

# KIC 008811811

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008811811-01	OBS	No	535.892269	393.460738	3047.2	3.825	14.8	9.6	0.67	4114	3.52	0.09
008811811-03	OBS	No	528.869526	456.246638	2550.0	3.613	14.5	7.7	0.67	4114	3.47	0.09
008811811-04	OBS	No	613.671503	217.232872	2857.3	4.231	14.4	8.1	0.67	4114	3.59	0.07
008811811-05	OBS	No	0.748702	131.537035	757.4	2.500	13.0	-1.0	0.67	4114	1.75	577.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008811811-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008811811-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008811811-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008811811-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

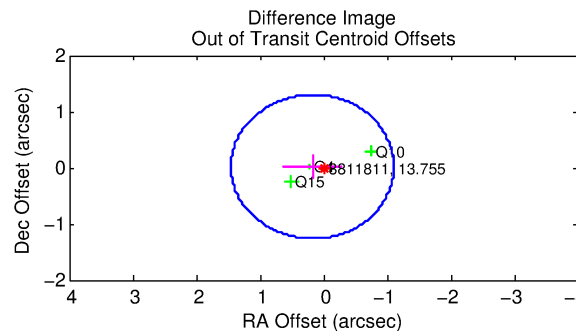
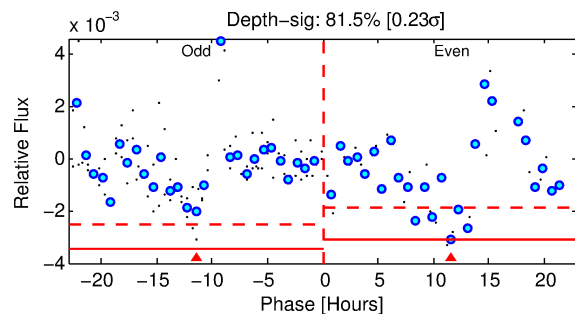
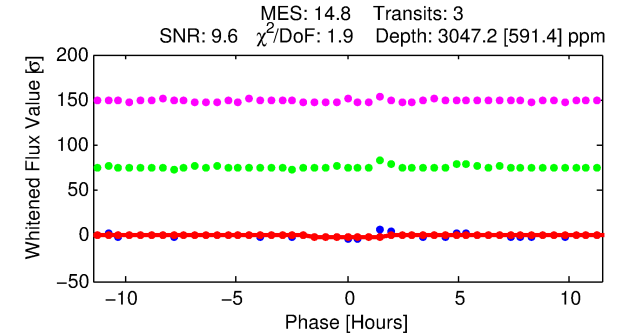
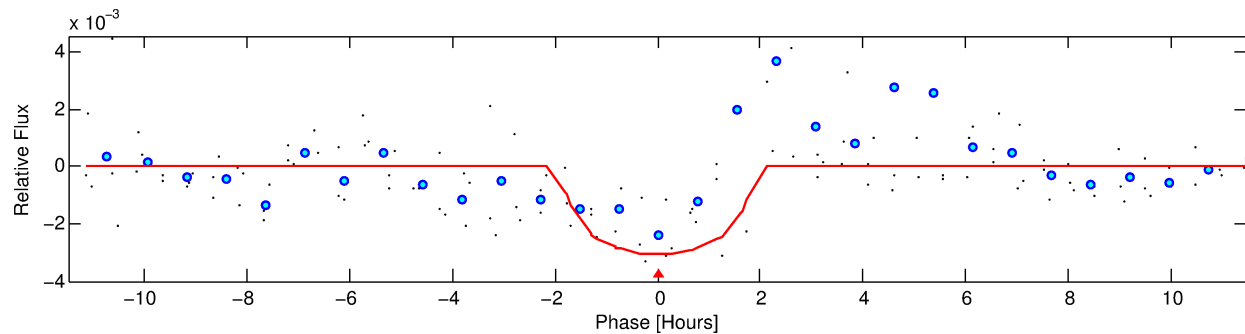
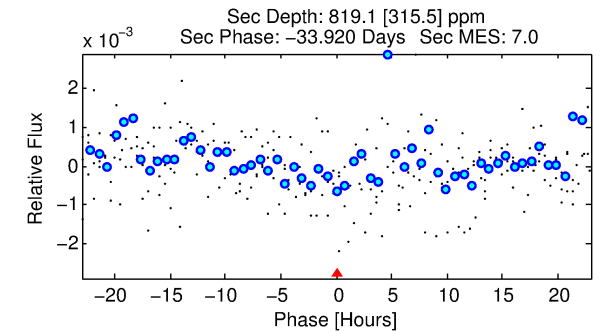
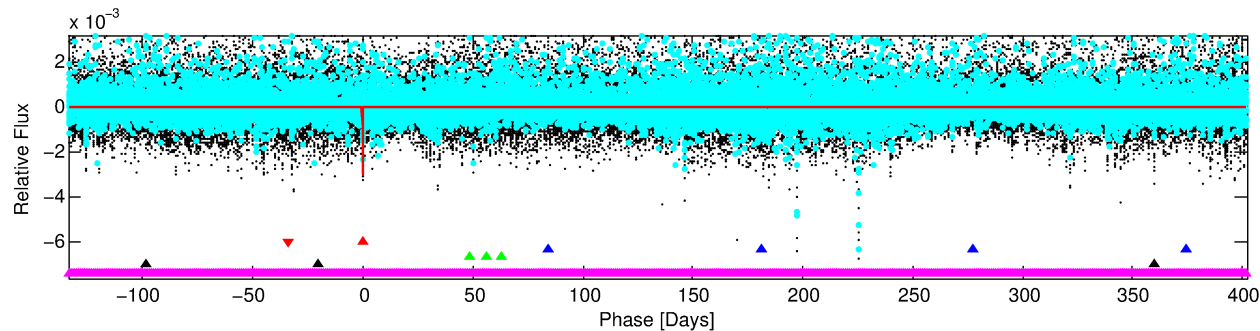
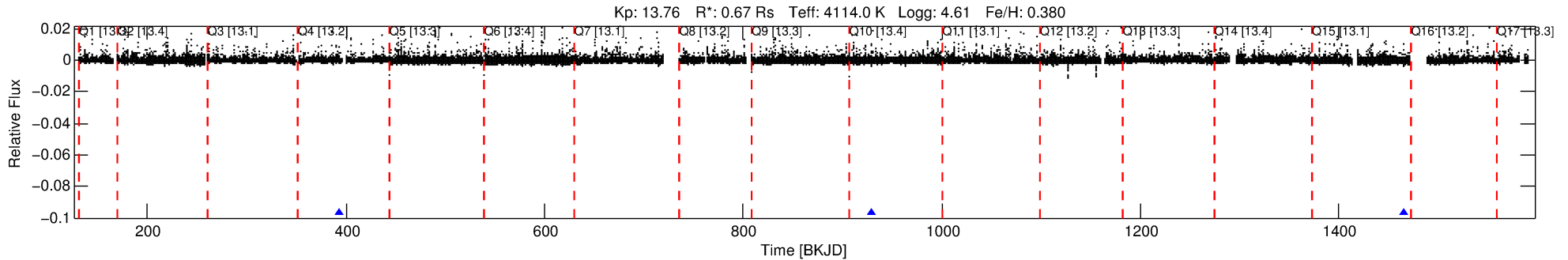
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008811811-01

No Significant Match Found

# DV One-Page Summary

KIC: 8811811 Candidate: 1 of 5 Period: 535.892 d



## DV Fit Results:

Period = 535.89227 [0.00561] d  
Epoch = 393.4607 [0.0077] BKJD  
Rp/R\* = 0.0481 [0.1015]  
a/R\* = 1121.68 [6446.90]  
b = 0.01 [548.45]  
Seff = 0.09 [0.02]  
Teq = 140 [7] K  
Rp = 3.51 [7.42] Re  
a = 1.1281 [0.0915] AU  
Ag = 46422.33 [196649.44] [0.24σ]  
Teffp = 3172 [3360] K [0.90σ]

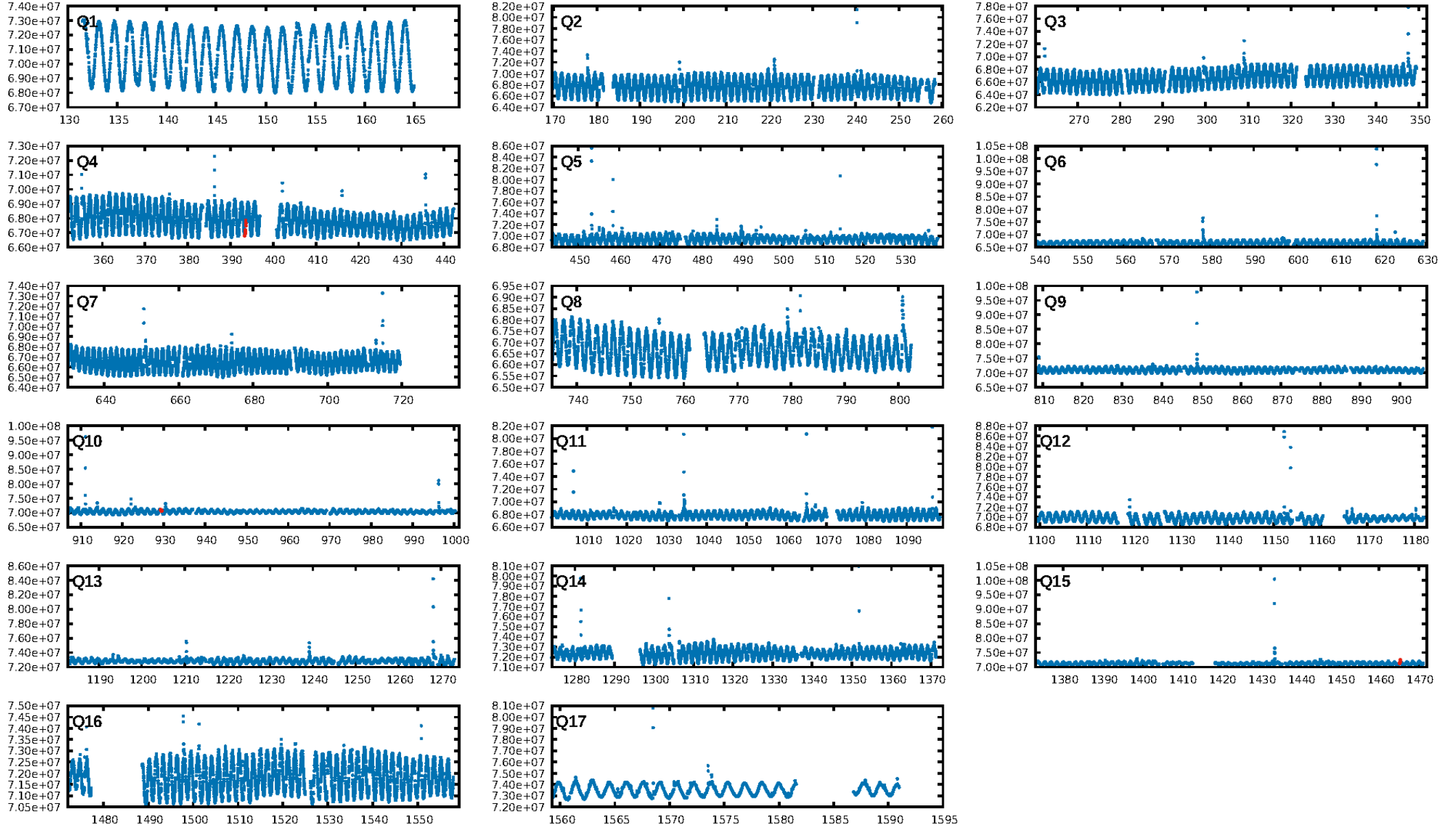
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.03σ]  
LongPeriod-sig: 100.0% [327.25σ]  
ModelChiSquare2-sig: 12.2%  
ModelChiSquareGof-sig: 24.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.044  
Centroid-sig: N/A  
Centroid-so: 0.578 arcsec [1.93σ]  
OotOffset-rm: 0.177 arcsec [0.41σ]  
KicOffset-rm: 0.140 arcsec [0.57σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

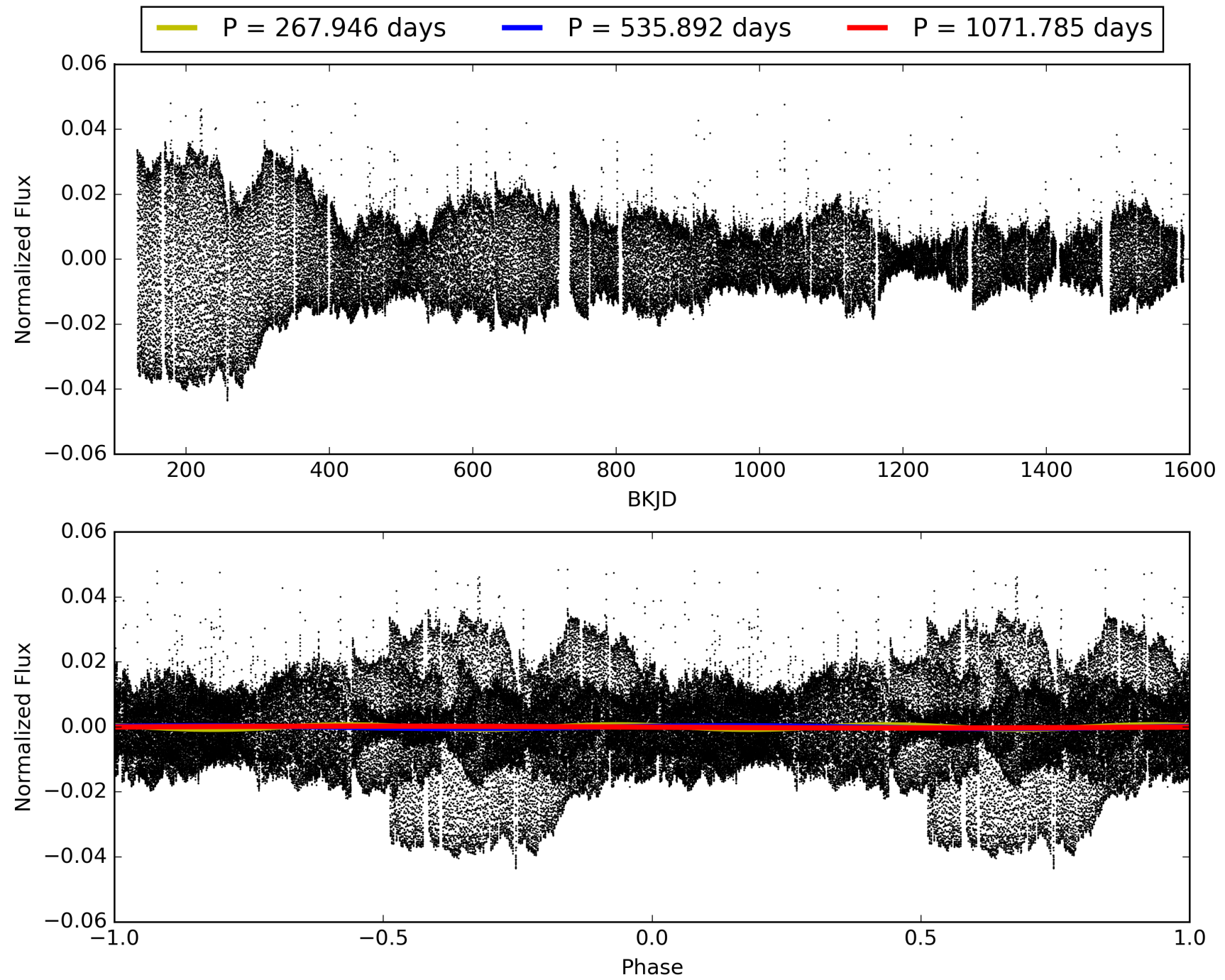
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:37:59 Z

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

# TCE 008811811-01, PDC Light Curves



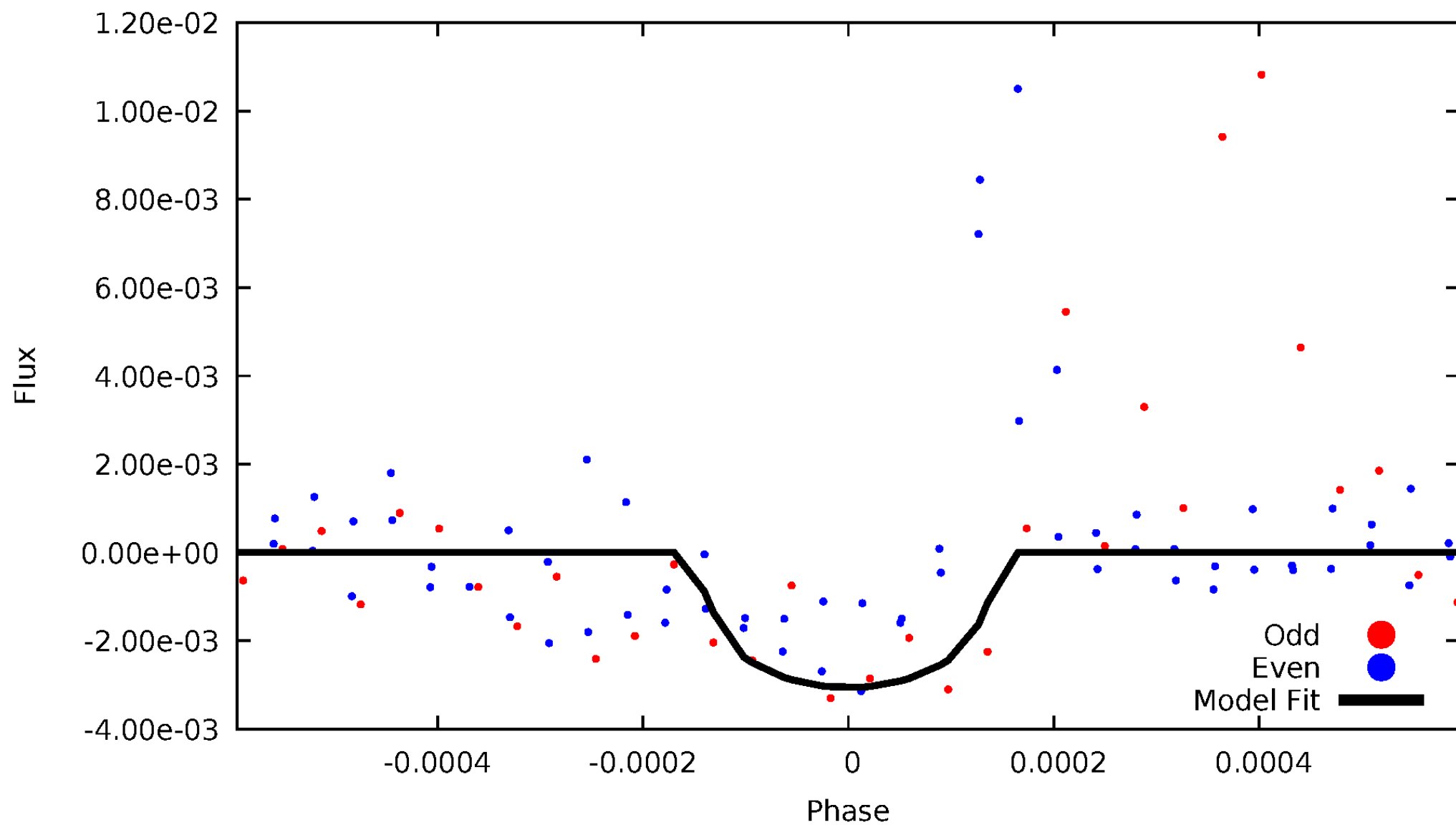
# TCE 008811811-01





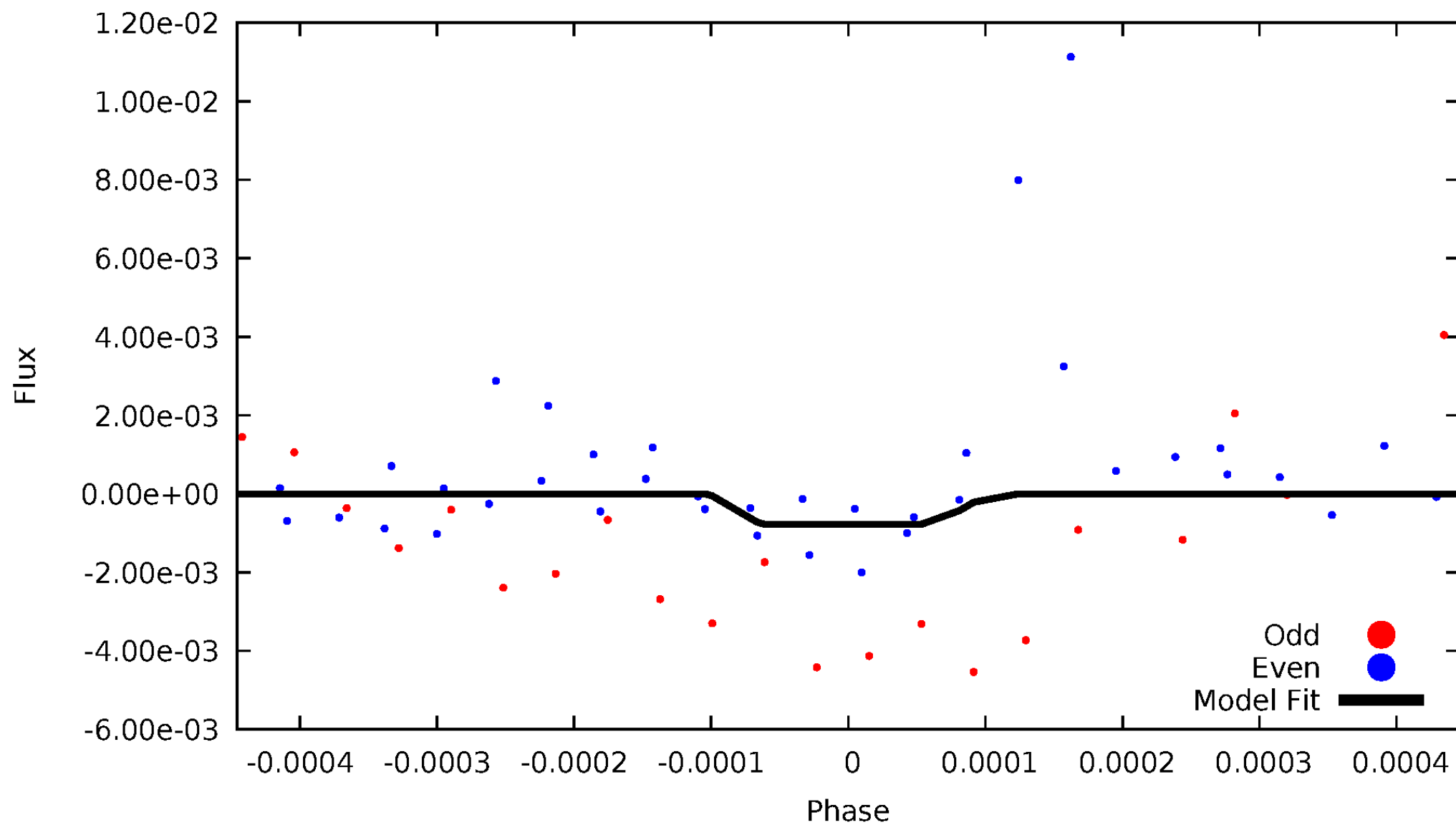
# DV Odd/Even

TCE 008811811-01



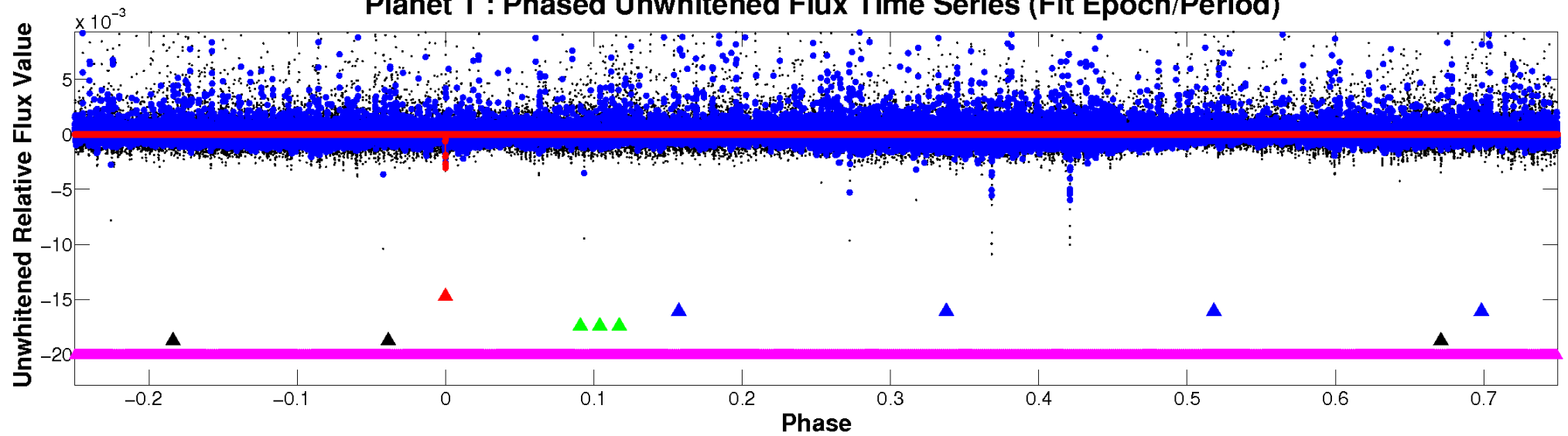
# ALT Odd/Even

TCE 008811811-01

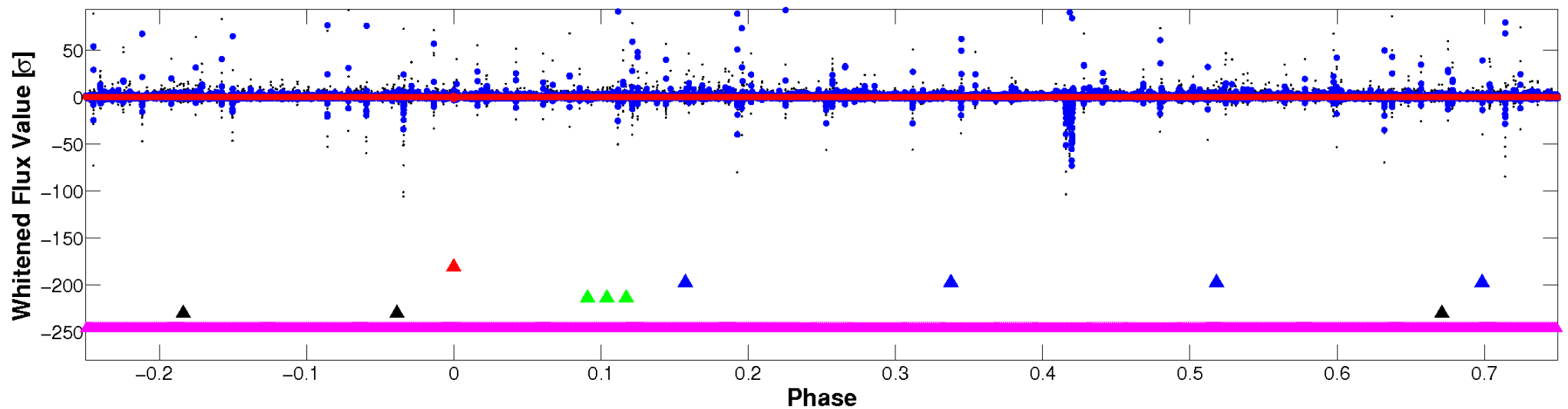


# Non-Whitened Vs. Whitened Light Curve

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

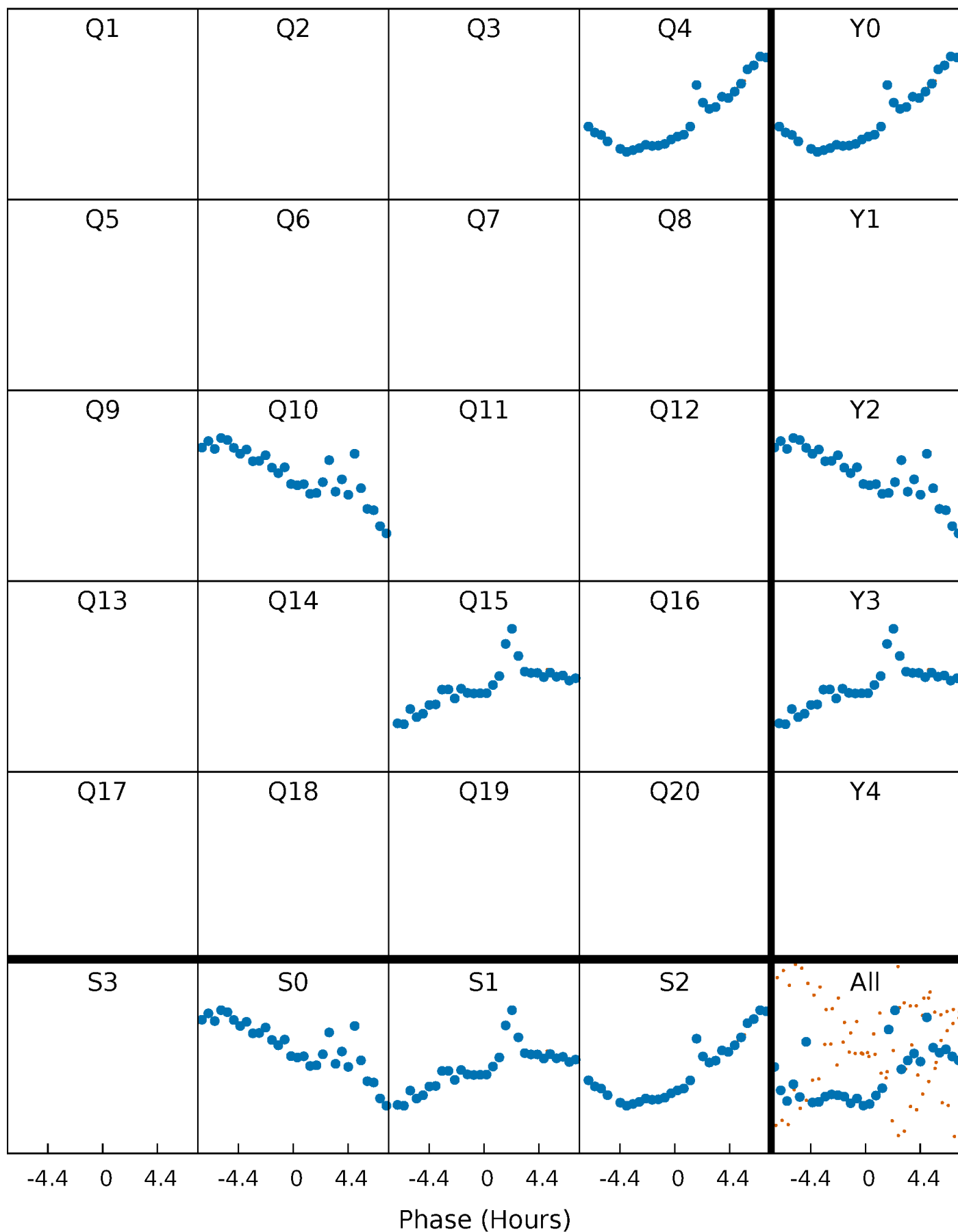


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



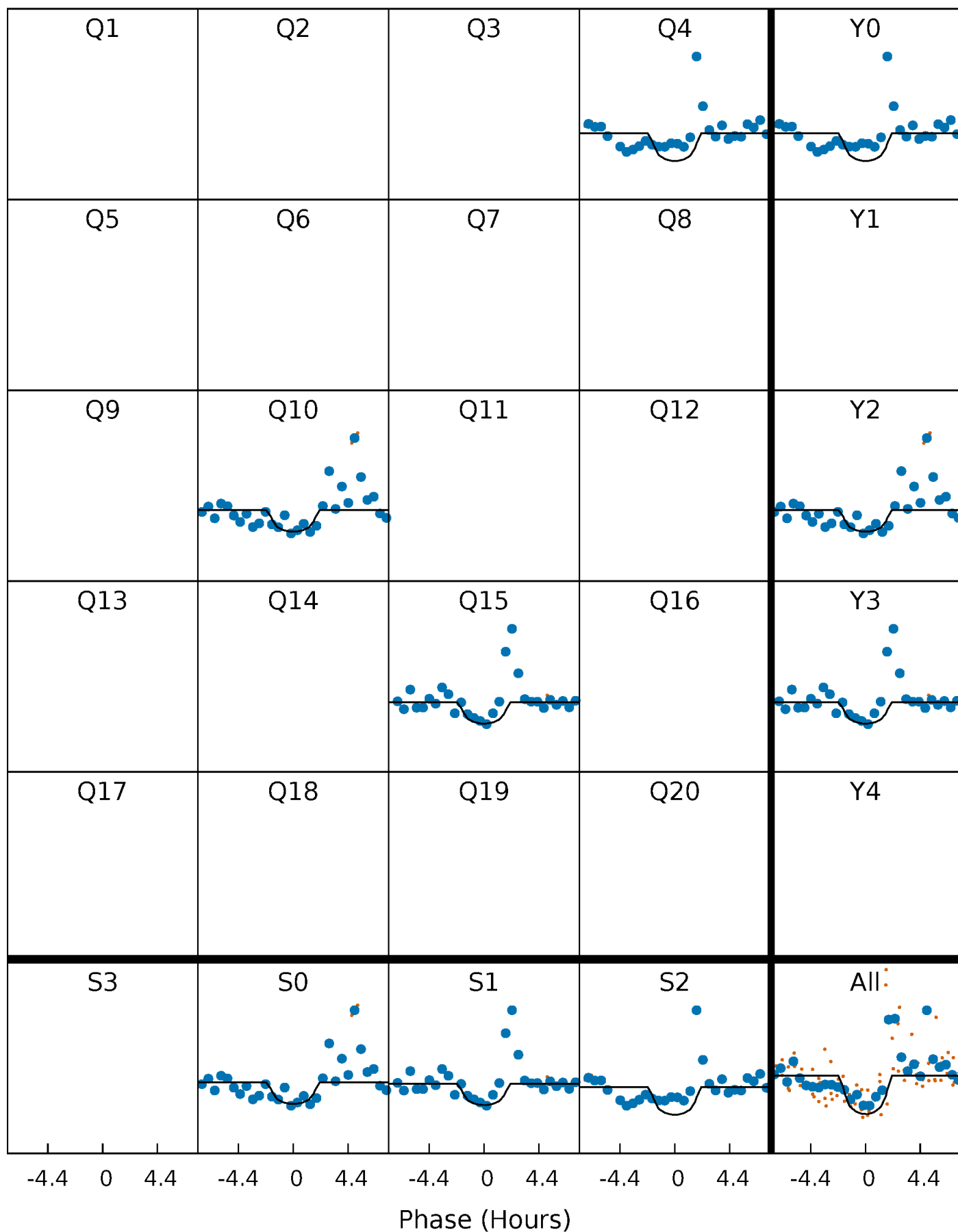
# PDC Quarter-Phased Transit Curves

TCE 008811811-01 P=535.892269 Days  $T_0=393.460738$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 008811811-01 P=535.892269 Days  $T_0=393.460738$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008811811-01 P=535.890545 Days  $T_0=393.465599$  (BKJD)

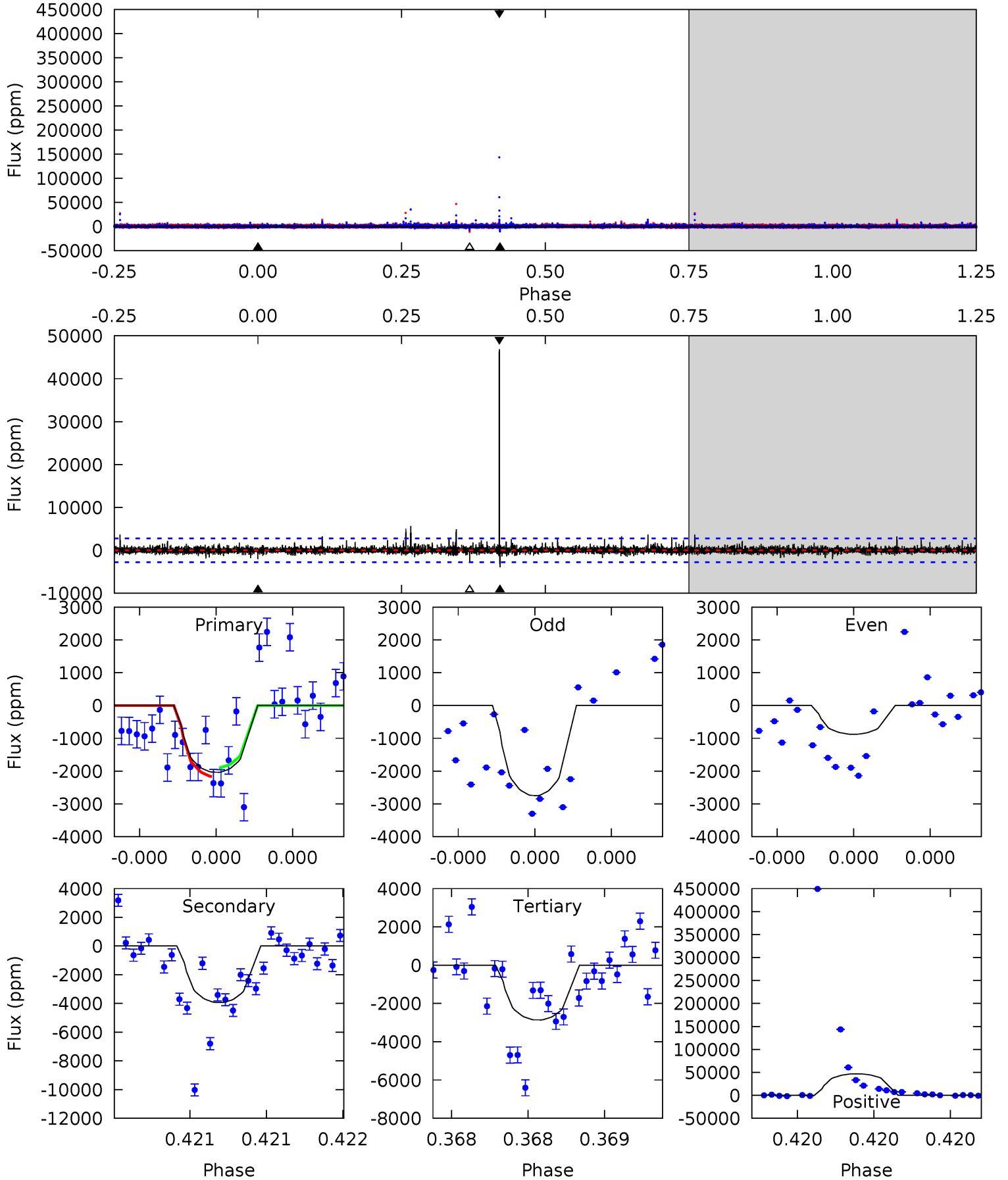




# DV Model-Shift Uniqueness Test

008811811-01, P = 535.892269 Days, E = 393.460738 Days

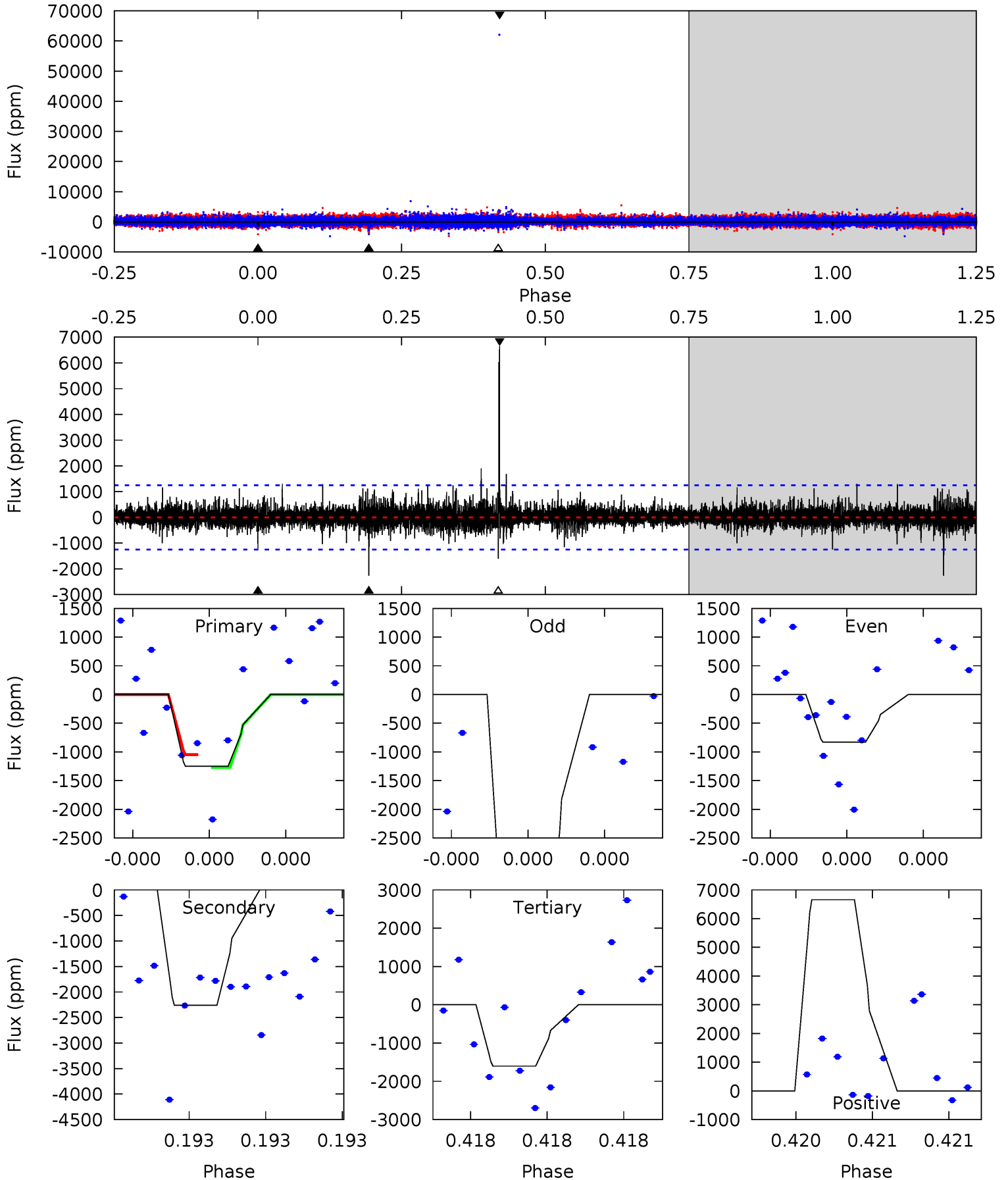
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.16	8.04	5.85	95.7	5.66	3.61	1.77	-1.68	-91.5	2.20	-87.6	1.28	1.20	0.92	0.26



# Alt Model-Shift Uniqueness Test

008811811-01, P = 535.890545 Days, E = 393.465599 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
5.74	10.4	7.35	30.6	5.73	3.72	1.10	-1.61	-24.8	3.01	-20.2	7.05	1.53	0.75	0



### Stellar Parameters For KIC 008811811

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4114^{+148}_{-165}$	$4.611^{+0.060}_{-0.016}$	$0.380^{+0.100}_{-0.300}$	$0.669^{+0.027}_{-0.067}$	$0.667^{+0.039}_{-0.058}$	$3.135^{+0.850}_{-0.226}$
	+4%/-4%	+1%/-0%	+26%/-79%	+4%/-10%	+6%/-9%	+27%/-7%
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 008811811-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-3937 \pm 490$	$6.43^{+6.08}_{-4.75}$	$193^{+7}_{-8}$	$3659^{+2471}_{-699}$	$67072^{+837469}_{-49539}$
Alt.	$-2258 \pm 218$	$5.72^{+6.44}_{-3.86}$	$194^{+7}_{-8}$	$3435^{+1870}_{-654}$	$49286^{+413465}_{-38638}$

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

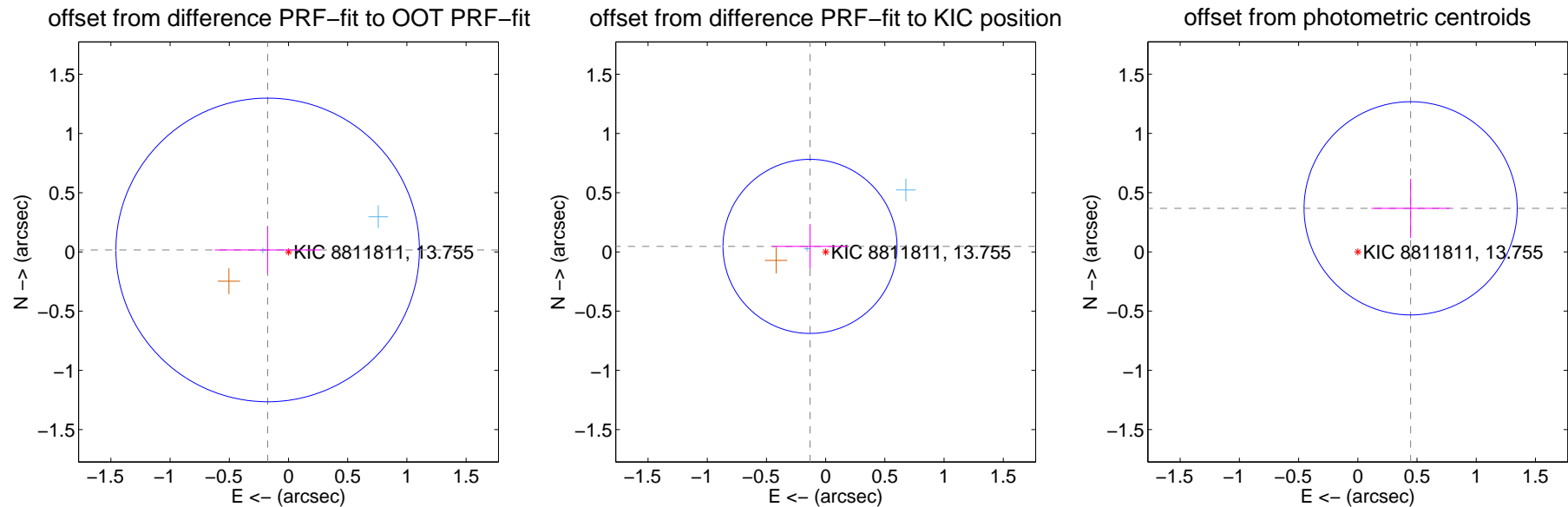
## DV Centroid Data

Supplemental centroid analysis for 008811811-01. Kepler magnitude: 13.76. Transit SNR 9.62

There are 2 quarters with good PRF difference image offsets

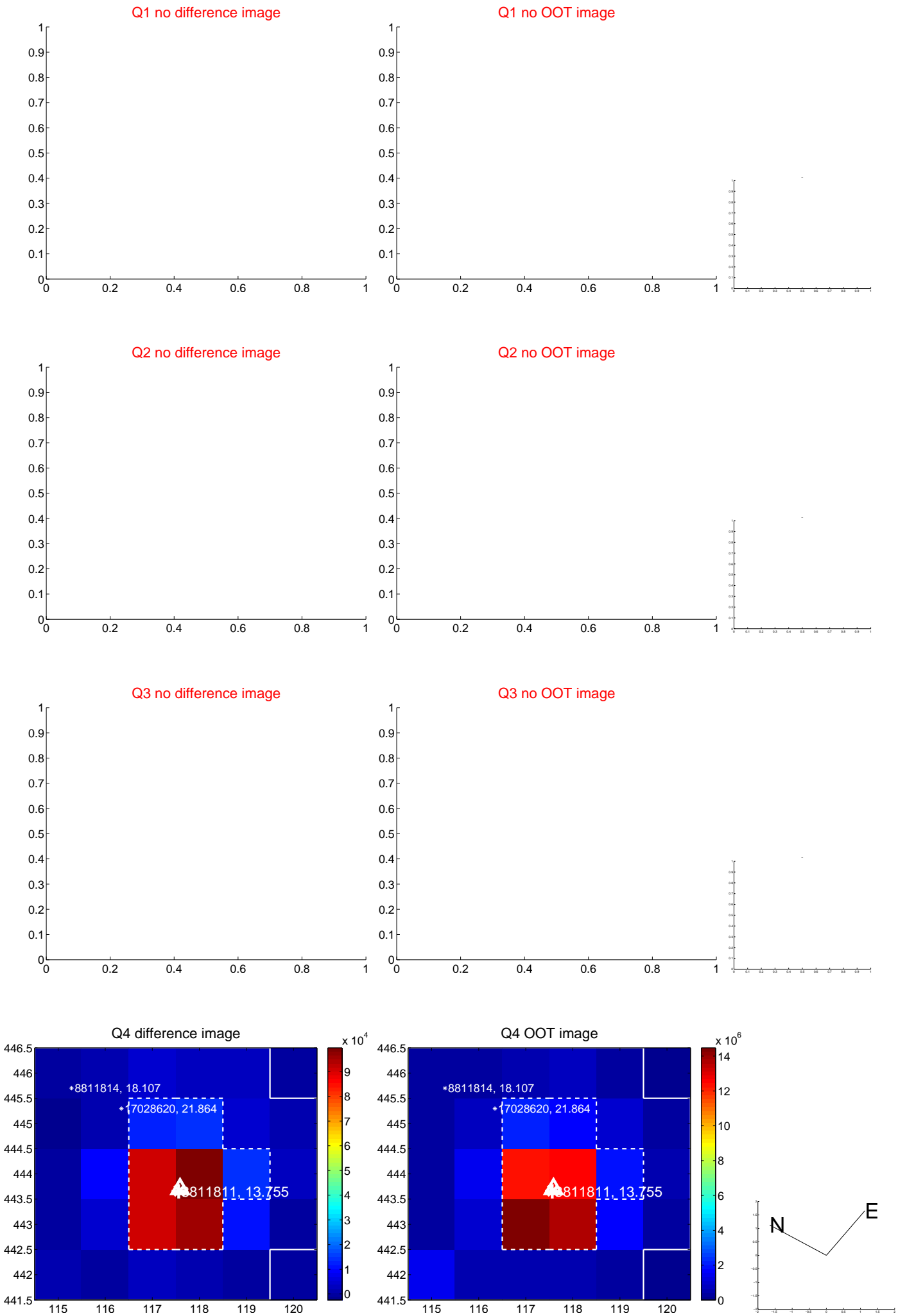
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.177 \pm 0.427$	0.41	$0.176 \pm 0.446$	$0.017 \pm 0.199$
PRF-fit source offset from KIC position	$0.140 \pm 0.245$	0.57	$0.132 \pm 0.319$	$0.047 \pm 0.188$
photometric centroid source offset	$0.58 \pm 0.30$	1.93	$-0.45 \pm 0.33$	$0.37 \pm 0.25$



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.

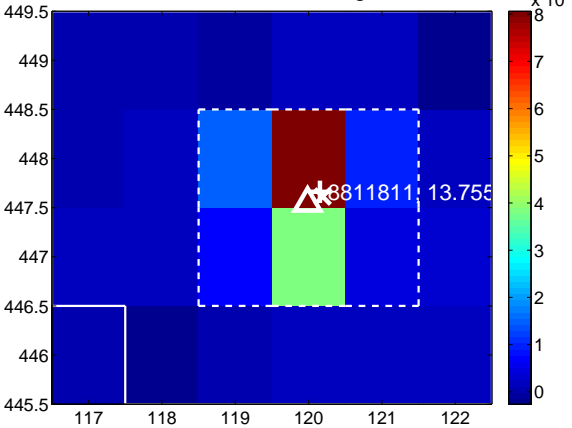
Q9 no difference image



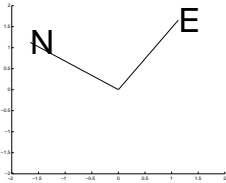
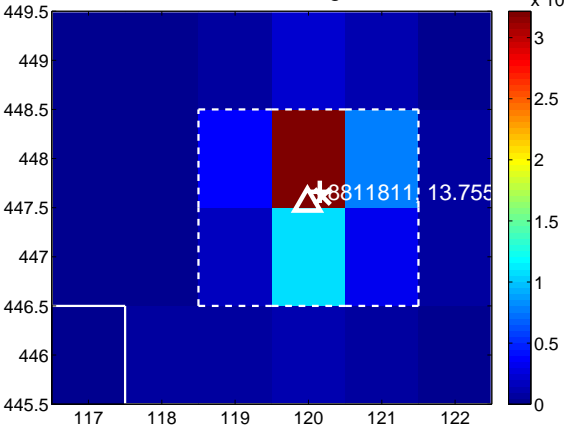
Q9 no OOT image



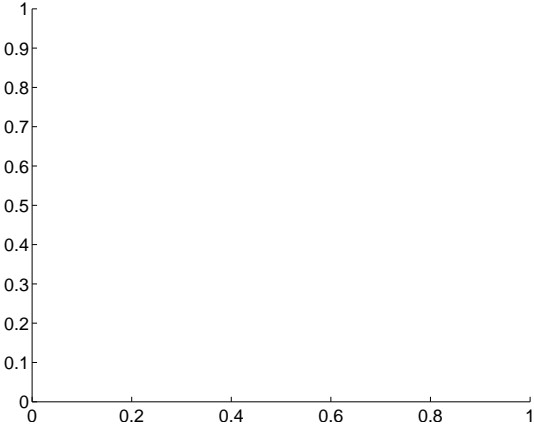
Q10 difference image



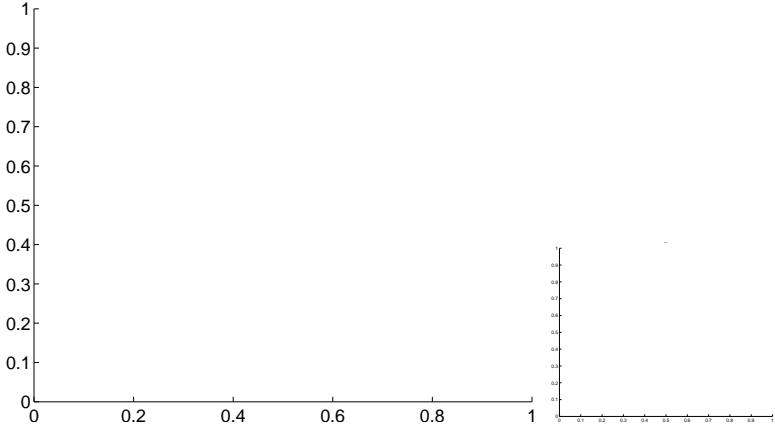
Q10 OOT image



Q11 no difference image



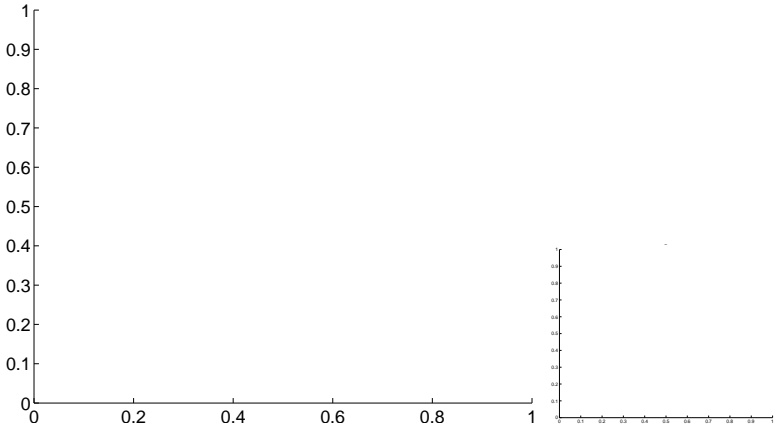
Q11 no OOT image



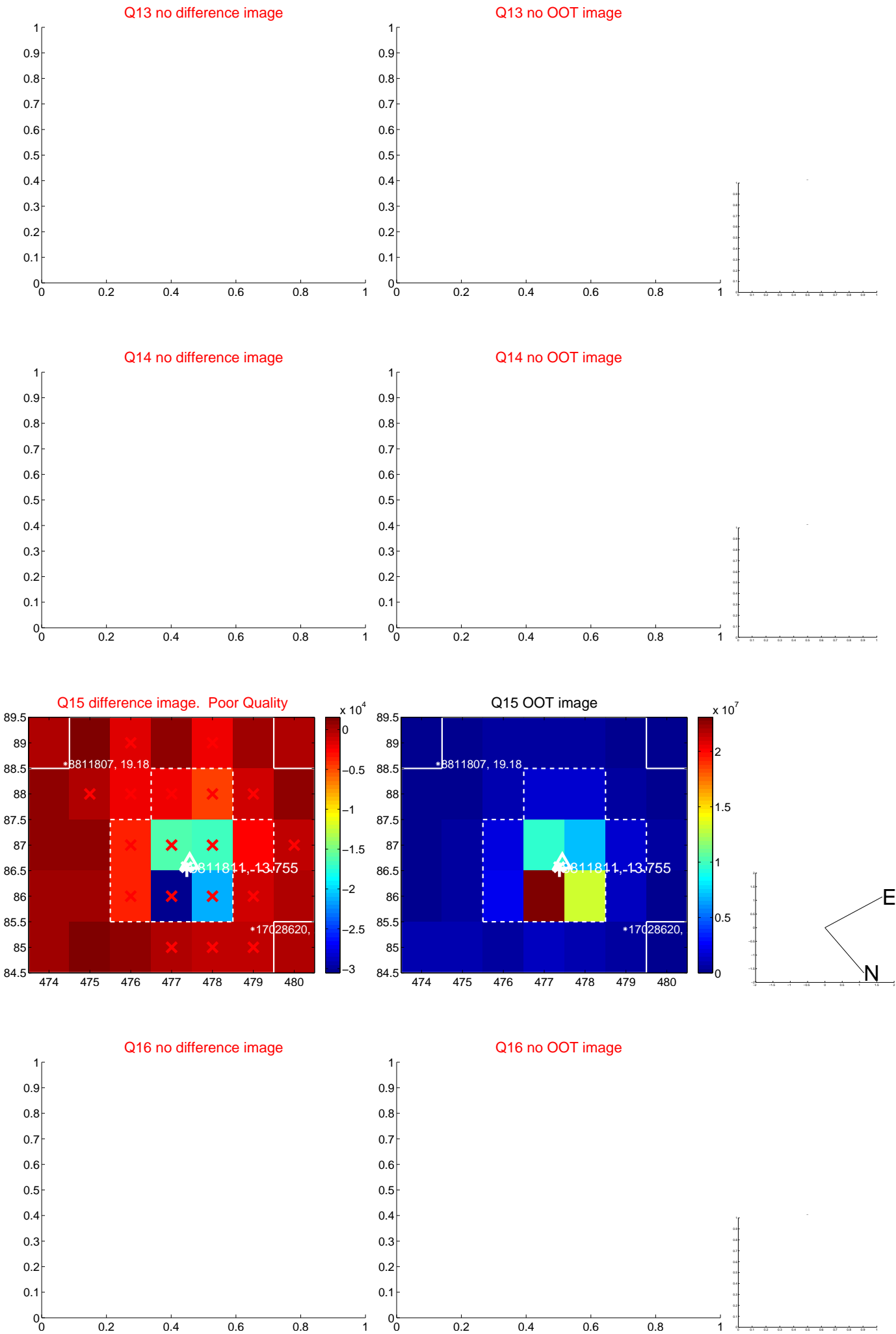
Q12 no difference image



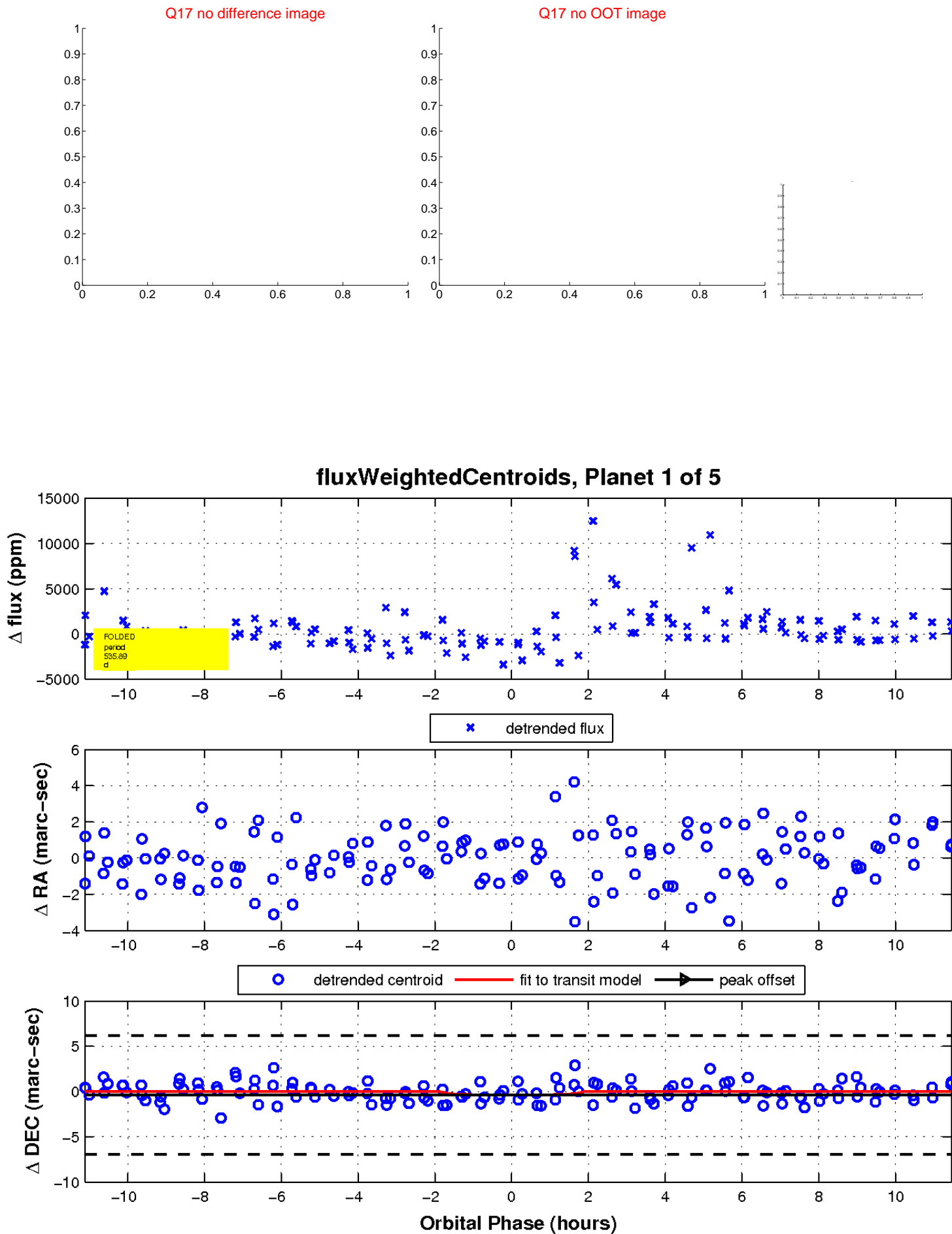
Q12 no OOT image



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

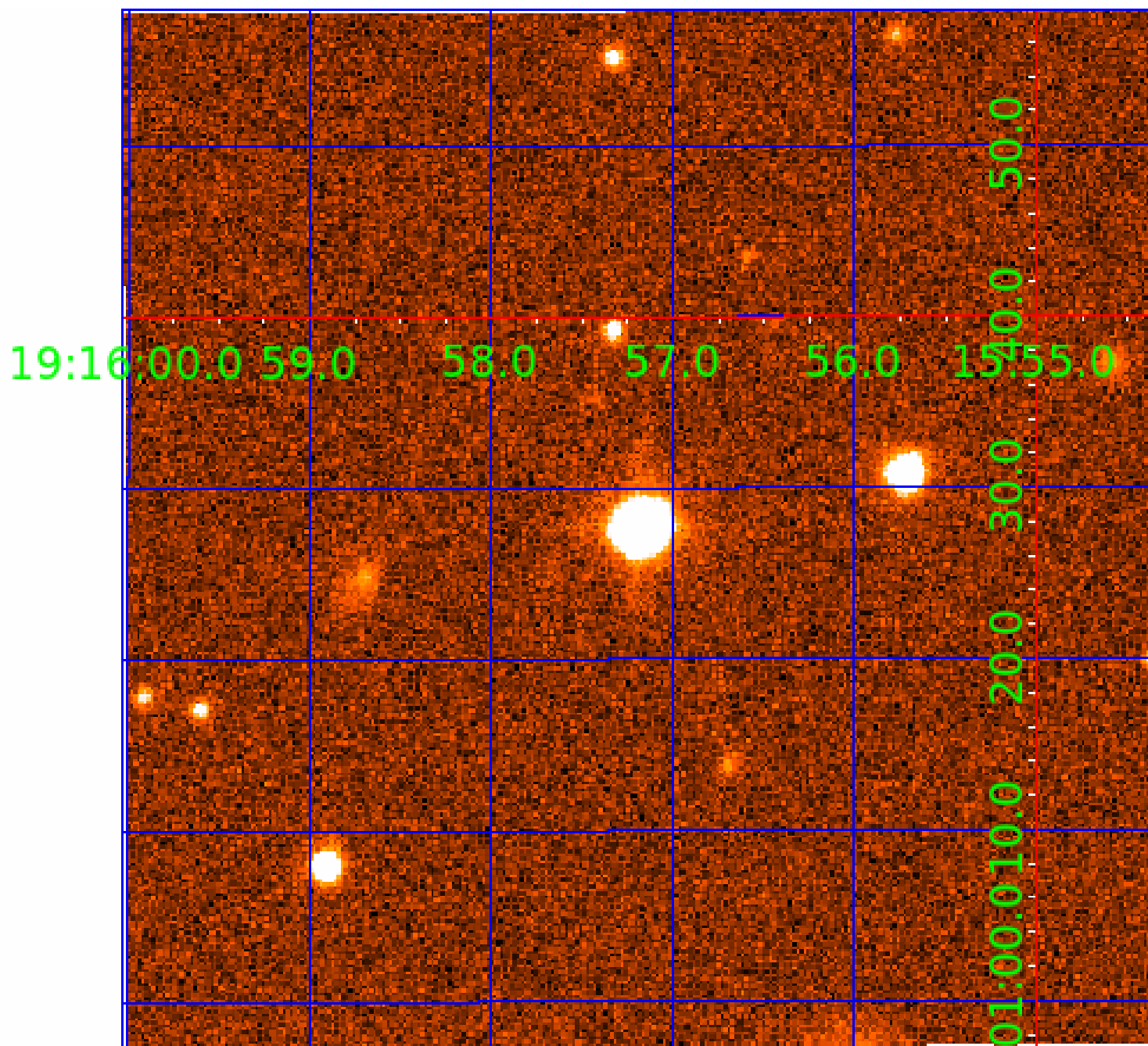


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008811811

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008811811-01	OBS	No	535.892269	393.460738	3047.2	3.825	14.8	9.6	0.67	4114	3.52	0.09
008811811-03	OBS	No	528.869526	456.246638	2550.0	3.613	14.5	7.7	0.67	4114	3.47	0.09
008811811-04	OBS	No	613.671503	217.232872	2857.3	4.231	14.4	8.1	0.67	4114	3.59	0.07
008811811-05	OBS	No	0.748702	131.537035	757.4	2.500	13.0	-1.0	0.67	4114	1.75	577.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008811811-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008811811-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008811811-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008811811-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

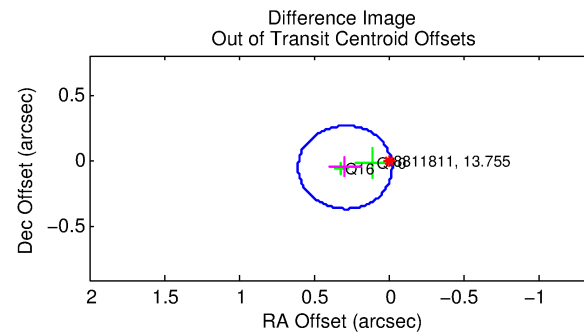
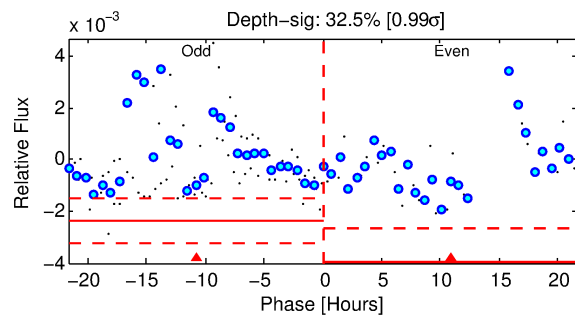
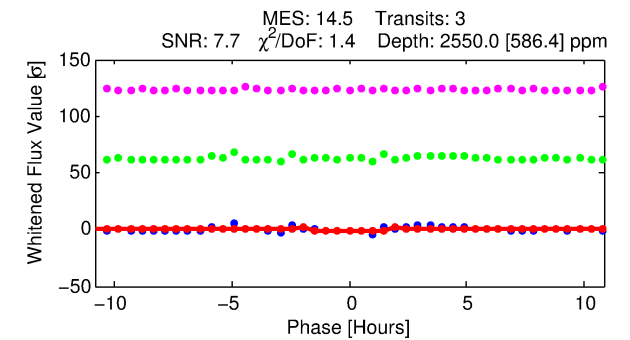
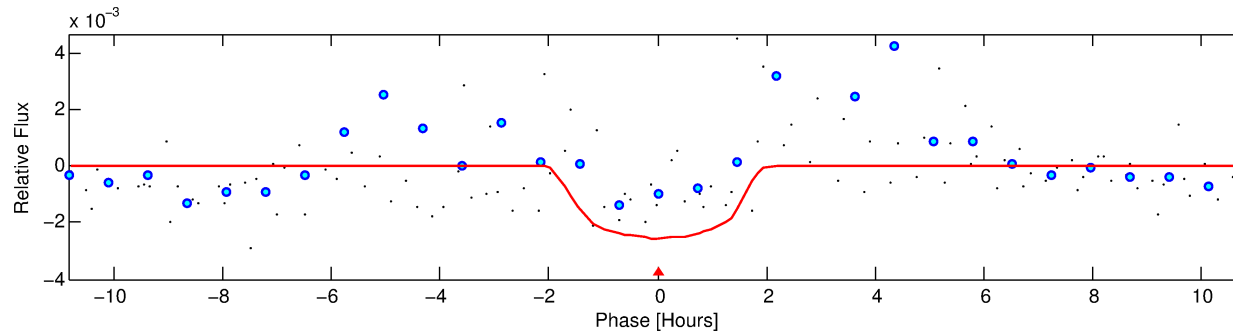
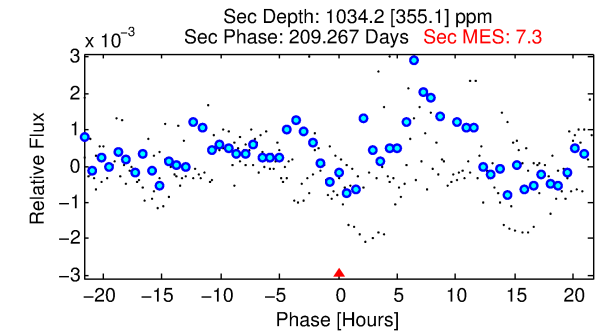
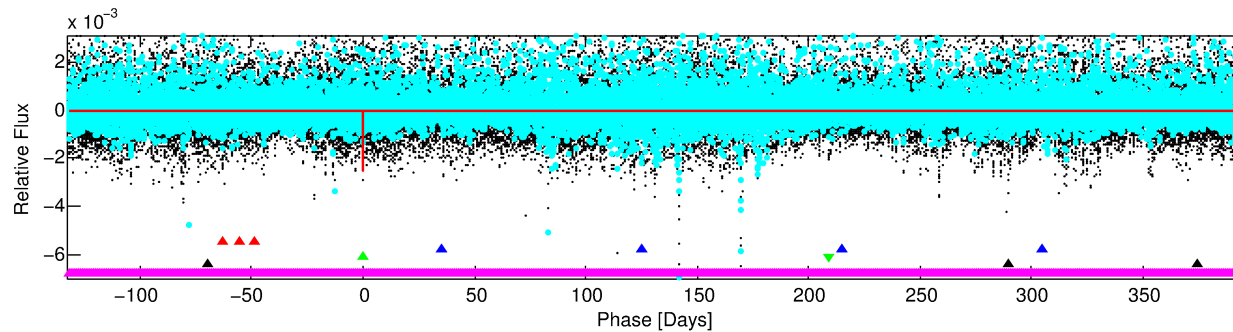
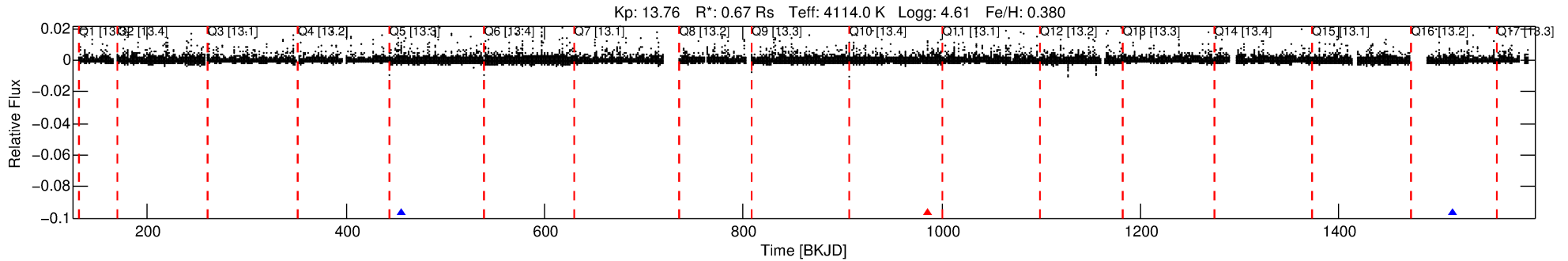
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008811811-03

No Significant Match Found

# DV One-Page Summary

KIC: 8811811 Candidate: 3 of 5 Period: 528.870 d



## DV Fit Results:

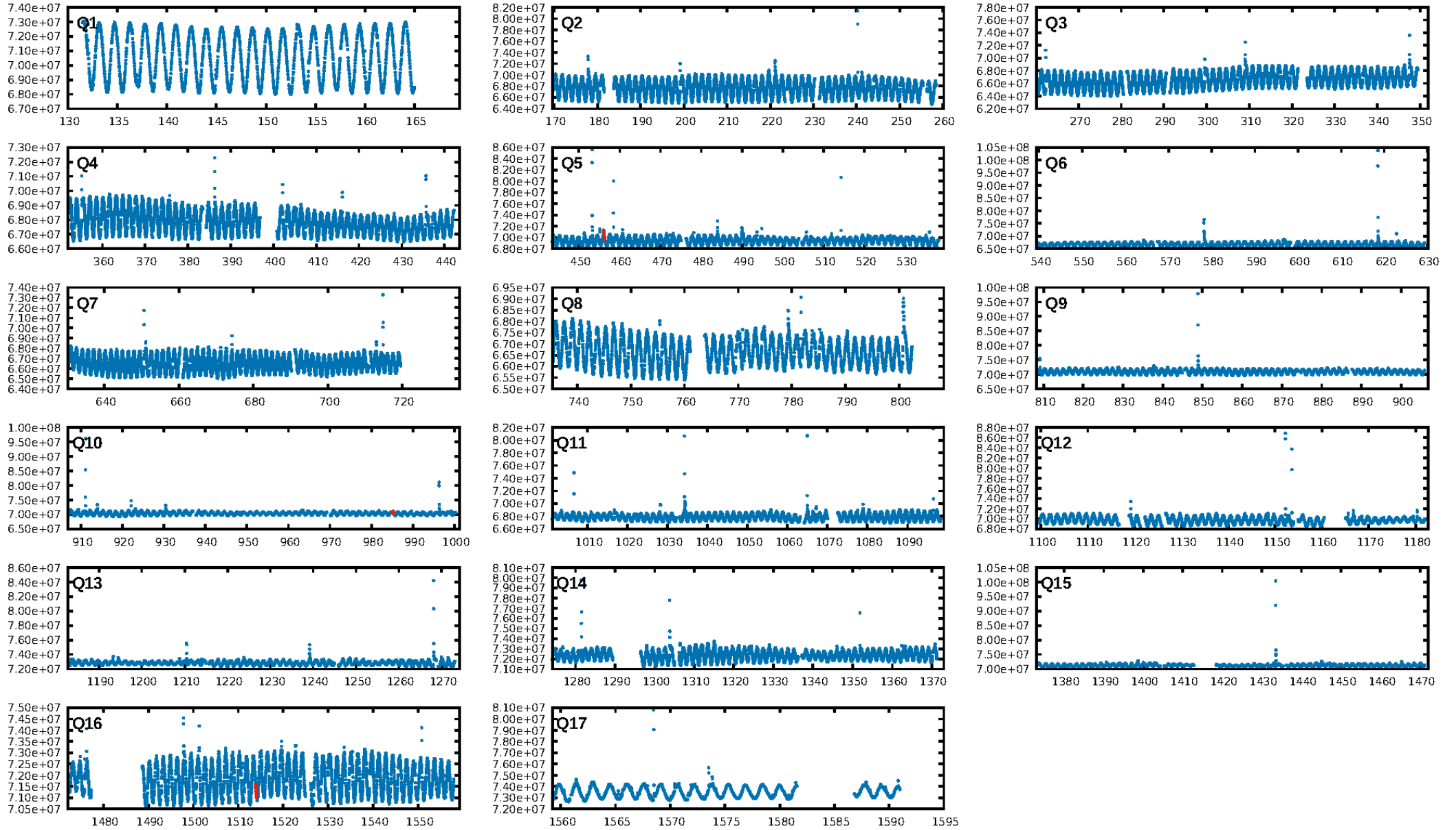
Period = 528.86953 [0.00493] d  
Epoch = 456.2466 [0.0087] BKJD  
Rp/R\* = 0.0475 [0.0406]  
a/R\* = 962.96 [2308.30]  
b = 0.60 [2.64]  
Seff = 0.09 [0.02]  
Teq = 140 [7] K  
Rp = 3.47 [2.99] Re  
a = 1.1183 [0.0907] AU  
Ag = 59069.25 [103246.60] [0.57σ]  
Teffp = 3384 [1482] K [2.19σ]

## DV Diagnostic Results:

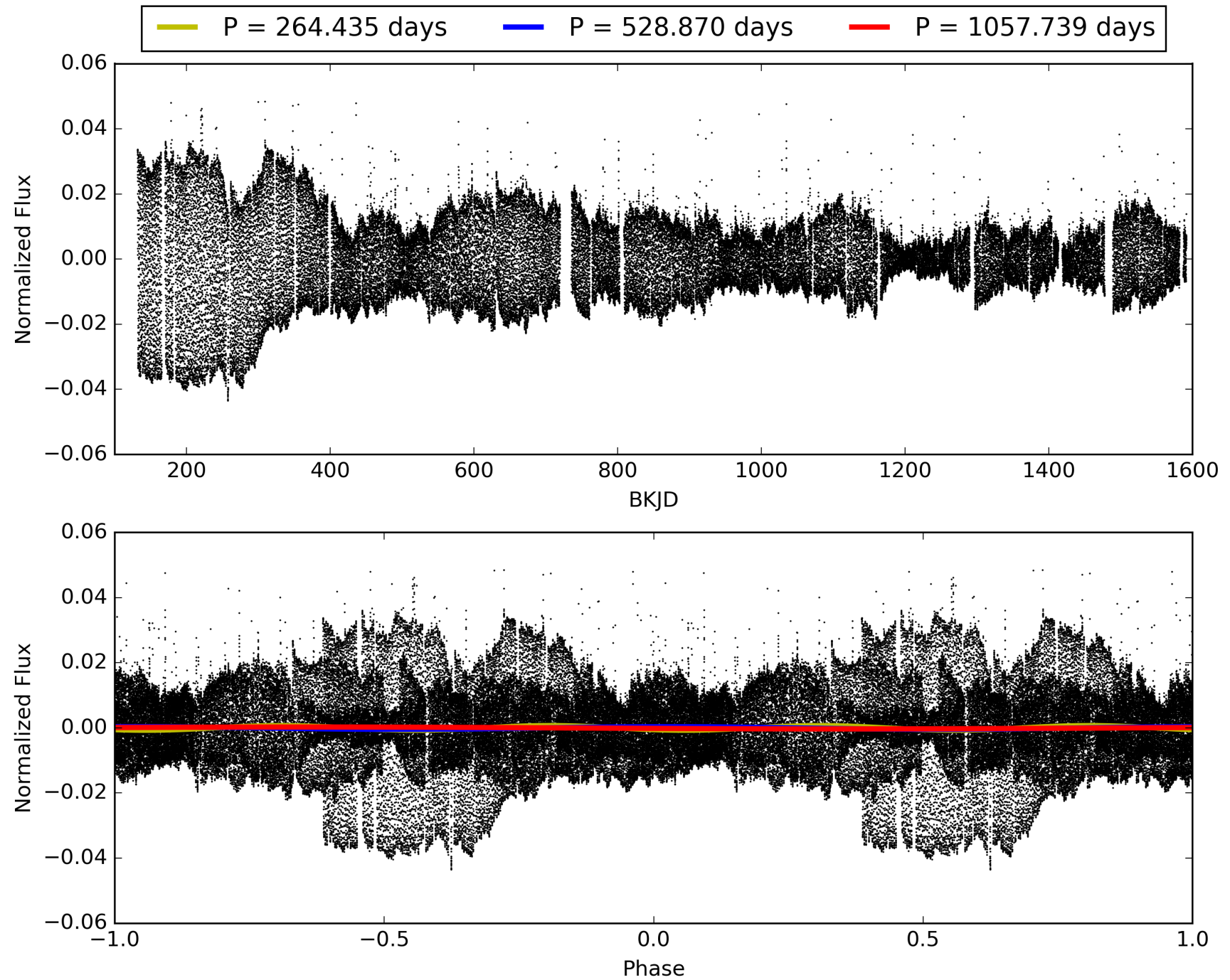
ShortPeriod-sig: 100.0% [331.57σ]  
LongPeriod-sig: 100.0% [32.03σ]  
ModelChiSquare2-sig: 86.9%  
ModelChiSquareGof-sig: 74.0%  
Bootstrap-pfa: N/A  
**RollingBand-fgt: 0.67 [2/3]**  
GhostDiagnostic-chr: 1.114  
Centroid-sig: N/A  
Centroid-so: 0.610 arcsec [1.88σ]  
OotOffset-rm: 0.293 arcsec [2.80σ]  
KicOffset-rm: 0.251 arcsec [2.75σ]  
OotOffset-st: 1/0/1/0 [2]  
KicOffset-st: 1/0/1/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.00 [0/3]



# TCE 008811811-03, PDC Light Curves

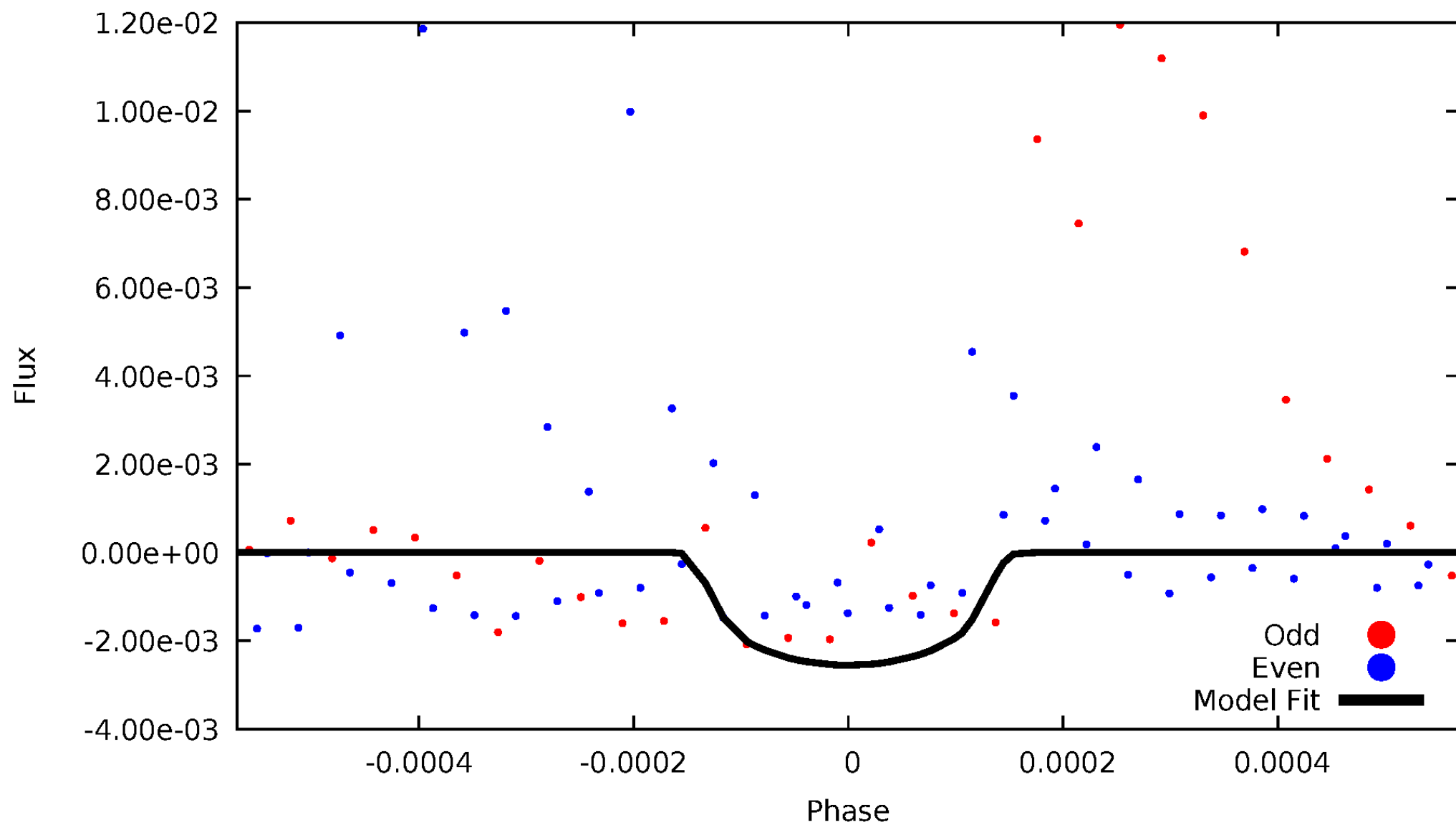


# TCE 008811811-03



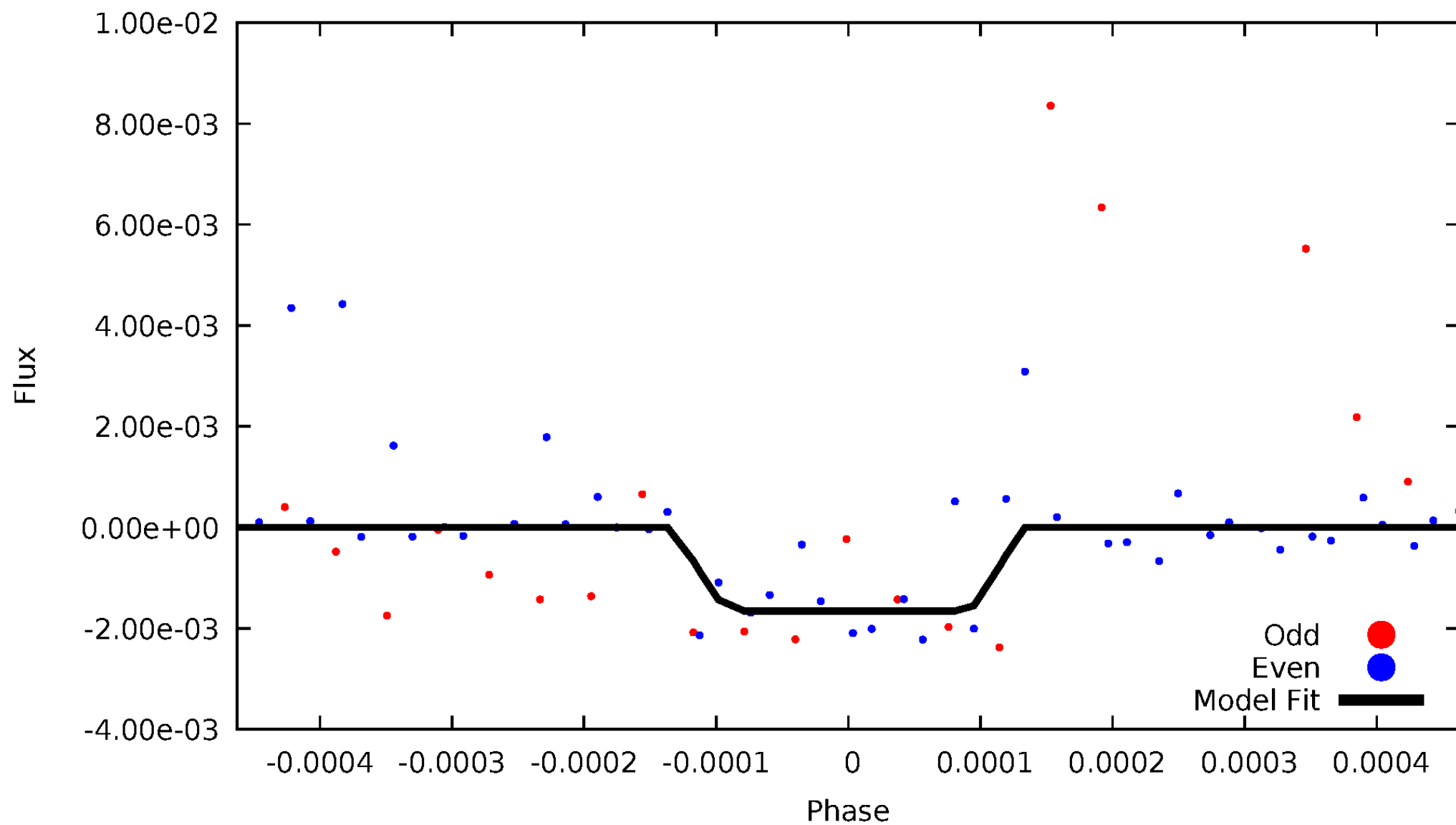
# DV Odd/Even

TCE 008811811-03



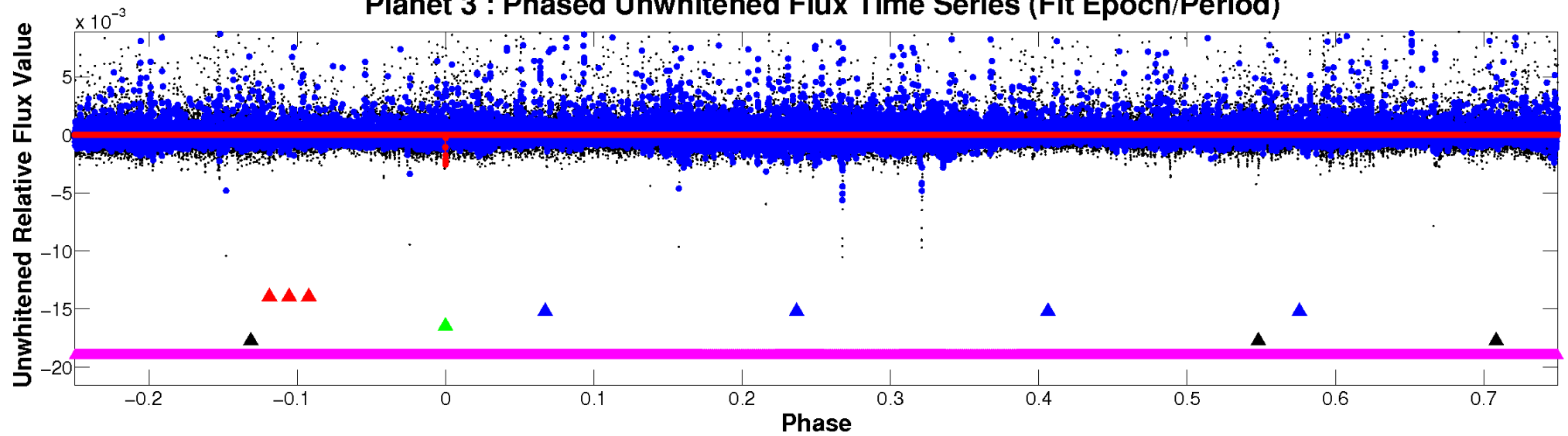
# ALT Odd/Even

TCE 008811811-03

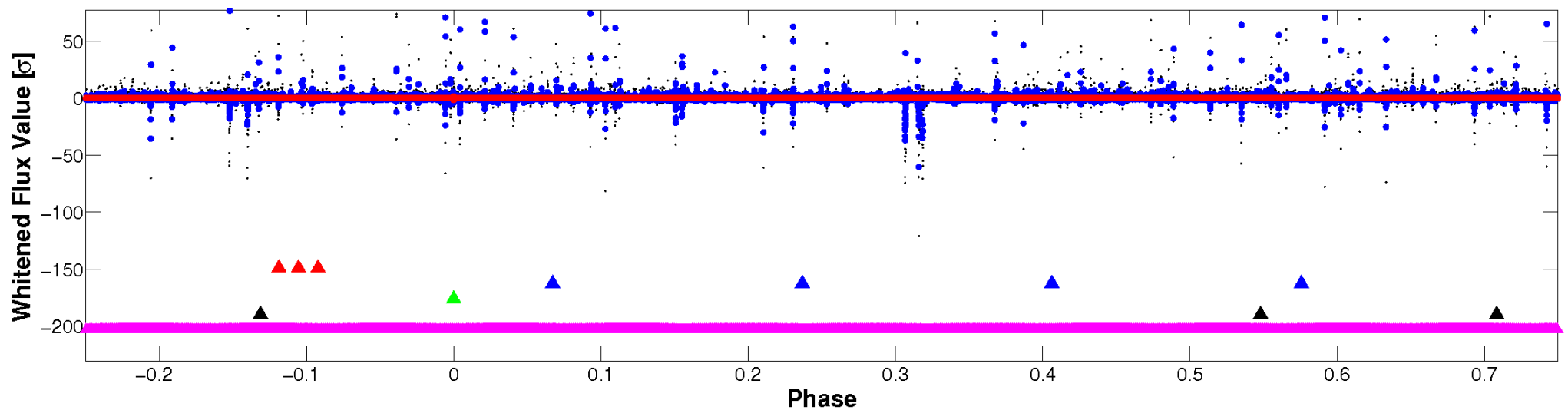


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

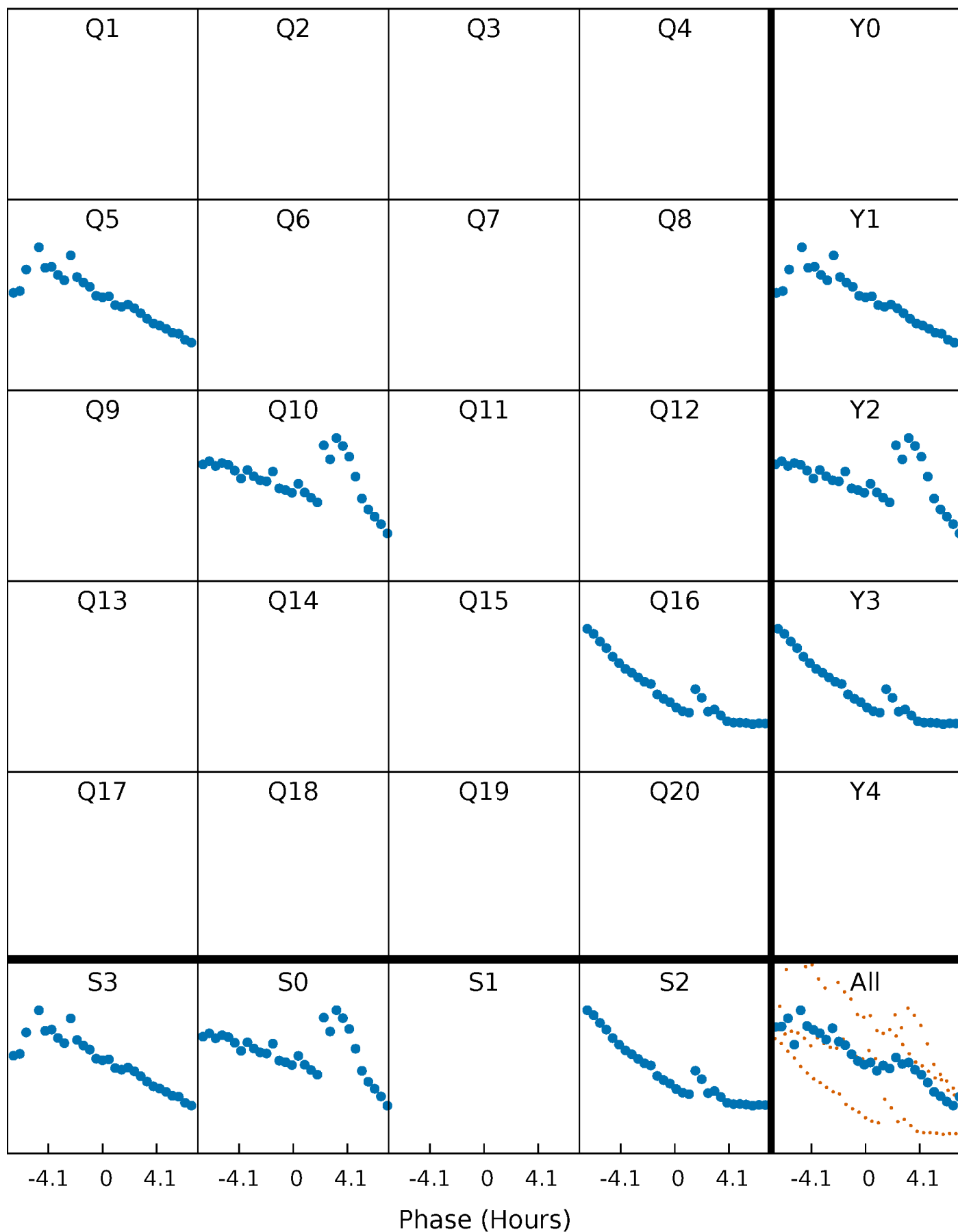


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

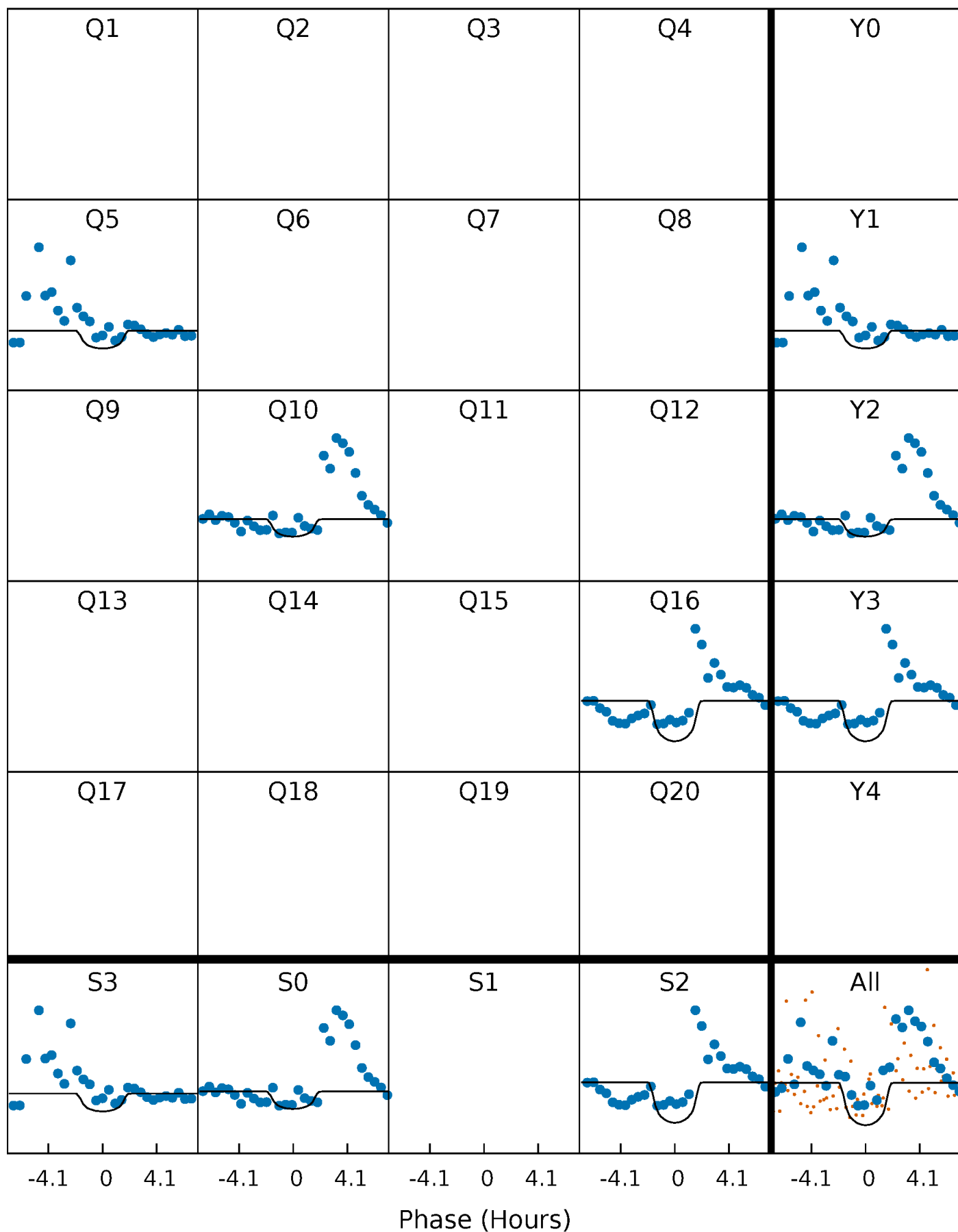
TCE 008811811-03 P=528.869526 Days  $T_0=456.246638$  (BKJD)





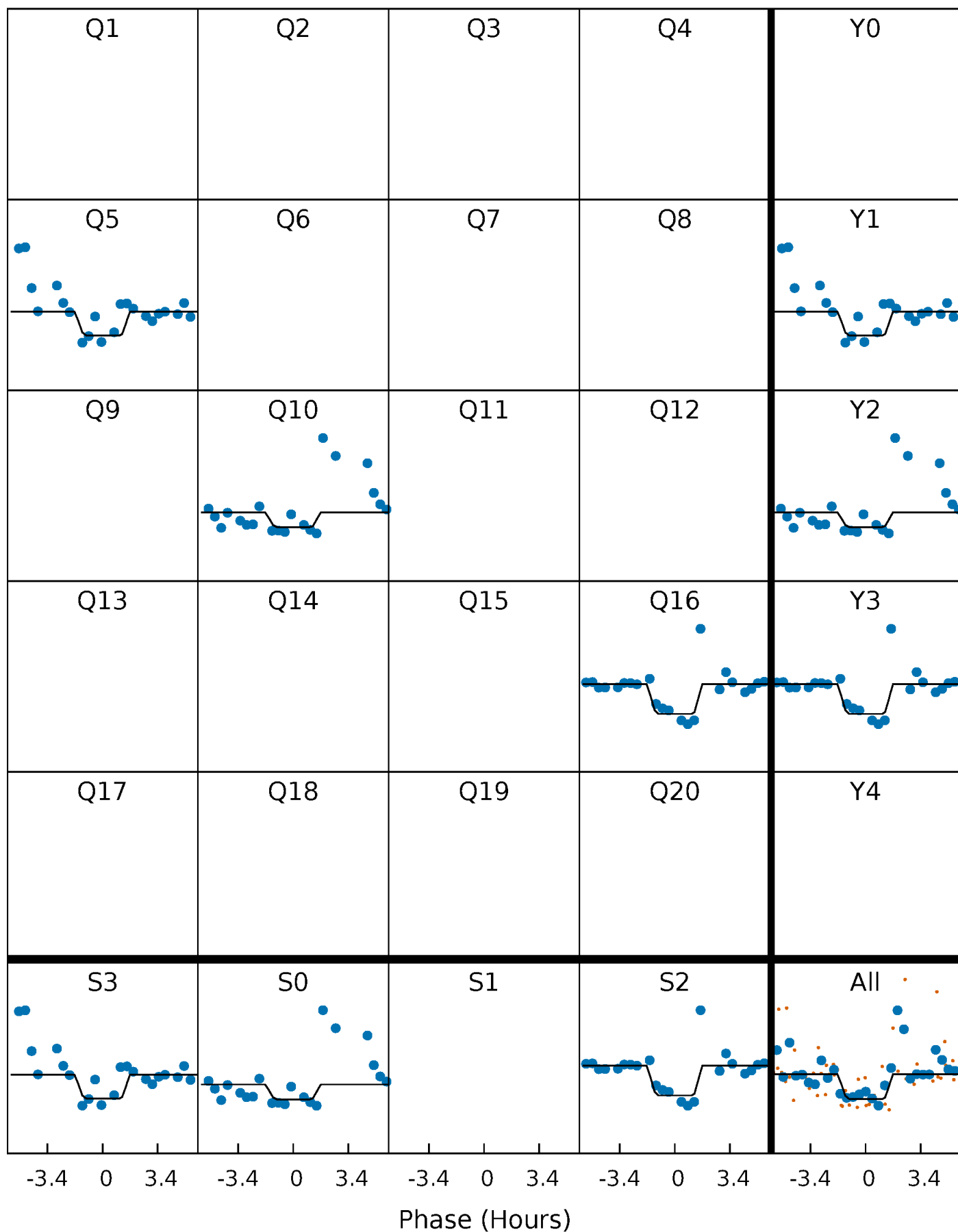
# DV Quarter-Phased Transit Curves

TCE 008811811-03     $P=528.869526$  Days     $T_0=456.246638$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

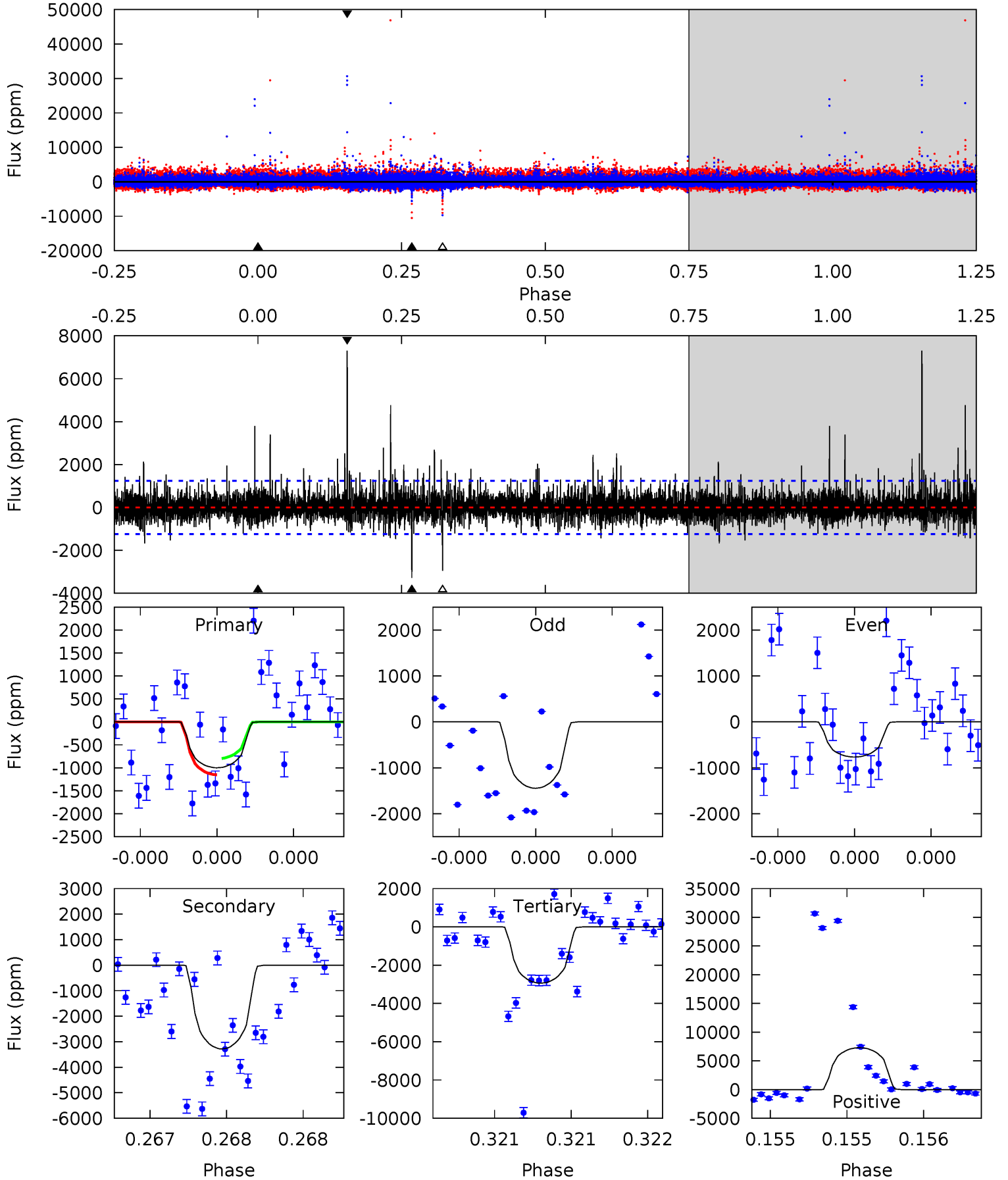
TCE 008811811-03 P=528.847778 Days  $T_0=456.280447$  (BKJD)



# DV Model-Shift Uniqueness Test

008811811-03, P = 528.869526 Days, E = 456.246638 Days

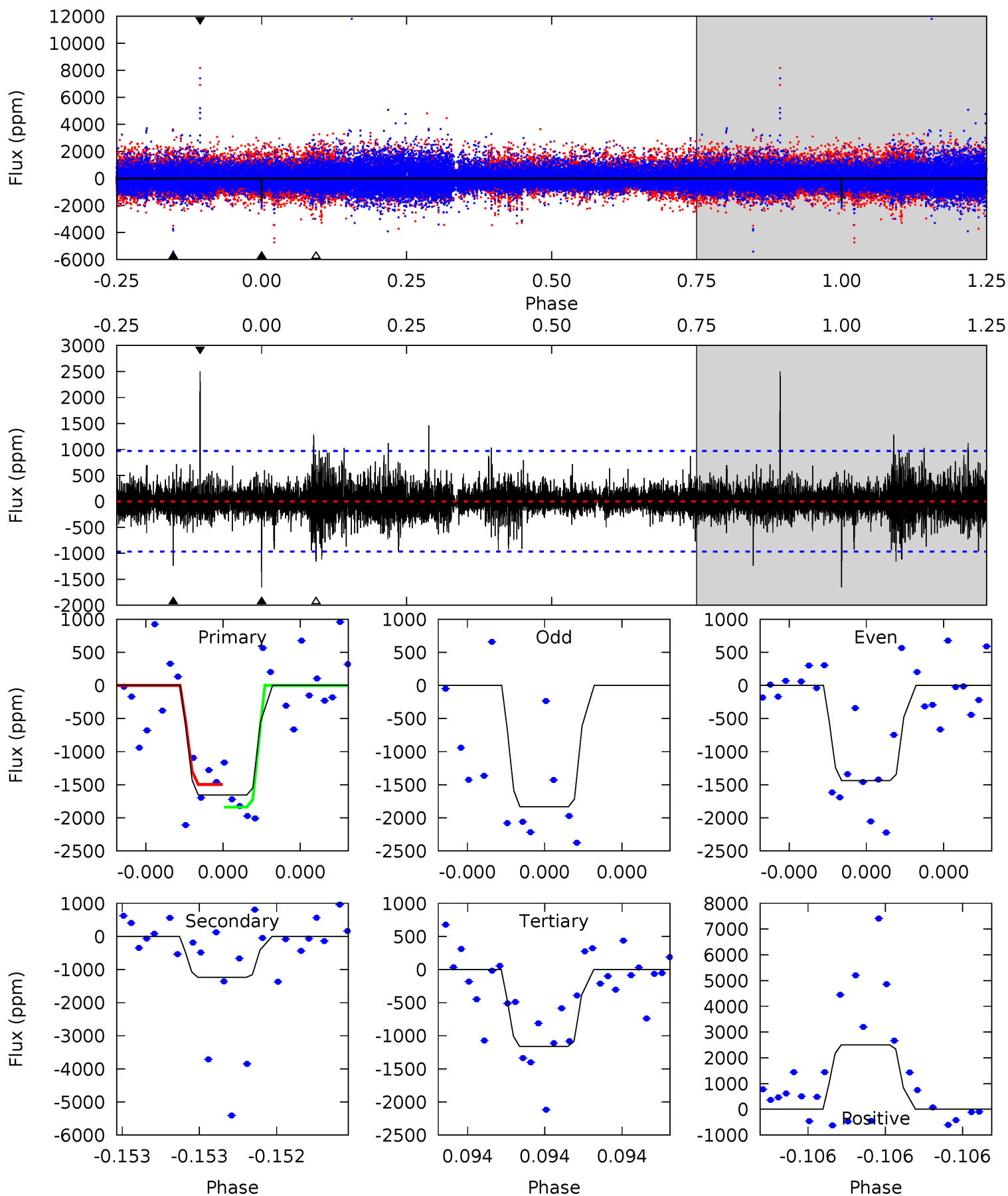
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.55	14.9	13.4	33.2	5.64	3.59	2.06	-8.85	-28.7	1.55	-18.3	0.48	1.09	0.69	0.81



# Alt Model-Shift Uniqueness Test

008811811-03, P = 528.847778 Days, E = 456.280447 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
9.73	7.27	6.82	14.7	5.70	3.67	1.17	2.91	-4.99	0.45	-7.45	1.01	0.89	0.60	1.00



### Stellar Parameters For KIC 008811811

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4114^{+148}_{-165}$	$4.611^{+0.060}_{-0.016}$	$0.380^{+0.100}_{-0.300}$	$0.669^{+0.027}_{-0.067}$	$0.667^{+0.039}_{-0.058}$	$3.135^{+0.850}_{-0.226}$
	+4%/-4%	+1%/-0%	+26%/-79%	+4%/-10%	+6%/-9%	+27%/-7%
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 008811811-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-3283 \pm 220$	$3.81^{+2.81}_{-2.39}$	$194^{+8}_{-8}$	$4230^{+2189}_{-722}$	$158163^{+950573}_{-106182}$
Alt.	$-1236 \pm 170$	$3.48^{+2.63}_{-2.07}$	$194^{+8}_{-9}$	$3665^{+1476}_{-592}$	$69468^{+358139}_{-46770}$

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

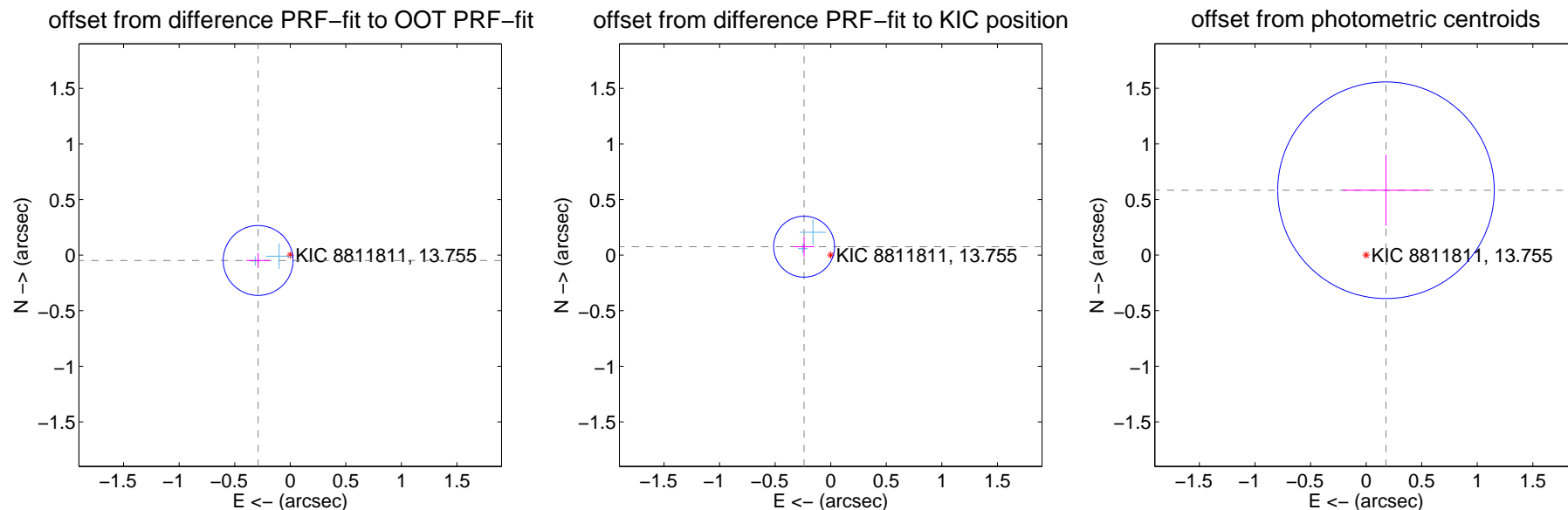
## DV Centroid Data

Supplemental centroid analysis for 008811811-03. Kepler magnitude: 13.76. Transit SNR 7.69

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.293 \pm 0.105$	2.80	$0.289 \pm 0.106$	$-0.048 \pm 0.069$
PRF-fit source offset from KIC position	$0.251 \pm 0.091$	2.75	$0.240 \pm 0.091$	$0.076 \pm 0.090$
photometric centroid source offset	$0.61 \pm 0.32$	1.88	$-0.18 \pm 0.39$	$0.58 \pm 0.32$

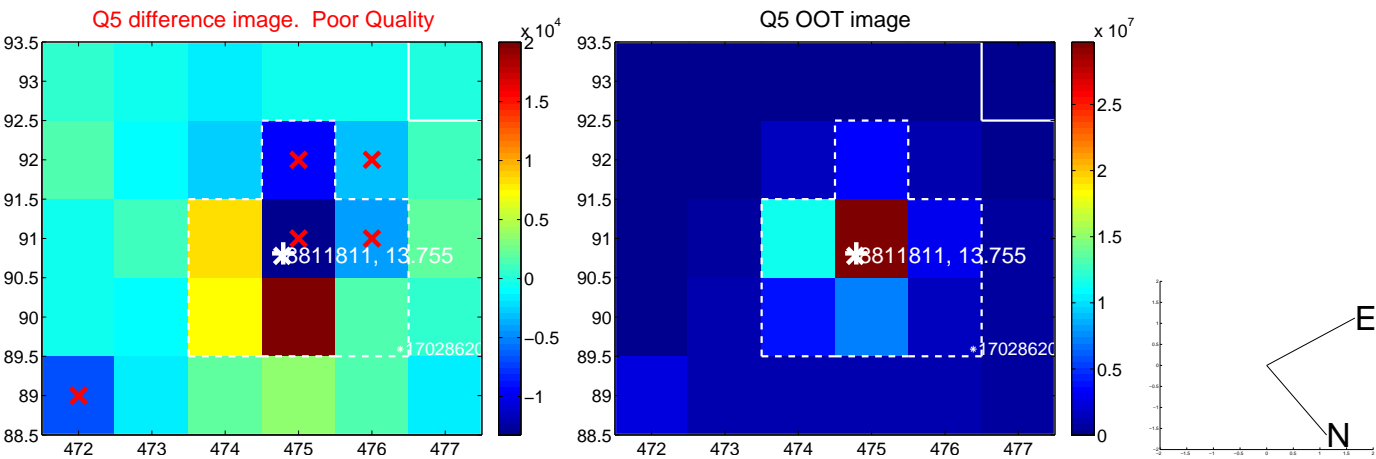


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

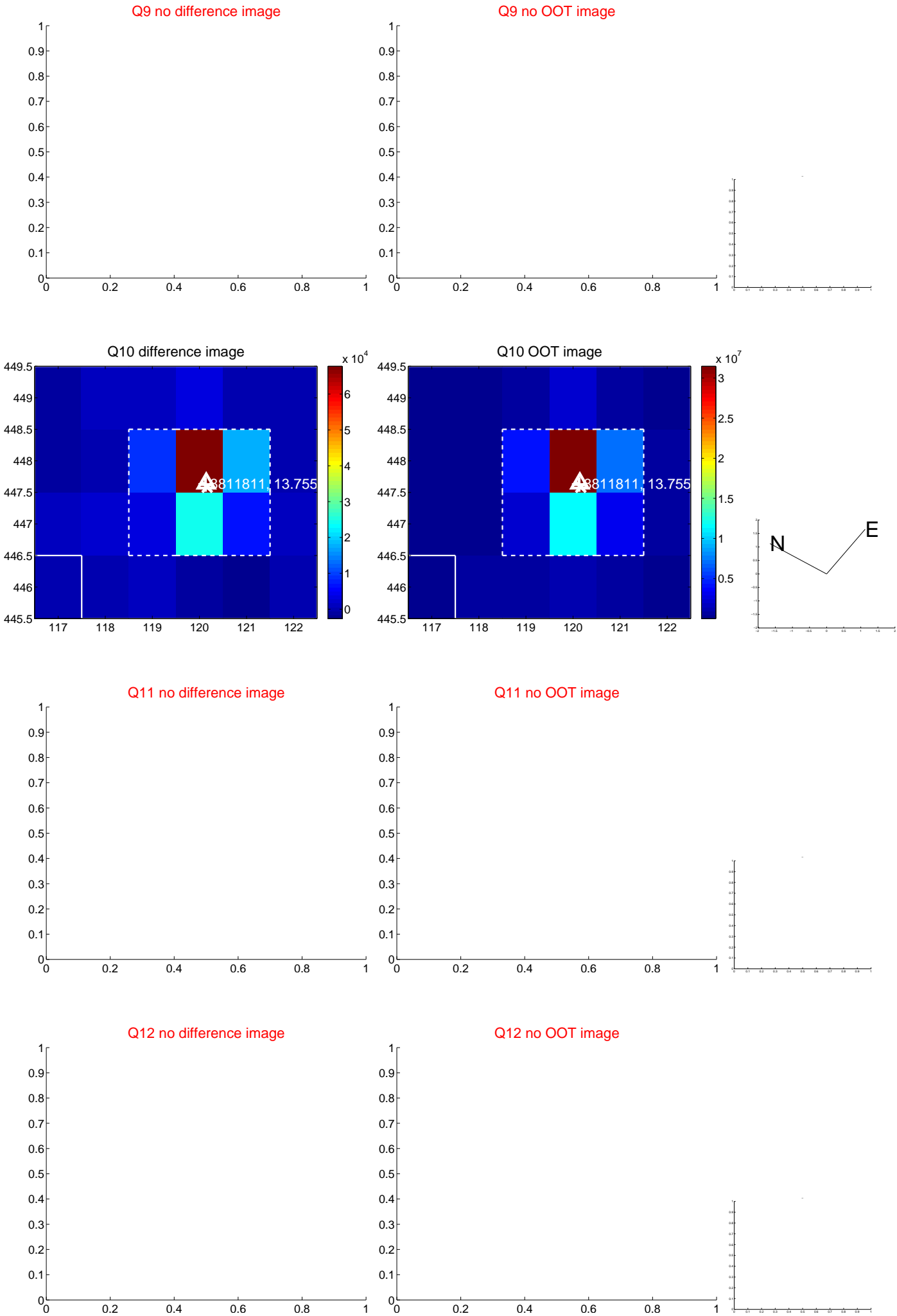


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

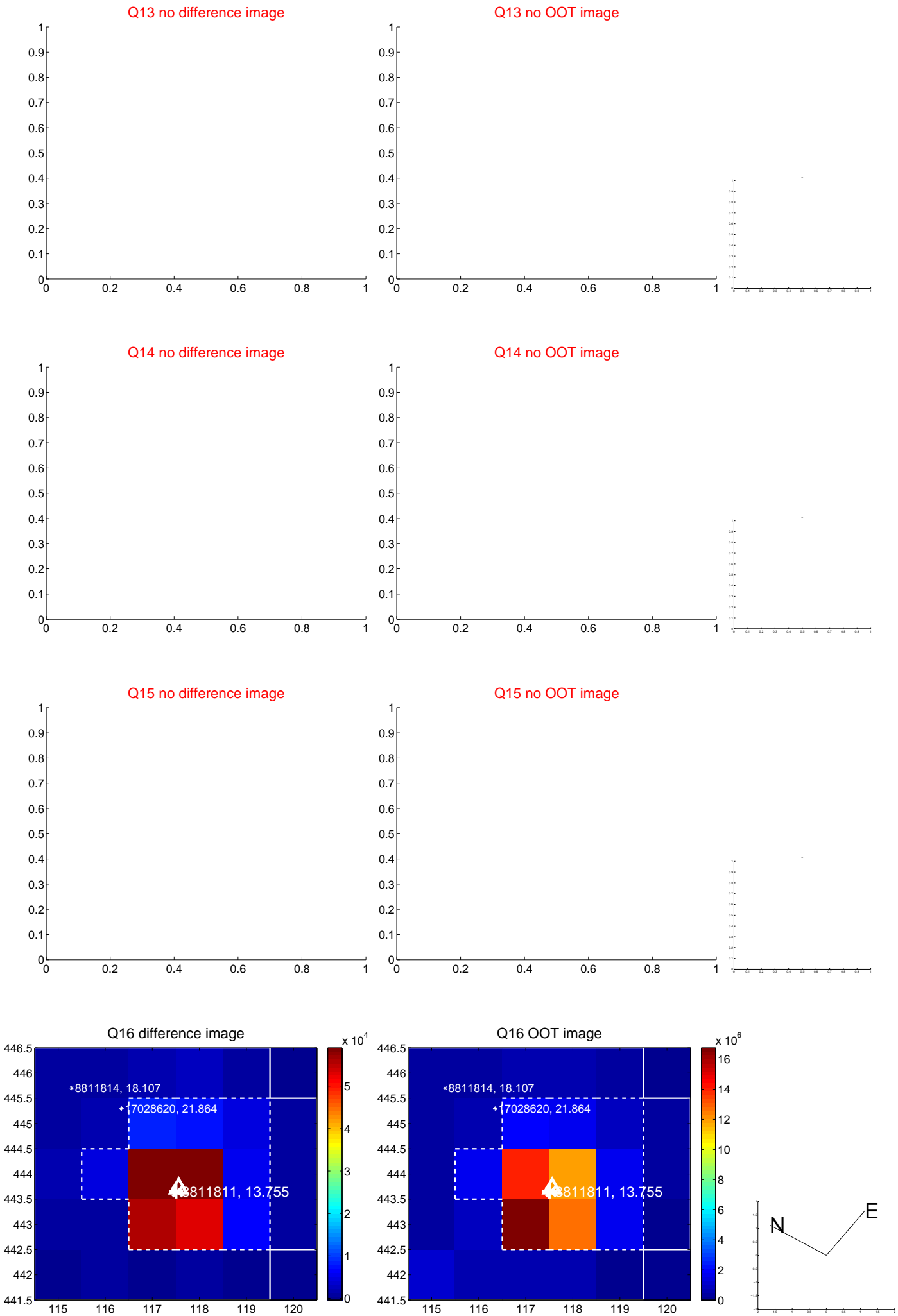




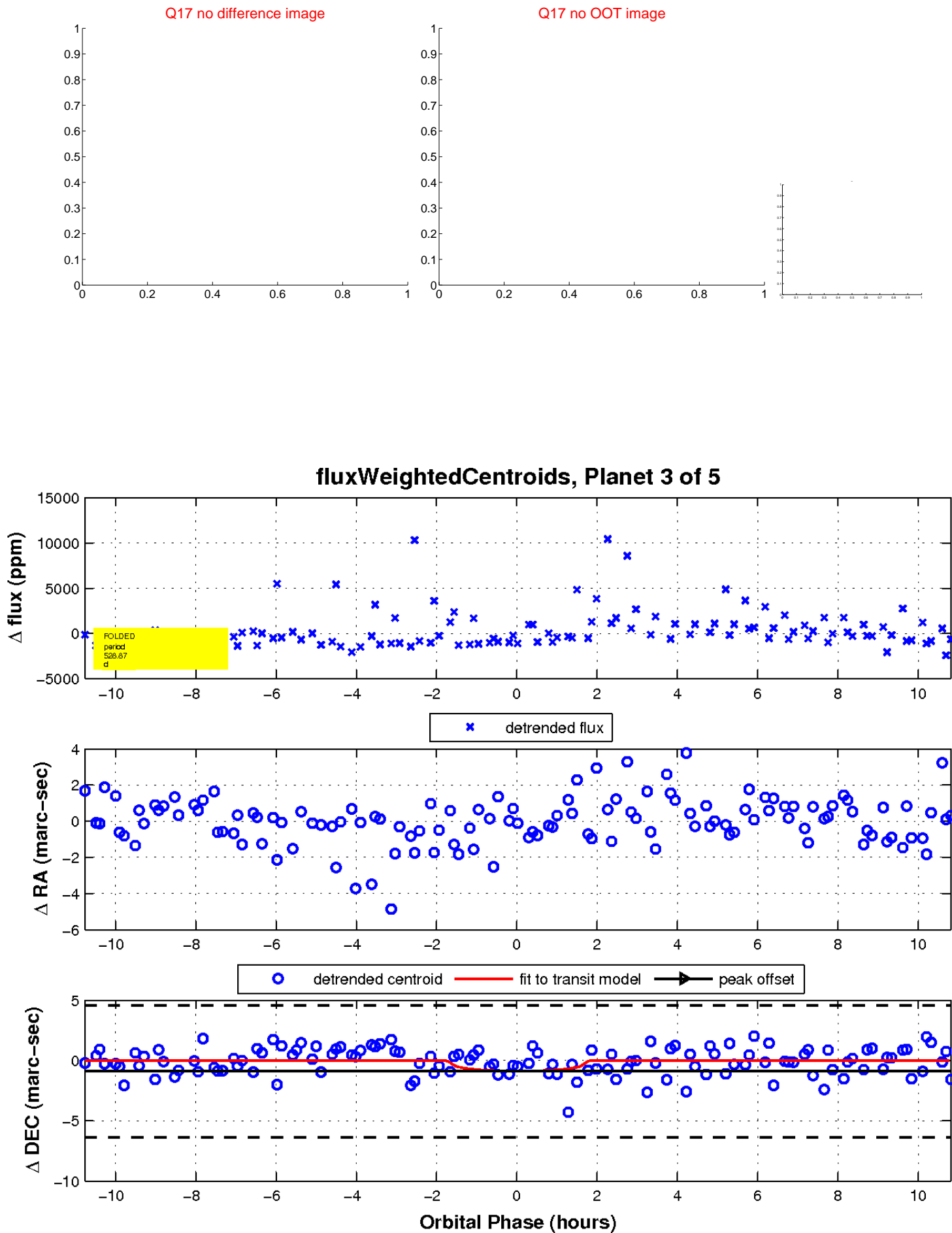
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

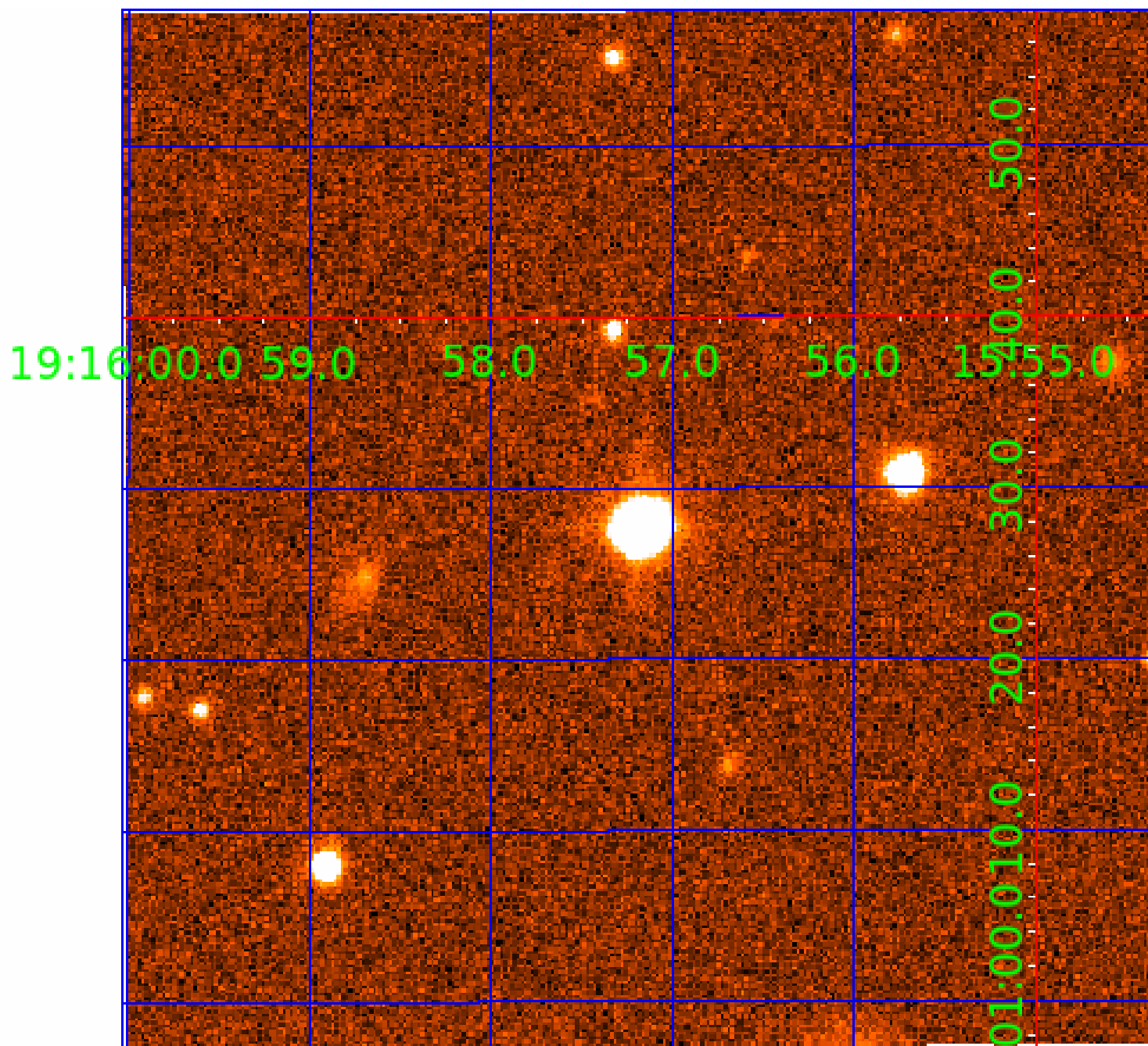


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008811811

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008811811-01	OBS	No	535.892269	393.460738	3047.2	3.825	14.8	9.6	0.67	4114	3.52	0.09
008811811-03	OBS	No	528.869526	456.246638	2550.0	3.613	14.5	7.7	0.67	4114	3.47	0.09
008811811-04	OBS	No	613.671503	217.232872	2857.3	4.231	14.4	8.1	0.67	4114	3.59	0.07
008811811-05	OBS	No	0.748702	131.537035	757.4	2.500	13.0	-1.0	0.67	4114	1.75	577.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008811811-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008811811-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008811811-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008811811-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

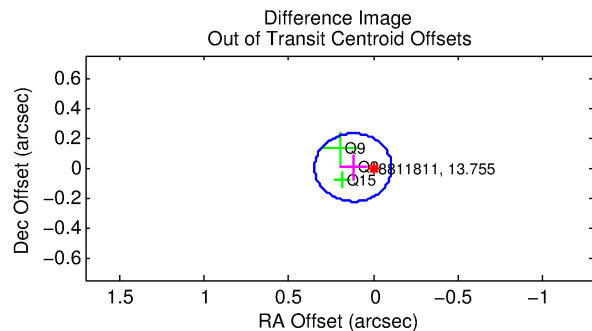
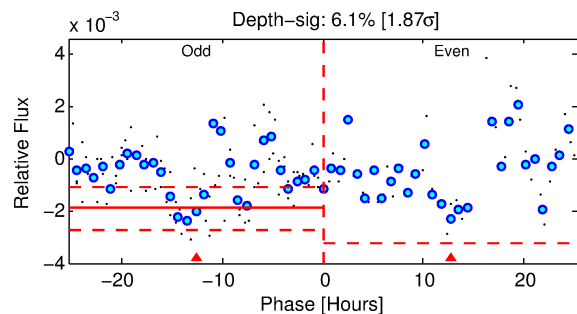
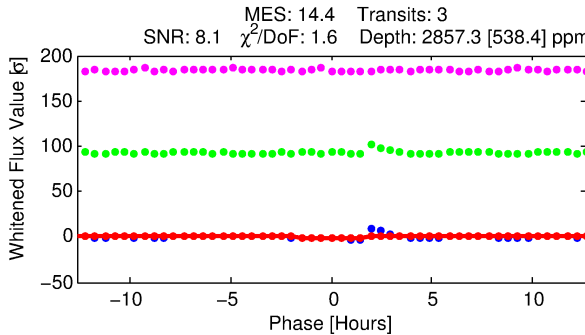
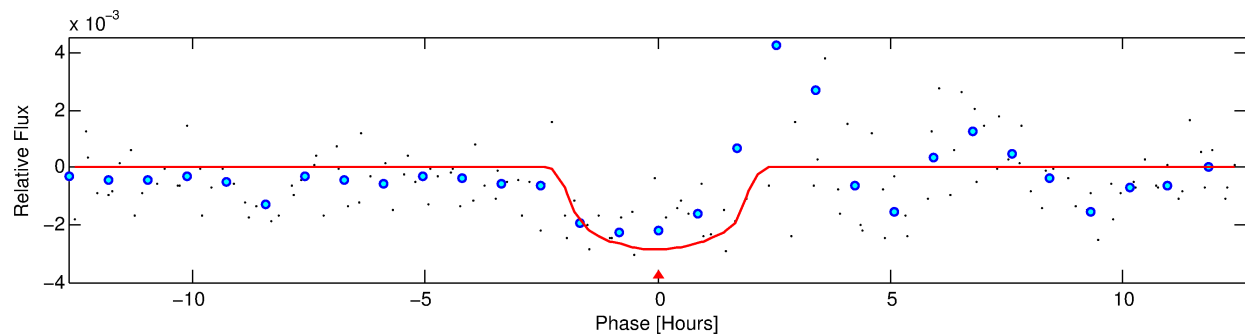
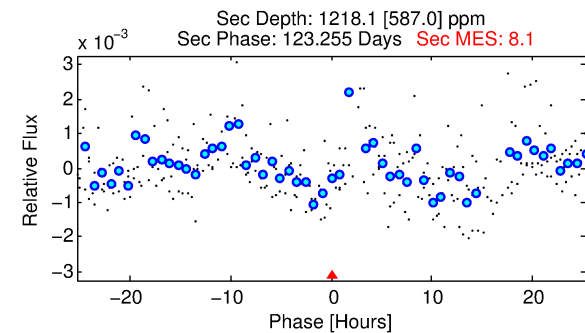
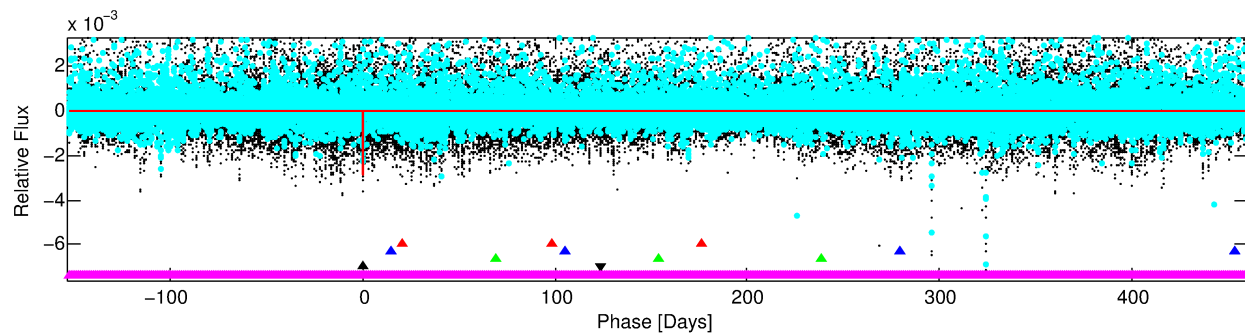
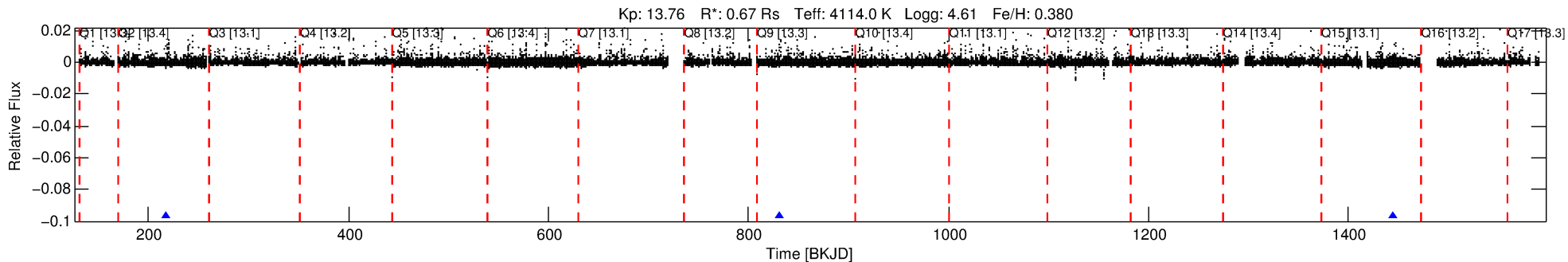
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008811811-04

No Significant Match Found

# DV One-Page Summary

KIC: 8811811 Candidate: 4 of 5 Period: 613.672 d



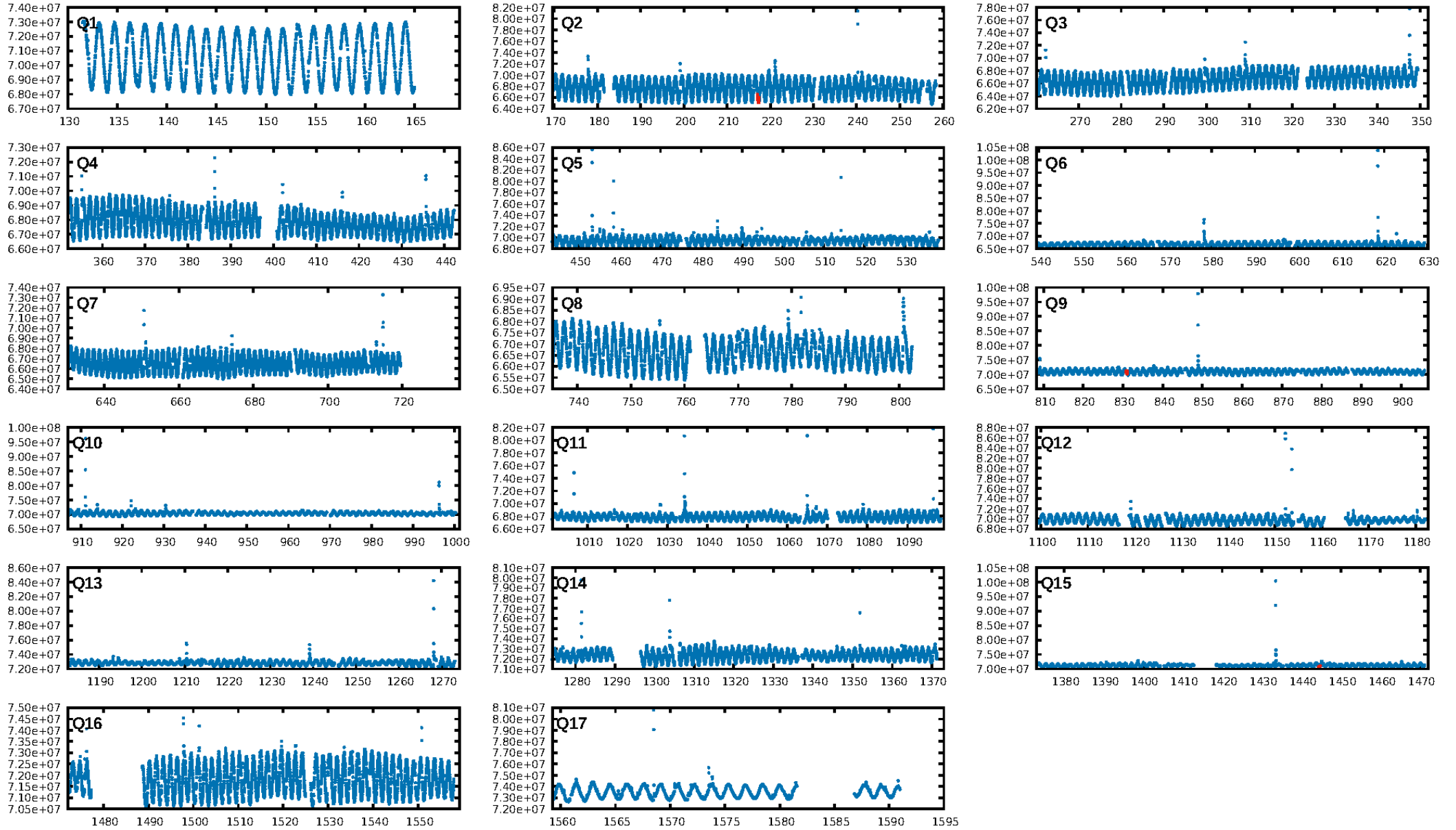
## DV Fit Results:

Period = 613.67150 [0.00756] d  
Epoch = 217.2329 [0.0093] BKJD  
Rp/R\* = 0.0492 [0.0775]  
a/R\* = 1013.06 [4503.74]  
b = 0.51 [6.57]  
Seff = 0.08 [0.01]  
Teq = 134 [7] K  
Rp = 3.59 [5.67] Re  
a = 1.2348 [0.1002] AU  
Ag = 79305.35 [253049.97] [0.31σ]  
Teffp = 3466 [2767] K [1.20σ]

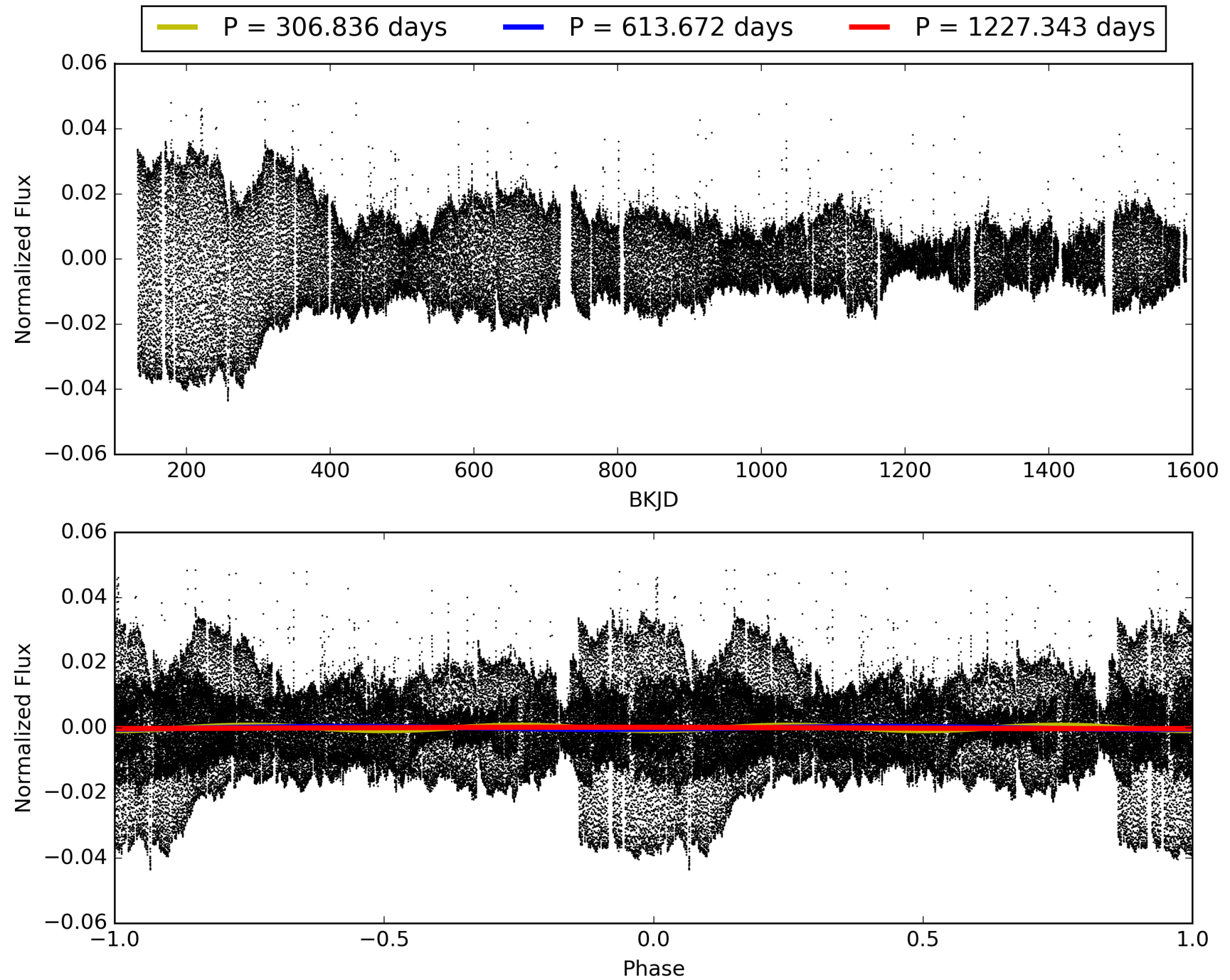
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [327.25σ]  
LongPeriod-sig: N/A  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 13.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.2638**  
Centroid-sig: N/A  
Centroid-so: 0.400 arcsec [1.46σ]  
OotOffset-rm: 0.121 arcsec [1.59σ]  
**KicOffset-rm: 0.305 arcsec [3.20σ]**  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/3]

# TCE 008811811-04, PDC Light Curves



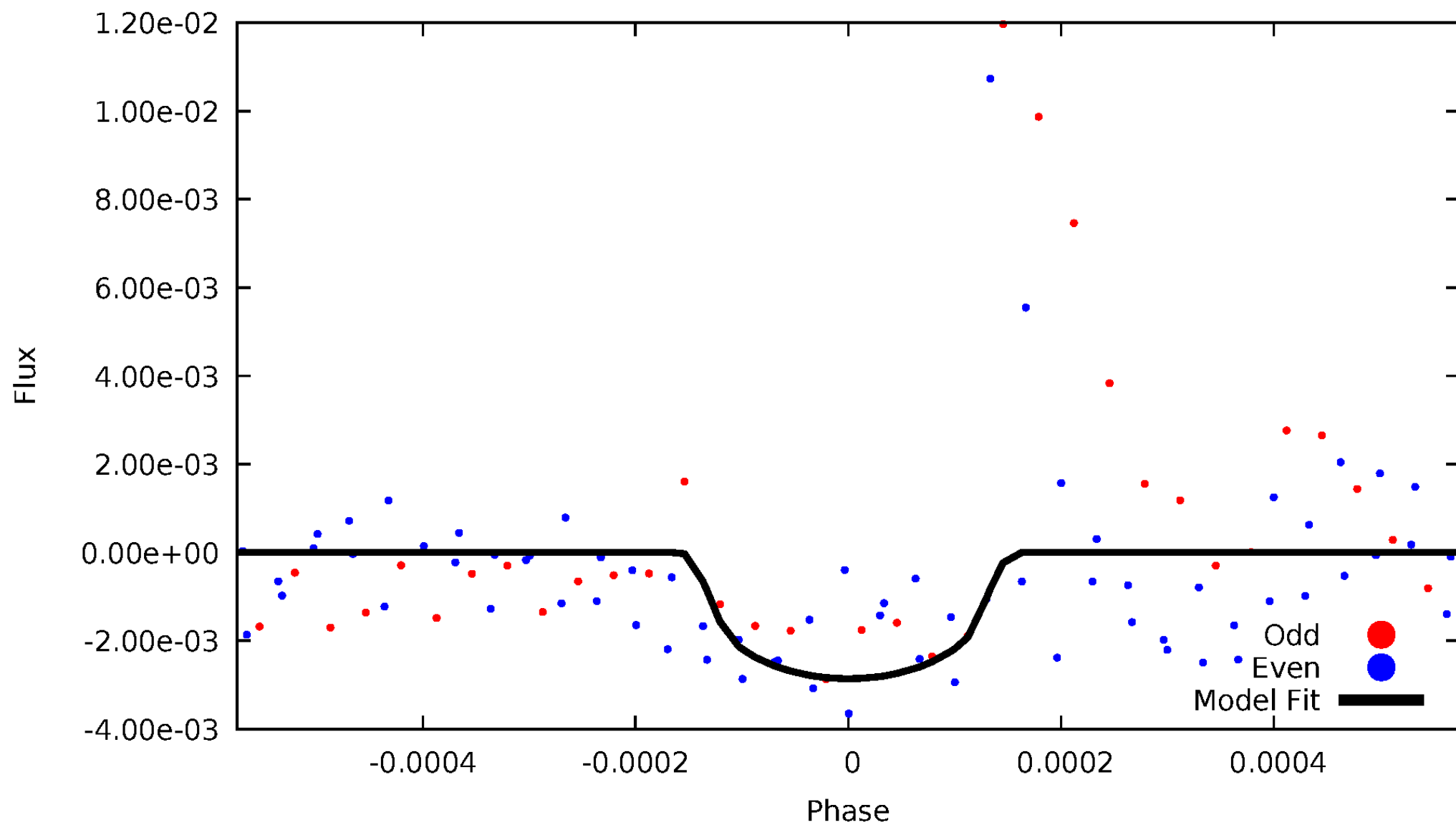
# TCE 008811811-04





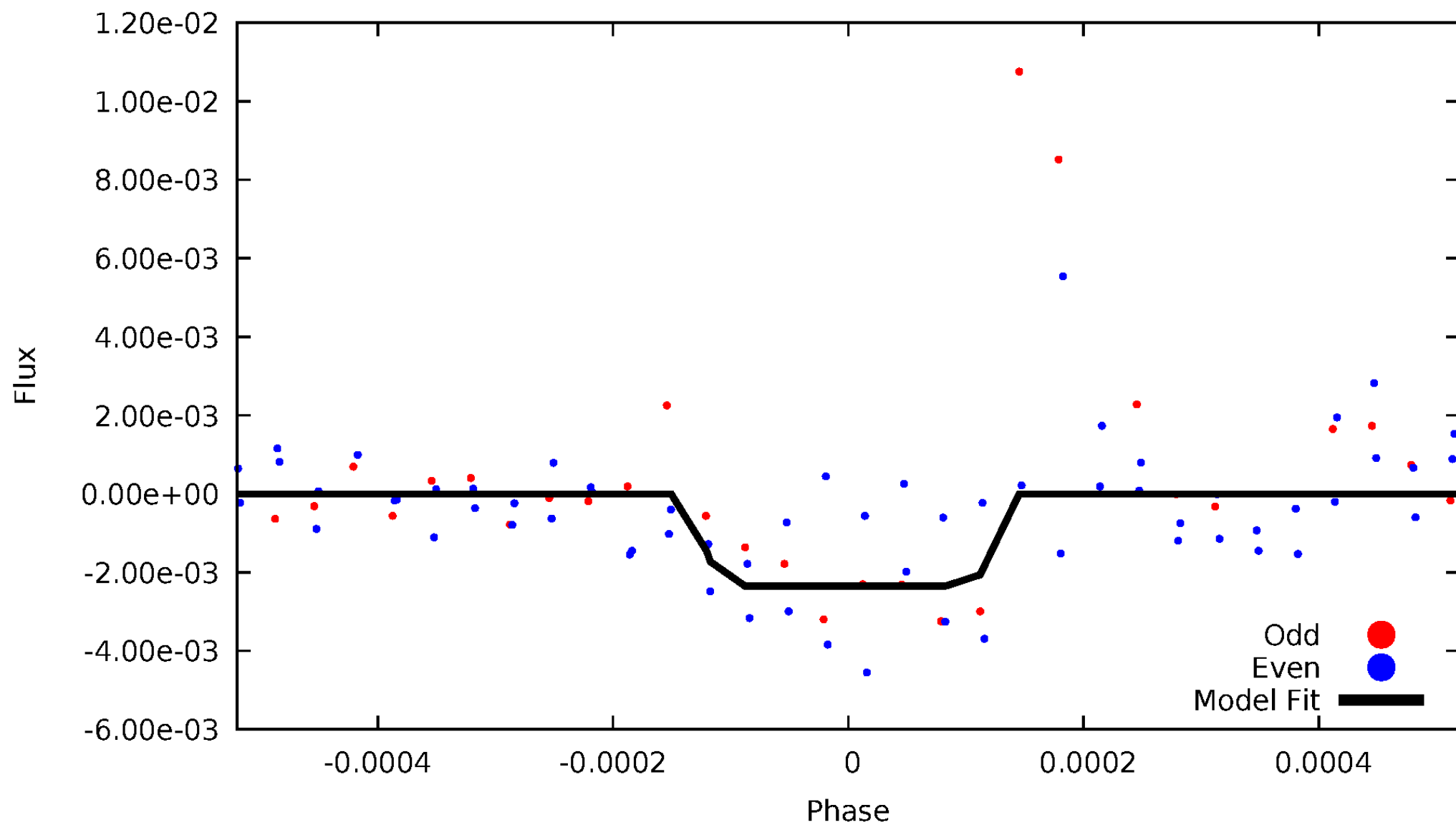
# DV Odd/Even

TCE 008811811-04



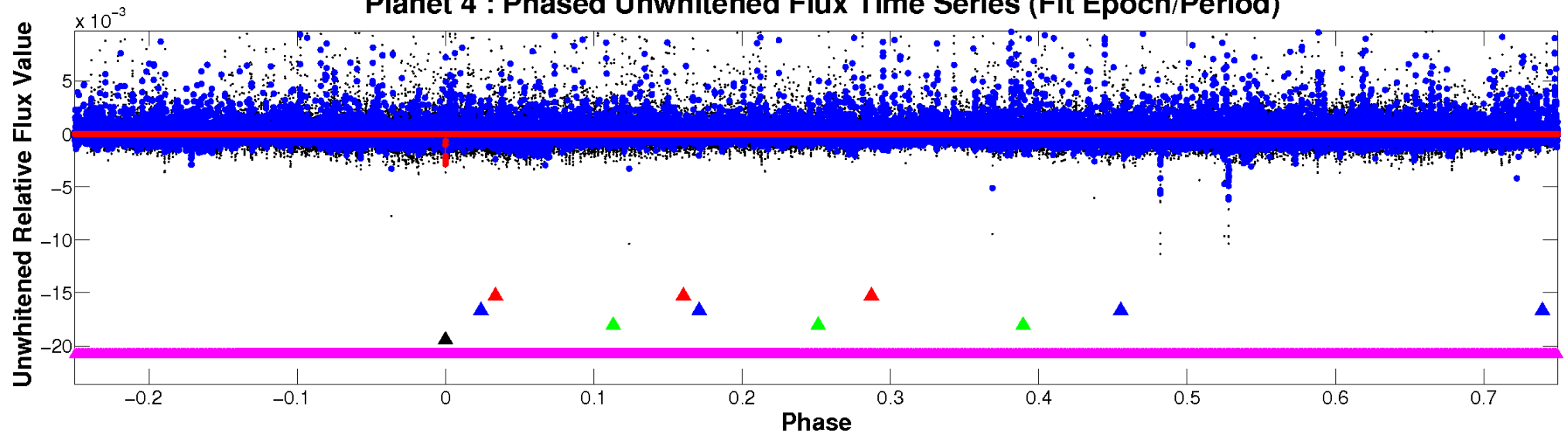
# ALT Odd/Even

TCE 008811811-04

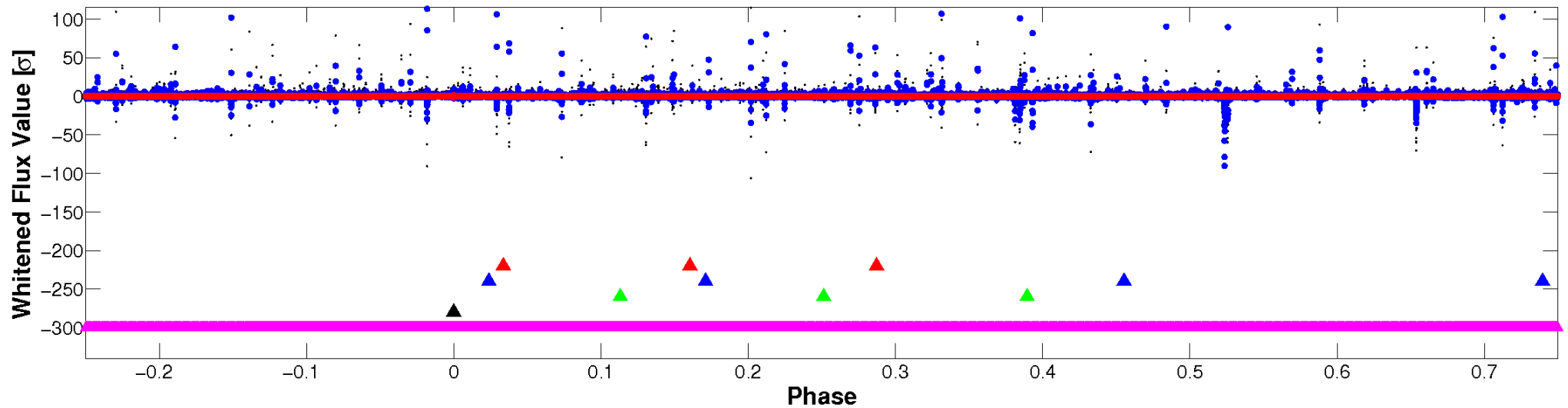


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

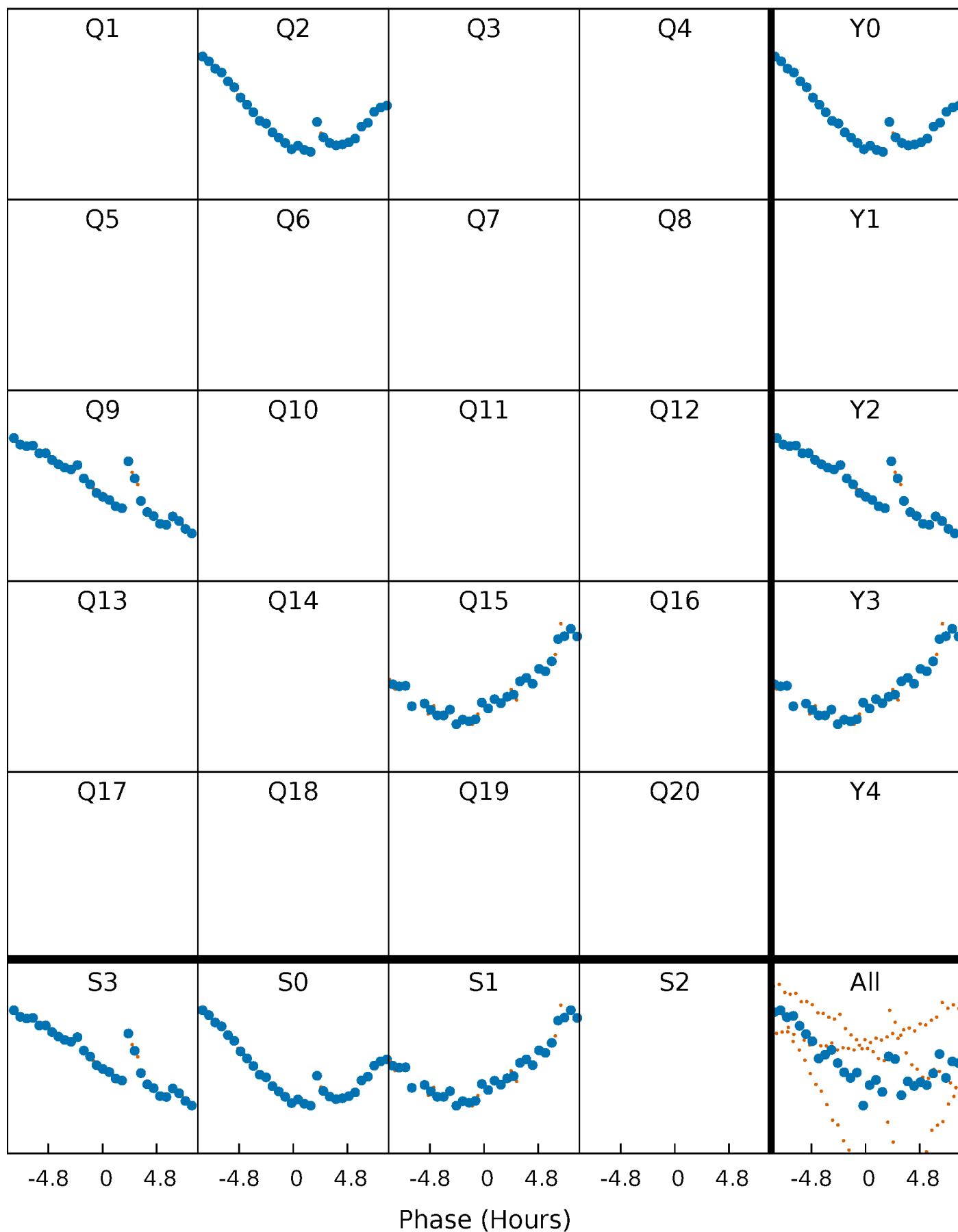


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



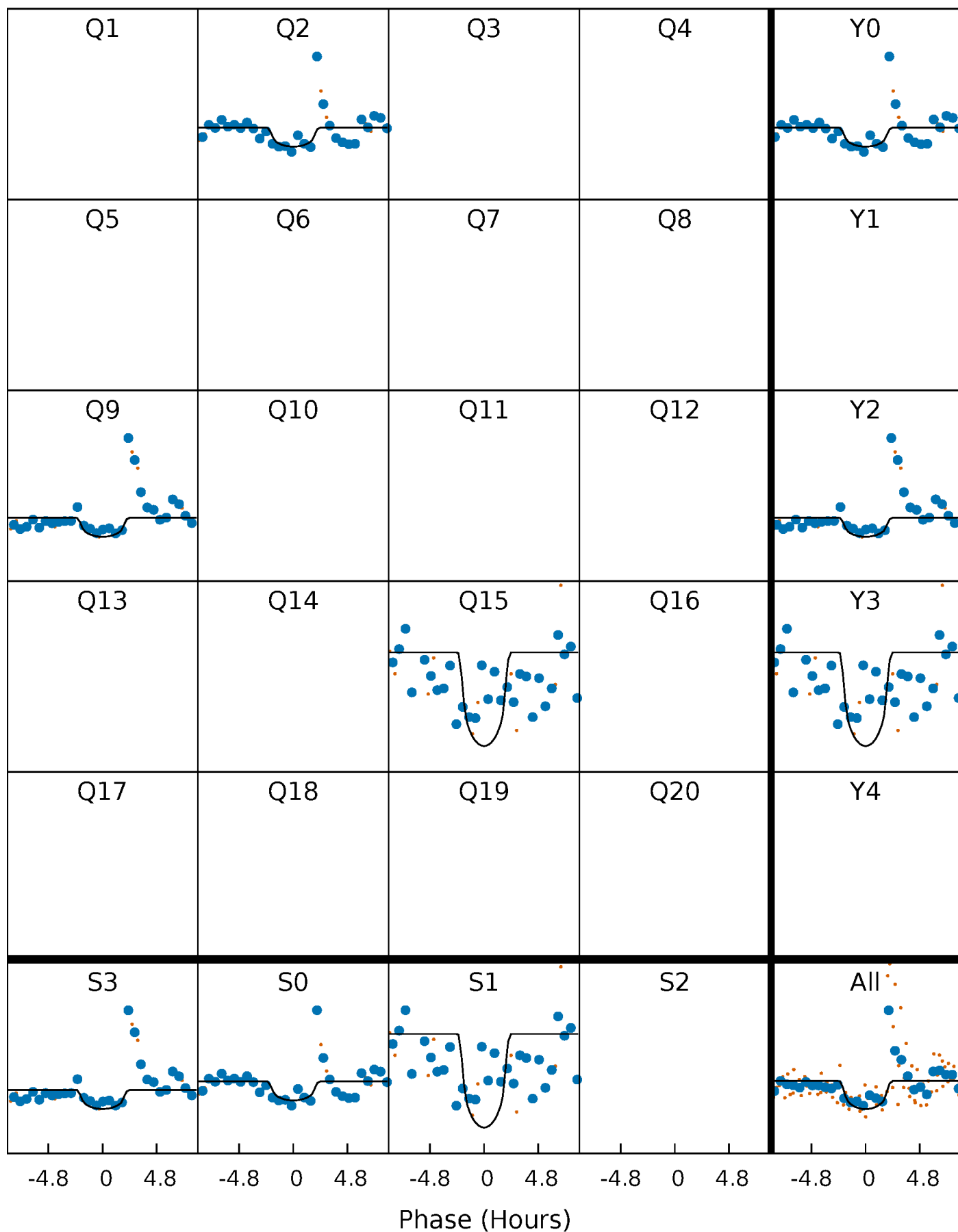
# PDC Quarter-Phased Transit Curves

TCE 008811811-04 P=613.671503 Days  $T_0=217.232872$  (BKJD)



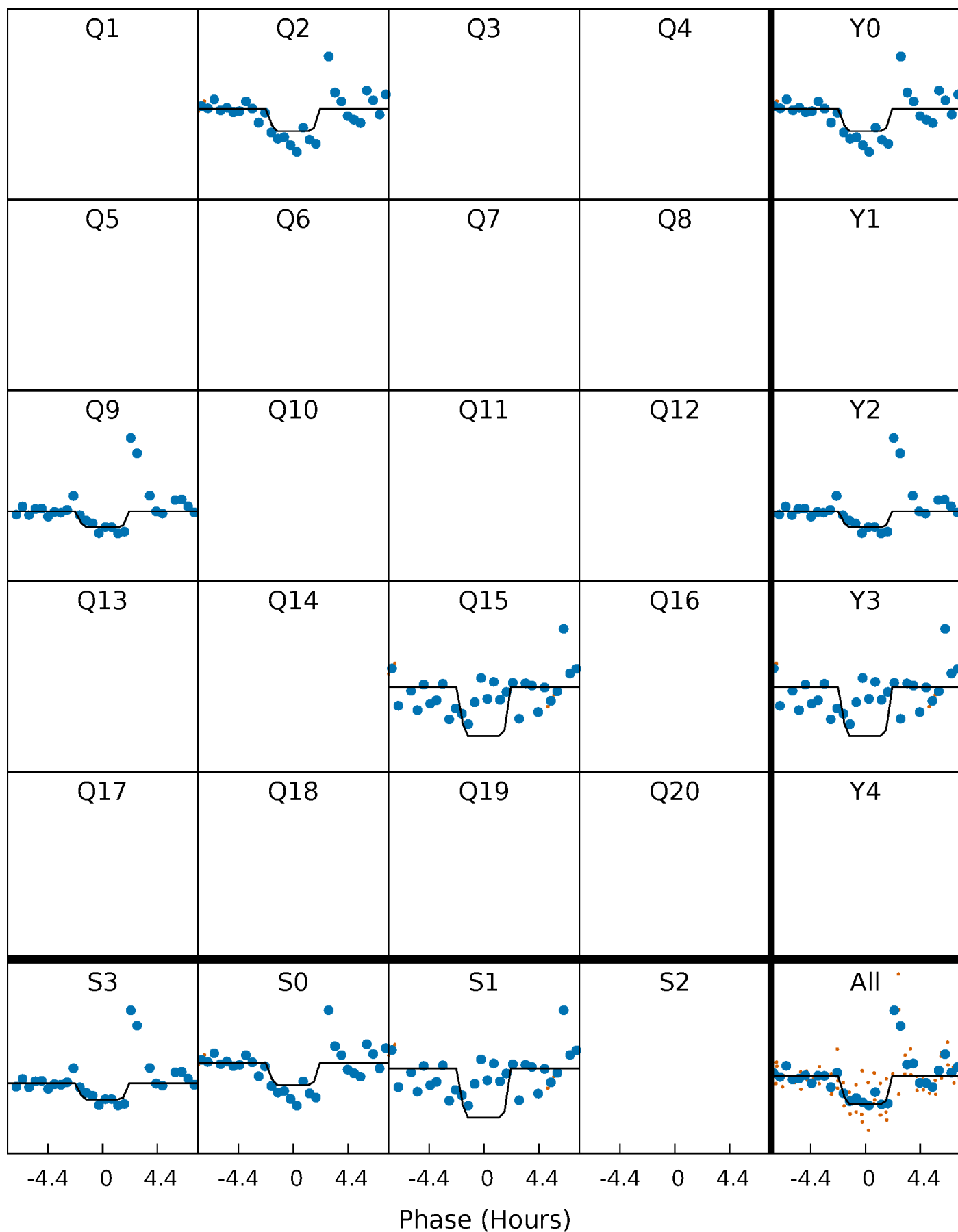
# DV Quarter-Phased Transit Curves

TCE 008811811-04     $P=613.671503$  Days     $T_0=217.232872$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

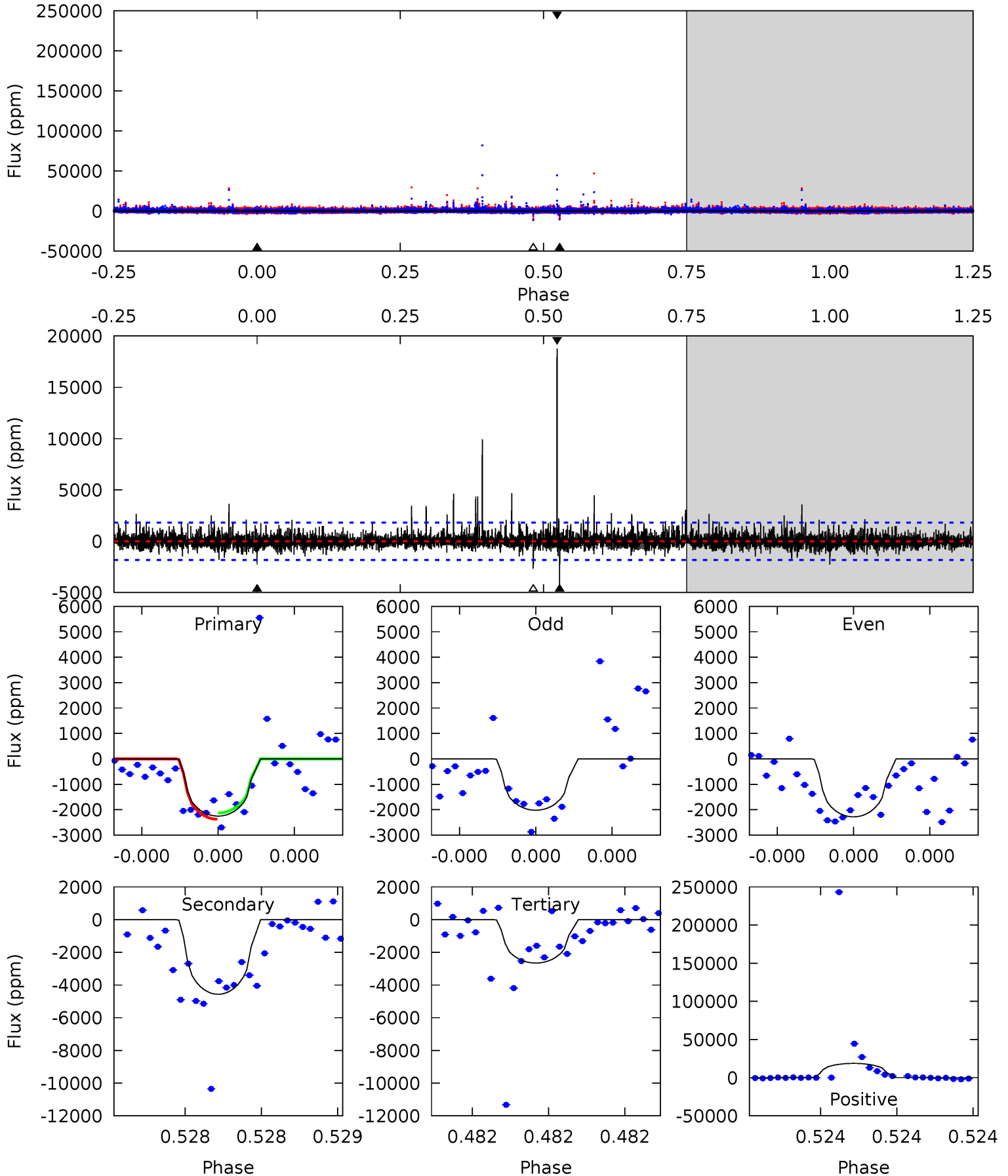
TCE 008811811-04 P=613.681108 Days  $T_0=217.223389$  (BKJD)



# DV Model-Shift Uniqueness Test

008811811-04, P = 613.671503 Days, E = 217.232872 Days

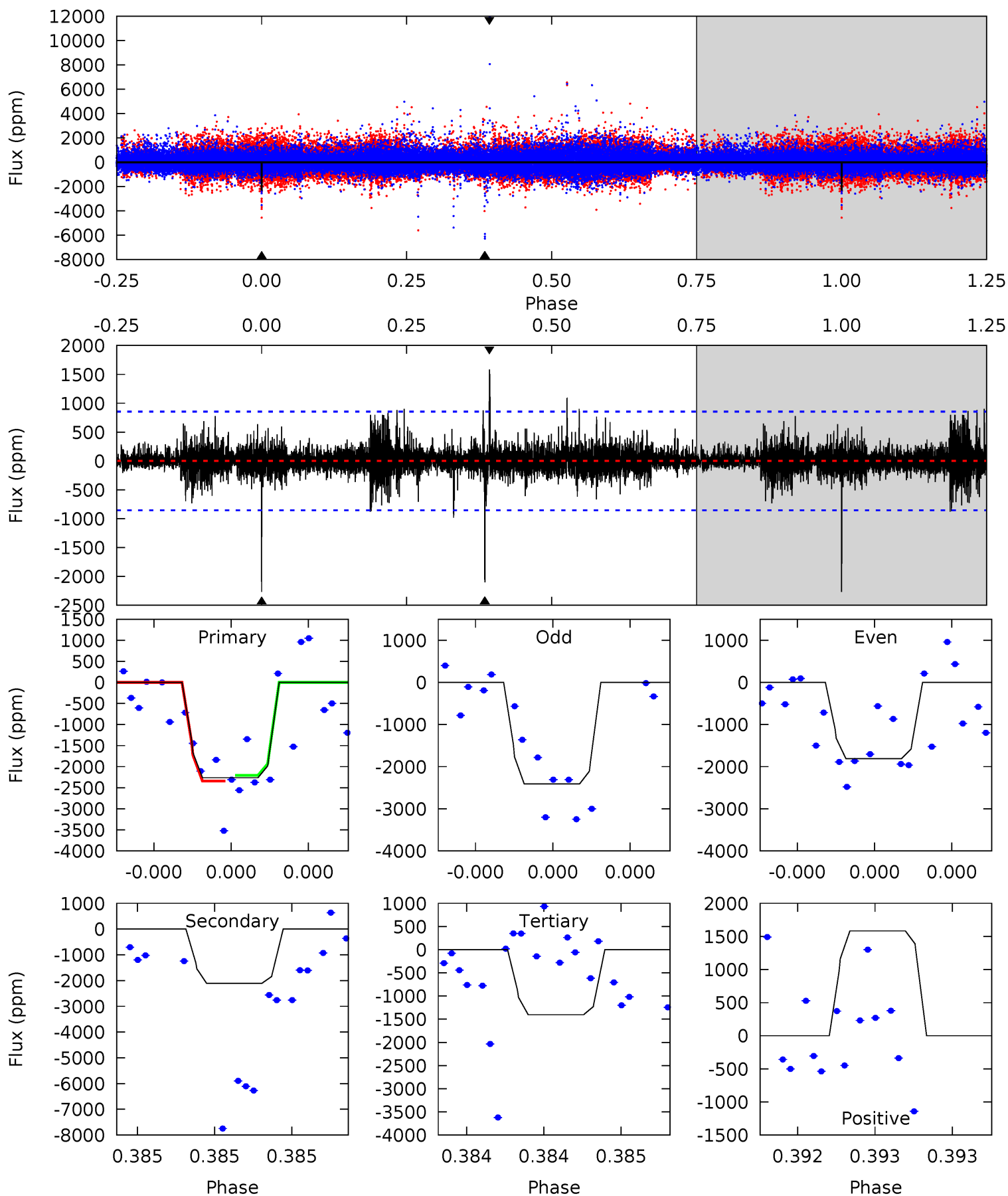
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.01	14.2	8.28	58.4	5.66	3.62	1.96	-1.27	-51.4	5.94	-44.2	0.17	0.99	0.80	0.38



# Alt Model-Shift Uniqueness Test

008811811-04, P = 613.681108 Days, E = 217.223389 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
15.1	14.0	9.36	10.6	5.70	3.68	1.12	5.75	4.55	4.67	3.47	1.36	0.89	0.41	0.43





### Stellar Parameters For KIC 008811811

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4114^{+148}_{-165}$	$4.611^{+0.060}_{-0.016}$	$0.380^{+0.100}_{-0.300}$	$0.669^{+0.027}_{-0.067}$	$0.667^{+0.039}_{-0.058}$	$3.135^{+0.850}_{-0.226}$
	+4%/-4%	+1%/-0%	+26%/-79%	+4%/-10%	+6%/-9%	+27%/-7%
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 008811811-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-4569 \pm 321$	$5.01^{+4.72}_{-3.35}$	$185^{+7}_{-8}$	$4073^{+2355}_{-801}$	$152872^{+1216463}_{-111702}$
Alt.	$-2102 \pm 150$	$5.27^{+4.87}_{-3.47}$	$185^{+8}_{-8}$	$3502^{+1720}_{-627}$	$63492^{+481042}_{-45951}$

$T_{\text{max}}$  = 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

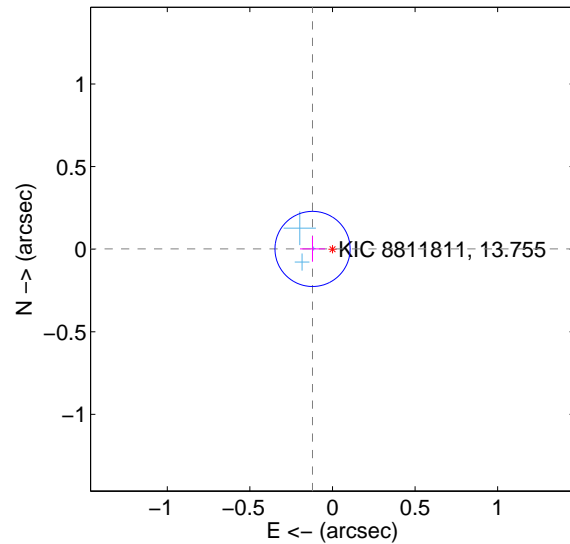
Supplemental centroid analysis for 008811811-04. Kepler magnitude: 13.76. Transit SNR 8.05

There are 3 quarters with good PRF difference image offsets

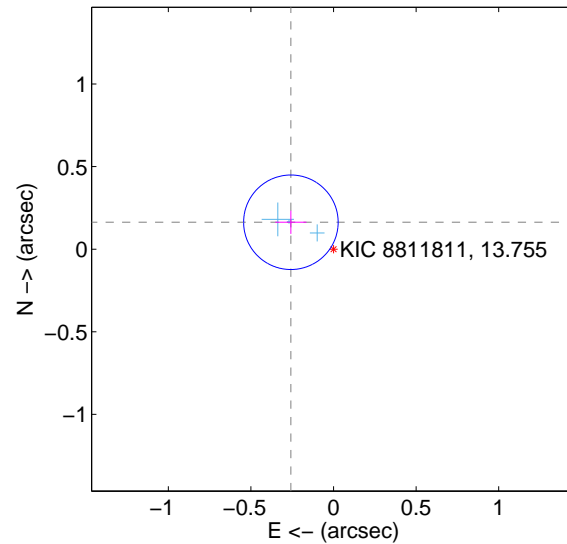
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.121 \pm 0.076$	1.59	$0.121 \pm 0.076$	$0.001 \pm 0.077$
PRF-fit source offset from KIC position	<b><math>0.305 \pm 0.095</math></b>	<b>3.20</b>	$0.258 \pm 0.094$	$0.163 \pm 0.070$
photometric centroid source offset	$0.40 \pm 0.27$	1.46	$0.20 \pm 0.35$	$0.35 \pm 0.25$

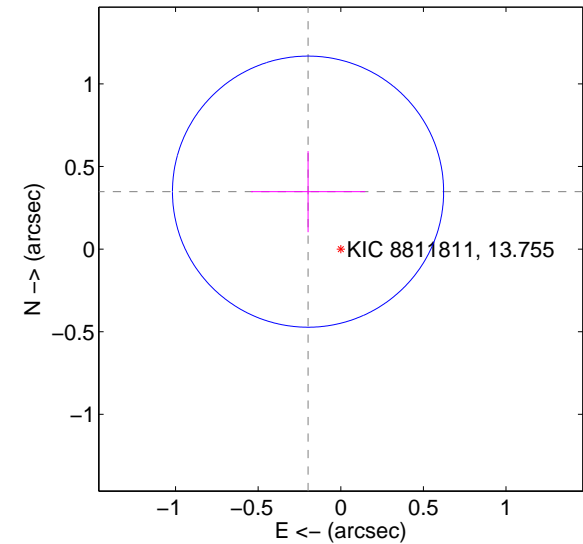
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

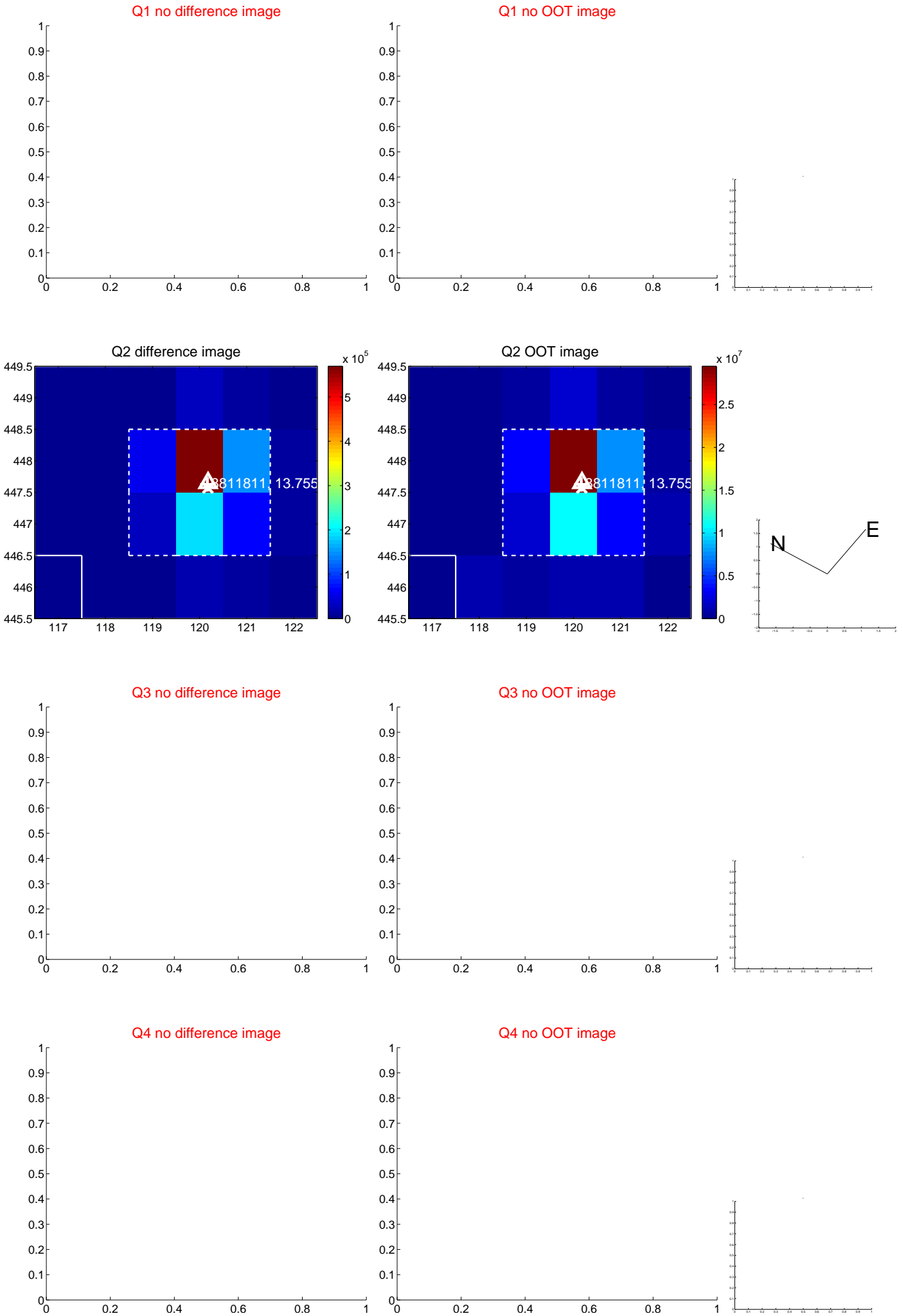


offset from photometric centroids



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.

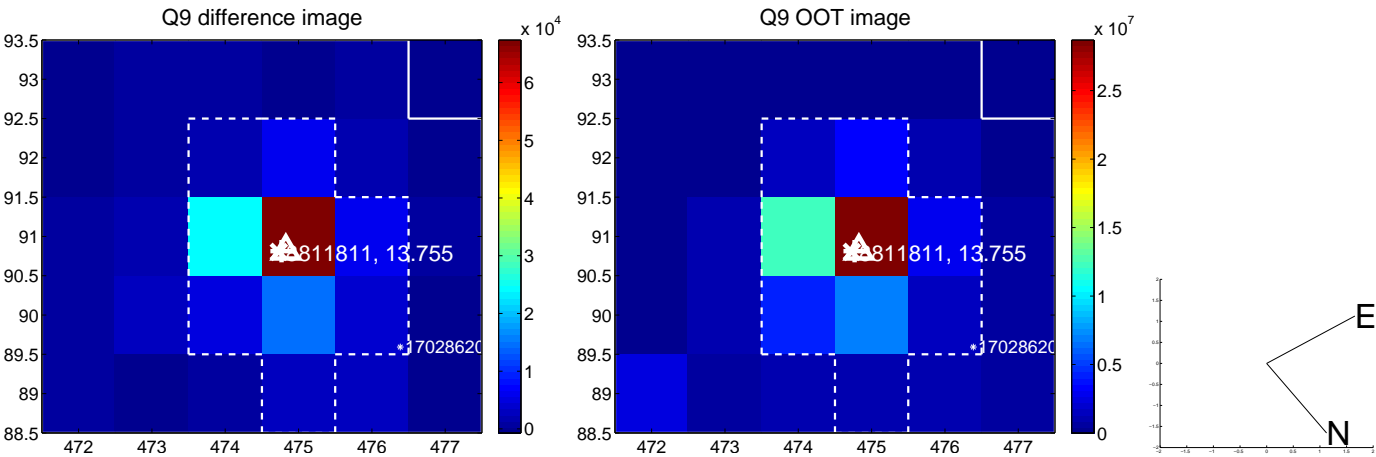
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

Q13 no difference image



Q13 no OOT image



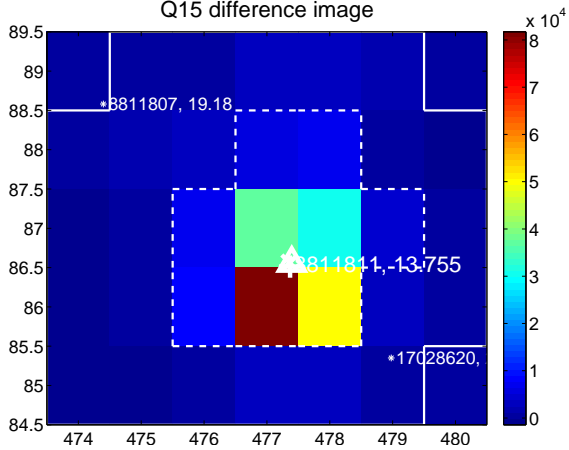
Q14 no difference image



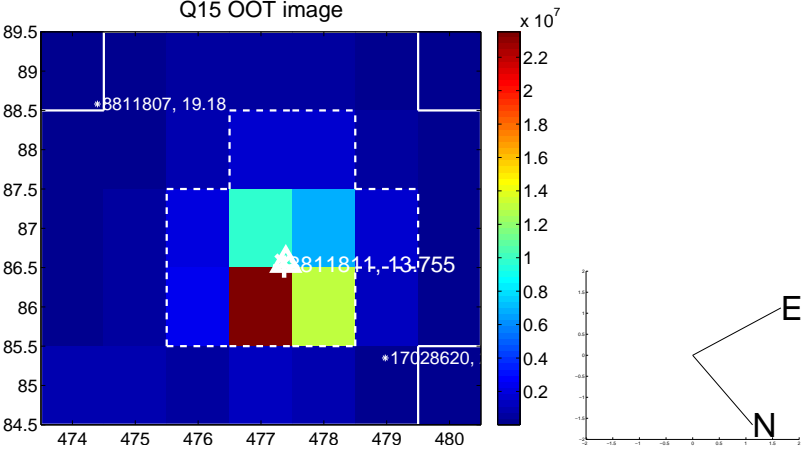
Q14 no OOT image



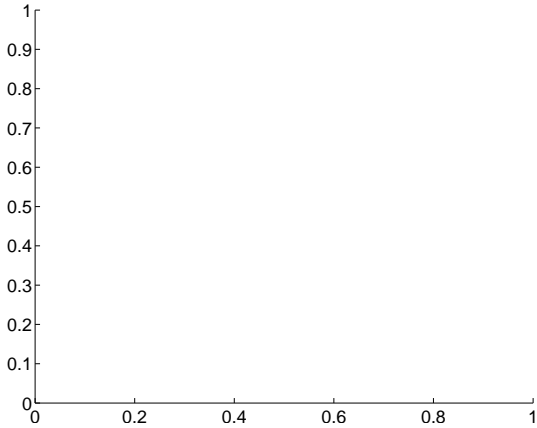
Q15 difference image



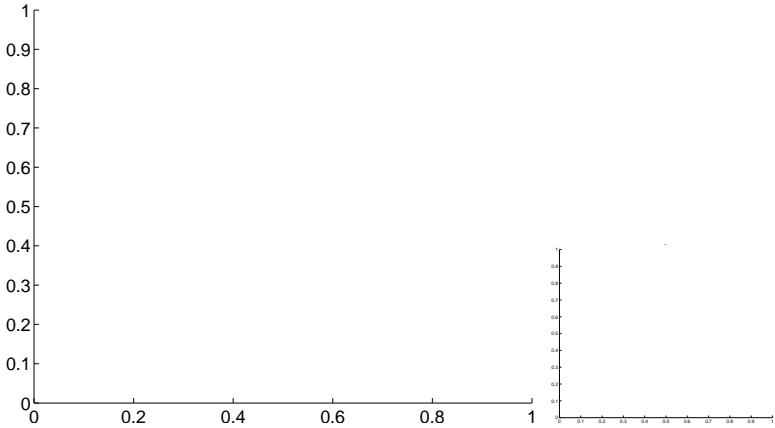
Q15 OOT image



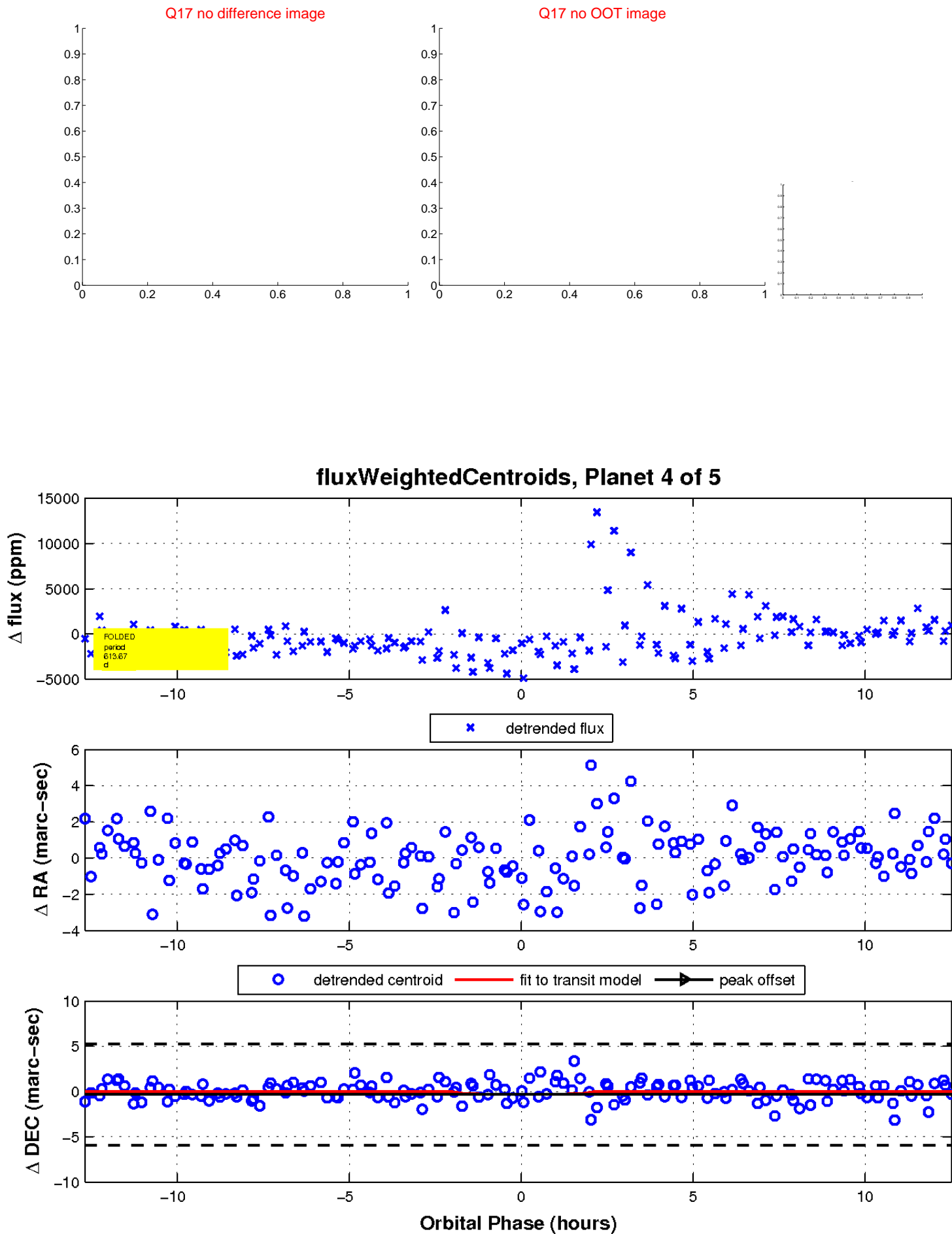
Q16 no difference image



Q16 no OOT image

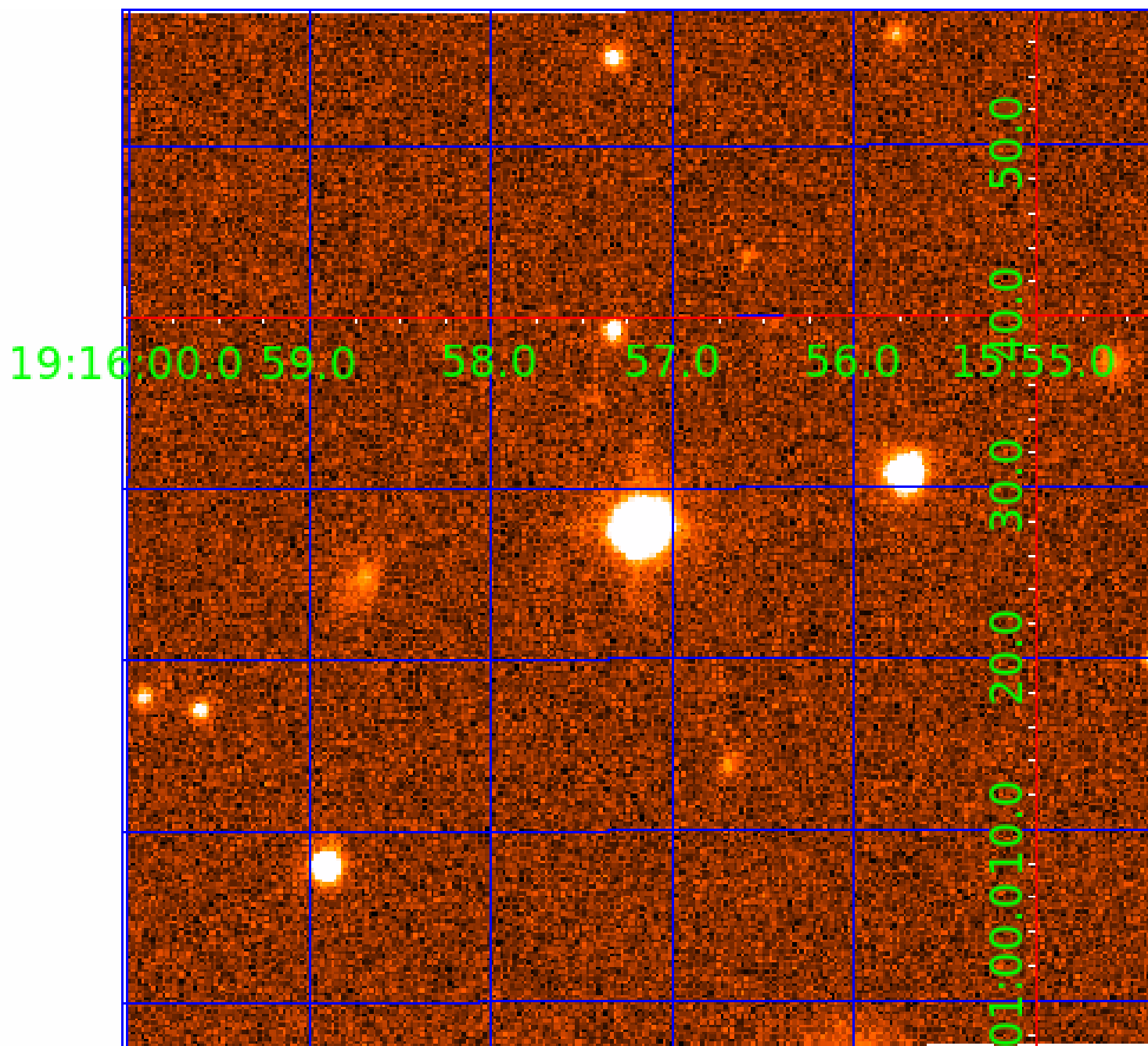


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008811811

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008811811-01	OBS	No	535.892269	393.460738	3047.2	3.825	14.8	9.6	0.67	4114	3.52	0.09
008811811-03	OBS	No	528.869526	456.246638	2550.0	3.613	14.5	7.7	0.67	4114	3.47	0.09
008811811-04	OBS	No	613.671503	217.232872	2857.3	4.231	14.4	8.1	0.67	4114	3.59	0.07
008811811-05	OBS	No	0.748702	131.537035	757.4	2.500	13.0	-1.0	0.67	4114	1.75	577.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008811811-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008811811-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008811811-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008811811-05	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

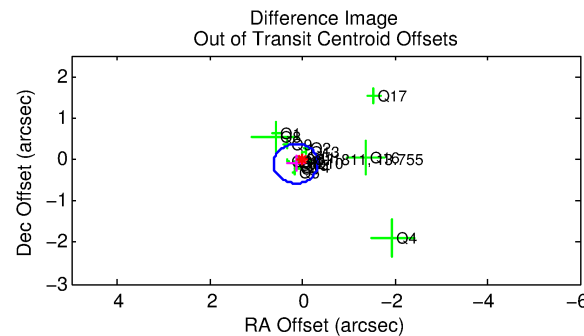
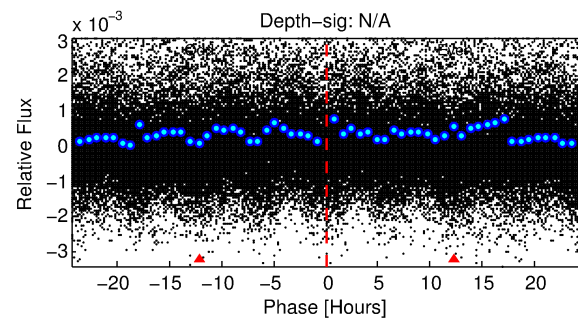
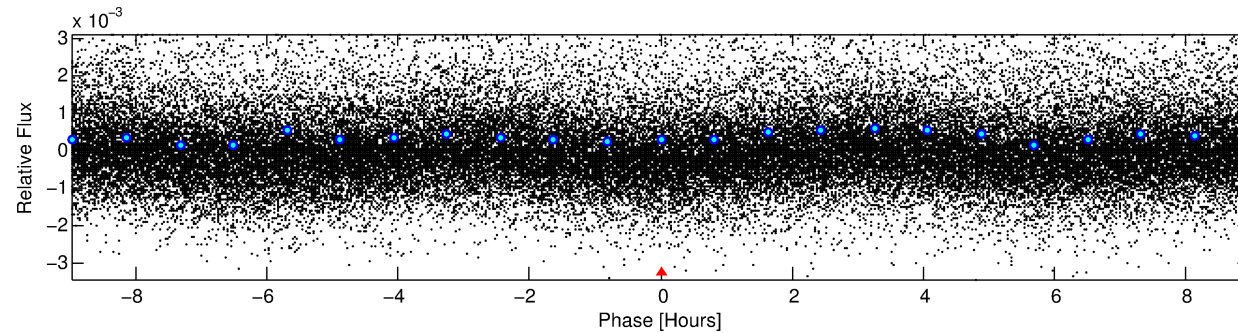
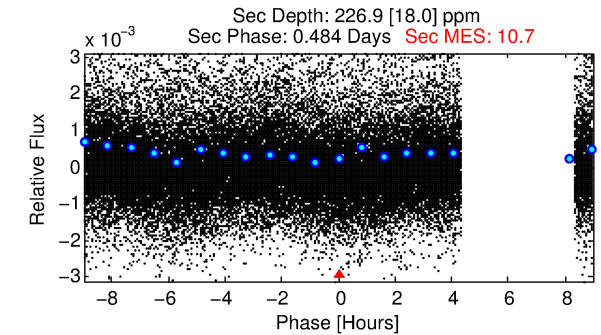
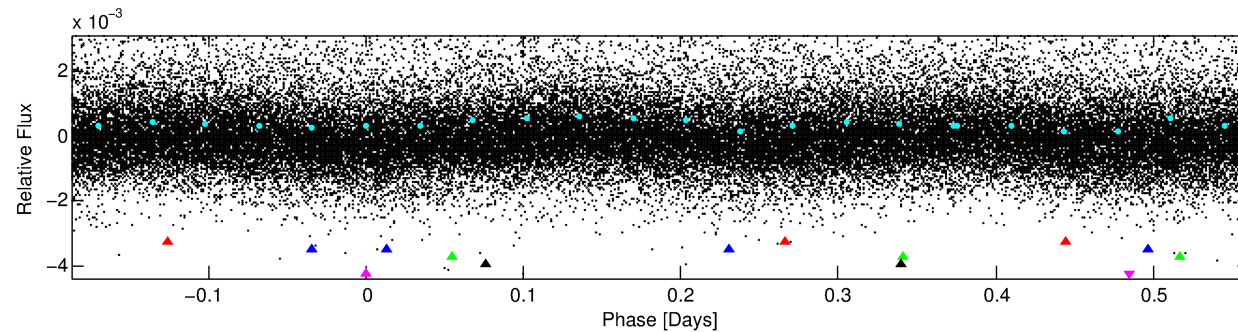
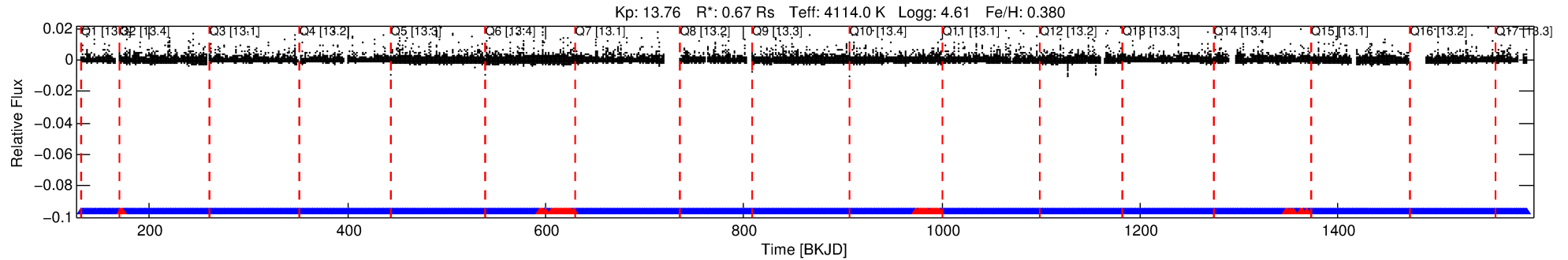
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008811811-05

No Significant Match Found

# DV One-Page Summary

KIC: 8811811 Candidate: 5 of 5 Period: 0.749 d



## TPS TCE Results:

Period = 0.74870 d  
Epoch = 131.5370 BKJD

**DV fit results are unavailable**

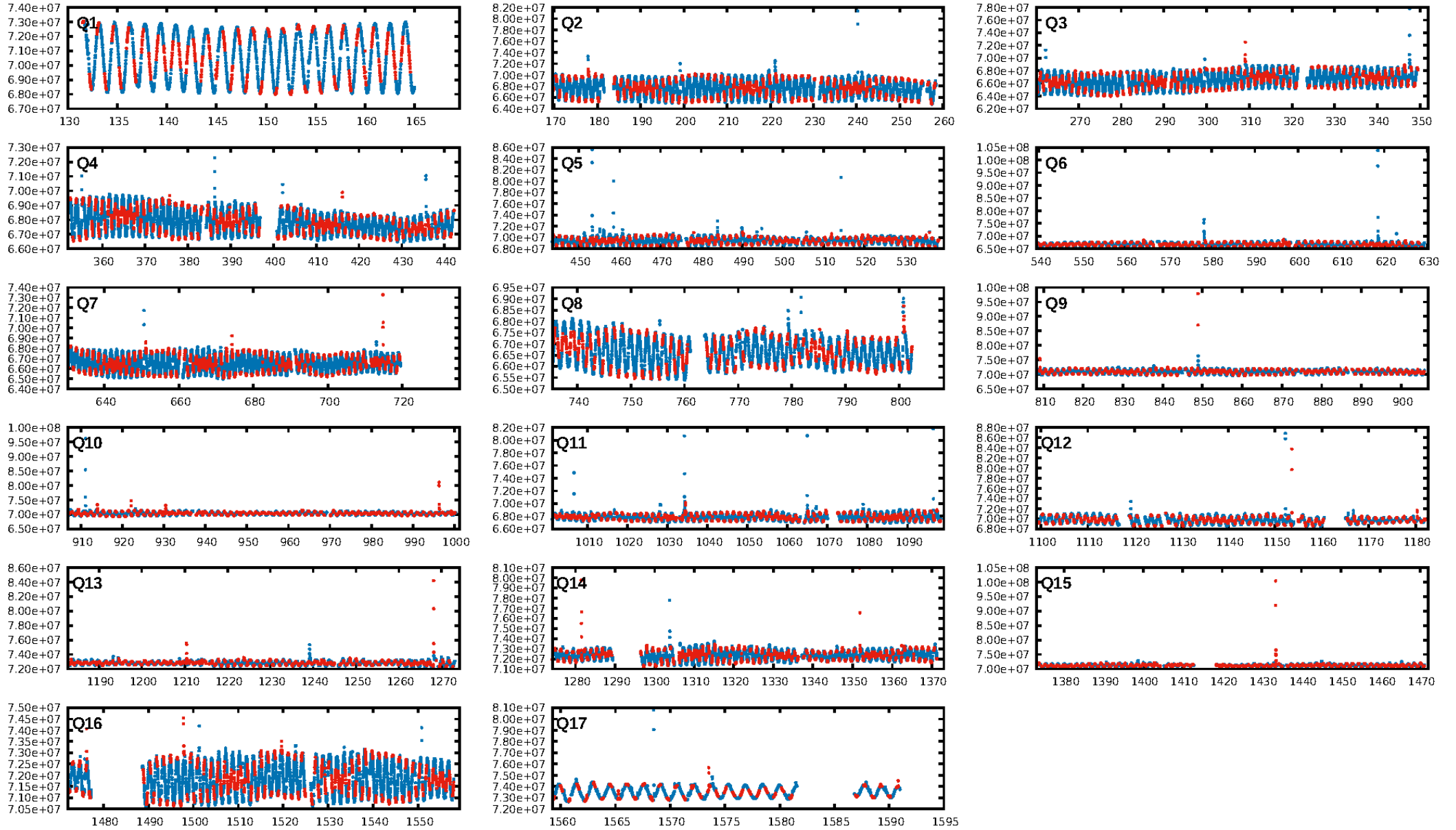
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1771.13σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.96 [1643/1707]  
**GhostDiagnostic-chr: 0.6531**  
Centroid-sig: N/A  
Centroid-so: 0.190 arcsec [1.71σ]  
OotOffset-rm: 0.176 arcsec [1.11σ]  
KicOffset-rm: 0.120 arcsec [0.63σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.53 [9/17]  
DiffImageOverlap-fno: 1.00 [17/17]

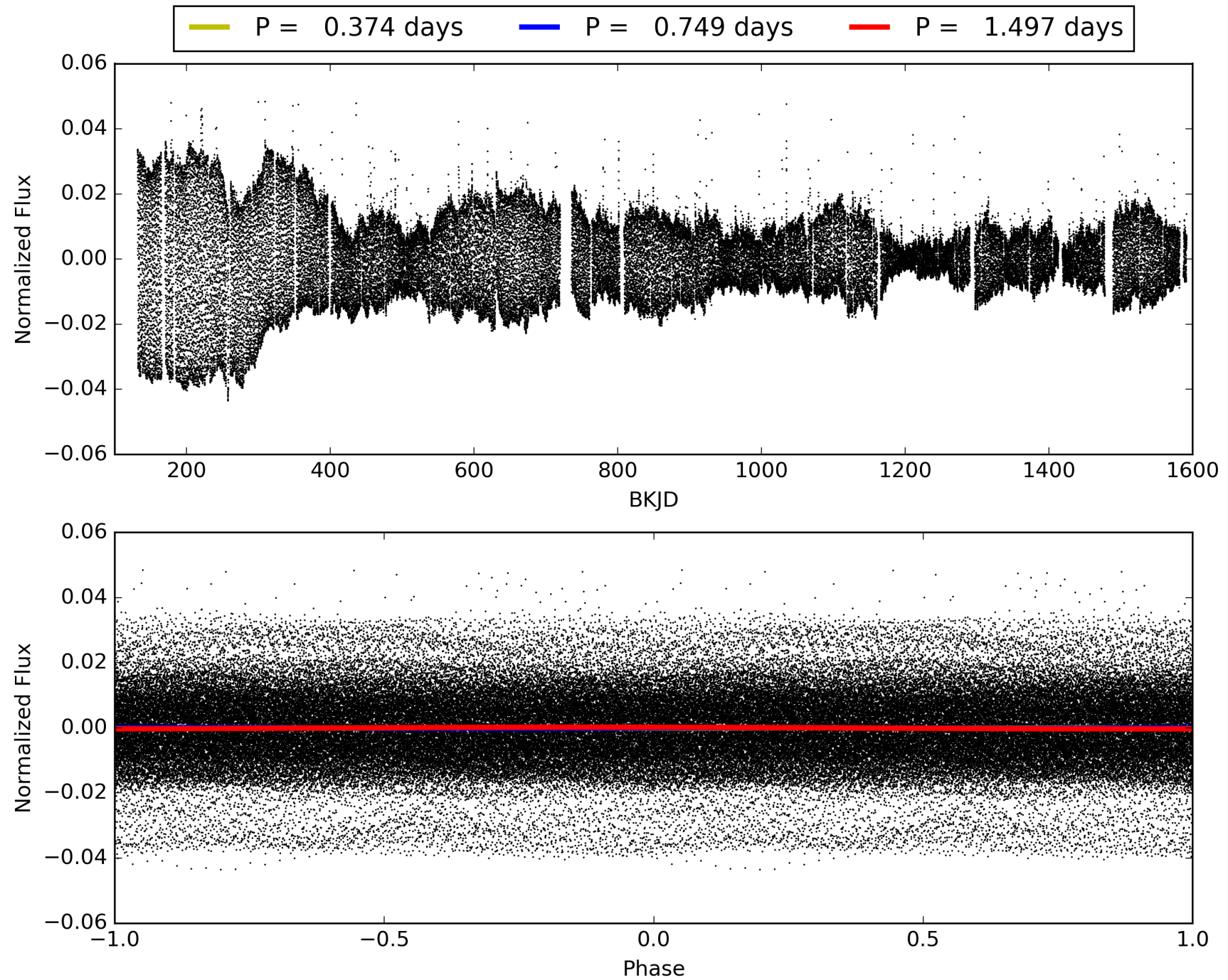
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:39:01 Z

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

# TCE 008811811-05, PDC Light Curves

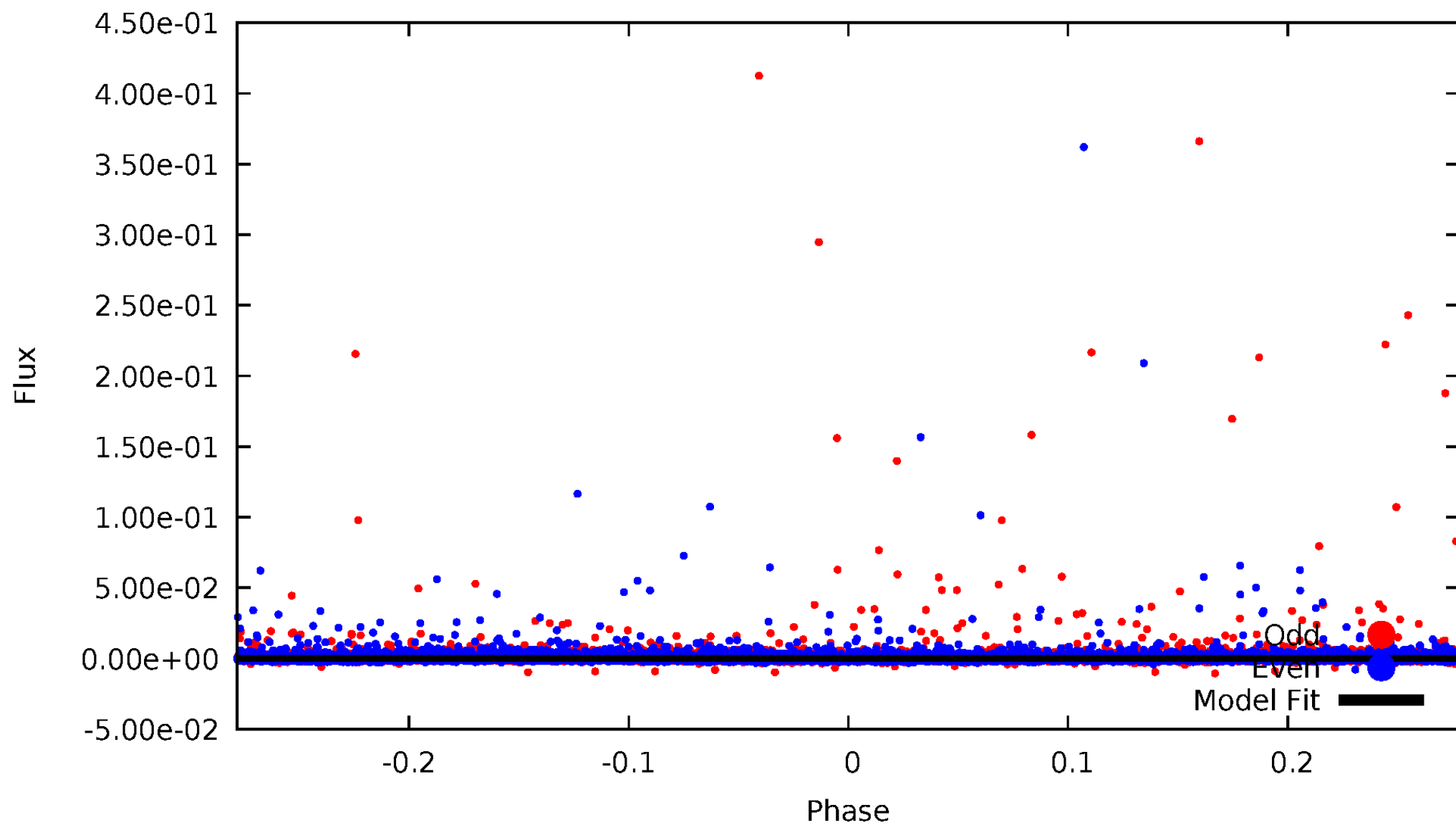


TCE 008811811-05



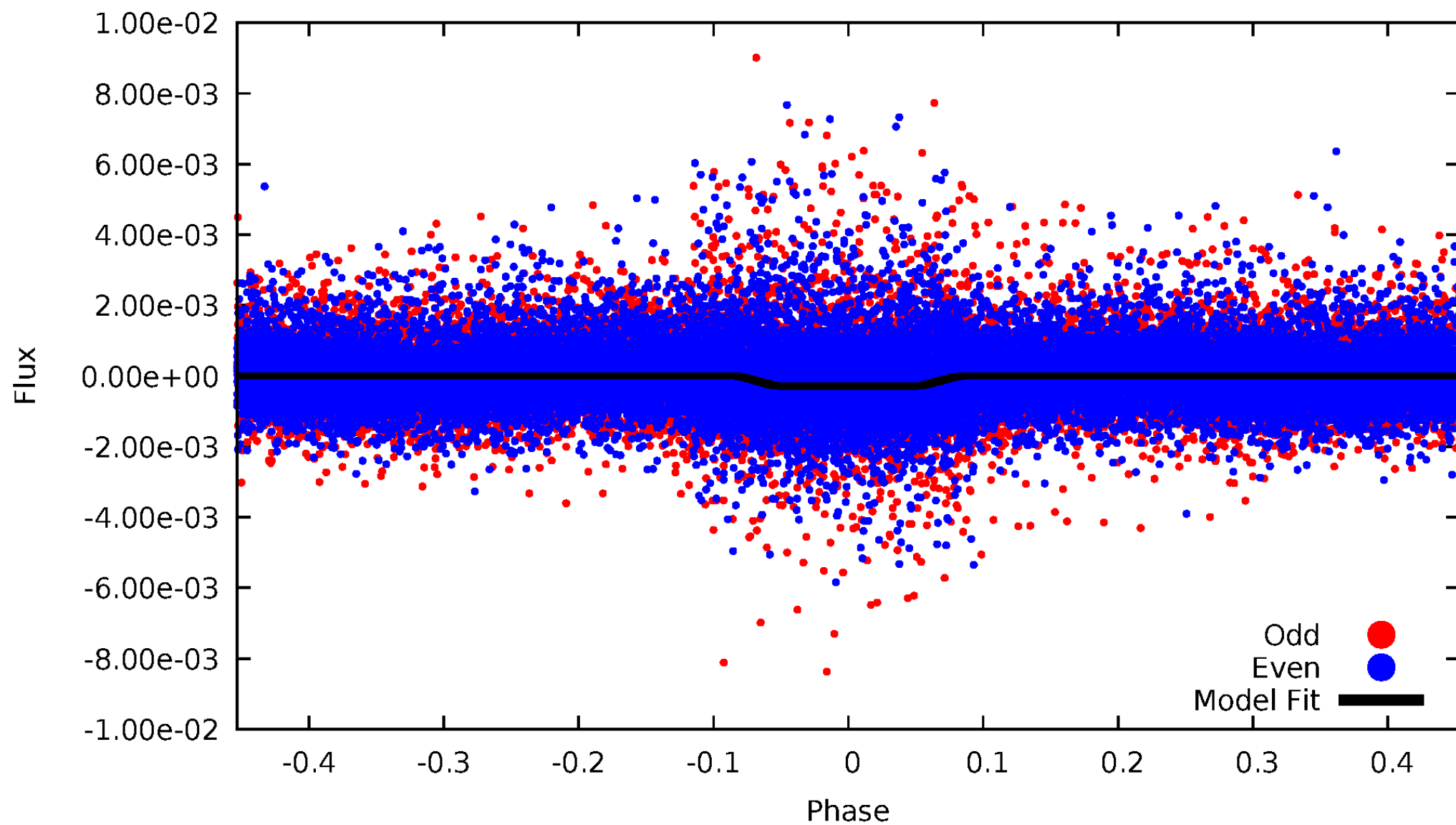
# DV Odd/Even

TCE 008811811-05



# ALT Odd/Even

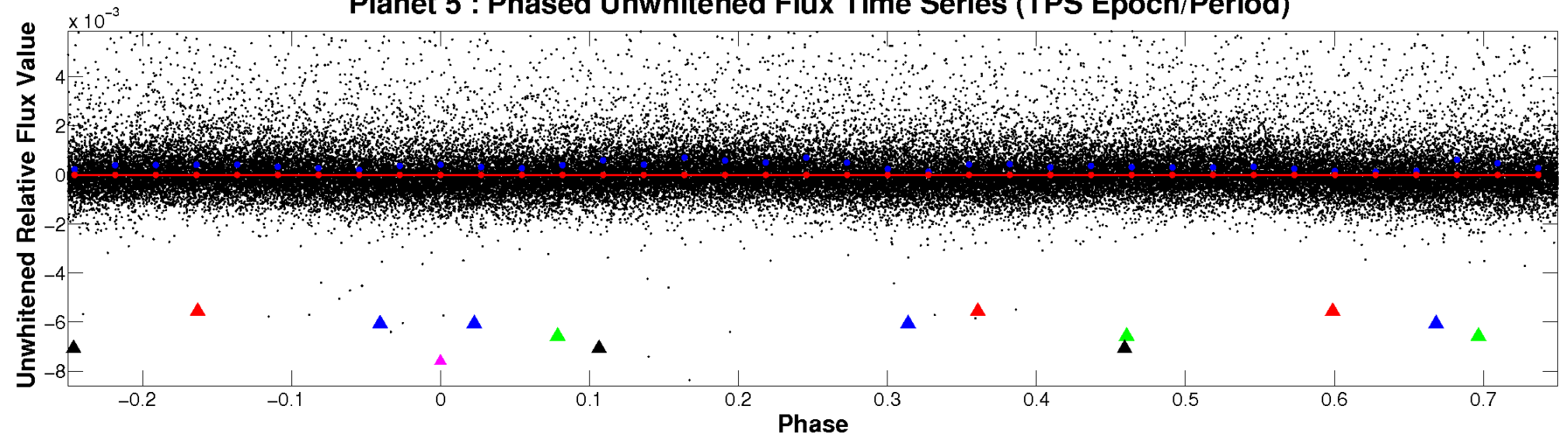
TCE 008811811-05



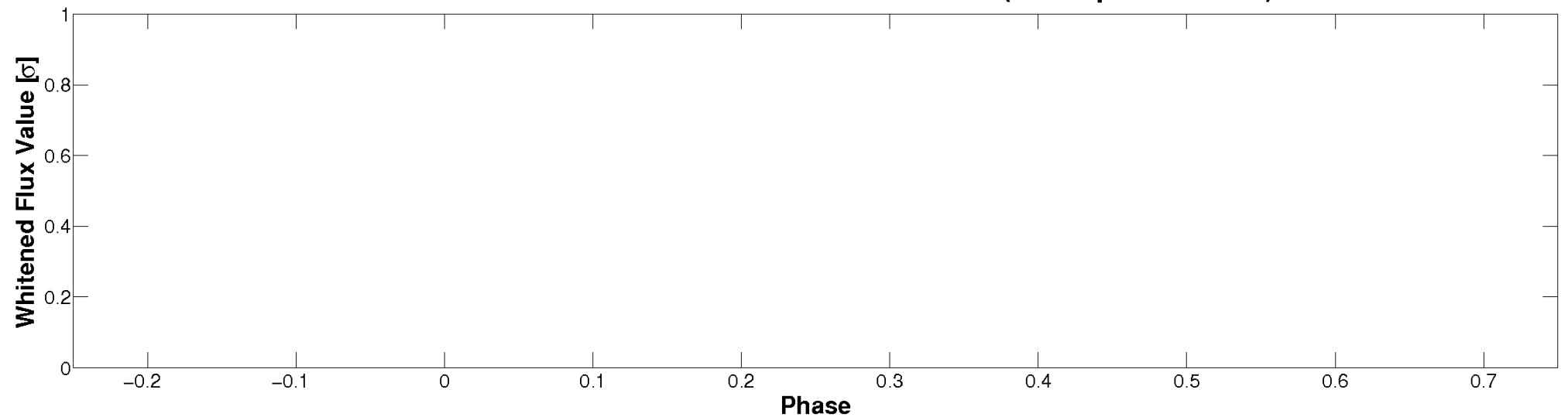


# Non-Whitened Vs. Whitened Light Curve

**Planet 5 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

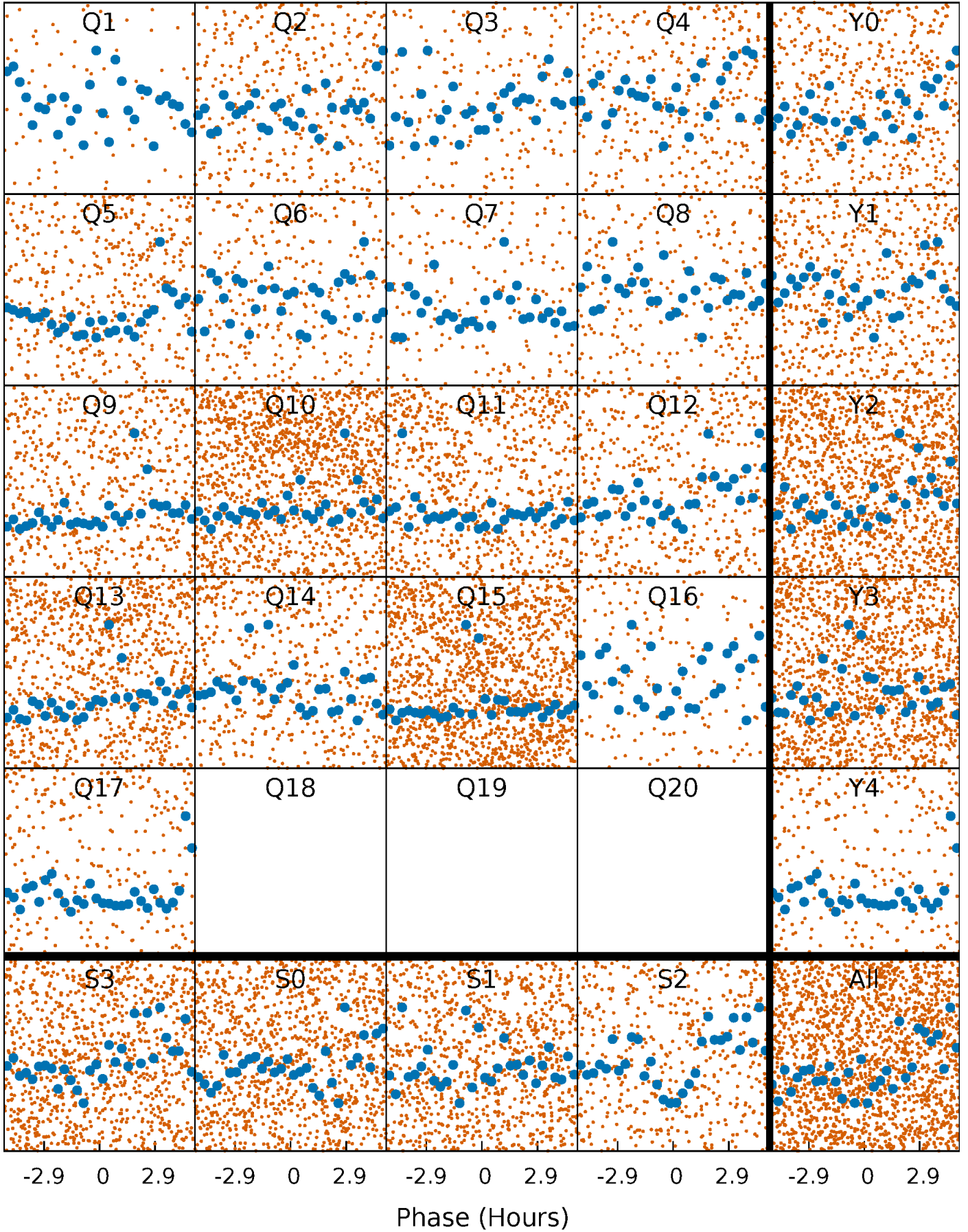


**Planet 5 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

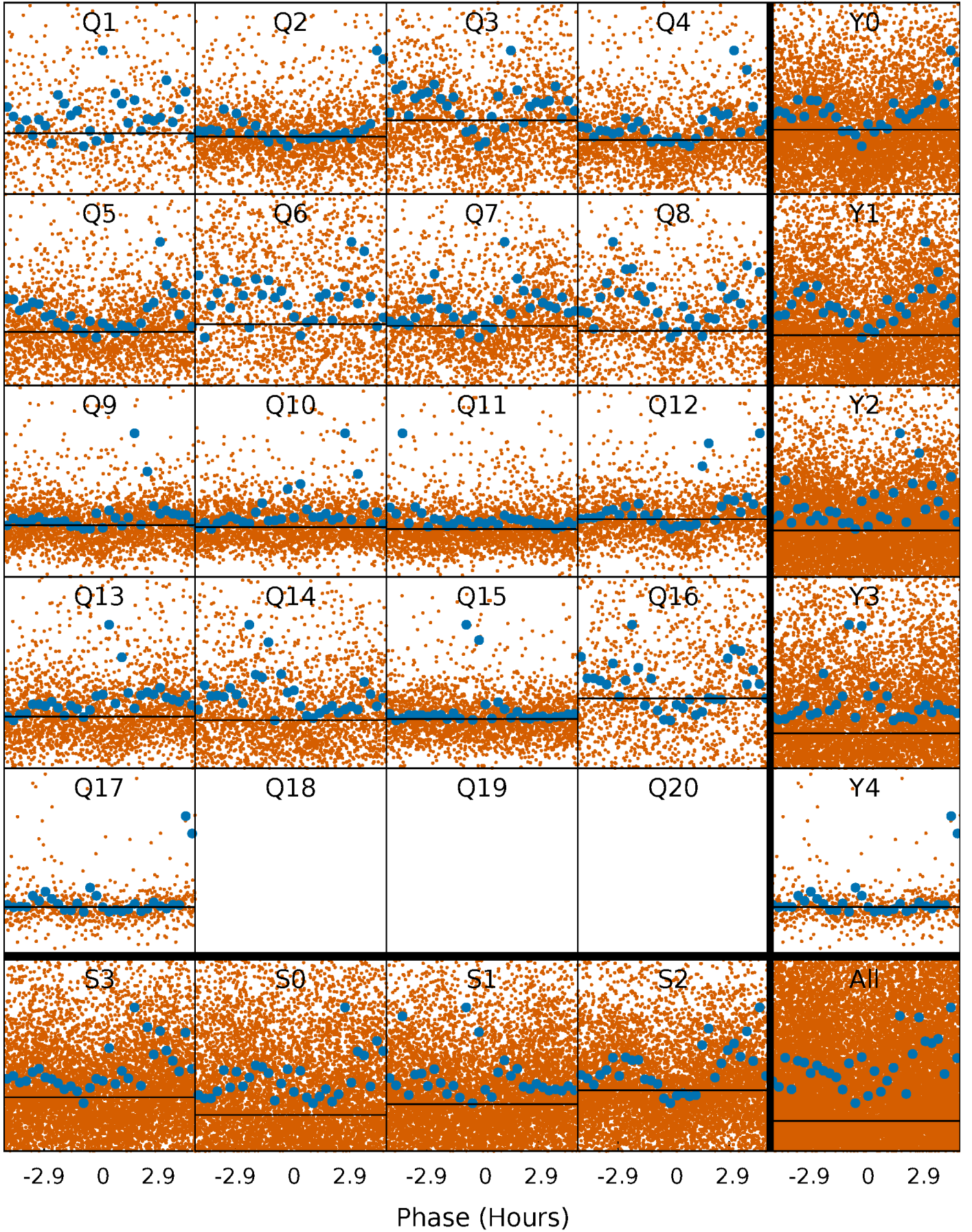
TCE 008811811-05   P= 0.748702 Days    $T_0=131.537036$  (BKJD)





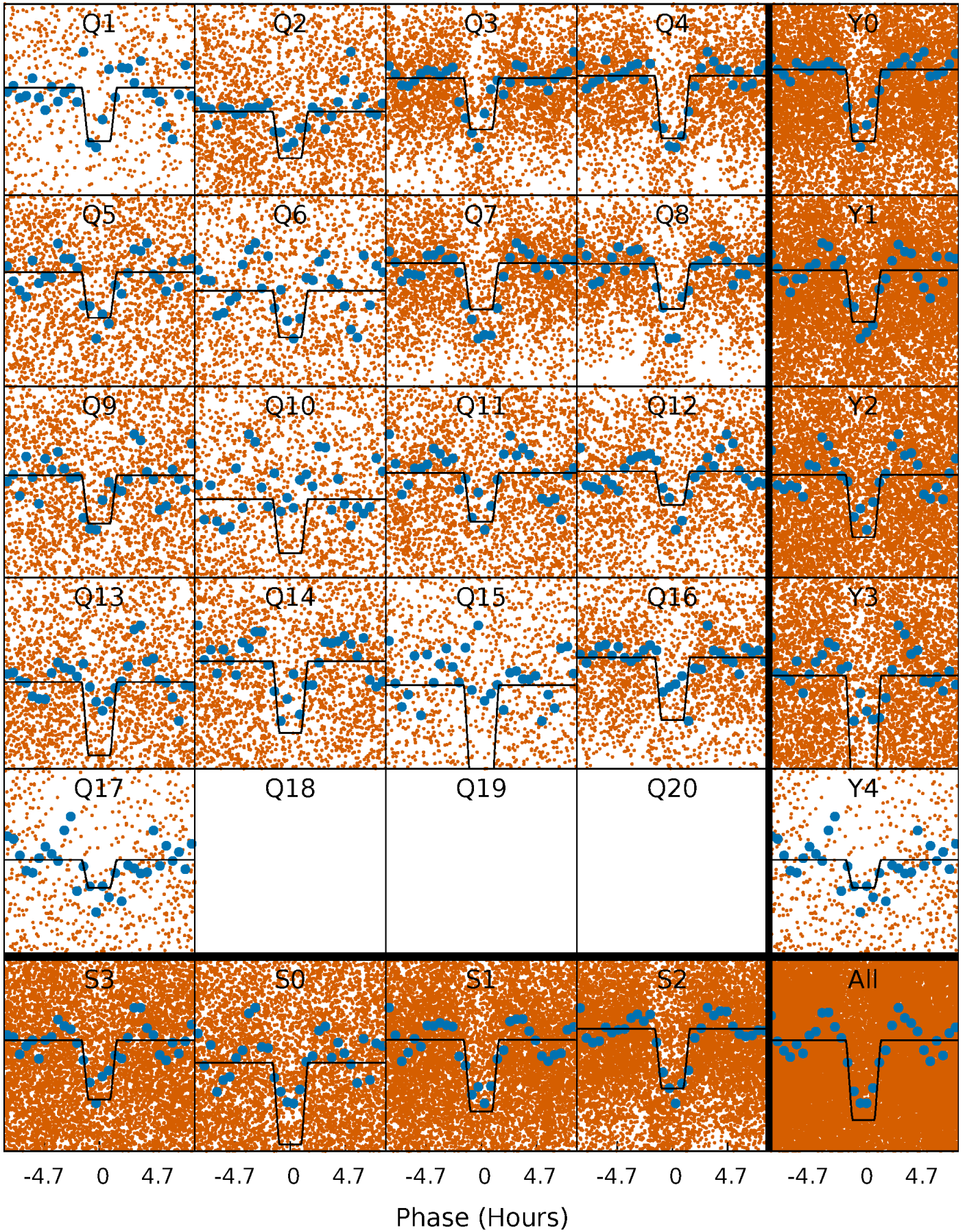
# DV Quarter-Phased Transit Curves

TCE 008811811-05     $P = 0.748702$  Days     $T_0 = 131.537036$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

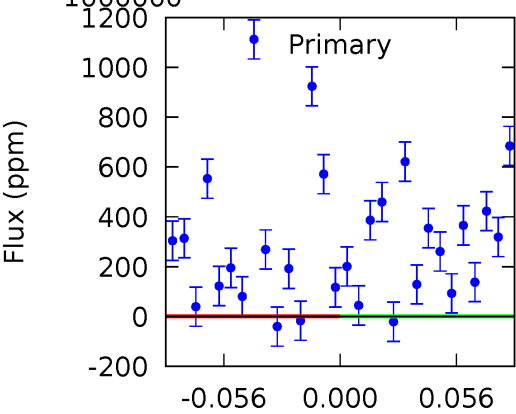
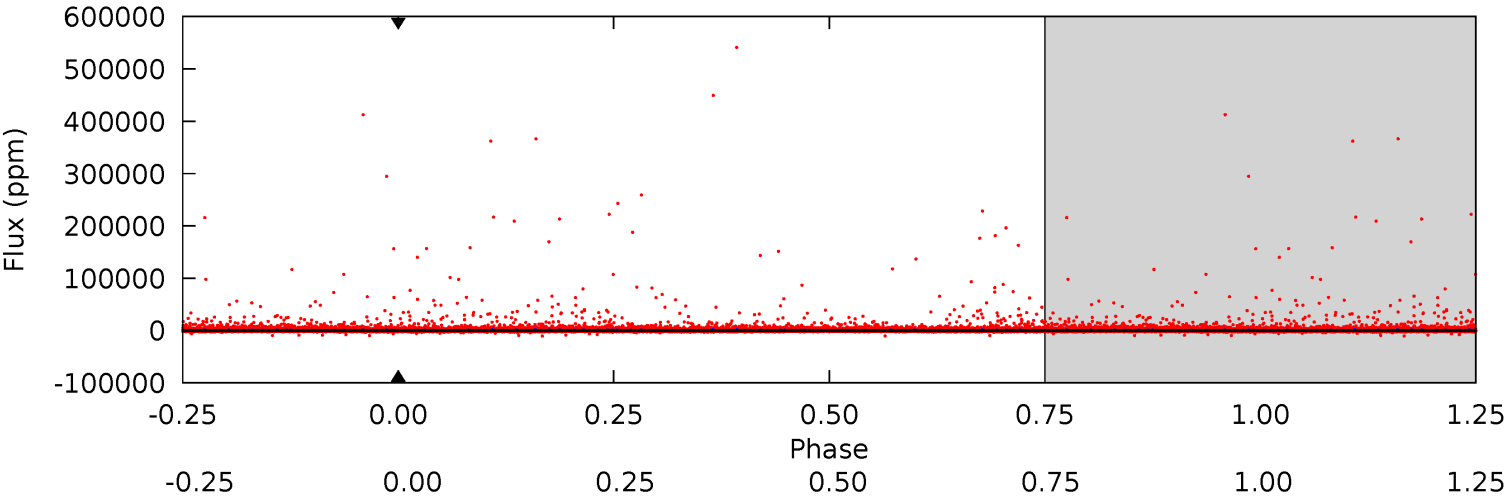
TCE 008811811-05   P= 0.748702 Days    $T_0=131.541137$  (BKJD)



DV Model-Shift Uniqueness Test

008811811-05, P = 0.748702 Days, E = 130.788334 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
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0

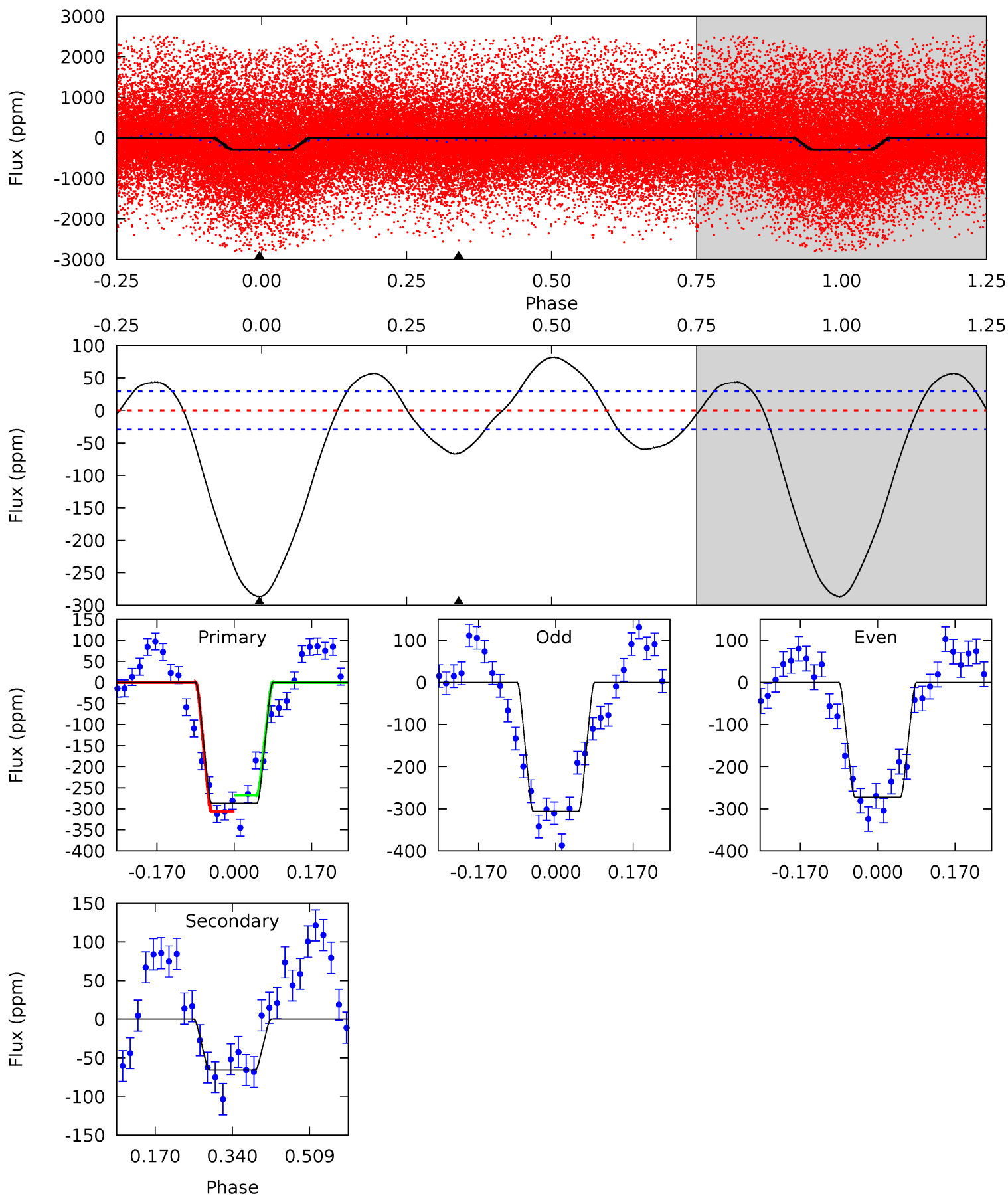




# Alt Model-Shift Uniqueness Test

008811811-05, P = 0.748702 Days, E = 130.792435 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
43.6	10.0	0	0	4.45	1.37	6.88	43.6	43.6	10.0	10.0	2.58	0.83	0.22	2.89



### Stellar Parameters For KIC 008811811

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4114^{+148}_{-165}$	$4.611^{+0.060}_{-0.016}$	$0.380^{+0.100}_{-0.300}$	$0.669^{+0.027}_{-0.067}$	$0.667^{+0.039}_{-0.058}$	$3.135^{+0.850}_{-0.226}$
	+4%/-4%	+1%/-0%	+26%/-79%	+4%/-10%	+6%/-9%	+27%/-7%
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 008811811-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$5.63^{+5.42}_{-3.90}$	$1730^{+68}_{-74}$	$-3157^{+12721}_{-6162}$	$-3.973^{+603.019}_{-552.018}$
Alt.	$-66 \pm 7$	$5.37^{+5.74}_{-3.79}$	$1728^{+71}_{-70}$	$-1848^{+4815}_{-343}$	$0.254^{+2.655}_{-0.194}$

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

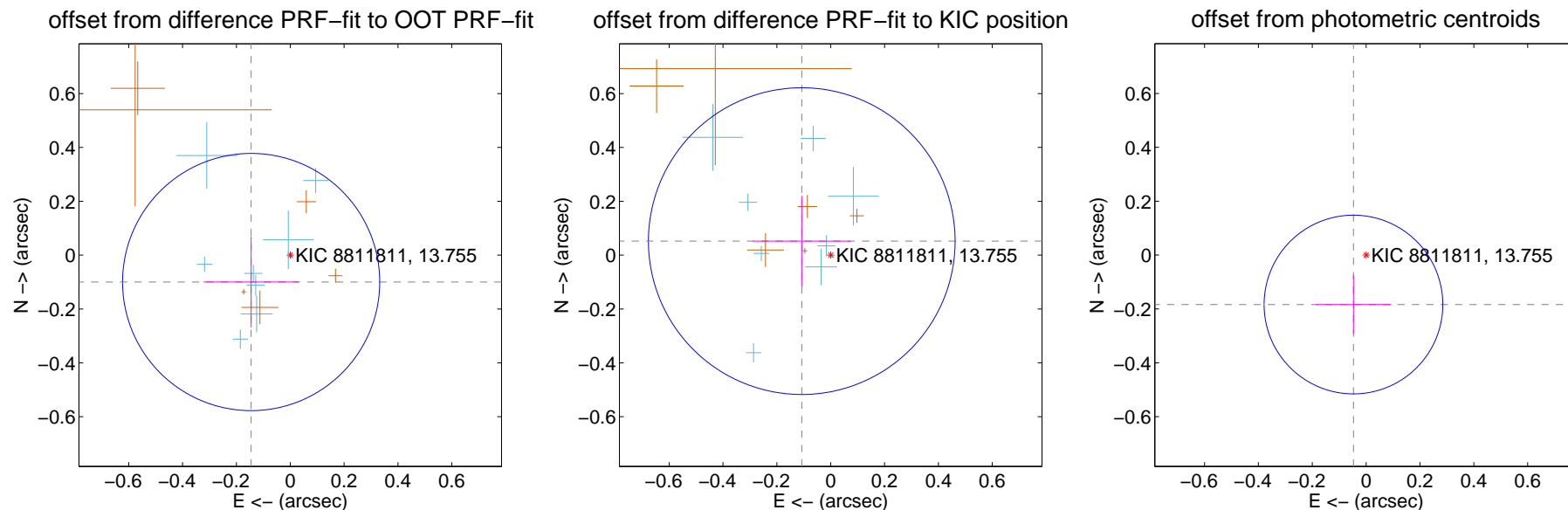
## DV Centroid Data

Supplemental centroid analysis for 008811811-05. Kepler magnitude: 13.76. Transit SNR -1.00

There are 9 quarters with good PRF difference image offsets

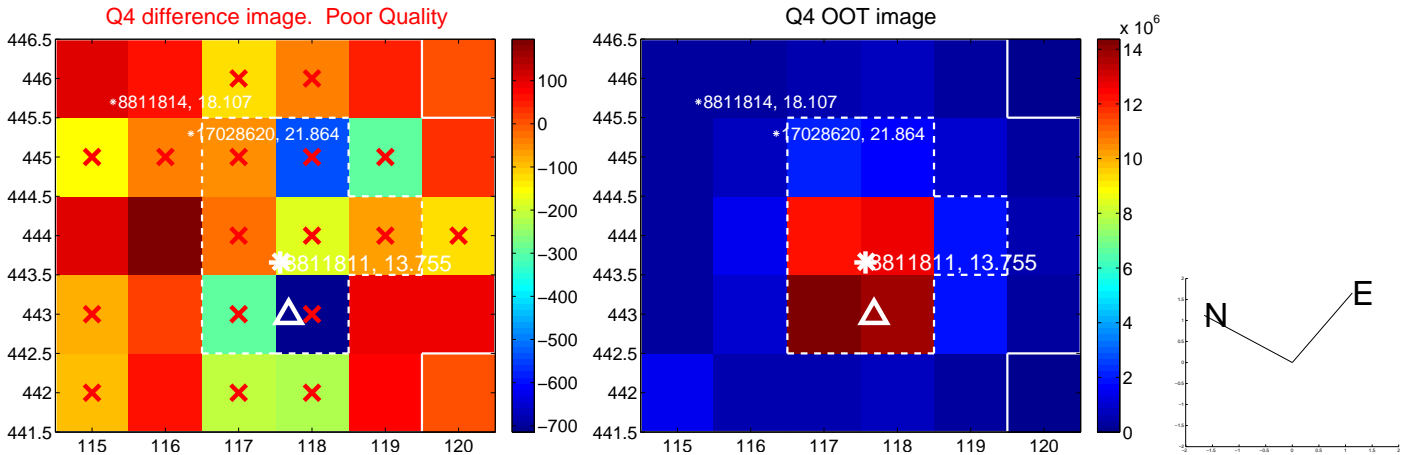
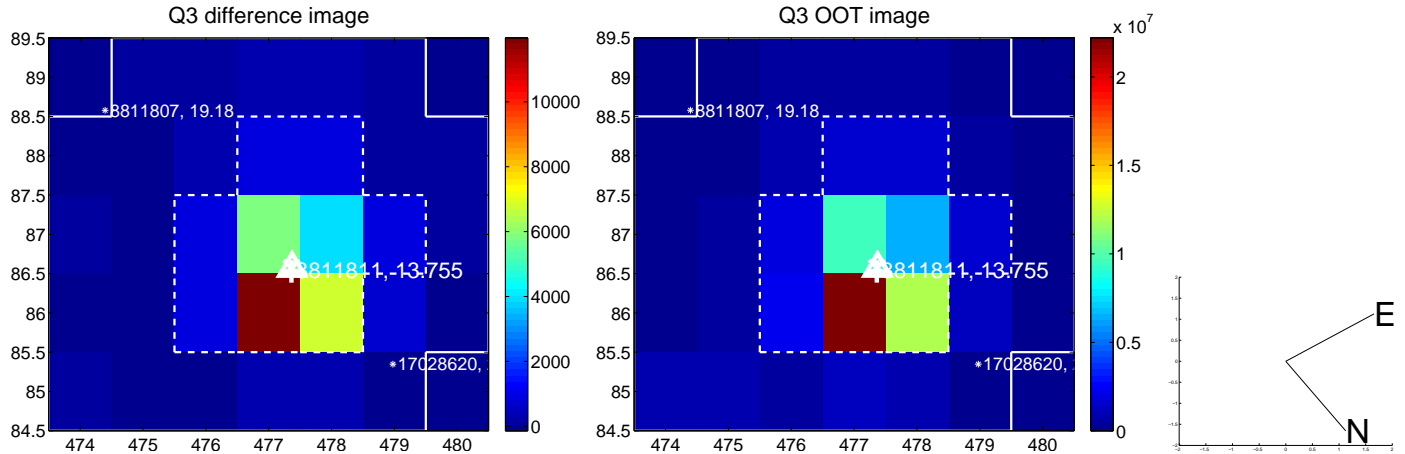
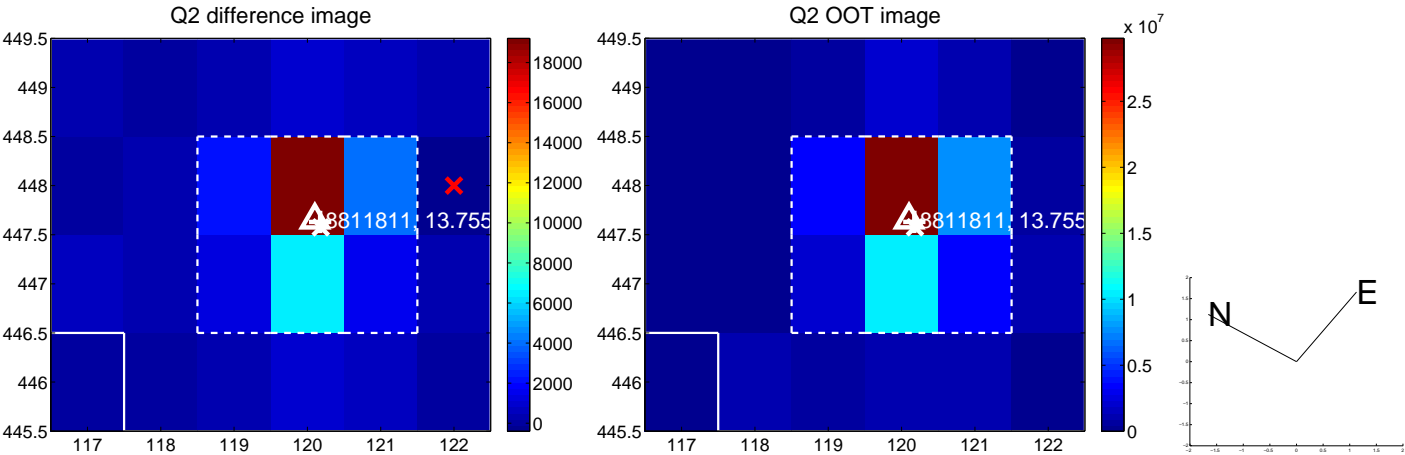
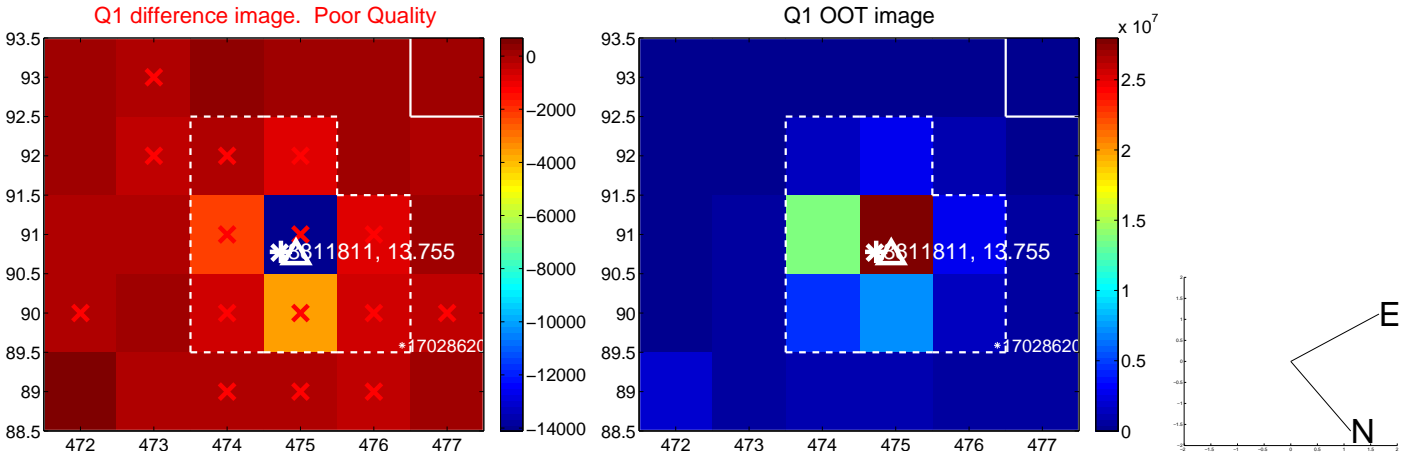
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.176 \pm 0.159$	1.11	$0.145 \pm 0.176$	$-0.100 \pm 0.168$
PRF-fit source offset from KIC position	$0.120 \pm 0.190$	0.63	$0.108 \pm 0.182$	$0.052 \pm 0.168$
photometric centroid source offset	$0.19 \pm 0.11$	1.71	$0.05 \pm 0.14$	$-0.18 \pm 0.11$

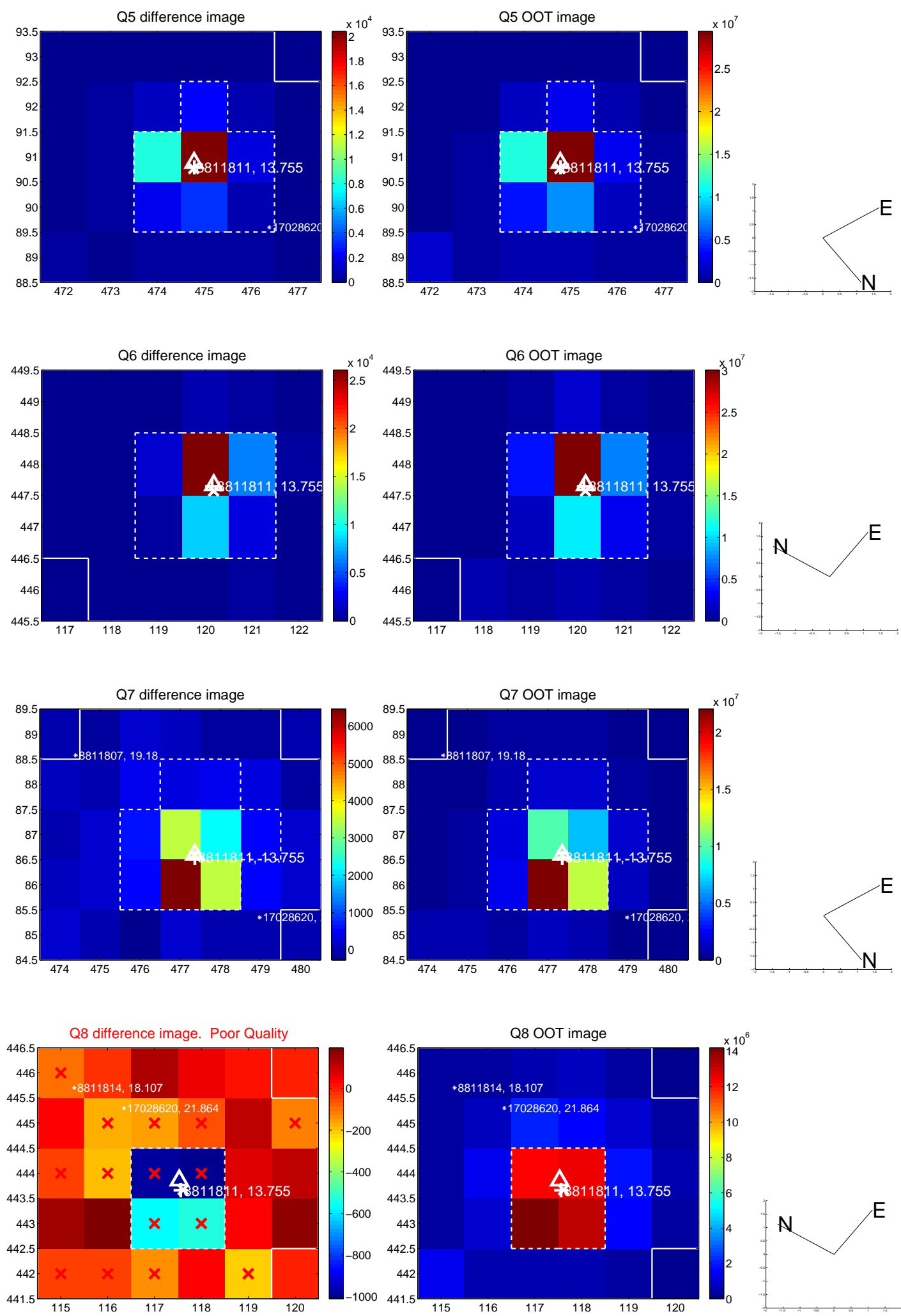


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

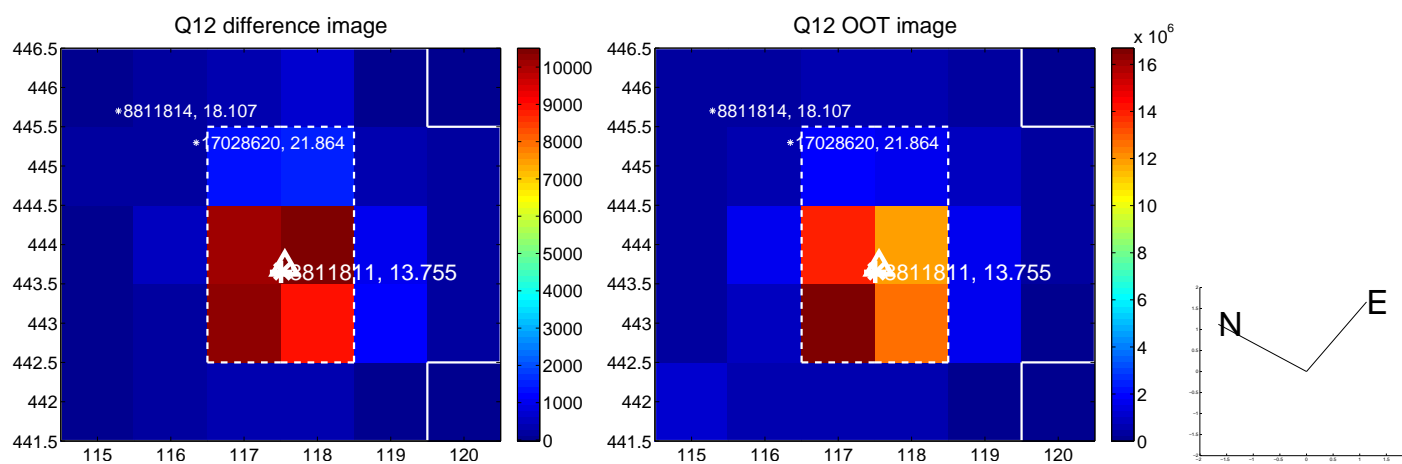
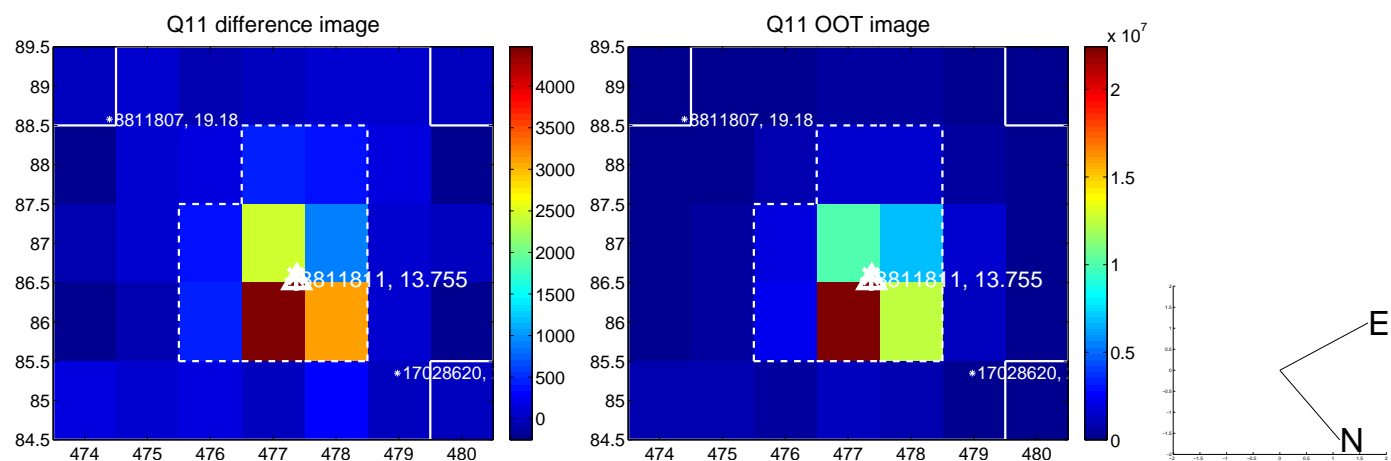
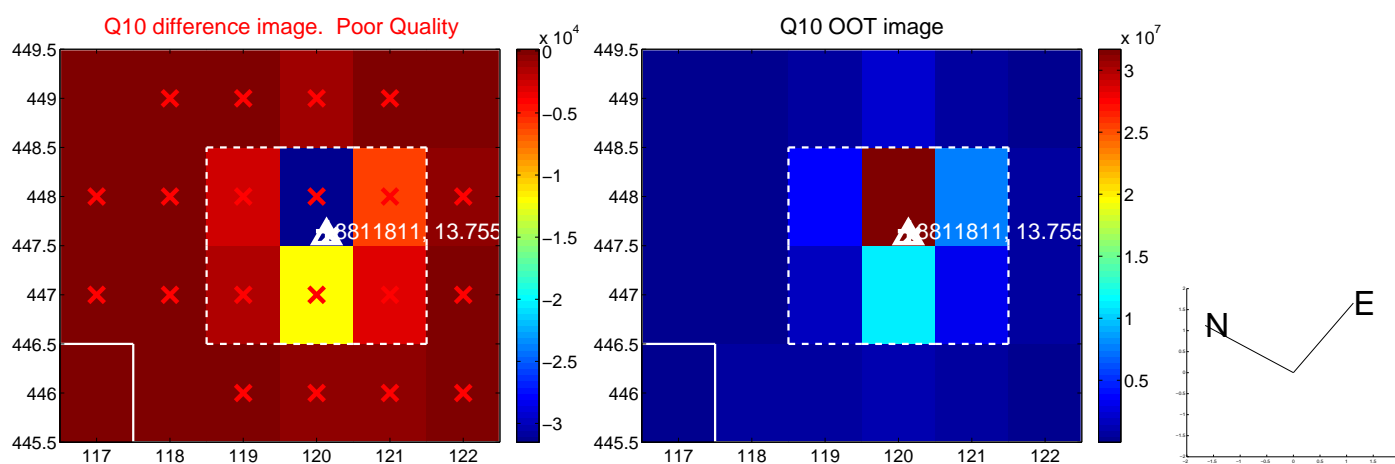
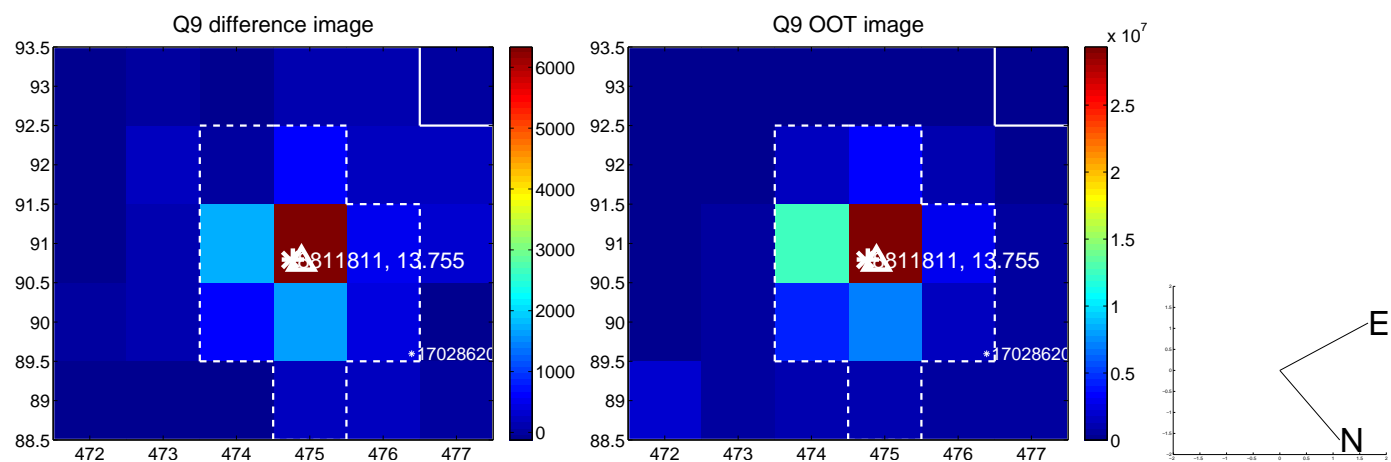


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

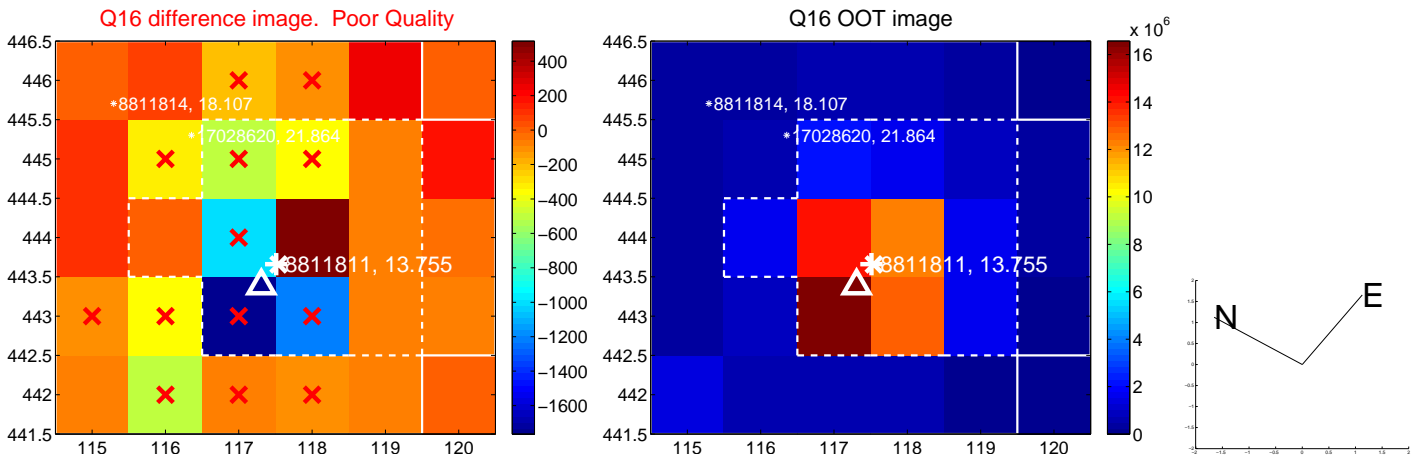
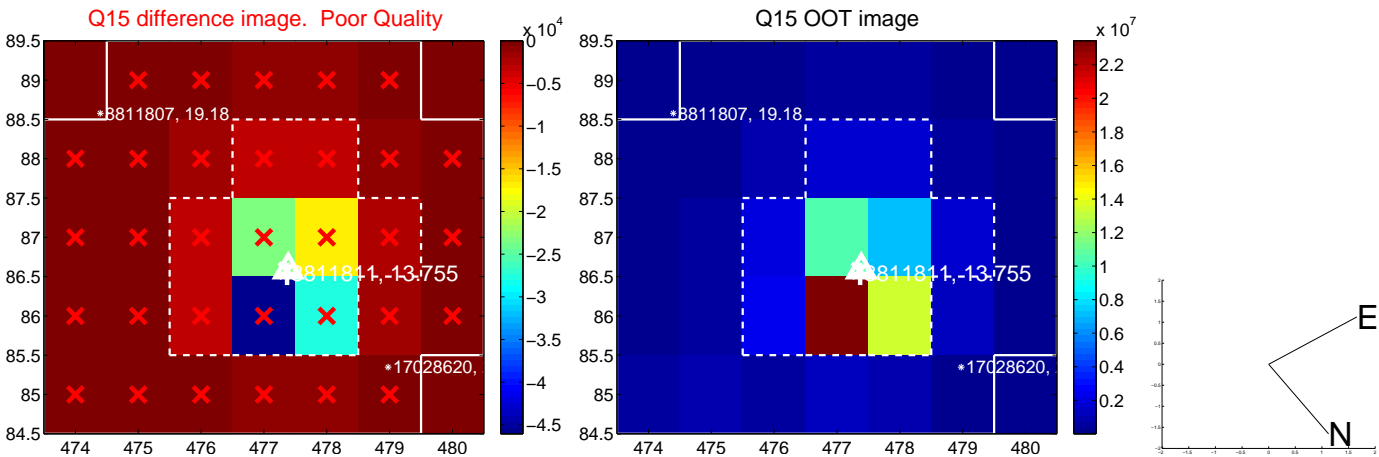
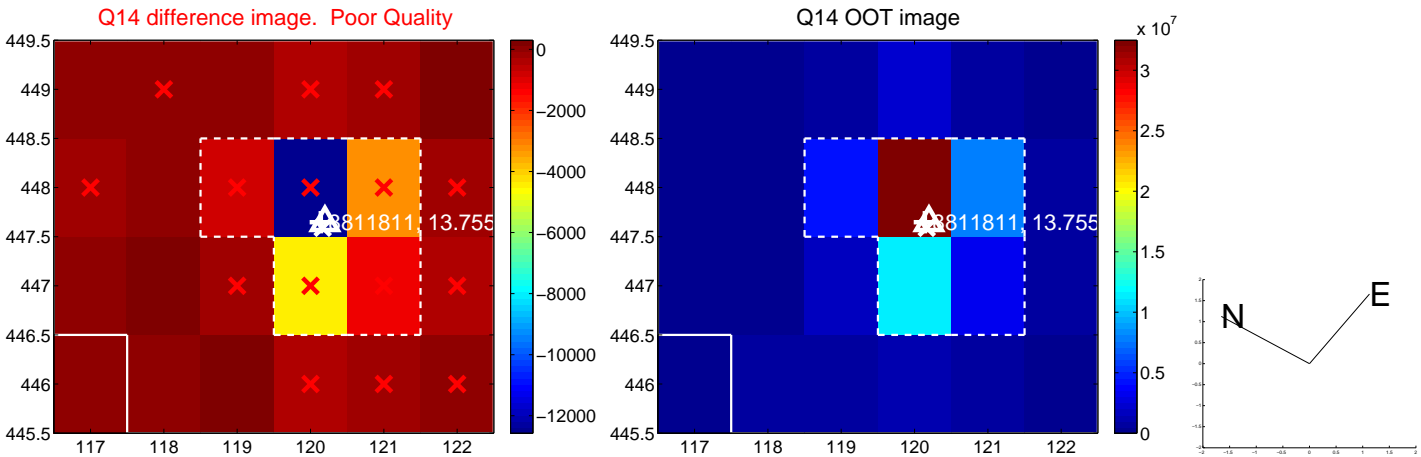
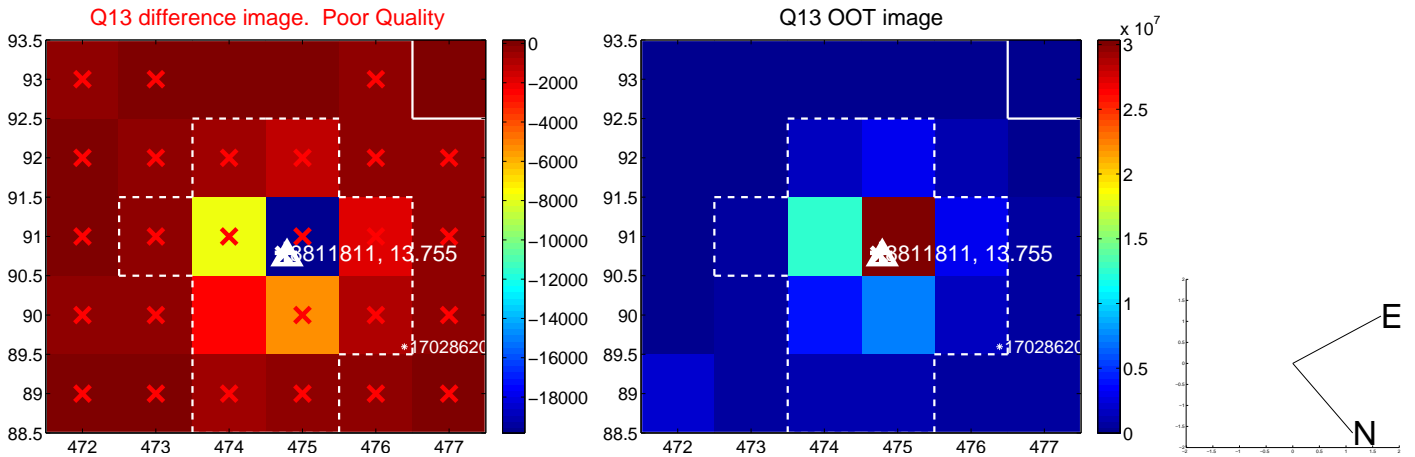




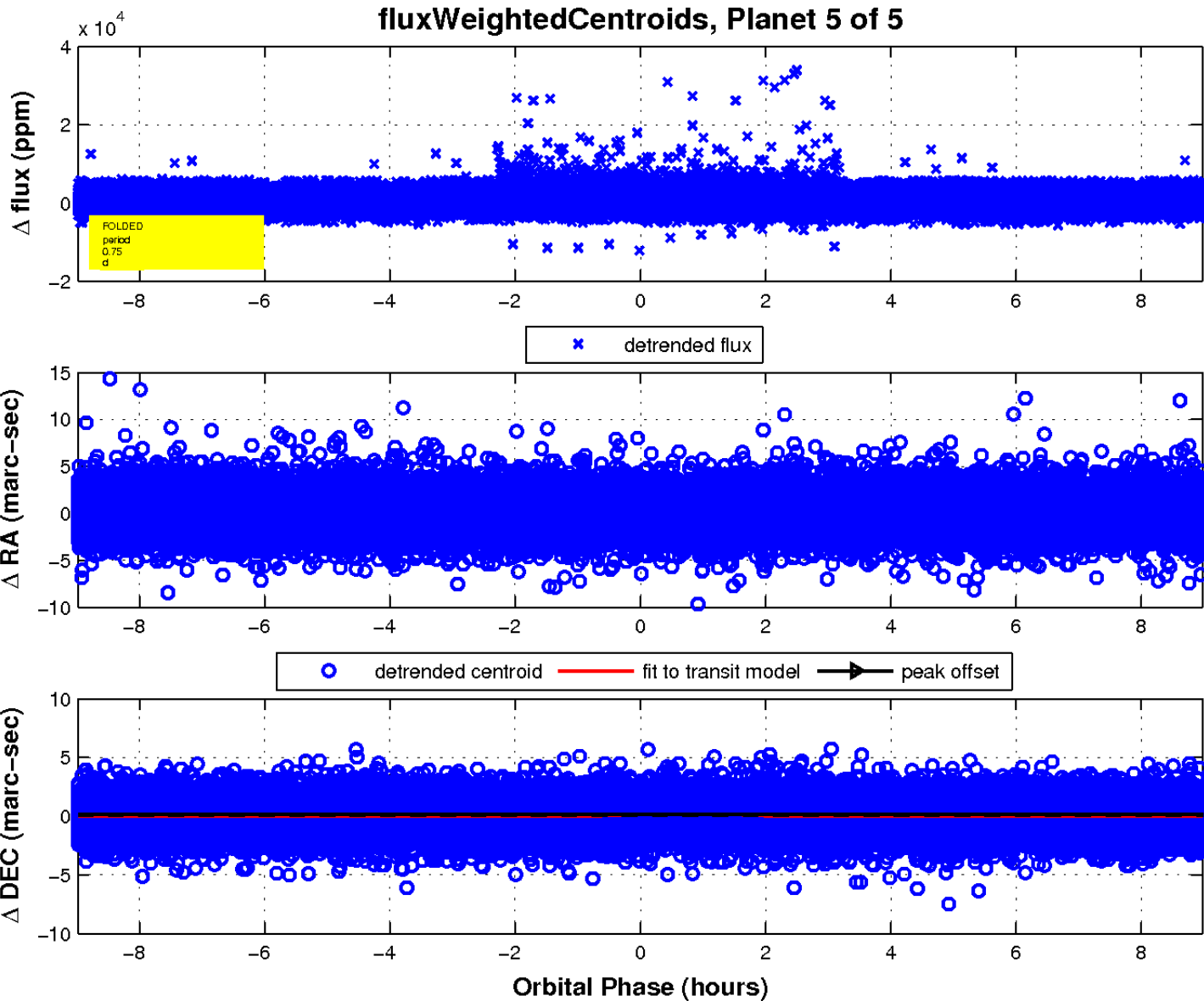
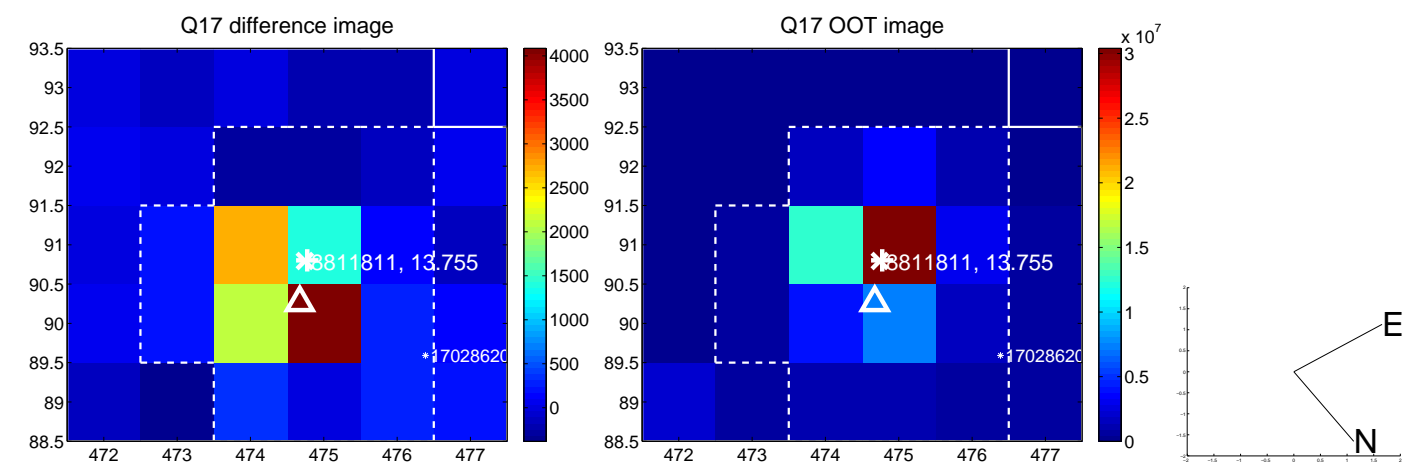
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

