

# KIC 007953880

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007953880-01	OBS	No	0.598747	131.666317	47.9	2.562	10.2	11.6	3.05	7884	2.45	108700.80
007953880-02	OBS	No	2.994637	132.992342	78.9	23.246	10.2	13.0	3.05	7884	3.28	12708.62

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007953880-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007953880-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV

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

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

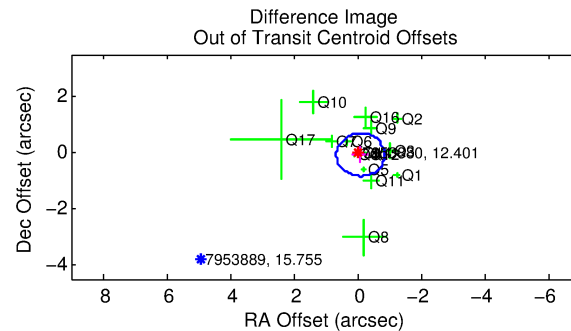
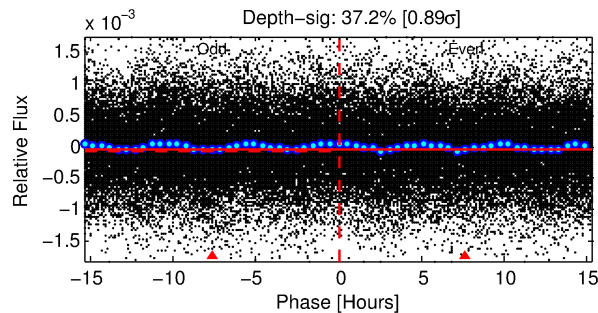
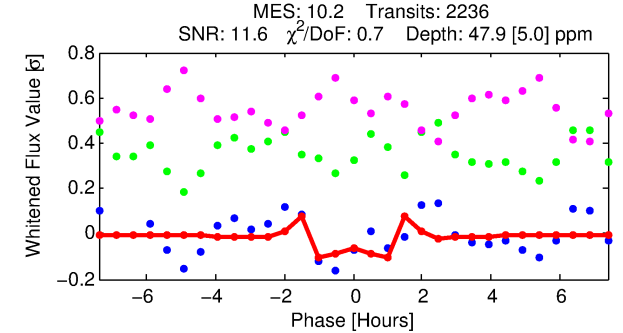
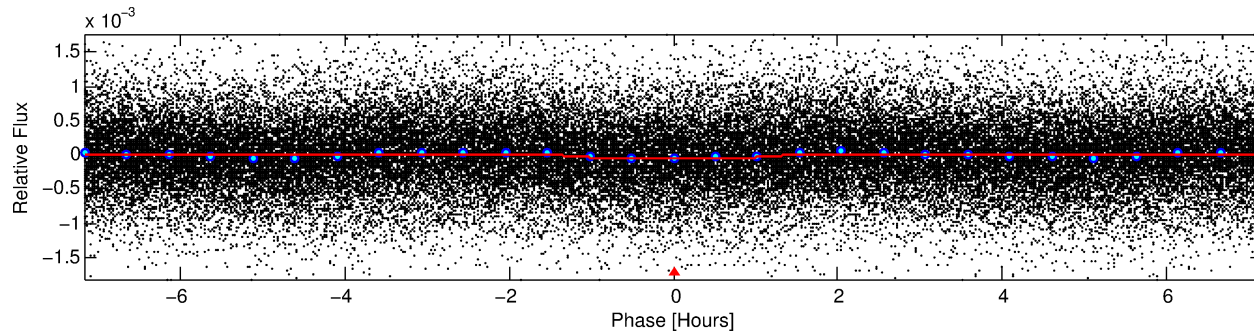
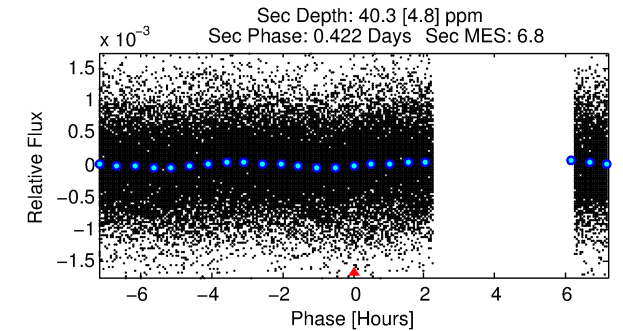
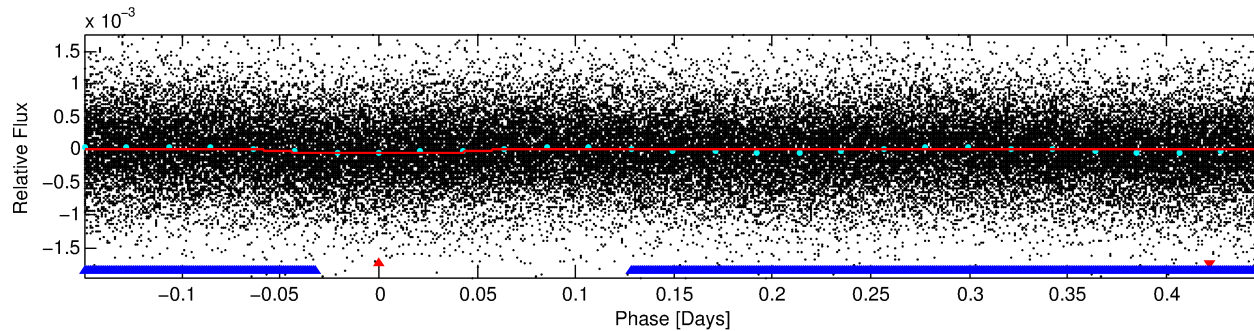
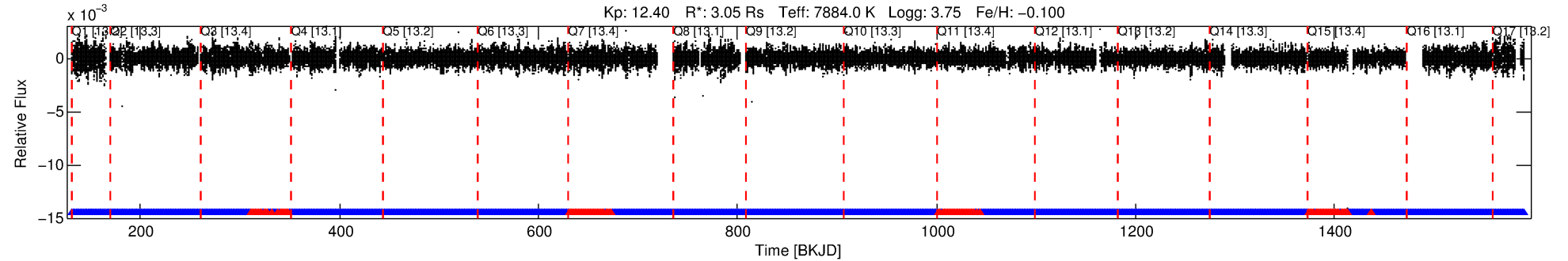
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007953880-01

No Significant Match Found

# DV One-Page Summary

KIC: 7953880 Candidate: 1 of 2 Period: 0.599 d



## DV Fit Results:

Period = 0.59875 [0.00001] d  
Epoch = 131.6663 [0.0010] BKJD  
Rp/R\* = 0.0074 [0.0012]  
a/R\* = 1.24 [0.43]  
b = 0.90 [0.21]  
Seff = 108700.80 [76806.69]  
Teq = 4630 [818] K  
Rp = 2.45 [1.11] Re  
a = 0.0172 [0.0072] AU  
Ag = 1.09 [0.84] [0.11σ]  
Teffp = 7319 [709] K [2.48σ]

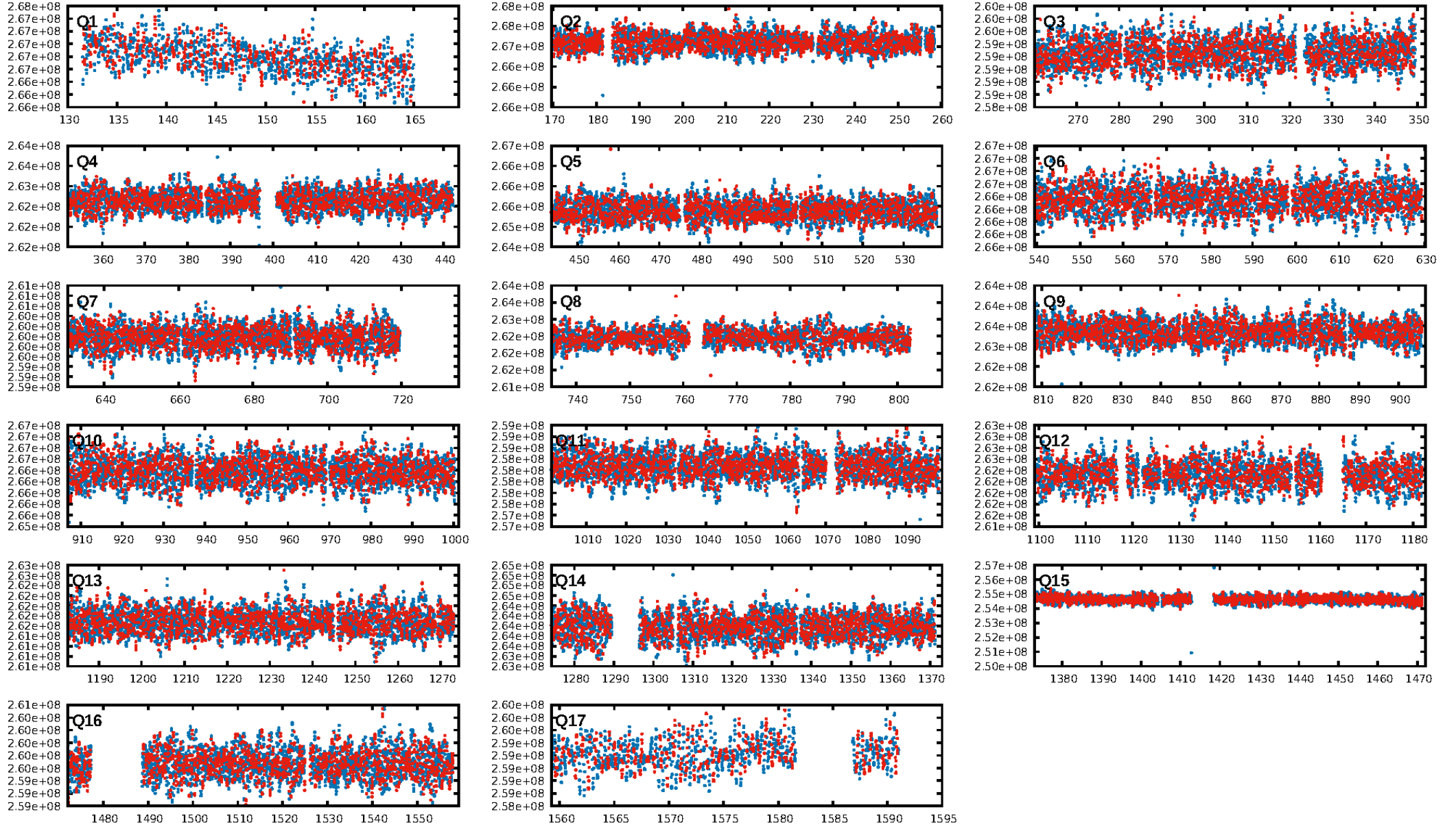
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 98.6% [2.46σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.90 [1928/2136]  
GhostDiagnostic-chr: 2.194  
Centroid-sig: 0.0%  
Centroid-so: 0.620 arcsec [1.95σ]  
OotOffset-rm: 0.123 arcsec [0.48σ]  
KicOffset-rm: 0.051 arcsec [0.19σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.81 [13/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:02:56 Z

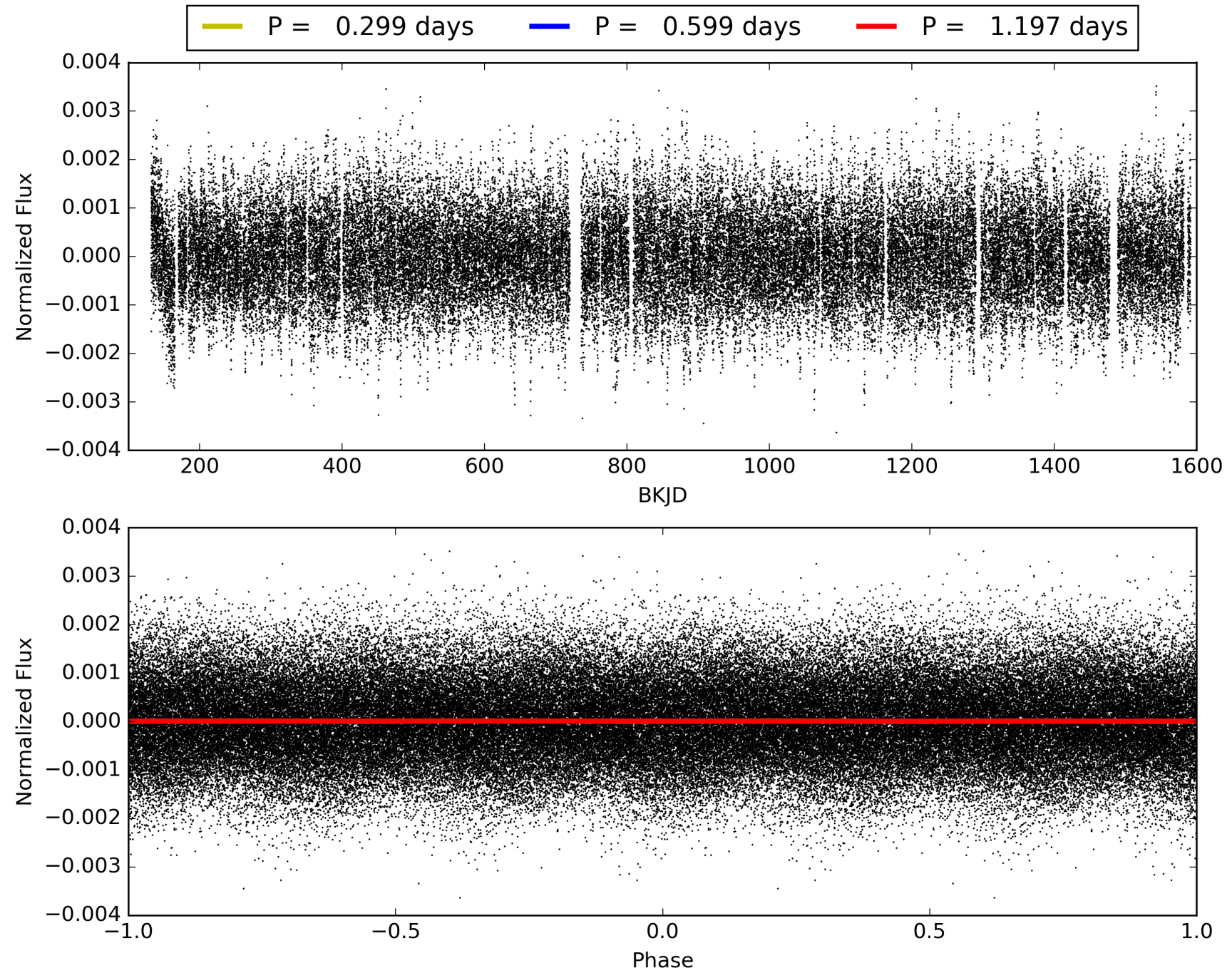
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007953880-01, PDC Light Curves



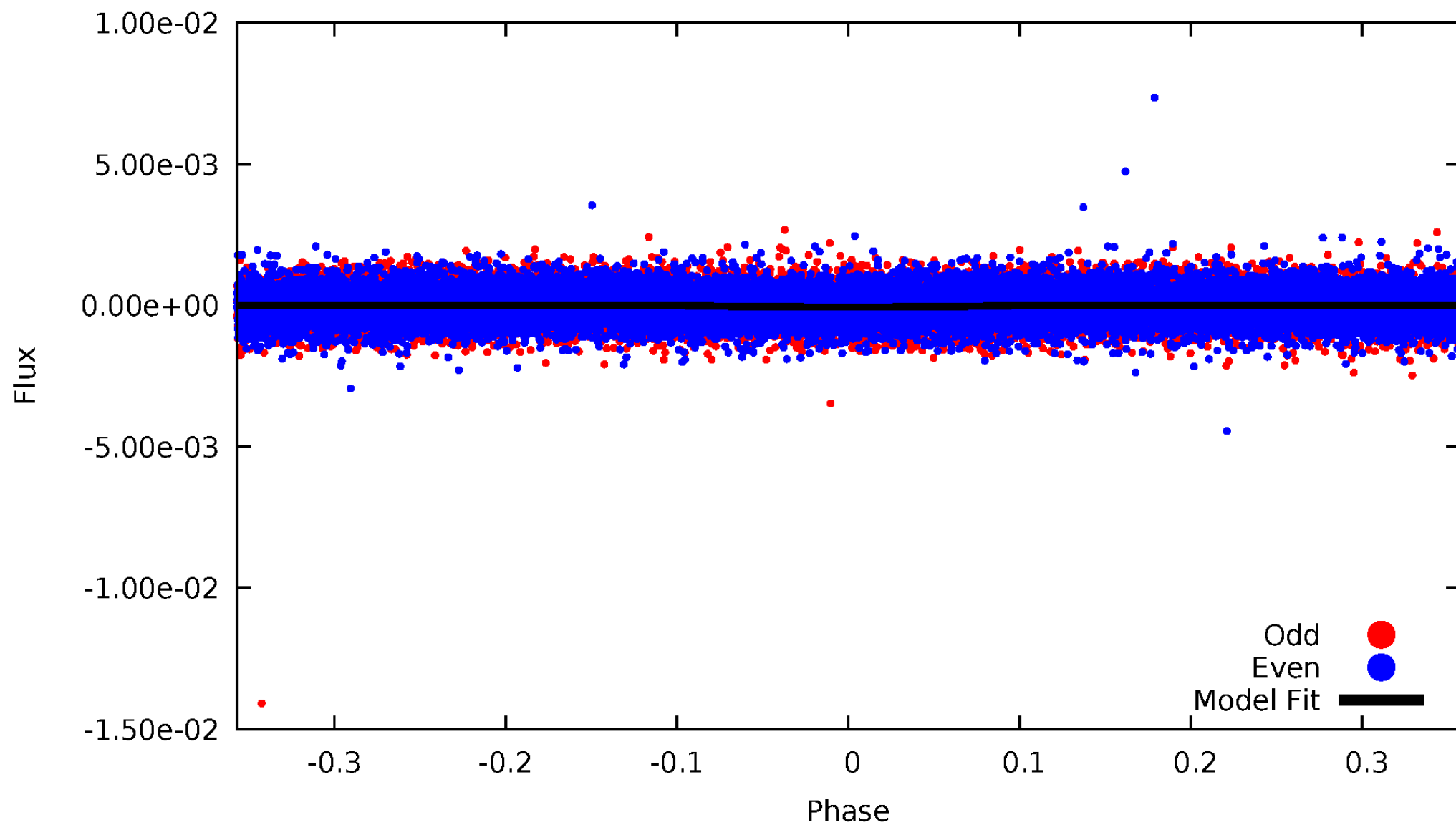


TCE 007953880-01



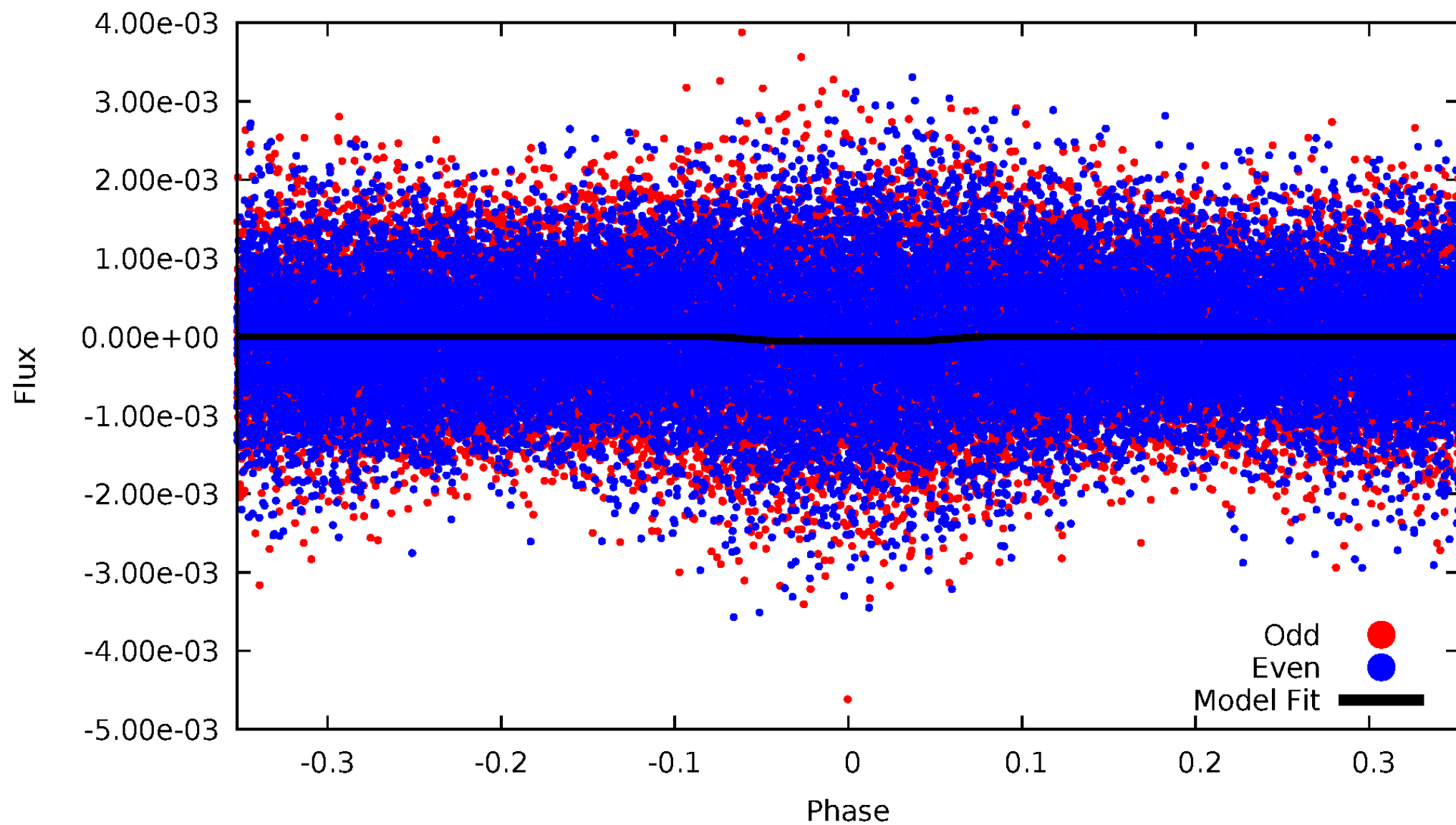
# DV Odd/Even

TCE 007953880-01



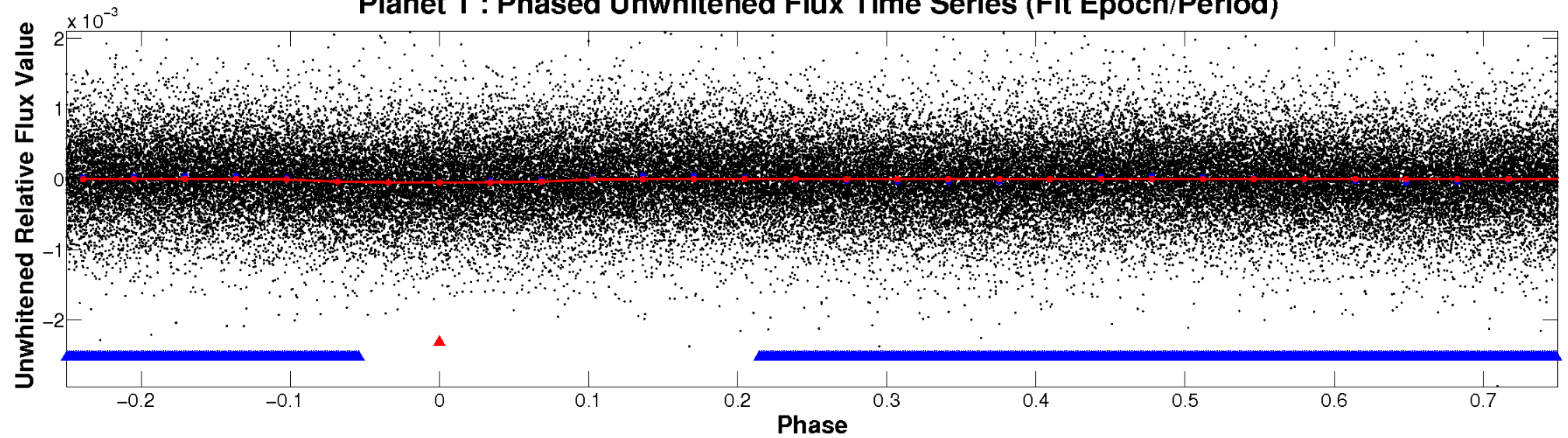
# ALT Odd/Even

TCE 007953880-01

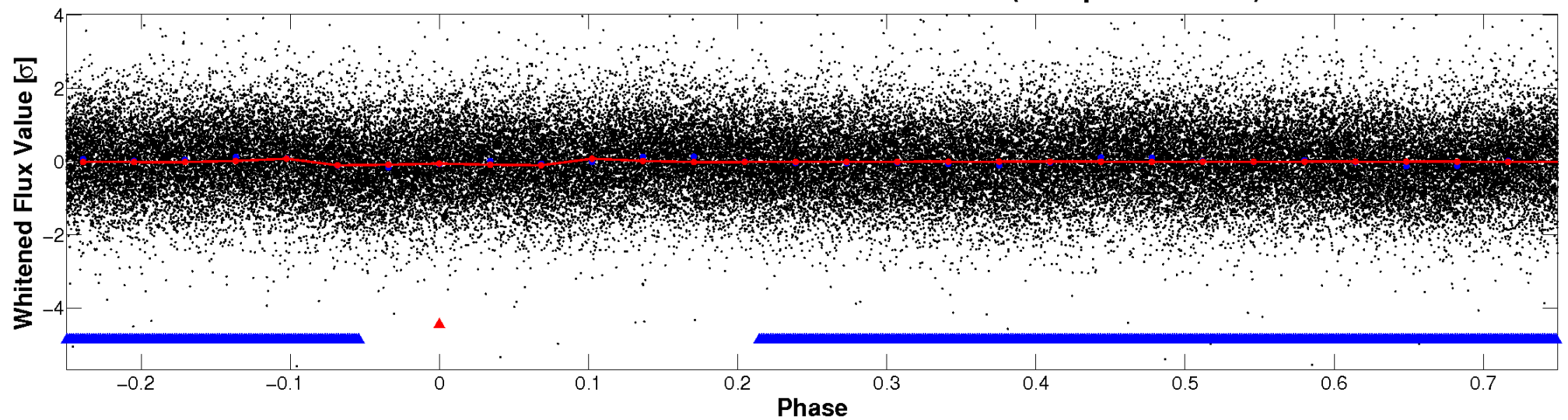


# Non-Whitened Vs. Whitened Light Curve

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



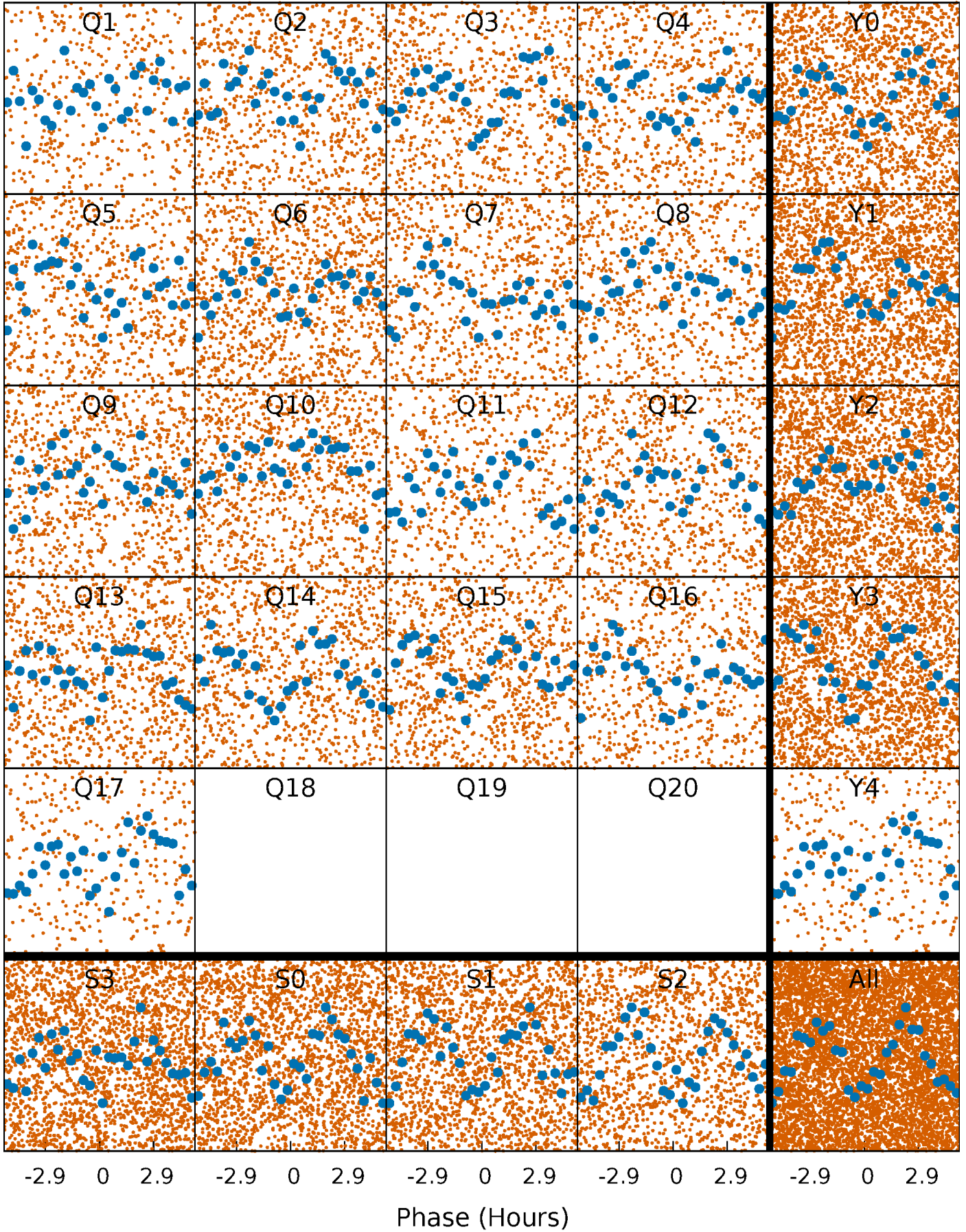
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

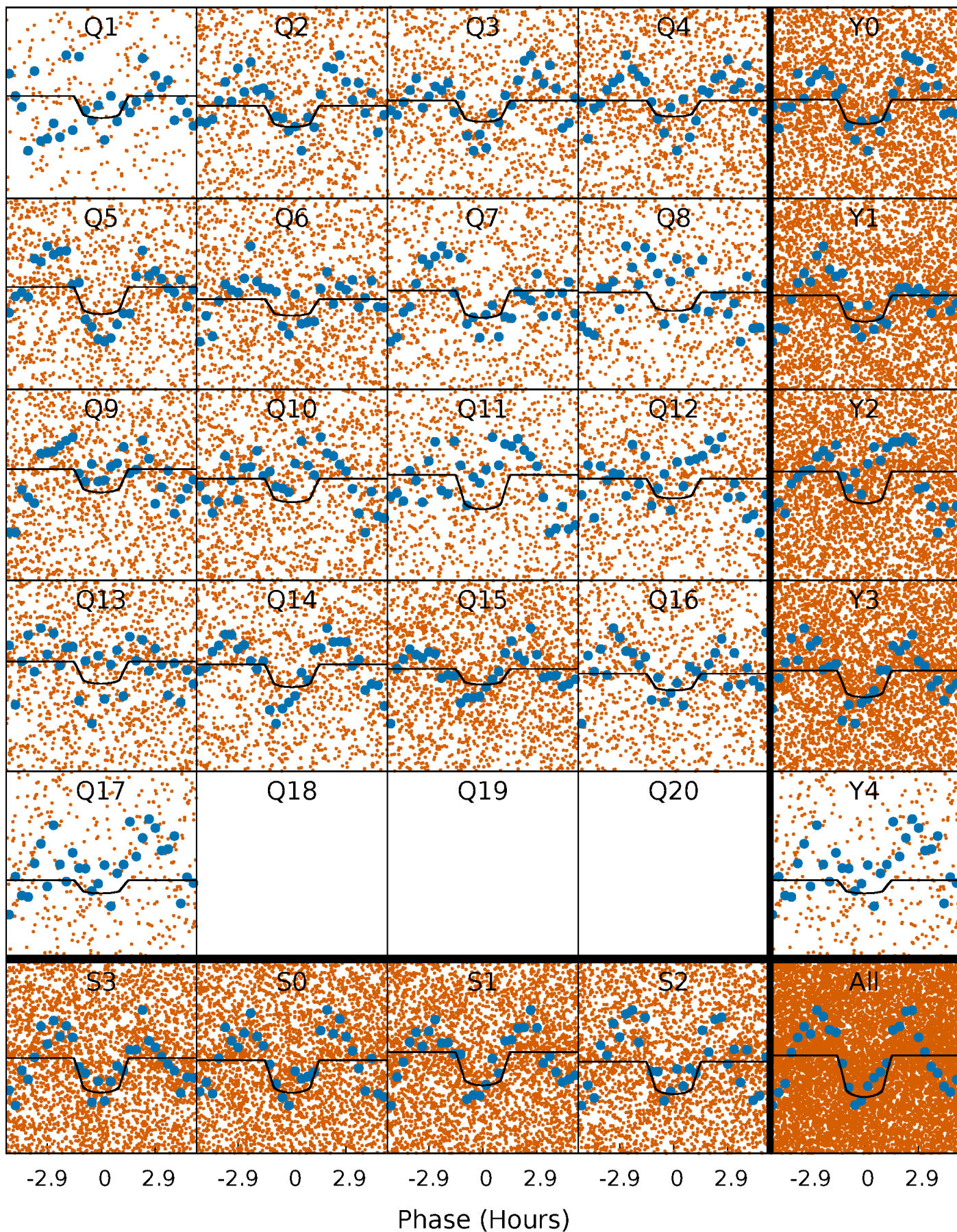
TCE 007953880-01 P= 0.598747 Days  $T_0=131.666317$  (BKJD)





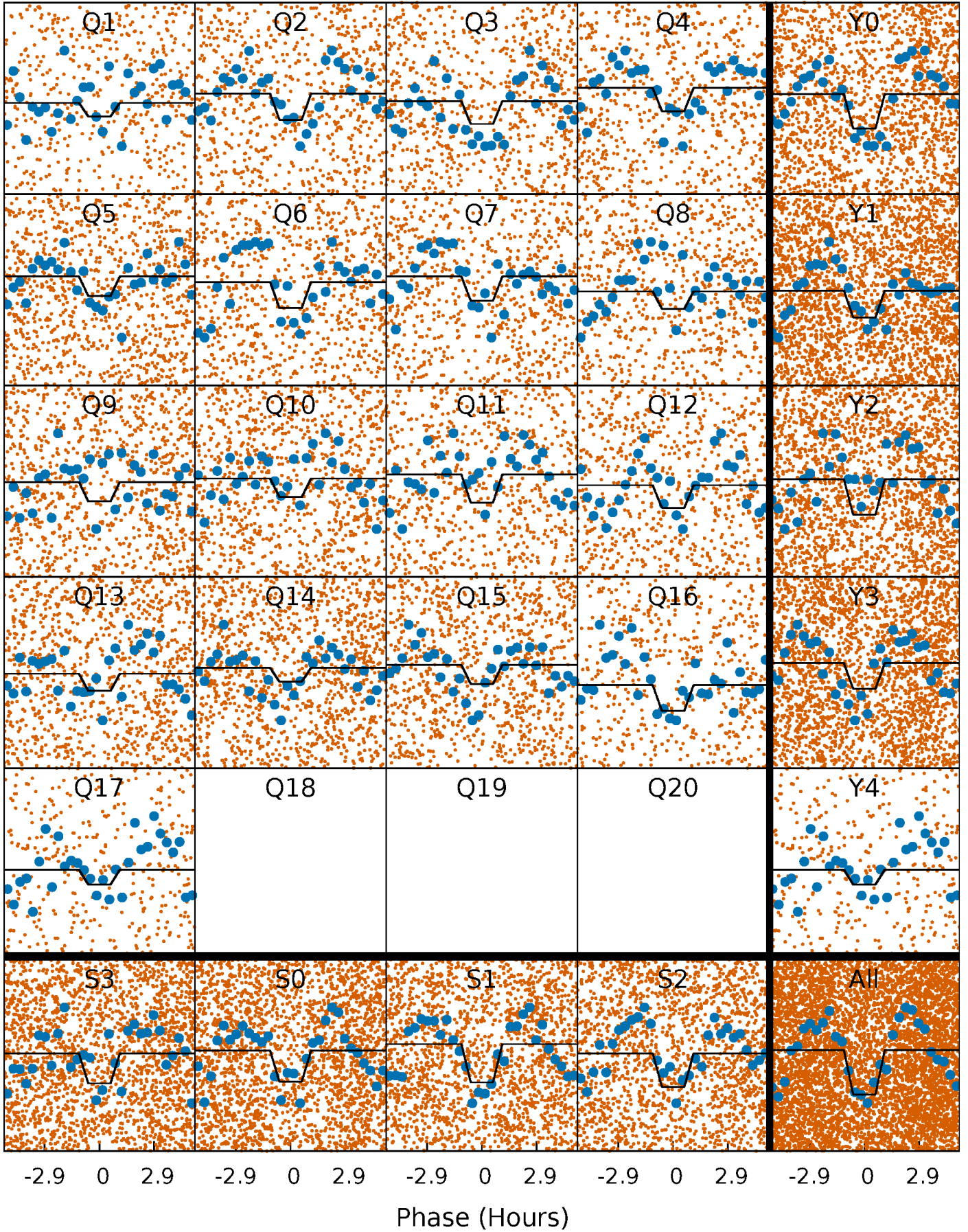
# DV Quarter-Phased Transit Curves

TCE 007953880-01 P= 0.598747 Days  $T_0=131.666317$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007953880-01 P= 0.598742 Days  $T_0=131.665618$  (BKJD)

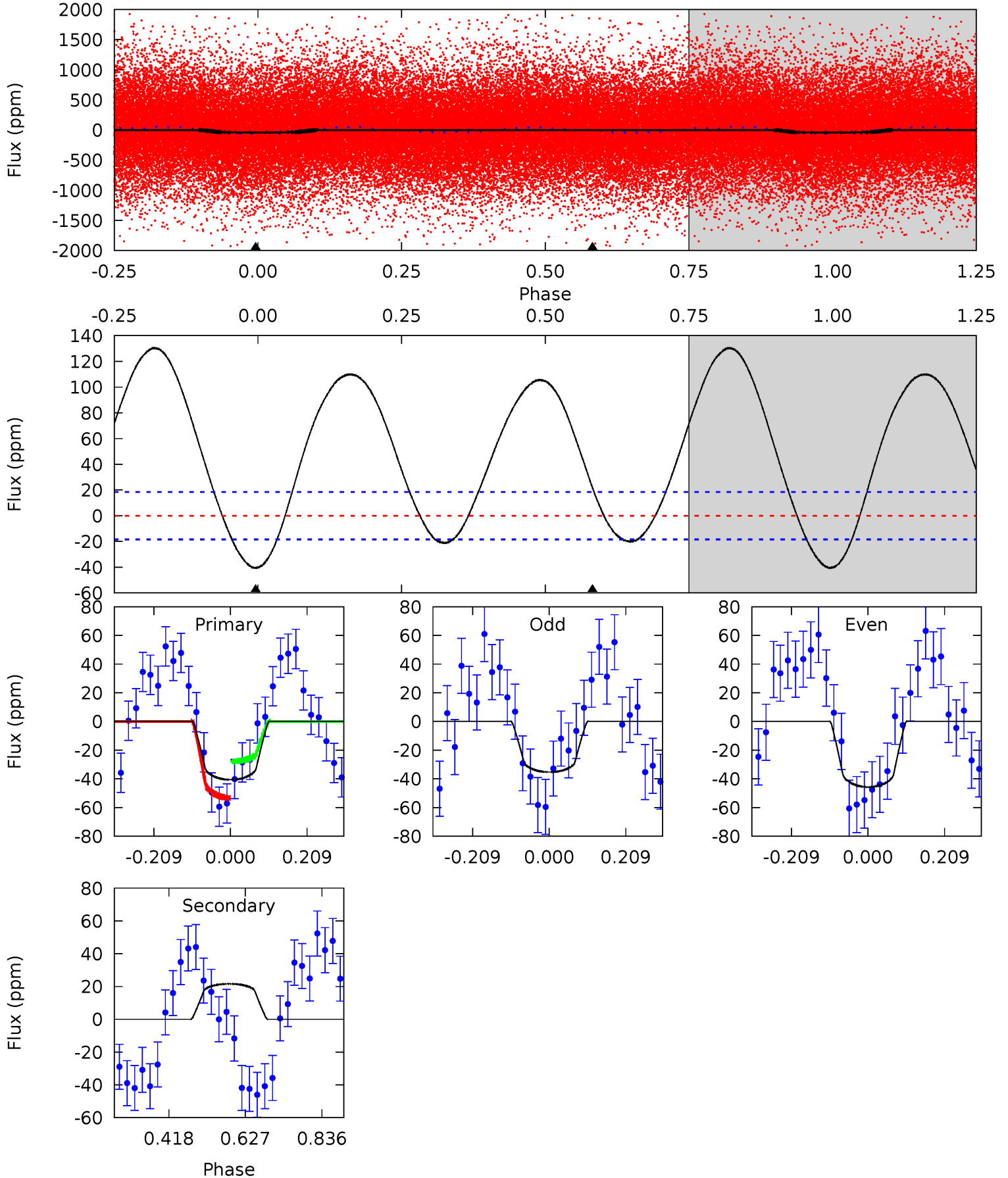




# DV Model-Shift Uniqueness Test

007953880-01, P = 0.598747 Days, E = 131.067570 Days

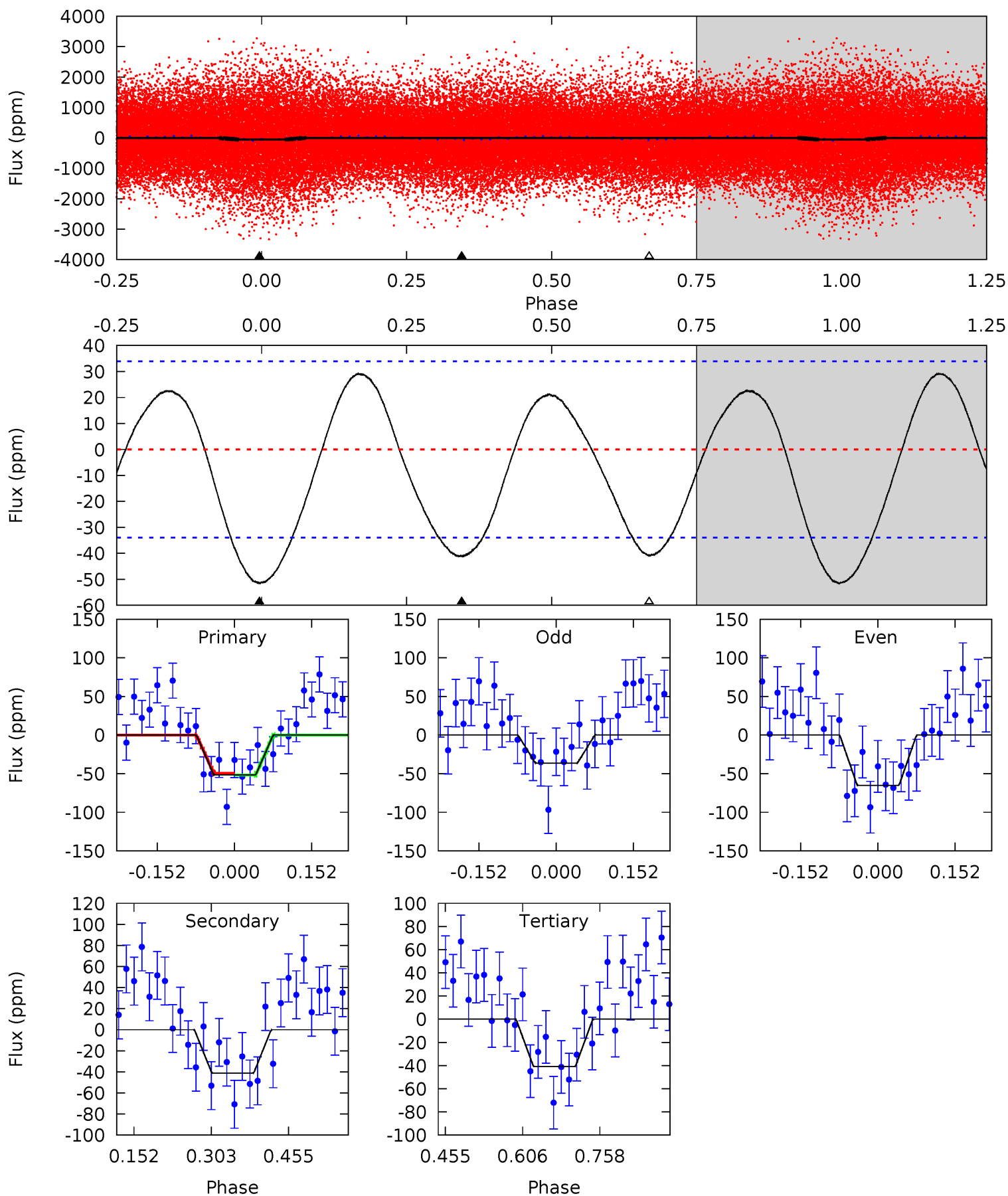
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.72	-5.17	0	0	4.41	1.26	8.20	9.72	9.72	-5.17	-5.17	1.25	1.04	0.76	2.94



# Alt Model-Shift Uniqueness Test

007953880-01, P = 0.598742 Days, E = 131.066876 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
6.81	5.44	5.40	0	4.48	1.43	3.09	1.41	6.81	0.04	5.44	1.79	2.16	0.36	0.14





### Stellar Parameters For KIC 007953880

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7884^{+218}_{-327}$	$3.747^{+0.408}_{-0.096}$	$-0.100^{+0.200}_{-0.300}$	$3.048^{+0.430}_{-1.289}$	$1.891^{+0.096}_{-0.383}$	$0.094^{+0.306}_{-0.029}$
	+3%/-4%	+11%/-3%	+200%/-300%	+14%/-42%	+5%/-20%	+325%/-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 007953880-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$22 \pm 4$	$2.25^{+0.58}_{-0.54}$	$6301^{+434}_{-703}$	$-6698^{+499}_{-623}$	$-0.680^{+0.252}_{-0.473}$
Alt.	$-41 \pm 8$	$2.35^{+0.58}_{-0.55}$	$6351^{+424}_{-681}$	$6486^{+1031}_{-850}$	$1.153^{+0.831}_{-0.421}$

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

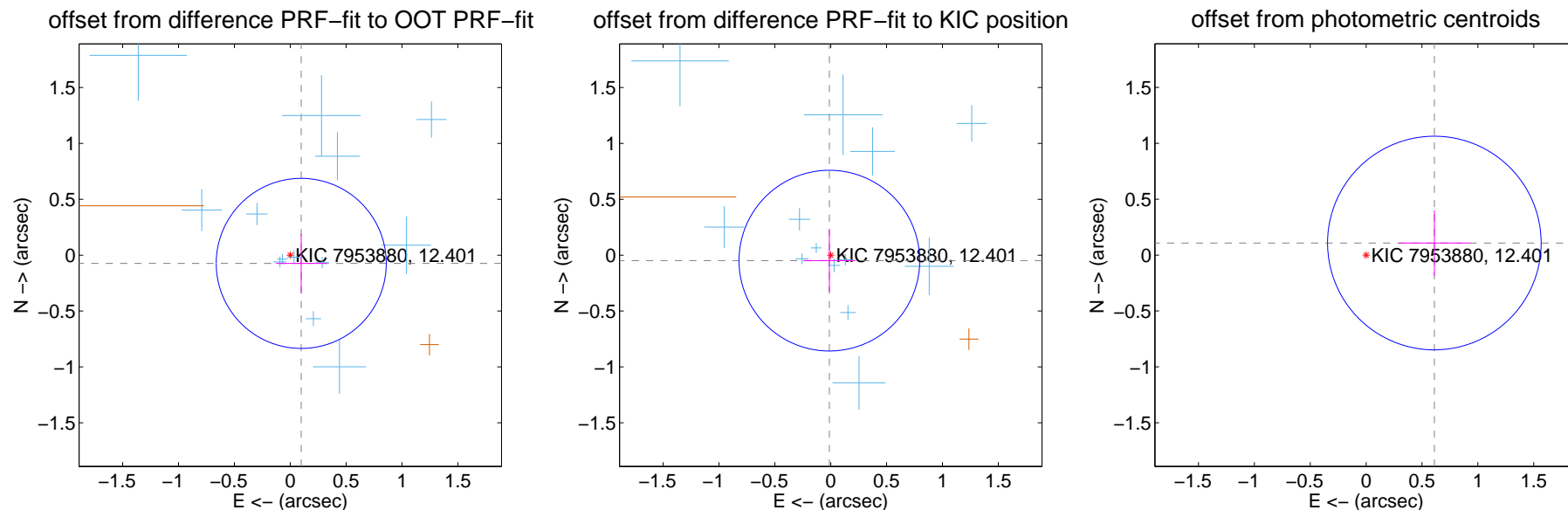
## DV Centroid Data

Supplemental centroid analysis for 007953880-01. Kepler magnitude: 12.40. Transit SNR 11.64

There are 13 quarters with good PRF difference image offsets

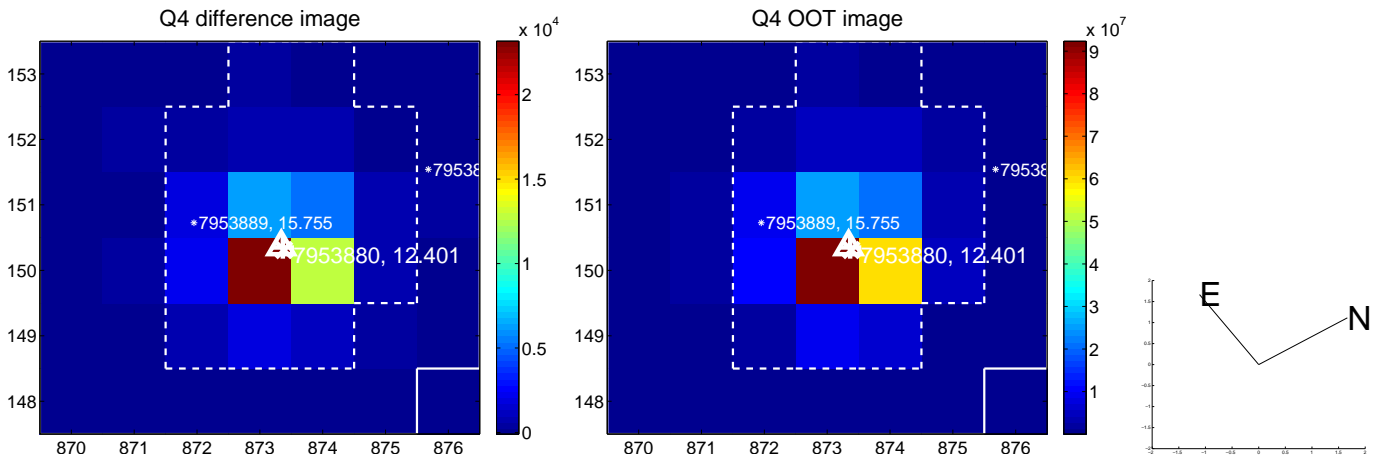
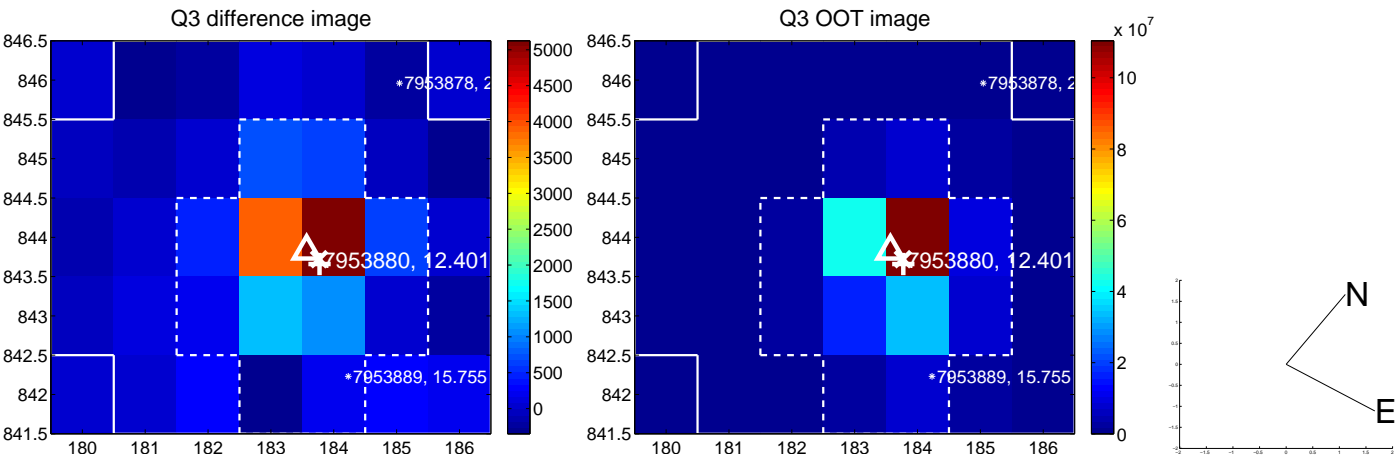
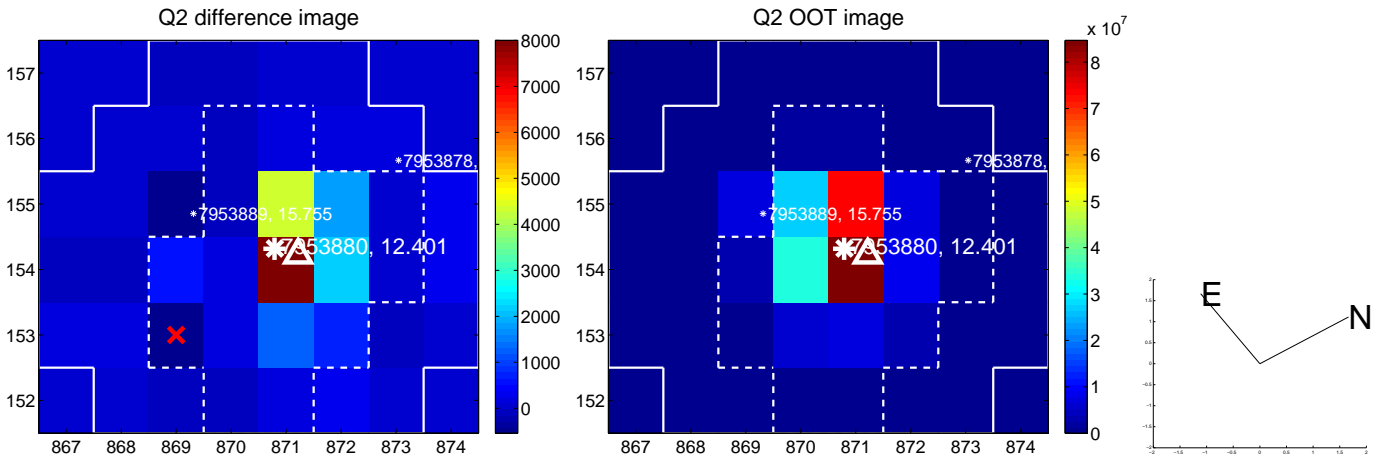
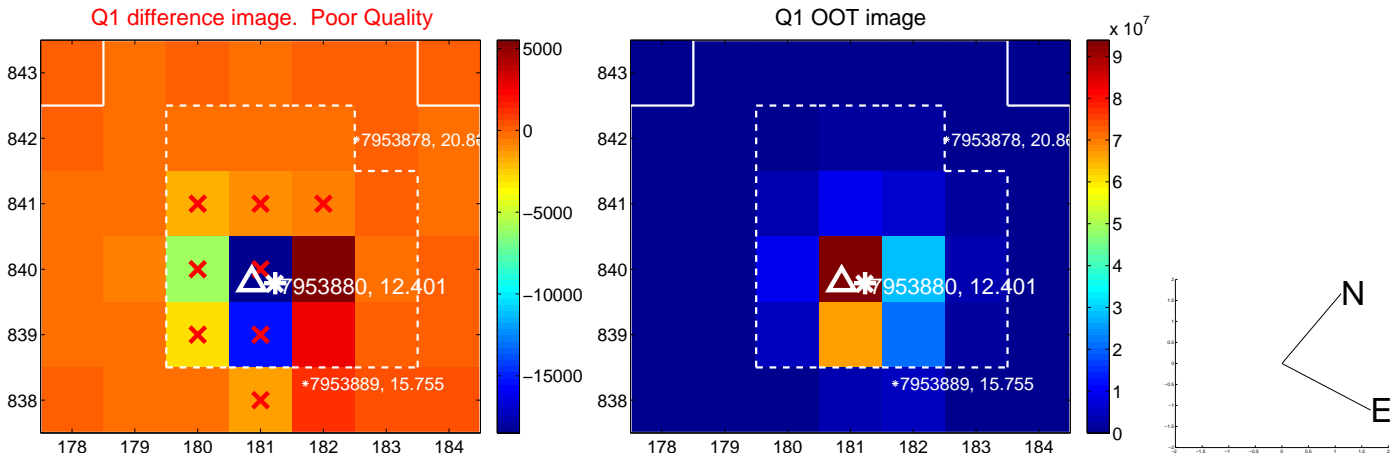
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.123 \pm 0.254$	0.48	$-0.098 \pm 0.226$	$-0.074 \pm 0.266$
PRF-fit source offset from KIC position	$0.051 \pm 0.270$	0.19	$0.012 \pm 0.233$	$-0.049 \pm 0.279$
photometric centroid source offset	$0.62 \pm 0.32$	1.95	$-0.61 \pm 0.32$	$0.11 \pm 0.29$

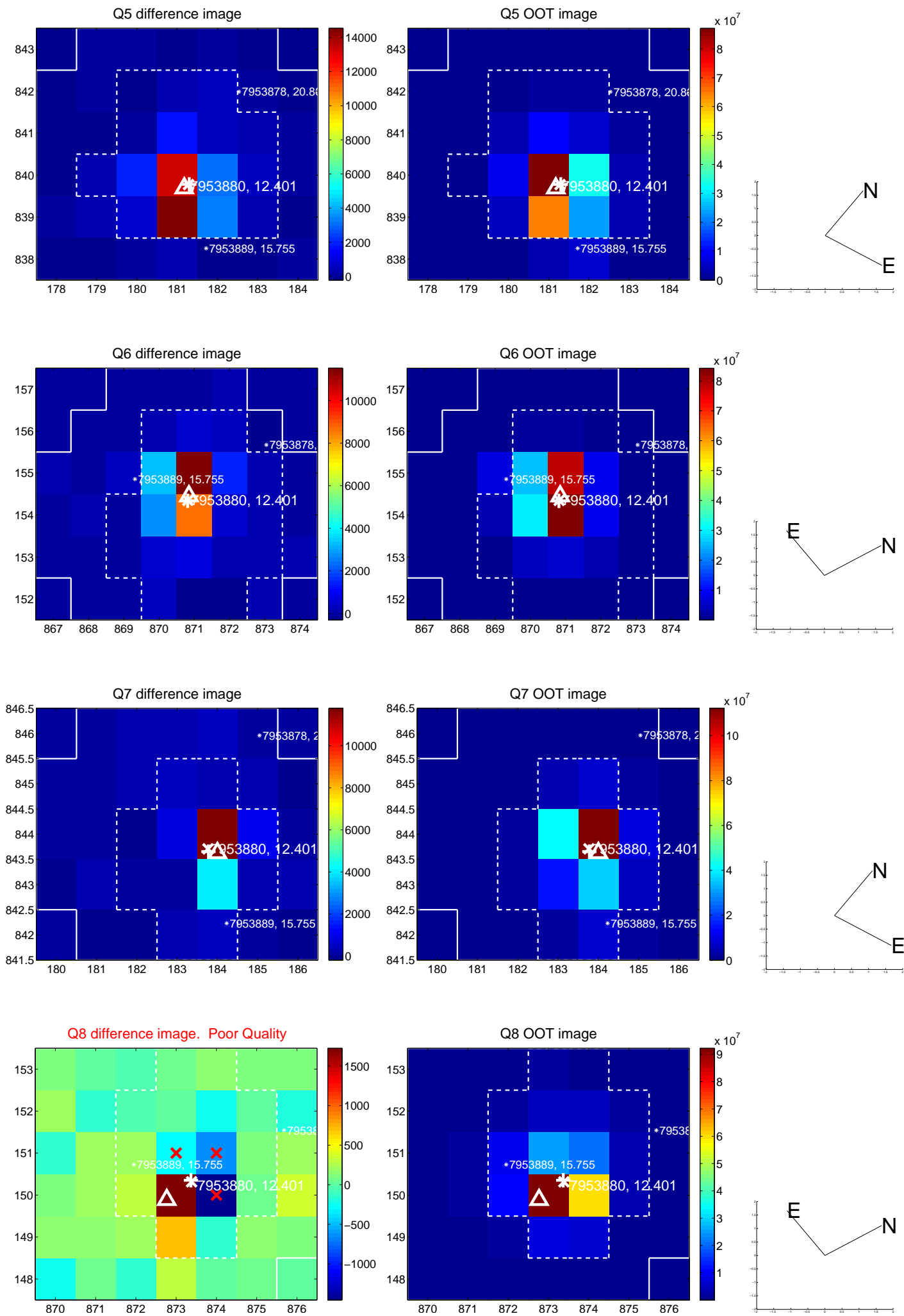


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

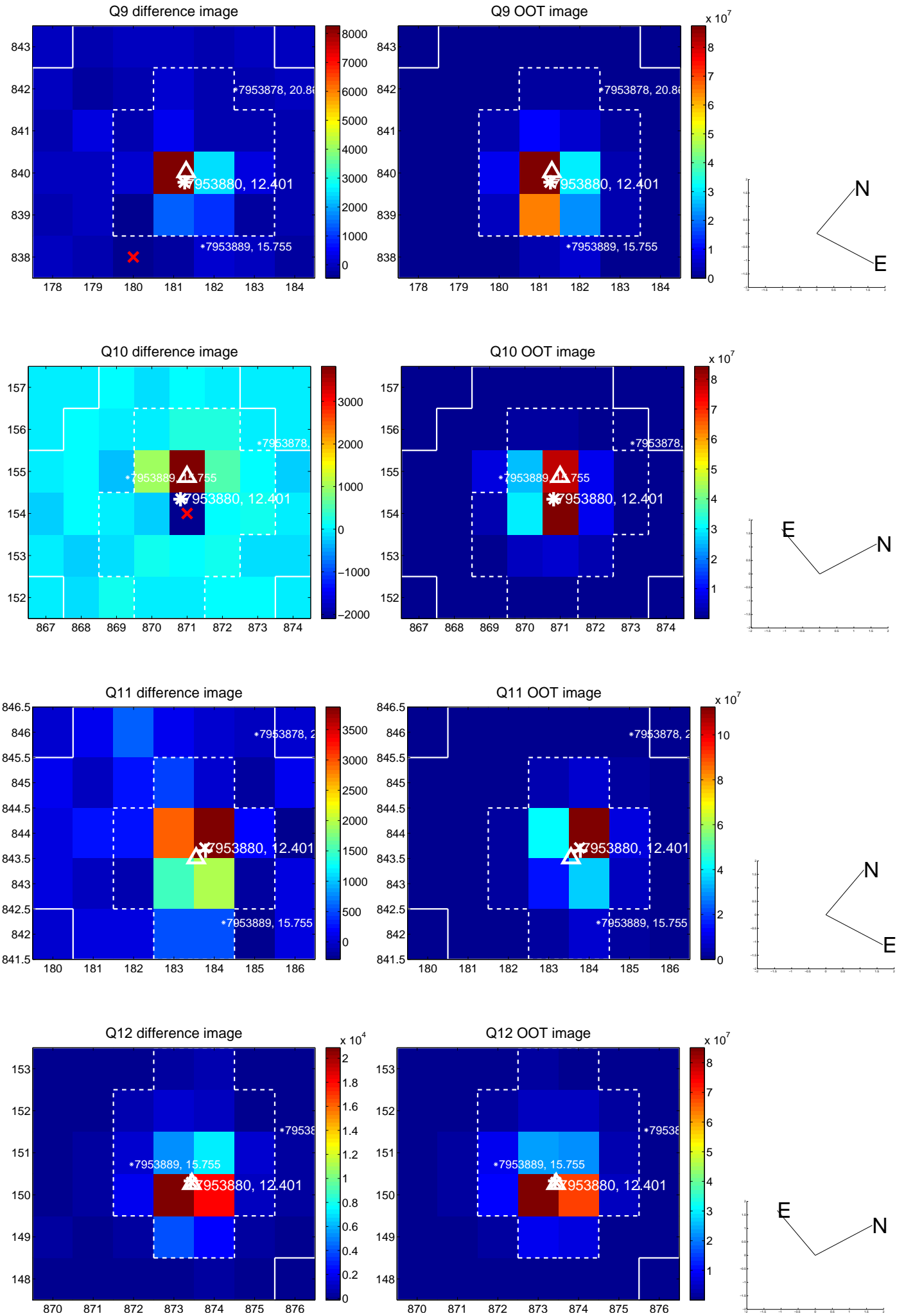


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

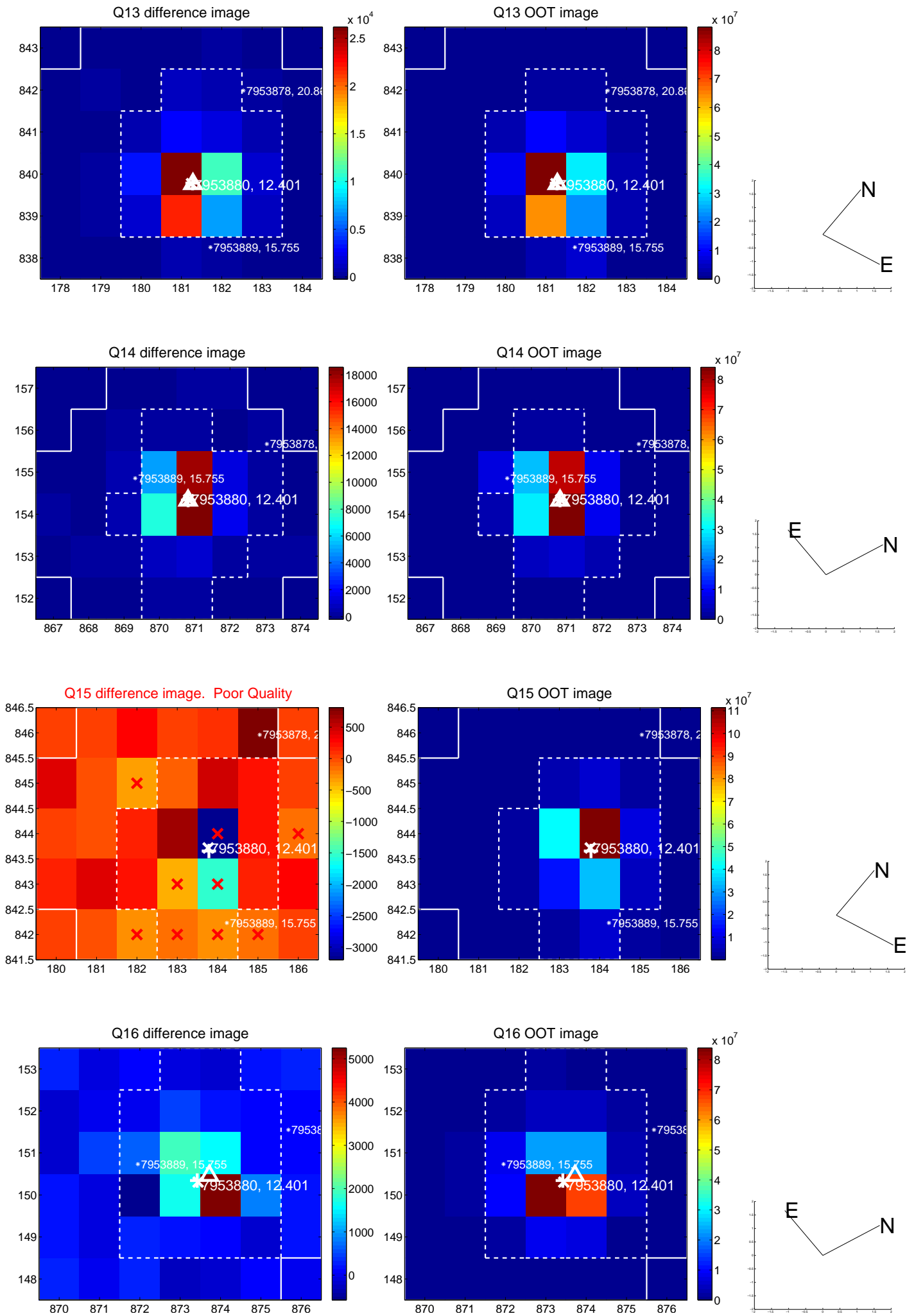




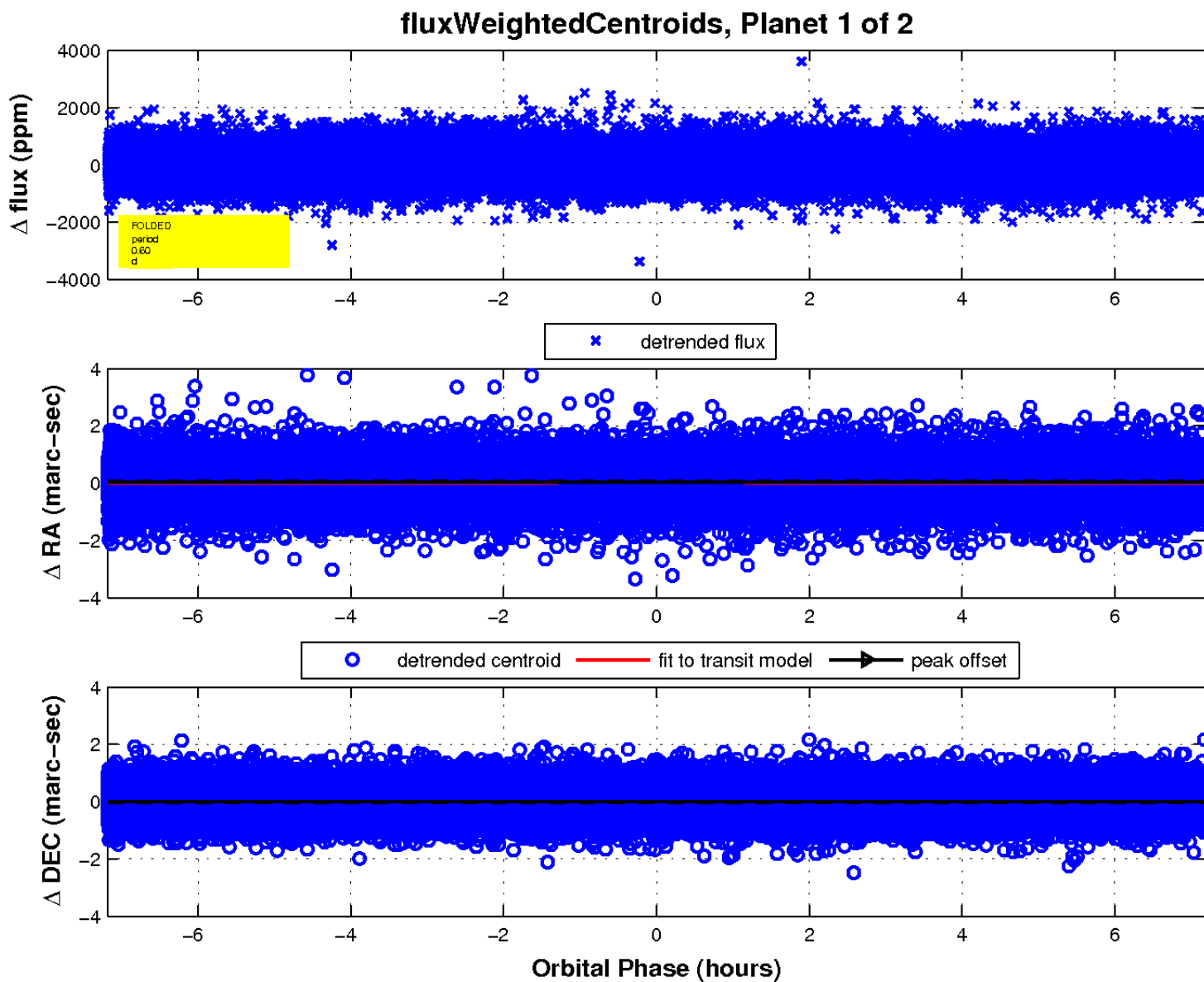
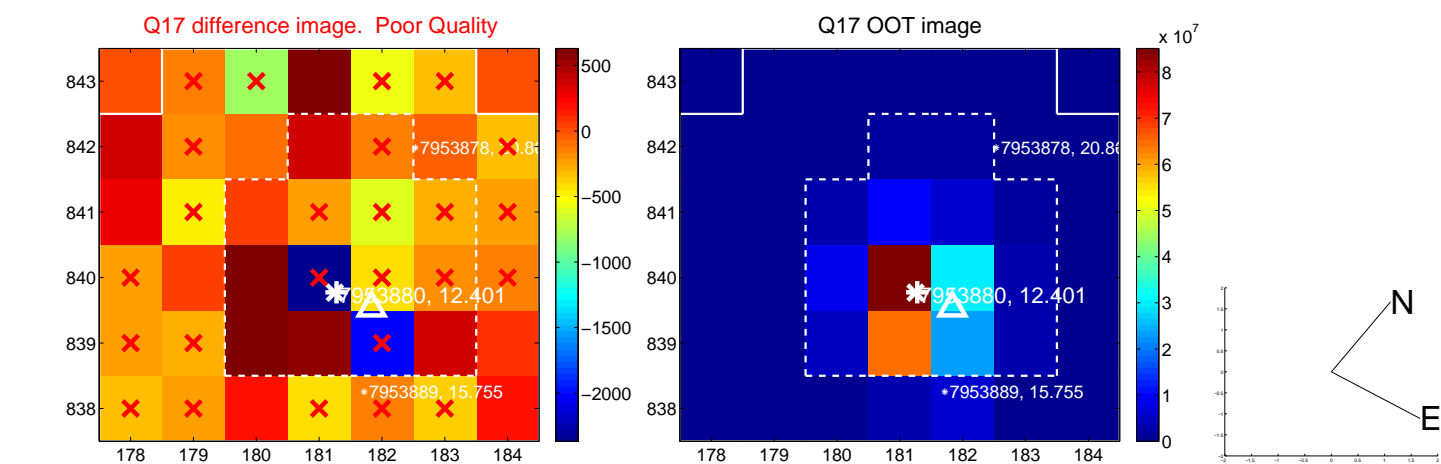
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

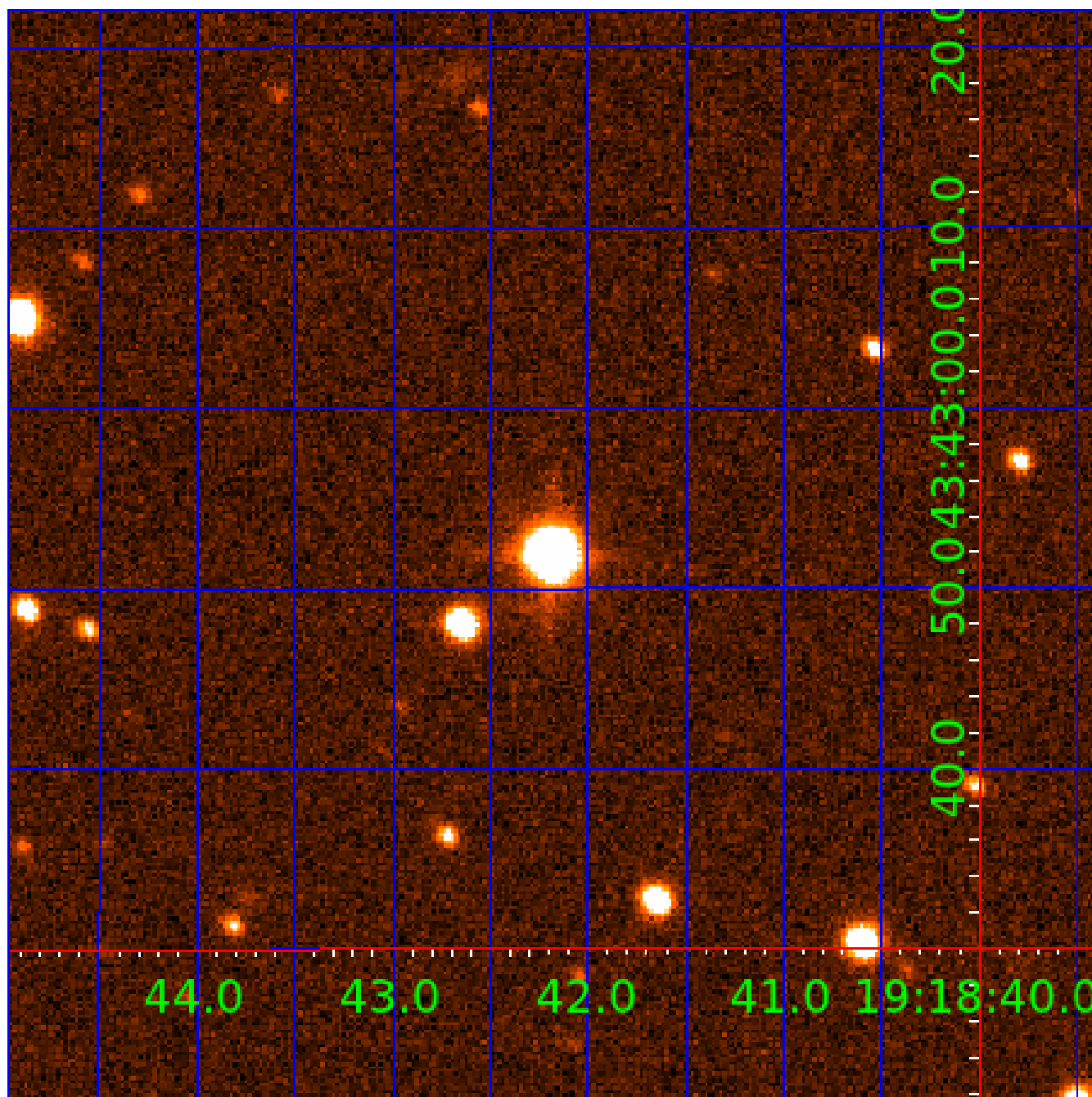


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007953880

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007953880-01	OBS	No	0.598747	131.666317	47.9	2.562	10.2	11.6	3.05	7884	2.45	108700.80
007953880-02	OBS	No	2.994637	132.992342	78.9	23.246	10.2	13.0	3.05	7884	3.28	12708.62

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007953880-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007953880-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV

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

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

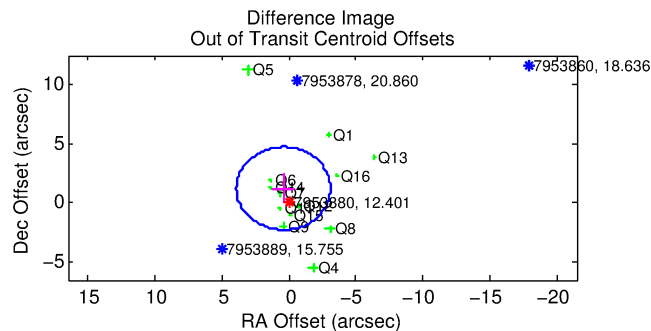
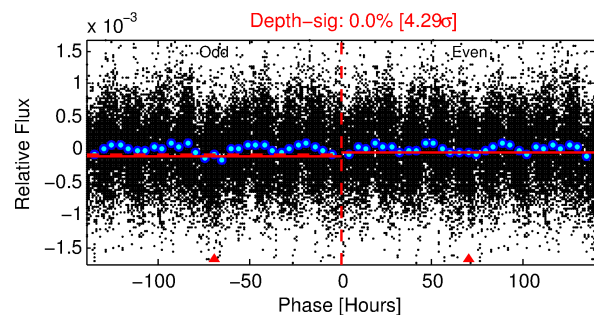
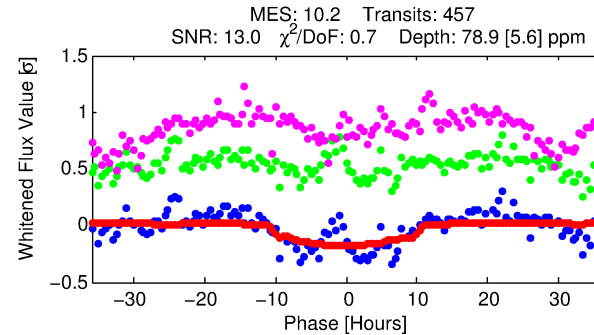
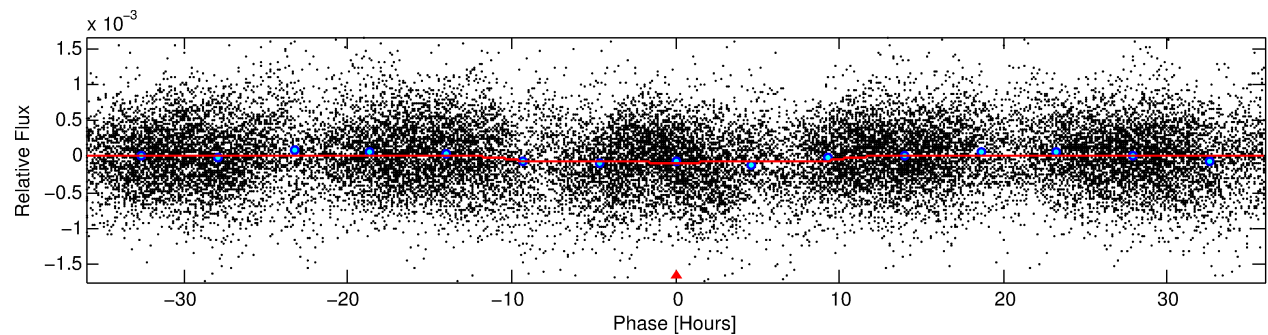
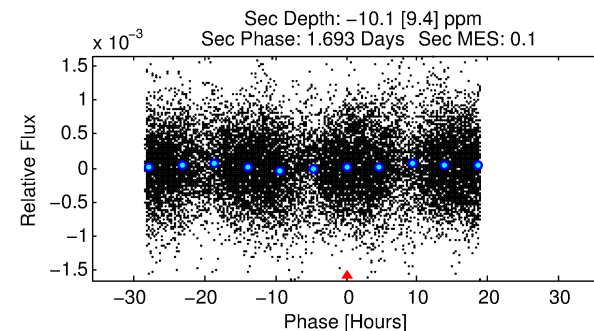
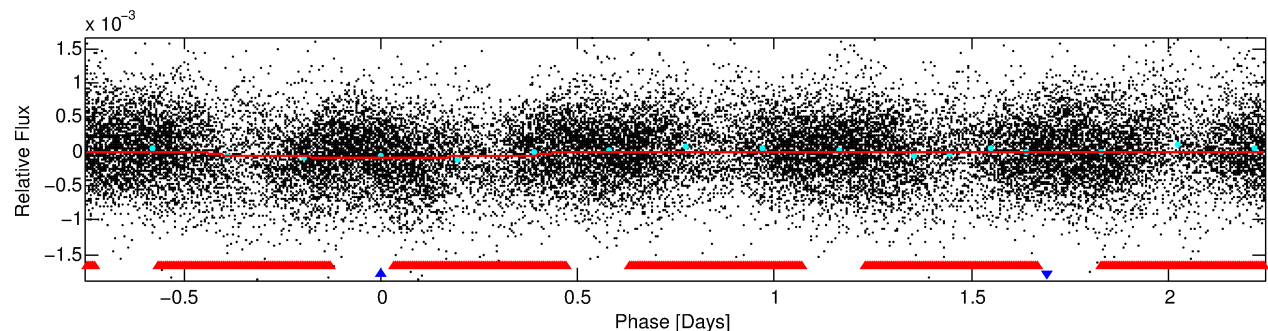
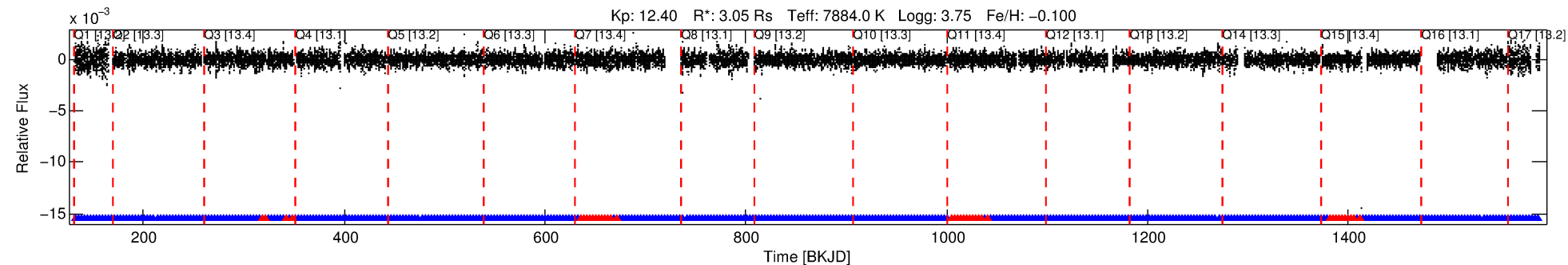
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007953880-02

No Significant Match Found

# DV One-Page Summary

KIC: 7953880 Candidate: 2 of 2 Period: 2.995 d



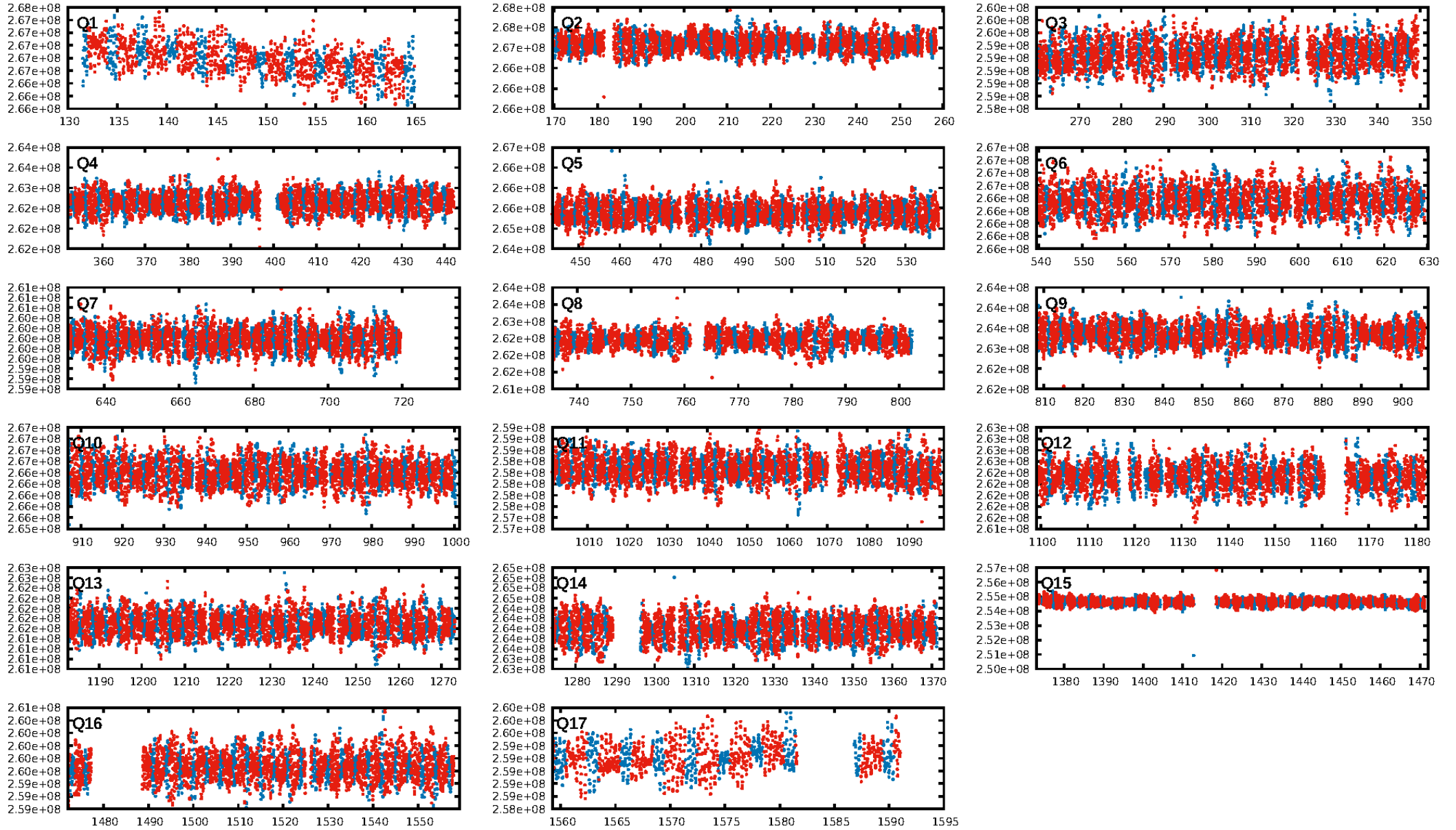
## DV Fit Results:

Period = 2.99464 [0.00011] d  
Epoch = 132.9923 [0.0270] BKJD  
Rp/R\* = 0.0099 [0.0005]  
a/R\* = 1.03 [0.02]  
b = 0.94 [0.03]  
Seff = 12708.62 [8979.76]  
Teff = 2707 [478] K  
Rp = 3.28 [1.40] Re  
a = 0.0503 [0.0212] AU  
Ag = N/A  
Teffp = N/A

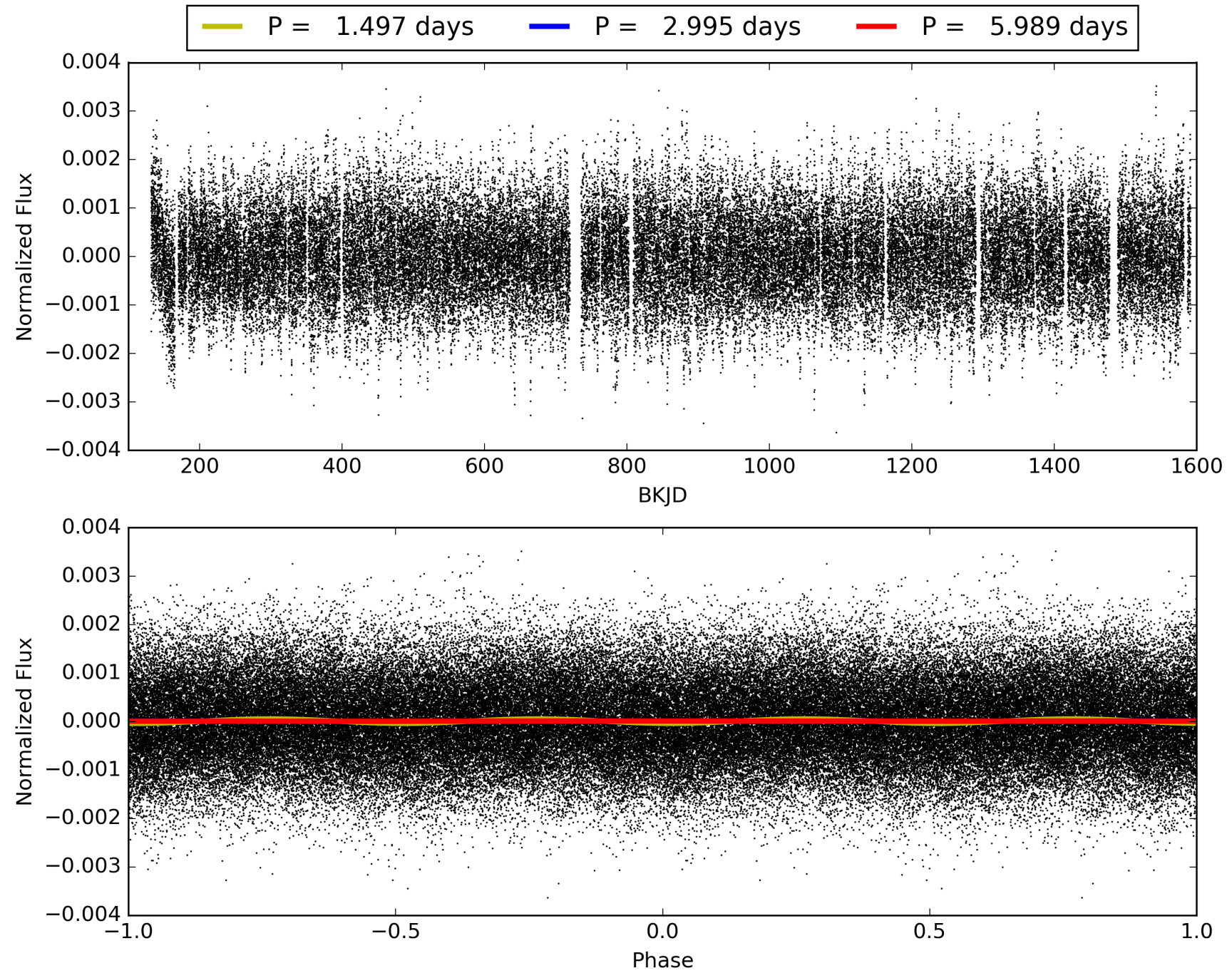
## DV Diagnostic Results:

ShortPeriod-sig: 98.6% [2.46σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.91 [399/437]  
GhostDiagnostic-chr: 2.514  
Centroid-sig: 1.4%  
Centroid-so: 0.194 arcsec [1.12σ]  
OotOffset-rm: 1.313 arcsec [1.12σ]  
KicOffset-rm: 1.310 arcsec [1.20σ]  
OotOffset-st: 2/3/4/4 [13]  
KicOffset-st: 2/3/4/4 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 007953880-02, PDC Light Curves



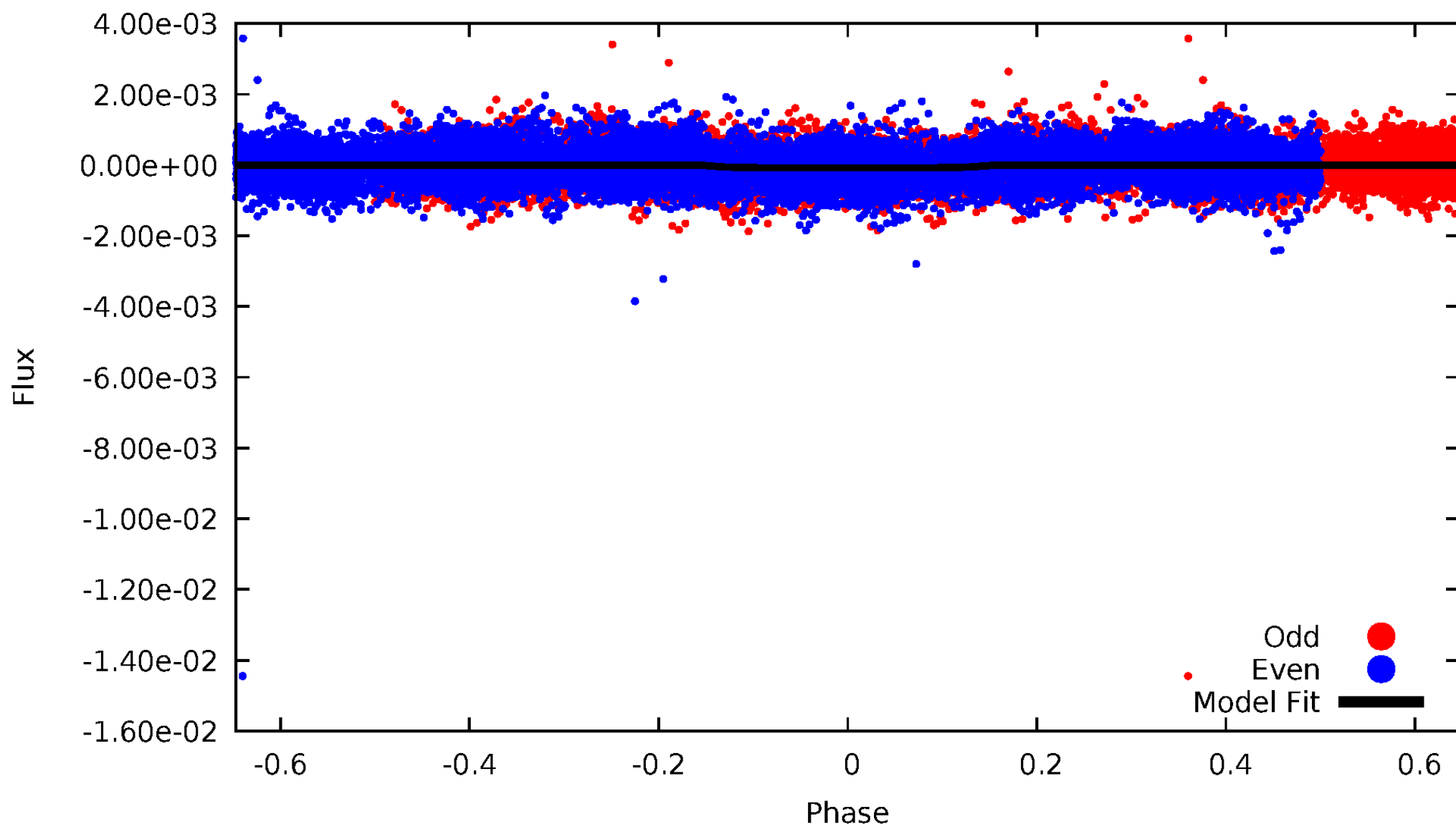
# TCE 007953880-02





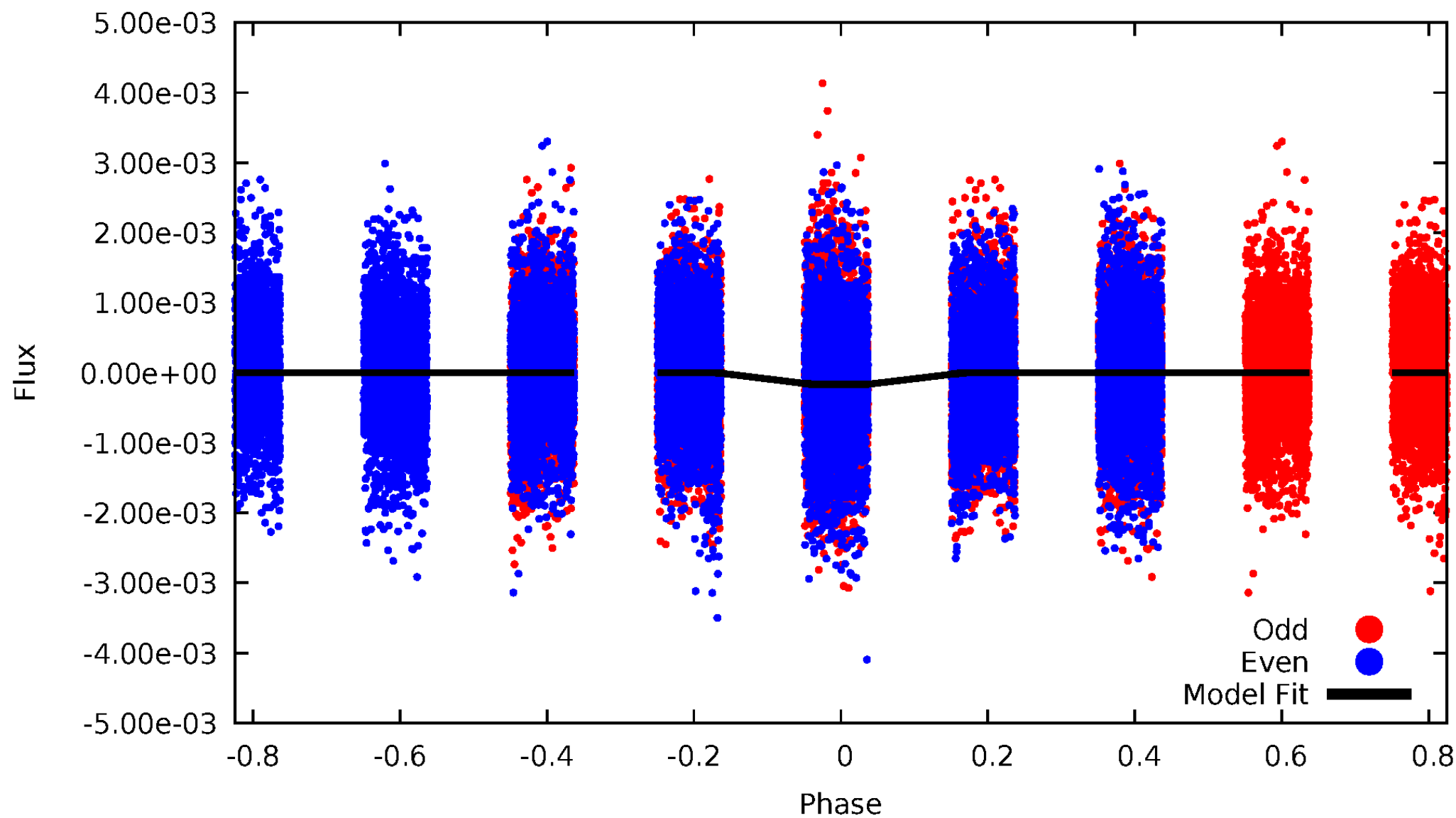
# DV Odd/Even

TCE 007953880-02



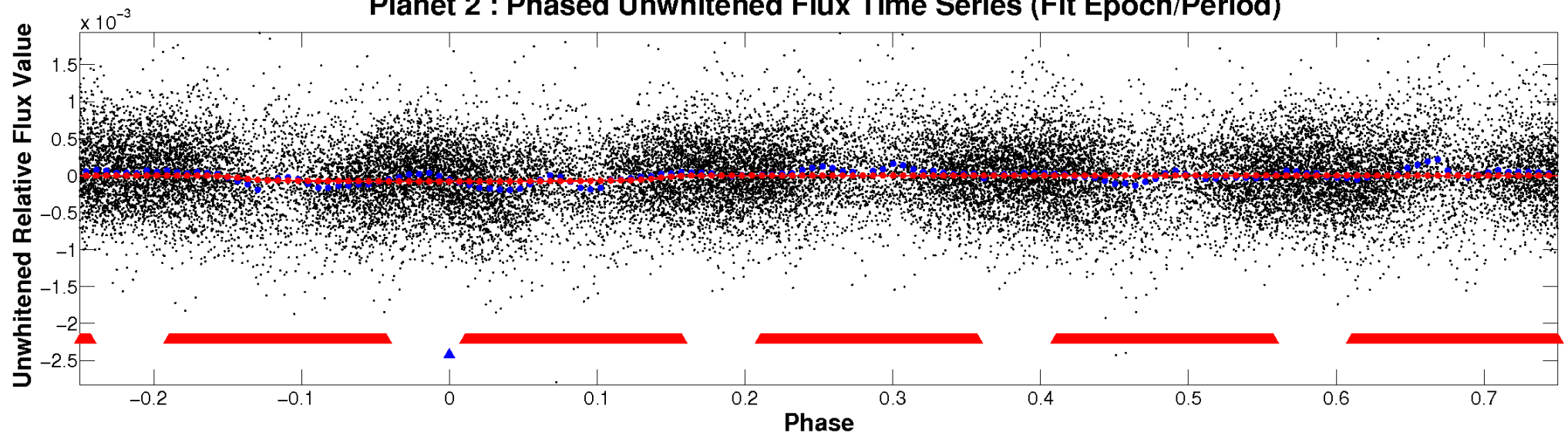
# ALT Odd/Even

TCE 007953880-02

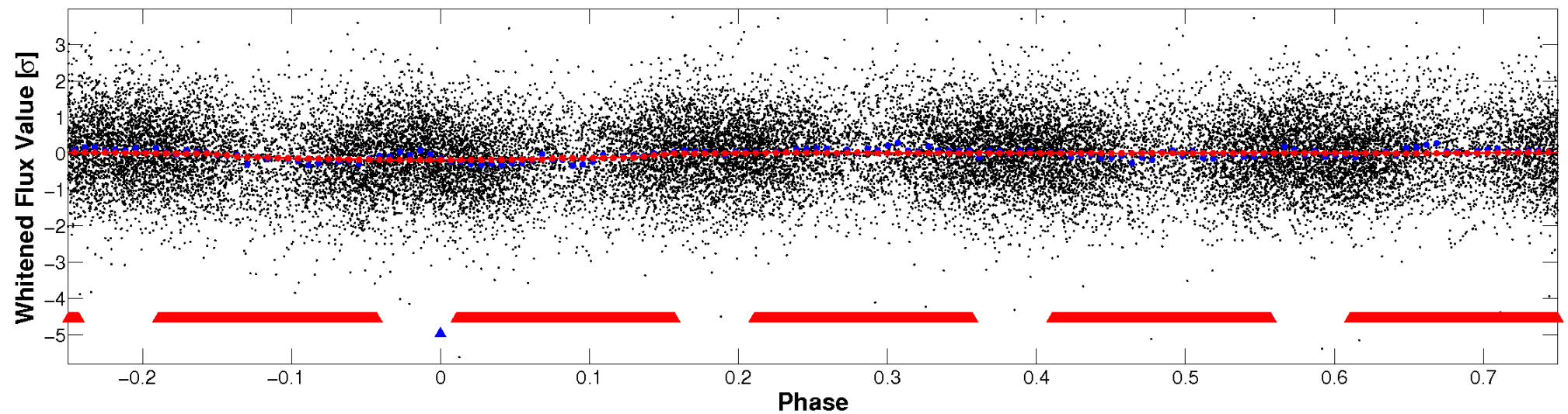


# Non-Whitened Vs. Whitened Light Curve

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

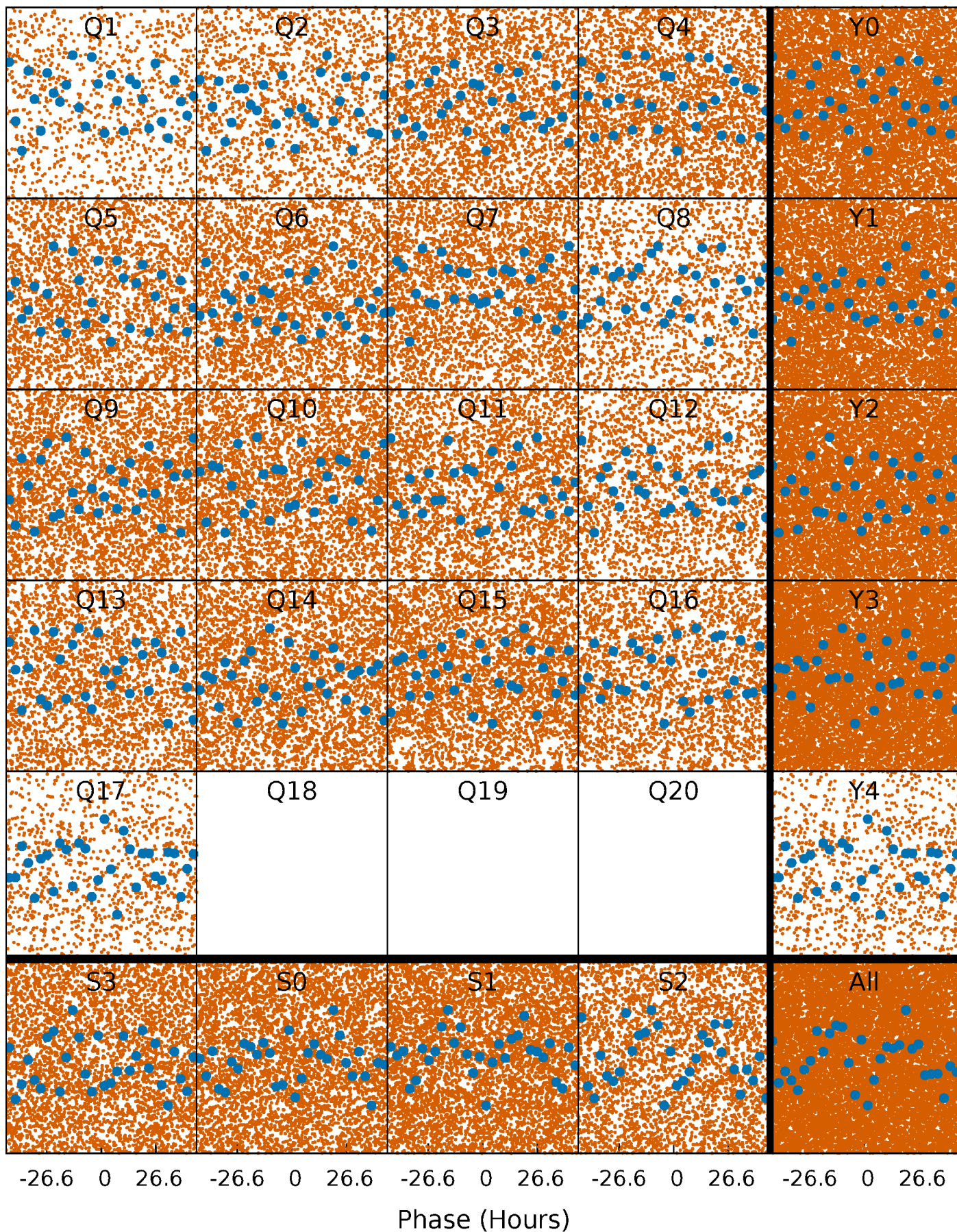


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

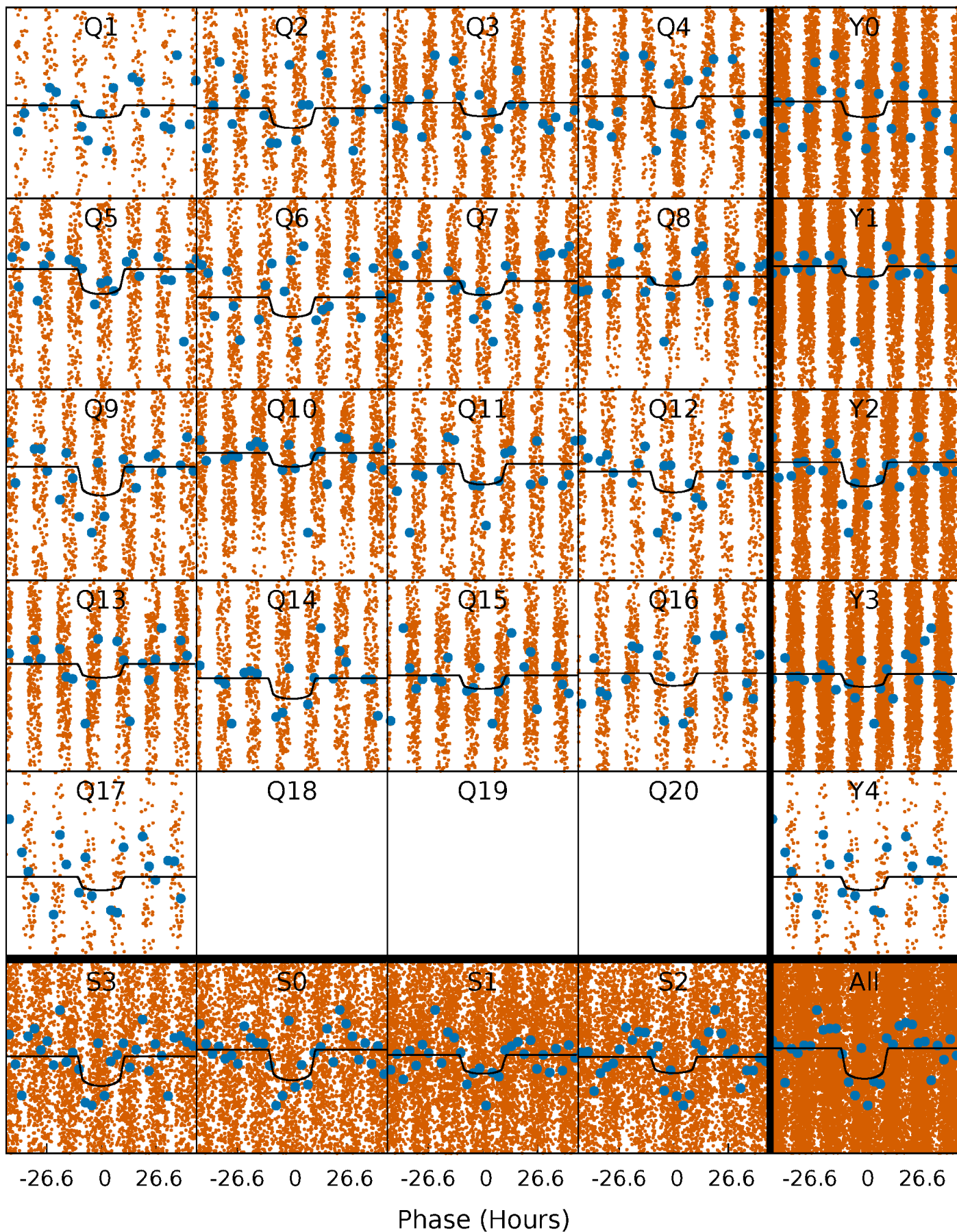
TCE 007953880-02   P= 2.994637 Days    $T_0=132.992342$  (BKJD)





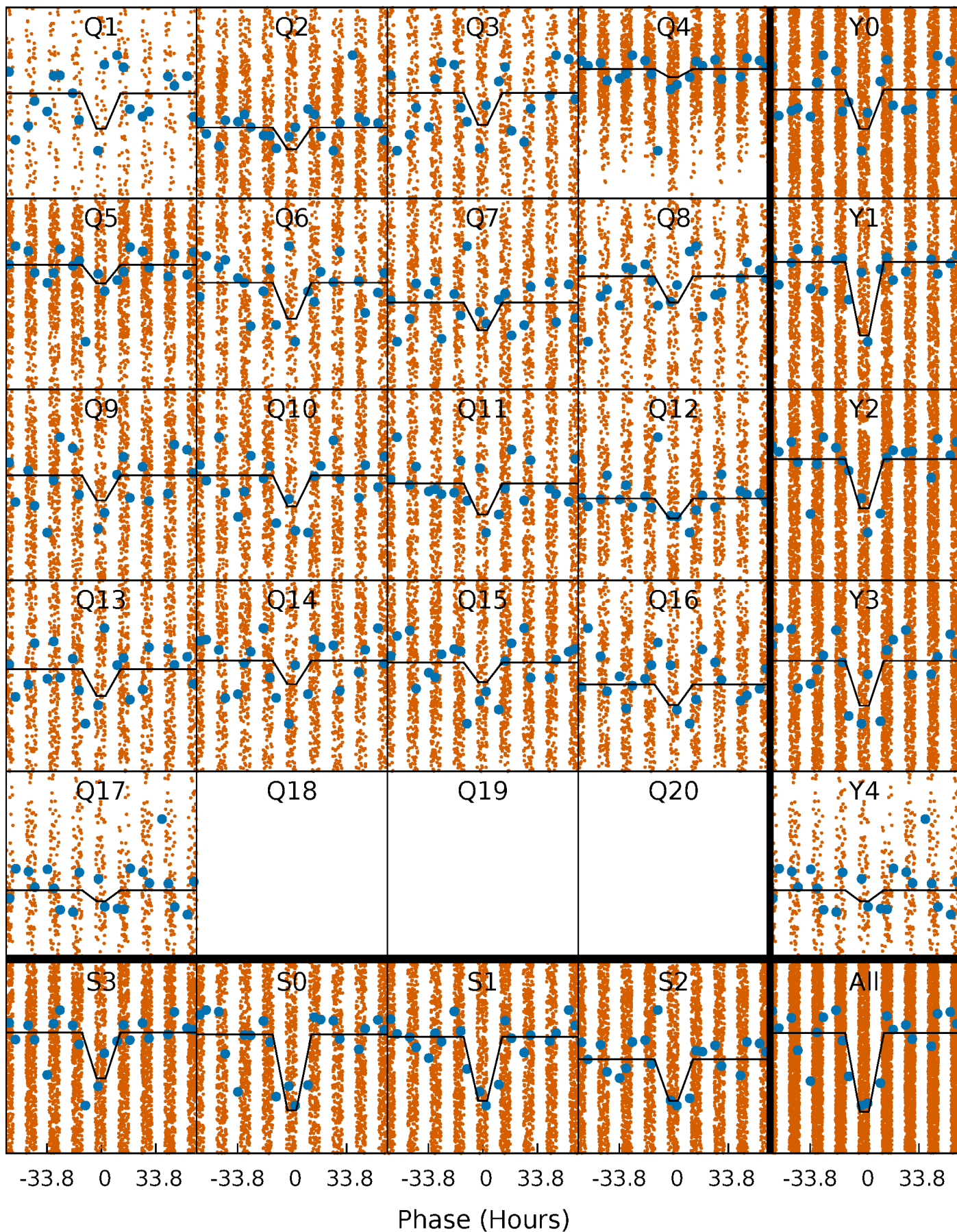
# DV Quarter-Phased Transit Curves

TCE 007953880-02   P= 2.994637 Days    $T_0=132.992342$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007953880-02 P= 2.993733 Days  $T_0=133.182640$  (BKJD)

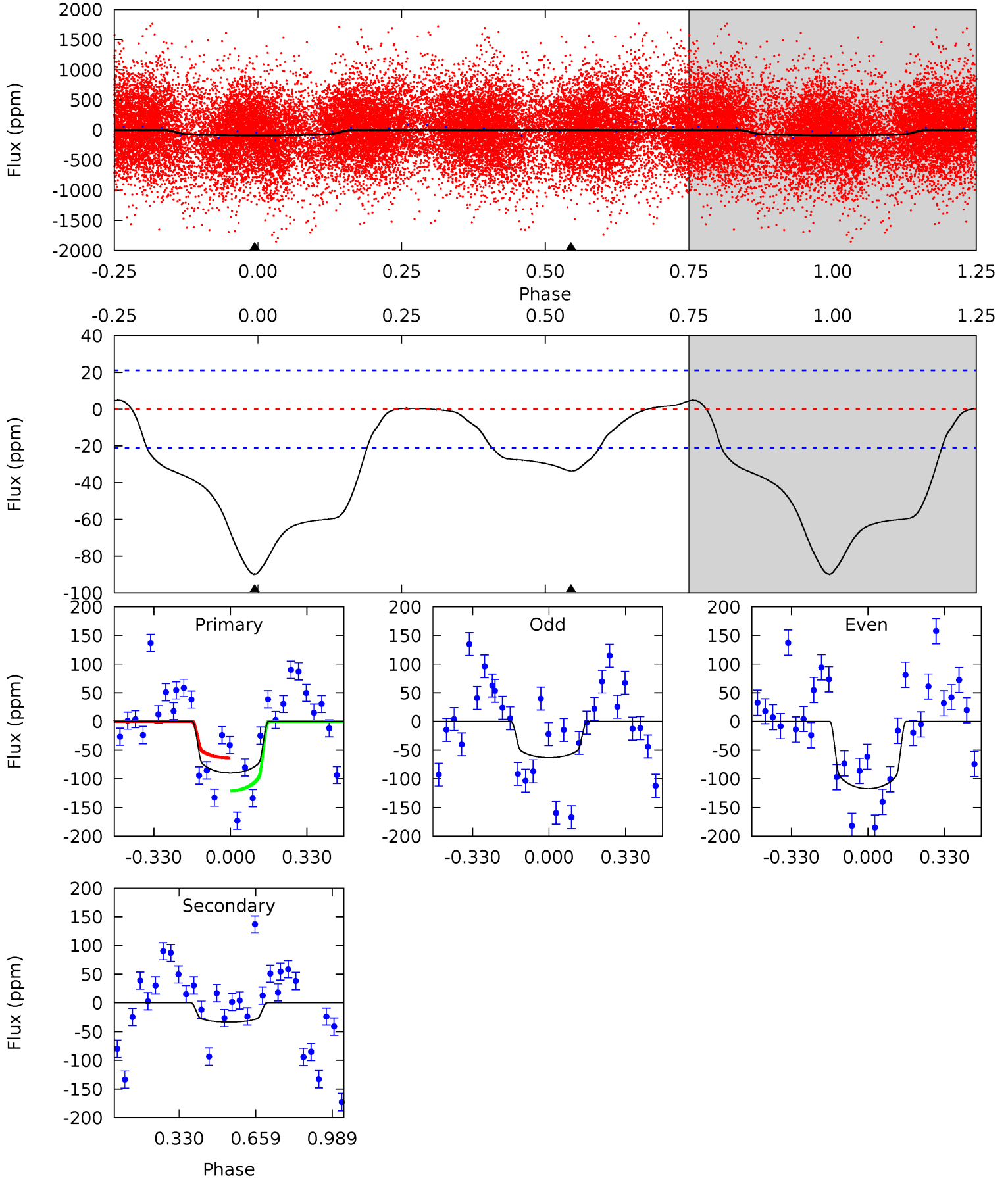




# DV Model-Shift Uniqueness Test

007953880-02, P = 2.994637 Days, E = 129.997705 Days

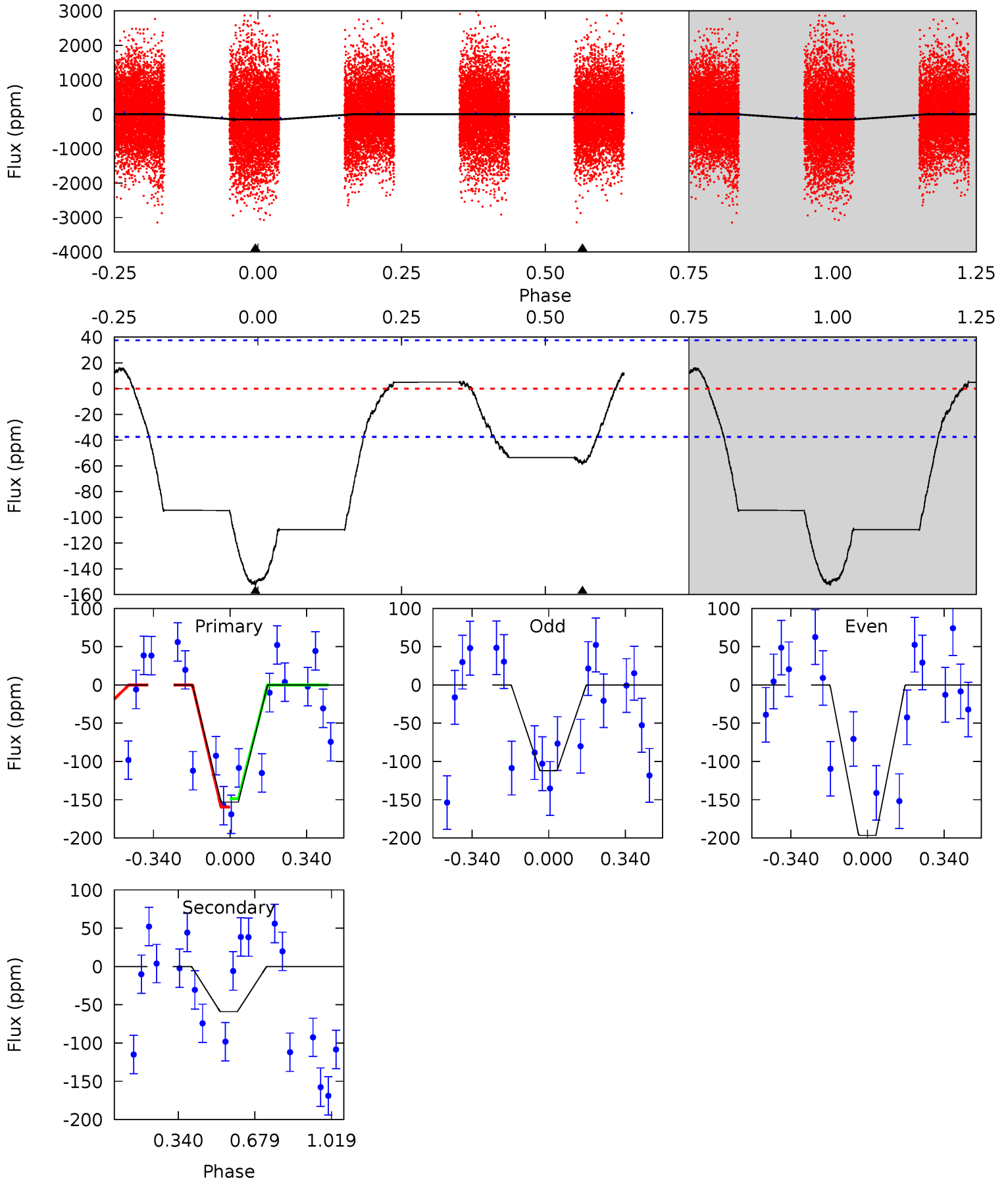
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.3	6.88	0	0	4.31	0.97	0.46	18.3	18.3	6.88	6.88	5.58	0.95	0.05	6.01



# Alt Model-Shift Uniqueness Test

007953880-02, P = 2.993733 Days, E = 130.188907 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
17.5	6.76	0	0	4.30	0.95	0.61	17.5	17.5	6.76	6.76	4.89	0.73	0.10	0.52



### Stellar Parameters For KIC 007953880

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7884^{+218}_{-327}$	$3.747^{+0.408}_{-0.096}$	$-0.100^{+0.200}_{-0.300}$	$3.048^{+0.430}_{-1.289}$	$1.891^{+0.096}_{-0.383}$	$0.094^{+0.306}_{-0.029}$
	+3%/-4%	+11%/-3%	+200%/-300%	+14%/-42%	+5%/-20%	+325%/-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 007953880-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-34 \pm 5$	$3.12^{+0.42}_{-0.71}$	$3675^{+250}_{-390}$	$5806^{+322}_{-326}$	$4.814^{+2.894}_{-1.282}$
Alt.	$-59 \pm 9$	$4.00^{+0.56}_{-0.95}$	$3666^{+275}_{-454}$	$5859^{+327}_{-310}$	$5.044^{+3.647}_{-1.301}$

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

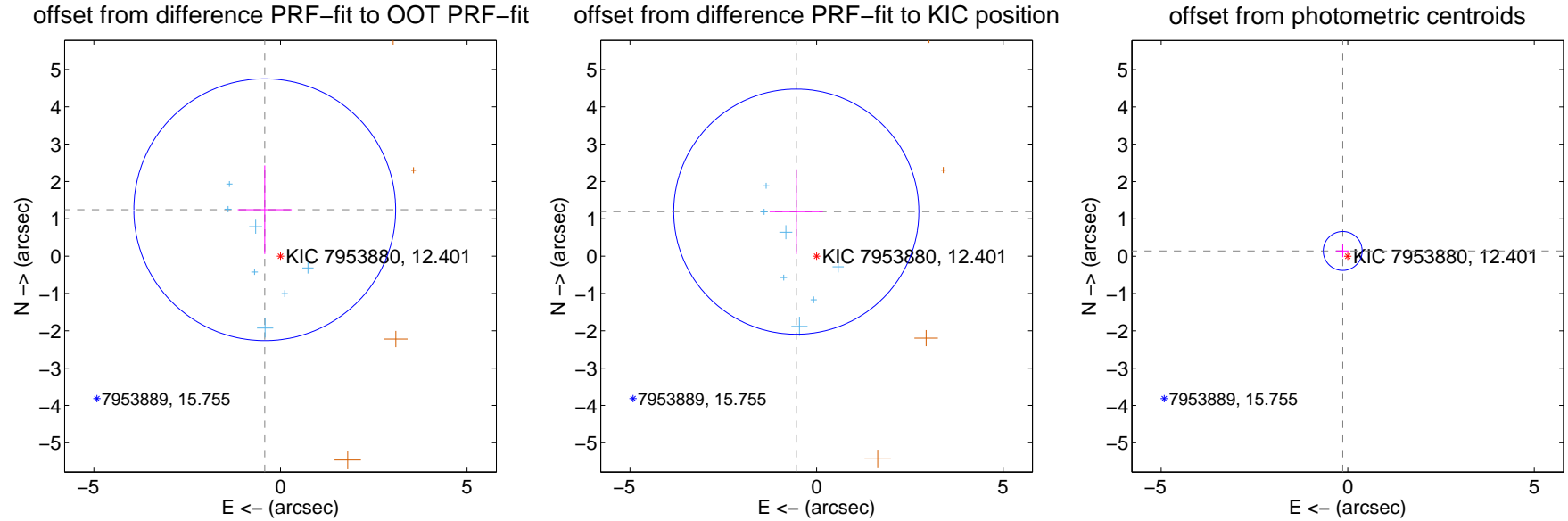
## DV Centroid Data

Supplemental centroid analysis for 007953880-02. Kepler magnitude: 12.40. Transit SNR 12.96

There are 7 quarters with good PRF difference image offsets

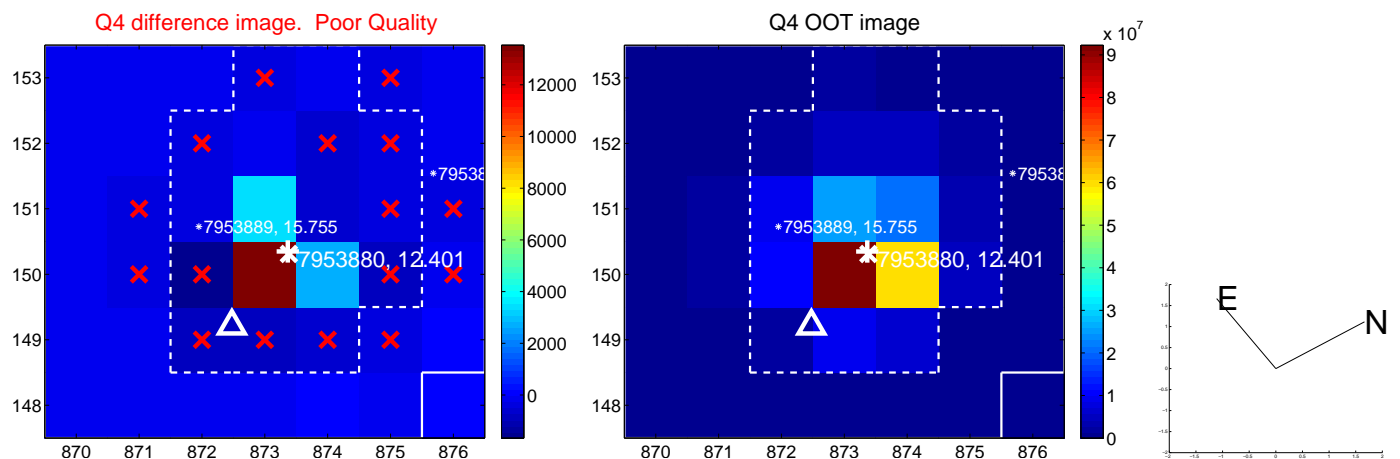
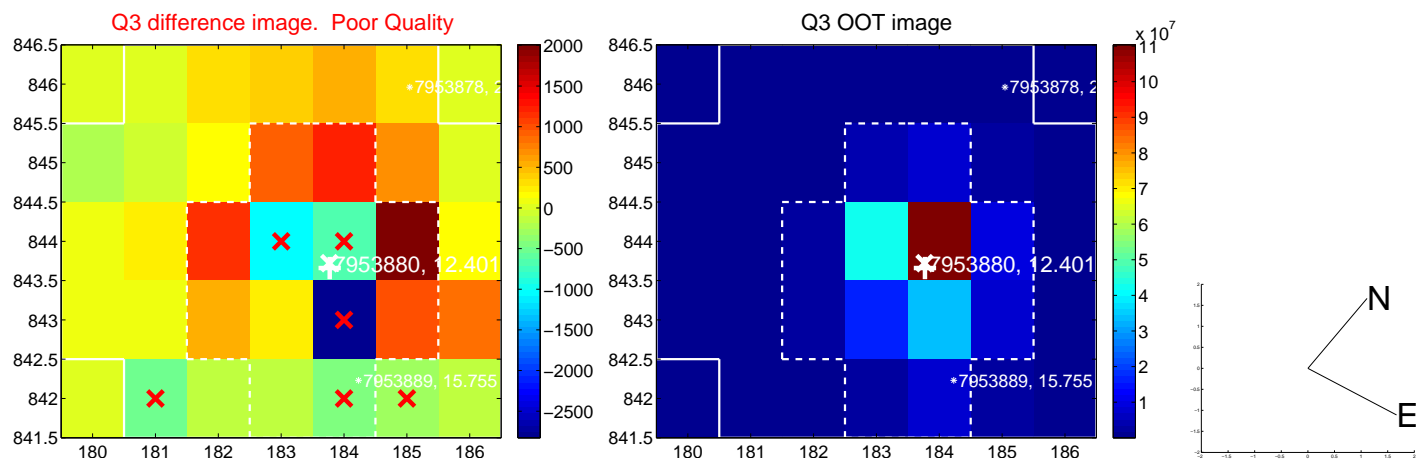
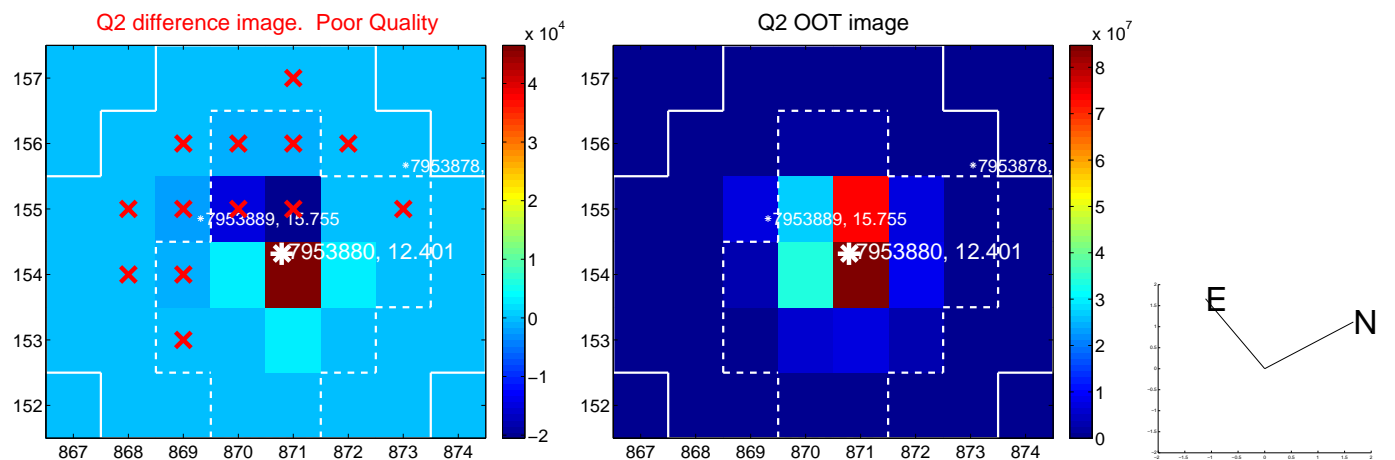
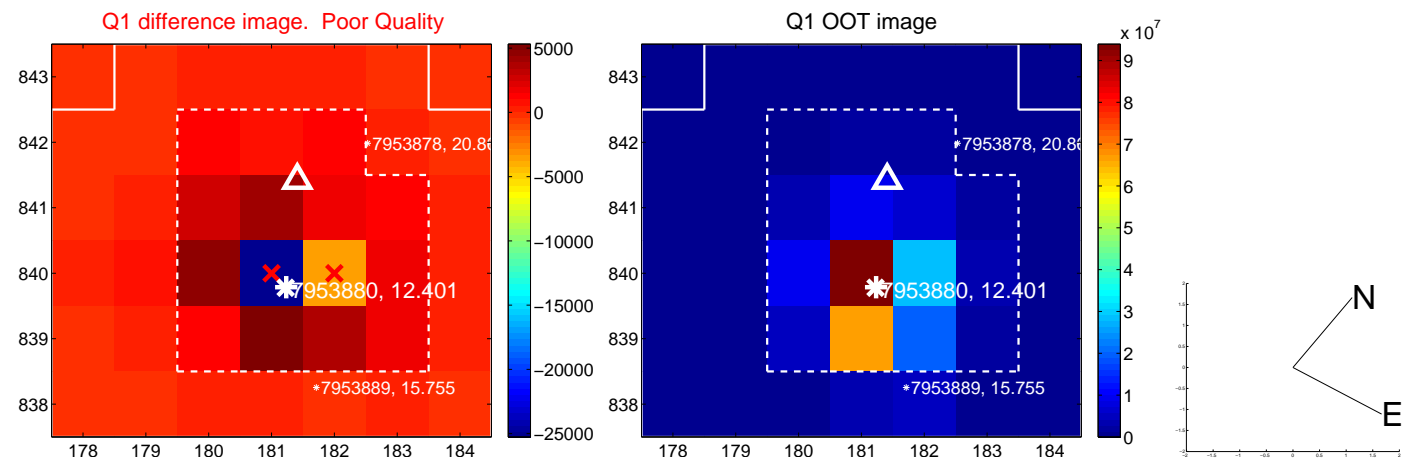
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.313 \pm 1.169$	1.12	$0.421 \pm 0.722$	$1.244 \pm 1.186$
PRF-fit source offset from KIC position	$1.310 \pm 1.095$	1.20	$0.544 \pm 0.715$	$1.191 \pm 1.138$
photometric centroid source offset	$0.19 \pm 0.17$	1.12	$0.13 \pm 0.18$	$0.14 \pm 0.17$

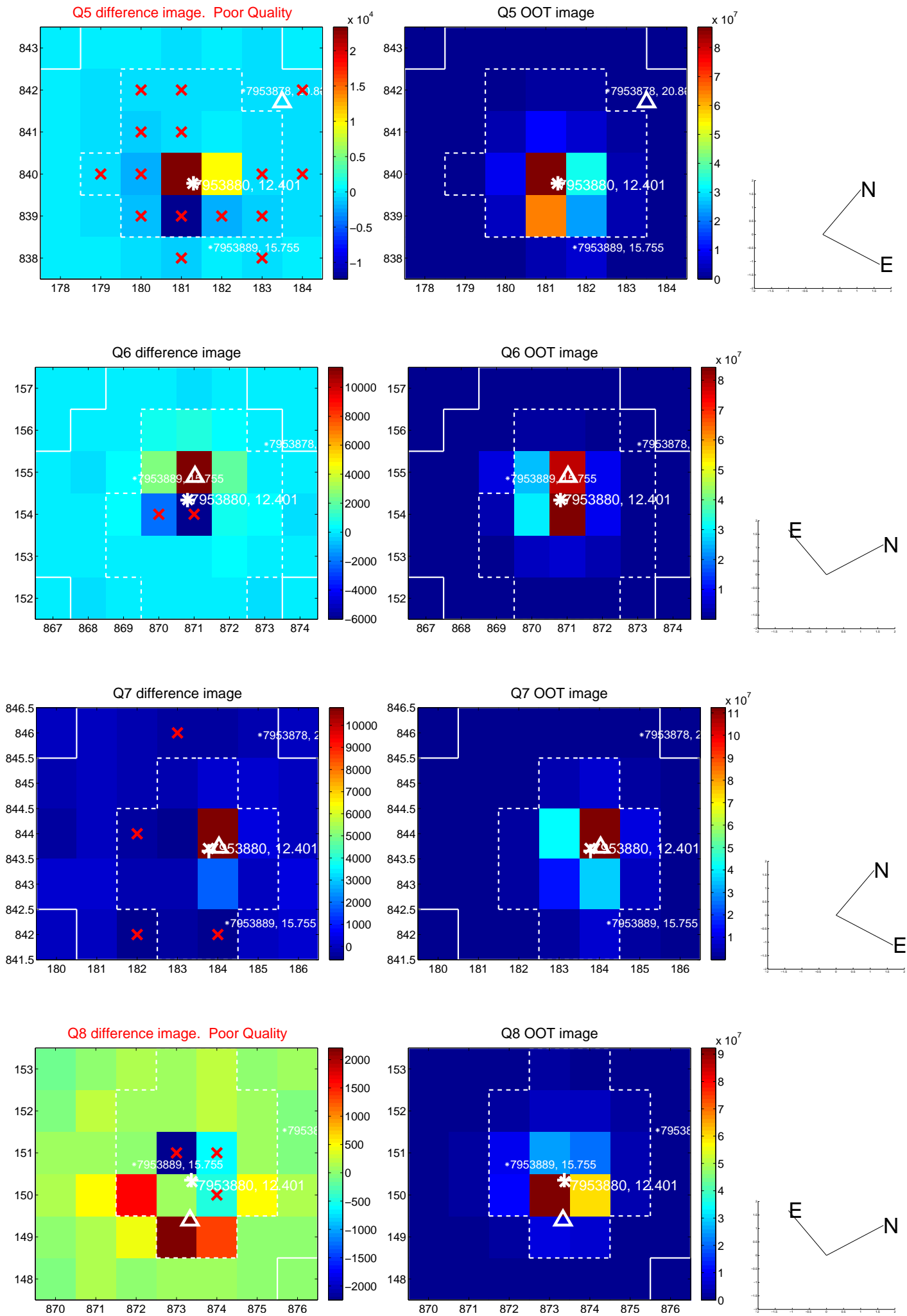


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

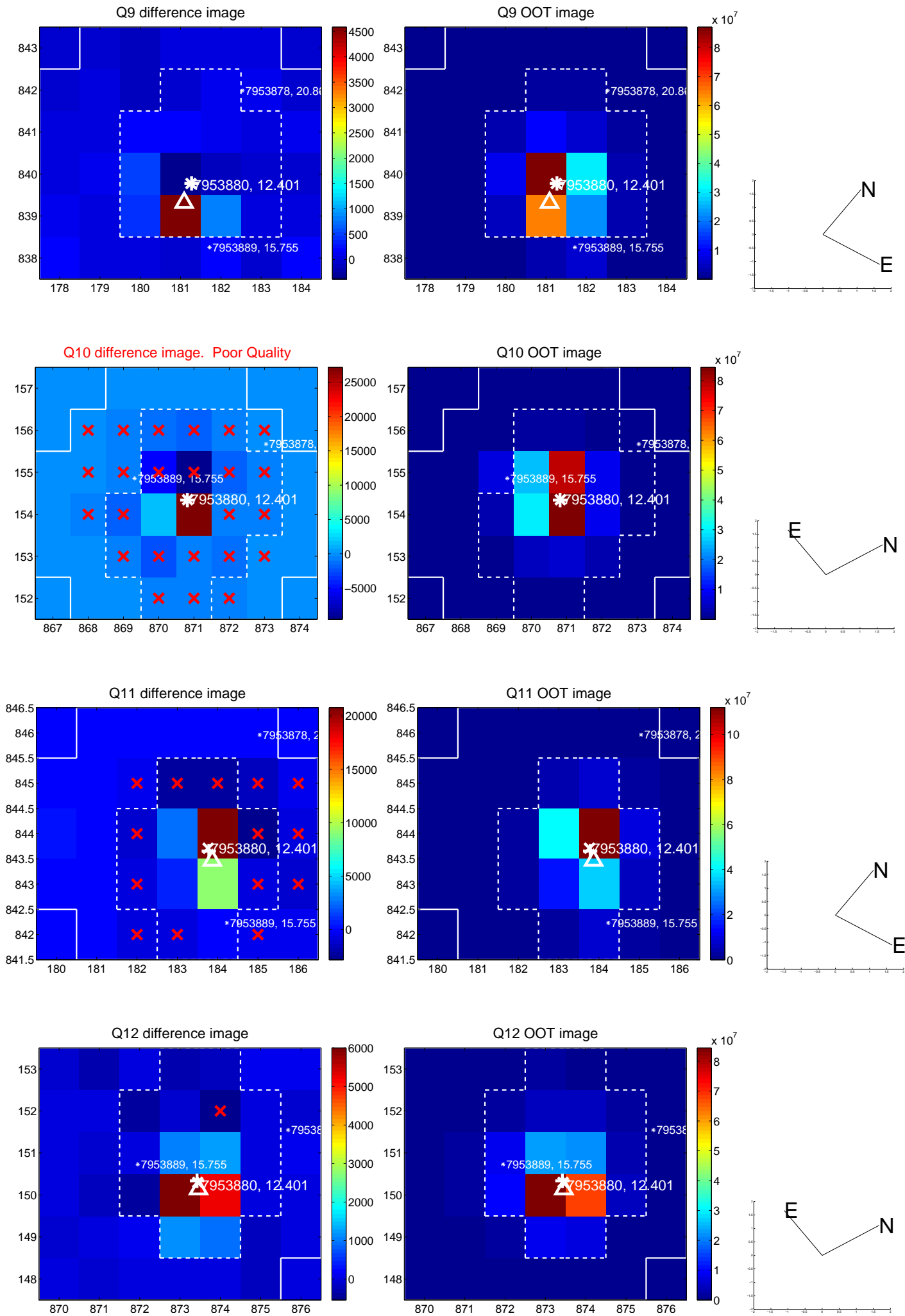


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

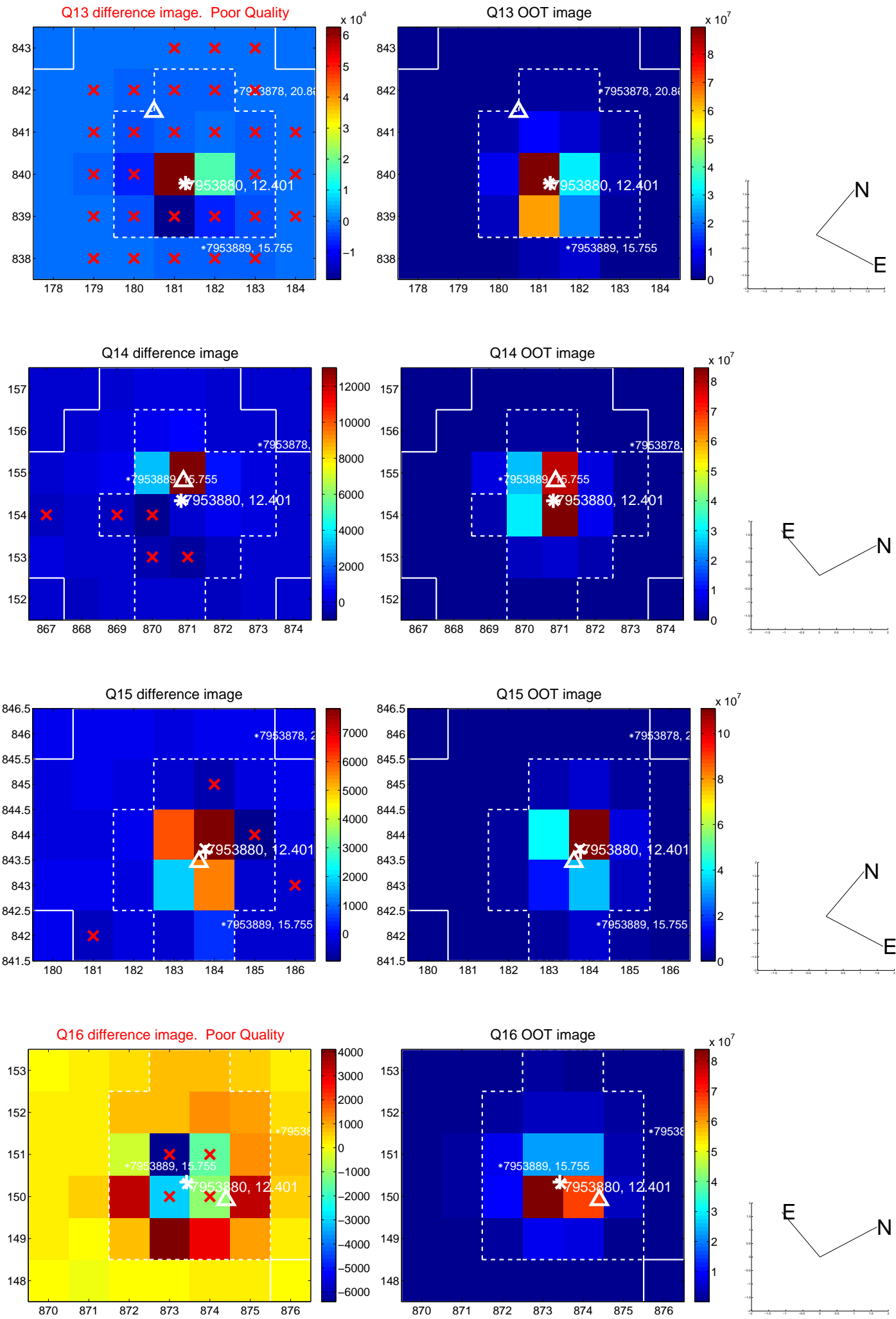




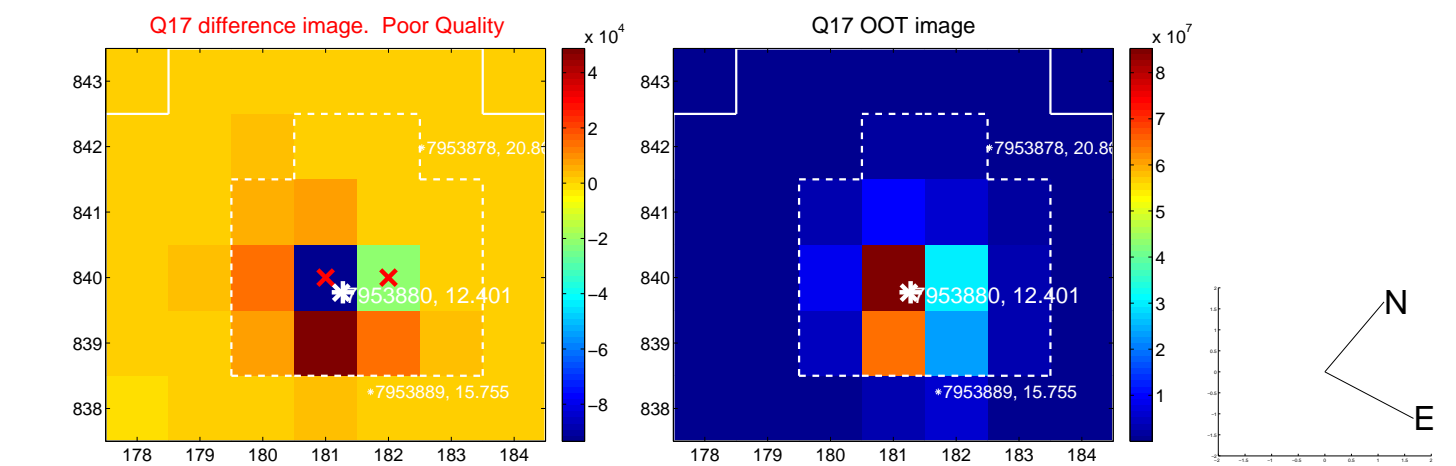
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



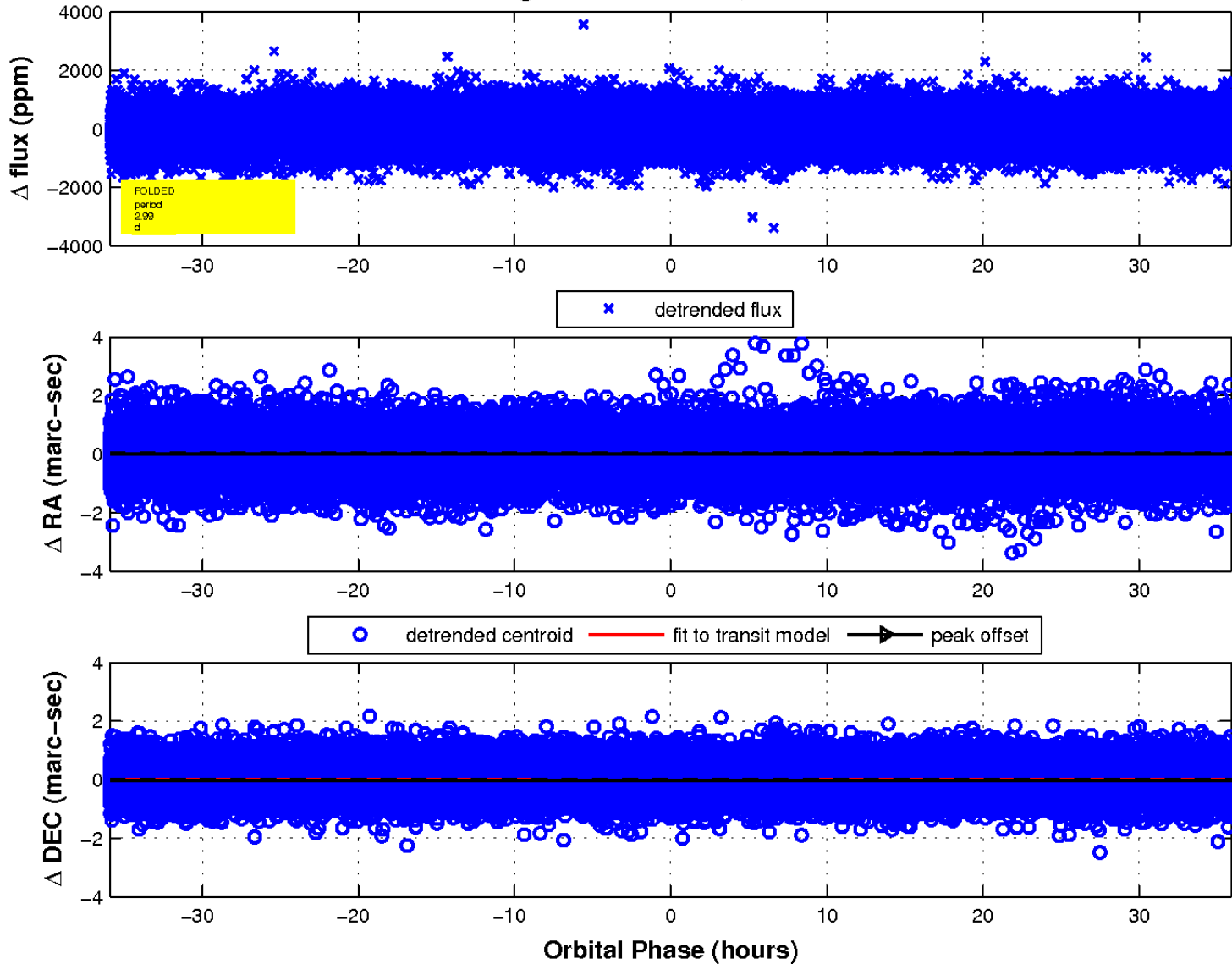
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

