

# KIC 008282831

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008282831-01	OBS	No	0.831621	131.920934	26.0	2.096	11.4	1.6	0.96	5982	0.53	3424.21
008282831-02	OBS	No	0.831628	132.330496	139.9	1.589	10.1	8.5	0.96	5982	1.23	3424.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008282831-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008282831-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

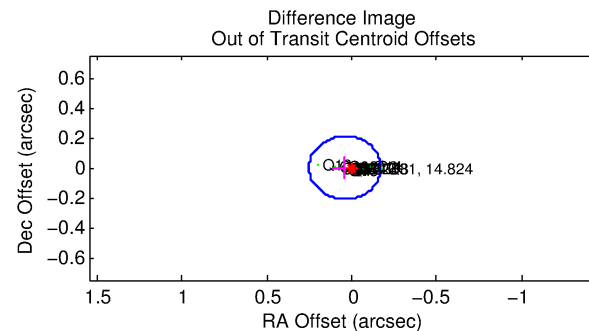
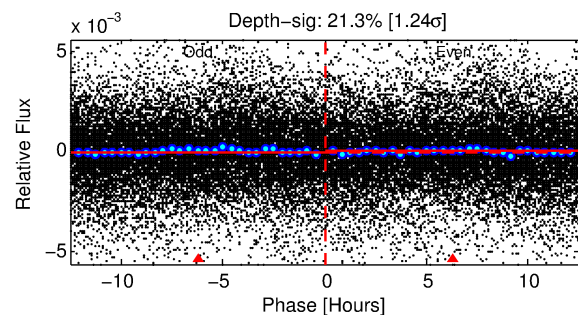
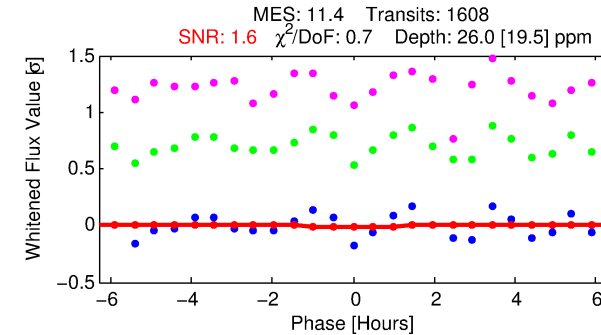
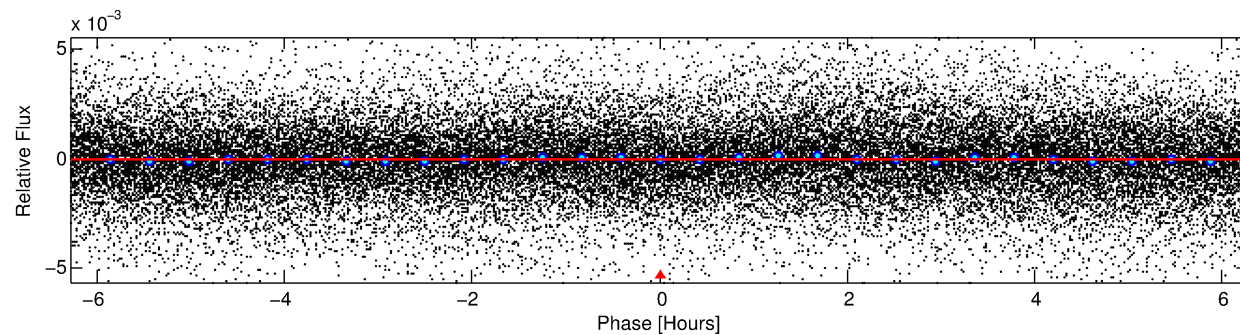
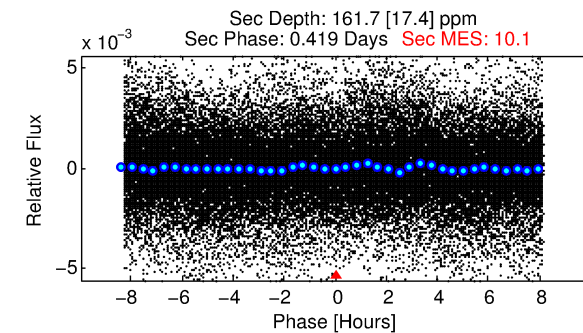
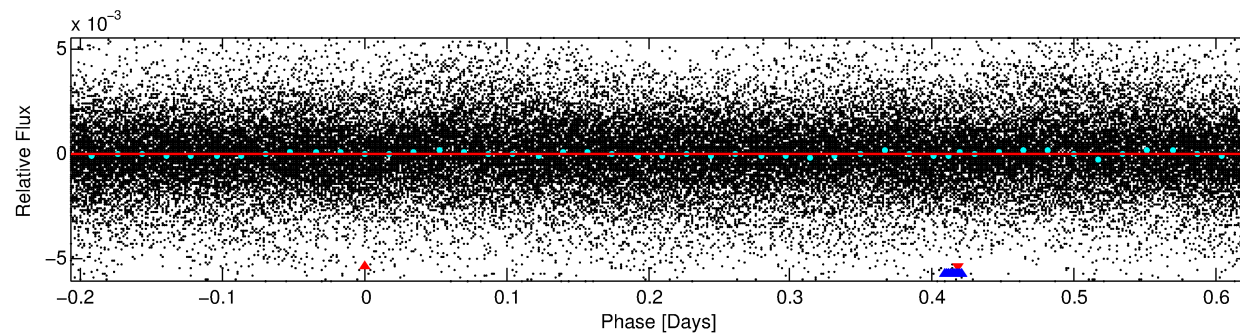
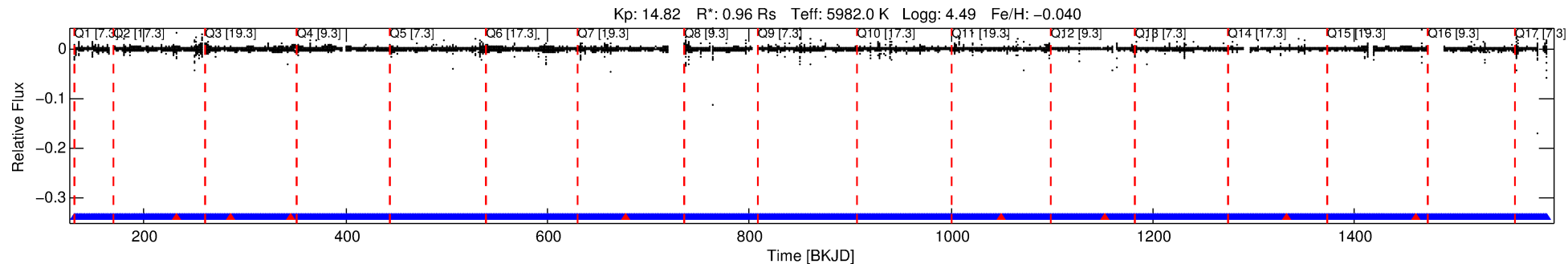
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008282831-01

No Significant Match Found

# DV One-Page Summary

KIC: 8282831 Candidate: 1 of 2 Period: 0.832 d



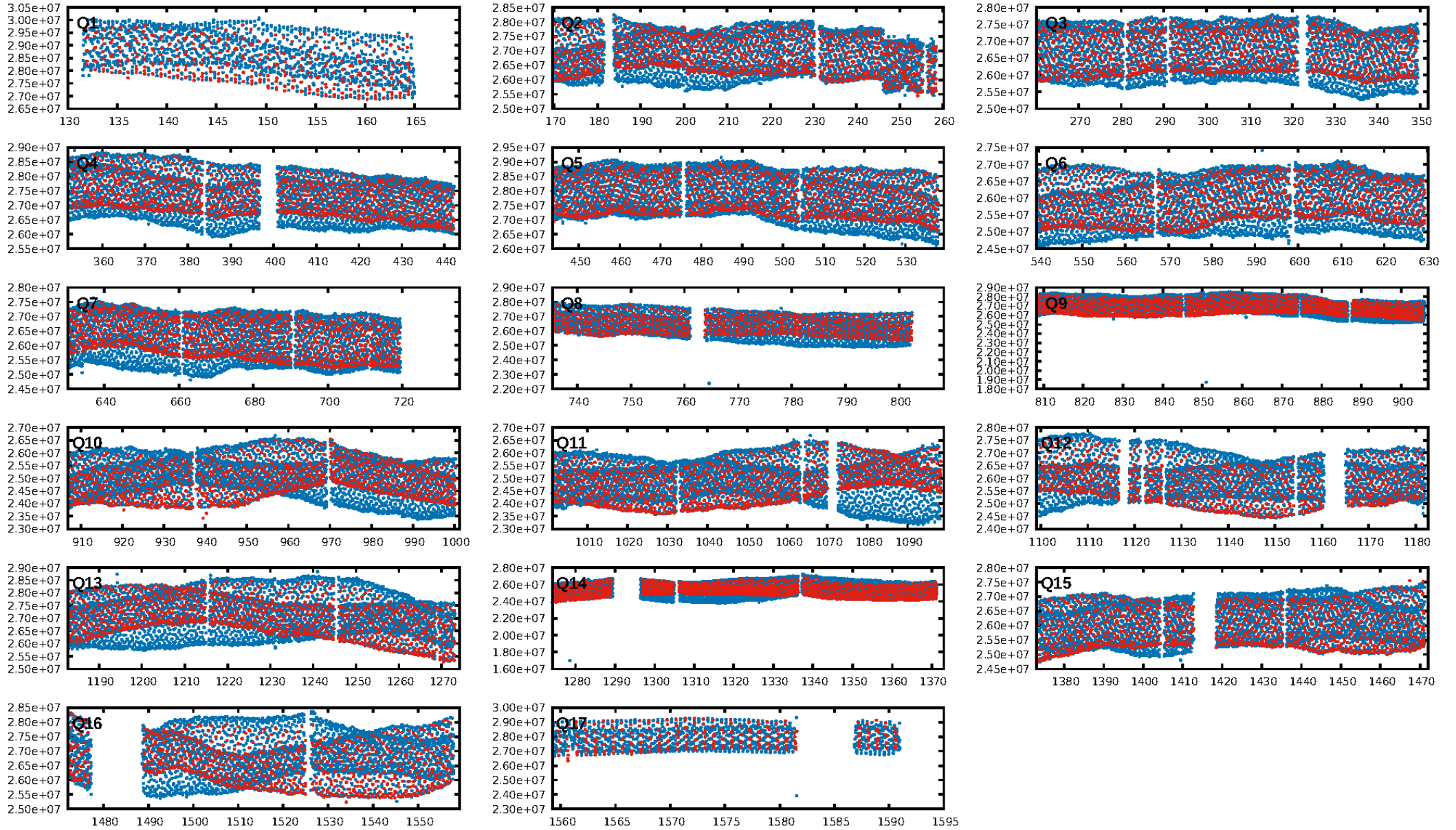
## DV Fit Results:

Period = 0.83162 [0.00006] d  
Epoch = 131.9209 [0.0078] BKJD  
Rp/R\* = 0.0050 [0.0038]  
a/R\* = 2.30 [5.87]  
b = 0.71 [2.18]  
Seff = 3424.21 [1381.95]  
Teq = 1951 [197] K  
Rp = 0.53 [0.43] Re  
a = 0.0176 [0.0046] AU  
Ag = 99.02 [155.39] [0.63σ]  
Teffp = 9514 [3634] K [2.08σ]

## DV Diagnostic Results:

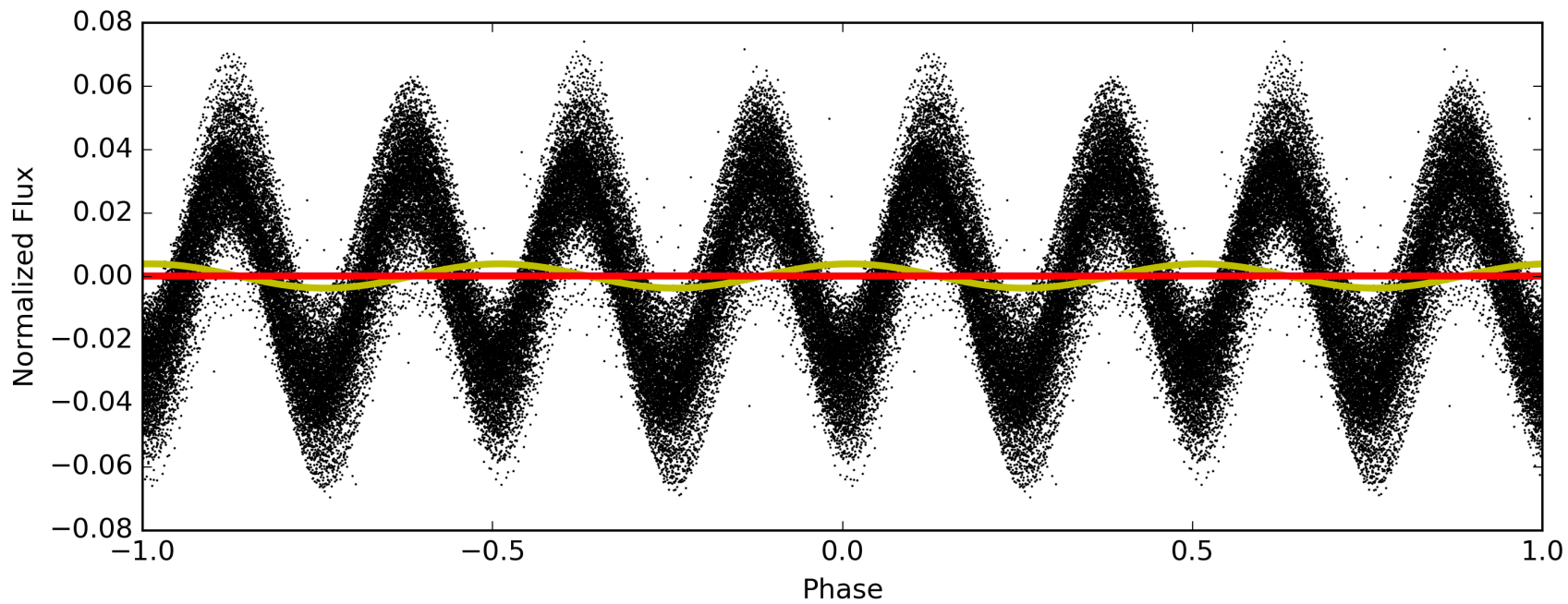
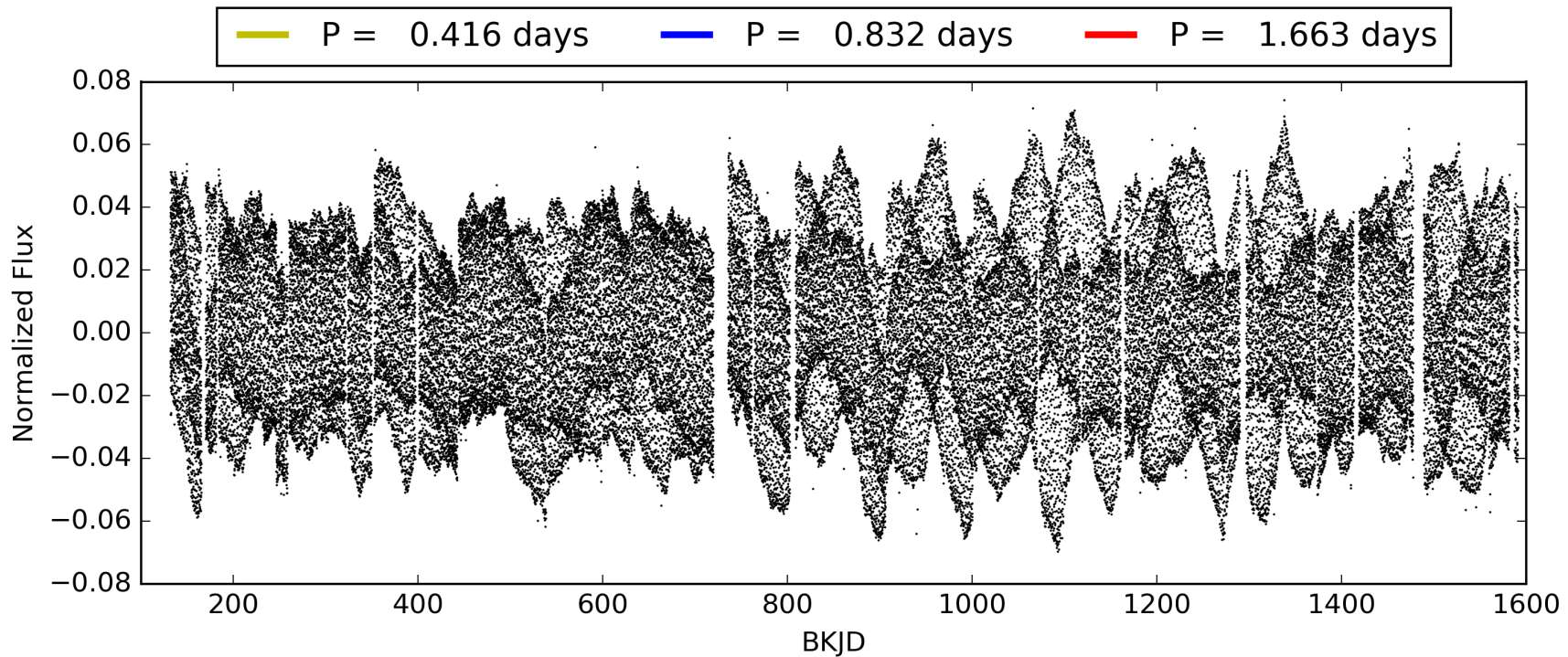
ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.01e-22  
RollingBand-fgt: 0.99 [1528/1536]  
GhostDiagnostic-chr: 1.047  
Centroid-sig: 79.9%  
Centroid-so: 1.308 arcsec [0.50σ]  
OotOffset-rm: 0.042 arcsec [0.60σ]  
KicOffset-rm: 0.136 arcsec [1.96σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008282831-01, PDC Light Curves



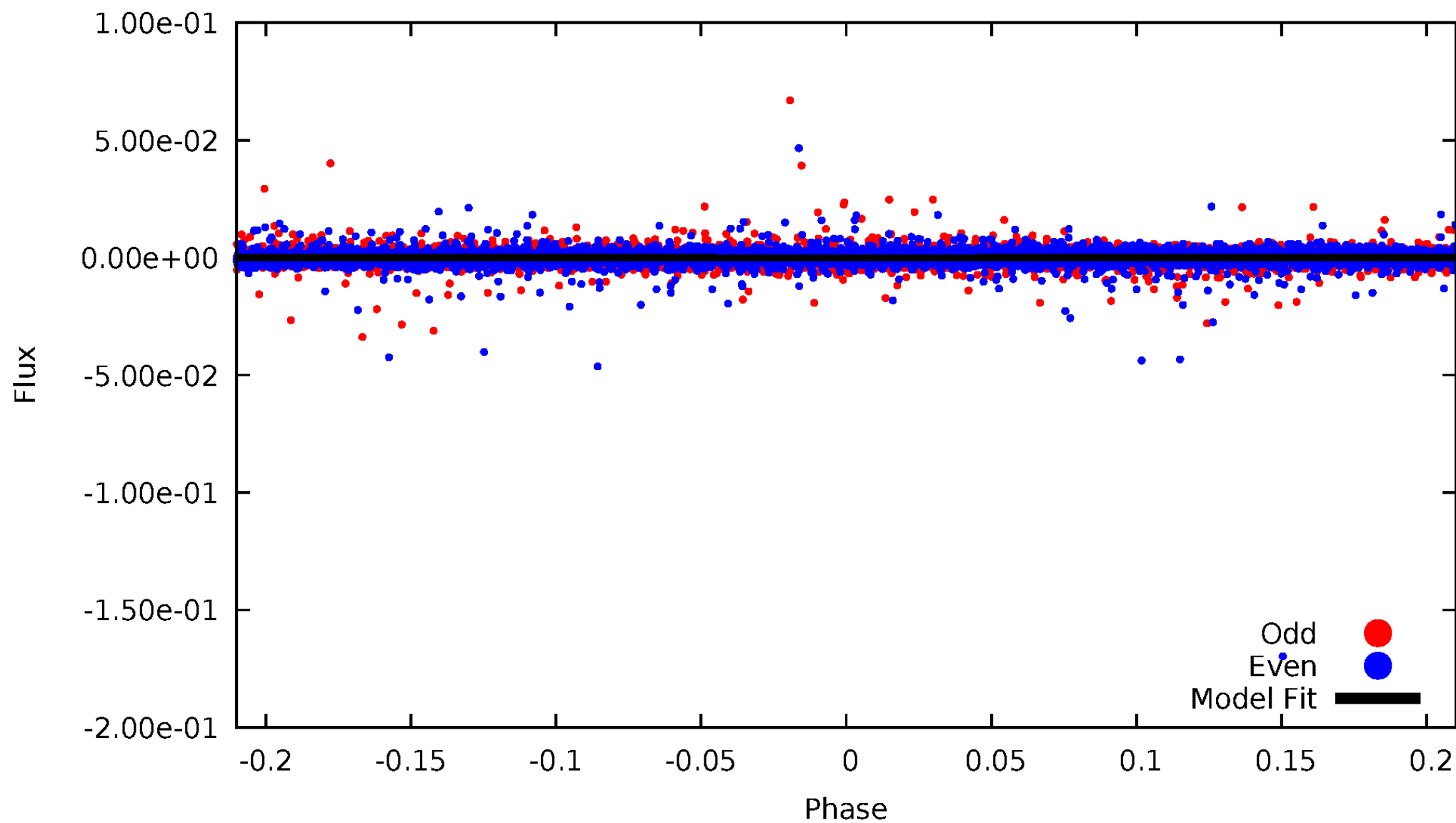


TCE 008282831-01



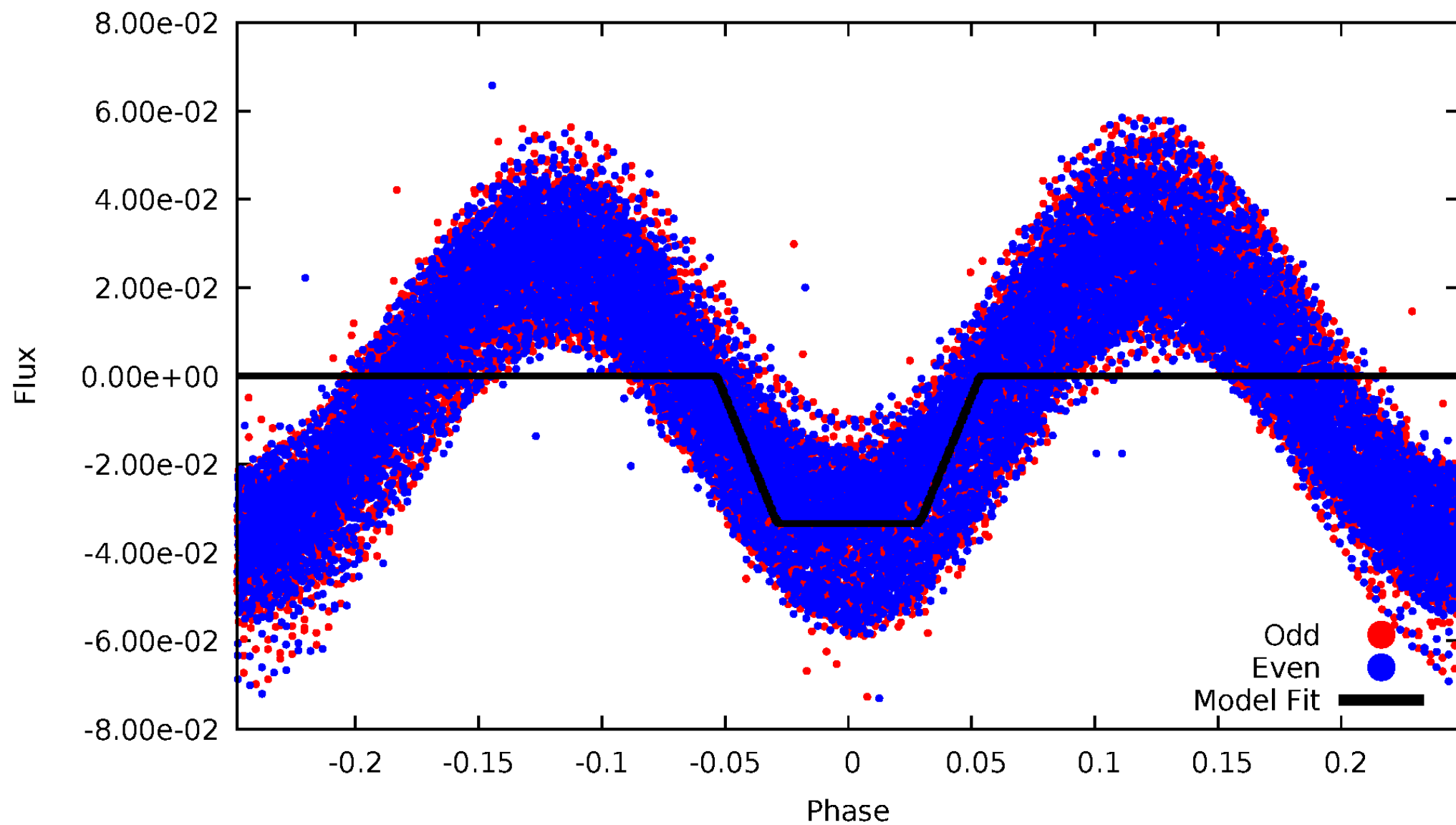
# DV Odd/Even

TCE 008282831-01



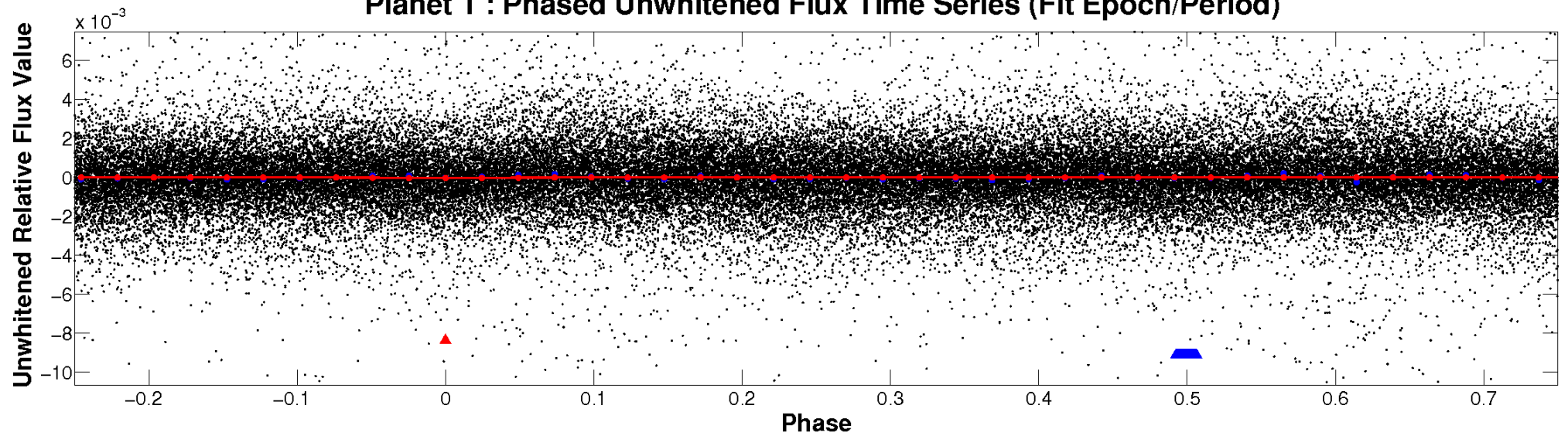
# ALT Odd/Even

TCE 008282831-01

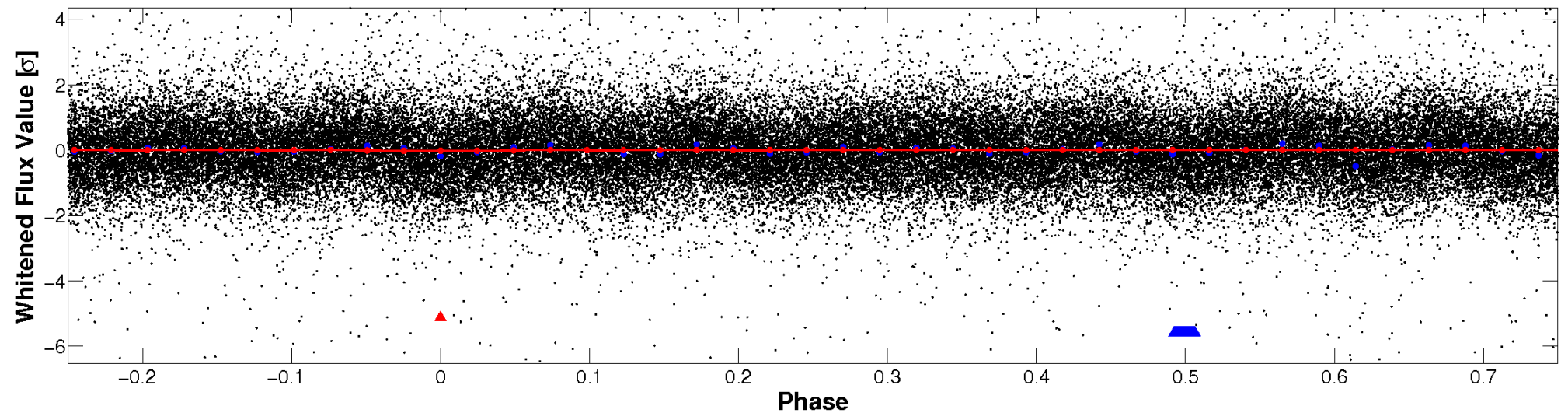


# Non-Whitened Vs. Whitened Light Curve

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

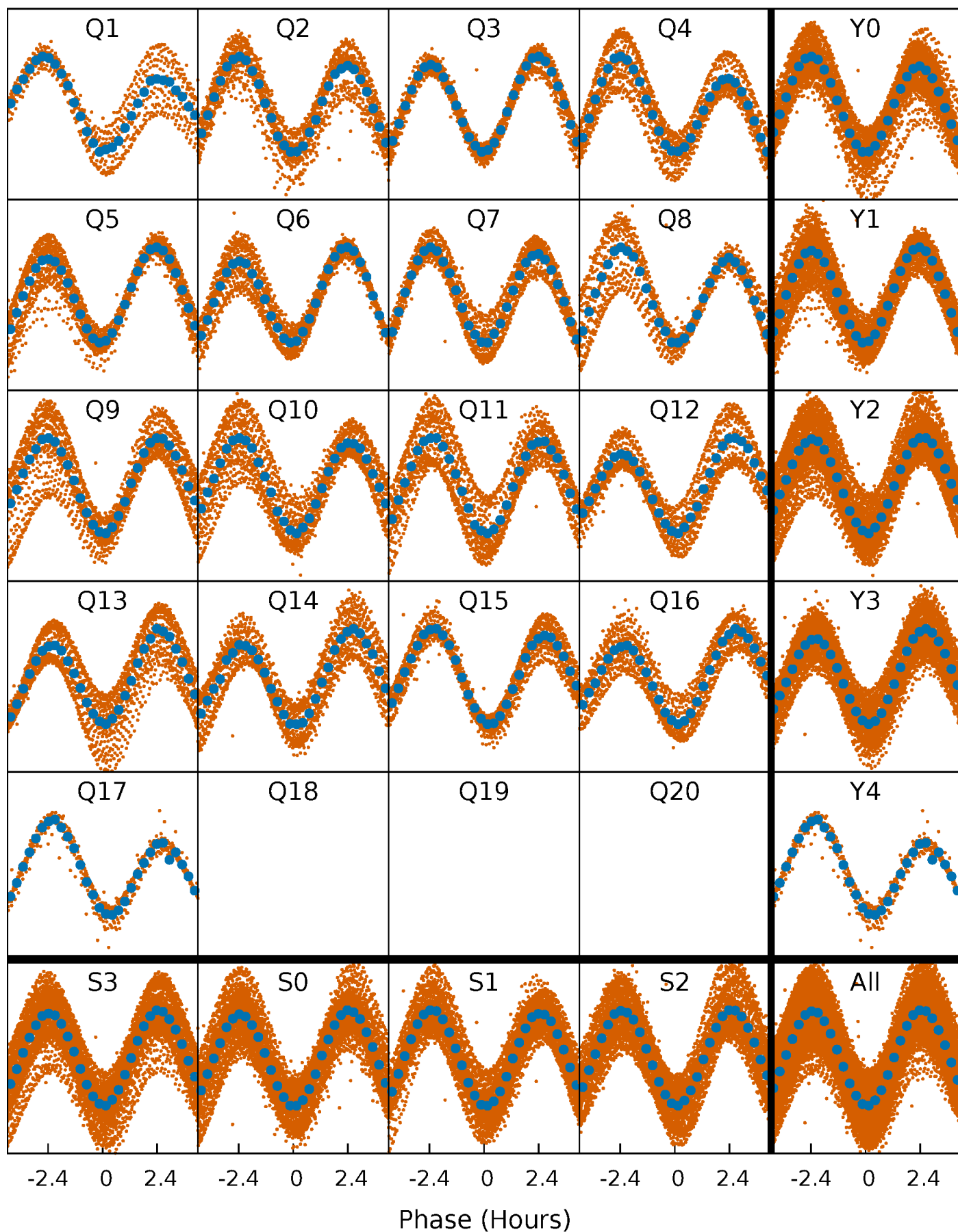


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

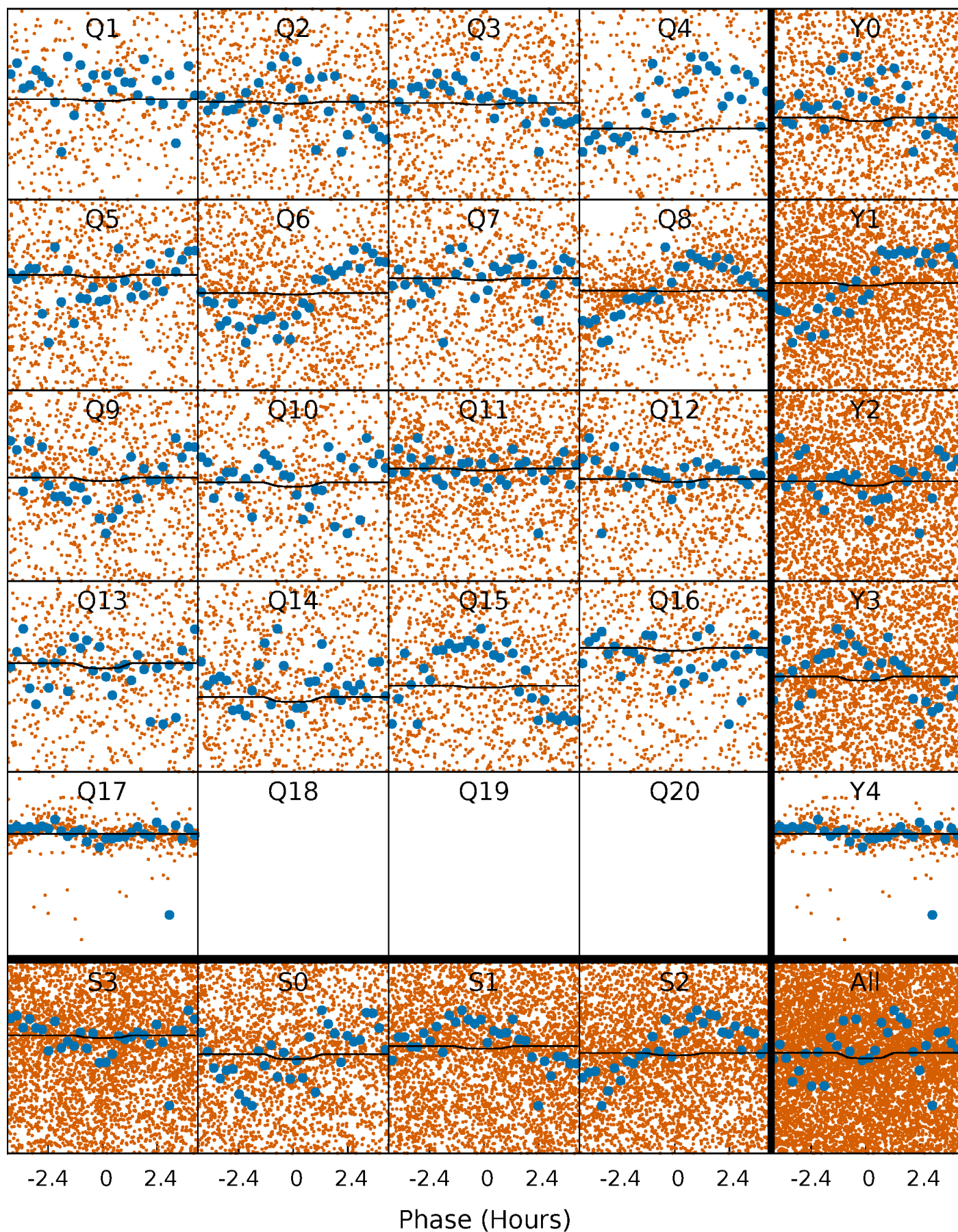
TCE 008282831-01 P= 0.831621 Days  $T_0=131.920934$  (BKJD)





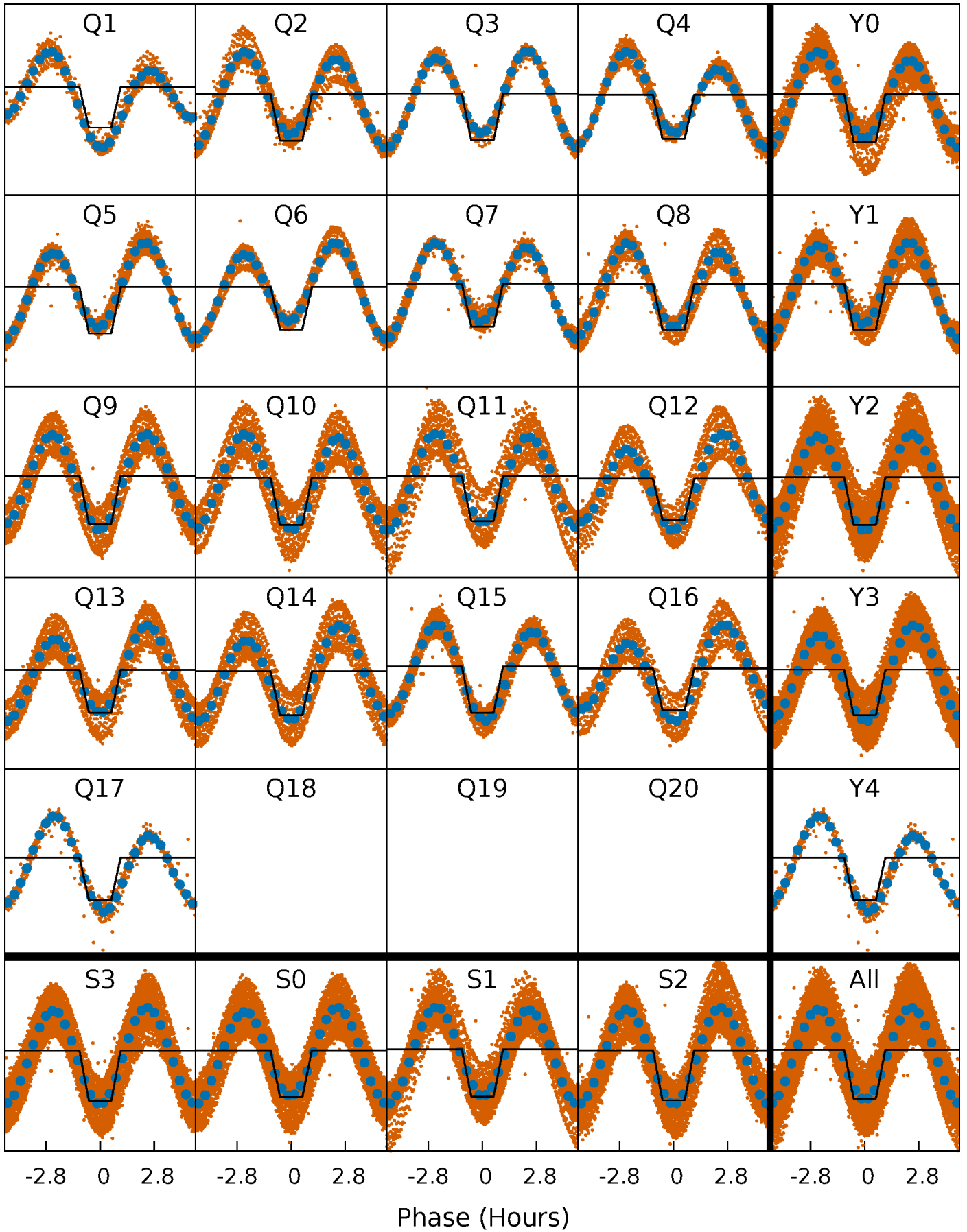
# DV Quarter-Phased Transit Curves

TCE 008282831-01 P= 0.831621 Days  $T_0=131.920934$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

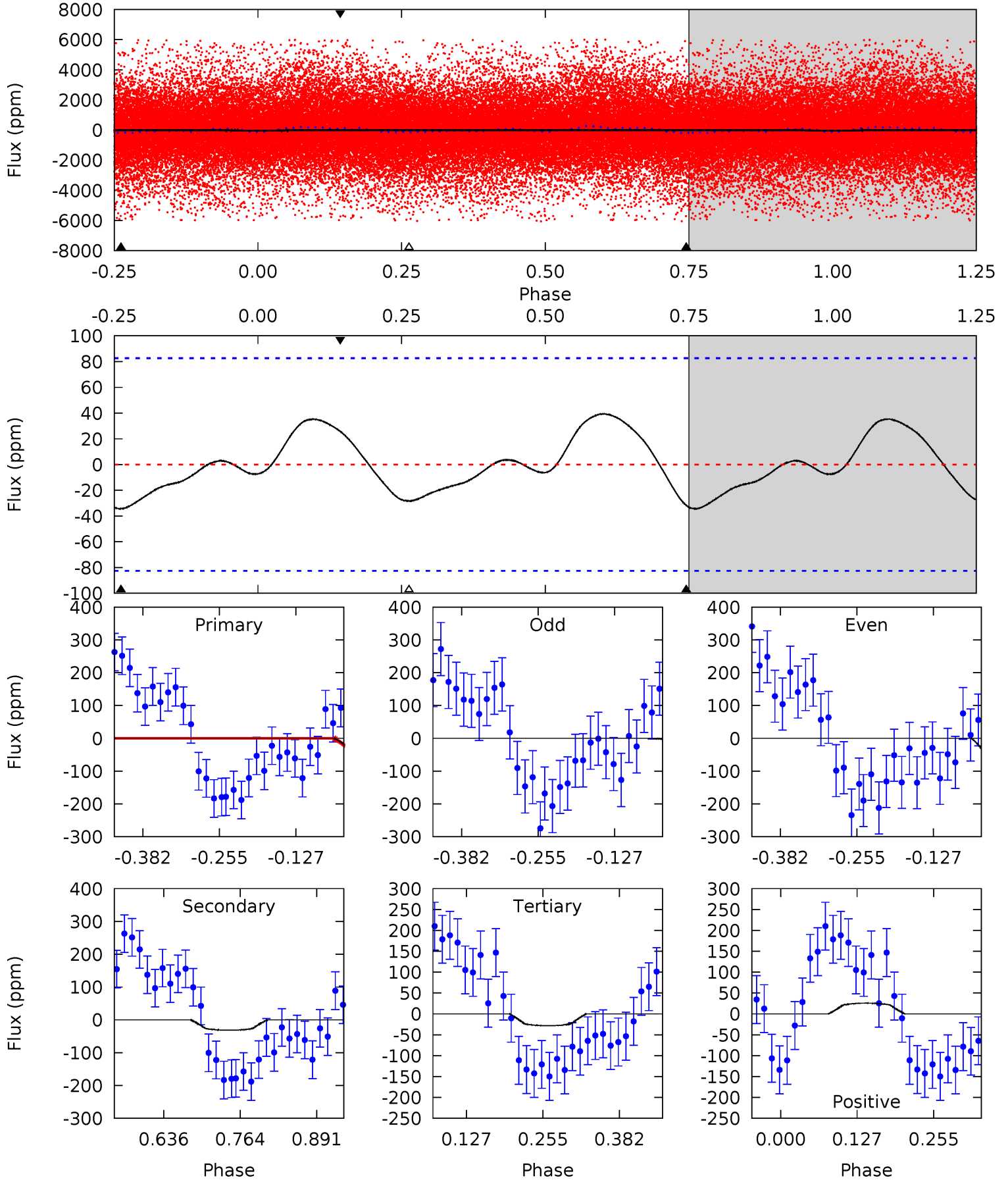
TCE 008282831-01   P= 0.831623 Days    $T_0=131.921427$  (BKJD)



# DV Model-Shift Uniqueness Test

008282831-01, P = 0.831621 Days, E = 131.089313 Days

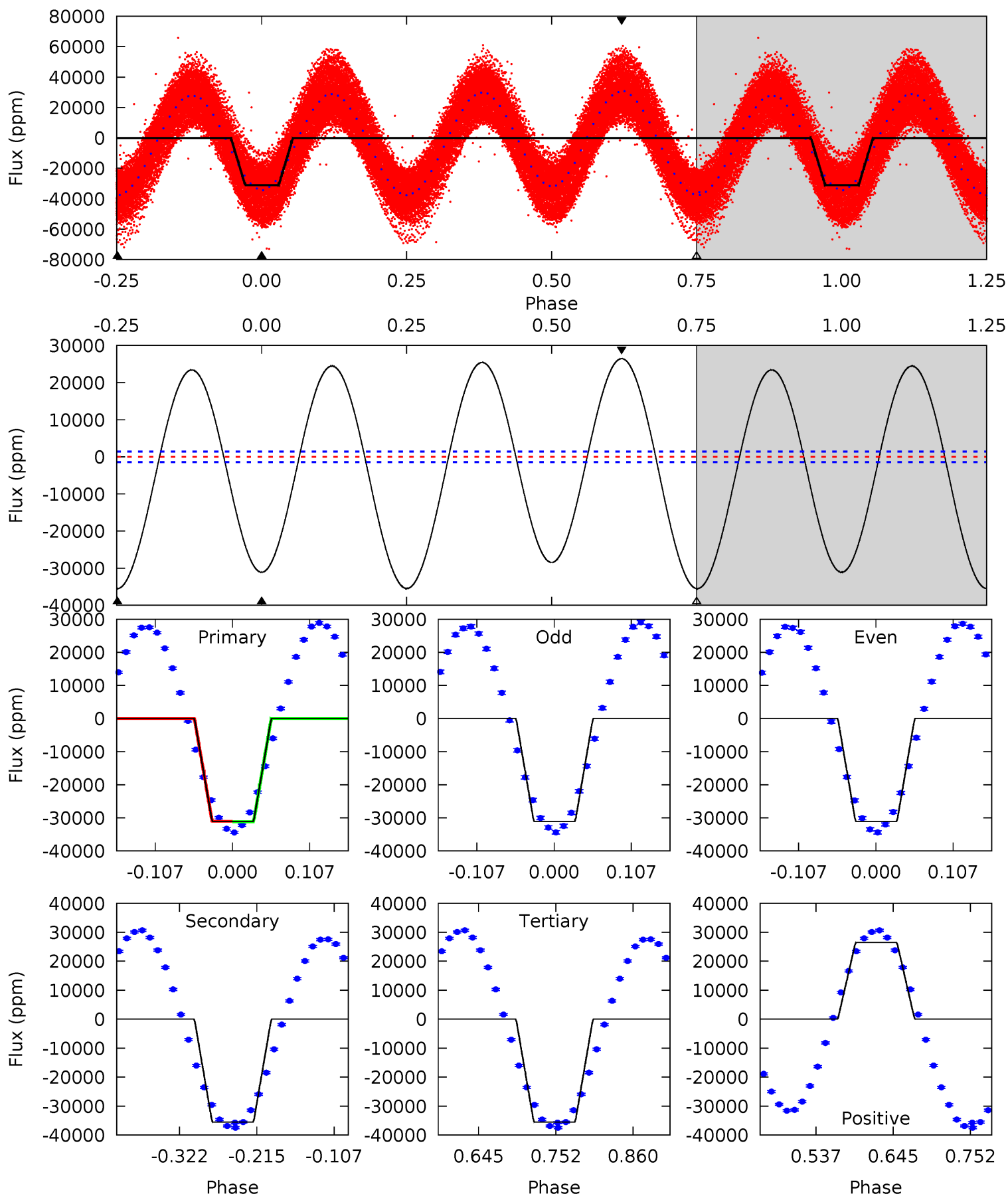
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.88	1.73	1.55	1.40	4.51	1.52	1.04	0.33	0.47	0.18	0.32	1.52	-1.39	0.53	0.28



# Alt Model-Shift Uniqueness Test

008282831-01, P = 0.831623 Days, E = 131.089804 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
100.7	114.9	114.8	85.6	4.55	1.61	68.4	-14.2	15.1	0.04	29.3	0.02	1.08	0.43	0.32





### Stellar Parameters For KIC 008282831

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5982^{+180}_{-198}$	$4.493^{+0.052}_{-0.208}$	$-0.040^{+0.250}_{-0.300}$	$0.960^{+0.300}_{-0.100}$	$1.047^{+0.126}_{-0.139}$	$1.667^{+0.442}_{-0.879}$
	+3%/-3%	+1%/-5%	+625%/-750%	+31%/-10%	+12%/-13%	+26%/-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 008282831-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-32 \pm 18$	$0.62^{+0.39}_{-0.35}$	$2792^{+201}_{-142}$	$5846^{+3893}_{-1506}$	$13^{+53}_{-10}$
Alt.	$-35517 \pm 309$	$19.74^{+3.16}_{-1.58}$	$2788^{+203}_{-143}$	$6095^{+199}_{-223}$	$16^{+3}_{-4}$

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

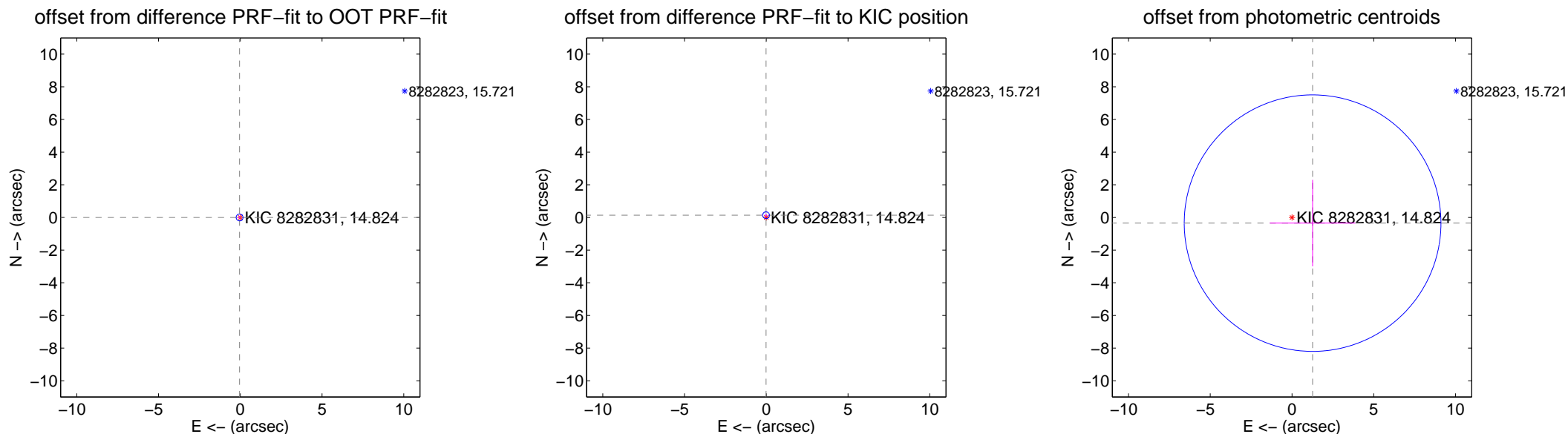
## DV Centroid Data

Supplemental centroid analysis for 008282831-01. Kepler magnitude: 14.82. Transit SNR 1.65

There are 17 quarters with good PRF difference image offsets

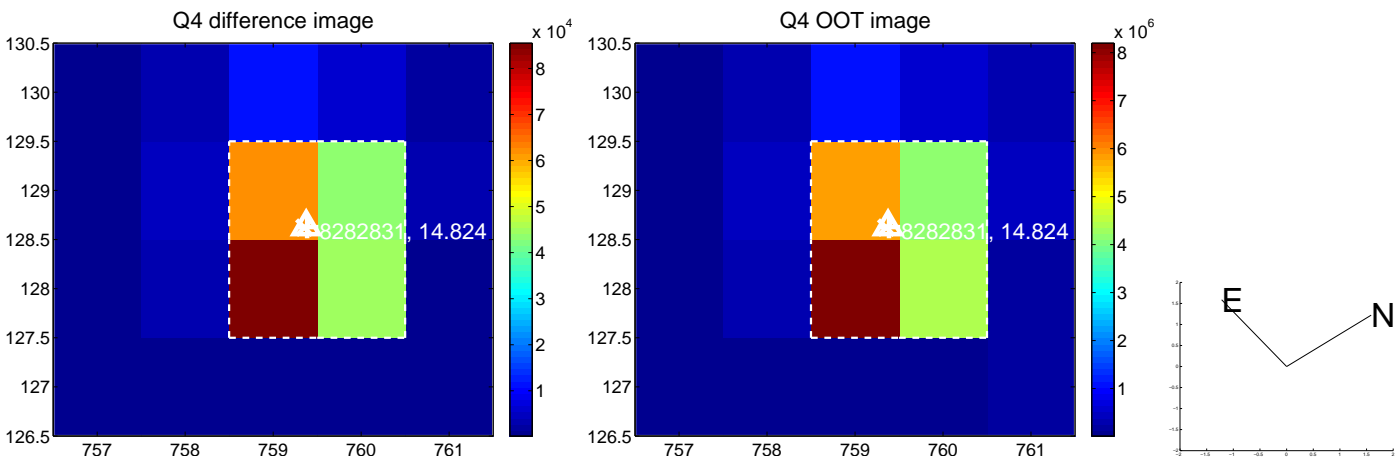
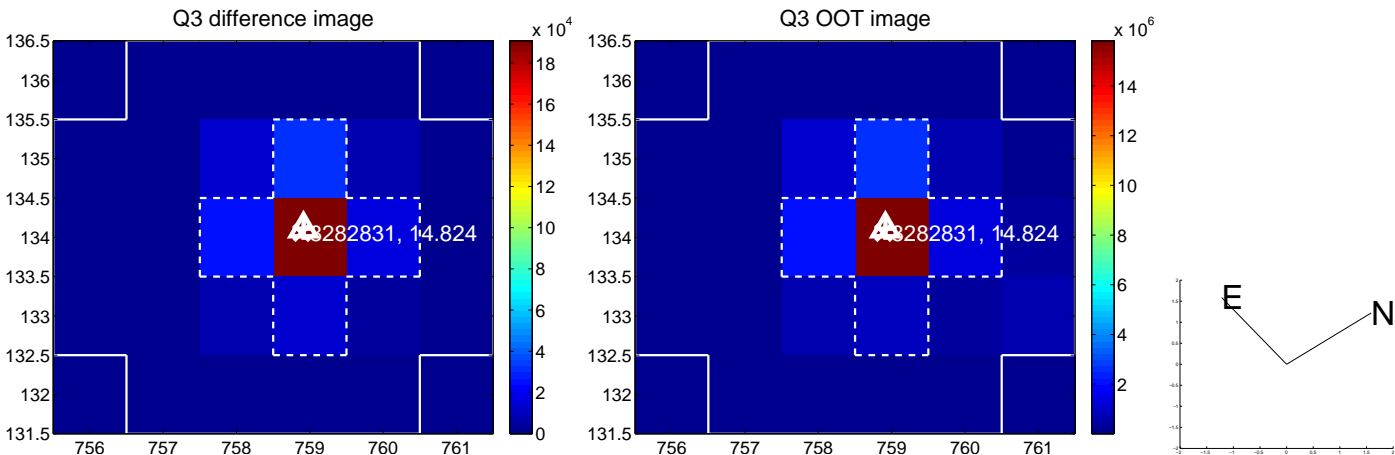
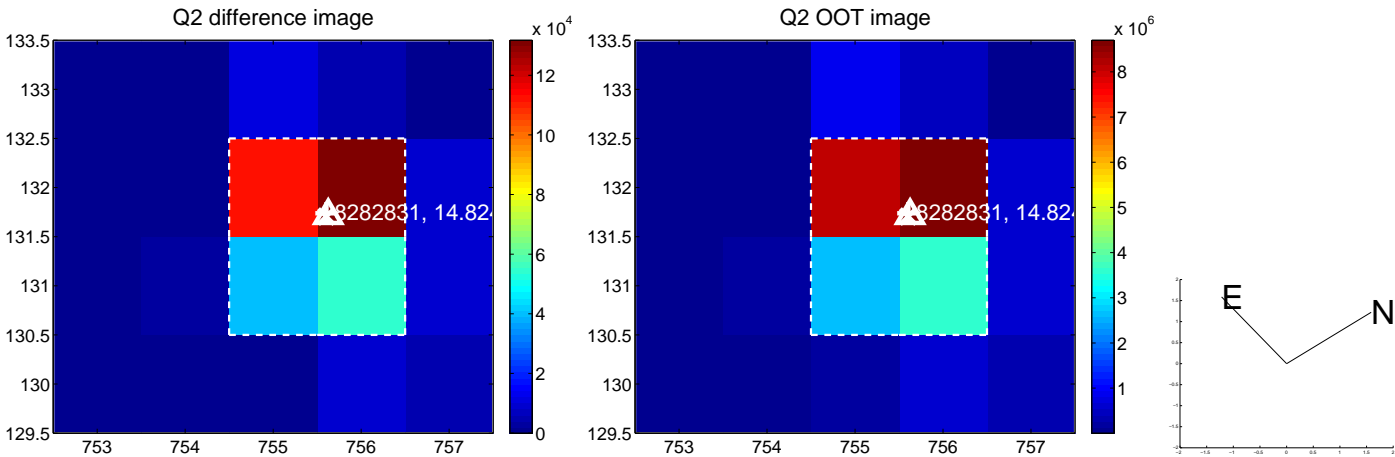
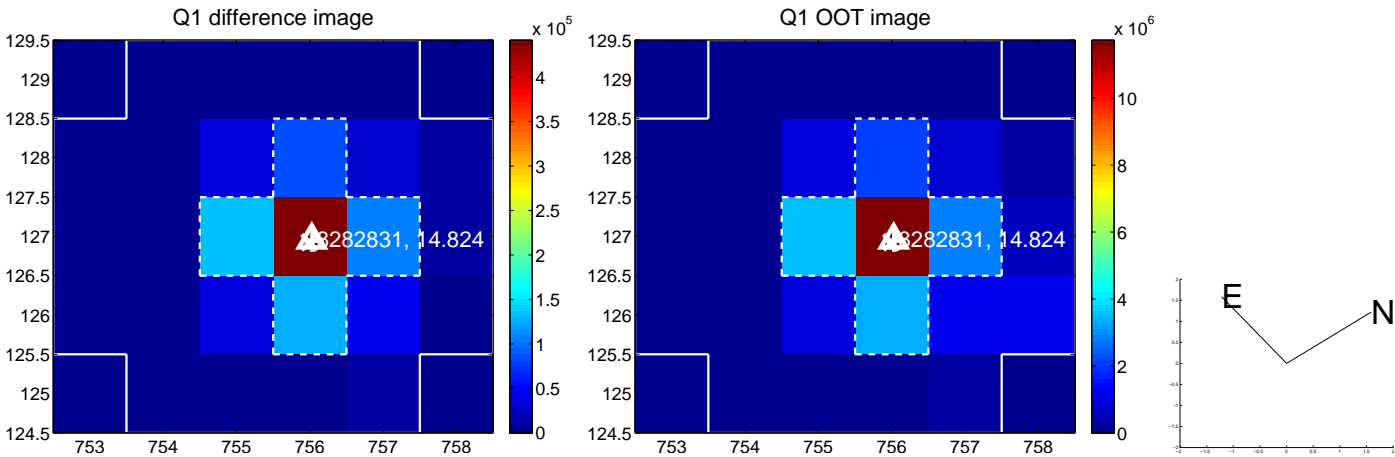
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.042 \pm 0.070$	0.60	$0.042 \pm 0.070$	$-0.001 \pm 0.067$
PRF-fit source offset from KIC position	$0.136 \pm 0.069$	1.96	$0.015 \pm 0.071$	$0.136 \pm 0.069$
photometric centroid source offset	$1.31 \pm 2.62$	0.50	$-1.26 \pm 2.62$	$-0.35 \pm 2.65$

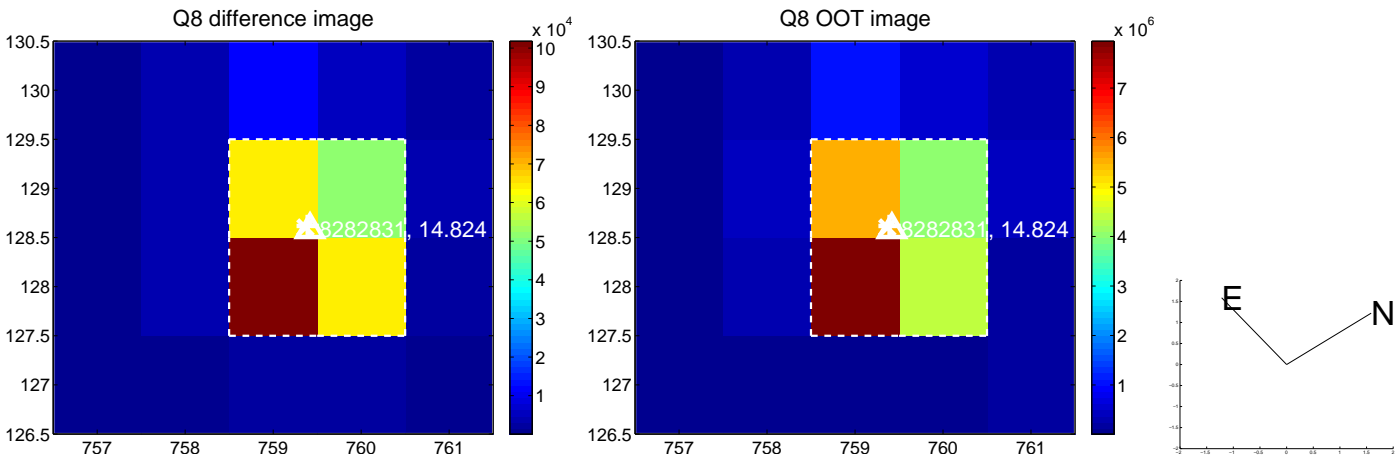
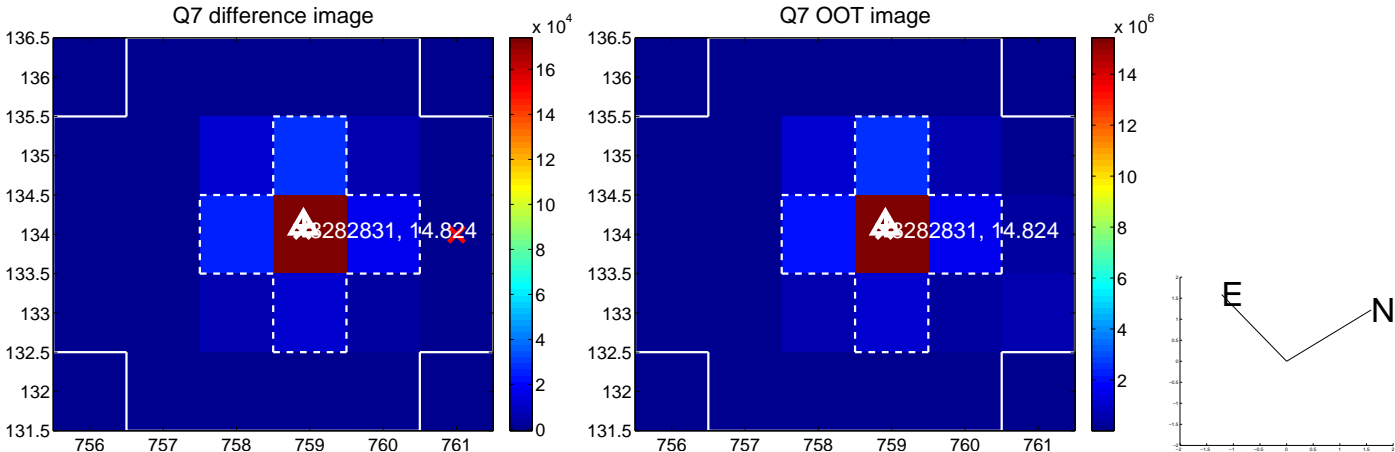
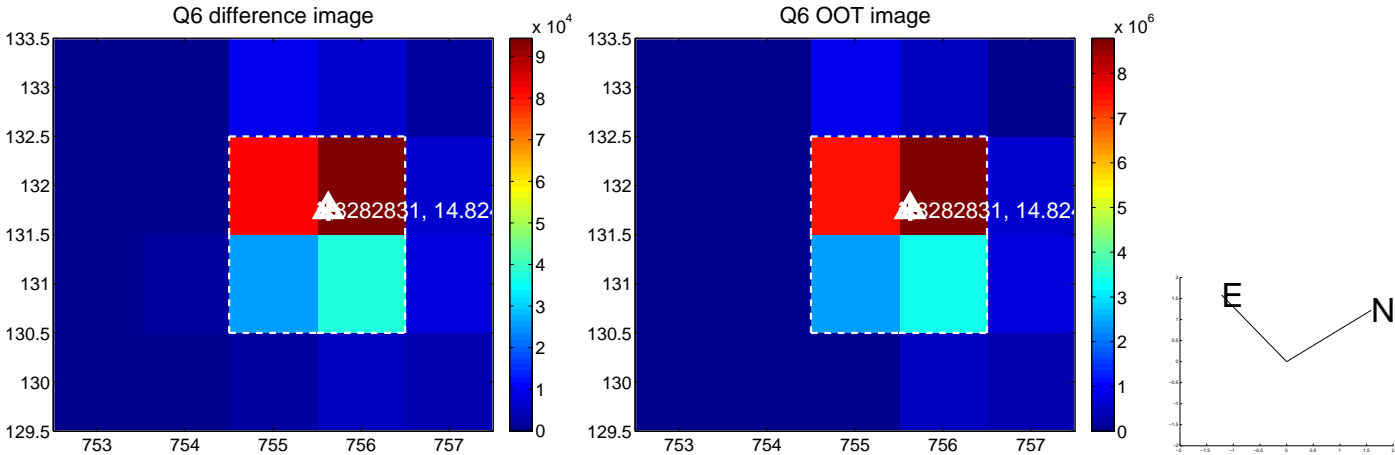
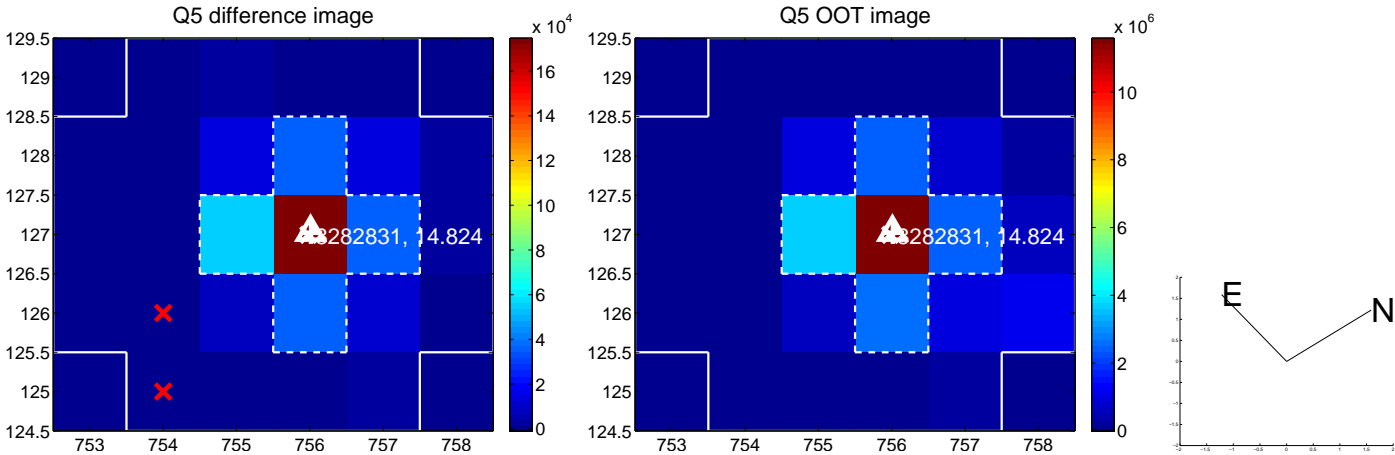


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

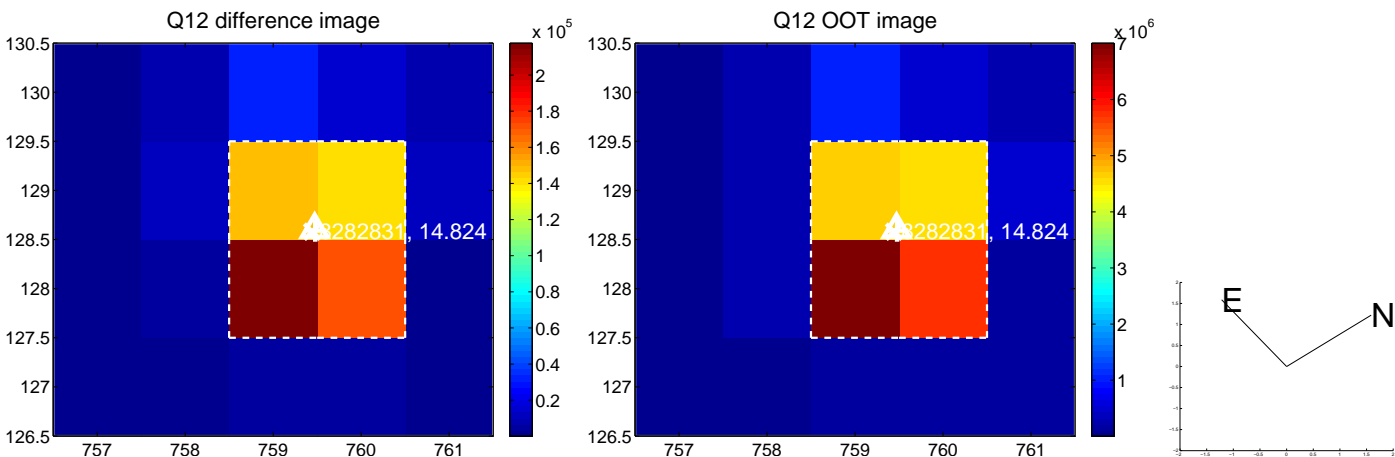
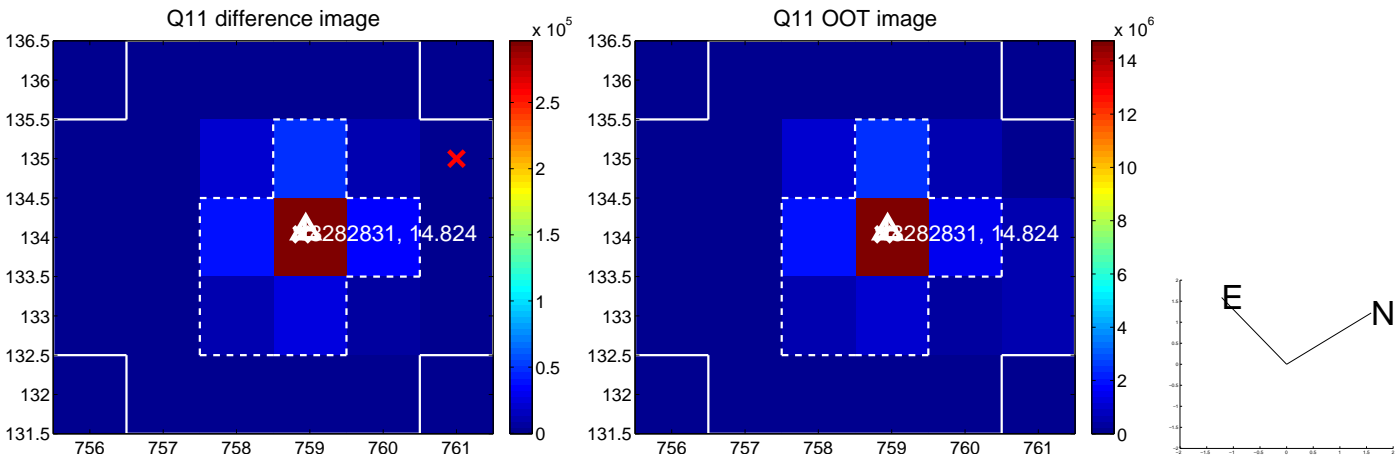
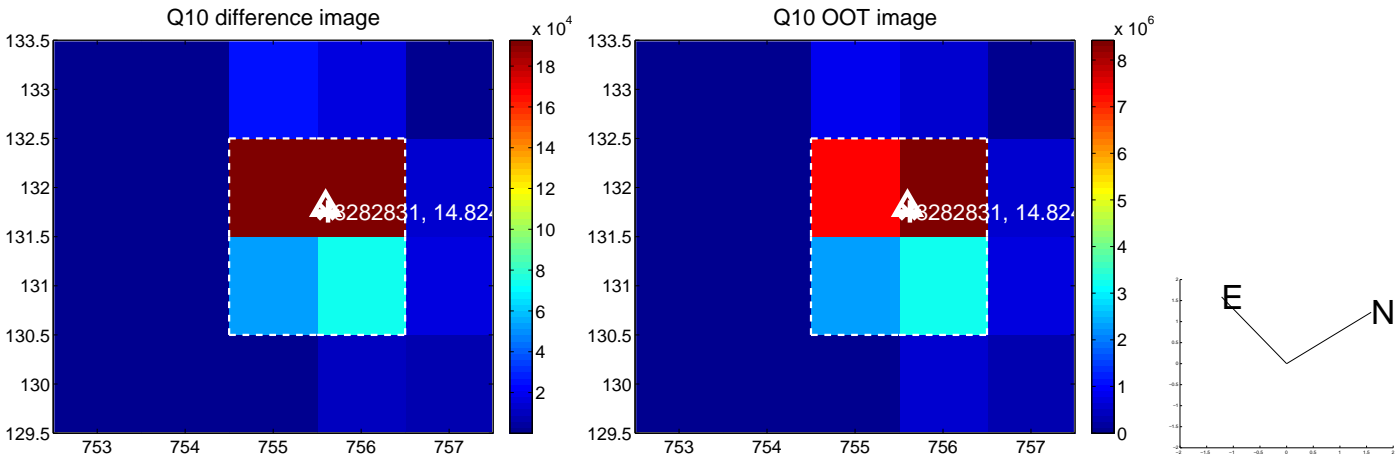
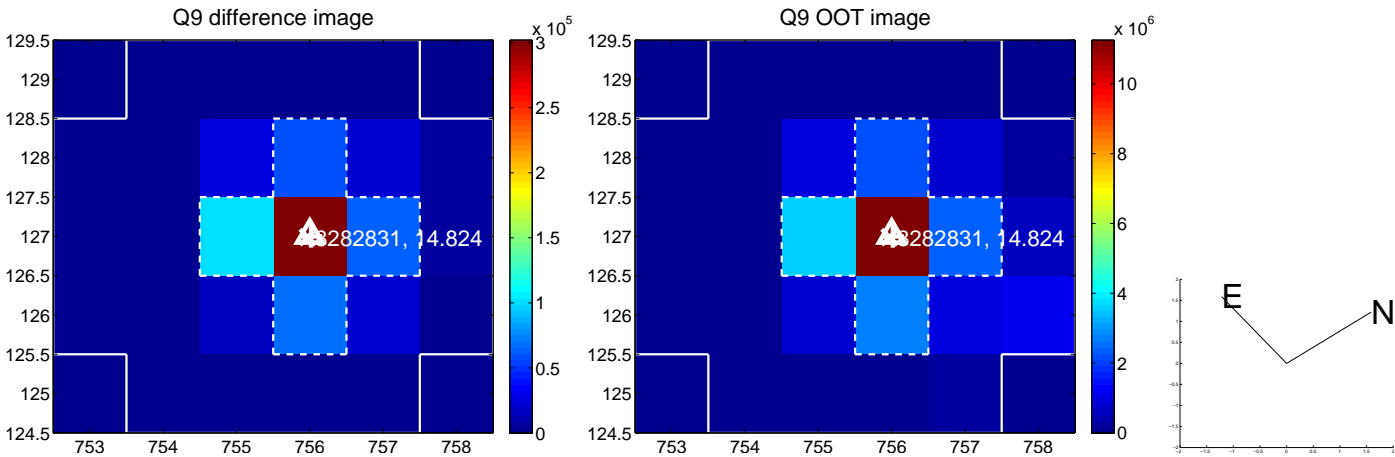


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

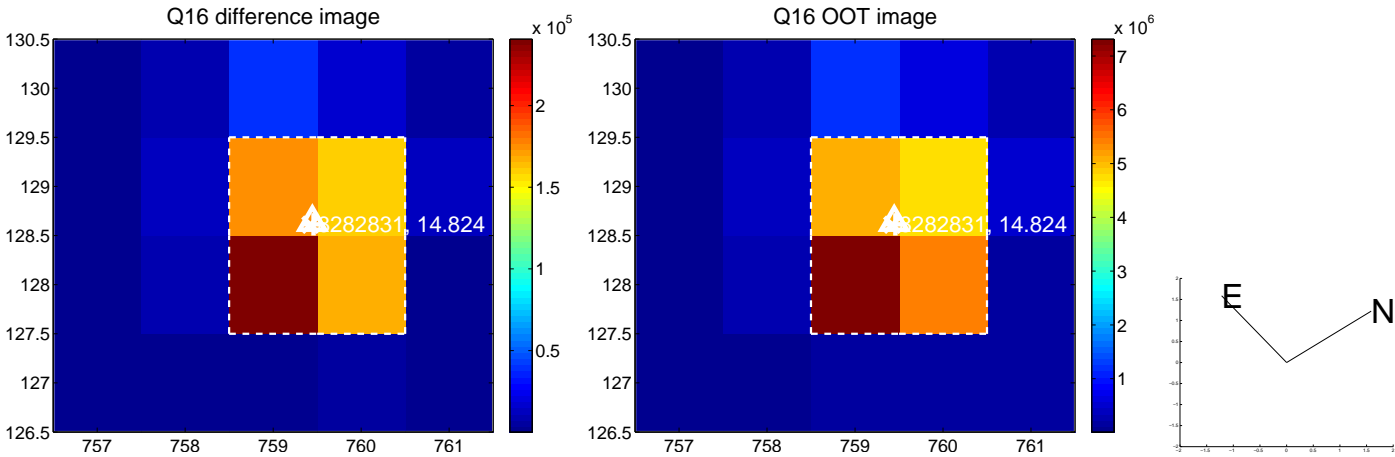
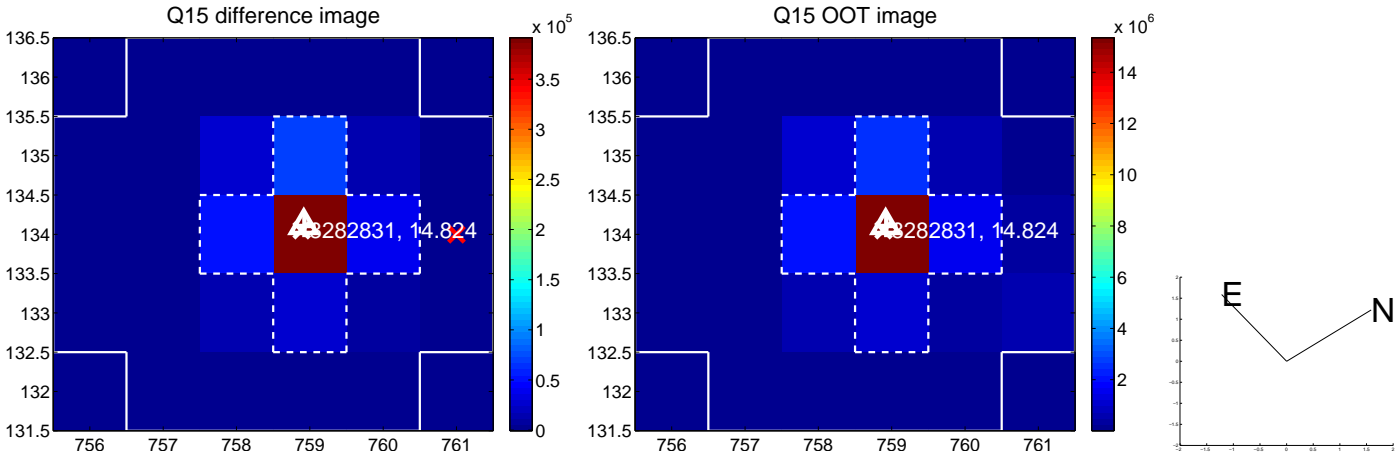
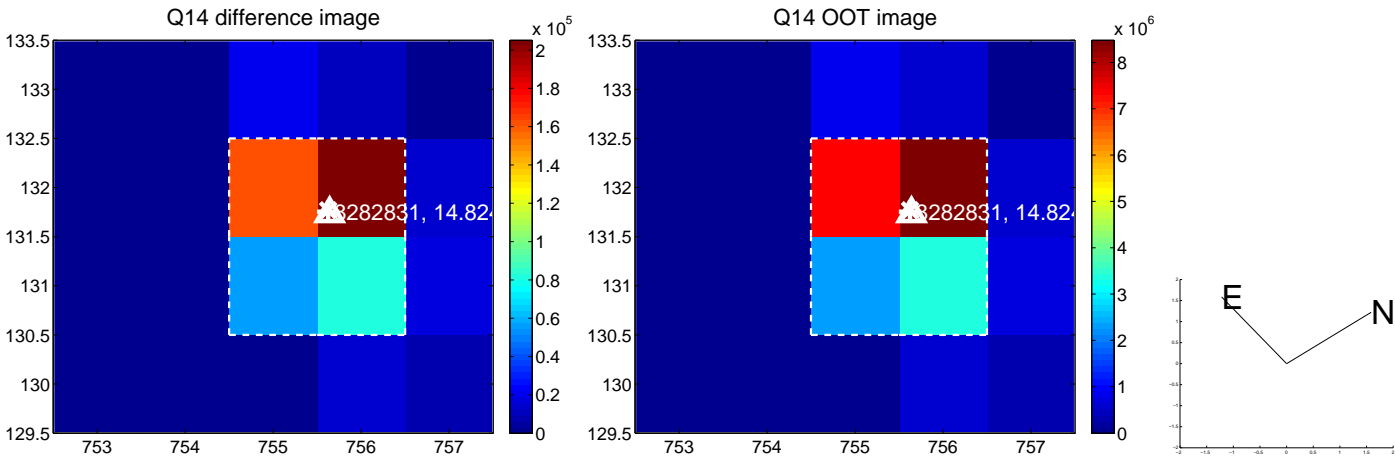
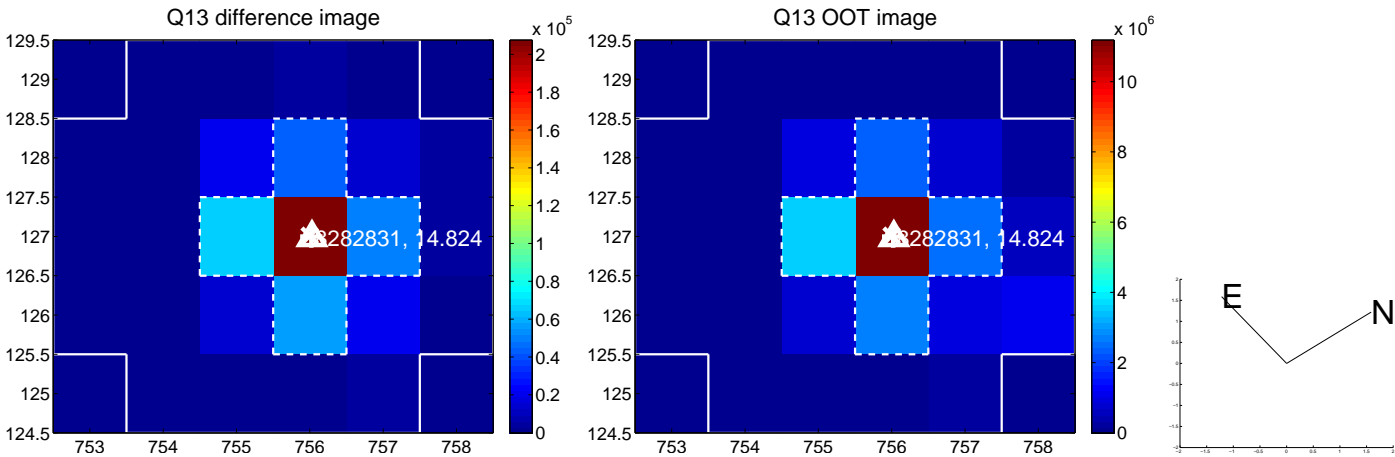




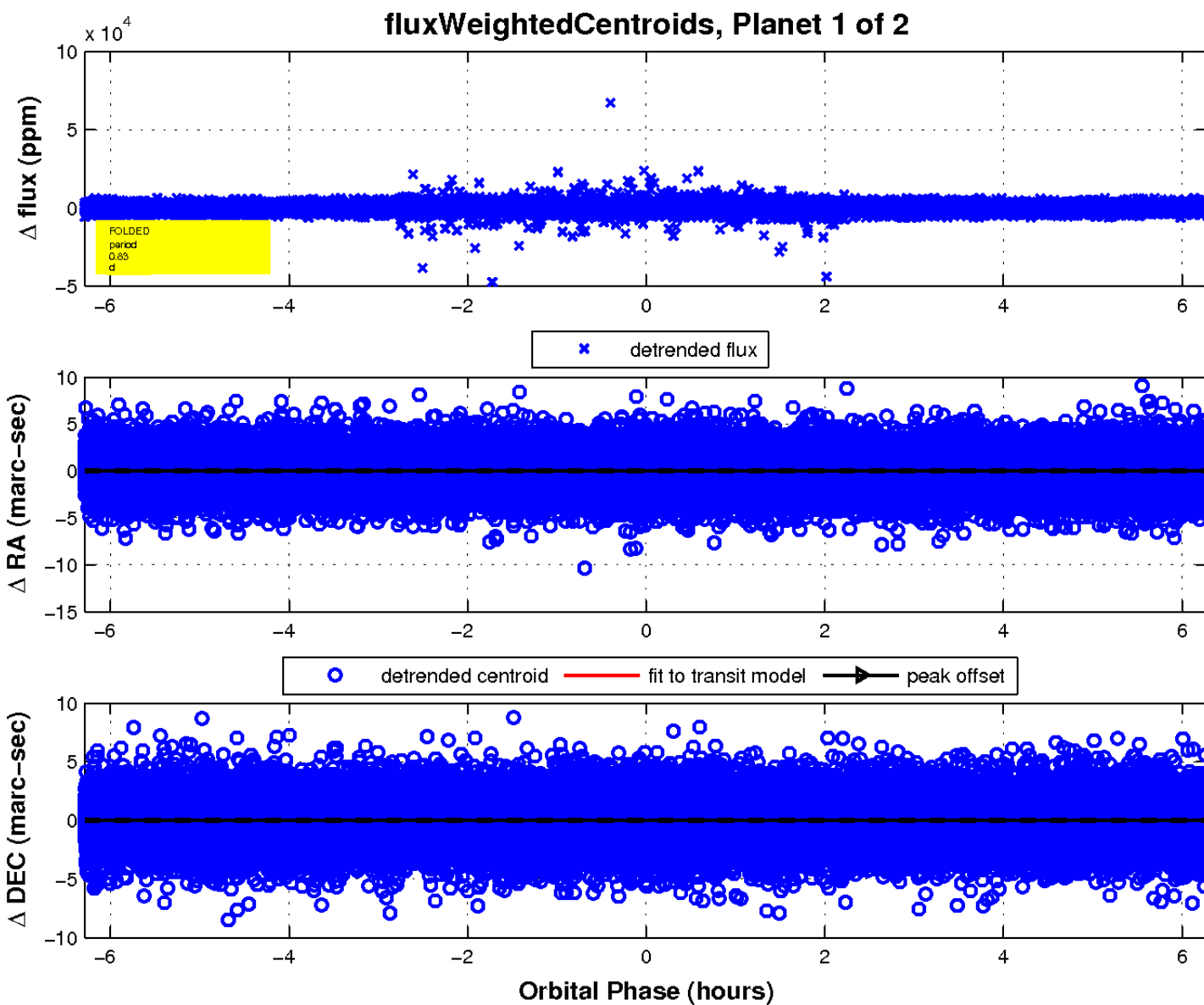
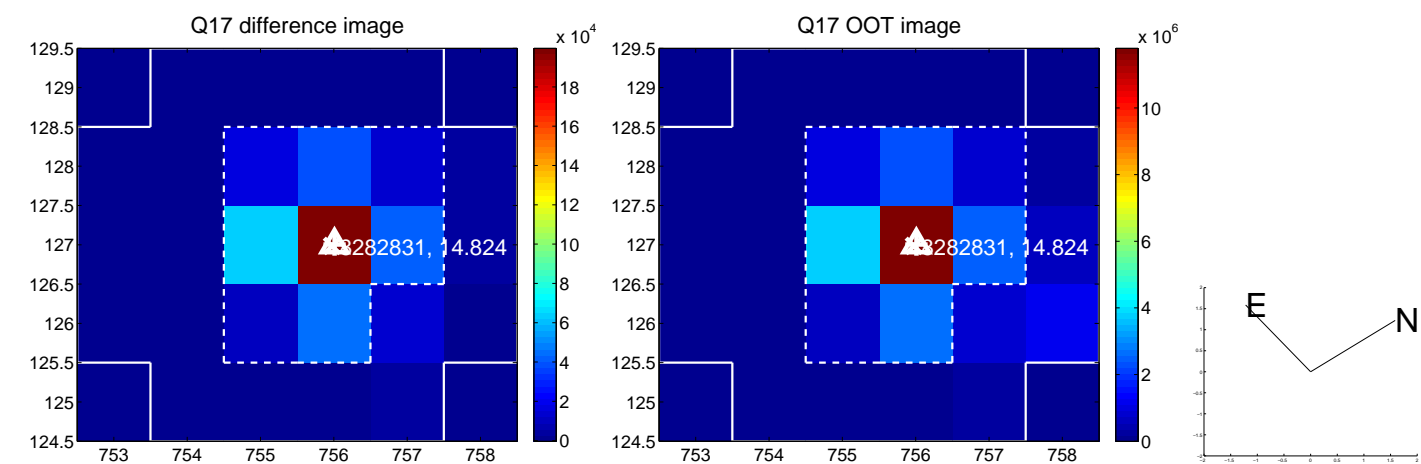
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

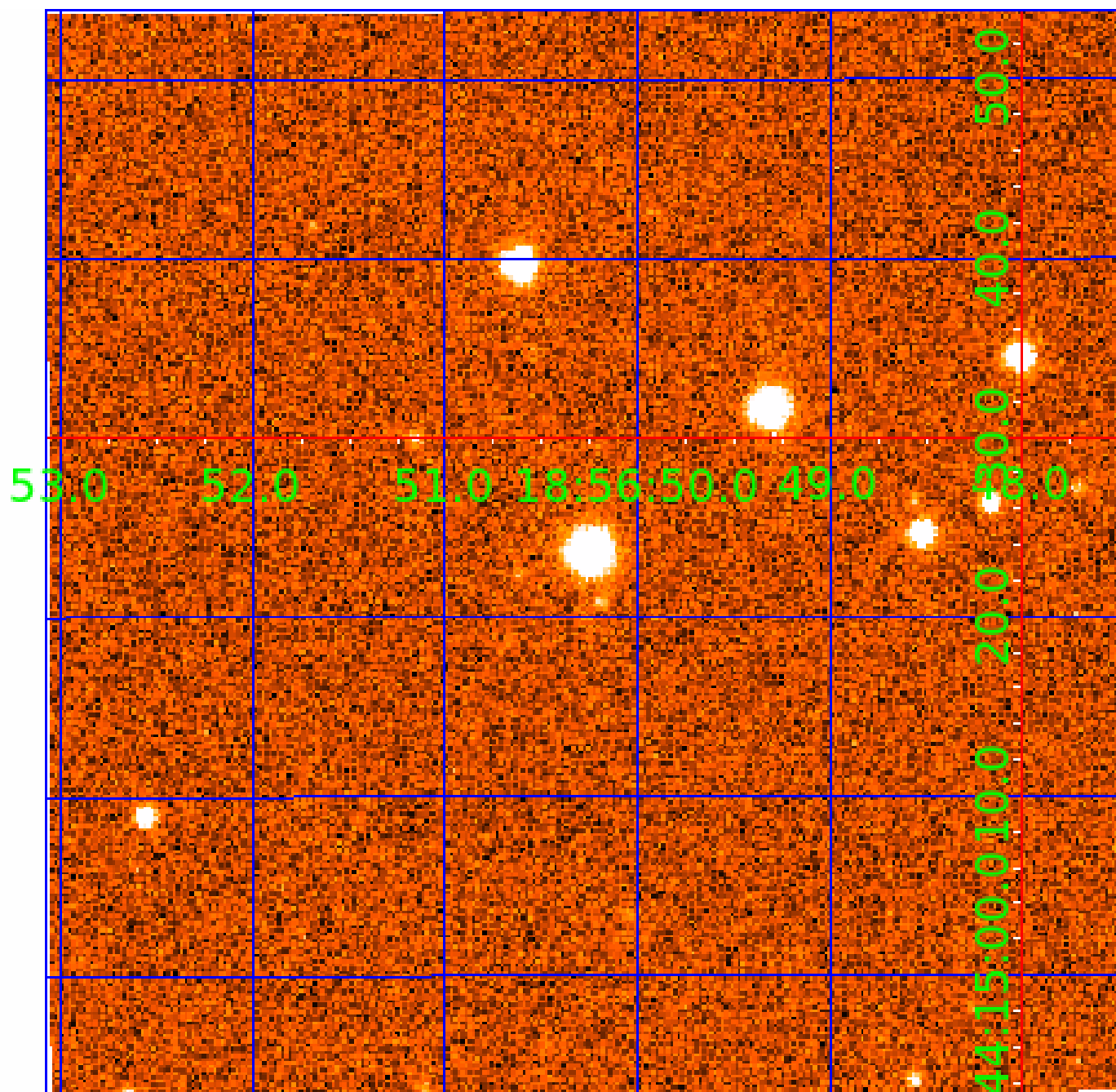


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 008282831

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008282831-01	OBS	No	0.831621	131.920934	26.0	2.096	11.4	1.6	0.96	5982	0.53	3424.21
008282831-02	OBS	No	0.831628	132.330496	139.9	1.589	10.1	8.5	0.96	5982	1.23	3424.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008282831-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008282831-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

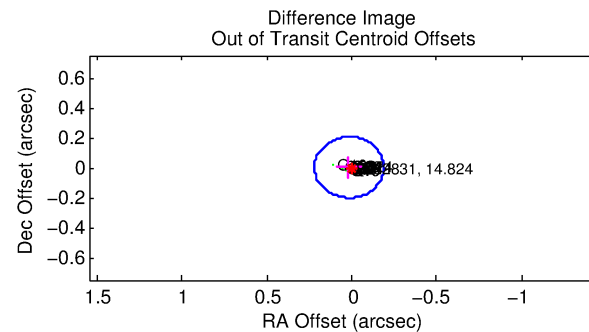
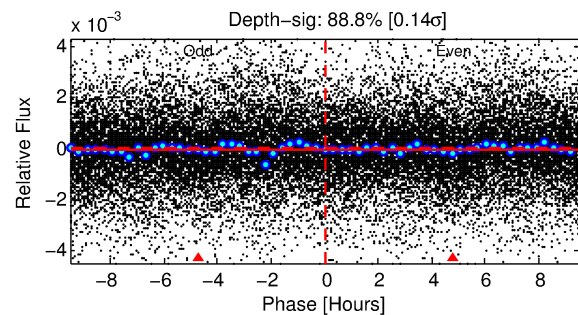
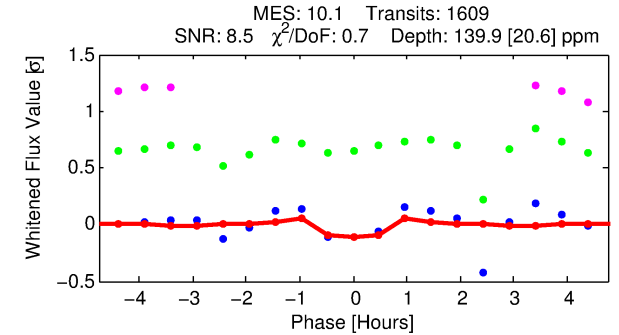
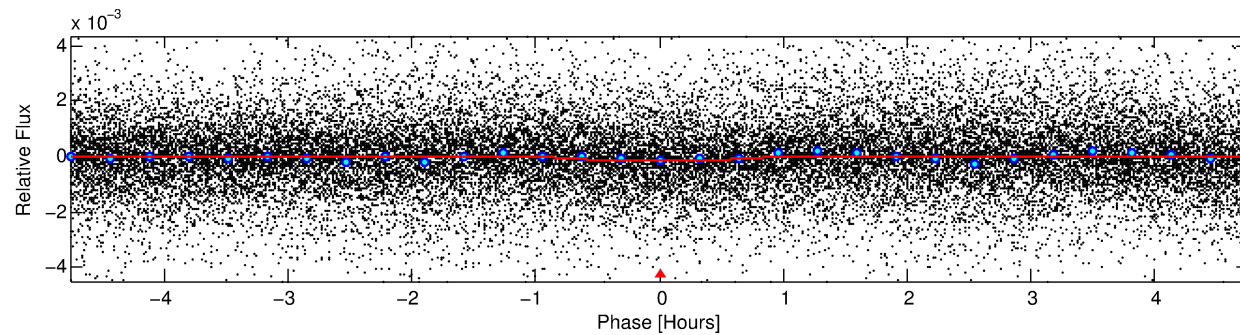
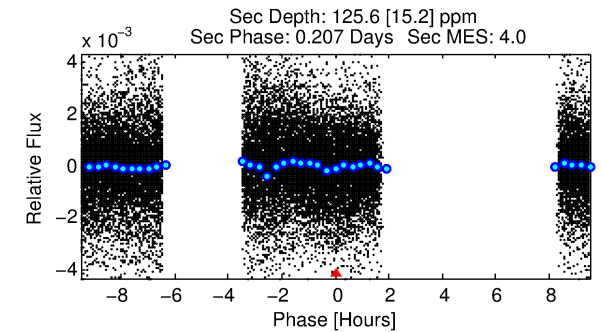
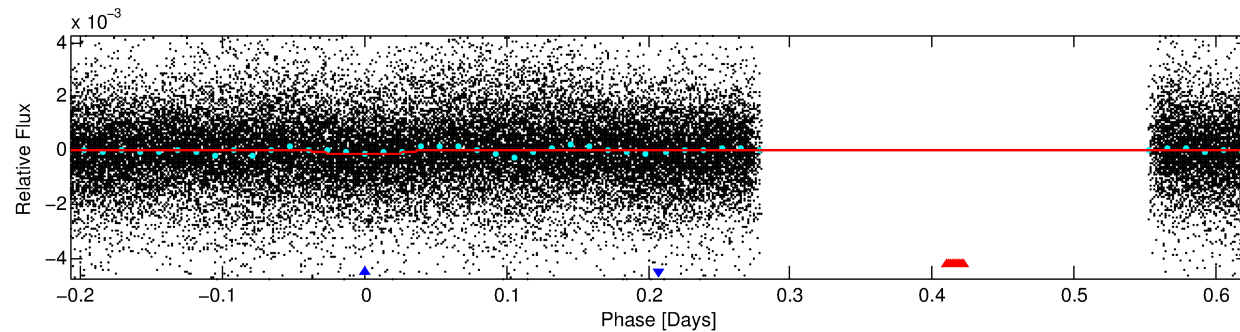
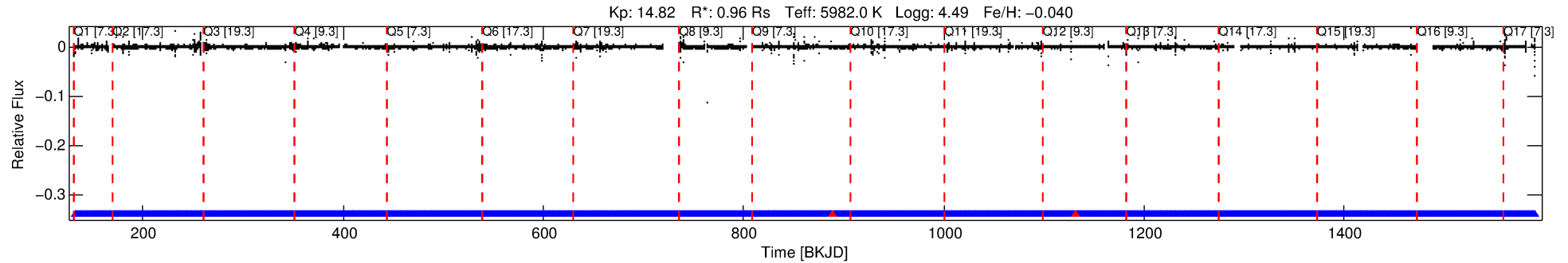
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008282831-02

No Significant Match Found

# DV One-Page Summary

KIC: 8282831 Candidate: 2 of 2 Period: 0.832 d



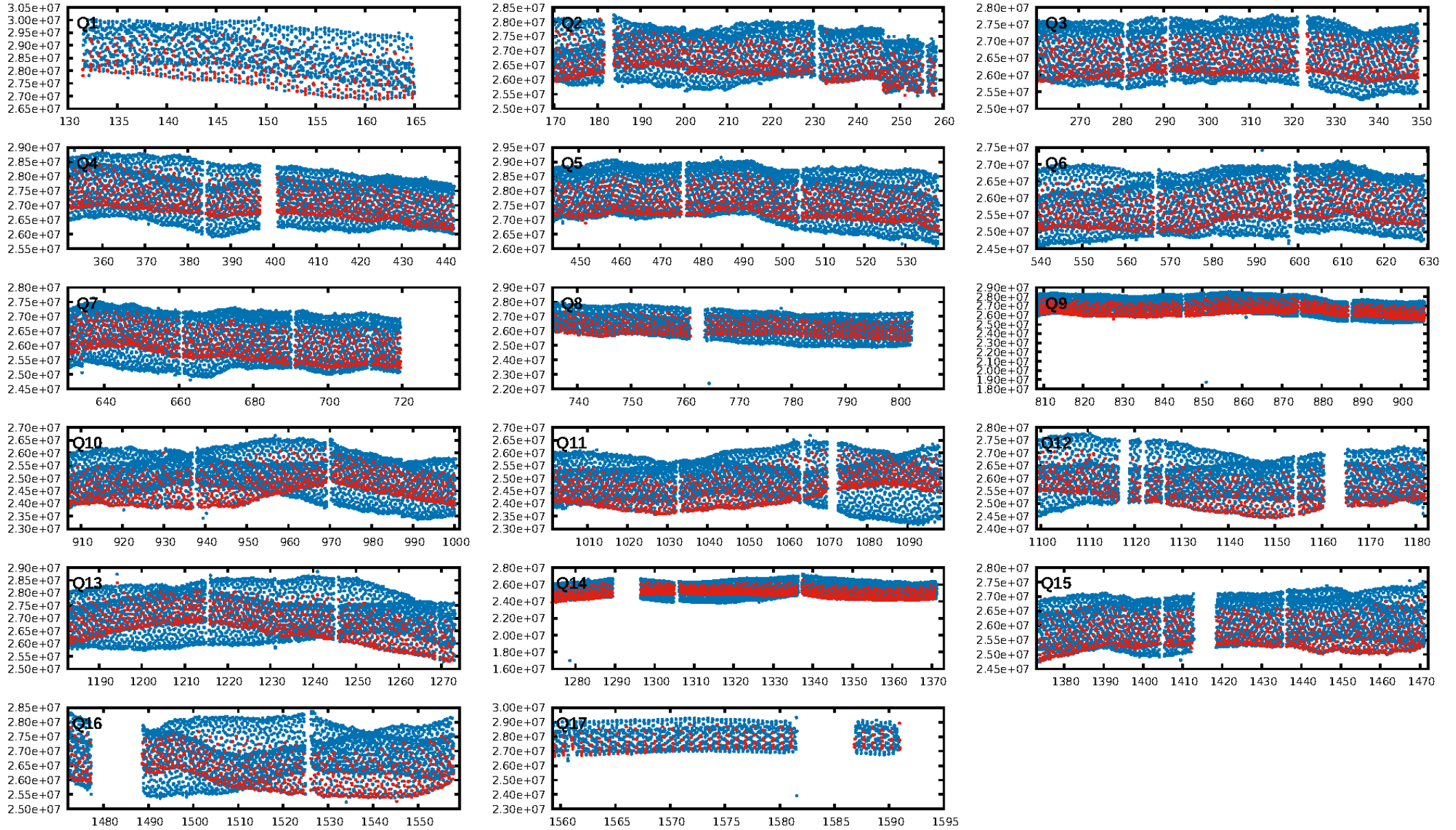
## DV Fit Results:

Period = 0.83163 [0.00001] d  
Epoch = 132.3305 [0.0014] BKJD  
Rp/R\* = 0.0117 [0.0032]  
a/R\* = 2.90 [3.20]  
b = 0.73 [0.80]  
Seff = 3424.17 [1381.94]  
Teff = 1951 [197] K  
Rp = 1.23 [0.51] Re  
a = 0.0176 [0.0046] AU  
Ag = 14.10 [9.50] [1.38 $\sigma$ ]  
Teffp = 5844 [835] K [4.54 $\sigma$ ]

## DV Diagnostic Results:

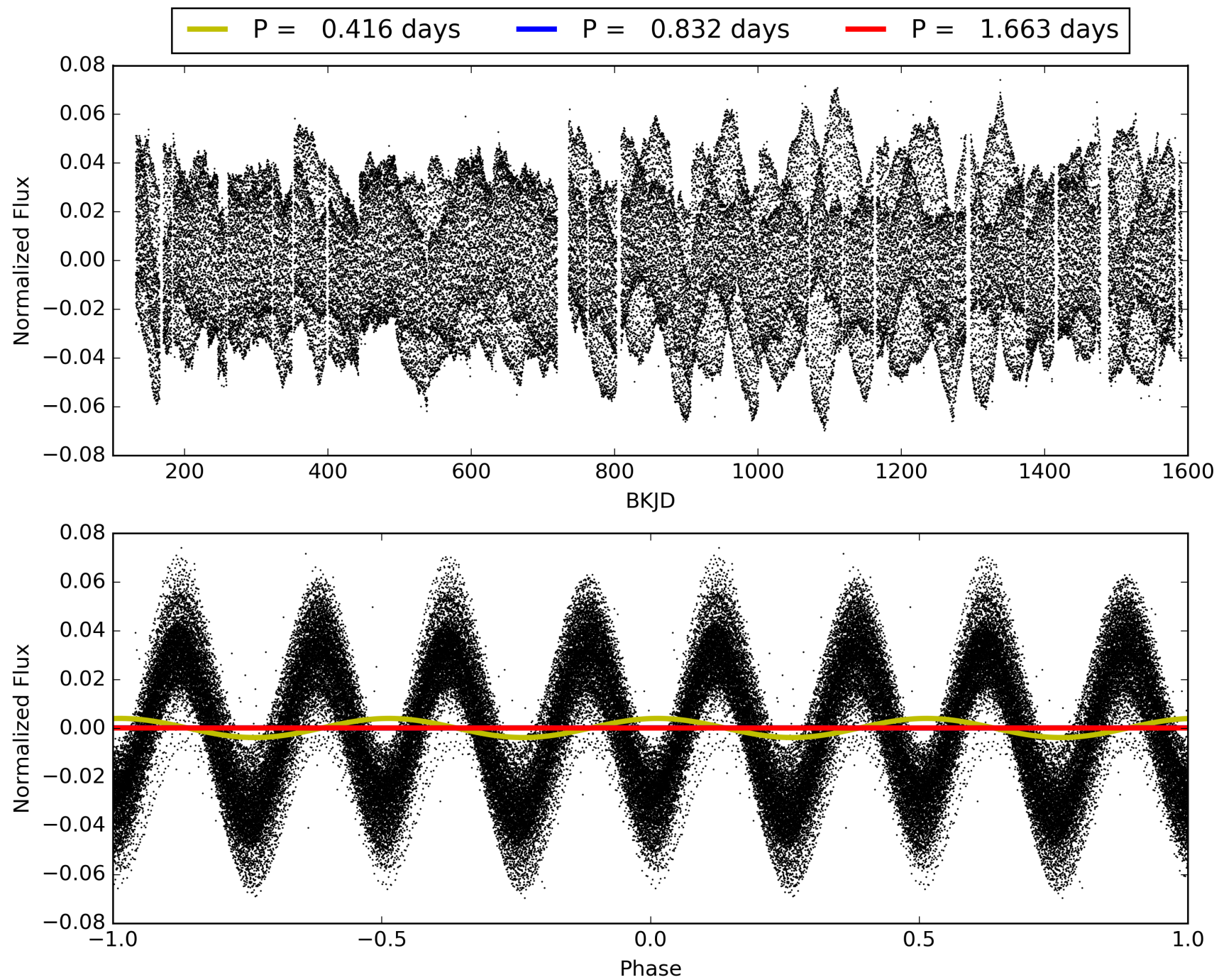
ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.87e-18  
RollingBand-fgt: 1.00 [1533/1535]  
GhostDiagnostic-chr: 1.031  
Centroid-sig: 0.2%  
Centroid-so: 0.848 arcsec [1.49 $\sigma$ ]  
OotOffset-rm: 0.018 arcsec [0.26 $\sigma$ ]  
KicOffset-rm: 0.136 arcsec [1.97 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008282831-02, PDC Light Curves



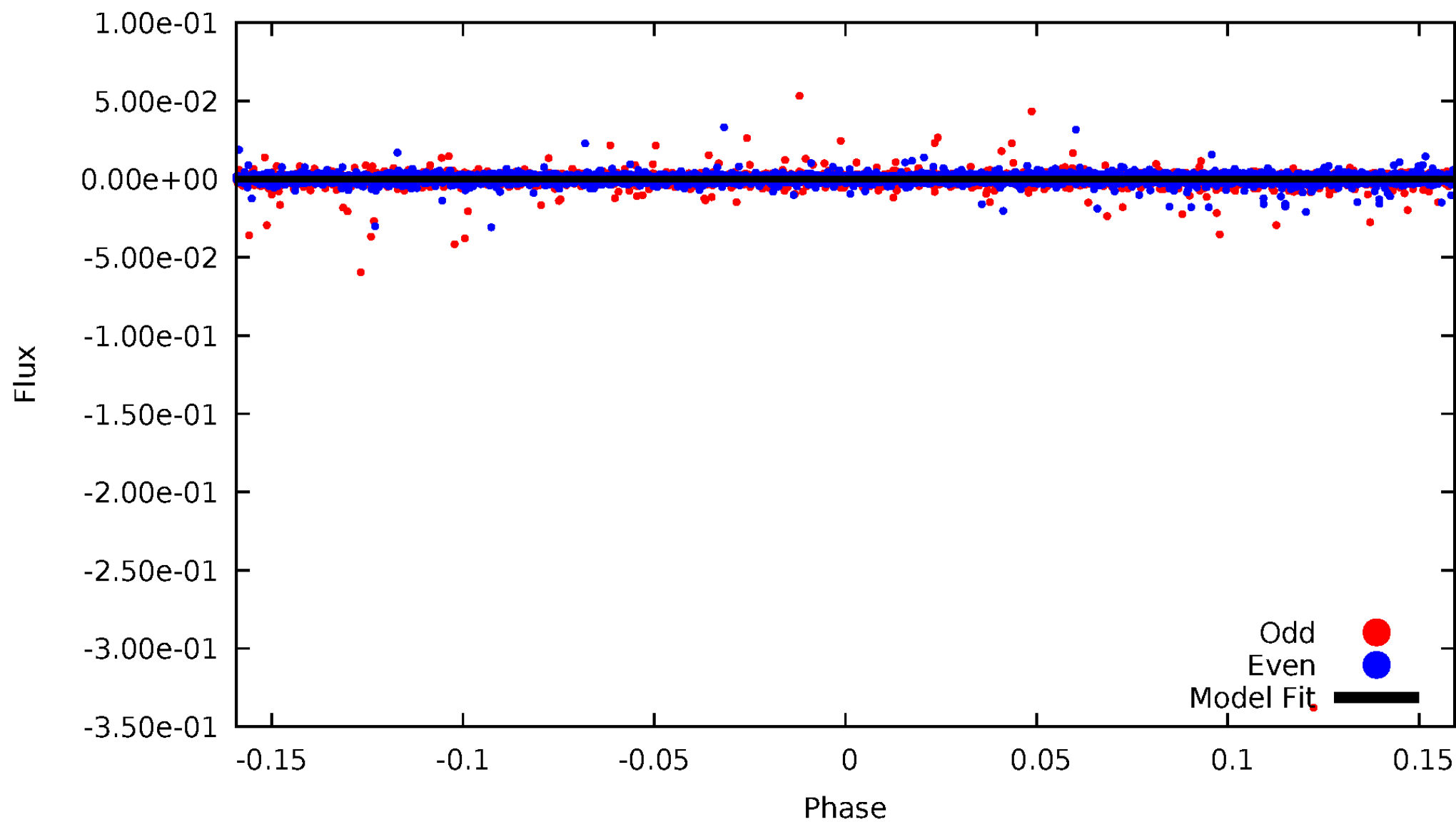


TCE 008282831-02



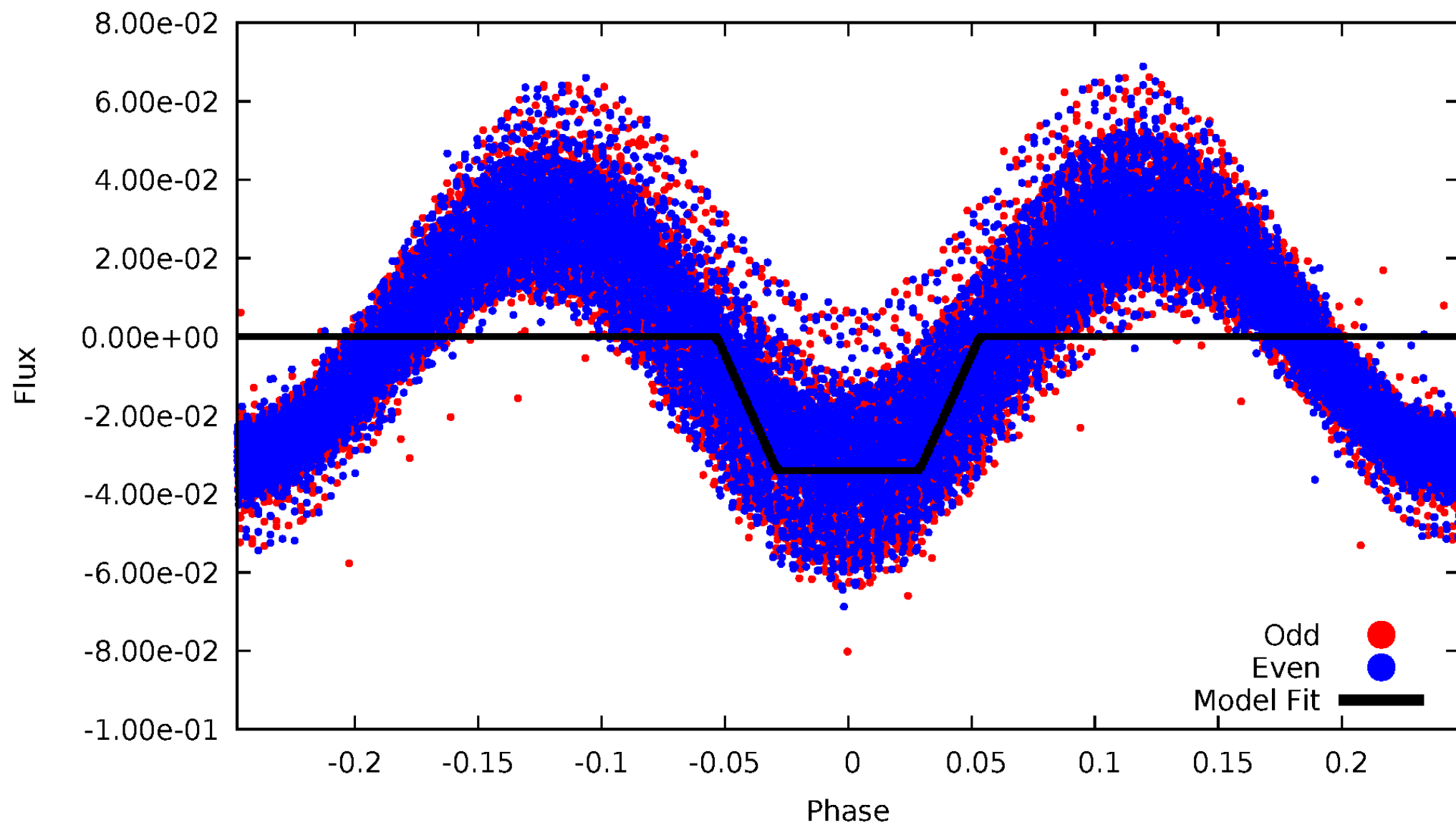
DV Odd/Even

TCE 008282831-02



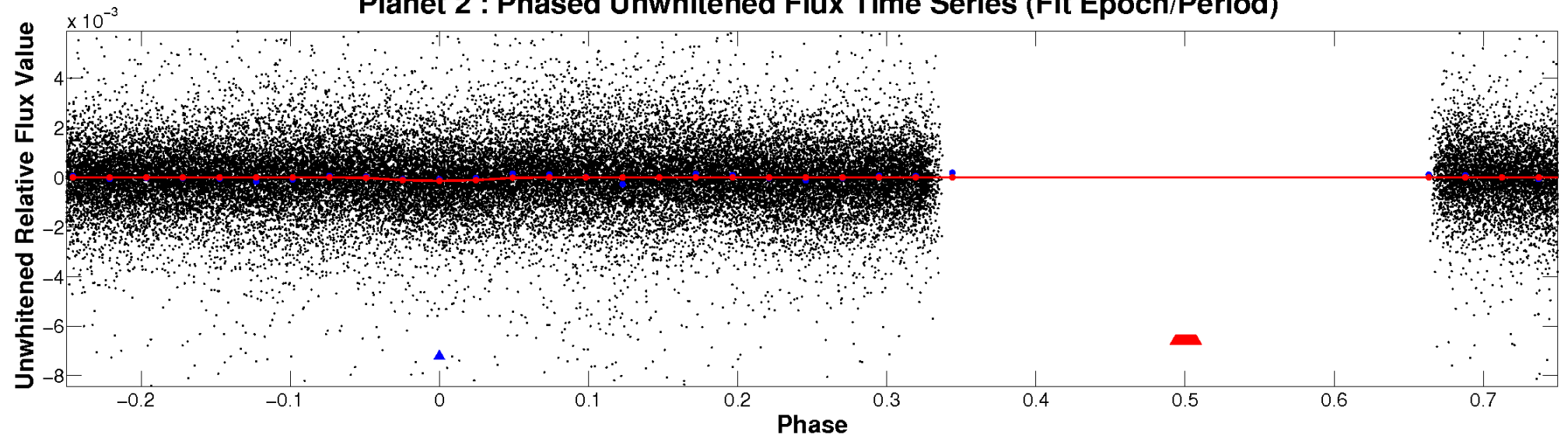
# ALT Odd/Even

TCE 008282831-02

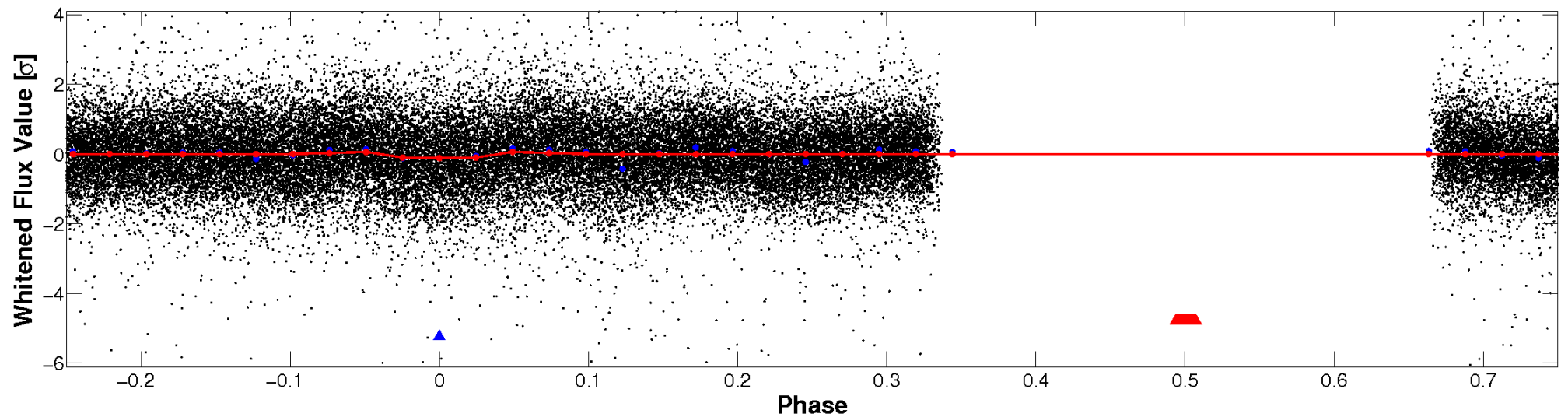


# Non-Whitened Vs. Whitened Light Curve

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



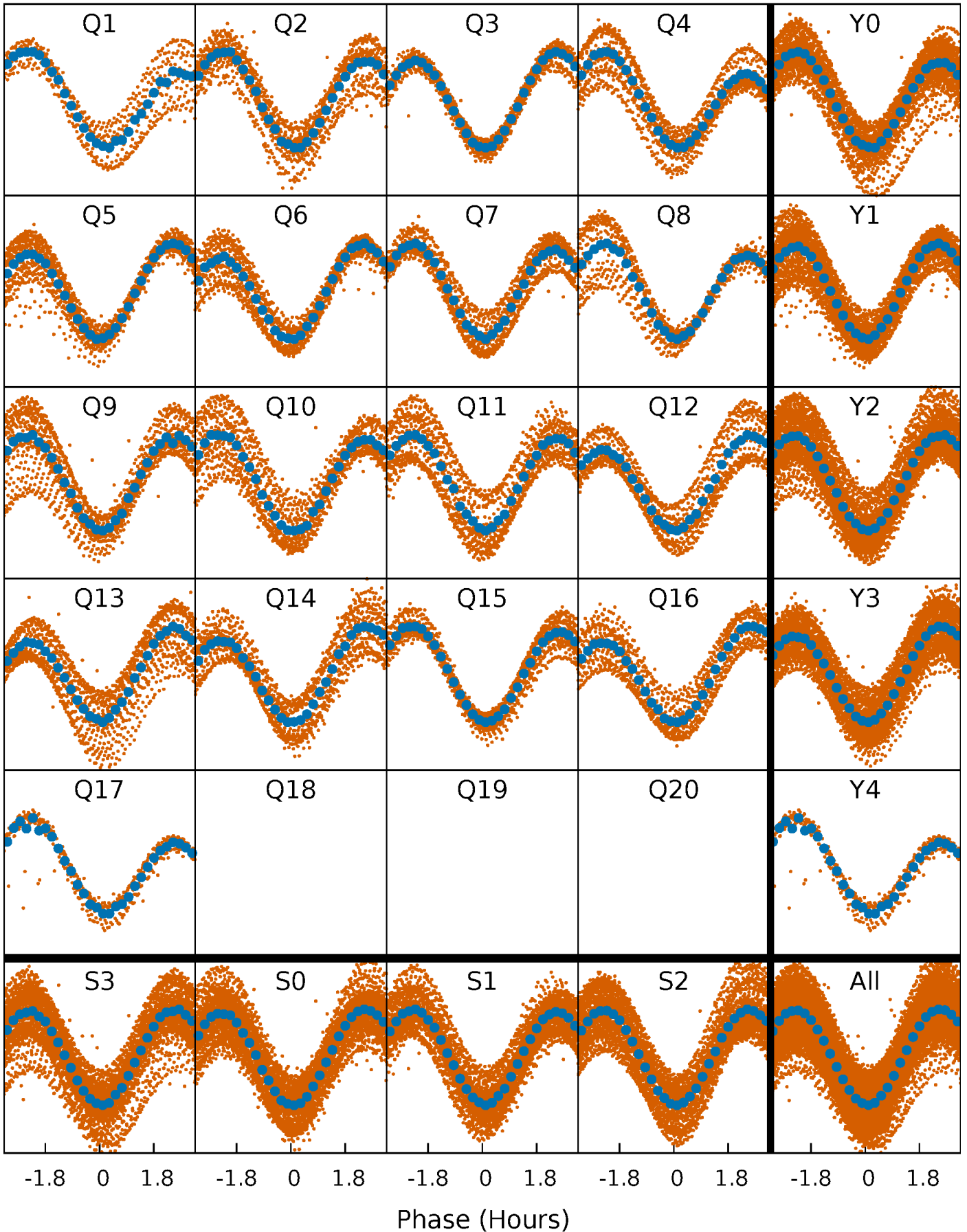
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





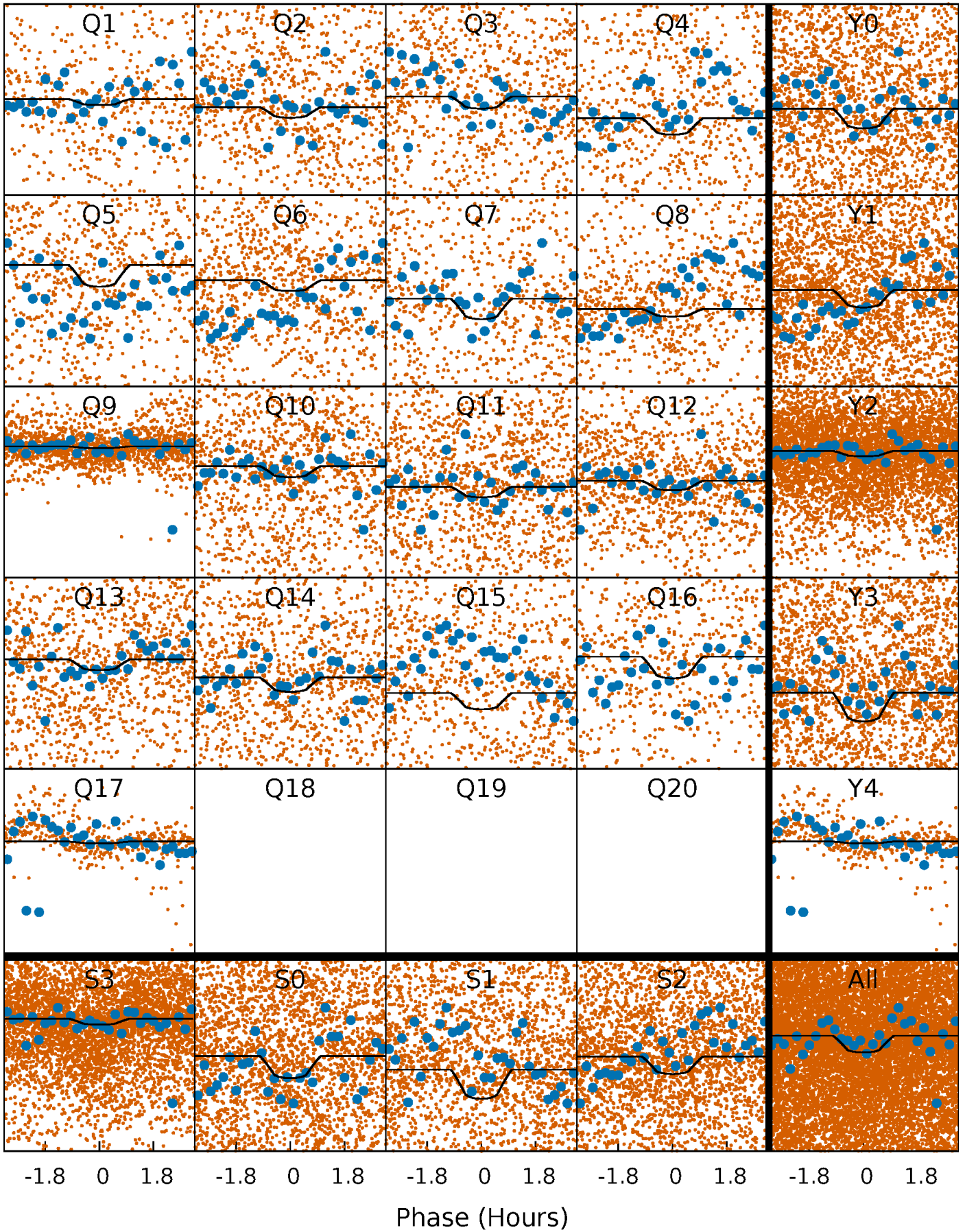
# PDC Quarter-Phased Transit Curves

TCE 008282831-02   P= 0.831628 Days    $T_0=132.330496$  (BKJD)



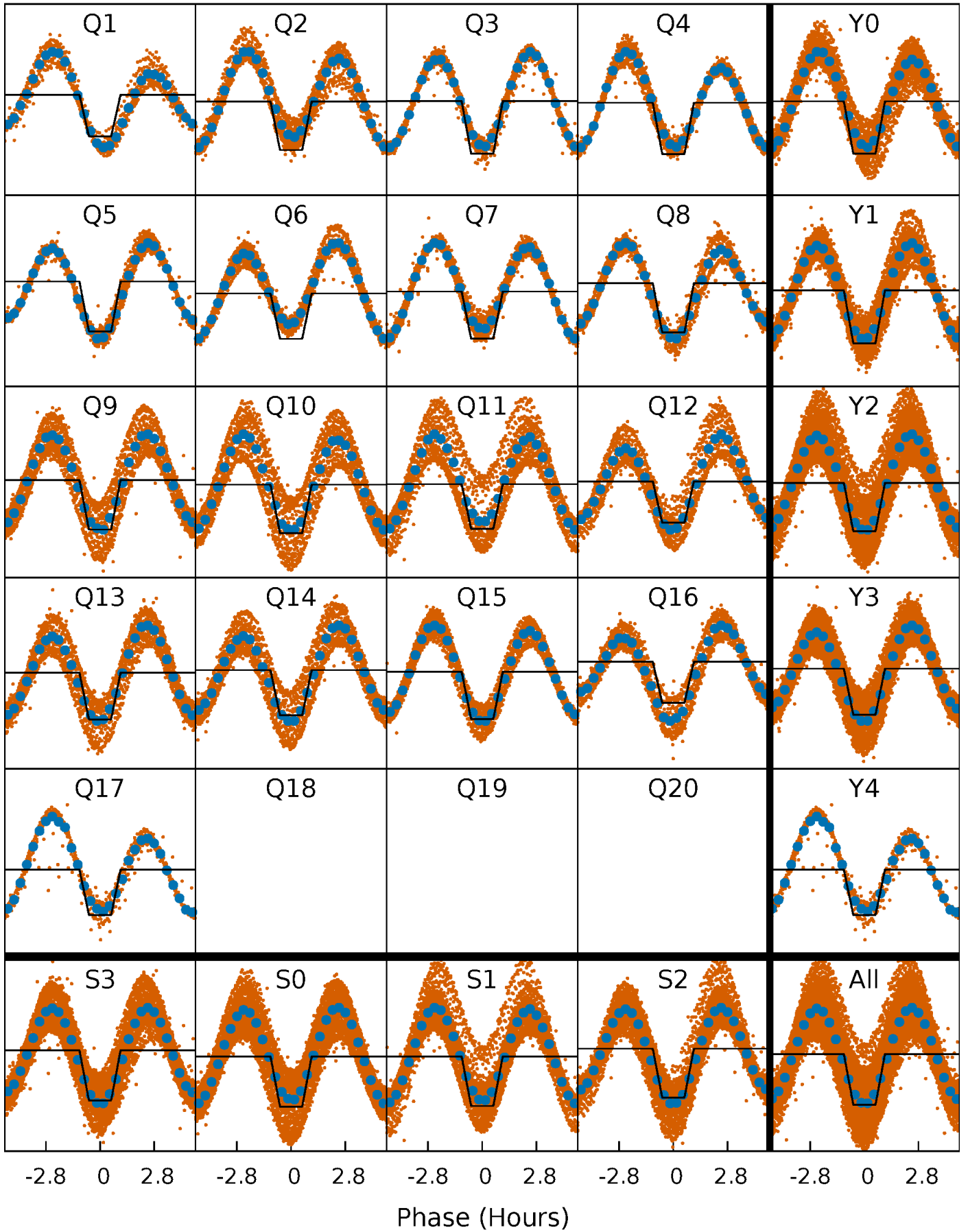
# DV Quarter-Phased Transit Curves

TCE 008282831-02   P= 0.831628 Days    $T_0=132.330496$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

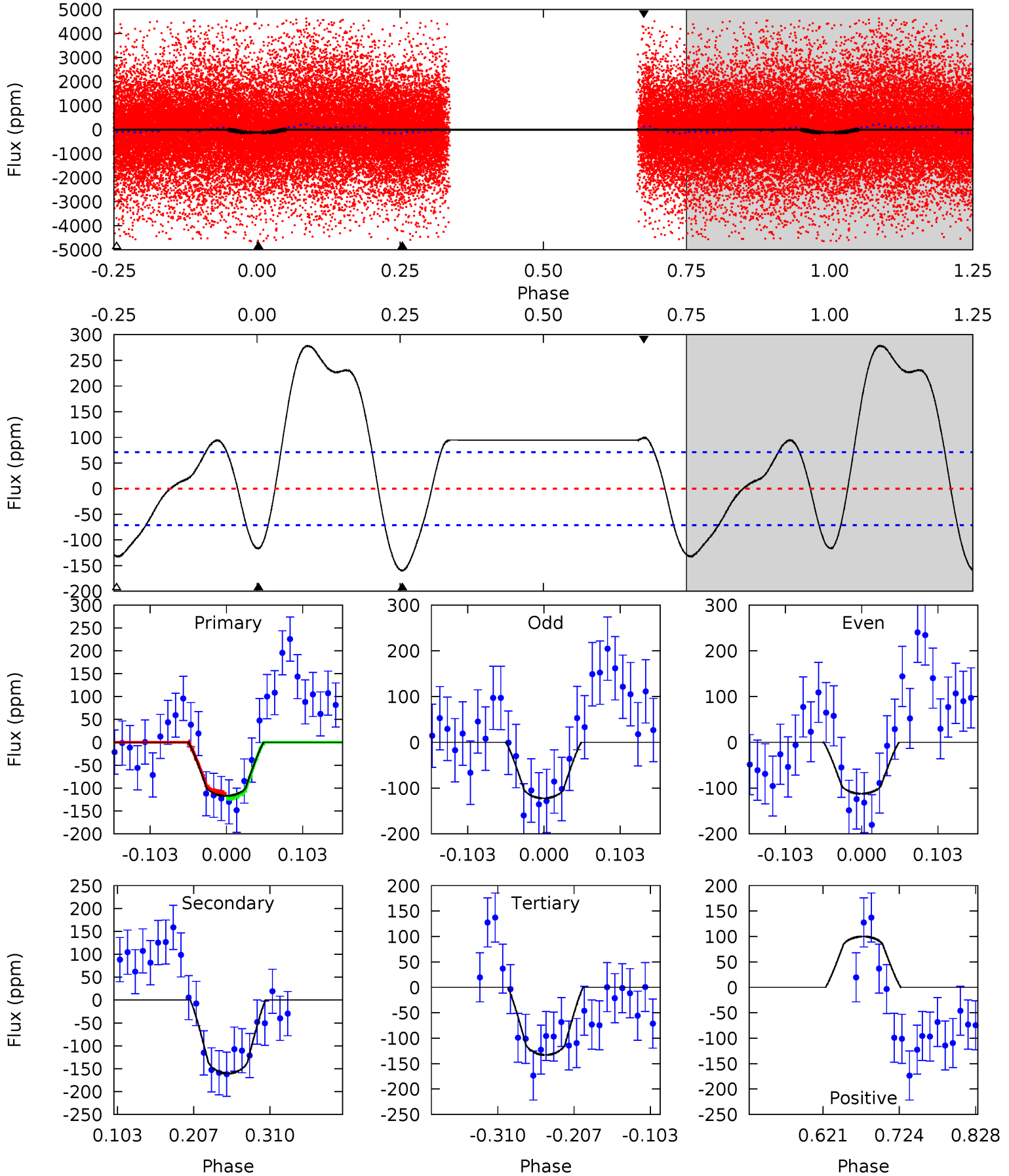
TCE 008282831-02   P= 0.831631 Days    $T_0=132.331091$  (BKJD)



# DV Model-Shift Uniqueness Test

008282831-02, P = 0.831628 Days, E = 131.498868 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
7.52	10.3	8.53	6.41	4.56	1.63	7.47	-1.02	1.10	1.75	3.87	0.32	0.66	0.63	0.30

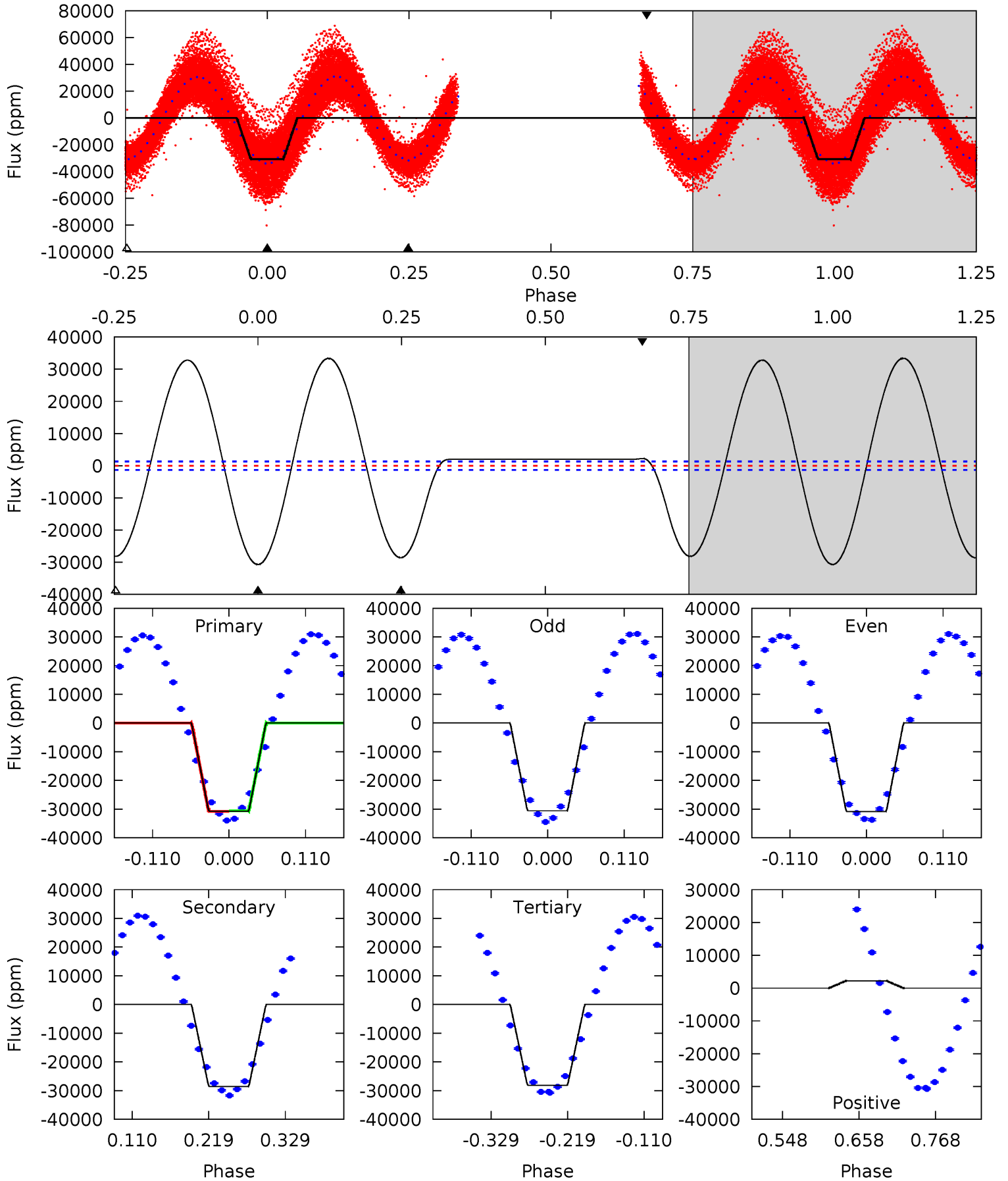




# Alt Model-Shift Uniqueness Test

008282831-02, P = 0.831631 Days, E = 131.499460 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
106.4	99.0	97.5	7.74	4.55	1.60	77.1	8.88	98.6	1.46	91.2	0.43	1.04	0.52	0.50



### Stellar Parameters For KIC 008282831

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5982^{+180}_{-198}$	$4.493^{+0.052}_{-0.208}$	$-0.040^{+0.250}_{-0.300}$	$0.960^{+0.300}_{-0.100}$	$1.047^{+0.126}_{-0.139}$	$1.667^{+0.442}_{-0.879}$
	+3%/-3%	+1%/-5%	+625%/-750%	+31%/-10%	+12%/-13%	+26%/-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 008282831-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-160 \pm 16$	$1.28^{+0.40}_{-0.34}$	$2786^{+198}_{-124}$	$6156^{+1167}_{-698}$	$16^{+14}_{-7}$
Alt.	$-28581 \pm 289$	$19.85^{+3.52}_{-1.49}$	$2787^{+205}_{-143}$	$5738^{+180}_{-182}$	$12^{+2}_{-3}$

$T_{\text{max}}$  = 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

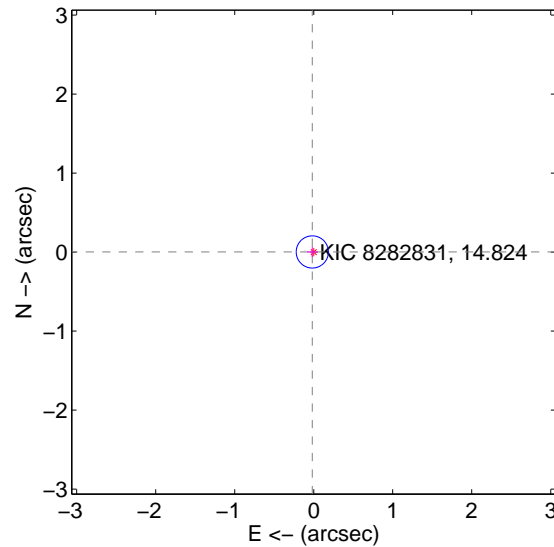
Supplemental centroid analysis for 008282831-02. Kepler magnitude: 14.82. Transit SNR 8.54

There are 17 quarters with good PRF difference image offsets

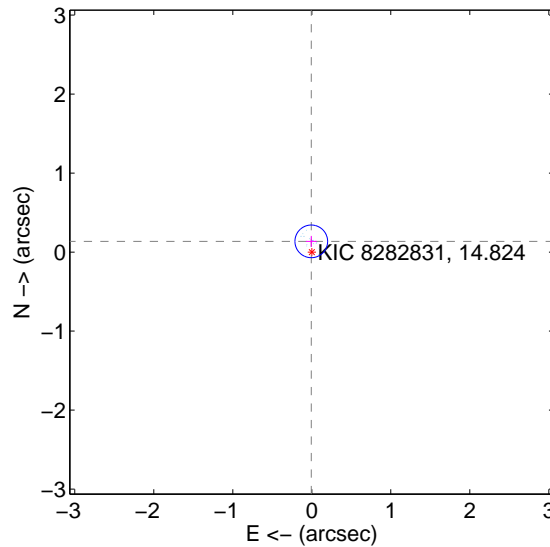
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.018 \pm 0.068$	0.26	$0.018 \pm 0.068$	$0.002 \pm 0.067$
PRF-fit source offset from KIC position	$0.136 \pm 0.069$	1.97	$0.006 \pm 0.069$	$0.136 \pm 0.069$
photometric centroid source offset	$0.85 \pm 0.57$	1.49	$0.53 \pm 0.56$	$-0.67 \pm 0.57$

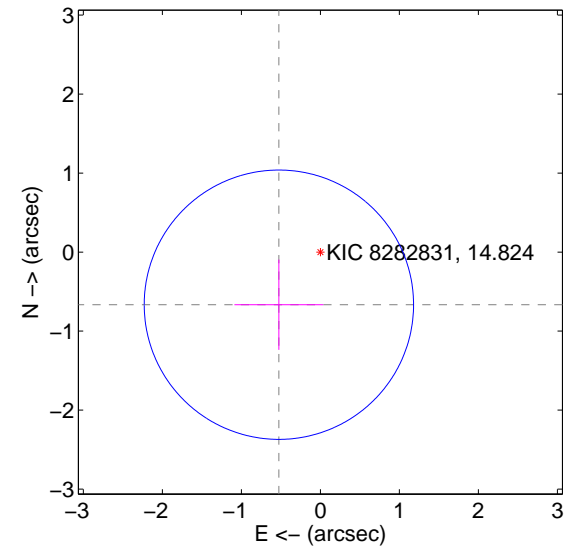
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



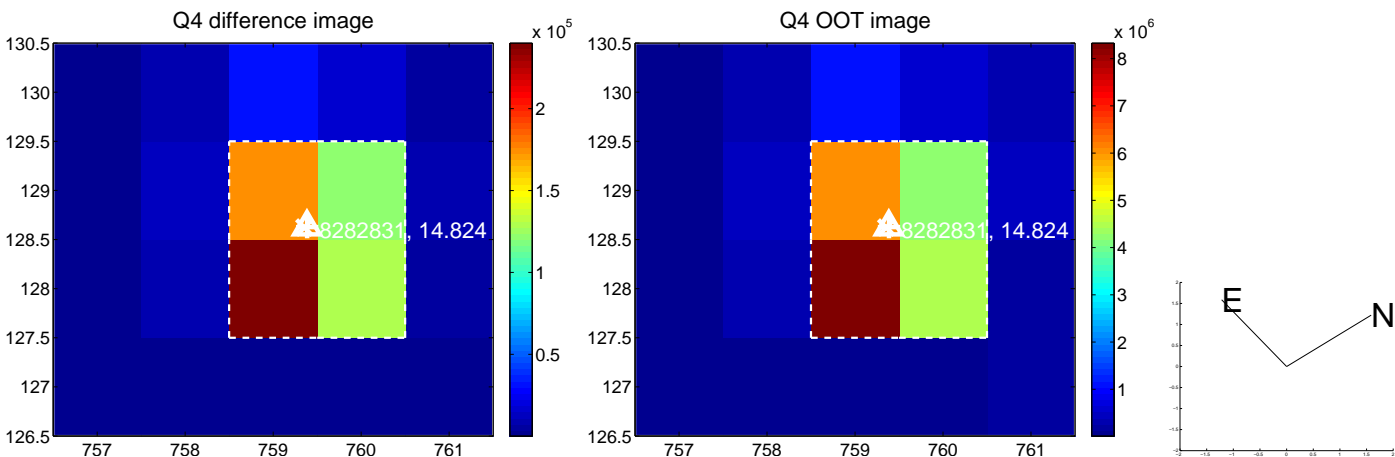
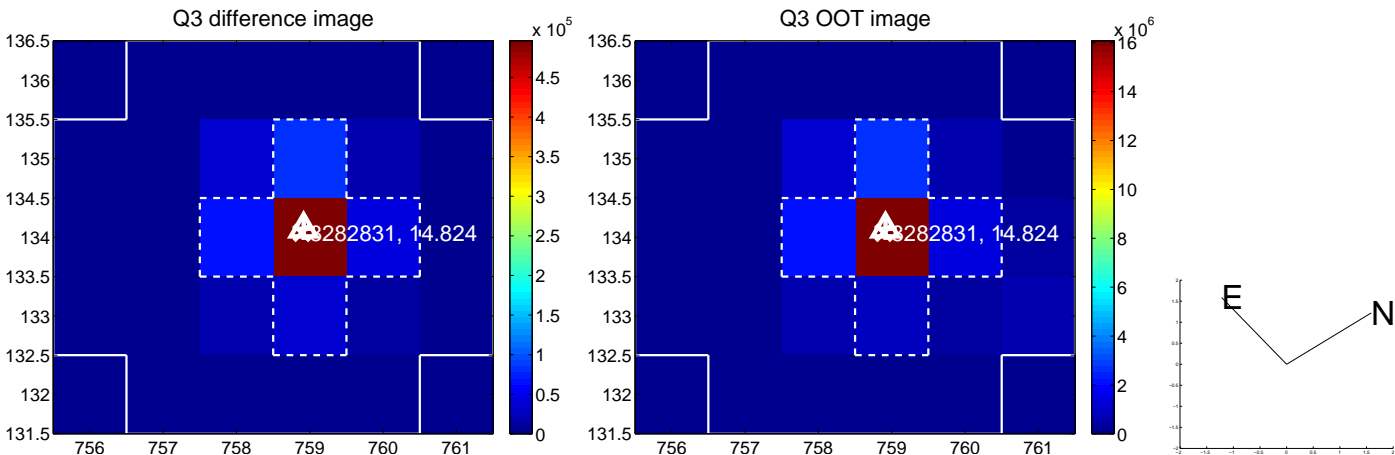
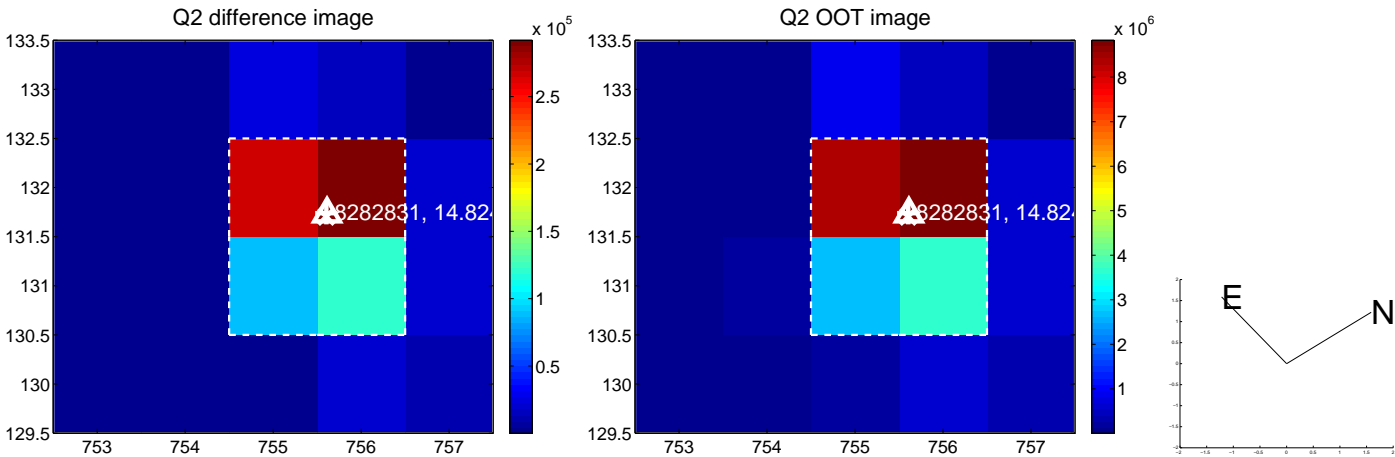
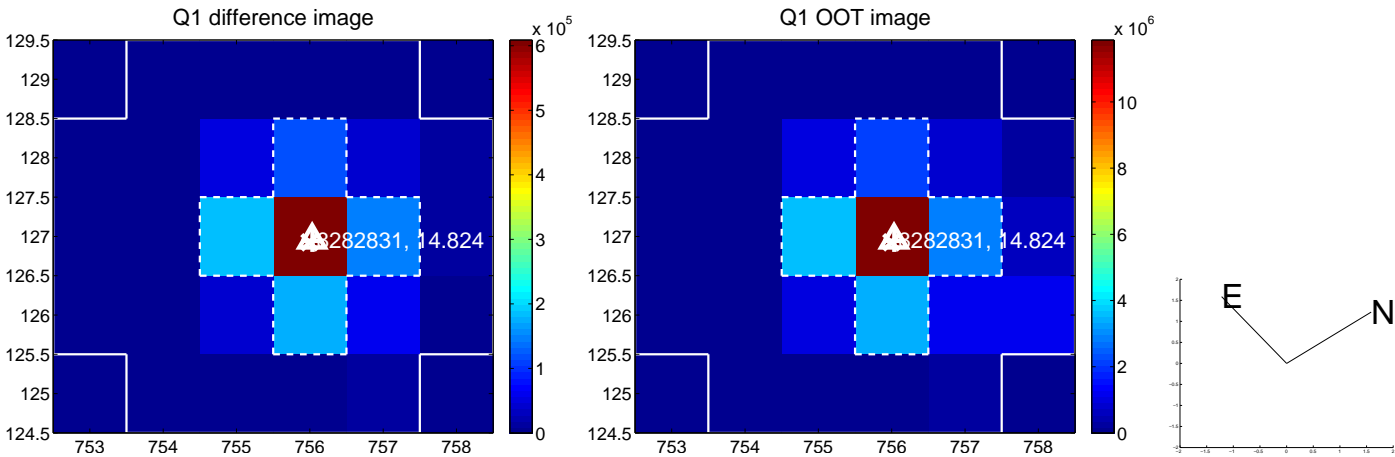
offset from photometric centroids



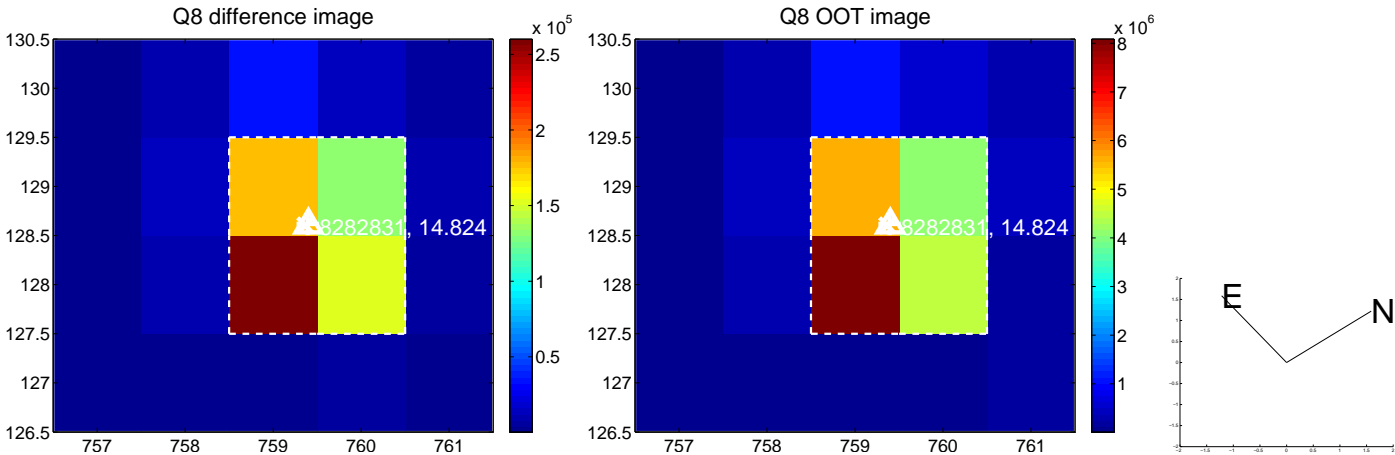
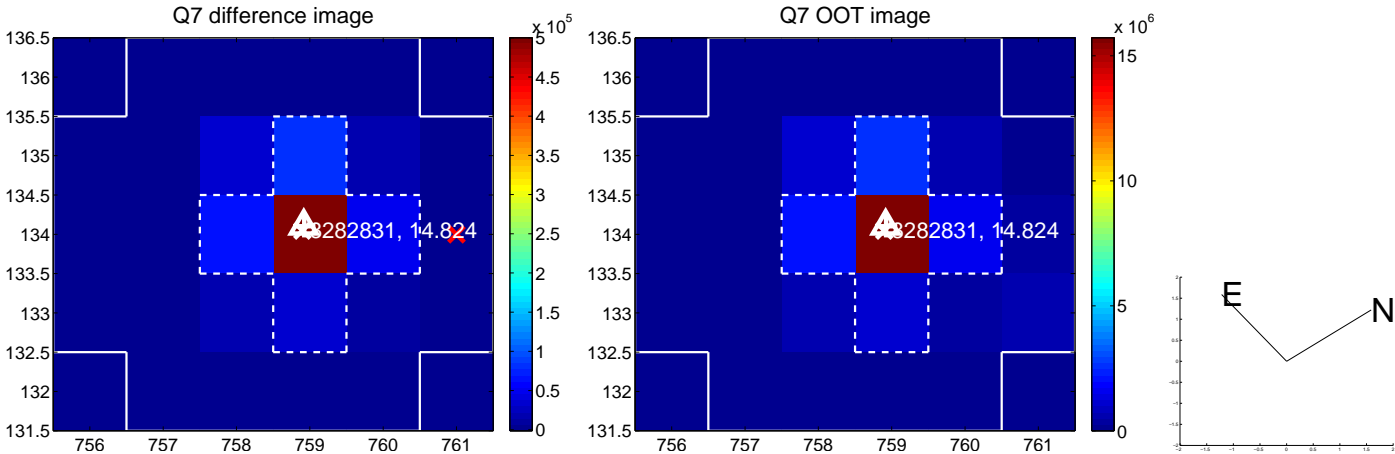
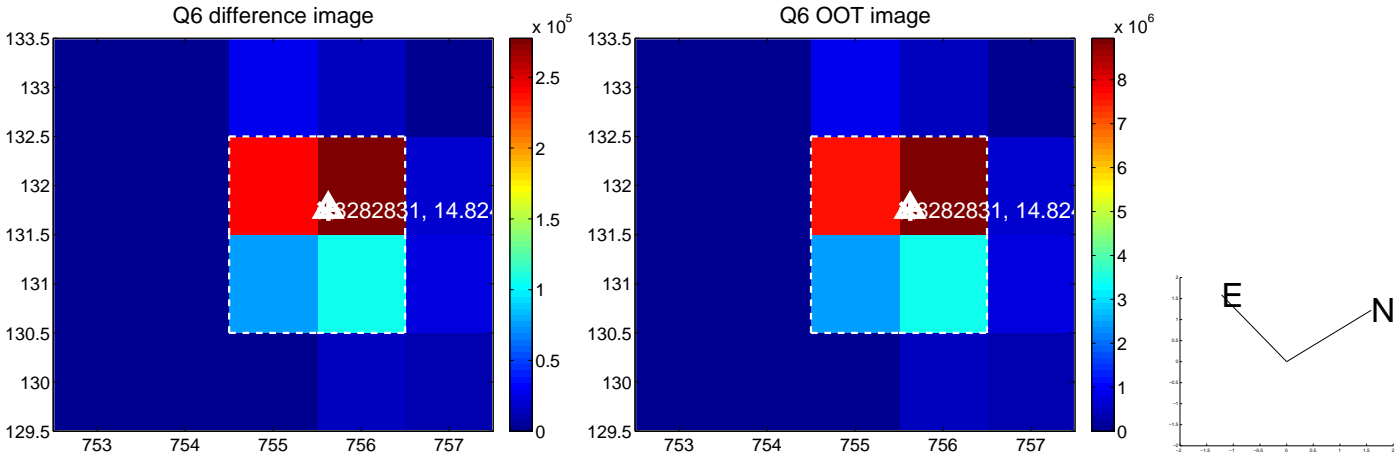
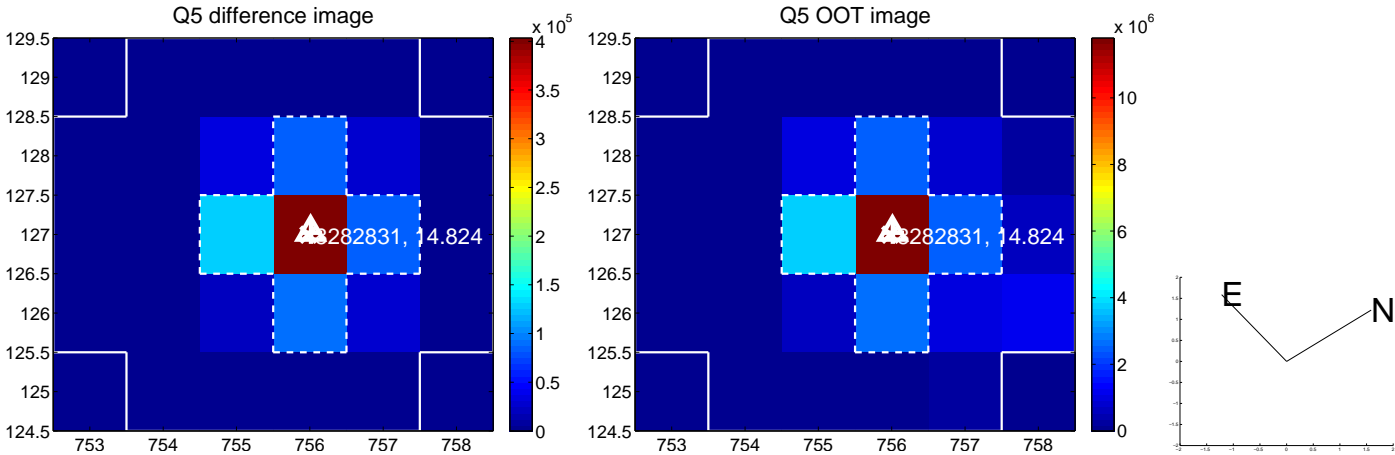
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



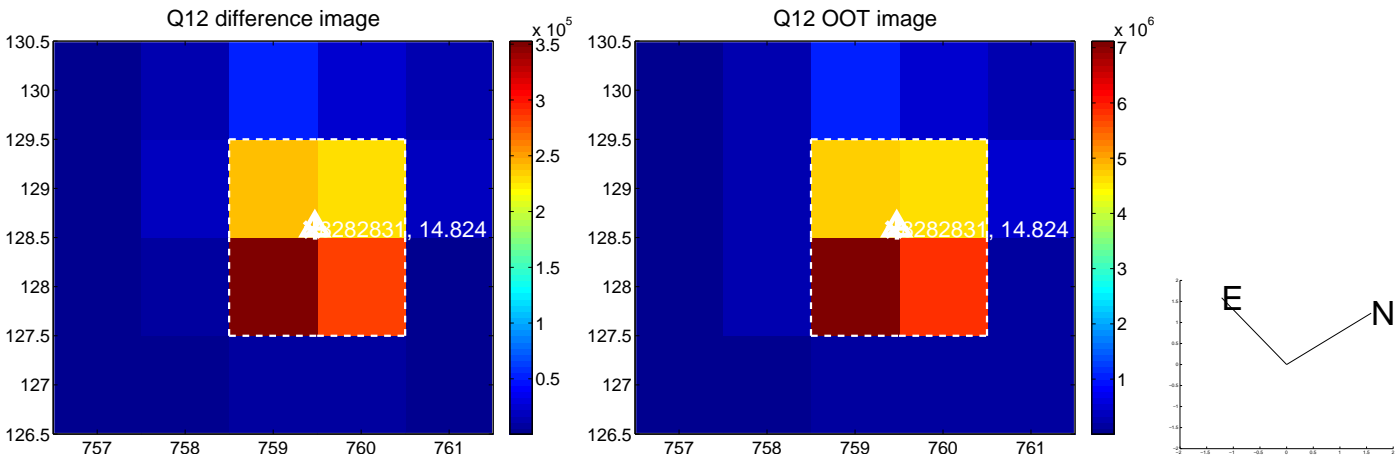
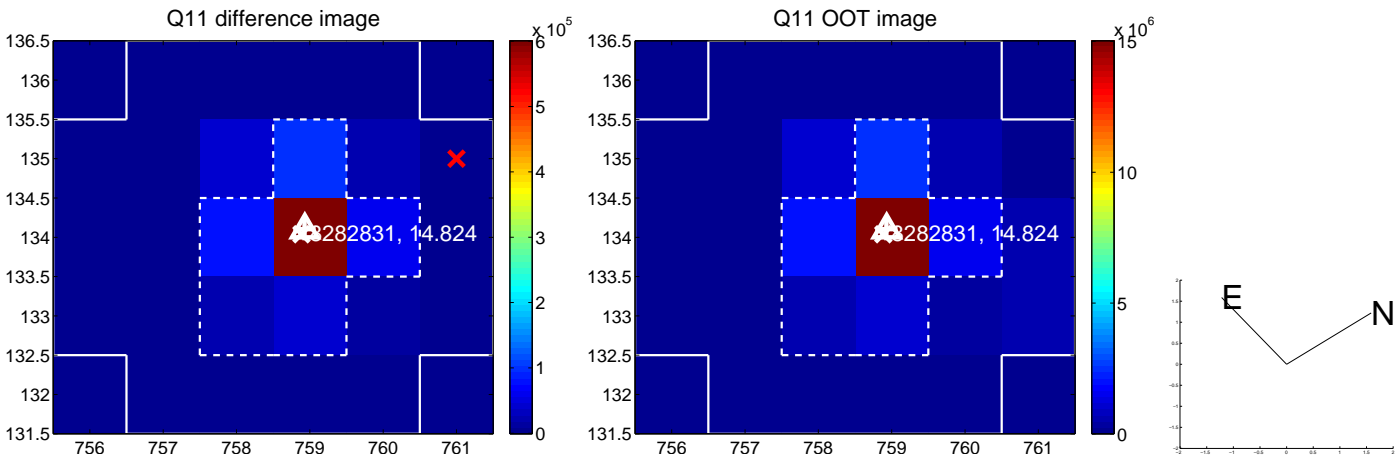
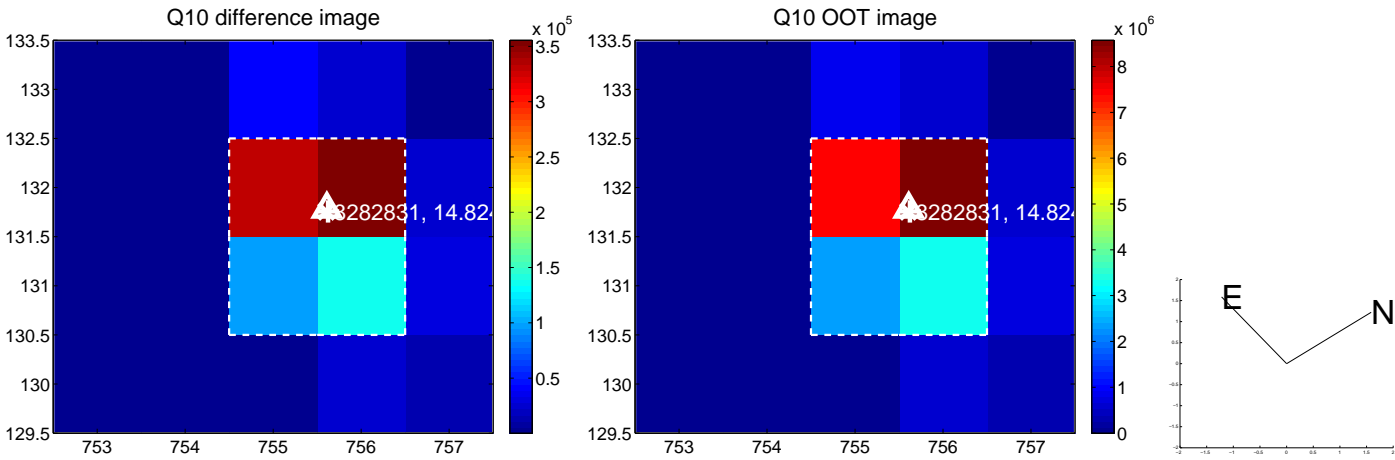
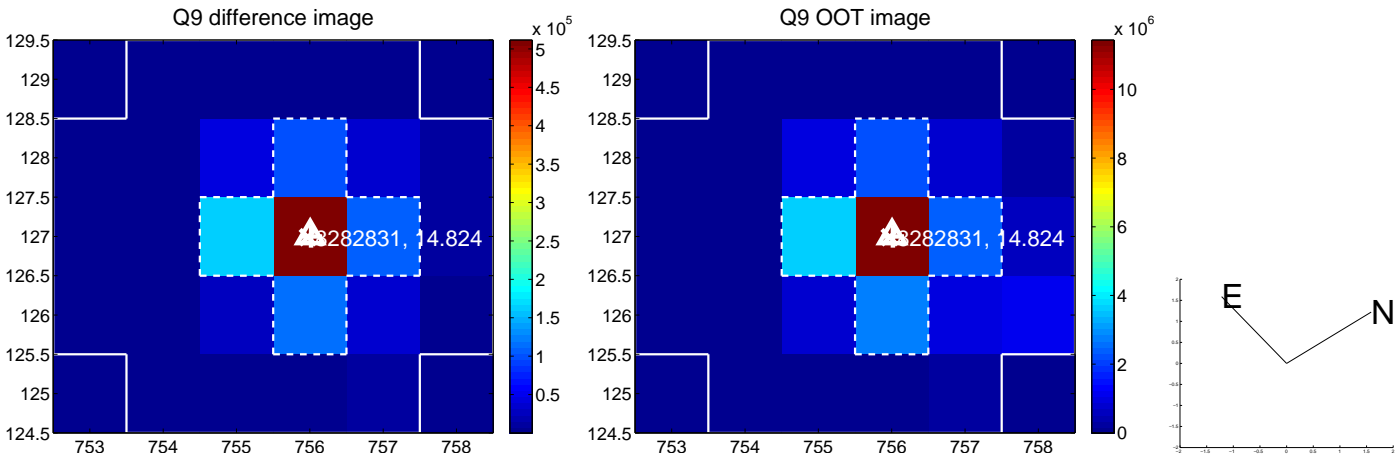
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



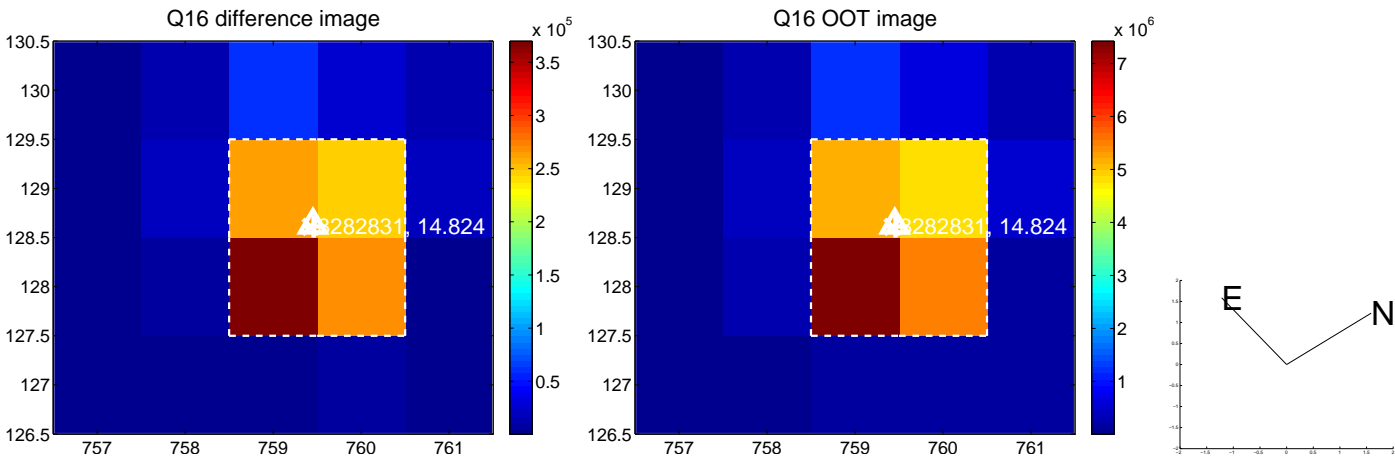
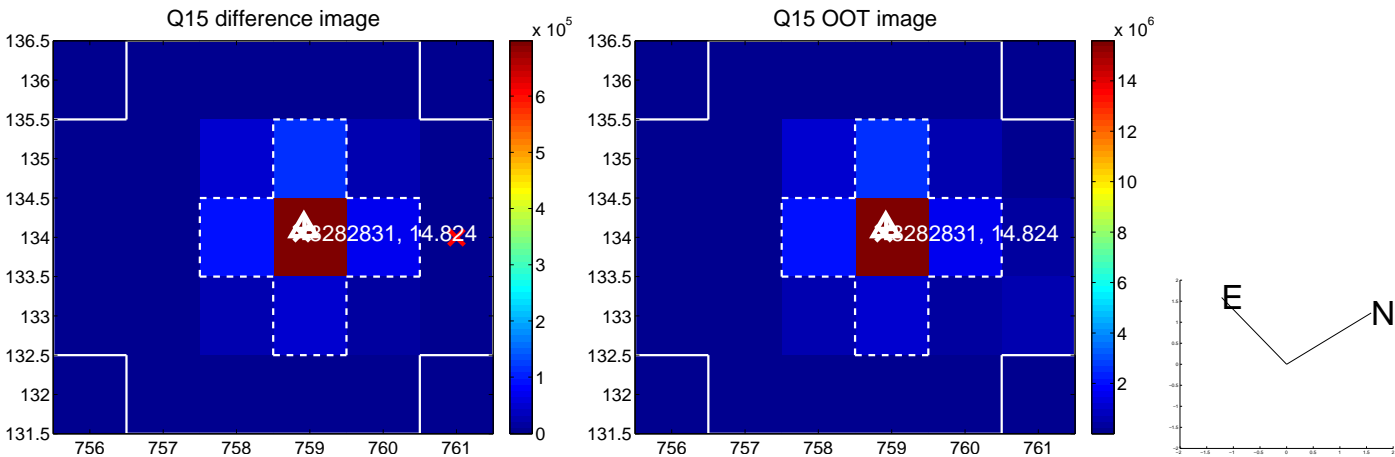
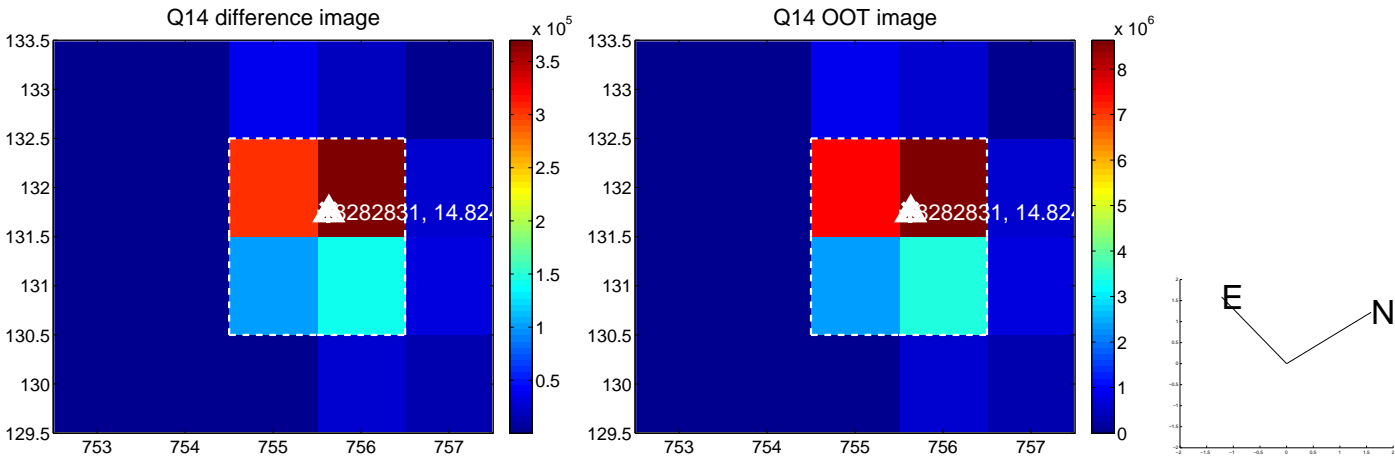
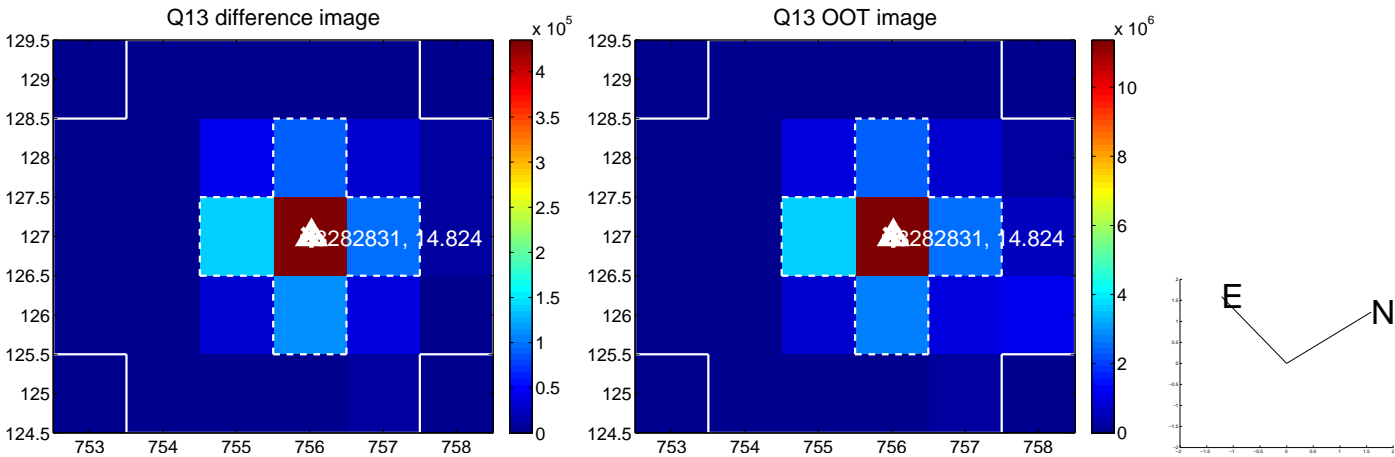
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



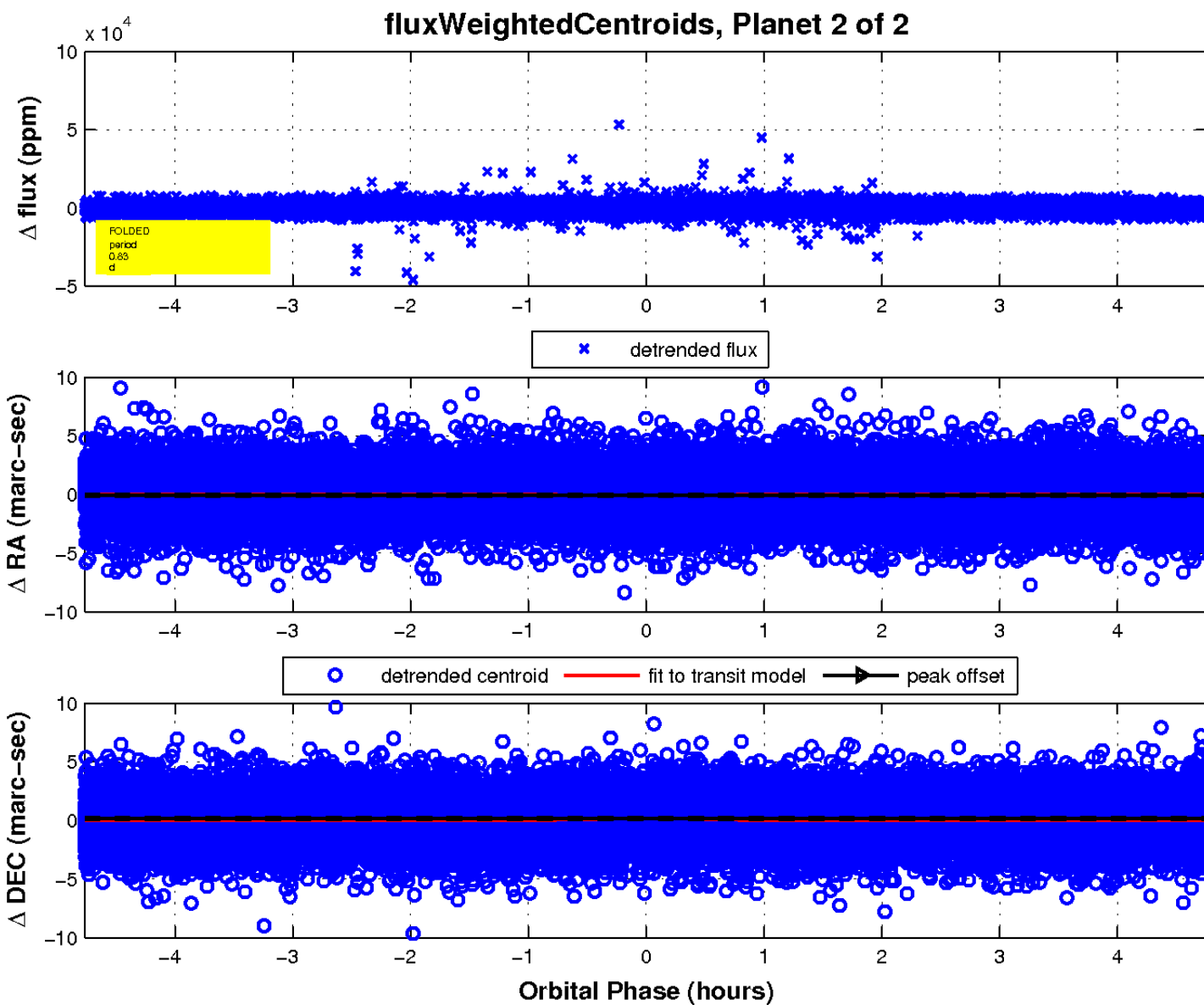
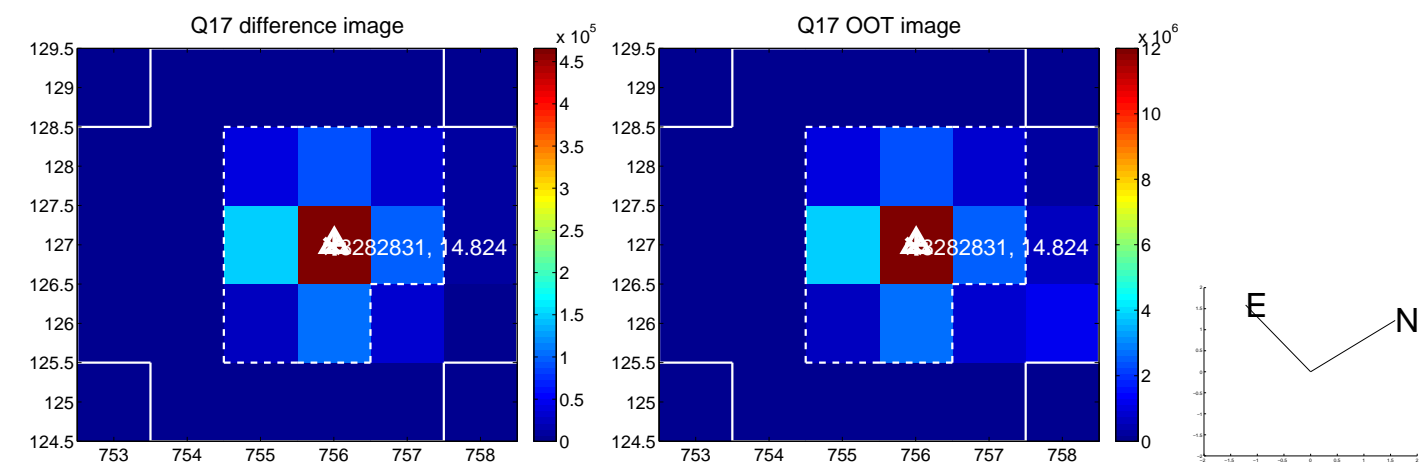
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



# UKIRT Image

Declination

