

# KIC 002860930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002860930-01	OBS	No	1.129841	132.457342	50.6	3.729	8.3	8.8	0.82	5278	0.72	1159.80
002860930-02	OBS	No	308.881403	283.760098	683.7	4.789	10.2	4.7	0.82	5278	2.21	0.65
002860930-03	OBS	No	467.205467	199.935928	1091.5	1.795	10.5	7.0	0.82	5278	2.94	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002860930-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002860930-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002860930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

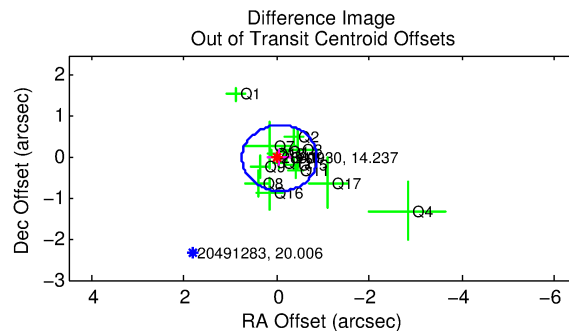
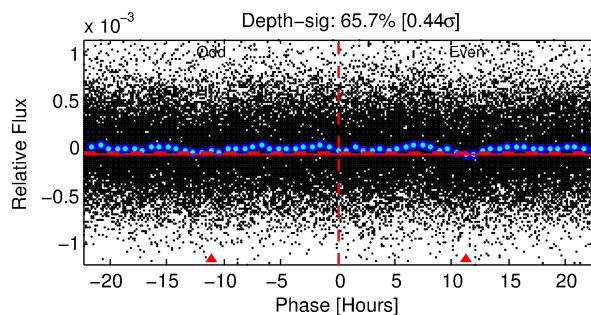
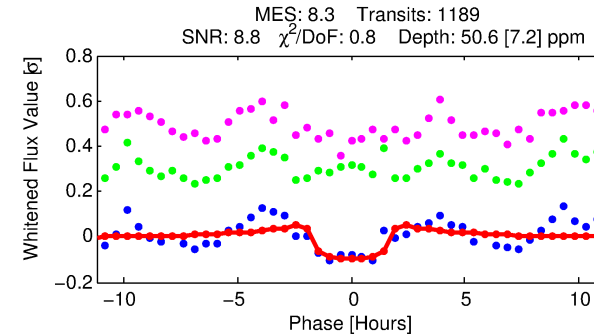
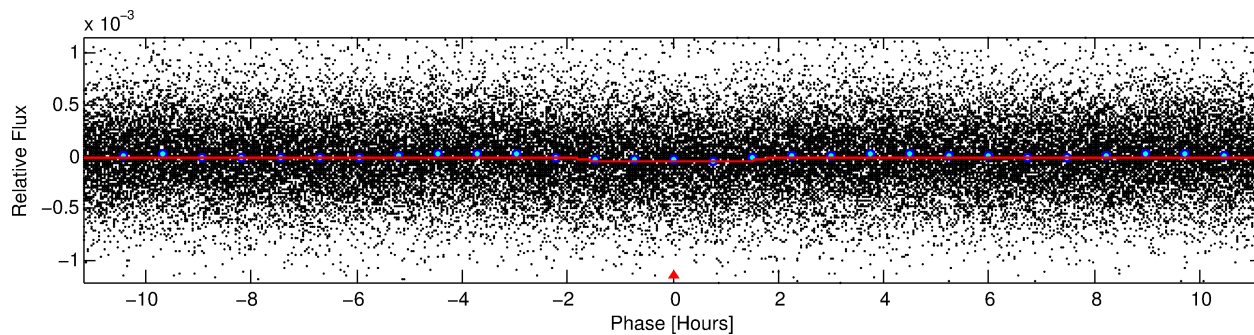
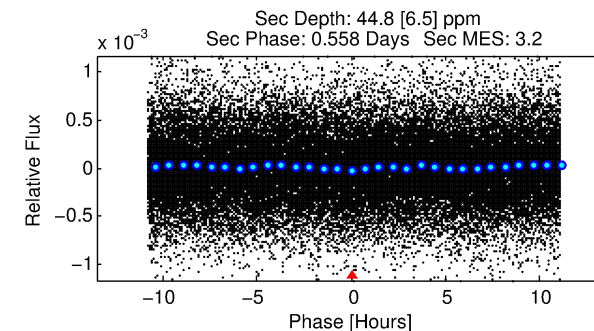
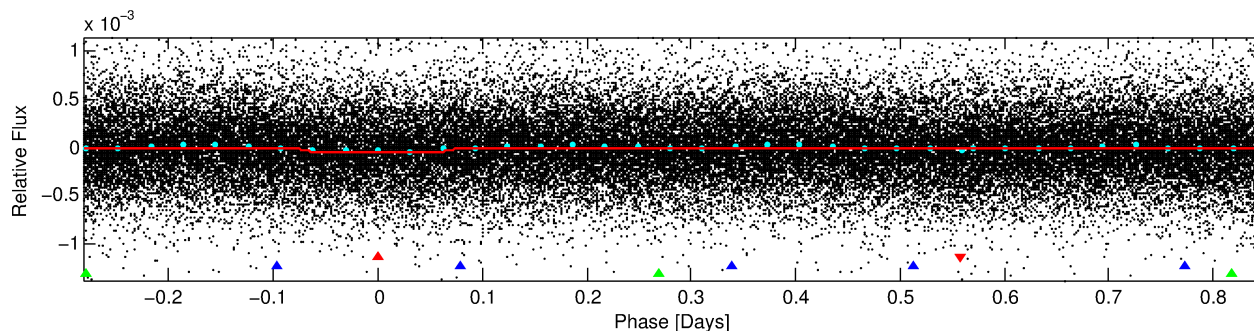
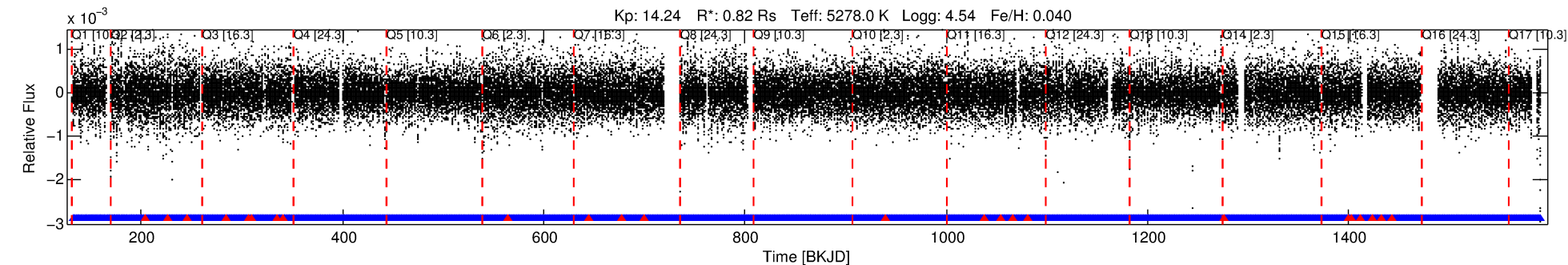
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002860930-01

No Significant Match Found

# DV One-Page Summary

KIC: 2860930 Candidate: 1 of 3 Period: 1.130 d



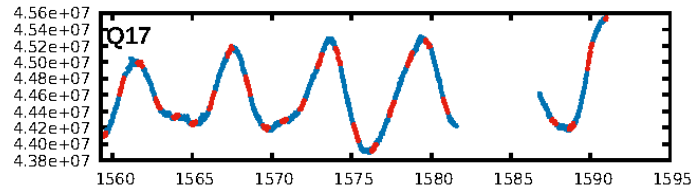
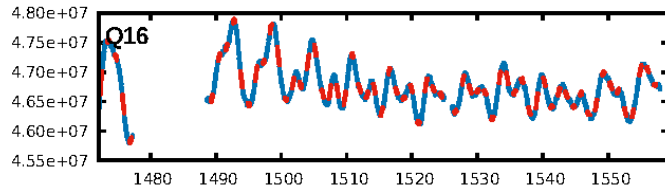
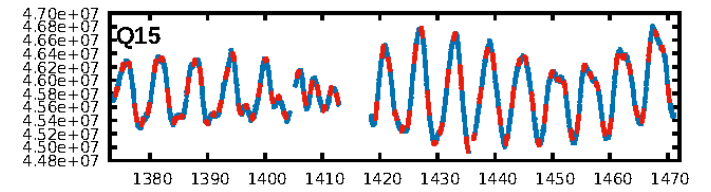
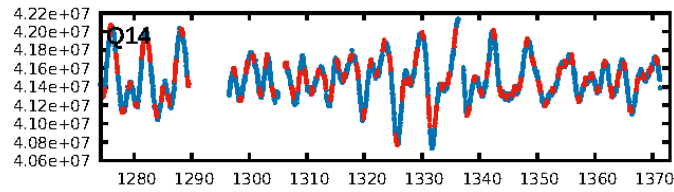
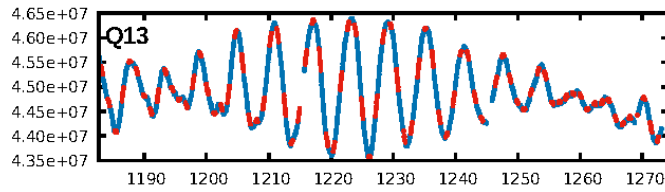
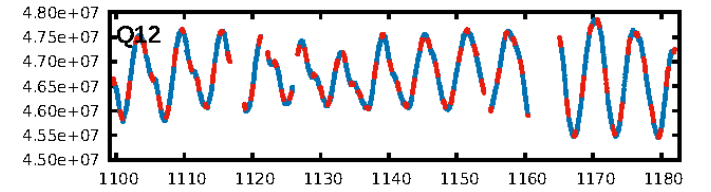
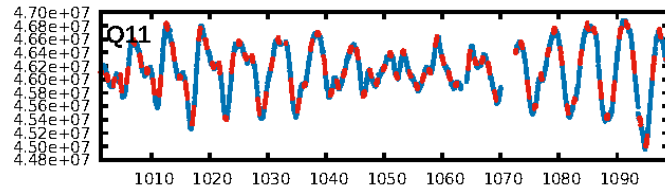
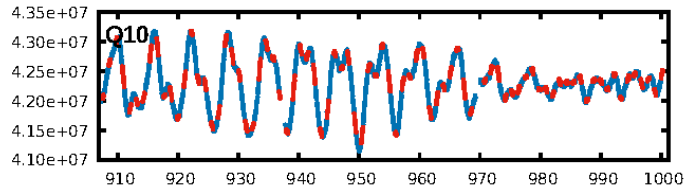
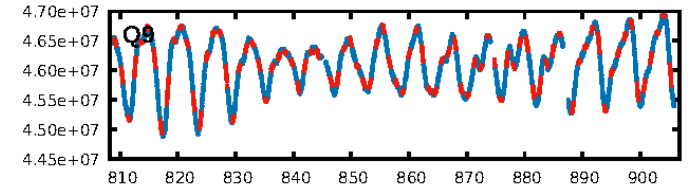
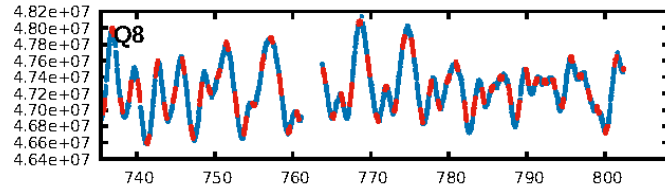
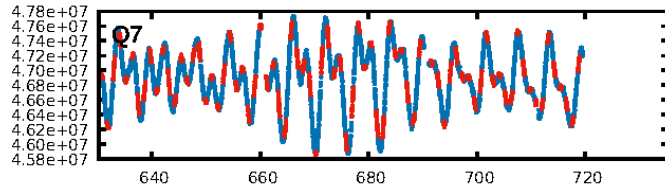
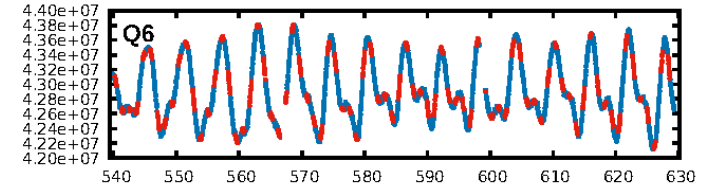
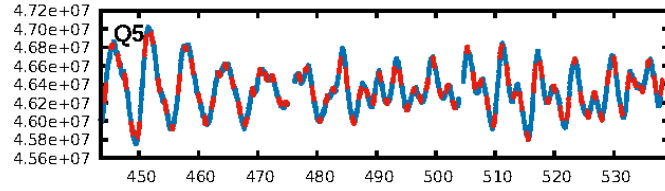
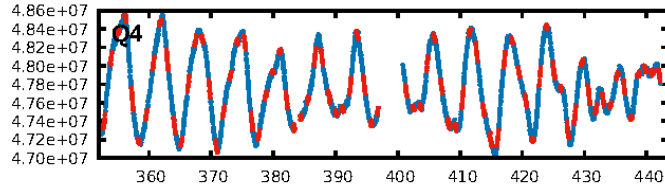
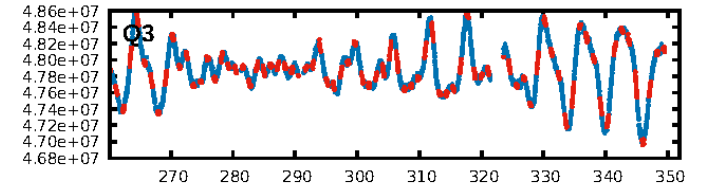
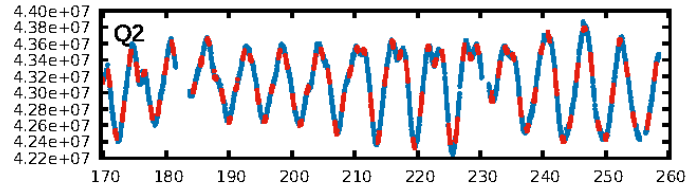
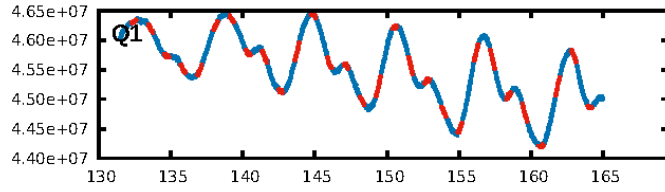
## DV Fit Results:

Period = 1.12984 [0.00001] d  
Epoch = 132.4573 [0.0035] BKJD  
Rp/R\* = 0.0080 [0.0039]  
a/R\* = 1.36 [1.33]  
b = 0.91 [0.39]  
Seff = 1159.80 [157.51]  
Teq = 1488 [51] K  
Rp = 0.72 [0.35] Re  
a = 0.0202 [0.0015] AU  
Ag = 19.35 [19.09] [0.96σ]  
Teffp = 4825 [1184] K [2.82σ]

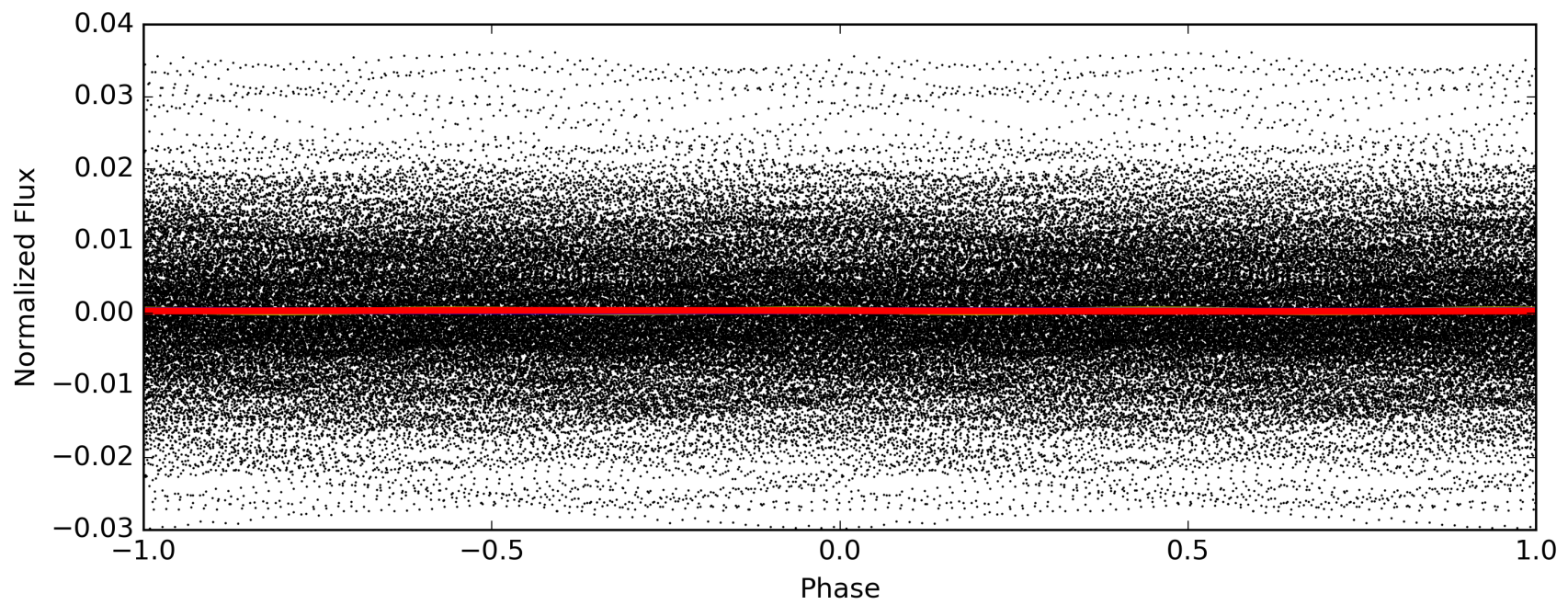
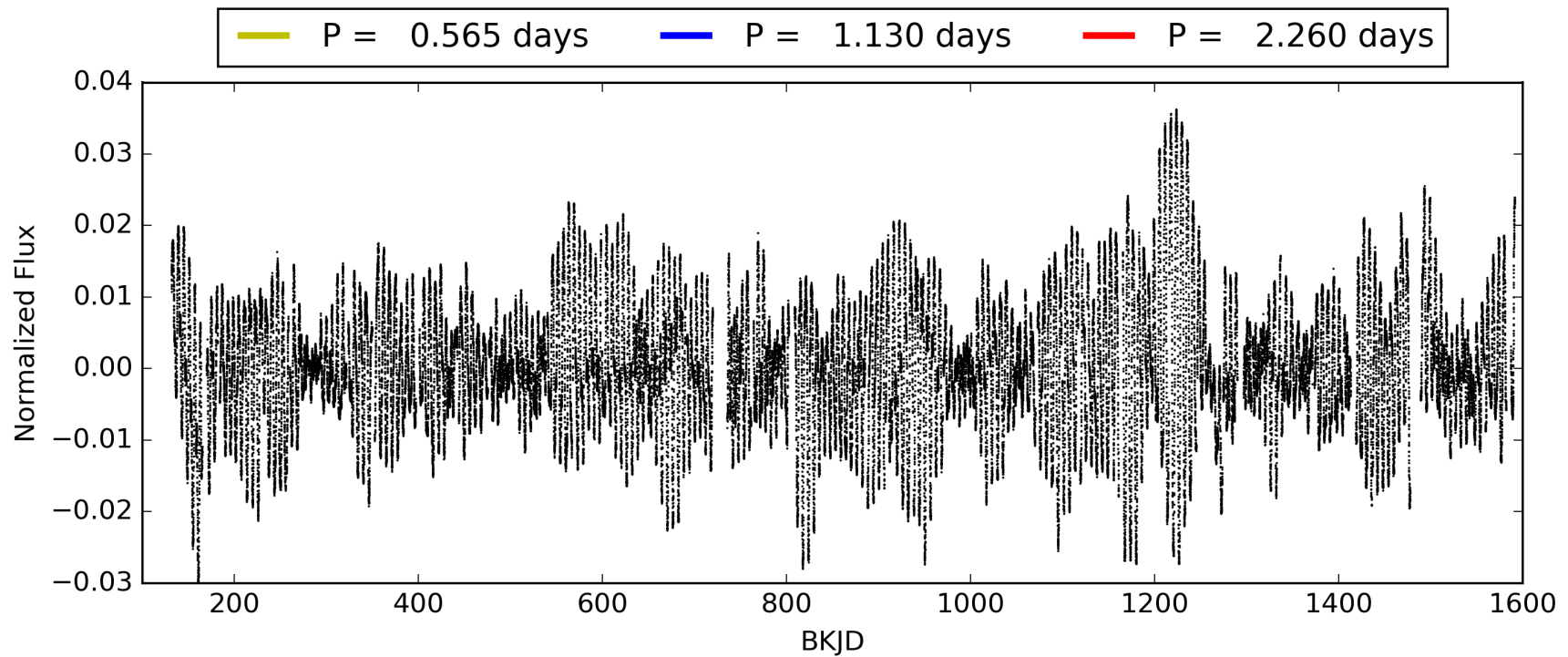
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1216.97σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.24e-14  
RollingBand-fgt: 0.98 [1111/1136]  
GhostDiagnostic-chr: -2.266  
Centroid-sig: 2.2%  
Centroid-so: 1.691 arcsec [1.61σ]  
OotOffset-rm: 0.063 arcsec [0.23σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-rm: 0.084 arcsec [0.49σ]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.27 [4/15]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 002860930-01, PDC Light Curves



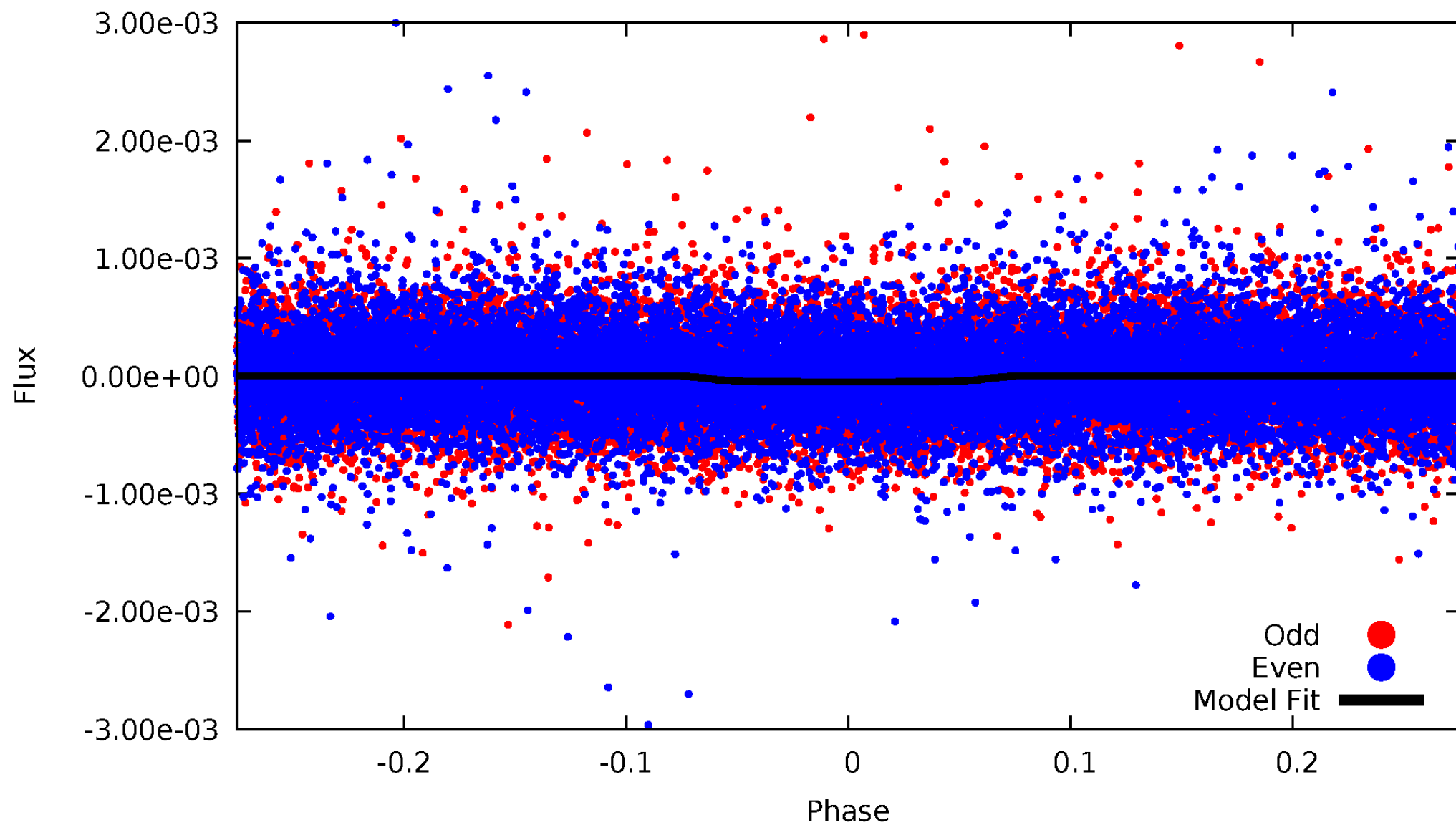
TCE 002860930-01





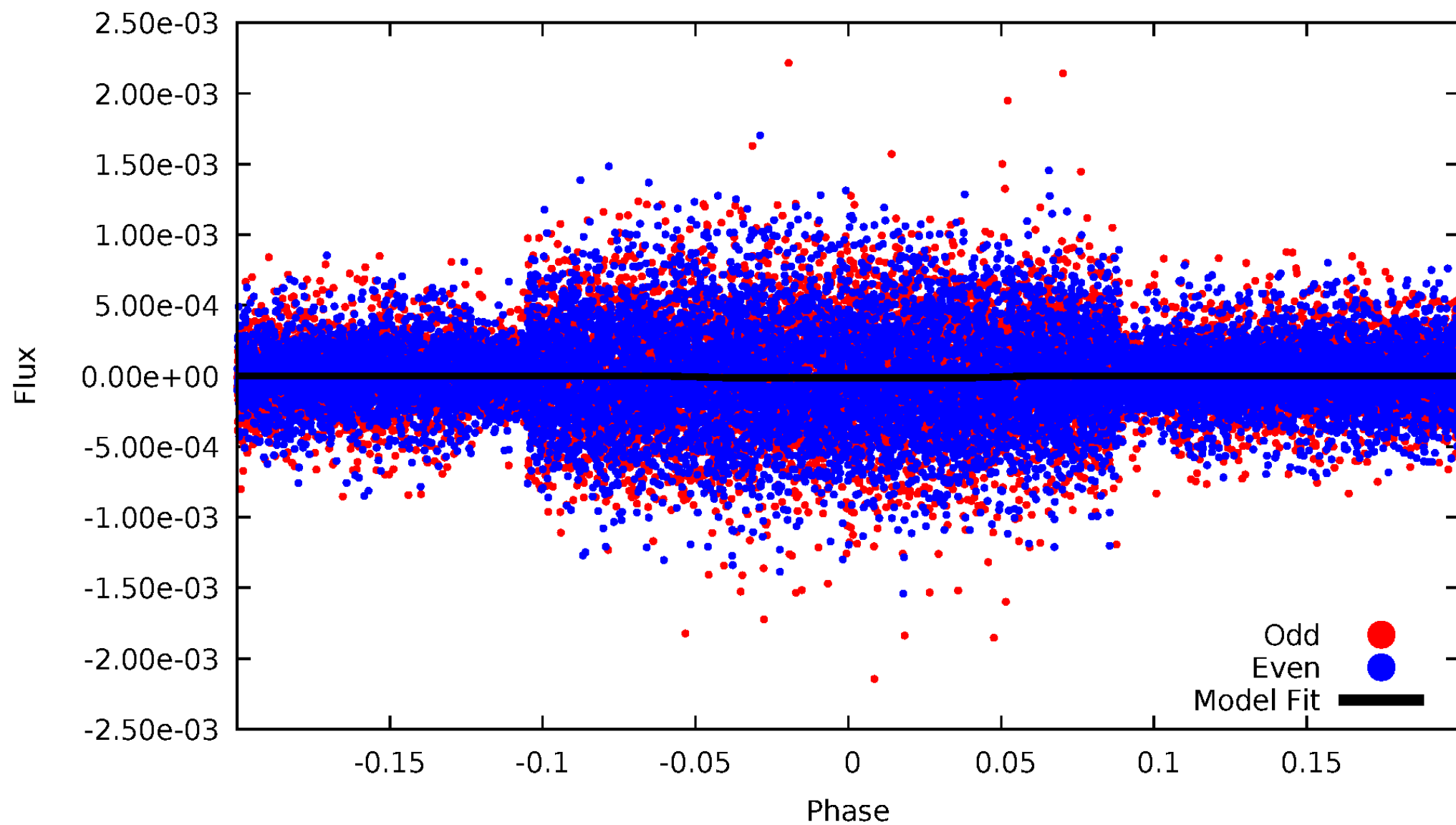
# DV Odd/Even

TCE 002860930-01



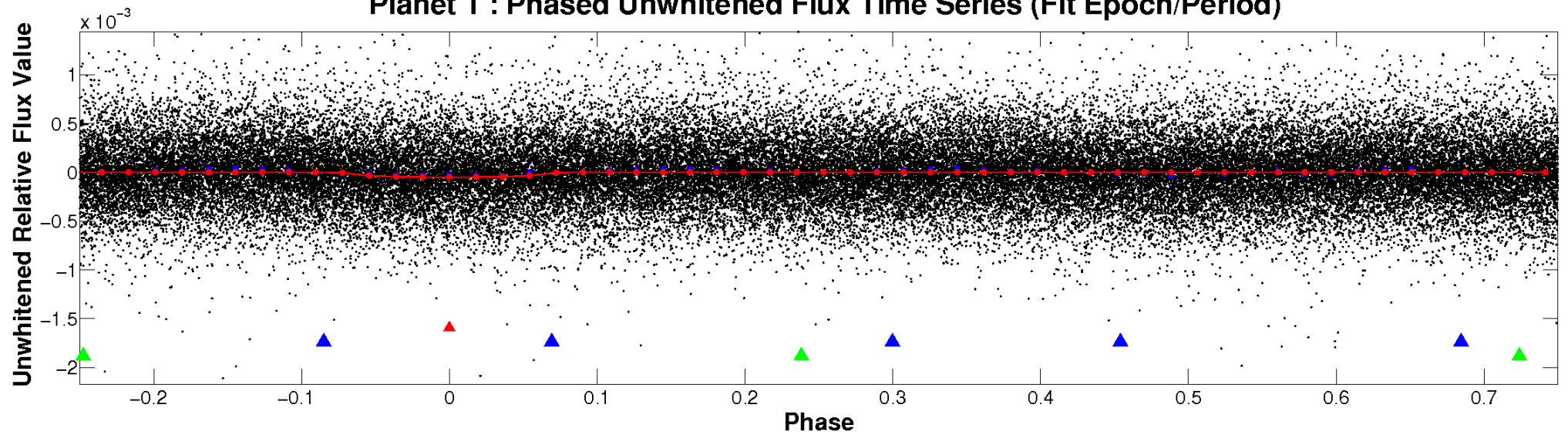
# ALT Odd/Even

TCE 002860930-01

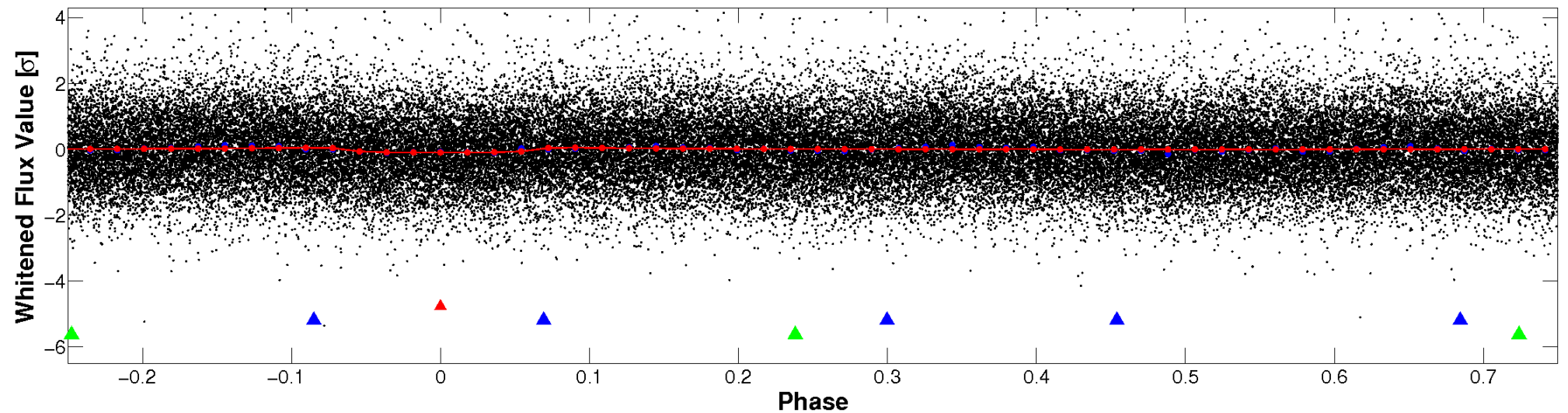


# Non-Whitened Vs. Whitened Light Curve

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

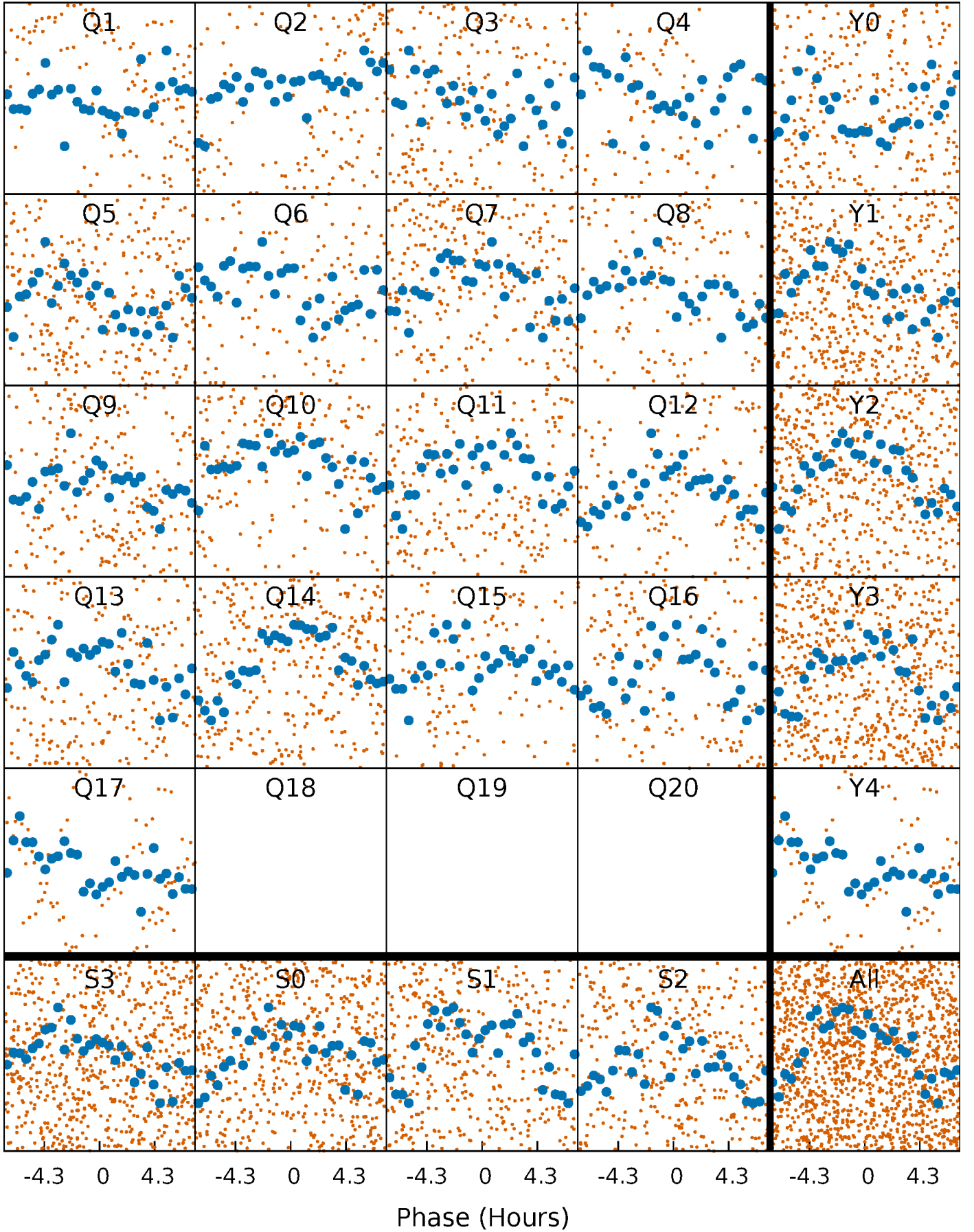


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

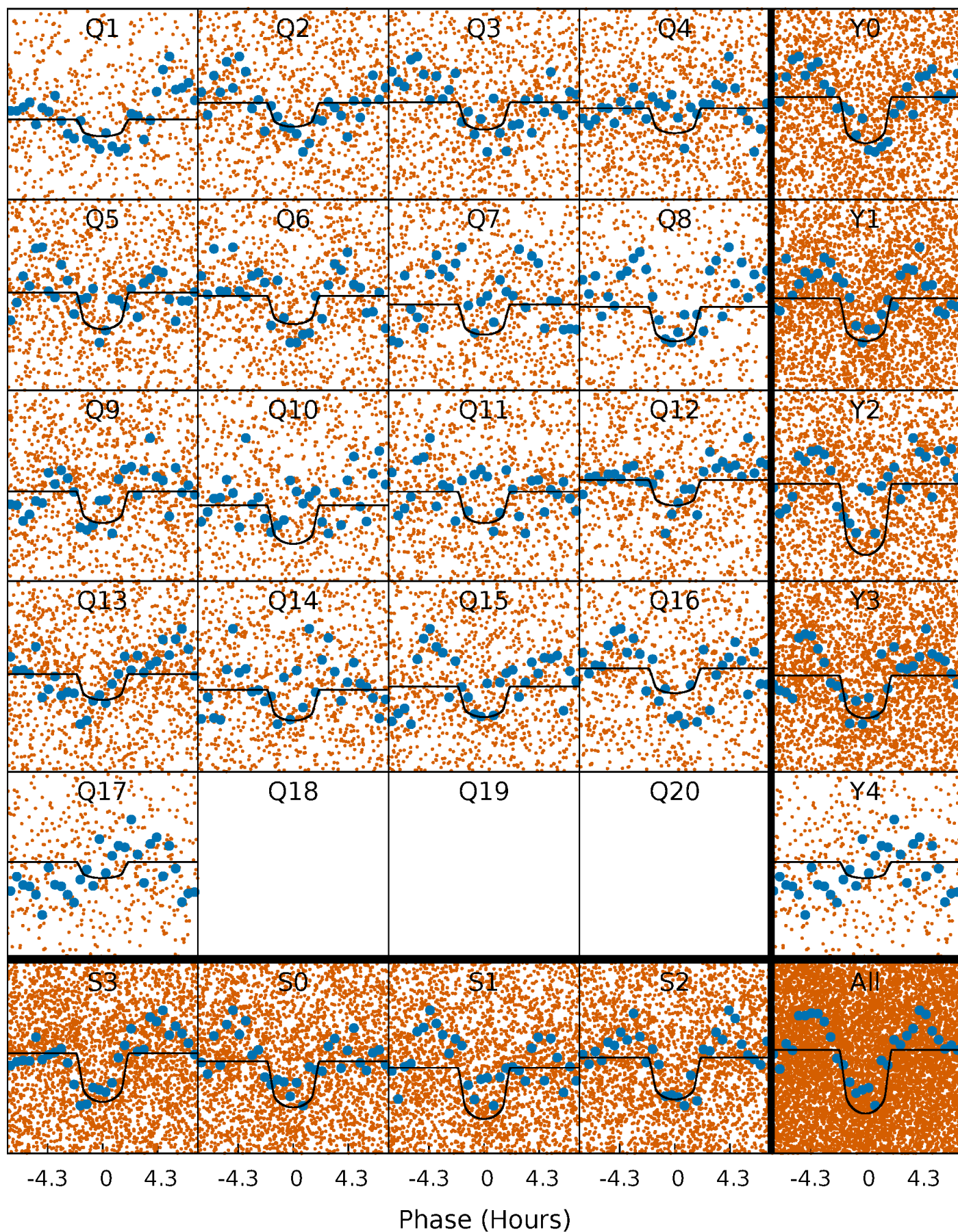
TCE 002860930-01 P= 1.129841 Days  $T_0=132.457342$  (BKJD)





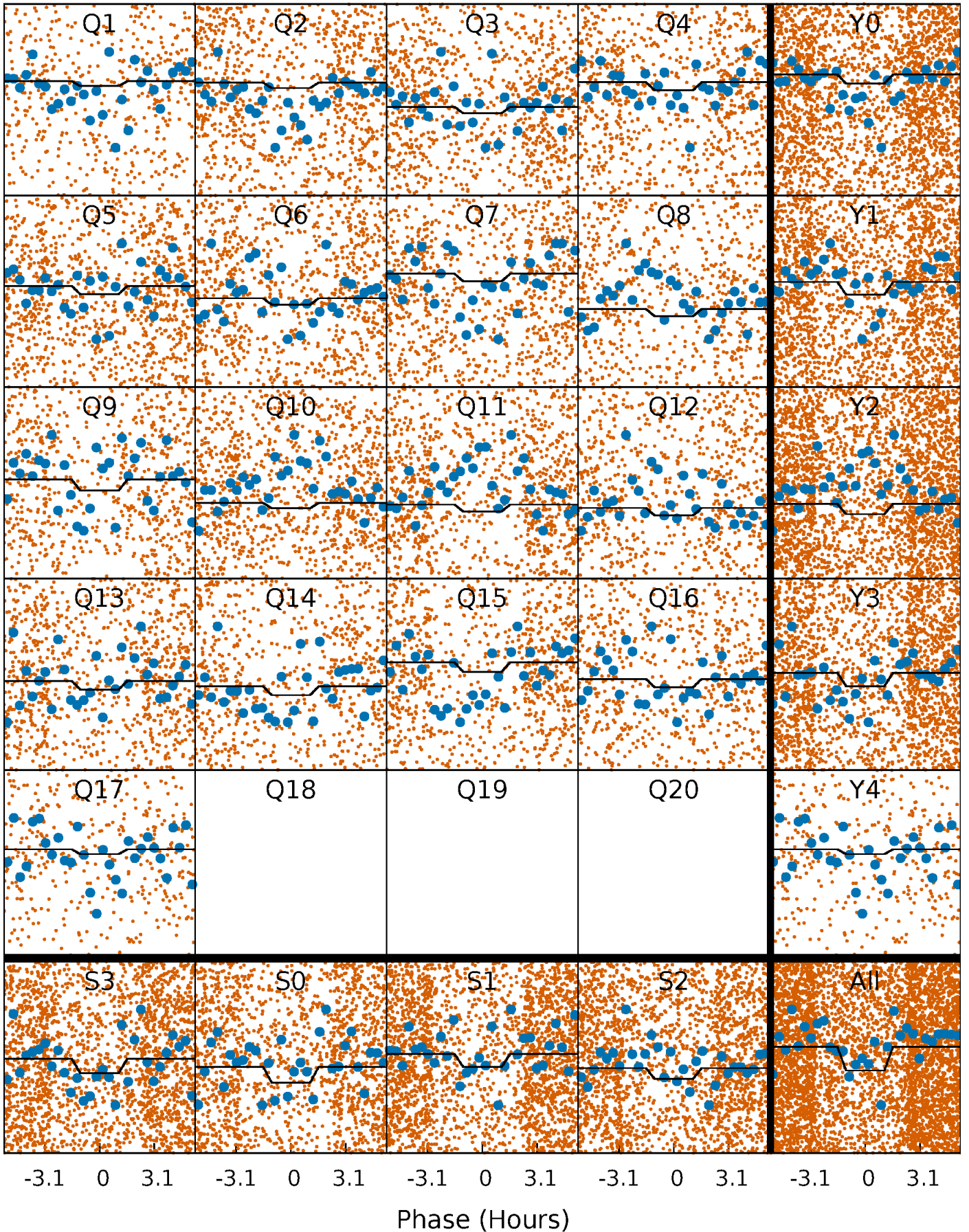
# DV Quarter-Phased Transit Curves

TCE 002860930-01 P= 1.129841 Days  $T_0=132.457342$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 002860930-01 P= 1.129823 Days  $T_0=132.461794$  (BKJD)

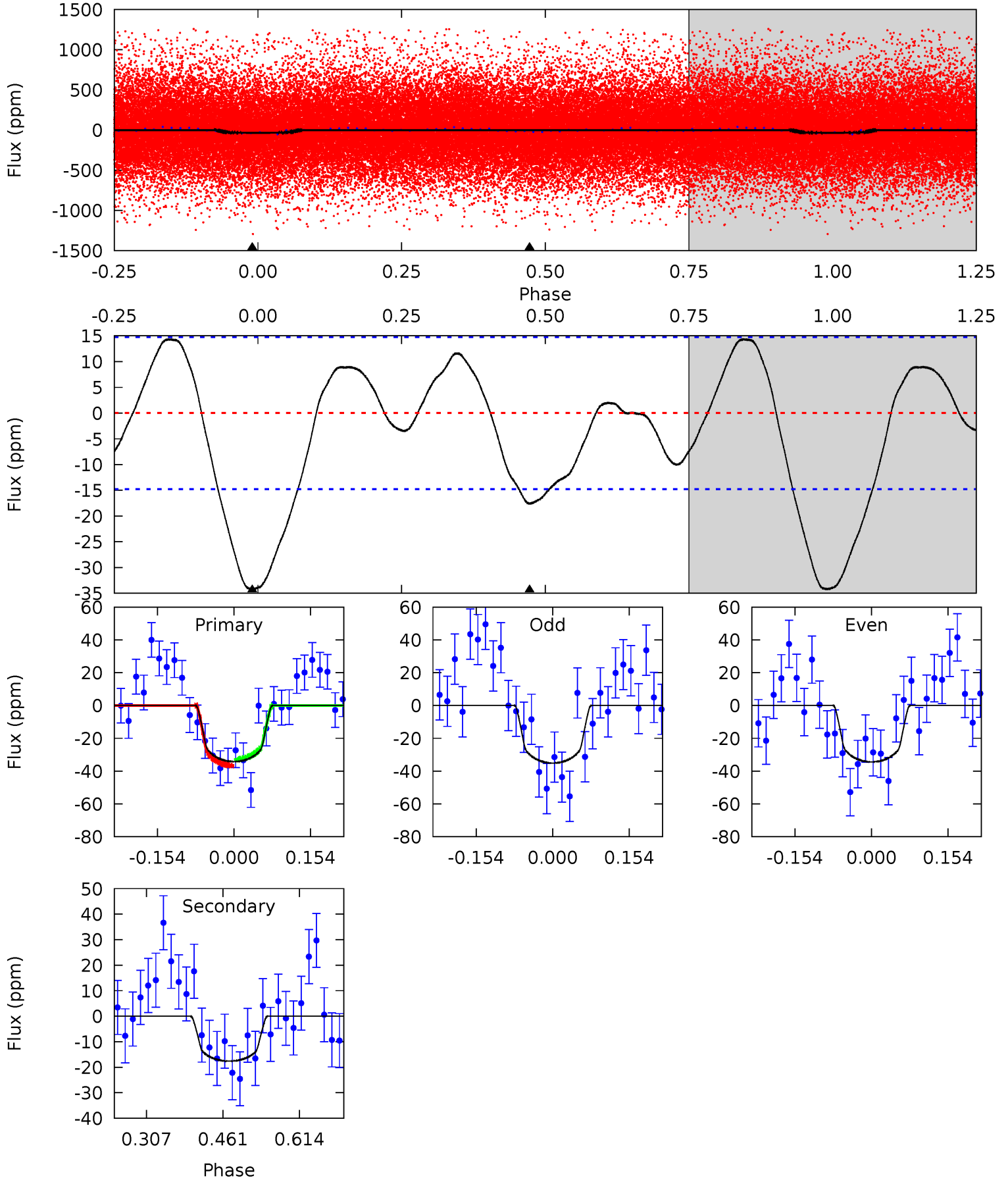




# DV Model-Shift Uniqueness Test

002860930-01, P = 1.129841 Days, E = 131.327501 Days

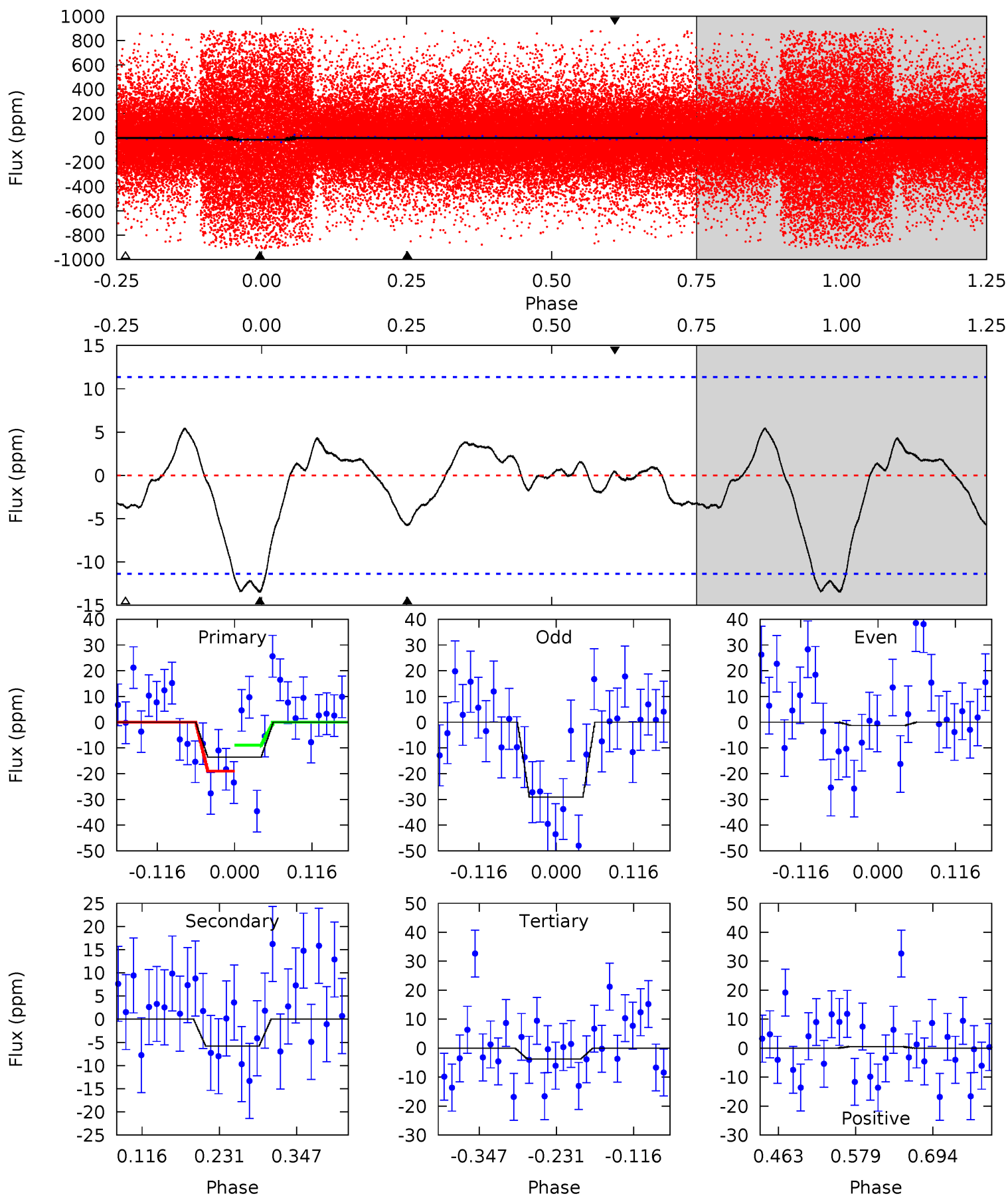
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	5.33	0	0	4.47	1.43	1.80	10.4	10.4	5.33	5.33	0.11	0.94	0.30	0.56



# Alt Model-Shift Uniqueness Test

002860930-01, P = 1.129823 Days, E = 131.331971 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
5.40	2.31	1.49	0.21	4.53	1.57	0.88	3.91	5.19	0.82	2.10	5.43	-8.11	0.29	1.98





### Stellar Parameters For KIC 002860930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5278^{+84}_{-73}$	$4.540^{+0.035}_{-0.070}$	$0.040^{+0.150}_{-0.150}$	$0.825^{+0.066}_{-0.039}$	$0.862^{+0.048}_{-0.048}$	$2.161^{+0.295}_{-0.425}$
	+2%/-1%	+1%/-2%	+375%/-375%	+8%/-5%	+6%/-6%	+14%/-20%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 002860930-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-18 \pm 3$	$0.76^{+0.33}_{-0.37}$	$2090^{+52}_{-44}$	$4003^{+1241}_{-538}$	$6.925^{+19.733}_{-3.851}$
Alt.	$-6 \pm 3$	$0.41^{+0.34}_{-0.25}$	$2092^{+52}_{-48}$	$4013^{+2006}_{-819}$	$6.860^{+40.946}_{-4.909}$

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

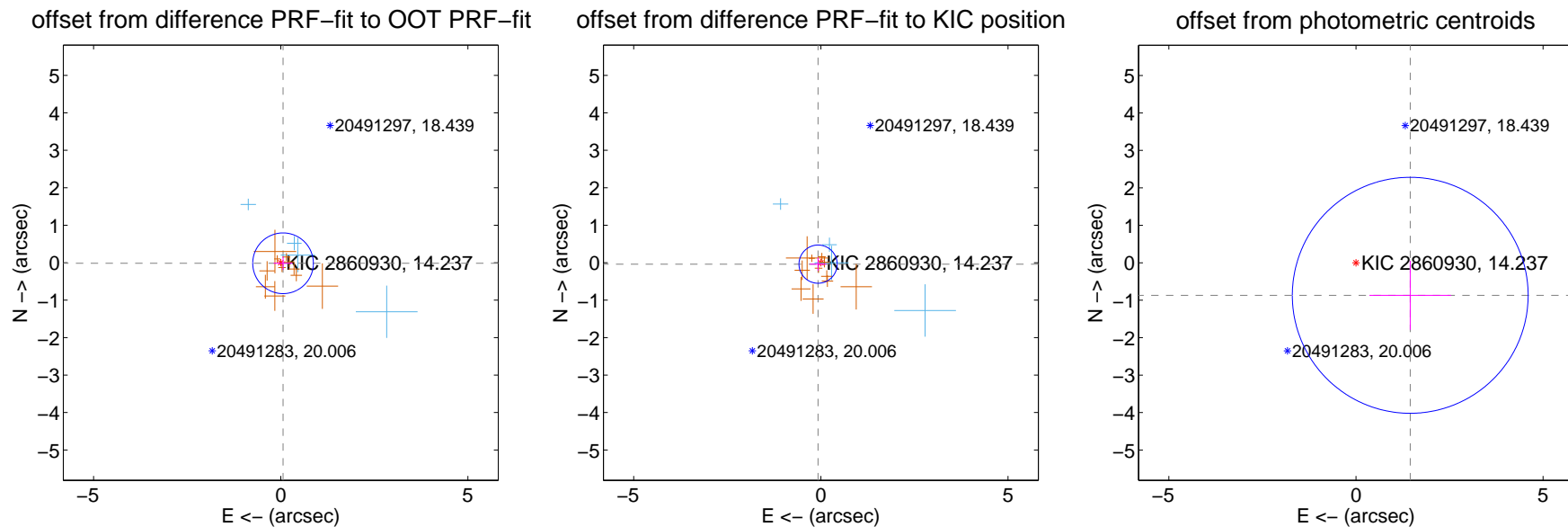
## DV Centroid Data

Supplemental centroid analysis for 002860930-01. Kepler magnitude: 14.24. Transit SNR 8.79

There are 4 quarters with good PRF difference image offsets

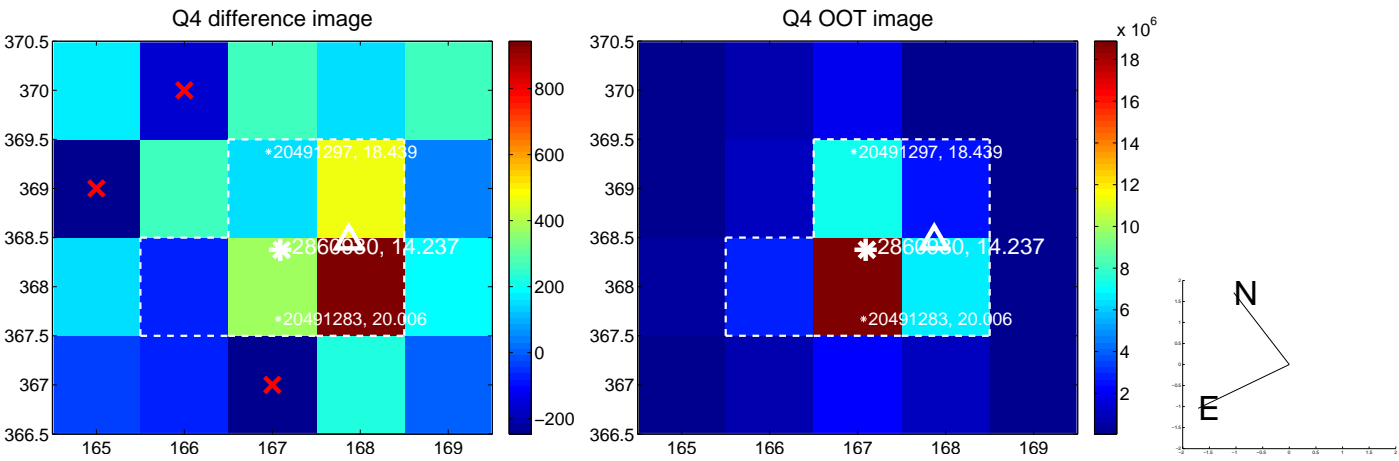
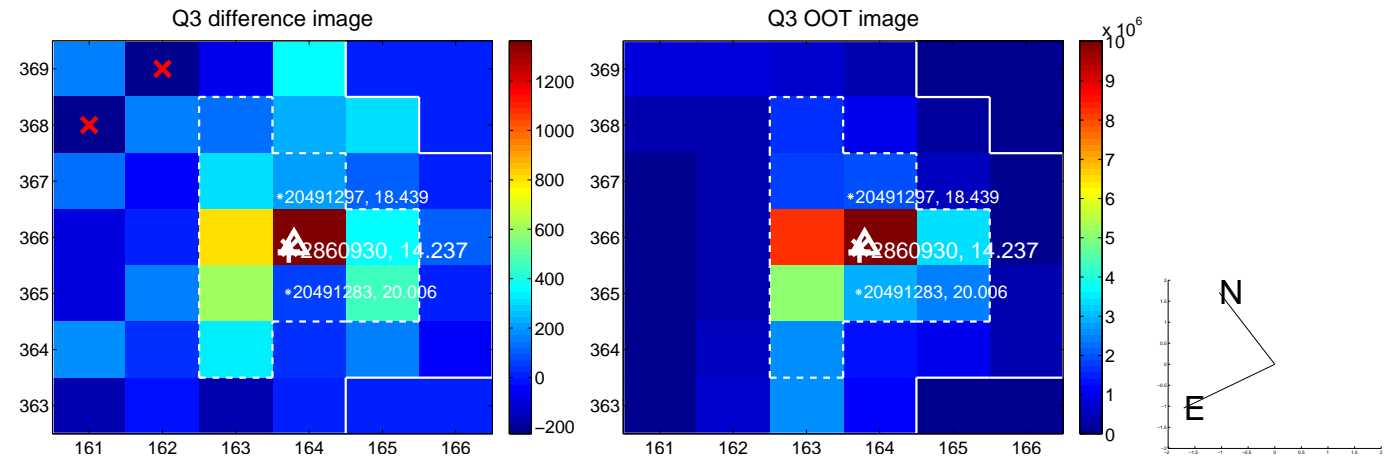
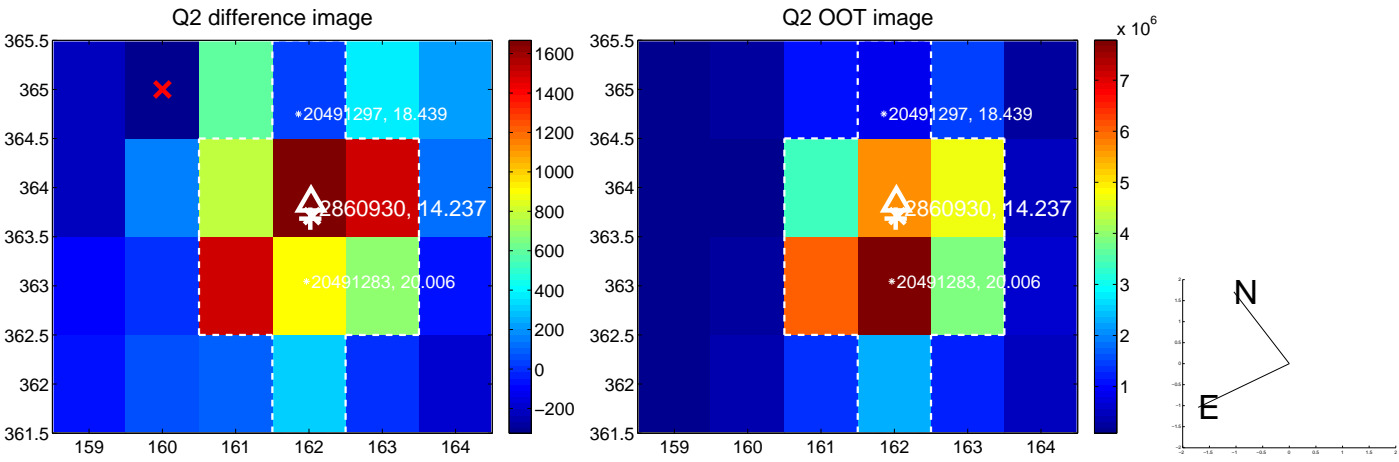
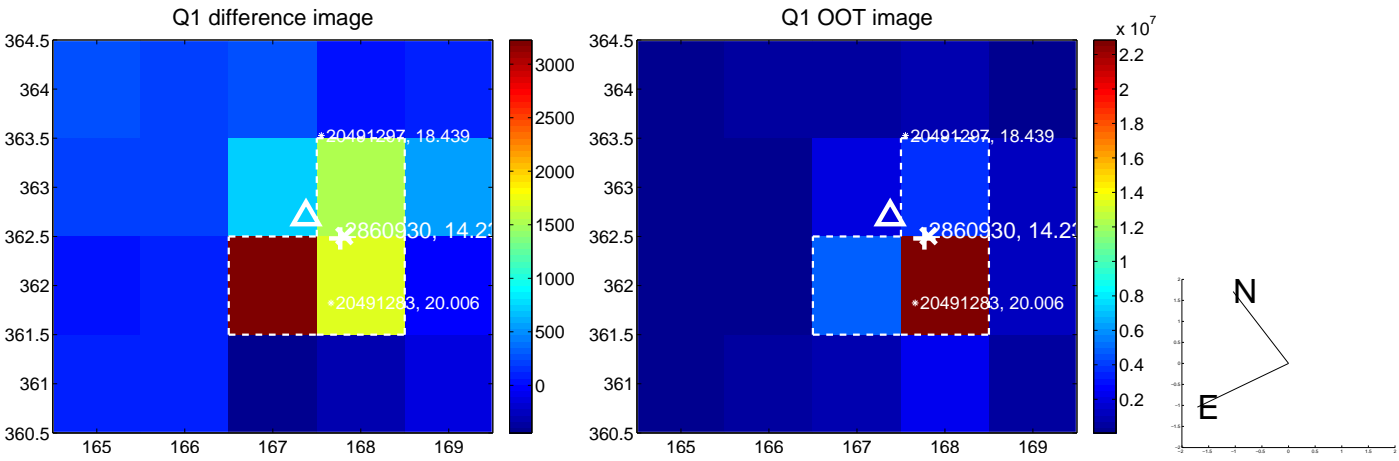
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.063 \pm 0.270$	0.23	$-0.061 \pm 0.250$	$-0.015 \pm 0.180$
PRF-fit source offset from KIC position	$0.084 \pm 0.170$	0.49	$0.074 \pm 0.221$	$-0.039 \pm 0.176$
photometric centroid source offset	$1.69 \pm 1.05$	1.61	$-1.45 \pm 1.09$	$-0.87 \pm 0.92$

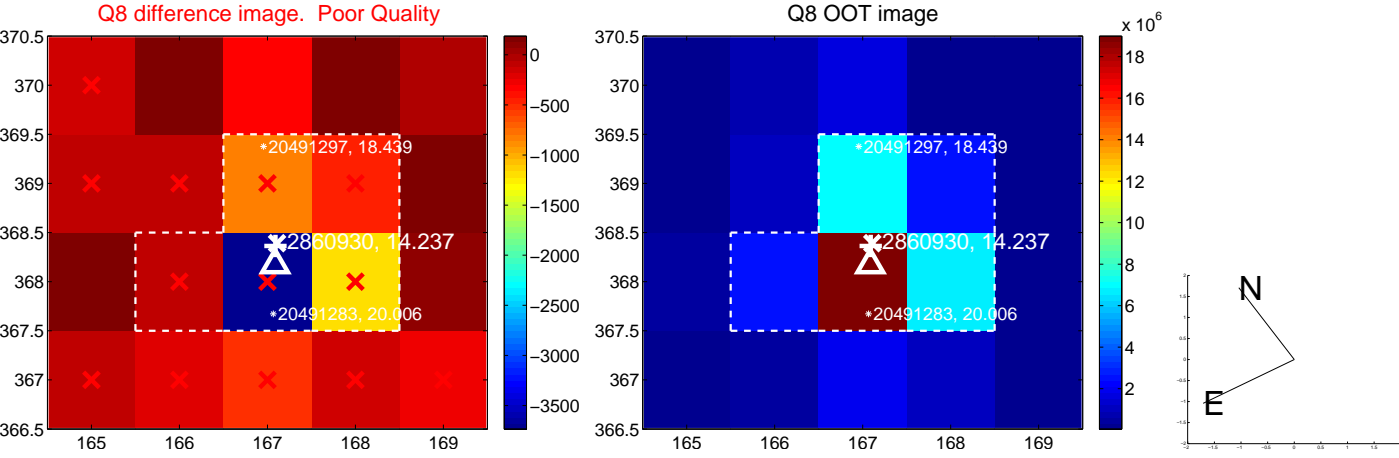
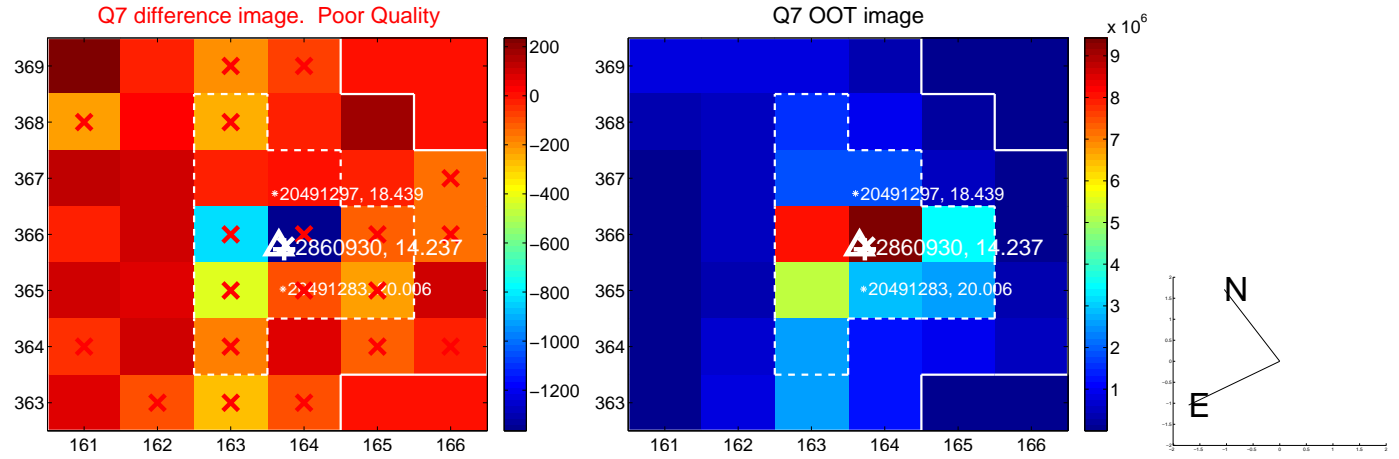
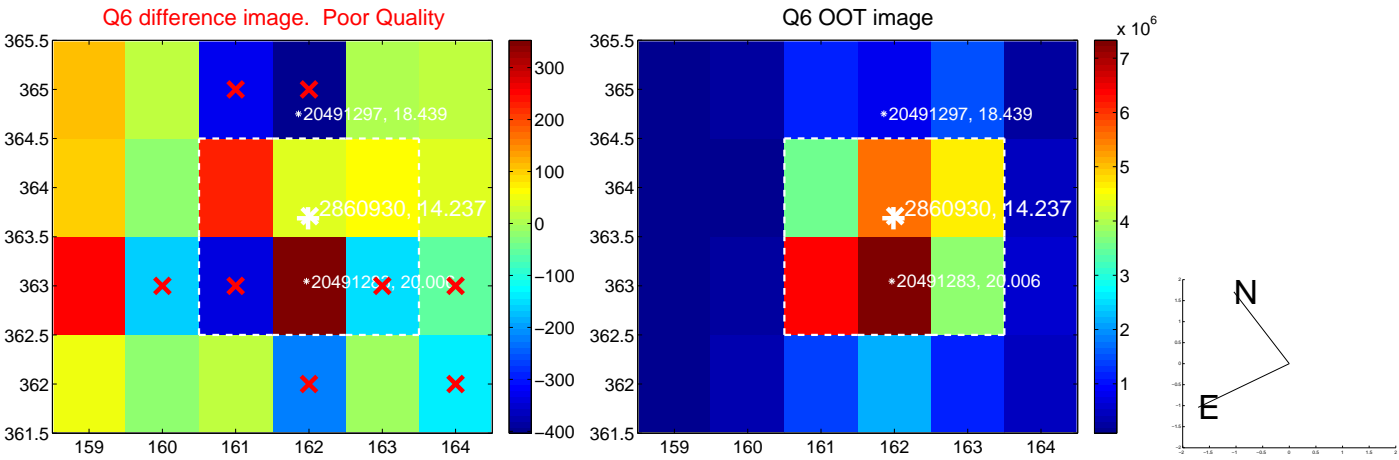
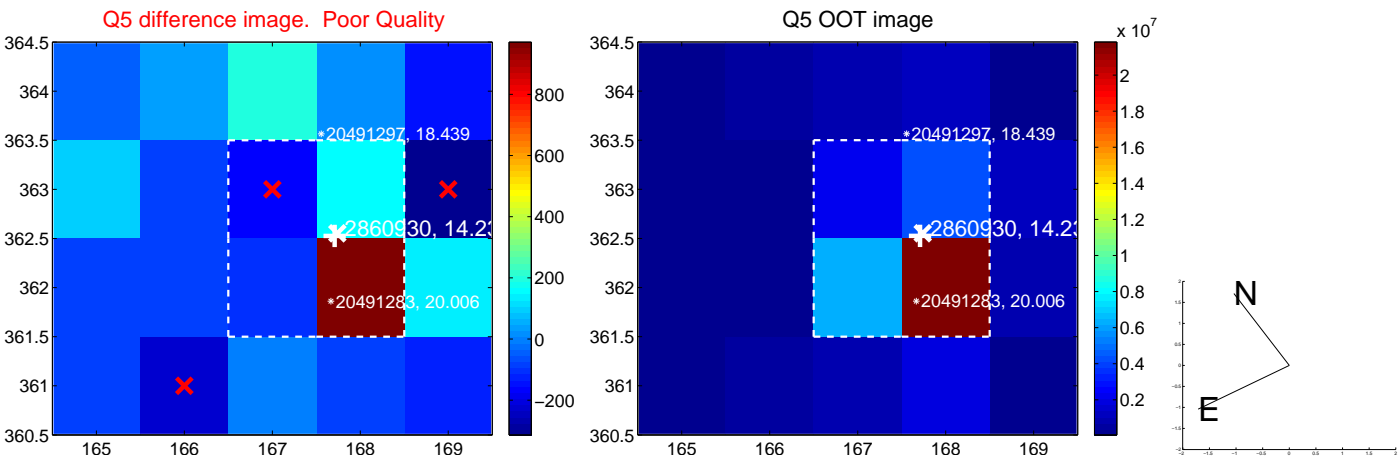


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

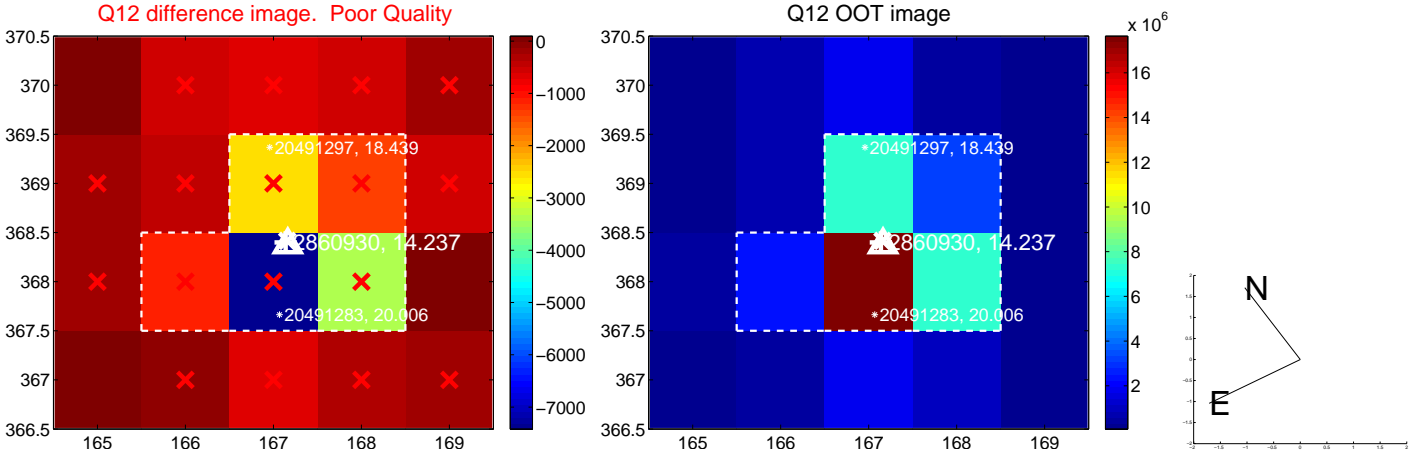
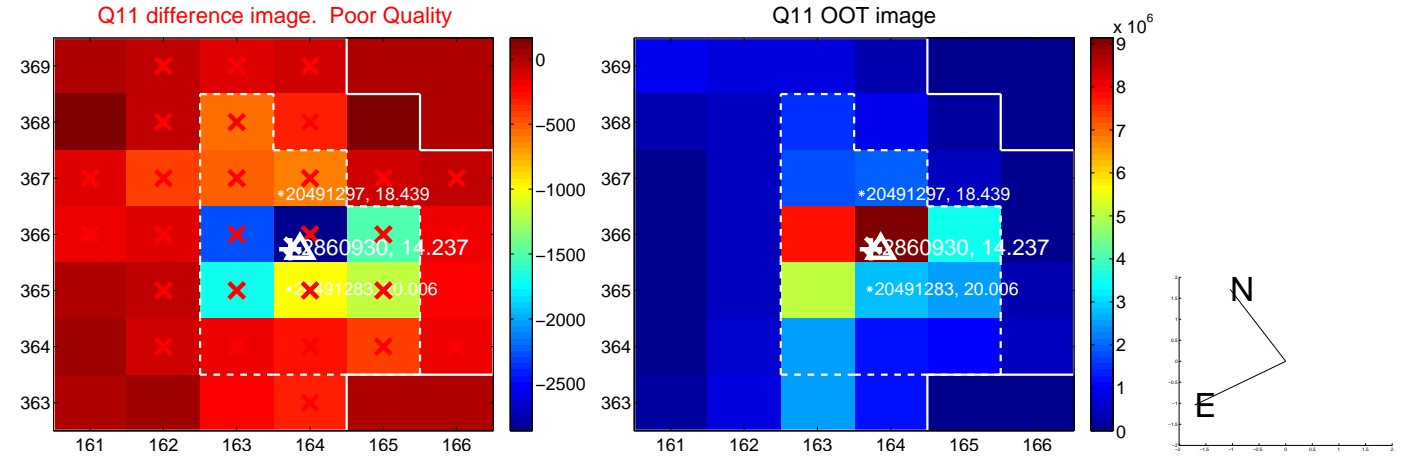
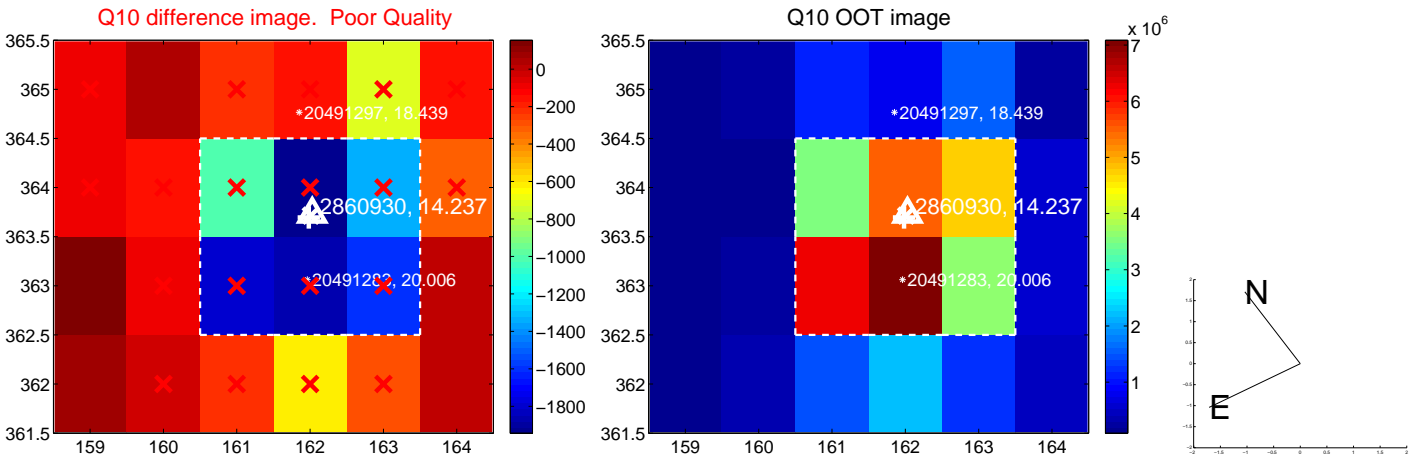
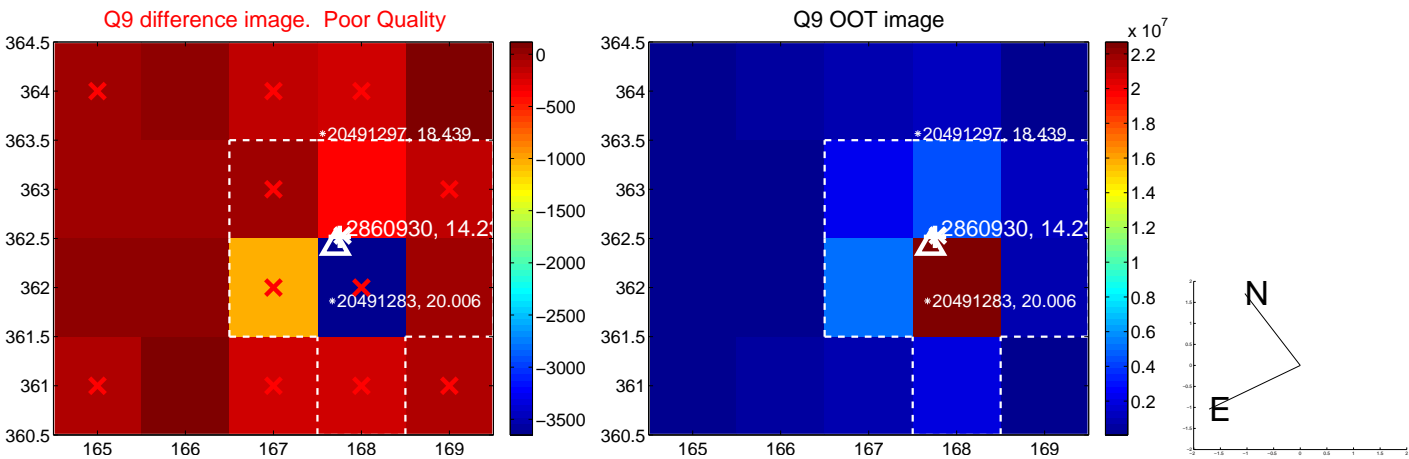


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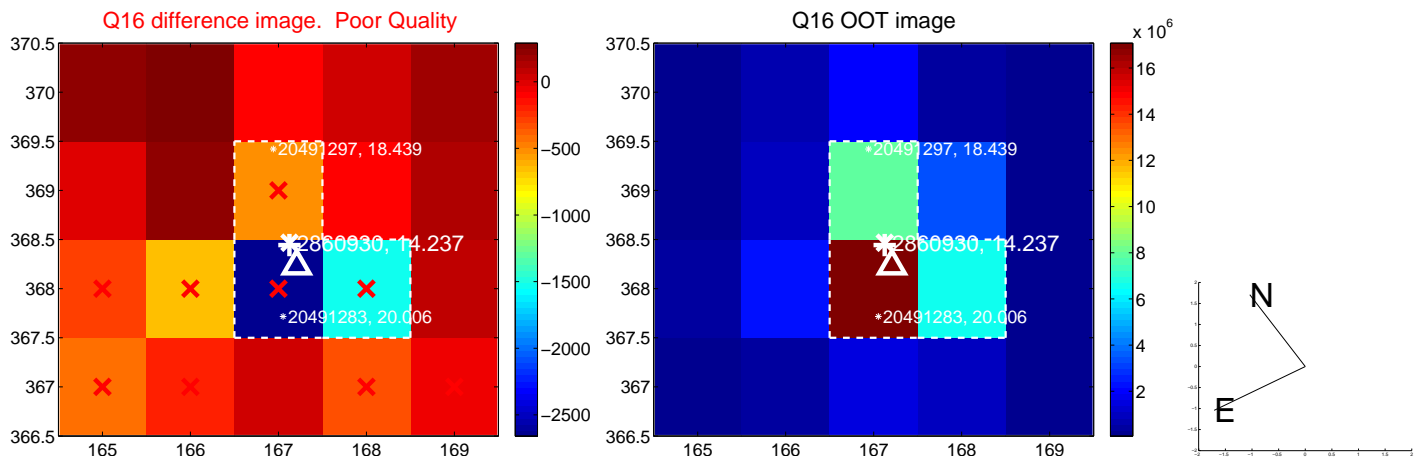
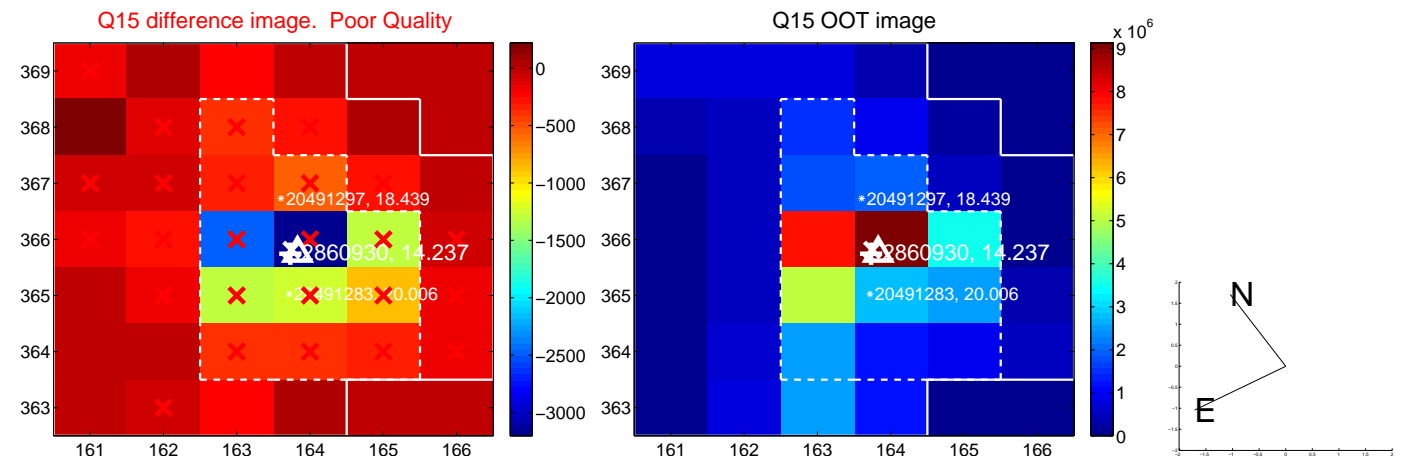
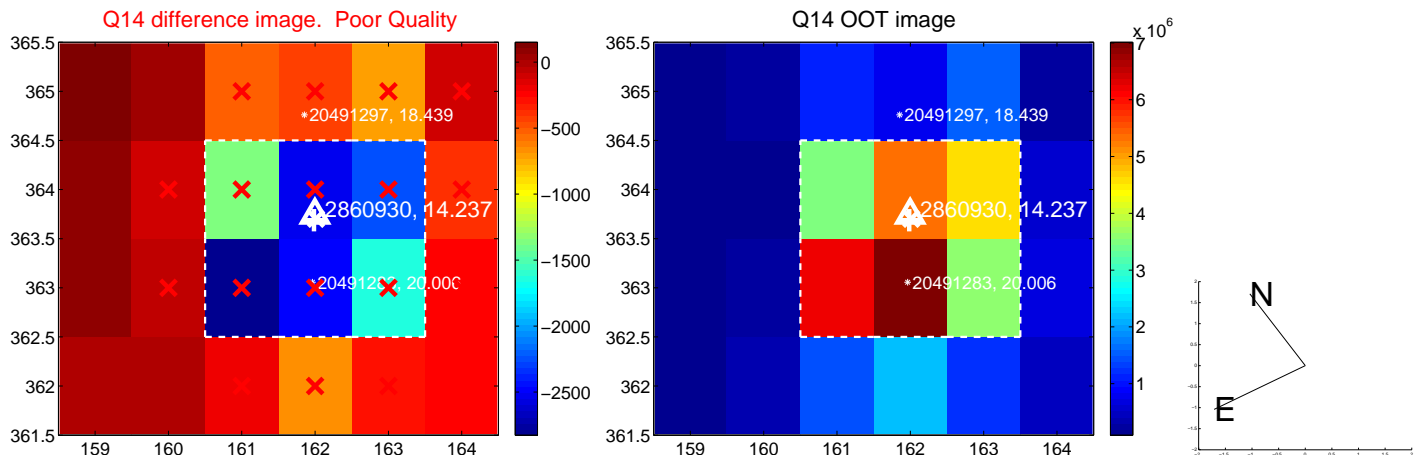
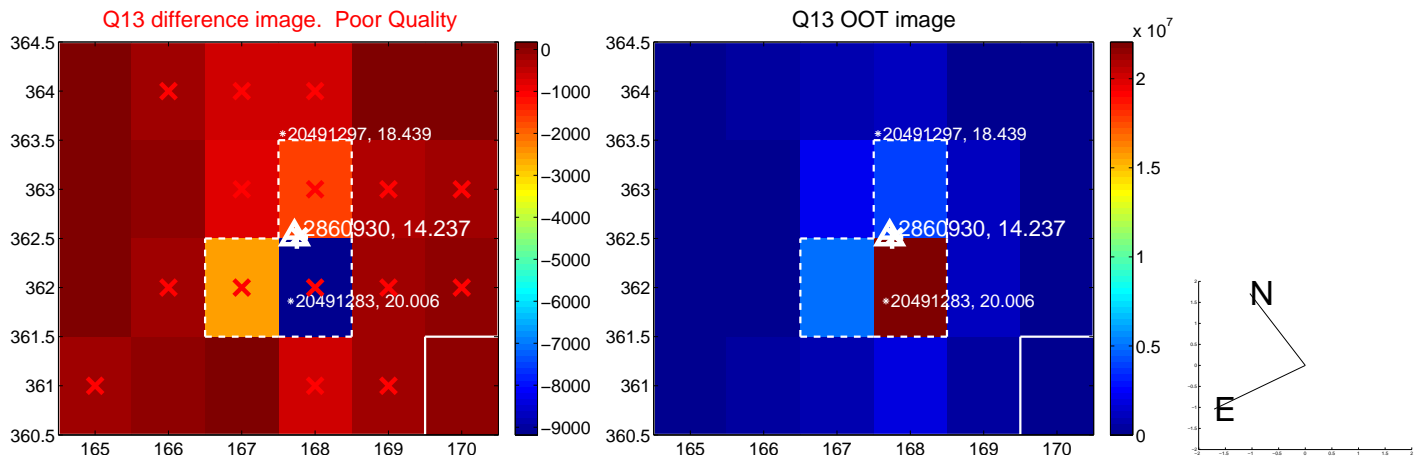




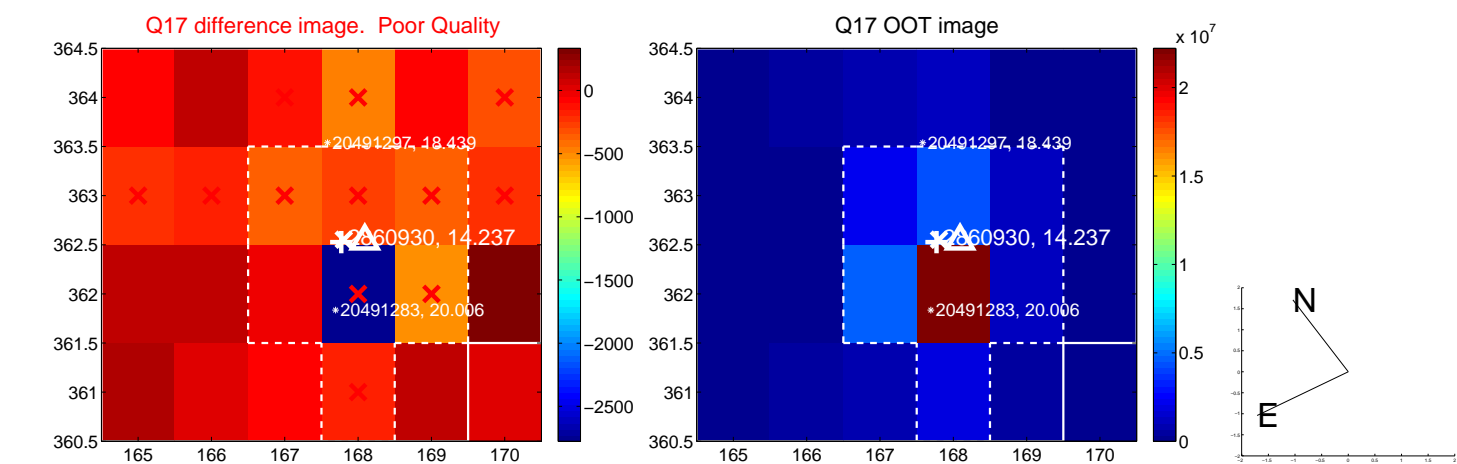
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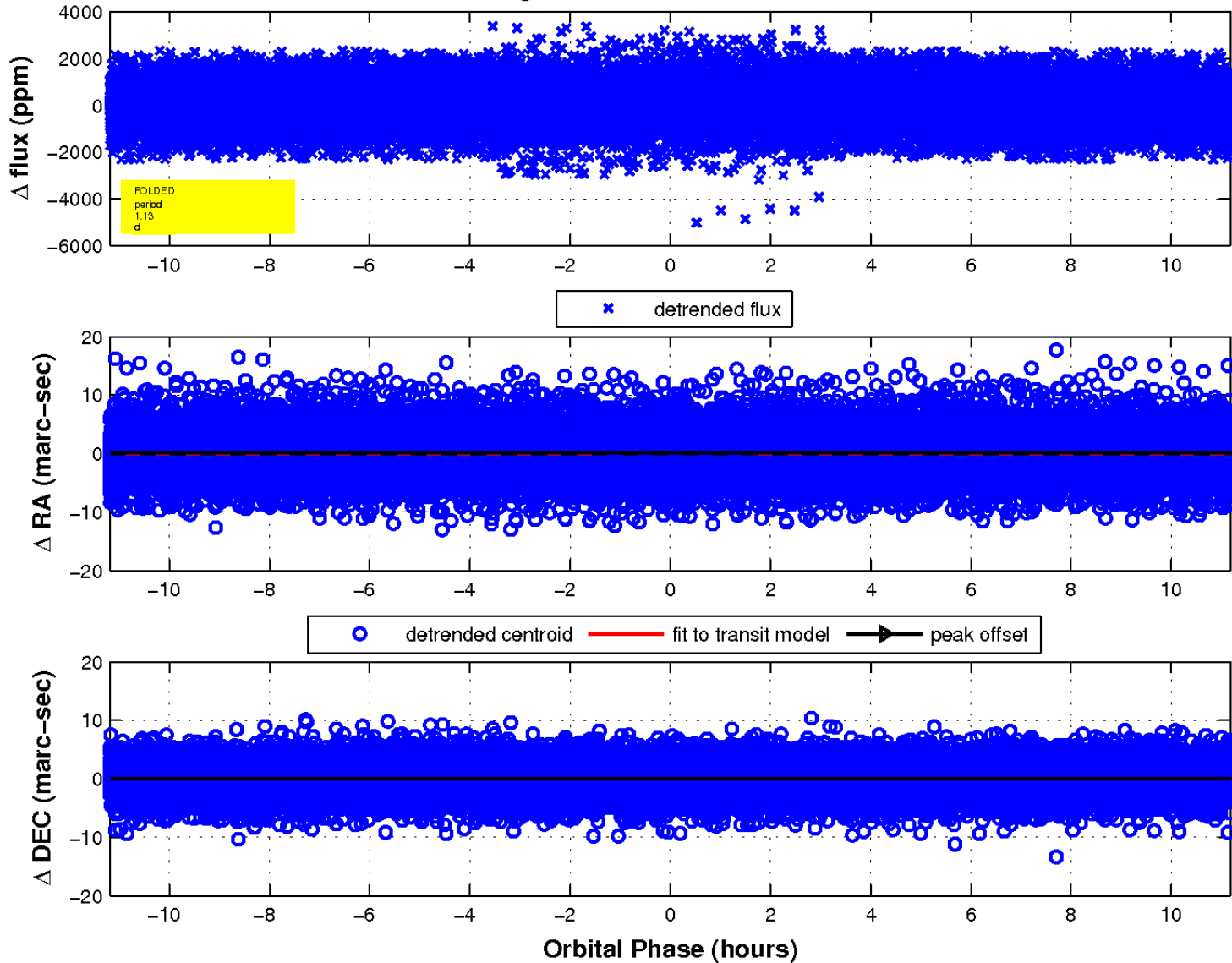
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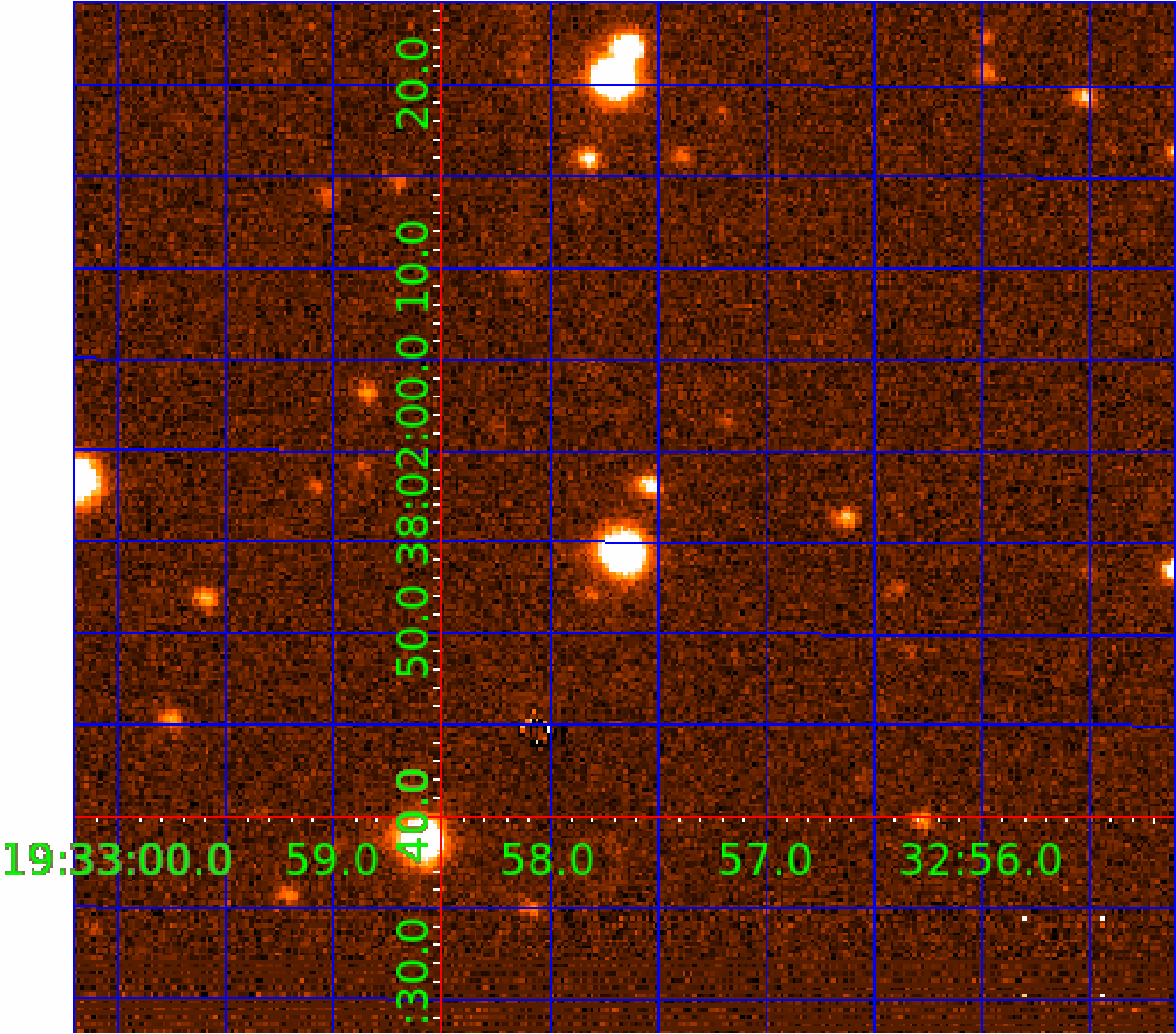


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 002860930

## Q1-17 DR25 TCE Parameters

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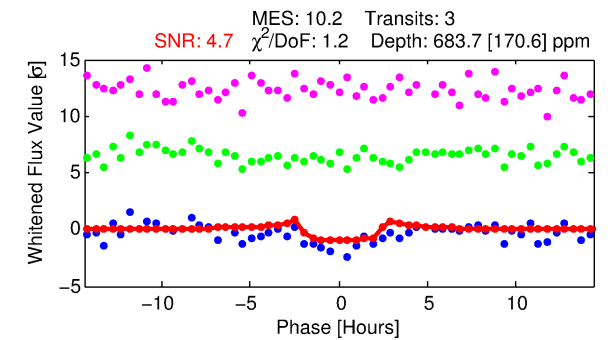
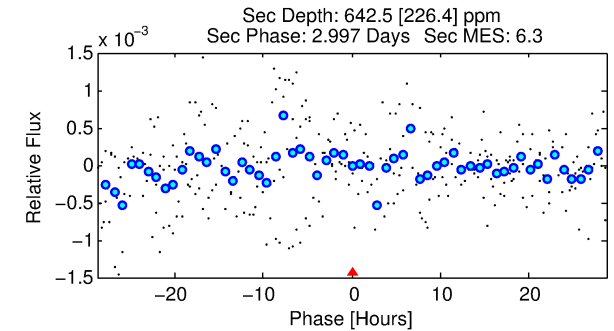
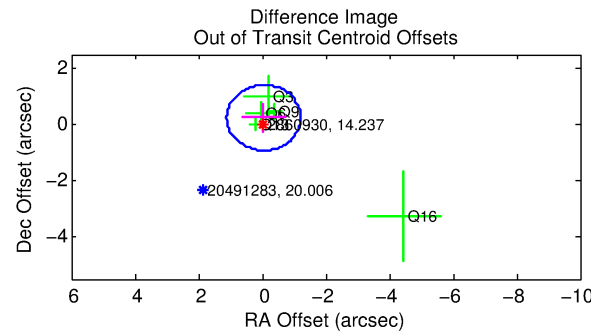
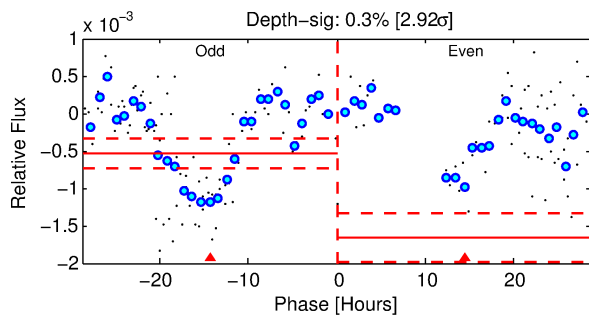
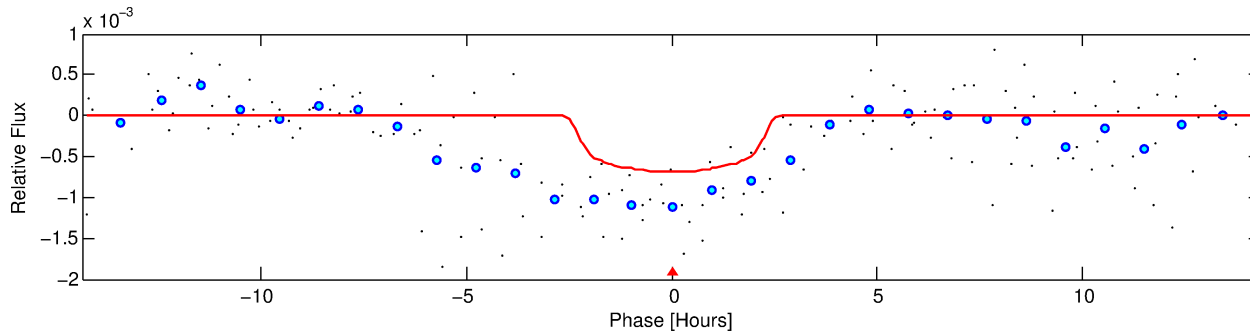
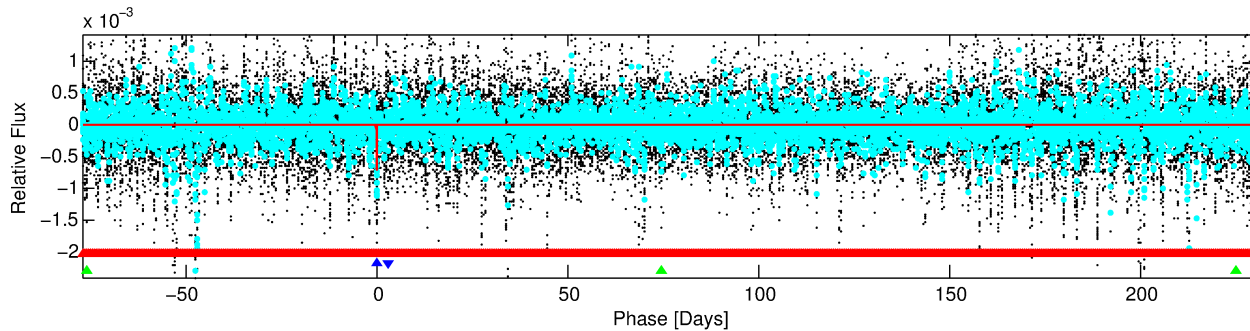
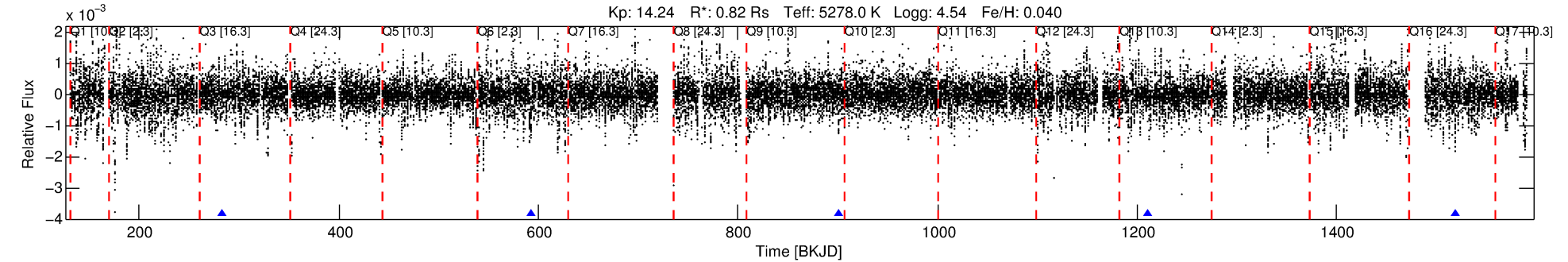
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002860930-02

No Significant Match Found

# DV One-Page Summary

KIC: 2860930 Candidate: 2 of 3 Period: 308.881 d



## DV Fit Results:

Period = 308.88140 [0.00598] d  
Epoch = 283.7601 [0.0165] BKJD  
Rp/R\* = 0.0245 [0.0625]  
a/R\* = 427.04 [4020.28]  
b = 0.55 [12.32]  
Seff = 0.65 [0.09]  
Teq = 229 [8] K  
Rp = 2.20 [5.63] Re  
a = 0.8509 [0.0644] AU  
Ag = 52634.19 [269244.16] [0.20 $\sigma$ ]  
Teffp = 5369 [6865] K [0.75 $\sigma$ ]

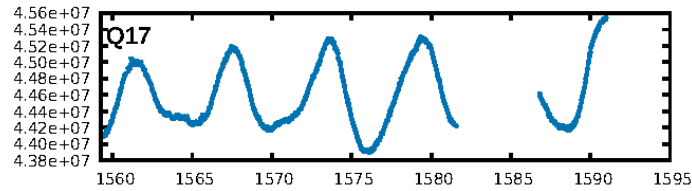
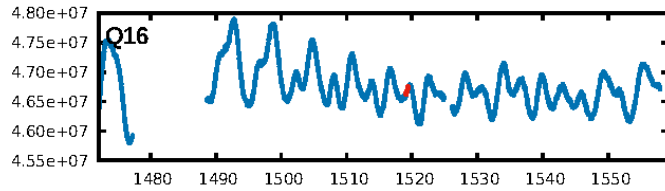
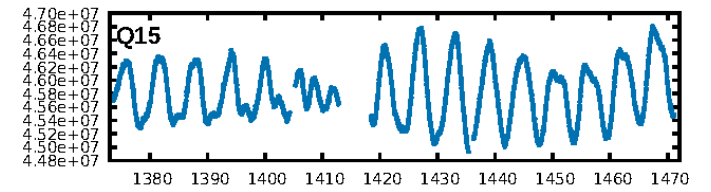
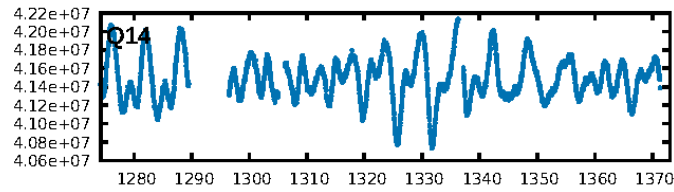
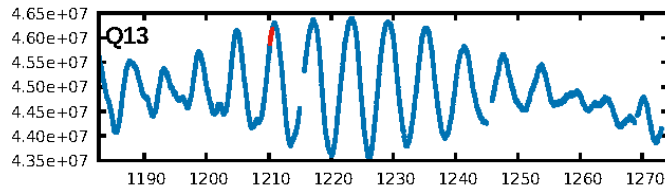
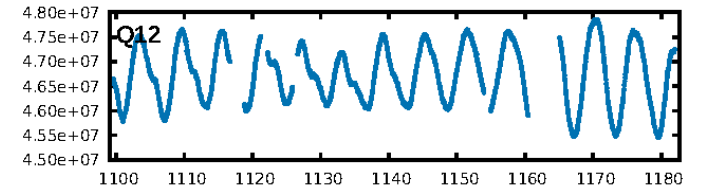
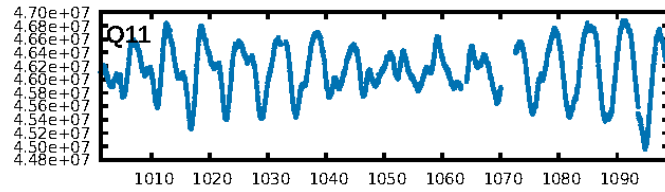
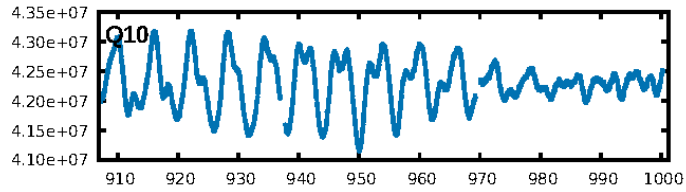
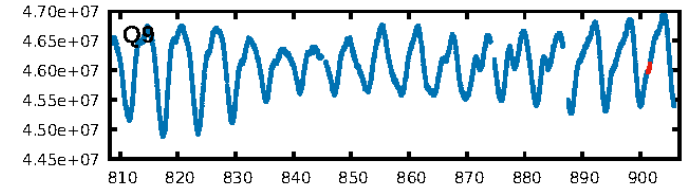
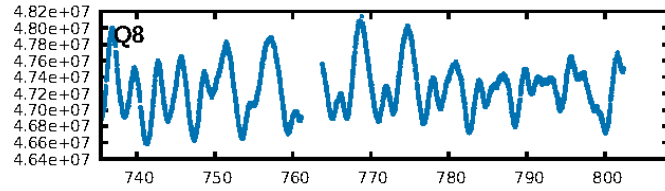
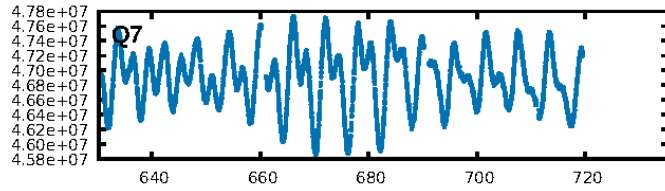
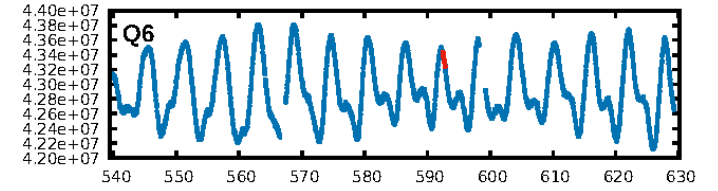
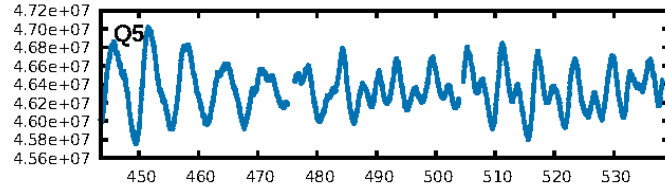
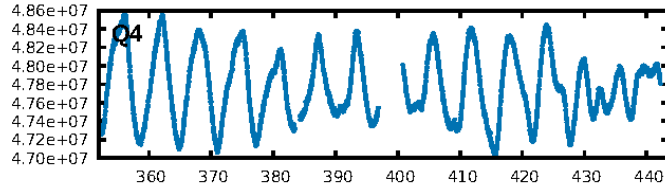
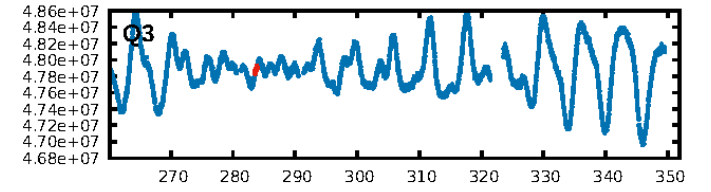
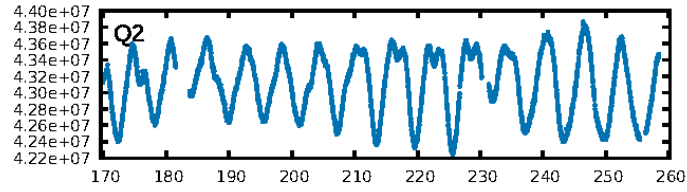
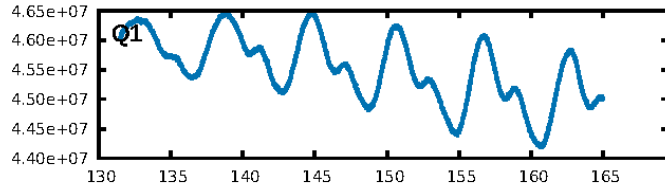
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1216.97 $\sigma$ ]  
LongPeriod-sig: 100.0% [743.02 $\sigma$ ]  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 69.6%  
**Bootstrap-pfa: 8.50e-10**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -3.546**  
Centroid-sig: 56.7%  
Centroid-so: 1.033 arcsec [1.13 $\sigma$ ]  
OotOffset-rm: 0.245 arcsec [0.63 $\sigma$ ]  
KicOffset-rm: 0.249 arcsec [0.24 $\sigma$ ]  
OotOffset-st: 1/1/1/2 [5]  
KicOffset-st: 1/1/1/2 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.20 [1/5]

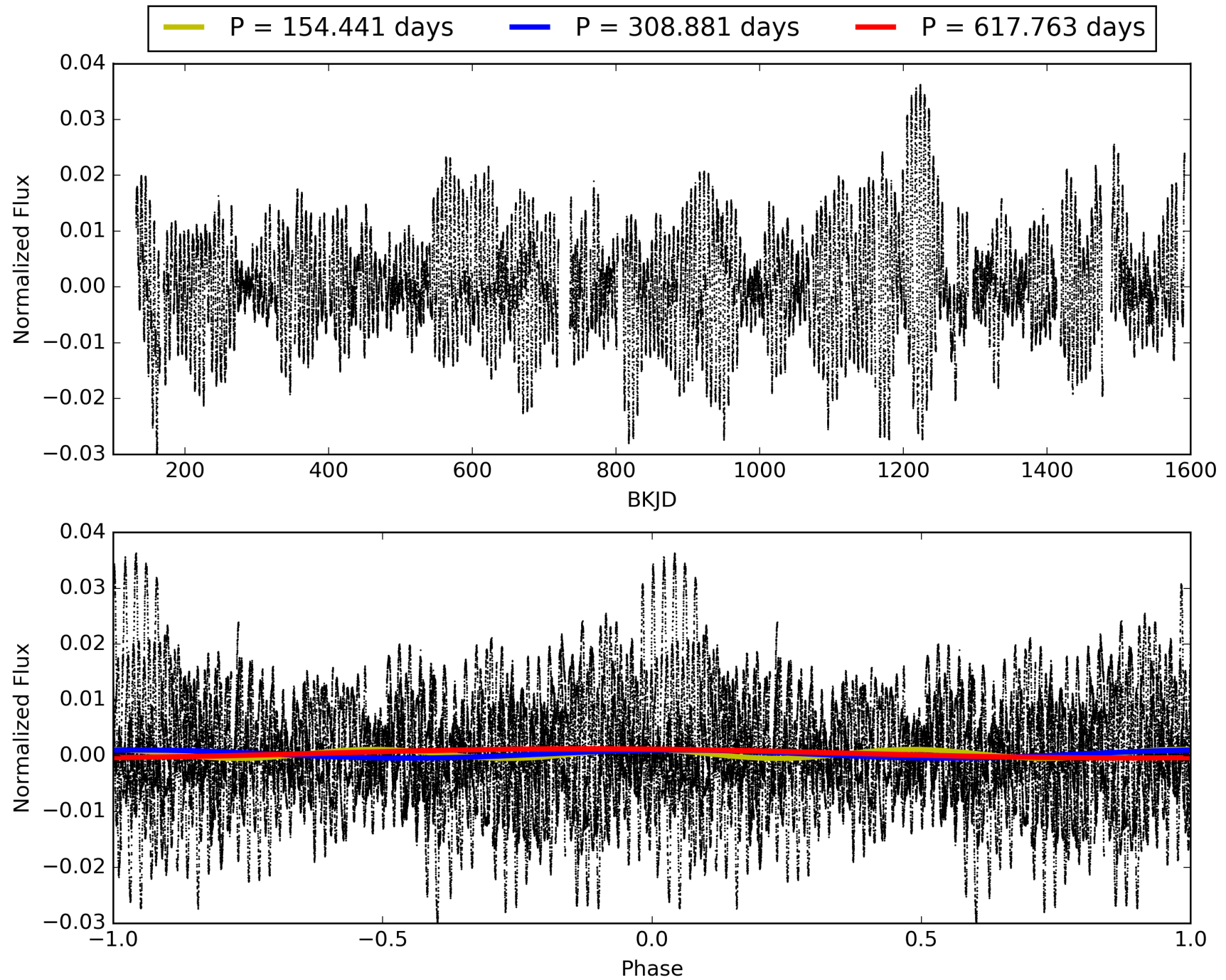
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:54:21 Z

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

# TCE 002860930-02, PDC Light Curves



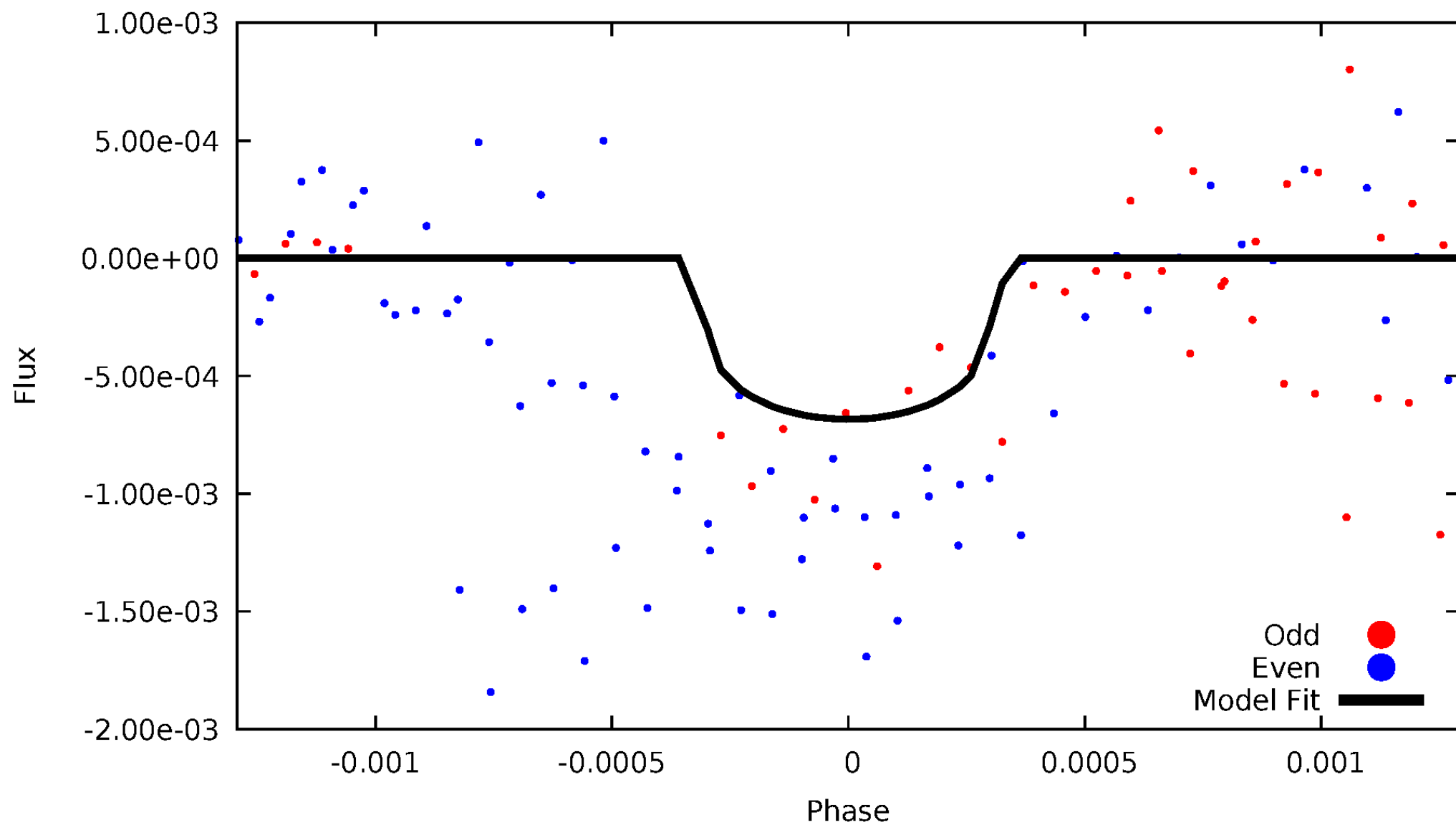
# TCE 002860930-02





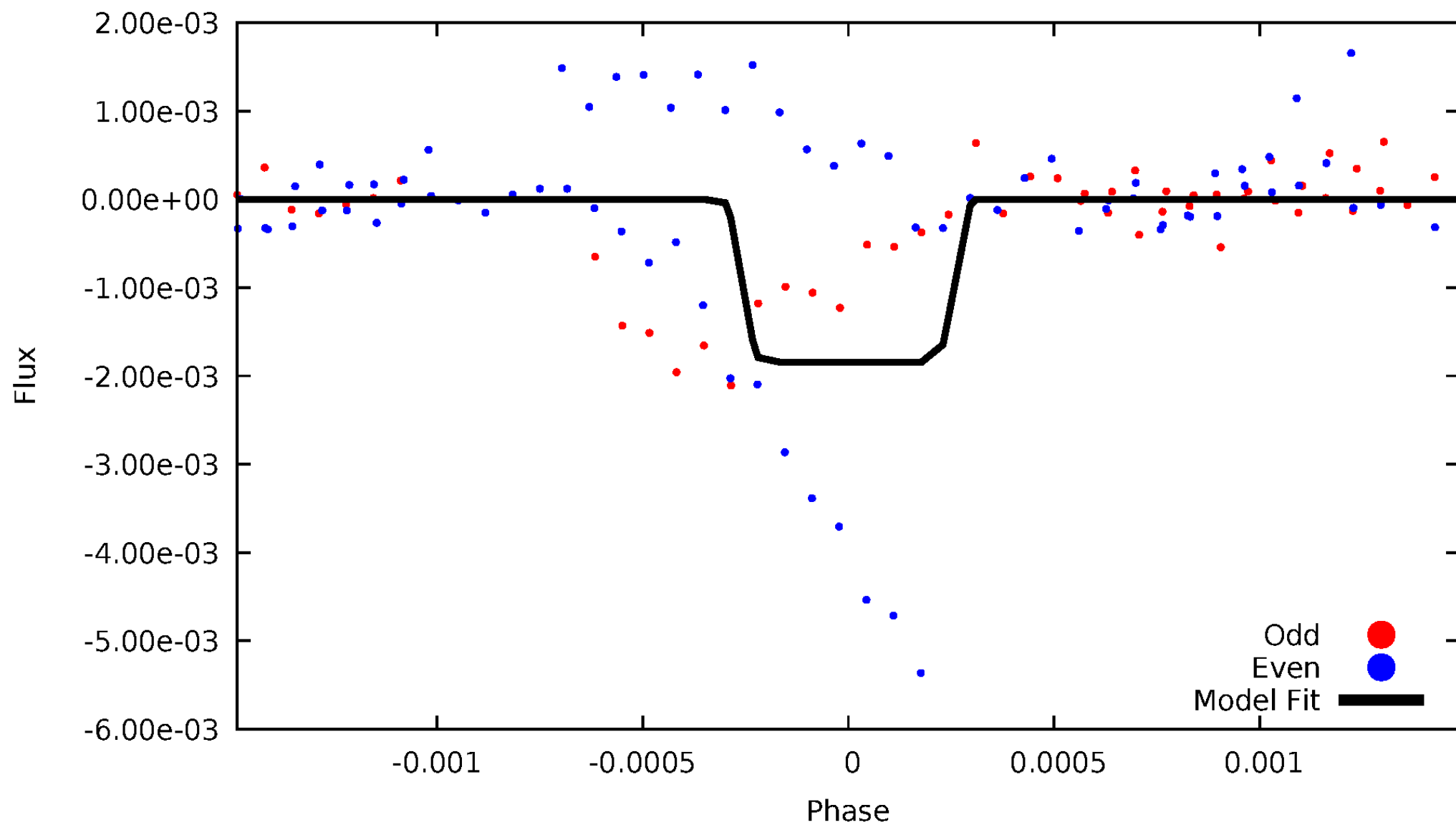
# DV Odd/Even

TCE 002860930-02



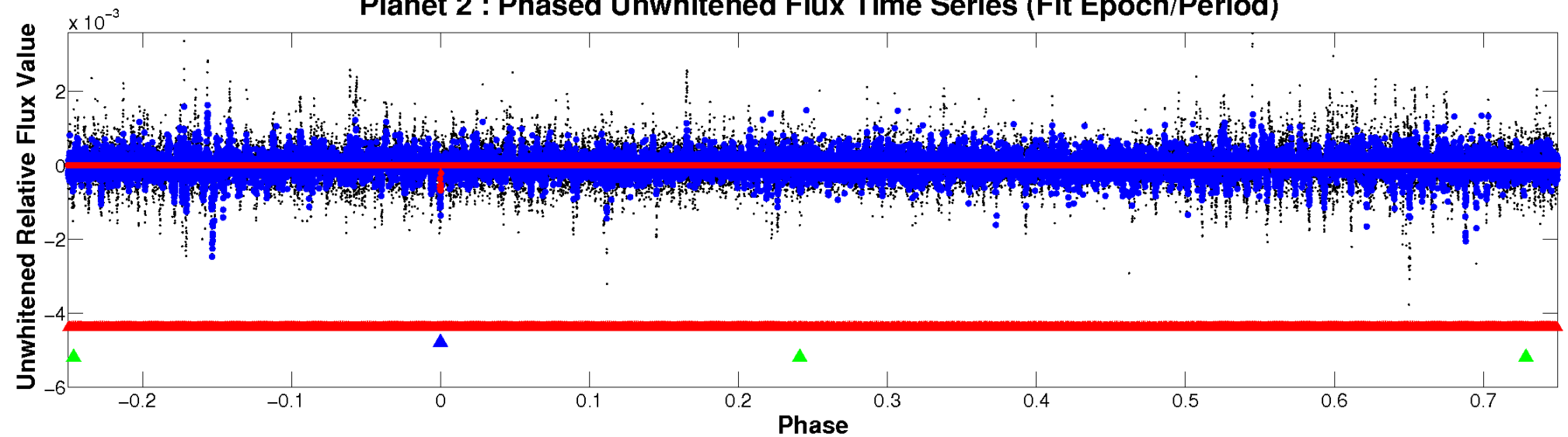
# ALT Odd/Even

TCE 002860930-02

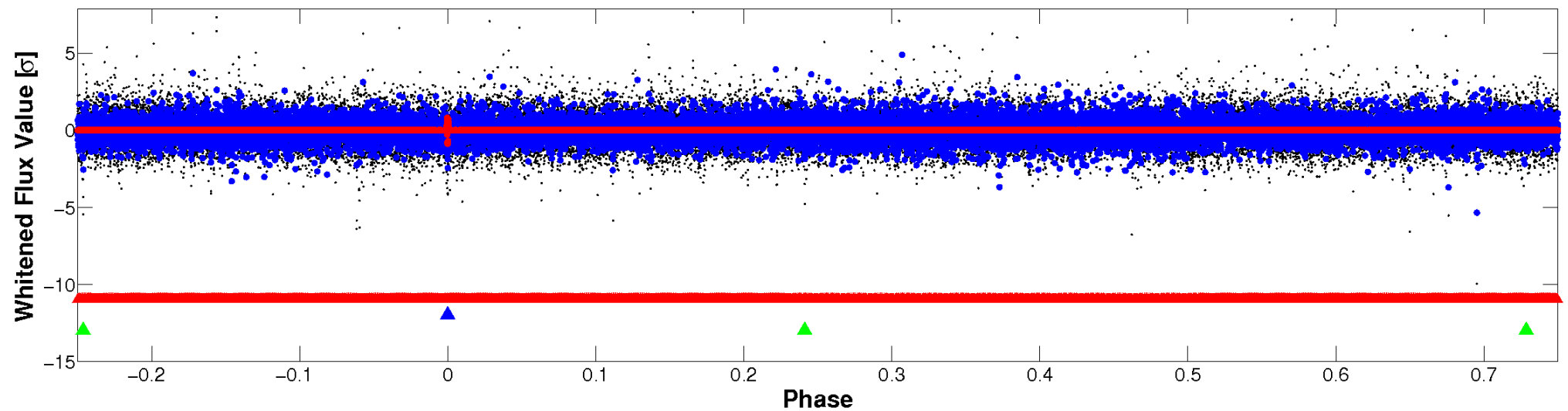


# Non-Whitened Vs. Whitened Light Curve

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

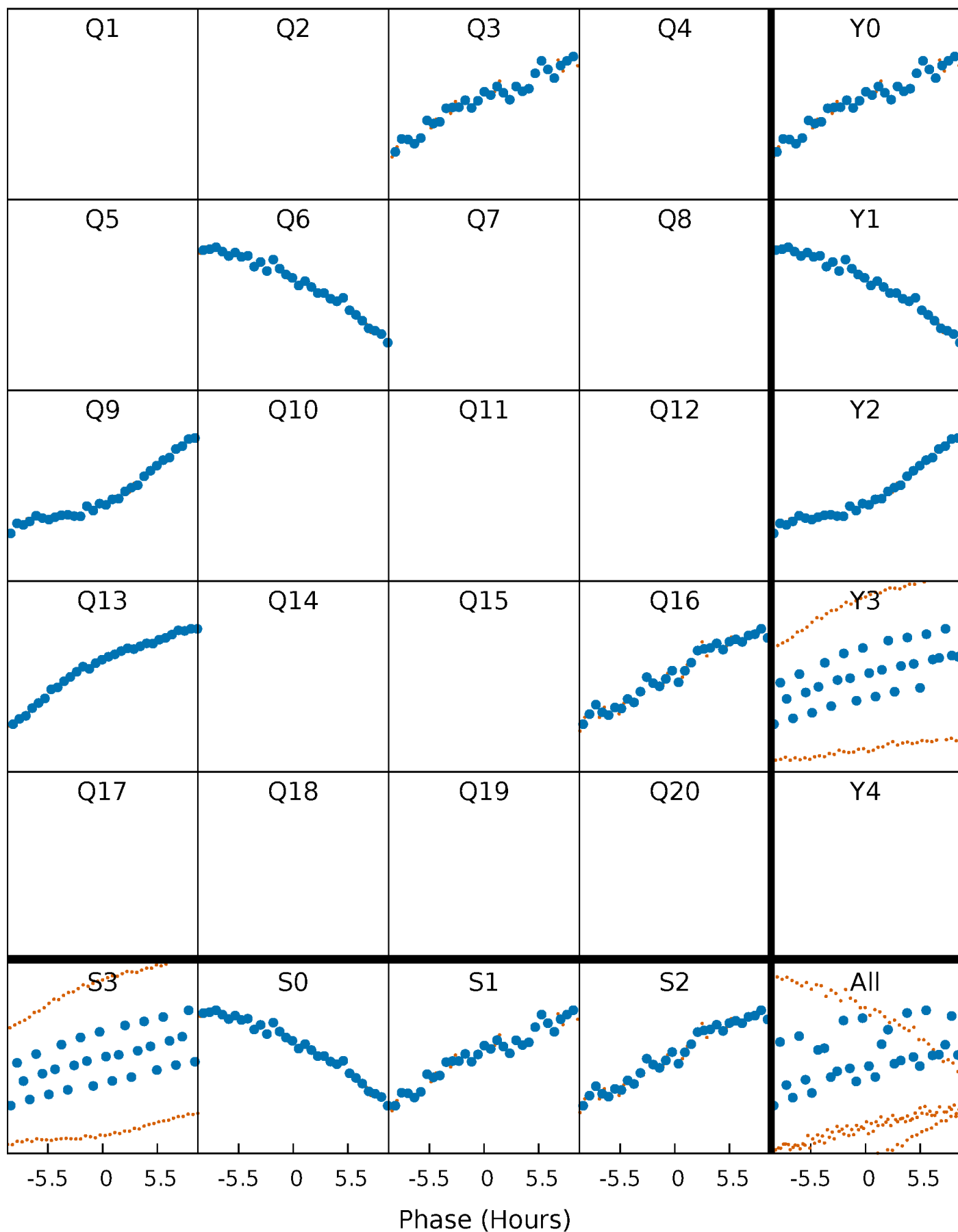


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



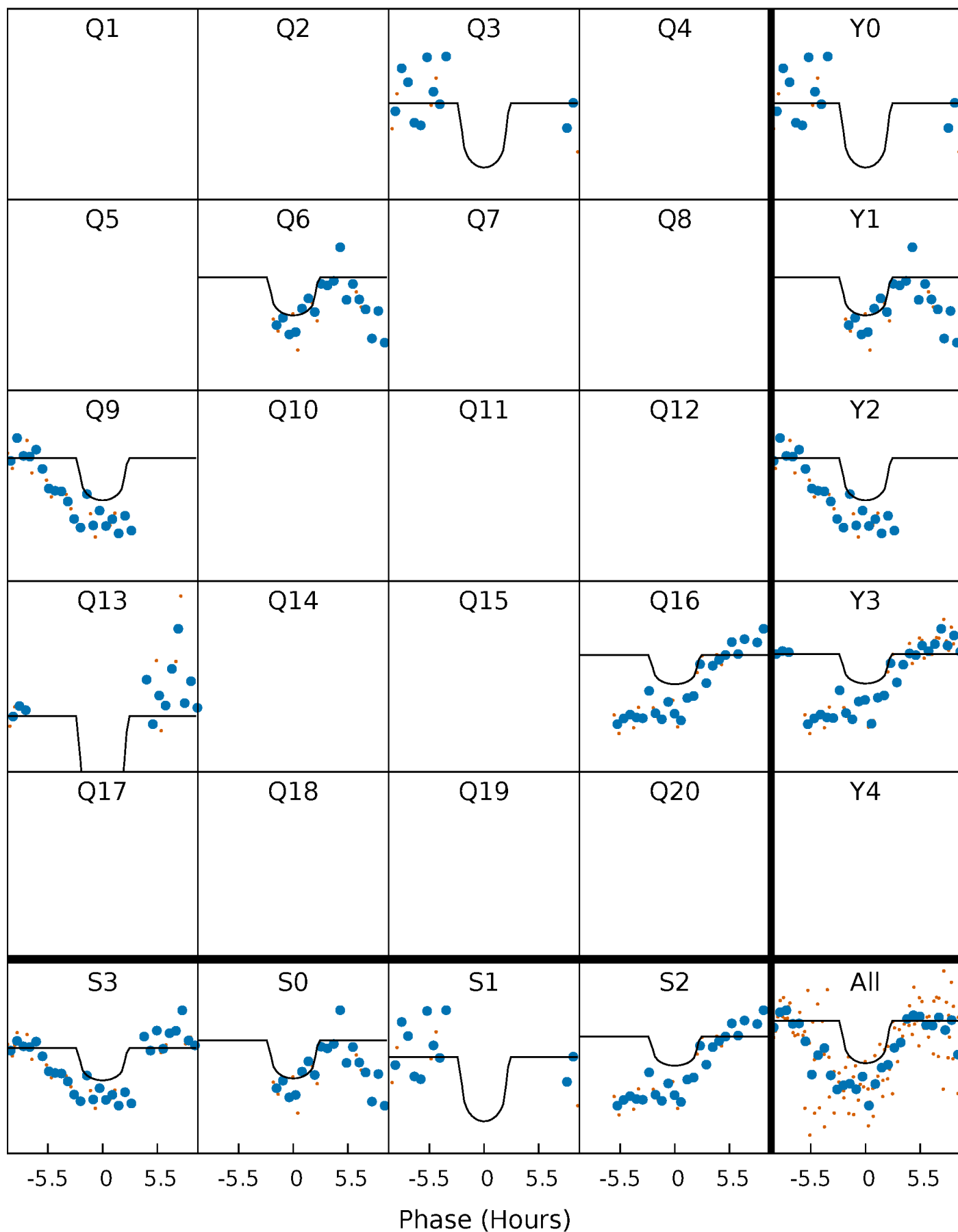
# PDC Quarter-Phased Transit Curves

TCE 002860930-02     $P=308.881403$  Days     $T_0=283.760098$  (BKJD)



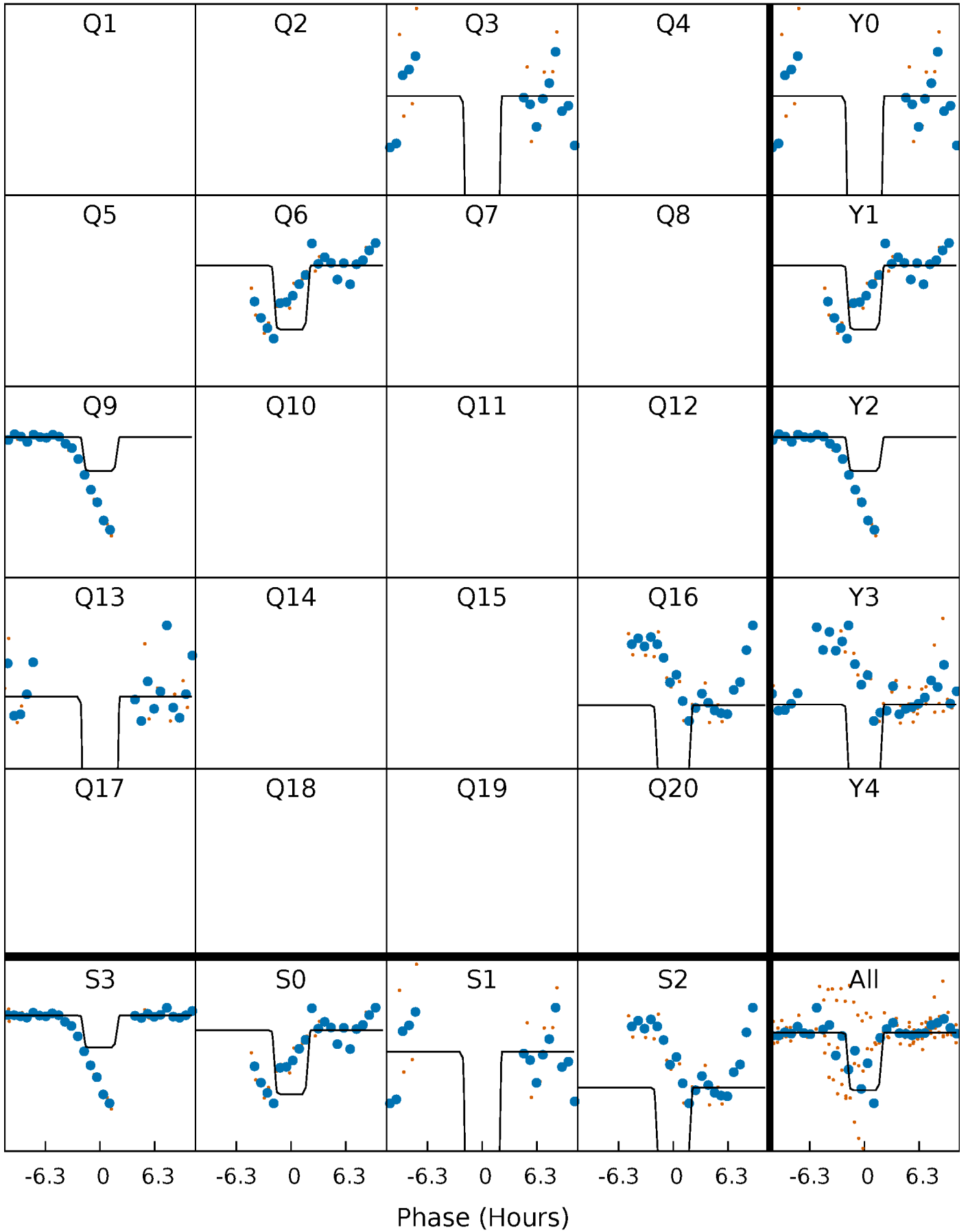
# DV Quarter-Phased Transit Curves

TCE 002860930-02 P=308.881403 Days  $T_0=283.760098$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

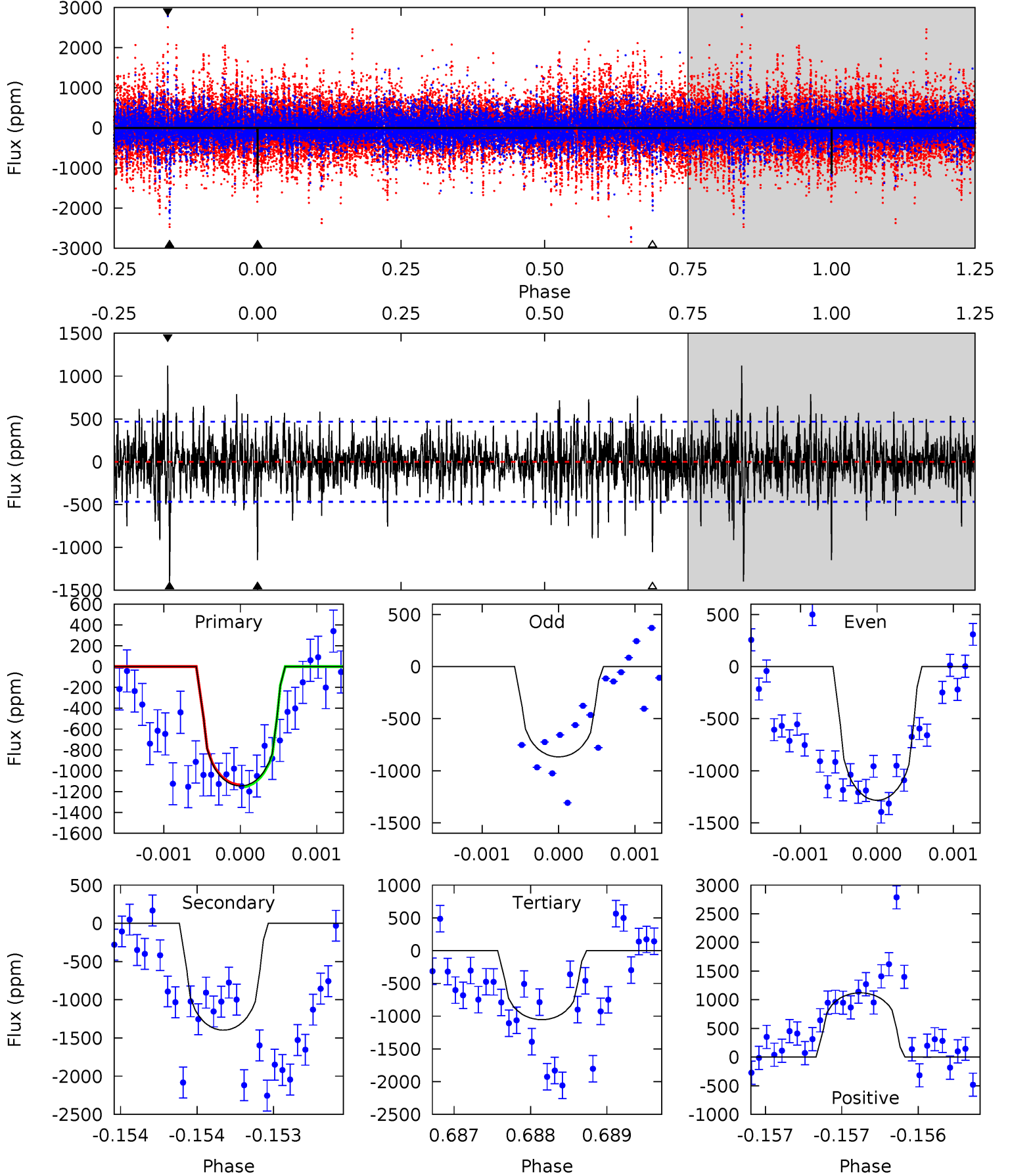
TCE 002860930-02 P=308.832826 Days  $T_0=283.915574$  (BKJD)



# DV Model-Shift Uniqueness Test

002860930-02, P = 308.881403 Days, E = 283.760098 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
13.6	16.6	12.5	13.3	5.54	3.42	2.49	1.09	0.29	4.07	3.28	2.26	1.01	0.45	0.12

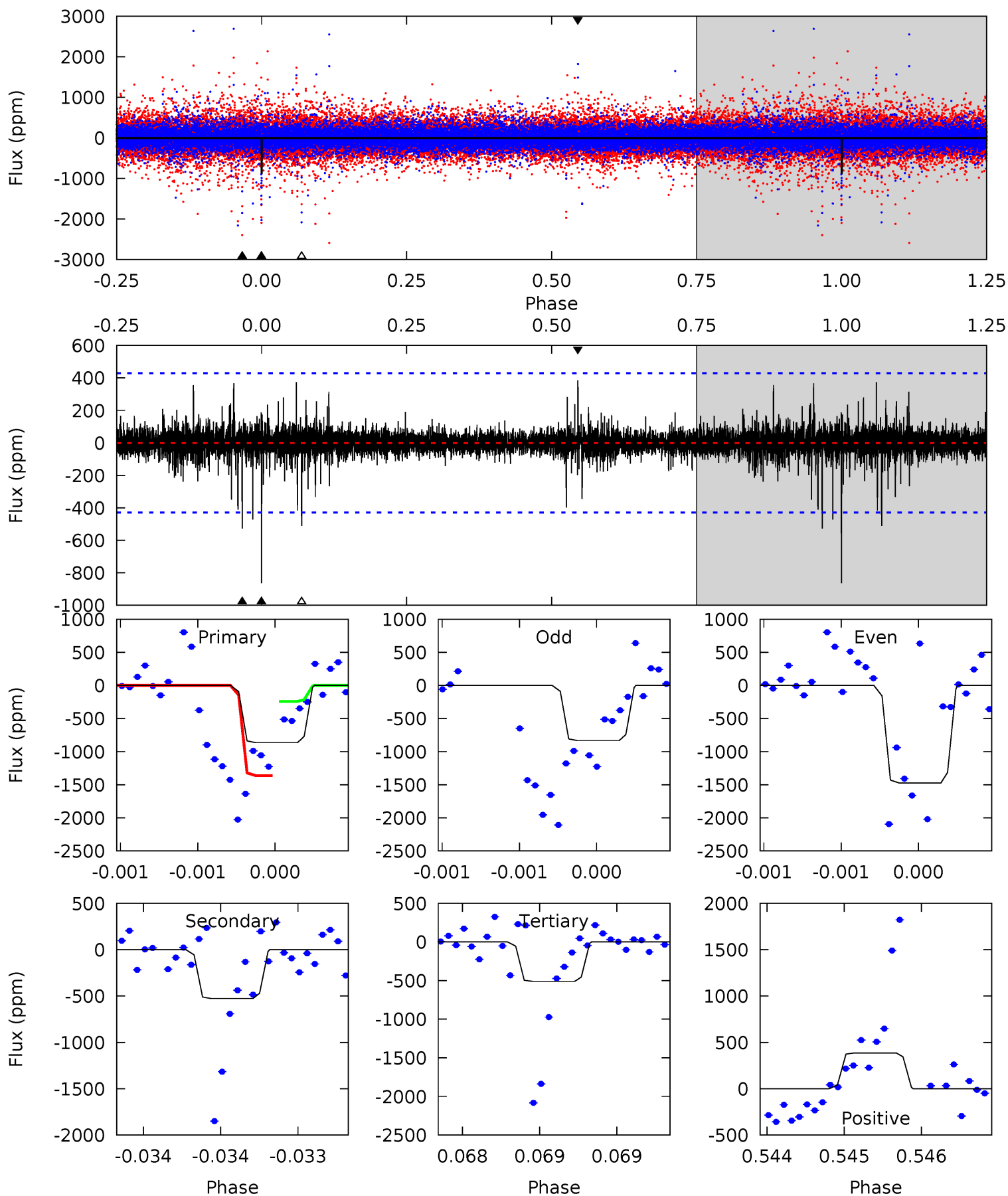




# Alt Model-Shift Uniqueness Test

002860930-02, P = 308.832826 Days, E = 283.915574 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
11.1	6.80	6.59	4.97	5.54	3.43	0.67	4.55	6.18	0.21	1.83	4.74	1.68	0.31	7.51



### Stellar Parameters For KIC 002860930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5278^{+84}_{-73}$	$4.540^{+0.035}_{-0.070}$	$0.040^{+0.150}_{-0.150}$	$0.825^{+0.066}_{-0.039}$	$0.862^{+0.048}_{-0.048}$	$2.161^{+0.295}_{-0.425}$
	+2%/-1%	+1%/-2%	+375%/-375%	+8%/-5%	+6%/-6%	+14%/-20%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 002860930-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1398 \pm 84$	$4.88^{+4.70}_{-3.23}$	$322^{+9}_{-7}$	$4519^{+3181}_{-926}$	$23106^{+177370}_{-16847}$
Alt.	$-527 \pm 78$	$5.87^{+4.58}_{-3.83}$	$322^{+8}_{-7}$	$3581^{+1765}_{-587}$	$6216^{+43322}_{-4314}$

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

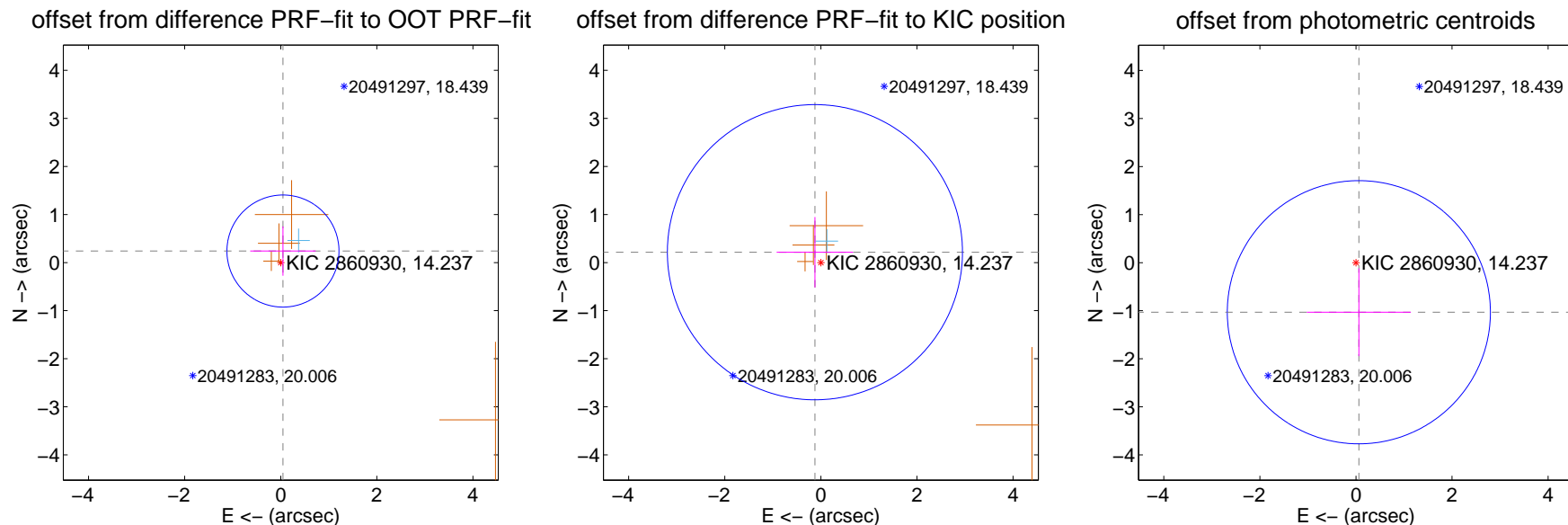
## DV Centroid Data

Supplemental centroid analysis for 002860930-02. Kepler magnitude: 14.24. Transit SNR 4.67

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.245 \pm 0.389$	0.63	$-0.046 \pm 0.682$	$0.240 \pm 0.513$
PRF-fit source offset from KIC position	$0.249 \pm 1.023$	0.24	$0.124 \pm 0.795$	$0.216 \pm 0.732$
photometric centroid source offset	$1.03 \pm 0.91$	1.13	$-0.06 \pm 1.08$	$-1.03 \pm 0.91$



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.

Q1 no difference image



Q1 no OOT image



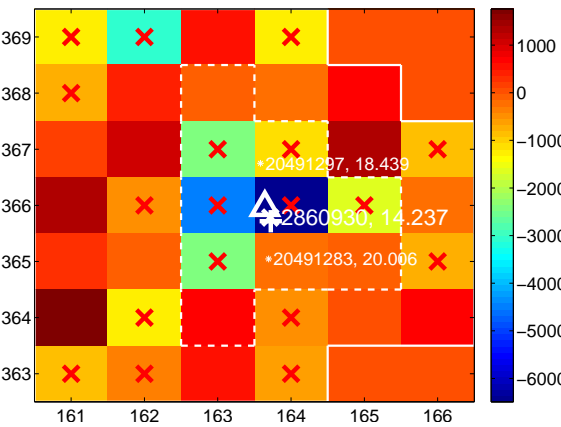
Q2 no difference image



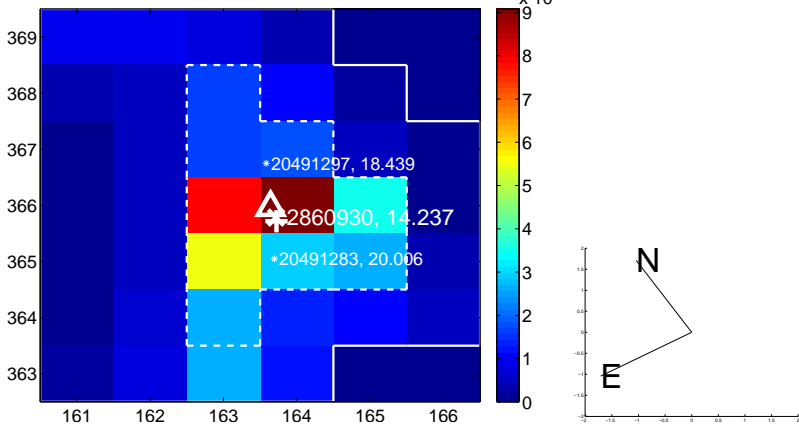
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



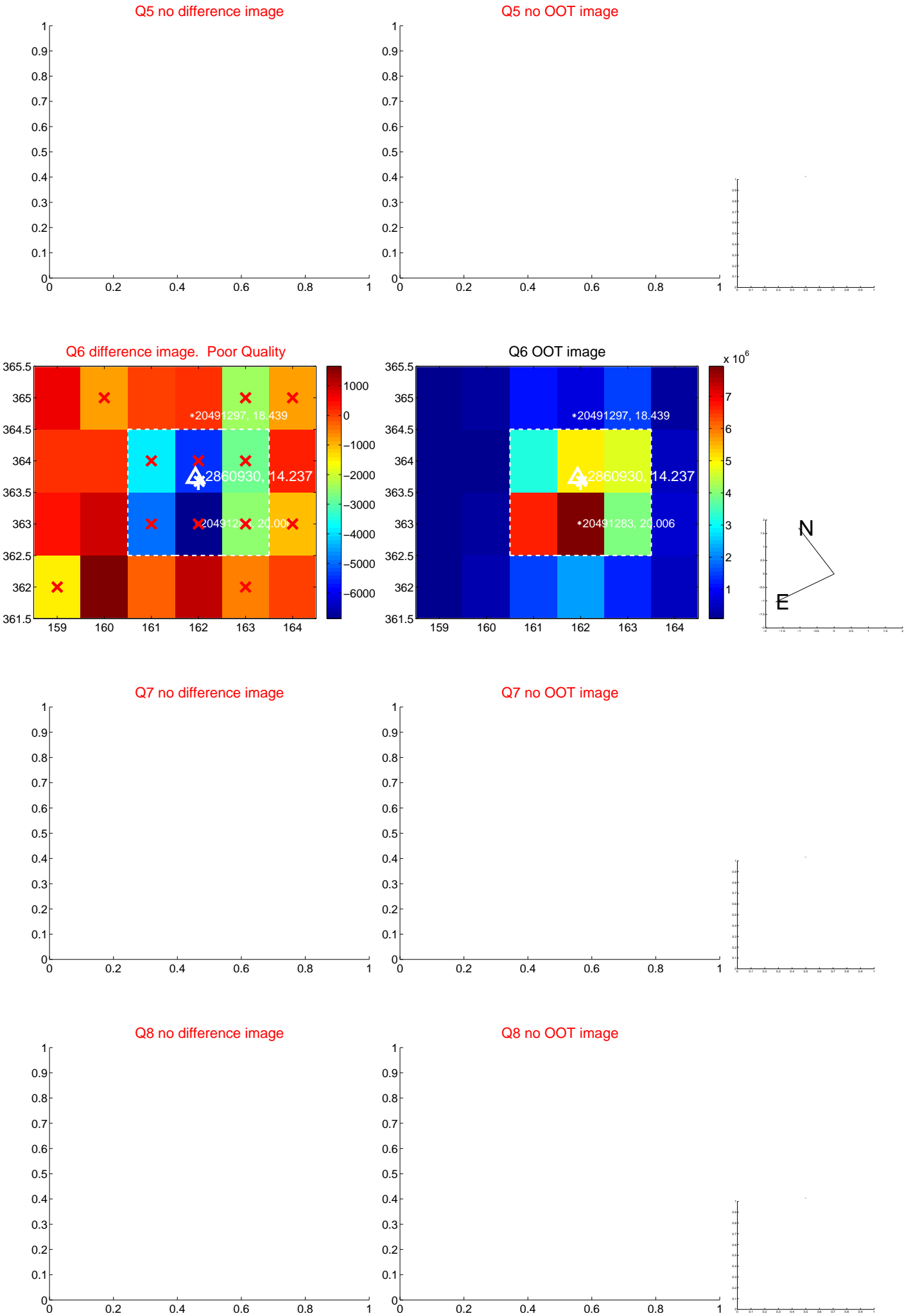
Q4 no difference image



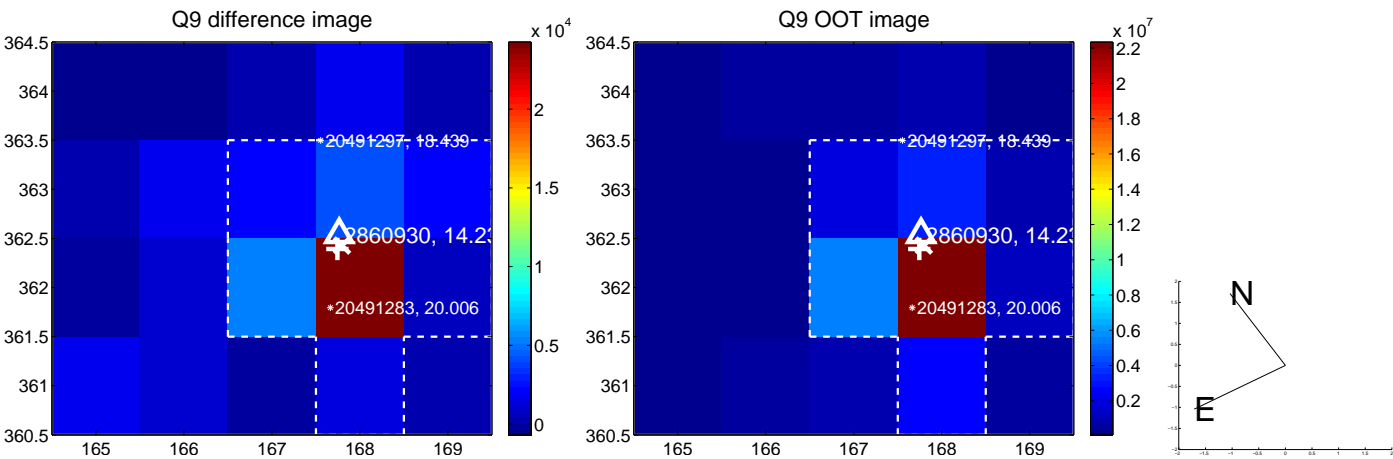
Q4 no OOT image



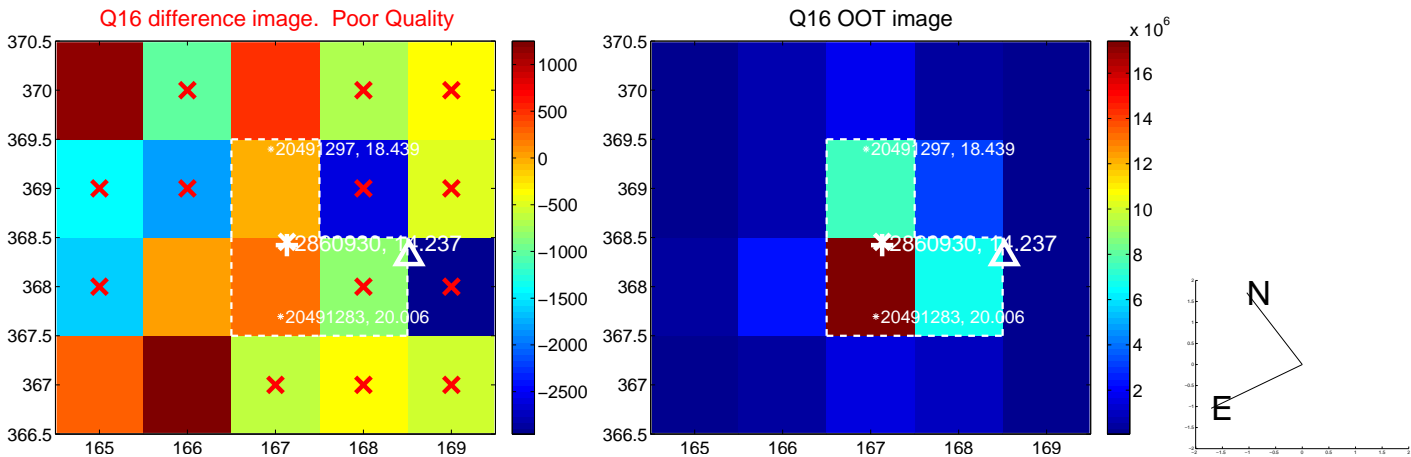
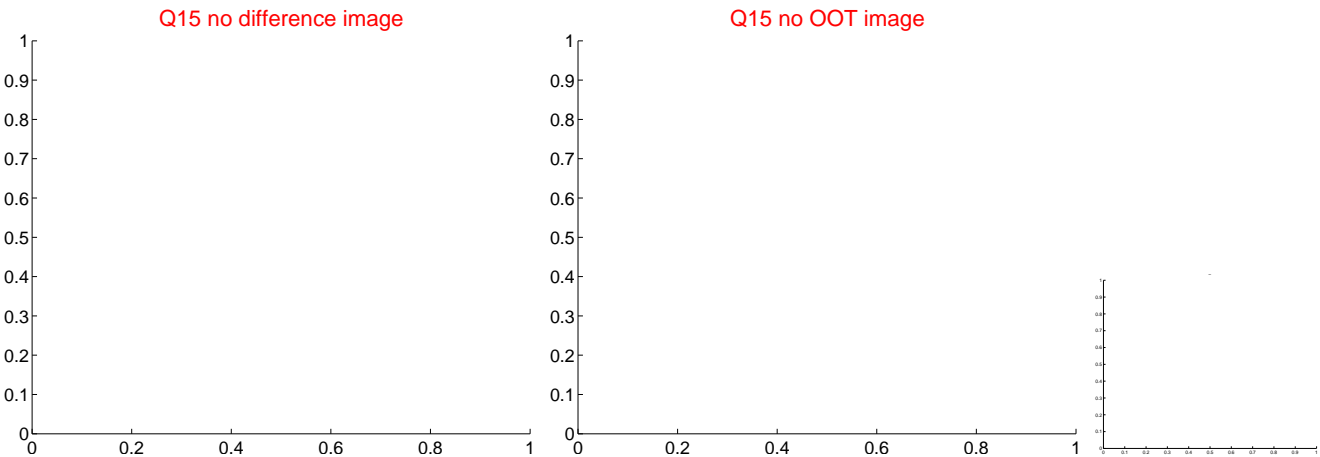
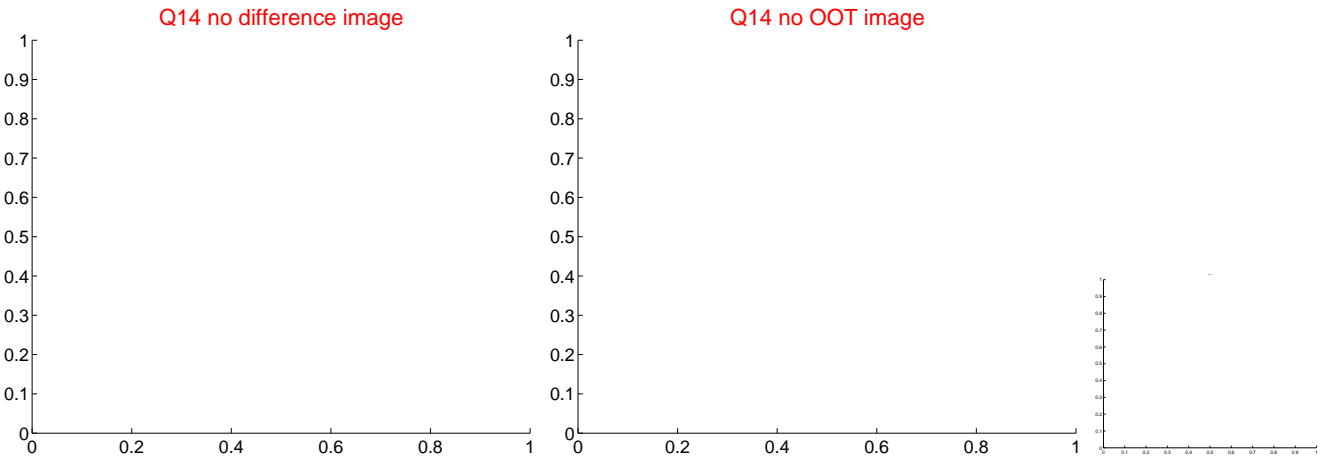
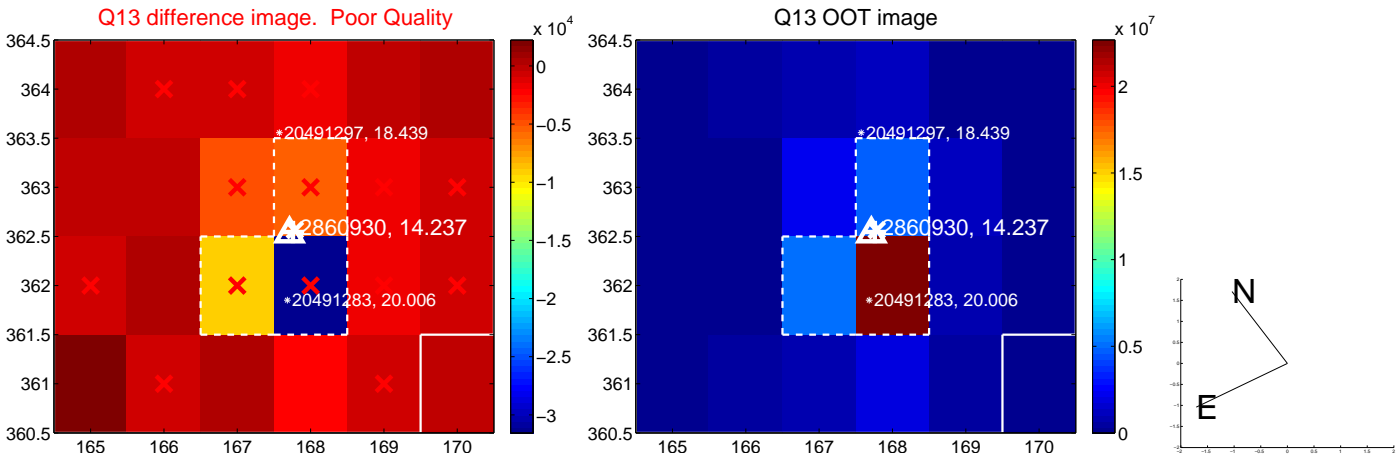
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

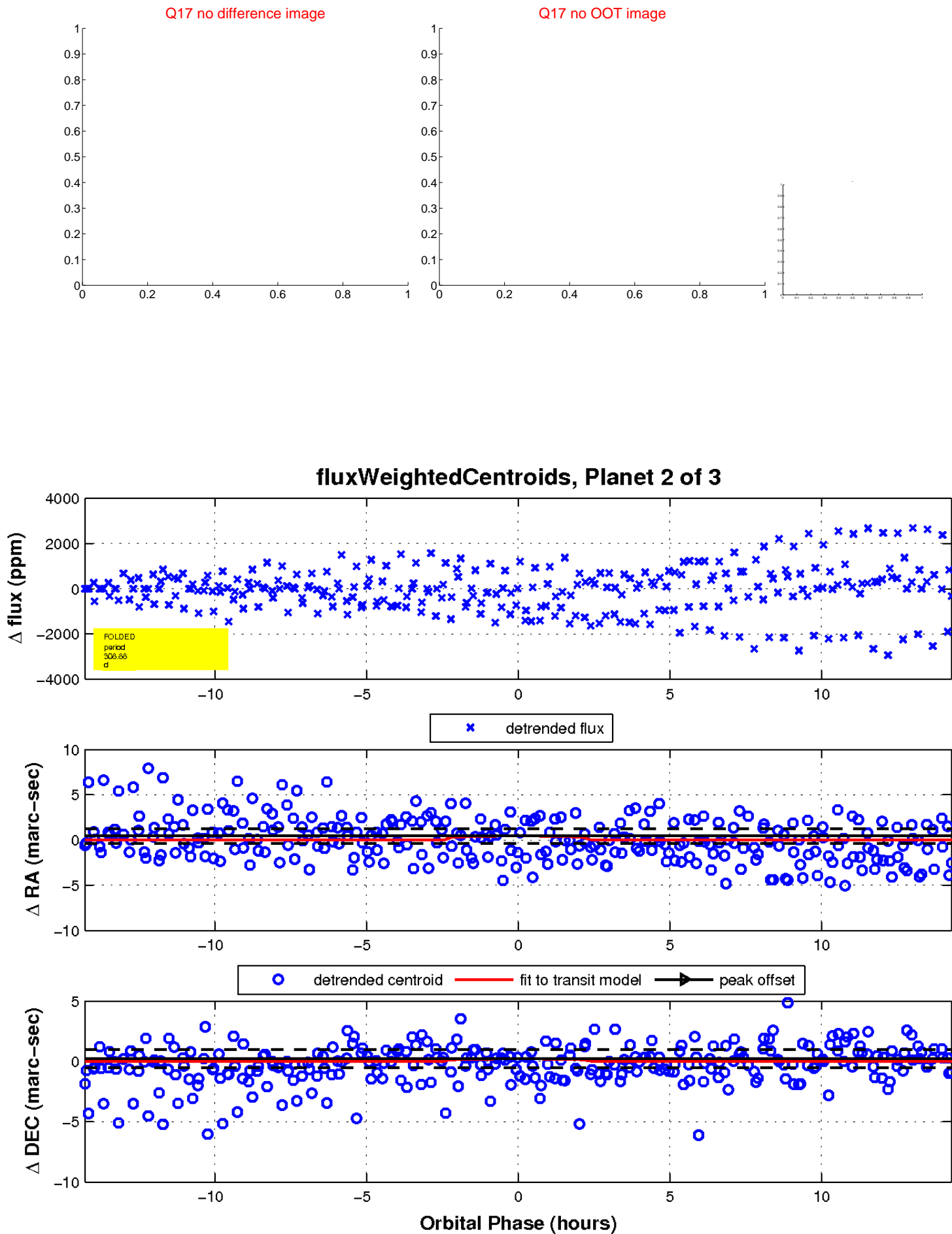


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



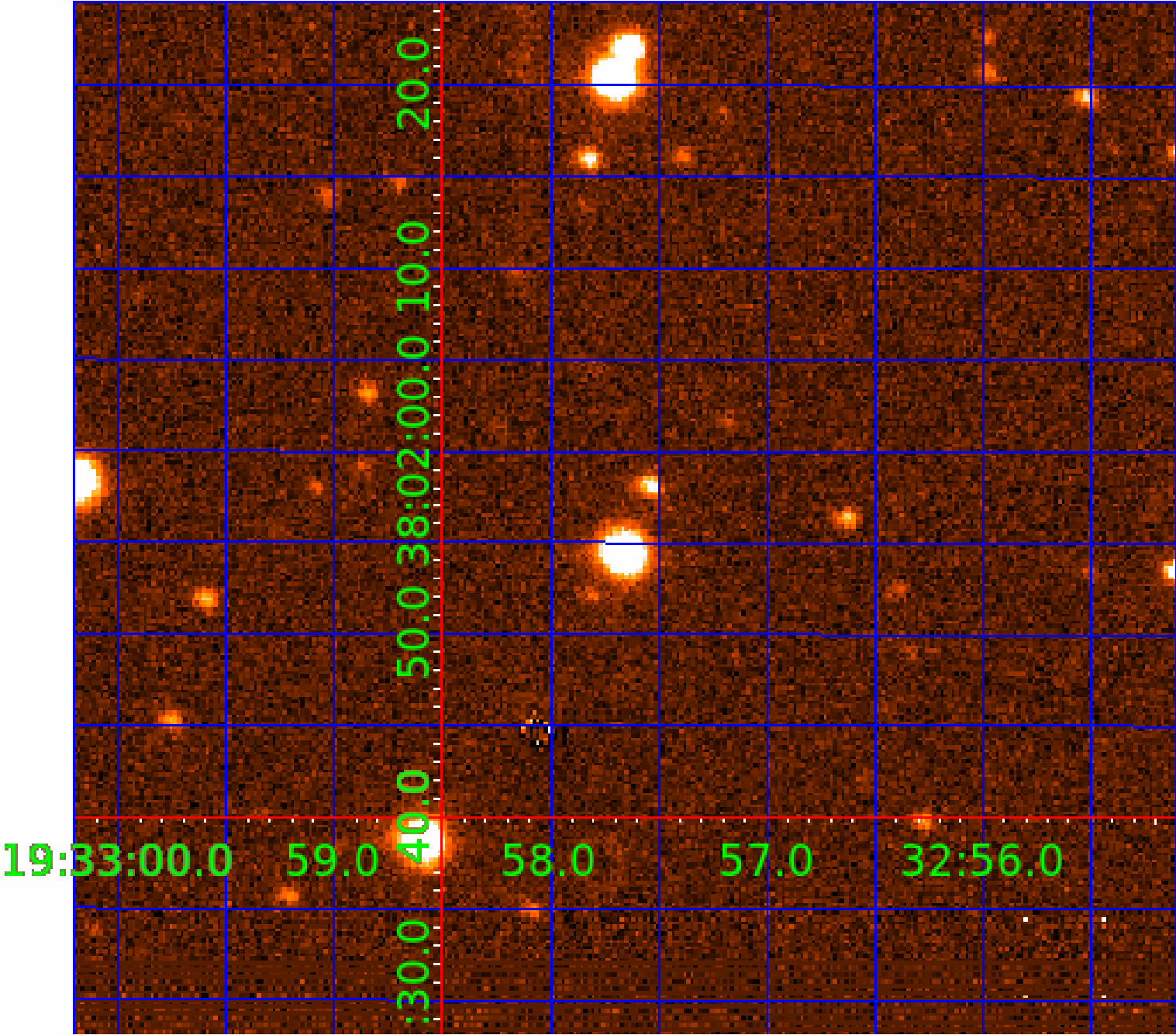


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002860930

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002860930-01	OBS	No	1.129841	132.457342	50.6	3.729	8.3	8.8	0.82	5278	0.72	1159.80
002860930-02	OBS	No	308.881403	283.760098	683.7	4.789	10.2	4.7	0.82	5278	2.21	0.65
002860930-03	OBS	No	467.205467	199.935928	1091.5	1.795	10.5	7.0	0.82	5278	2.94	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002860930-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002860930-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002860930-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

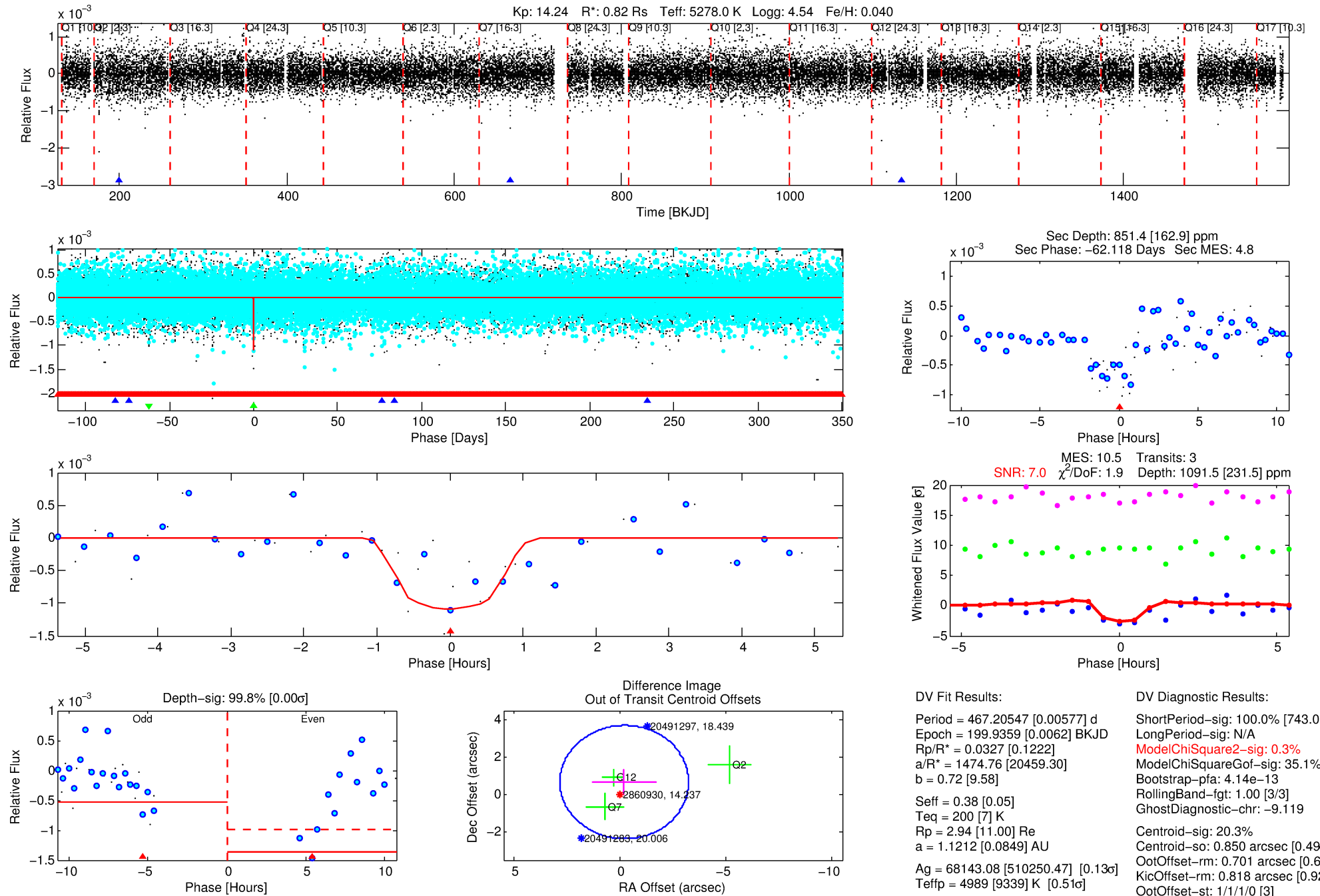
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002860930-03

No Significant Match Found

# DV One-Page Summary

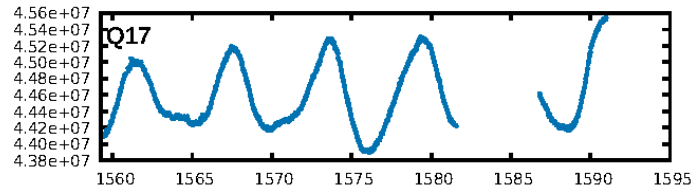
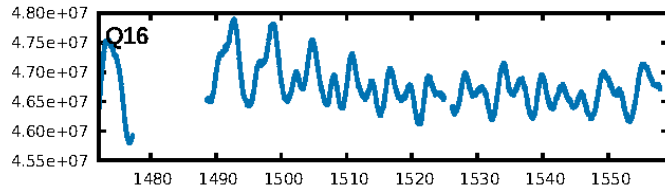
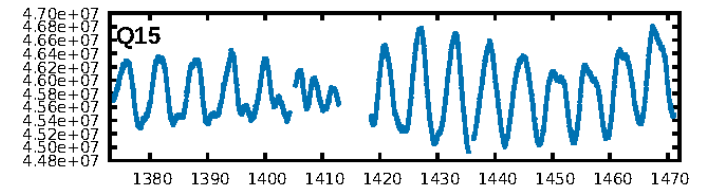
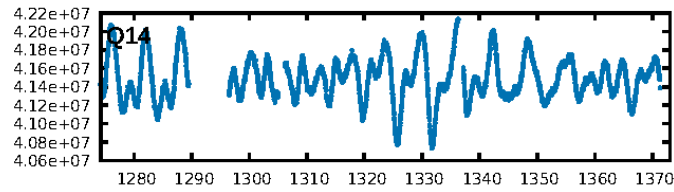
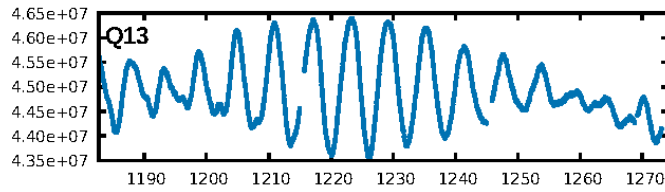
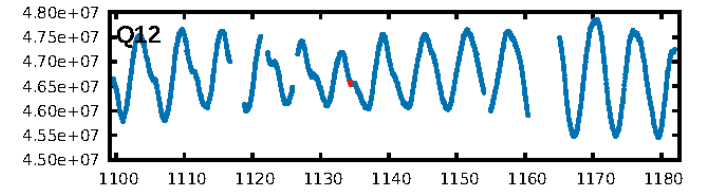
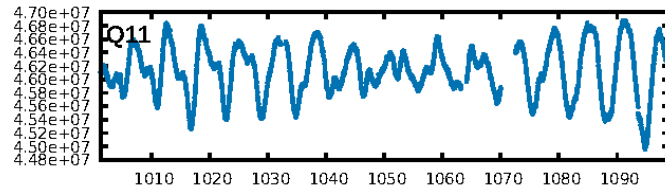
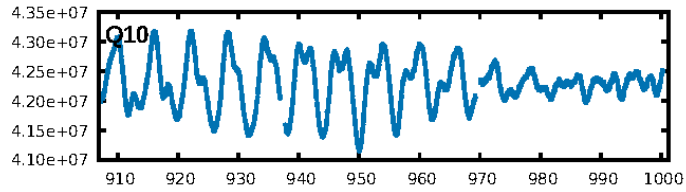
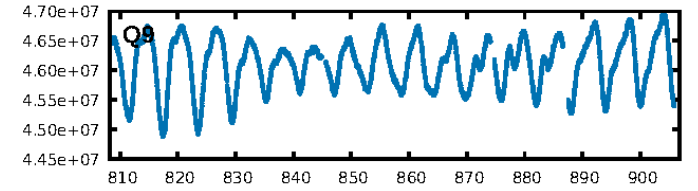
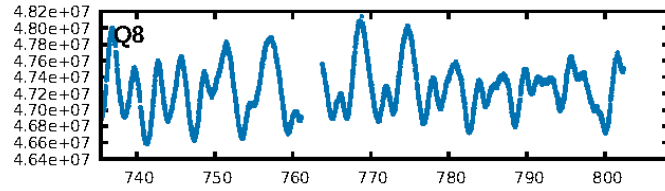
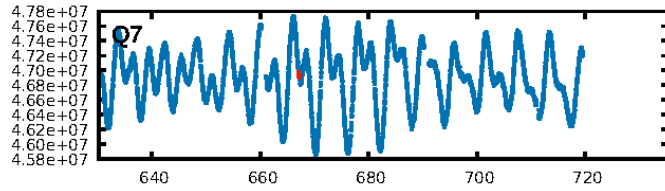
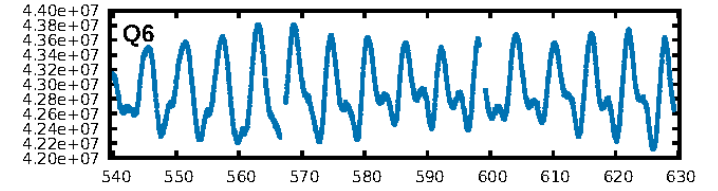
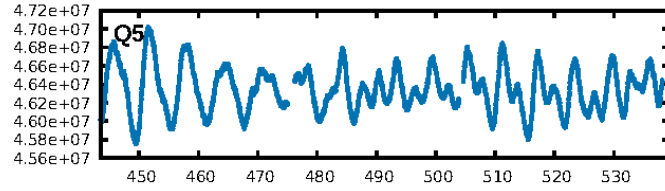
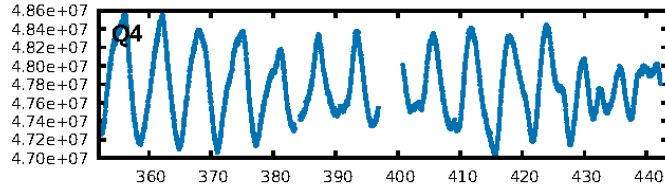
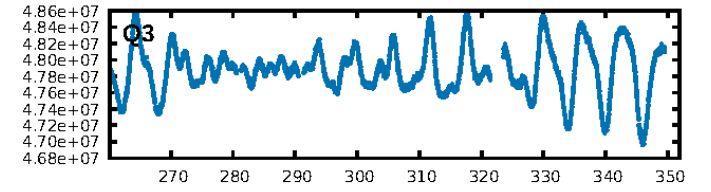
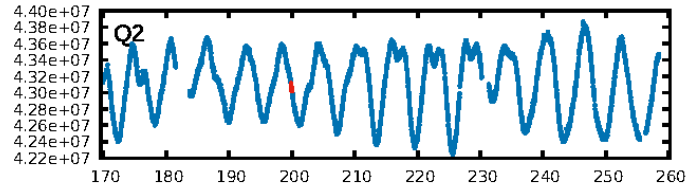
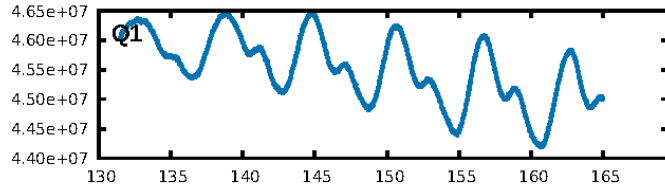
KIC: 2860930 Candidate: 3 of 3 Period: 467.205 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:54:41 Z

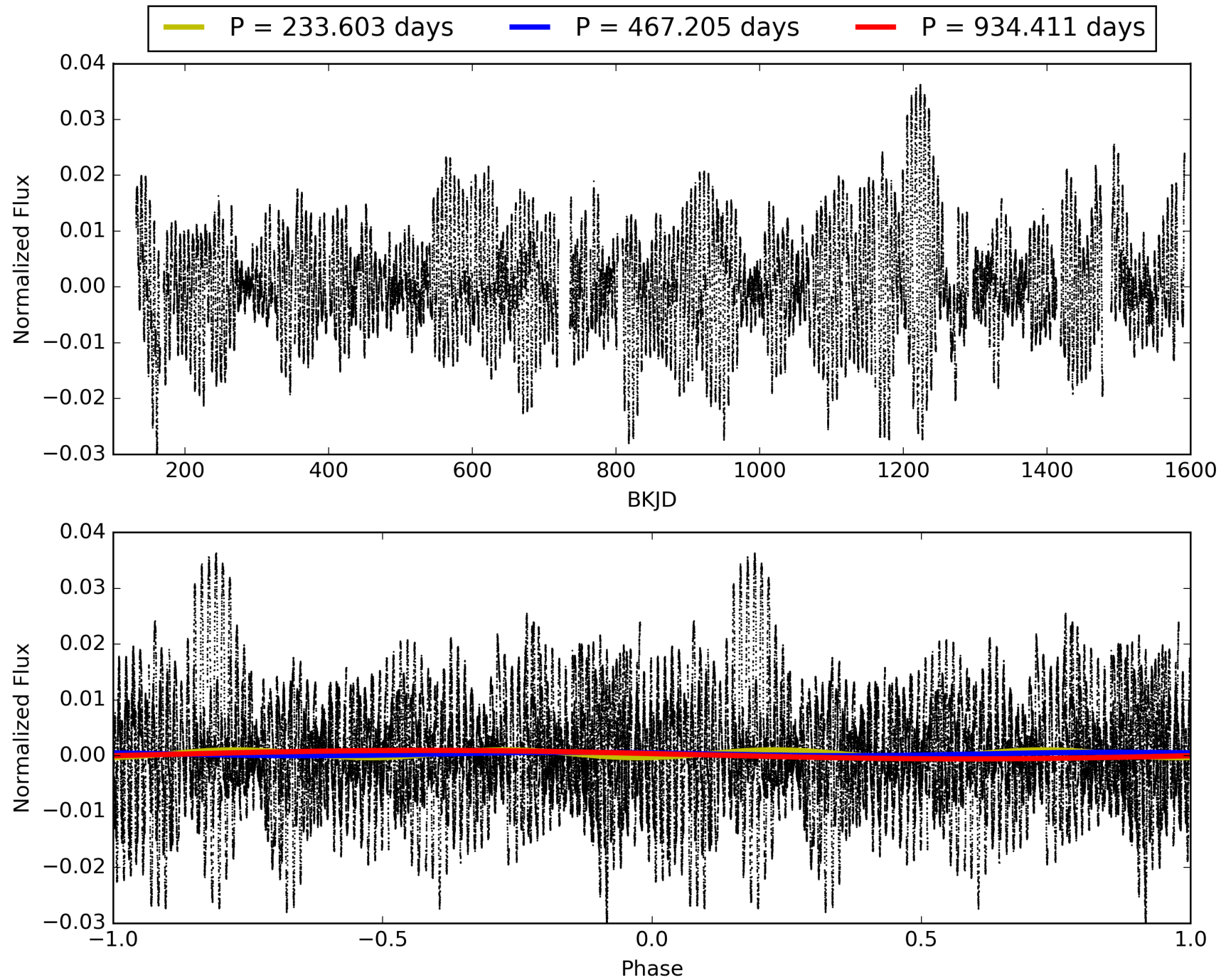
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002860930-03, PDC Light Curves



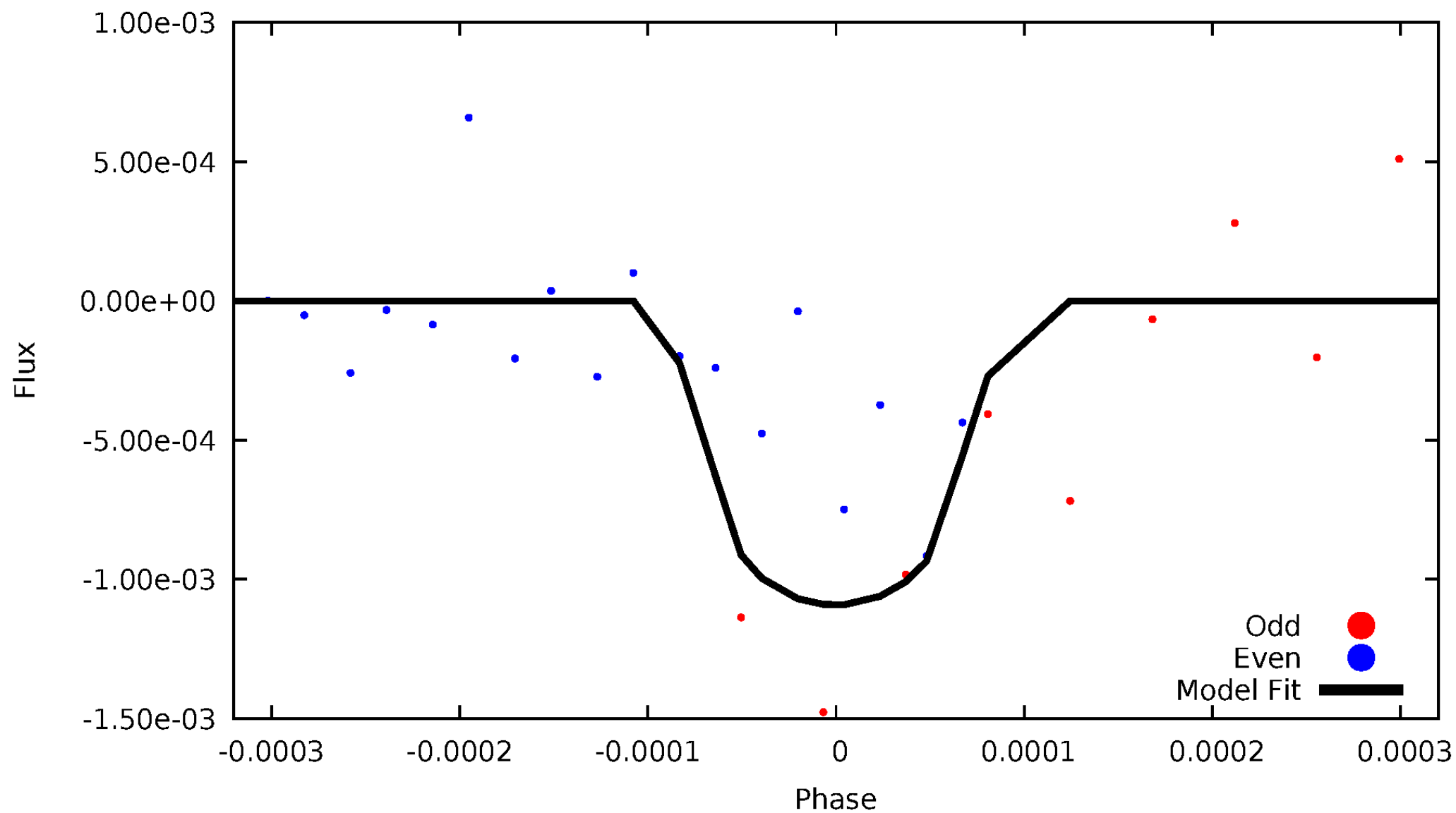


# TCE 002860930-03



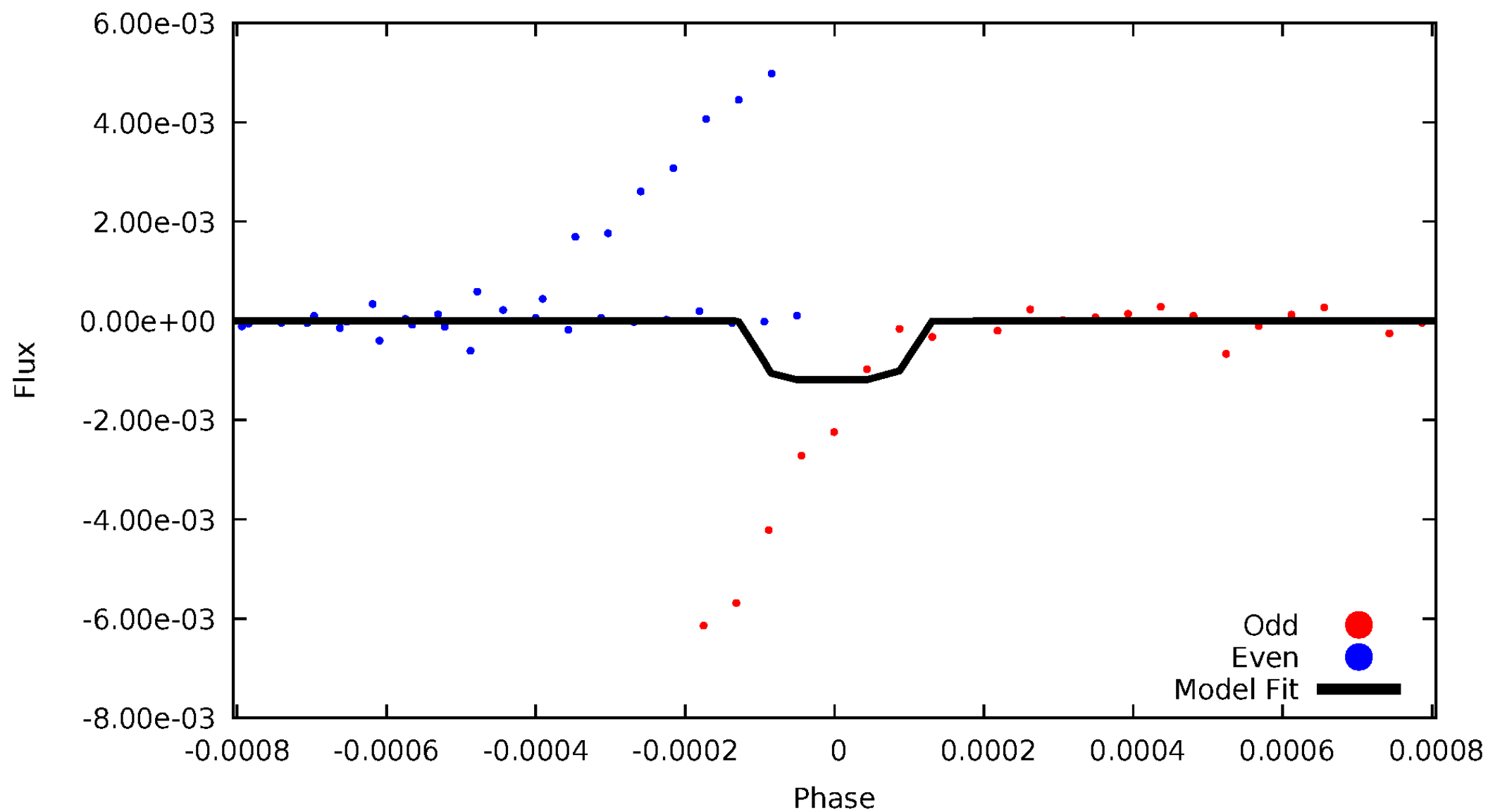
# DV Odd/Even

TCE 002860930-03



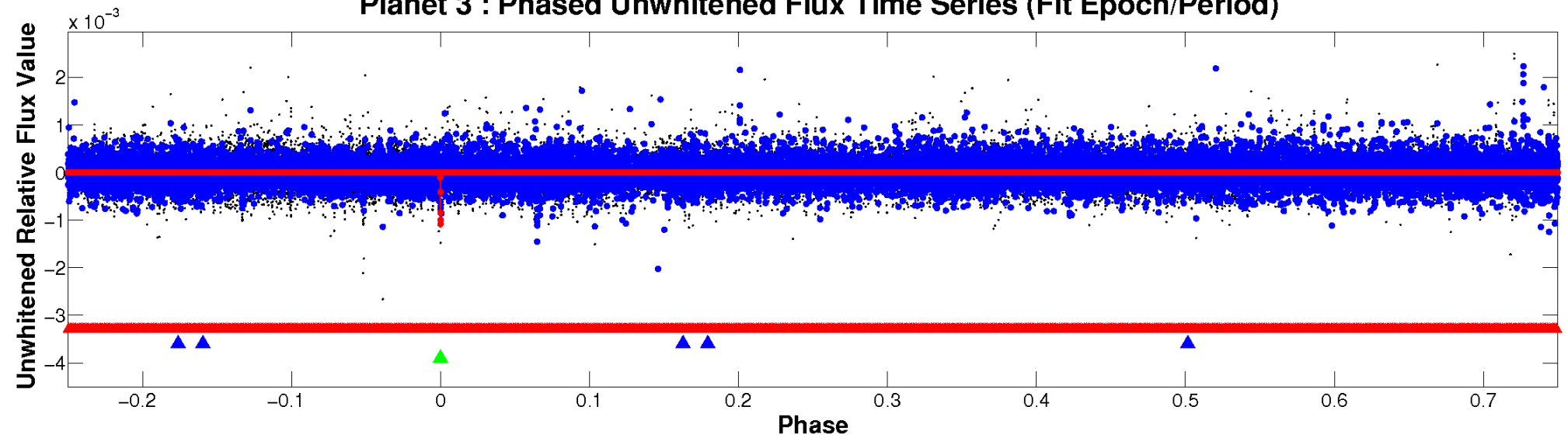
# ALT Odd/Even

TCE 002860930-03

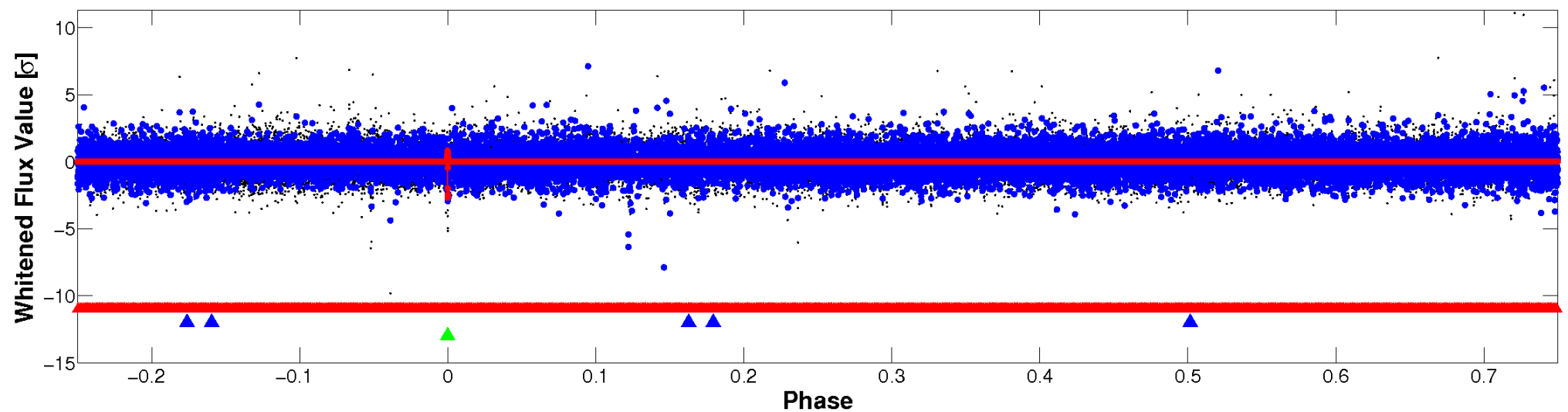


# Non-Whitened Vs. Whitened Light Curve

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

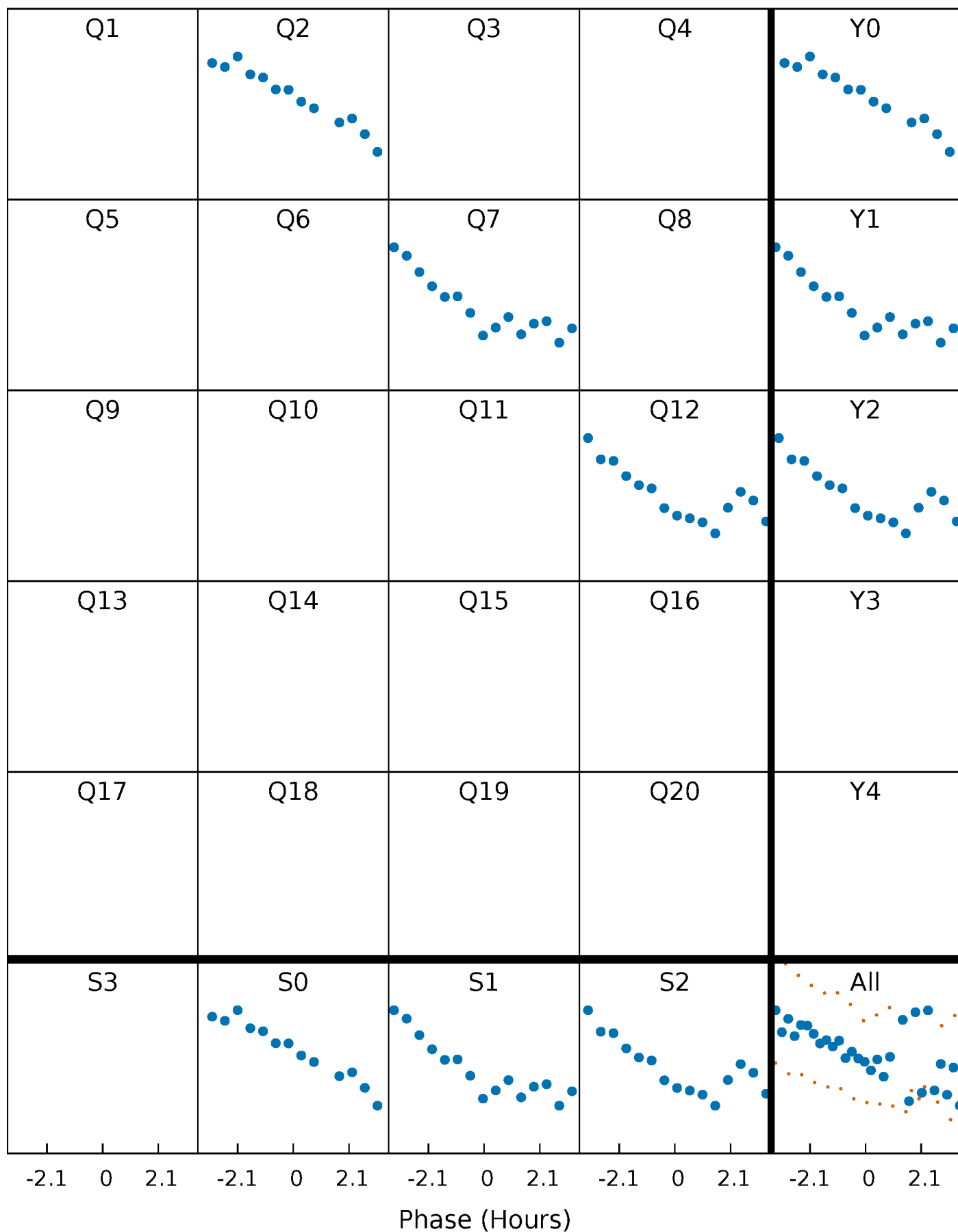


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



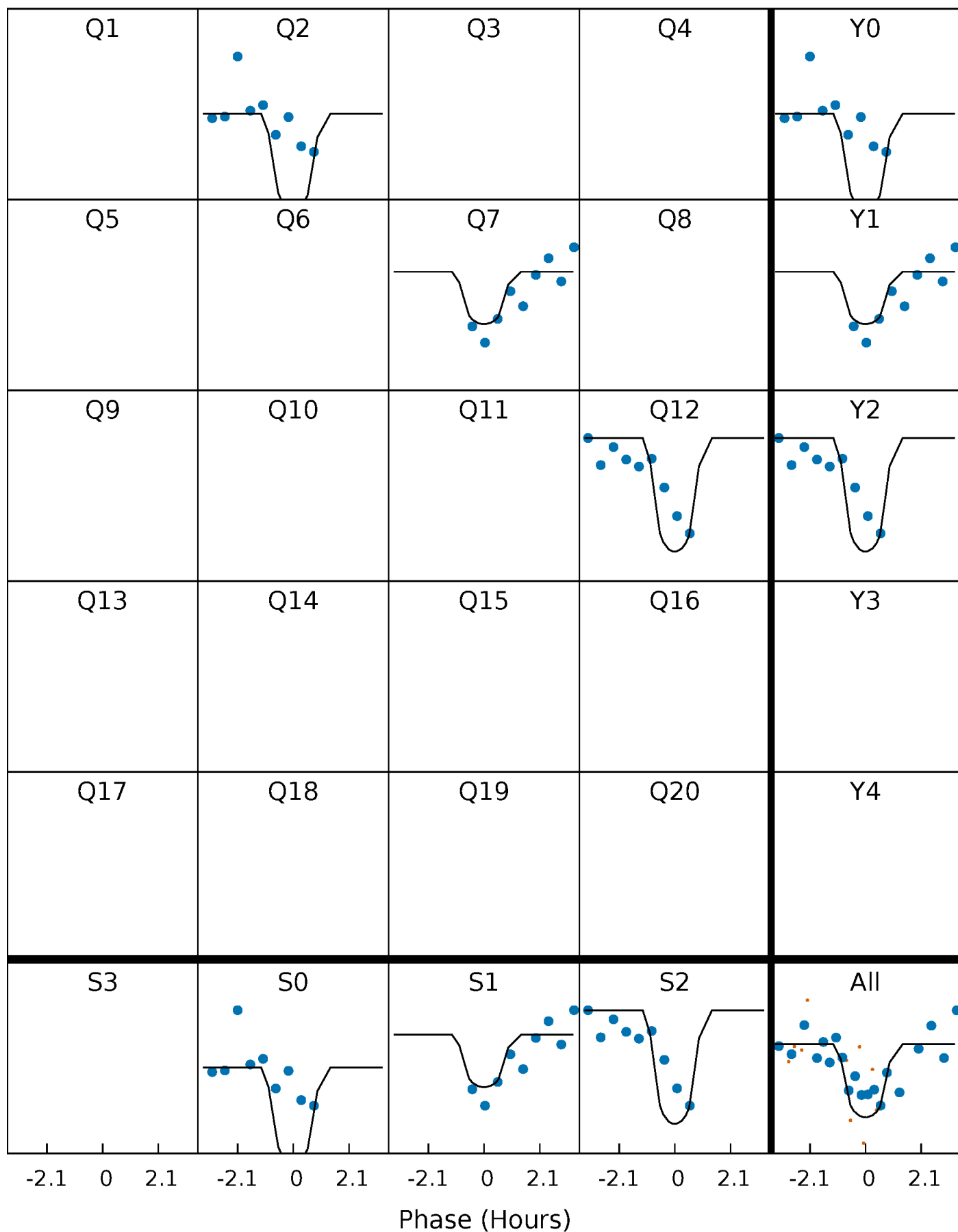
# PDC Quarter-Phased Transit Curves

TCE 002860930-03 P=467.205467 Days  $T_0=199.935928$  (BKJD)



# DV Quarter-Phased Transit Curves

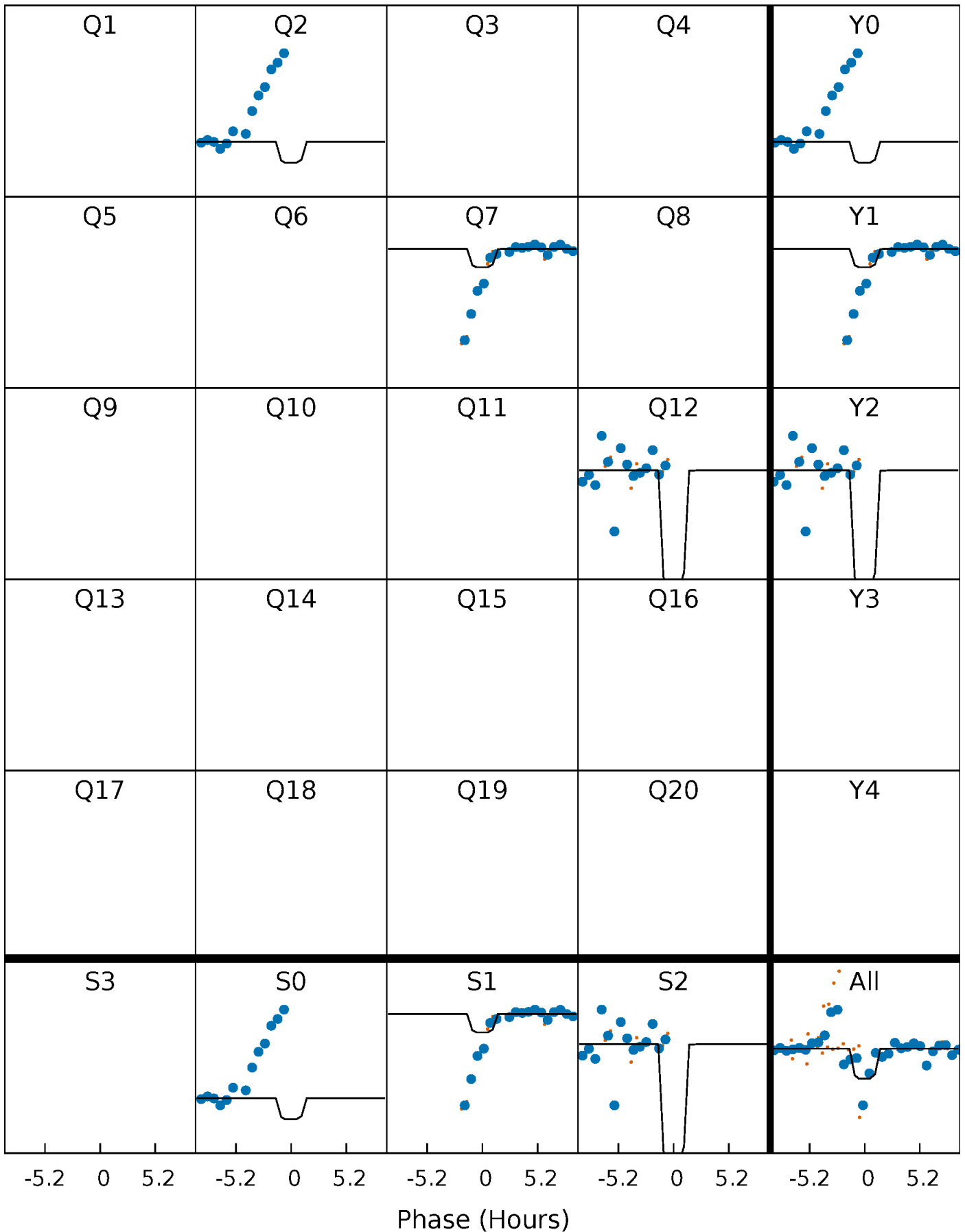
TCE 002860930-03 P=467.205467 Days  $T_0=199.935928$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

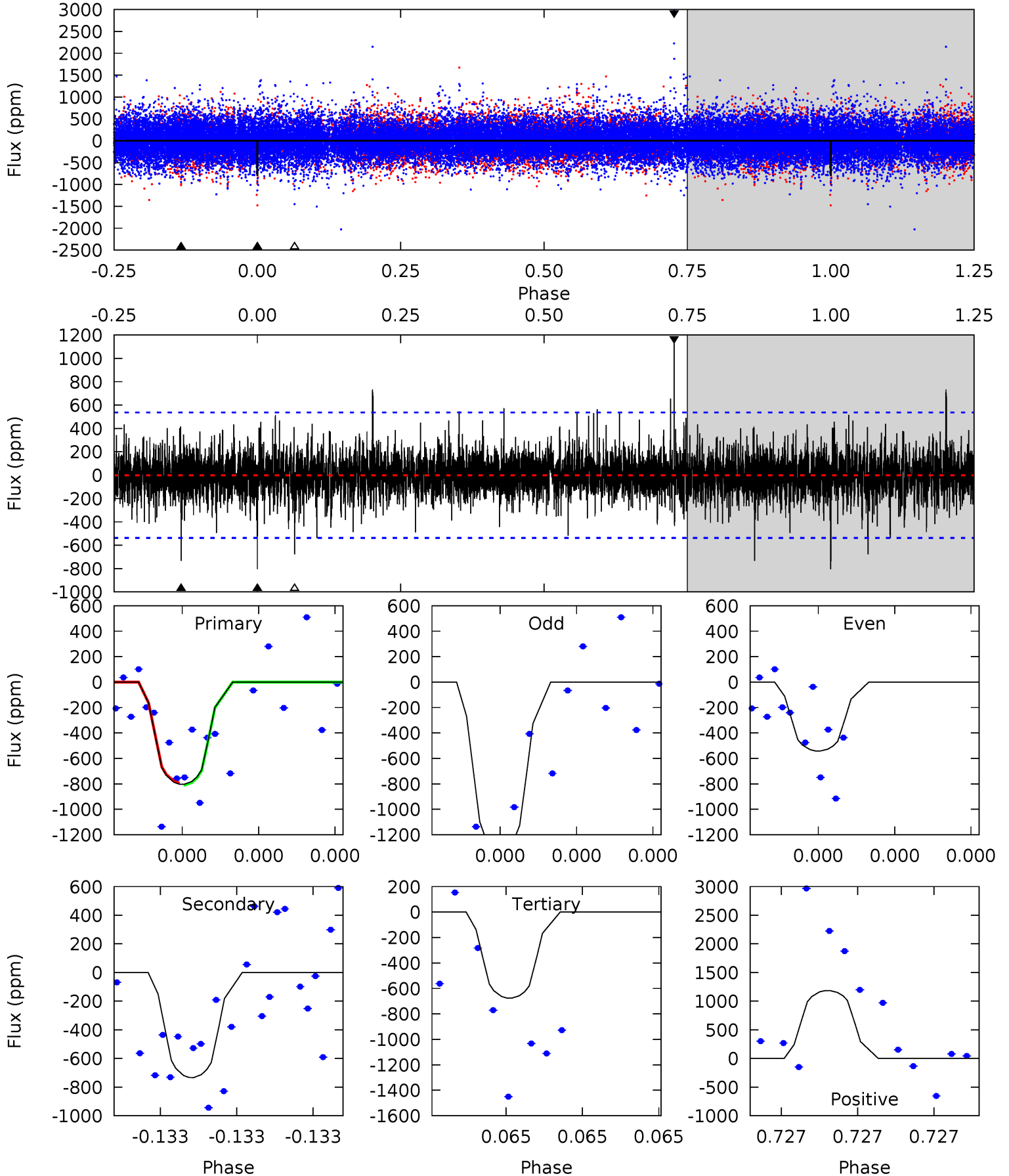
TCE 002860930-03     $P=467.192916$  Days     $T_0=200.006871$  (BKJD)



# DV Model-Shift Uniqueness Test

002860930-03, P = 467.205467 Days, E = 199.935928 Days

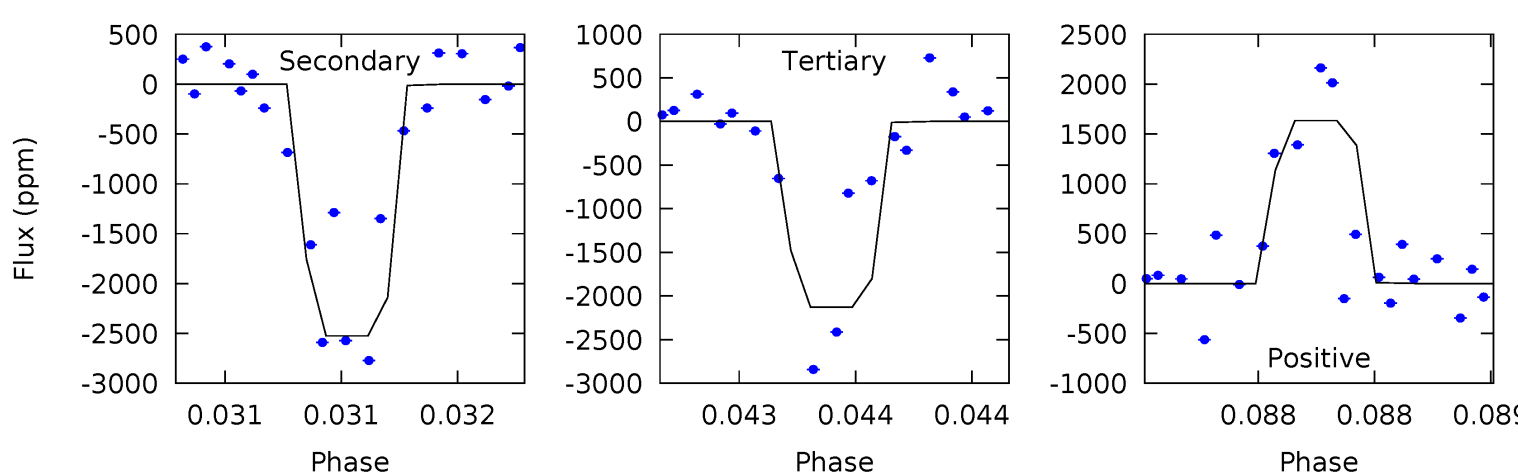
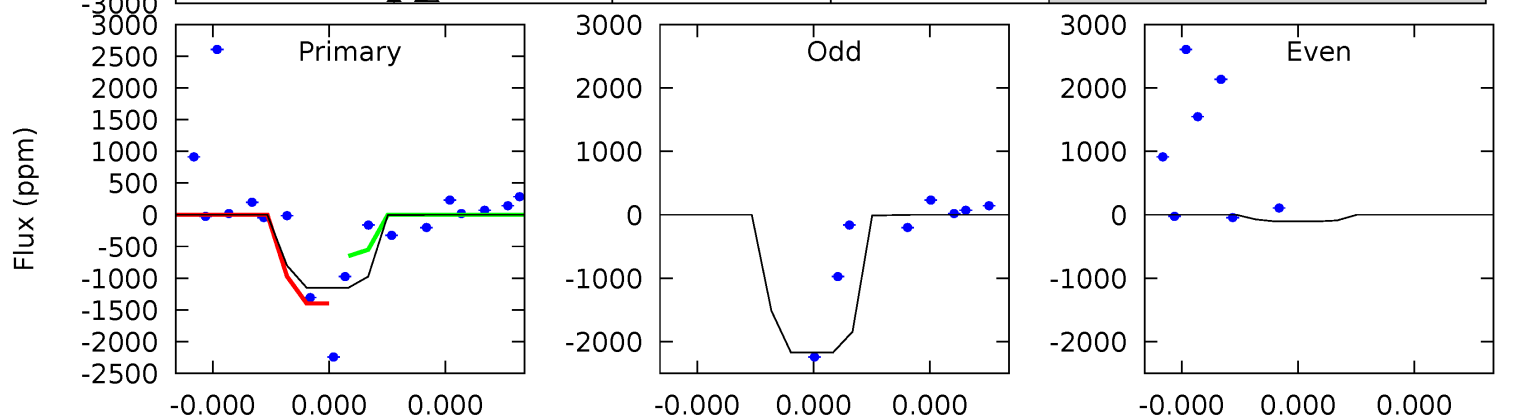
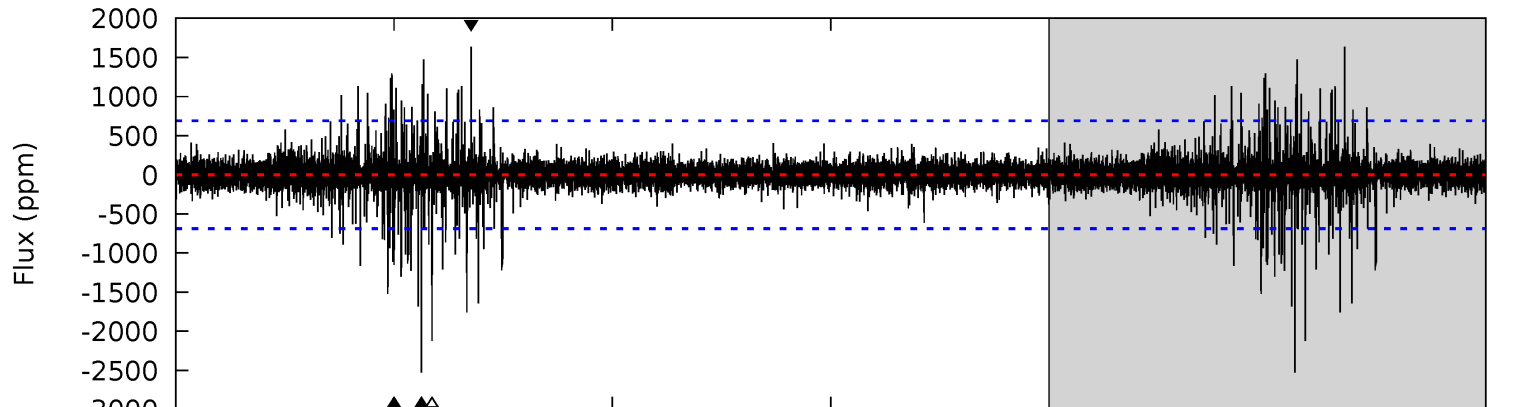
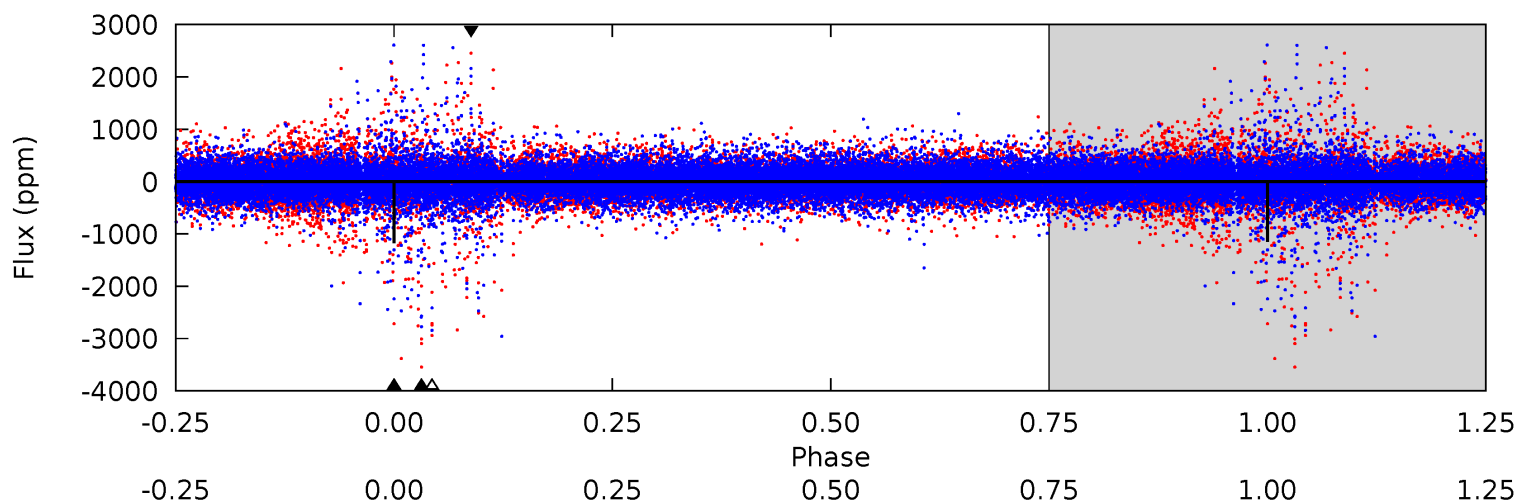
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.58	7.83	7.23	12.7	5.74	3.73	1.33	1.36	-4.08	0.61	-4.83	4.01	1.03	0.60	0.09



# Alt Model-Shift Uniqueness Test

002860930-03, P = 467.192916 Days, E = 200.006871 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
9.48	20.8	17.5	13.5	5.69	3.65	1.13	-8.05	-4.00	3.29	7.34	5.42	18.4	0.39	2.88



### Stellar Parameters For KIC 002860930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5278^{+84}_{-73}$	$4.540^{+0.035}_{-0.070}$	$0.040^{+0.150}_{-0.150}$	$0.825^{+0.066}_{-0.039}$	$0.862^{+0.048}_{-0.048}$	$2.161^{+0.295}_{-0.425}$
	+2%/-1%	+1%/-2%	+375%/-375%	+8%/-5%	+6%/-6%	+14%/-20%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 002860930-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-734 \pm 94$	$8.76^{+8.64}_{-6.06}$	$281^{+7}_{-6}$	$3331^{+1754}_{-589}$	$6680^{+64886}_{-5028}$
Alt.	$-2525 \pm 121$	$8.95^{+8.83}_{-5.99}$	$281^{+7}_{-6}$	$4050^{+2455}_{-813}$	$21993^{+163708}_{-16443}$

$T_{max}$  = 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

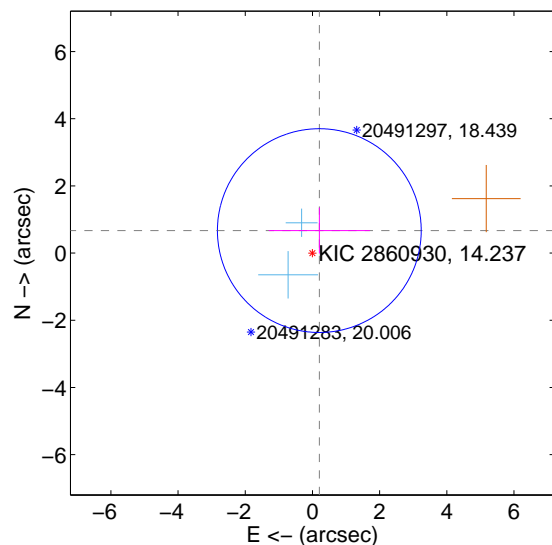
Supplemental centroid analysis for 002860930-03. Kepler magnitude: 14.24. Transit SNR 7.00

There are 2 quarters with good PRF difference image offsets

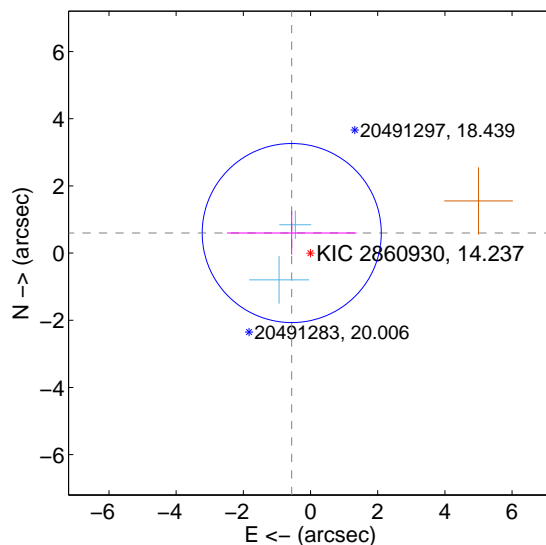
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.701 \pm 1.011$	0.69	$-0.205 \pm 1.504$	$0.670 \pm 0.682$
PRF-fit source offset from KIC position	$0.818 \pm 0.889$	0.92	$0.559 \pm 1.928$	$0.597 \pm 0.644$
photometric centroid source offset	$0.85 \pm 1.72$	0.49	$0.53 \pm 1.78$	$0.66 \pm 1.68$

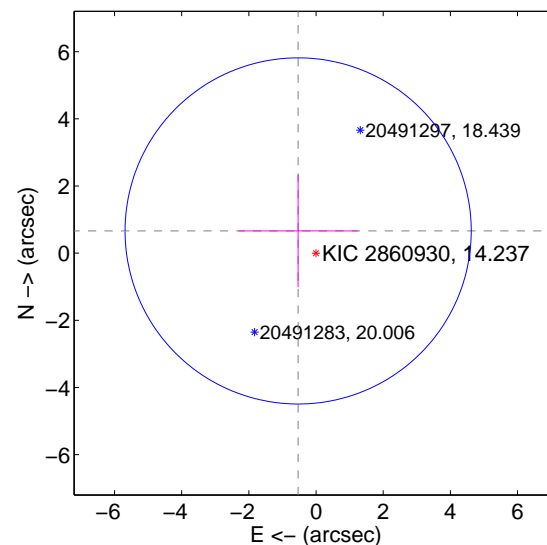
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

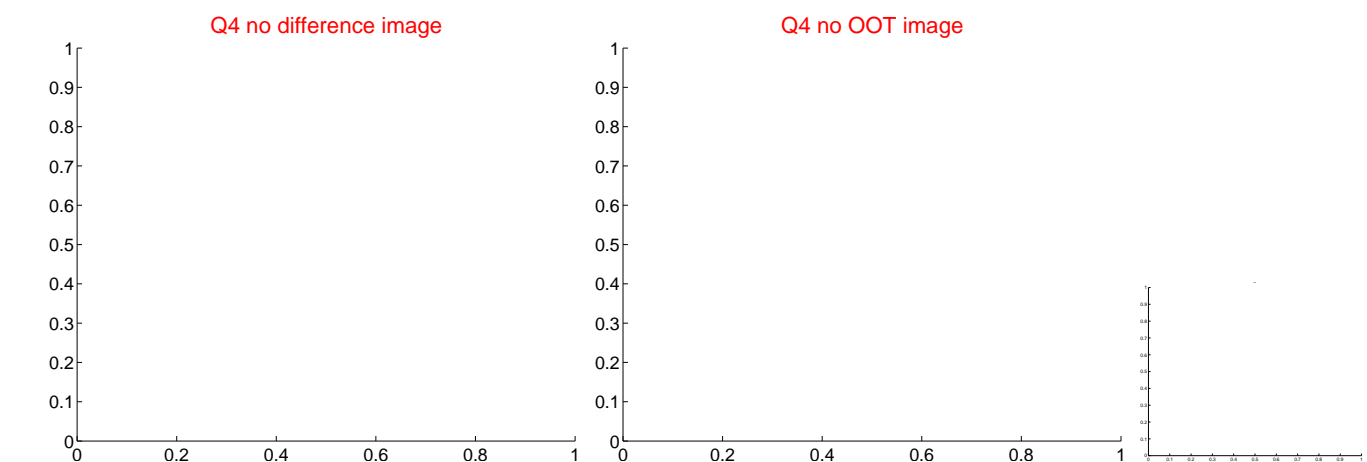
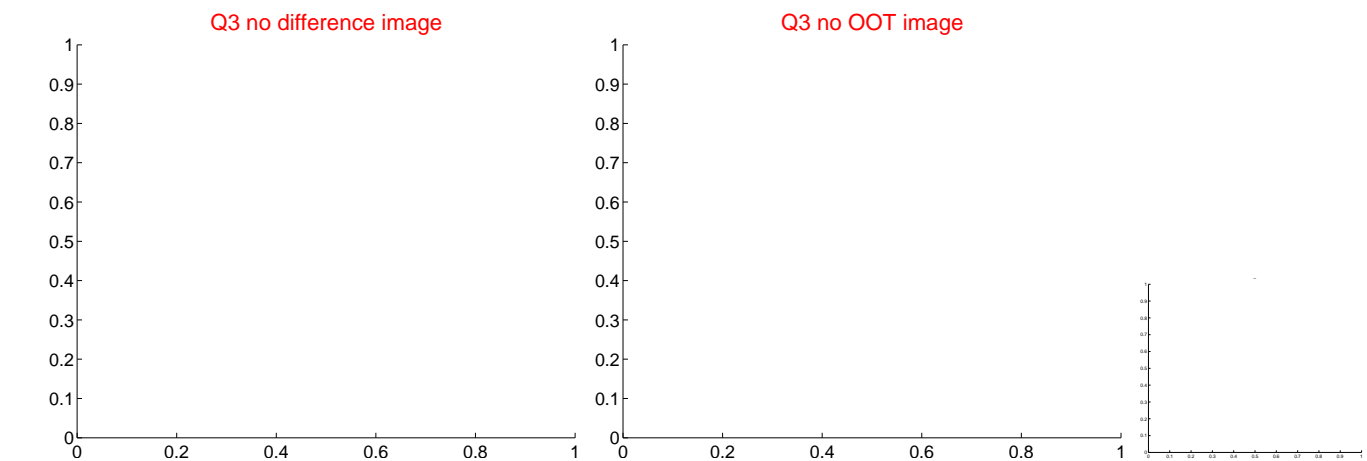
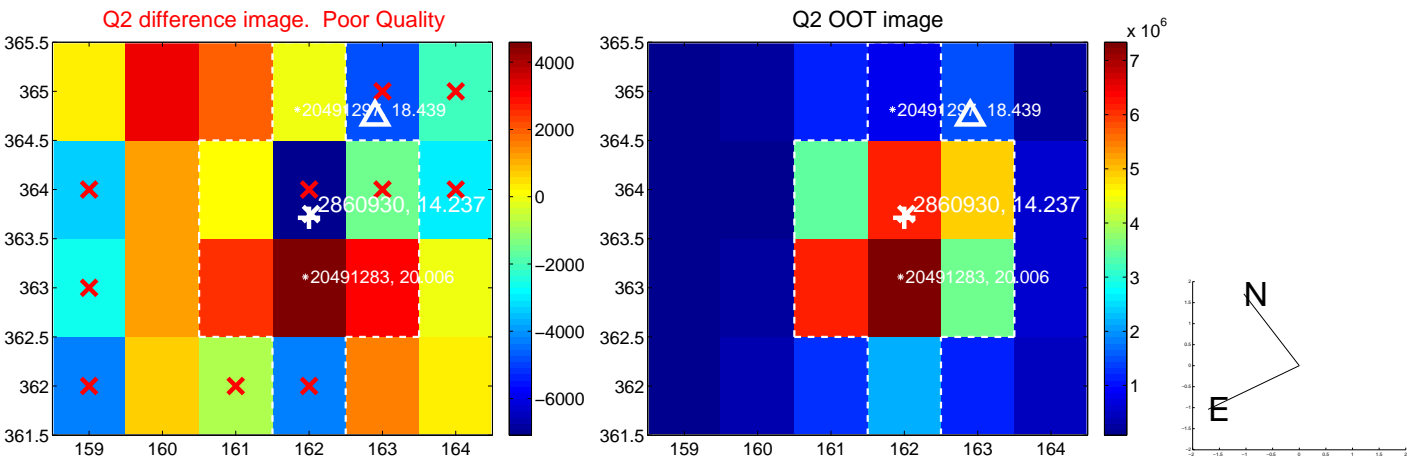
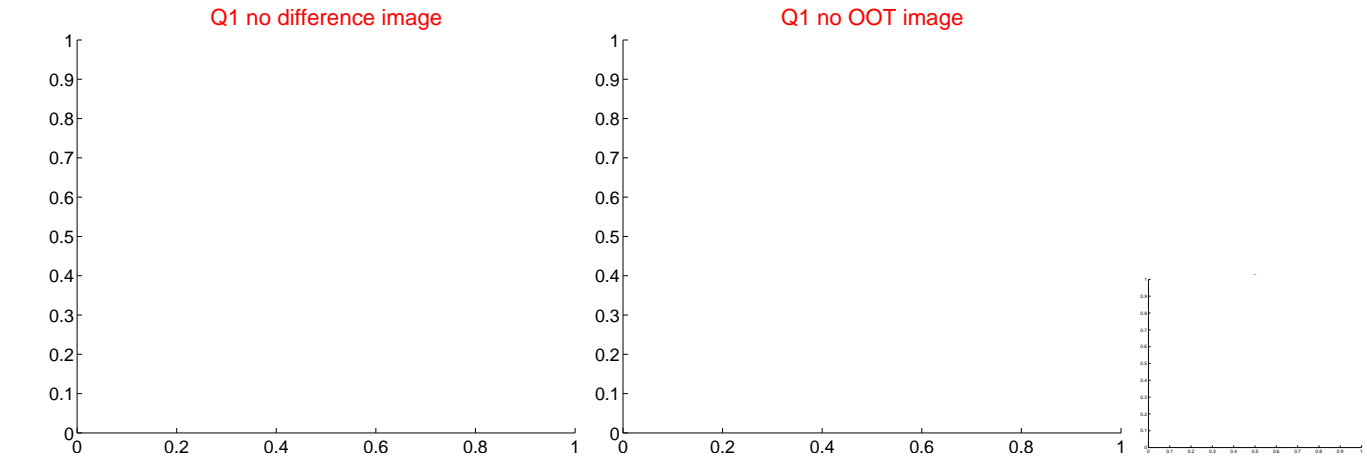


offset from photometric centroids



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.

Q5 no difference image



Q5 no OOT image



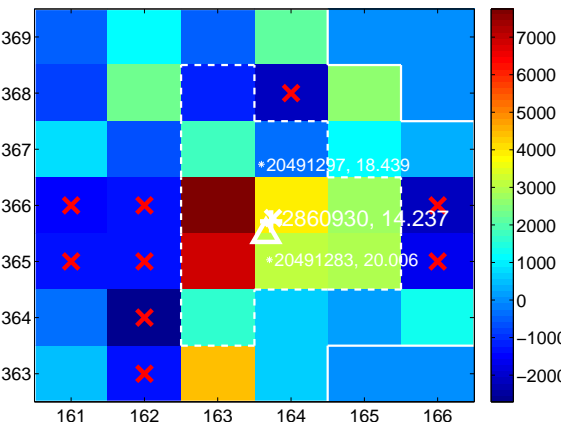
Q6 no difference image



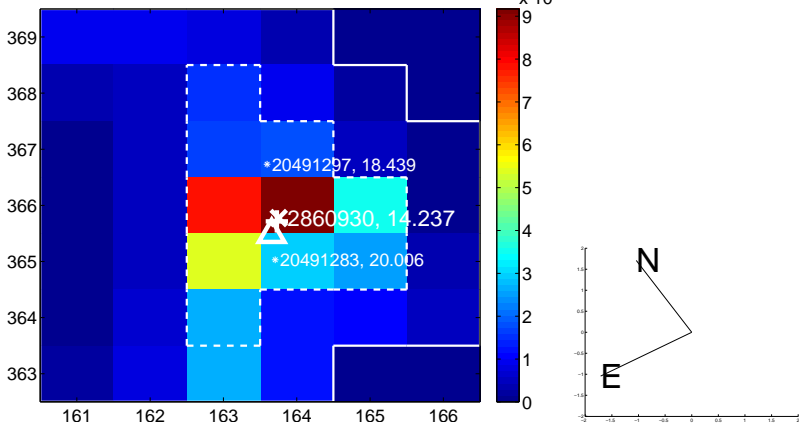
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image

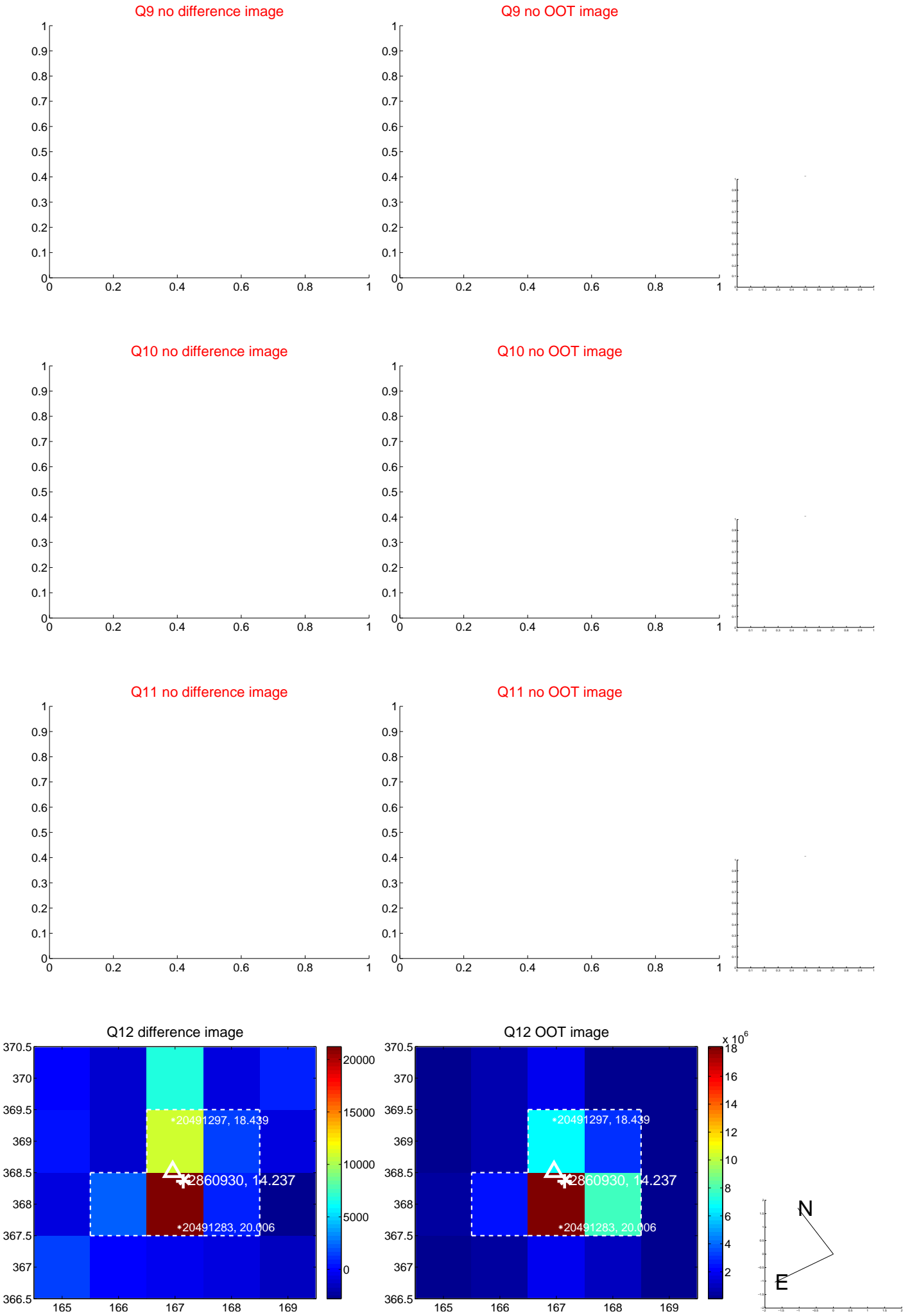


Q8 no OOT image





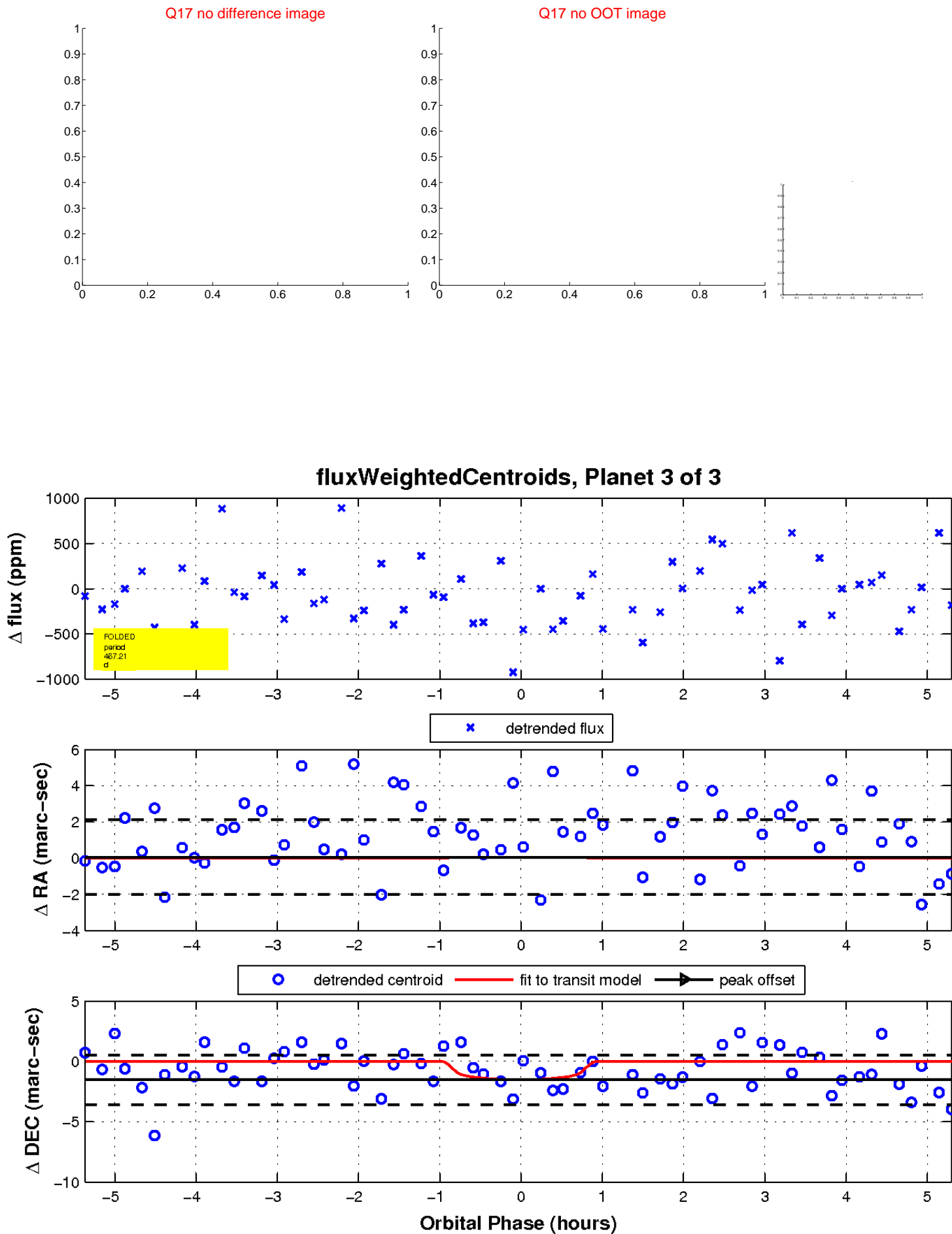
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



UKIRT Image

Declination

