

# KIC 005981039

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005981039-01	OBS	No	0.720473	132.091007	97.5	1.806	9.8	7.2	2.32	7154	2.65	35096.07
005981039-02	OBS	No	1.067775	132.462682	174.5	12.813	8.0	14.2	2.32	7154	3.96	20770.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005981039-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005981039-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

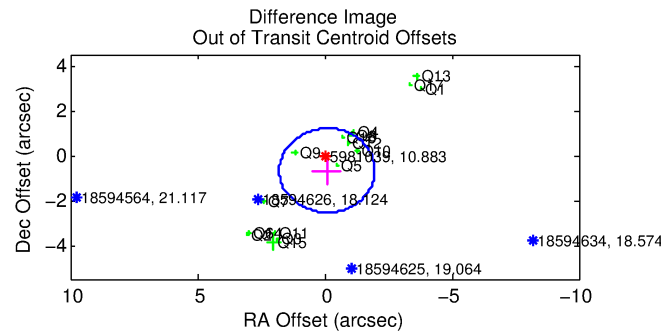
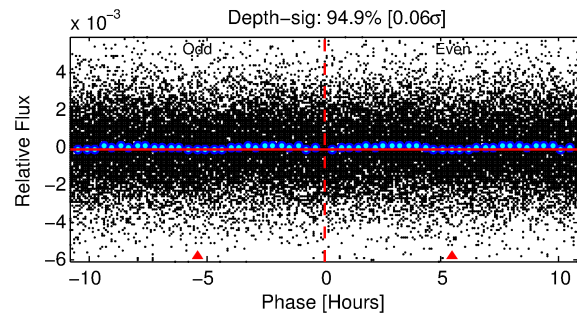
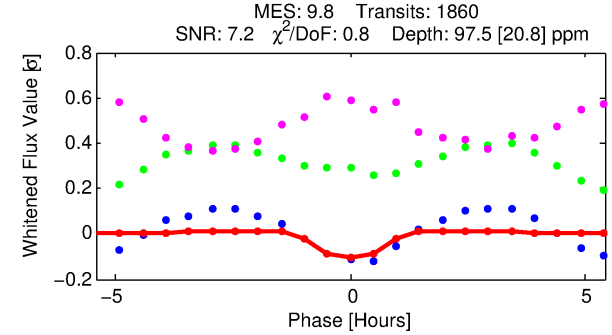
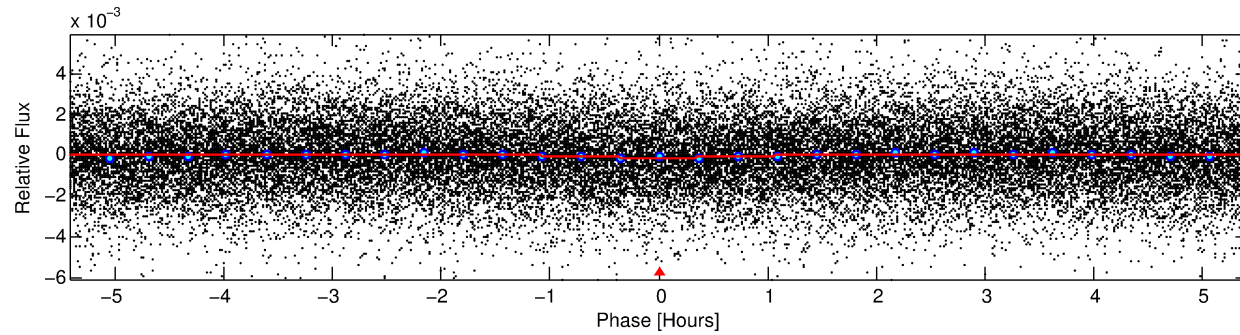
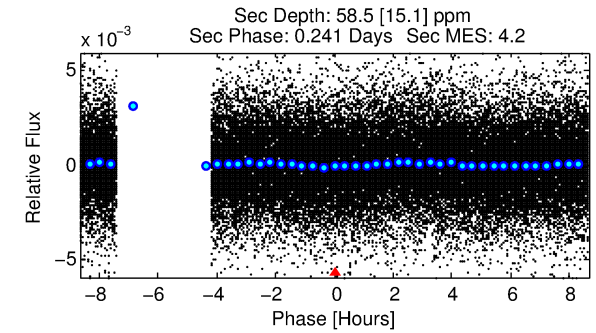
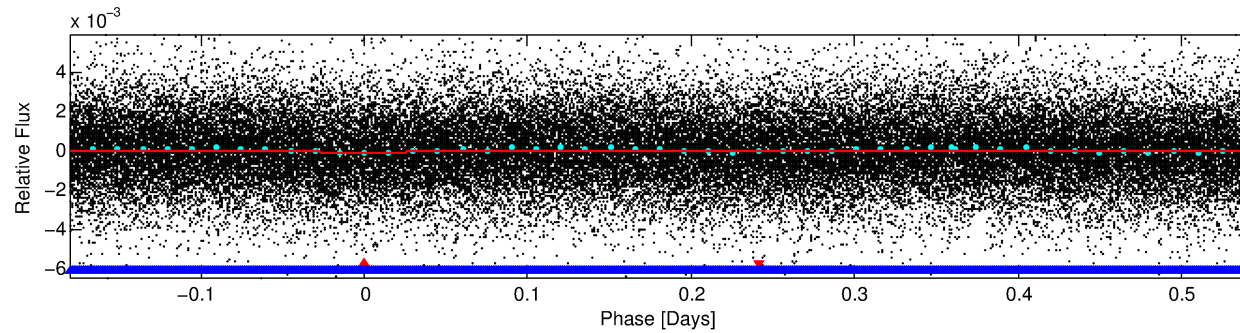
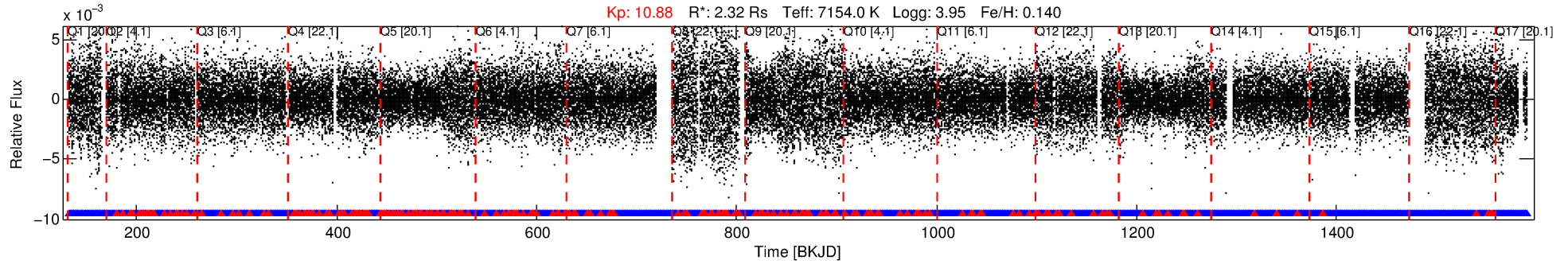
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005981039-01

No Significant Match Found

# DV One-Page Summary

KIC: 5981039 Candidate: 1 of 2 Period: 0.720 d



## DV Fit Results:

Period = 0.72047 [0.00001] d  
Epoch = 132.0910 [0.0040] BKJD  
Rp/R\* = 0.0105 [0.0104]  
a/R\* = 1.72 [7.08]  
b = 0.89 [1.44]  
Seff = 35096.07 [15326.99]  
Teff = 3490 [381] K  
Rp = 2.65 [2.74] Re  
a = 0.0190 [0.0050] AU  
Ag = 1.65 [3.38] [0.19 sigma]  
Teffp = 6119 [3080] K [0.85 sigma]

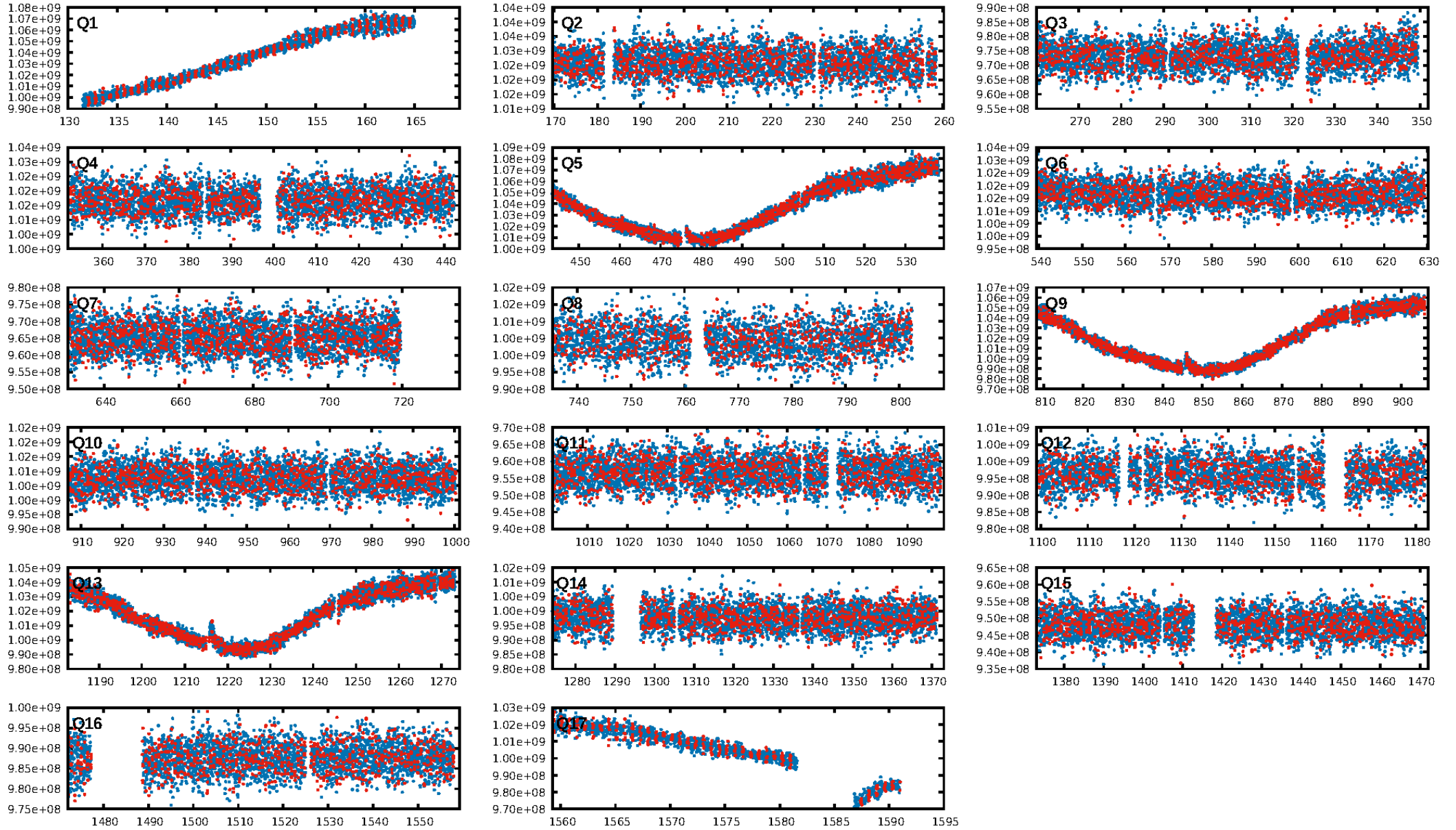
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 48.1% [0.64 sigma]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.88 [1562/1777]  
GhostDiagnostic-chr: 1.83  
Centroid-sig: 64.7%  
Centroid-so: 0.229 arcsec [1.37 sigma]  
OotOffset-rm: 0.675 arcsec [1.08 sigma]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.472 arcsec [0.97 sigma]  
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: 31-Jan-2016 15:47:53 Z

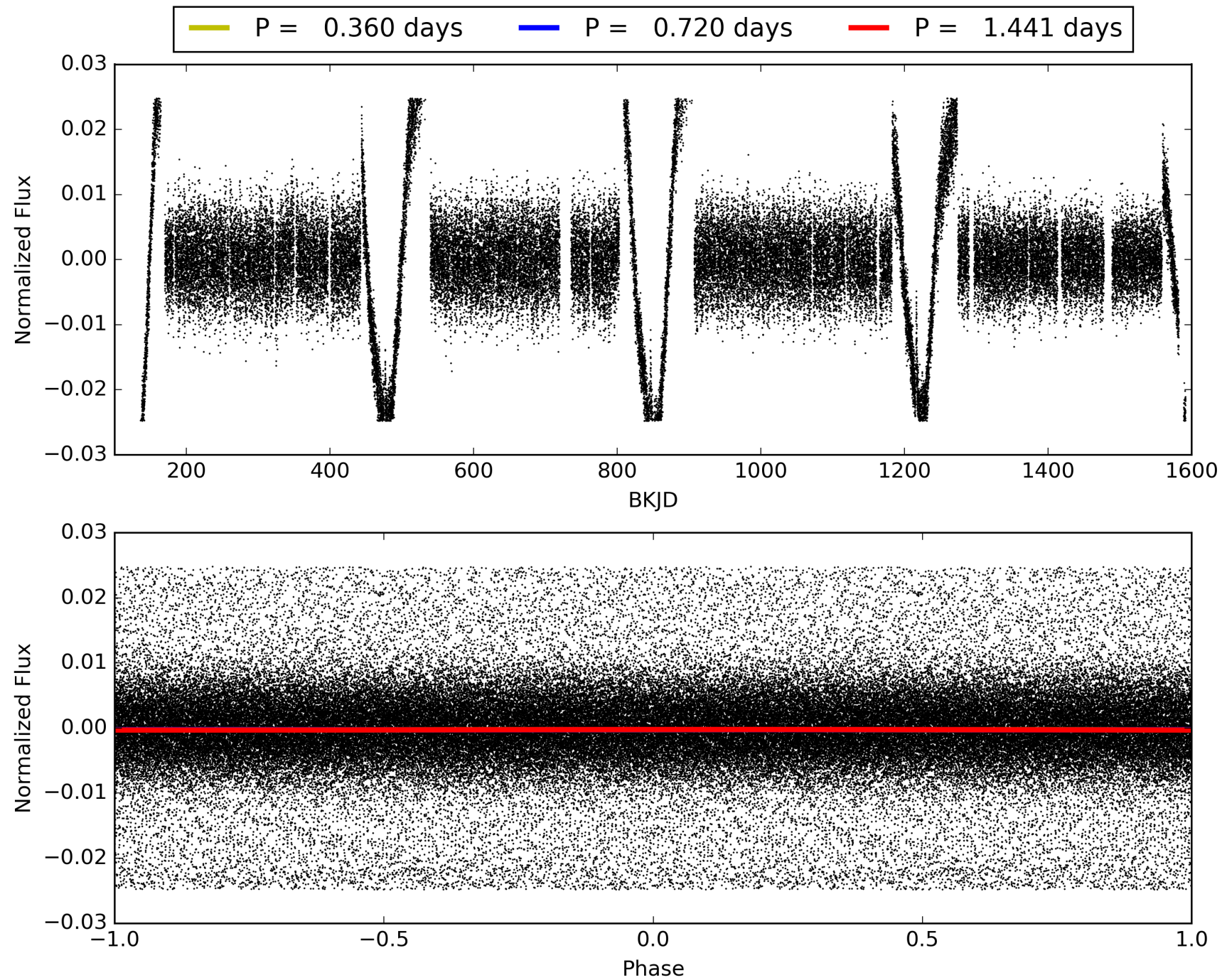
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005981039-01, PDC Light Curves



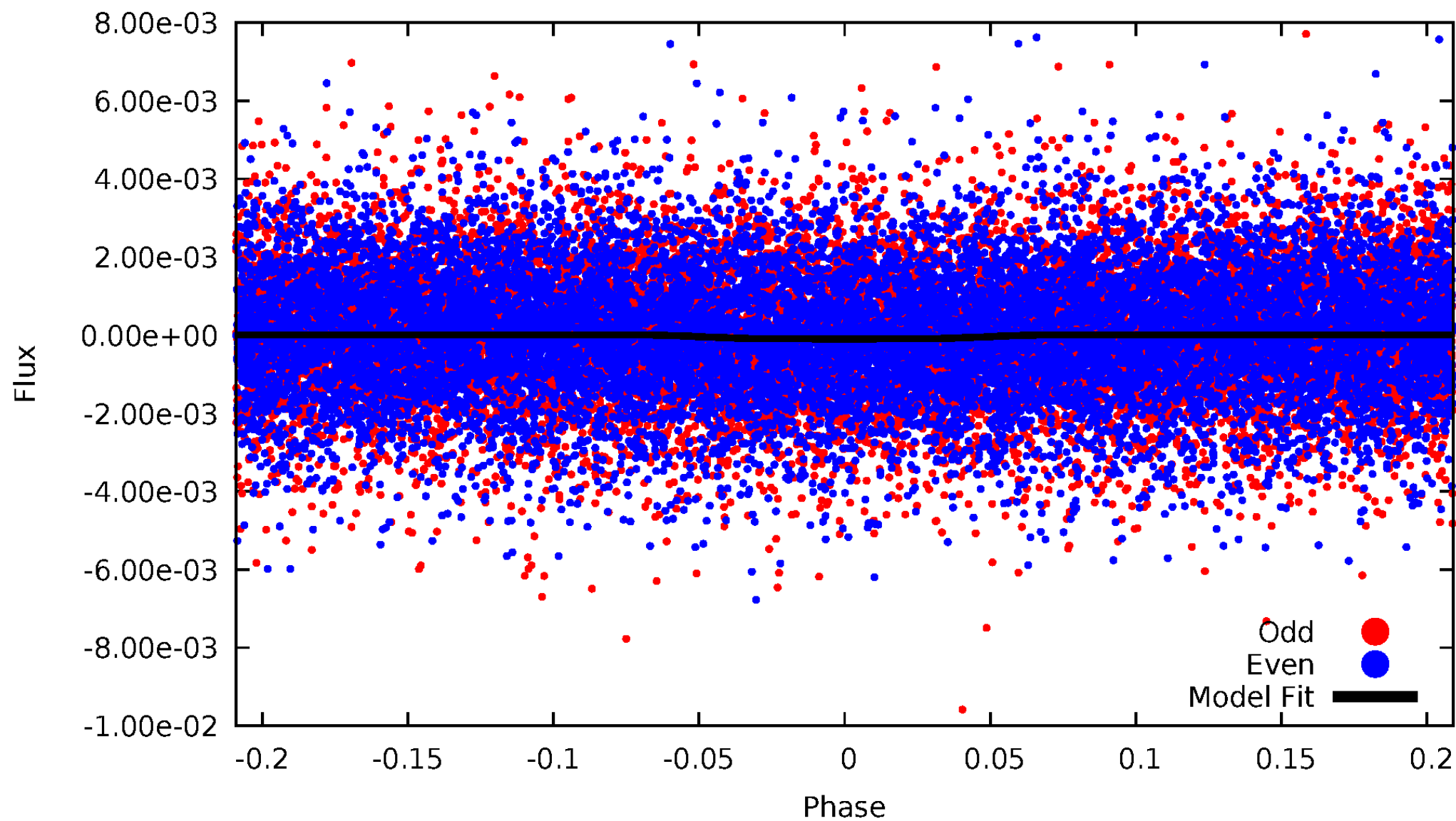


TCE 005981039-01



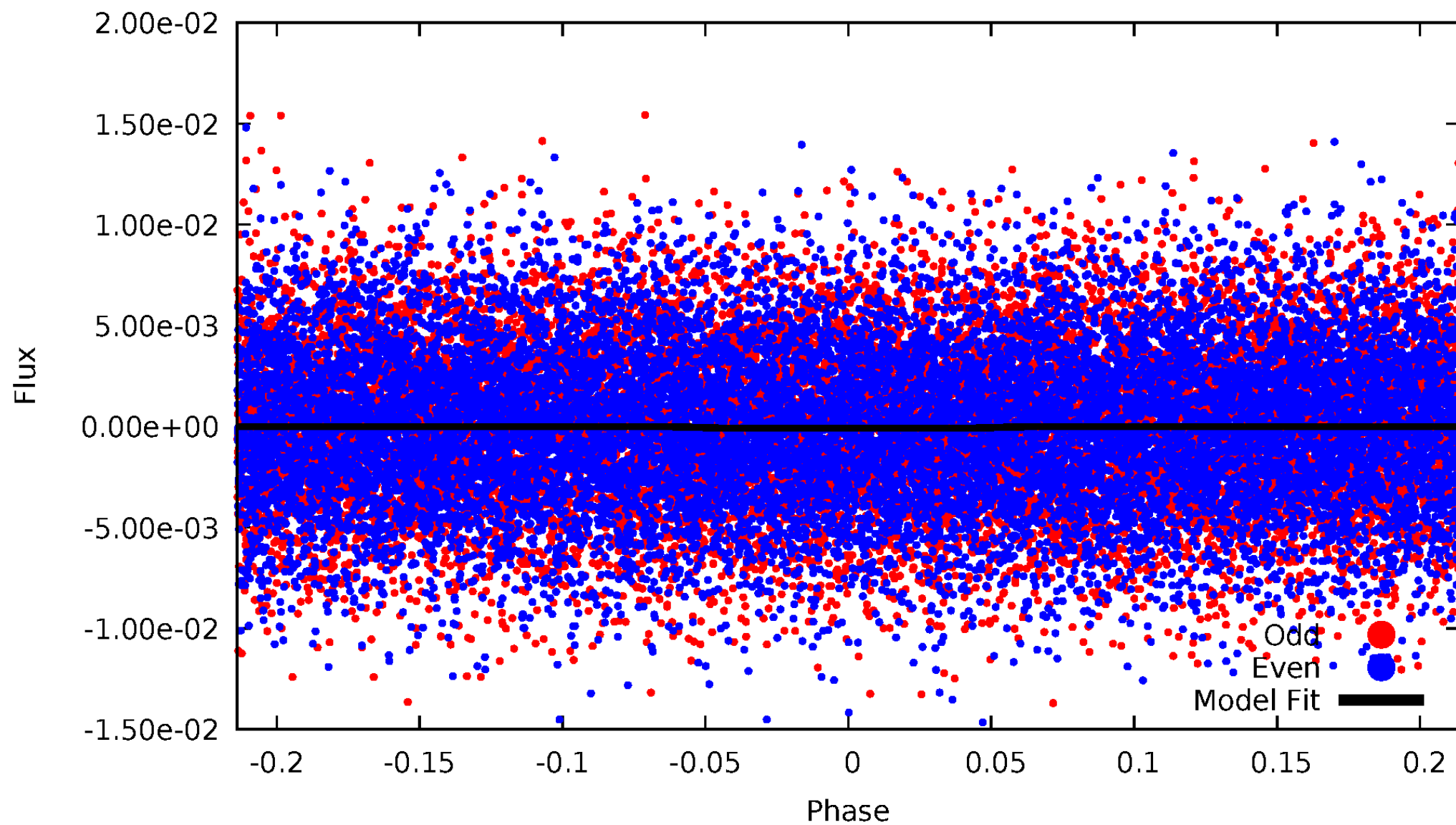
# DV Odd/Even

TCE 005981039-01



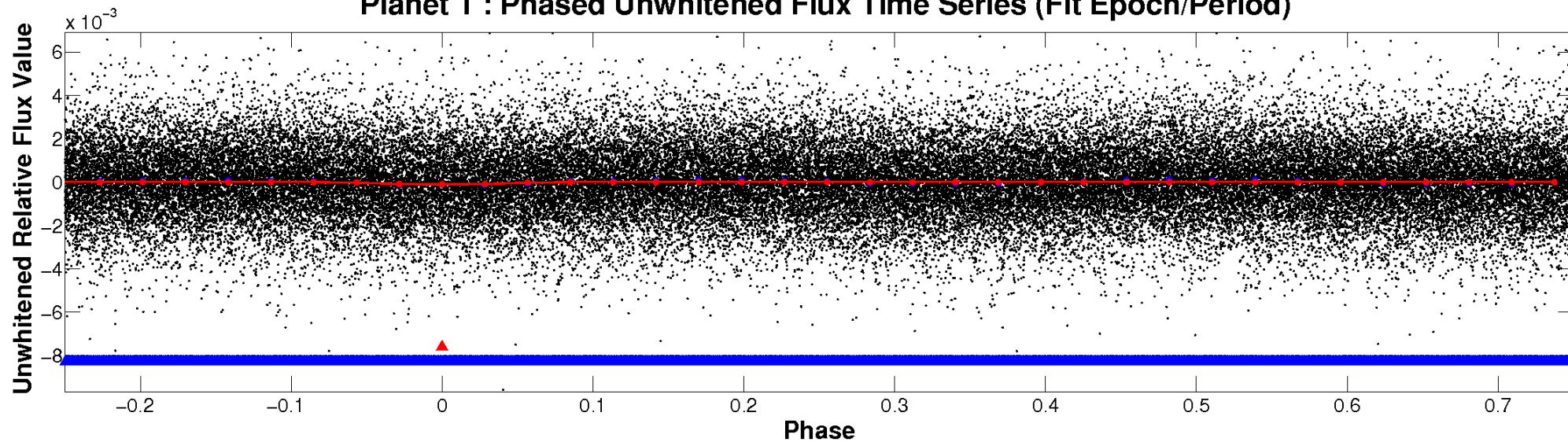
# ALT Odd/Even

TCE 005981039-01

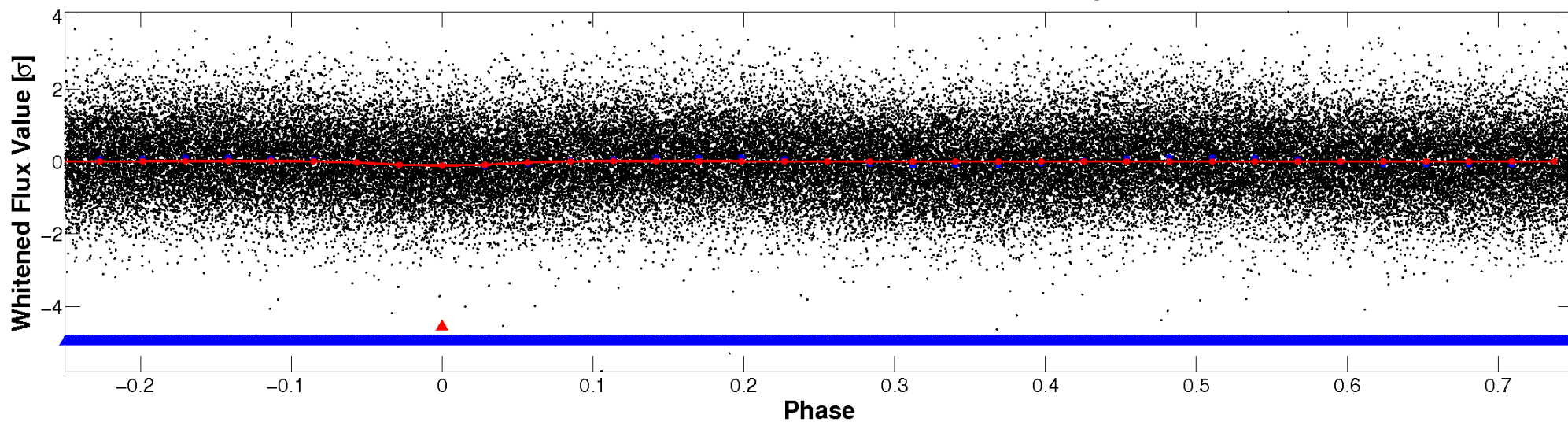


# Non-Whitened Vs. Whitened Light Curve

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



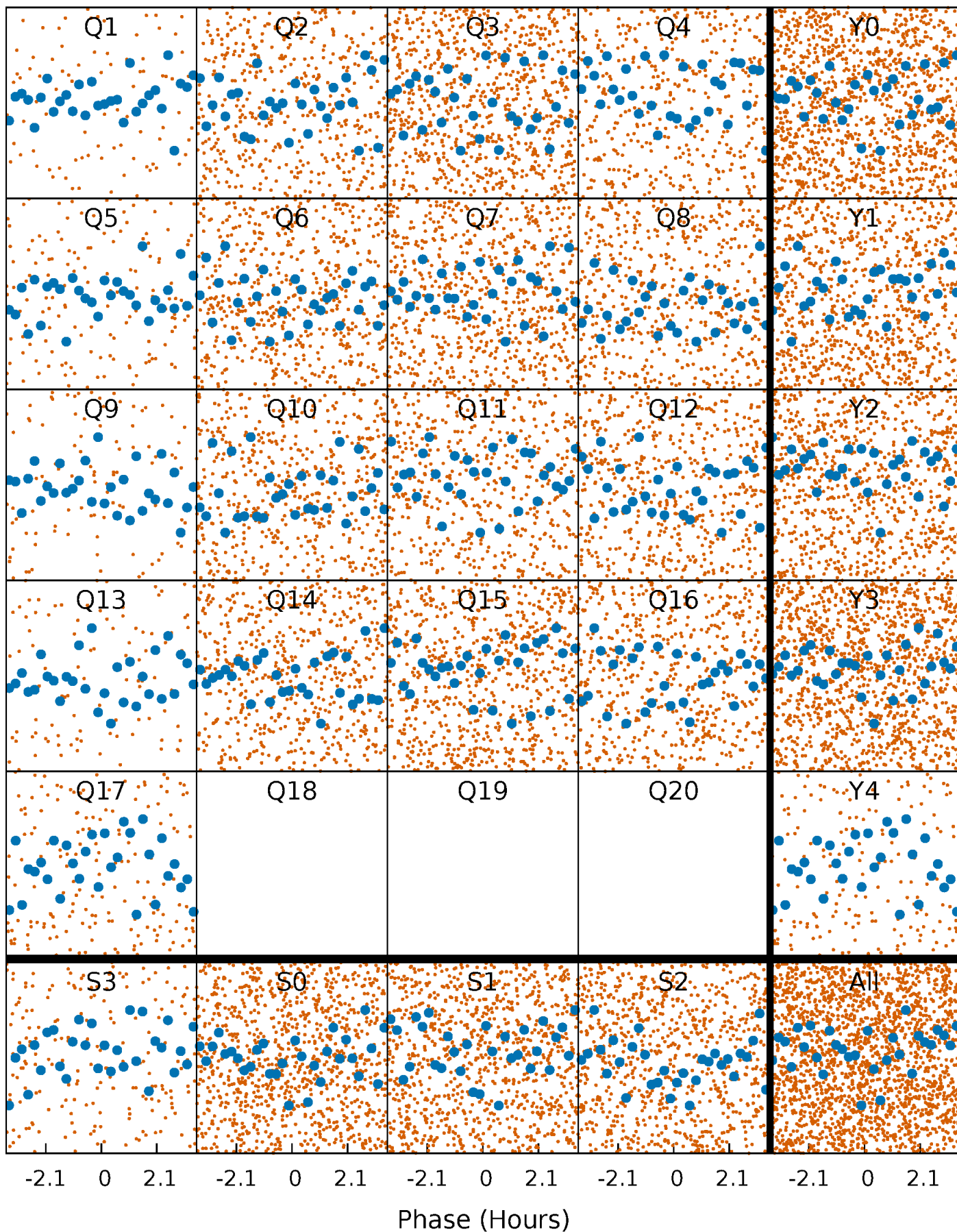
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

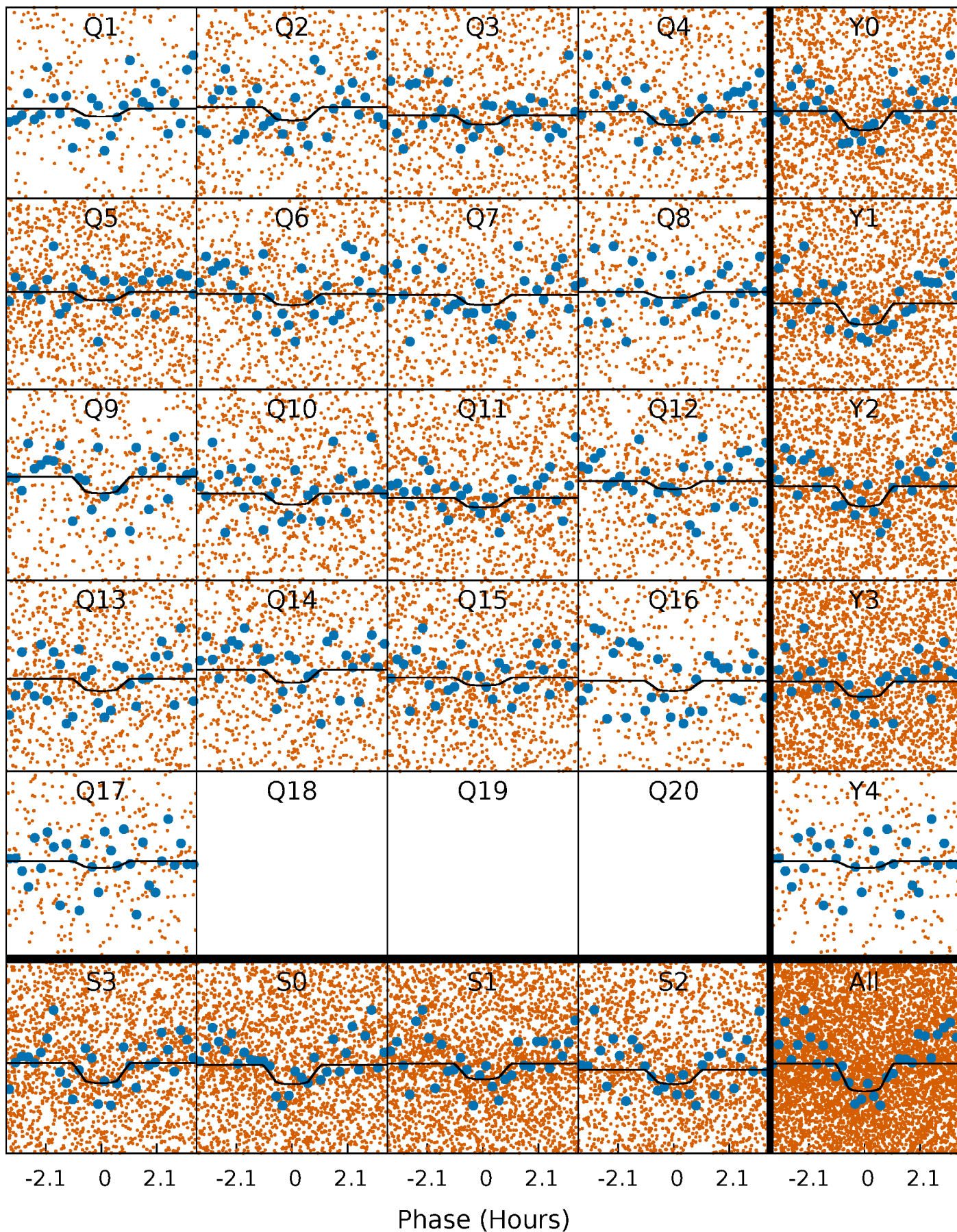
TCE 005981039-01 P= 0.720473 Days  $T_0=132.091007$  (BKJD)





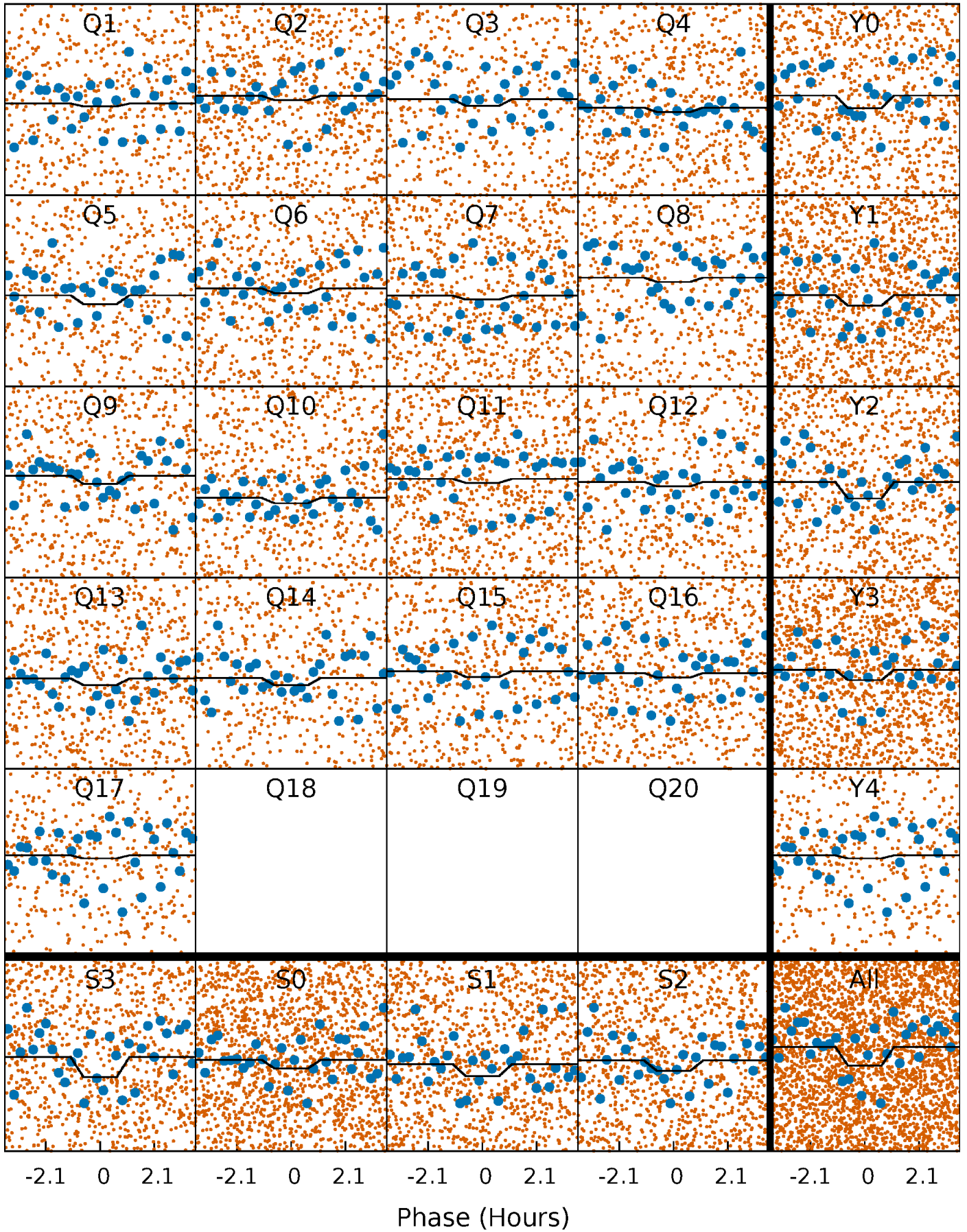
# DV Quarter-Phased Transit Curves

TCE 005981039-01 P= 0.720473 Days  $T_0=132.091007$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

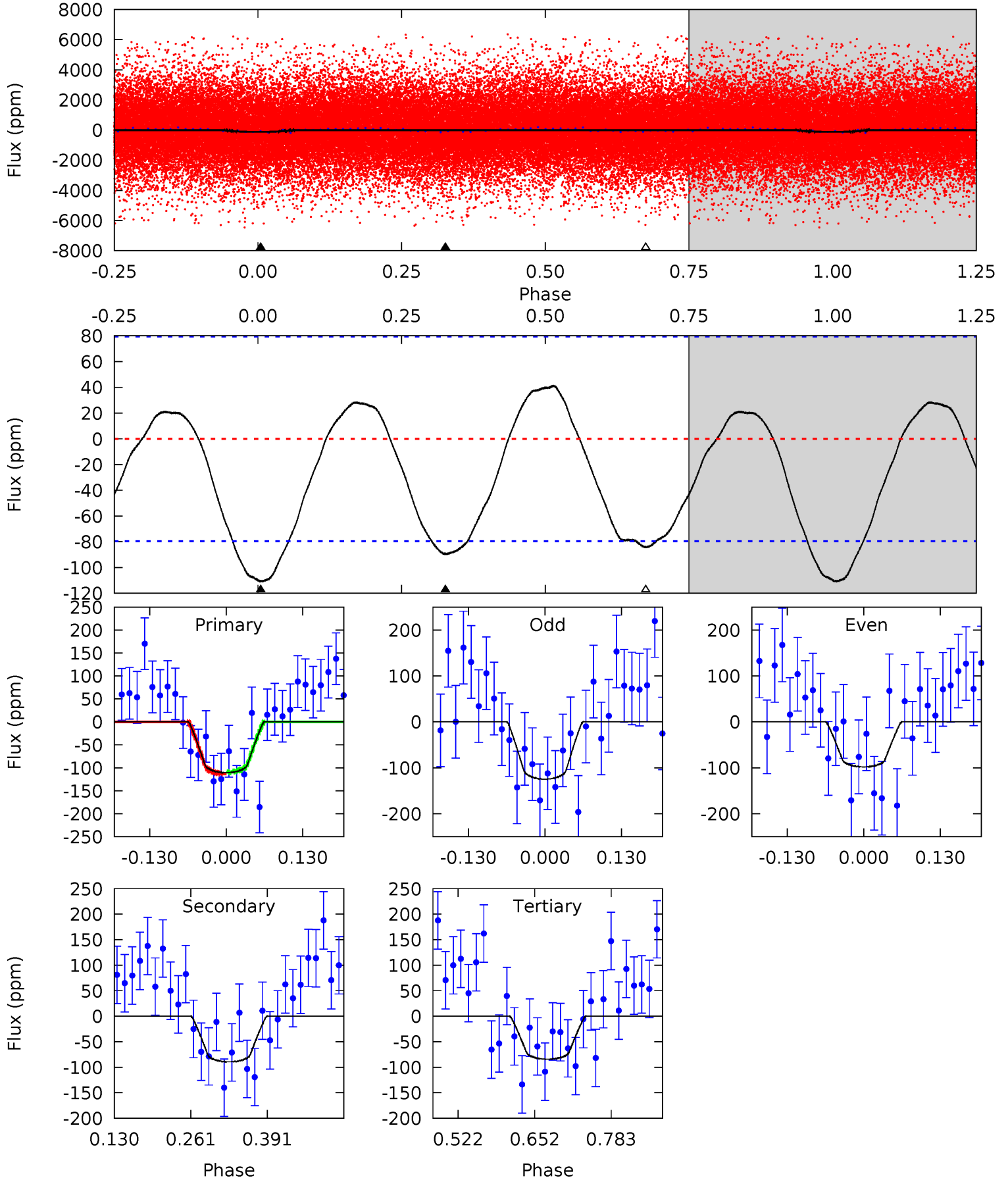
TCE 005981039-01 P= 0.720483 Days  $T_0=132.091002$  (BKJD)



# DV Model-Shift Uniqueness Test

005981039-01, P = 0.720473 Days, E = 131.370534 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
6.27	5.07	4.77	0	4.51	1.51	2.47	1.50	6.27	0.30	5.07	0.76	1.10	0.27	0.11

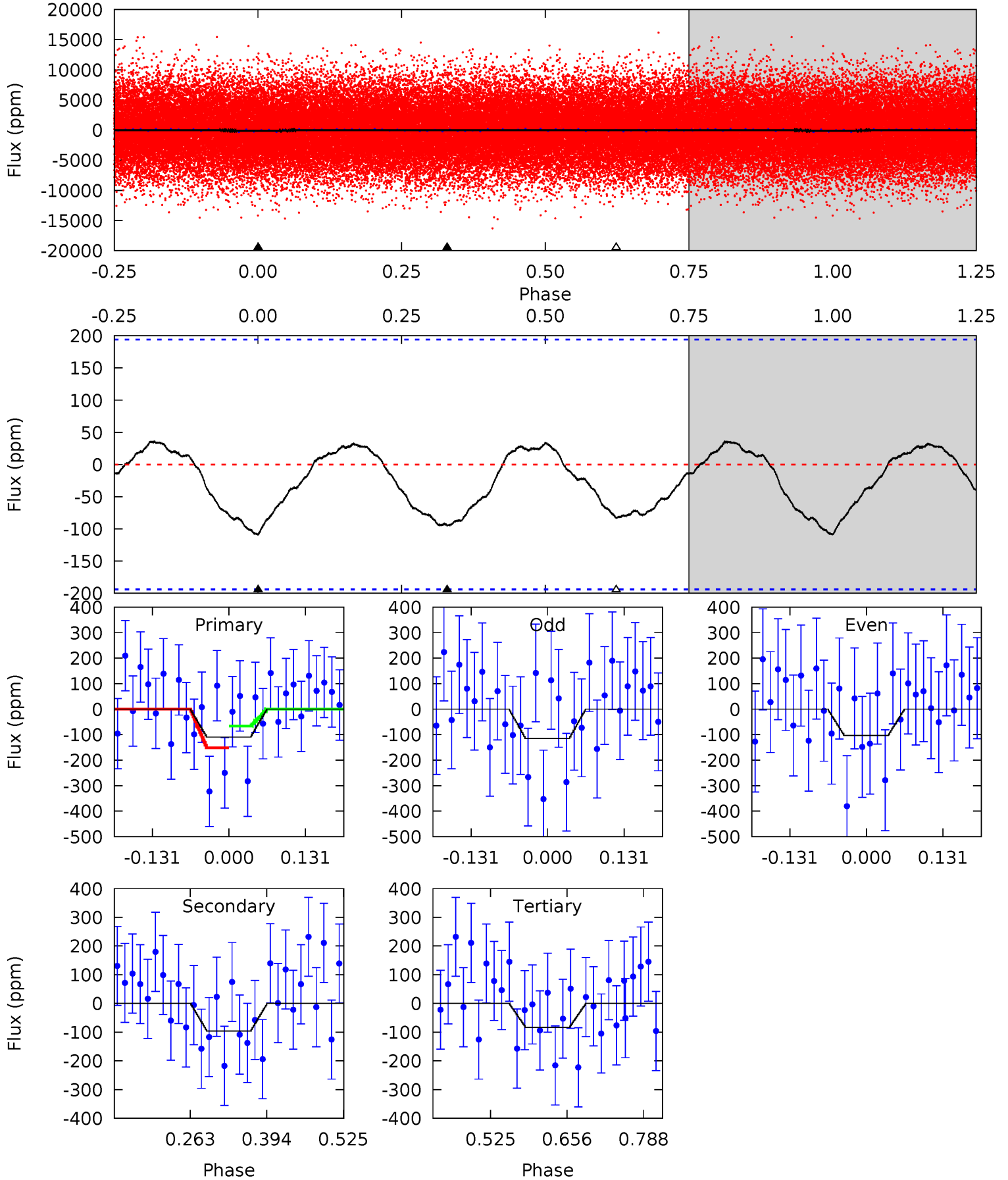




# Alt Model-Shift Uniqueness Test

005981039-01, P = 0.720483 Days, E = 131.370519 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
2.54	2.23	1.94	0	4.51	1.51	0.94	0.60	2.54	0.29	2.23	0.13	1.07	0.25	0.98





### Stellar Parameters For KIC 005981039

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7154^{+197}_{-310}$	$3.951^{+0.228}_{-0.152}$	$0.140^{+0.200}_{-0.300}$	$2.320^{+0.618}_{-0.680}$	$1.755^{+0.195}_{-0.293}$	$0.198^{+0.266}_{-0.084}$
	+3%/-4%	+6%/-4%	+143%/-214%	+27%/-29%	+11%/-17%	+134%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005981039-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-89 \pm 18$	$3.10^{+2.58}_{-1.95}$	$4840^{+365}_{-395}$	$5884^{+5183}_{-1848}$	$1.851^{+11.061}_{-1.331}$
Alt.	$-96 \pm 43$	$2.91^{+2.50}_{-1.70}$	$4787^{+396}_{-355}$	$5938^{+4823}_{-2097}$	$1.991^{+10.206}_{-1.496}$

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

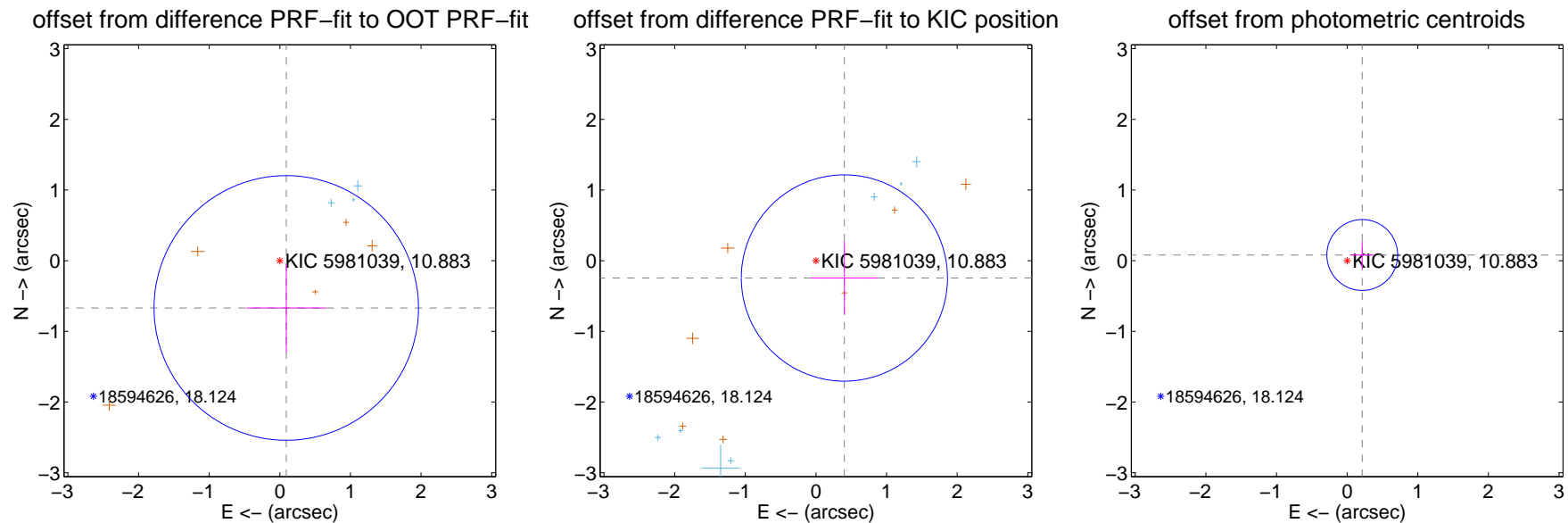
## DV Centroid Data

Supplemental centroid analysis for 005981039-01. **Kepler magnitude: 10.88.** Transit SNR 7.20

There are 9 quarters with good PRF difference image offsets

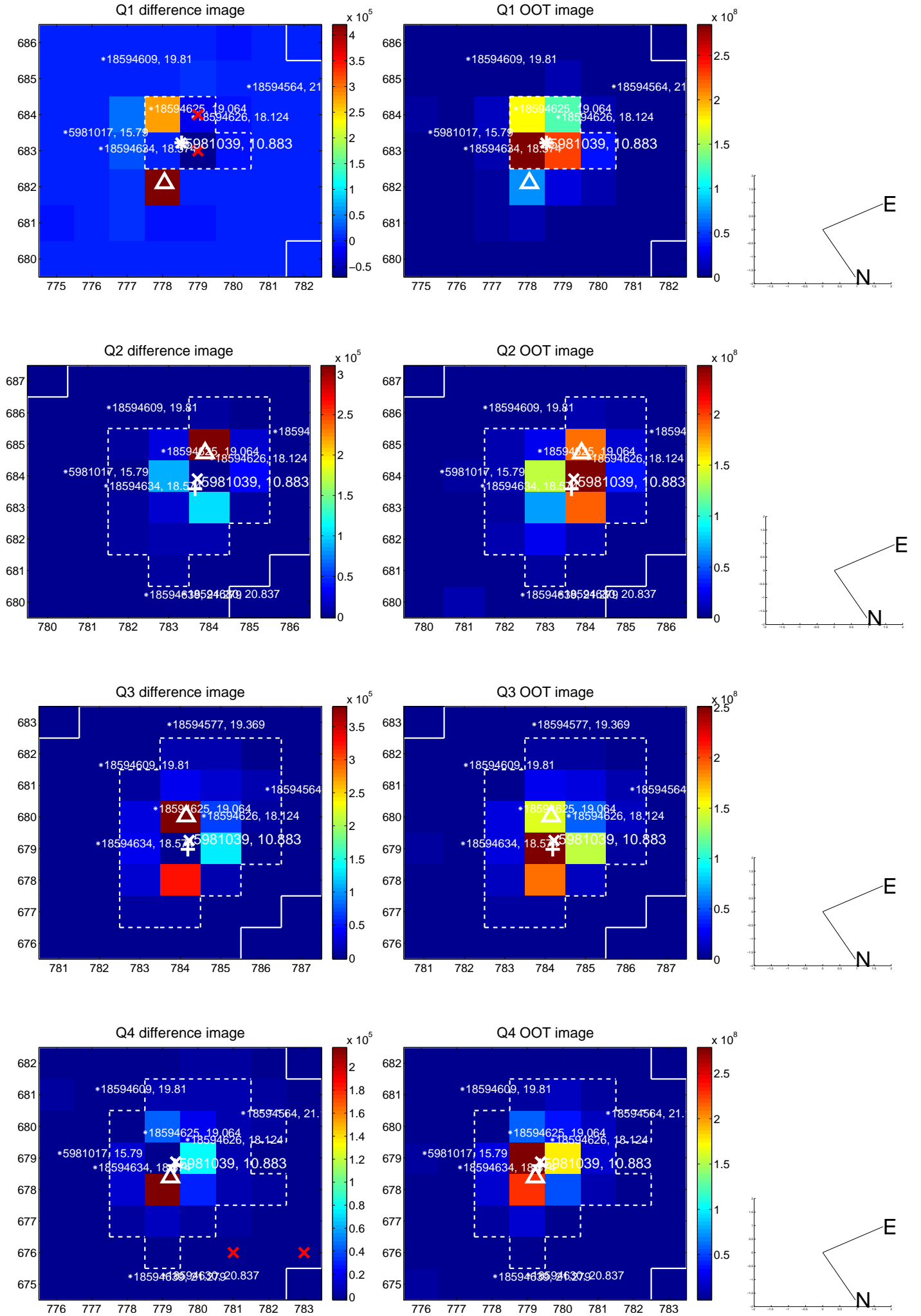
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.675 \pm 0.624$	1.08	$-0.092 \pm 0.565$	$-0.669 \pm 0.625$
PRF-fit source offset from KIC position	$0.472 \pm 0.487$	0.97	$-0.403 \pm 0.474$	$-0.245 \pm 0.518$
photometric centroid source offset	$0.23 \pm 0.17$	1.37	$-0.21 \pm 0.16$	$0.08 \pm 0.19$

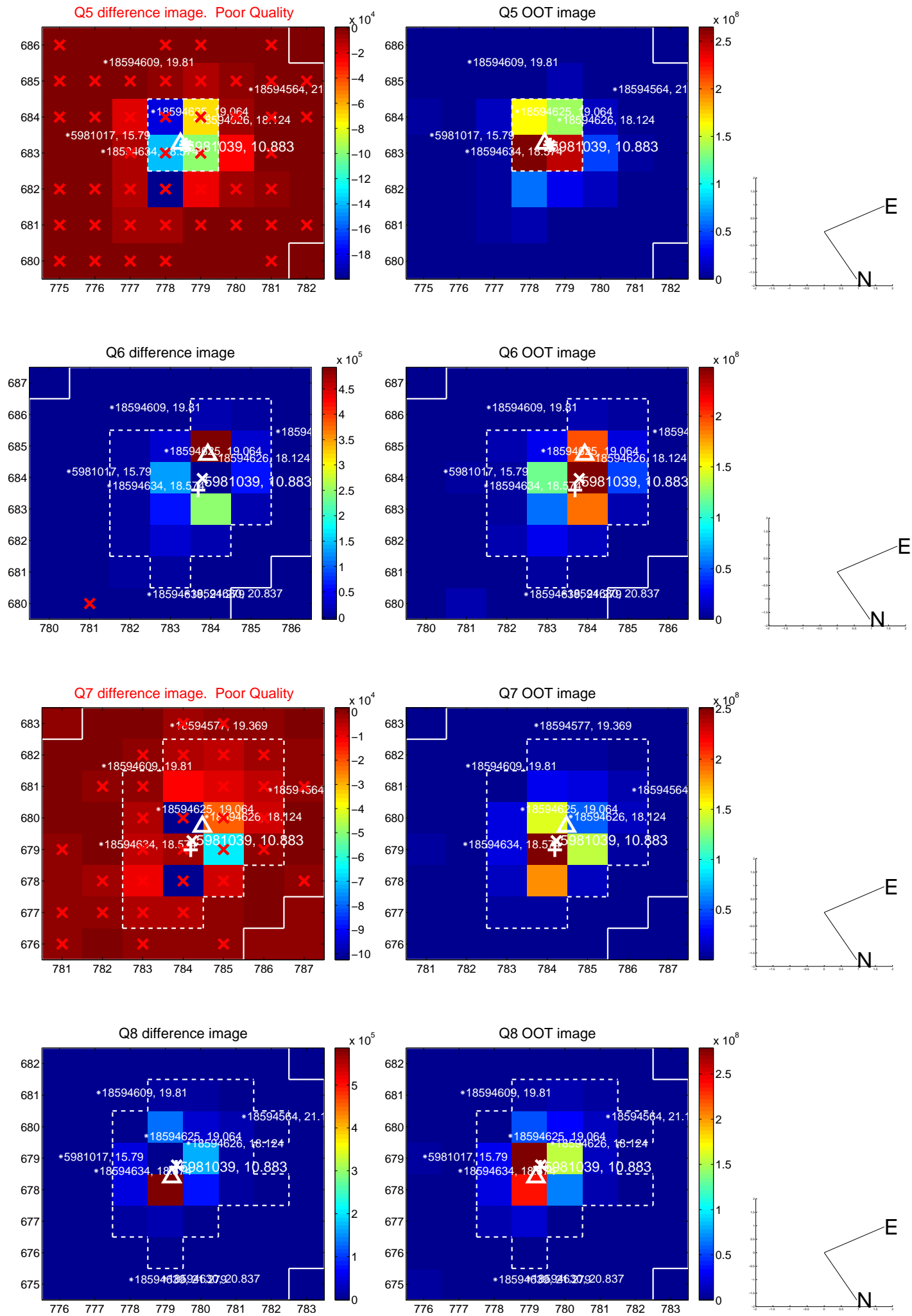


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

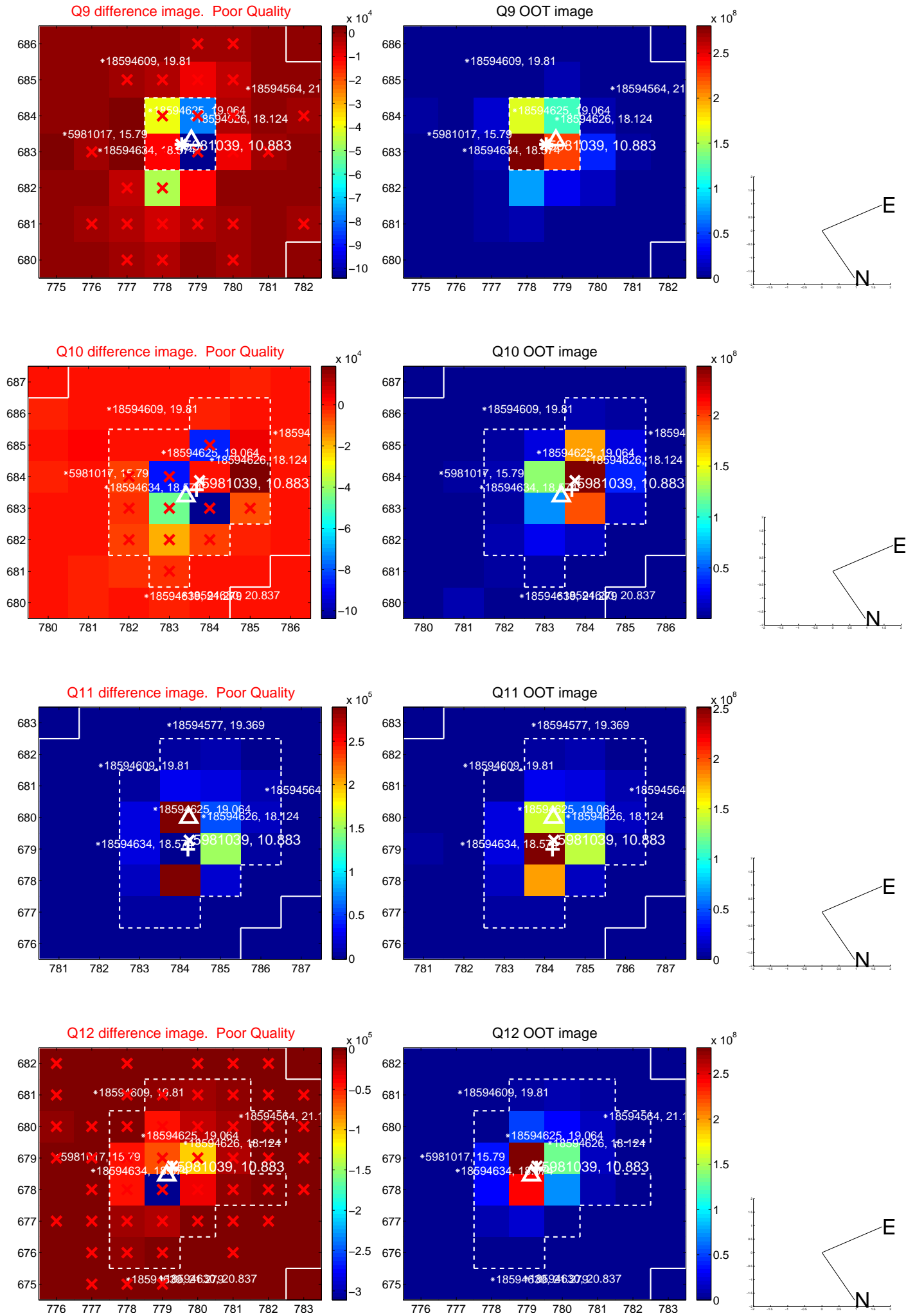


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

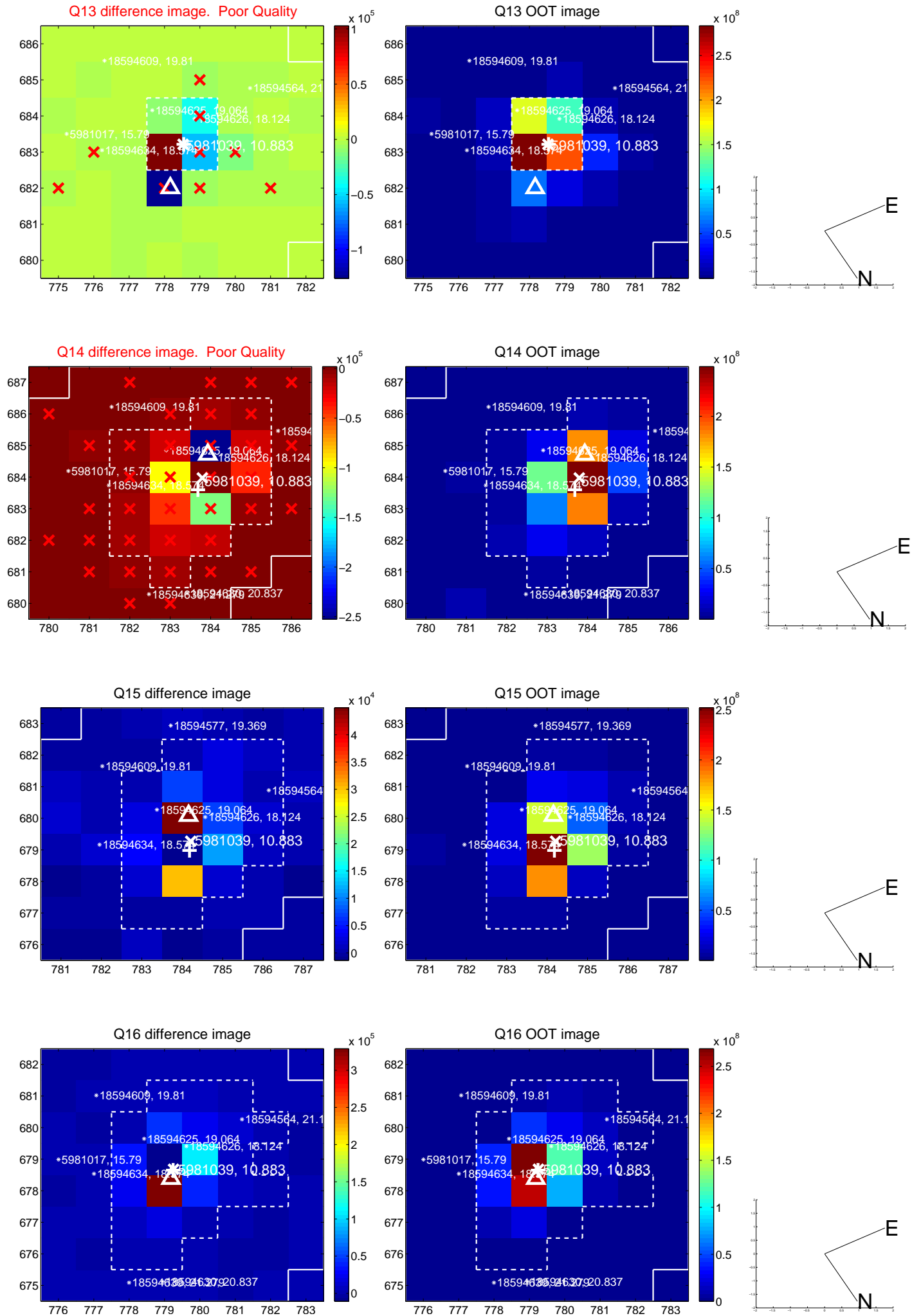




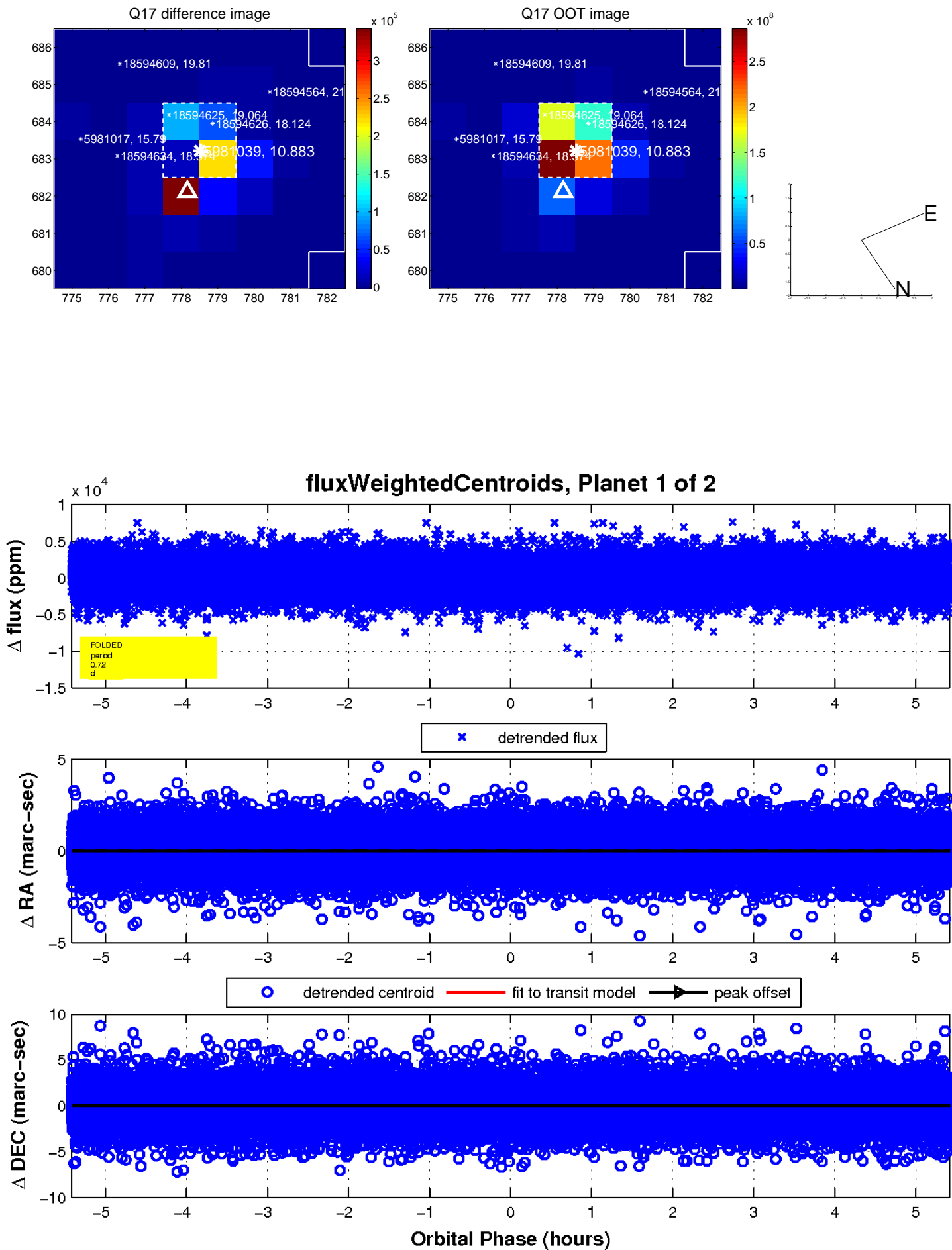
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

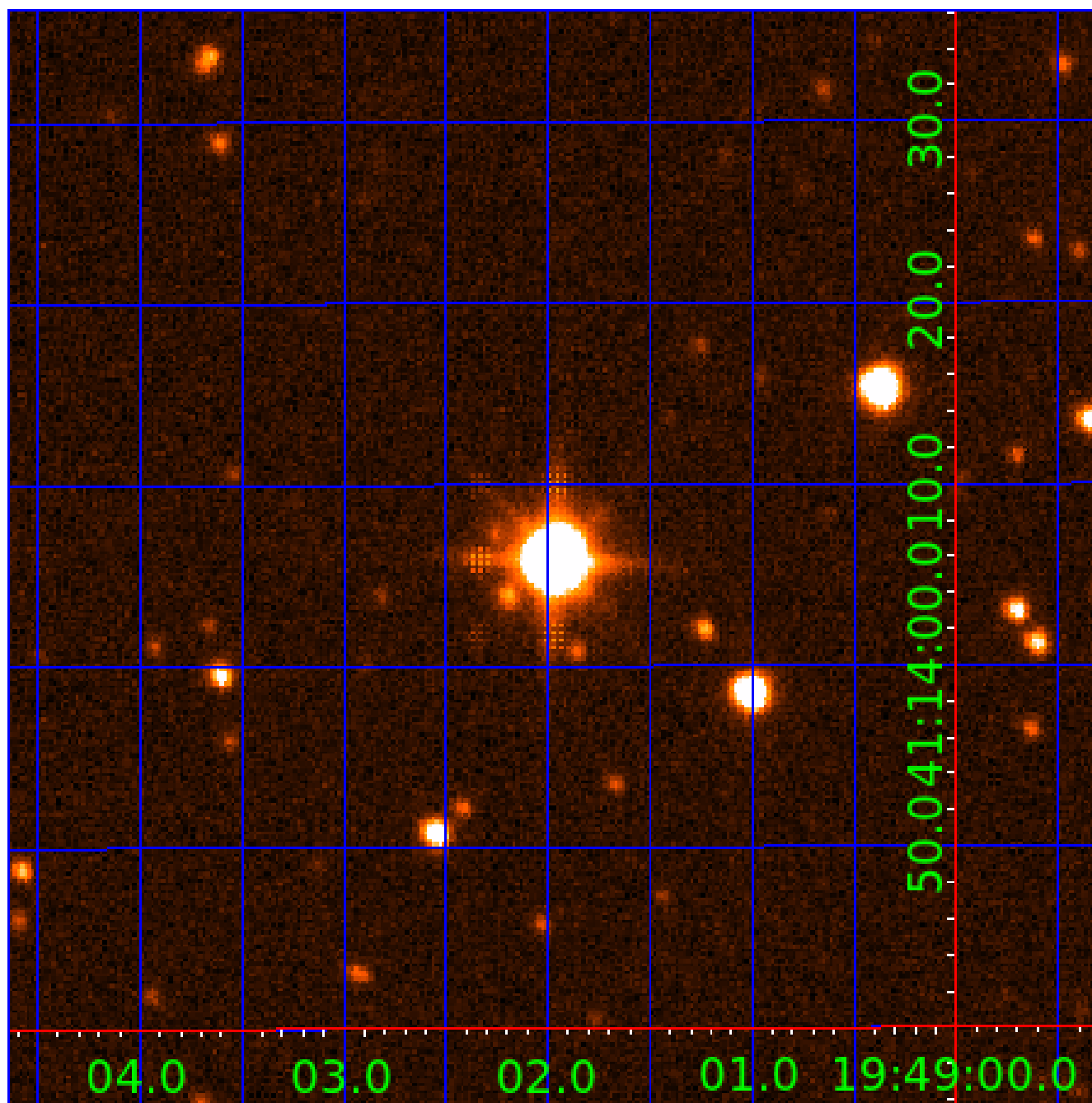


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005981039

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005981039-01	OBS	No	0.720473	132.091007	97.5	1.806	9.8	7.2	2.32	7154	2.65	35096.07
005981039-02	OBS	No	1.067775	132.462682	174.5	12.813	8.0	14.2	2.32	7154	3.96	20770.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005981039-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005981039-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

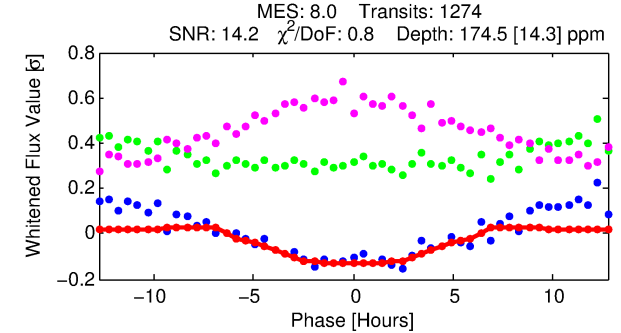
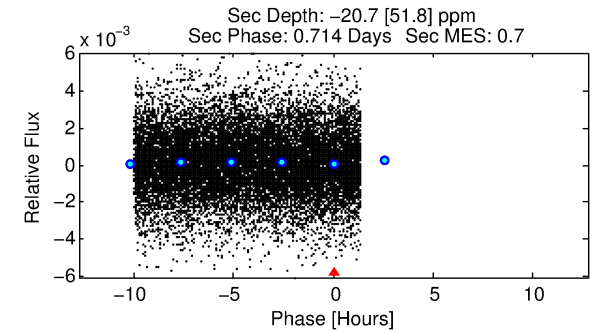
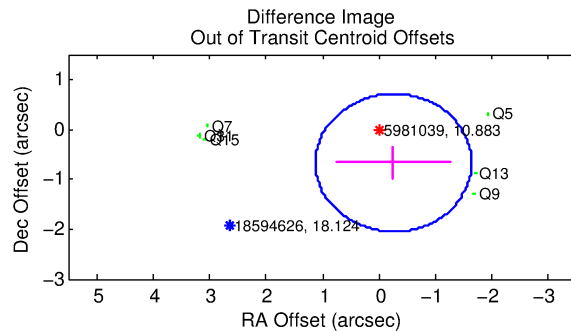
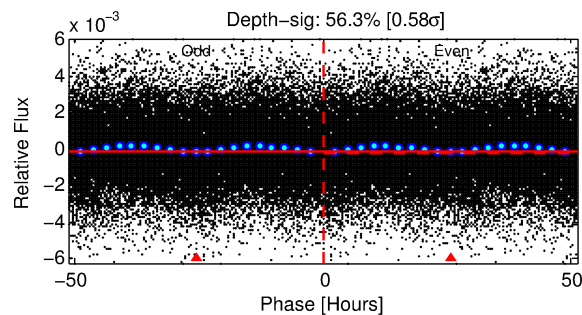
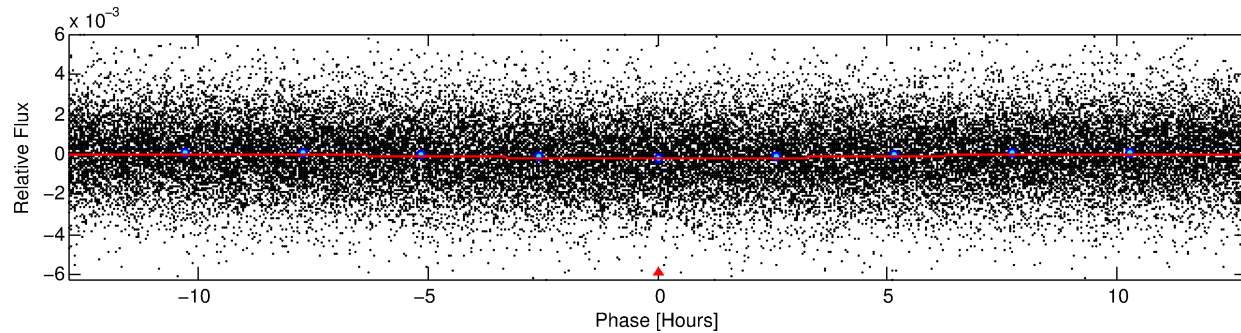
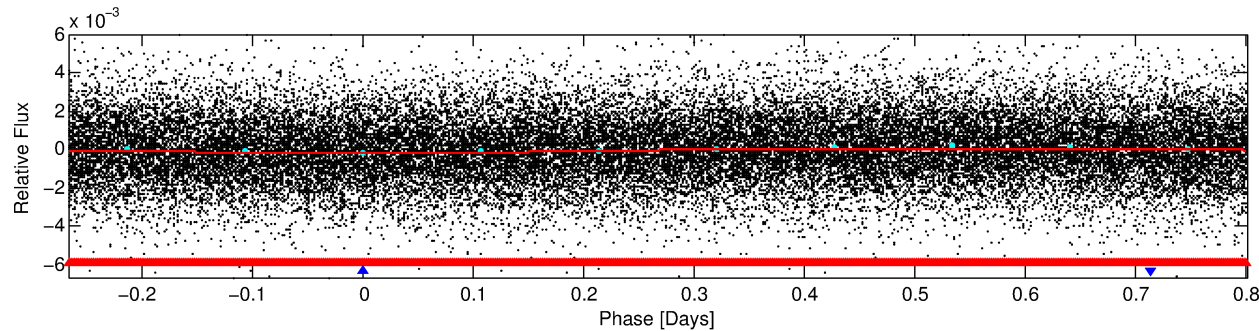
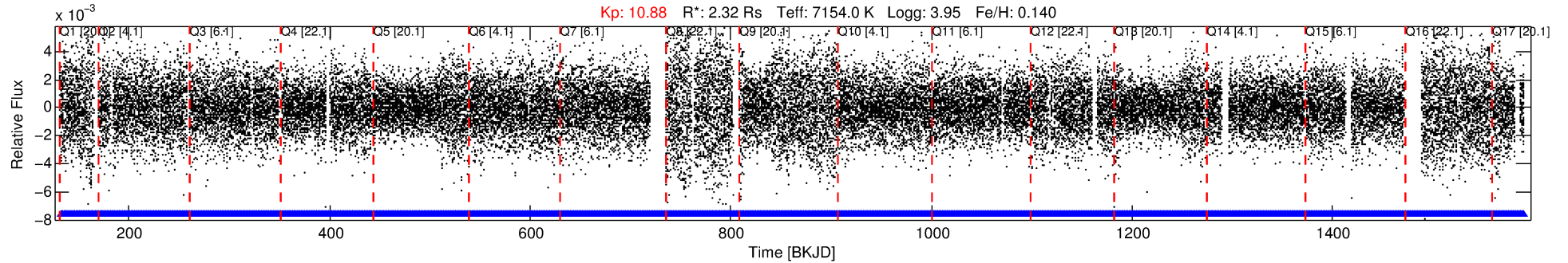
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005981039-02

No Significant Match Found

# DV One-Page Summary

KIC: 5981039 Candidate: 2 of 2 Period: 1.068 d



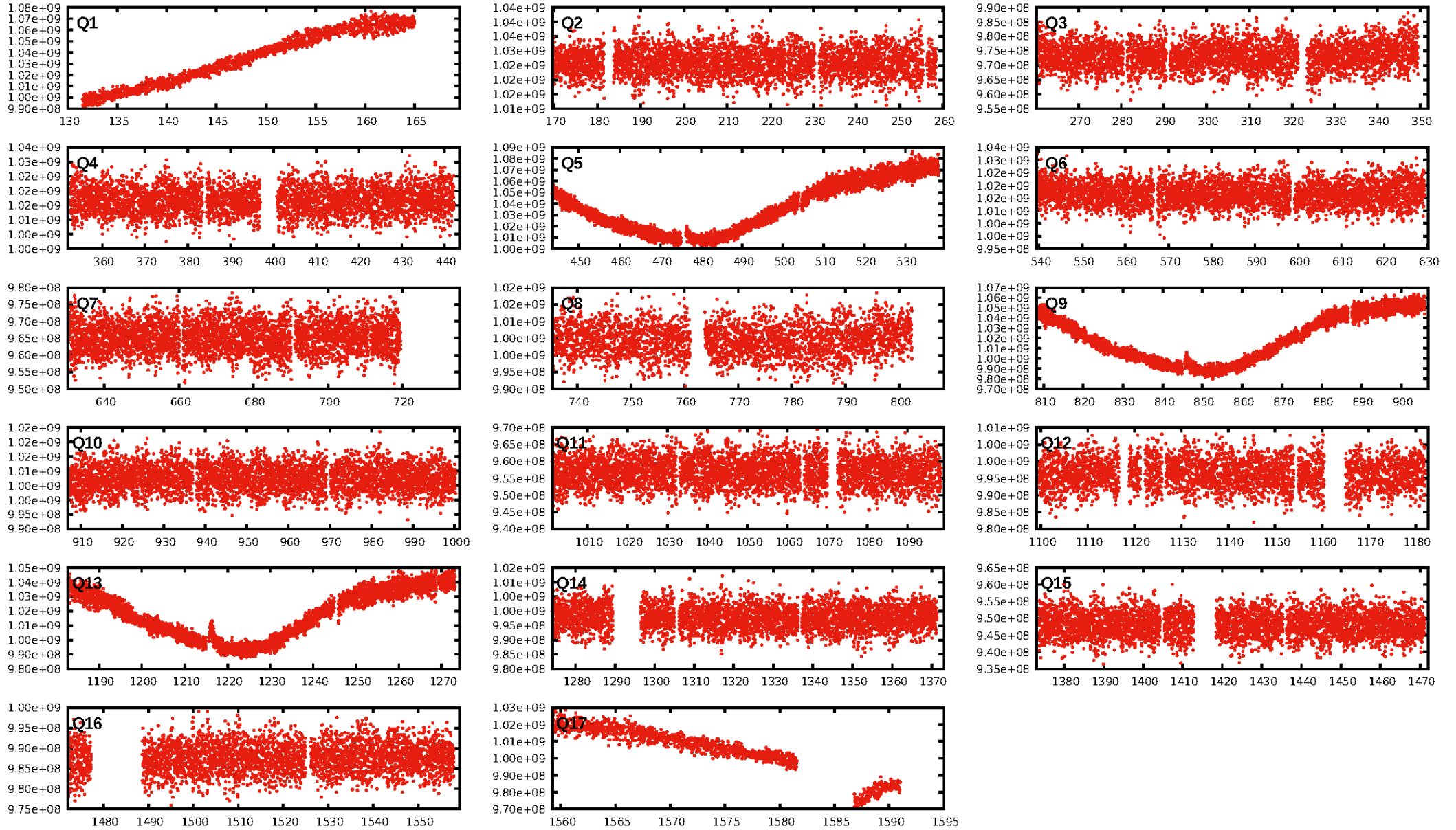
## DV Fit Results:

Period = 1.06777 [0.00002] d  
Epoch = 132.4627 [0.0112] BKJD  
 $R_p/R^* = 0.0157$  [0.0008]  
 $a/R^* = 1.00$  [0.00]  
 $b = 0.98$  [0.01]  
 $\text{Seff} = 20770.29$  [9070.70]  
 $T_{\text{eq}} = 3061$  [334] K  
 $R_p = 3.97$  [1.18]  $R_{\text{e}}$   
 $a = 0.0247$  [0.0065] AU  
 $\text{Ag} = \text{N/A}$   
 $T_{\text{effp}} = \text{N/A}$

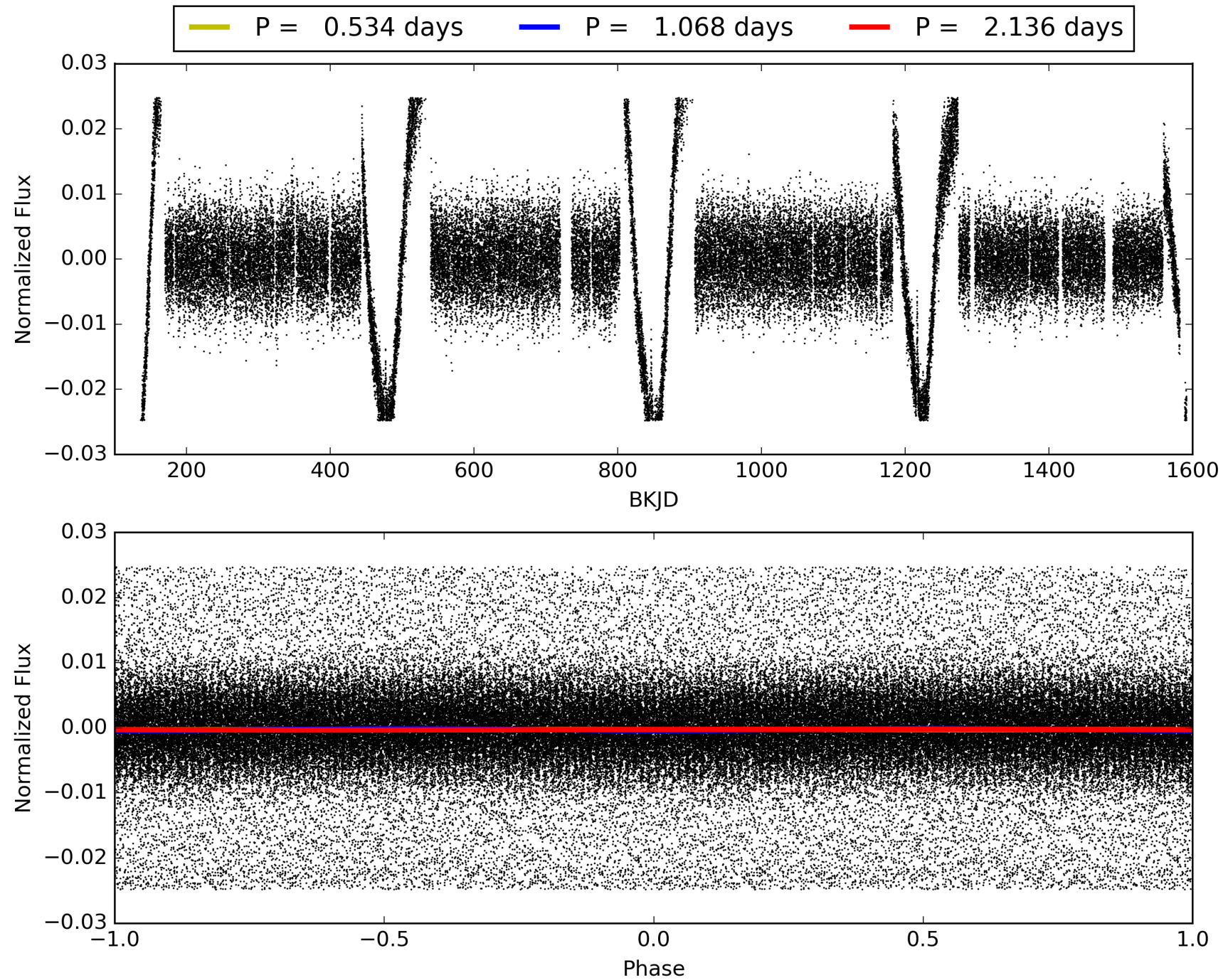
## DV Diagnostic Results:

ShortPeriod-sig: 48.1% [0.64 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1216/1216]  
GhostDiagnostic-chr: 1.017  
Centroid-sig: 0.0%  
Centroid-so: 0.143 arcsec [2.26 $\sigma$ ]  
OotOffset-rm: 0.720 arcsec [1.57 $\sigma$ ]  
KicOffset-rm: 0.687 arcsec [1.16 $\sigma$ ]  
OotOffset-st: 0/4/0/3 [7]  
KicOffset-st: 0/4/0/3 [7]  
DiffImageQuality-fgm: 1.00 [7/7]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 005981039-02, PDC Light Curves



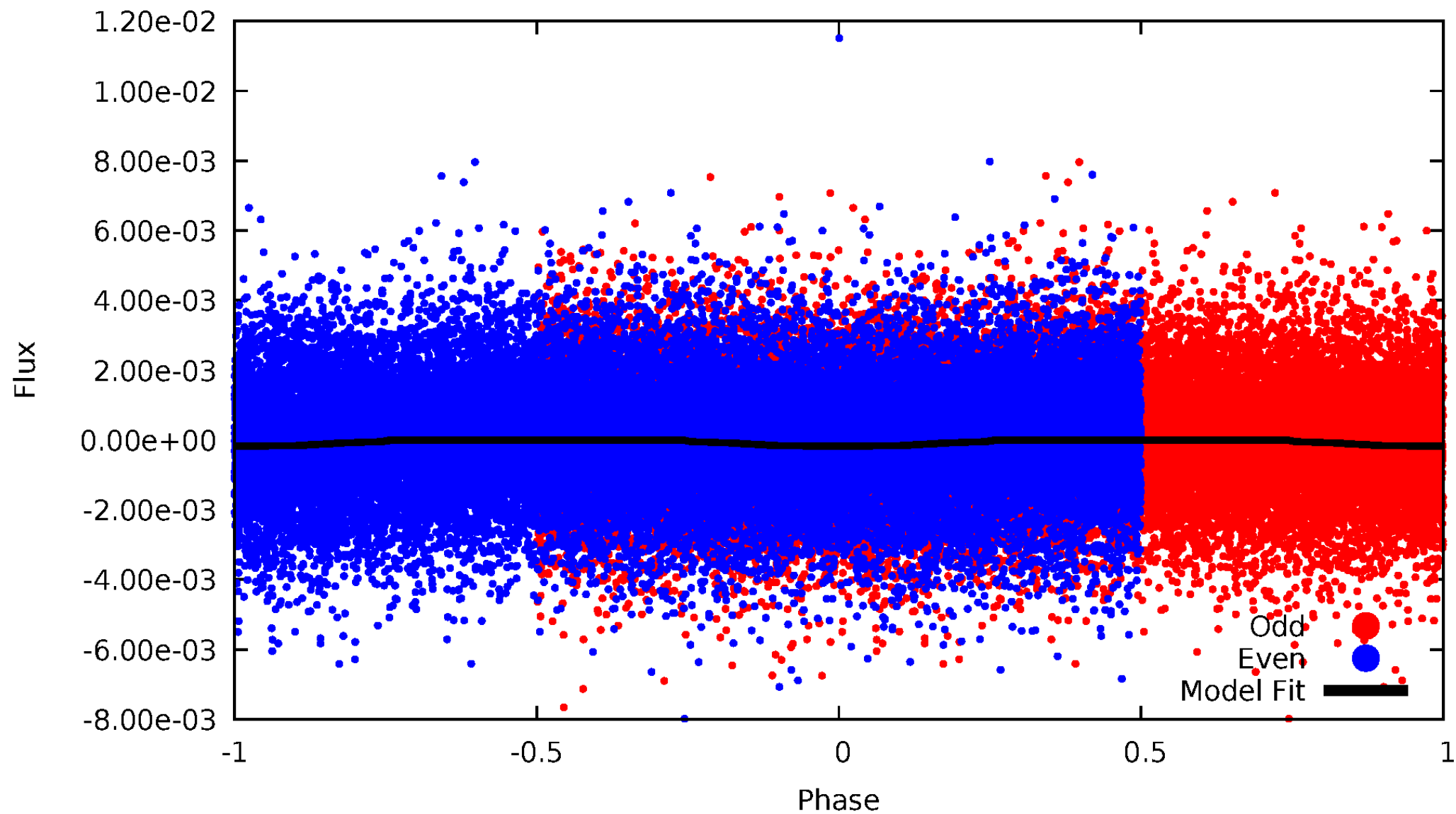
TCE 005981039-02





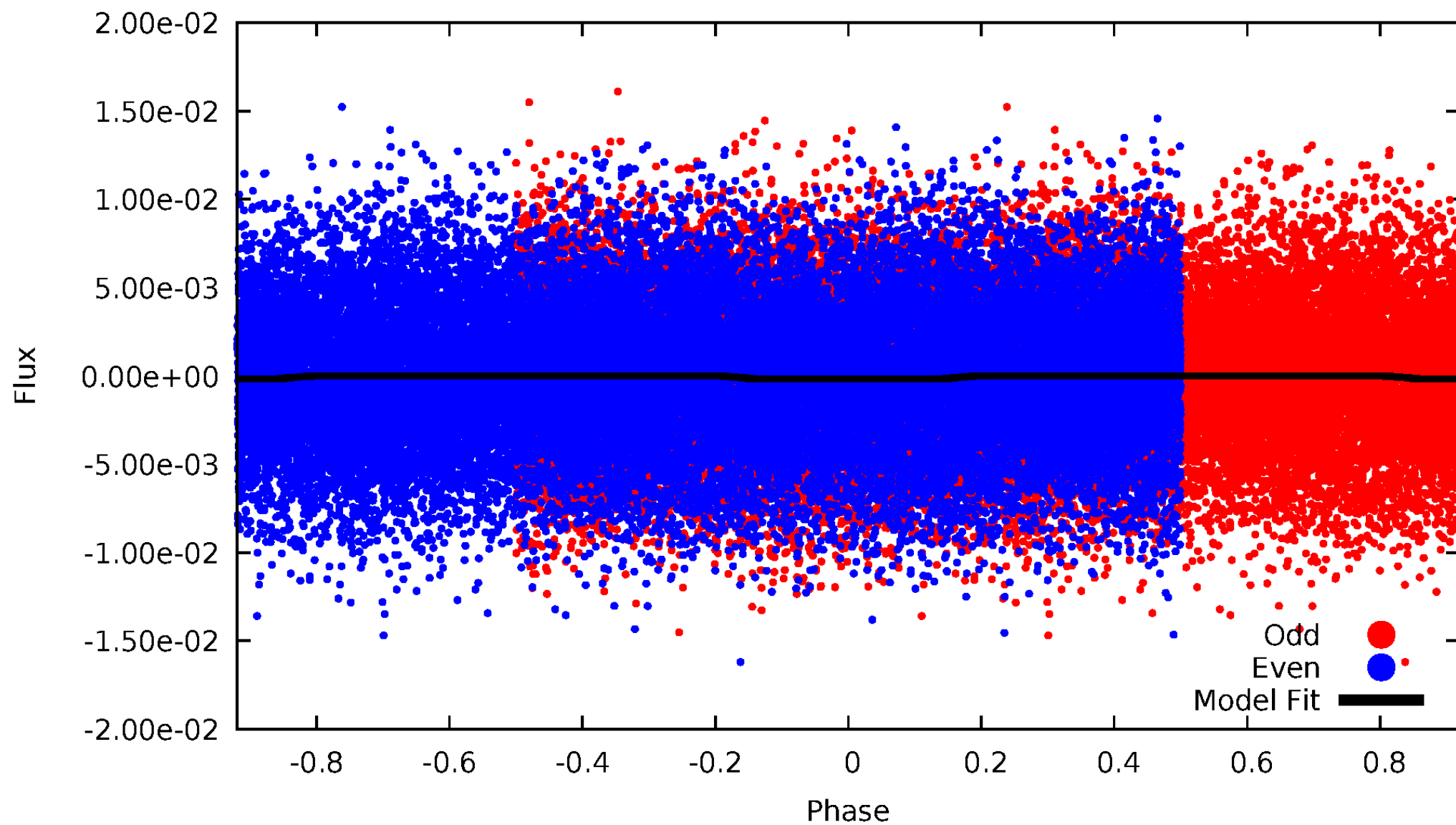
# DV Odd/Even

TCE 005981039-02



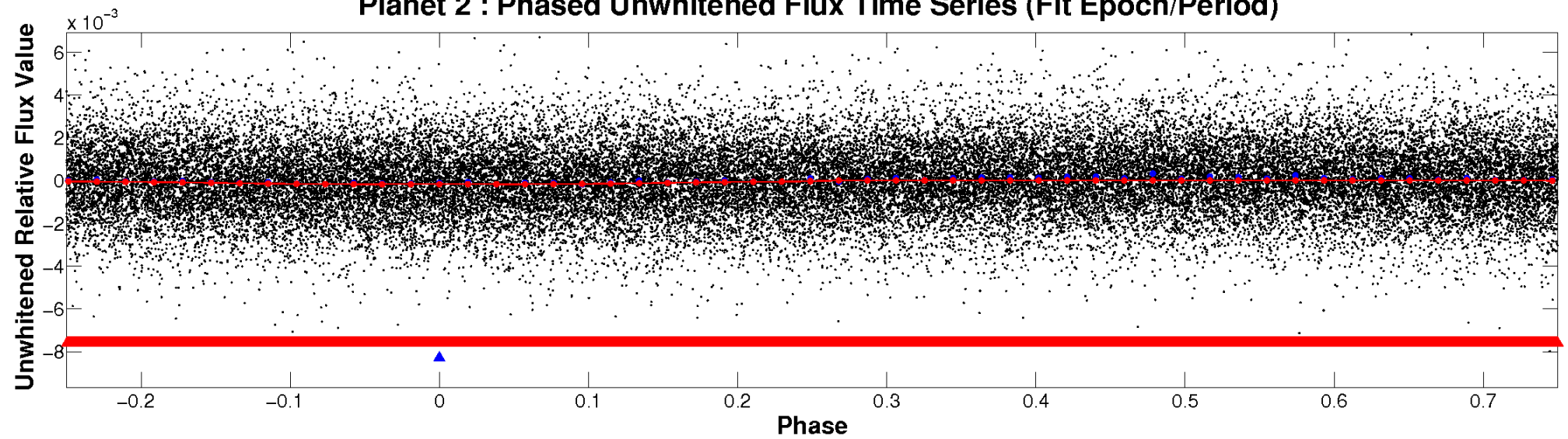
# ALT Odd/Even

TCE 005981039-02

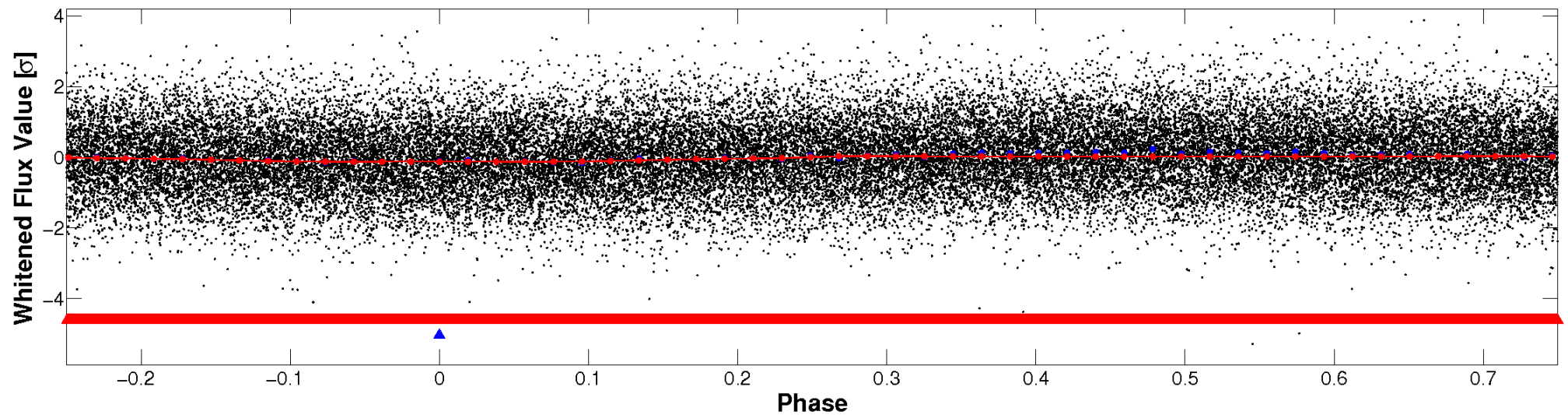


# Non-Whitened Vs. Whitened Light Curve

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

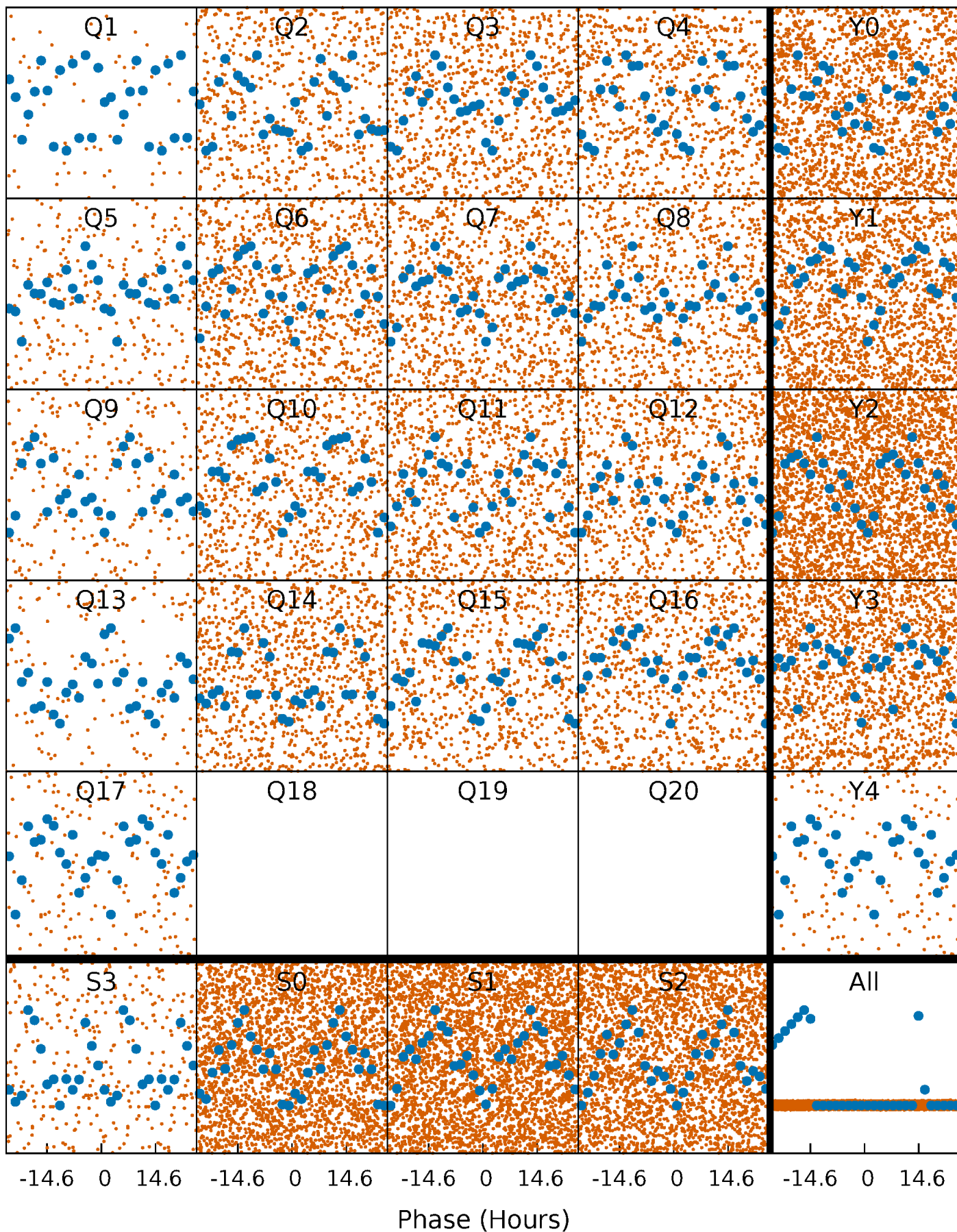


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

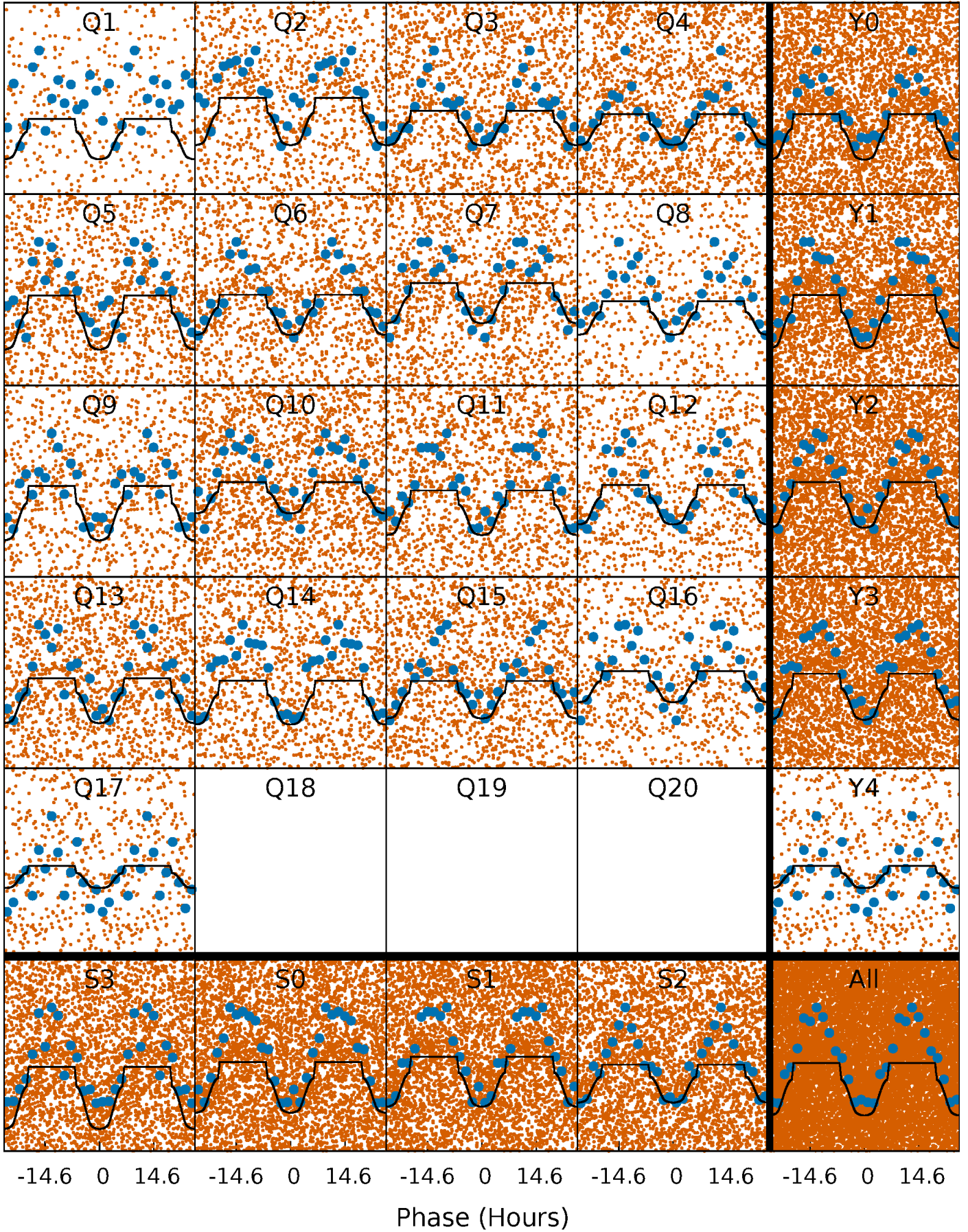
TCE 005981039-02   P= 1.067775 Days    $T_0=132.462682$  (BKJD)





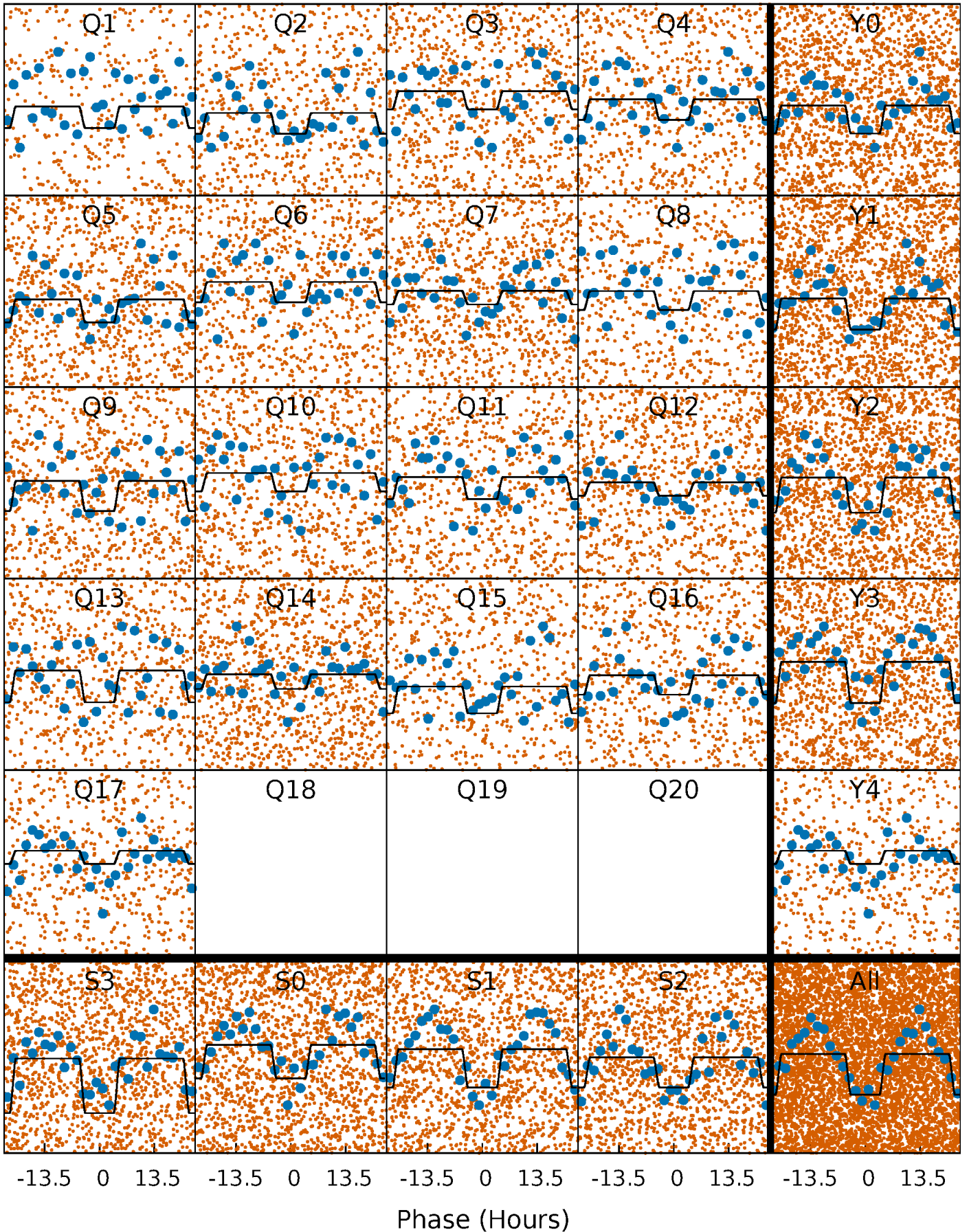
# DV Quarter-Phased Transit Curves

TCE 005981039-02   P= 1.067775 Days    $T_0=132.462682$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005981039-02 P= 1.067808 Days  $T_0=132.437620$  (BKJD)

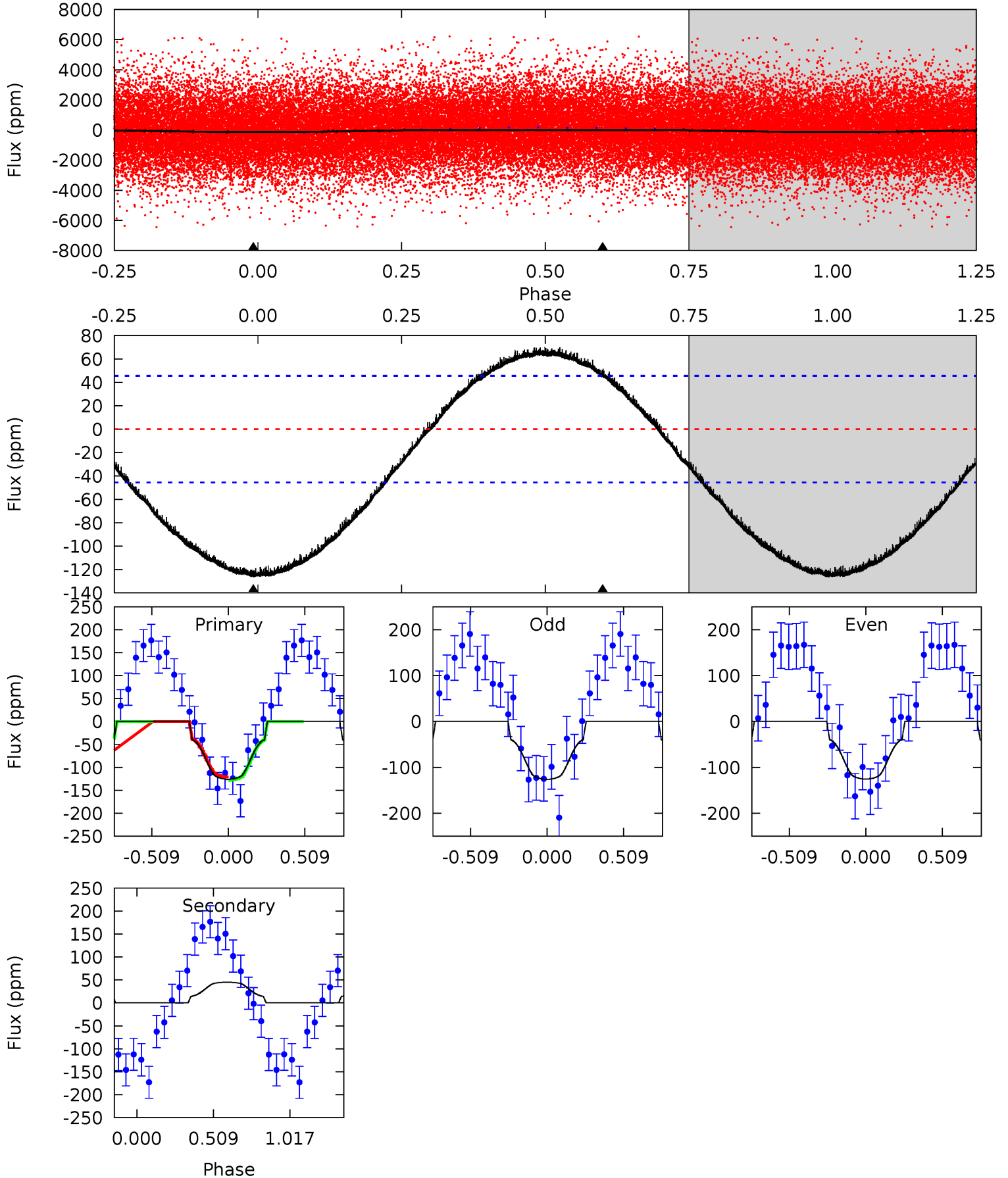




# DV Model-Shift Uniqueness Test

005981039-02, P = 1.067775 Days, E = 131.394907 Days

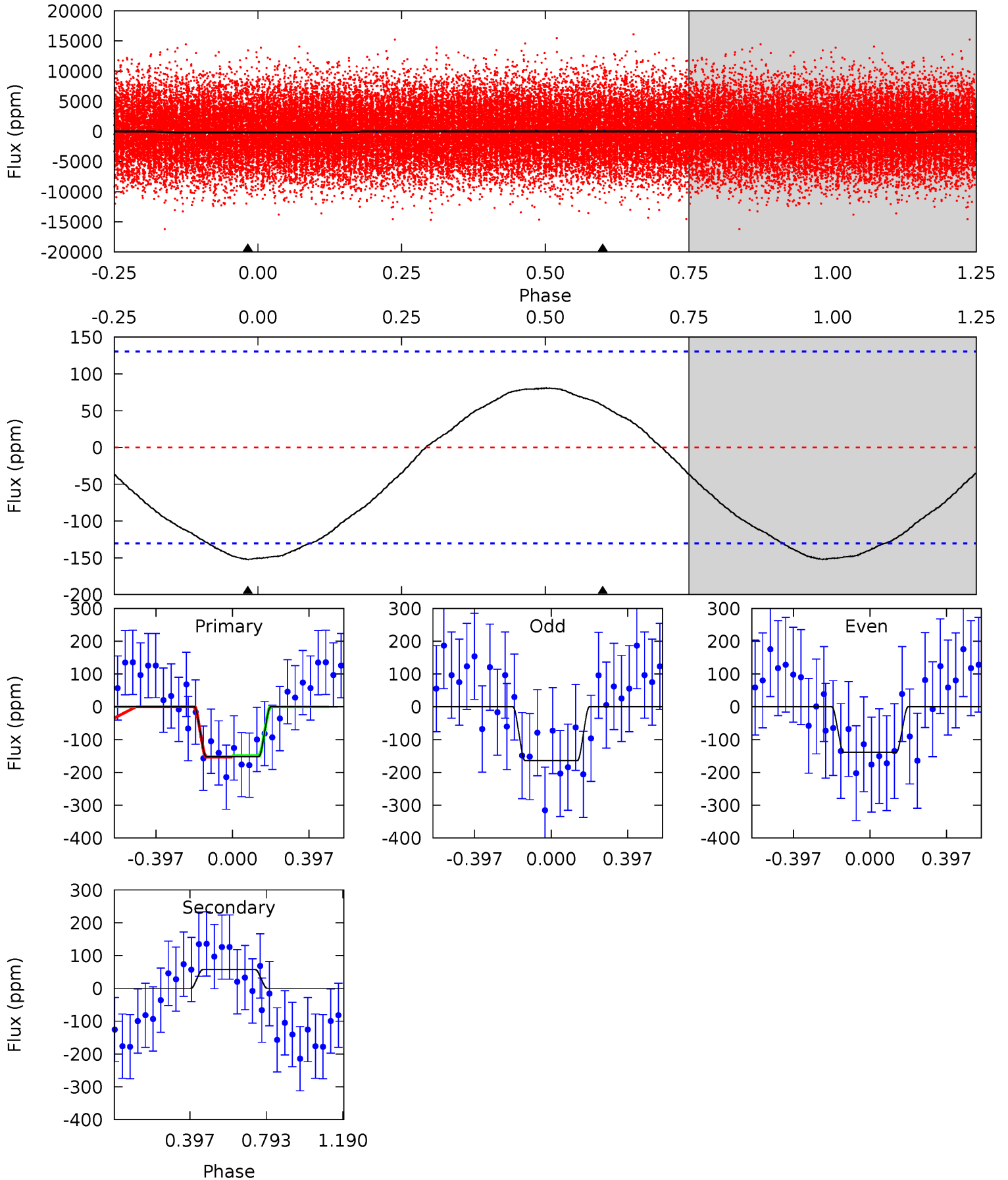
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	-4.16	0	0	4.21	0.66	1.60	11.6	11.6	-4.16	-4.16	0.03	0.99	0.36	0.32



# Alt Model-Shift Uniqueness Test

005981039-02, P = 1.067808 Days, E = 131.369812 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
4.97	-1.88	0	0	4.27	0.85	0.67	4.97	4.97	-1.88	-1.88	0.41	0.83	0.35	0.06



### Stellar Parameters For KIC 005981039

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7154^{+197}_{-310}$	$3.951^{+0.228}_{-0.152}$	$0.140^{+0.200}_{-0.300}$	$2.320^{+0.618}_{-0.680}$	$1.755^{+0.195}_{-0.293}$	$0.198^{+0.266}_{-0.084}$
	+3%/-4%	+6%/-4%	+143%/-214%	+27%/-29%	+11%/-17%	+134%/-43%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005981039-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$45 \pm 11$	$3.89^{+0.62}_{-0.60}$	$4229^{+294}_{-325}$	$-5027^{+261}_{-260}$	$-0.996^{+0.326}_{-0.395}$
Alt.	$57 \pm 31$	$3.13^{+0.53}_{-0.54}$	$4229^{+334}_{-337}$	$-5676^{+744}_{-624}$	$-1.904^{+1.000}_{-1.345}$

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

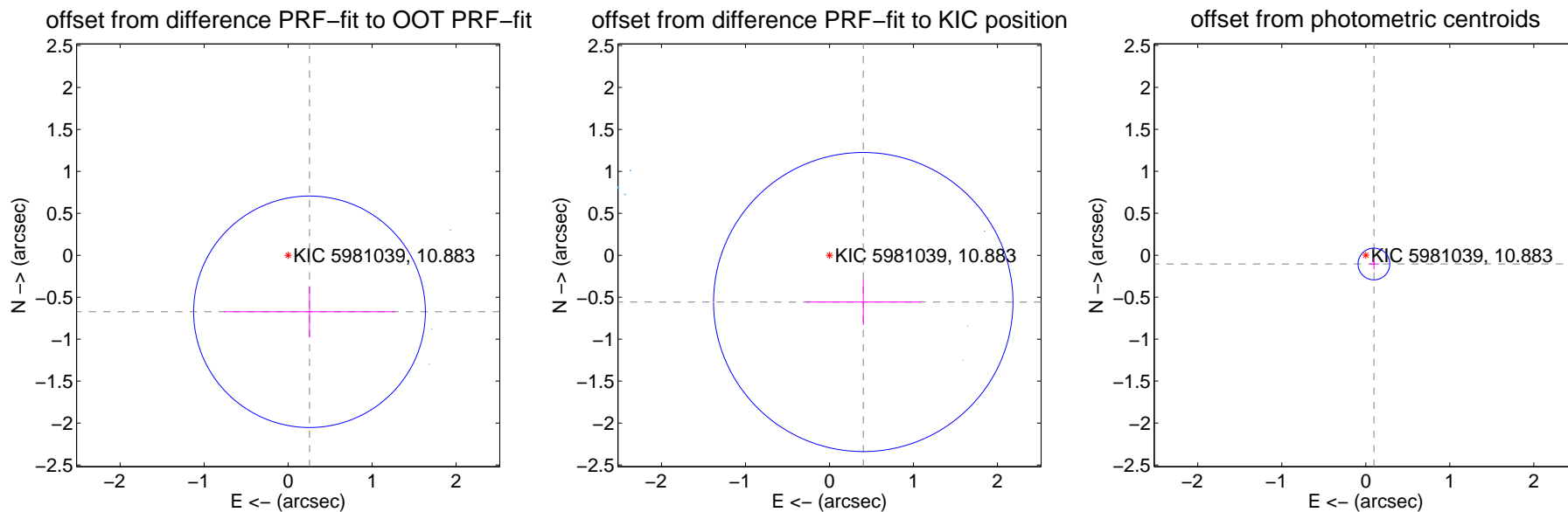
## DV Centroid Data

Supplemental centroid analysis for 005981039-02. **Kepler magnitude: 10.88.** Transit SNR 14.17

There are 7 quarters with good PRF difference image offsets

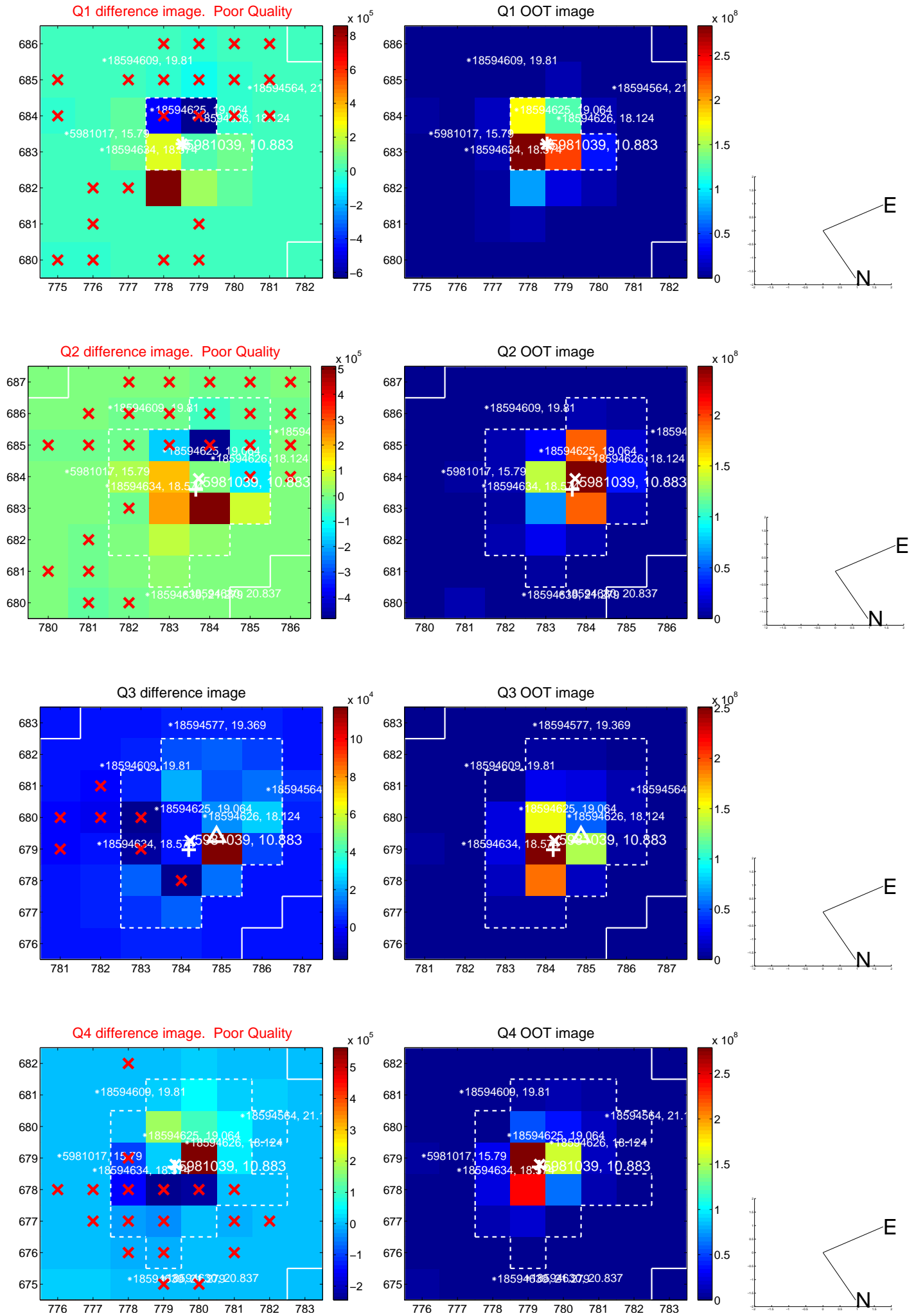
The direct PRF centroid is offset from the target star catalog position by about 1.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.720 \pm 0.460$	1.57	$-0.255 \pm 1.022$	$-0.674 \pm 0.304$
PRF-fit source offset from KIC position	$0.687 \pm 0.594$	1.16	$-0.402 \pm 0.685$	$-0.557 \pm 0.274$
photometric centroid source offset	$0.14 \pm 0.06$	2.26	$-0.10 \pm 0.06$	$-0.10 \pm 0.07$

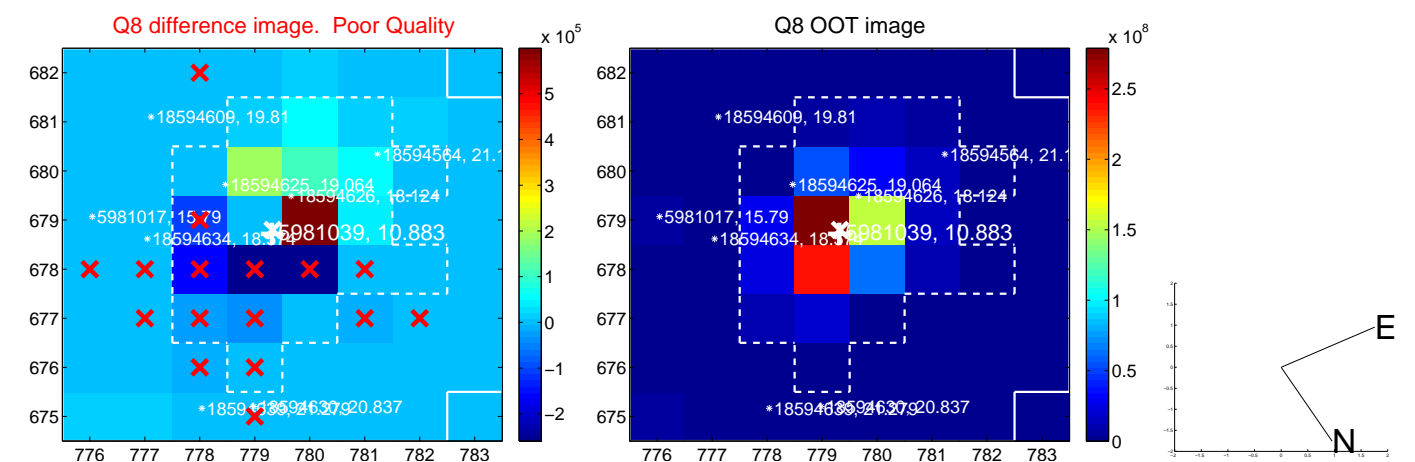
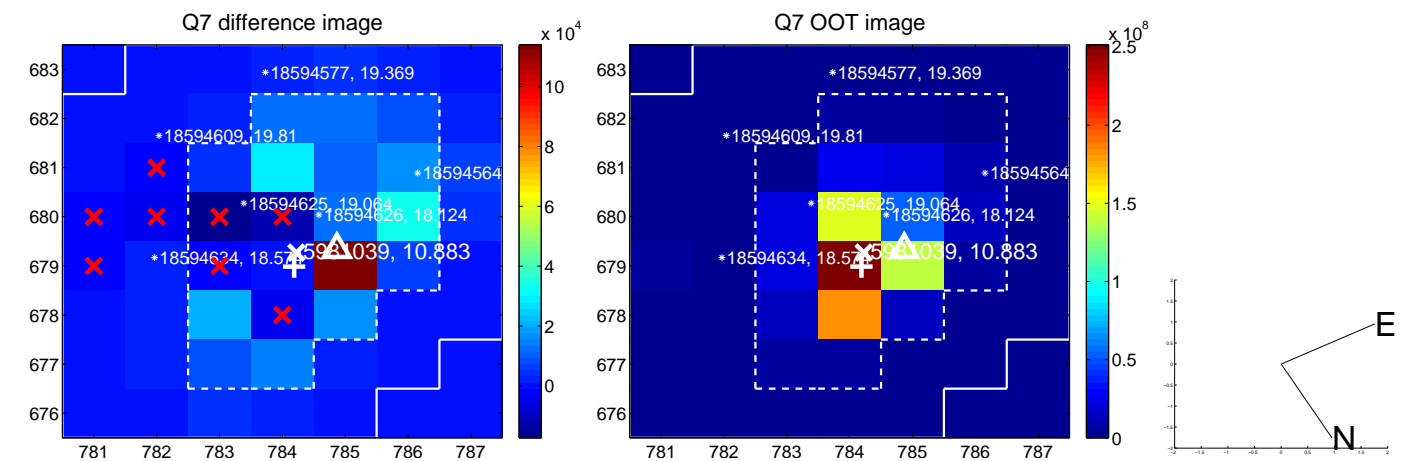
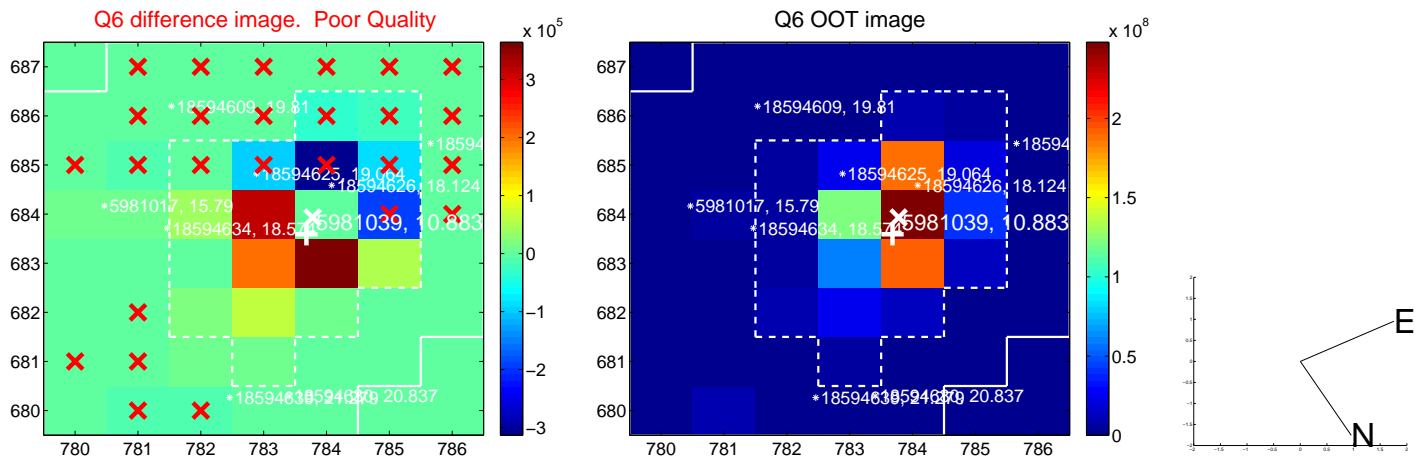
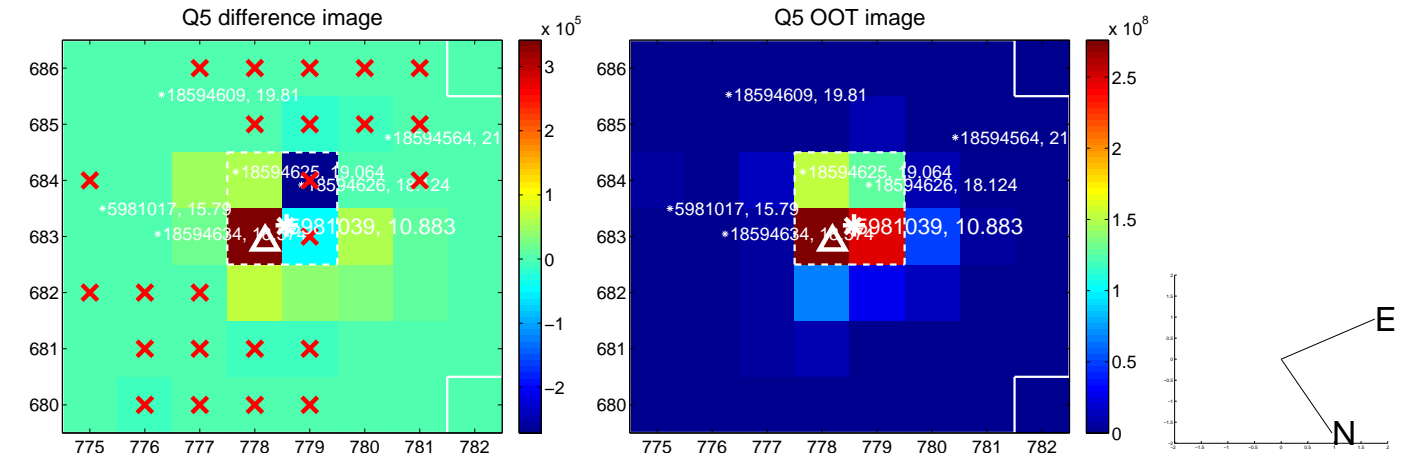


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

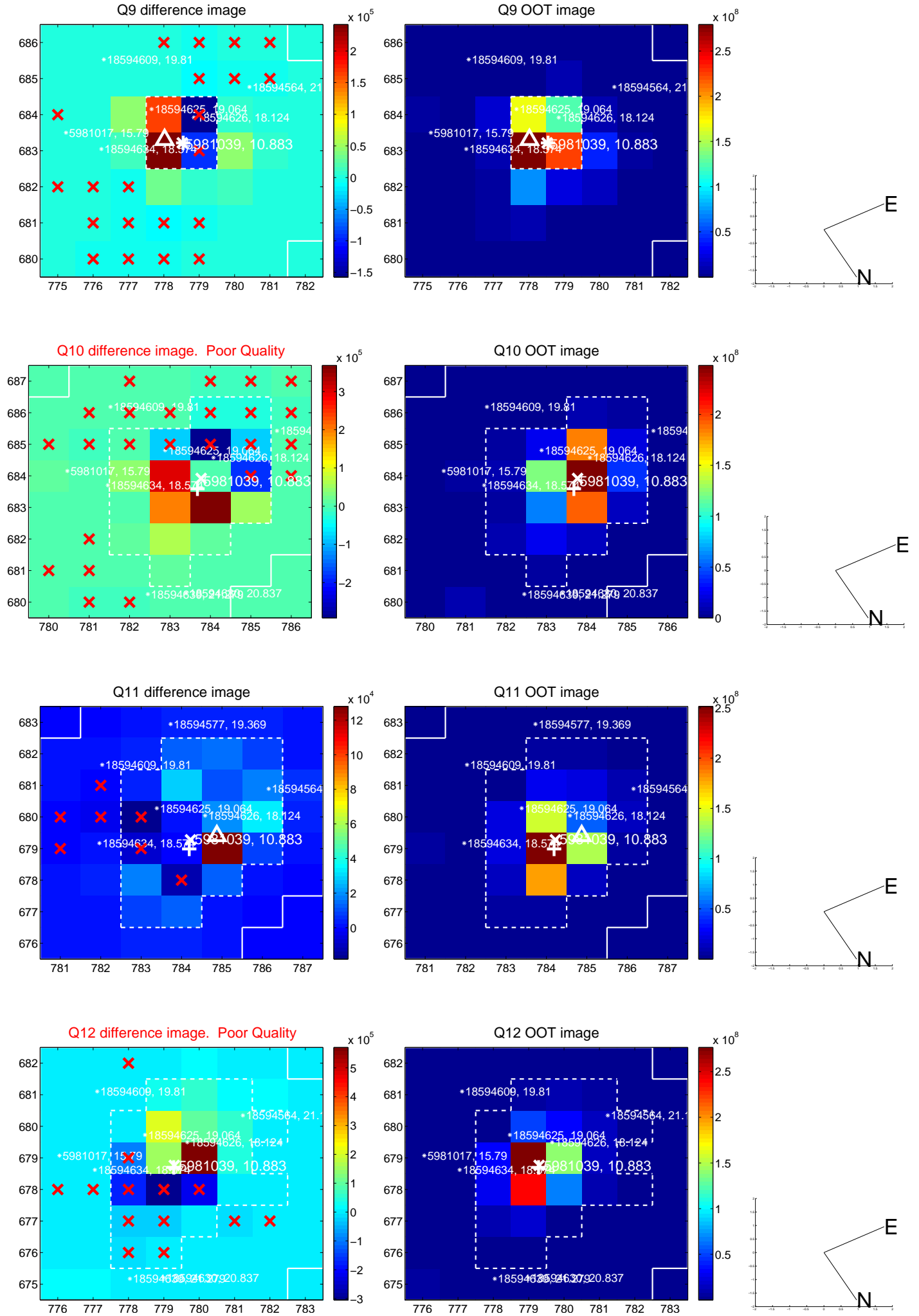


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

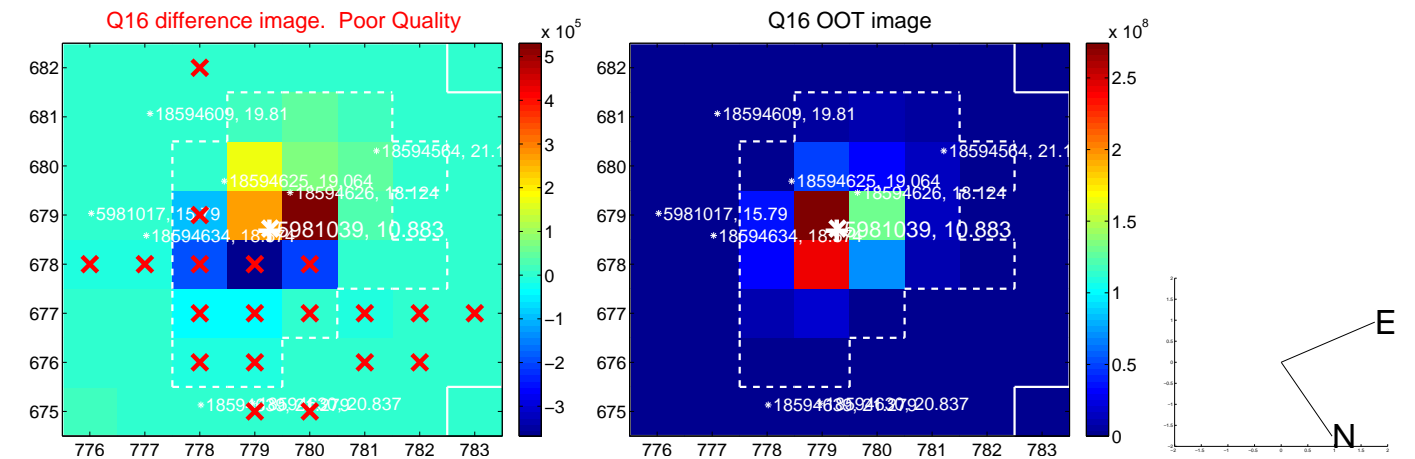
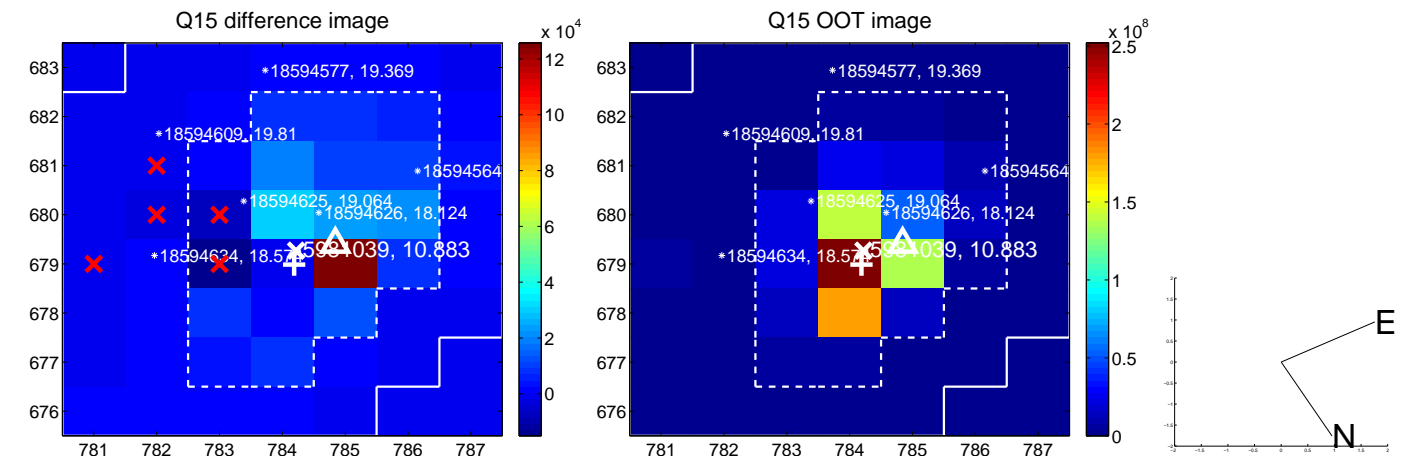
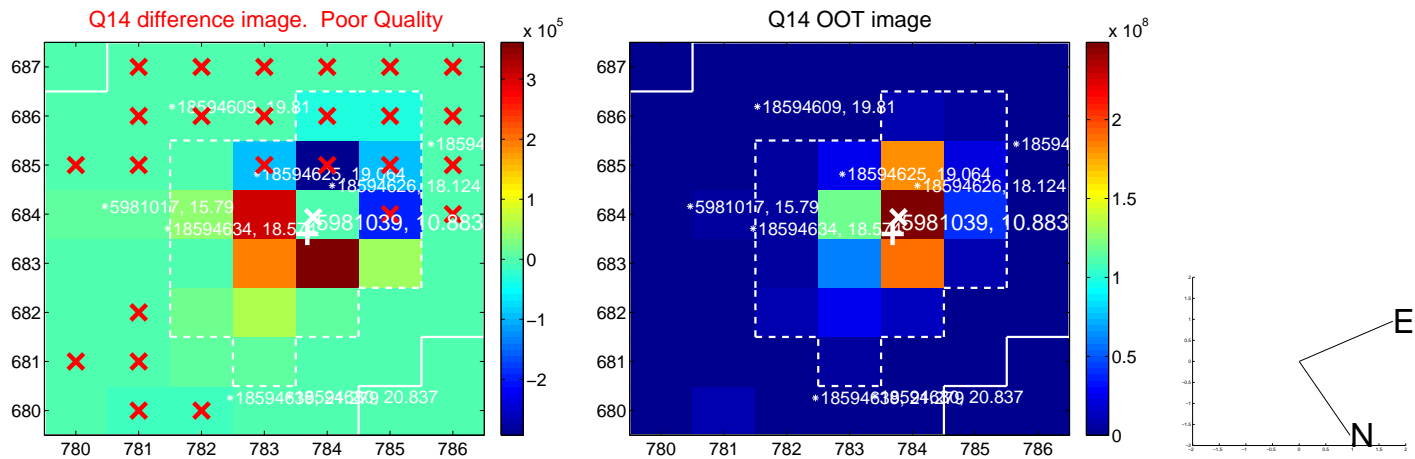
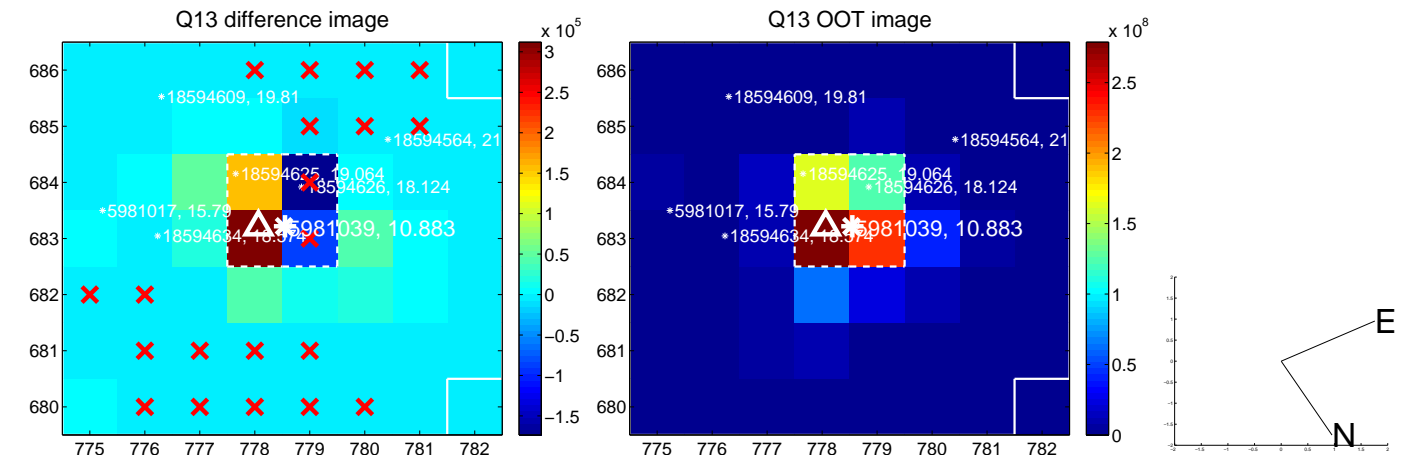




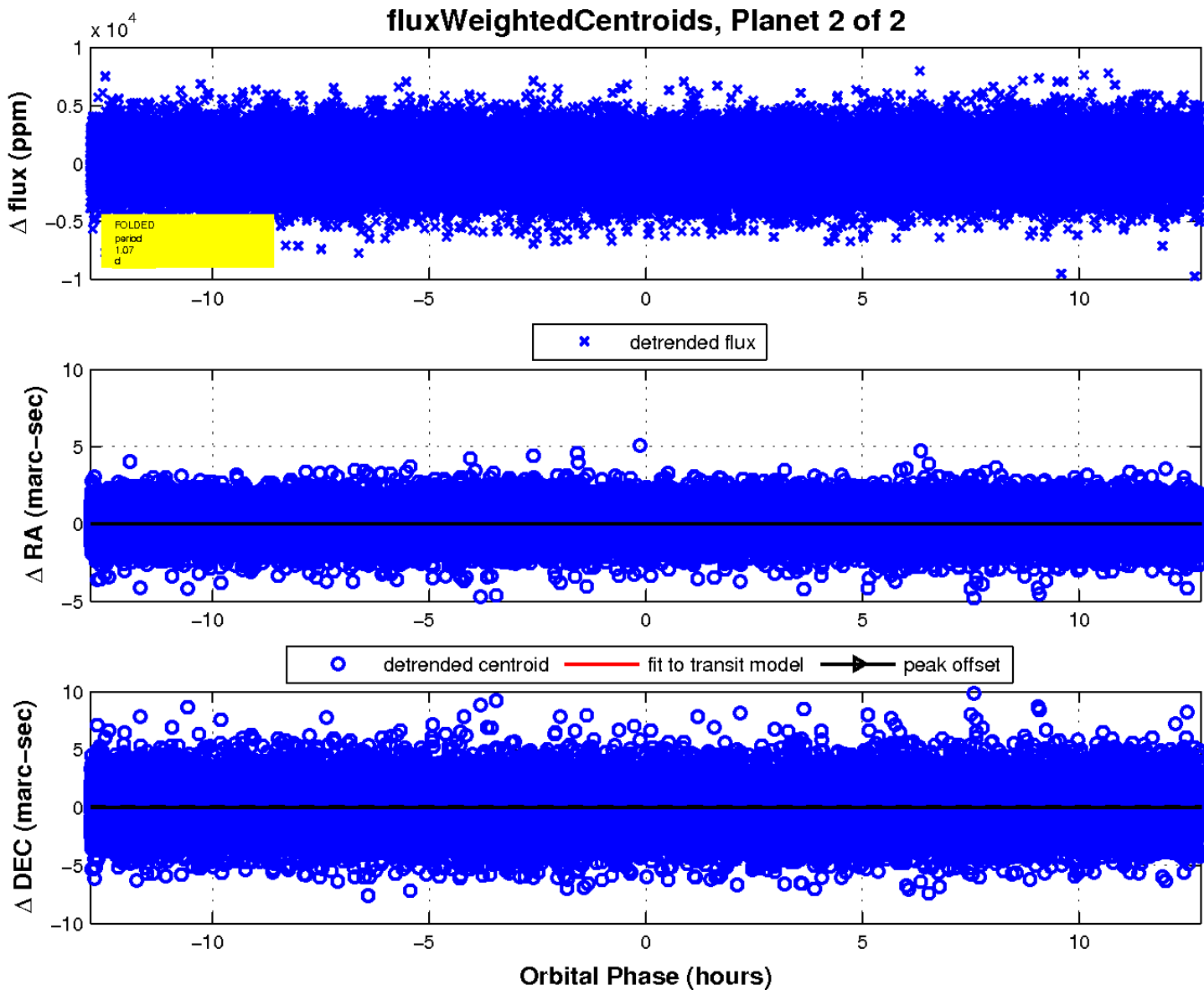
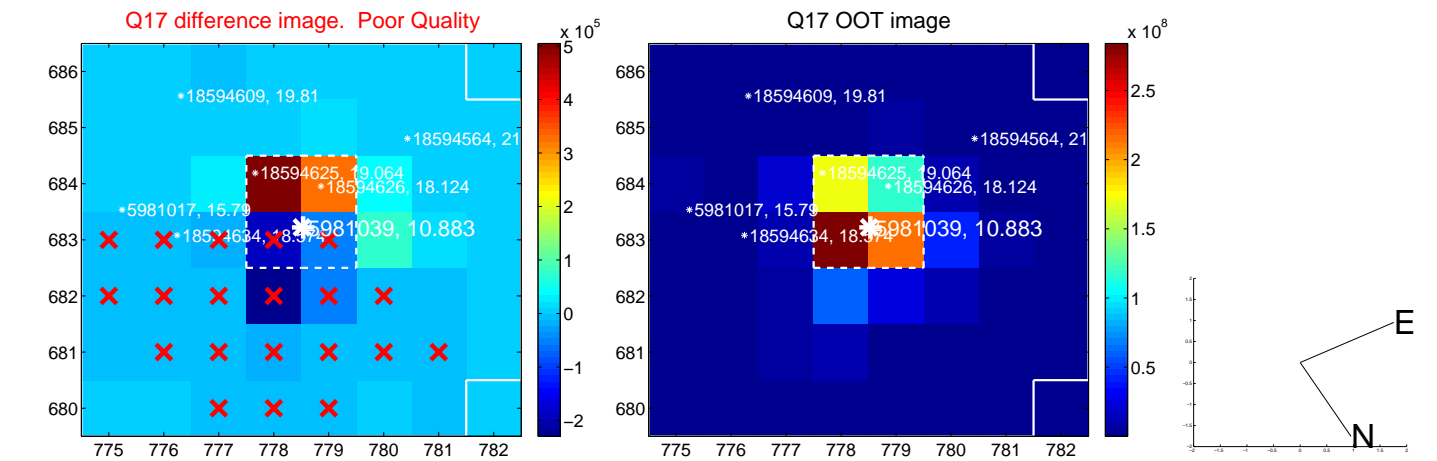
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

