

# KIC 005781774

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005781774-01	OBS	No	0.653978	131.553064	66.6	1.587	12.3	6.7	3.01	7921	2.86	96091.62
005781774-02	OBS	No	1.807459	132.080983	231.5	21.689	11.7	24.2	3.01	7921	6.98	24774.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005781774-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005781774-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—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.

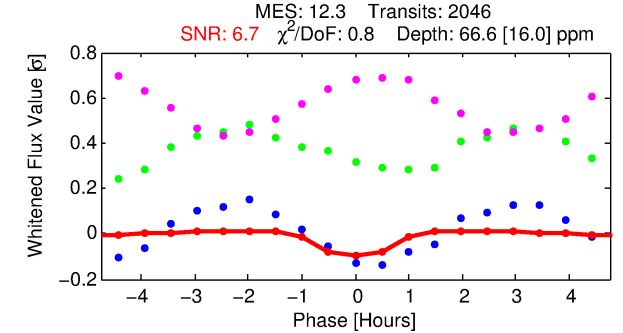
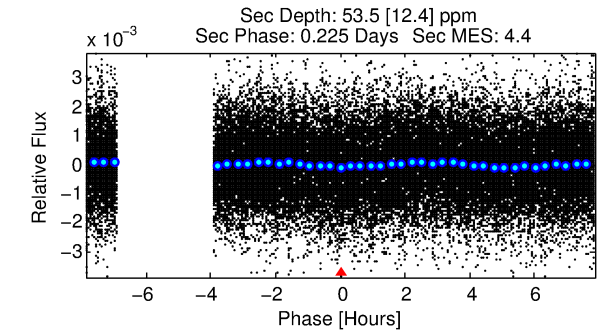
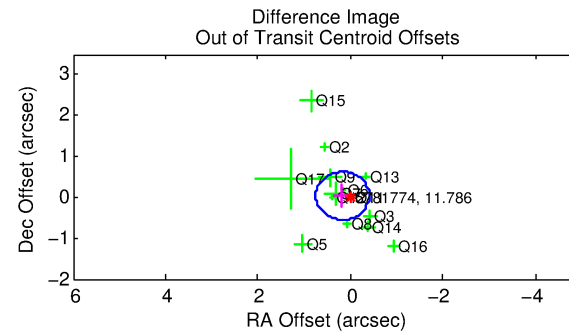
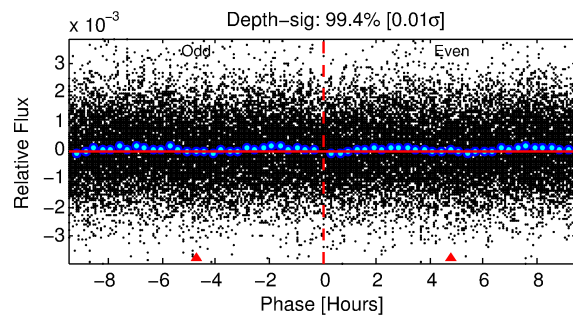
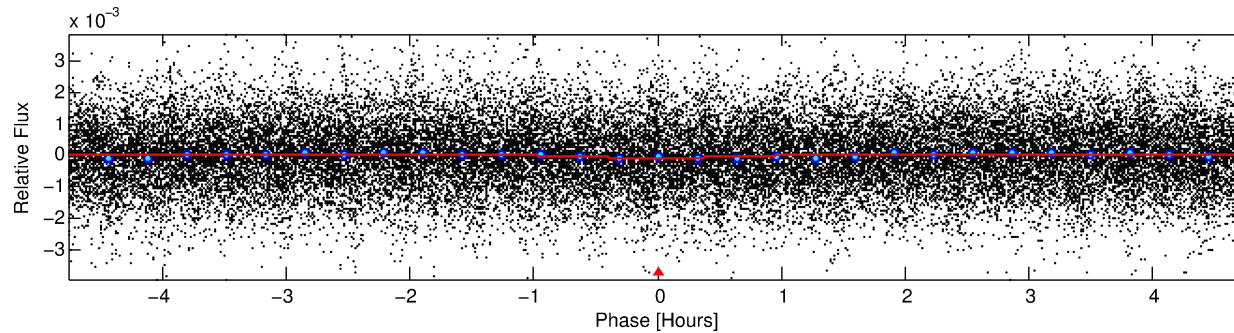
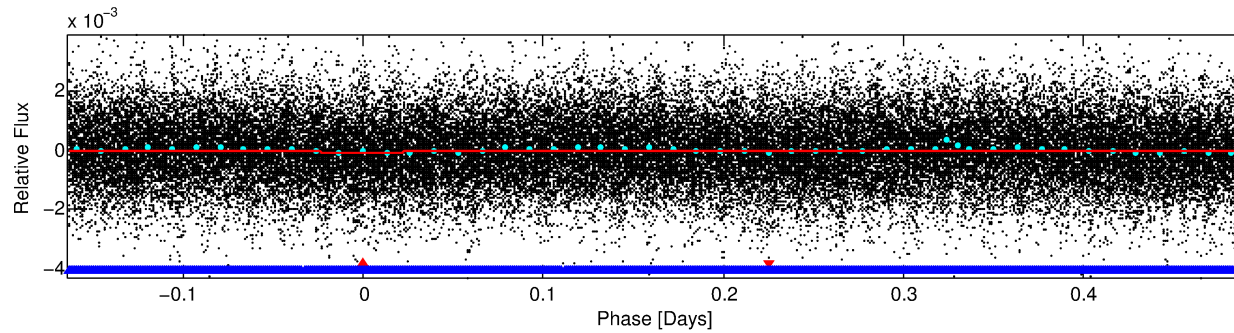
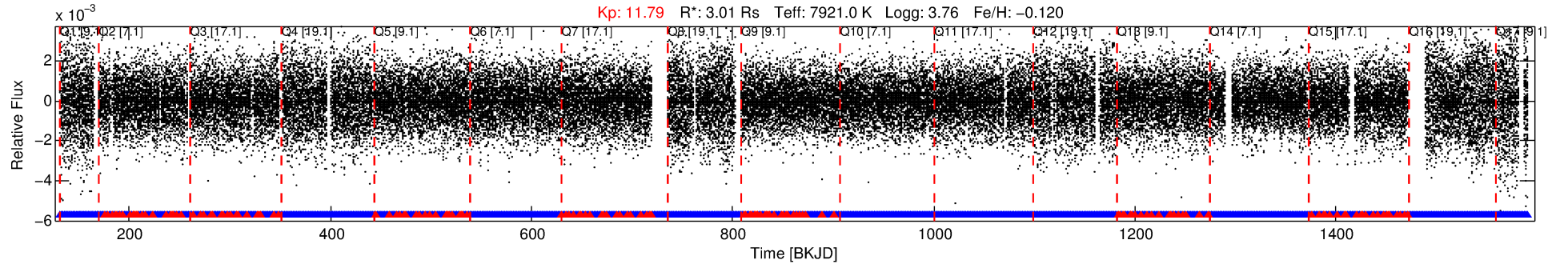
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005781774-01

No Significant Match Found

# DV One-Page Summary

KIC: 5781774 Candidate: 1 of 2 Period: 0.654 d



## DV Fit Results:

Period = 0.65398 [0.00002] d  
Epoch = 131.5531 [0.0040] BKJD  
Rp/R\* = 0.0087 [0.0097]  
a/R\* = 1.73 [7.79]  
b = 0.90 [1.50]  
Seff = 96091.62 [66105.93]  
Teq = 4489 [772] K  
Rp = 2.86 [3.40] Re  
a = 0.0182 [0.0076] AU  
Ag = 1.19 [2.78] [0.07 $\sigma$ ]  
Teffp = 7256 [4053] K [0.67 $\sigma$ ]

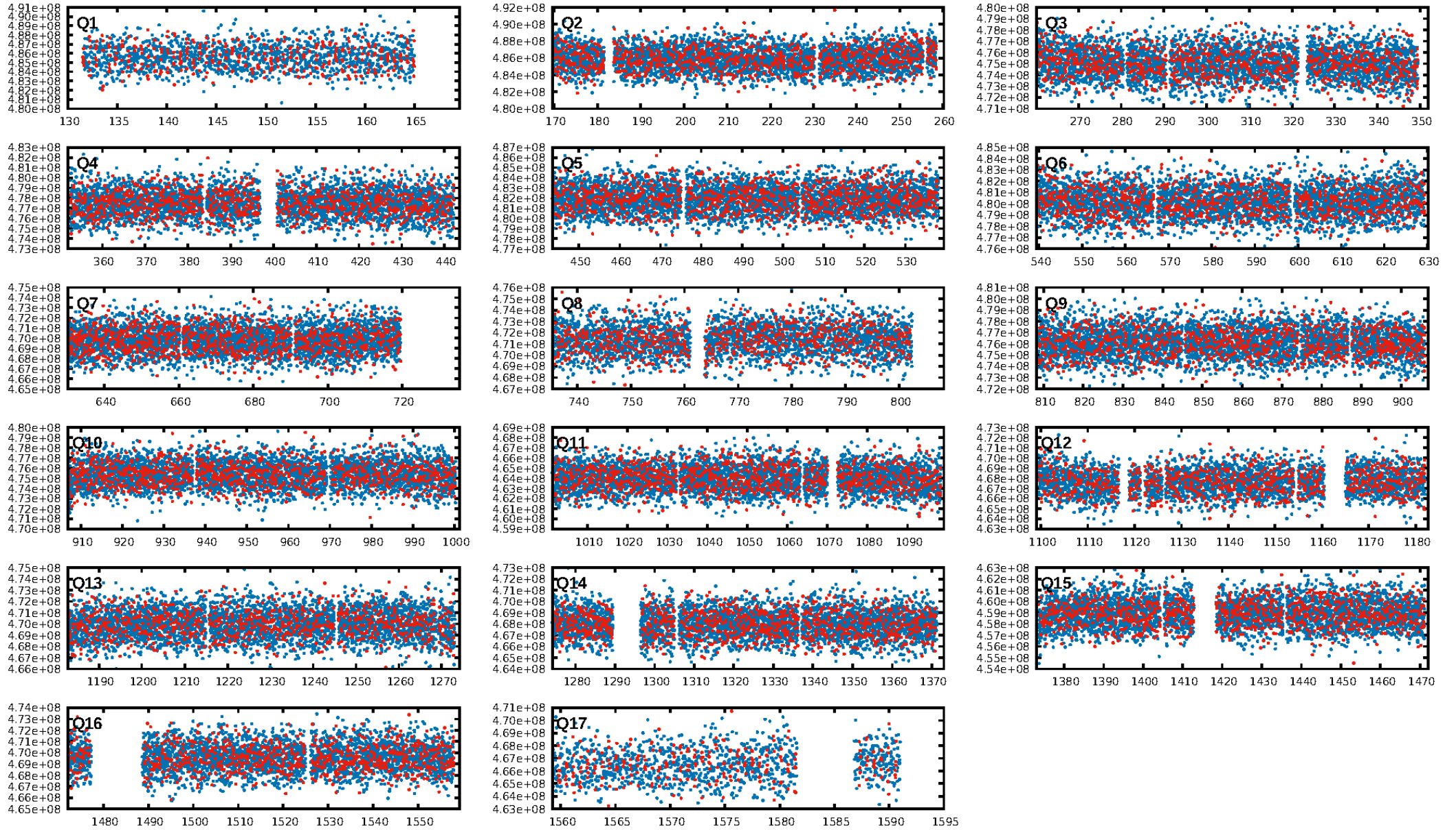
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 79.7% [1.27 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.92 [1796/1954]  
GhostDiagnostic-chr: 2.618  
Centroid-sig: 54.5%  
Centroid-so: 0.204 arcsec [1.39 $\sigma$ ]  
OotOffset-rm: 0.183 arcsec [0.94 $\sigma$ ]  
KicOffset-rm: 0.284 arcsec [1.92 $\sigma$ ]  
OotOffset-st: 3/4/3/4 [14]  
KicOffset-st: 3/4/3/4 [14]  
DiffImageQuality-fgm: 0.43 [6/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:40:23 Z

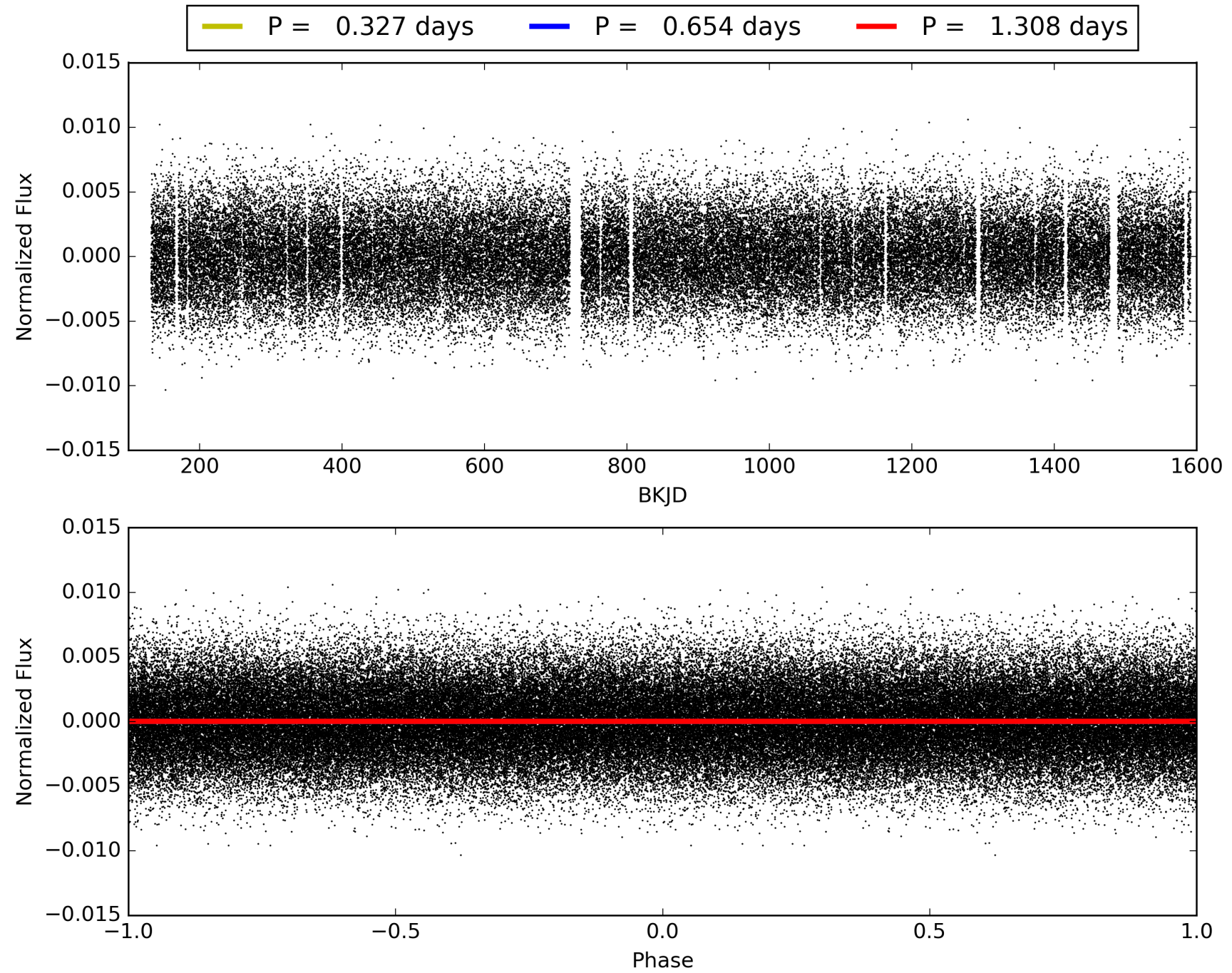
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005781774-01, PDC Light Curves



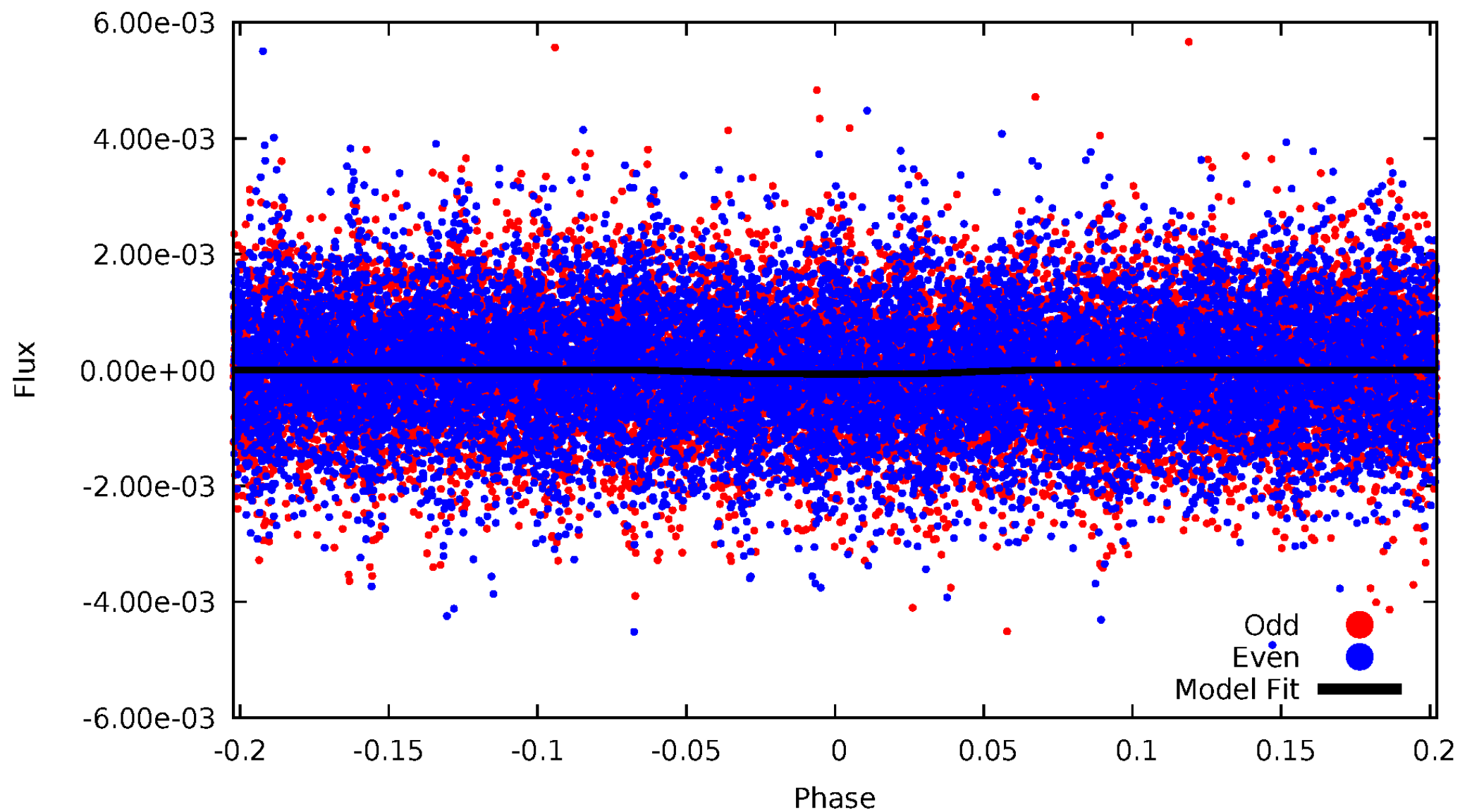


TCE 005781774-01



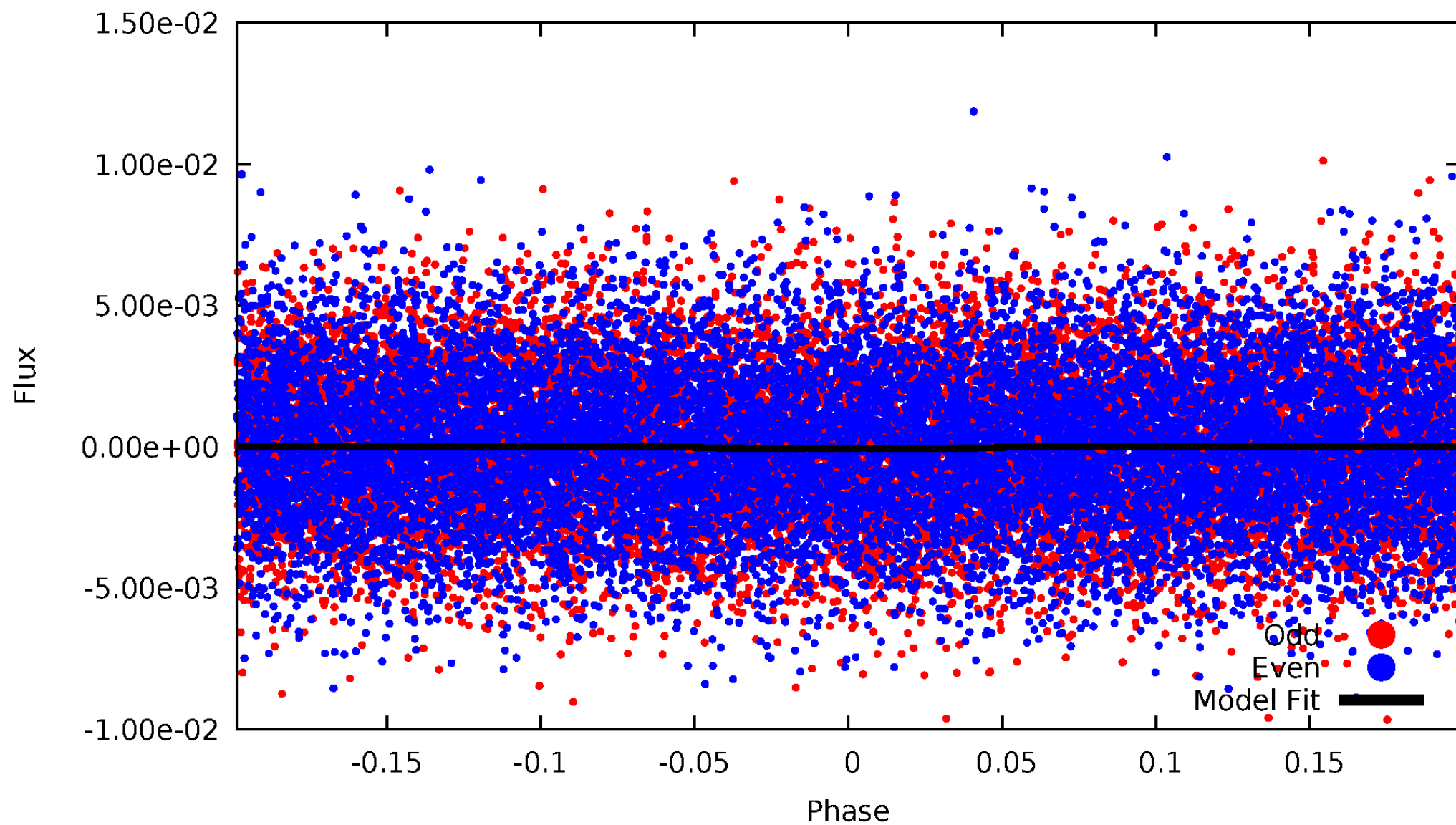
# DV Odd/Even

TCE 005781774-01



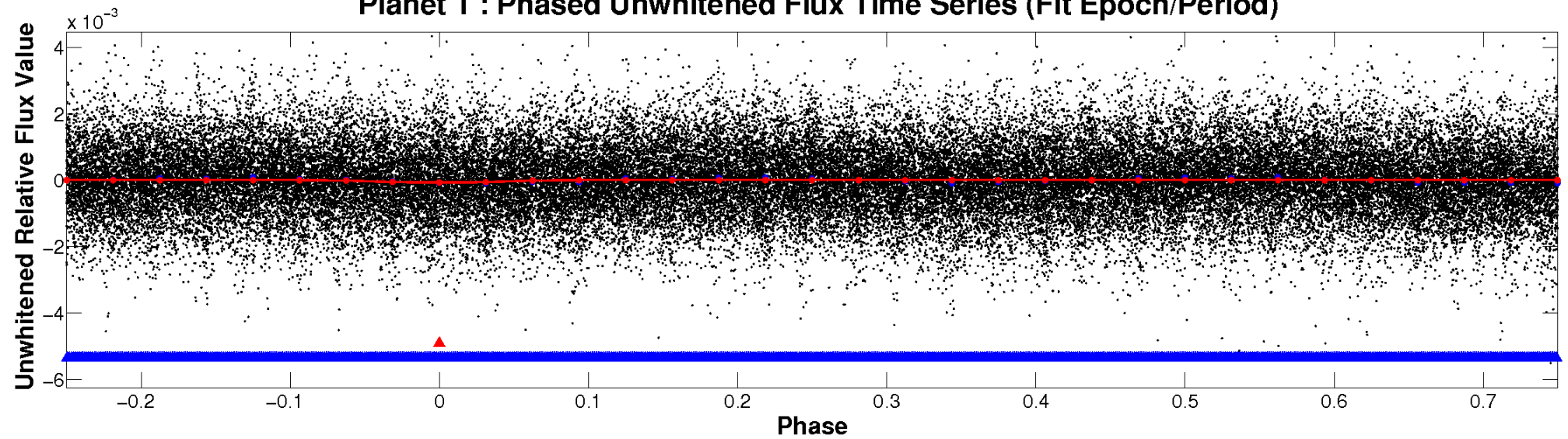
# ALT Odd/Even

TCE 005781774-01

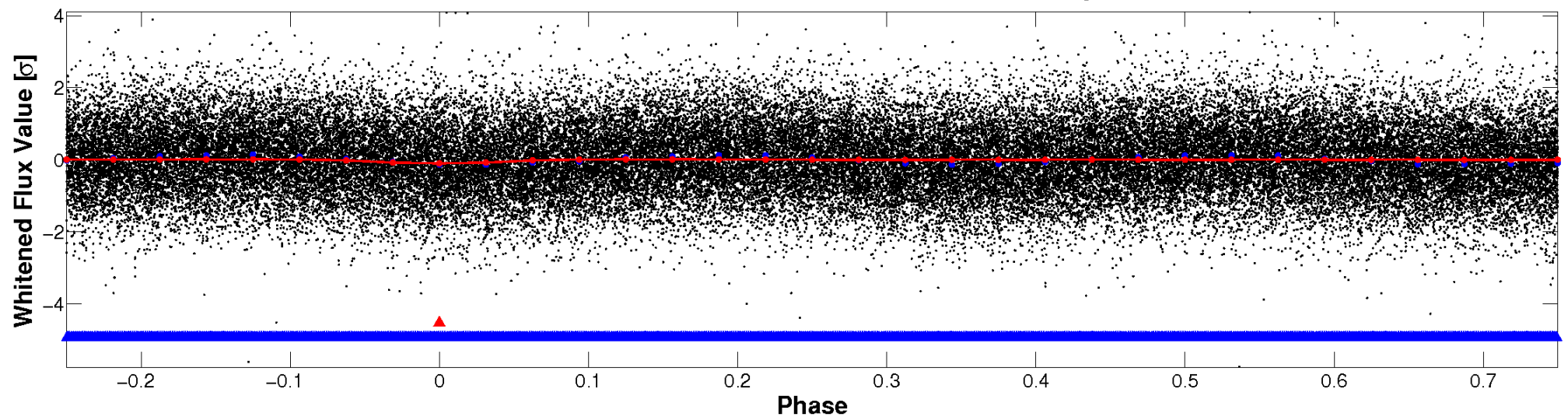


# Non-Whitened Vs. Whitened Light Curve

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



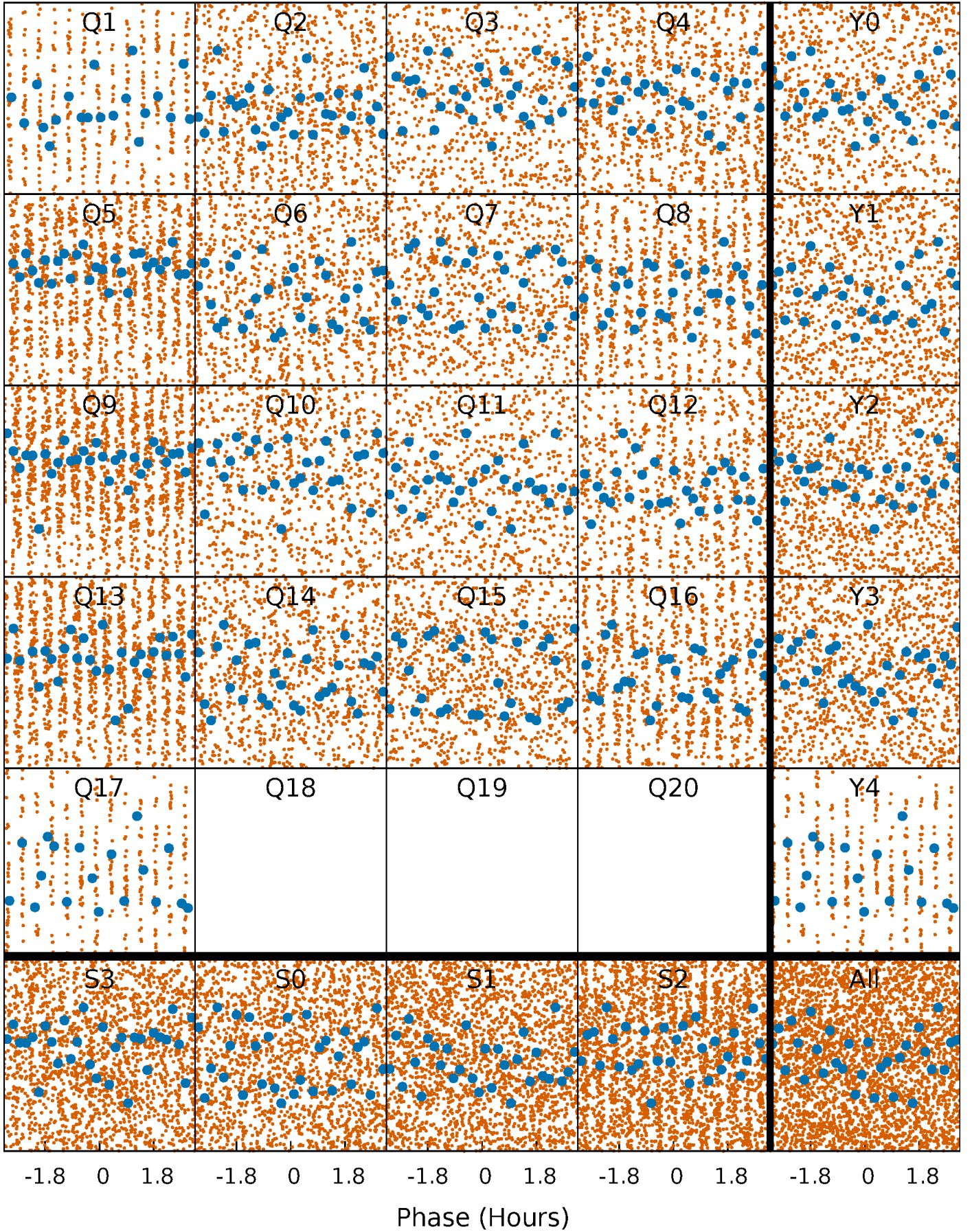
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

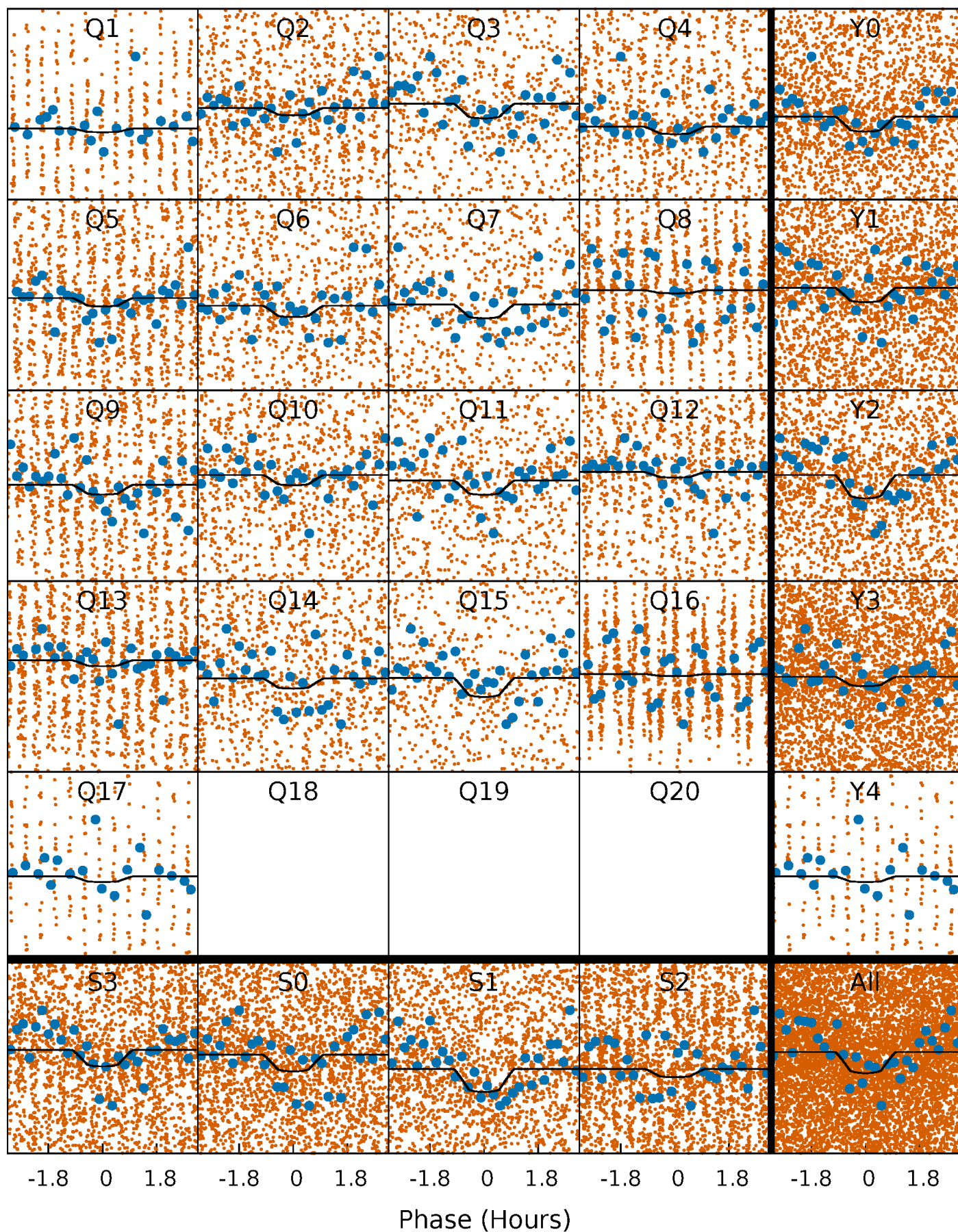
TCE 005781774-01   P= 0.653978 Days    $T_0=131.553064$  (BKJD)





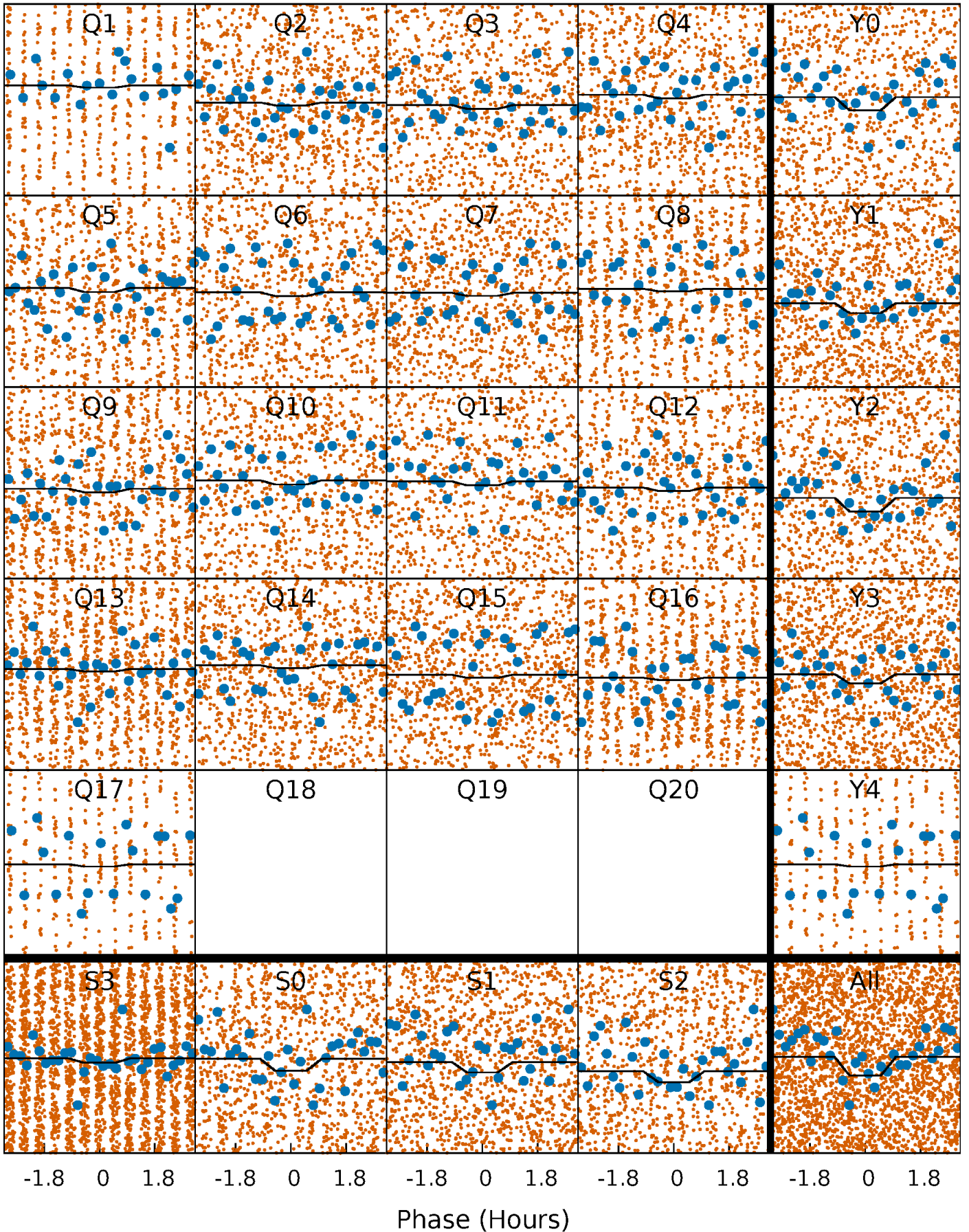
# DV Quarter-Phased Transit Curves

TCE 005781774-01 P= 0.653978 Days  $T_0=131.553064$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

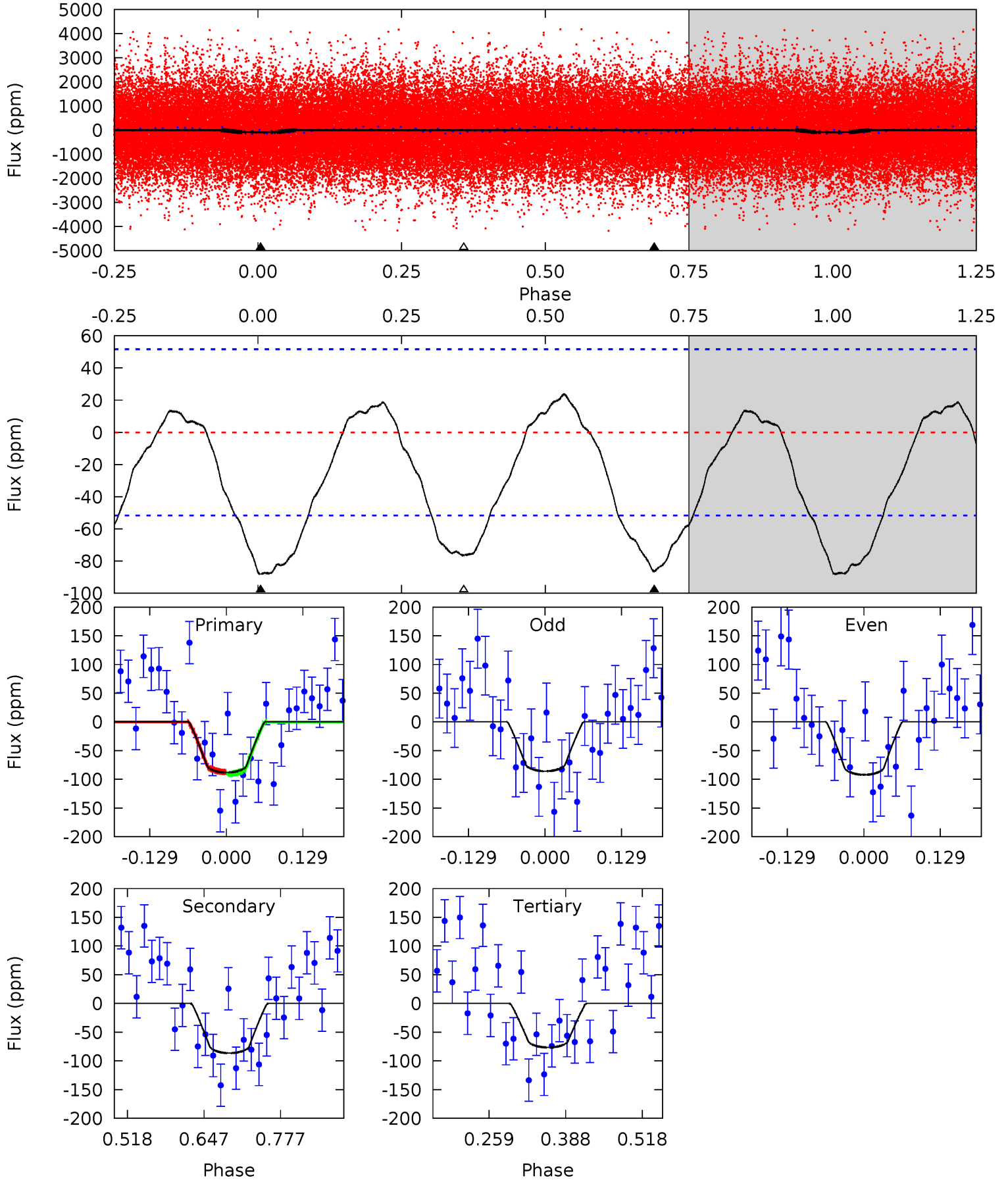
TCE 005781774-01 P= 0.653986 Days  $T_0=131.551867$  (BKJD)



# DV Model-Shift Uniqueness Test

005781774-01, P = 0.653978 Days, E = 130.899086 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
7.71	7.56	6.69	0	4.51	1.52	2.91	1.02	7.71	0.87	7.56	0.27	0.92	0.21	0.15

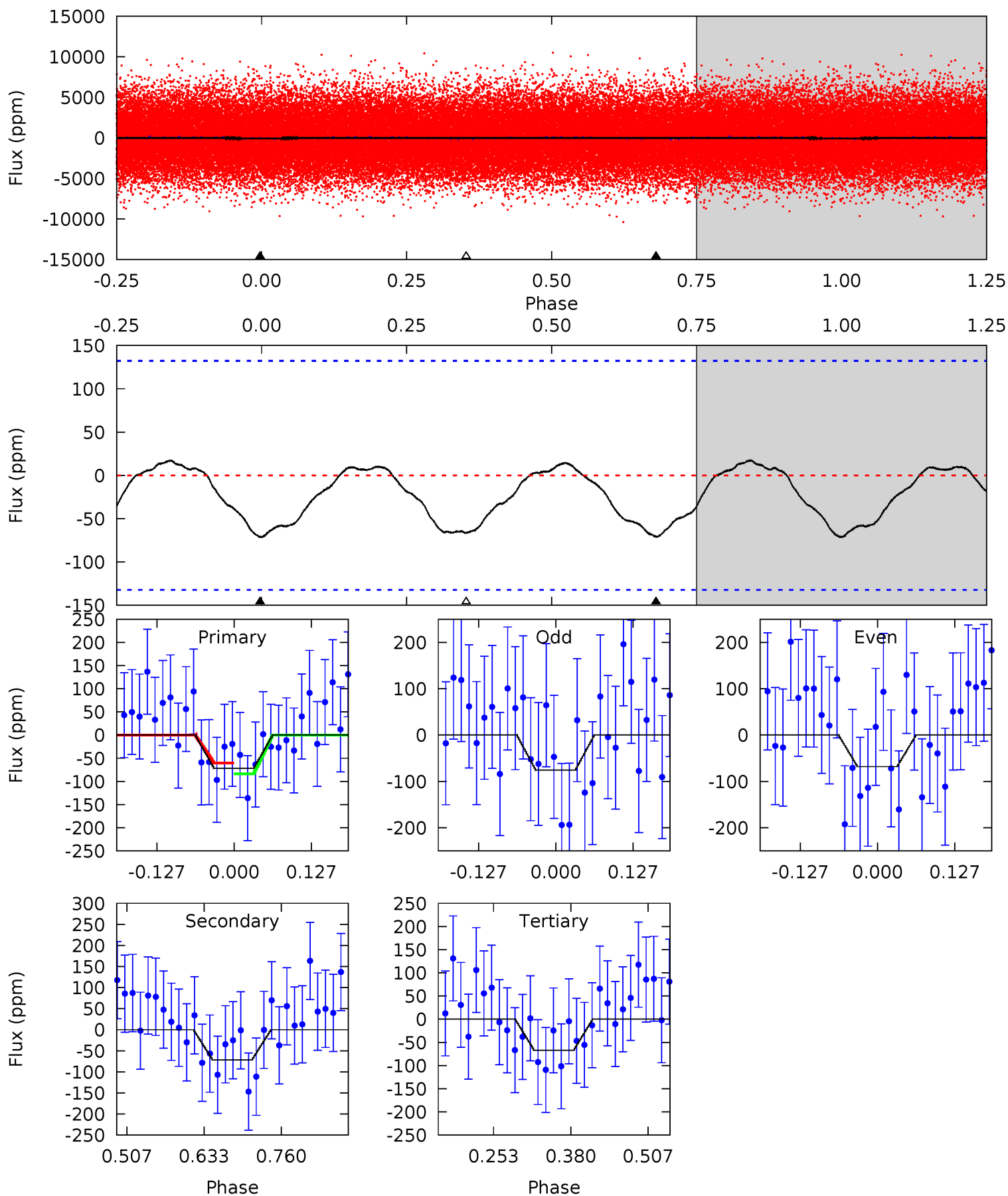




# Alt Model-Shift Uniqueness Test

005781774-01, P = 0.653986 Days, E = 130.897881 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
2.46	2.44	2.29	0	4.51	1.53	0.96	0.16	2.46	0.14	2.44	0.13	0.71	0.20	0.40



### Stellar Parameters For KIC 005781774

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7921^{+221}_{-332}$	$3.757^{+0.392}_{-0.098}$	$-0.120^{+0.200}_{-0.300}$	$3.007^{+0.433}_{-1.300}$	$1.884^{+0.119}_{-0.357}$	$0.098^{+0.329}_{-0.030}$
	+3%/-4%	+10%/-3%	+167%/-250%	+14%/-43%	+6%/-19%	+336%/-31%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 005781774-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-87 \pm 11$	$3.30^{+2.39}_{-2.05}$	$6154^{+397}_{-663}$	$6702^{+7350}_{-2347}$	$1.413^{+8.050}_{-0.953}$
Alt.	$-71 \pm 29$	$3.07^{+2.81}_{-2.00}$	$6128^{+429}_{-712}$	$6632^{+8622}_{-3699}$	$1.340^{+8.988}_{-1.029}$

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

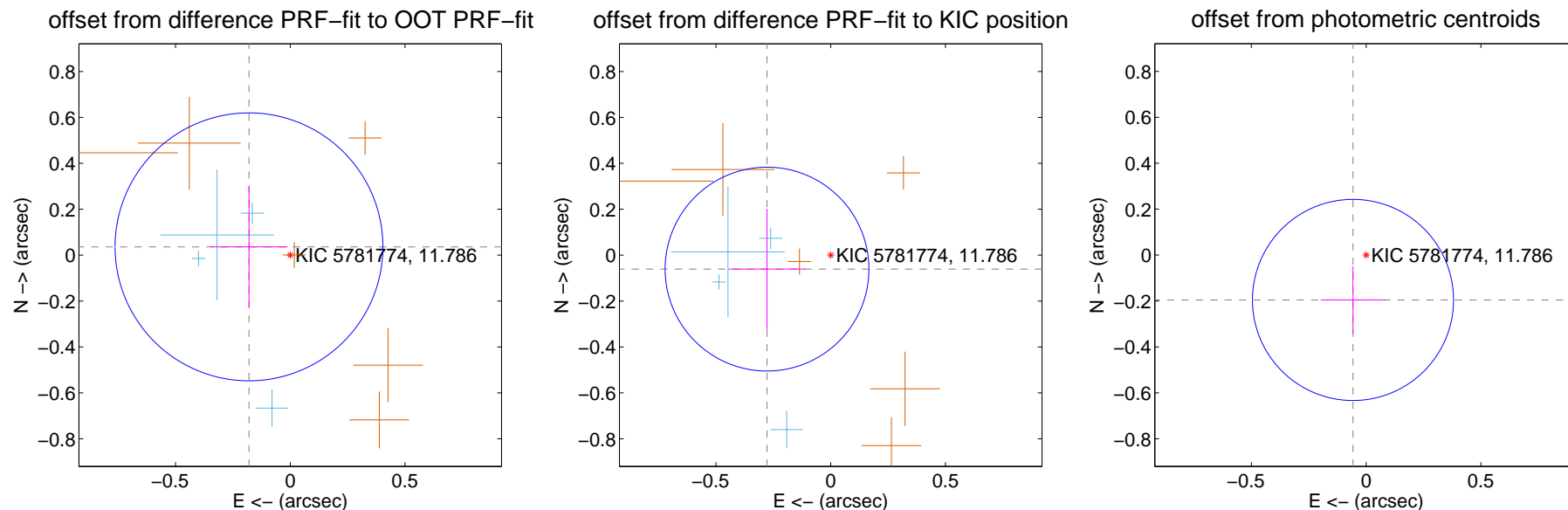
## DV Centroid Data

Supplemental centroid analysis for 005781774-01. **Kepler magnitude: 11.79.** Transit SNR 6.74

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

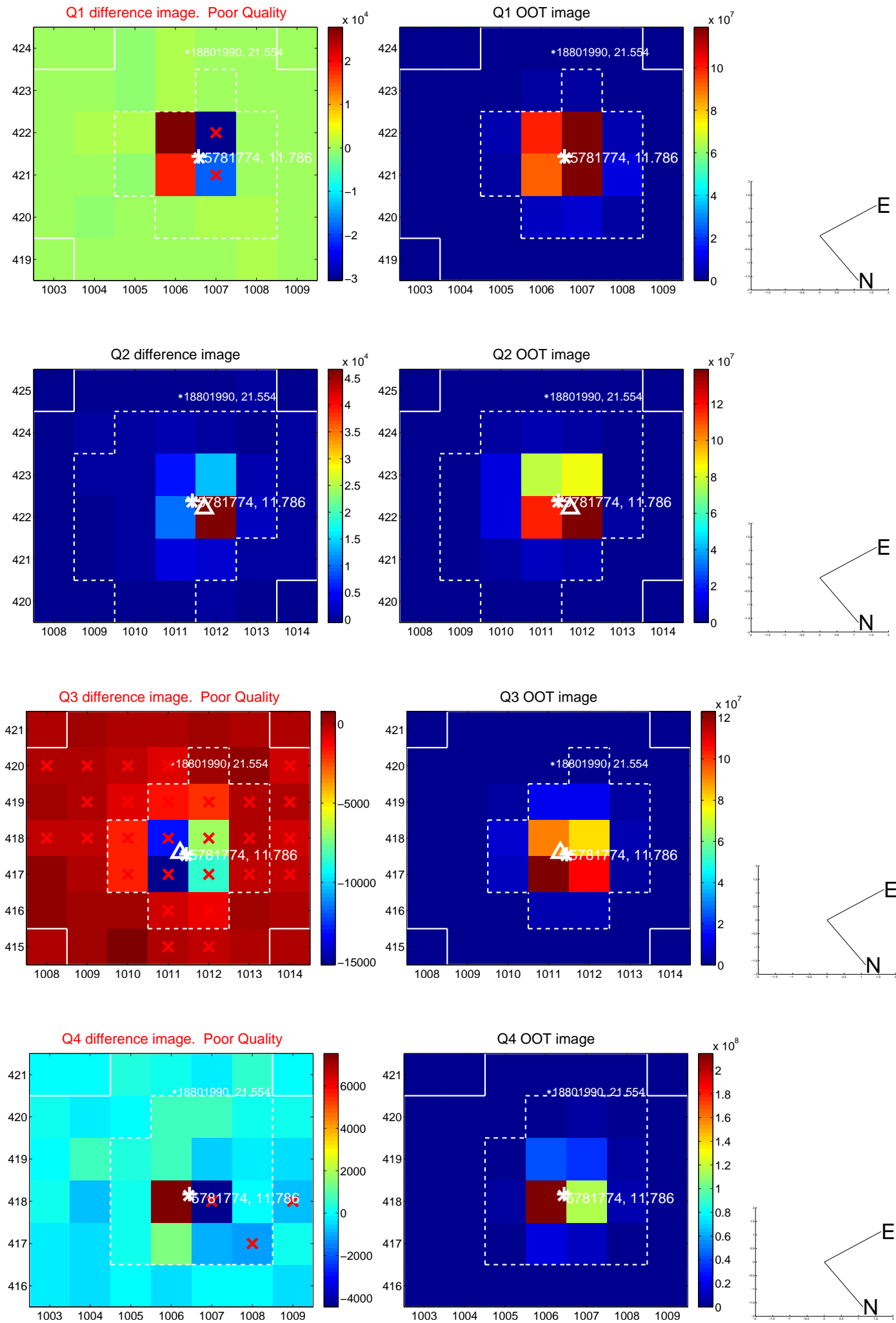
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.183 \pm 0.195$	0.94	$0.180 \pm 0.168$	$0.036 \pm 0.265$
PRF-fit source offset from KIC position	$0.284 \pm 0.148$	1.92	$0.278 \pm 0.168$	$-0.061 \pm 0.263$
photometric centroid source offset	$0.20 \pm 0.15$	1.39	$0.06 \pm 0.14$	$-0.20 \pm 0.15$



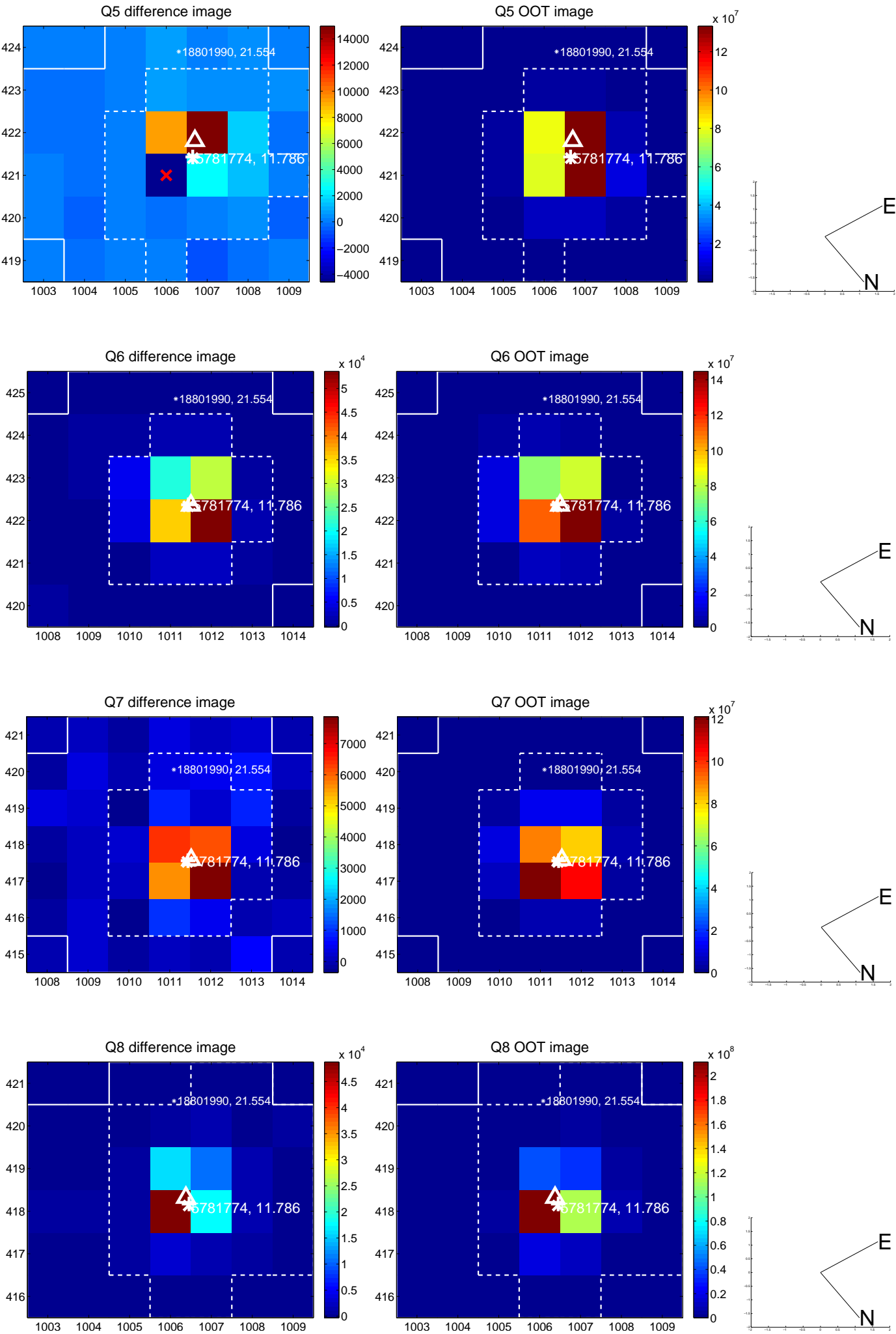
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



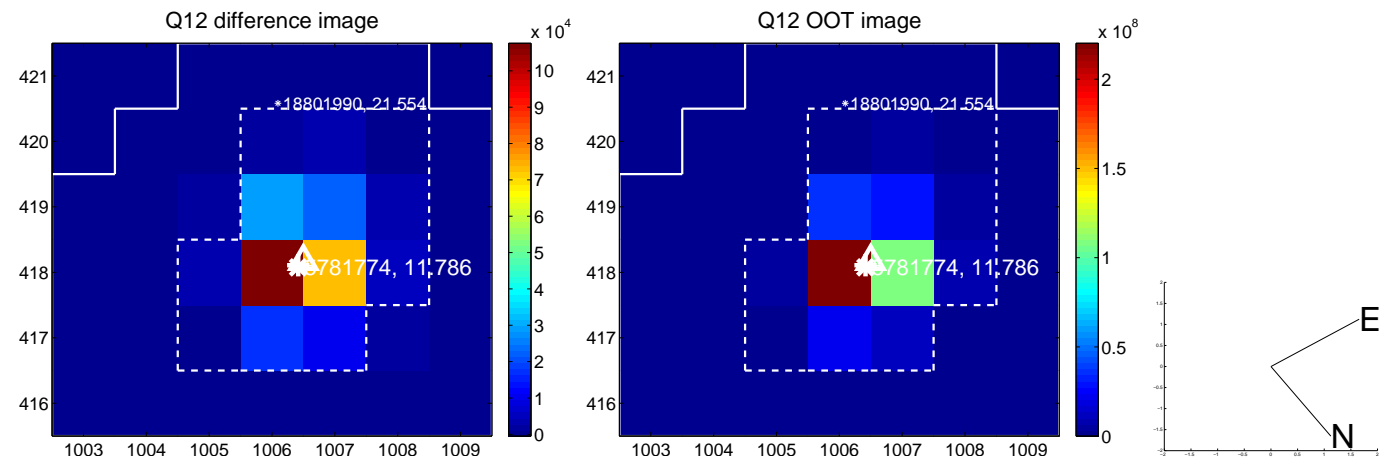
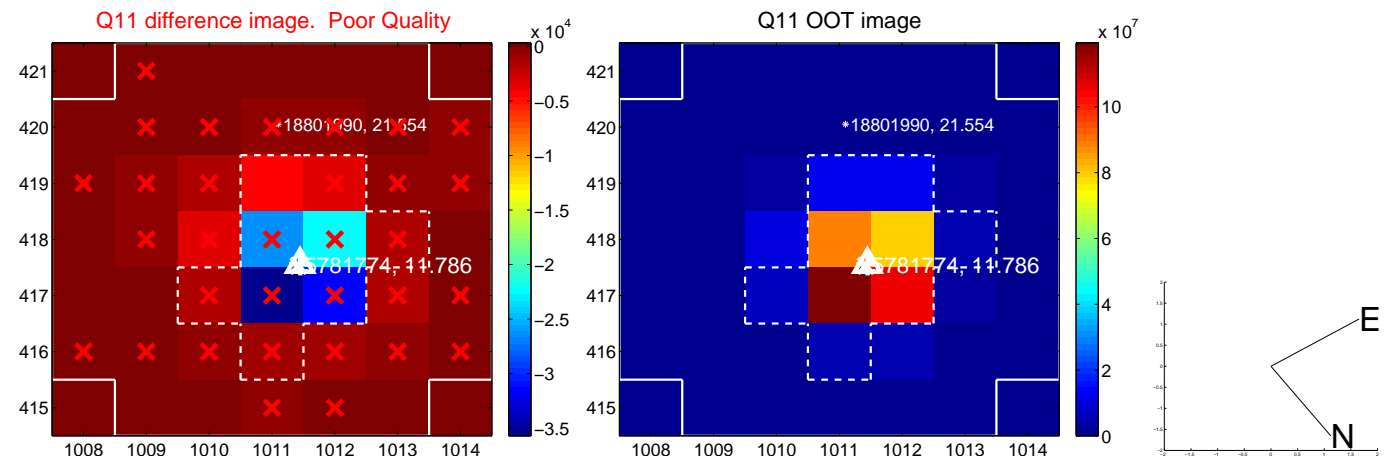
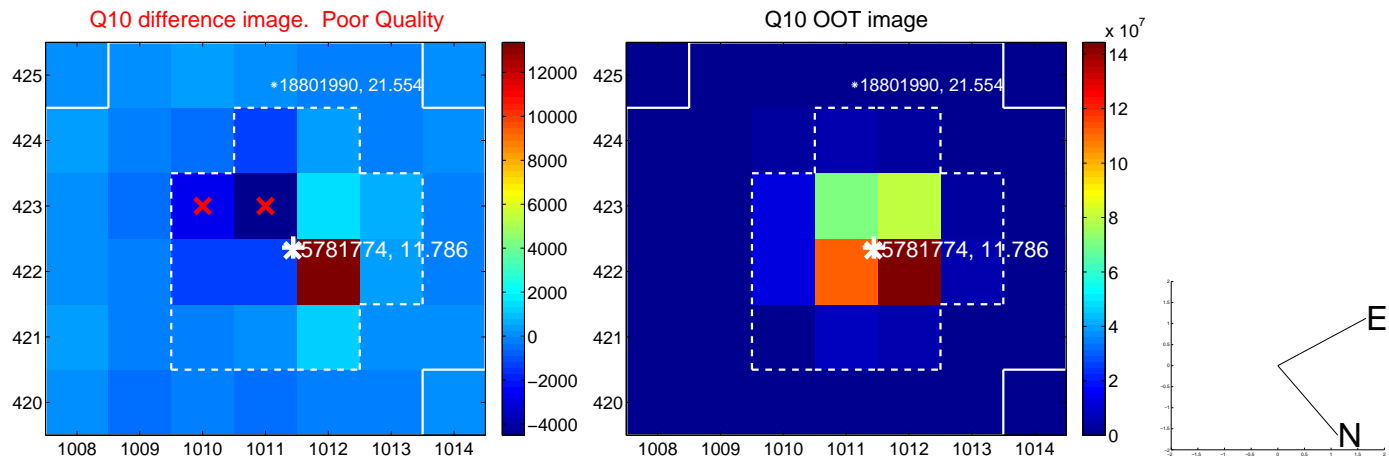
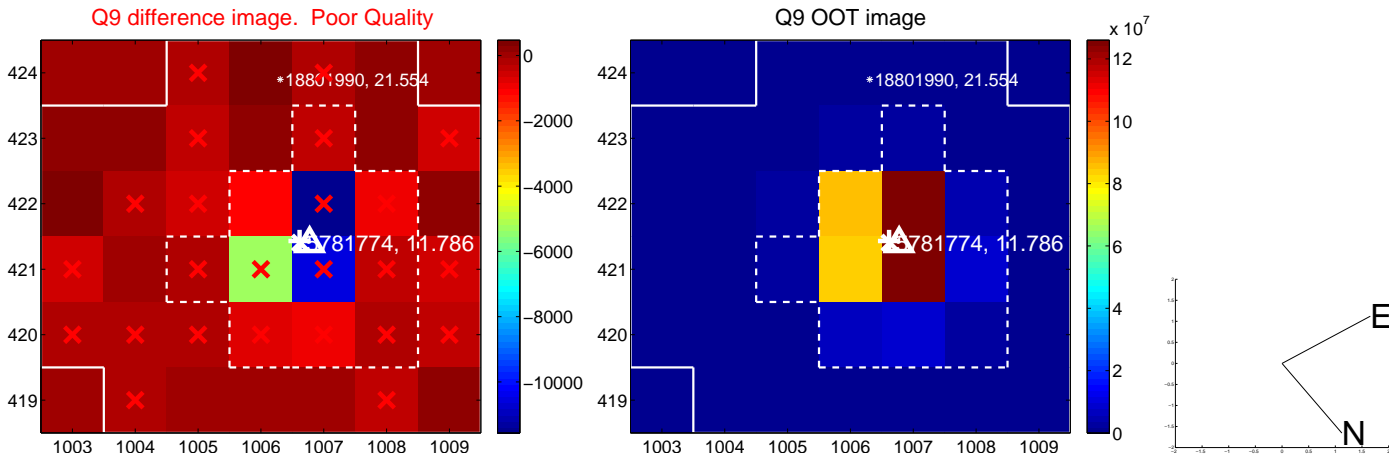
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

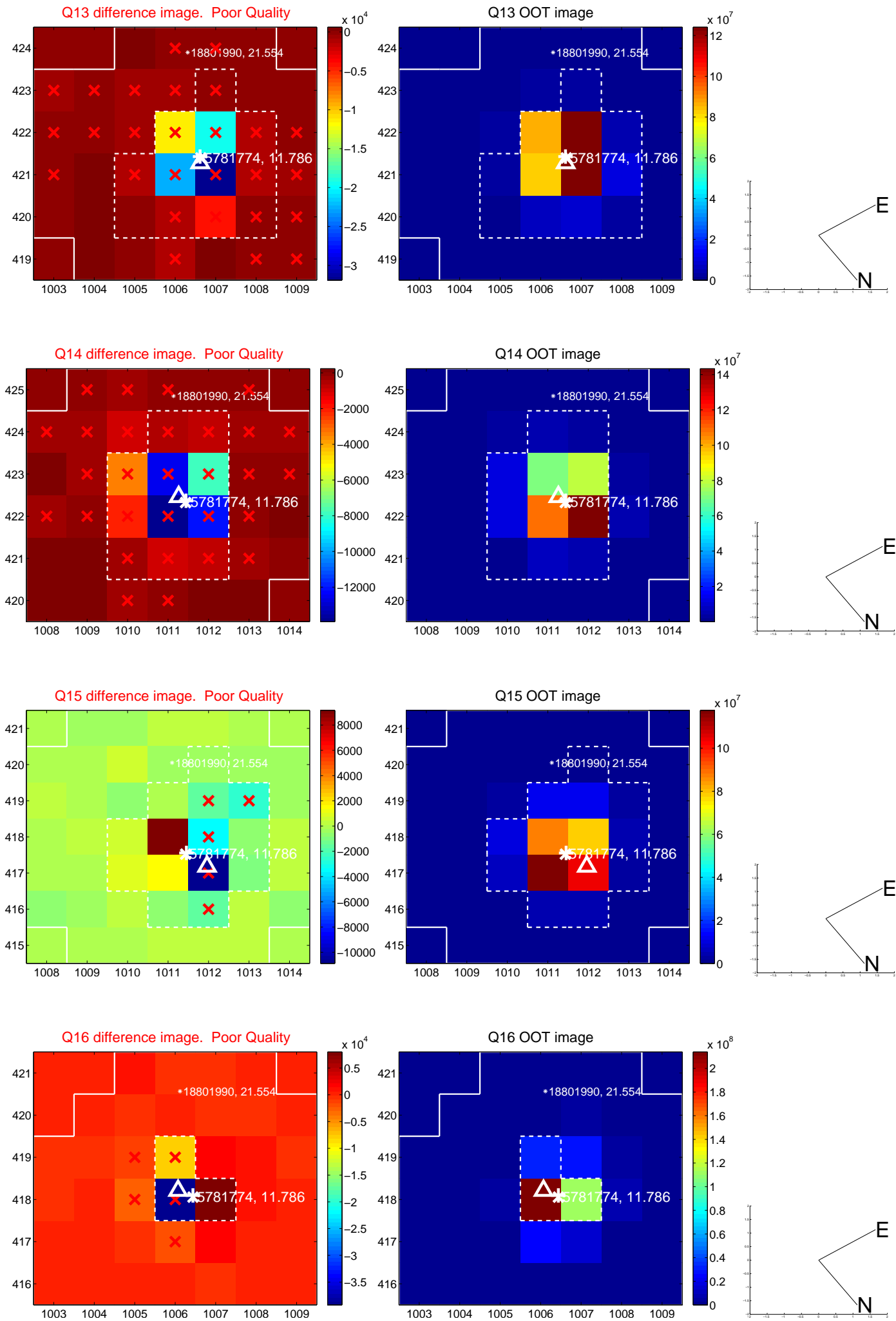


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

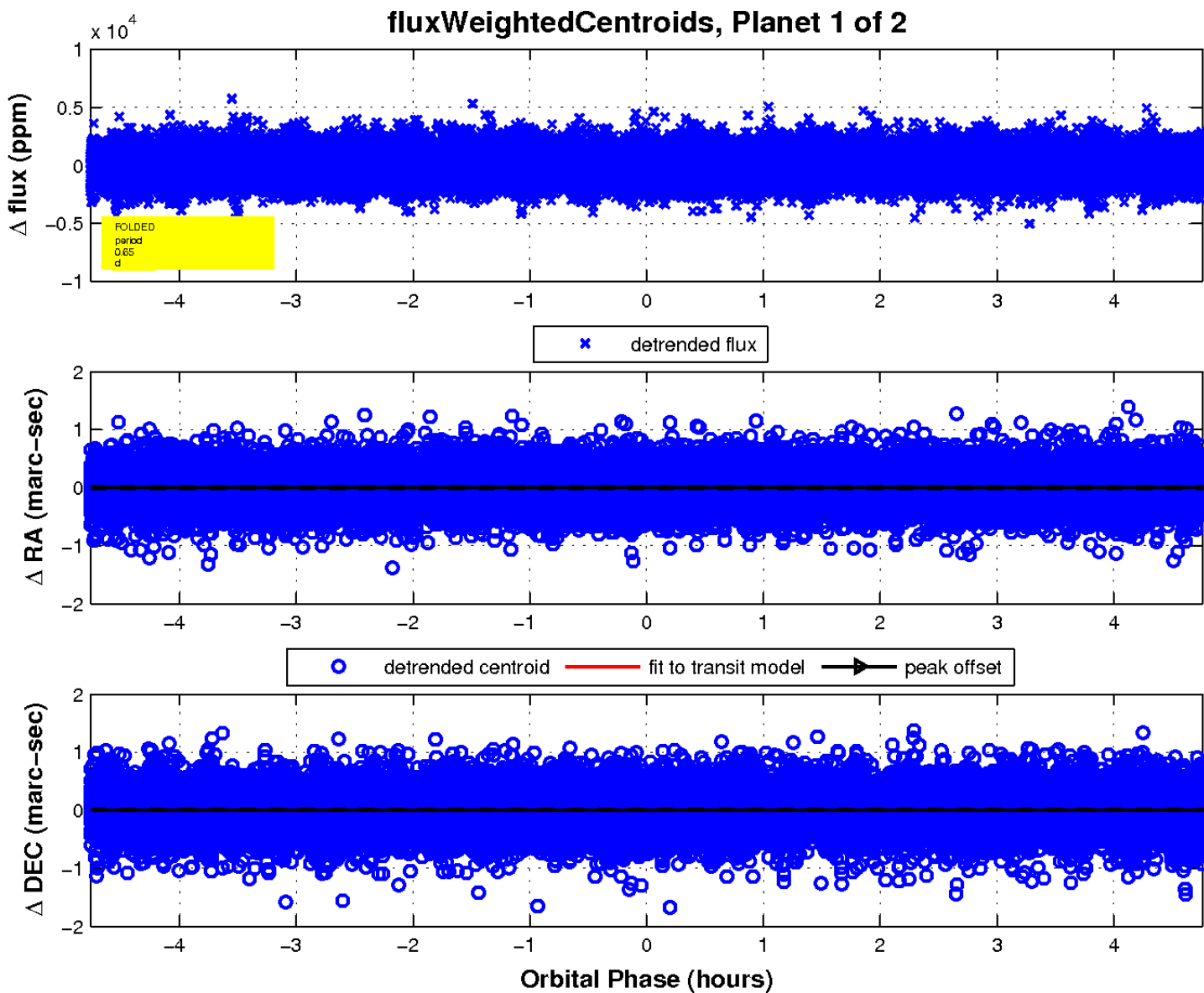
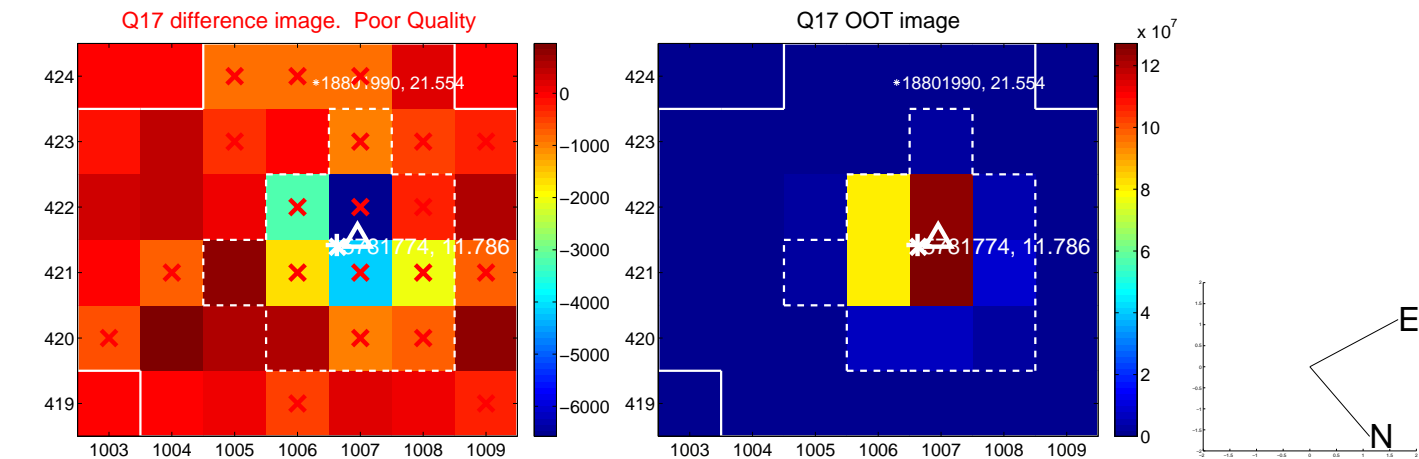




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

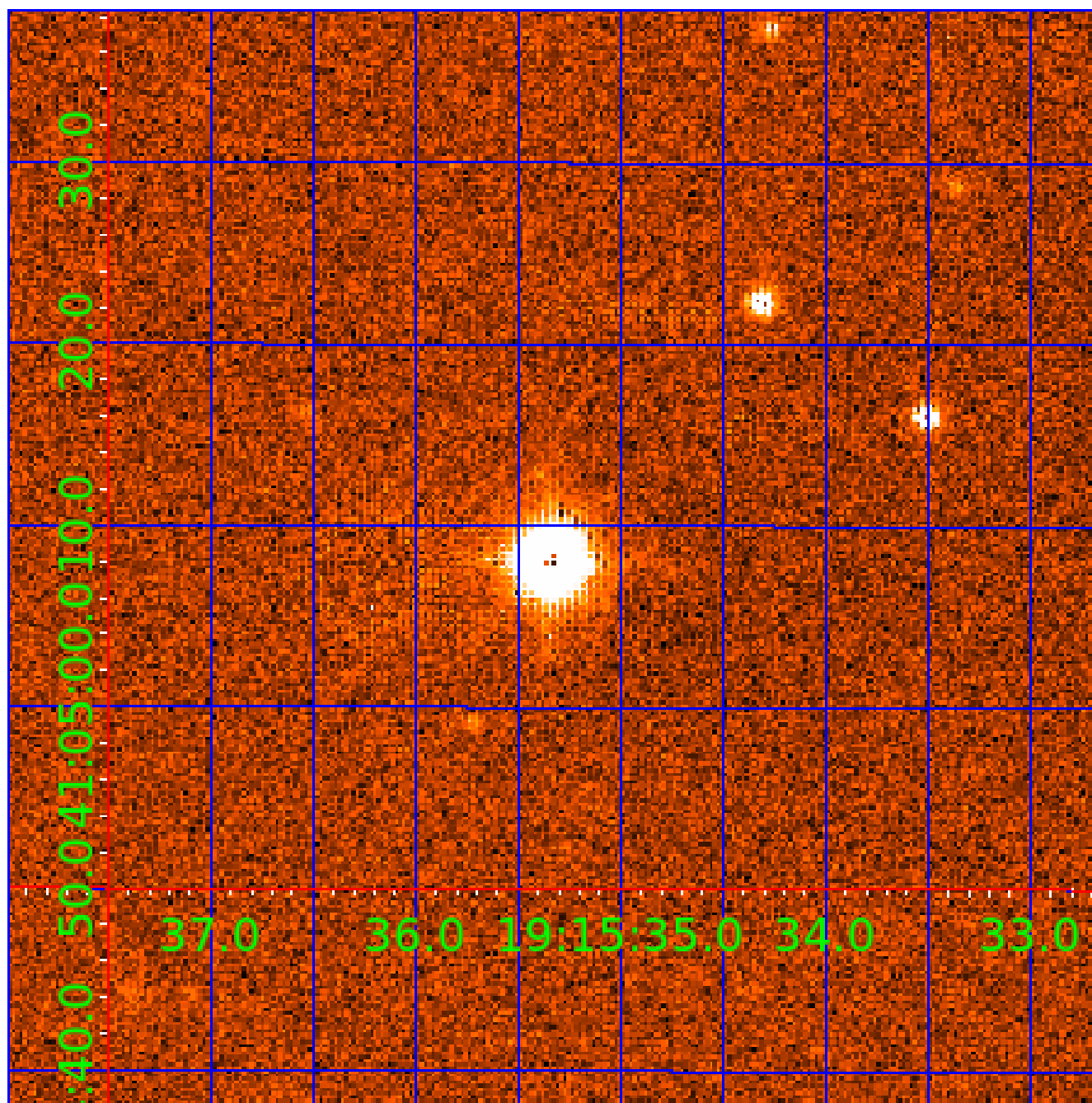


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005781774

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005781774-01	OBS	No	0.653978	131.553064	66.6	1.587	12.3	6.7	3.01	7921	2.86	96091.62
005781774-02	OBS	No	1.807459	132.080983	231.5	21.689	11.7	24.2	3.01	7921	6.98	24774.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005781774-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005781774-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—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.

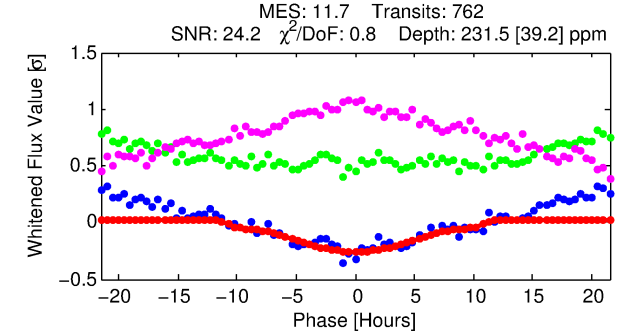
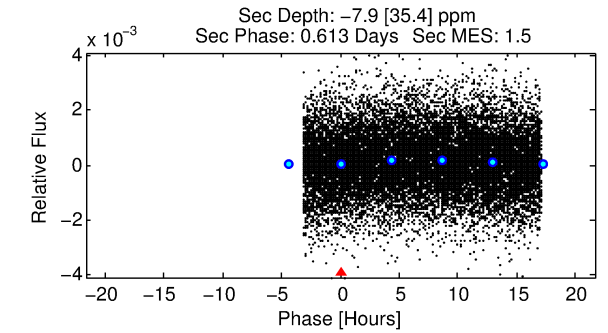
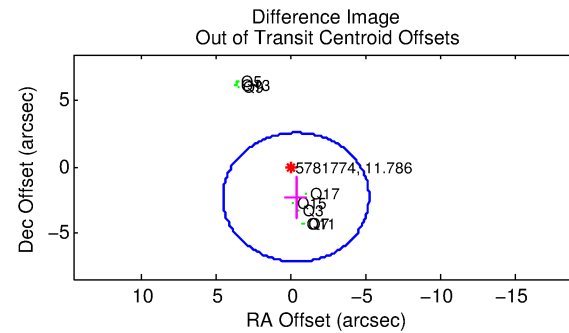
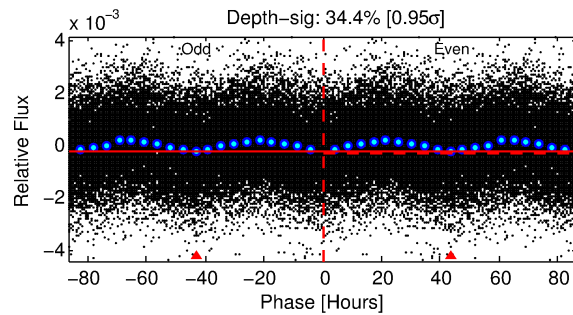
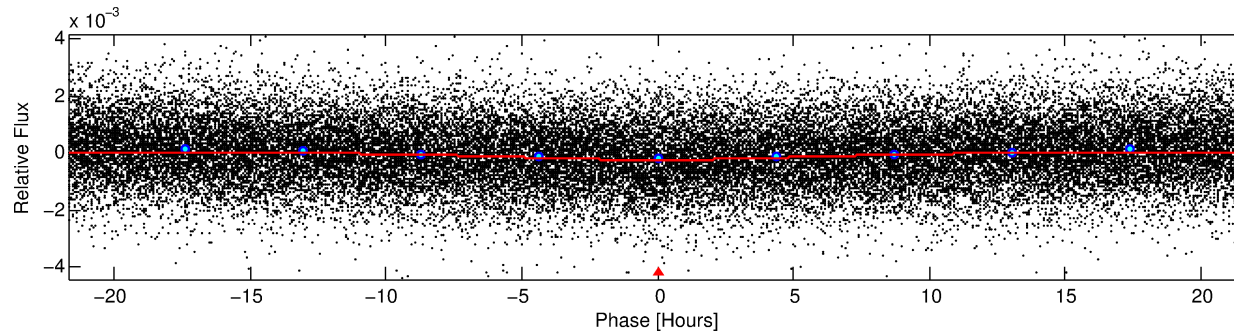
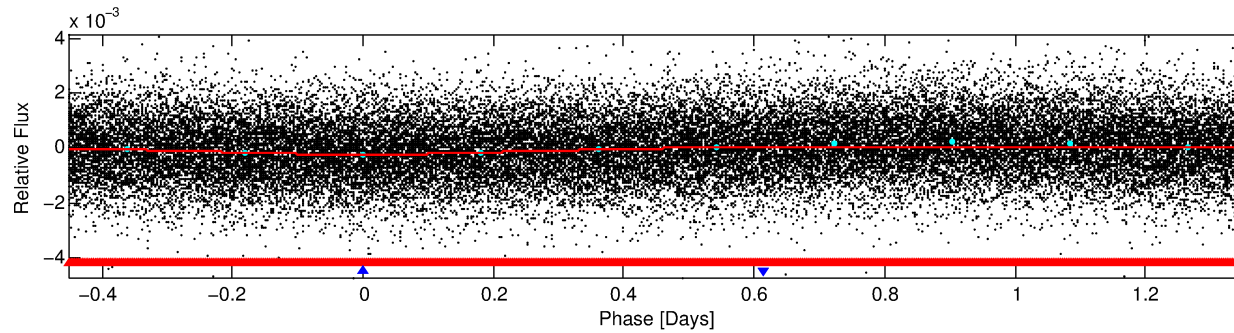
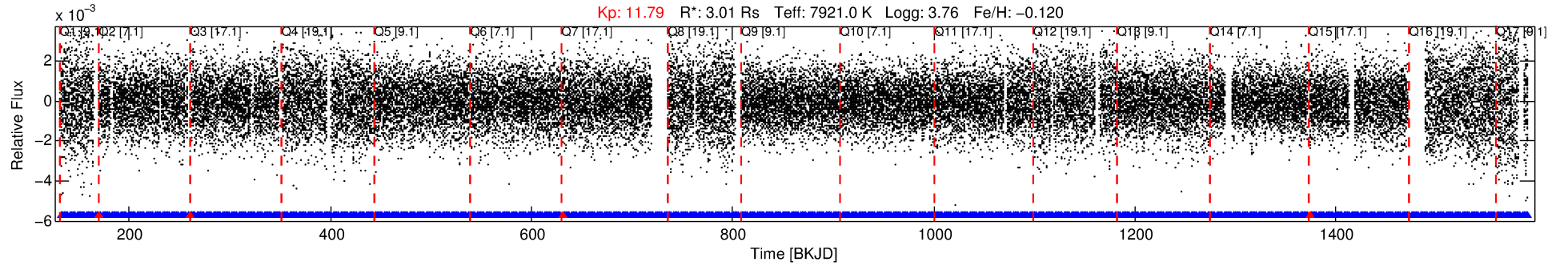
## Ephemeris Match Information For 005781774-02

No Significant Match Found



# DV One-Page Summary

KIC: 5781774 Candidate: 2 of 2 Period: 1.807 d



## DV Fit Results:

Period = 1.80746 [0.00003] d  
Epoch = 132.0810 [0.0132] BKJD  
Rp/R\* = 0.0213 [0.0114]  
a/R\* = 1.01 [0.01]  
b = 0.99 [0.02]  
Seff = 24774.91 [17043.82]  
Teq = 3199 [550] K  
Rp = 6.98 [4.80] Re  
a = 0.0359 [0.0149] AU  
Ag = N/A  
Teffp = N/A

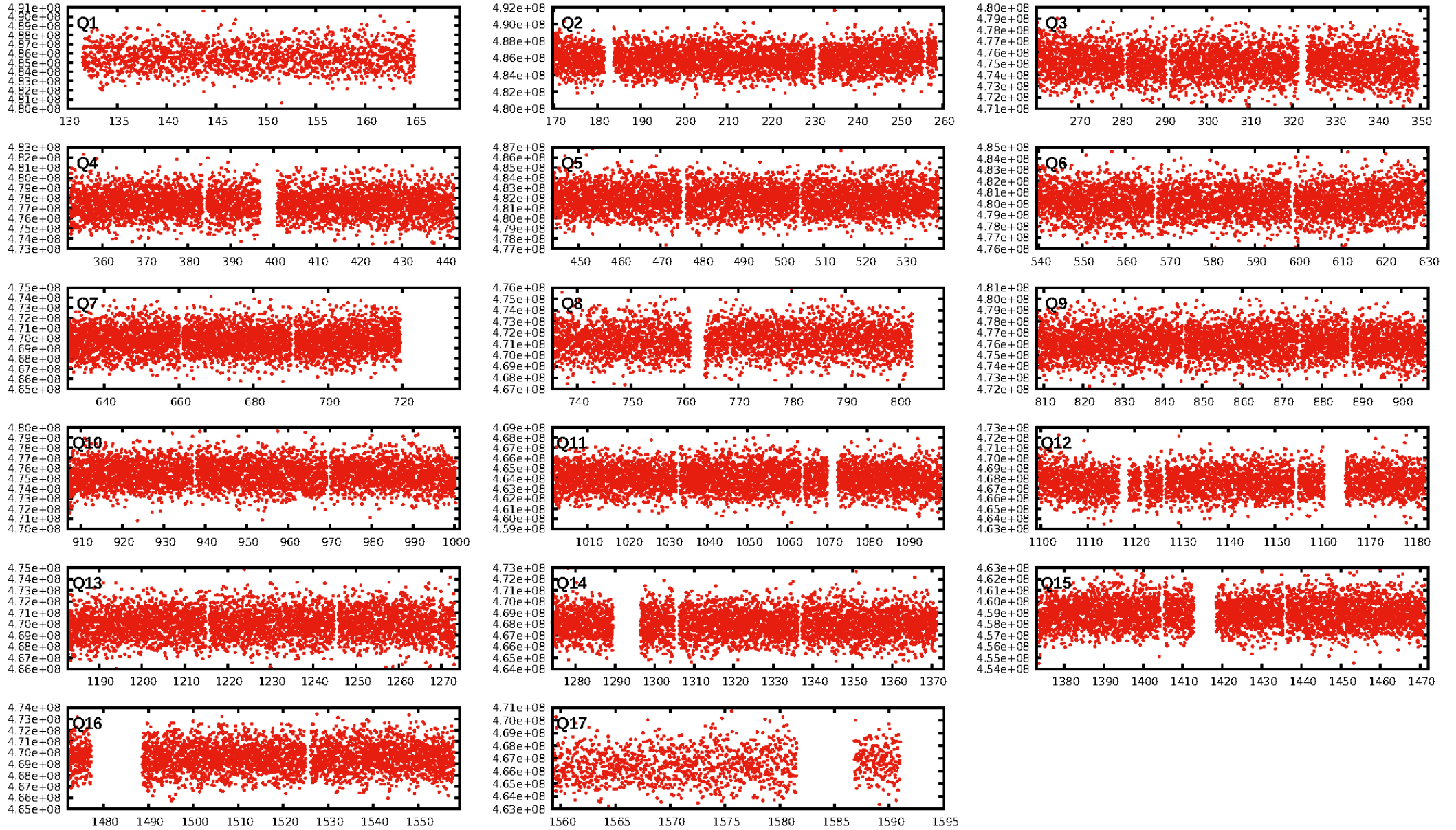
## DV Diagnostic Results:

ShortPeriod-sig: 79.7% [1.27 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [723/727]  
GhostDiagnostic-chr: 1.669  
Centroid-sig: 0.9%  
Centroid-so: 0.183 arcsec [5.72 $\sigma$ ]  
OotOffset-rm: 2.356 arcsec [1.45 $\sigma$ ]  
KicOffset-rm: 2.448 arcsec [1.49 $\sigma$ ]  
OotOffset-st: 0/4/0/4 [8]  
KicOffset-st: 0/4/0/4 [8]  
DiffImageQuality-fgm: 0.38 [3/8]  
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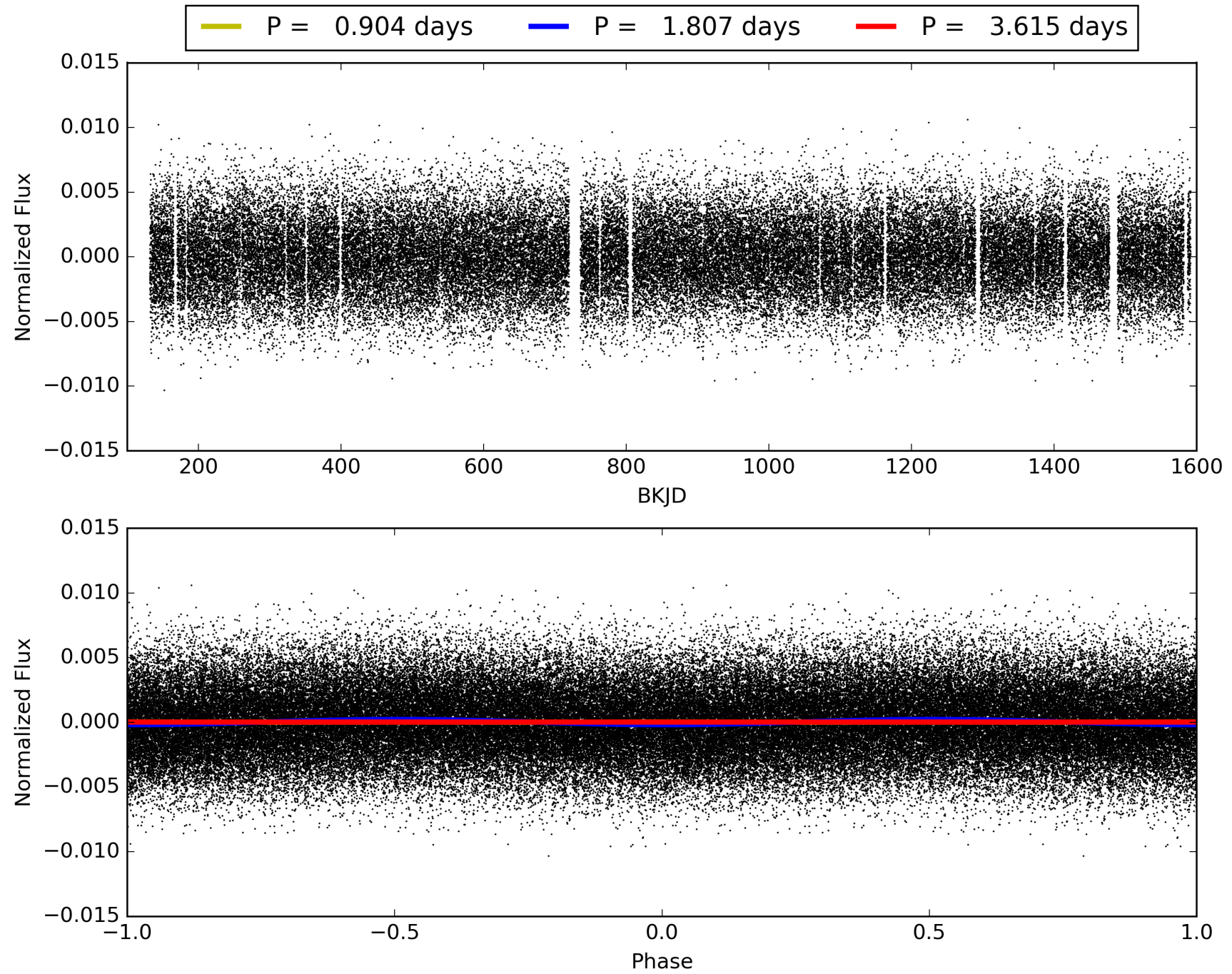
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:40:39 Z

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

# TCE 005781774-02, PDC Light Curves



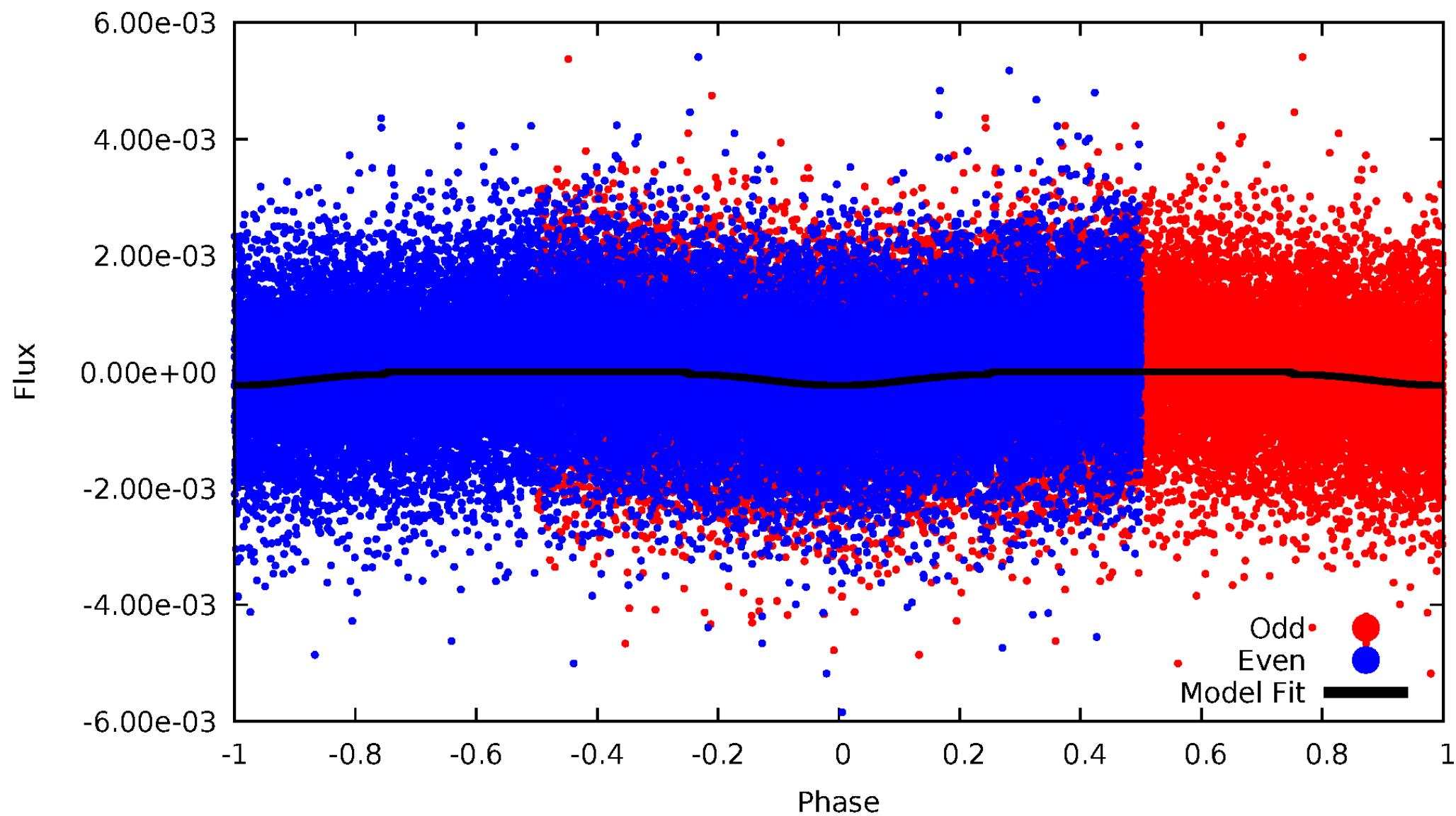
TCE 005781774-02





# DV Odd/Even

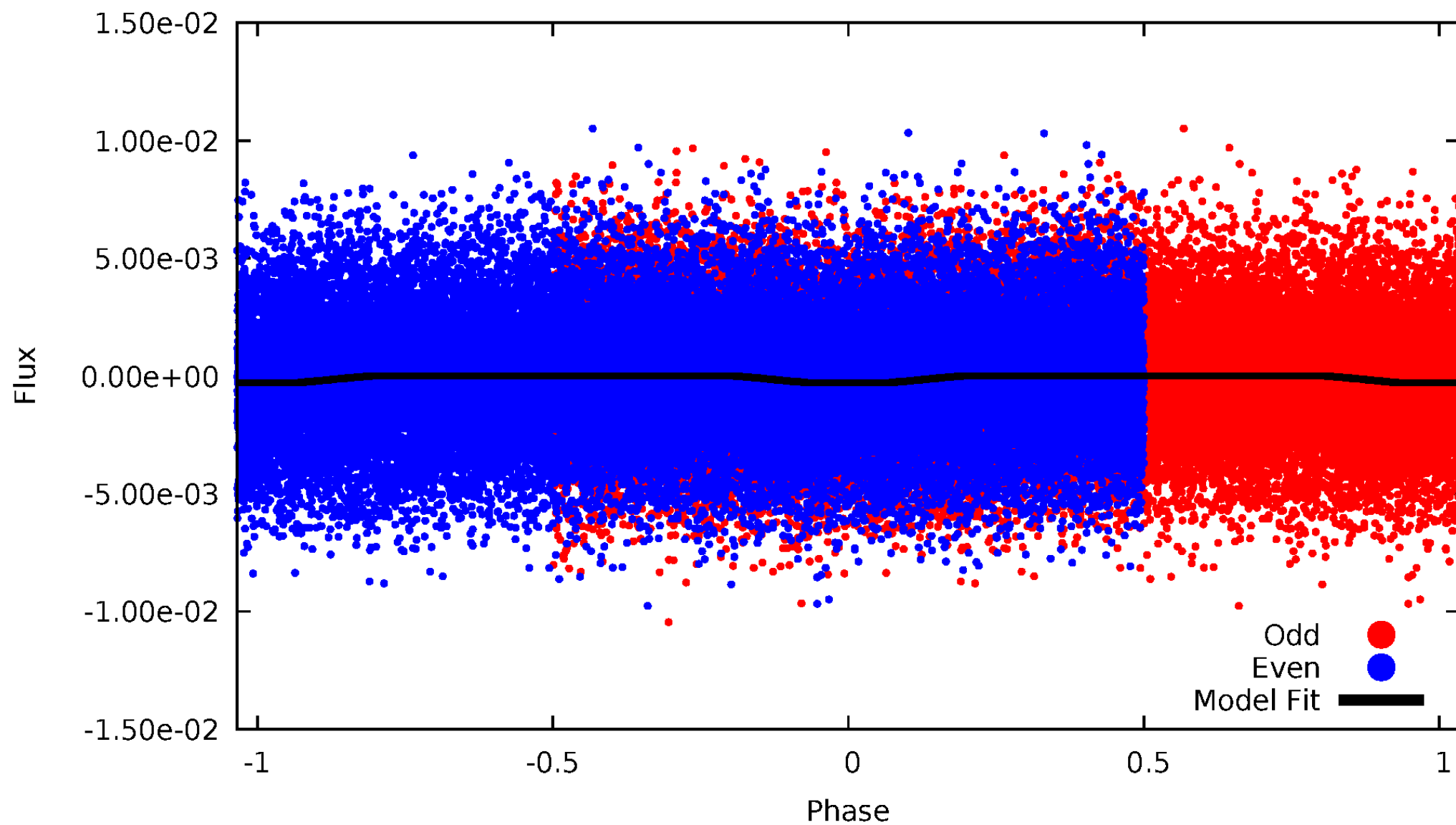
TCE 005781774-02





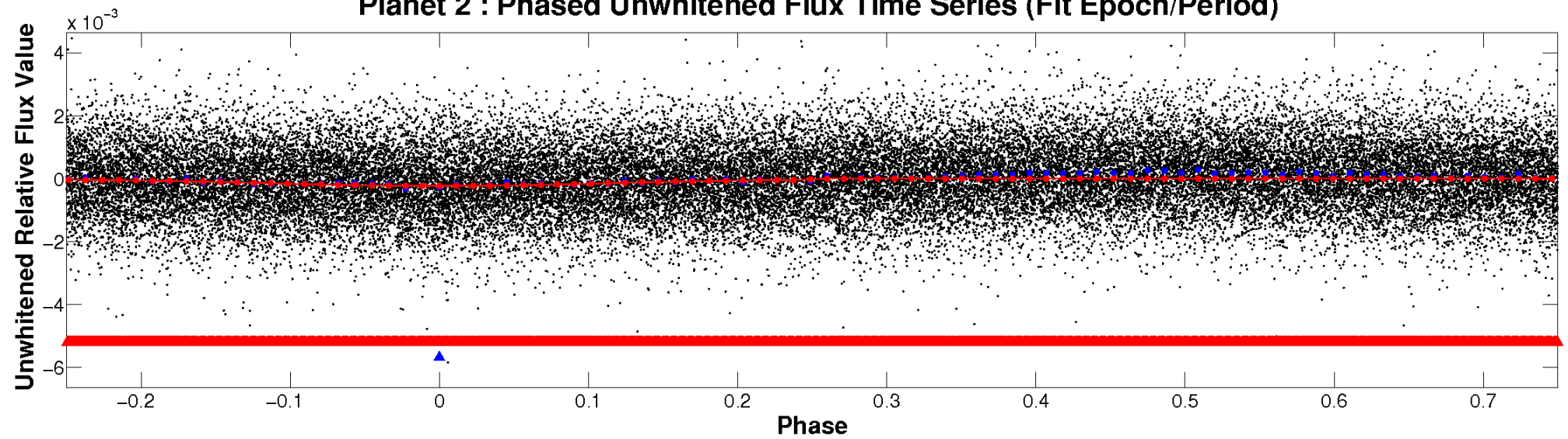
# ALT Odd/Even

TCE 005781774-02

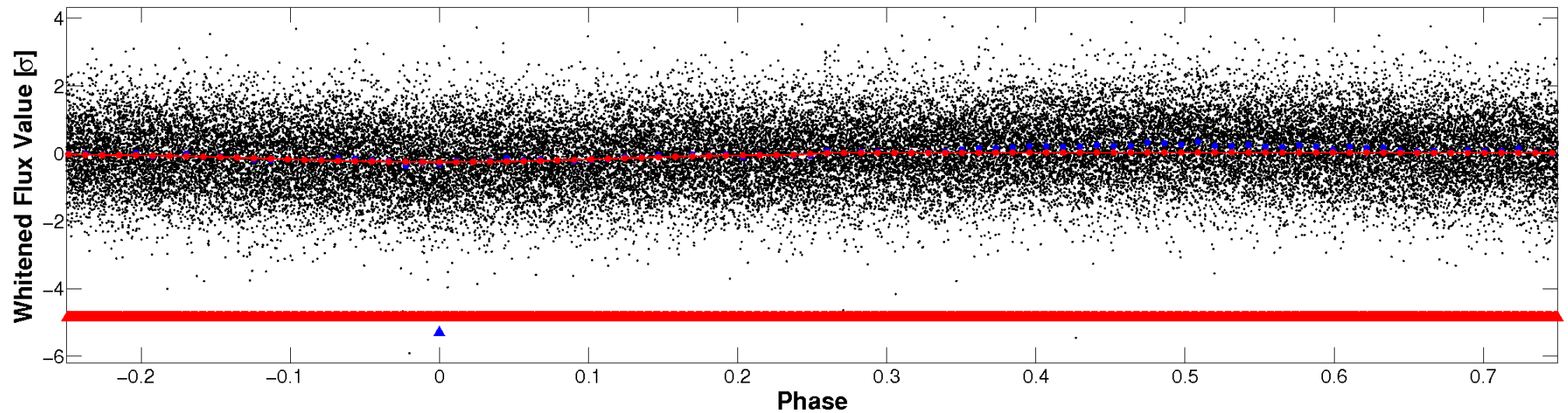


# Non-Whitened Vs. Whitened Light Curve

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

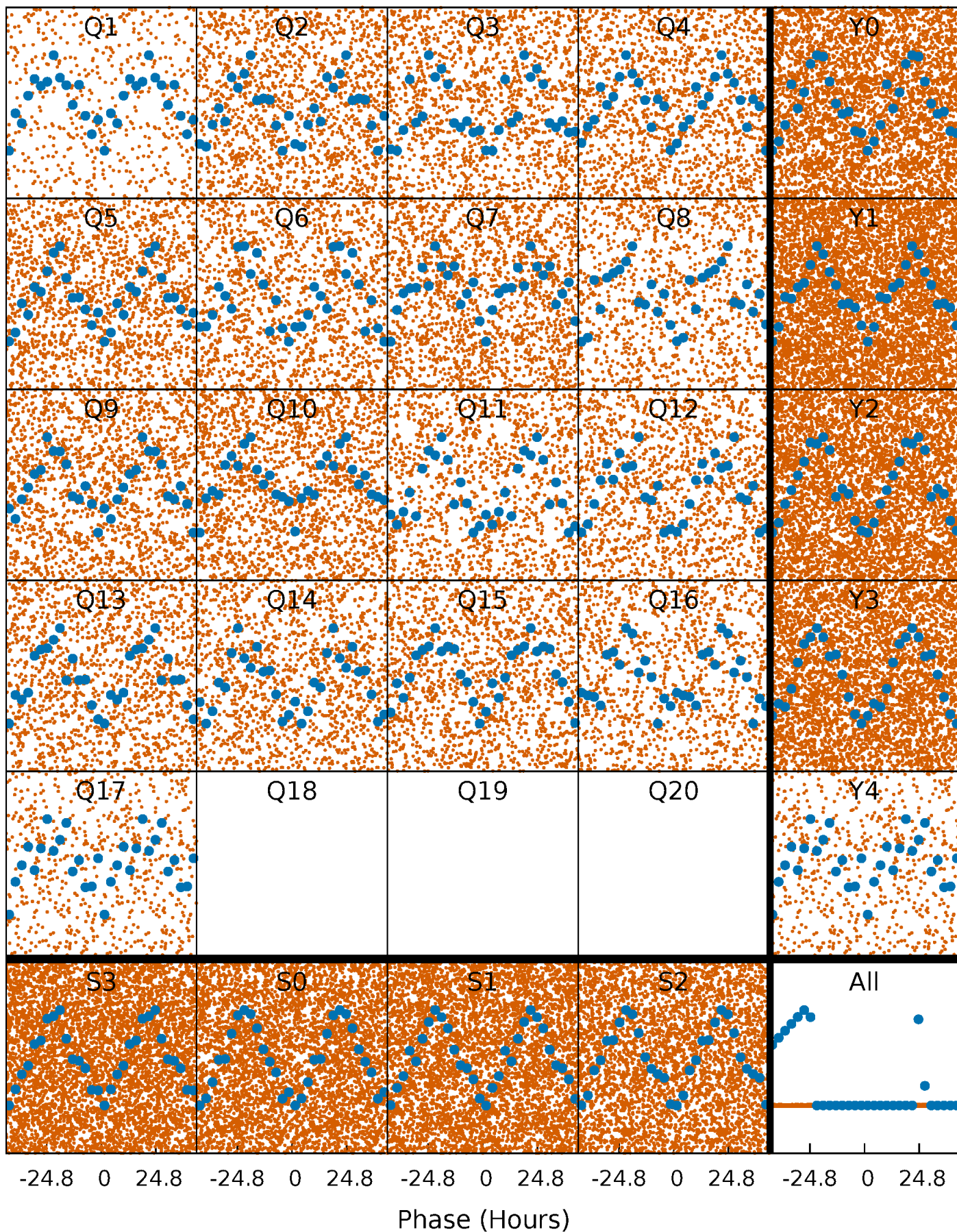


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

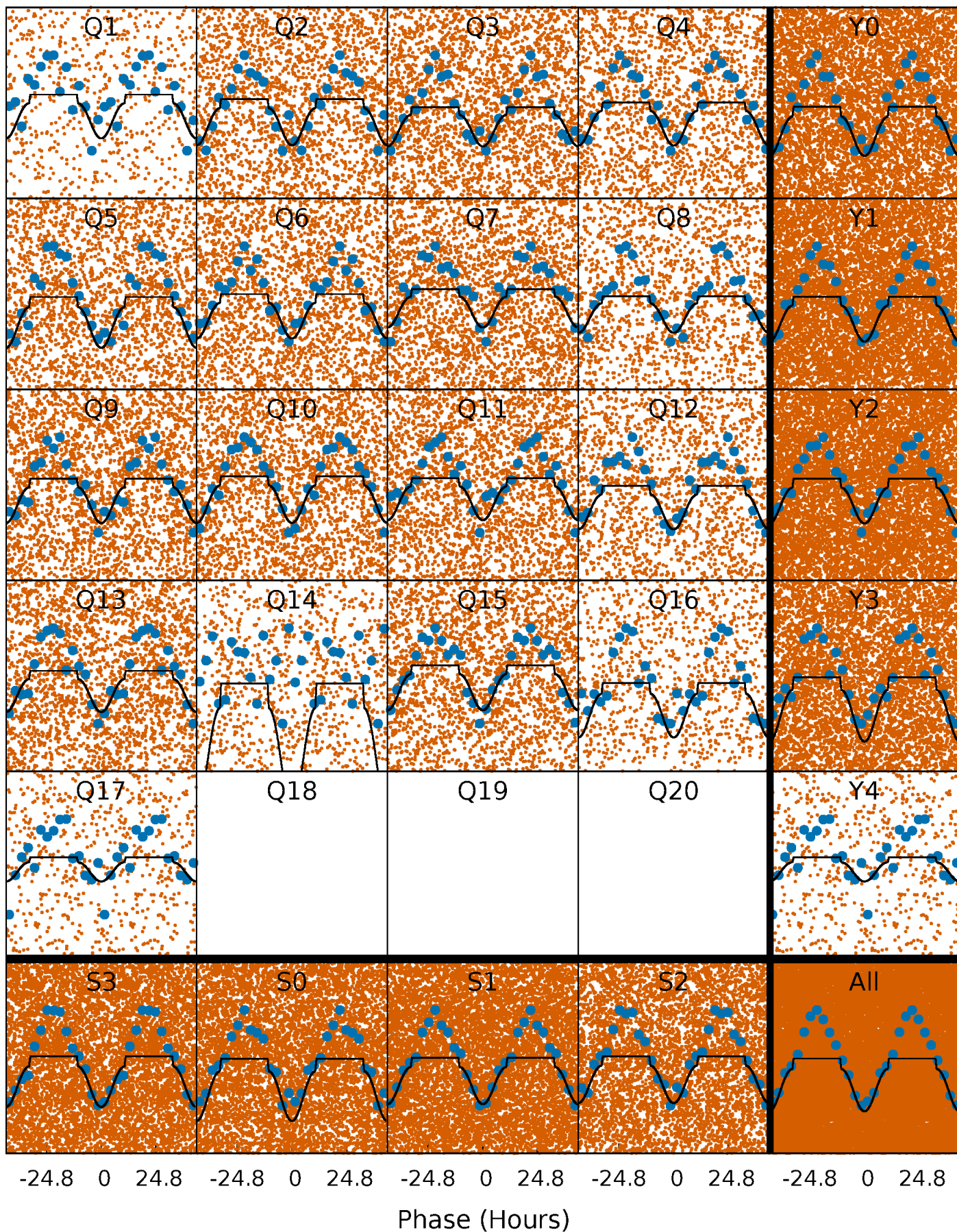
TCE 005781774-02   P= 1.807459 Days    $T_0=132.080983$  (BKJD)





# DV Quarter-Phased Transit Curves

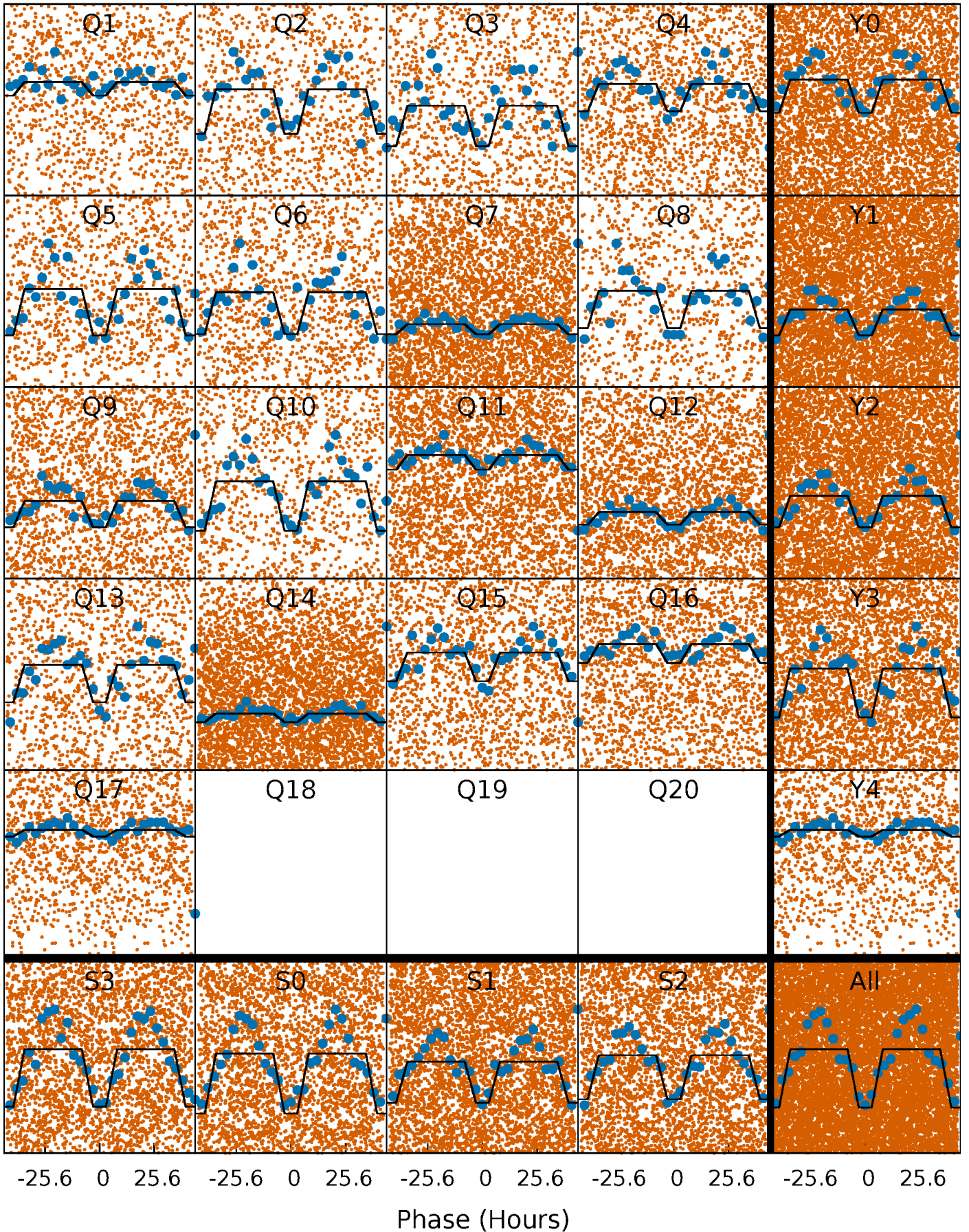
TCE 005781774-02   P= 1.807459 Days    $T_0=132.080983$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

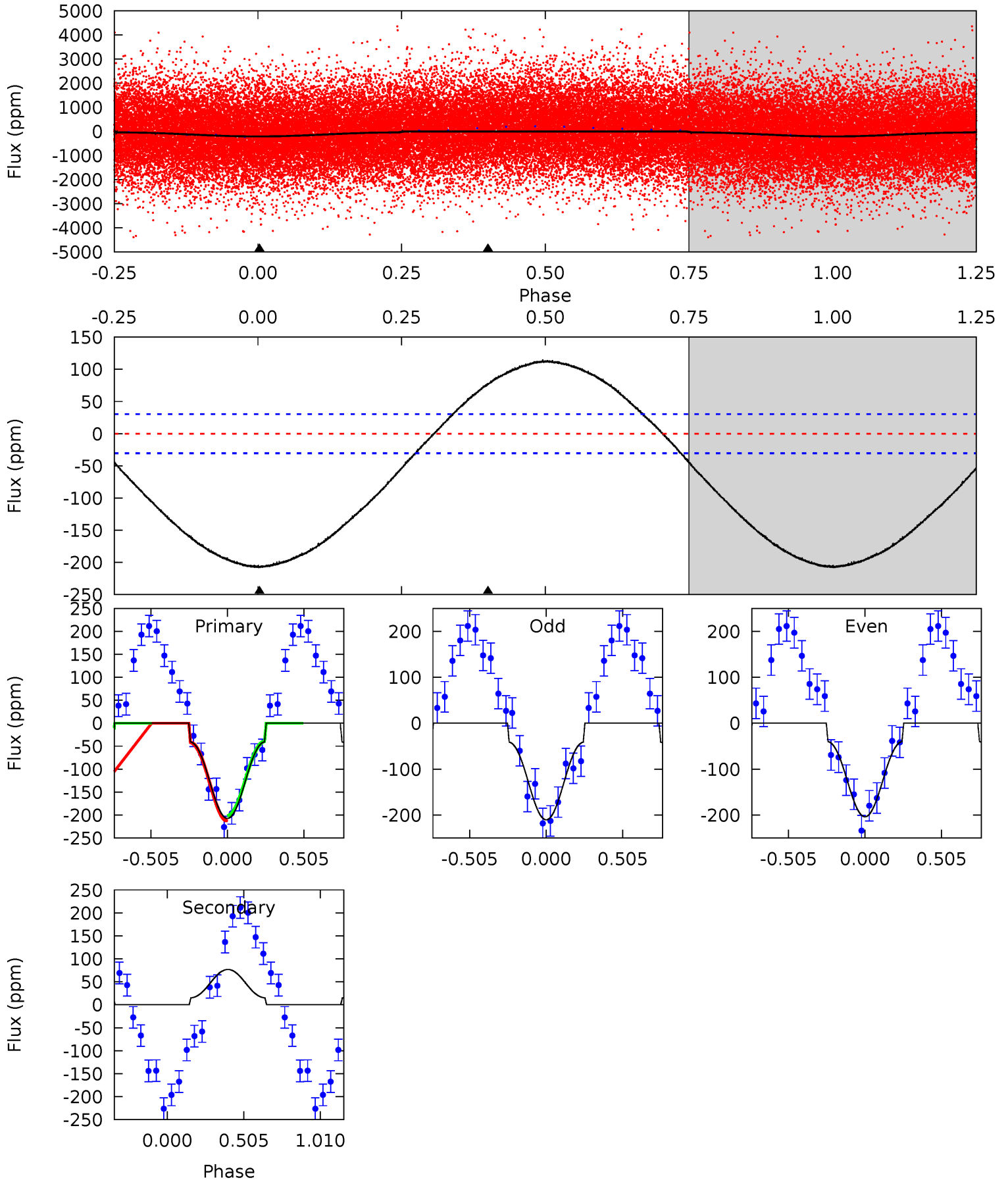
TCE 005781774-02 P= 1.807049 Days  $T_0=132.251145$  (BKJD)



# DV Model-Shift Uniqueness Test

005781774-02, P = 1.807459 Days, E = 130.273524 Days

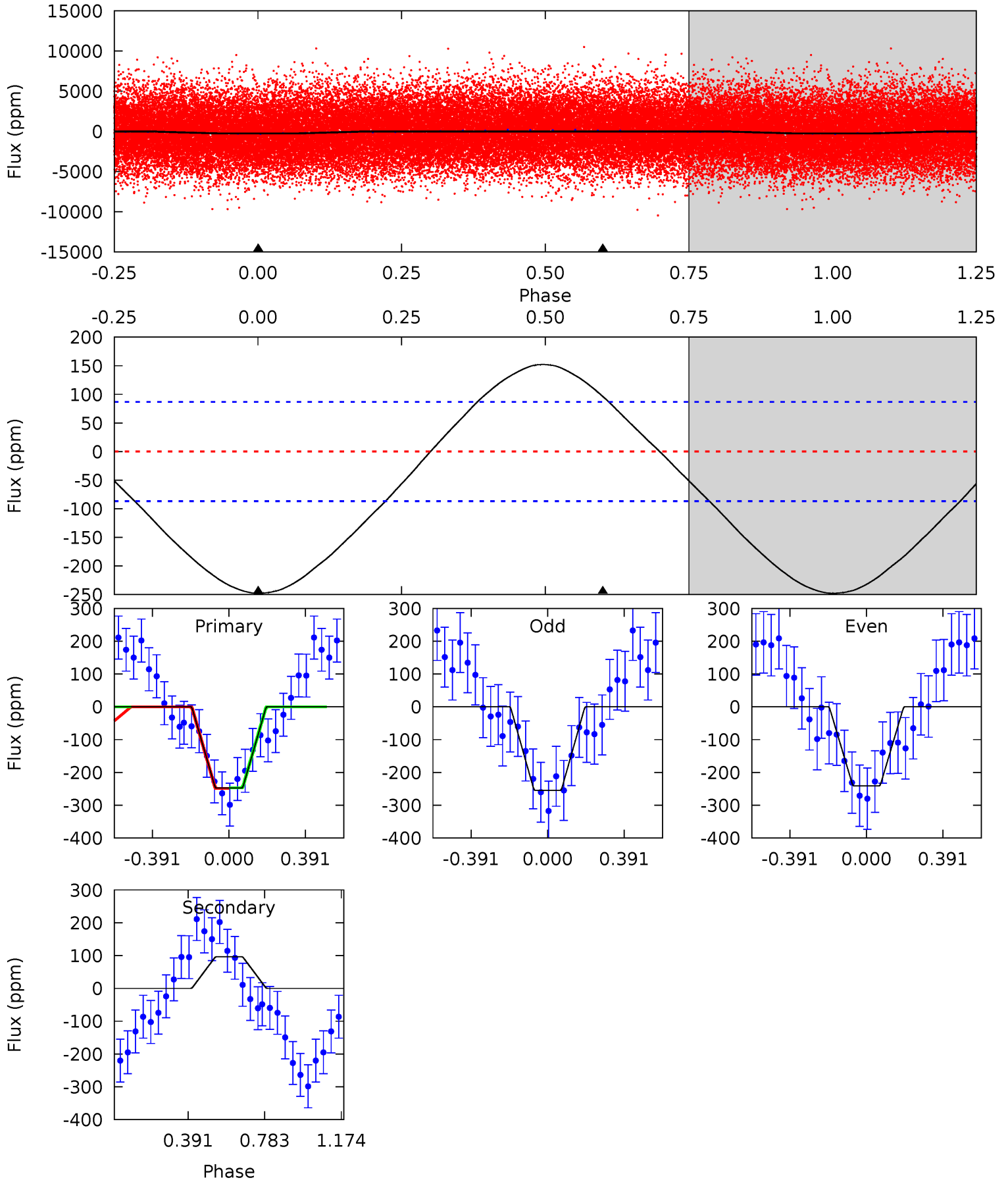
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.7	-10.6	0	0	4.21	0.67	3.75	28.7	28.7	-10.6	-10.6	0.46	1.16	0.36	0.79



# Alt Model-Shift Uniqueness Test

005781774-02, P = 1.807049 Days, E = 130.444096 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
12.2	-4.73	0	0	4.27	0.86	1.61	12.2	12.2	-4.73	-4.73	0.33	0.83	0.38	0.05



### Stellar Parameters For KIC 005781774

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7921^{+221}_{-332}$	$3.757^{+0.392}_{-0.098}$	$-0.120^{+0.200}_{-0.300}$	$3.007^{+0.433}_{-1.300}$	$1.884^{+0.119}_{-0.357}$	$0.098^{+0.329}_{-0.030}$
	+3%/-4%	+10%/-3%	+167%/-250%	+14%/-43%	+6%/-19%	+336%/-31%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 005781774-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$77 \pm 7$	$6.46^{+3.94}_{-3.10}$	$4392^{+277}_{-490}$	$-5226^{+581}_{-1625}$	$-1.284^{+0.785}_{-3.322}$
Alt.	$96 \pm 20$	$5.34^{+3.66}_{-3.03}$	$4350^{+286}_{-451}$	$-5874^{+1005}_{-3397}$	$-2.285^{+1.478}_{-10.072}$

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



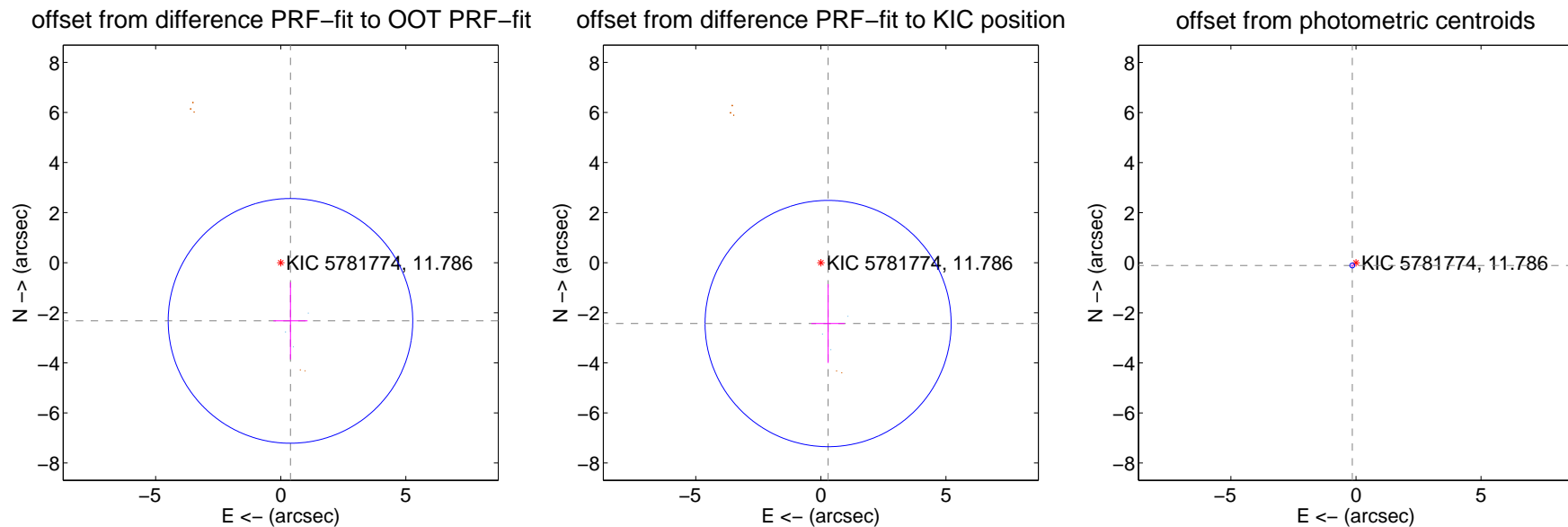
## DV Centroid Data

Supplemental centroid analysis for 005781774-02. **Kepler magnitude: 11.79.** Transit SNR 24.20

**There are 3 quarters with good PRF difference image offsets**

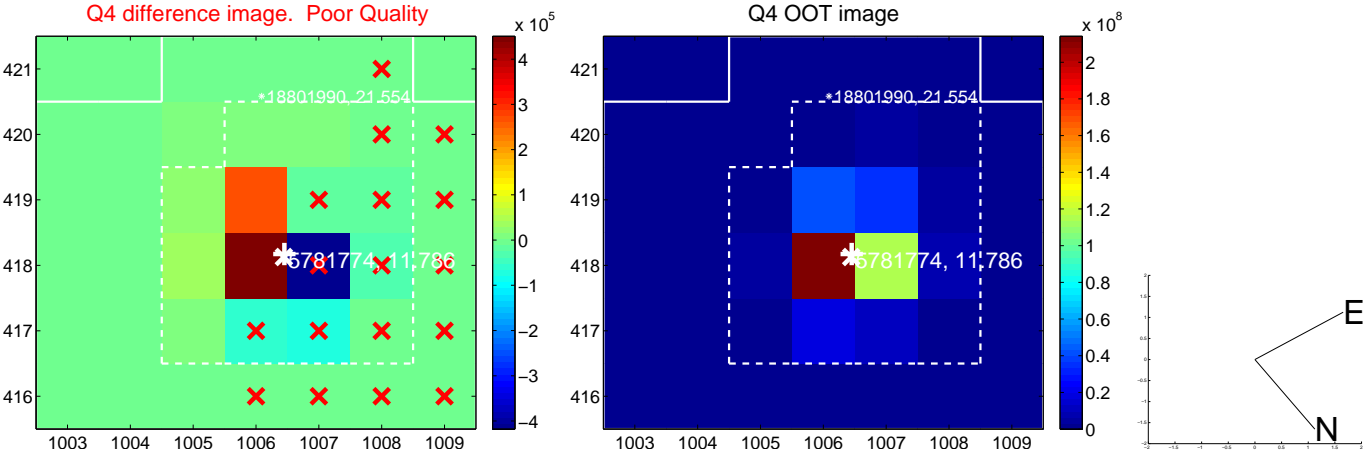
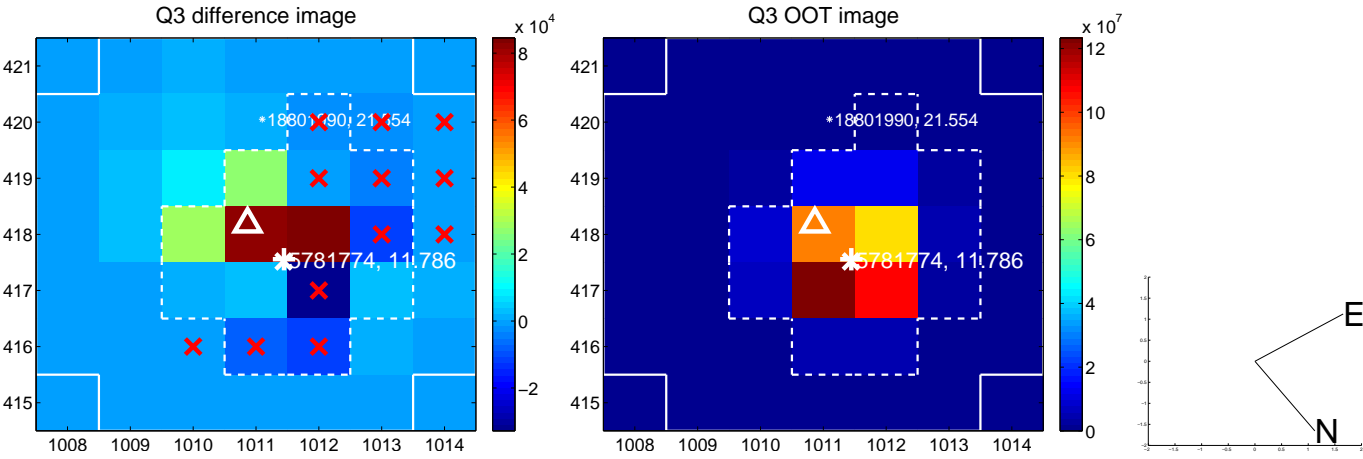
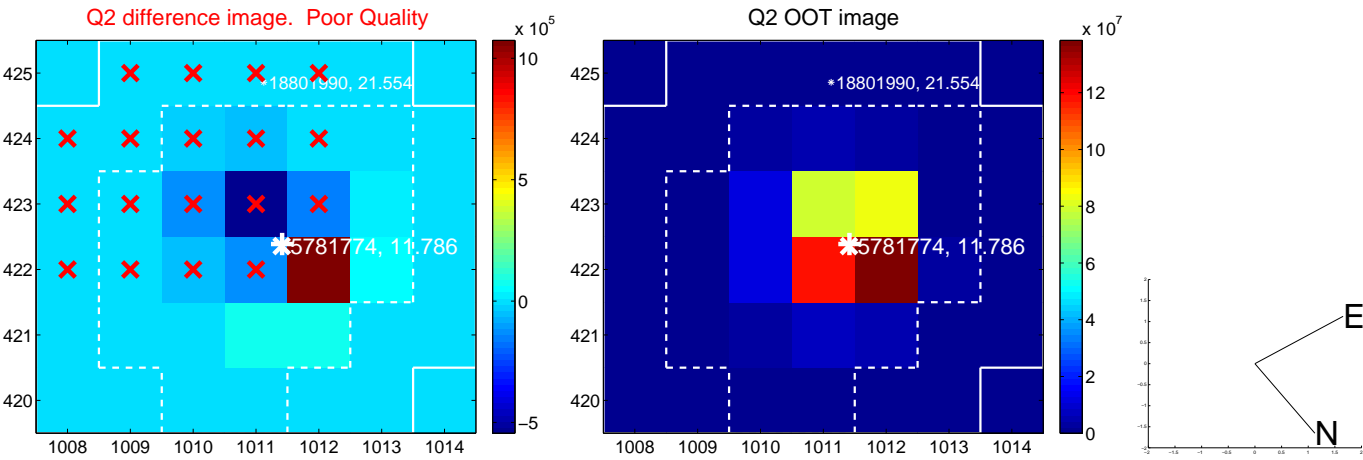
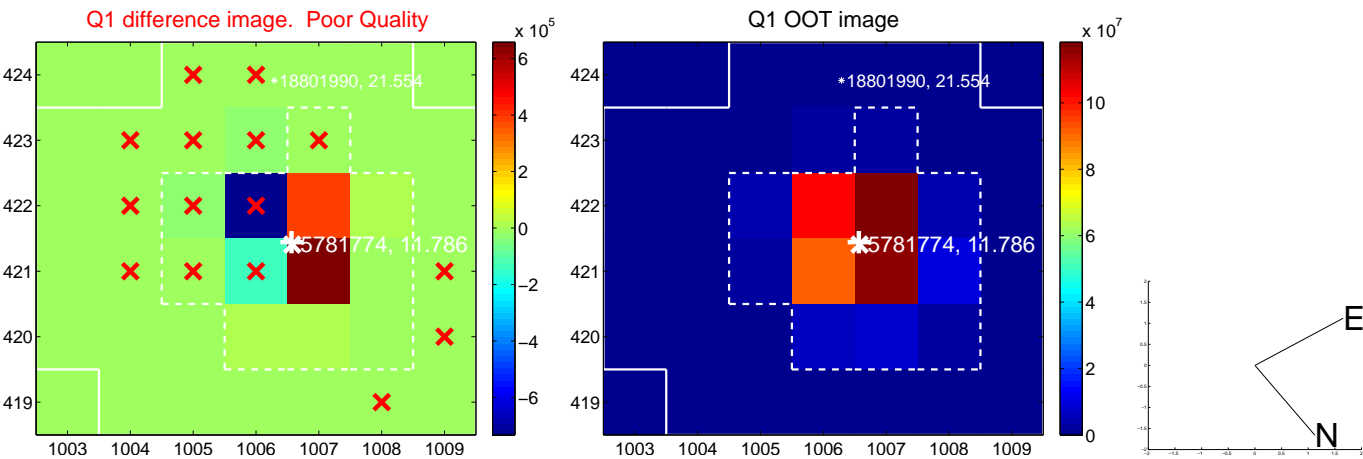
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.356 \pm 1.629$	1.45	$-0.388 \pm 0.684$	$-2.324 \pm 1.540$
PRF-fit source offset from KIC position	$2.448 \pm 1.639$	1.49	$-0.290 \pm 0.669$	$-2.430 \pm 1.573$
photometric centroid source offset	<b><math>0.18 \pm 0.03</math></b>	<b>5.72</b>	$0.15 \pm 0.03$	$-0.11 \pm 0.03$

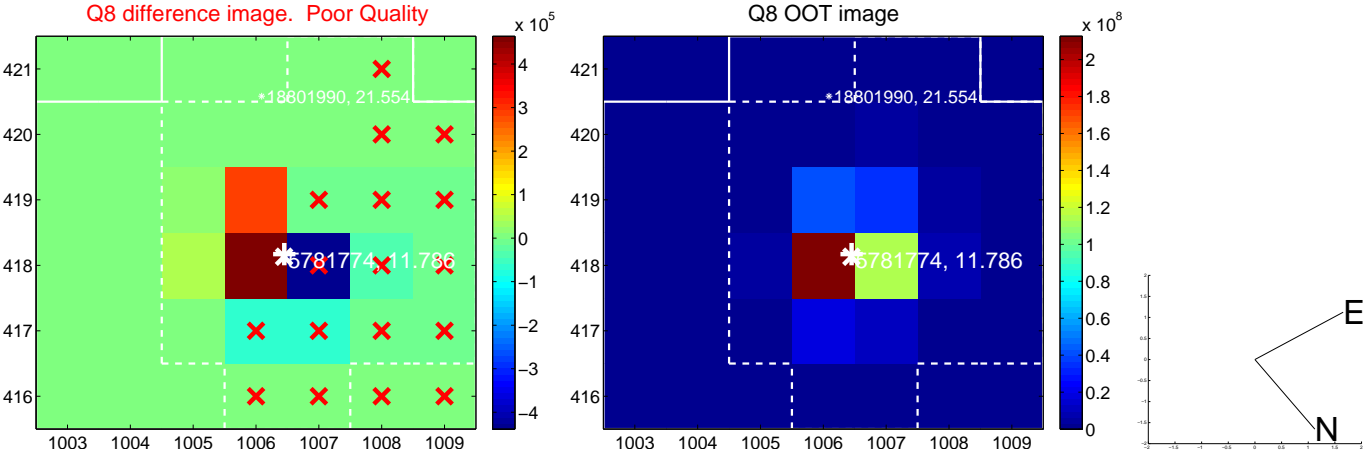
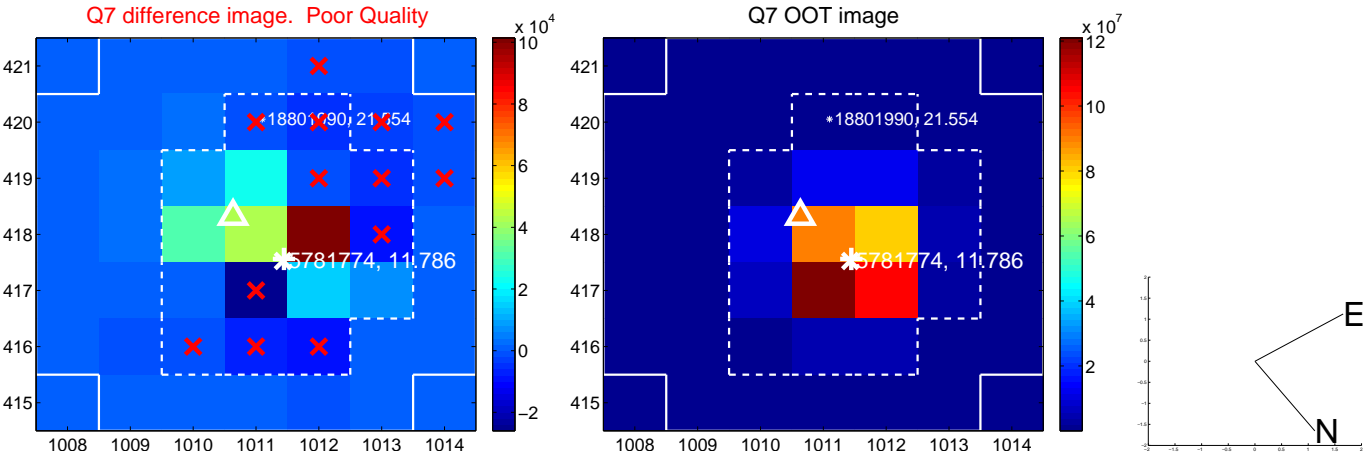
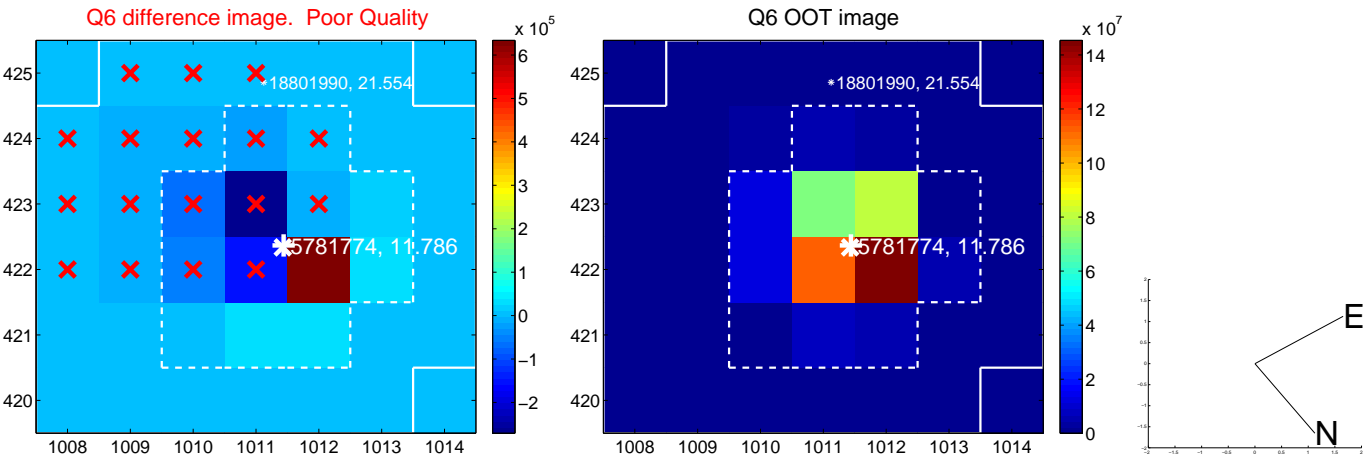
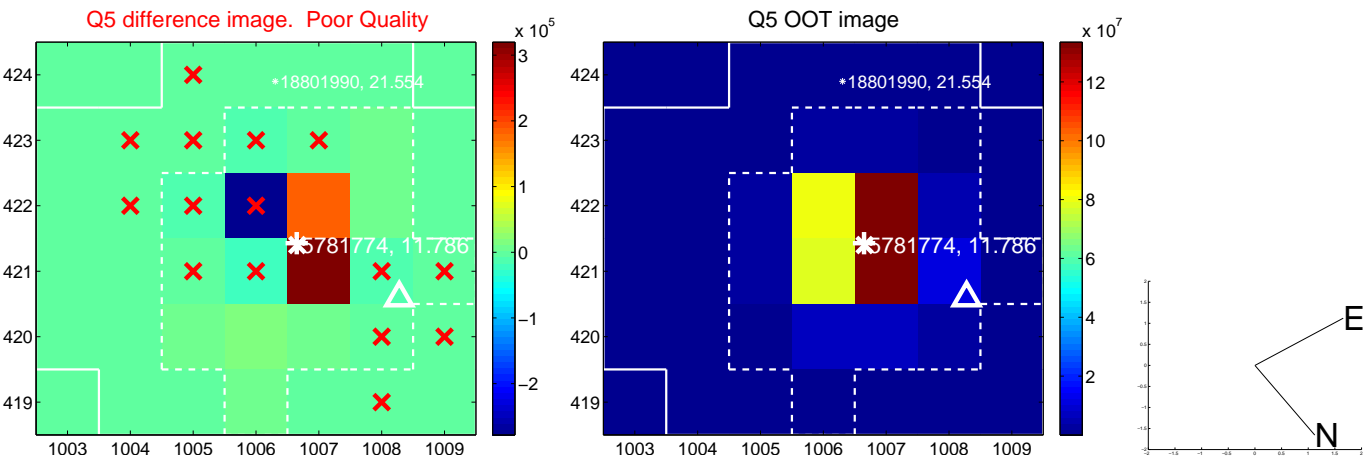


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

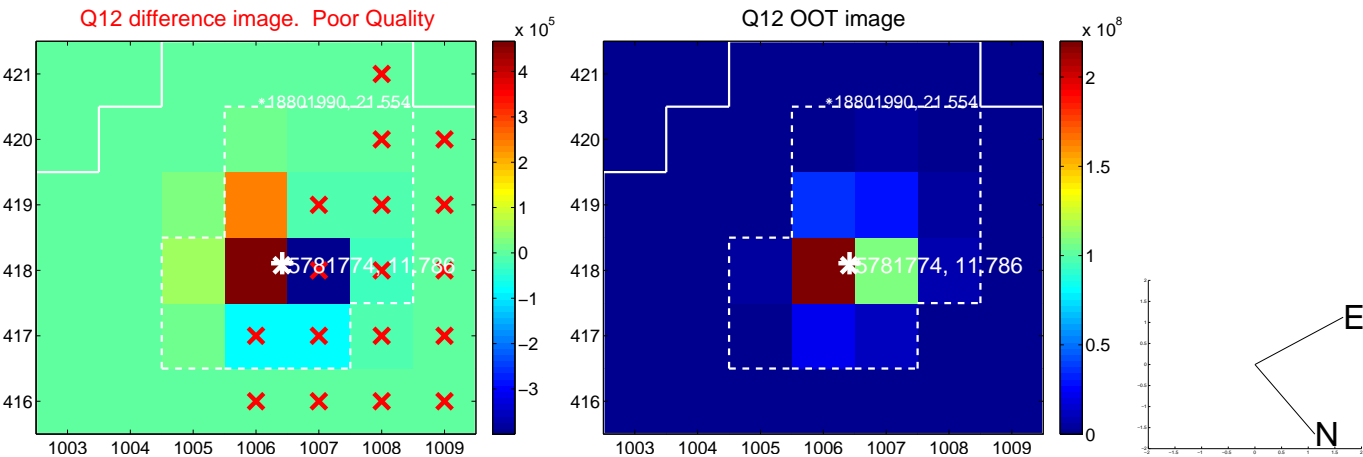
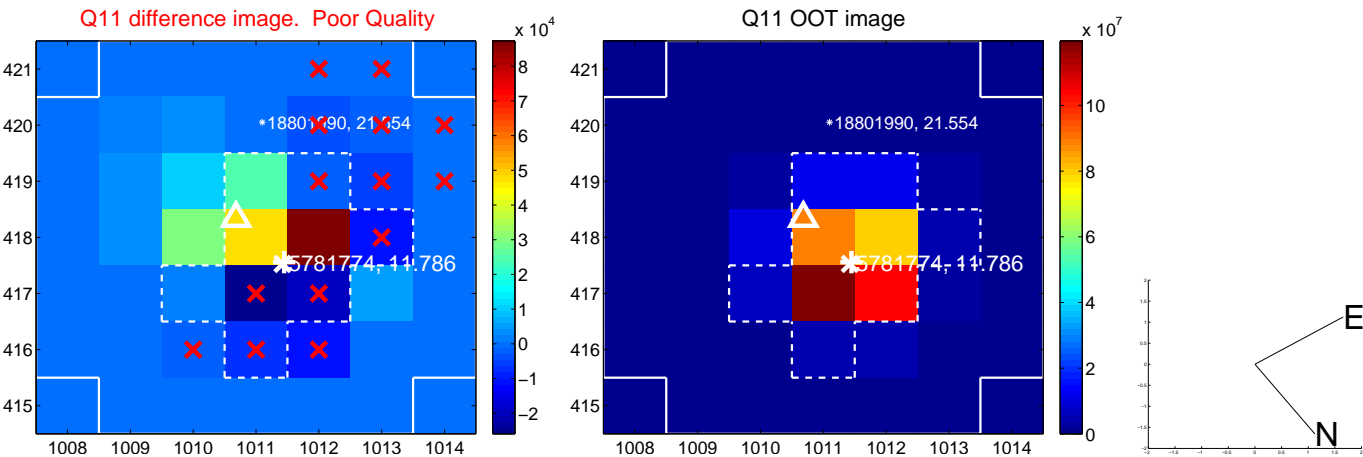
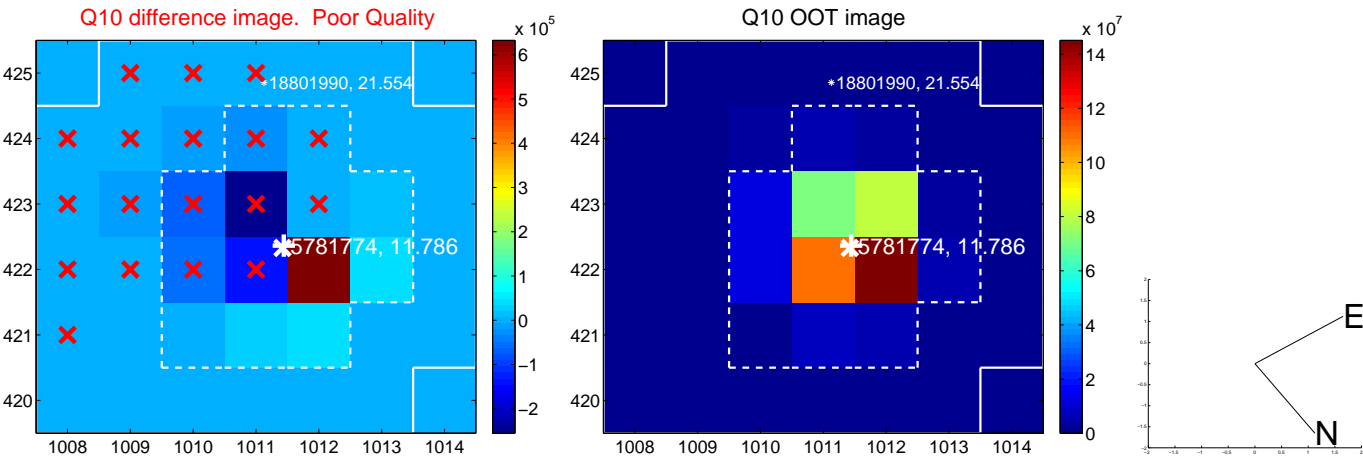
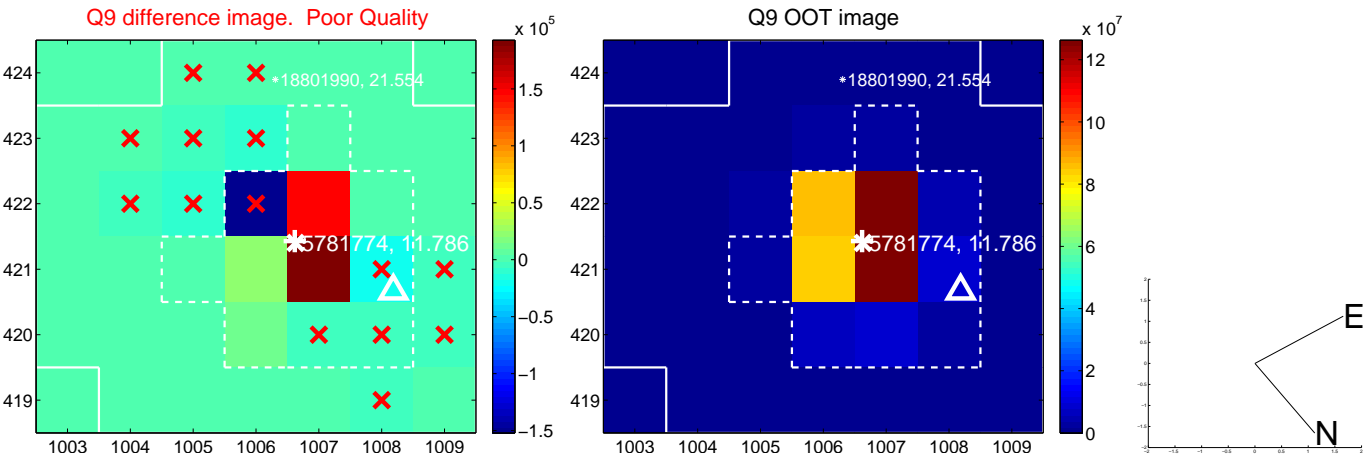
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



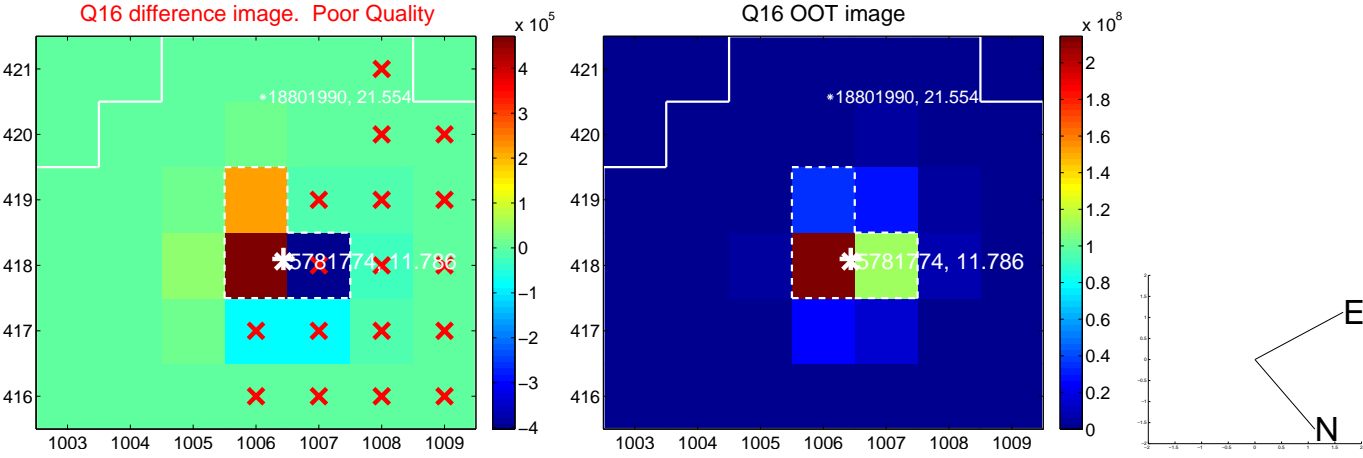
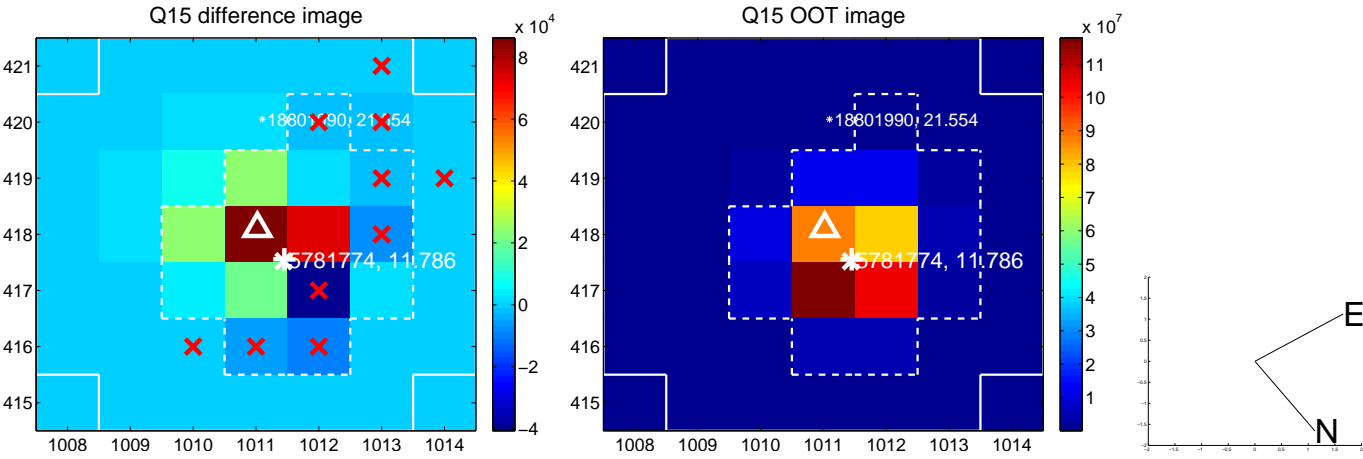
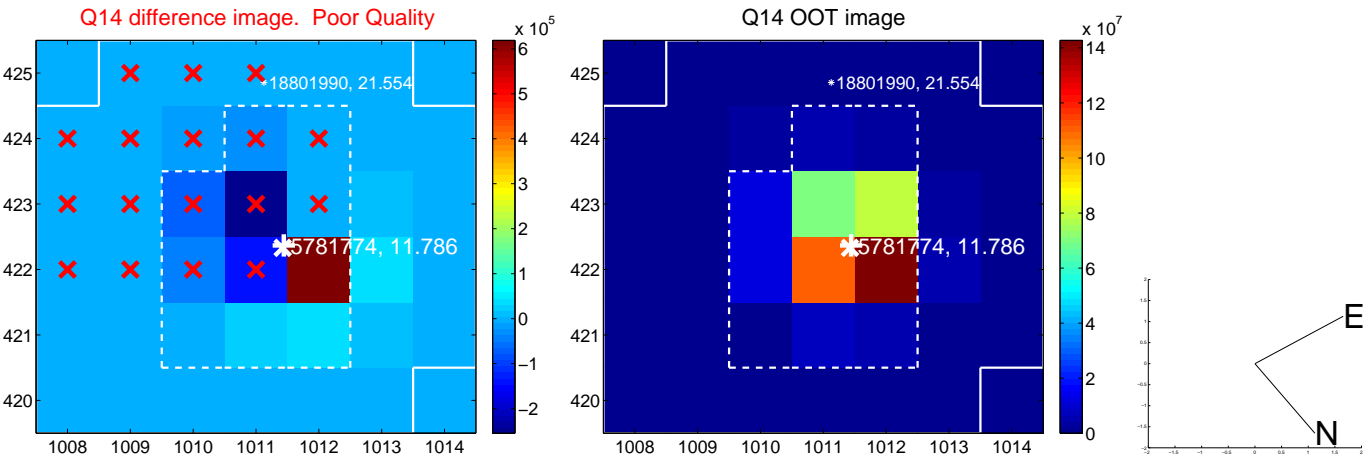
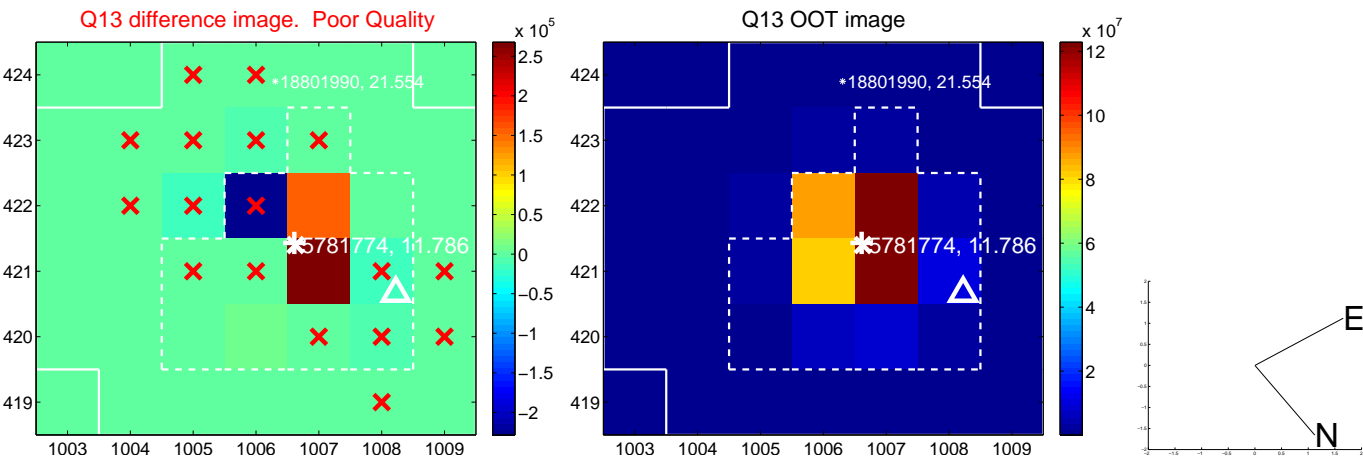
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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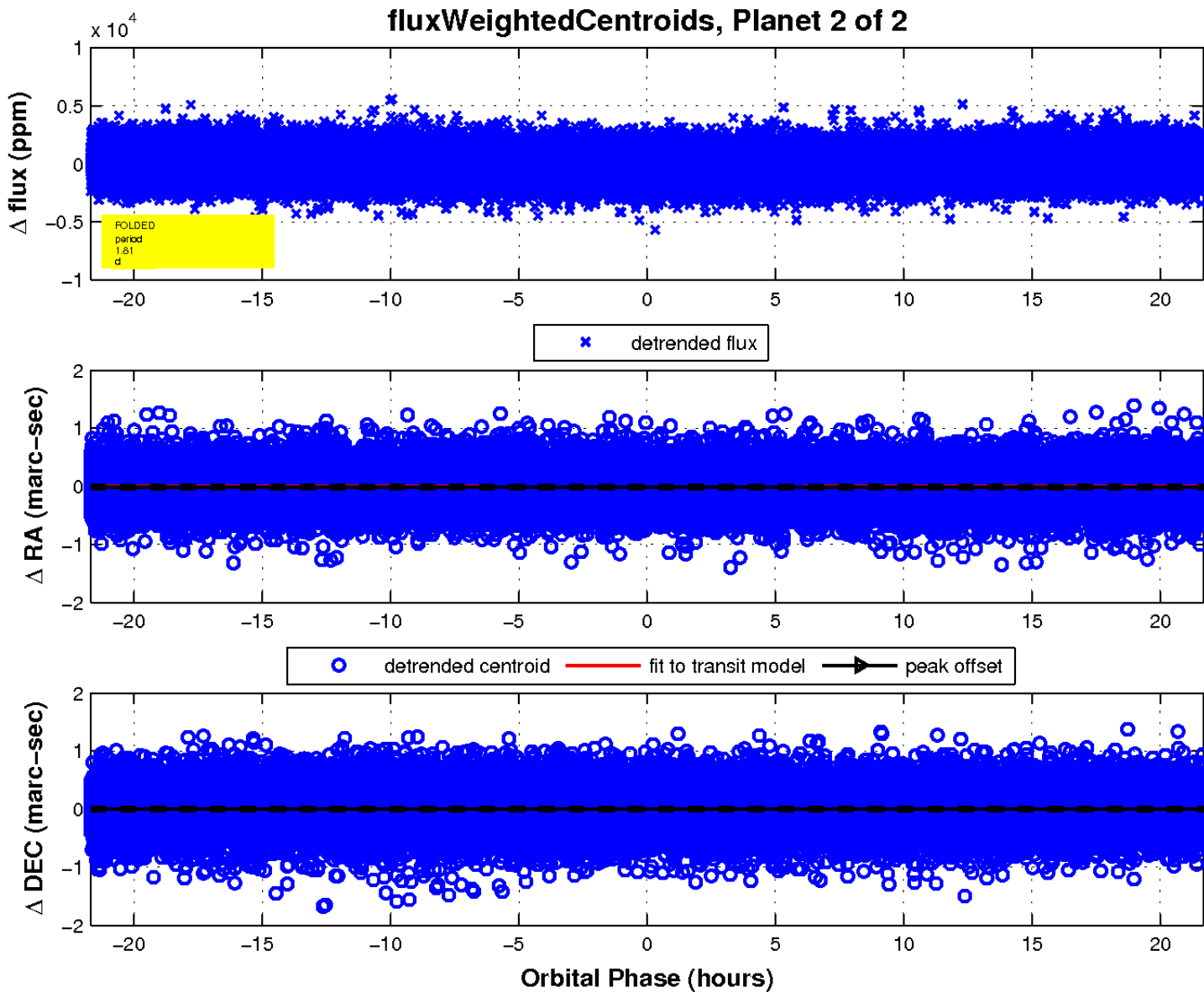
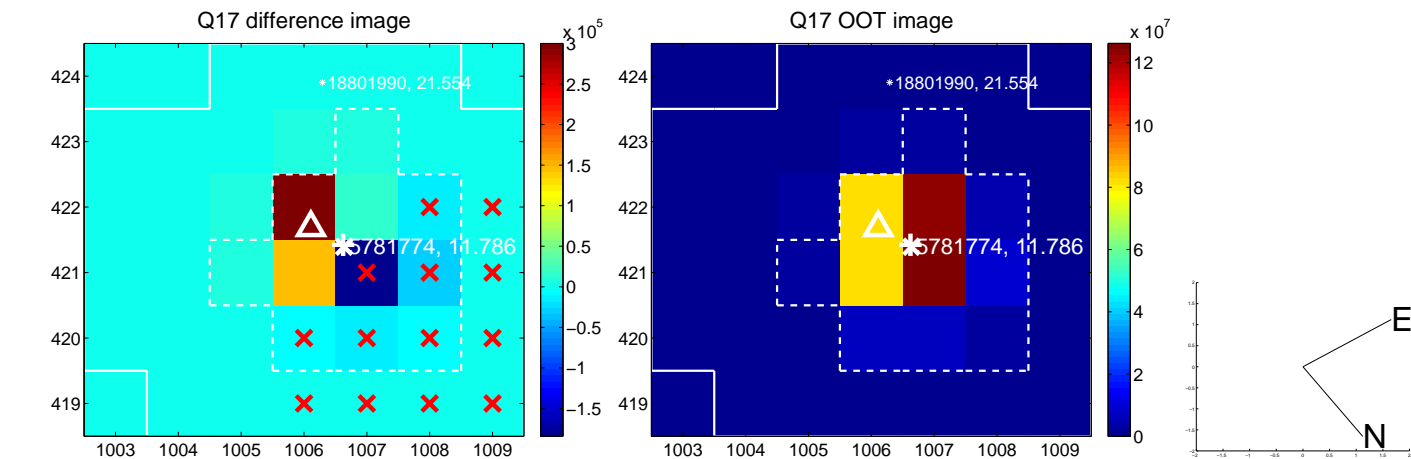


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

