

# KIC 010622651

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010622651-01	OBS	No	1.378986	132.476579	21.0	7.934	7.4	7.2	1.49	6770	0.82	5872.47
010622651-02	OBS	No	370.812110	177.477842	334.1	4.146	7.3	7.6	1.49	6770	2.75	3.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010622651-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010622651-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

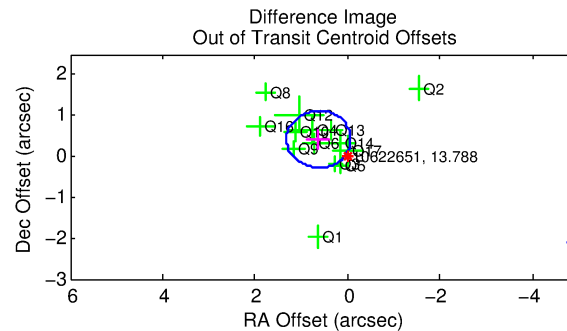
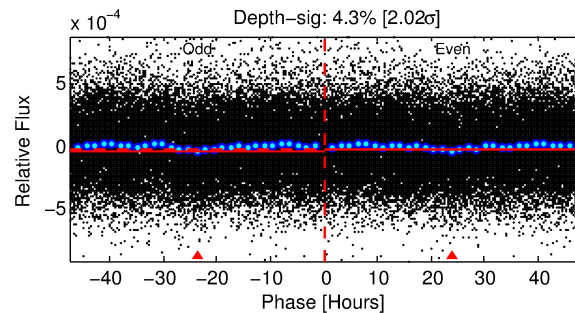
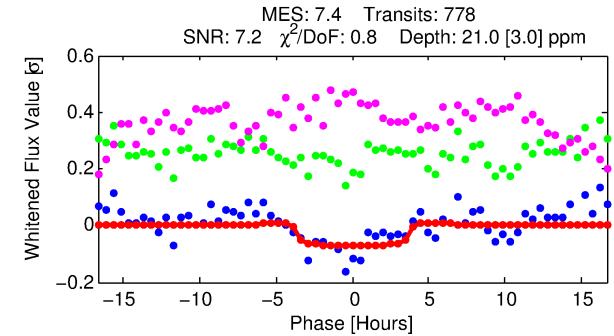
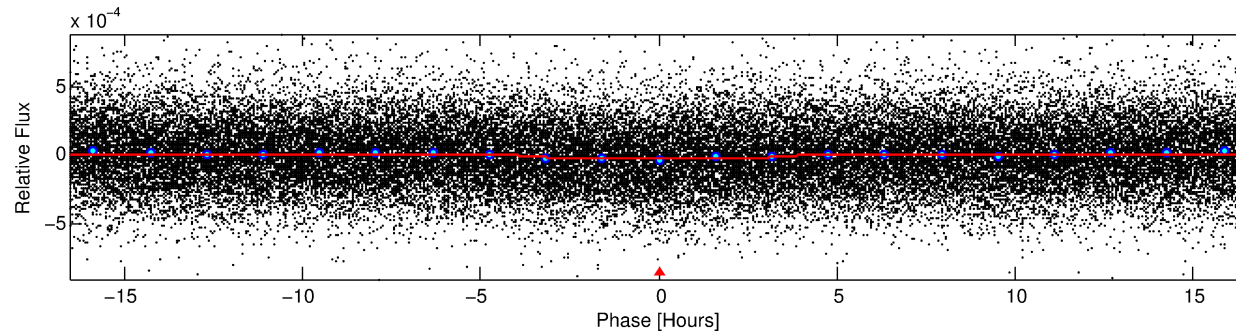
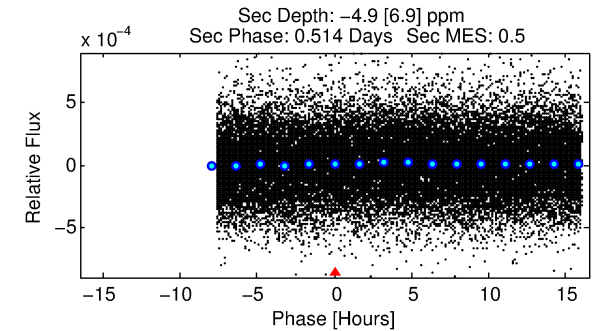
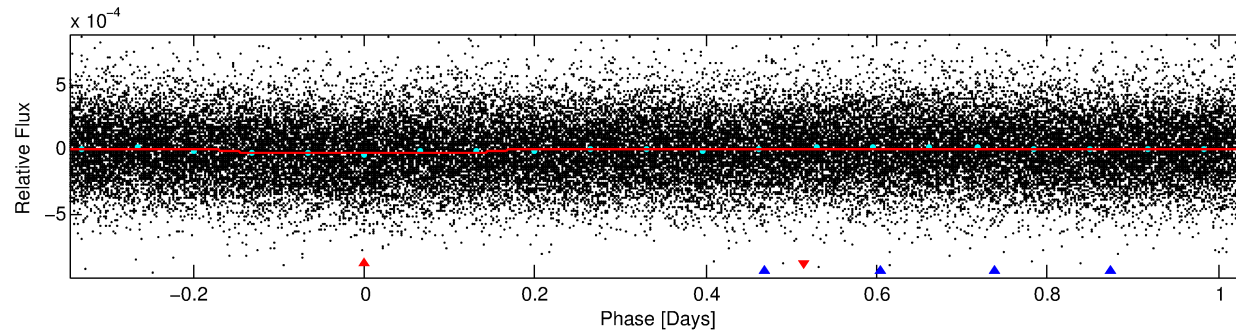
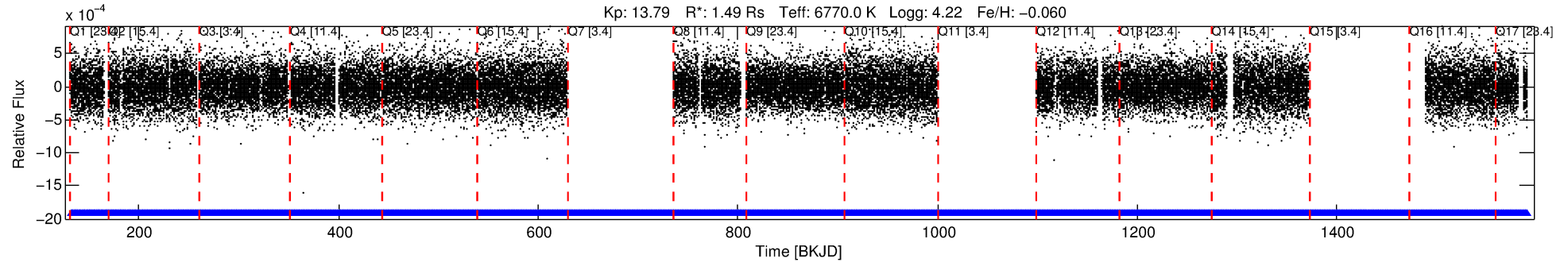
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010622651-01

No Significant Match Found

# DV One-Page Summary

KIC: 10622651 Candidate: 1 of 2 Period: 1.379 d



## DV Fit Results:

Period = 1.37899 [0.00003] d  
Epoch = 132.4766 [0.0095] BKJD  
Rp/R\* = 0.0050 [0.0018]  
a/R\* = 1.08 [0.34]  
b = 0.93 [0.31]  
Seff = 5872.47 [2404.16]  
Teff = 2232 [228] K  
Rp = 0.82 [0.40] Re  
a = 0.0267 [0.0072] AU  
Ag = N/A  
Teffp = N/A

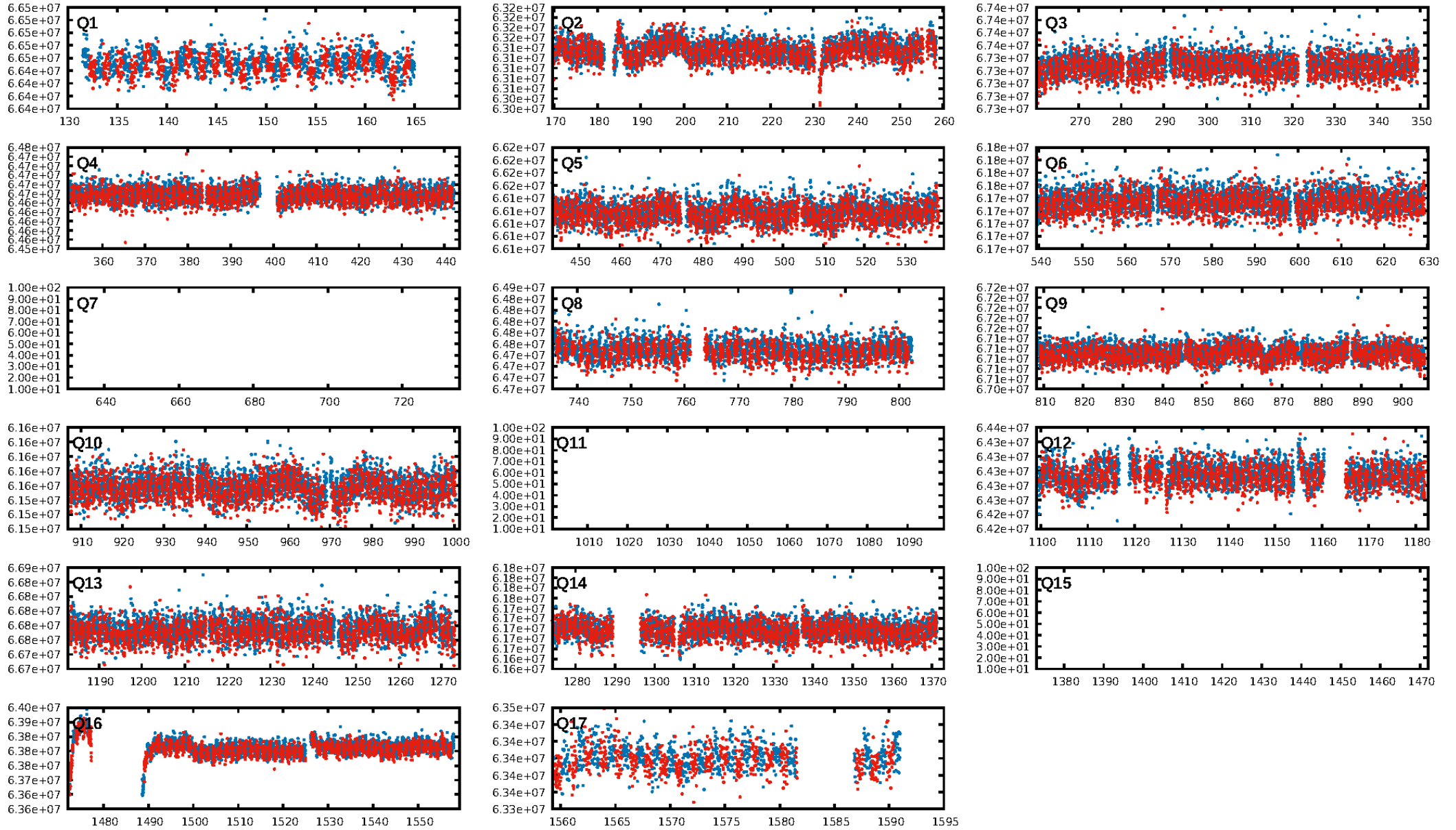
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [990.47σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.11e-15  
RollingBand-fgt: 1.00 [735/735]  
GhostDiagnostic-chr: 1.129  
Centroid-sig: 0.0%  
Centroid-so: 5.409 arcsec [4.05σ]  
OotOffset-rm: 0.757 arcsec [3.26σ]  
KicOffset-rm: 0.125 arcsec [0.46σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

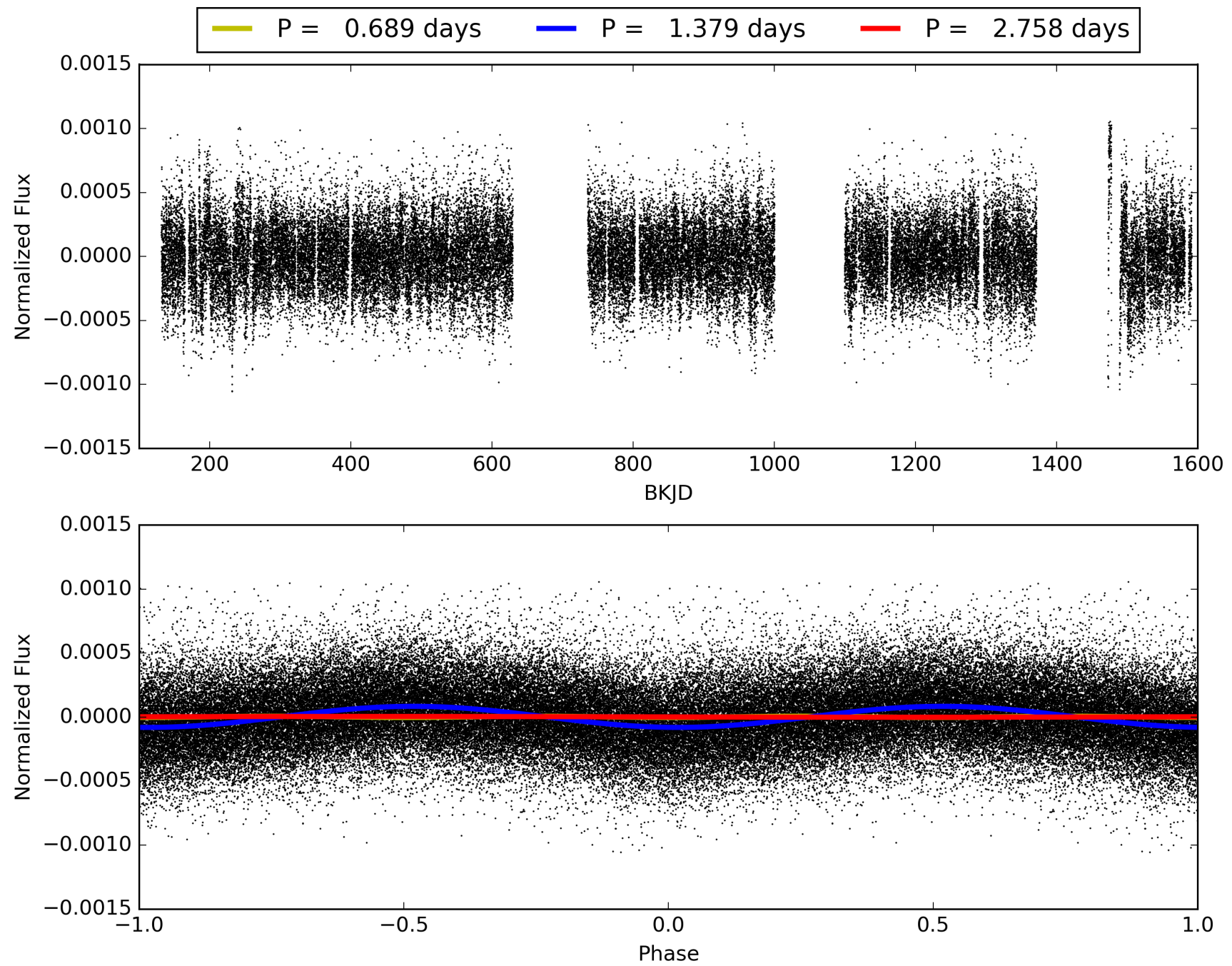
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:49:03 Z

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

# TCE 010622651-01, PDC Light Curves

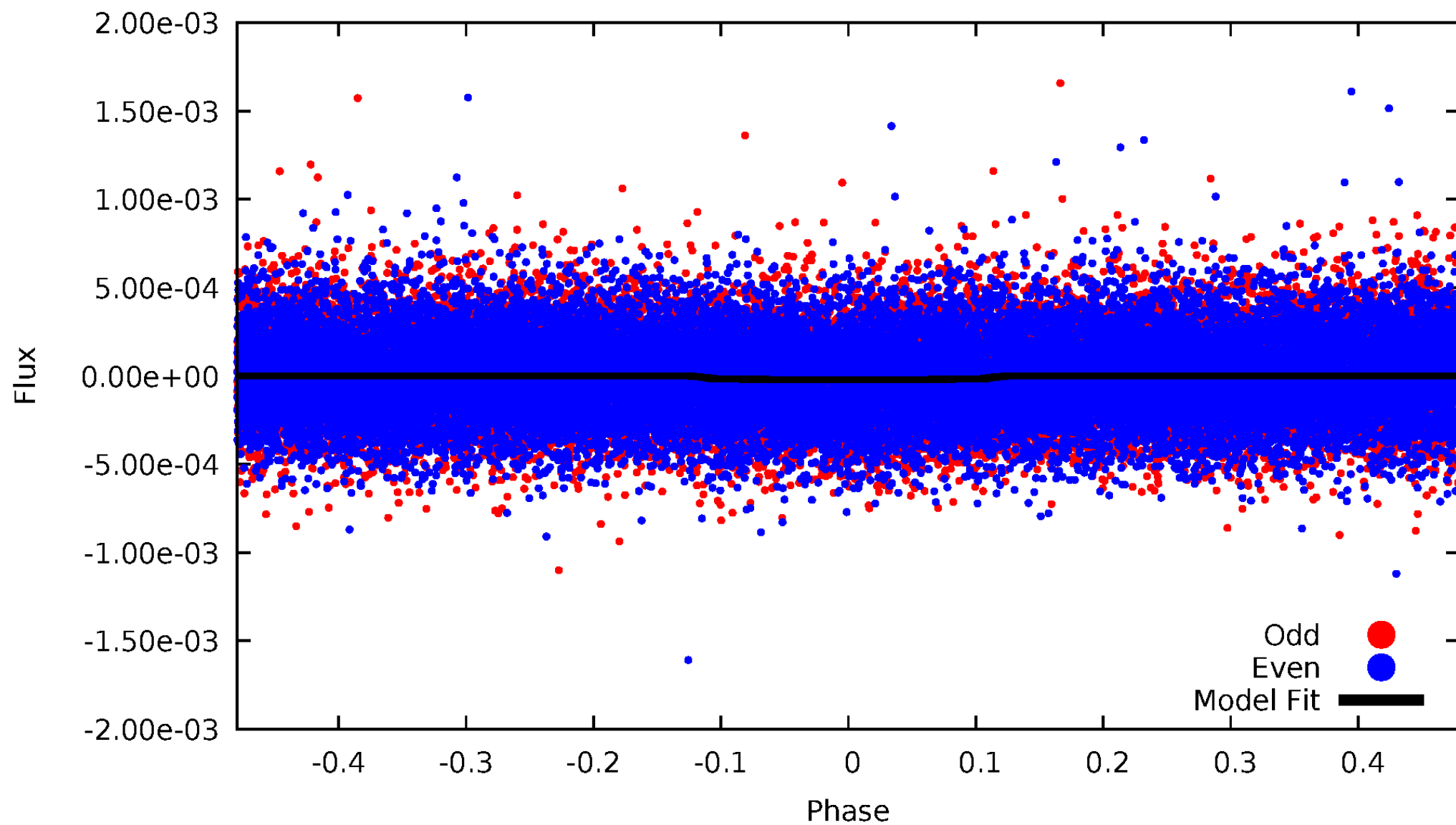


# TCE 010622651-01



# DV Odd/Even

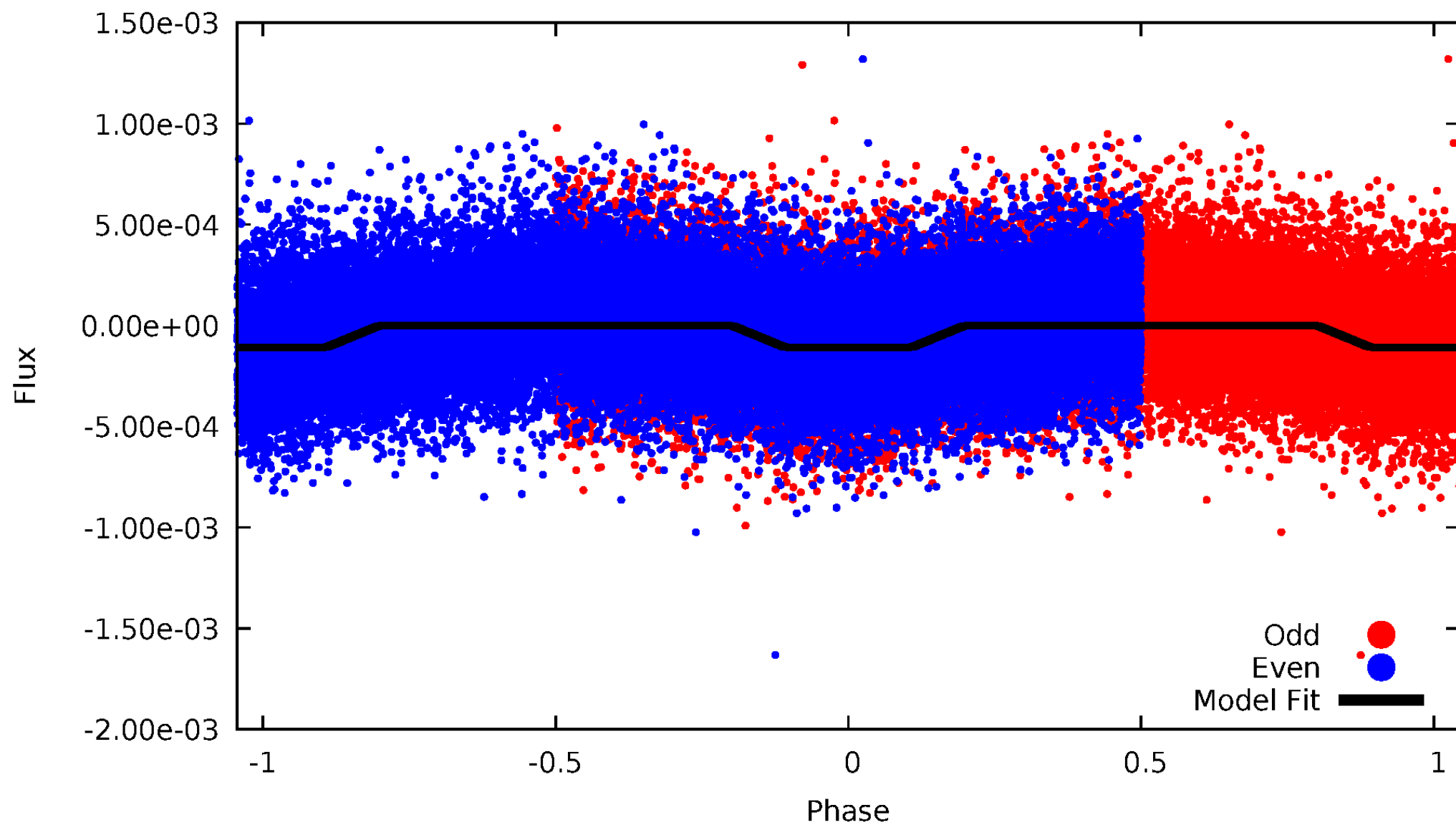
TCE 010622651-01



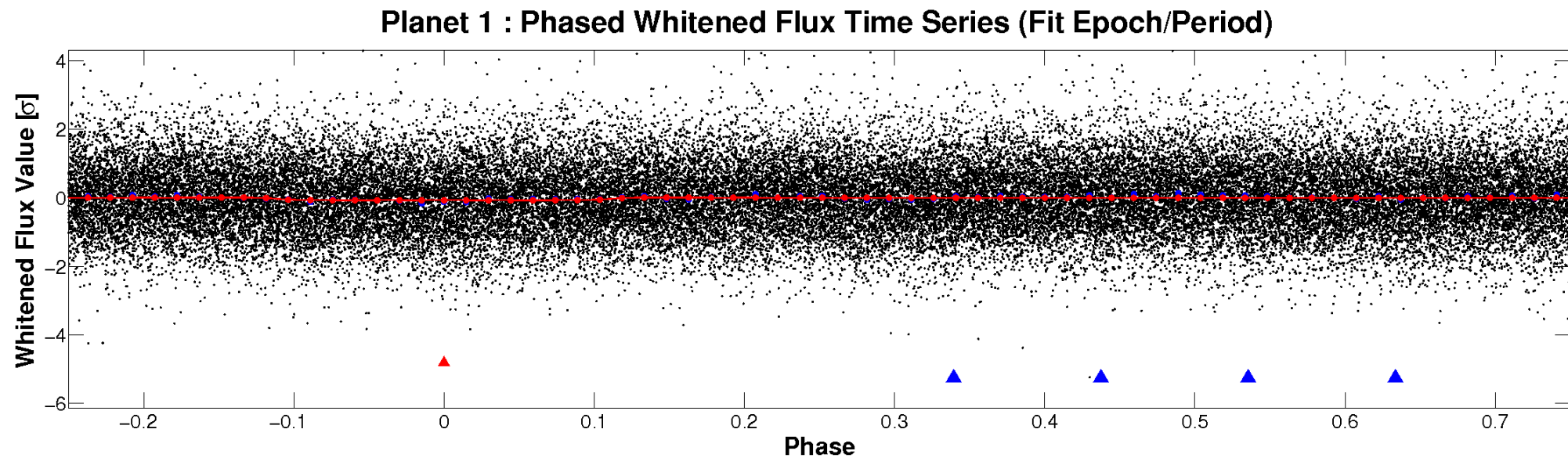
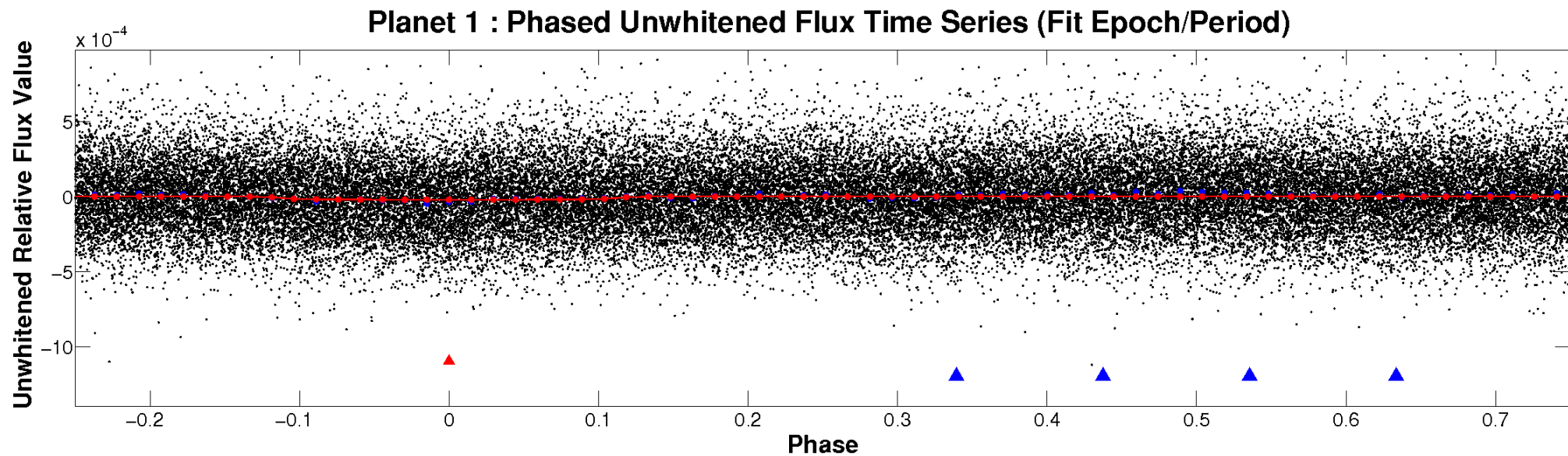


# ALT Odd/Even

TCE 010622651-01

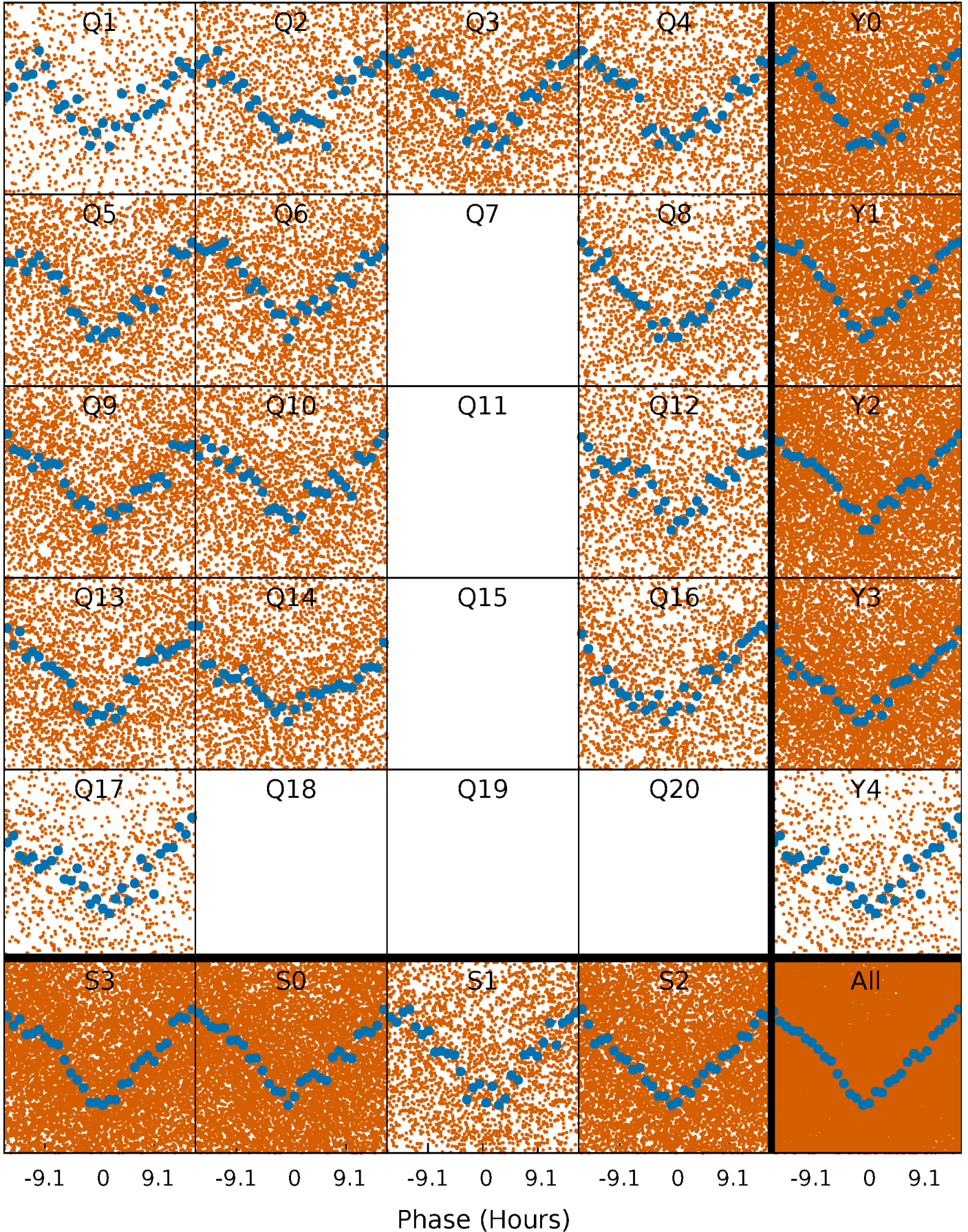


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

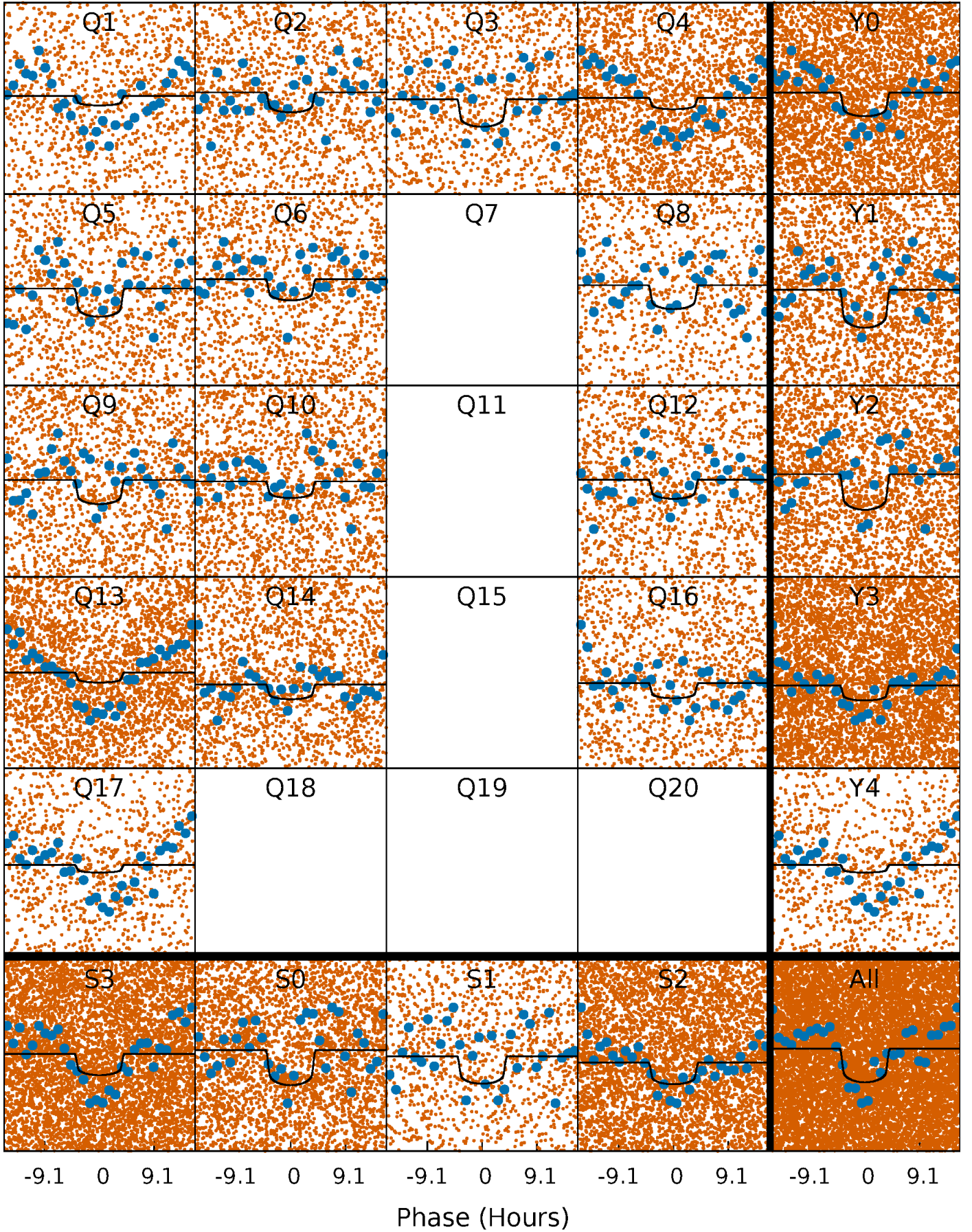
TCE 010622651-01 P= 1.378986 Days  $T_0=132.476579$  (BKJD)





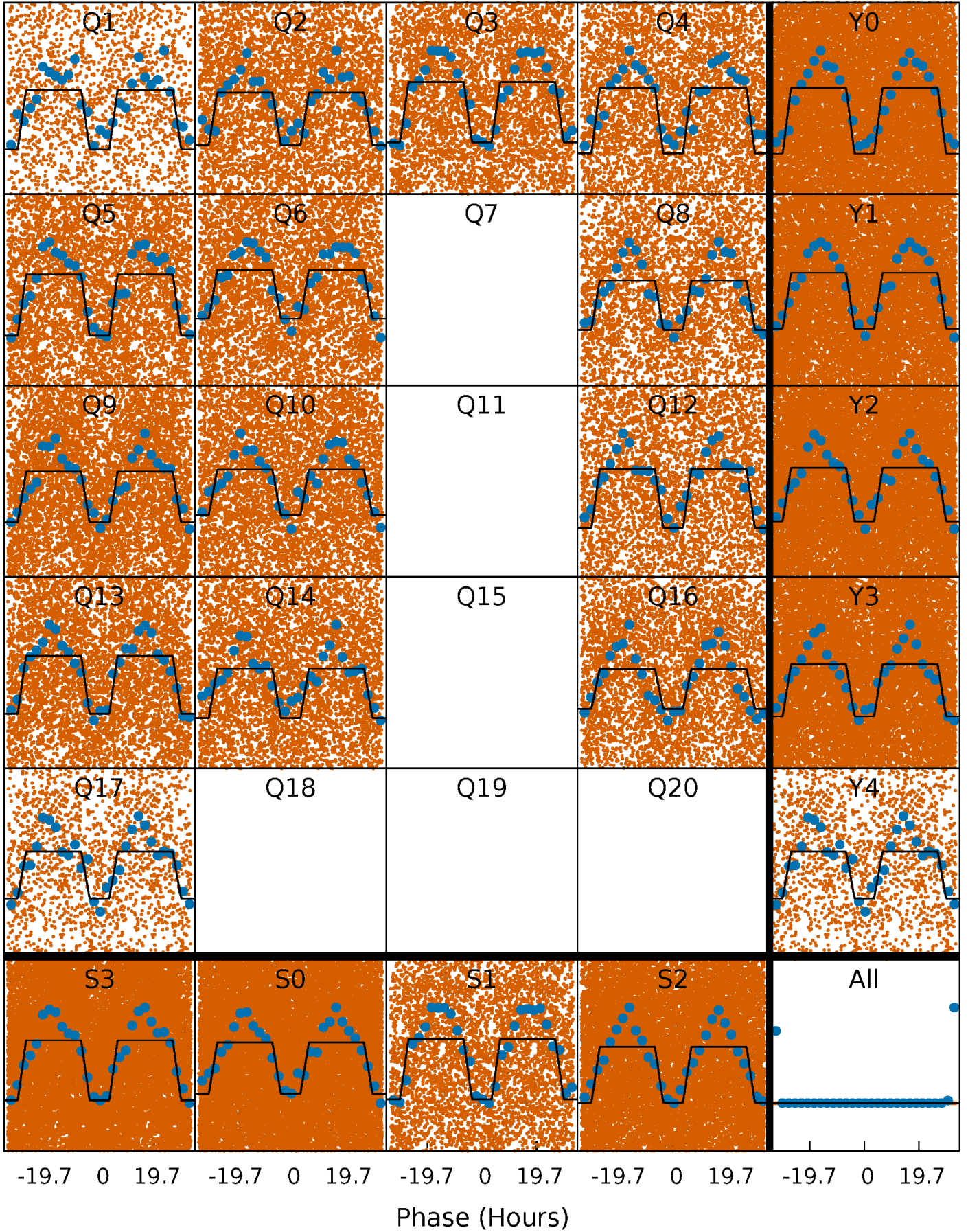
# DV Quarter-Phased Transit Curves

TCE 010622651-01 P= 1.378986 Days  $T_0=132.476579$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010622651-01   P= 1.379027 Days    $T_0=132.468489$  (BKJD)

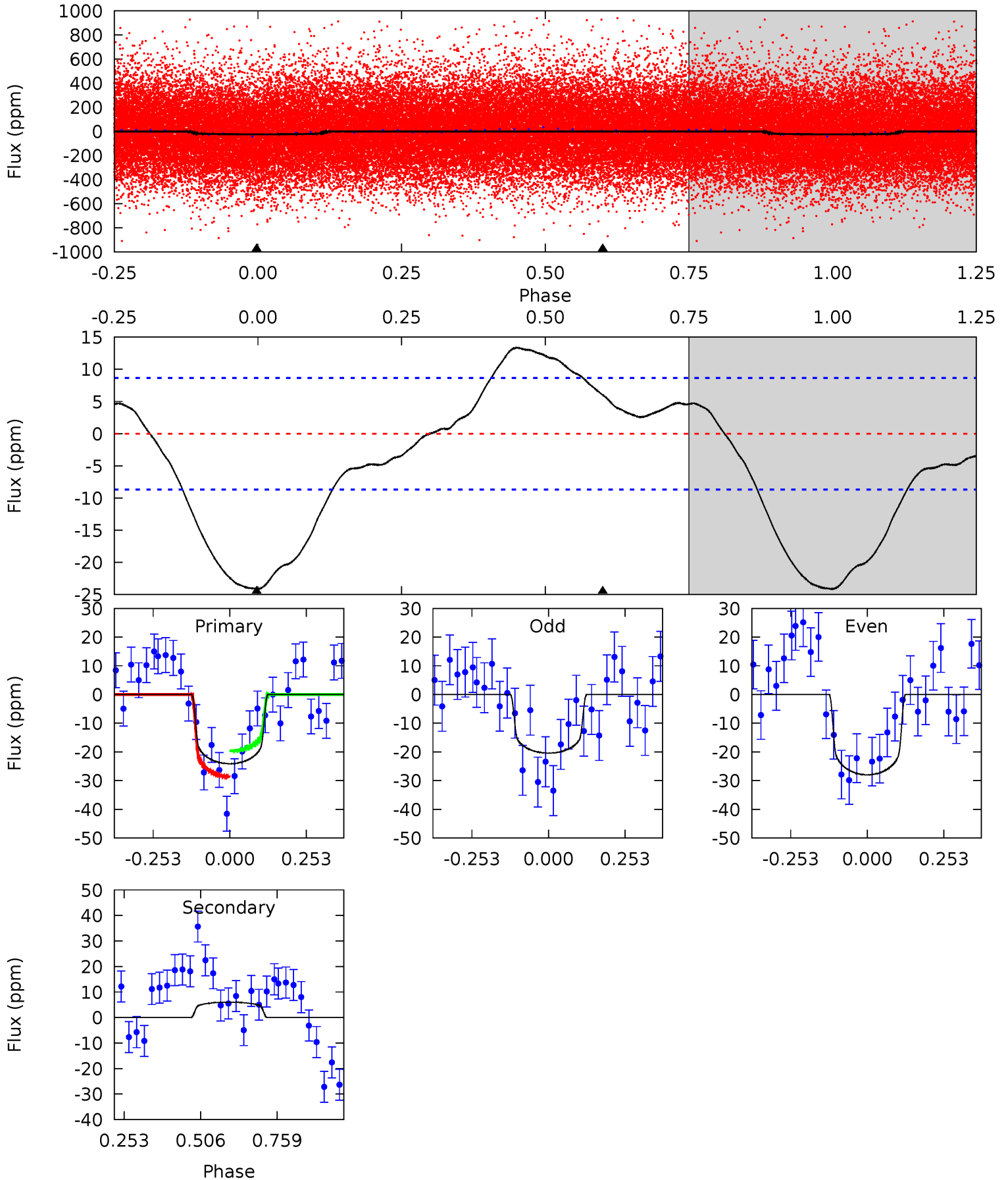




# DV Model-Shift Uniqueness Test

010622651-01, P = 1.378986 Days, E = 131.097593 Days

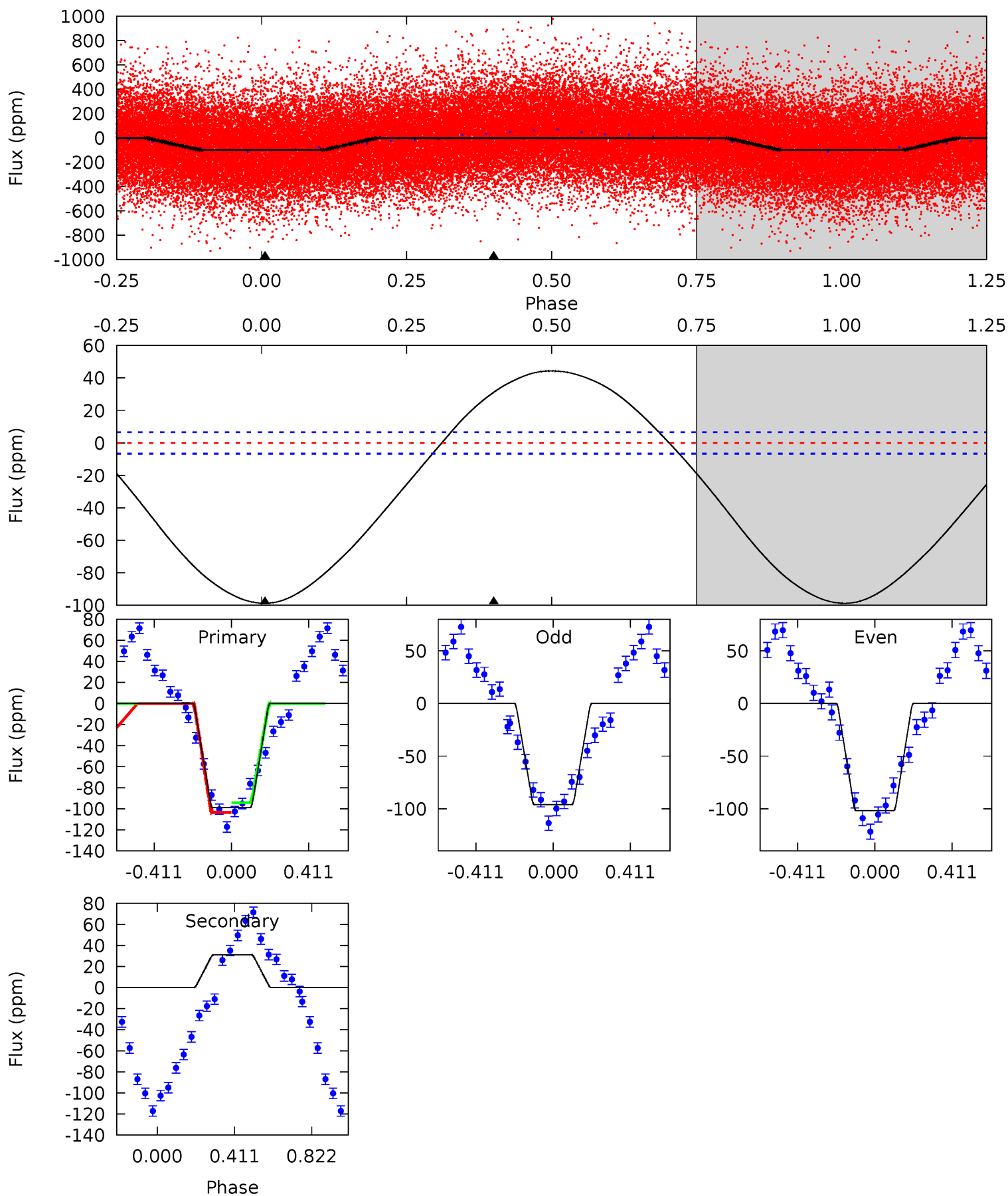
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	-3.03	0	0	4.37	1.14	0.76	12.1	12.1	-3.03	-3.03	1.89	1.12	0.36	2.28



# Alt Model-Shift Uniqueness Test

010622651-01, P = 1.379027 Days, E = 131.089462 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
63.4	-20.0	0	0	4.26	0.82	7.08	63.4	63.4	-20.0	-20.0	1.83	1.04	0.31	3.02





### Stellar Parameters For KIC 010622651

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6770^{+165}_{-259}$	$4.216^{+0.124}_{-0.201}$	$-0.060^{+0.250}_{-0.350}$	$1.491^{+0.495}_{-0.304}$	$1.340^{+0.204}_{-0.224}$	$0.570^{+0.364}_{-0.300}$
	+2%/-4%	+3%/-5%	+417%/-583%	+33%/-20%	+15%/-17%	+64%/-53%
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 010622651-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$6 \pm 2$	$0.85^{+0.32}_{-0.32}$	$3135^{+255}_{-194}$	$-4853^{+594}_{-1096}$	$-3.165^{+1.690}_{-4.927}$
Alt.	$31 \pm 2$	$1.75^{+0.41}_{-0.33}$	$3150^{+245}_{-204}$	$-5086^{+339}_{-431}$	$-4.022^{+1.396}_{-2.112}$

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

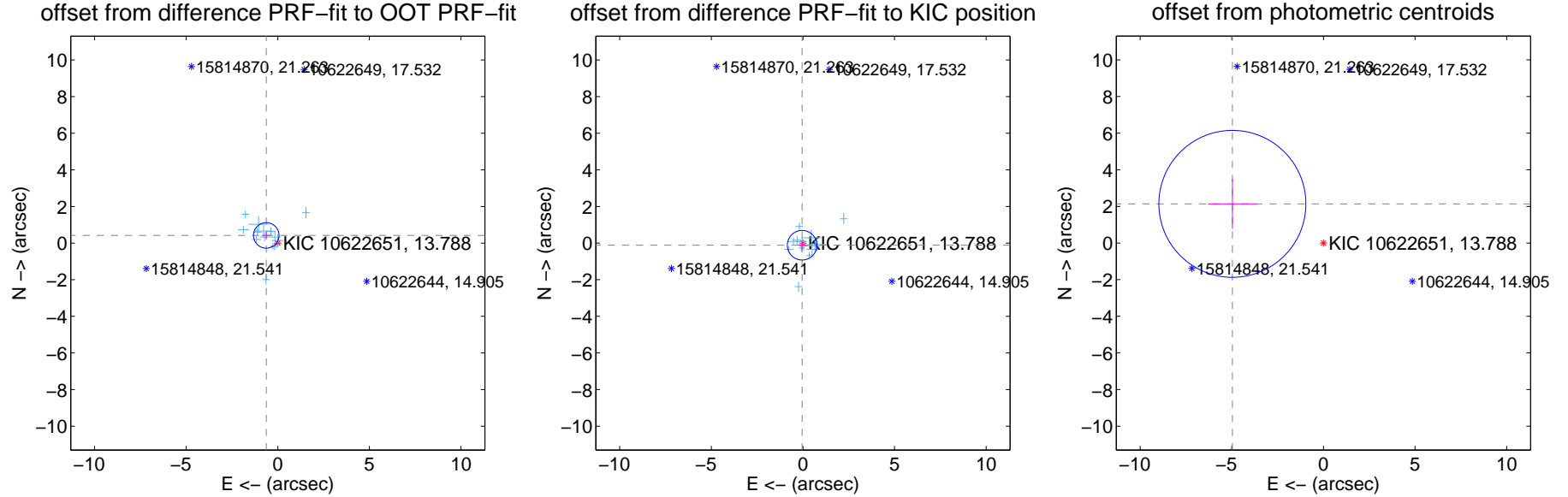
## DV Centroid Data

Supplemental centroid analysis for 010622651-01. Kepler magnitude: 13.79. Transit SNR 7.21

There are 14 quarters with good PRF difference image offsets

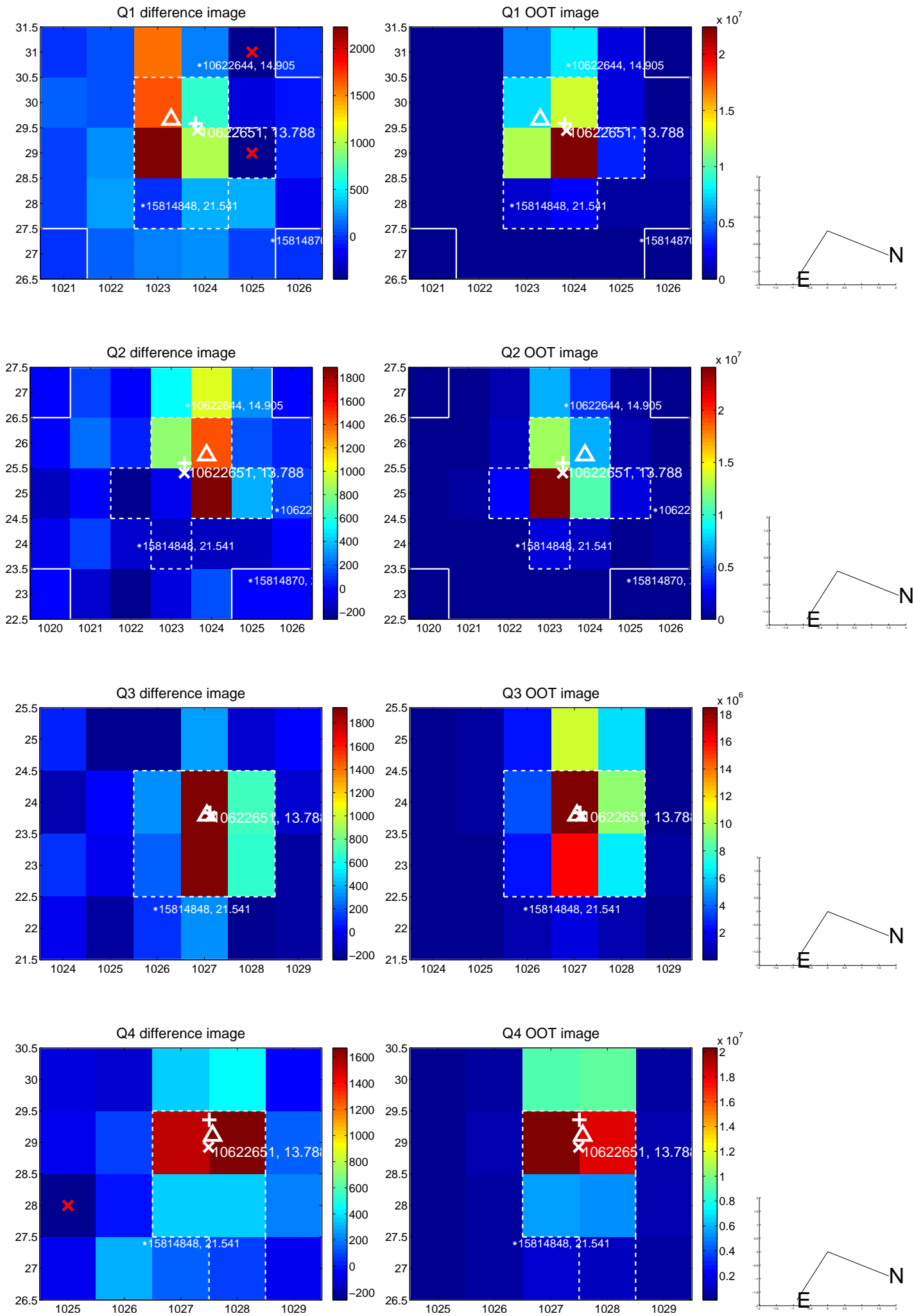
The direct PRF centroid is offset from the target star catalog position by about 0.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>0.757 \pm 0.232</math></b>	<b>3.26</b>	$0.630 \pm 0.246$	$0.420 \pm 0.218$
PRF-fit source offset from KIC position	$0.125 \pm 0.269$	0.46	$0.044 \pm 0.203$	$-0.117 \pm 0.244$
photometric centroid source offset	<b><math>5.41 \pm 1.34</math></b>	<b>4.05</b>	$4.97 \pm 1.33$	$2.14 \pm 1.36$

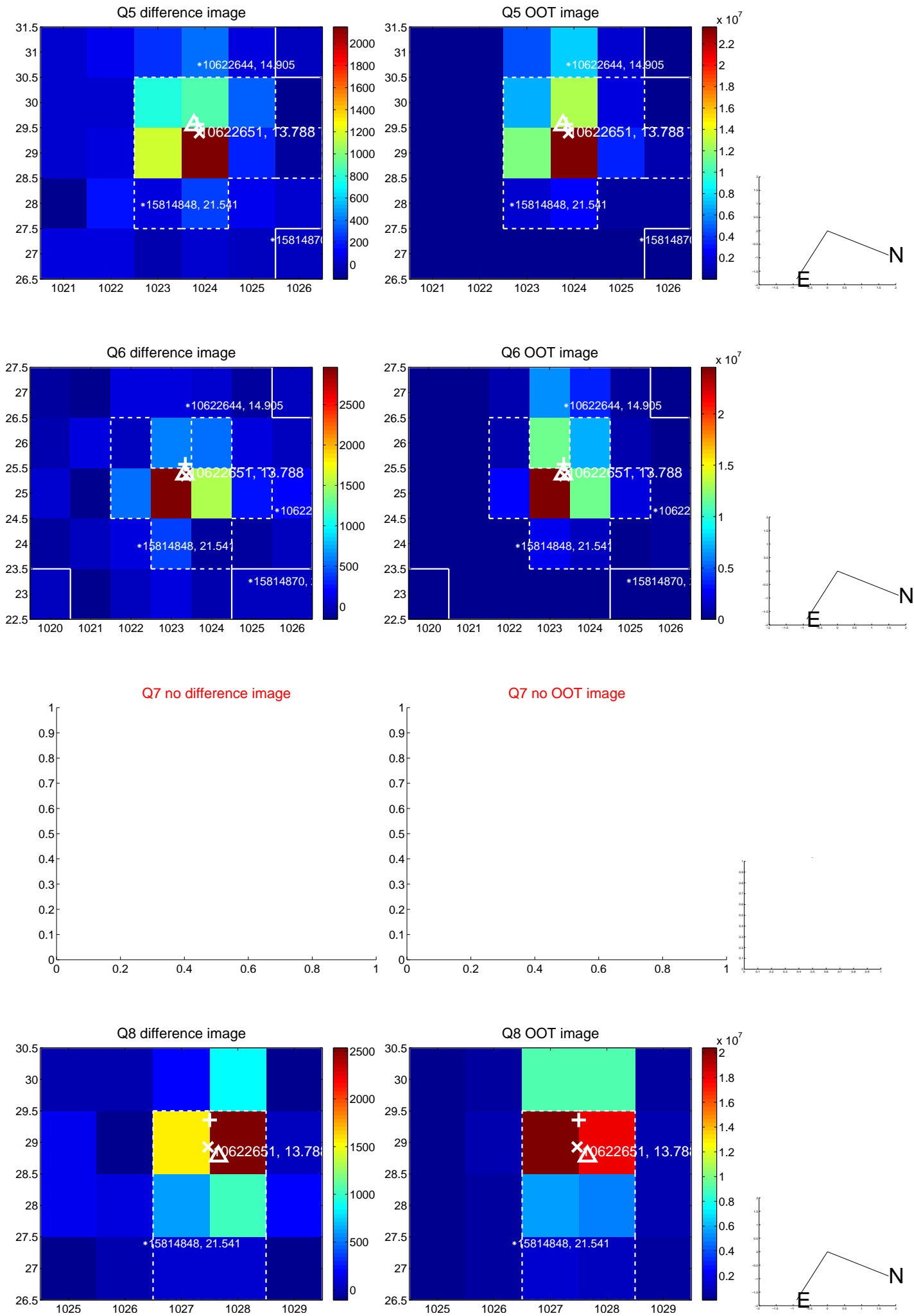


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

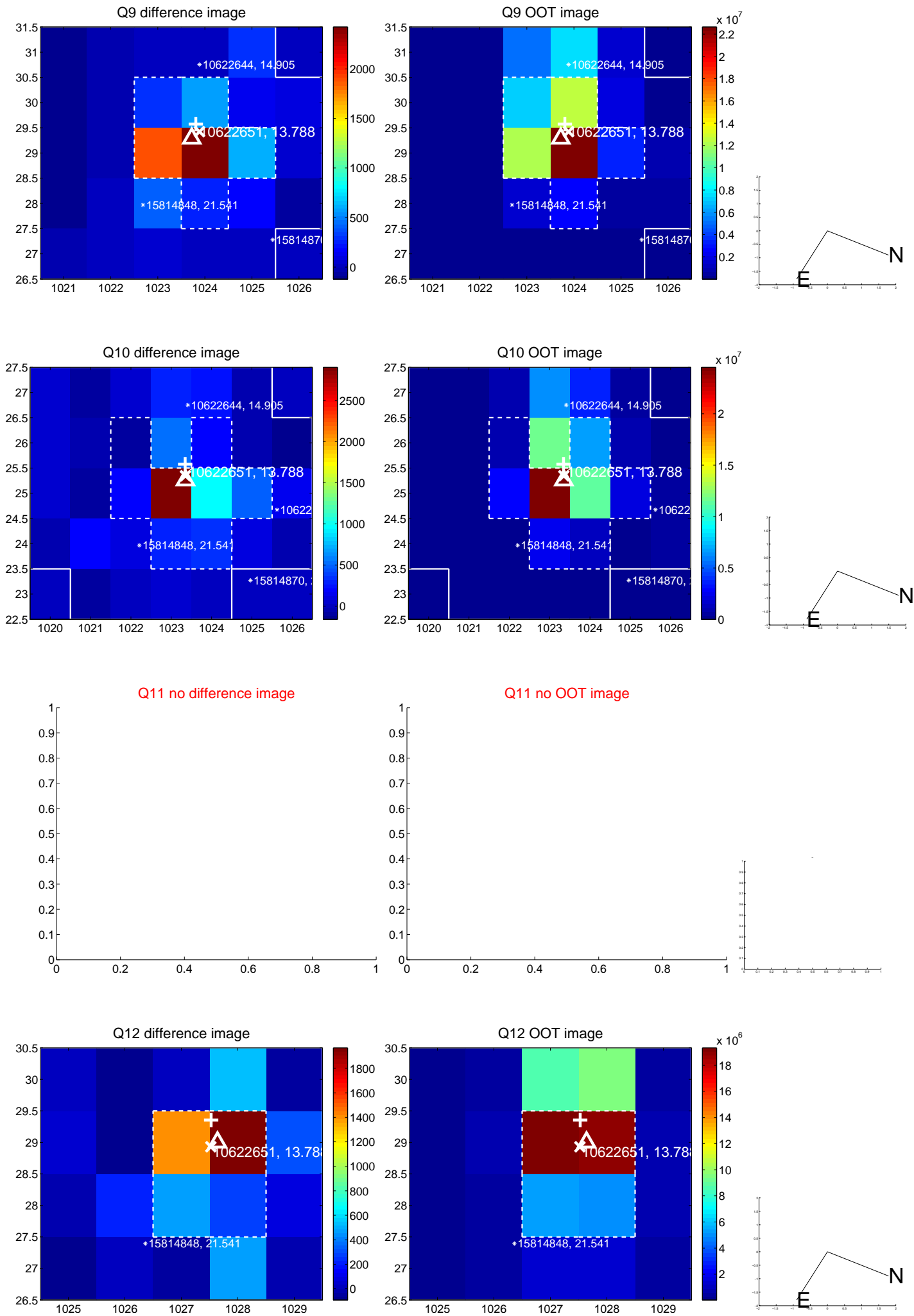


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

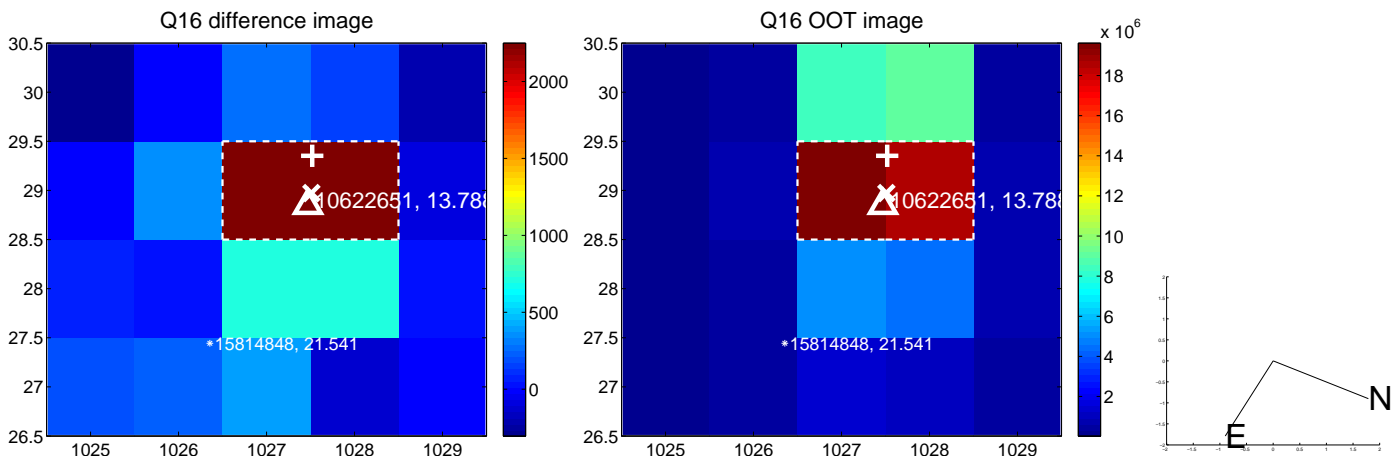
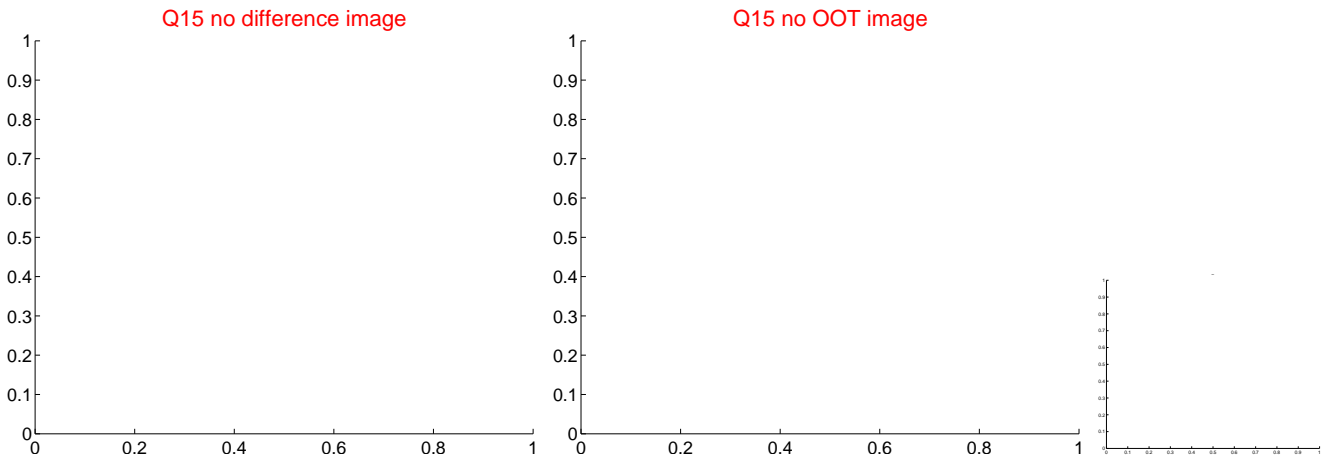
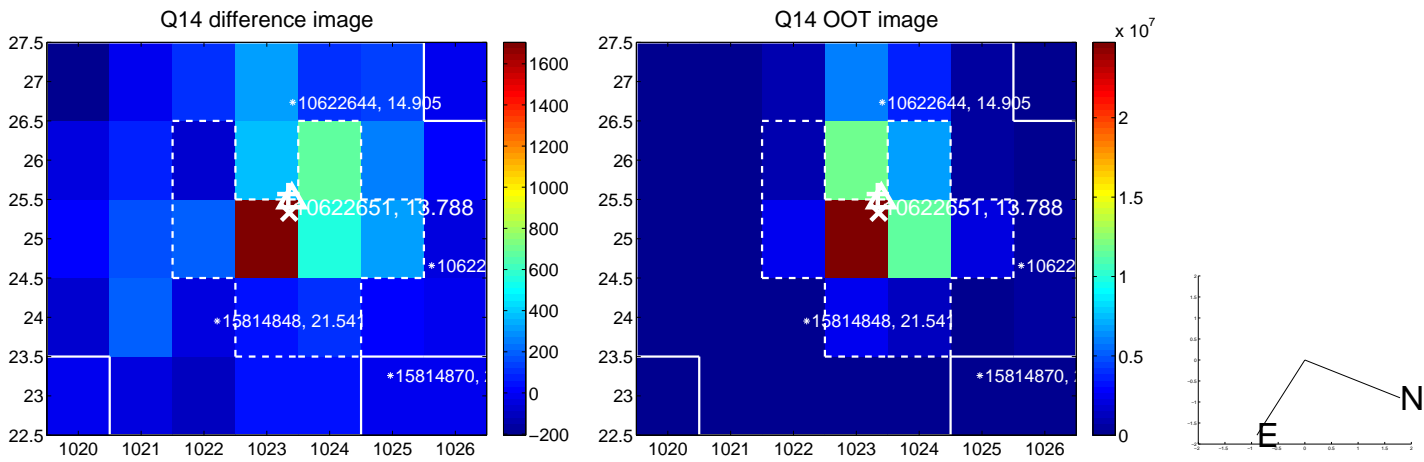
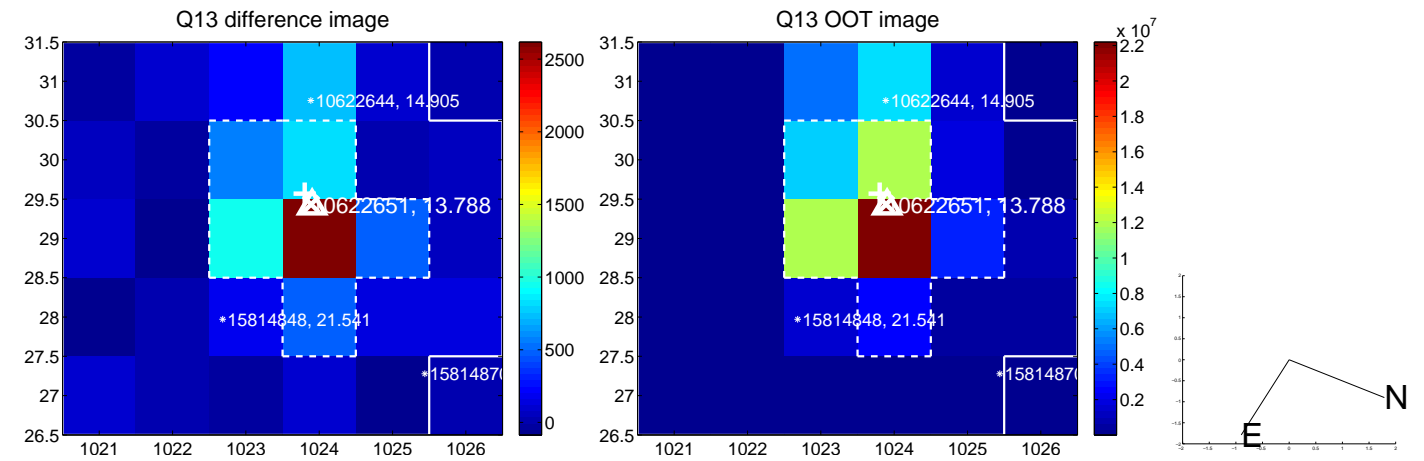




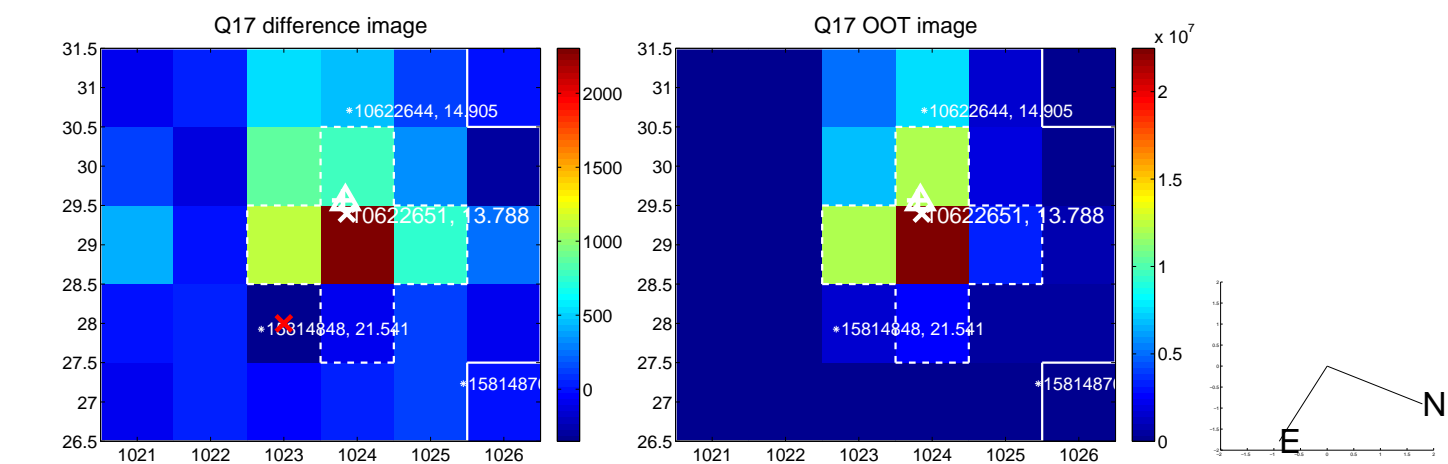
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



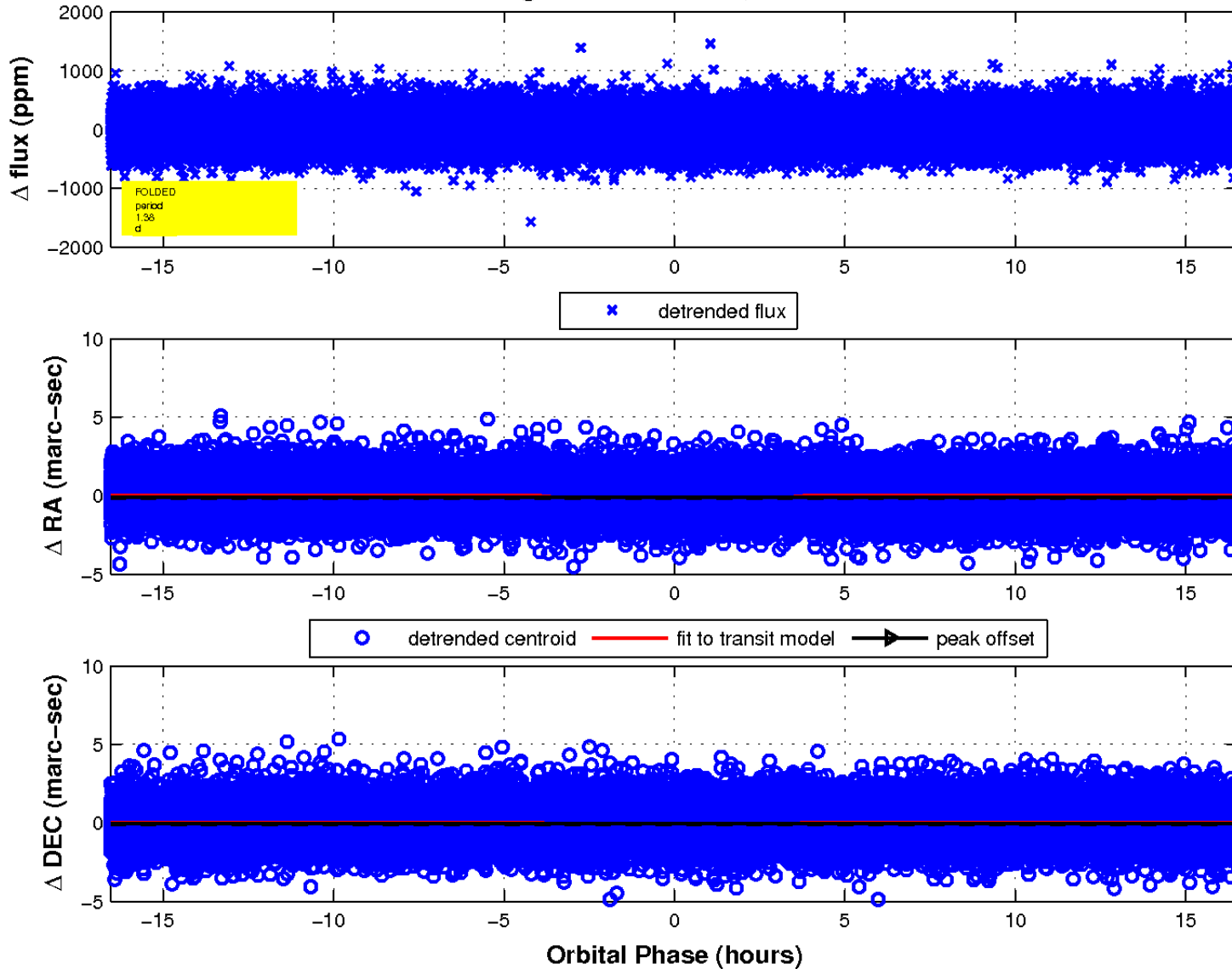
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

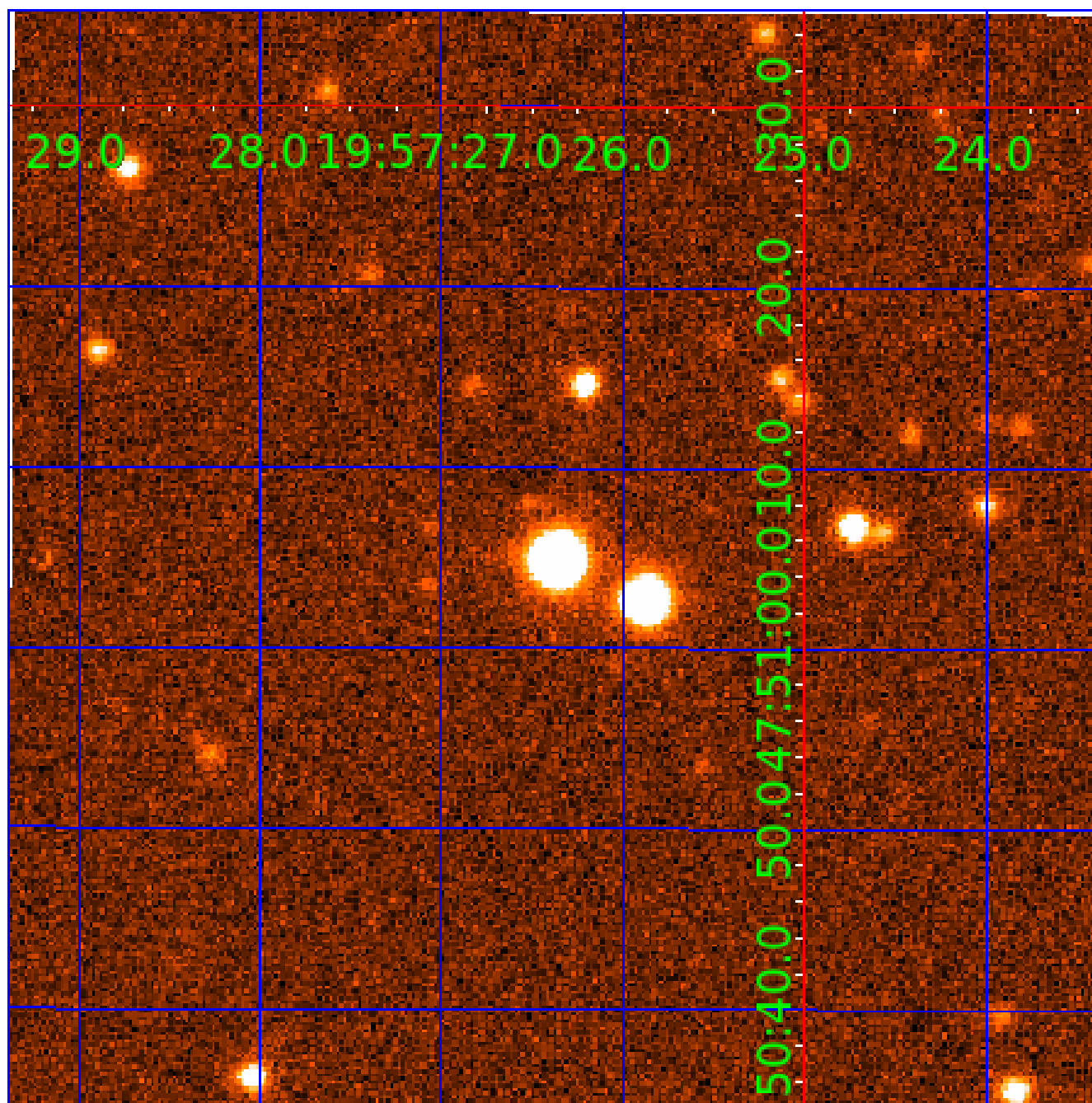


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 010622651

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010622651-01	OBS	No	1.378986	132.476579	21.0	7.934	7.4	7.2	1.49	6770	0.82	5872.47
010622651-02	OBS	No	370.812110	177.477842	334.1	4.146	7.3	7.6	1.49	6770	2.75	3.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010622651-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010622651-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

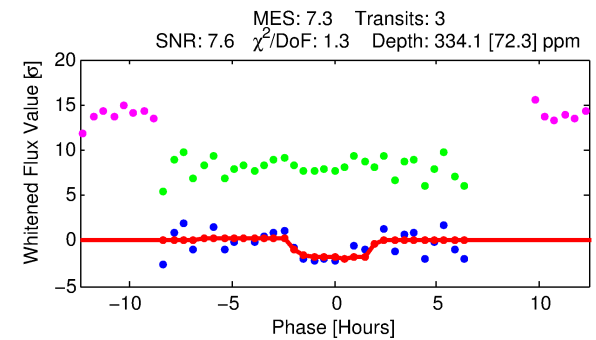
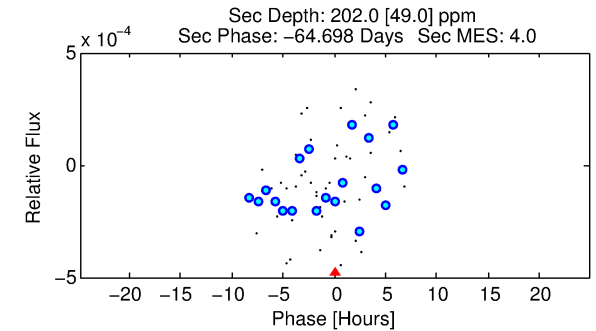
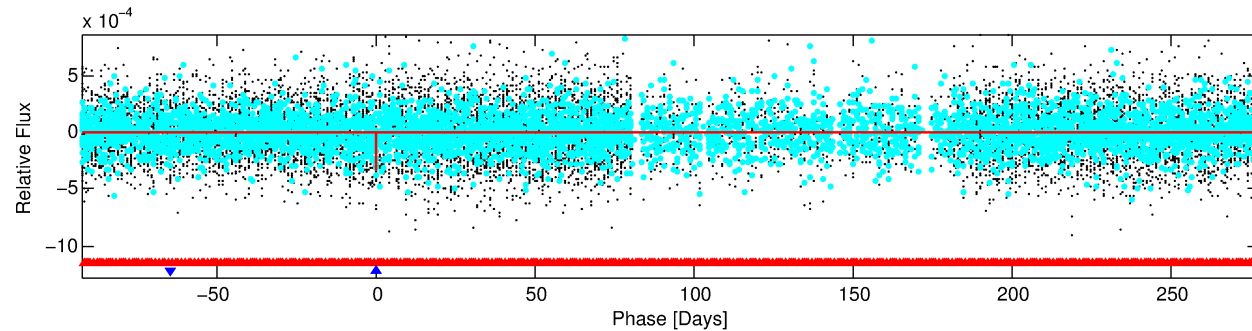
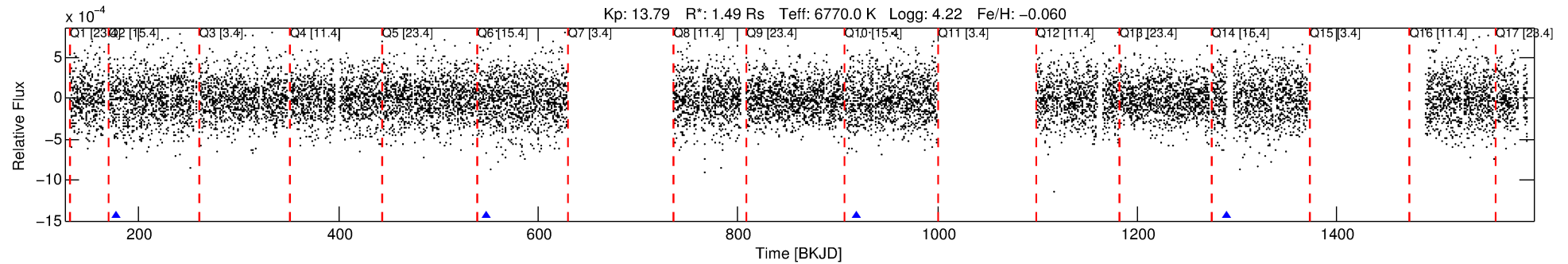
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010622651-02

No Significant Match Found

# DV One-Page Summary

KIC: 10622651 Candidate: 2 of 2 Period: 370.812 d

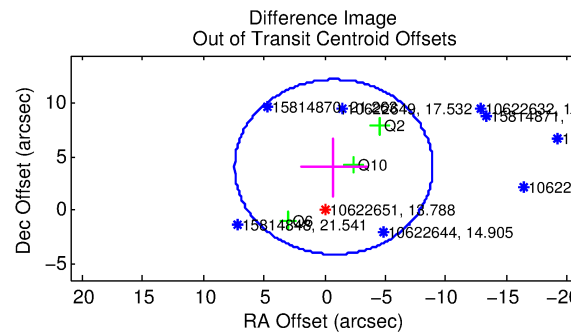
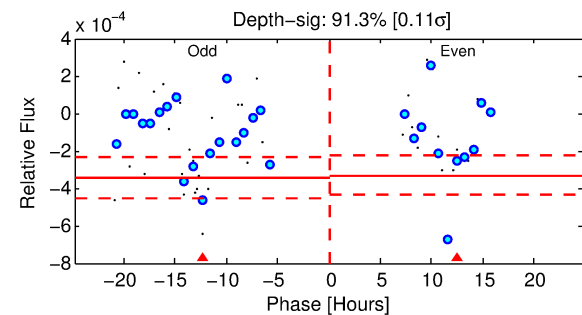
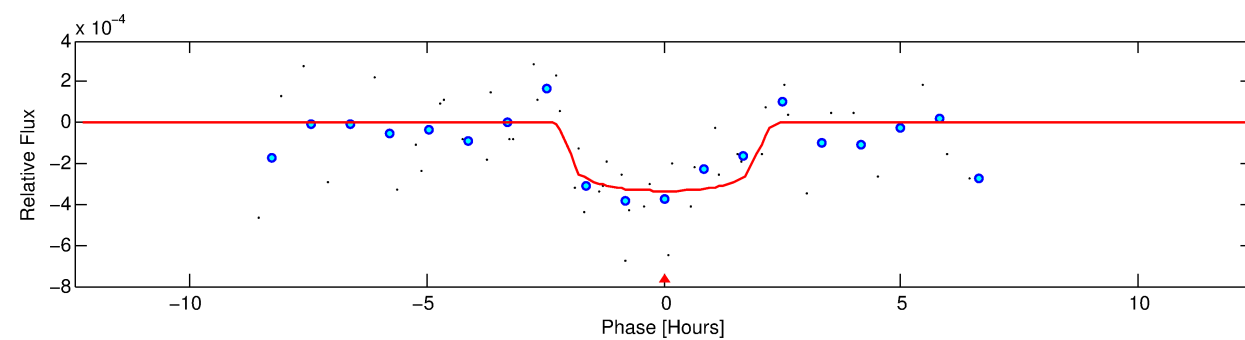


## DV Fit Results:

Period = 370.81211 [0.00984] d  
Epoch = 177.4778 [0.0156] BKJD  
Rp/R\* = 0.0169 [0.0487]  
a/R\* = 690.50 [10865.56]  
b = 0.11 [138.67]  
Seff = 3.38 [1.39]  
Teq = 346 [35] K  
Rp = 2.75 [7.98] Re  
a = 1.1120 [0.3000] AU  
Ag = 18171.97 [105151.63] [0.17σ]  
Teffp = 6208 [8965] K [0.65σ]

## DV Diagnostic Results:

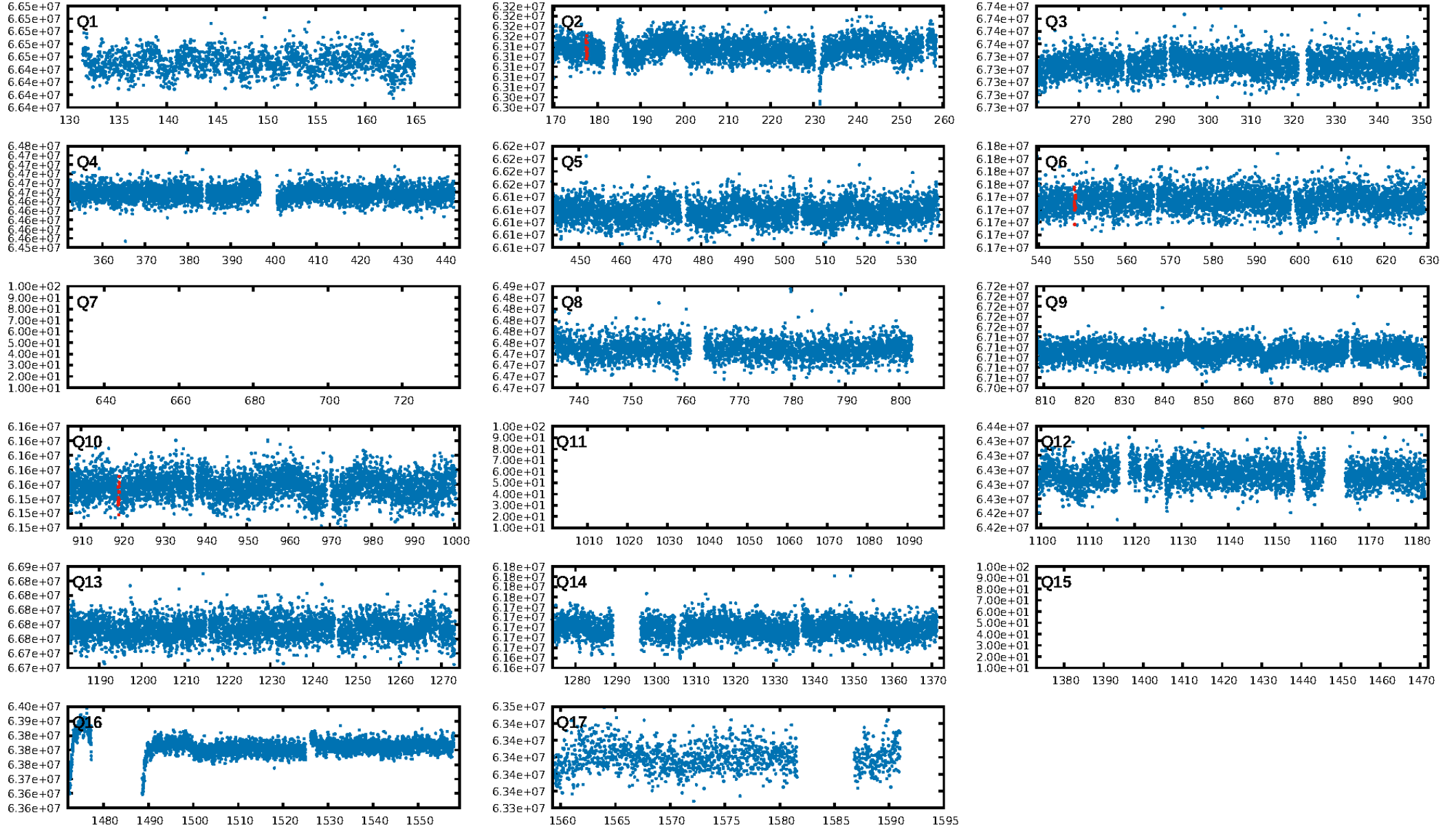
ShortPeriod-sig: 100.0% [990.47σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 72.6%  
ModelChiSquareGof-sig: 97.9%  
**Bootstrap-pfa: 1.30e-08**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.8242**  
Centroid-sig: 10.8%  
Centroid-so: 2.817 arcsec [1.17σ]  
OotOffset-rm: 4.133 arcsec [1.52σ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 4.022 arcsec [1.46σ]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.67 [2/3]



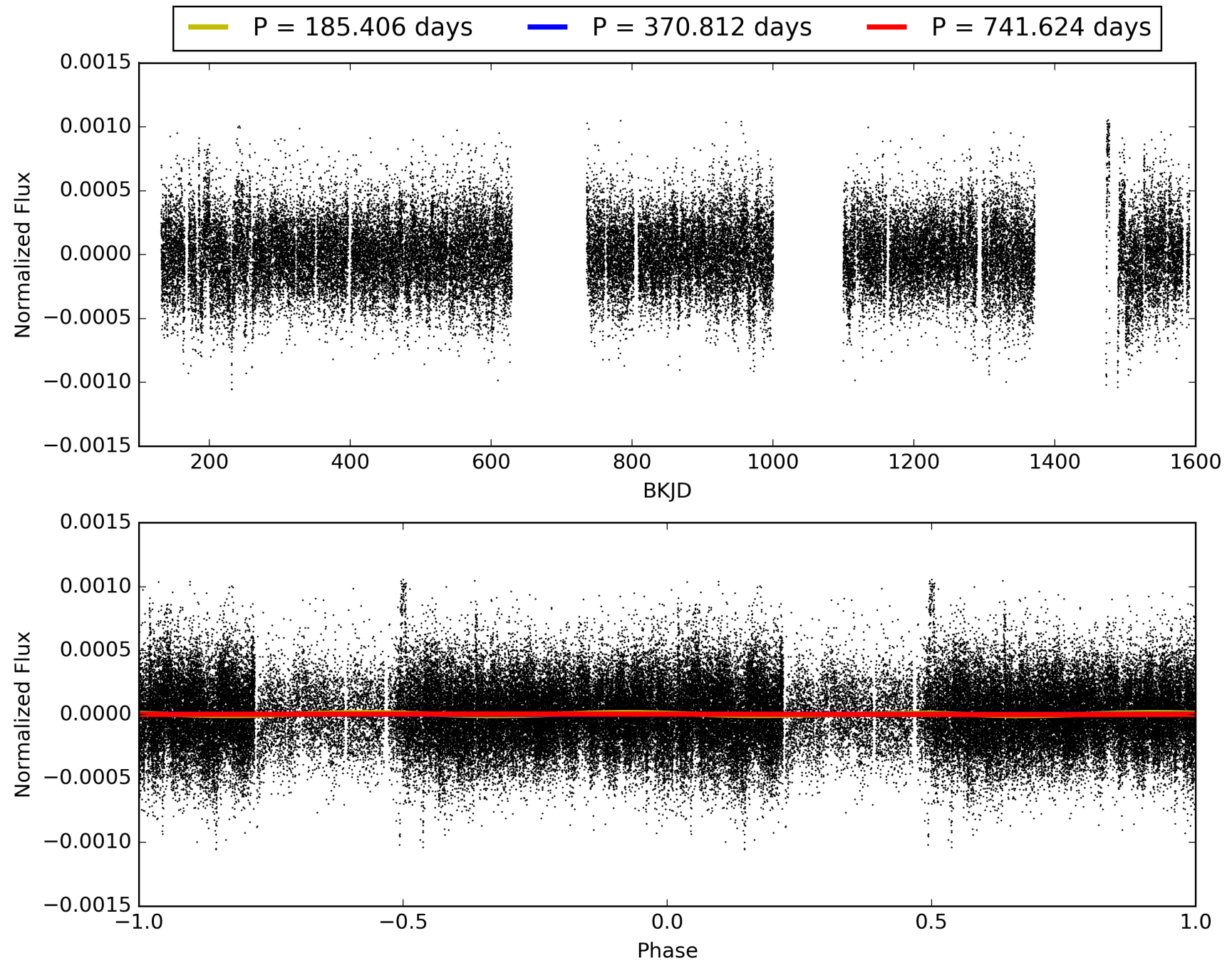
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:49:14 Z

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

# TCE 010622651-02, PDC Light Curves



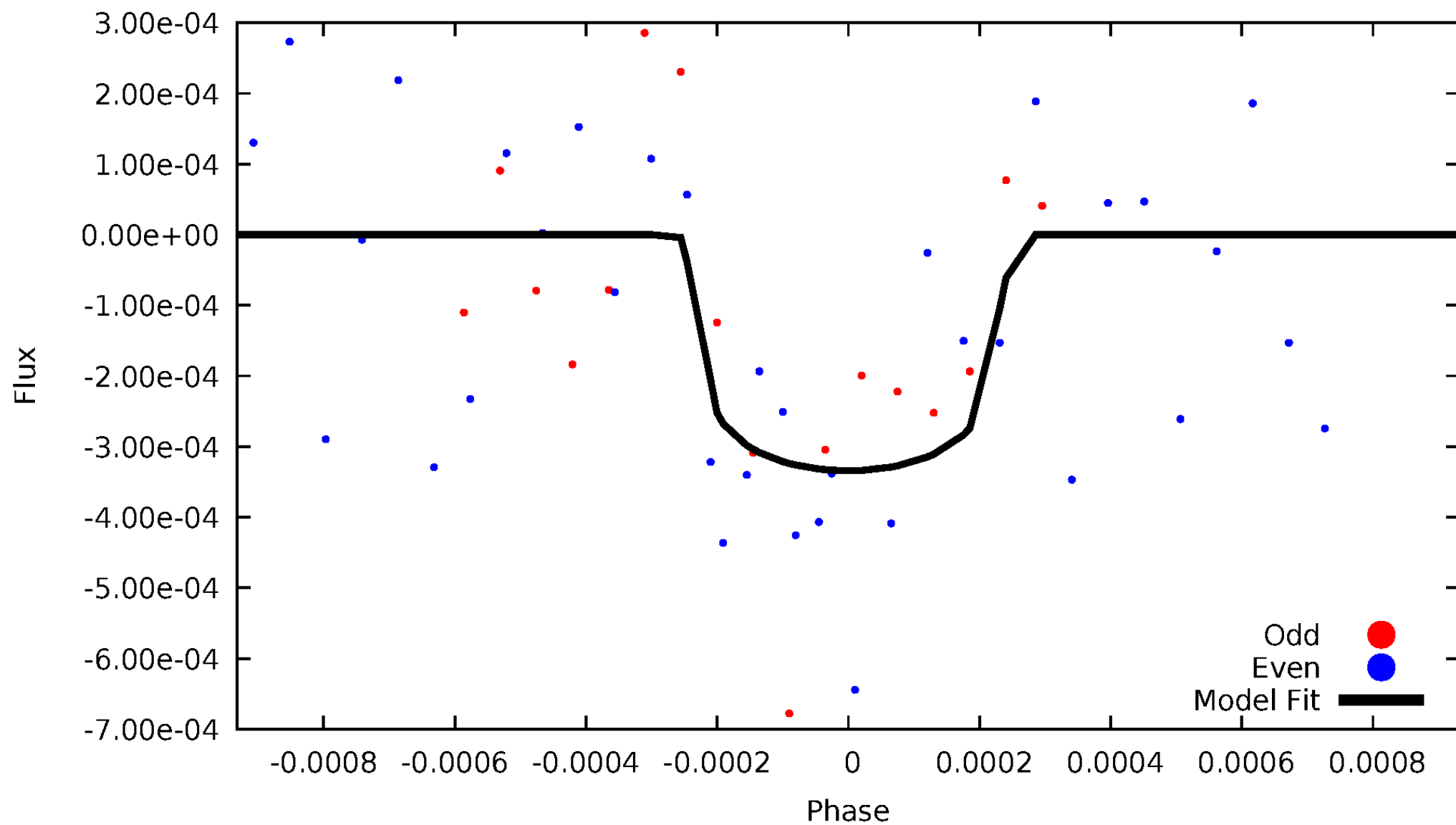
TCE 010622651-02





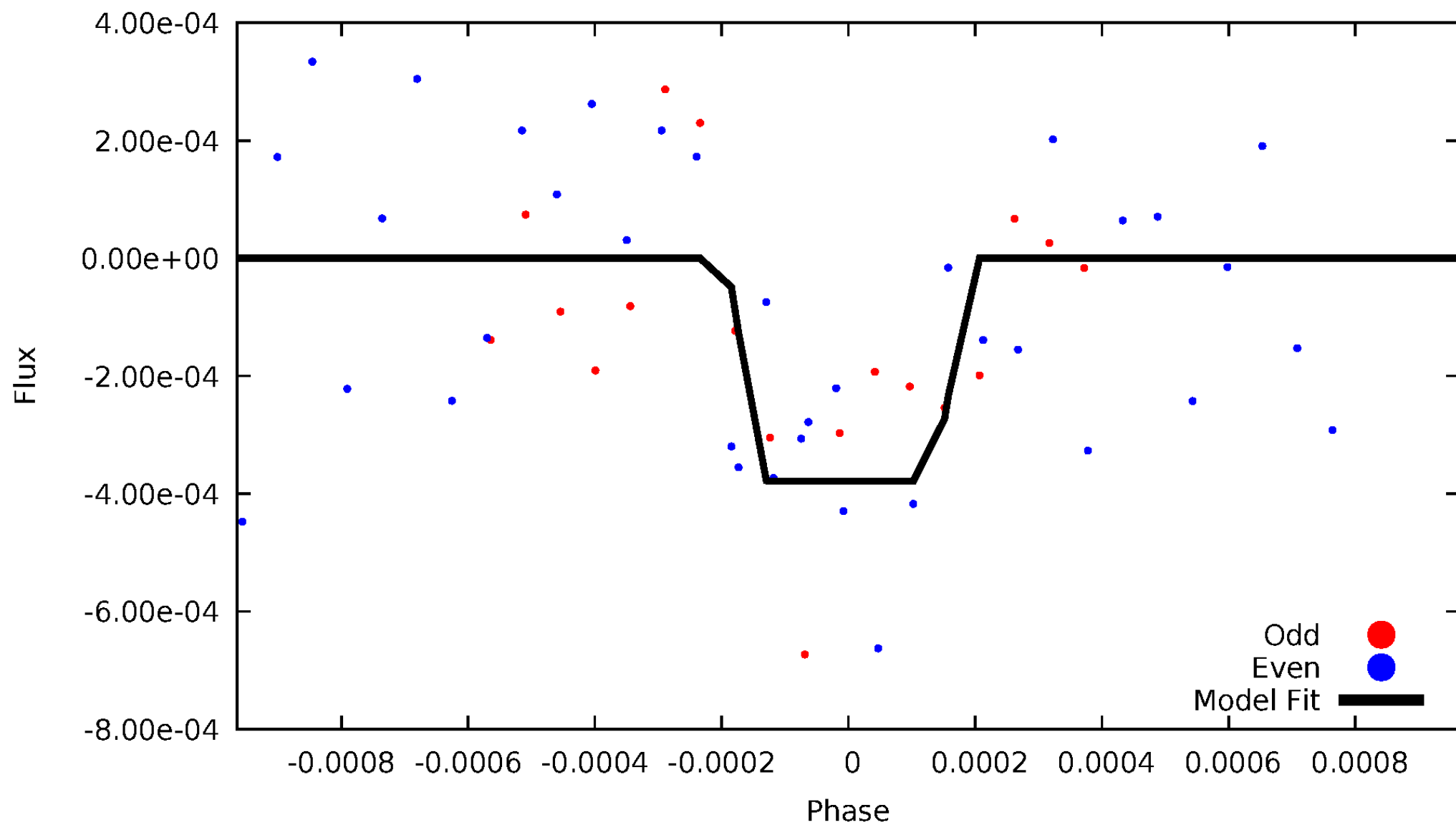
# DV Odd/Even

TCE 010622651-02



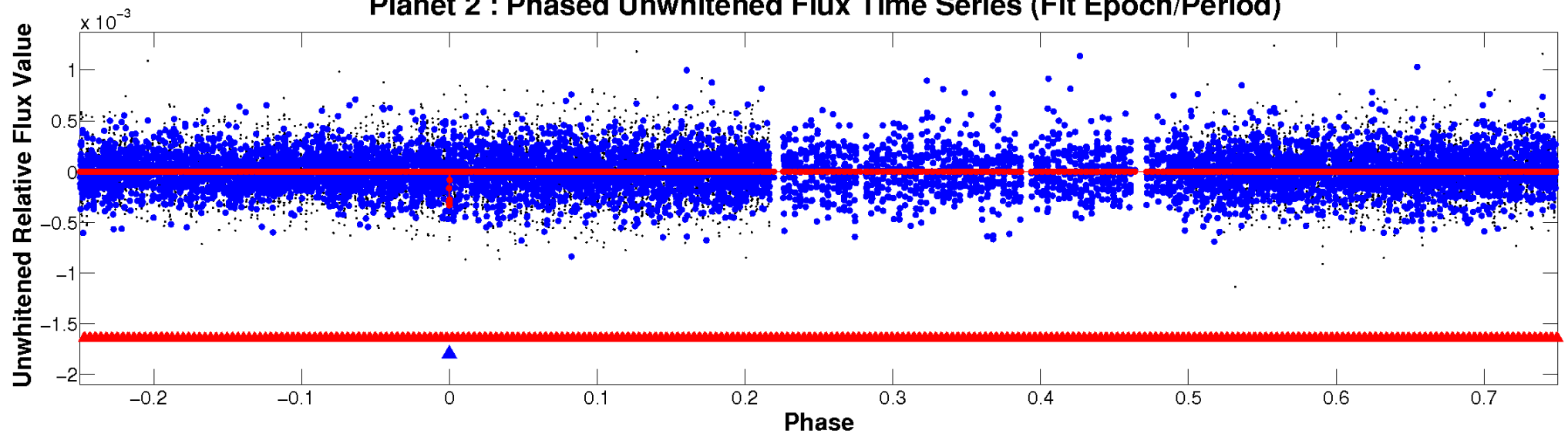
# ALT Odd/Even

TCE 010622651-02

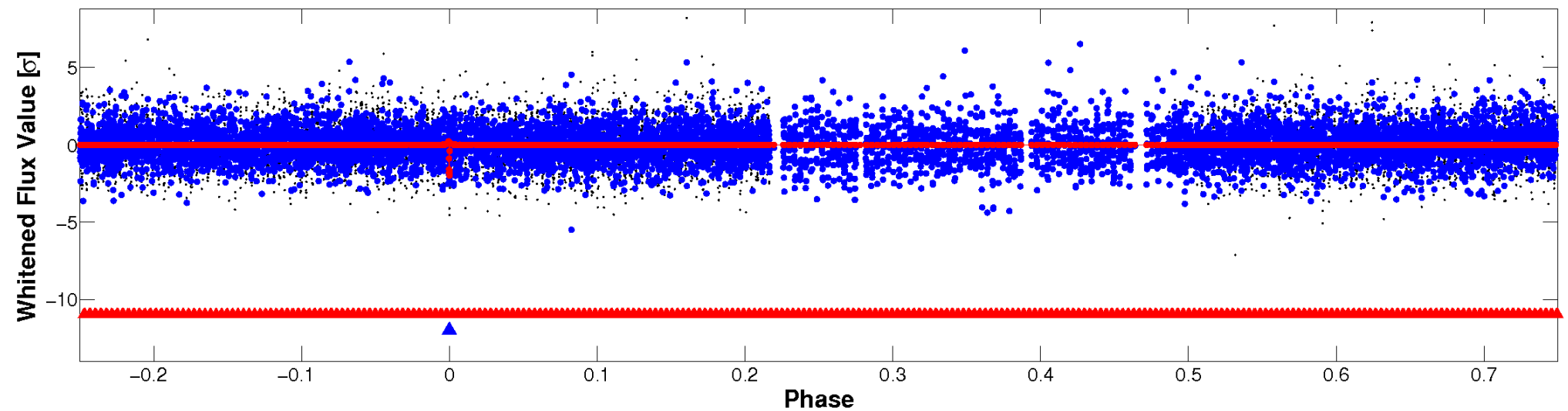


# Non-Whitened Vs. Whitened Light Curve

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

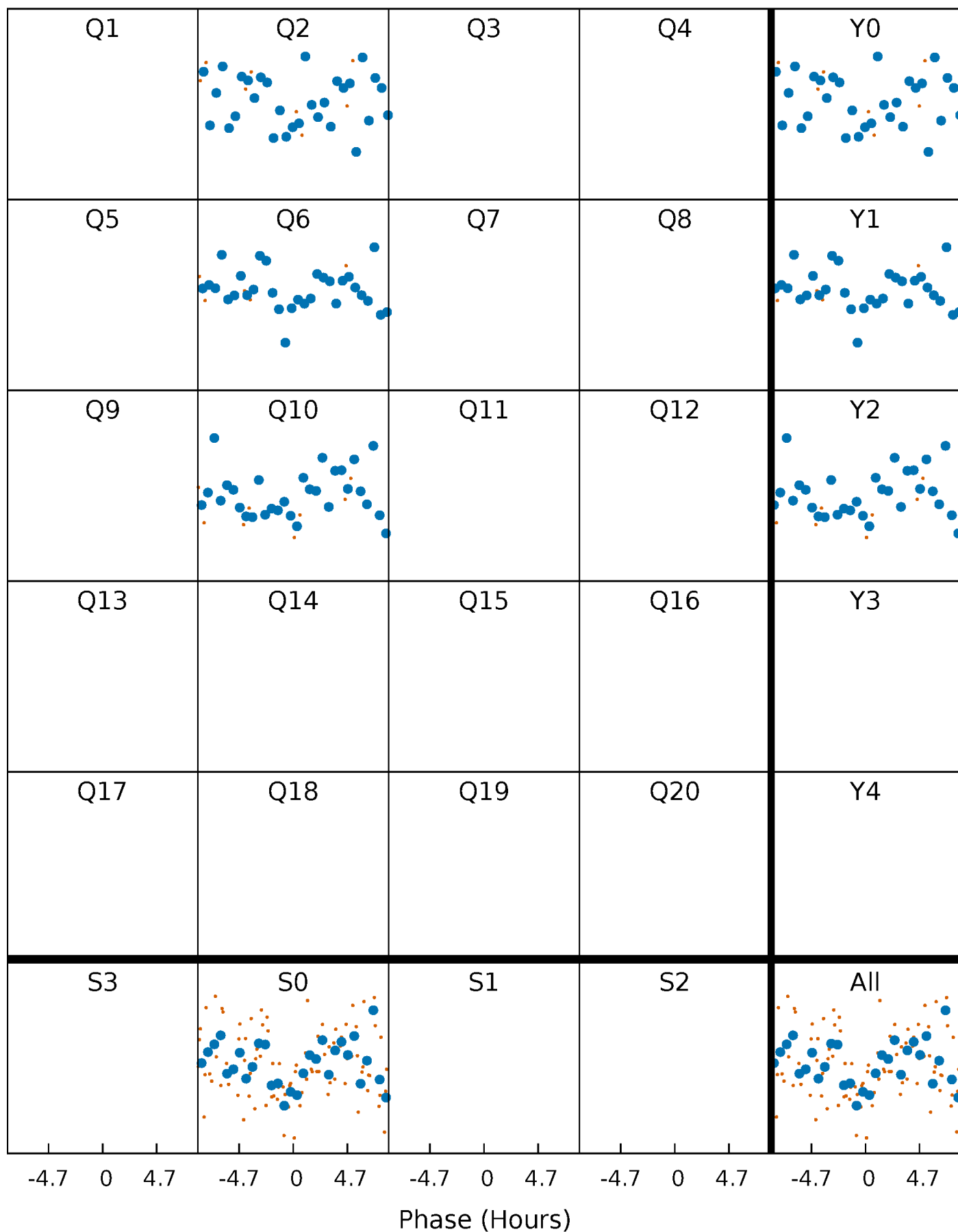


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



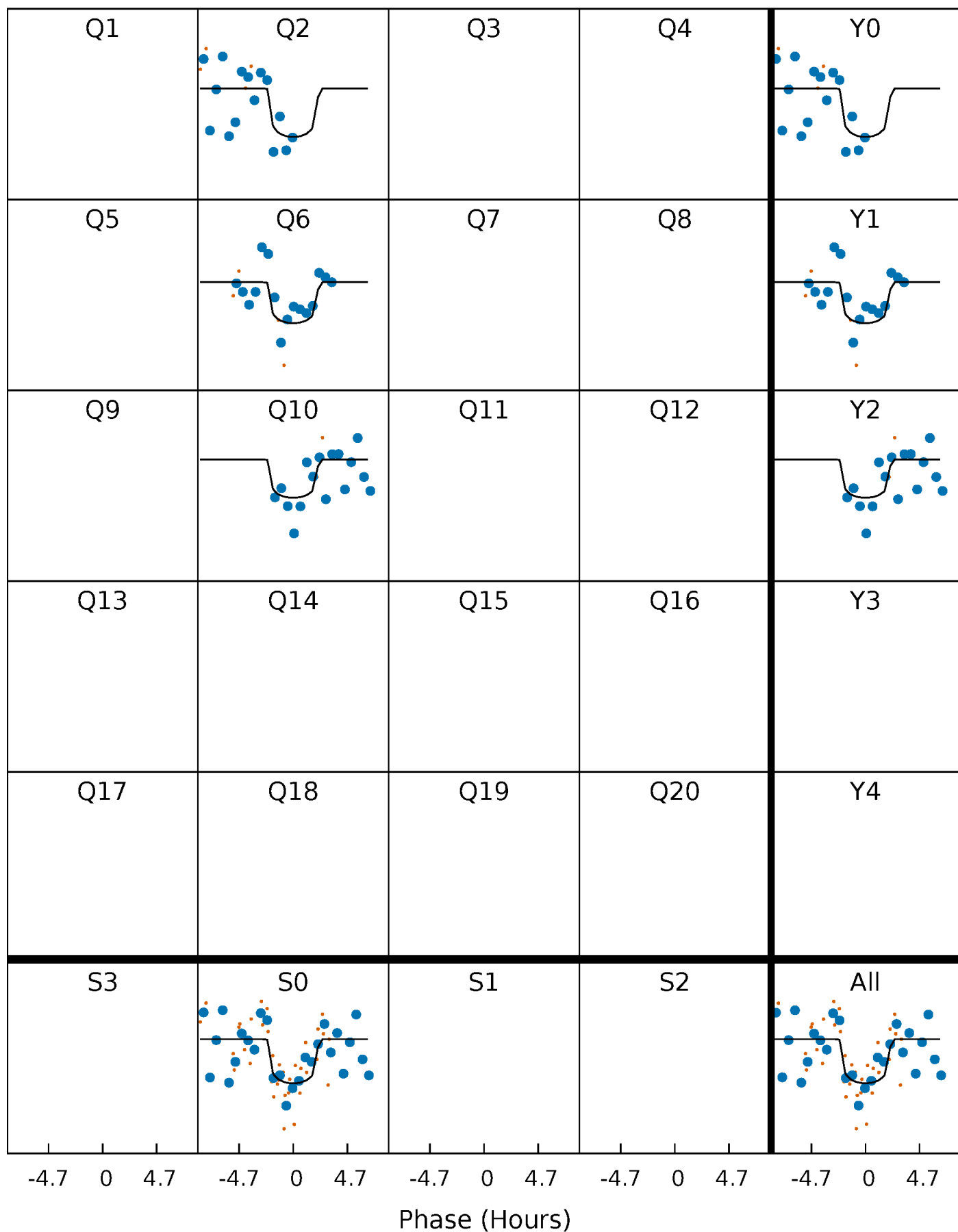
# PDC Quarter-Phased Transit Curves

TCE 010622651-02     $P=370.812110$  Days     $T_0=177.477842$  (BKJD)



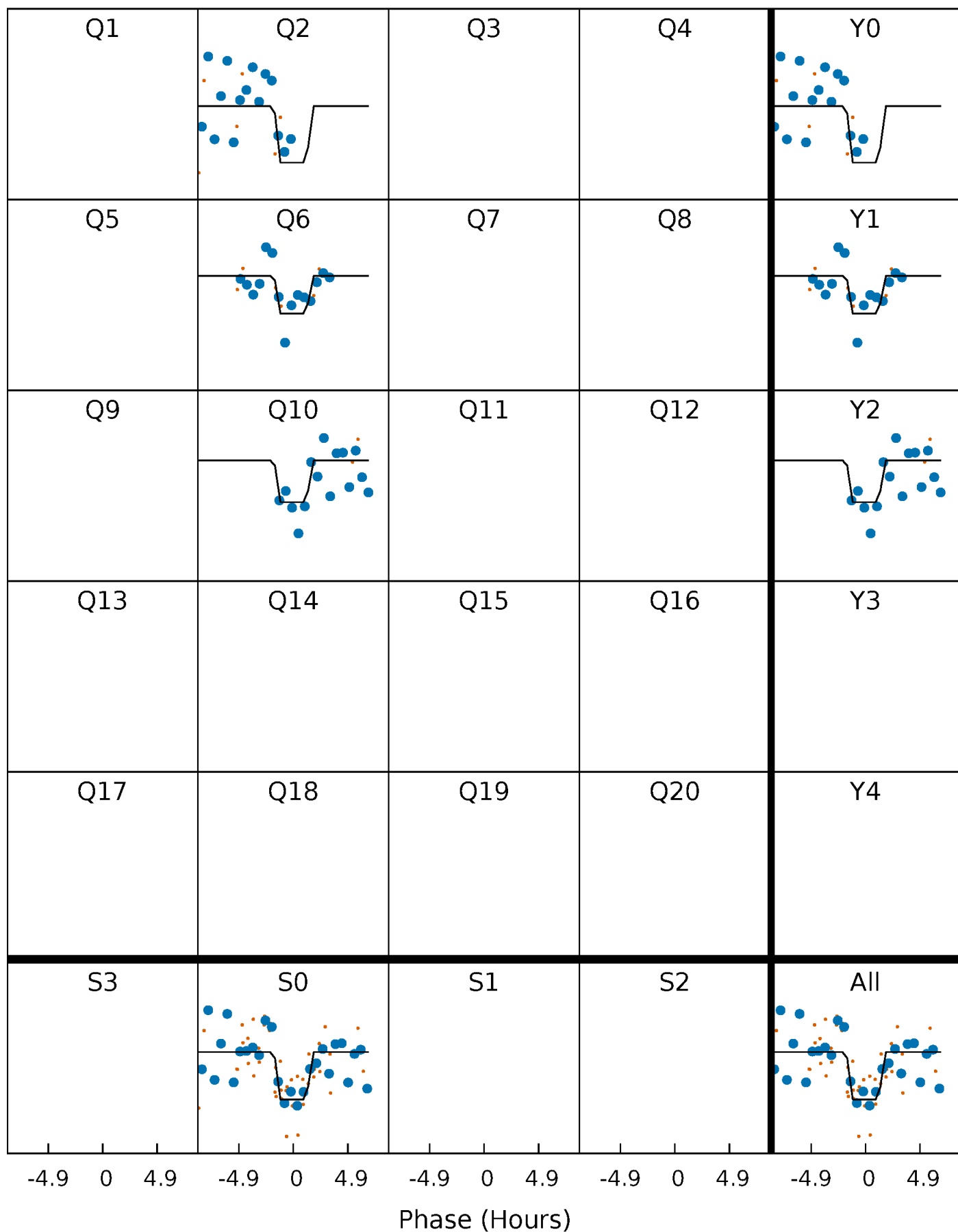
# DV Quarter-Phased Transit Curves

TCE 010622651-02 P=370.812110 Days  $T_0=177.477842$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010622651-02 P=370.806408 Days  $T_0=177.475538$  (BKJD)

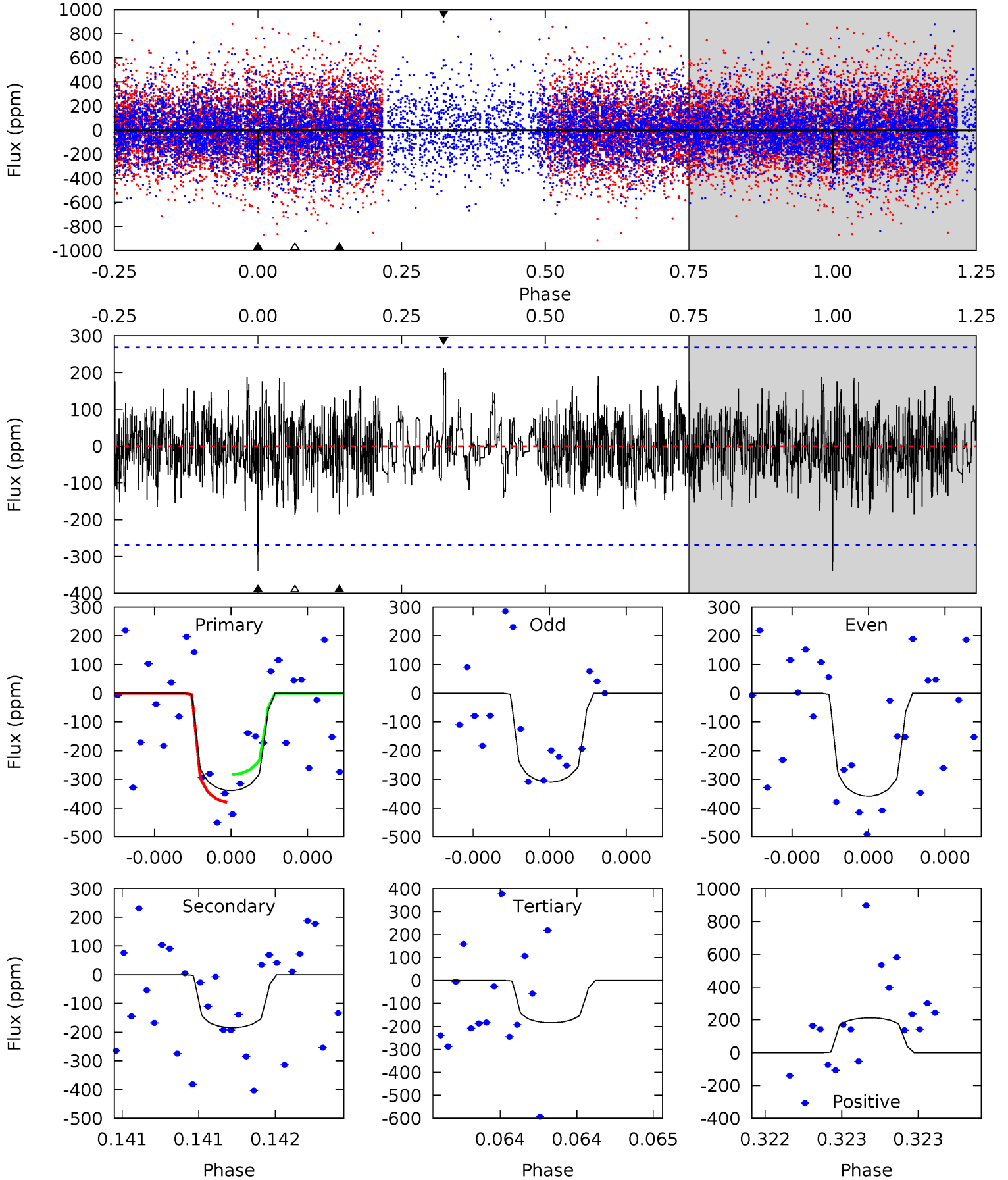




# DV Model-Shift Uniqueness Test

010622651-02, P = 370.812110 Days, E = 177.477842 Days

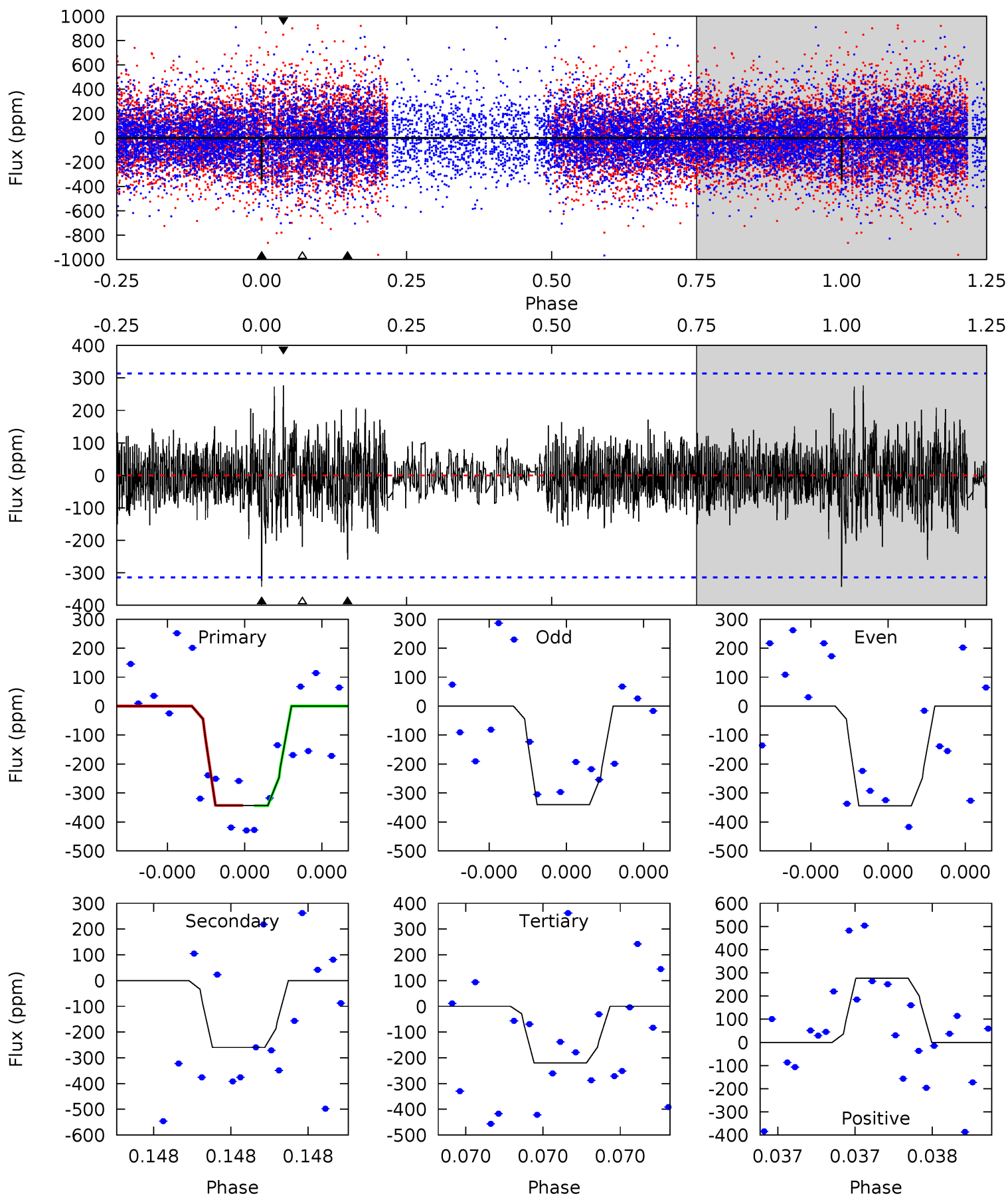
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.05	3.83	3.83	4.41	5.57	3.48	1.23	3.22	2.64	0.00	-0.58	0.49	0.97	0.38	0.96



# Alt Model-Shift Uniqueness Test

010622651-02, P = 370.806408 Days, E = 177.475538 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
6.16	4.66	3.95	4.97	5.64	3.58	1.06	2.21	1.19	0.71	-0.30	0.04	0.95	0.45	0.01



### Stellar Parameters For KIC 010622651

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6770^{+165}_{-259}$	$4.216^{+0.124}_{-0.201}$	$-0.060^{+0.250}_{-0.350}$	$1.491^{+0.495}_{-0.304}$	$1.340^{+0.204}_{-0.224}$	$0.570^{+0.364}_{-0.300}$
	+2%/-4%	+3%/-5%	+417%/-583%	+33%/-20%	+15%/-17%	+64%/-53%
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 010622651-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-185 \pm 48$	$6.21^{+6.78}_{-4.49}$	$488^{+40}_{-32}$	$4308^{+3564}_{-1006}$	$3159^{+38166}_{-2464}$
Alt.	$-260 \pm 56$	$6.62^{+6.86}_{-4.59}$	$486^{+40}_{-30}$	$4454^{+3144}_{-972}$	$3819^{+32914}_{-2893}$

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

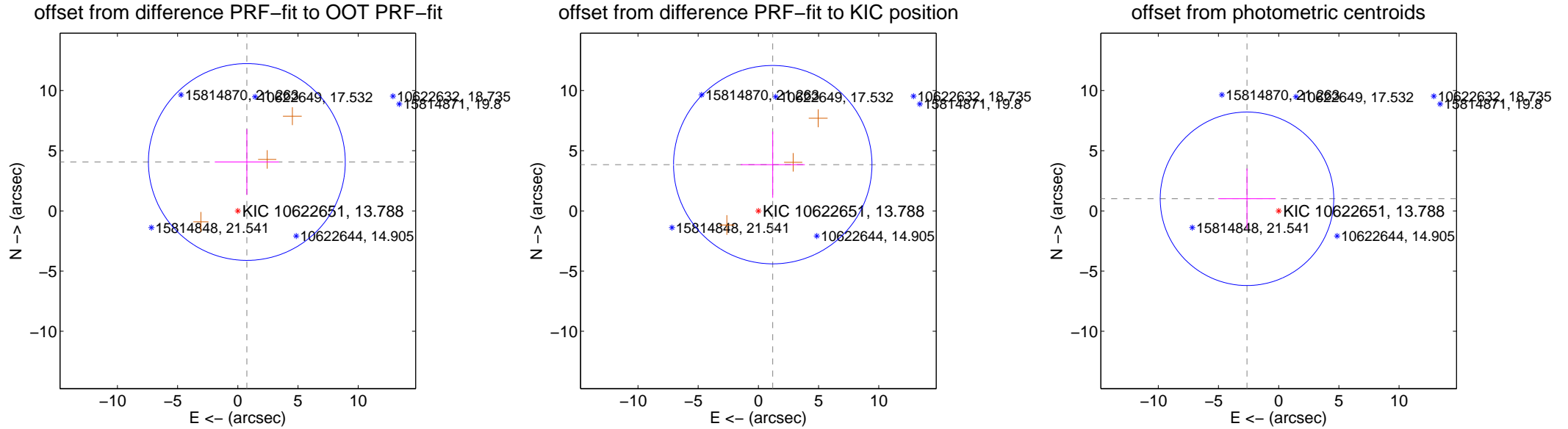
## DV Centroid Data

Supplemental centroid analysis for 010622651-02. Kepler magnitude: 13.79. Transit SNR 7.65

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.133 \pm 2.725$	1.52	$-0.751 \pm 2.659$	$4.064 \pm 2.727$
PRF-fit source offset from KIC position	$4.022 \pm 2.746$	1.46	$-1.194 \pm 2.658$	$3.841 \pm 2.755$
photometric centroid source offset	$2.82 \pm 2.40$	1.17	$2.63 \pm 2.39$	$1.01 \pm 2.51$



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.

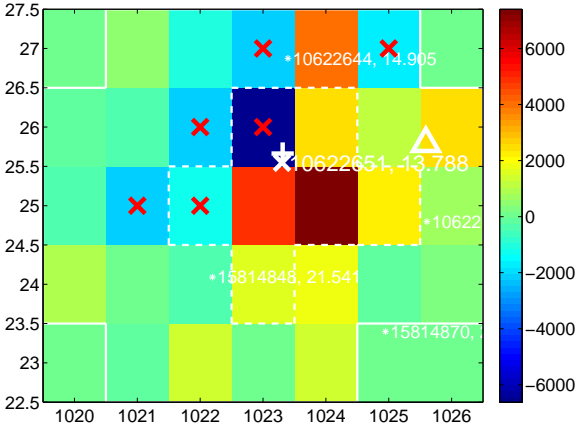
Q1 no difference image



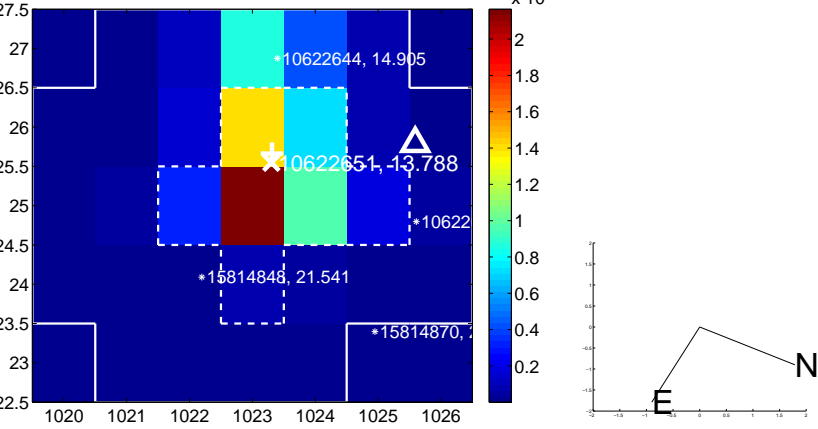
Q1 no OOT image



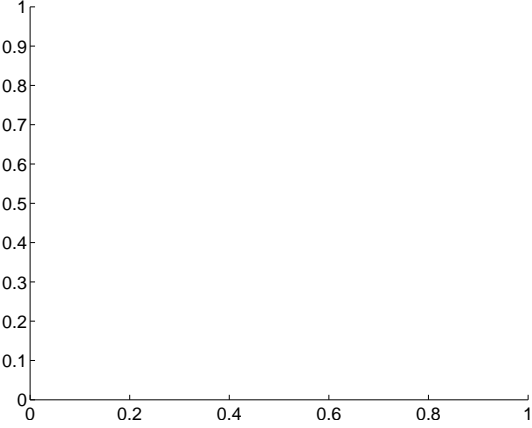
Q2 difference image. Poor Quality



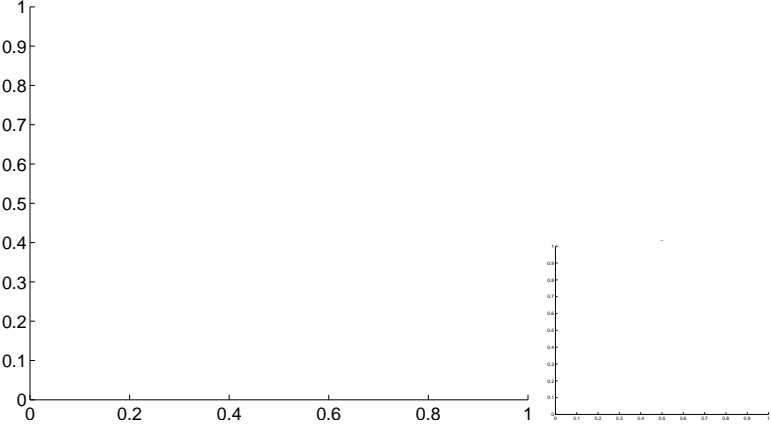
Q2 OOT image



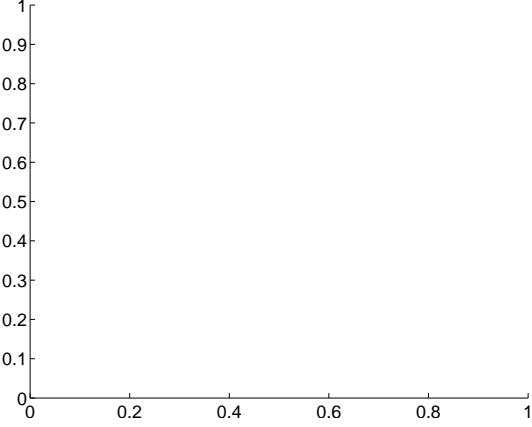
Q3 no difference image



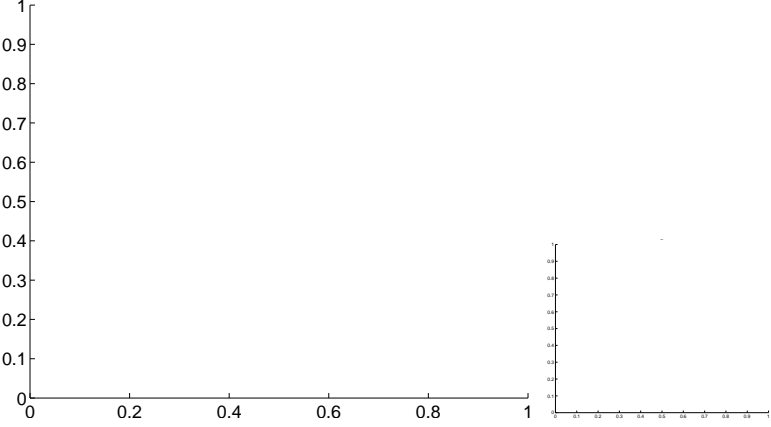
Q3 no OOT image



Q4 no difference image

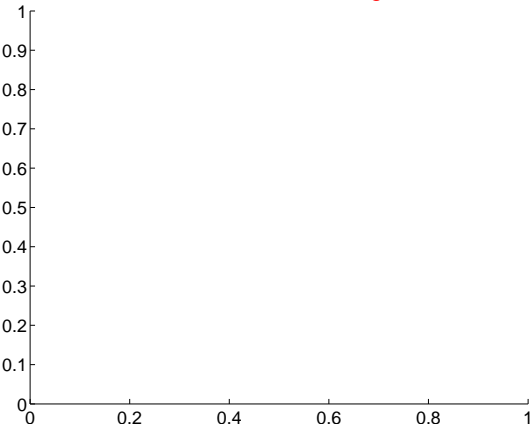


Q4 no OOT image

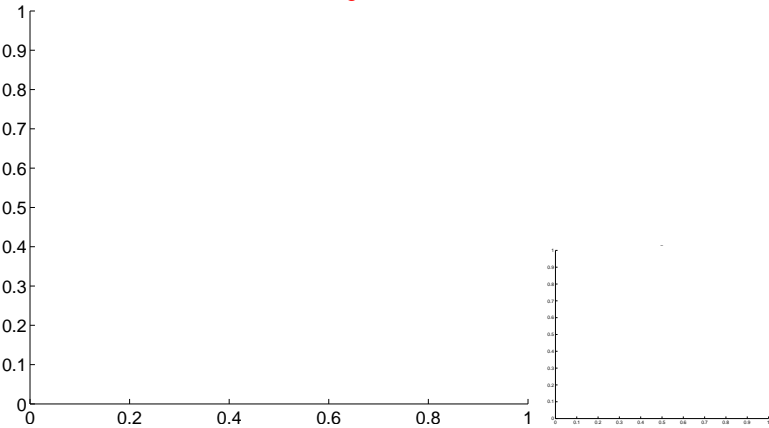


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

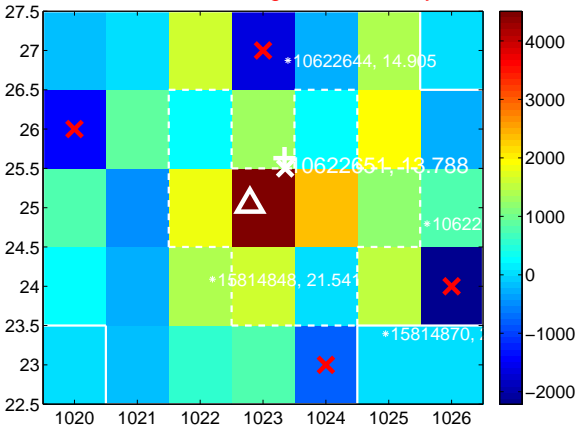
Q5 no difference image



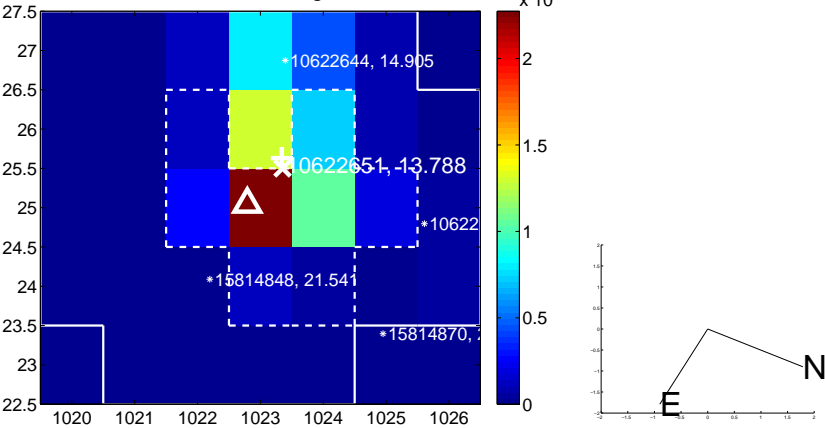
Q5 no OOT image



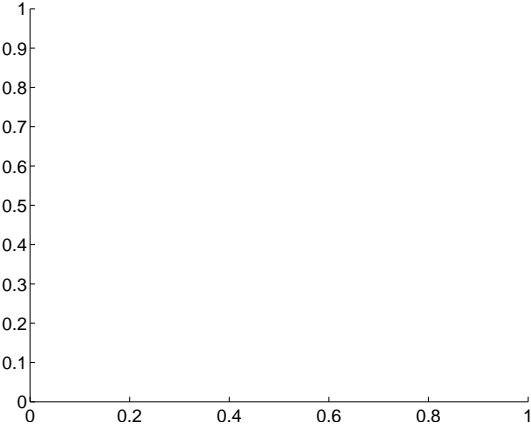
Q6 difference image. Poor Quality



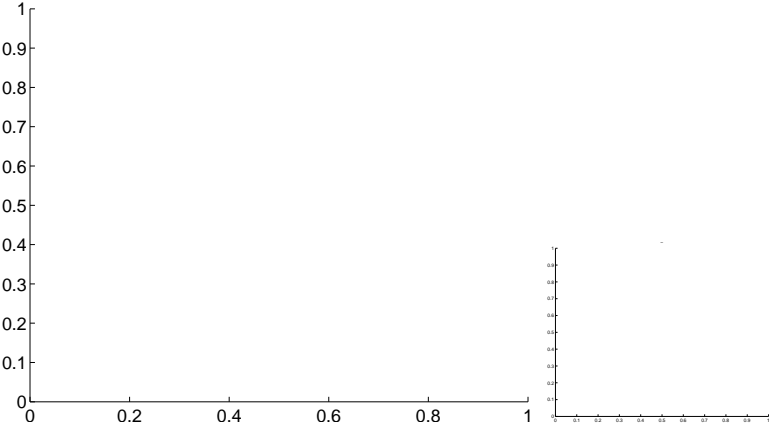
Q6 OOT image



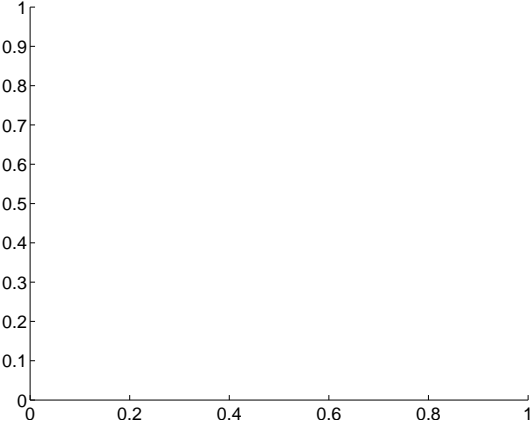
Q7 no difference image



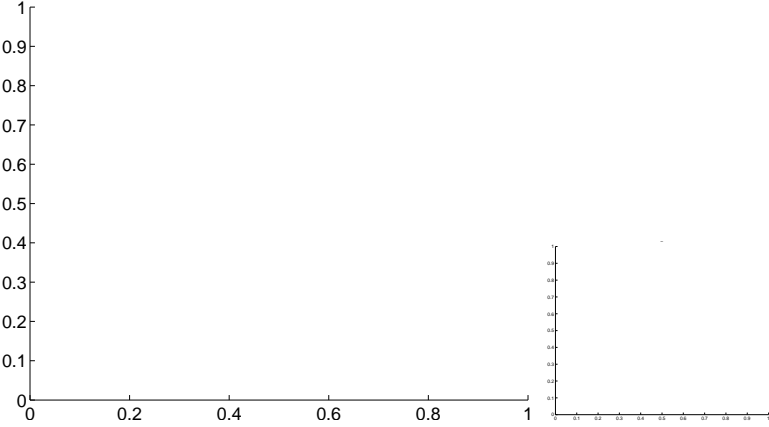
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



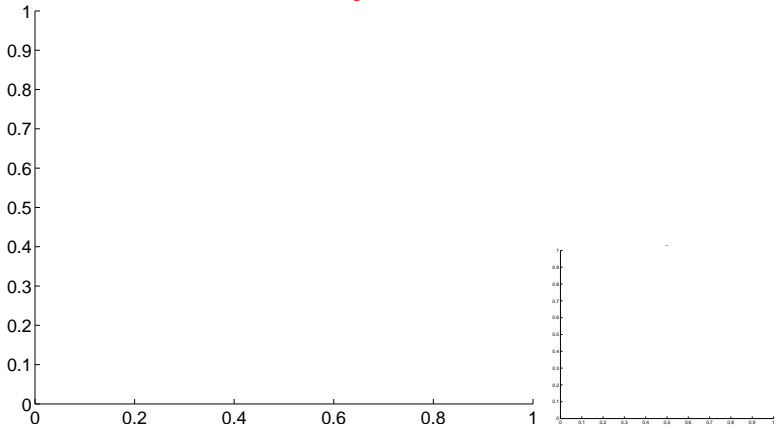


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

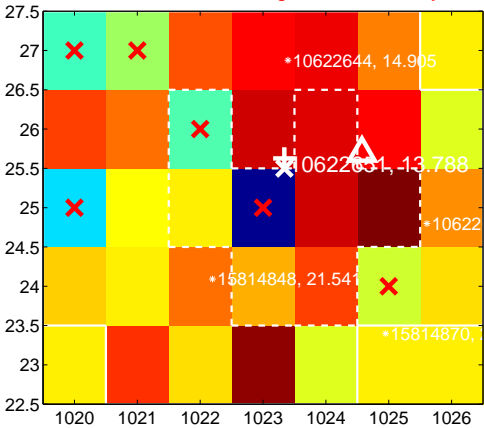
Q9 no difference image



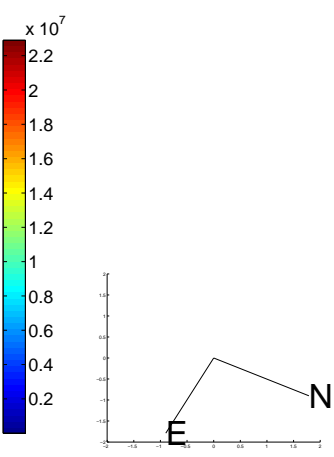
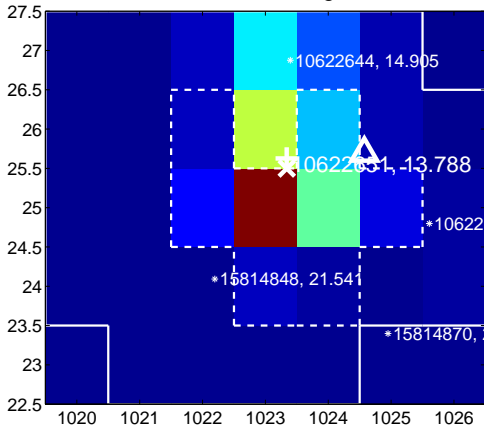
Q9 no OOT image



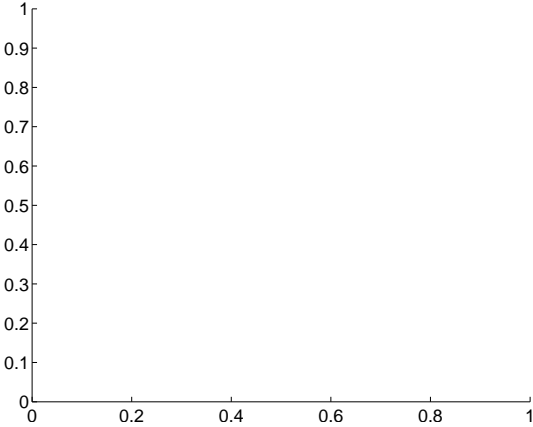
Q10 difference image. Poor Quality



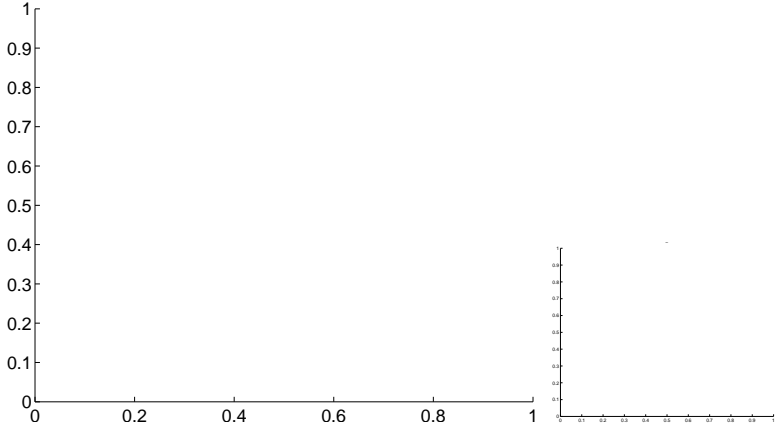
Q10 OOT image



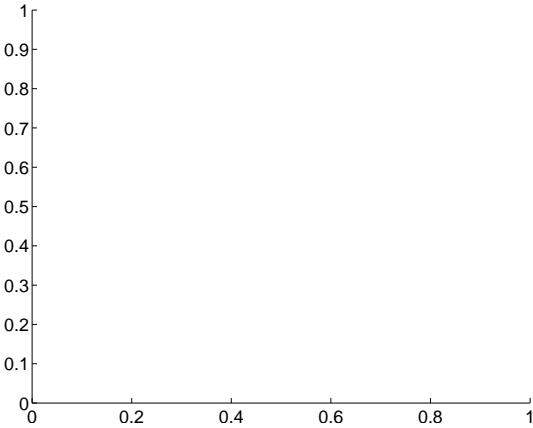
Q11 no difference image



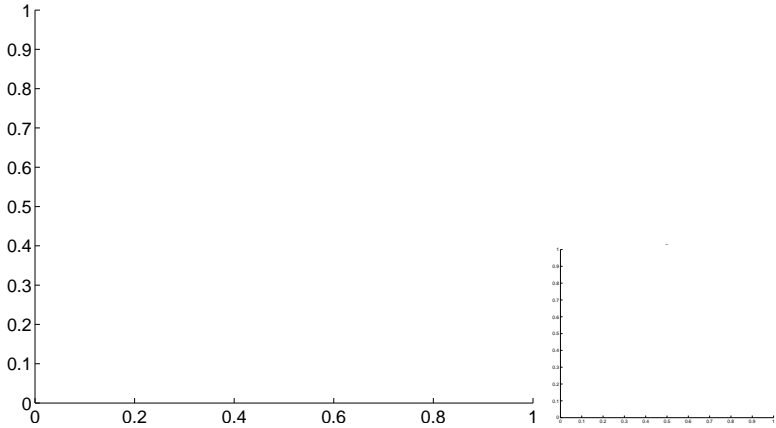
Q11 no OOT image



Q12 no difference image



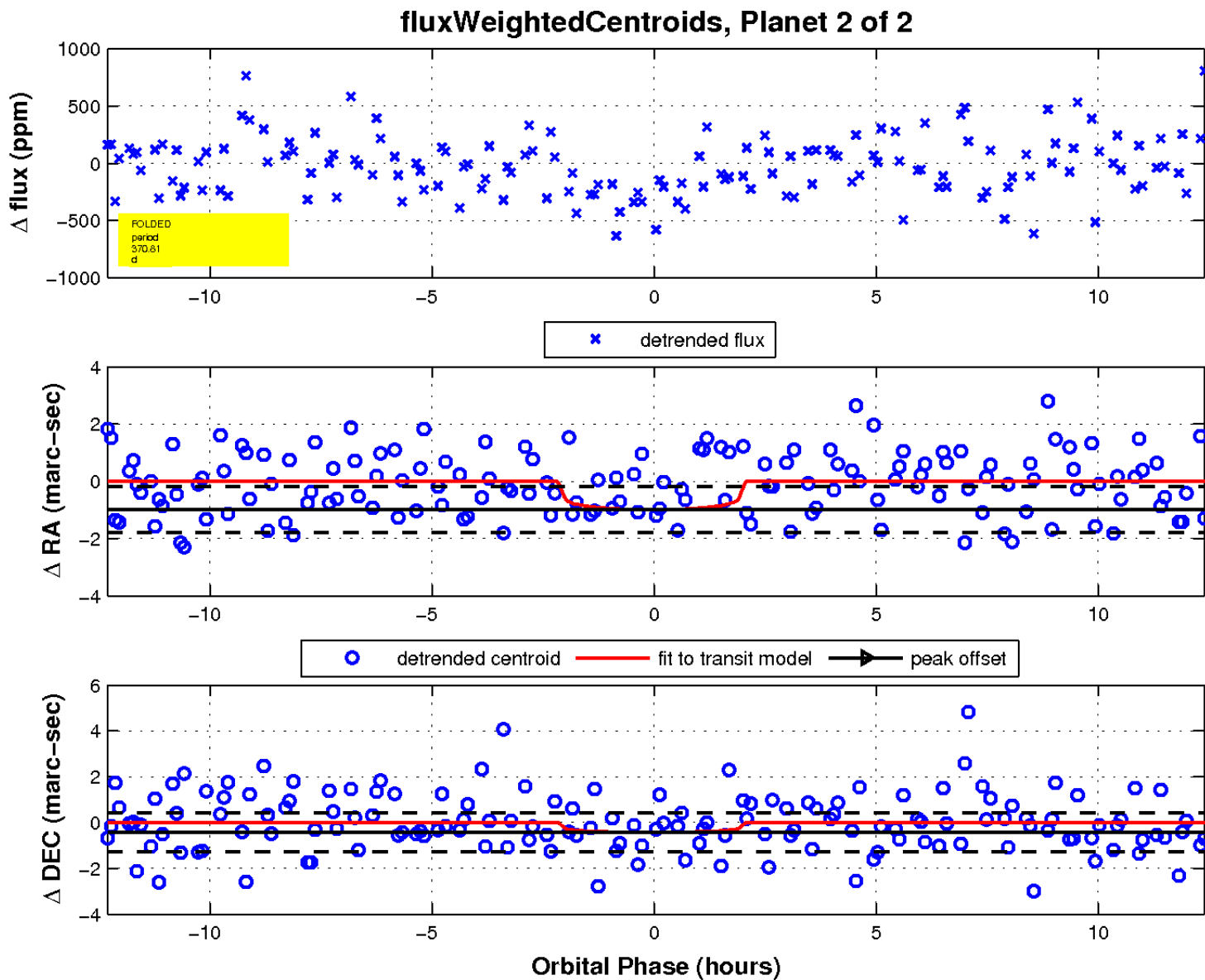
Q12 no OOT image



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



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



UKIRT Image

Declination

