

# KIC 010777903

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010777903-01	OBS	No	0.686750	131.747715	111.2	4.096	9.6	7.0	4.17	7535	5.14	123745.78
010777903-02	OBS	No	0.515618	131.631206	897.4	1.171	15.7	15.7	4.17	7535	14.65	0.00
010777903-03	OBS	No	0.515619	131.959123	1117.9	1.423	15.3	22.6	4.17	7535	15.02	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010777903-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010777903-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010777903-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

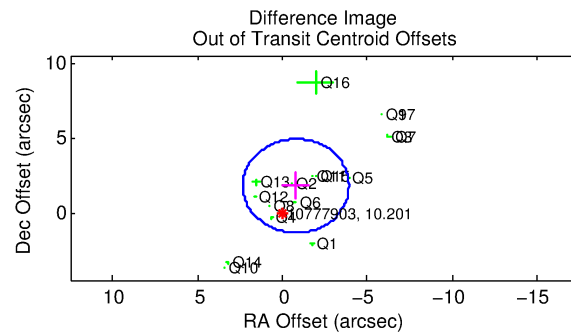
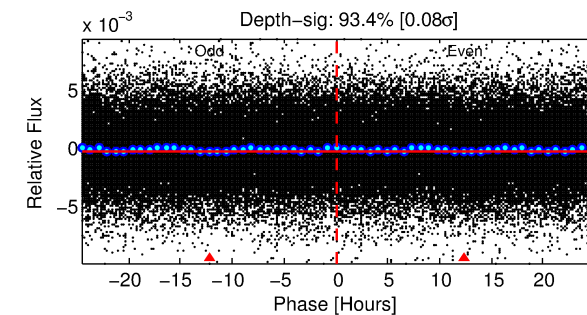
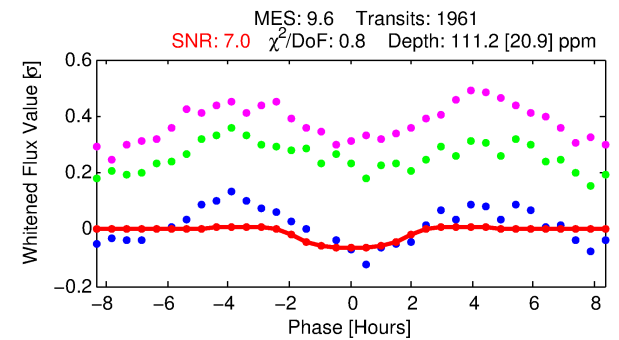
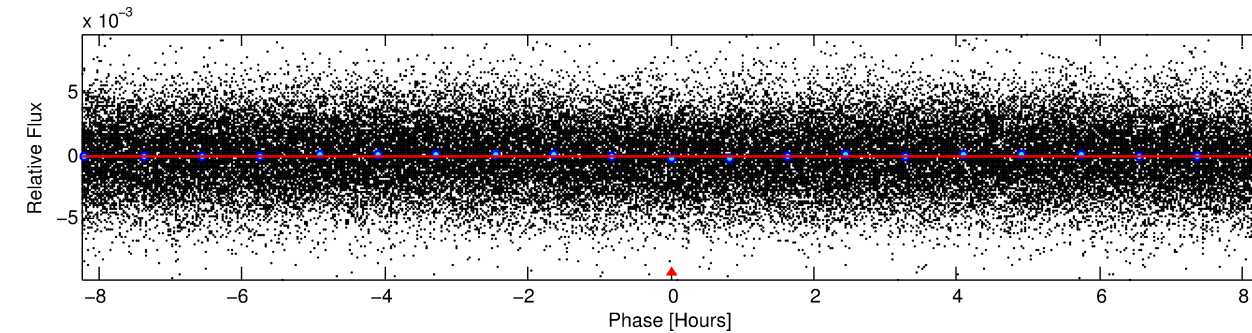
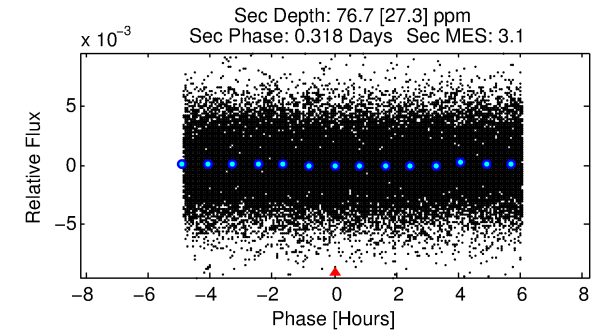
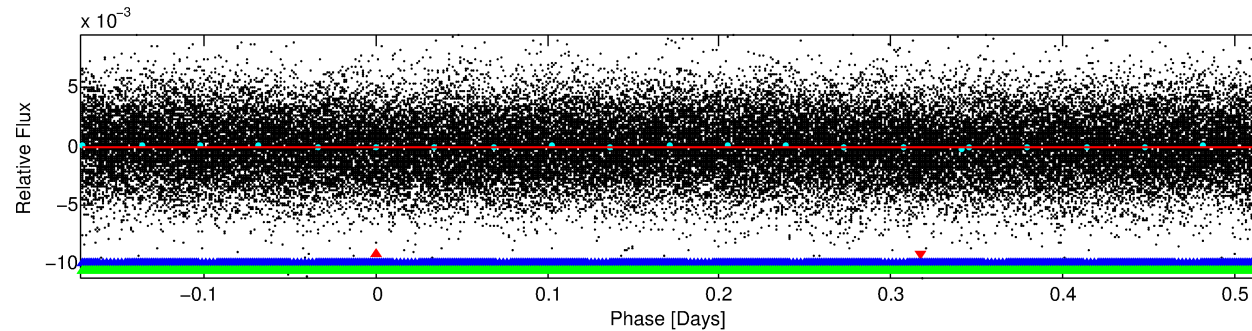
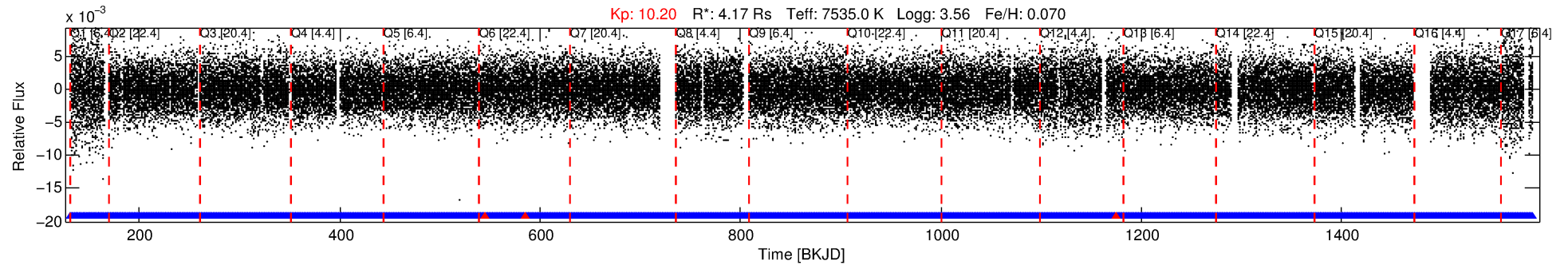
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010777903-01

No Significant Match Found

# DV One-Page Summary

KIC: 10777903 Candidate: 1 of 3 Period: 0.687 d



## DV Fit Results:

Period = 0.68675 [0.00002] d  
Epoch = 131.7477 [0.0079] BKJD  
Rp/R\* = 0.0113 [0.0094]  
a/R\* = 1.11 [1.06]  
b = 0.91 [1.04]  
Seff = 123745.78 [111139.99]  
Teq = 4783 [1074] K  
Rp = 5.14 [5.14] Re  
a = 0.0202 [0.0110] AU  
Ag = 0.65 [1.24] [-0.28σ]  
Teffp = 6636 [2835] K [0.61σ]

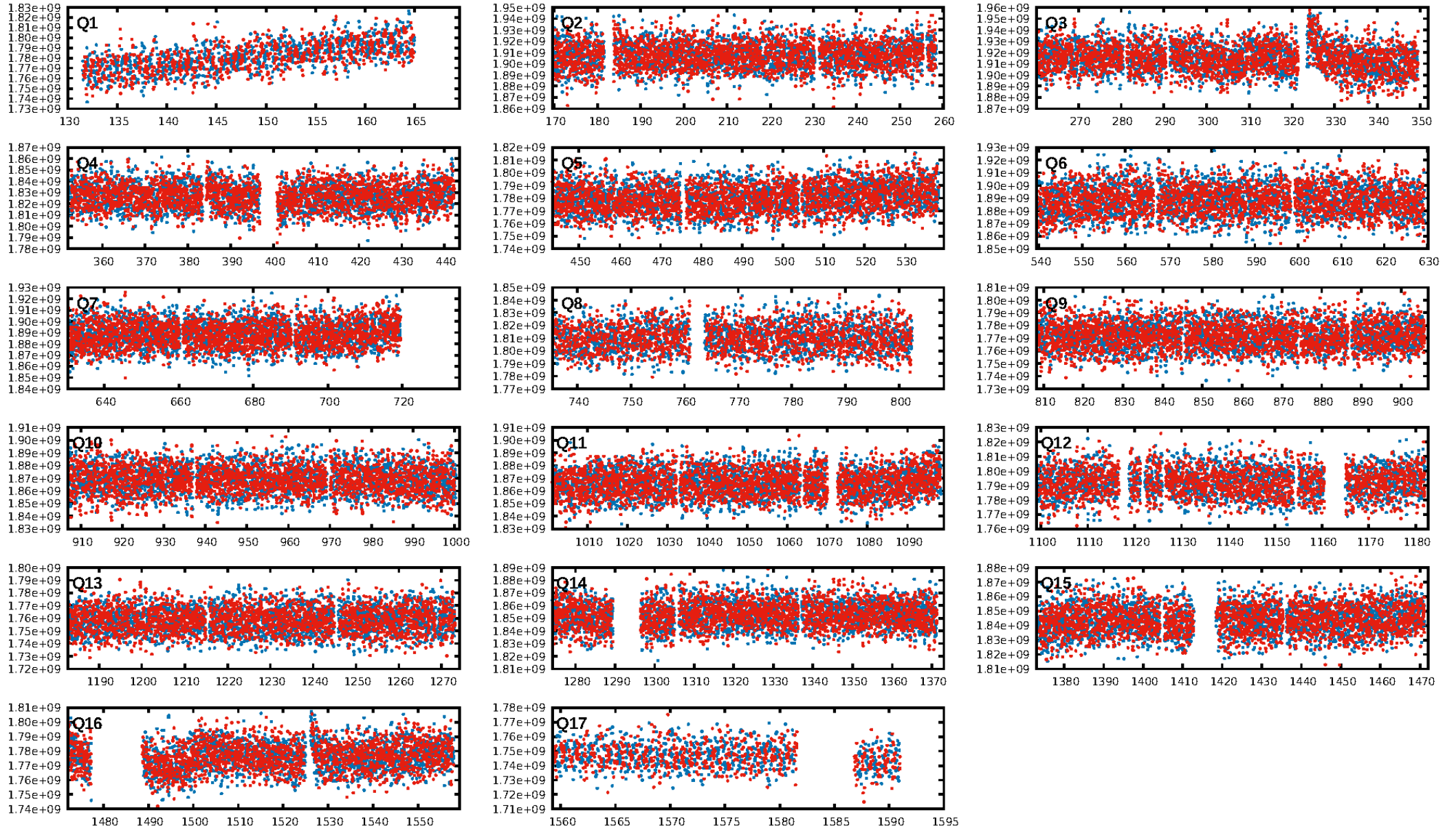
## DV Diagnostic Results:

ShortPeriod-sig: 65.6% [0.95σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1869/1872]  
GhostDiagnostic-chr: 0.3989  
Centroid-sig: 0.1%  
Centroid-so: 0.251 arcsec [0.93σ]  
OotOffset-rm: 1.951 arcsec [1.87σ]  
KicOffset-rm: 2.398 arcsec [2.65σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.47 [8/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:08:59 Z

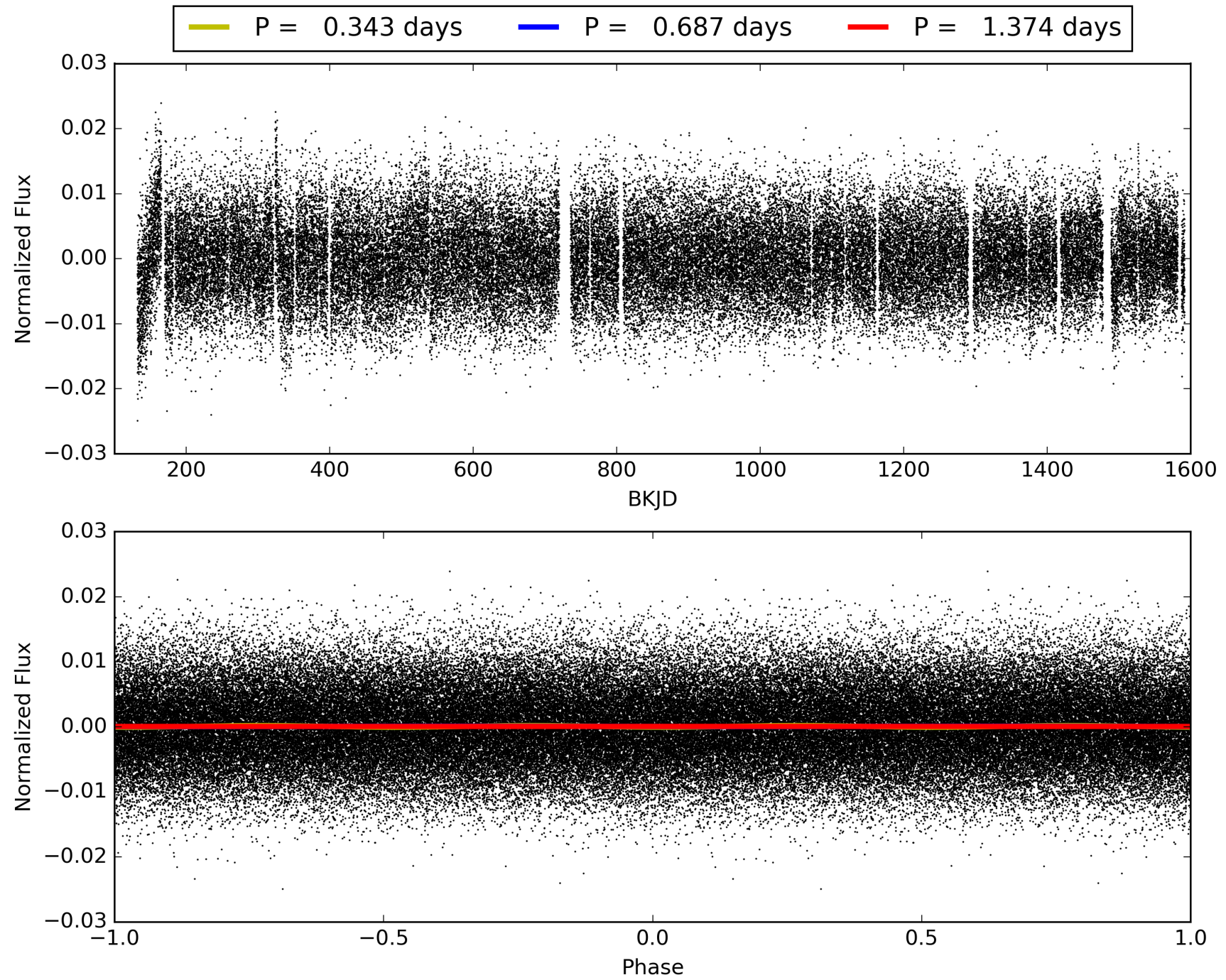
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010777903-01, PDC Light Curves





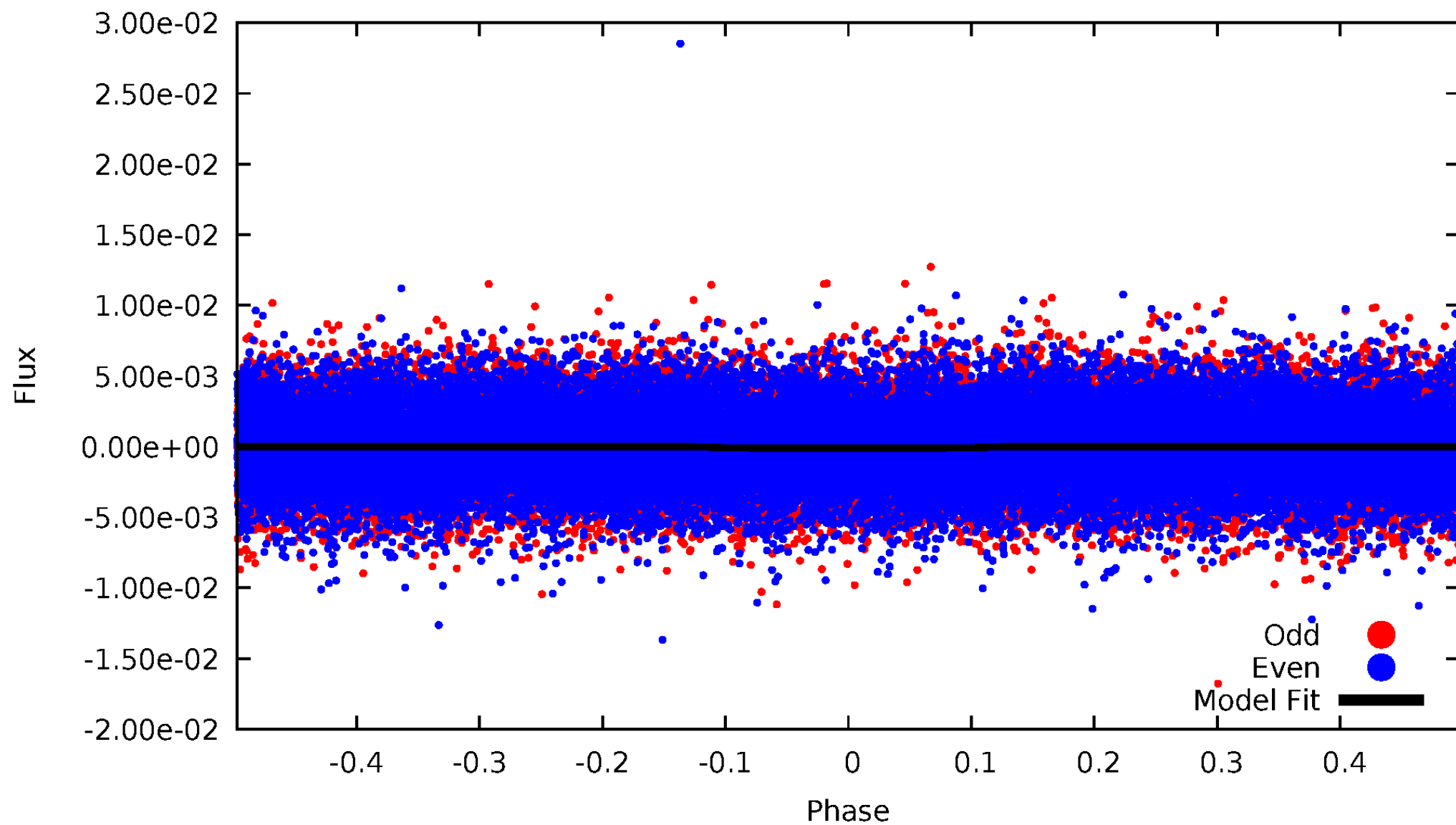
TCE 010777903-01





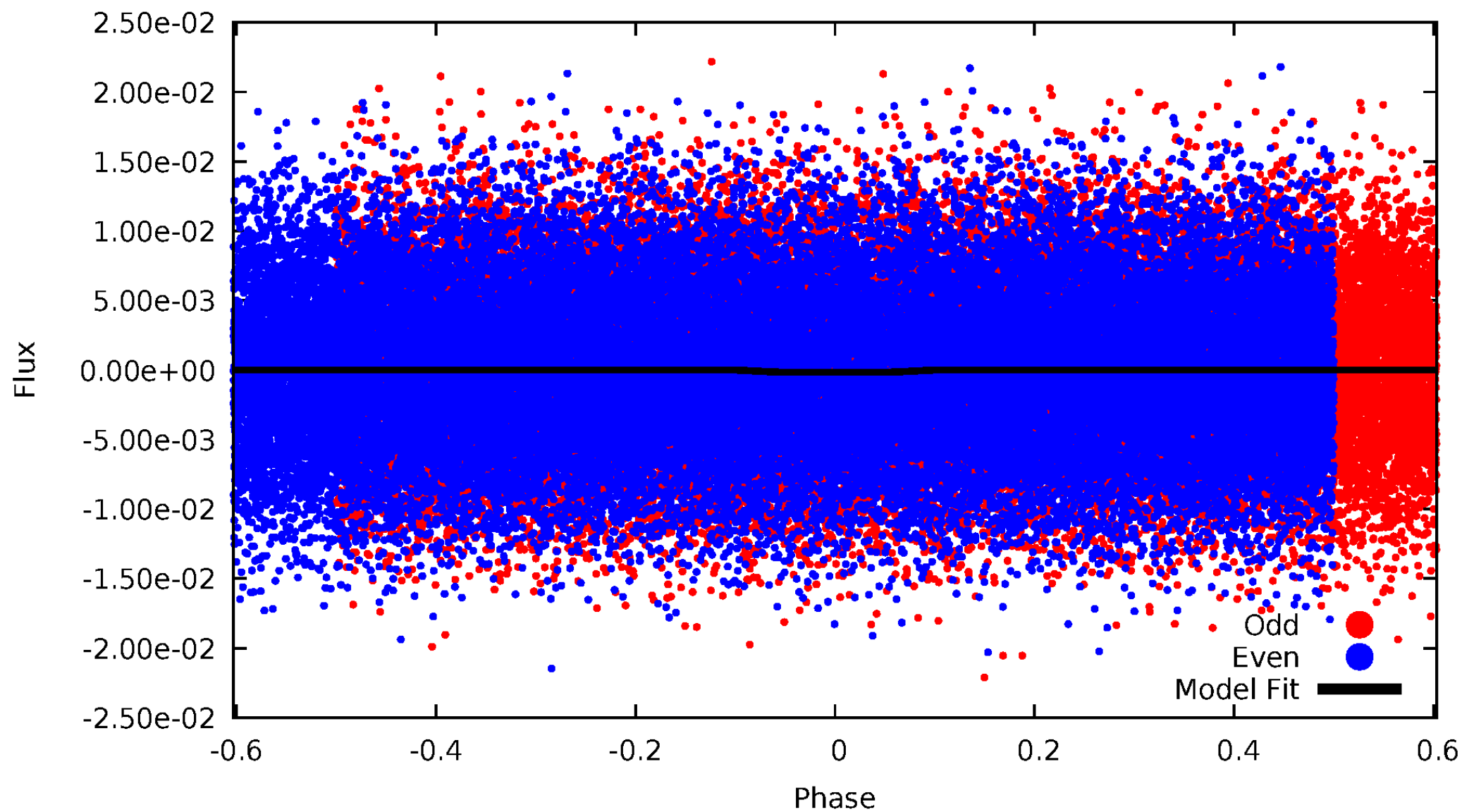
# DV Odd/Even

TCE 010777903-01



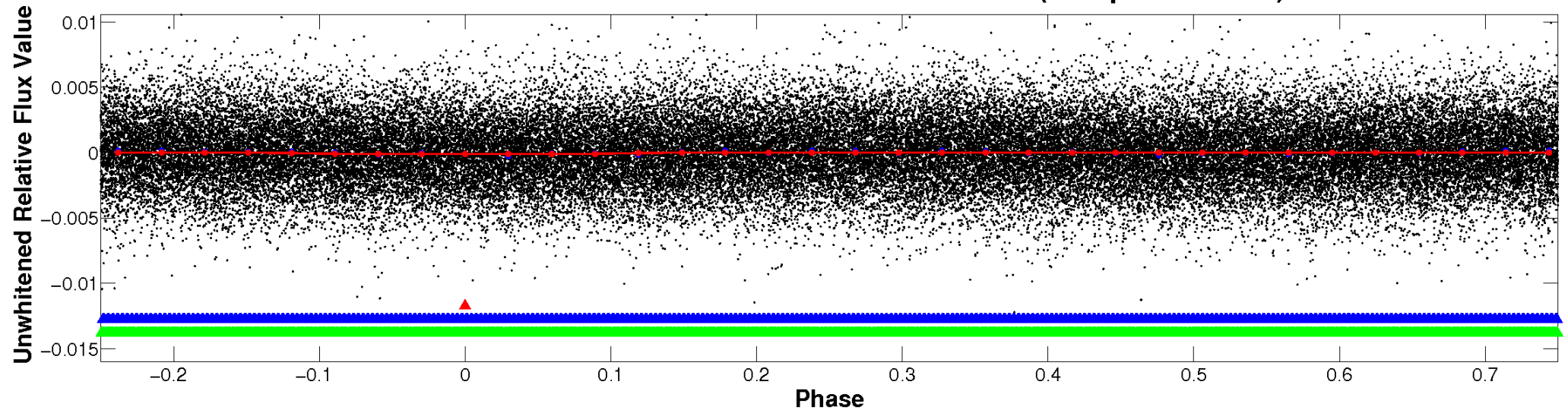
# ALT Odd/Even

TCE 010777903-01

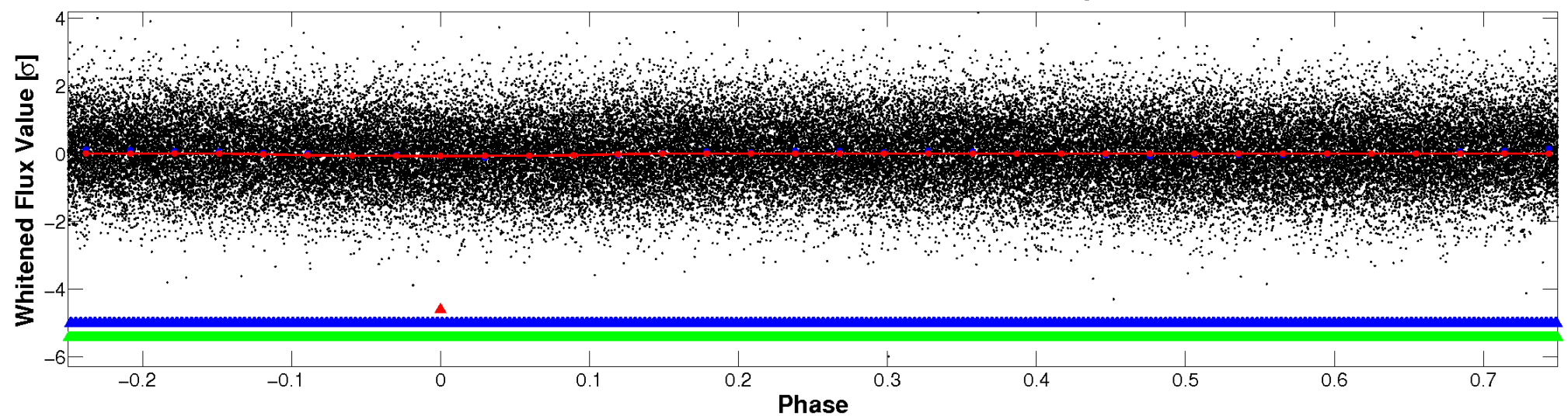


# Non-Whitened Vs. Whitened Light Curve

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



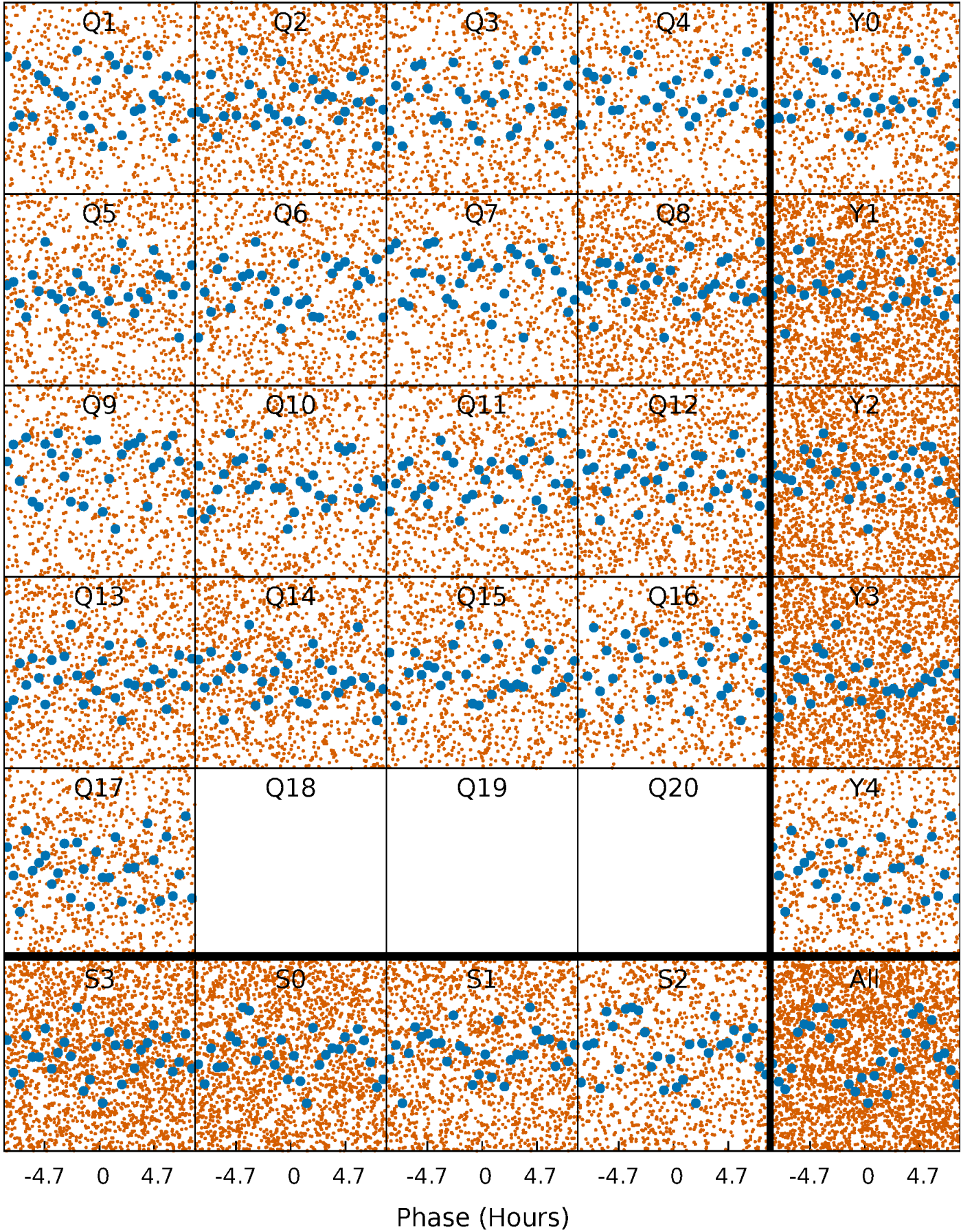
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

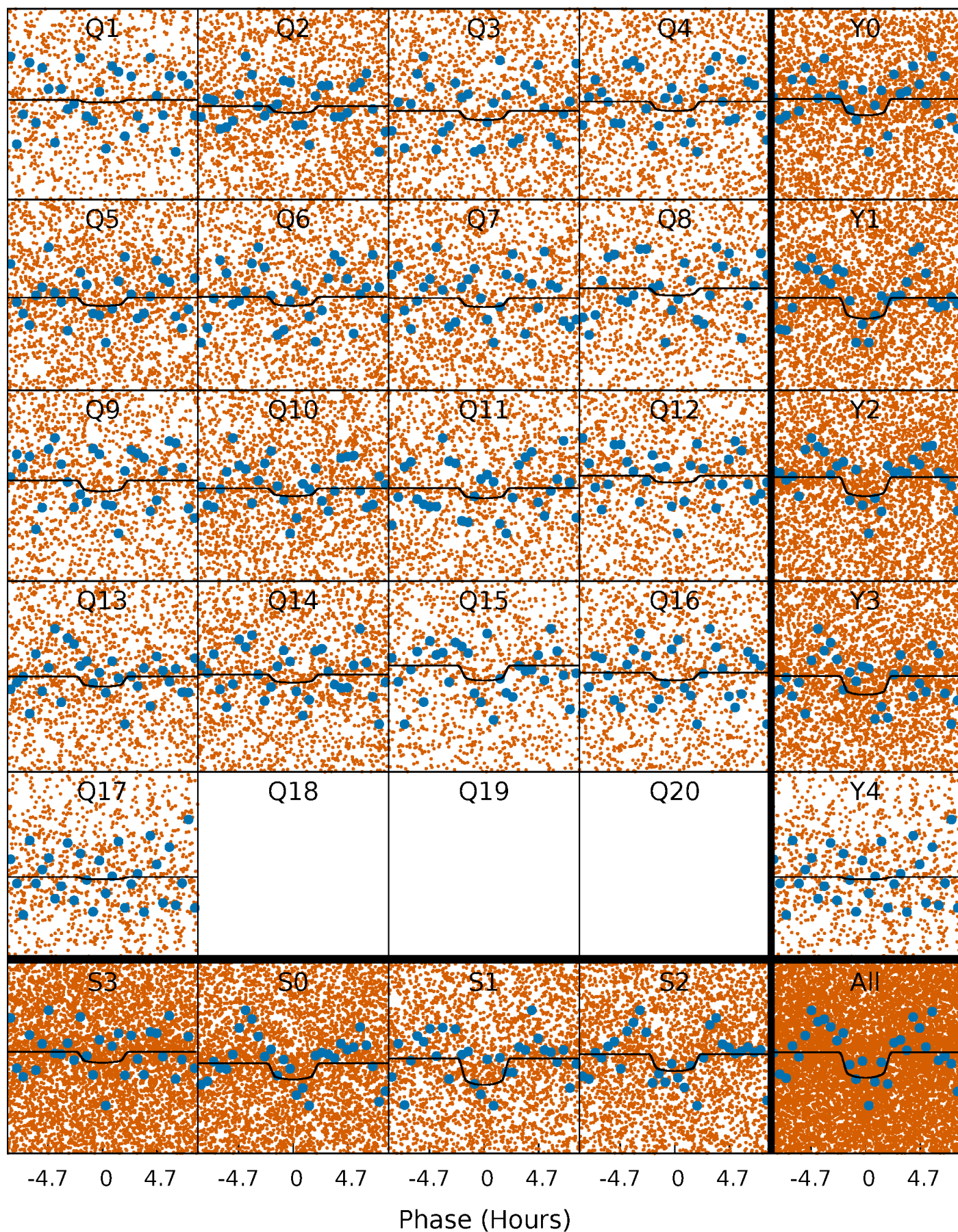
TCE 010777903-01   P= 0.686750 Days    $T_0=131.747715$  (BKJD)





# DV Quarter-Phased Transit Curves

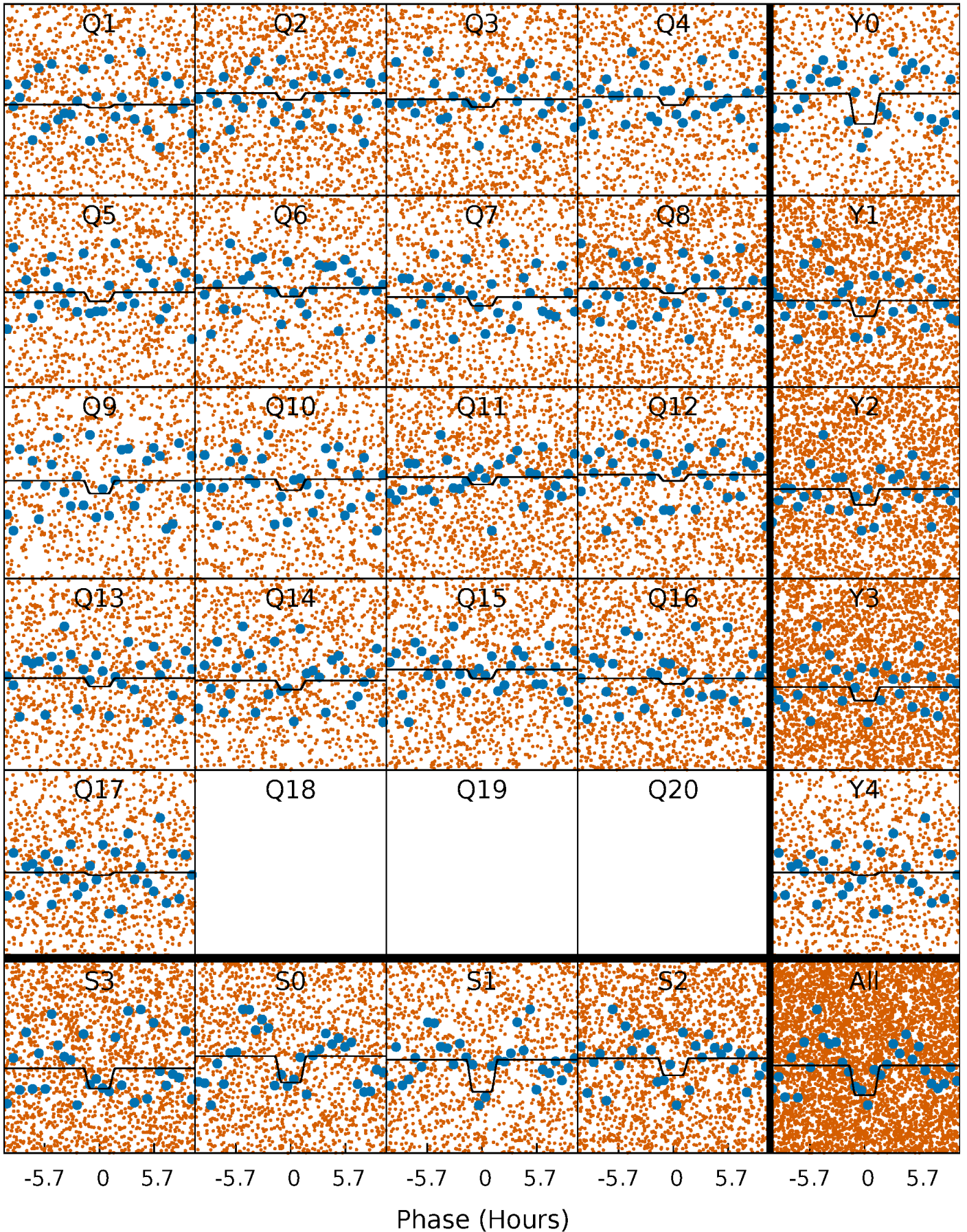
TCE 010777903-01 P= 0.686750 Days  $T_0=131.747715$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010777903-01 P= 0.686773 Days  $T_0=131.745776$  (BKJD)

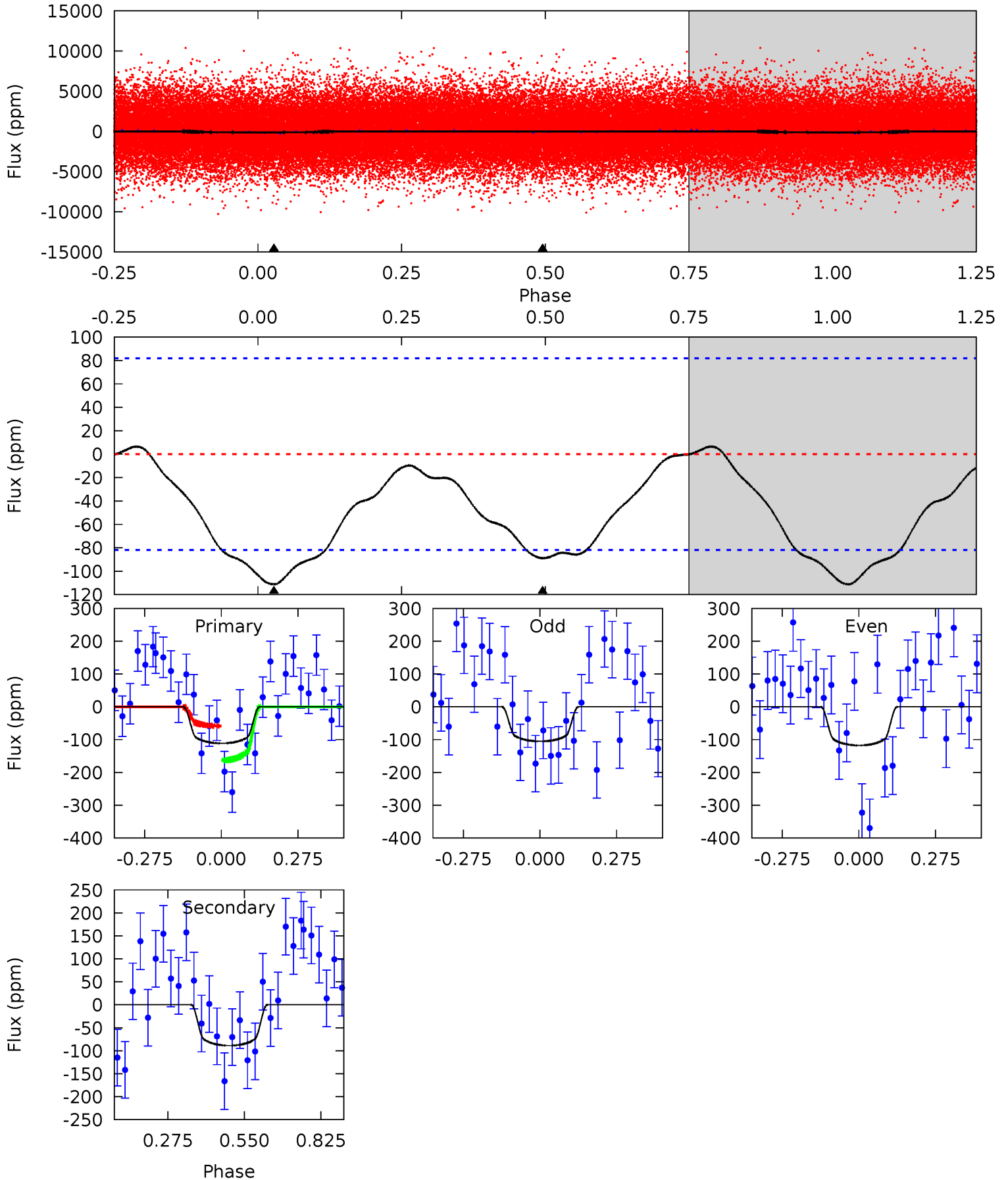




# DV Model-Shift Uniqueness Test

010777903-01, P = 0.686750 Days, E = 131.060965 Days

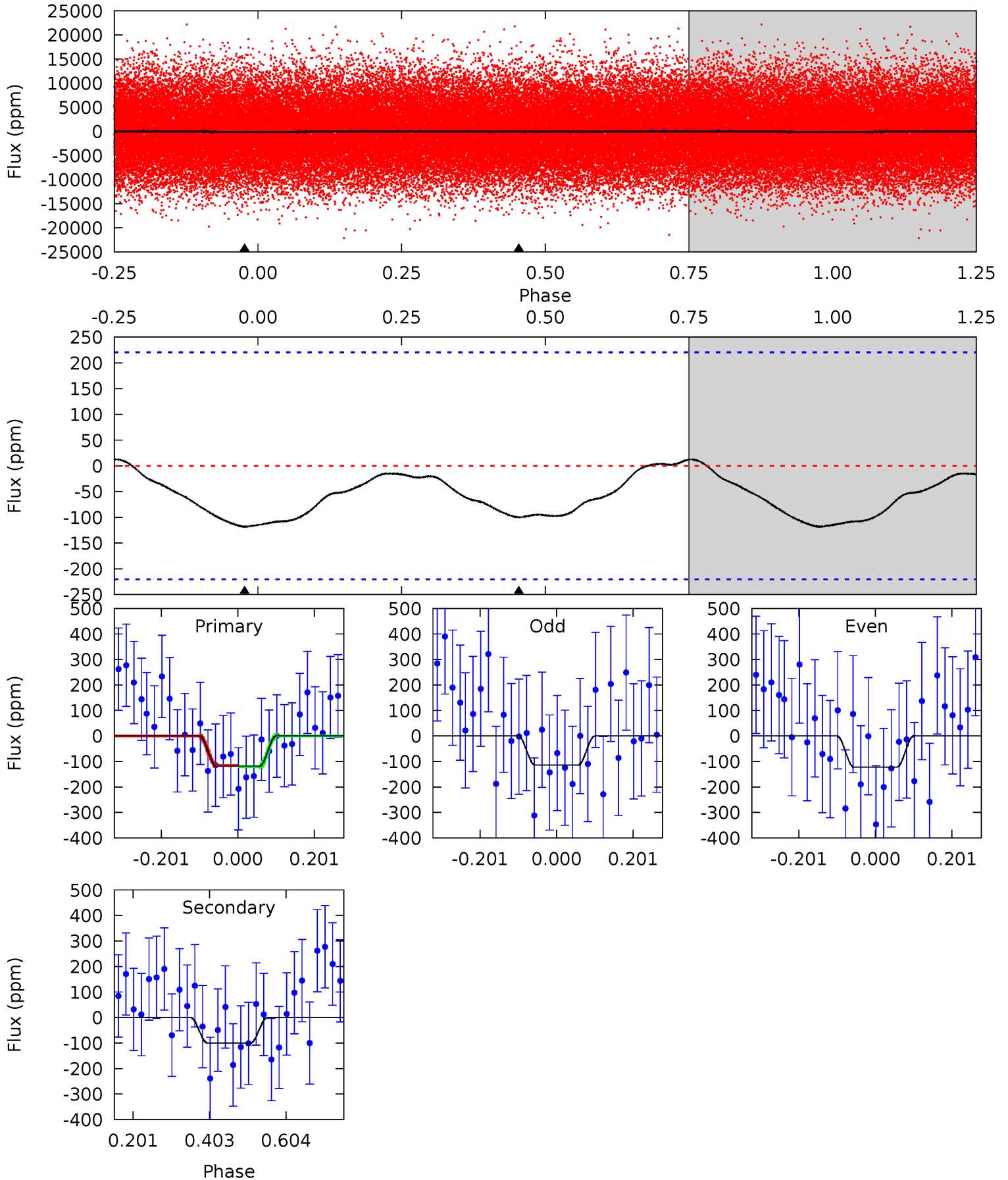
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.91	4.72	0	0	4.35	1.09	0.29	5.91	5.91	4.72	4.72	0.33	0.98	0.06	2.81



# Alt Model-Shift Uniqueness Test

010777903-01, P = 0.686773 Days, E = 131.059003 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
2.36	2.00	0	0	4.42	1.28	0.28	2.36	2.36	2.00	2.00	0.08	0.66	0.10	0.05



### Stellar Parameters For KIC 010777903

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7535^{+209}_{-313}$	$3.562^{+0.522}_{-0.058}$	$0.070^{+0.150}_{-0.350}$	$4.174^{+0.409}_{-2.317}$	$2.319^{+0.196}_{-0.736}$	$0.045^{+0.279}_{-0.009}$
	+3%/-4%	+15%/-2%	+214%/-500%	+10%/-56%	+8%/-32%	+622%/-20%
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 010777903-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-89 \pm 19$	$4.62^{+4.14}_{-2.73}$	$6396^{+445}_{-891}$	$5760^{+5246}_{-9396}$	$0.895^{+4.285}_{-0.644}$
Alt.	$-100 \pm 50$	$5.00^{+3.96}_{-3.02}$	$6406^{+436}_{-859}$	$5744^{+5199}_{-9816}$	$0.815^{+4.146}_{-0.601}$

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



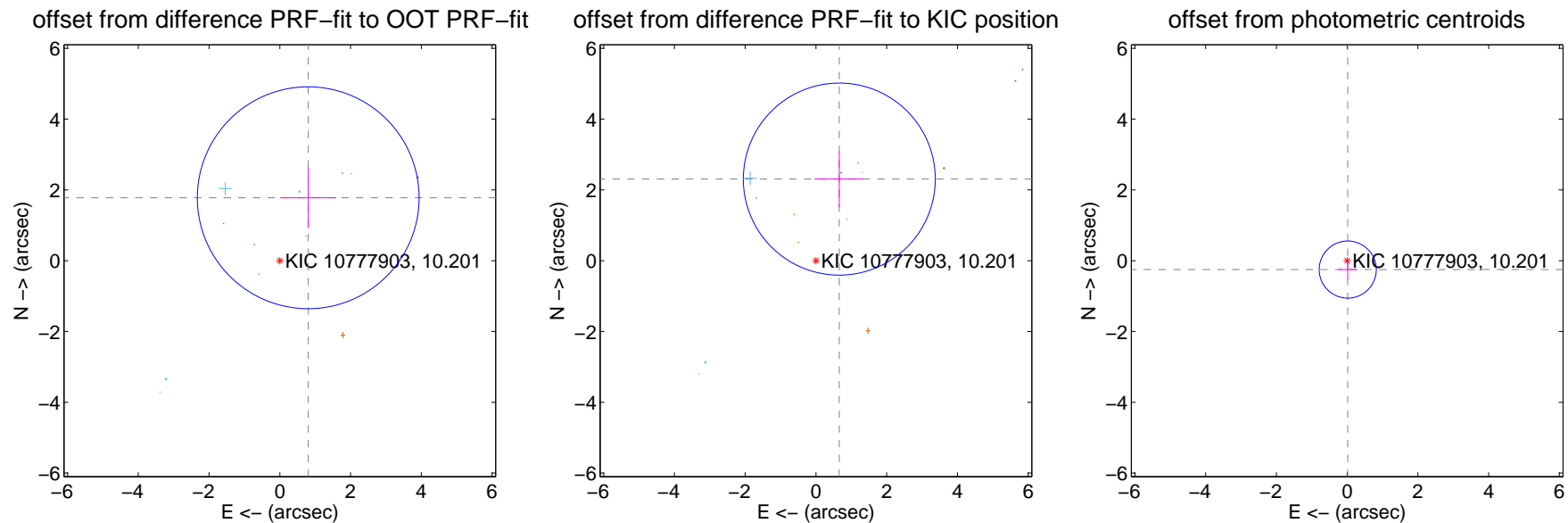
## DV Centroid Data

Supplemental centroid analysis for 010777903-01. **Kepler magnitude: 10.20.** Transit SNR 6.97

There are 8 quarters with good PRF difference image offsets

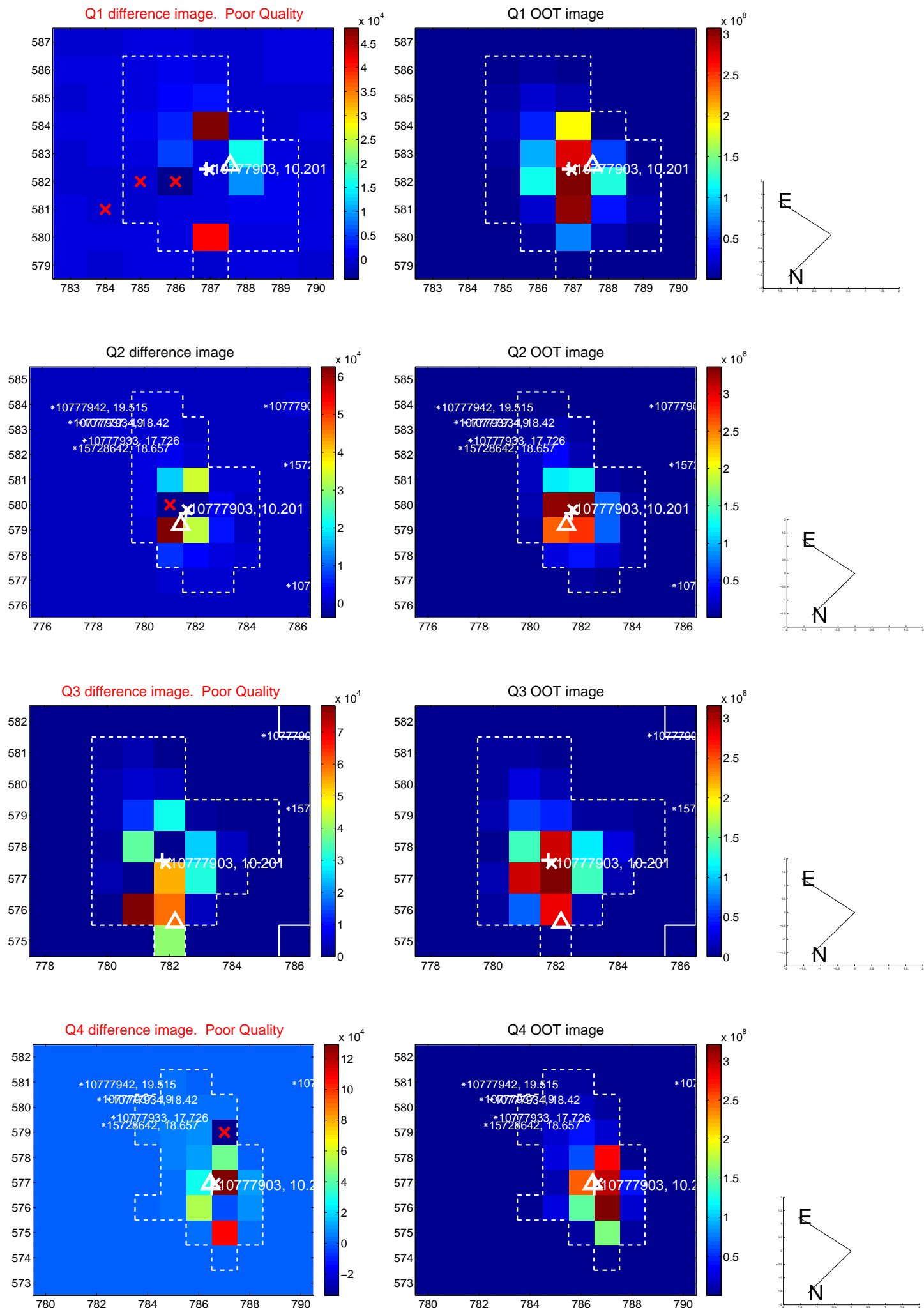
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.951 \pm 1.045$	1.87	$-0.803 \pm 0.793$	$1.778 \pm 0.852$
PRF-fit source offset from KIC position	$2.398 \pm 0.904$	2.65	$-0.661 \pm 0.706$	$2.305 \pm 0.784$
photometric centroid source offset	$0.25 \pm 0.27$	0.93	$-0.02 \pm 0.26$	$-0.25 \pm 0.27$

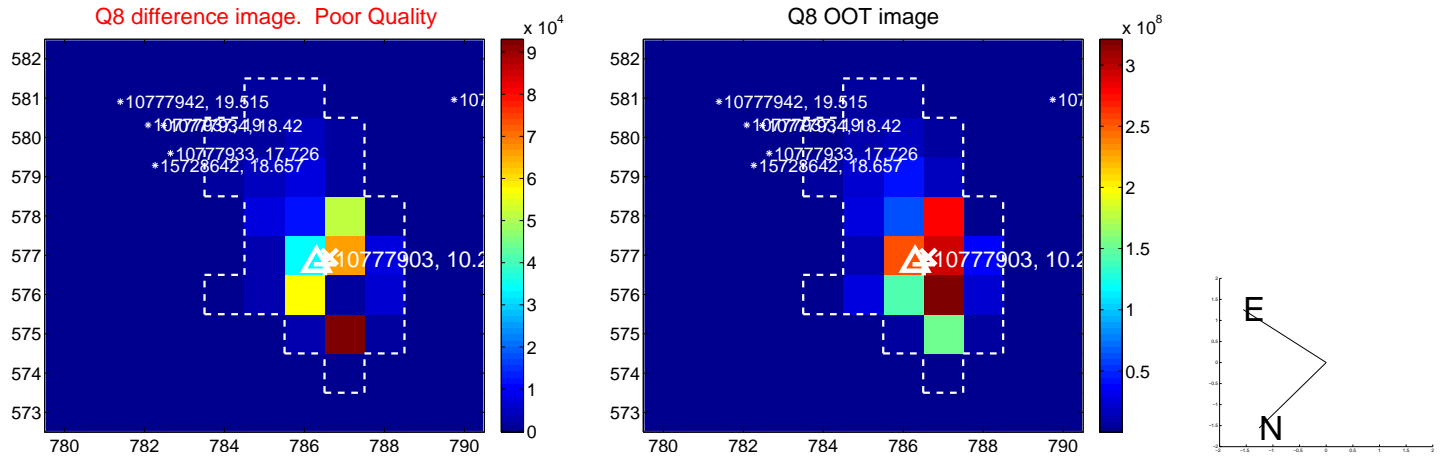
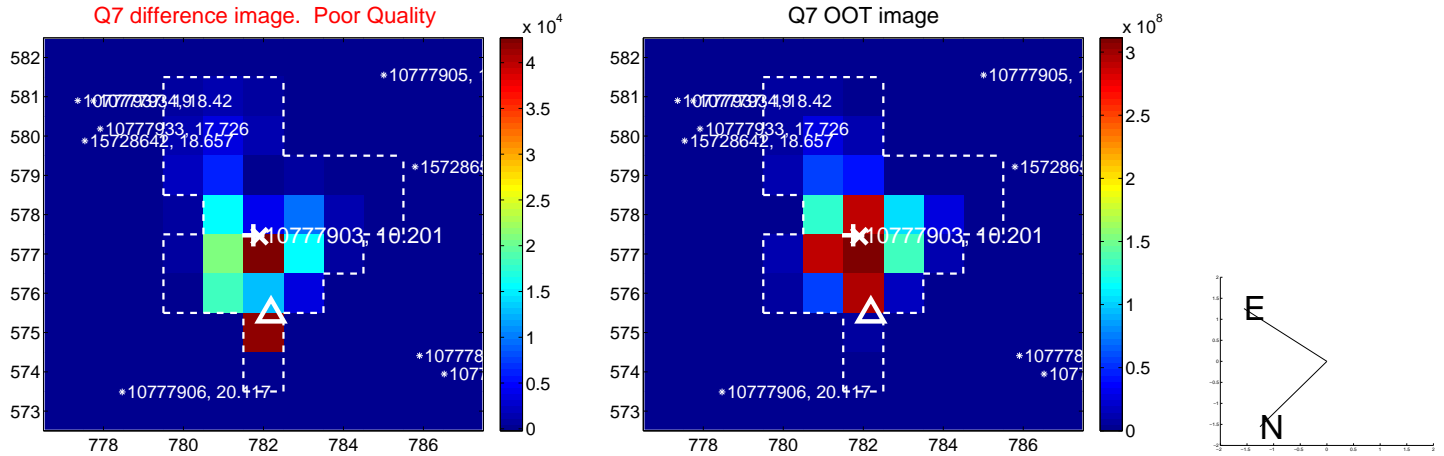
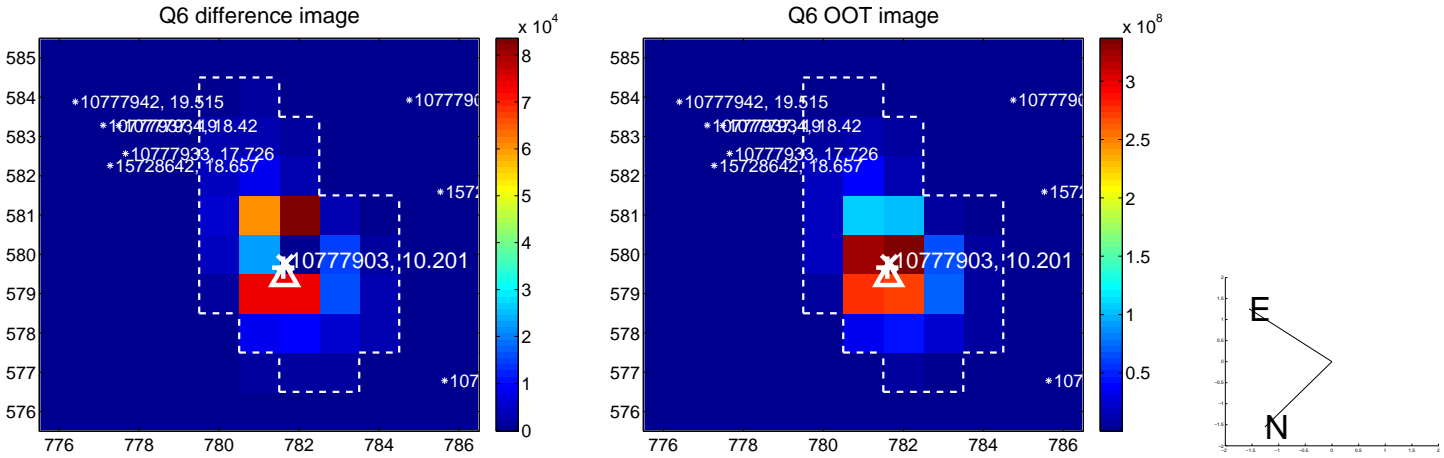
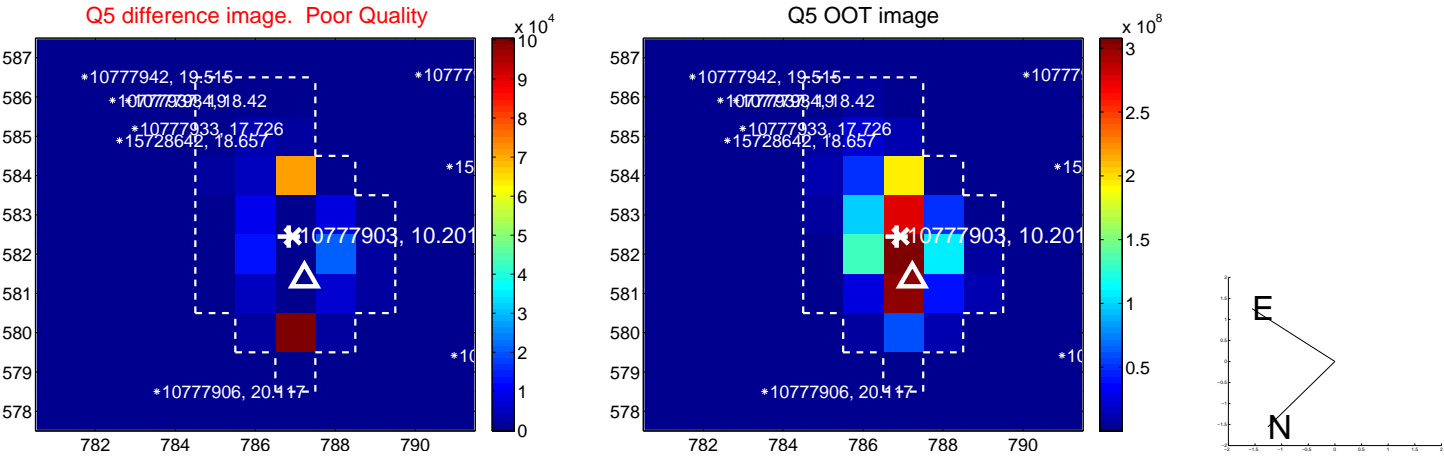


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

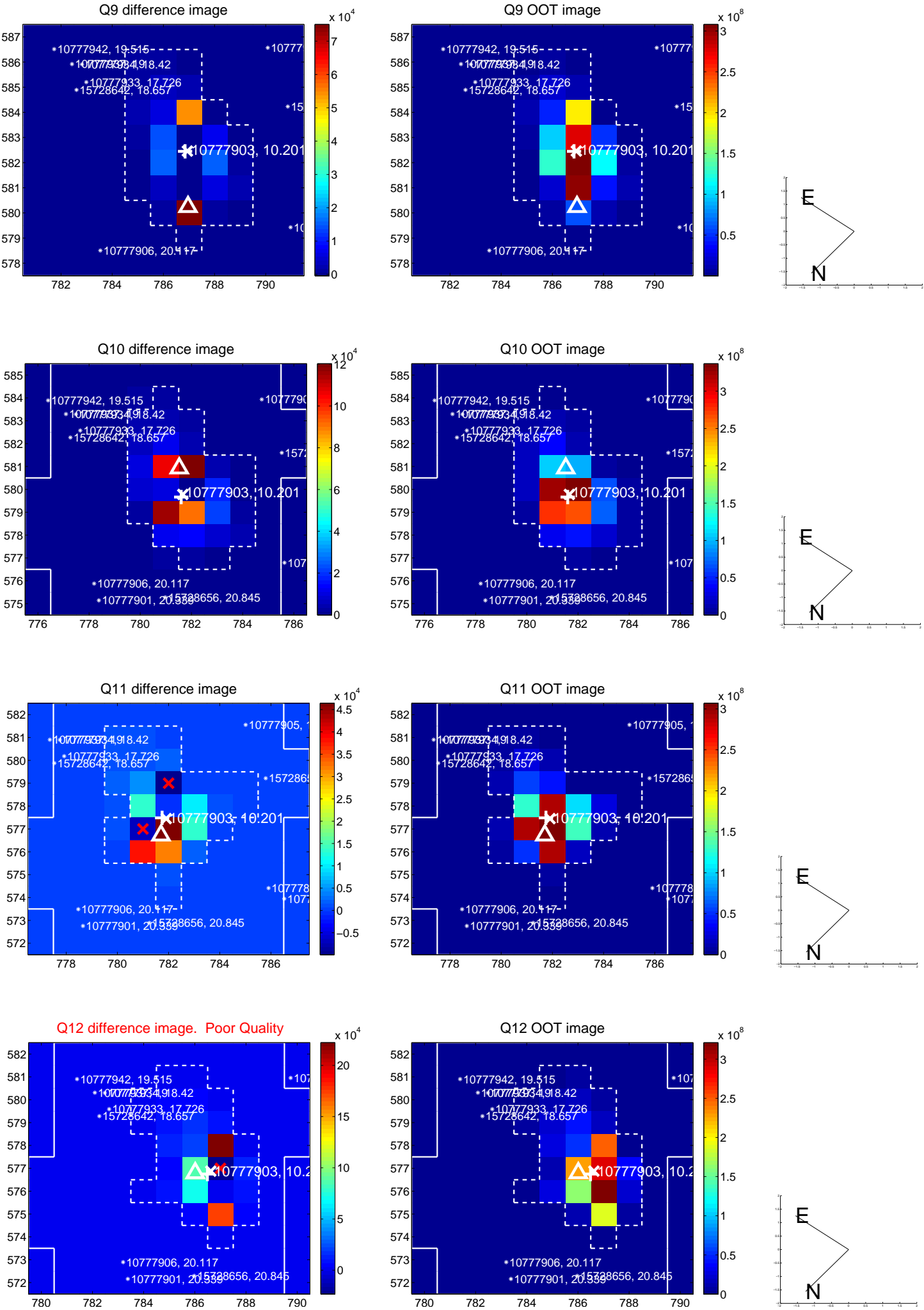


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

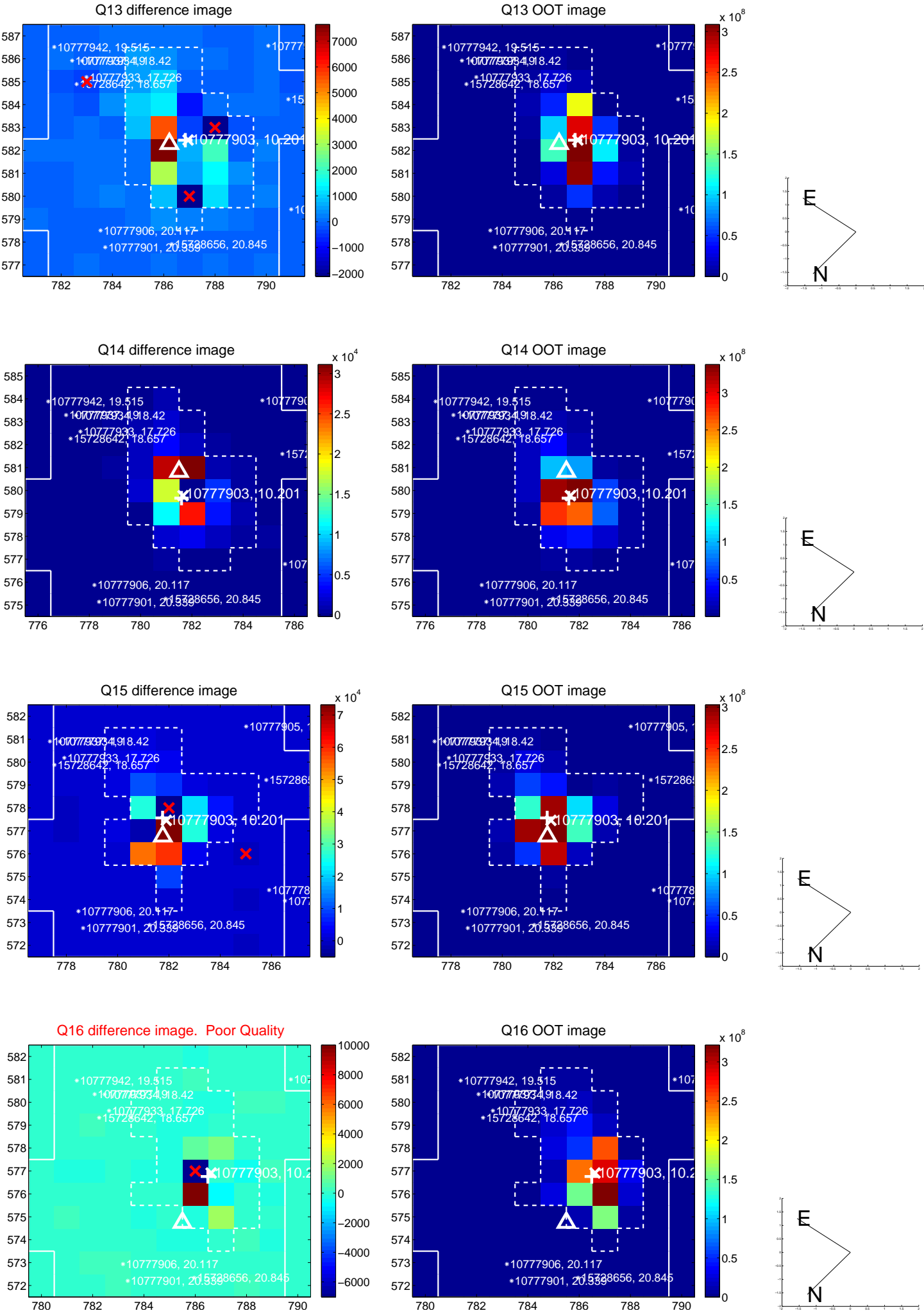




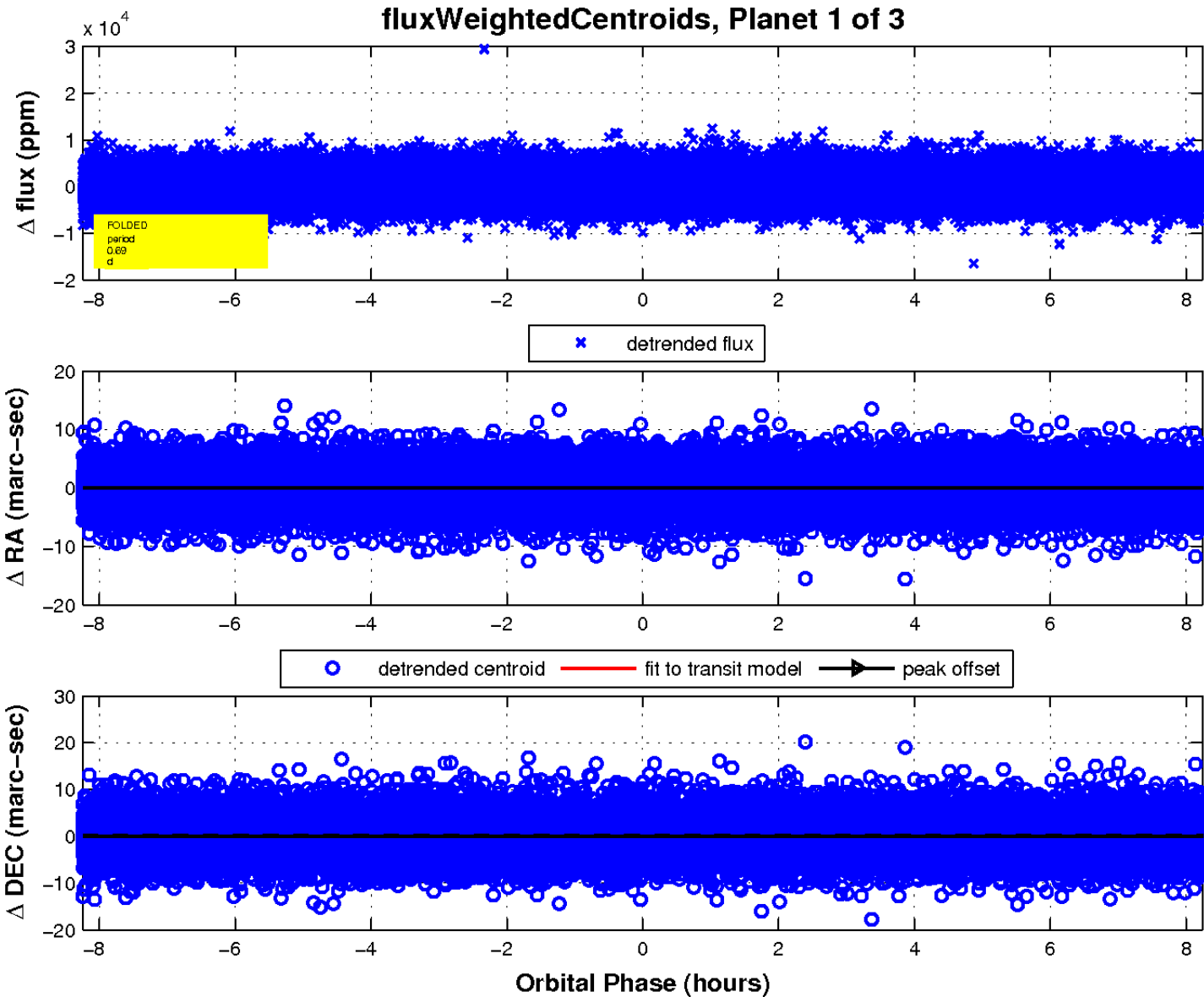
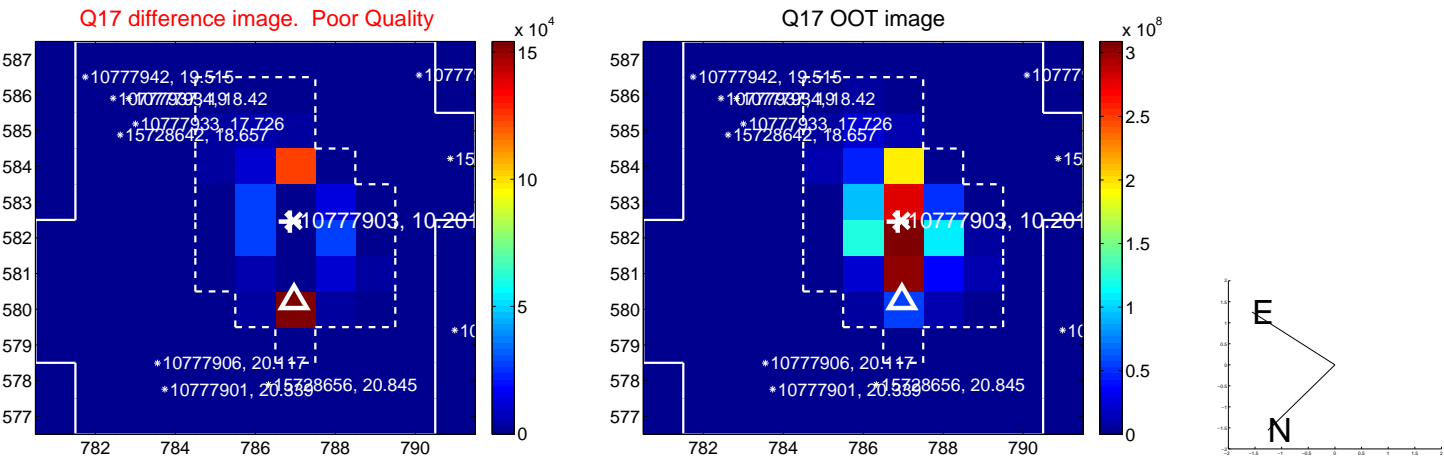
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

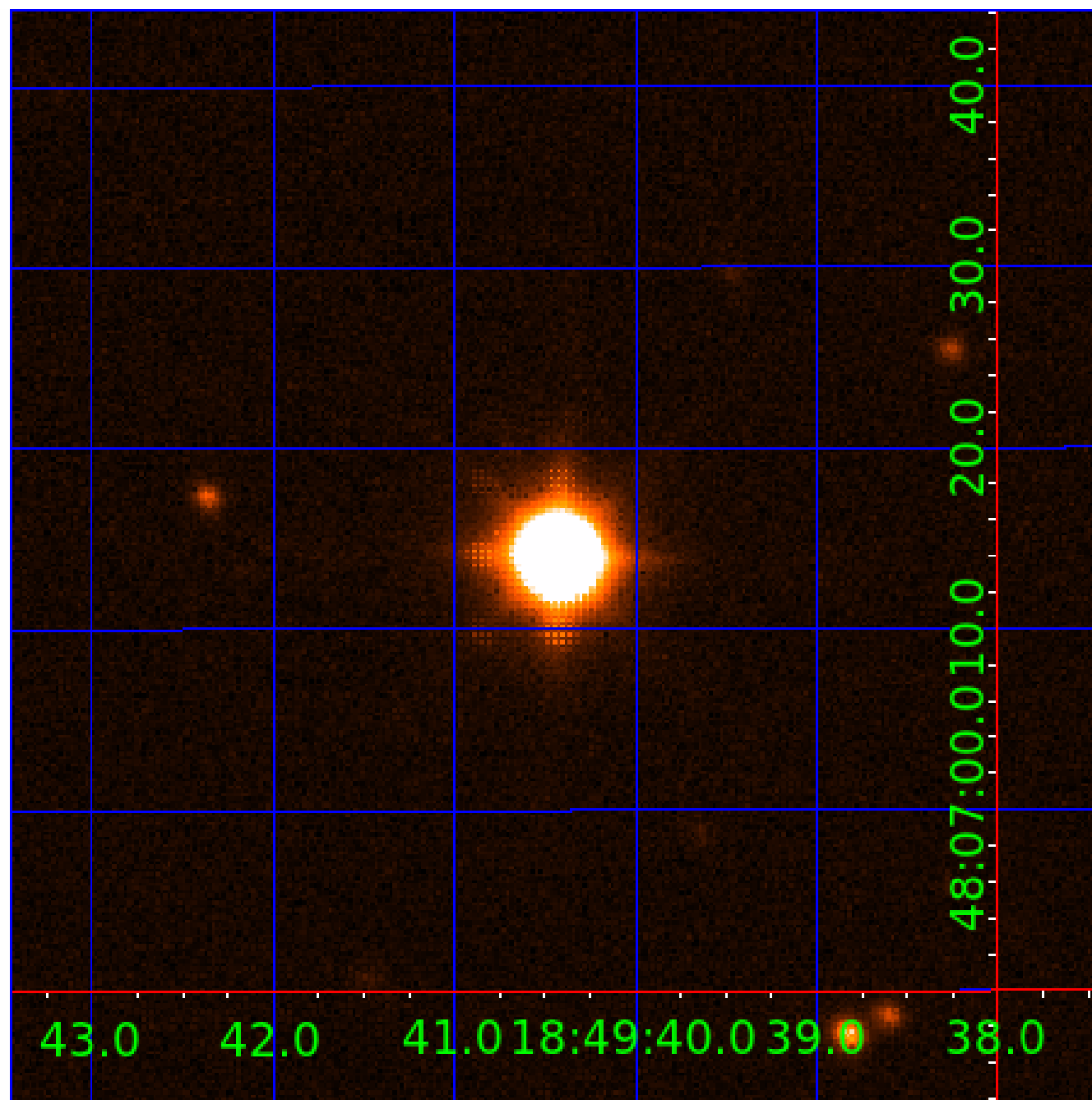


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010777903

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010777903-01	OBS	No	0.686750	131.747715	111.2	4.096	9.6	7.0	4.17	7535	5.14	123745.78
010777903-02	OBS	No	0.515618	131.631206	897.4	1.171	15.7	15.7	4.17	7535	14.65	0.00
010777903-03	OBS	No	0.515619	131.959123	1117.9	1.423	15.3	22.6	4.17	7535	15.02	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010777903-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010777903-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010777903-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—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.

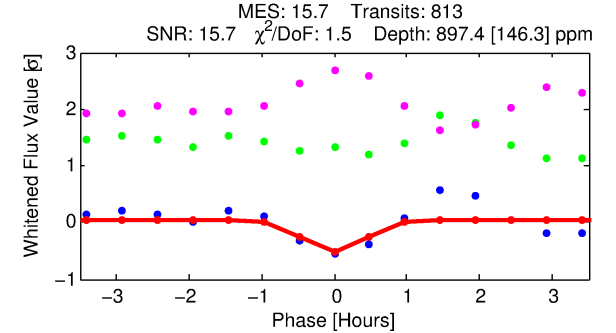
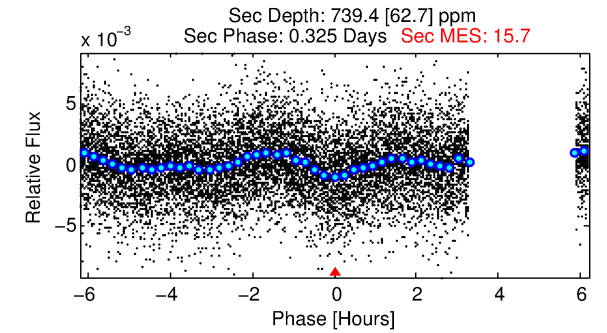
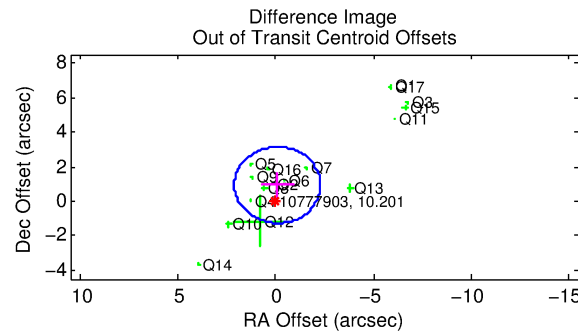
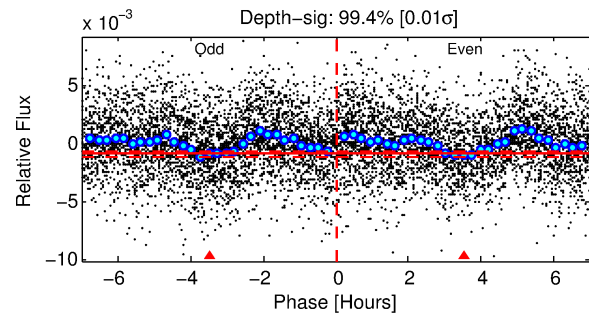
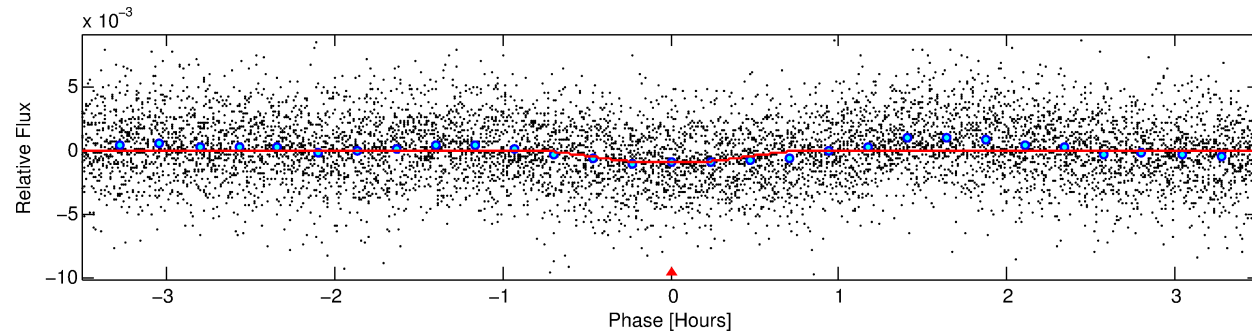
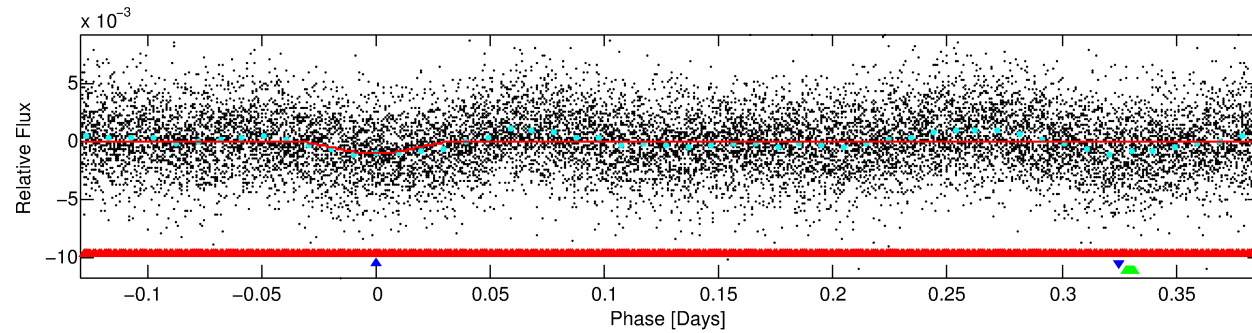
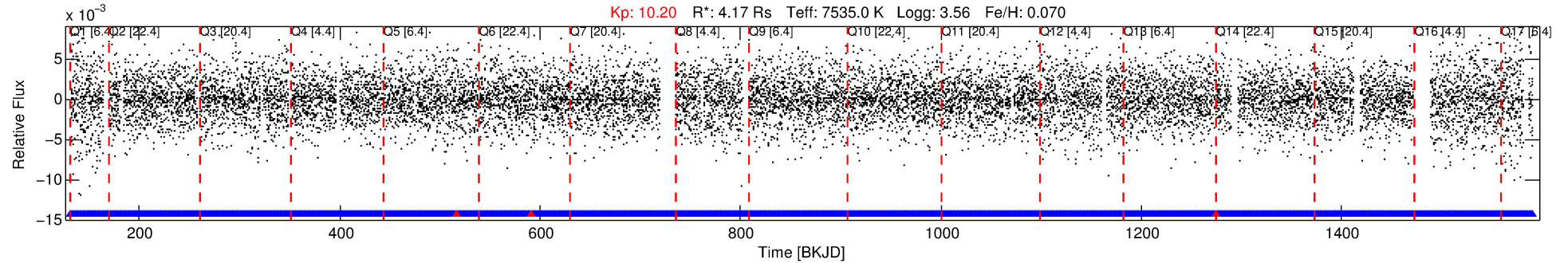
## Ephemeris Match Information For 010777903-02

No Significant Match Found



# DV One-Page Summary

KIC: 10777903 Candidate: 2 of 3 Period: 0.516 d



## DV Fit Results:

Period = 0.51562 [0.00001] d  
Epoch = 131.6312 [0.0017] BKJD  
Rp/R\* = 0.0322 [0.0122]  
a/R\* = 1.95 [3.01]  
b = 0.90 [0.45]  
Seff = N/A  
Teq = N/A  
Rp = 14.65 [9.84] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

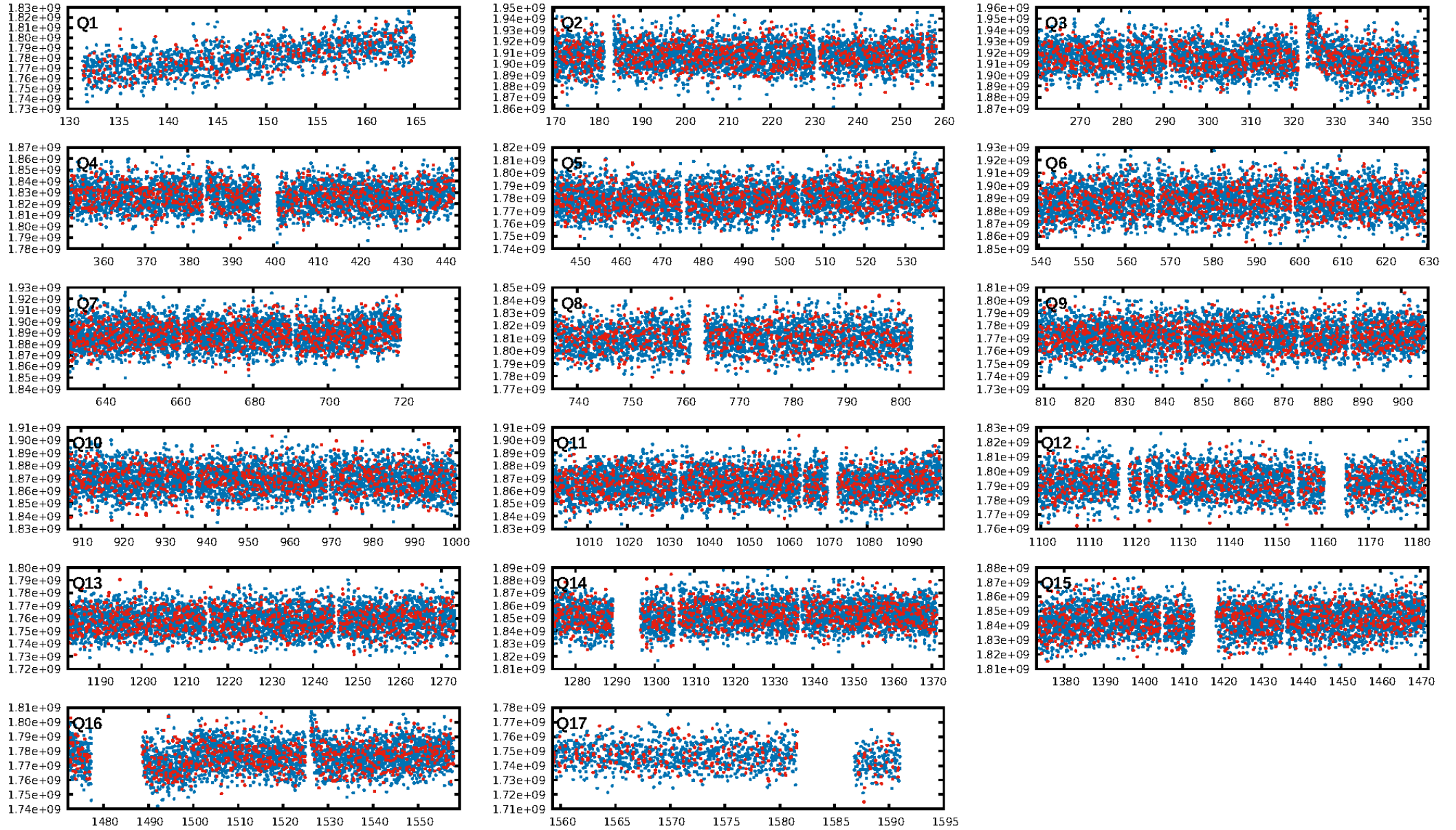
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [762/765]  
GhostDiagnostic-chr: 1.245  
Centroid-sig: 26.4%  
Centroid-so: 0.266 arcsec [4.56 $\sigma$ ]  
OotOffset-rm: 0.940 arcsec [1.28 $\sigma$ ]  
KicOffset-rm: 1.502 arcsec [2.33 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.18 [3/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:09:11 Z

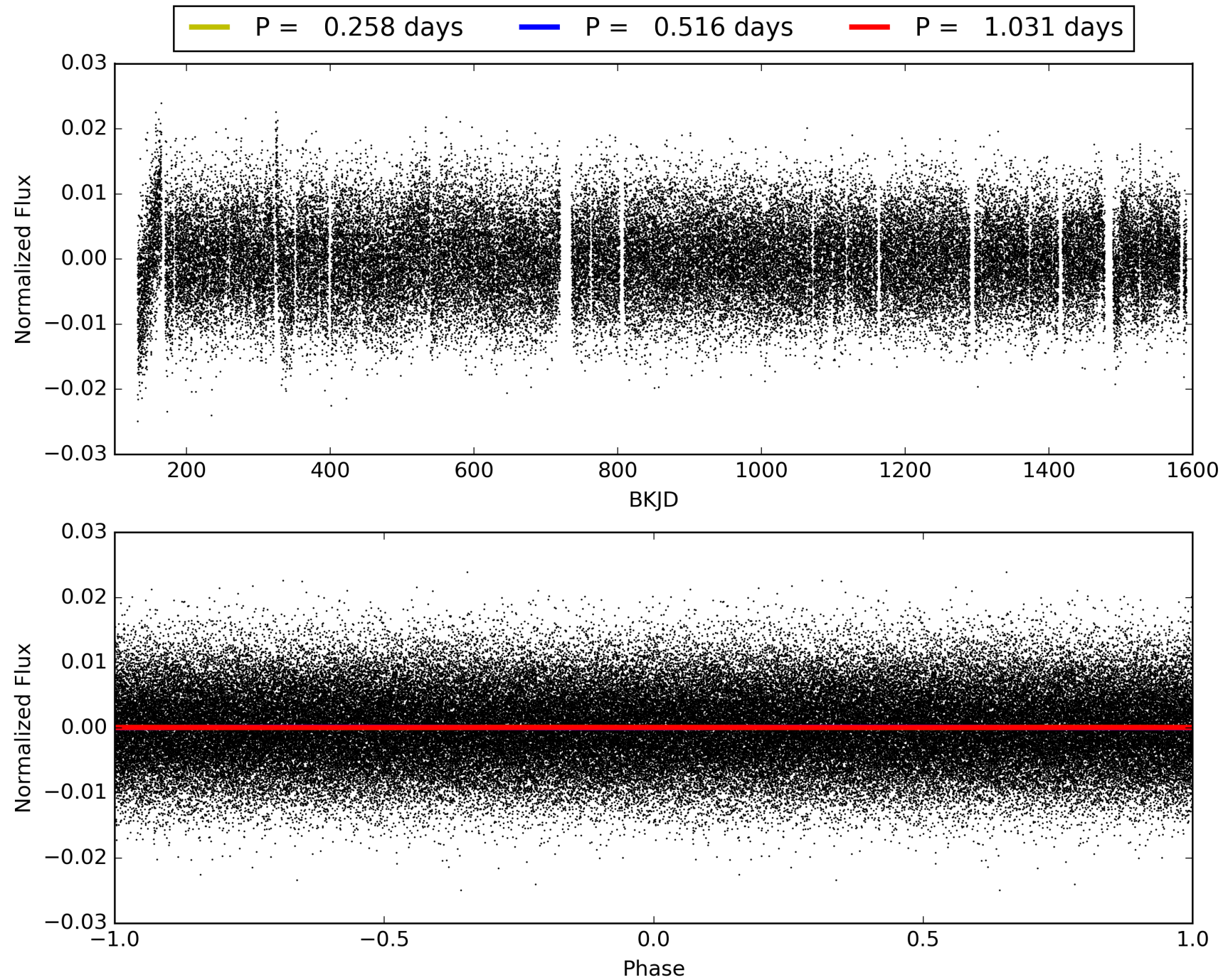
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010777903-02, PDC Light Curves



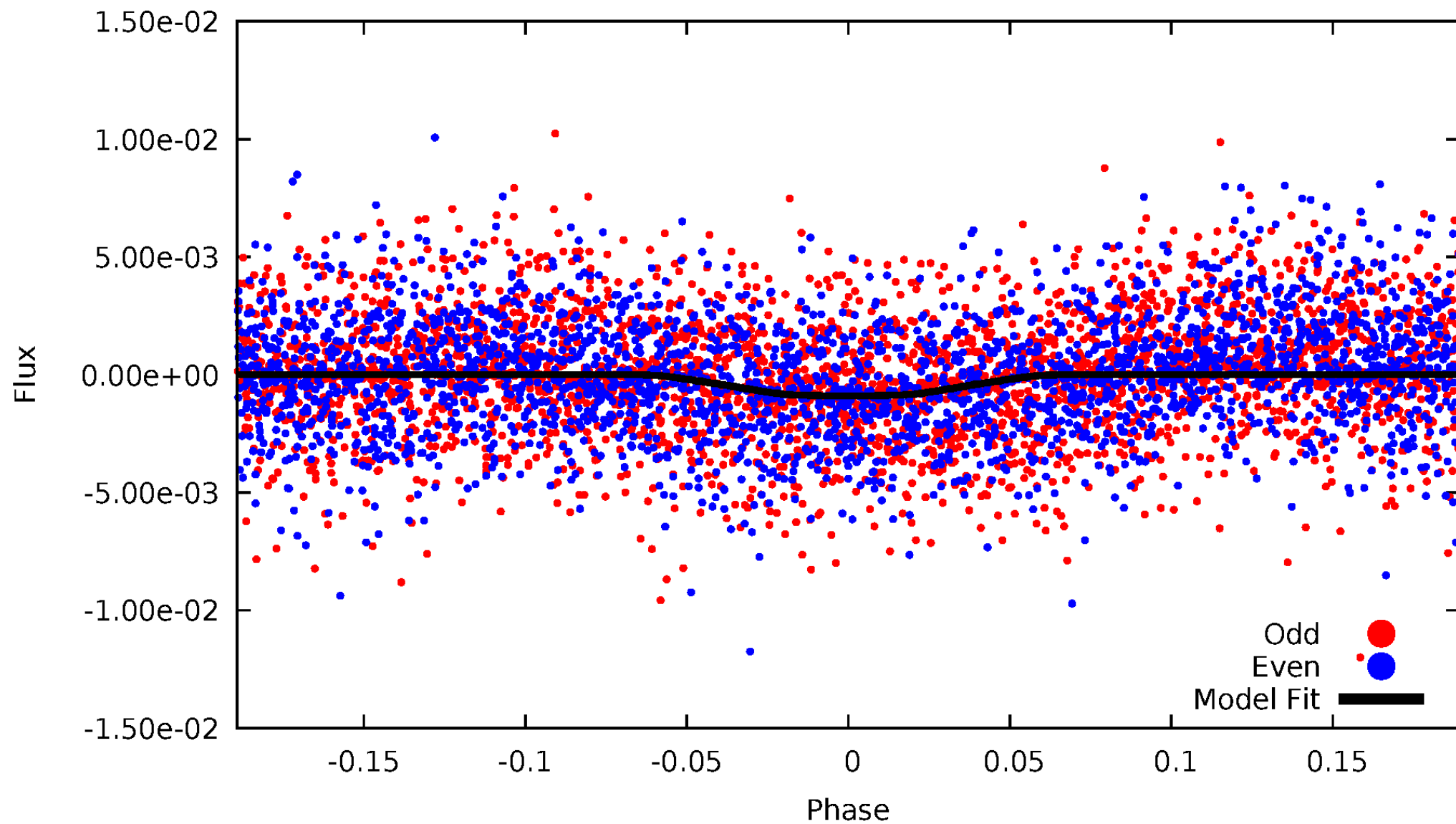


TCE 010777903-02



# DV Odd/Even

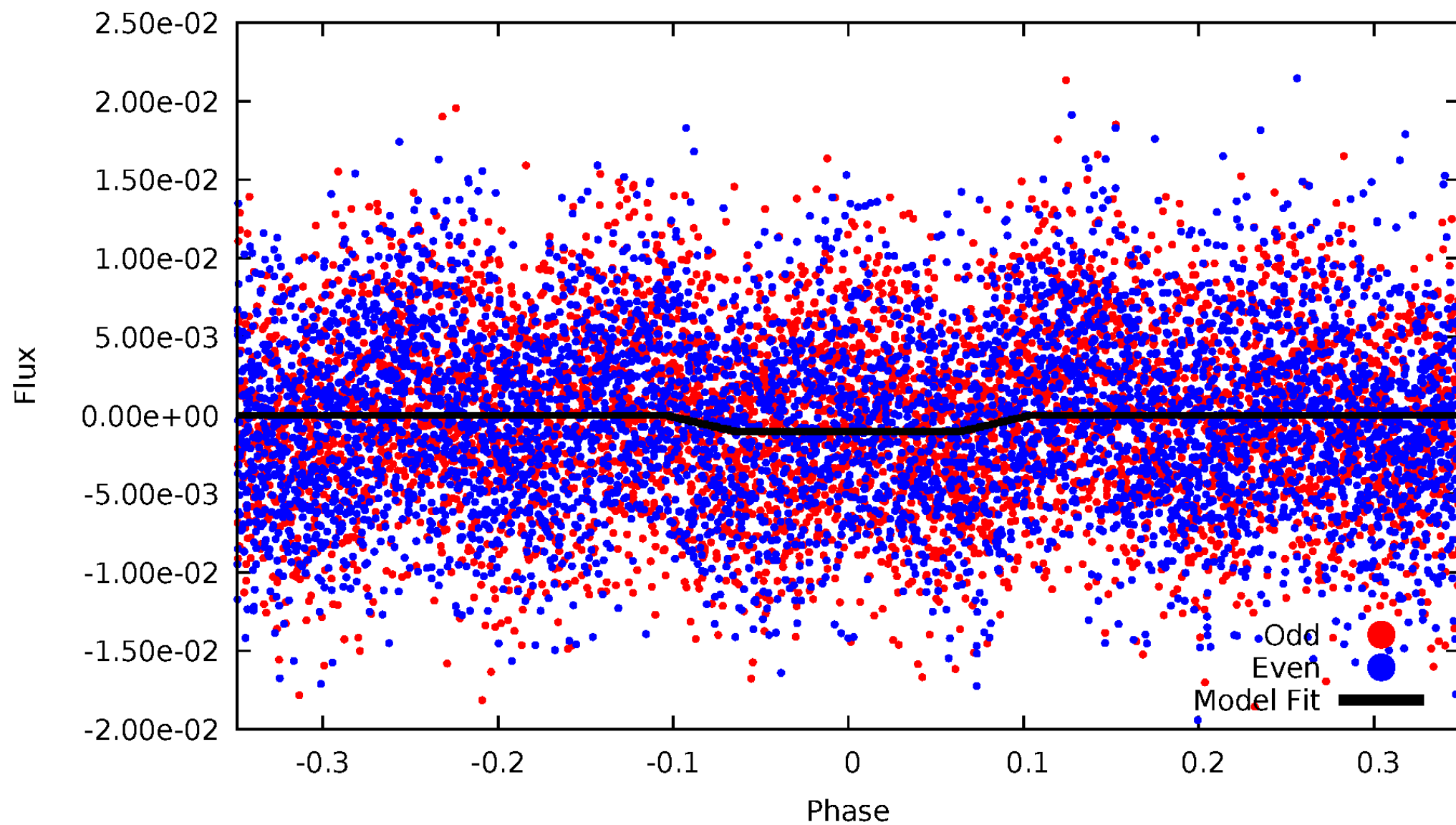
TCE 010777903-02





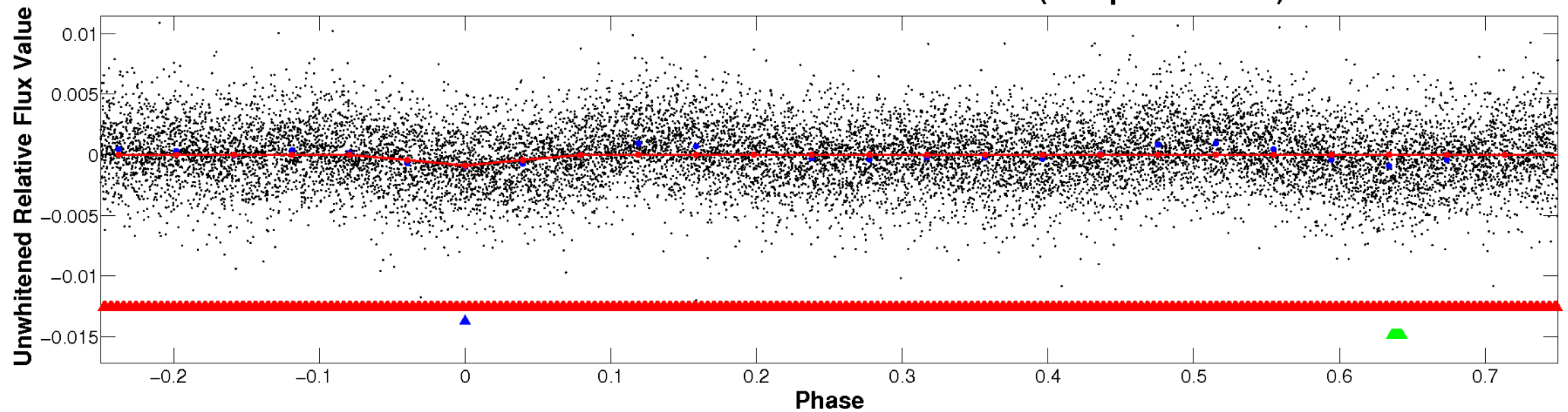
# ALT Odd/Even

TCE 010777903-02

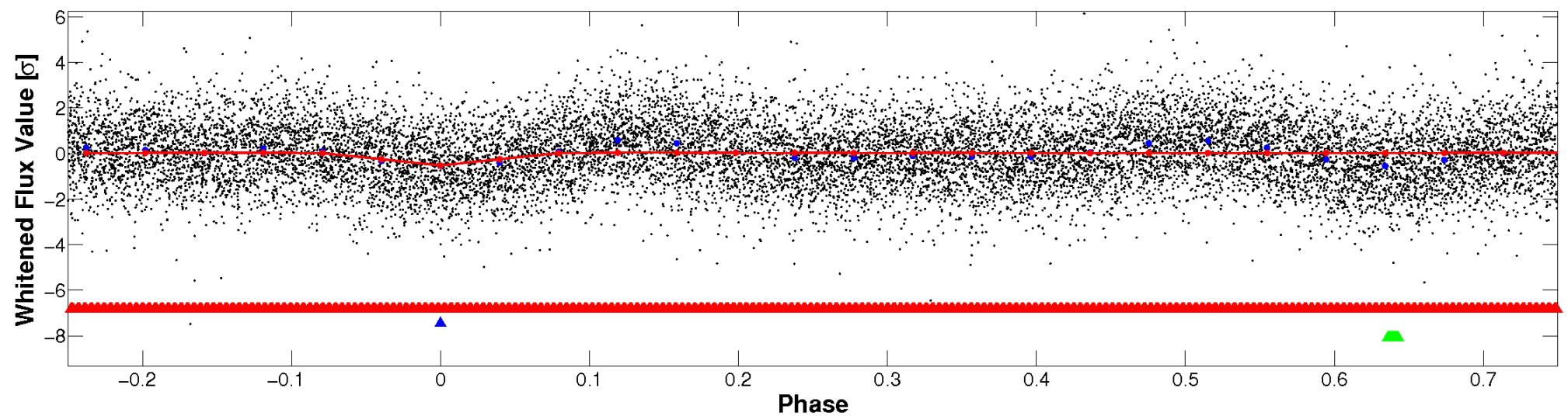


# Non-Whitened Vs. Whitened Light Curve

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

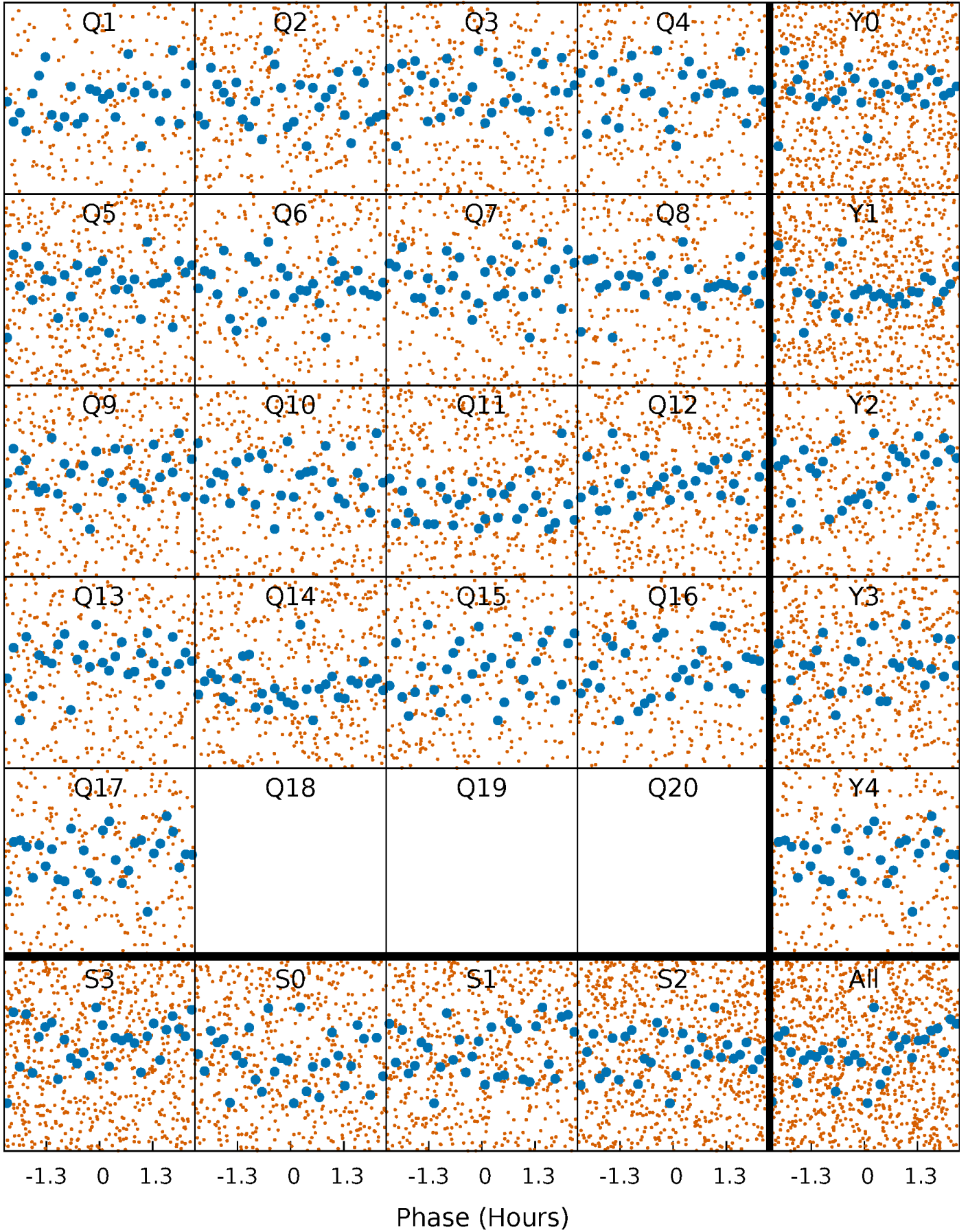


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



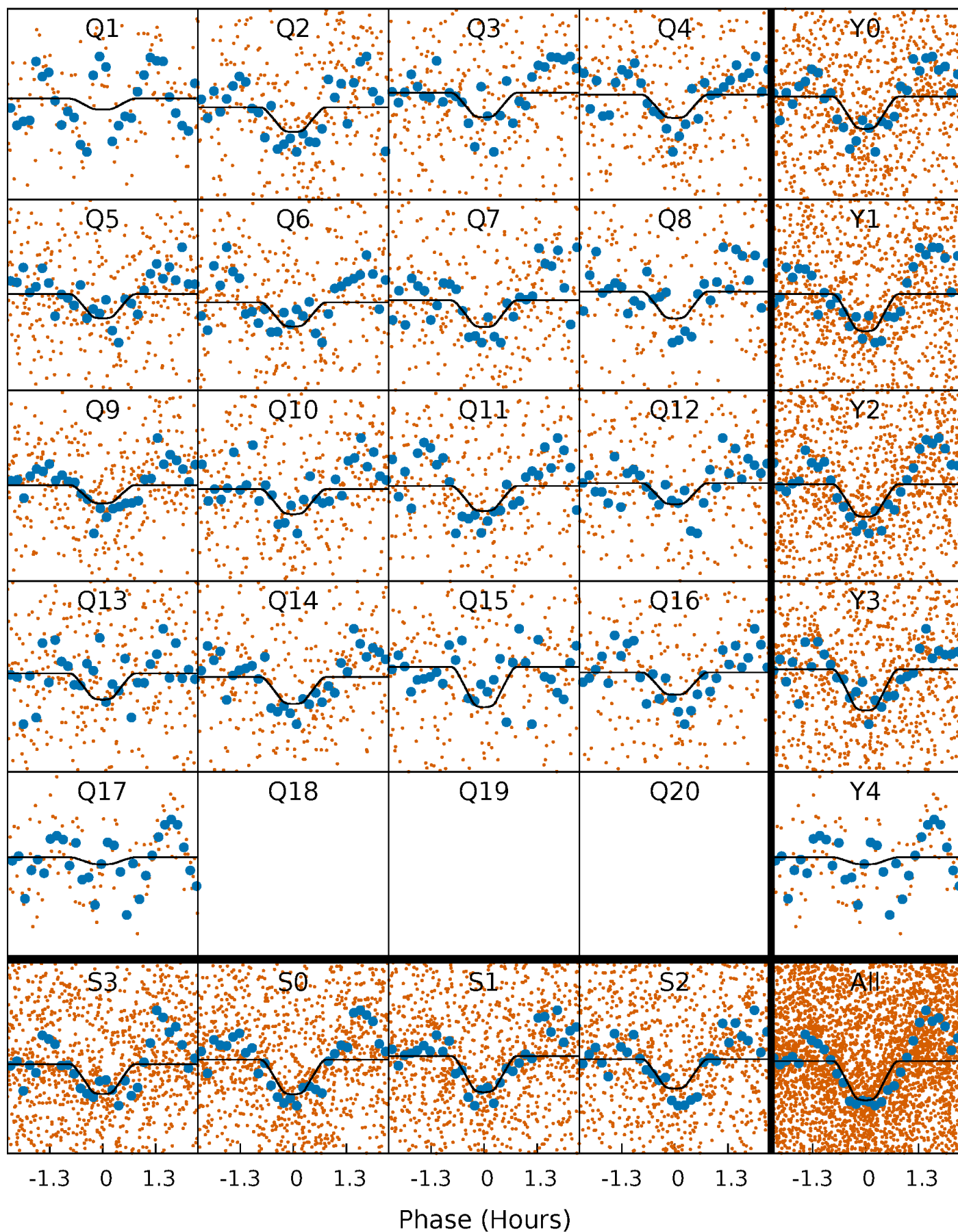
# PDC Quarter-Phased Transit Curves

TCE 010777903-02   P= 0.515618 Days    $T_0=131.631206$  (BKJD)



# DV Quarter-Phased Transit Curves

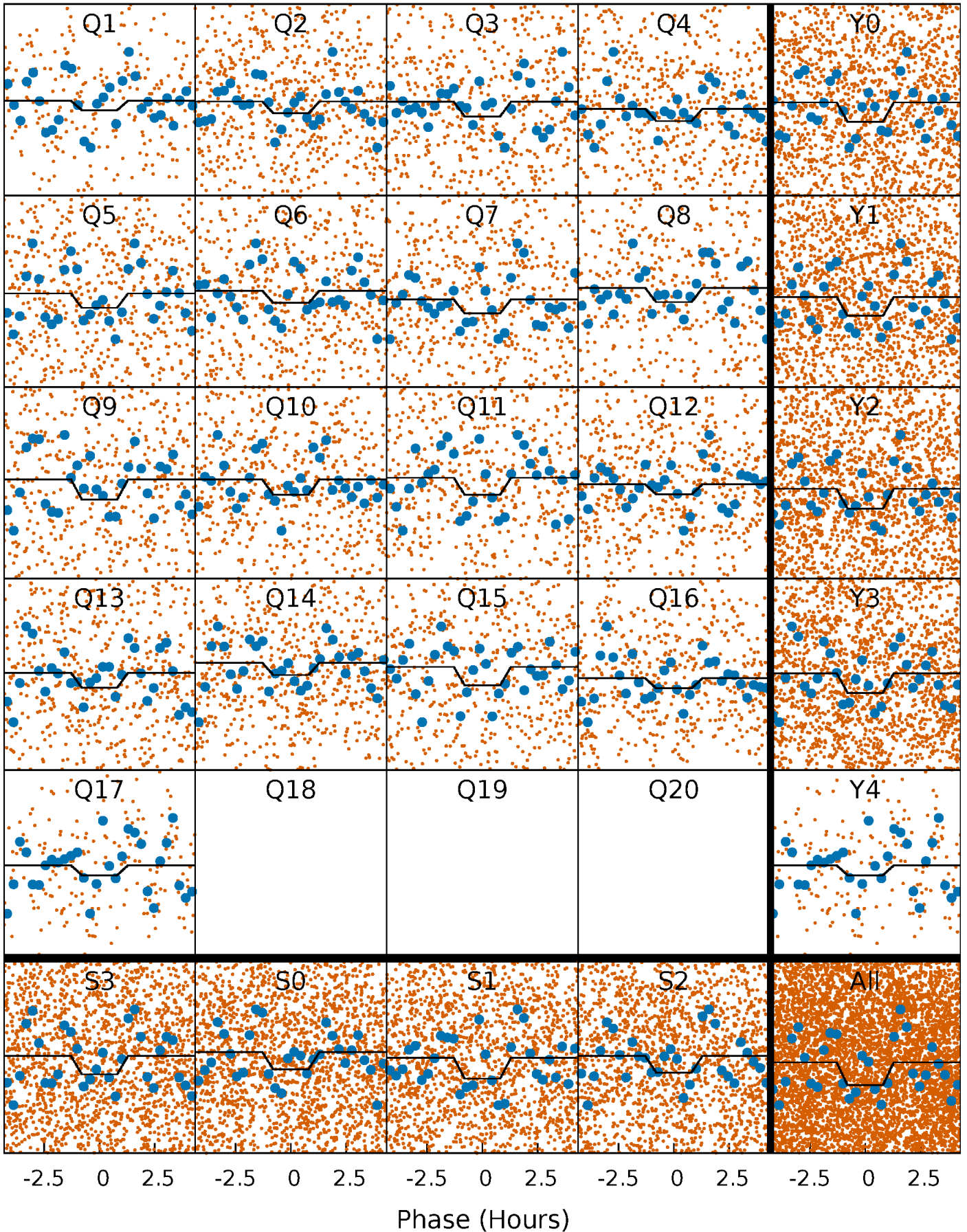
TCE 010777903-02 P= 0.515618 Days  $T_0=131.631206$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

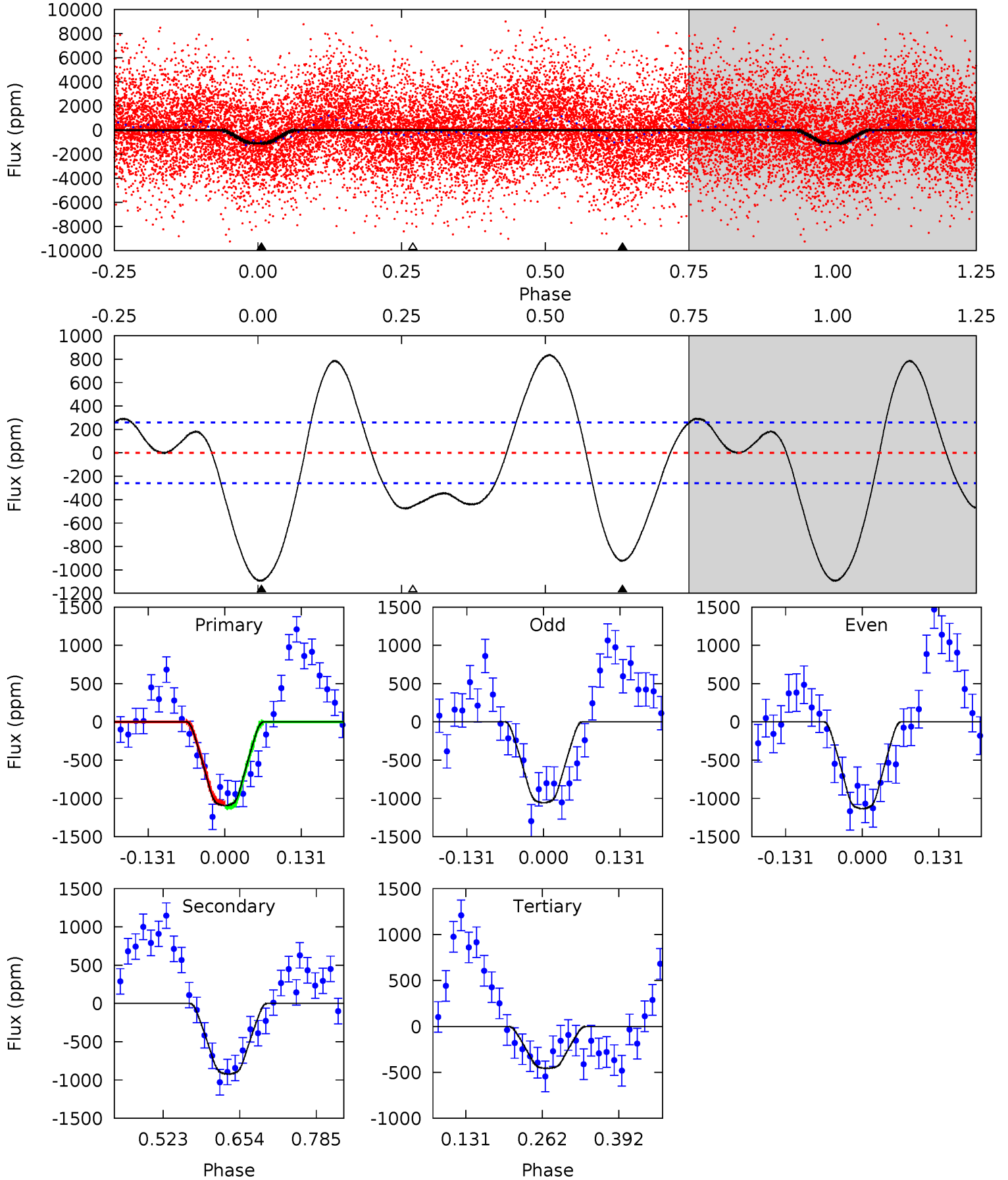
TCE 010777903-02     $P = 0.515618$  Days     $T_0 = 131.631206$  (BKJD)



# DV Model-Shift Uniqueness Test

010777903-02, P = 0.515618 Days, E = 131.631206 Days

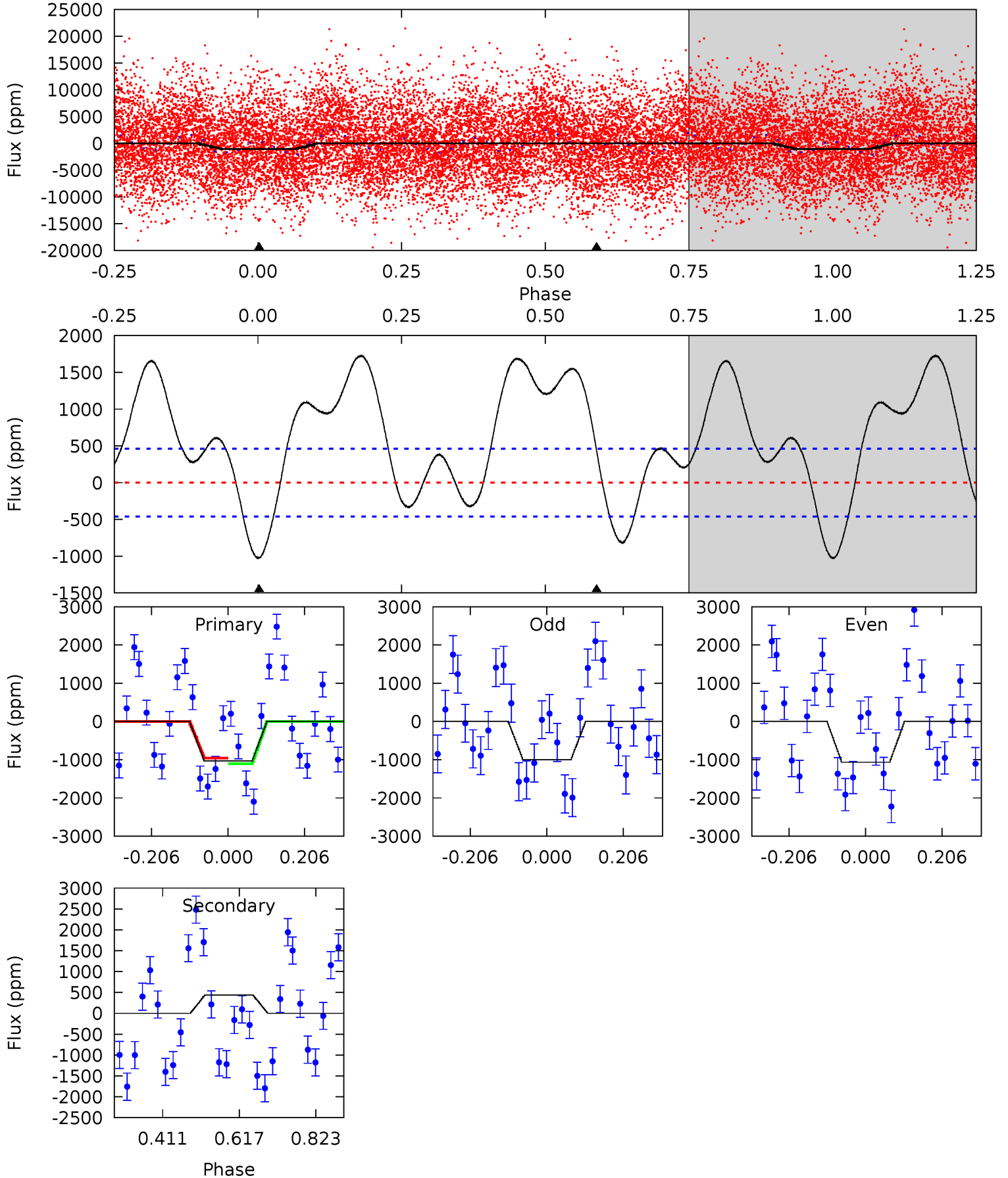
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	16.0	7.92	0	4.51	1.51	6.81	11.1	19.0	8.10	16.0	0.67	1.04	0.43	0.47



# Alt Model-Shift Uniqueness Test

010777903-02, P = 0.515618 Days, E = 131.631206 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
9.85	-4.20	0	0	4.41	1.27	3.59	9.85	9.85	-4.20	-4.20	0.30	0.98	0.63	0.72



### Stellar Parameters For KIC 010777903

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7535^{+209}_{-313}$	$3.562^{+0.522}_{-0.058}$	$0.070^{+0.150}_{-0.350}$	$4.174^{+0.409}_{-2.317}$	$2.319^{+0.196}_{-0.736}$	$0.045^{+0.279}_{-0.009}$
	+3%/-4%	+15%/-2%	+214%/-500%	+10%/-56%	+8%/-32%	+622%/-20%
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 010777903-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-922 \pm 58$	$12.94^{+6.46}_{-5.12}$	$7083^{+456}_{-910}$	$6331^{+2591}_{-2003}$	$0.821^{+1.432}_{-0.446}$
Alt.	$439 \pm 105$	$13.17^{+5.79}_{-5.73}$	$7113^{+428}_{-904}$	$-6991^{+706}_{-1368}$	$-0.372^{+0.202}_{-0.802}$

$T_{\text{max}}$  = 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

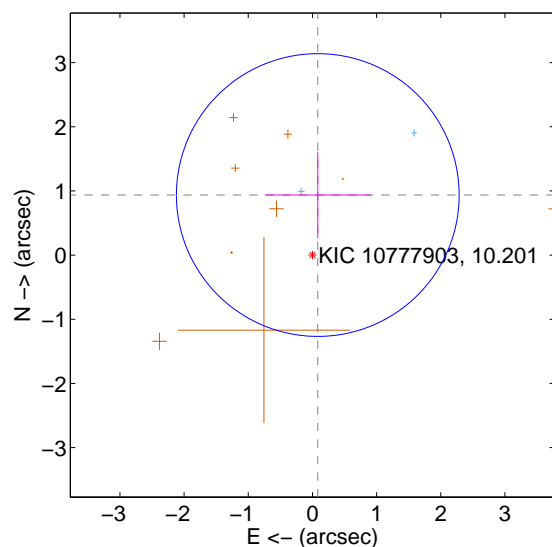
Supplemental centroid analysis for 010777903-02. **Kepler magnitude: 10.20.** Transit SNR 15.74

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

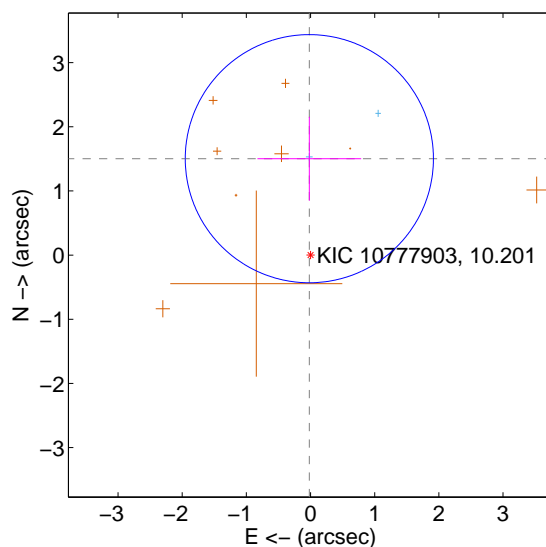
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.940 \pm 0.734$	1.28	$-0.083 \pm 0.826$	$0.936 \pm 0.671$
PRF-fit source offset from KIC position	$1.502 \pm 0.645$	2.33	$0.018 \pm 0.808$	$1.502 \pm 0.653$
photometric centroid source offset	<b><math>0.27 \pm 0.06</math></b>	<b>4.56</b>	$0.04 \pm 0.06$	$0.26 \pm 0.06$

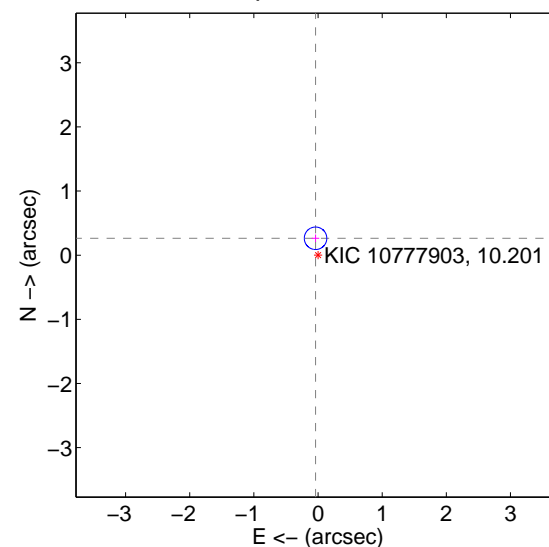
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

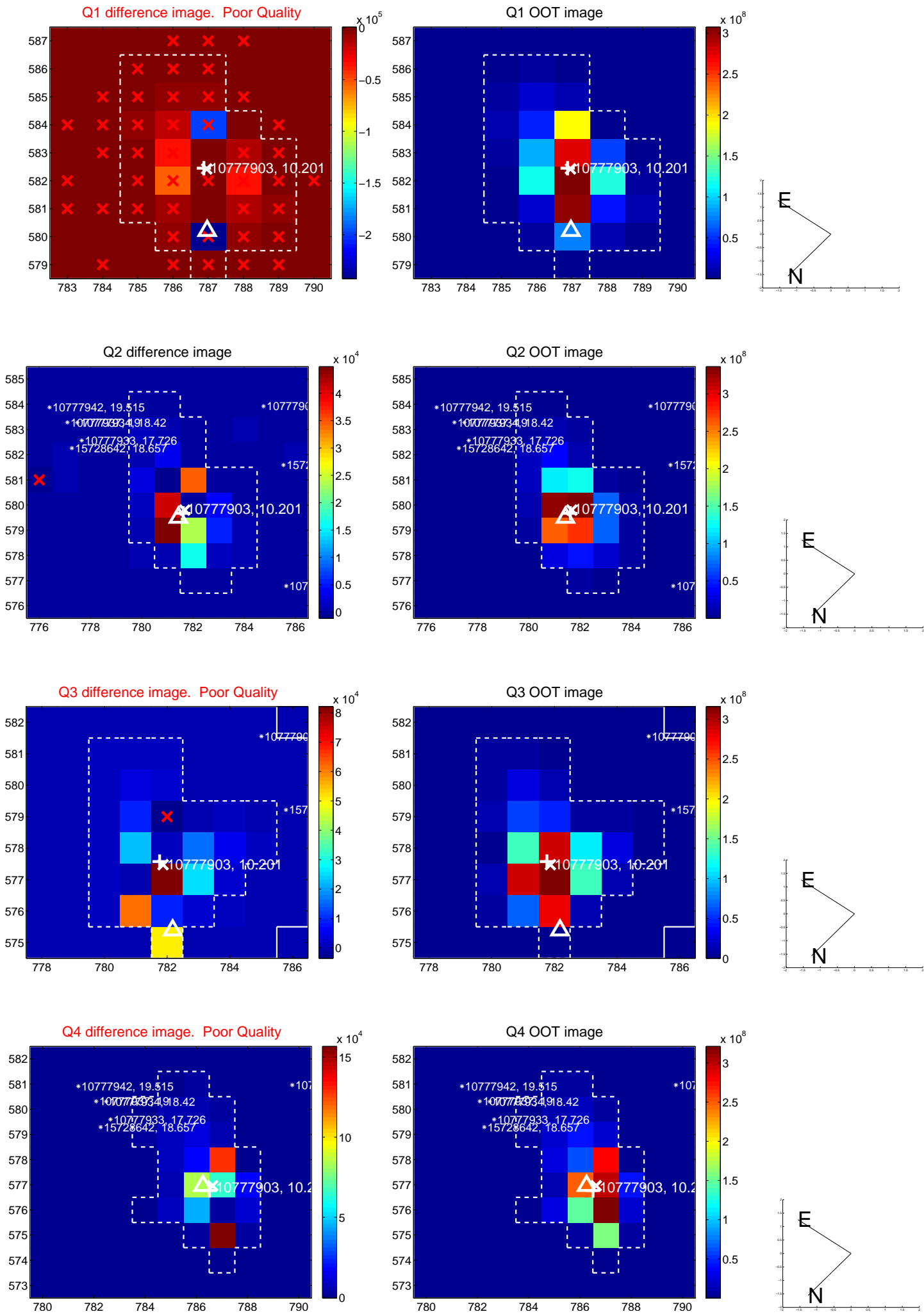


offset from photometric centroids

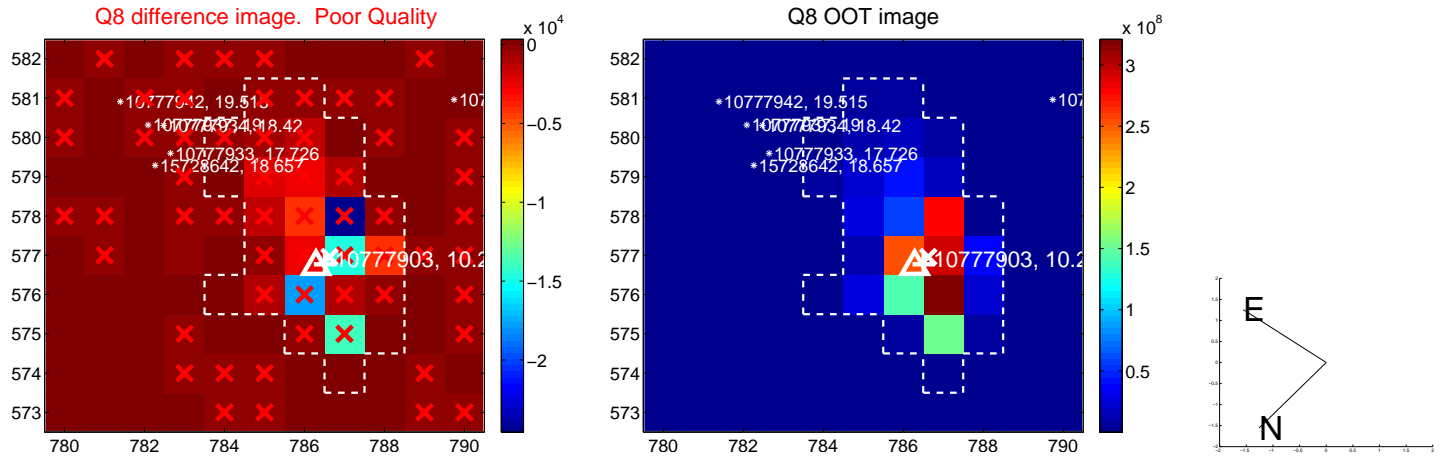
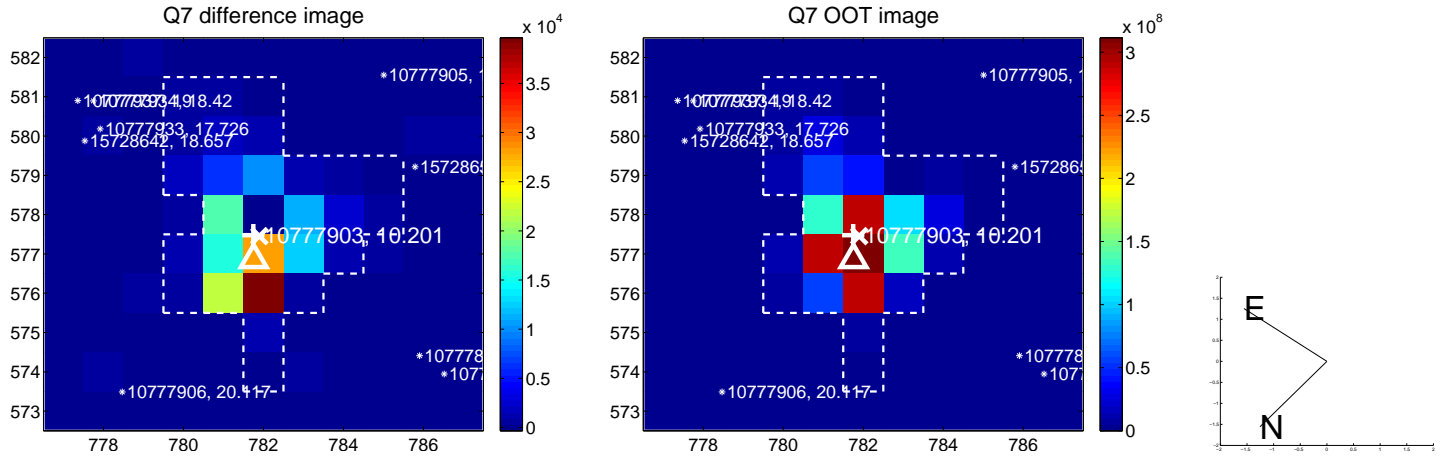
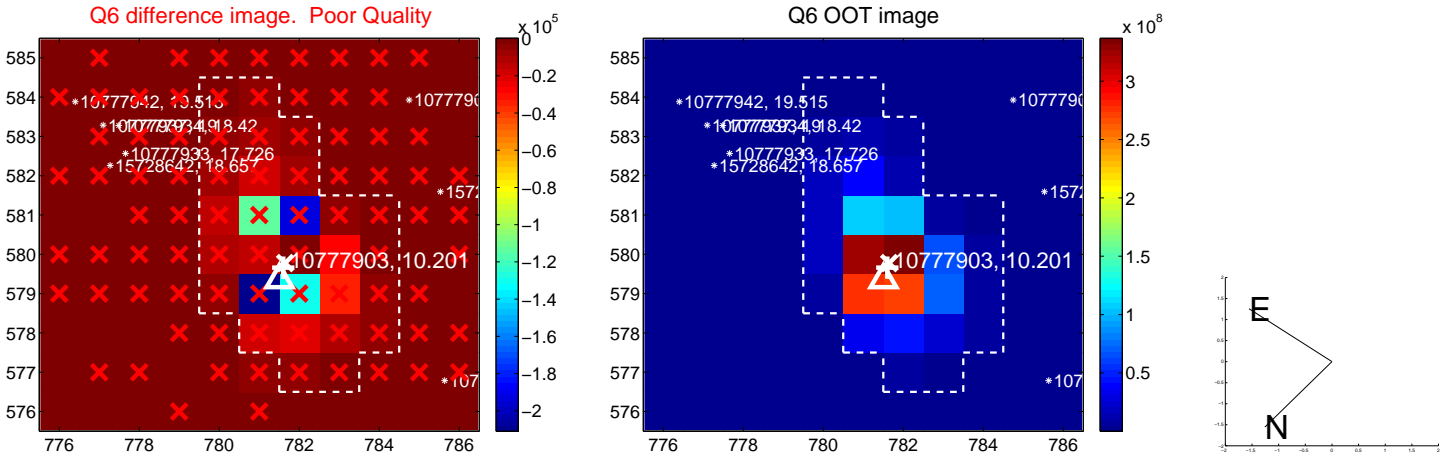
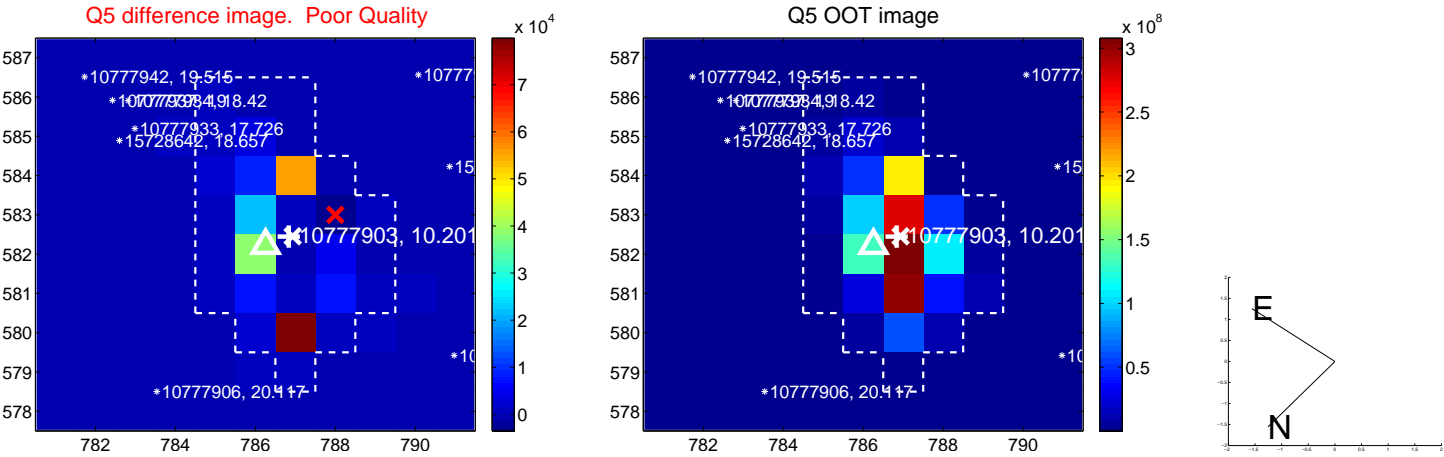


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

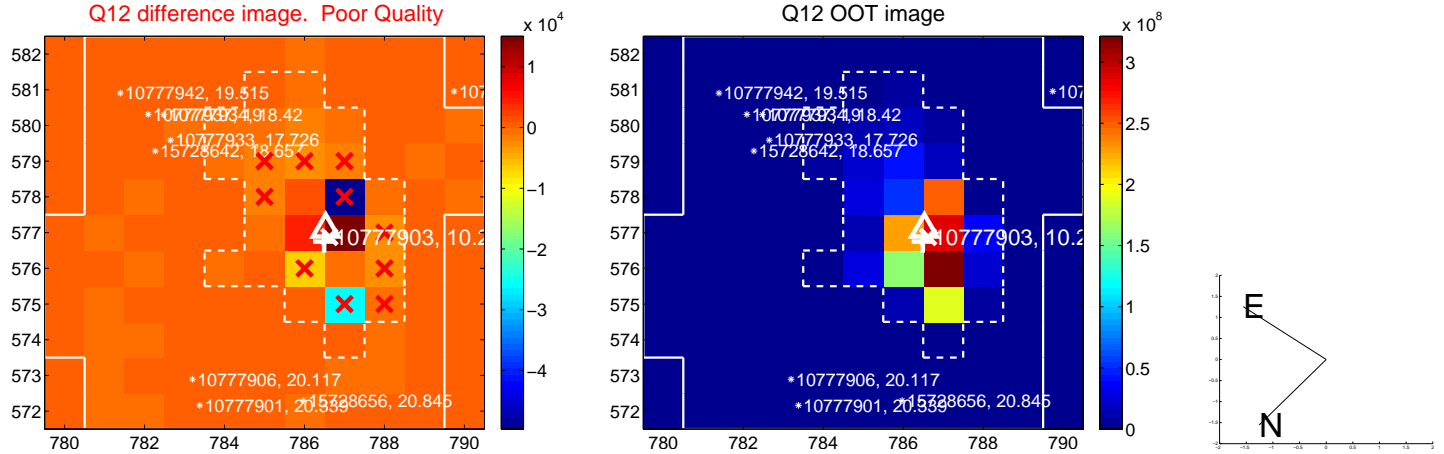
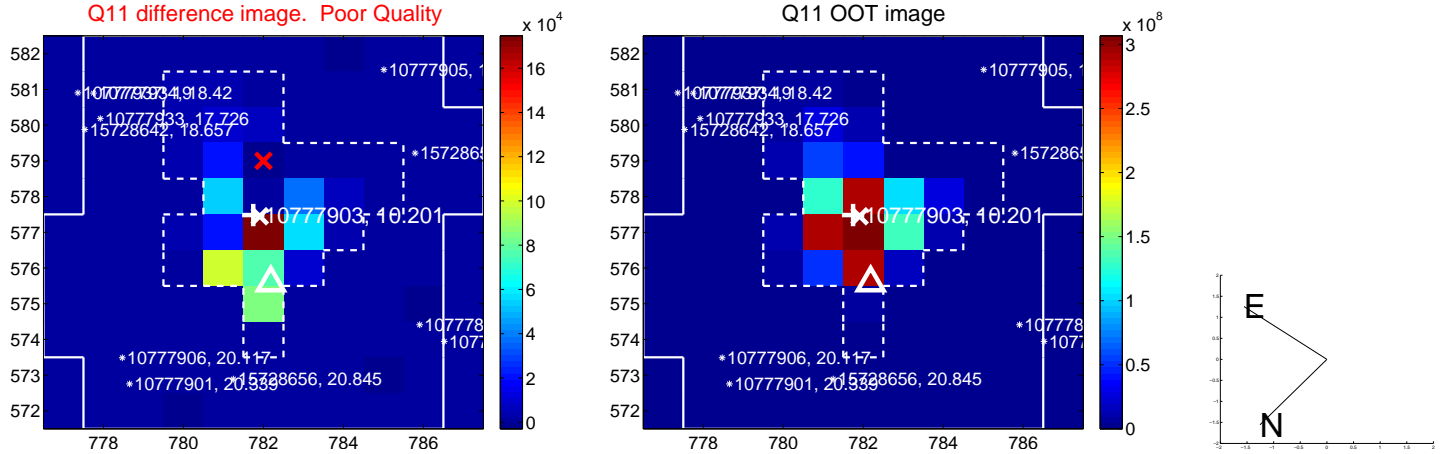
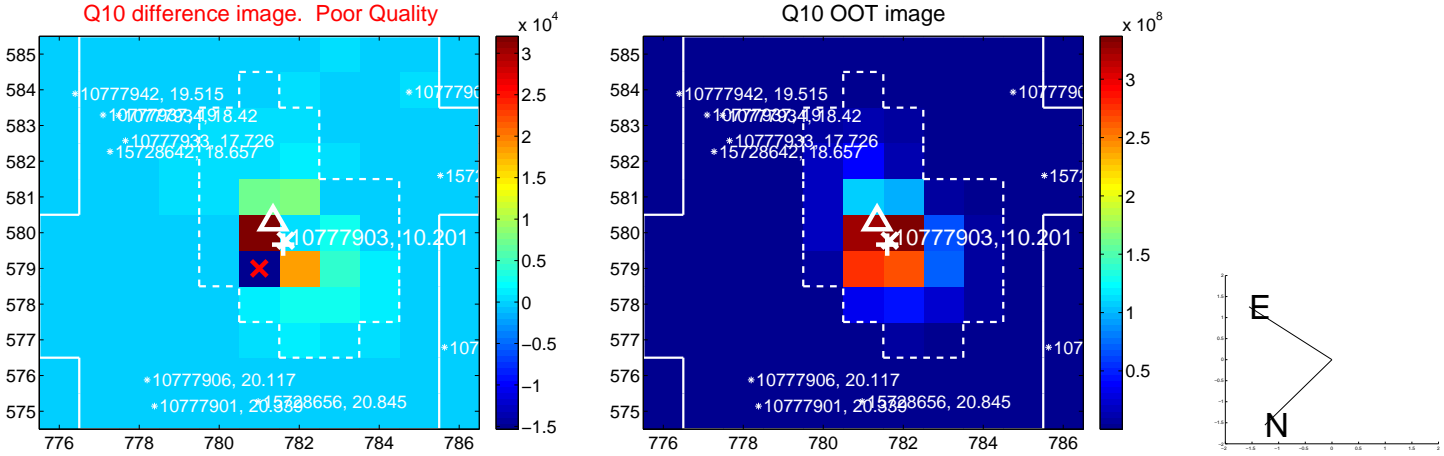
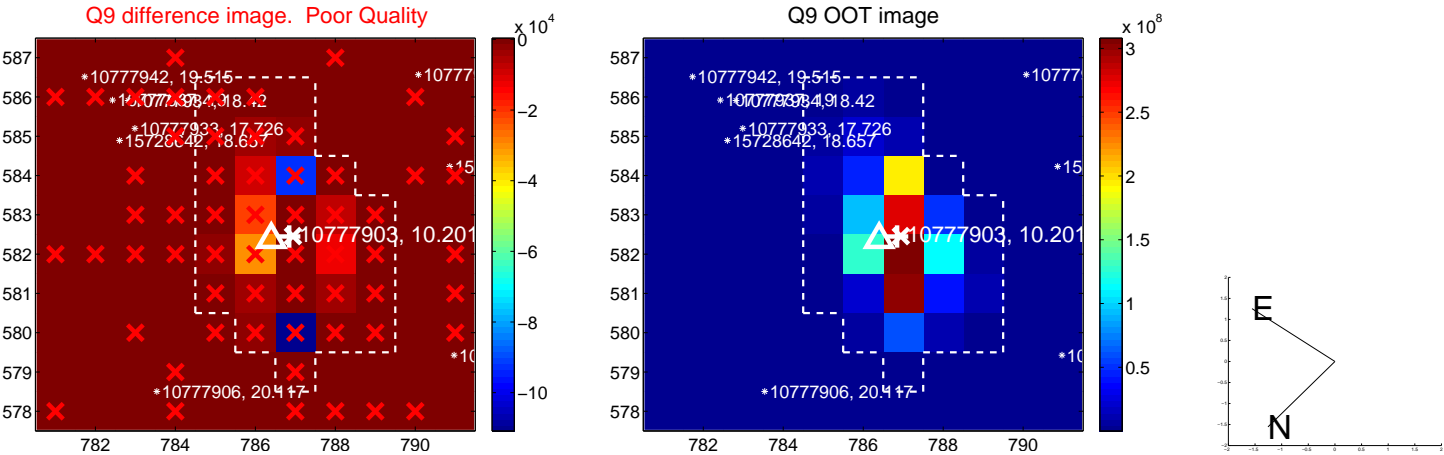
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



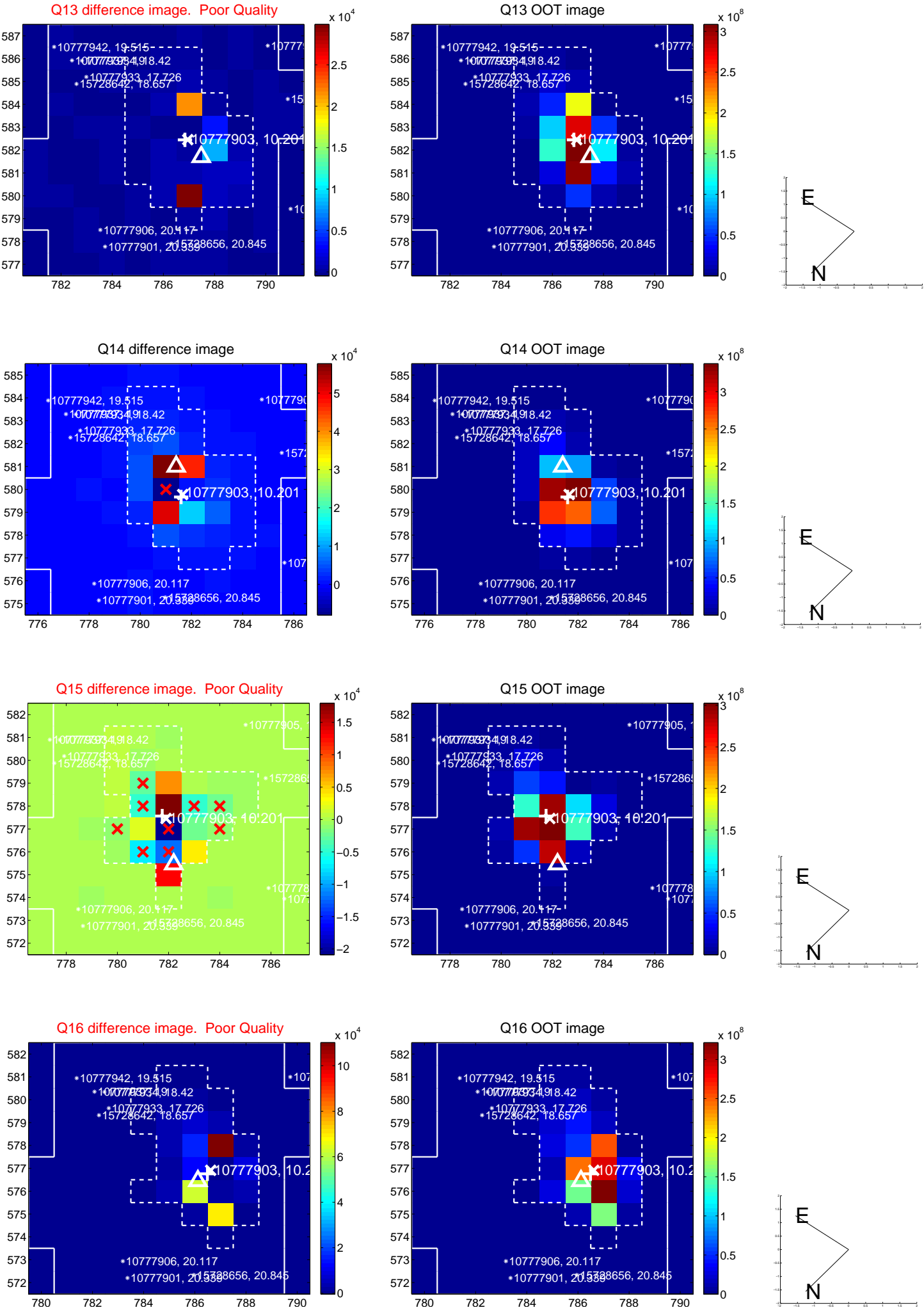
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

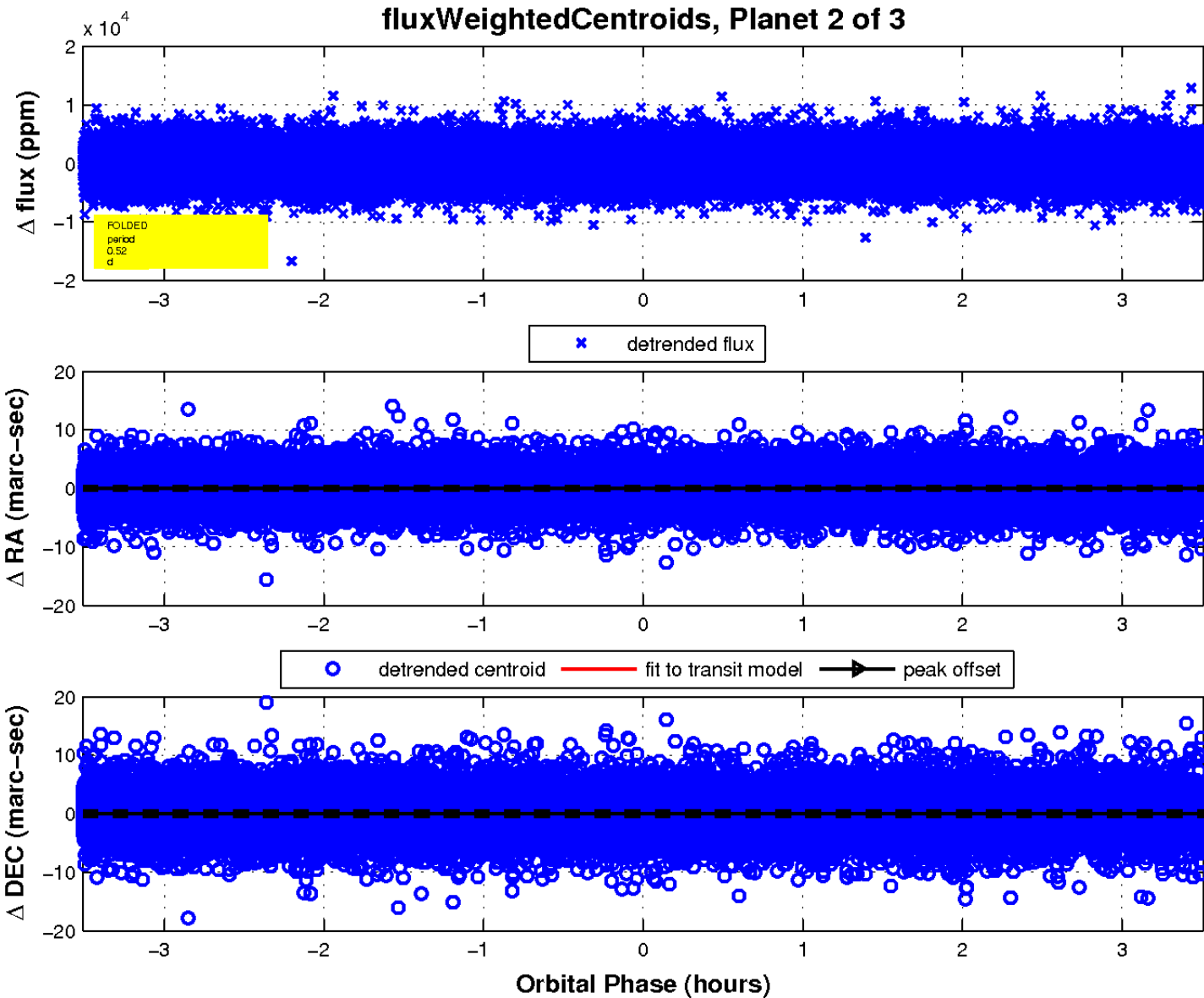
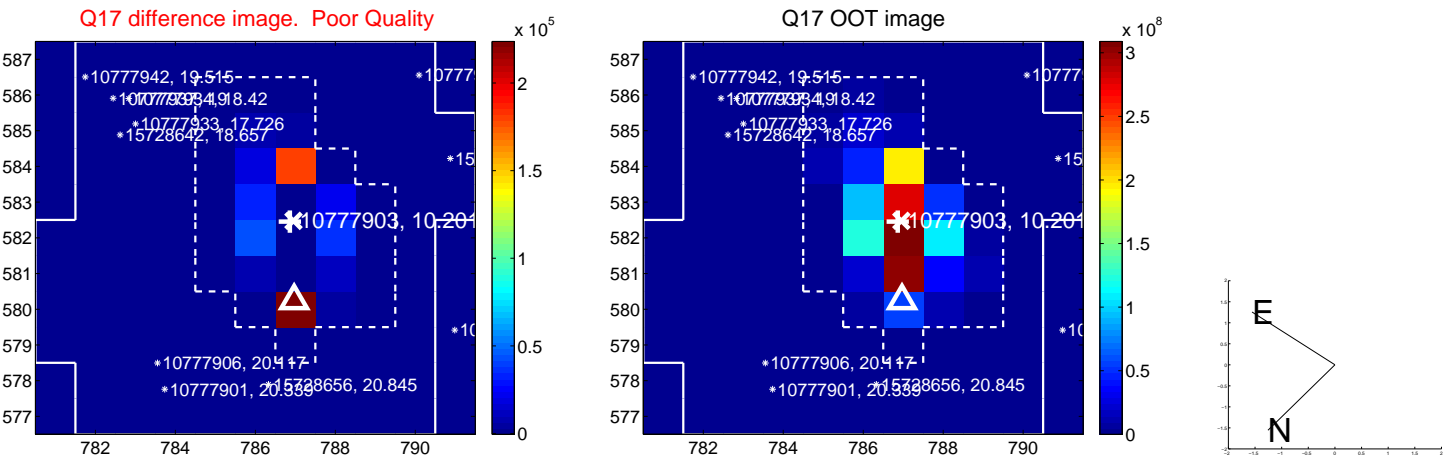


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



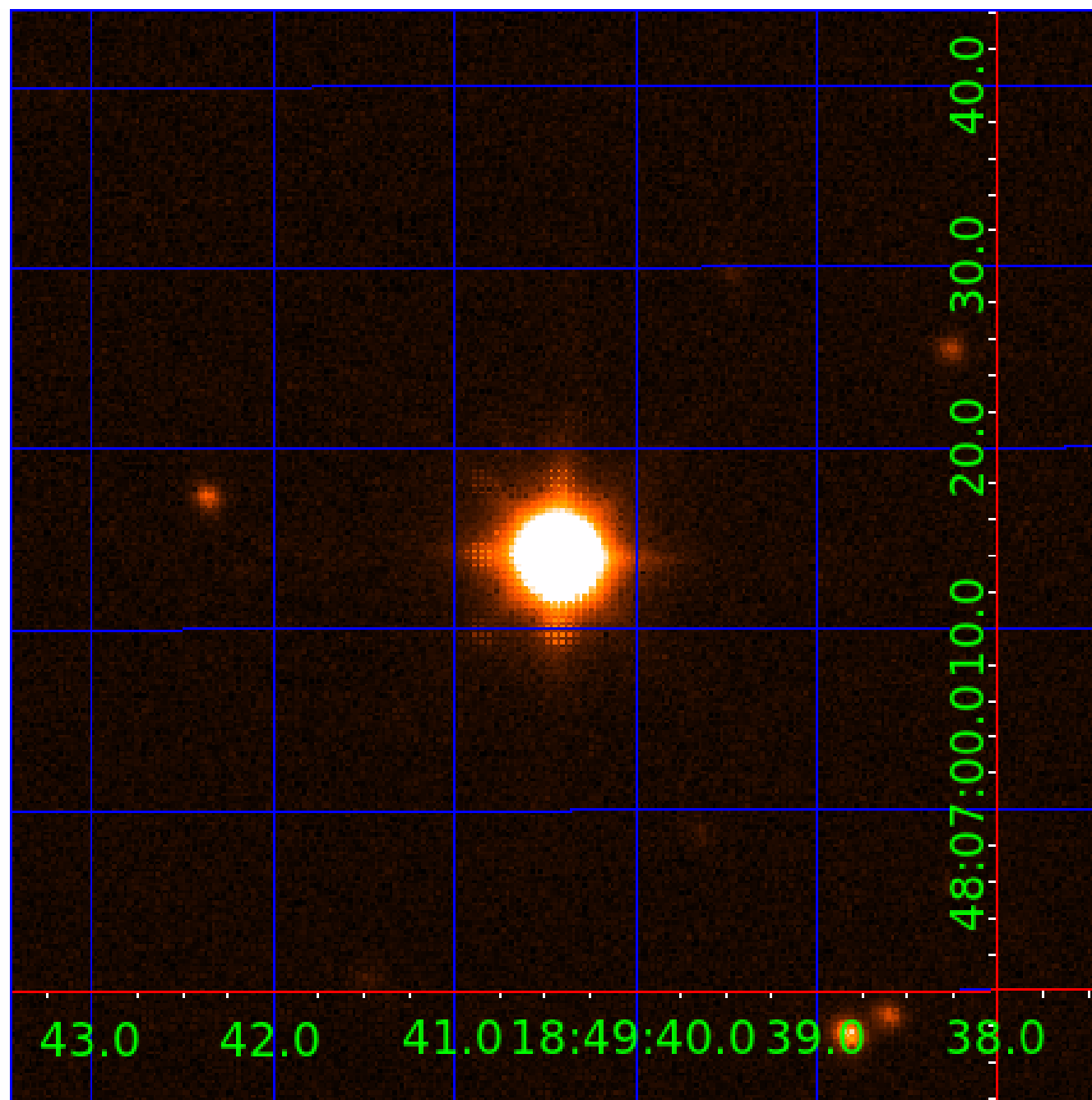


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010777903

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010777903-01	OBS	No	0.686750	131.747715	111.2	4.096	9.6	7.0	4.17	7535	5.14	123745.78
010777903-02	OBS	No	0.515618	131.631206	897.4	1.171	15.7	15.7	4.17	7535	14.65	0.00
010777903-03	OBS	No	0.515619	131.959123	1117.9	1.423	15.3	22.6	4.17	7535	15.02	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010777903-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
010777903-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010777903-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_SATURATED

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

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

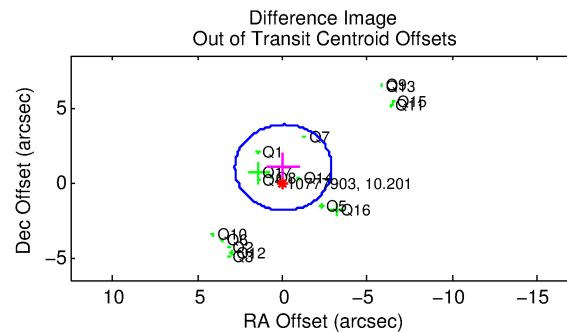
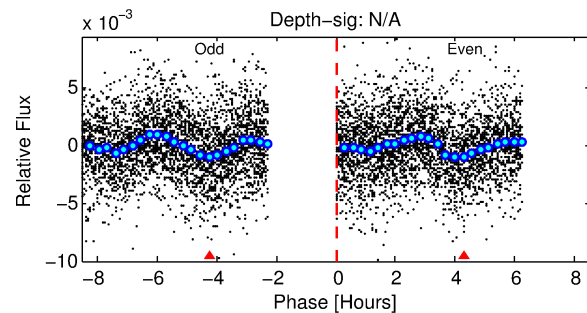
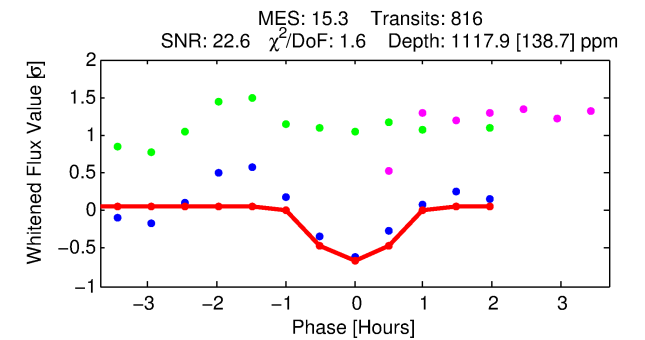
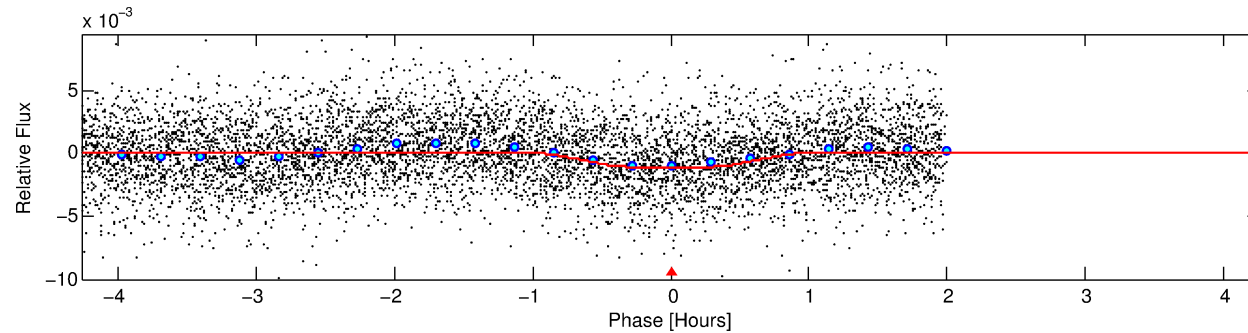
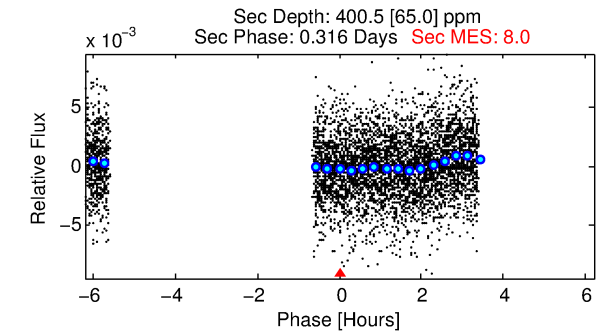
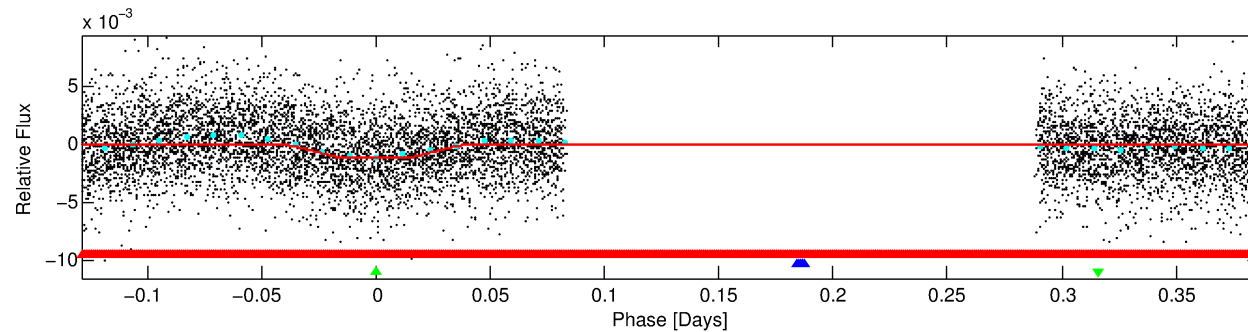
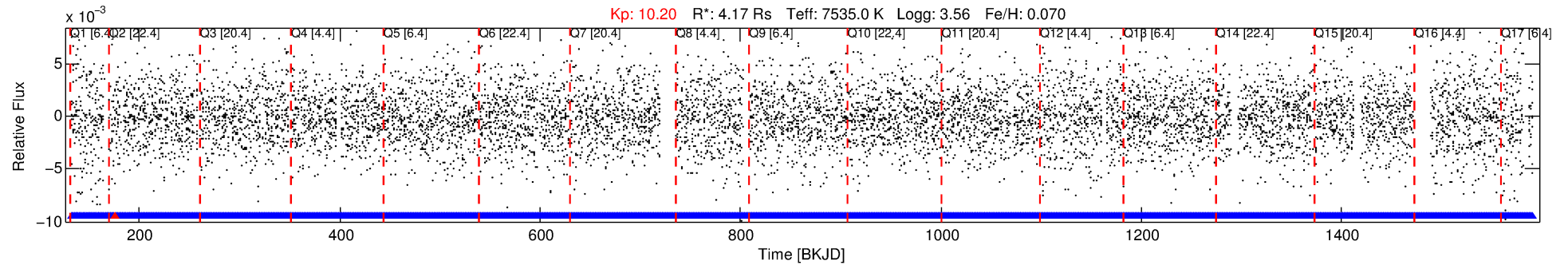
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010777903-03

No Significant Match Found

# DV One-Page Summary

KIC: 10777903 Candidate: 3 of 3 Period: 0.516 d



## DV Fit Results:

Period = 0.51562 [0.00001] d  
Epoch = 131.9591 [0.0014] BKJD  
Rp/R\* = 0.0330 [0.0164]  
a/R\* = 2.26 [5.11]  
b = 0.70 [2.06]  
Seff = N/A  
Teq = N/A  
Rp = 15.02 [11.20] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

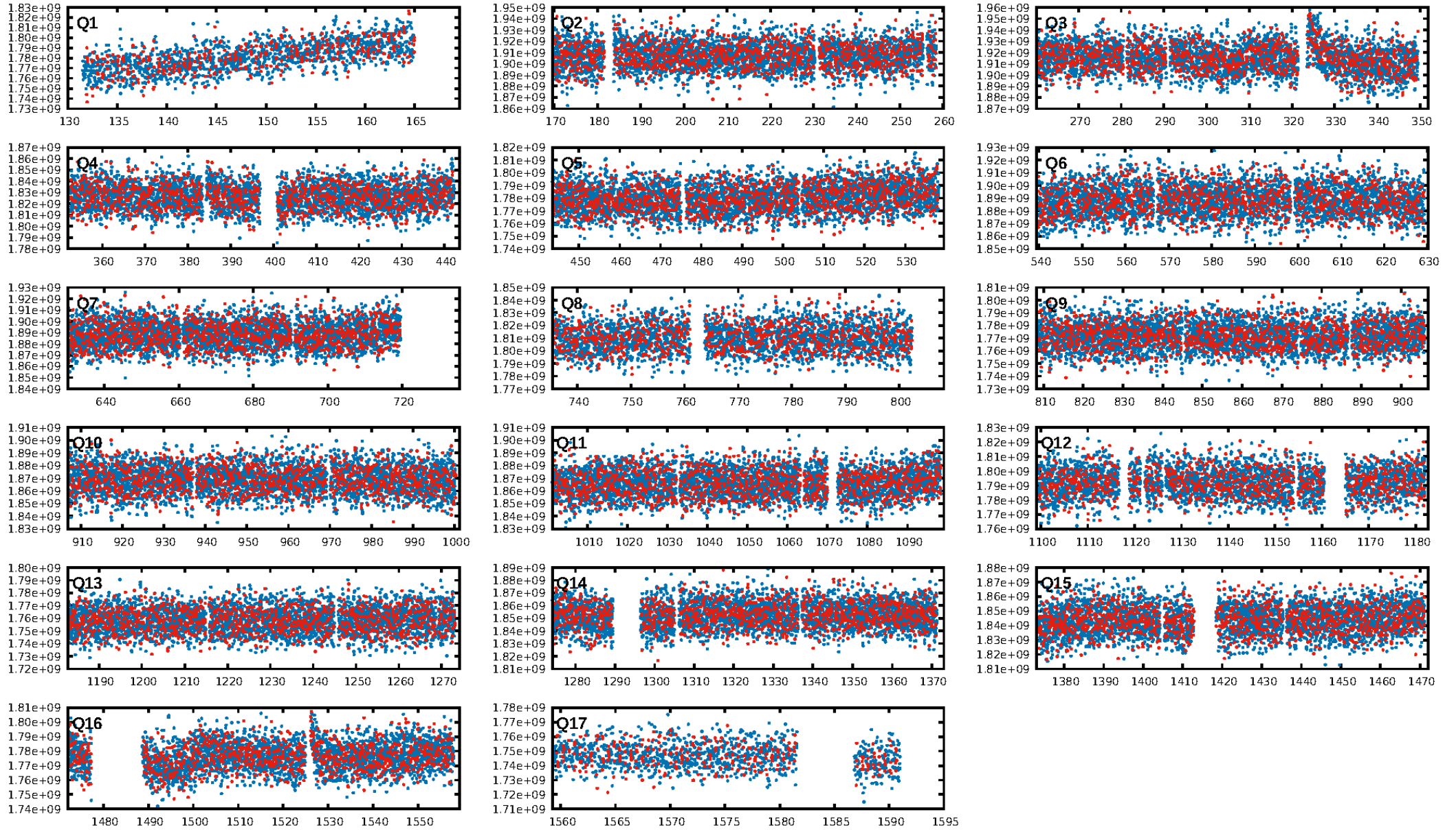
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 65.6% [0.95σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [778/779]  
GhostDiagnostic-chr: -7.964  
Centroid-sig: 48.4%  
Centroid-so: 0.265 arcsec [6.79σ]  
OotOffset-rm: 1.012 arcsec [1.06σ]  
KicOffset-rm: 1.640 arcsec [1.70σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.24 [4/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:09:18 Z

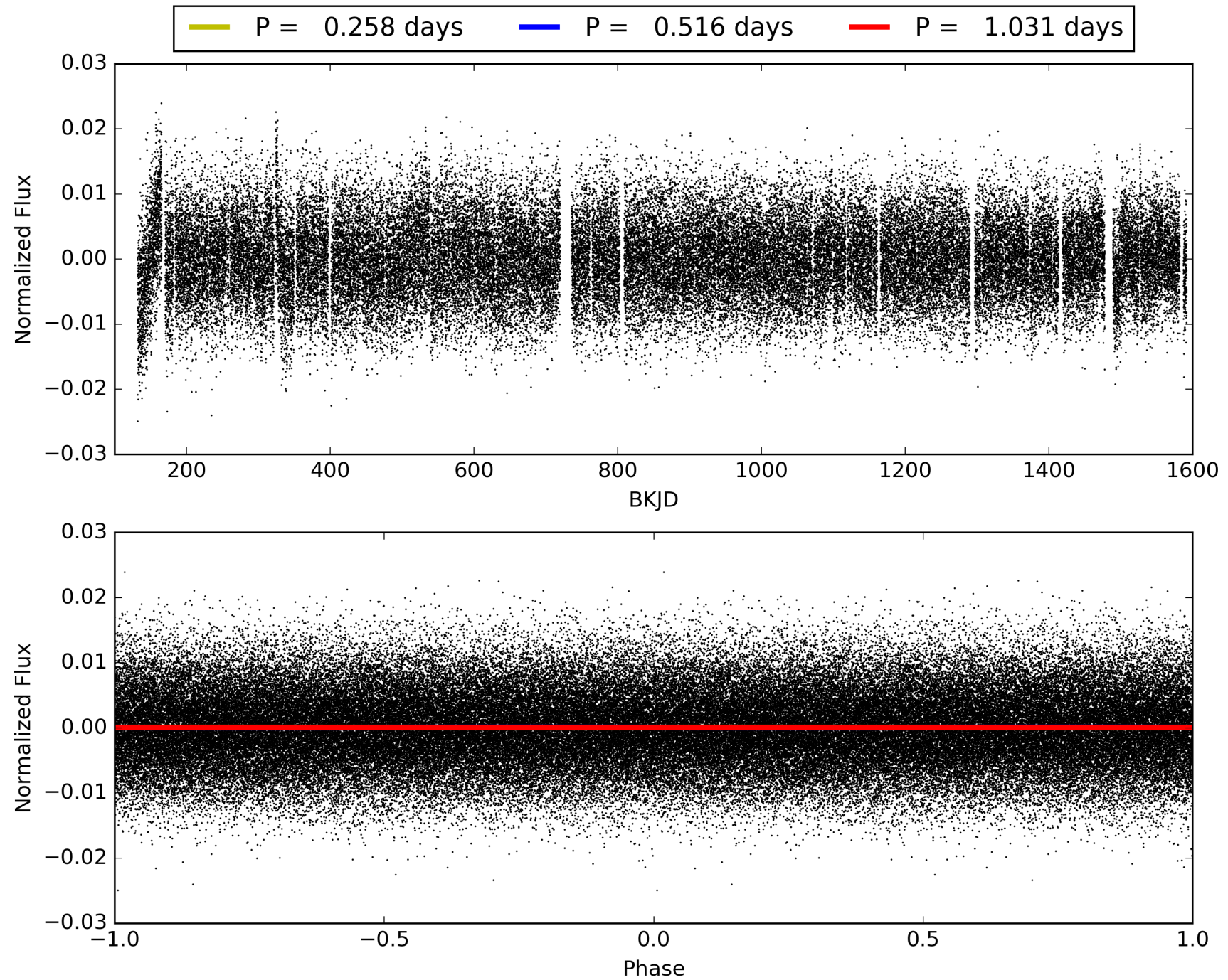
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010777903-03, PDC Light Curves



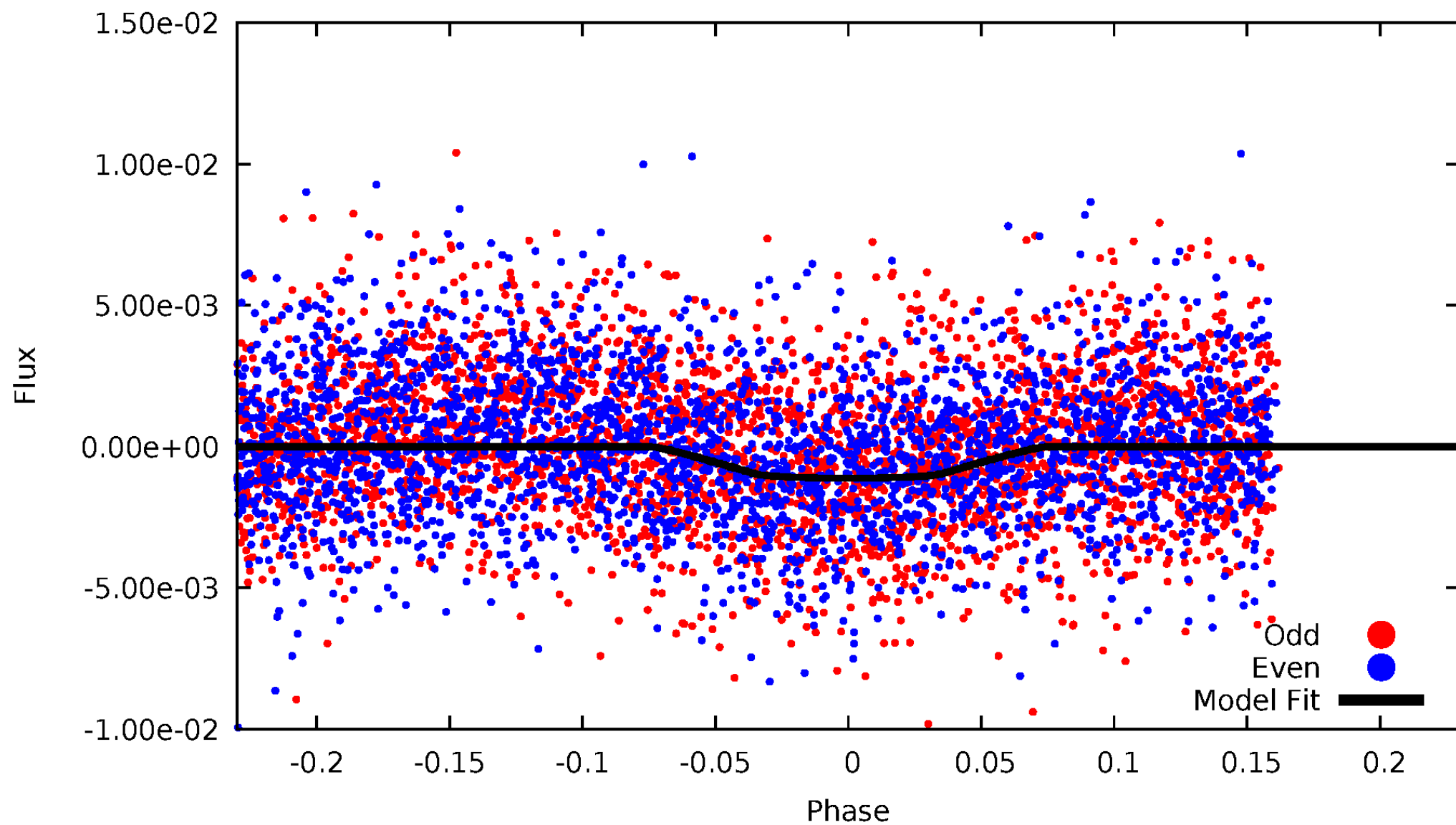


# TCE 010777903-03



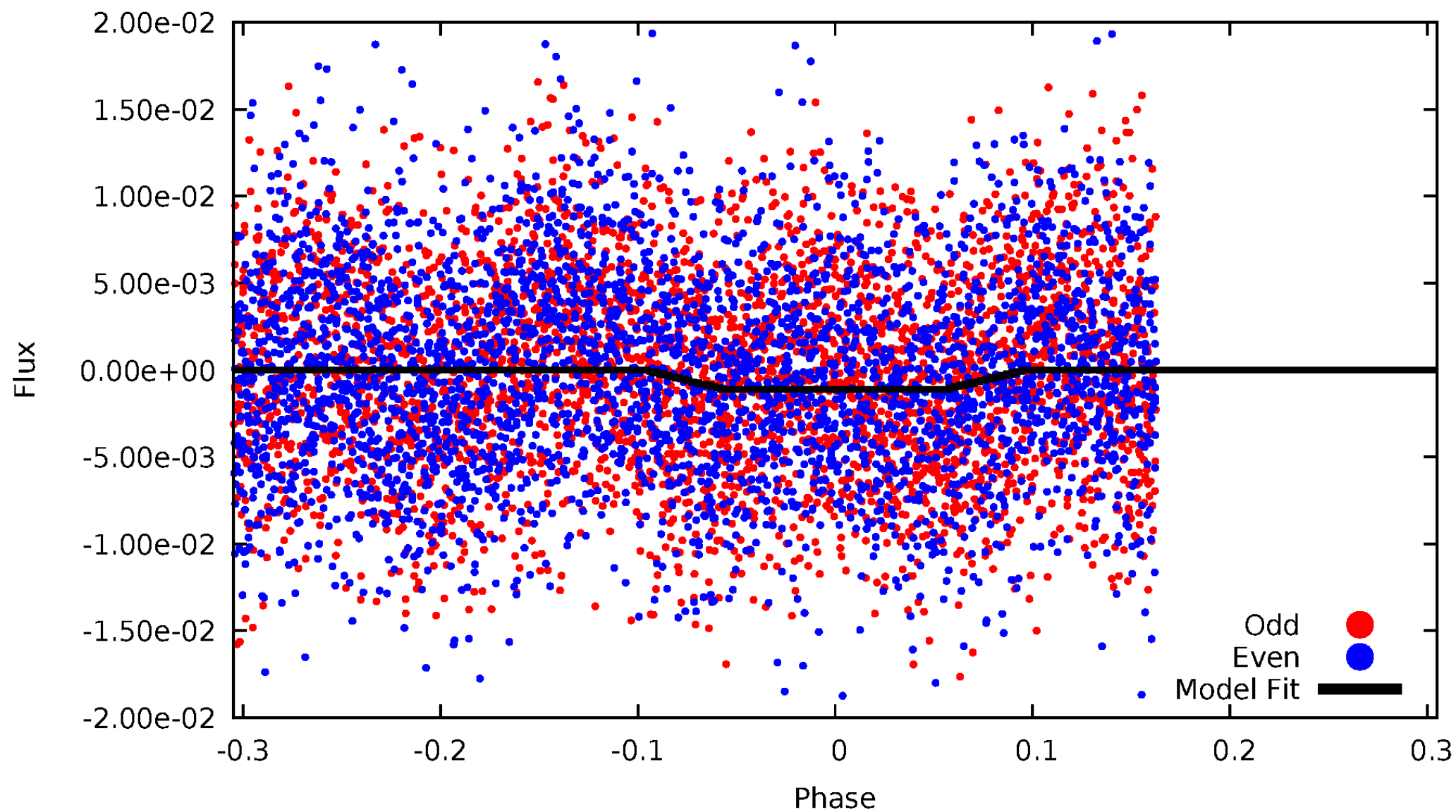
# DV Odd/Even

TCE 010777903-03



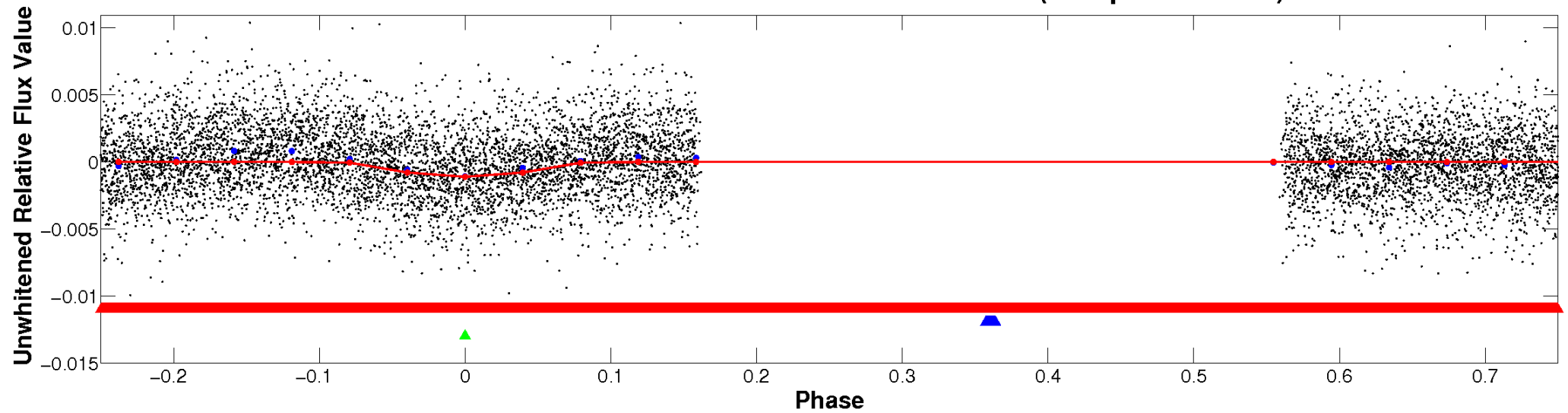
# ALT Odd/Even

TCE 010777903-03

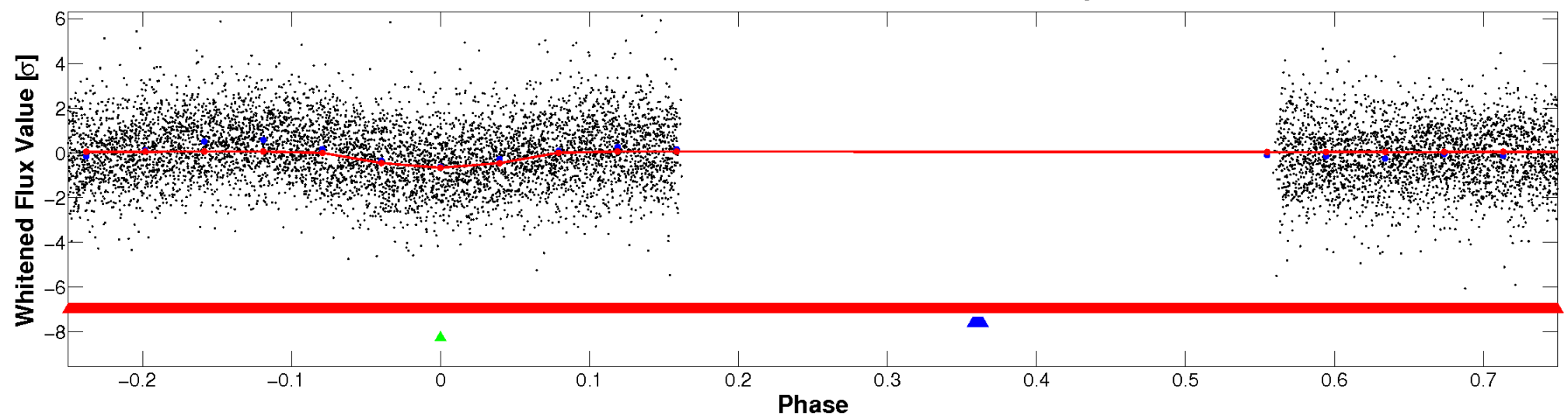


# Non-Whitened Vs. Whitened Light Curve

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



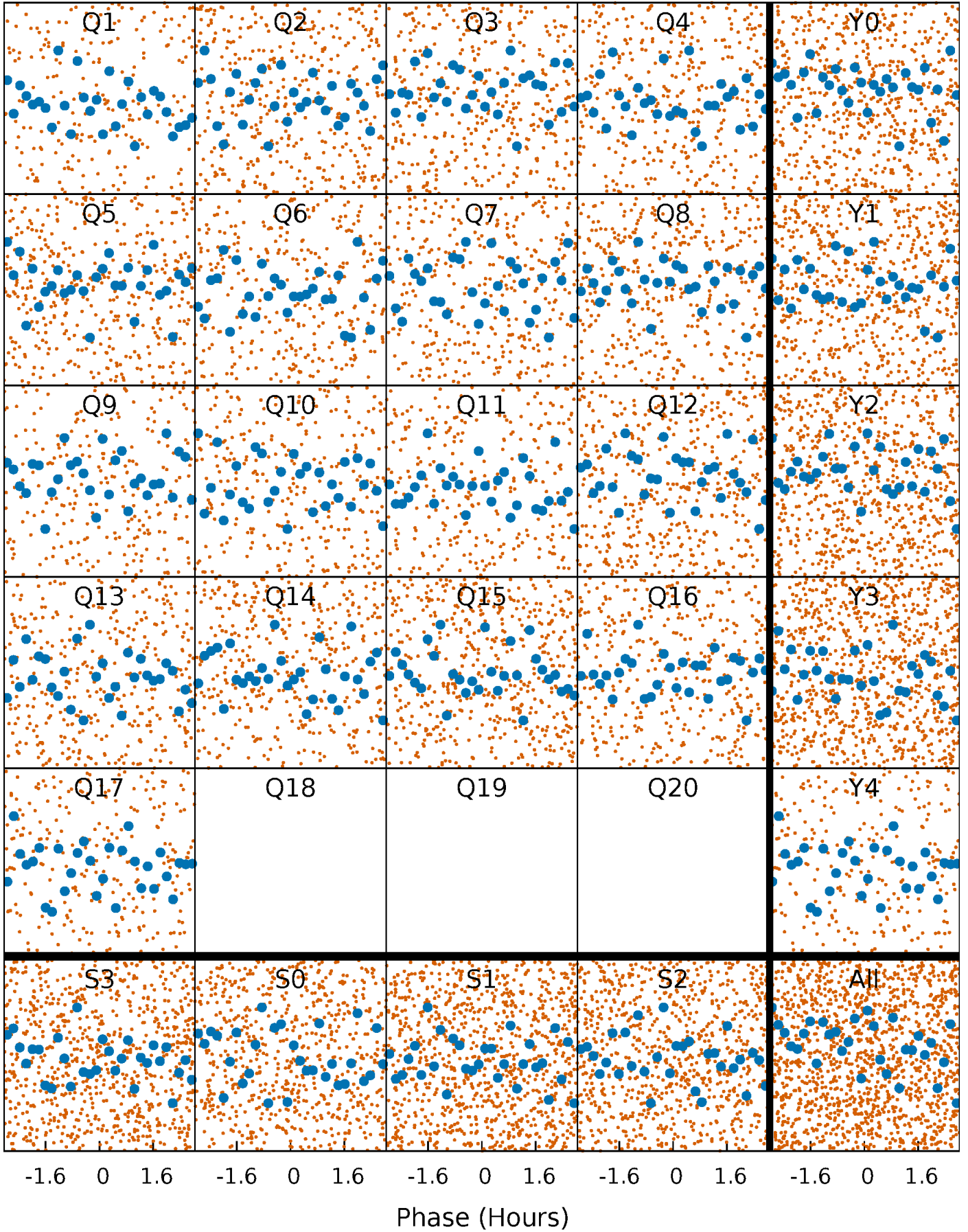
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

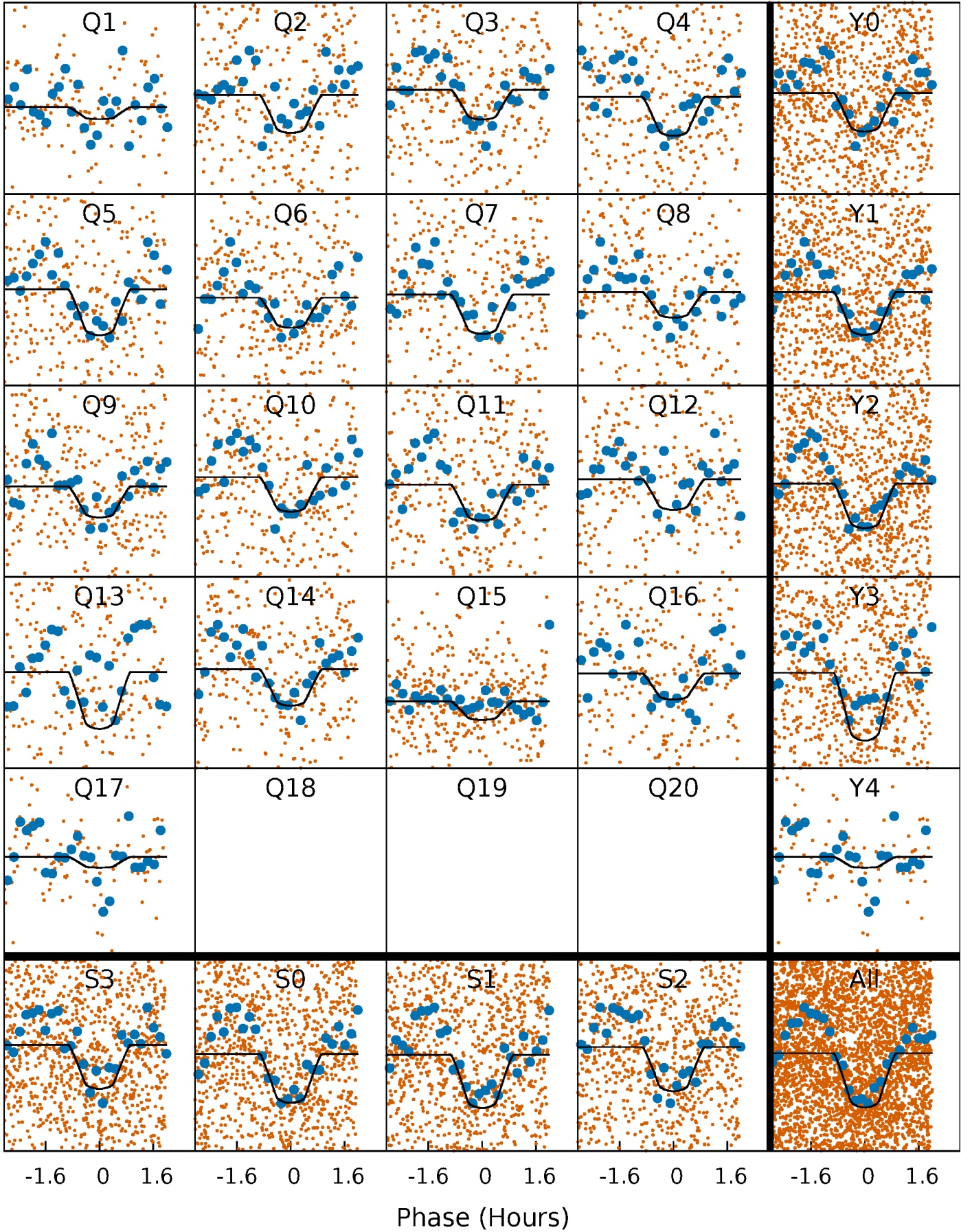
TCE 010777903-03    P= 0.515619 Days     $T_0=131.959123$  (BKJD)





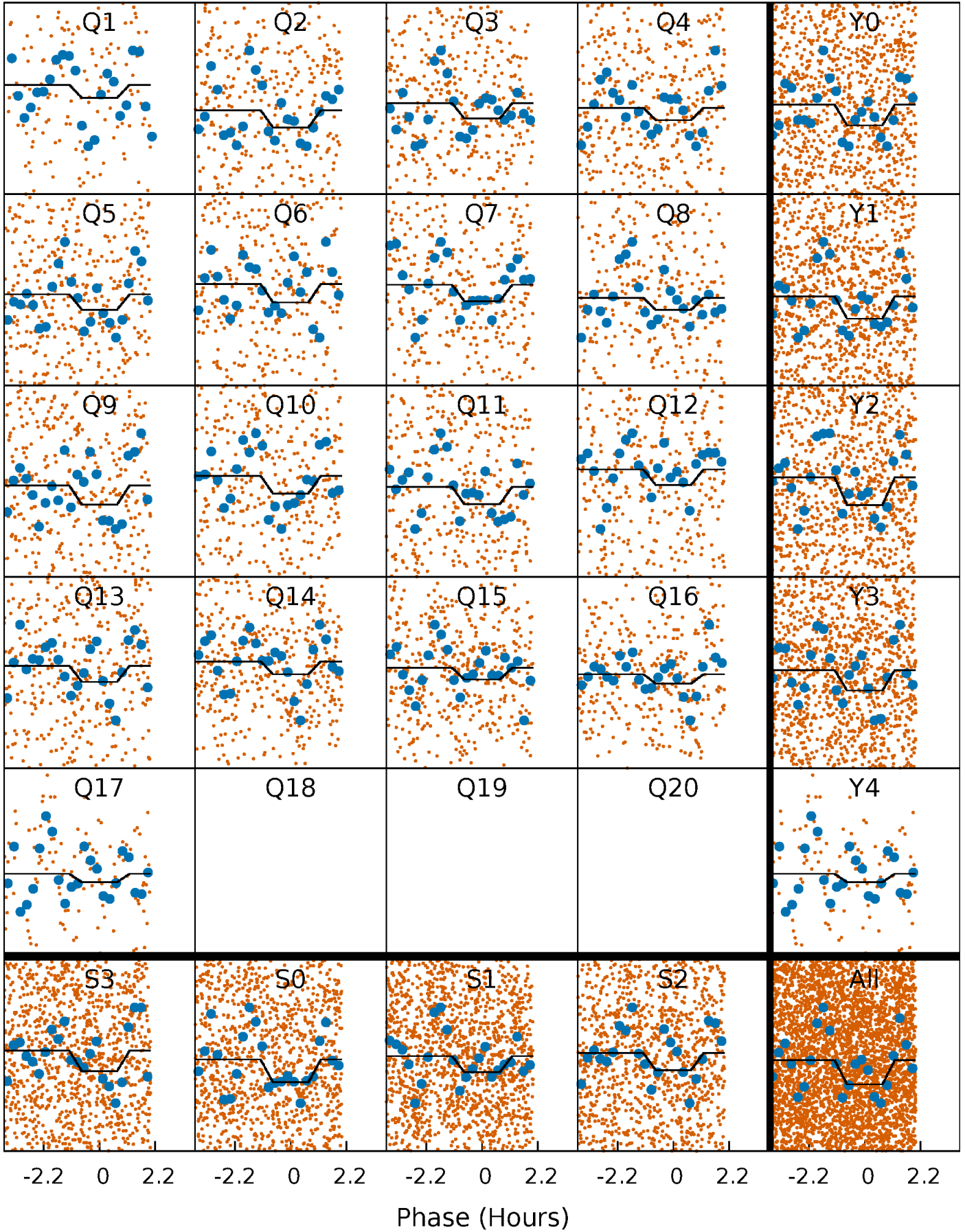
# DV Quarter-Phased Transit Curves

TCE 010777903-03     $P = 0.515619$  Days     $T_0 = 131.959123$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

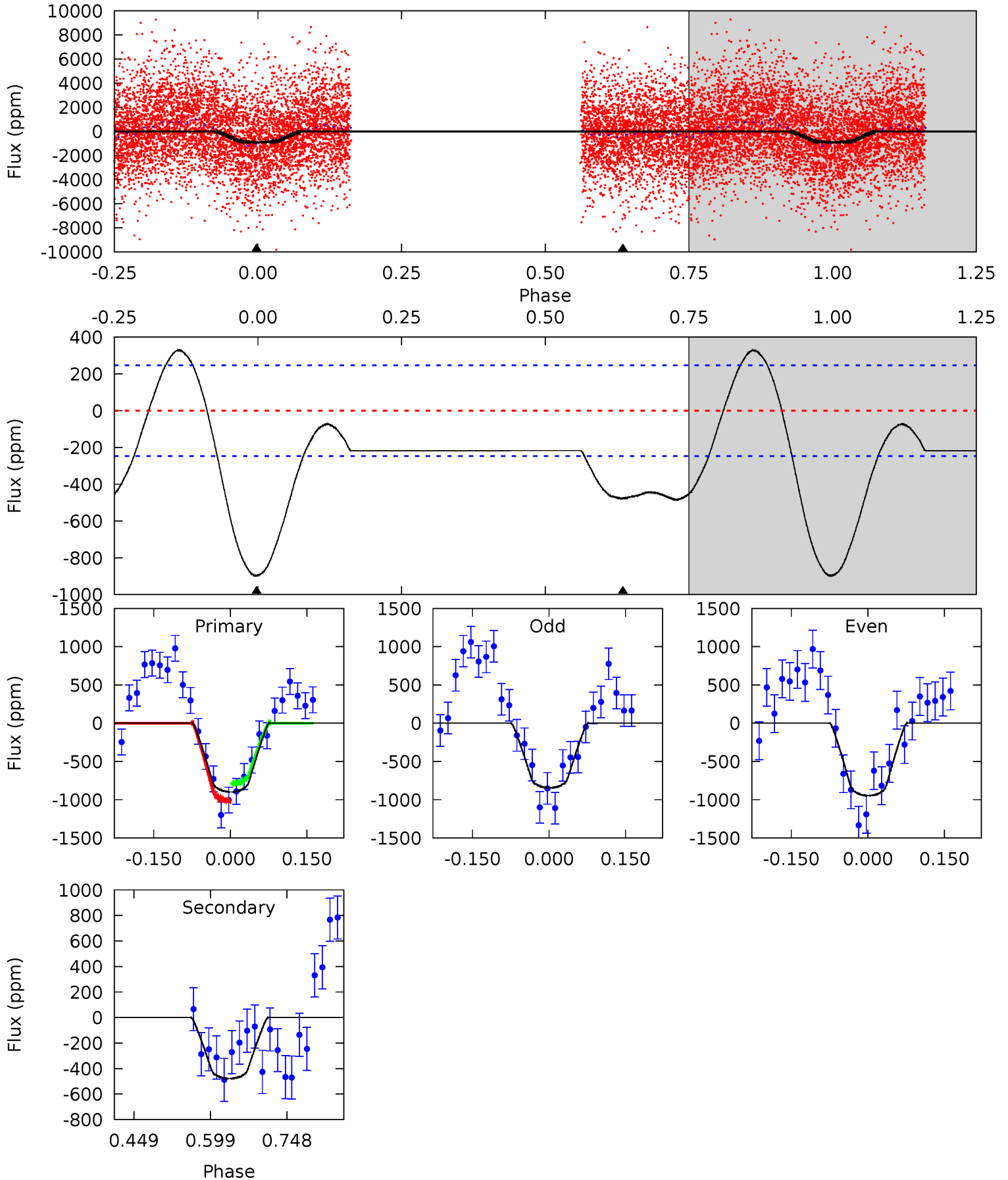
TCE 010777903-03     $P = 0.515618$  Days     $T_0 = 131.959019$  (BKJD)



# DV Model-Shift Uniqueness Test

010777903-03, P = 0.515619 Days, E = 131.959123 Days

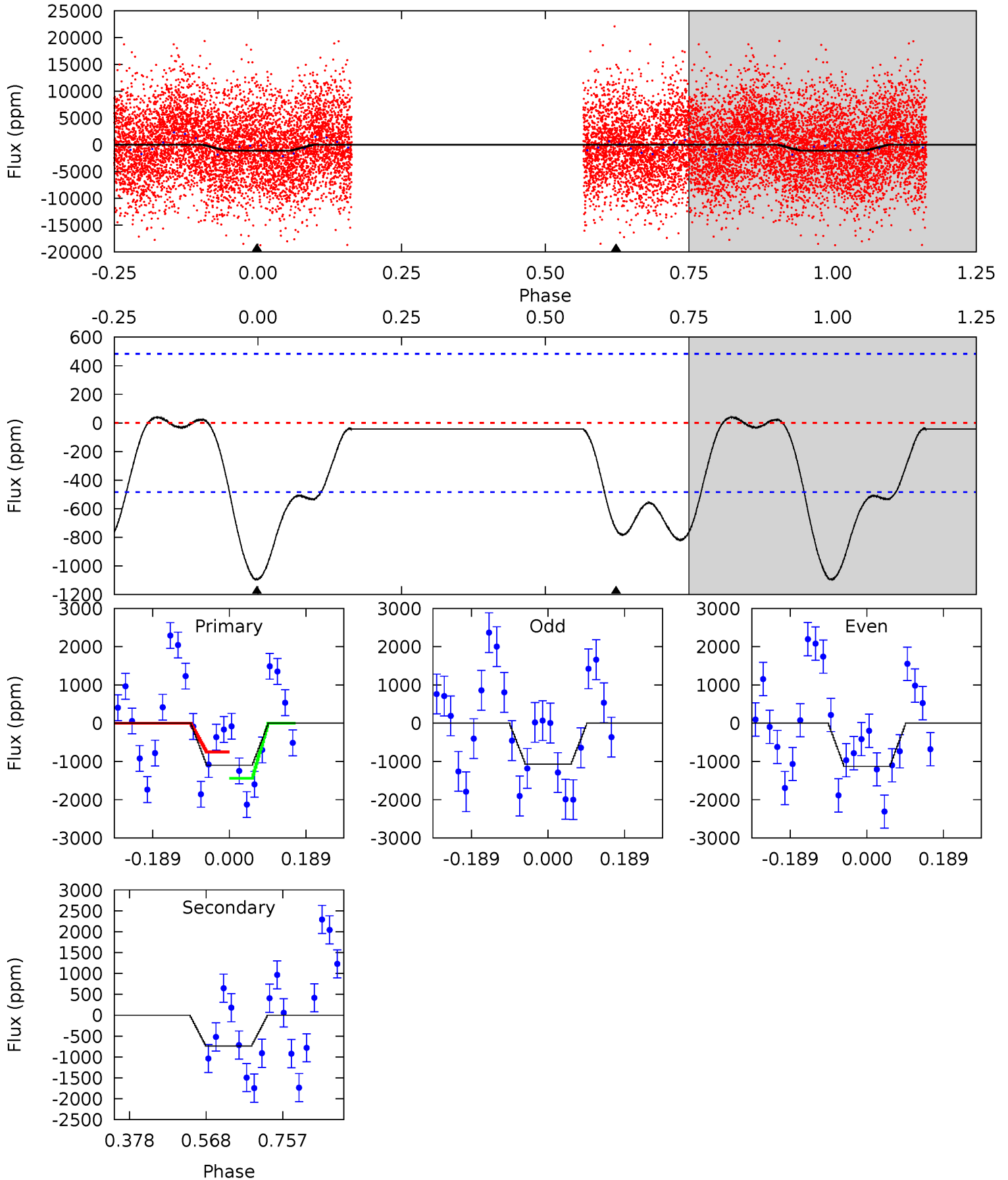
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	8.69	0	0	4.48	1.44	3.09	16.3	16.3	8.69	8.69	0.97	1.00	0.27	2.13



# Alt Model-Shift Uniqueness Test

010777903-03, P = 0.515618 Days, E = 131.959019 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
10.1	6.79	0	0	4.43	1.31	0.81	10.1	10.1	6.79	6.79	0.28	1.16	0.04	3.08



### Stellar Parameters For KIC 010777903

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7535^{+209}_{-313}$	$3.562^{+0.522}_{-0.058}$	$0.070^{+0.150}_{-0.350}$	$4.174^{+0.409}_{-2.317}$	$2.319^{+0.196}_{-0.736}$	$0.045^{+0.279}_{-0.009}$
	+3%/-4%	+15%/-2%	+214%/-500%	+10%/-56%	+8%/-32%	+622%/-20%
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 010777903-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-479 \pm 55$	$12.92^{+7.34}_{-6.60}$	$7048^{+486}_{-872}$	$4620^{+3504}_{-9346}$	$0.449^{+1.234}_{-0.270}$
Alt.	$-740 \pm 109$	$13.41^{+7.51}_{-6.56}$	$7086^{+466}_{-916}$	$5540^{+3366}_{-9579}$	$0.610^{+1.681}_{-0.363}$

$T_{max}$  = 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

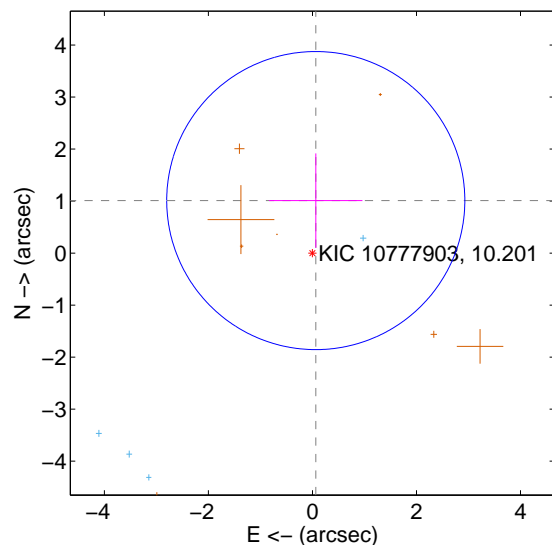
Supplemental centroid analysis for 010777903-03. **Kepler magnitude: 10.20.** Transit SNR 22.56

There are 4 quarters with good PRF difference image offsets

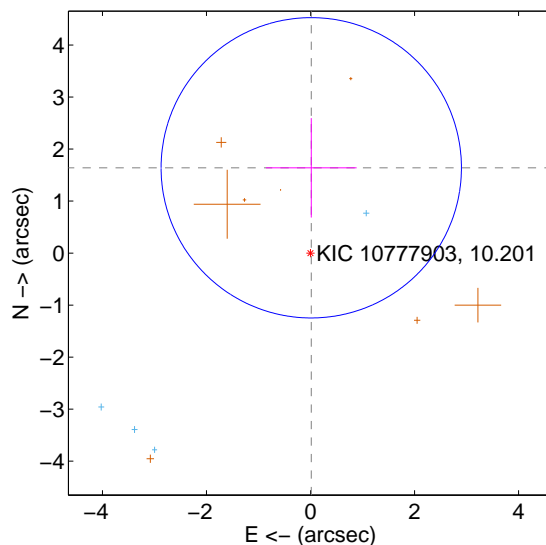
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.012 \pm 0.955$	1.06	$-0.064 \pm 0.897$	$1.010 \pm 0.908$
PRF-fit source offset from KIC position	$1.640 \pm 0.962$	1.70	$-0.014 \pm 0.873$	$1.640 \pm 0.956$
photometric centroid source offset	<b><math>0.27 \pm 0.04</math></b>	<b>6.79</b>	$-0.05 \pm 0.04$	$0.26 \pm 0.04$

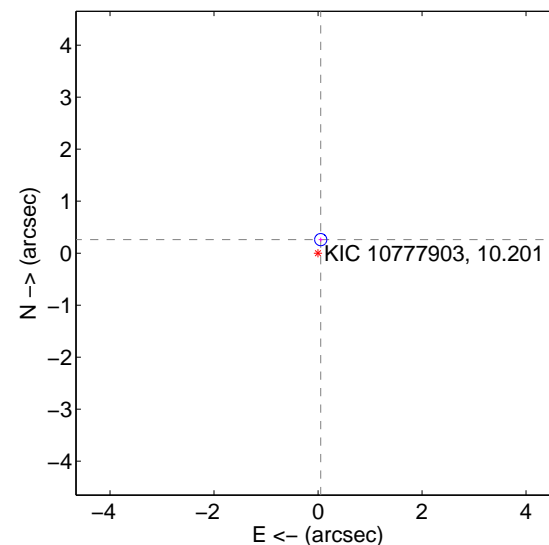
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

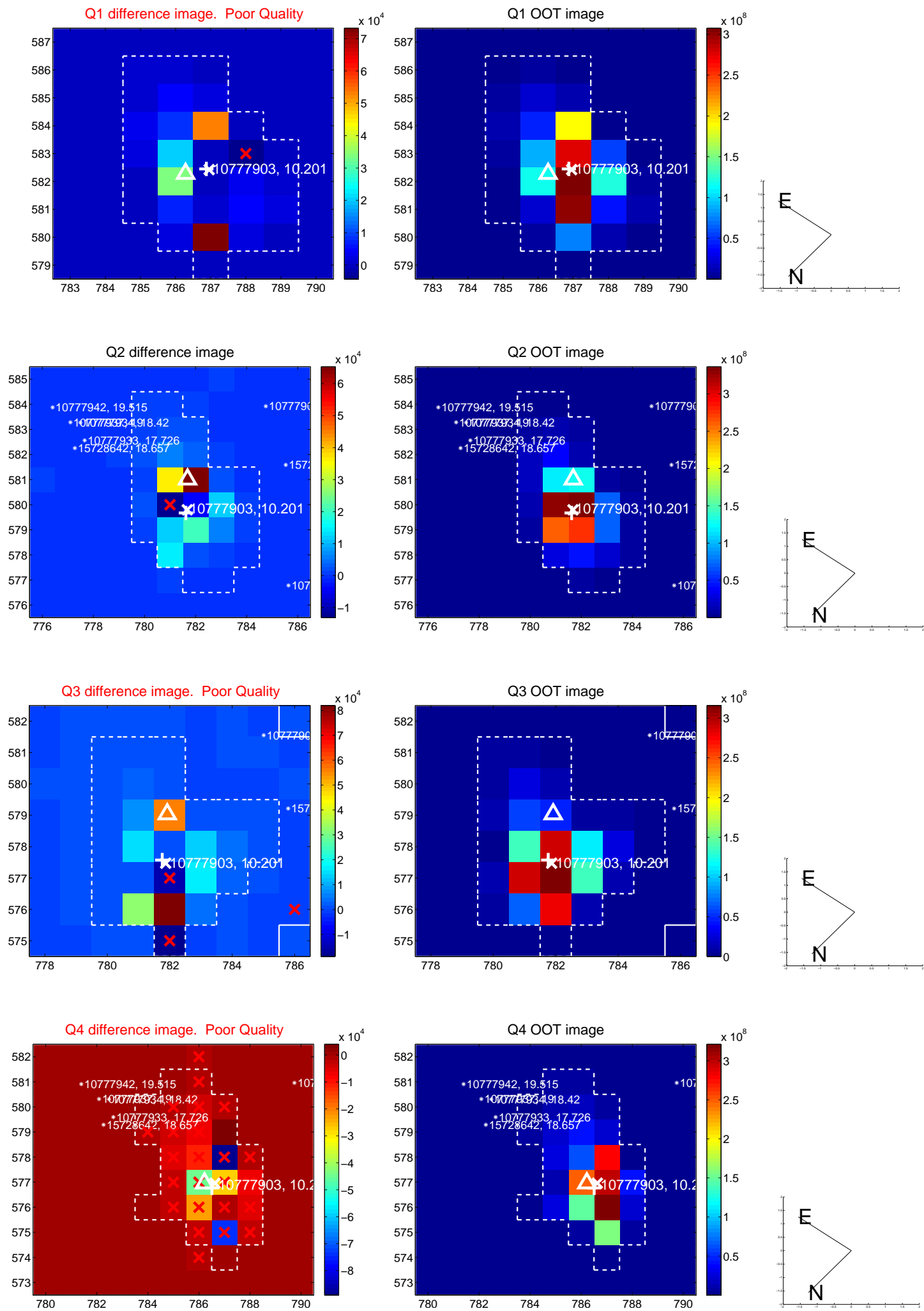


offset from photometric centroids

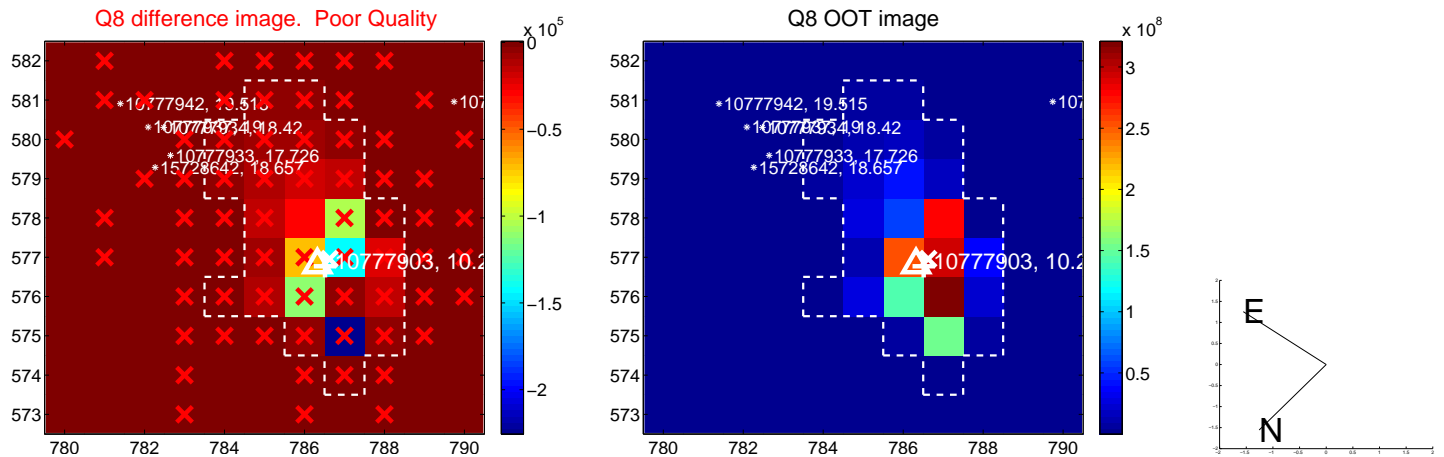
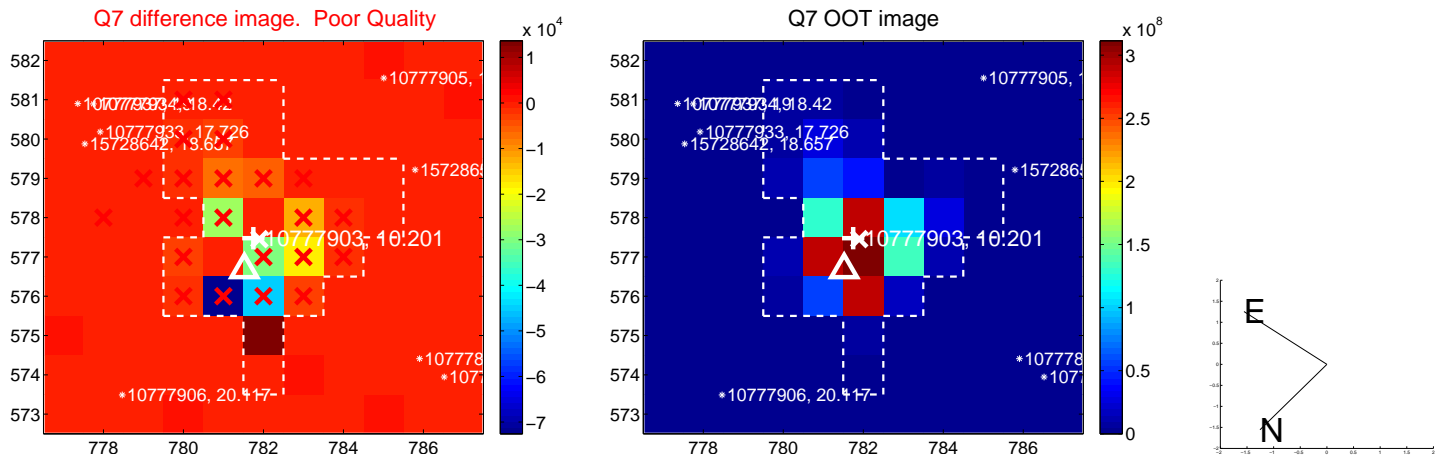
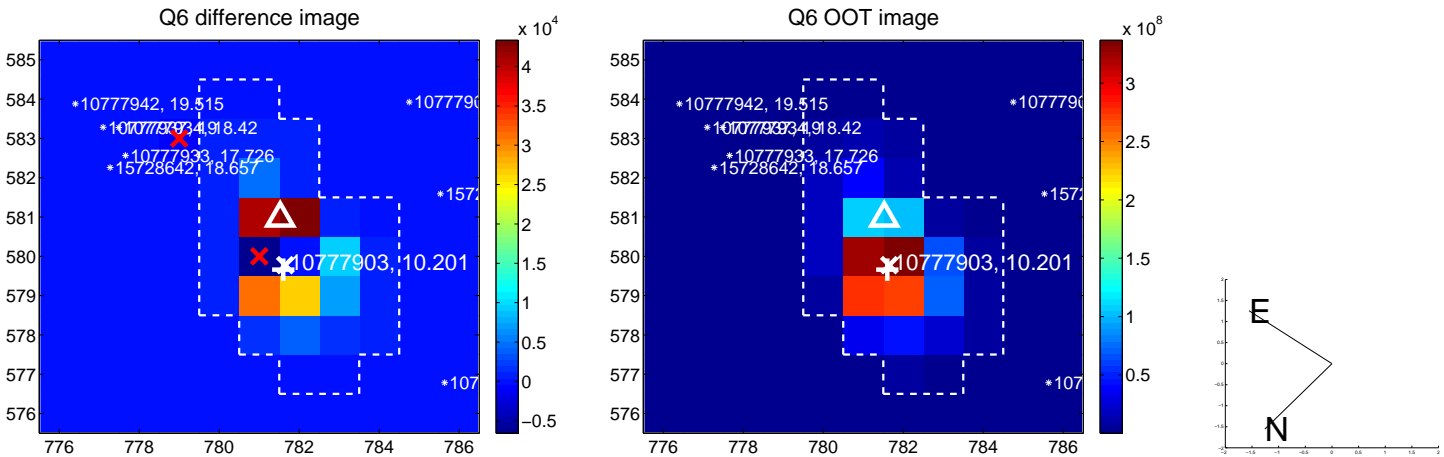
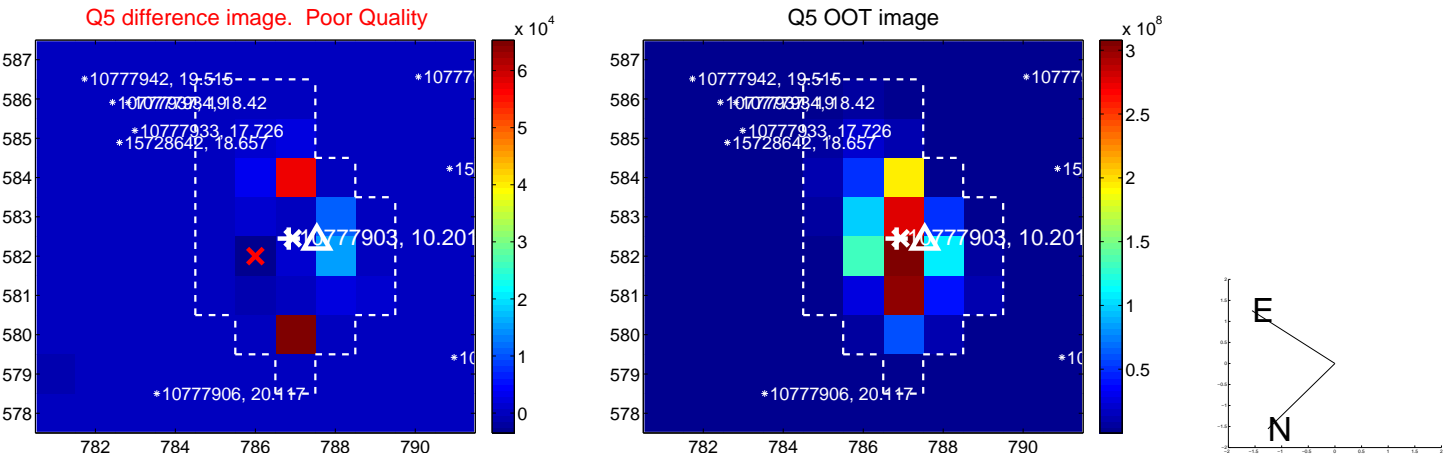


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

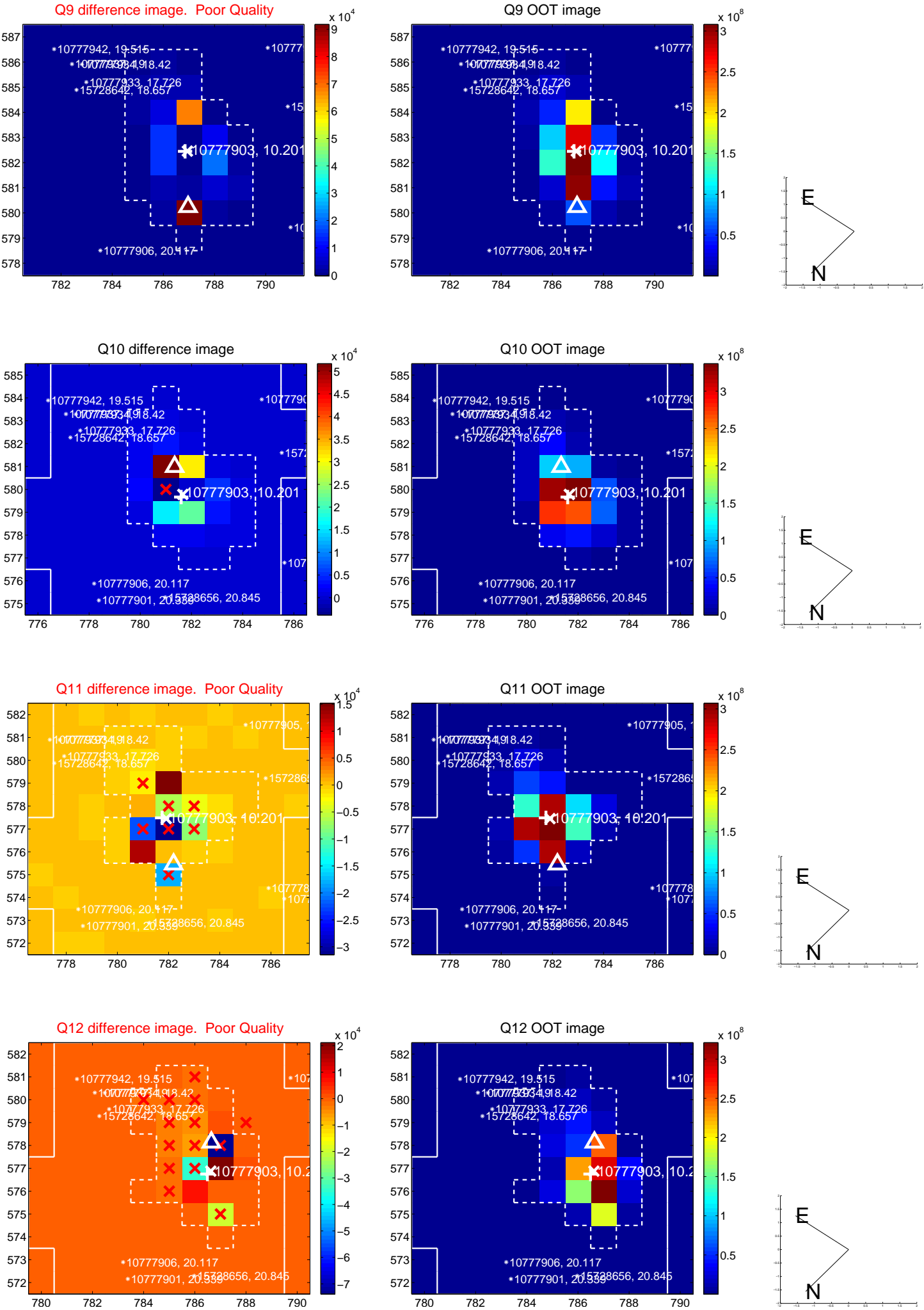
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



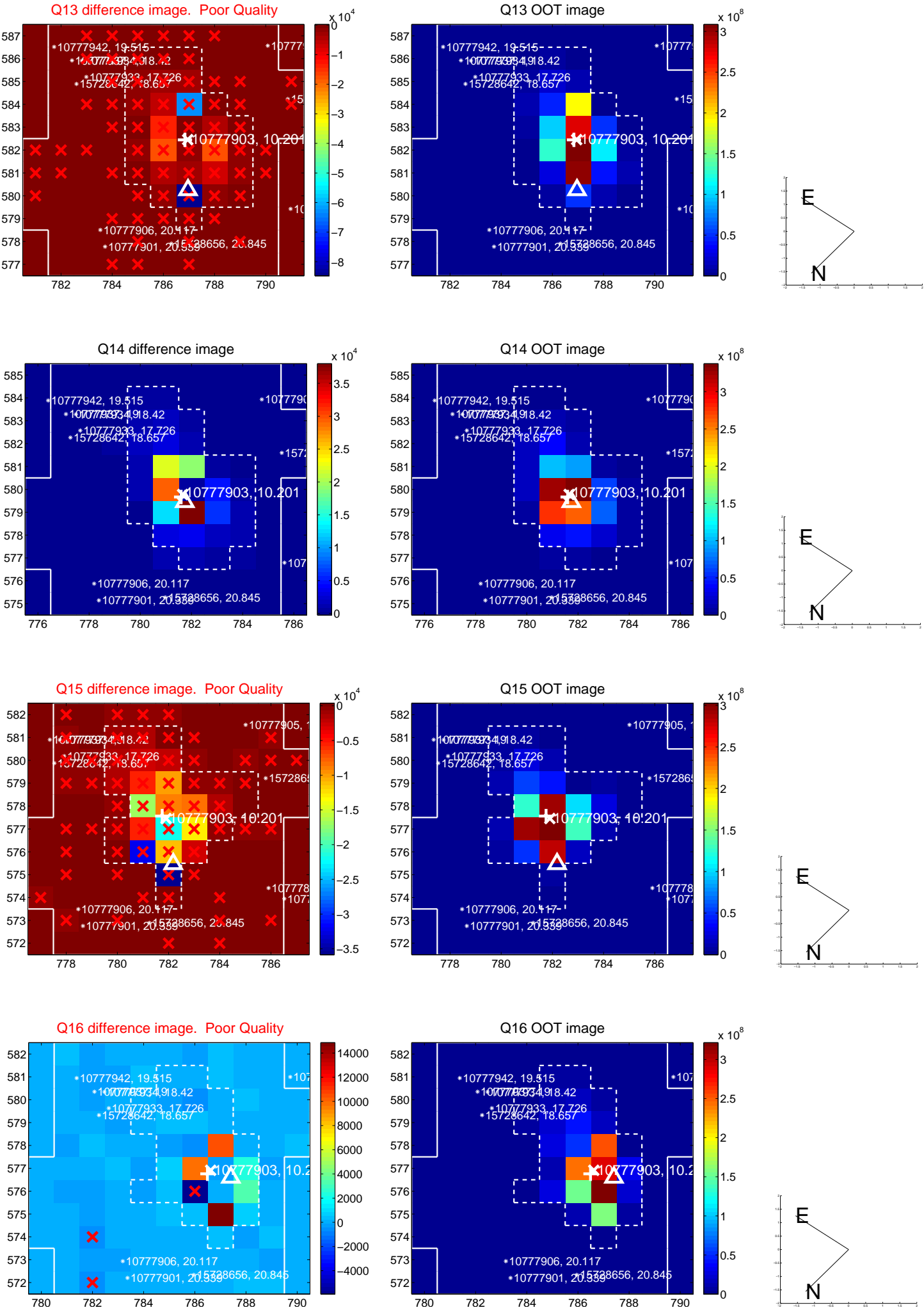
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

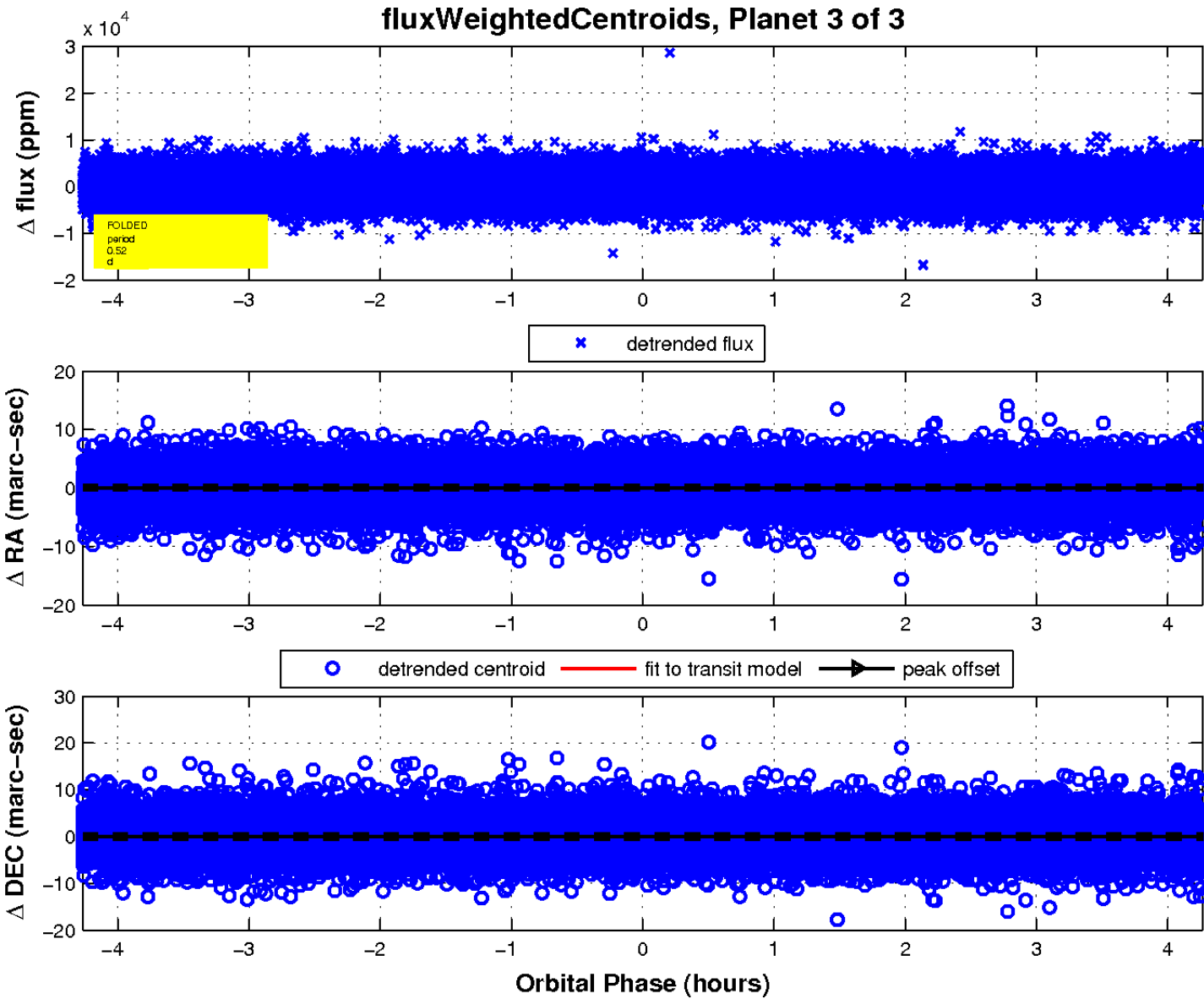
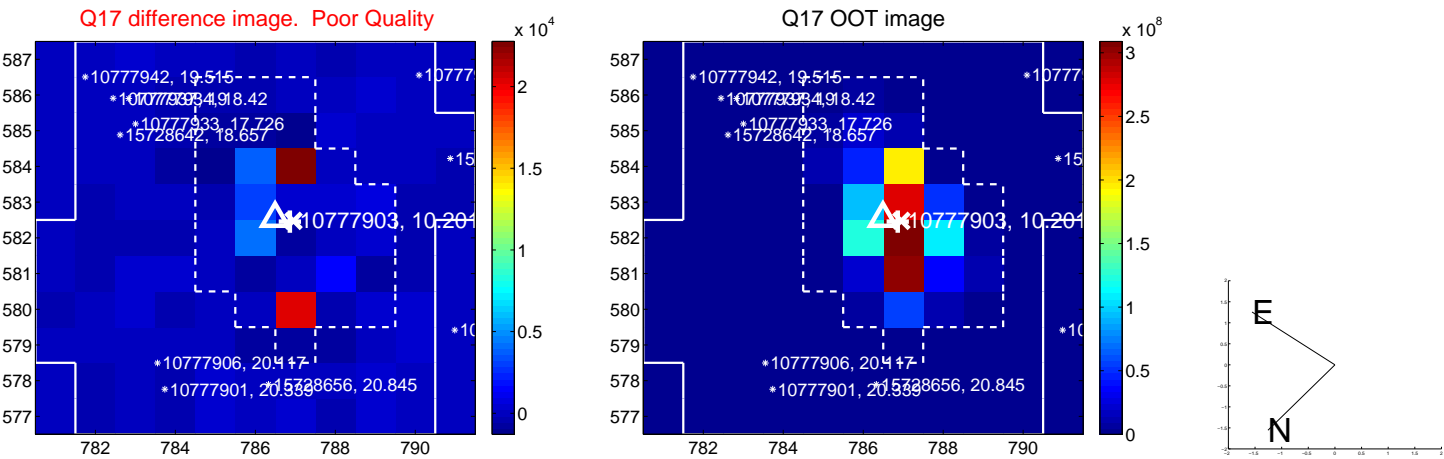


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

