

# KIC 006614168

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006614168-01	OBS	No	0.500611	131.741532	234.3	1.357	17.5	16.4	1.74	7488	3.10	42647.21
006614168-02	OBS	No	0.500622	131.863424	334.2	1.427	16.9	22.1	1.74	7488	3.75	42645.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006614168-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006614168-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

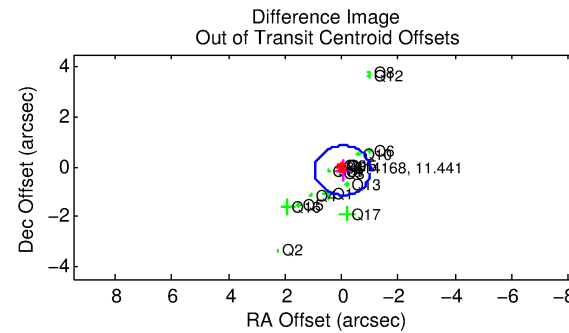
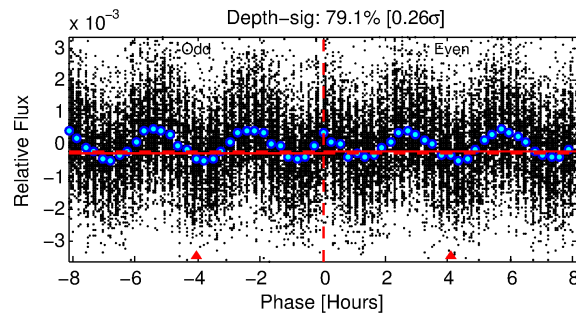
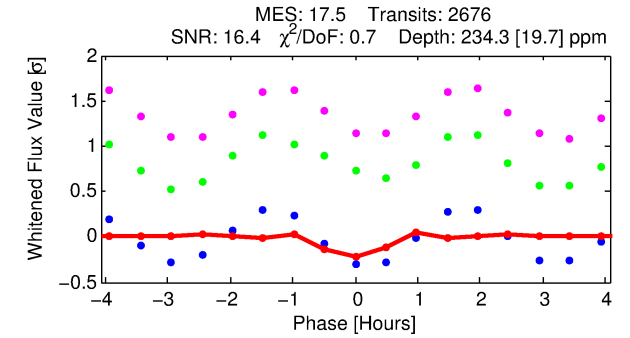
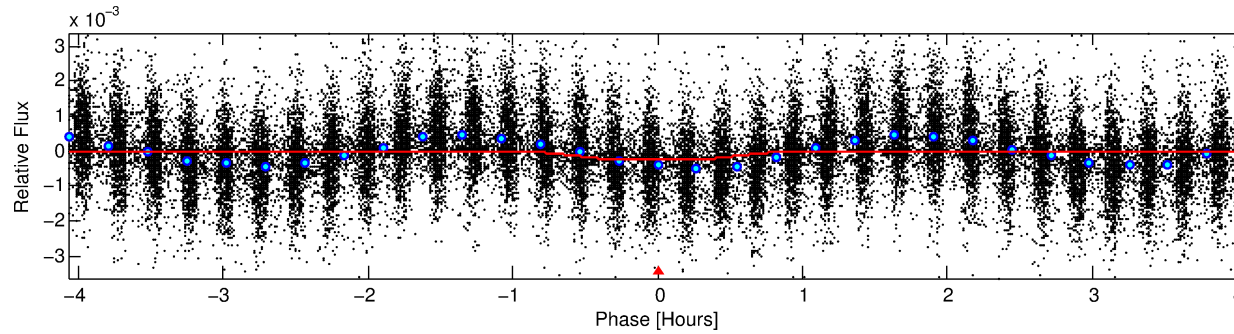
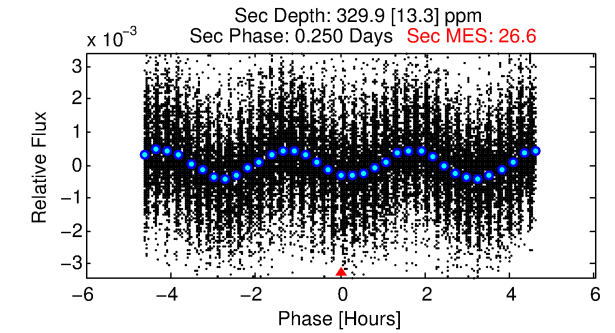
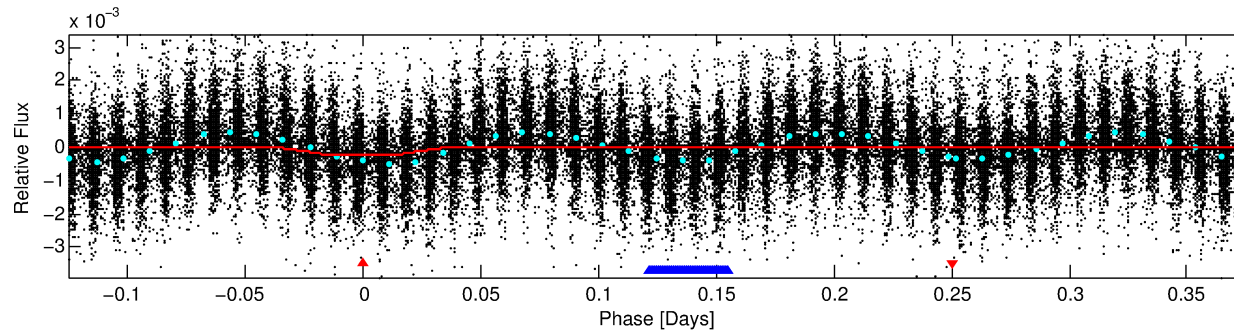
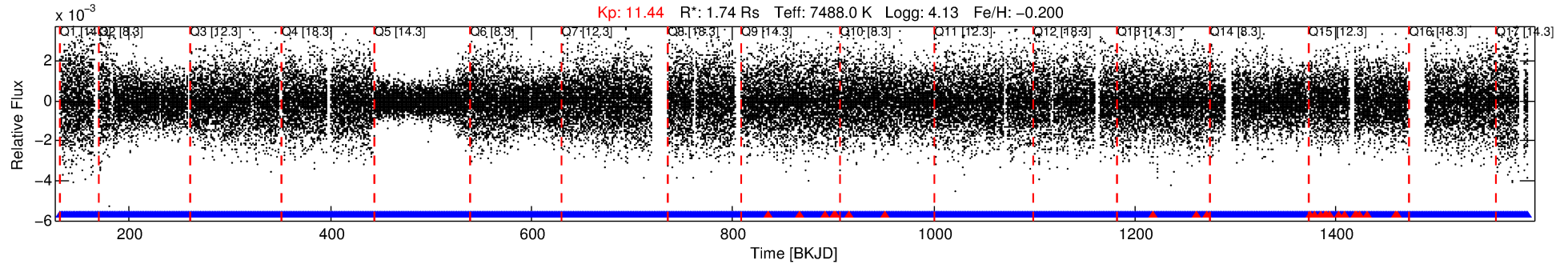
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006614168-01

No Significant Match Found

# DV One-Page Summary

KIC: 6614168 Candidate: 1 of 2 Period: 0.501 d



## DV Fit Results:

Period = 0.50061 [0.00001] d  
Epoch = 131.7415 [0.0009] BKJD  
 $R_p/R^* = 0.0163$  [0.0040]  
 $a/R^* = 1.67$  [1.48]  
 $b = 0.89$  [0.33]  
 $\text{Seff} = 42647.21$  [16182.48]  
 $\text{Teq} = 3664$  [348] K  
 $R_p = 3.10$  [1.23]  $R_e$   
 $a = 0.0141$  [0.0035] AU  
 $\text{Ag} = 3.77$  [2.26] [1.23σ]  
**Teffp = 7895 [1026] K [3.91σ]**

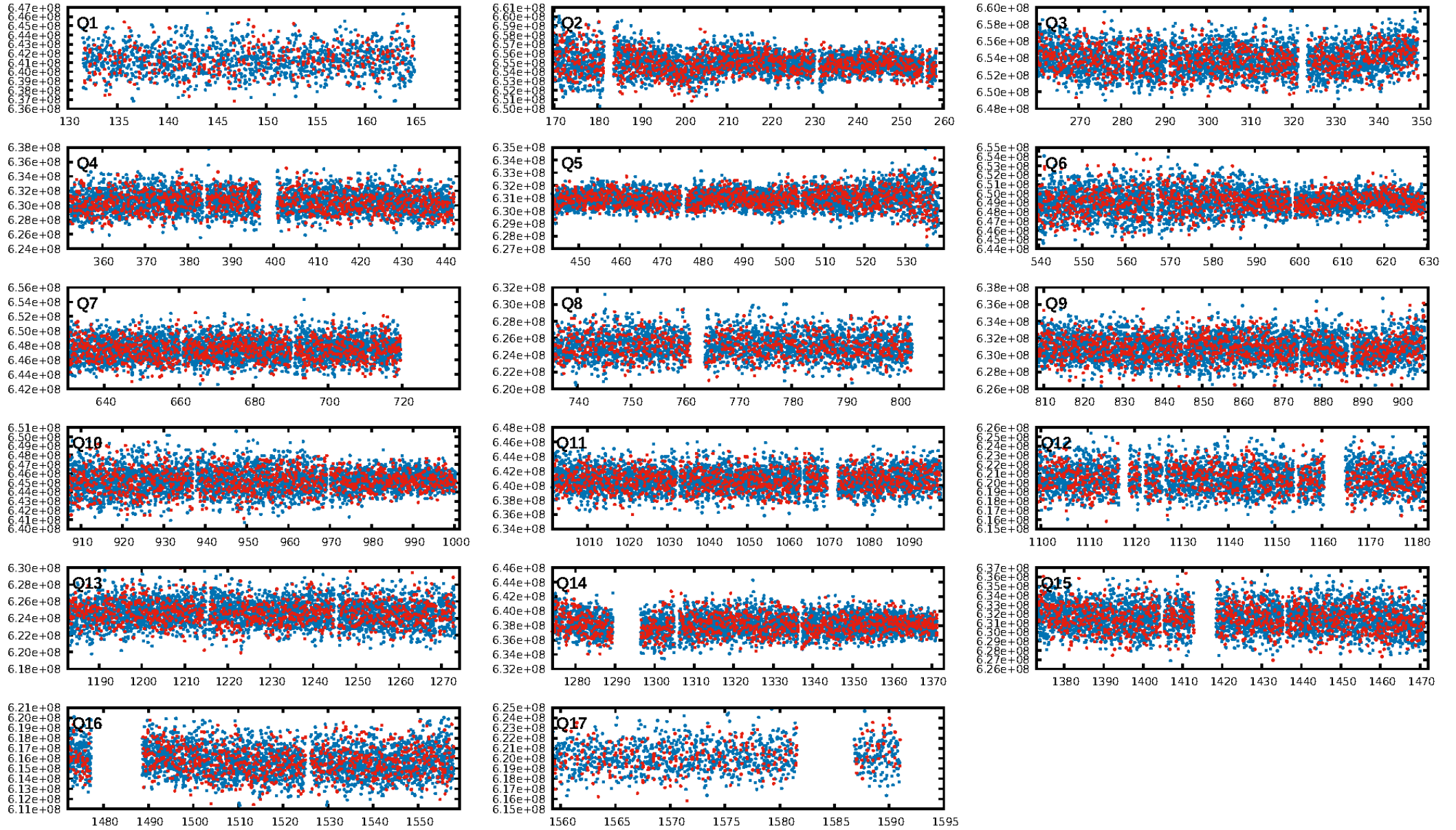
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [2530/2555]  
**GhostDiagnostic-chr: 0.4832**  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.156 arcsec [0.47σ]  
Centroid-so: N/A  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.323 arcsec [2.03σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.82 [14/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 10:22:15 Z

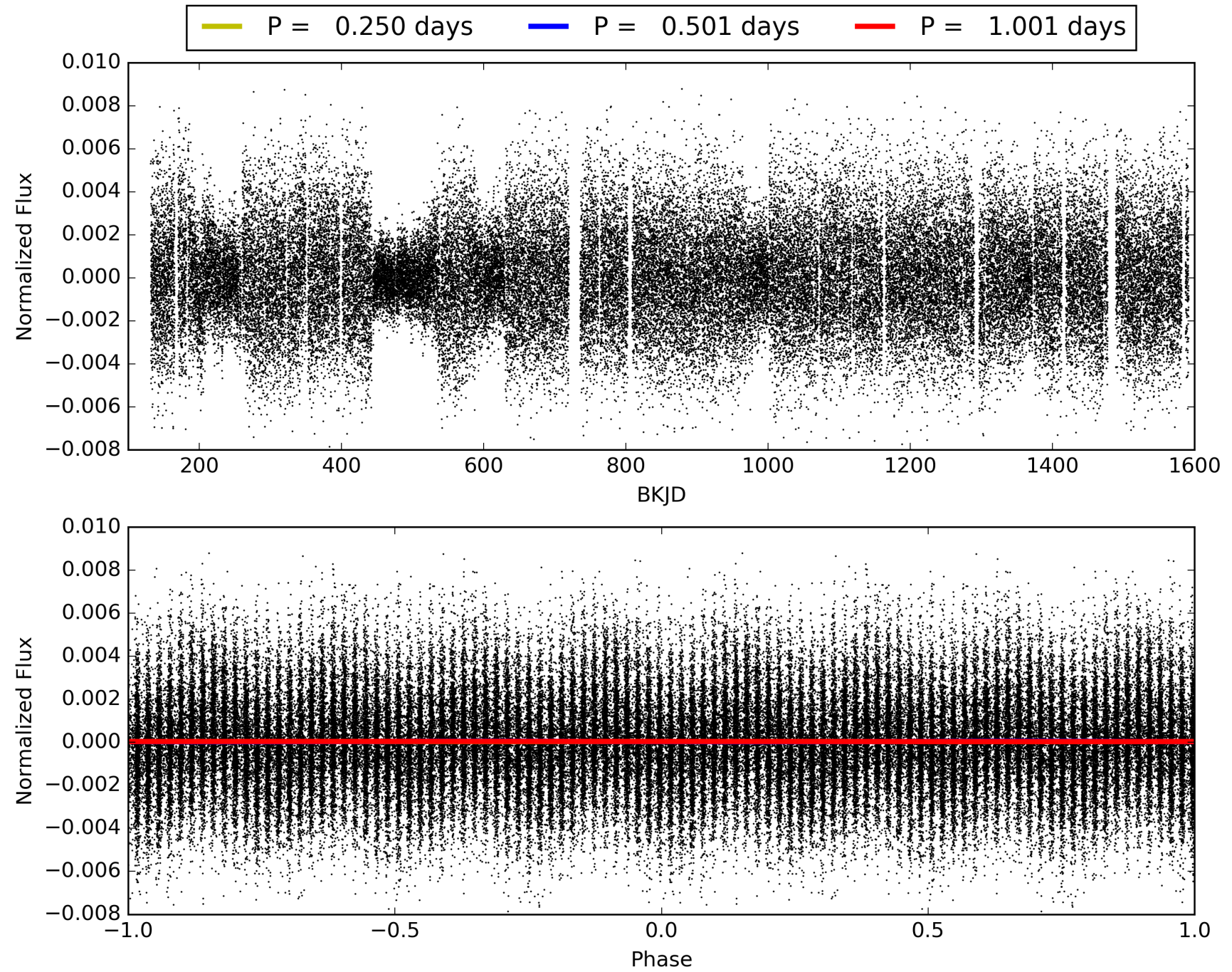
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006614168-01, PDC Light Curves



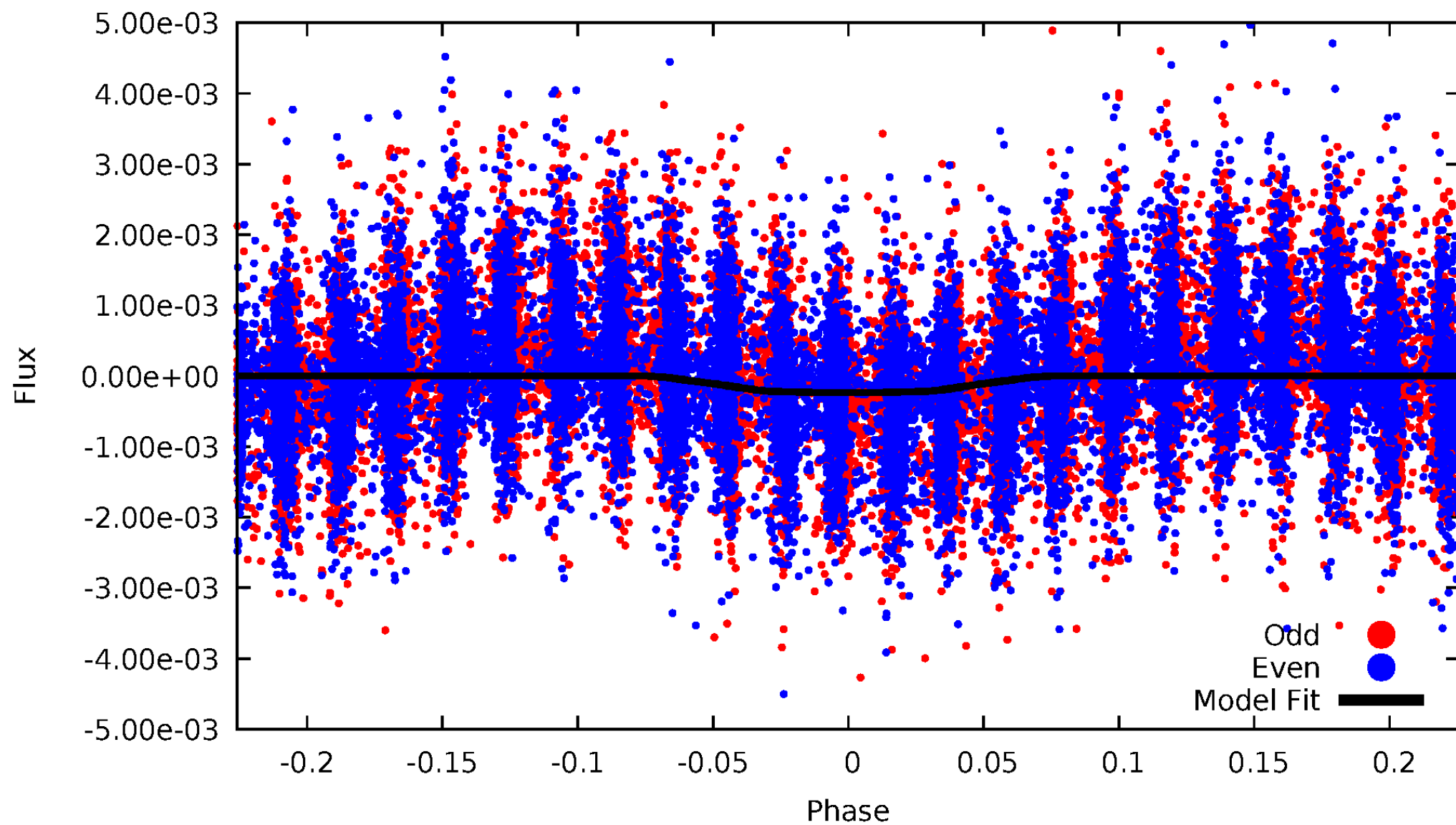


# TCE 006614168-01



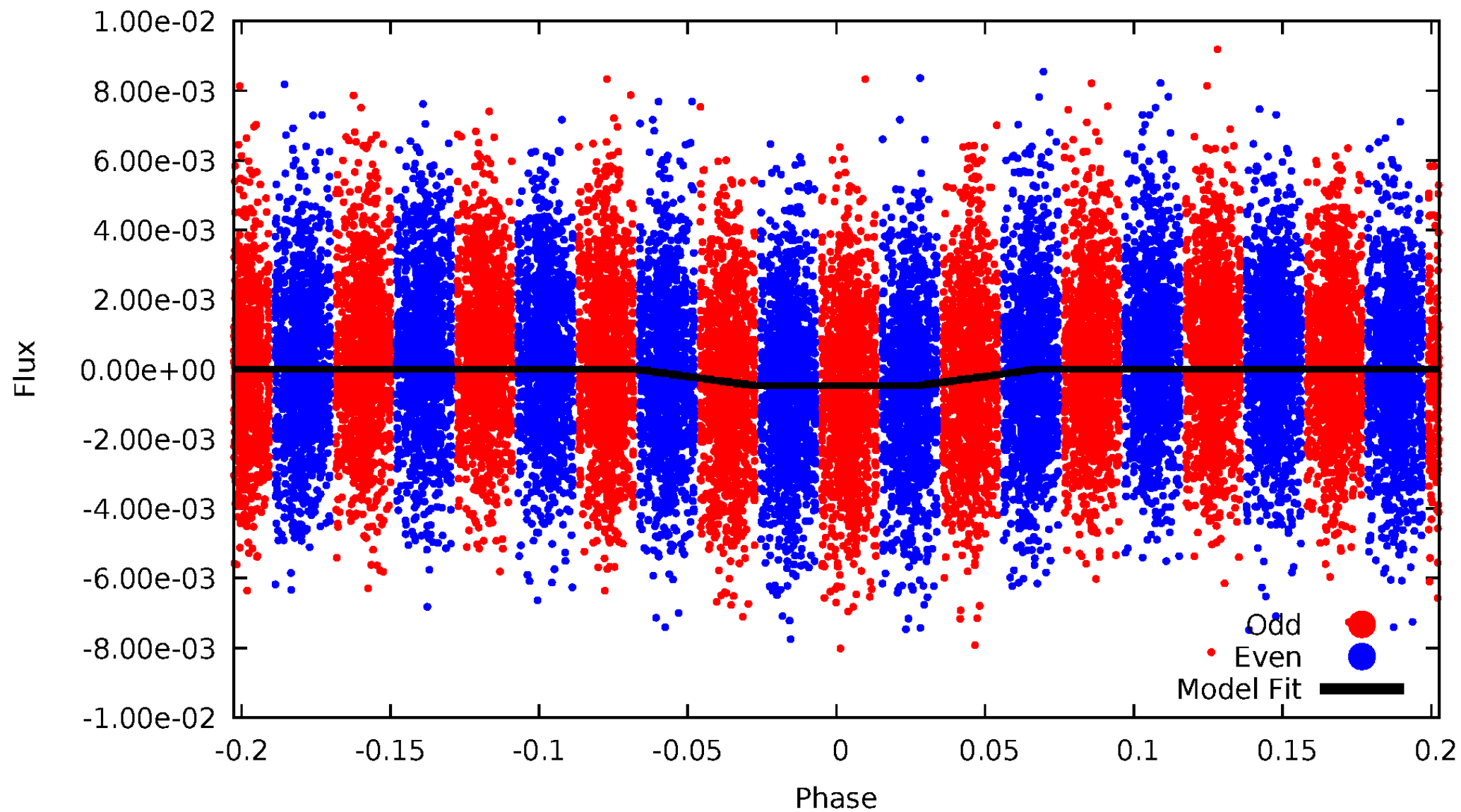
# DV Odd/Even

TCE 006614168-01



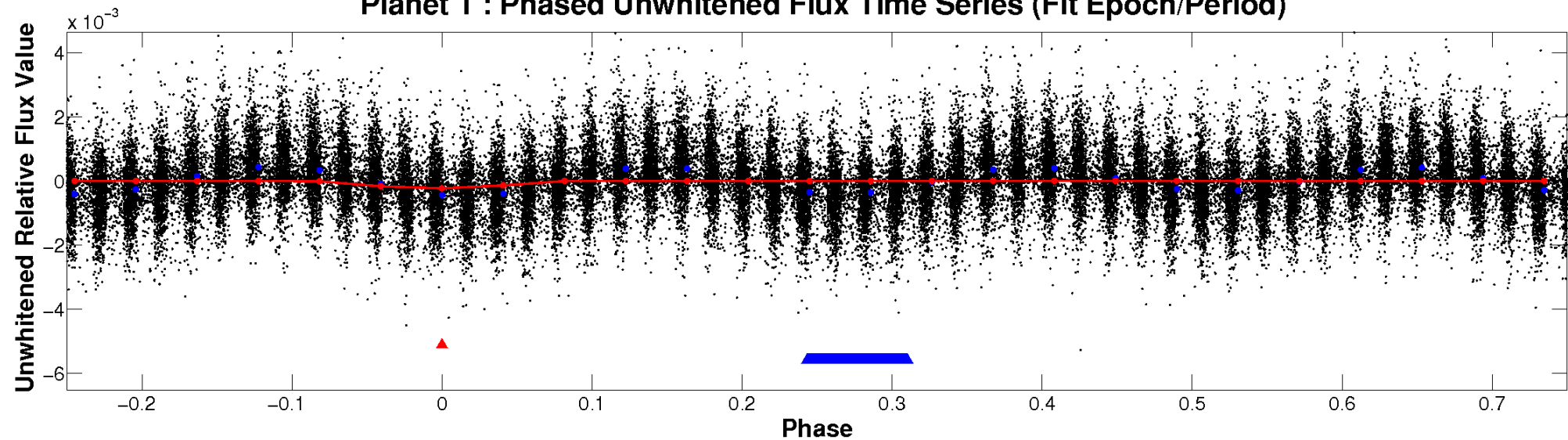
# ALT Odd/Even

TCE 006614168-01

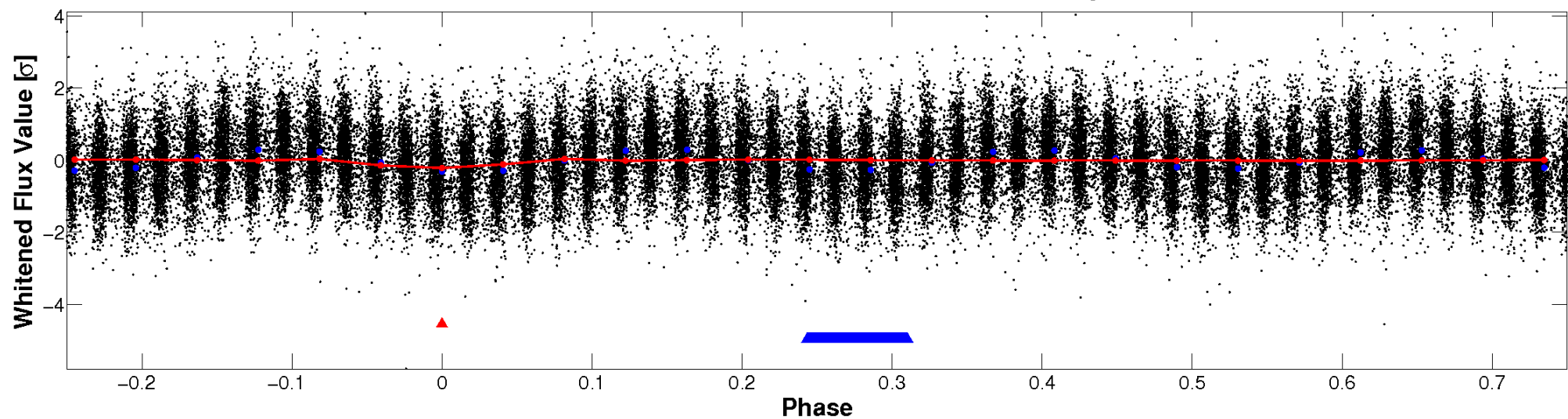


# Non-Whitened Vs. Whitened Light Curve

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



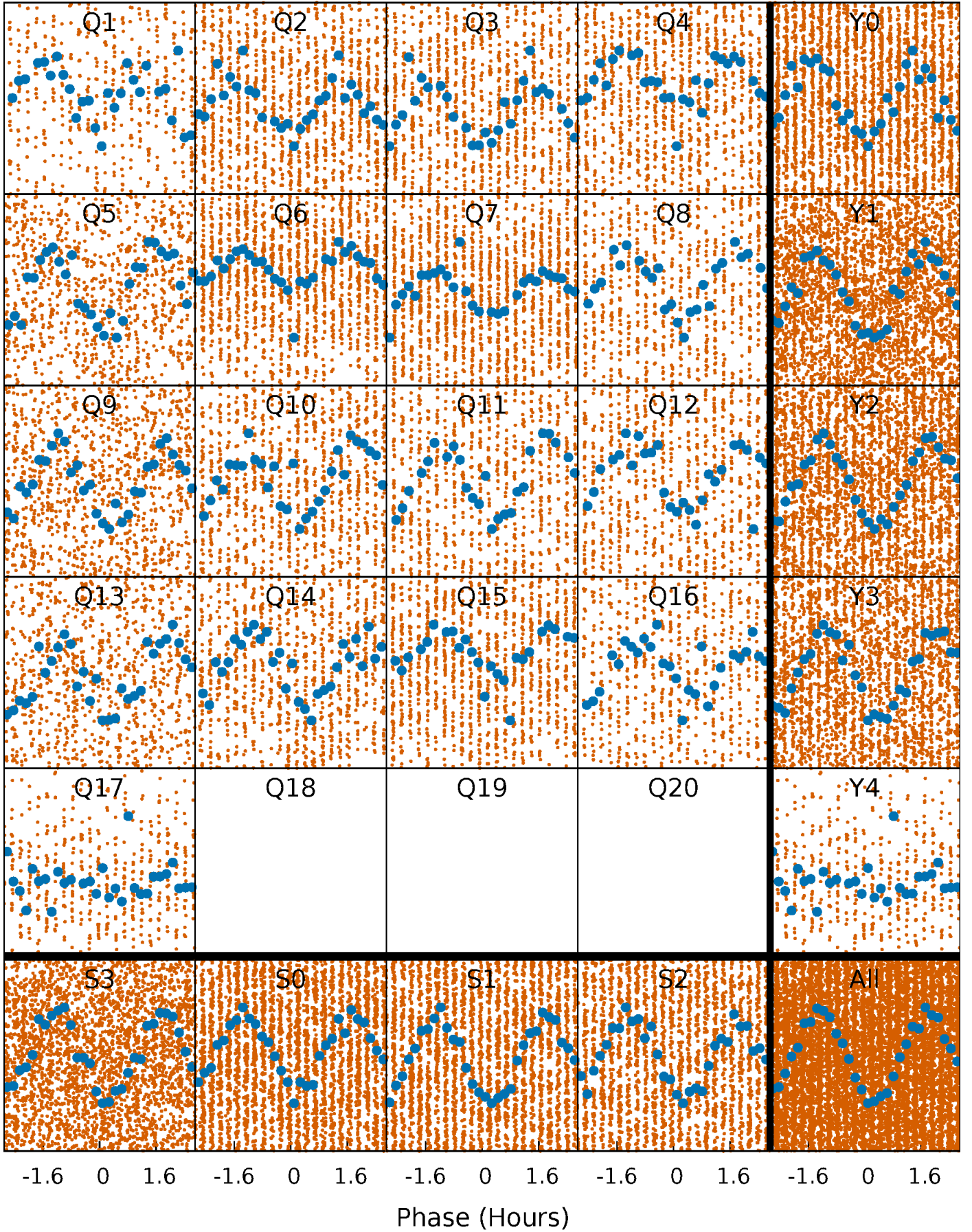
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

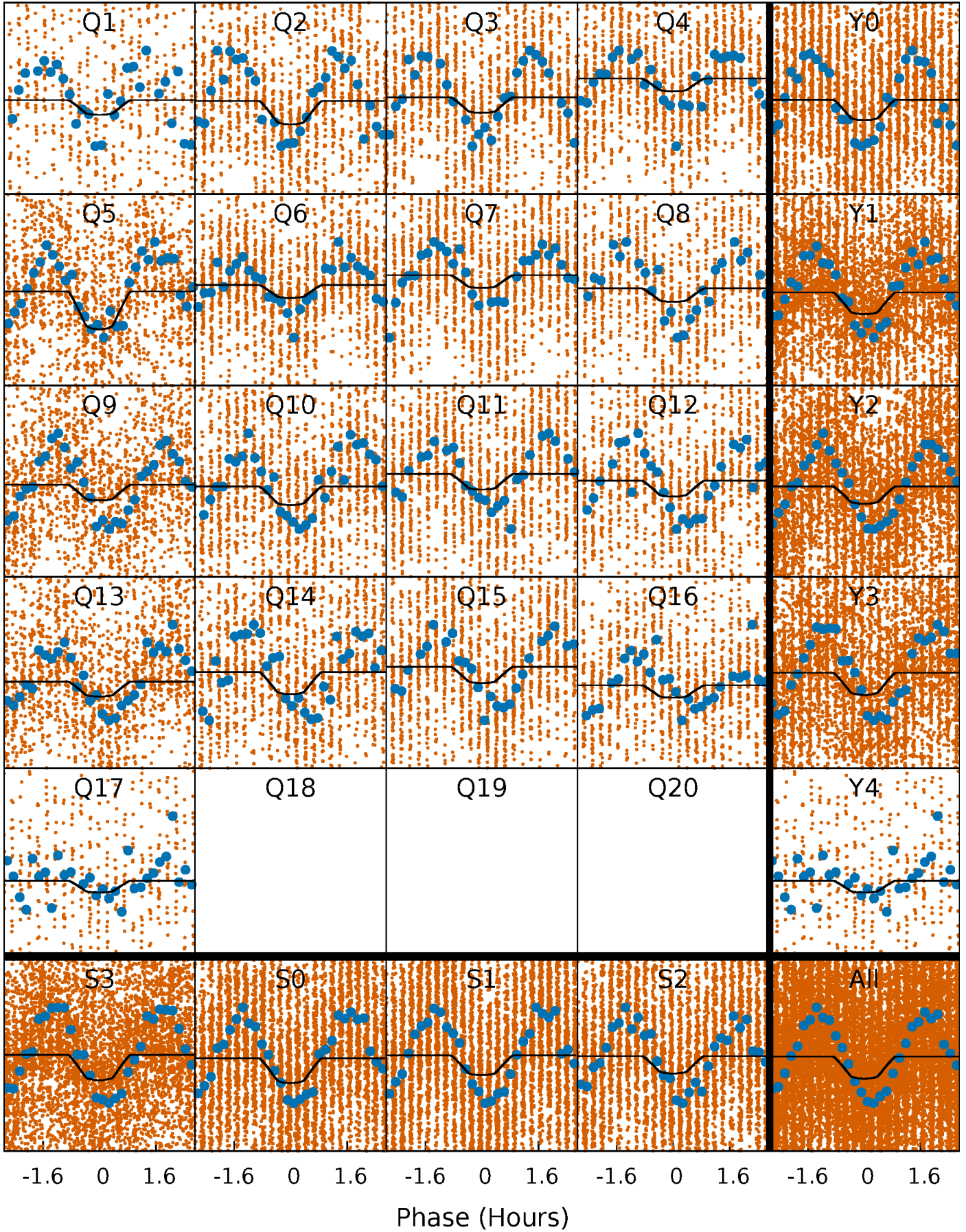
TCE 006614168-01   P= 0.500611 Days    $T_0=131.741532$  (BKJD)





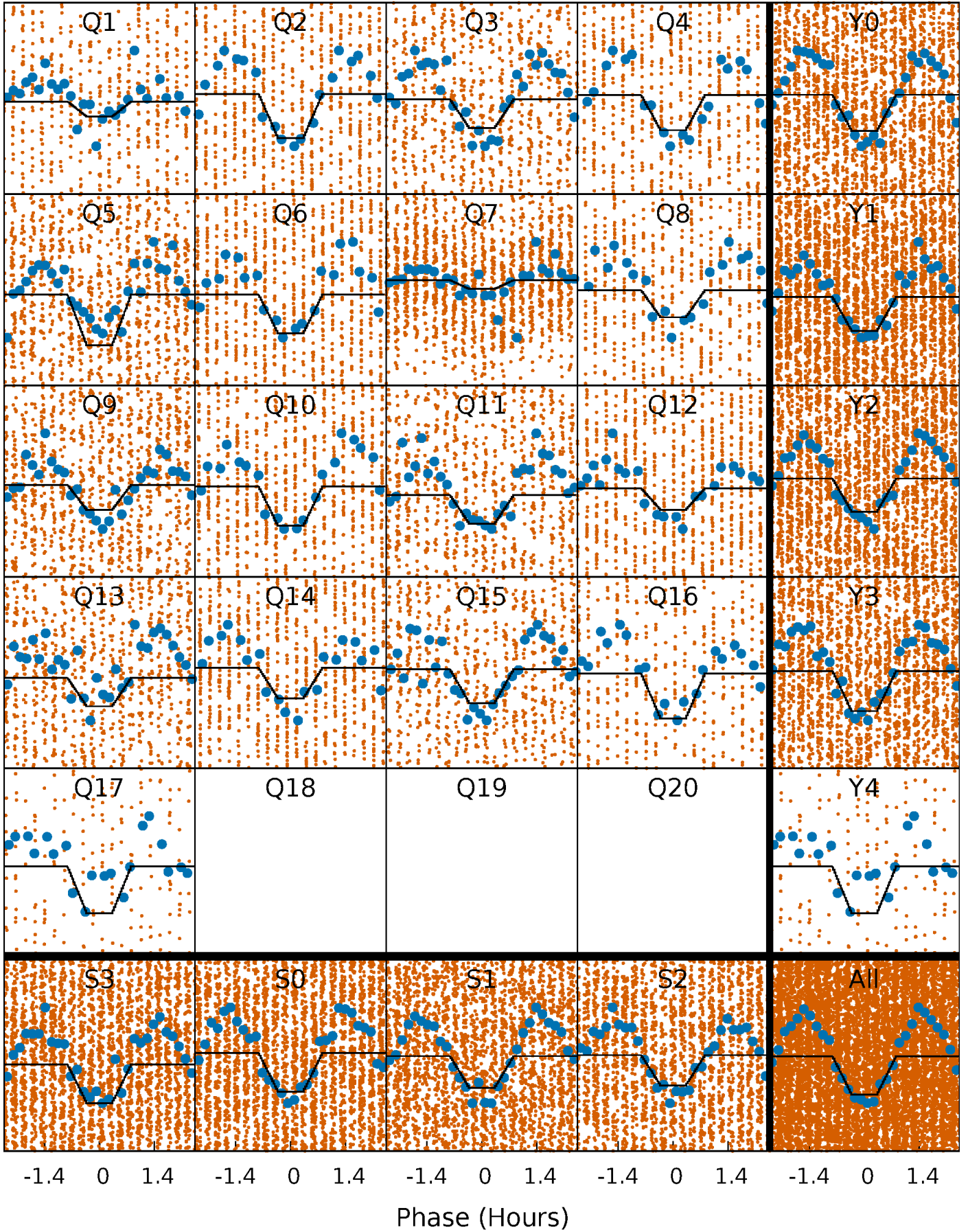
# DV Quarter-Phased Transit Curves

TCE 006614168-01 P= 0.500611 Days  $T_0=131.741532$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

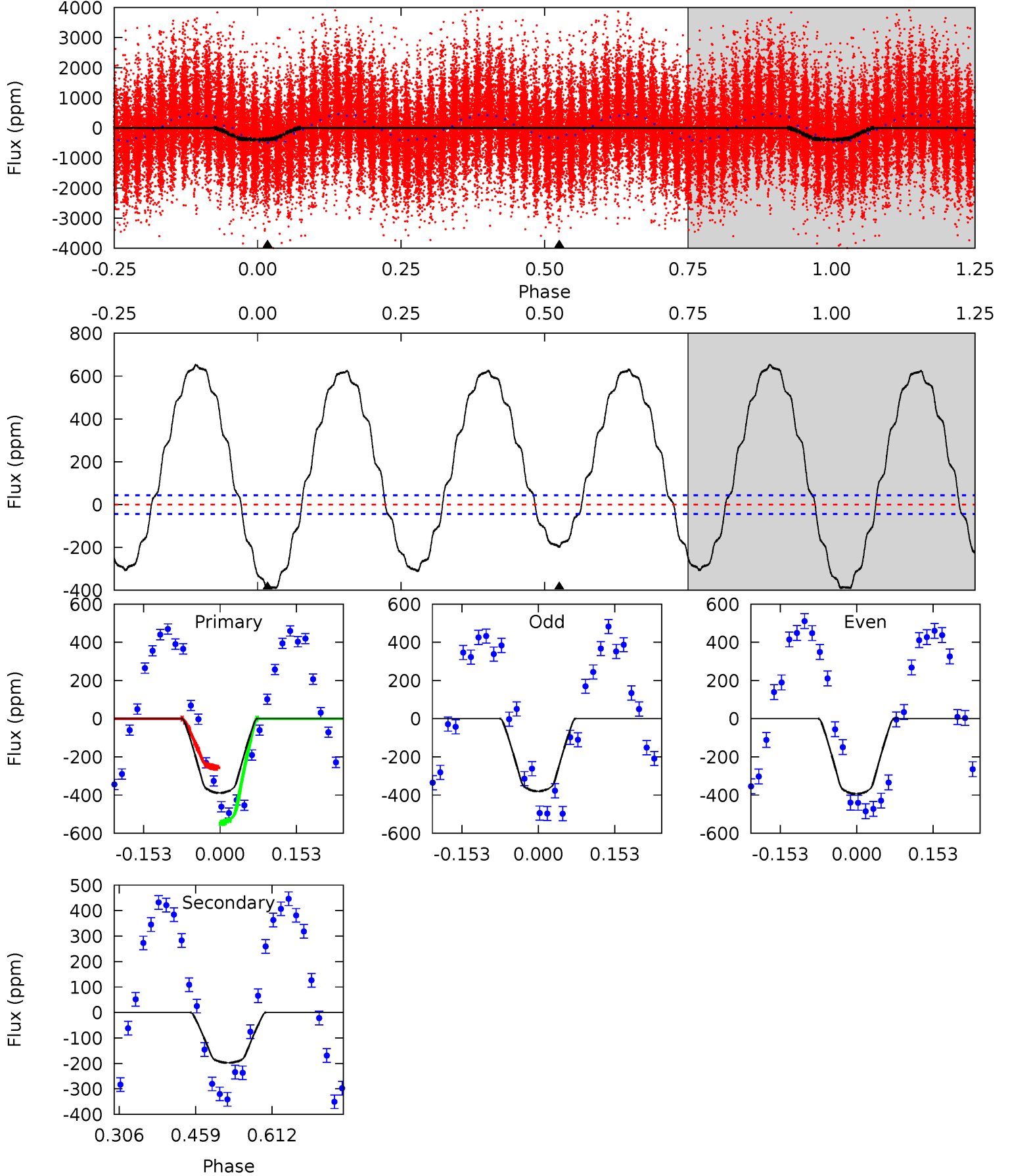
TCE 006614168-01 P= 0.500621 Days  $T_0=131.737341$  (BKJD)



# DV Model-Shift Uniqueness Test

006614168-01, P = 0.500611 Days, E = 131.240921 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
40.0	20.3	0	0	4.47	1.43	27.6	40.0	40.0	20.3	20.3	0.73	1.09	0.63	15.0

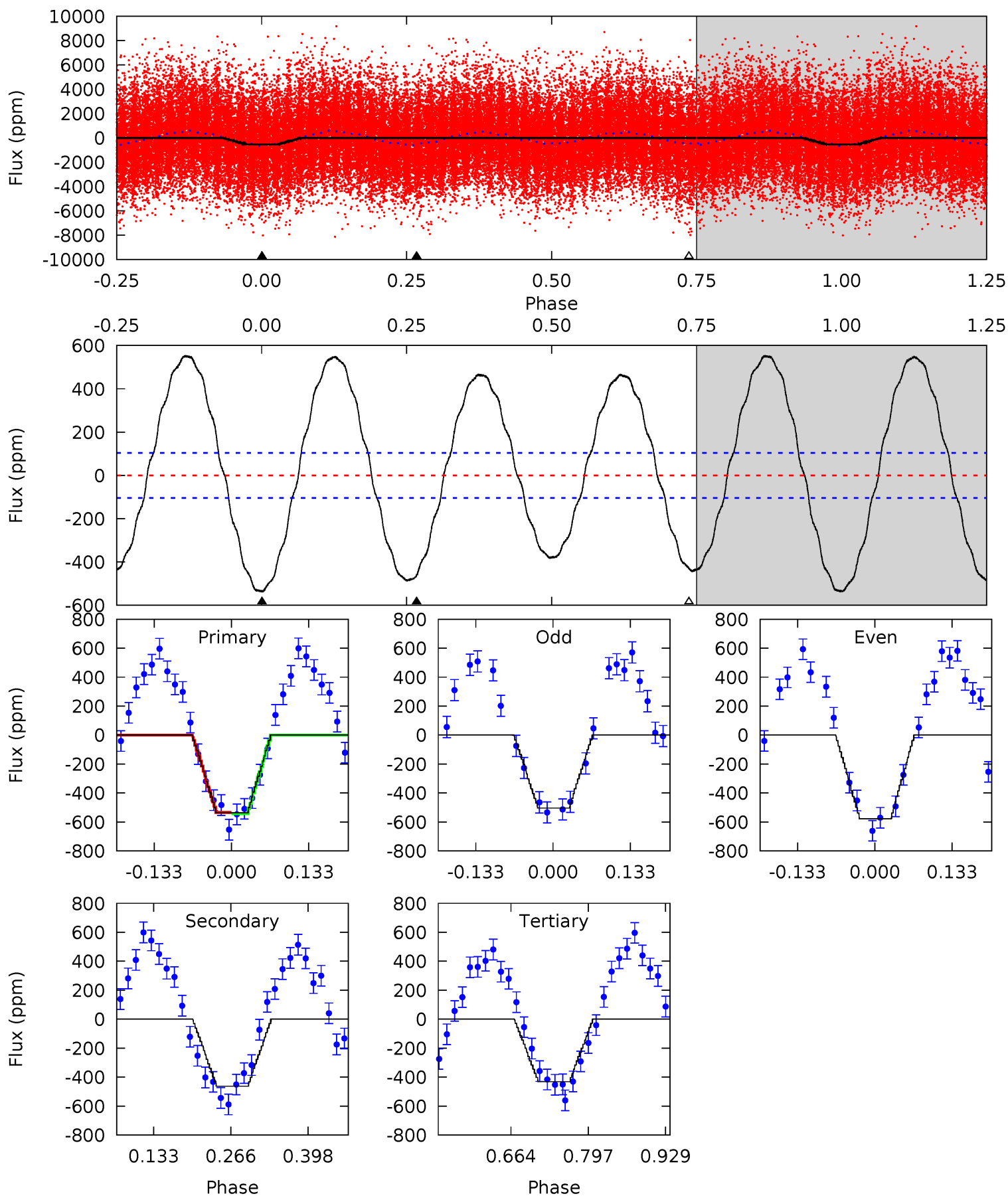




# Alt Model-Shift Uniqueness Test

006614168-01, P = 0.500621 Days, E = 131.236720 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
23.3	20.1	18.7	0	4.50	1.50	13.6	4.57	23.3	1.36	20.1	1.57	1.03	0.51	0.21



### Stellar Parameters For KIC 006614168

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7488^{+235}_{-314}$	$4.134^{+0.144}_{-0.176}$	$-0.200^{+0.250}_{-0.350}$	$1.739^{+0.540}_{-0.360}$	$1.499^{+0.220}_{-0.220}$	$0.402^{+0.300}_{-0.200}$
	+3%/-4%	+3%/-4%	+125%/-175%	+31%/-21%	+15%/-15%	+75%/-50%
Source	KIC0	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 006614168-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-198 \pm 10$	$3.14^{+0.83}_{-0.82}$	$5133^{+368}_{-366}$	$6559^{+1272}_{-809}$	$2.223^{+1.805}_{-0.840}$
Alt.	$-463 \pm 23$	$4.12^{+0.96}_{-0.94}$	$5104^{+389}_{-363}$	$7207^{+1111}_{-843}$	$2.975^{+2.025}_{-1.034}$

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

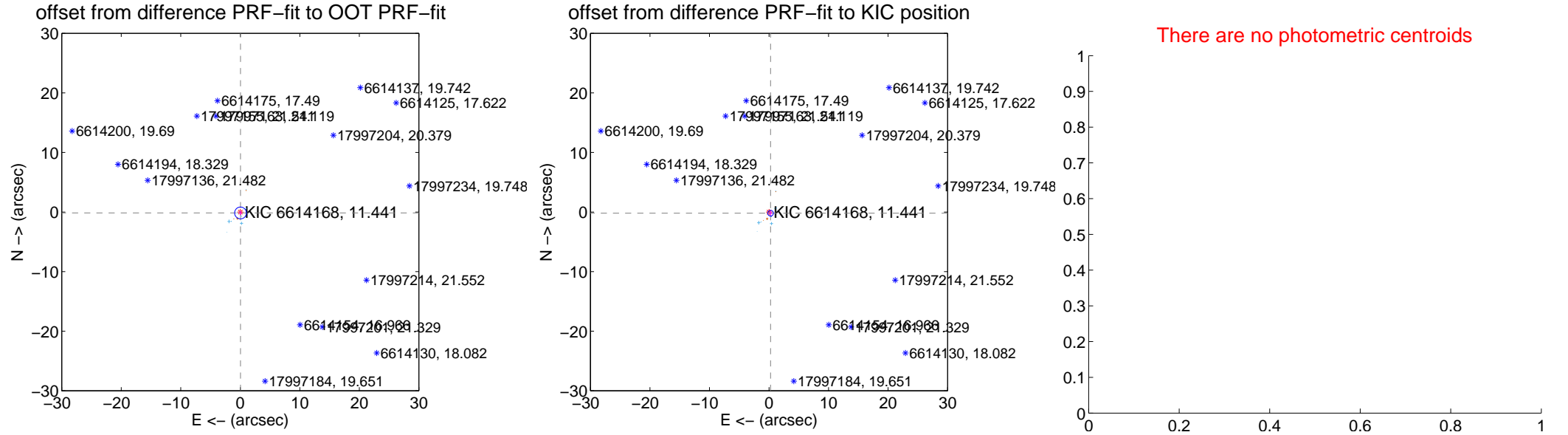
## DV Centroid Data

Supplemental centroid analysis for 006614168-01. **Kepler magnitude: 11.44.** Transit SNR 16.42

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

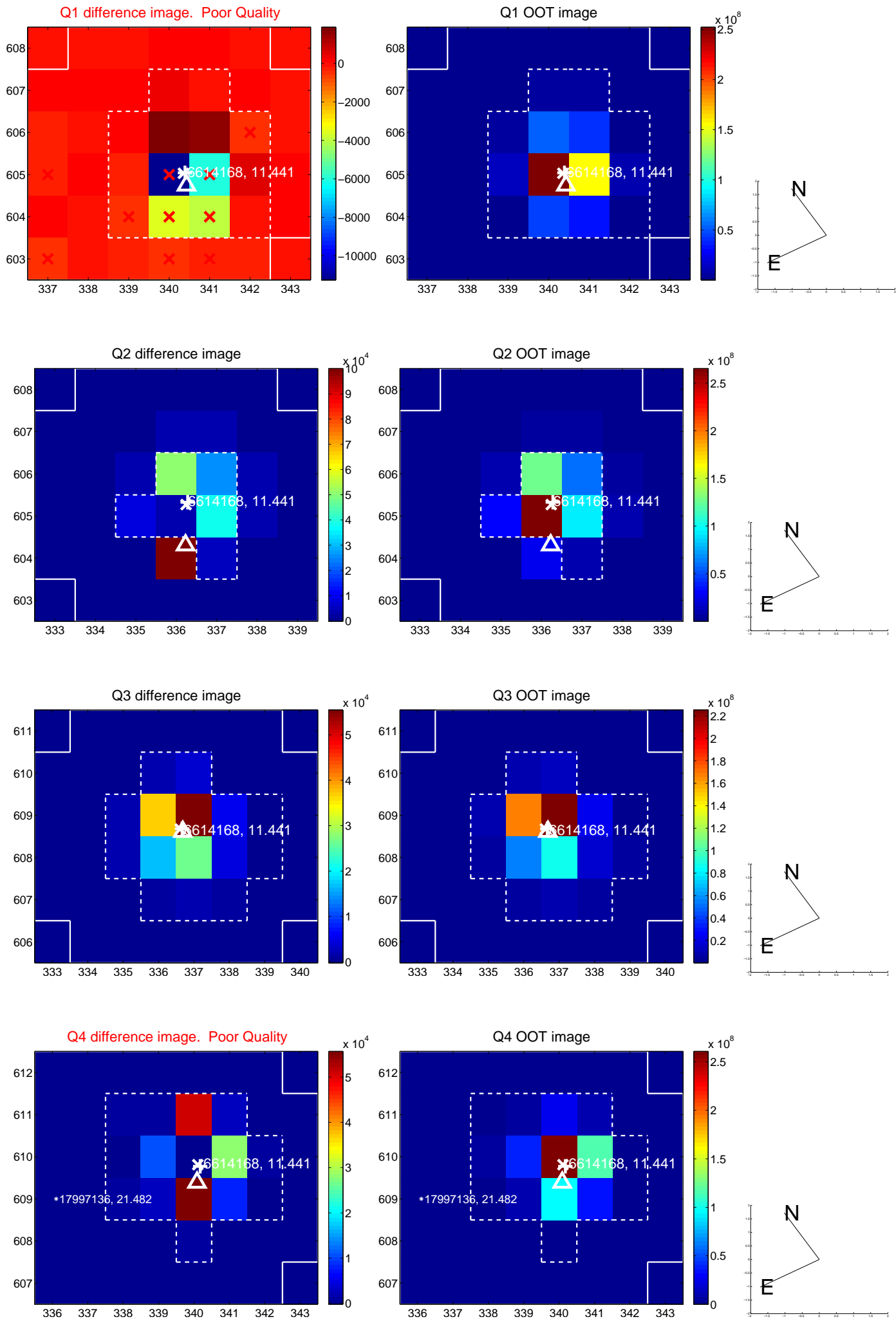
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.156 \pm 0.331$	0.47	$-0.037 \pm 0.227$	$-0.151 \pm 0.379$
PRF-fit source offset from KIC position	$0.323 \pm 0.159$	2.03	$-0.258 \pm 0.242$	$-0.196 \pm 0.410$
photometric centroid source offset	—	—	—	—



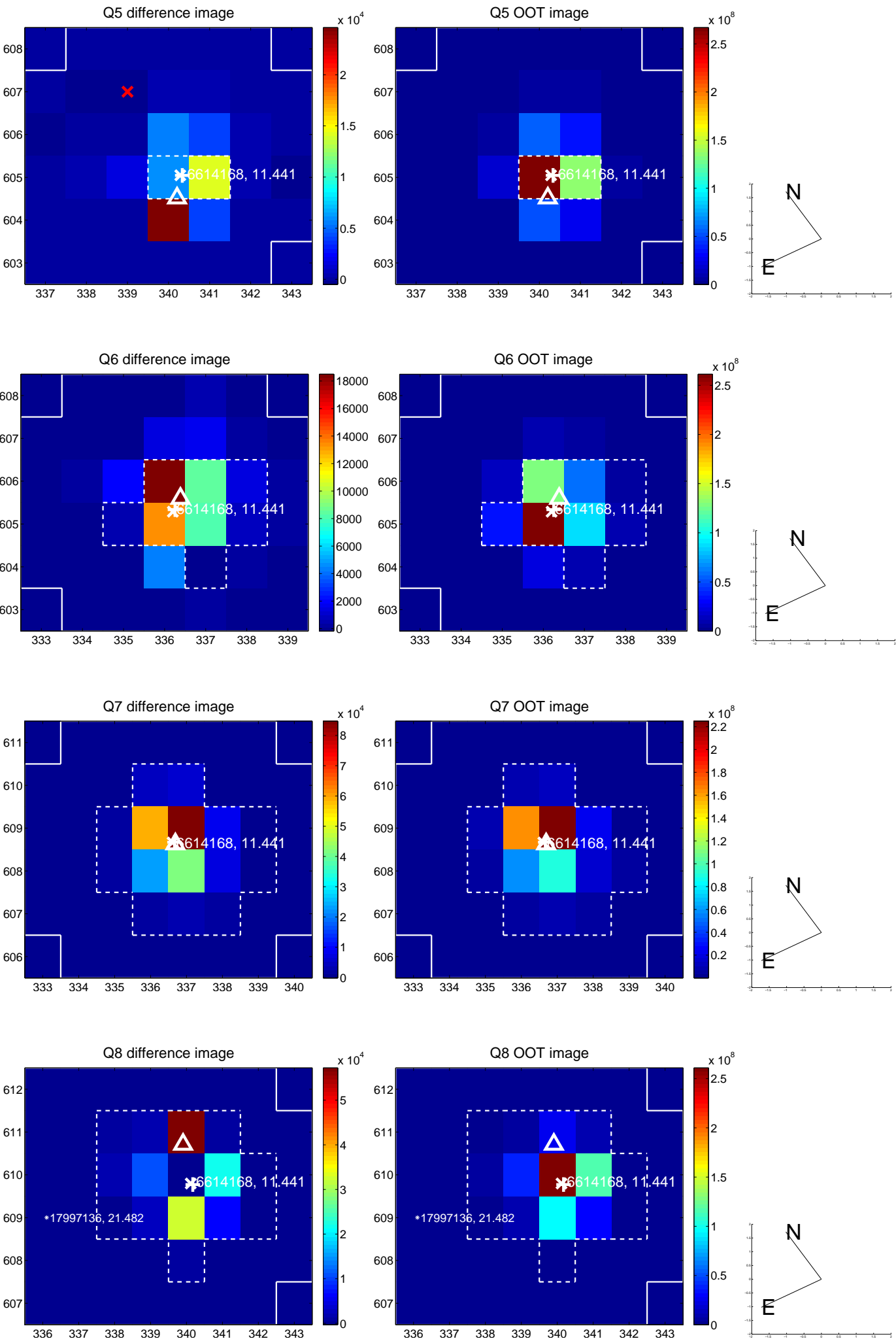
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



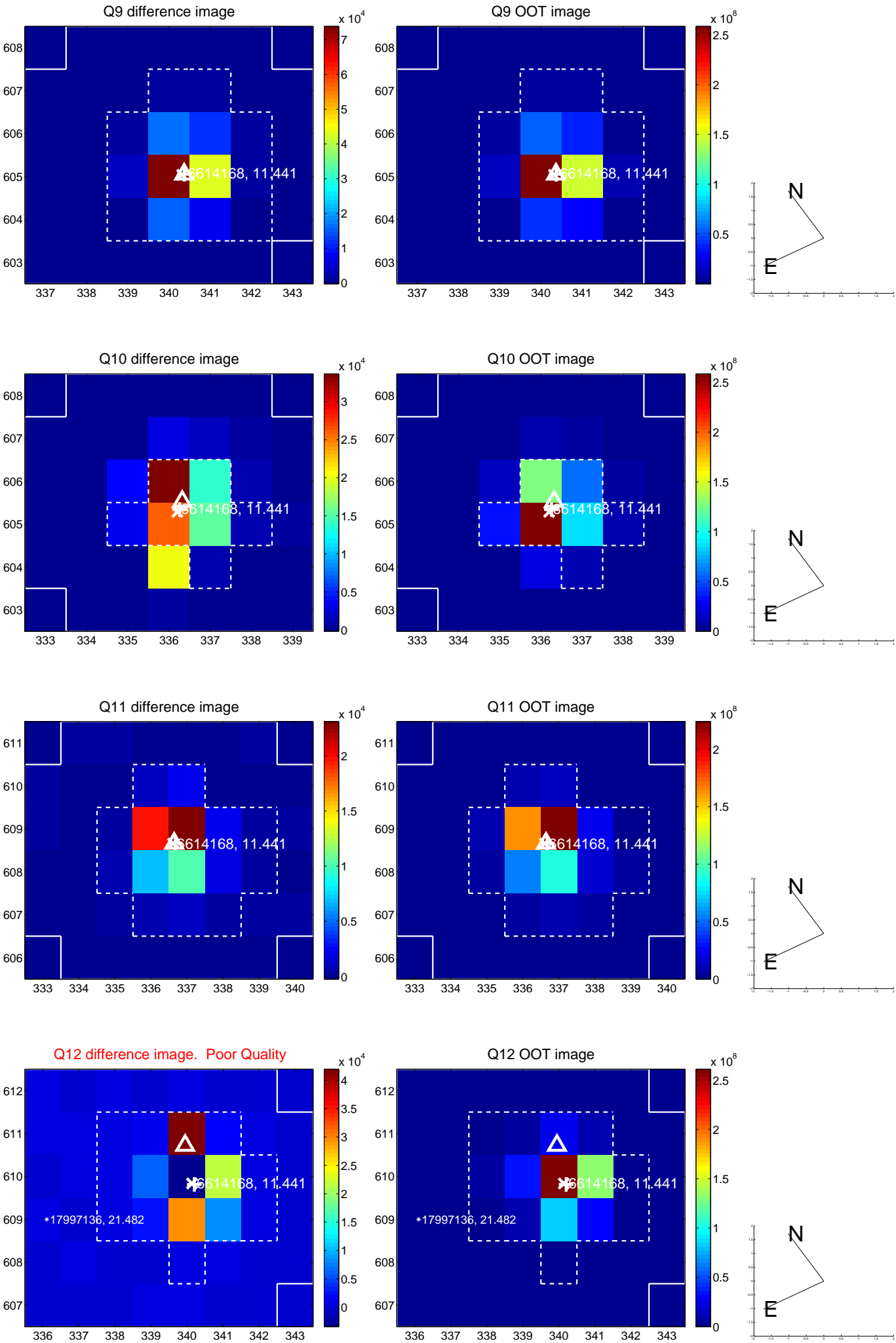
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

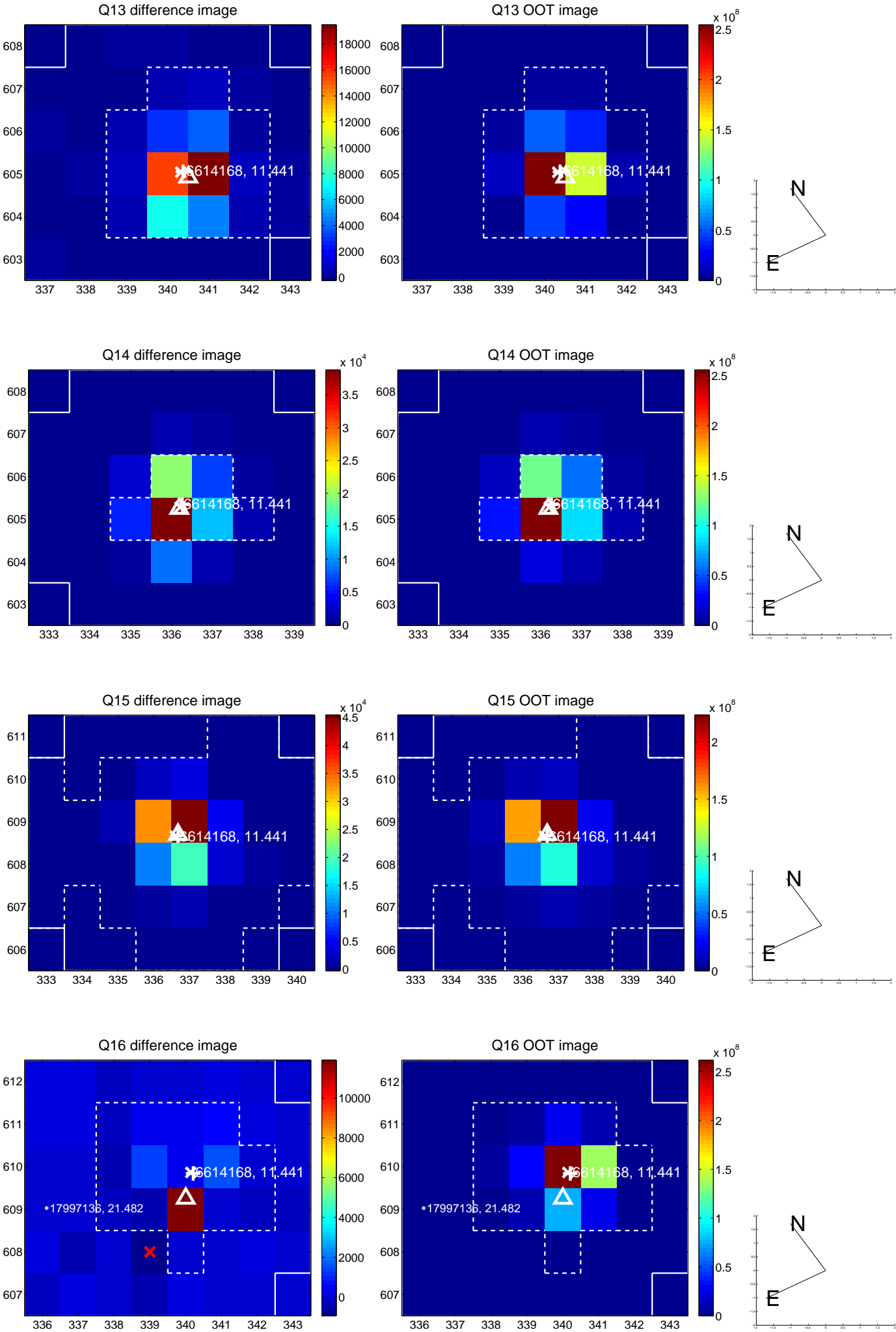


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

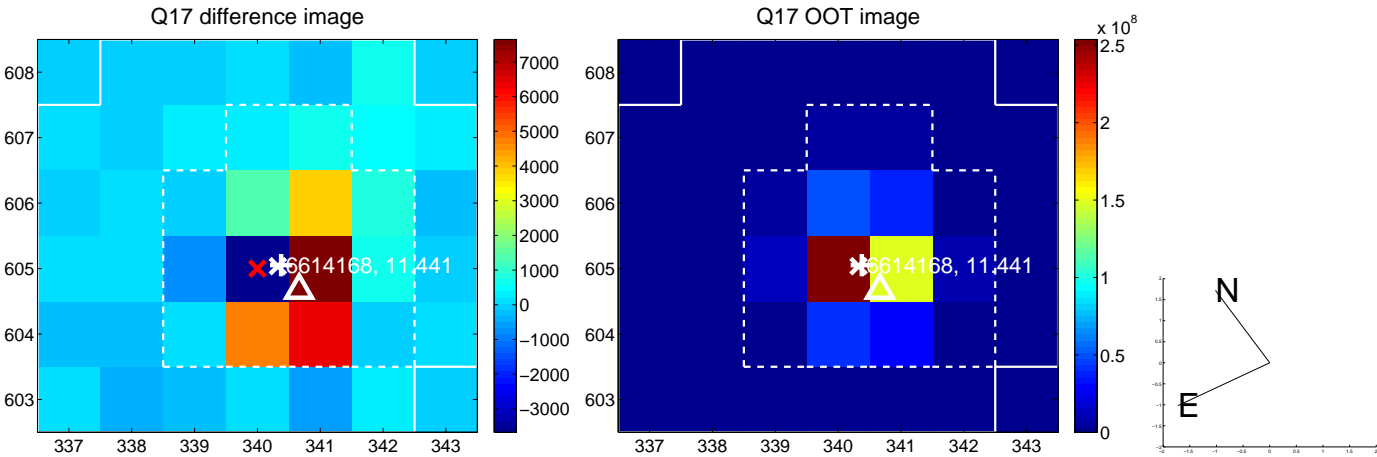




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

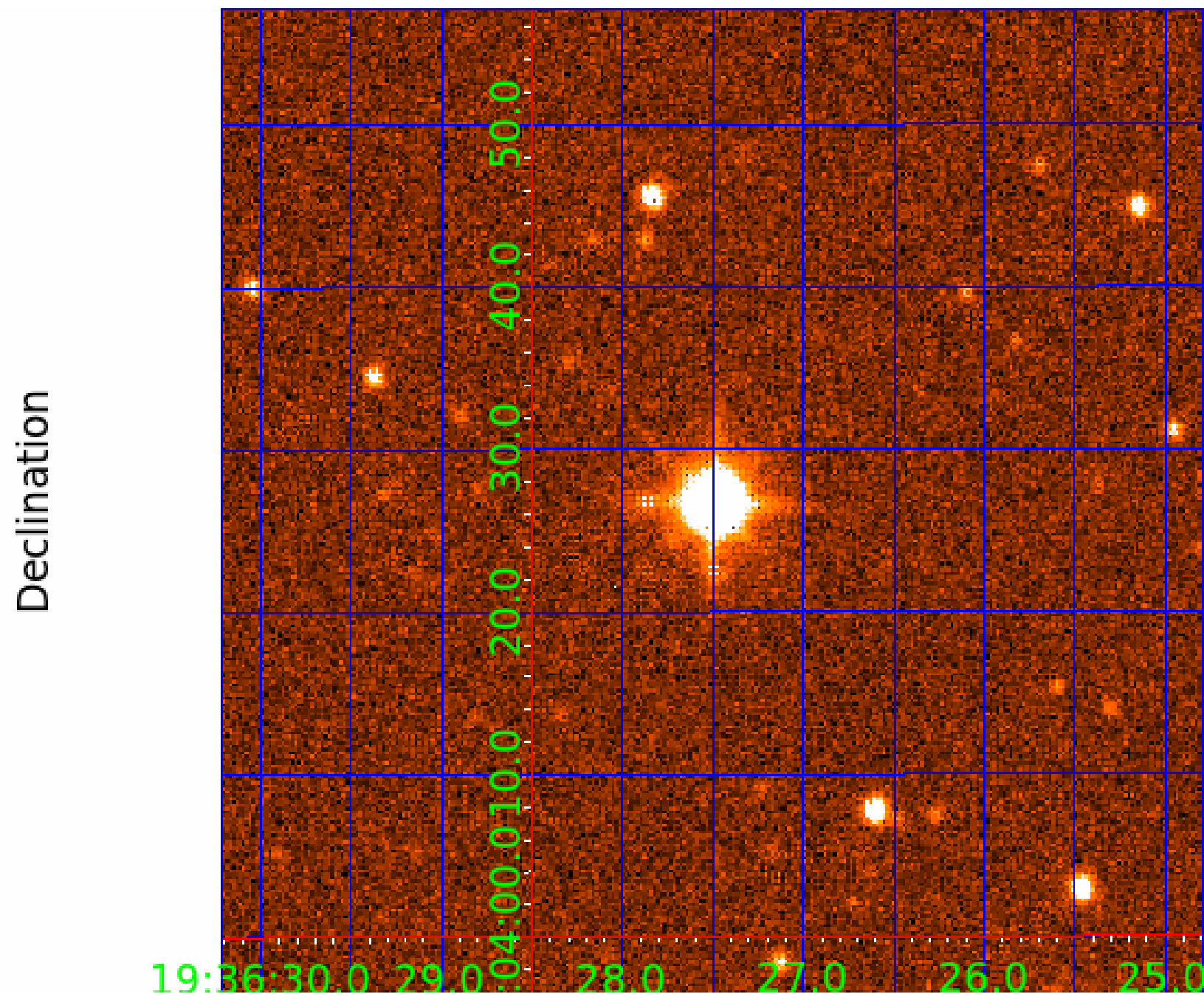


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image





# KIC 006614168

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006614168-01	OBS	No	0.500611	131.741532	234.3	1.357	17.5	16.4	1.74	7488	3.10	42647.21
006614168-02	OBS	No	0.500622	131.863424	334.2	1.427	16.9	22.1	1.74	7488	3.75	42645.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006614168-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
006614168-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

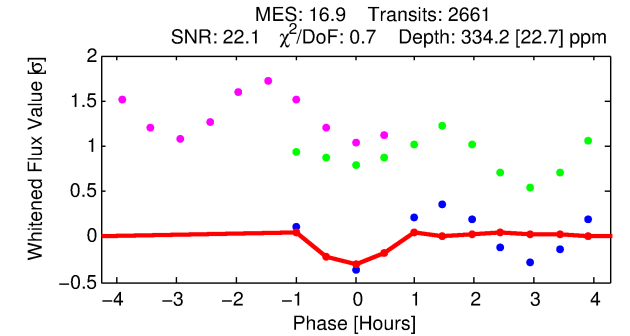
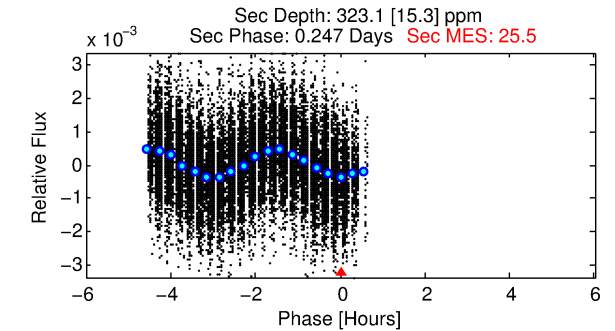
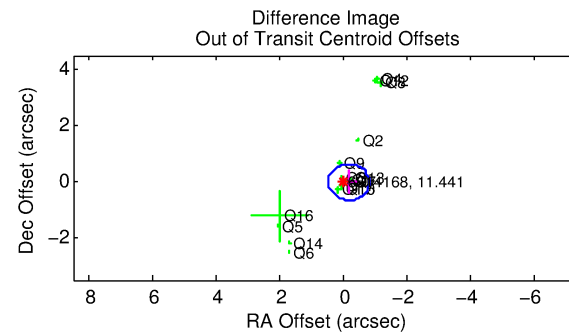
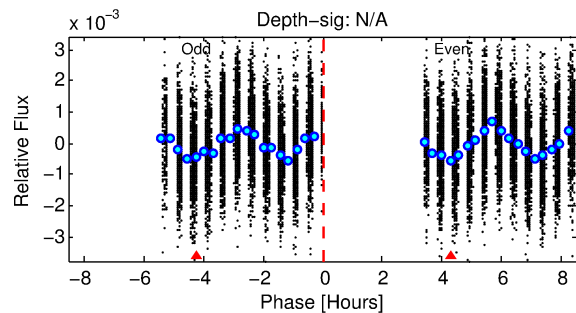
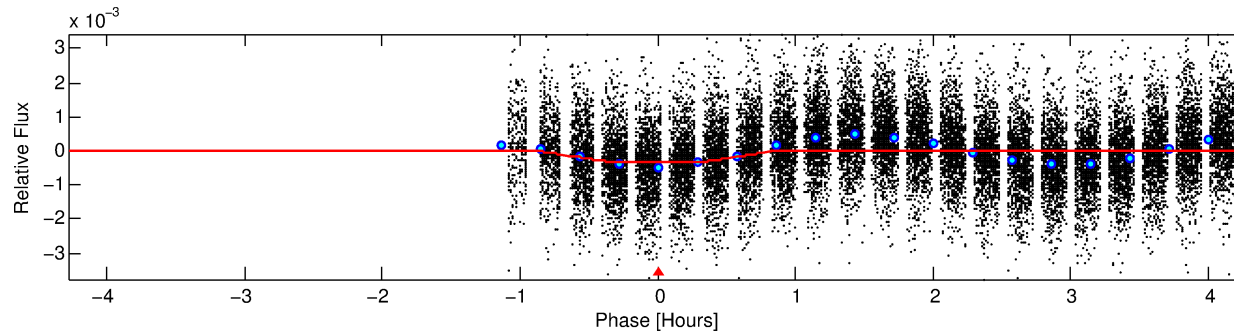
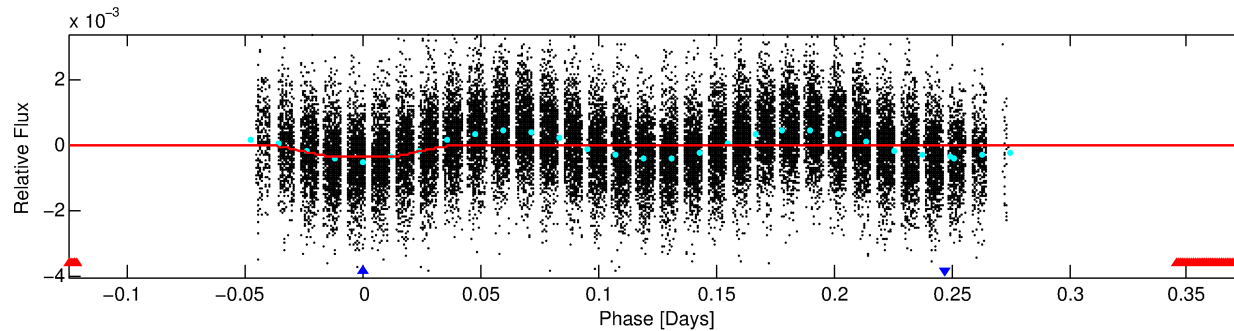
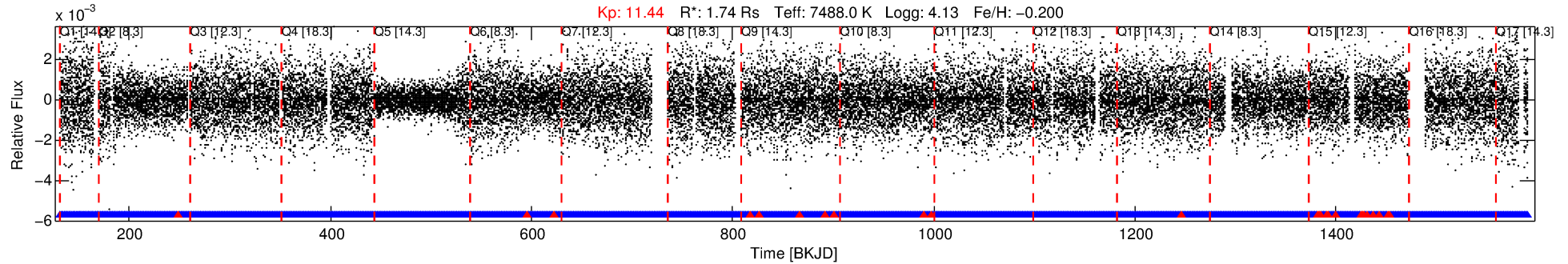
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006614168-02

No Significant Match Found

# DV One-Page Summary

KIC: 6614168 Candidate: 2 of 2 Period: 0.501 d



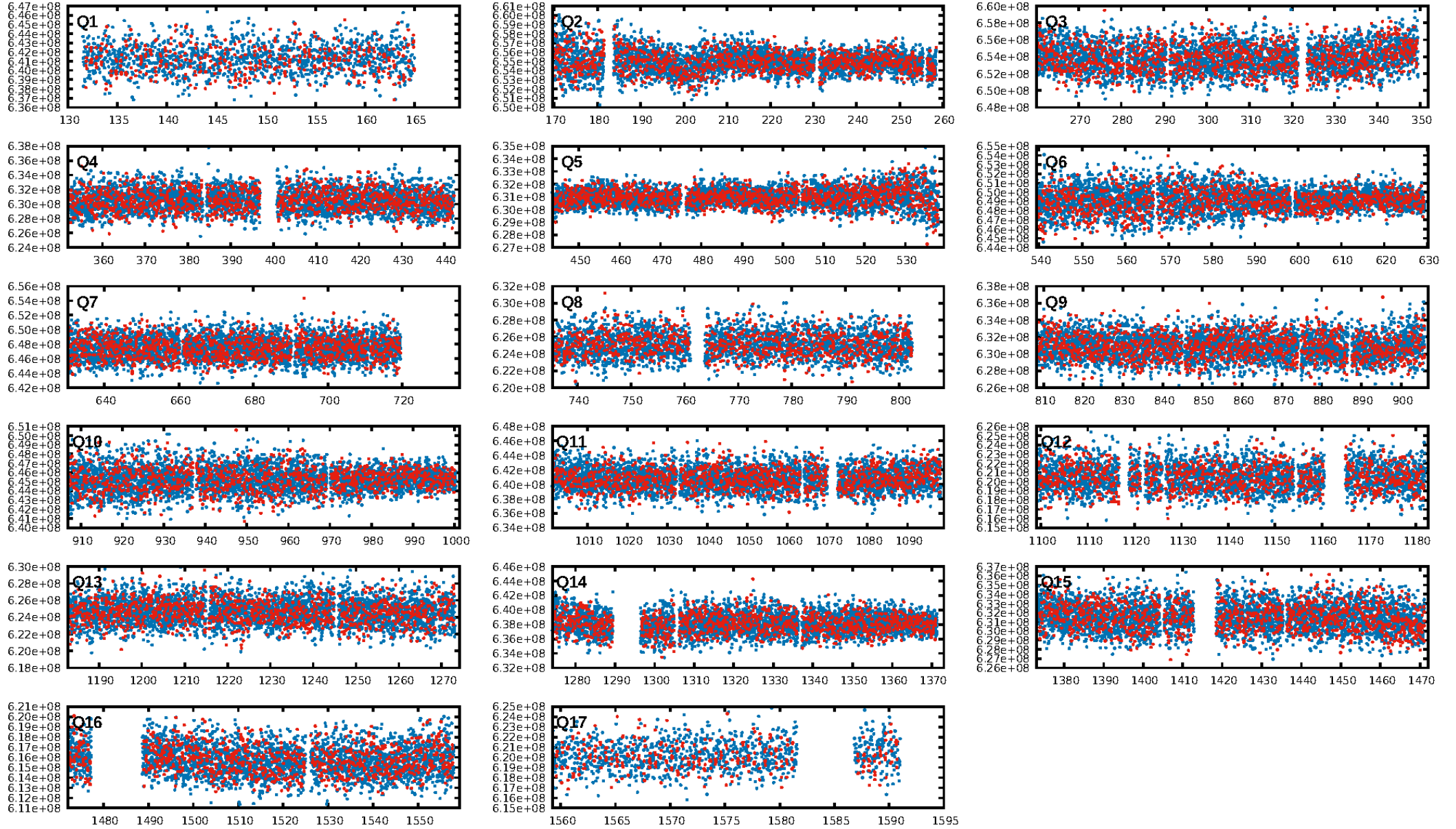
## DV Fit Results:

Period = 0.50062 [0.00000] d  
Epoch = 131.8634 [0.0008] BKJD  
Rp/R\* = 0.0197 [0.0032]  
a/R\* = 1.58 [0.84]  
b = 0.90 [0.18]  
Seff = 42645.91 [16181.99]  
Teq = 3664 [348] K  
Rp = 3.75 [1.31] Re  
a = 0.0141 [0.0035] AU  
Ag = 2.53 [1.20] [1.28]  
Teffp = 7144 [659] K [4.67]

## DV Diagnostic Results:

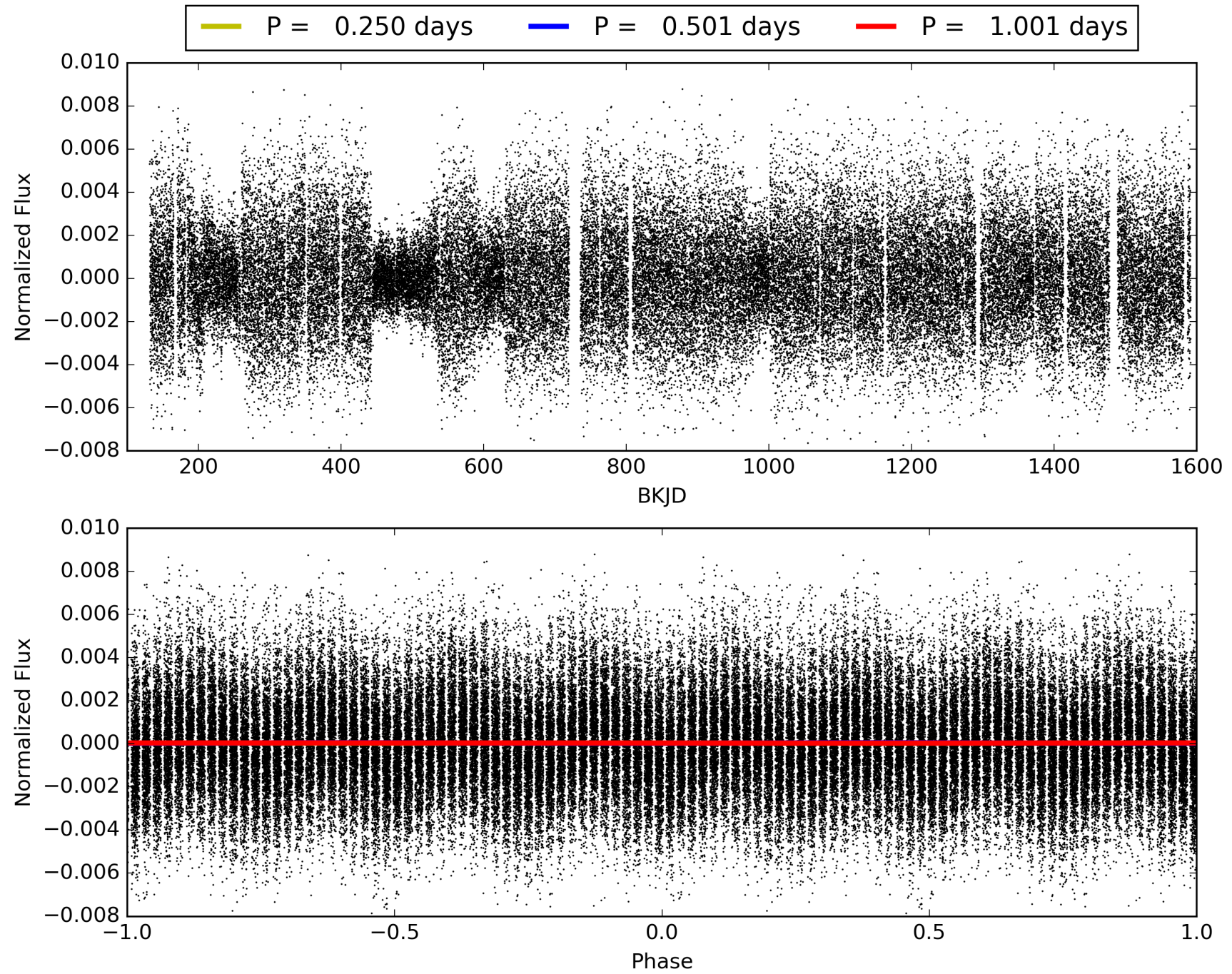
ShortPeriod-sig: 0.0% [0.00]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [2517/2542]  
GhostDiagnostic-chr: 1.571  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.166 arcsec [0.78]  
KicOffset-rm: 0.372 arcsec [1.87]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.82 [14/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 006614168-02, PDC Light Curves



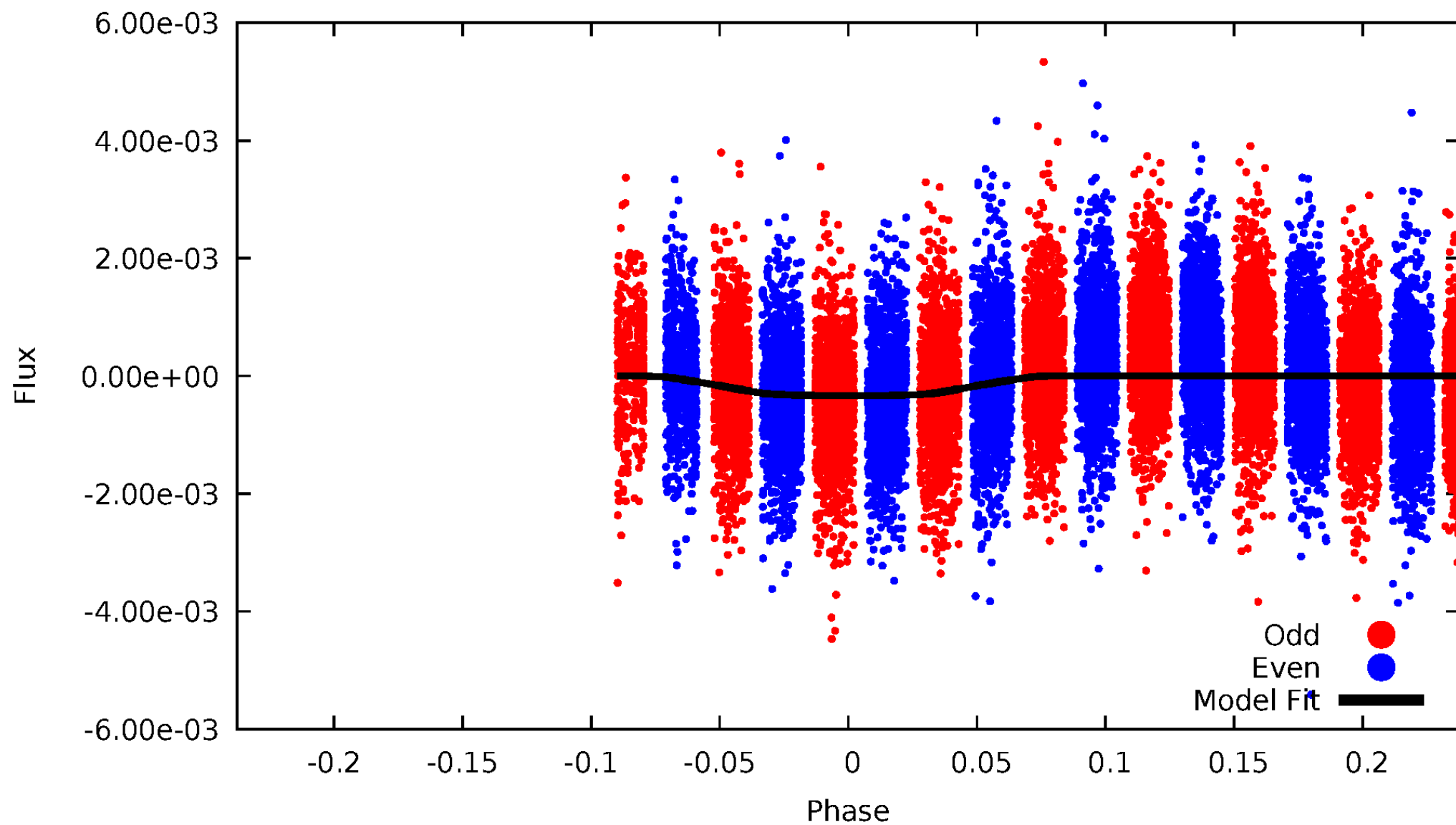


TCE 006614168-02



DV Odd/Even

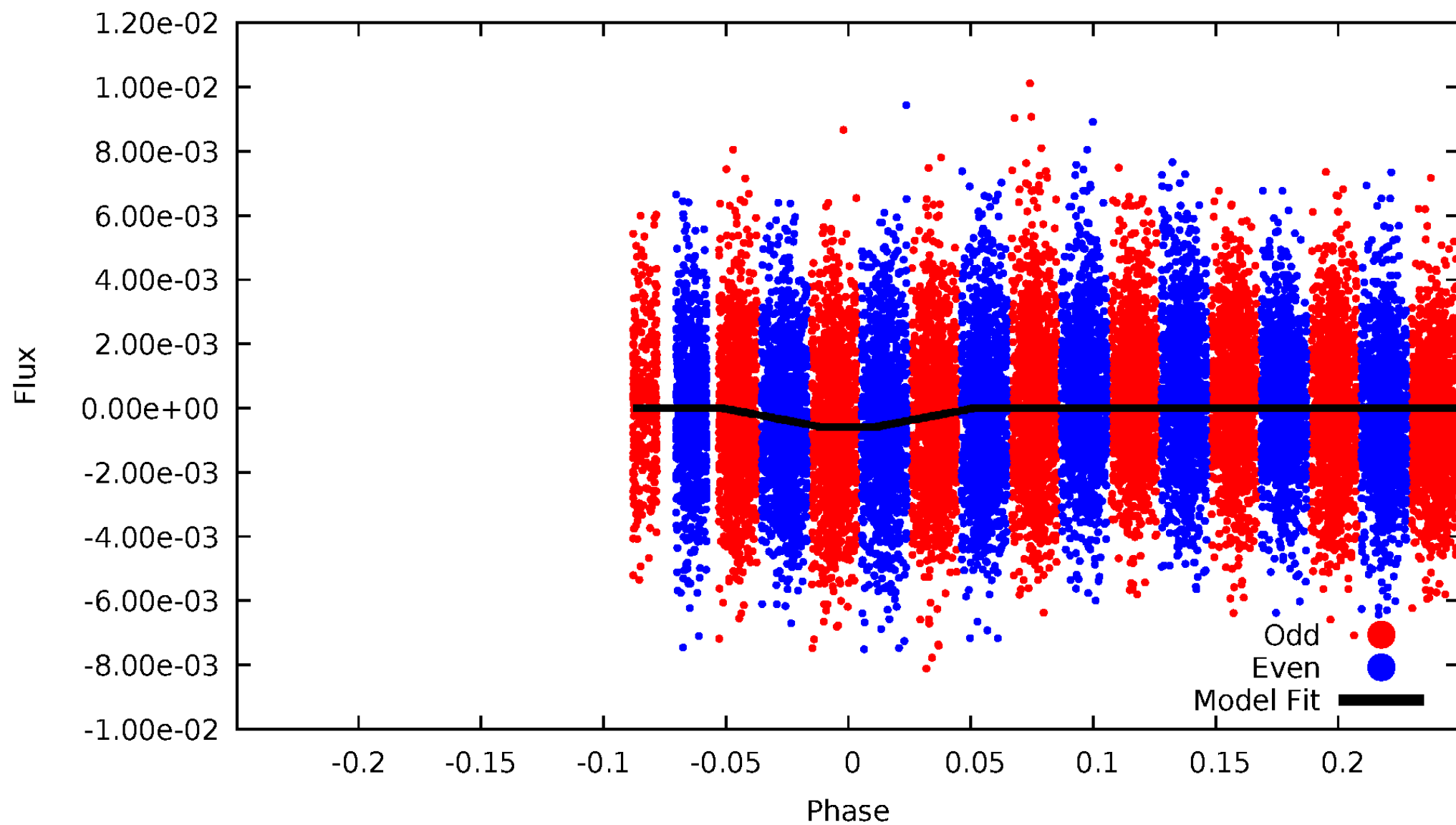
TCE 006614168-02





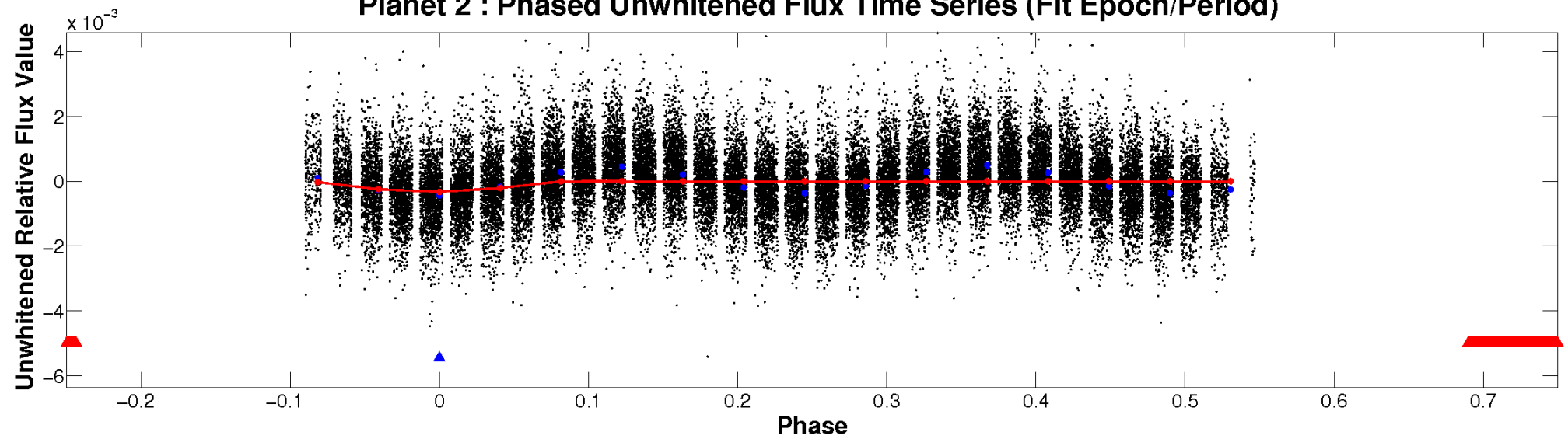
# ALT Odd/Even

TCE 006614168-02

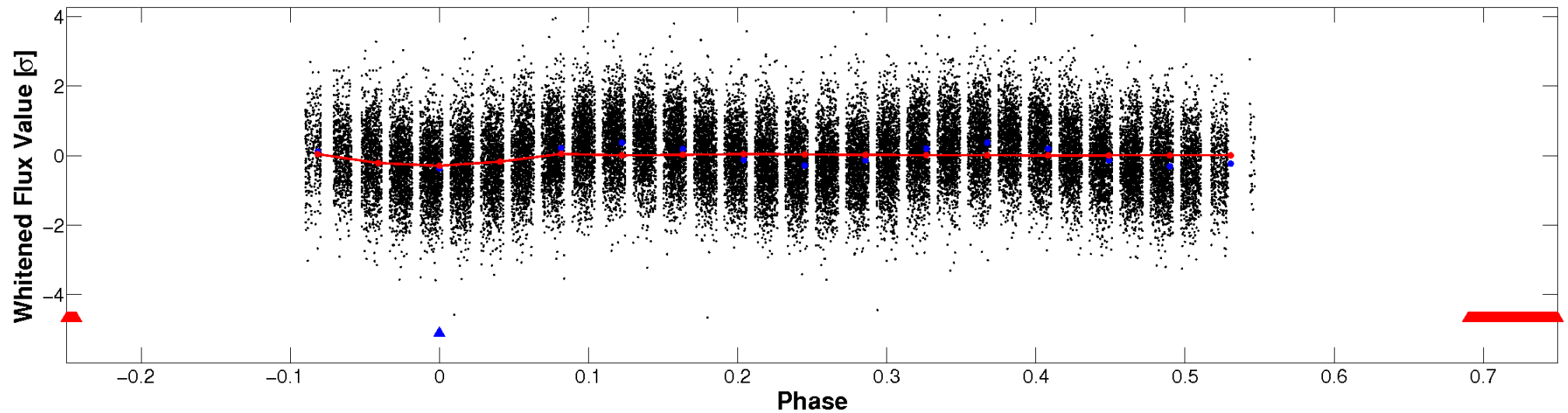


# Non-Whitened Vs. Whitened Light Curve

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

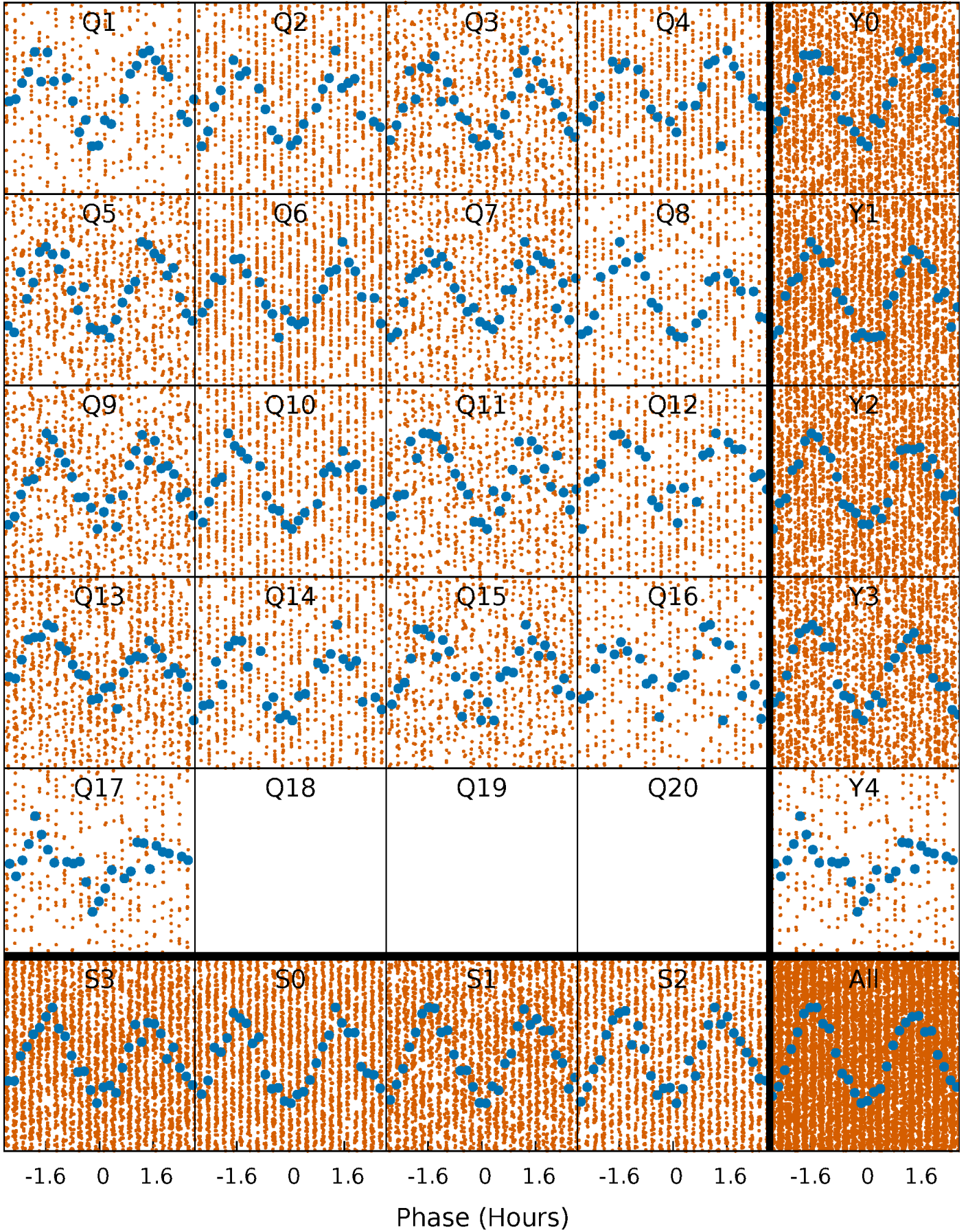


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



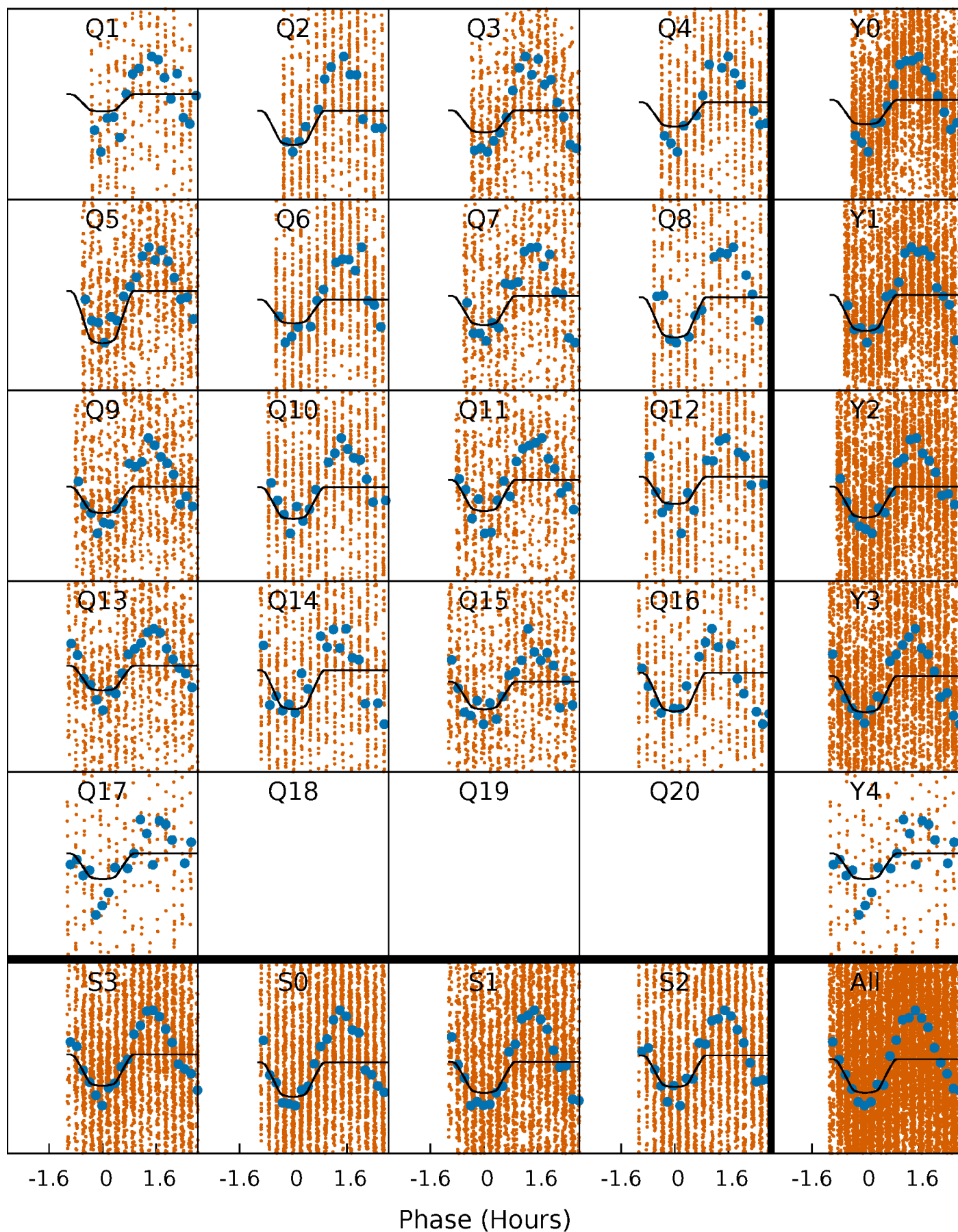
# PDC Quarter-Phased Transit Curves

TCE 006614168-02   P= 0.500622 Days    $T_0=131.863424$  (BKJD)



# DV Quarter-Phased Transit Curves

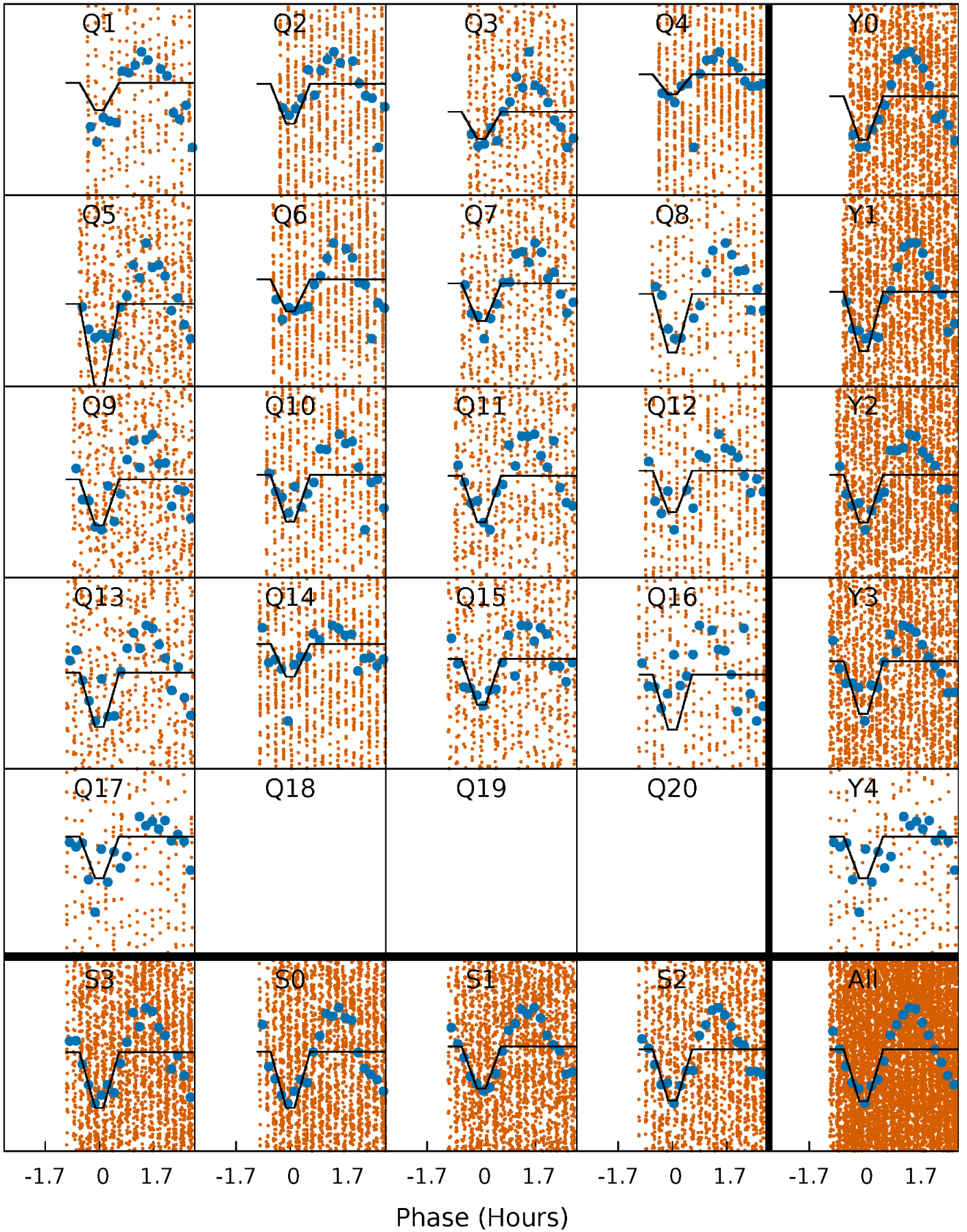
TCE 006614168-02   P= 0.500622 Days    $T_0=131.863424$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 006614168-02 P= 0.500621 Days  $T_0=131.864913$  (BKJD)

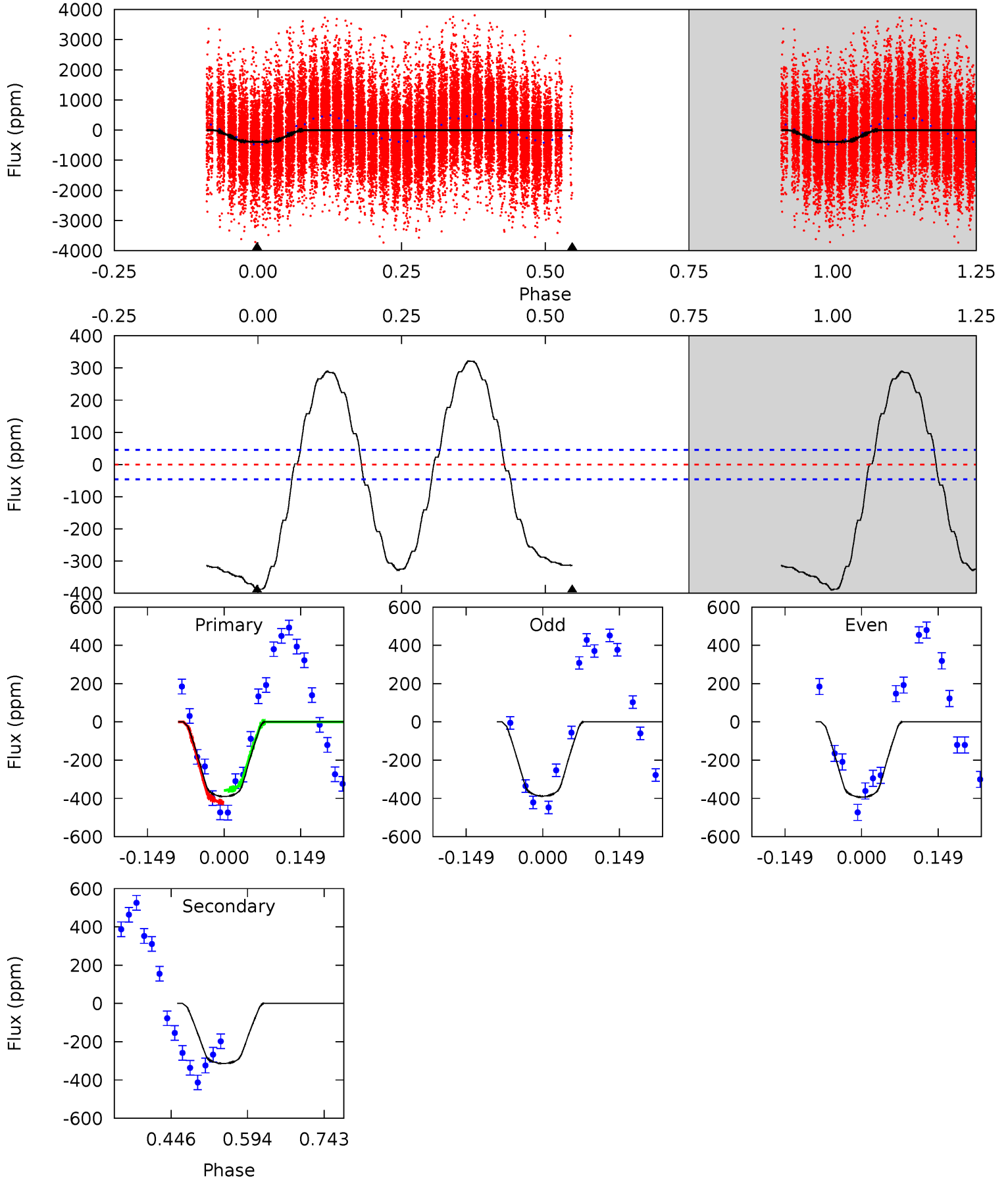




# DV Model-Shift Uniqueness Test

006614168-02, P = 0.500622 Days, E = 131.362802 Days

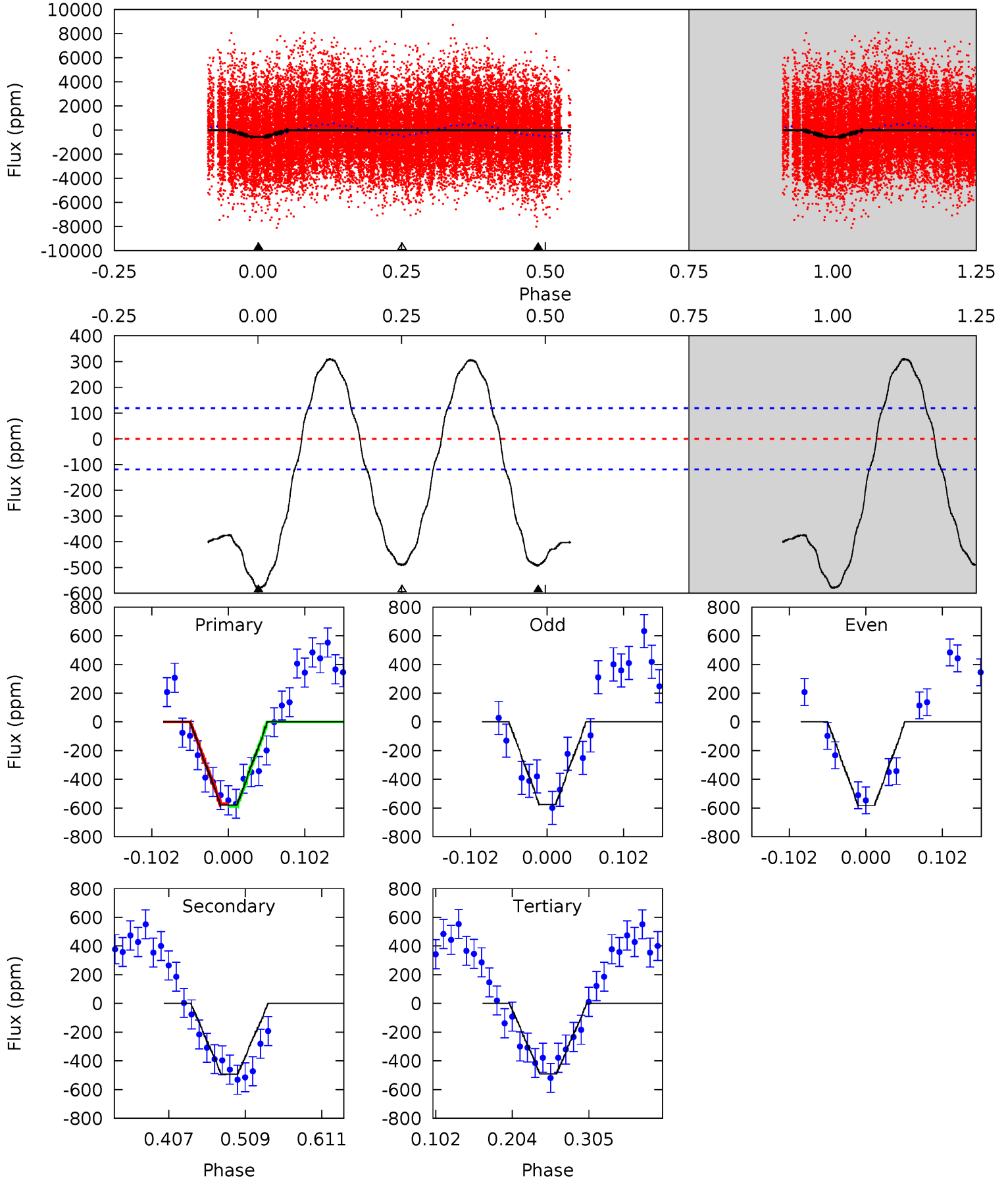
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.3	30.8	0	0	4.48	1.44	22.4	38.3	38.3	30.8	30.8	0.29	1.01	0.45	3.26



# Alt Model-Shift Uniqueness Test

006614168-02, P = 0.500621 Days, E = 131.364292 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
22.3	18.9	18.8	0	4.56	1.64	11.2	3.41	22.3	0.09	18.9	0.13	0.94	0.35	0.31



### Stellar Parameters For KIC 006614168

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7488^{+235}_{-314}$	$4.134^{+0.144}_{-0.176}$	$-0.200^{+0.250}_{-0.350}$	$1.739^{+0.540}_{-0.360}$	$1.499^{+0.220}_{-0.220}$	$0.402^{+0.300}_{-0.200}$
	+3%/-4%	+3%/-4%	+125%/-175%	+31%/-21%	+15%/-15%	+75%/-50%
Source	KIC0	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 006614168-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-314 \pm 10$	$3.77^{+0.81}_{-0.71}$	$5147^{+385}_{-354}$	$6784^{+816}_{-680}$	$2.416^{+1.236}_{-0.763}$
Alt.	$-493 \pm 26$	$4.60^{+1.03}_{-0.81}$	$5099^{+426}_{-337}$	$6813^{+728}_{-566}$	$2.576^{+1.158}_{-0.856}$

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

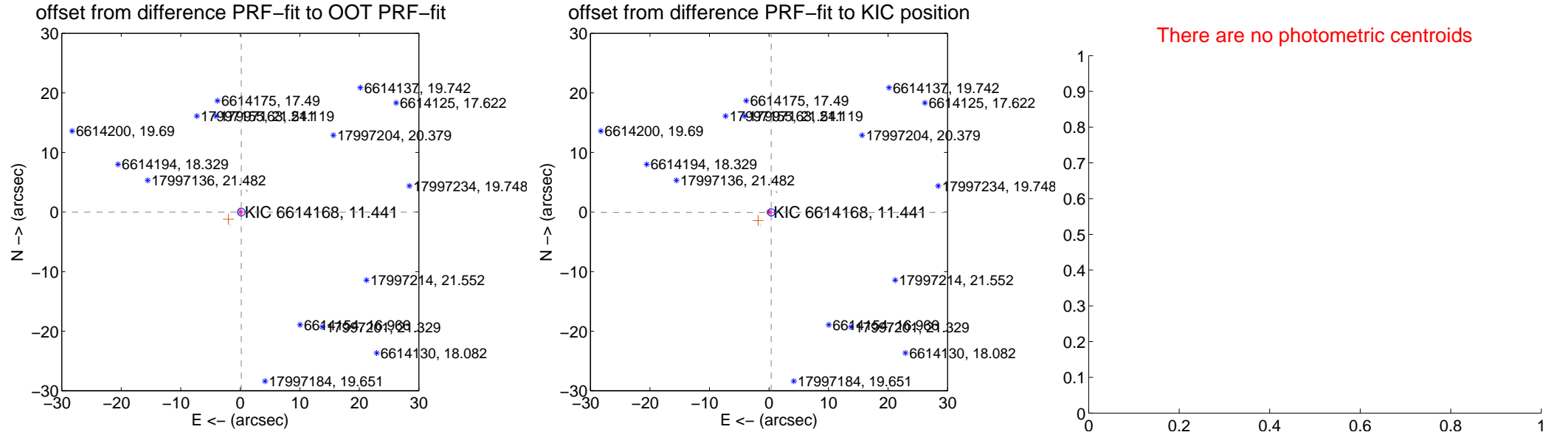
## DV Centroid Data

Supplemental centroid analysis for 006614168-02. **Kepler magnitude: 11.44.** Transit SNR 22.11

There are 14 quarters with good PRF difference image offsets

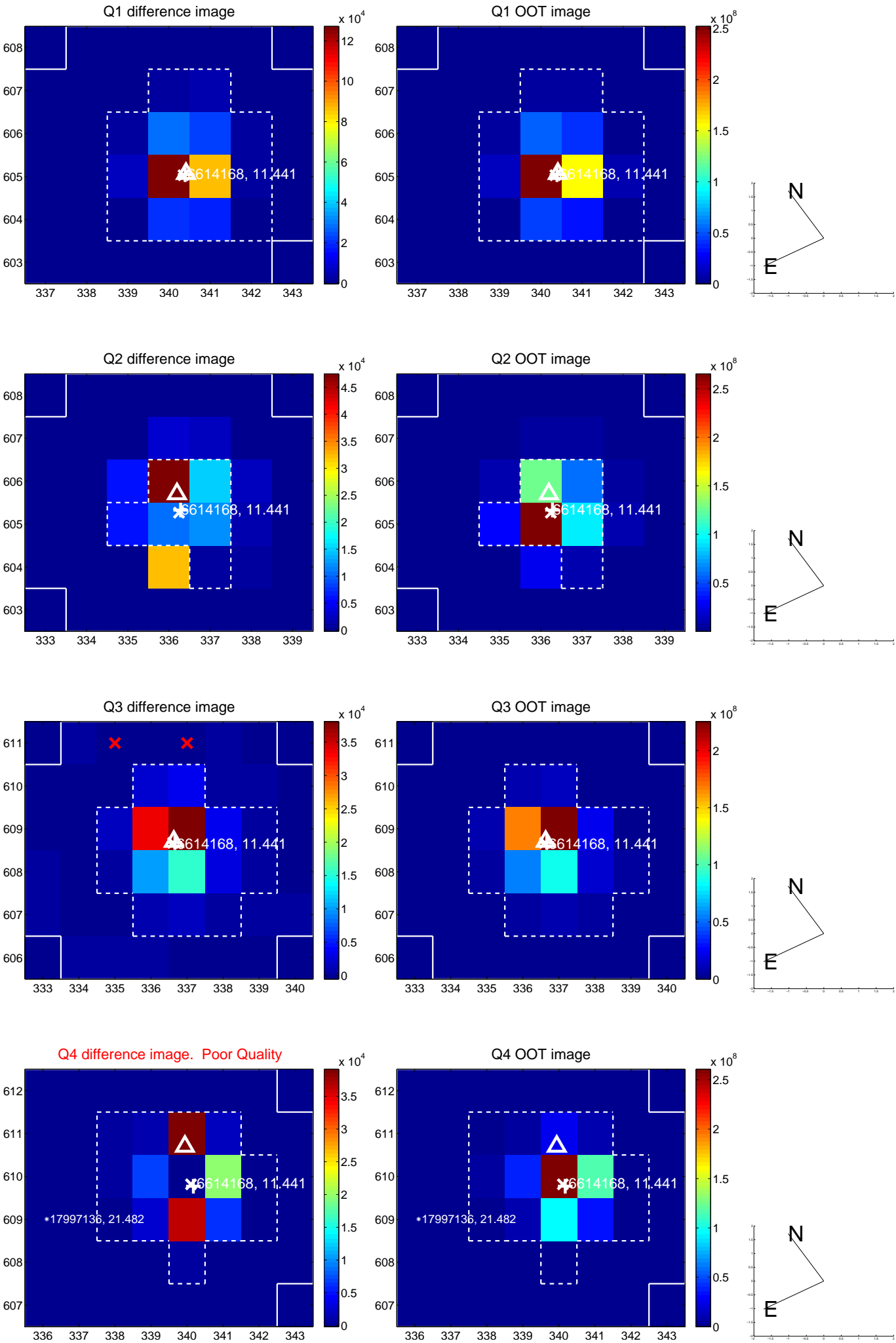
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.166 \pm 0.213$	0.78	$-0.165 \pm 0.243$	$-0.014 \pm 0.418$
PRF-fit source offset from KIC position	$0.372 \pm 0.199$	1.87	$-0.368 \pm 0.257$	$-0.058 \pm 0.455$
photometric centroid source offset	—	—	—	—



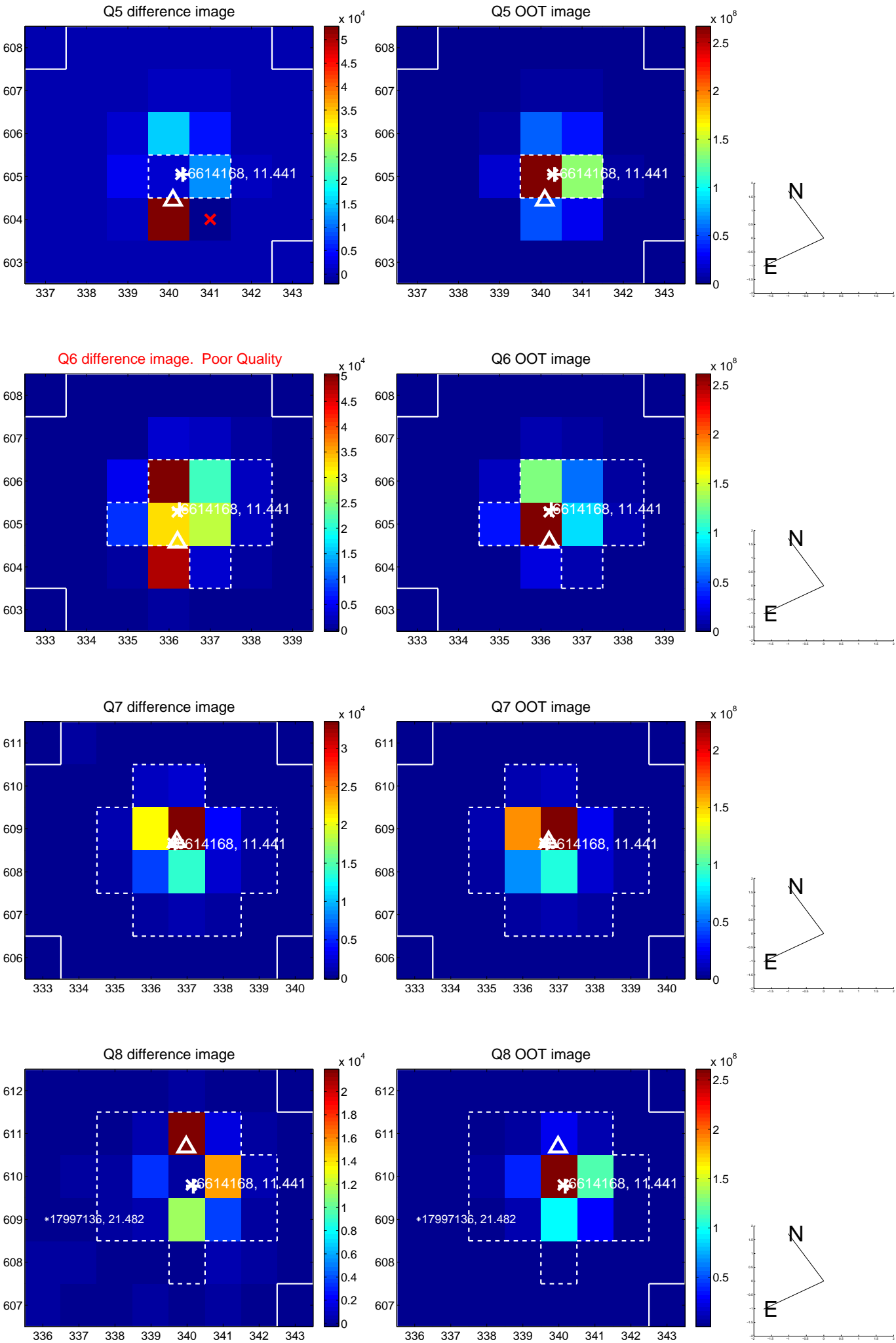
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

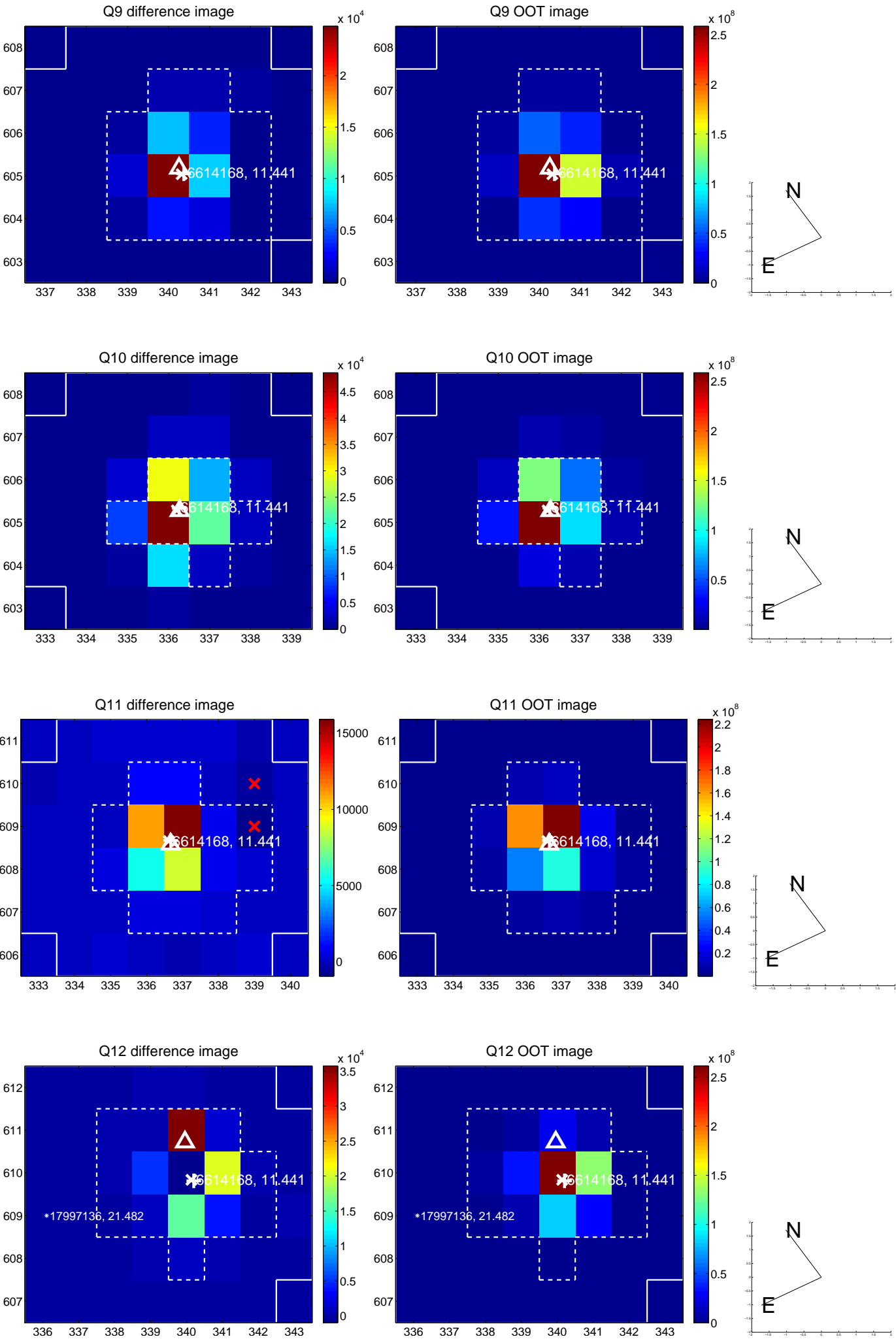




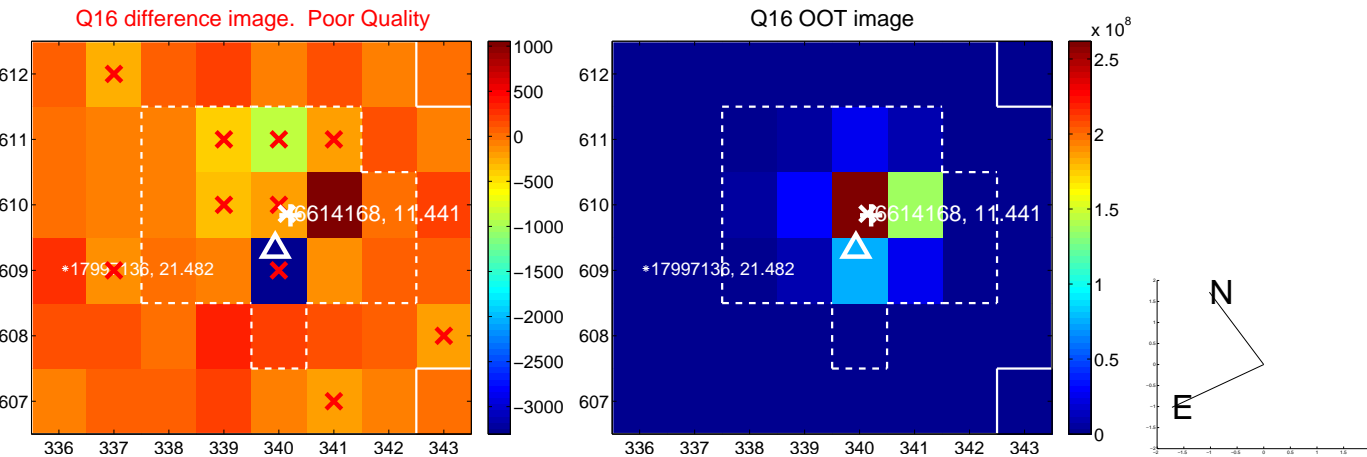
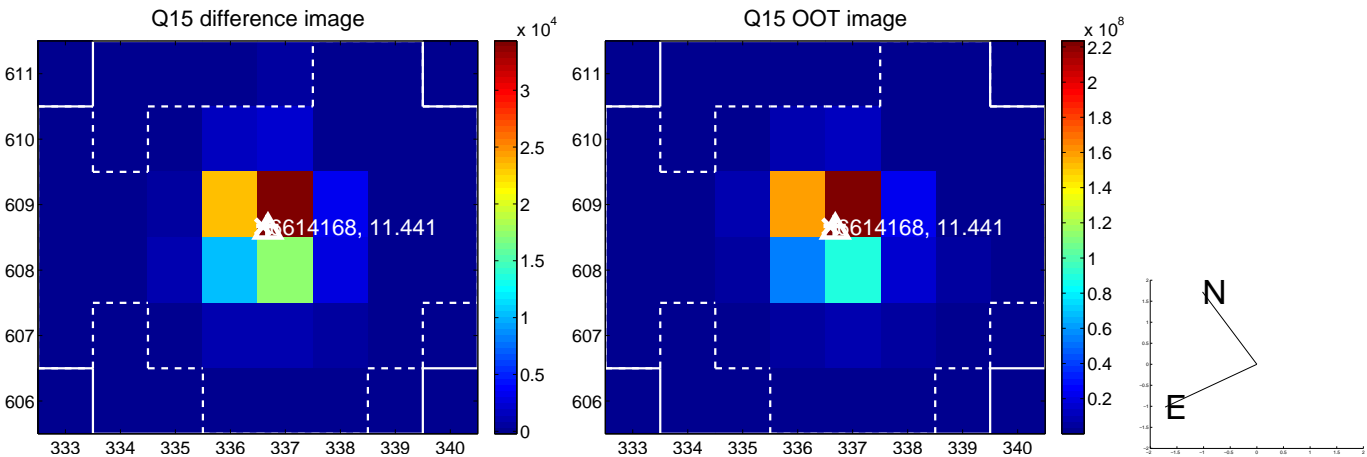
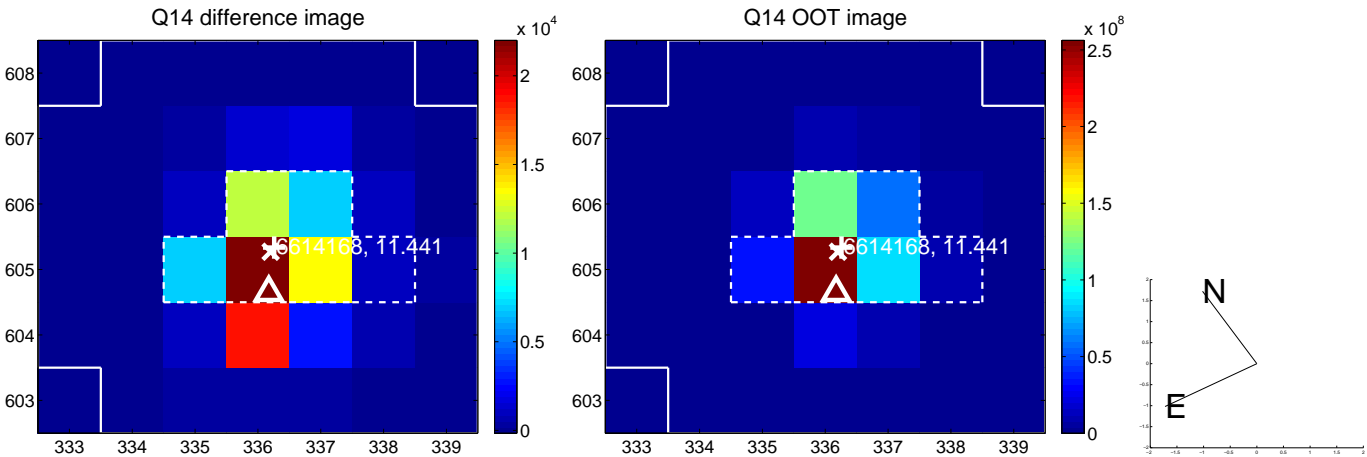
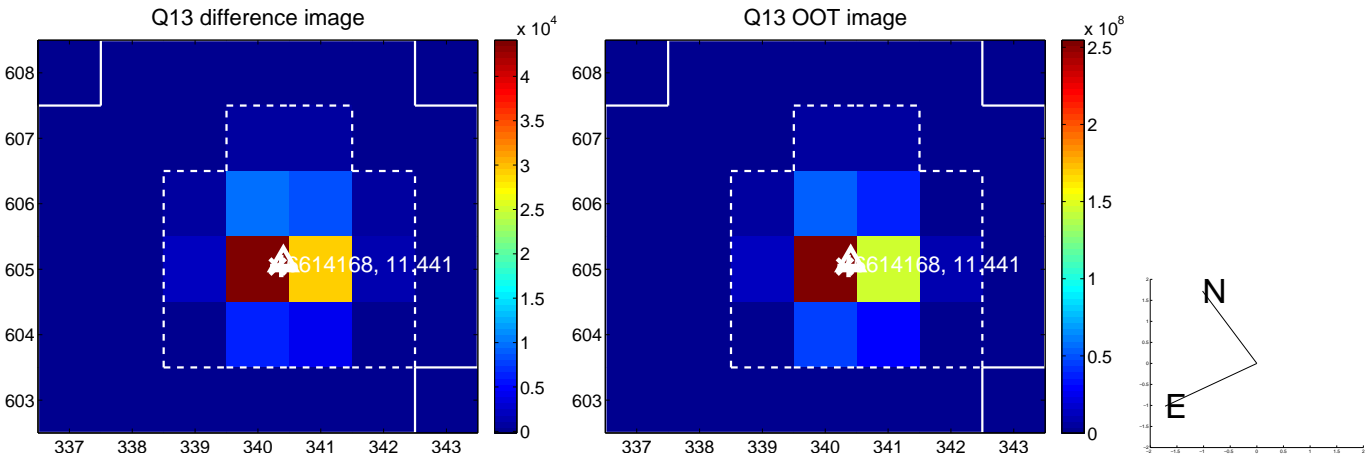
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



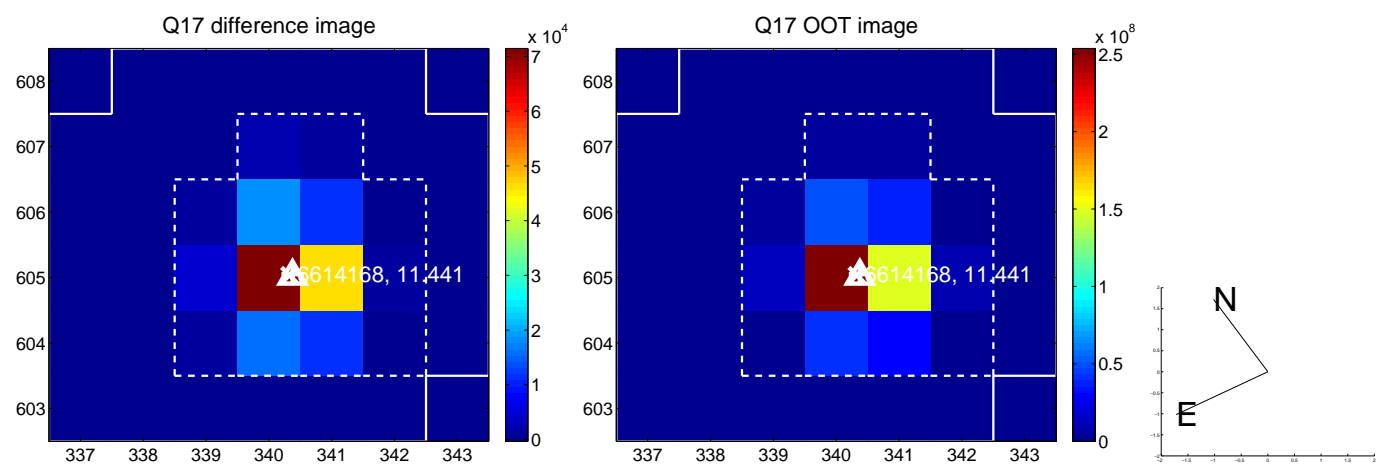
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

