

# KIC 008111381

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111381-01	OBS	1550.01	2.233806	132.485031	2650.9	2.940	241.9	239.6	0.85	5741	6.90	650.18
008111381-02	OBS	No	1.116875	132.497781	177.4	2.295	20.1	21.1	0.85	5741	1.34	1638.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111381-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
008111381-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

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

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

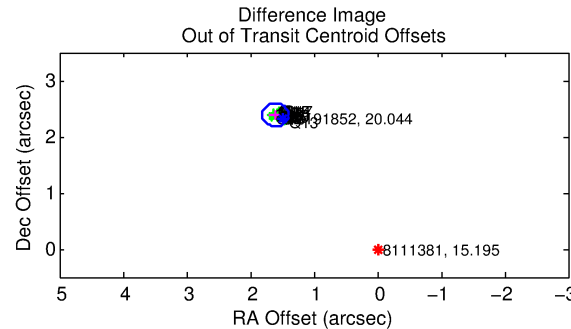
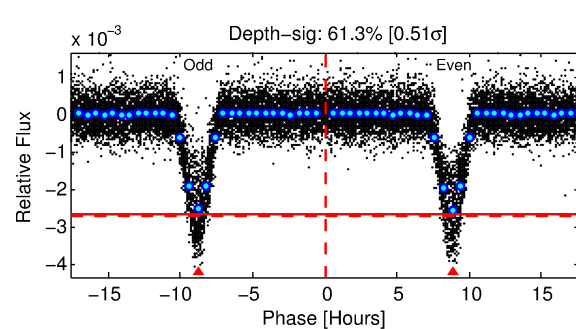
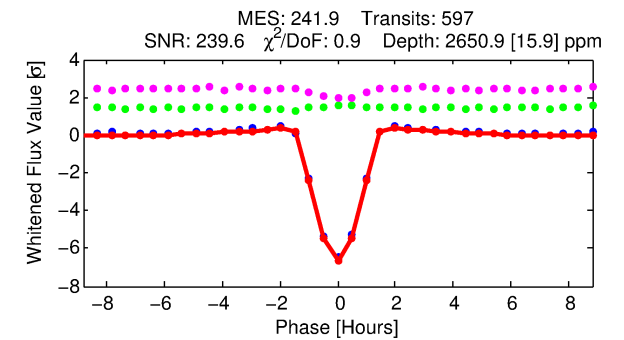
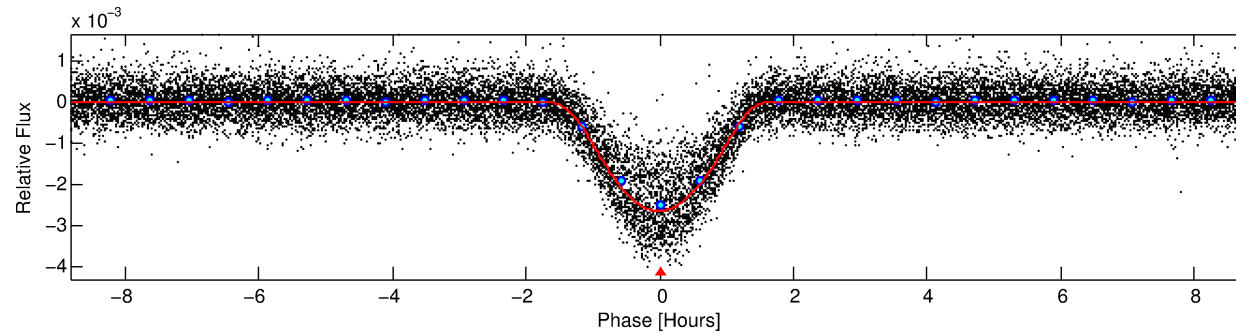
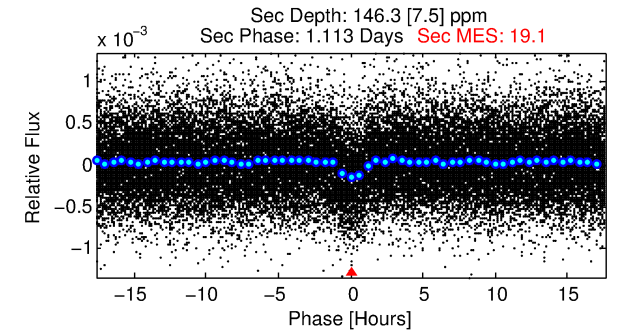
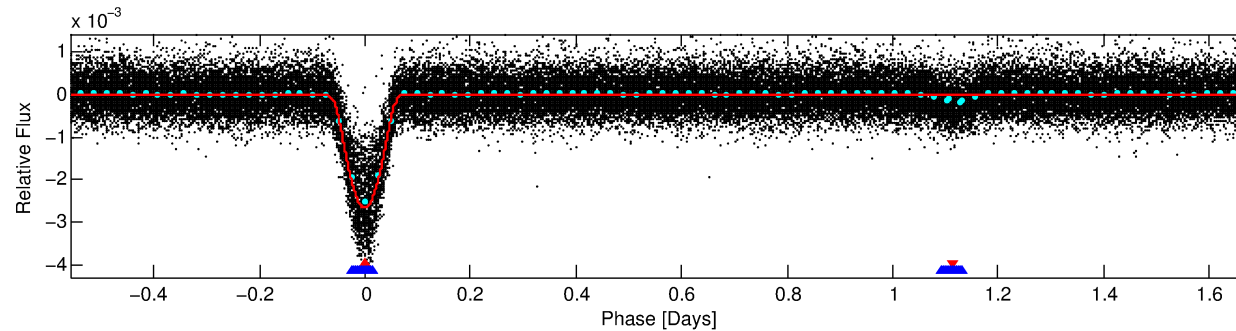
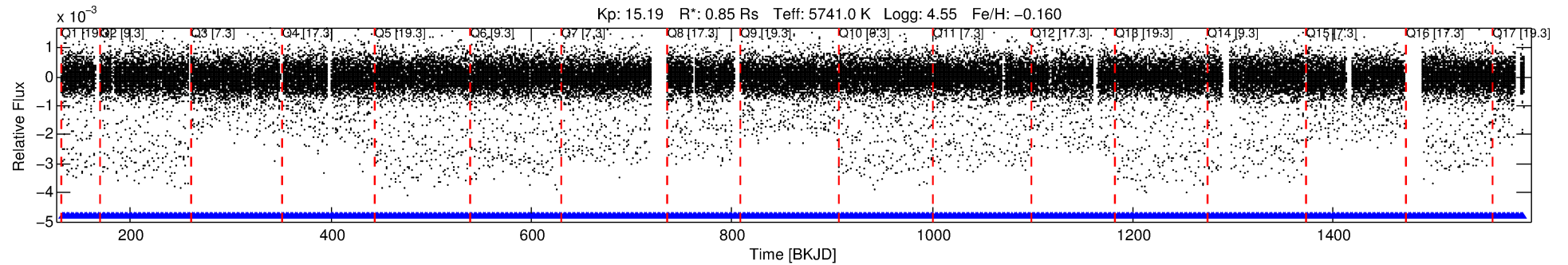
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008111381-01

No Significant Match Found

# DV One-Page Summary

KIC: 8111381 Candidate: 1 of 2 Period: 2.234 d  
KOI: K01550.01 Corr: 0.989



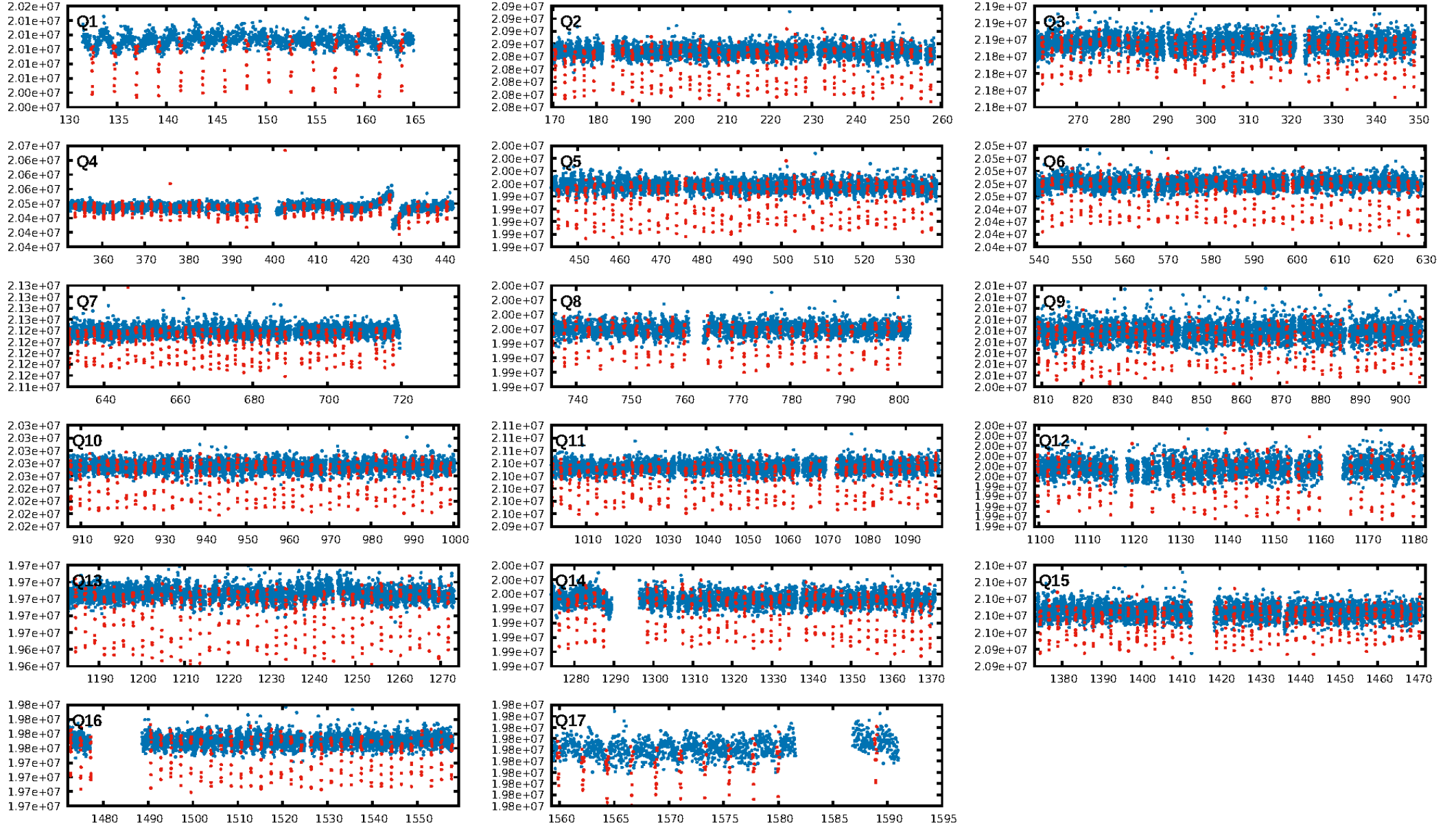
## DV Fit Results:

Period = 2.23381 [0.00000] d  
Epoch = 132.4850 [0.0002] BKJD  
Rp/R\* = 0.0747 [0.0073]  
a/R\* = 2.79 [0.07]  
b = 0.98 [0.01]  
Seff = 650.18 [242.02]  
Teq = 1288 [120] K  
Rp = 6.90 [2.02] Re  
a = 0.0327 [0.0078] AU  
Ag = 1.81 [0.74] [1.10σ]  
Teff = 2310 [136] K [5.65σ]

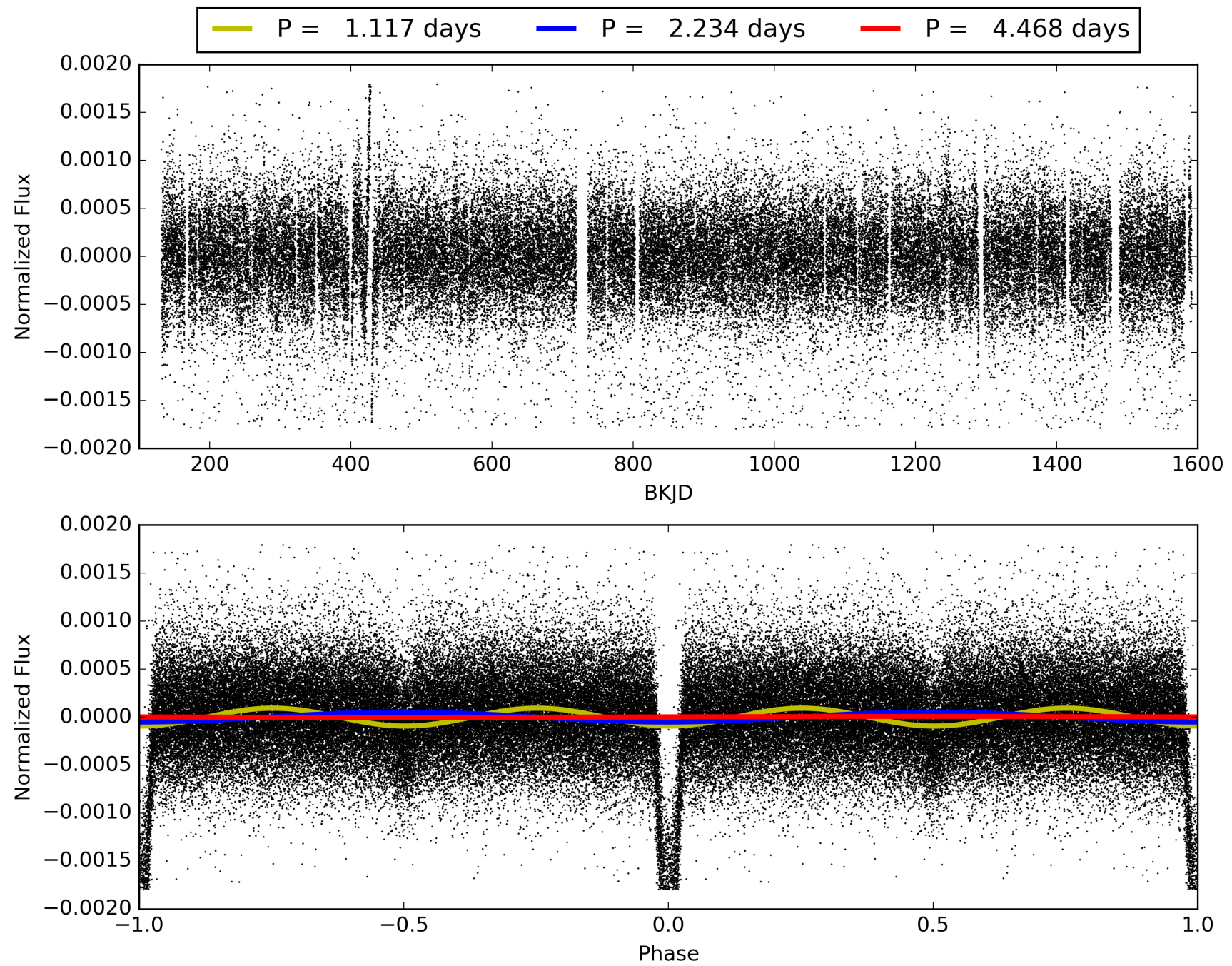
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.19σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [571/571]  
GhostDiagnostic-chr: 1.854  
Centroid-sig: 0.0%  
Centroid-so: 2.160 arcsec [33.00σ]  
OotOffset-rm: 2.878 arcsec [42.01σ]  
KicOffset-rm: 2.722 arcsec [39.75σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 008111381-01, PDC Light Curves

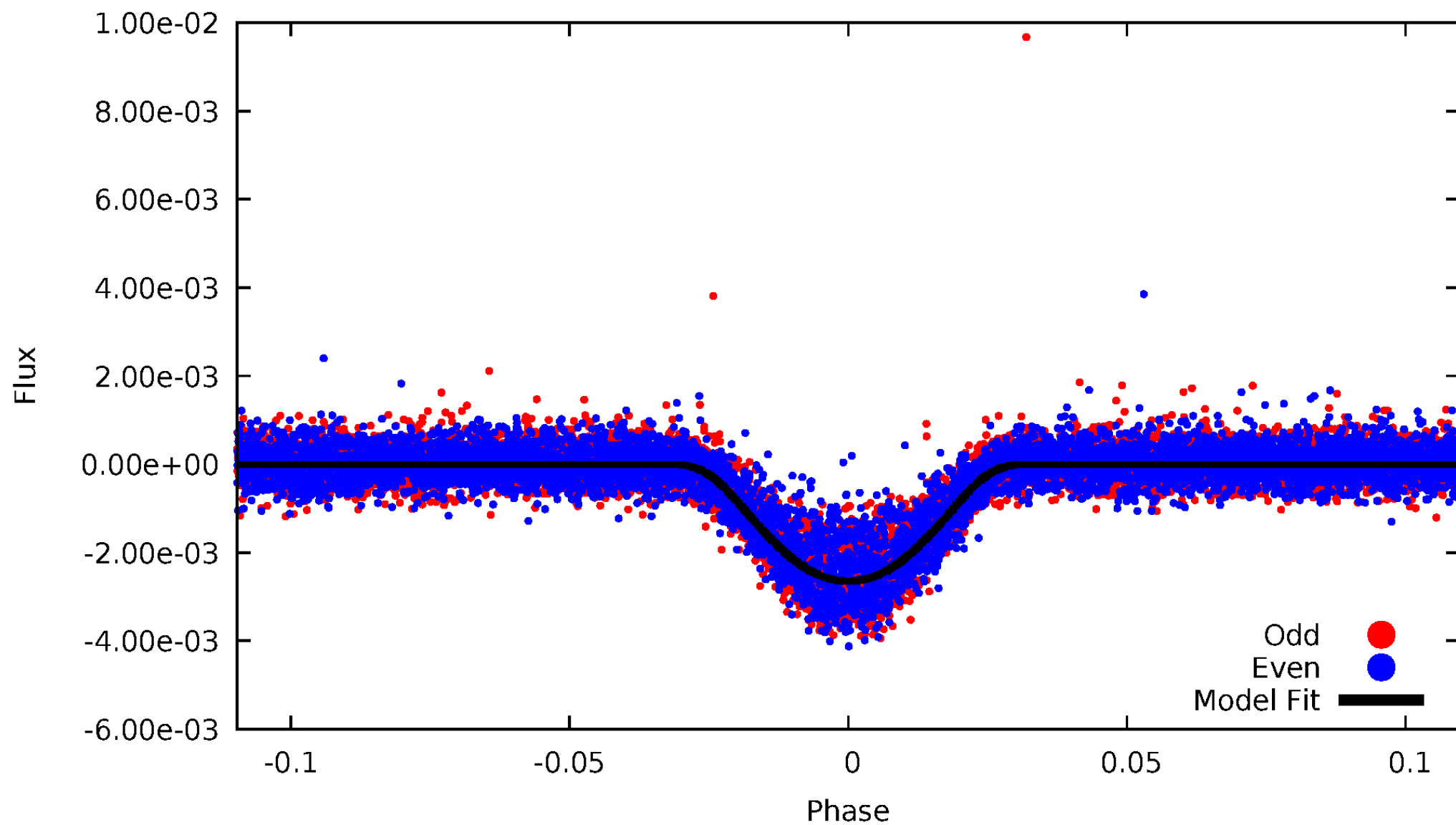


TCE 008111381-01



# DV Odd/Even

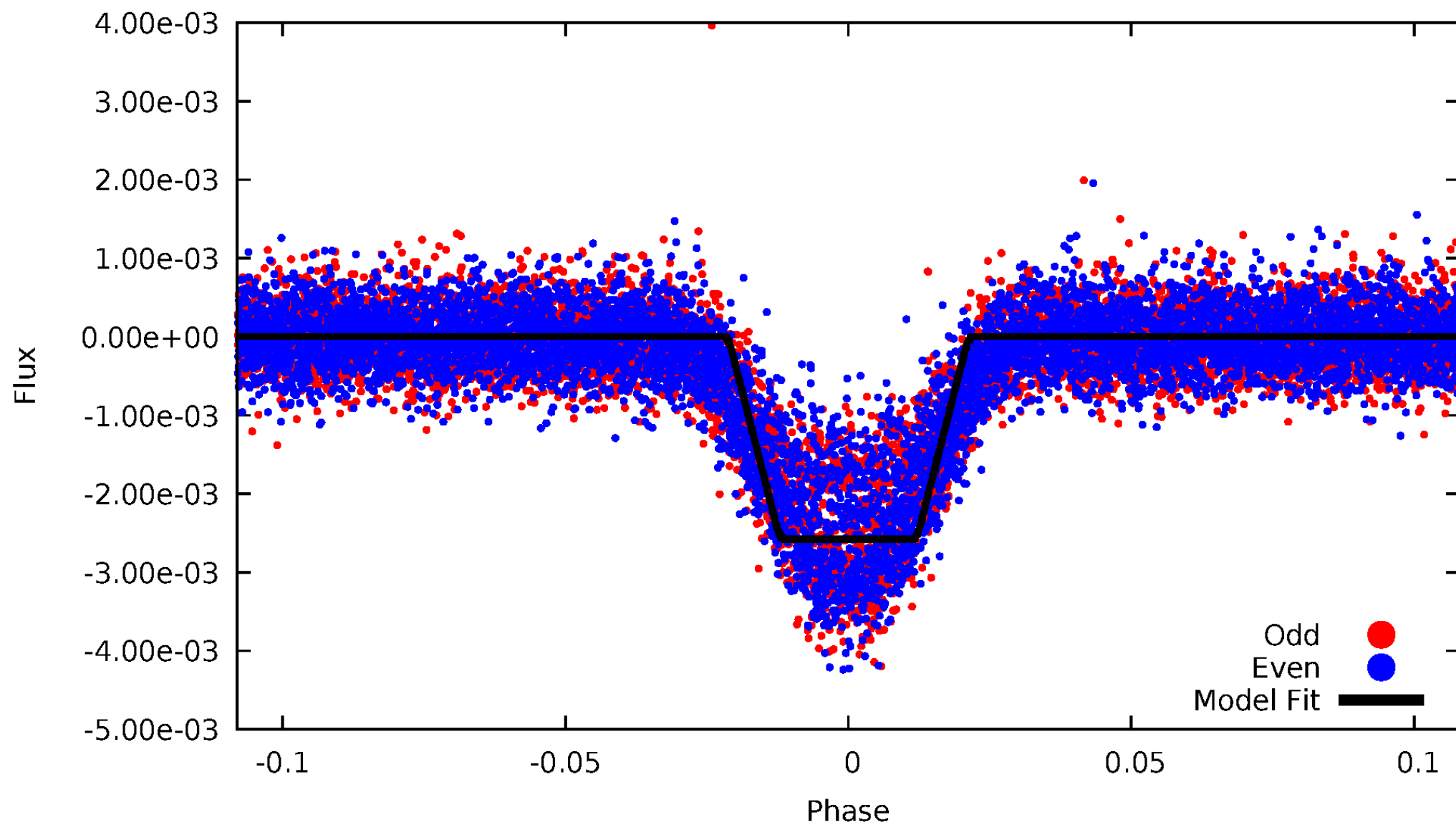
TCE 008111381-01





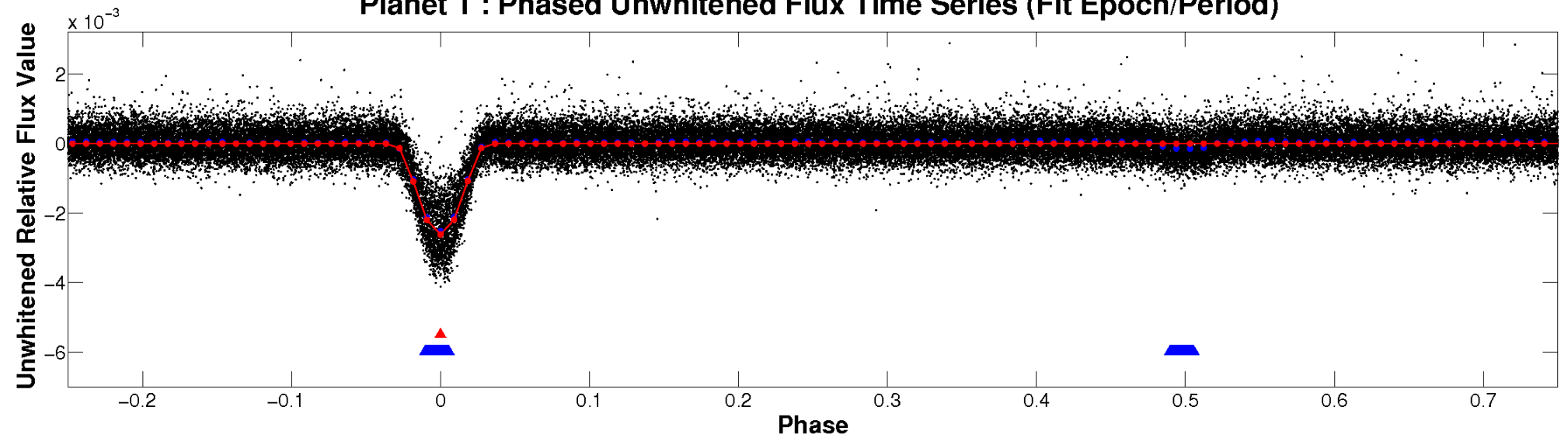
# ALT Odd/Even

TCE 008111381-01

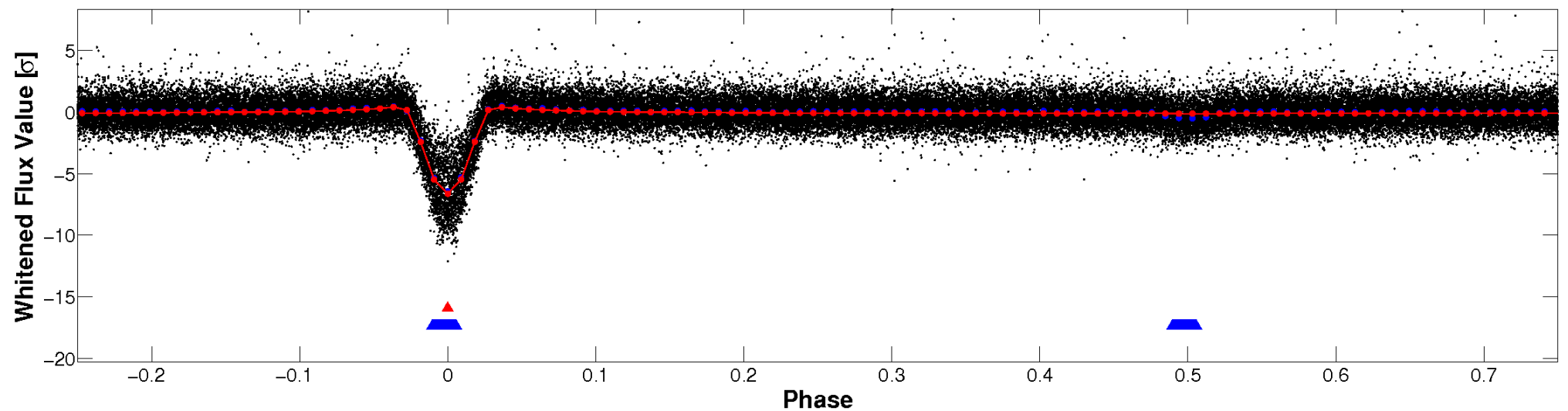


# Non-Whitened Vs. Whitened Light Curve

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

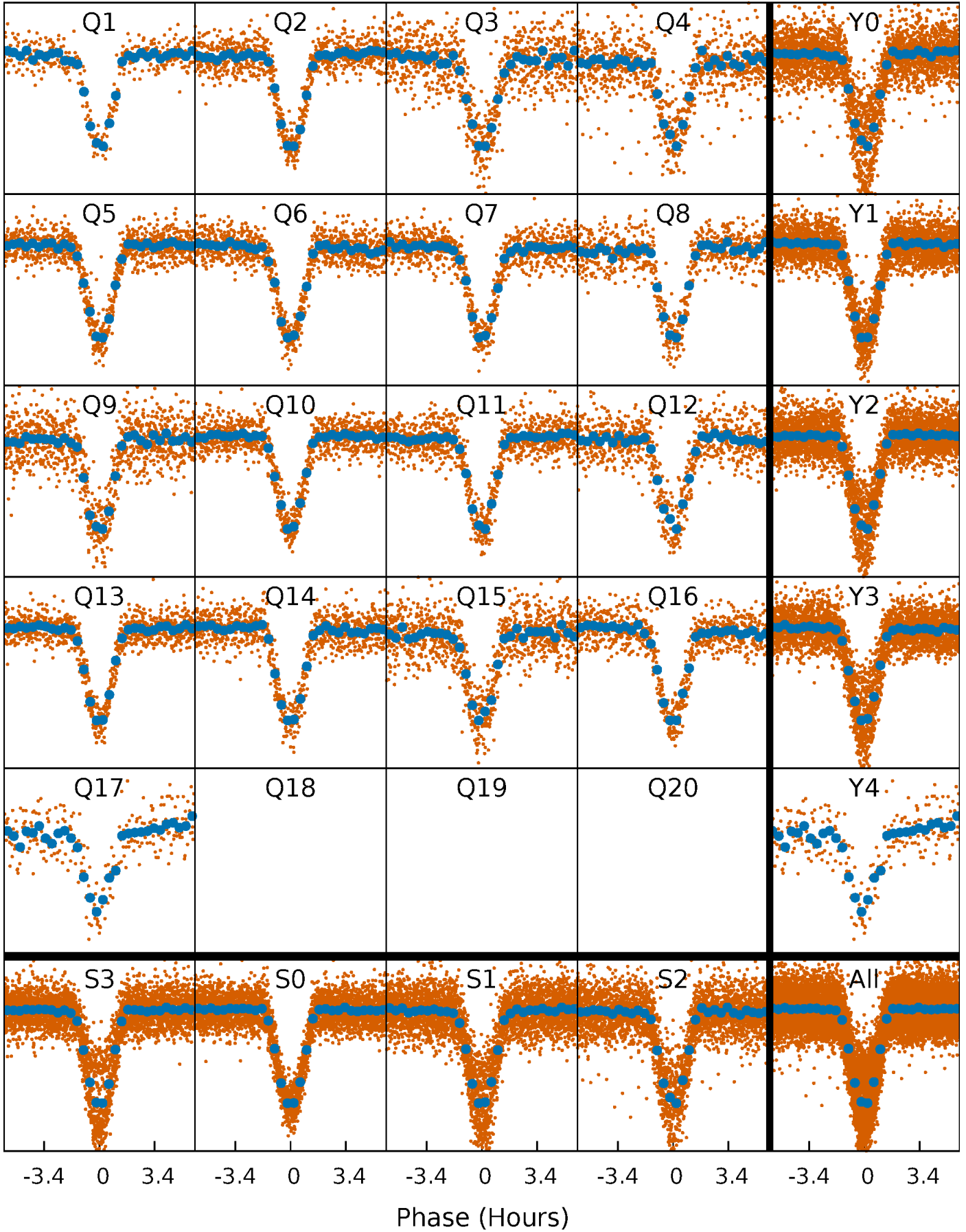


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

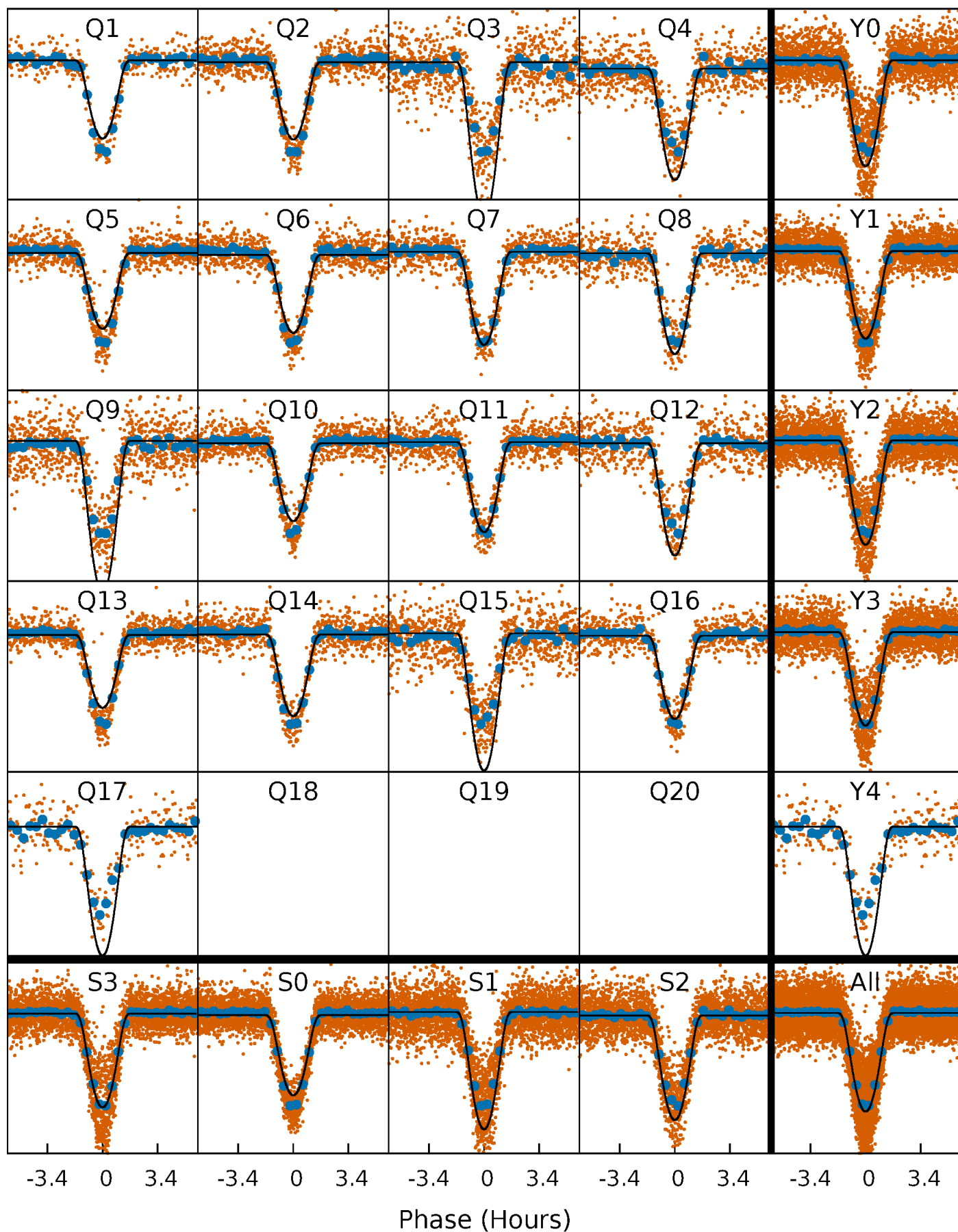
TCE 008111381-01 P= 2.233806 Days  $T_0=132.485031$  (BKJD)





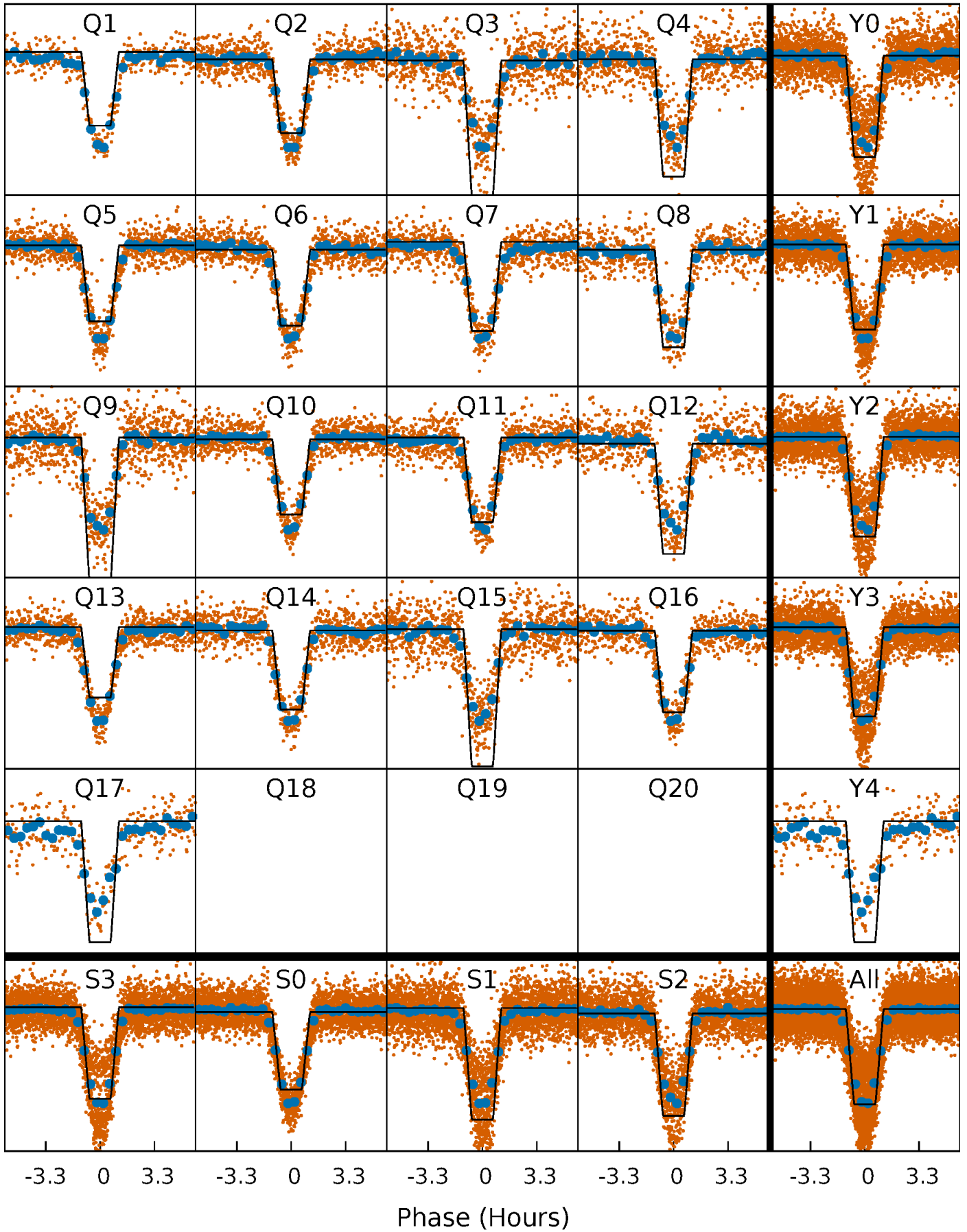
# DV Quarter-Phased Transit Curves

TCE 008111381-01 P= 2.233806 Days  $T_0=132.485031$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

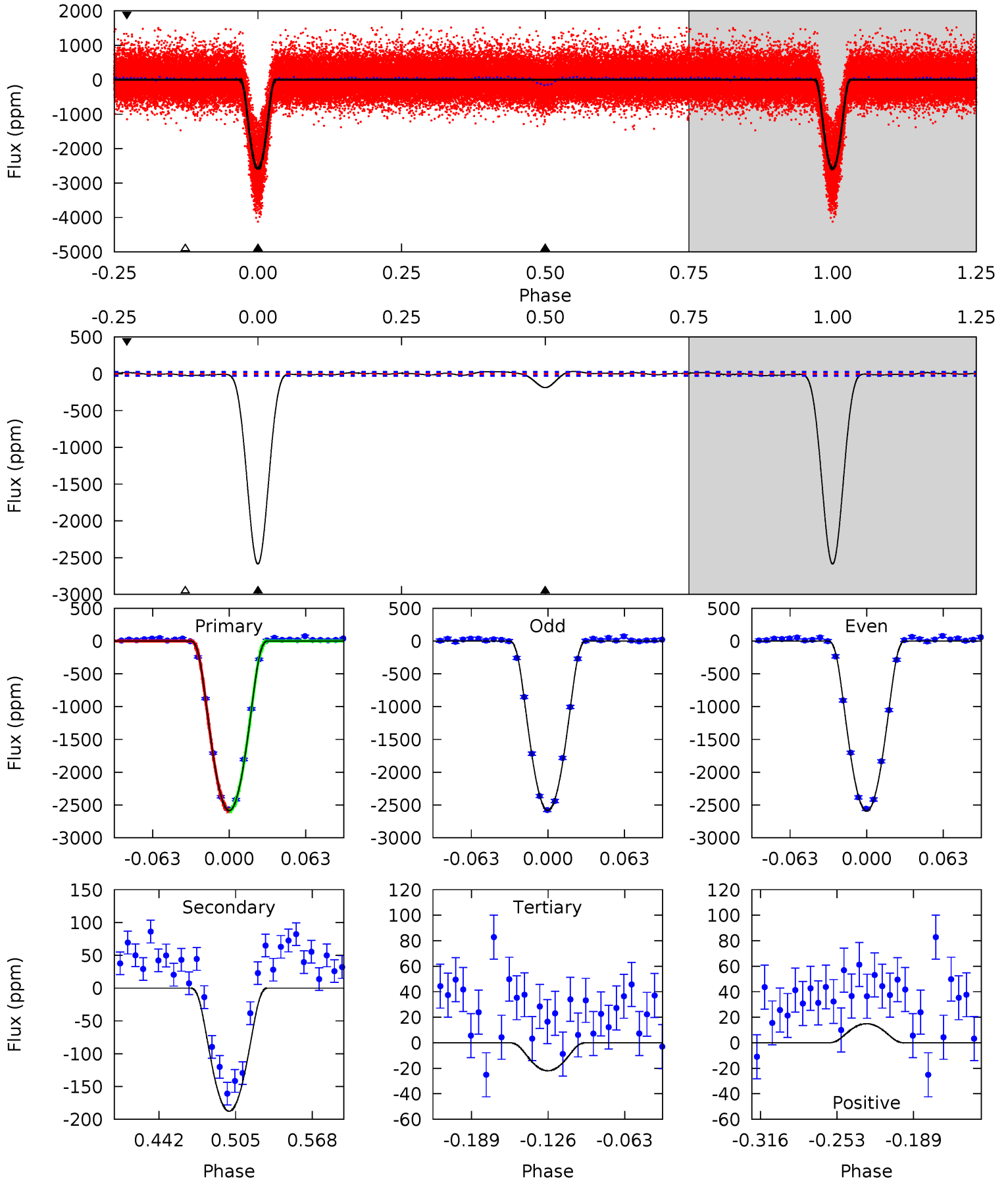
TCE 008111381-01 P= 2.233806 Days  $T_0=132.484694$  (BKJD)



# DV Model-Shift Uniqueness Test

008111381-01, P = 2.233806 Days, E = 130.251225 Days

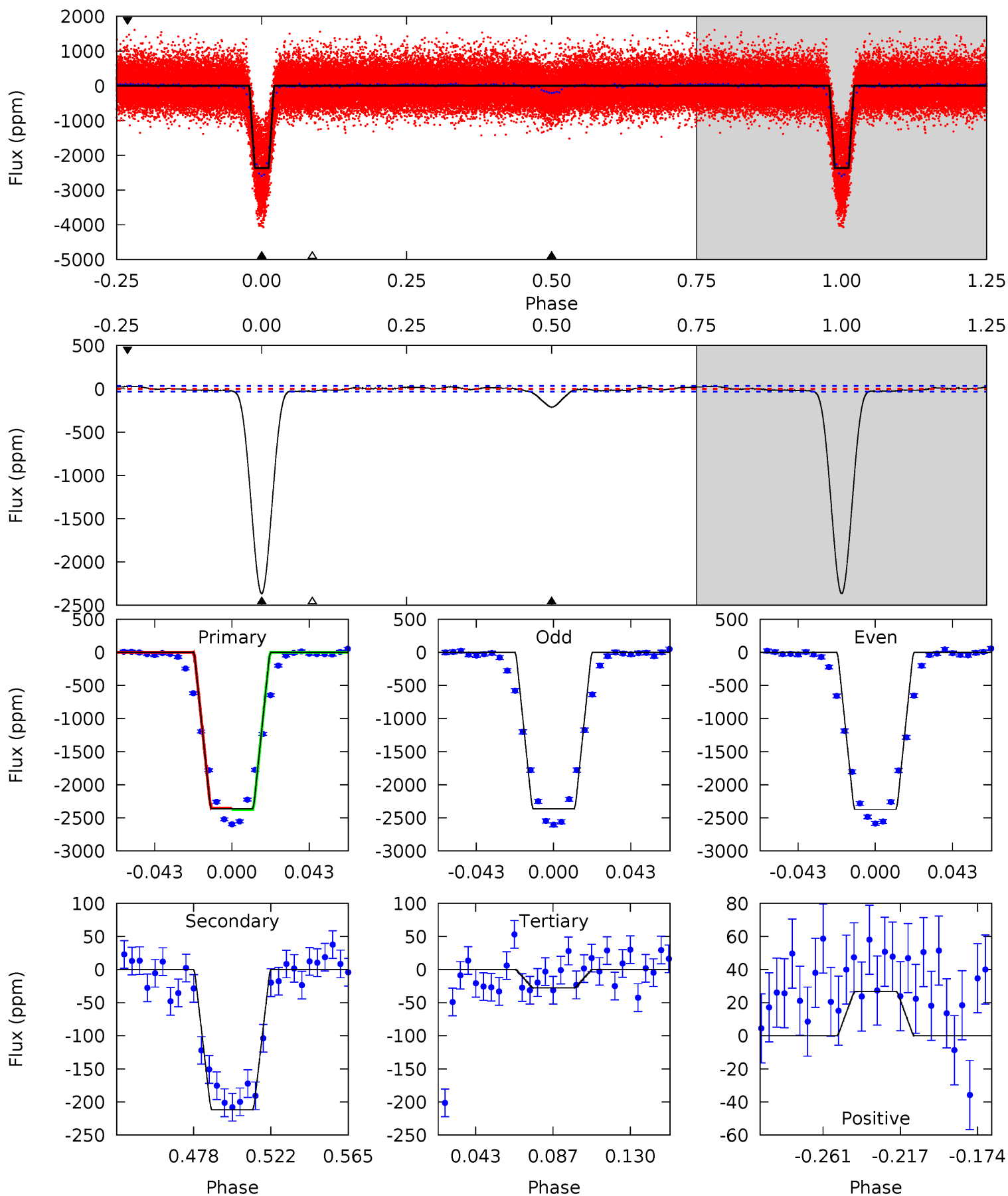
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
458.8	33.3	3.89	2.65	4.66	1.86	2.21	454.9	456.1	29.4	30.6	0.96	0.95	0.01	0.02



# Alt Model-Shift Uniqueness Test

008111381-01, P = 2.233806 Days, E = 130.250888 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
337.7	30.2	3.96	3.83	4.74	2.02	2.14	333.8	333.9	26.3	26.4	0.51	0.94	0.01	1.61



### Stellar Parameters For KIC 008111381

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5741^{+153}_{-170}$	$4.555^{+0.035}_{-0.196}$	$-0.160^{+0.300}_{-0.300}$	$0.846^{+0.234}_{-0.078}$	$0.938^{+0.095}_{-0.106}$	$2.178^{+0.397}_{-1.056}$
	+3%/-3%	+1%/-4%	+188%/-188%	+28%/-9%	+10%/-11%	+18%/-48%
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 008111381-01 / KOI 1550.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-188 \pm 6$	$7.22^{+1.21}_{-0.90}$	$1843^{+125}_{-81}$	$3014^{+120}_{-103}$	$2.076^{+0.614}_{-0.534}$
Alt.	$-212 \pm 7$	$4.84^{+0.99}_{-0.76}$	$1839^{+121}_{-82}$	$3508^{+193}_{-166}$	$5.217^{+1.967}_{-1.613}$

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



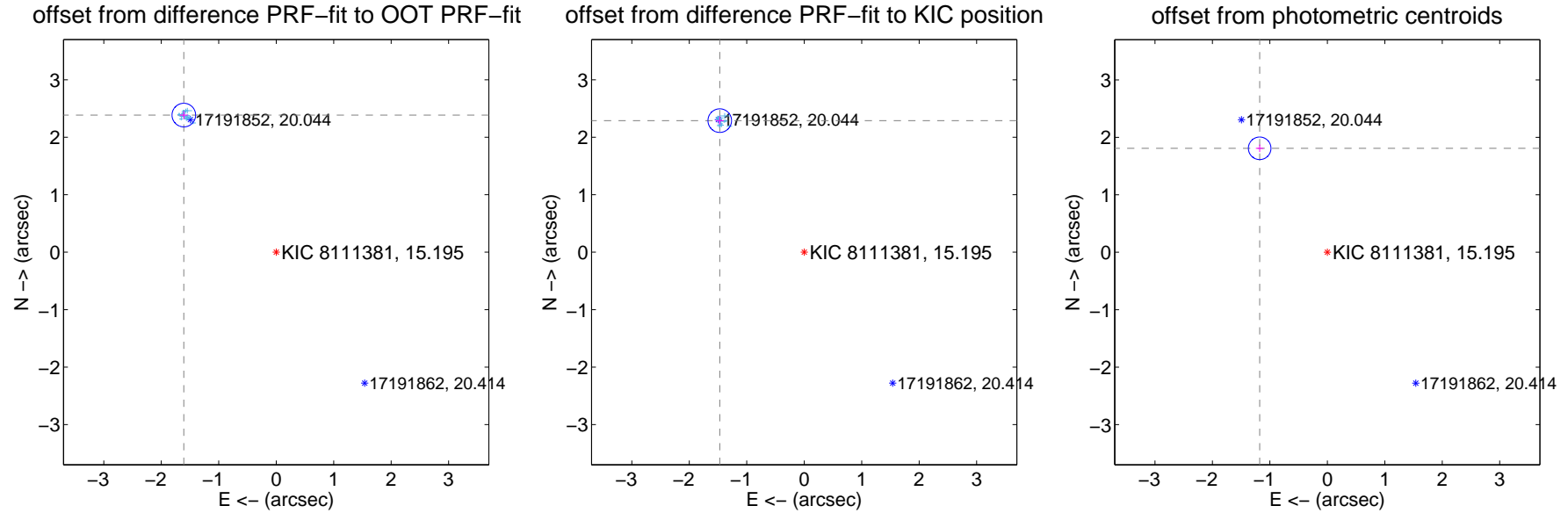
## DV Centroid Data

Supplemental centroid analysis for 008111381-01. Kepler magnitude: 15.20. Transit SNR 239.57

There are 17 quarters with good PRF difference image offsets

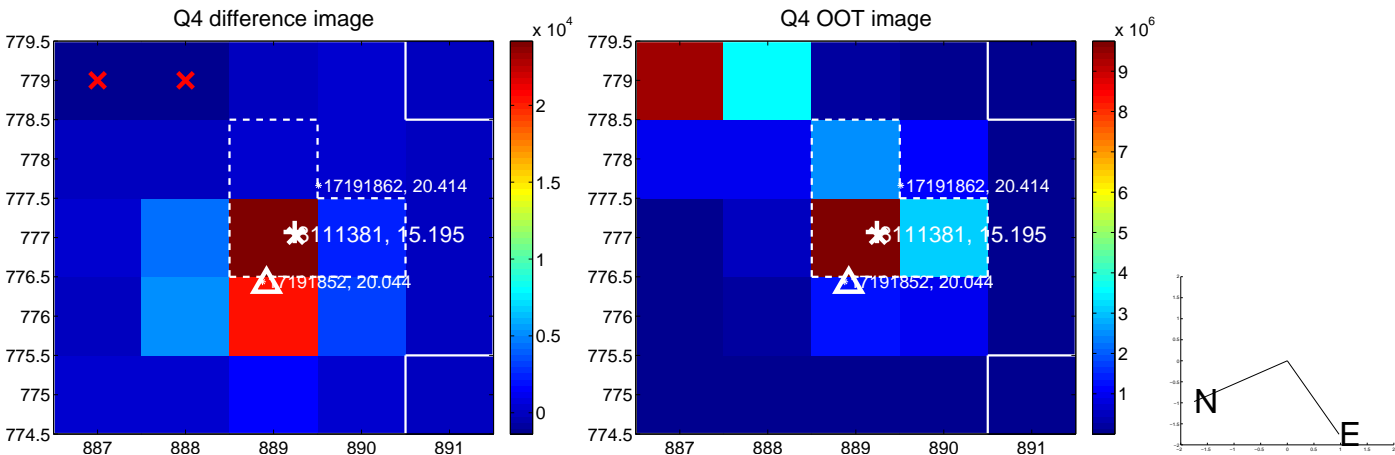
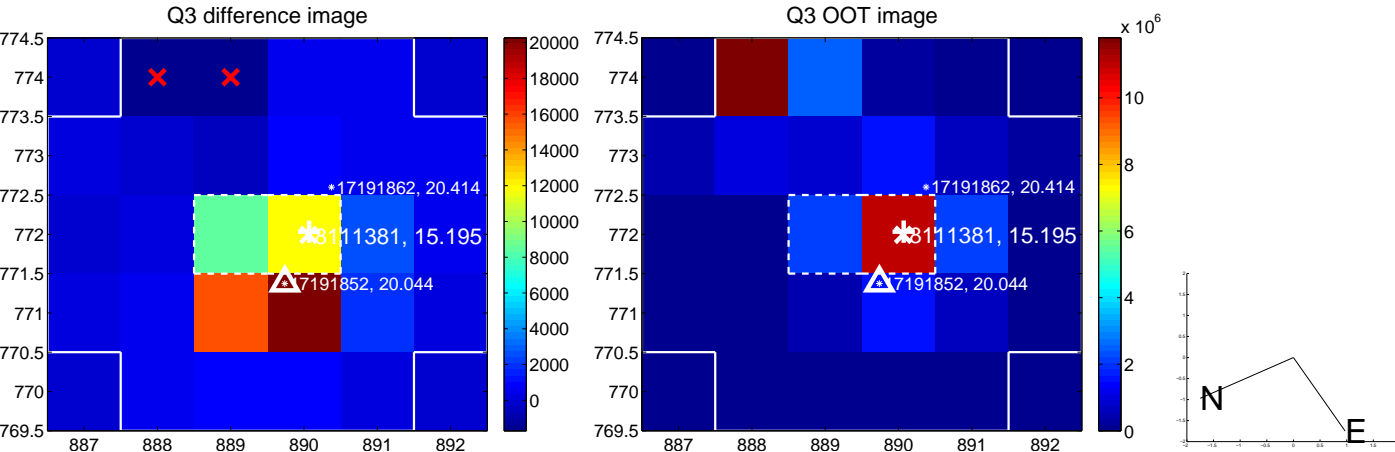
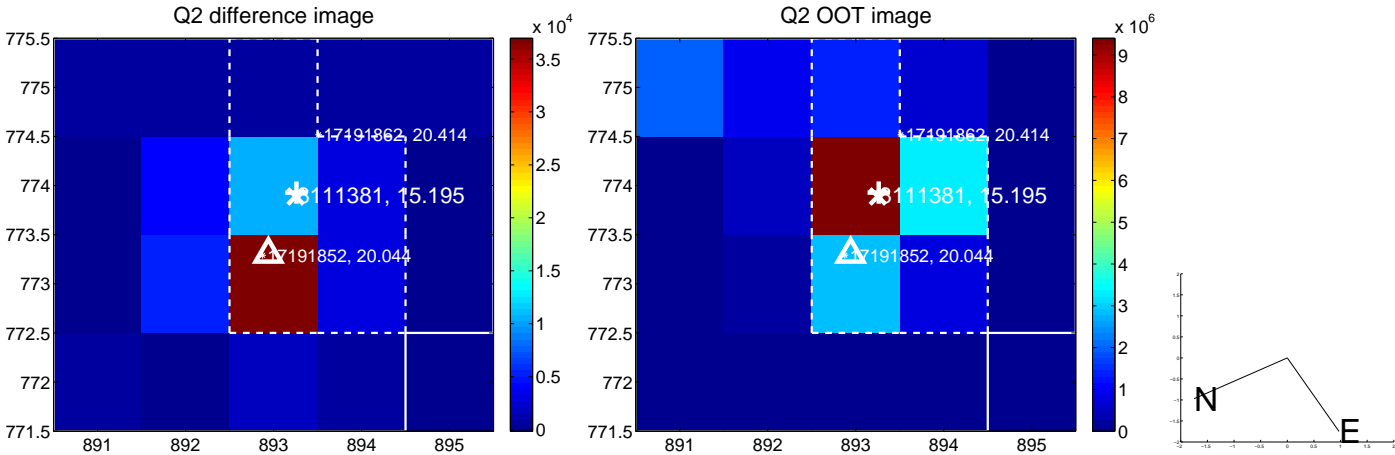
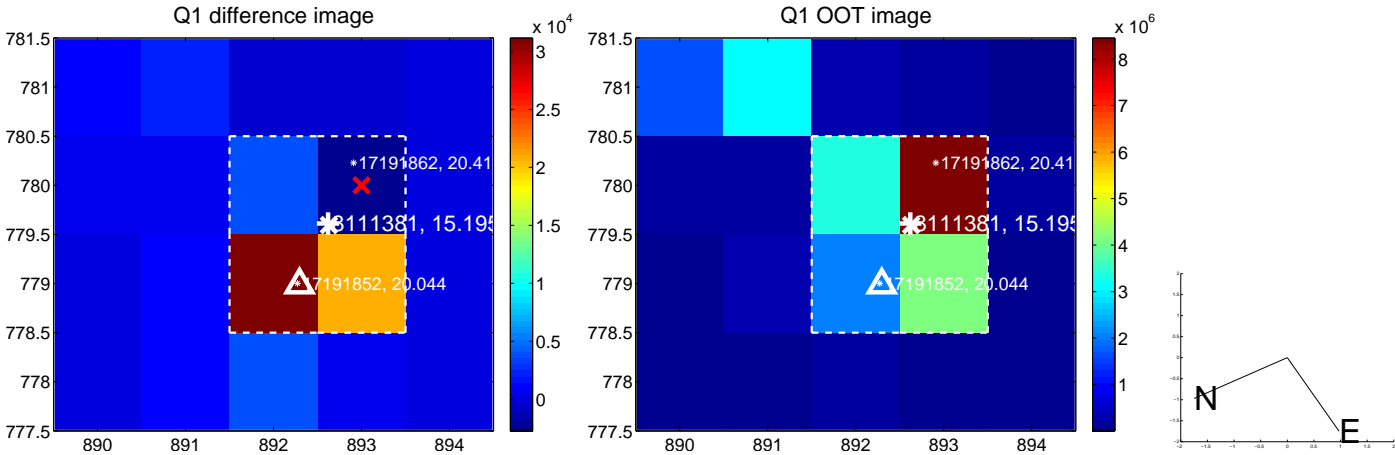
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.878 \pm 0.069$	42.01	$1.608 \pm 0.068$	$2.387 \pm 0.068$
PRF-fit source offset from KIC position	$2.722 \pm 0.068$	39.75	$1.470 \pm 0.068$	$2.290 \pm 0.068$
photometric centroid source offset	$2.16 \pm 0.07$	33.00	$1.18 \pm 0.07$	$1.81 \pm 0.07$

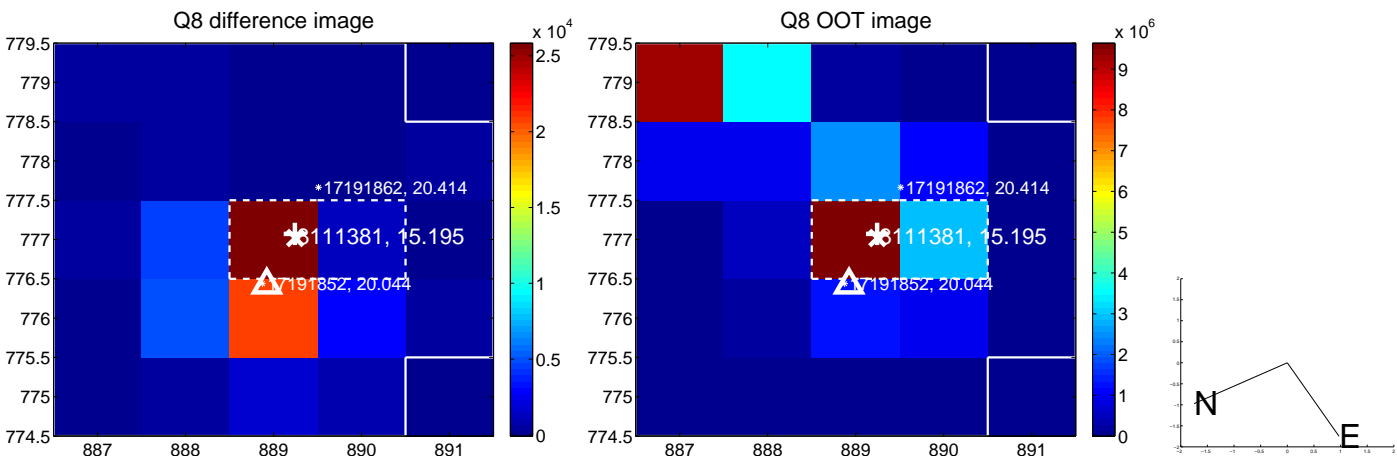
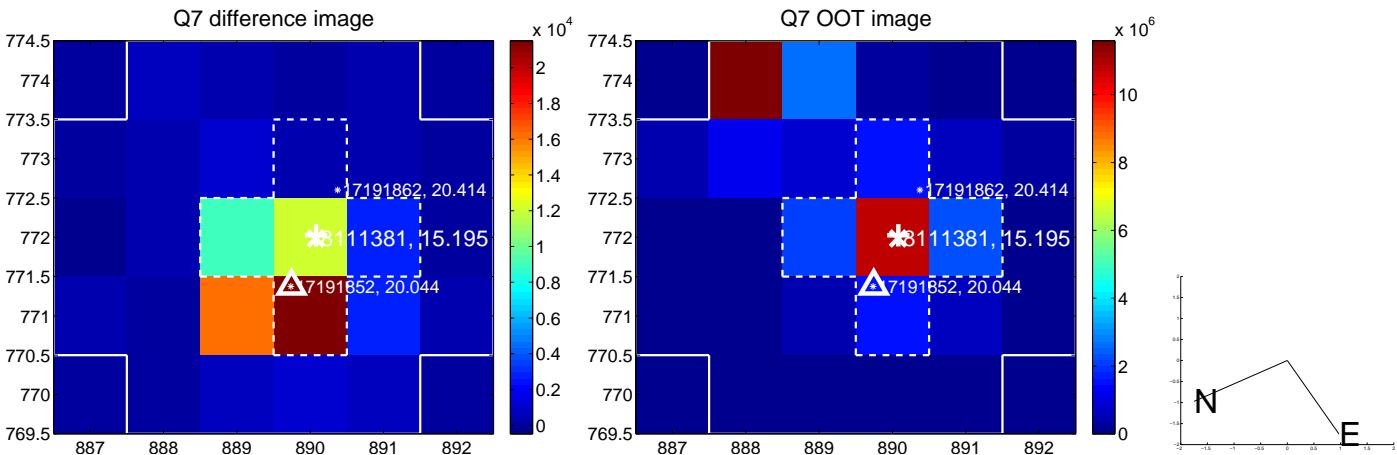
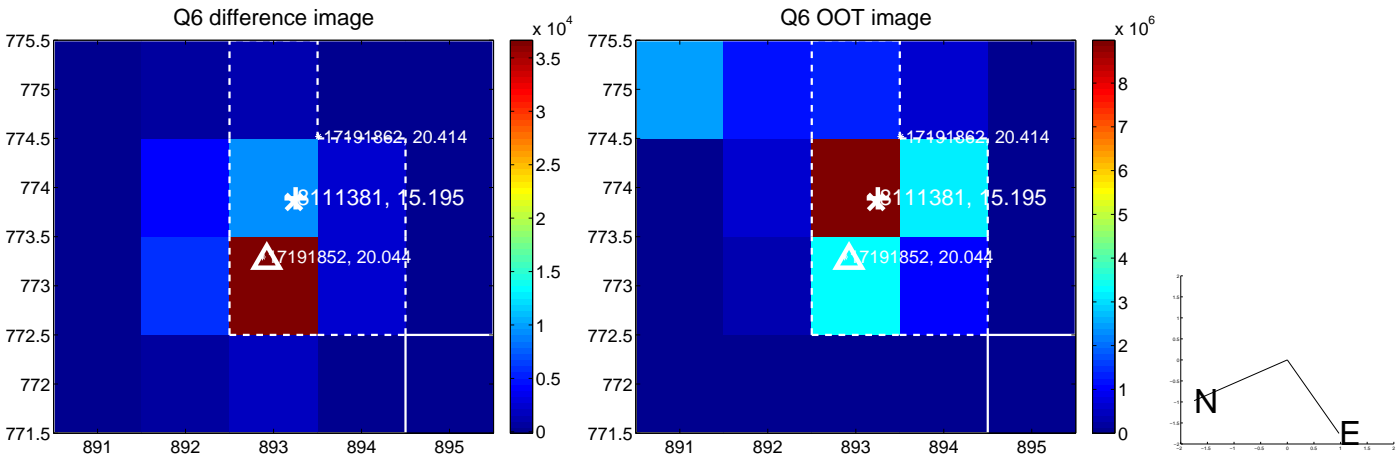
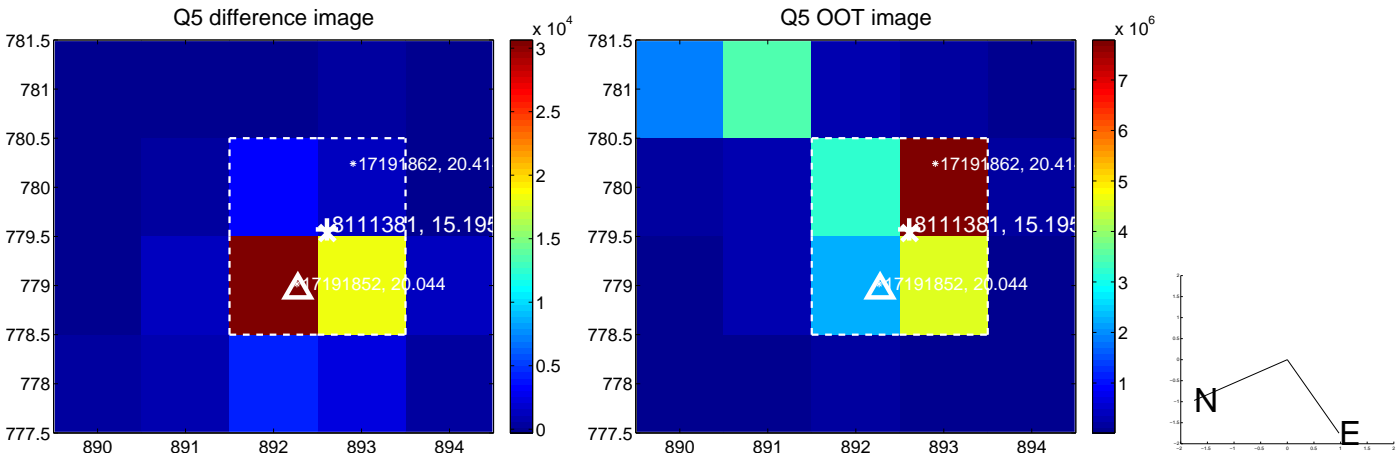


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

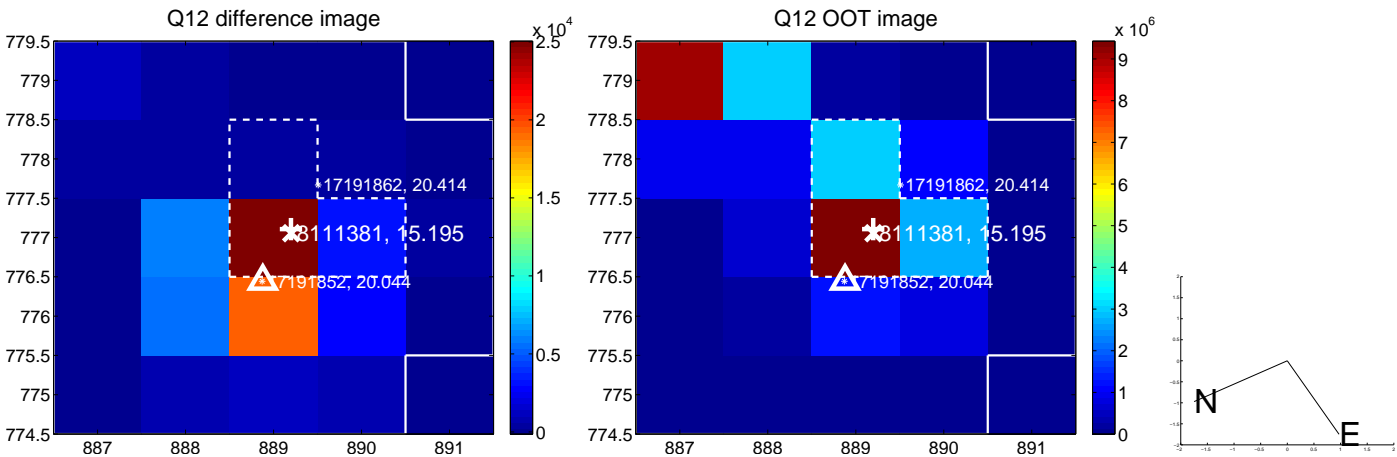
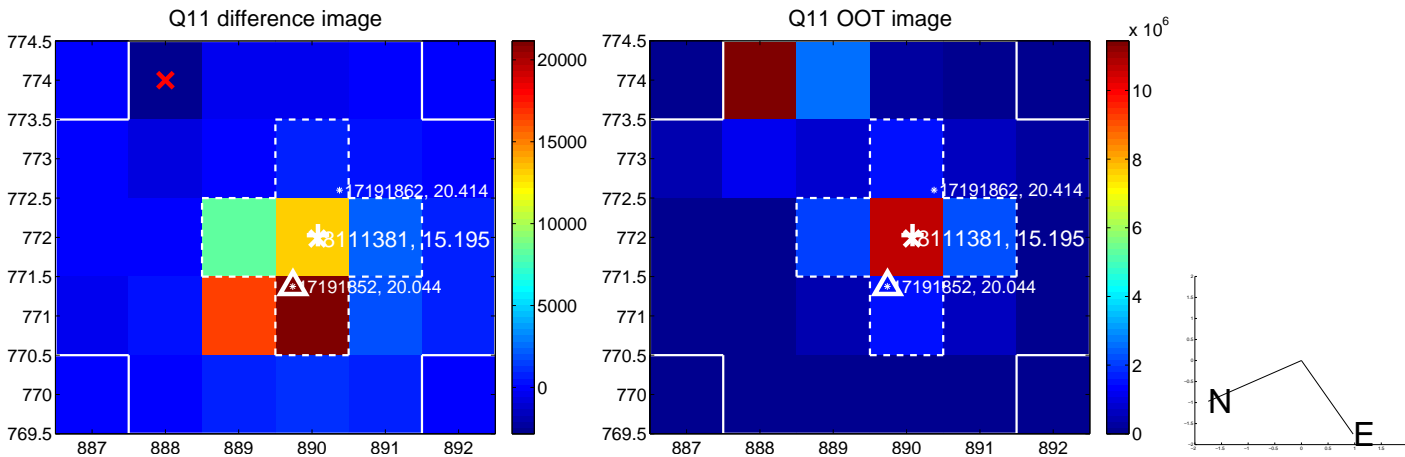
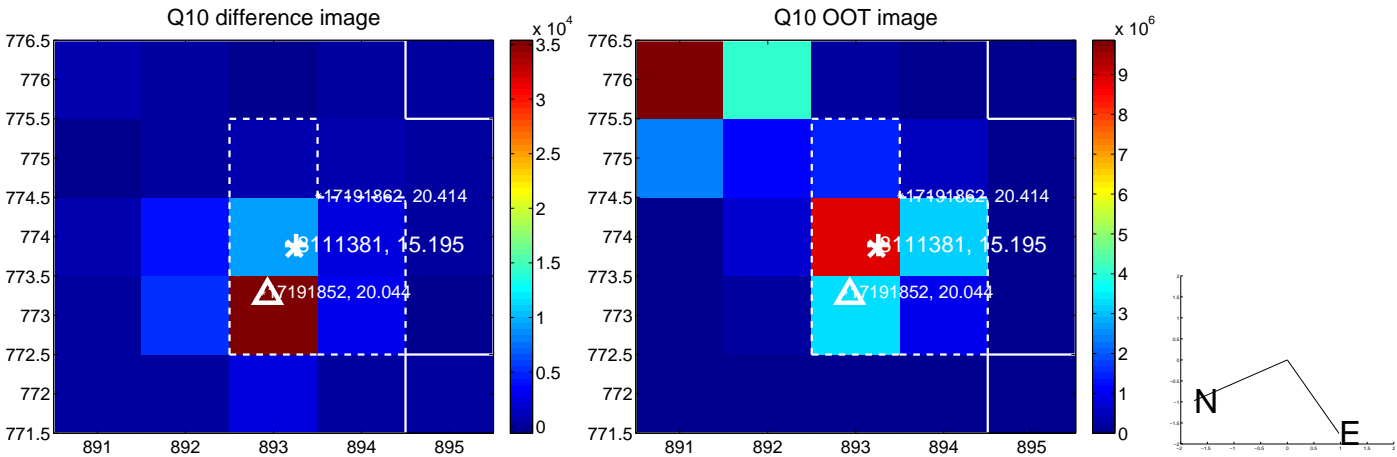
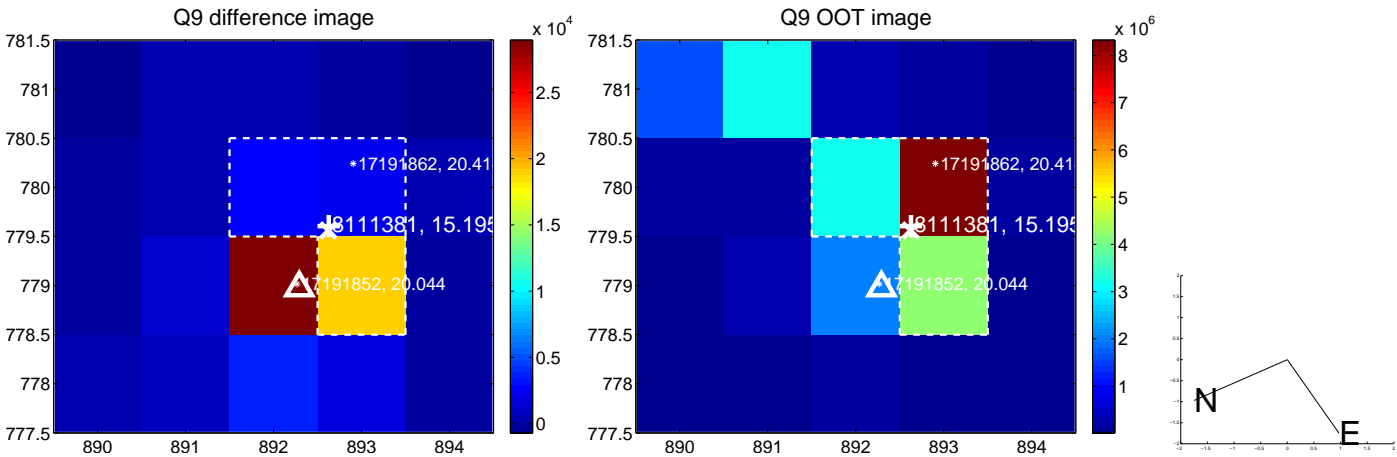
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



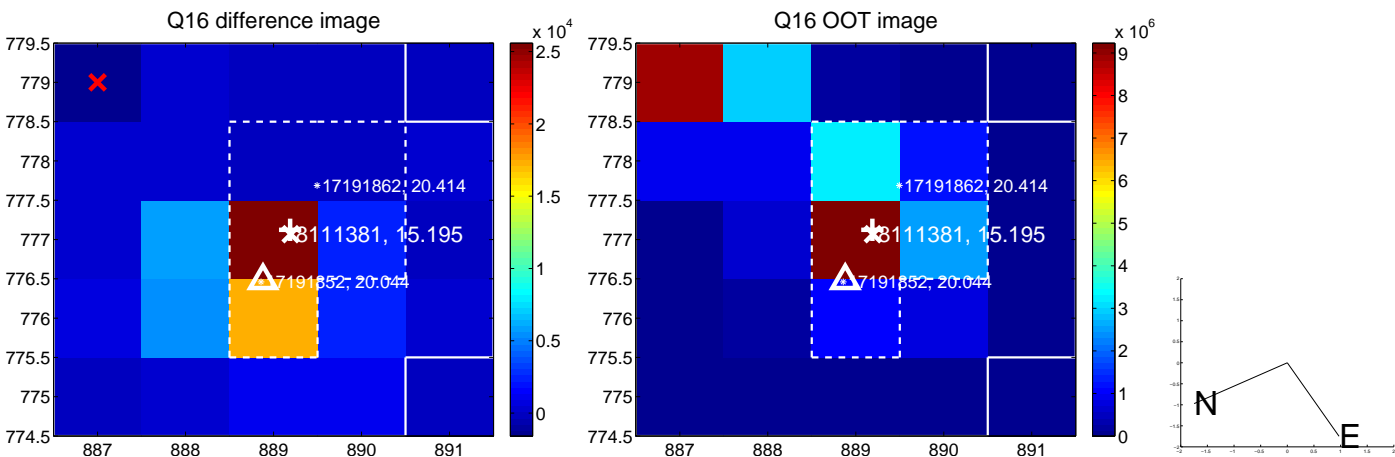
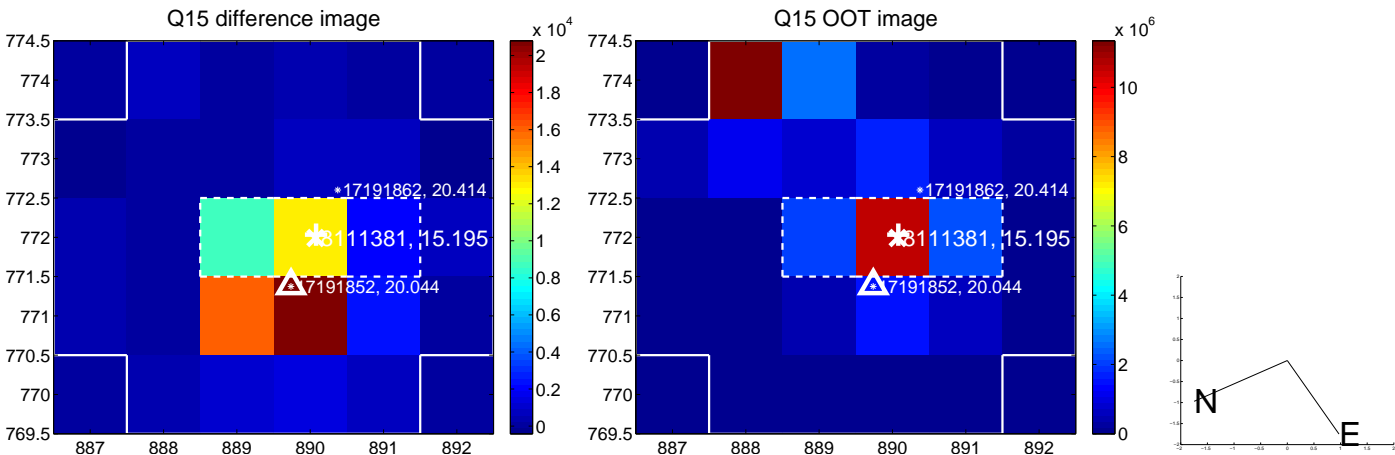
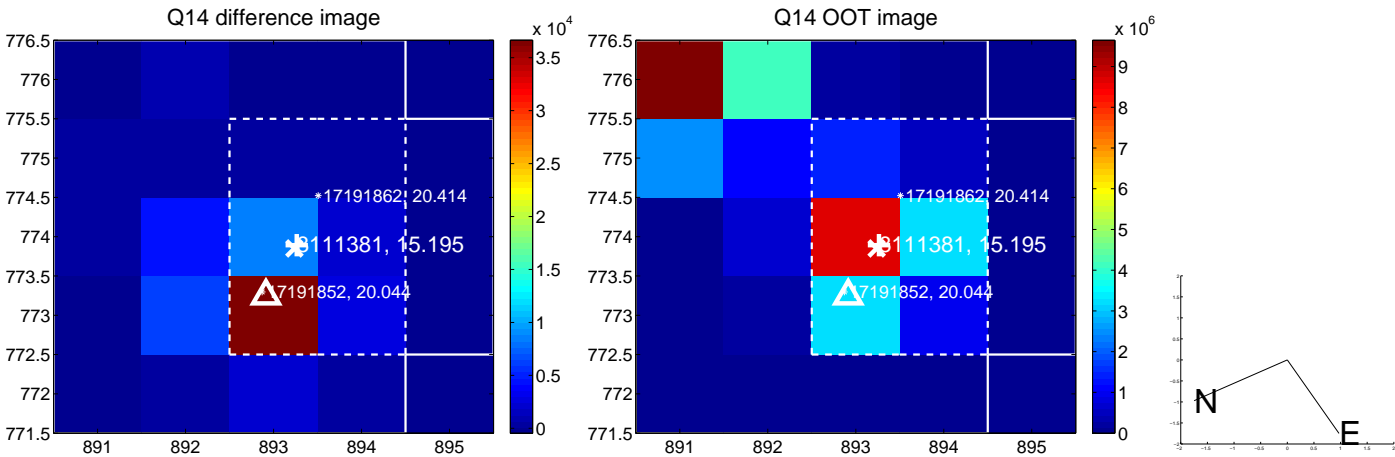
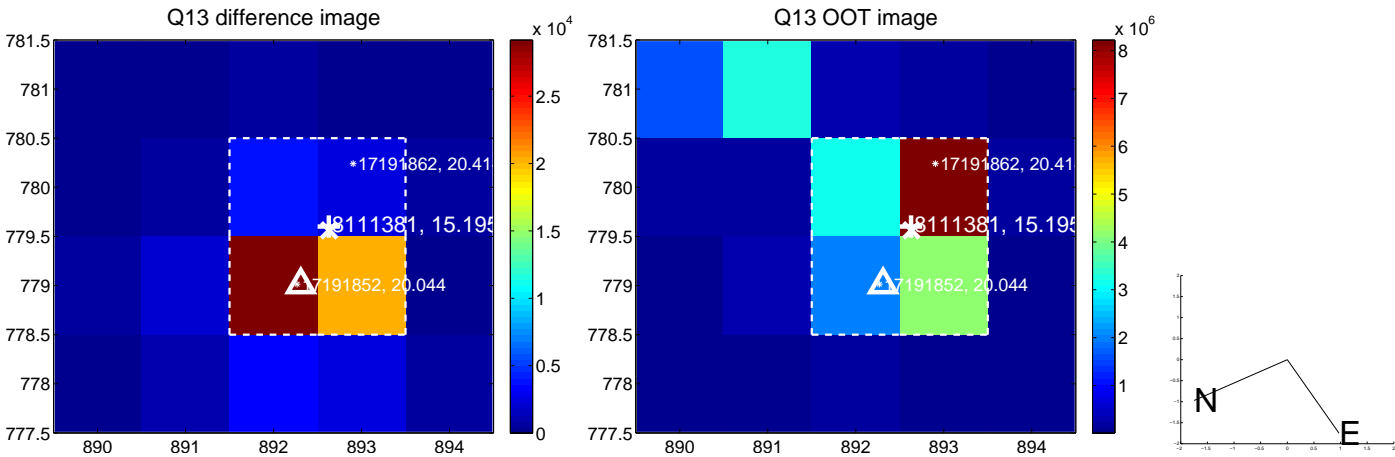
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

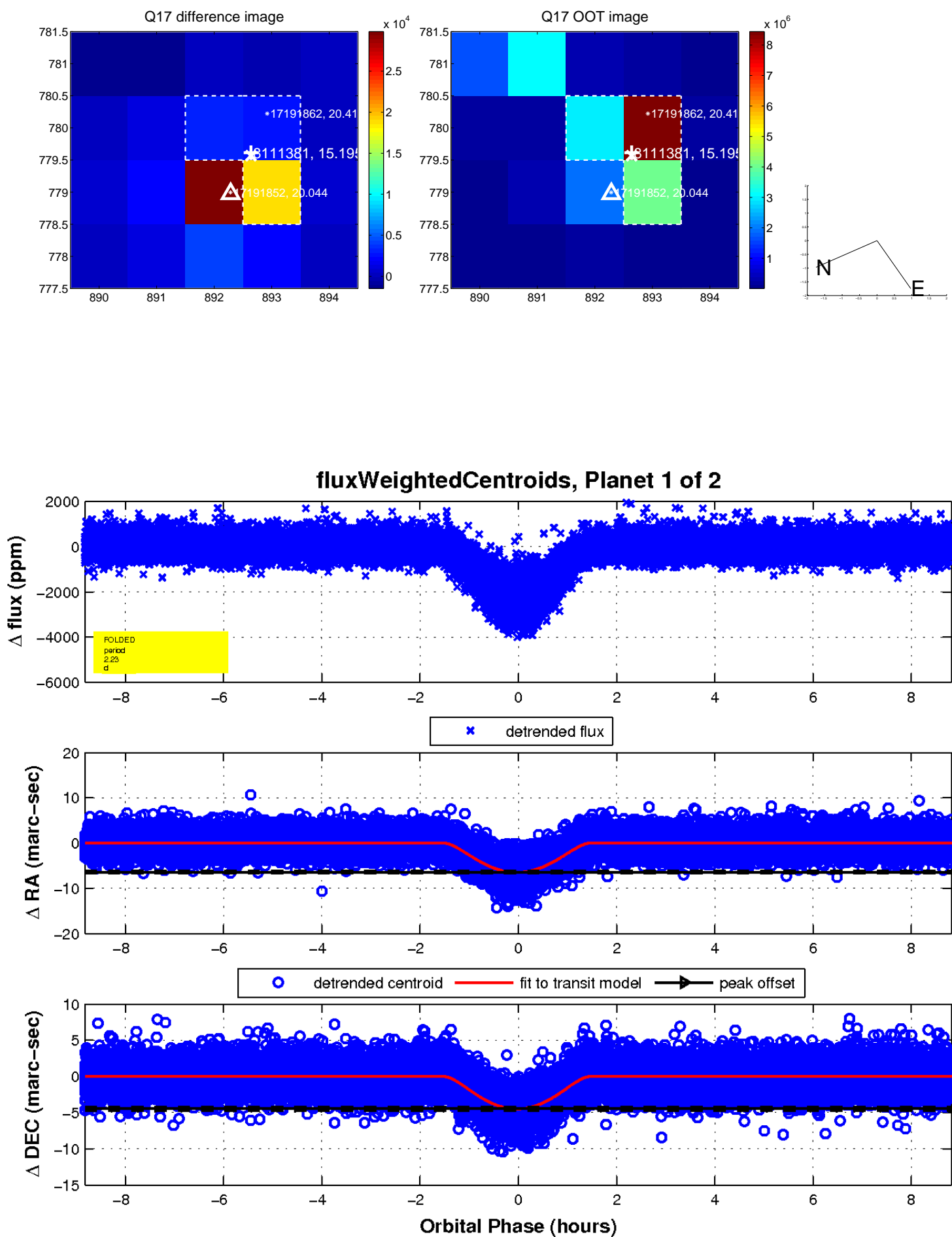


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



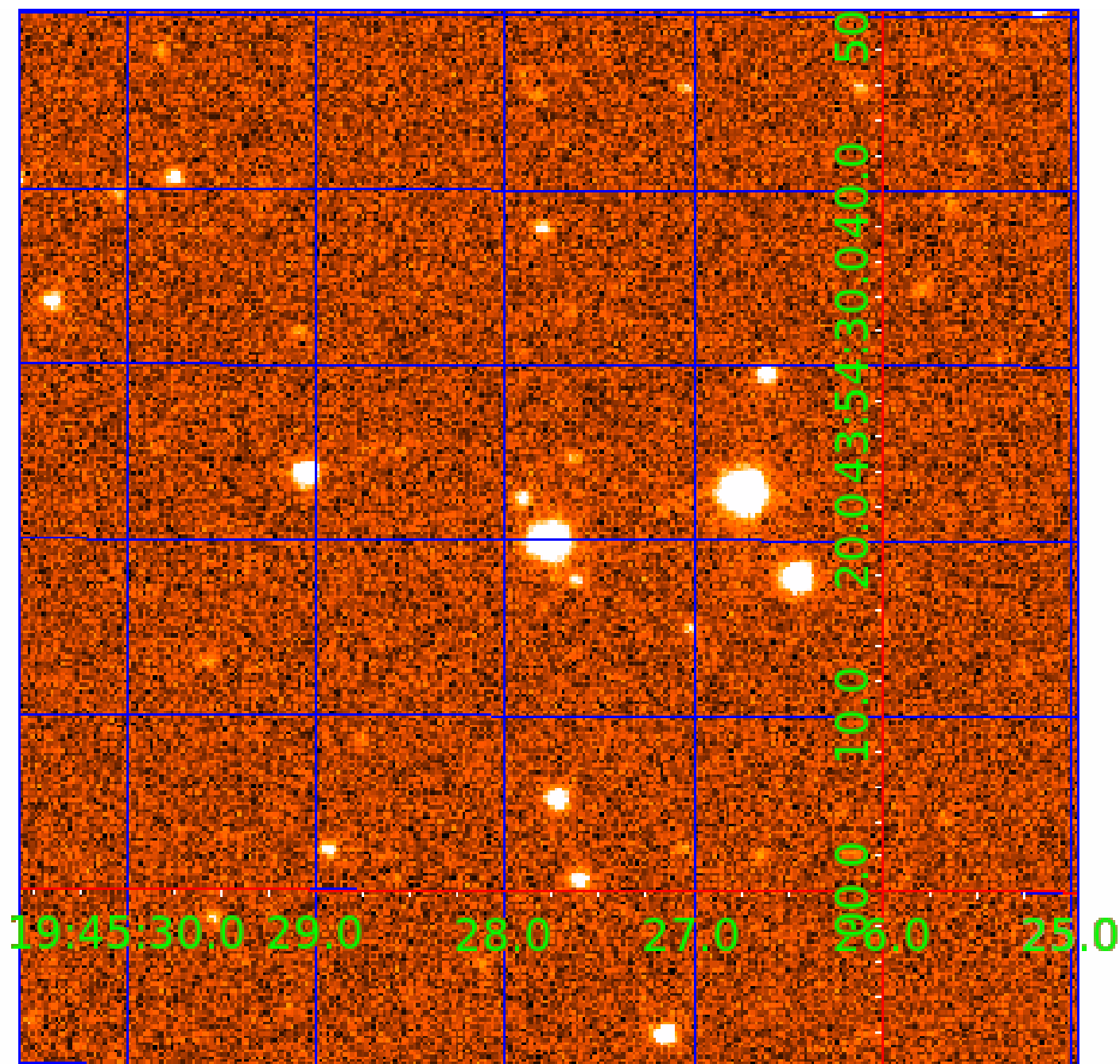


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 008111381

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111381-01	OBS	1550.01	2.233806	132.485031	2650.9	2.940	241.9	239.6	0.85	5741	6.90	650.18
008111381-02	OBS	No	1.116875	132.497781	177.4	2.295	20.1	21.1	0.85	5741	1.34	1638.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111381-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
008111381-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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.

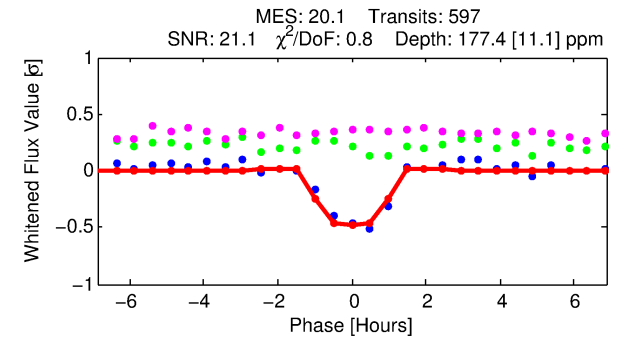
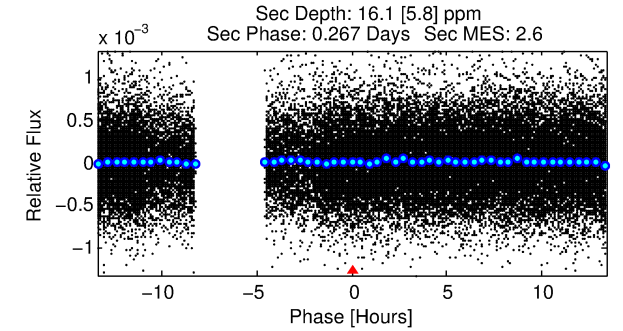
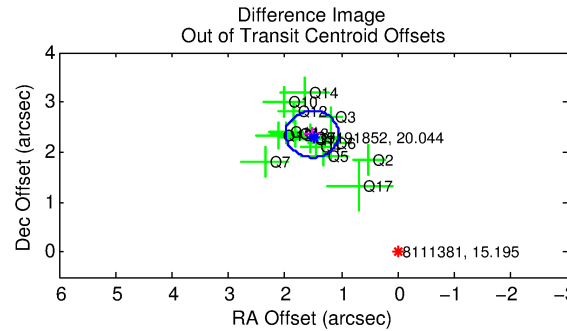
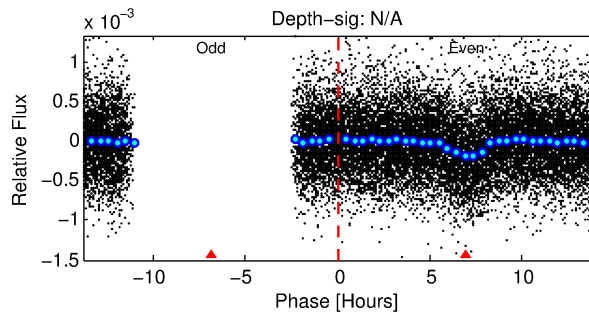
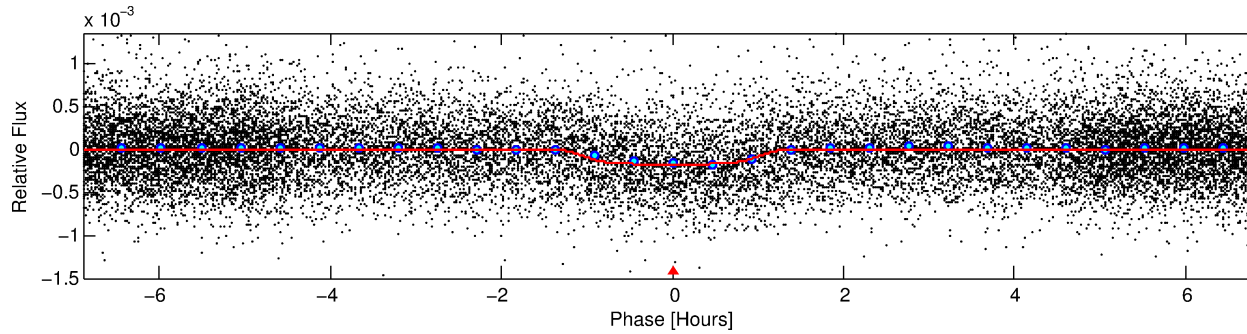
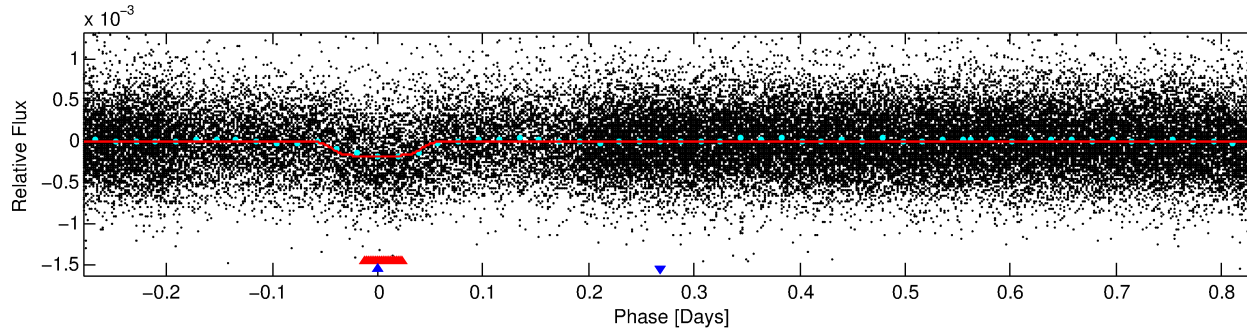
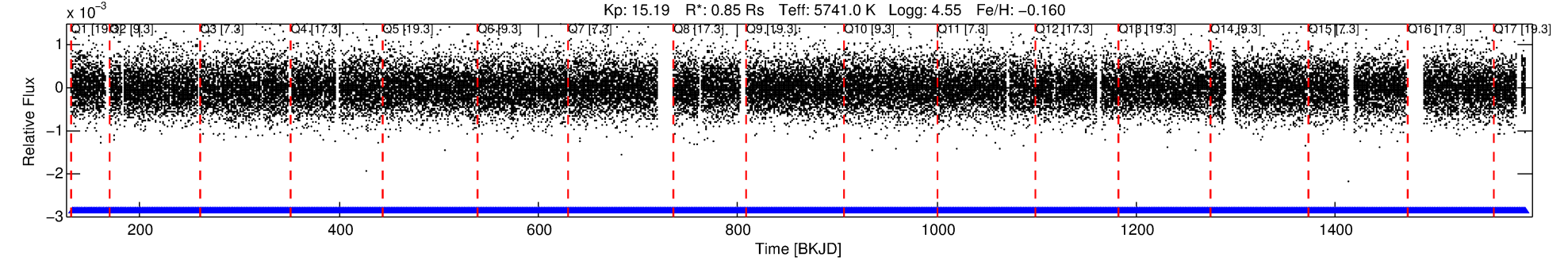
## Ephemeris Match Information For 008111381-02

No Significant Match Found

# DV One-Page Summary

KIC: 8111381 Candidate: 2 of 2 Period: 1.117 d  
KOI: K01550 Corr: No Ephemeris Match

Kp: 15.19 R\*: 0.85 Rs Teff: 5741.0 K Logg: 4.55 Fe/H: -0.160



## DV Fit Results:

Period = 1.11688 [0.00001] d  
Epoch = 132.4978 [0.0015] BKJD  
Rp/R\* = 0.0145 [0.0052]  
a/R\* = 1.99 [2.58]  
b = 0.90 [0.38]  
Seff = 1638.39 [609.86]  
Teq = 1622 [151] K  
Rp = 1.34 [0.61] Re  
a = 0.0206 [0.0049] AU  
Ag = 2.11 [1.85] [0.60σ]  
Teffp = 3021 [615] K [2.21σ]

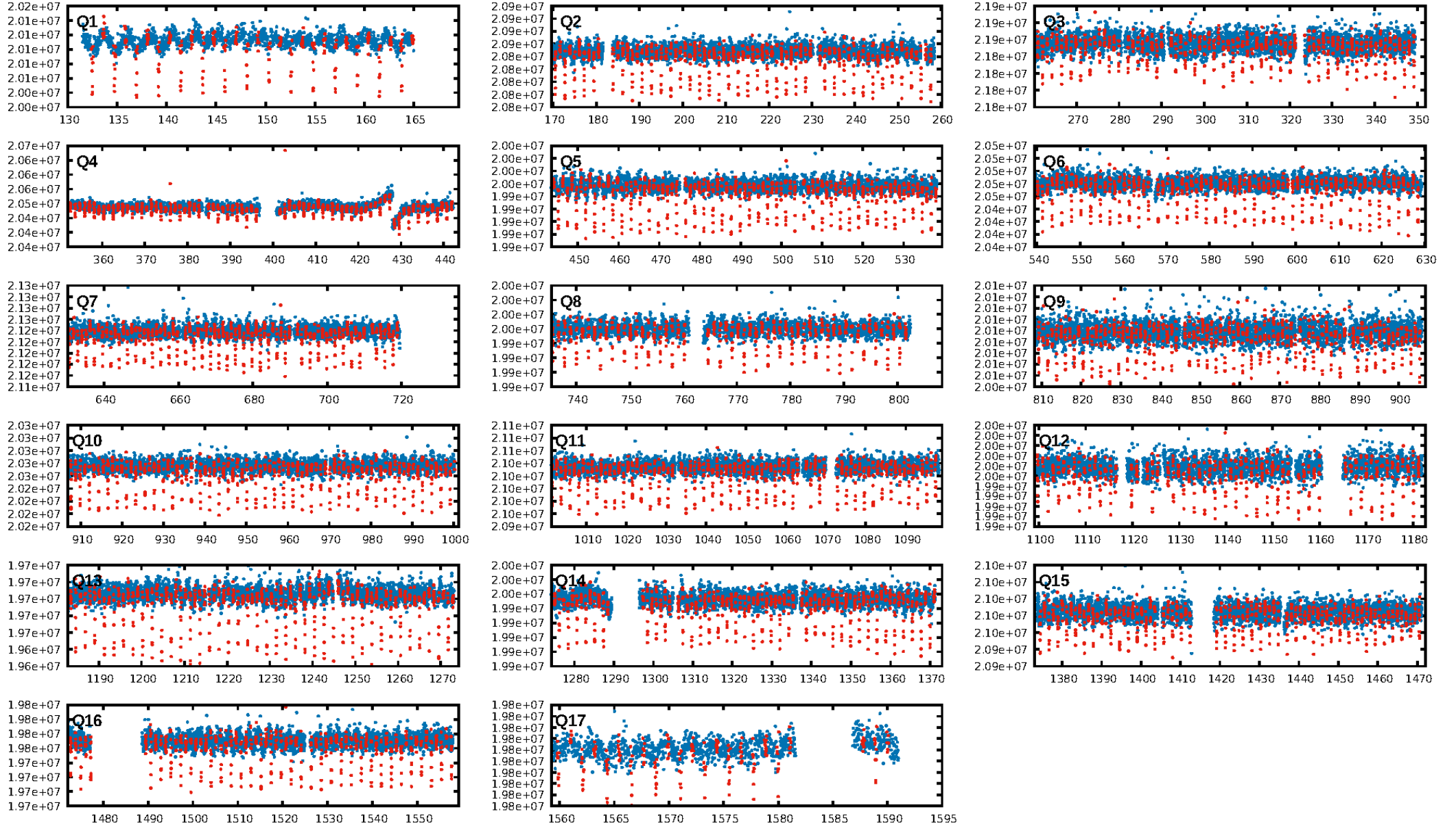
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [7.19σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.71e-86  
RollingBand-fgt: 1.00 [570/570]  
GhostDiagnostic-chr: 2.039  
Centroid-sig: 0.0%  
Centroid-so: 2.240 arcsec [3.69σ]  
OotOffset-rm: 2.808 arcsec [18.03σ]  
KicOffset-rm: 2.671 arcsec [17.11σ]  
OotOffset-st: 4/4/2/5 [15]  
KicOffset-st: 4/4/2/5 [15]  
DiffImageQuality-fgm: 0.87 [13/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:41:51 Z

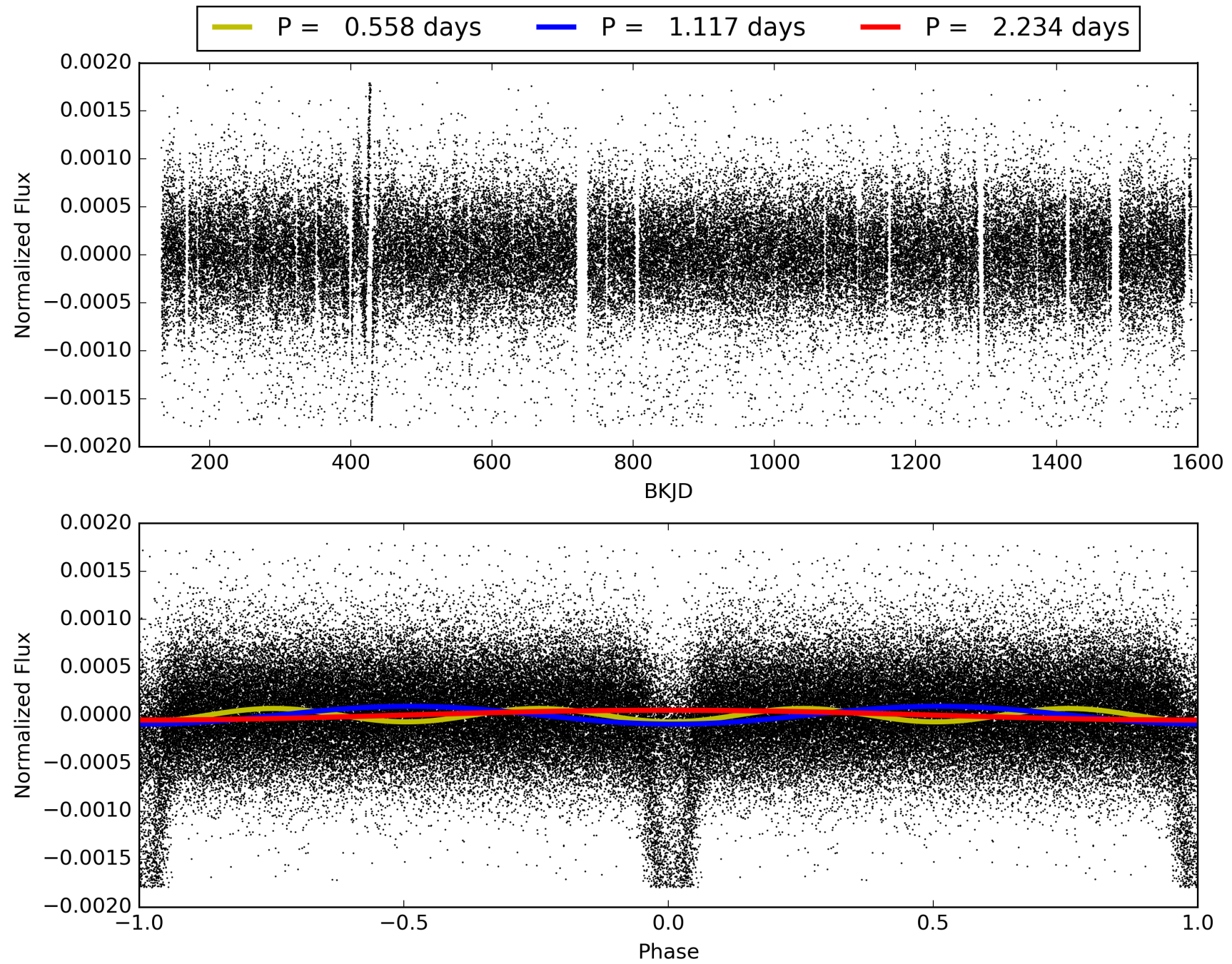
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008111381-02, PDC Light Curves



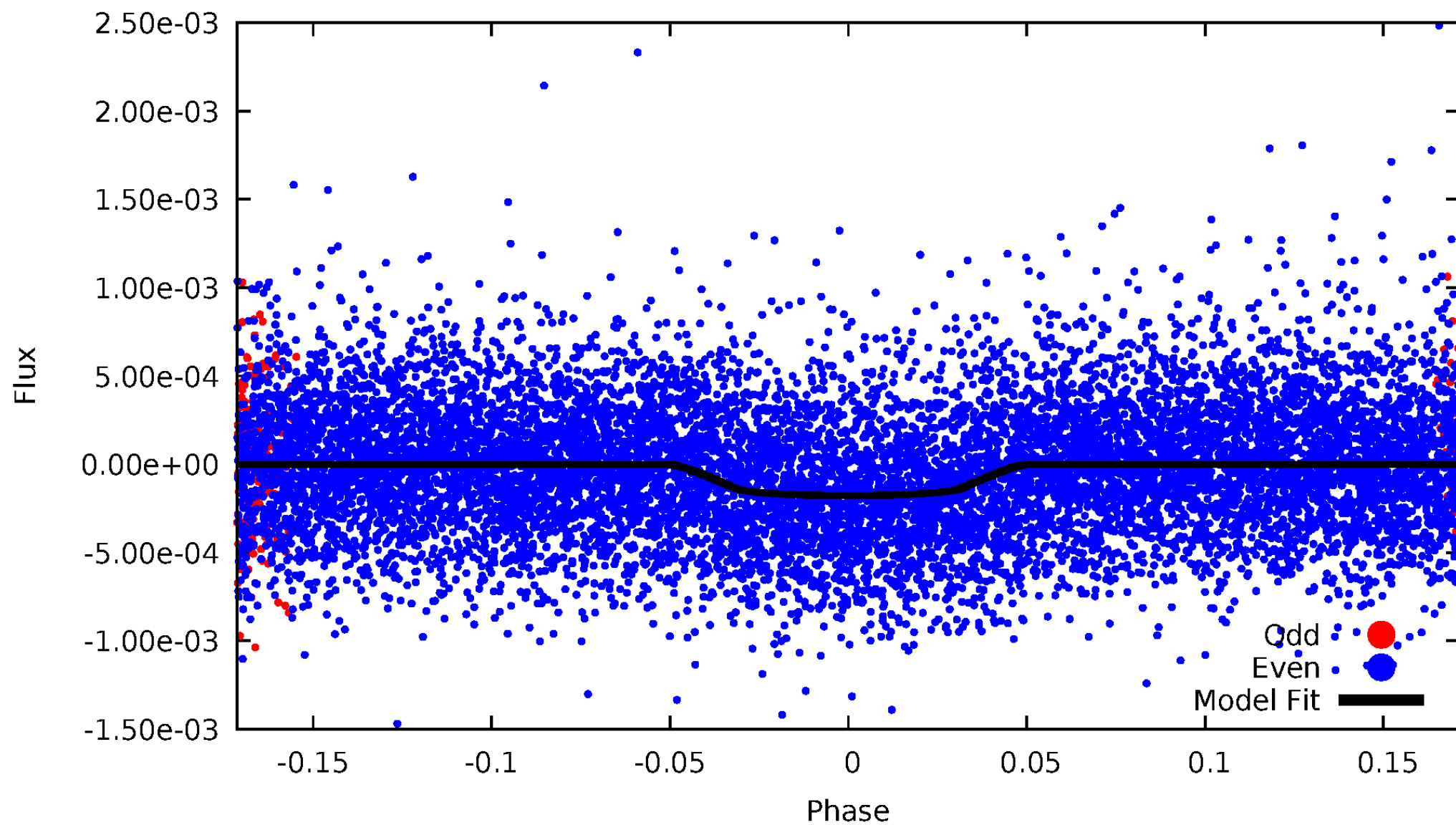


TCE 008111381-02



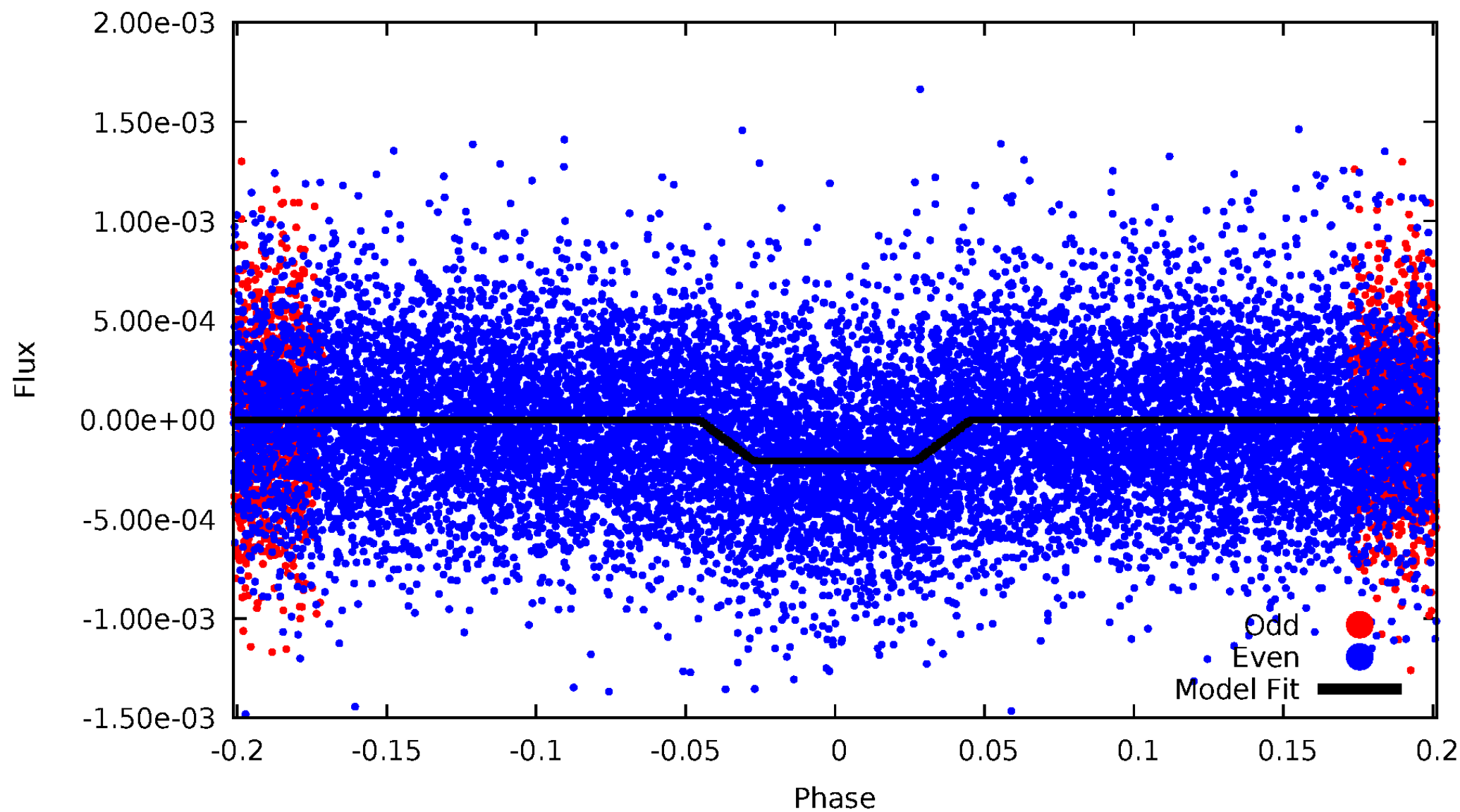
# DV Odd/Even

TCE 008111381-02



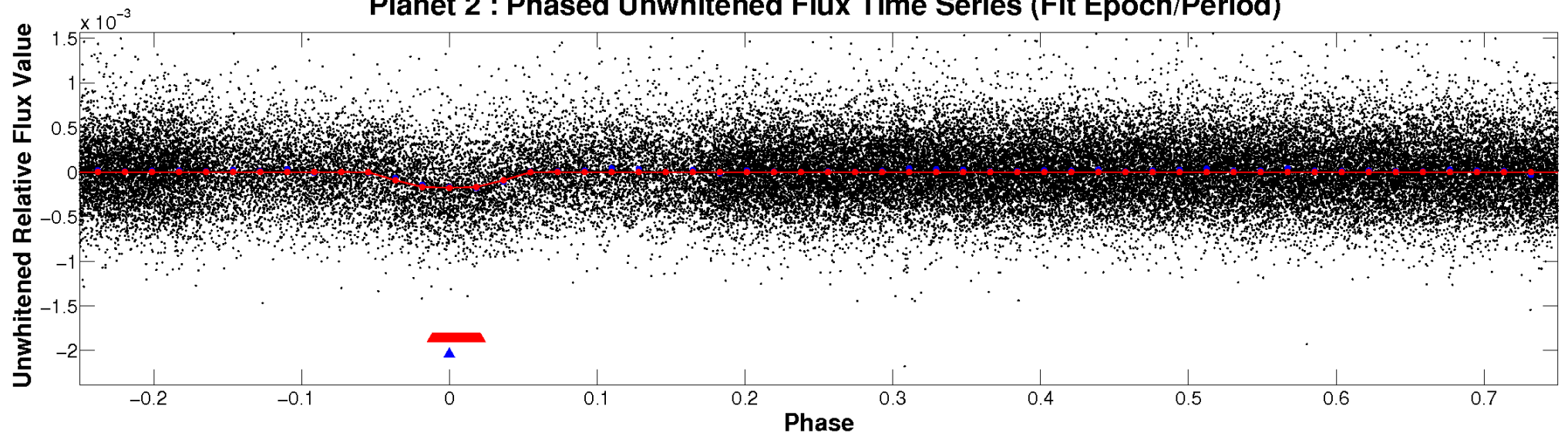
# ALT Odd/Even

TCE 008111381-02

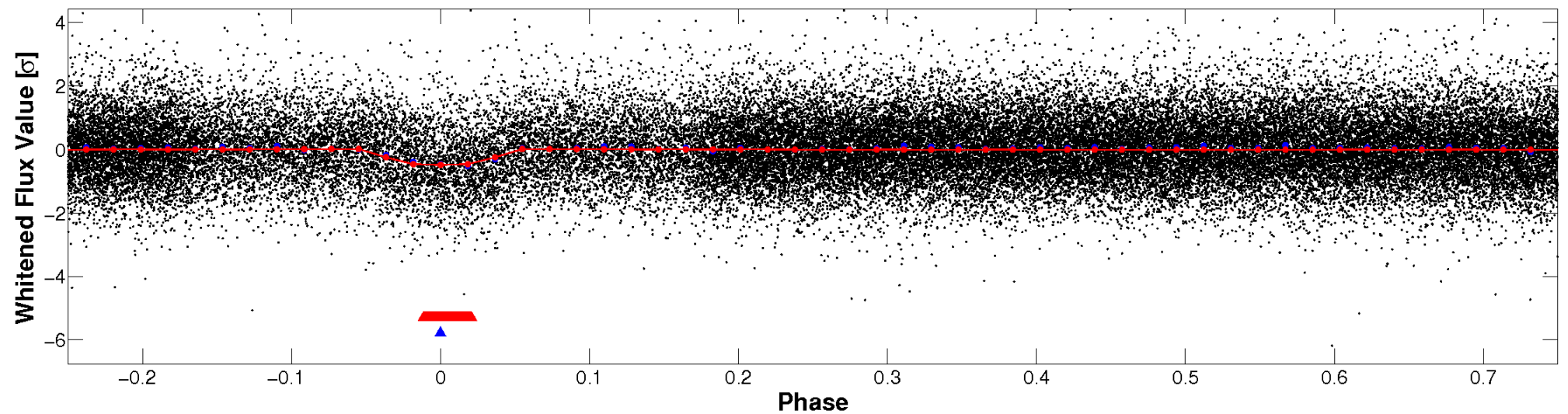


# Non-Whitened Vs. Whitened Light Curve

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



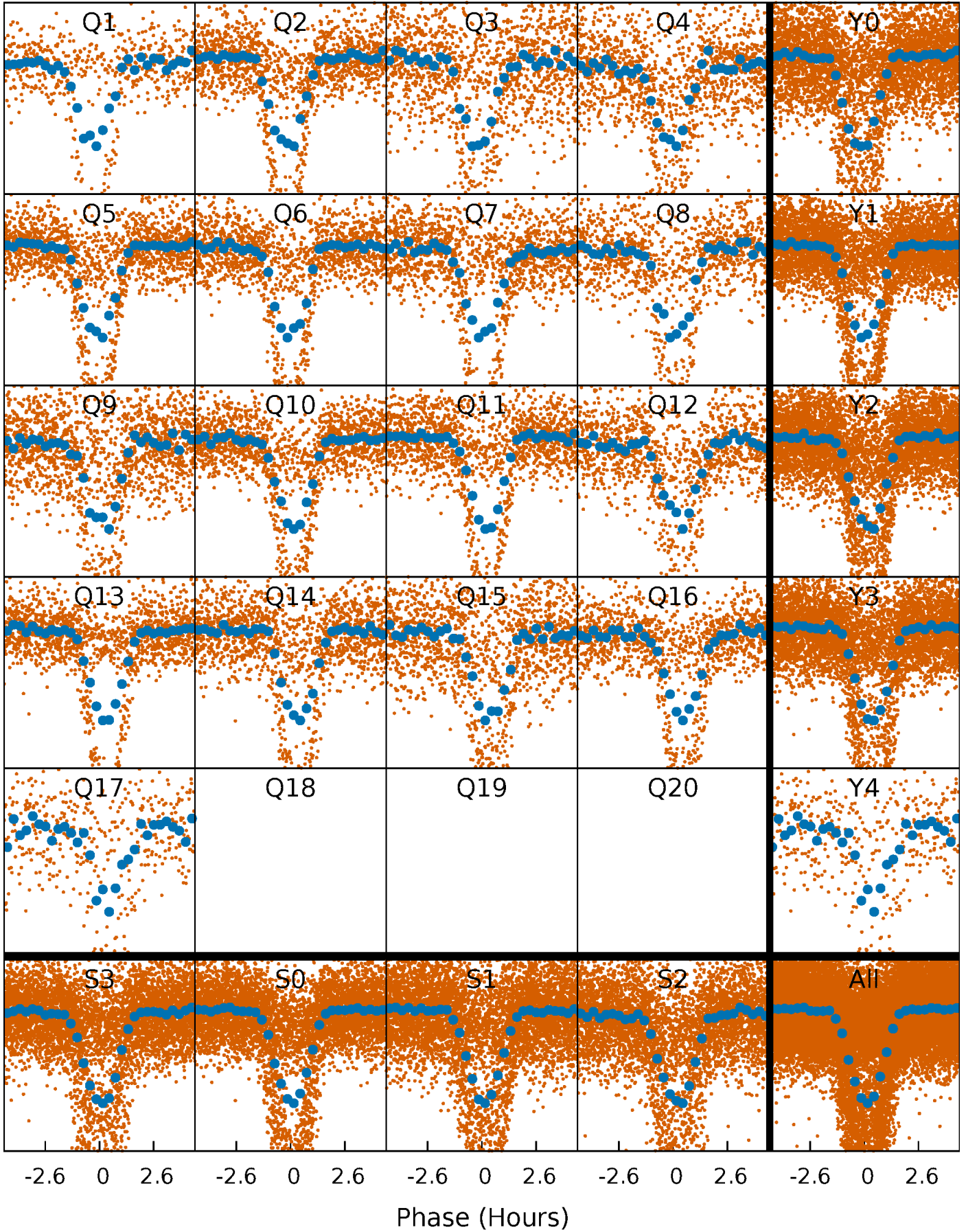
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

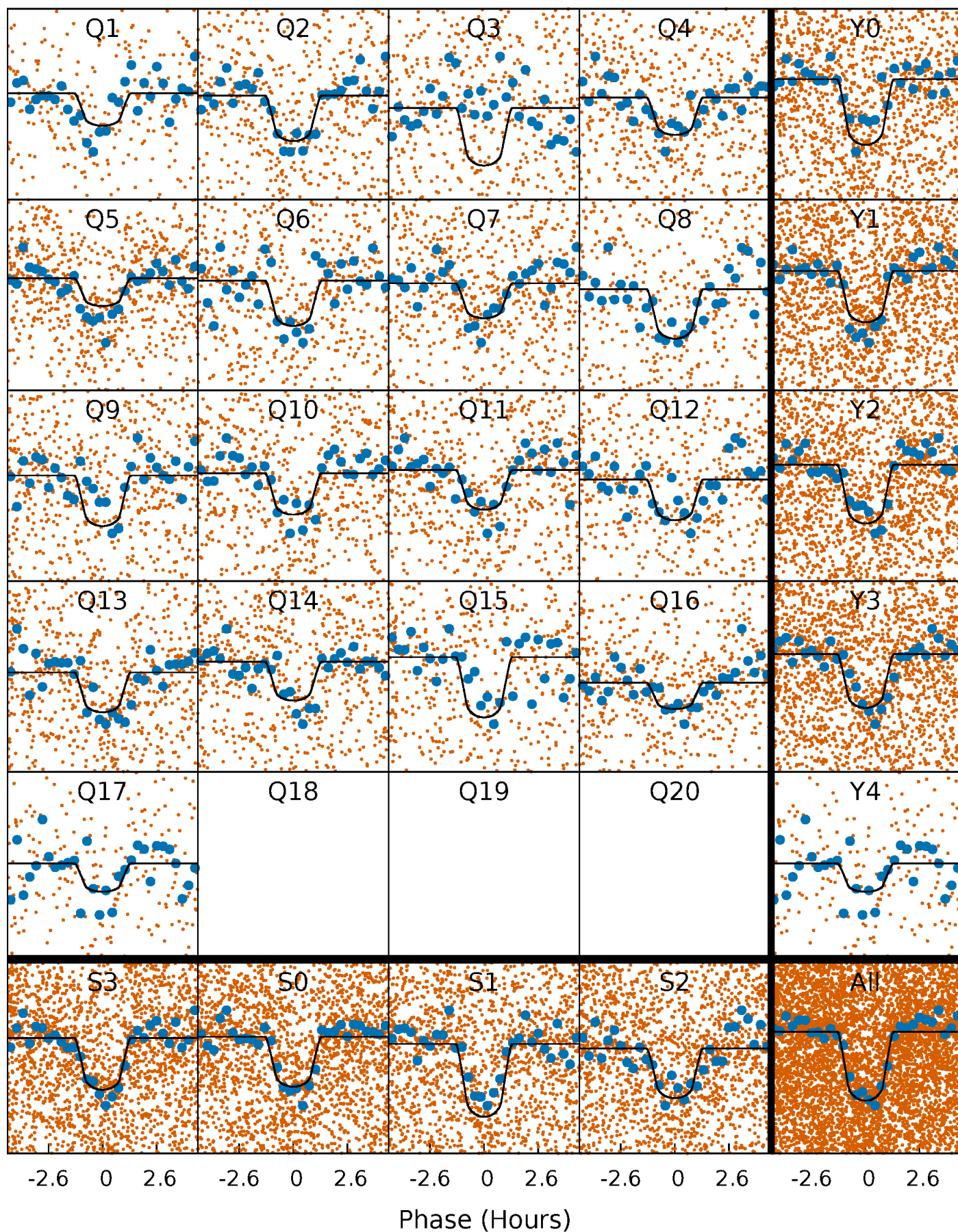
TCE 008111381-02   P= 1.116875 Days    $T_0=132.497781$  (BKJD)





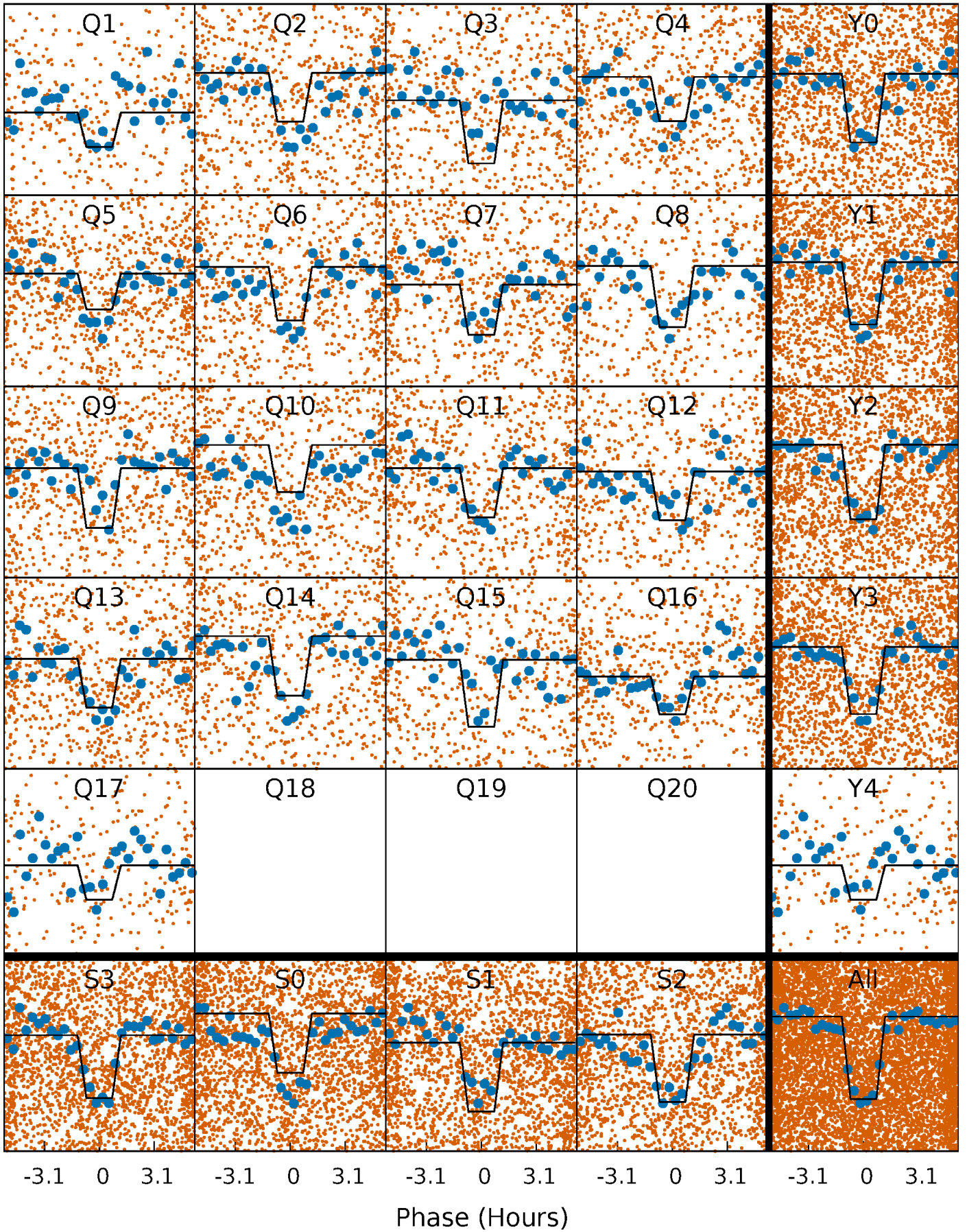
# DV Quarter-Phased Transit Curves

TCE 008111381-02 P= 1.116875 Days  $T_0=132.497781$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

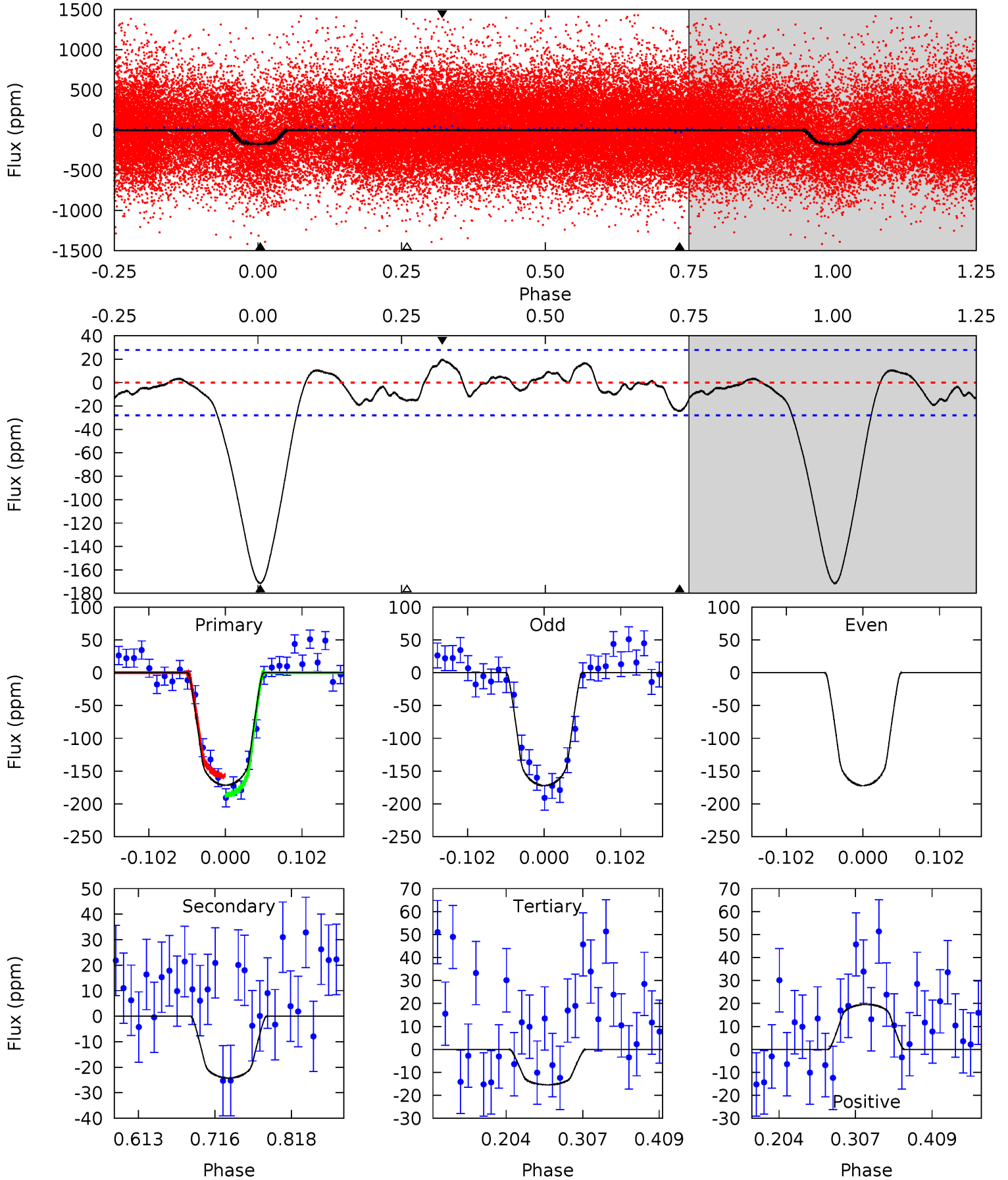
TCE 008111381-02 P= 1.116898 Days  $T_0=132.488478$  (BKJD)



# DV Model-Shift Uniqueness Test

008111381-02, P = 1.116875 Days, E = 131.380906 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
28.0	3.96	2.52	3.20	4.56	1.63	1.57	25.5	24.8	1.44	0.76	0	0.92	0.10	2.35

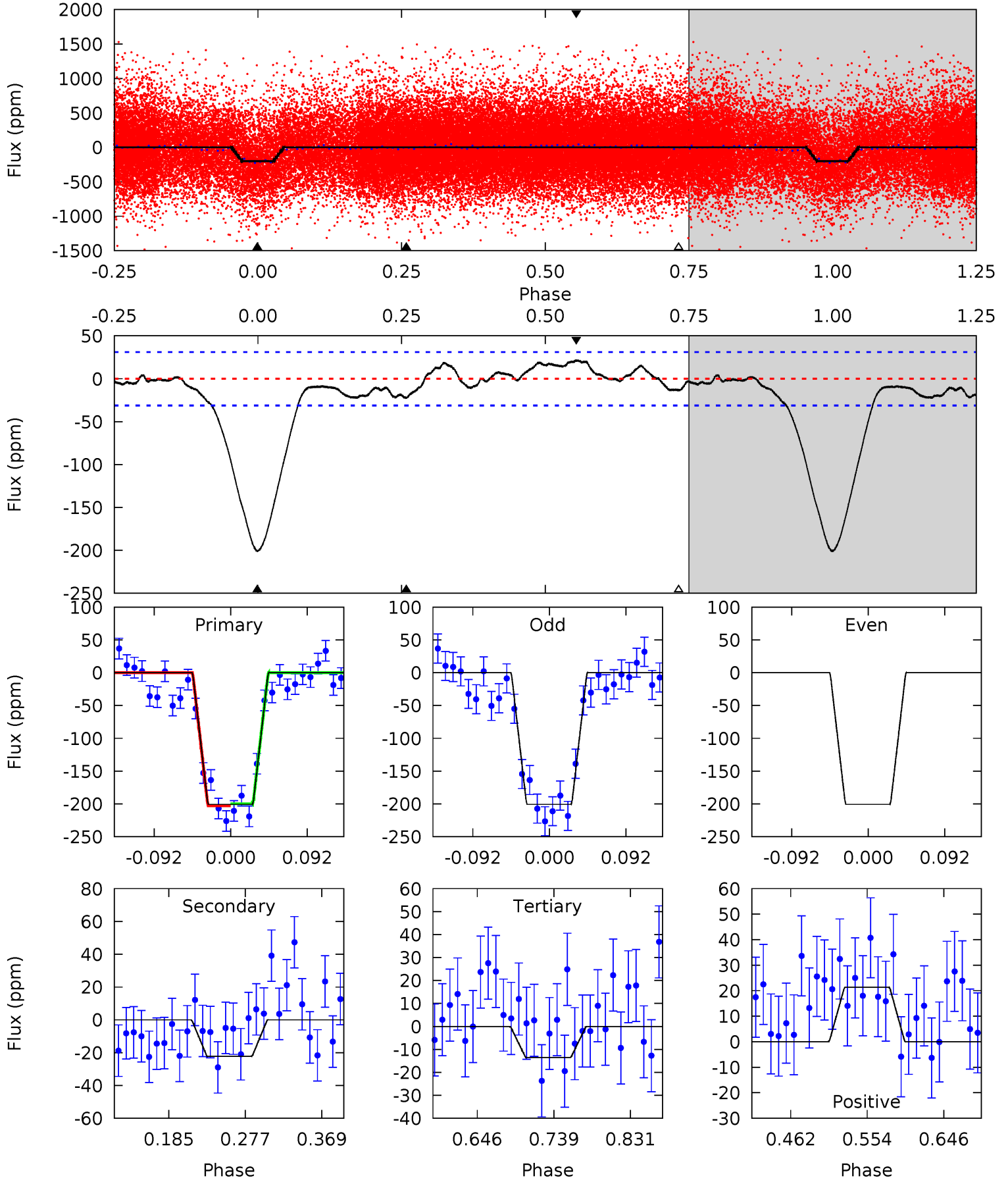




# Alt Model-Shift Uniqueness Test

008111381-02, P = 1.116898 Days, E = 131.371580 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
29.5	3.27	2.00	3.14	4.58	1.68	1.48	27.5	26.4	1.27	0.13	0	1.02	0.10	0.23



### Stellar Parameters For KIC 008111381

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5741^{+153}_{-170}$	$4.555^{+0.035}_{-0.196}$	$-0.160^{+0.300}_{-0.300}$	$0.846^{+0.234}_{-0.078}$	$0.938^{+0.095}_{-0.106}$	$2.178^{+0.397}_{-1.056}$
	+3%/-3%	+1%/-4%	+188%/-188%	+28%/-9%	+10%/-11%	+18%/-48%
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 008111381-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-24 \pm 6$	$1.38^{+0.56}_{-0.47}$	$2319^{+149}_{-98}$	$3715^{+614}_{-509}$	$2.881^{+3.990}_{-1.542}$
Alt.	$-22 \pm 7$	$1.42^{+0.56}_{-0.55}$	$2318^{+167}_{-98}$	$3614^{+683}_{-518}$	$2.491^{+4.266}_{-1.370}$

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

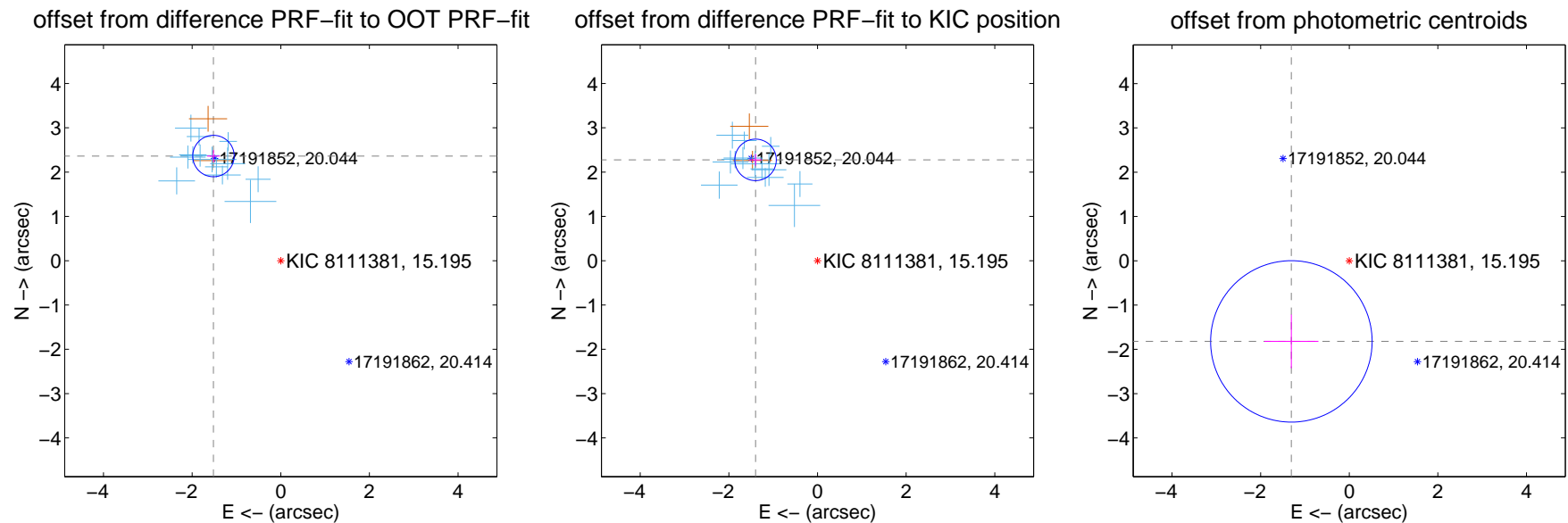
## DV Centroid Data

Supplemental centroid analysis for 008111381-02. Kepler magnitude: 15.20. Transit SNR 21.14

There are 13 quarters with good PRF difference image offsets

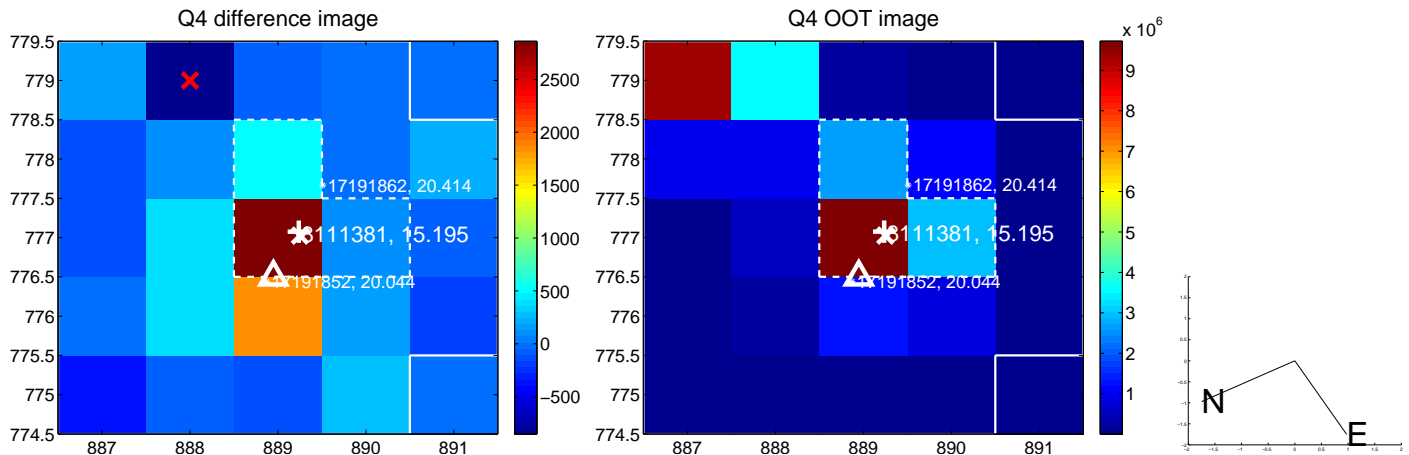
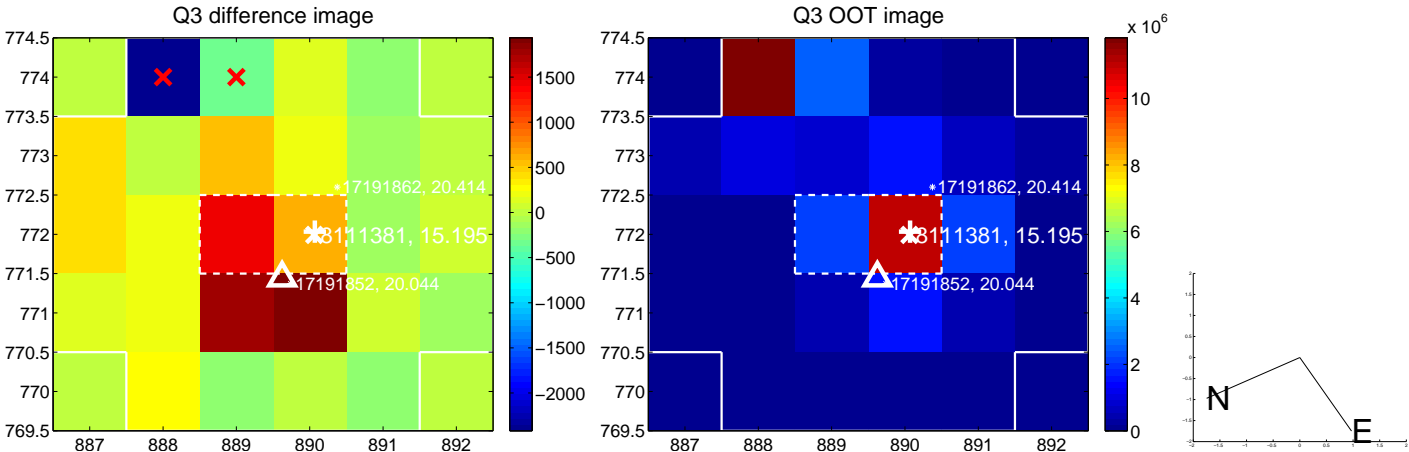
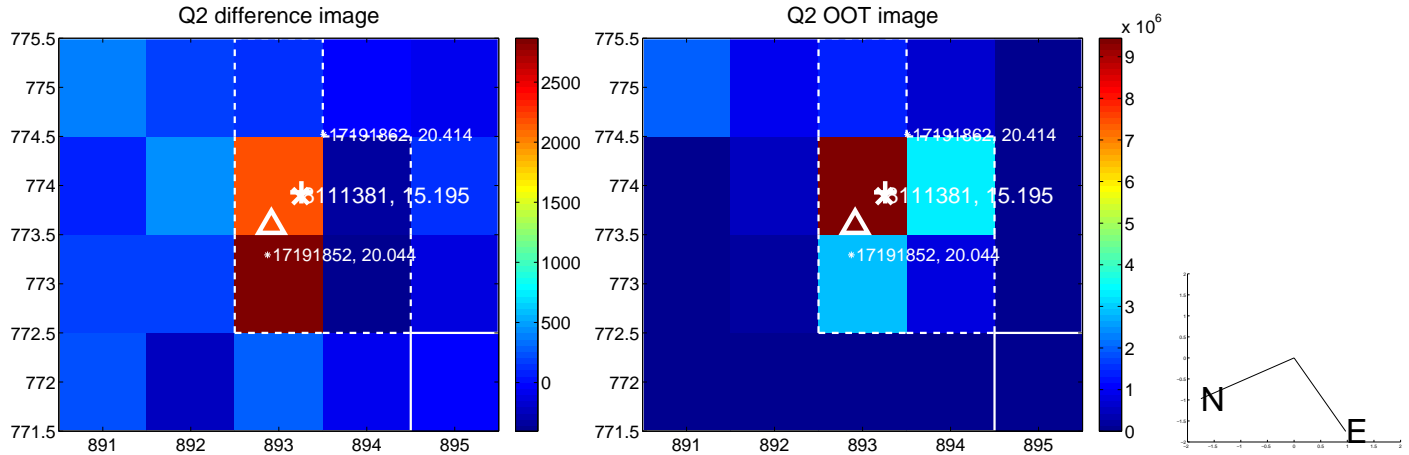
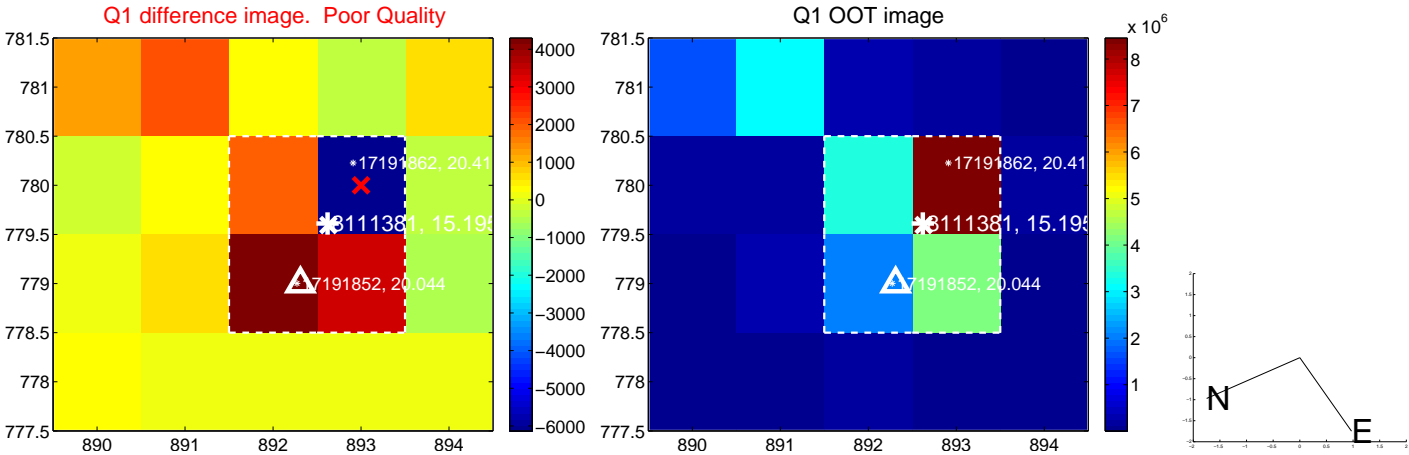
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.808 \pm 0.156$	18.03	$1.519 \pm 0.144$	$2.362 \pm 0.136$
PRF-fit source offset from KIC position	$2.671 \pm 0.156$	17.11	$1.398 \pm 0.144$	$2.276 \pm 0.131$
photometric centroid source offset	$2.24 \pm 0.61$	3.69	$1.31 \pm 0.61$	$-1.82 \pm 0.61$



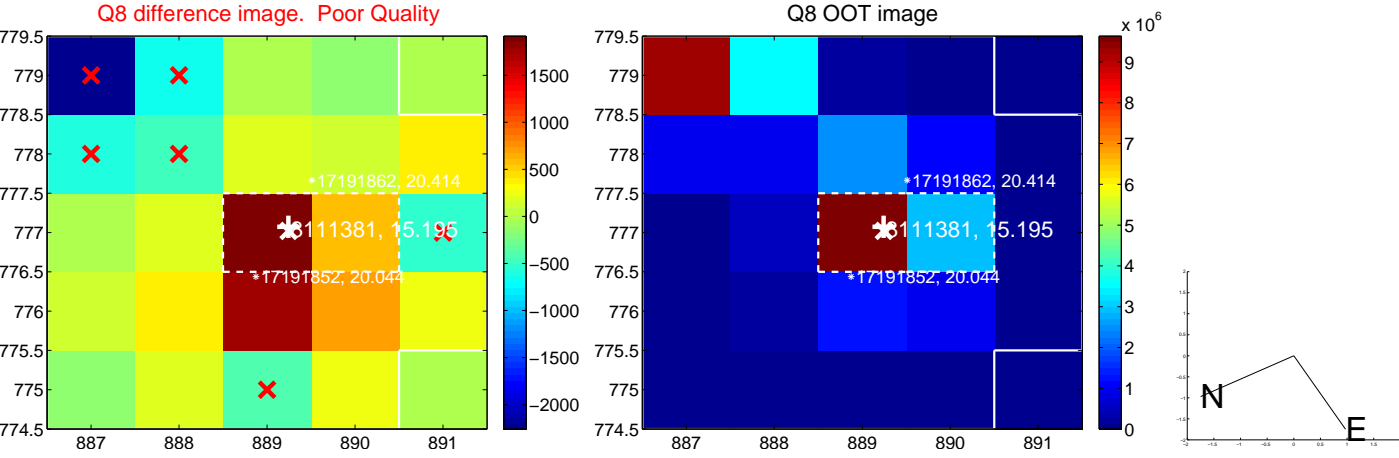
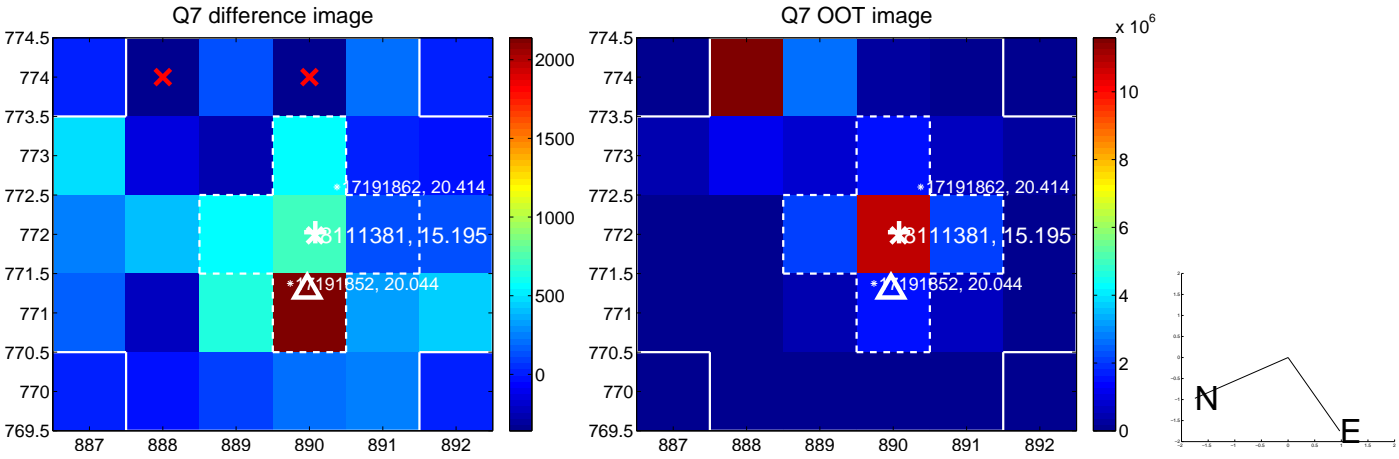
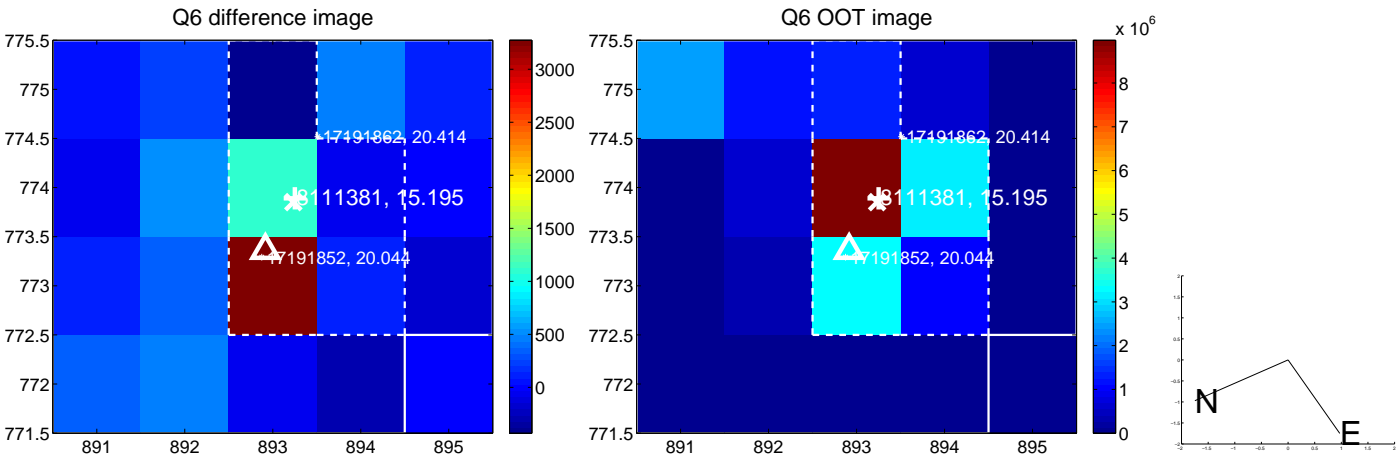
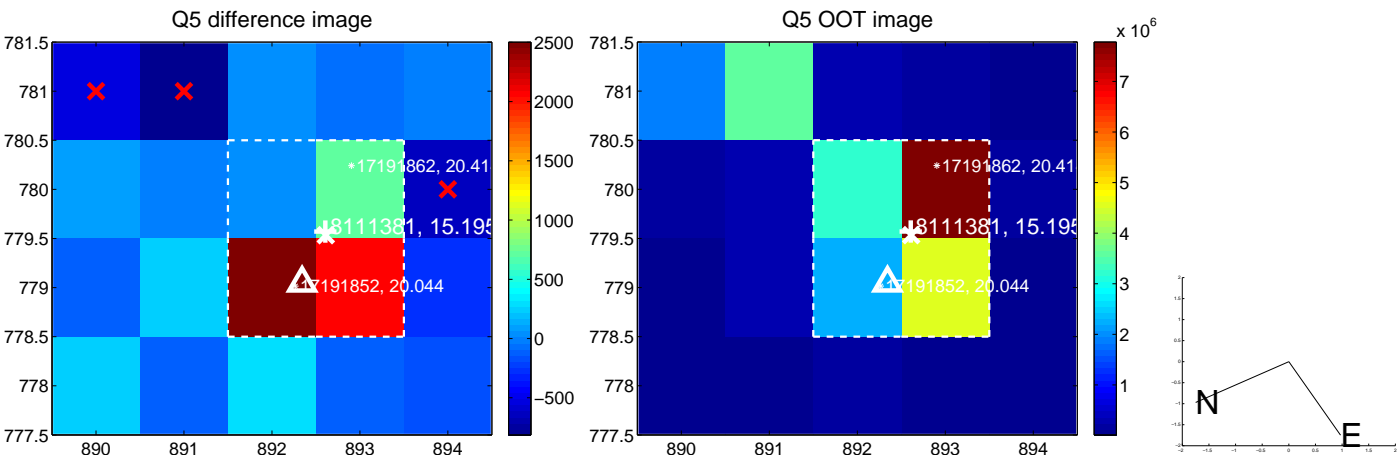
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

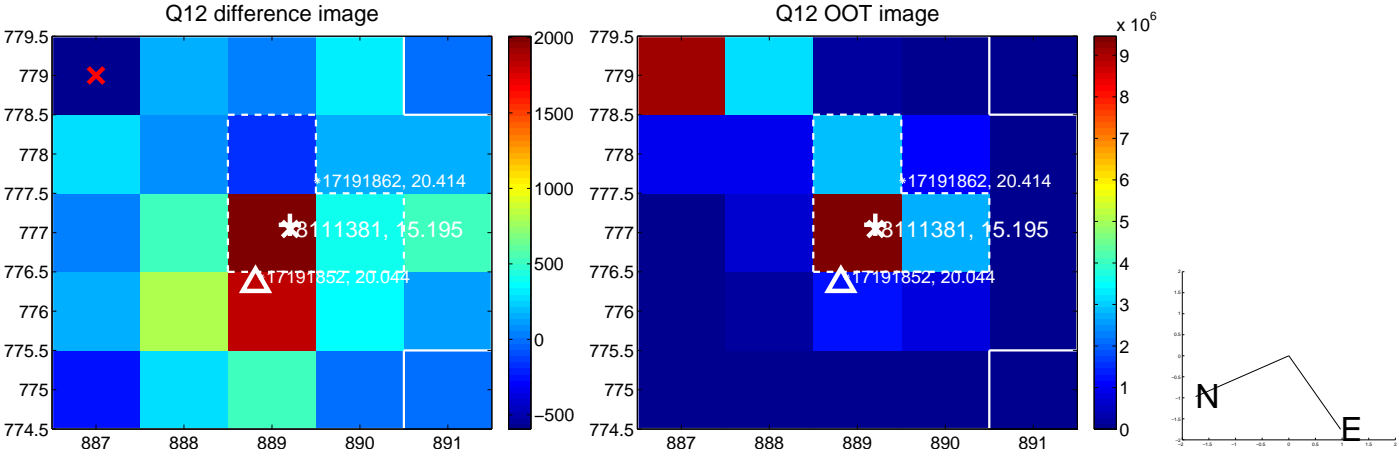
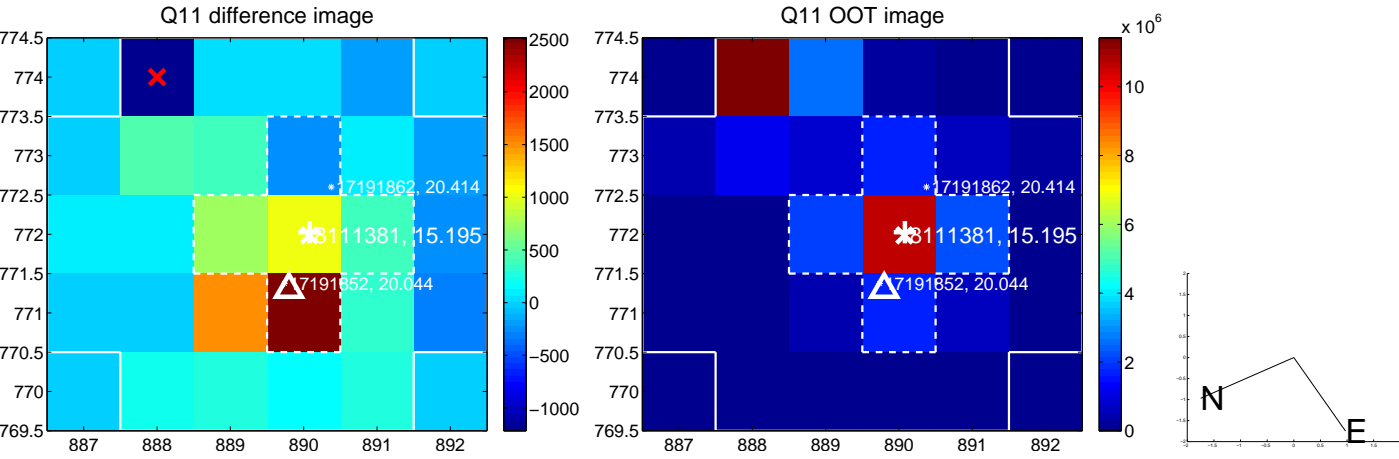
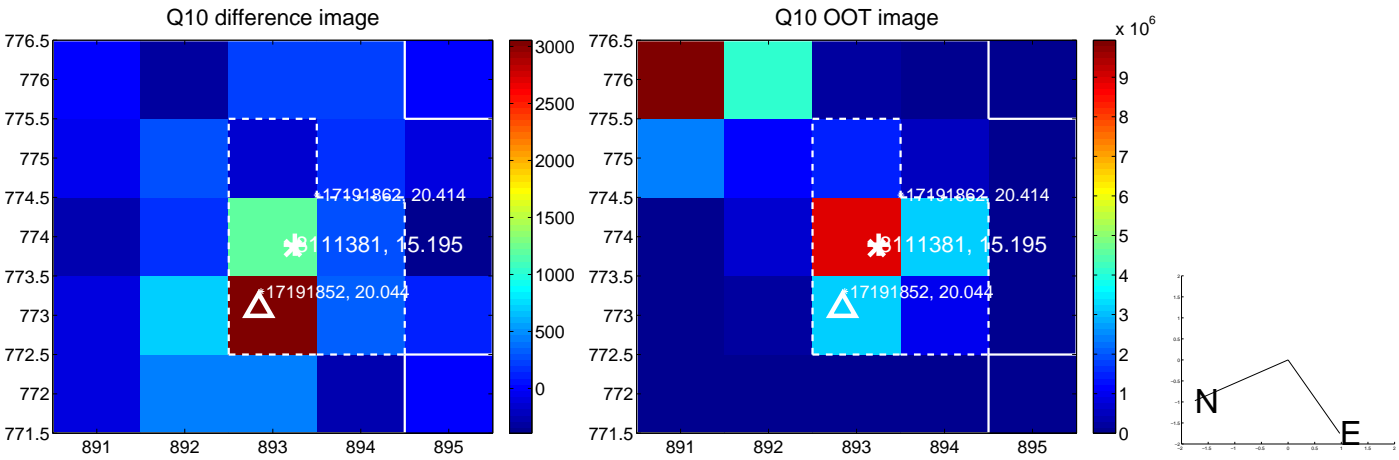
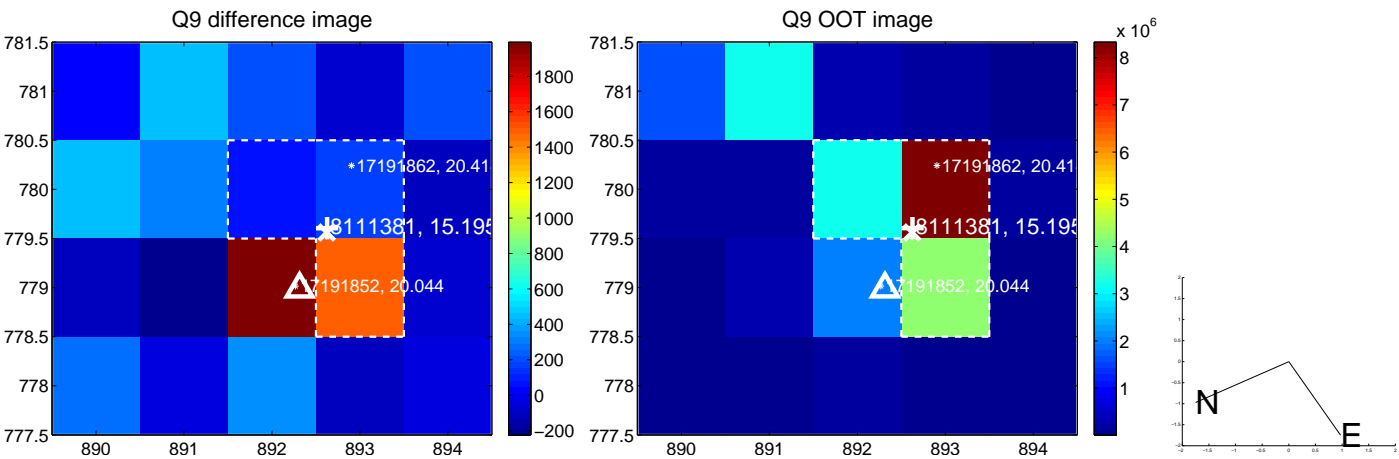




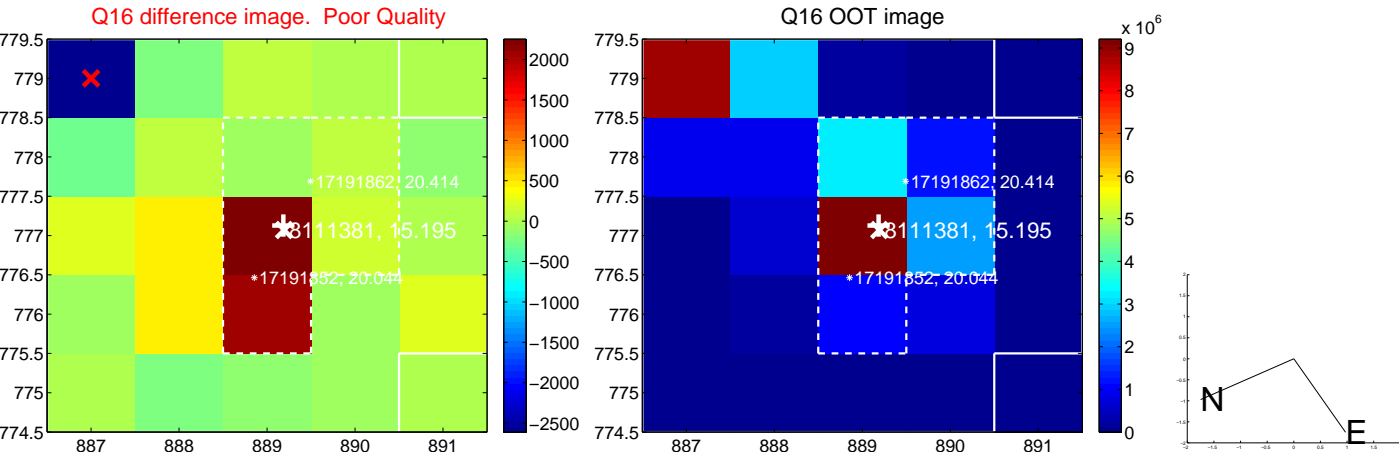
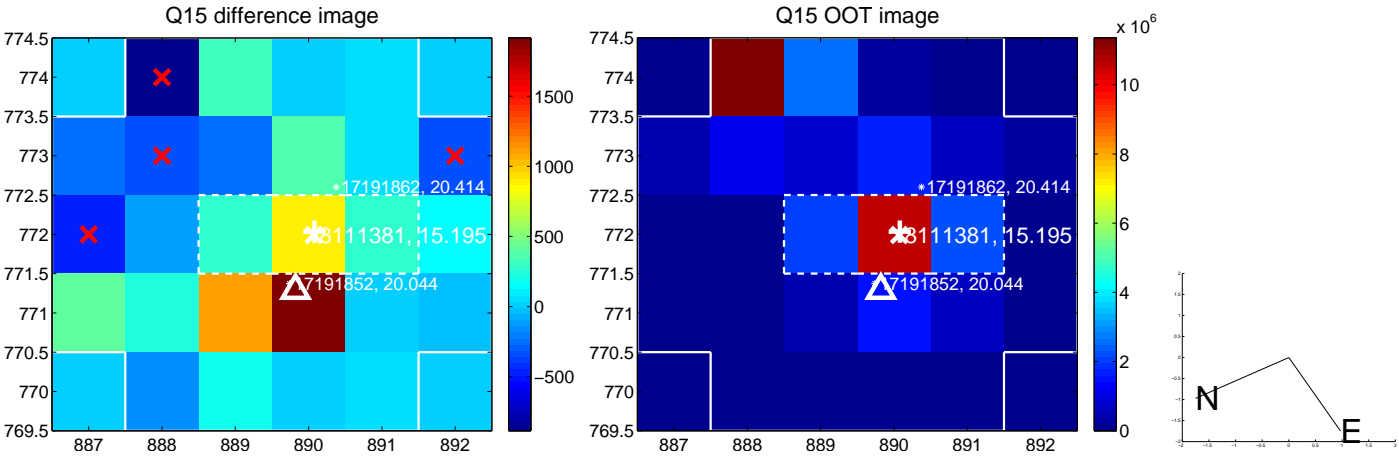
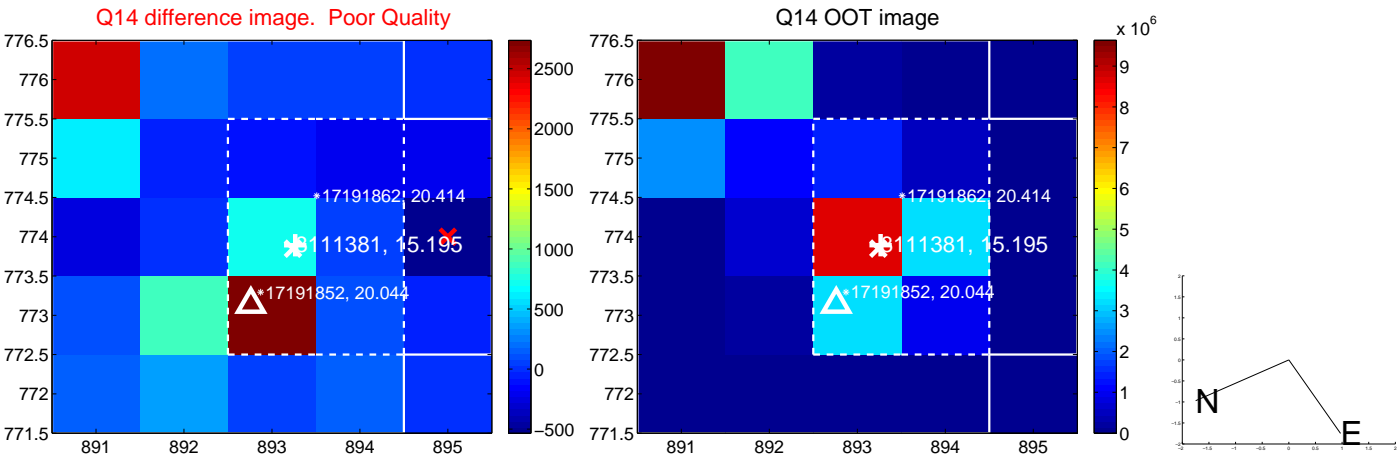
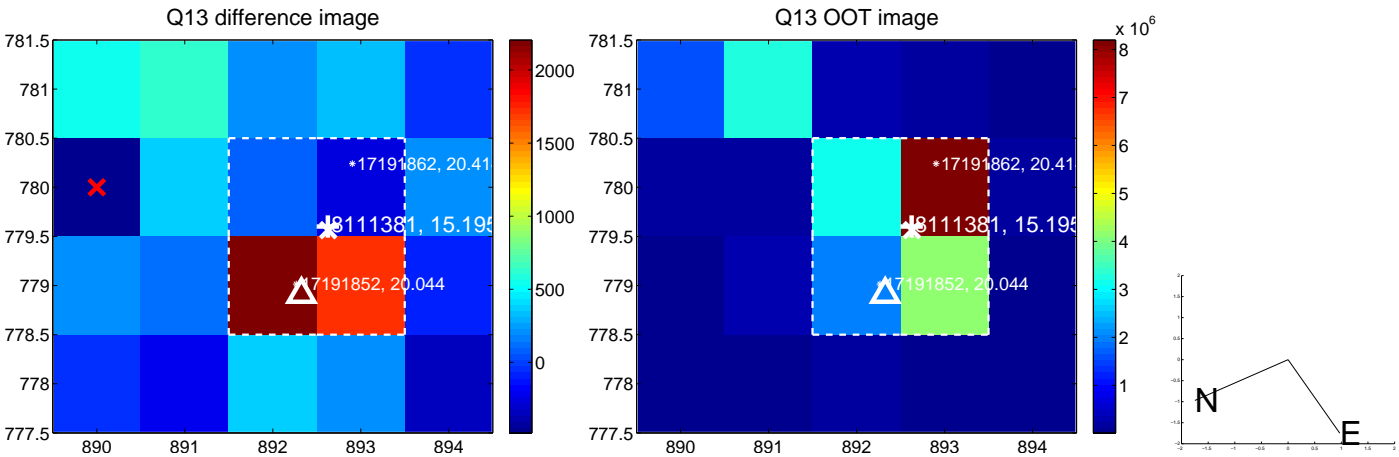
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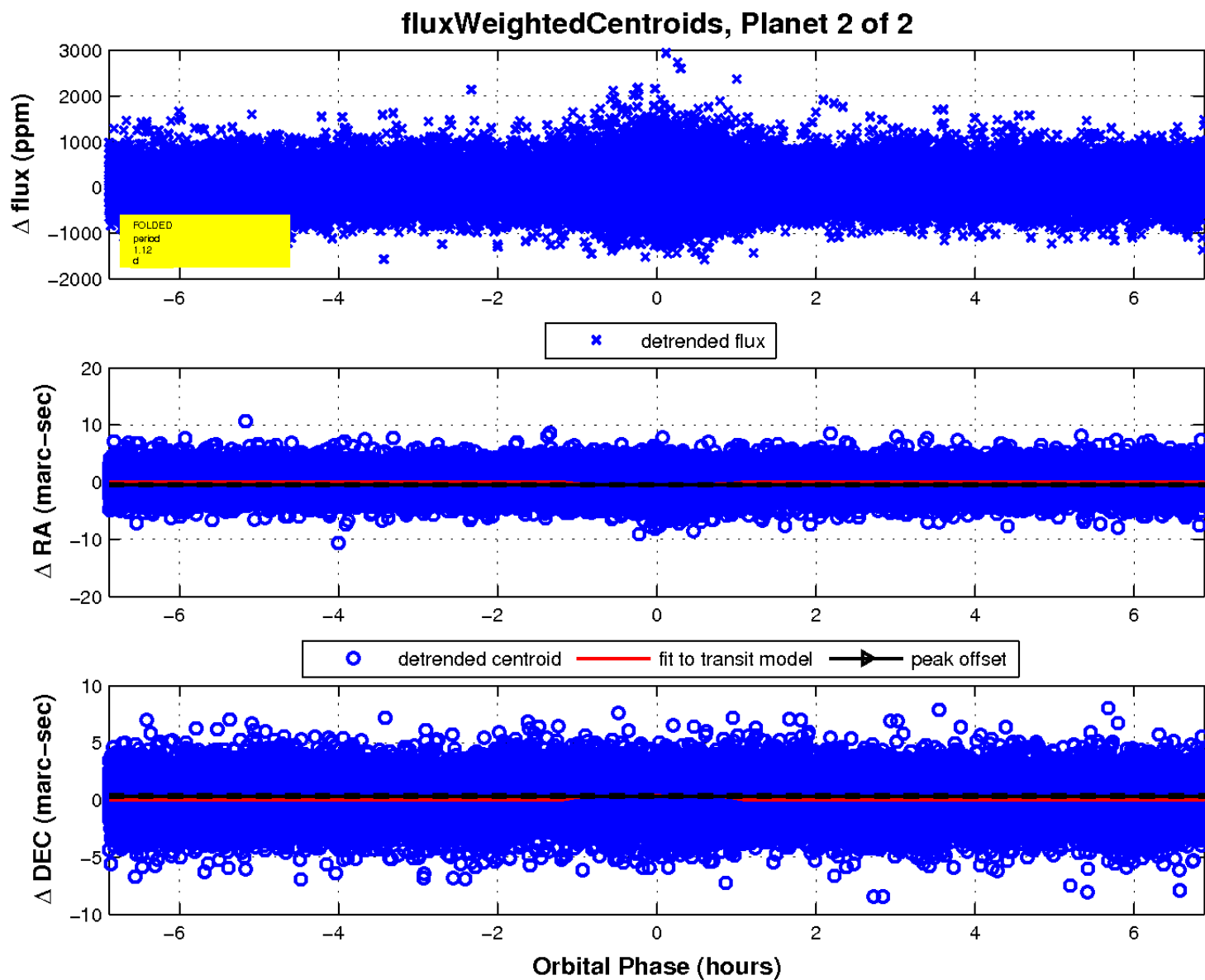
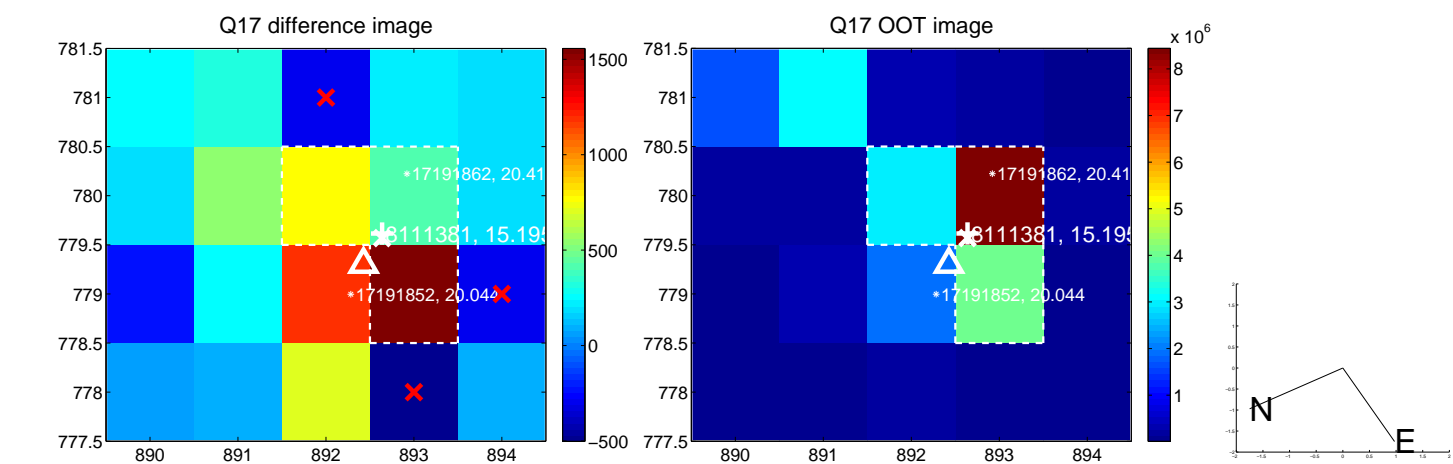
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# UKIRT Image

Declination

