

# KIC 007047963

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007047963-01	OBS	No	1.201075	132.003871	12.8	0.870	9.9	1.3	1.95	7443	0.81	14911.42
007047963-02	OBS	No	0.564738	131.999433	94.4	1.682	8.7	9.9	1.95	7443	2.20	40783.41
007047963-03	OBS	No	593.043212	162.733474	170.6	3.500	8.7	-1.0	1.95	7443	2.58	3.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007047963-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
007047963-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007047963-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

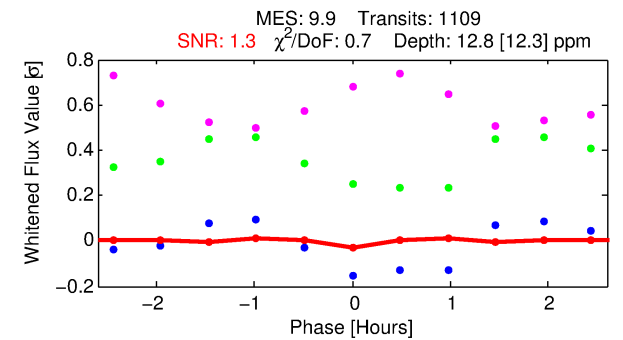
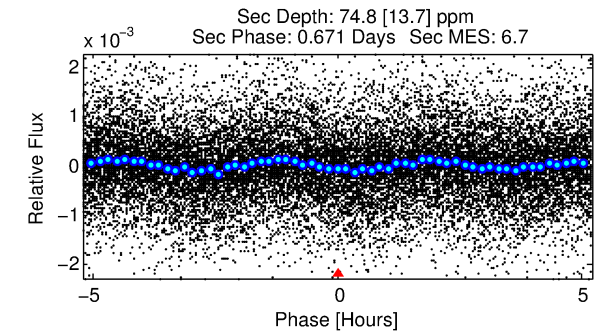
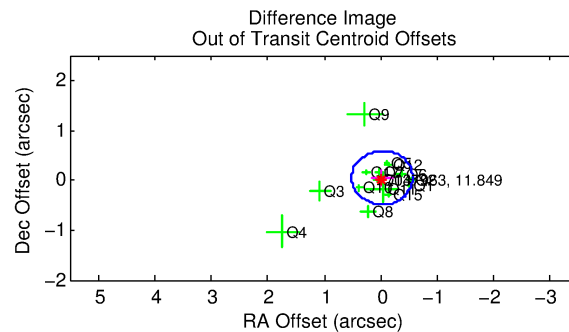
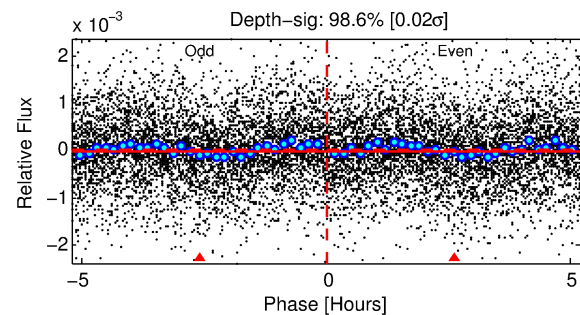
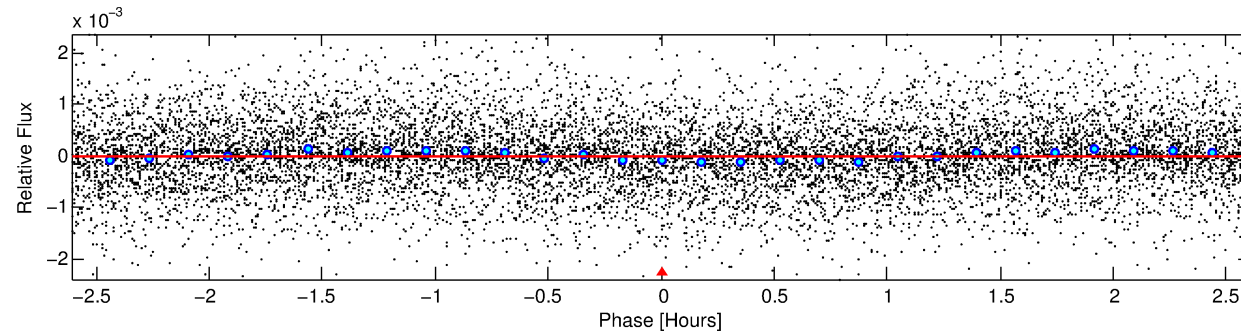
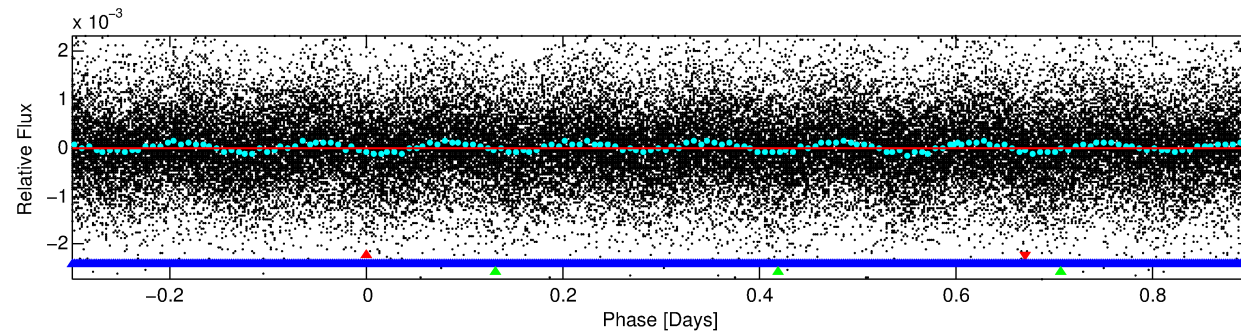
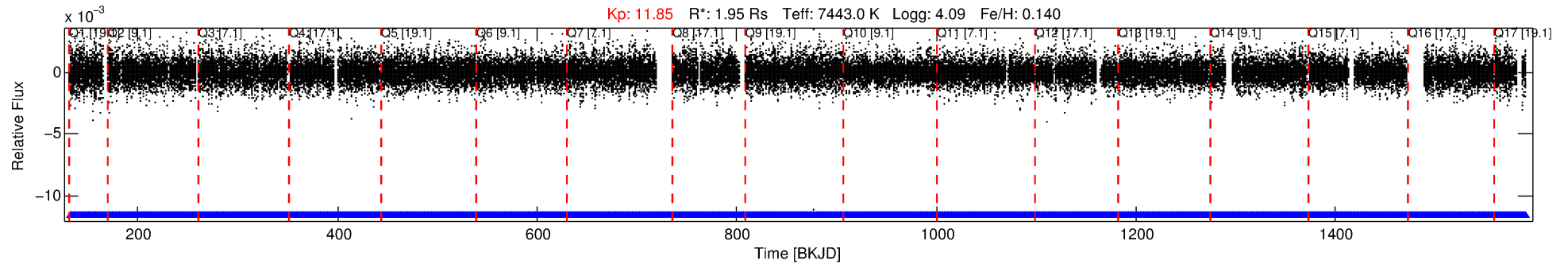
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007047963-01

No Significant Match Found

# DV One-Page Summary

KIC: 7047963 Candidate: 1 of 3 Period: 1.201 d



## DV Fit Results:

Period = 1.20107 [0.00007] d  
Epoch = 132.0039 [0.0070] BKJD  
 $R_p/R^*$  = 0.0038 [0.0028]  
 $a/R^*$  = 4.82 [17.03]  
 $b$  = 0.90 [0.80]  
 $\text{Seff}$  = 14911.42 [5867.66]  
 $\text{Teq}$  = 2818 [277] K  
 $R_p$  = 0.81 [0.64]  $R_e$   
 $a$  = 0.0265 [0.0065] AU  
 $A_g$  = 43.68 [66.31] [0.64 $\sigma$ ]  
 $\text{Teffp}$  = 11200 [4167] K [2.0 $\sigma$ ]

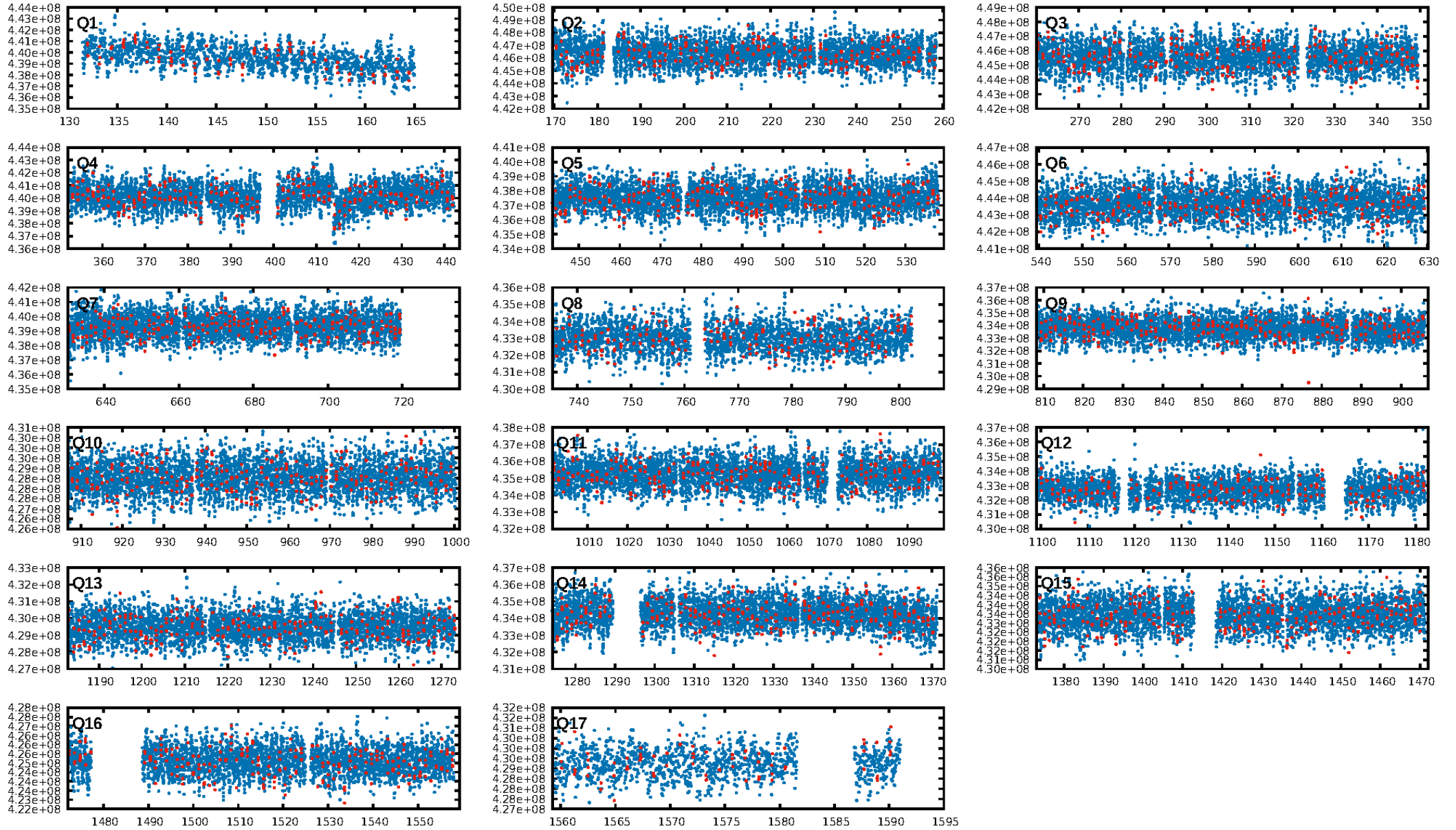
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.07 $\sigma$ ]  
LongPeriod-sig: 100.0% [3938.55 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.31e-18  
RollingBand-fgt: 1.00 [1060/1060]  
GhostDiagnostic-chr: 2.465  
Centroid-sig: 16.6%  
Centroid-so: 1.605 arcsec [1.24 $\sigma$ ]  
OotOffset-rm: 0.054 arcsec [0.30 $\sigma$ ]  
KicOffset-rm: 0.068 arcsec [0.45 $\sigma$ ]  
OotOffset-st: 3/4/3/5 [15]  
KicOffset-st: 3/4/3/5 [15]  
DiffImageQuality-fgm: 0.40 [6/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:46:20 Z

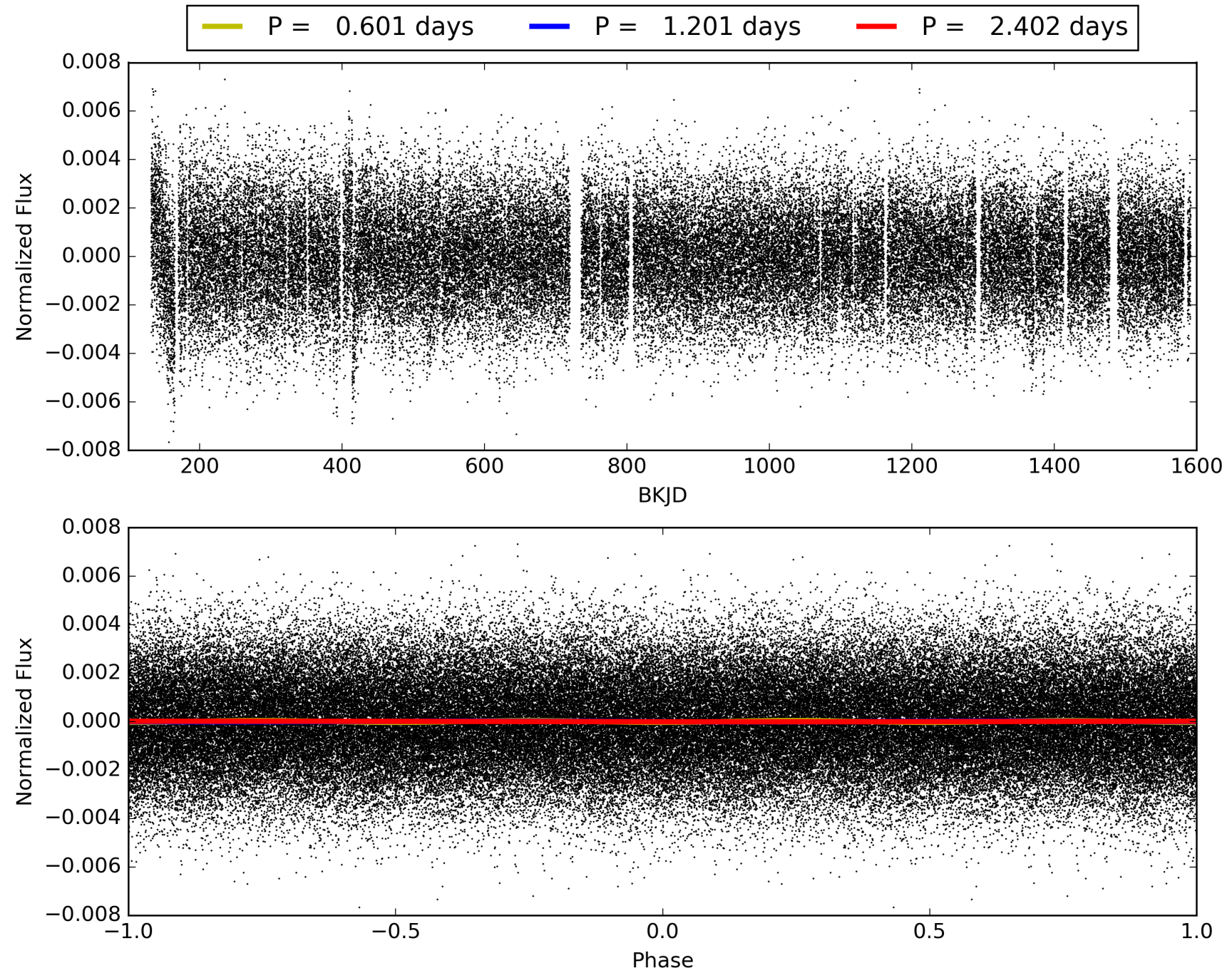
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007047963-01, PDC Light Curves





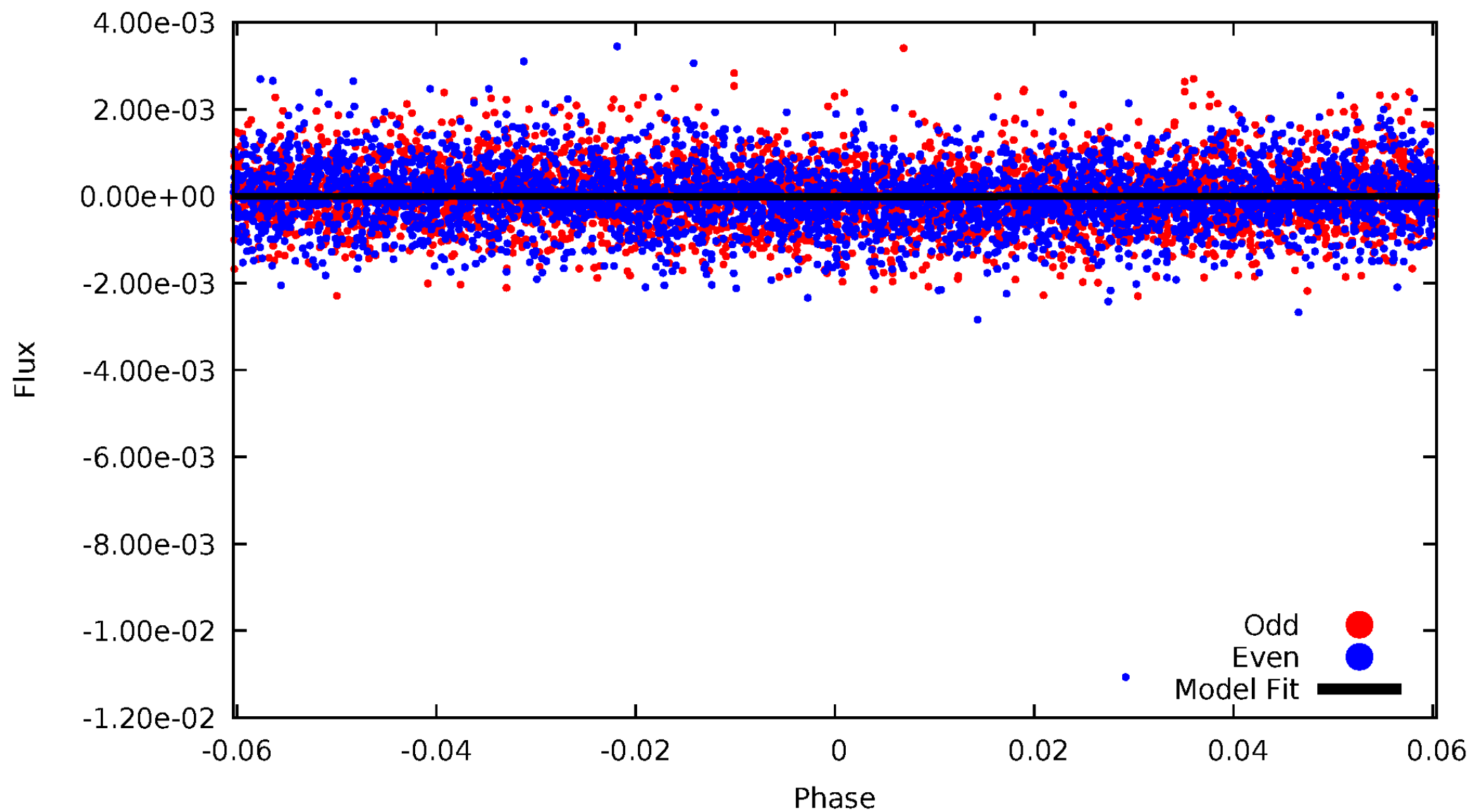
TCE 007047963-01





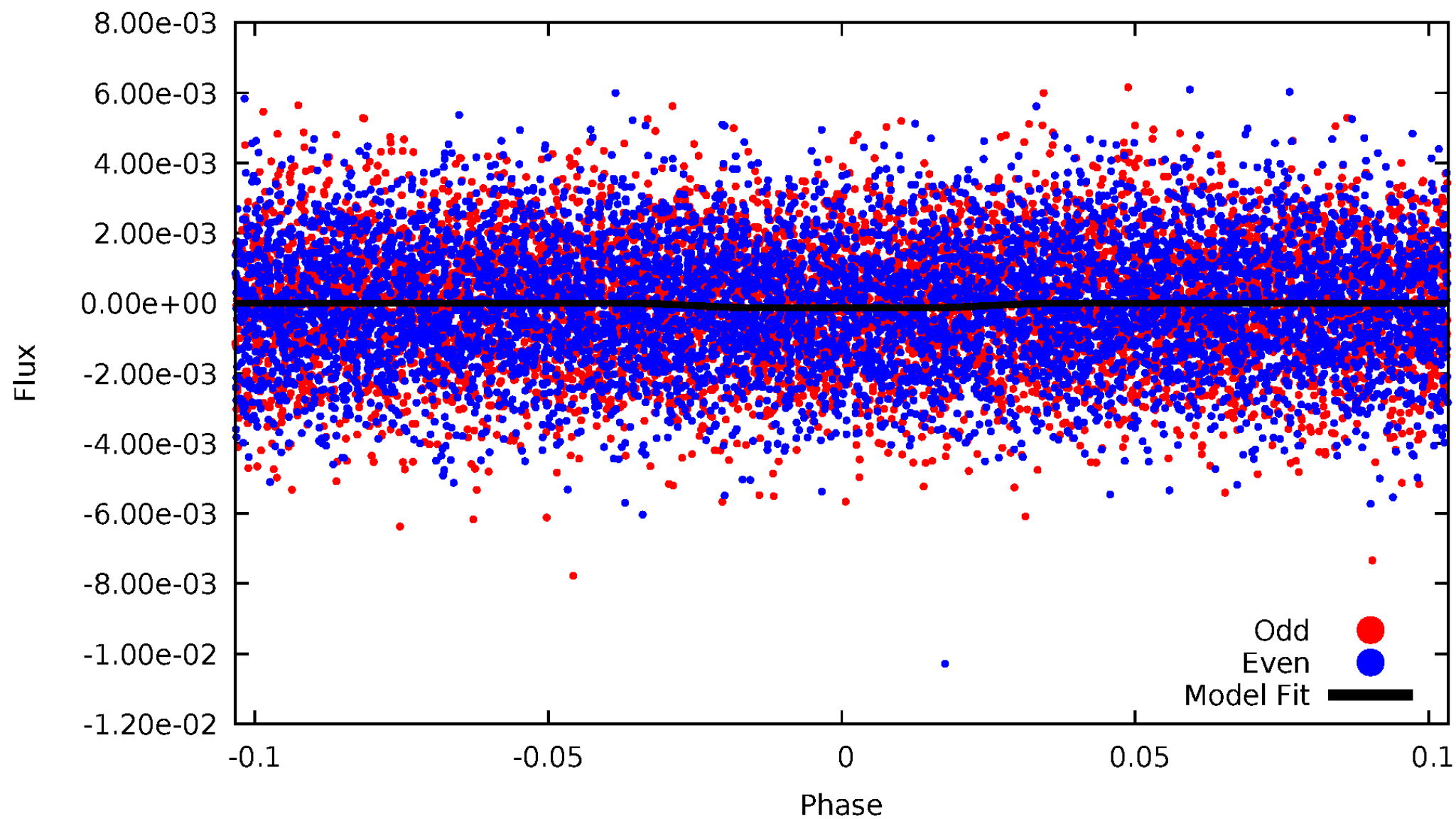
# DV Odd/Even

TCE 007047963-01



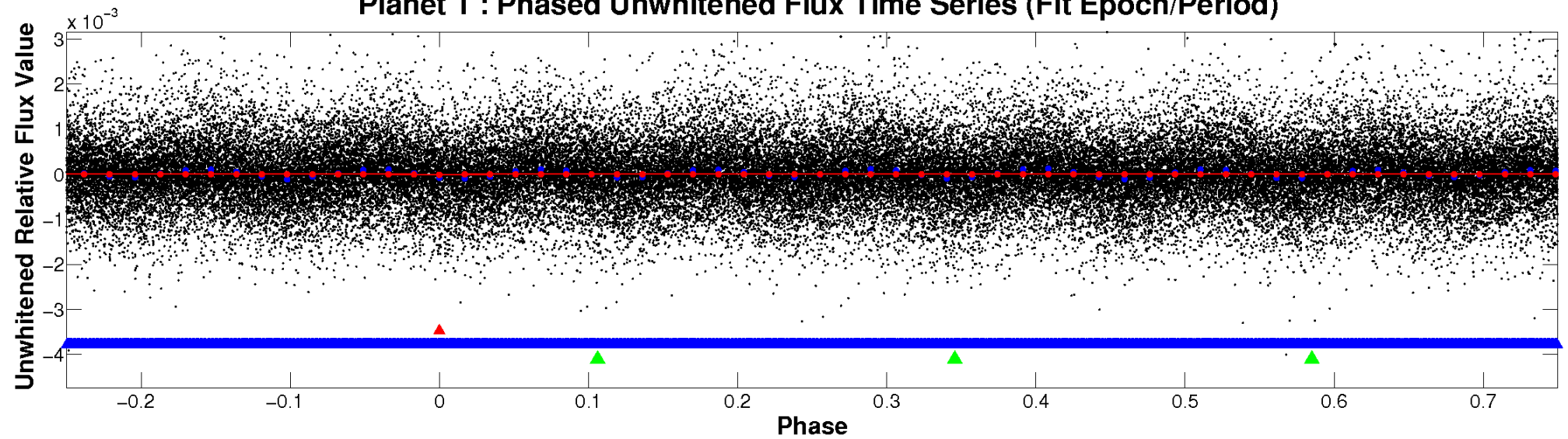
# ALT Odd/Even

TCE 007047963-01

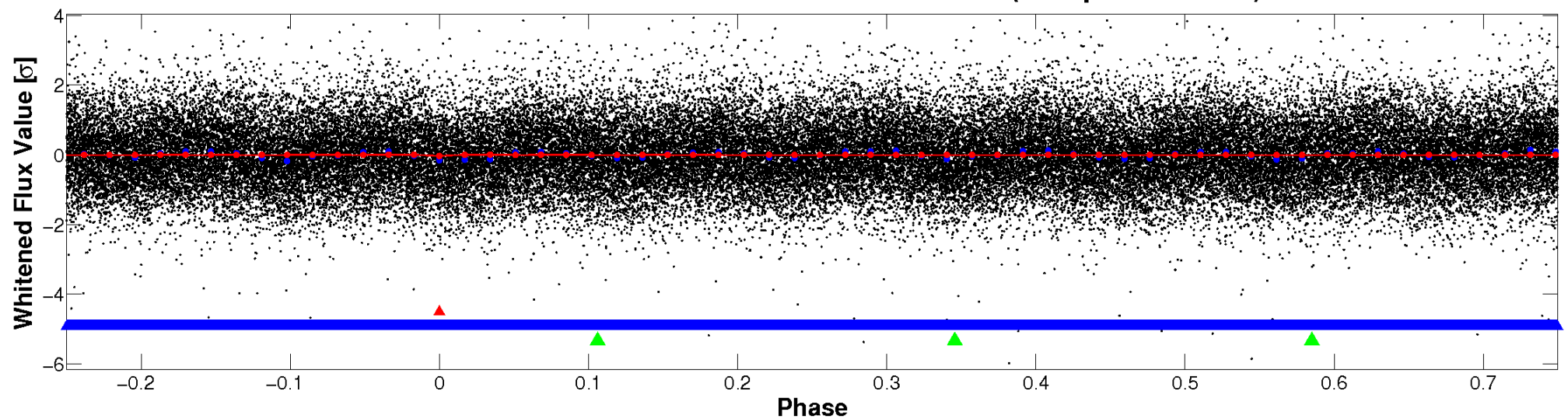


# Non-Whitened Vs. Whitened Light Curve

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



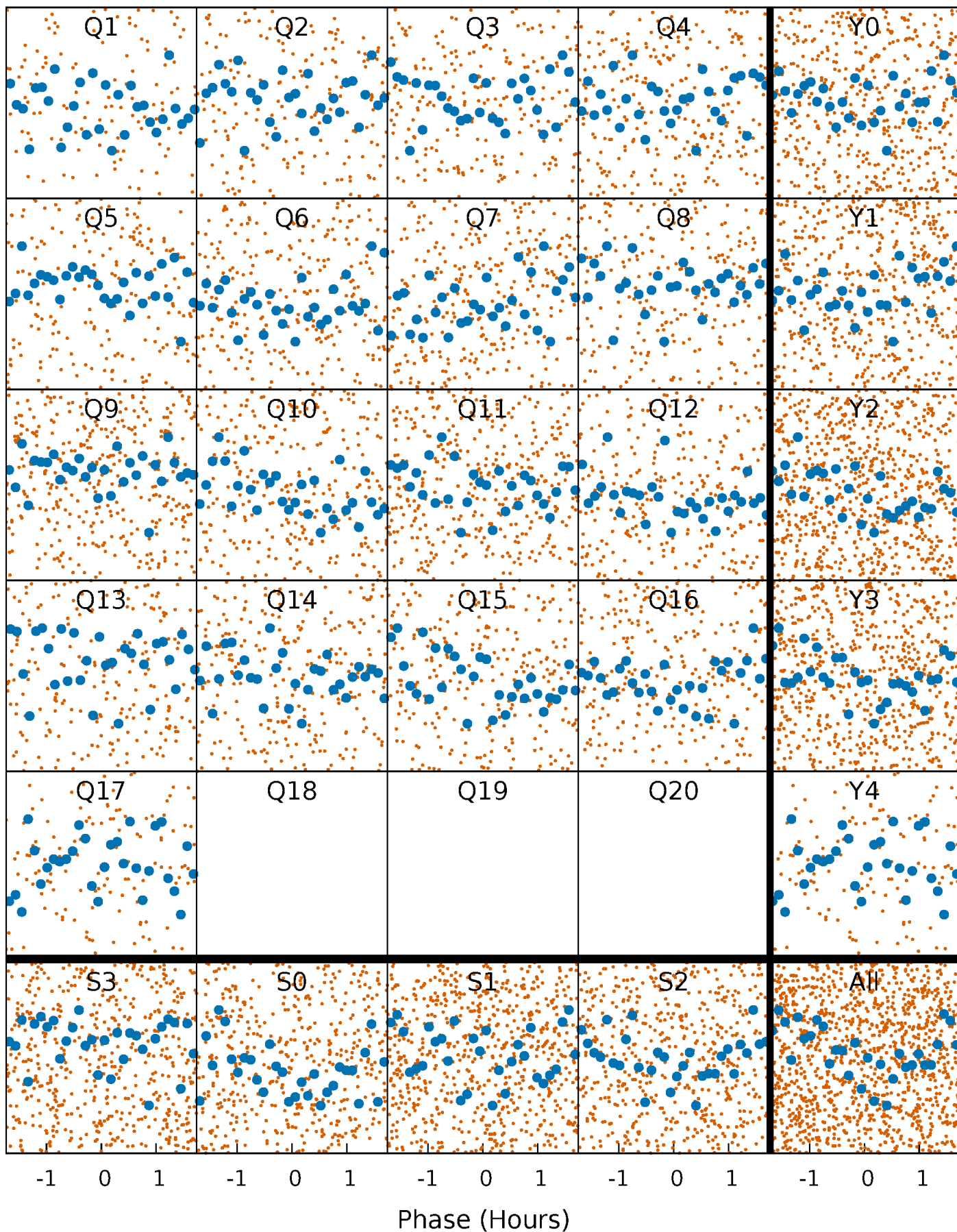
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





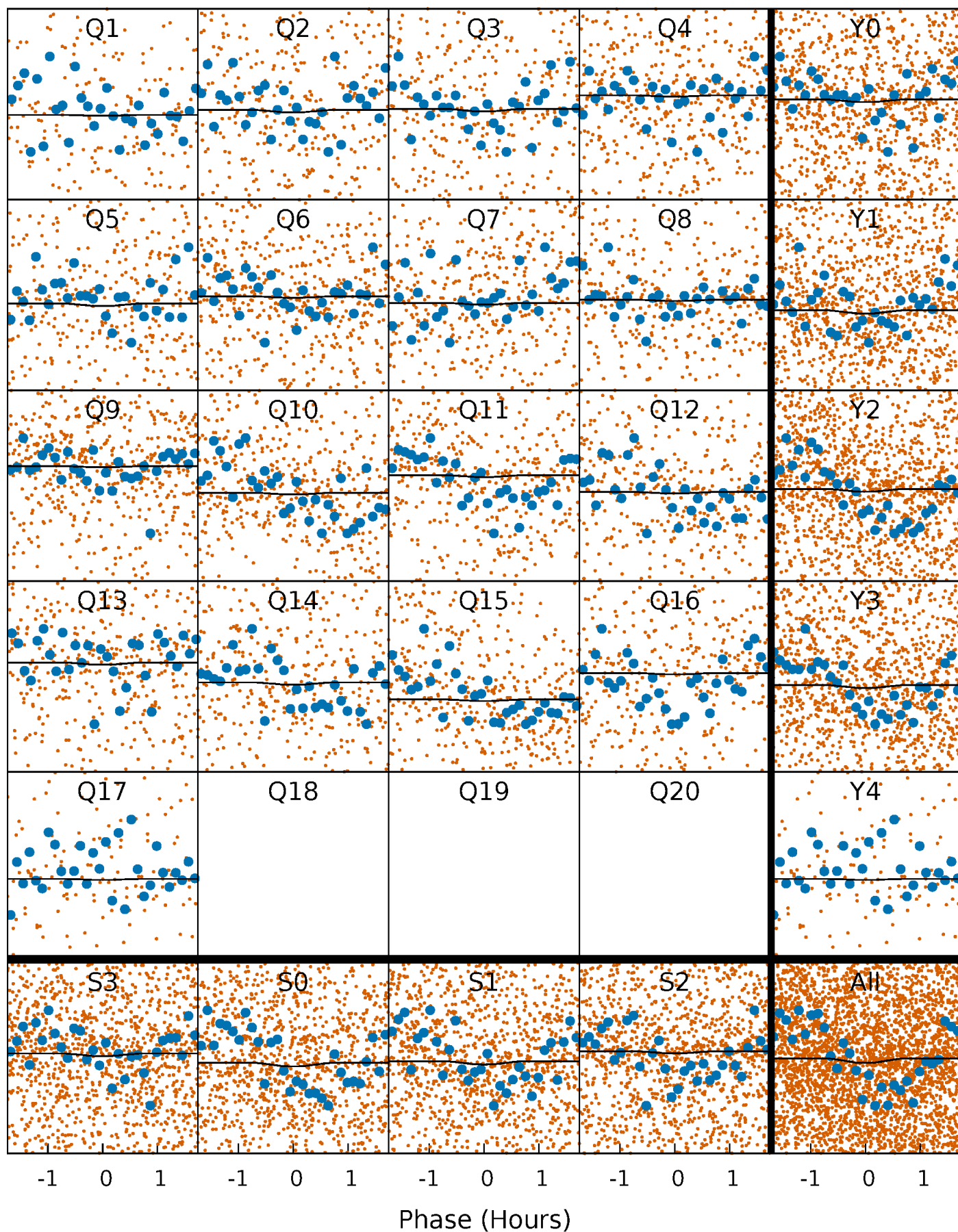
# PDC Quarter-Phased Transit Curves

TCE 007047963-01 P= 1.201075 Days  $T_0=132.003871$  (BKJD)



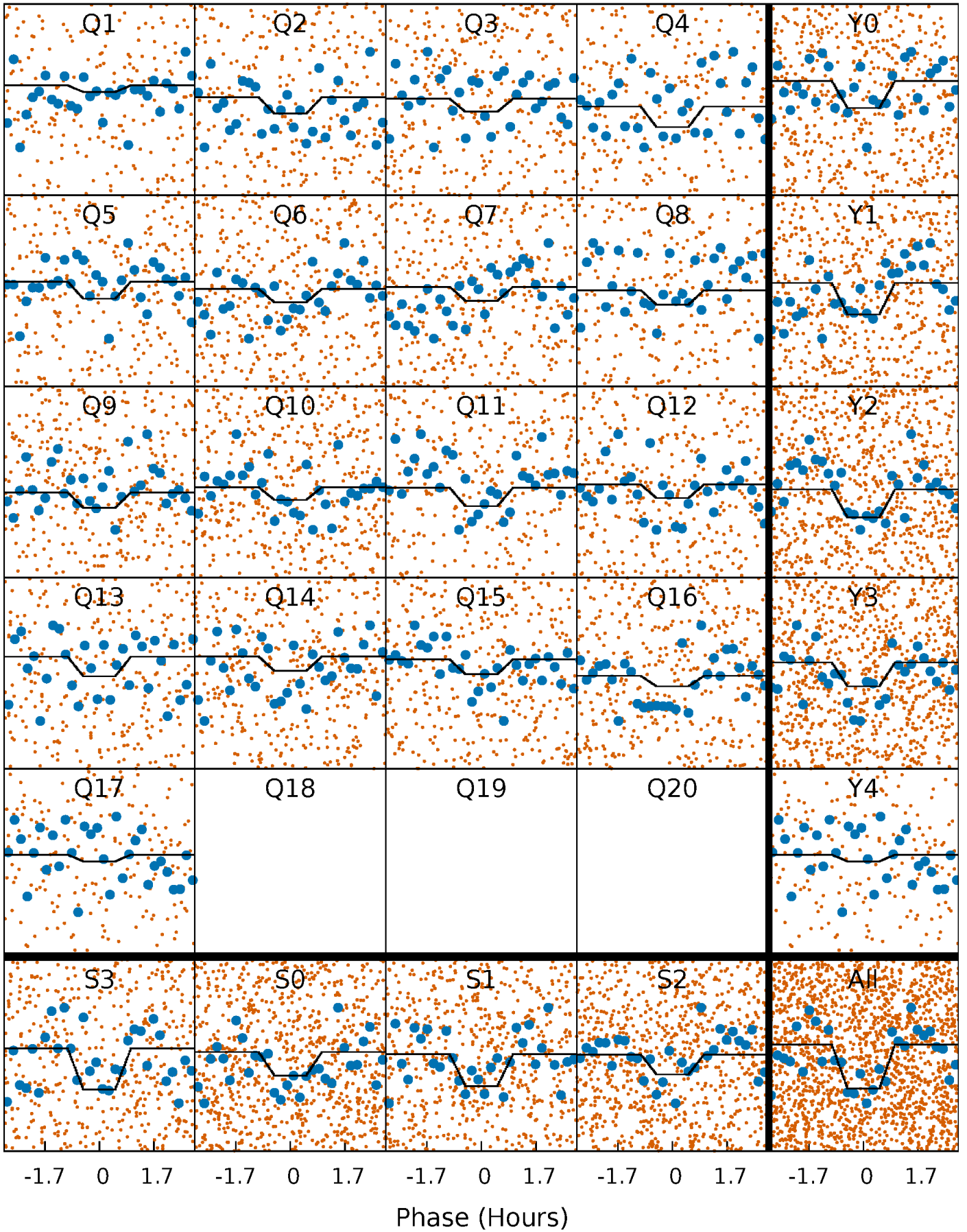
# DV Quarter-Phased Transit Curves

TCE 007047963-01 P= 1.201075 Days  $T_0=132.003871$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007047963-01 P= 1.201094 Days  $T_0=132.005788$  (BKJD)

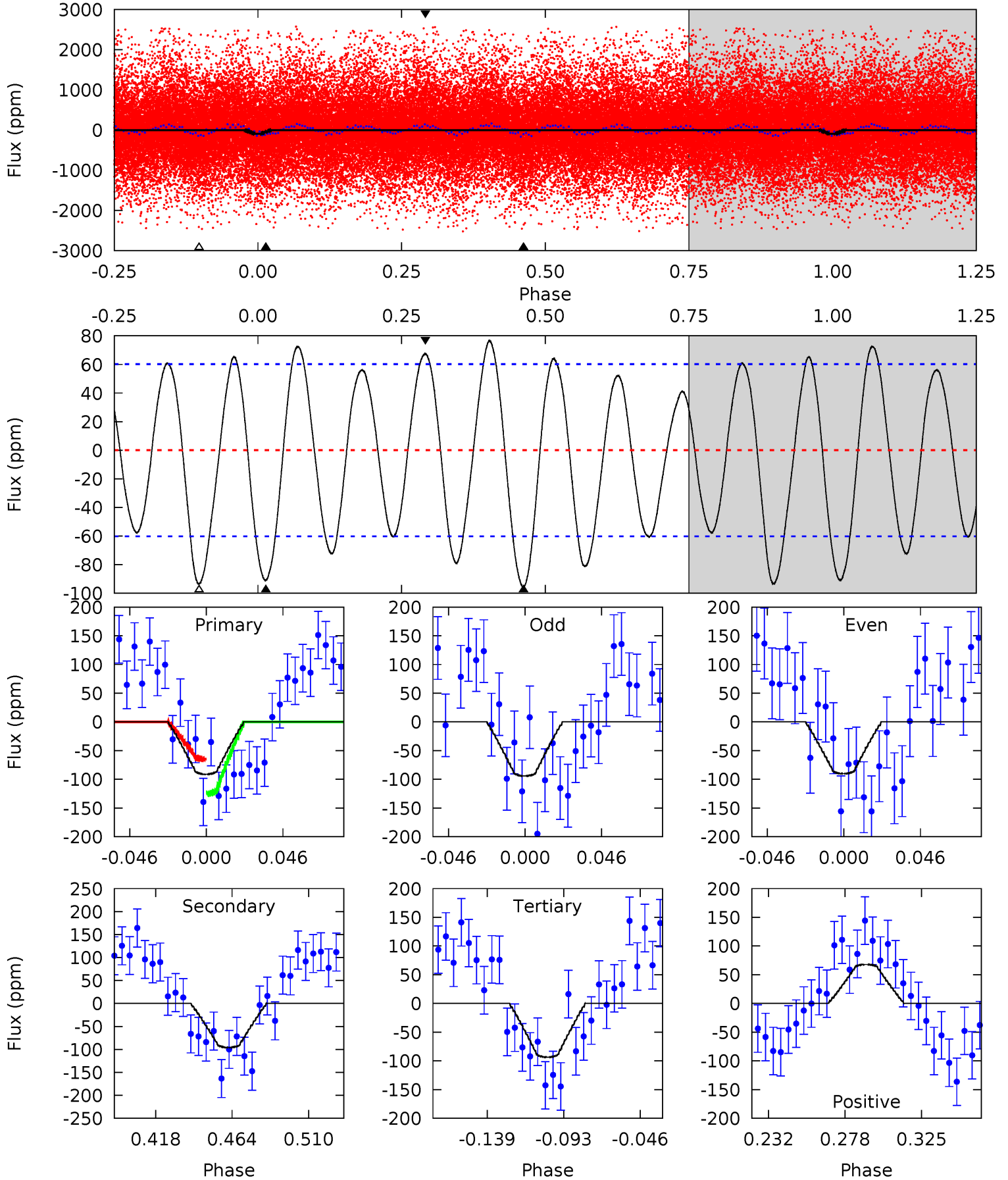




# DV Model-Shift Uniqueness Test

007047963-01, P = 1.201075 Days, E = 130.802796 Days

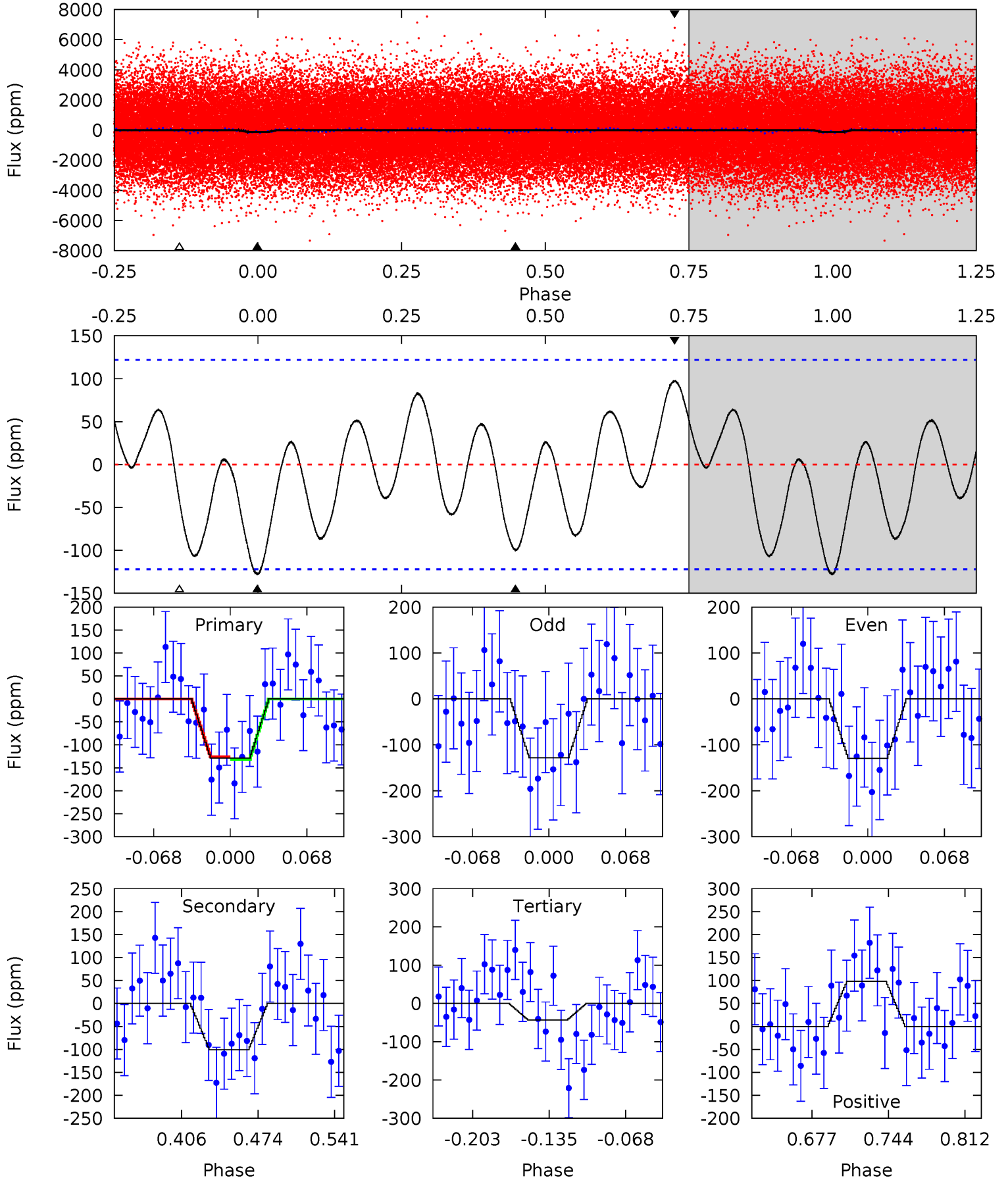
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.16	7.53	7.36	5.32	4.72	1.99	3.80	-0.20	1.83	0.17	2.20	0.16	2.06	0.45	2.39



# Alt Model-Shift Uniqueness Test

007047963-01, P = 1.201094 Days, E = 130.804694 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.90	3.84	1.65	3.73	4.65	1.83	1.96	3.26	1.18	2.20	0.12	0.02	1.30	0.43	0.10



### Stellar Parameters For KIC 007047963

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7443^{+206}_{-335}$	$4.092^{+0.139}_{-0.186}$	$0.140^{+0.150}_{-0.400}$	$1.948^{+0.591}_{-0.394}$	$1.710^{+0.207}_{-0.276}$	$0.326^{+0.229}_{-0.155}$
	+3%/-5%	+3%/-5%	+107%/-286%	+30%/-20%	+12%/-16%	+70%/-48%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007047963-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-96 \pm 13$	$0.88^{+0.63}_{-0.48}$	$3948^{+313}_{-281}$	$13938^{+20794}_{-4724}$	$46^{+179}_{-30}$
Alt.	$-101 \pm 26$	$2.44^{+0.70}_{-0.58}$	$3935^{+276}_{-258}$	$6727^{+1332}_{-944}$	$6.503^{+4.654}_{-2.998}$

$T_{max}$  = 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

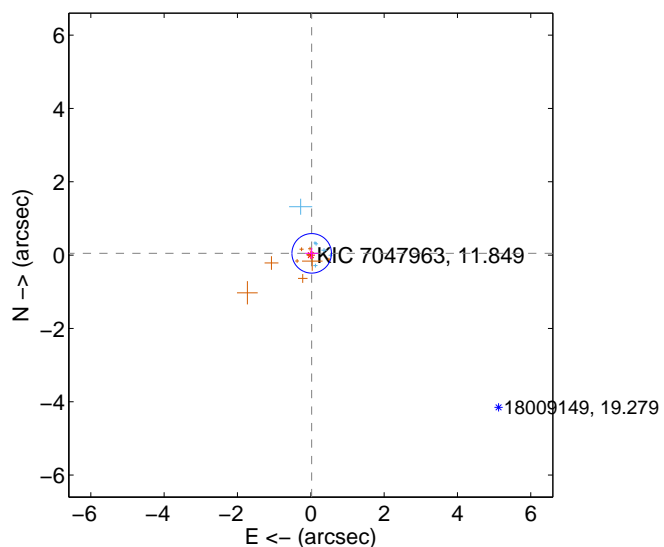
Supplemental centroid analysis for 007047963-01. **Kepler magnitude: 11.85.** Transit SNR 1.33

There are 6 quarters with good PRF difference image offsets

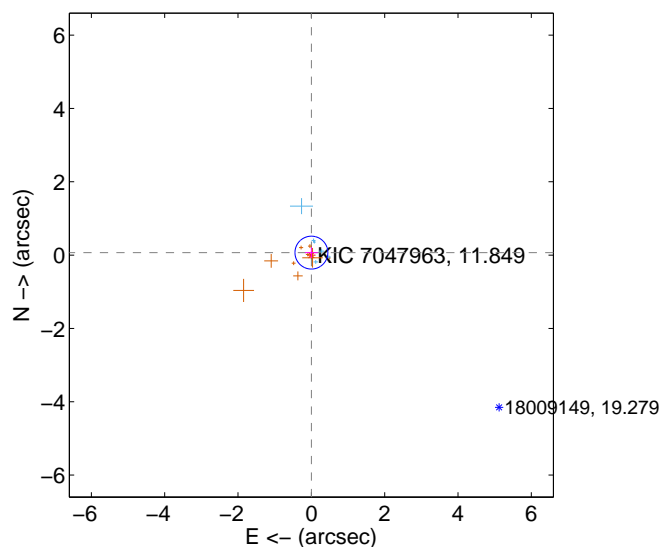
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.054 \pm 0.180$	0.30	$-0.025 \pm 0.176$	$0.048 \pm 0.148$
PRF-fit source offset from KIC position	$0.068 \pm 0.150$	0.45	$-0.002 \pm 0.174$	$0.068 \pm 0.148$
photometric centroid source offset	$1.60 \pm 1.30$	1.24	$0.98 \pm 1.33$	$1.27 \pm 1.28$

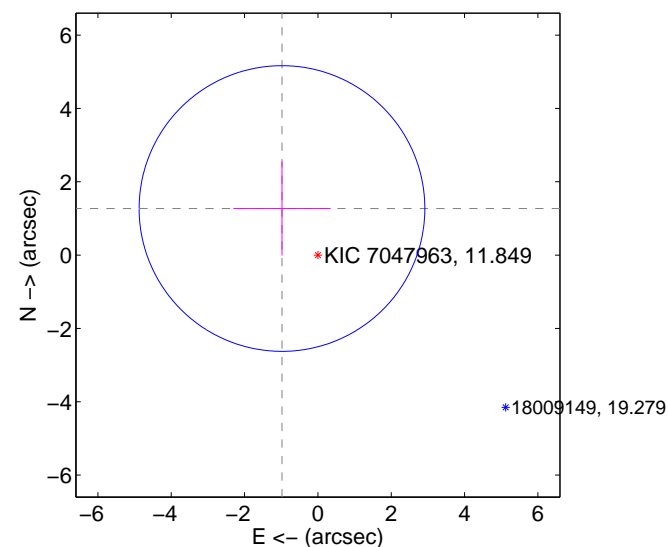
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

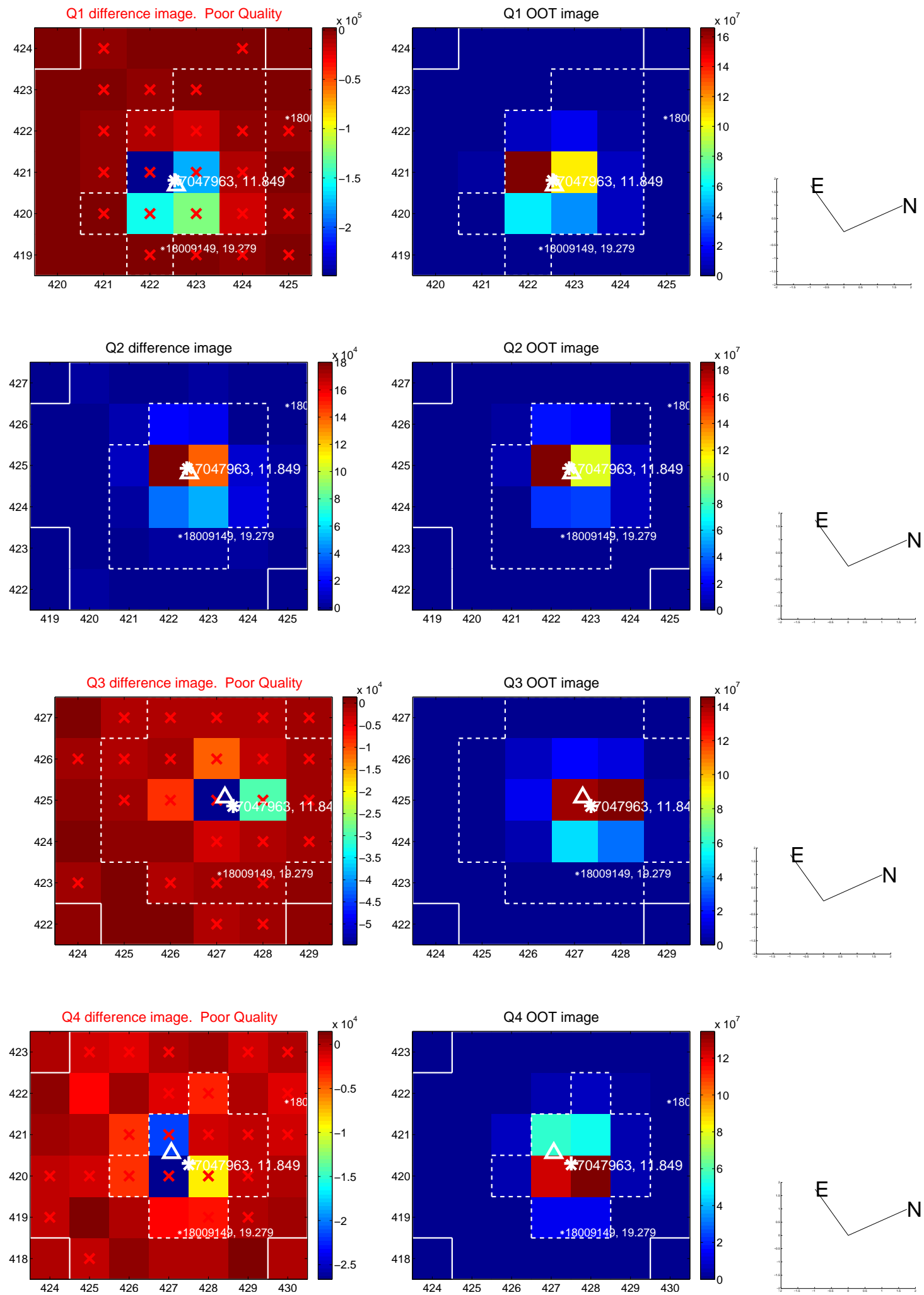


offset from photometric centroids

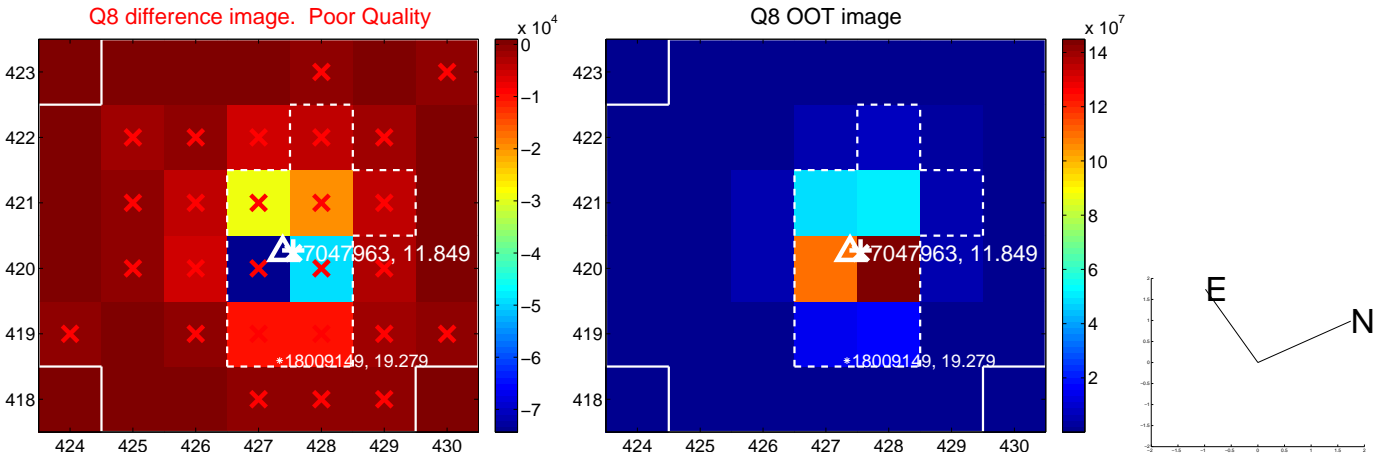
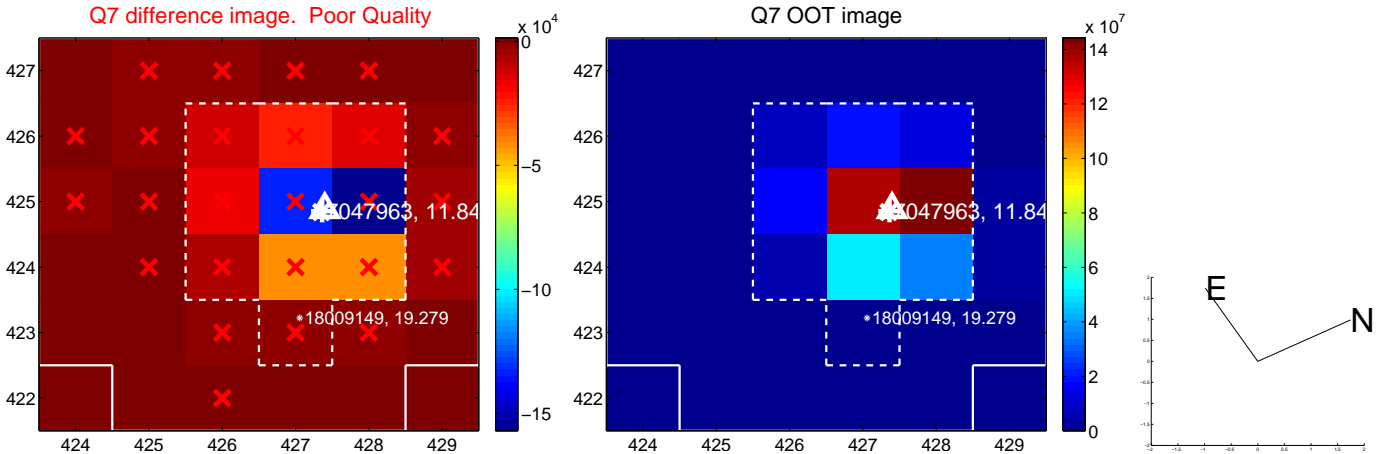
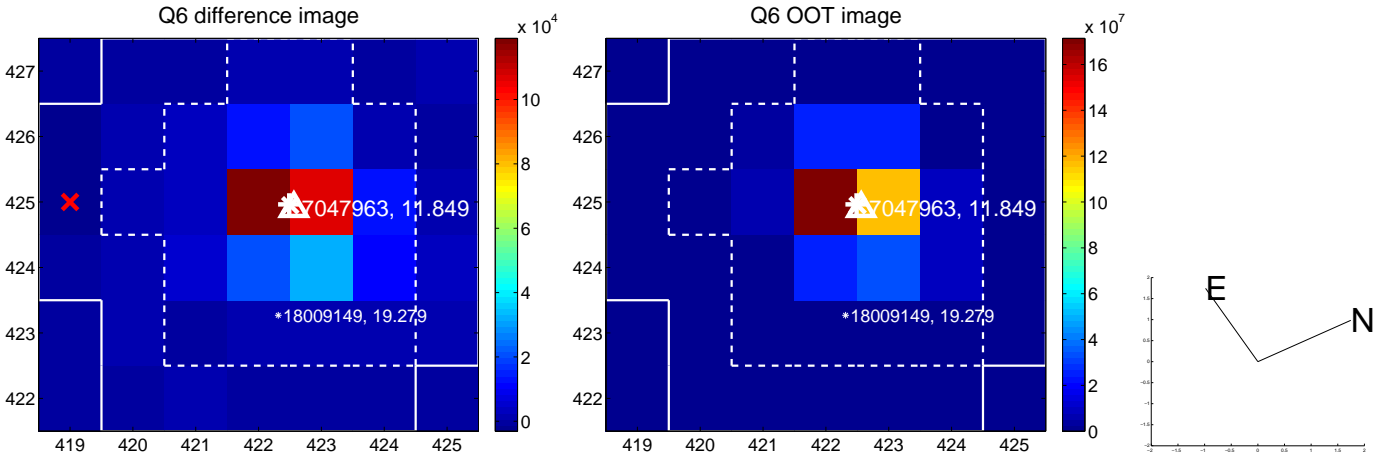
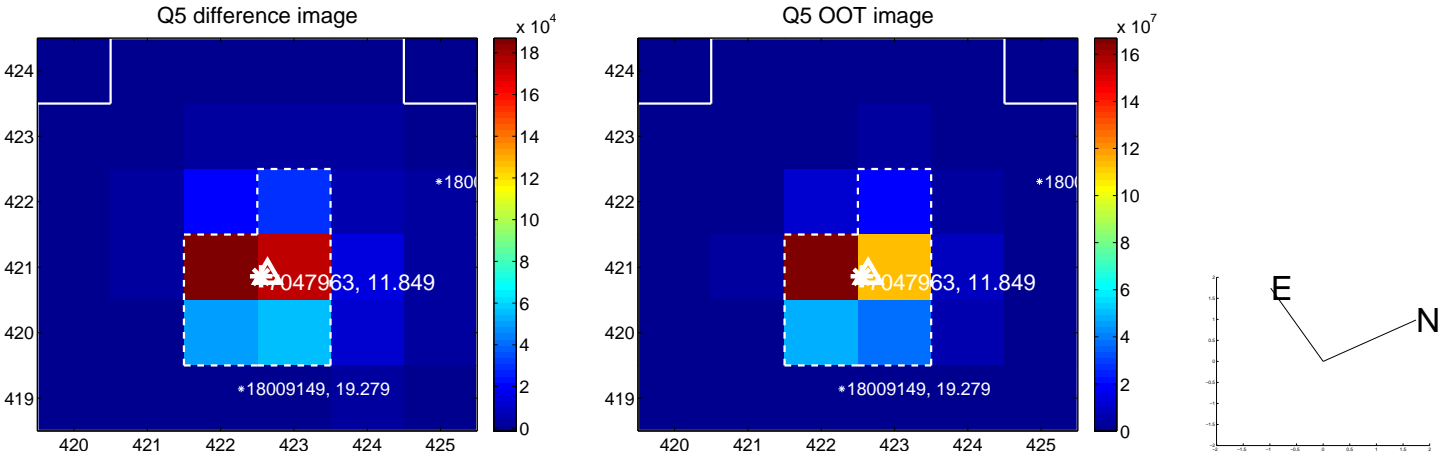


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

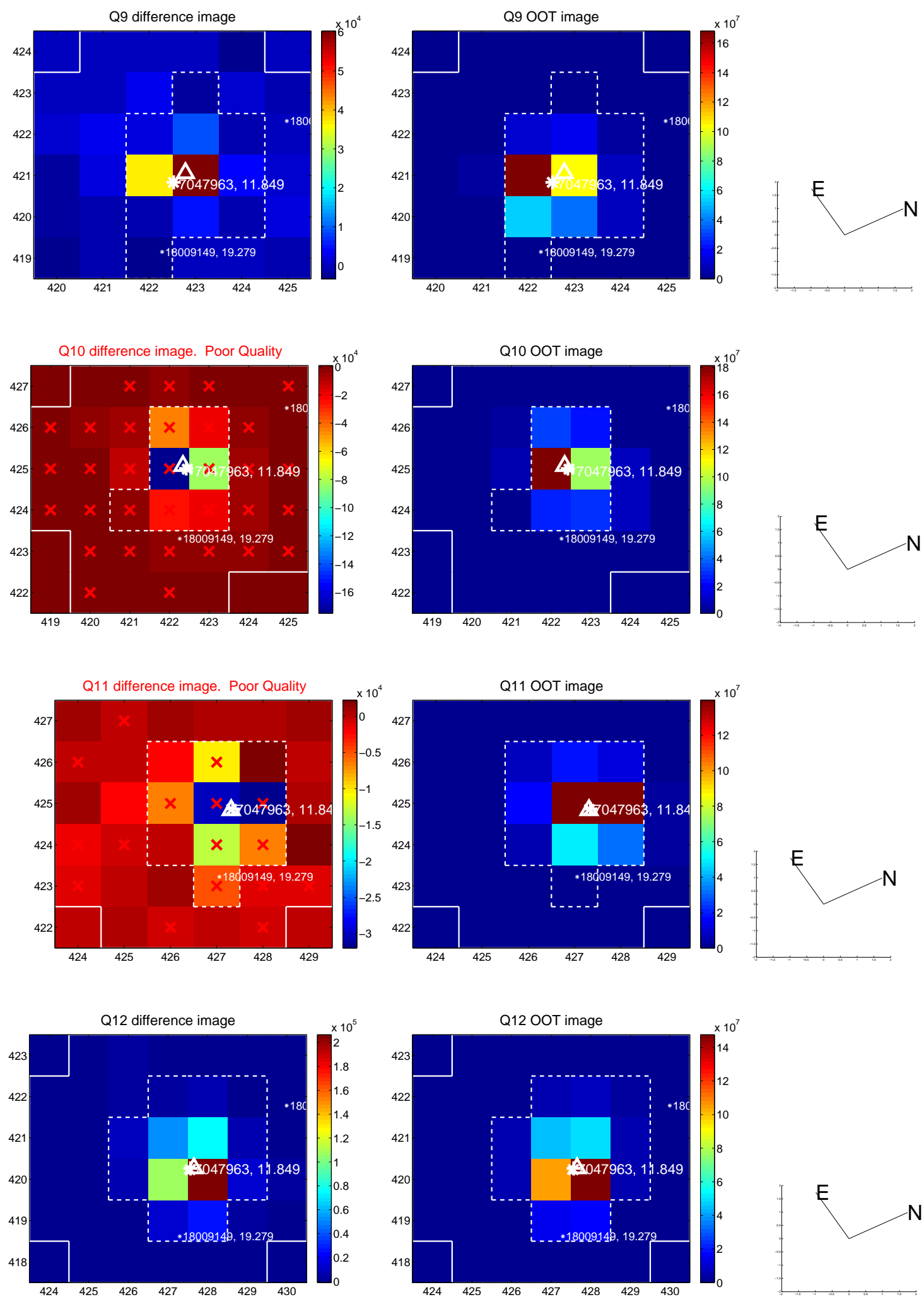


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

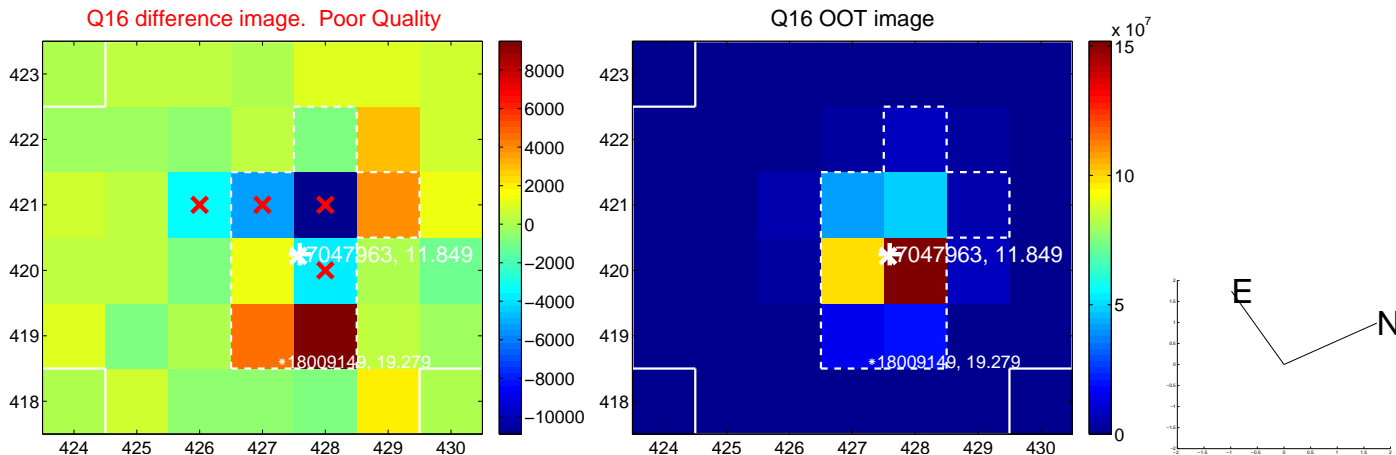
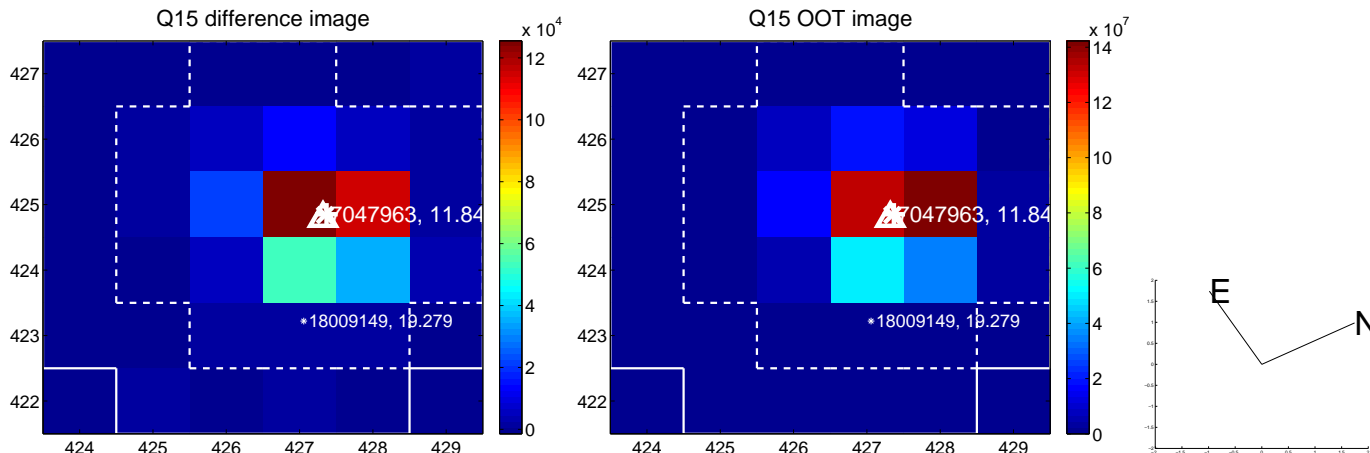
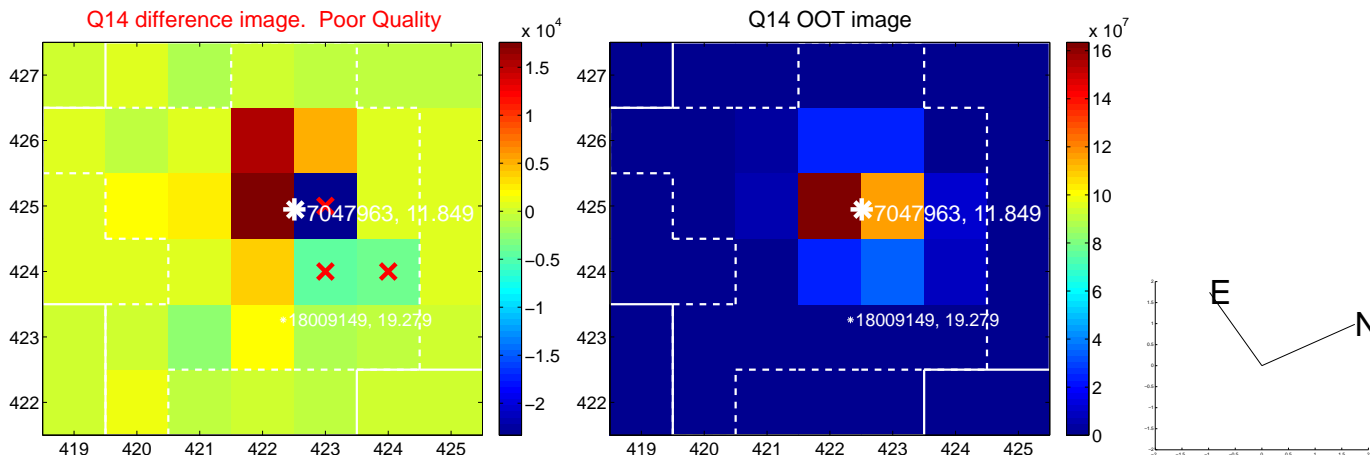
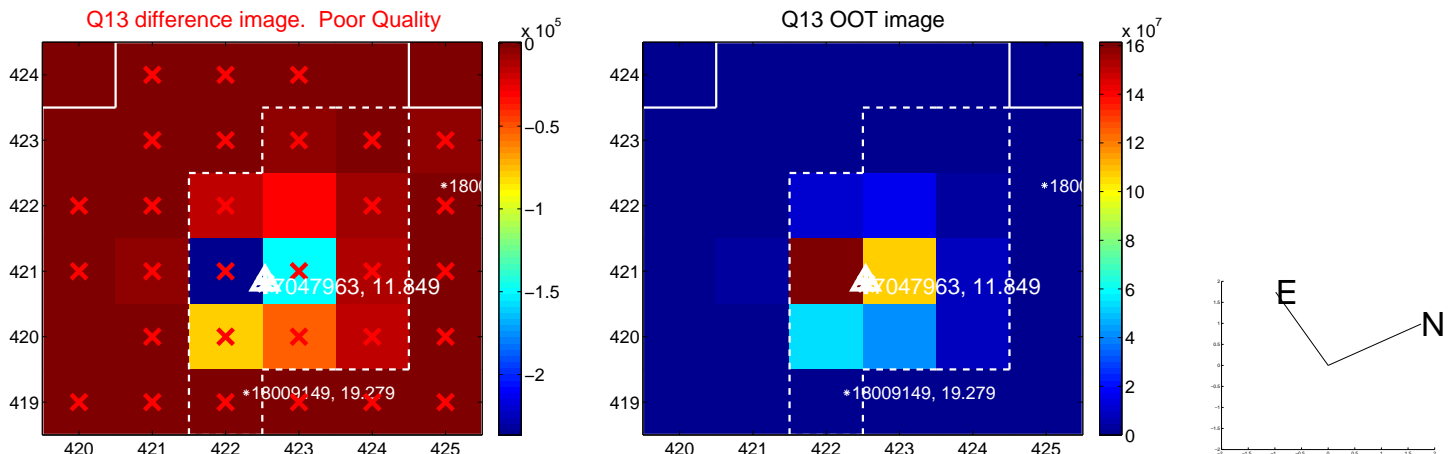




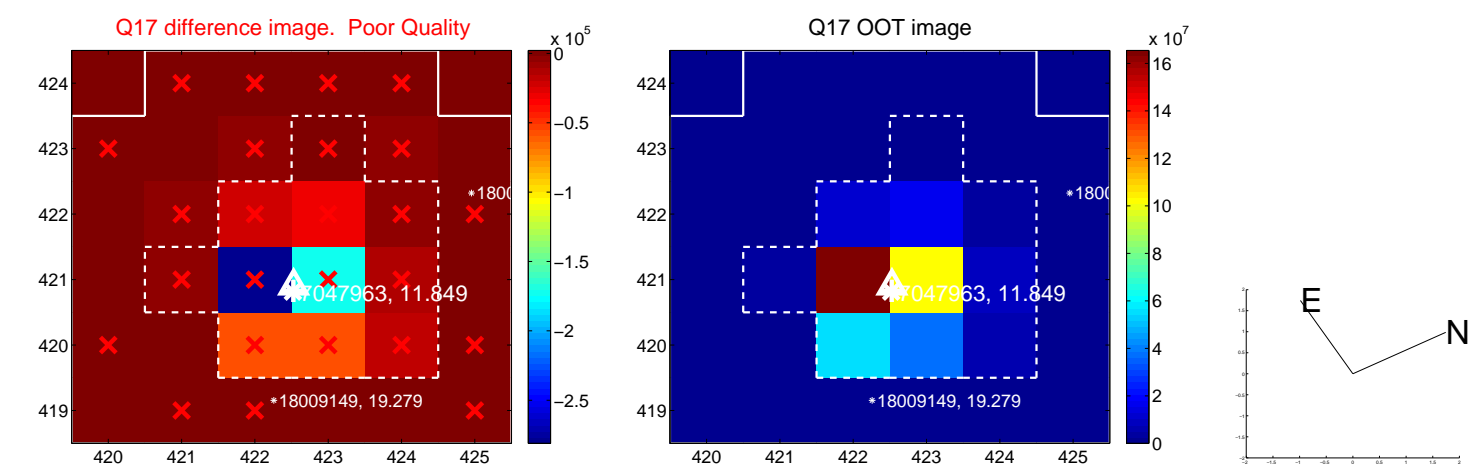
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



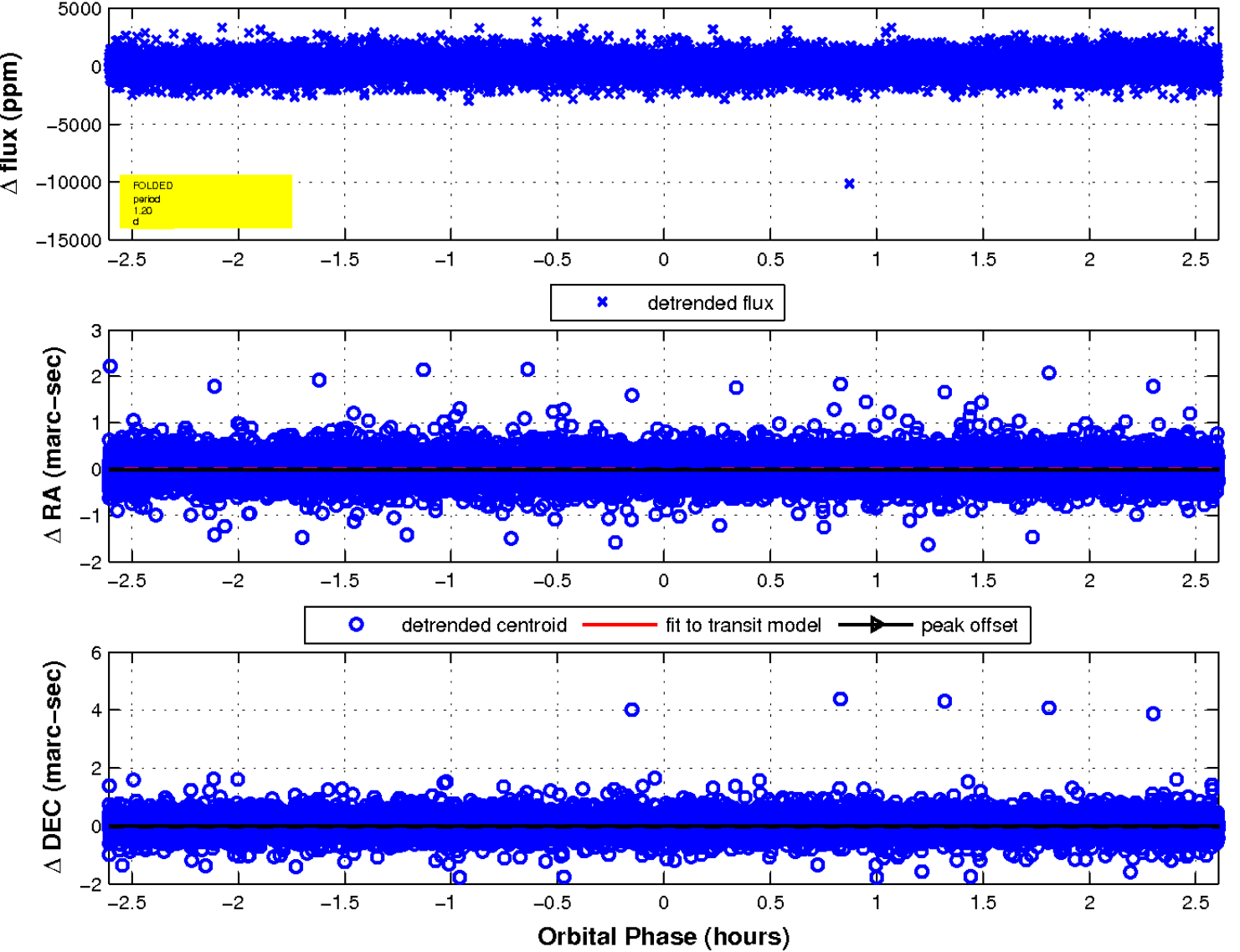
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

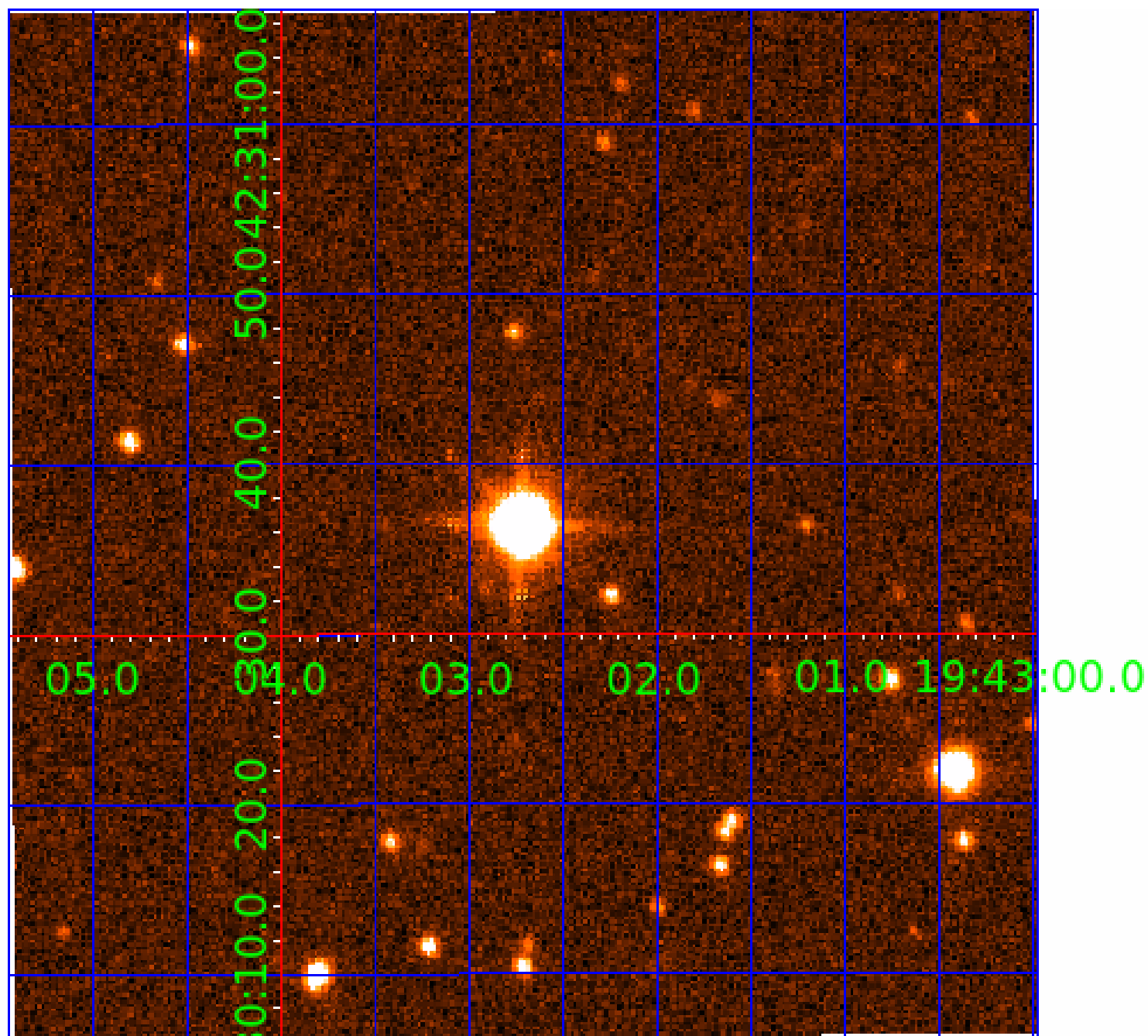


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 007047963

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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007047963-03	OBS	No	593.043212	162.733474	170.6	3.500	8.7	-1.0	1.95	7443	2.58	3.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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007047963-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007047963-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

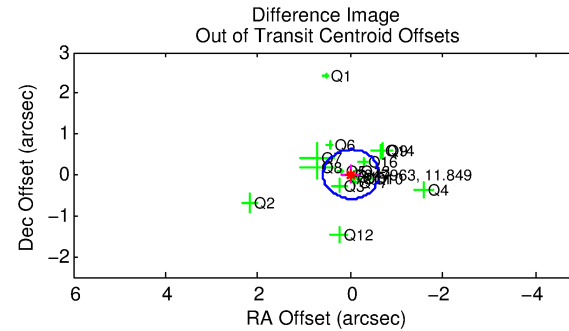
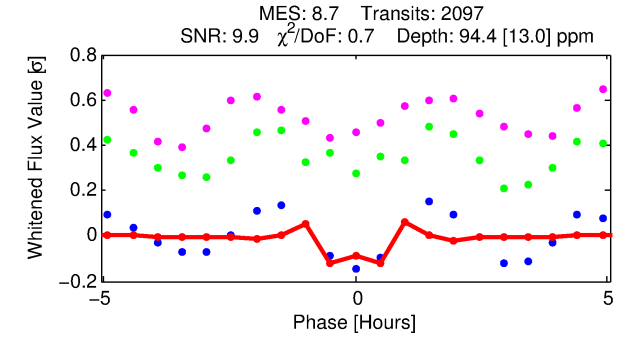
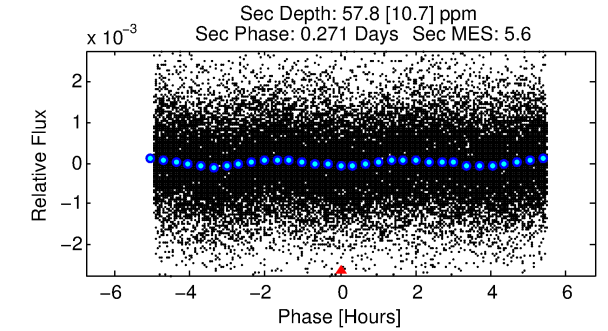
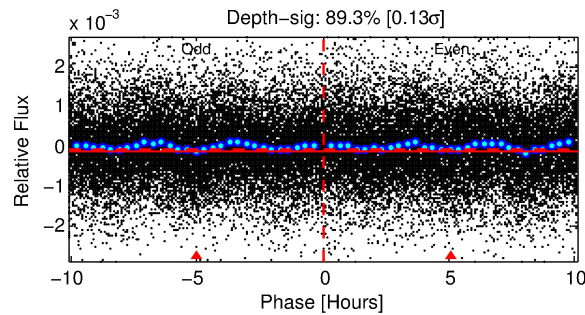
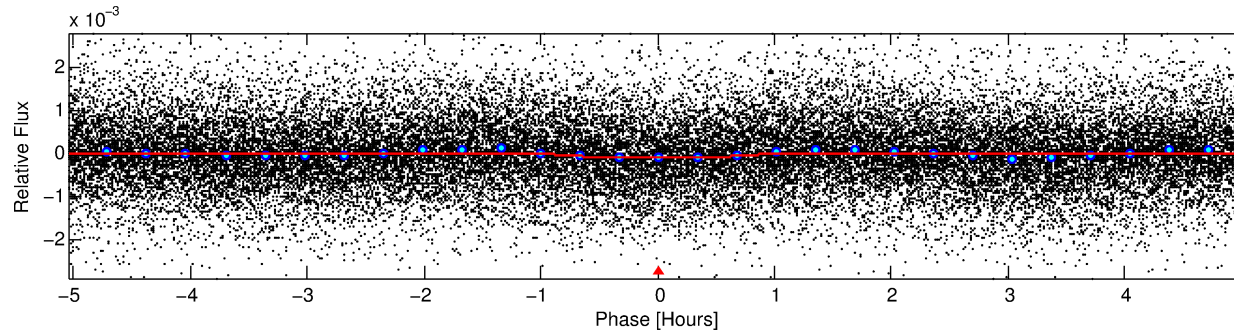
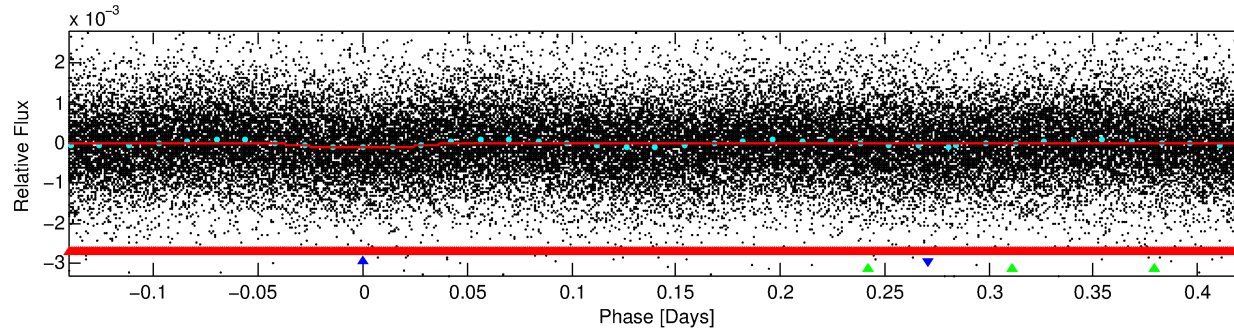
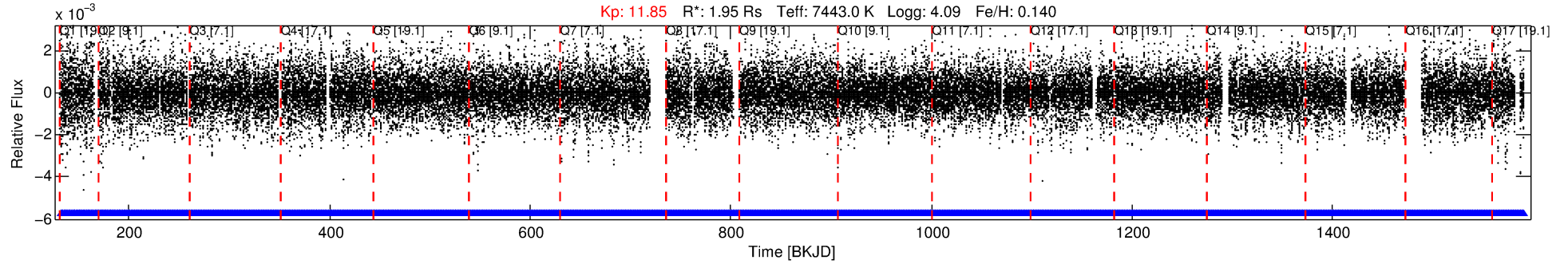
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007047963-02

No Significant Match Found

# DV One-Page Summary

KIC: 7047963 Candidate: 2 of 3 Period: 0.565 d



## DV Fit Results:

Period = 0.56474 [0.00001] d  
Epoch = 131.9994 [0.0010] BKJD  
 $R_p/R^*$  = 0.0103 [0.0019]  
 $a/R^*$  = 1.50 [0.91]  
 $b$  = 0.90 [0.23]  
 $\text{Seff}$  = 40783.41 [16048.32]  
 $T_{\text{eq}}$  = 3624 [356] K  
 $R_p$  = 2.20 [0.78]  $R_e$   
 $a$  = 0.0160 [0.0040] AU  
 $A_g$  = 1.69 [0.91] [0.75 $\sigma$ ]  
 $T_{\text{eff}}$  = 6384 [715] K [3.45 $\sigma$ ]

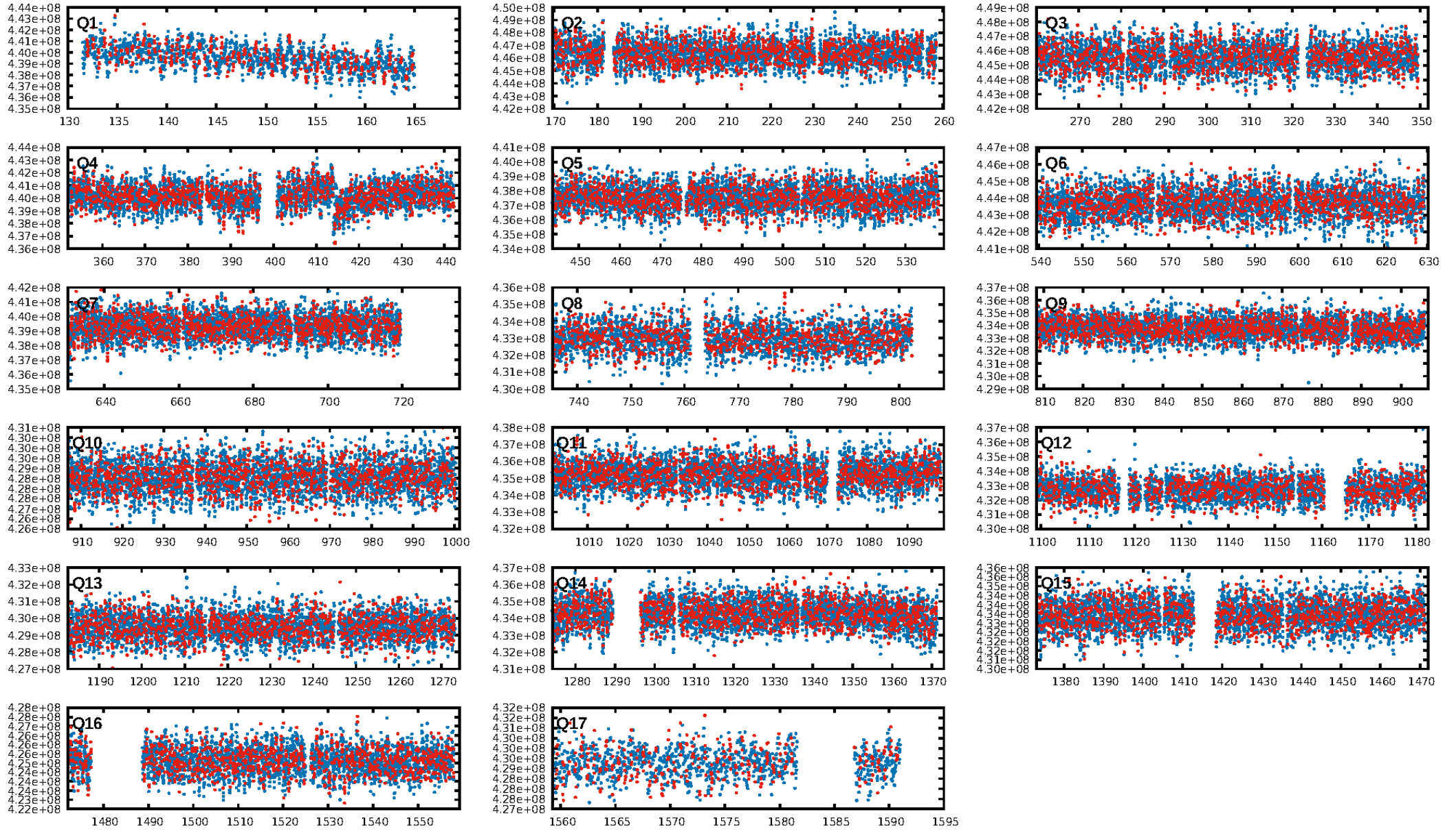
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [8.07 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.00e-28  
RollingBand-fgt: 1.00 [2003/2003]  
**GhostDiagnostic-chr: 0.6461**  
Centroid-sig: 5.1%  
Centroid-so: 0.104 arcsec [1.17 $\sigma$ ]  
OotOffset-rm: 0.017 arcsec [0.09 $\sigma$ ]  
KicOffset-rm: 0.055 arcsec [0.28 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.65 [11/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:46:29 Z

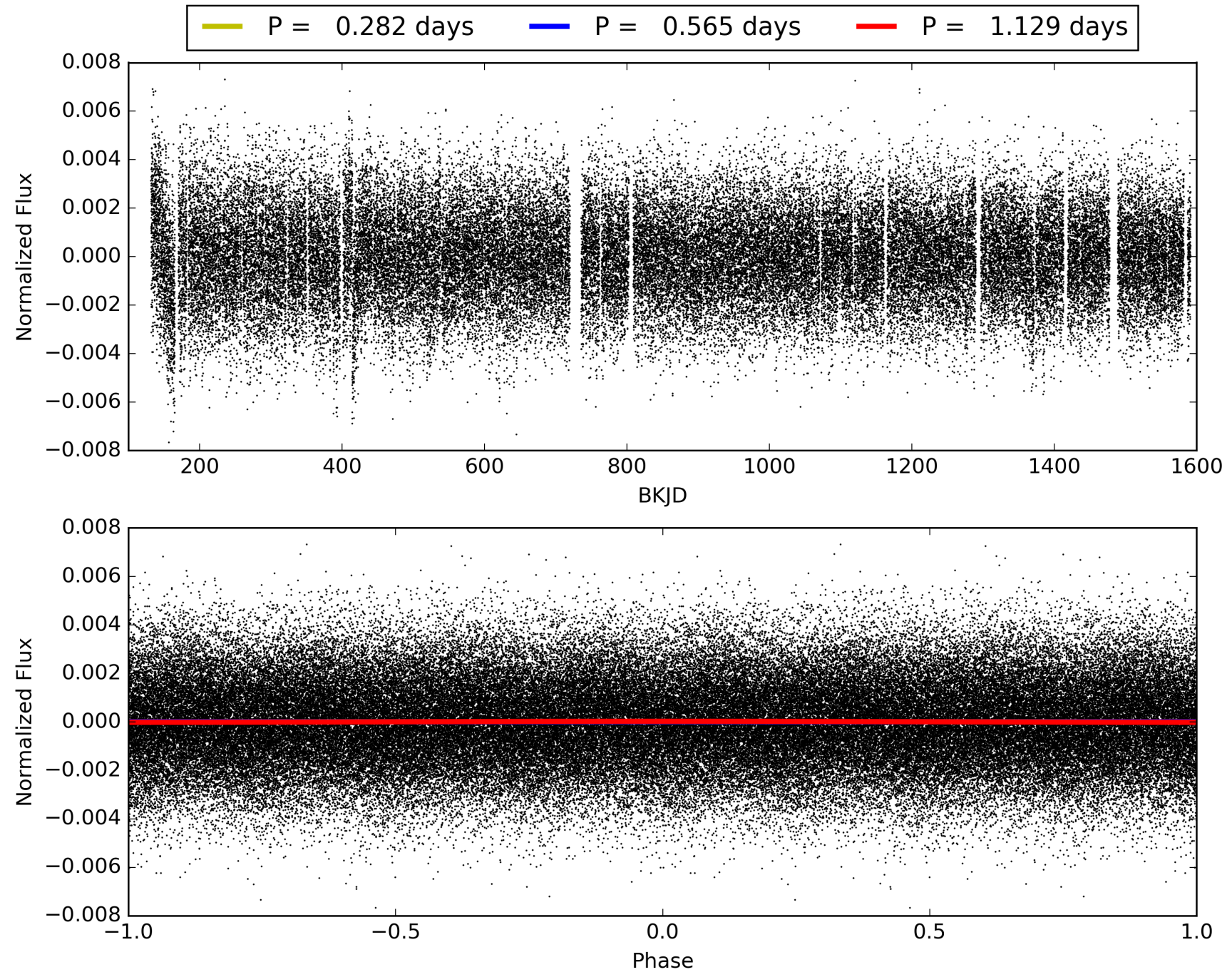
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007047963-02, PDC Light Curves





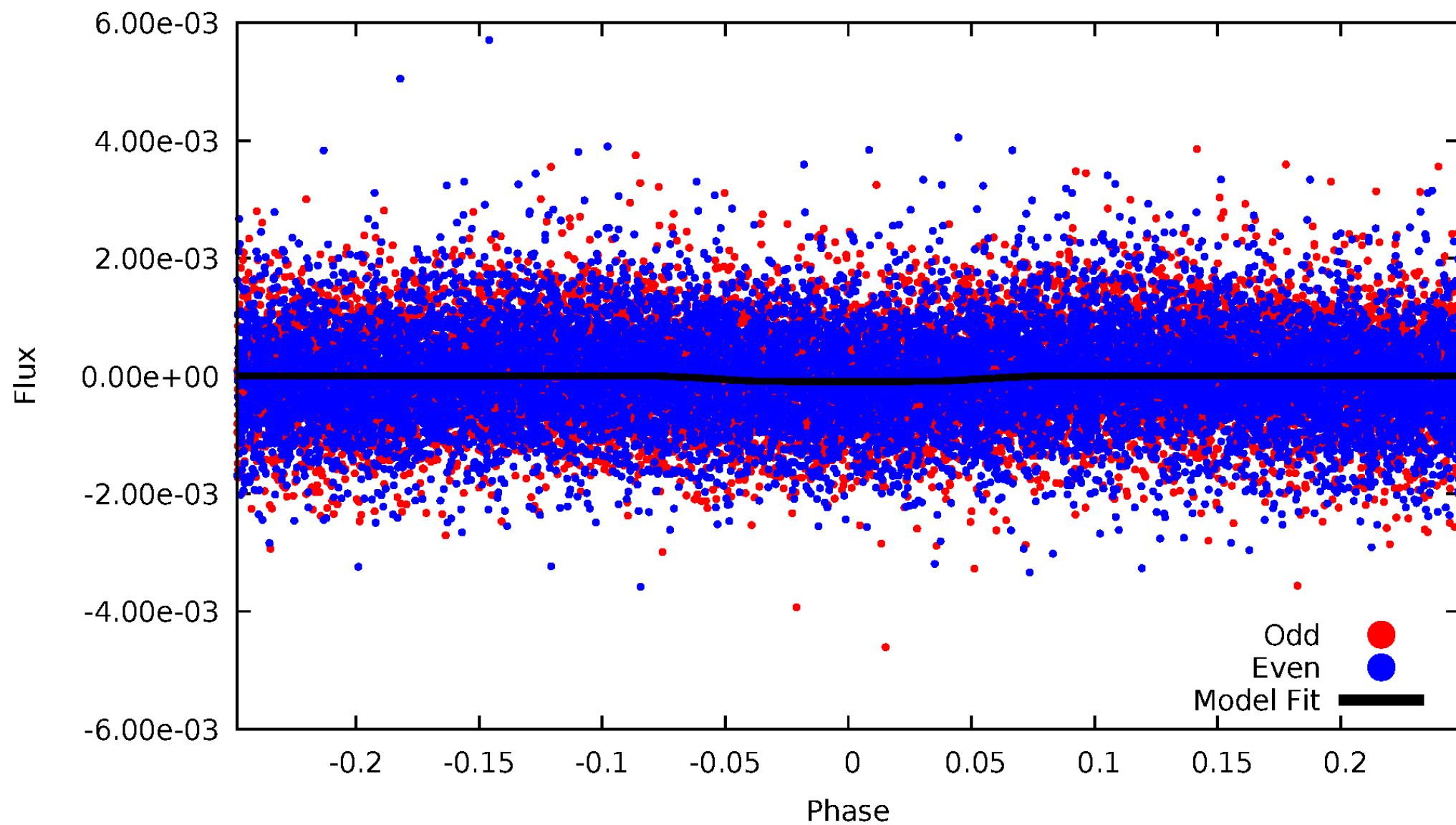
TCE 007047963-02





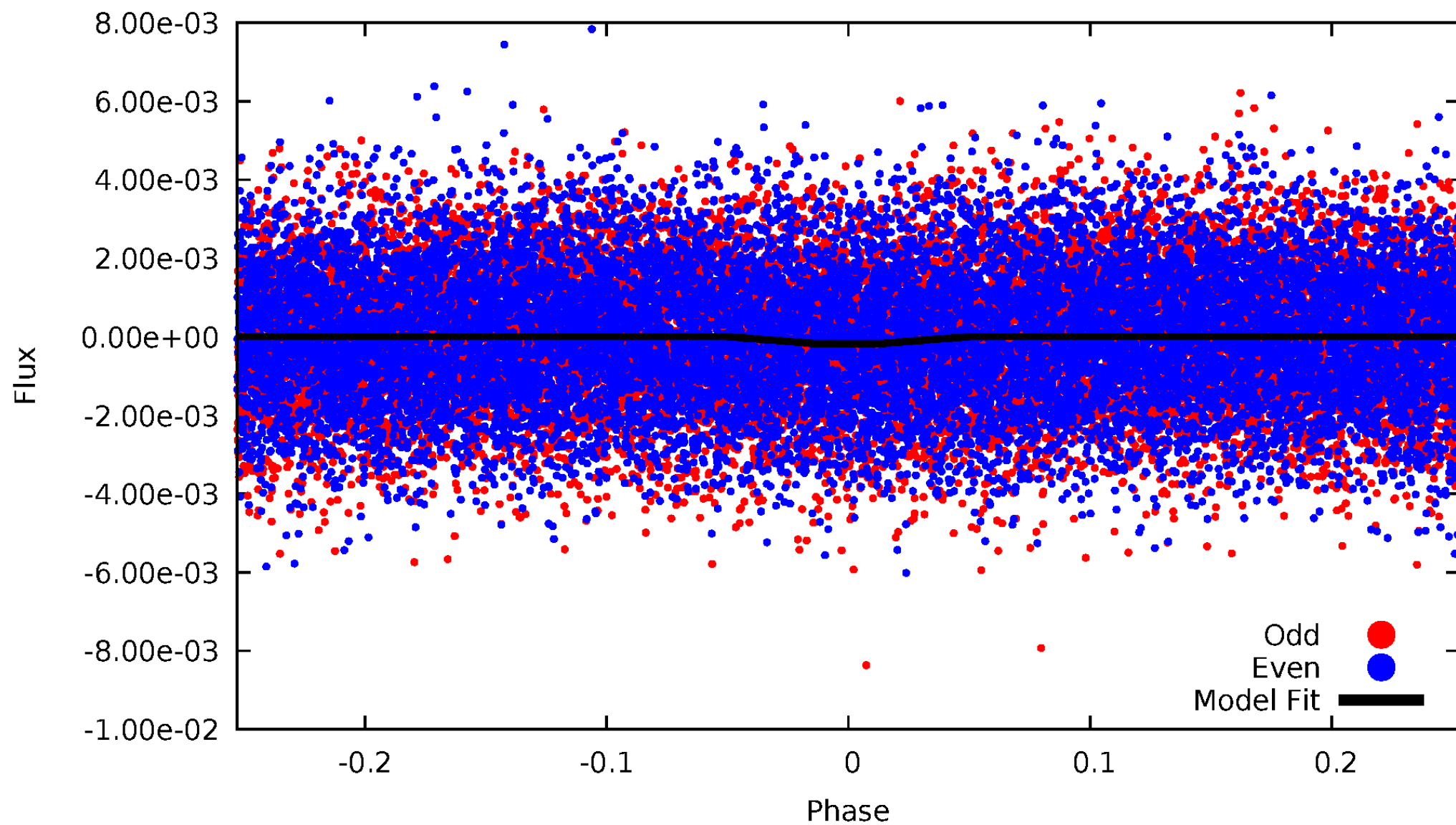
DV Odd/Even

TCE 007047963-02



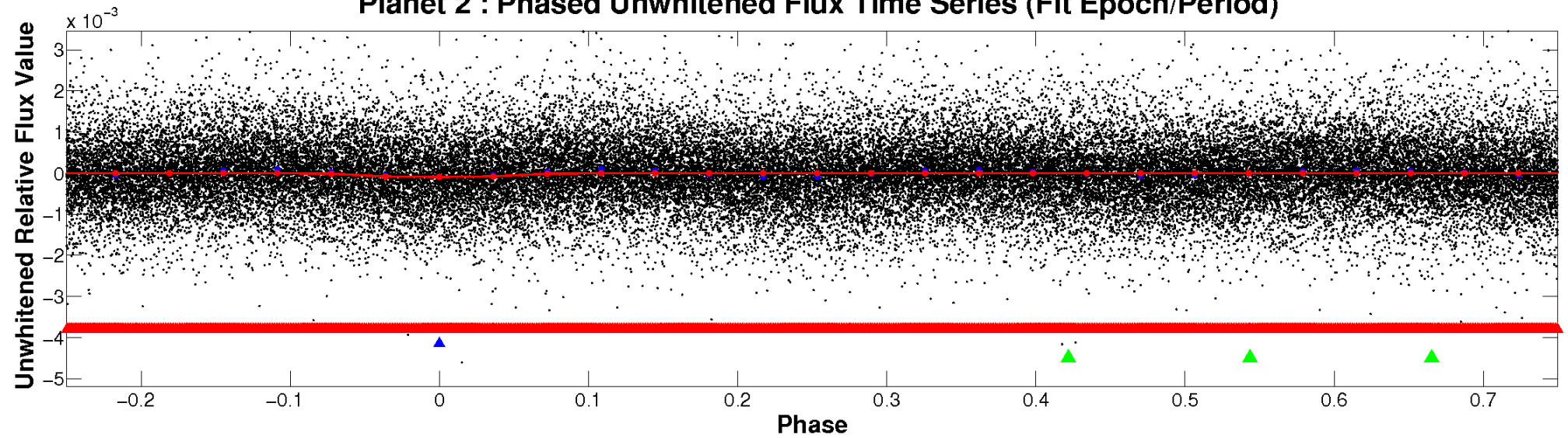
# ALT Odd/Even

TCE 007047963-02

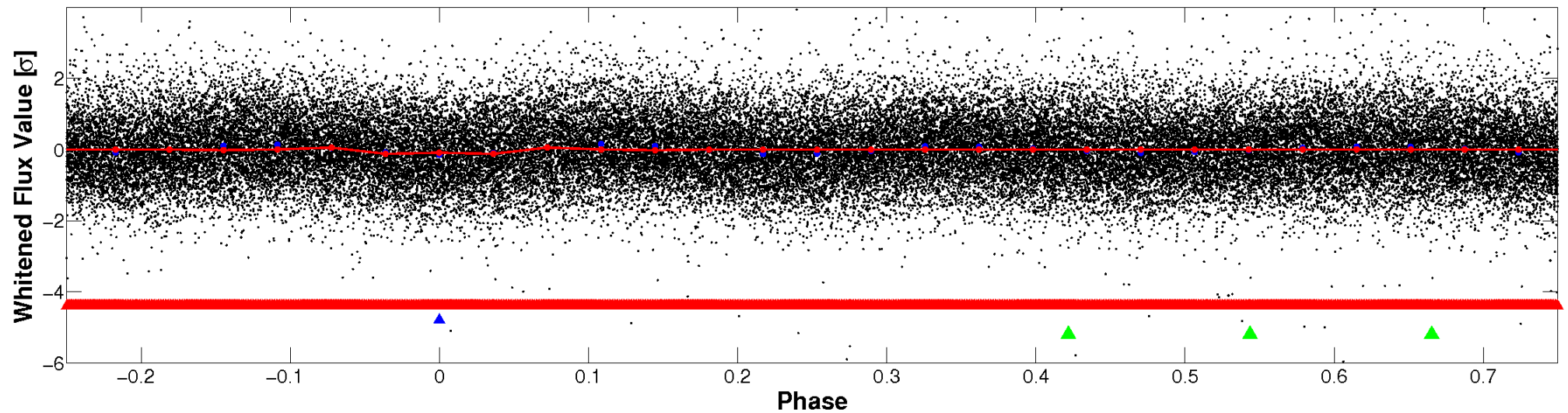


# Non-Whitened Vs. Whitened Light Curve

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

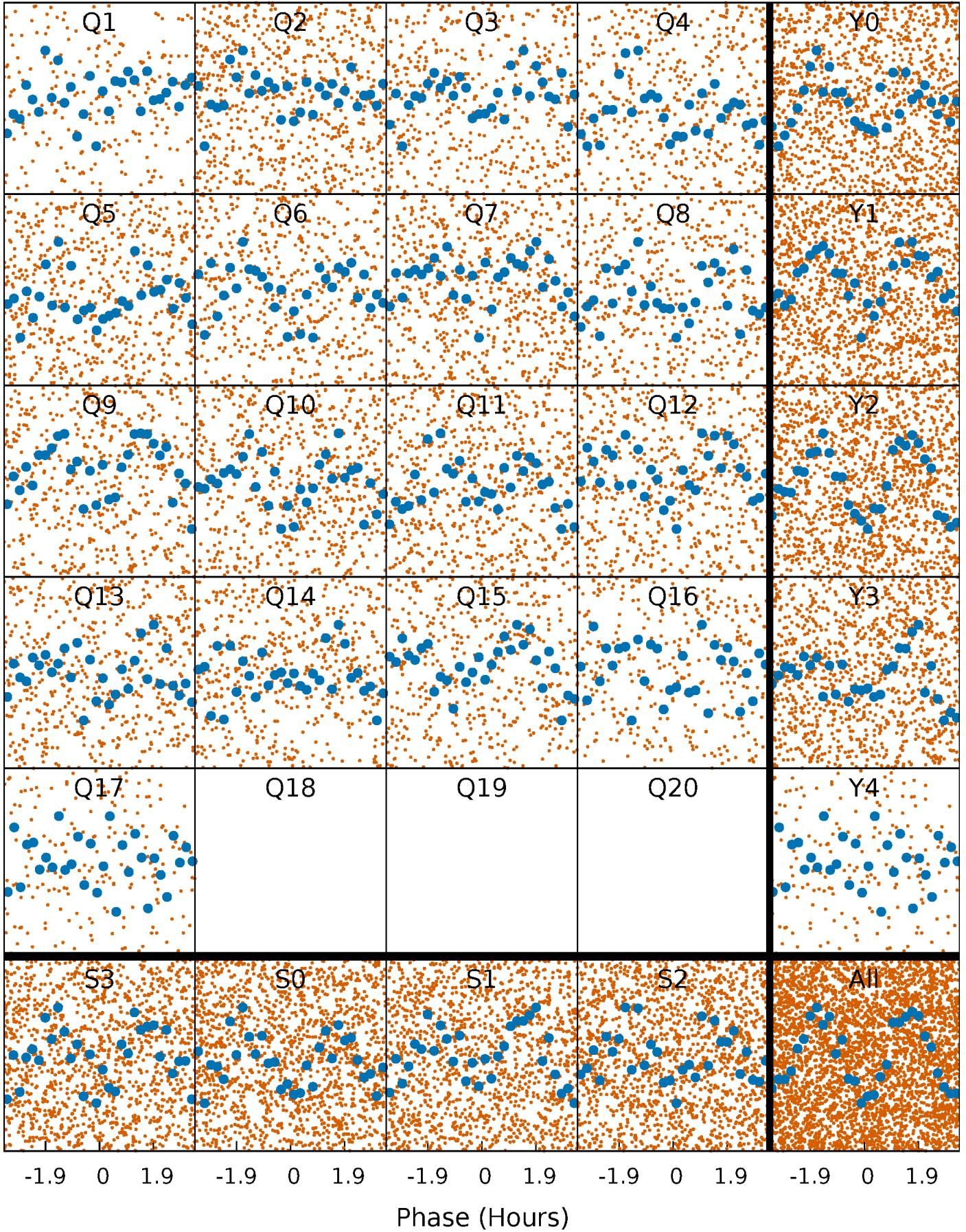


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

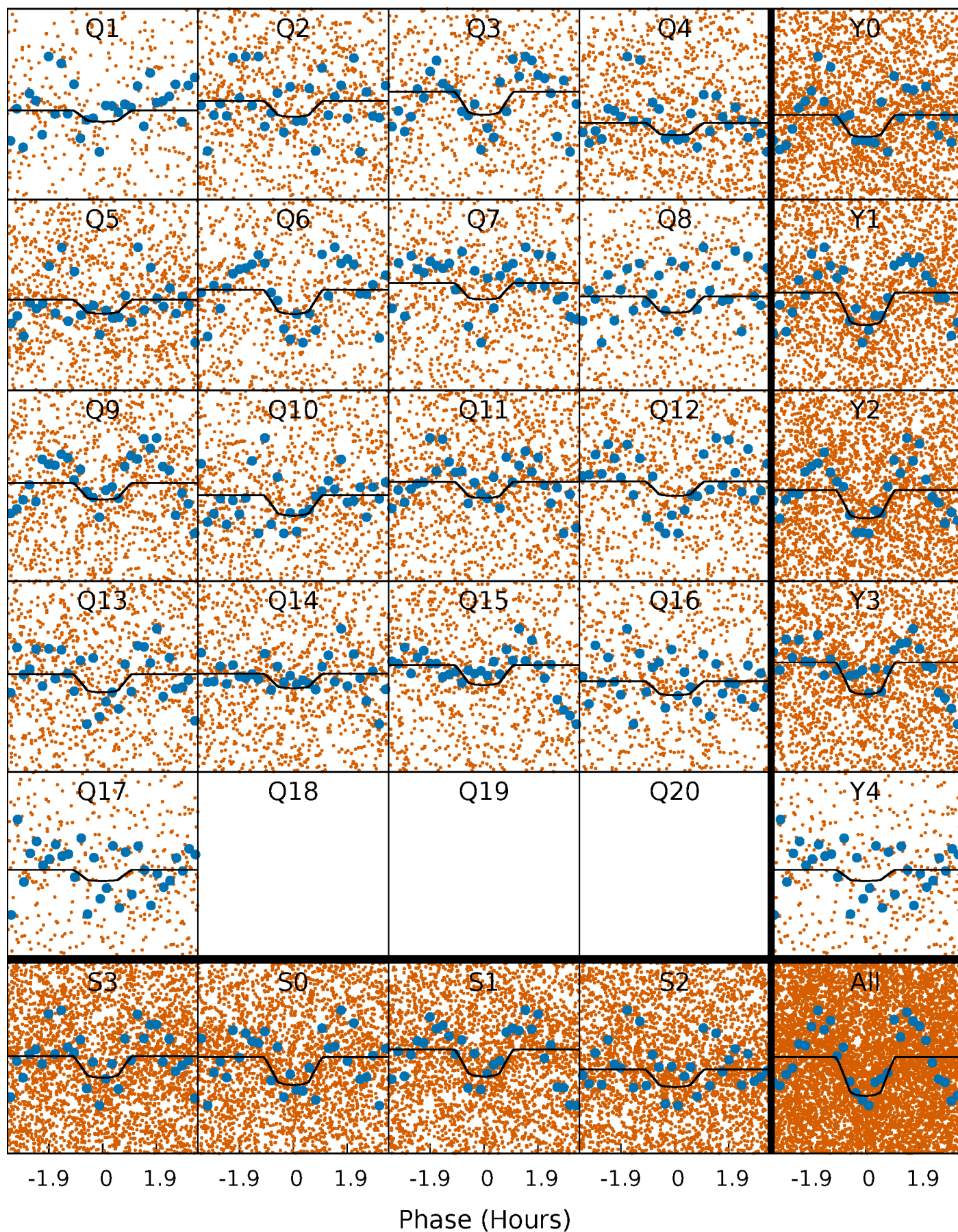
TCE 007047963-02   P= 0.564738 Days    $T_0=131.999433$  (BKJD)





# DV Quarter-Phased Transit Curves

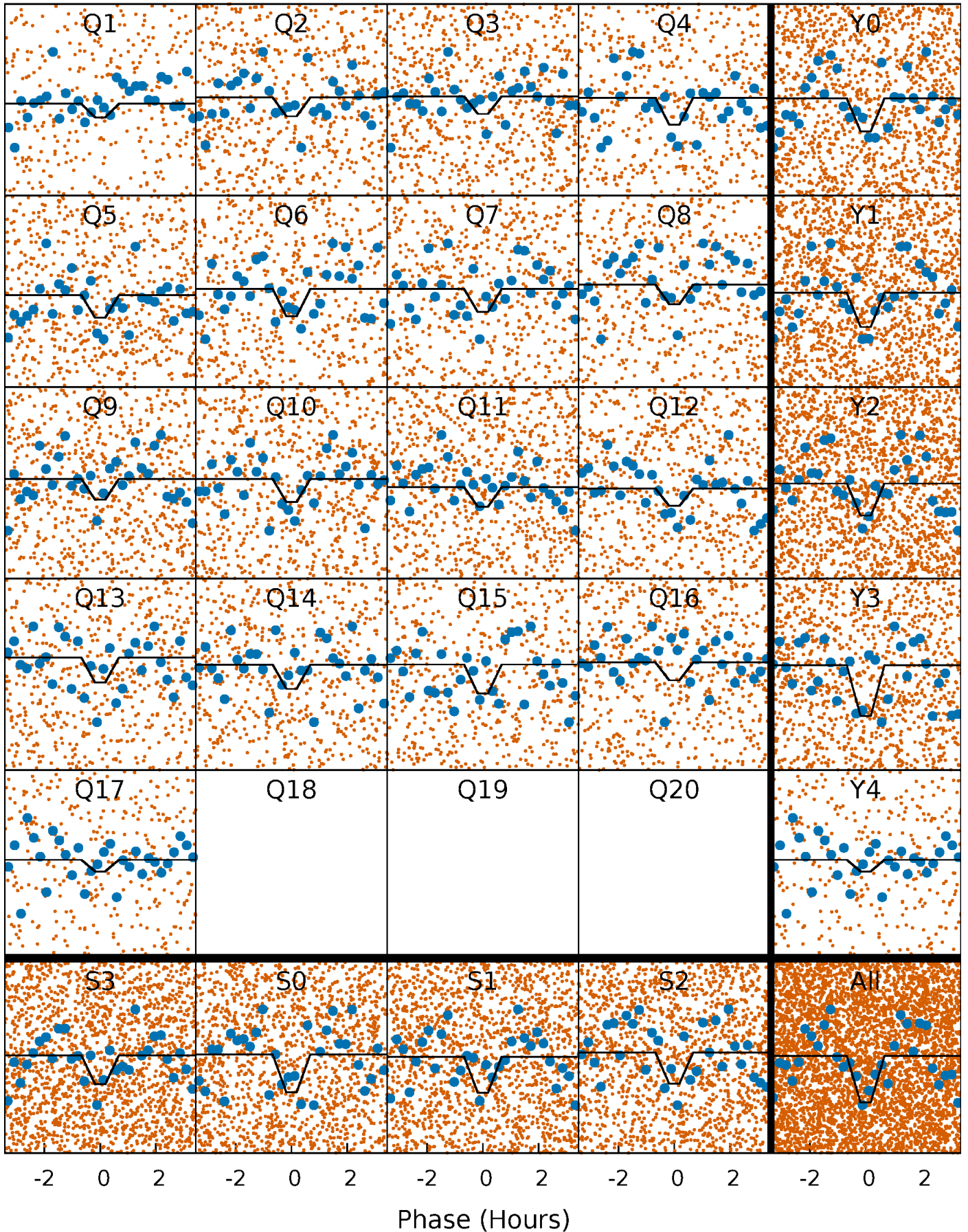
TCE 007047963-02   P= 0.564738 Days    $T_0=131.999433$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

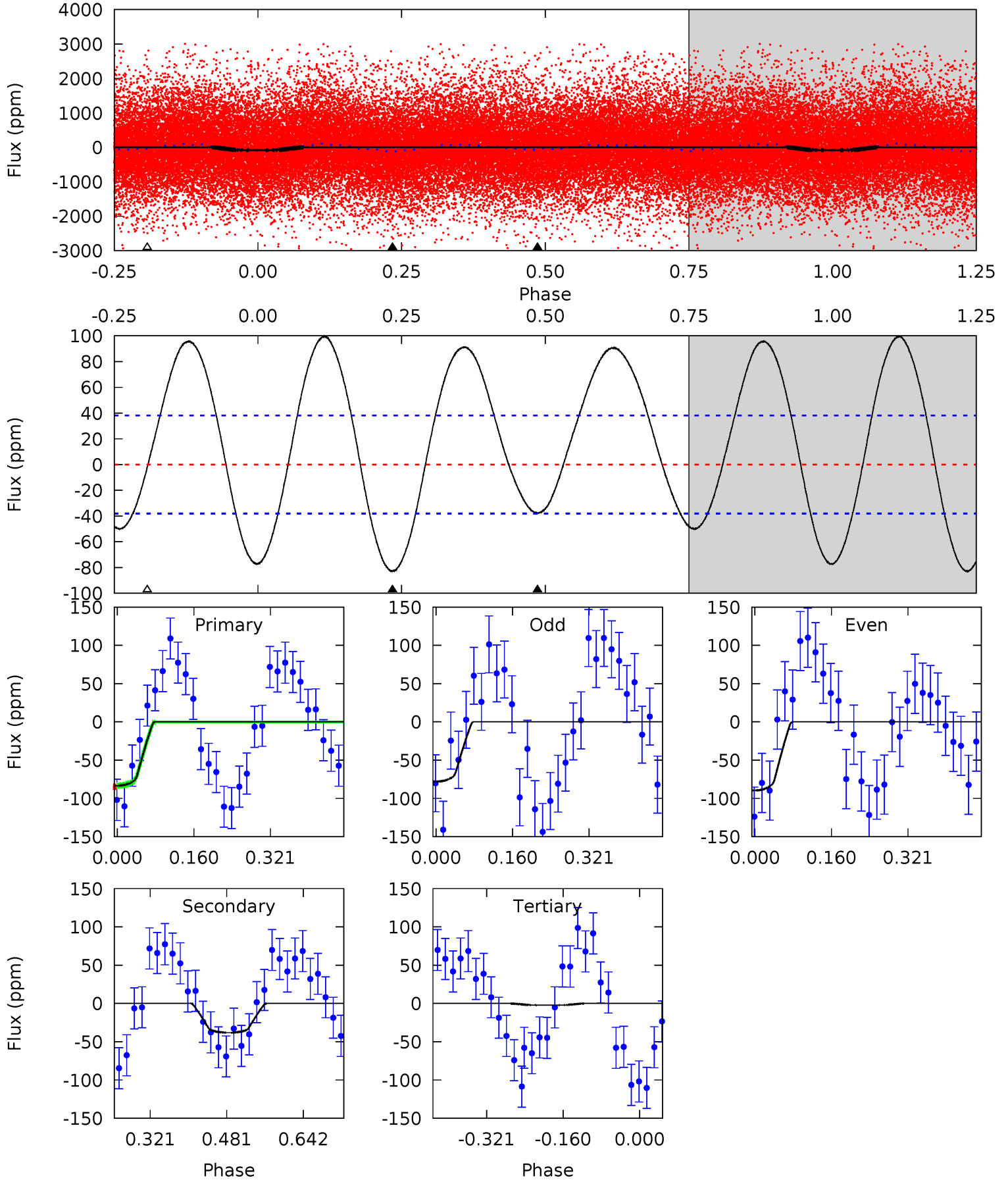
TCE 007047963-02     $P = 0.564739$  Days     $T_0 = 131.997459$  (BKJD)



# DV Model-Shift Uniqueness Test

007047963-02, P = 0.564738 Days, E = 131.434695 Days

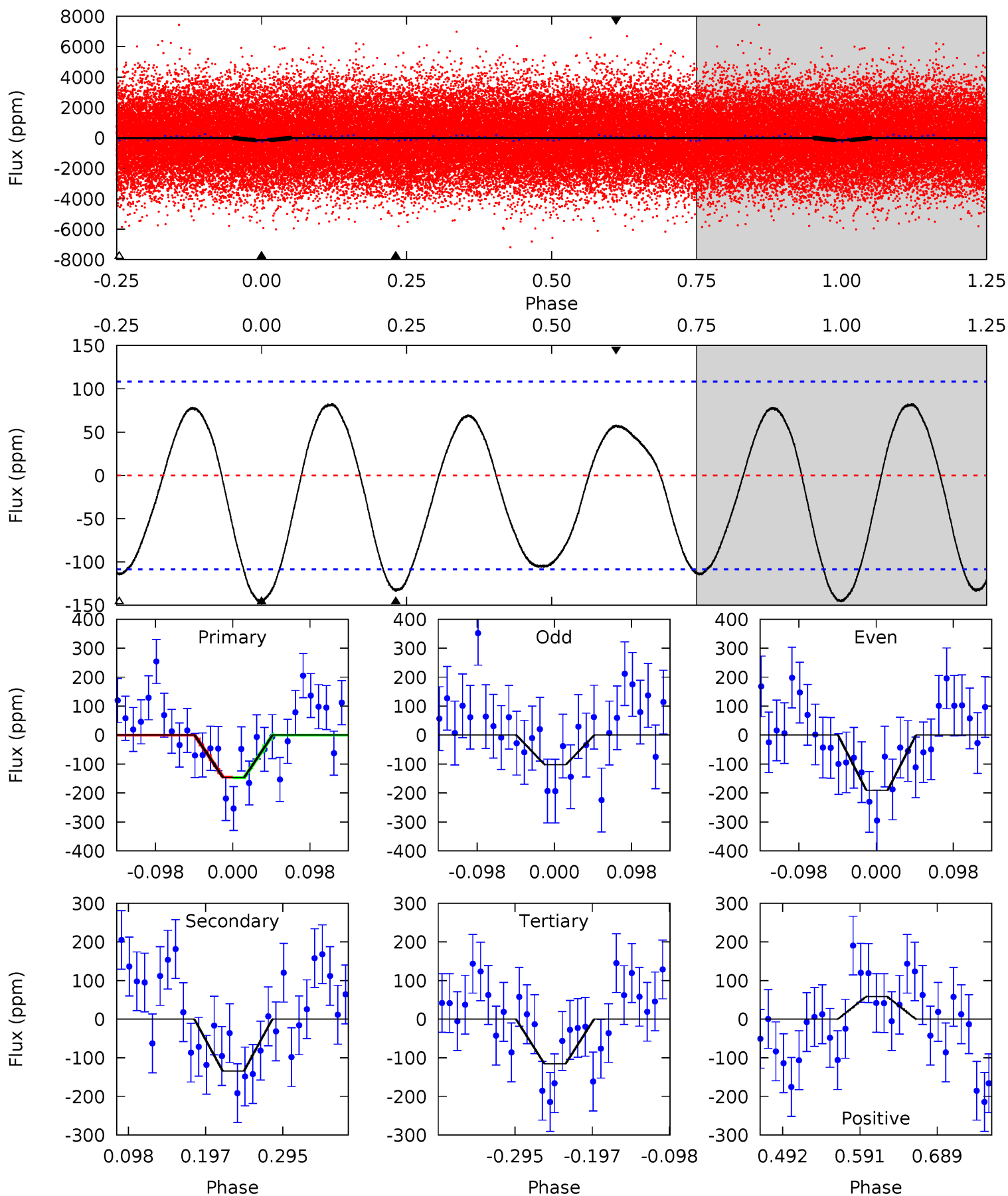
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.78	4.47	0.26	0	4.46	1.40	6.21	9.53	9.78	4.22	4.47	0.68	0.94	0.55	0.10



# Alt Model-Shift Uniqueness Test

007047963-02, P = 0.564739 Days, E = 131.432720 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.17	5.66	4.87	2.46	4.57	1.65	2.80	1.30	3.71	0.79	3.20	1.87	0.87	0.36	0.04



### Stellar Parameters For KIC 007047963

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7443^{+206}_{-335}$	$4.092^{+0.139}_{-0.186}$	$0.140^{+0.150}_{-0.400}$	$1.948^{+0.591}_{-0.394}$	$1.710^{+0.207}_{-0.276}$	$0.326^{+0.229}_{-0.155}$
	+3%/-5%	+3%/-5%	+107%/-286%	+30%/-20%	+12%/-16%	+70%/-48%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007047963-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-38 \pm 9$	$2.19^{+0.54}_{-0.47}$	$5068^{+384}_{-314}$	$5253^{+825}_{-684}$	$1.081^{+0.771}_{-0.411}$
Alt.	$-134 \pm 24$	$2.80^{+0.59}_{-0.49}$	$5069^{+357}_{-361}$	$6608^{+776}_{-732}$	$2.341^{+1.119}_{-0.825}$

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

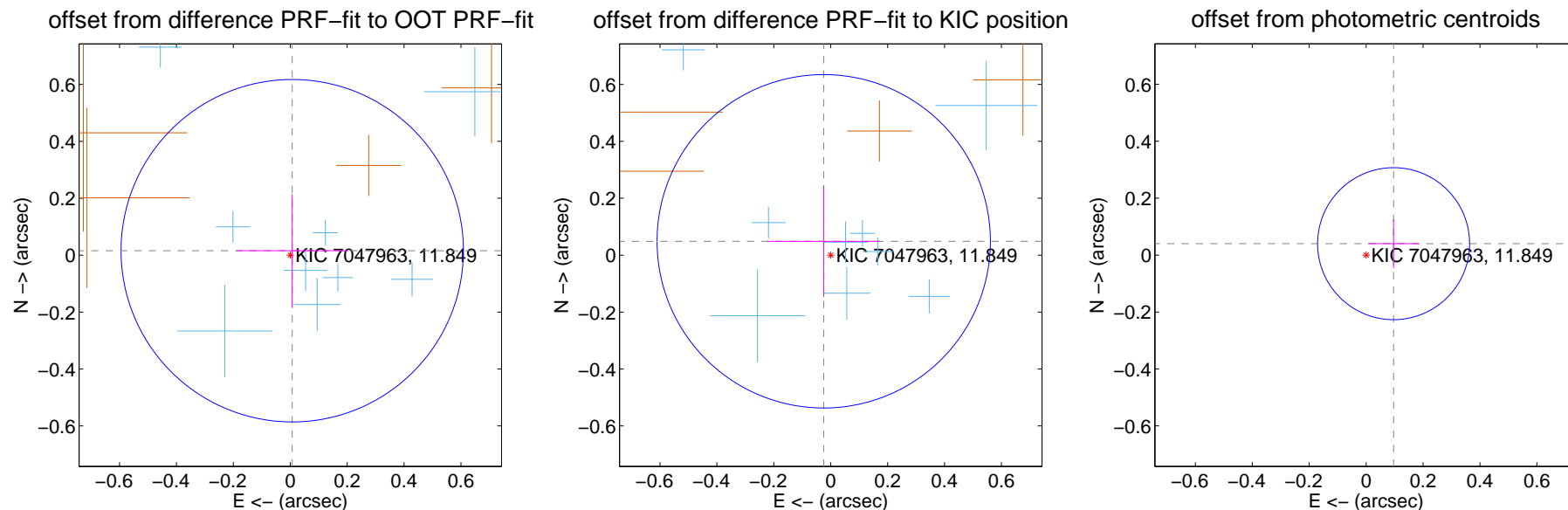
## DV Centroid Data

Supplemental centroid analysis for 007047963-02. **Kepler magnitude: 11.85.** Transit SNR 9.91

There are 11 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

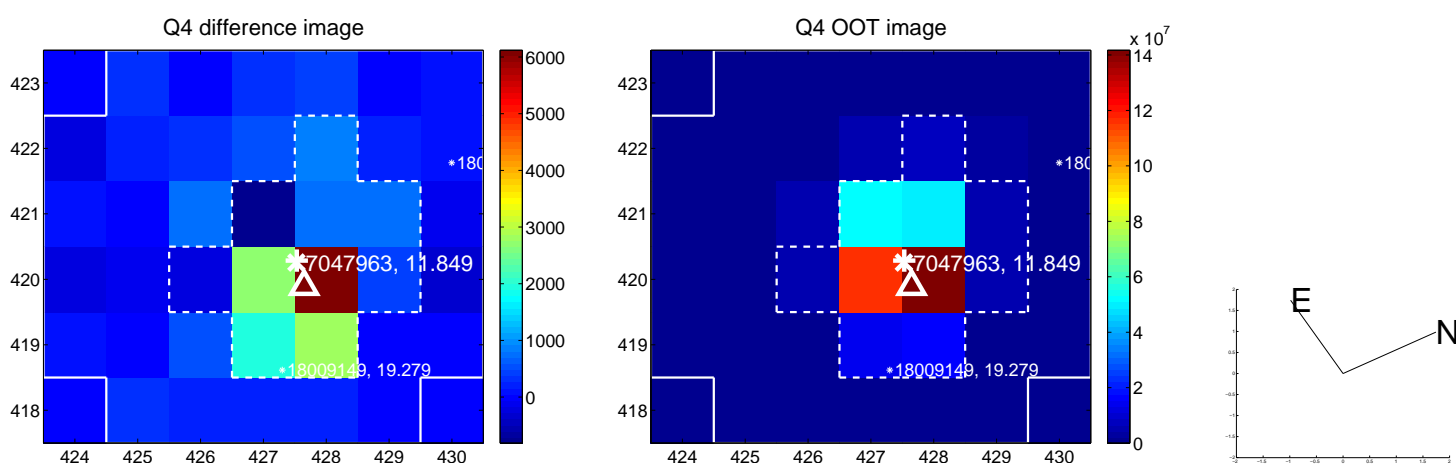
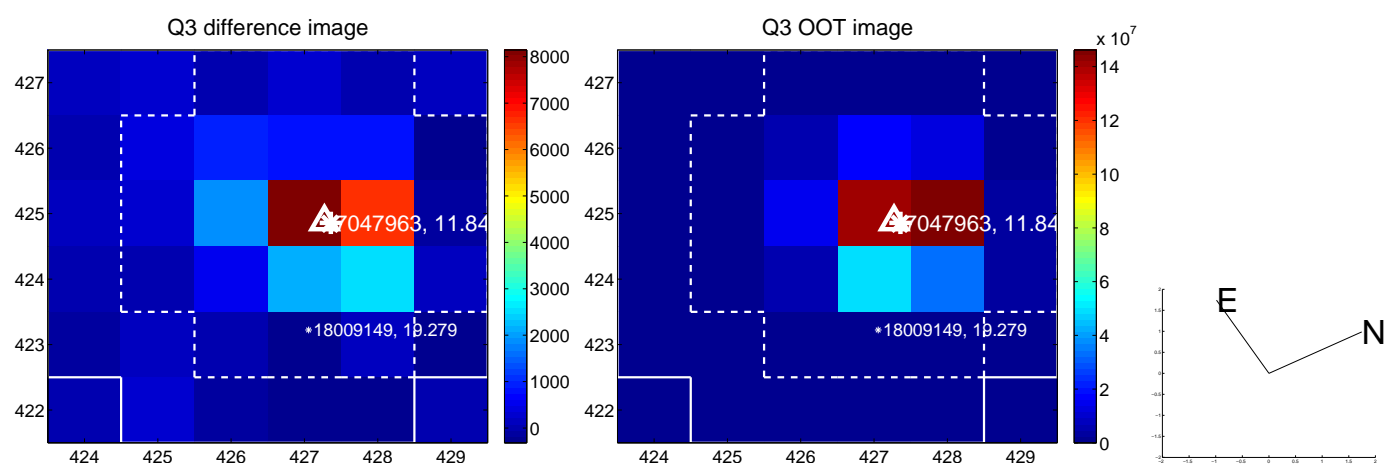
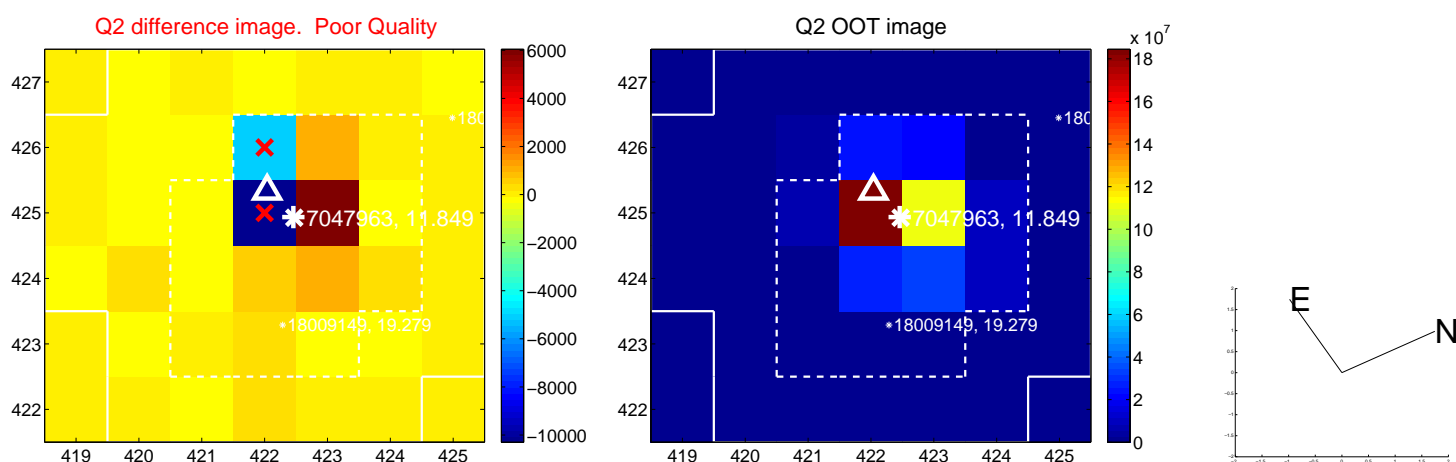
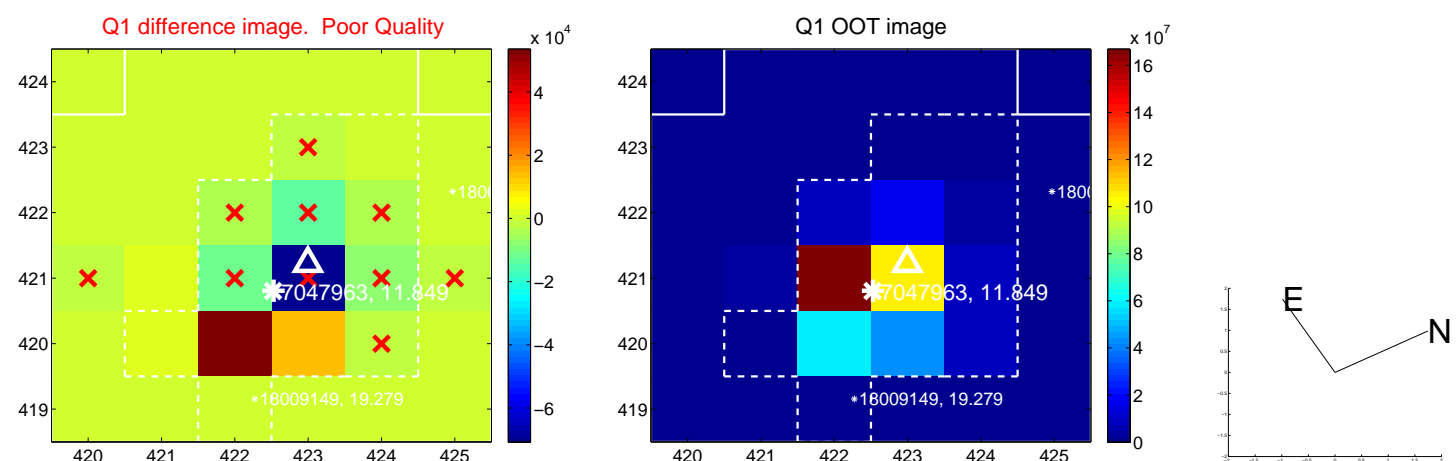
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.017 \pm 0.201$	0.09	$-0.007 \pm 0.196$	$0.016 \pm 0.198$
PRF-fit source offset from KIC position	$0.055 \pm 0.195$	0.28	$0.025 \pm 0.198$	$0.049 \pm 0.196$
photometric centroid source offset	$0.10 \pm 0.09$	1.17	$-0.10 \pm 0.09$	$0.04 \pm 0.09$



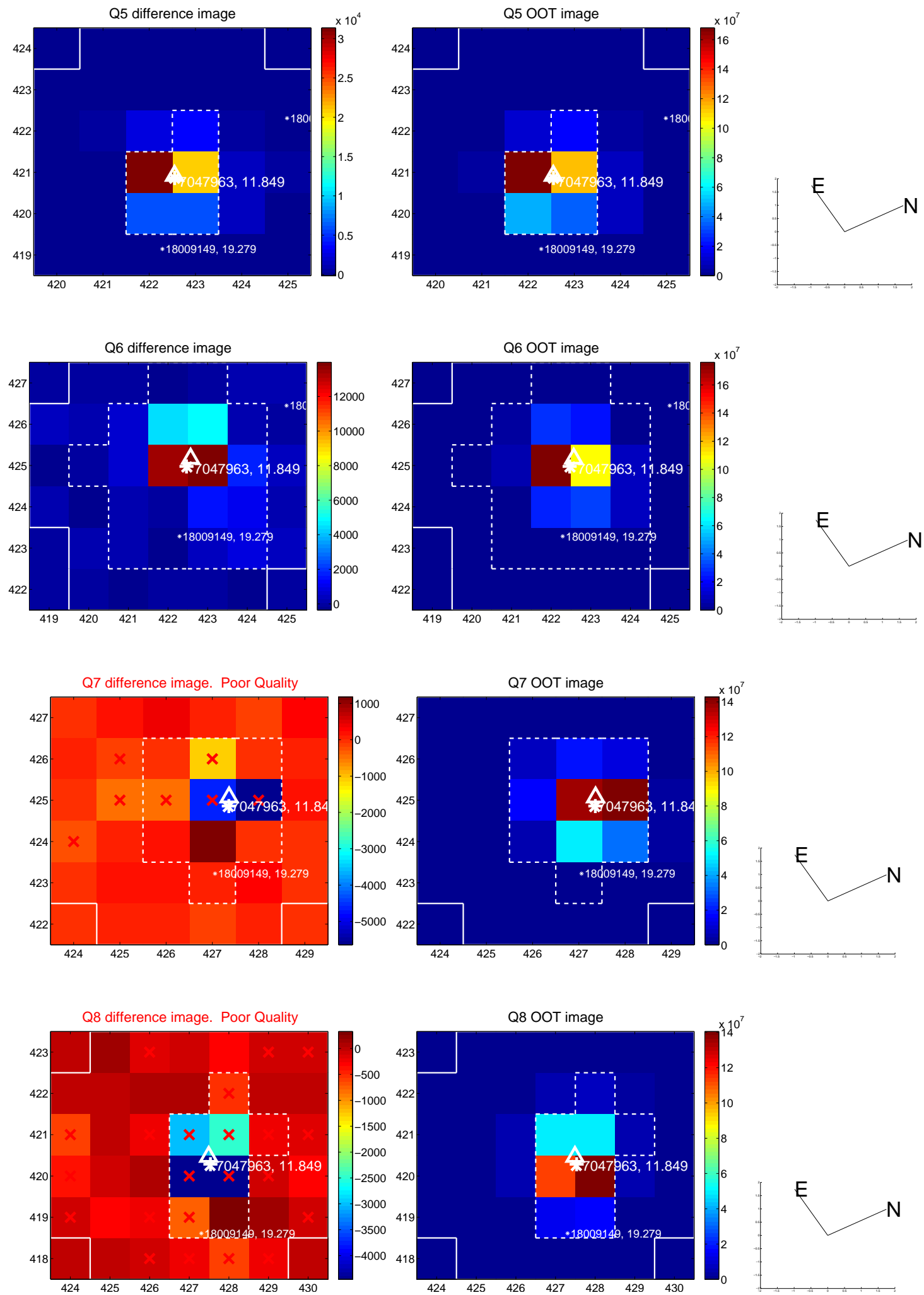
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



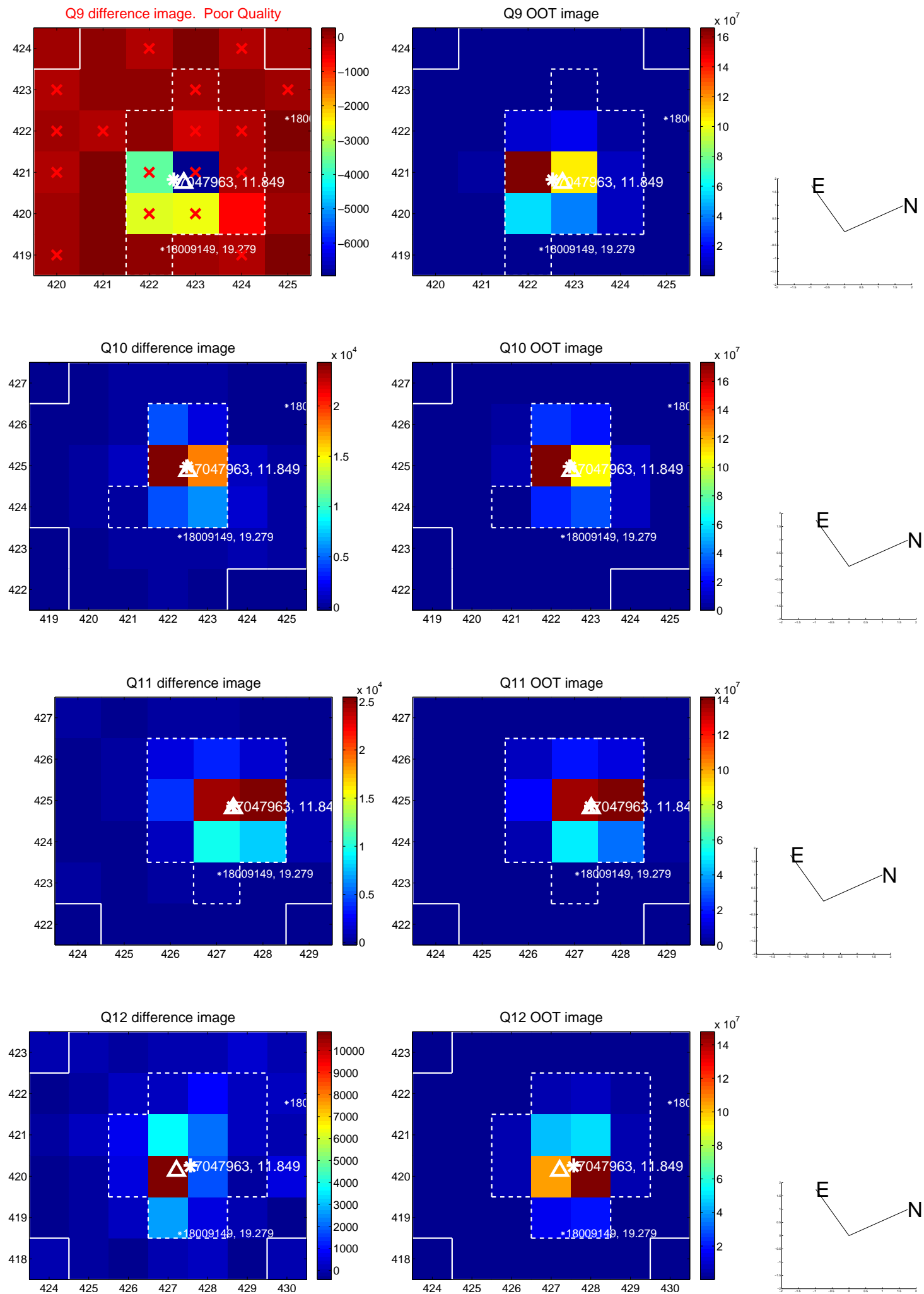
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



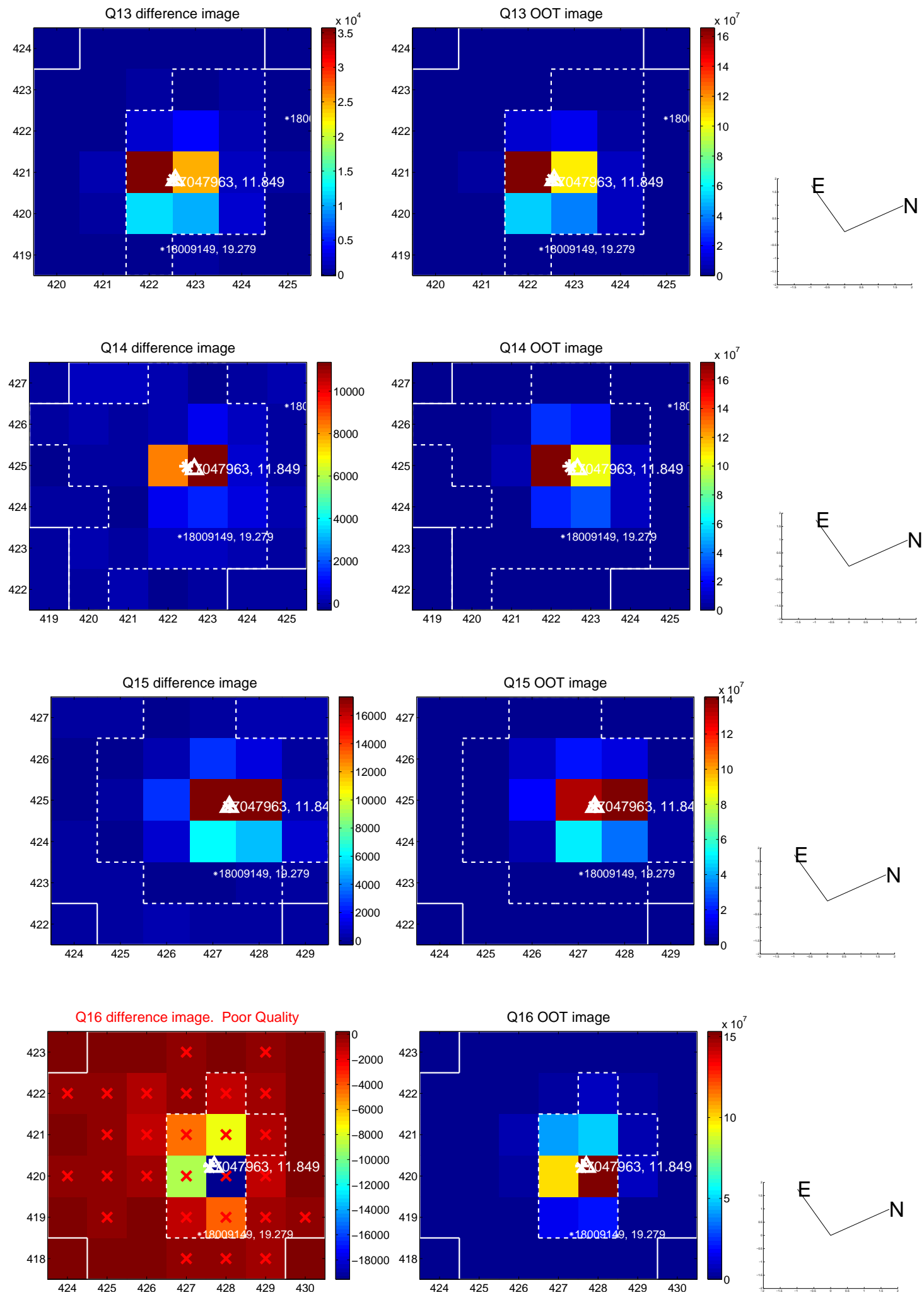
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



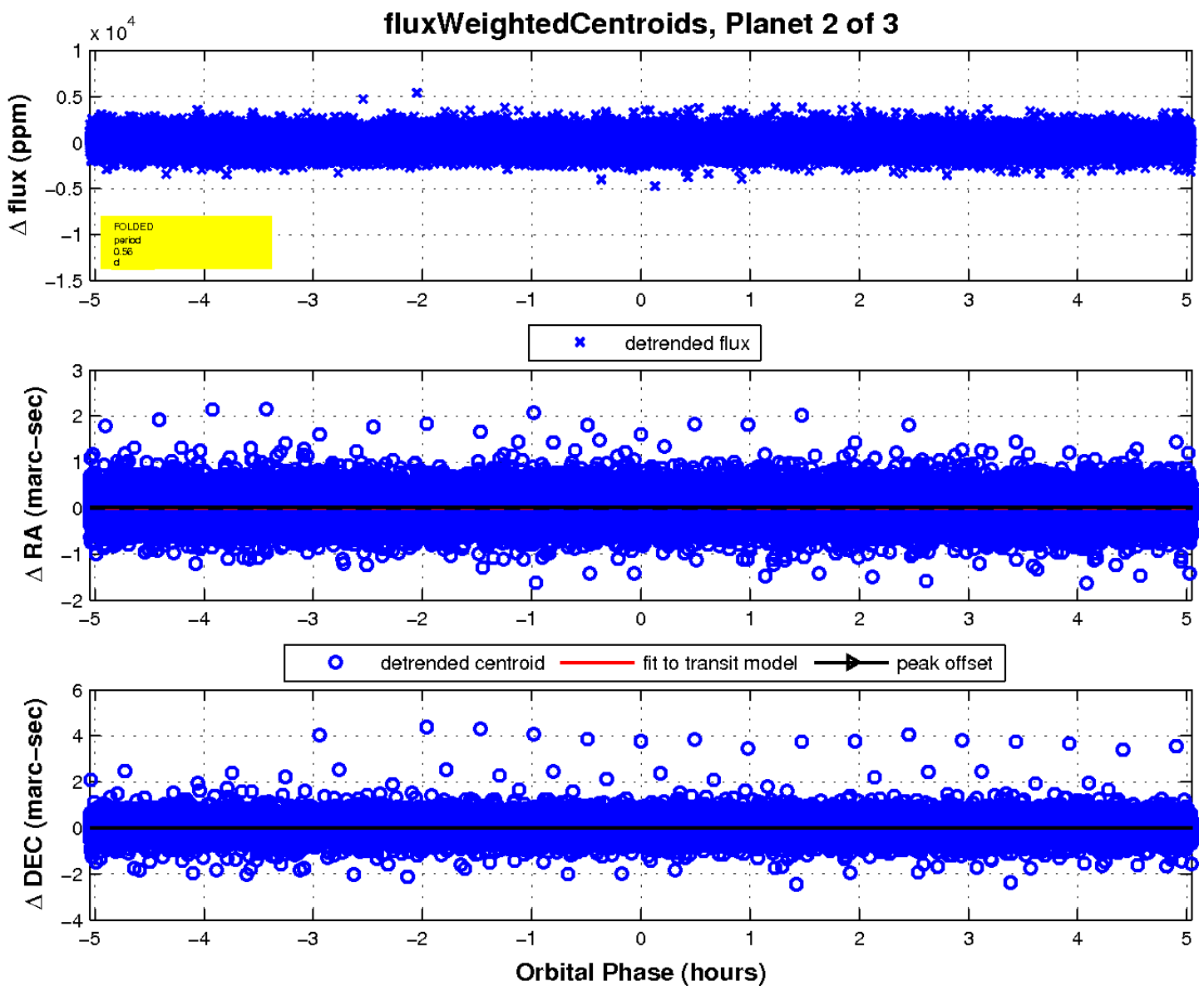
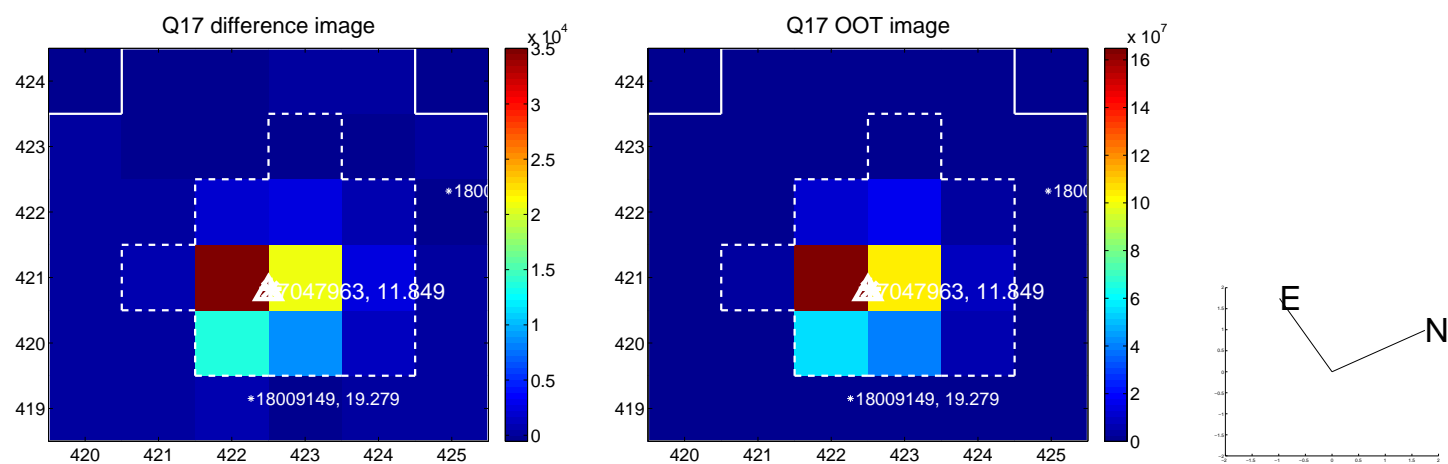
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

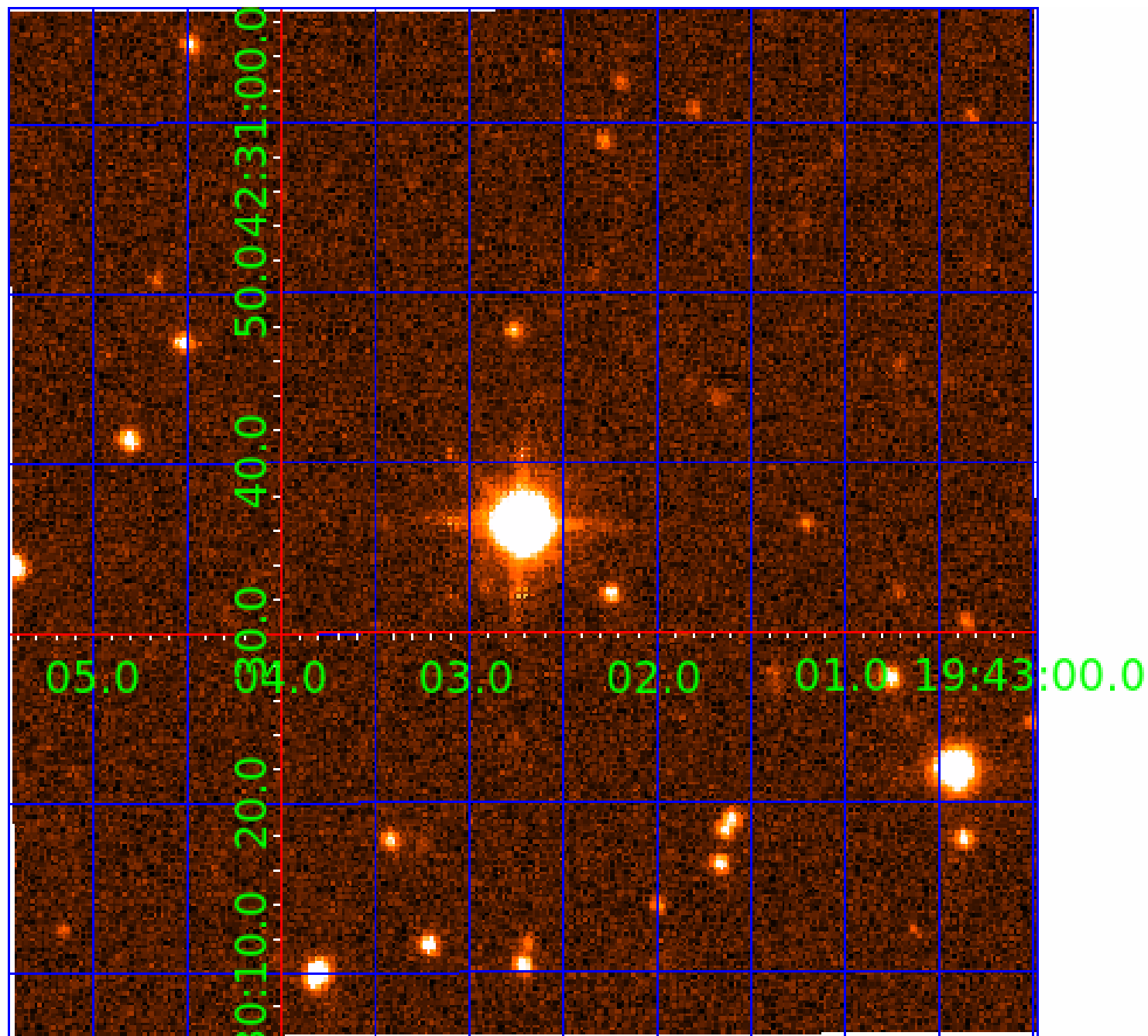


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007047963

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007047963-01	OBS	No	1.201075	132.003871	12.8	0.870	9.9	1.3	1.95	7443	0.81	14911.42
007047963-02	OBS	No	0.564738	131.999433	94.4	1.682	8.7	9.9	1.95	7443	2.20	40783.41
007047963-03	OBS	No	593.043212	162.733474	170.6	3.500	8.7	-1.0	1.95	7443	2.58	3.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007047963-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT
007047963-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007047963-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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

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

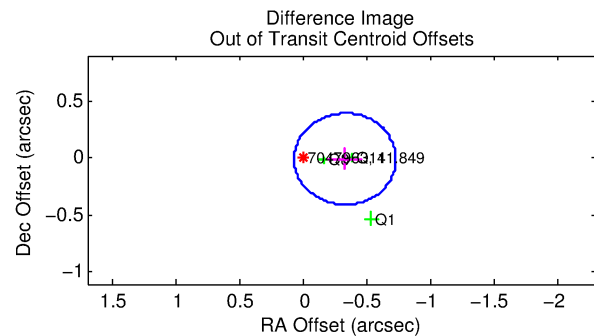
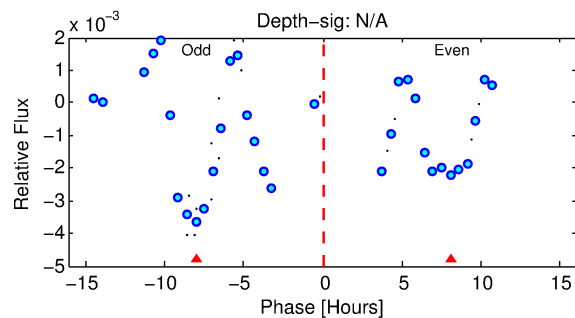
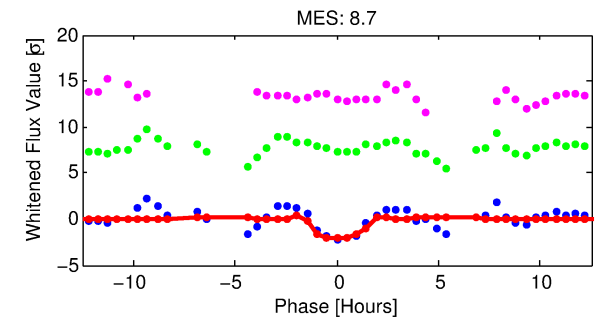
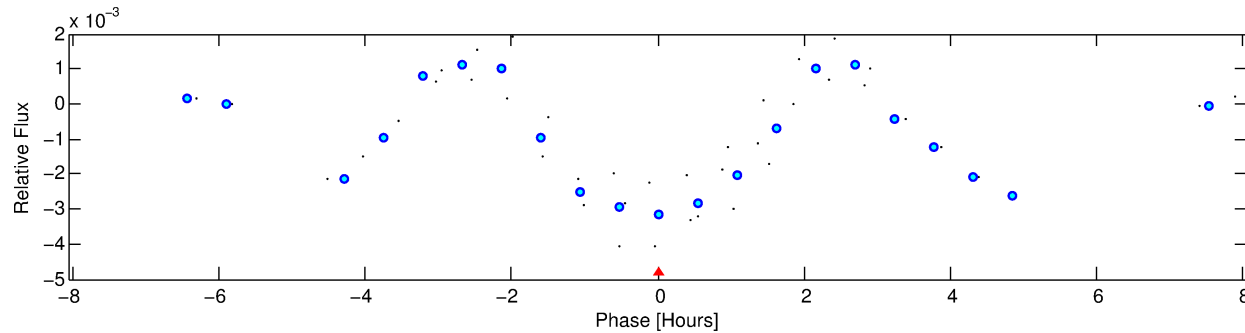
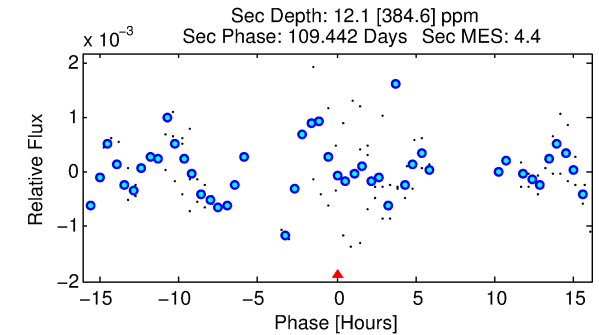
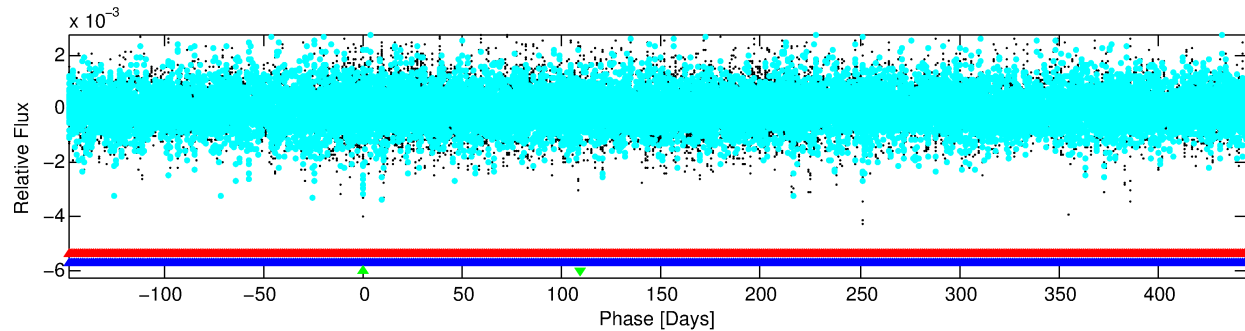
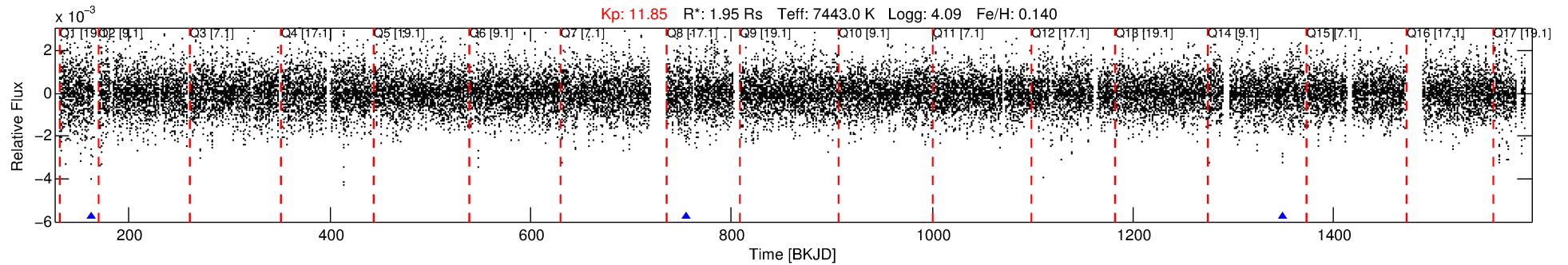
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007047963-03

No Significant Match Found

# DV One-Page Summary

KIC: 7047963 Candidate: 3 of 3 Period: 593.043 d



## TPS TCE Results:

Period = 593.04321 d  
Epoch = 162.7335 BKJD

DV fit results are unavailable

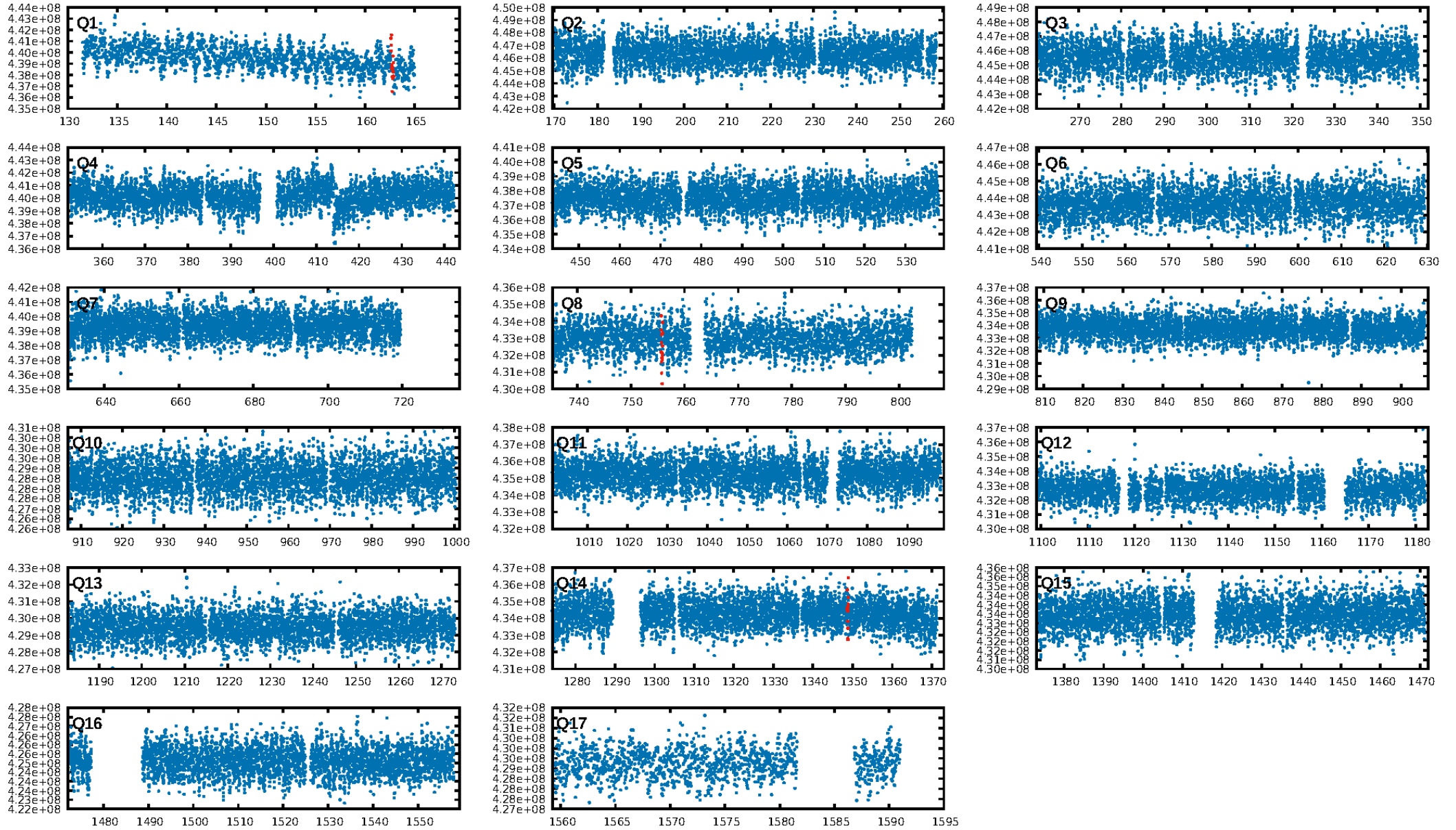
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [3938.55σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.98e-10  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.3816  
Centroid-sig: 5.7%  
Centroid-so: 0.048 arcsec [0.65σ]  
OotOffset-rm: 0.324 arcsec [2.43σ]  
KicOffset-rm: 0.239 arcsec [1.36σ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/3]

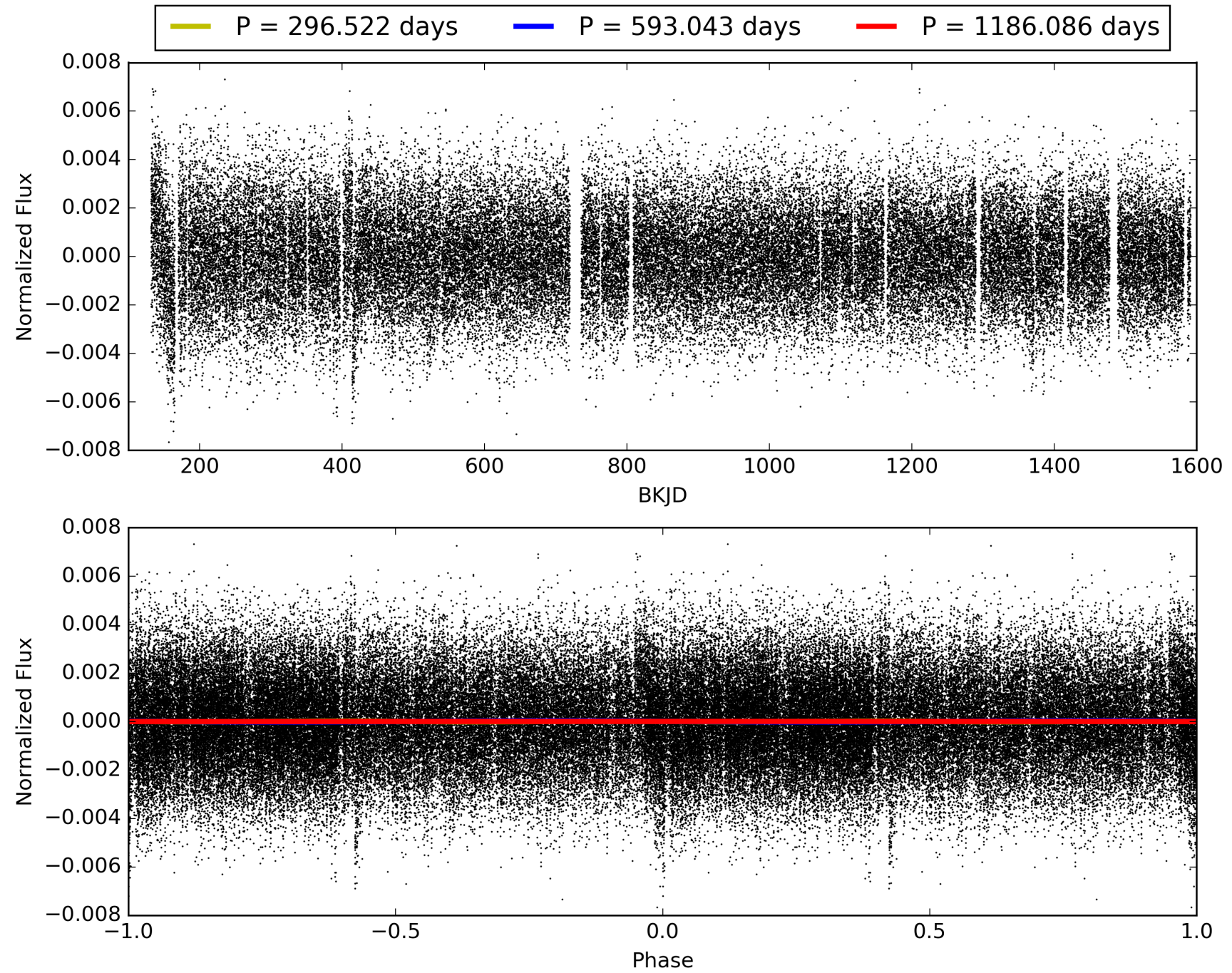
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:46:48 Z

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

# TCE 007047963-03, PDC Light Curves

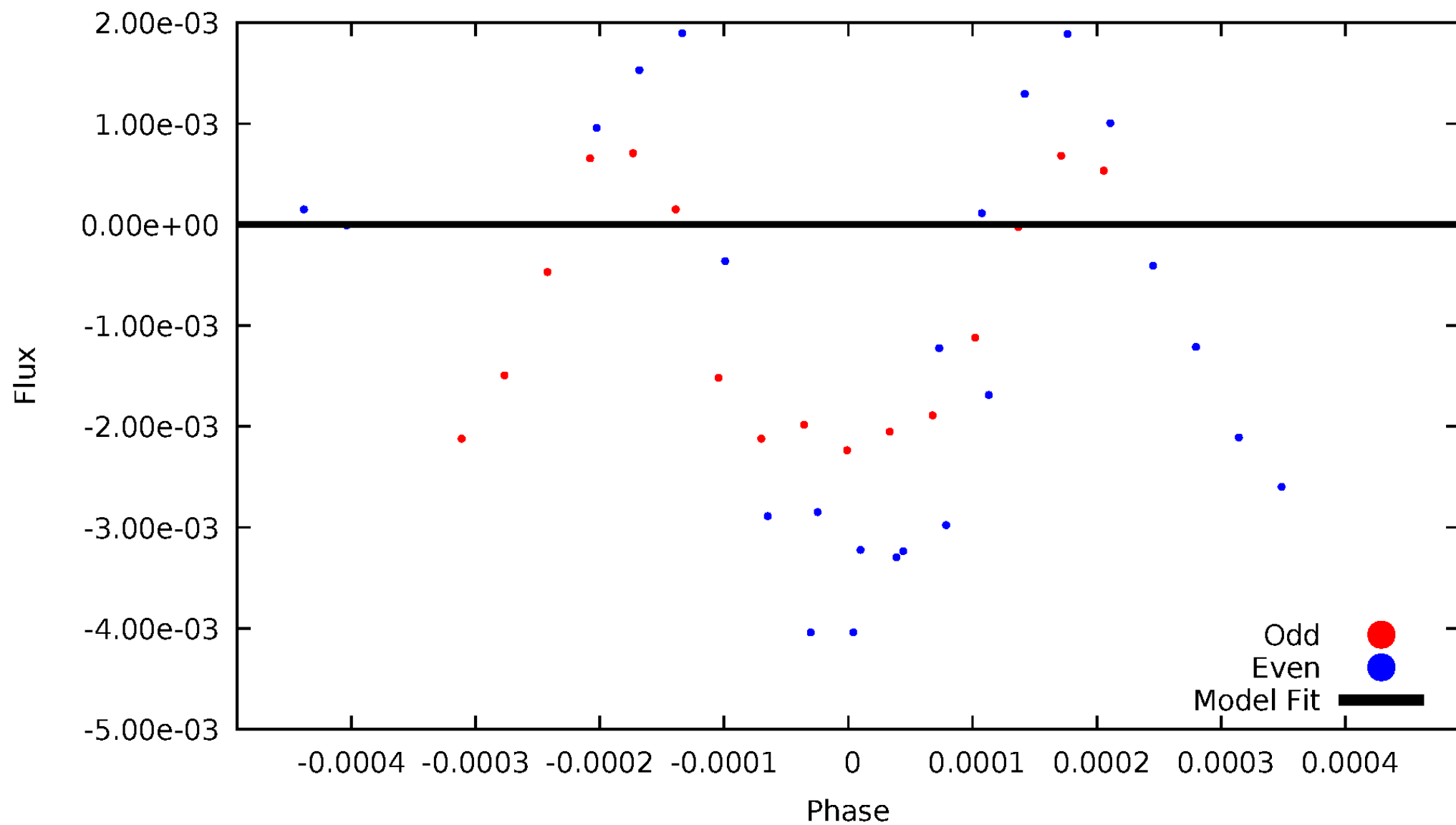


TCE 007047963-03



# DV Odd/Even

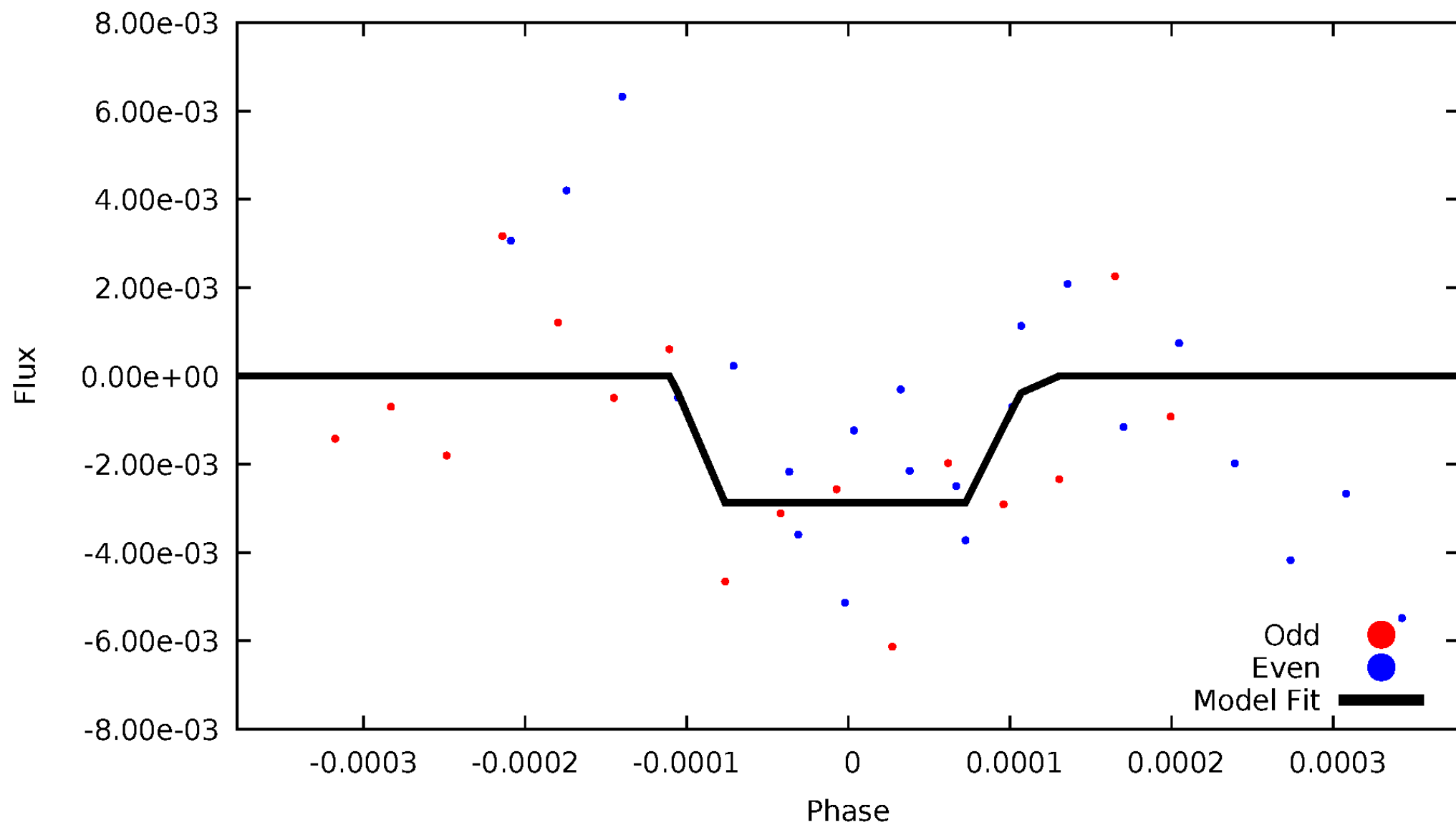
TCE 007047963-03





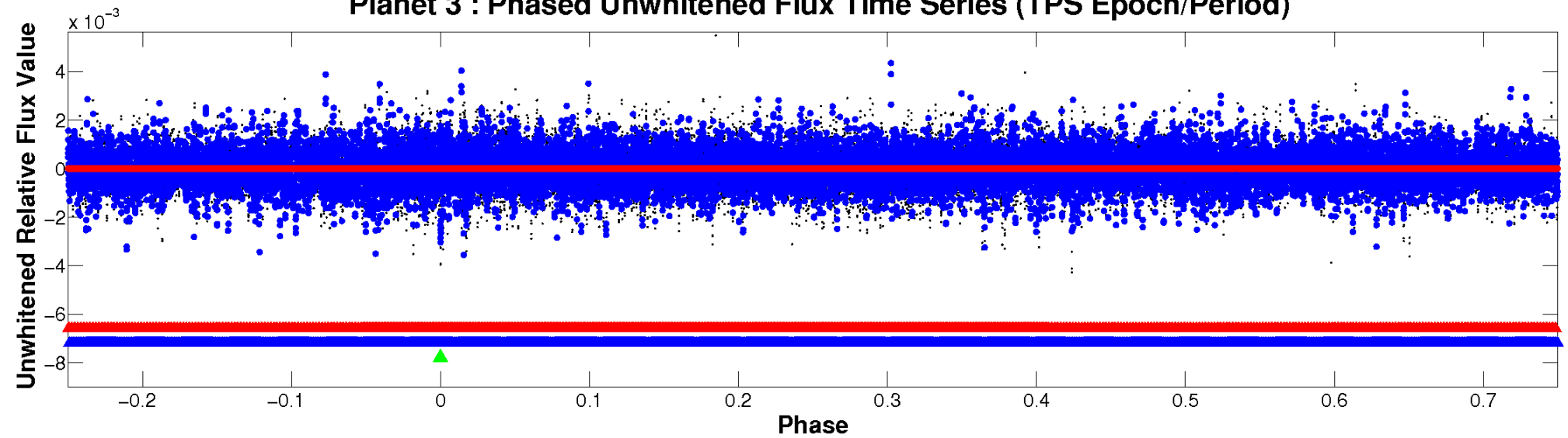
# ALT Odd/Even

TCE 007047963-03

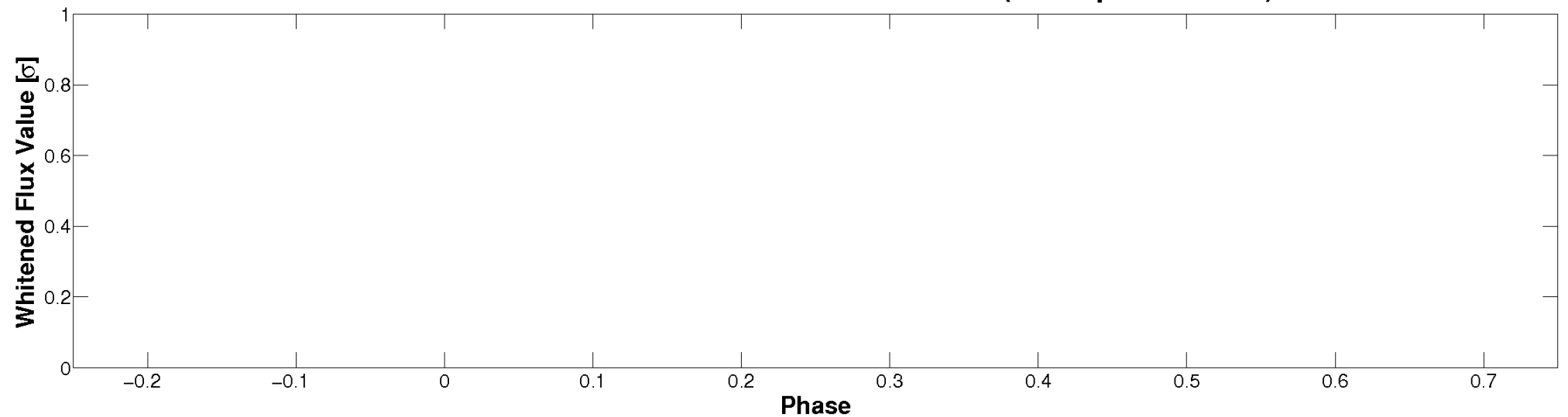


# Non-Whitened Vs. Whitened Light Curve

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

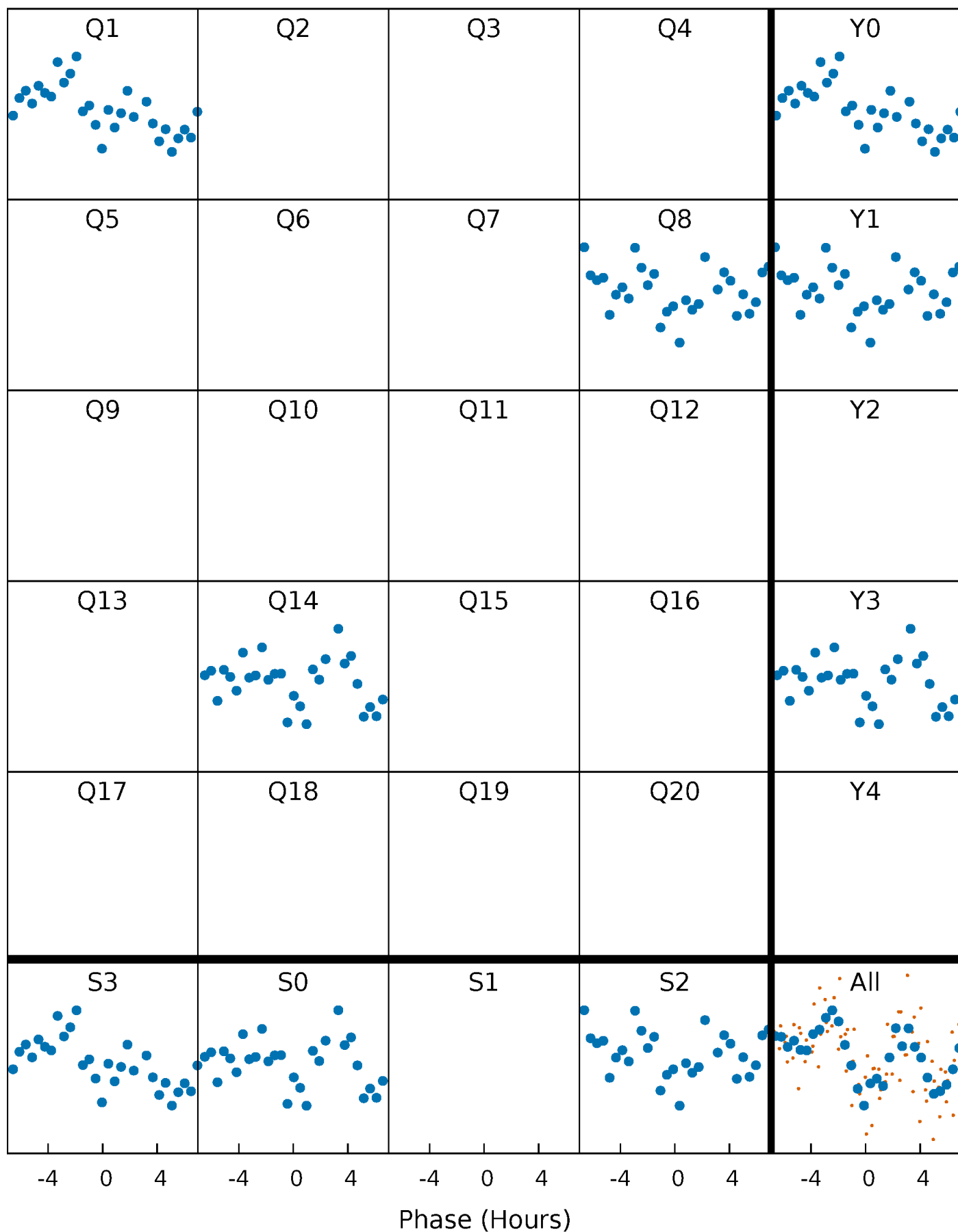


**Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



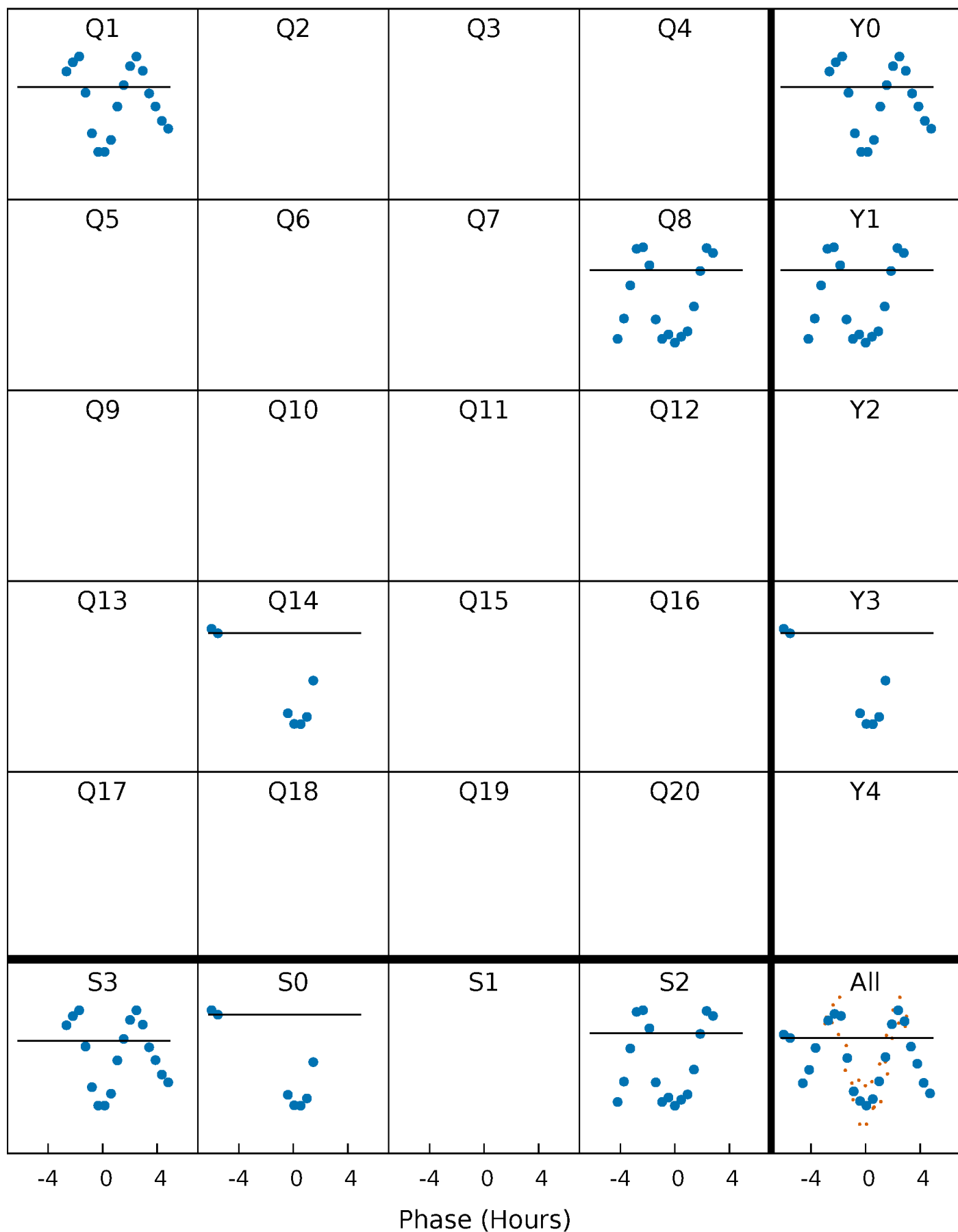
# PDC Quarter-Phased Transit Curves

TCE 007047963-03 P=593.043212 Days  $T_0=162.733474$  (BKJD)



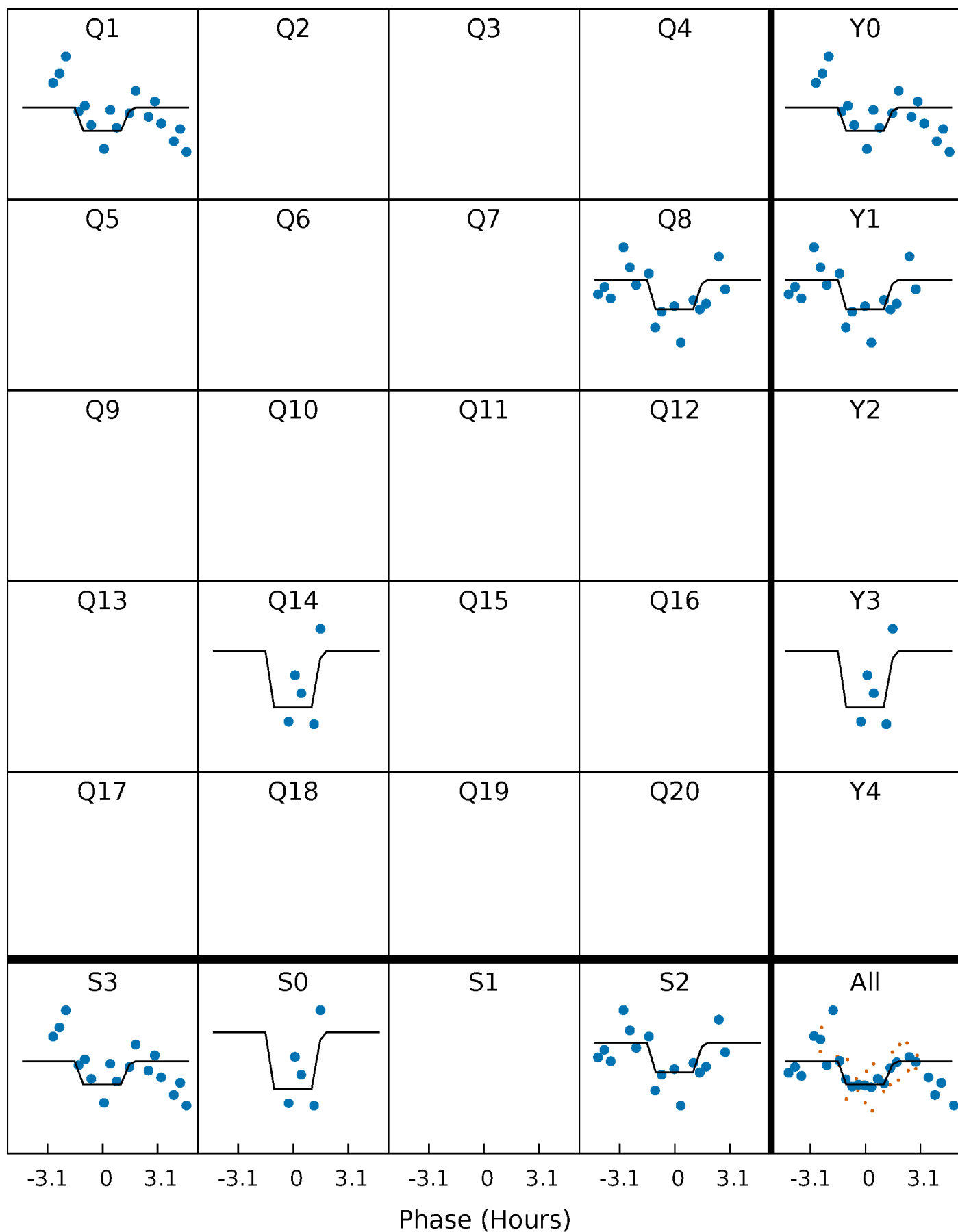
# DV Quarter-Phased Transit Curves

TCE 007047963-03 P=593.043212 Days  $T_0=162.733474$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007047963-03 P=593.043212 Days  $T_0=162.737154$  (BKJD)

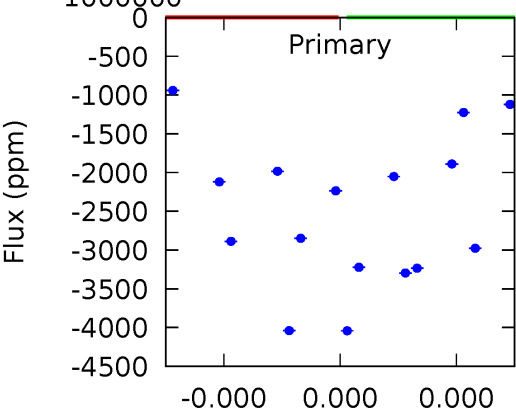
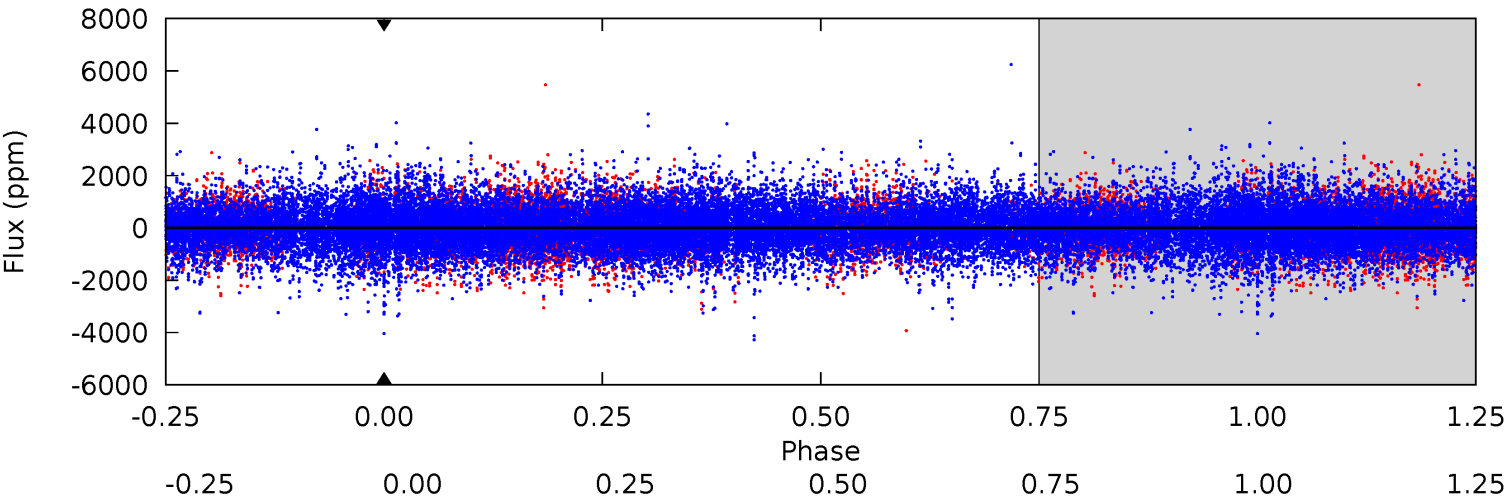




# DV Model-Shift Uniqueness Test

007047963-03, P = 593.043212 Days, E = 162.733474 Days

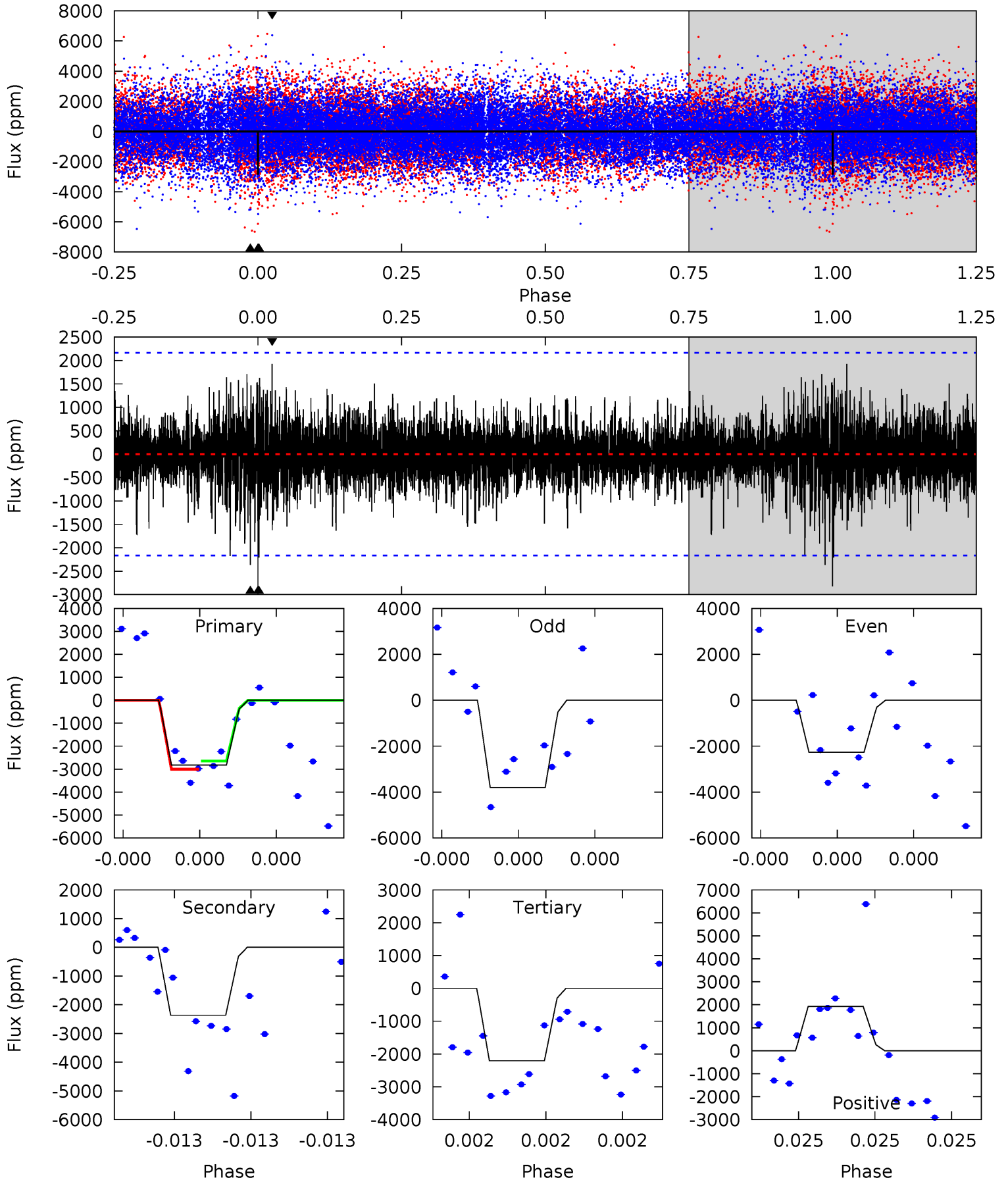
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007047963-03, P = 593.043212 Days, E = 162.737154 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
7.47	6.25	5.84	5.09	5.73	3.71	1.15	1.63	2.38	0.41	1.16	1.89	1.07	0.41	0.45



### Stellar Parameters For KIC 007047963

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7443^{+206}_{-335}$	$4.092^{+0.139}_{-0.186}$	$0.140^{+0.150}_{-0.400}$	$1.948^{+0.591}_{-0.394}$	$1.710^{+0.207}_{-0.276}$	$0.326^{+0.229}_{-0.155}$
	+3%/-5%	+3%/-5%	+107%/-286%	+30%/-20%	+12%/-16%	+70%/-48%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007047963-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$15.99^{+15.70}_{-11.17}$	$499^{+39}_{-34}$	$6675^{+37055}_{-39579}$	$19265^{+1193232}_{-951956}$
Alt.	$-2363 \pm 378$	$19.54^{+20.23}_{-12.70}$	$502^{+38}_{-35}$	$5377^{+4030}_{-1285}$	$9088^{+61695}_{-6877}$

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

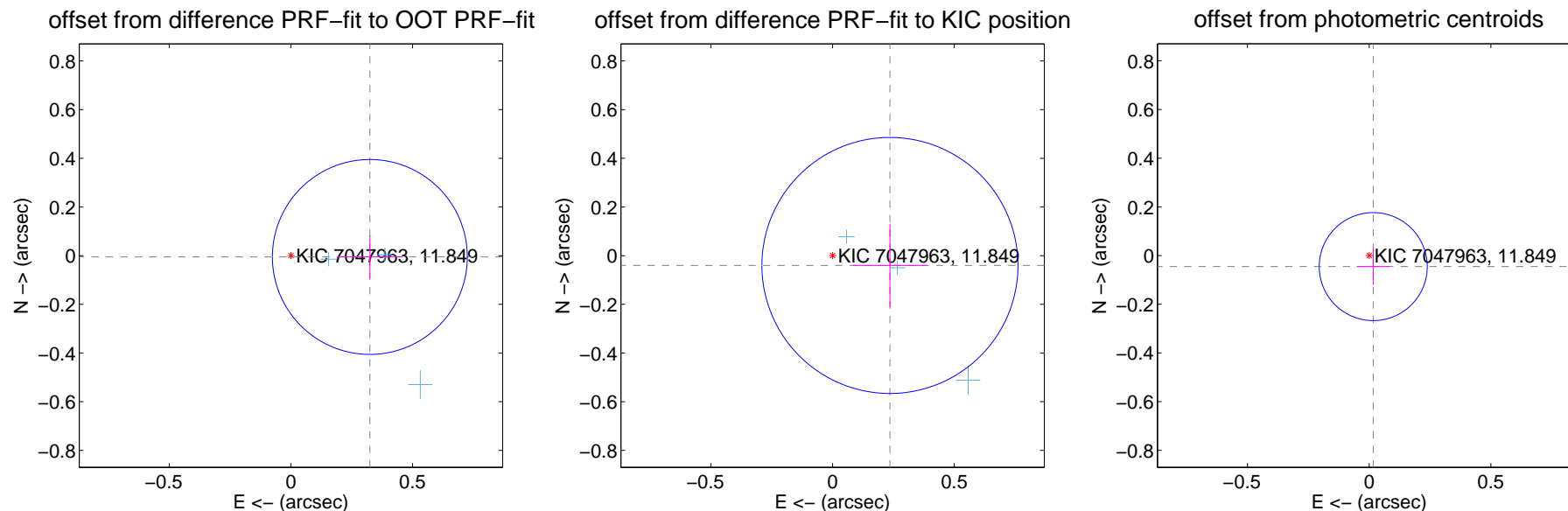
## DV Centroid Data

Supplemental centroid analysis for 007047963-03. **Kepler magnitude: 11.85.** Transit SNR -1.00

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

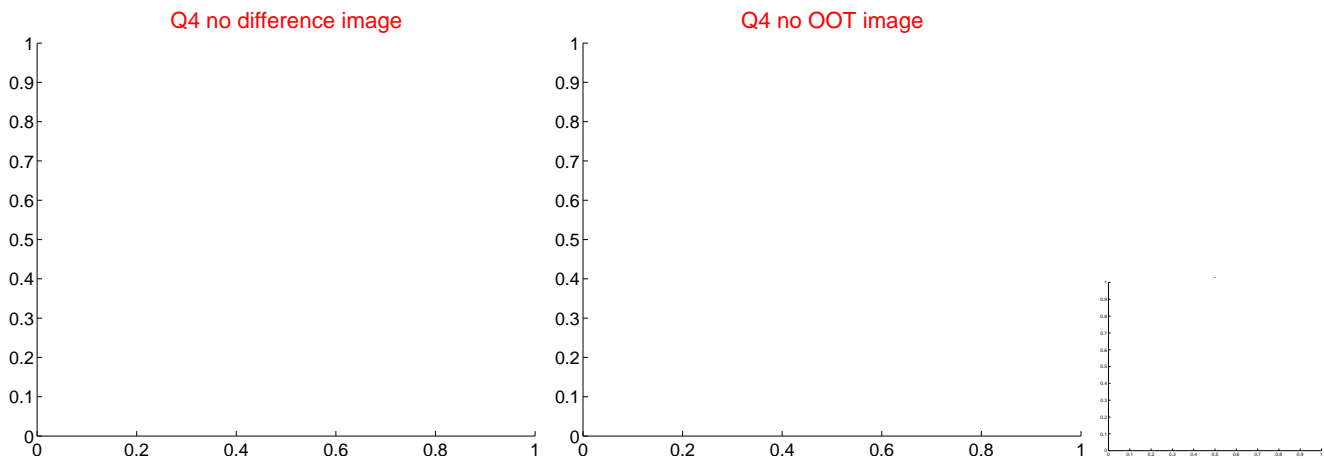
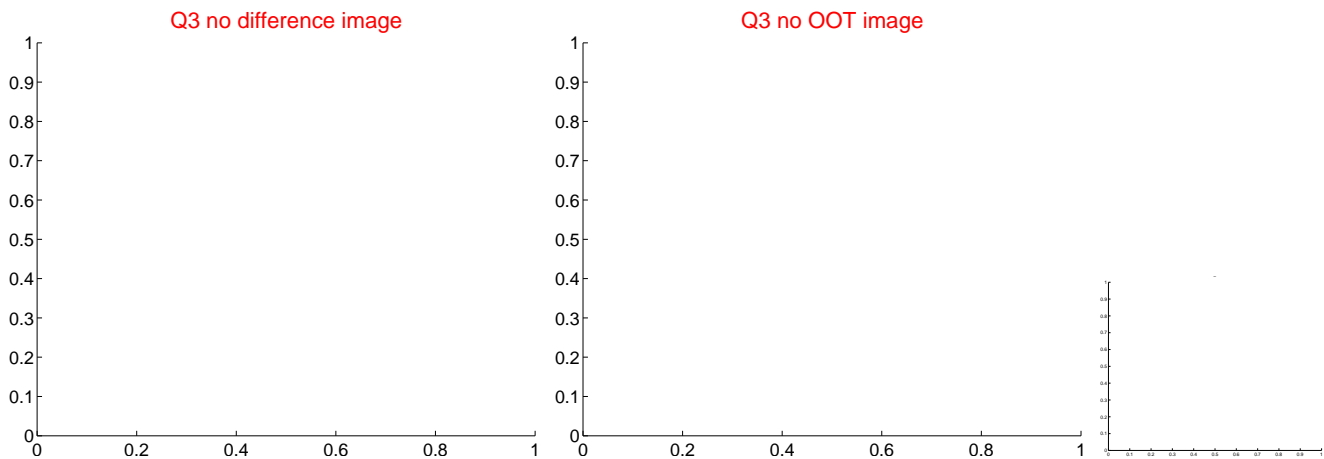
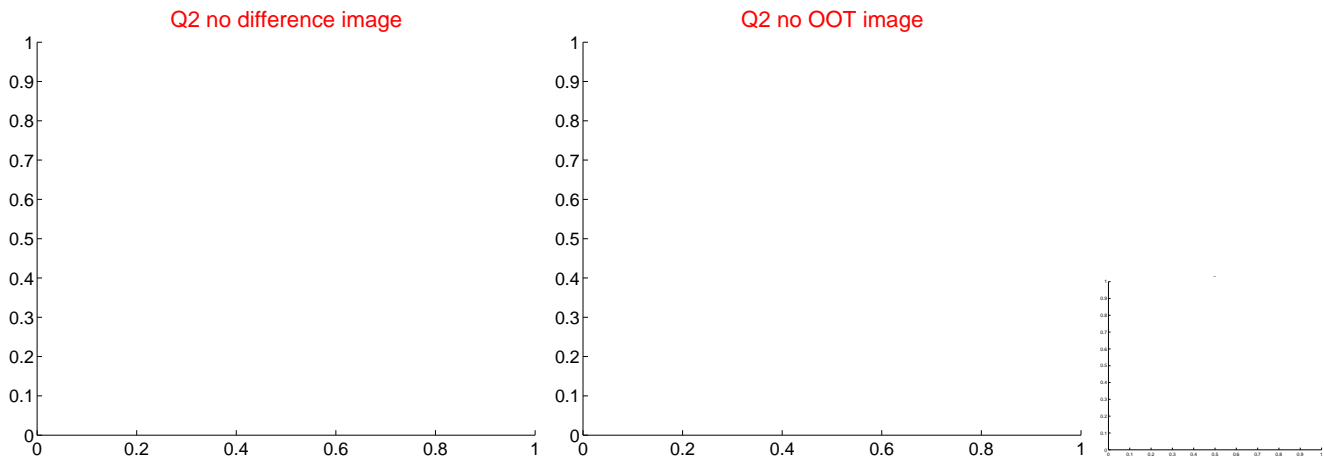
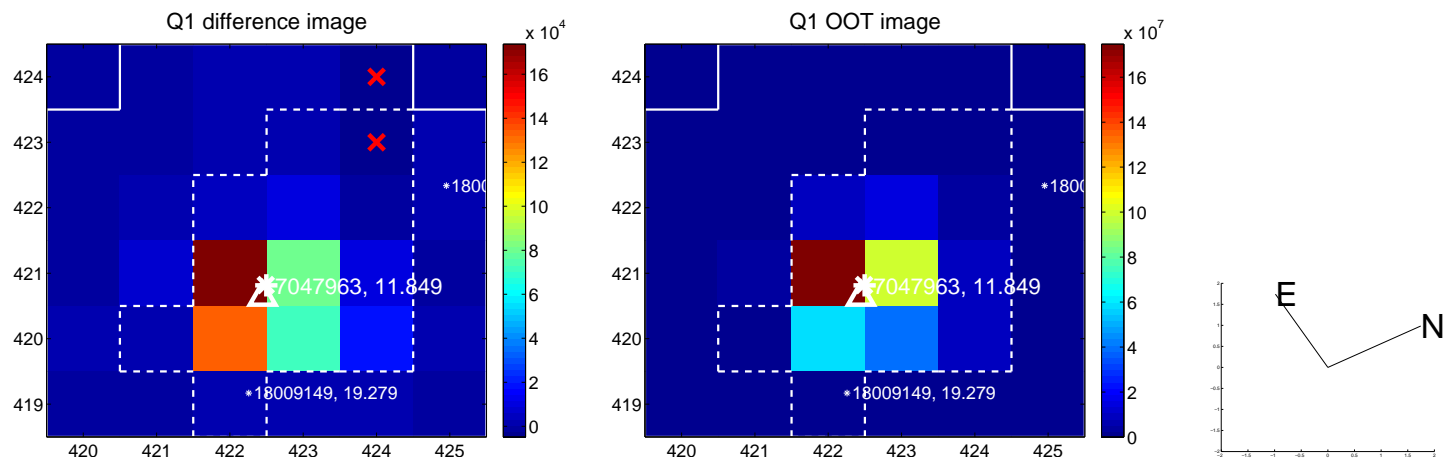
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.324 \pm 0.133$	2.43	$-0.324 \pm 0.133$	$-0.005 \pm 0.089$
PRF-fit source offset from KIC position	$0.239 \pm 0.175$	1.36	$-0.236 \pm 0.153$	$-0.040 \pm 0.170$
photometric centroid source offset	$0.05 \pm 0.07$	0.65	$-0.02 \pm 0.07$	$-0.05 \pm 0.07$



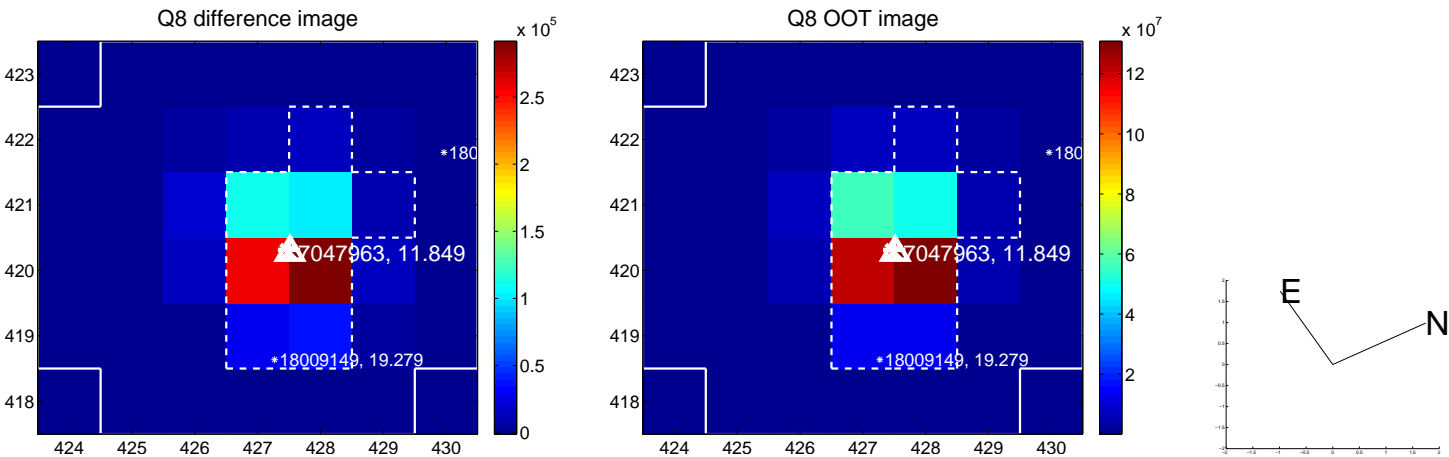
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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





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



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



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

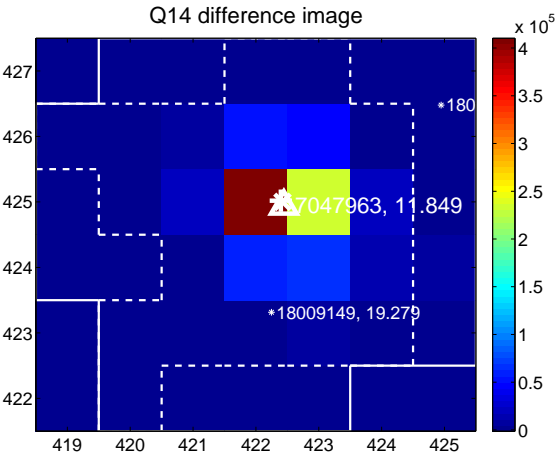
Q13 no difference image



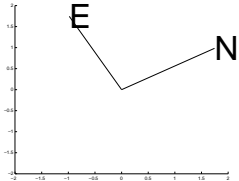
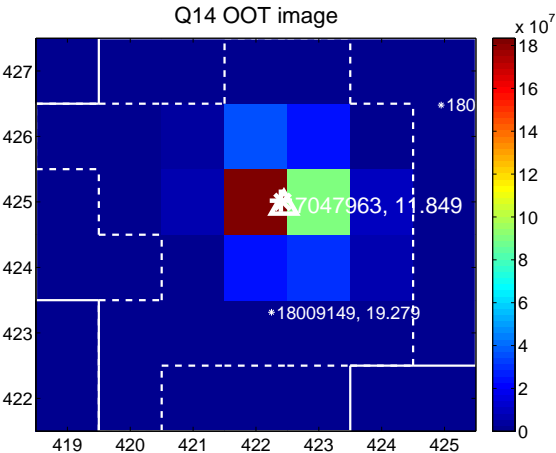
Q13 no OOT image



Q14 difference image



Q14 OOT image



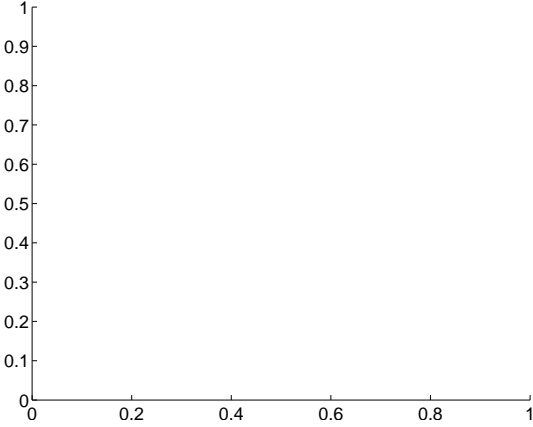
Q15 no difference image



Q15 no OOT image



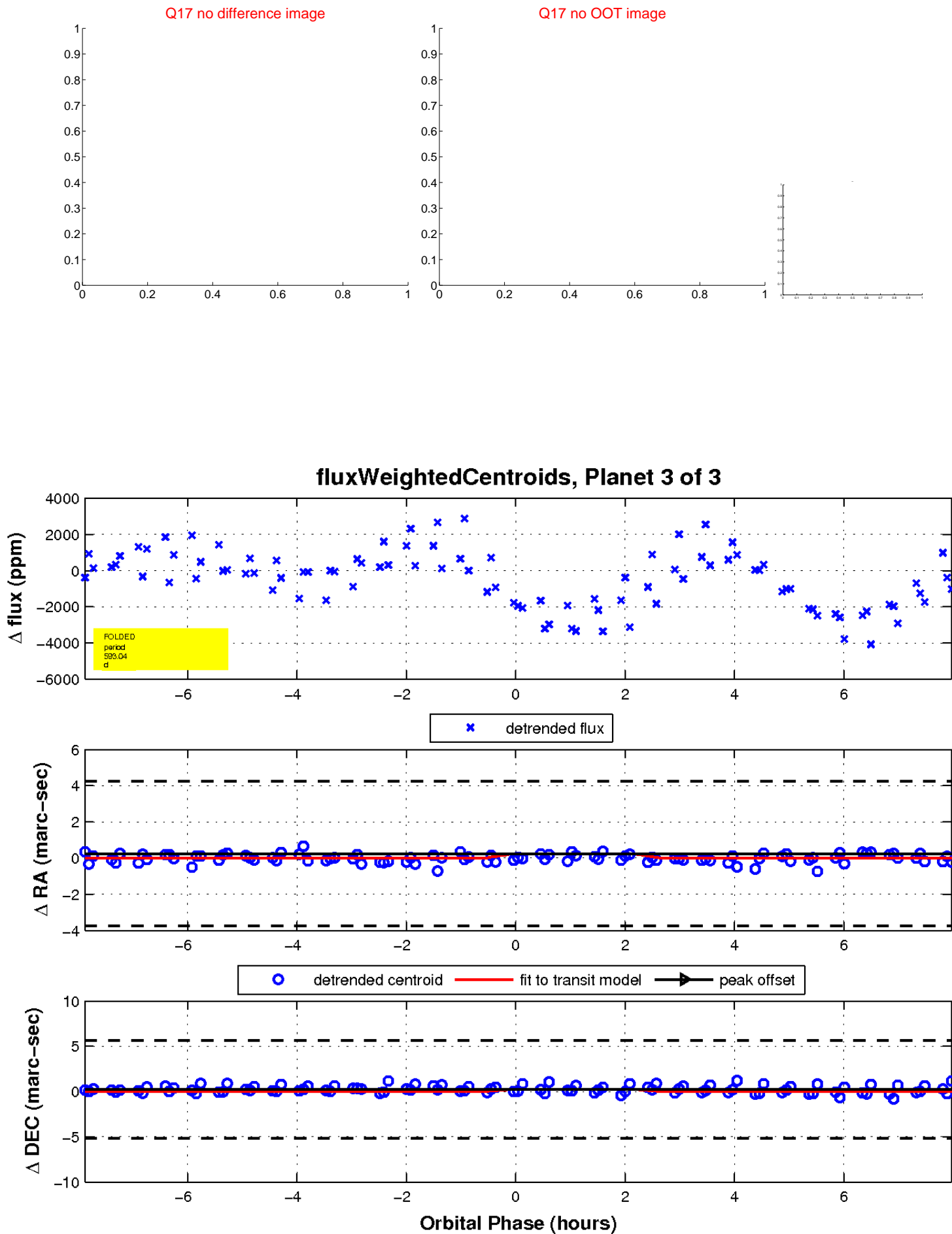
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

