

# KIC 007107311

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007107311-01	OBS	No	362.322892	391.994149	1750.7	4.574	11.9	10.8	0.79	6084	4.30	0.85
007107311-02	OBS	No	447.486769	375.132032	1381.5	4.277	12.6	6.8	0.79	6084	3.48	0.64
007107311-03	OBS	No	0.734570	131.588908	67.0	5.838	7.6	10.4	0.79	6084	0.65	3298.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007107311-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_NOFITS
007107311-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007107311-03	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT

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

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

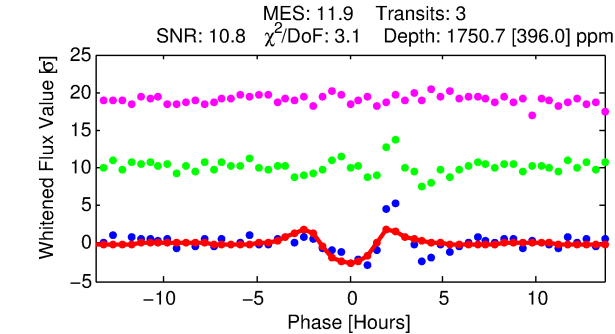
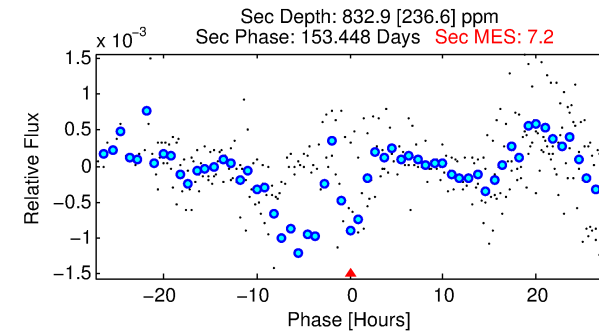
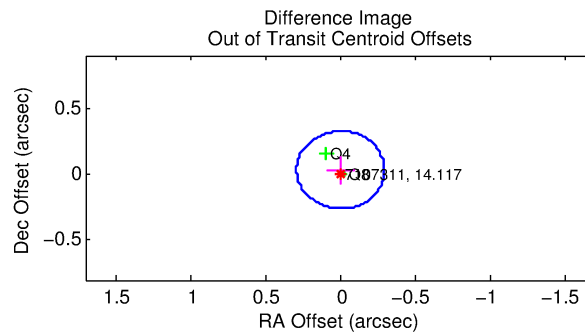
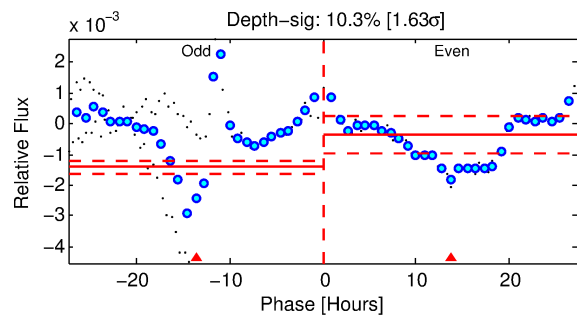
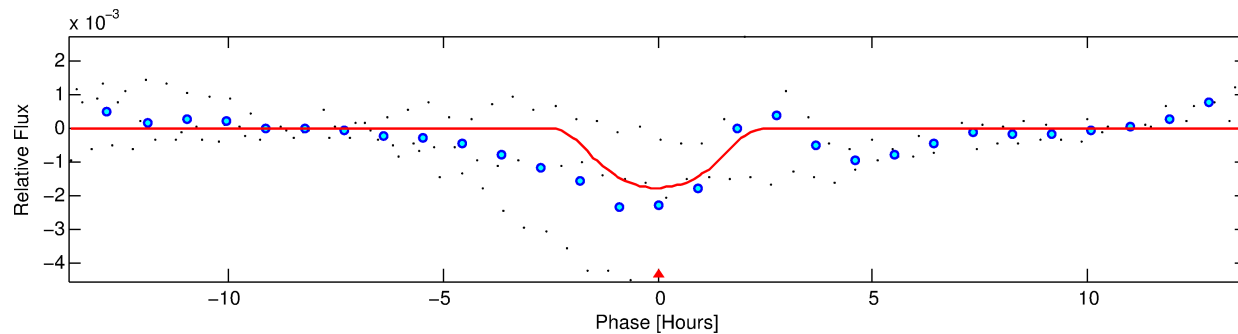
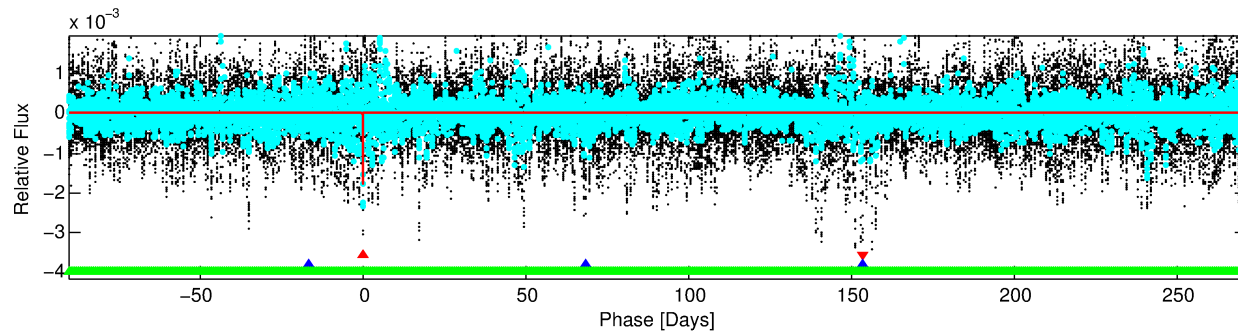
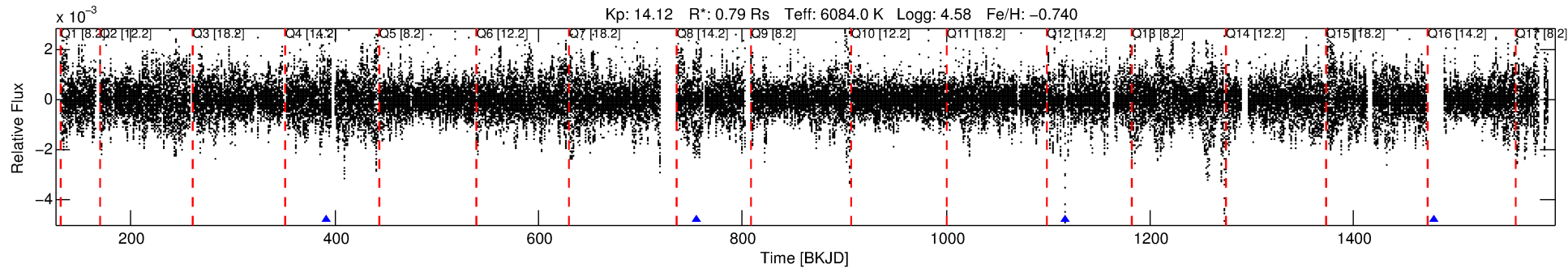
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007107311-01

No Significant Match Found

# DV One-Page Summary

KIC: 7107311 Candidate: 1 of 3 Period: 362.323 d



## DV Fit Results:

Period = 362.32289 [0.00742] d  
Epoch = 391.9941 [0.0080] BKJD  
Rp/R\* = 0.0500 [0.0155]  
a/R\* = 258.32 [56.67]  
b = 0.96 [0.04]  
Seff = 0.85 [0.30]  
Teq = 245 [22] K  
Rp = 4.30 [1.72] Re  
a = 0.9502 [0.2101] AU  
Ag = 22359.69 [16979.23] [1.32 $\sigma$ ]  
**Teff = 4624 [801] K [5.46 $\sigma$ ]**

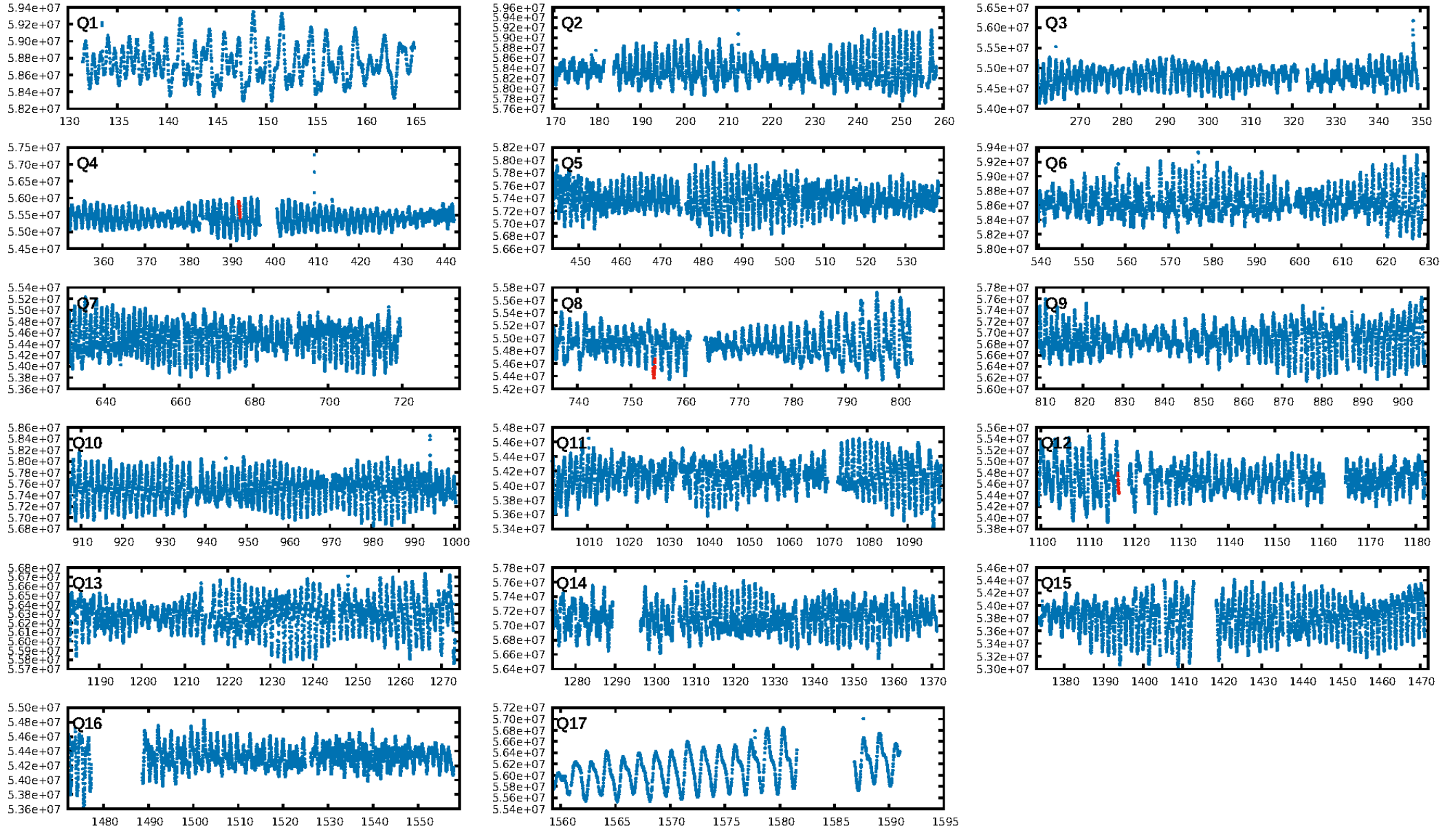
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1170.16 $\sigma$ ]  
LongPeriod-sig: 100.0% [326.39 $\sigma$ ]  
**ModelChiSquare2-sig: 0.0%**  
**ModelChiSquareGof-sig: 0.0%**  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -1.153  
Centroid-sig: 2.3%  
Centroid-so: 0.711 arcsec [1.85 $\sigma$ ]  
OotOffset-rm: 0.032 arcsec [0.33 $\sigma$ ]  
OotOffset-st: 0/0/2/0 [2]  
KicOffset-rm: 0.109 arcsec [1.10 $\sigma$ ]  
KicOffset-st: 0/0/2/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.00 [0/2]

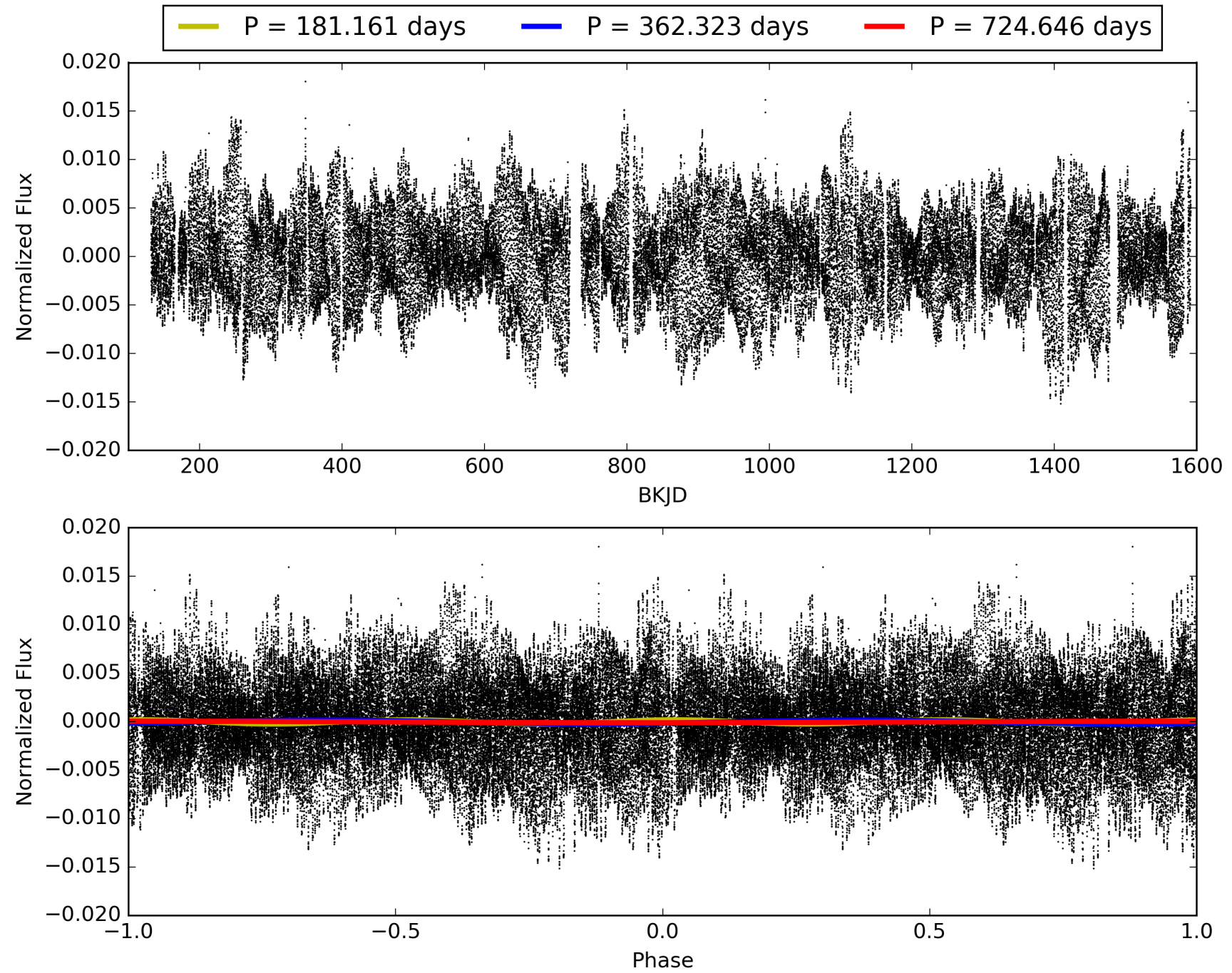
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 20:06:24 Z

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

# TCE 007107311-01, PDC Light Curves

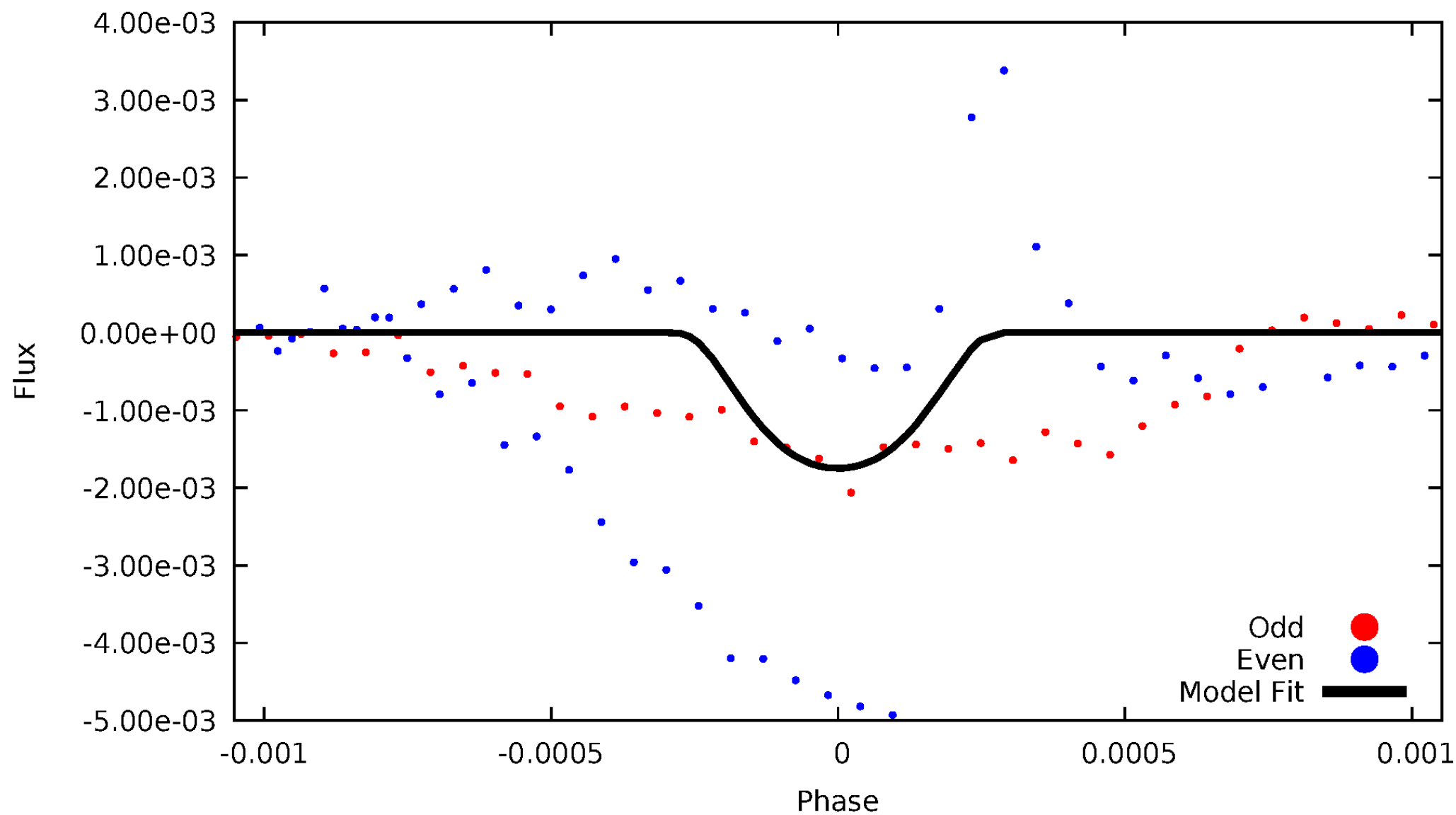


TCE 007107311-01



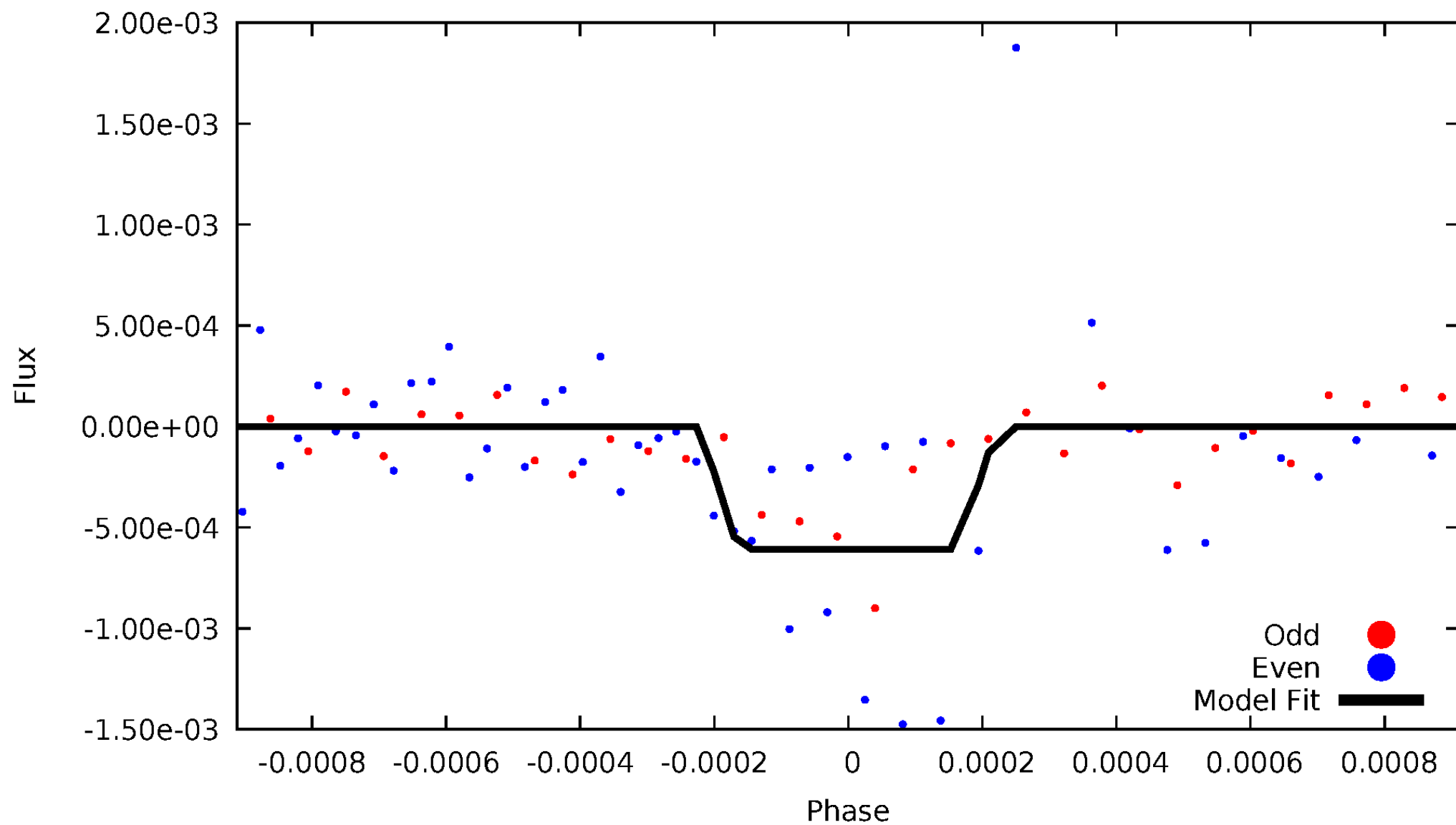
# DV Odd/Even

TCE 007107311-01



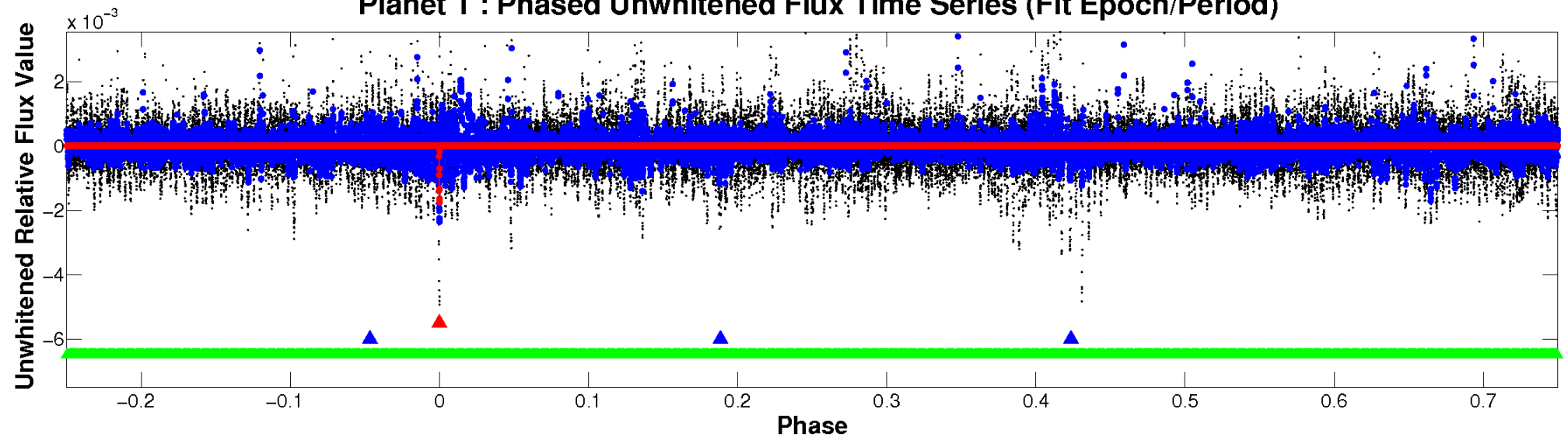
# ALT Odd/Even

TCE 007107311-01

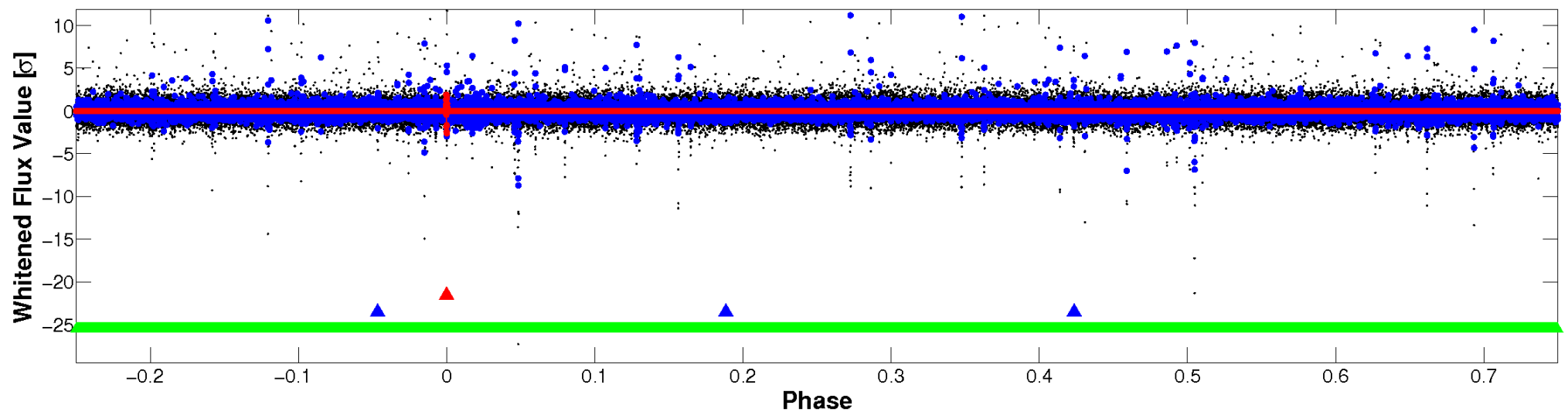


# Non-Whitened Vs. Whitened Light Curve

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



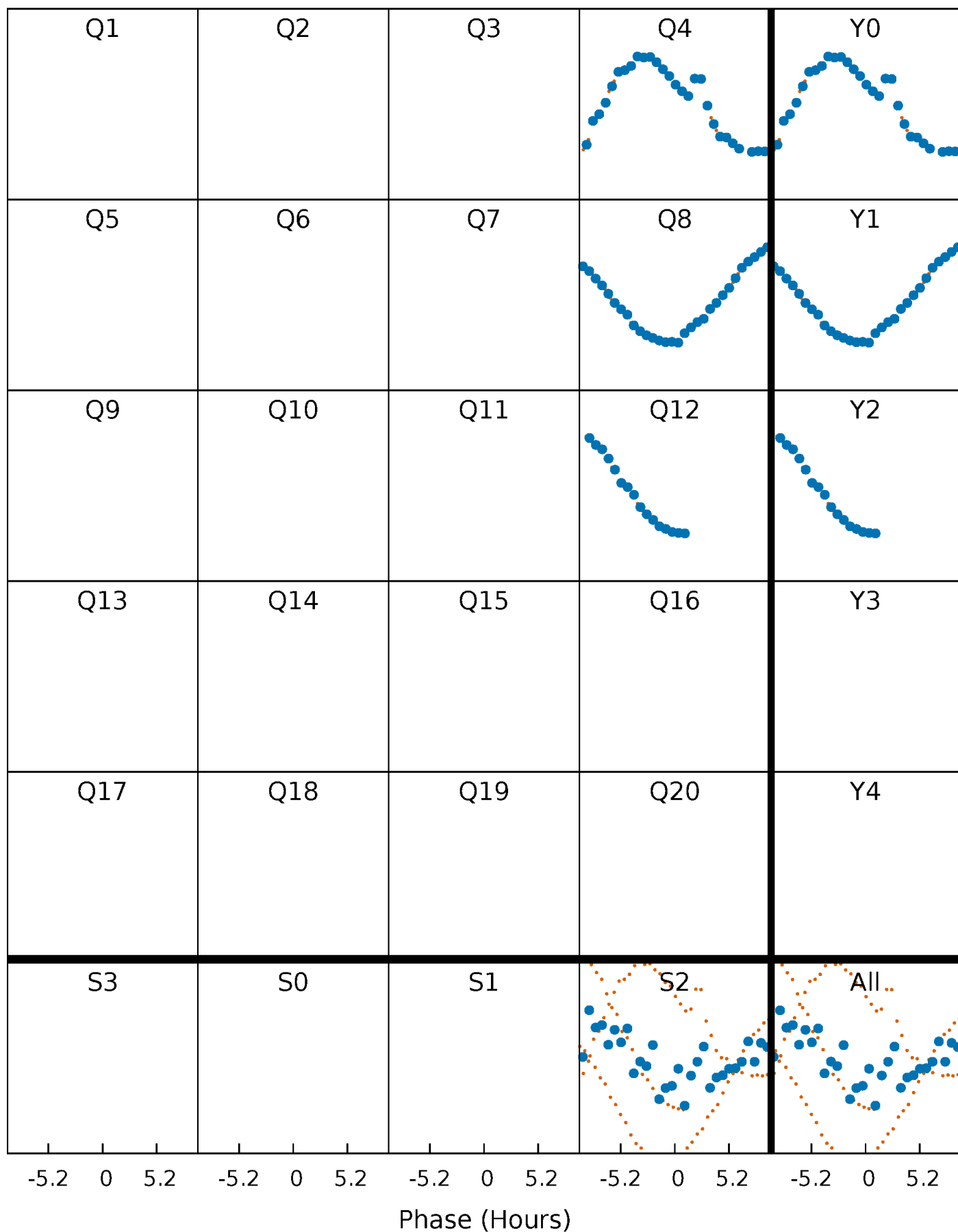
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

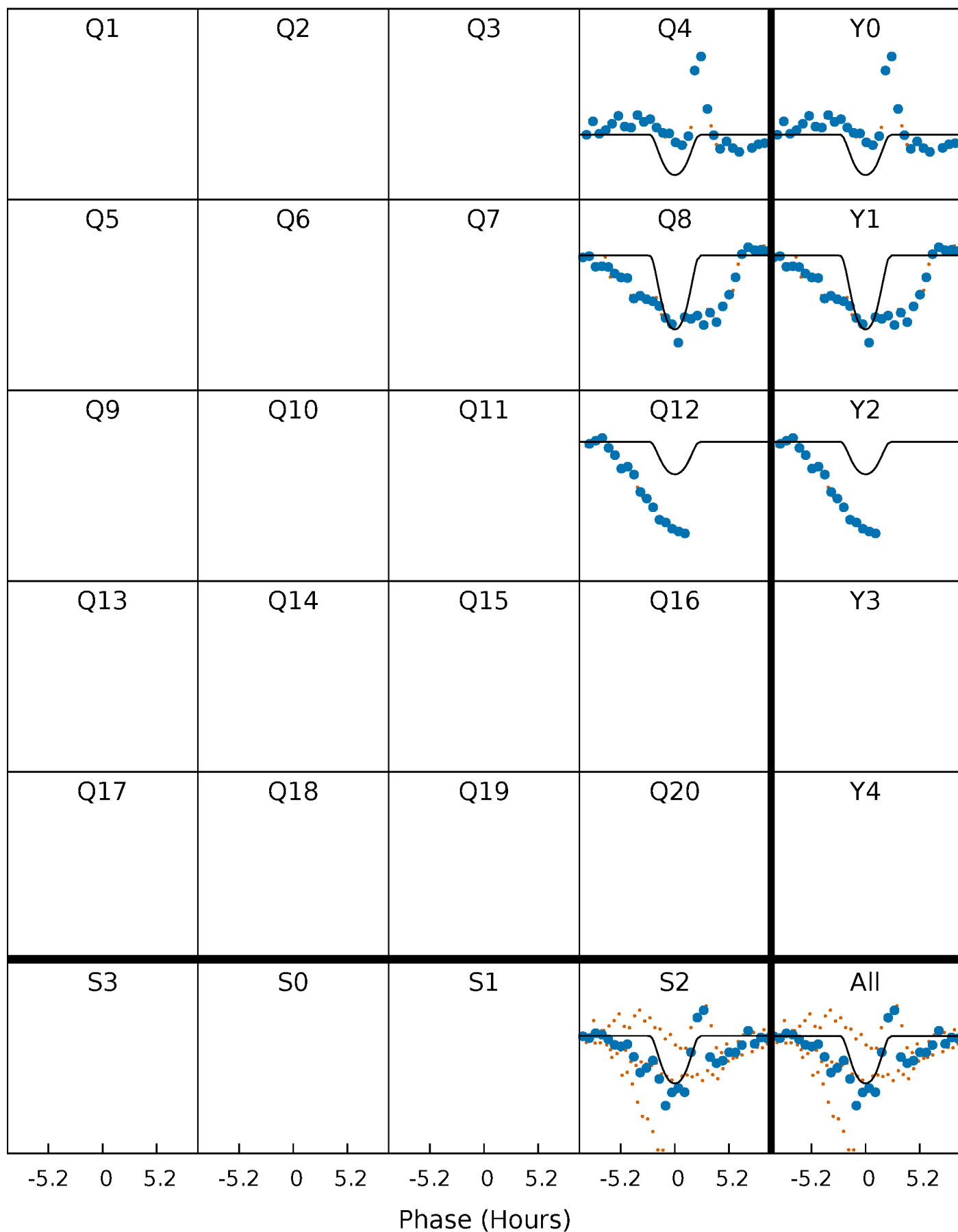
TCE 007107311-01 P=362.322892 Days  $T_0=391.994149$  (BKJD)





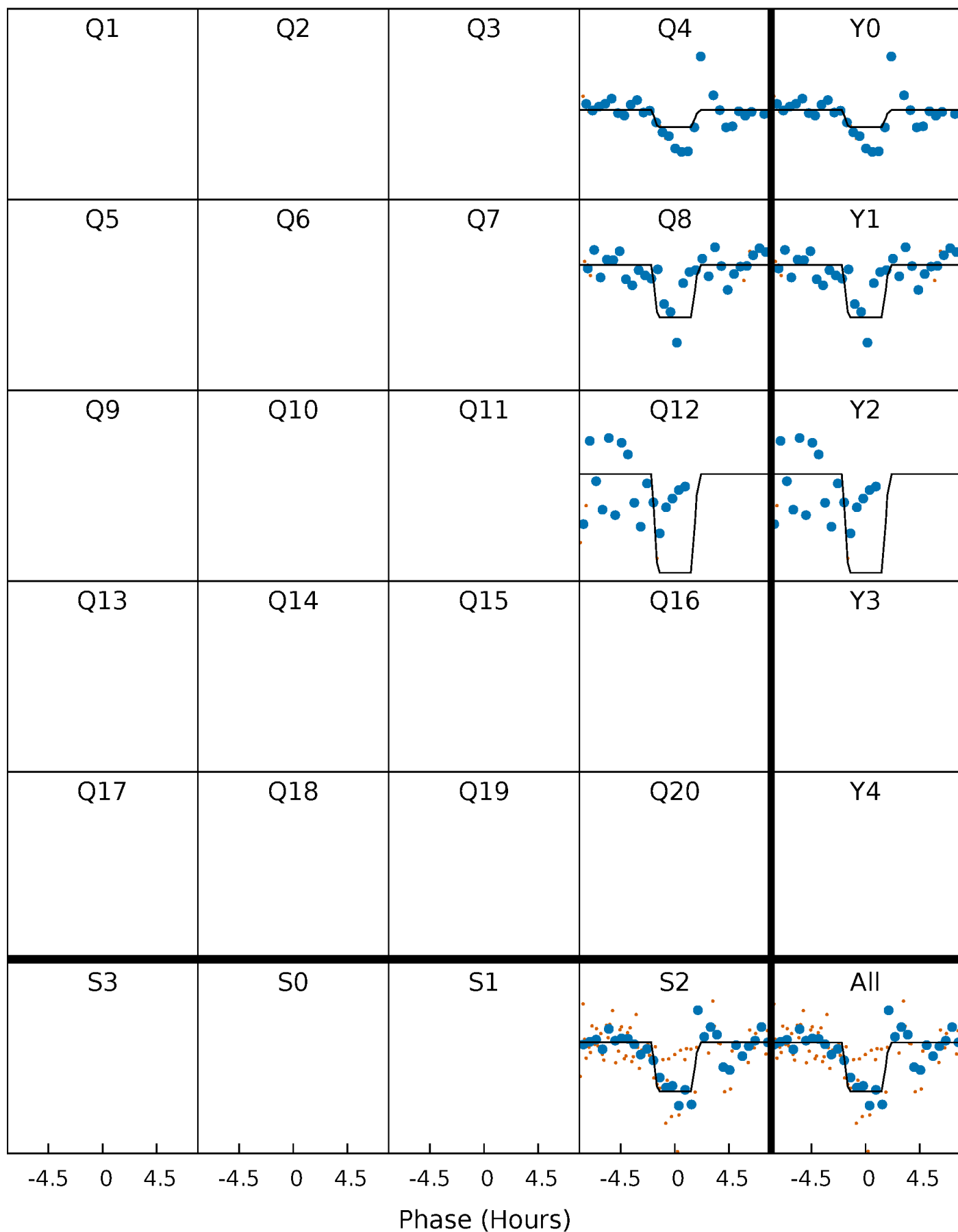
# DV Quarter-Phased Transit Curves

TCE 007107311-01 P=362.322892 Days  $T_0=391.994149$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

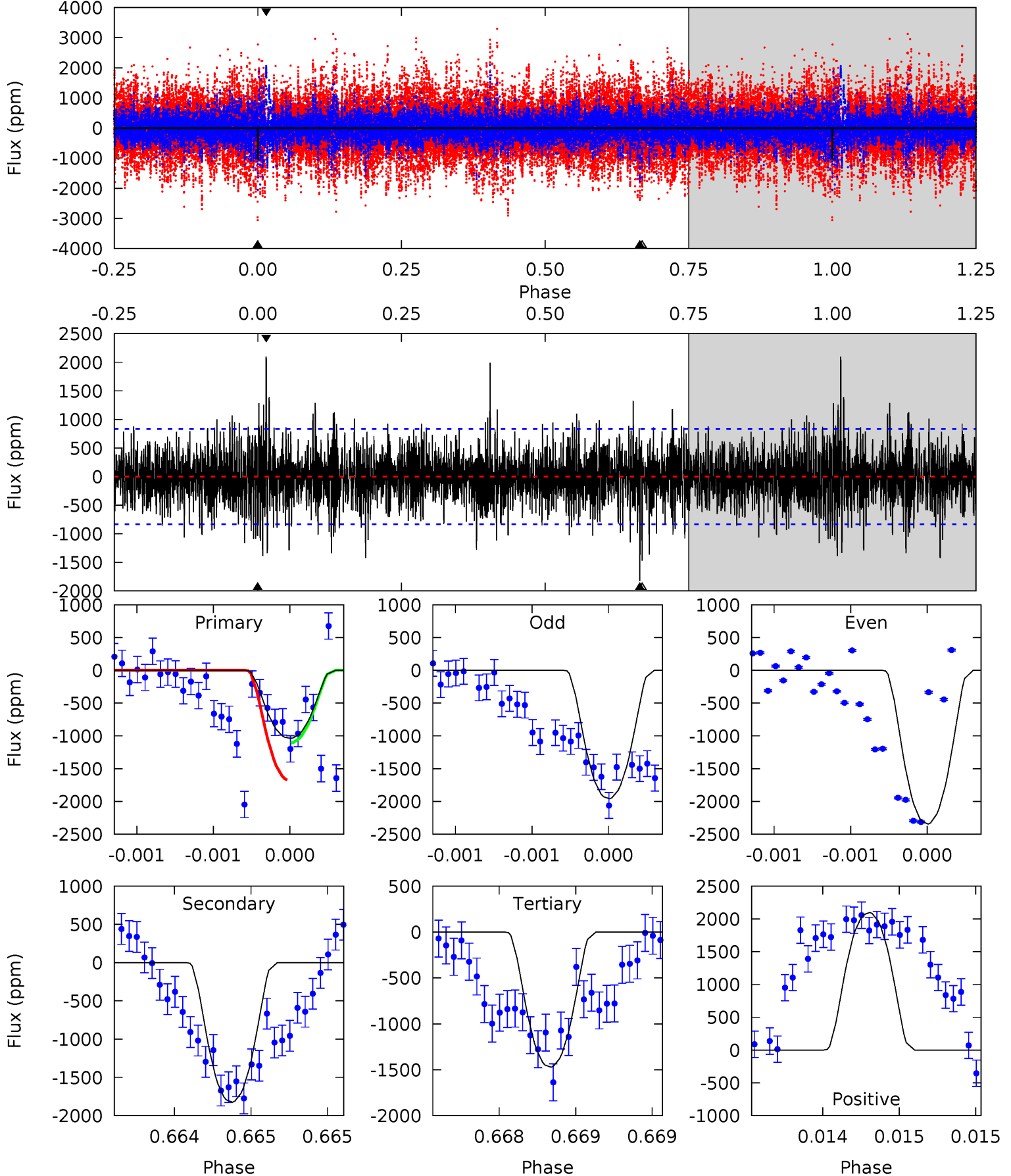
TCE 007107311-01 P=362.323186 Days  $T_0=391.987716$  (BKJD)



# DV Model-Shift Uniqueness Test

007107311-01, P = 362.322892 Days, E = 29.671257 Days

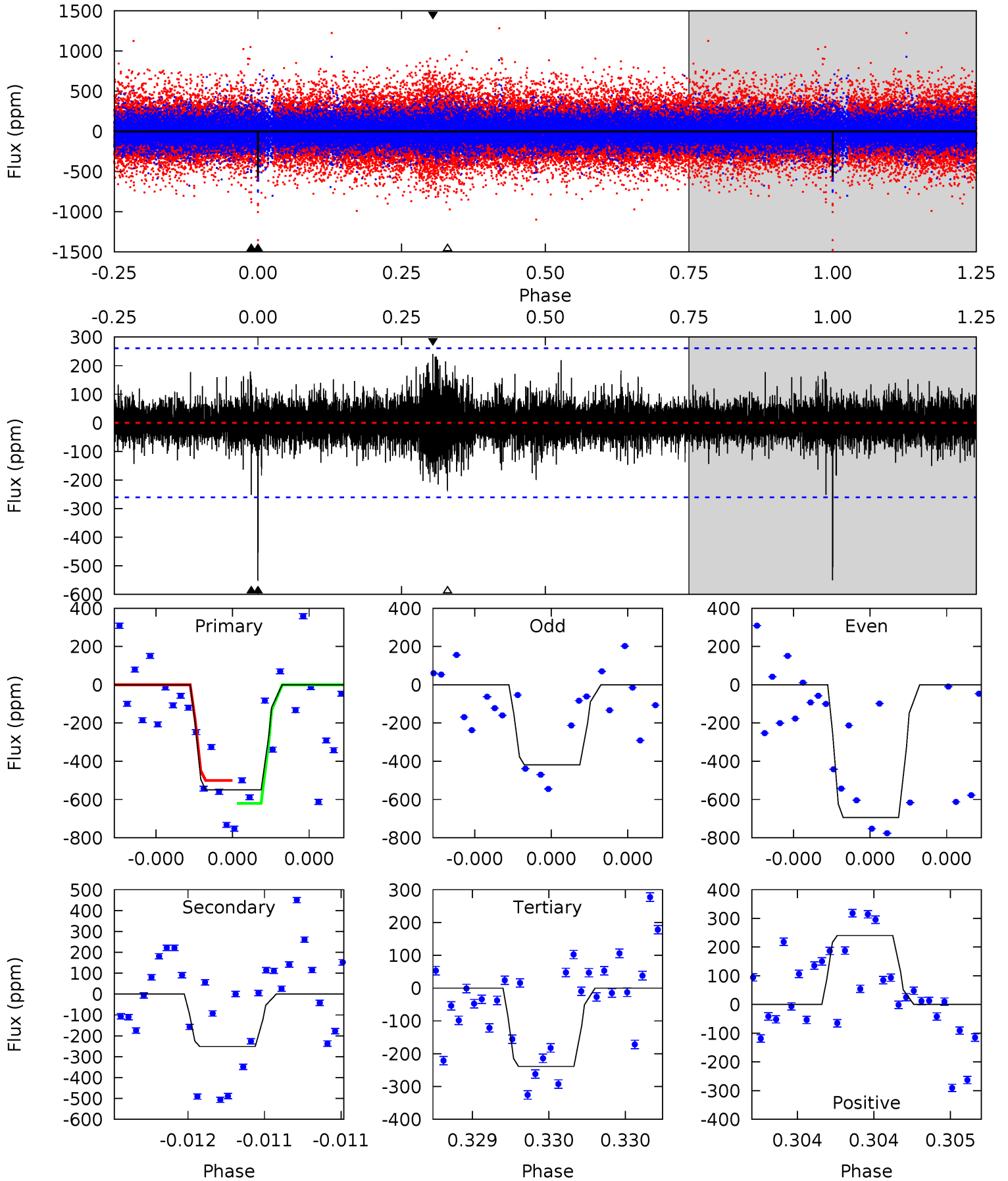
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.95	12.2	9.86	14.1	5.57	3.48	2.37	-2.91	-7.10	2.35	-1.84	1.37	1.27	0.54	1.96



# Alt Model-Shift Uniqueness Test

007107311-01, P = 362.323186 Days, E = 29.664530 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	5.40	5.14	5.17	5.61	3.53	1.00	6.70	6.66	0.26	0.23	2.87	1.40	0.30	1.26



### Stellar Parameters For KIC 007107311

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6084^{+164}_{-182}$	$4.584^{+0.033}_{-0.187}$	$-0.740^{+0.300}_{-0.300}$	$0.789^{+0.199}_{-0.062}$	$0.875^{+0.081}_{-0.097}$	$2.508^{+0.450}_{-1.209}$
	+3%/-3%	+1%/-4%	+41%/-41%	+25%/-8%	+9%/-11%	+18%/-48%
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 007107311-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1824 \pm 149$	$4.53^{+1.65}_{-1.45}$	$351^{+21}_{-15}$	$5658^{+1134}_{-679}$	$43606^{+48937}_{-20247}$
Alt.	$-251 \pm 46$	$2.28^{+1.43}_{-1.19}$	$350^{+22}_{-16}$	$4871^{+2197}_{-791}$	$22659^{+84533}_{-13943}$

$T_{max}$  = 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

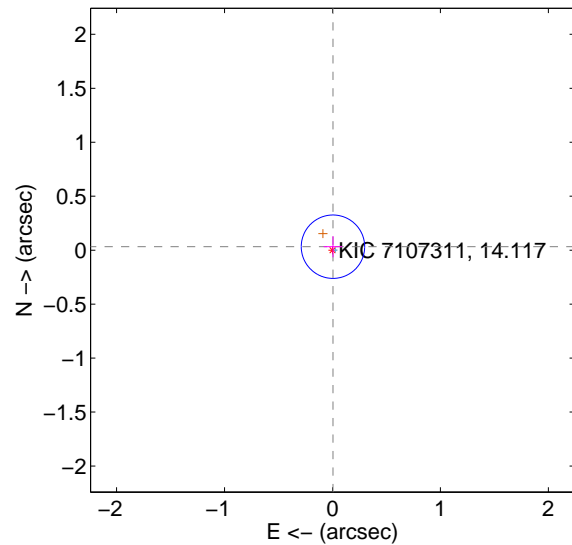
Supplemental centroid analysis for 007107311-01. Kepler magnitude: 14.12. Transit SNR 10.80

There are 1 quarters with good PRF difference image offsets

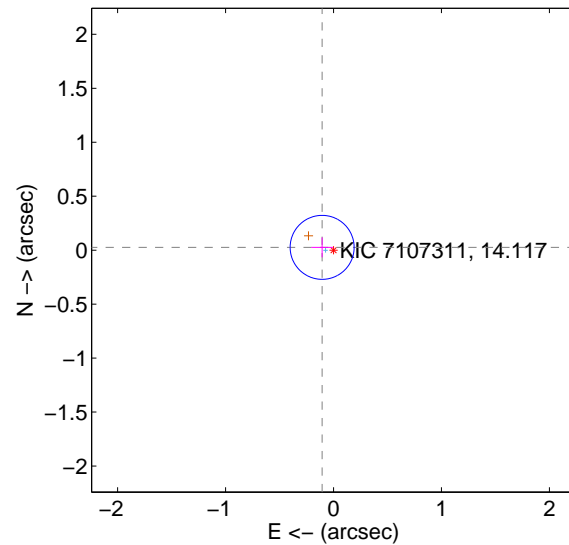
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.032 \pm 0.098$	0.33	$-0.005 \pm 0.086$	$0.032 \pm 0.098$
PRF-fit source offset from KIC position	$0.109 \pm 0.099$	1.10	$0.105 \pm 0.099$	$0.026 \pm 0.092$
photometric centroid source offset	$0.71 \pm 0.39$	1.85	$0.55 \pm 0.41$	$-0.45 \pm 0.35$

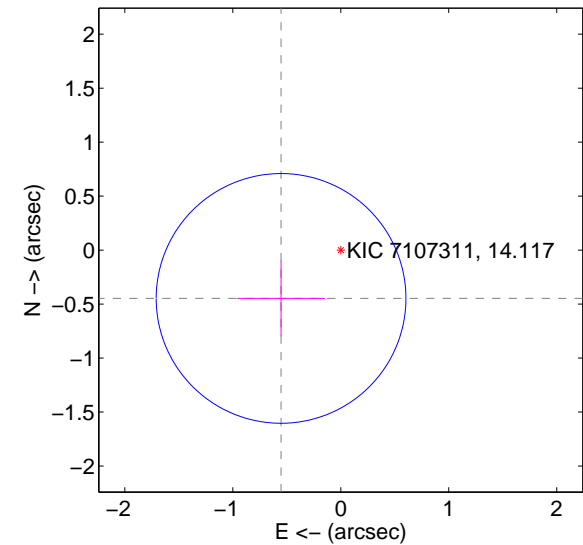
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

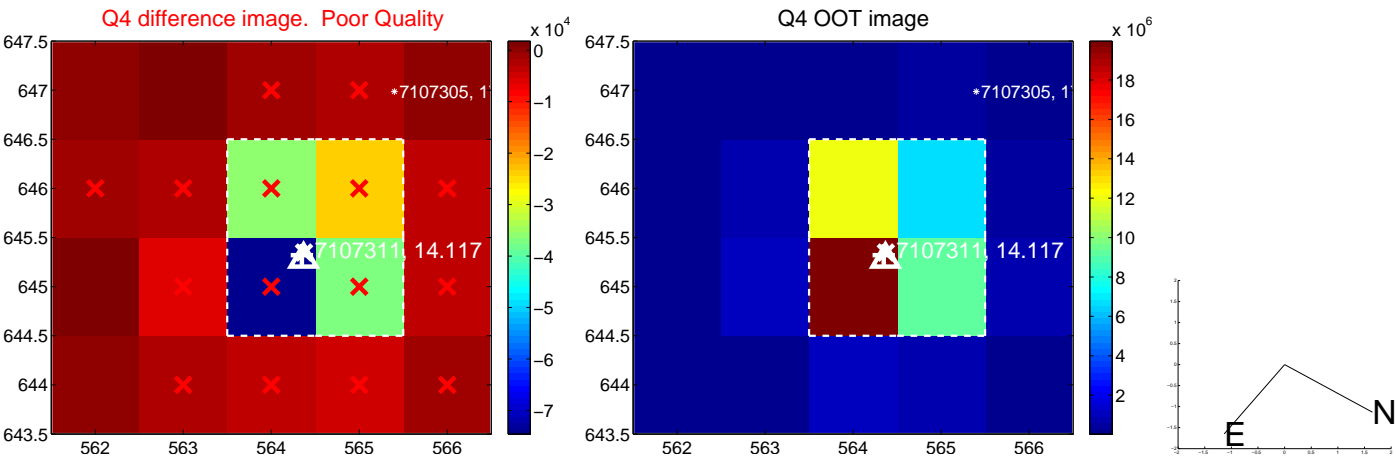
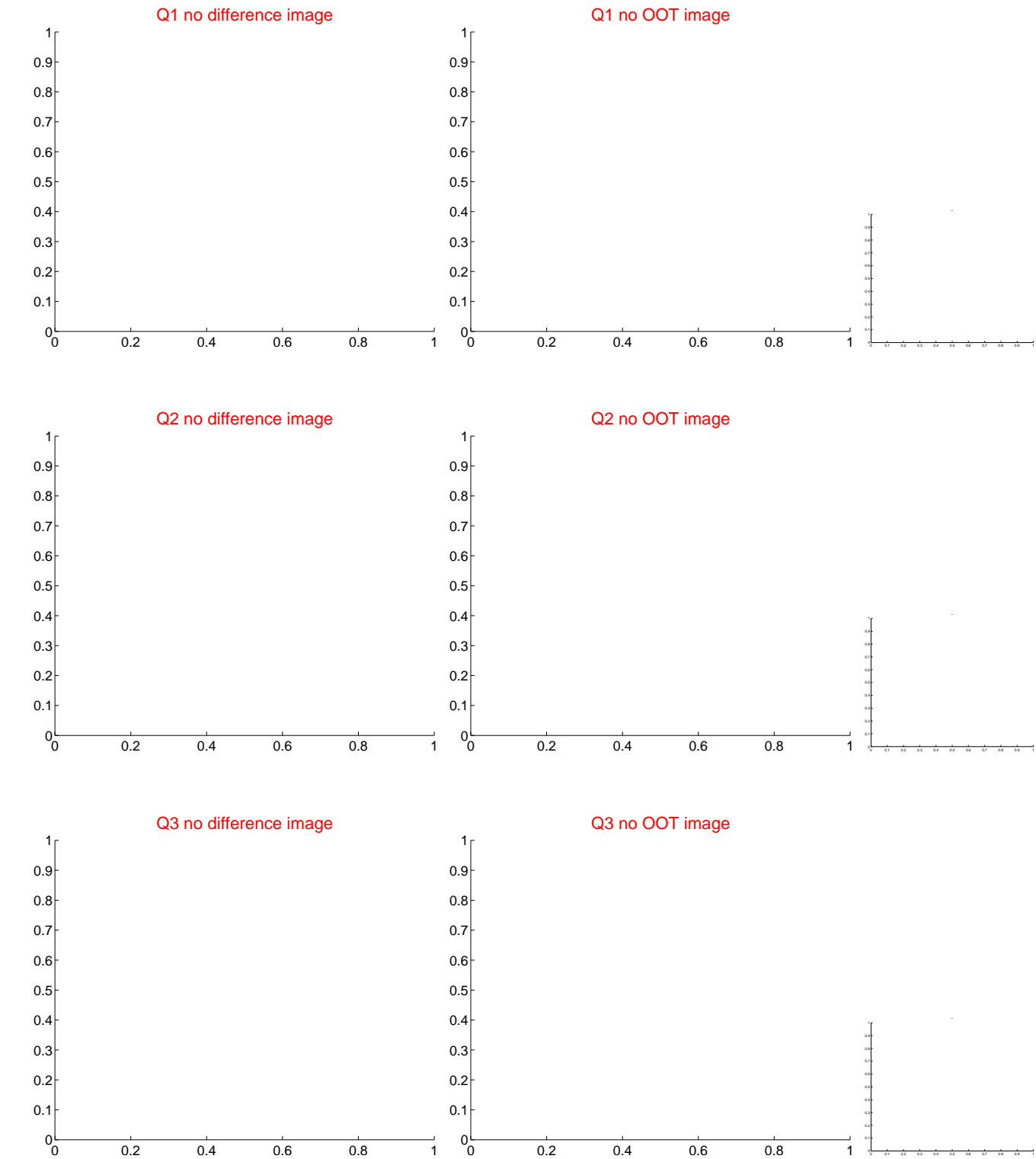


offset from photometric centroids



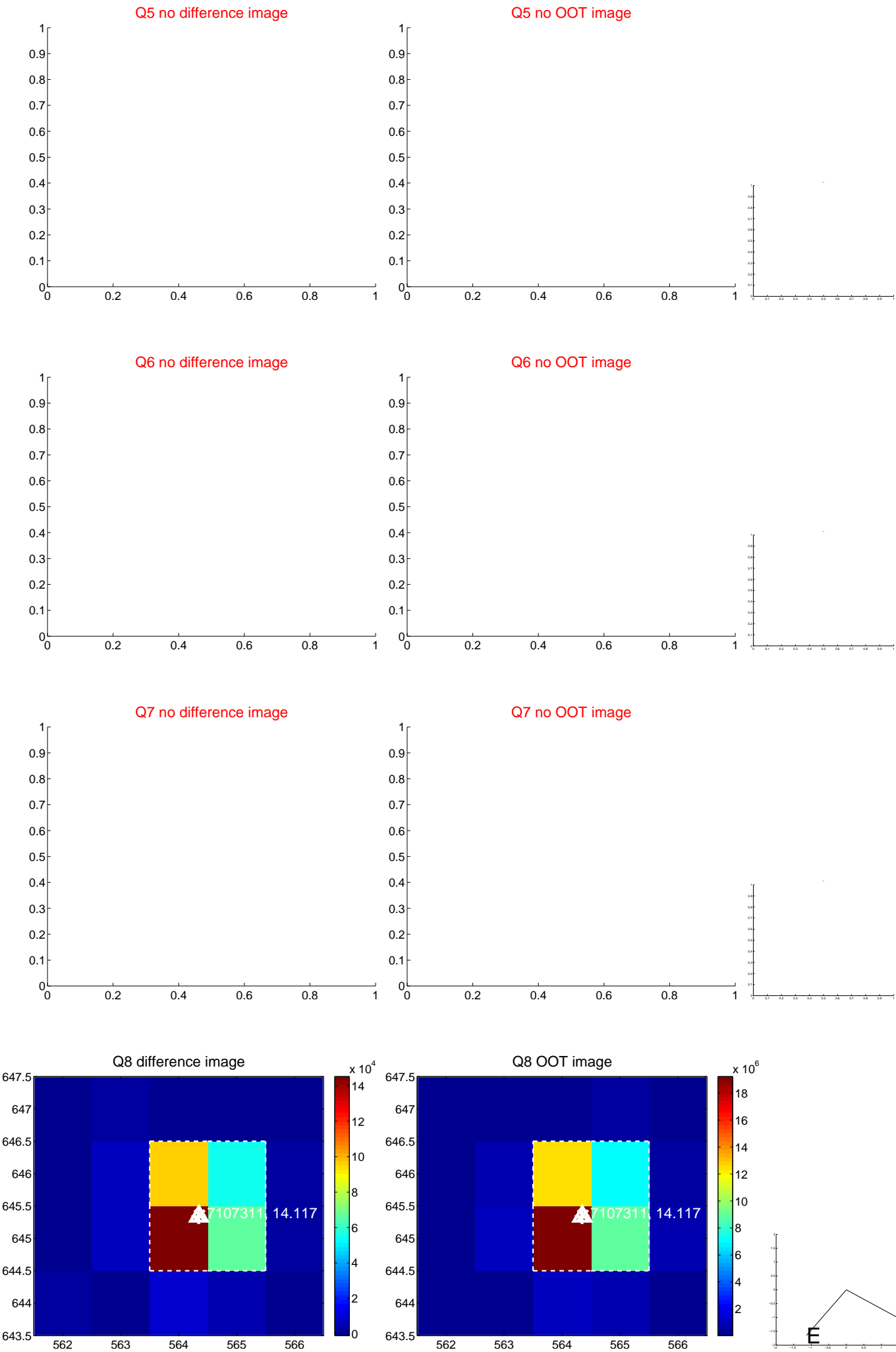
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



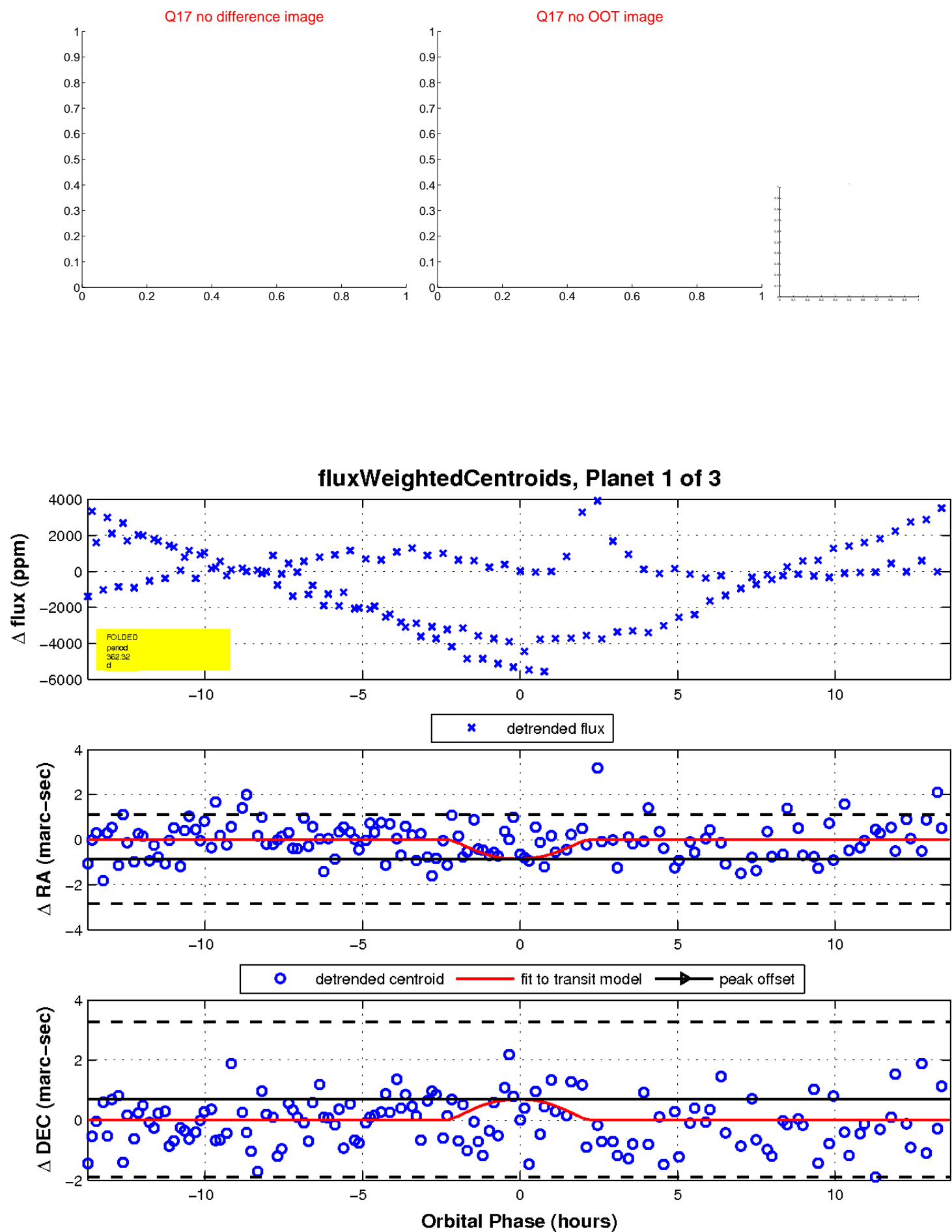
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

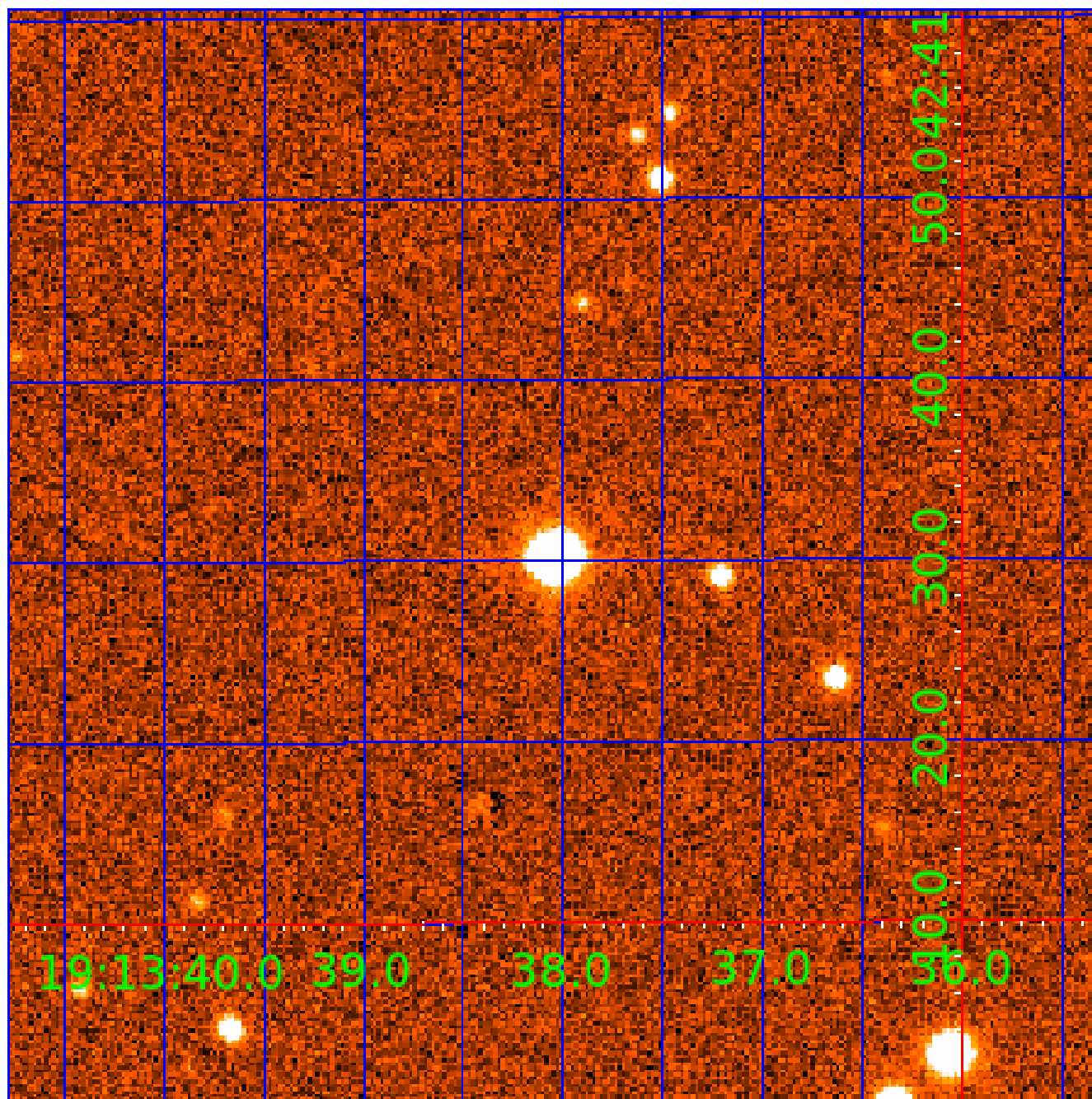


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 007107311

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007107311-01	OBS	No	362.322892	391.994149	1750.7	4.574	11.9	10.8	0.79	6084	4.30	0.85
007107311-02	OBS	No	447.486769	375.132032	1381.5	4.277	12.6	6.8	0.79	6084	3.48	0.64
007107311-03	OBS	No	0.734570	131.588908	67.0	5.838	7.6	10.4	0.79	6084	0.65	3298.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007107311-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_NOFITS
007107311-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007107311-03	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT

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

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

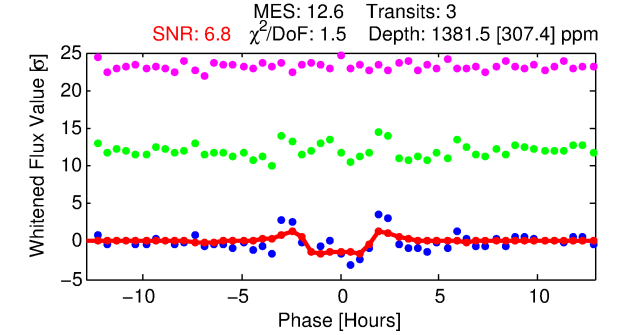
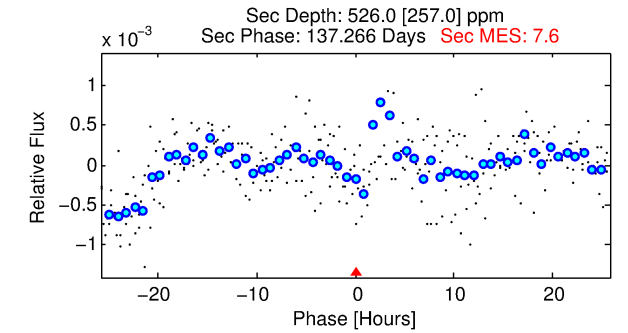
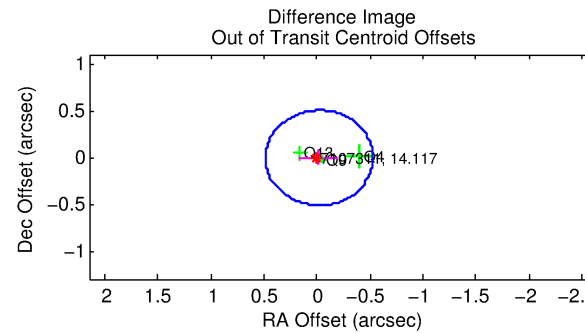
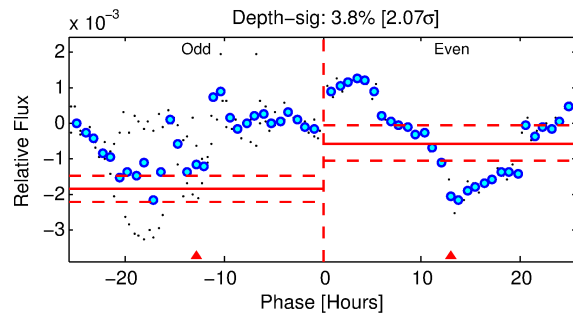
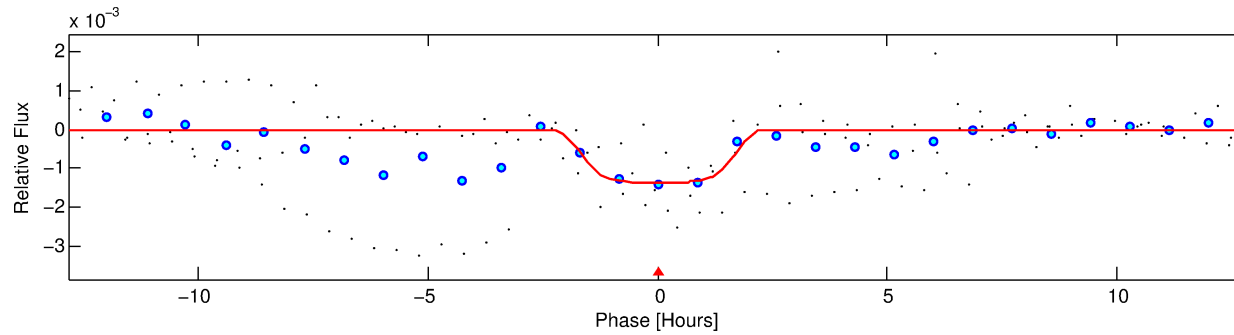
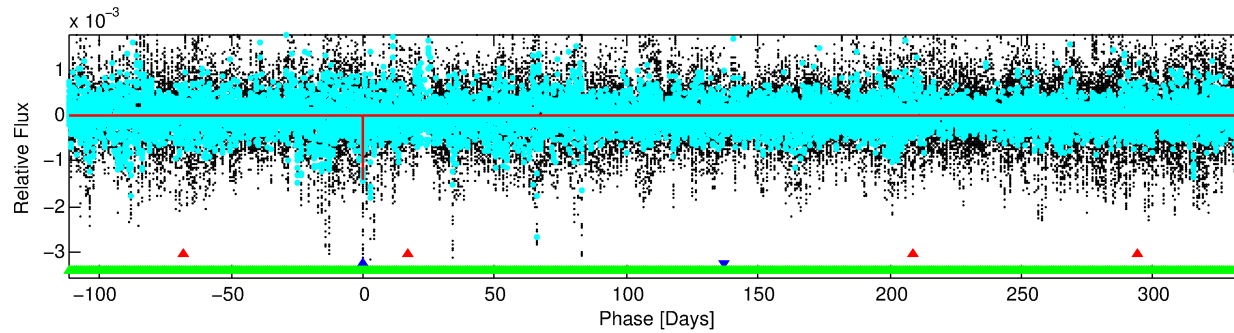
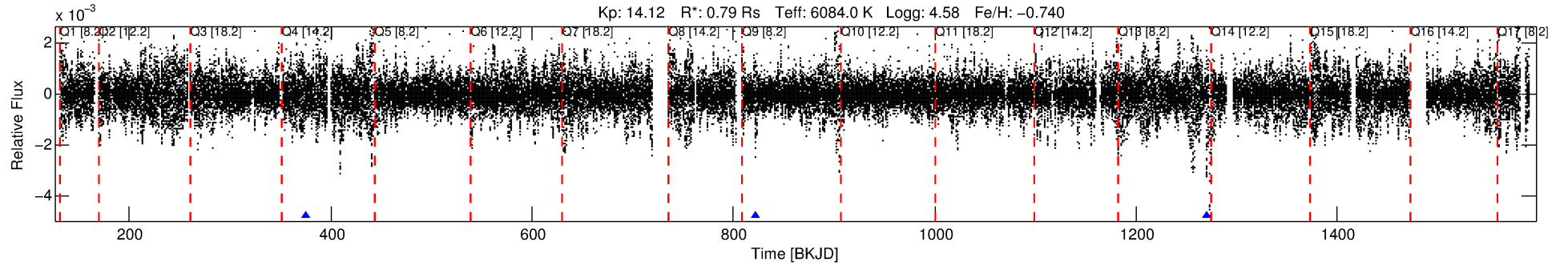
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007107311-02

No Significant Match Found

# DV One-Page Summary

KIC: 7107311 Candidate: 2 of 3 Period: 447.487 d



## DV Fit Results:

Period = 447.48677 [0.00542] d  
Epoch = 375.1320 [0.0077] BKJD  
Rp/R\* = 0.0405 [0.0062]  
a/R\* = 397.27 [153.48]  
b = 0.91 [0.07]  
Seff = 0.64 [0.23]  
Teq = 228 [20] K  
Rp = 3.48 [1.03] Re  
a = 1.0938 [0.2418] AU  
Ag = 28542.94 [19005.67] [1.50 $\sigma$ ]  
Teffp = 4581 [675] K [6.45 $\sigma$ ]

## DV Diagnostic Results:

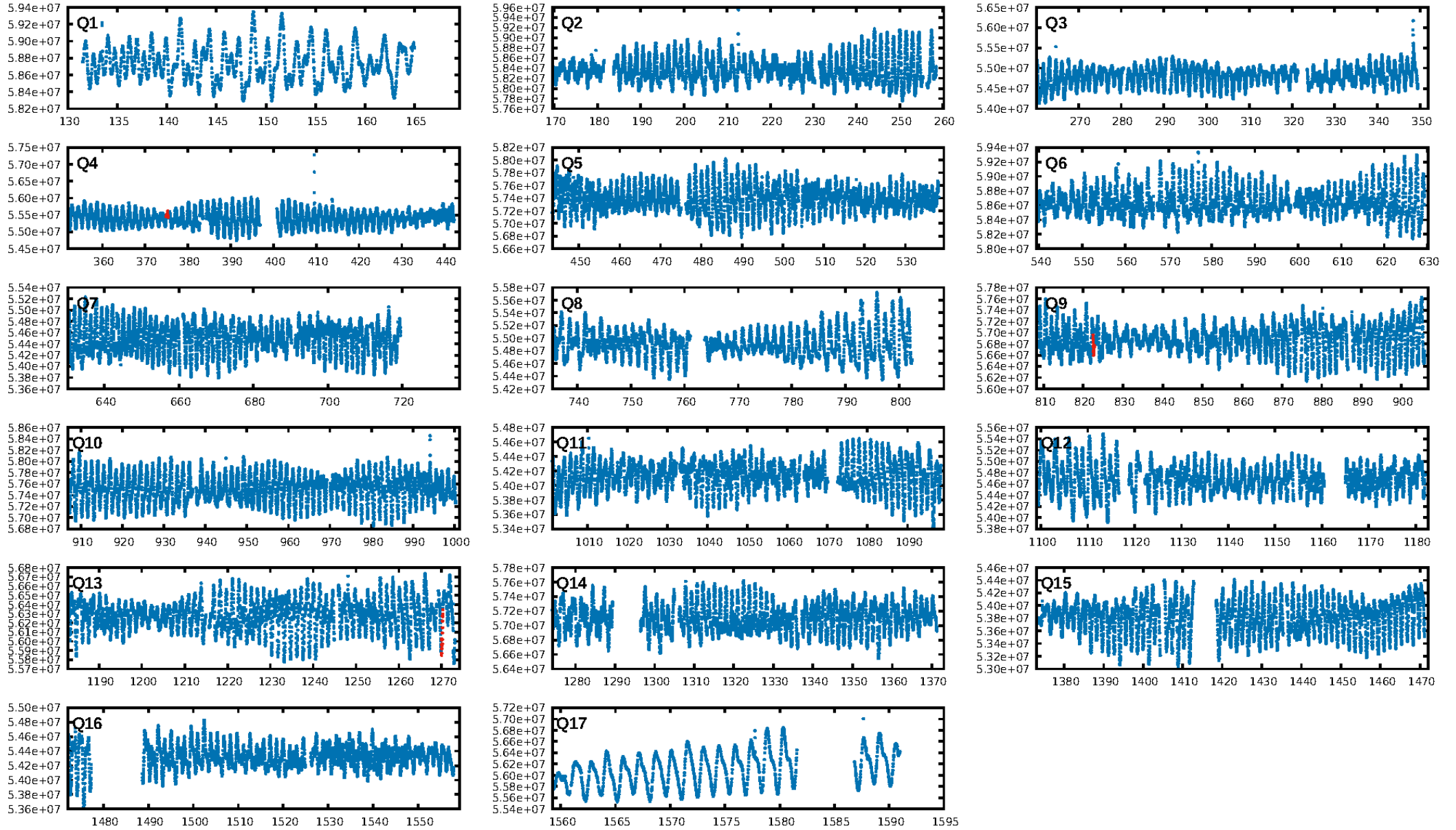
ShortPeriod-sig: 100.0% [326.39 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 23.1%  
ModelChiSquareGof-sig: 44.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.099  
Centroid-sig: 57.0%  
Centroid-so: 0.312 arcsec [0.66 $\sigma$ ]  
OotOffset-rm: 0.020 arcsec [0.12 $\sigma$ ]  
OotOffset-st: 0/0/1/2 [3]  
KicOffset-rm: 0.057 arcsec [0.46 $\sigma$ ]  
KicOffset-st: 0/0/1/2 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 20:06:40 Z

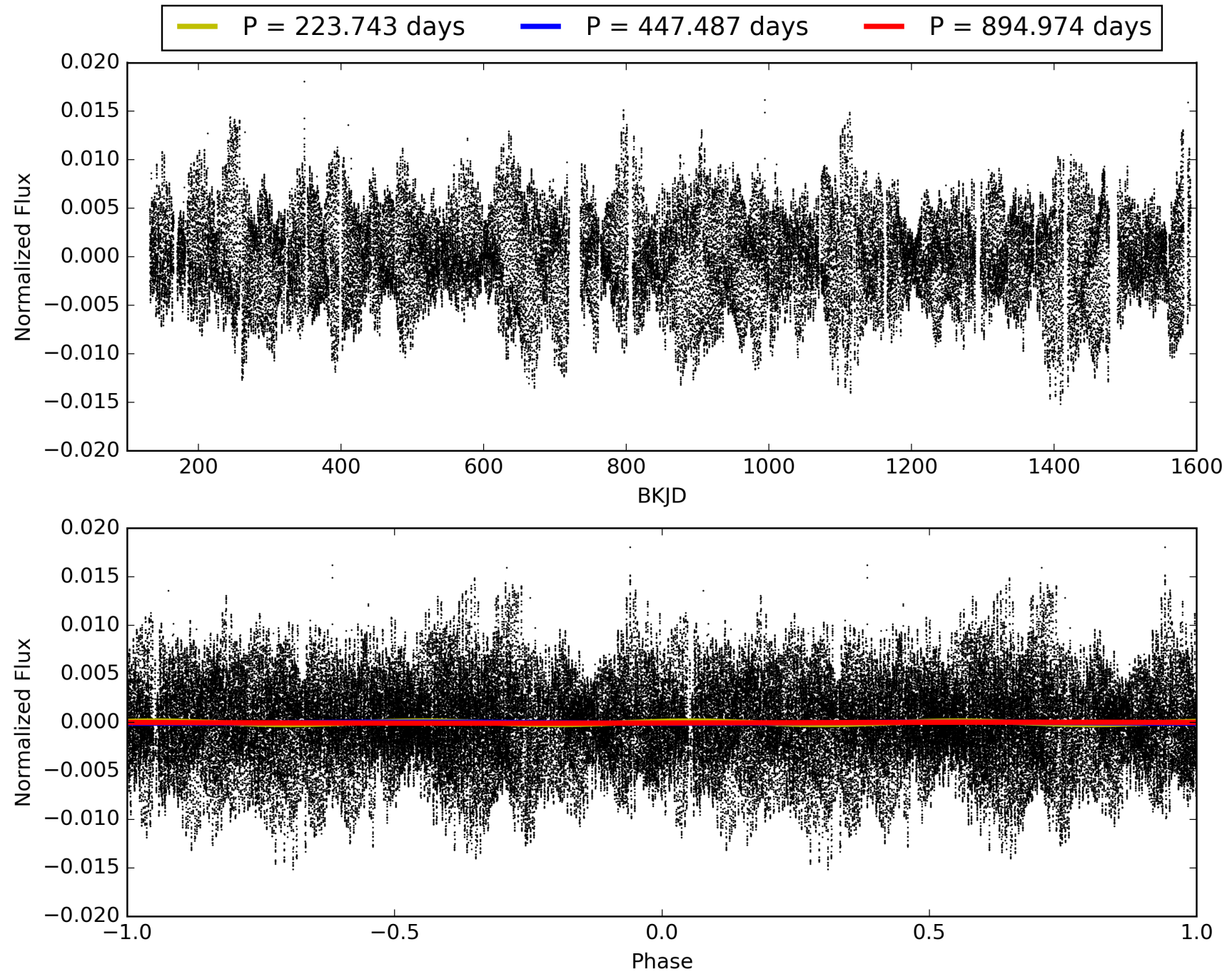
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007107311-02, PDC Light Curves

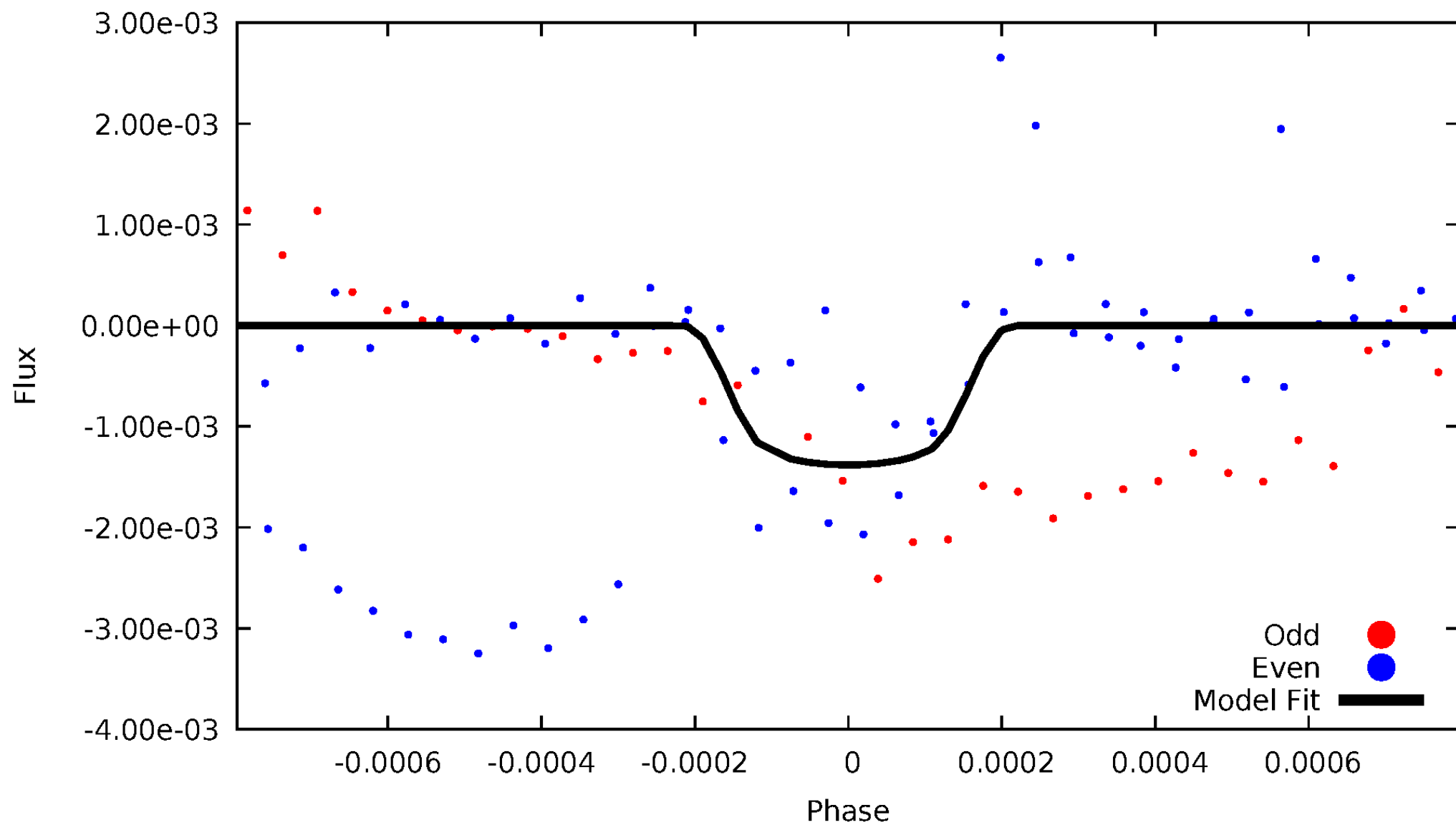


TCE 007107311-02



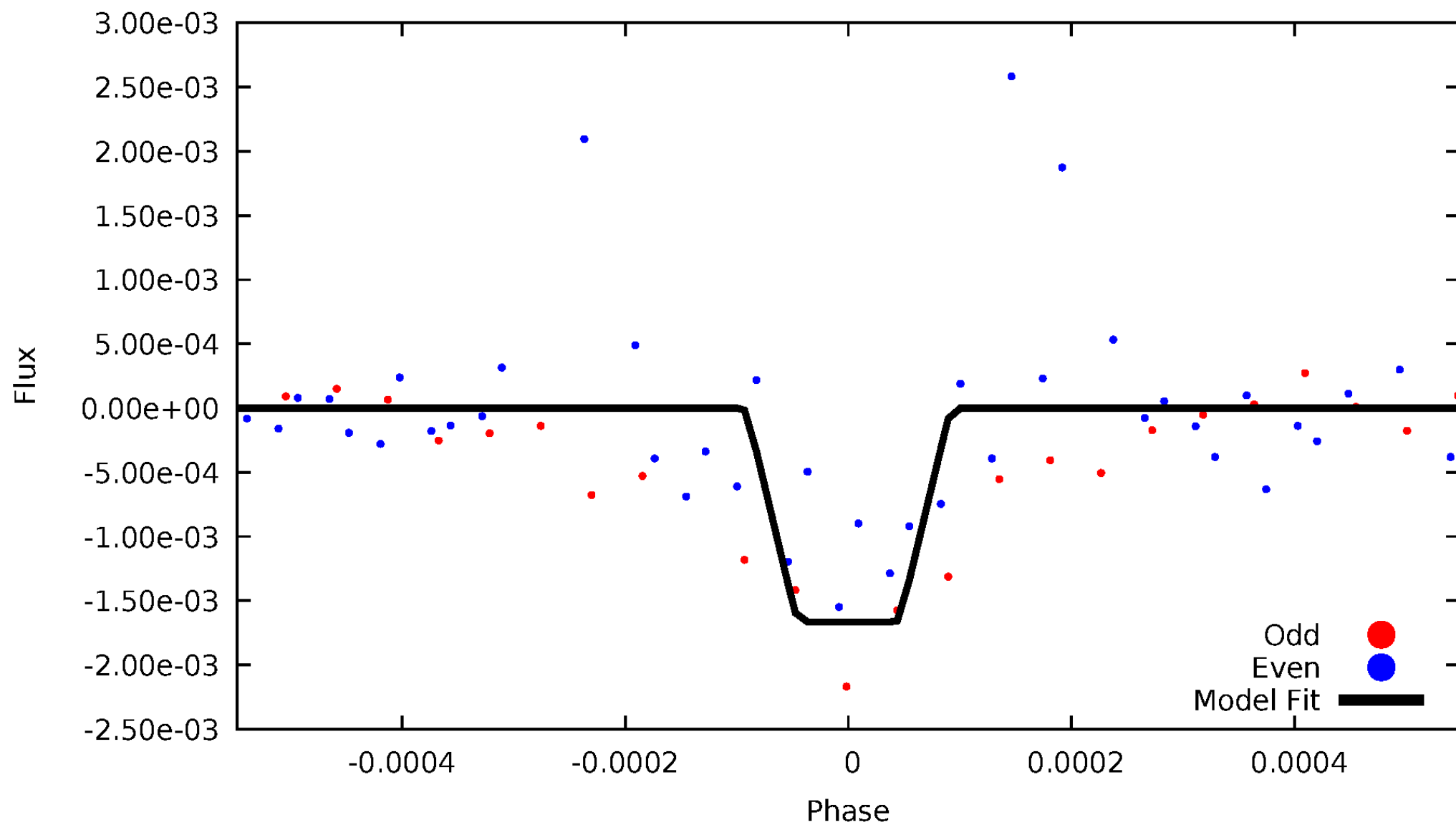
# DV Odd/Even

TCE 007107311-02



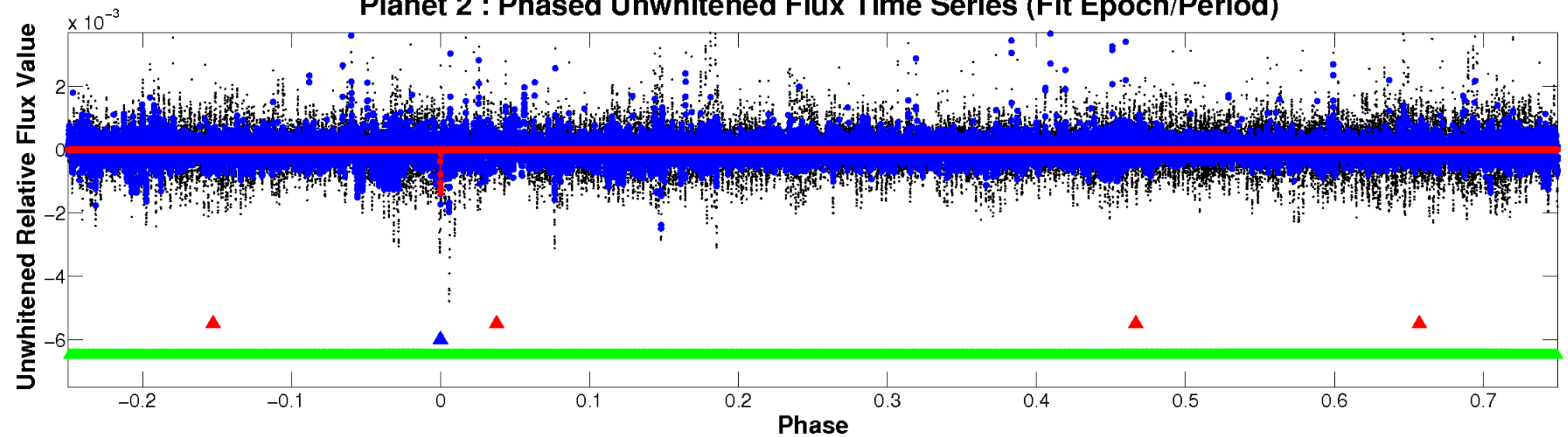
# ALT Odd/Even

TCE 007107311-02

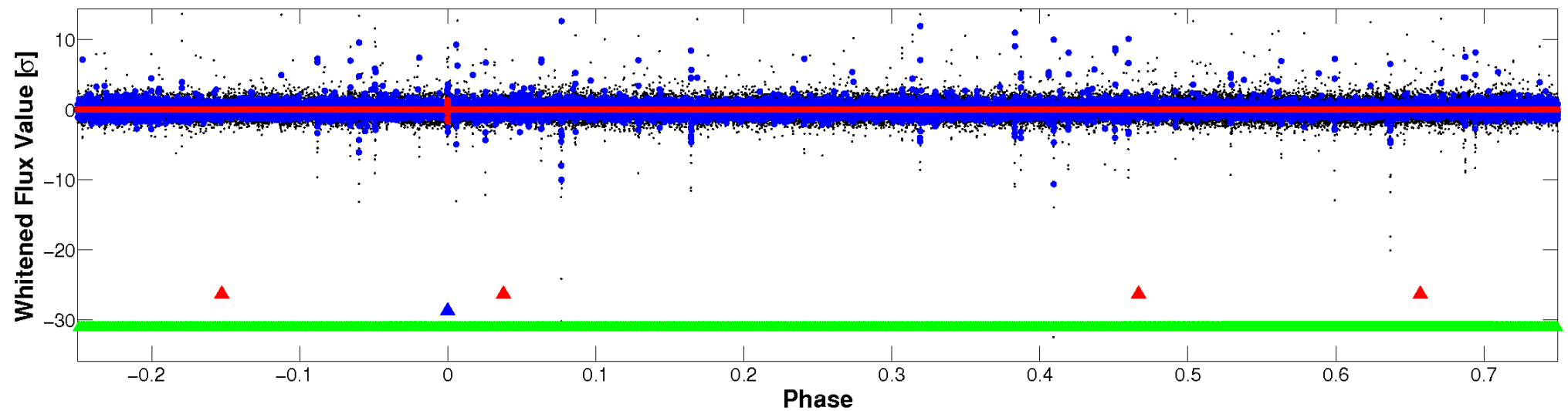


# Non-Whitened Vs. Whitened Light Curve

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

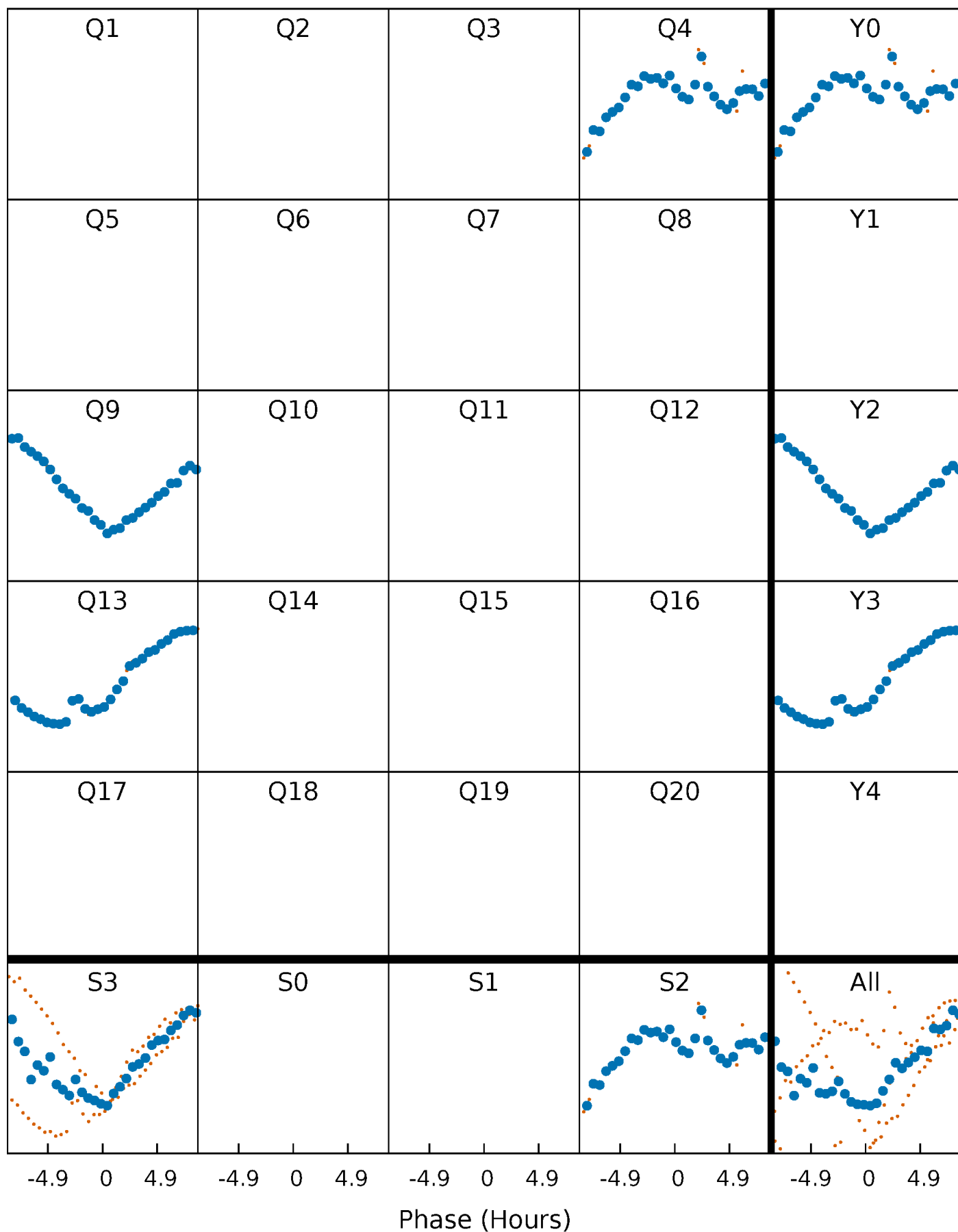


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



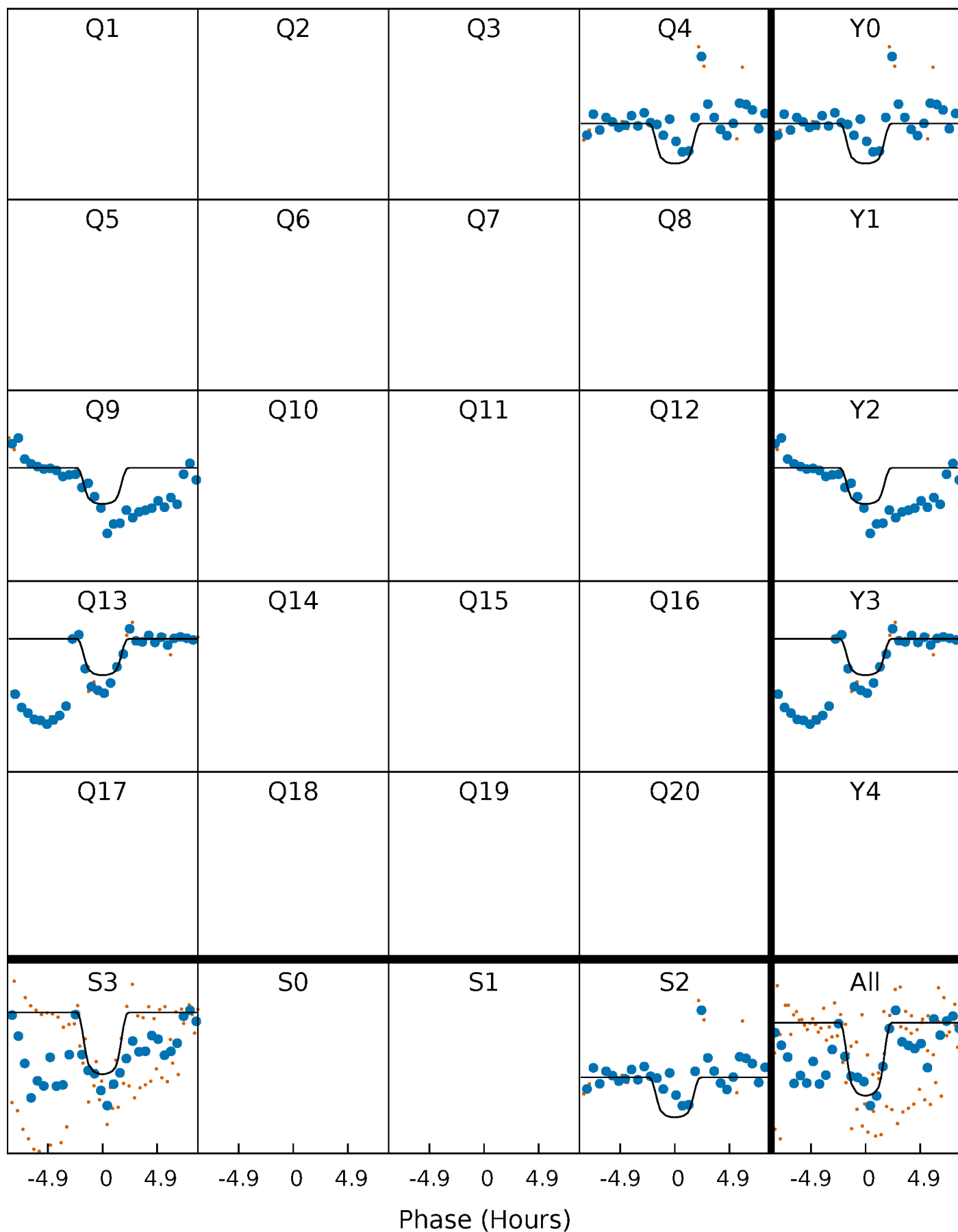
# PDC Quarter-Phased Transit Curves

TCE 007107311-02 P=447.486769 Days  $T_0=375.132032$  (BKJD)



# DV Quarter-Phased Transit Curves

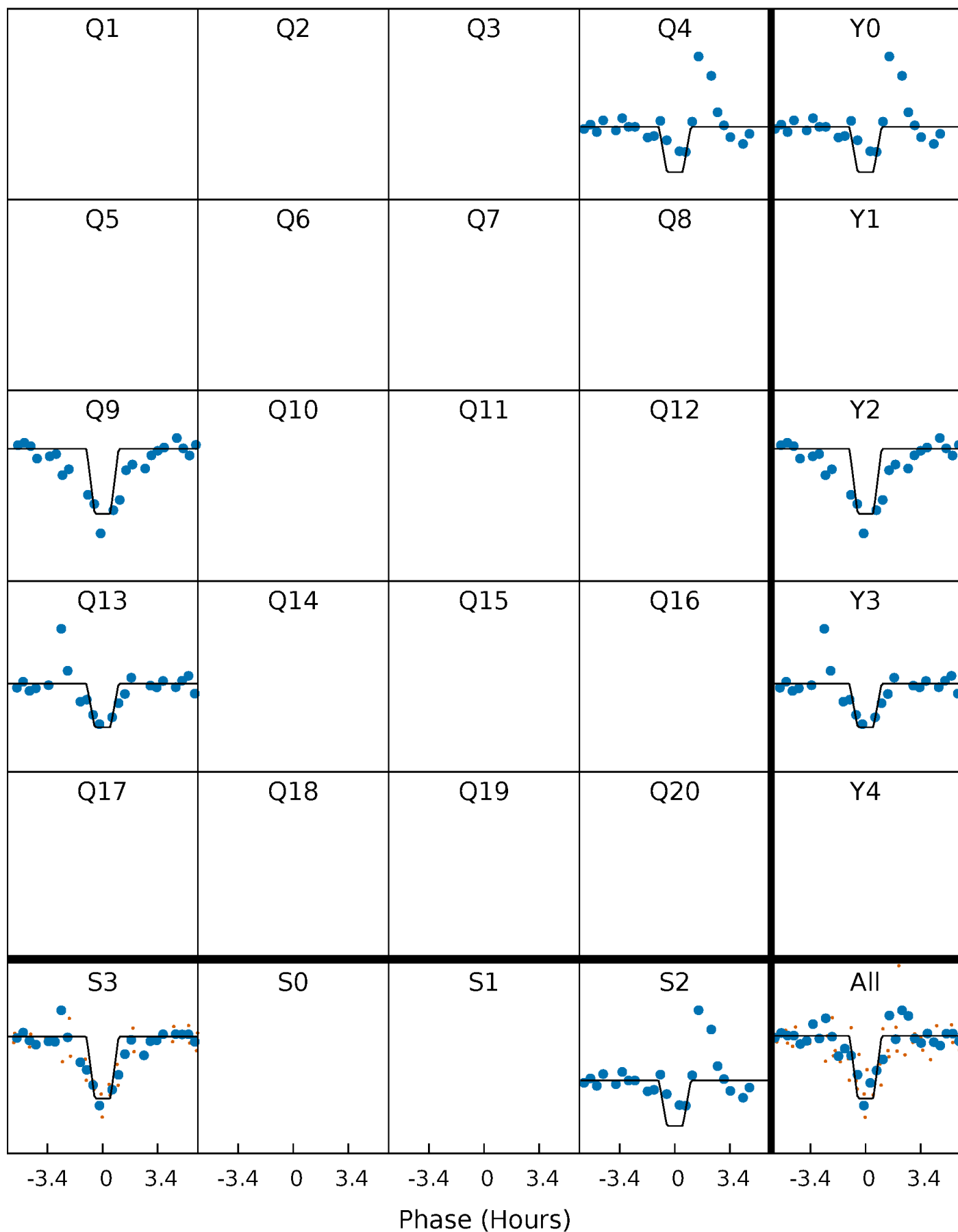
TCE 007107311-02 P=447.486769 Days  $T_0=375.132032$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

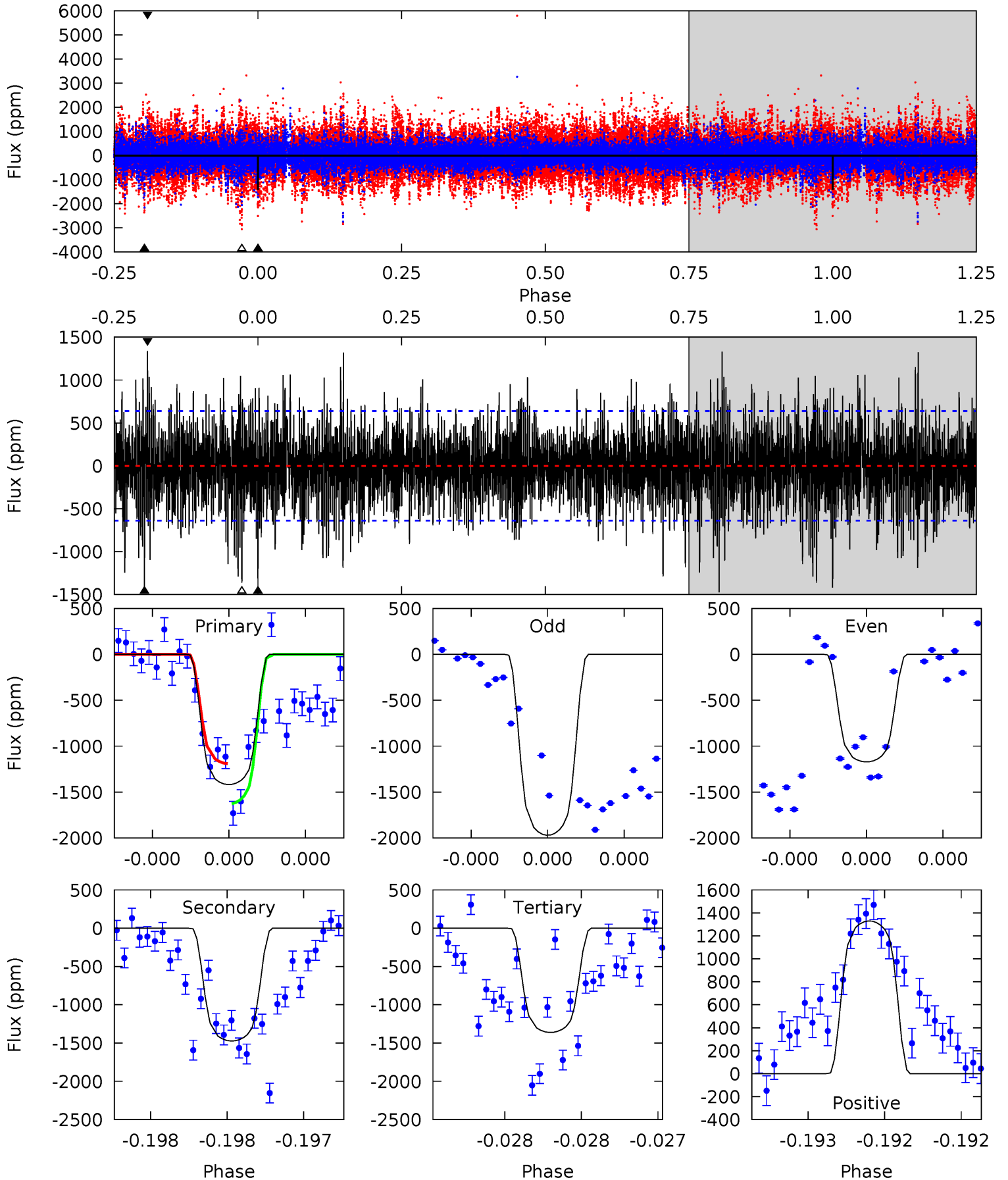
TCE 007107311-02 P=447.481342 Days  $T_0=375.155505$  (BKJD)



# DV Model-Shift Uniqueness Test

007107311-02, P = 447.486769 Days, E = 375.132032 Days

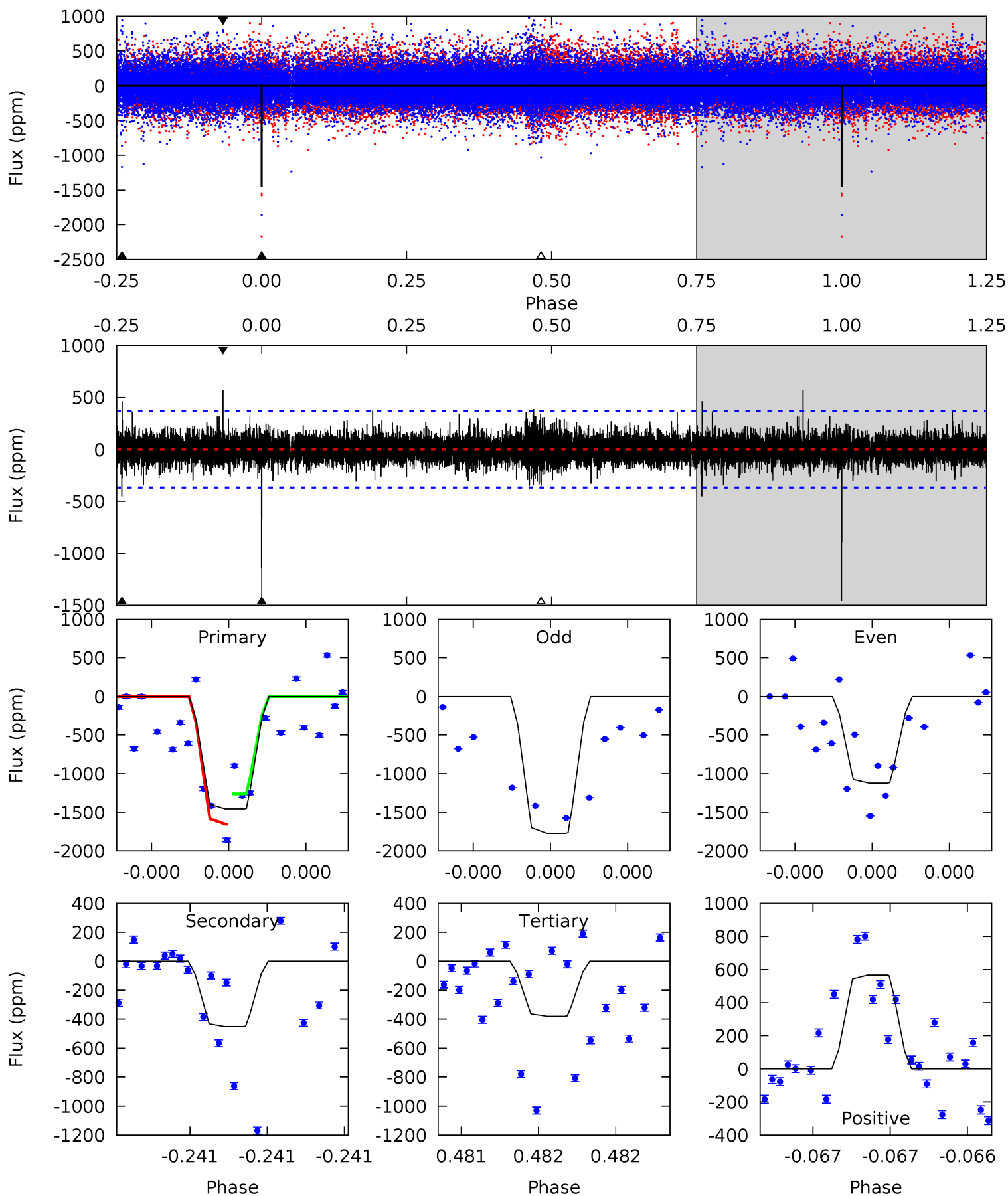
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	12.9	11.9	11.7	5.61	3.53	2.79	0.50	0.77	0.98	1.26	3.18	0.77	0.47	1.93



# Alt Model-Shift Uniqueness Test

007107311-02, P = 447.481342 Days, E = 375.155505 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
22.7	7.03	5.91	8.85	5.74	3.73	1.19	16.8	13.8	1.11	-1.82	5.17	0.92	0.28	3.06



### Stellar Parameters For KIC 007107311

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6084^{+164}_{-182}$	$4.584^{+0.033}_{-0.187}$	$-0.740^{+0.300}_{-0.300}$	$0.789^{+0.199}_{-0.062}$	$0.875^{+0.081}_{-0.097}$	$2.508^{+0.450}_{-1.209}$
	+3%/-3%	+1%/-4%	+41%/-41%	+25%/-8%	+9%/-11%	+18%/-48%
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 007107311-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1473 \pm 114$	$3.66^{+0.71}_{-0.61}$	$326^{+20}_{-14}$	$5923^{+500}_{-451}$	$70393^{+31309}_{-20510}$
Alt.	$-451 \pm 64$	$3.70^{+0.73}_{-0.63}$	$326^{+21}_{-15}$	$4561^{+338}_{-296}$	$21151^{+10243}_{-6511}$

$T_{max}$  = 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

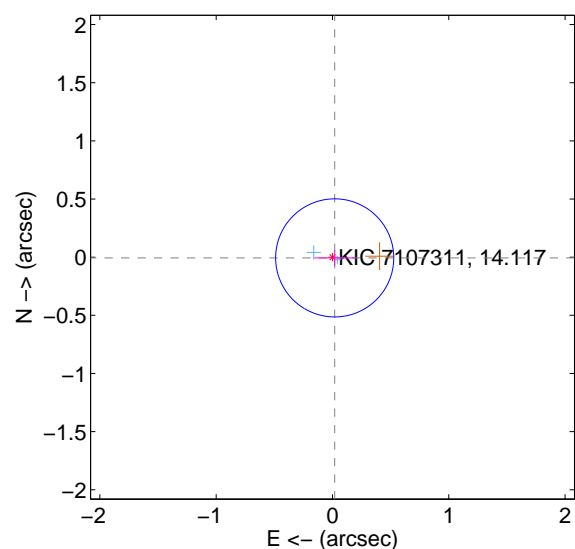
Supplemental centroid analysis for 007107311-02. Kepler magnitude: 14.12. Transit SNR 6.82

There are 2 quarters with good PRF difference image offsets

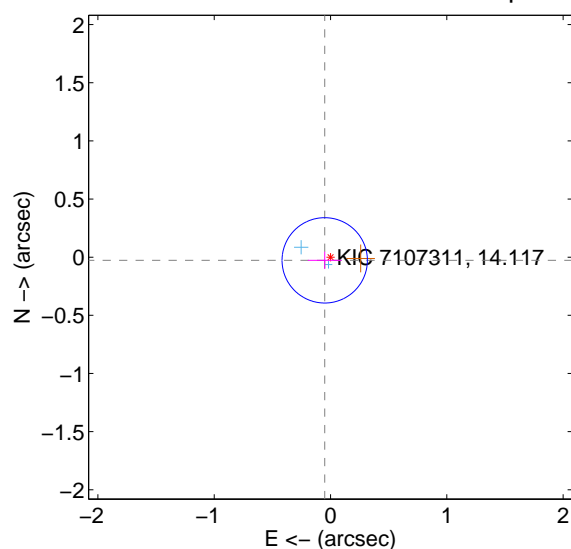
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.020 \pm 0.169$	0.12	$-0.019 \pm 0.175$	$-0.006 \pm 0.068$
PRF-fit source offset from KIC position	$0.057 \pm 0.122$	0.46	$0.050 \pm 0.145$	$-0.027 \pm 0.075$
photometric centroid source offset	$0.31 \pm 0.47$	0.66	$-0.21 \pm 0.50$	$-0.23 \pm 0.45$

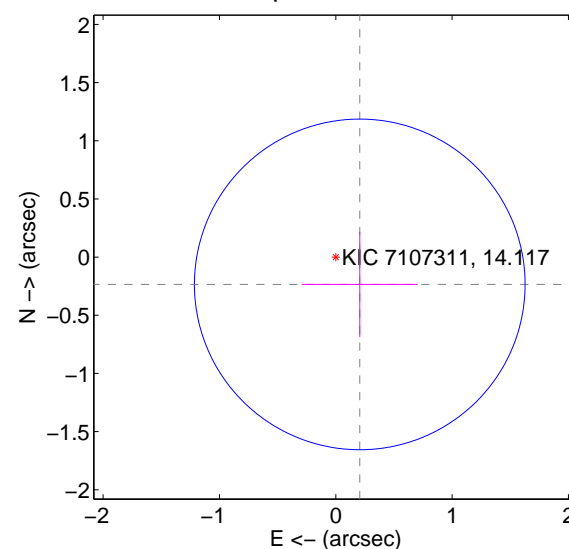
offset from difference PRF-fit to OOT PRF-fit



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.

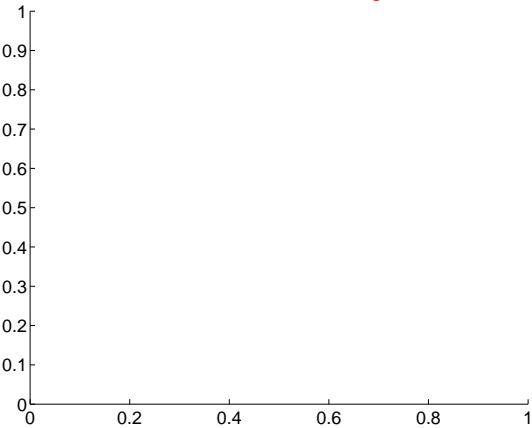
Q1 no difference image



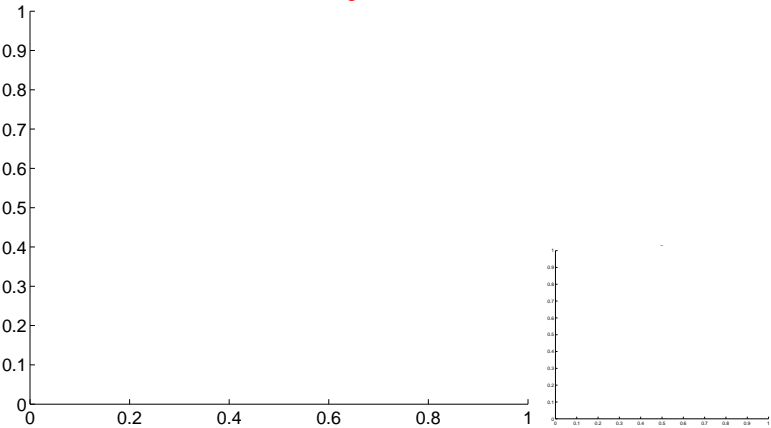
Q1 no OOT image



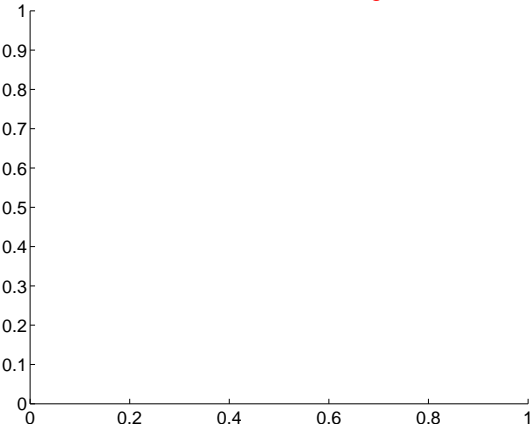
Q2 no difference image



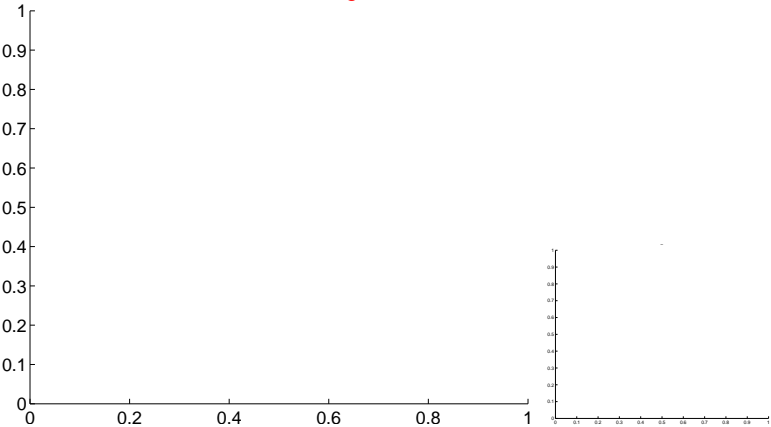
Q2 no OOT image



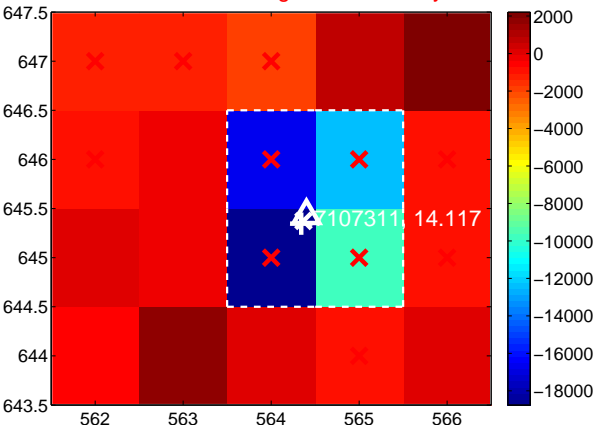
Q3 no difference image



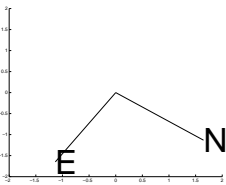
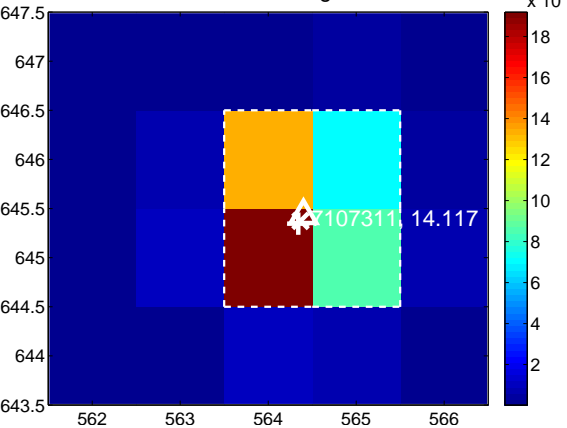
Q3 no OOT image



Q4 difference image. Poor Quality



Q4 OOT image

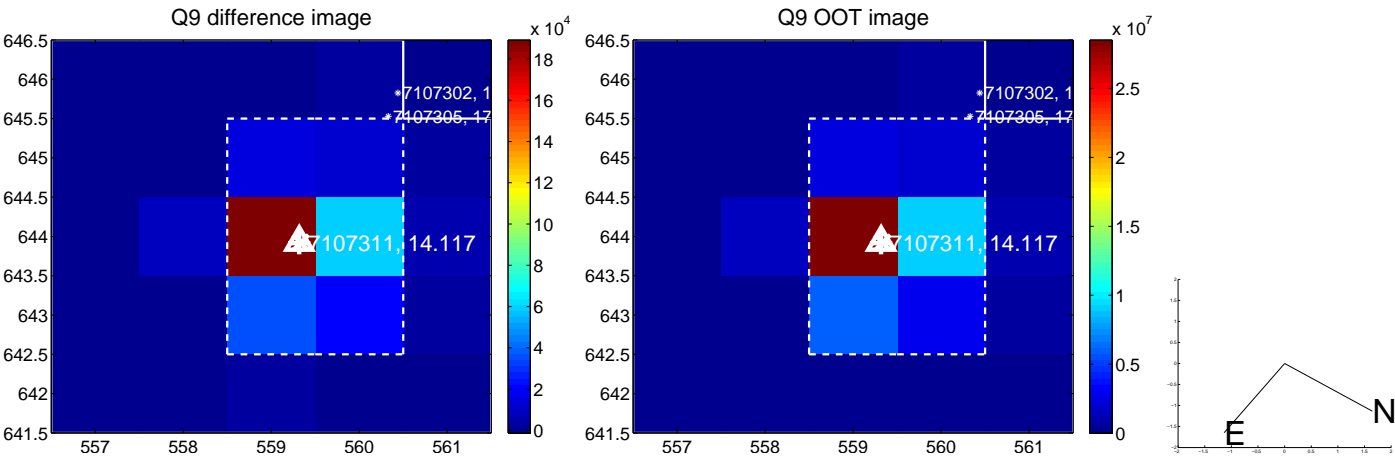


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

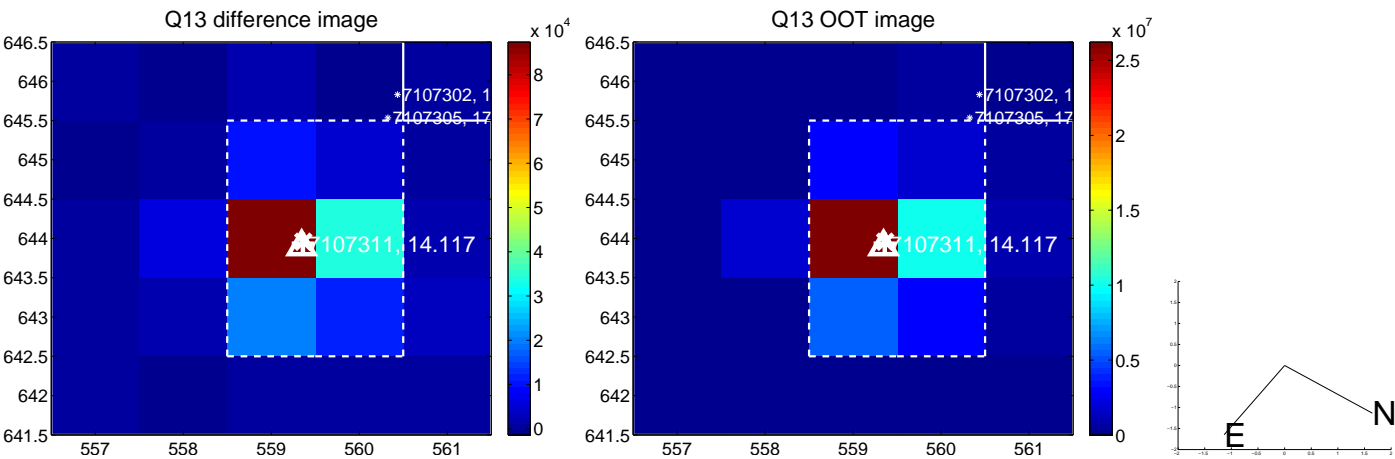




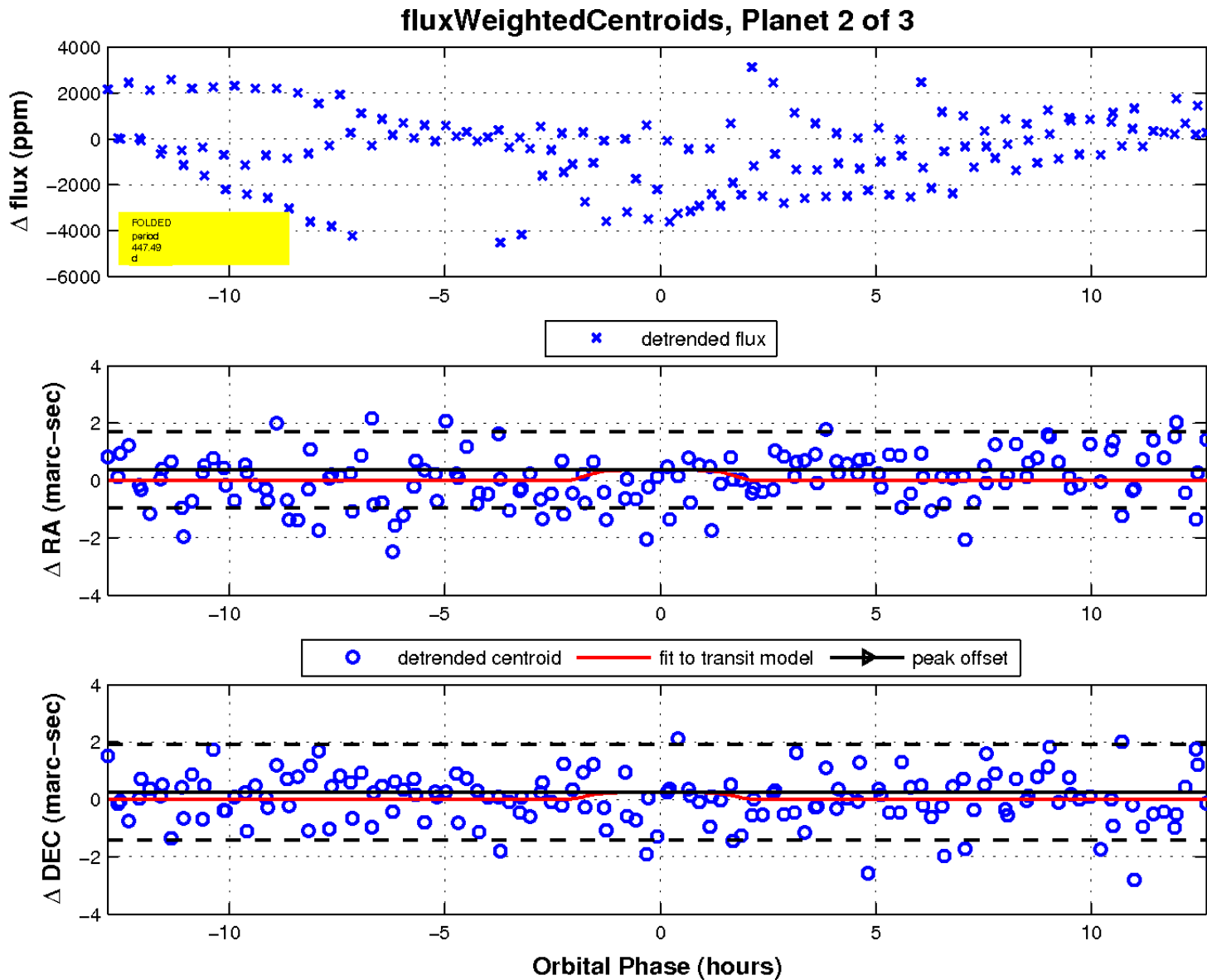
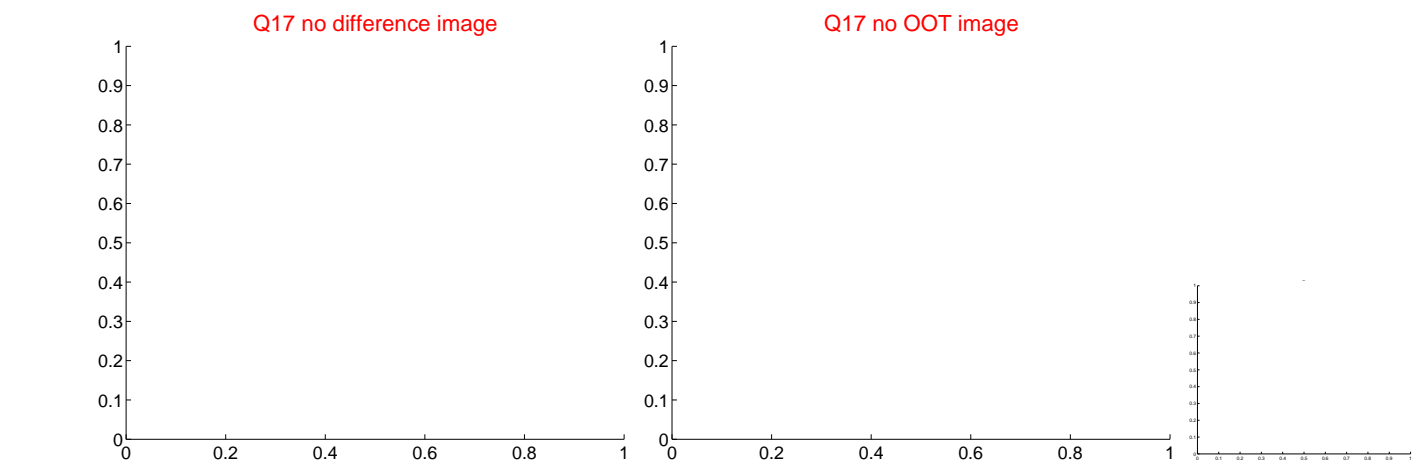
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

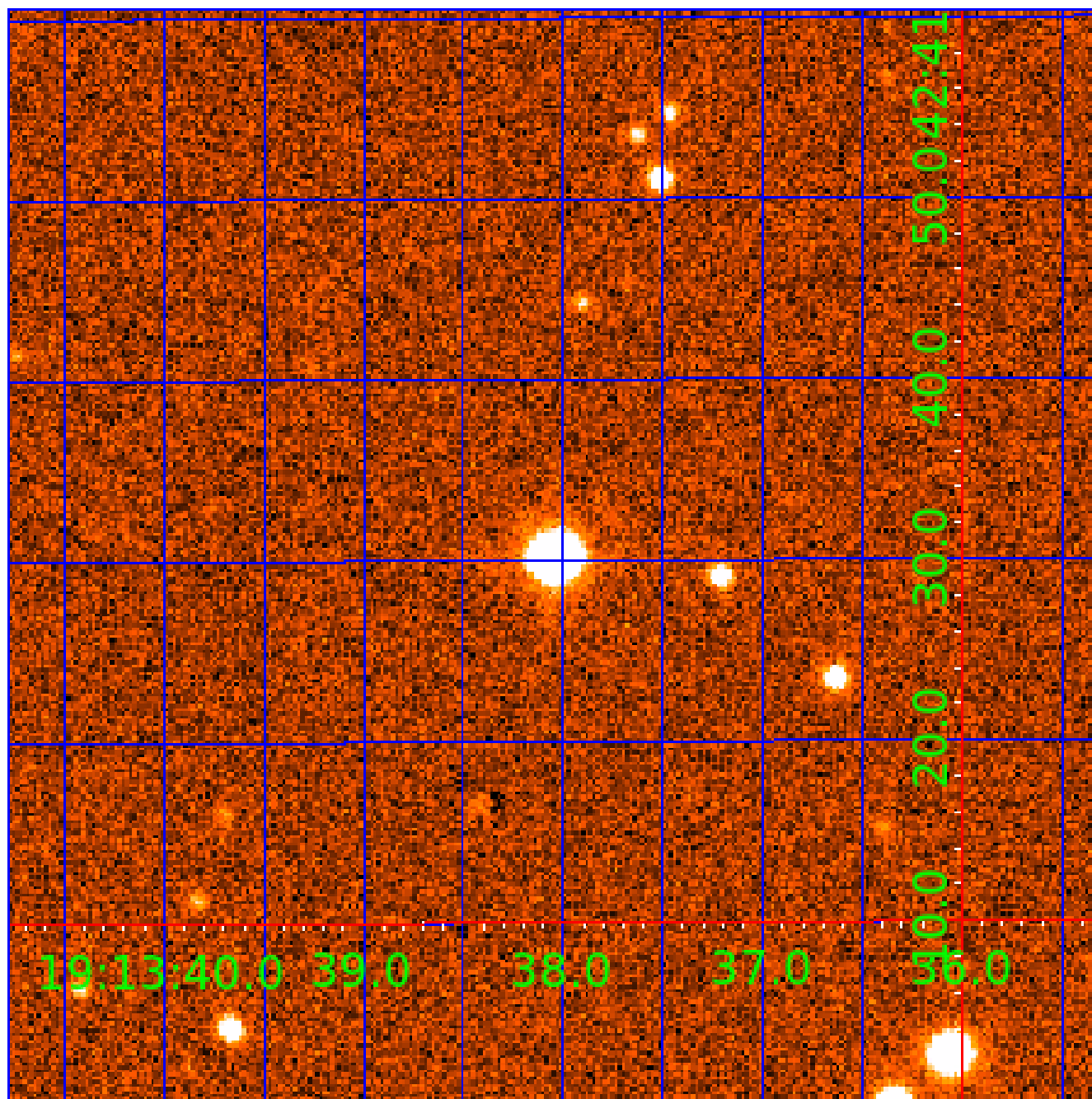


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 007107311

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007107311-01	OBS	No	362.322892	391.994149	1750.7	4.574	11.9	10.8	0.79	6084	4.30	0.85
007107311-02	OBS	No	447.486769	375.132032	1381.5	4.277	12.6	6.8	0.79	6084	3.48	0.64
007107311-03	OBS	No	0.734570	131.588908	67.0	5.838	7.6	10.4	0.79	6084	0.65	3298.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007107311-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_NOFITS
007107311-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007107311-03	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT

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

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

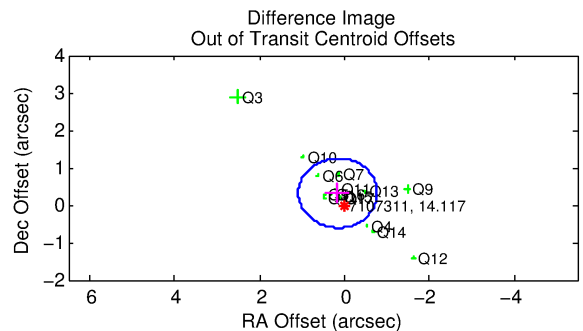
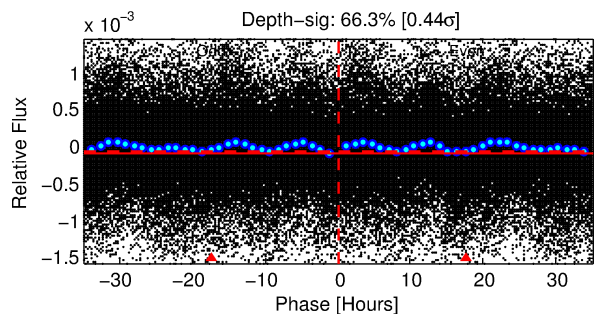
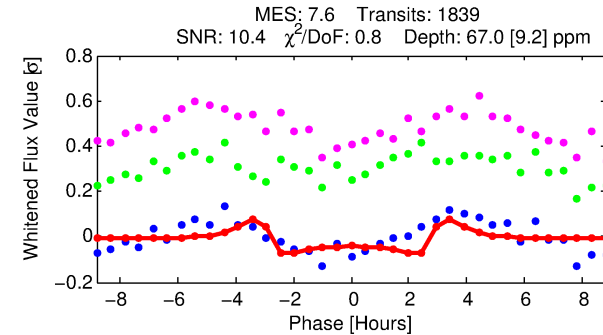
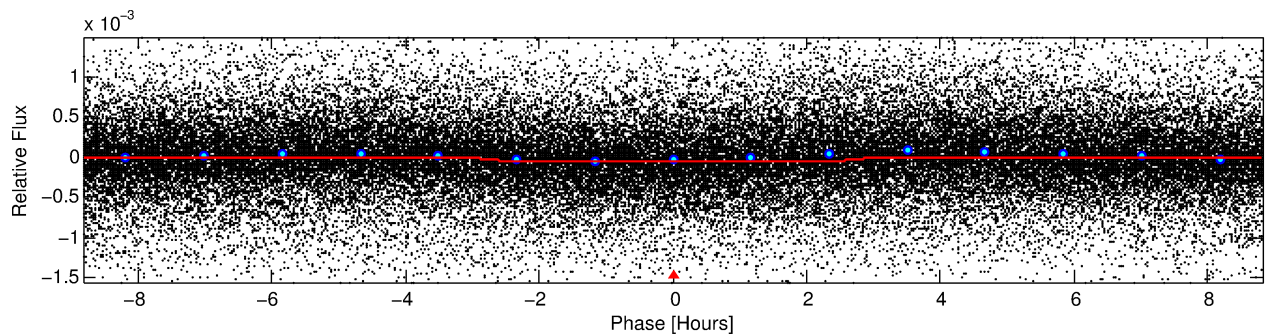
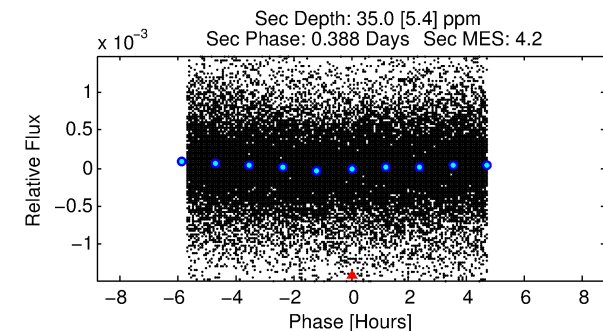
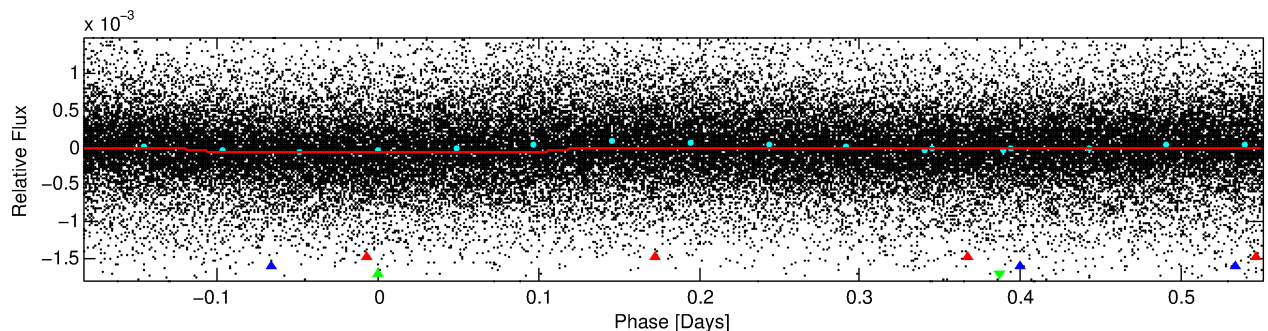
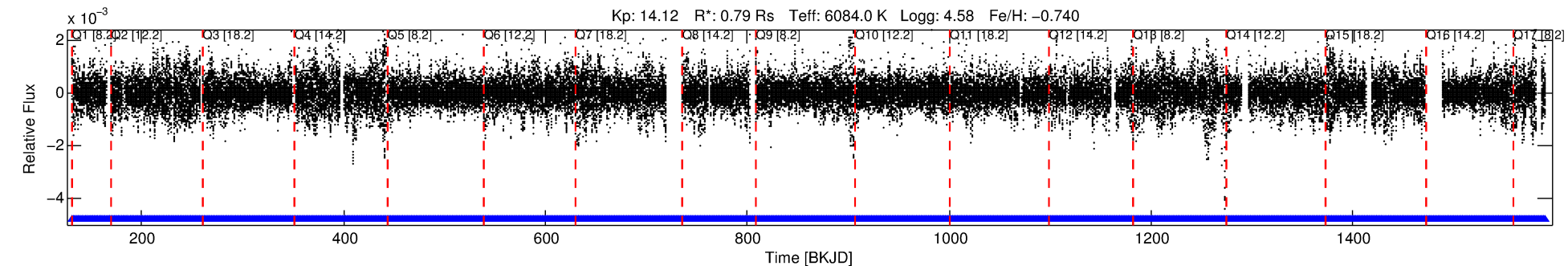
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007107311-03

No Significant Match Found

# DV One-Page Summary

KIC: 7107311 Candidate: 3 of 3 Period: 0.735 d



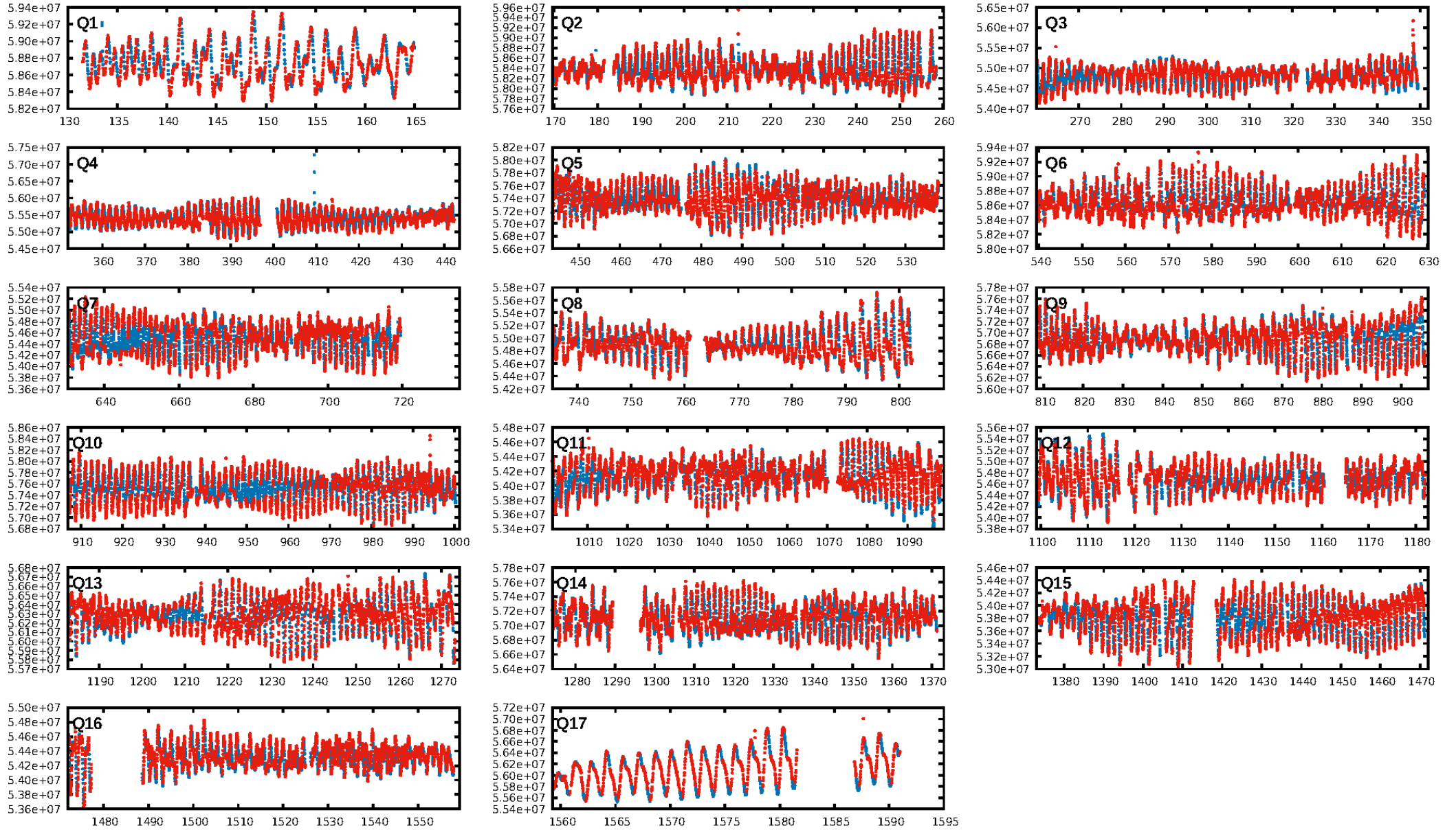
## DV Fit Results:

Period = 0.73457 [0.00001] d  
Epoch = 131.5889 [0.0019] BKJD  
Rp/R\* = 0.0075 [0.0035]  
a/R\* = 1.17 [0.78]  
b = 0.05 [51.29]  
Seff = 3298.56 [1166.18]  
Teq = 1932 [171] K  
Rp = 0.65 [0.35] Re  
a = 0.0152 [0.0034] AU  
Ag = 10.61 [10.73] [0.90σ]  
Teffp = 5393 [1297] K [2.64σ]

## DV Diagnostic Results:

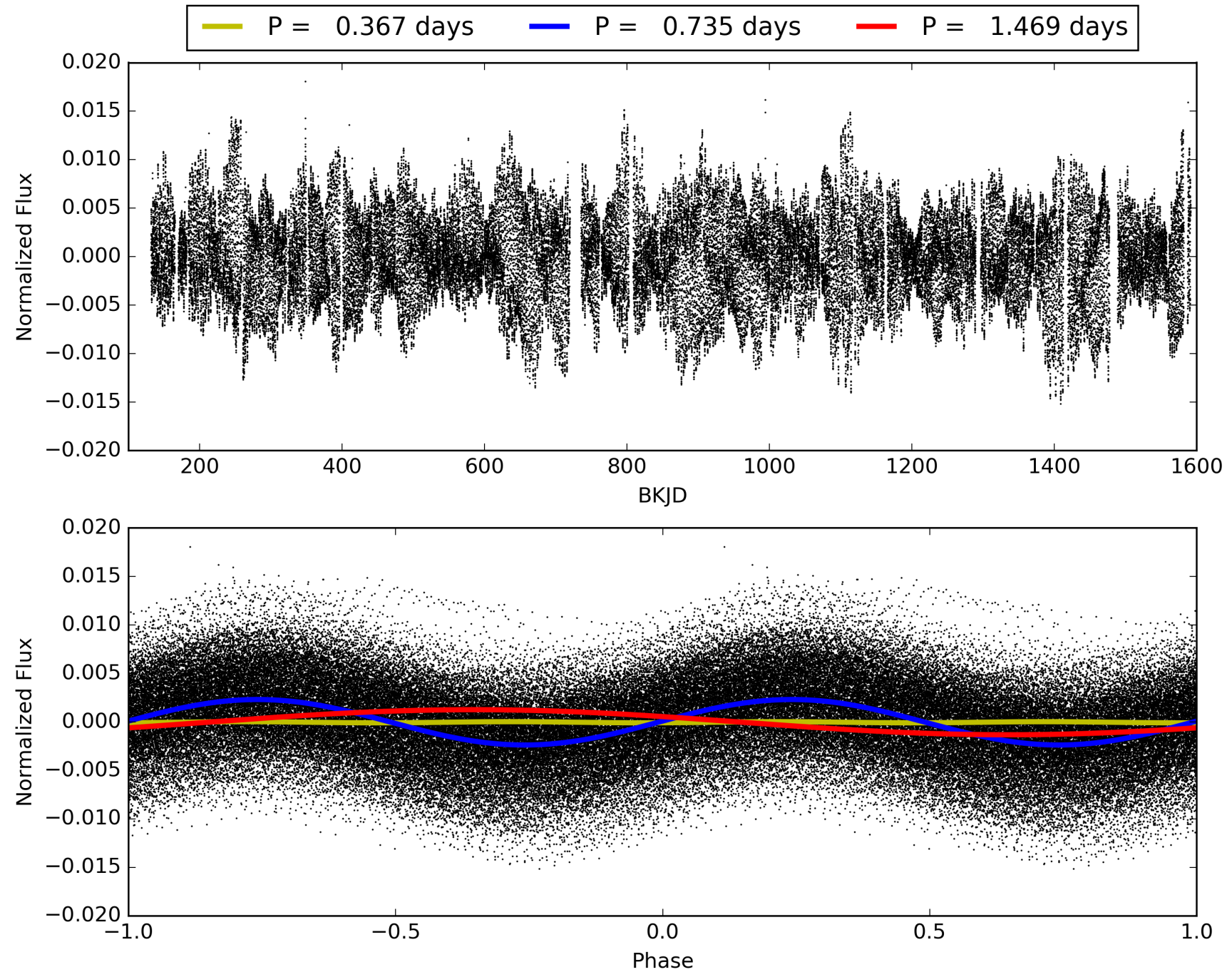
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1170.16σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1756/1756]  
**GhostDiagnostic-chr: 0.8436**  
**Centroid-sig: 0.1%**  
Centroid-so: 0.914 arcsec [2.74σ]  
OotOffset-rm: 0.356 arcsec [1.15σ]  
KicOffset-rm: 0.409 arcsec [1.33σ]  
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]

# TCE 007107311-03, PDC Light Curves





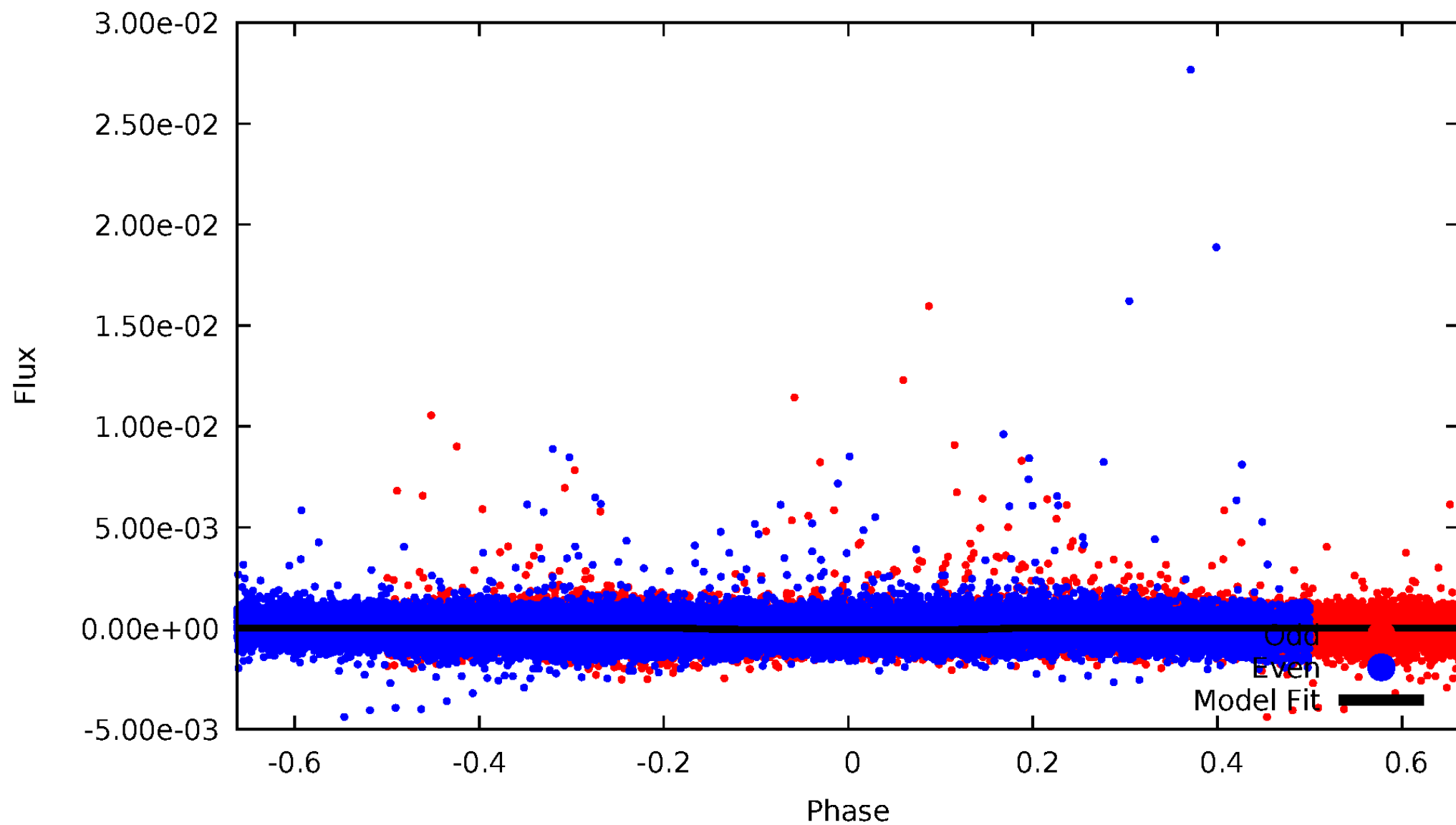
# TCE 007107311-03





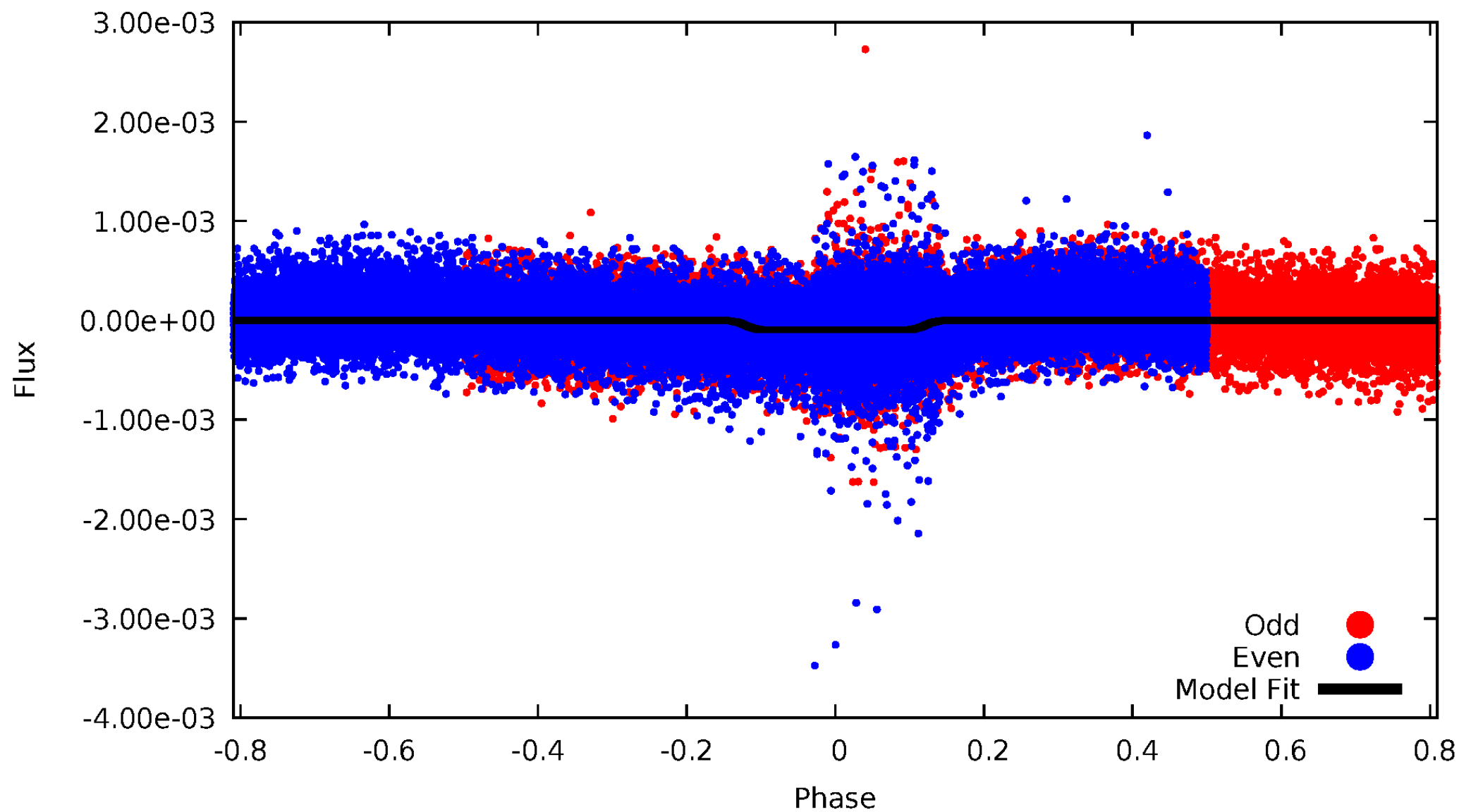
# DV Odd/Even

TCE 007107311-03



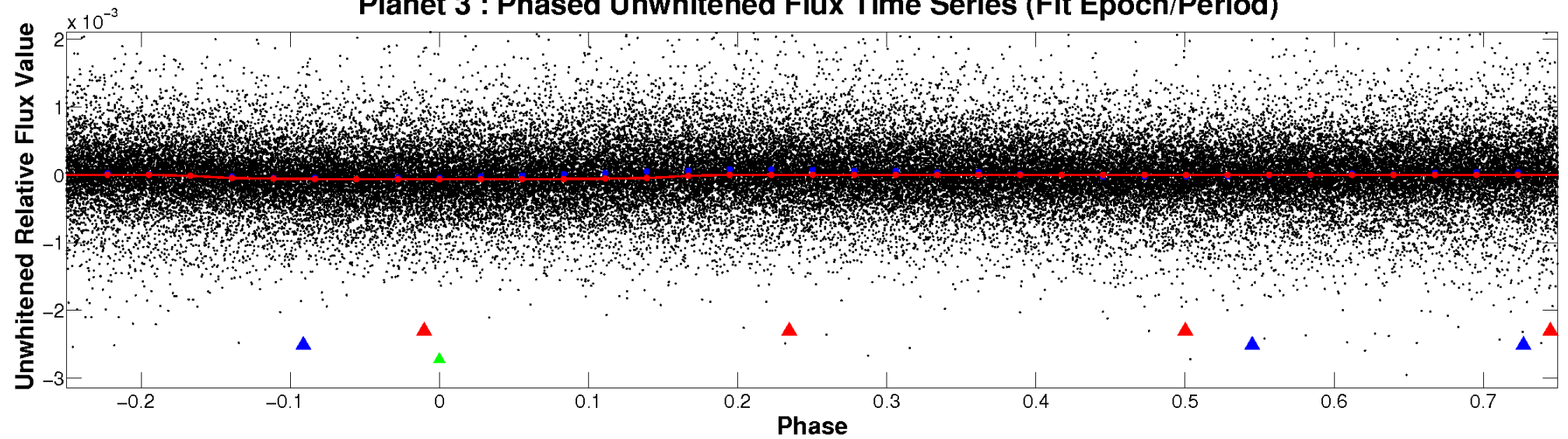
# ALT Odd/Even

TCE 007107311-03

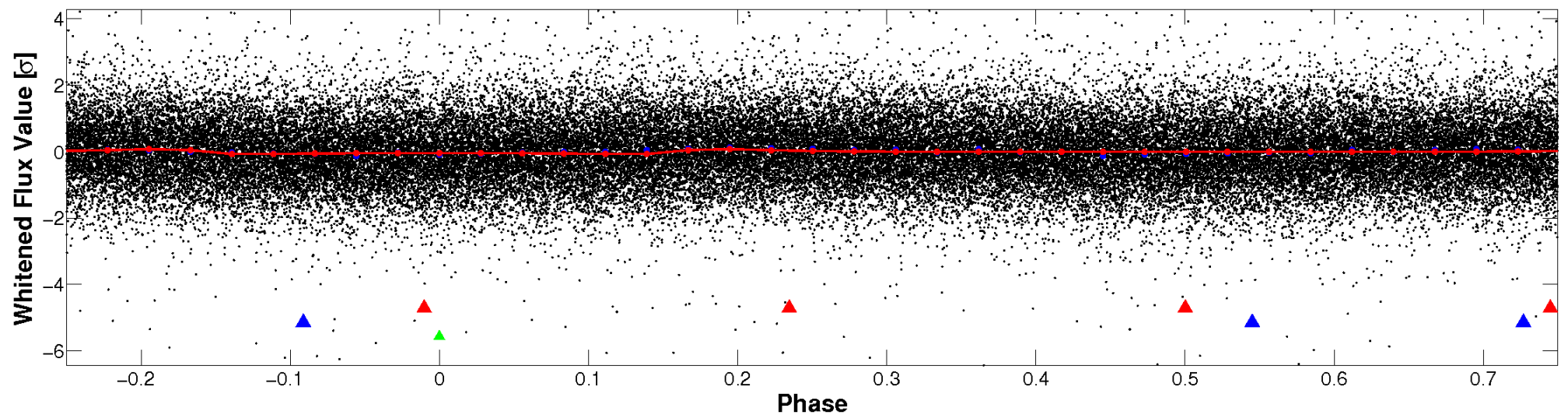


# Non-Whitened Vs. Whitened Light Curve

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

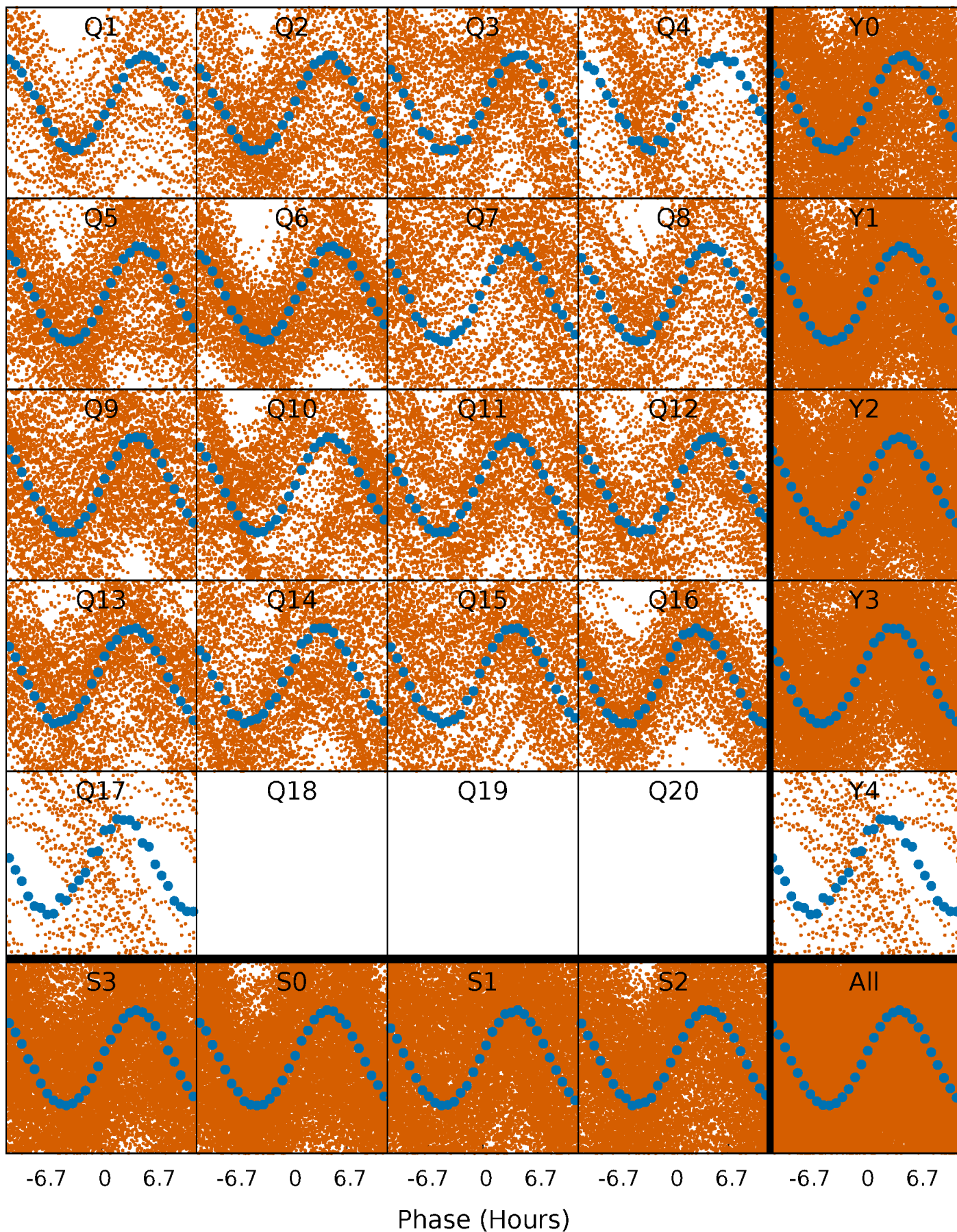


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

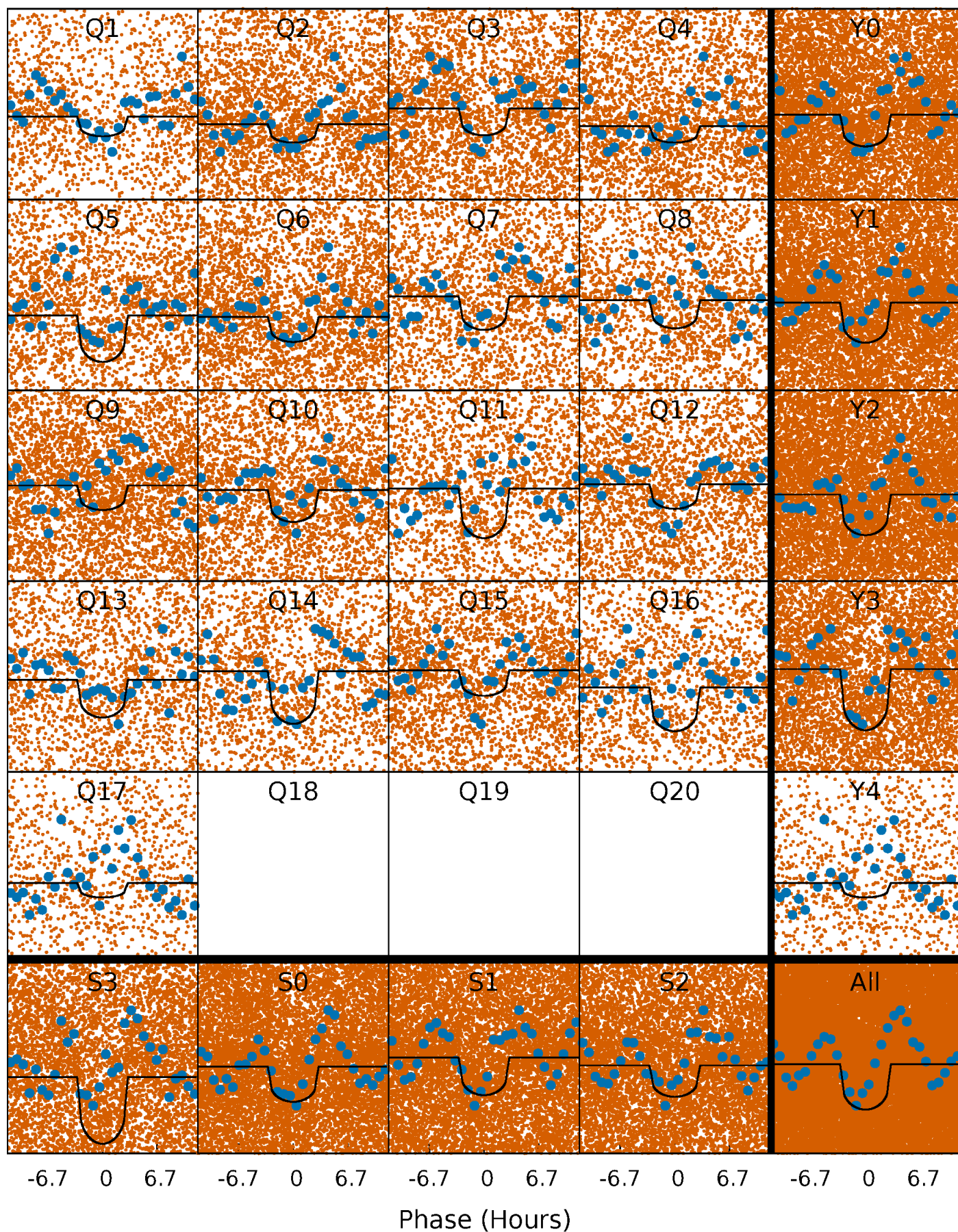
TCE 007107311-03 P= 0.734570 Days  $T_0=131.588908$  (BKJD)





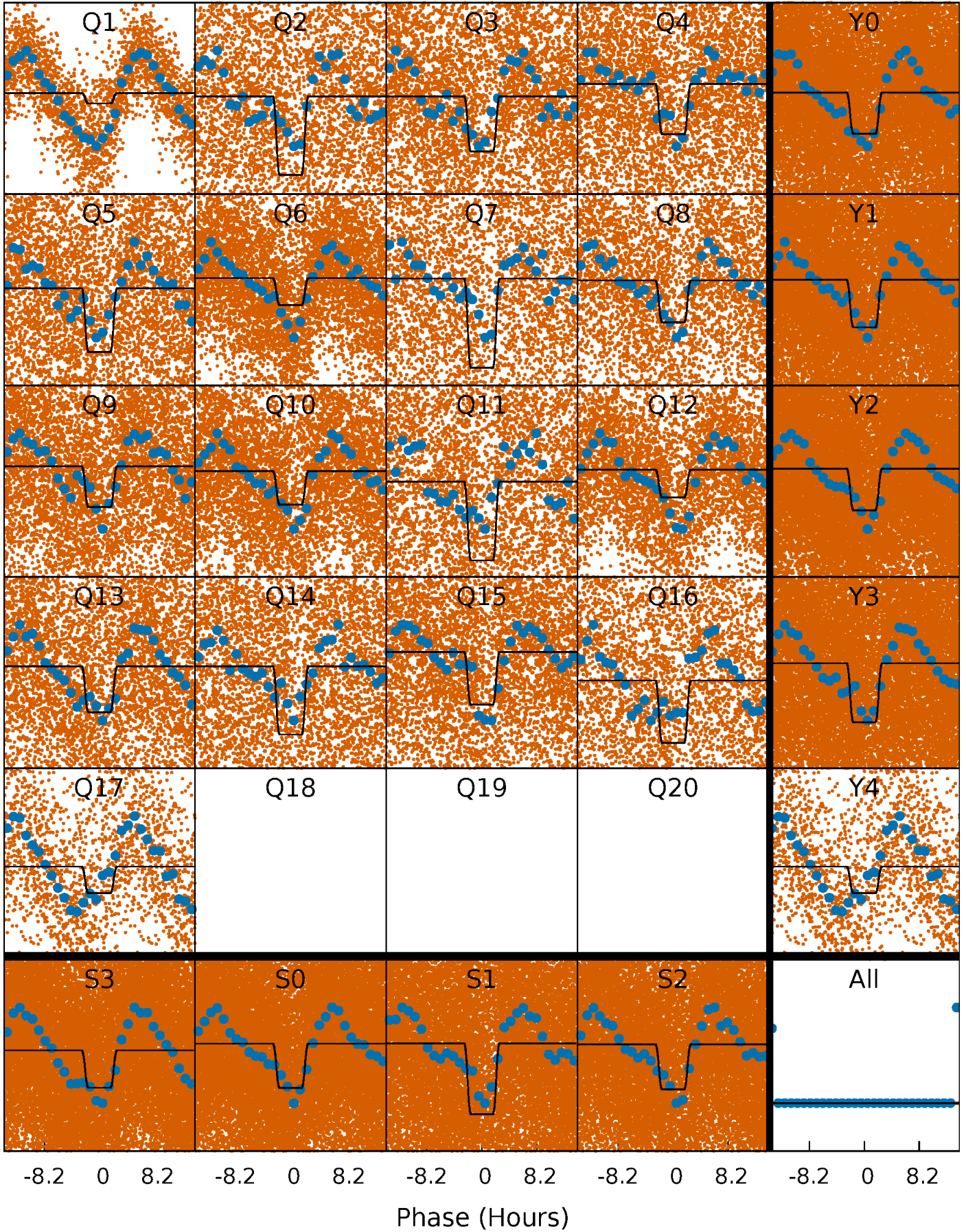
# DV Quarter-Phased Transit Curves

TCE 007107311-03   P= 0.734570 Days    $T_0=131.588908$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007107311-03   P= 0.734527 Days    $T_0=131.553200$  (BKJD)

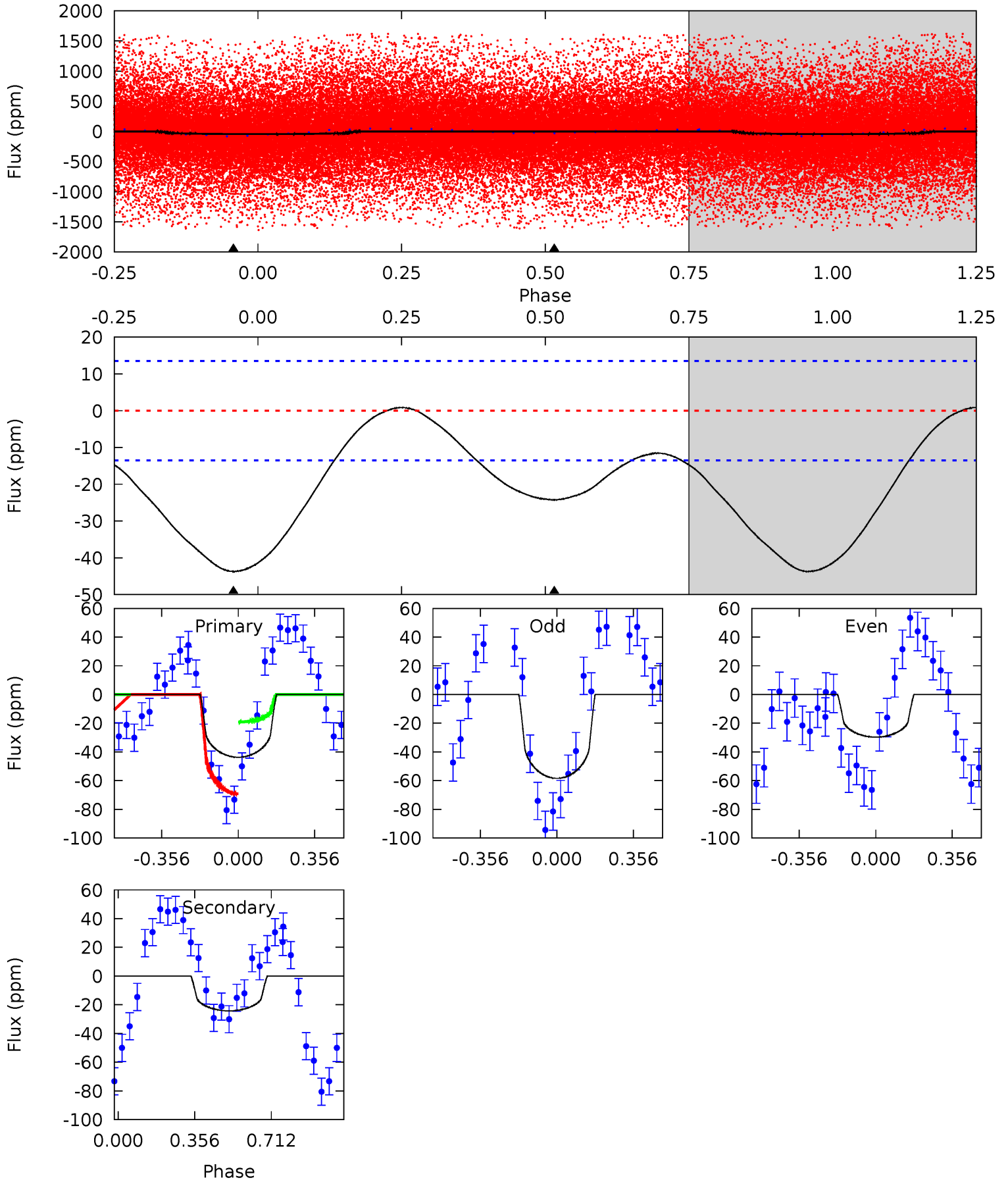




# DV Model-Shift Uniqueness Test

007107311-03, P = 0.734570 Days, E = 130.854338 Days

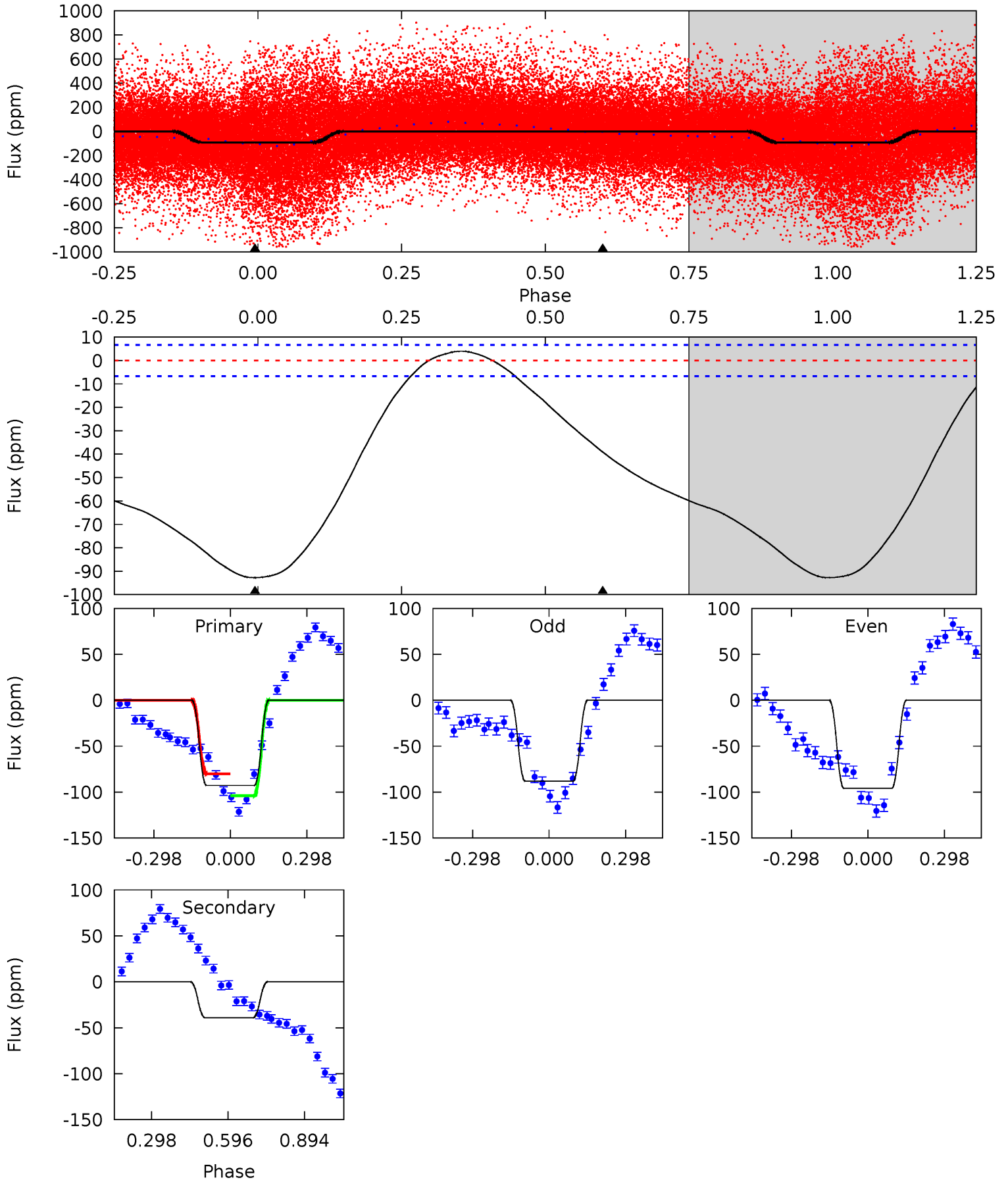
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	7.70	0	0	4.29	0.92	0.39	13.9	13.9	7.70	7.70	4.60	0.56	0.02	8.44



# Alt Model-Shift Uniqueness Test

007107311-03, P = 0.734527 Days, E = 130.818673 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
60.1	25.3	0	0	4.33	1.04	3.10	60.1	60.1	25.3	25.3	2.50	1.23	0.04	7.89





### Stellar Parameters For KIC 007107311

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6084^{+164}_{-182}$	$4.584^{+0.033}_{-0.187}$	$-0.740^{+0.300}_{-0.300}$	$0.789^{+0.199}_{-0.062}$	$0.875^{+0.081}_{-0.097}$	$2.508^{+0.450}_{-1.209}$
	+3%/-3%	+1%/-4%	+41%/-41%	+25%/-8%	+9%/-11%	+18%/-48%
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 007107311-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-24 \pm 3$	$0.69^{+0.33}_{-0.31}$	$2748^{+173}_{-106}$	$4930^{+1486}_{-766}$	$6.502^{+14.207}_{-3.582}$
Alt.	$-39 \pm 2$	$0.89^{+0.33}_{-0.32}$	$2767^{+163}_{-121}$	$4912^{+1123}_{-590}$	$6.196^{+9.603}_{-2.814}$

$T_{max}$  = 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

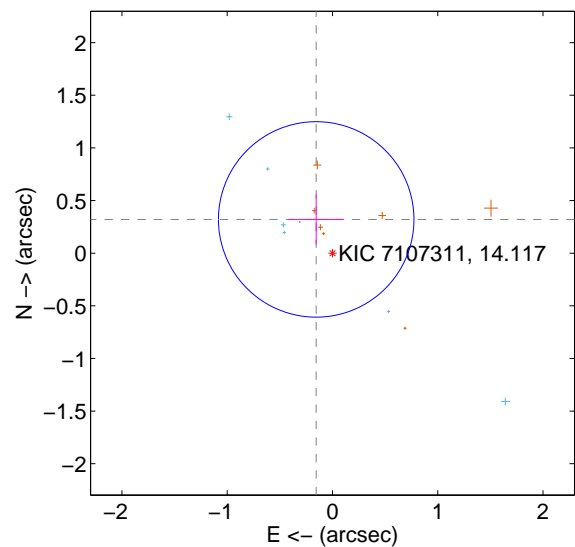
Supplemental centroid analysis for 007107311-03. Kepler magnitude: 14.12. Transit SNR 10.41

There are 6 quarters with good PRF difference image offsets

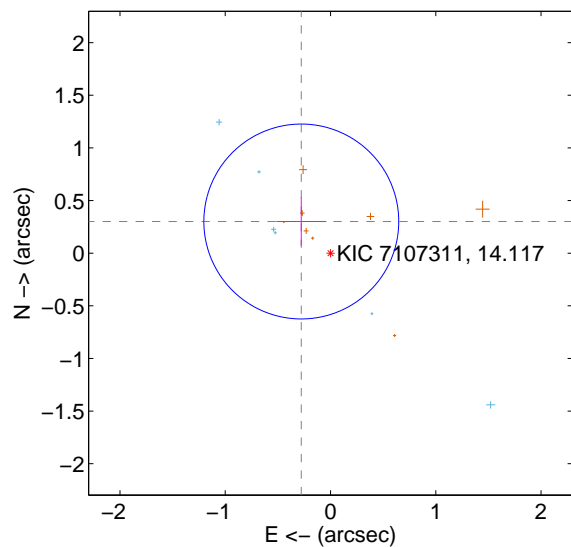
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.356 \pm 0.309$	1.15	$0.155 \pm 0.262$	$0.321 \pm 0.237$
PRF-fit source offset from KIC position	$0.409 \pm 0.309$	1.33	$0.277 \pm 0.238$	$0.301 \pm 0.230$
photometric centroid source offset	$0.91 \pm 0.33$	2.74	$0.75 \pm 0.34$	$-0.52 \pm 0.32$

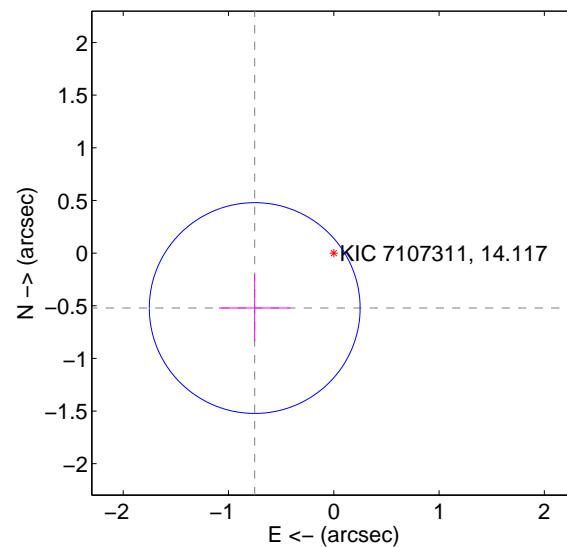
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

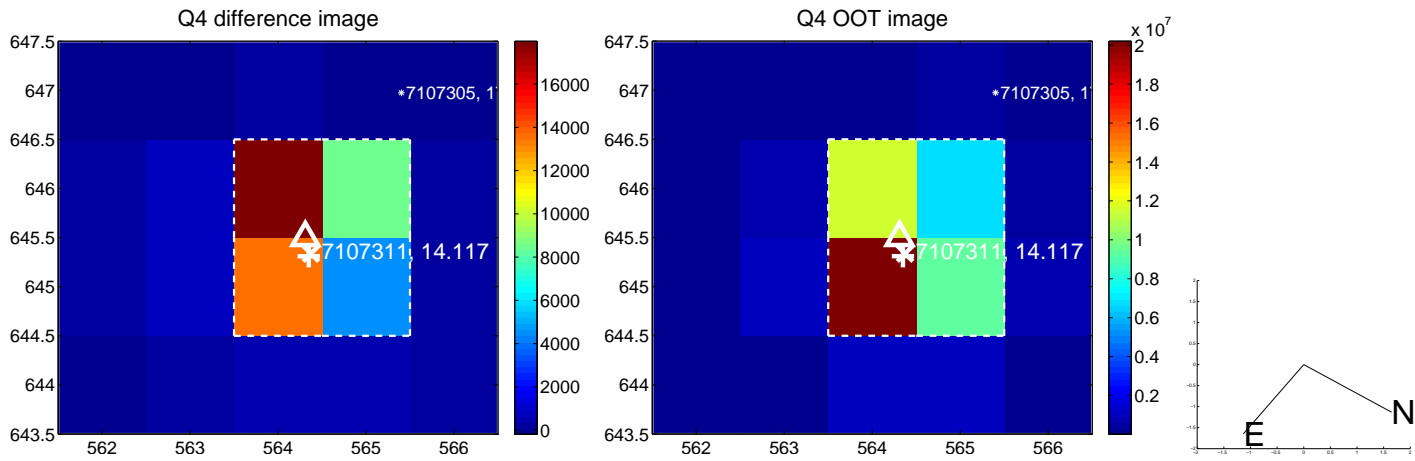
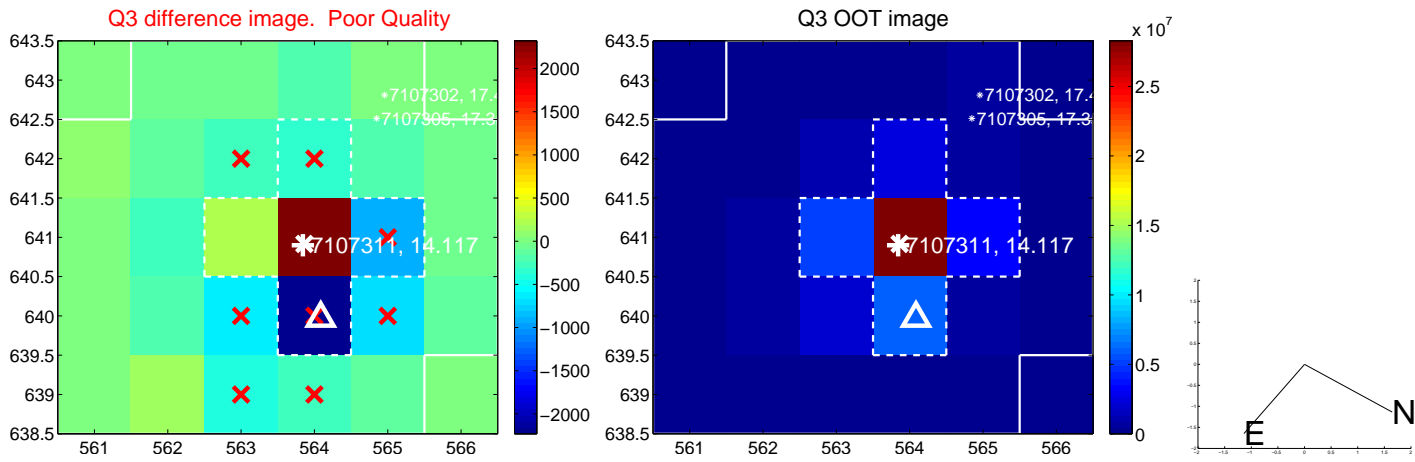
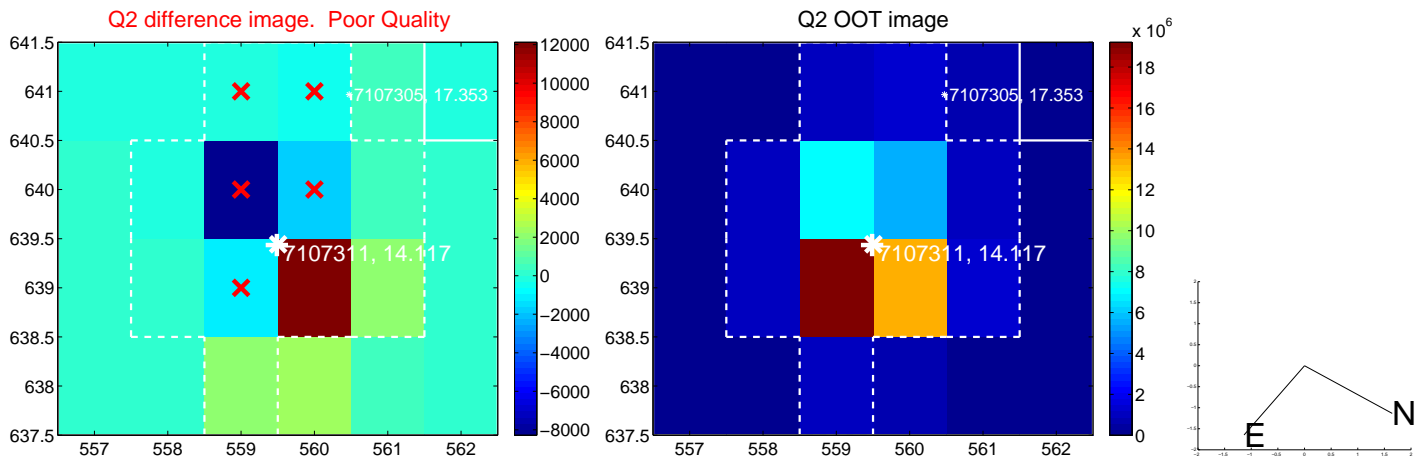
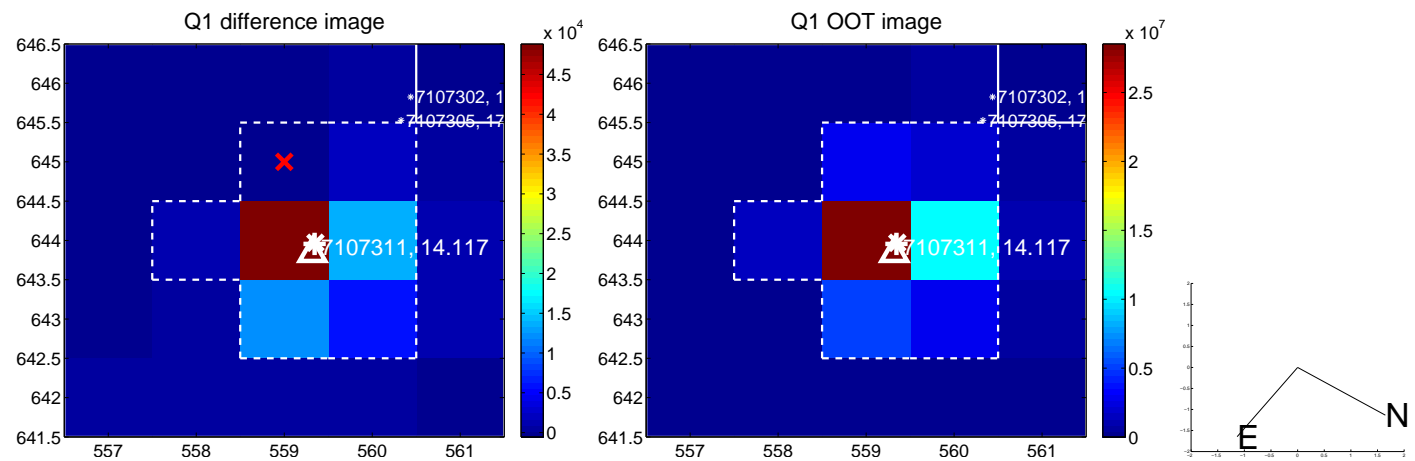


offset from photometric centroids

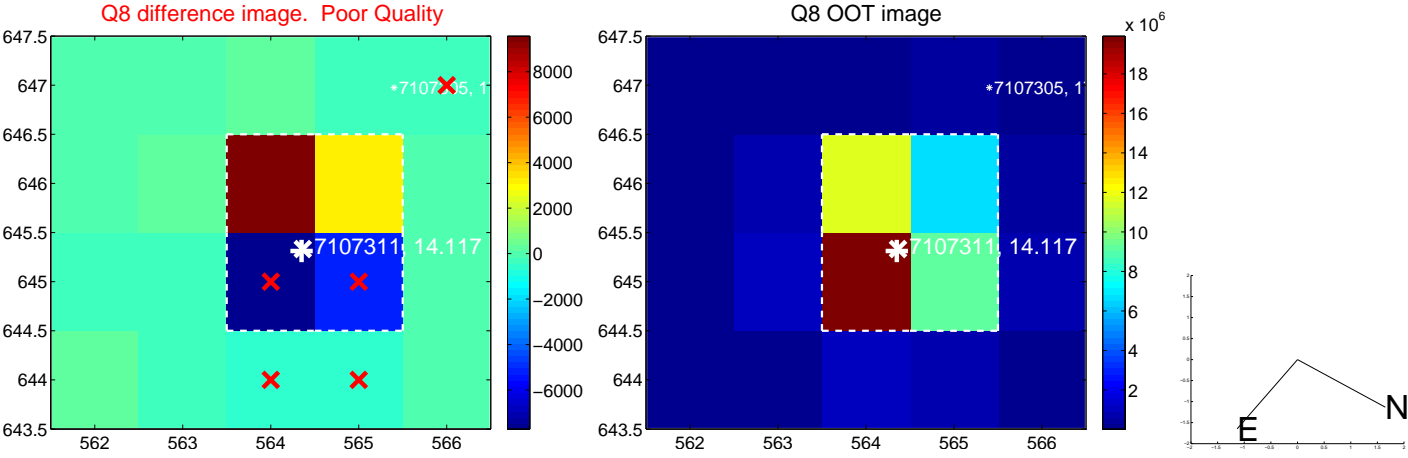
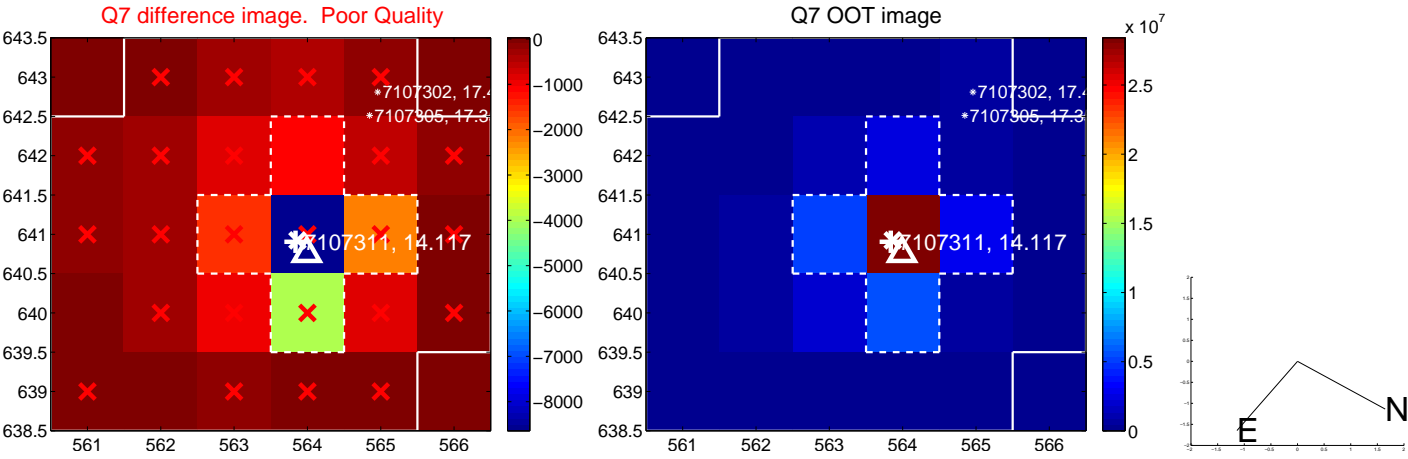
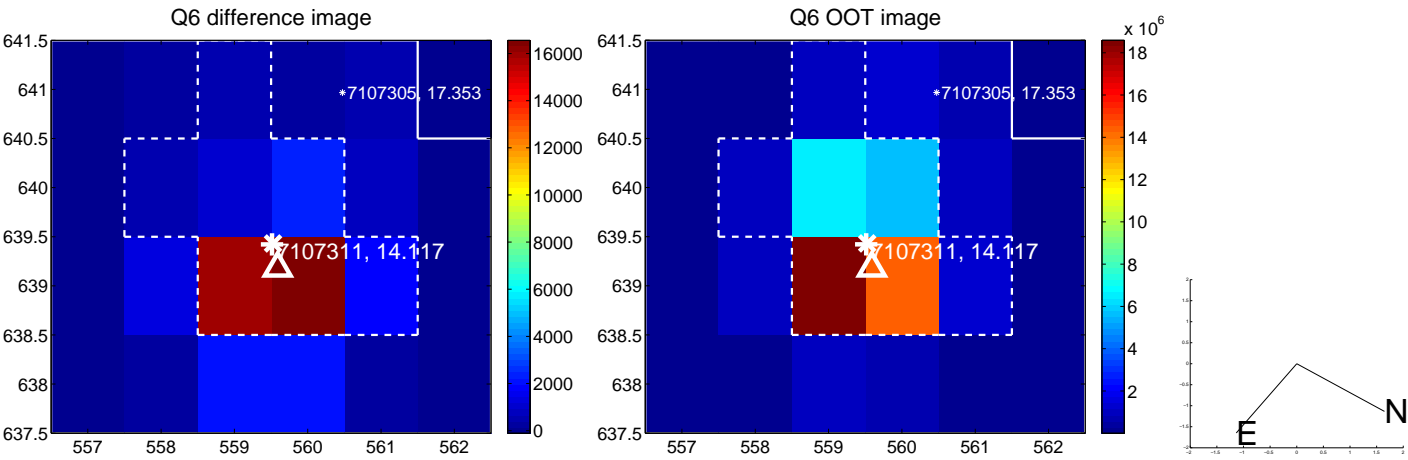
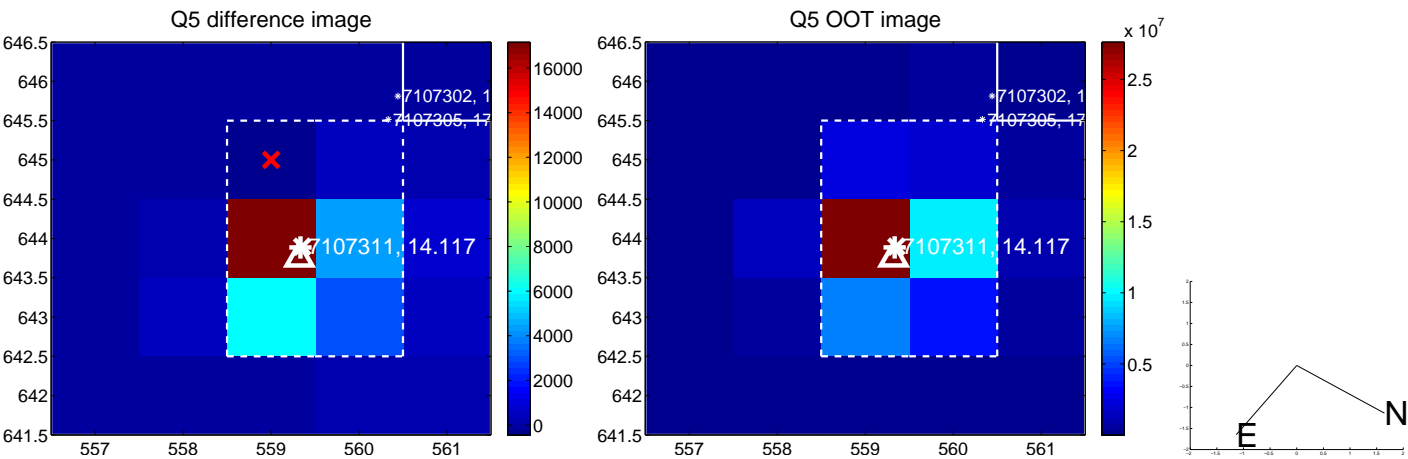


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

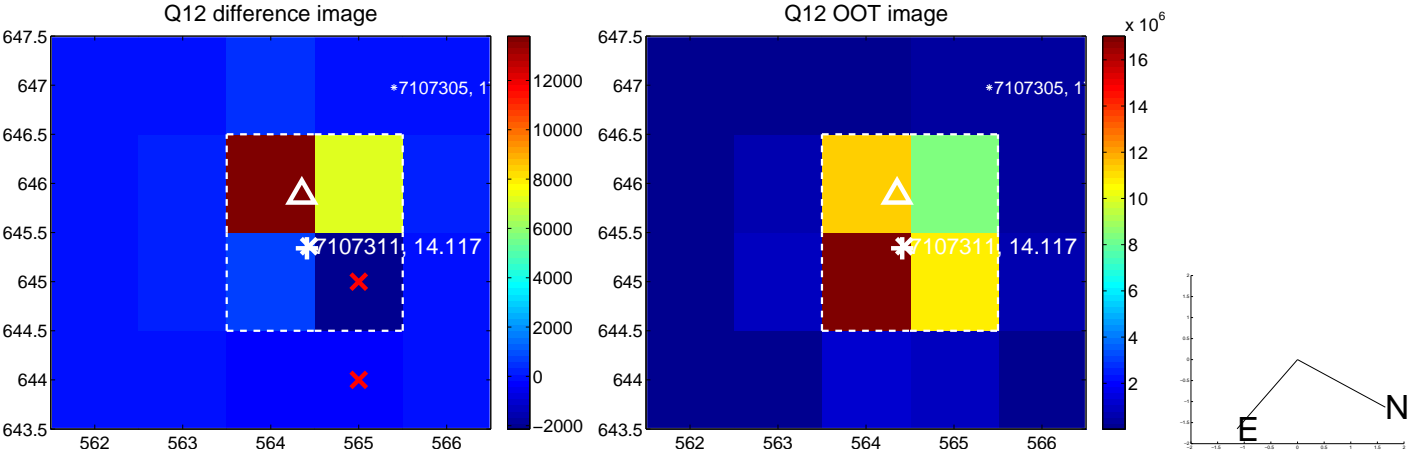
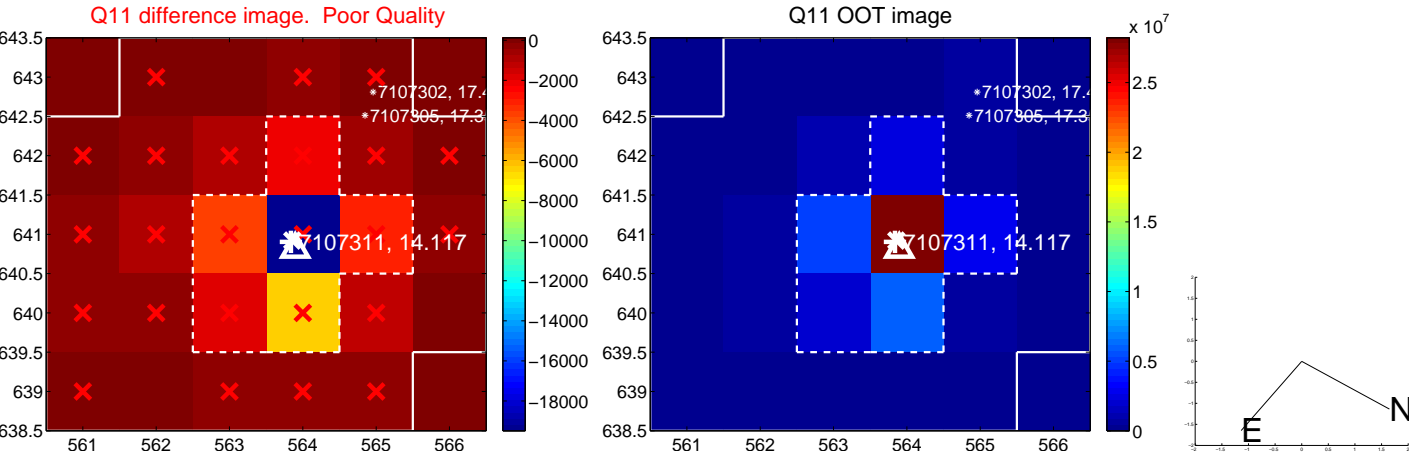
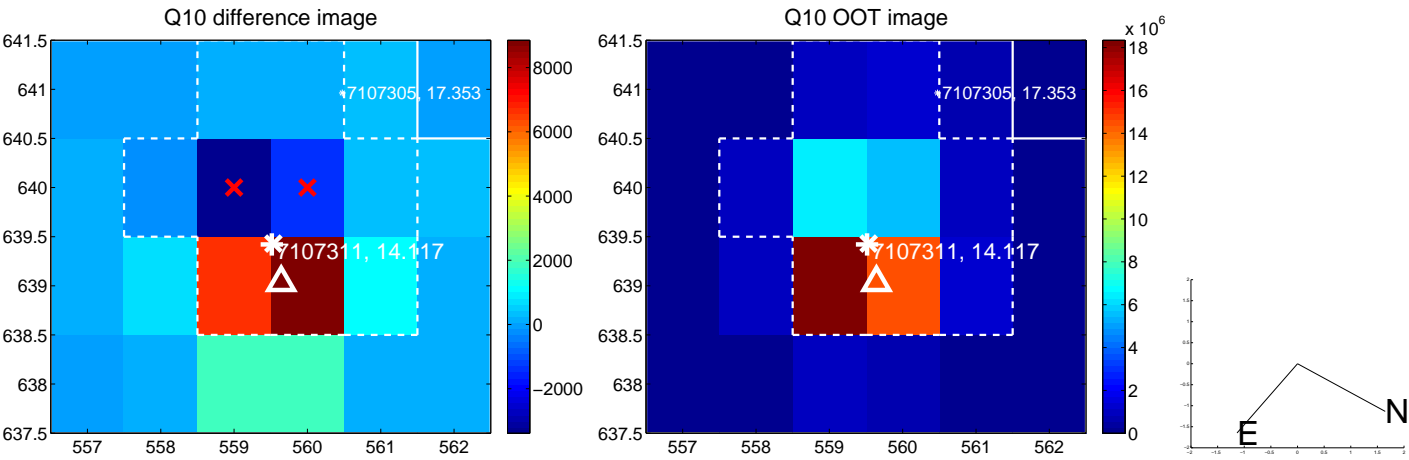
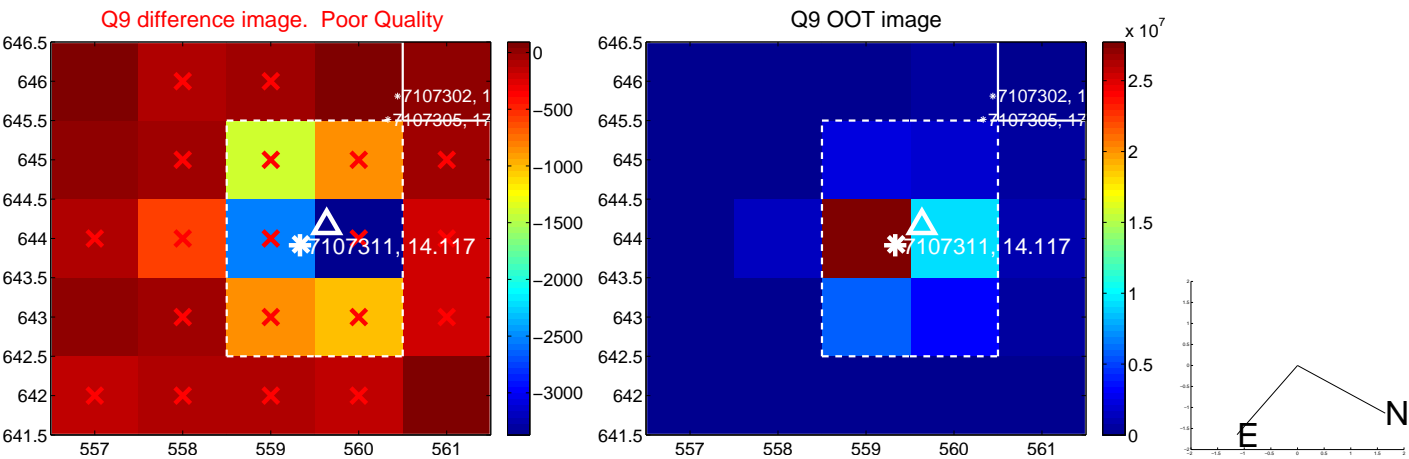
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



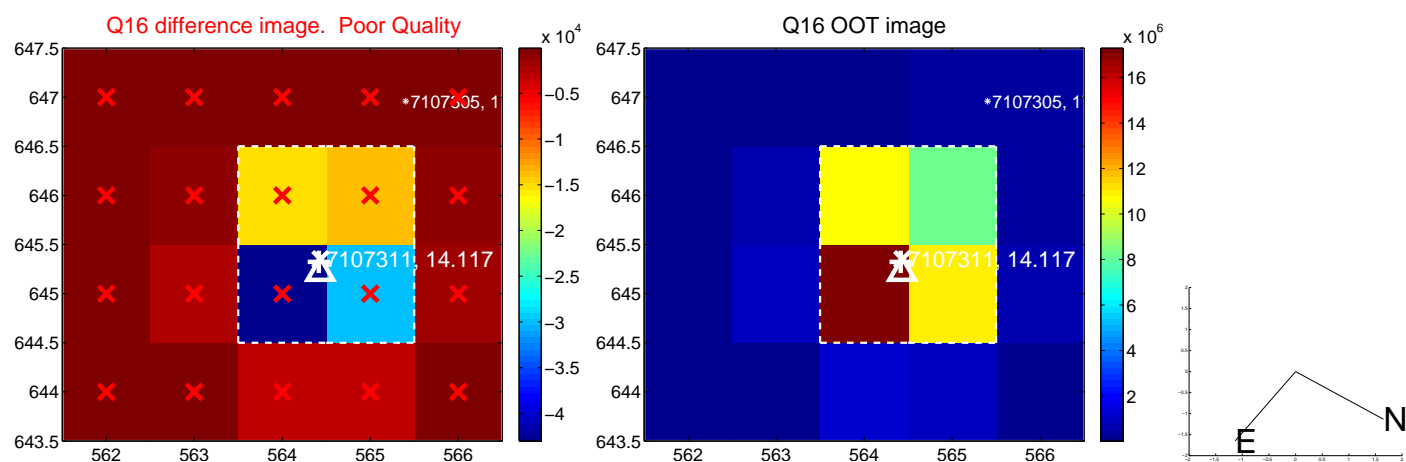
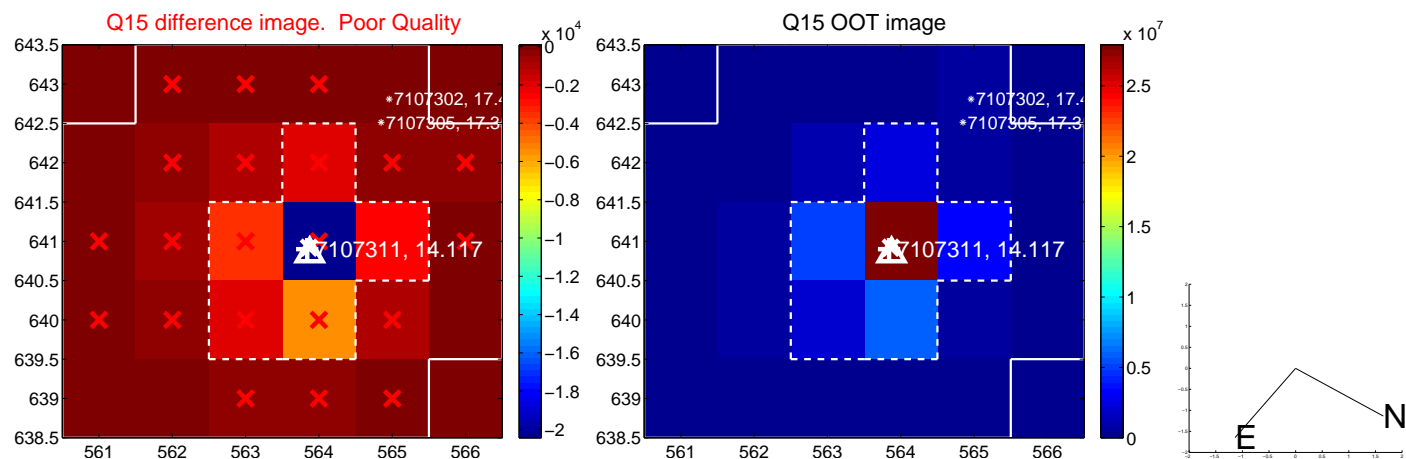
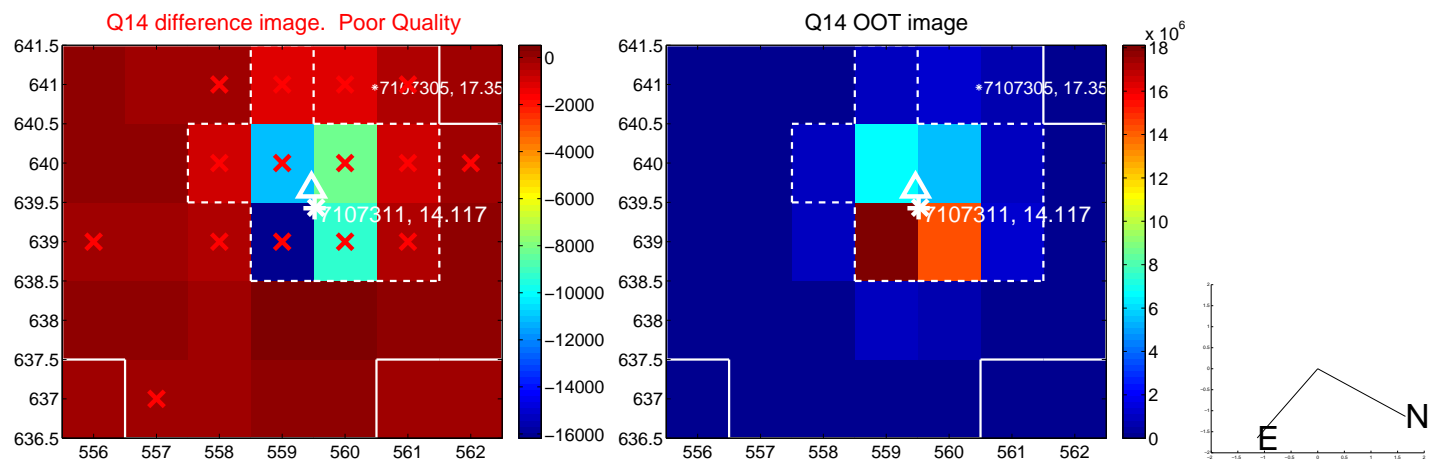
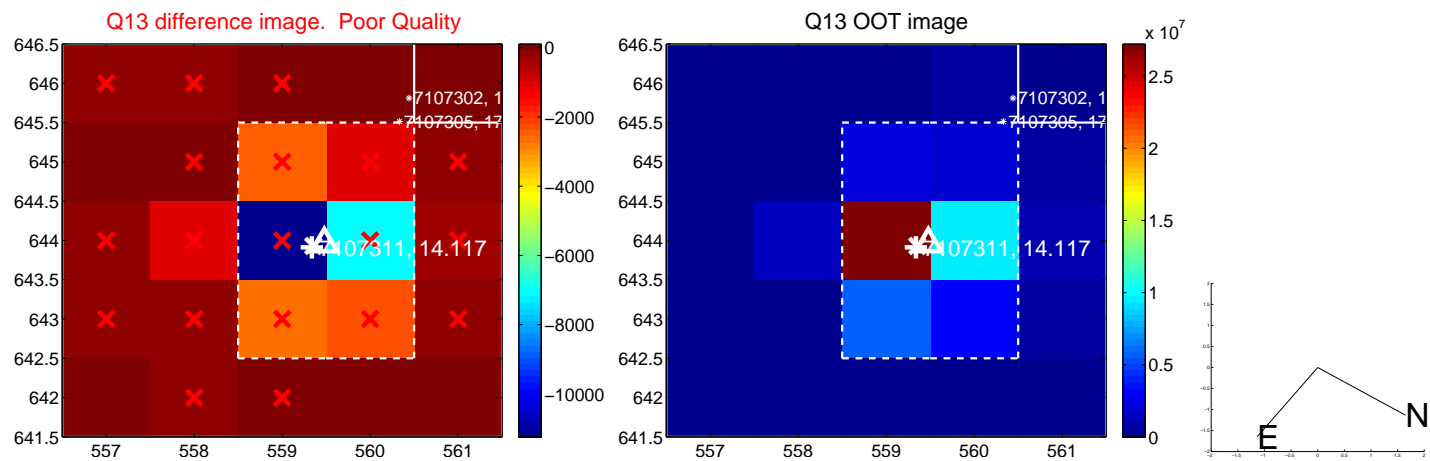
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



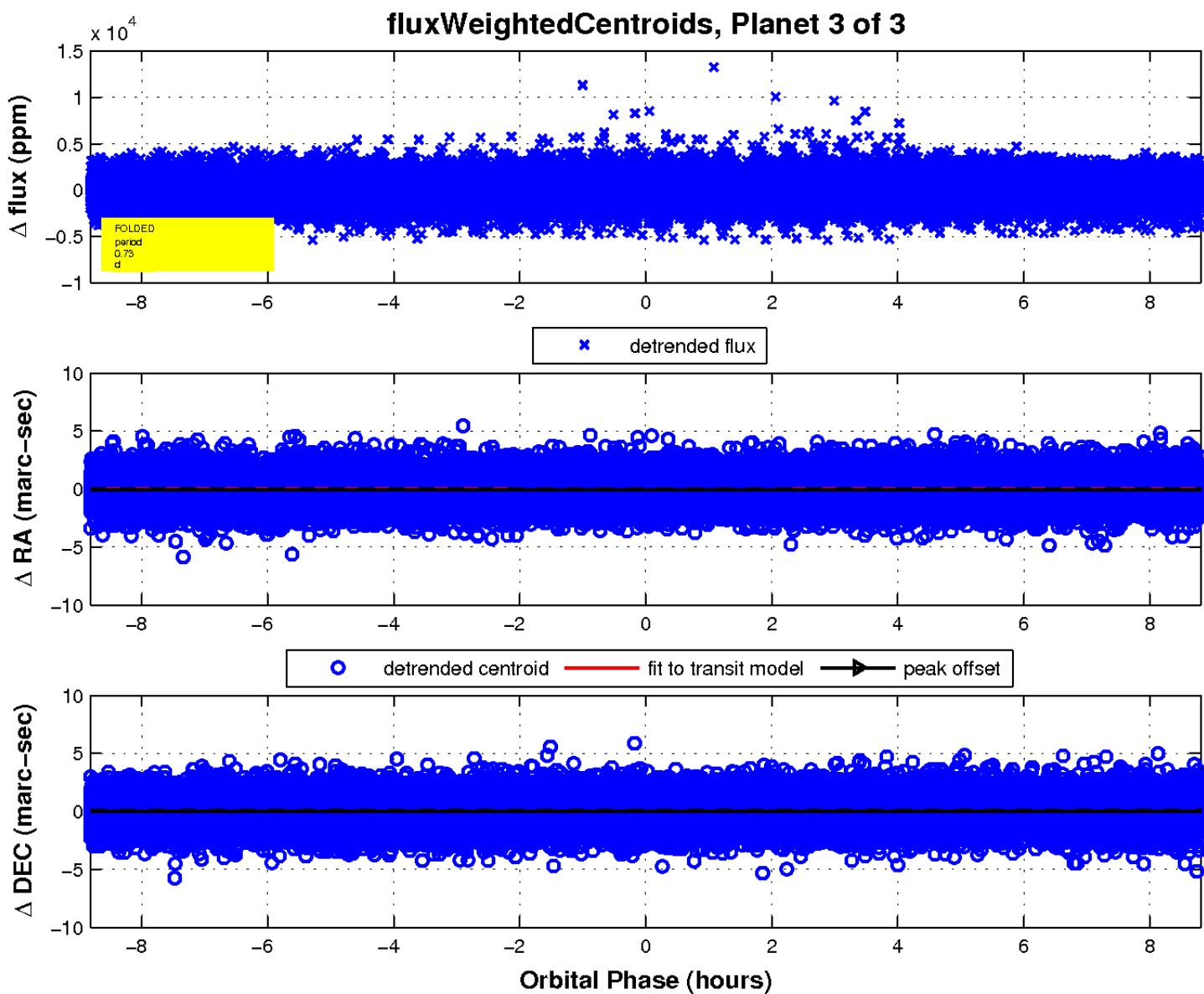
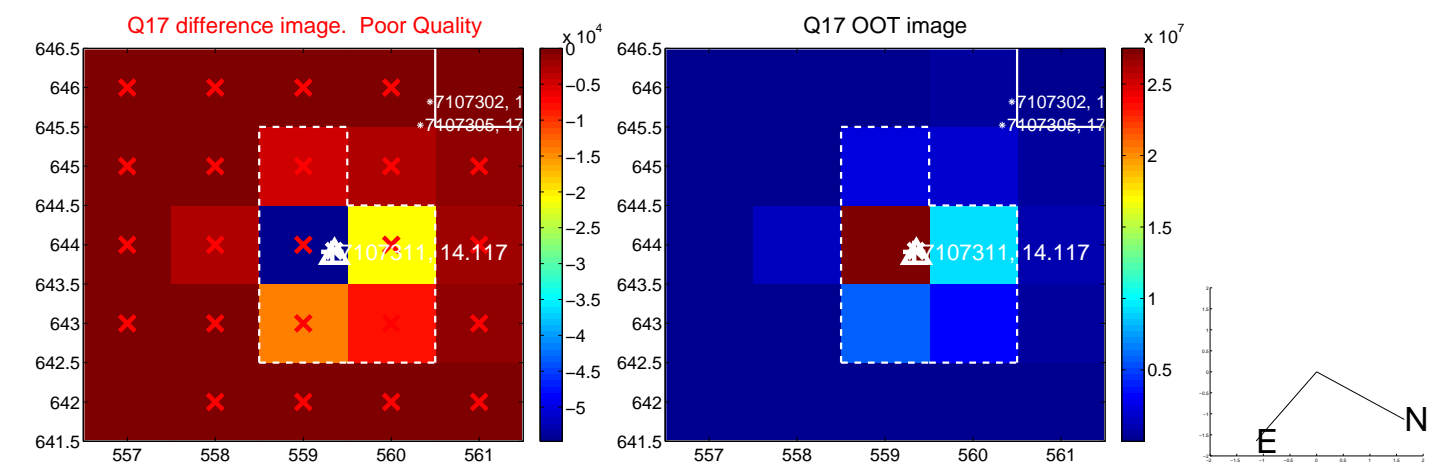
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

