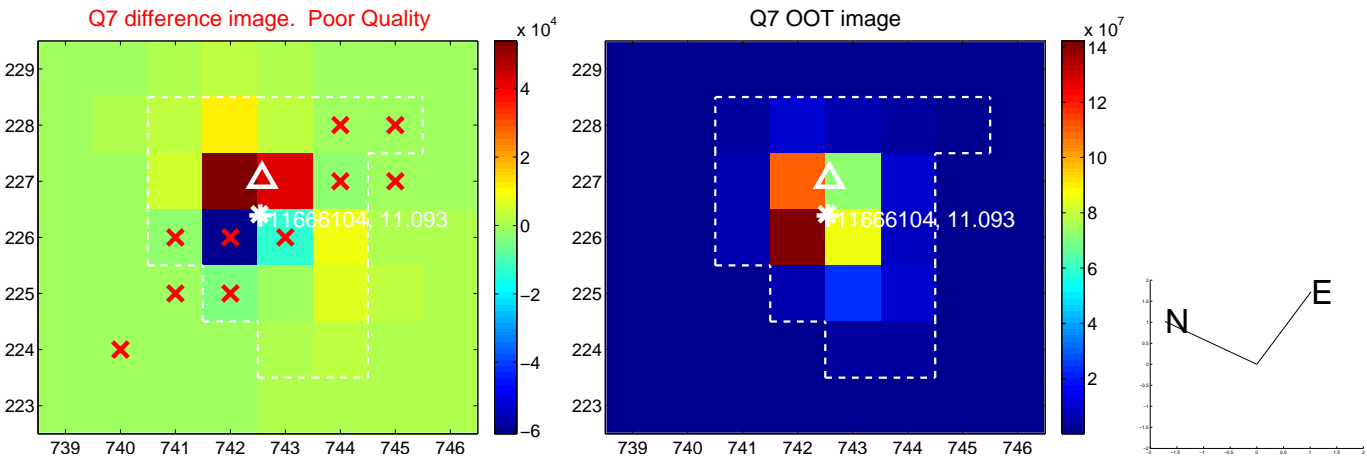
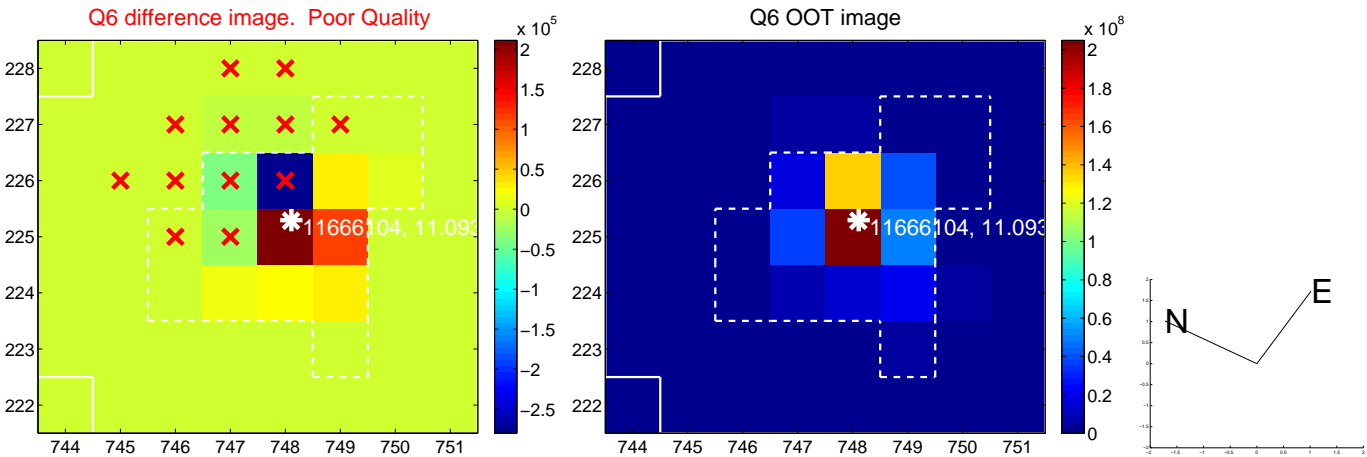
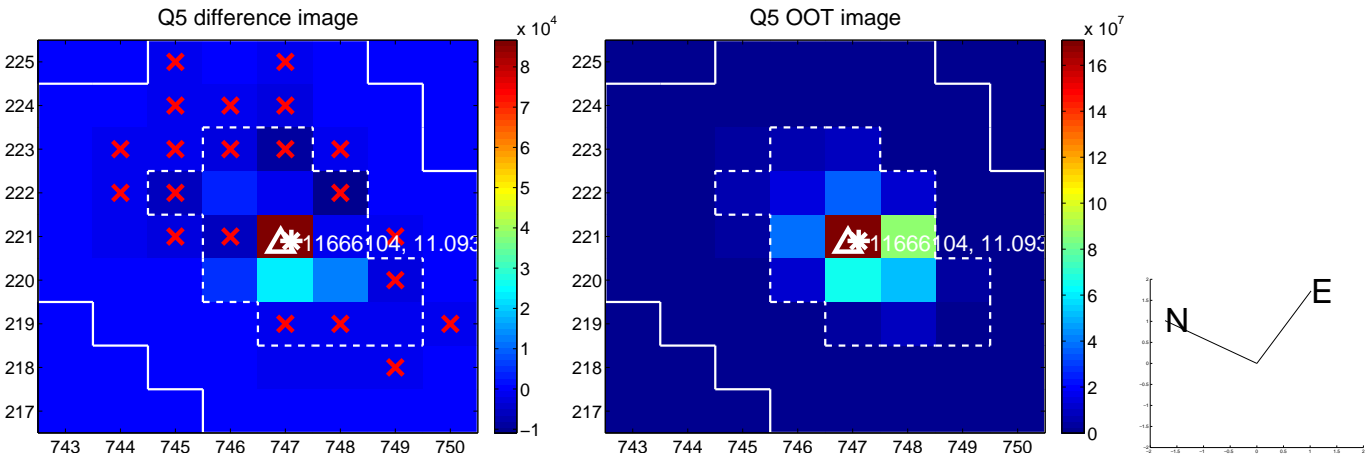


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

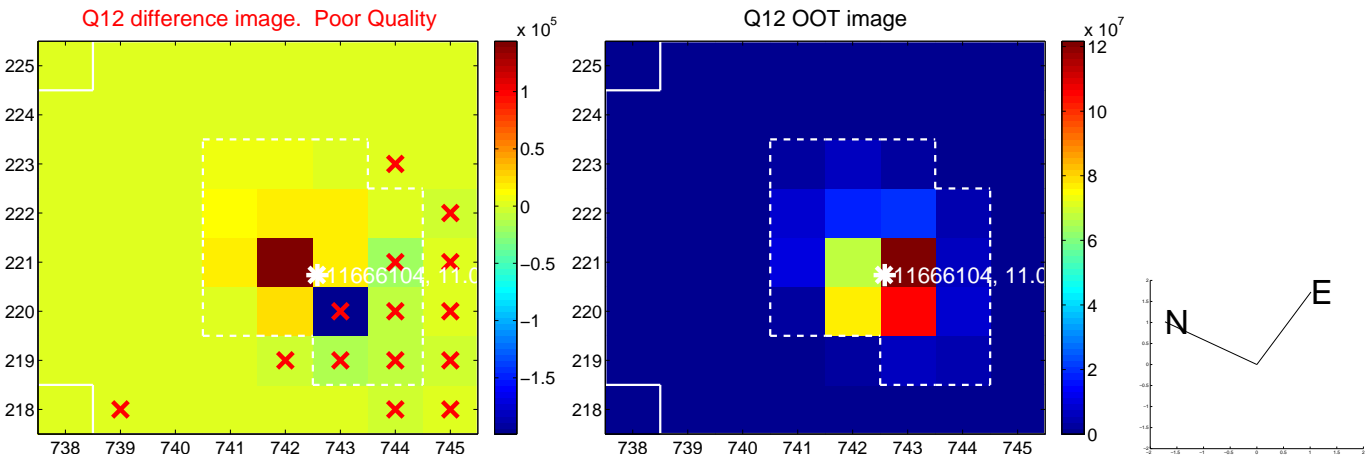
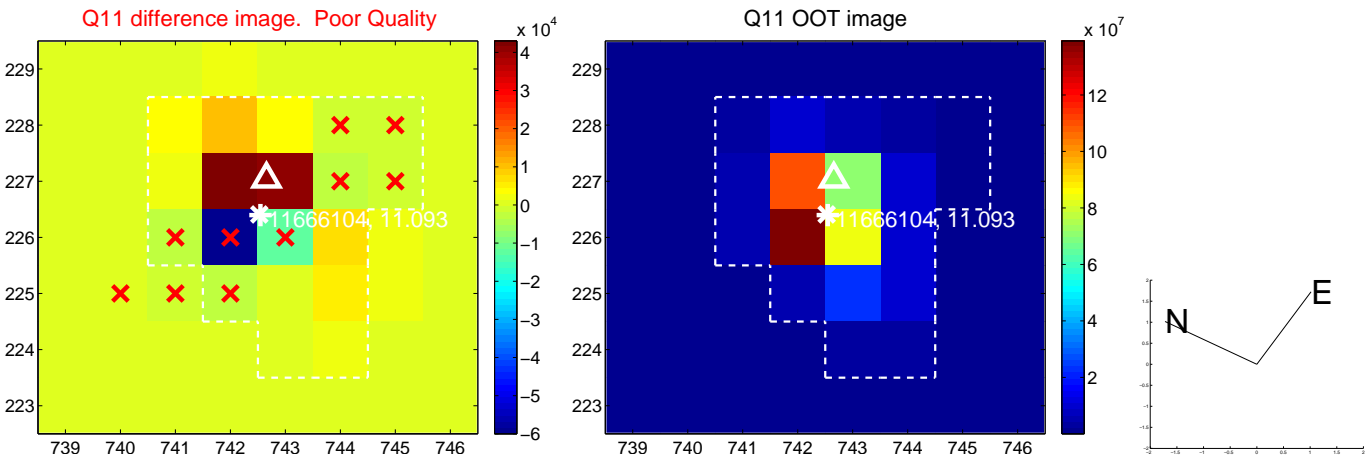
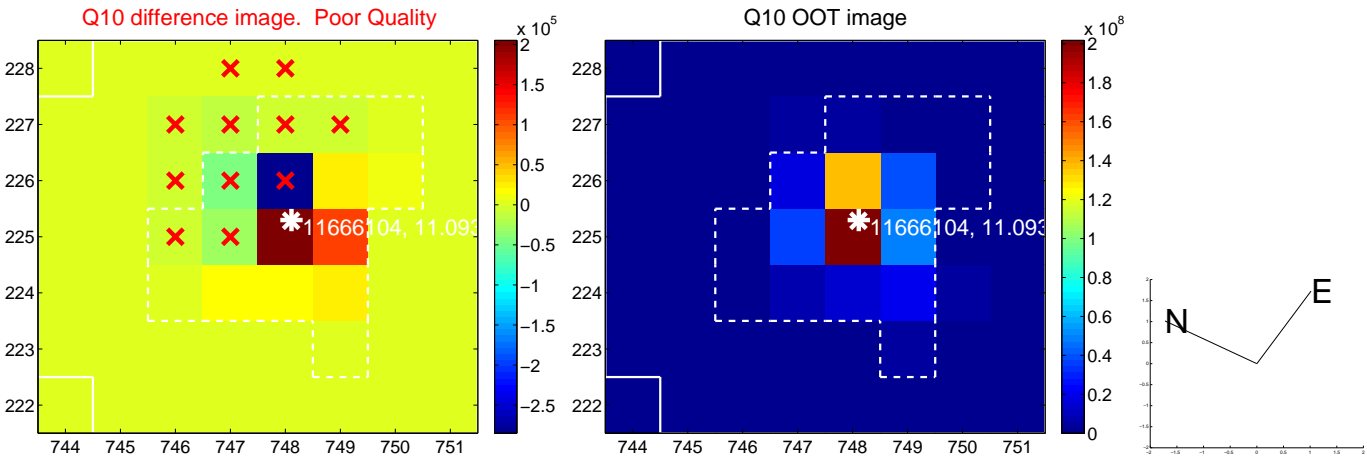
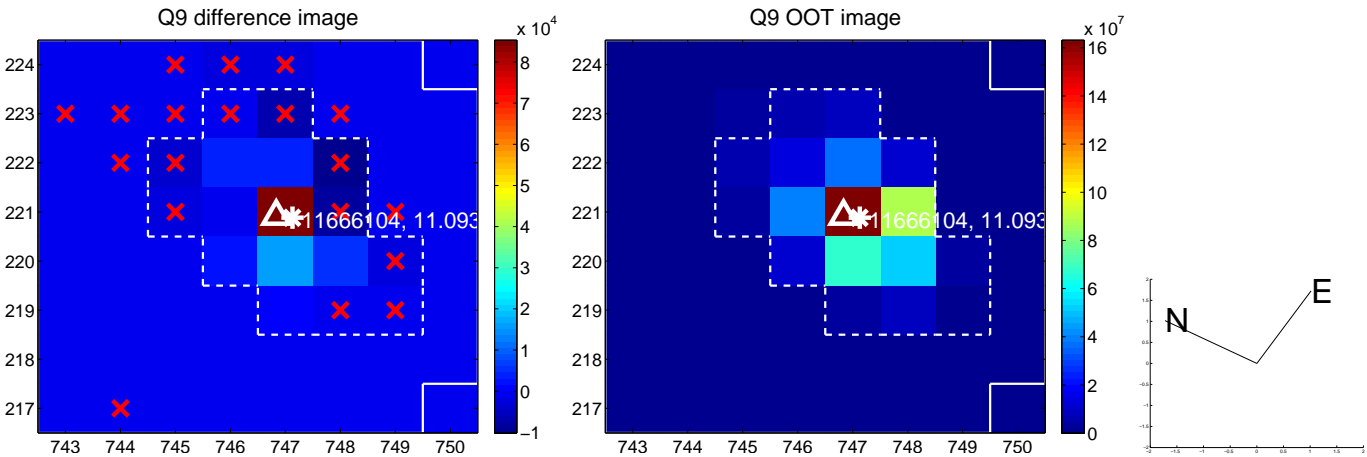


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

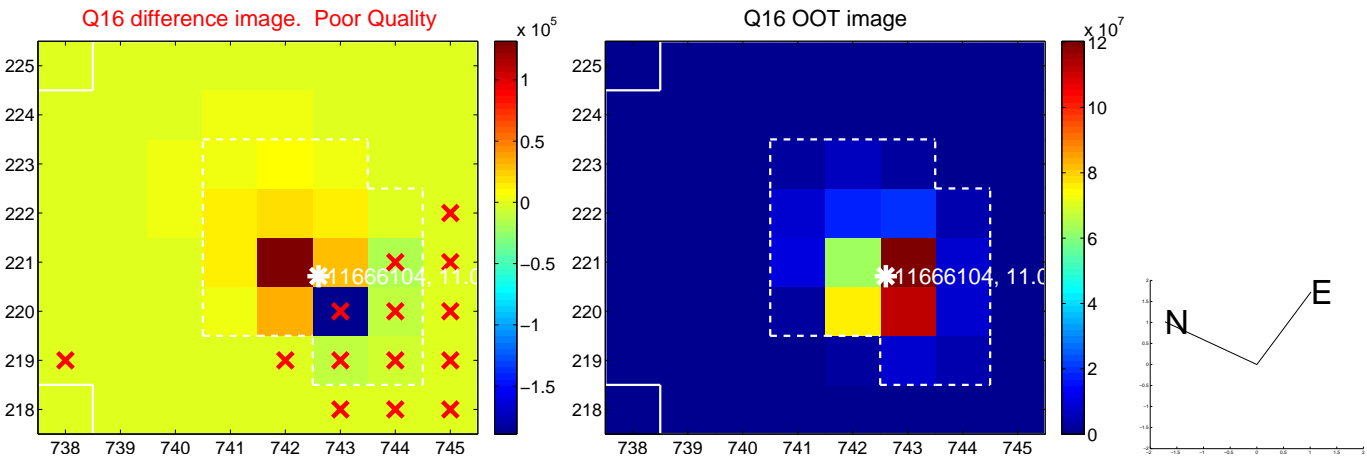
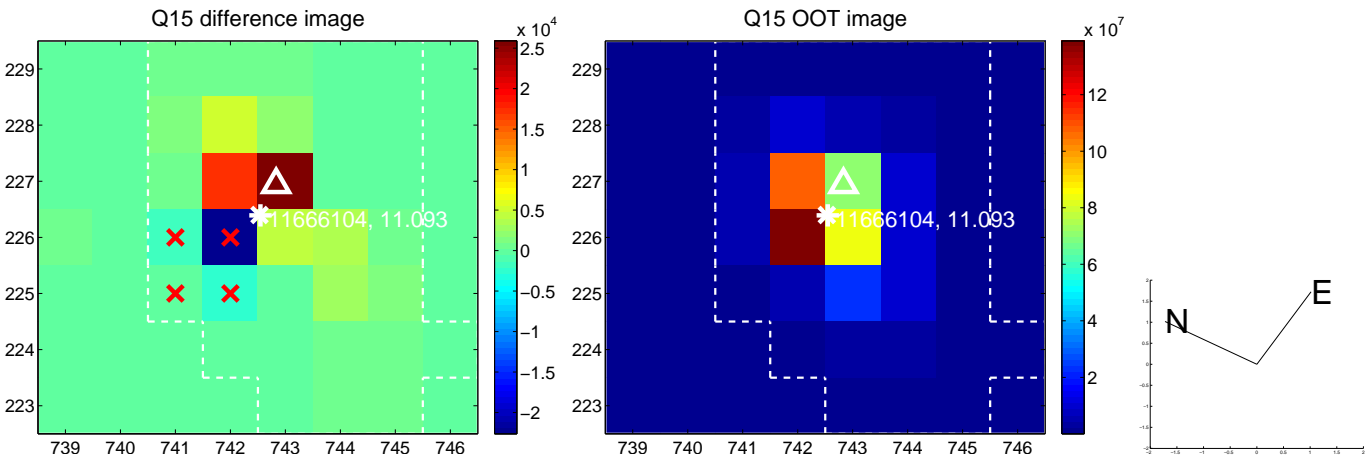
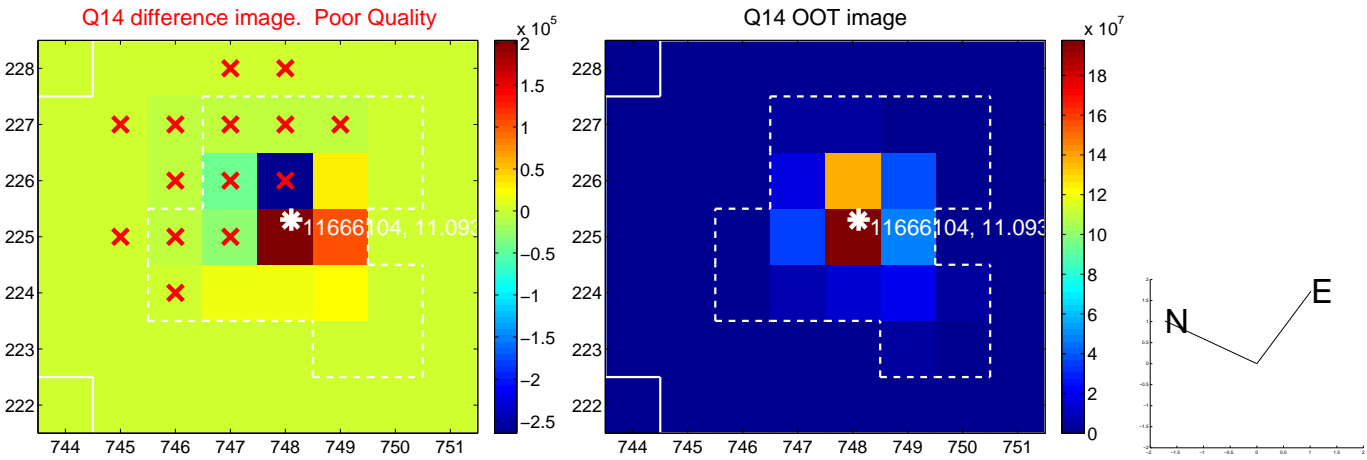
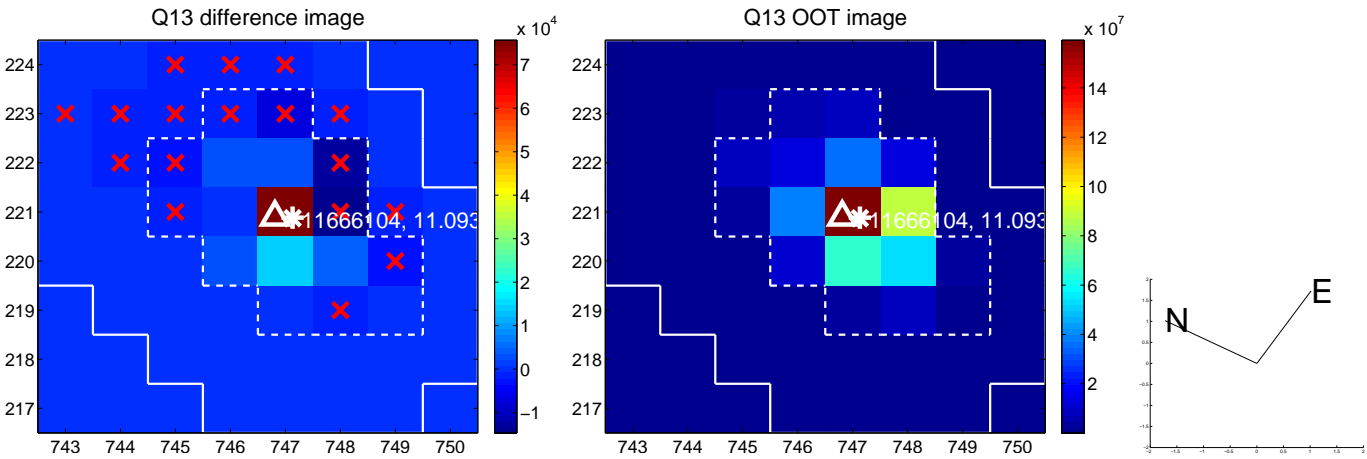




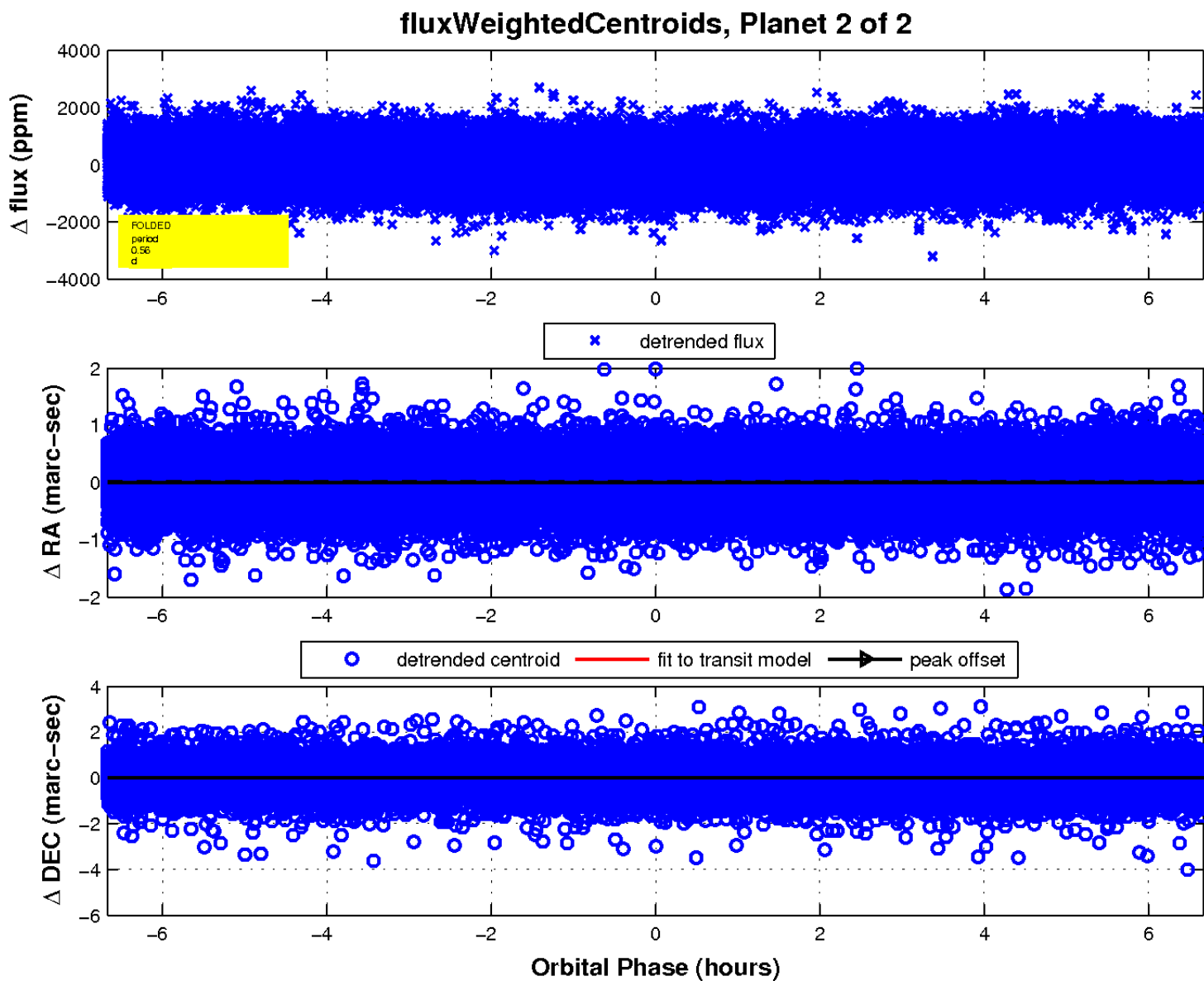
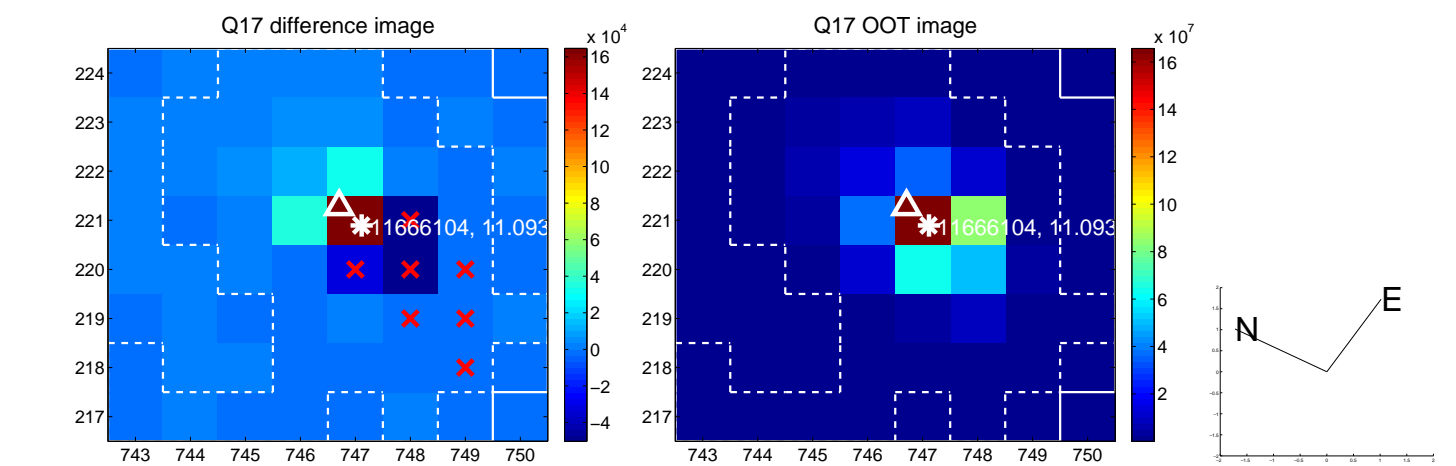
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

