

# KIC 012203662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012203662-01	OBS	No	469.157826	419.653079	1064.5	3.234	15.1	5.7	0.57	4878	1.93	0.17
012203662-02	OBS	No	586.953956	393.637225	1086.1	3.421	12.6	7.0	0.57	4878	1.98	0.13
012203662-03	OBS	No	256.330290	151.444918	933.5	3.476	11.1	8.2	0.57	4878	1.81	0.39
012203662-04	OBS	No	451.658922	304.058204	2835.2	4.576	10.3	9.3	0.57	4878	5.91	0.18
012203662-05	OBS	No	332.607776	223.725496	1209.2	2.434	13.6	5.9	0.57	4878	1.99	0.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012203662-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS
012203662-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—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.

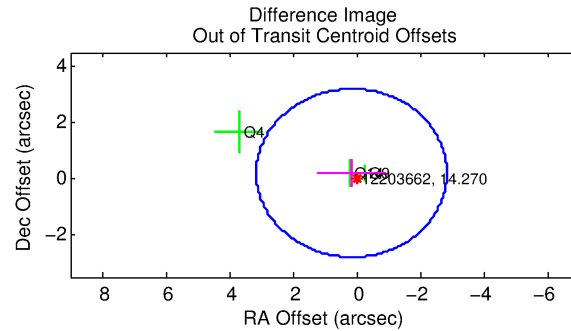
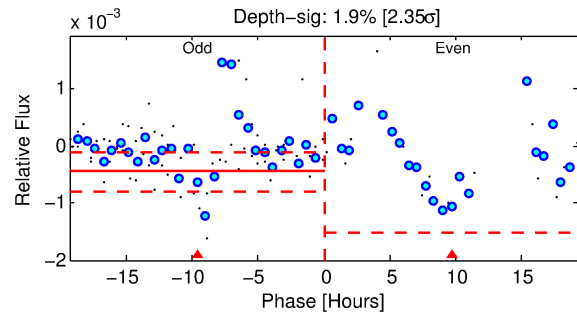
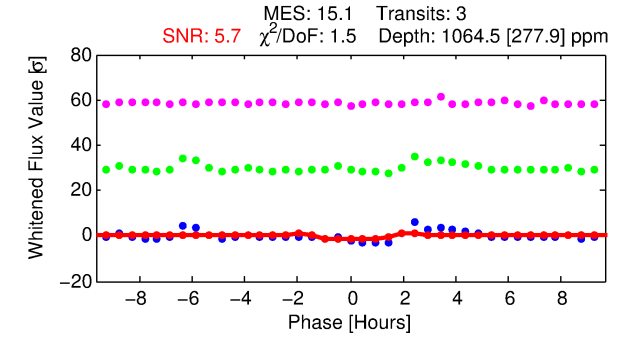
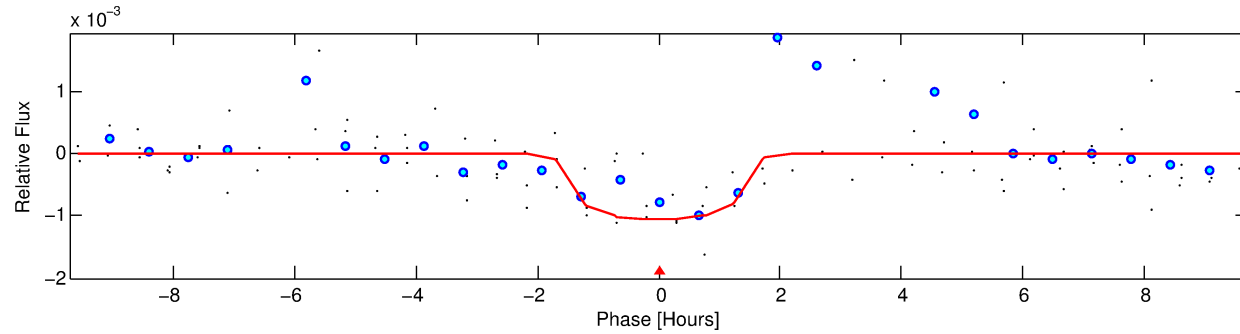
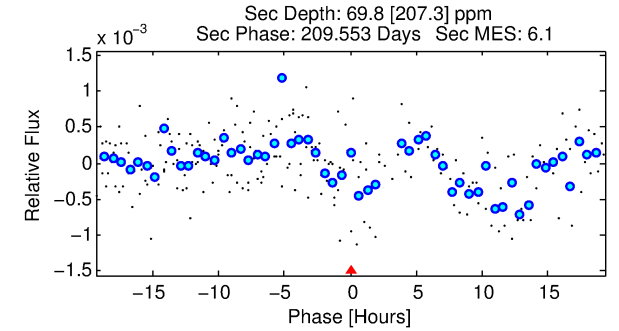
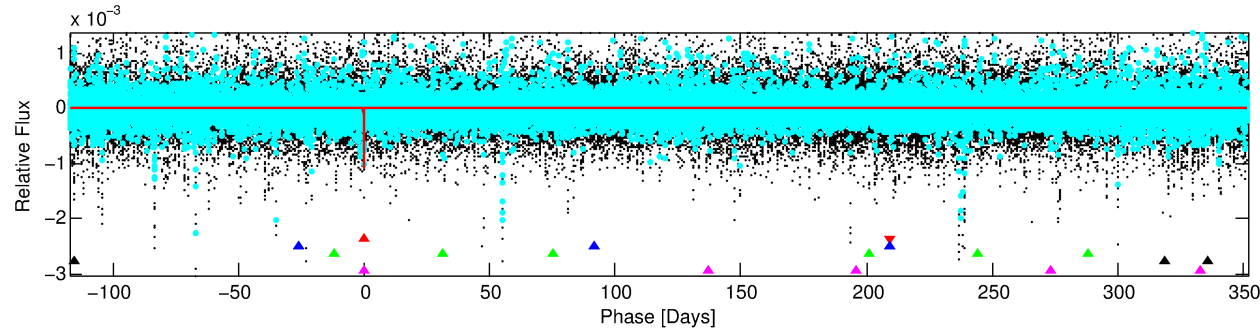
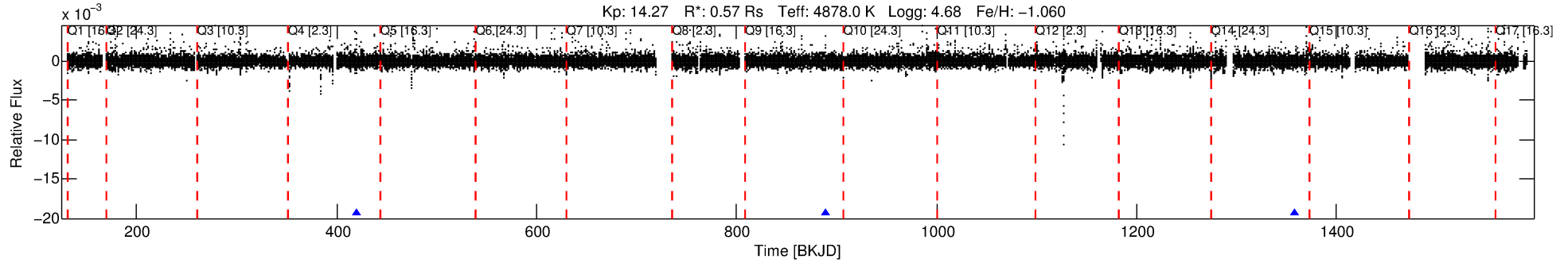
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012203662-01

No Significant Match Found

# DV One-Page Summary

KIC: 12203662 Candidate: 1 of 5 Period: 469.158 d



## DV Fit Results:

Period = 469.15783 [0.00828] d  
Epoch = 419.6531 [0.0108] BKJD  
Rp/R\* = 0.0308 [0.0778]  
a/R\* = 954.64 [9263.55]  
b = 0.57 [11.79]  
Seff = 0.17 [0.03]  
Teq = 165 [6] K  
Rp = 1.93 [4.88] Re  
a = 0.9826 [0.0620] AU  
Ag = 9909.18 [58030.32] [0.17 $\sigma$ ]  
Teffp = 2539 [3718] K [0.64 $\sigma$ ]

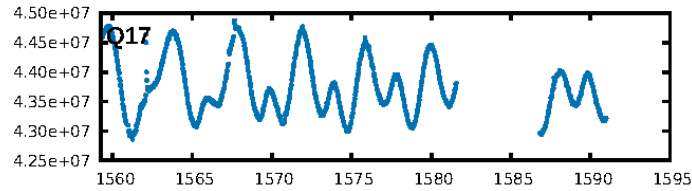
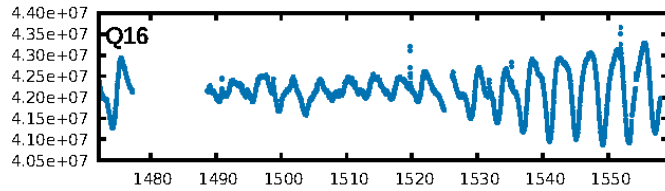
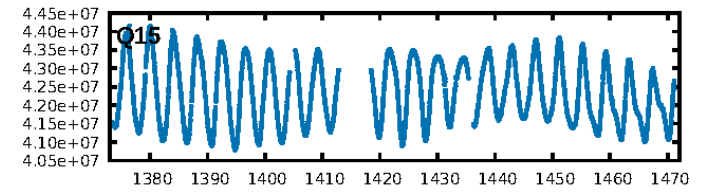
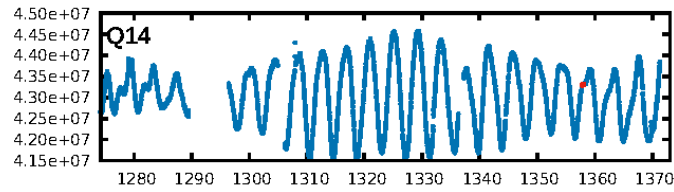
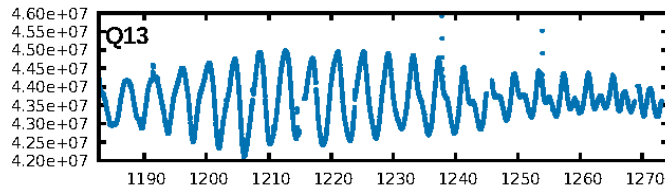
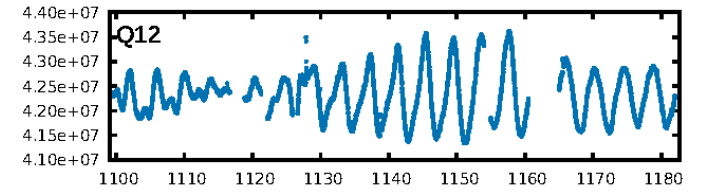
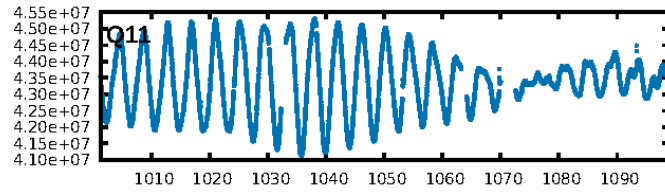
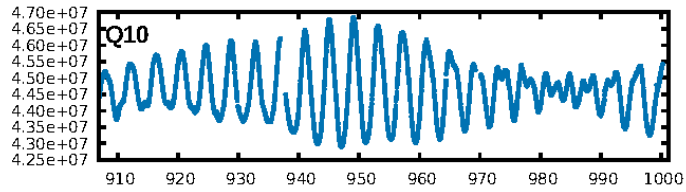
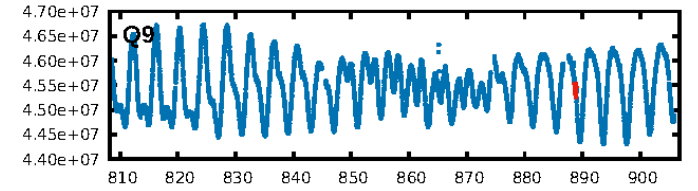
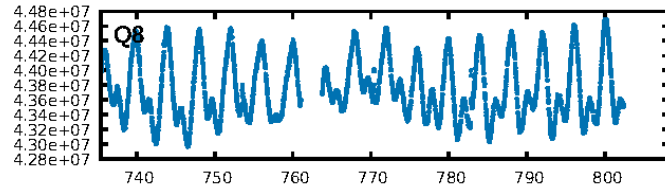
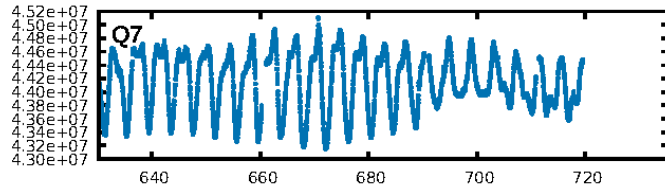
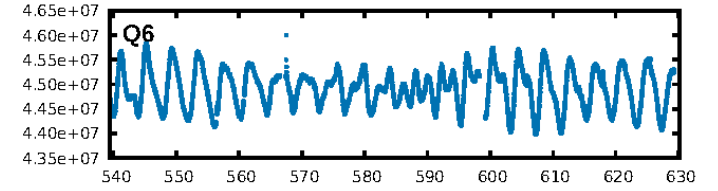
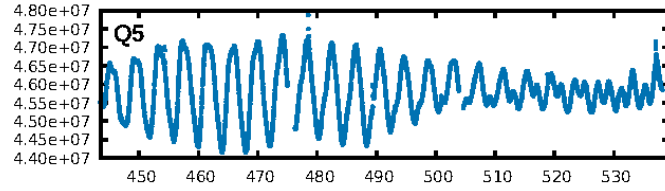
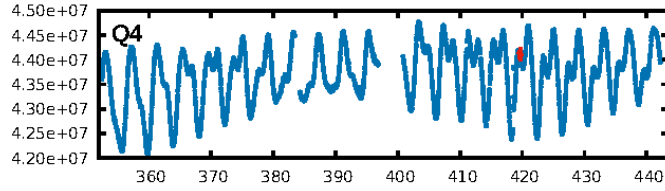
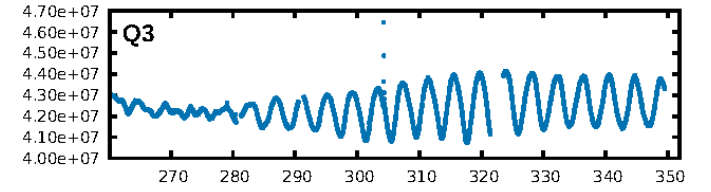
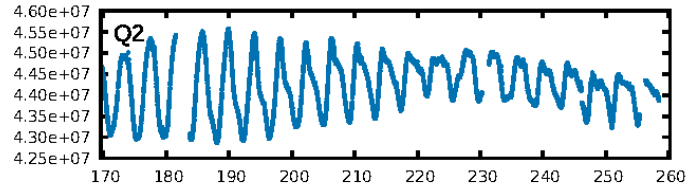
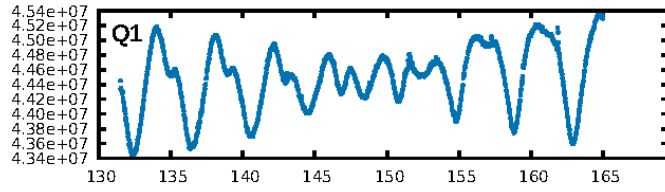
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [74.95 $\sigma$ ]  
LongPeriod-sig: 100.0% [600.54 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquare2-sig: 11.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.096  
Centroid-sig: 9.1%  
Centroid-so: 1.560 arcsec [1.21 $\sigma$ ]  
OotOffset-rm: 0.251 arcsec [0.25 $\sigma$ ]  
KicOffset-rm: 0.081 arcsec [0.07 $\sigma$ ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.67 [2/3]

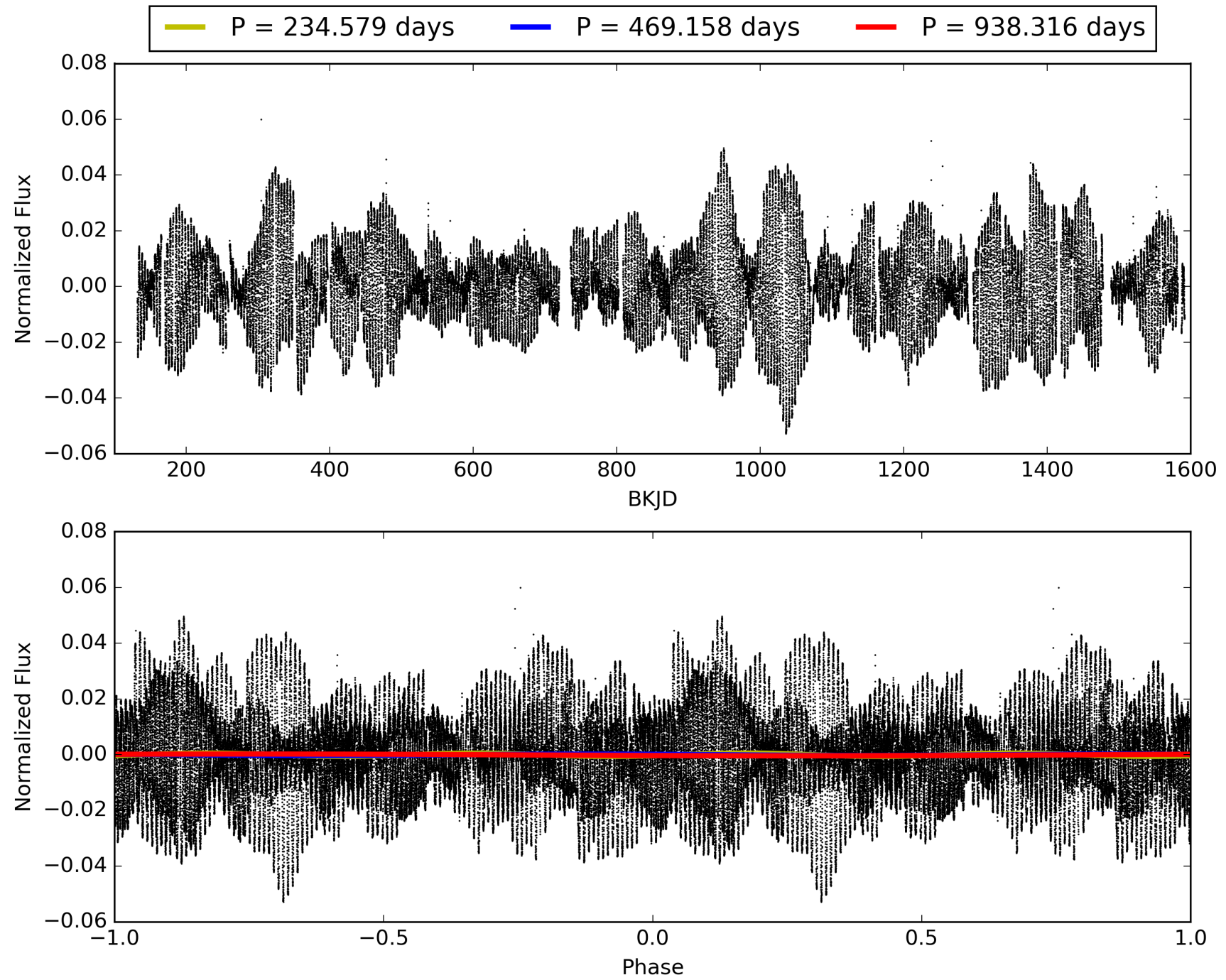
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:53:42 Z

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

# TCE 012203662-01, PDC Light Curves



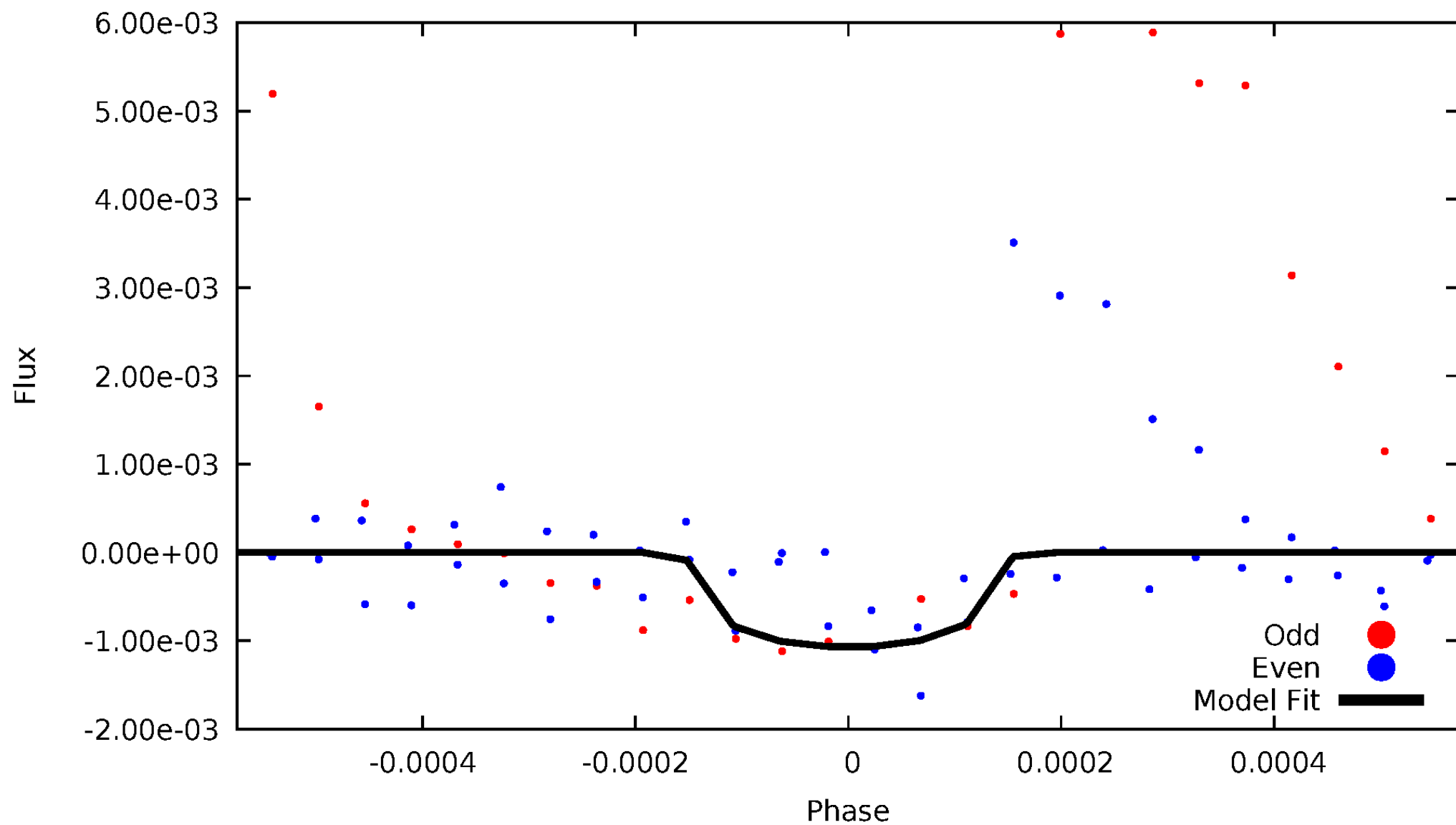
TCE 012203662-01





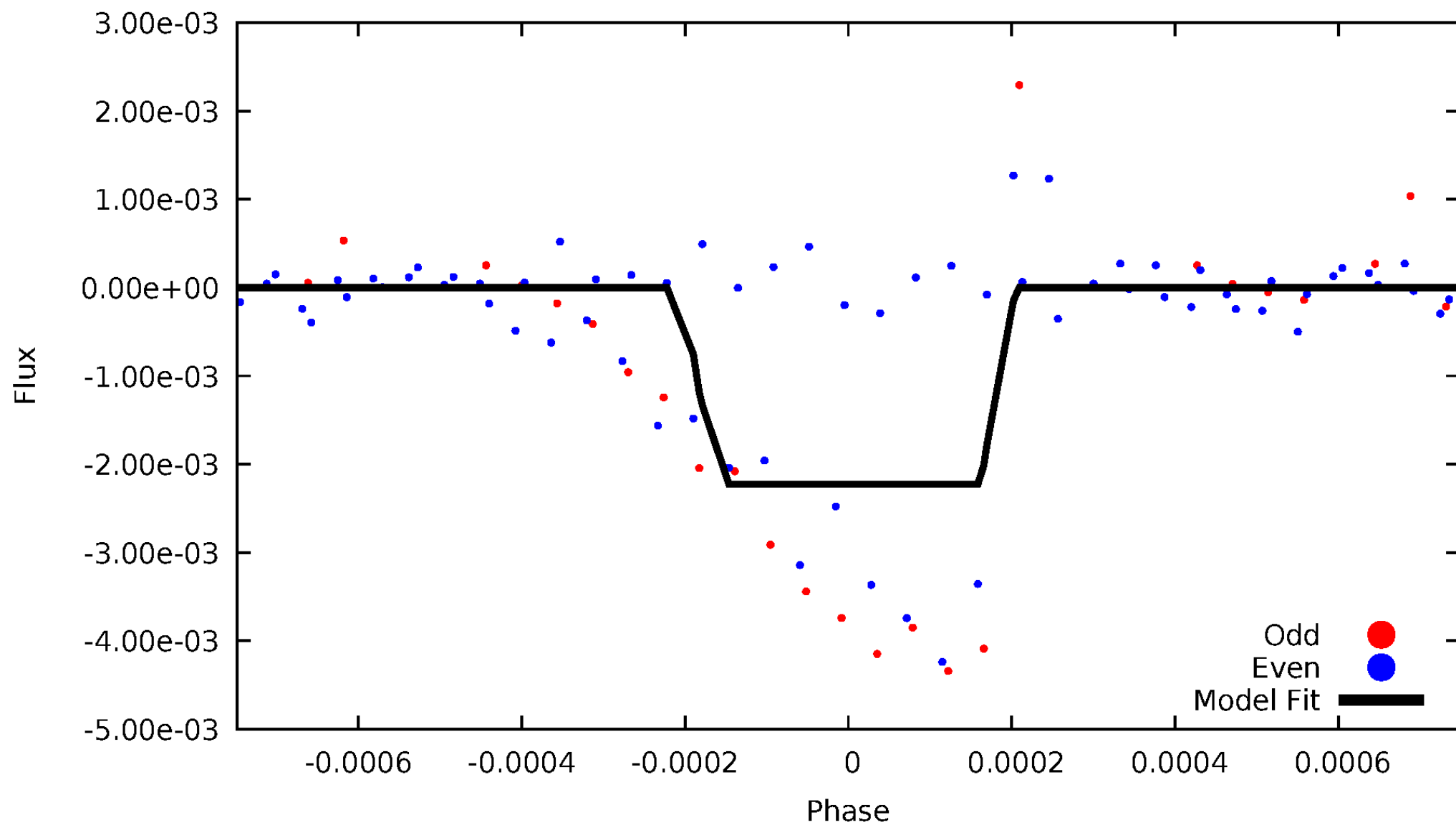
# DV Odd/Even

TCE 012203662-01



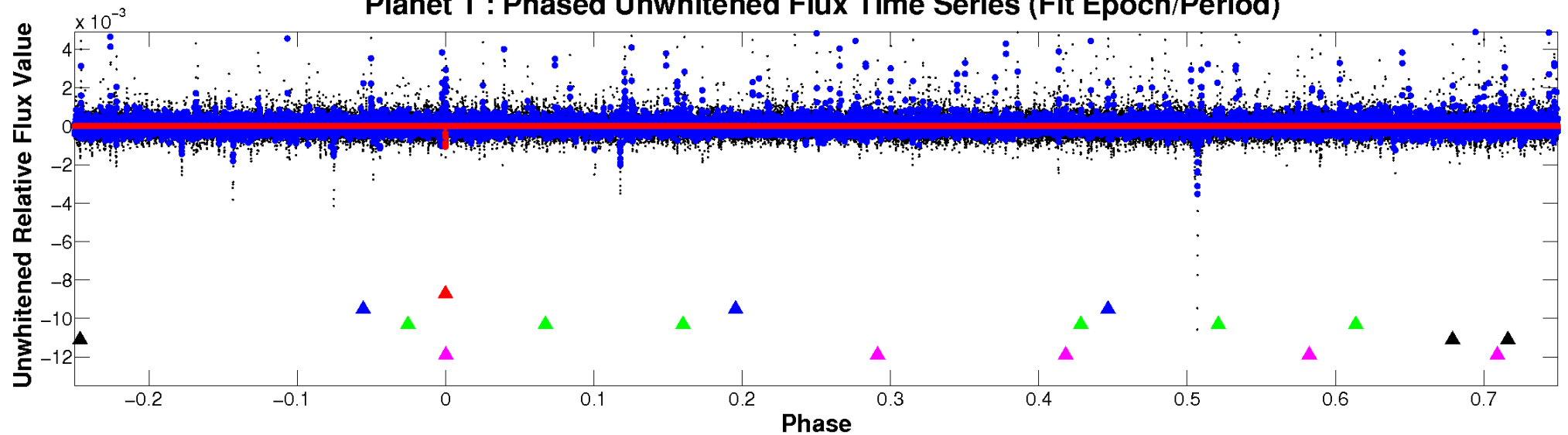
# ALT Odd/Even

TCE 012203662-01

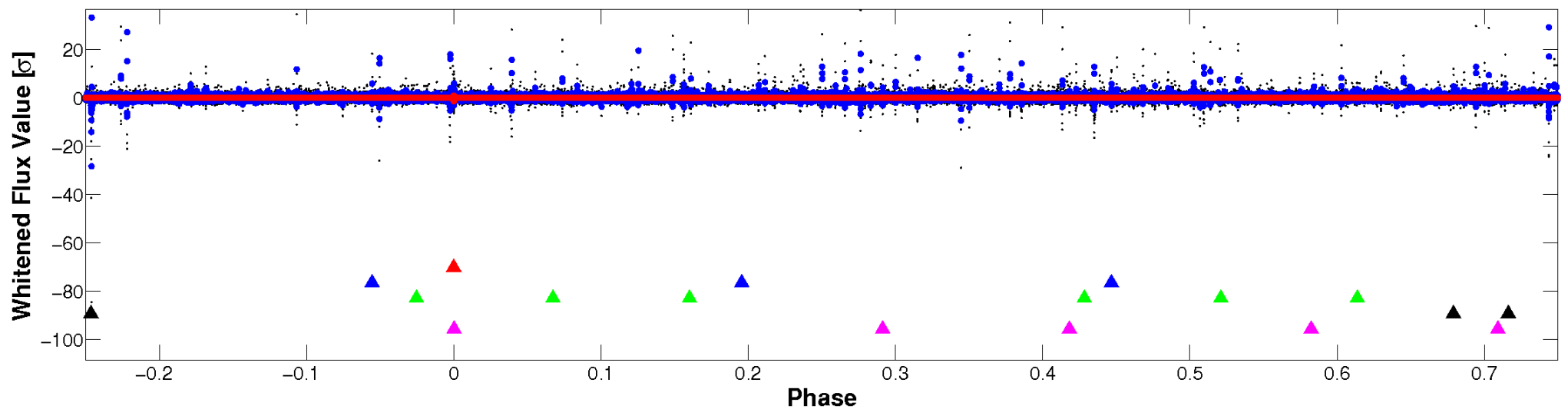


# Non-Whitened Vs. Whitened Light Curve

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

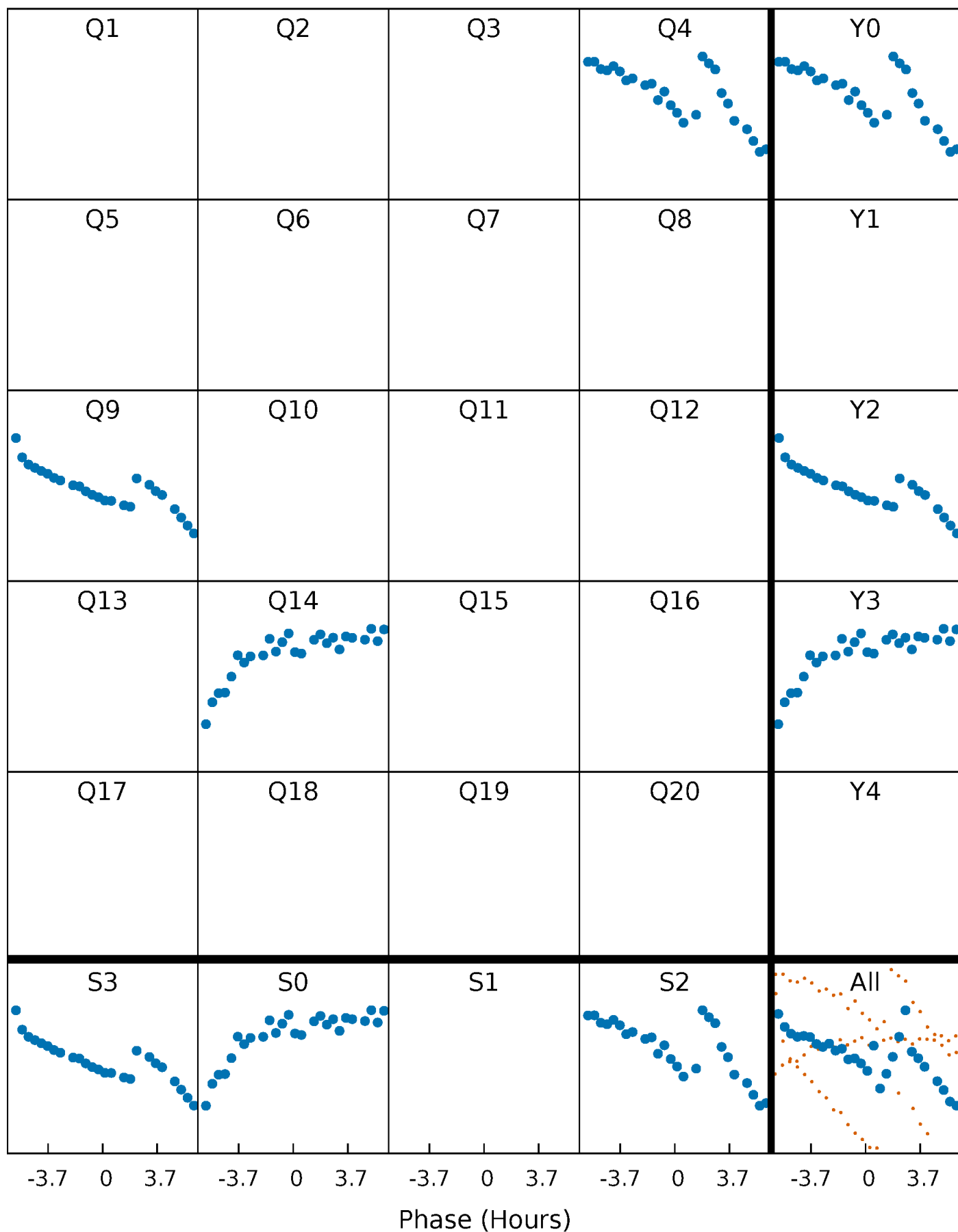


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



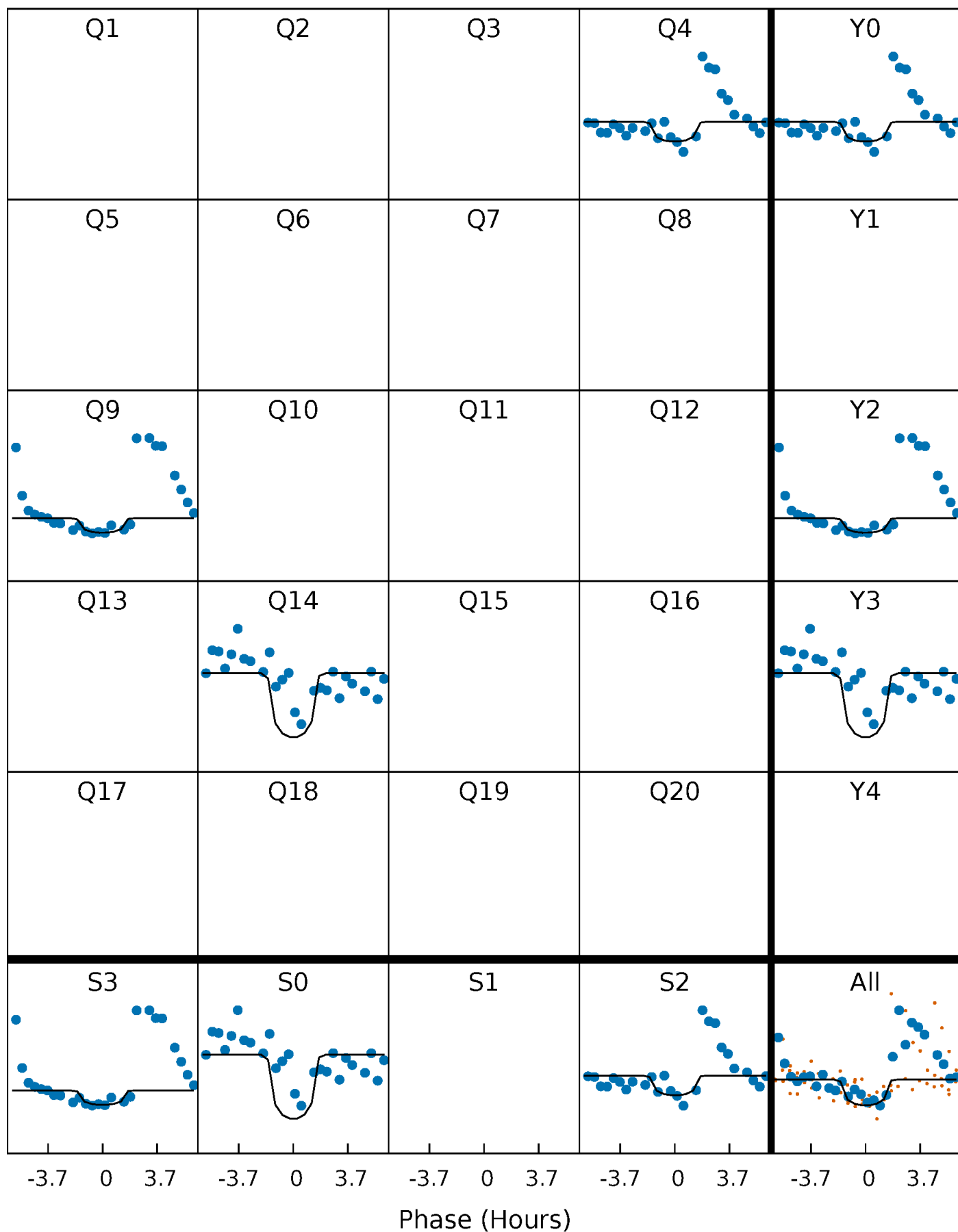
# PDC Quarter-Phased Transit Curves

TCE 012203662-01 P=469.157826 Days  $T_0=419.653079$  (BKJD)



# DV Quarter-Phased Transit Curves

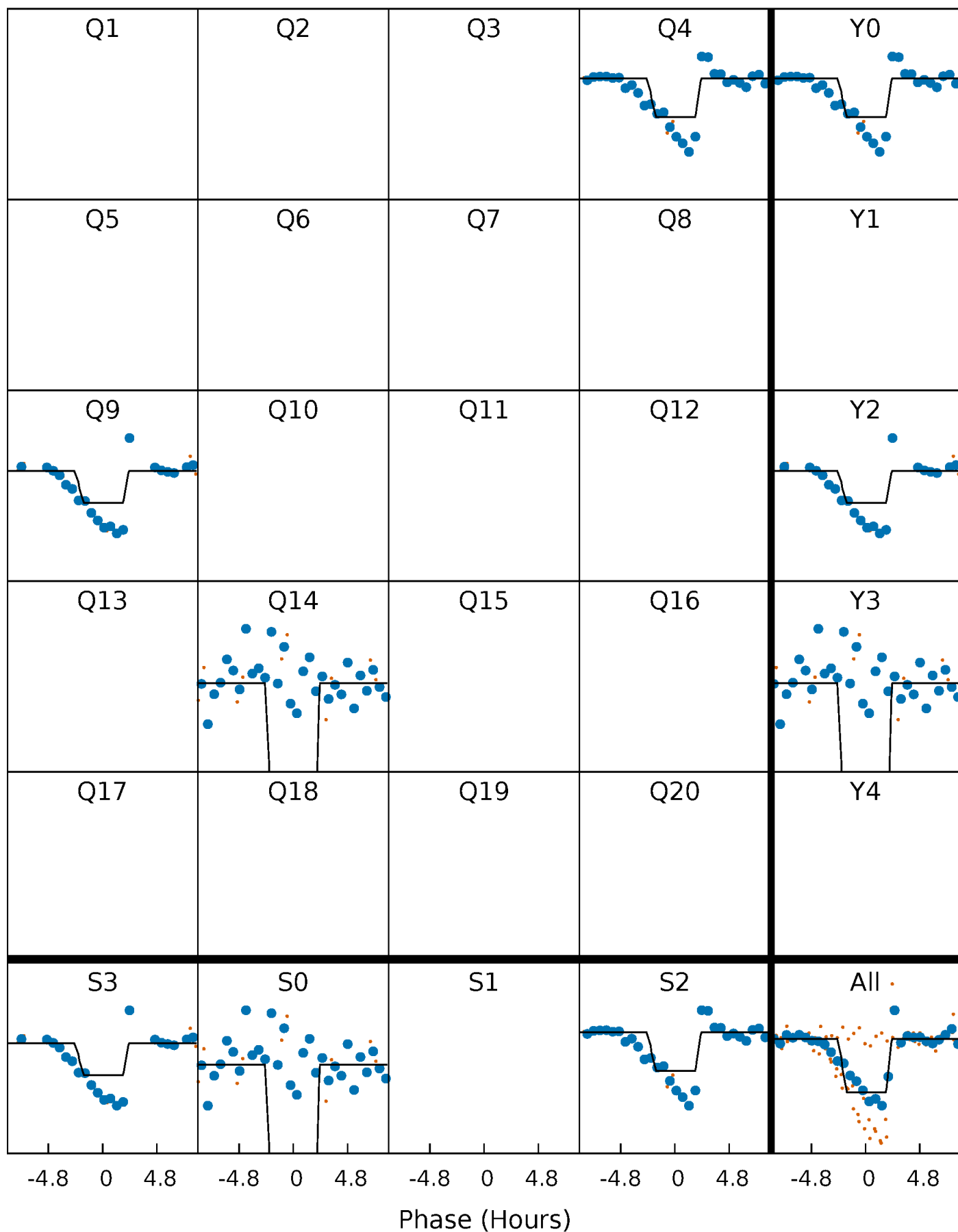
TCE 012203662-01 P=469.157826 Days  $T_0=419.653079$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

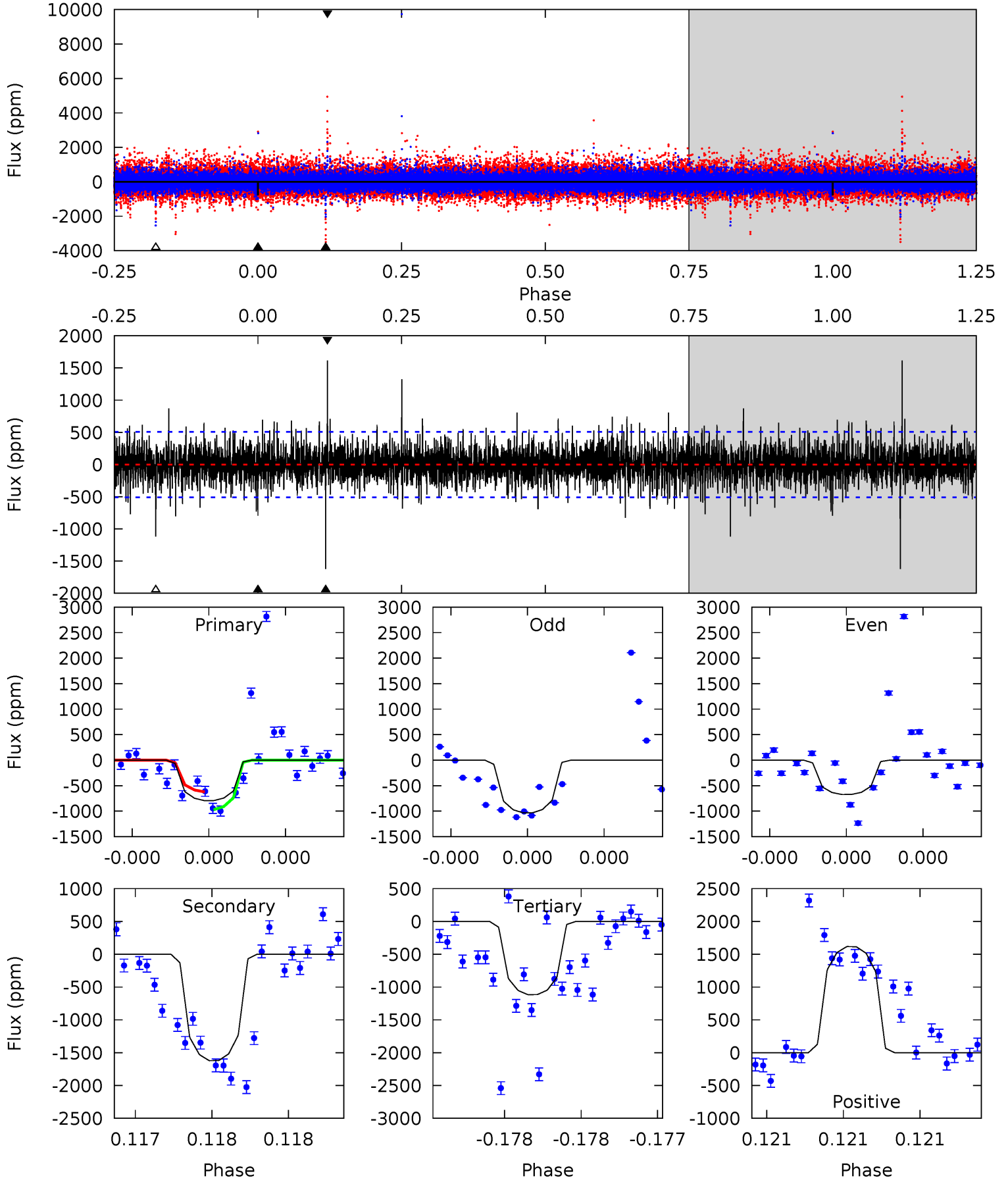
TCE 012203662-01 P=469.174971 Days  $T_0=419.631085$  (BKJD)



# DV Model-Shift Uniqueness Test

012203662-01, P = 469.157826 Days, E = 419.653079 Days

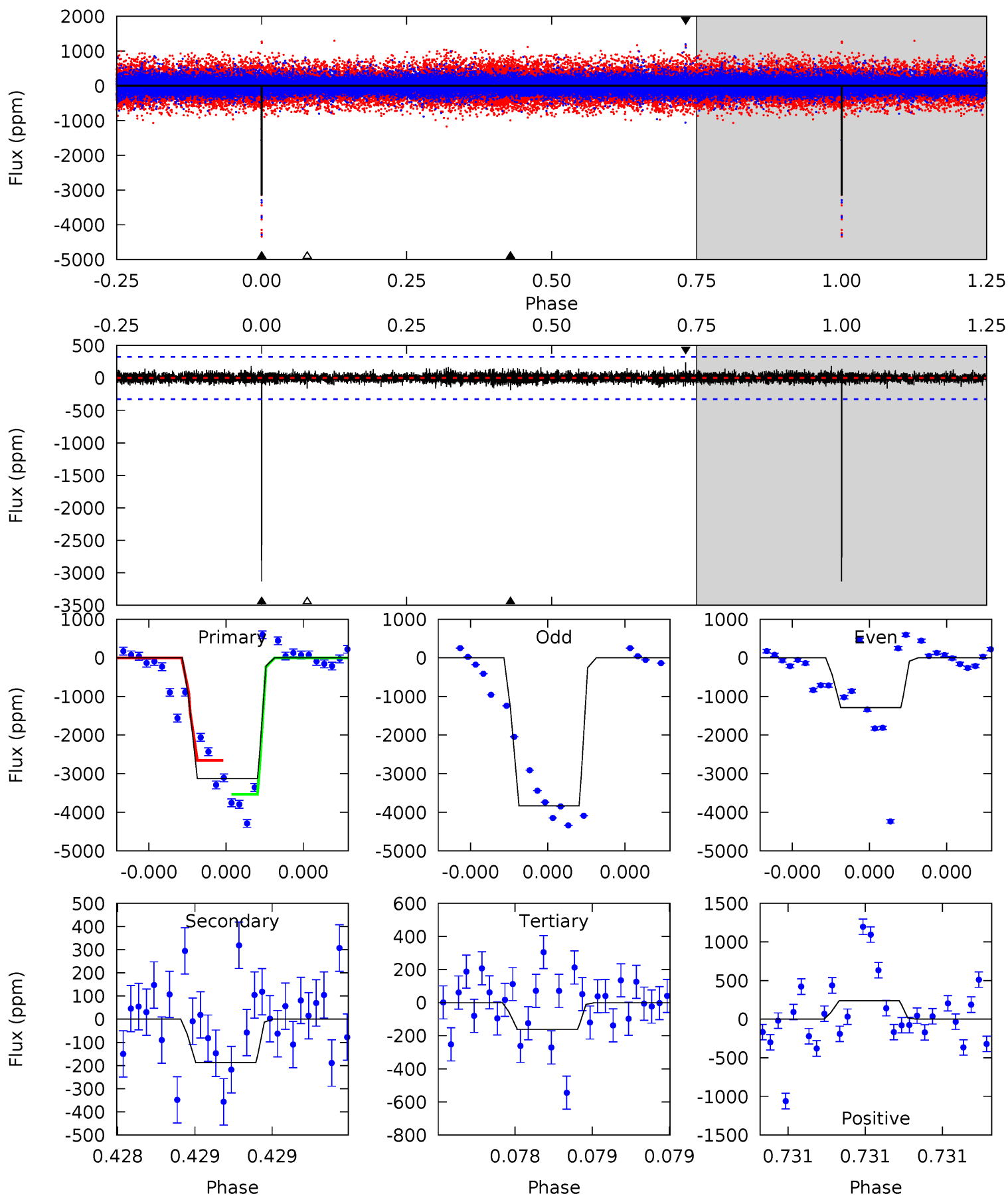
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.78	17.9	12.4	17.9	5.64	3.58	2.05	-3.58	-9.12	5.59	0.06	1.62	0.85	0.50	1.93



# Alt Model-Shift Uniqueness Test

012203662-01, P = 469.174971 Days, E = 419.631085 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
54.0	3.23	2.79	4.12	5.62	3.55	0.62	51.2	49.9	0.44	-0.89	23.4	0.72	0.07	0



### Stellar Parameters For KIC 012203662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4878^{+147}_{-147}$	$4.678^{+0.054}_{-0.032}$	$-1.060^{+0.300}_{-0.300}$	$0.575^{+0.038}_{-0.041}$	$0.575^{+0.046}_{-0.021}$	$4.254^{+0.907}_{-0.514}$
	+3%/-3%	+1%/-1%	+28%/-28%	+7%/-7%	+8%/-4%	+21%/-12%
Source	PHO1	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 012203662-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1622 \pm 90$	$4.02^{+4.44}_{-2.75}$	$229^{+8}_{-8}$	$4076^{+2656}_{-882}$	$55346^{+461292}_{-42772}$
Alt.	$-187 \pm 58$	$4.31^{+4.69}_{-2.87}$	$230^{+8}_{-8}$	$2844^{+1087}_{-495}$	$5438^{+42655}_{-4282}$

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

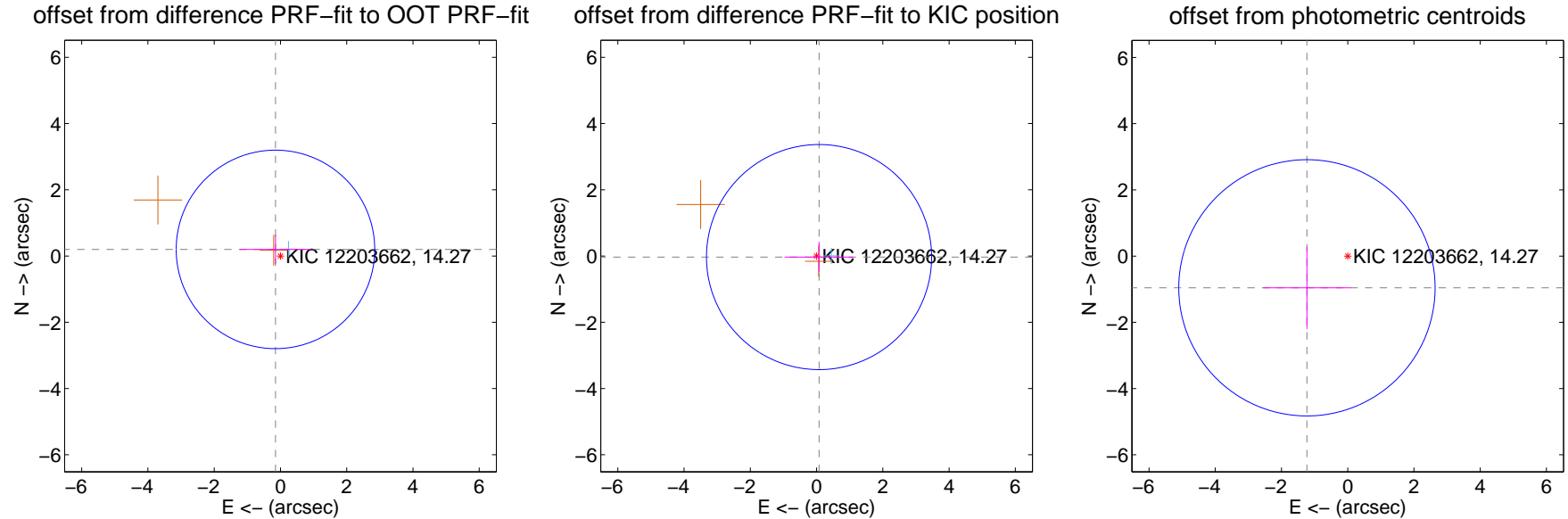
## DV Centroid Data

Supplemental centroid analysis for 012203662-01. Kepler magnitude: 14.27. Transit SNR 5.75

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

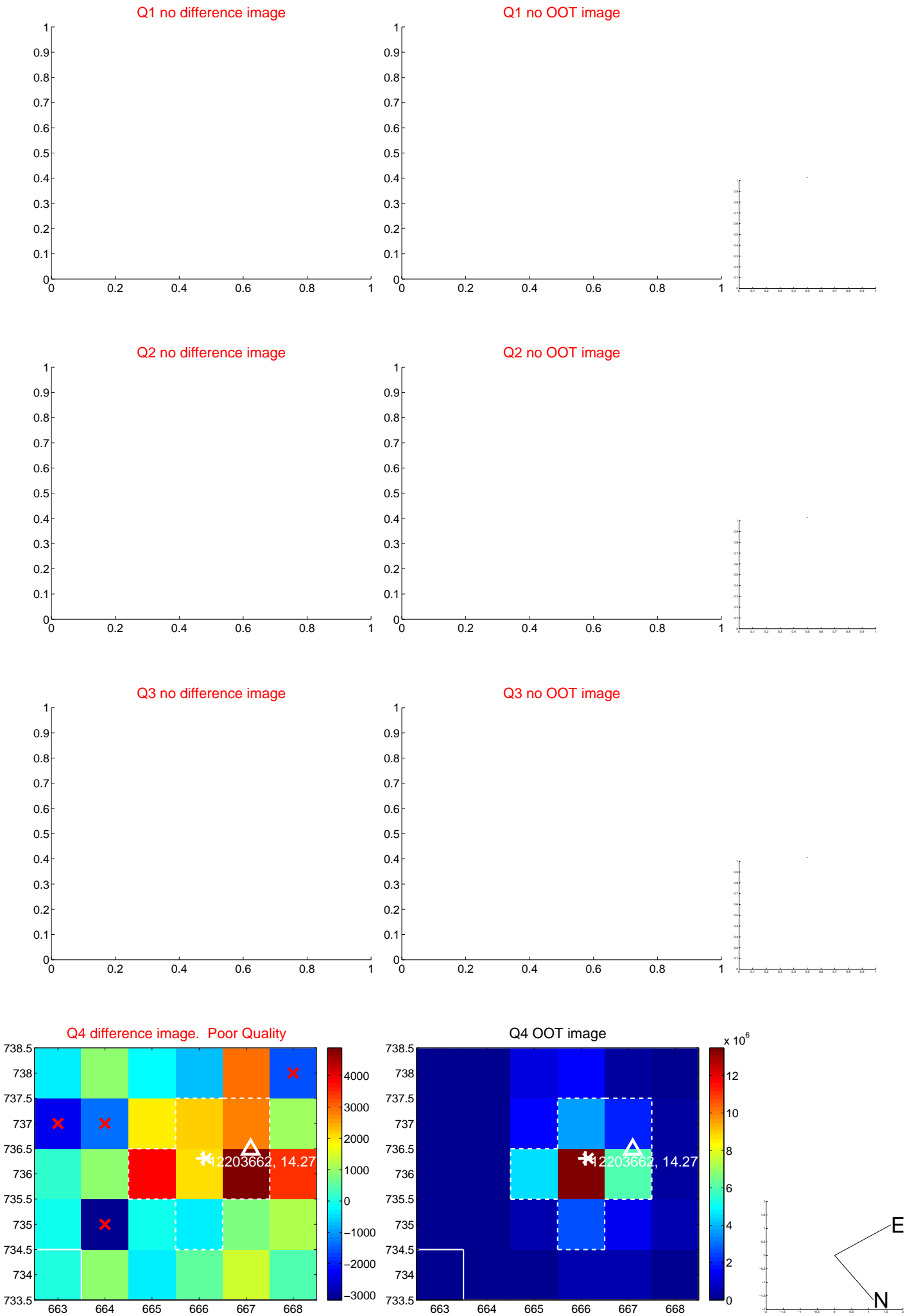
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.251 \pm 0.999$	0.25	$0.151 \pm 1.084$	$0.200 \pm 0.438$
PRF-fit source offset from KIC position	$0.081 \pm 1.133$	0.07	$-0.075 \pm 1.037$	$-0.032 \pm 0.462$
photometric centroid source offset	$1.56 \pm 1.29$	1.21	$1.23 \pm 1.32$	$-0.96 \pm 1.24$



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.



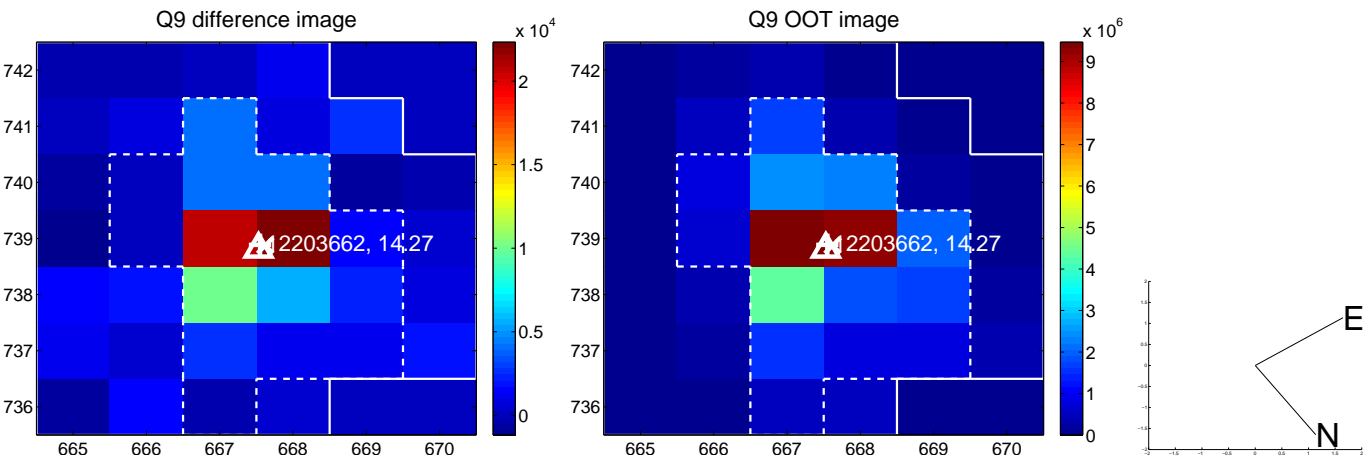
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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.



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

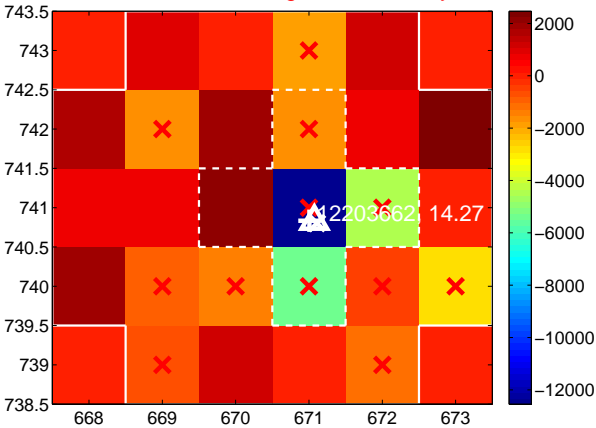
Q13 no difference image



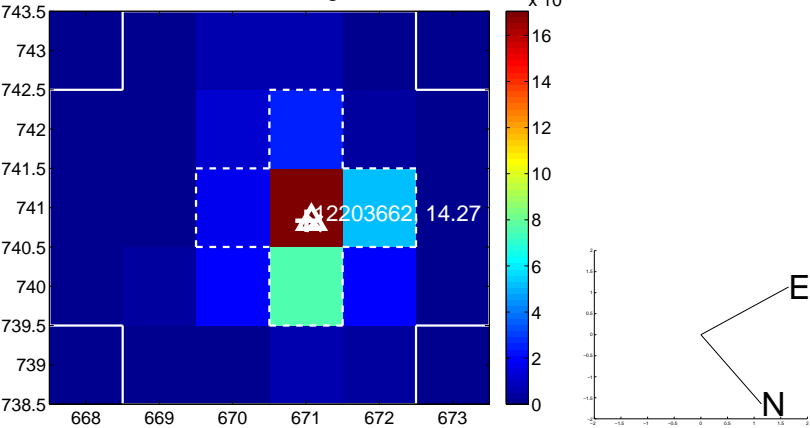
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



Q15 no difference image



Q15 no OOT image



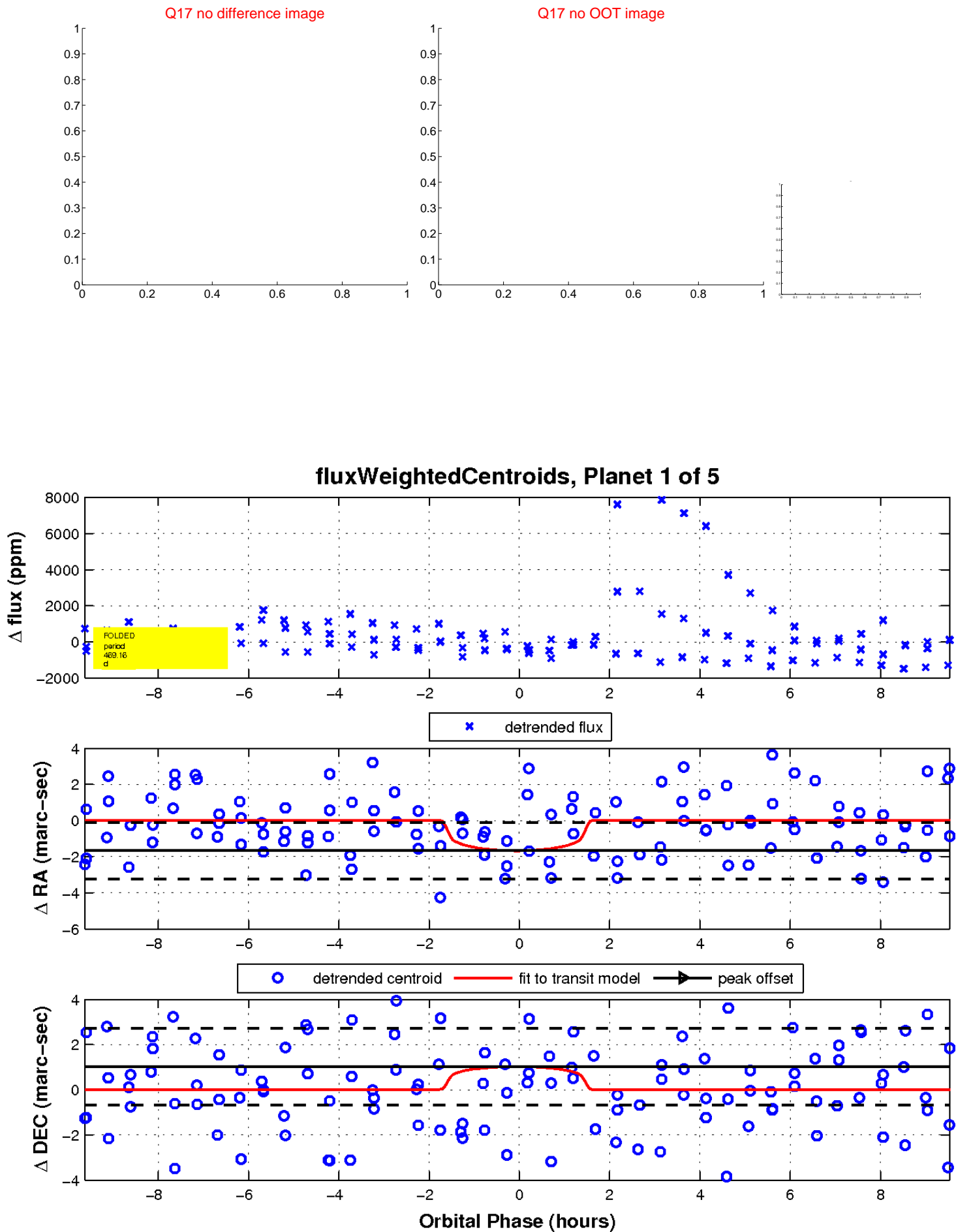
Q16 no difference image



Q16 no OOT image



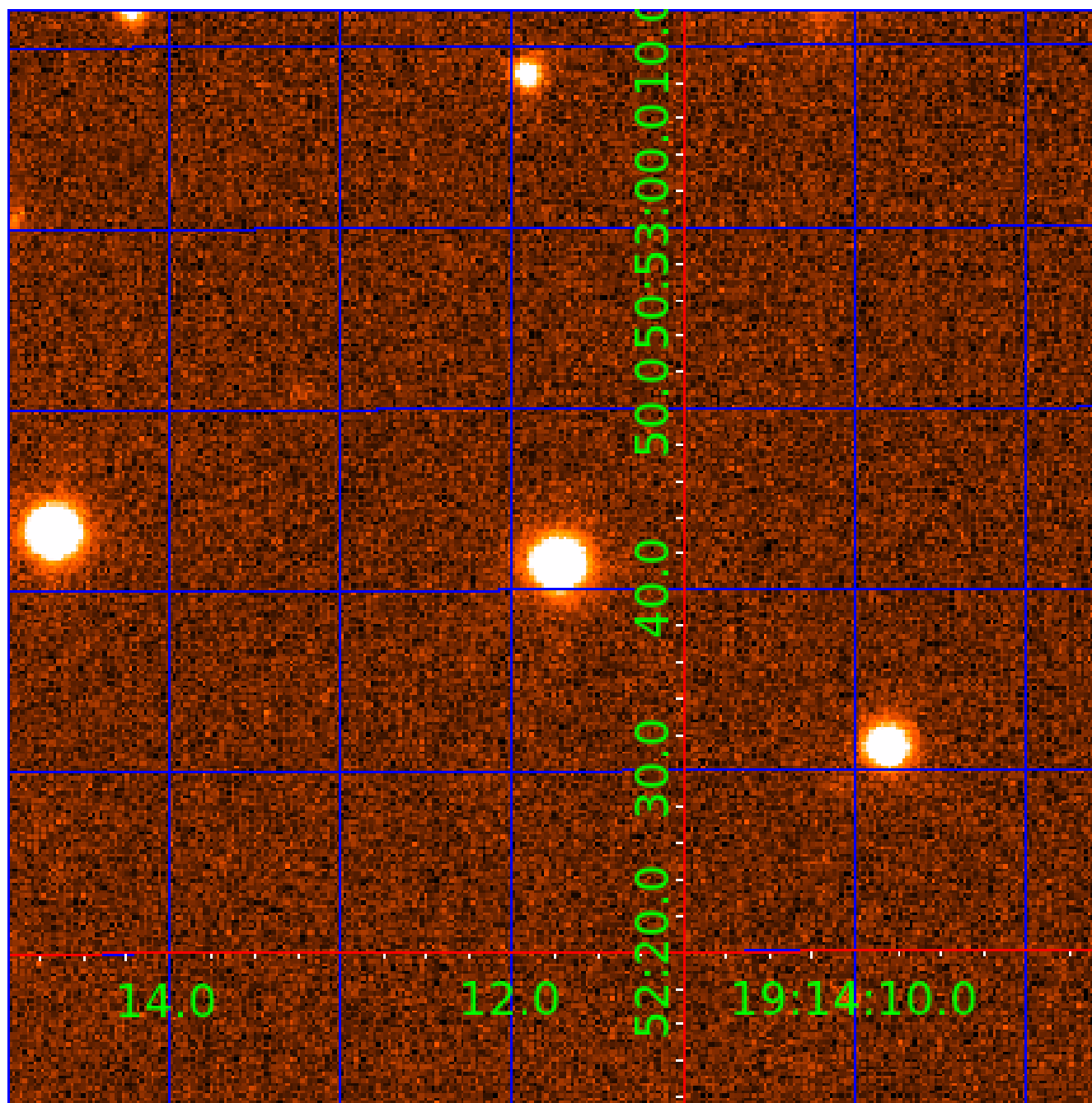
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 012203662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012203662-01	OBS	No	469.157826	419.653079	1064.5	3.234	15.1	5.7	0.57	4878	1.93	0.17
012203662-02	OBS	No	586.953956	393.637225	1086.1	3.421	12.6	7.0	0.57	4878	1.98	0.13
012203662-03	OBS	No	256.330290	151.444918	933.5	3.476	11.1	8.2	0.57	4878	1.81	0.39
012203662-04	OBS	No	451.658922	304.058204	2835.2	4.576	10.3	9.3	0.57	4878	5.91	0.18
012203662-05	OBS	No	332.607776	223.725496	1209.2	2.434	13.6	5.9	0.57	4878	1.99	0.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012203662-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS
012203662-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—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.

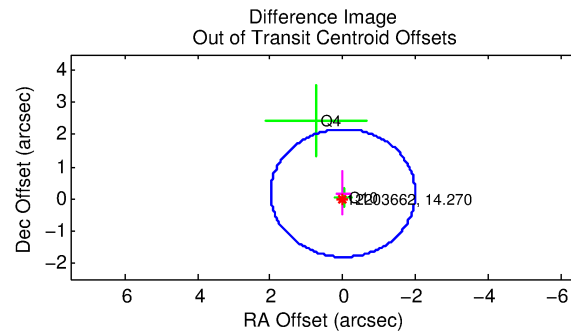
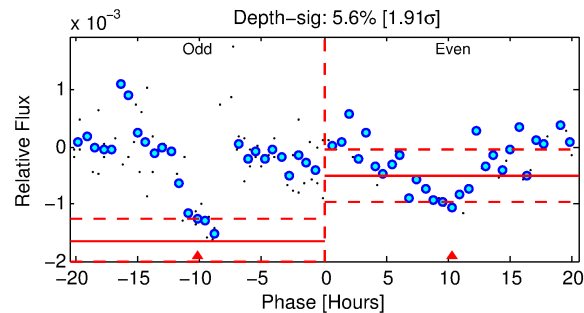
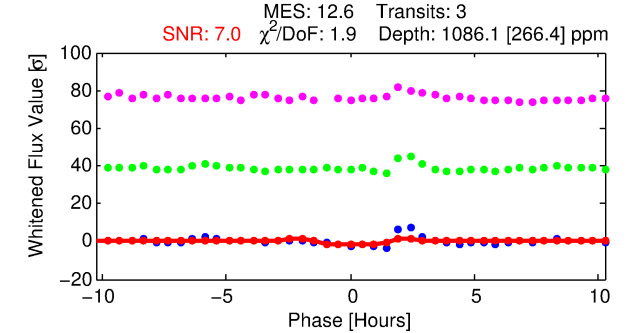
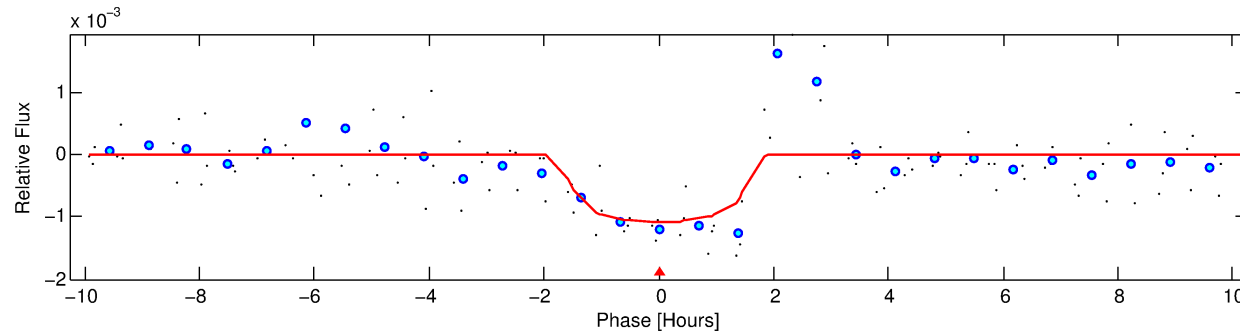
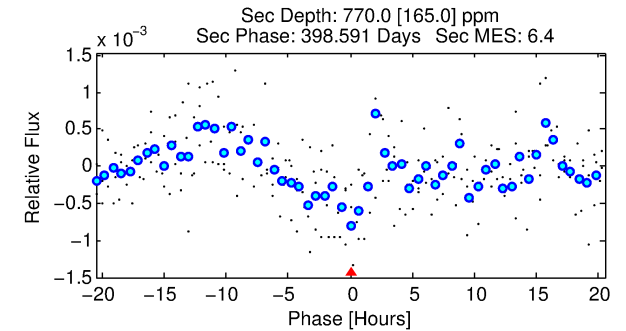
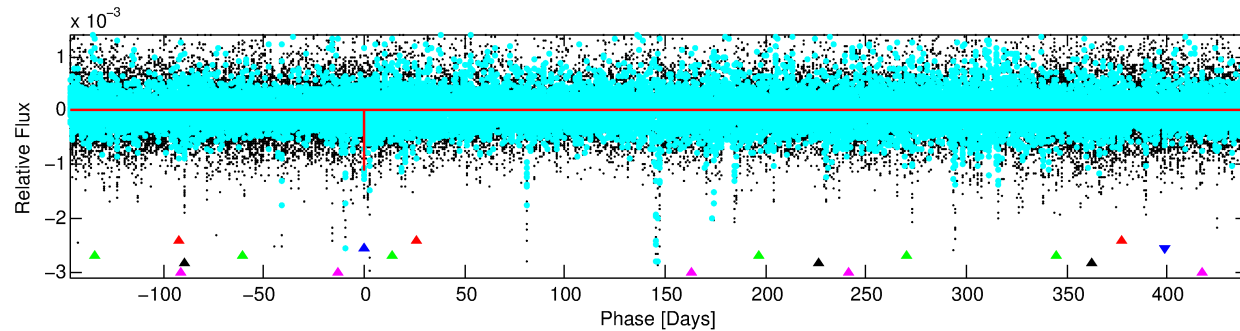
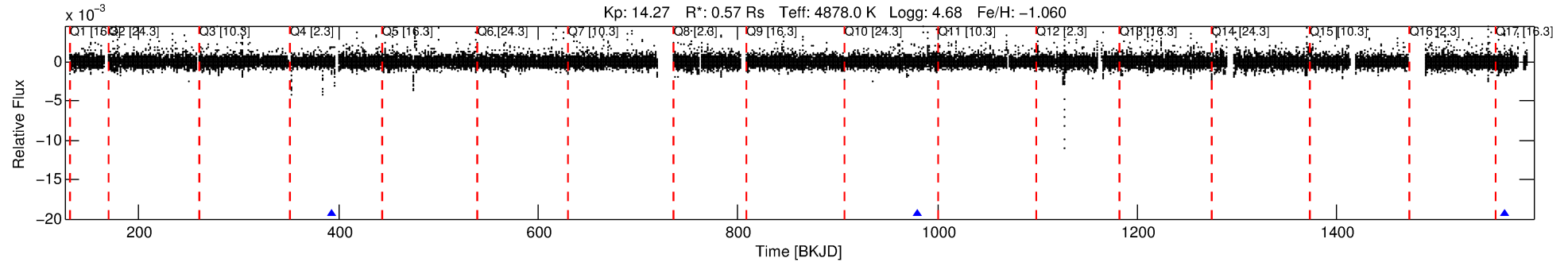
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012203662-02

No Significant Match Found

# DV One-Page Summary

KIC: 12203662 Candidate: 2 of 5 Period: 586.954 d



## DV Fit Results:

Period = 586.95396 [0.00733] d  
Epoch = 393.6372 [0.0100] BKJD  
Rp/R\* = 0.0316 [0.0593]  
a/R\* = 1067.13 [7616.39]  
b = 0.63 [6.86]  
Seff = 0.13 [0.02]  
Teq = 153 [6] K  
Rp = 1.98 [3.72] Re  
a = 1.1408 [0.0719] AU  
Ag = 140612.75 [529364.27] [0.27 $\sigma$ ]  
Teffp = 4574 [4306] K [1.03 $\sigma$ ]

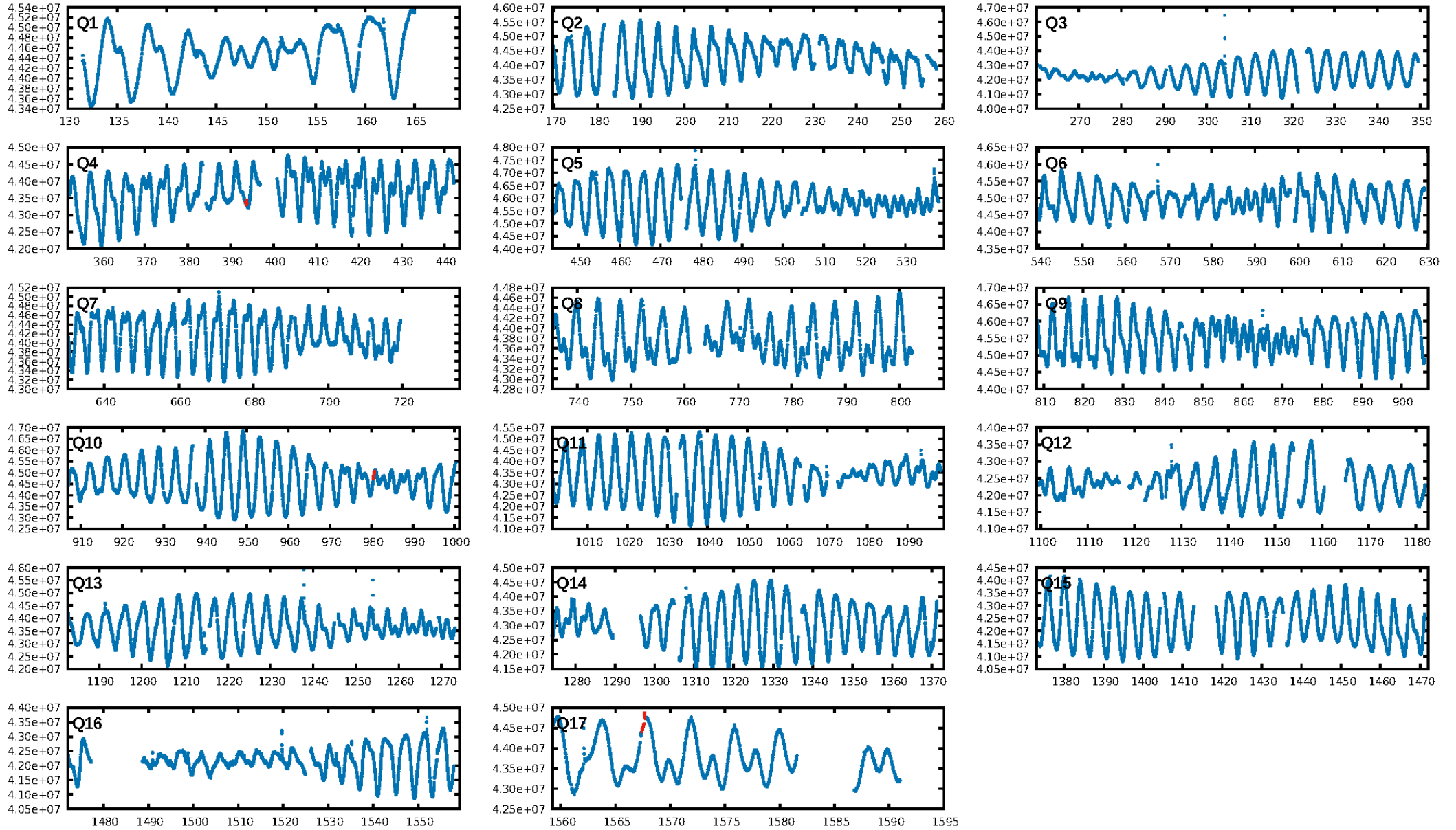
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [600.54 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 2.9%  
ModelChiSquareGof-sig: 58.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 1.33  
Centroid-sig: 93.1%  
Centroid-so: 0.007 arcsec [0.01 $\sigma$ ]  
OotOffset-rm: 0.174 arcsec [0.26 $\sigma$ ]  
OotOffset-st: 1/0/1/0 [2]  
KicOffset-rm: 0.247 arcsec [0.35 $\sigma$ ]  
KicOffset-st: 1/0/1/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [3/3]

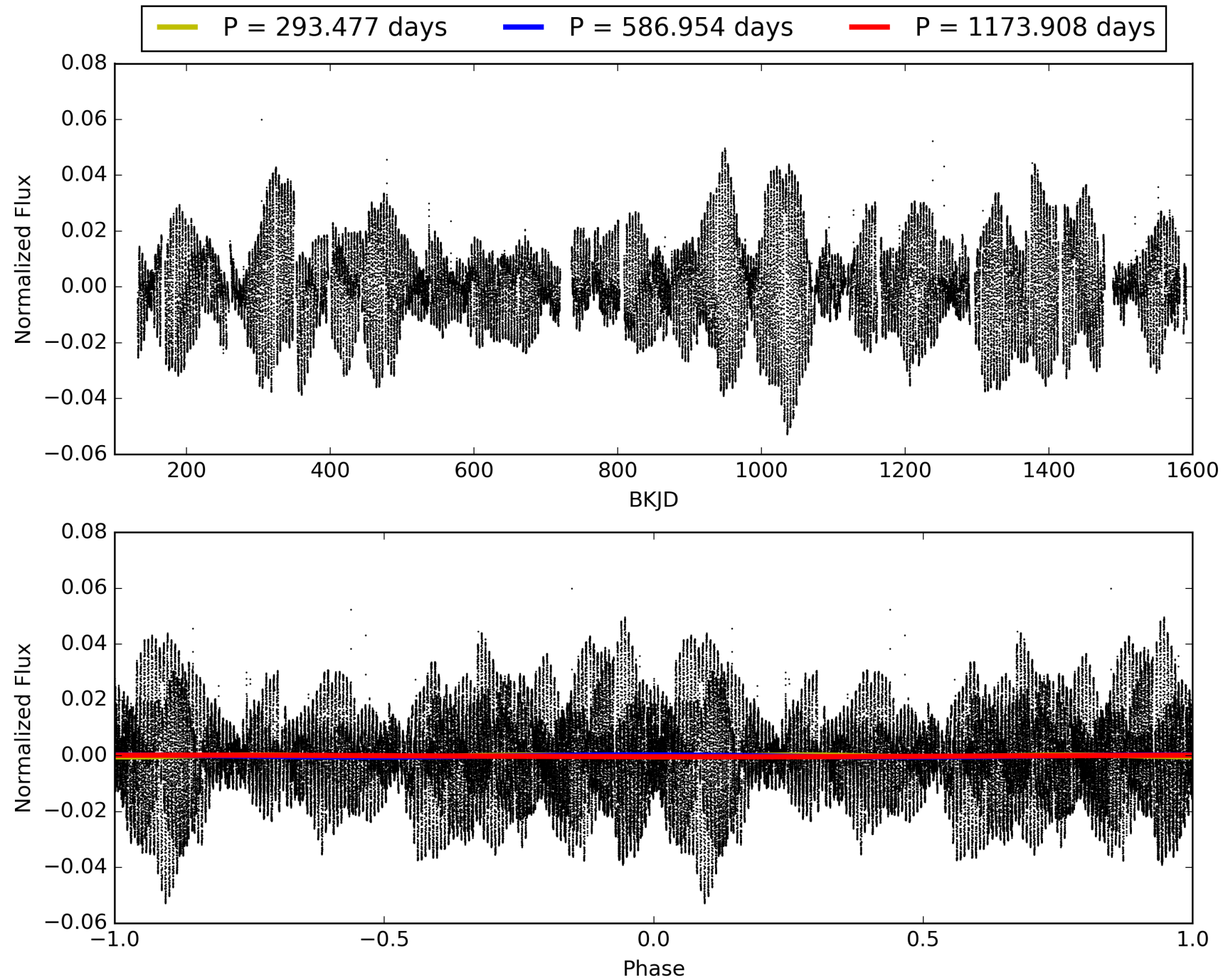
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:54:05 Z

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

# TCE 012203662-02, PDC Light Curves



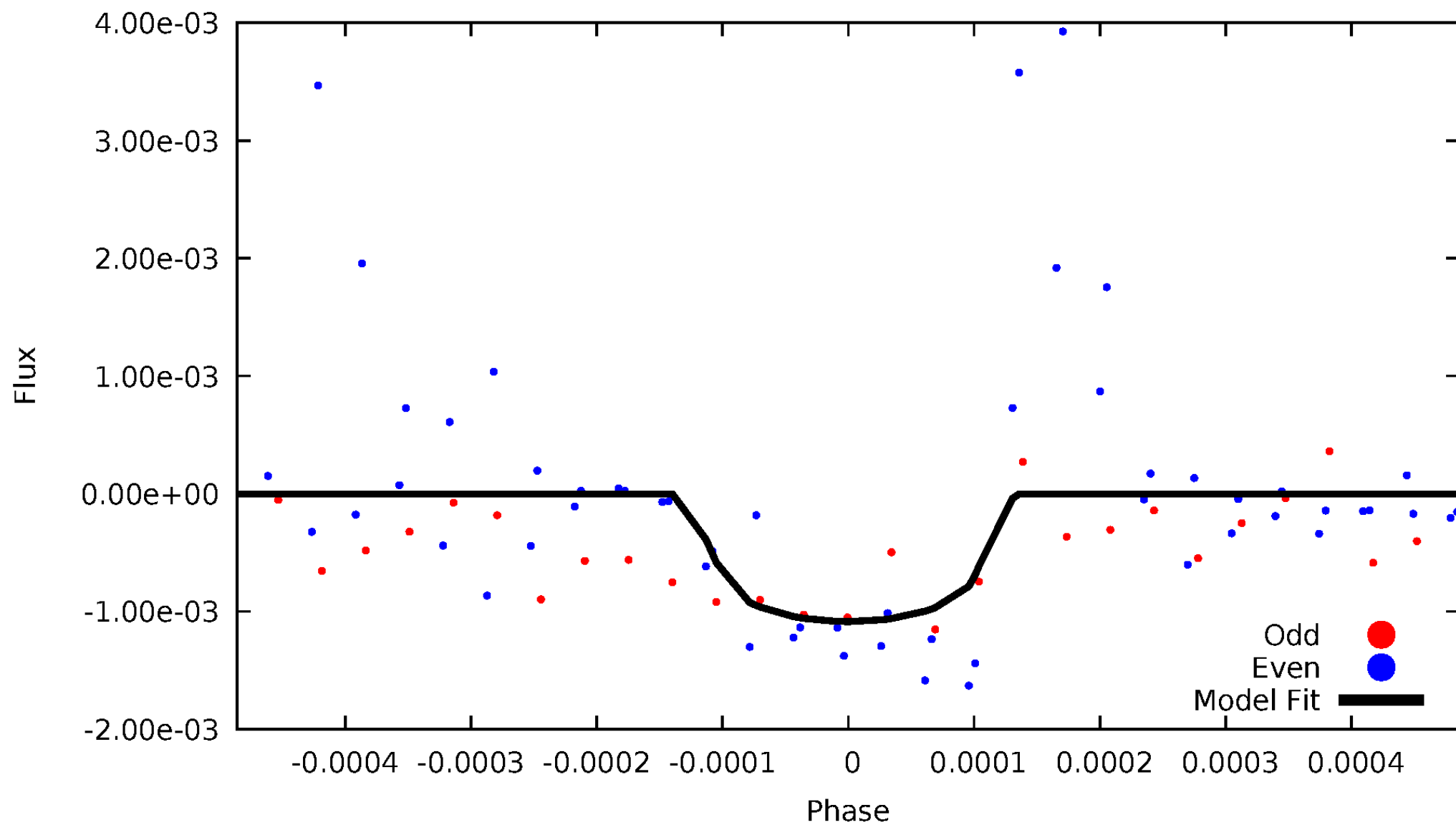
TCE 012203662-02





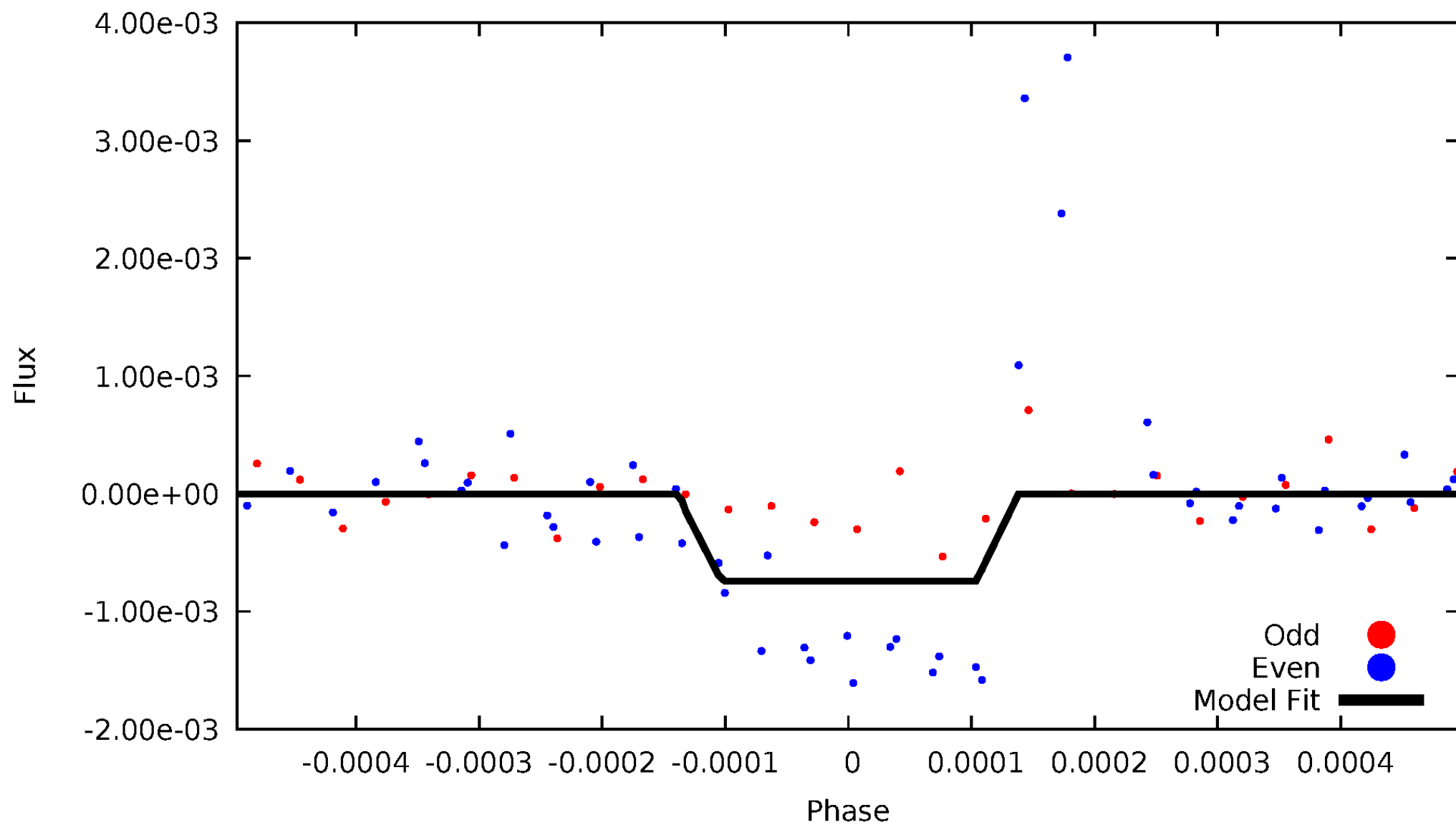
# DV Odd/Even

TCE 012203662-02



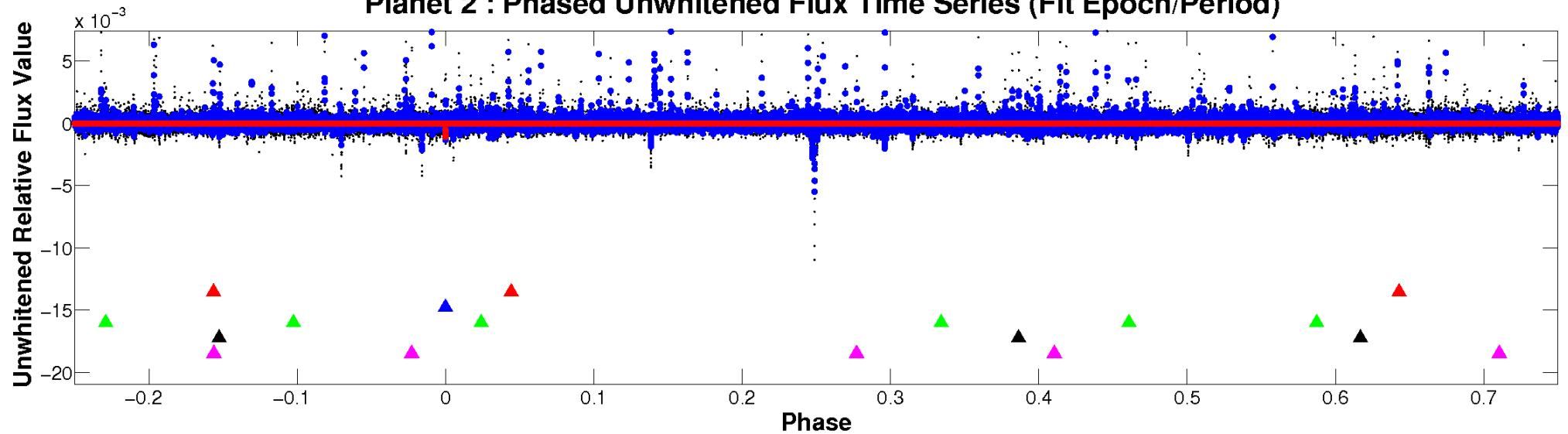
# ALT Odd/Even

TCE 012203662-02

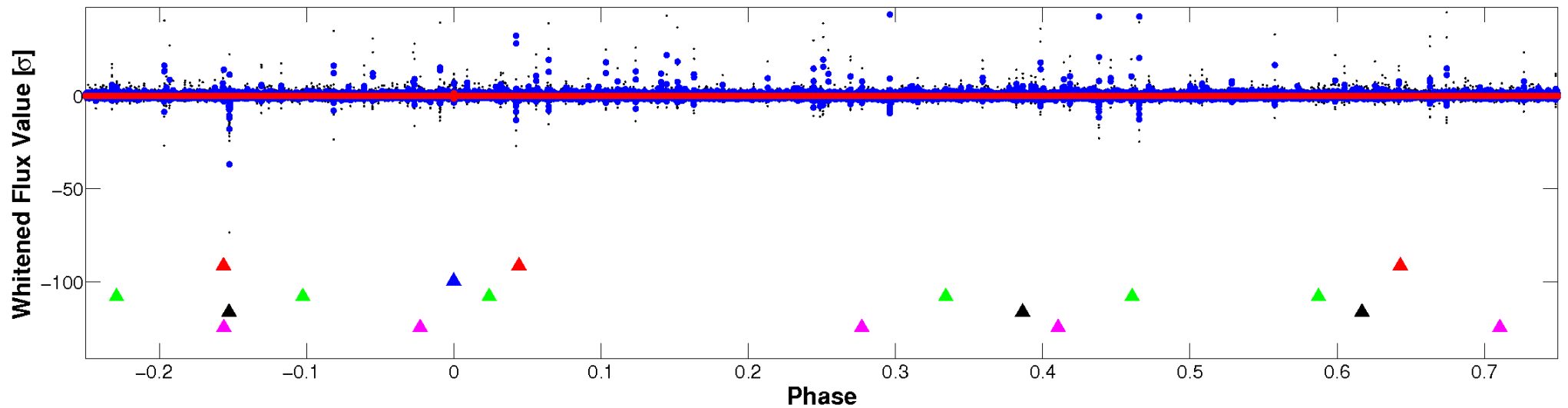


# Non-Whitened Vs. Whitened Light Curve

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

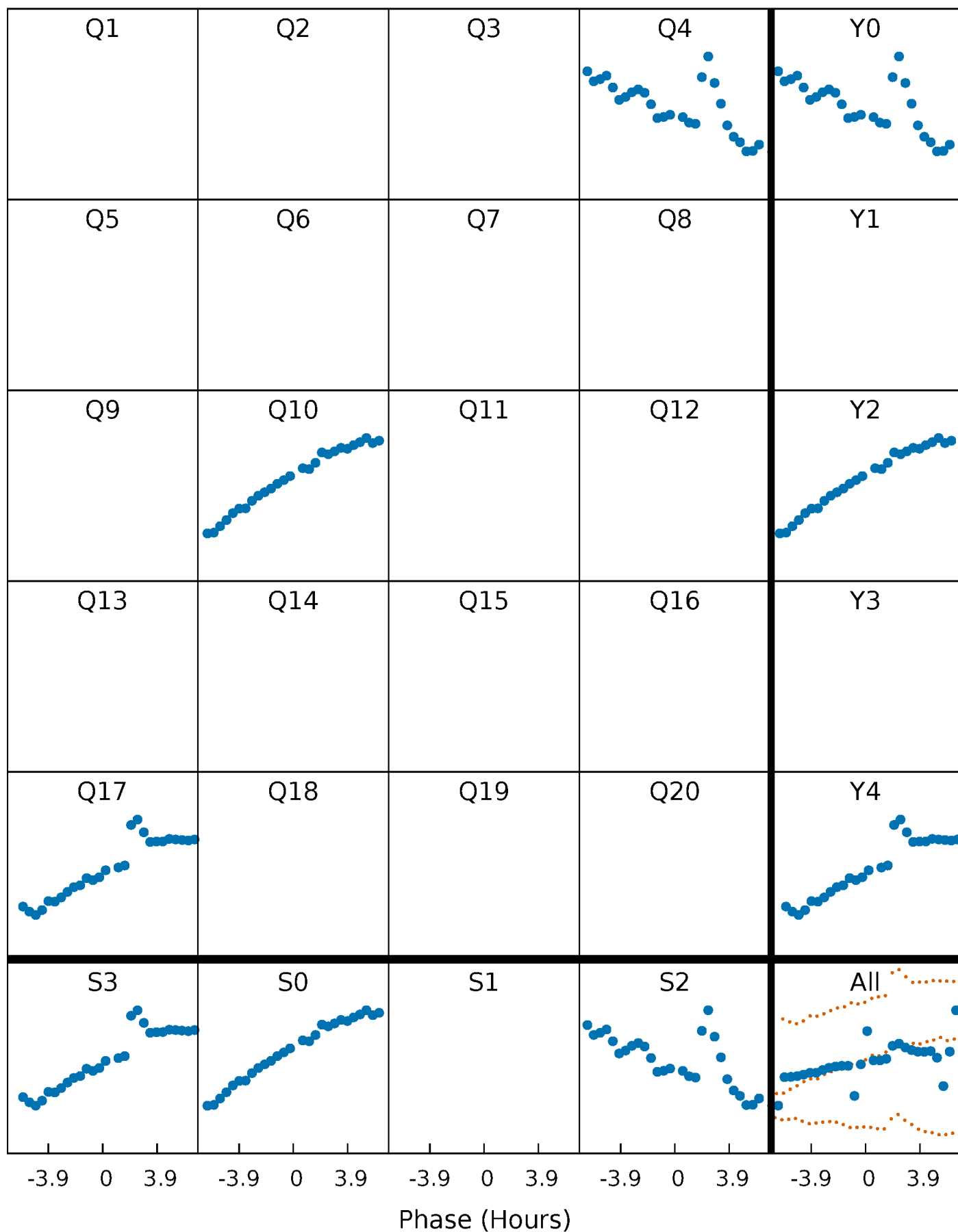


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



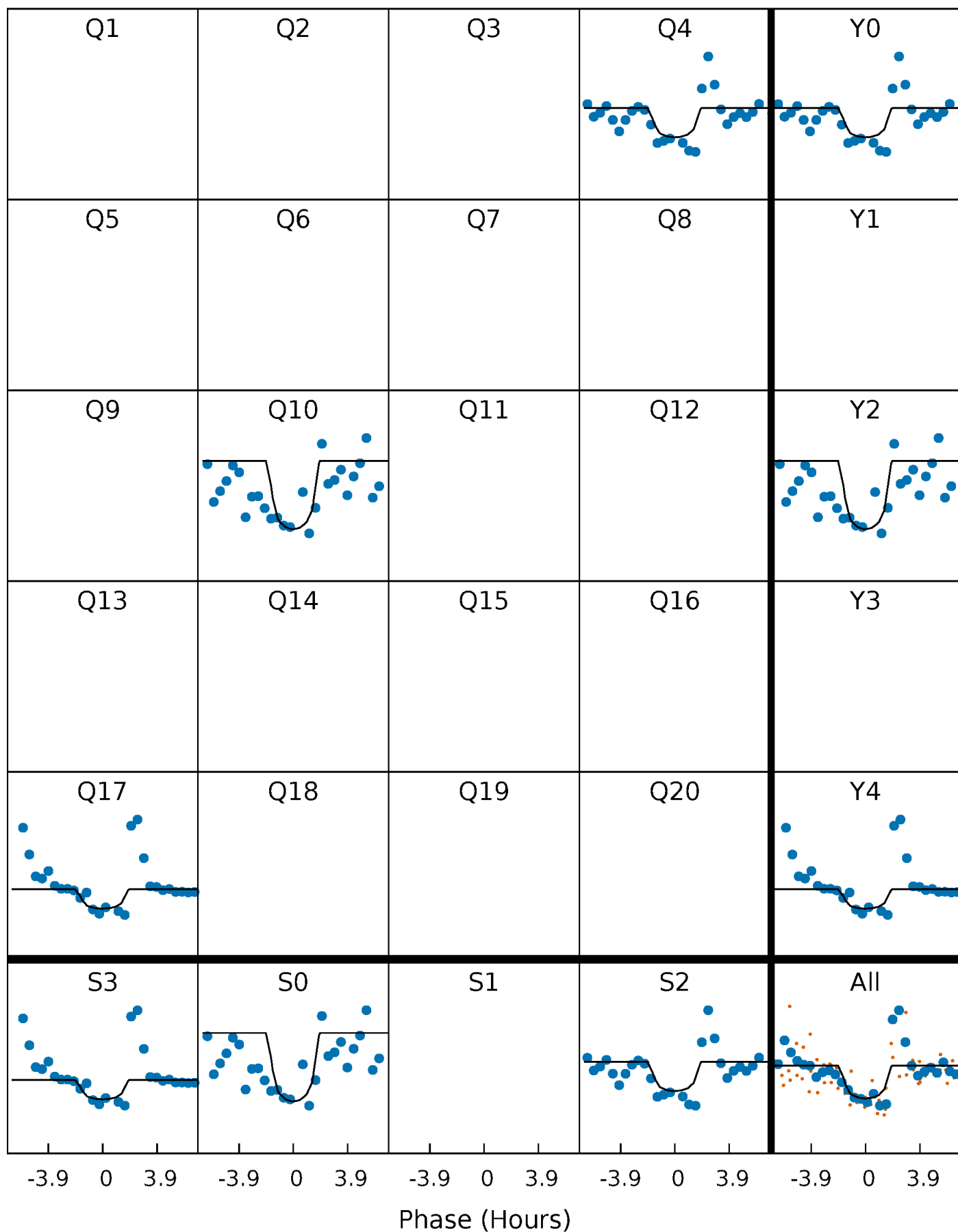
# PDC Quarter-Phased Transit Curves

TCE 012203662-02 P=586.953957 Days  $T_0=393.637225$  (BKJD)



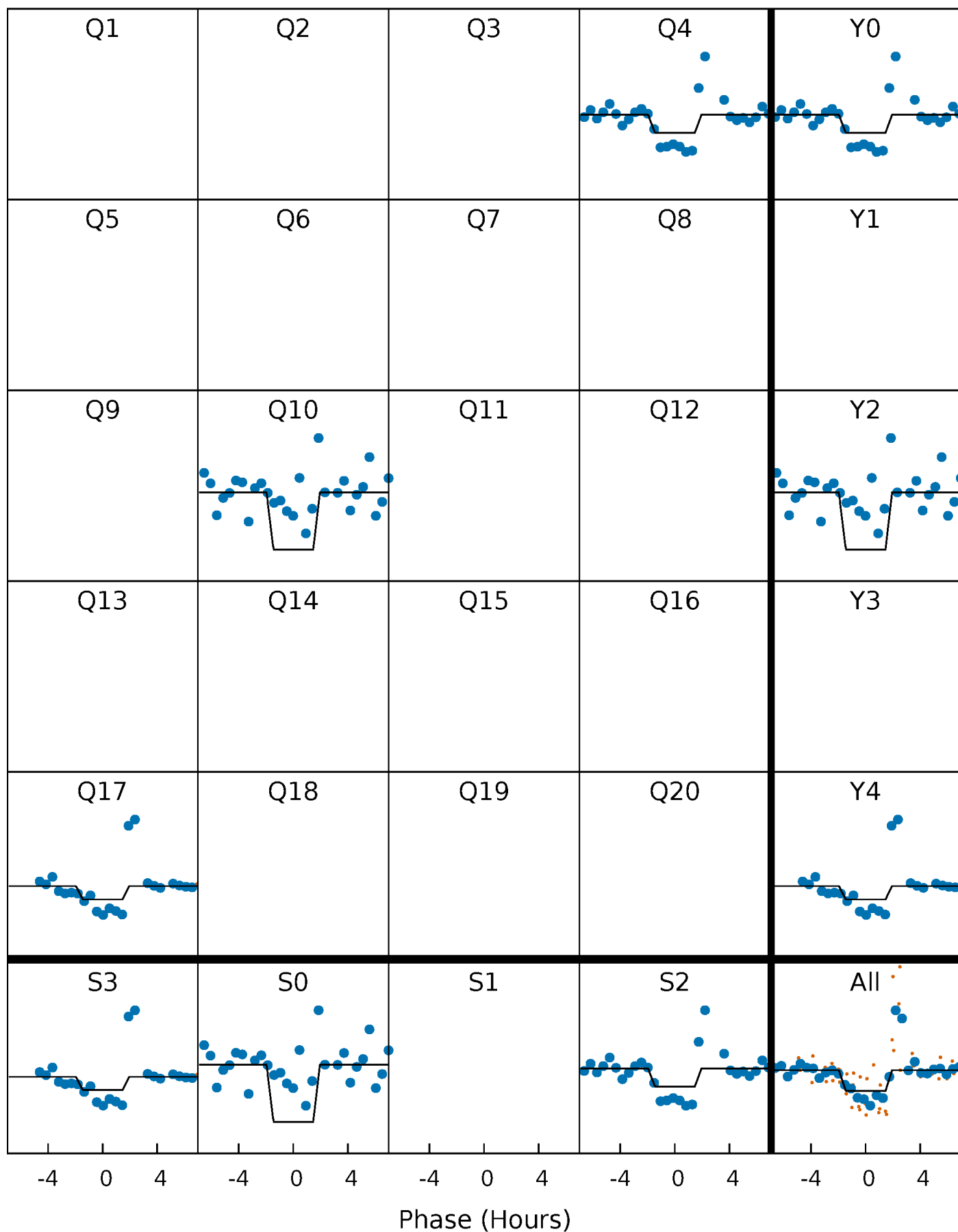
# DV Quarter-Phased Transit Curves

TCE 012203662-02 P=586.953957 Days  $T_0=393.637225$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

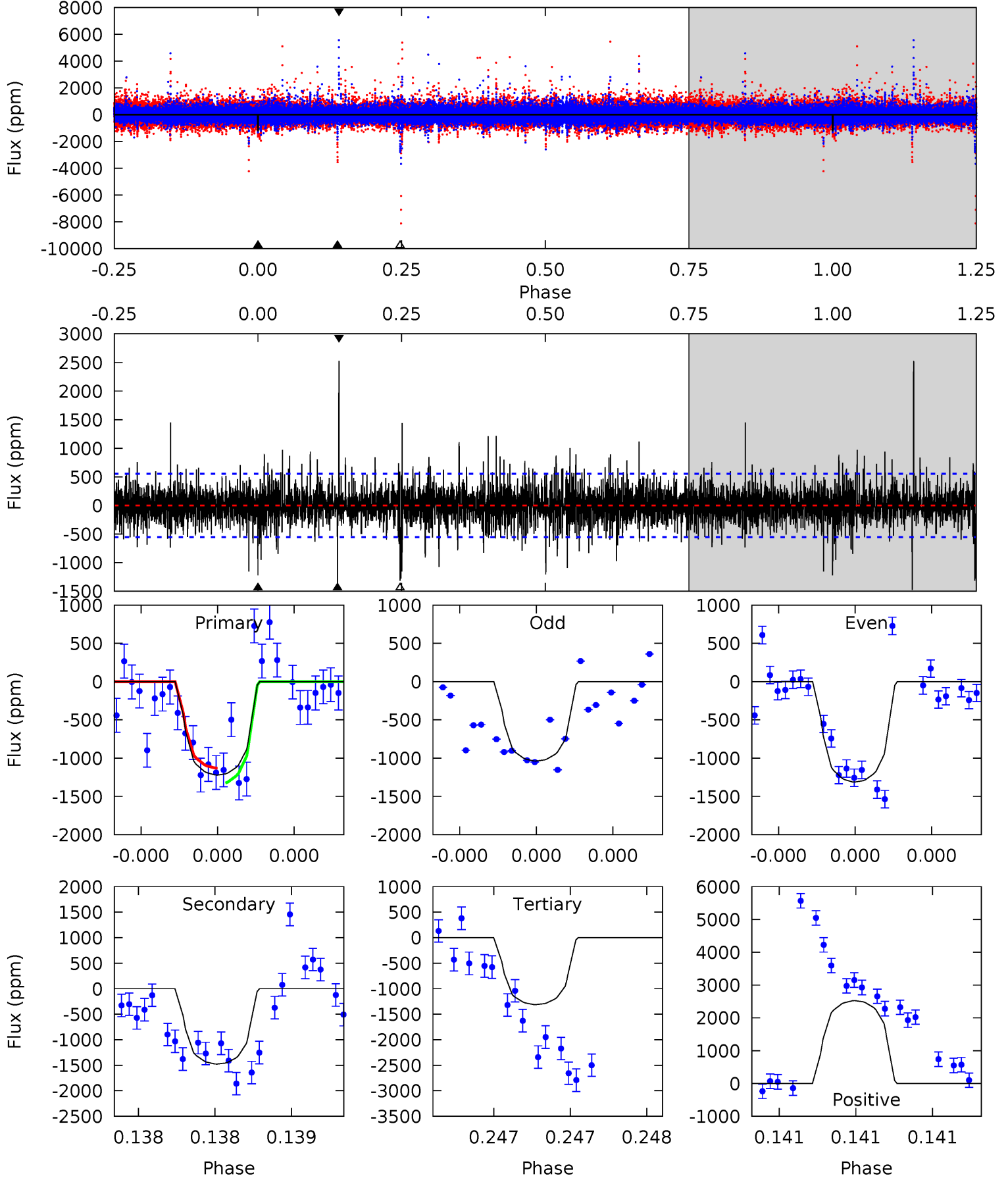
TCE 012203662-02 P=586.954011 Days  $T_0=393.632647$  (BKJD)



# DV Model-Shift Uniqueness Test

012203662-02, P = 586.953957 Days, E = 393.637225 Days

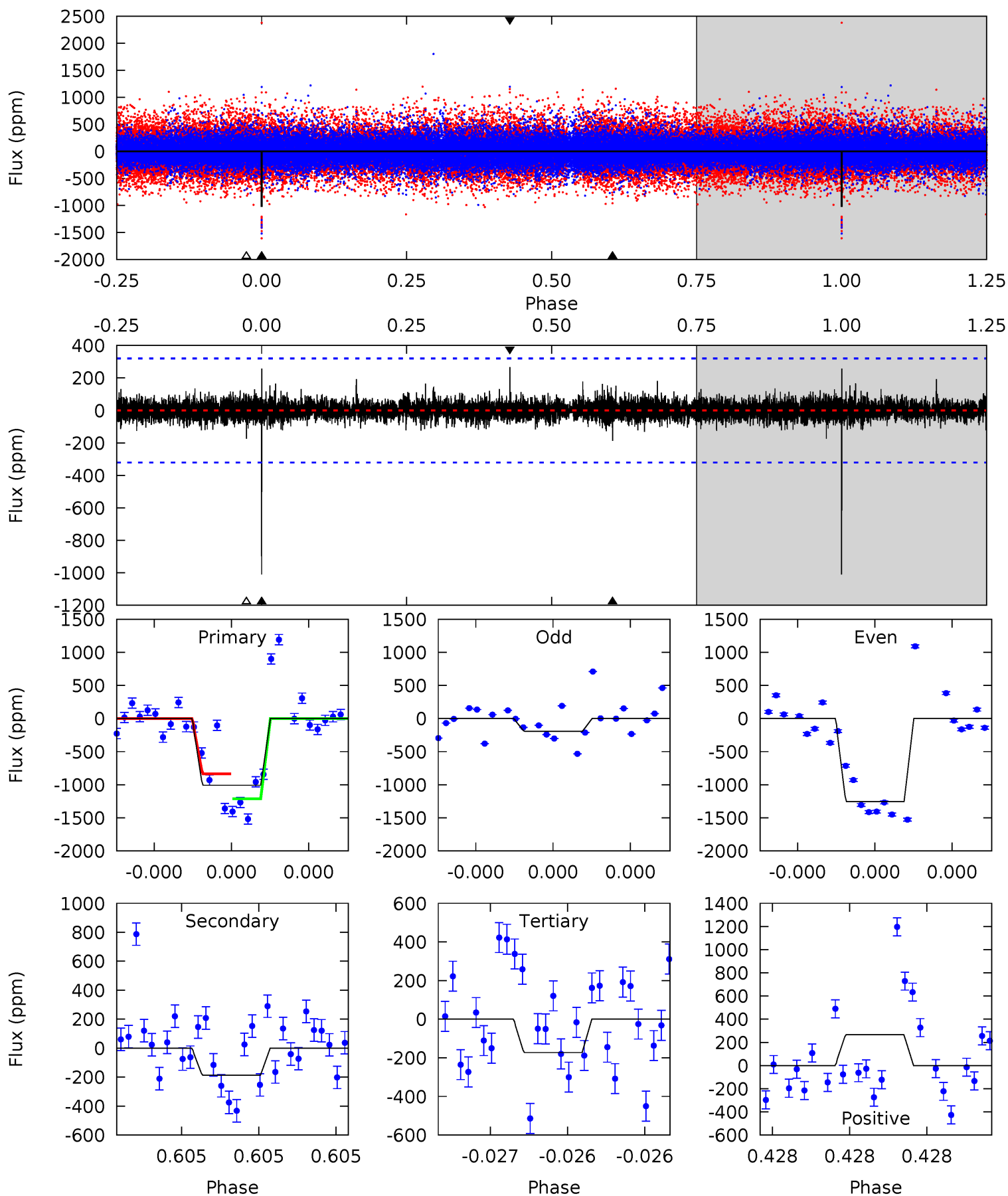
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	15.1	13.5	25.9	5.69	3.66	2.30	-0.94	-13.4	1.68	-10.7	0.97	1.06	0.63	1.01



# Alt Model-Shift Uniqueness Test

012203662-02, P = 586.954011 Days, E = 393.632647 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.9	3.32	3.06	4.72	5.68	3.64	0.57	14.8	13.2	0.26	-1.41	9.89	0.72	0.21	3.32





### Stellar Parameters For KIC 012203662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4878^{+147}_{-147}$	$4.678^{+0.054}_{-0.032}$	$-1.060^{+0.300}_{-0.300}$	$0.575^{+0.038}_{-0.041}$	$0.575^{+0.046}_{-0.021}$	$4.254^{+0.907}_{-0.514}$
	+3%/-3%	+1%/-1%	+28%/-28%	+7%/-7%	+8%/-4%	+21%/-12%
Source	PHO1	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 012203662-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1476 \pm 98$	$3.48^{+3.14}_{-2.36}$	$213^{+7}_{-8}$	$4233^{+2966}_{-853}$	$90162^{+775896}_{-65707}$
Alt.	$-187 \pm 56$	$3.14^{+3.03}_{-2.08}$	$212^{+7}_{-8}$	$3117^{+1369}_{-554}$	$13572^{+116378}_{-10251}$

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

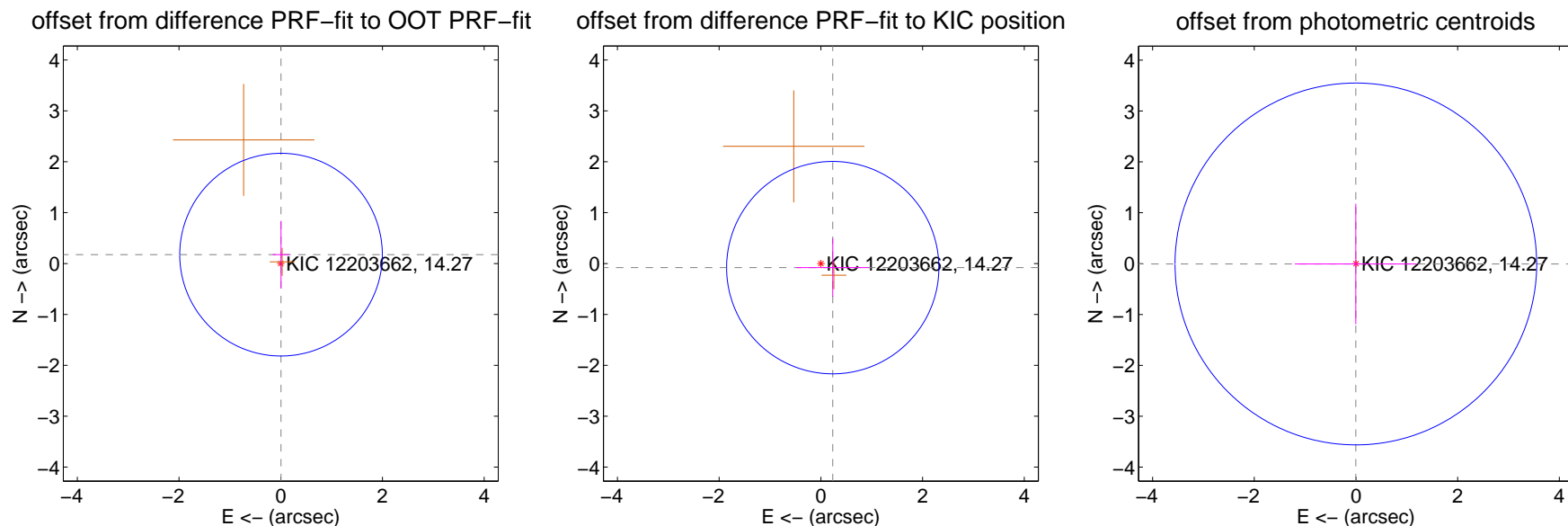
## DV Centroid Data

Supplemental centroid analysis for 012203662-02. Kepler magnitude: 14.27. Transit SNR 6.97

There are 0 quarters with good PRF difference image offsets

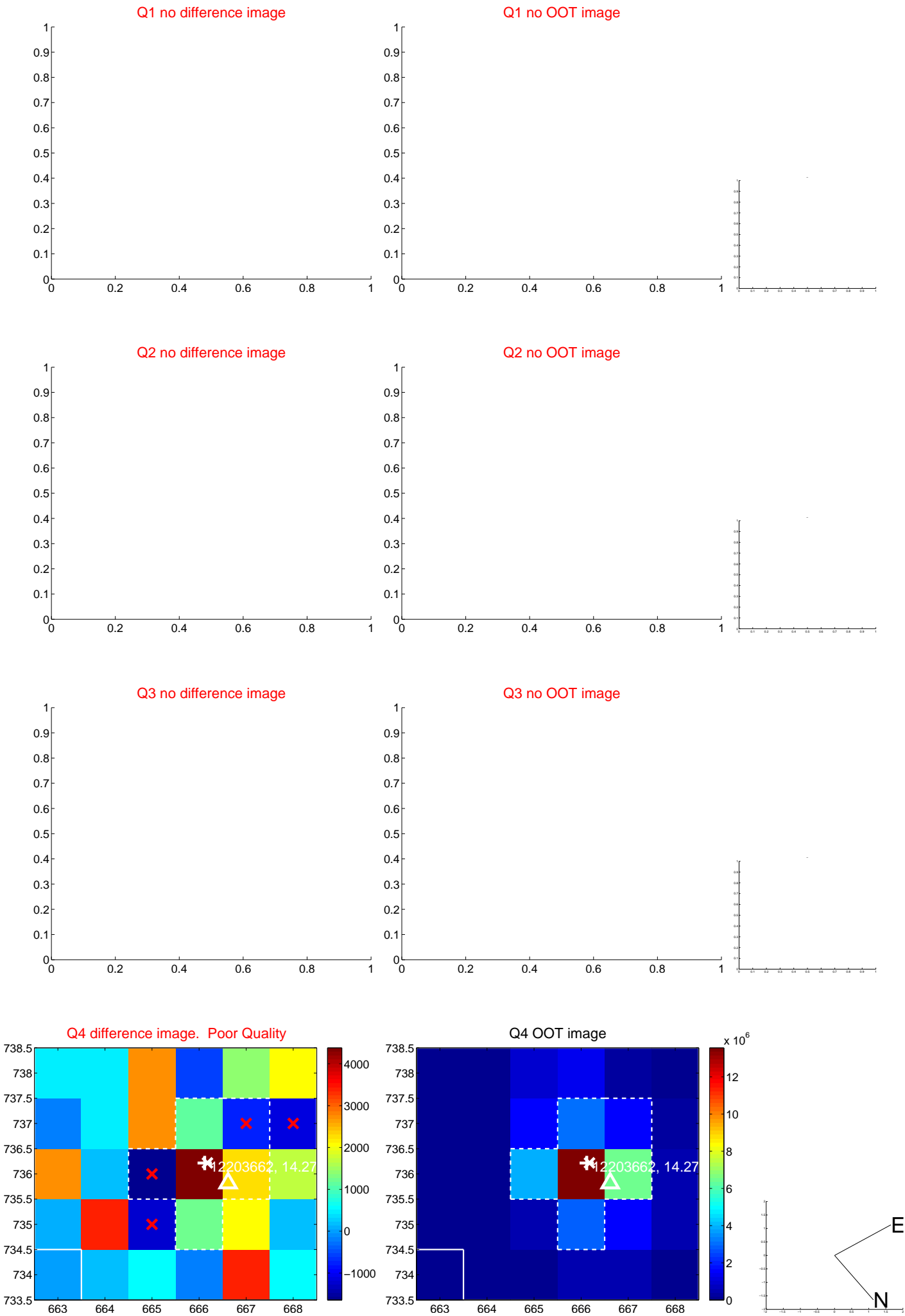
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.174 \pm 0.664$	0.26	$-0.006 \pm 0.165$	$0.174 \pm 0.664$
PRF-fit source offset from KIC position	$0.247 \pm 0.696$	0.35	$-0.233 \pm 0.709$	$-0.081 \pm 0.571$
photometric centroid source offset	$0.01 \pm 1.19$	0.01	$0.00 \pm 1.20$	$-0.01 \pm 1.18$



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.

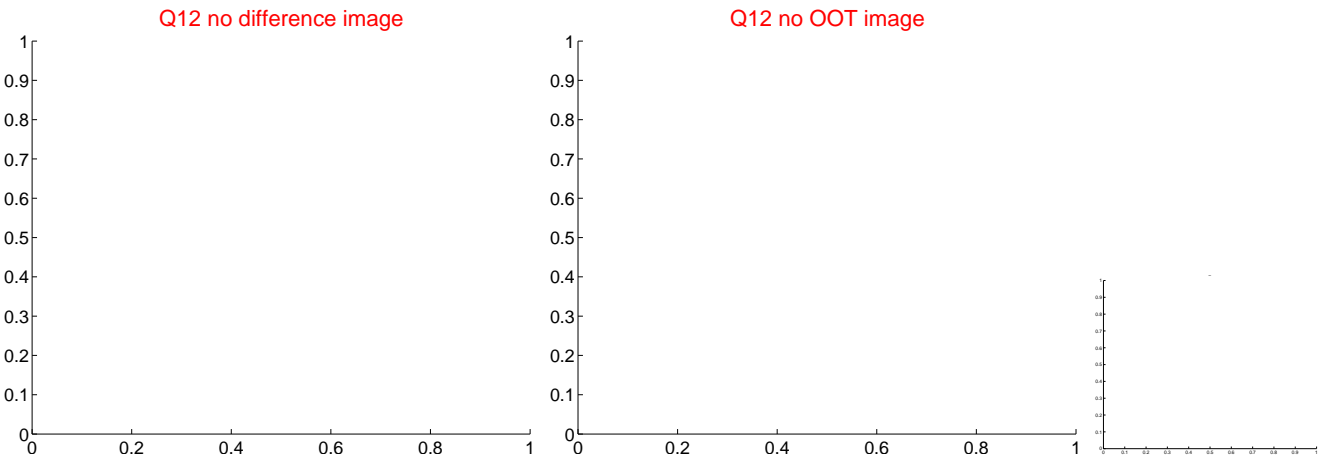
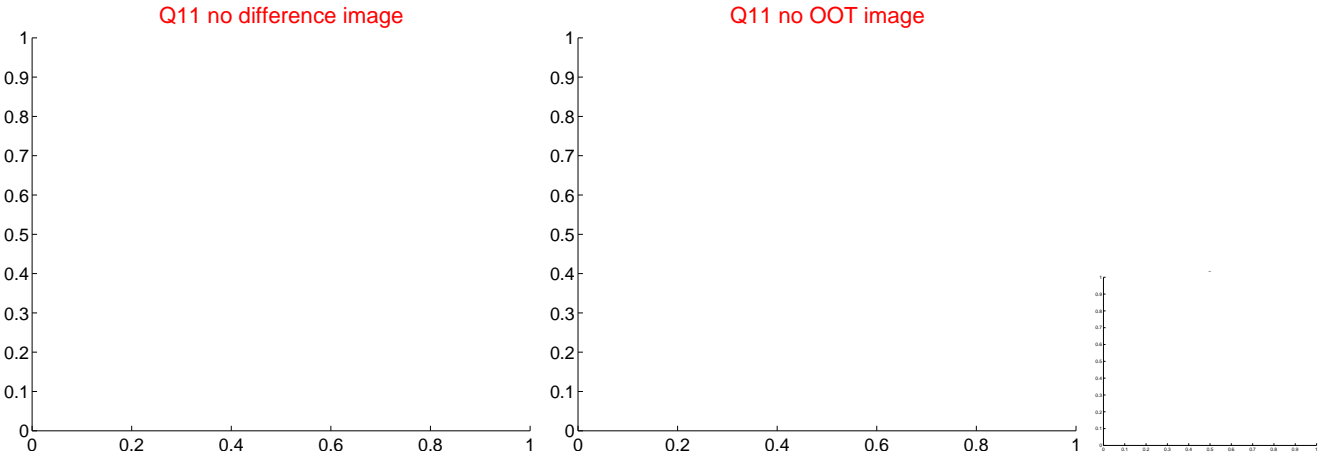
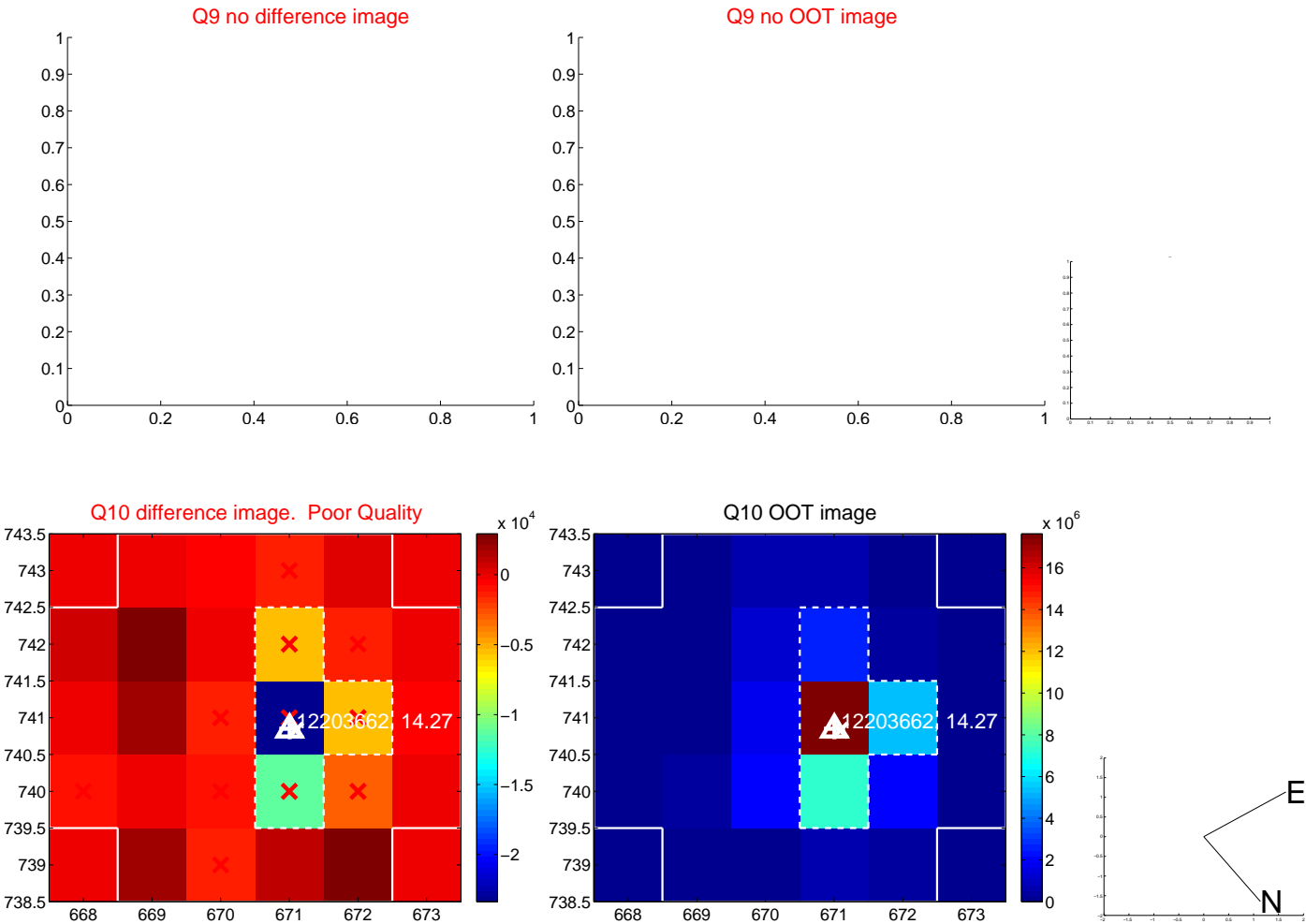
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



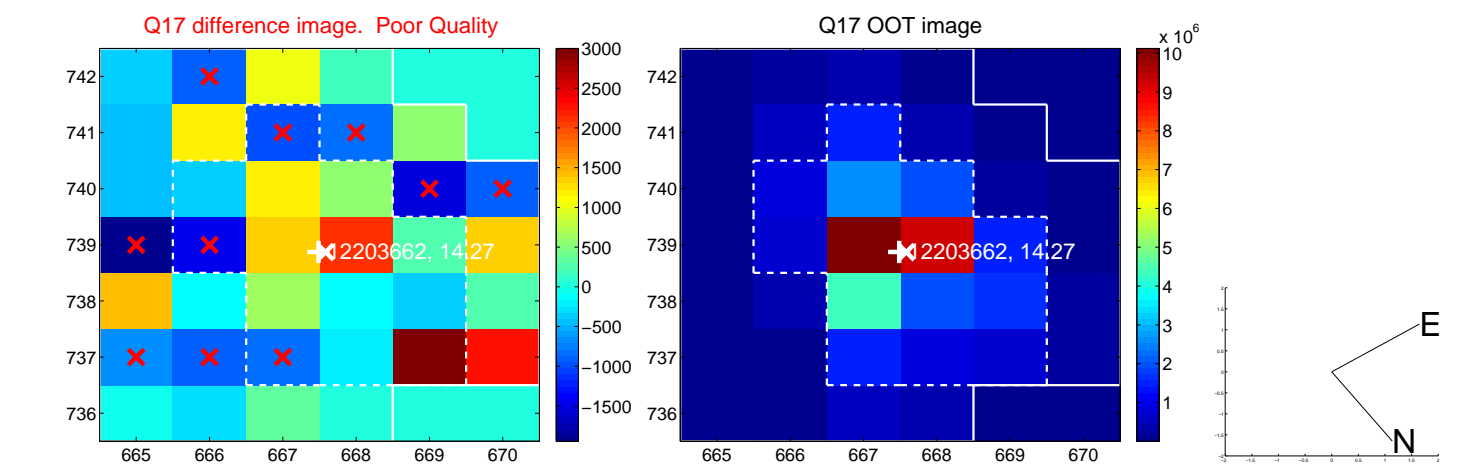
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



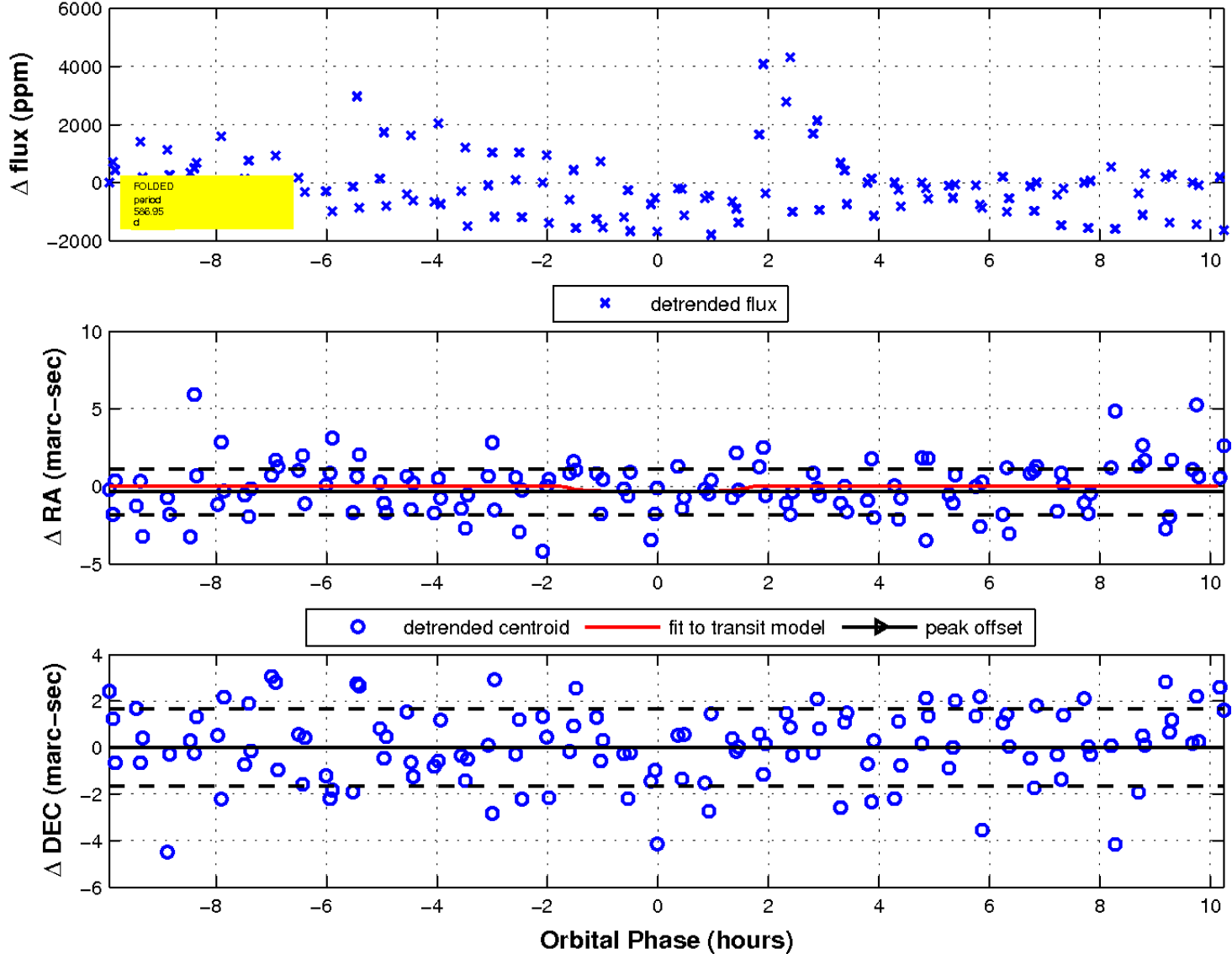
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

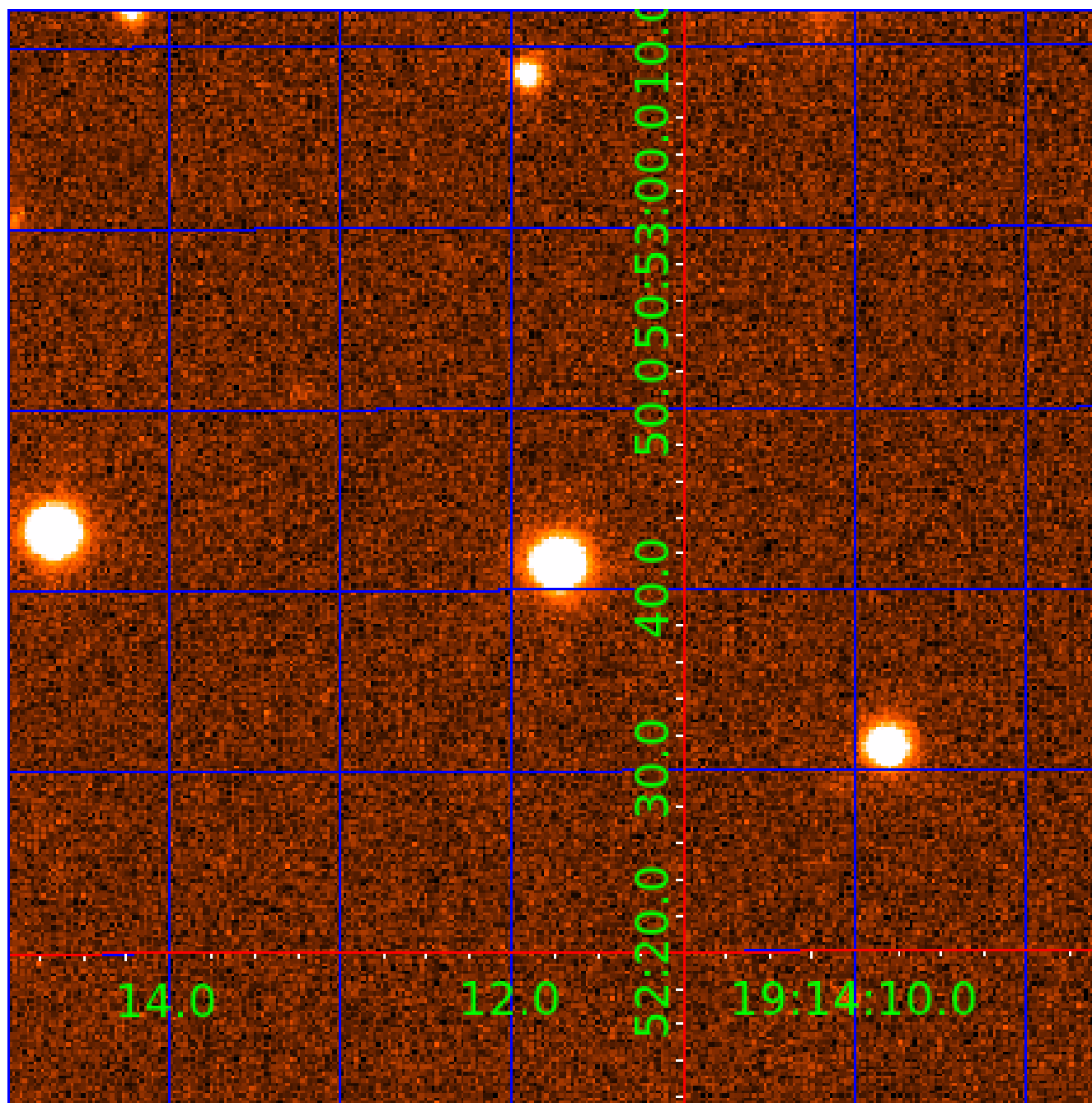


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination





# KIC 012203662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012203662-01	OBS	No	469.157826	419.653079	1064.5	3.234	15.1	5.7	0.57	4878	1.93	0.17
012203662-02	OBS	No	586.953956	393.637225	1086.1	3.421	12.6	7.0	0.57	4878	1.98	0.13
012203662-03	OBS	No	256.330290	151.444918	933.5	3.476	11.1	8.2	0.57	4878	1.81	0.39
012203662-04	OBS	No	451.658922	304.058204	2835.2	4.576	10.3	9.3	0.57	4878	5.91	0.18
012203662-05	OBS	No	332.607776	223.725496	1209.2	2.434	13.6	5.9	0.57	4878	1.99	0.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012203662-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS
012203662-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—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.

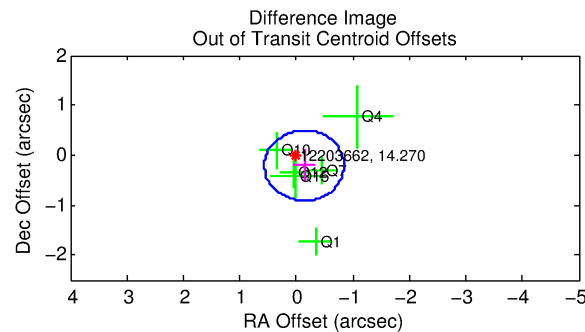
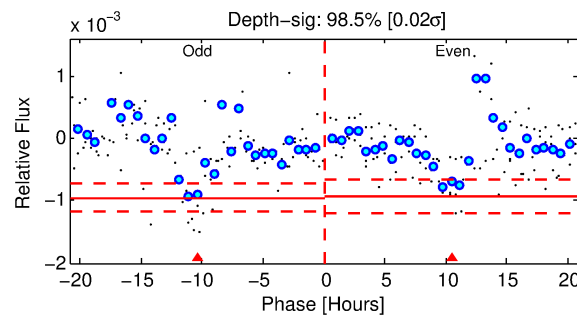
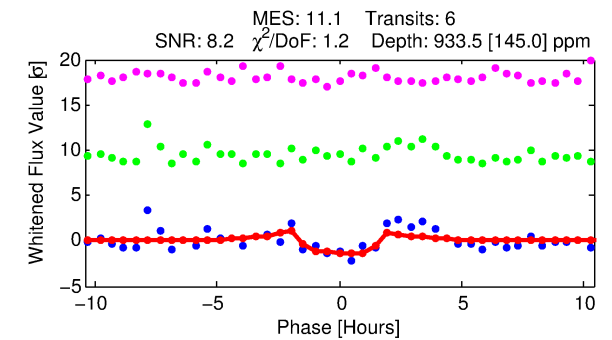
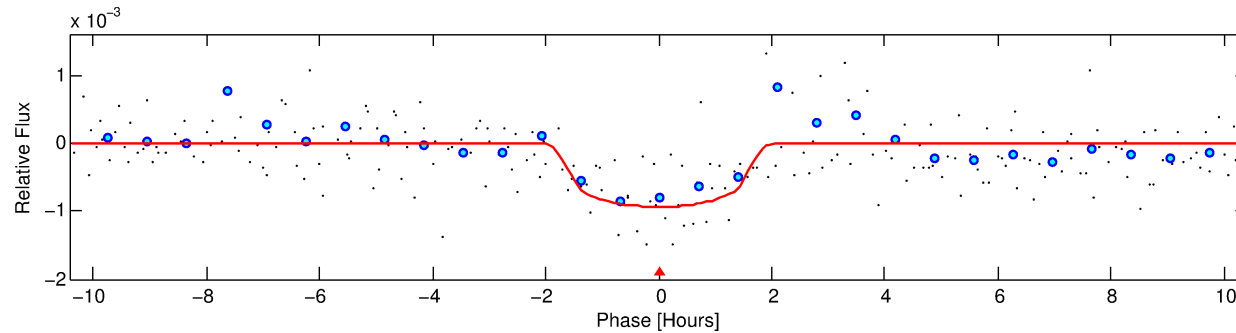
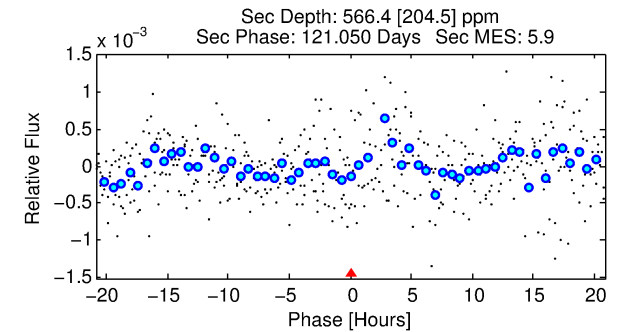
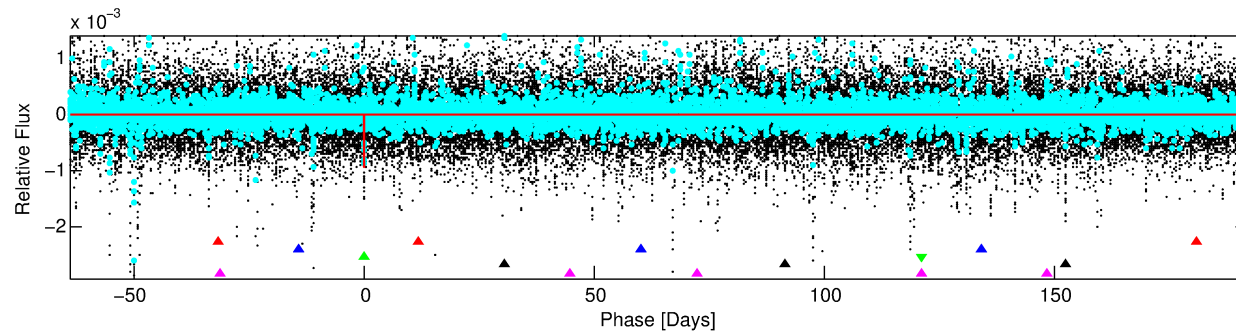
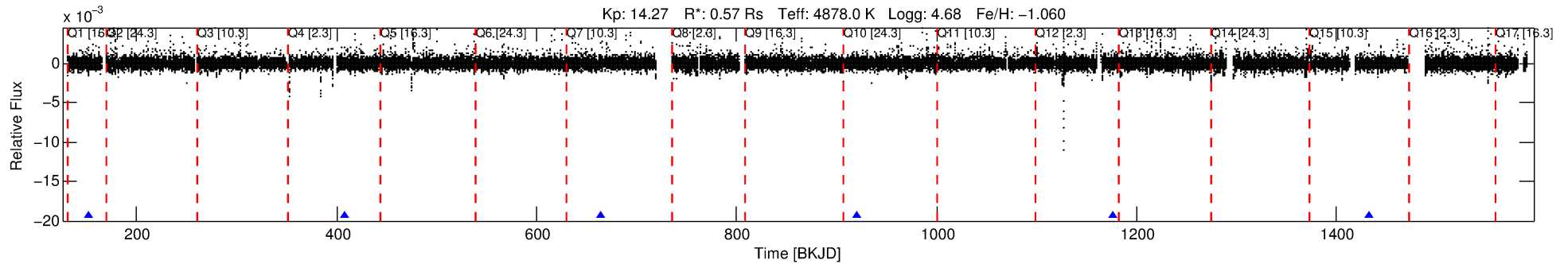
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012203662-03

No Significant Match Found

# DV One-Page Summary

KIC: 12203662 Candidate: 3 of 5 Period: 256.330 d



## DV Fit Results:

Period = 256.33029 [0.00226] d  
Epoch = 151.4449 [0.0068] BKJD  
Rp/R\* = 0.0289 [0.0544]  
a/R\* = 478.39 [3475.73]  
b = 0.58 [8.42]  
Seff = 0.39 [0.06]  
Teq = 201 [8] K  
Rp = 1.81 [3.41] Re  
a = 0.6567 [0.0414] AU  
Ag = 40908.39 [154783.84] [0.26σ]  
Teffp = 4428 [4189] K [1.01σ]

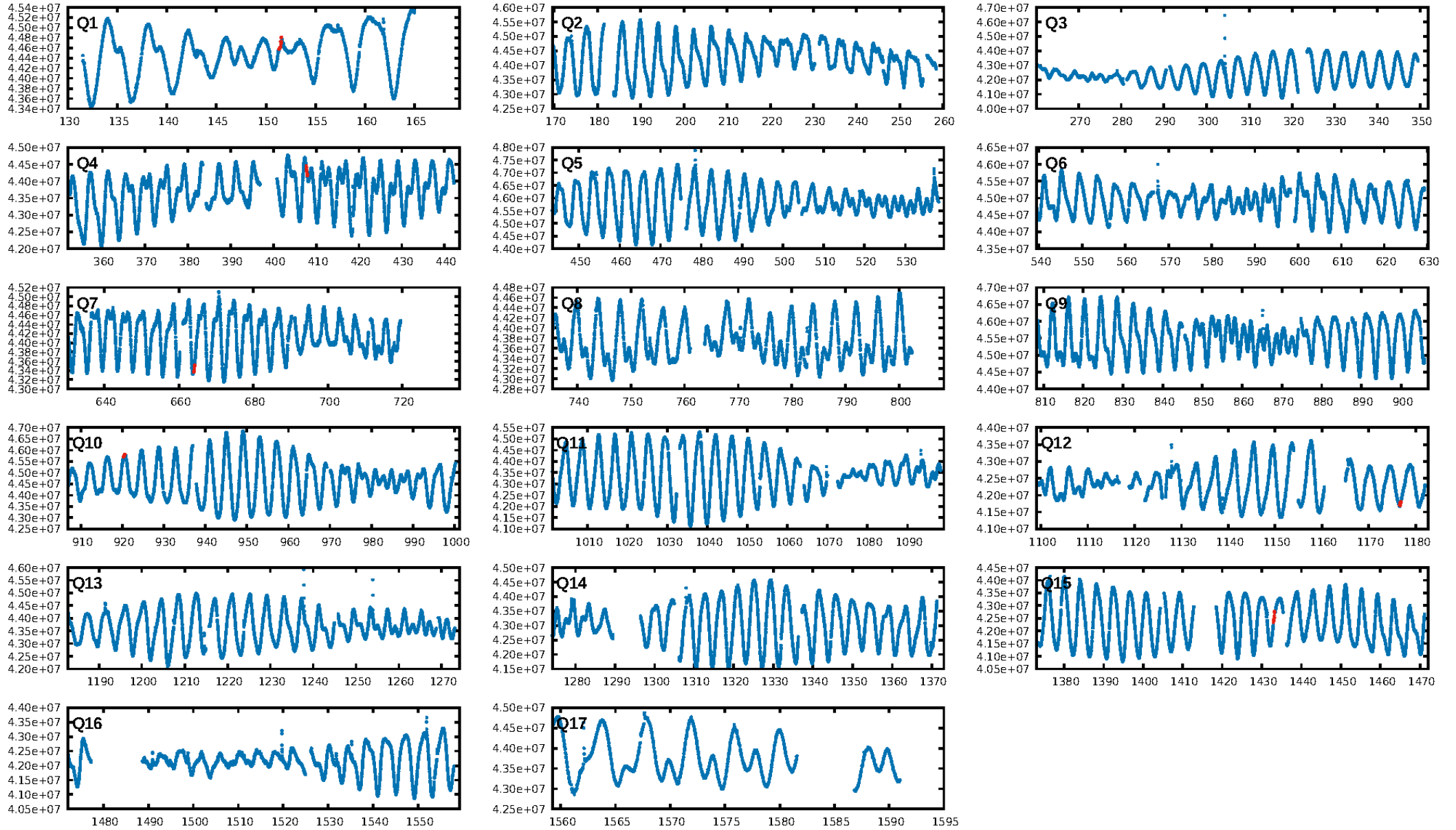
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [431.39σ]  
ModelChiSquare2-sig: 1.2%  
ModelChiSquareGof-sig: 80.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 1.445  
Centroid-sig: 0.1%  
Centroid-so: 2.270 arcsec [2.33σ]  
OotOffset-rm: 0.249 arcsec [1.06σ]  
OotOffset-st: 1/2/2/1 [6]  
KicOffset-rm: 0.589 arcsec [2.34σ]  
KicOffset-st: 1/2/2/1 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 1.00 [6/6]

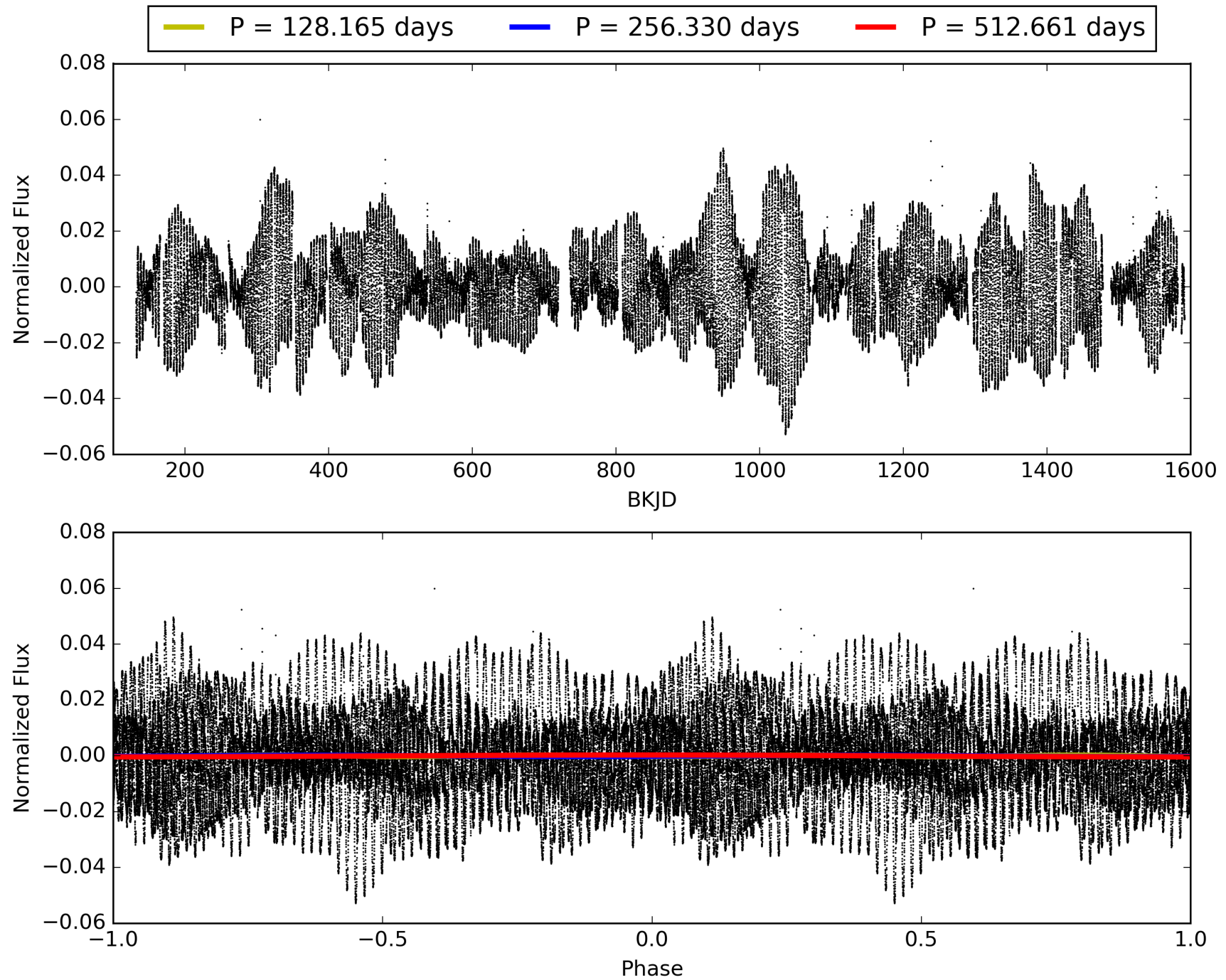
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:54:19 Z

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

# TCE 012203662-03, PDC Light Curves

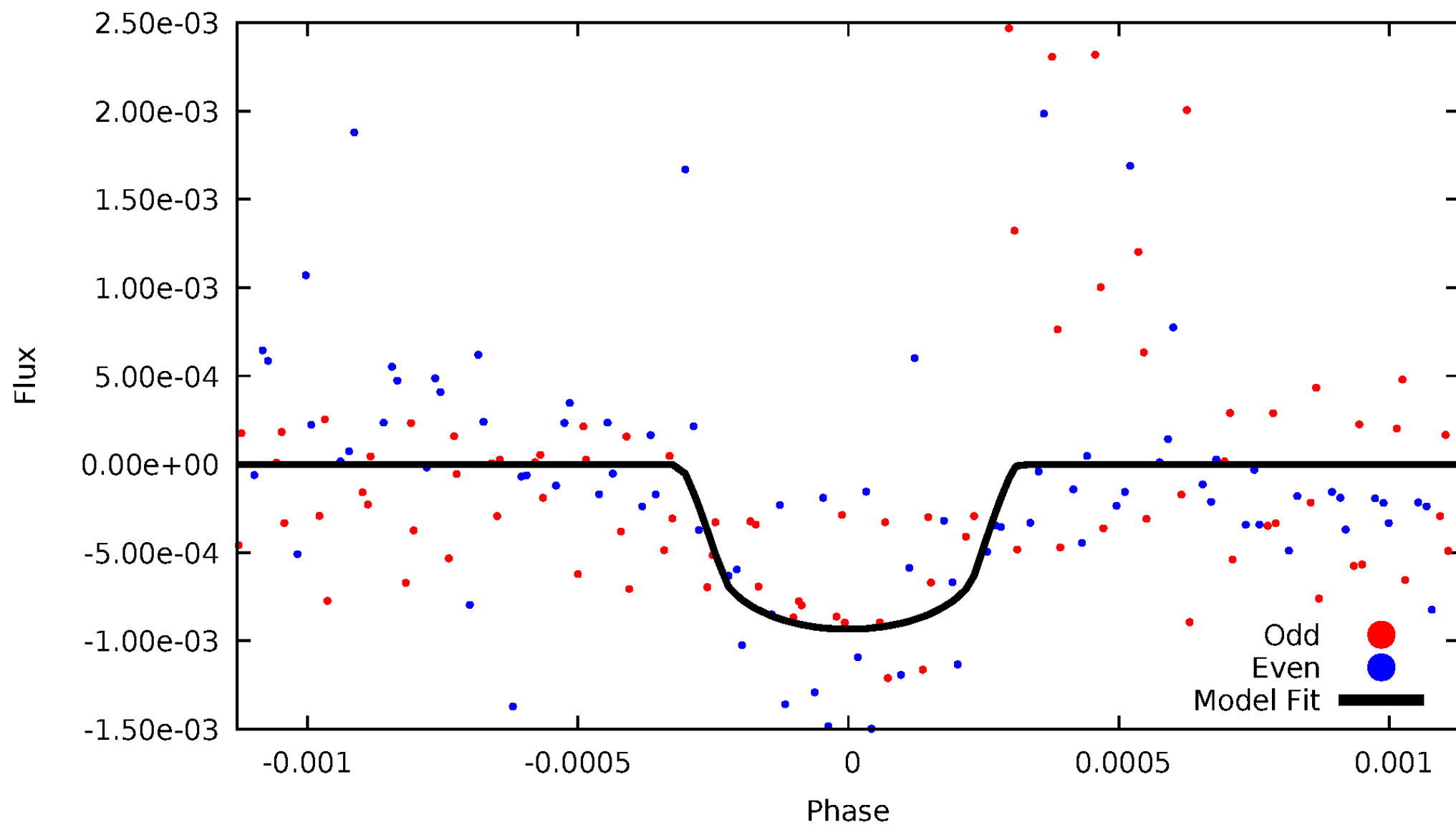


TCE 012203662-03



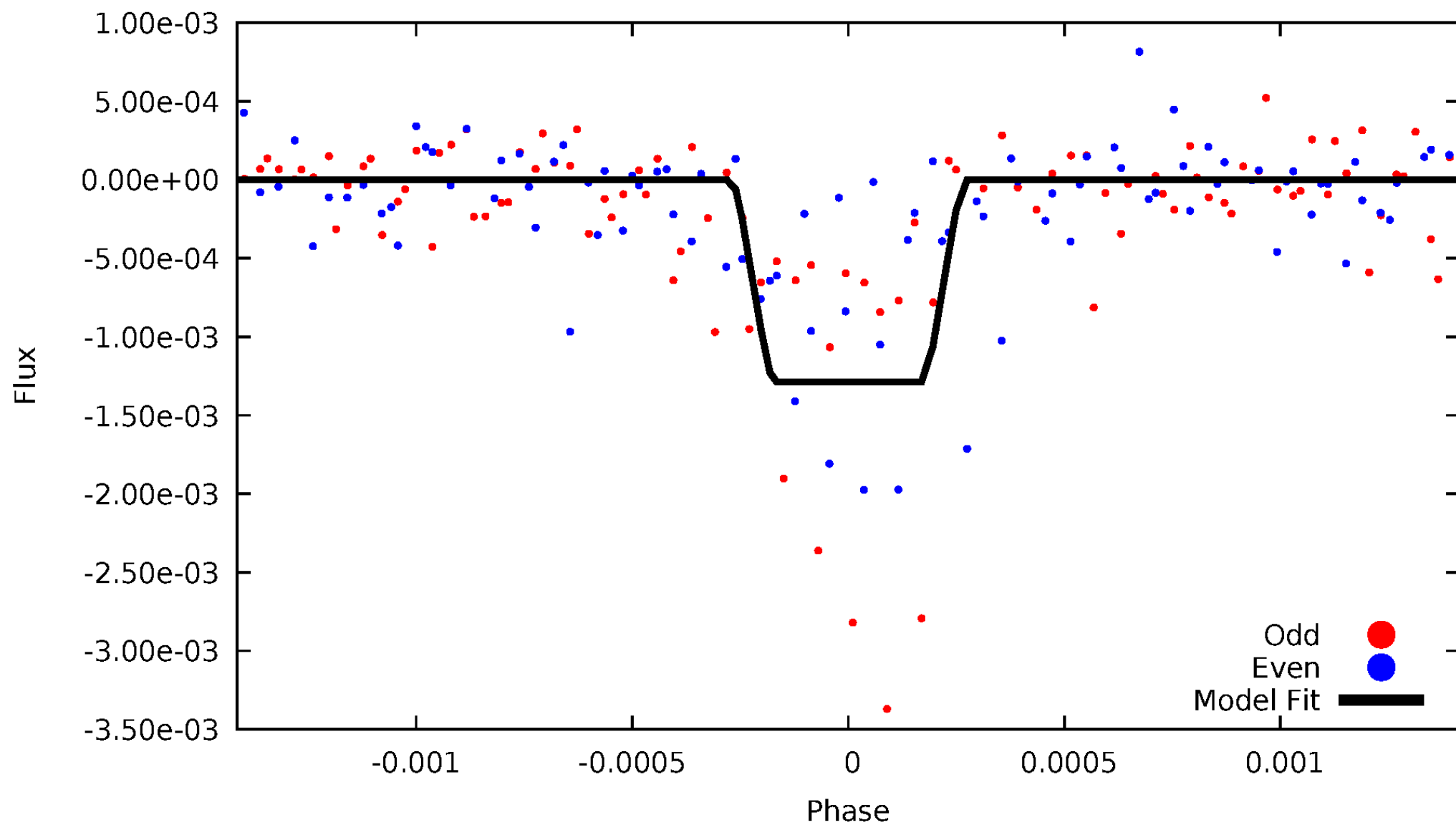
# DV Odd/Even

TCE 012203662-03



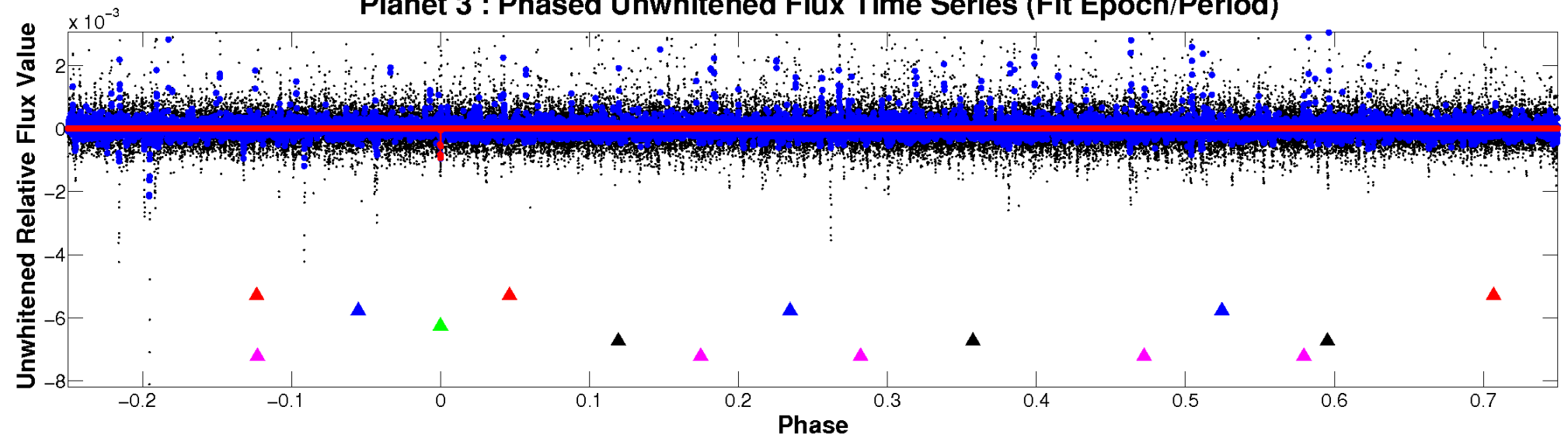
# ALT Odd/Even

TCE 012203662-03

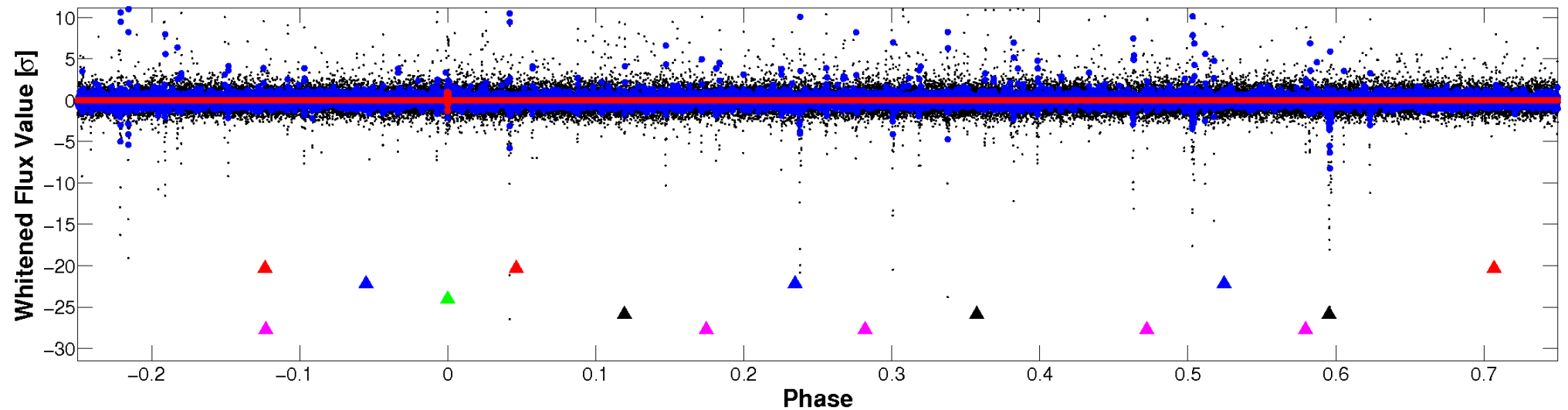


# Non-Whitened Vs. Whitened Light Curve

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

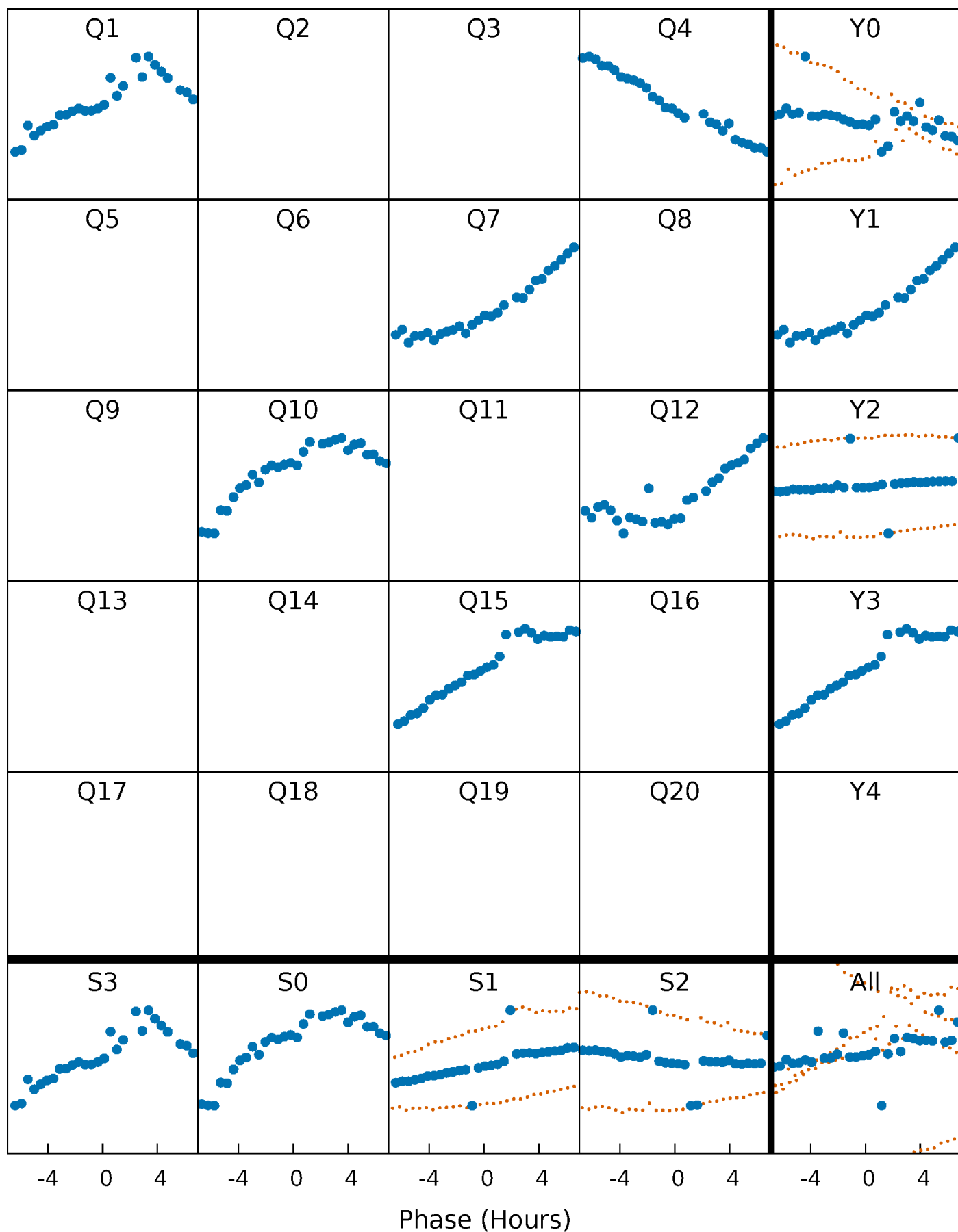


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

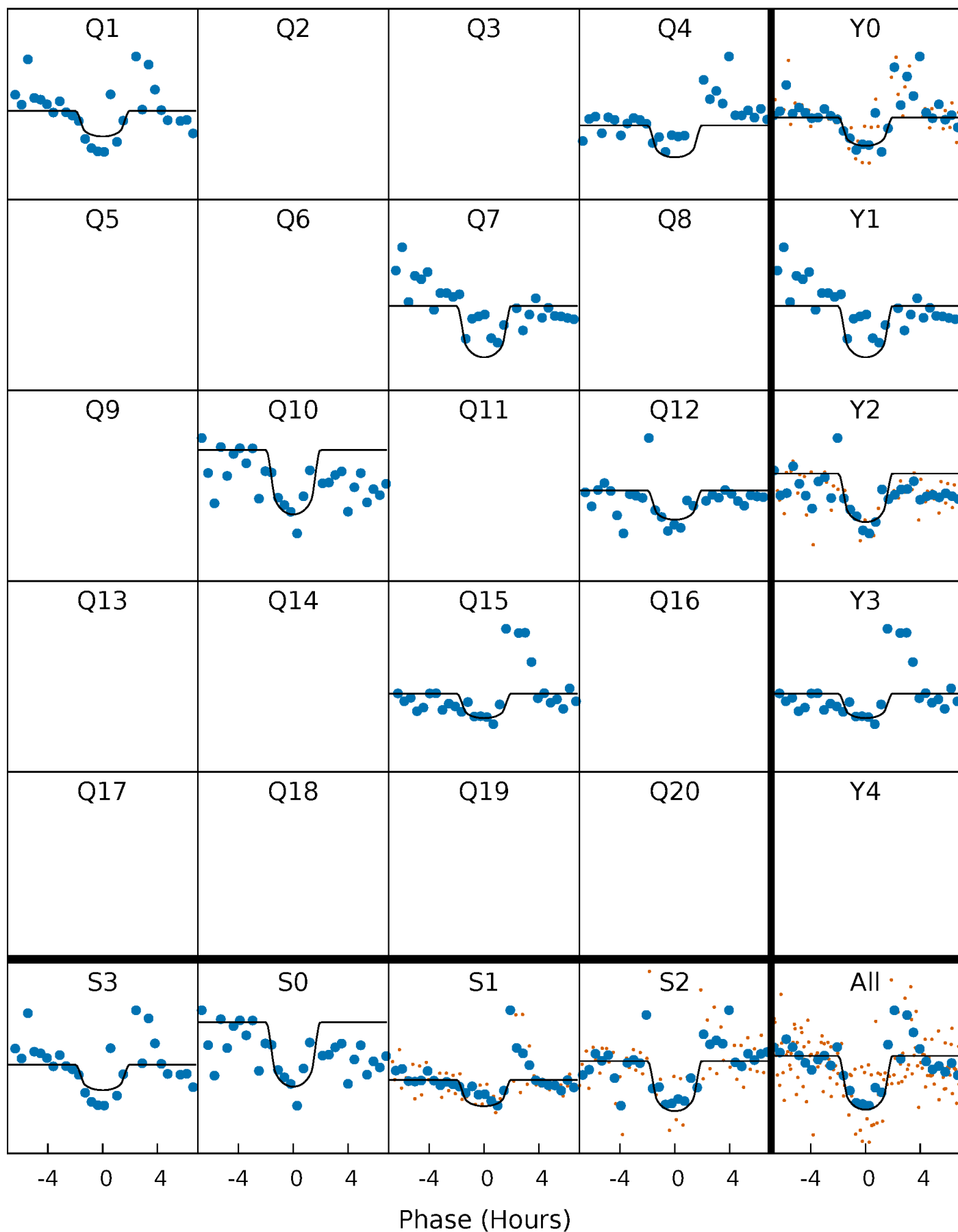
TCE 012203662-03     $P=256.330290$  Days     $T_0=151.444918$  (BKJD)





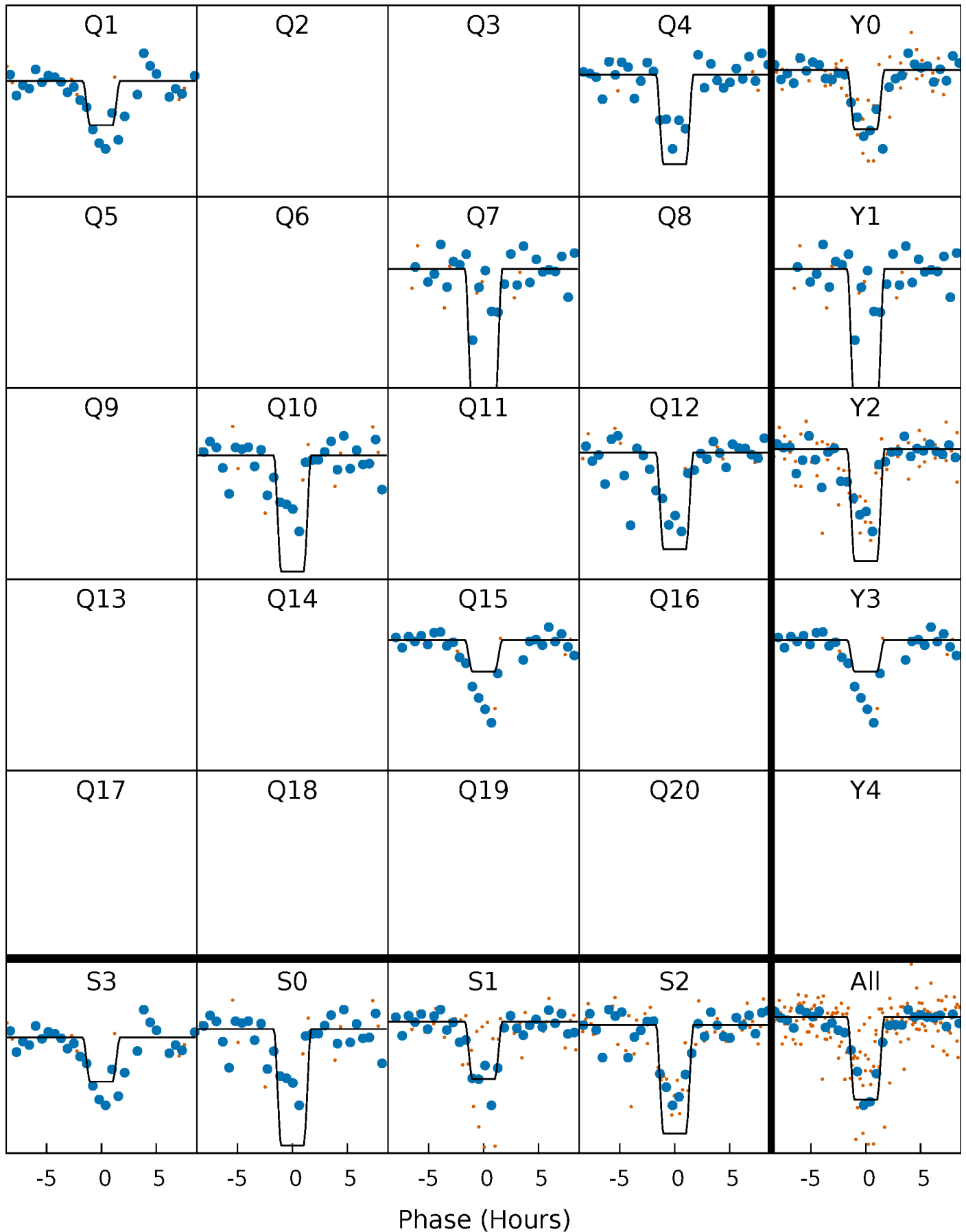
# DV Quarter-Phased Transit Curves

TCE 012203662-03     $P=256.330290$  Days     $T_0=151.444918$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

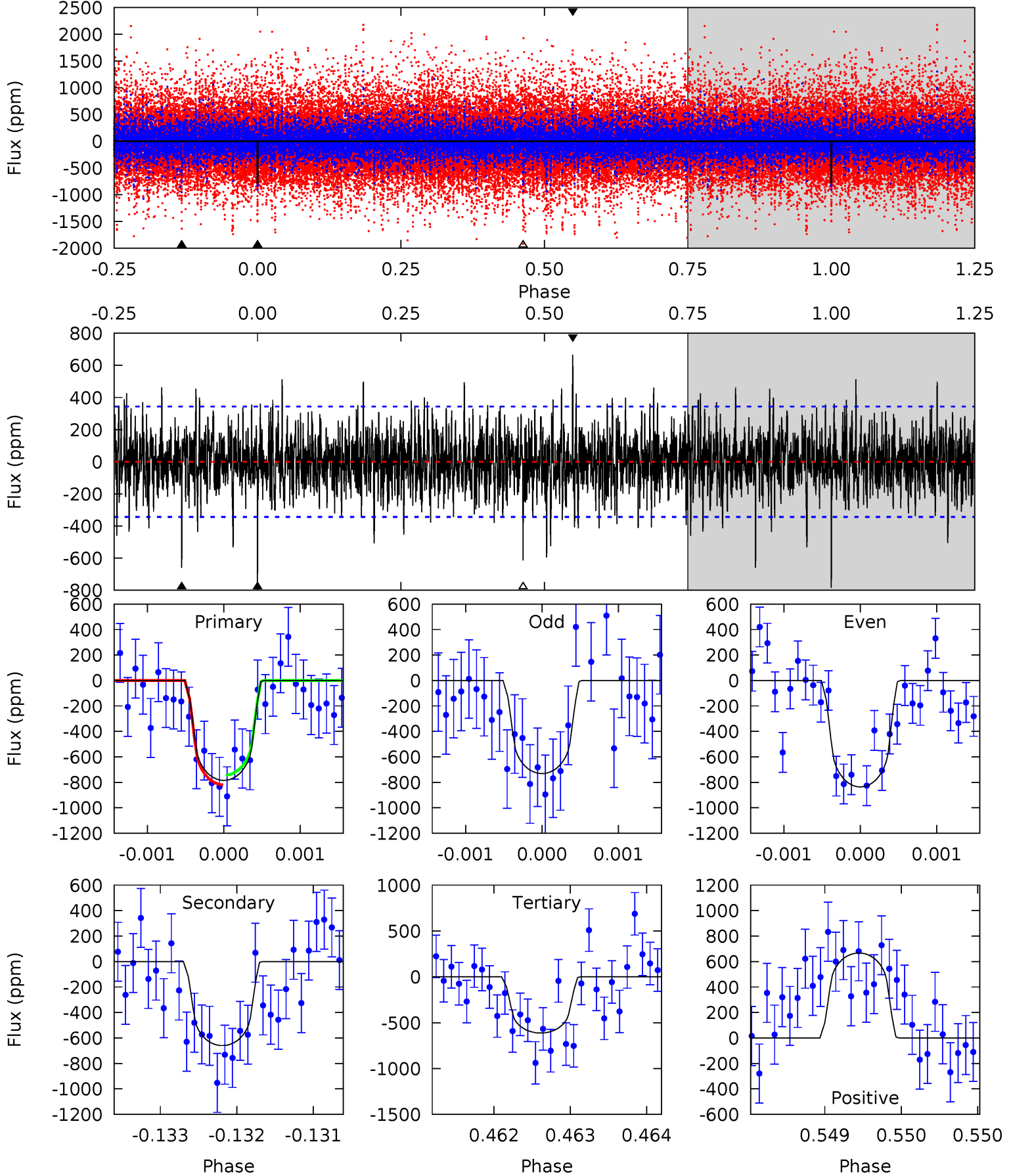
TCE 012203662-03 P=256.336494 Days  $T_0=151.426208$  (BKJD)



# DV Model-Shift Uniqueness Test

012203662-03, P = 256.330290 Days, E = 151.444918 Days

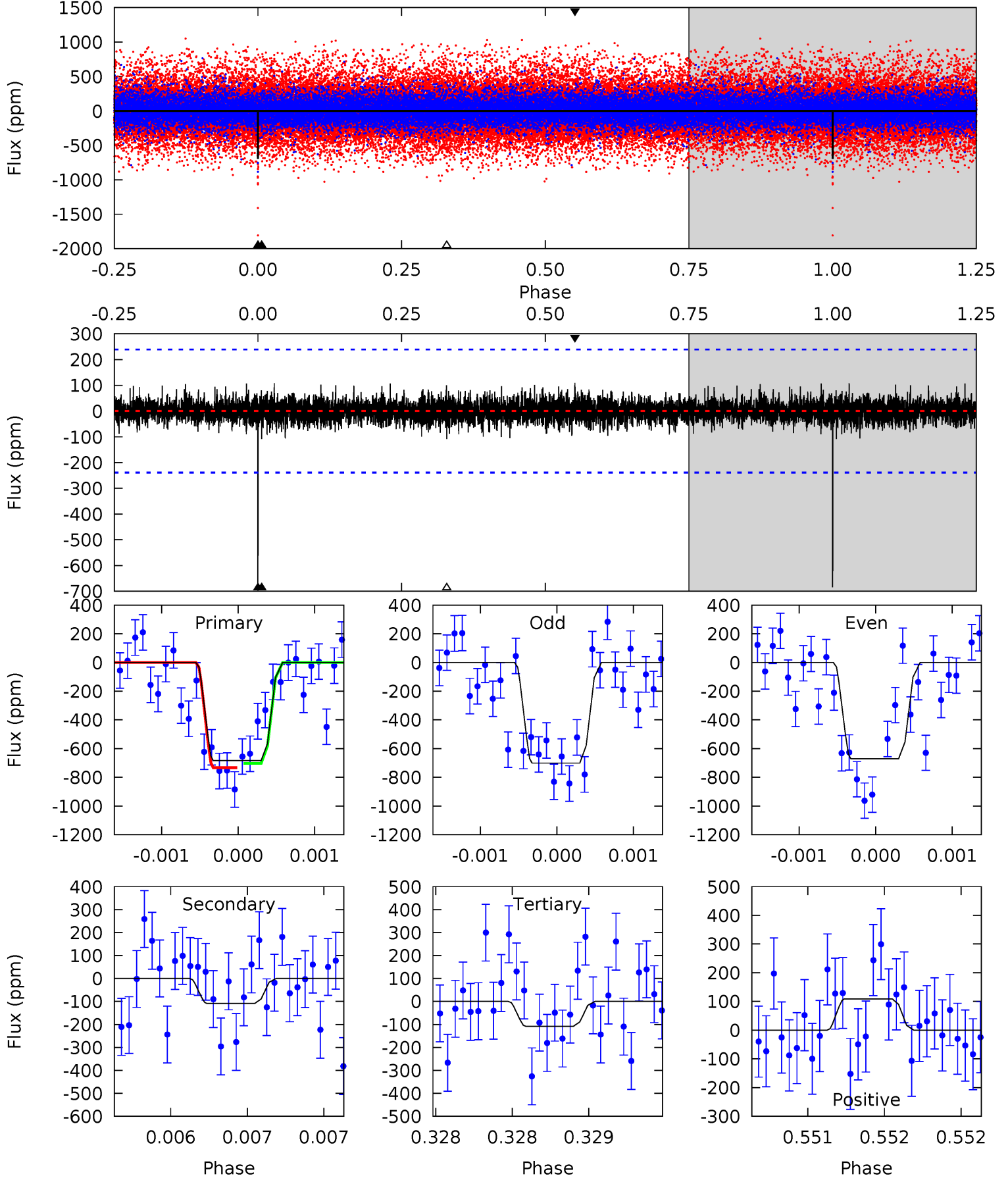
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	10.6	9.86	10.7	5.53	3.42	2.26	2.76	1.89	0.76	-0.12	0.83	0.92	0.46	0.61



# Alt Model-Shift Uniqueness Test

012203662-03, P = 256.336494 Days, E = 151.426208 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
15.9	2.53	2.52	2.53	5.57	3.48	0.64	13.4	13.4	0.01	-0.01	0.36	1.38	0.14	0.33



### Stellar Parameters For KIC 012203662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4878^{+147}_{-147}$	$4.678^{+0.054}_{-0.032}$	$-1.060^{+0.300}_{-0.300}$	$0.575^{+0.038}_{-0.041}$	$0.575^{+0.046}_{-0.021}$	$4.254^{+0.907}_{-0.514}$
	+3%/-3%	+1%/-1%	+28%/-28%	+7%/-7%	+8%/-4%	+21%/-12%
Source	PHO1	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 012203662-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-660 \pm 62$	$3.16^{+2.83}_{-2.16}$	$280^{+10}_{-9}$	$3811^{+2217}_{-718}$	$16608^{+145982}_{-12029}$
Alt.	$-109 \pm 43$	$3.27^{+3.06}_{-2.13}$	$281^{+9}_{-11}$	$2858^{+1041}_{-478}$	$2428^{+17982}_{-1827}$

$T_{\text{max}}$  = 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

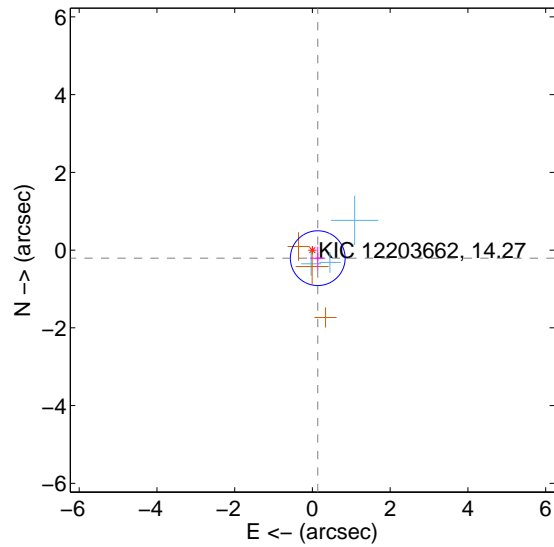
Supplemental centroid analysis for 012203662-03. Kepler magnitude: 14.27. Transit SNR 8.23

There are 3 quarters with good PRF difference image offsets

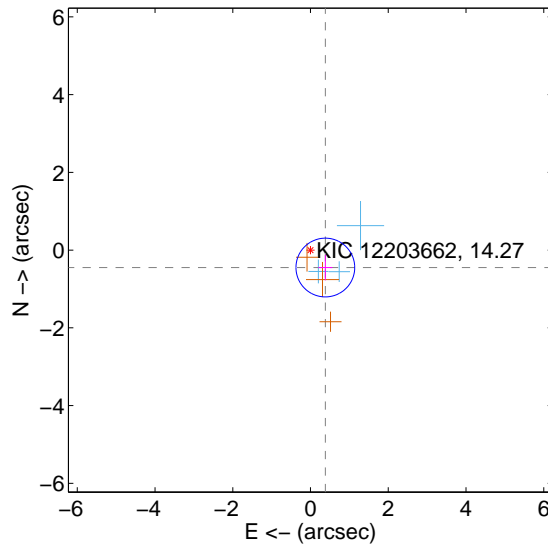
The direct PRF centroid is offset from the target star catalog position by about 0.46 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.249 \pm 0.235$	1.06	$-0.137 \pm 0.193$	$-0.208 \pm 0.297$
PRF-fit source offset from KIC position	$0.589 \pm 0.252$	2.34	$-0.381 \pm 0.180$	$-0.448 \pm 0.330$
photometric centroid source offset	$2.27 \pm 0.97$	2.33	$-0.80 \pm 0.97$	$2.12 \pm 0.97$

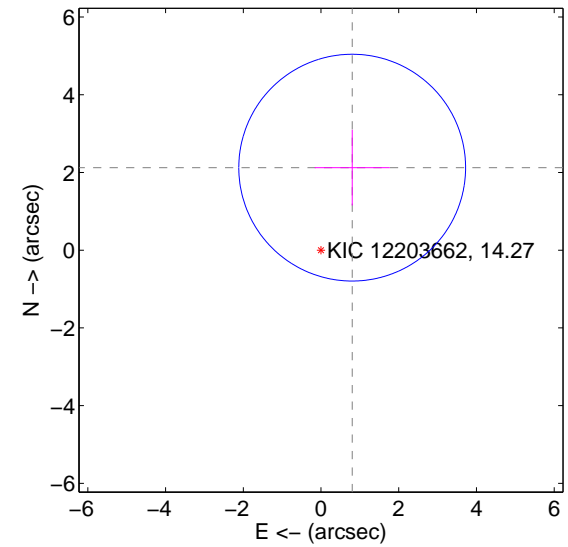
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

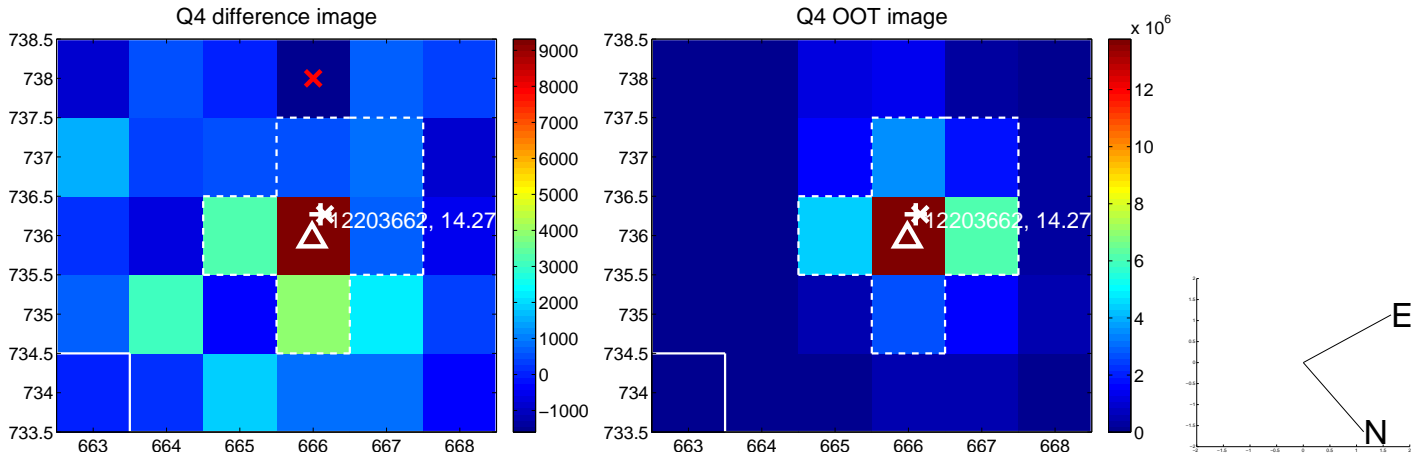
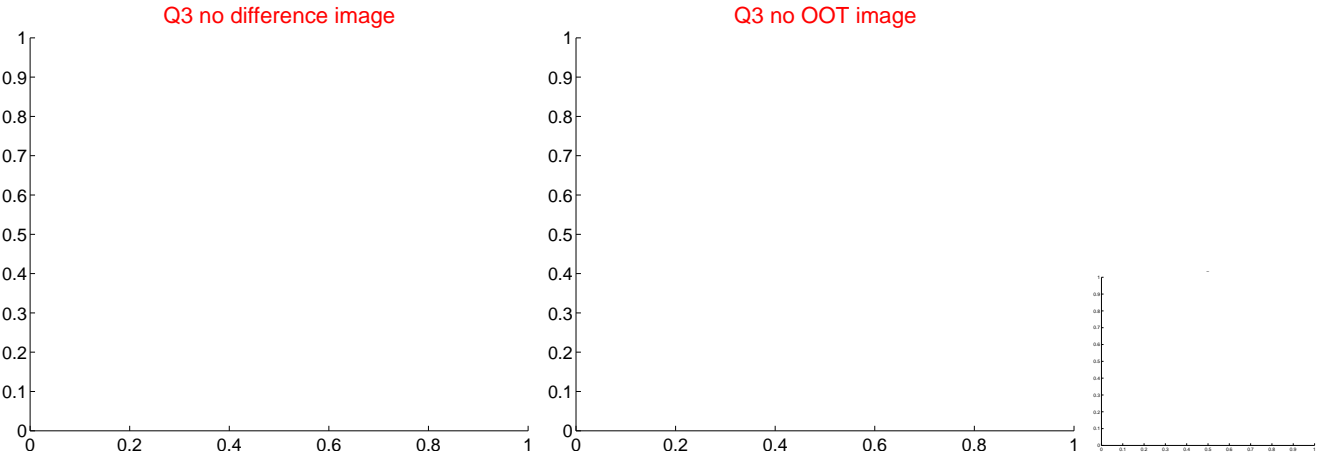
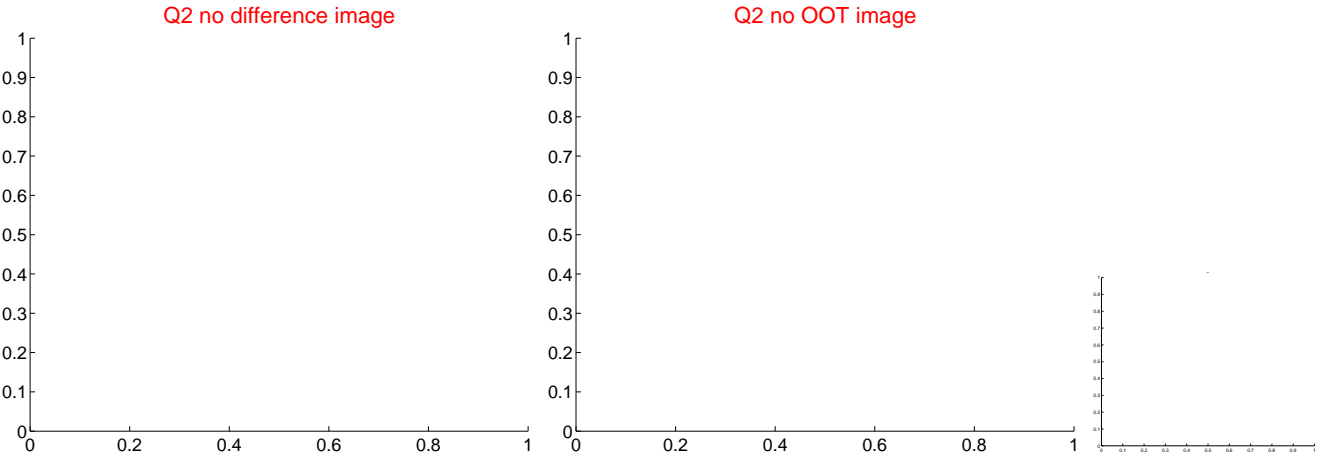
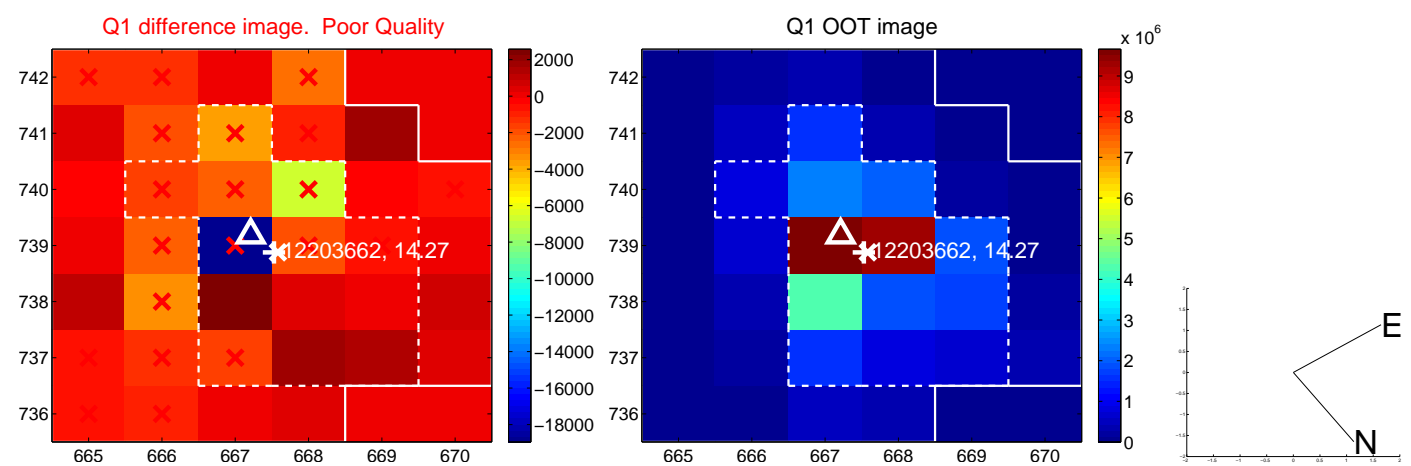


offset from photometric centroids

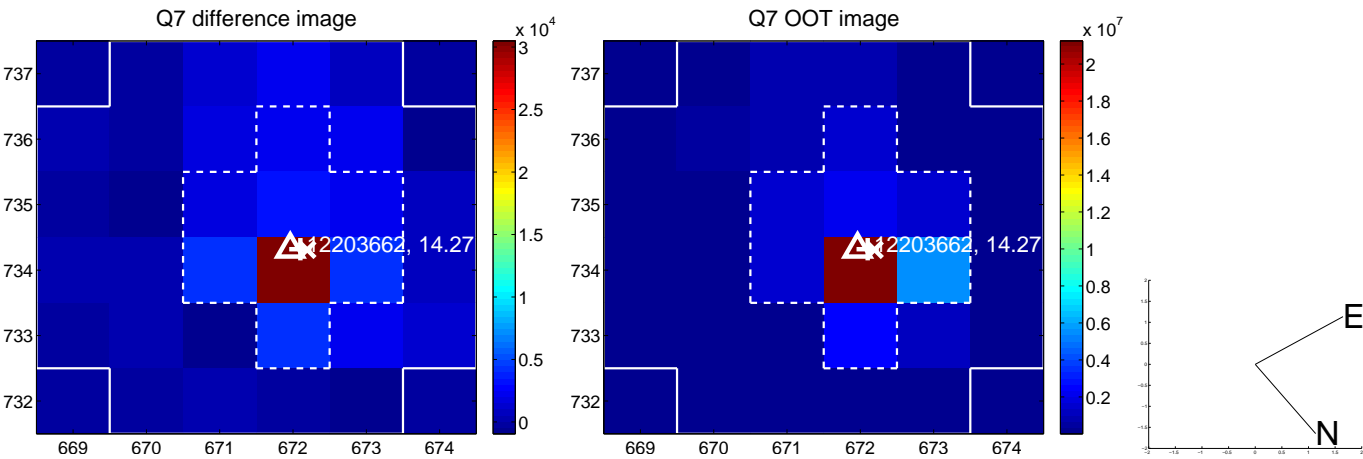


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

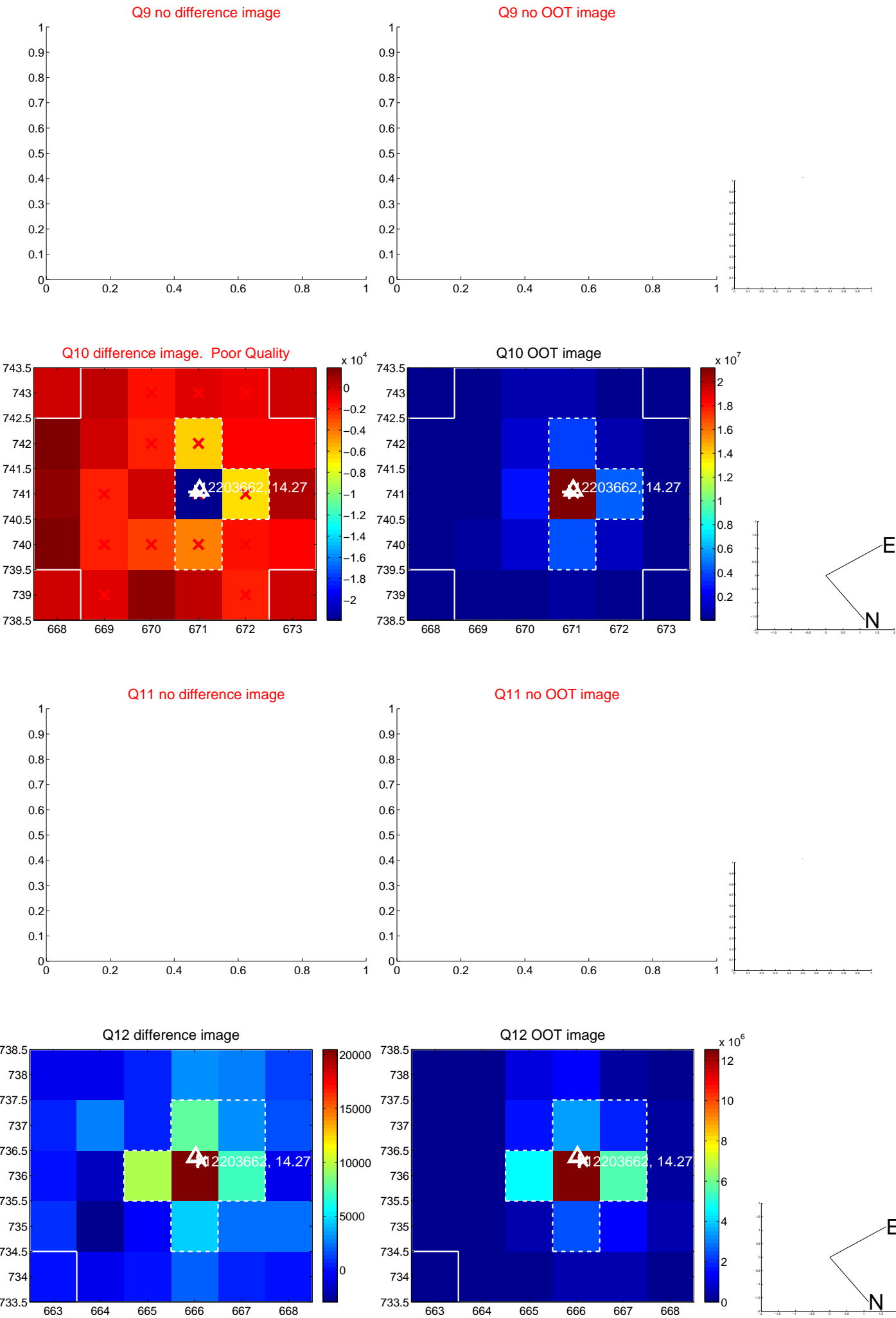


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

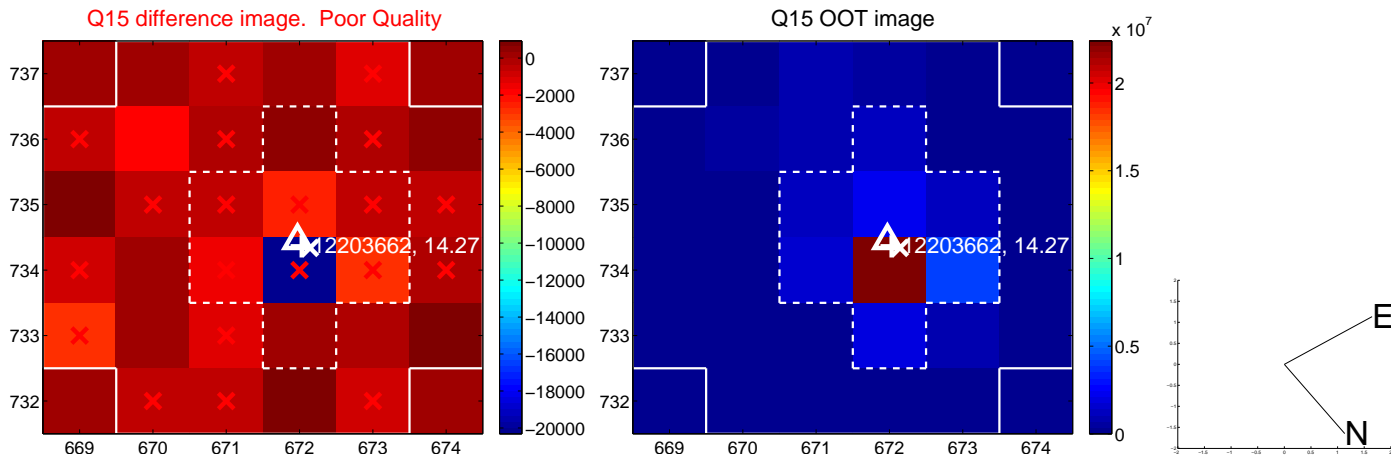




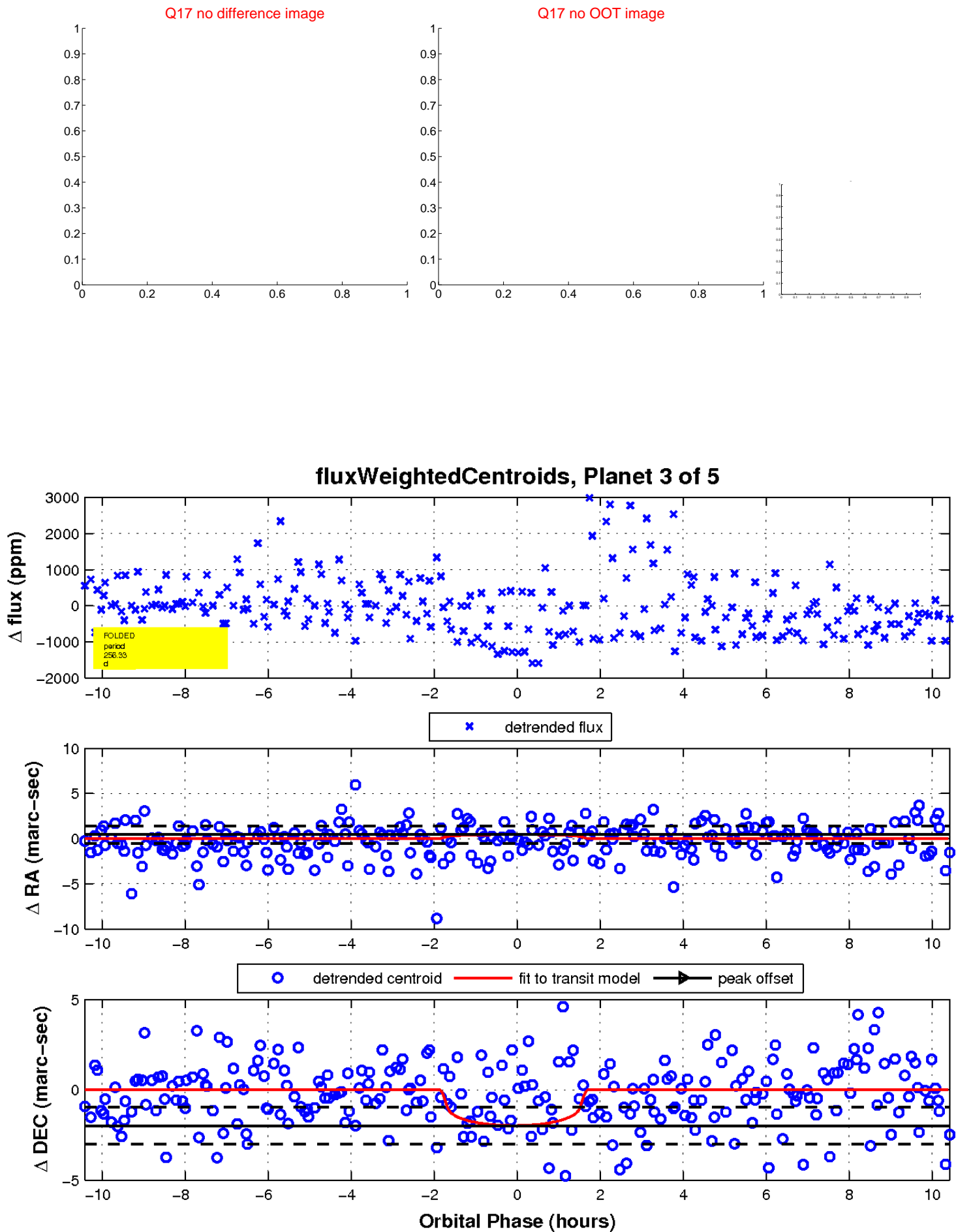
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

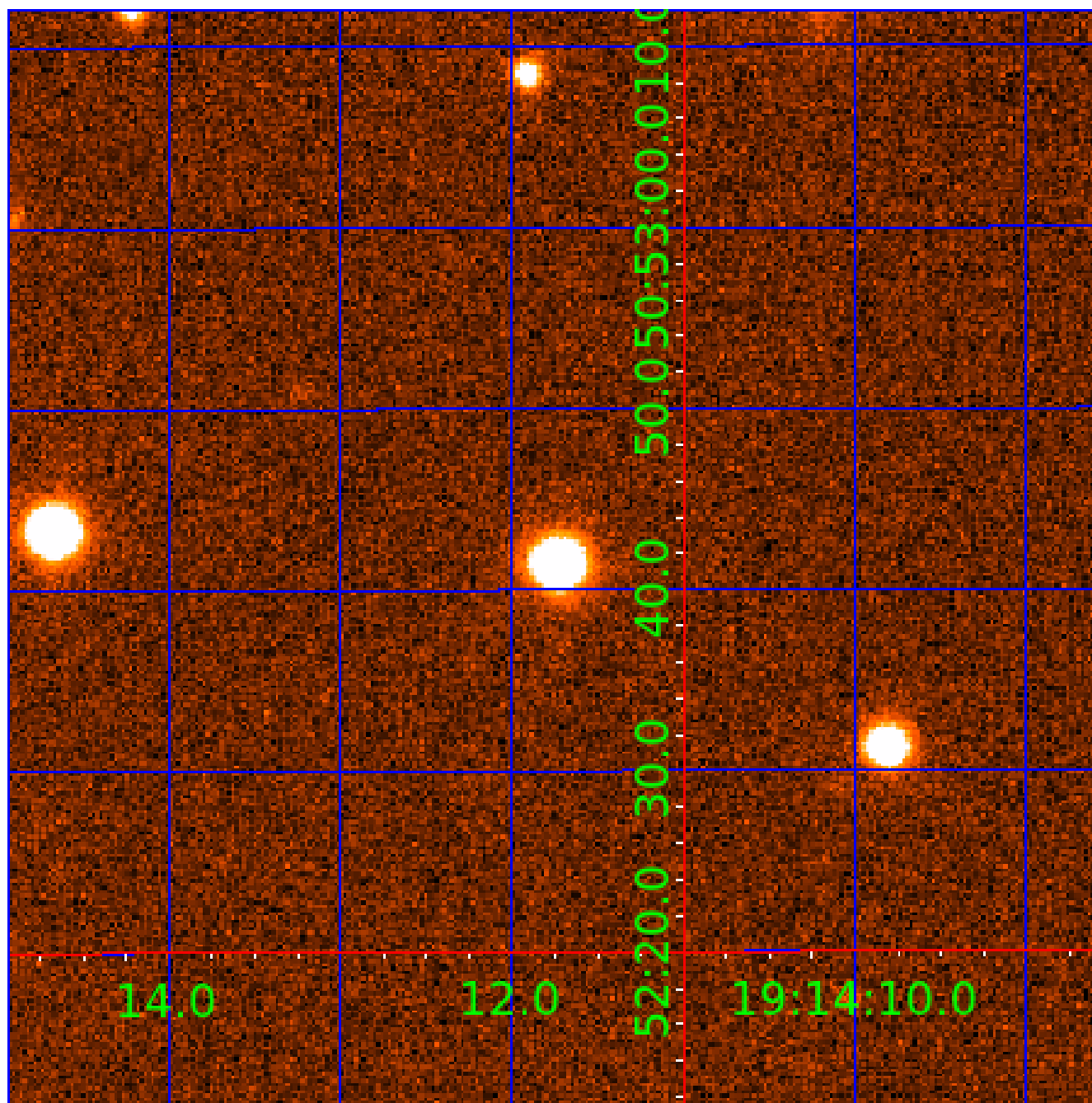


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 012203662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012203662-01	OBS	No	469.157826	419.653079	1064.5	3.234	15.1	5.7	0.57	4878	1.93	0.17
012203662-02	OBS	No	586.953956	393.637225	1086.1	3.421	12.6	7.0	0.57	4878	1.98	0.13
012203662-03	OBS	No	256.330290	151.444918	933.5	3.476	11.1	8.2	0.57	4878	1.81	0.39
012203662-04	OBS	No	451.658922	304.058204	2835.2	4.576	10.3	9.3	0.57	4878	5.91	0.18
012203662-05	OBS	No	332.607776	223.725496	1209.2	2.434	13.6	5.9	0.57	4878	1.99	0.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012203662-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS
012203662-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—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.

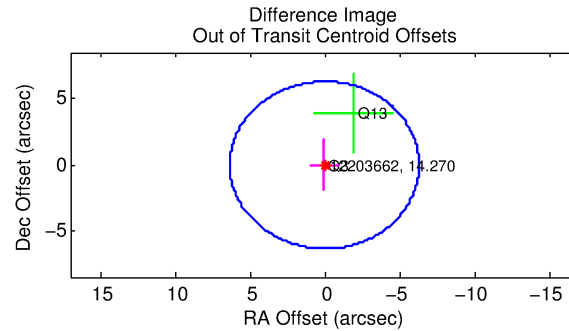
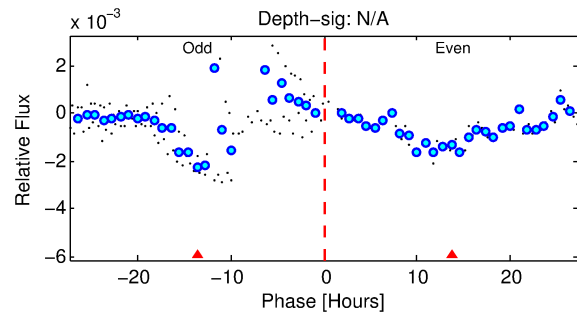
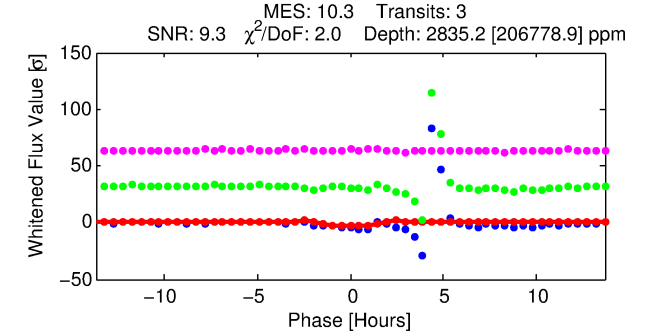
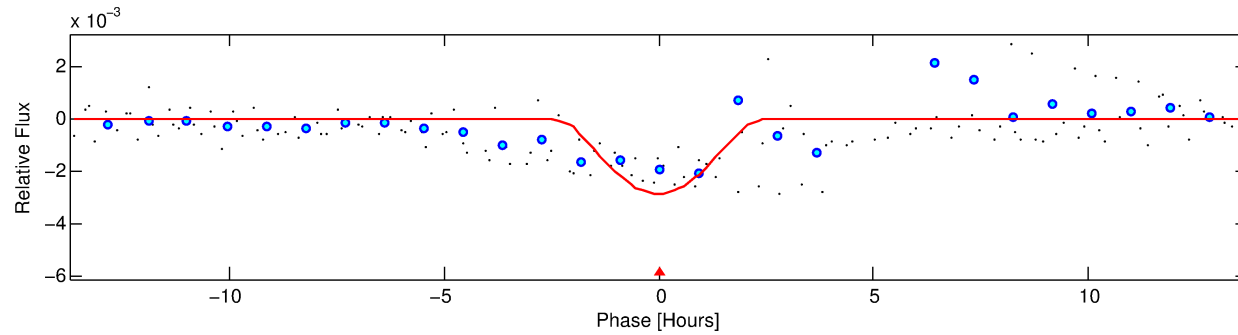
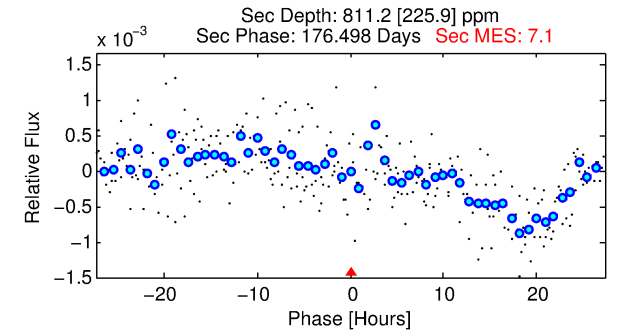
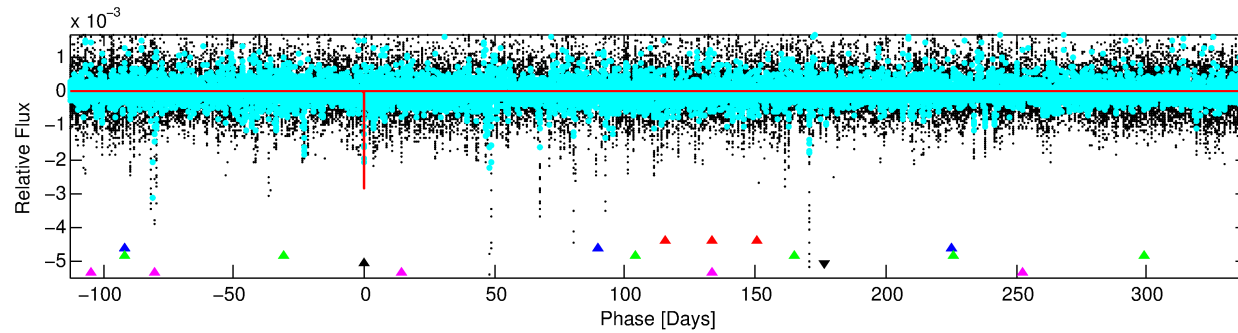
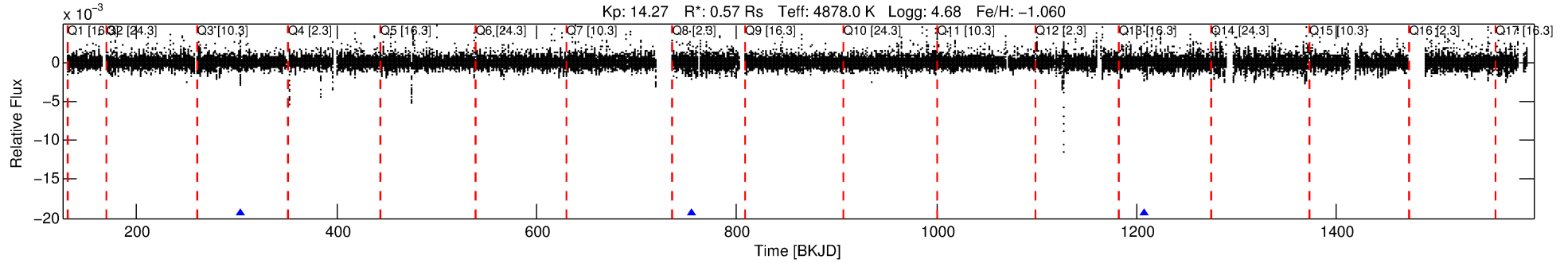
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012203662-04

No Significant Match Found

# DV One-Page Summary

KIC: 12203662 Candidate: 4 of 5 Period: 451.659 d



## DV Fit Results:

Period = 451.65892 [0.02535] d  
Epoch = 304.0582 [0.0323] BKJD  
Rp/R\* = 0.0942 [1.1844]  
a/R\* = 334.89 [834.83]  
b = 1.00 [2.81]  
Seff = 0.18 [0.03]  
Teq = 167 [6] K  
Rp = 5.91 [74.32] Re  
a = 0.9580 [0.0604] AU  
Ag = 11728.66 [295030.54] [0.04σ]  
Teffp = 2683 [16870] K [0.15σ]

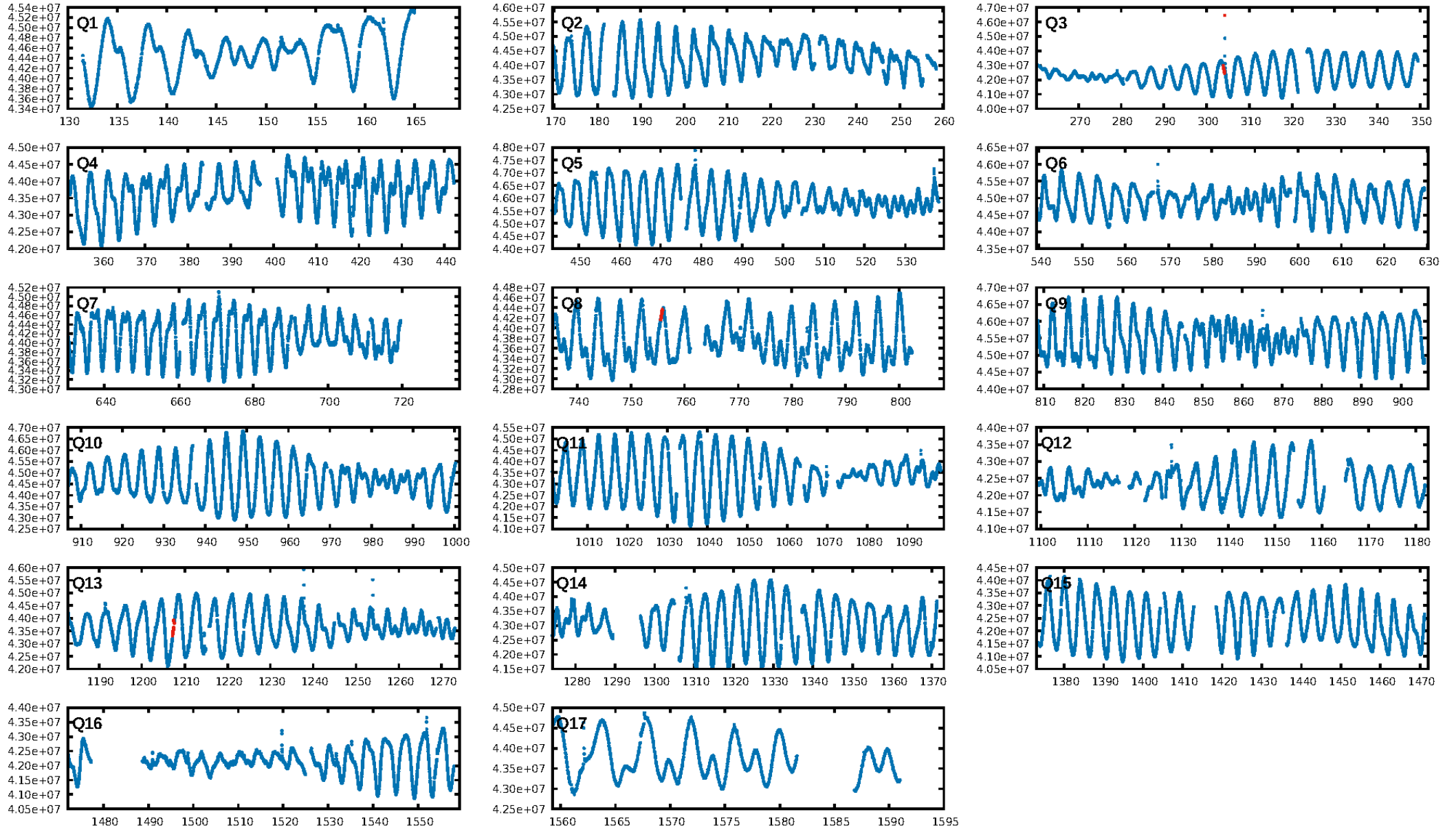
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [551.27σ]  
LongPeriod-sig: 100.0% [74.95σ]  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 48.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 3.187  
Centroid-sig: 49.1%  
Centroid-so: 0.680 arcsec [1.42σ]  
OotOffset-rm: 0.042 arcsec [0.02σ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-rm: 0.350 arcsec [0.25σ]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

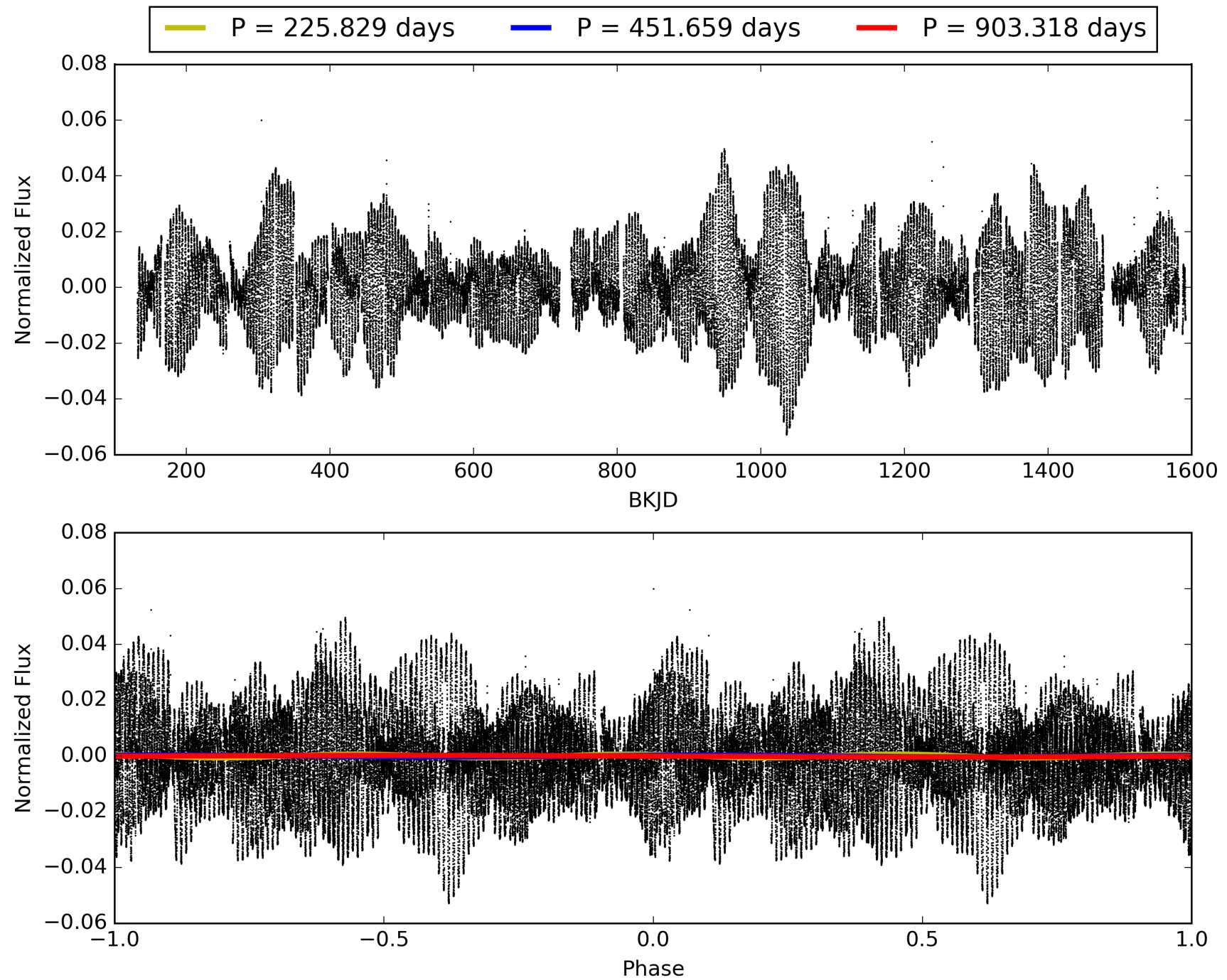
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:54:34 Z

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

# TCE 012203662-04, PDC Light Curves



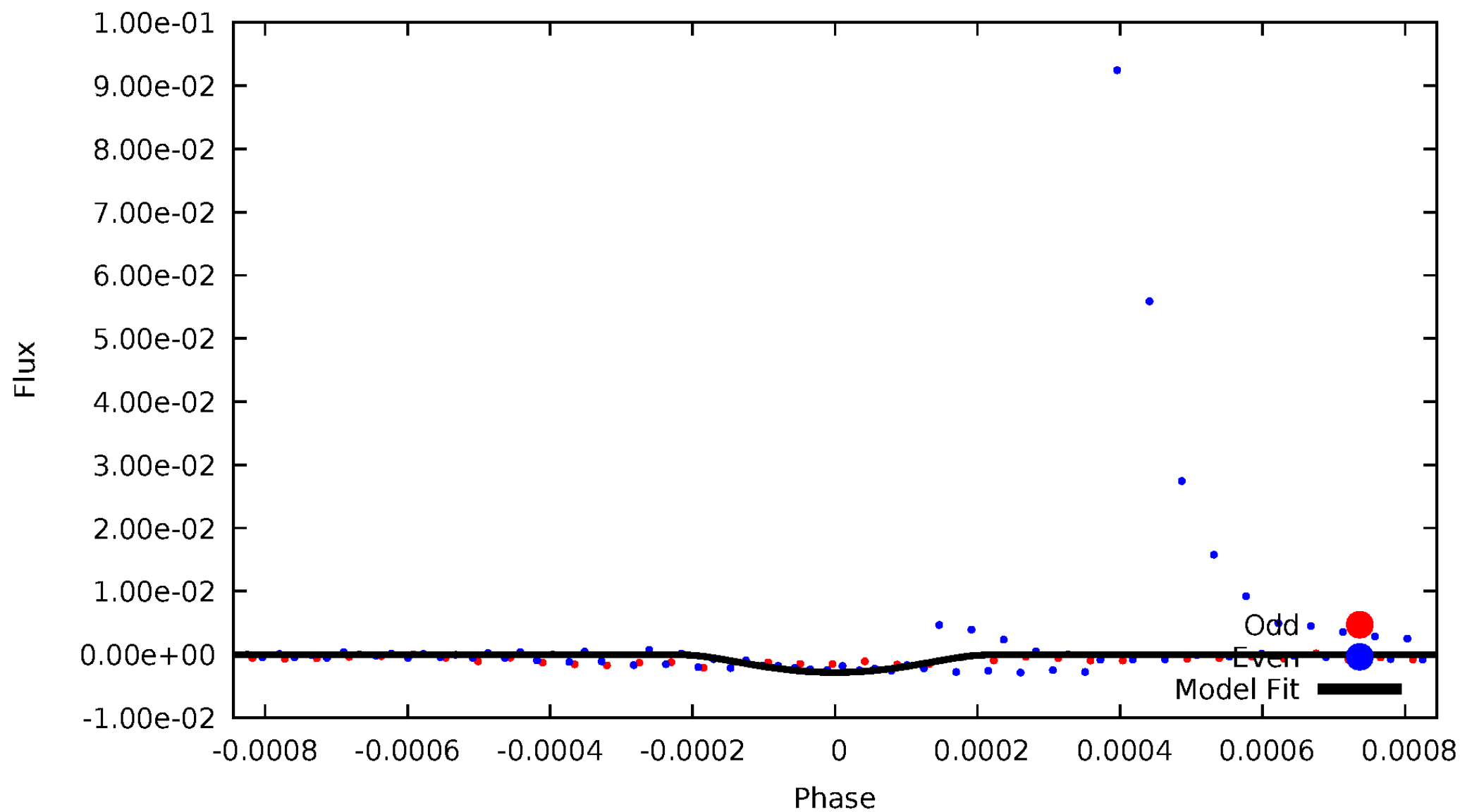
# TCE 012203662-04





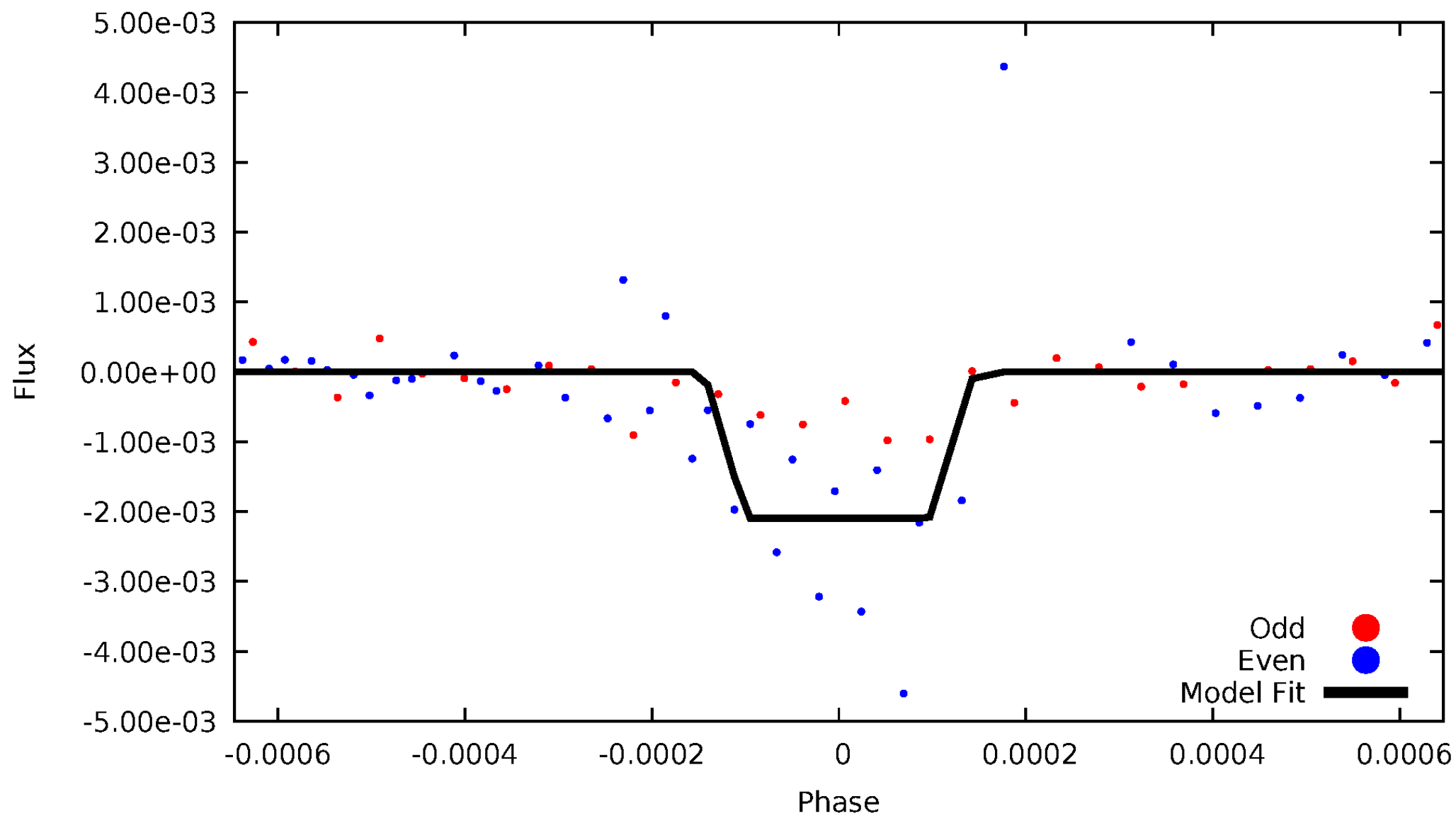
# DV Odd/Even

TCE 012203662-04



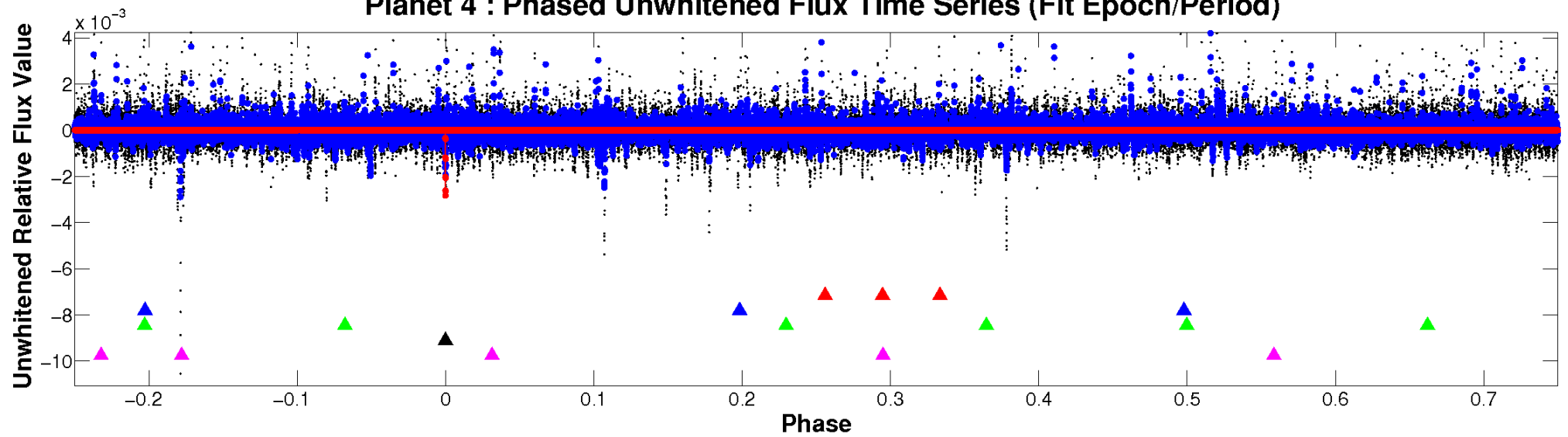
# ALT Odd/Even

TCE 012203662-04

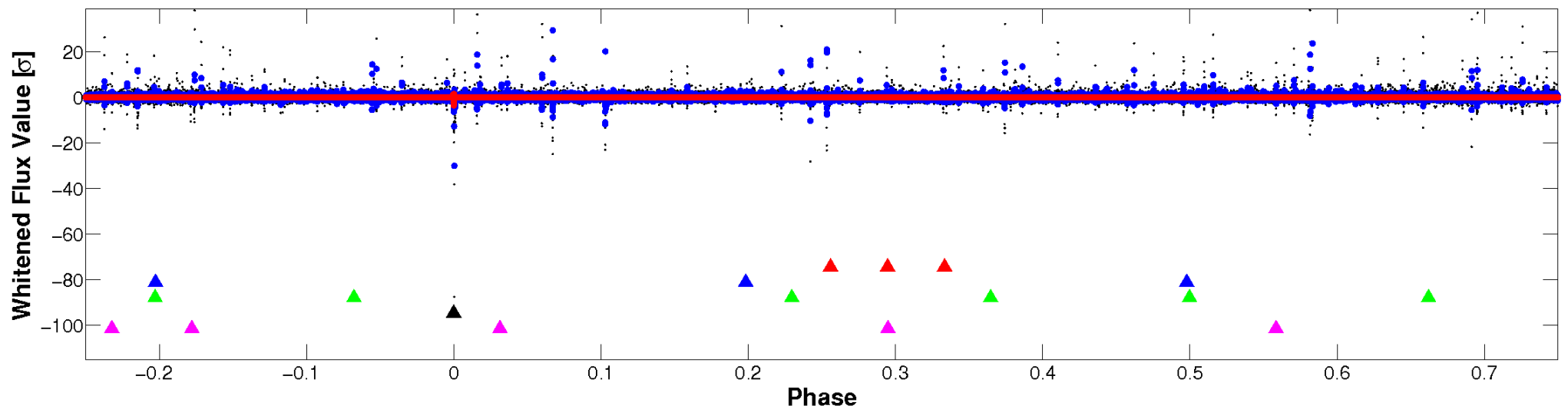


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

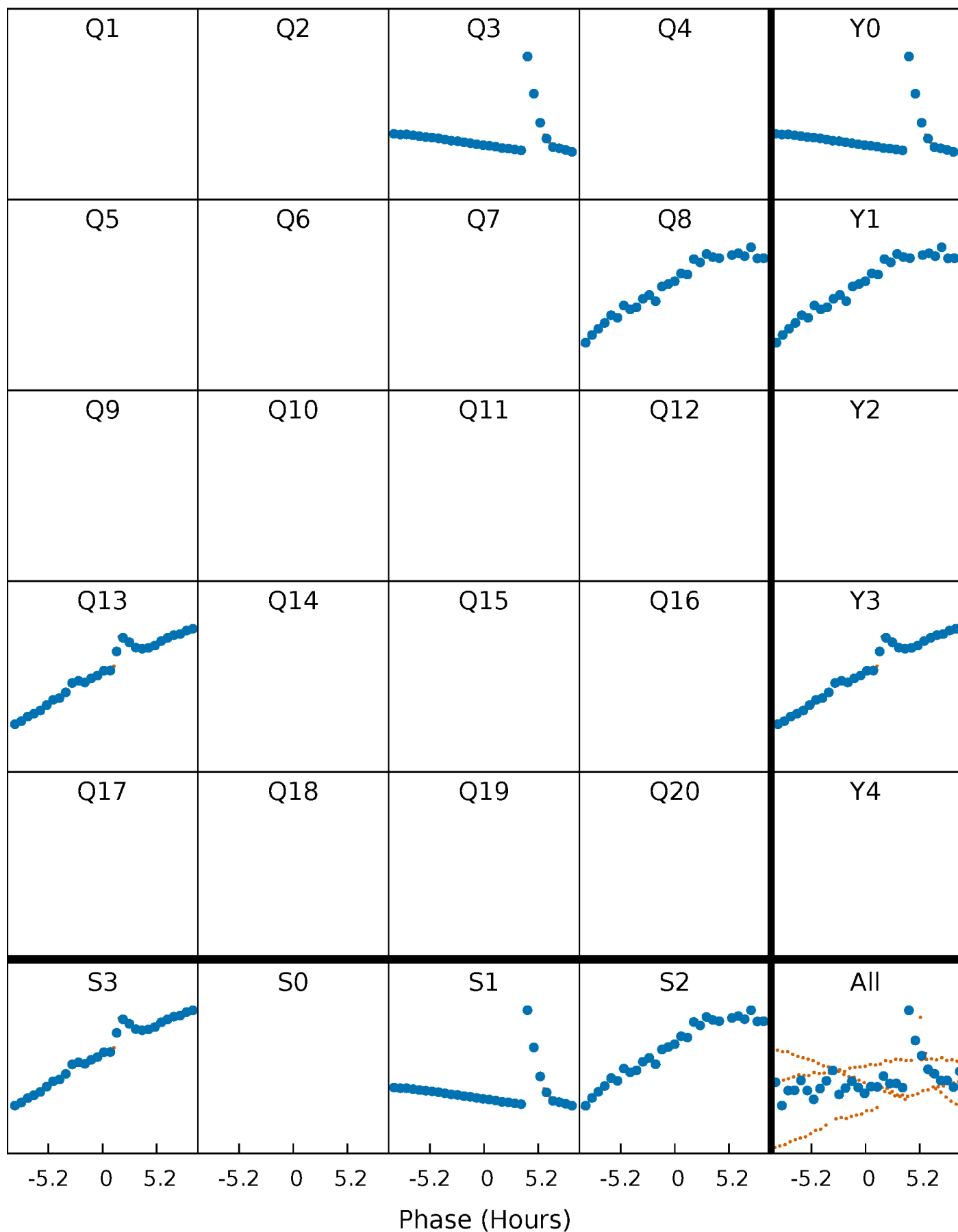


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



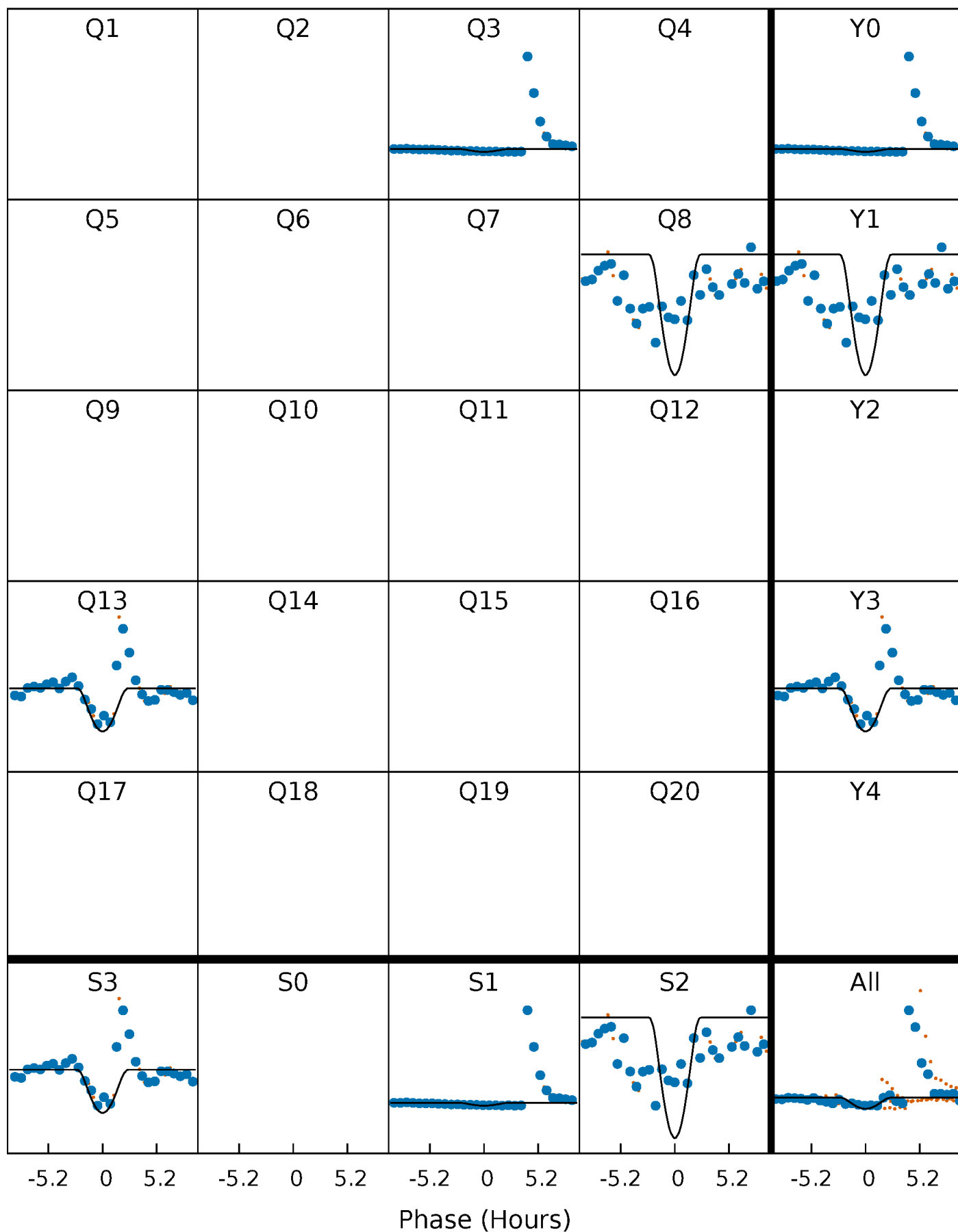
# PDC Quarter-Phased Transit Curves

TCE 012203662-04     $P=451.658922$  Days     $T_0=304.058204$  (BKJD)



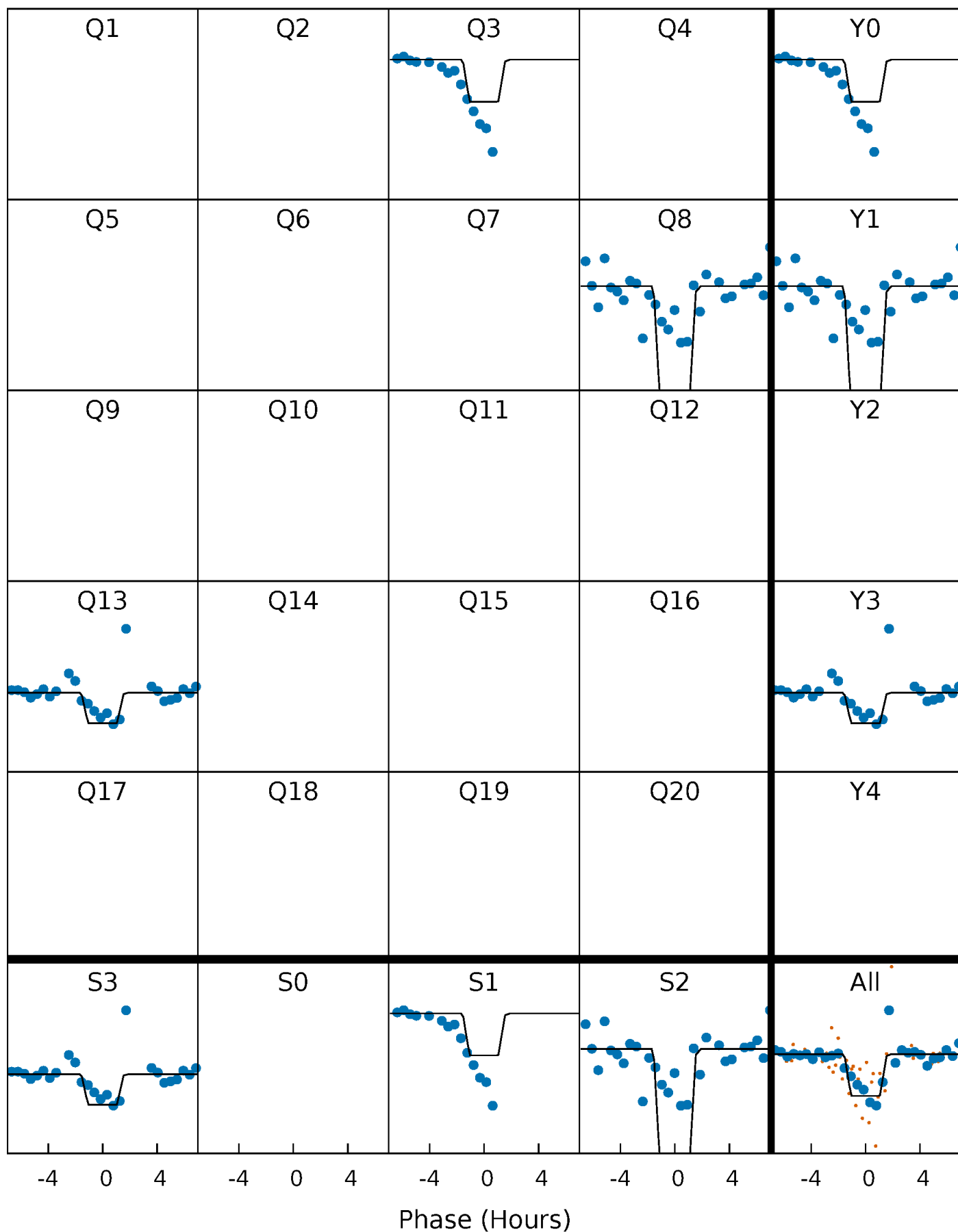
# DV Quarter-Phased Transit Curves

TCE 012203662-04     $P=451.658922$  Days     $T_0=304.058204$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

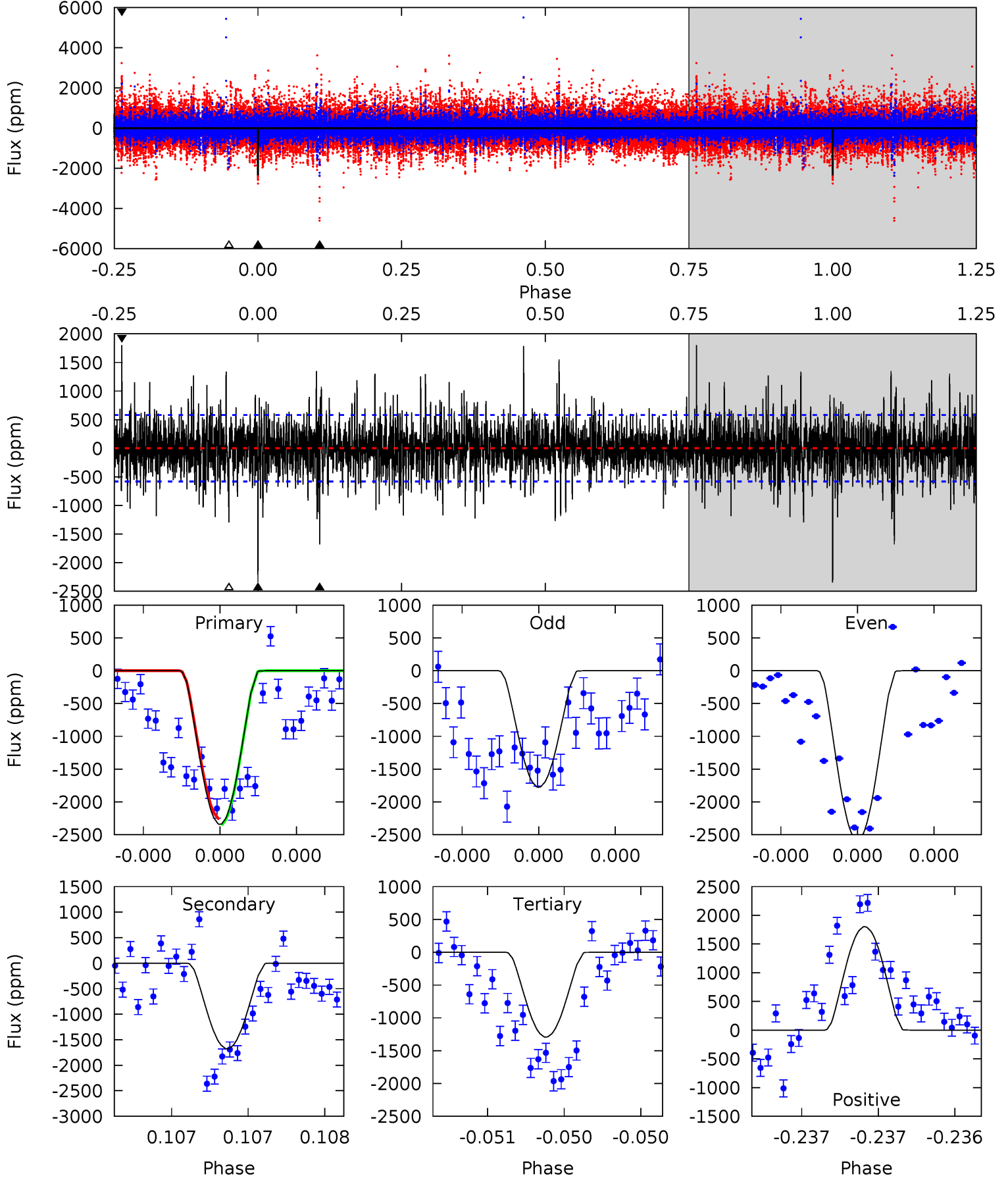
TCE 012203662-04     $P=451.629354$  Days     $T_0=304.103608$  (BKJD)



# DV Model-Shift Uniqueness Test

012203662-04, P = 451.658922 Days, E = 304.058204 Days

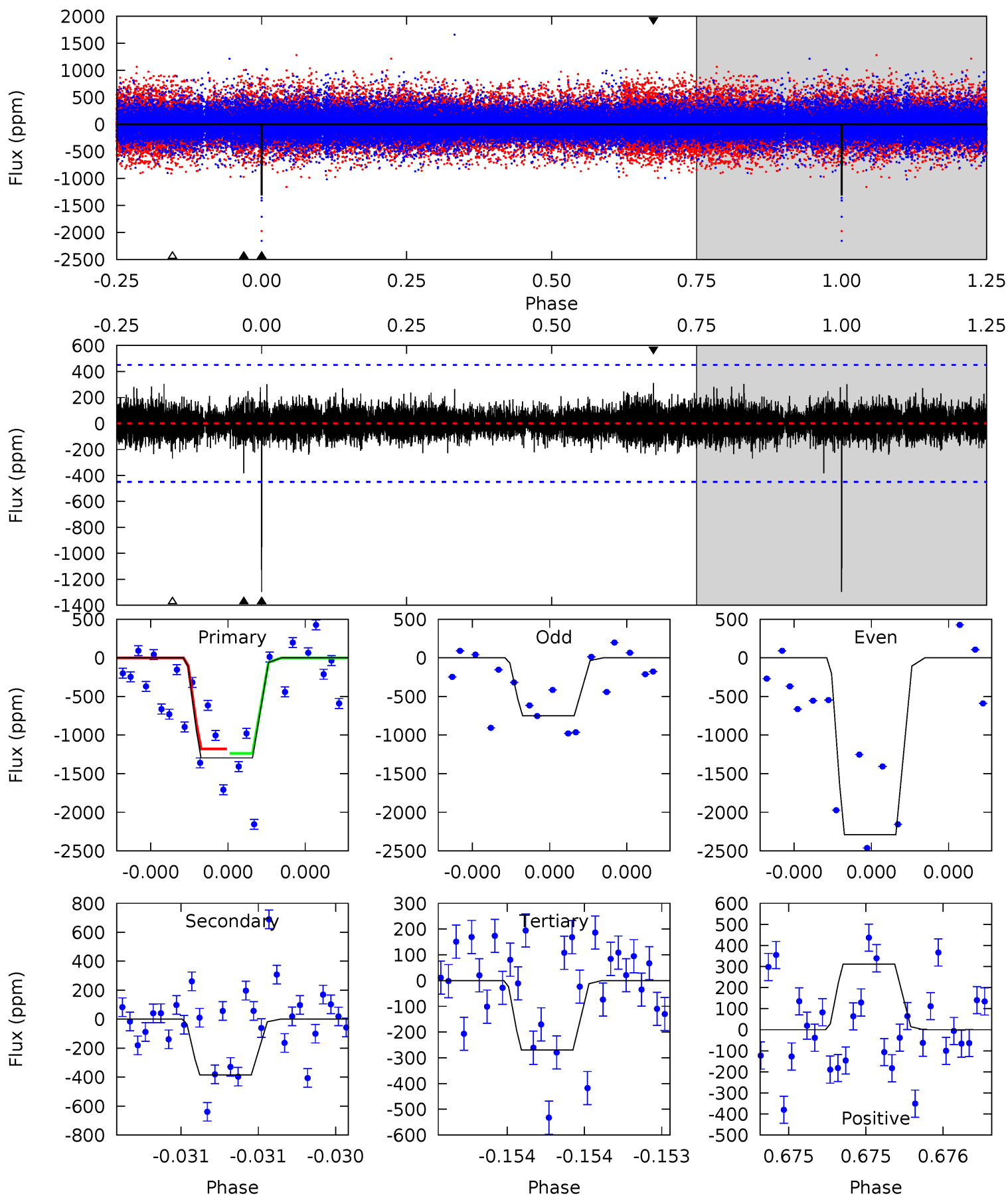
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.6	16.2	12.5	17.4	5.60	3.52	3.02	10.1	5.20	3.69	-1.20	3.29	1.22	0.43	0.46



# Alt Model-Shift Uniqueness Test

012203662-04, P = 451.629354 Days, E = 304.103608 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	4.84	3.39	3.93	5.68	3.64	0.77	12.9	12.4	1.45	0.91	11.3	1.23	0.19	0.38





### Stellar Parameters For KIC 012203662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4878^{+147}_{-147}$	$4.678^{+0.054}_{-0.032}$	$-1.060^{+0.300}_{-0.300}$	$0.575^{+0.038}_{-0.041}$	$0.575^{+0.046}_{-0.021}$	$4.254^{+0.907}_{-0.514}$
	+3%/-3%	+1%/-1%	+28%/-28%	+7%/-7%	+8%/-4%	+21%/-12%
Source	PHO1	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 012203662-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1678 \pm 104$	$52.42^{+56.79}_{-37.40}$	$232^{+8}_{-8}$	$2059^{+684}_{-292}$	$315^{+3421}_{-244}$
Alt.	$-384 \pm 79$	$53.63^{+53.62}_{-37.17}$	$232^{+8}_{-9}$	$1770^{+465}_{-214}$	$67^{+661}_{-50}$

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

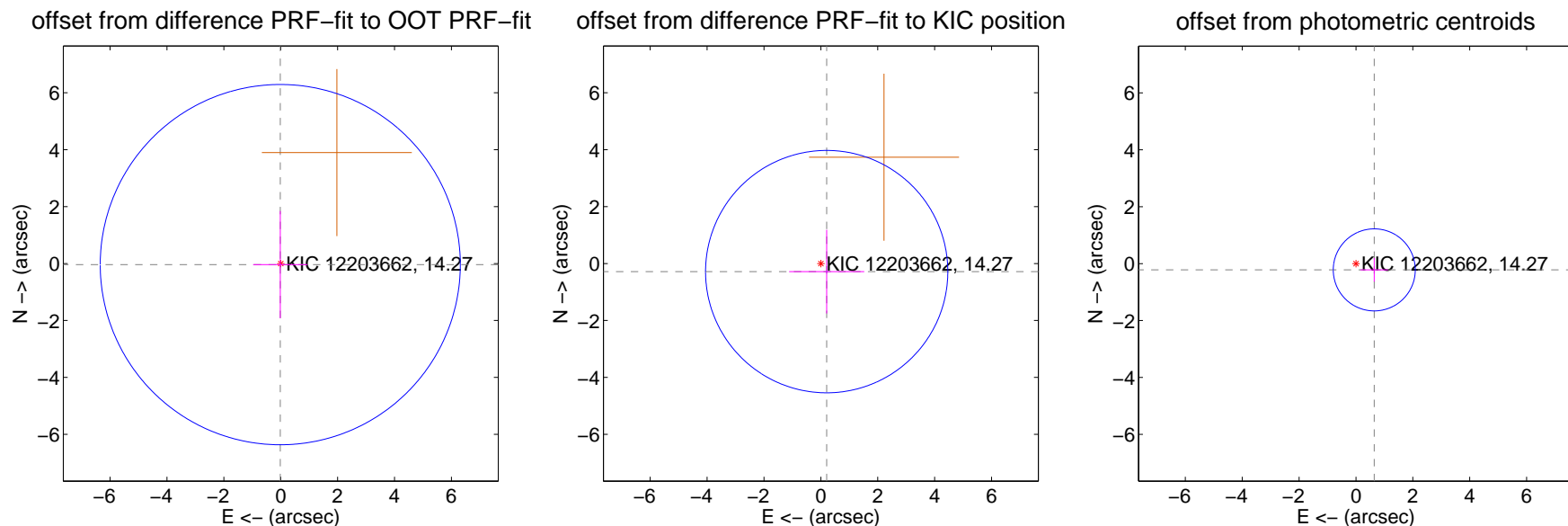
## DV Centroid Data

Supplemental centroid analysis for 012203662-04. Kepler magnitude: 14.27. Transit SNR 9.27

There are 1 quarters with good PRF difference image offsets

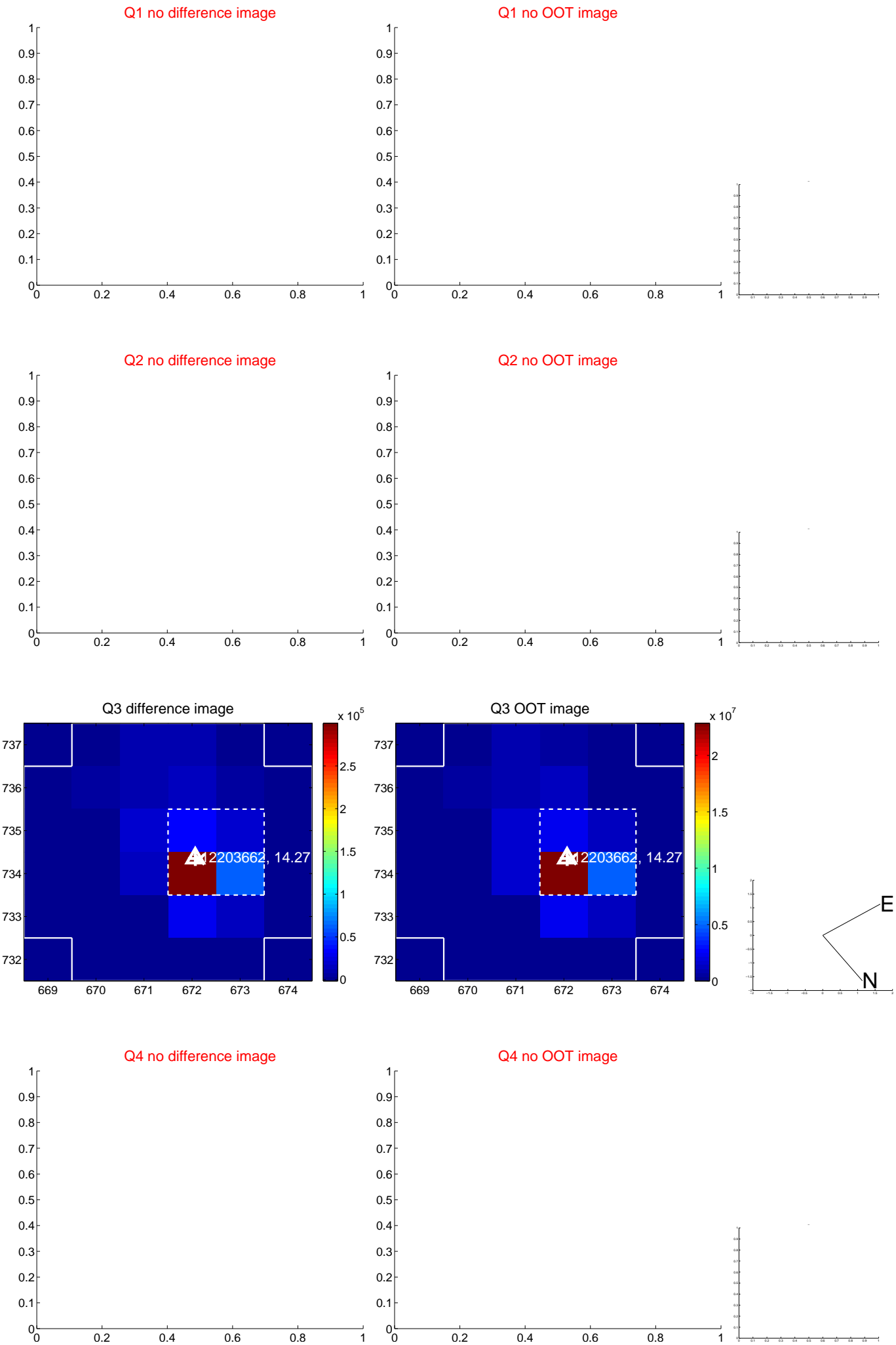
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.042 \pm 2.109$	0.02	$0.017 \pm 0.954$	$-0.038 \pm 1.886$
PRF-fit source offset from KIC position	$0.350 \pm 1.419$	0.25	$-0.205 \pm 1.319$	$-0.284 \pm 1.468$
photometric centroid source offset	$0.68 \pm 0.48$	1.42	$-0.64 \pm 0.49$	$-0.22 \pm 0.42$

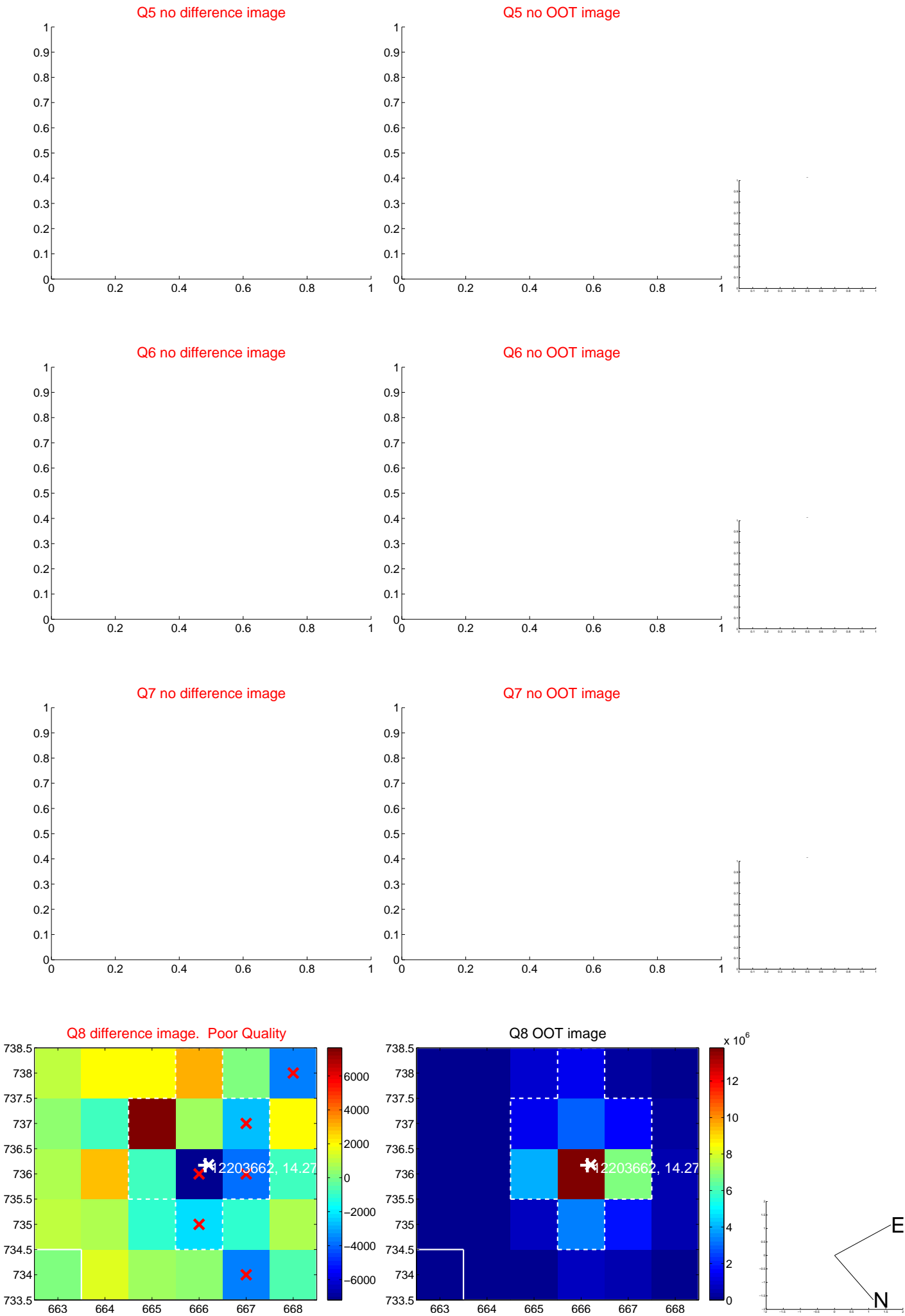


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

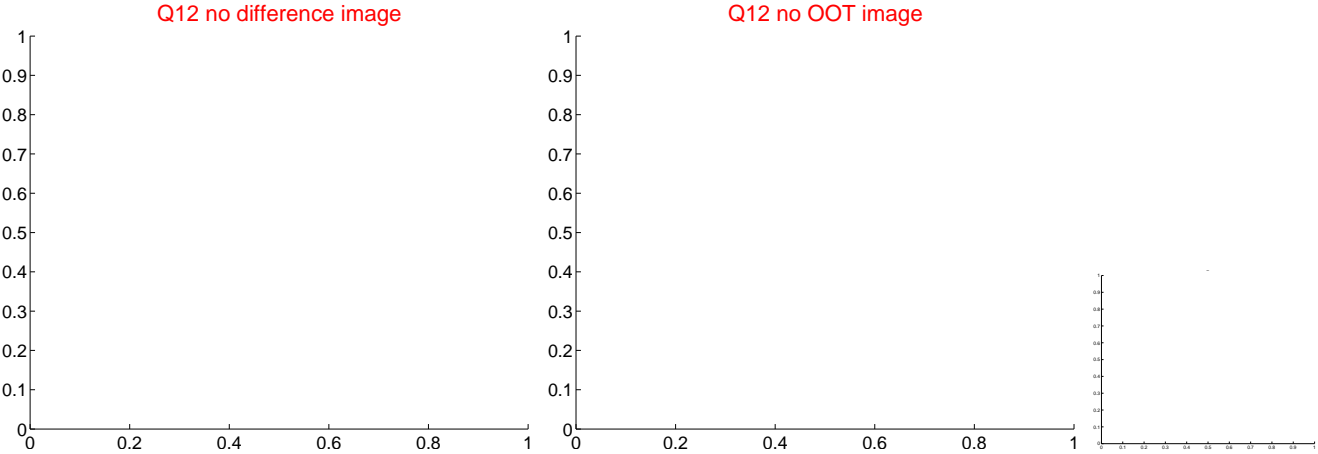
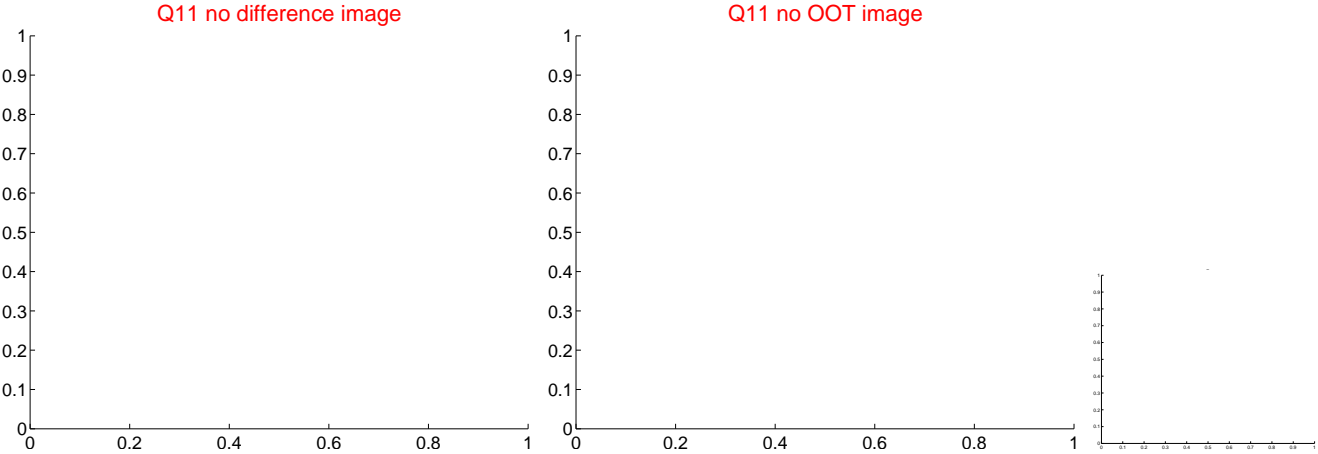
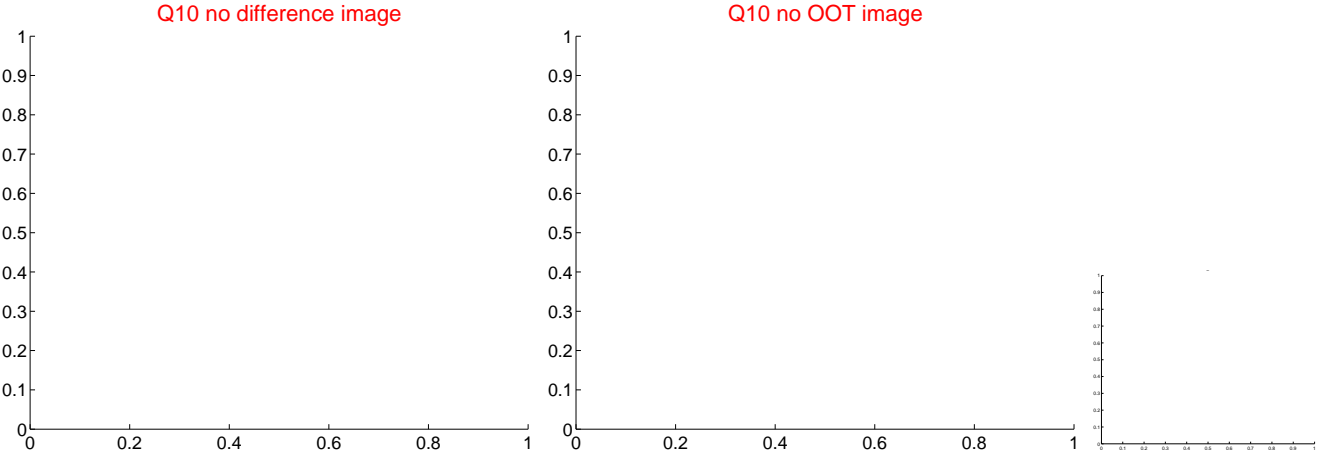
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



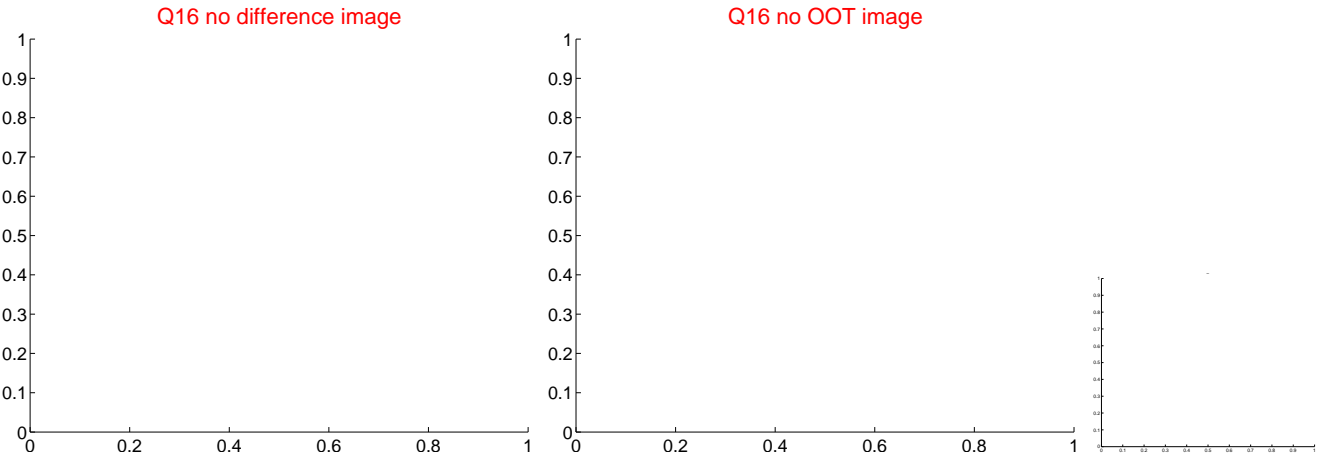
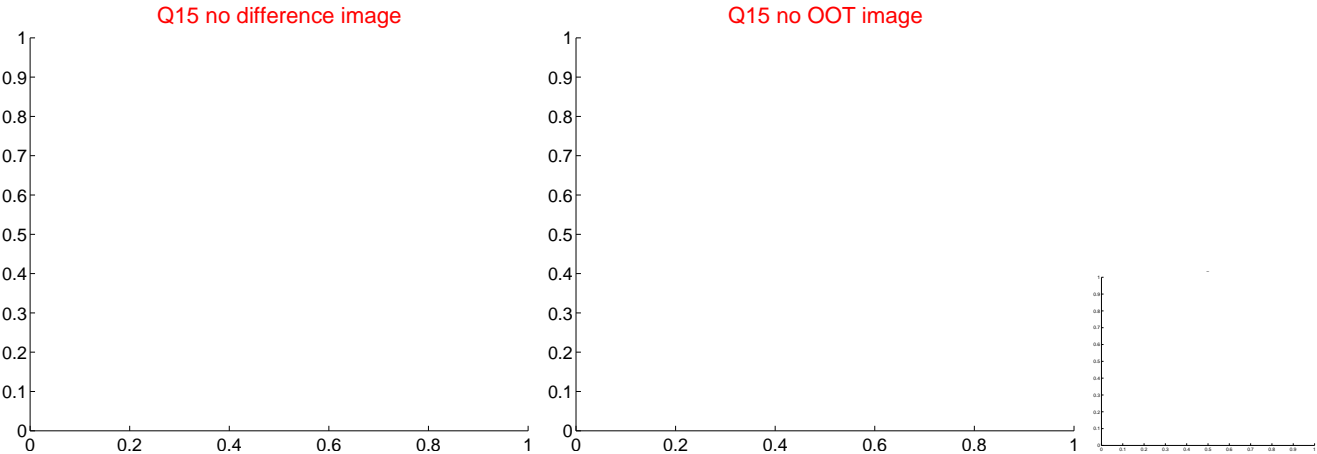
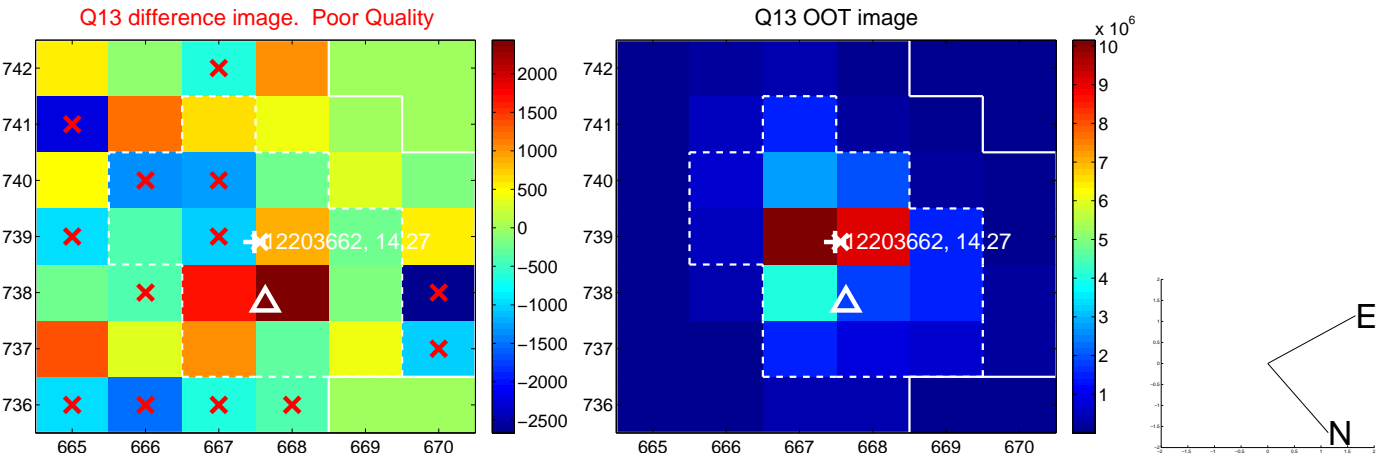
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



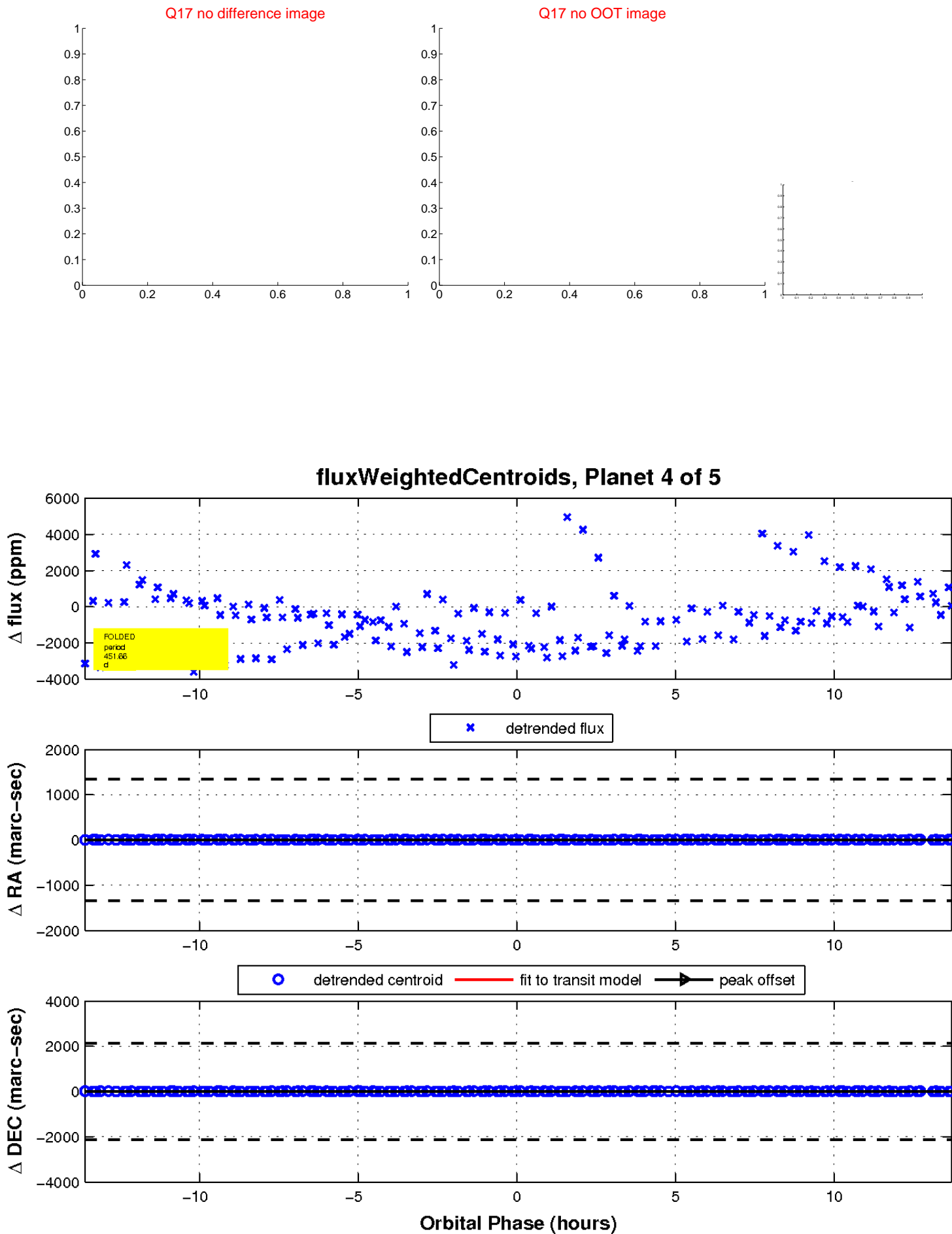
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

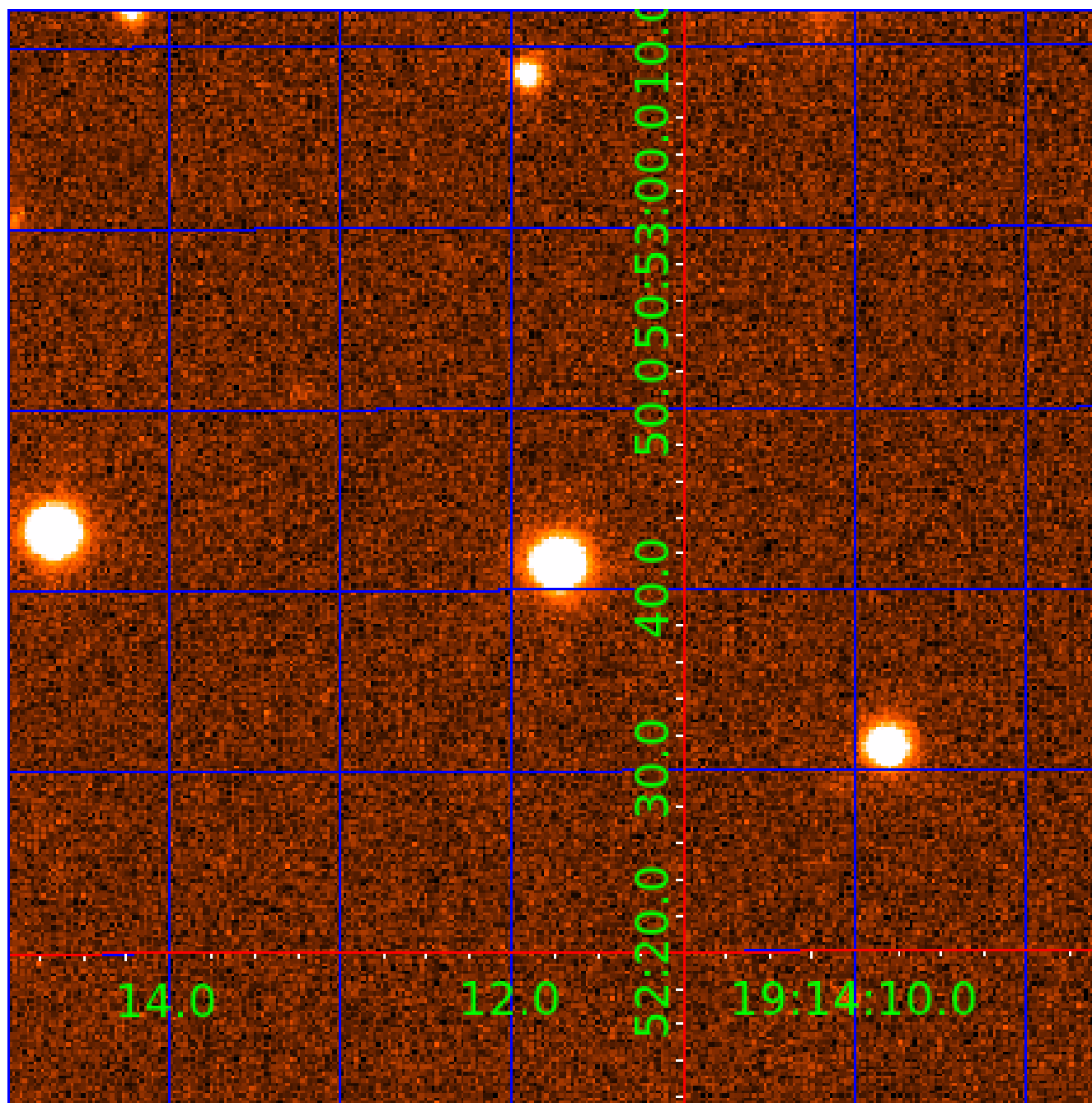


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



UKIRT Image

Declination





# KIC 012203662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012203662-01	OBS	No	469.157826	419.653079	1064.5	3.234	15.1	5.7	0.57	4878	1.93	0.17
012203662-02	OBS	No	586.953956	393.637225	1086.1	3.421	12.6	7.0	0.57	4878	1.98	0.13
012203662-03	OBS	No	256.330290	151.444918	933.5	3.476	11.1	8.2	0.57	4878	1.81	0.39
012203662-04	OBS	No	451.658922	304.058204	2835.2	4.576	10.3	9.3	0.57	4878	5.91	0.18
012203662-05	OBS	No	332.607776	223.725496	1209.2	2.434	13.6	5.9	0.57	4878	1.99	0.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012203662-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS
012203662-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012203662-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—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.

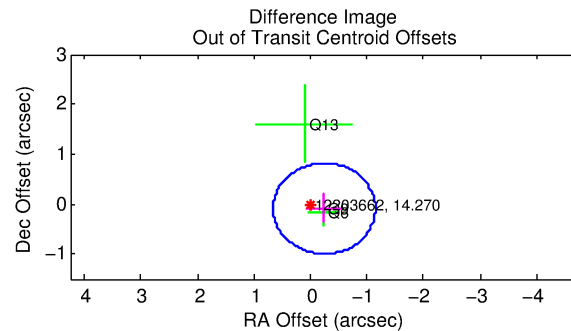
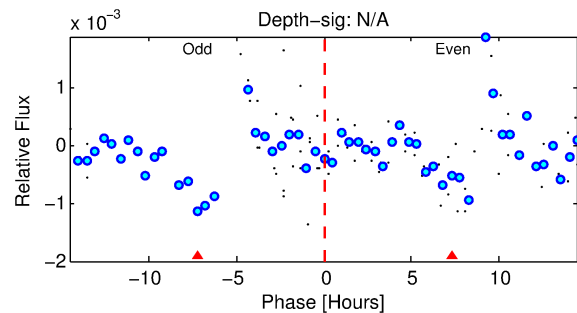
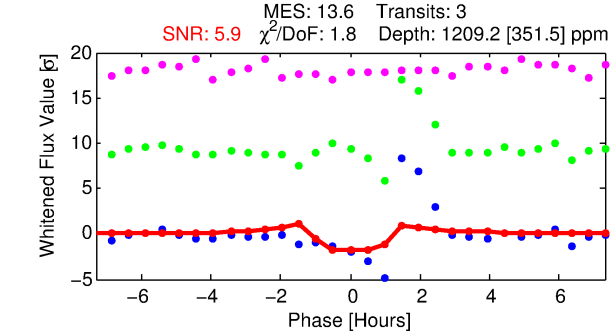
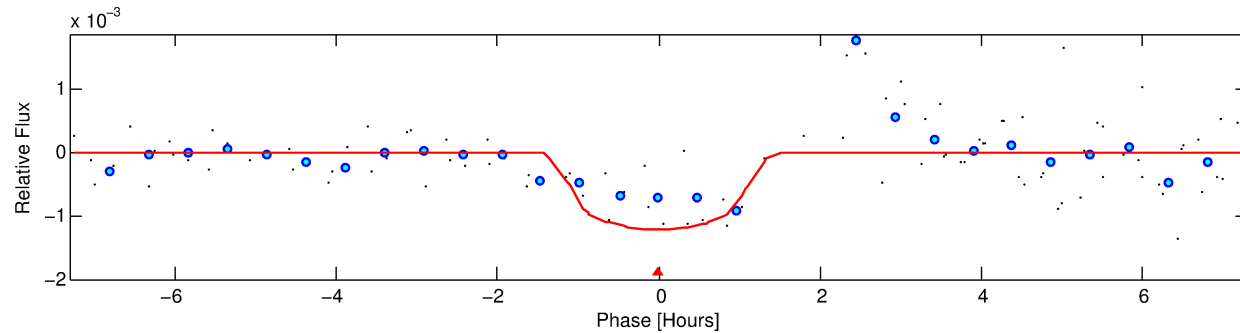
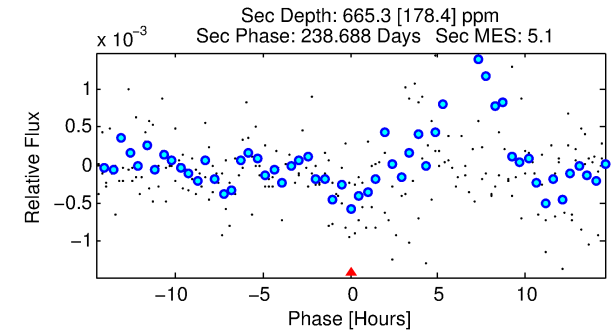
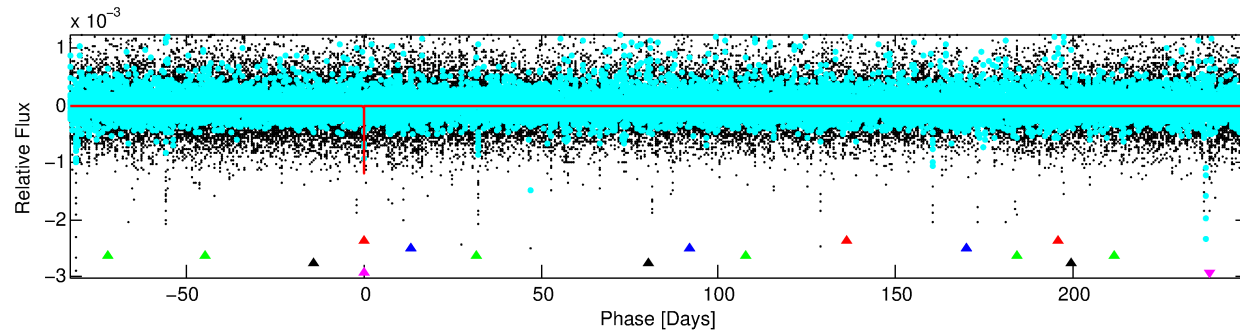
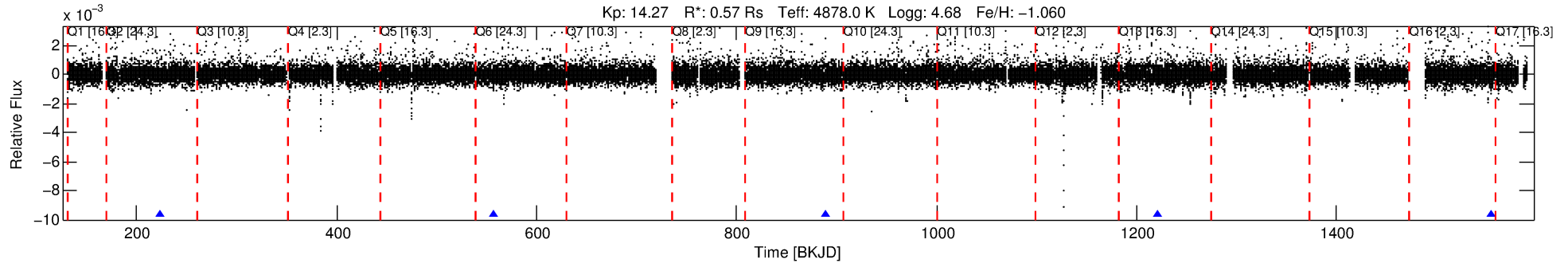
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012203662-05

No Significant Match Found

# DV One-Page Summary

KIC: 12203662 Candidate: 5 of 5 Period: 332.608 d



## DV Fit Results:

Period = 332.60778 [0.00476] d  
Epoch = 223.7255 [0.0130] BKJD  
Rp/R\* = 0.0318 [0.1577]  
a/R\* = 1010.82 [19402.65]  
b = 0.36 [47.66]  
Seff = 0.27 [0.04]  
Teq = 185 [7] K  
Rp = 1.99 [9.90] Re  
a = 0.7812 [0.0493] AU  
Ag = 56180.94 [557851.47] [0.10σ]  
Teffp = 4395 [10910] K [0.39σ]

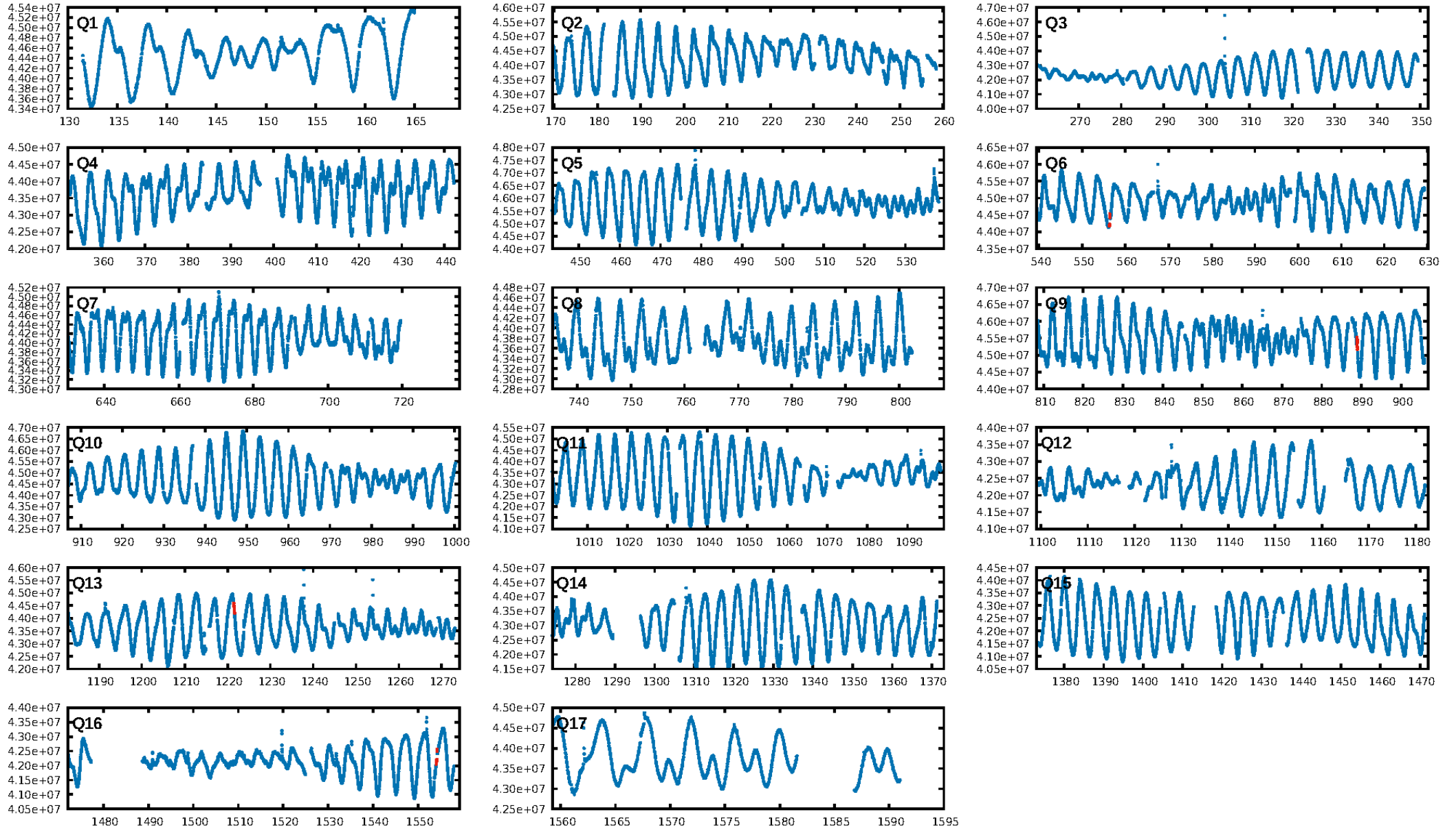
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [431.39σ]  
LongPeriod-sig: 100.0% [551.27σ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 30.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.5635  
Centroid-sig: 28.6%  
Centroid-so: 1.197 arcsec [1.03σ]  
OotOffset-rm: 0.259 arcsec [0.86σ]  
KicOffset-rm: 0.538 arcsec [1.59σ]  
OotOffset-st: 1/0/0/2 [3]  
KicOffset-st: 1/0/0/2 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.75 [3/4]

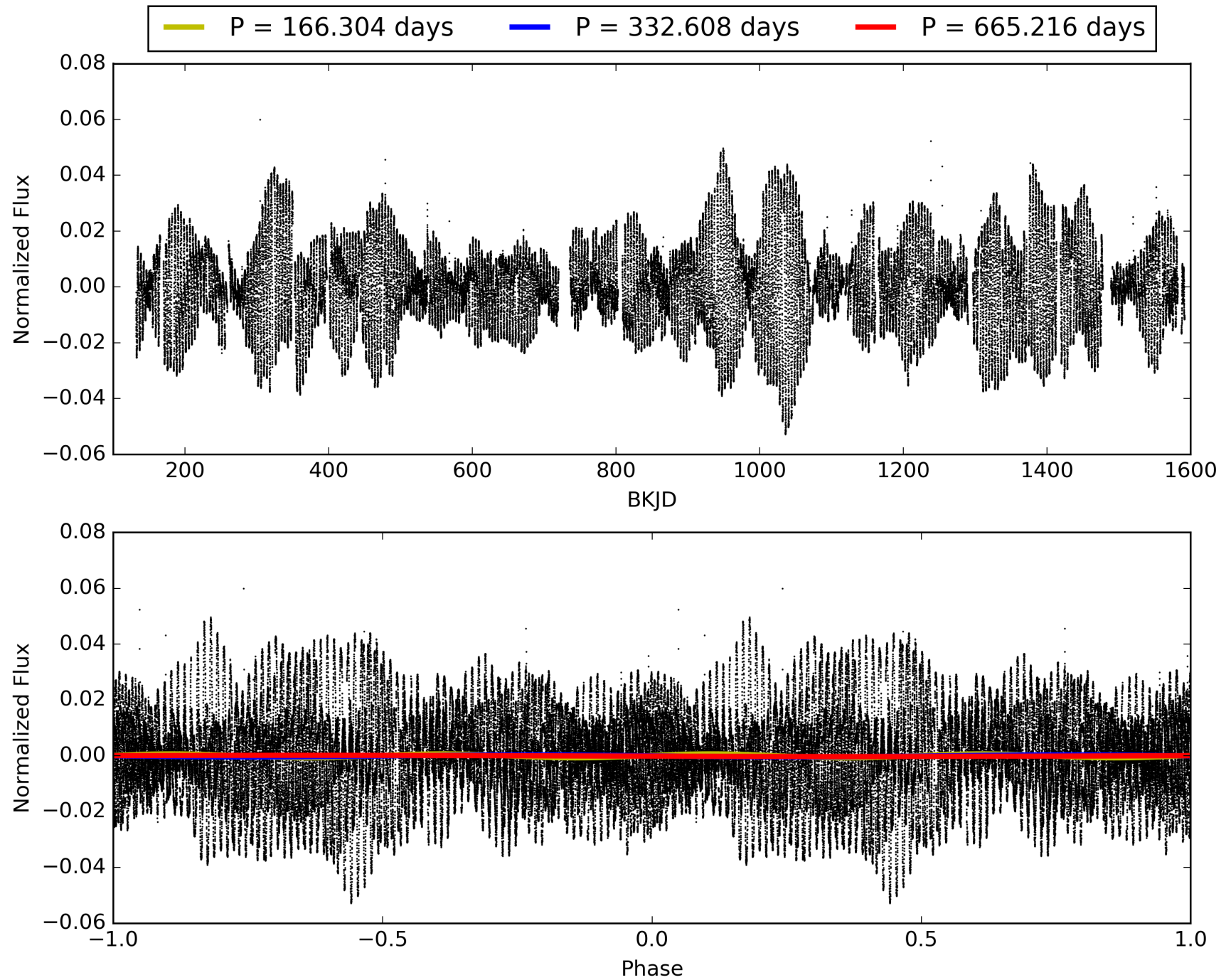
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:54:53 Z

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

# TCE 012203662-05, PDC Light Curves

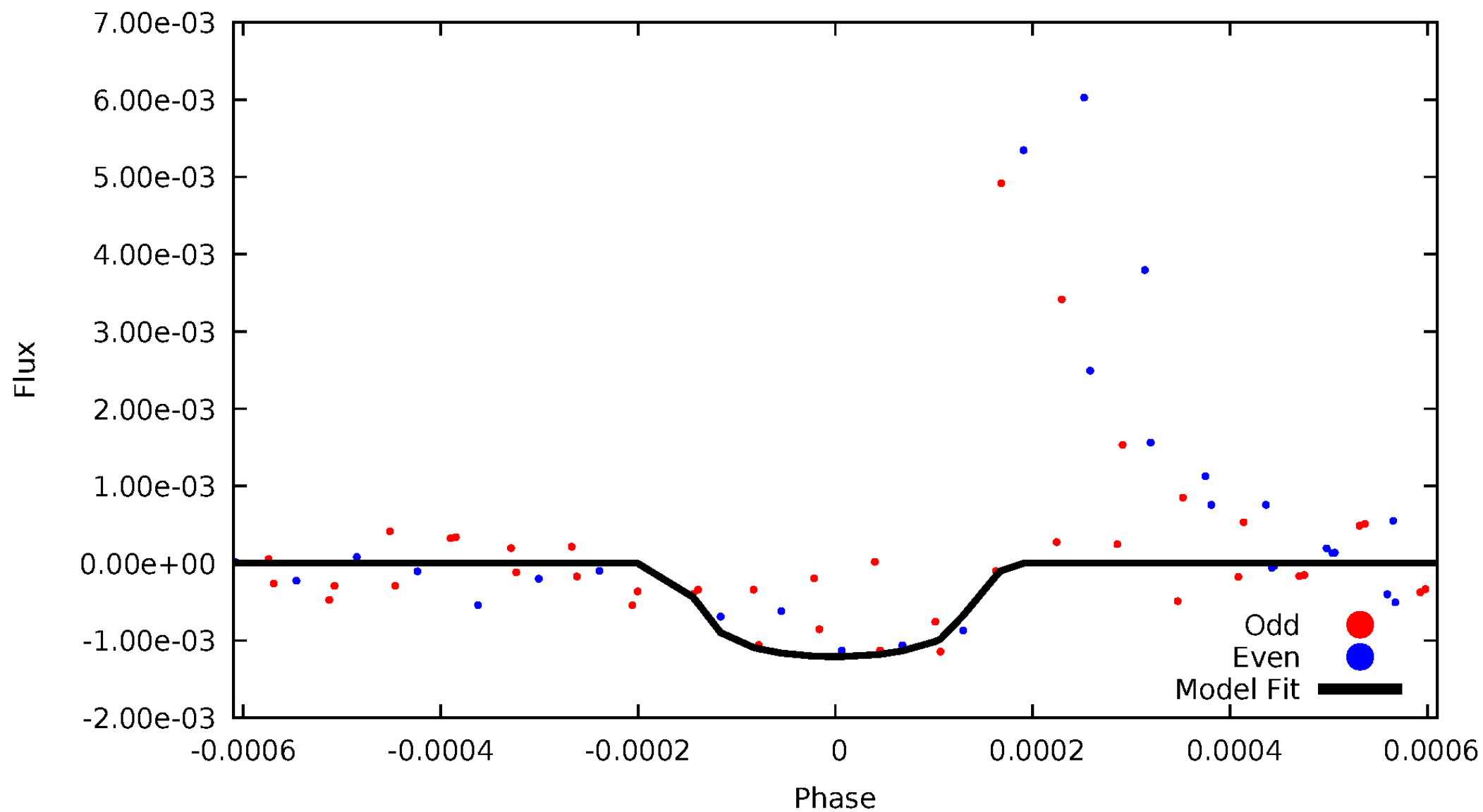


TCE 012203662-05



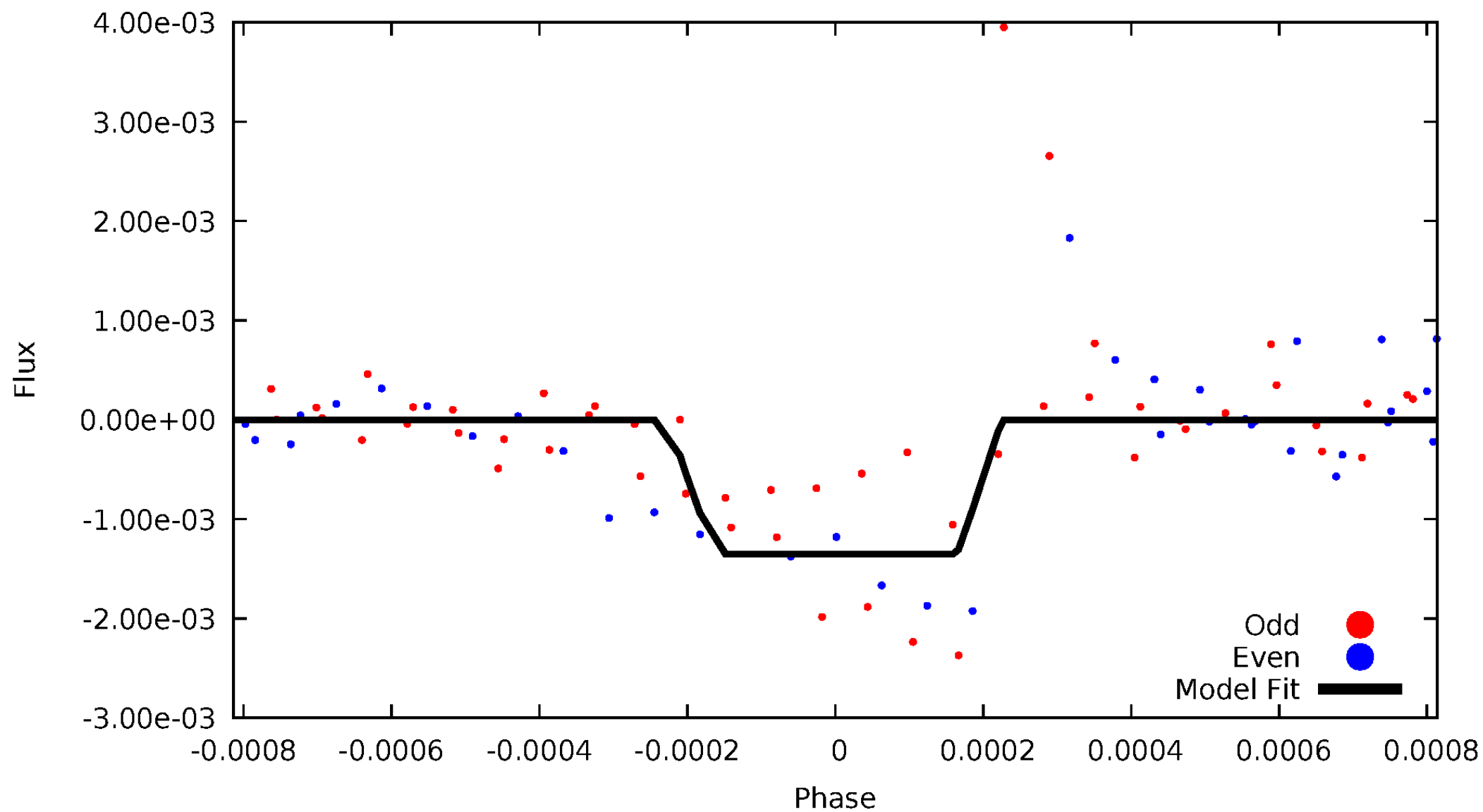
# DV Odd/Even

TCE 012203662-05



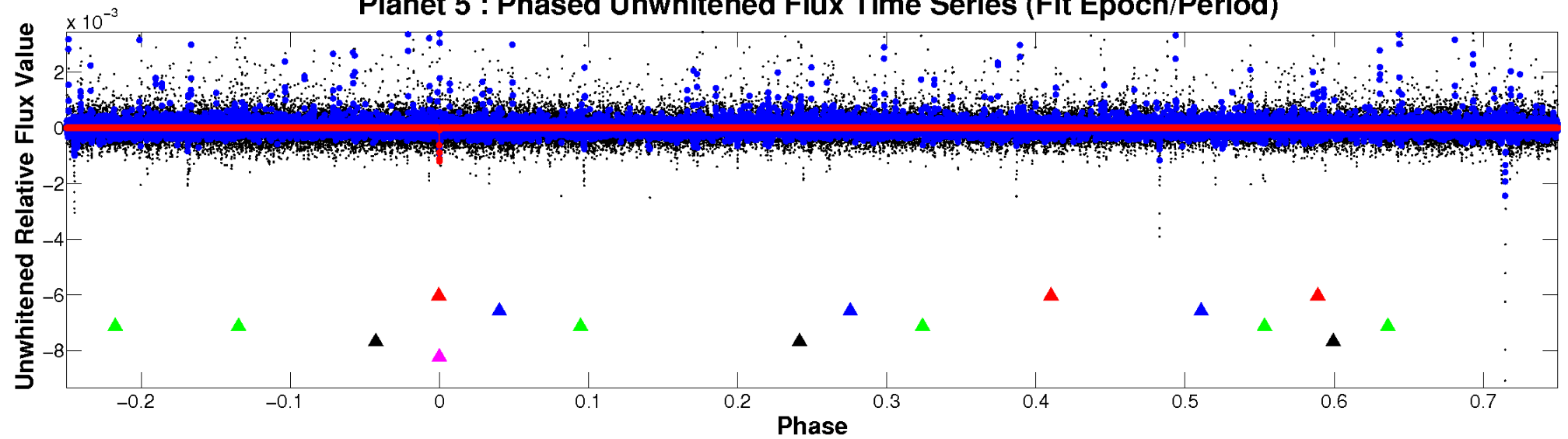
# ALT Odd/Even

TCE 012203662-05

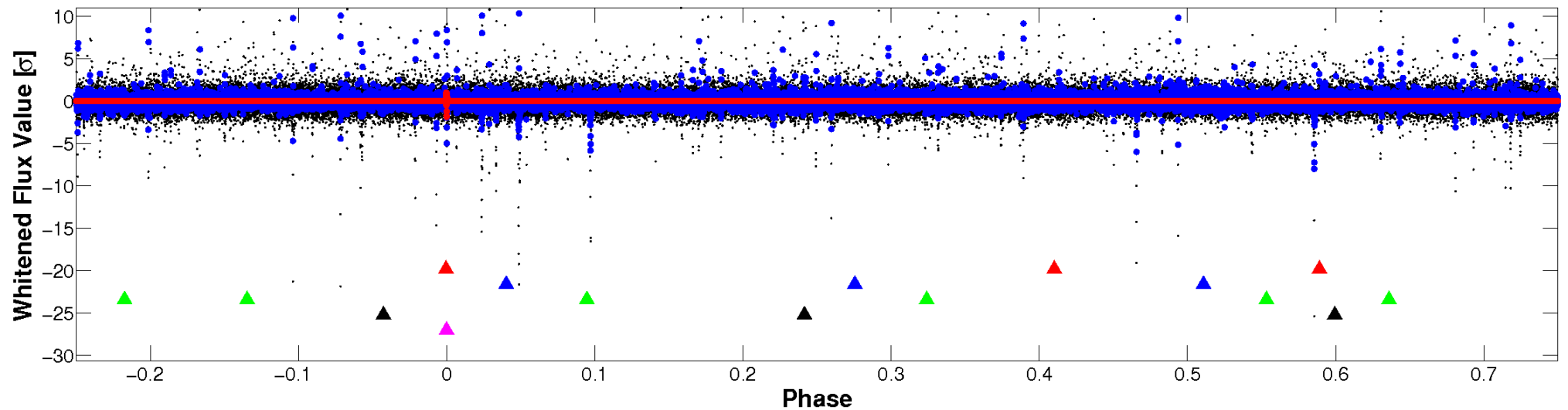


# Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

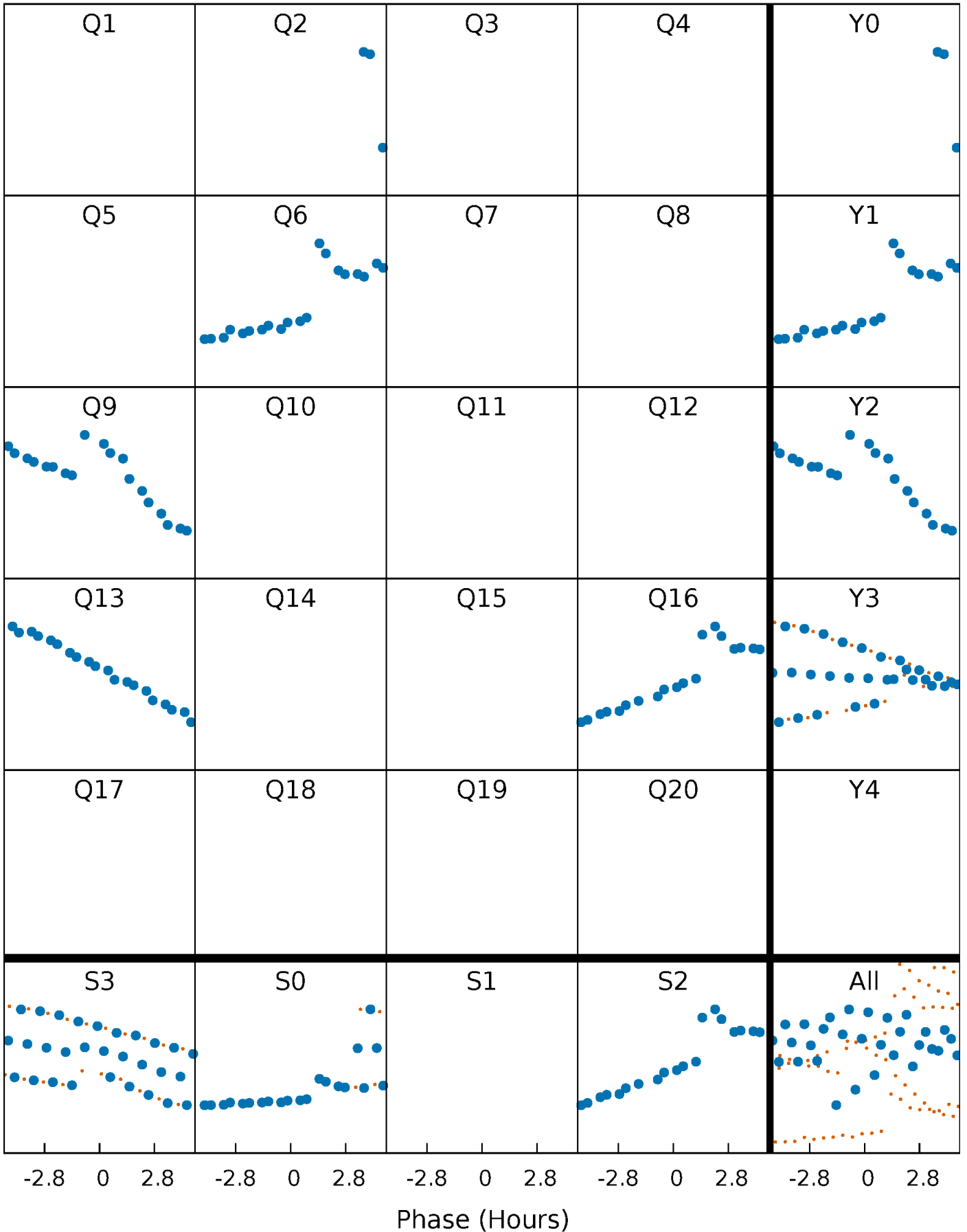


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

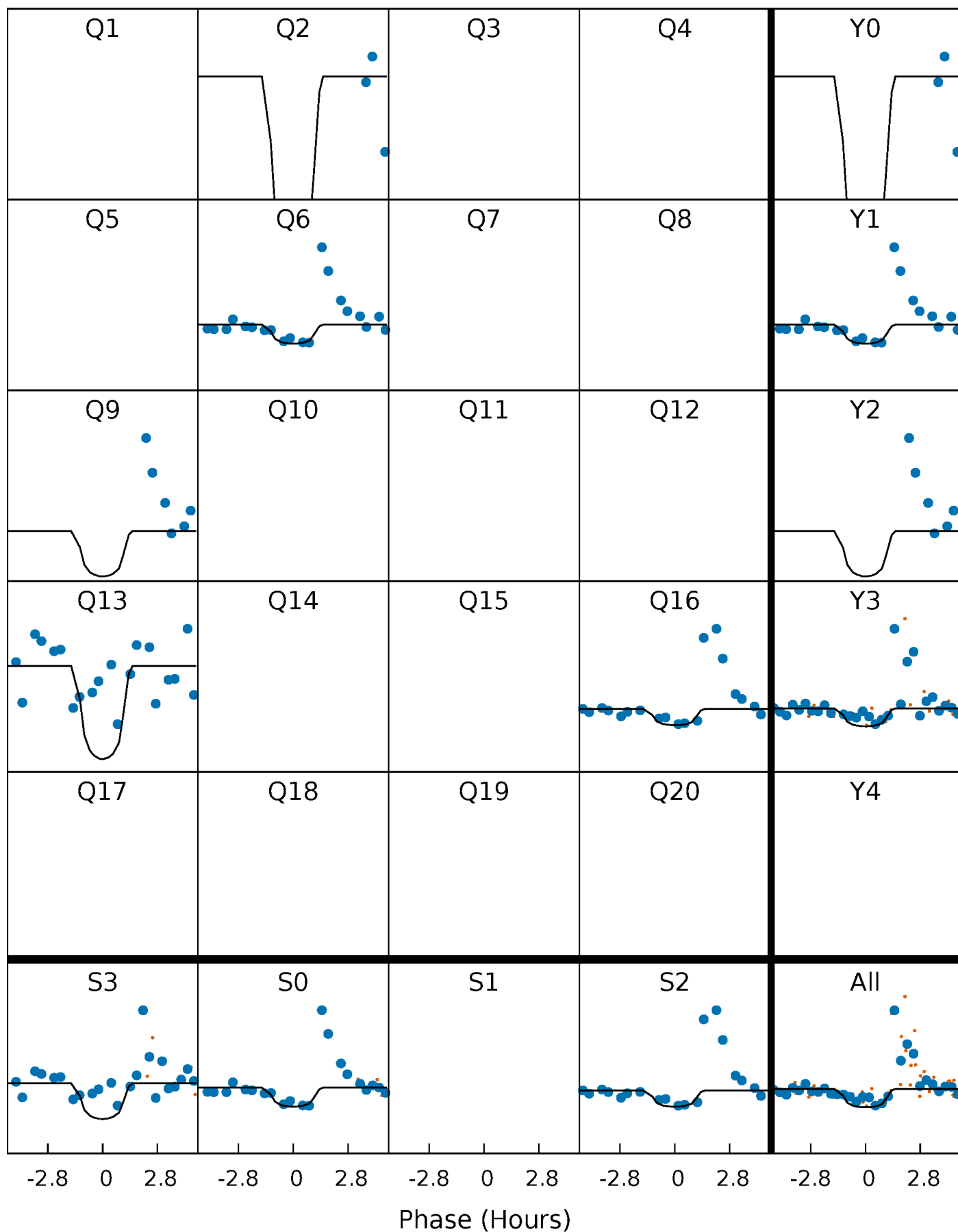
TCE 012203662-05     $P=332.607776$  Days     $T_0=223.725496$  (BKJD)





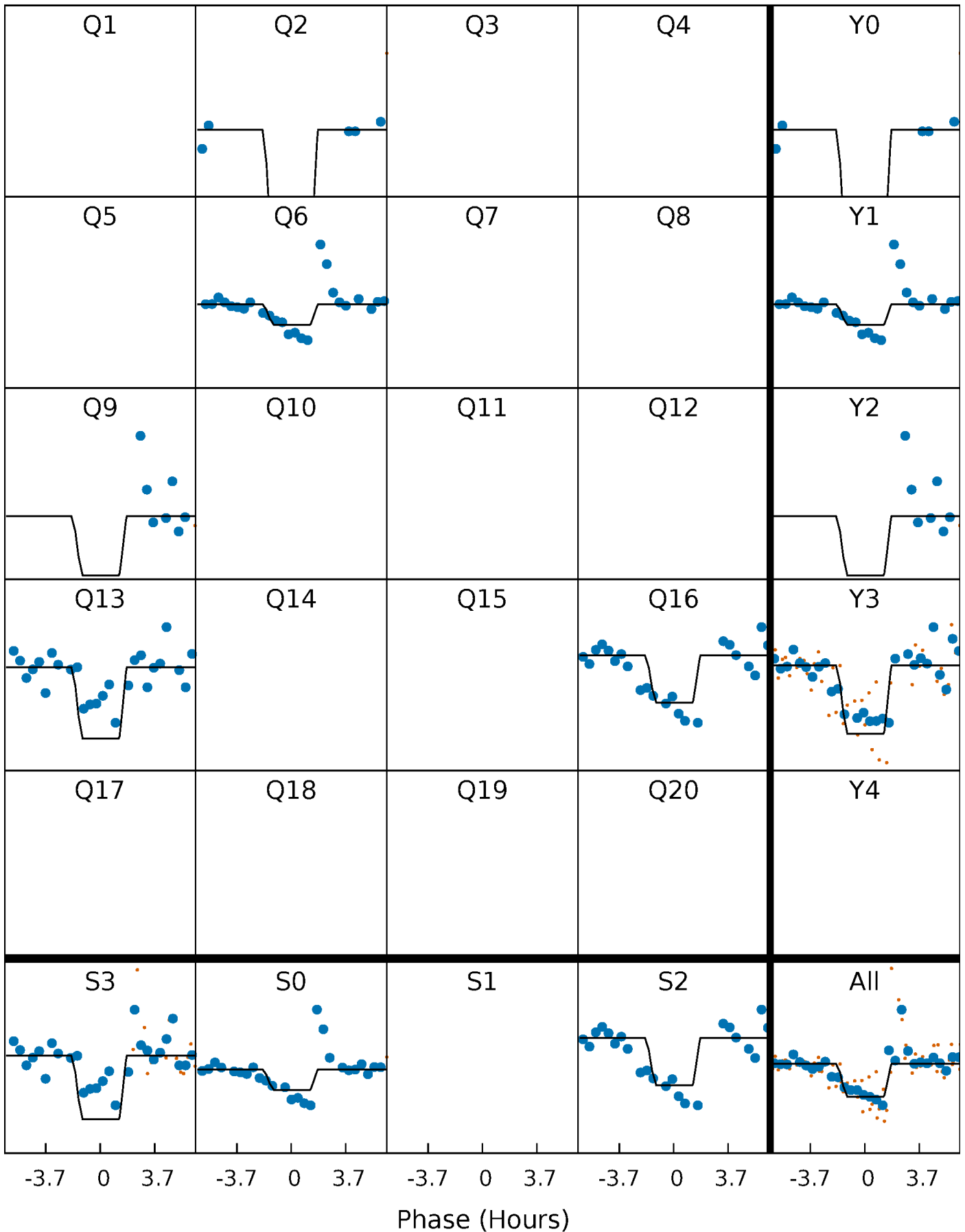
# DV Quarter-Phased Transit Curves

TCE 012203662-05     $P=332.607776$  Days     $T_0=223.725496$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

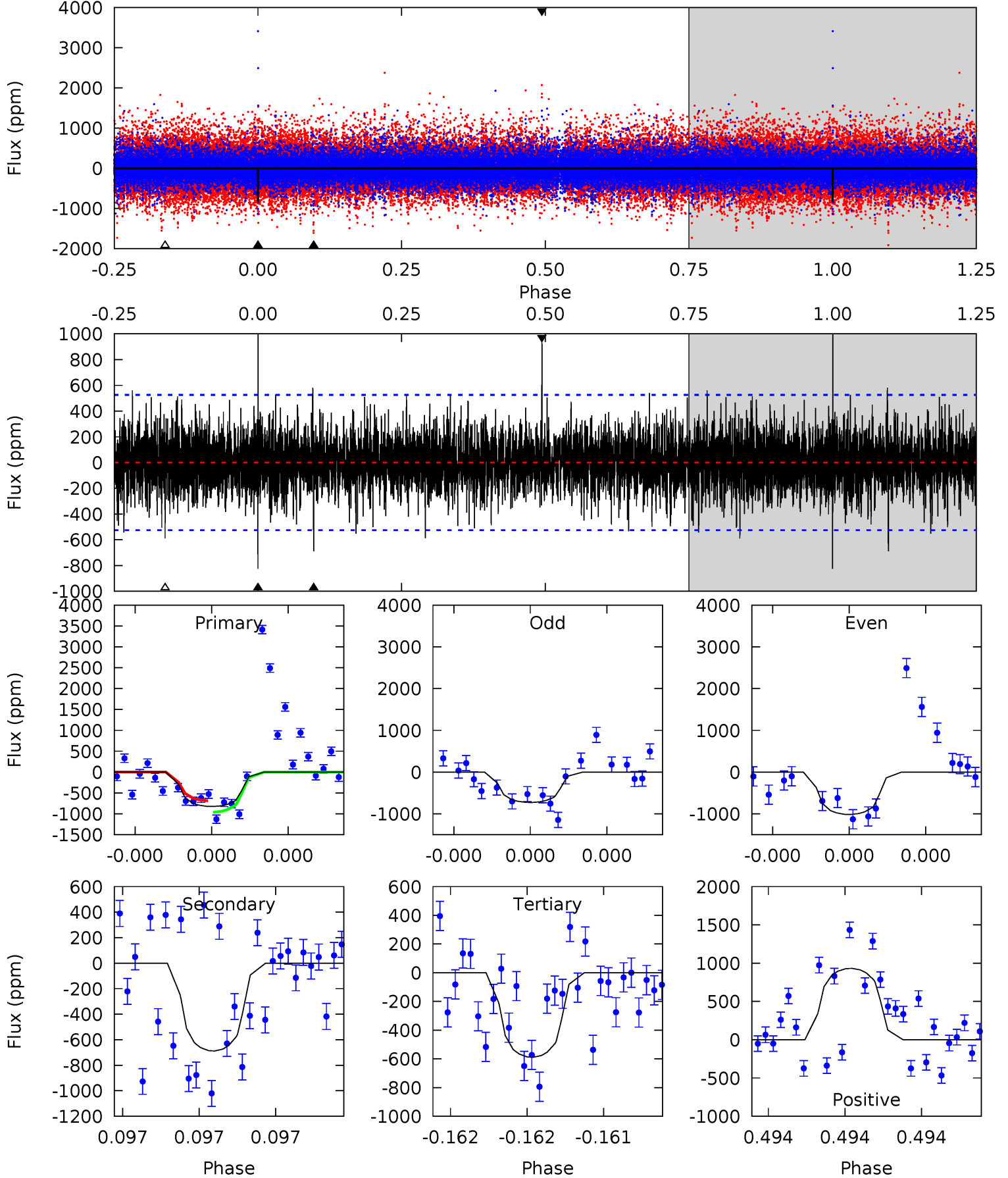
TCE 012203662-05     $P=332.608179$  Days     $T_0=223.705210$  (BKJD)



# DV Model-Shift Uniqueness Test

012203662-05, P = 332.607776 Days, E = 223.725496 Days

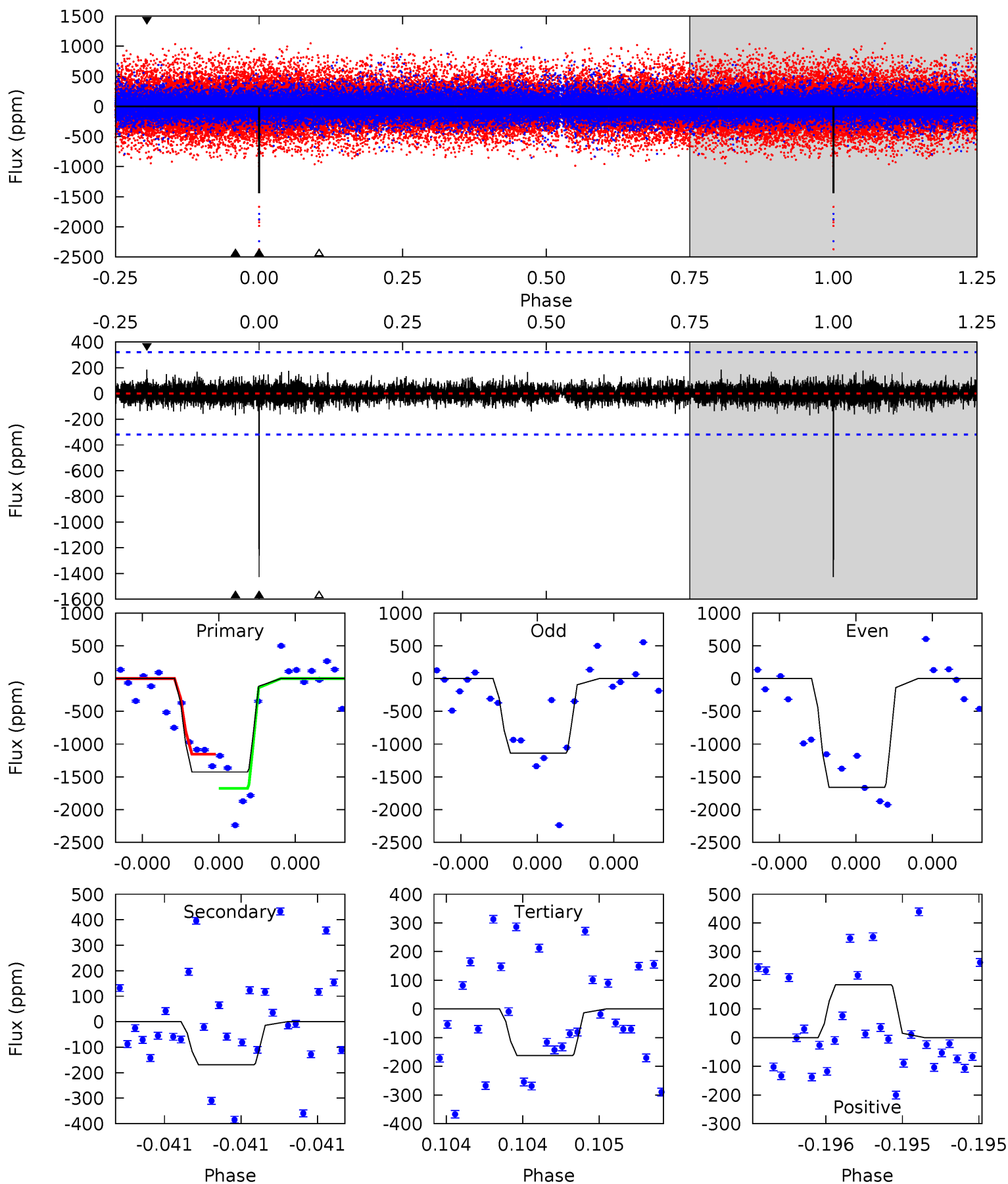
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.87	7.39	6.32	10.0	5.64	3.59	1.55	2.54	-1.14	1.07	-2.62	1.36	0.79	0.55	1.48



# Alt Model-Shift Uniqueness Test

012203662-05, P = 332.608179 Days, E = 223.705210 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
25.0	2.96	2.85	3.23	5.60	3.53	0.68	22.1	21.7	0.11	-0.27	4.38	0.83	0.11	4.57



### Stellar Parameters For KIC 012203662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4878^{+147}_{-147}$	$4.678^{+0.054}_{-0.032}$	$-1.060^{+0.300}_{-0.300}$	$0.575^{+0.038}_{-0.041}$	$0.575^{+0.046}_{-0.021}$	$4.254^{+0.907}_{-0.514}$
	+3%/-3%	+1%/-1%	+28%/-28%	+7%/-7%	+8%/-4%	+21%/-12%
Source	PHO1	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 012203662-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-688 \pm 93$	$8.00^{+7.77}_{-5.34}$	$257^{+8}_{-9}$	$2861^{+1189}_{-450}$	$3564^{+30138}_{-2624}$
Alt.	$-169 \pm 57$	$7.96^{+7.62}_{-5.59}$	$257^{+9}_{-9}$	$2405^{+931}_{-347}$	$871^{+9709}_{-655}$

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

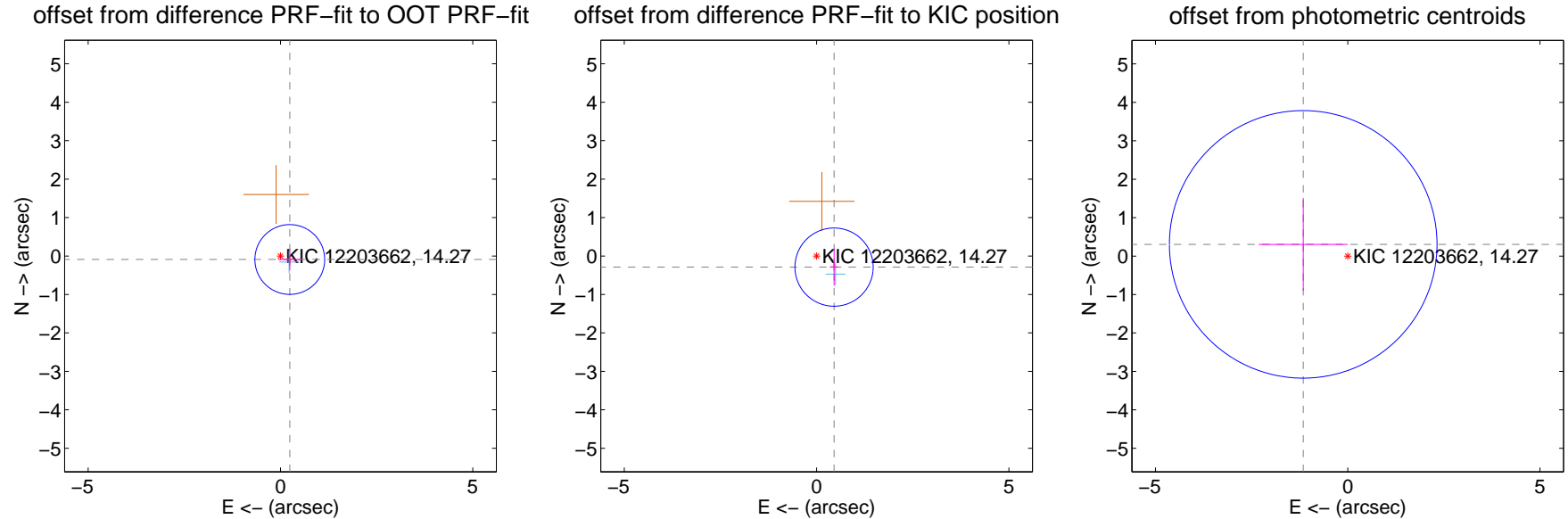
## DV Centroid Data

Supplemental centroid analysis for 012203662-05. Kepler magnitude: 14.27. Transit SNR 5.93

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.259 \pm 0.302$	0.86	$-0.243 \pm 0.305$	$-0.090 \pm 0.282$
PRF-fit source offset from KIC position	$0.538 \pm 0.339$	1.59	$-0.454 \pm 0.112$	$-0.288 \pm 0.484$
photometric centroid source offset	$1.20 \pm 1.16$	1.03	$1.16 \pm 1.16$	$0.31 \pm 1.21$

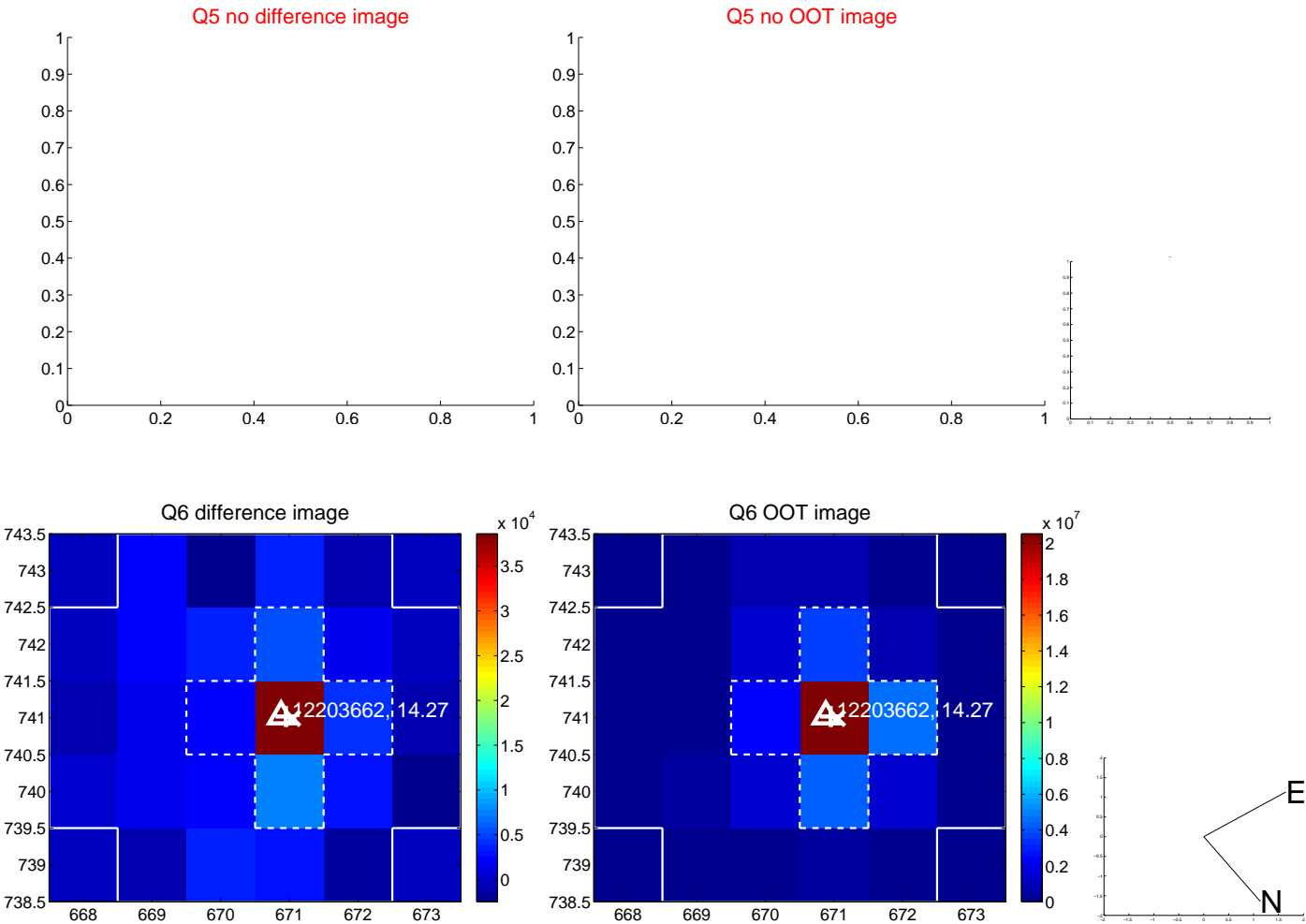


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

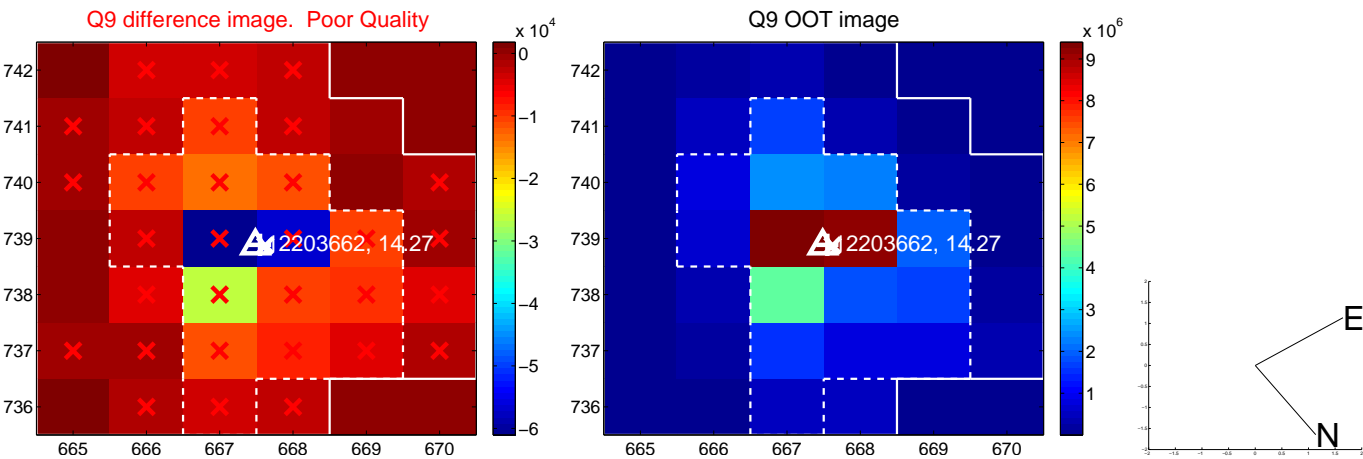


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

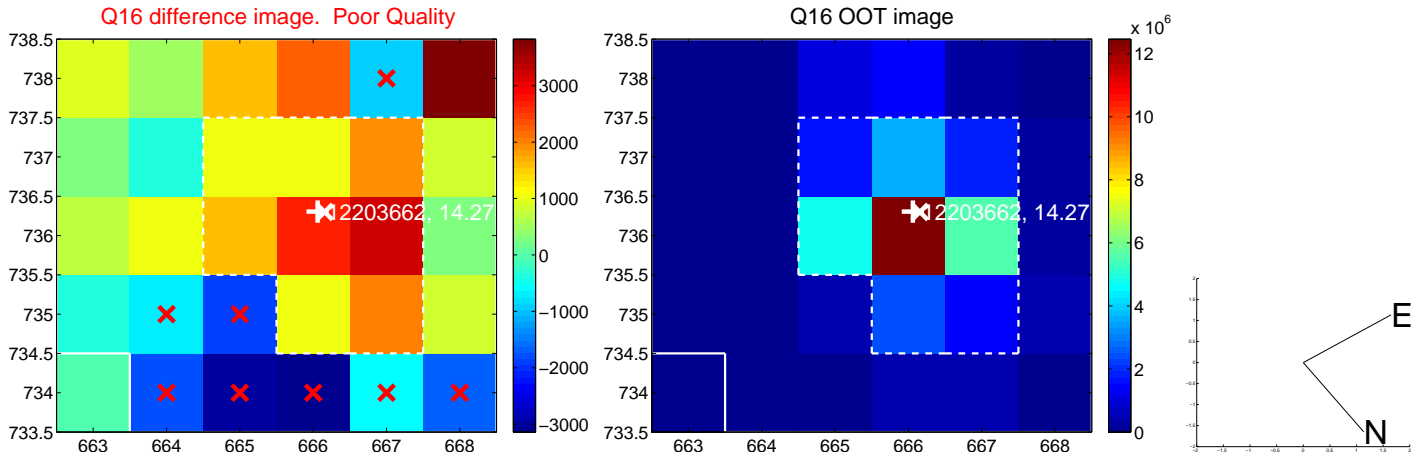
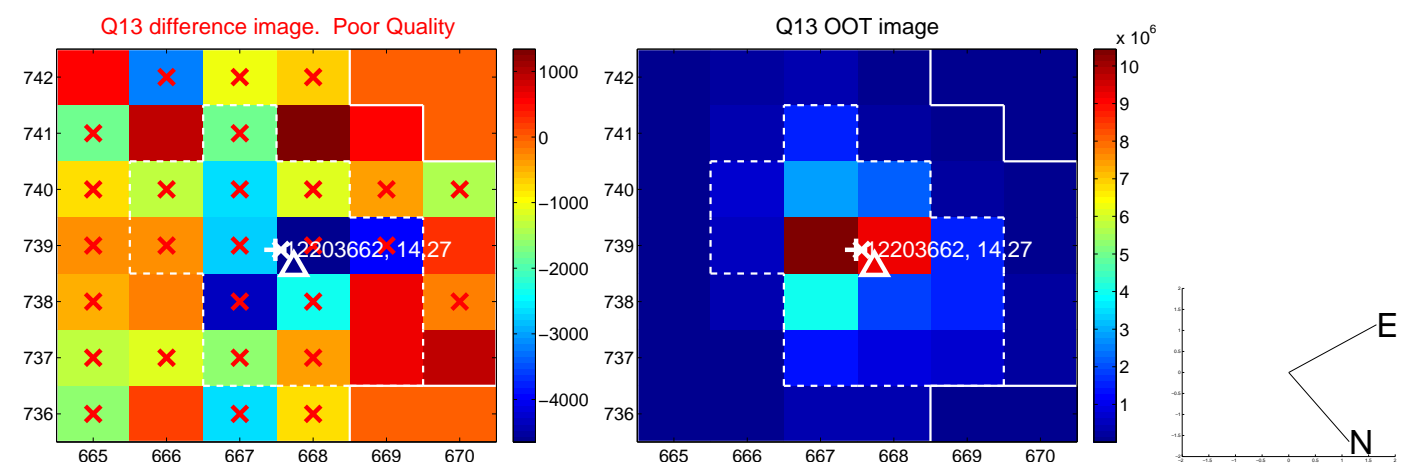




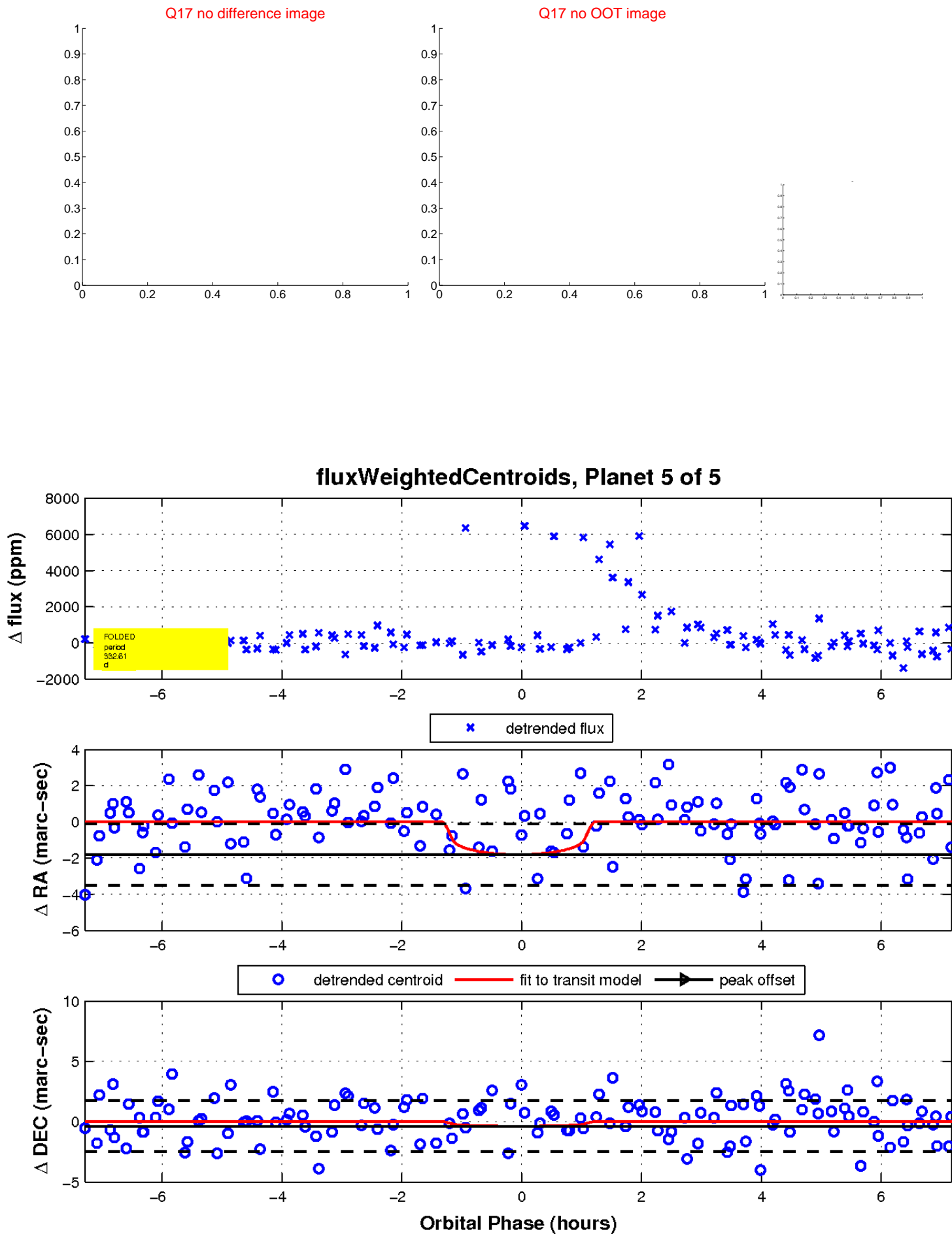
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

