

# KIC 010662202

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010662202-01	OBS	0750.01	21.676982	149.859874	843.0	3.449	24.5	28.0	0.83	4954	2.92	18.68
010662202-02	OBS	0750.02	5.044038	132.542517	164.7	1.908	8.2	9.5	0.83	4954	1.21	130.53
010662202-03	OBS	0750.03	14.516691	138.838289	249.6	2.737	7.5	9.2	0.83	4954	1.55	31.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010662202-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
010662202-02	OBS	PC	0.92	0	0	0	0	NO_COMMENT
010662202-03	OBS	PC	0.93	0	0	0	0	NO_COMMENT

**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 010662202-01

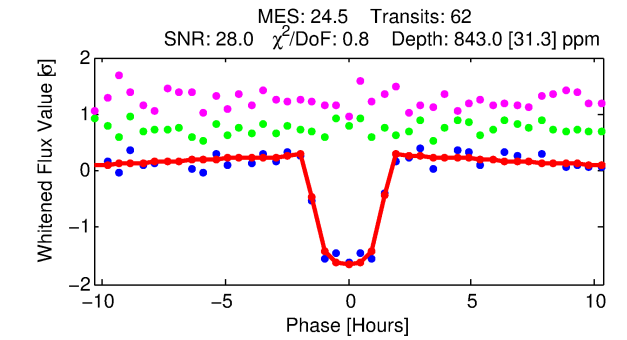
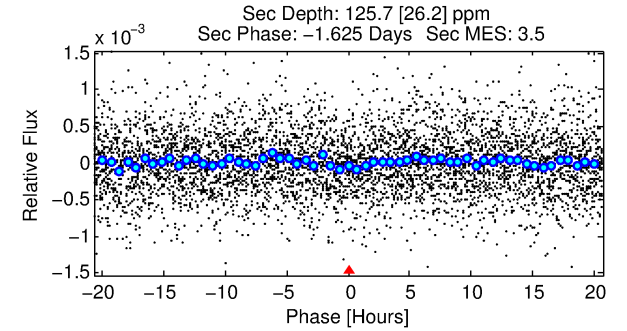
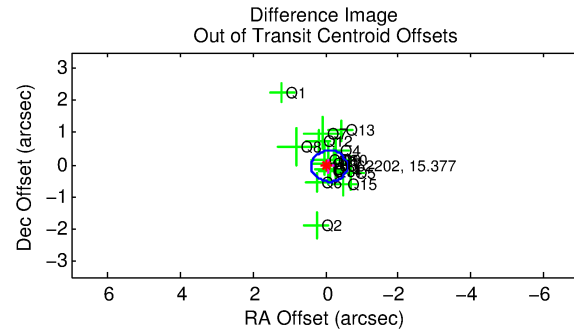
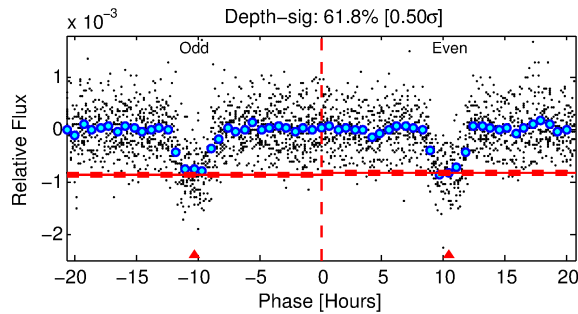
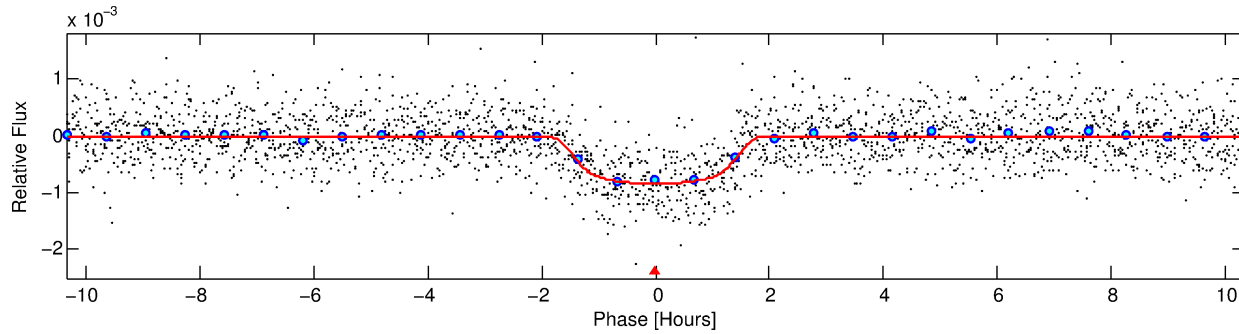
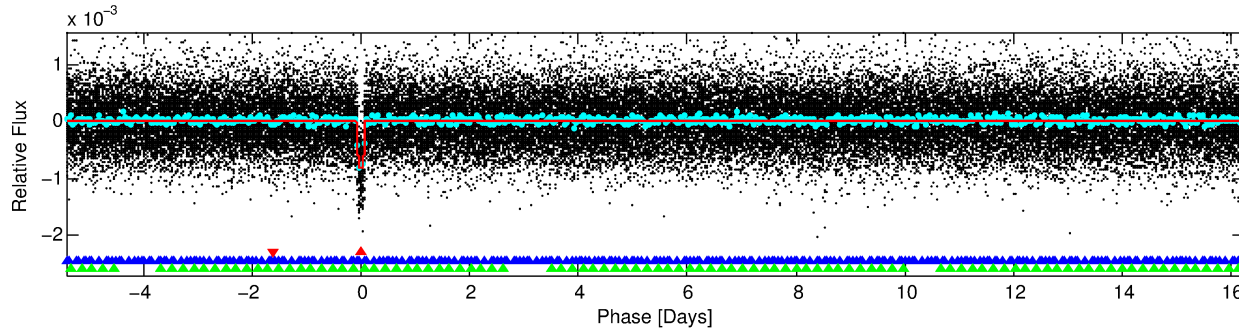
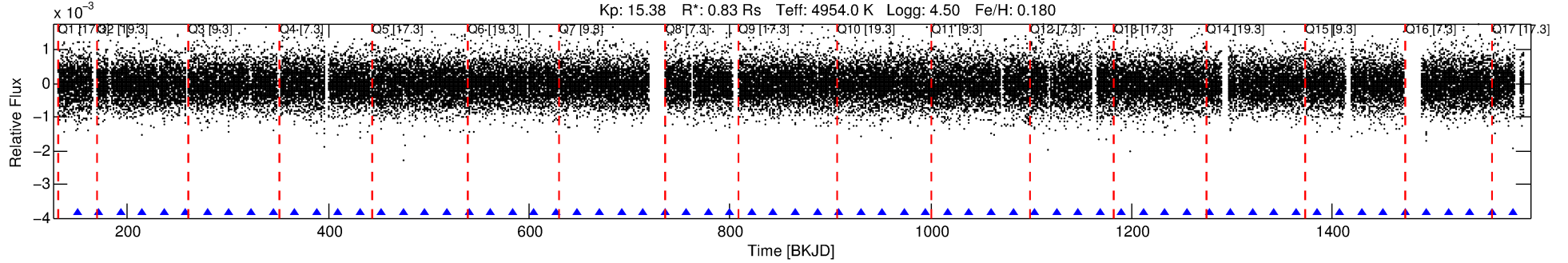
No Significant Match Found

# DV One-Page Summary

KIC: 10662202 Candidate: 1 of 3 Period: 21.677 d

KOI: K00750.01 Corr: 0.952

Kp: 15.38 R\*: 0.83 Rs Teff: 4954.0 K Logg: 4.50 Fe/H: 0.180



## DV Fit Results:

Period = 21.67698 [0.00007] d  
Epoch = 149.8599 [0.0026] BKJD  
Rp/R\* = 0.0323 [0.0028]  
a/R\* = 24.75 [7.51]  
b = 0.89 [0.07]  
Seff = 18.68 [2.65]  
Teq = 530 [19] K  
Rp = 2.92 [0.34] Re  
a = 0.1407 [0.0109] AU  
Ag = 160.30 [47.82] [3.33σ]  
Teffp = 2916 [202] K [11.74σ]

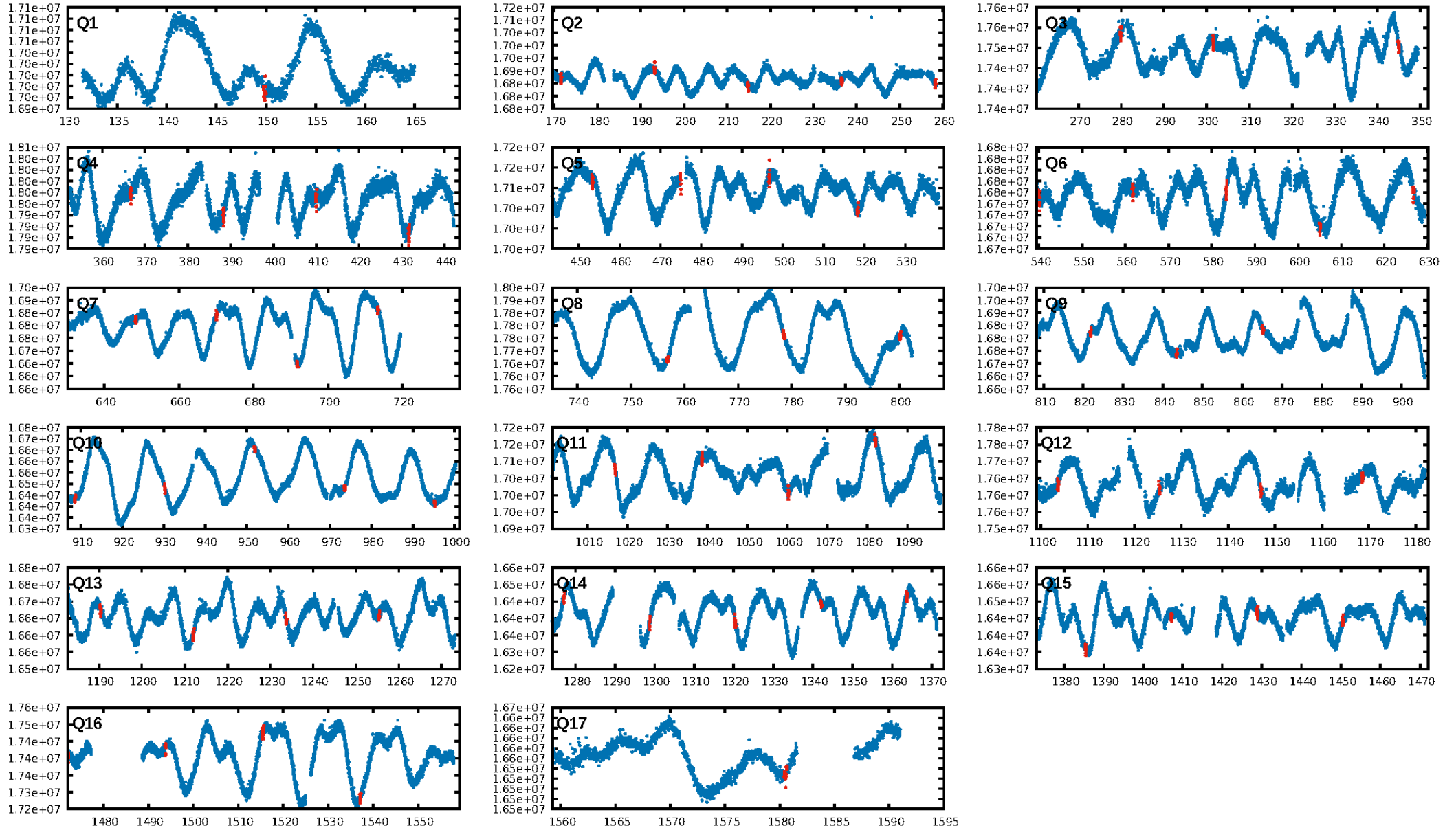
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [39.02σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.54e-128  
RollingBand-fgt: 1.00 [60/60]  
GhostDiagnostic-chr: 4.07  
Centroid-sig: 10.3%  
Centroid-so: 0.596 arcsec [1.39σ]  
OotOffset-rm: 0.109 arcsec [0.67σ]  
KicOffset-rm: 0.362 arcsec [1.87σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.94 [16/17]

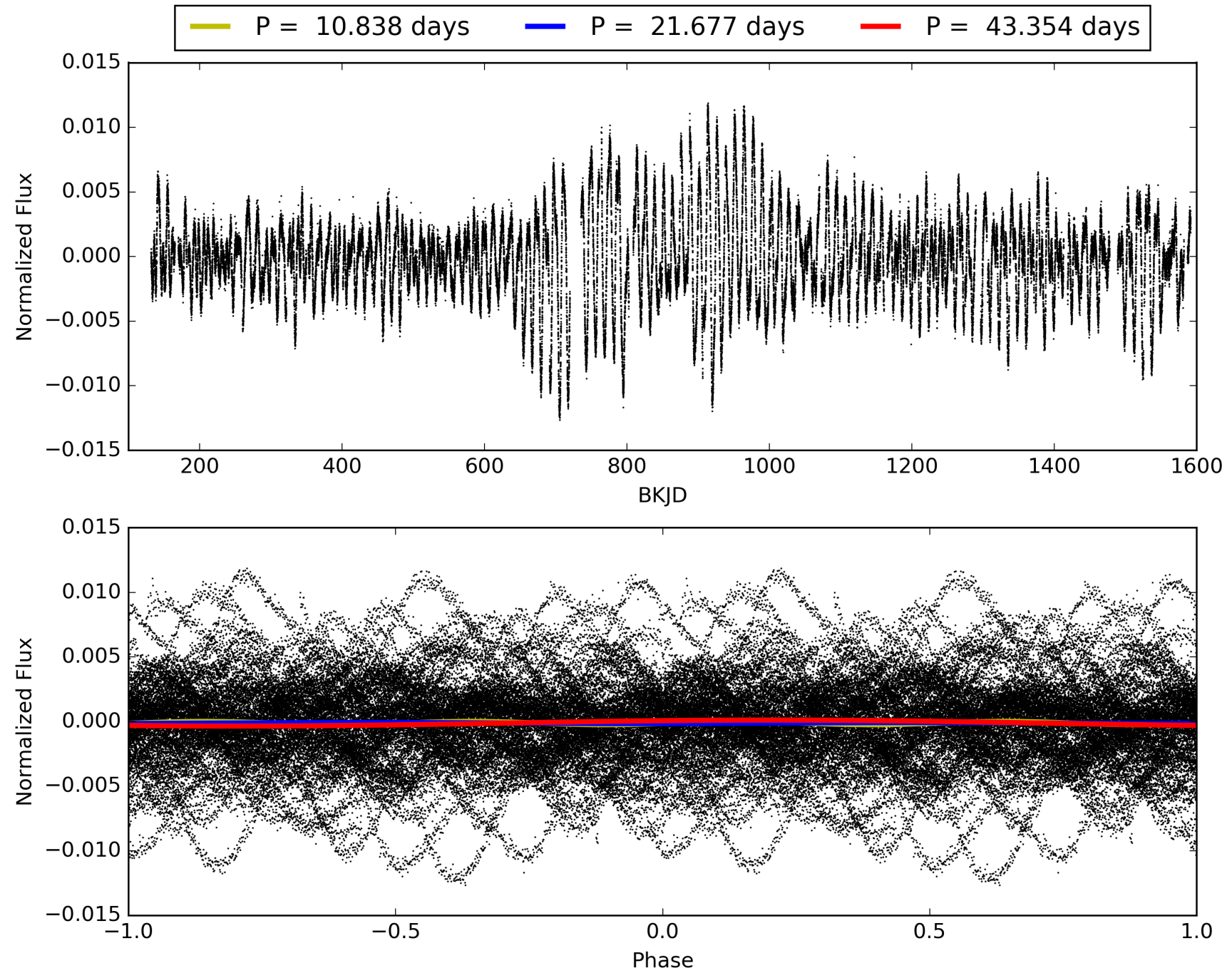
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:50:10 Z

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

# TCE 010662202-01, PDC Light Curves



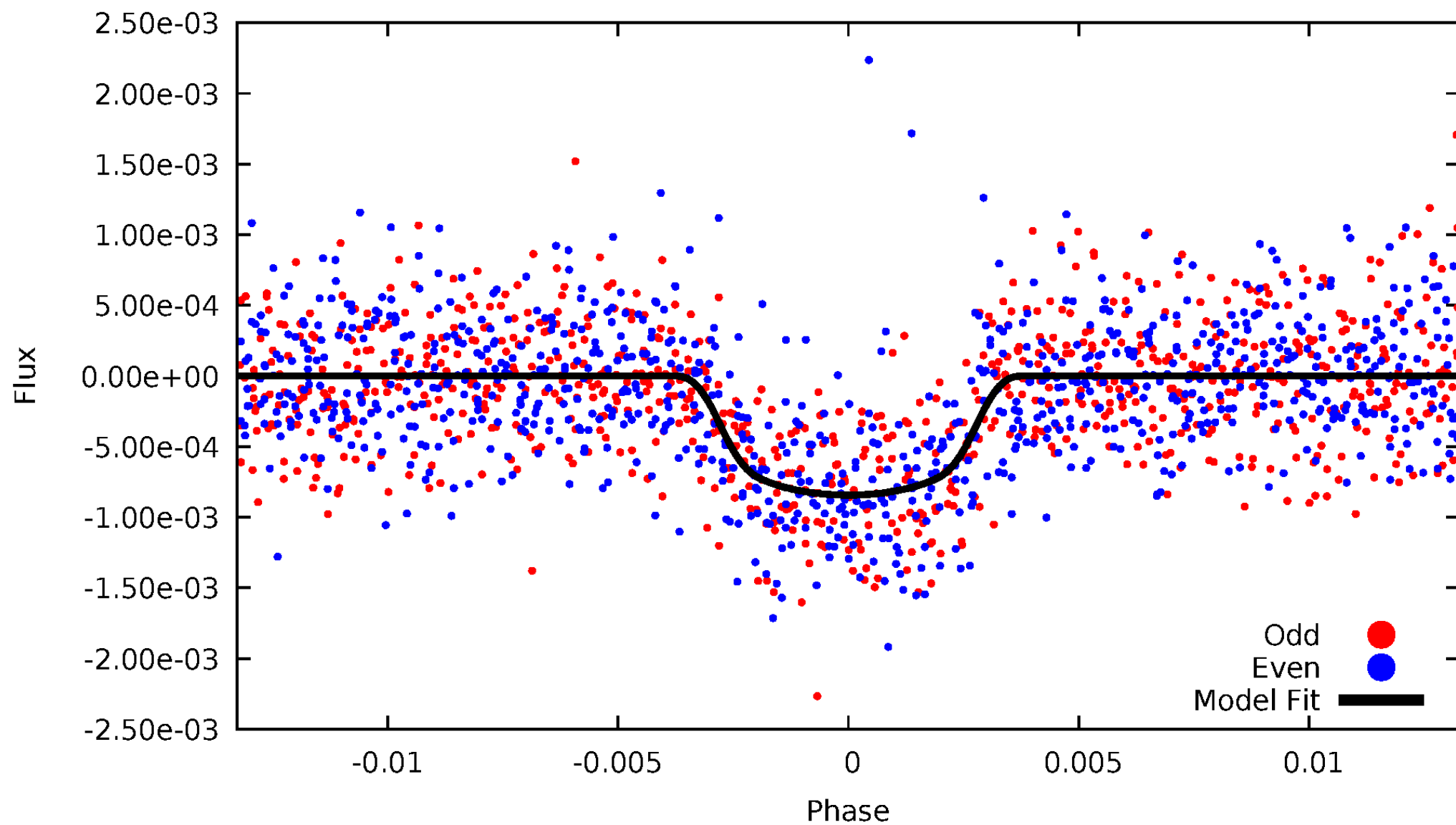
TCE 010662202-01





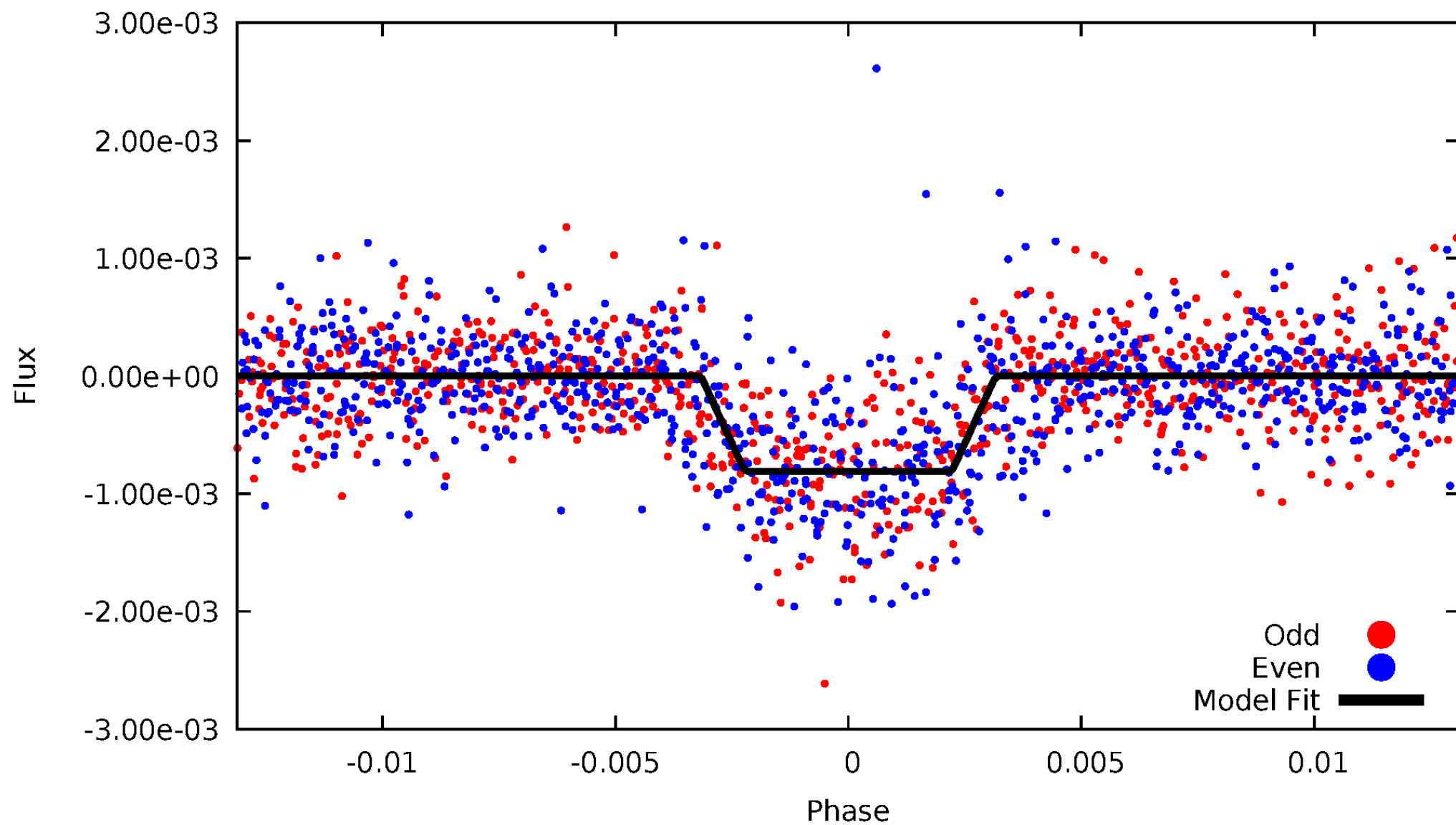
# DV Odd/Even

TCE 010662202-01



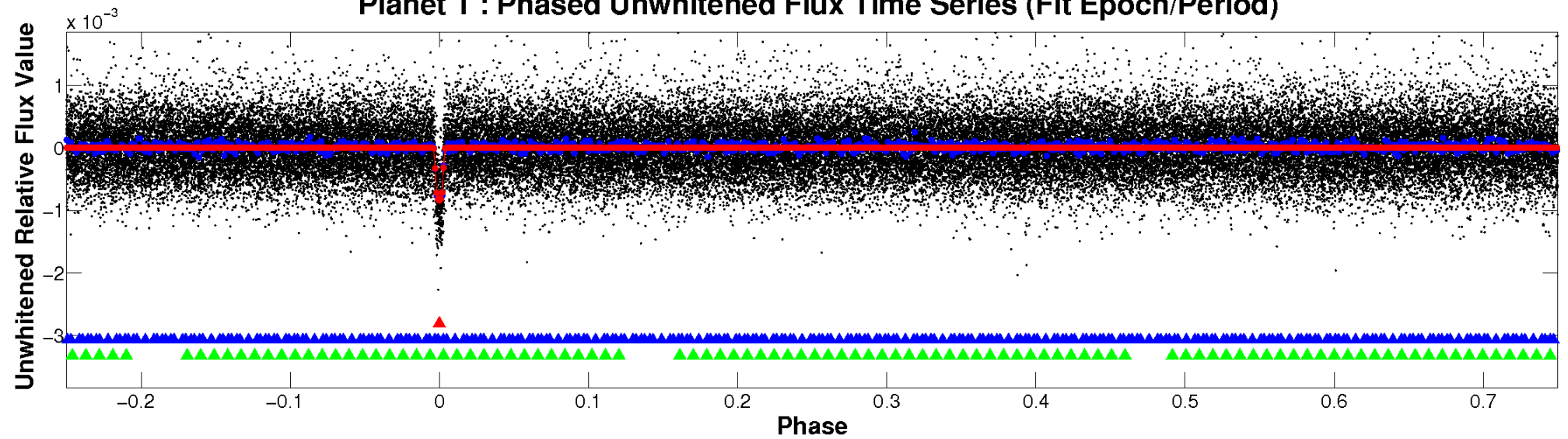
# ALT Odd/Even

TCE 010662202-01

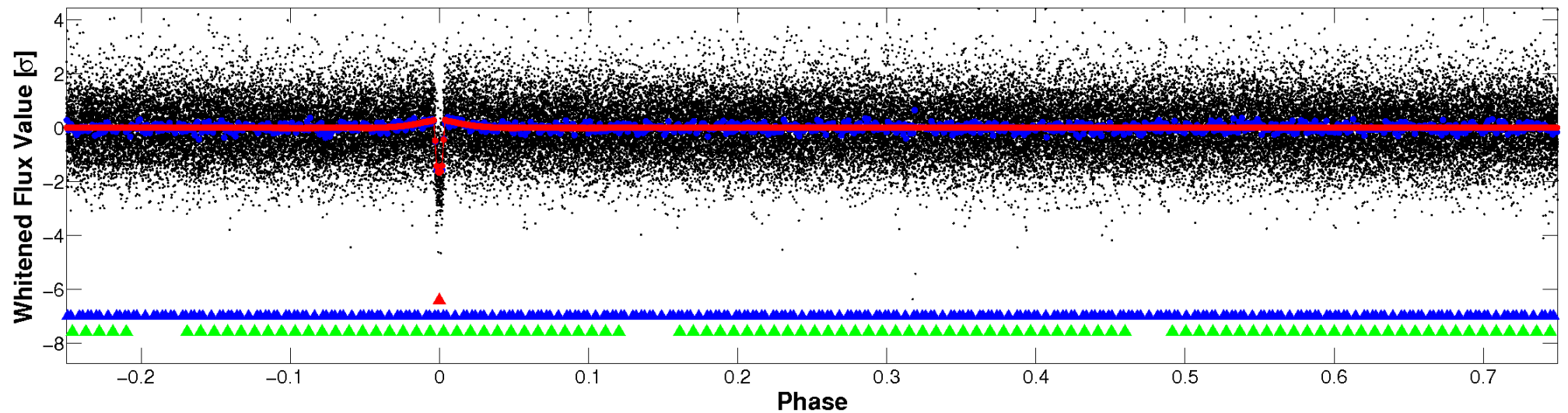


# Non-Whitened Vs. Whitened Light Curve

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

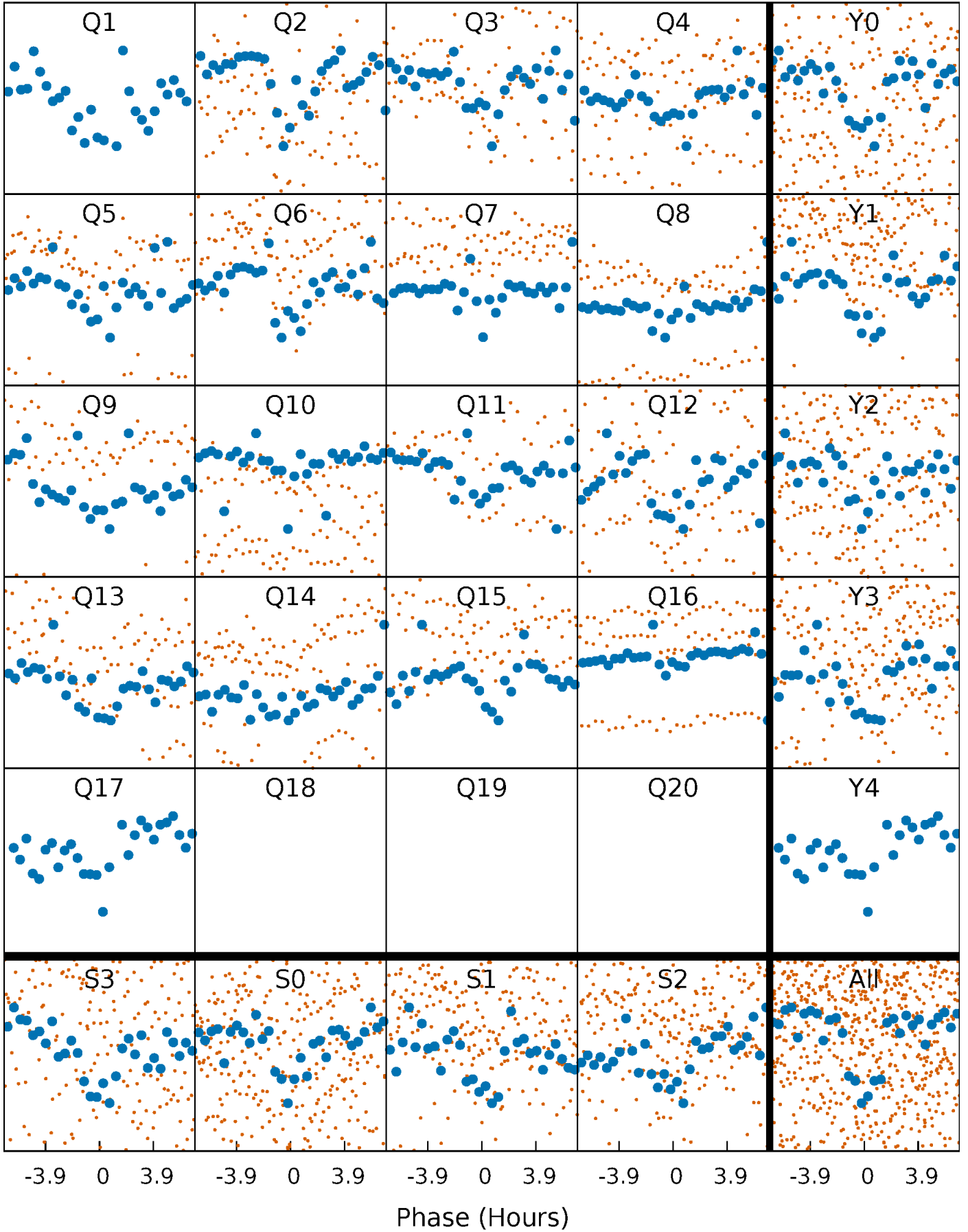


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



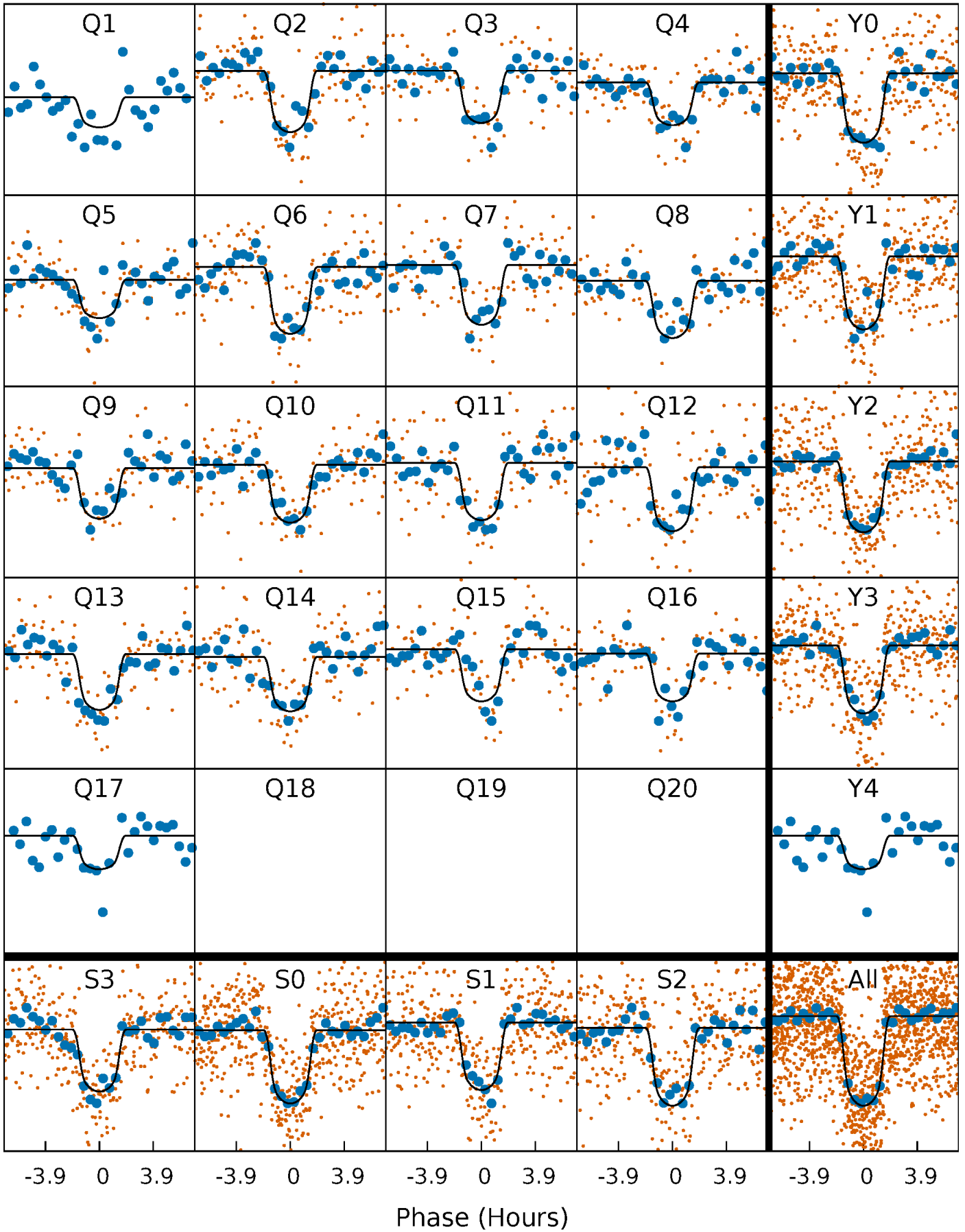
# PDC Quarter-Phased Transit Curves

TCE 010662202-01   P= 21.676982 Days    $T_0=149.859874$  (BKJD)



# DV Quarter-Phased Transit Curves

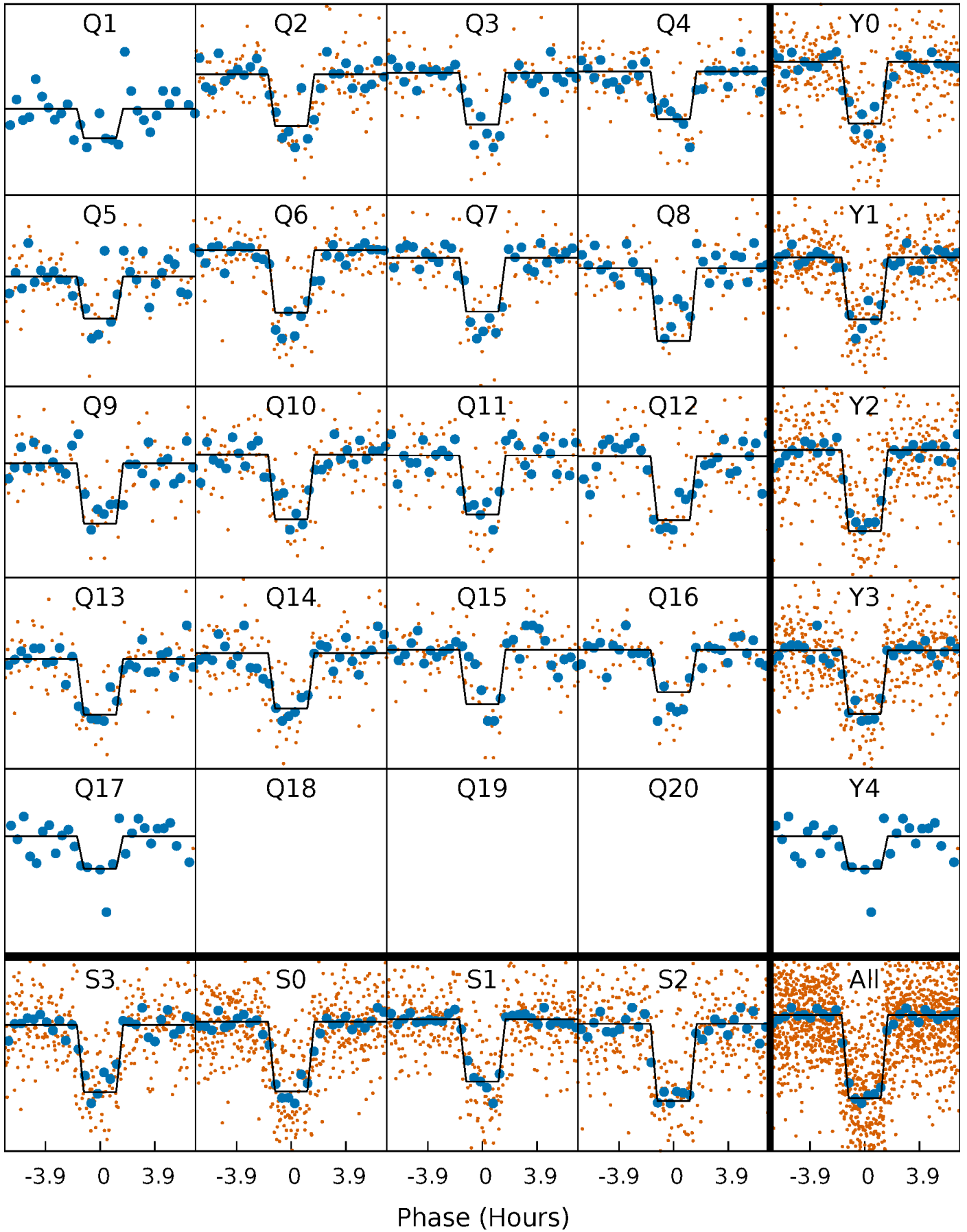
TCE 010662202-01 P= 21.676982 Days  $T_0=149.859874$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

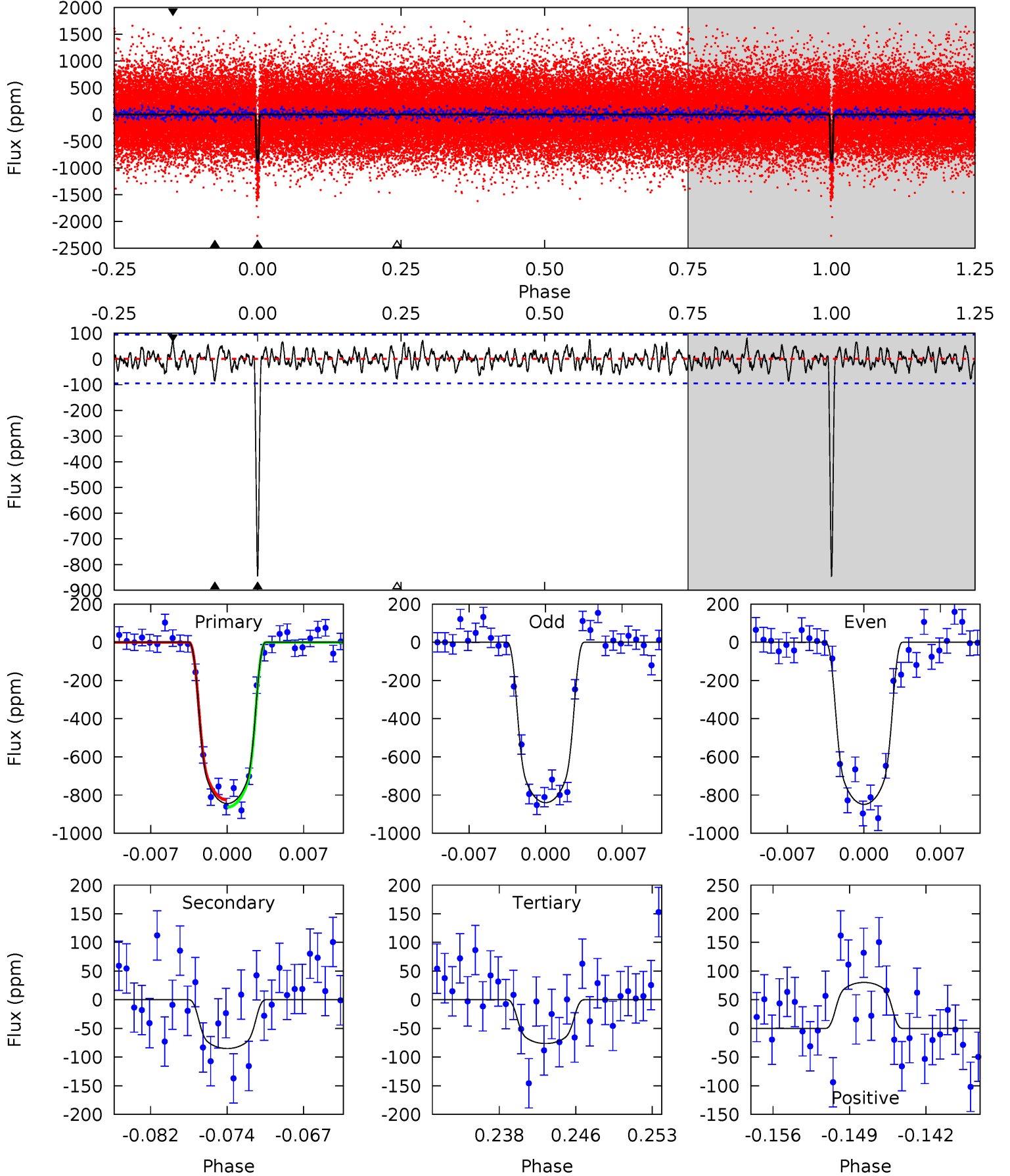
TCE 010662202-01 P= 21.677197 Days  $T_0=149.853003$  (BKJD)



# DV Model-Shift Uniqueness Test

010662202-01,  $P = 21.676982$  Days,  $E = 128.182892$  Days

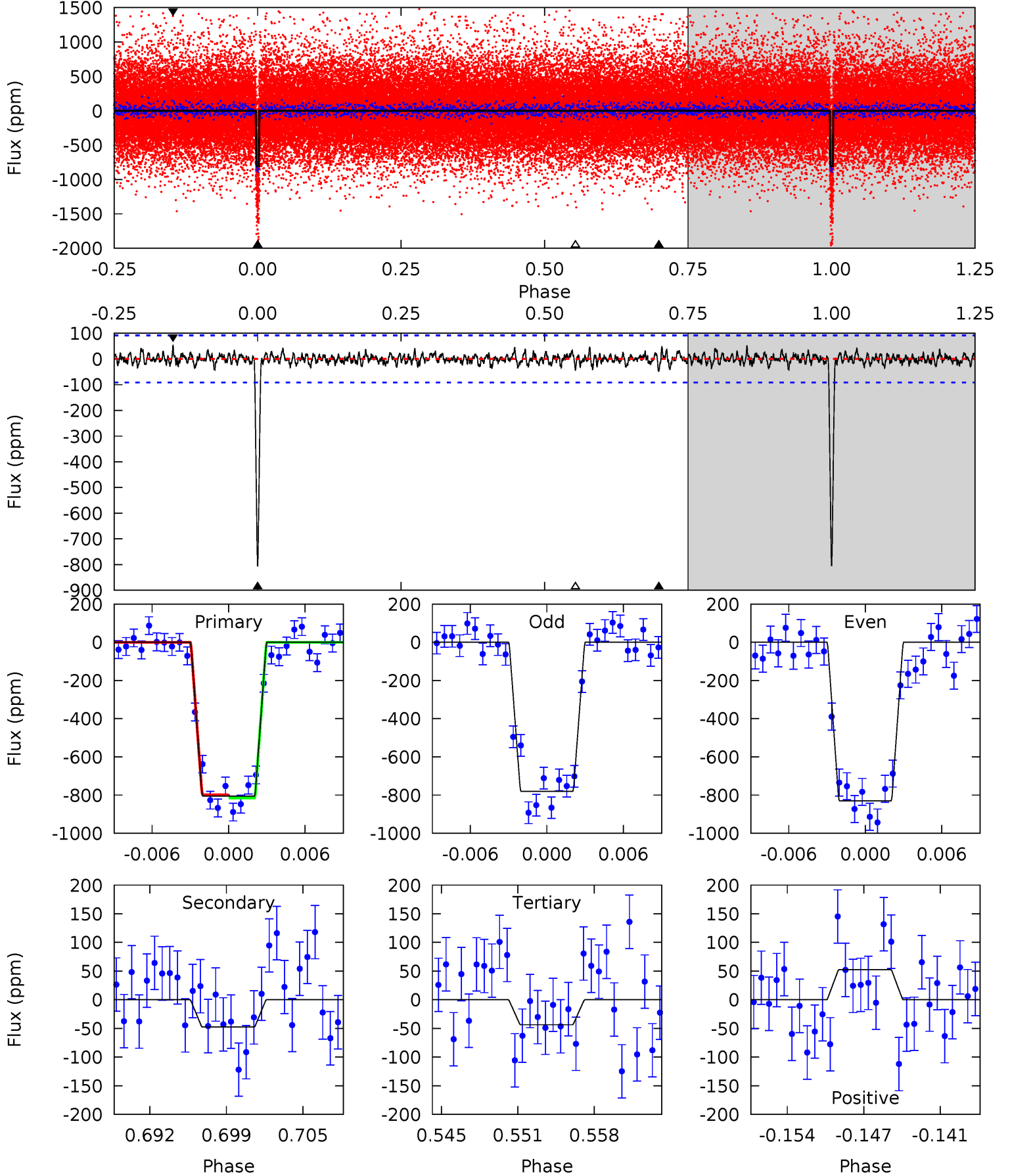
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.2	4.55	4.09	4.30	5.08	2.68	1.38	41.1	40.9	0.46	0.26	0.24	1.00	0.09	1.01



# Alt Model-Shift Uniqueness Test

010662202-01, P = 21.677197 Days, E = 128.175806 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
44.9	2.65	2.43	2.93	5.11	2.73	0.80	42.4	41.9	0.22	-0.28	1.38	1.00	0.06	0.48



### Stellar Parameters For KIC 010662202

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4954^{+79}_{-79}$	$4.500^{+0.075}_{-0.020}$	$0.180^{+0.150}_{-0.150}$	$0.828^{+0.032}_{-0.065}$	$0.791^{+0.050}_{-0.029}$	$1.964^{+0.537}_{-0.163}$
	+2%/-2%	+2%/-0%	+83%/-83%	+4%/-8%	+6%/-4%	+27%/-8%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 010662202-01 / KOI 0750.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-85 \pm 19$	$2.89^{+0.25}_{-0.28}$	$735^{+15}_{-19}$	$3193^{+121}_{-139}$	$112^{+35}_{-29}$
Alt.	$-48 \pm 18$	$2.54^{+0.28}_{-0.28}$	$735^{+15}_{-18}$	$3036^{+186}_{-211}$	$80^{+40}_{-32}$

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

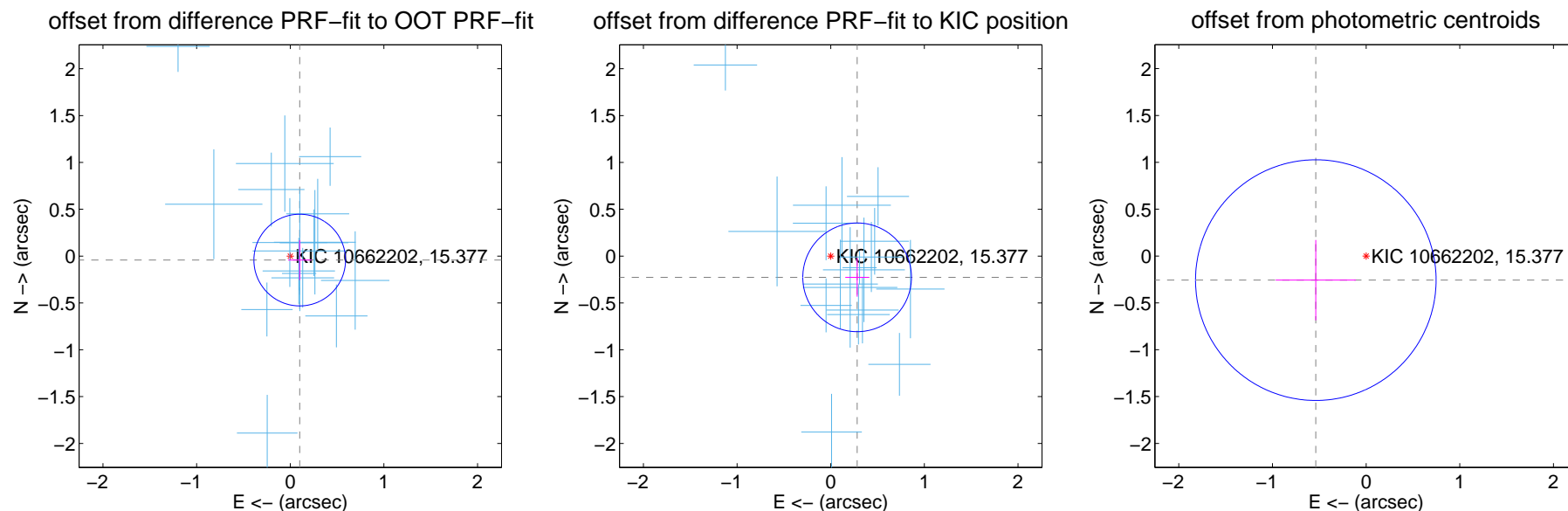
## DV Centroid Data

Supplemental centroid analysis for 010662202-01. Kepler magnitude: 15.38. Transit SNR 27.96

There are 17 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

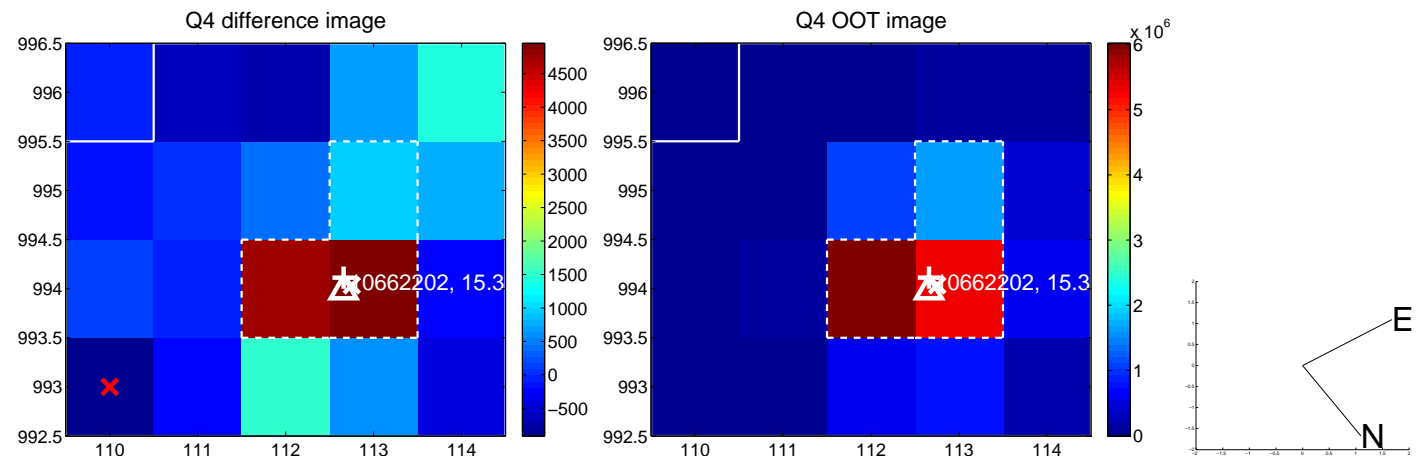
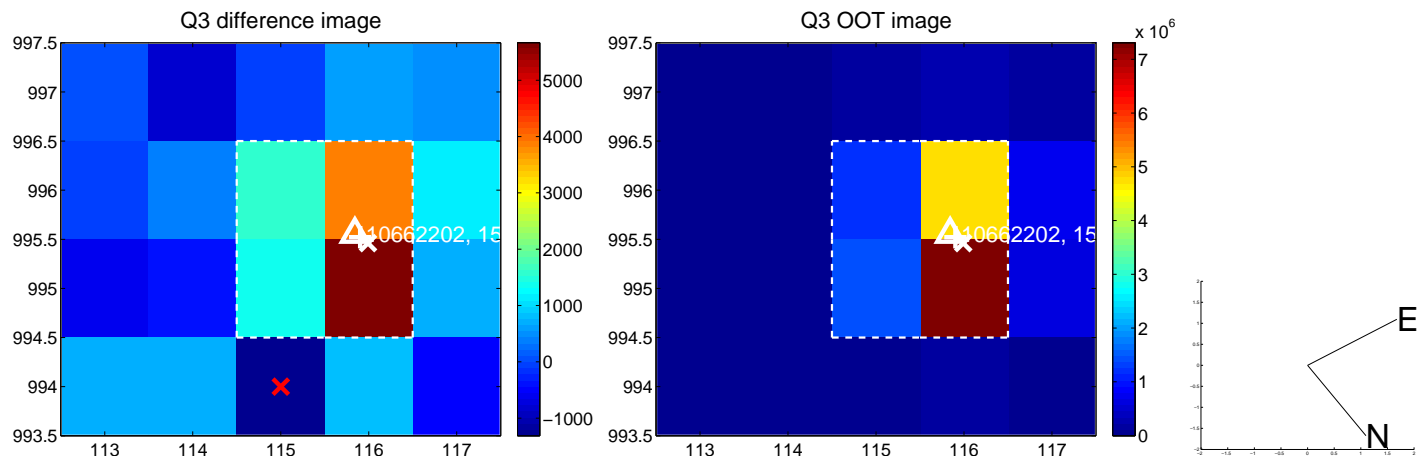
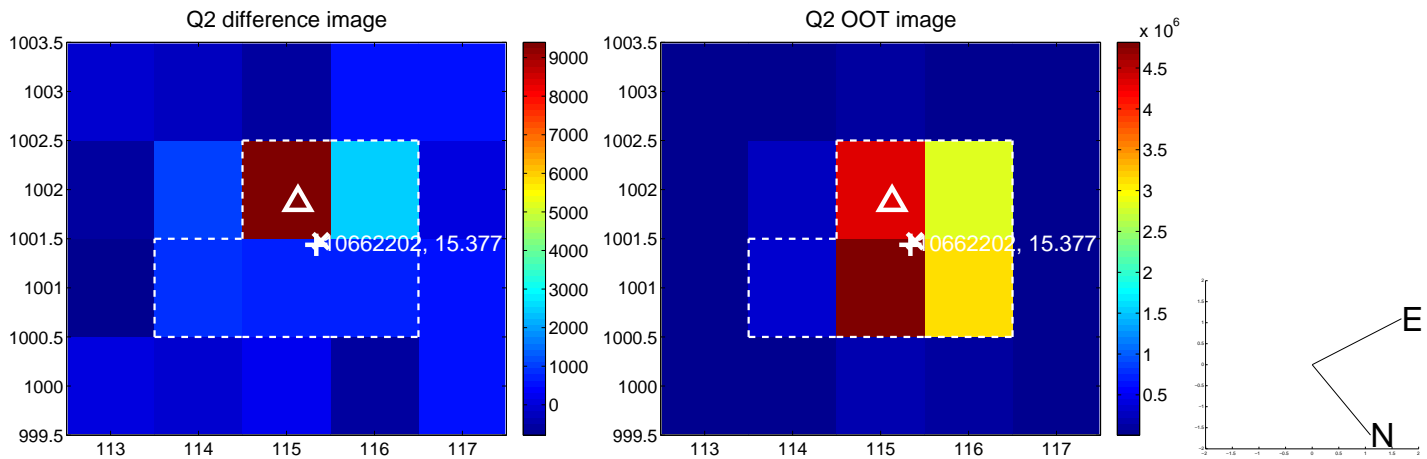
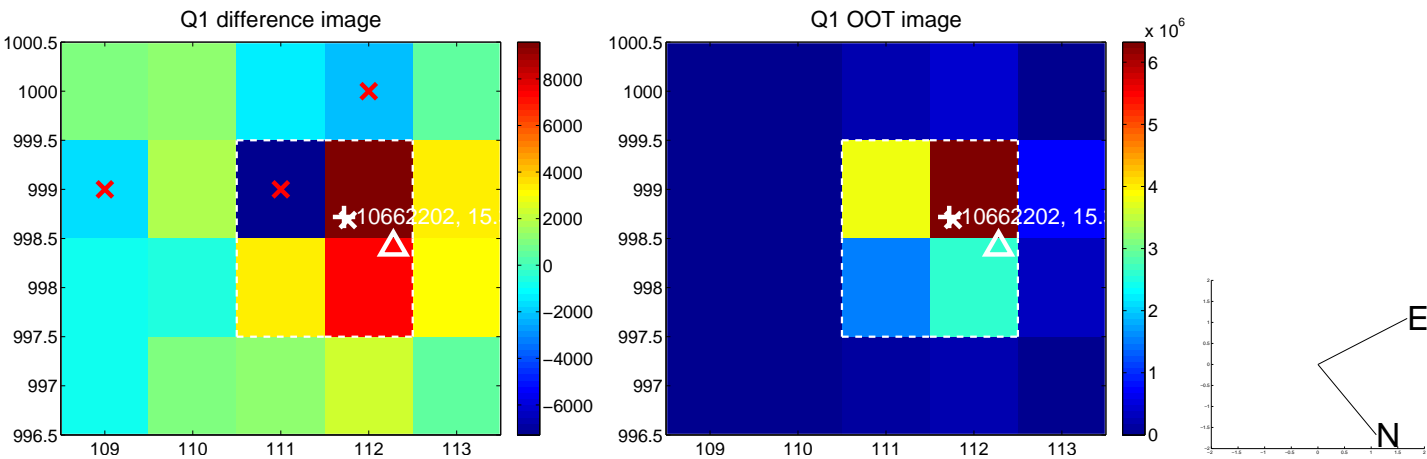
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.109 \pm 0.163$	0.67	$-0.101 \pm 0.124$	$-0.042 \pm 0.213$
PRF-fit source offset from KIC position	$0.362 \pm 0.193$	1.87	$-0.282 \pm 0.126$	$-0.227 \pm 0.206$
photometric centroid source offset	$0.60 \pm 0.43$	1.39	$0.54 \pm 0.43$	$-0.26 \pm 0.43$



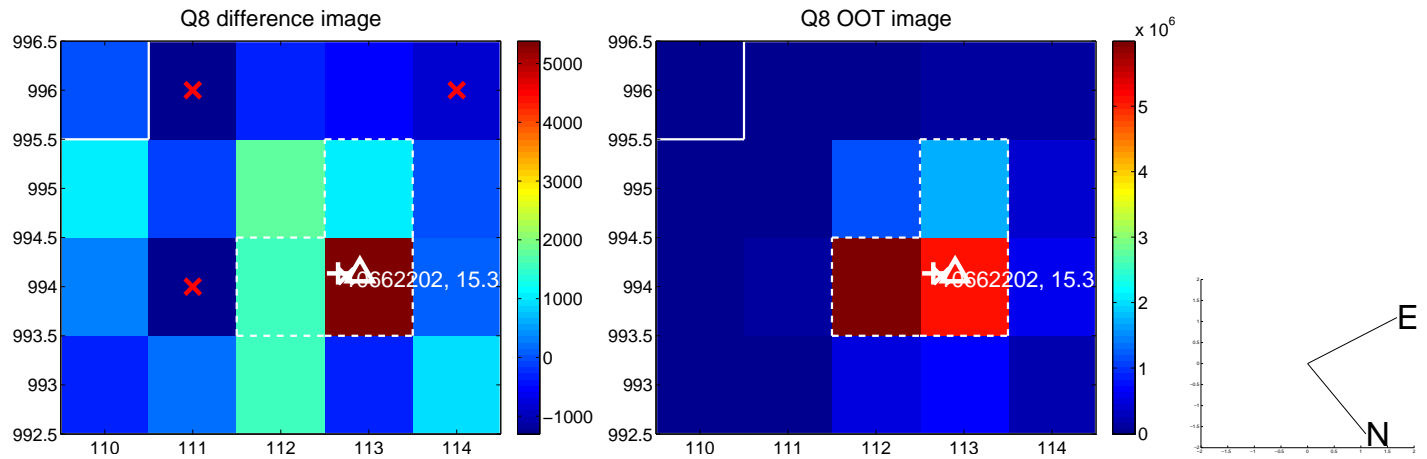
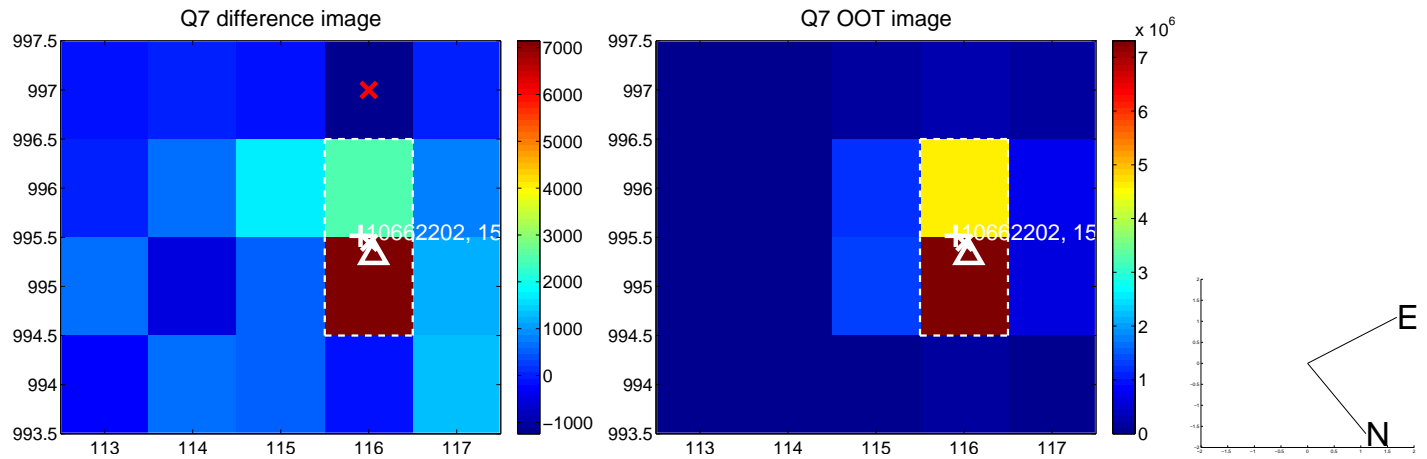
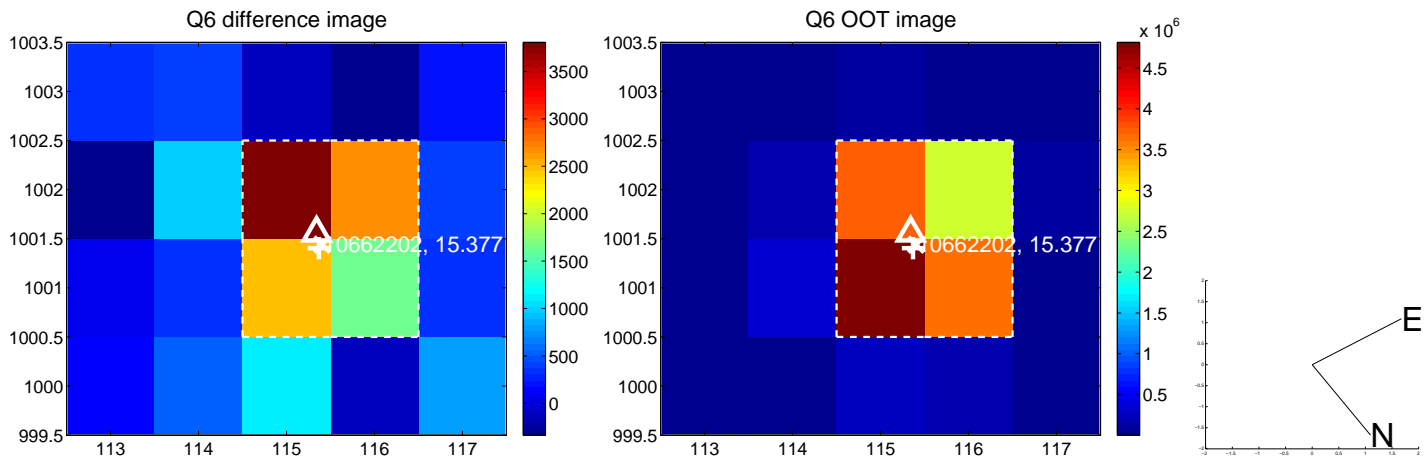
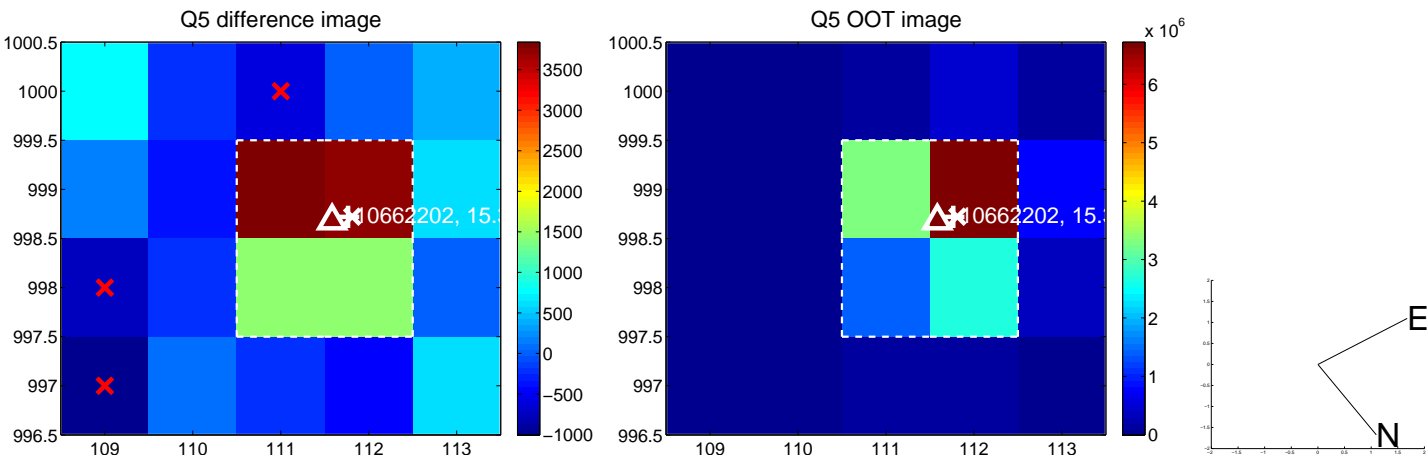
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



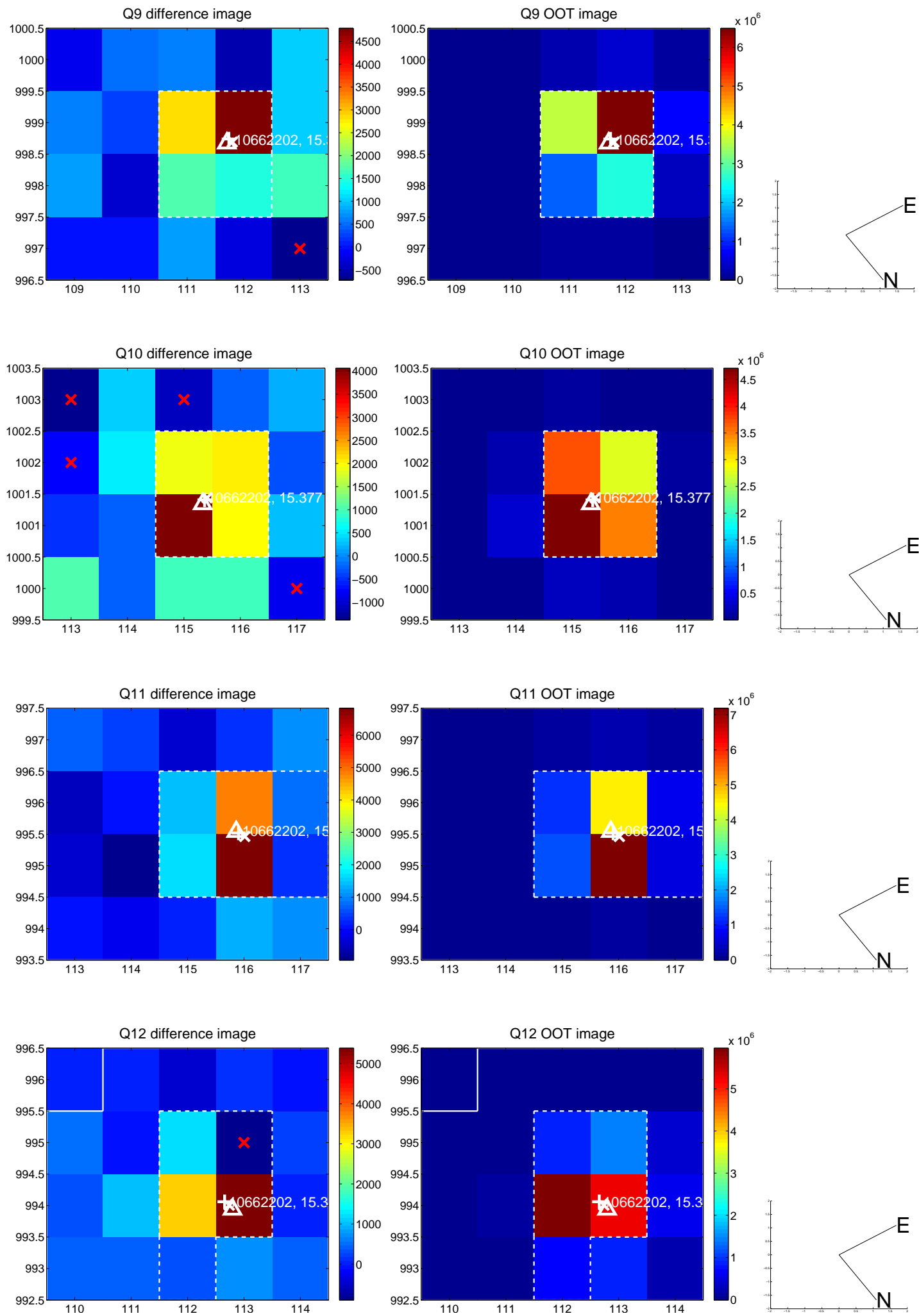
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



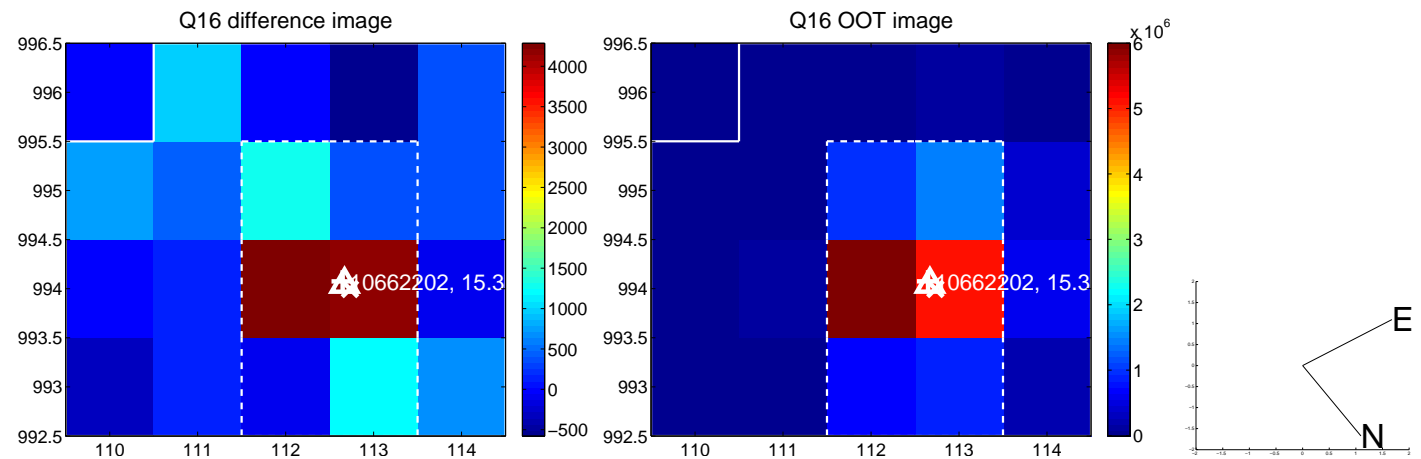
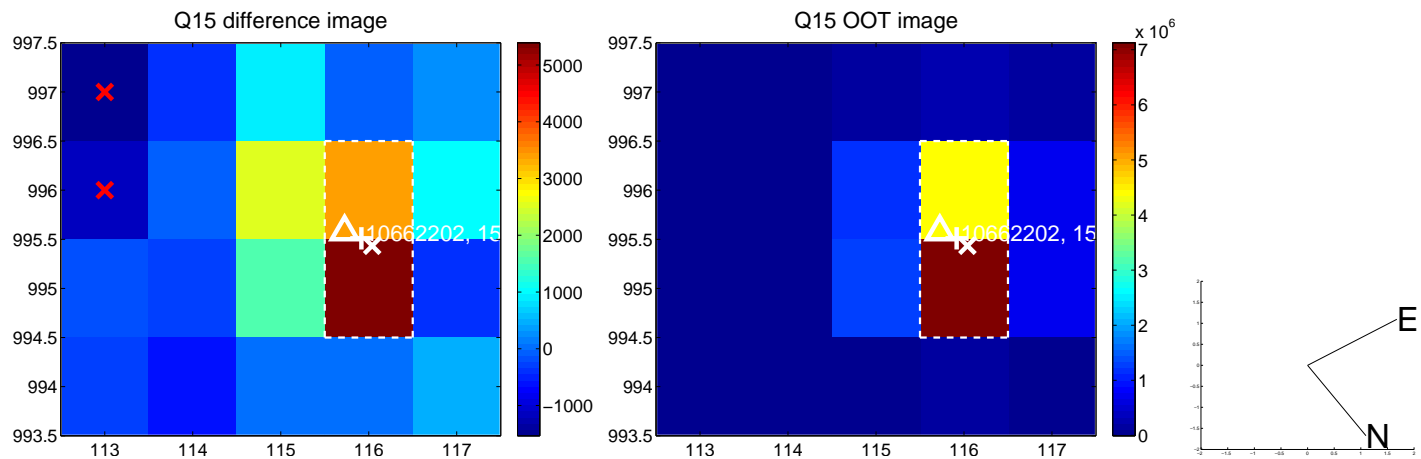
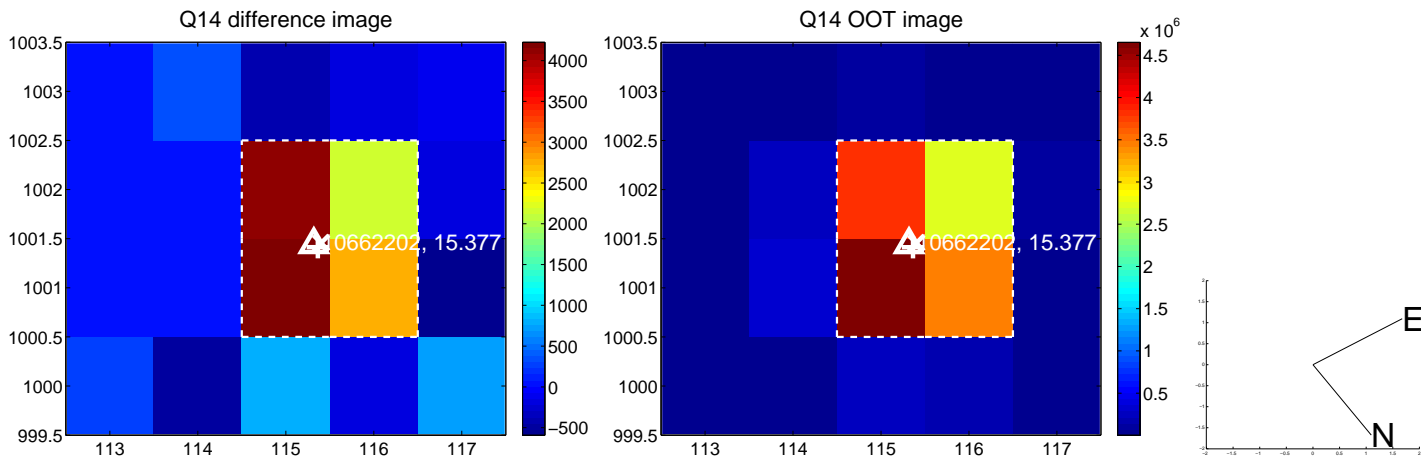
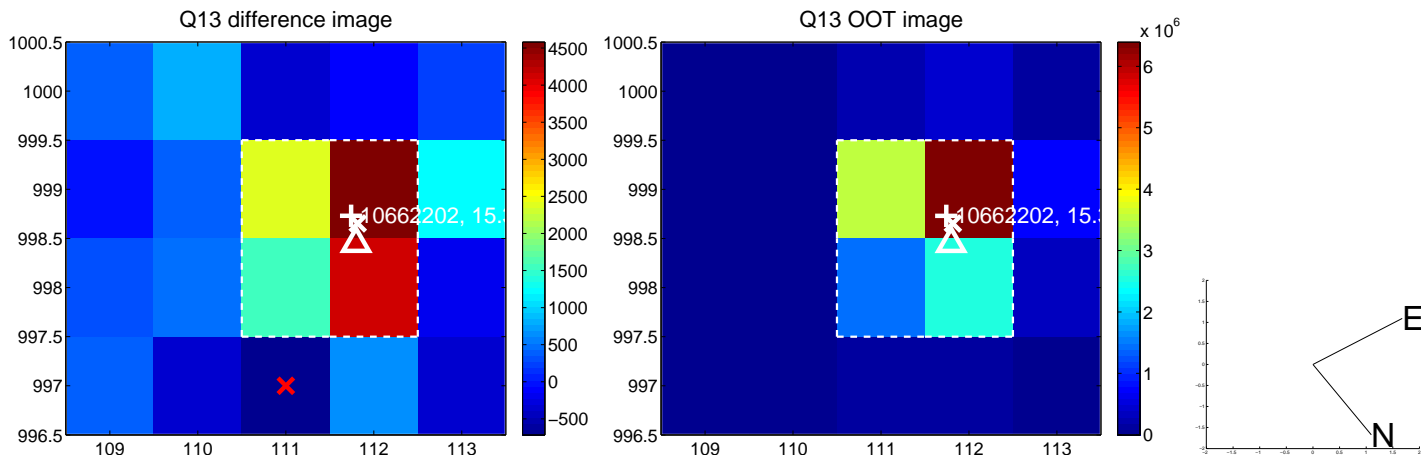
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



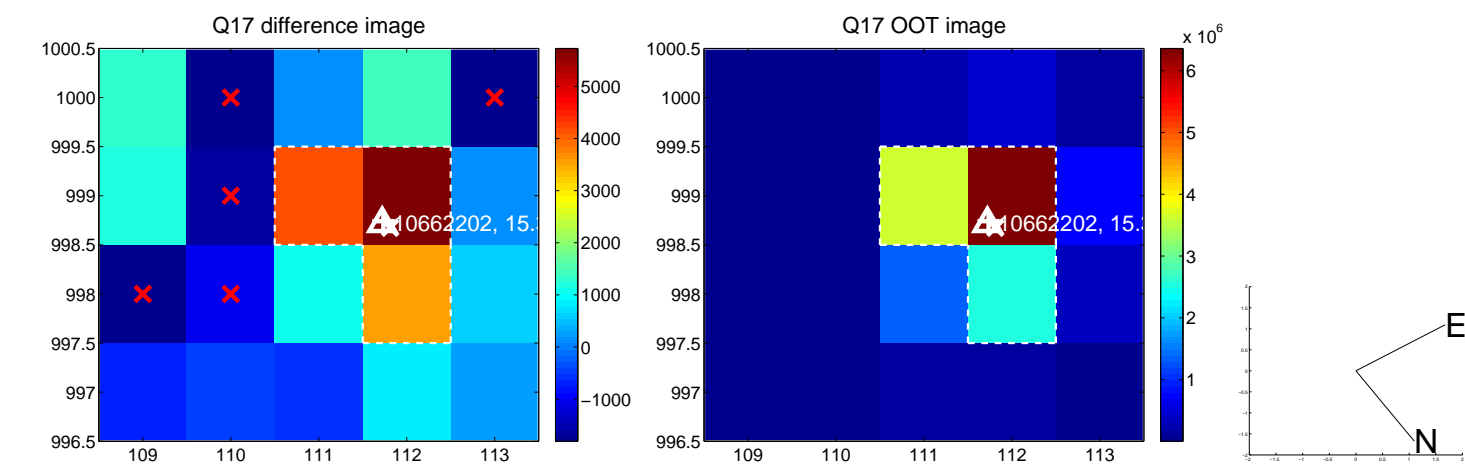
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



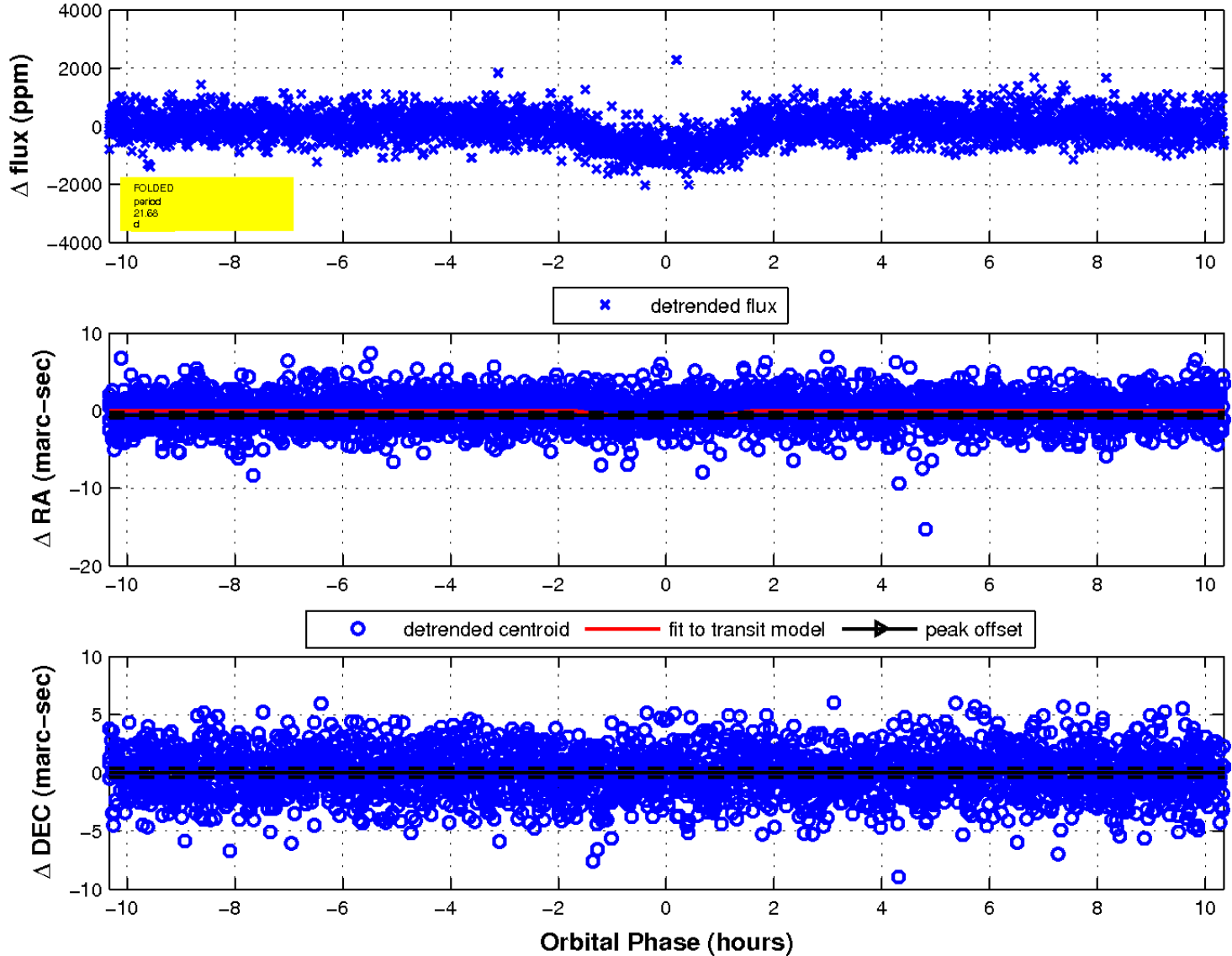
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



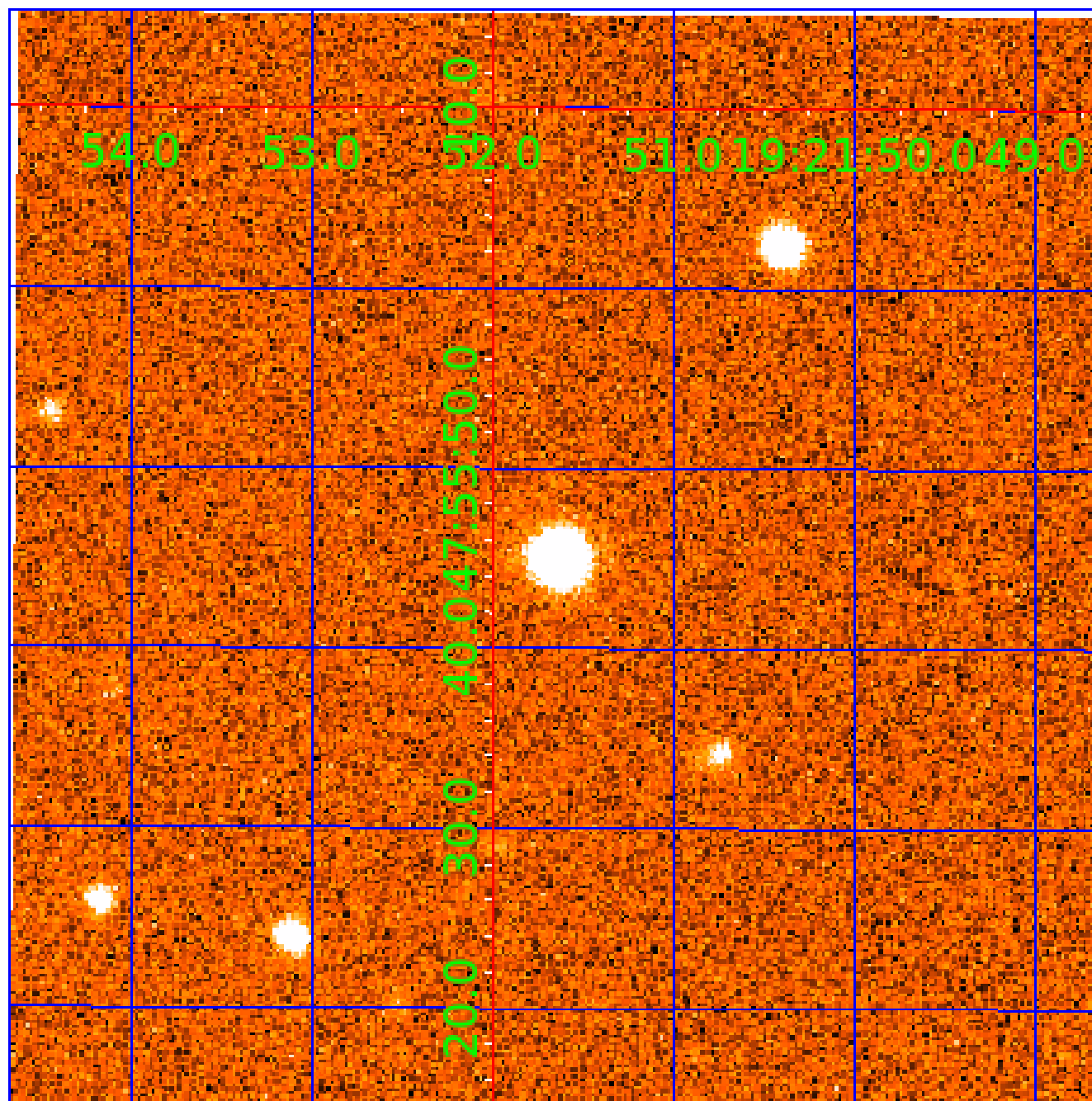
fluxWeightedCentroids, Planet 1 of 3





UKIRT Image

Declination



# KIC 010662202

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010662202-01	OBS	0750.01	21.676982	149.859874	843.0	3.449	24.5	28.0	0.83	4954	2.92	18.68
010662202-02	OBS	0750.02	5.044038	132.542517	164.7	1.908	8.2	9.5	0.83	4954	1.21	130.53
010662202-03	OBS	0750.03	14.516691	138.838289	249.6	2.737	7.5	9.2	0.83	4954	1.55	31.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010662202-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
010662202-02	OBS	PC	0.92	0	0	0	0	NO_COMMENT
010662202-03	OBS	PC	0.93	0	0	0	0	NO_COMMENT

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

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

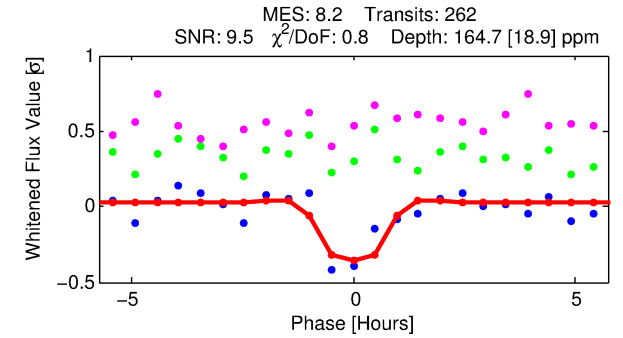
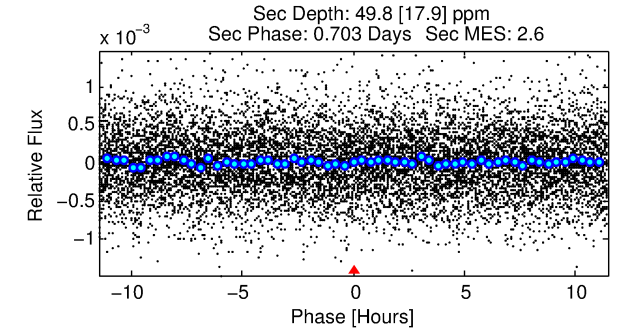
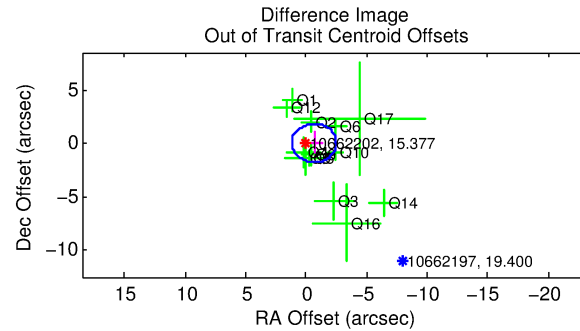
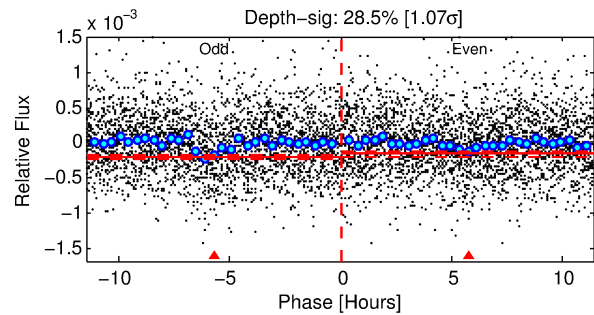
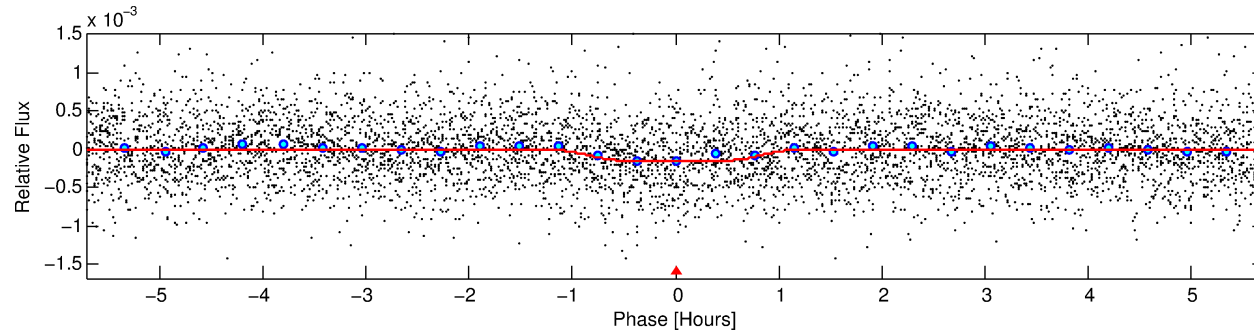
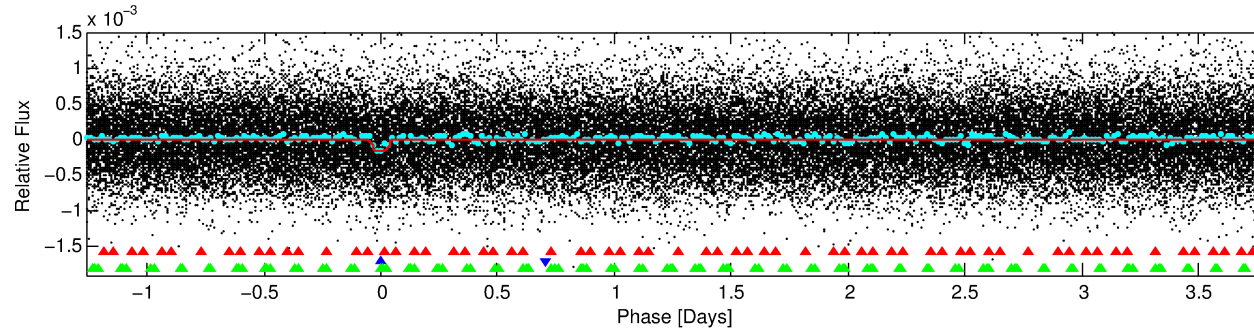
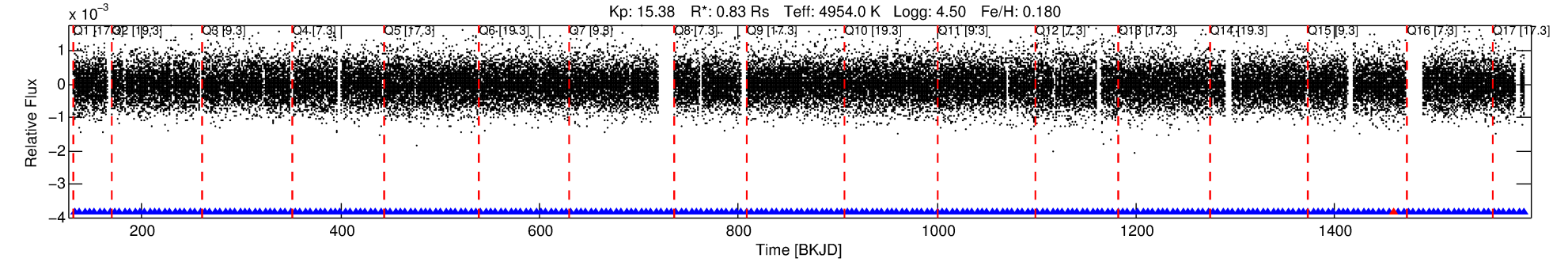
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010662202-02

No Significant Match Found

# DV One-Page Summary

KIC: 10662202 Candidate: 2 of 3 Period: 5.044 d  
KOI: K00750.02 Corr: 0.855



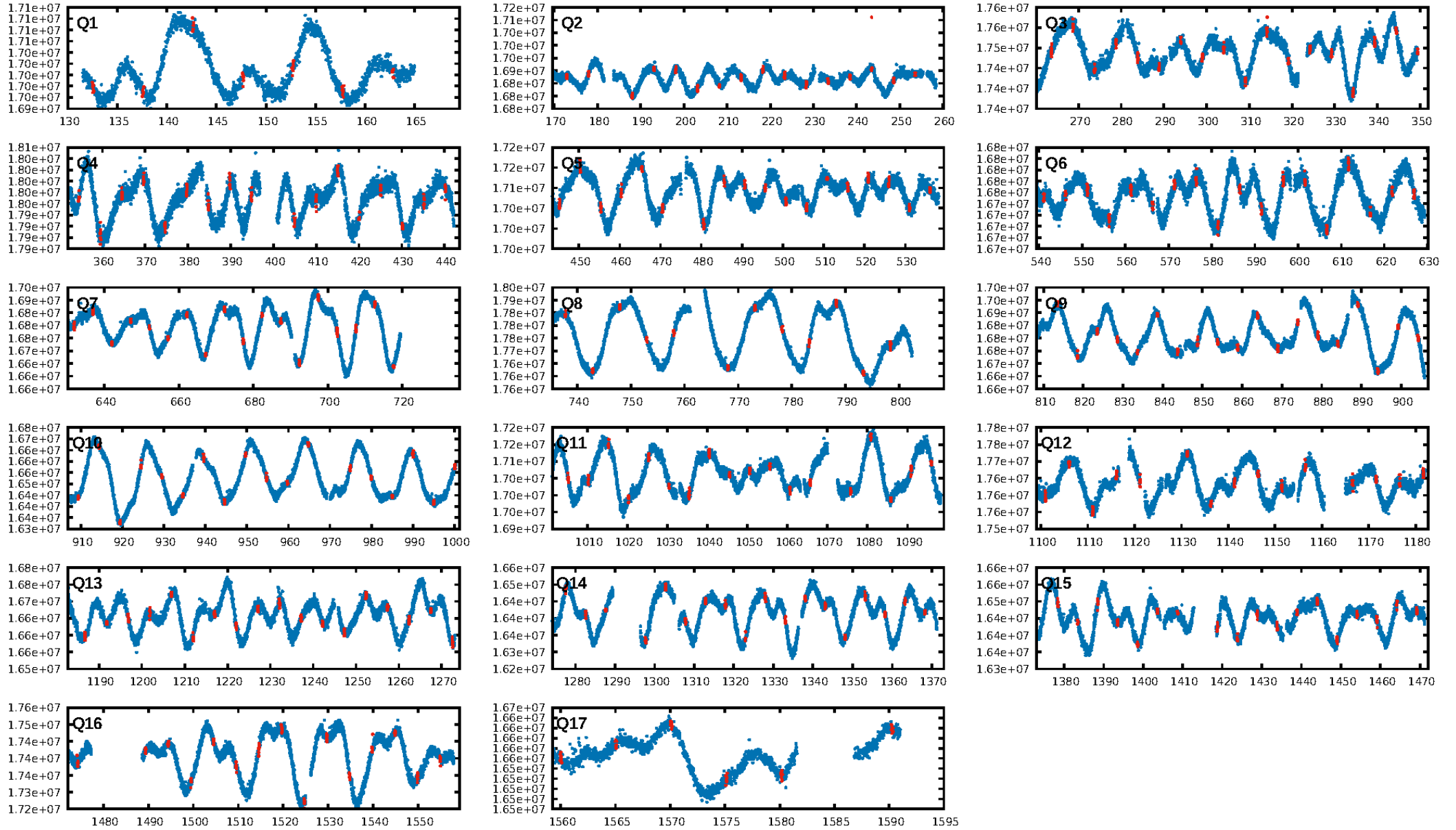
## DV Fit Results:

Period = 5.04404 [0.00003] d  
Epoch = 132.5425 [0.0038] BKJD  
Rp/R\* = 0.0134 [0.0141]  
a/R\* = 12.02 [44.81]  
b = 0.82 [1.53]  
Seff = 130.53 [18.49]  
Teff = 862 [31] K  
Rp = 1.21 [1.28] Re  
a = 0.0532 [0.0041] AU  
Ag = 52.82 [112.90] [0.46 $\sigma$ ]  
Teffp = 3593 [1917] K [1.42 $\sigma$ ]

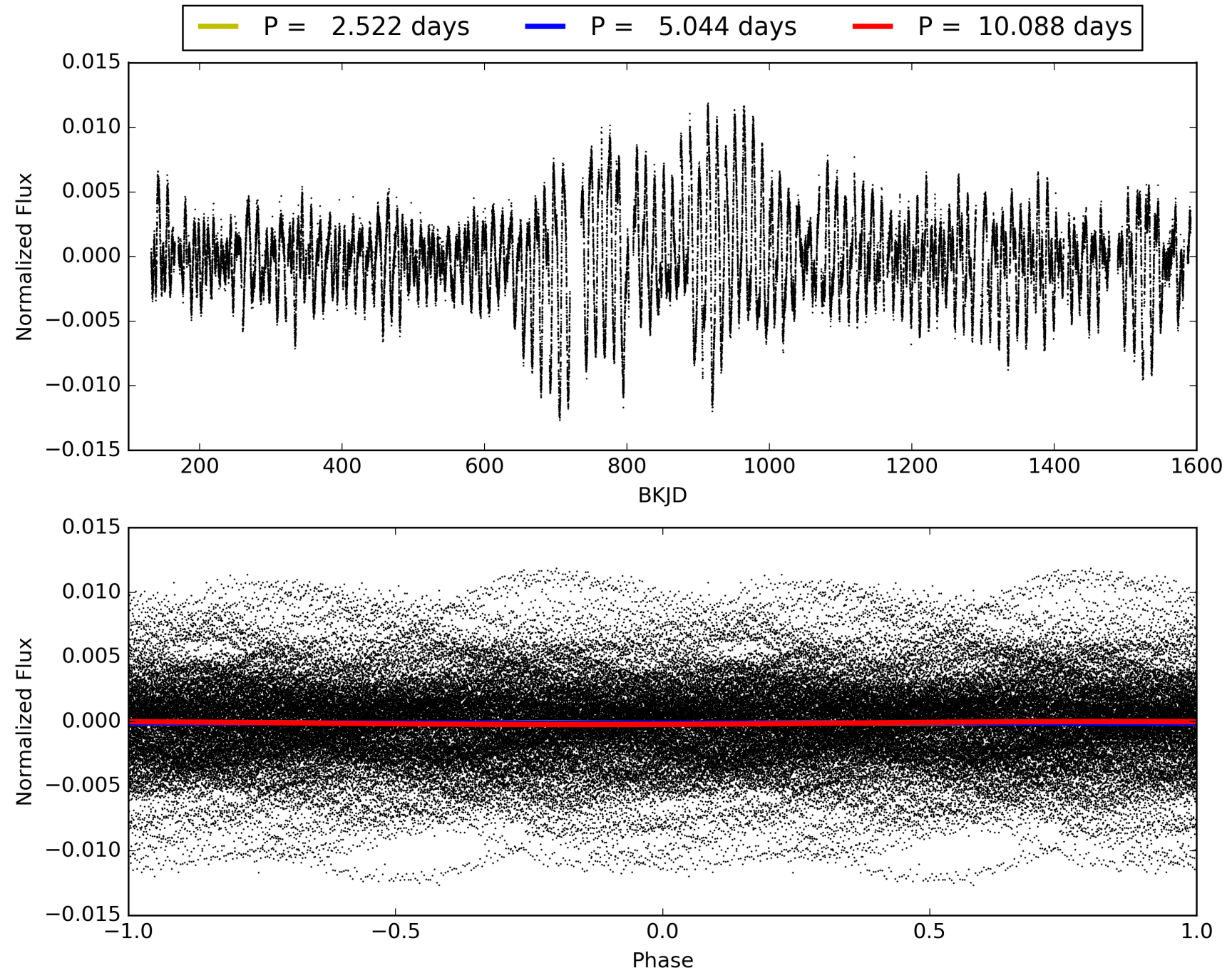
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [68.14 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.31e-16  
RollingBand-fgt: 1.00 [248/249]  
**GhostDiagnostic-chr: 0.8759**  
Centroid-sig: 61.9%  
Centroid-so: 0.887 arcsec [0.66 $\sigma$ ]  
OotOffset-rm: 0.650 arcsec [1.07 $\sigma$ ]  
KicOffset-rm: 0.806 arcsec [1.15 $\sigma$ ]  
OotOffset-st: 4/1/4/4 [13]  
KicOffset-st: 4/1/4/4 [13]  
DiffImageQuality-fgm: 0.31 [4/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010662202-02, PDC Light Curves



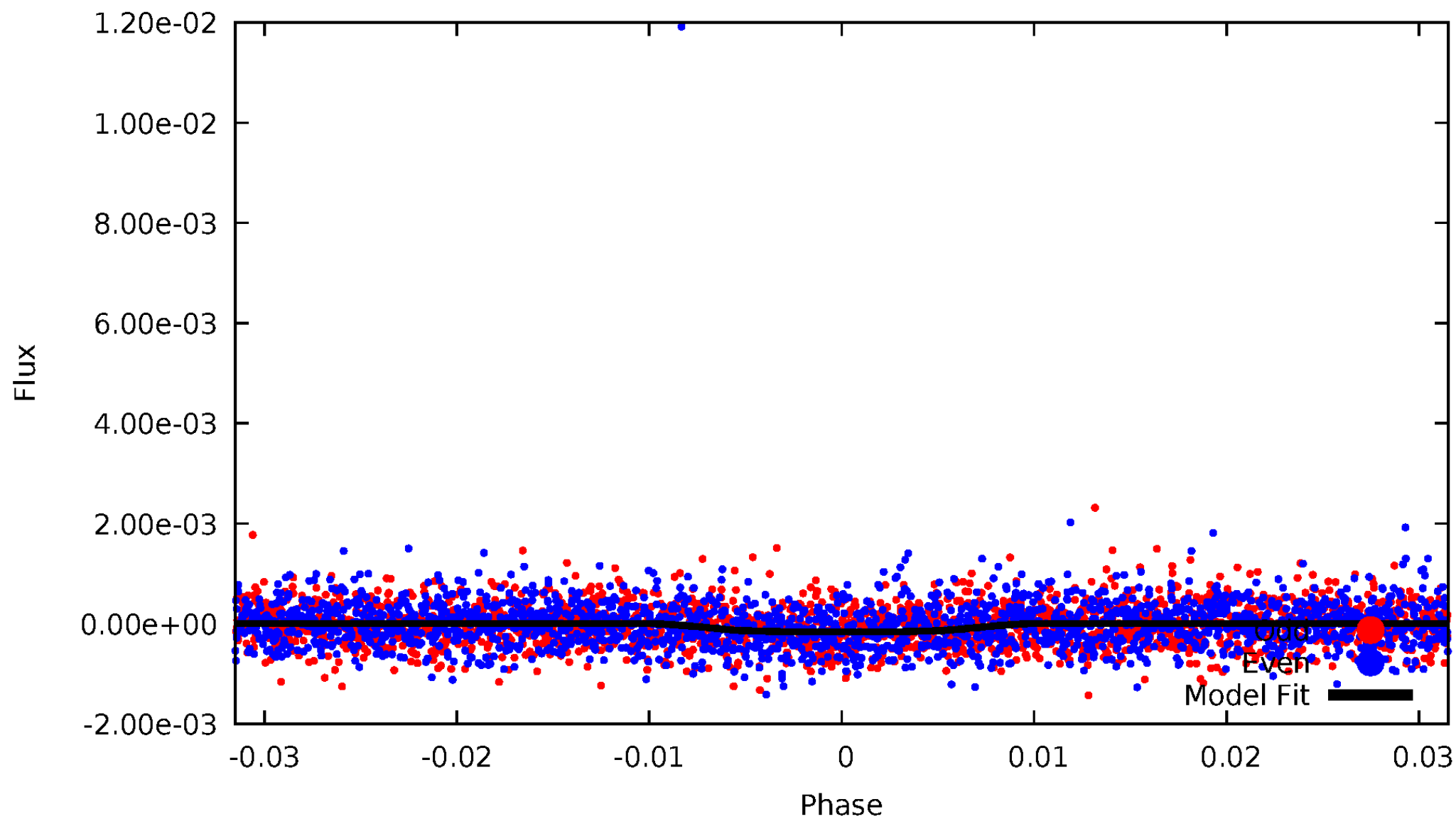
TCE 010662202-02





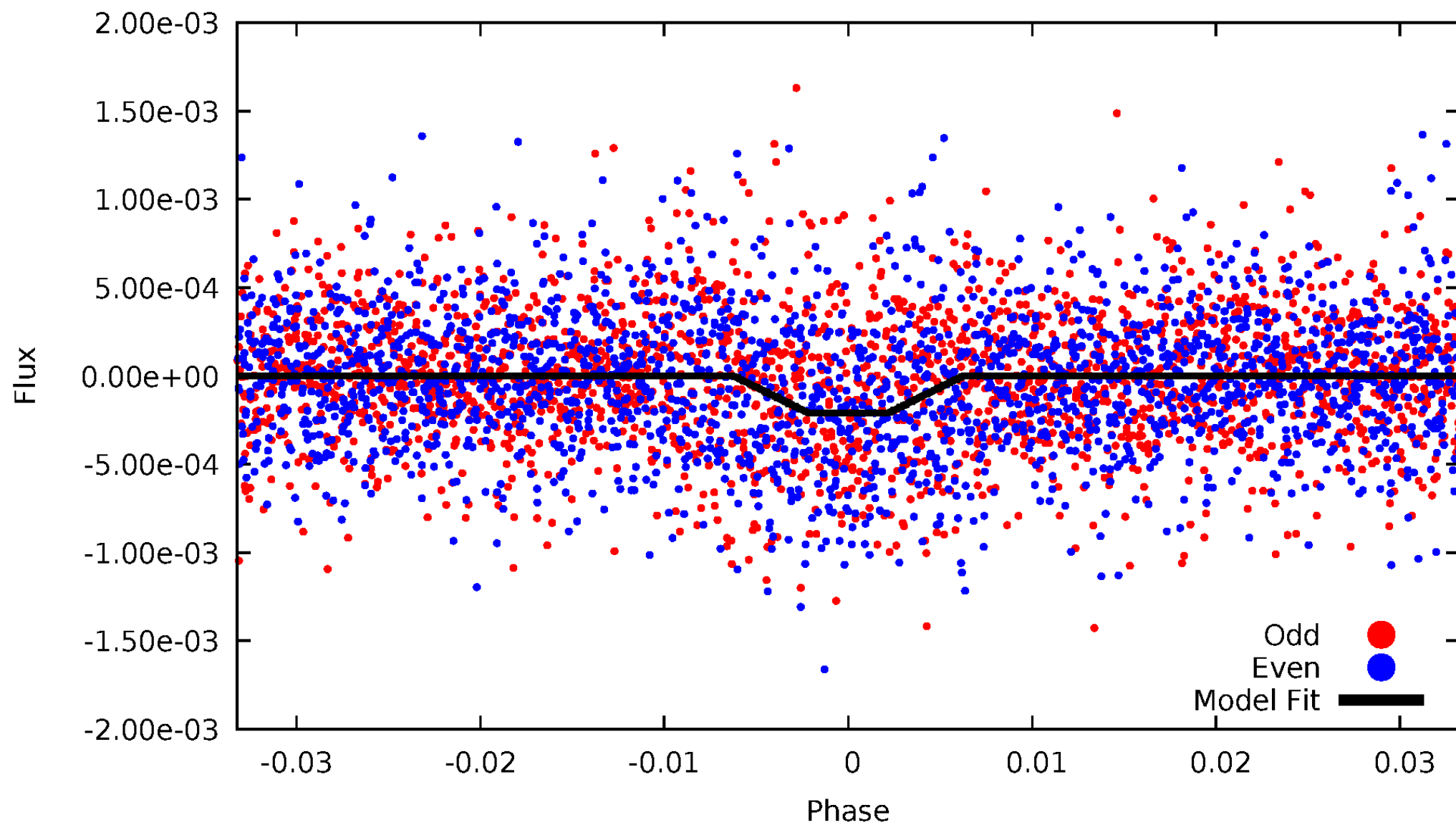
# DV Odd/Even

TCE 010662202-02



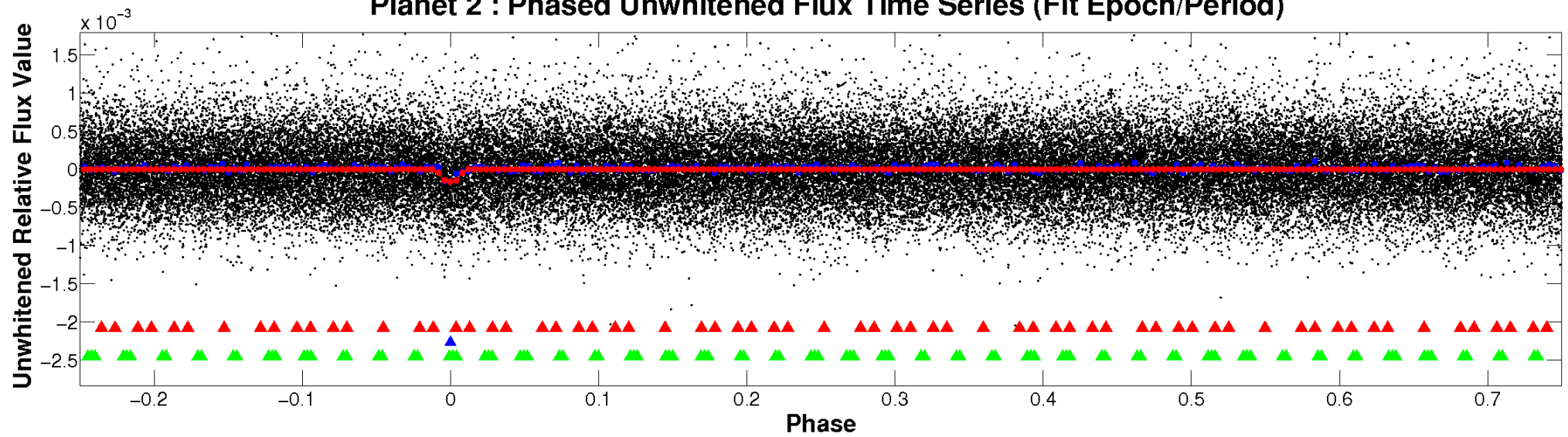
# ALT Odd/Even

TCE 010662202-02

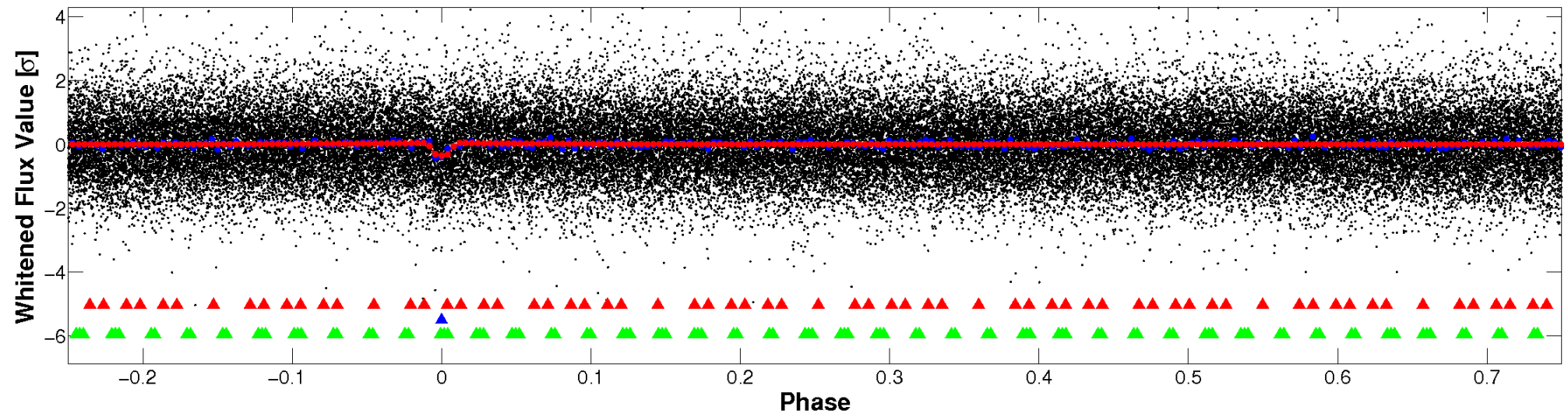


# Non-Whitened Vs. Whitened Light Curve

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

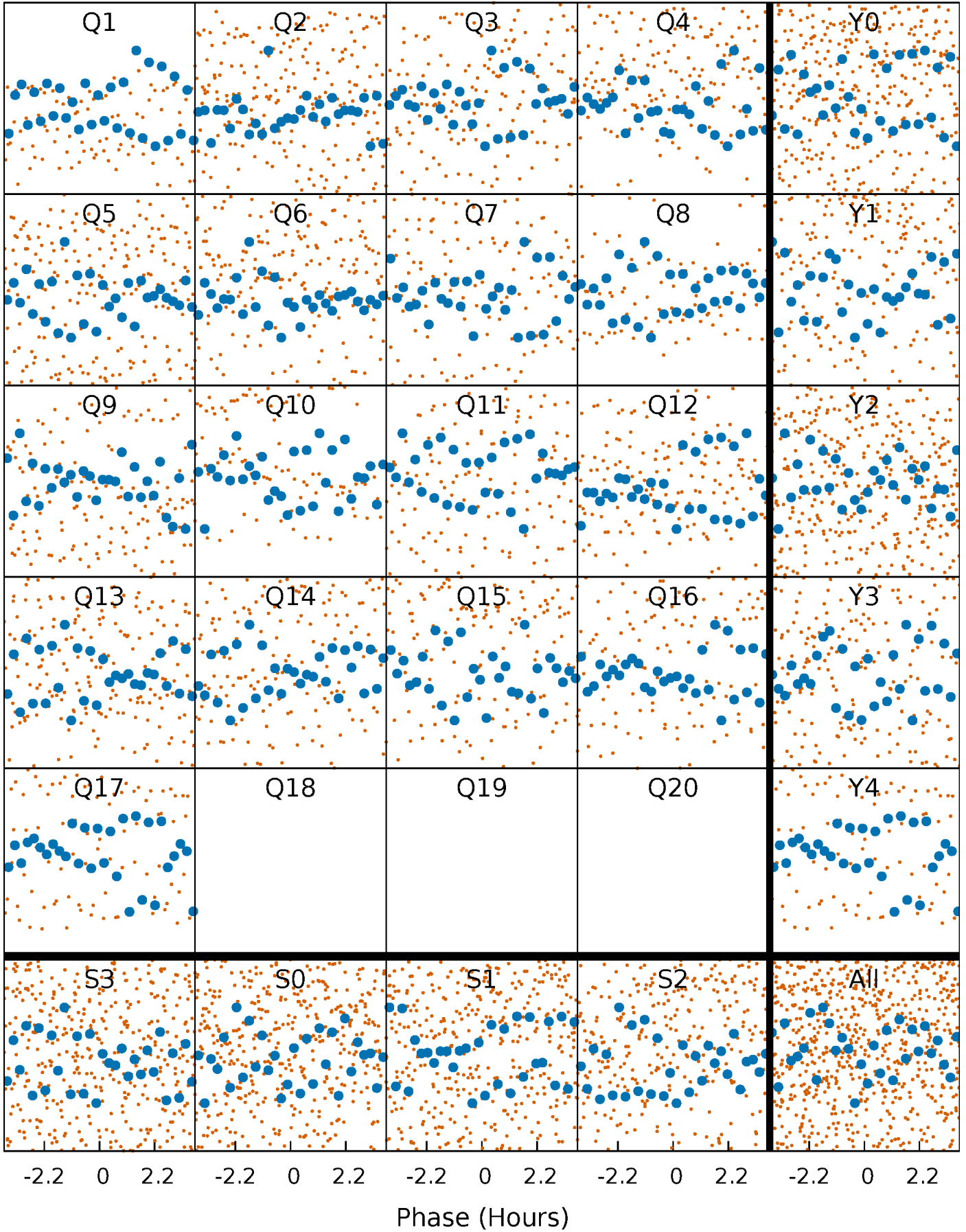


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



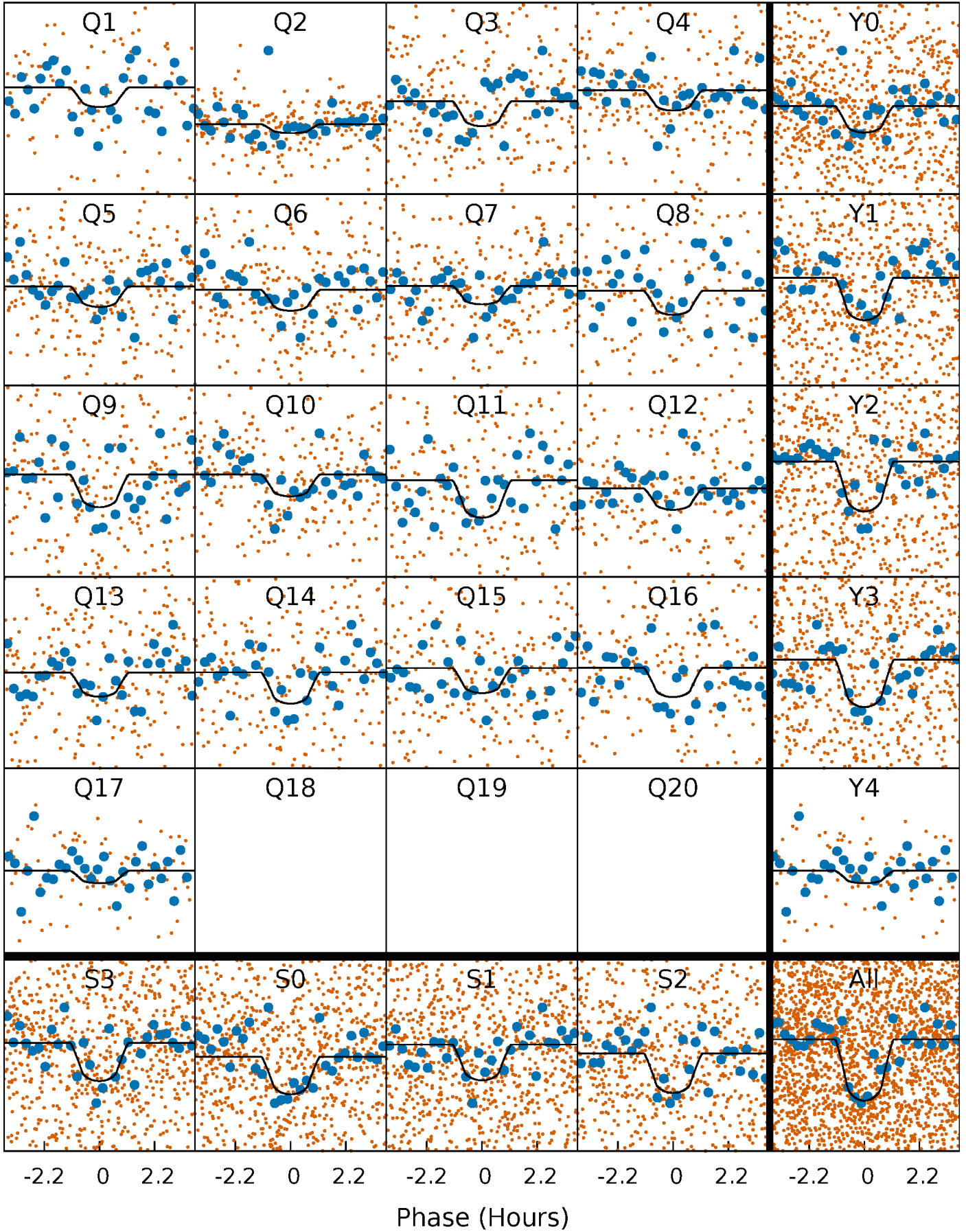
# PDC Quarter-Phased Transit Curves

TCE 010662202-02    P= 5.044038 Days     $T_0=132.542518$  (BKJD)



# DV Quarter-Phased Transit Curves

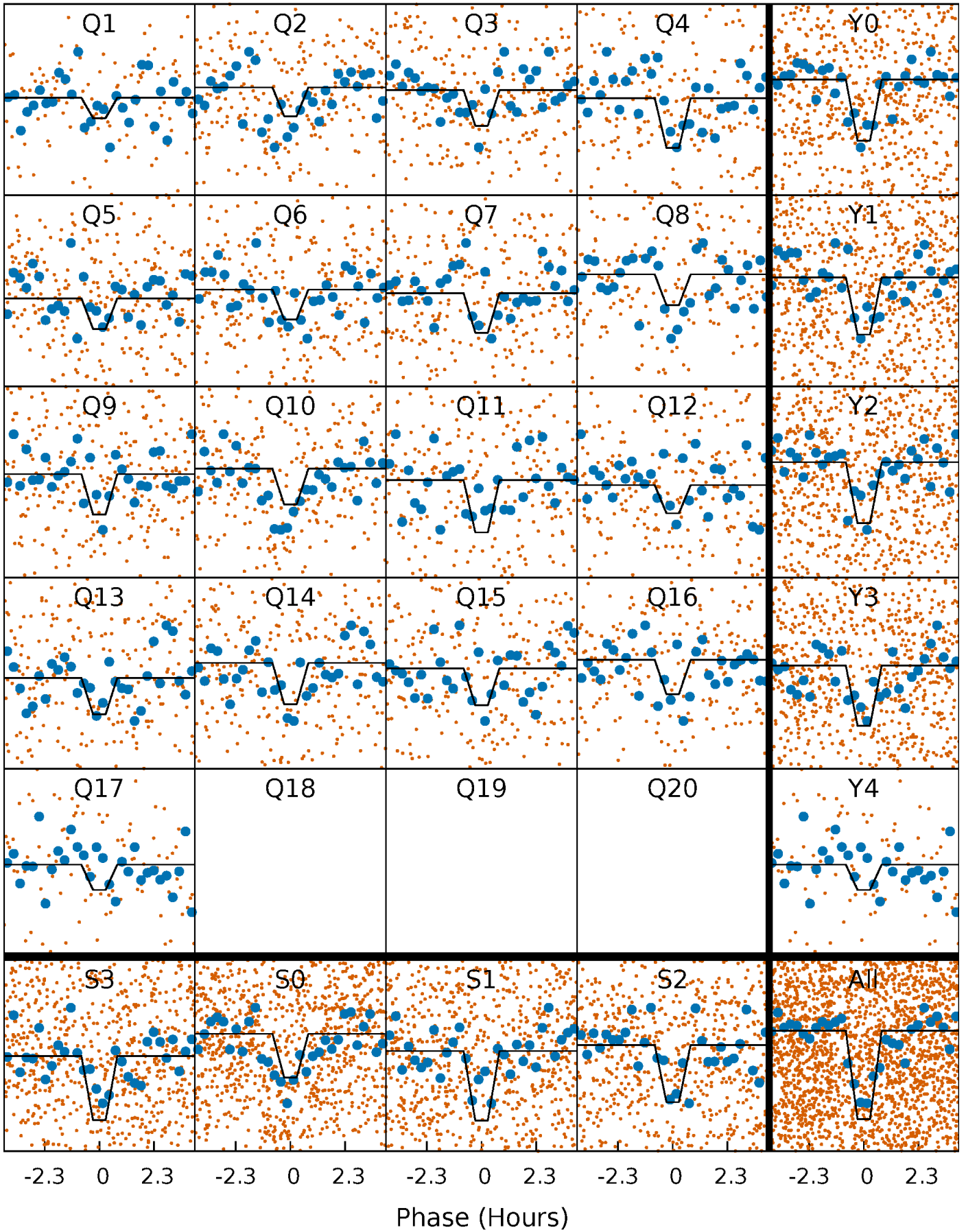
TCE 010662202-02     $P = 5.044038$  Days     $T_0 = 132.542518$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

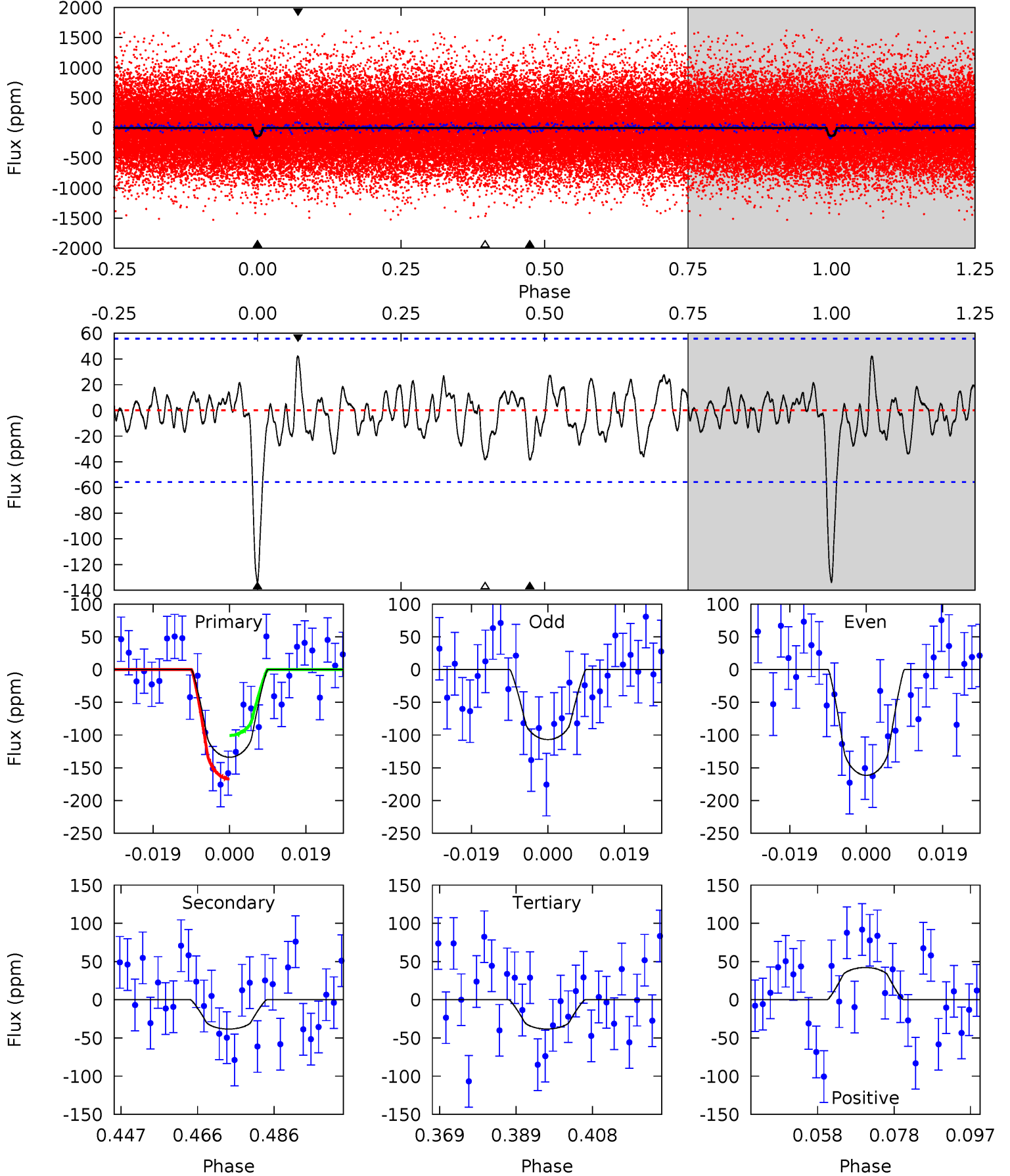
TCE 010662202-02 P= 5.044125 Days  $T_0=132.521925$  (BKJD)



# DV Model-Shift Uniqueness Test

010662202-02, P = 5.044038 Days, E = 127.498480 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
11.8	3.36	3.36	3.70	4.90	2.34	1.24	8.39	8.05	0.00	-0.34	2.40	0.99	0.24	2.92

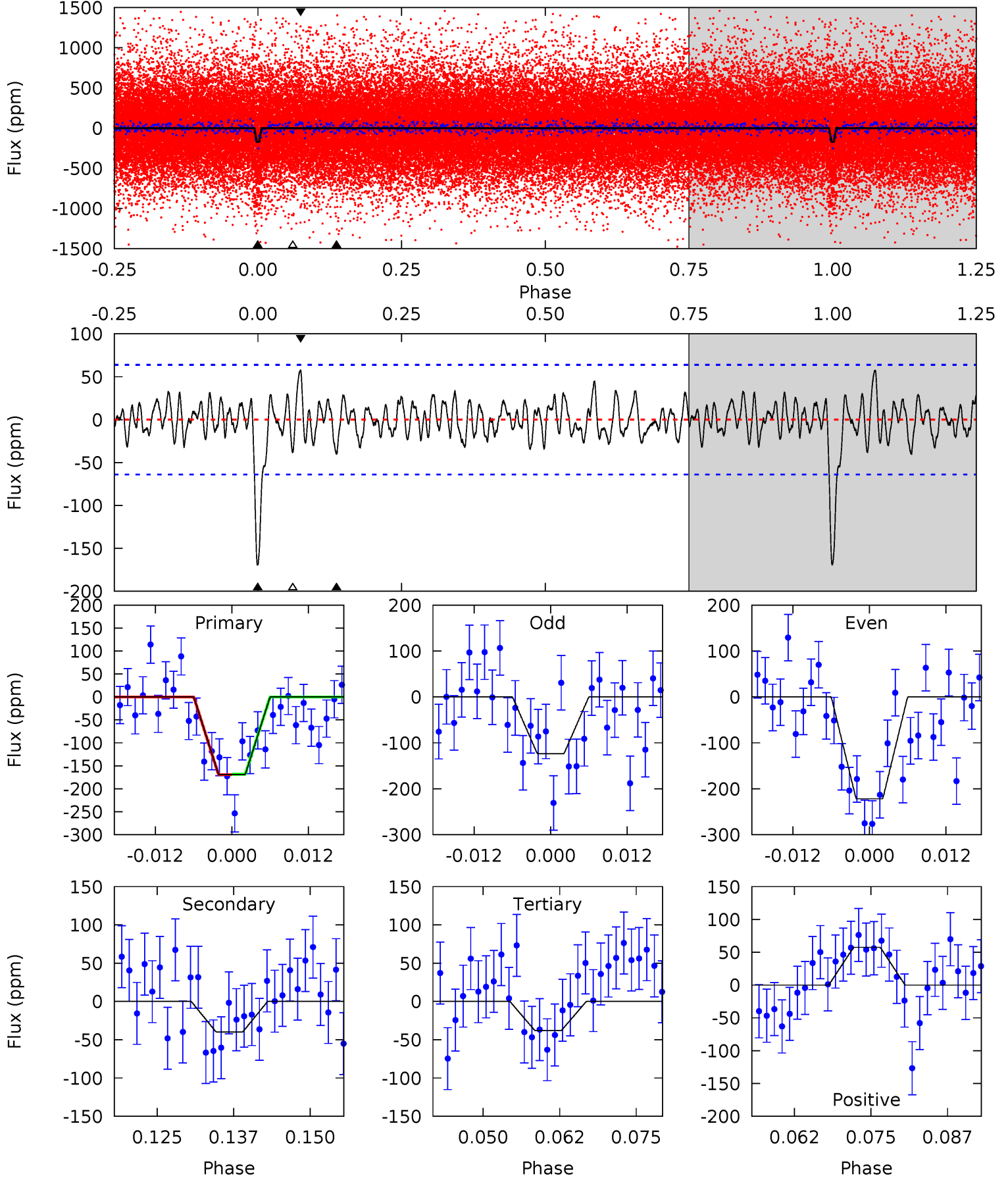




# Alt Model-Shift Uniqueness Test

010662202-02, P = 5.044125 Days, E = 127.477800 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
13.2	3.11	2.96	4.49	4.98	2.50	1.30	10.2	8.69	0.15	-1.38	3.83	0.98	0.25	0.05



### Stellar Parameters For KIC 010662202

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4954^{+79}_{-79}$	$4.500^{+0.075}_{-0.020}$	$0.180^{+0.150}_{-0.150}$	$0.828^{+0.032}_{-0.065}$	$0.791^{+0.050}_{-0.029}$	$1.964^{+0.537}_{-0.163}$
	+2%/-2%	+2%/-0%	+83%/-83%	+4%/-8%	+6%/-4%	+27%/-8%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 010662202-02 / KOI 0750.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-38 \pm 11$	$1.51^{+1.05}_{-0.96}$	$1196^{+26}_{-32}$	$3445^{+1576}_{-545}$	$27^{+186}_{-18}$
Alt.	$-40 \pm 13$	$1.63^{+1.17}_{-1.03}$	$1194^{+26}_{-28}$	$3365^{+1561}_{-527}$	$23^{+162}_{-15}$

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

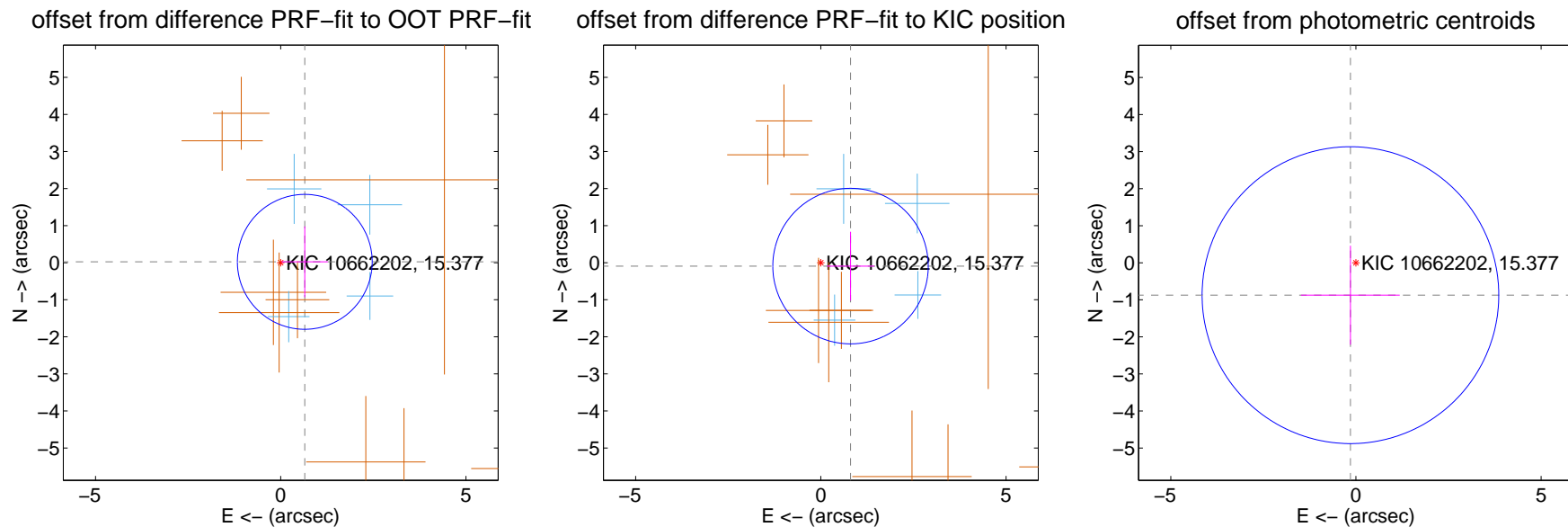
## DV Centroid Data

Supplemental centroid analysis for 010662202-02. Kepler magnitude: 15.38. Transit SNR 9.48

There are 4 quarters with good PRF difference image offsets

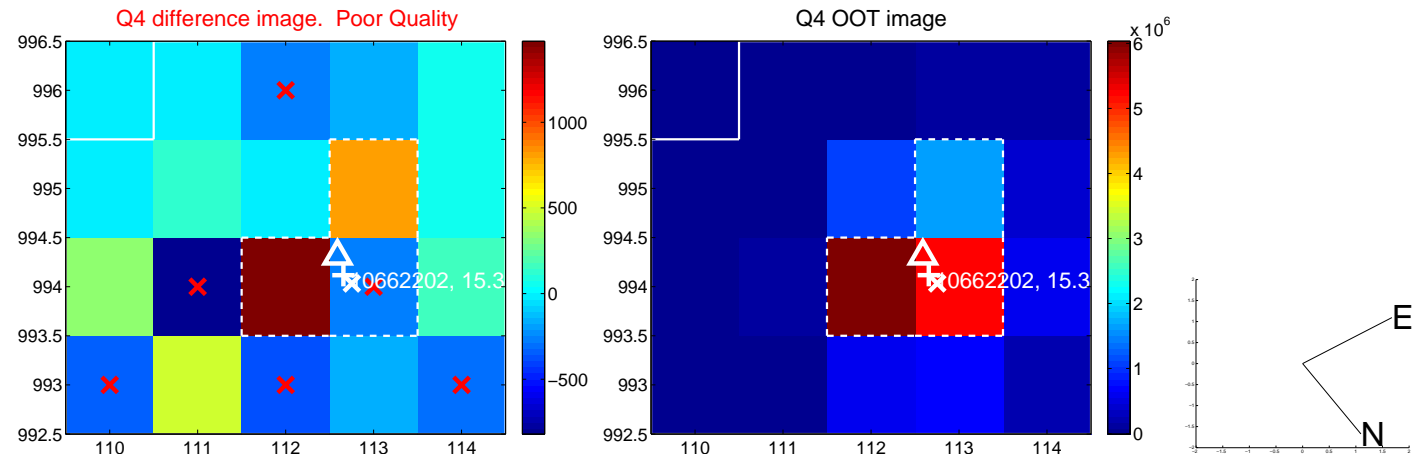
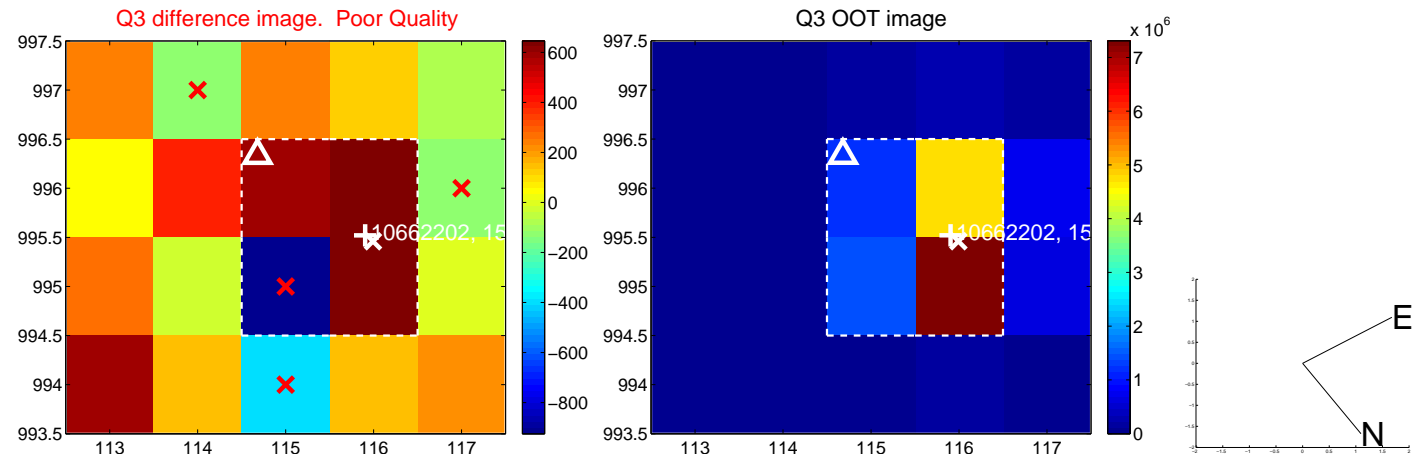
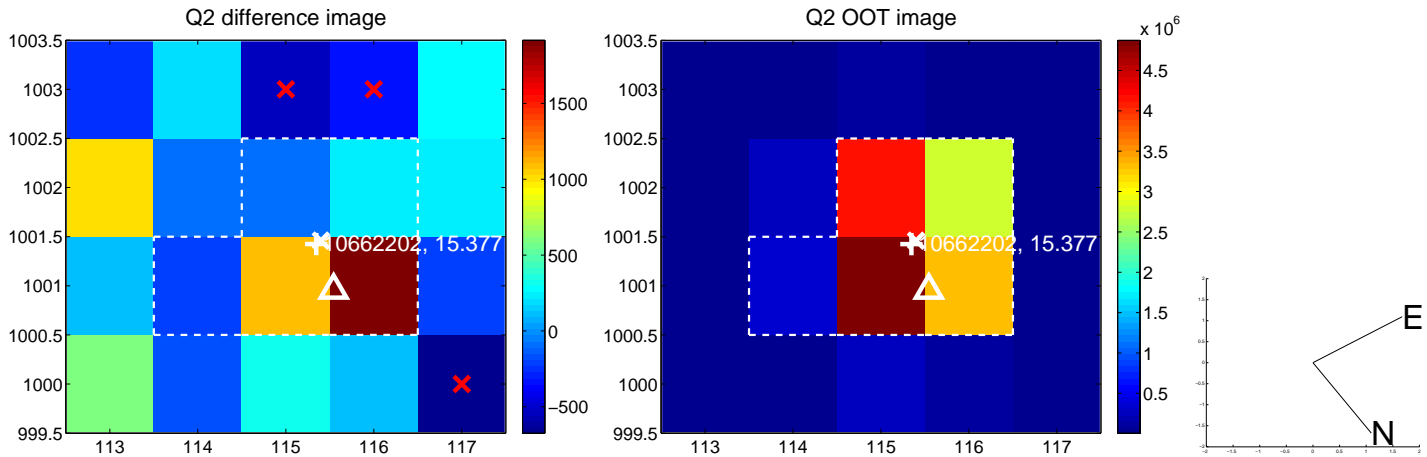
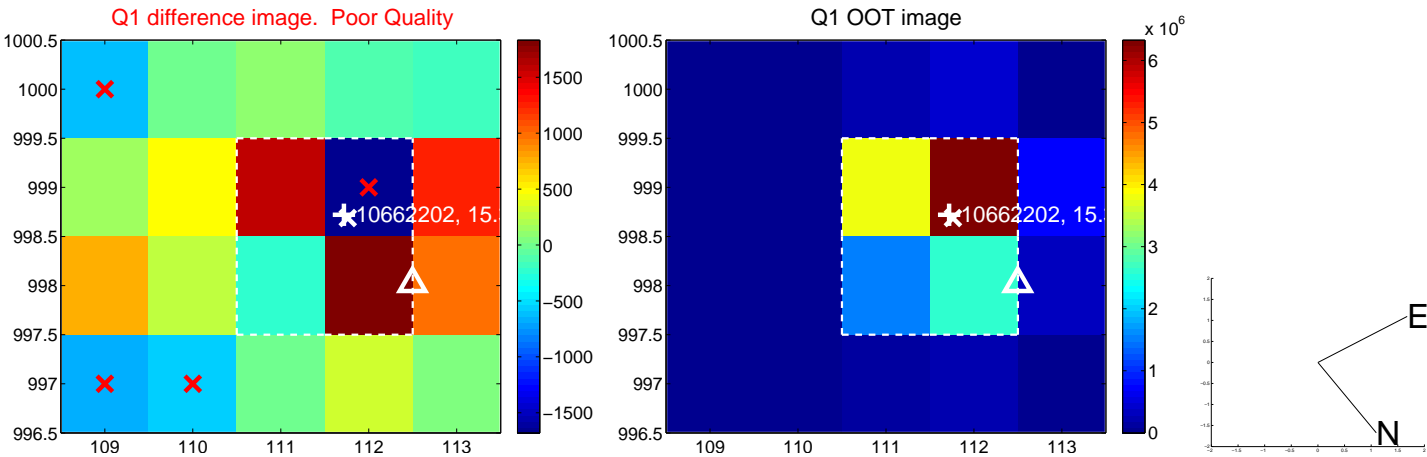
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.650 \pm 0.607$	1.07	$-0.649 \pm 0.624$	$0.023 \pm 0.957$
PRF-fit source offset from KIC position	$0.806 \pm 0.700$	1.15	$-0.801 \pm 0.641$	$-0.092 \pm 0.927$
photometric centroid source offset	$0.89 \pm 1.34$	0.66	$0.15 \pm 1.33$	$-0.87 \pm 1.34$

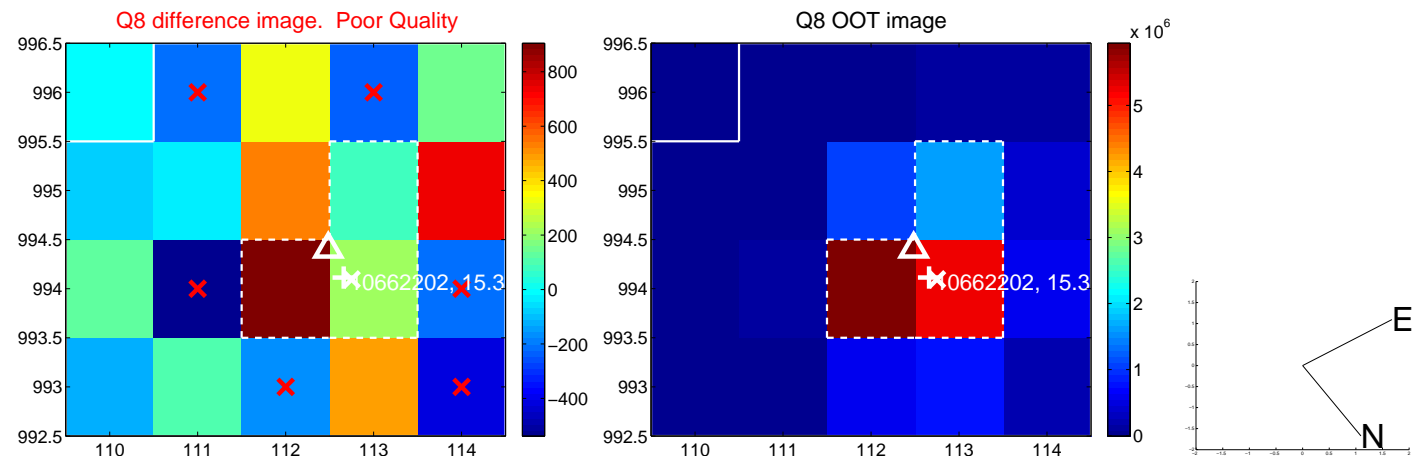
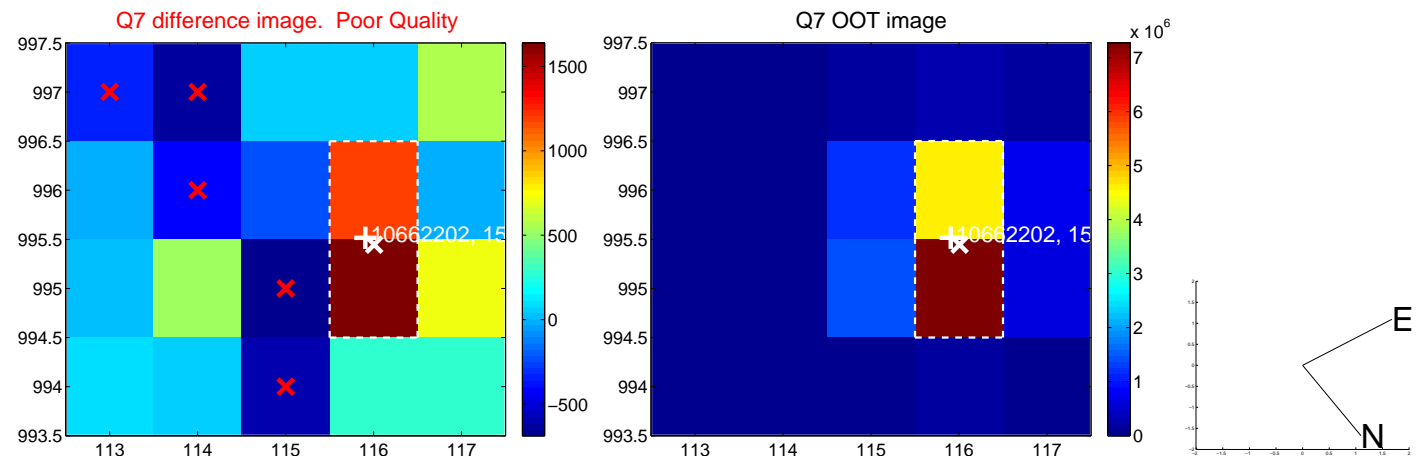
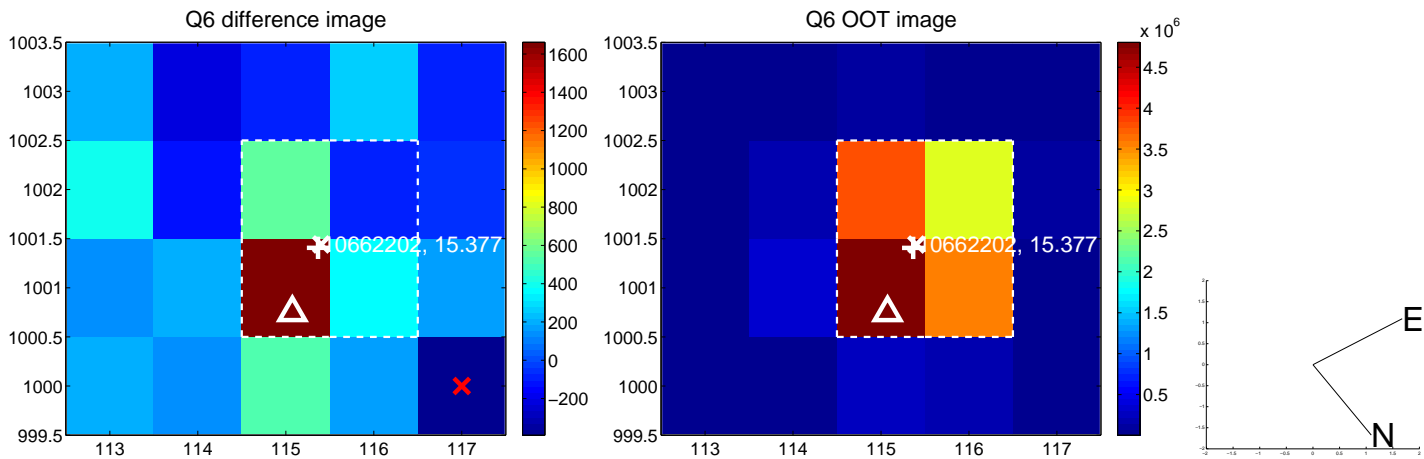
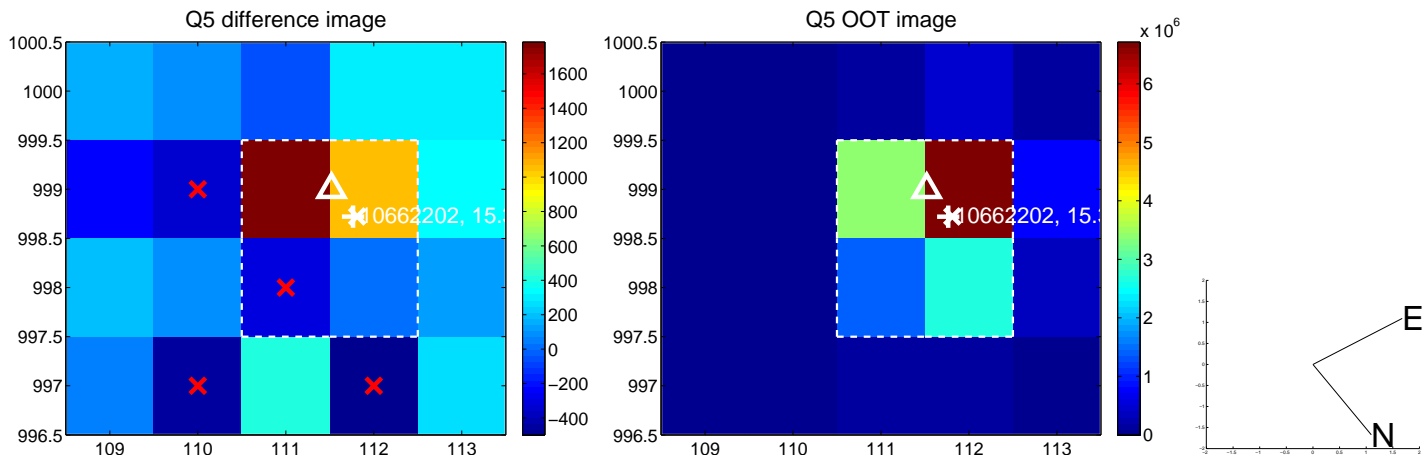


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

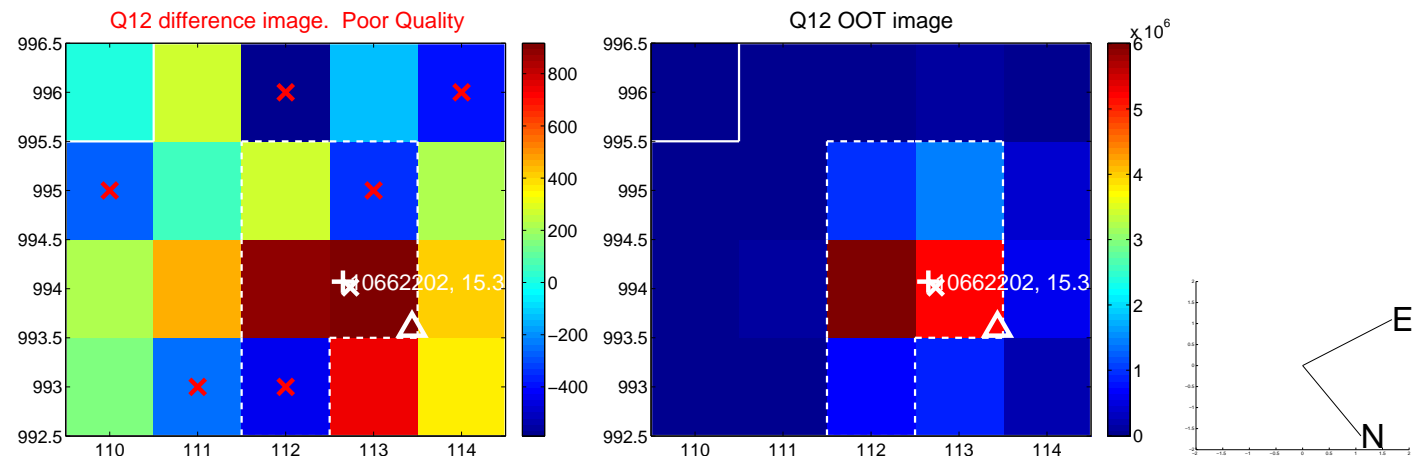
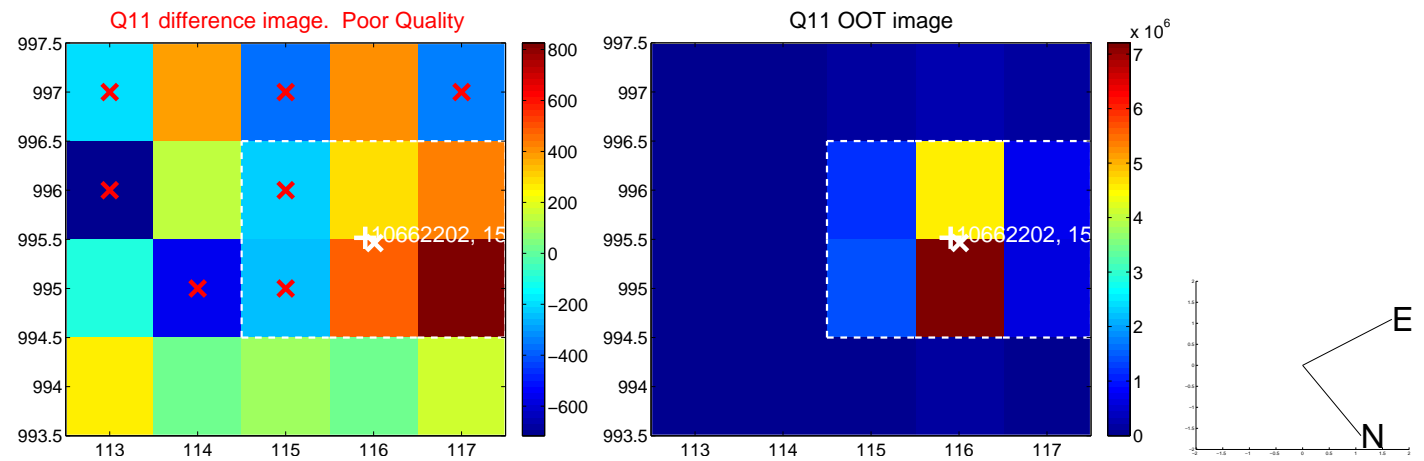
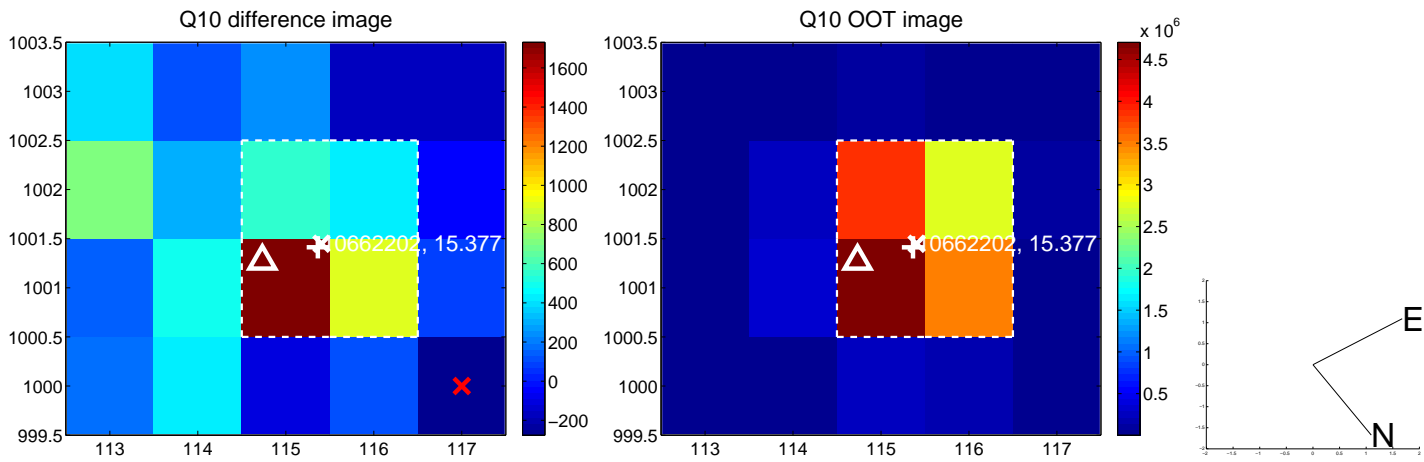
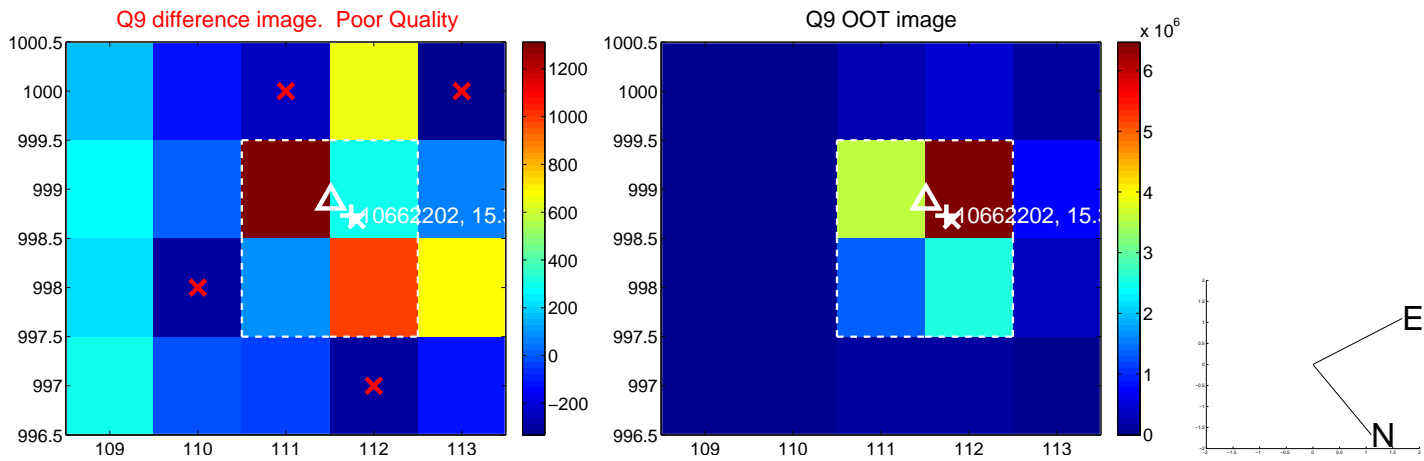
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



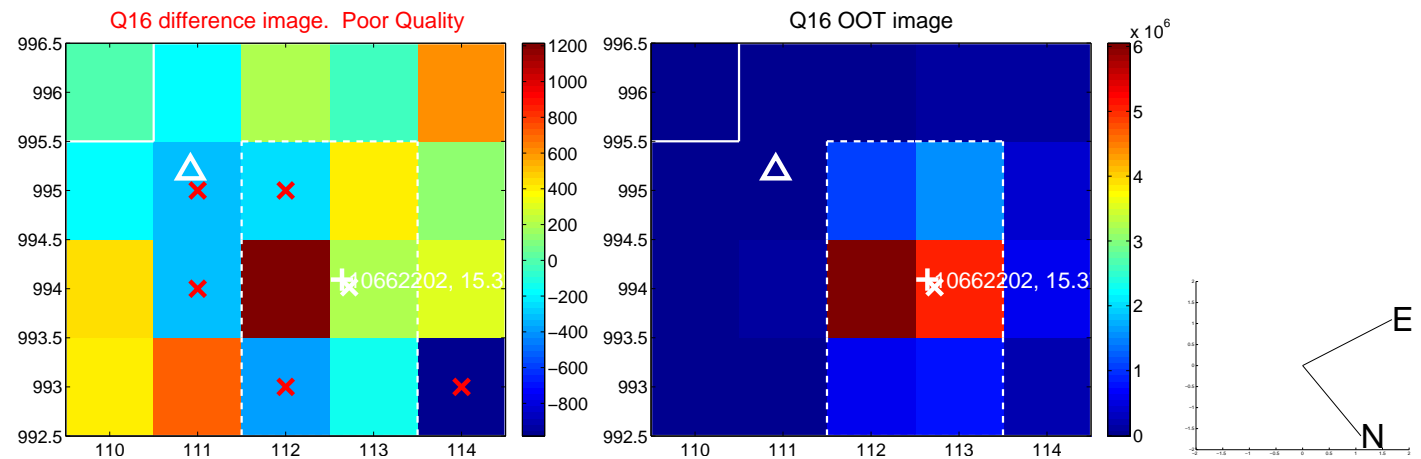
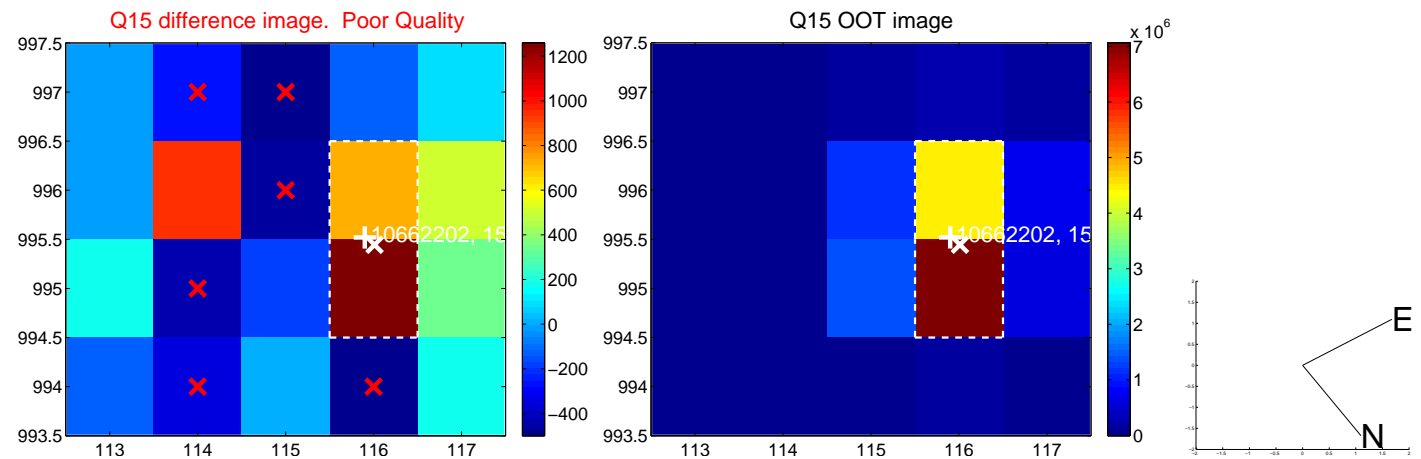
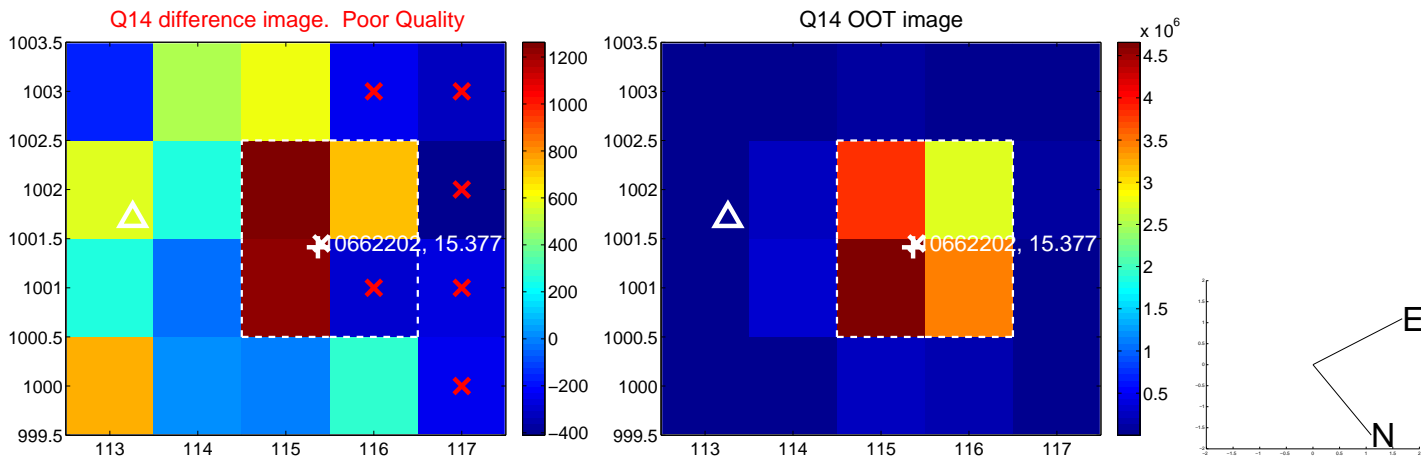
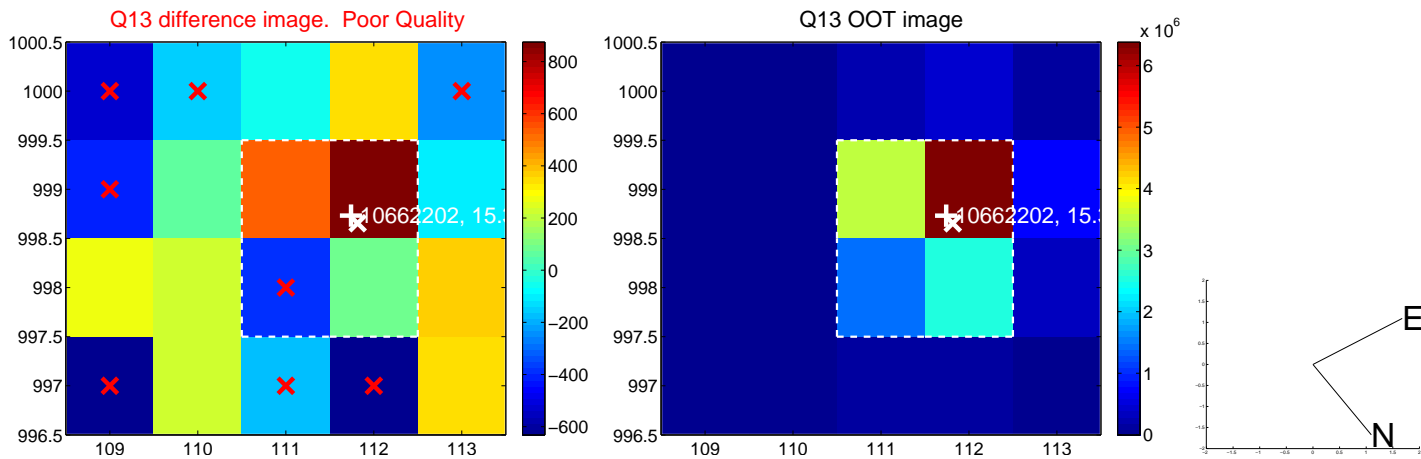
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



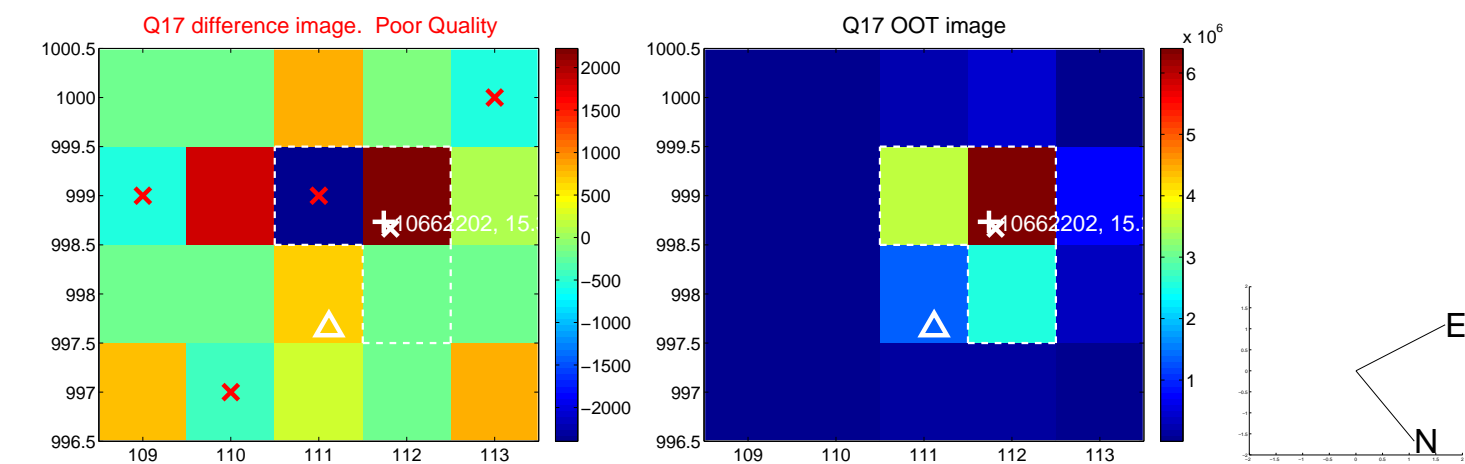
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



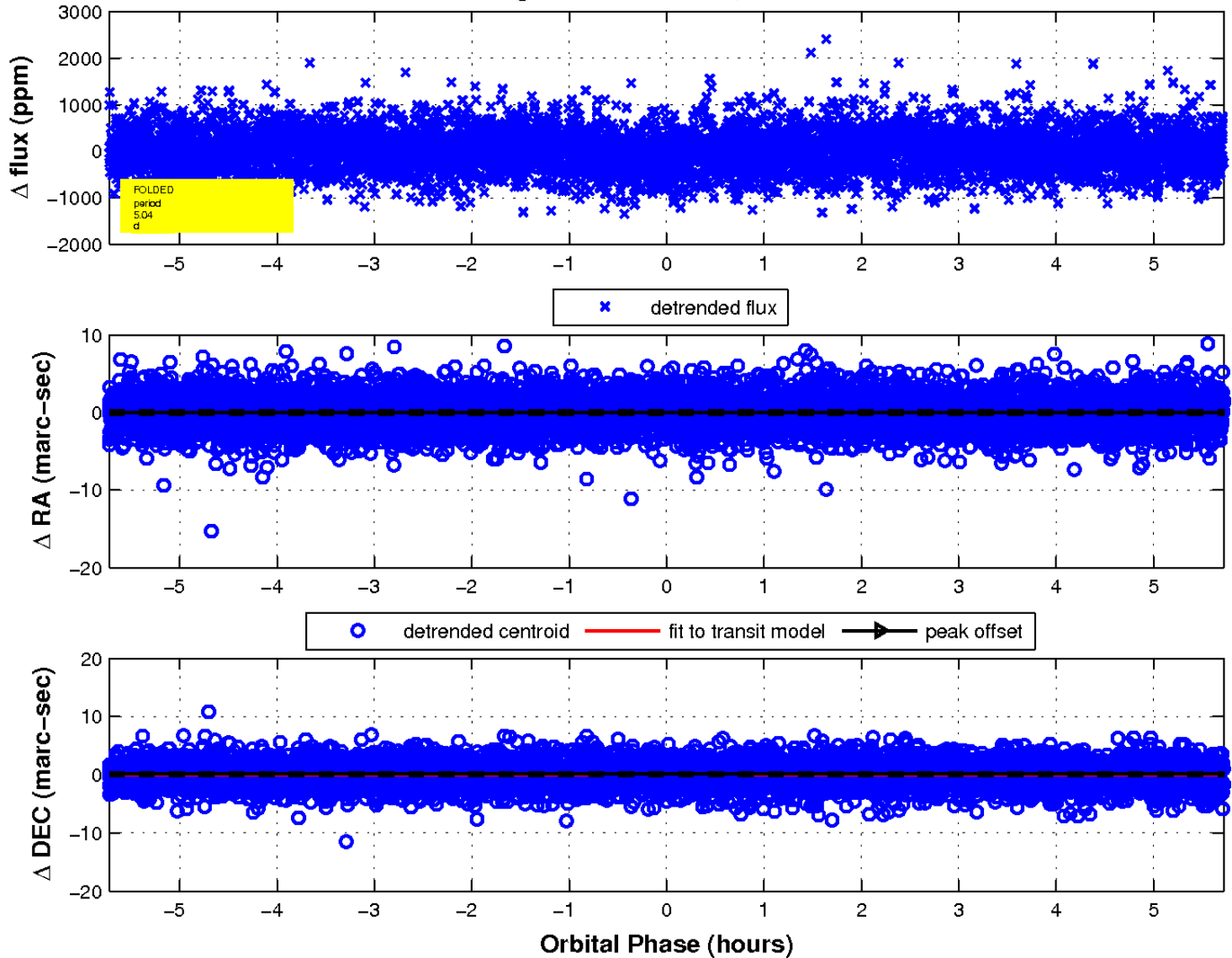
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



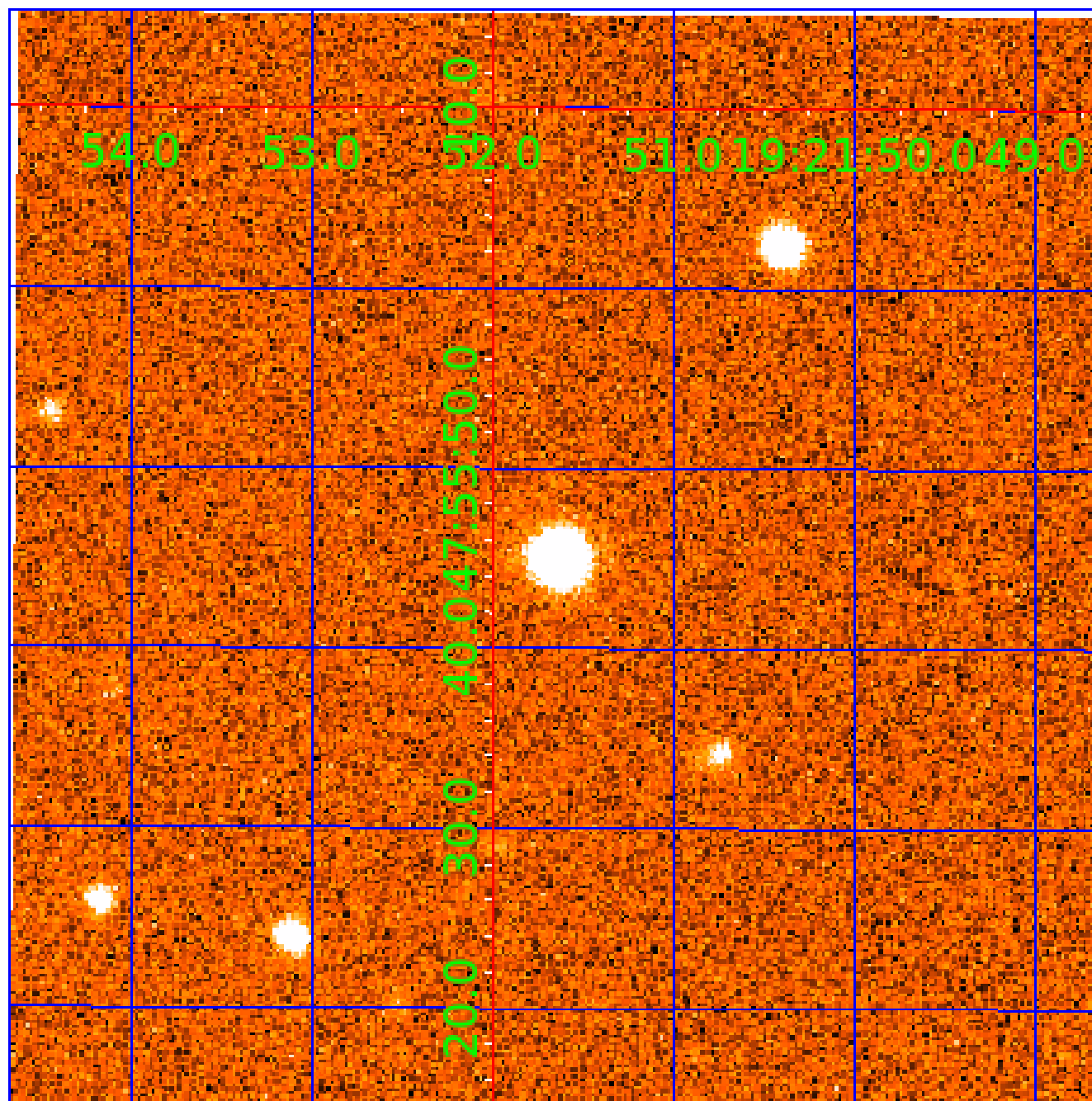
fluxWeightedCentroids, Planet 2 of 3





UKIRT Image

Declination



# KIC 010662202

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010662202-01	OBS	0750.01	21.676982	149.859874	843.0	3.449	24.5	28.0	0.83	4954	2.92	18.68
010662202-02	OBS	0750.02	5.044038	132.542517	164.7	1.908	8.2	9.5	0.83	4954	1.21	130.53
010662202-03	OBS	0750.03	14.516691	138.838289	249.6	2.737	7.5	9.2	0.83	4954	1.55	31.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010662202-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
010662202-02	OBS	PC	0.92	0	0	0	0	NO_COMMENT
010662202-03	OBS	PC	0.93	0	0	0	0	NO_COMMENT

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

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

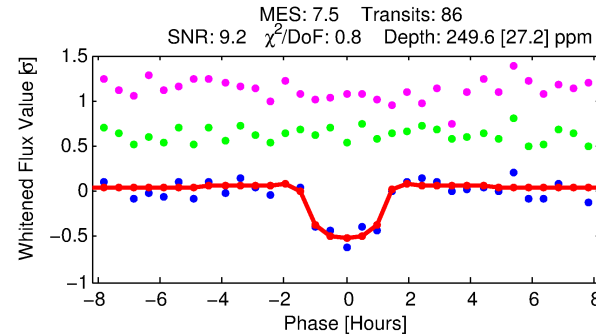
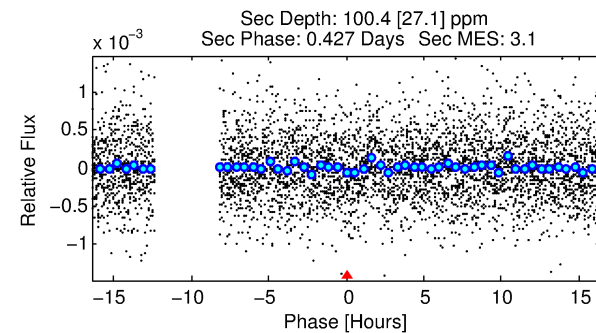
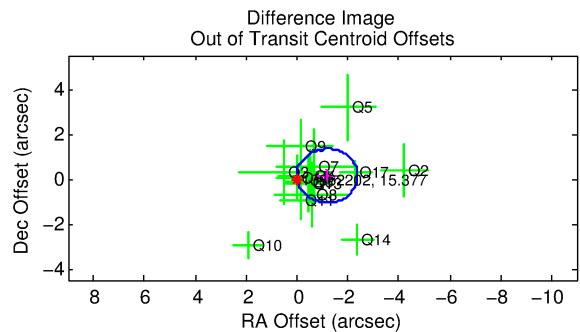
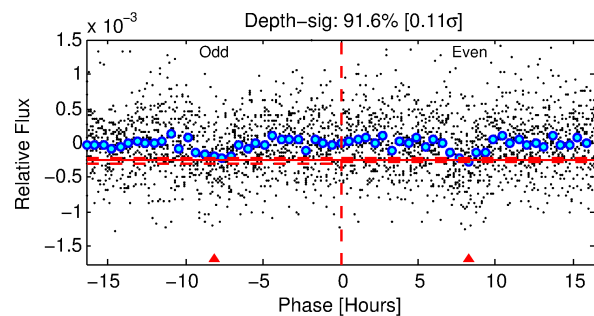
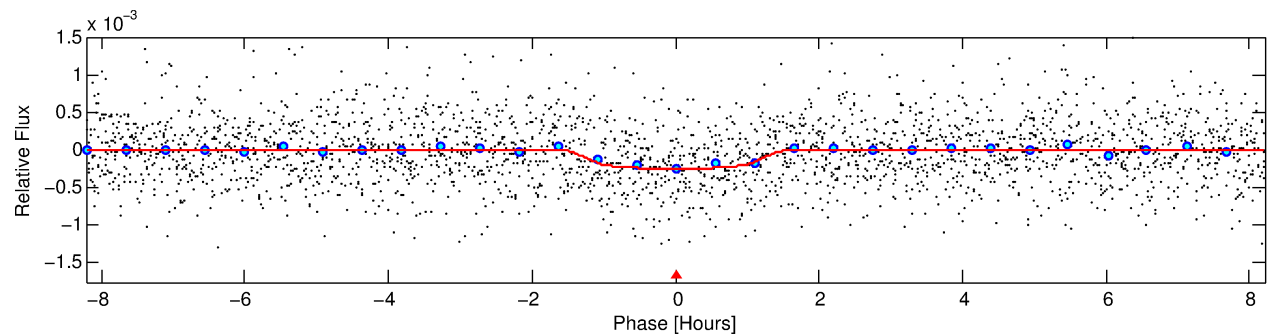
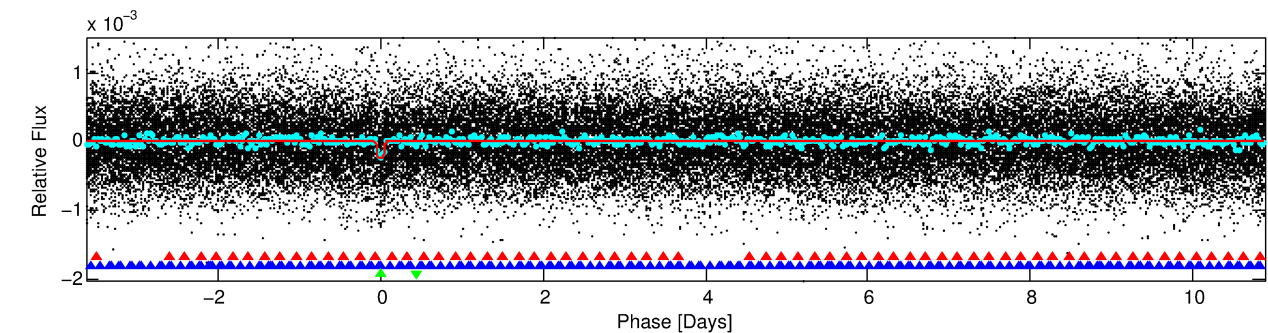
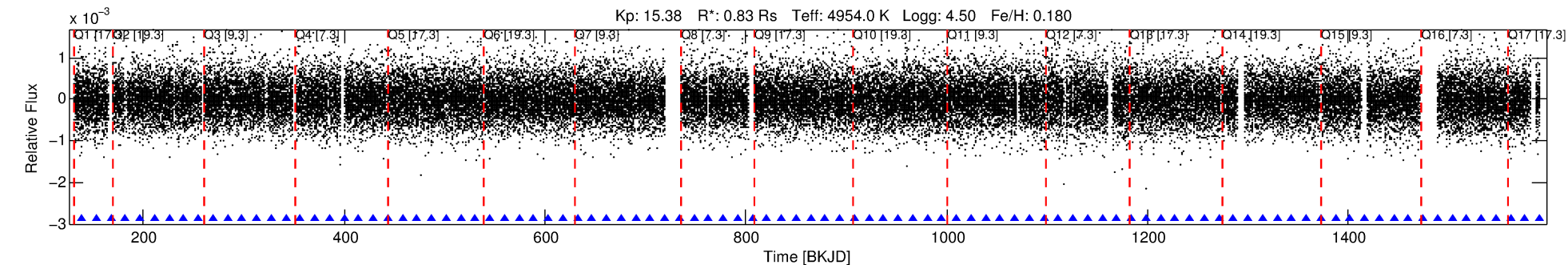
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010662202-03

No Significant Match Found

# DV One-Page Summary

KIC: 10662202 Candidate: 3 of 3 Period: 14.517 d  
KOI: K00750.03 Corr: 0.971



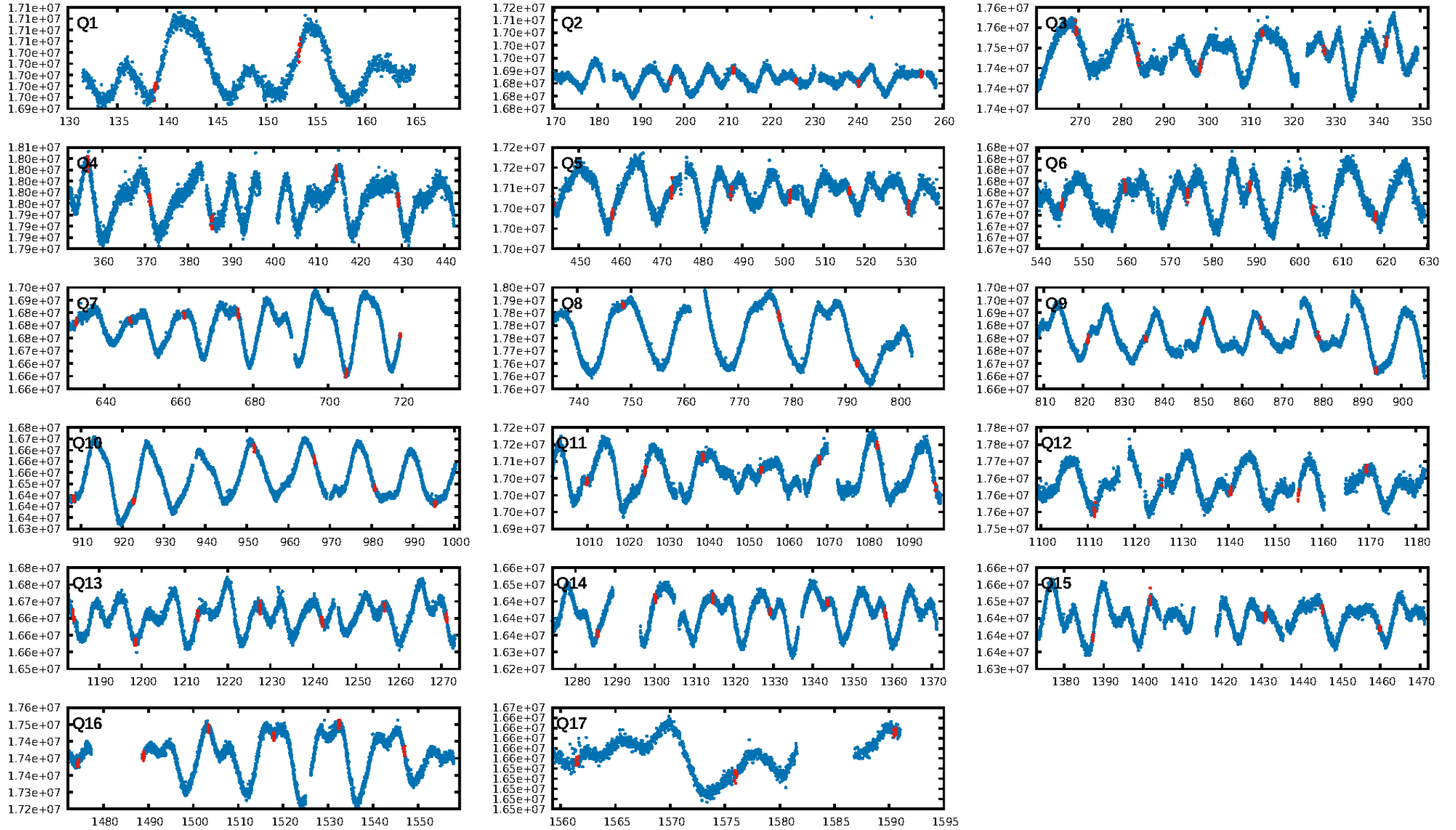
## DV Fit Results:

Period = 14.51669 [0.00011] d  
Epoch = 138.8383 [0.0063] BKJD  
Rp/R\* = 0.0171 [0.0155]  
a/R\* = 21.47 [73.06]  
b = 0.87 [0.99]  
Seff = 31.88 [4.52]  
Teff = 606 [21] K  
Rp = 1.55 [1.41] Re  
a = 0.1077 [0.0084] AU  
Ag = 267.78 [492.33] [0.54σ]  
Teffp = 3790 [1739] K [1.83σ]

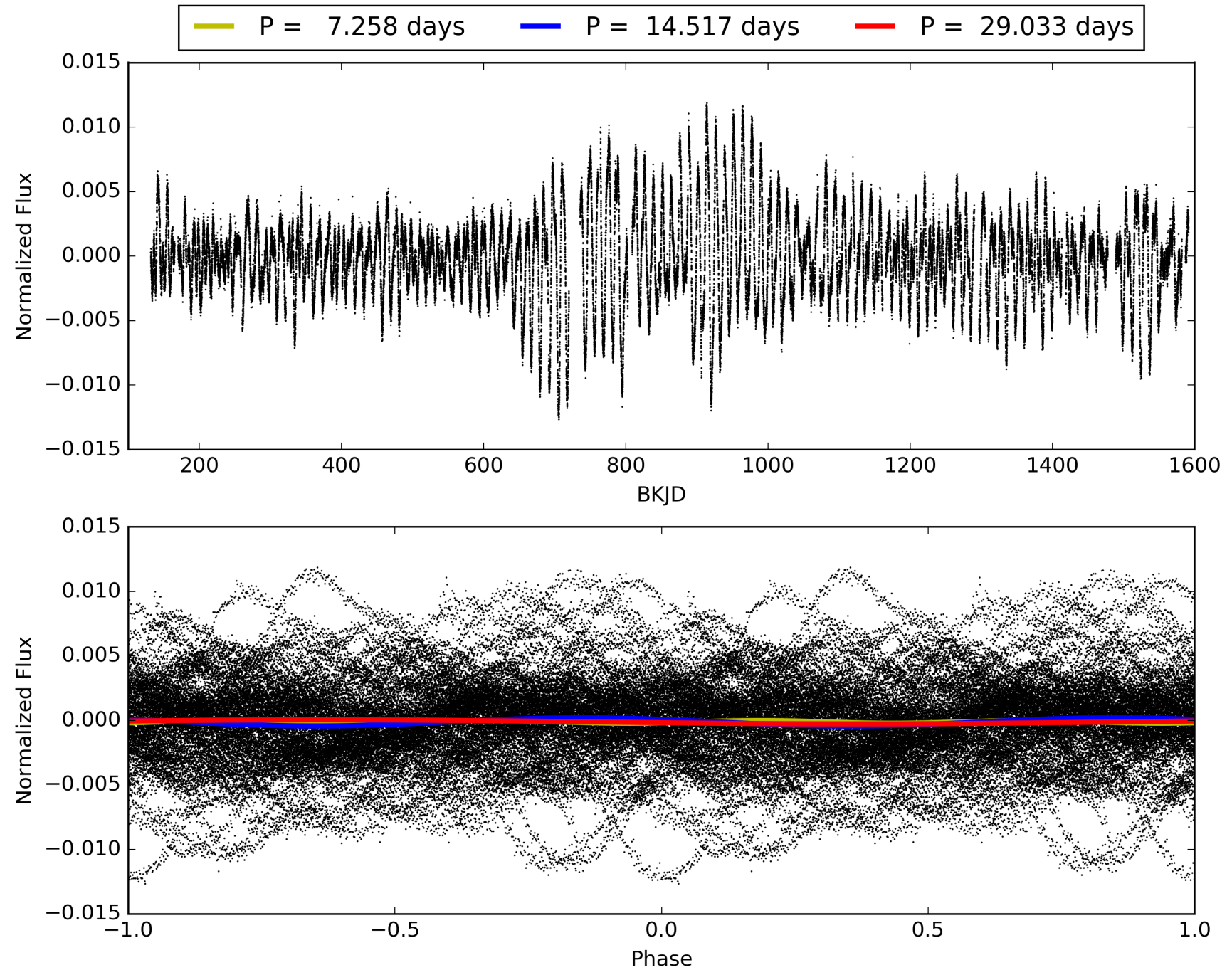
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [68.14σ]  
LongPeriod-sig: 100.0% [39.02σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.68e-14  
RollingBand-fgt: 1.00 [81/81]  
GhostDiagnostic-chr: 1.717  
Centroid-sig: 6.7%  
Centroid-so: 2.758 arcsec [2.13σ]  
OotOffset-rm: 1.191 arcsec [2.97σ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-rm: 1.338 arcsec [3.27σ]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 0.36 [5/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010662202-03, PDC Light Curves

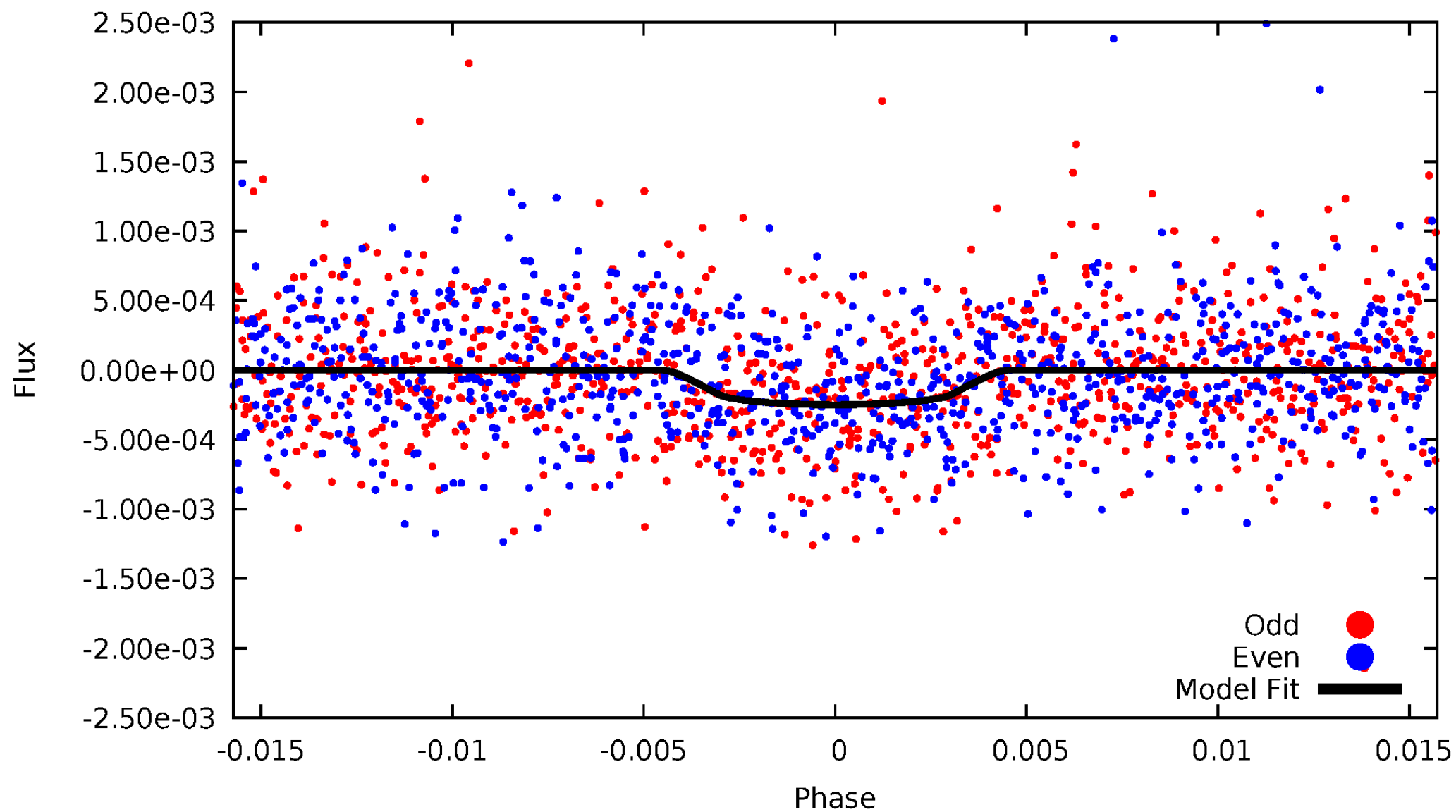


# TCE 010662202-03



# DV Odd/Even

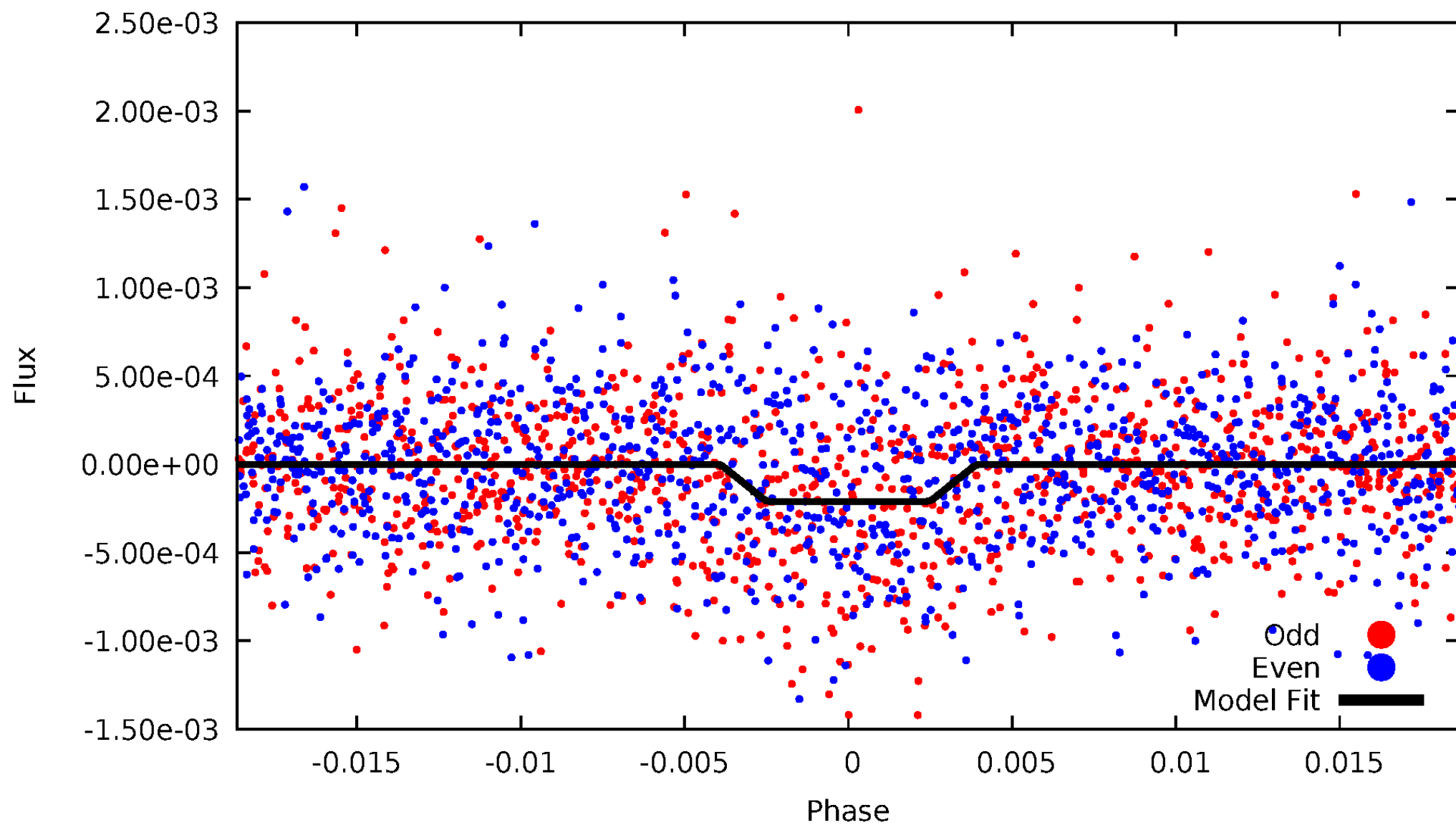
TCE 010662202-03





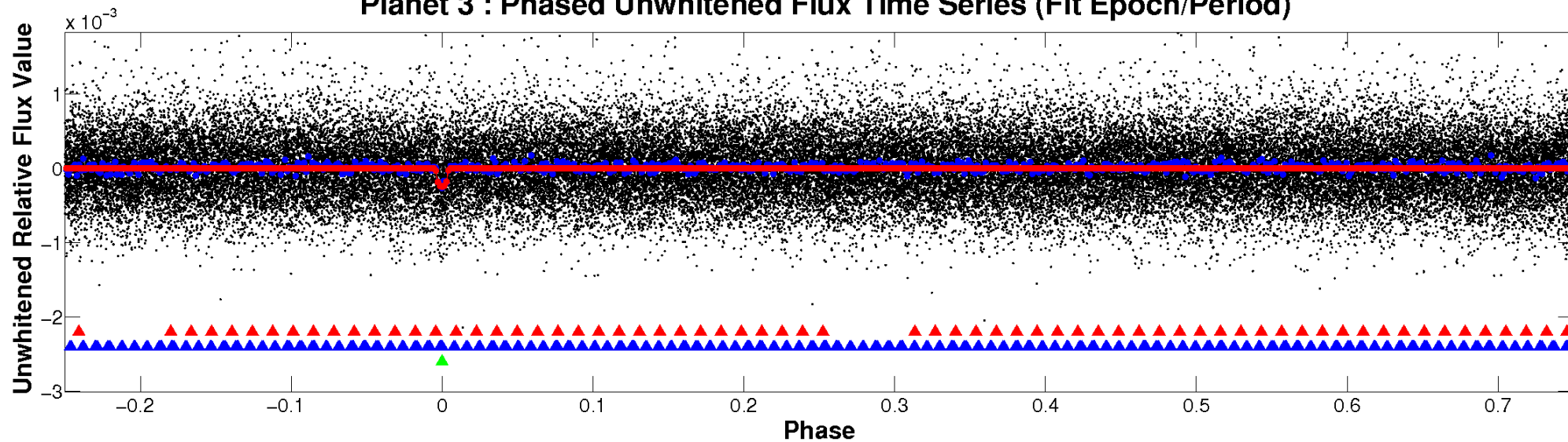
# ALT Odd/Even

TCE 010662202-03

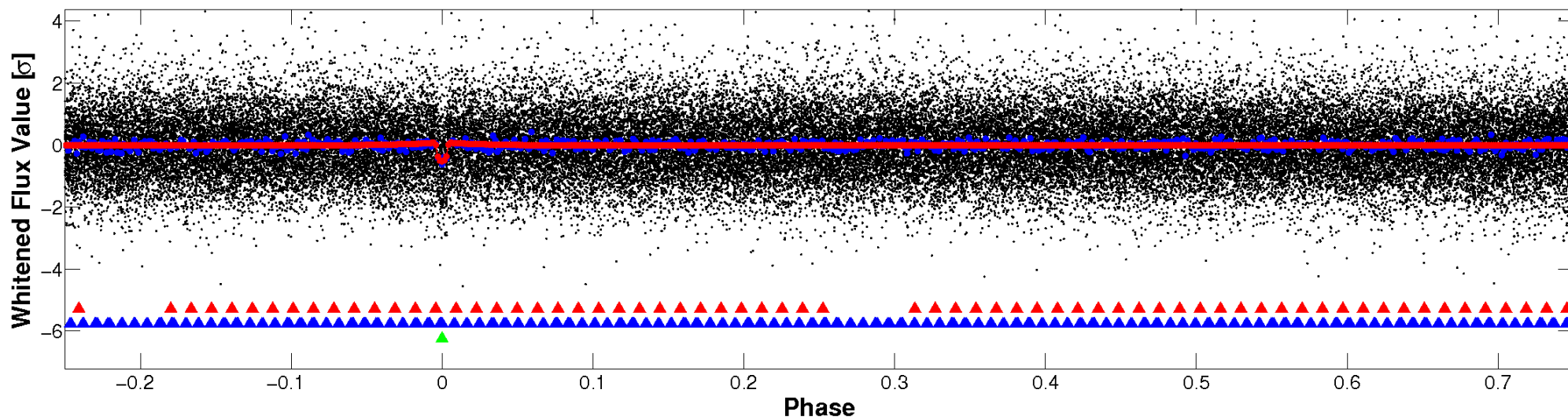


# Non-Whitened Vs. Whitened Light Curve

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



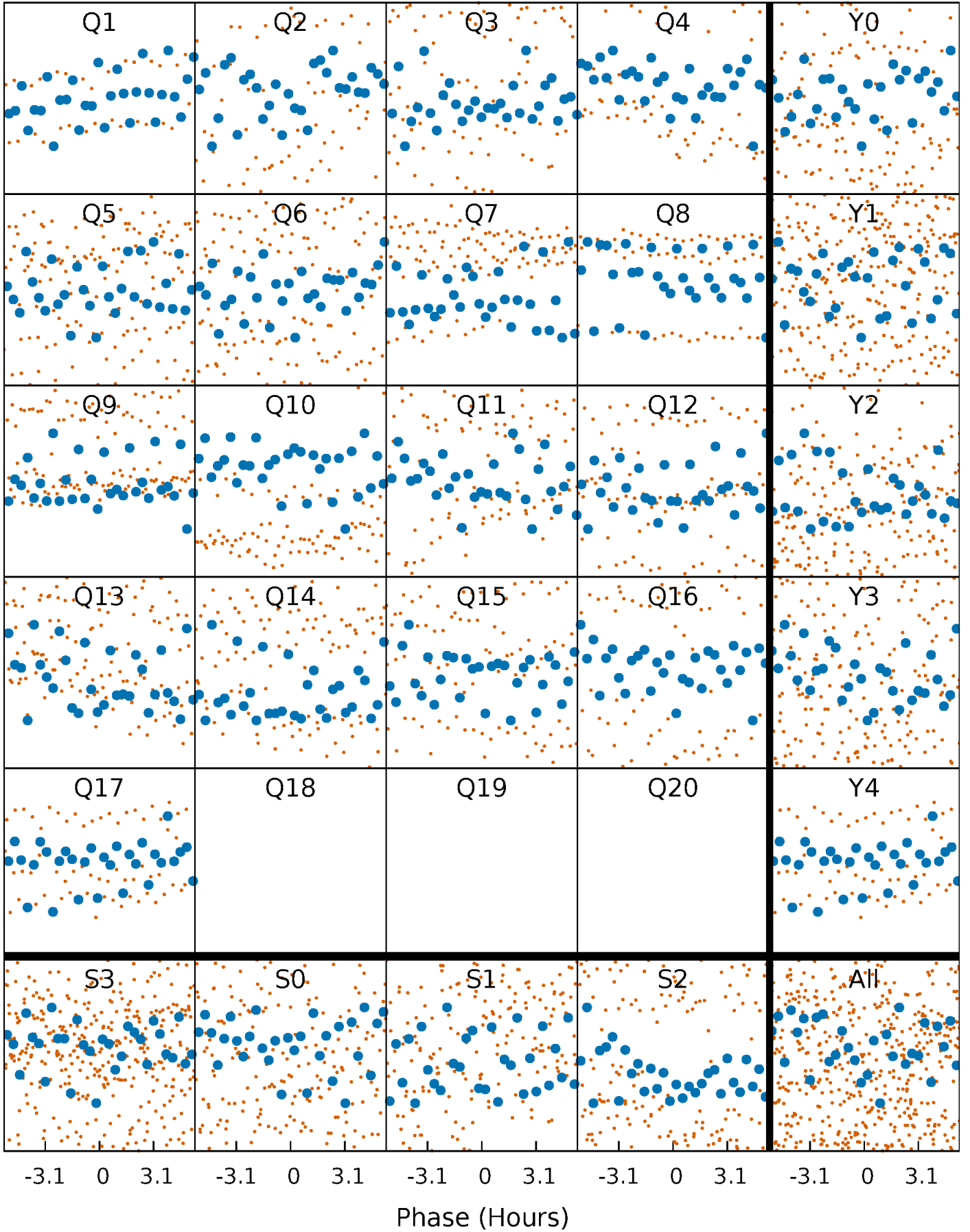
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





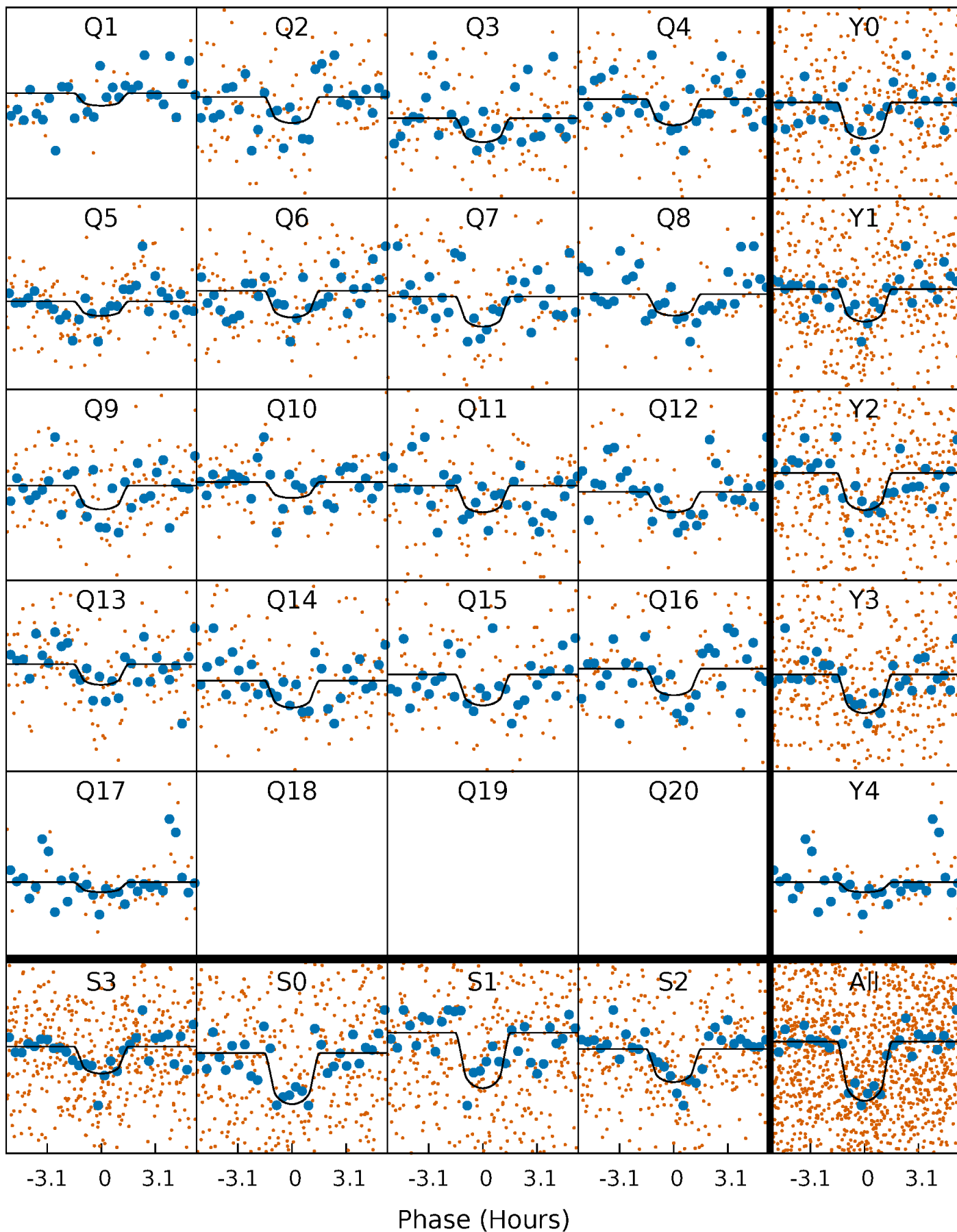
# PDC Quarter-Phased Transit Curves

TCE 010662202-03 P= 14.516691 Days  $T_0=138.838289$  (BKJD)



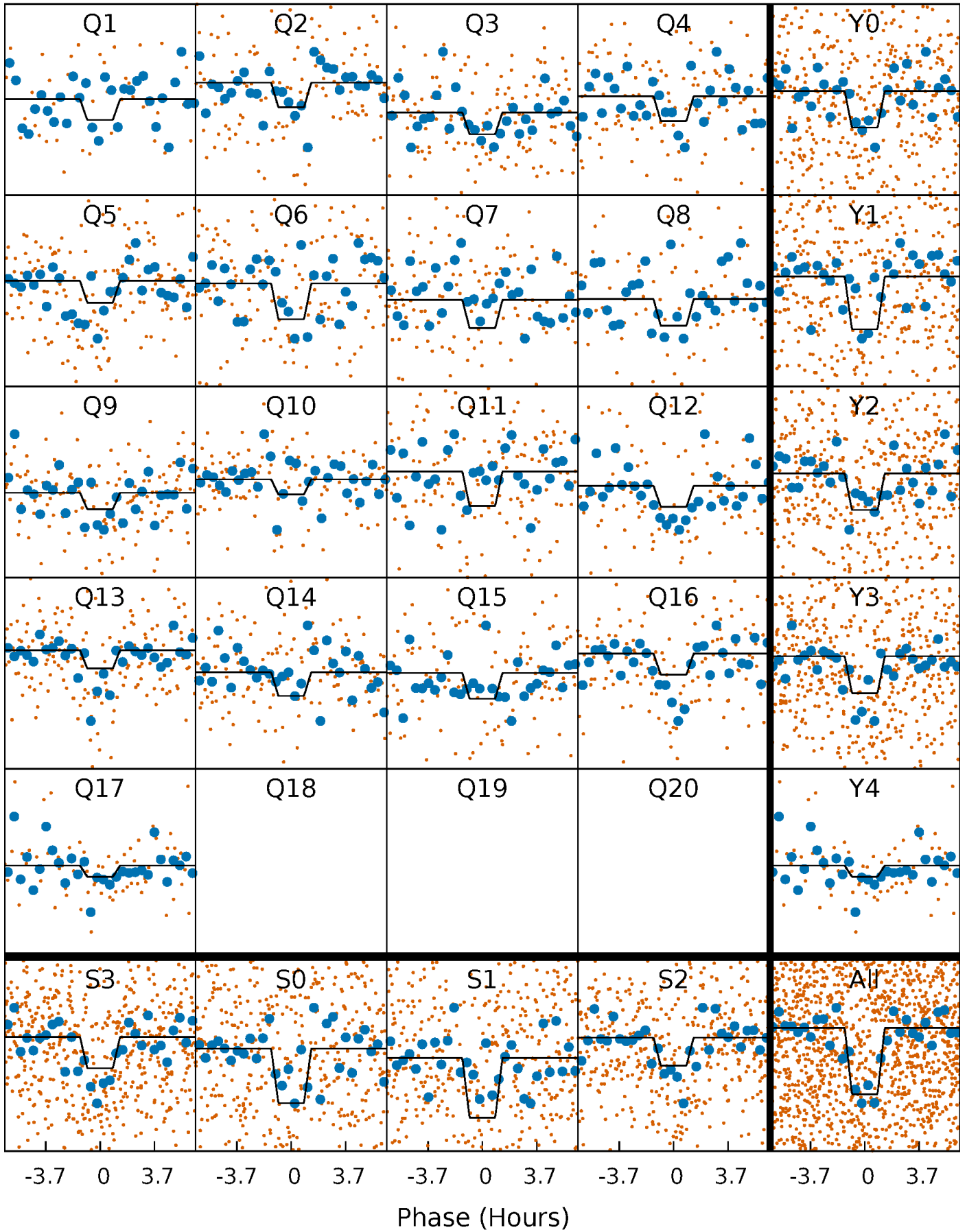
# DV Quarter-Phased Transit Curves

TCE 010662202-03 P= 14.516691 Days  $T_0=138.838289$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

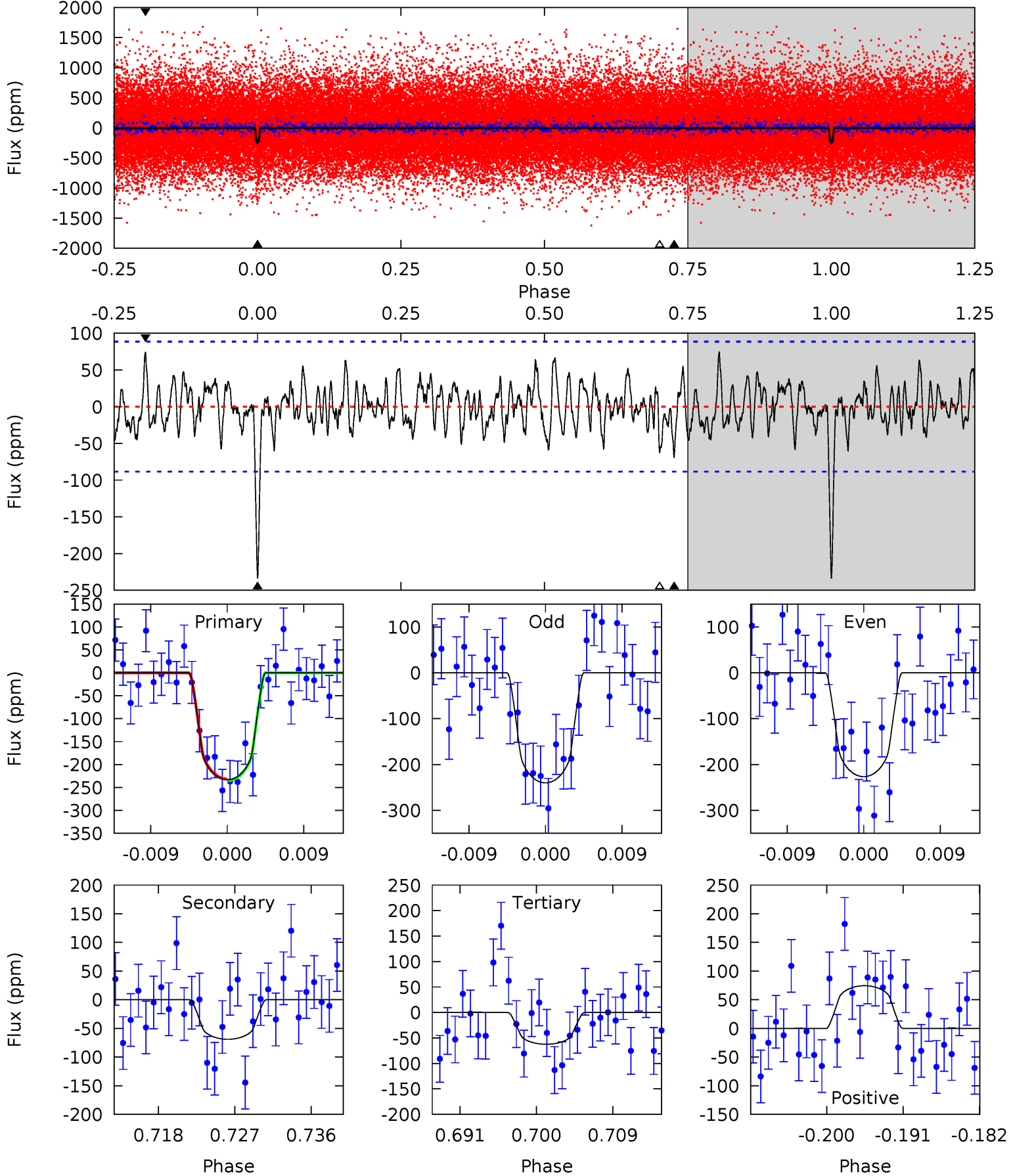
TCE 010662202-03   P= 14.516966 Days    $T_0=138.827603$  (BKJD)



# DV Model-Shift Uniqueness Test

010662202-03, P = 14.516691 Days, E = 124.321598 Days

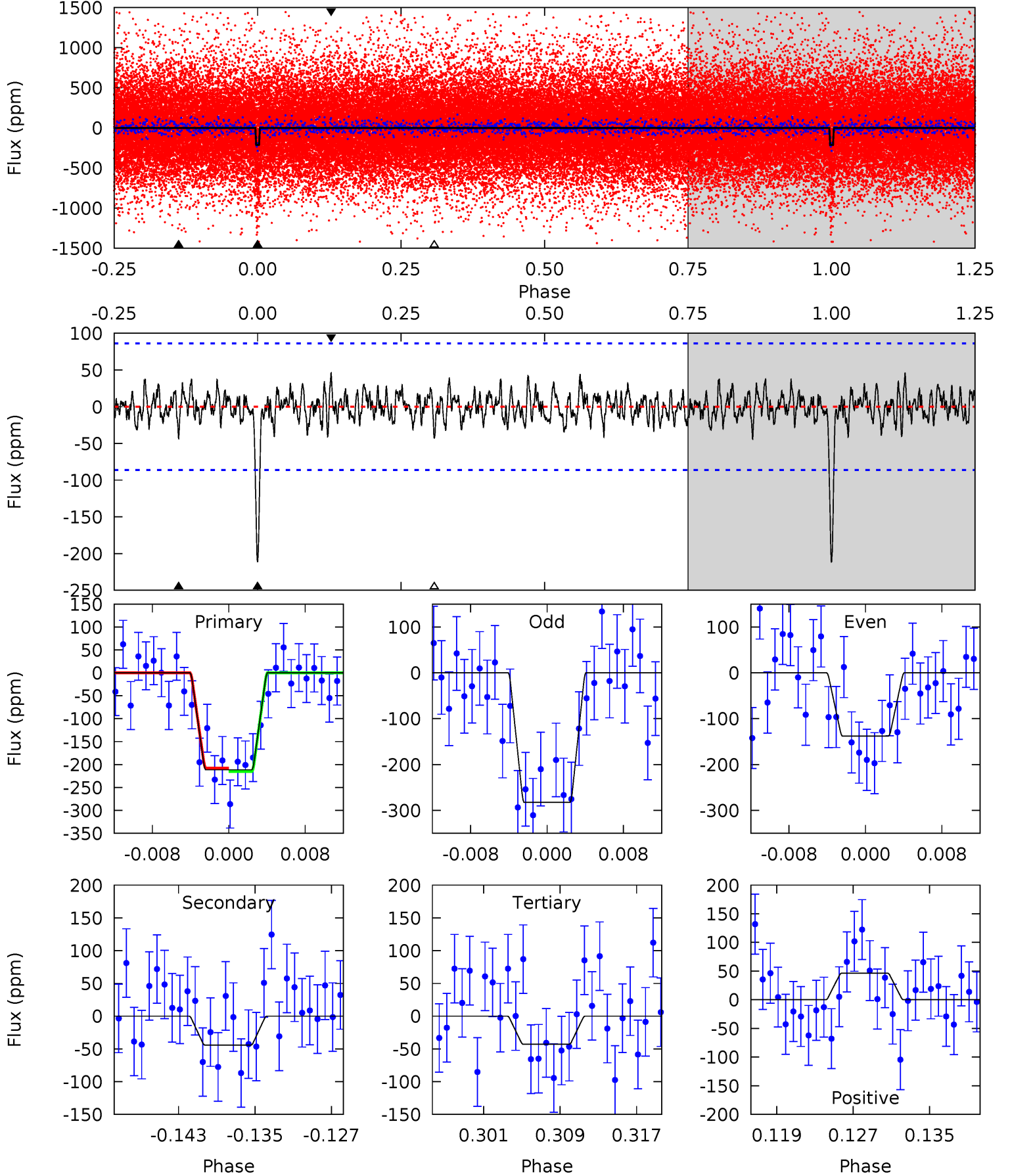
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.3	3.93	3.55	4.25	5.04	2.61	1.41	9.75	9.05	0.38	-0.31	0.39	0.97	0.24	0.10



# Alt Model-Shift Uniqueness Test

010662202-03, P = 14.516966 Days, E = 124.310637 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
12.5	2.60	2.53	2.73	5.07	2.66	0.89	9.93	9.72	0.08	-0.13	4.26	0.87	0.18	0.22



### Stellar Parameters For KIC 010662202

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4954^{+79}_{-79}$	$4.500^{+0.075}_{-0.020}$	$0.180^{+0.150}_{-0.150}$	$0.828^{+0.032}_{-0.065}$	$0.791^{+0.050}_{-0.029}$	$1.964^{+0.537}_{-0.163}$
	+2%/-2%	+2%/-0%	+83%/-83%	+4%/-8%	+6%/-4%	+27%/-8%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 010662202-03 / KOI 0750.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-69 \pm 18$	$1.69^{+1.37}_{-1.04}$	$840^{+18}_{-21}$	$3640^{+1487}_{-627}$	$154^{+852}_{-109}$
Alt.	$-44 \pm 17$	$1.58^{+1.26}_{-0.98}$	$840^{+17}_{-21}$	$3417^{+1508}_{-569}$	$103^{+655}_{-74}$

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

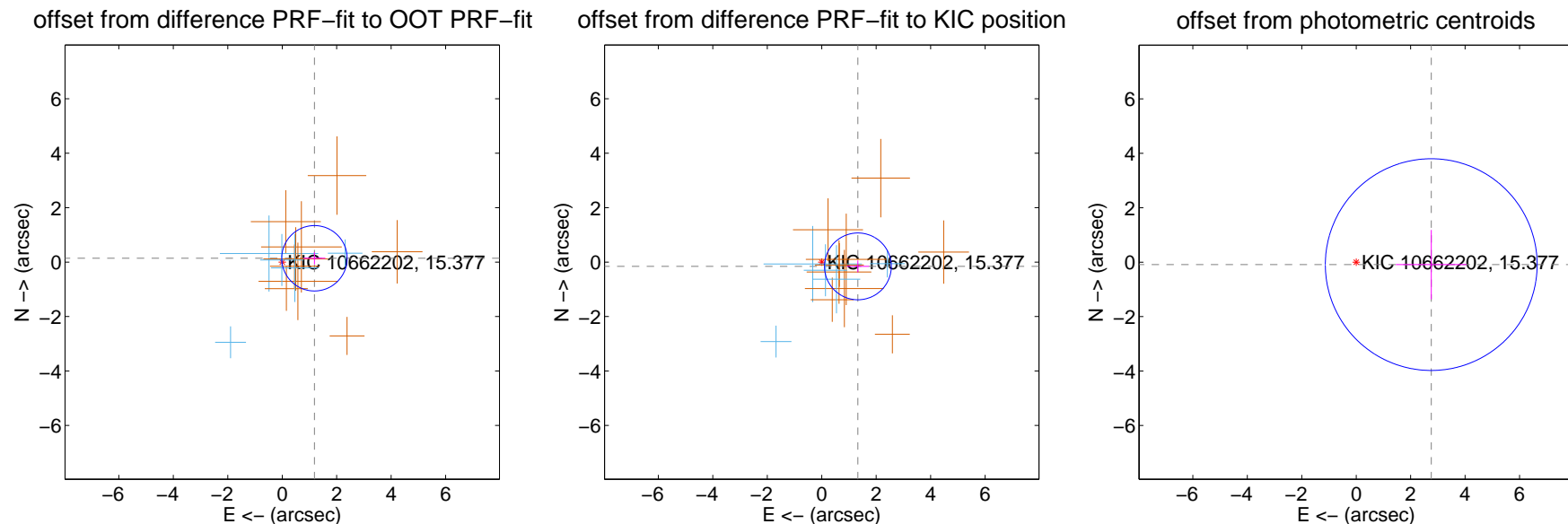
## DV Centroid Data

Supplemental centroid analysis for 010662202-03. Kepler magnitude: 15.38. Transit SNR 9.23

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

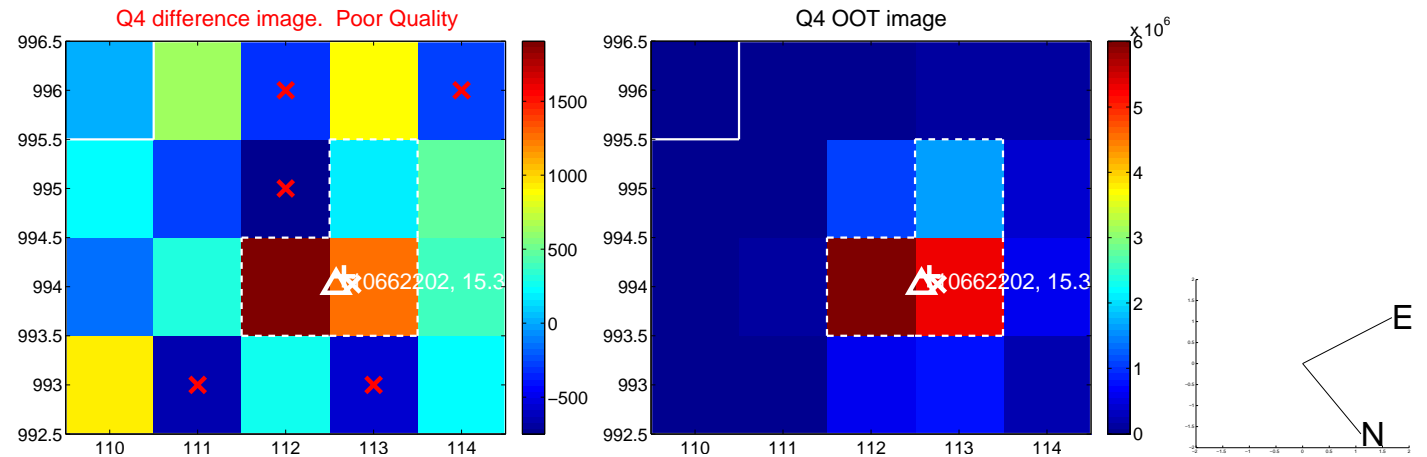
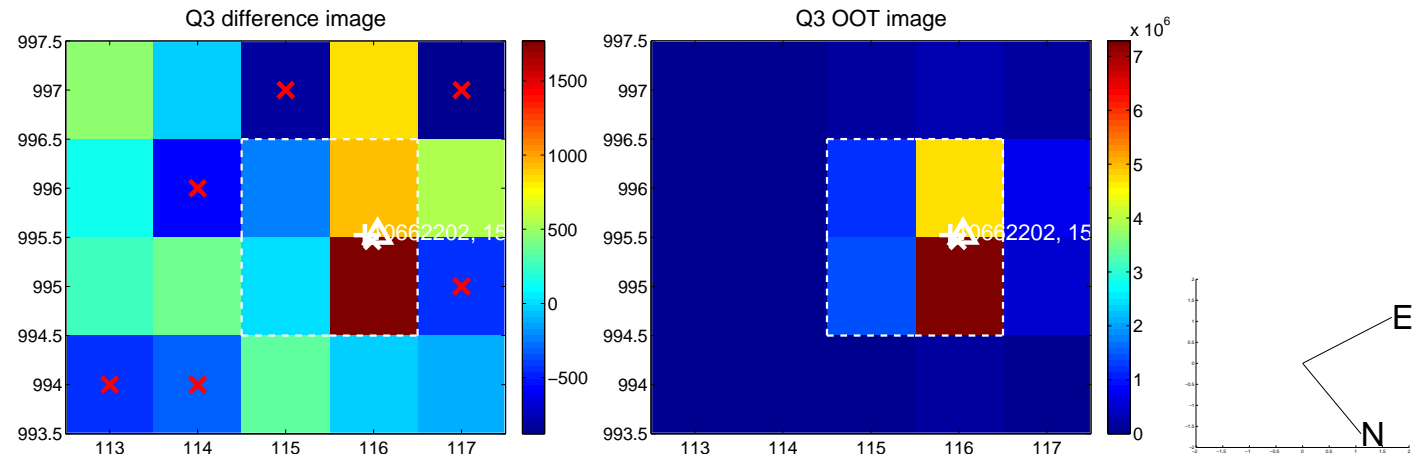
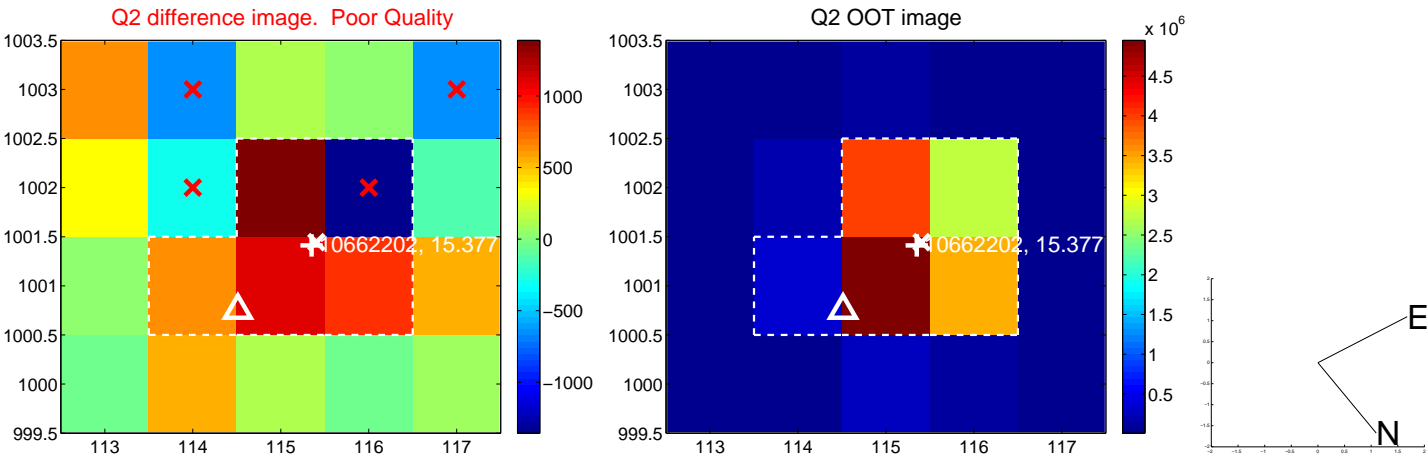
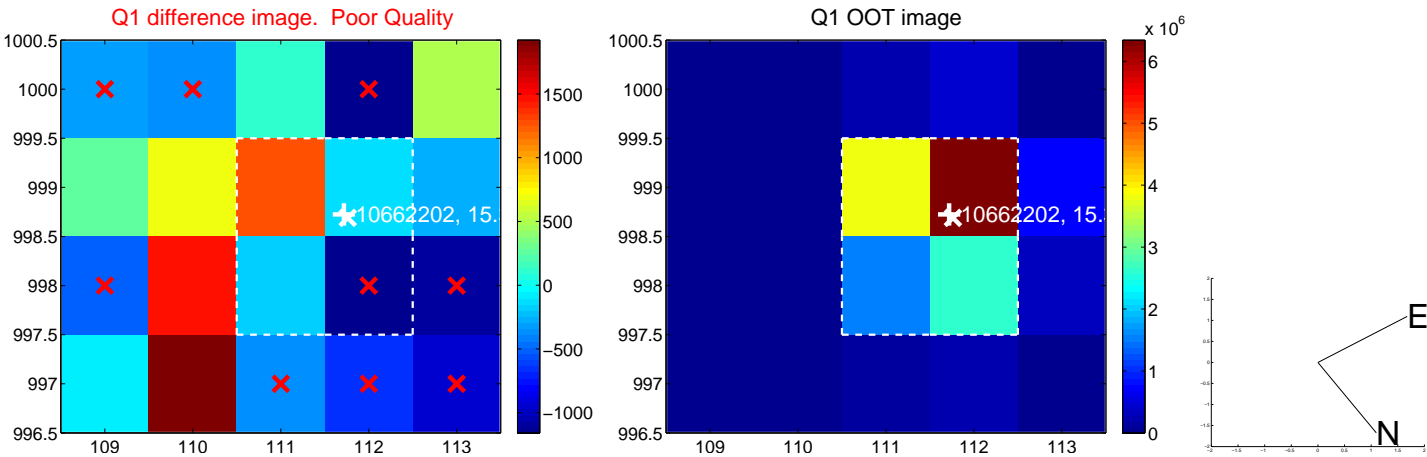
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.191 \pm 0.400$	2.97	$-1.183 \pm 0.402$	$0.140 \pm 0.224$
PRF-fit source offset from KIC position	$1.338 \pm 0.409$	3.27	$-1.329 \pm 0.411$	$-0.157 \pm 0.220$
photometric centroid source offset	$2.76 \pm 1.30$	2.13	$-2.76 \pm 1.30$	$-0.09 \pm 1.27$



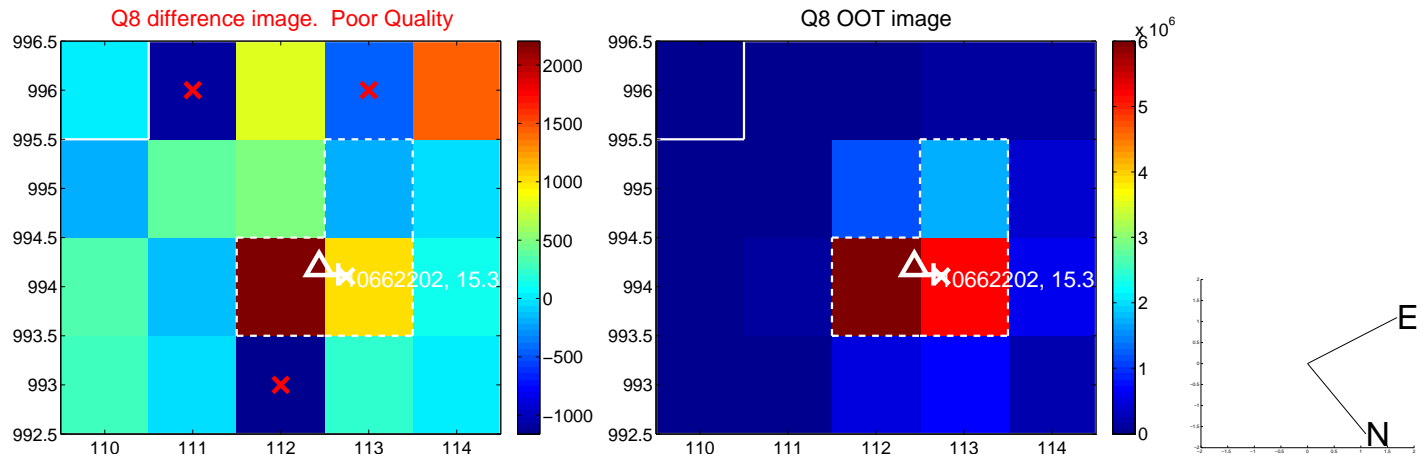
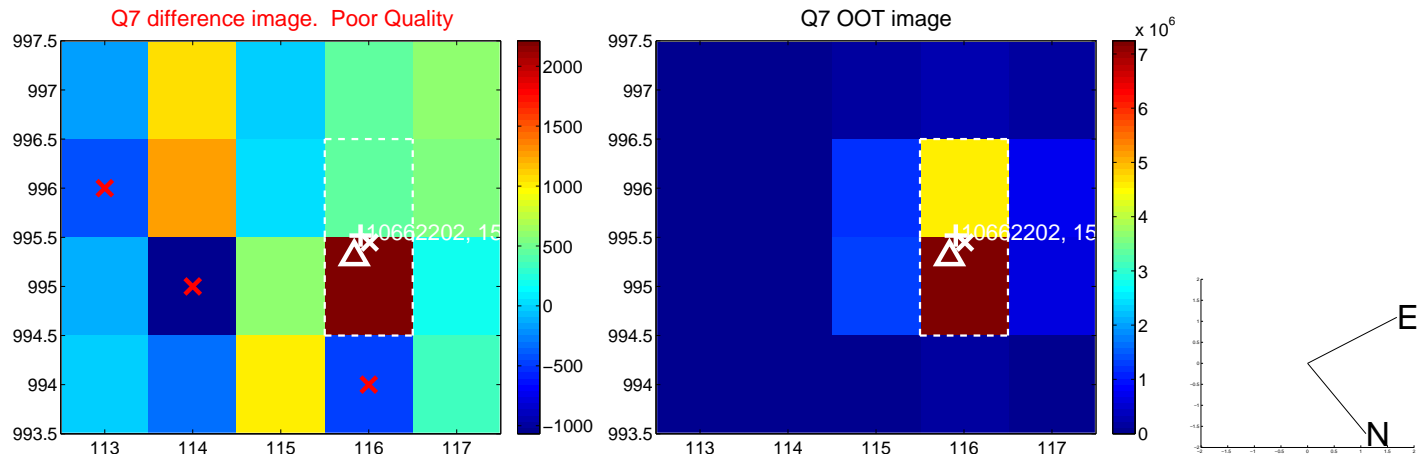
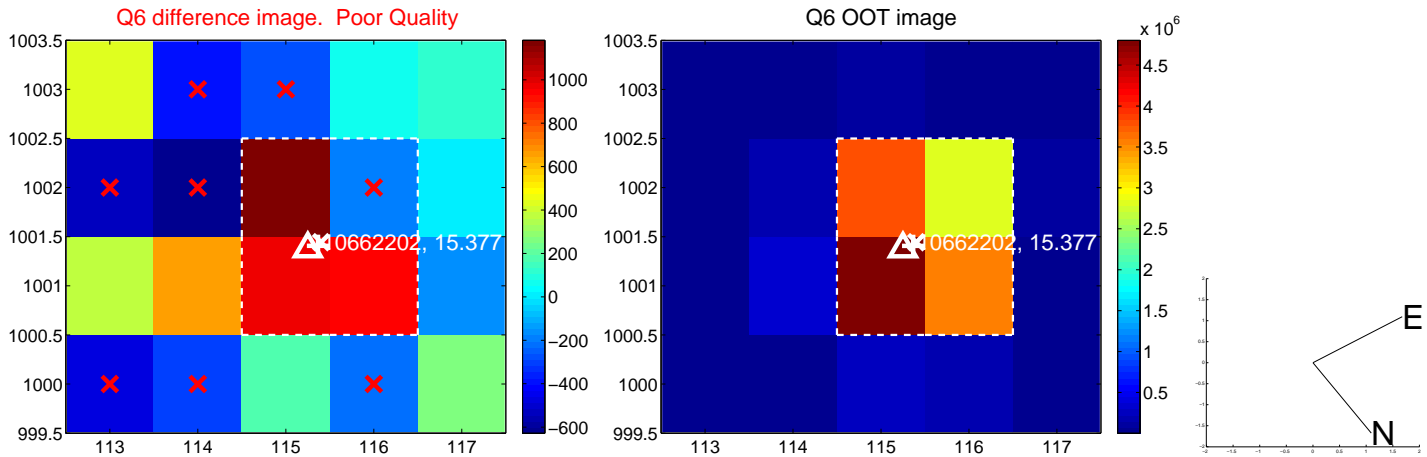
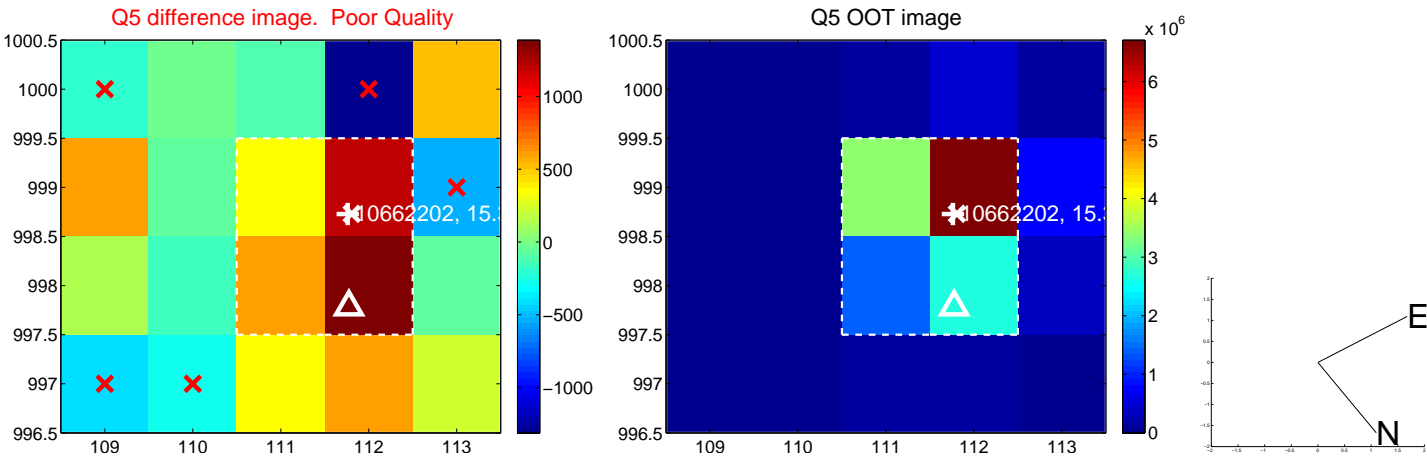
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



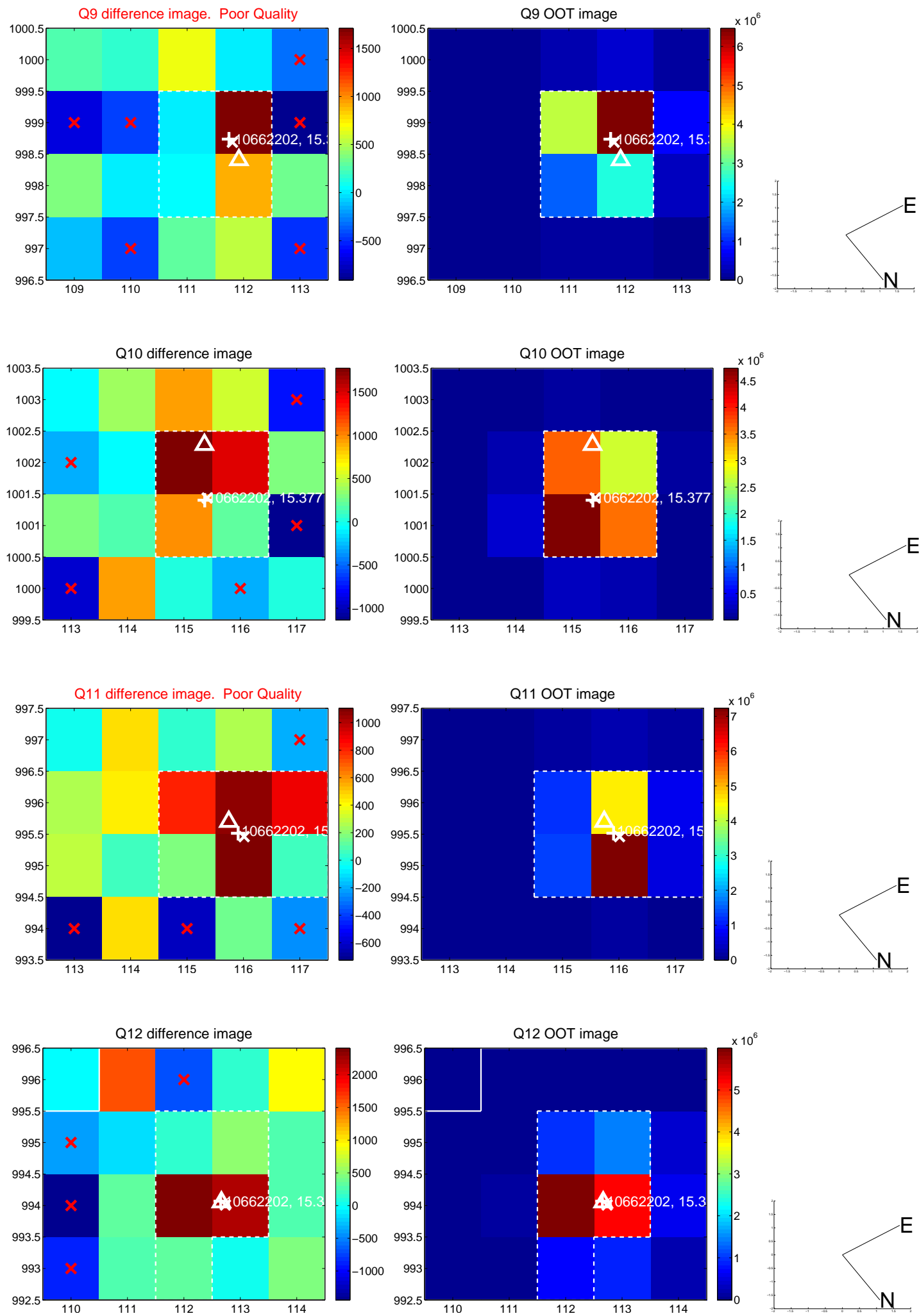
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



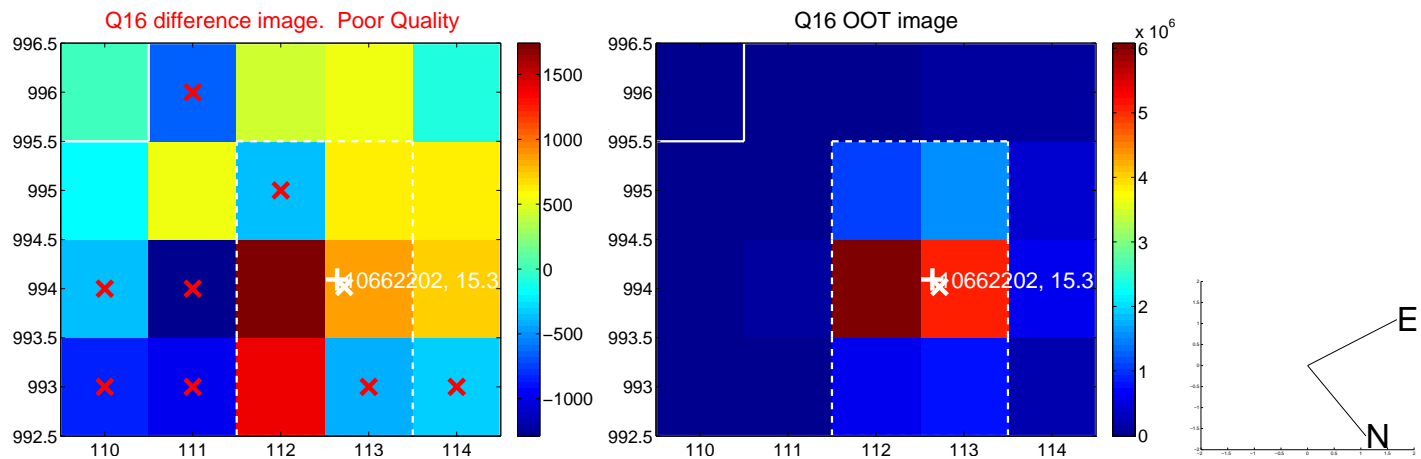
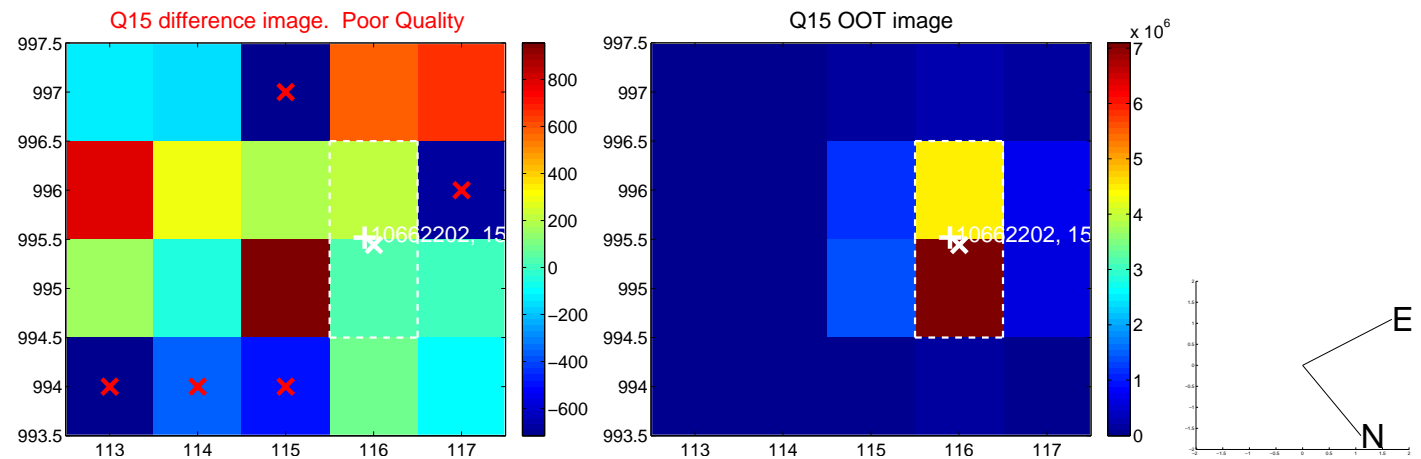
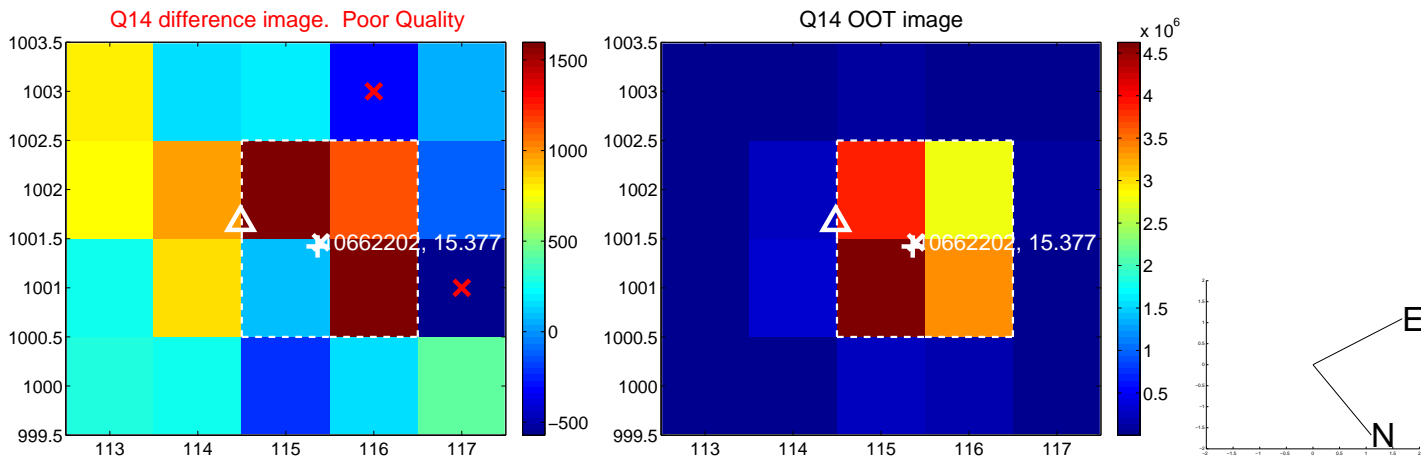
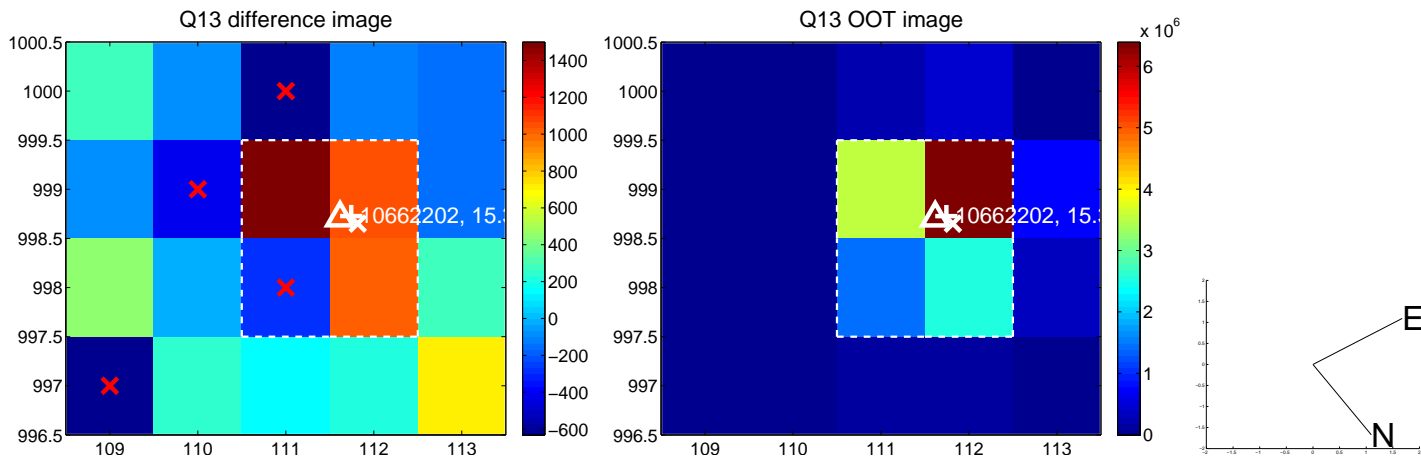
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



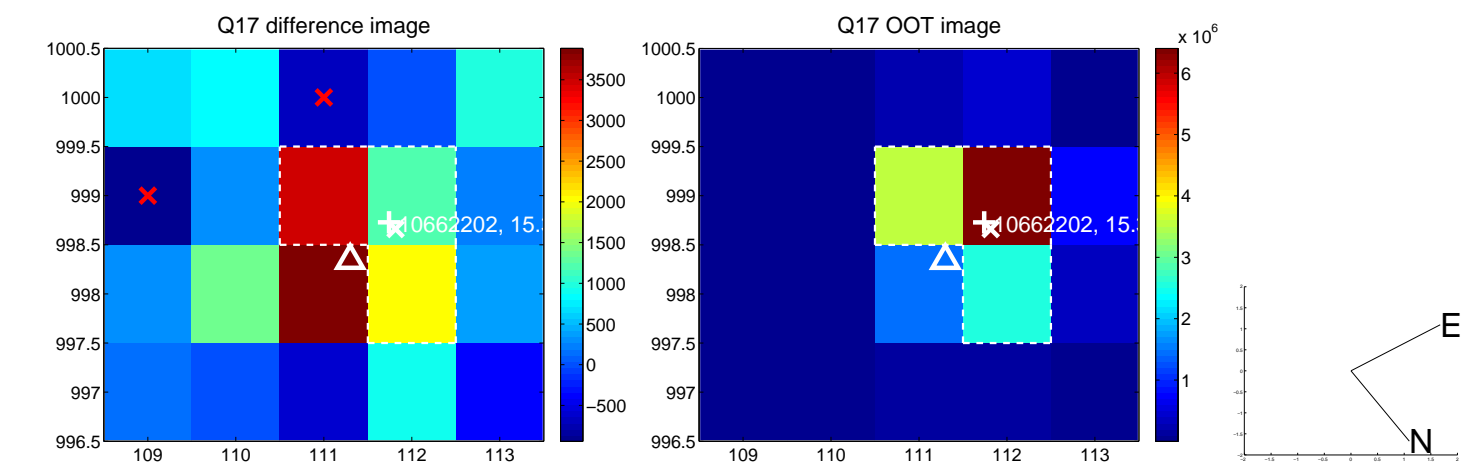
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



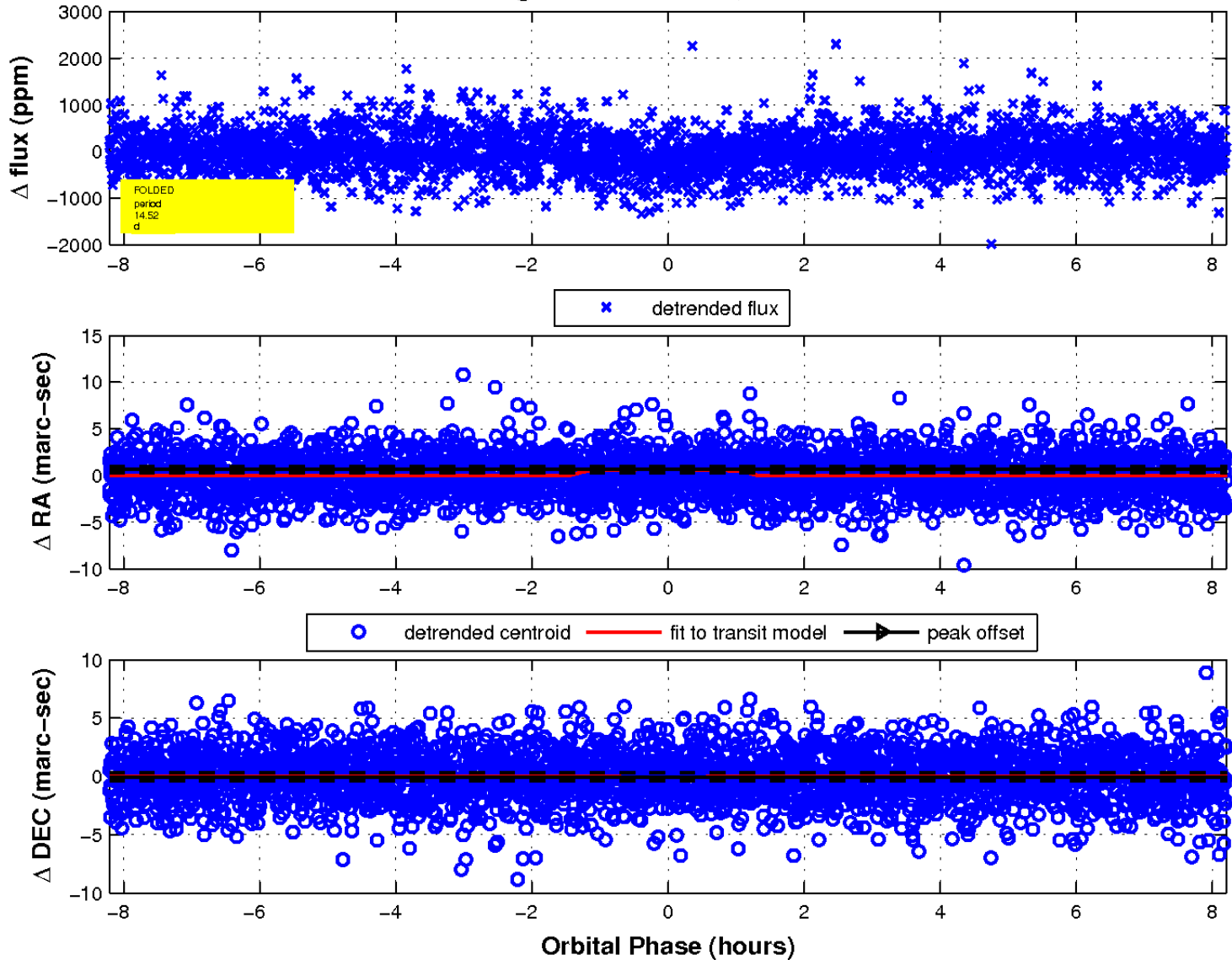
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

