

# KIC 008256643

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008256643-01	OBS	No	0.525394	131.518228	101.3	2.103	12.7	14.2	2.95	7502	3.45	103134.79
008256643-02	OBS	No	0.872324	132.253570	114.0	2.050	11.7	9.2	2.95	7502	3.66	52458.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008256643-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008256643-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

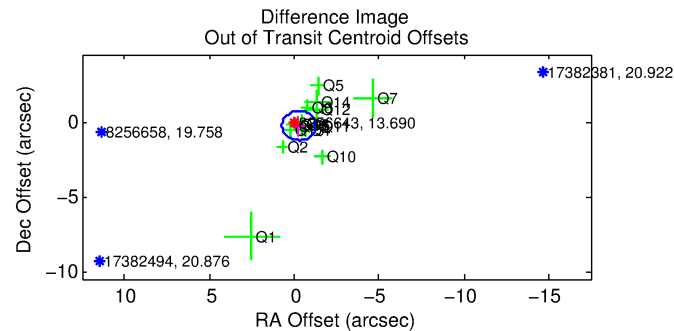
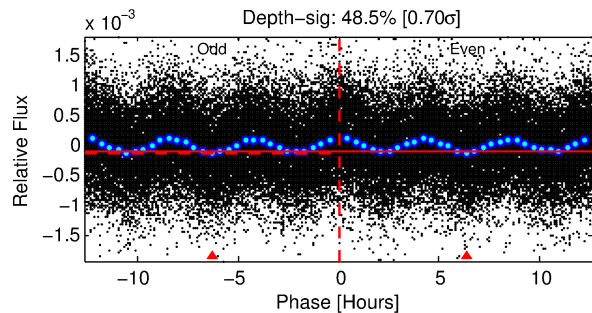
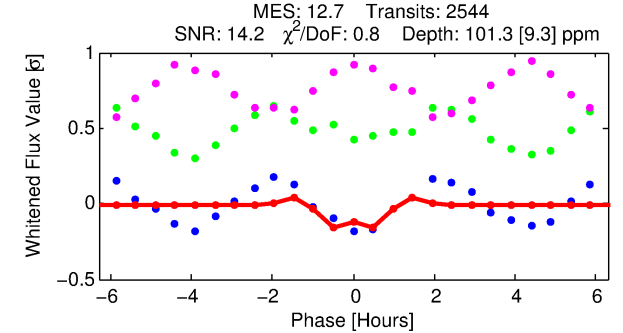
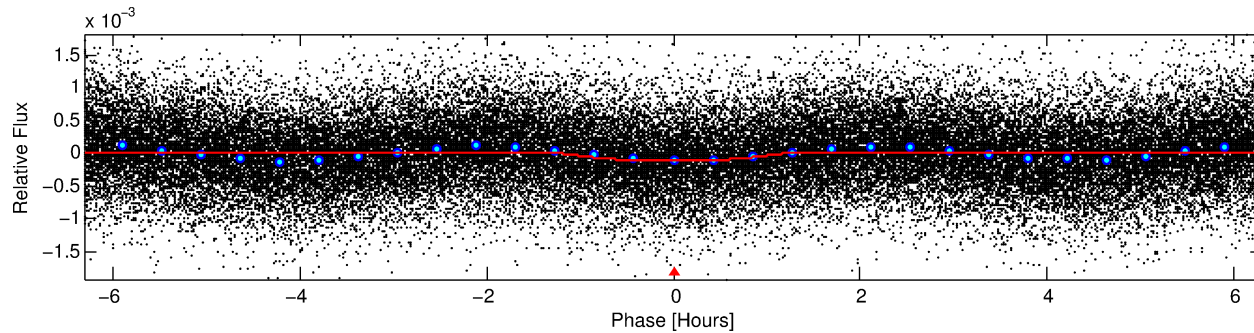
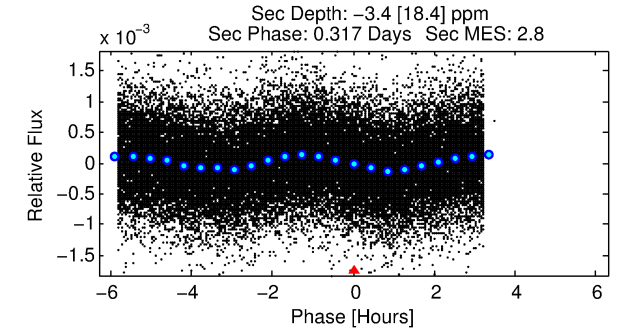
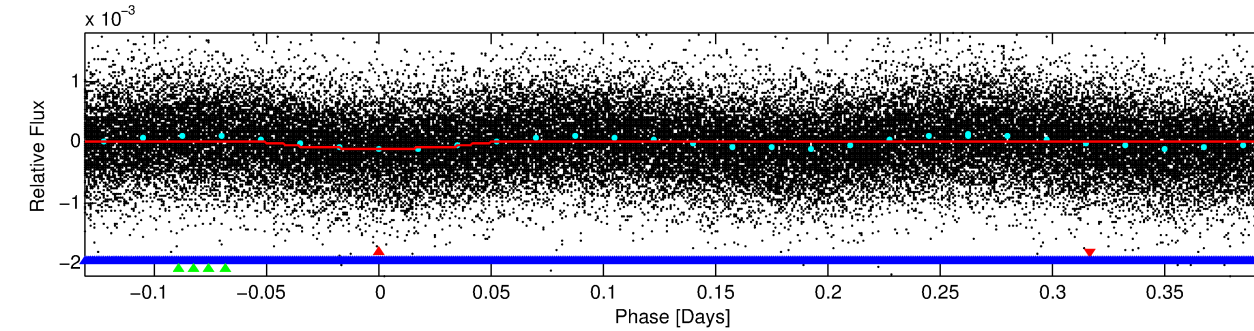
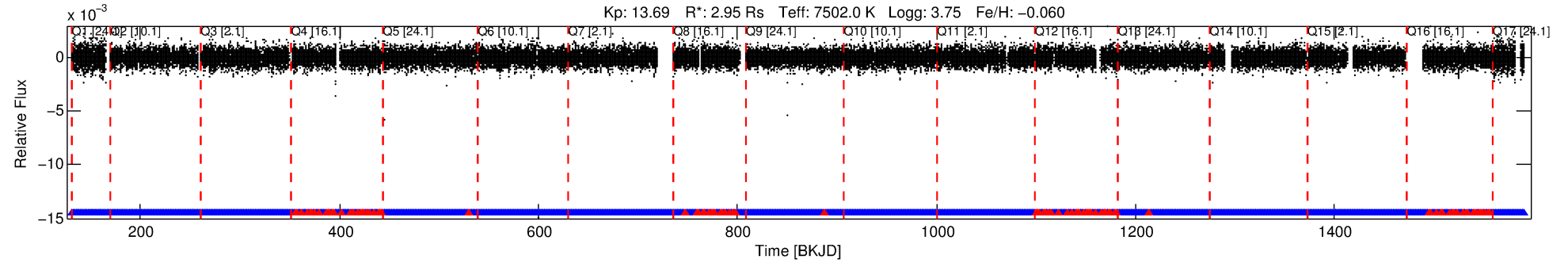
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008256643-01

No Significant Match Found

# DV One-Page Summary

KIC: 8256643 Candidate: 1 of 3 Period: 0.525 d



## DV Fit Results:

Period = 0.52539 [0.00001] d  
Epoch = 131.5182 [0.0011] BKJD  
Rp/R\* = 0.0107 [0.0022]  
a/R\* = 1.28 [0.64]  
b = 0.90 [0.27]  
Seff = 103134.79 [69020.67]  
Teff = 4570 [765] K  
Rp = 3.45 [1.56] Re  
a = 0.0155 [0.0062] AU  
Ag = N/A  
Teffp = N/A

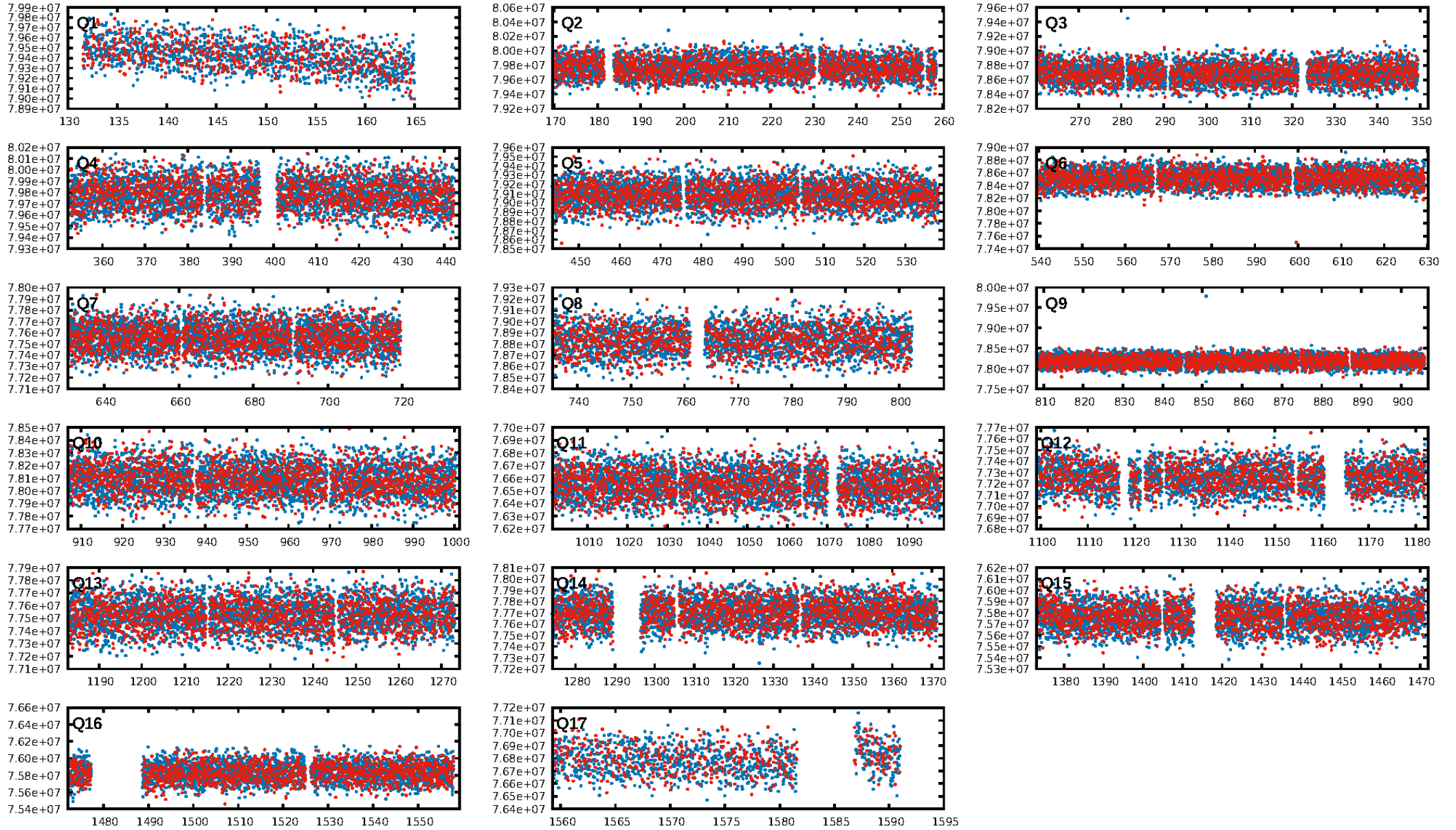
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.5% [2.83σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.95 [2313/2429]  
GhostDiagnostic-chr: 2.102  
Centroid-sig: 0.0%  
Centroid-so: 0.520 arcsec [1.84σ]  
OotOffset-rm: 0.378 arcsec [1.15σ]  
KicOffset-rm: 0.294 arcsec [1.17σ]  
OotOffset-st: 4/3/4/4 [15]  
KicOffset-st: 4/3/4/4 [15]  
DiffImageQuality-fgm: 0.47 [7/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:35:37 Z

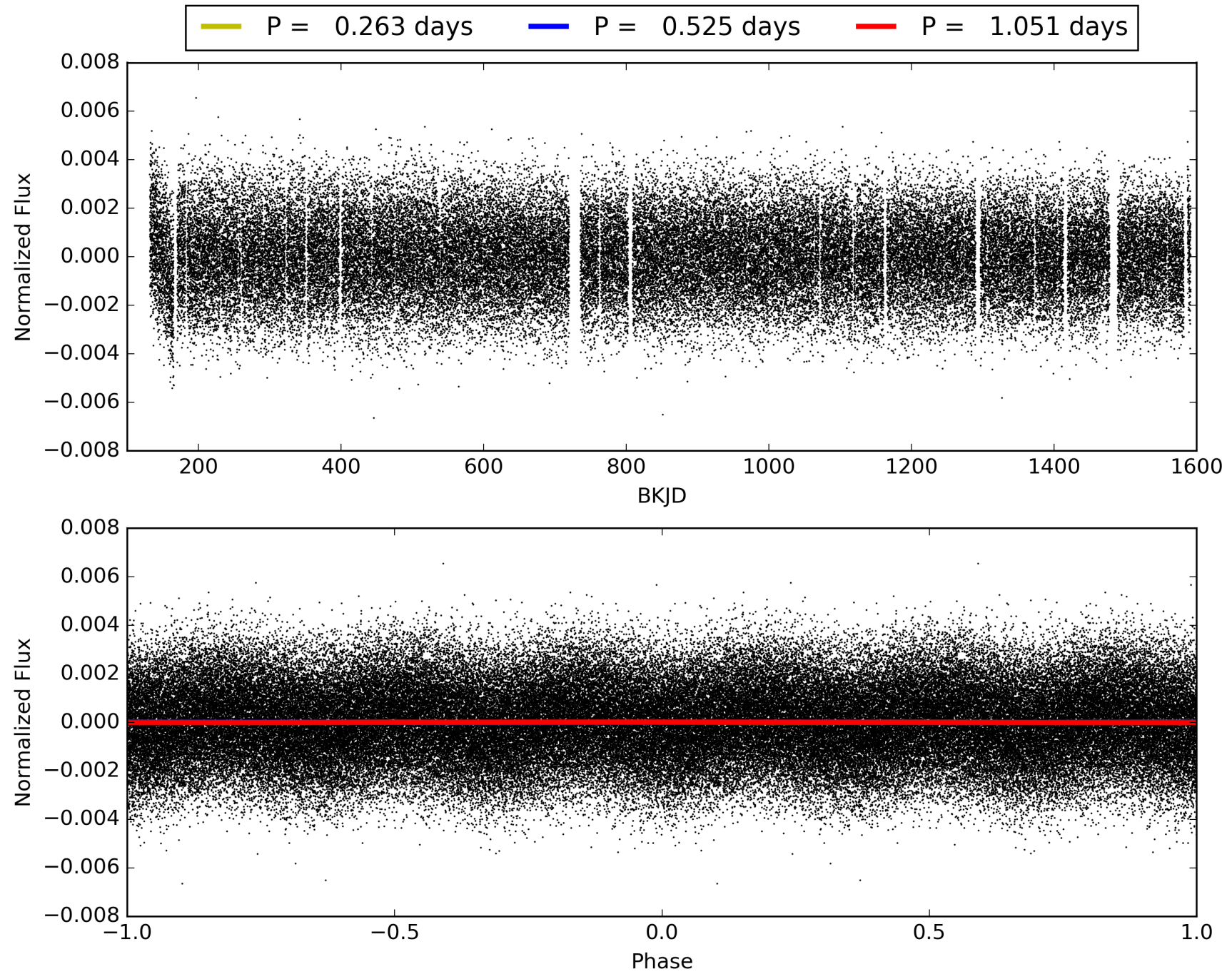
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008256643-01, PDC Light Curves



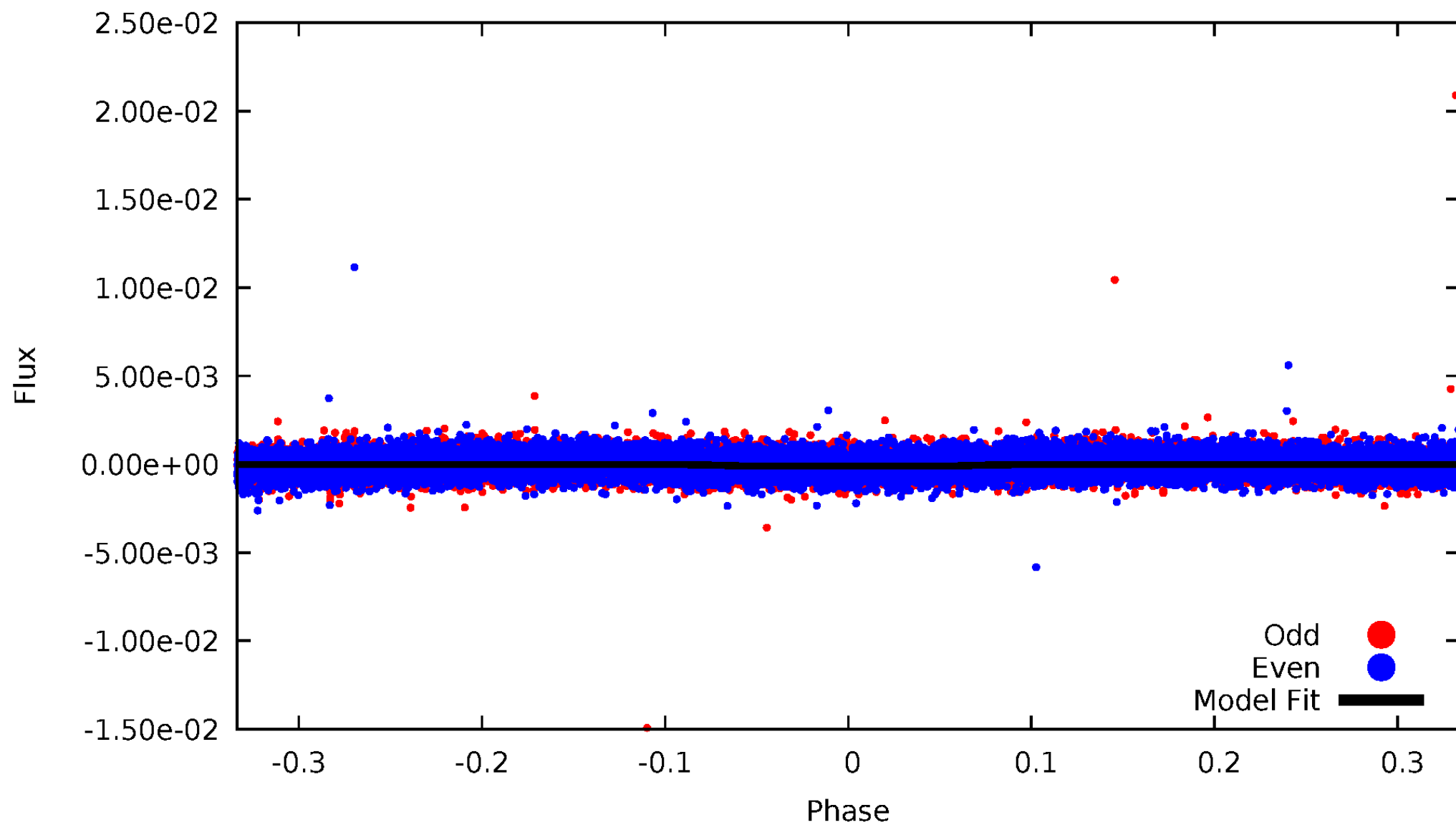


TCE 008256643-01



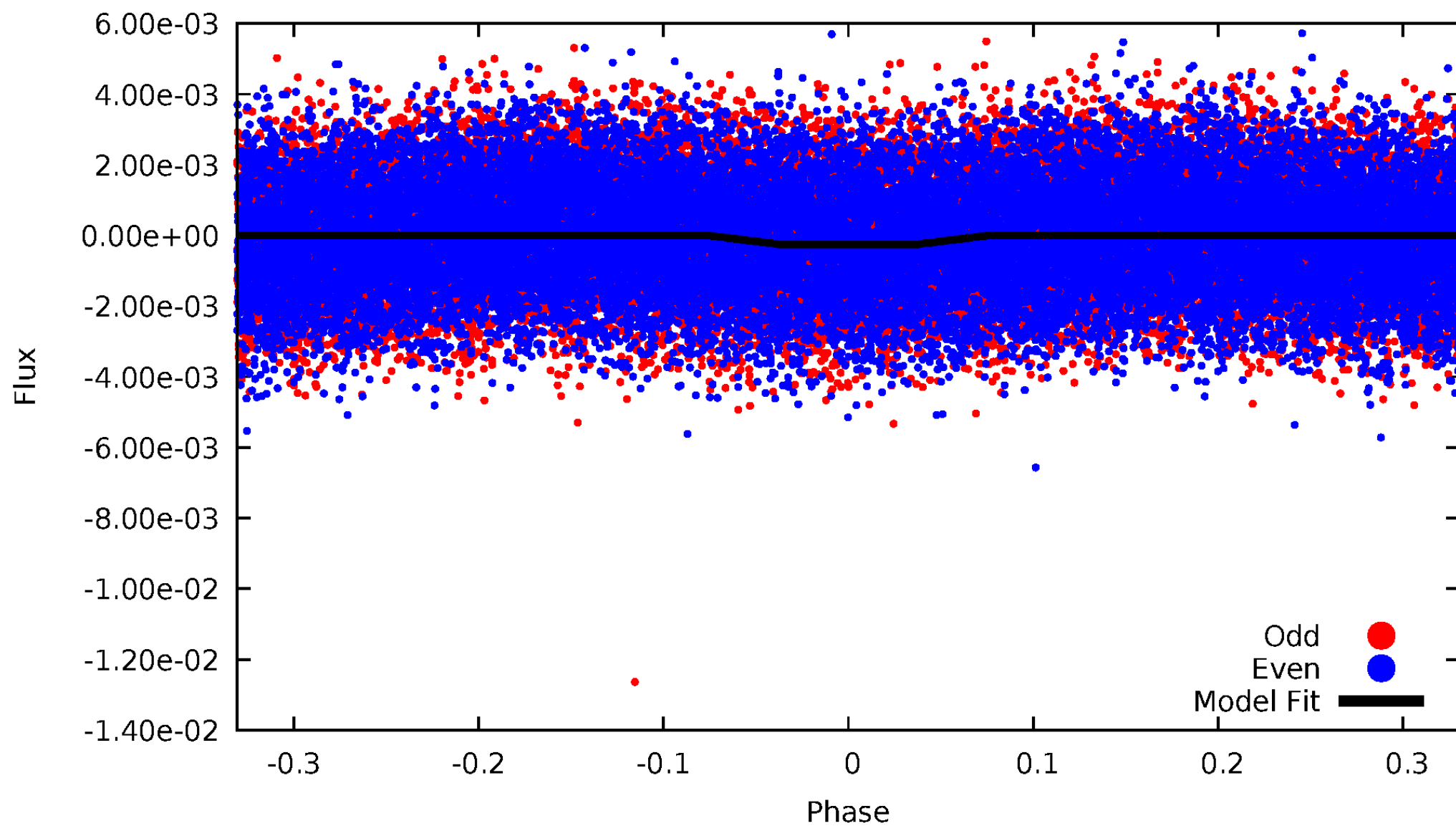
# DV Odd/Even

TCE 008256643-01



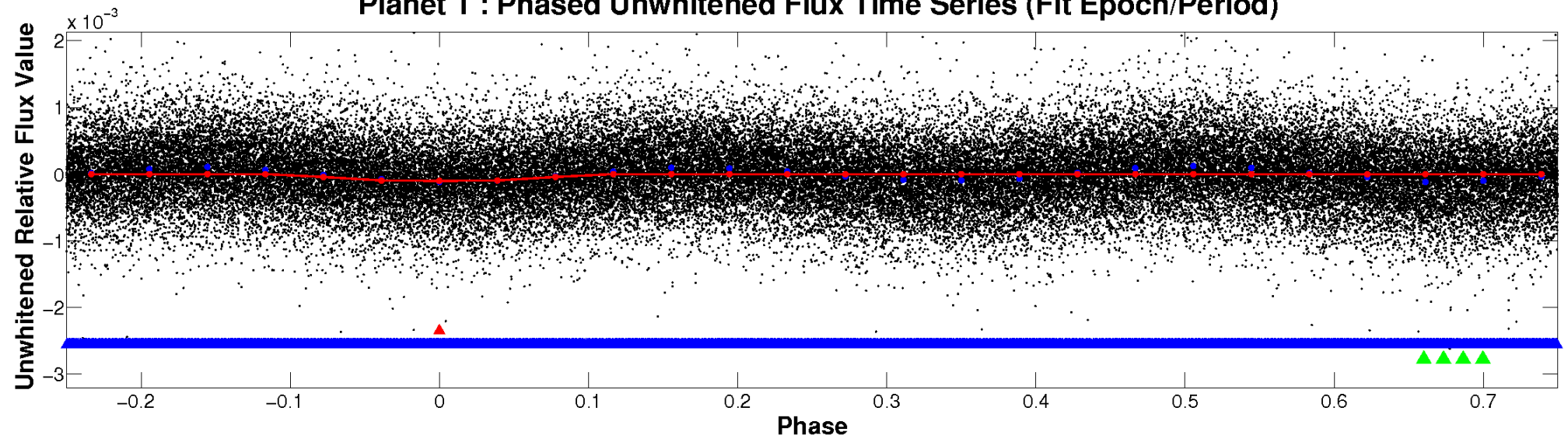
# ALT Odd/Even

TCE 008256643-01

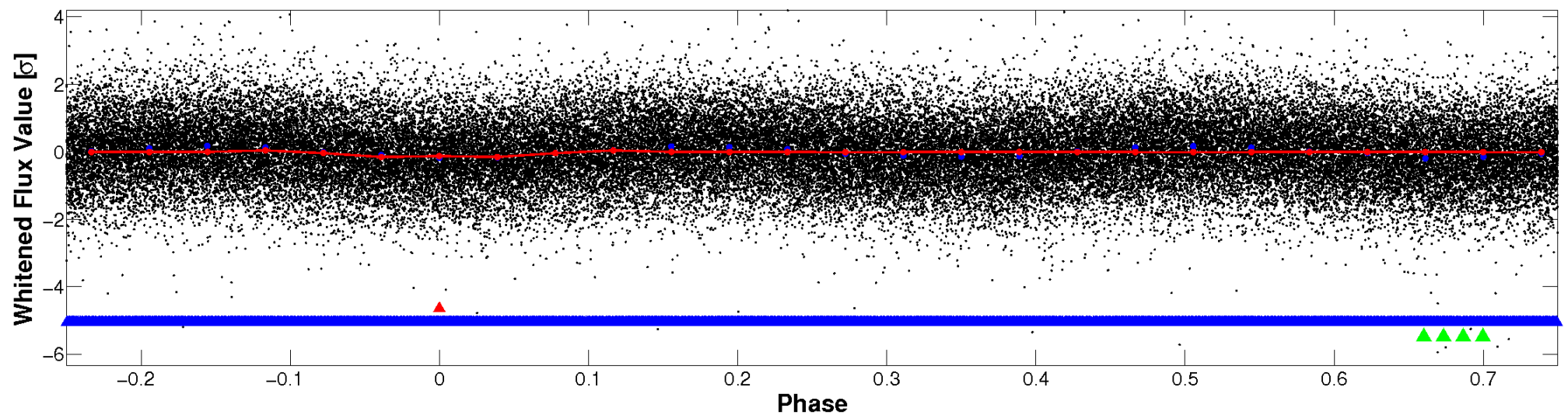


# Non-Whitened Vs. Whitened Light Curve

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



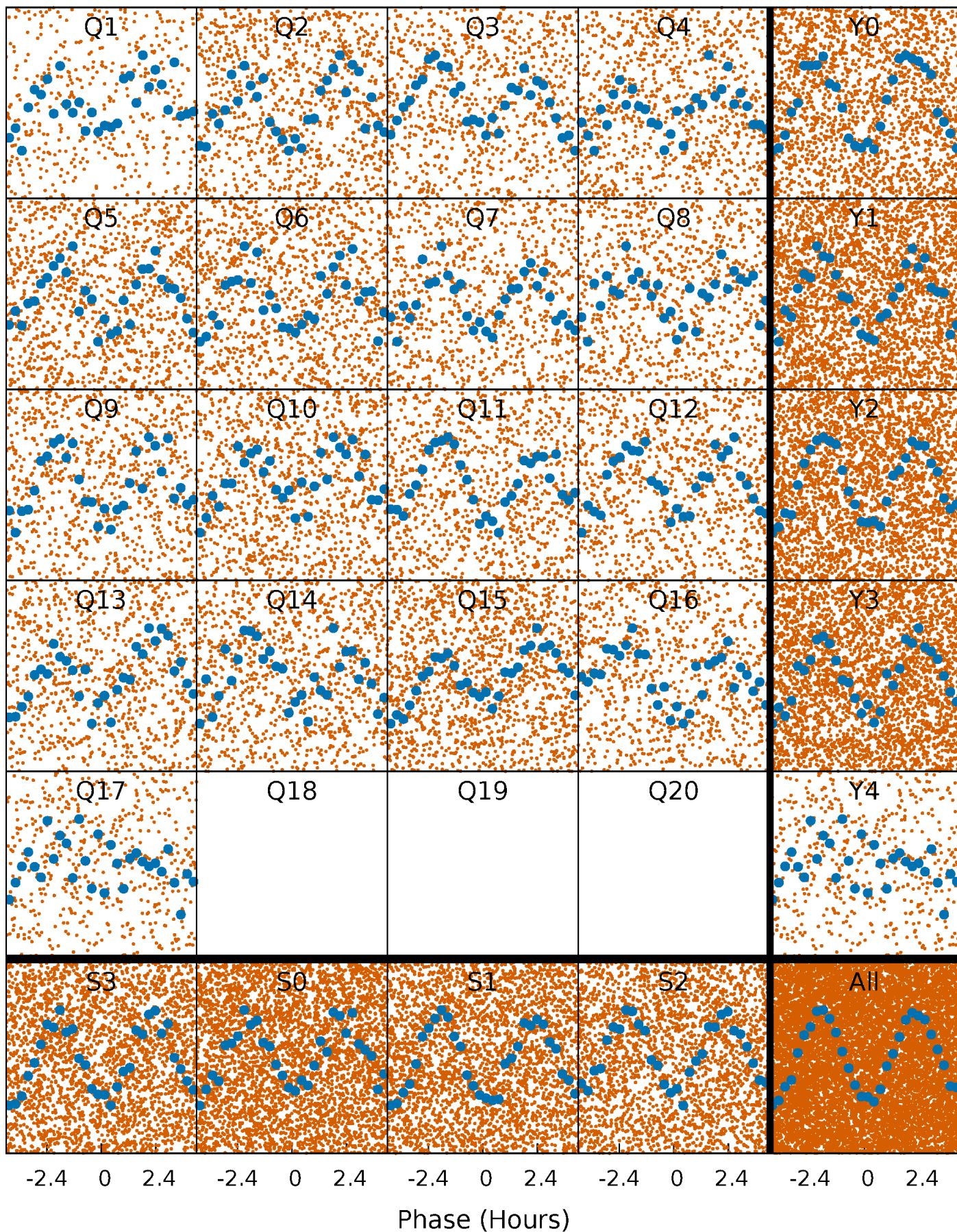
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

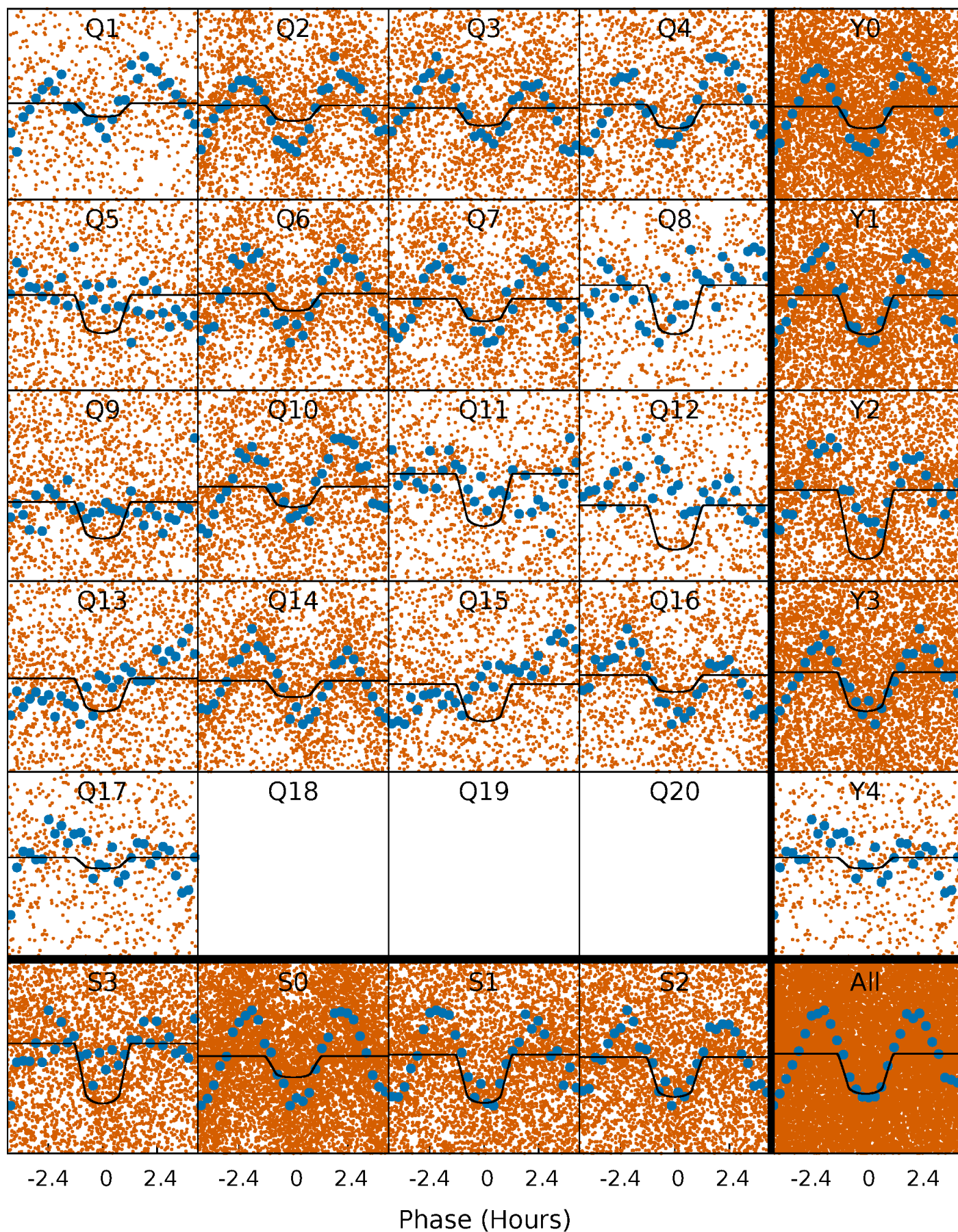
TCE 008256643-01 P= 0.525394 Days  $T_0=131.518228$  (BKJD)





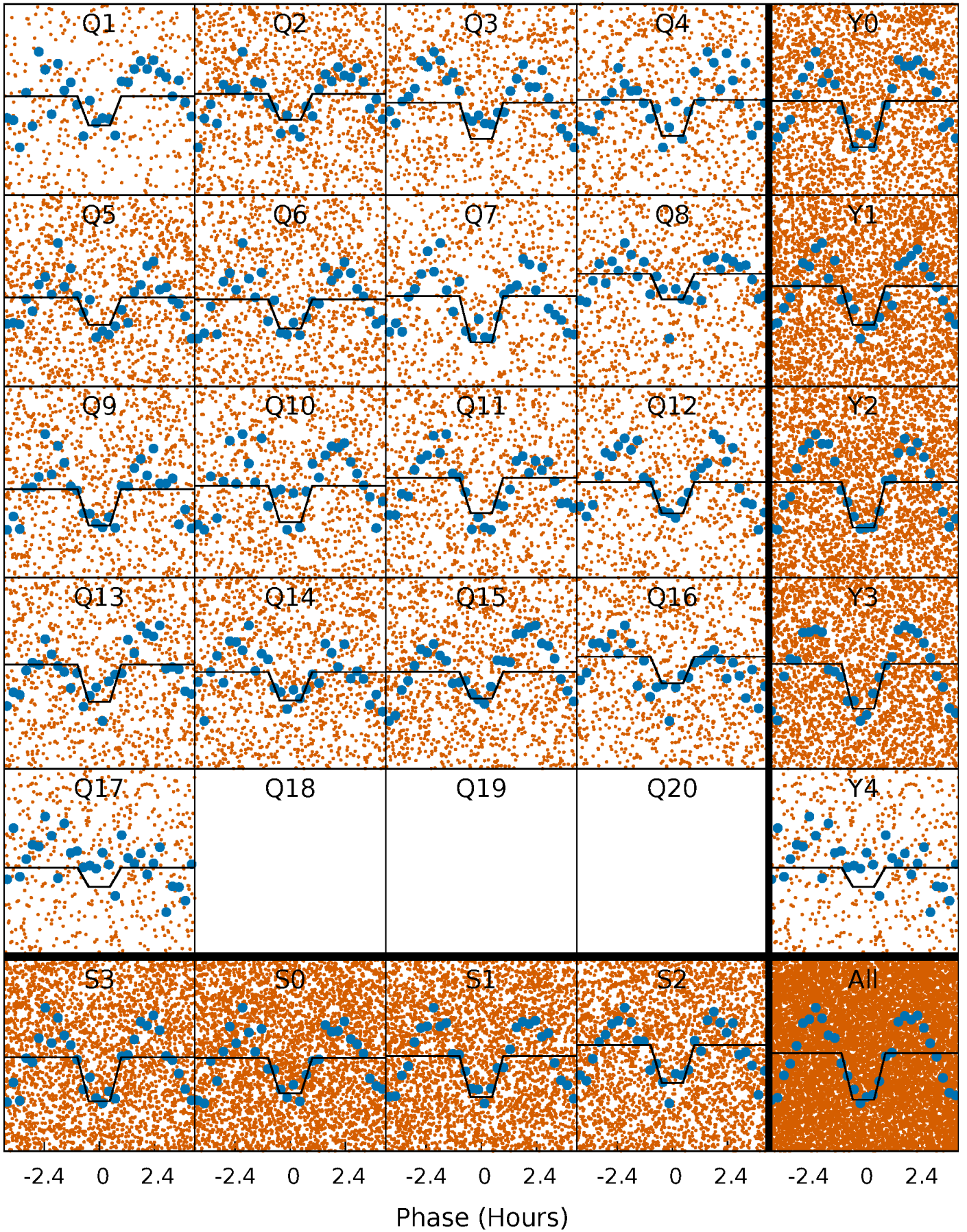
# DV Quarter-Phased Transit Curves

TCE 008256643-01 P= 0.525394 Days  $T_0=131.518228$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008256643-01 P= 0.525402 Days  $T_0=131.514072$  (BKJD)

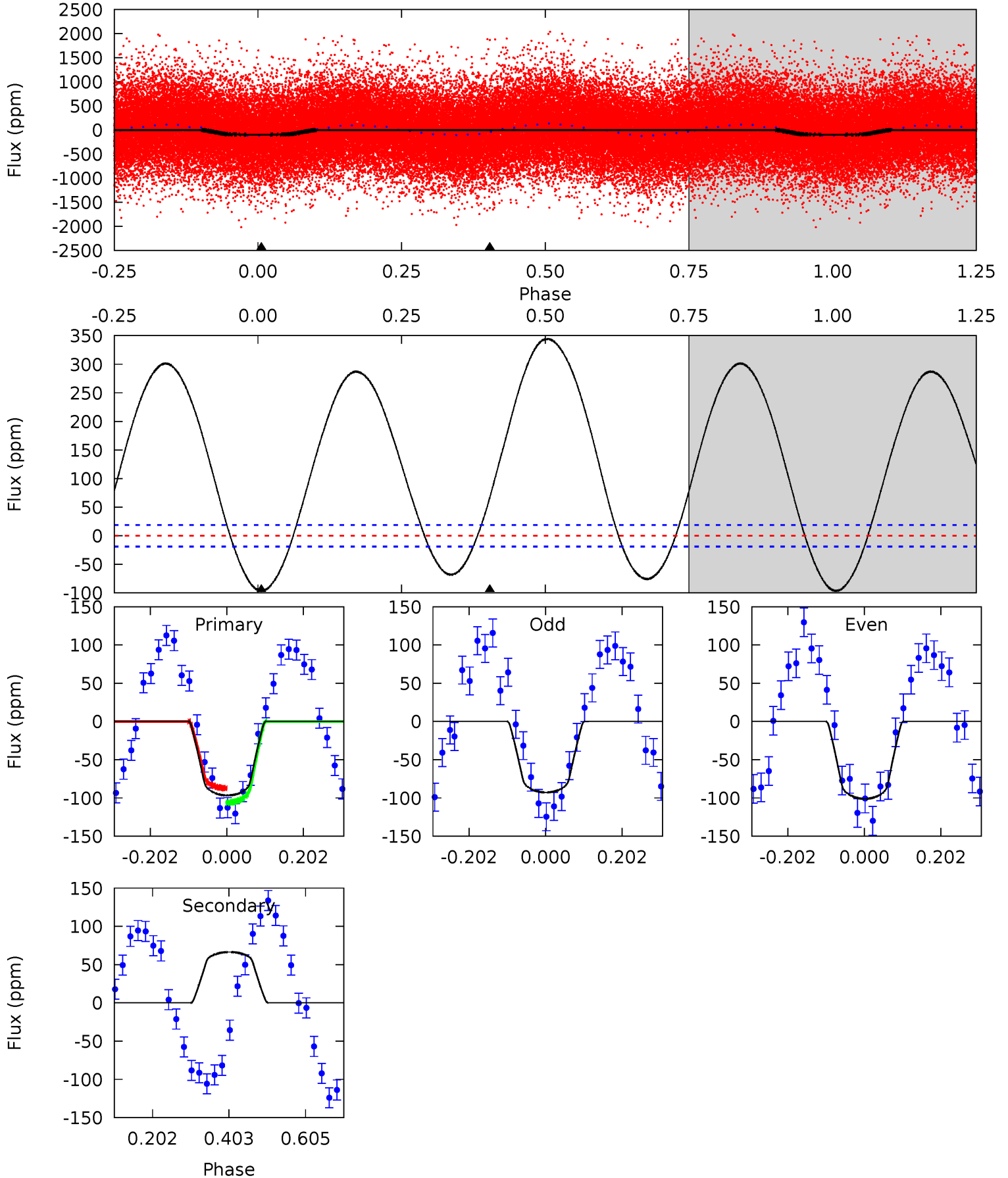




# DV Model-Shift Uniqueness Test

008256643-01, P = 0.525394 Days, E = 130.992834 Days

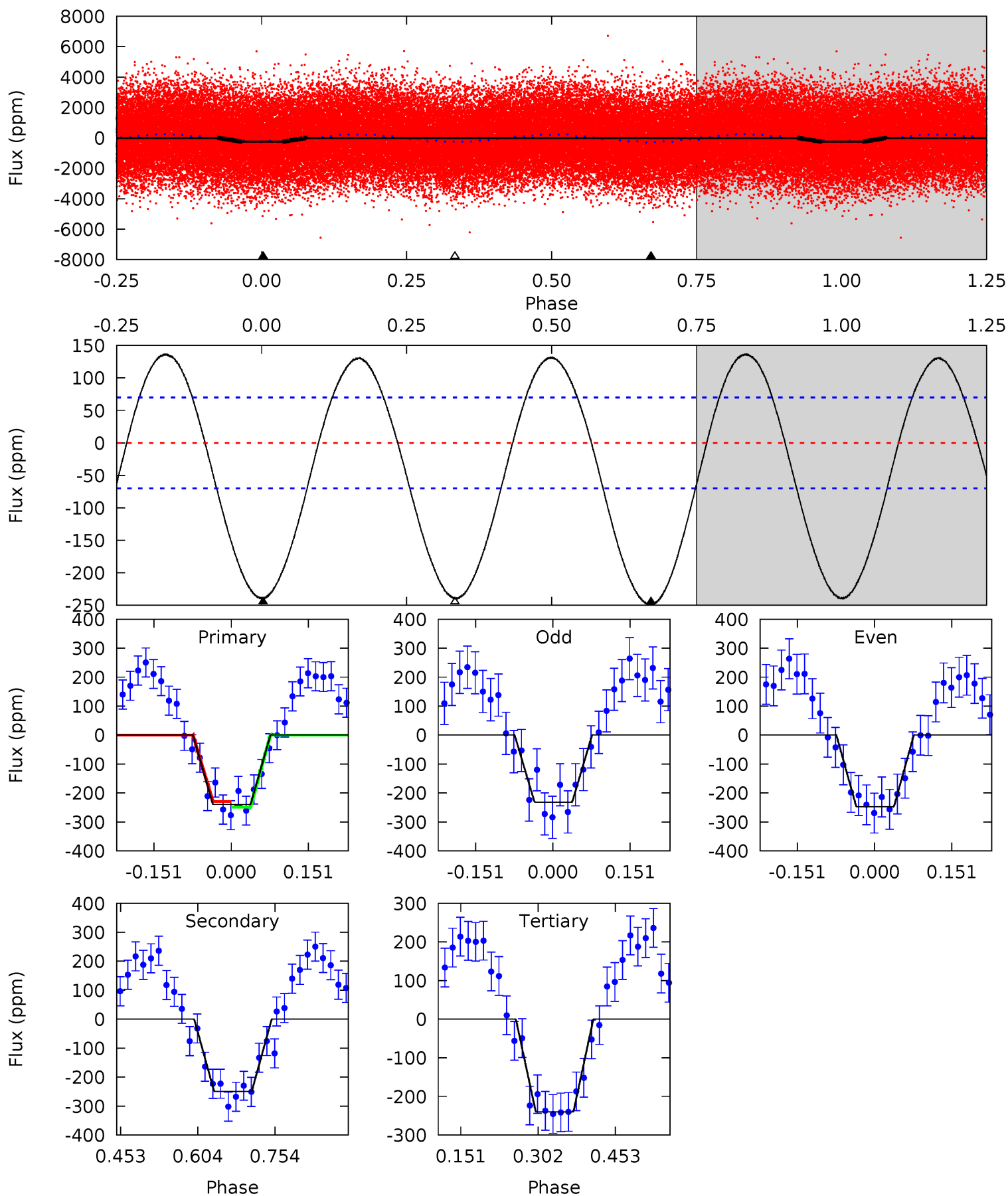
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.6	-15.6	0	0	4.42	1.28	23.6	22.6	22.6	-15.6	-15.6	0.97	1.08	0.78	2.25



# Alt Model-Shift Uniqueness Test

008256643-01, P = 0.525402 Days, E = 130.988670 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
15.3	16.0	15.4	0	4.48	1.44	8.78	-0.03	15.3	0.58	16.0	0.51	1.02	0.35	0.62





### Stellar Parameters For KIC 008256643

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7502^{+209}_{-314}$	$3.751^{+0.384}_{-0.096}$	$-0.060^{+0.200}_{-0.350}$	$2.949^{+0.425}_{-1.190}$	$1.787^{+0.185}_{-0.344}$	$0.098^{+0.341}_{-0.029}$
	+3%/-4%	+10%/-3%	+333%/-583%	+14%/-40%	+10%/-19%	+347%/-29%
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 008256643-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$66 \pm 4$	$3.22^{+0.86}_{-0.82}$	$6243^{+406}_{-587}$	$-7042^{+558}_{-731}$	$-0.840^{+0.313}_{-0.639}$
Alt.	$-249 \pm 16$	$4.83^{+1.02}_{-1.14}$	$6247^{+396}_{-653}$	$6909^{+800}_{-630}$	$1.398^{+0.904}_{-0.434}$

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

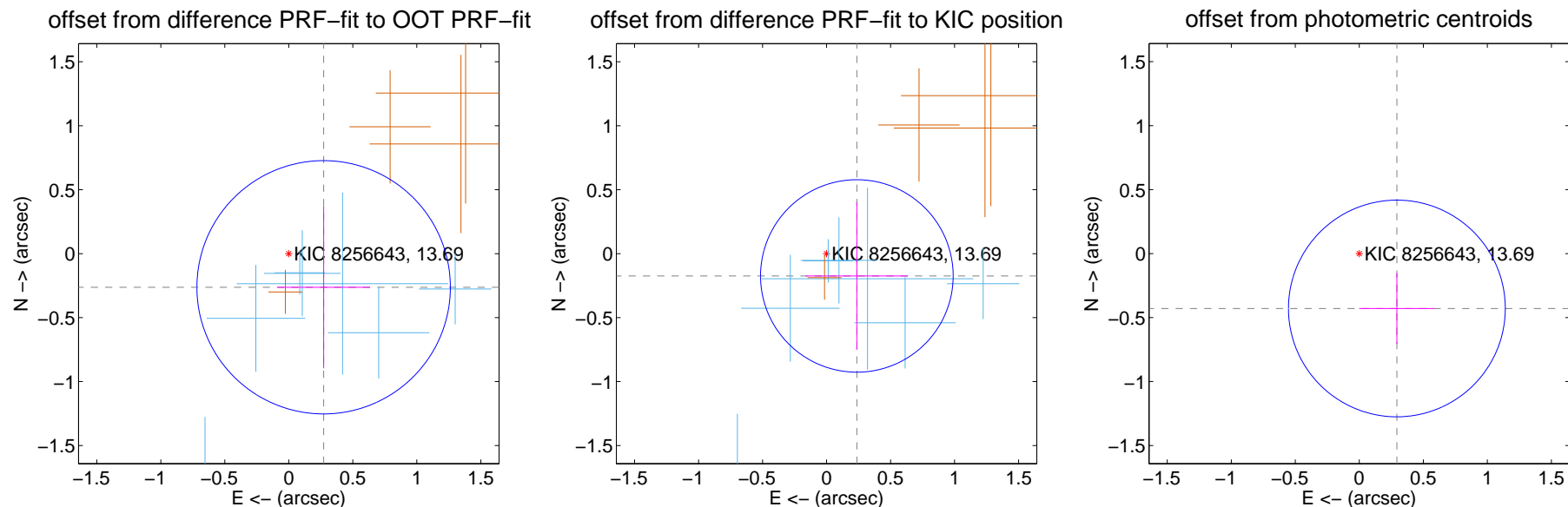
## DV Centroid Data

Supplemental centroid analysis for 008256643-01. Kepler magnitude: 13.69. Transit SNR 14.17

There are 7 quarters with good PRF difference image offsets

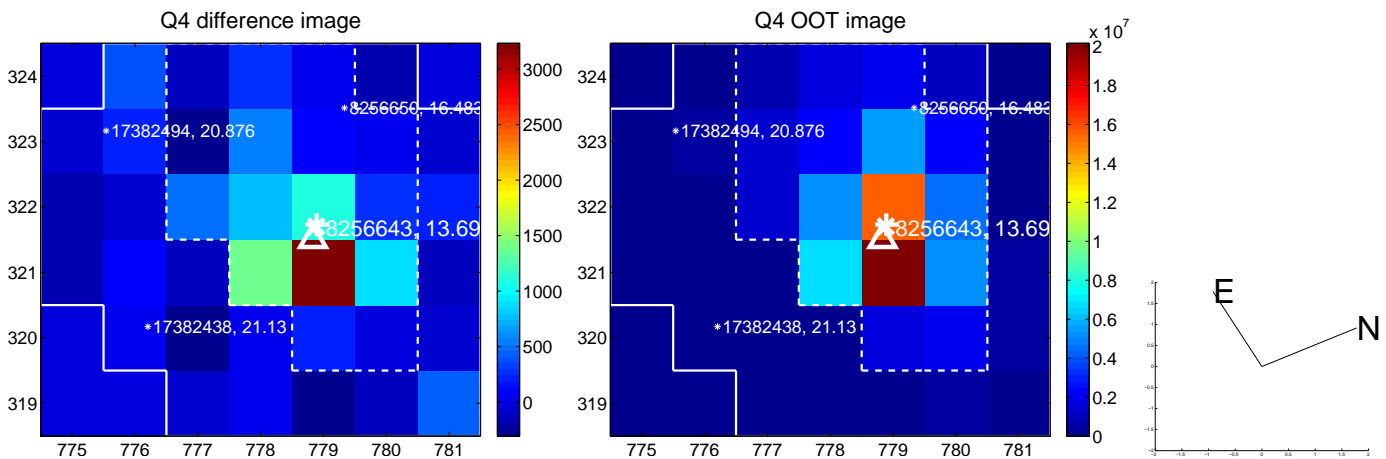
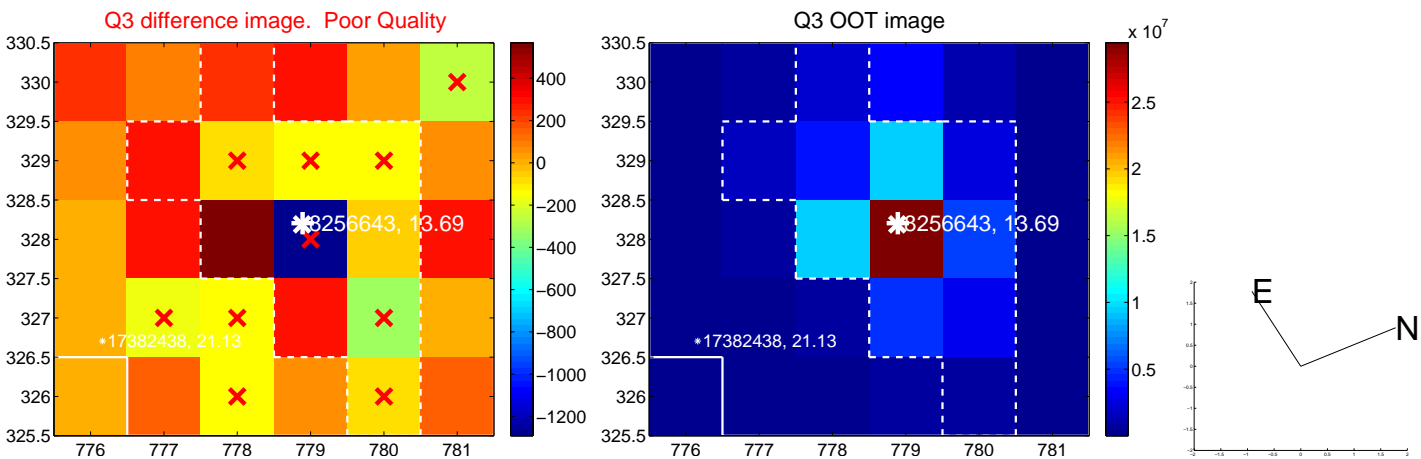
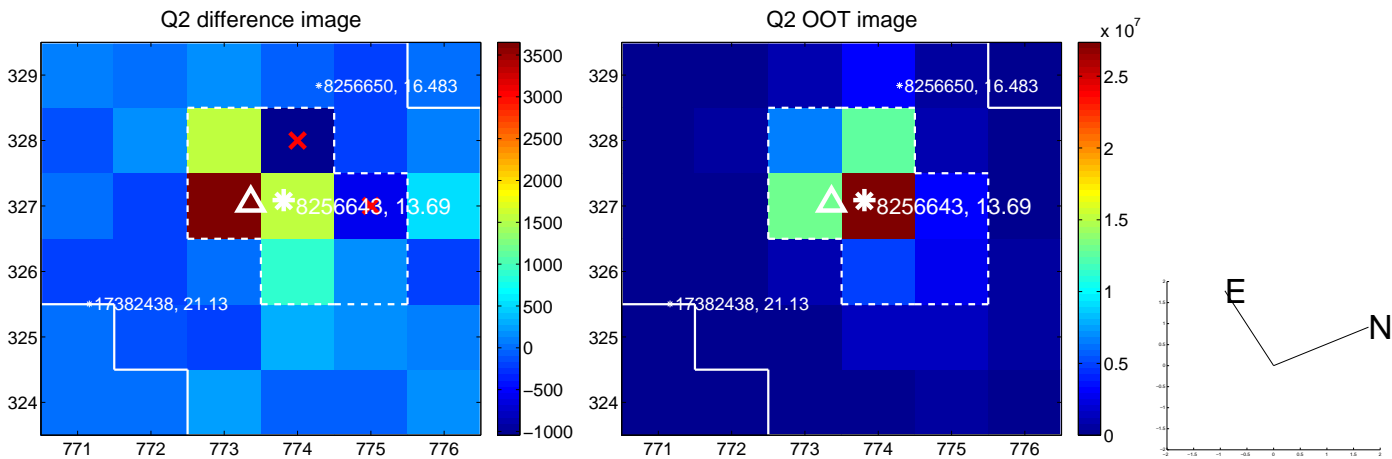
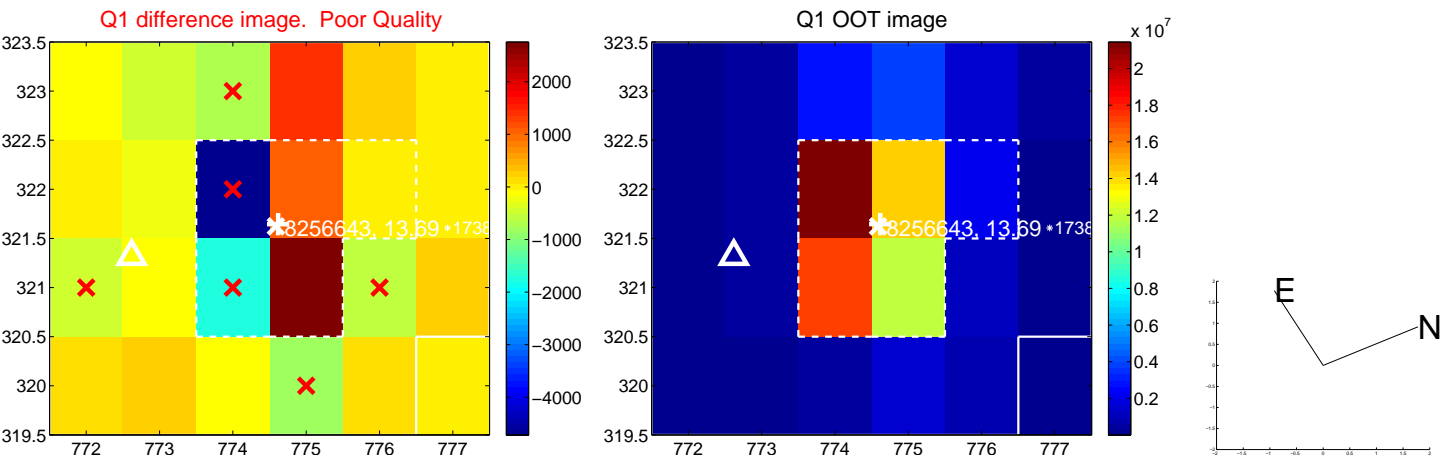
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.378 \pm 0.330$	1.15	$-0.272 \pm 0.362$	$-0.263 \pm 0.634$
PRF-fit source offset from KIC position	$0.294 \pm 0.251$	1.17	$-0.237 \pm 0.399$	$-0.174 \pm 0.577$
photometric centroid source offset	$0.52 \pm 0.28$	1.84	$-0.29 \pm 0.29$	$-0.43 \pm 0.28$

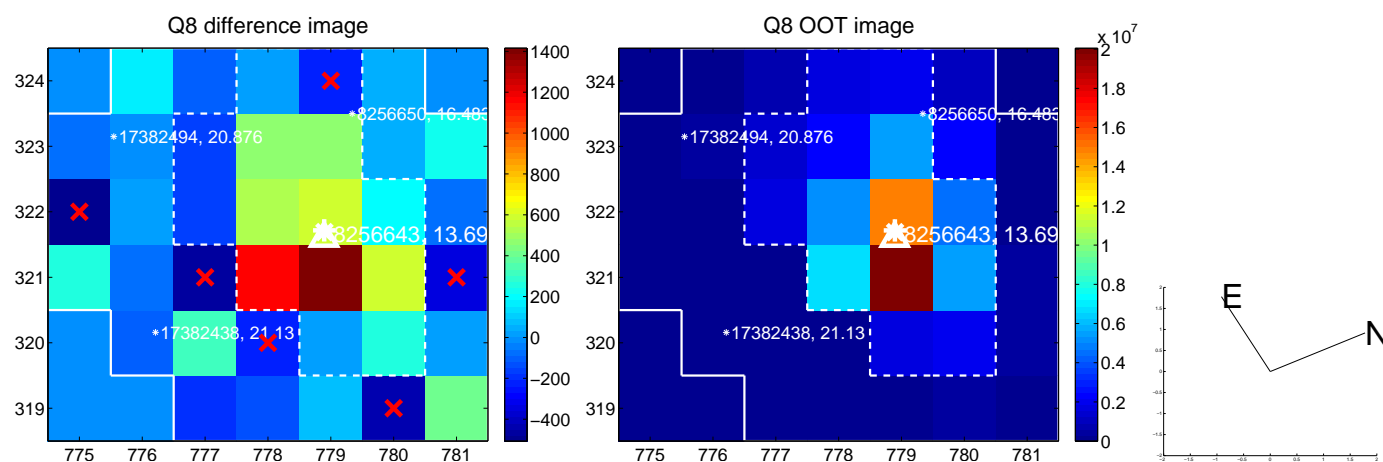
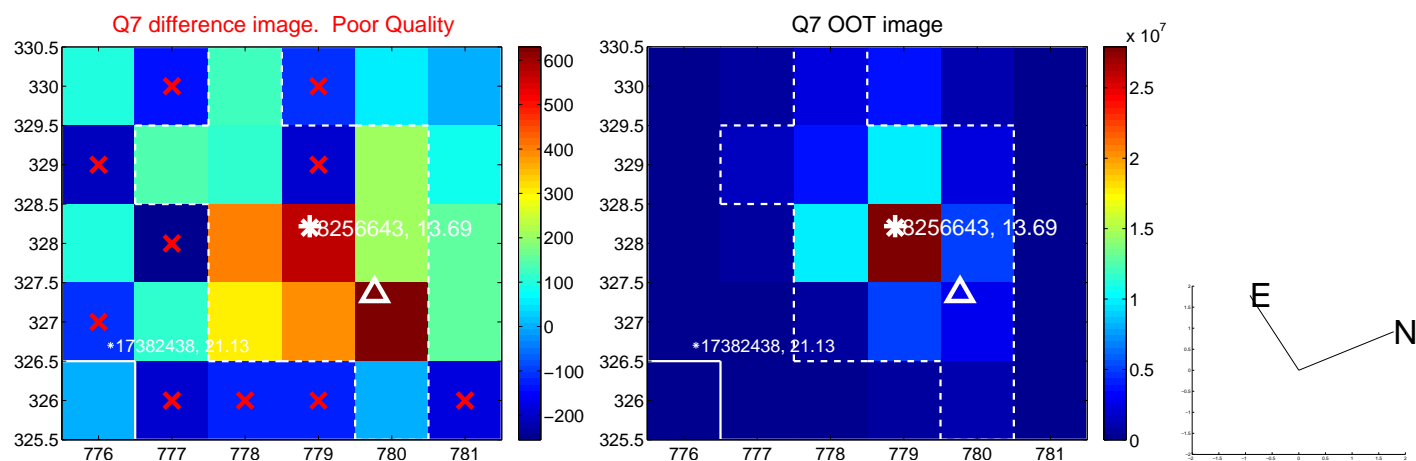
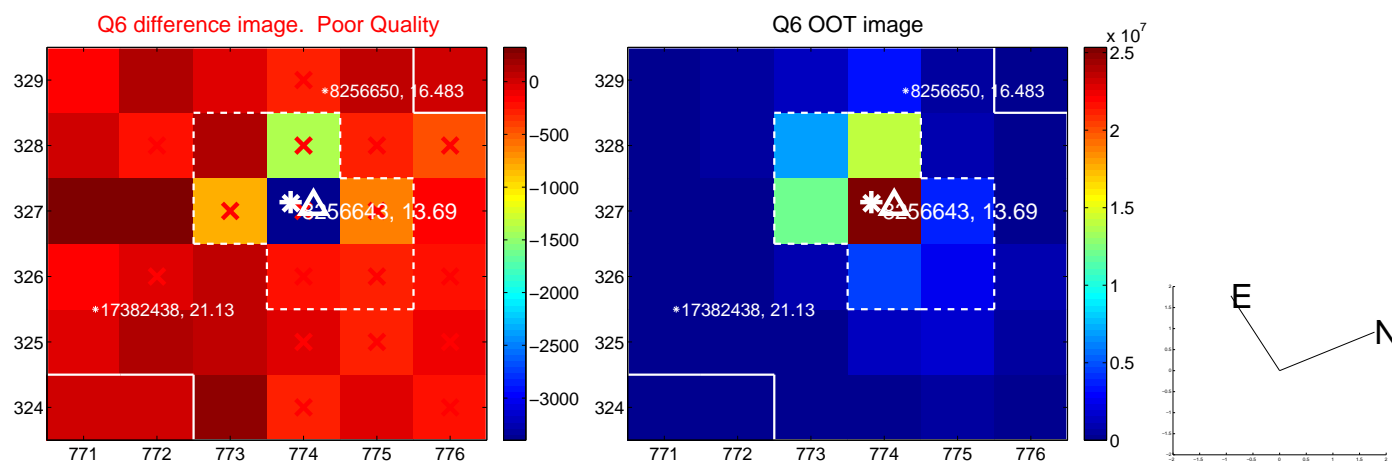
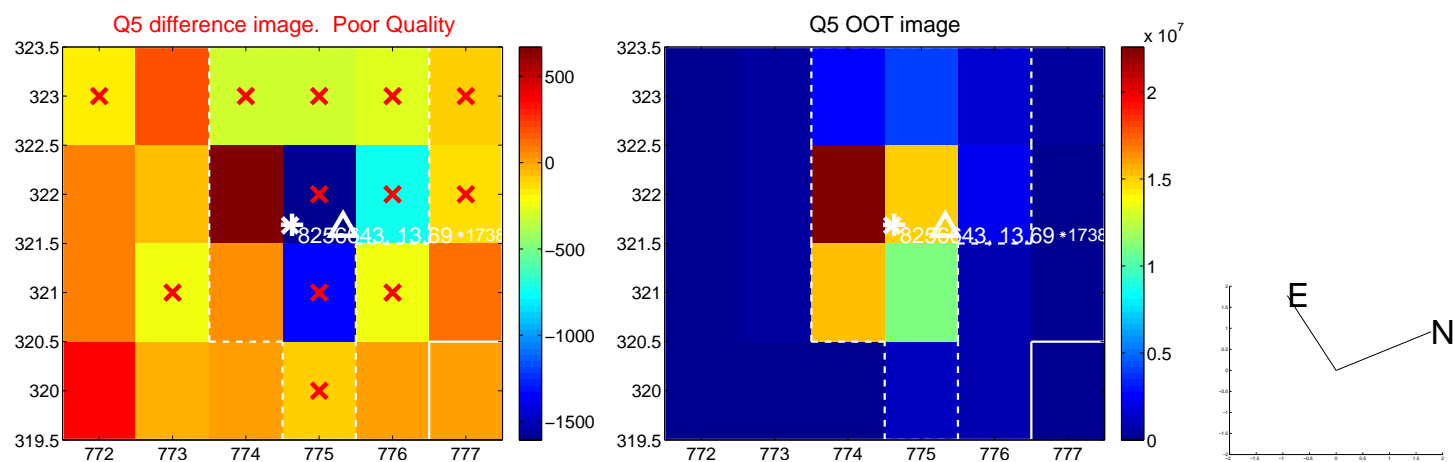


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

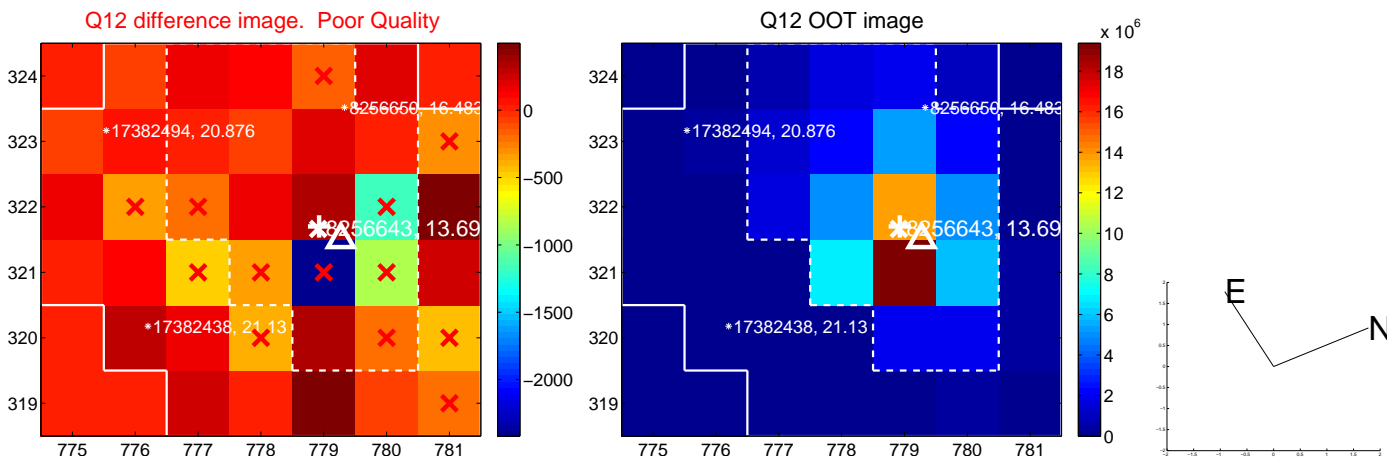
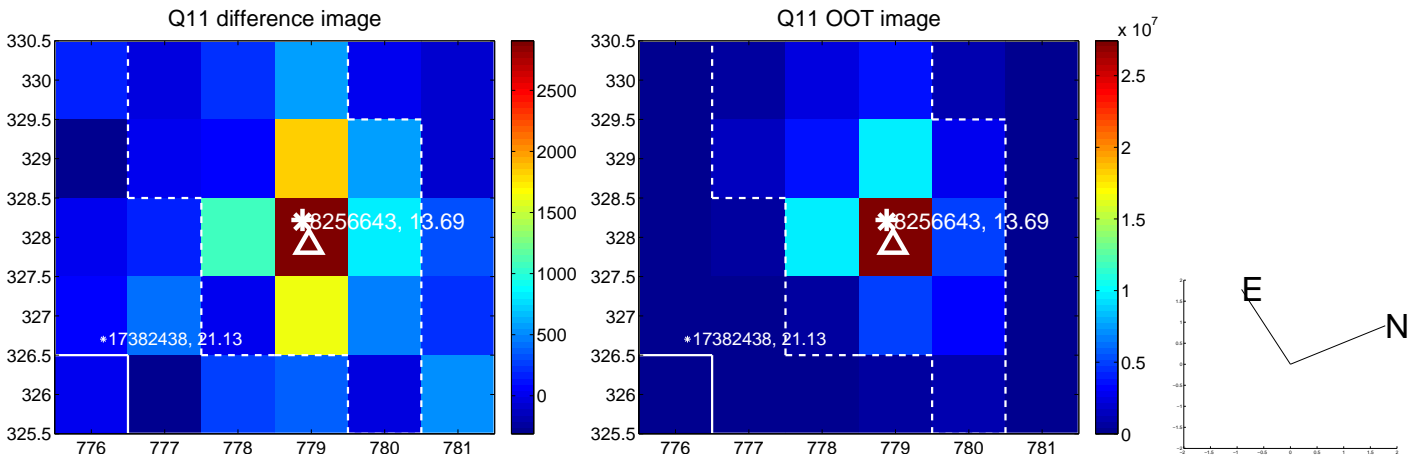
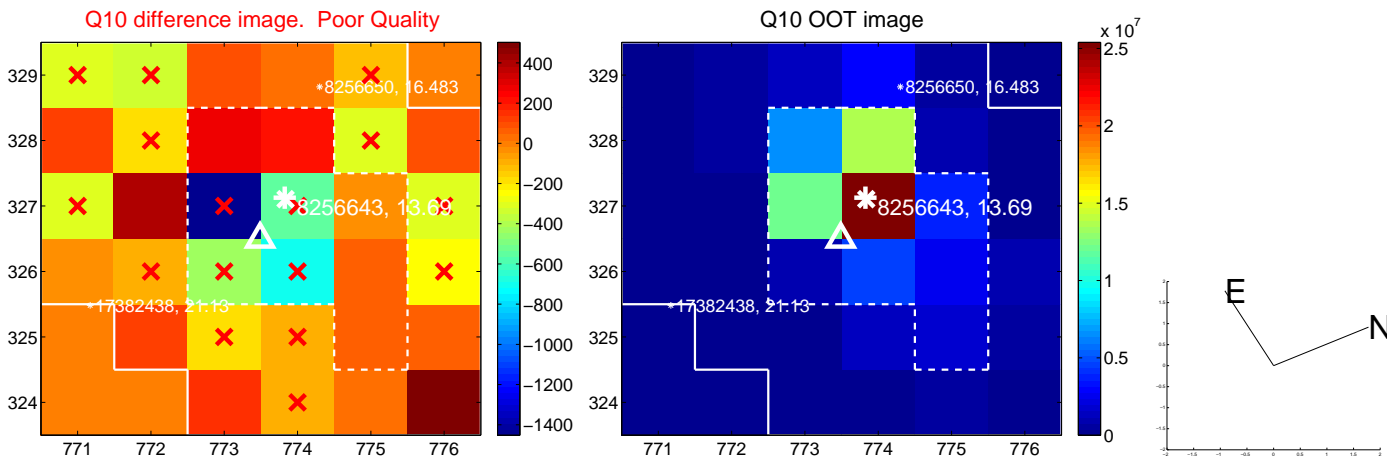
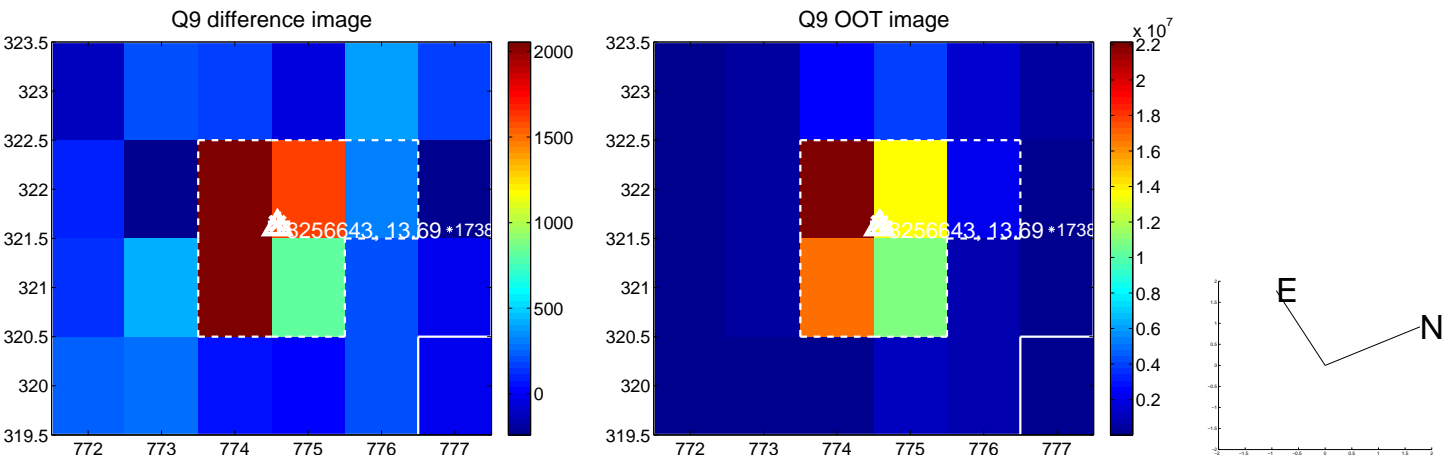


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

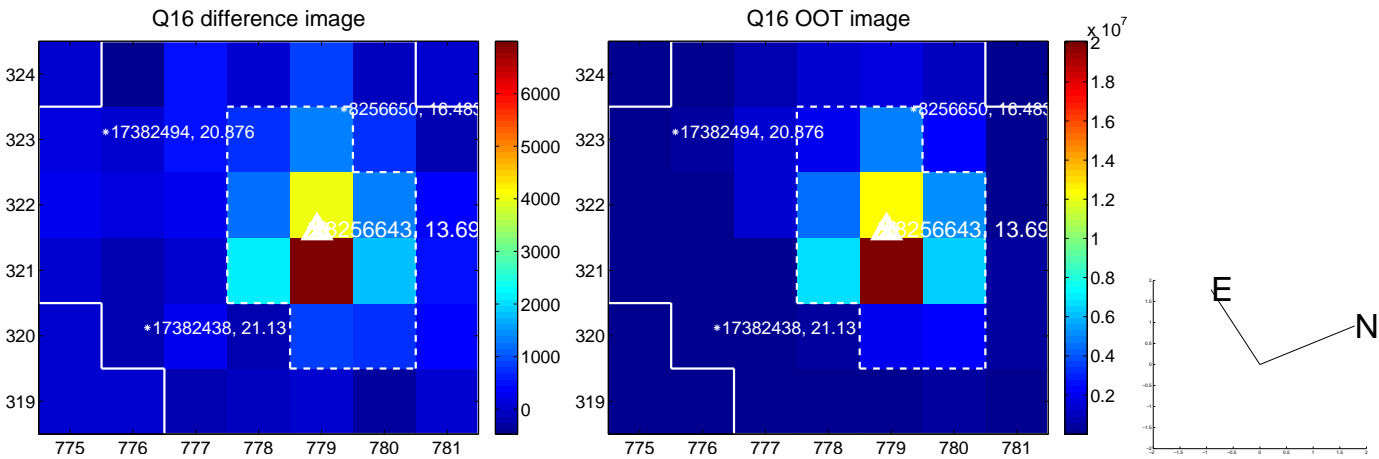
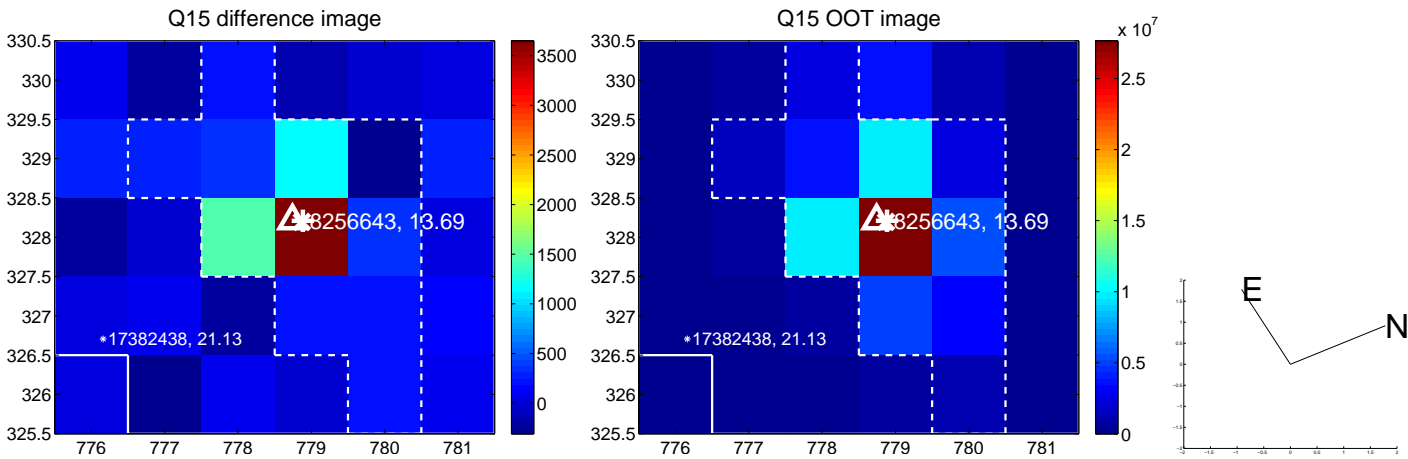
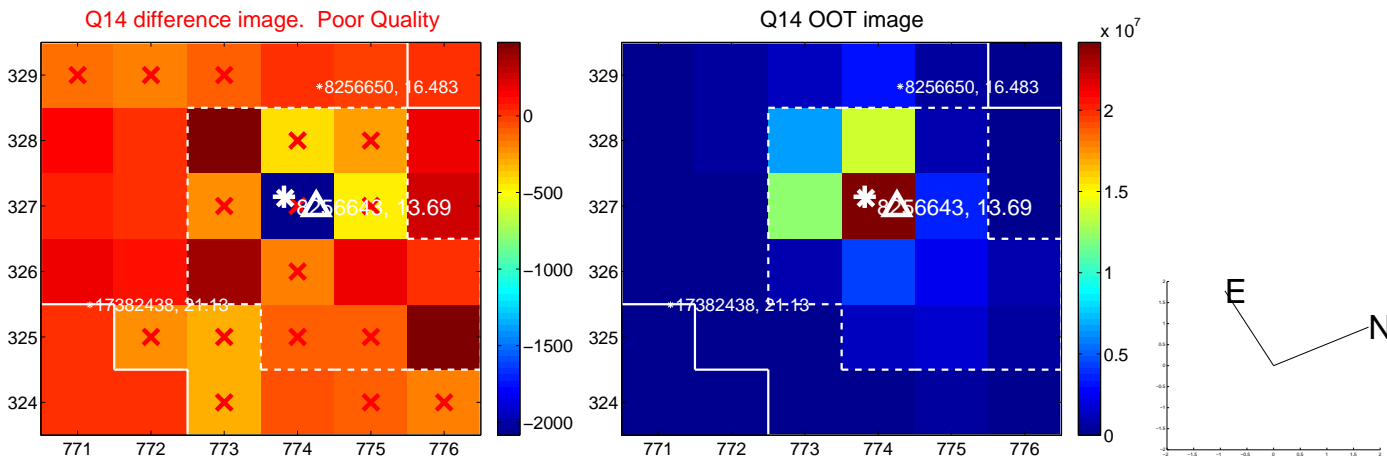
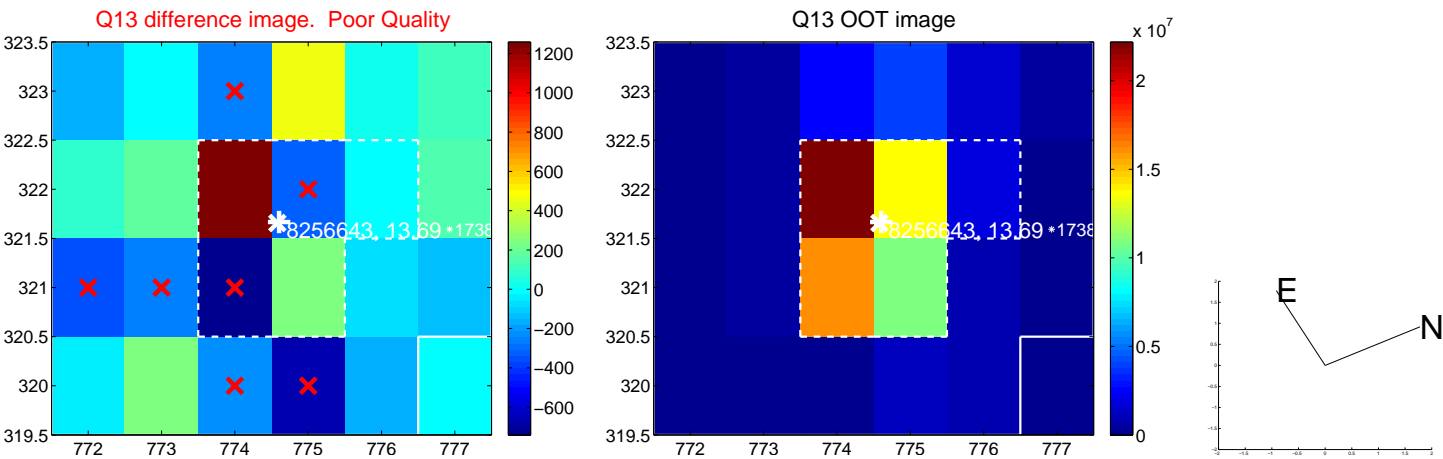




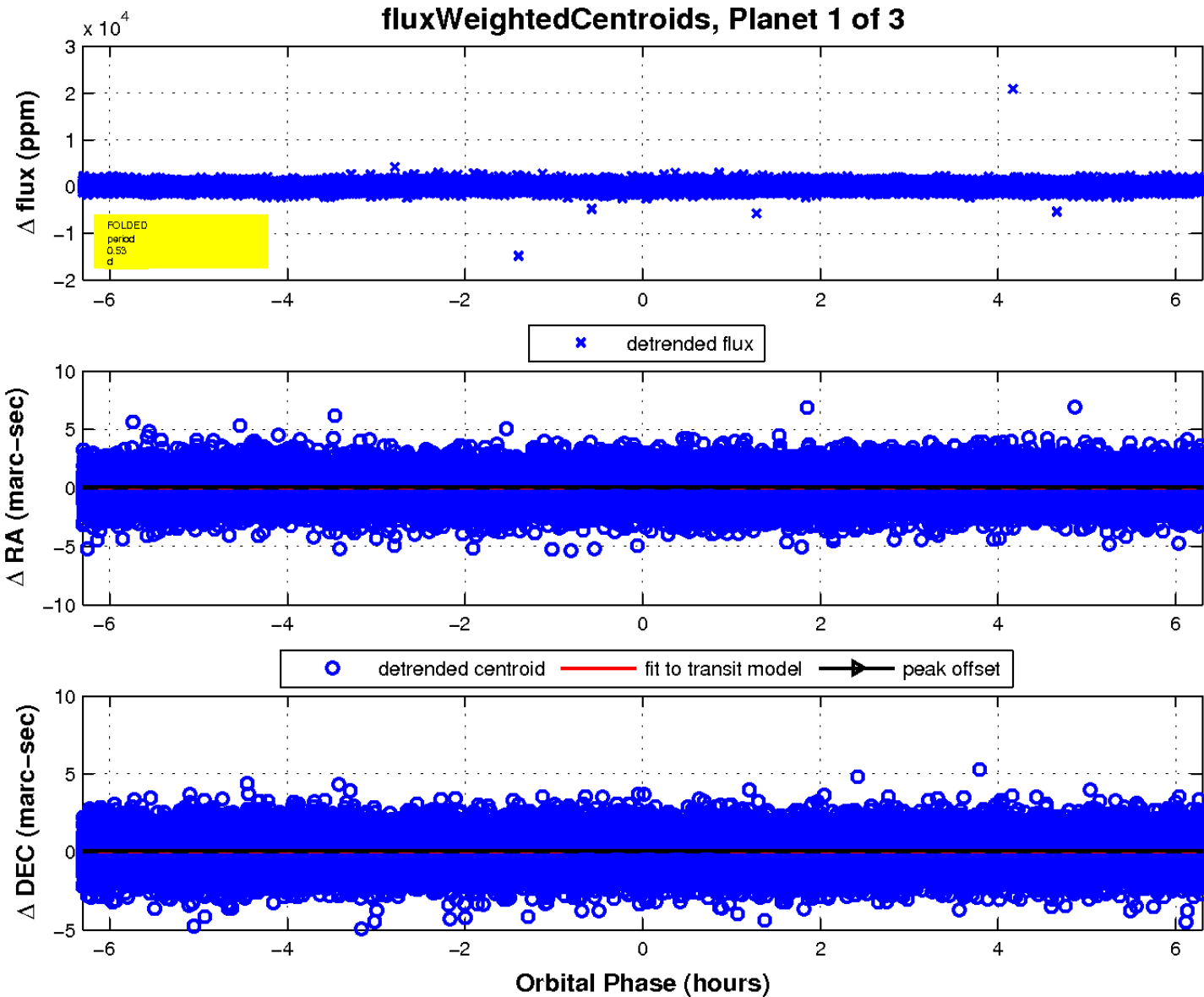
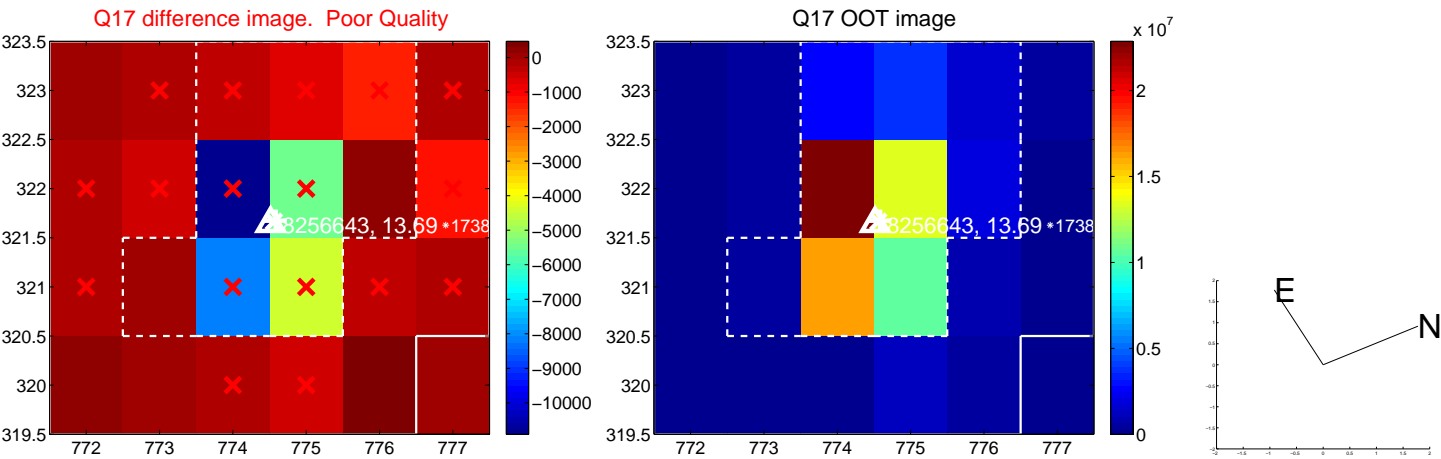
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

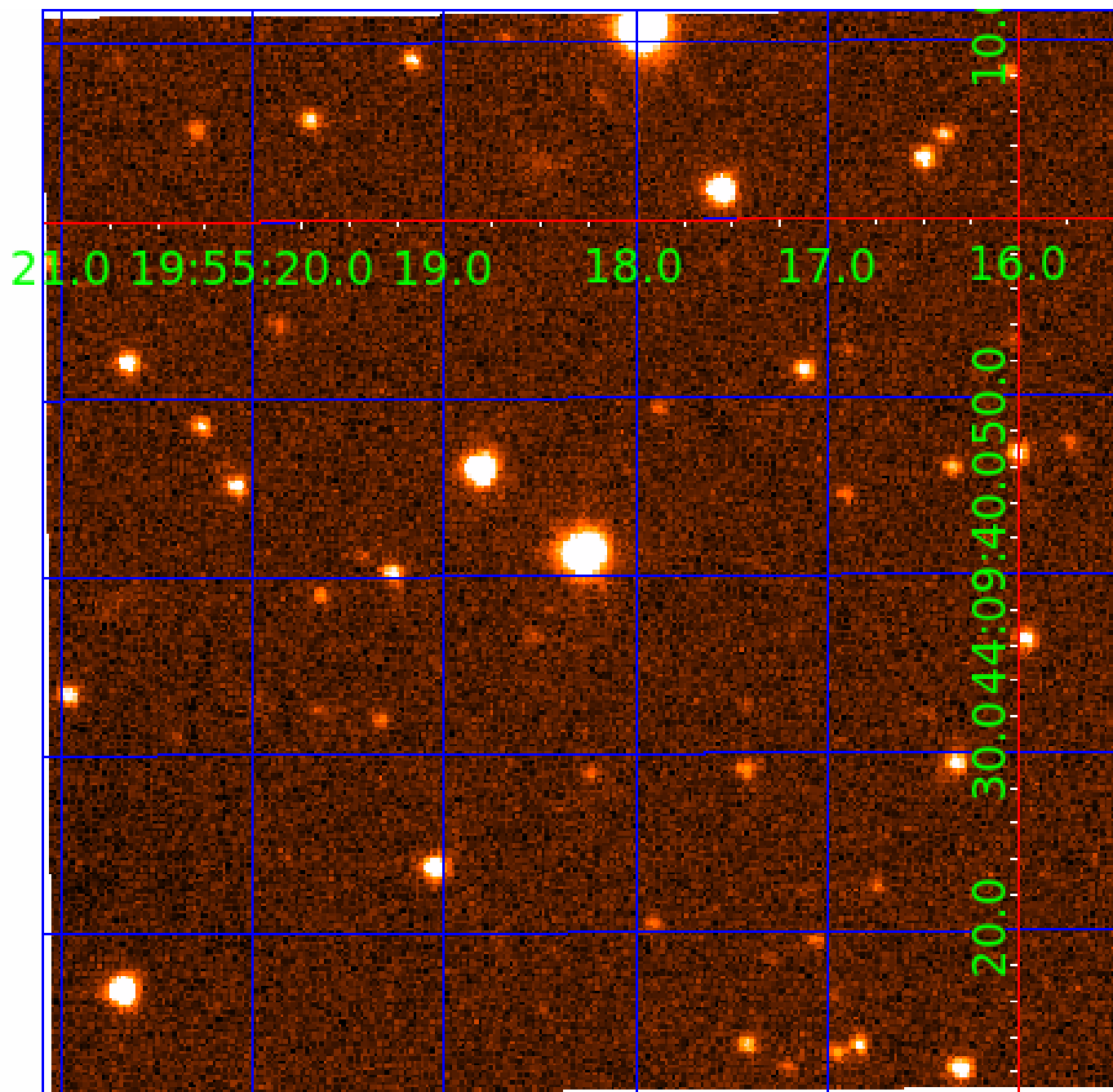


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008256643

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008256643-01	OBS	No	0.525394	131.518228	101.3	2.103	12.7	14.2	2.95	7502	3.45	103134.79
008256643-02	OBS	No	0.872324	132.253570	114.0	2.050	11.7	9.2	2.95	7502	3.66	52458.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008256643-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008256643-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

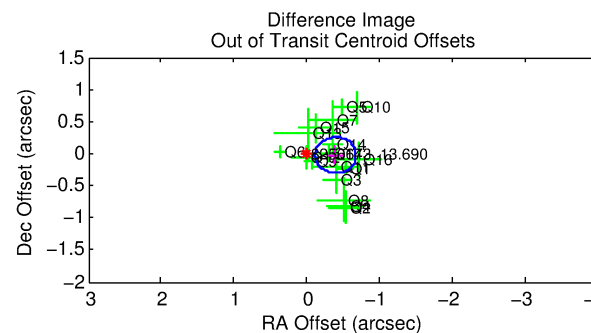
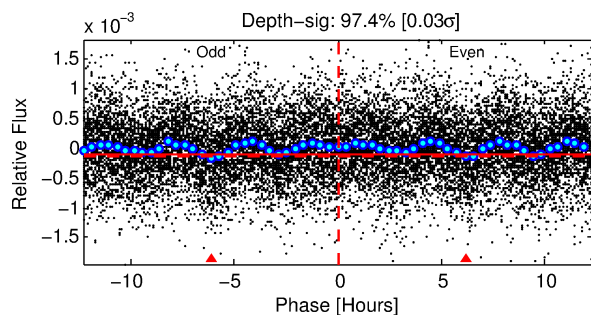
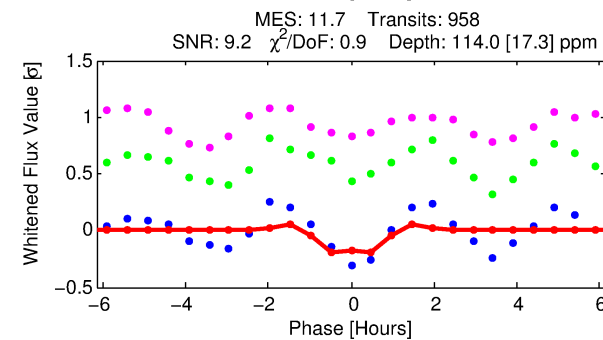
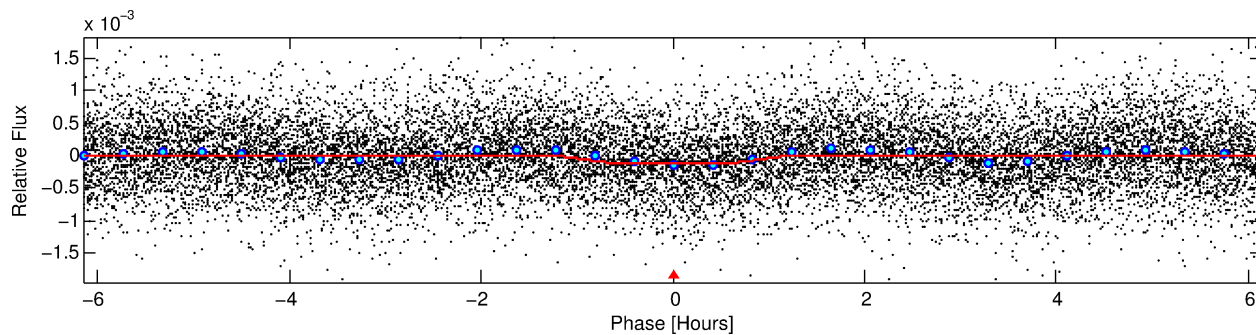
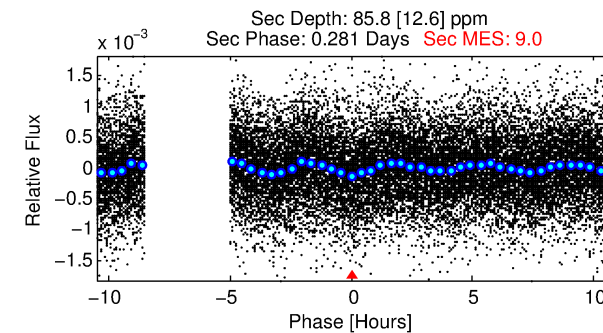
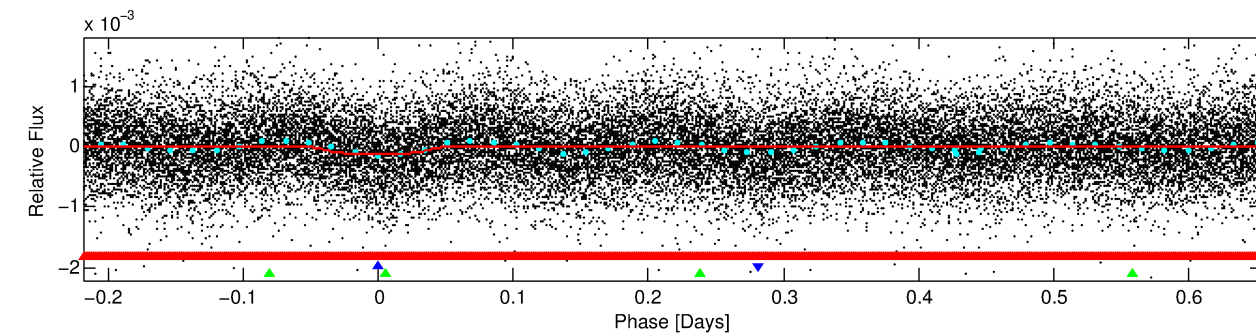
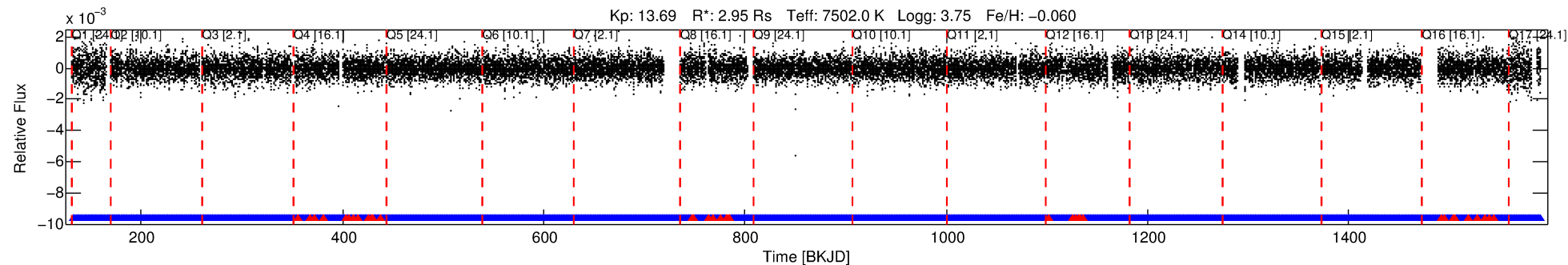
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008256643-02

No Significant Match Found

# DV One-Page Summary

KIC: 8256643 Candidate: 2 of 3 Period: 0.872 d



## DV Fit Results:

Period = 0.87232 [0.00001] d  
Epoch = 132.2536 [0.0022] BKJD  
Rp/R\* = 0.0114 [0.0045]  
a/R\* = 1.77 [3.00]  
b = 0.90 [0.53]  
Seff = 52458.48 [35106.67]  
Teq = 3859 [646] K  
Rp = 3.66 [2.08] Re  
a = 0.0217 [0.0087] AU  
Ag = 1.66 [1.73] [0.38σ]  
Teffp = 6773 [1406] K [1.88σ]

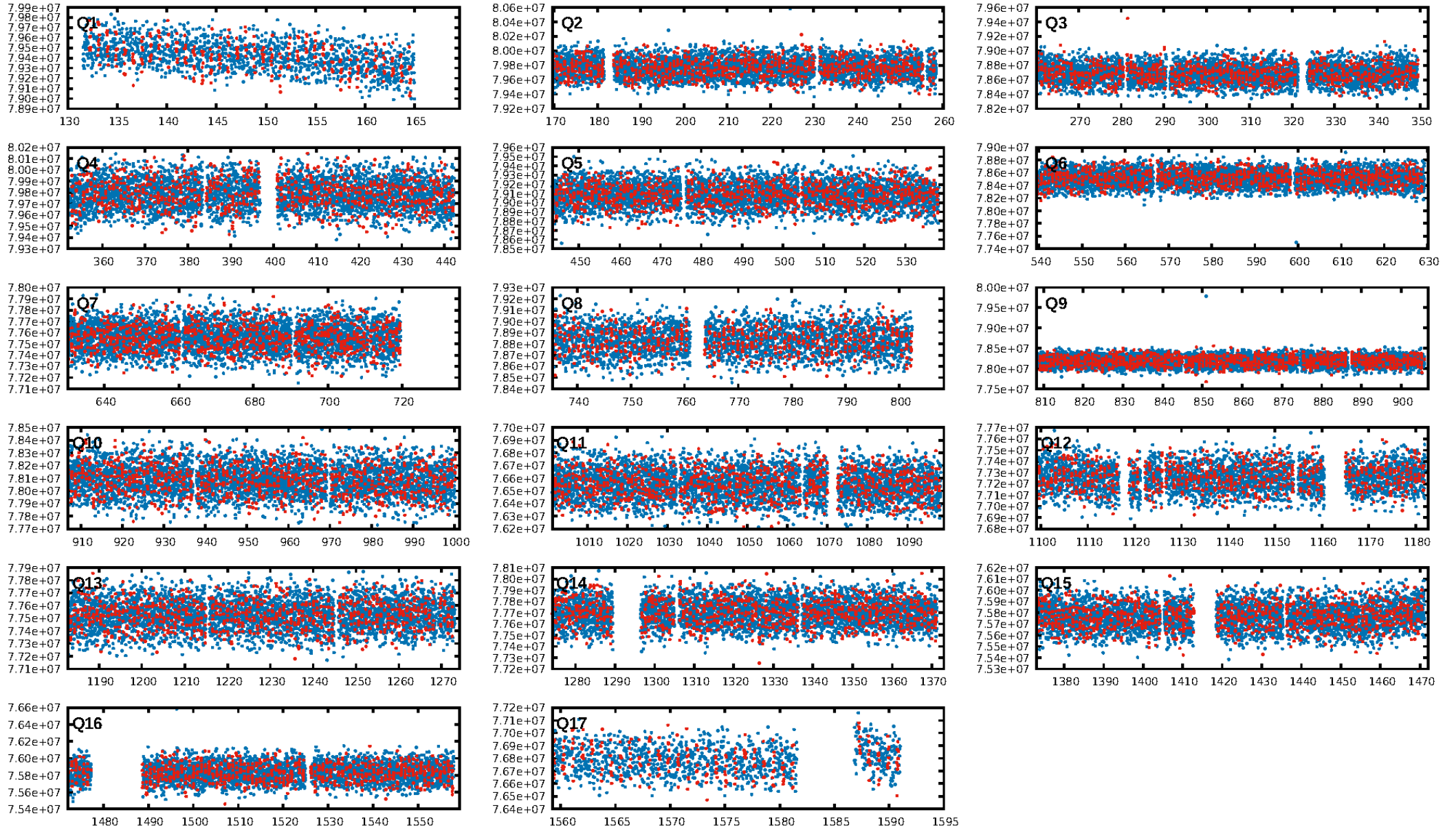
## DV Diagnostic Results:

ShortPeriod-sig: 99.5% [2.83σ]  
LongPeriod-sig: 100.0% [2649.77σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.96 [877/913]  
GhostDiagnostic-chr: -4.373  
Centroid-sig: 0.3%  
Centroid-so: 0.537 arcsec [1.59σ]  
OotOffset-rm: 0.396 arcsec [4.22σ]  
KicOffset-rm: 0.366 arcsec [3.96σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.71 [12/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:35:48 Z

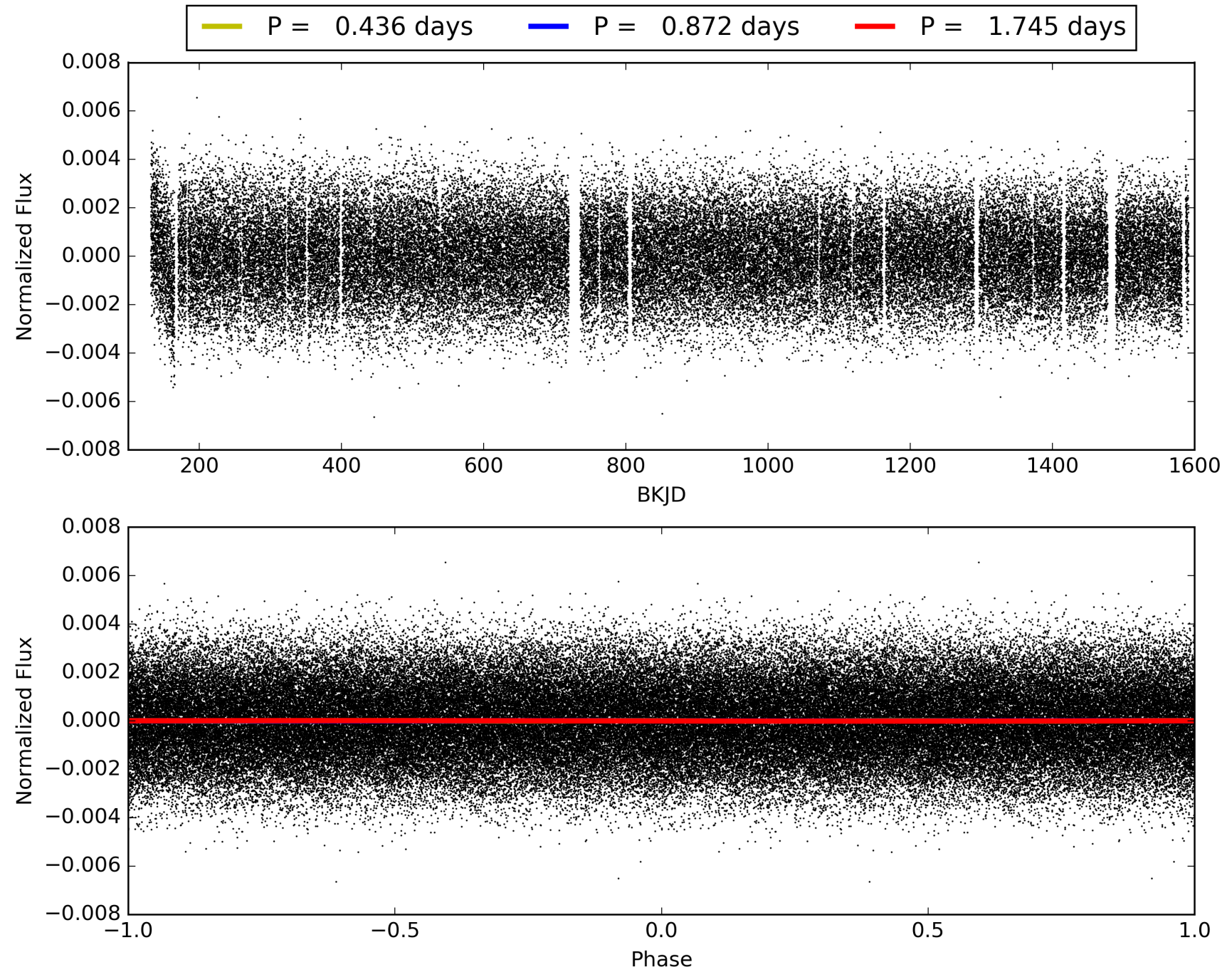
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008256643-02, PDC Light Curves





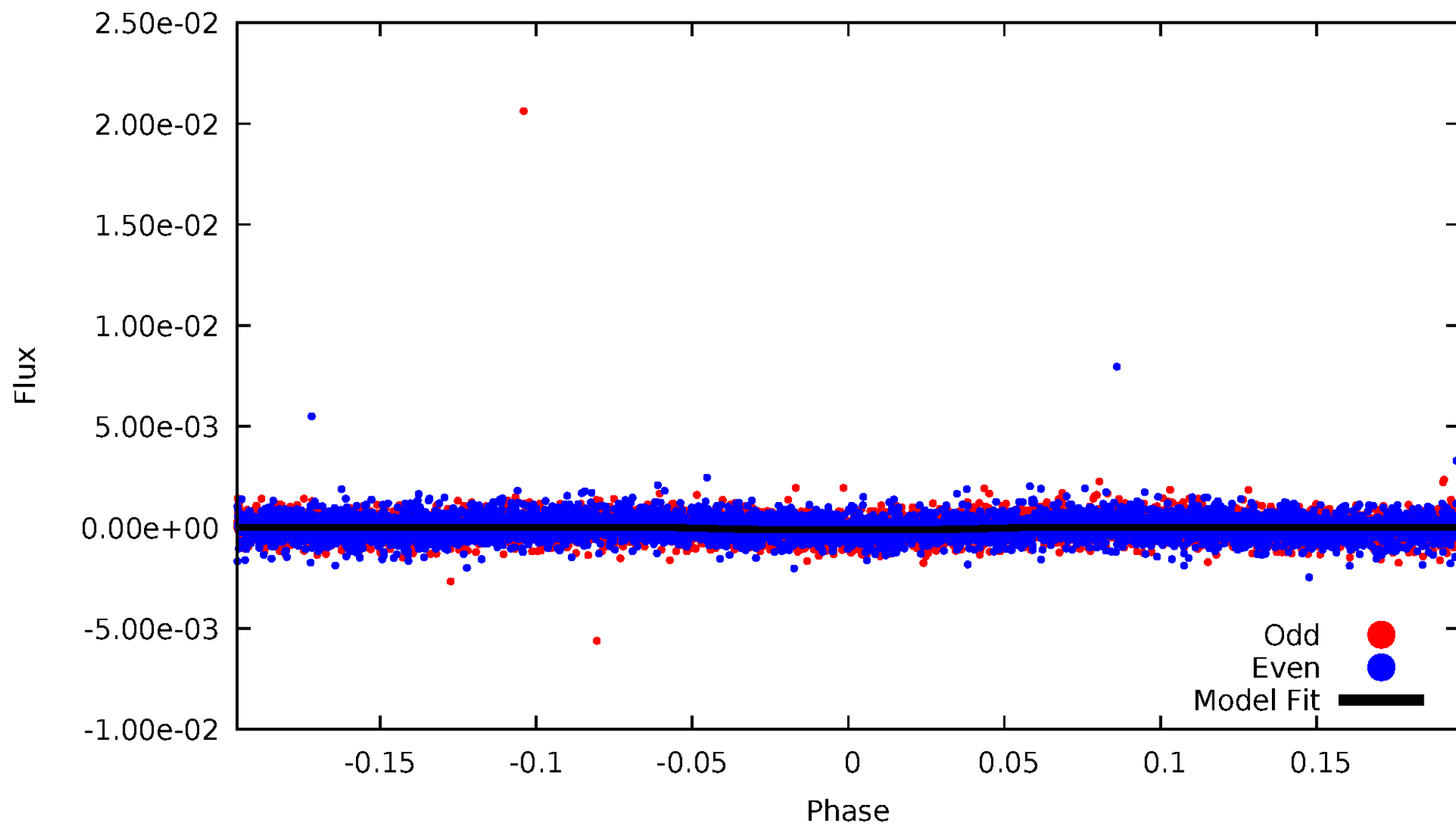
# TCE 008256643-02





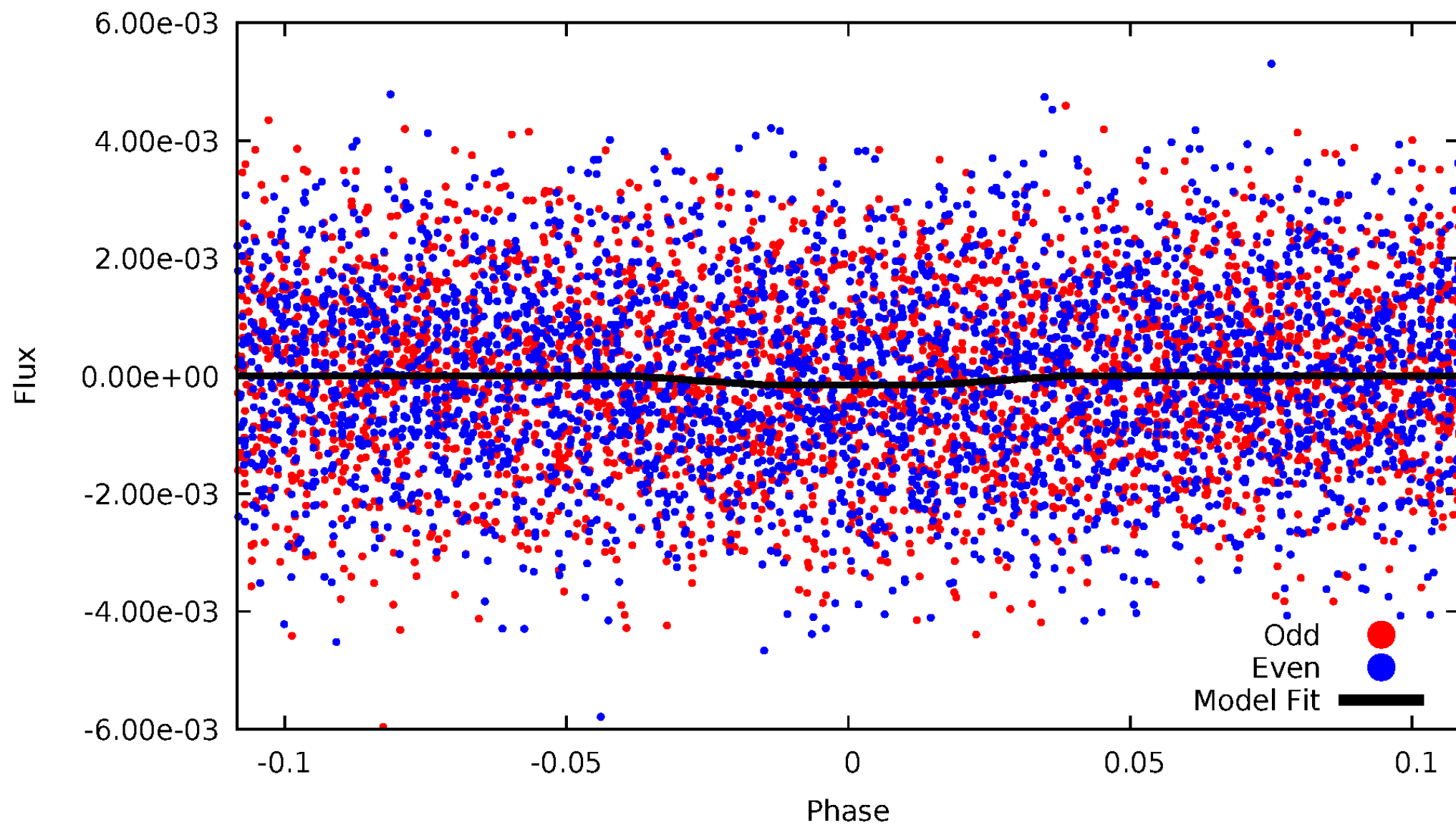
# DV Odd/Even

TCE 008256643-02



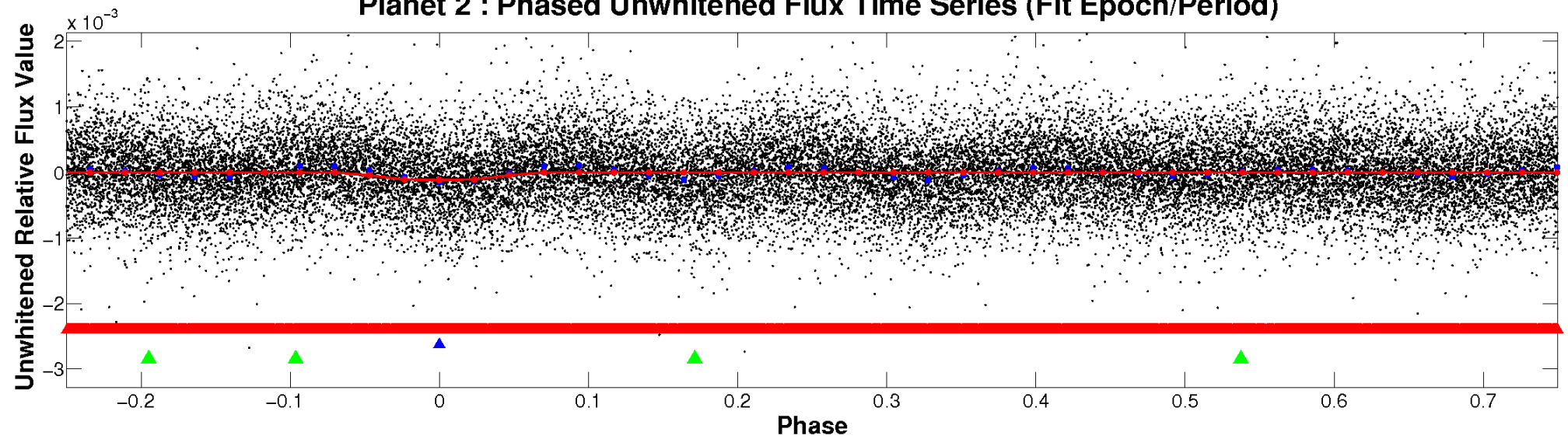
# ALT Odd/Even

TCE 008256643-02

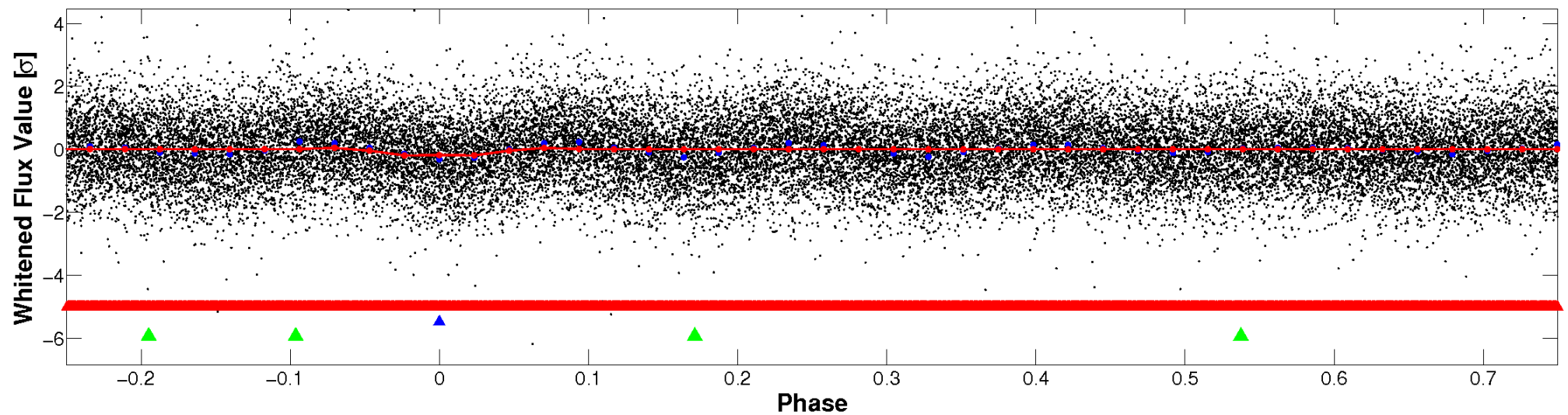


# Non-Whitened Vs. Whitened Light Curve

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

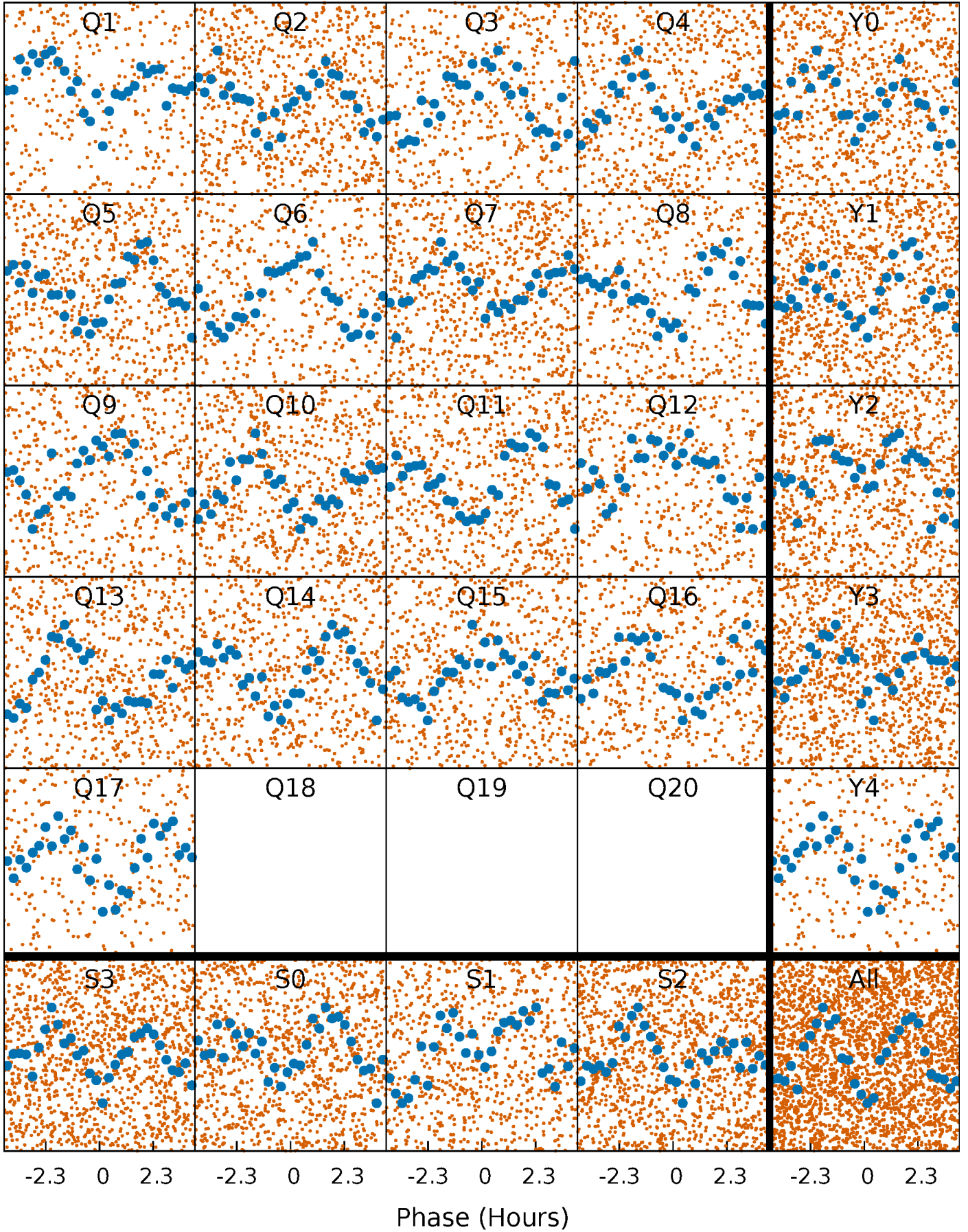


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

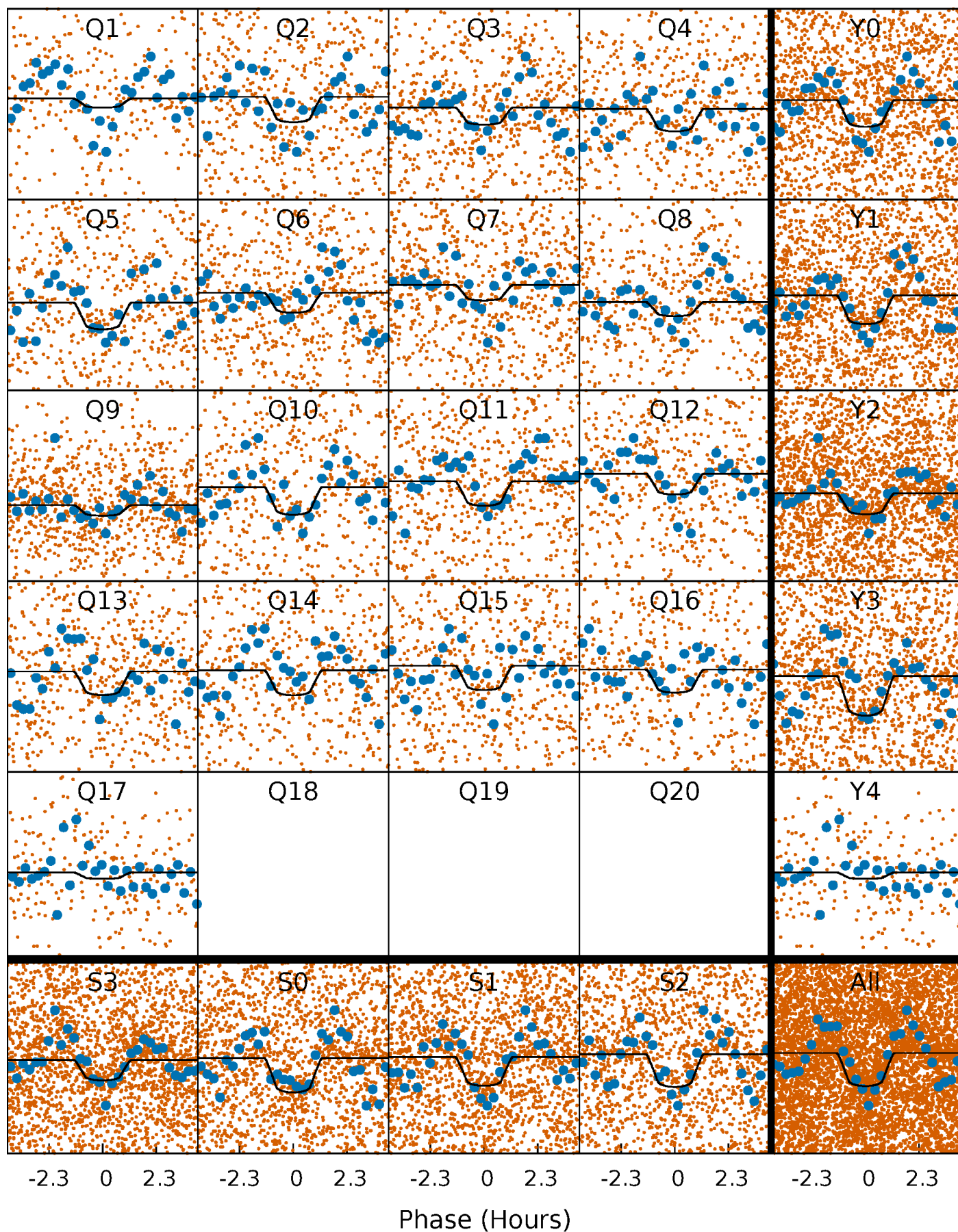
TCE 008256643-02   P= 0.872324 Days    $T_0=132.253570$  (BKJD)





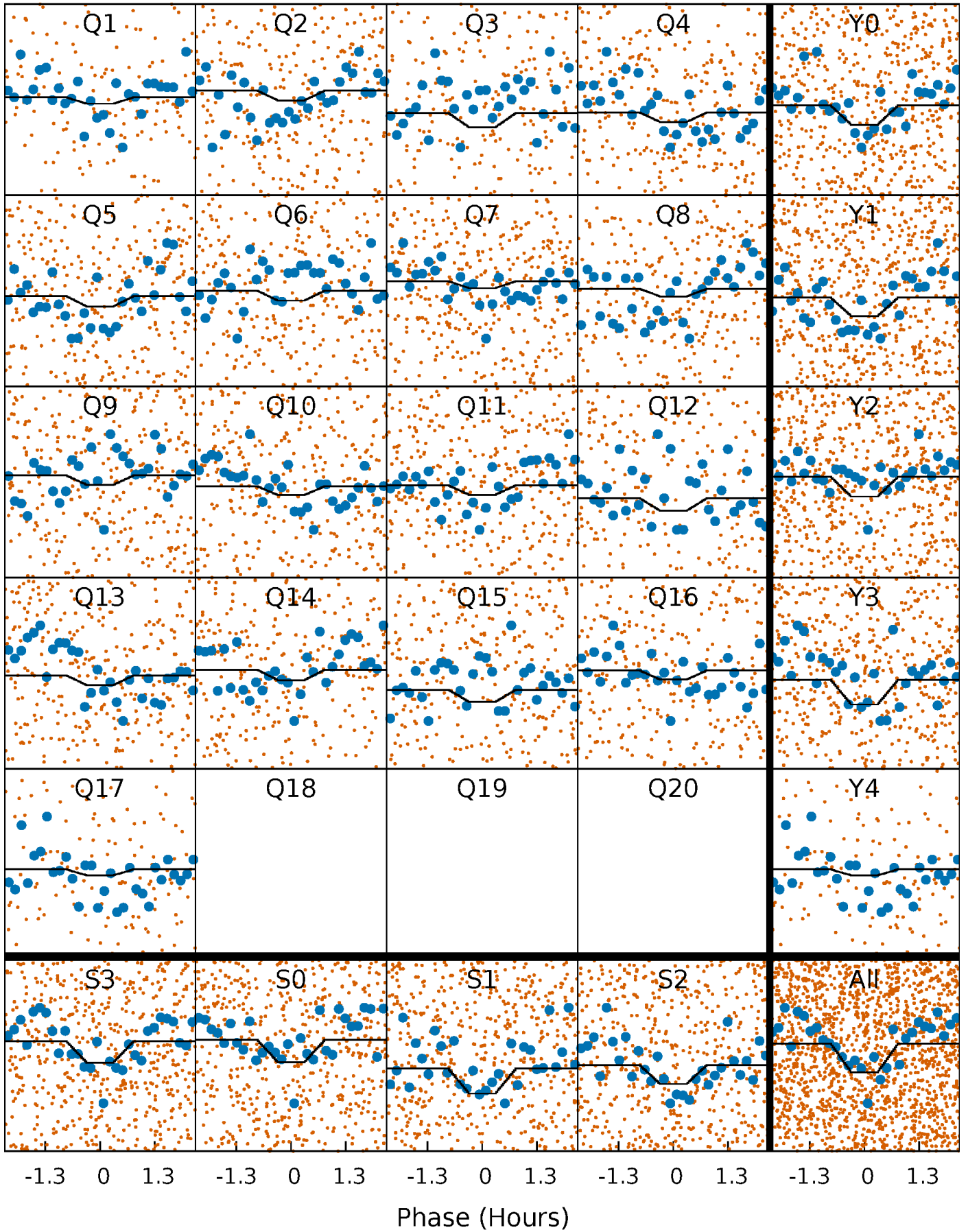
# DV Quarter-Phased Transit Curves

TCE 008256643-02   P= 0.872324 Days    $T_0=132.253570$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008256643-02 P= 0.872328 Days  $T_0=132.251375$  (BKJD)

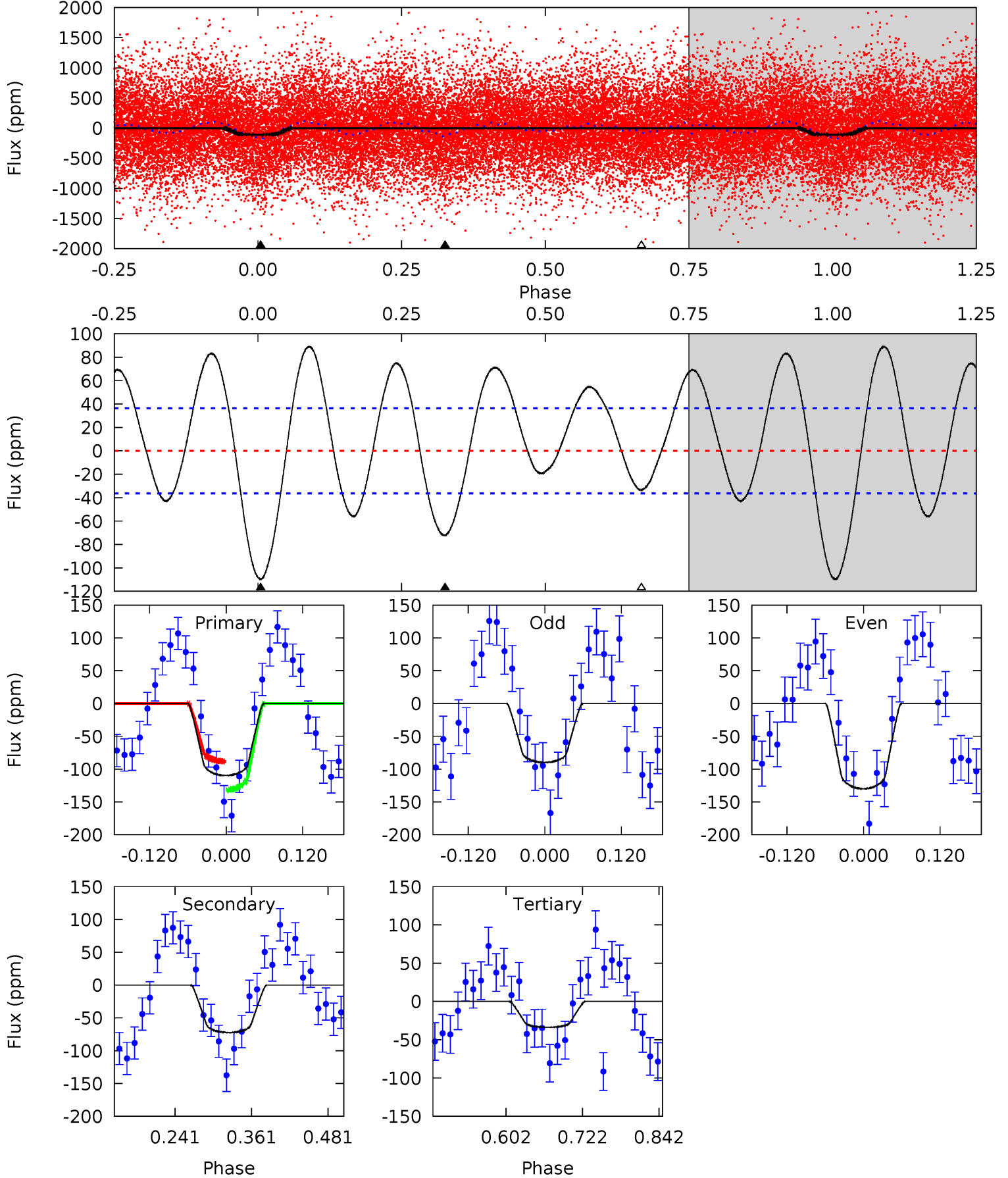




# DV Model-Shift Uniqueness Test

008256643-02, P = 0.872324 Days, E = 131.381246 Days

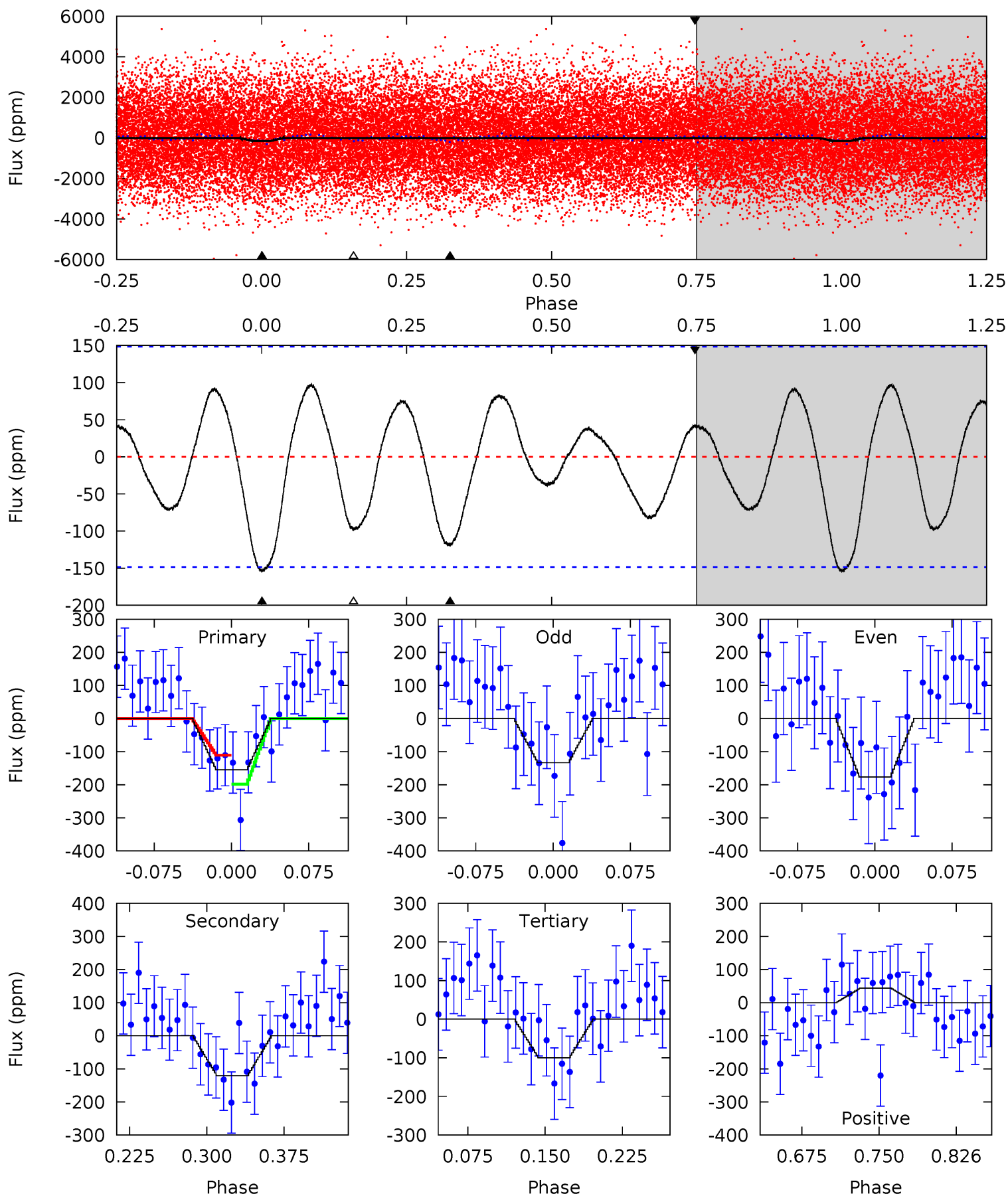
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.7	9.02	4.21	0	4.53	1.55	4.24	9.46	13.7	4.81	9.02	2.50	1.11	0.45	2.67



# Alt Model-Shift Uniqueness Test

008256643-02, P = 0.872328 Days, E = 131.379047 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
4.82	3.76	3.11	1.36	4.62	1.78	1.64	1.71	3.46	0.65	2.40	0.67	0.76	0.39	1.36



### Stellar Parameters For KIC 008256643

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7502^{+209}_{-314}$	$3.751^{+0.384}_{-0.096}$	$-0.060^{+0.200}_{-0.350}$	$2.949^{+0.425}_{-1.190}$	$1.787^{+0.185}_{-0.344}$	$0.098^{+0.341}_{-0.029}$
	+3%/-4%	+10%/-3%	+333%/-583%	+14%/-40%	+10%/-19%	+347%/-29%
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 008256643-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-72 \pm 8$	$3.32^{+1.60}_{-1.45}$	$5241^{+350}_{-508}$	$6065^{+2419}_{-1234}$	$1.679^{+3.575}_{-0.906}$
Alt.	$-121 \pm 32$	$3.62^{+1.68}_{-1.46}$	$5226^{+367}_{-549}$	$6629^{+2532}_{-1278}$	$2.246^{+4.348}_{-1.205}$

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

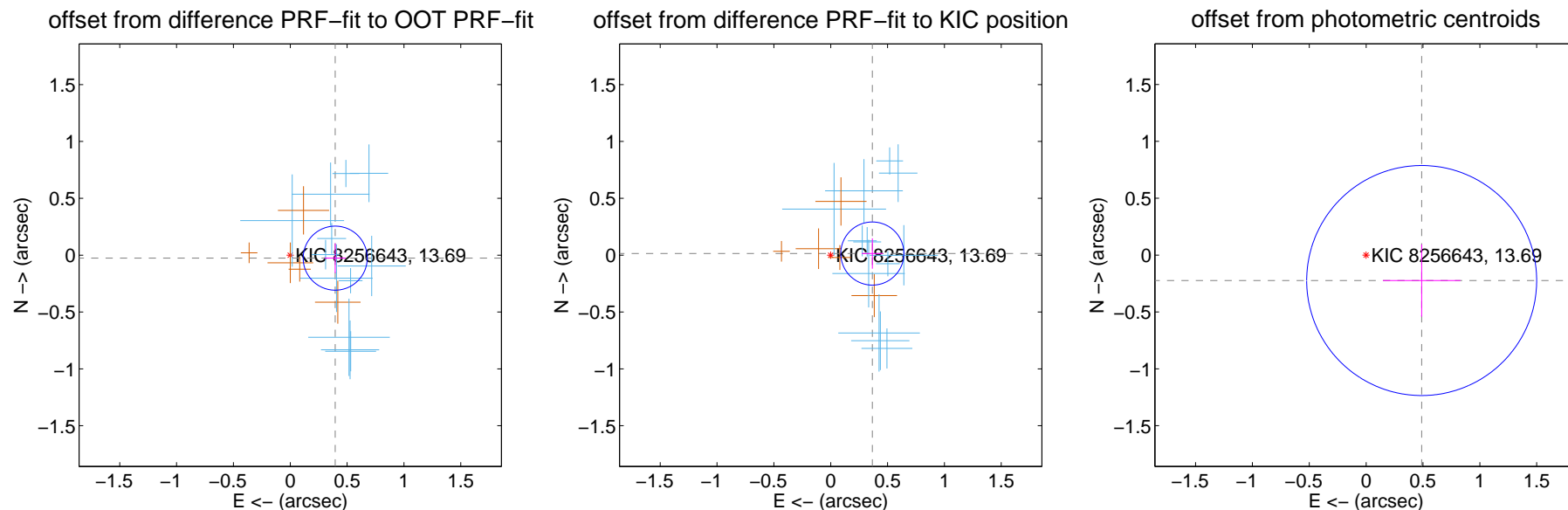
## DV Centroid Data

Supplemental centroid analysis for 008256643-02. Kepler magnitude: 13.69. Transit SNR 9.17

There are 12 quarters with good PRF difference image offsets

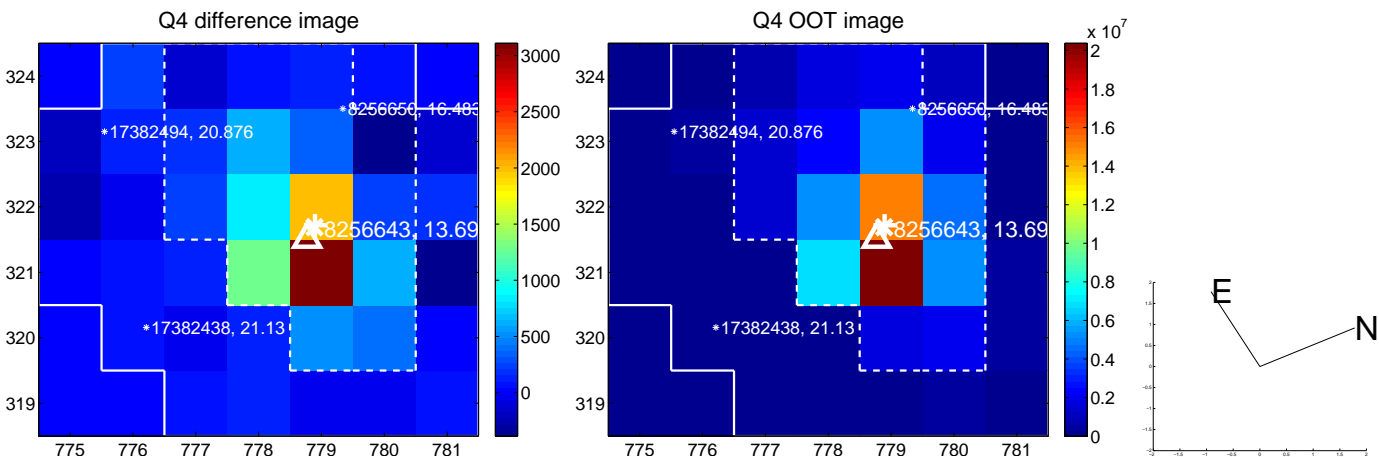
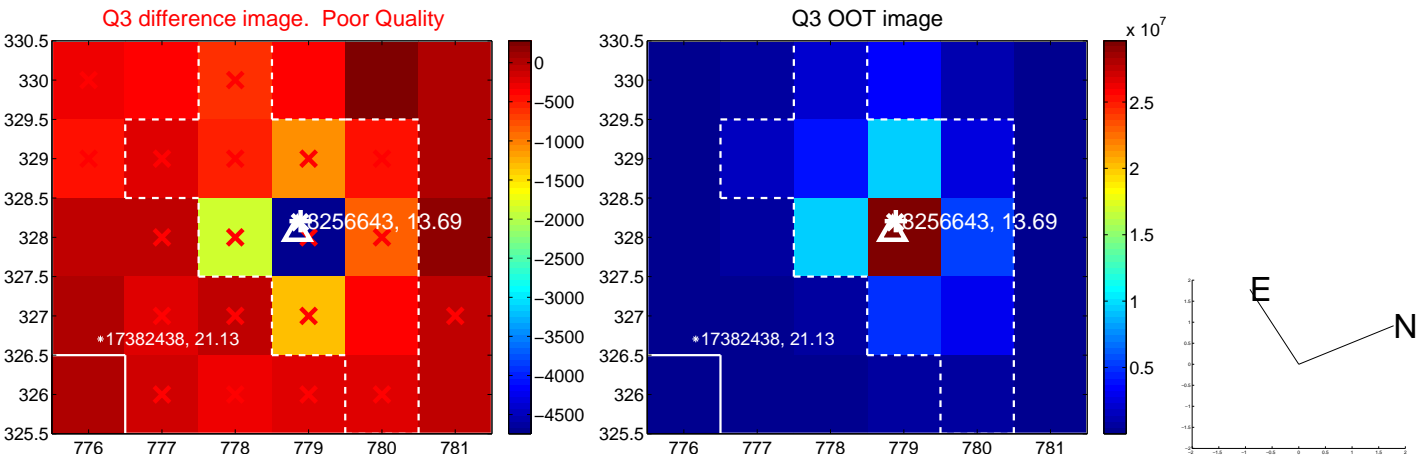
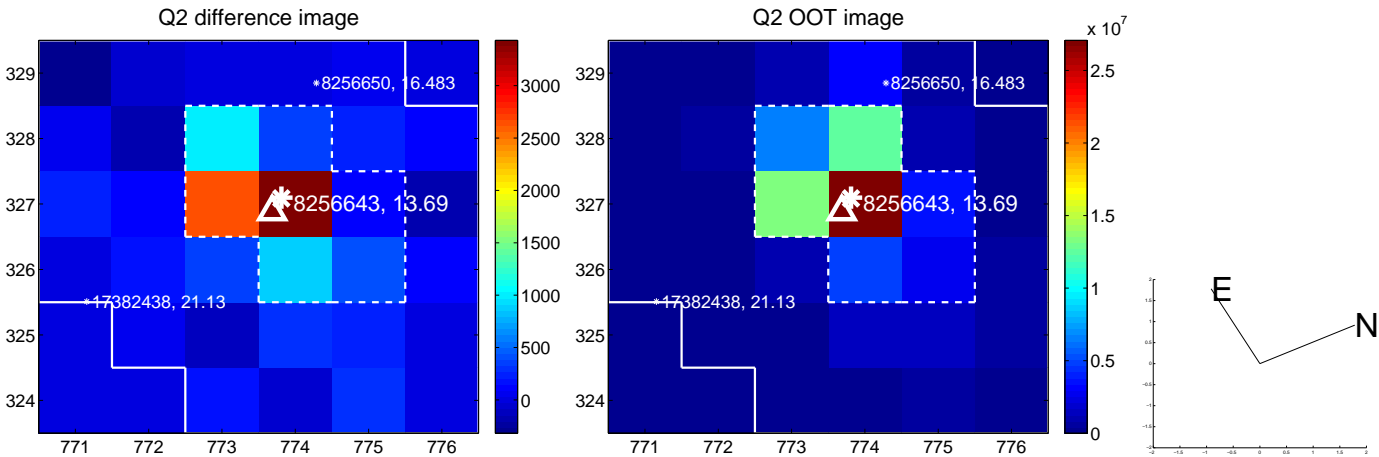
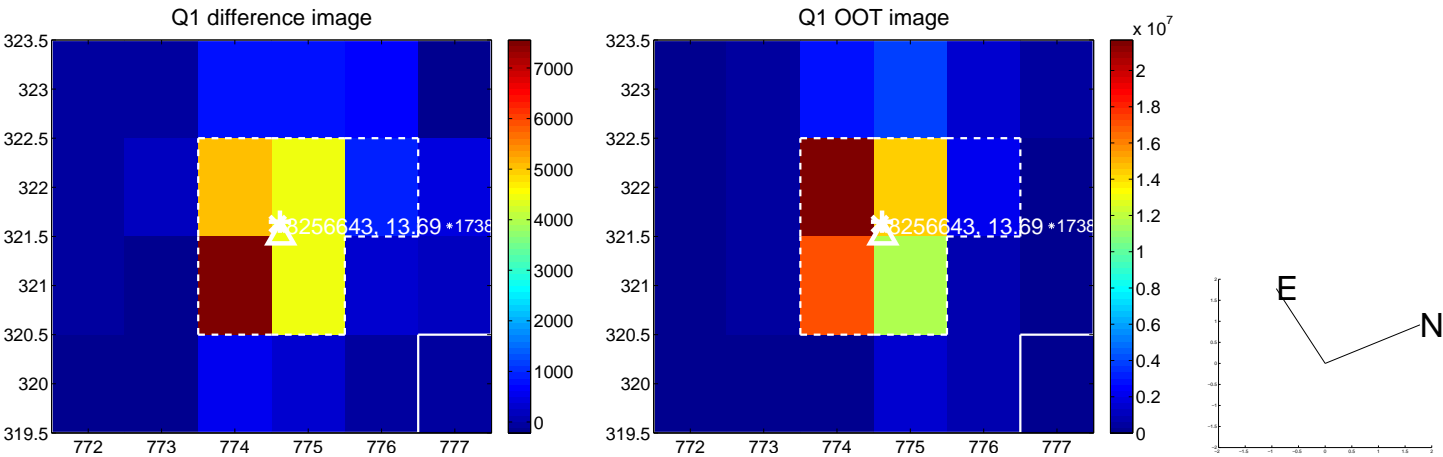
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.396 \pm 0.094$	4.22	$-0.395 \pm 0.093$	$-0.026 \pm 0.131$
PRF-fit source offset from KIC position	$0.366 \pm 0.093$	3.96	$-0.366 \pm 0.093$	$0.014 \pm 0.134$
photometric centroid source offset	$0.54 \pm 0.34$	1.59	$-0.49 \pm 0.34$	$-0.22 \pm 0.32$

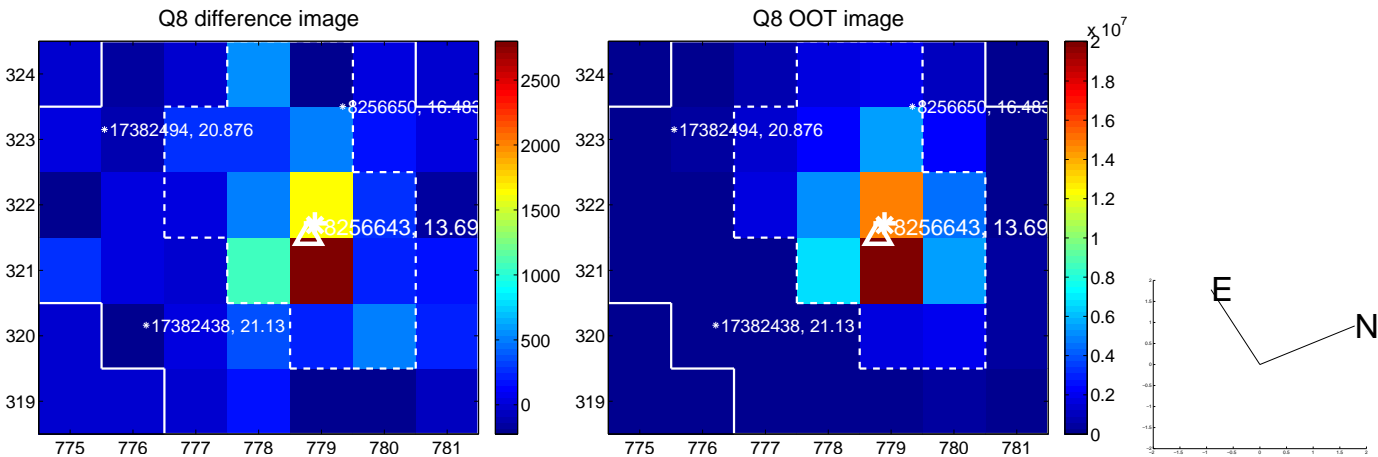
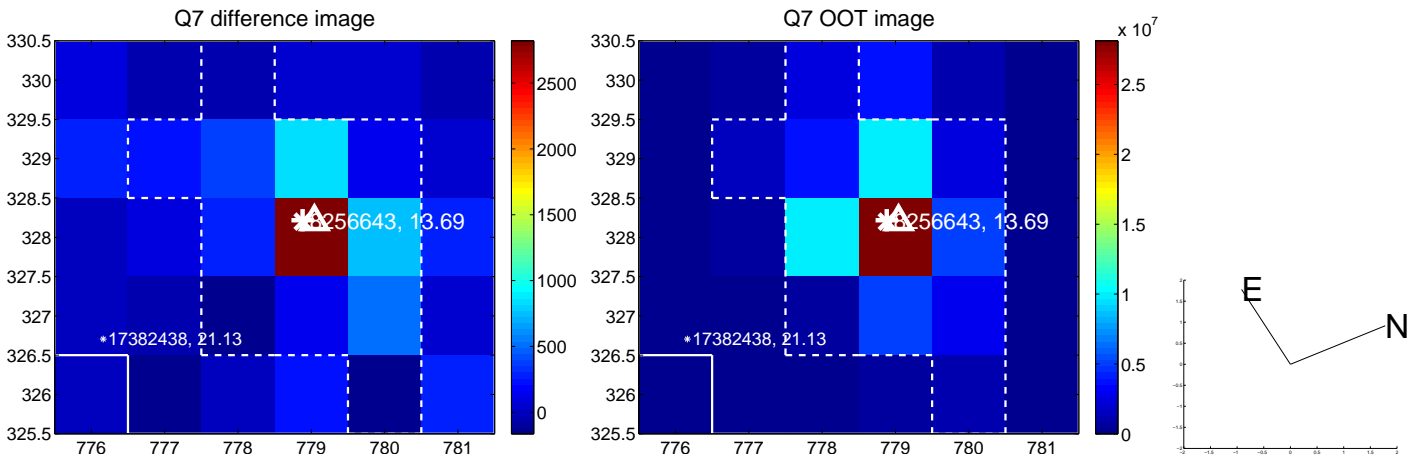
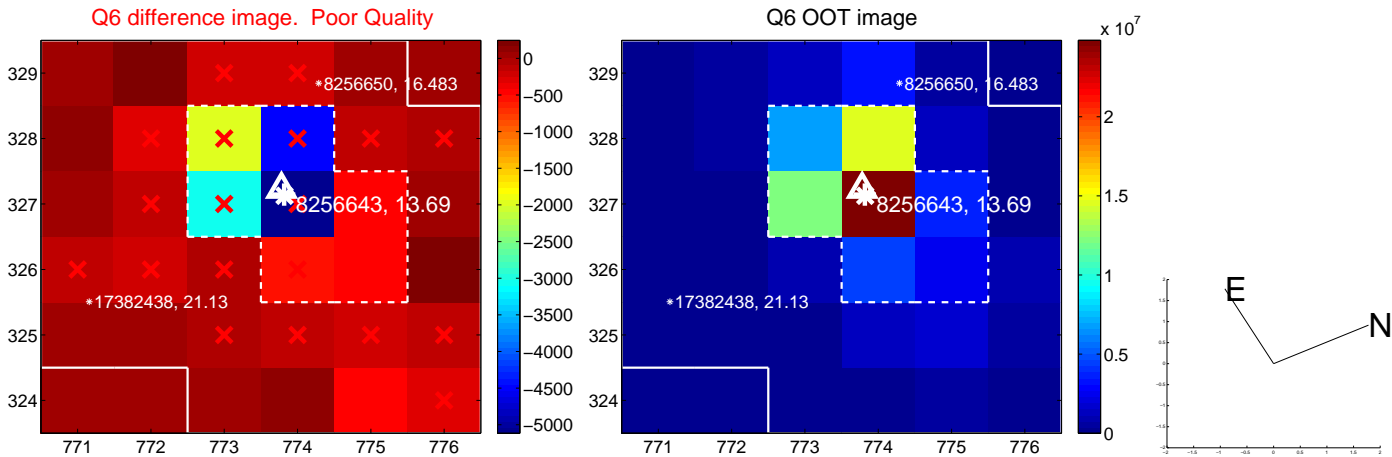
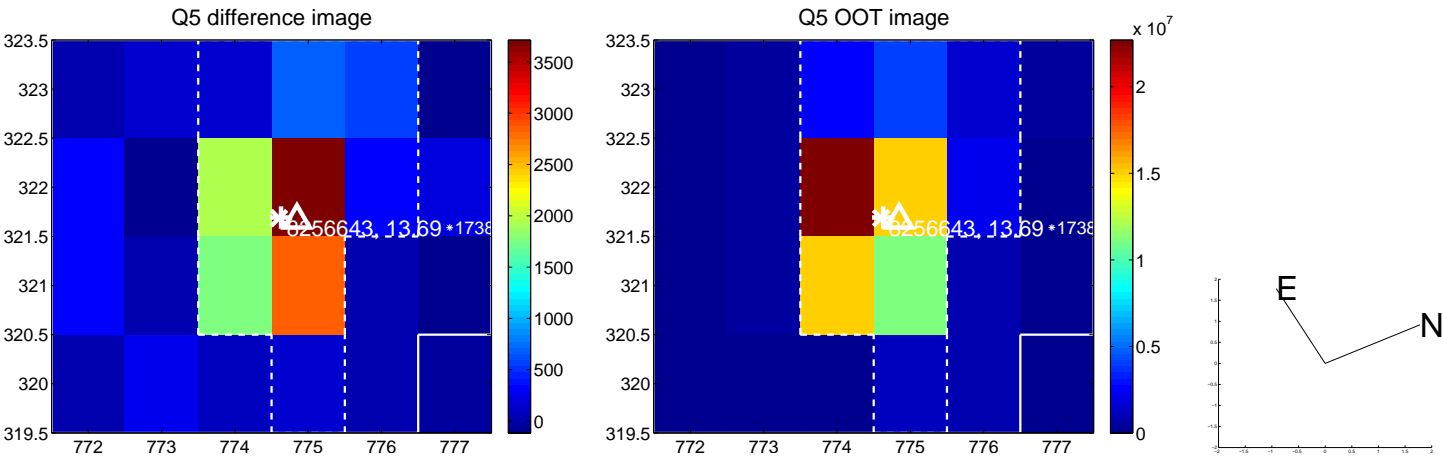


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

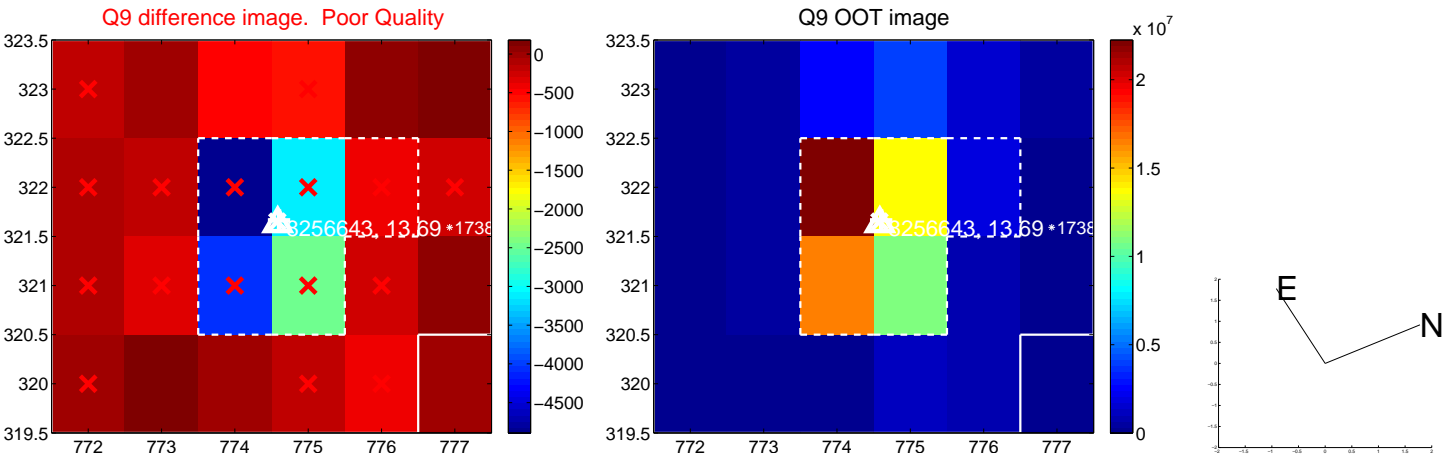


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

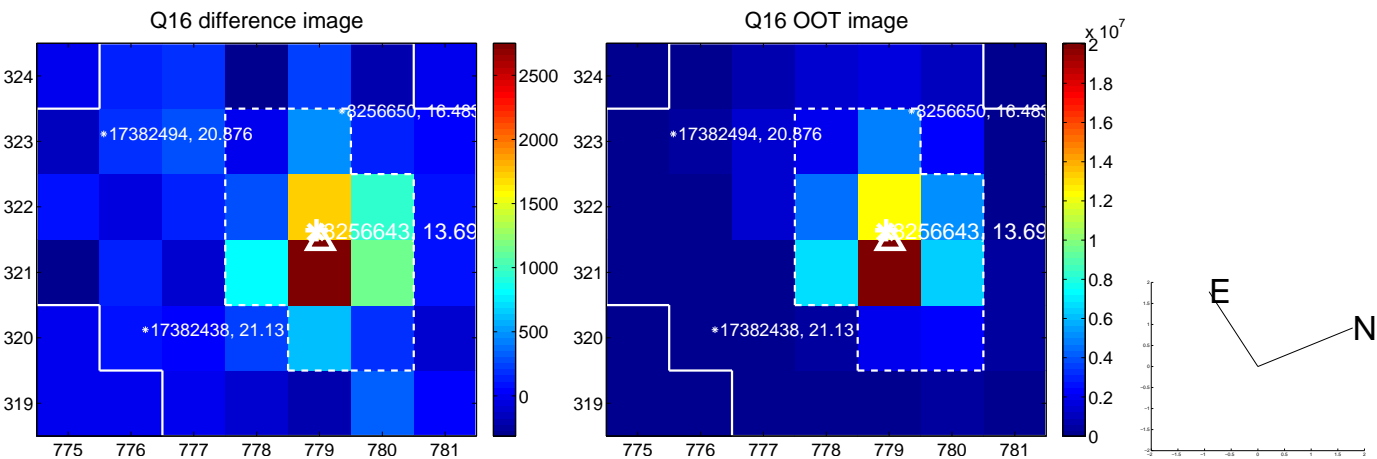
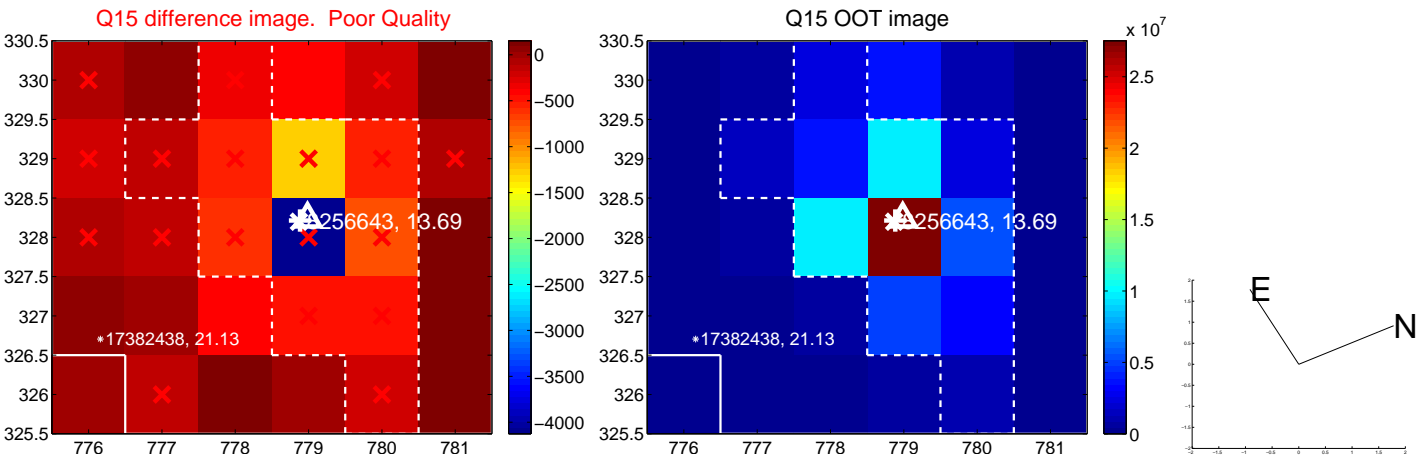
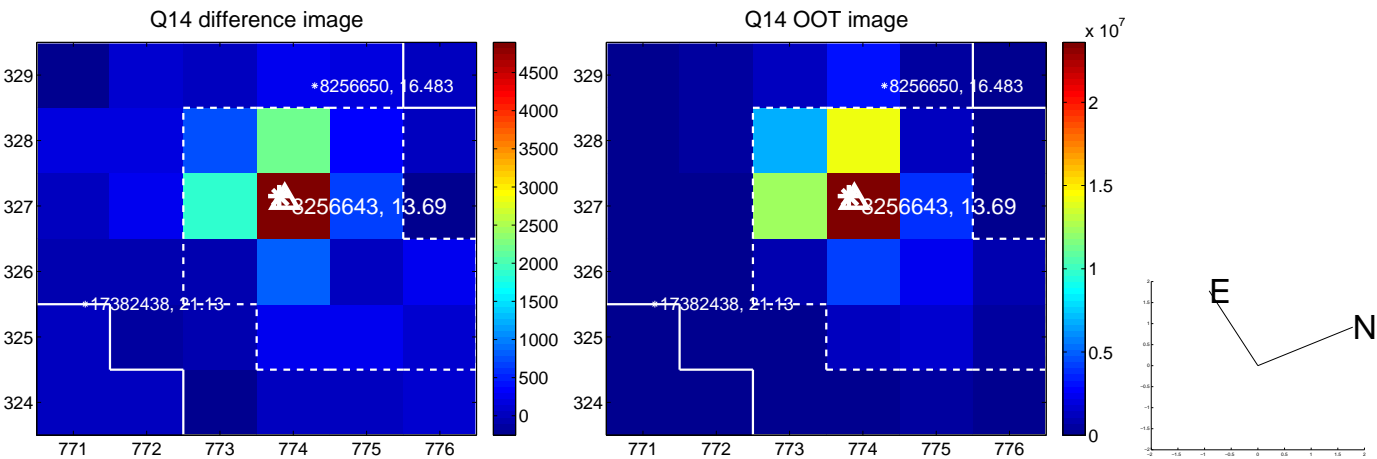
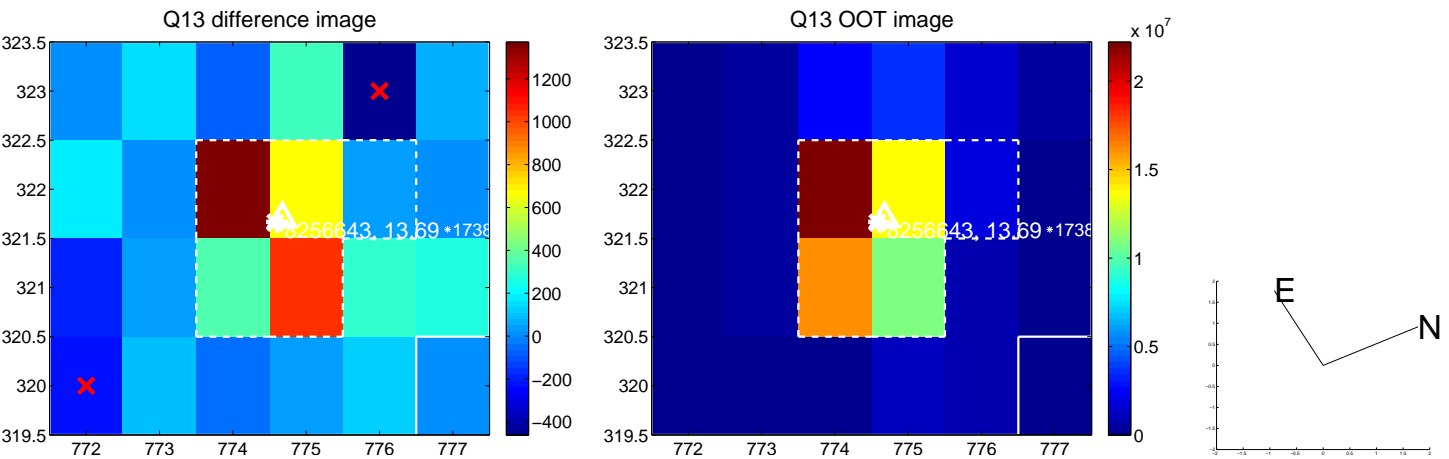




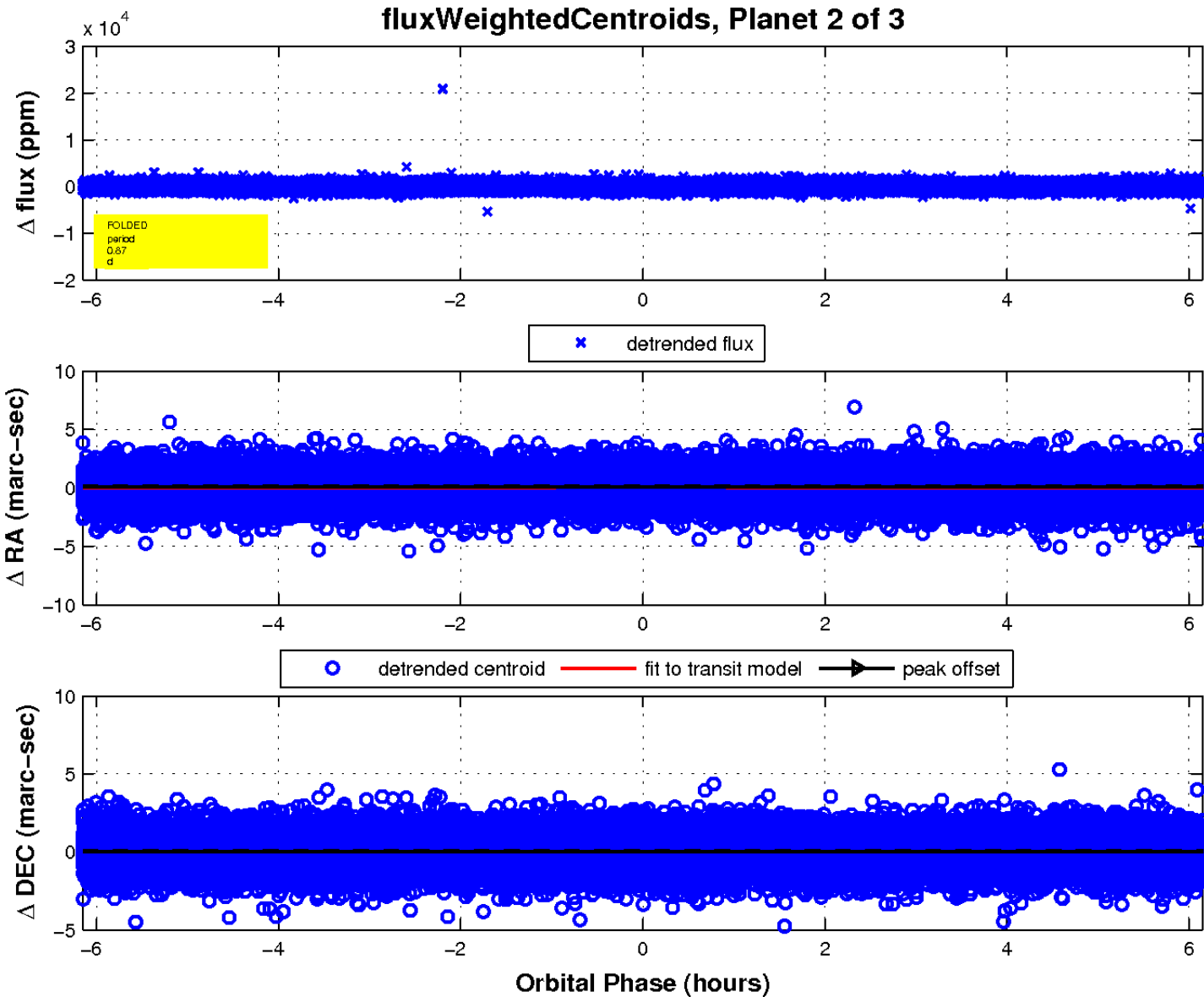
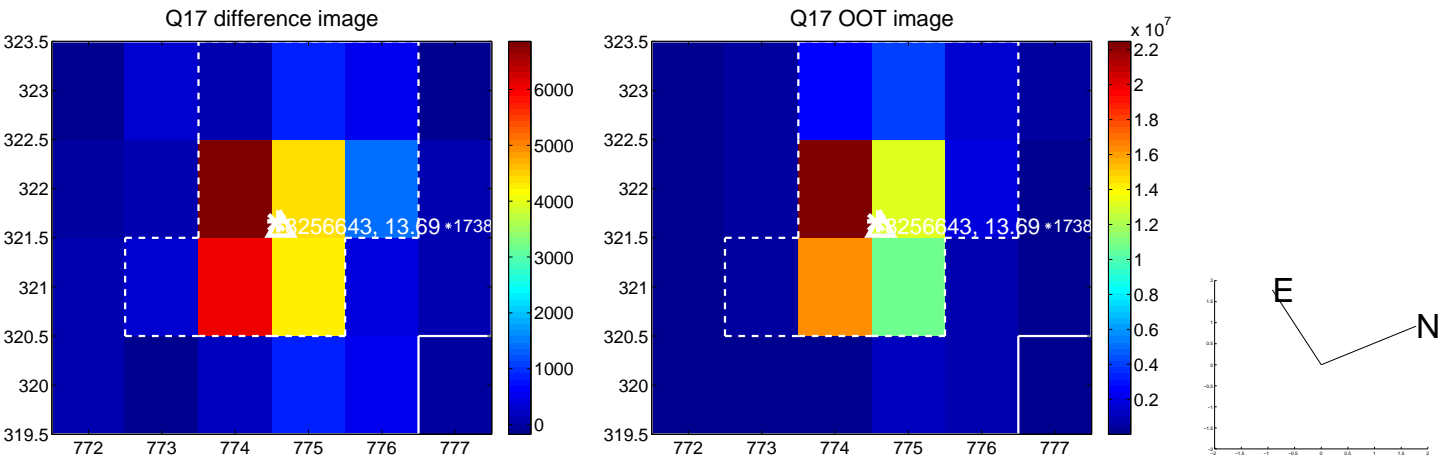
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

