

# KIC 002855603

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002855603-01	OBS	No	0.758180	131.563991	12.1	3.579	8.5	4.2	1.55	6921	0.63	15019.46
002855603-02	OBS	No	0.758224	132.082701	54.9	9.099	11.5	14.3	1.55	6921	1.17	15018.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002855603-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002855603-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—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.

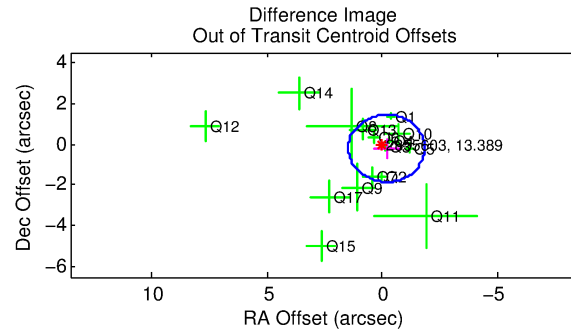
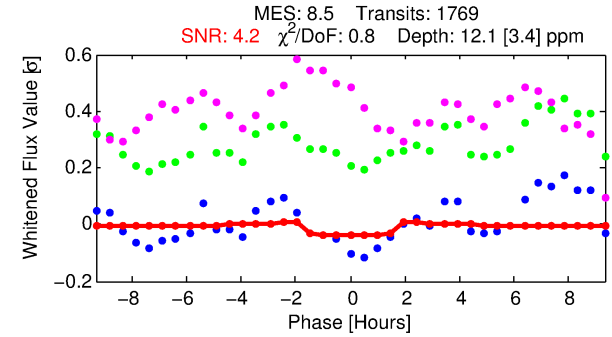
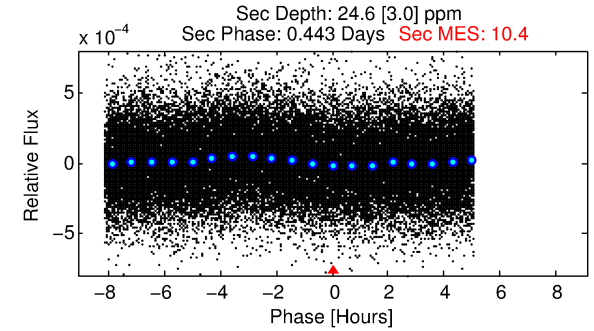
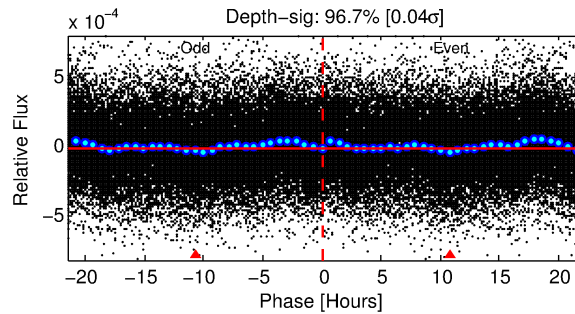
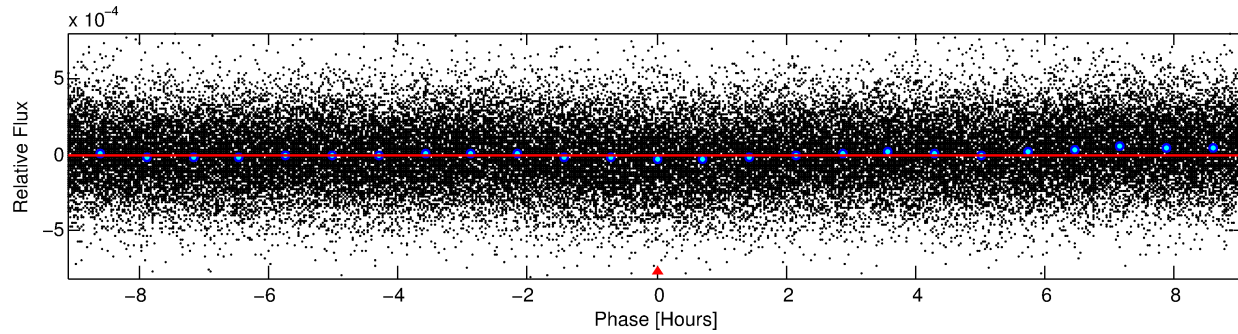
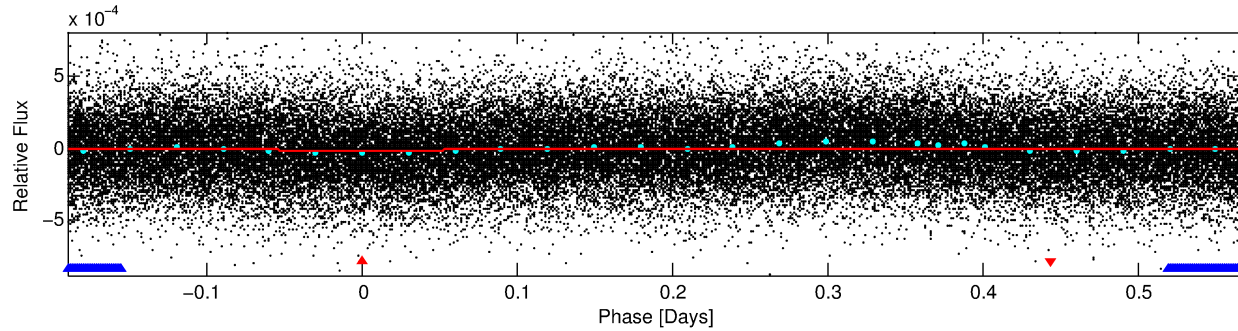
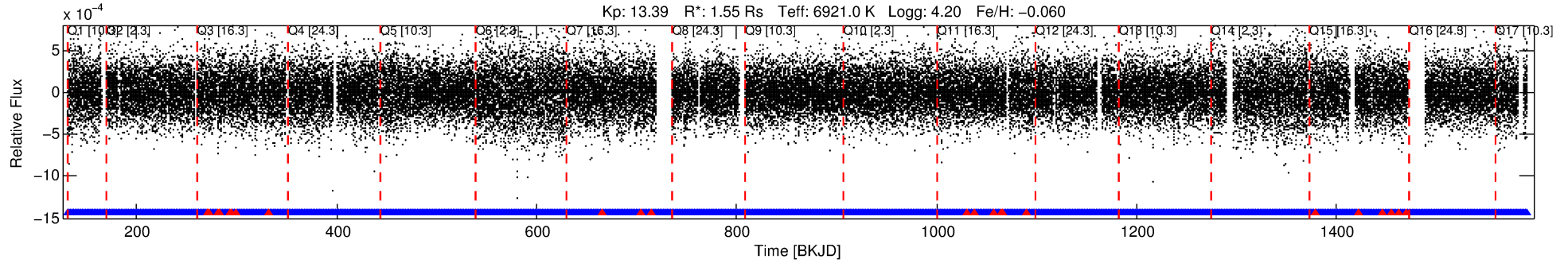
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002855603-01

No Significant Match Found

# DV One-Page Summary

KIC: 2855603 Candidate: 1 of 2 Period: 0.758 d



## DV Fit Results:

Period = 0.75818 [0.00002] d  
Epoch = 131.5640 [0.0067] BKJD  
Rp/R\* = 0.0037 [0.0019]  
a/R\* = 1.18 [1.05]  
b = 0.90 [0.67]  
Seff = 15019.46 [5958.08]  
Teq = 2823 [280] K  
Rp = 0.63 [0.39] Re  
a = 0.0182 [0.0047] AU  
Ag = 11.36 [12.58] [0.82 $\sigma$ ]  
Teffp = 8012 [2126] K [2.42 $\sigma$ ]

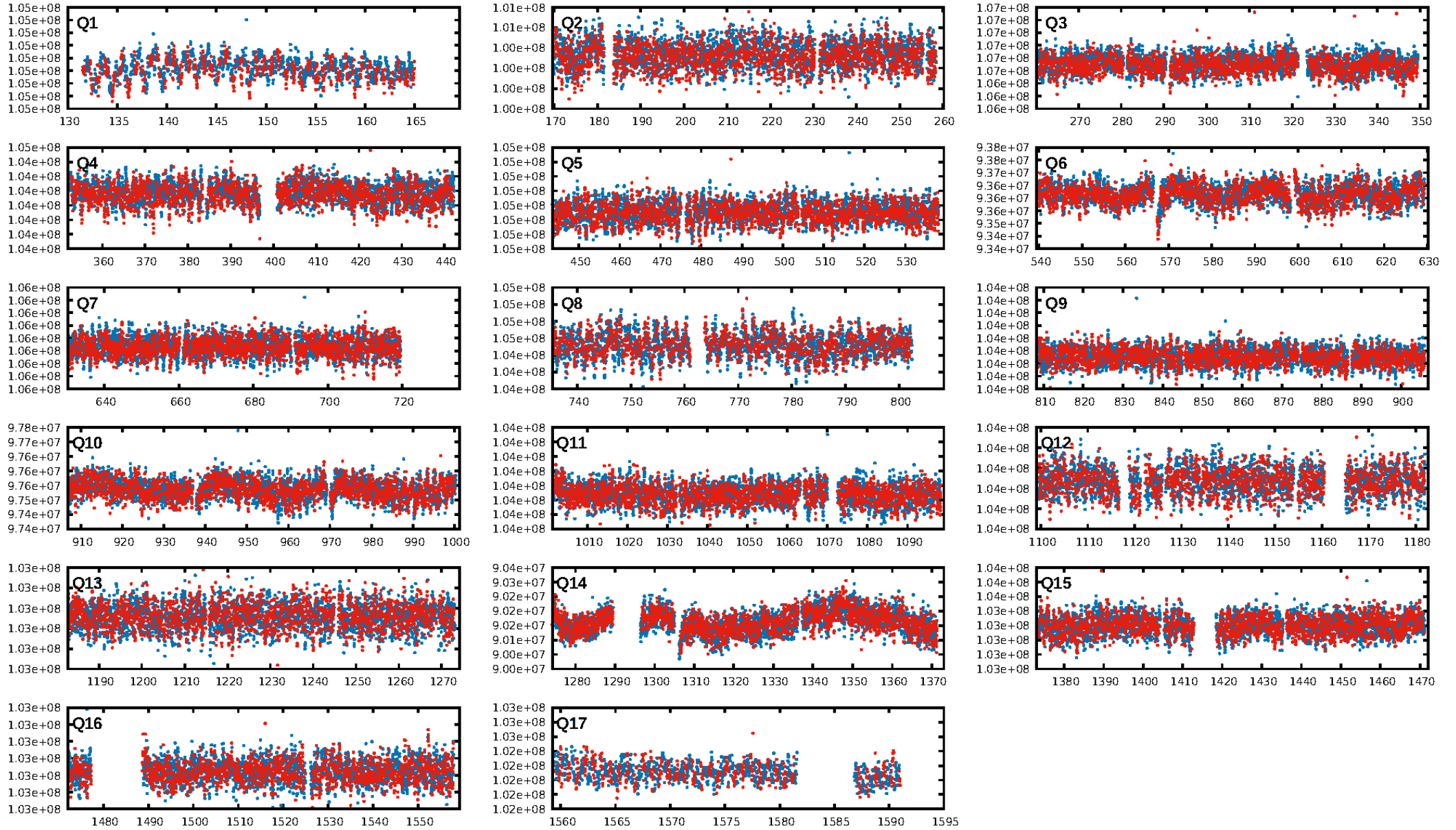
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00 $\sigma$ ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [1664/1688]  
GhostDiagnostic-chr: 2.44  
Centroid-sig: 79.7%  
Centroid-so: 0.774 arcsec [0.37 $\sigma$ ]  
OotOffset-rm: 0.260 arcsec [0.47 $\sigma$ ]  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-rm: 0.235 arcsec [0.40 $\sigma$ ]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.56 [9/16]  
DiffImageOverlap-fno: 0.00 [0/17]

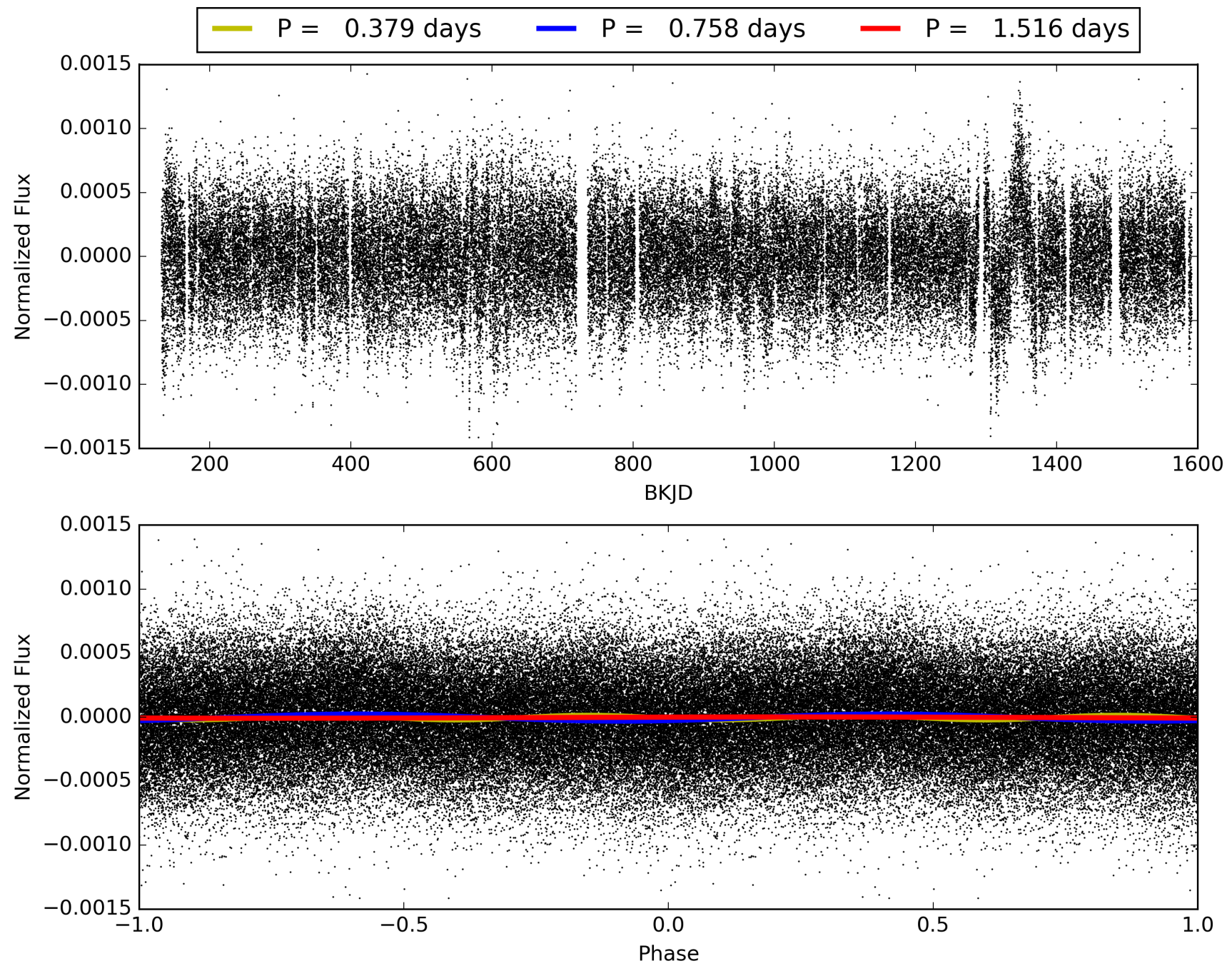
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:37:51 Z

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

# TCE 002855603-01, PDC Light Curves

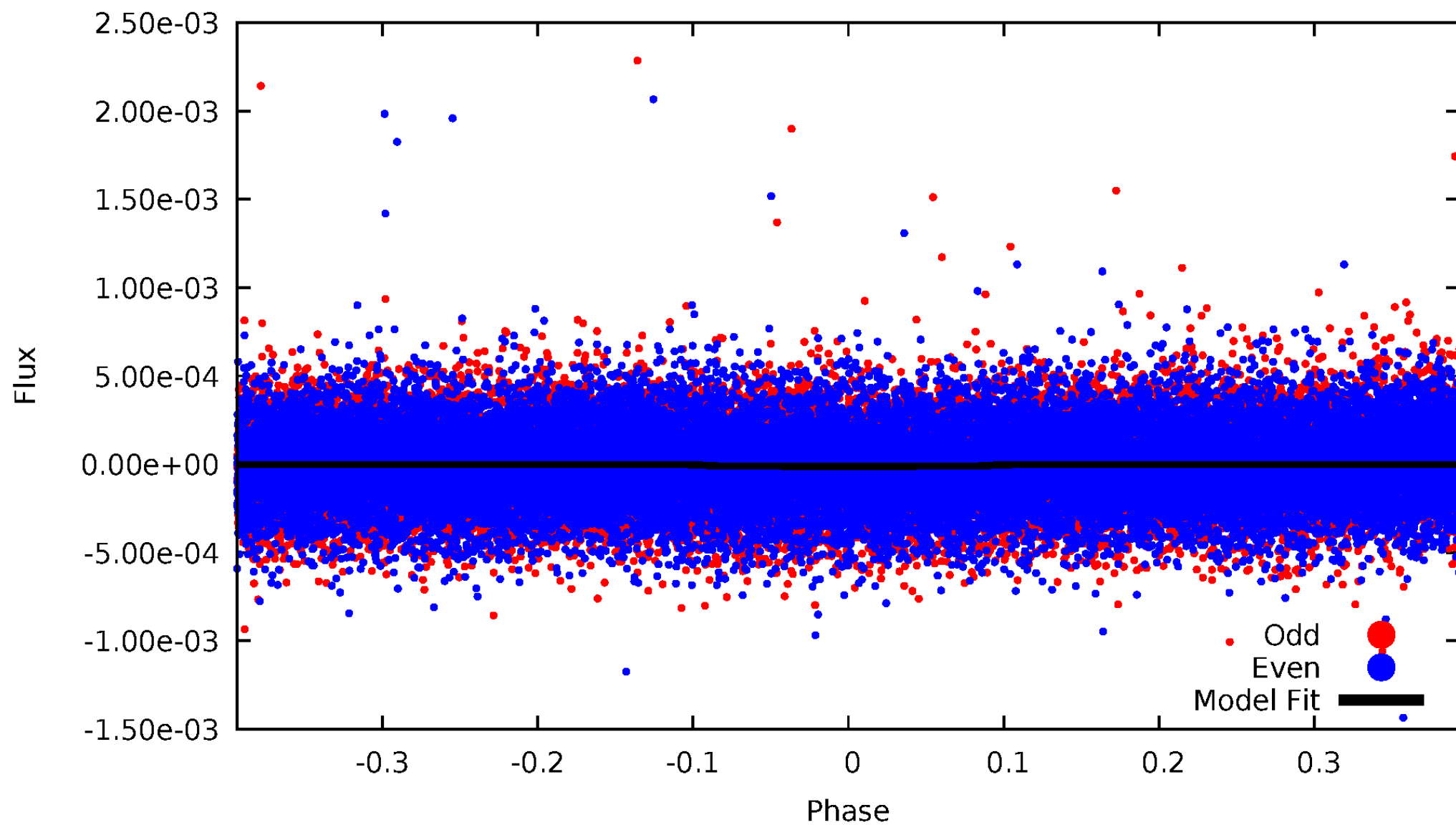


TCE 002855603-01



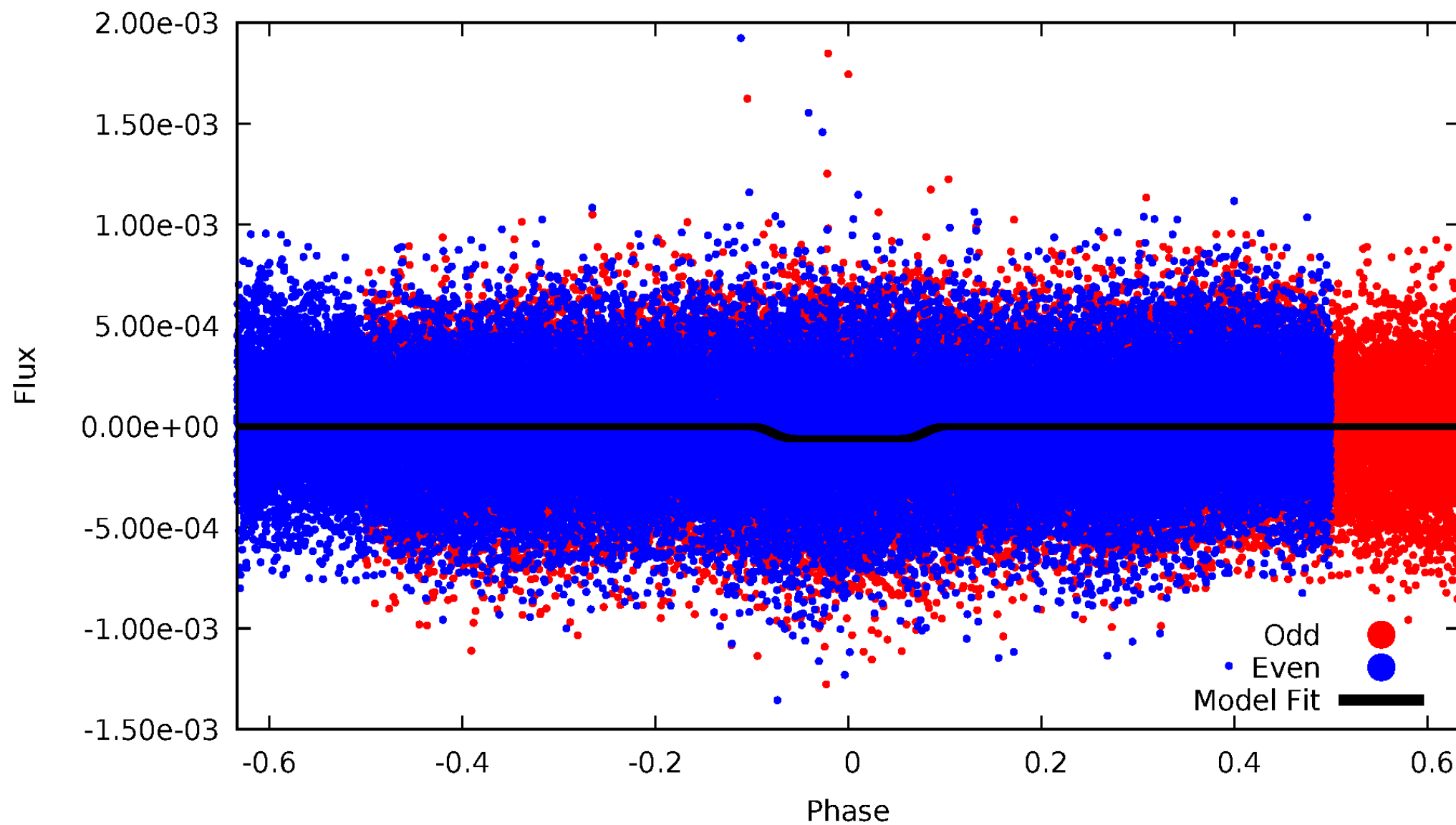
# DV Odd/Even

TCE 002855603-01

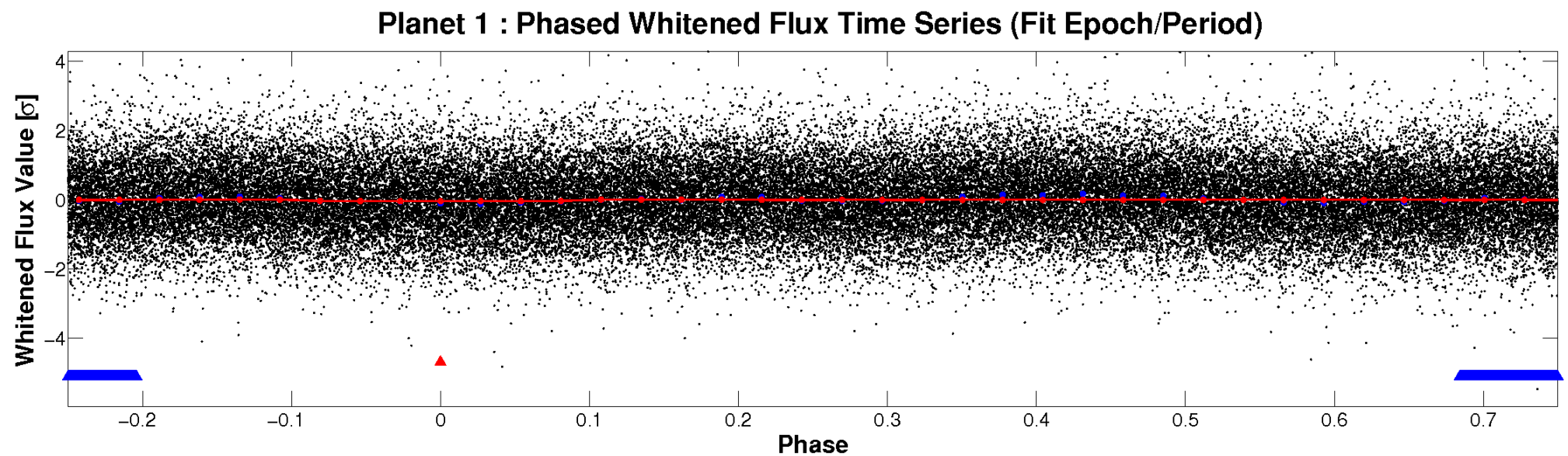
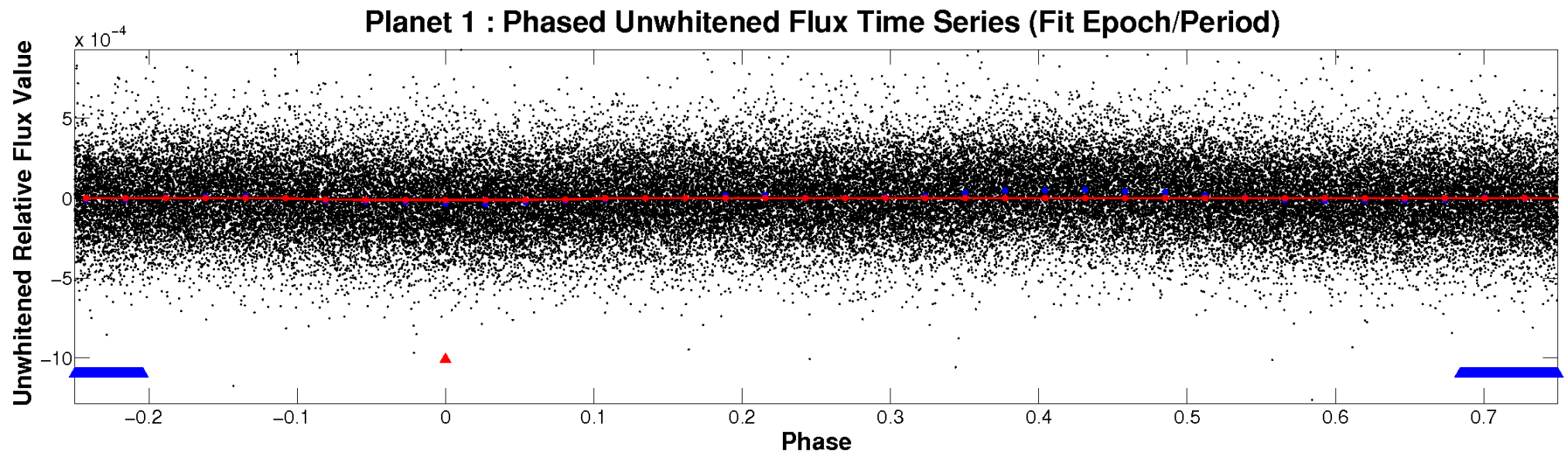


# ALT Odd/Even

TCE 002855603-01

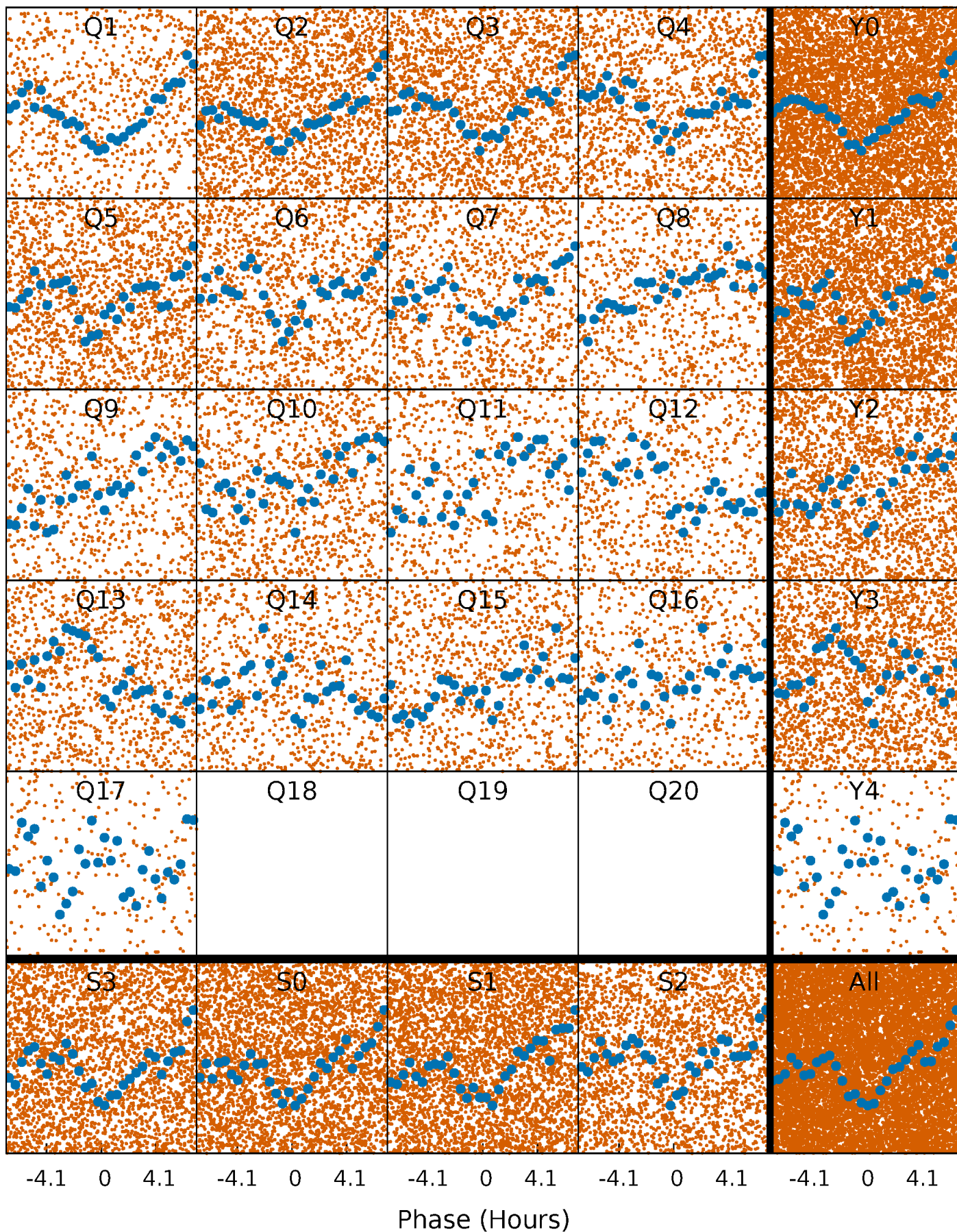


# Non-Whitened Vs. Whitened Light Curve



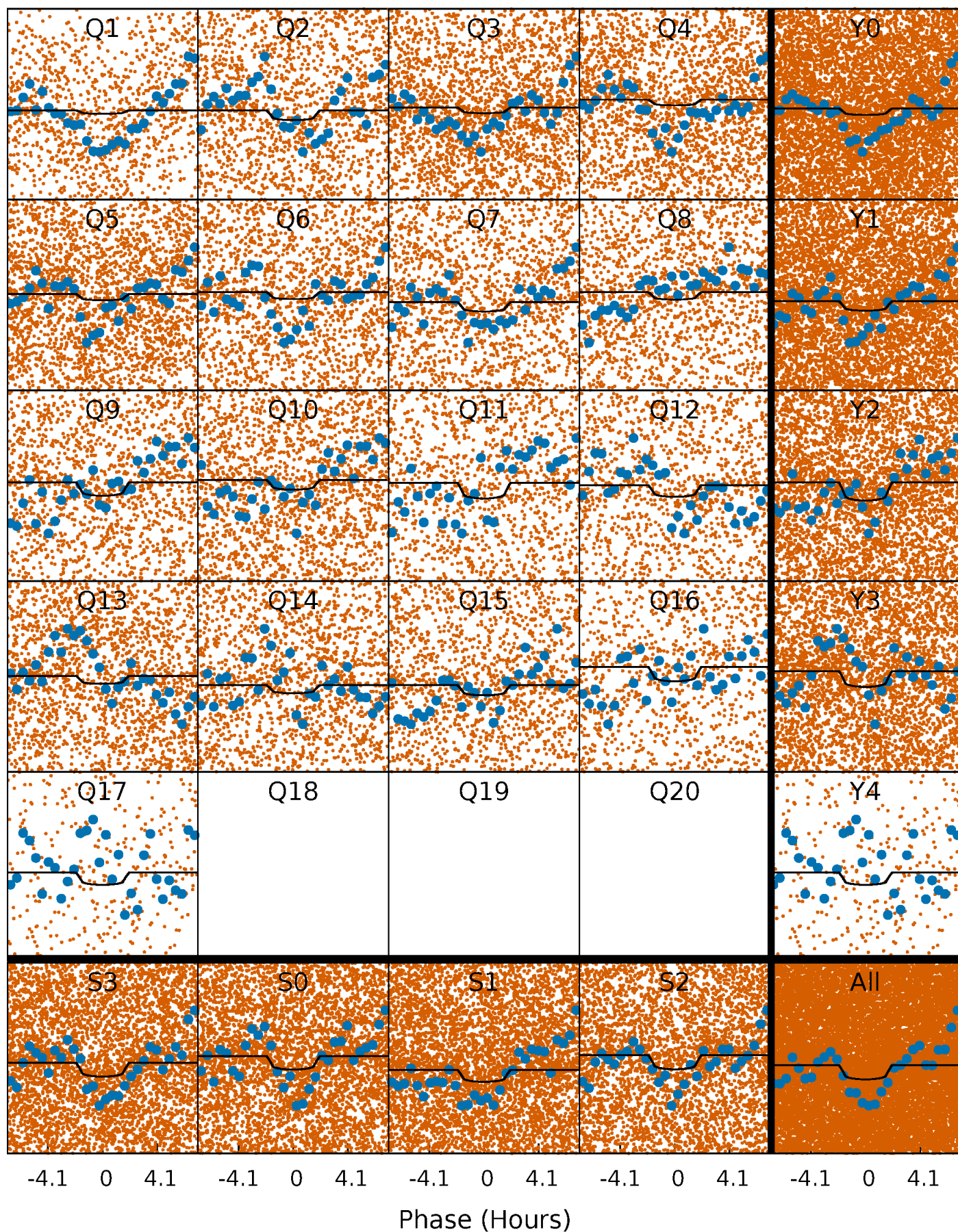
# PDC Quarter-Phased Transit Curves

TCE 002855603-01 P= 0.758180 Days  $T_0=131.563991$  (BKJD)



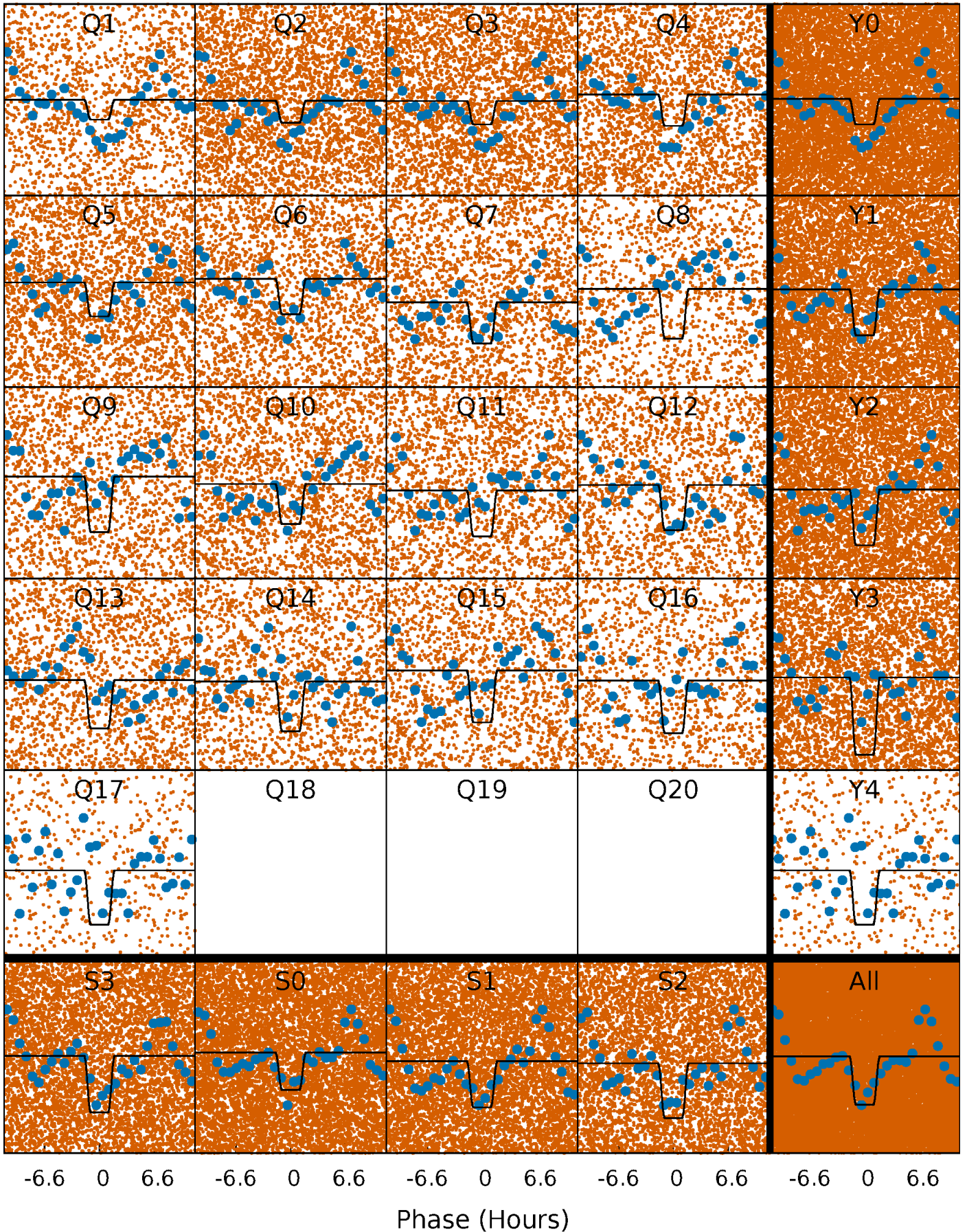
# DV Quarter-Phased Transit Curves

TCE 002855603-01 P= 0.758180 Days  $T_0=131.563991$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

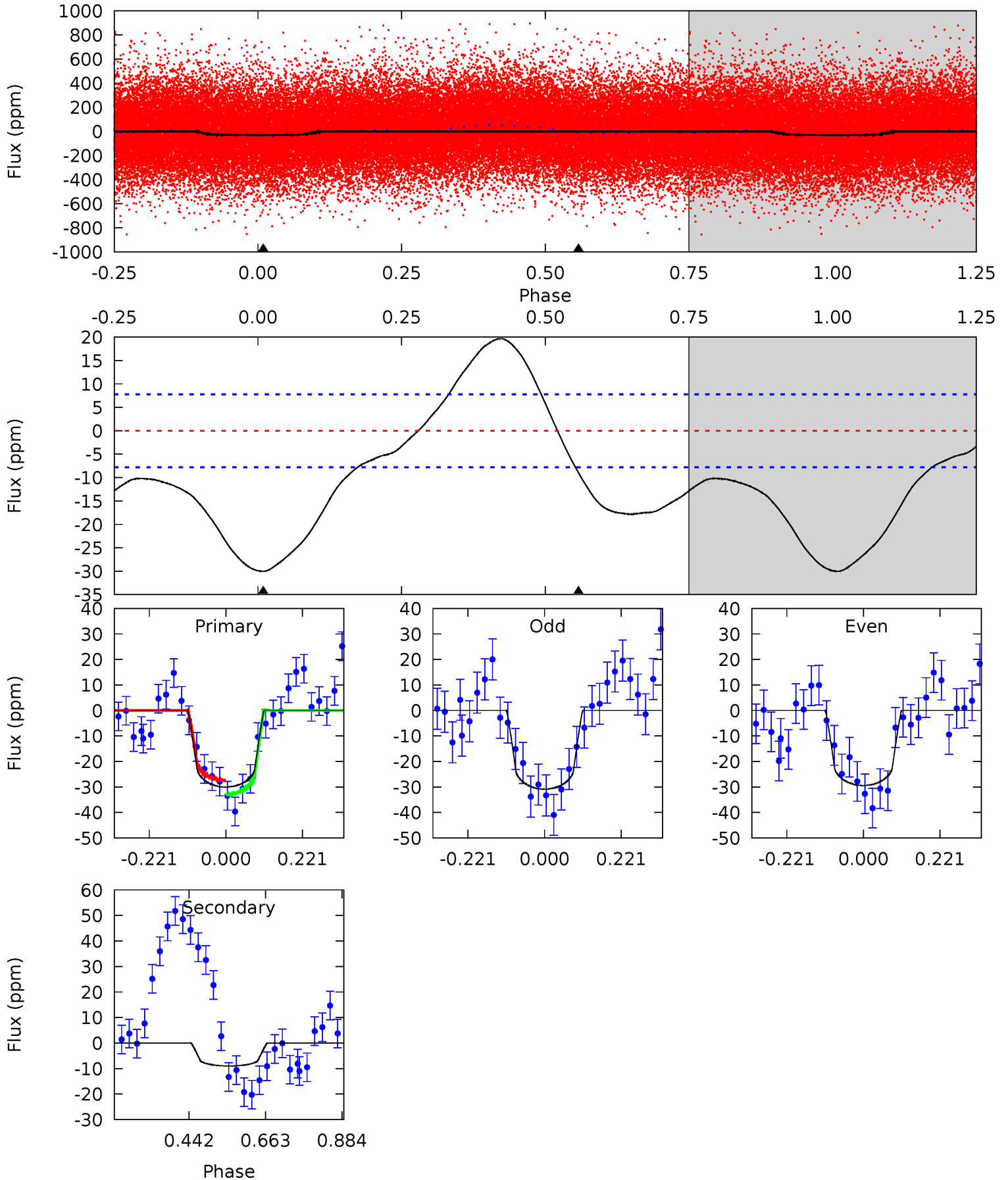
TCE 002855603-01 P= 0.758218 Days  $T_0=131.543199$  (BKJD)



# DV Model-Shift Uniqueness Test

002855603-01, P = 0.758180 Days, E = 130.805811 Days

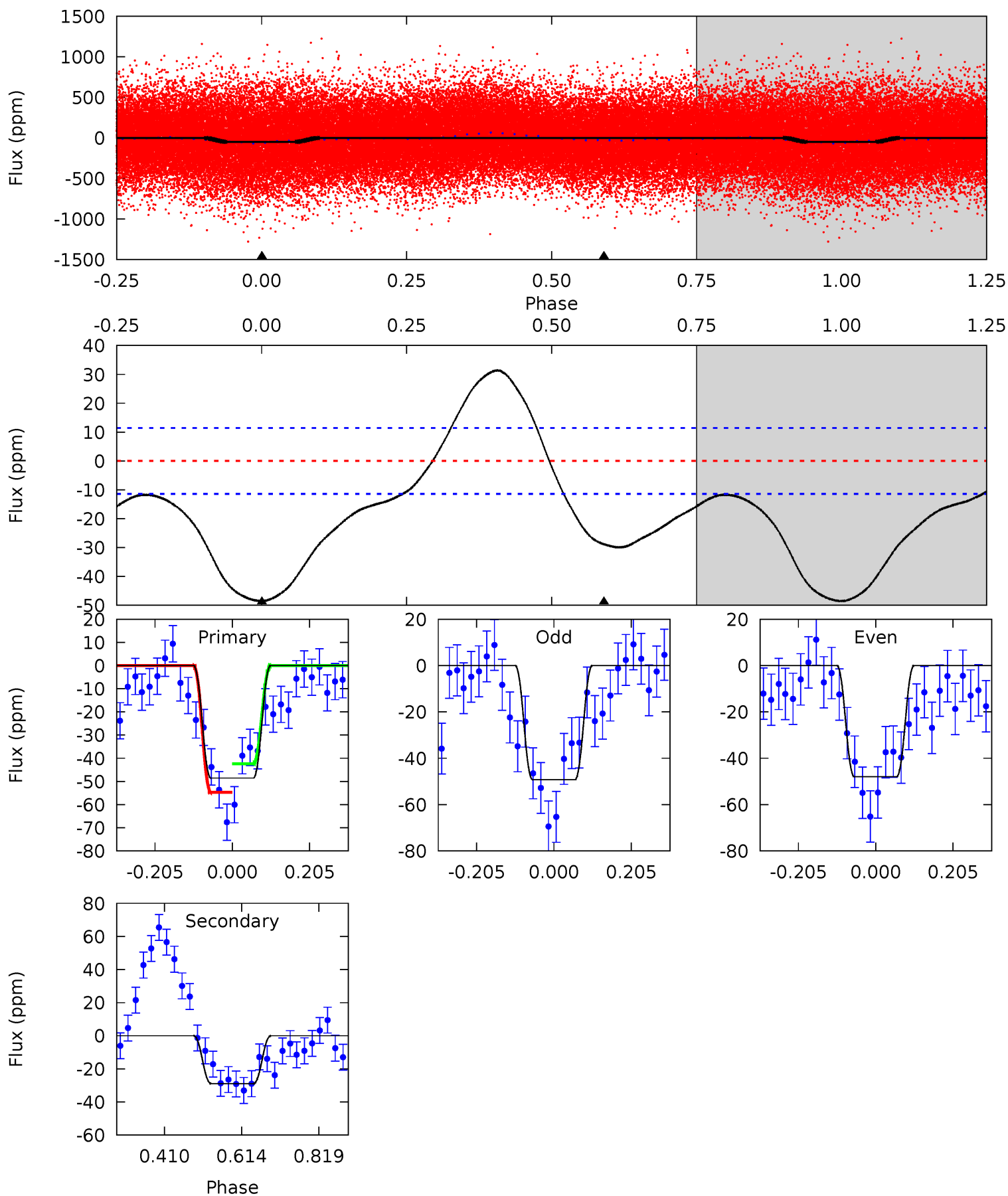
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	5.07	0	0	4.40	1.22	2.76	17.0	17.0	5.07	5.07	0.41	1.35	0.40	1.59



# Alt Model-Shift Uniqueness Test

002855603-01, P = 0.758218 Days, E = 130.784981 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
18.8	11.2	0	0	4.41	1.27	5.64	18.8	18.8	11.2	11.2	0.26	1.23	0.39	2.46



### Stellar Parameters For KIC 002855603

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6921^{+194}_{-291}$	$4.199^{+0.124}_{-0.186}$	$-0.060^{+0.250}_{-0.350}$	$1.553^{+0.508}_{-0.313}$	$1.399^{+0.195}_{-0.238}$	$0.526^{+0.321}_{-0.270}$
	+3%/-4%	+3%/-4%	+417%/-583%	+33%/-20%	+14%/-17%	+61%/-51%
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 002855603-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-9 \pm 2$	$0.66^{+0.34}_{-0.33}$	$3950^{+320}_{-249}$	$5899^{+3074}_{-1093}$	$3.688^{+11.433}_{-2.130}$
Alt.	$-29 \pm 3$	$1.33^{+0.43}_{-0.37}$	$3971^{+289}_{-262}$	$5585^{+849}_{-707}$	$2.841^{+2.710}_{-1.181}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

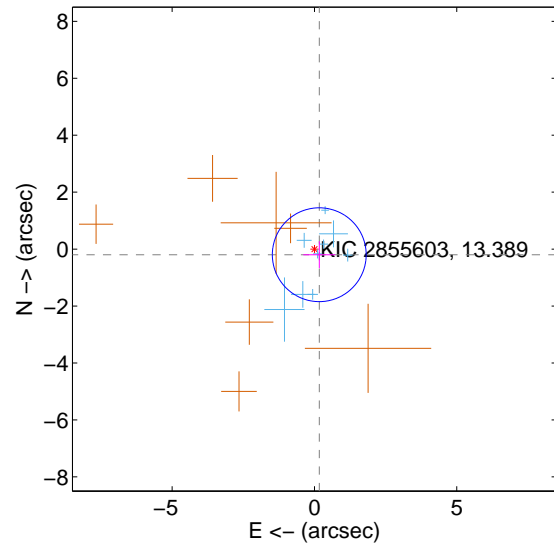
Supplemental centroid analysis for 002855603-01. Kepler magnitude: 13.39. Transit SNR 4.21

There are 9 quarters with good PRF difference image offsets

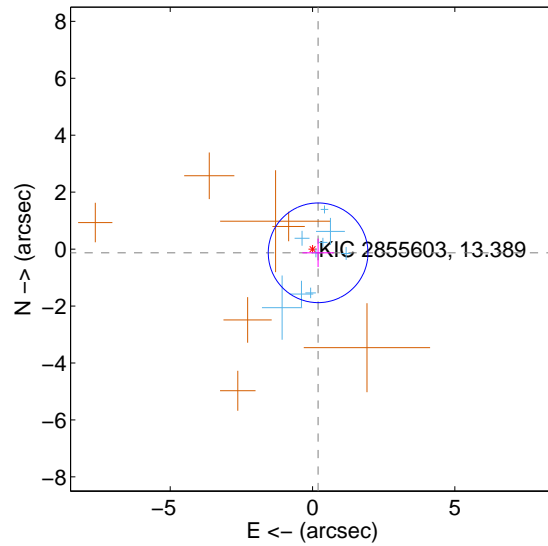
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.260 \pm 0.549$	0.47	$-0.169 \pm 0.560$	$-0.197 \pm 0.472$
PRF-fit source offset from KIC position	$0.235 \pm 0.584$	0.40	$-0.196 \pm 0.553$	$-0.130 \pm 0.498$
photometric centroid source offset	$0.77 \pm 2.10$	0.37	$-0.18 \pm 1.90$	$-0.75 \pm 2.11$

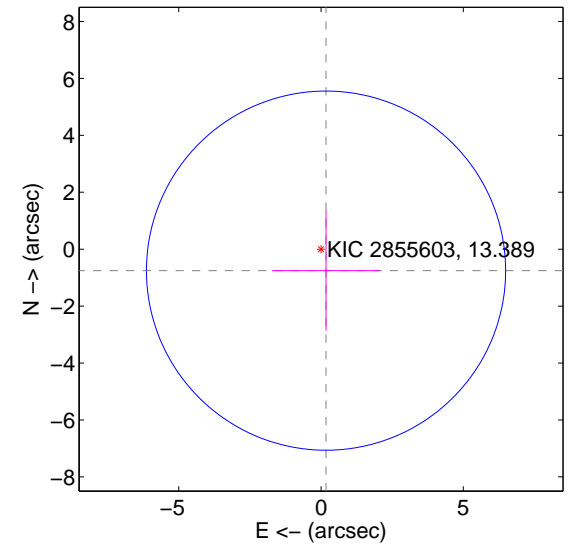
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

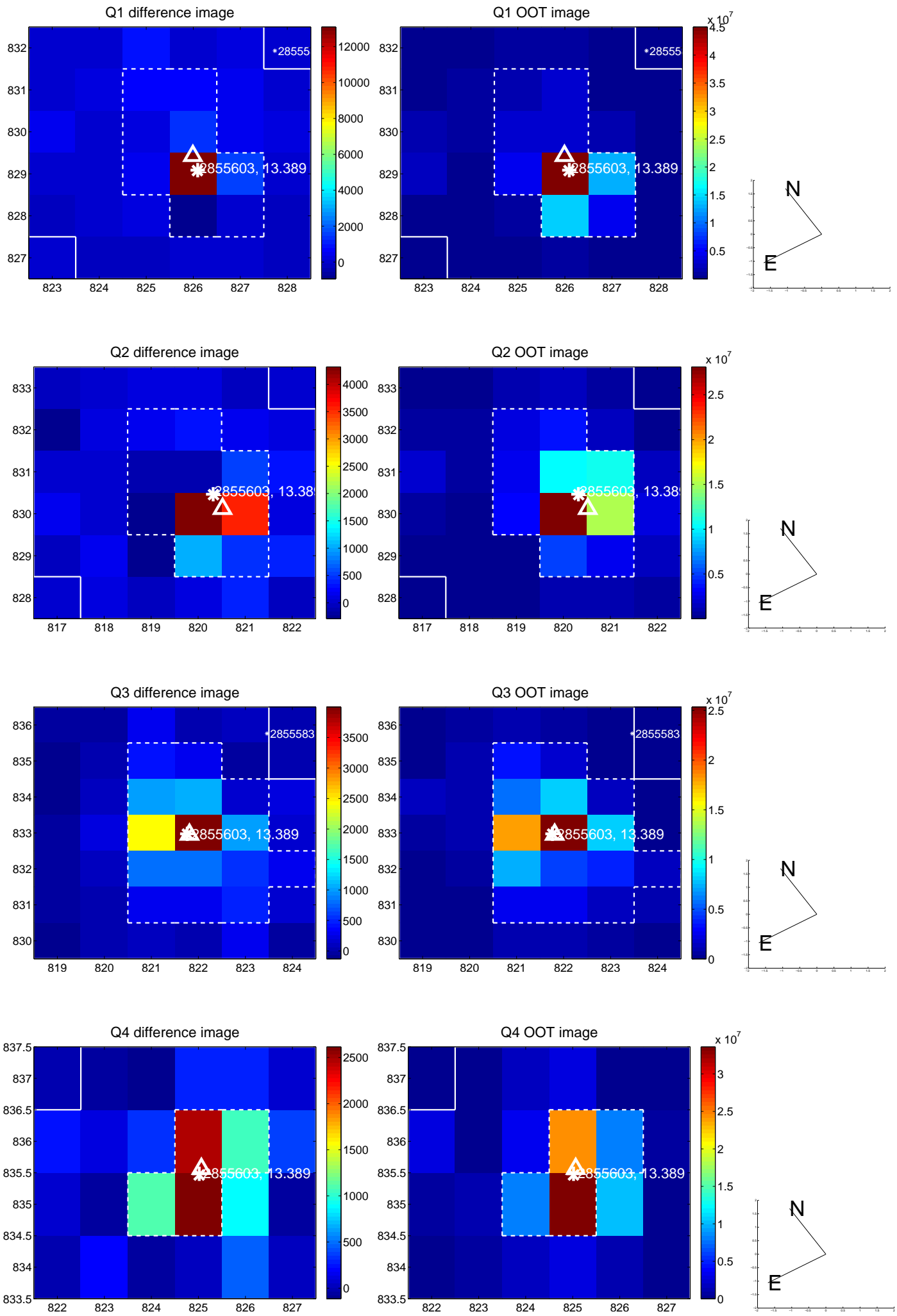


offset from photometric centroids

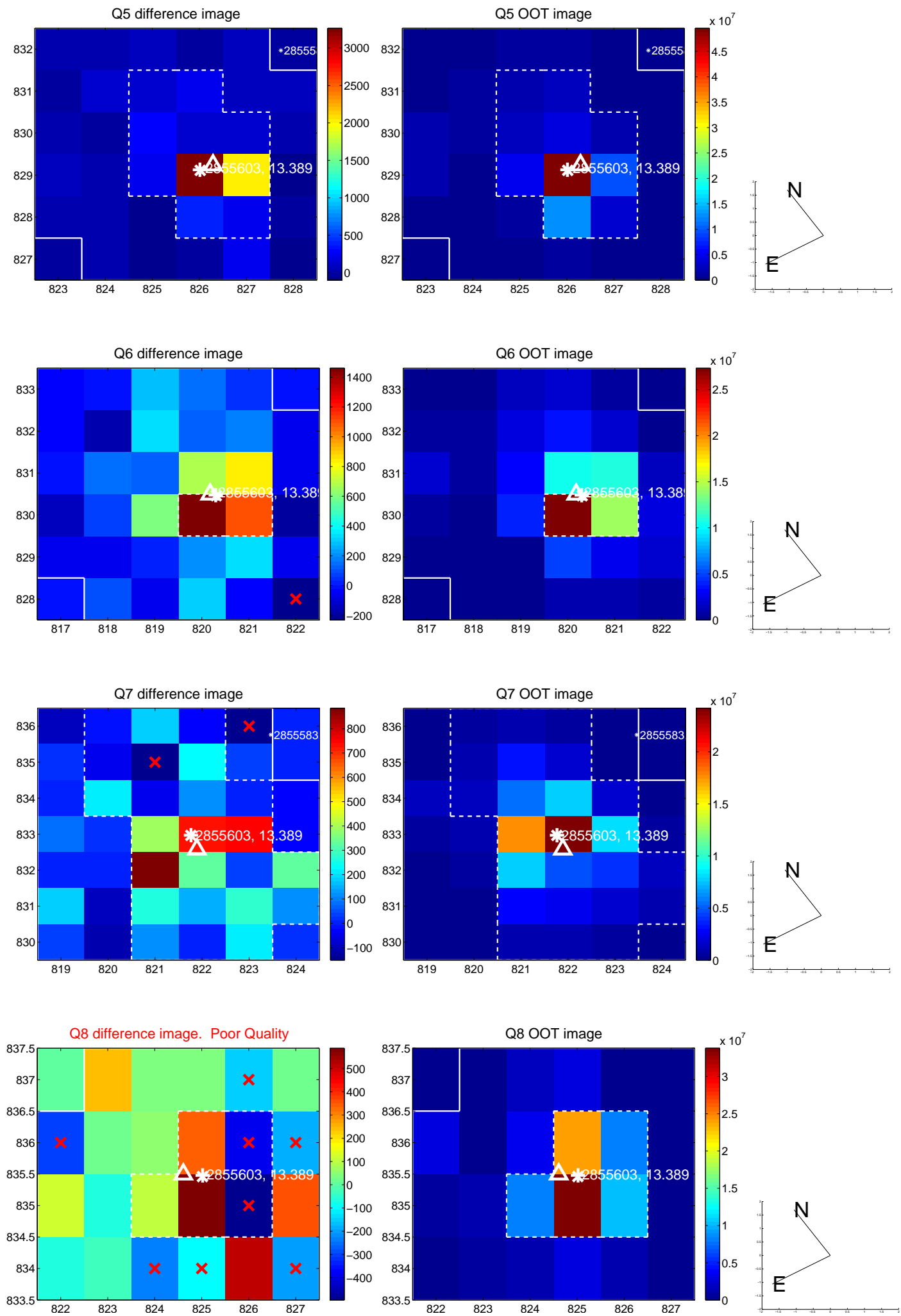


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

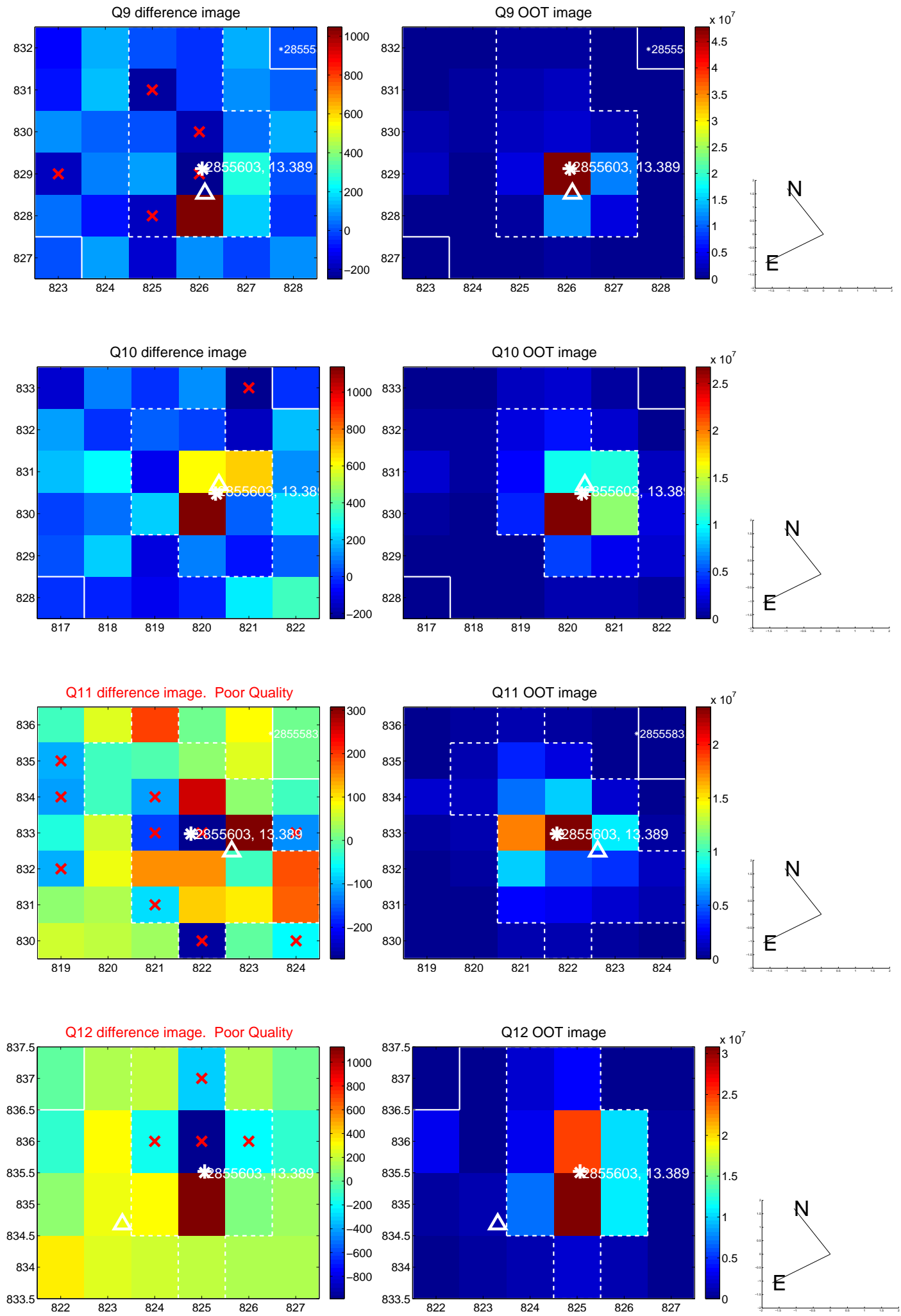
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



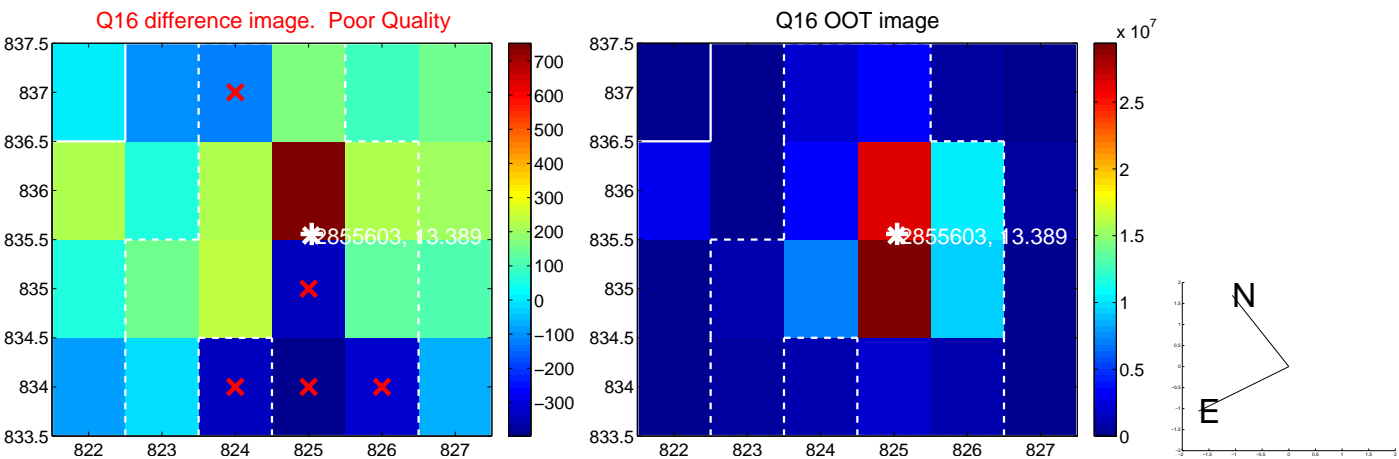
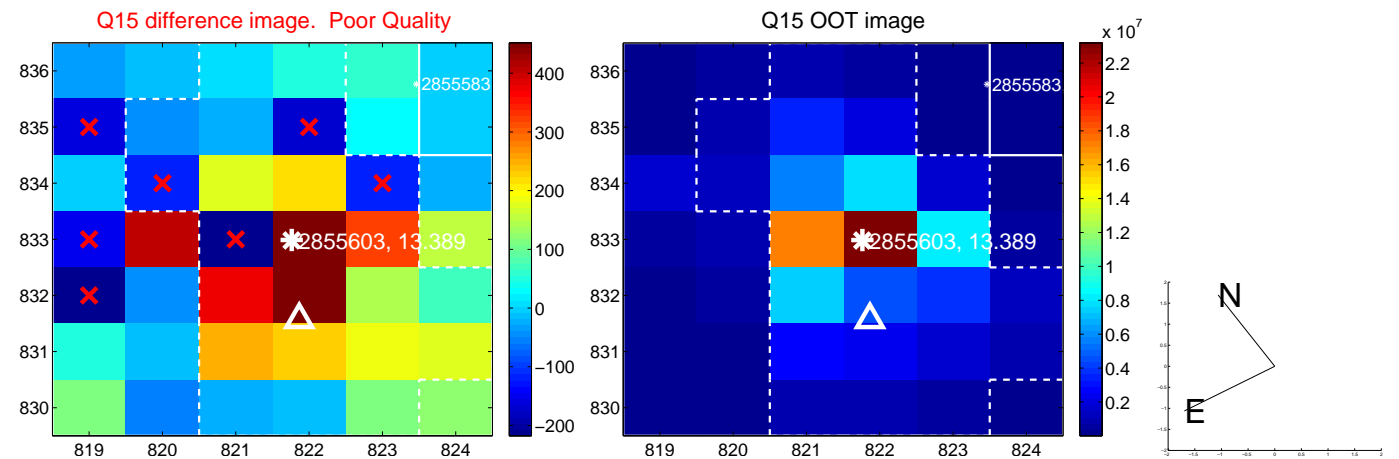
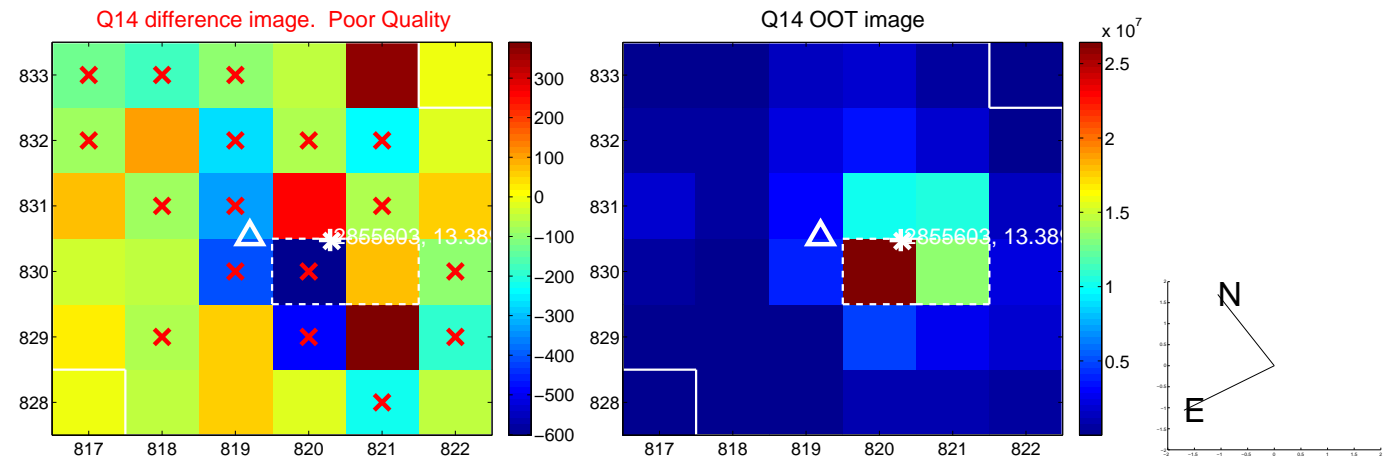
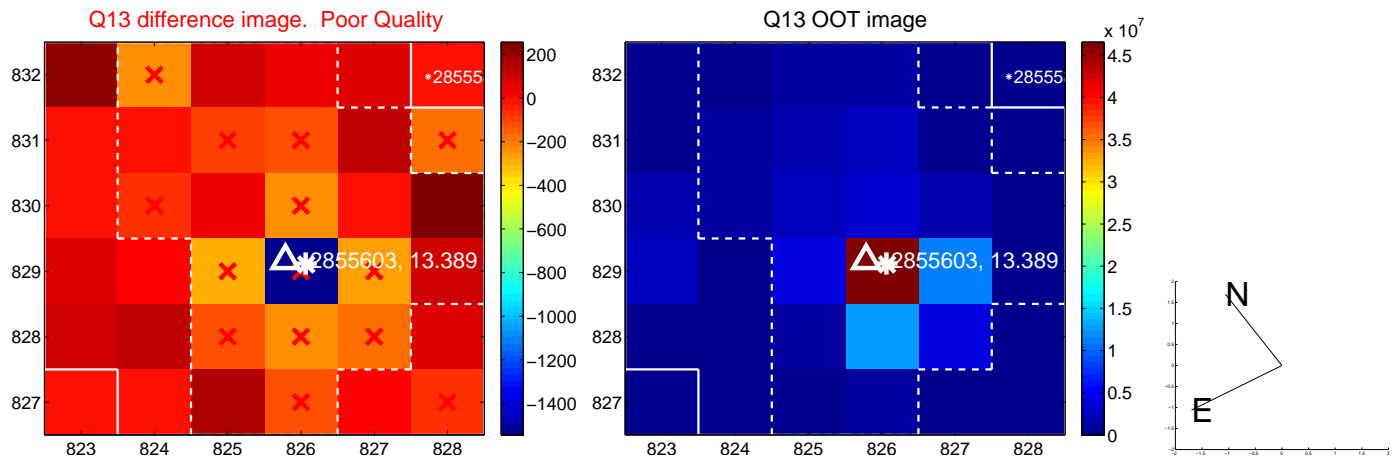
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



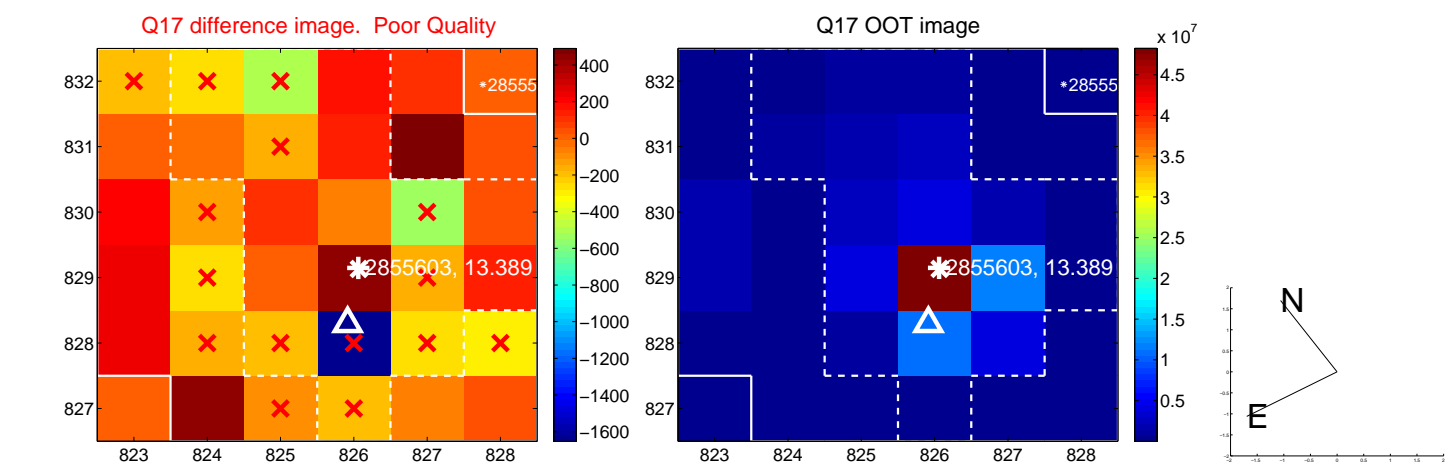
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



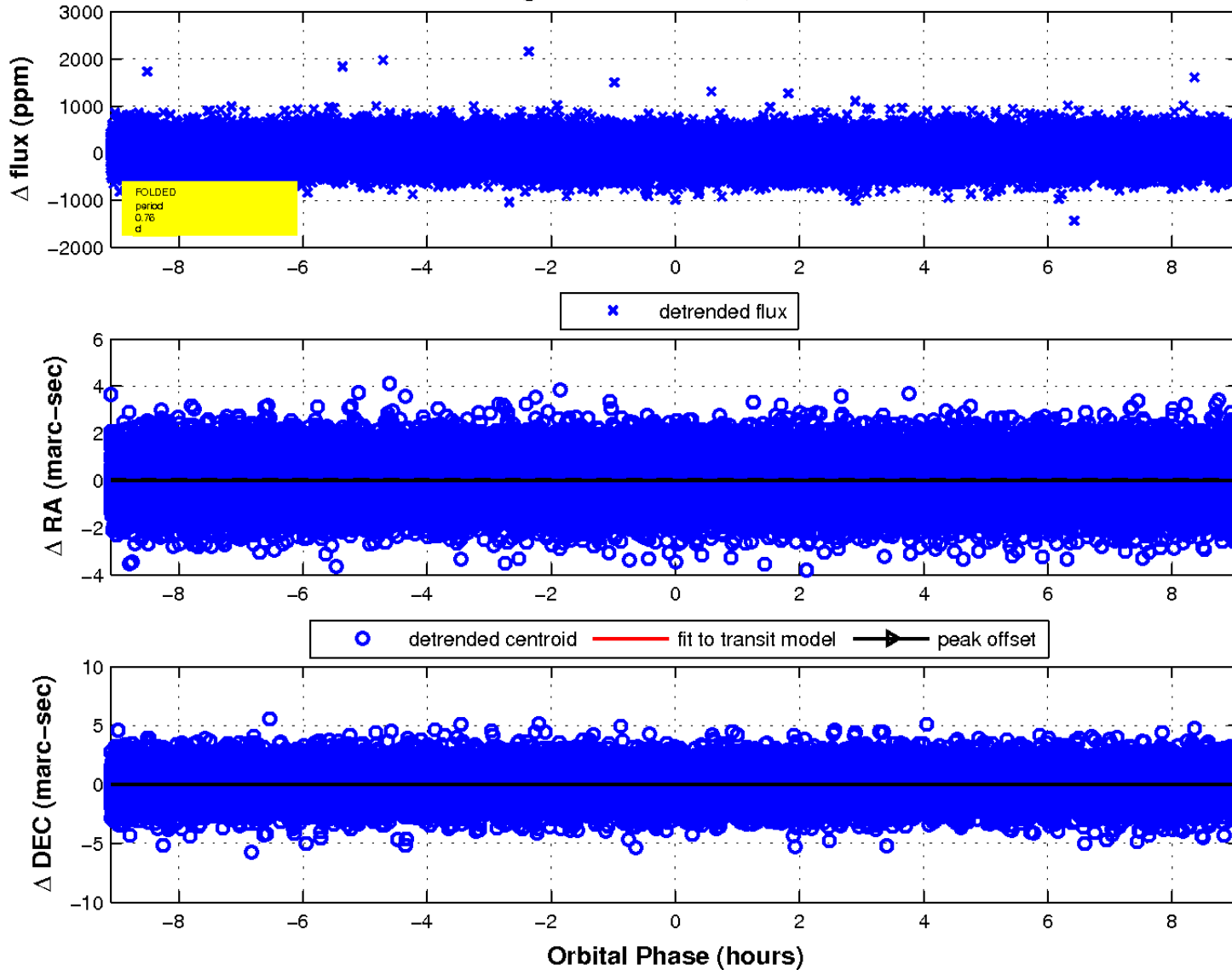
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

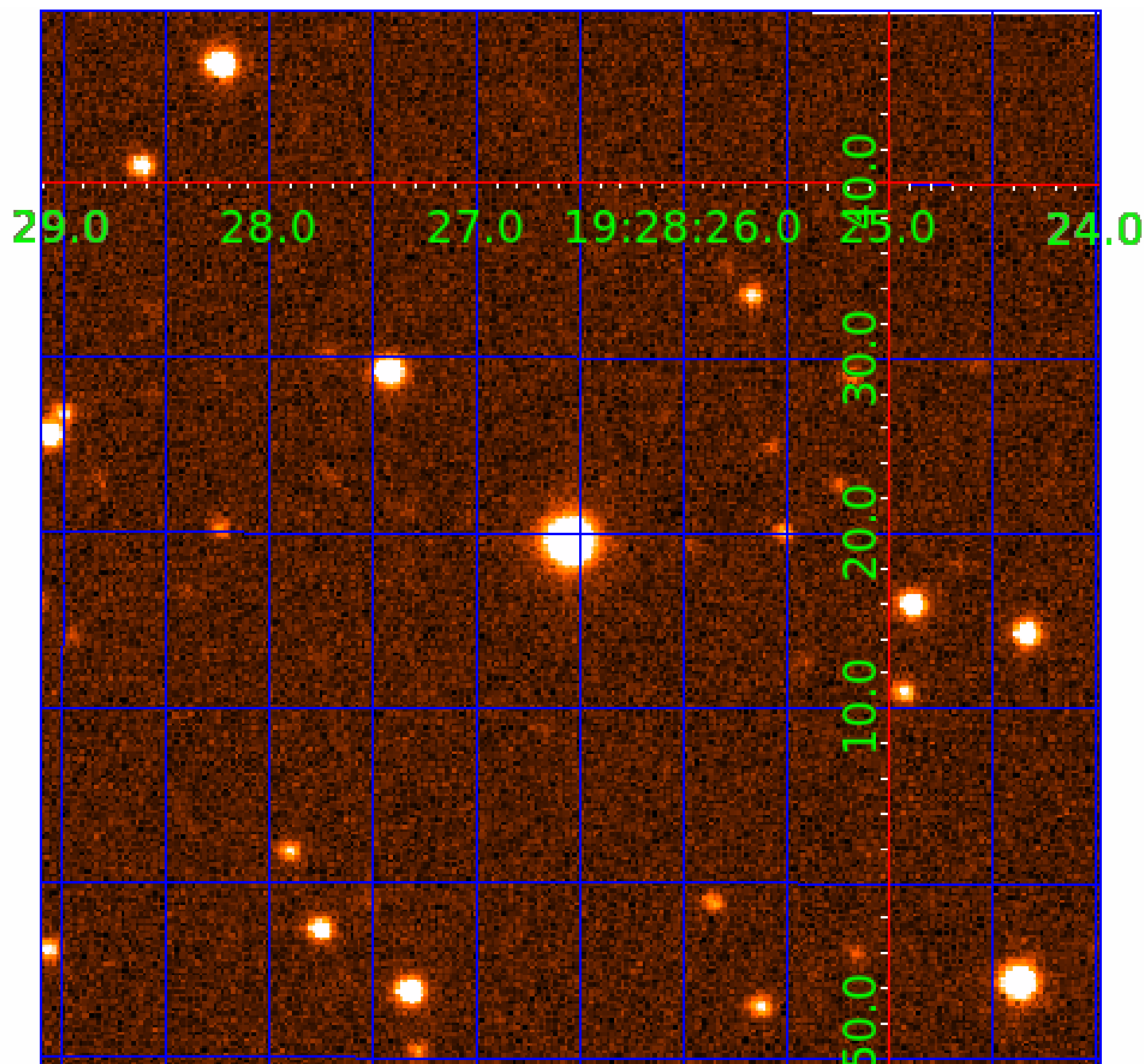


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 002855603

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002855603-01	OBS	No	0.758180	131.563991	12.1	3.579	8.5	4.2	1.55	6921	0.63	15019.46
002855603-02	OBS	No	0.758224	132.082701	54.9	9.099	11.5	14.3	1.55	6921	1.17	15018.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002855603-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002855603-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—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.

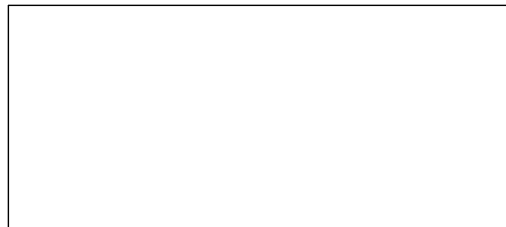
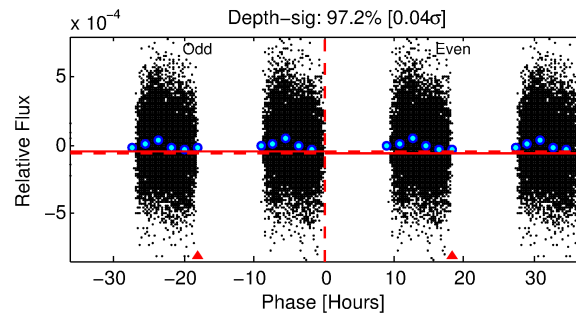
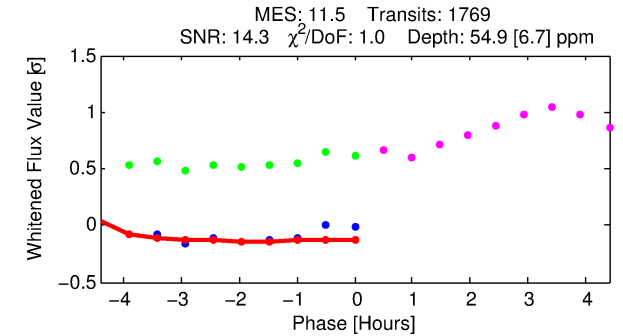
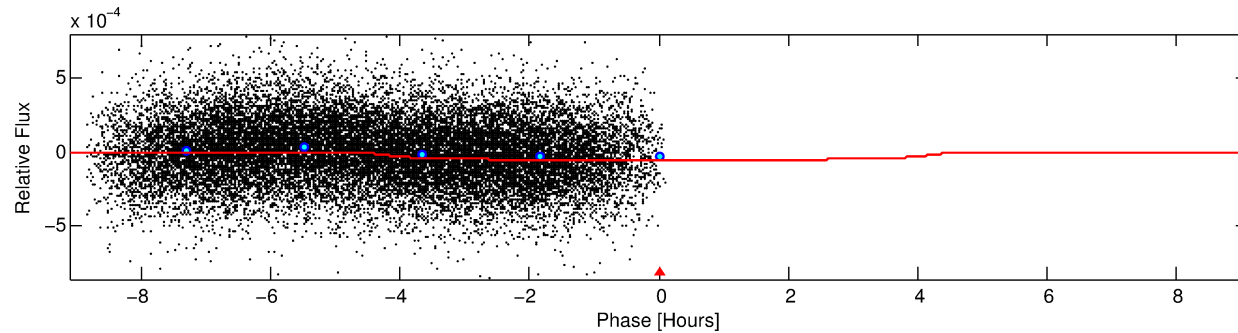
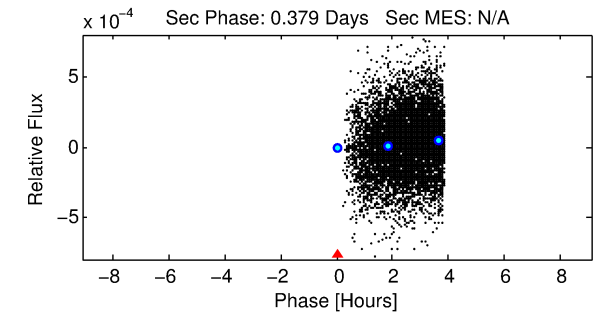
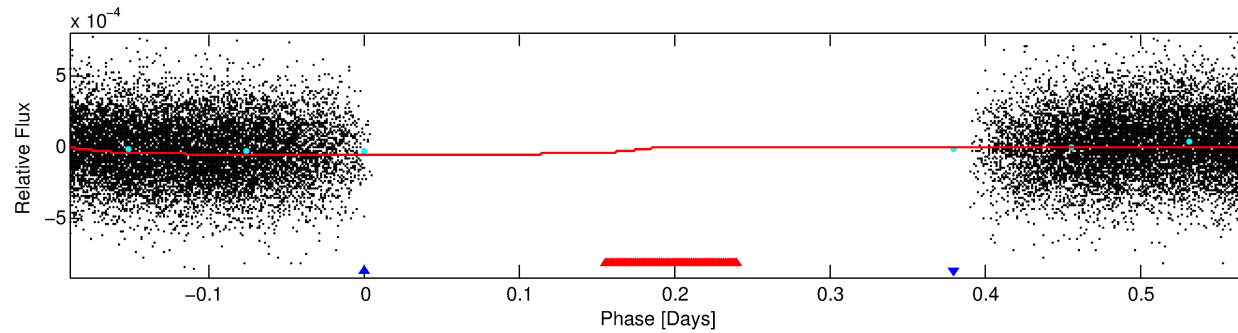
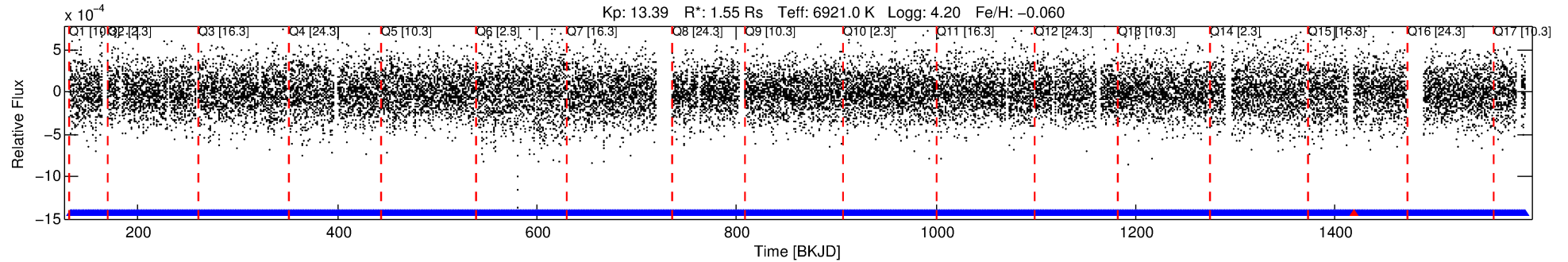
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002855603-02

No Significant Match Found

# DV One-Page Summary

KIC: 2855603 Candidate: 2 of 2 Period: 0.758 d



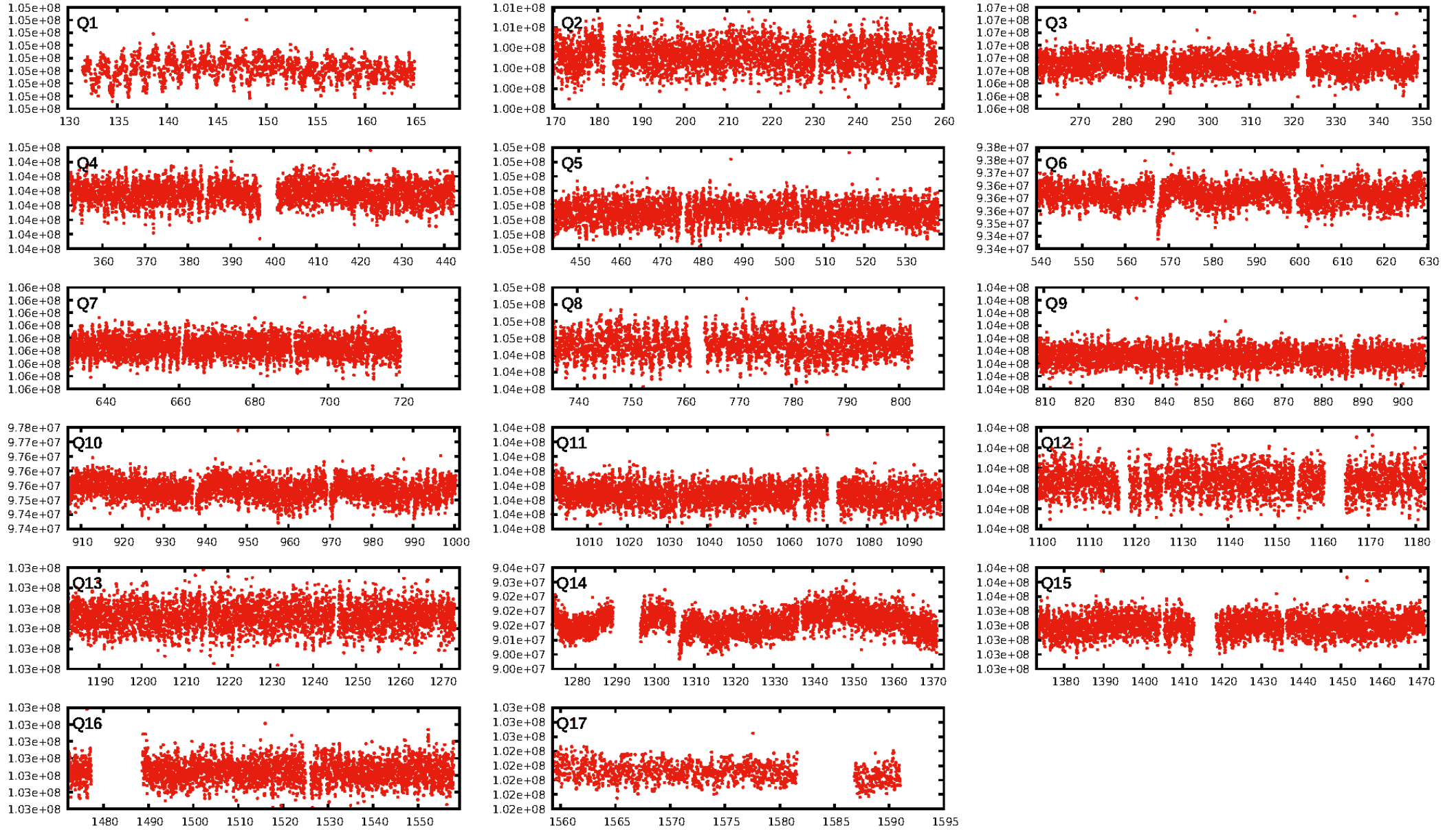
## DV Fit Results:

Period = 0.75822 [0.00001] d  
Epoch = 132.0827 [0.0141] BKJD  
Rp/R\* = 0.0069 [0.0016]  
a/R\* = 1.00 [0.01]  
b = 0.25 [4.99]  
Seff = 15018.29 [5957.62]  
Teq = 2823 [280] K  
Rp = 1.17 [0.47] Re  
a = 0.0182 [0.0047] AU

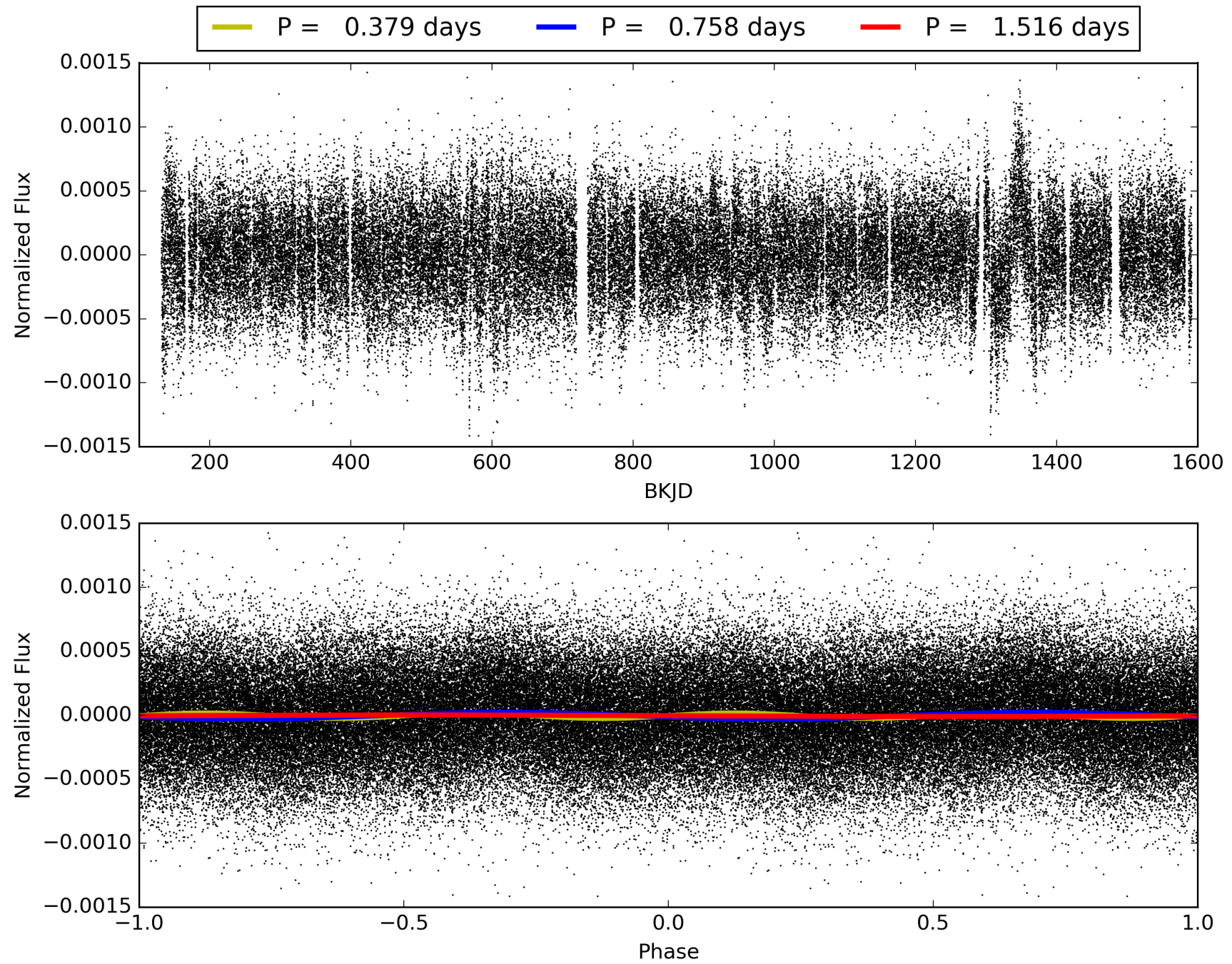
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1689/1690]  
GhostDiagnostic-chr: 1.324  
Centroid-sig: 90.5%  
Centroid-so: 0.299 arcsec [0.96 $\sigma$ ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0 [0]  
KicOffset-st: 0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 002855603-02, PDC Light Curves

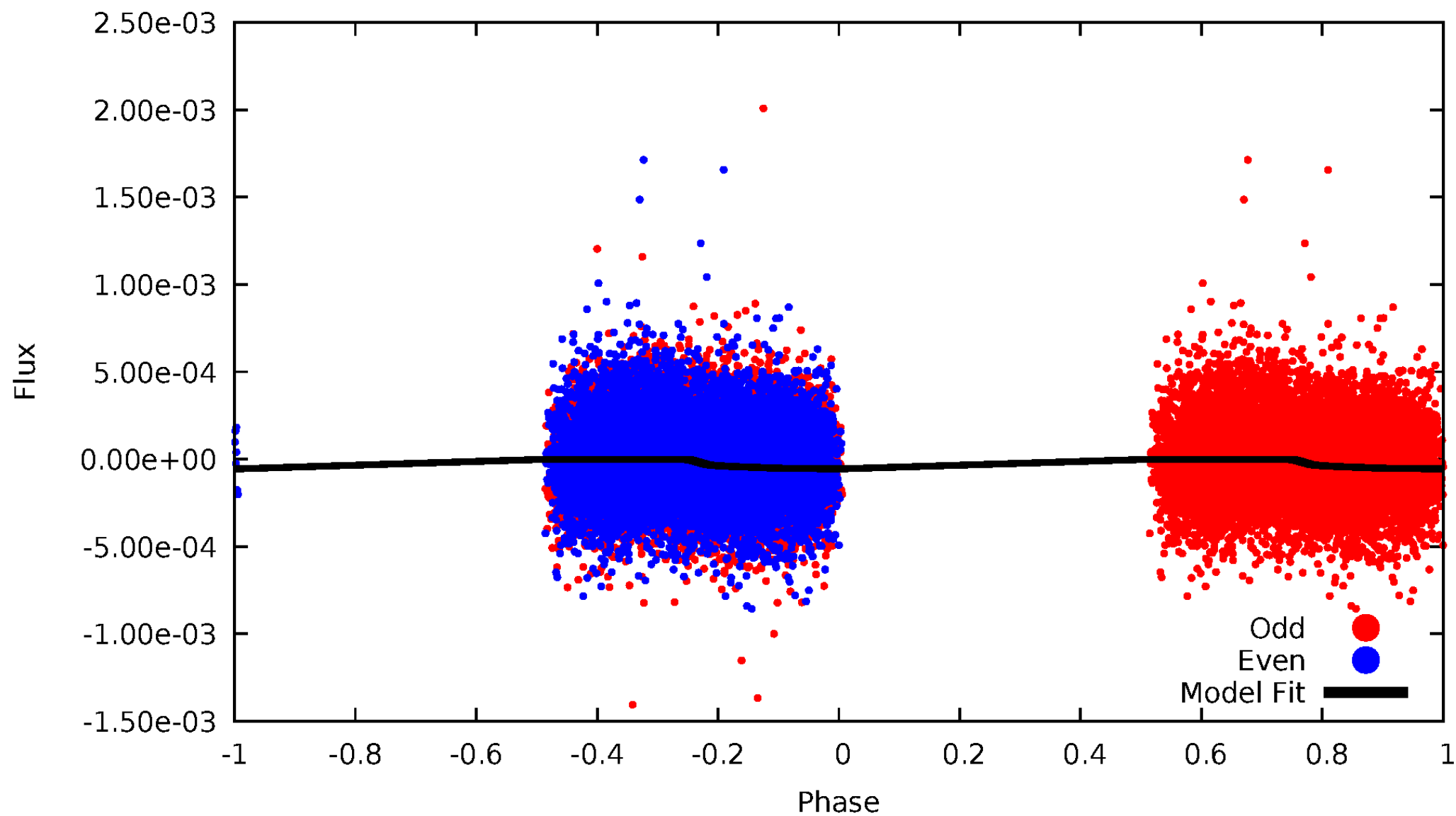


TCE 002855603-02



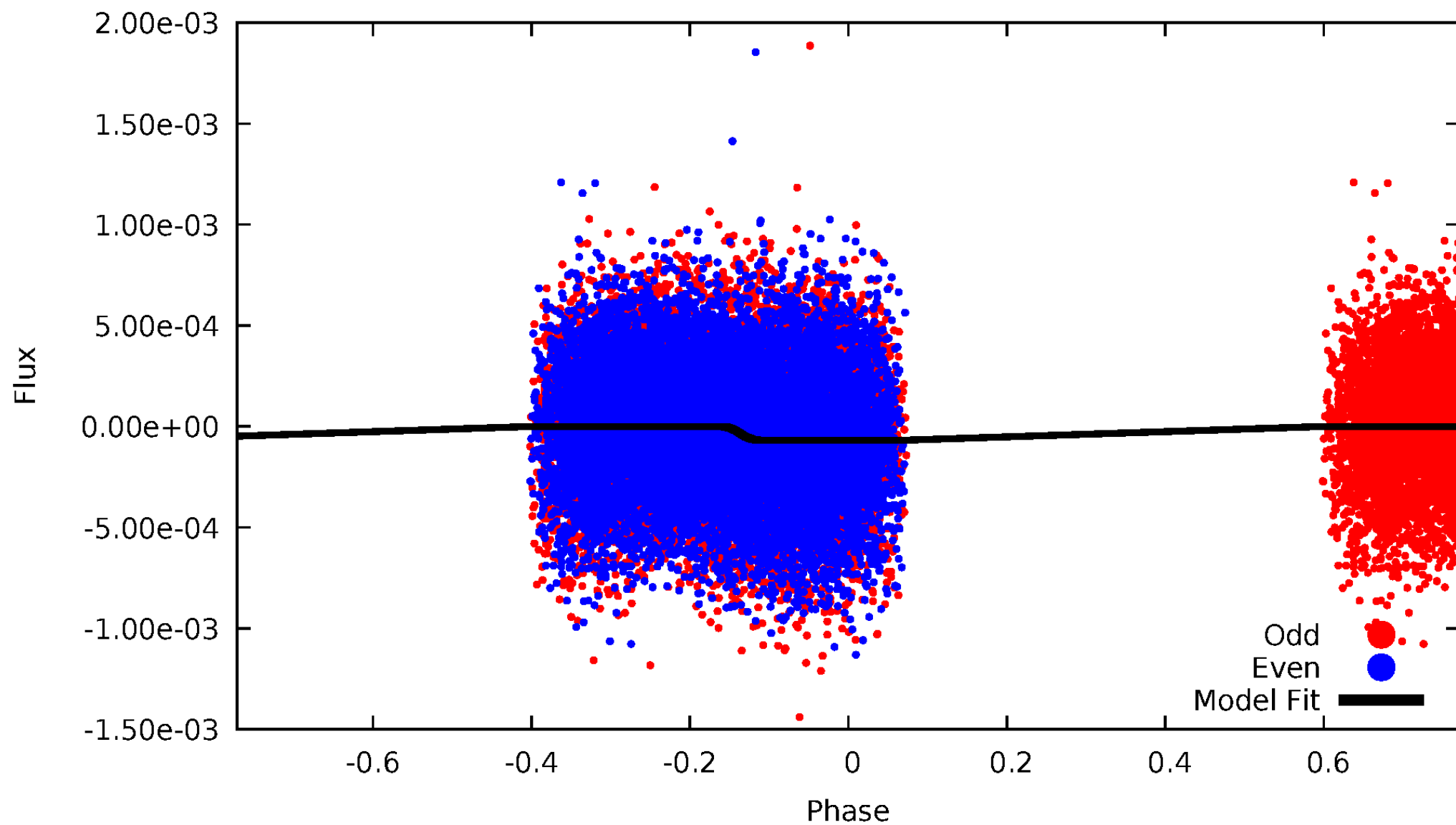
# DV Odd/Even

TCE 002855603-02



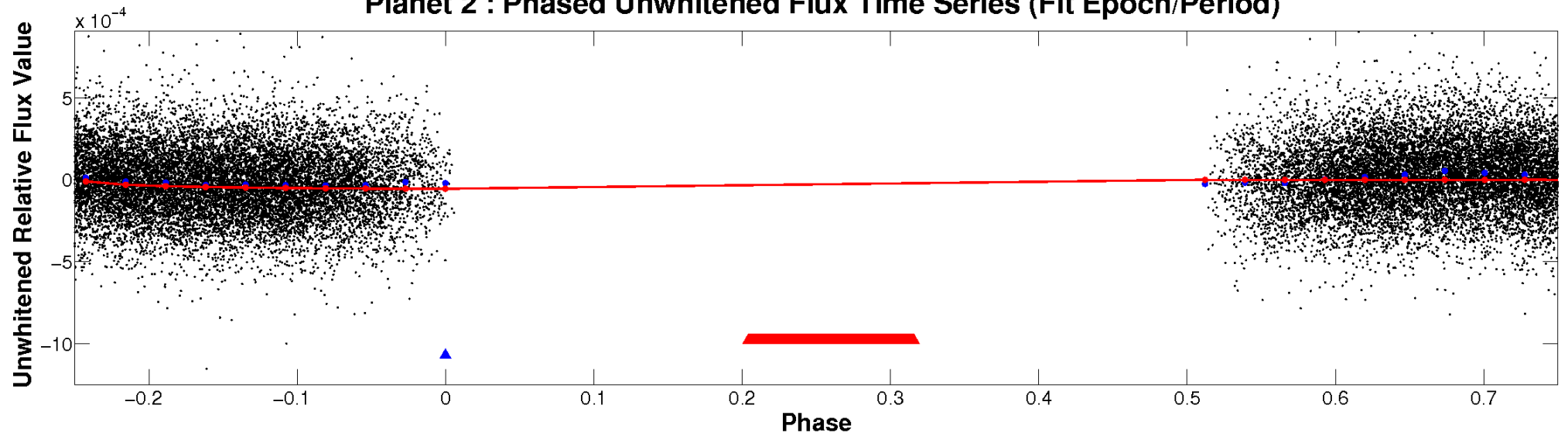
# ALT Odd/Even

TCE 002855603-02

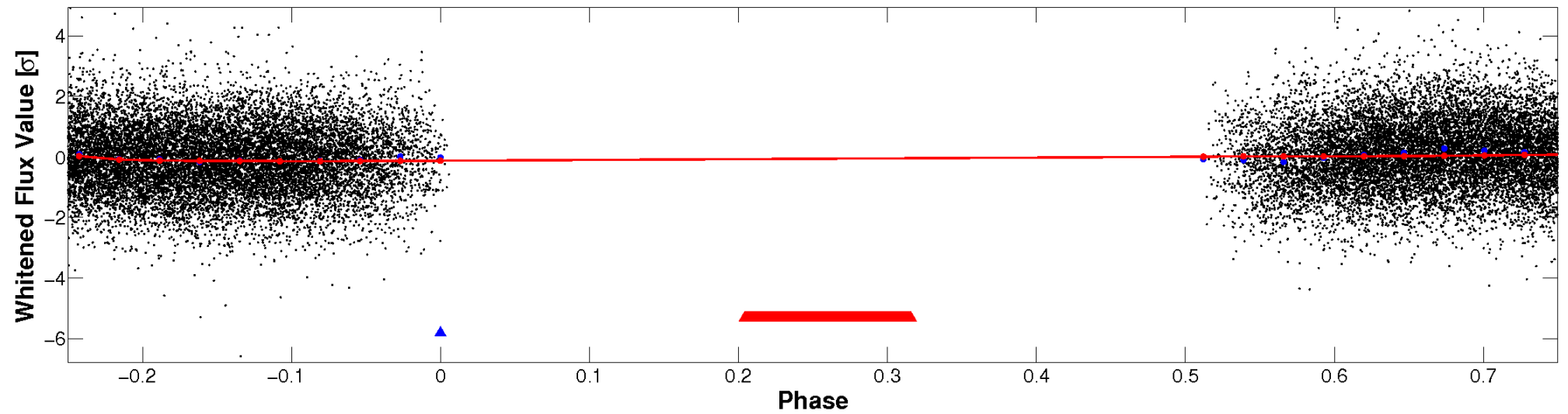


# Non-Whitened Vs. Whitened Light Curve

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

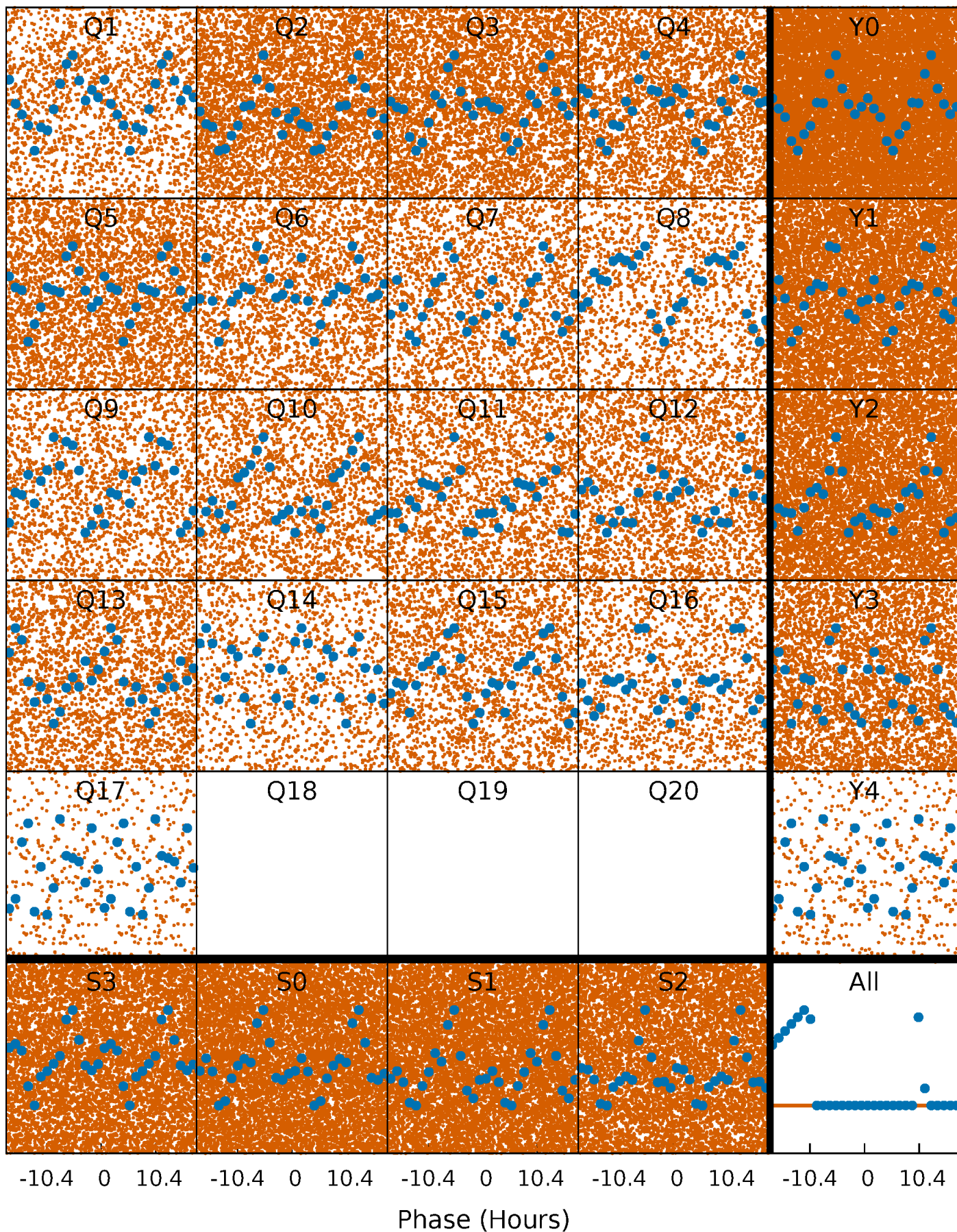


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



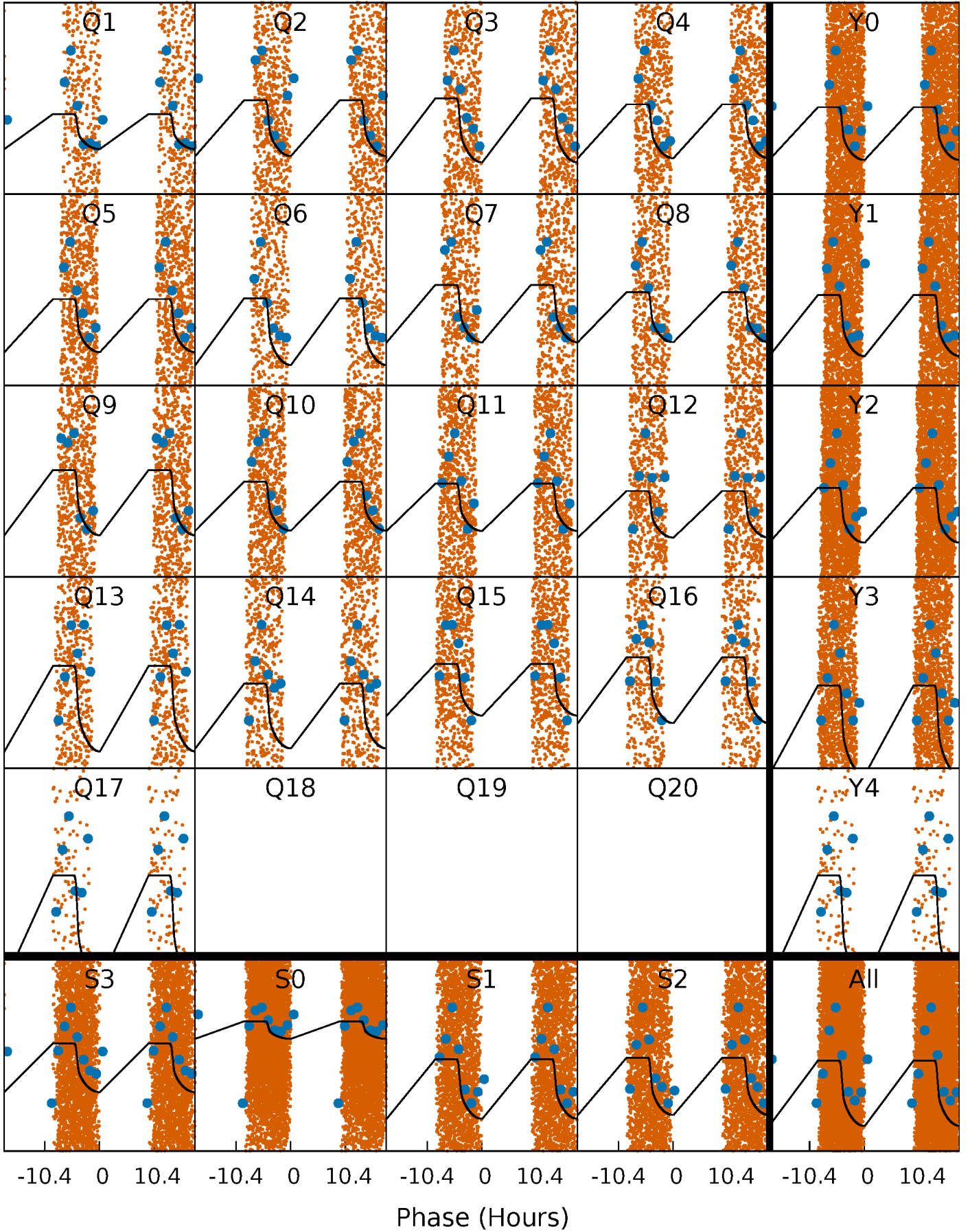
# PDC Quarter-Phased Transit Curves

TCE 002855603-02     $P = 0.758224$  Days     $T_0 = 132.082701$  (BKJD)



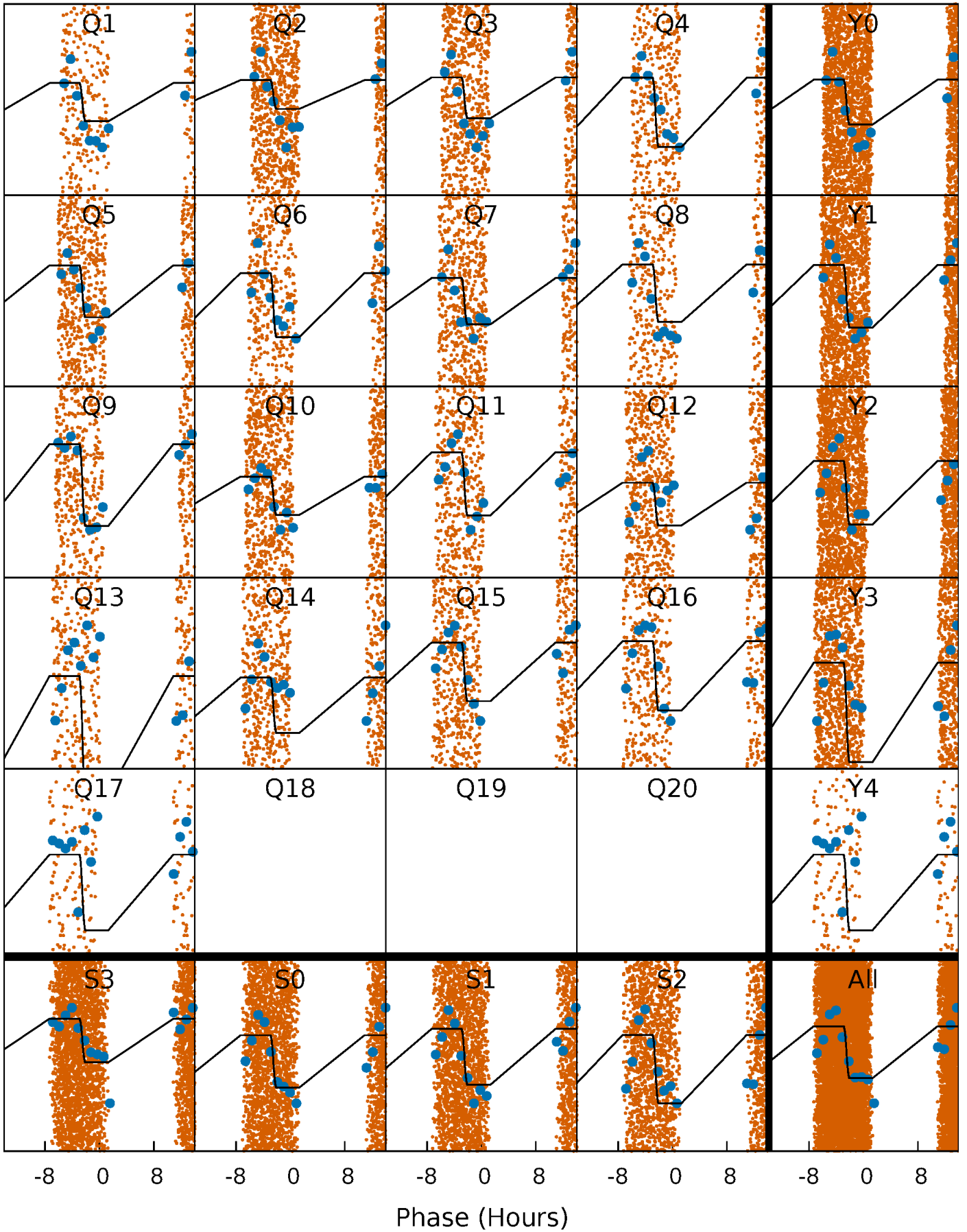
# DV Quarter-Phased Transit Curves

TCE 002855603-02   P= 0.758224 Days    $T_0=132.082701$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

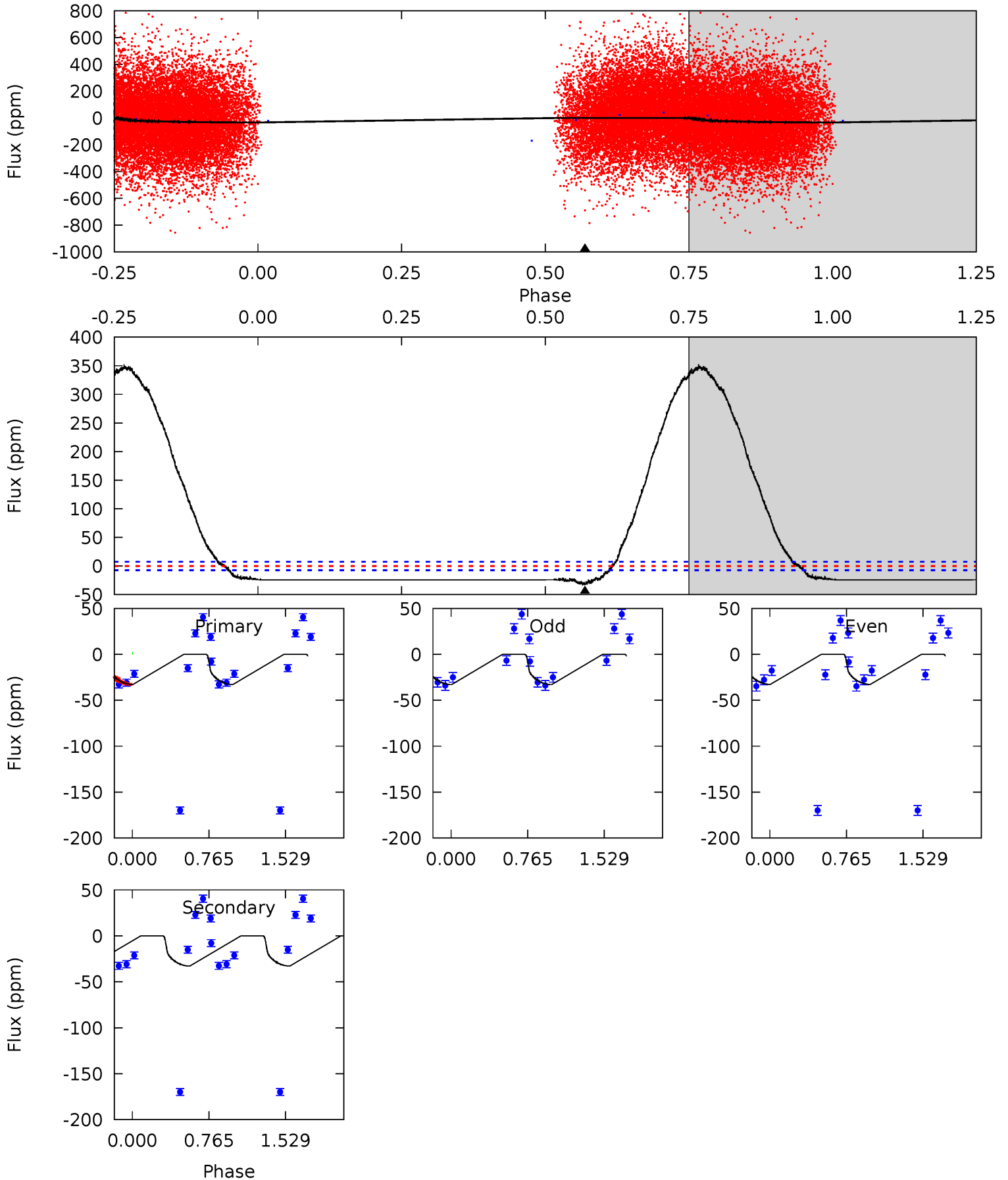
TCE 002855603-02   P= 0.758218 Days    $T_0=132.031576$  (BKJD)



# DV Model-Shift Uniqueness Test

002855603-02, P = 0.758224 Days, E = 131.324477 Days

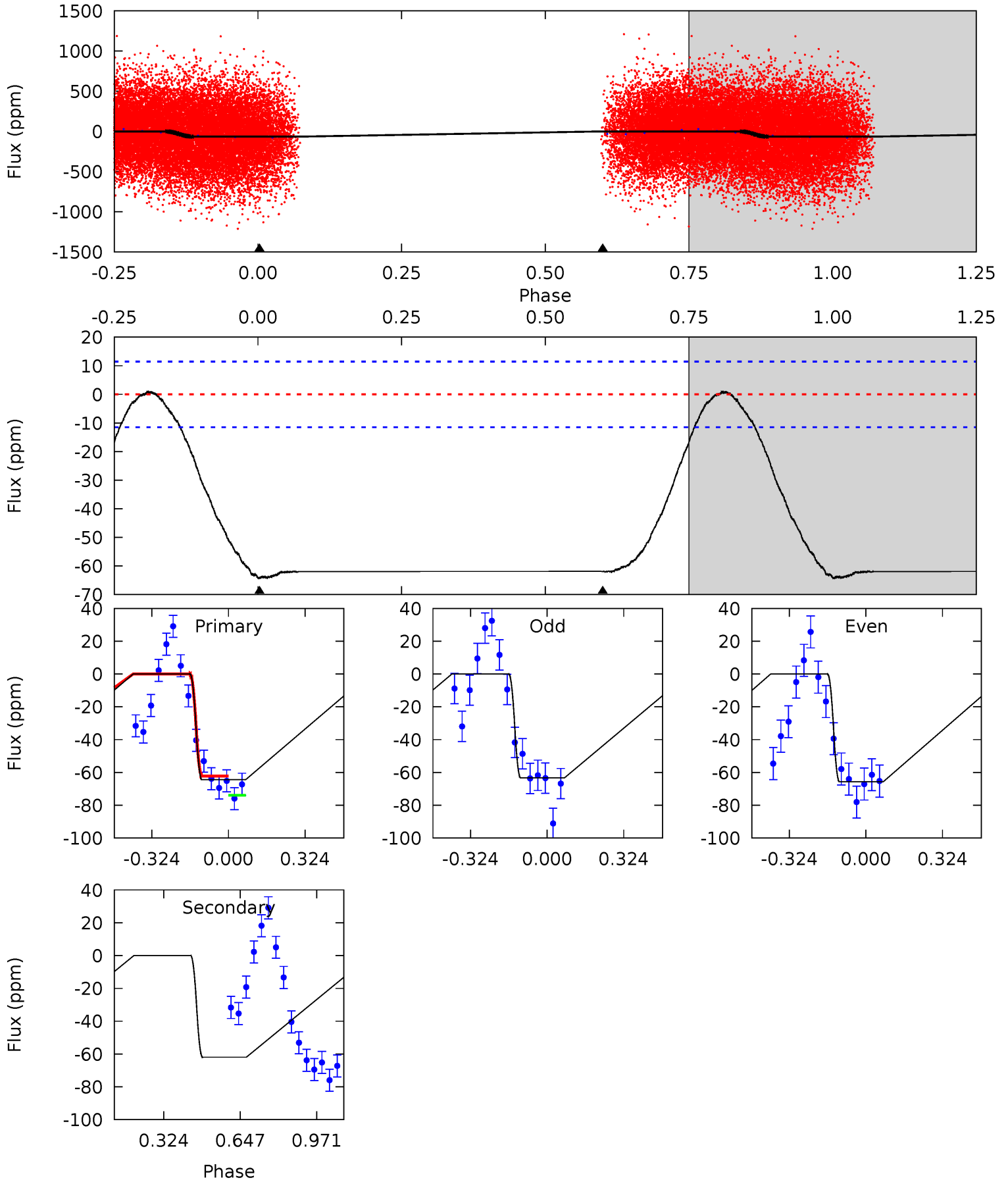
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.3	18.3	0	0	4.12	0.30	9.32	18.3	18.3	18.3	18.3	0.08	1.04	0.91	0.76



# Alt Model-Shift Uniqueness Test

002855603-02, P = 0.758218 Days, E = 131.273358 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
24.2	23.3	0	0	4.31	0.99	0.44	24.2	24.2	23.3	23.3	0.44	0.94	0.02	1.57



### Stellar Parameters For KIC 002855603

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6921^{+194}_{-291}$	$4.199^{+0.124}_{-0.186}$	$-0.060^{+0.250}_{-0.350}$	$1.553^{+0.508}_{-0.313}$	$1.399^{+0.195}_{-0.238}$	$0.526^{+0.321}_{-0.270}$
	+3%/-4%	+3%/-4%	+417%/-583%	+33%/-20%	+14%/-17%	+61%/-51%
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 002855603-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-33 \pm 2$	$1.17^{+0.34}_{-0.31}$	$3972^{+306}_{-252}$	$6171^{+1065}_{-715}$	$4.311^{+3.577}_{-1.722}$
Alt.	$-62 \pm 3$	$1.43^{+0.34}_{-0.34}$	$3966^{+302}_{-267}$	$6540^{+1004}_{-589}$	$5.343^{+3.624}_{-1.849}$

$T_{max}$  = 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

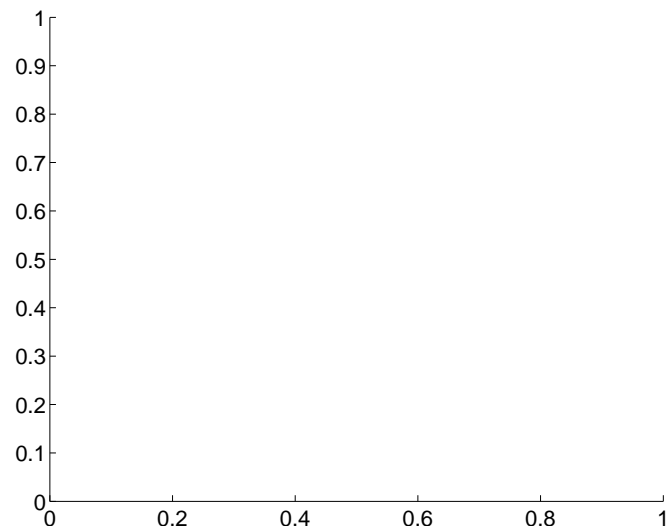
Supplemental centroid analysis for 002855603-02. Kepler magnitude: 13.39. Transit SNR 14.31

There are 0 quarters with good PRF difference image offsets

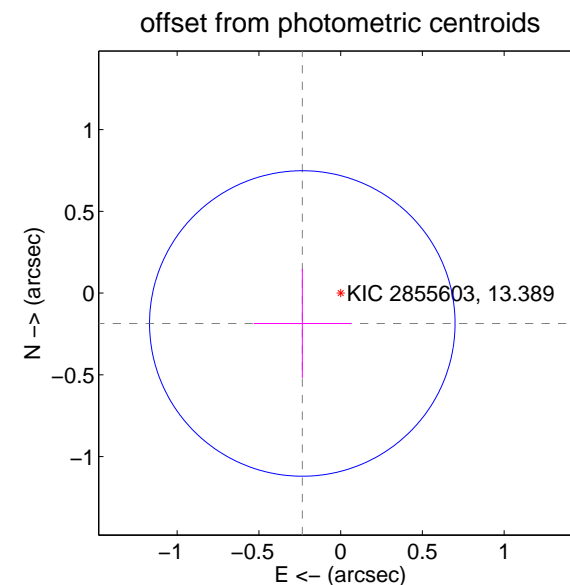
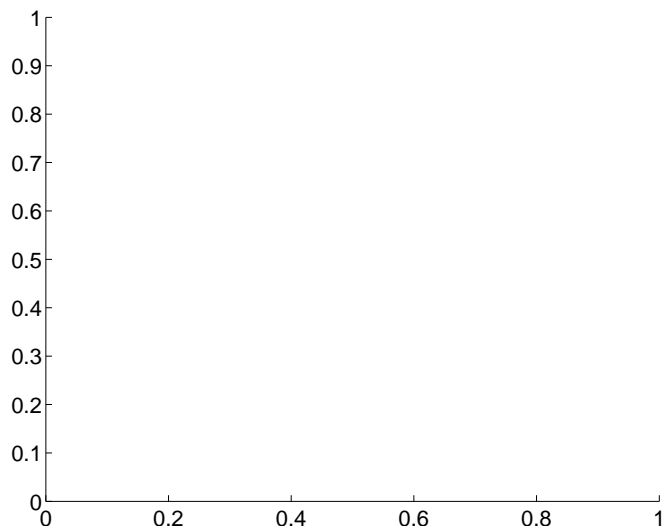
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$0.30 \pm 0.31$	0.96	$0.23 \pm 0.30$	$-0.19 \pm 0.33$

There is no PRF-fit offset from OOT-fit

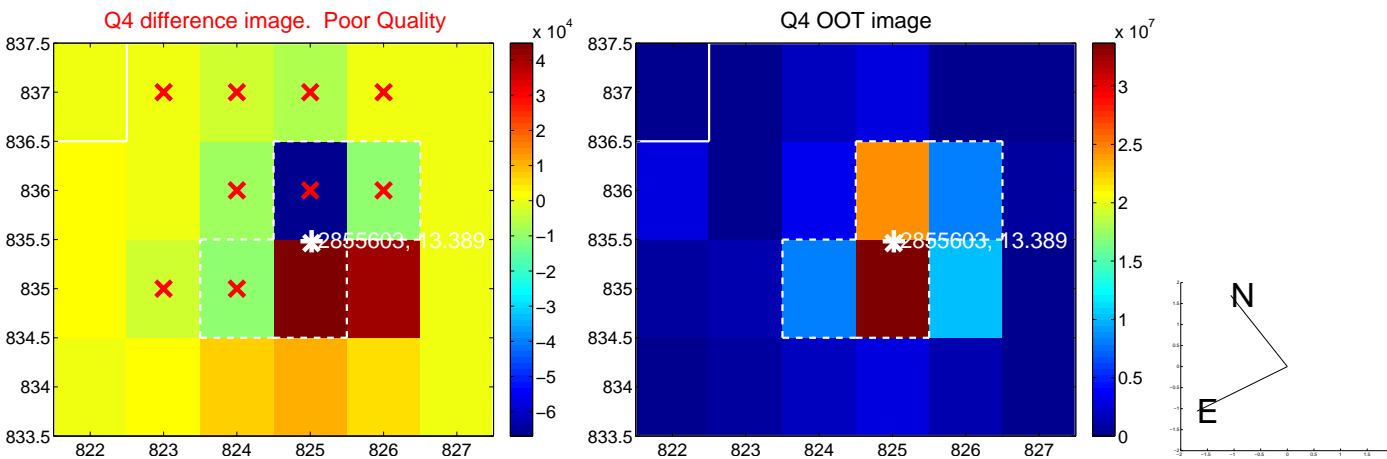
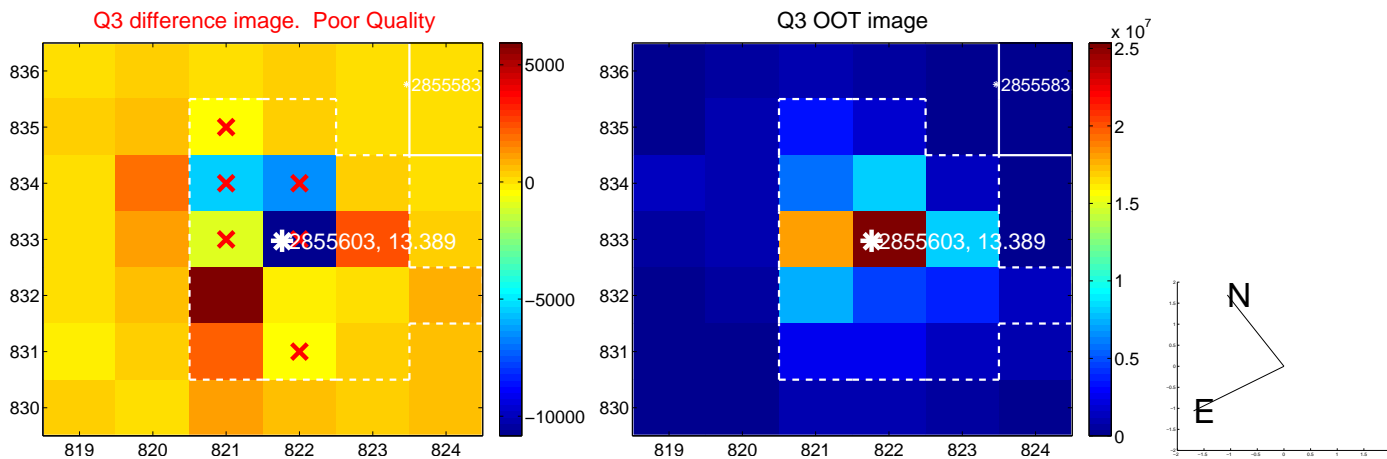
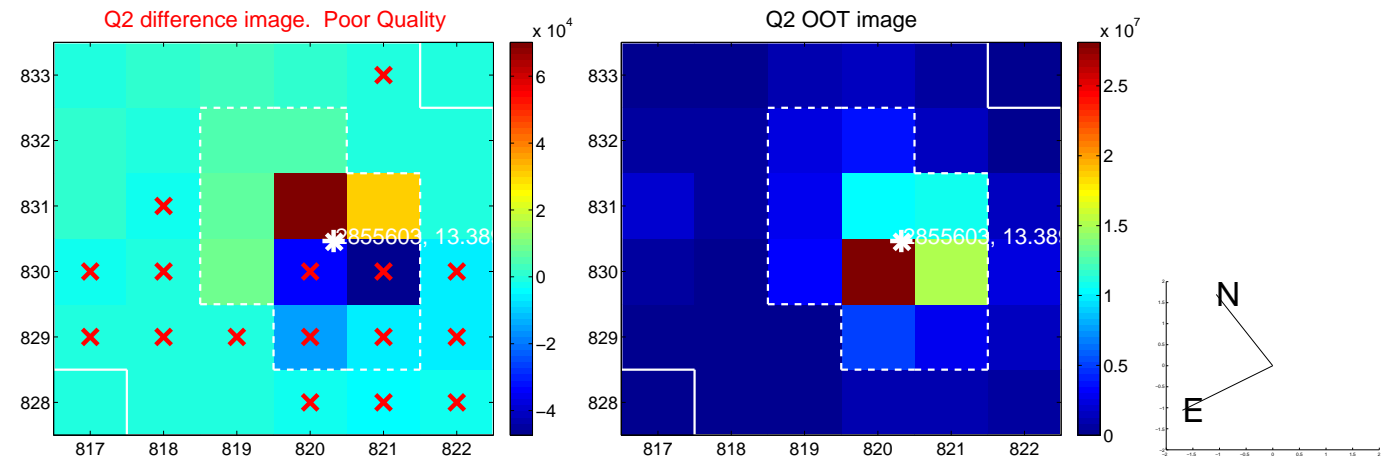
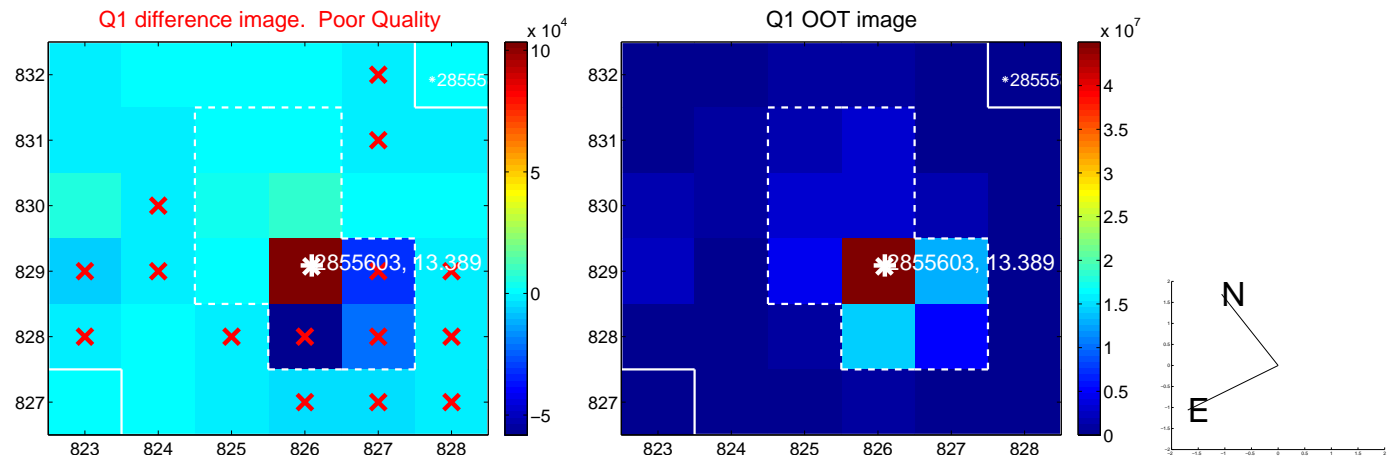


There is no PRF-fit offset from KIC

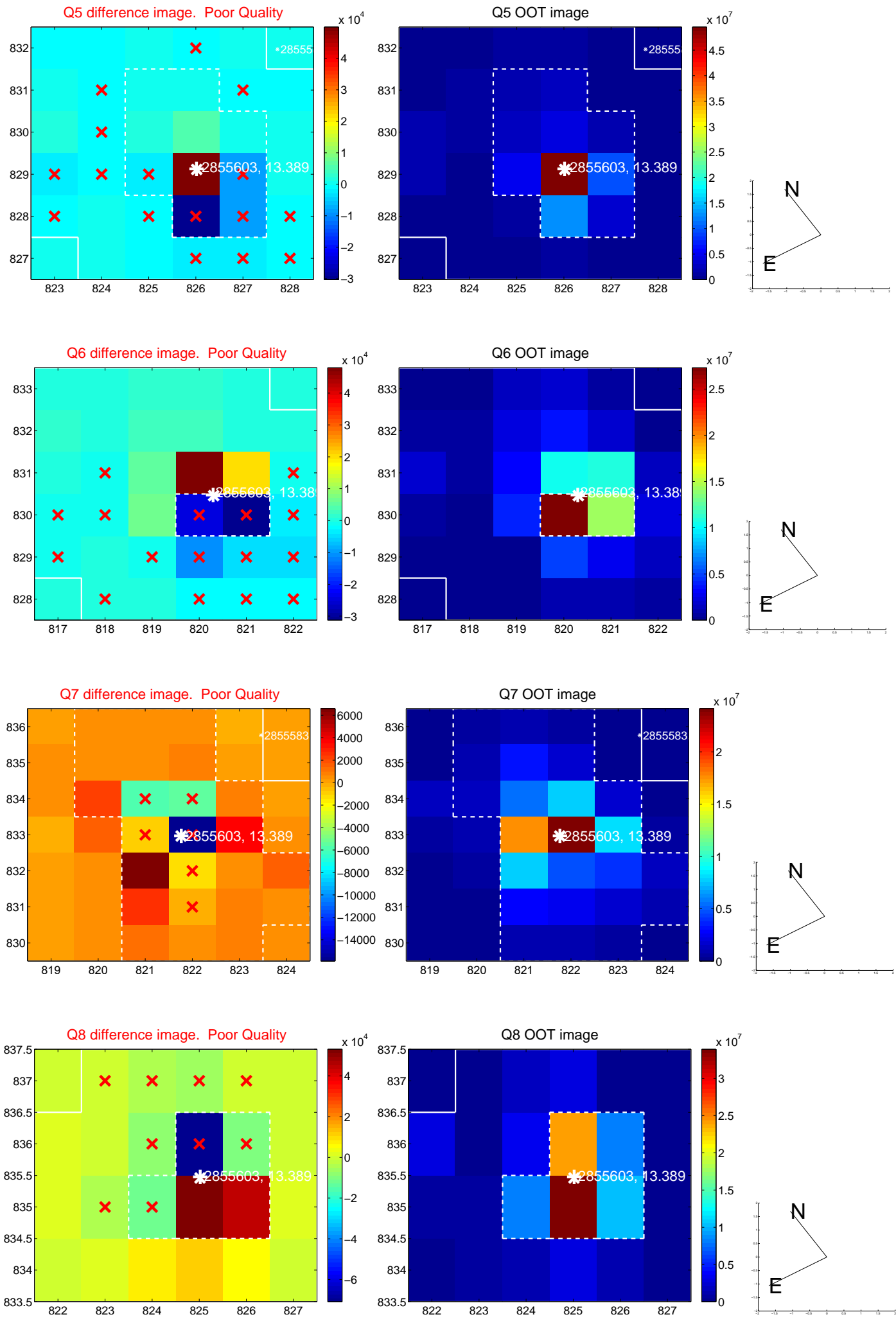


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

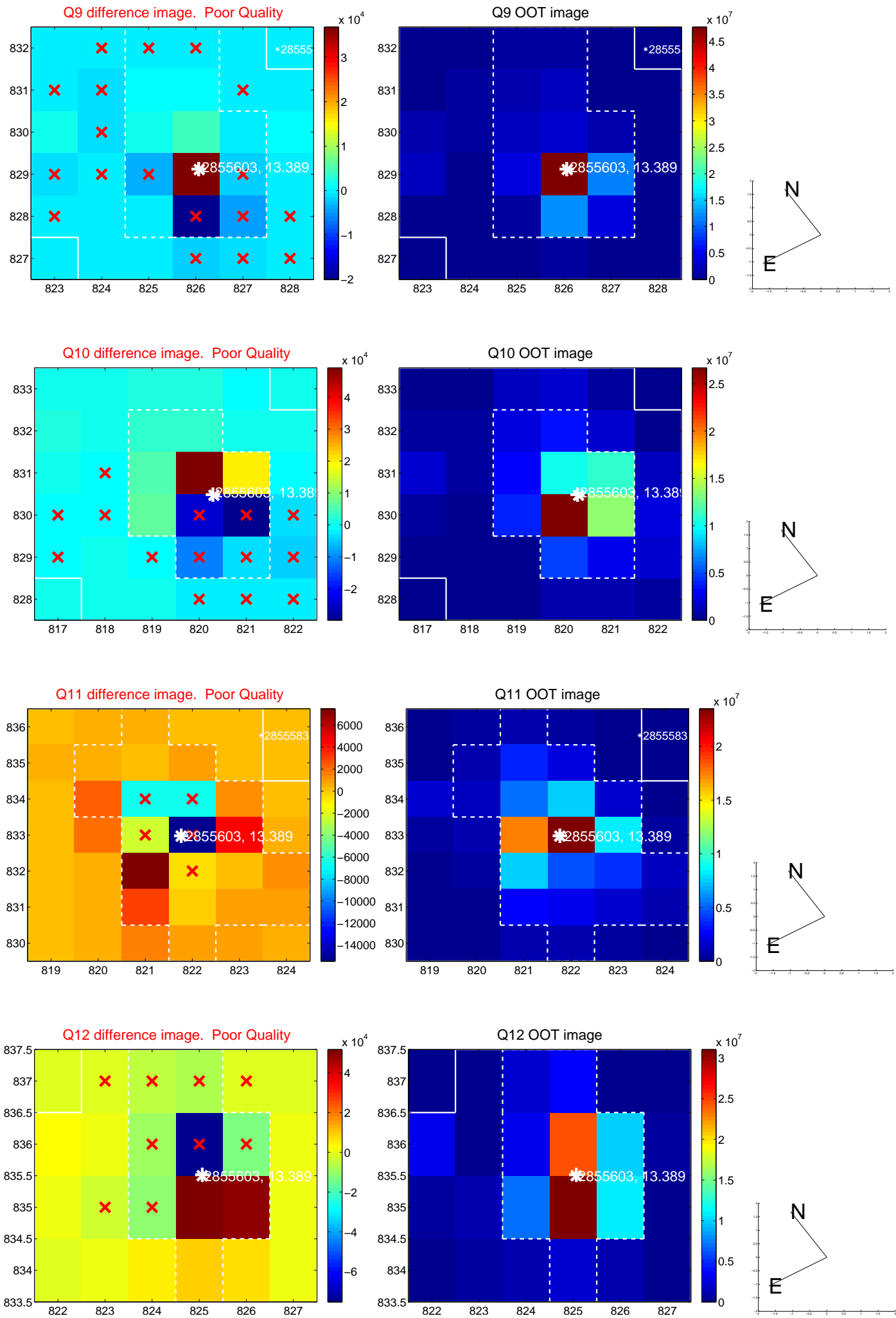
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



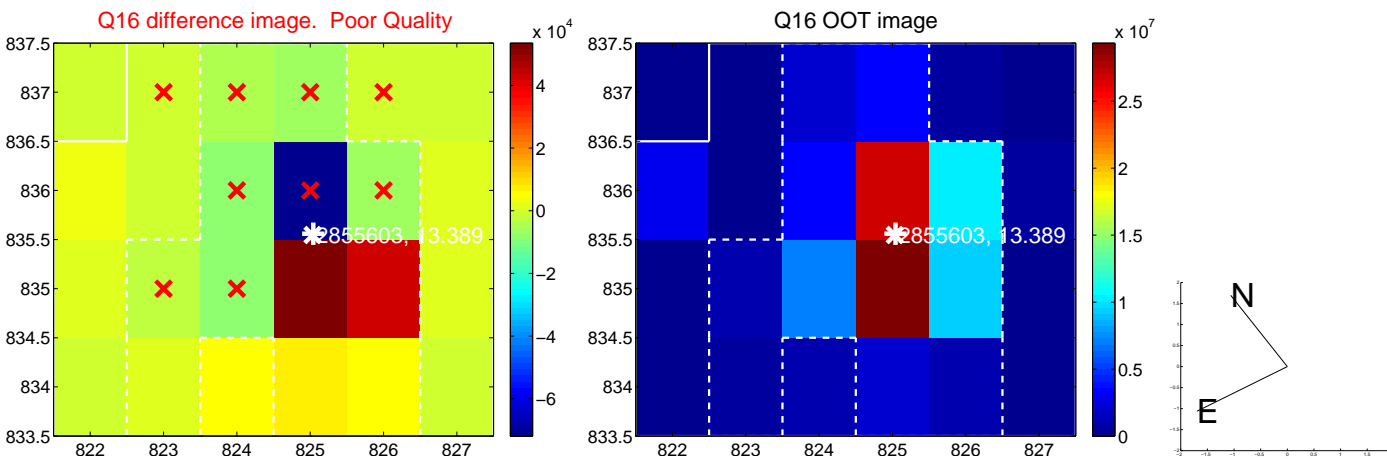
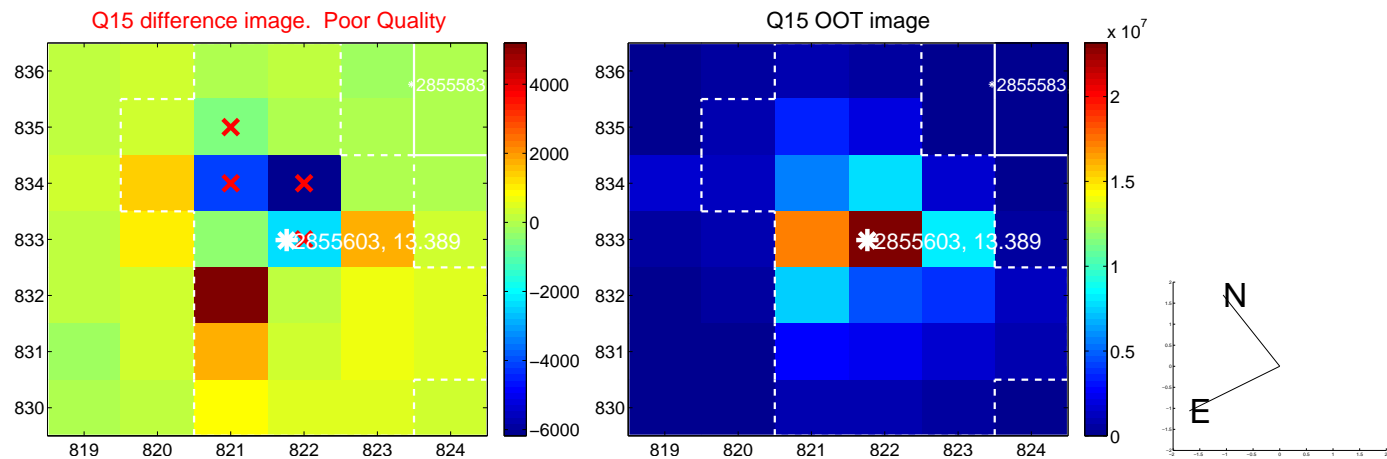
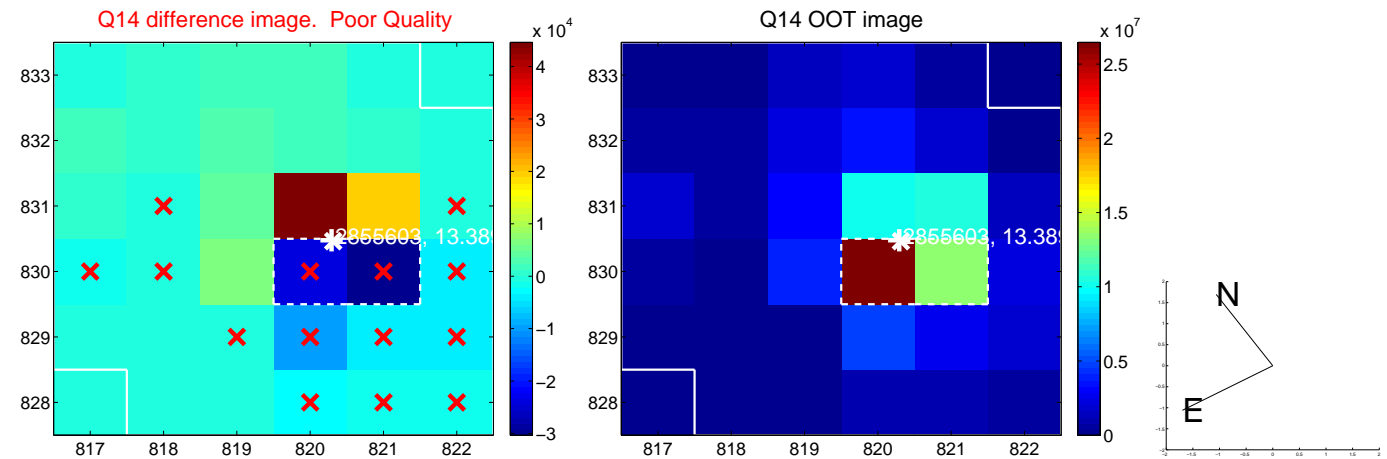
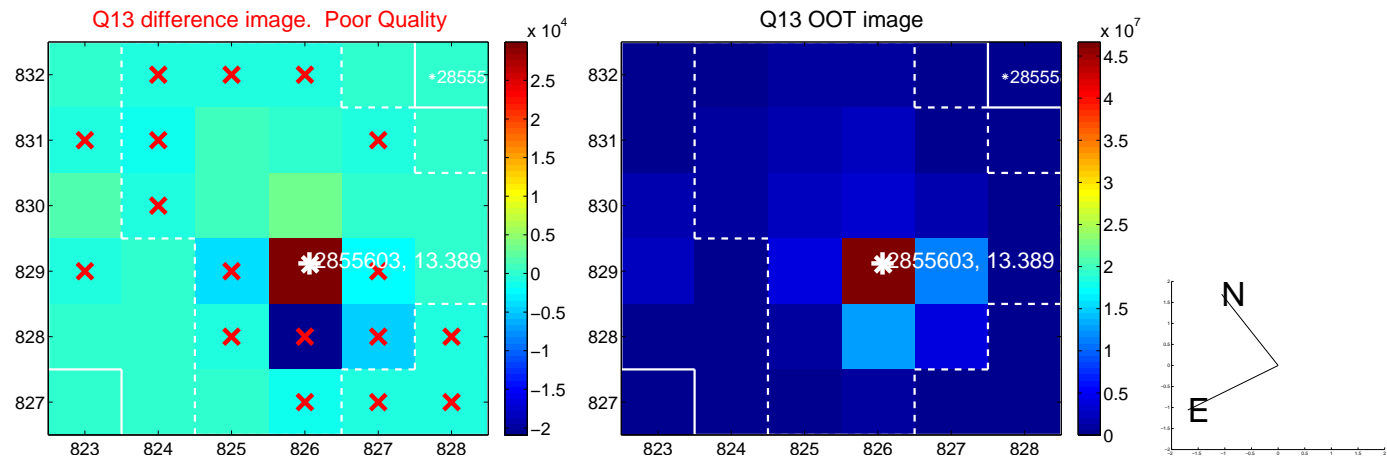
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



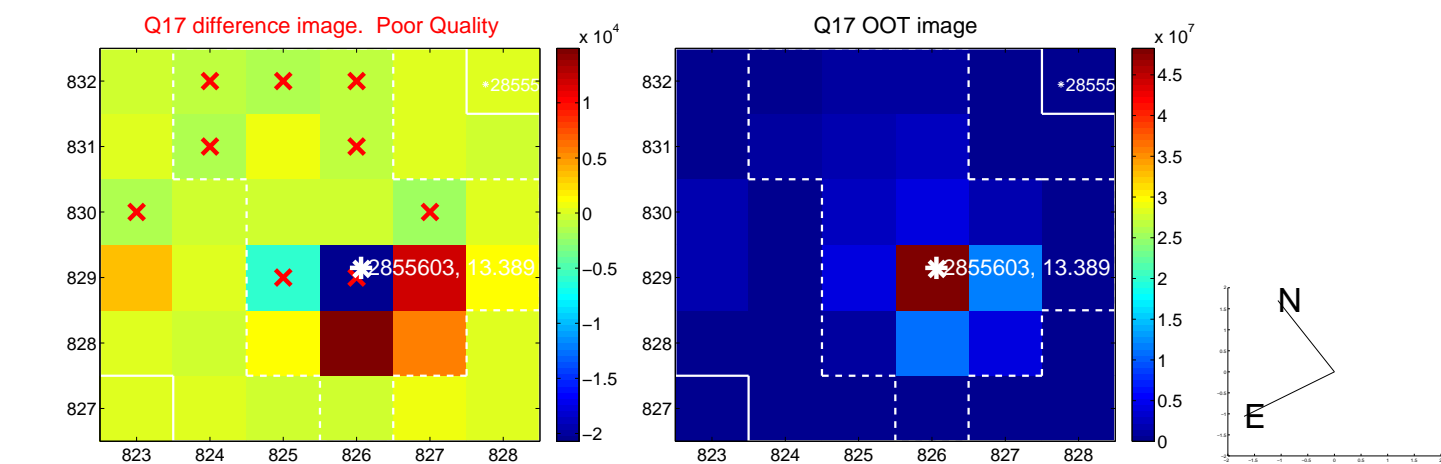
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



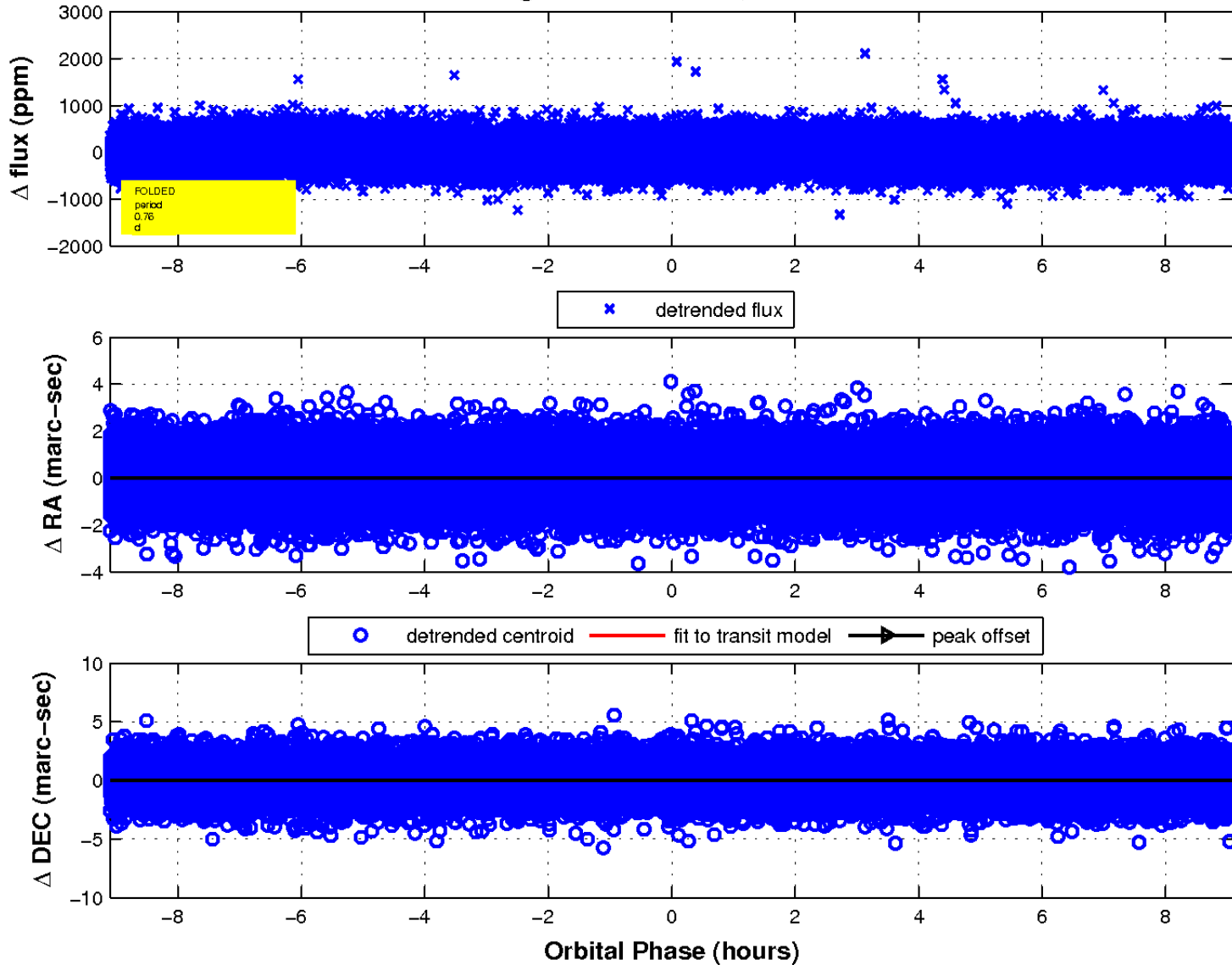
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

