

# KIC 010711913

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010711913-01	OBS	7365.01	19.407958	135.391561	141478.0	6.085	2538.9	2136.6	0.80	5702	41.20	37.97
010711913-02	OBS	No	19.407983	144.109841	6491.1	4.508	112.8	112.9	0.80	5702	9.79	37.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010711913-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
010711913-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

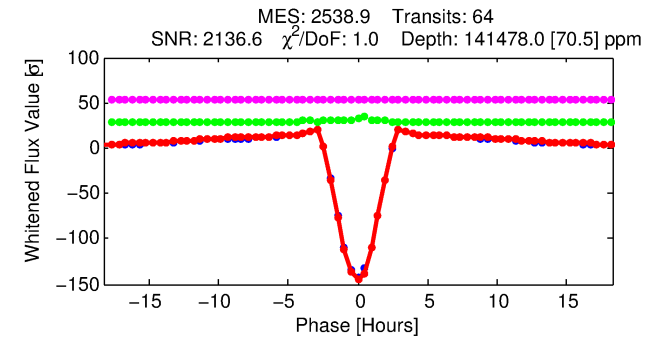
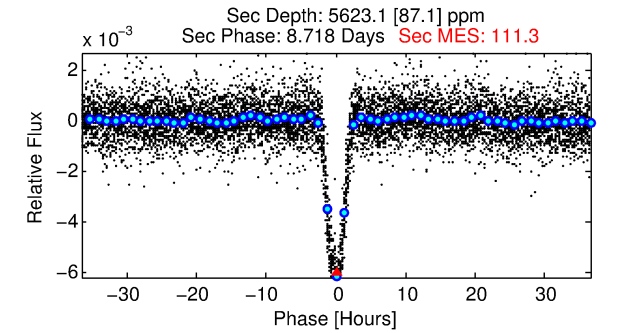
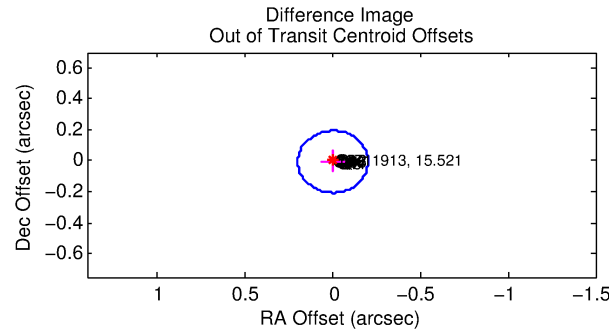
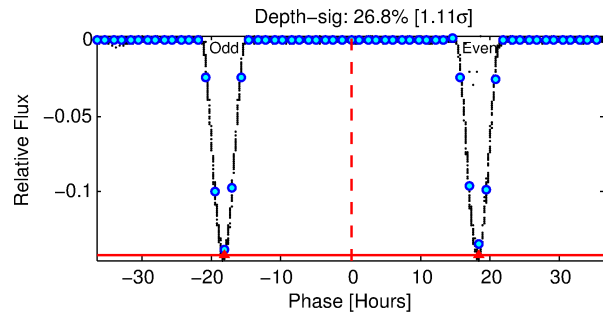
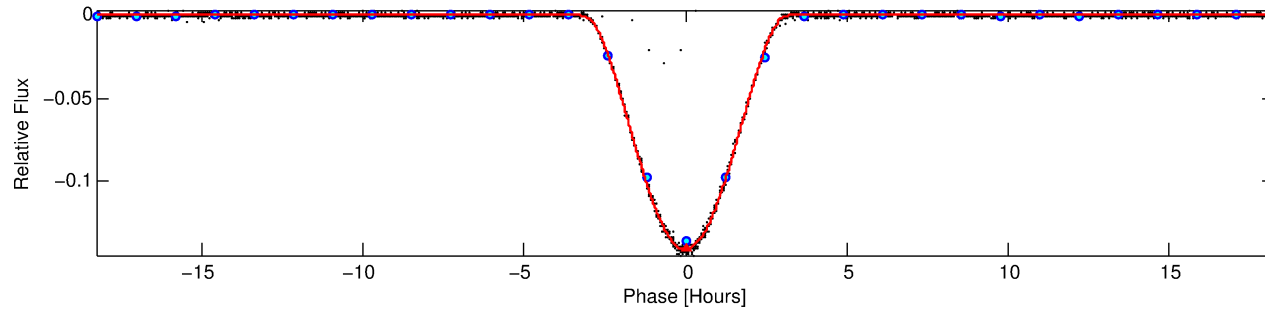
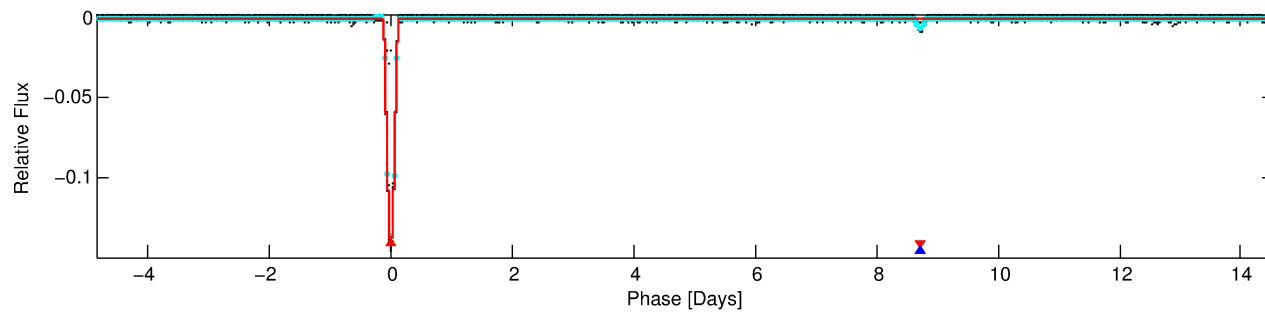
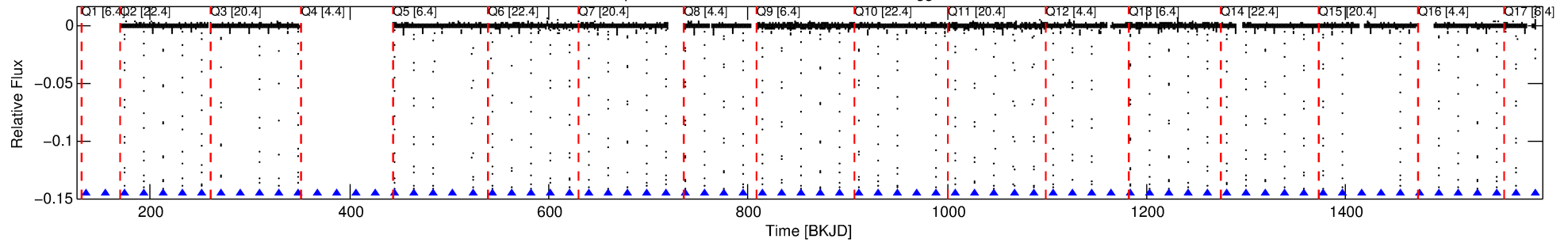
## Ephemeris Match Information For 010711913-01

No Significant Match Found

# DV One-Page Summary

KIC: 10711913 Candidate: 1 of 2 Period: 19.408 d  
KOI: K07365.01 Corr: 0.998

Kp: 15.52 R\*: 0.80 Rs Teff: 5702.0 K Logg: 4.49 Fe/H: -0.800



## DV Fit Results:

Period = 19.40796 [0.00000] d  
Epoch = 135.3916 [0.0001] BKJD  
Rp/R\* = 0.4725 [0.0174]  
a/R\* = 29.41 [0.06]  
b = 0.84 [0.03]  
Seff = 37.97 [10.20]  
Teq = 633 [43] K  
Rp = 41.20 [7.73] Re  
a = 0.1262 [0.0203] AU  
Ag = 29.03 [7.32] [3.83σ]  
Teffp = 2272 [80] K [18.07σ]

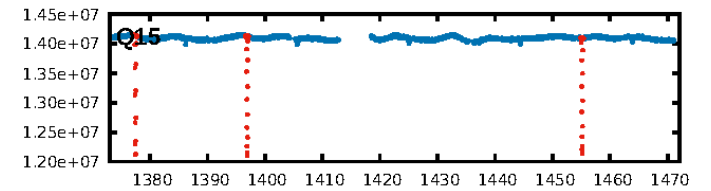
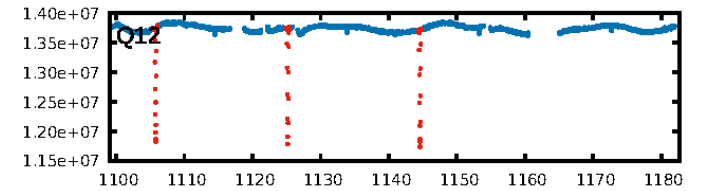
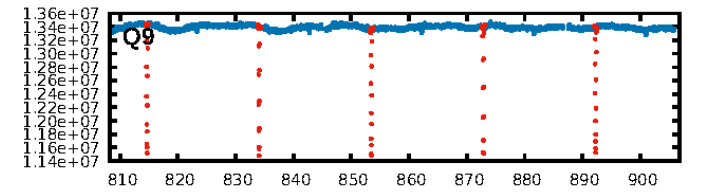
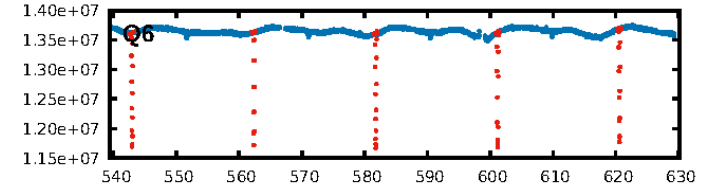
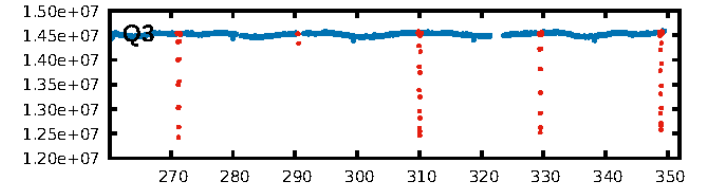
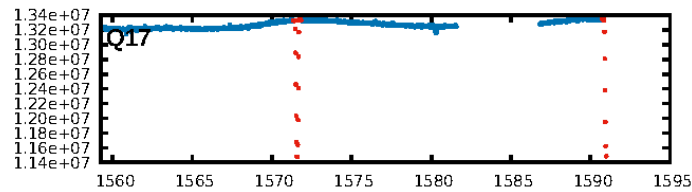
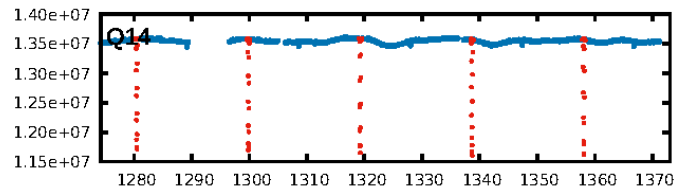
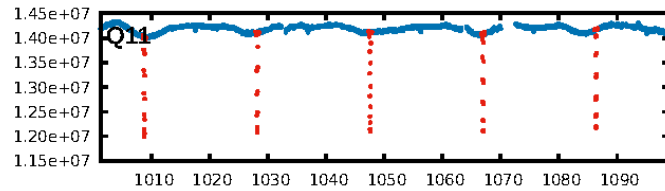
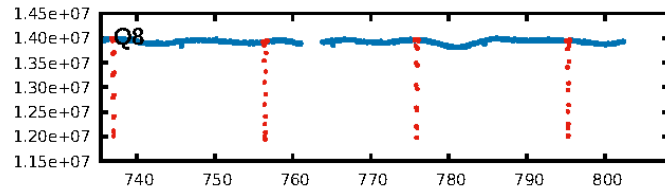
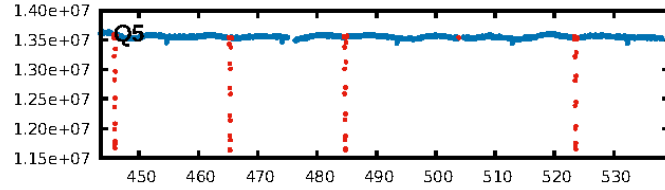
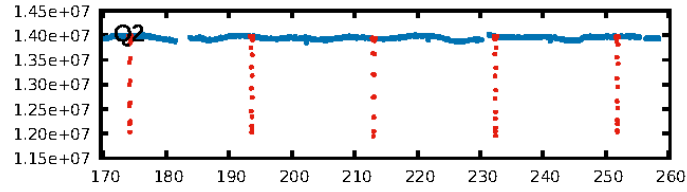
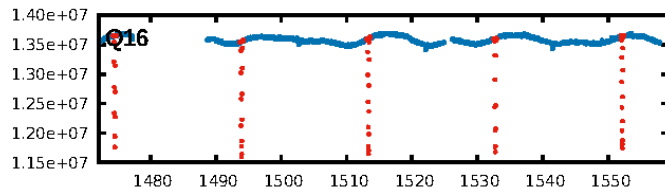
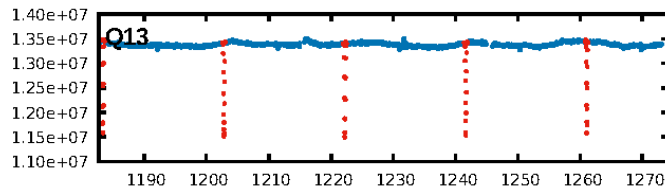
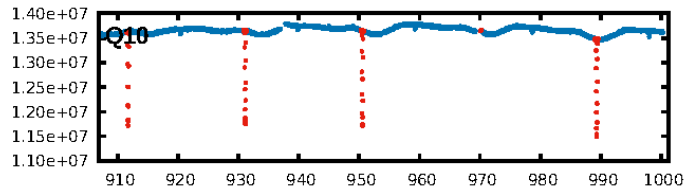
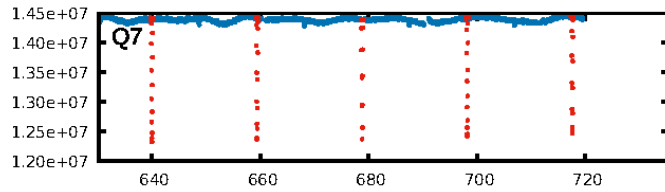
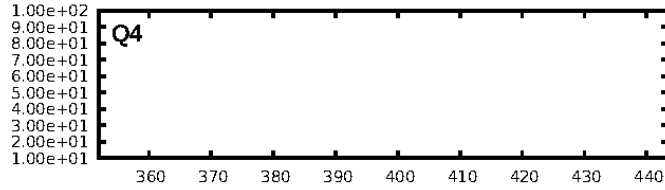
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [62/62]  
GhostDiagnostic-chr: 2.875  
Centroid-sig: 0.0%  
Centroid-so: 0.393 arcsec [124.99σ]  
OotOffset-rm: 0.006 arcsec [0.10σ]  
KicOffset-rm: 0.034 arcsec [0.49σ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 1.00 [15/15]

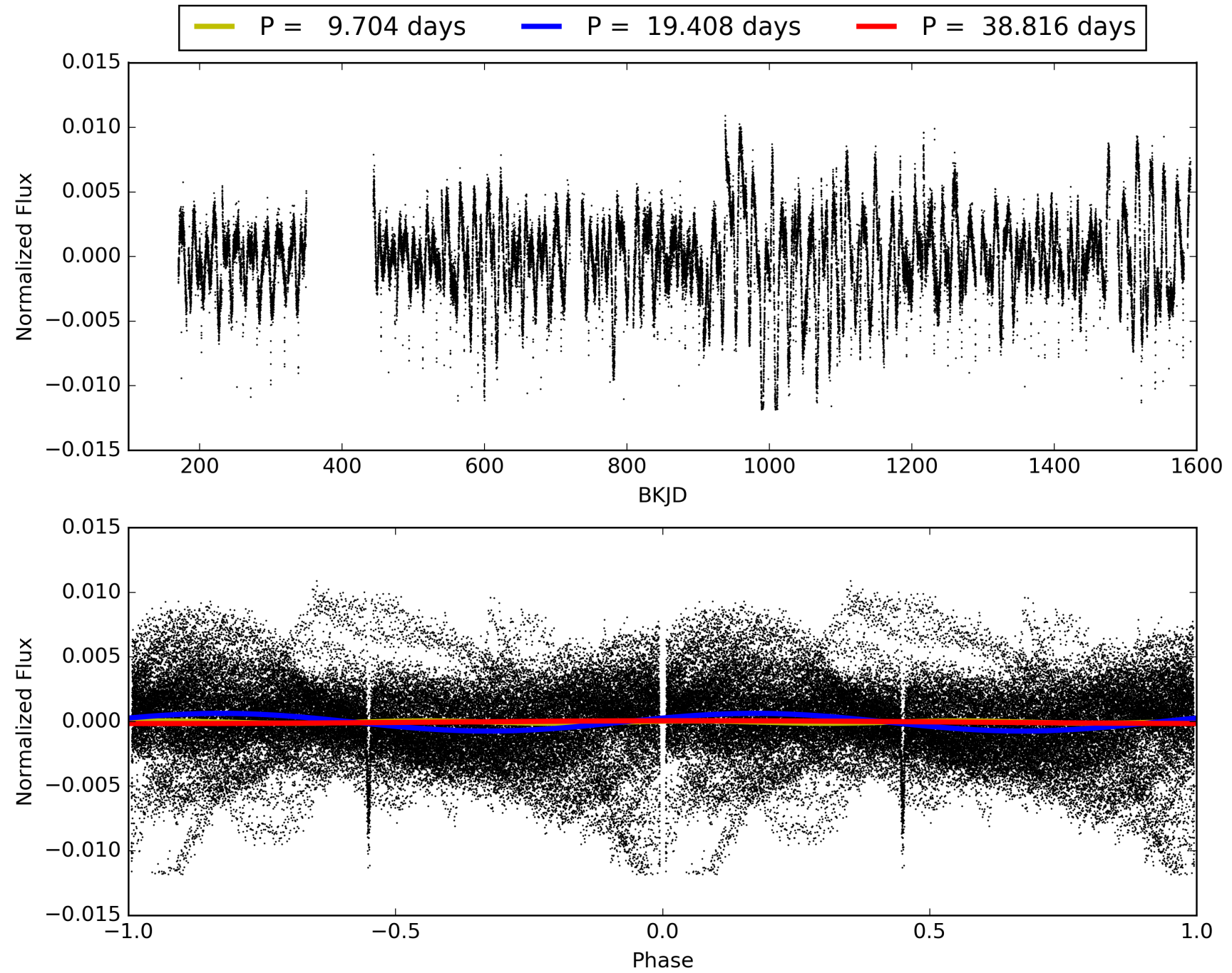
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 03:37:50 Z

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

# TCE 010711913-01, PDC Light Curves

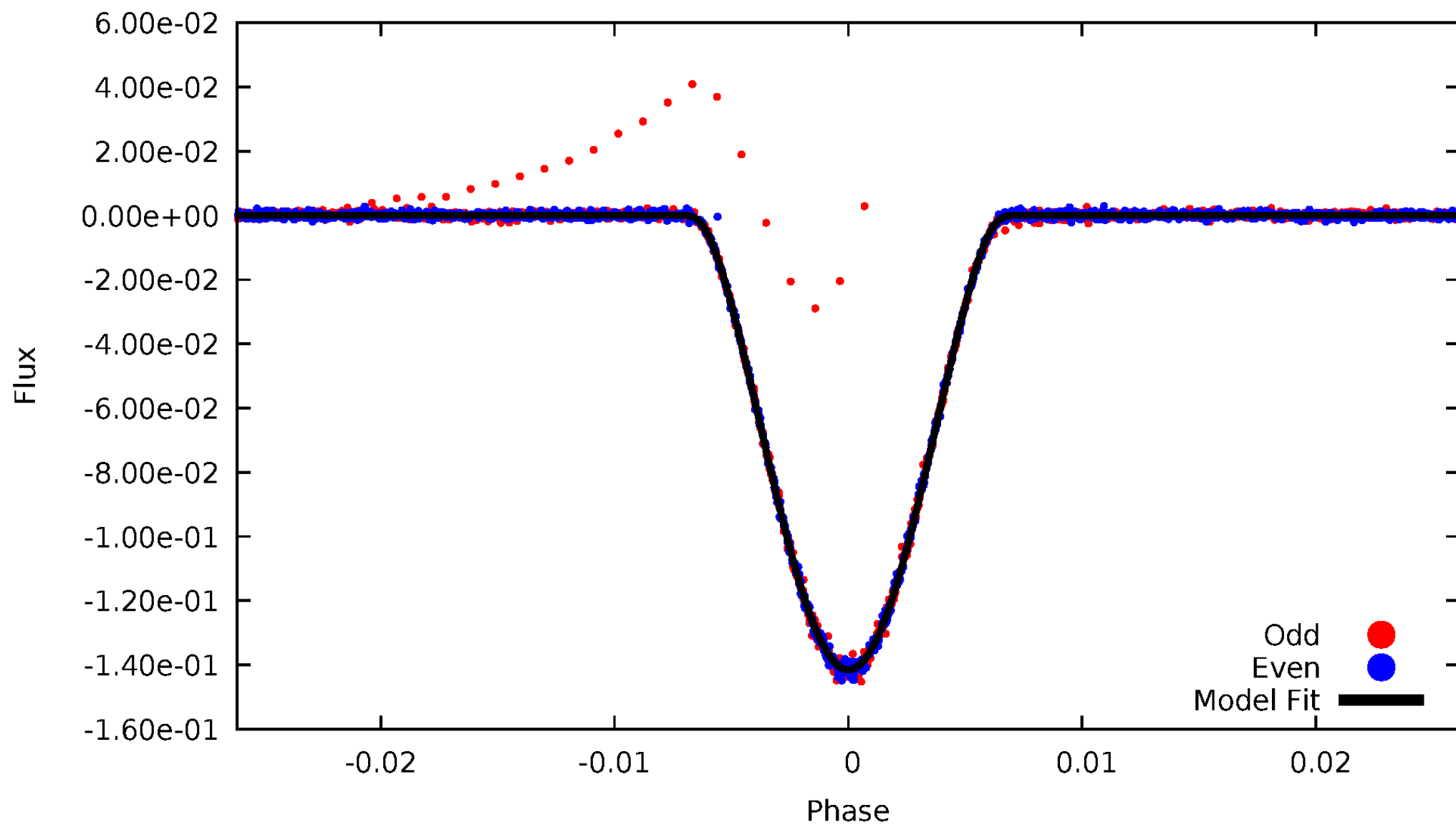


# TCE 010711913-01



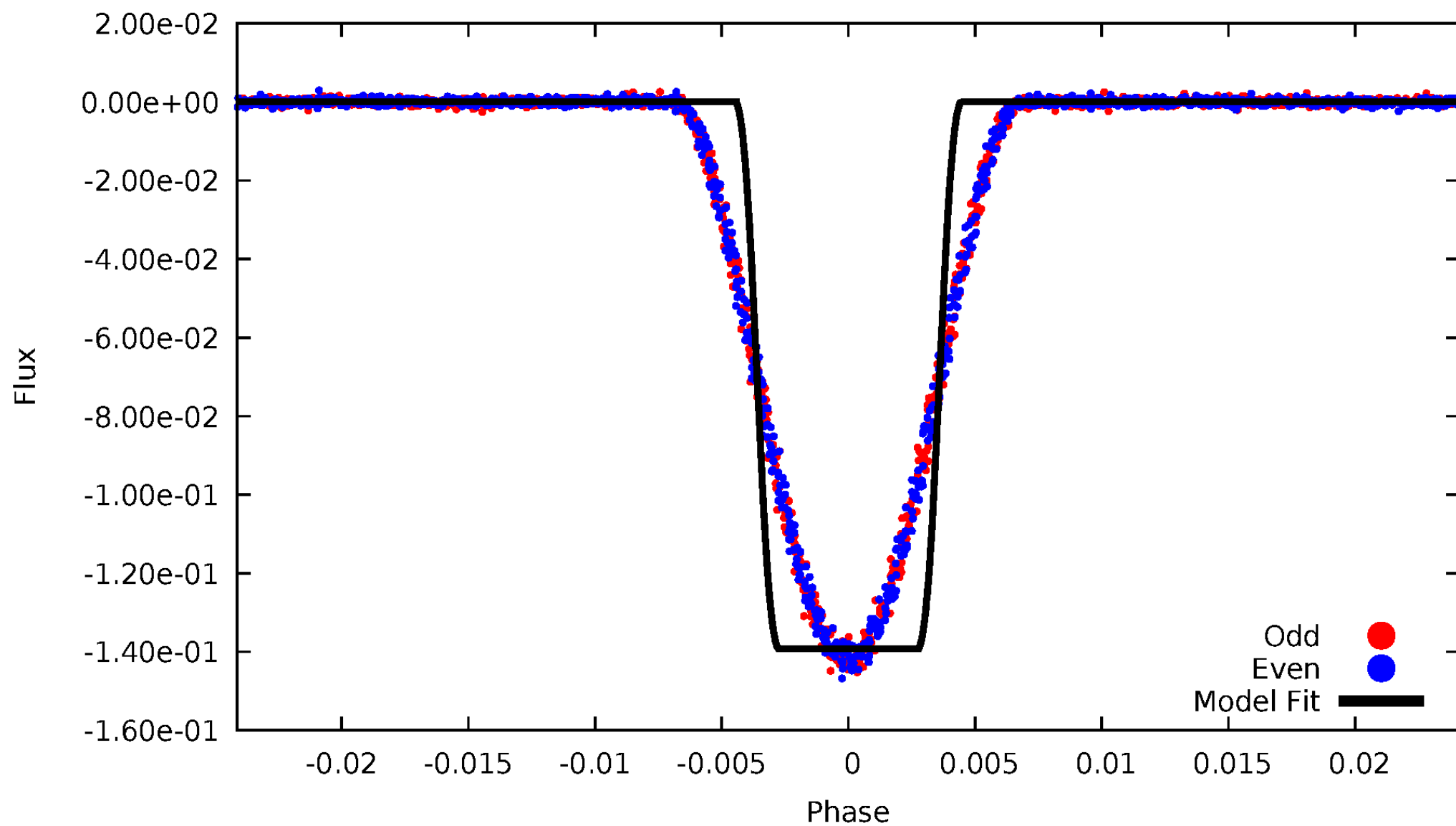
# DV Odd/Even

TCE 010711913-01



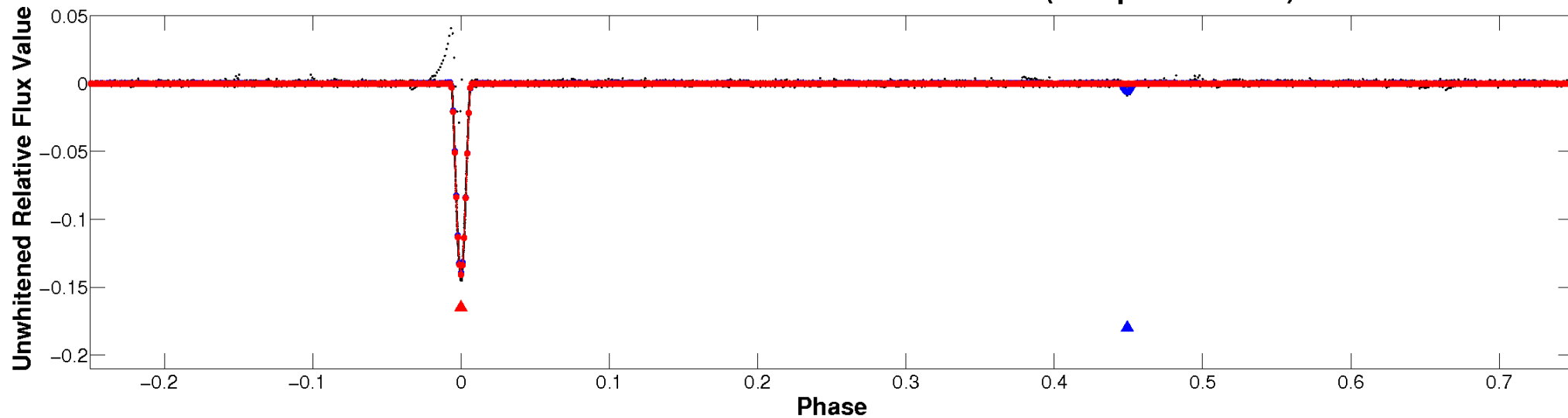
# ALT Odd/Even

TCE 010711913-01

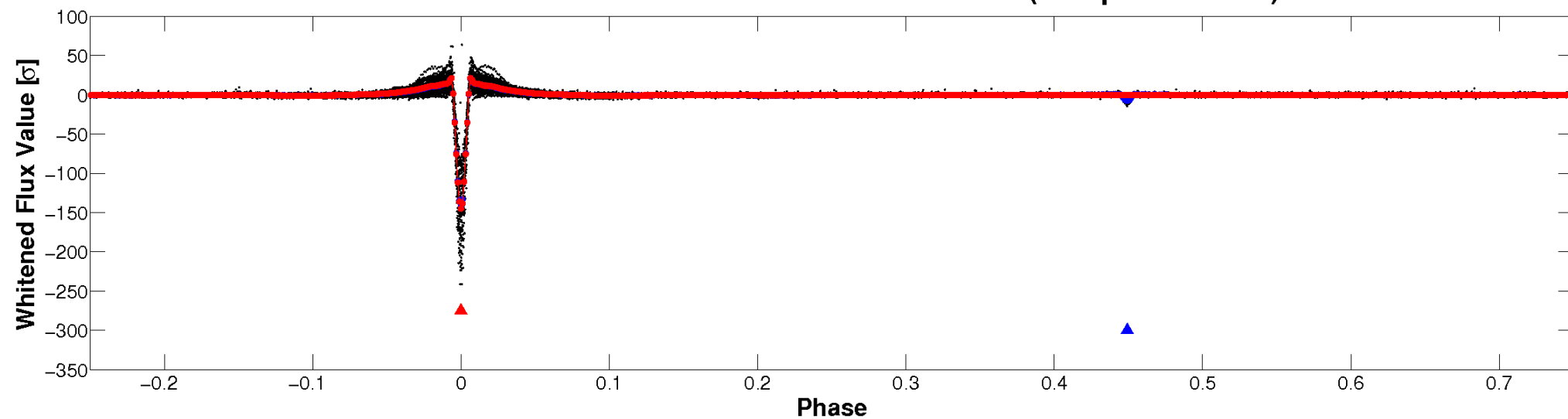


# Non-Whitened Vs. Whitened Light Curve

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

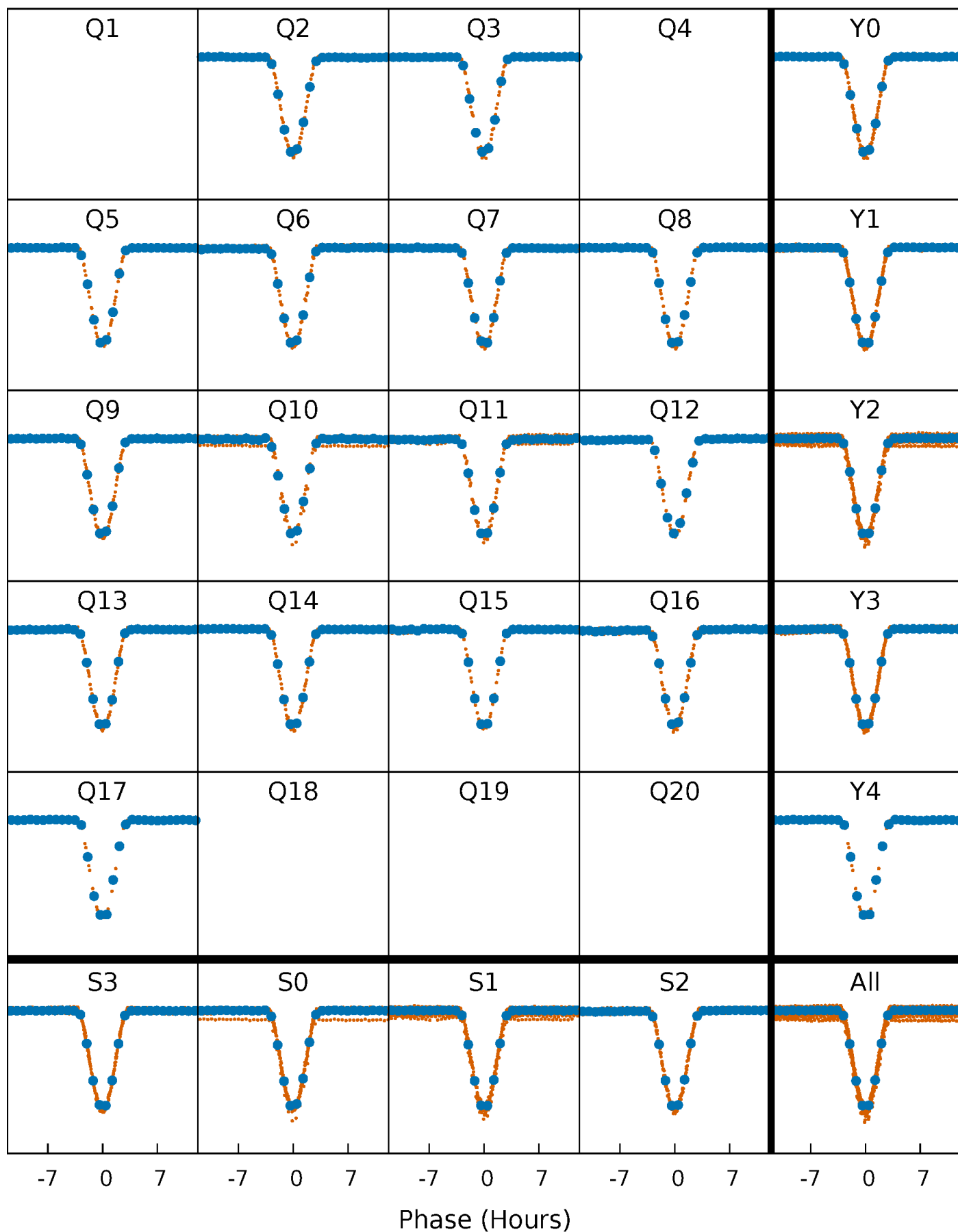


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

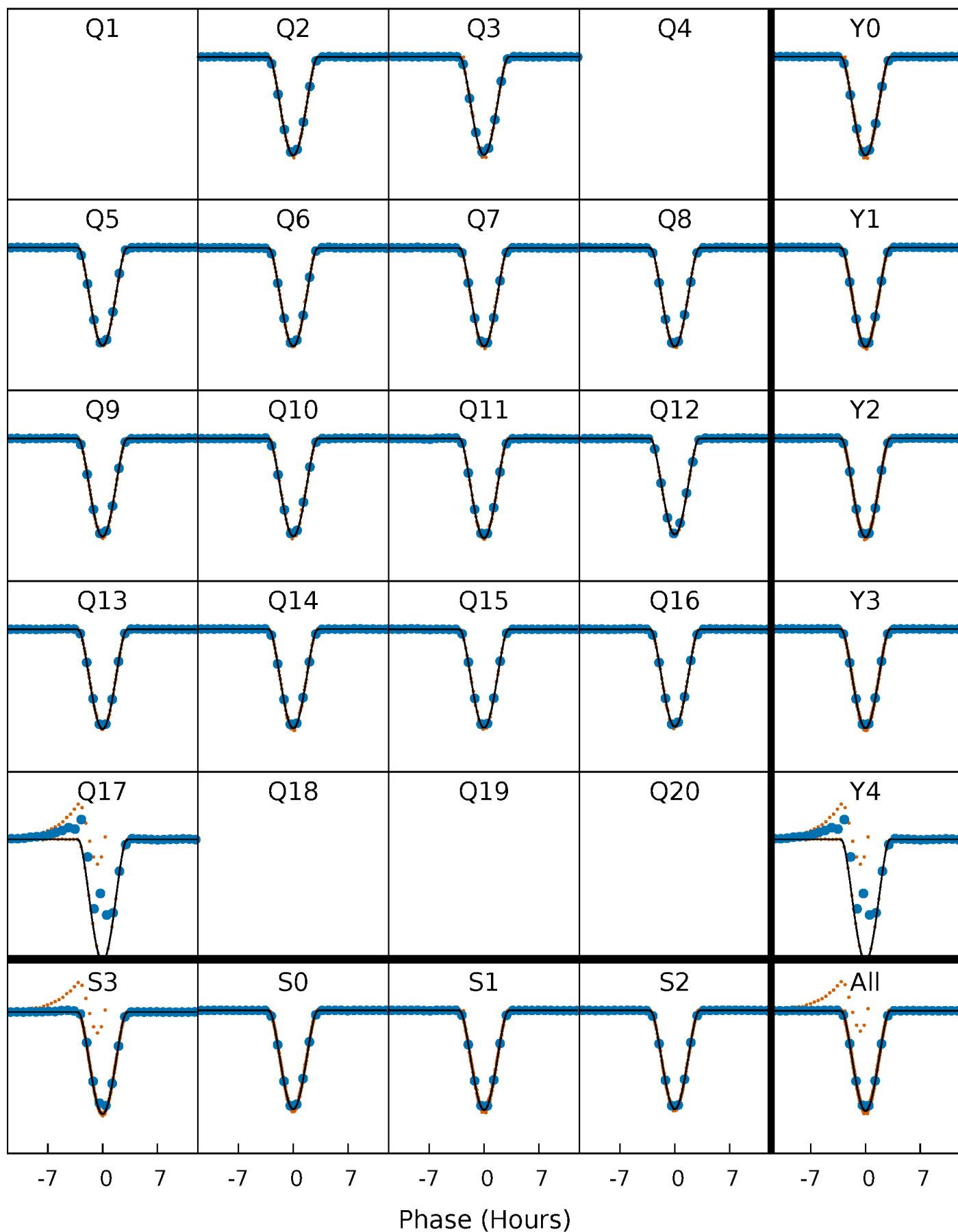
TCE 010711913-01 P= 19.407958 Days  $T_0=135.391561$  (BKJD)





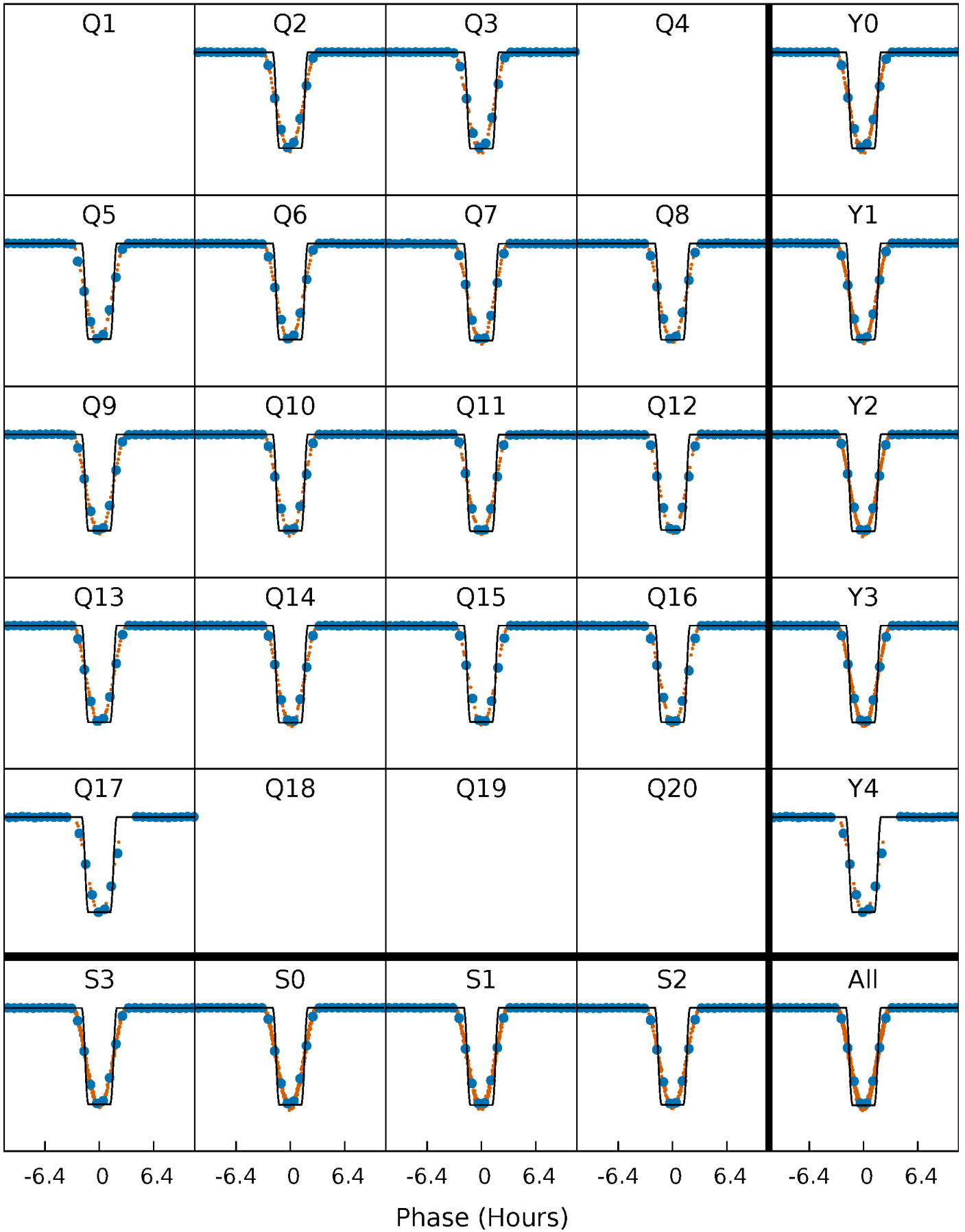
# DV Quarter-Phased Transit Curves

TCE 010711913-01 P= 19.407958 Days  $T_0=135.391561$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

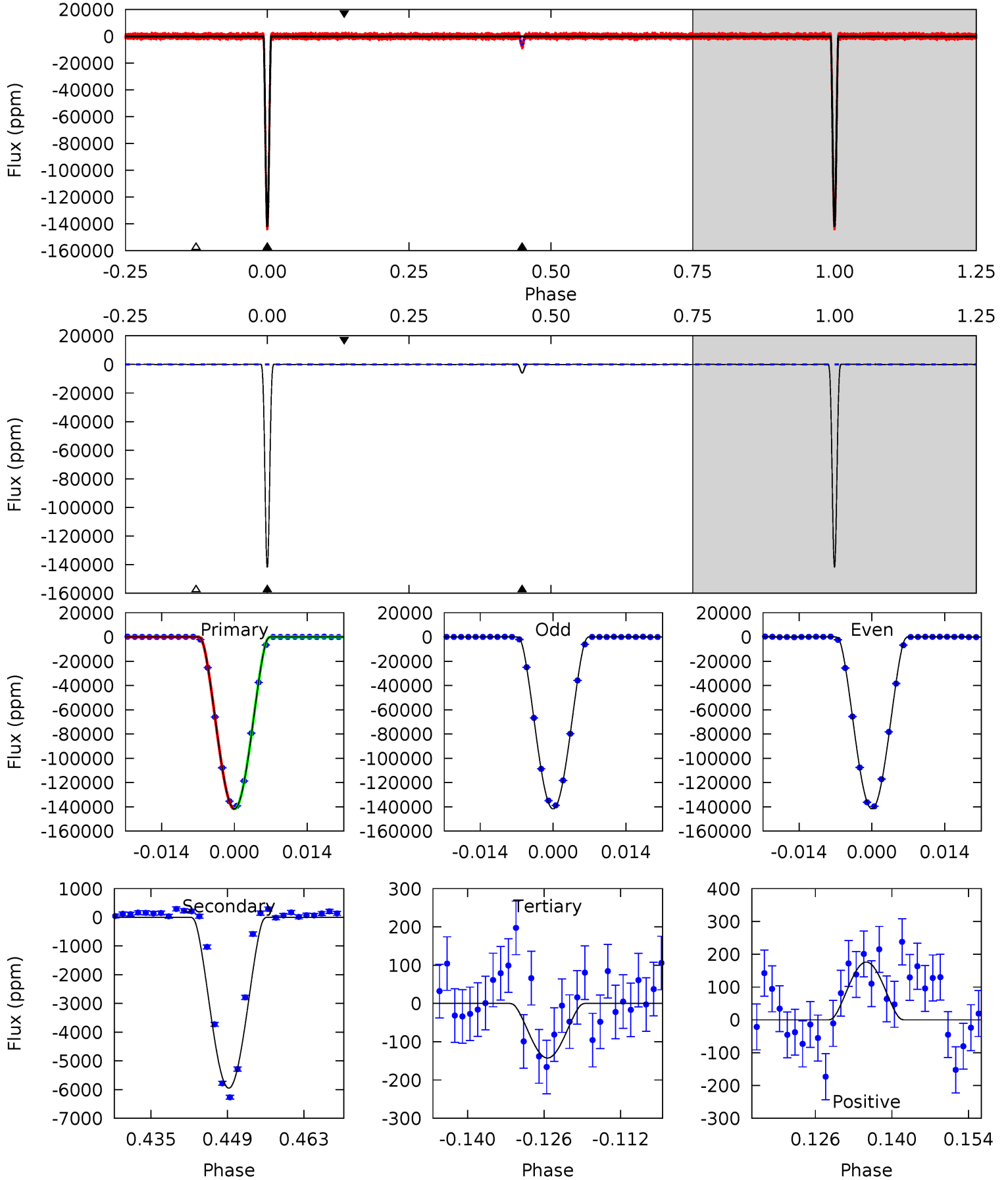
TCE 010711913-01 P= 19.407836 Days  $T_0=135.396253$  (BKJD)



# DV Model-Shift Uniqueness Test

010711913-01, P = 19.407958 Days, E = 135.391561 Days

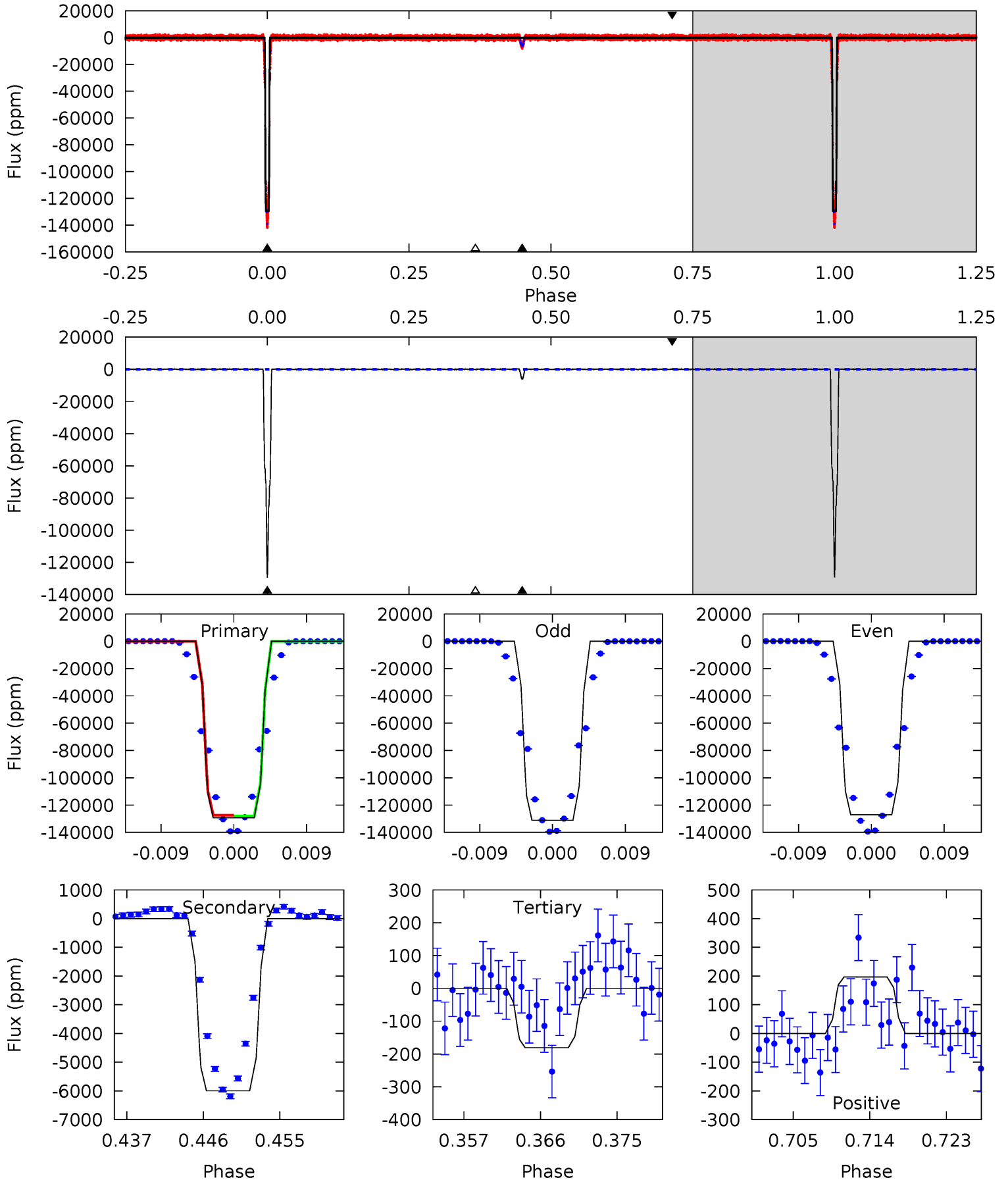
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5778	242.6	5.81	7.18	4.96	2.46	2.83	5773	5771	236.8	235.4	0.56	0.97	0.00	0.89



# Alt Model-Shift Uniqueness Test

010711913-01, P = 19.407836 Days, E = 135.396253 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
2881	133.6	4.03	4.38	5.05	2.61	1.39	2877	2877	129.6	129.2	46.8	1.00	0.00	5.92



### Stellar Parameters For KIC 010711913

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5702^{+170}_{-153}$	$4.485^{+0.135}_{-0.135}$	$-0.800^{+0.350}_{-0.300}$	$0.799^{+0.147}_{-0.110}$	$0.711^{+0.096}_{-0.030}$	$1.966^{+1.018}_{-0.732}$
	+3%/-3%	+3%/-3%	+44%/-37%	+18%/-14%	+14%/-4%	+52%/-37%
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 010711913-01 / KOI 7365.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-5949 \pm 25$	$41.44^{+4.63}_{-3.86}$	$884^{+48}_{-49}$	$2976^{+60}_{-57}$	$31^{+7}_{-6}$
Alt.	$-5997 \pm 45$	$32.69^{+3.88}_{-3.36}$	$882^{+51}_{-45}$	$3191^{+74}_{-70}$	$50^{+12}_{-9}$

$T_{\text{max}}$  = 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

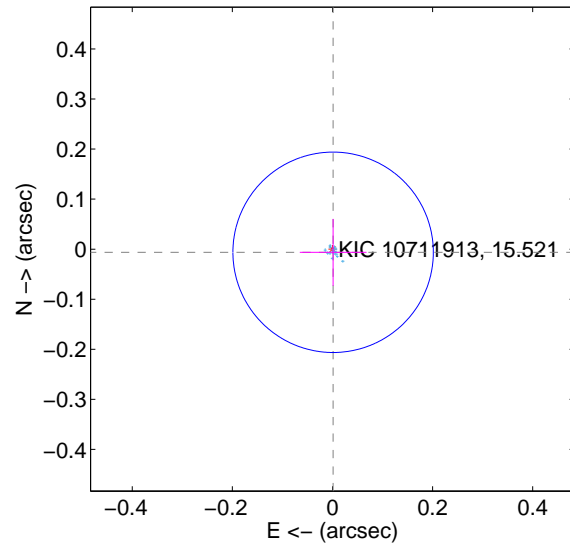
Supplemental centroid analysis for 010711913-01. Kepler magnitude: 15.52. Transit SNR 2136.63

There are 15 quarters with good PRF difference image offsets

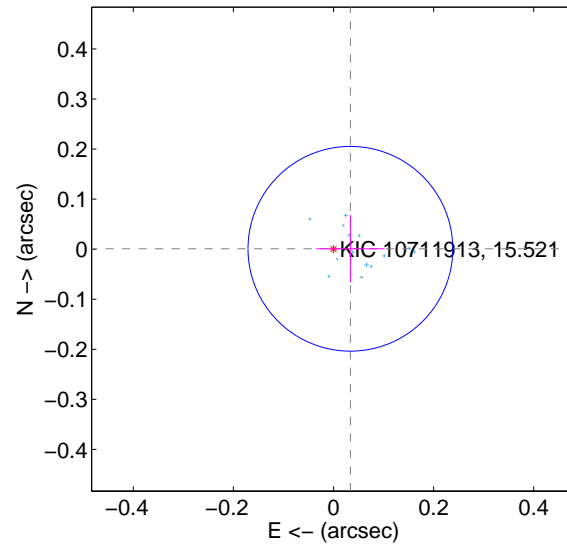
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.006 \pm 0.067$	0.10	$-0.001 \pm 0.067$	$-0.006 \pm 0.067$
PRF-fit source offset from KIC position	$0.034 \pm 0.068$	0.49	$-0.034 \pm 0.068$	$0.001 \pm 0.067$
photometric centroid source offset	$0.39 \pm 0.00$	124.99	$-0.28 \pm 0.00$	$0.28 \pm 0.00$

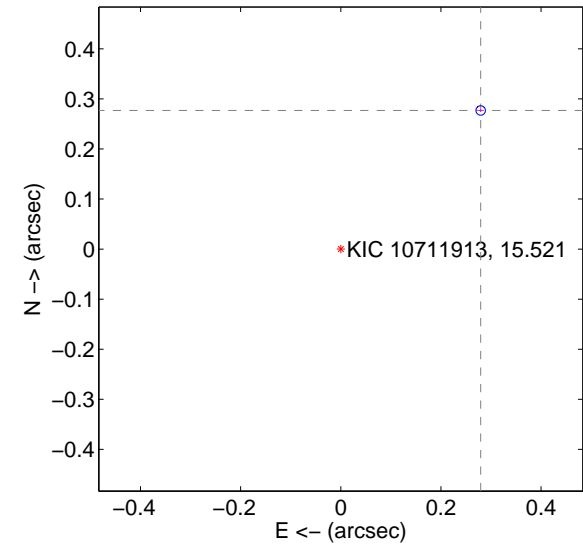
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



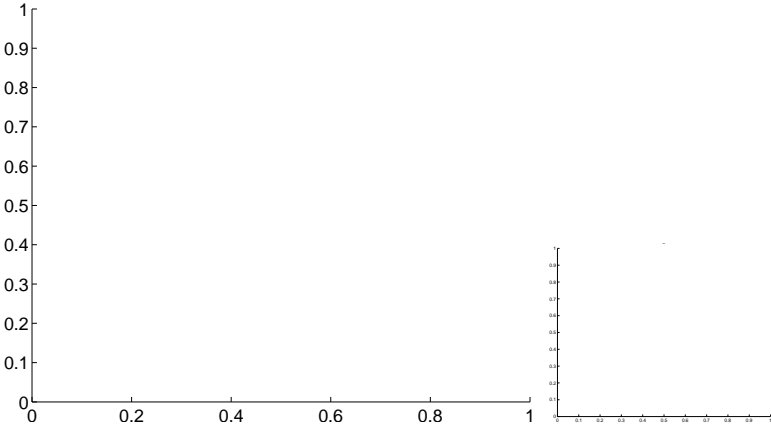
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

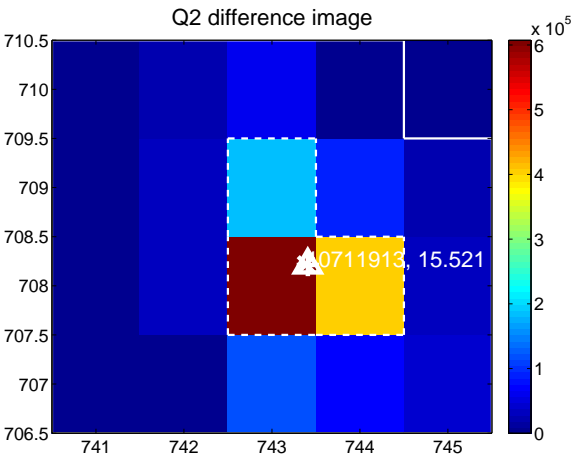
Q1 no difference image



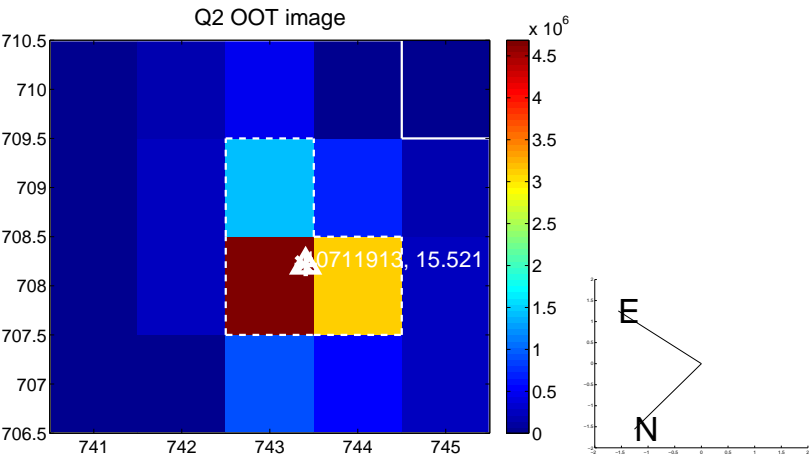
Q1 no OOT image



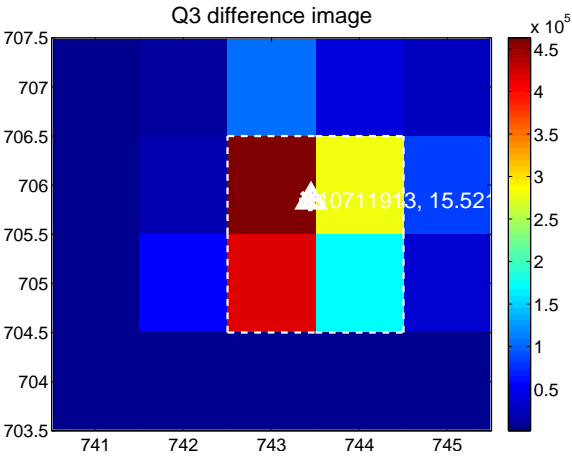
Q2 difference image



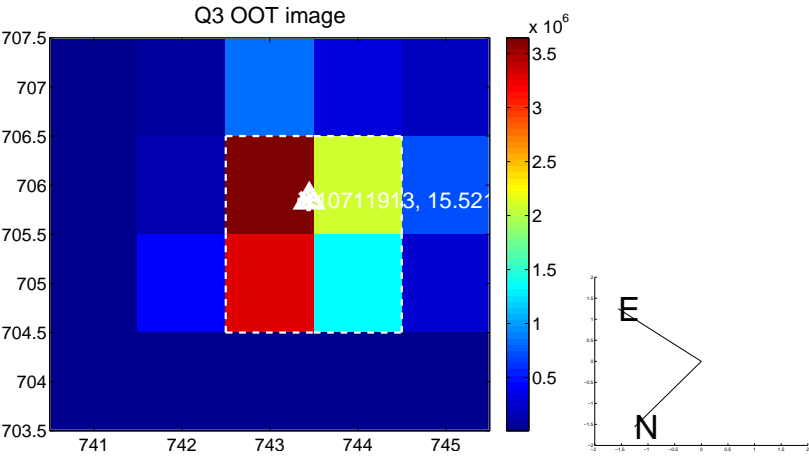
Q2 OOT image



Q3 difference image



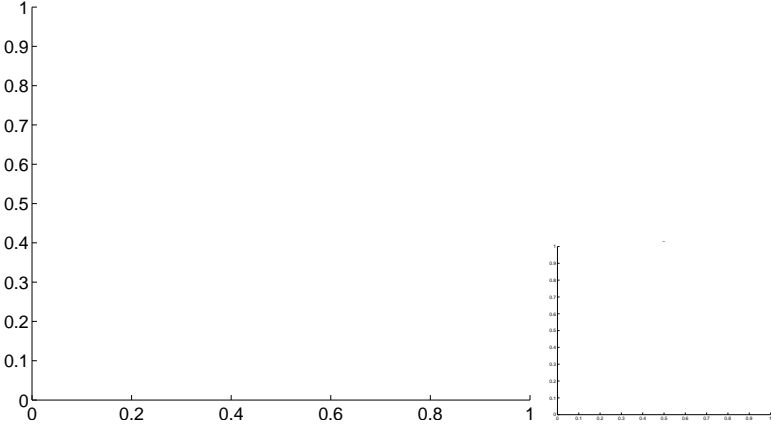
Q3 OOT image



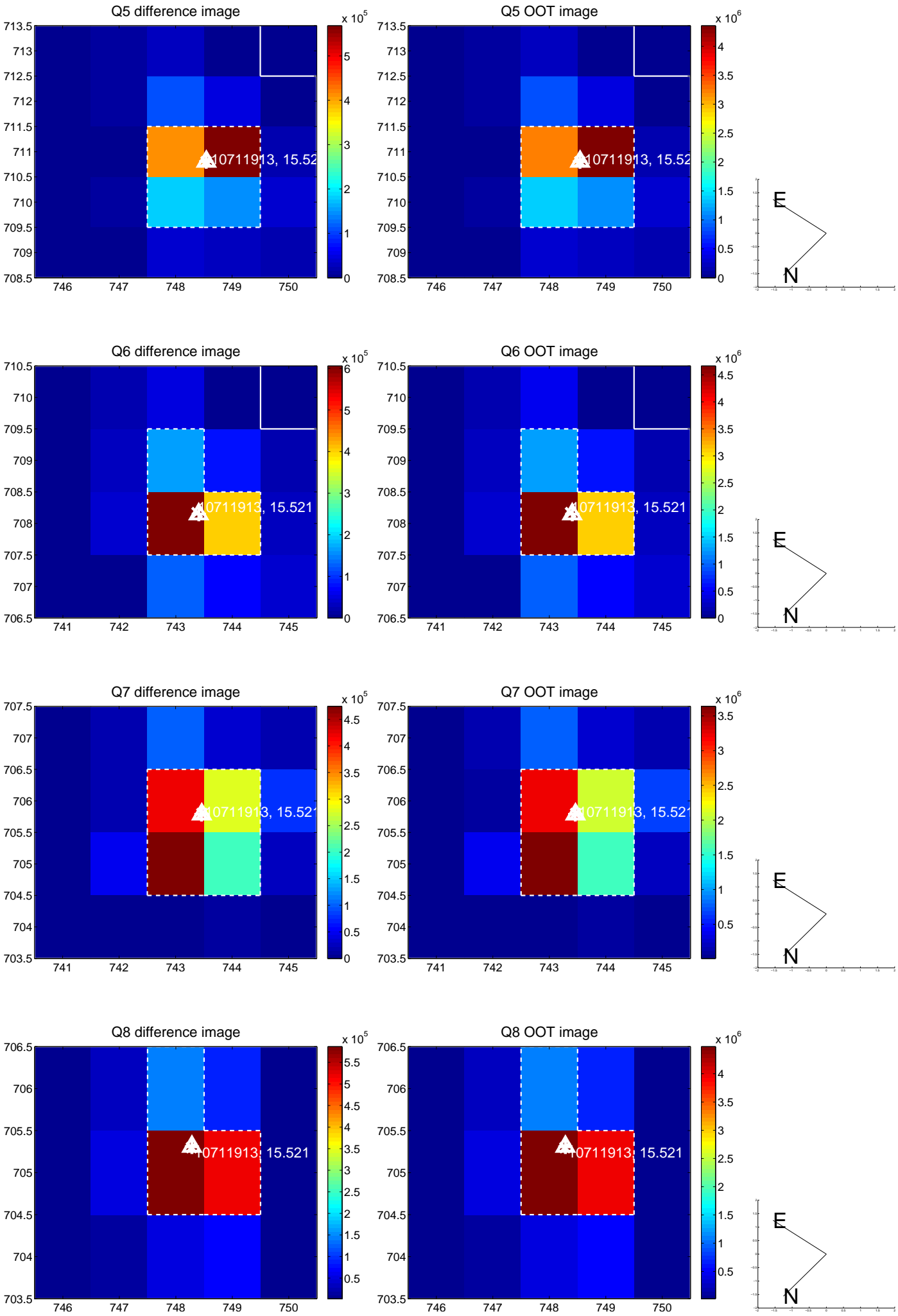
Q4 no difference image



Q4 no OOT image

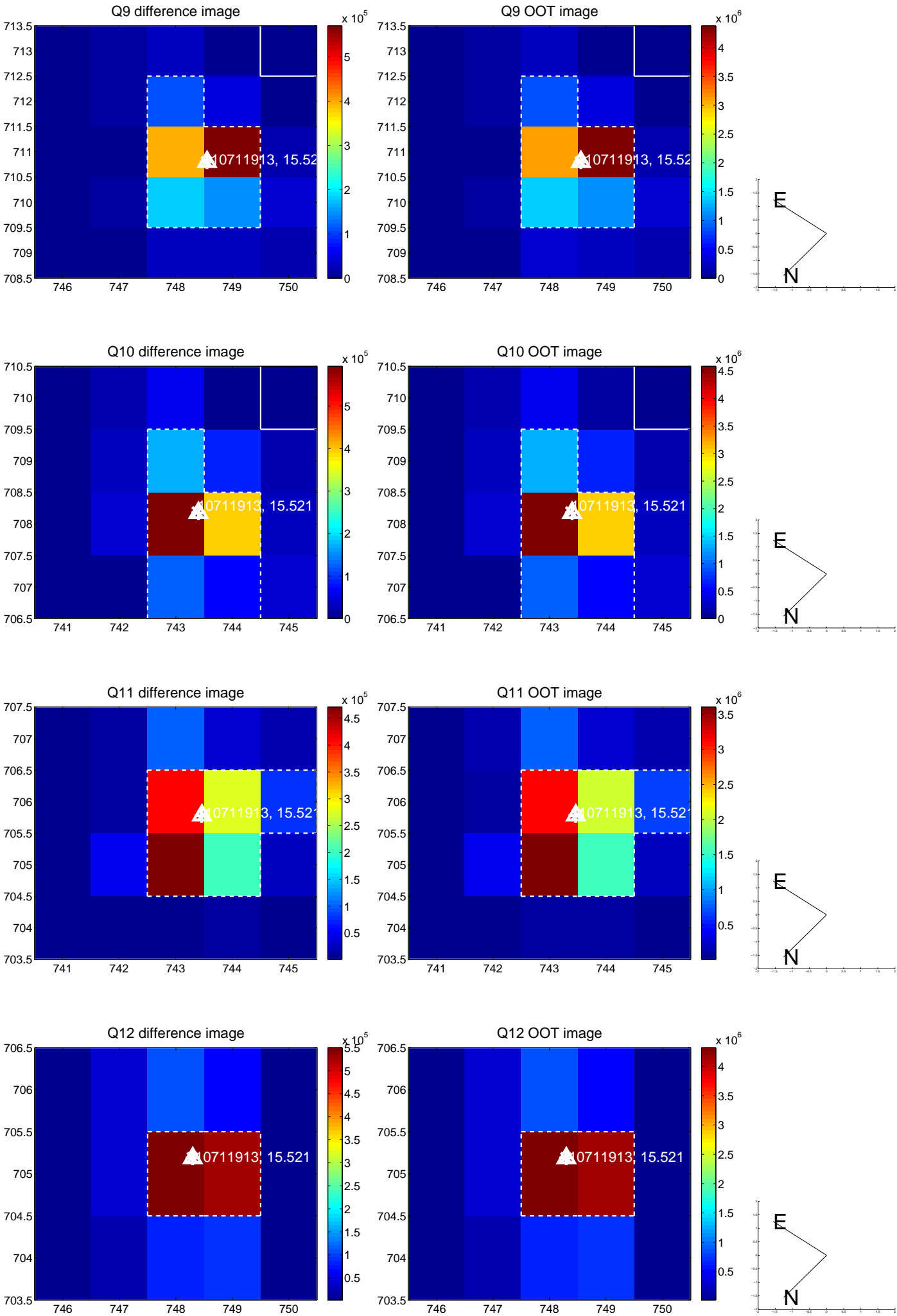


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

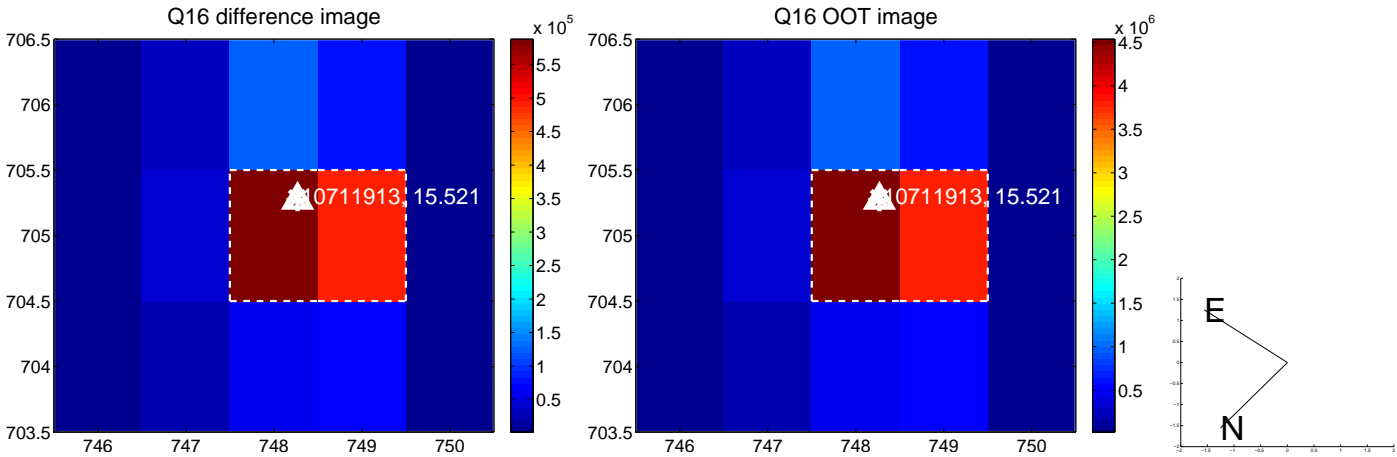
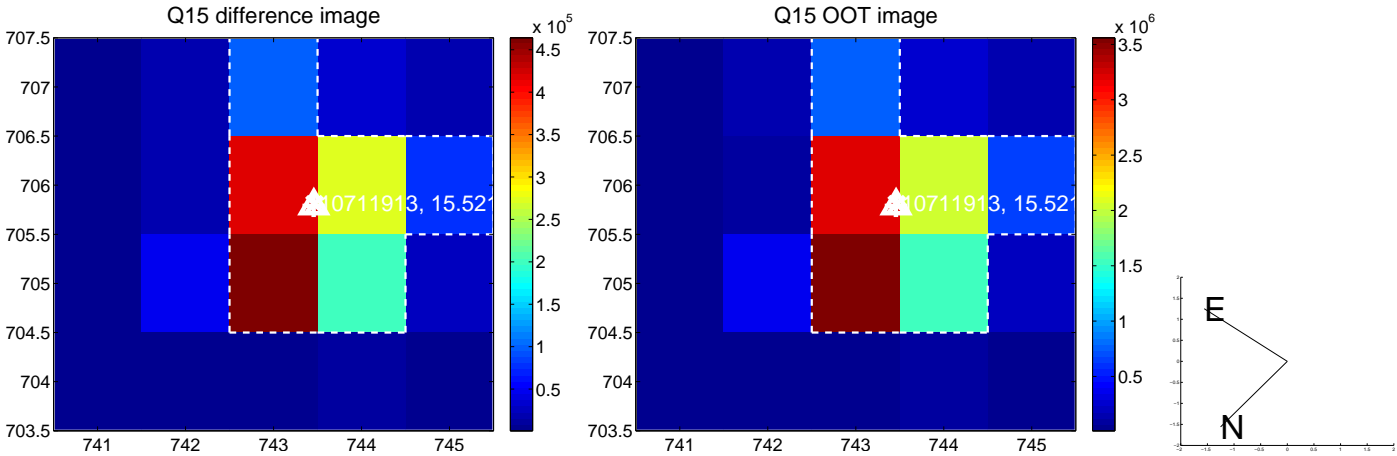
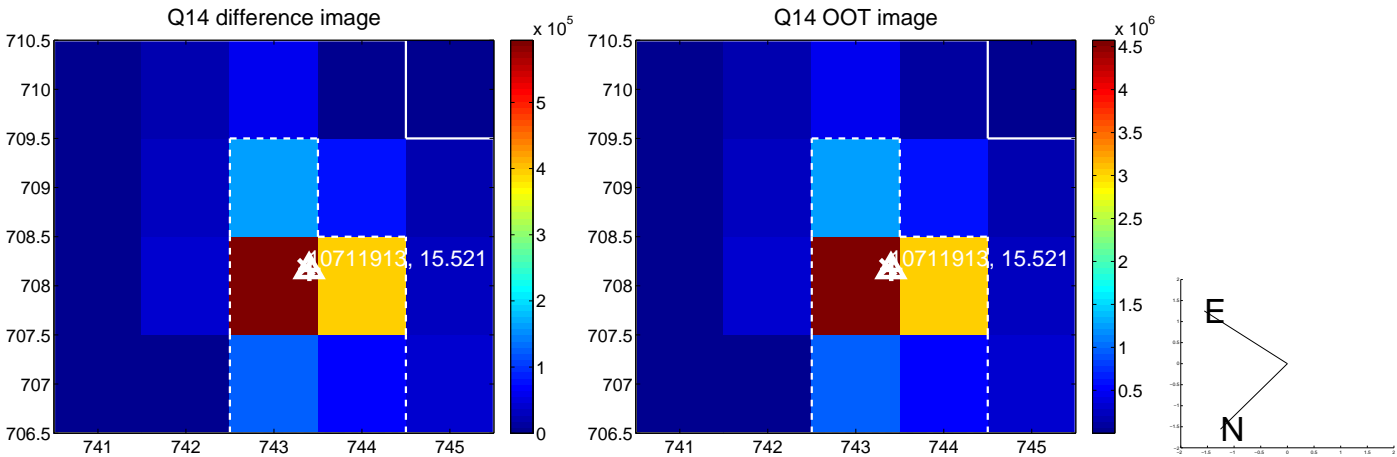
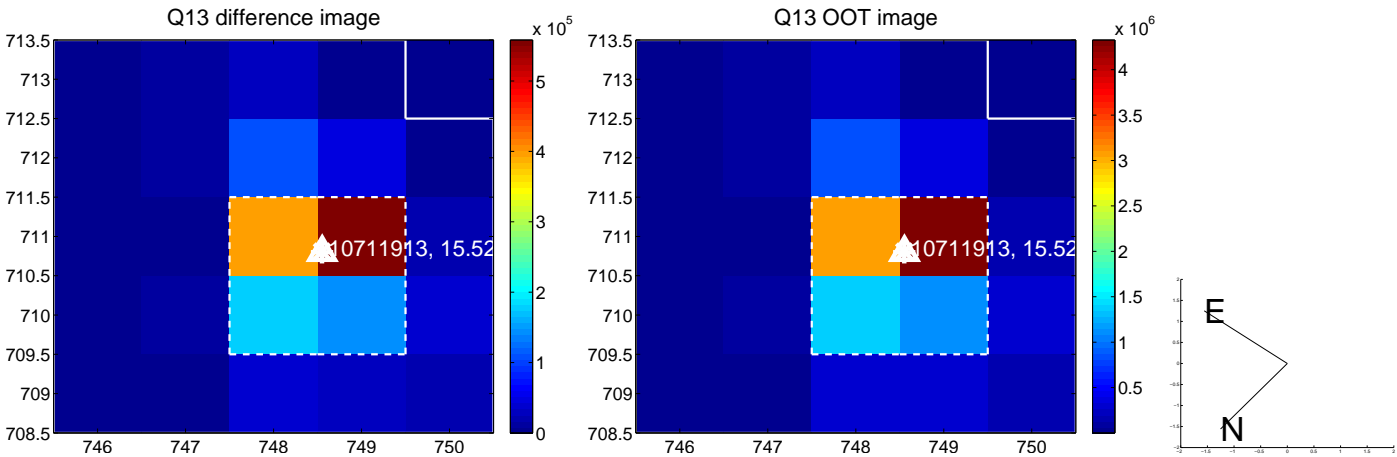




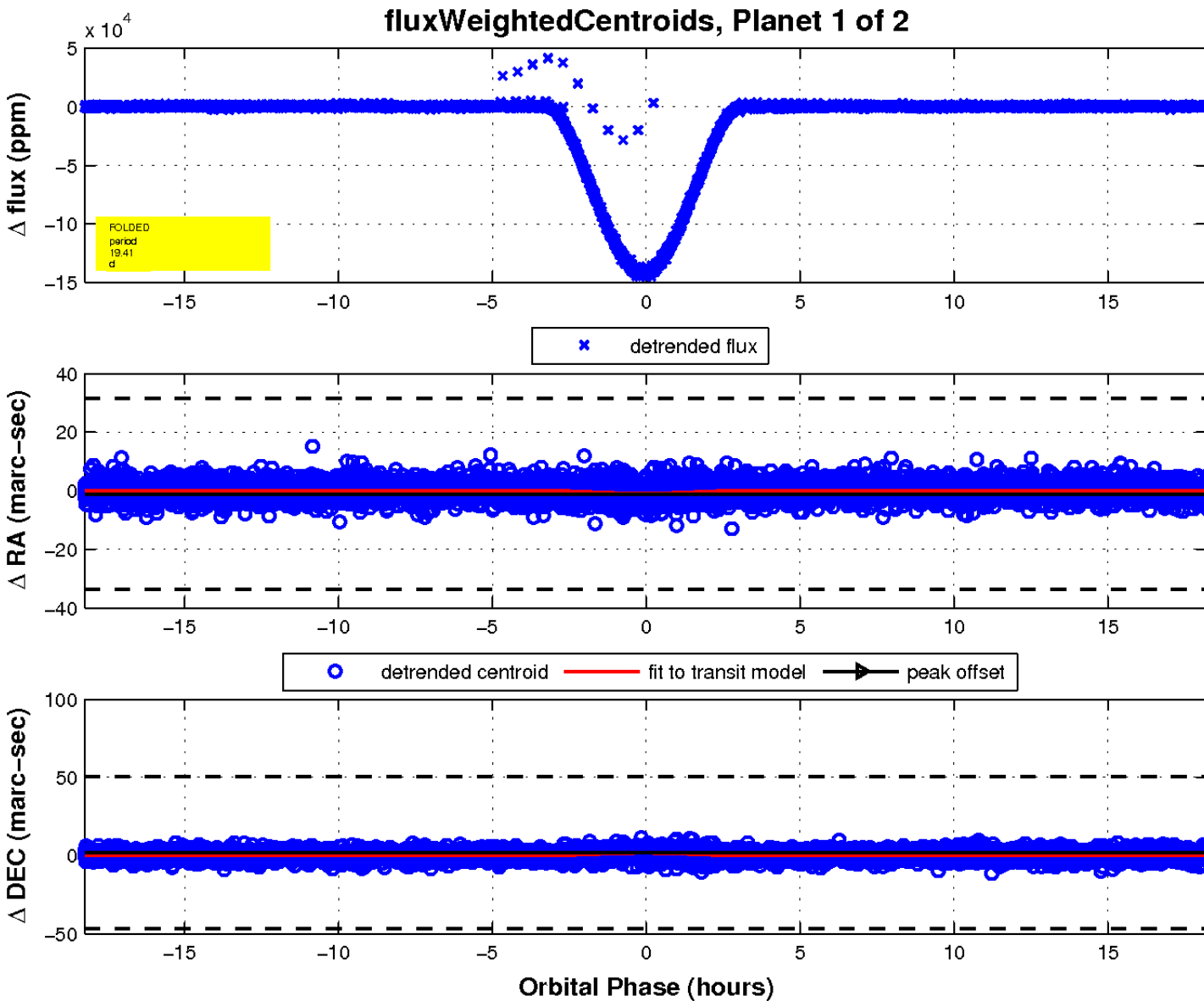
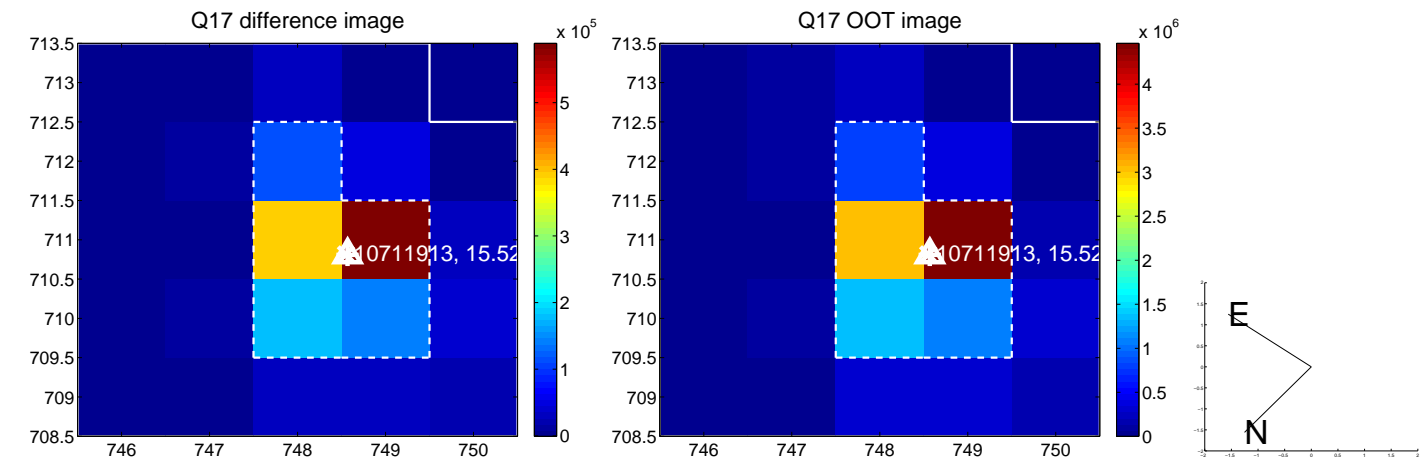
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

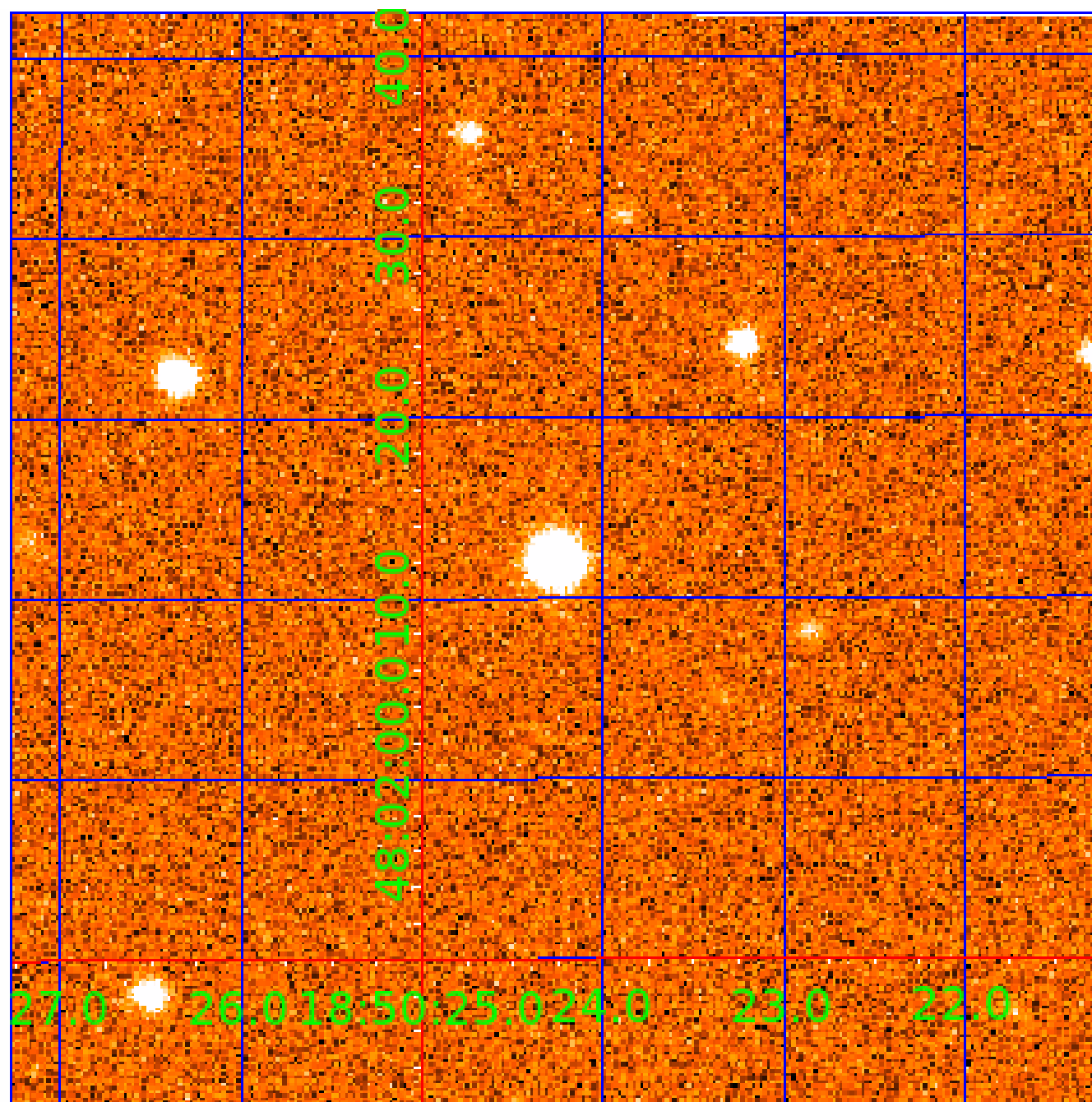


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 010711913

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010711913-01	OBS	7365.01	19.407958	135.391561	141478.0	6.085	2538.9	2136.6	0.80	5702	41.20	37.97
010711913-02	OBS	No	19.407983	144.109841	6491.1	4.508	112.8	112.9	0.80	5702	9.79	37.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010711913-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
010711913-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 010711913-02

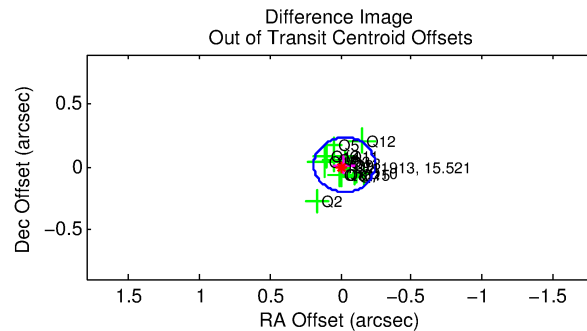
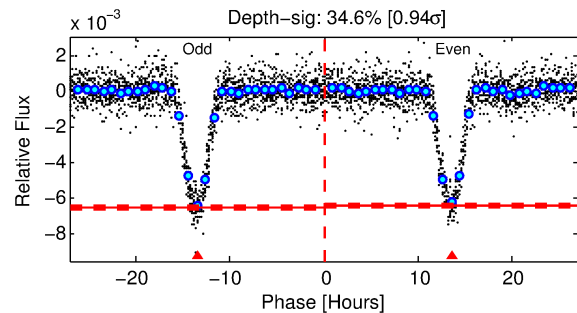
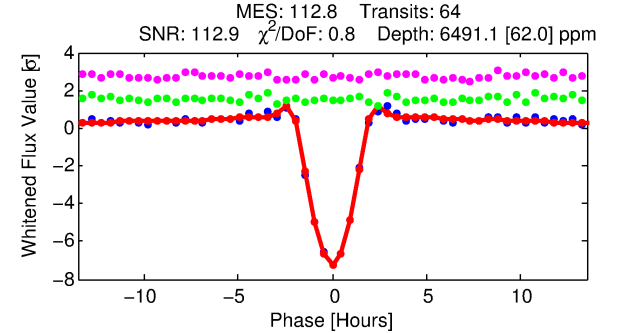
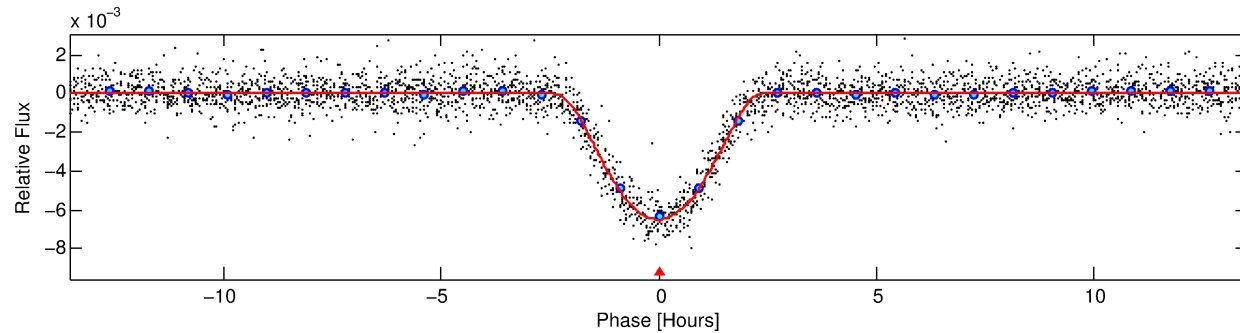
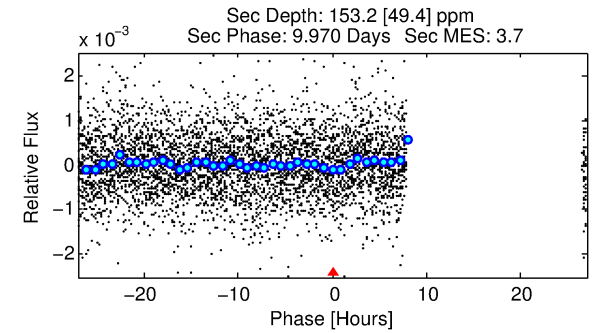
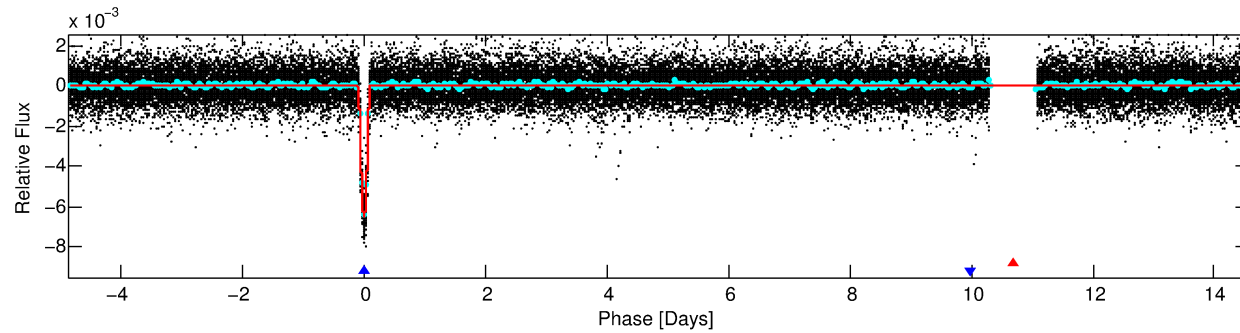
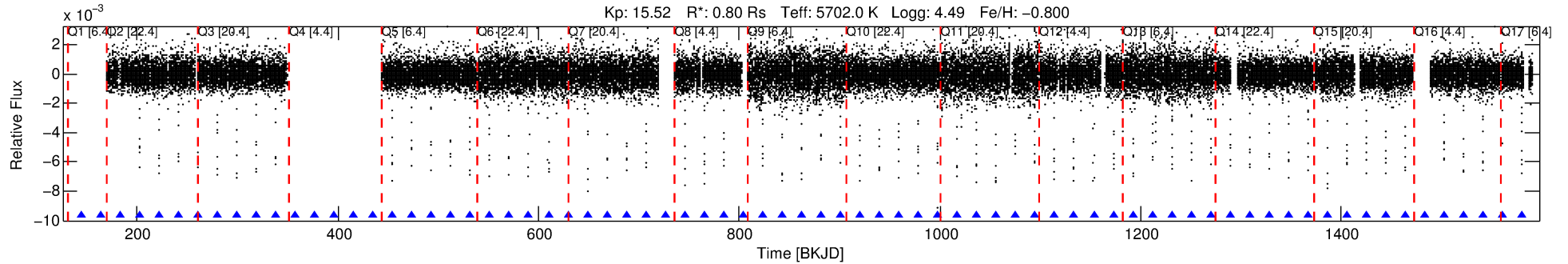
No Significant Match Found

# DV One-Page Summary

KIC: 10711913 Candidate: 2 of 2 Period: 19.408 d

KOI: K07365 Corr: No Ephemeris Match

Kp: 15.52 R\*: 0.80 Rs Teff: 5702.0 K Logg: 4.49 Fe/H: -0.800



## DV Fit Results:

Period = 19.40798 [0.00002] d  
Epoch = 144.1098 [0.0008] BKJD  
Rp/R\* = 0.1123 [0.0161]  
a/R\* = 18.13 [0.68]  
b = 0.97 [0.03]  
Seff = 37.97 [10.20]  
Teq = 633 [43] K  
Rp = 9.79 [2.28] Re  
a = 0.1262 [0.0203] AU  
Ag = 14.01 [6.92] [1.88σ]  
Teffp = 1893 [212] K [5.83σ]

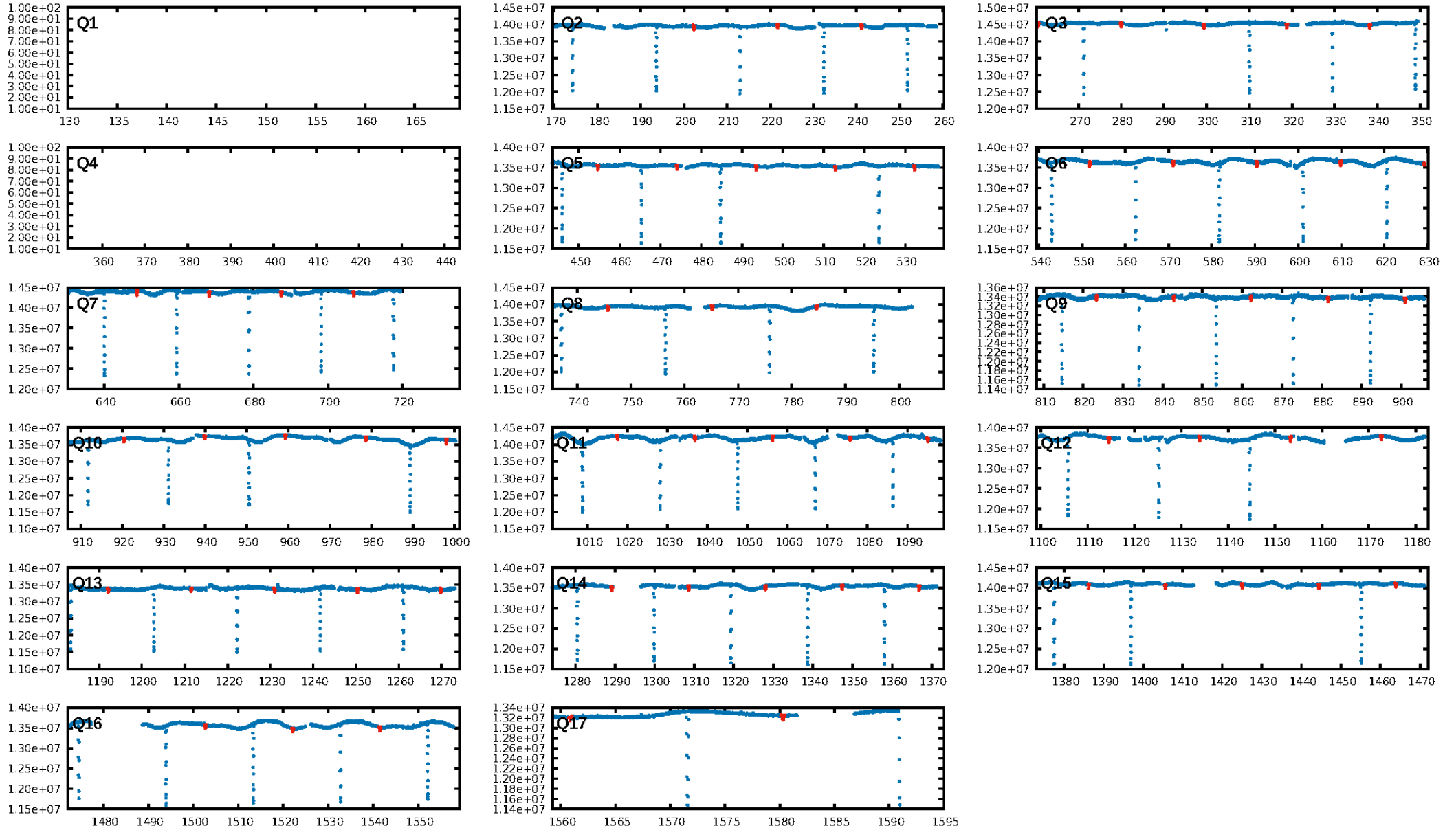
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [62/62]  
GhostDiagnostic-chr: 3.047  
Centroid-sig: 41.1%  
Centroid-so: 0.421 arcsec [5.69σ]  
OotOffset-rm: 0.030 arcsec [0.41σ]  
KicOffset-rm: 0.077 arcsec [1.06σ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 1.00 [15/15]

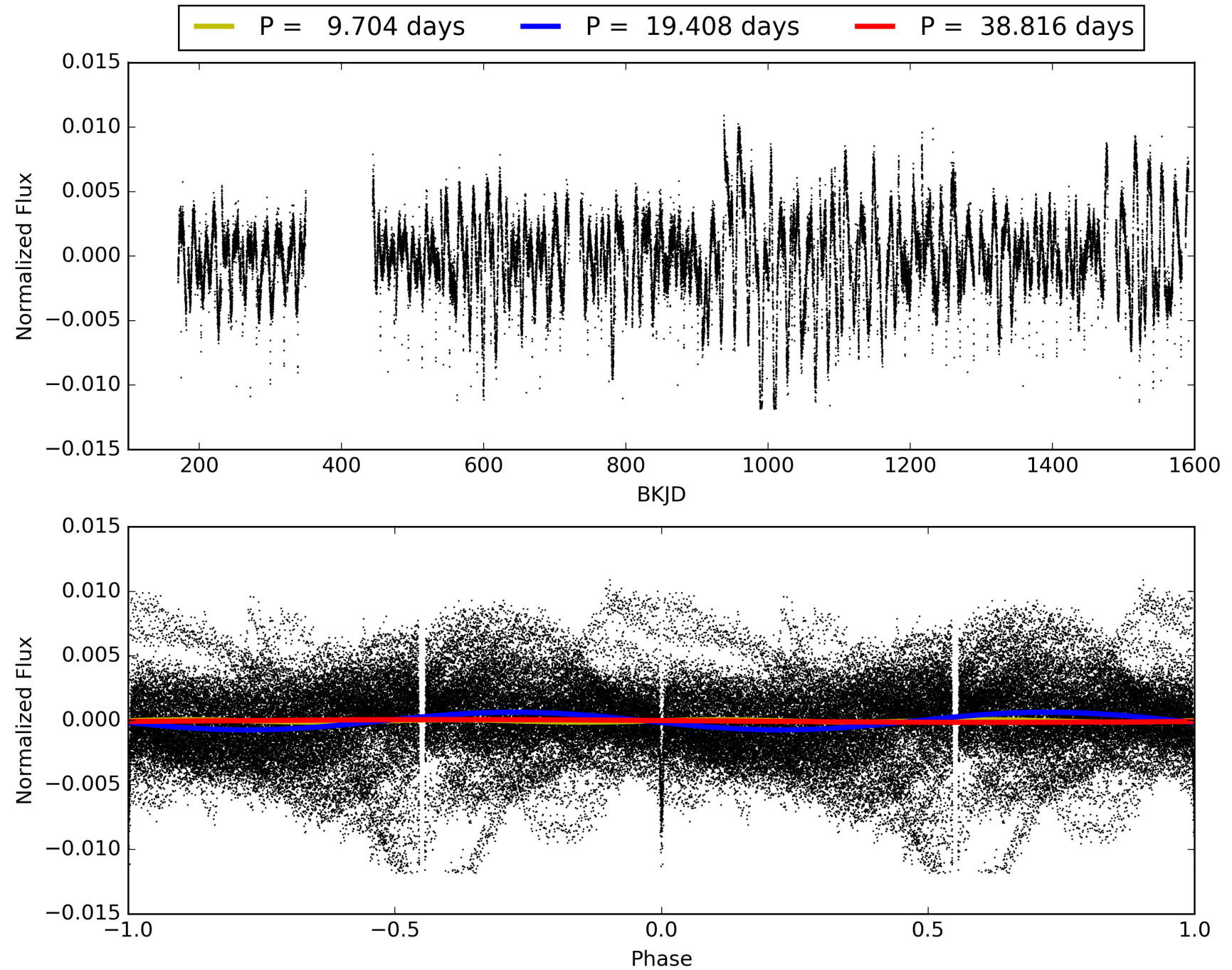
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 03:37:55 Z

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

# TCE 010711913-02, PDC Light Curves



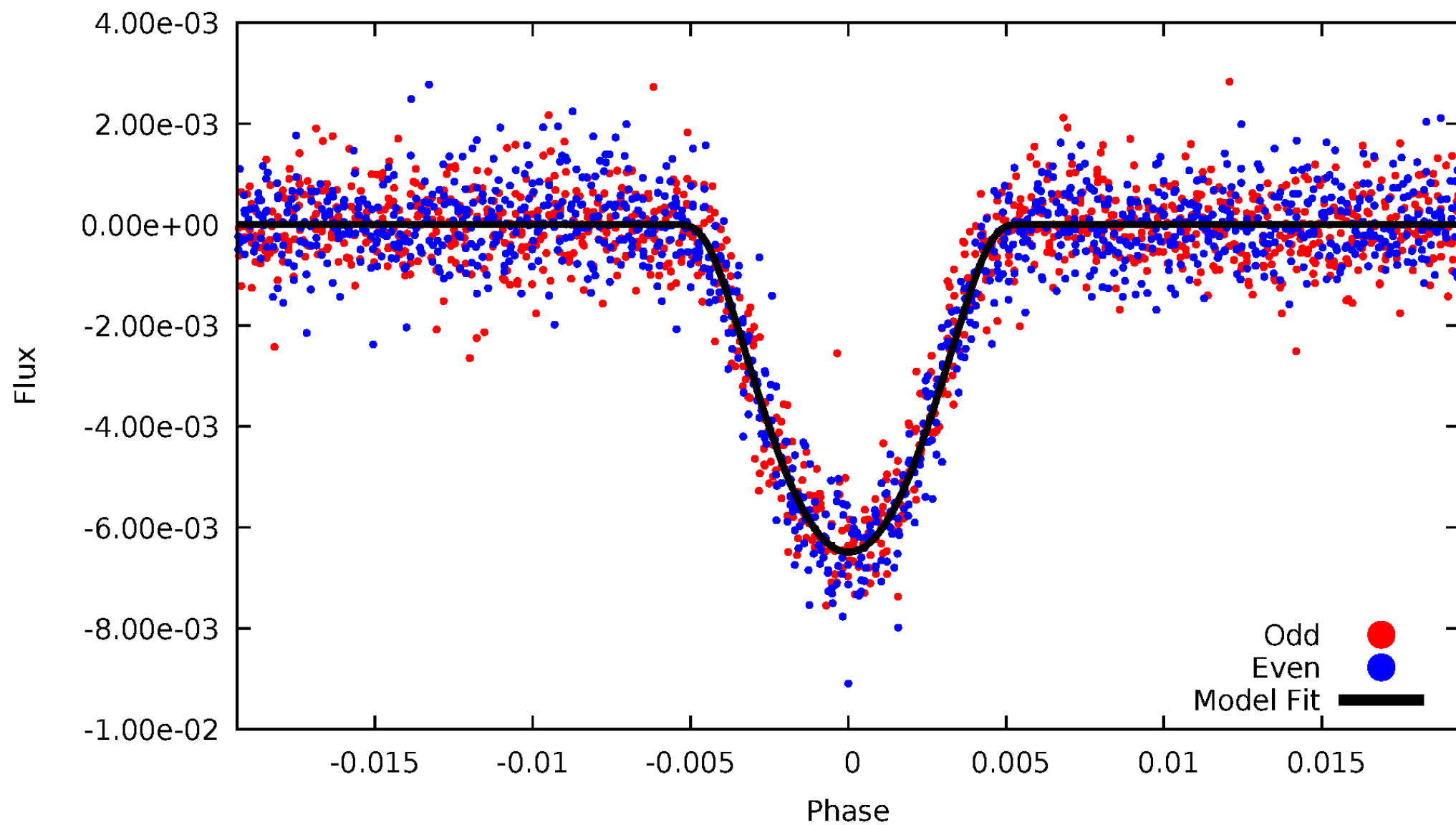
# TCE 010711913-02





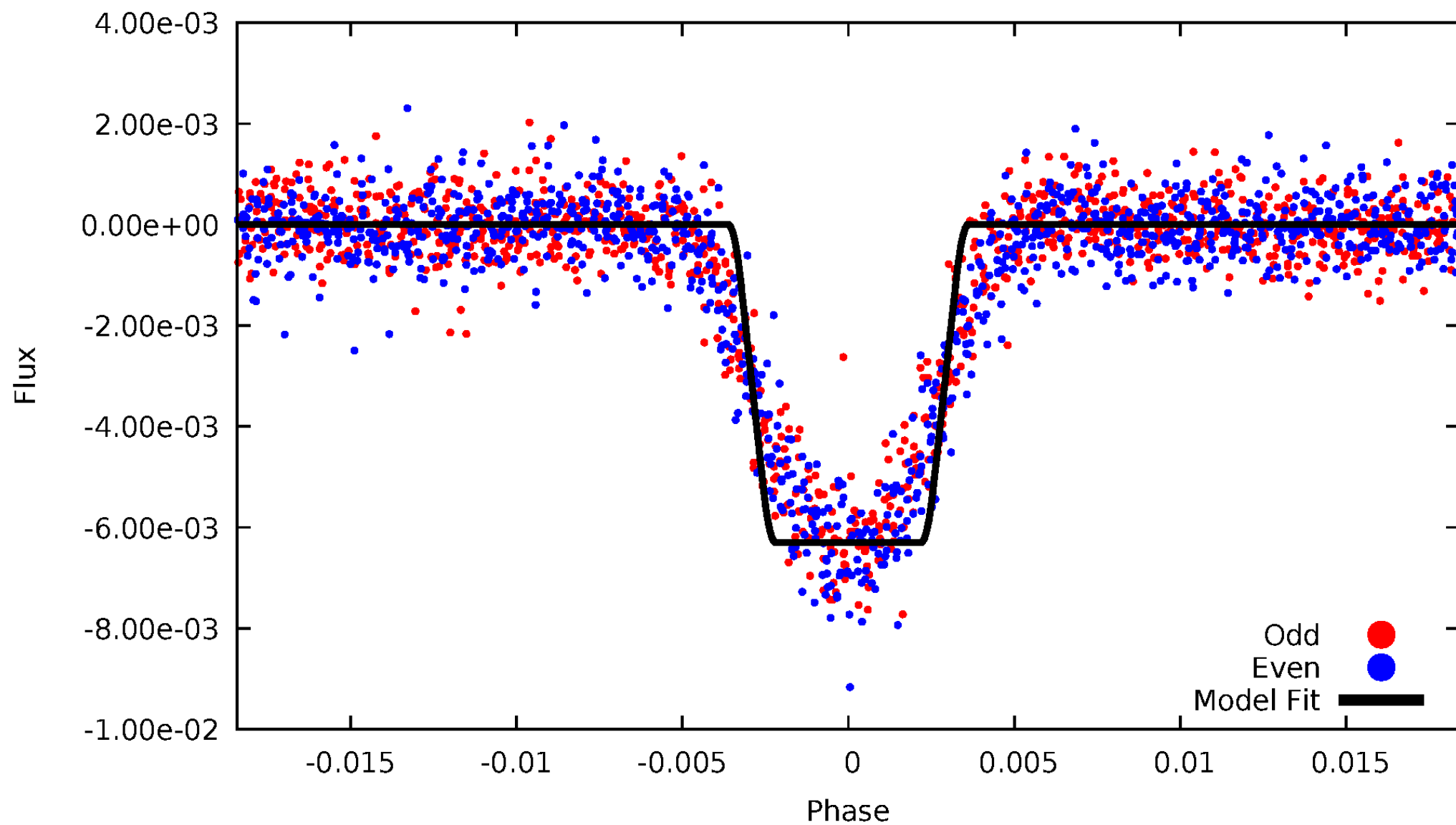
# DV Odd/Even

TCE 010711913-02



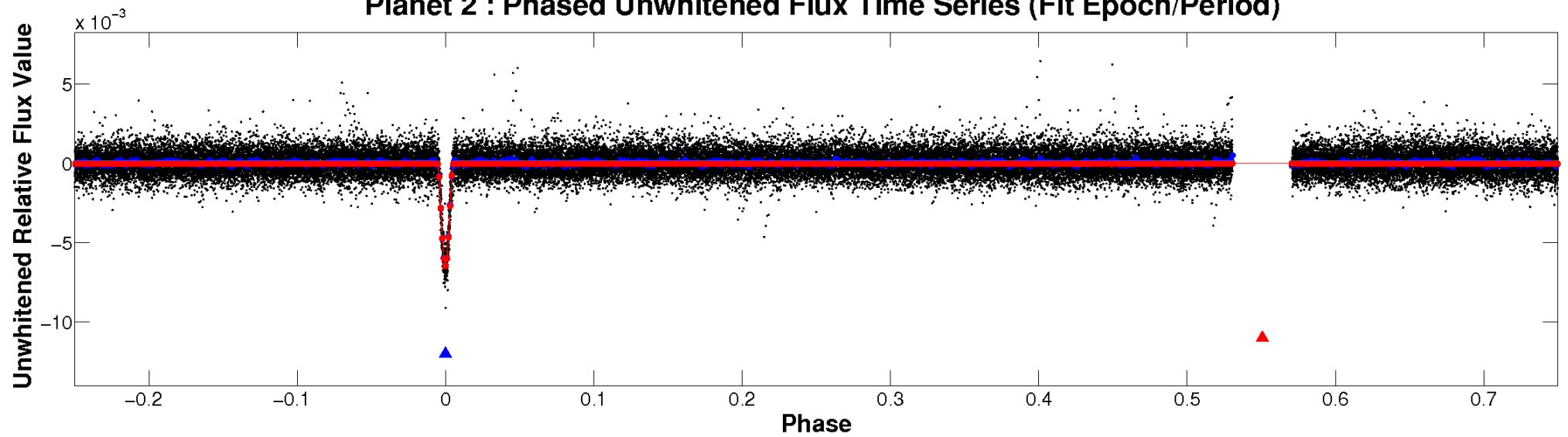
# ALT Odd/Even

TCE 010711913-02

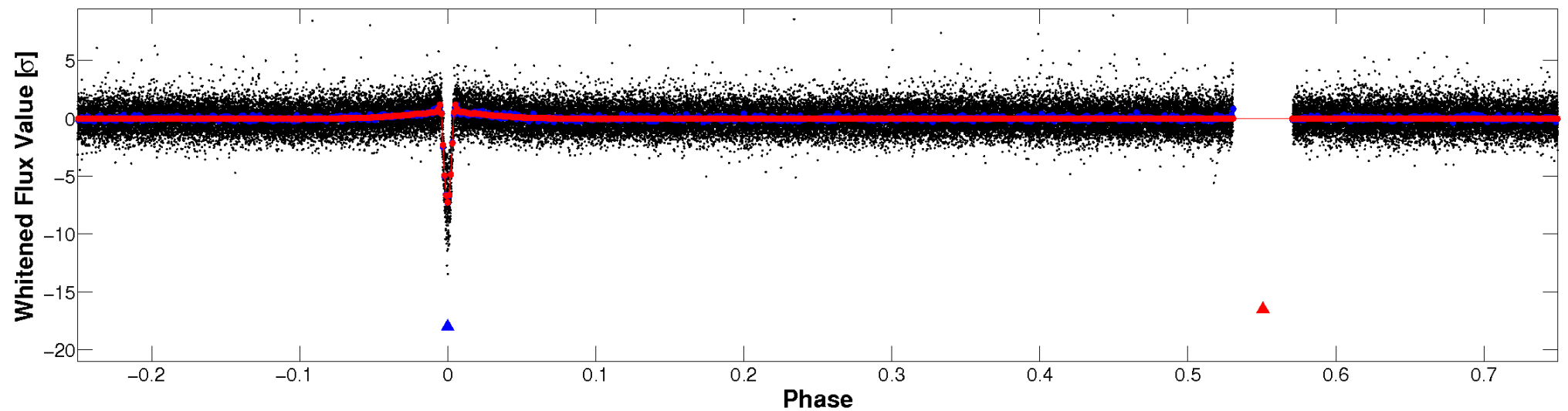


# Non-Whitened Vs. Whitened Light Curve

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

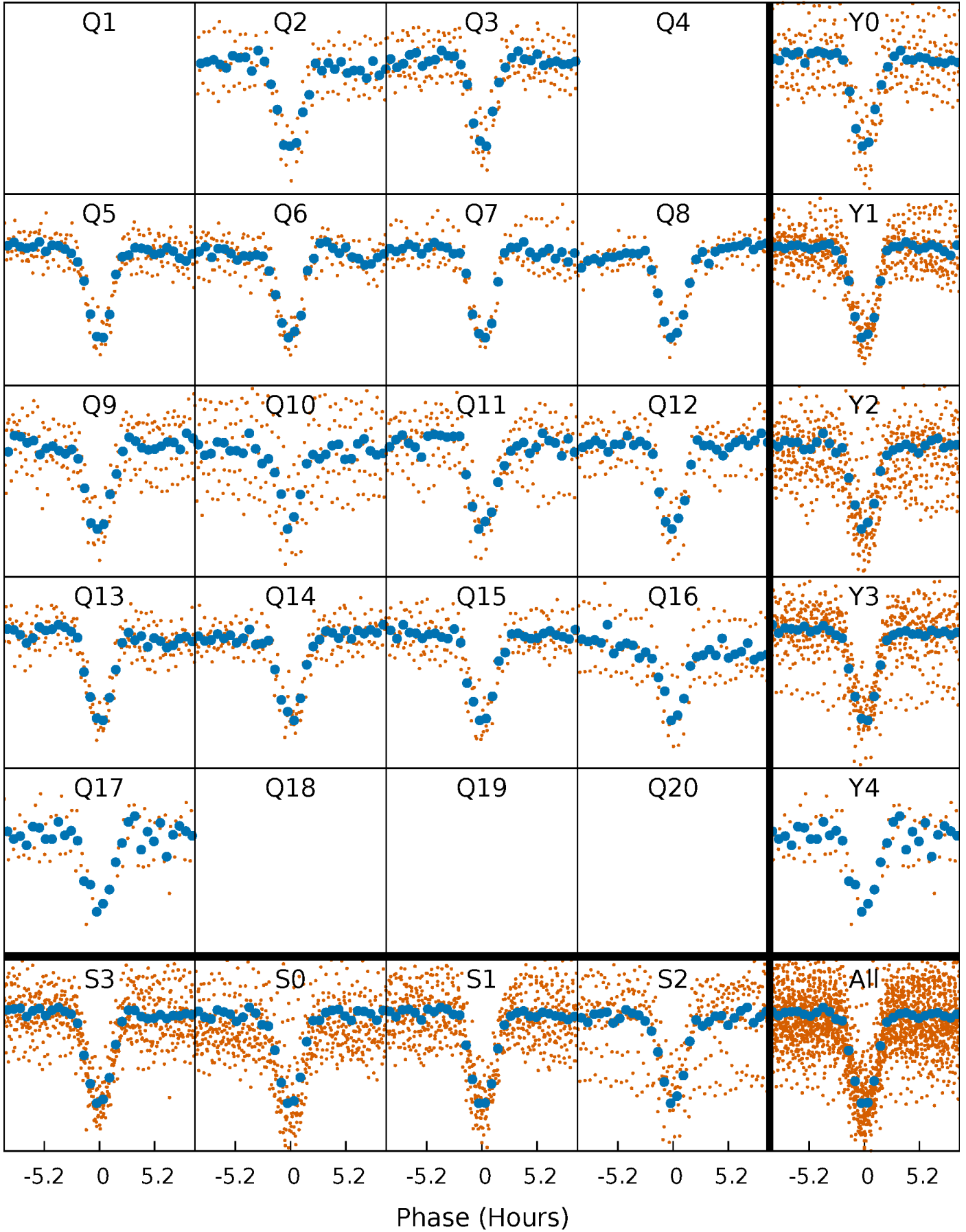


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



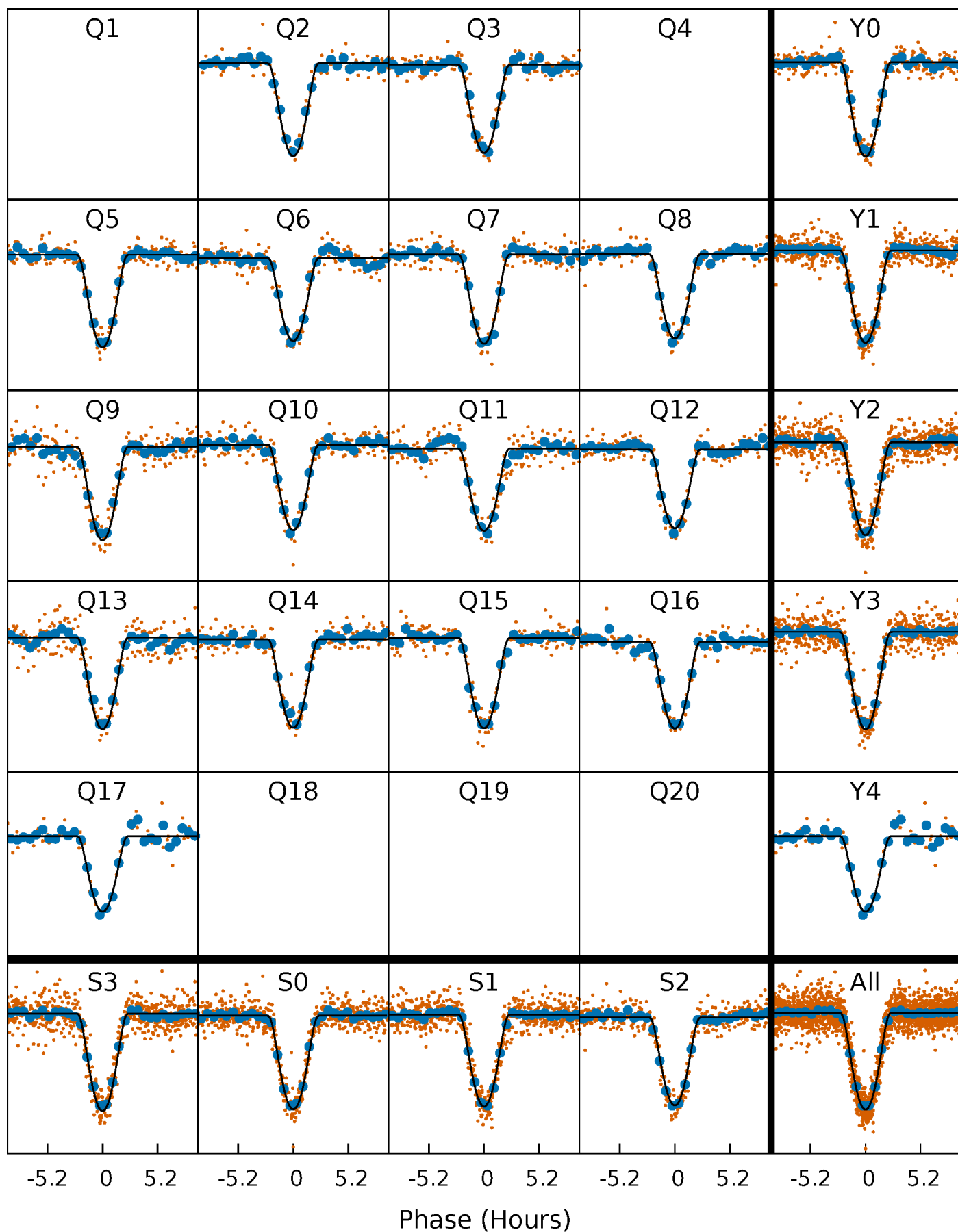
# PDC Quarter-Phased Transit Curves

TCE 010711913-02 P= 19.407983 Days  $T_0=144.109841$  (BKJD)



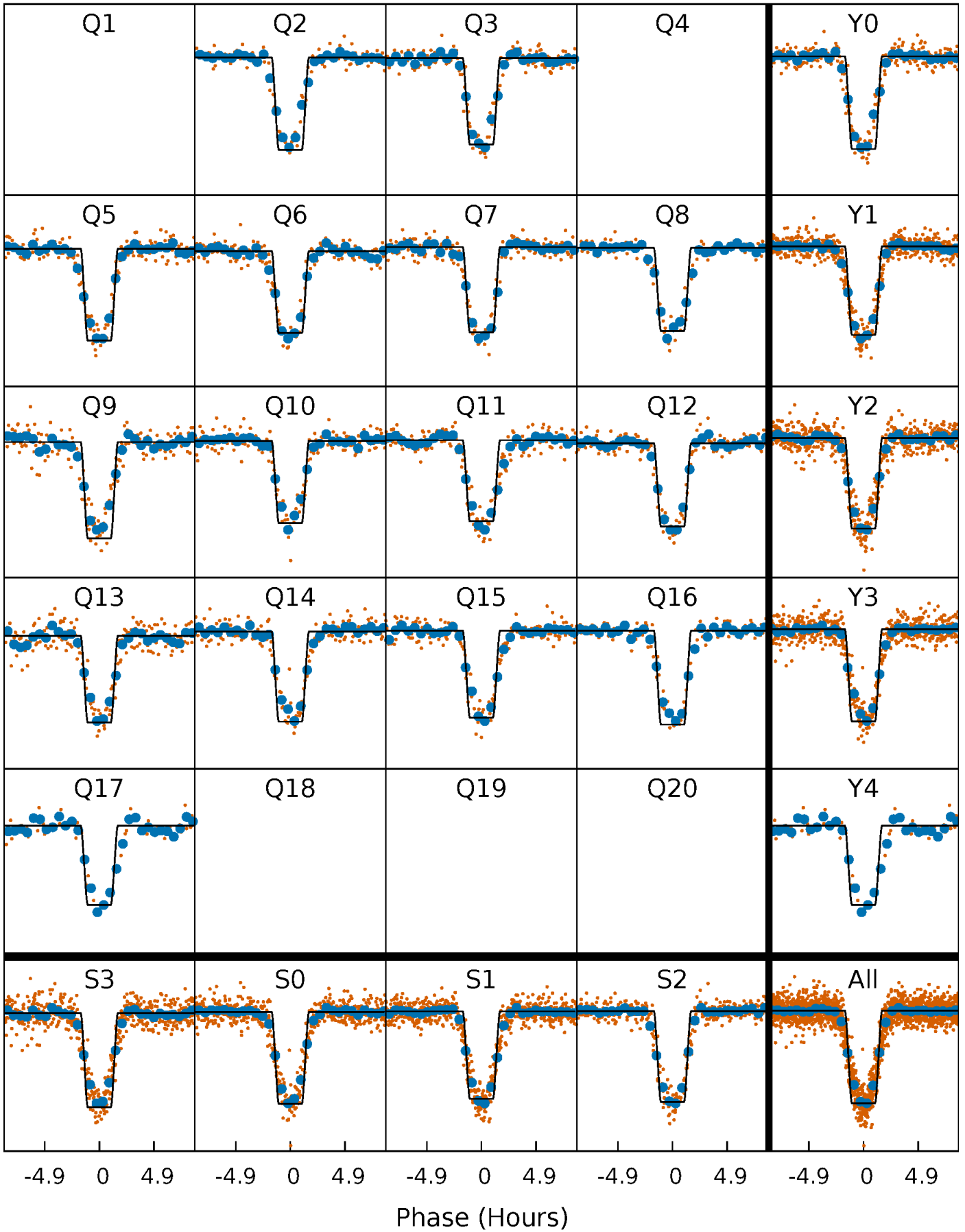
# DV Quarter-Phased Transit Curves

TCE 010711913-02 P= 19.407983 Days  $T_0=144.109841$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

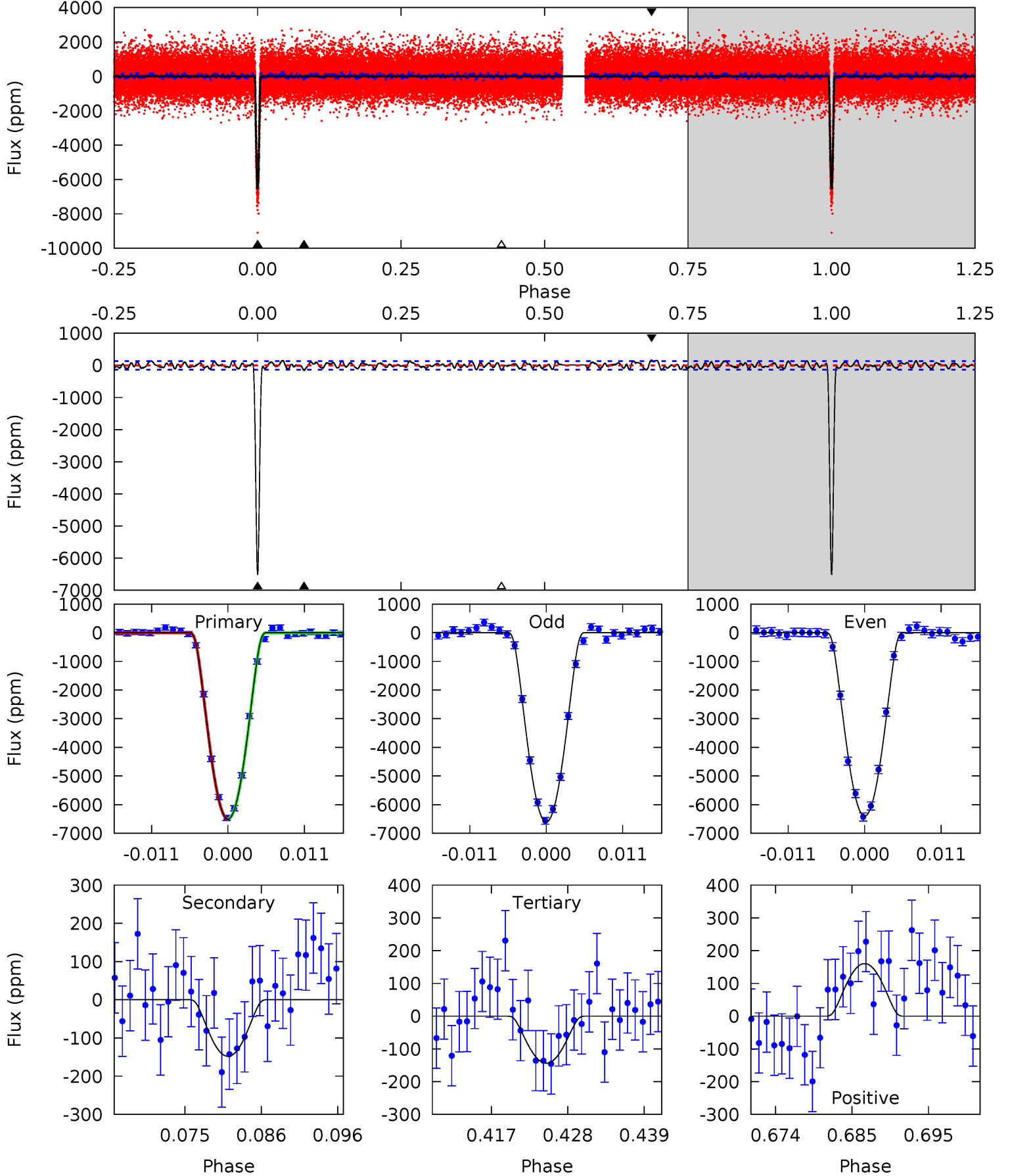
TCE 010711913-02   P= 19.407828 Days    $T_0=144.115652$  (BKJD)



# DV Model-Shift Uniqueness Test

010711913-02,  $P = 19.407983$  Days,  $E = 144.109841$  Days

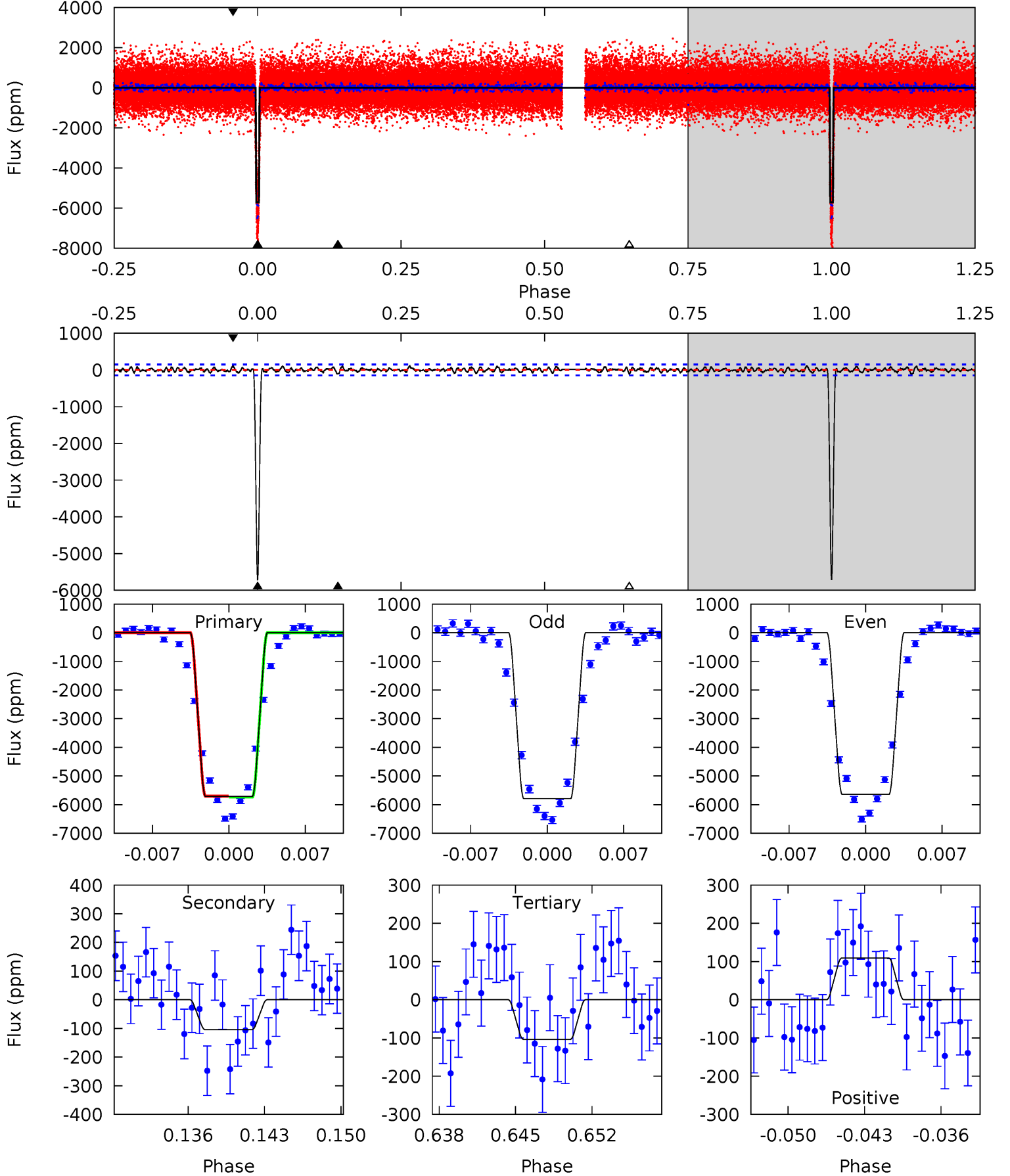
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
242.1	5.51	5.35	5.97	5.01	2.55	2.37	236.8	236.2	0.15	-0.46	3.81	1.00	0.02	0.23



# Alt Model-Shift Uniqueness Test

010711913-02,  $P = 19.407828$  Days,  $E = 144.115652$  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
197.8	3.61	3.59	3.79	5.09	2.69	1.31	194.2	194.0	0.02	-0.18	2.55	1.02	0.02	0.62





### Stellar Parameters For KIC 010711913

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5702^{+170}_{-153}$	$4.485^{+0.135}_{-0.135}$	$-0.800^{+0.350}_{-0.300}$	$0.799^{+0.147}_{-0.110}$	$0.711^{+0.096}_{-0.030}$	$1.966^{+1.018}_{-0.732}$
	+3%/-3%	+3%/-3%	+44%/-37%	+18%/-14%	+14%/-4%	+52%/-37%
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 010711913-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-148 \pm 27$	$9.87^{+1.98}_{-1.65}$	$883^{+53}_{-46}$	$2656^{+141}_{-120}$	$13^{+7}_{-4}$
Alt.	$-104 \pm 29$	$6.96^{+1.66}_{-1.57}$	$884^{+53}_{-44}$	$2789^{+213}_{-196}$	$19^{+14}_{-8}$

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

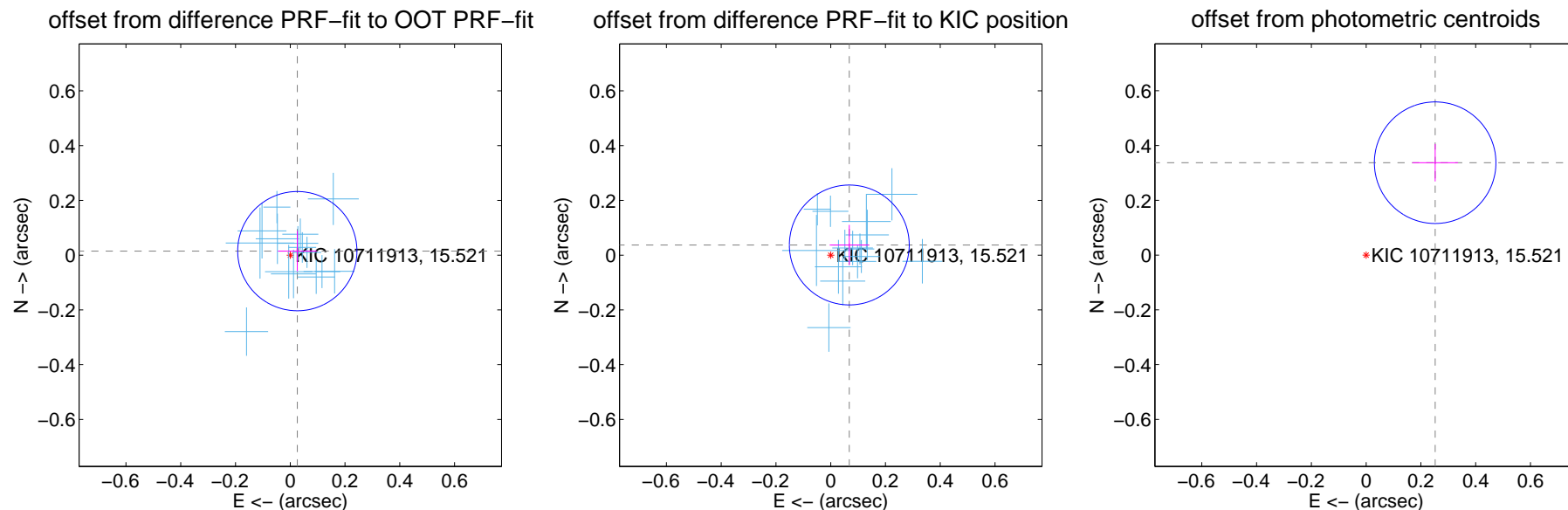
## DV Centroid Data

Supplemental centroid analysis for 010711913-02. Kepler magnitude: 15.52. Transit SNR 112.92

There are 15 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	$0.030 \pm 0.073$	0.41	$-0.026 \pm 0.071$	$0.015 \pm 0.074$
PRF-fit source offset from KIC position	$0.077 \pm 0.073$	1.06	$-0.068 \pm 0.072$	$0.037 \pm 0.073$
photometric centroid source offset	$0.42 \pm 0.07$	5.69	$-0.25 \pm 0.08$	$0.34 \pm 0.07$



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.

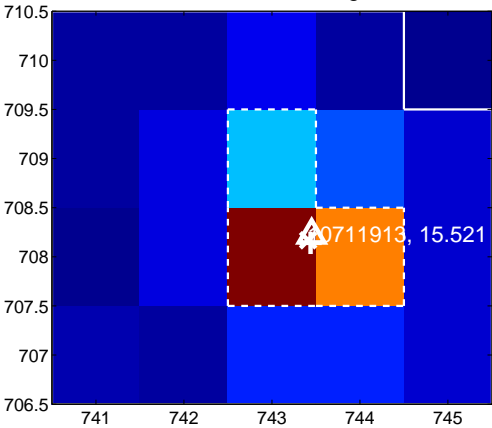
Q1 no difference image



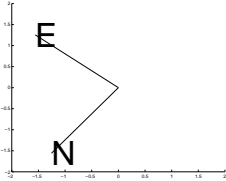
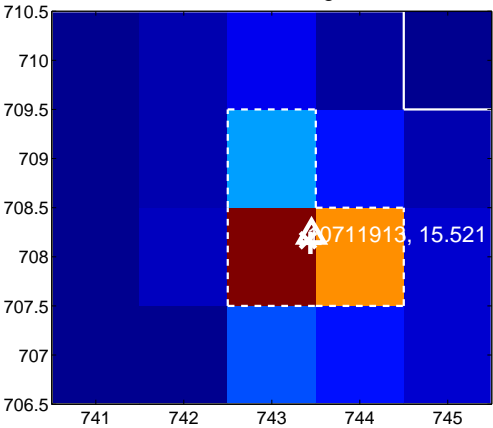
Q1 no OOT image



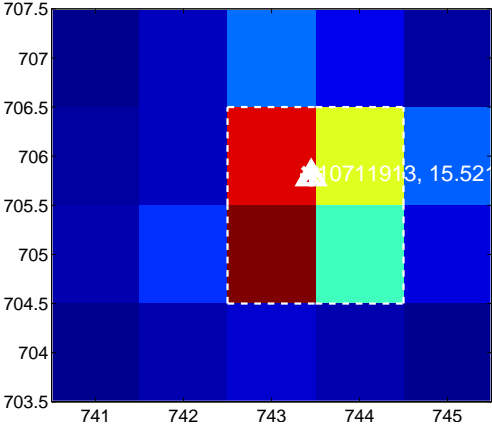
Q2 difference image



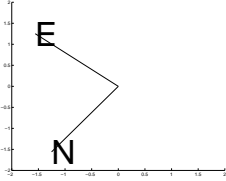
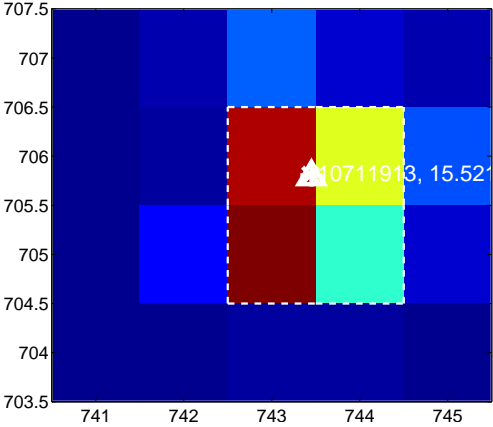
Q2 OOT image



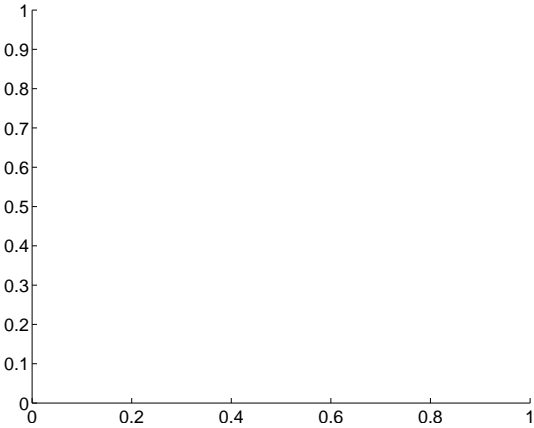
Q3 difference image



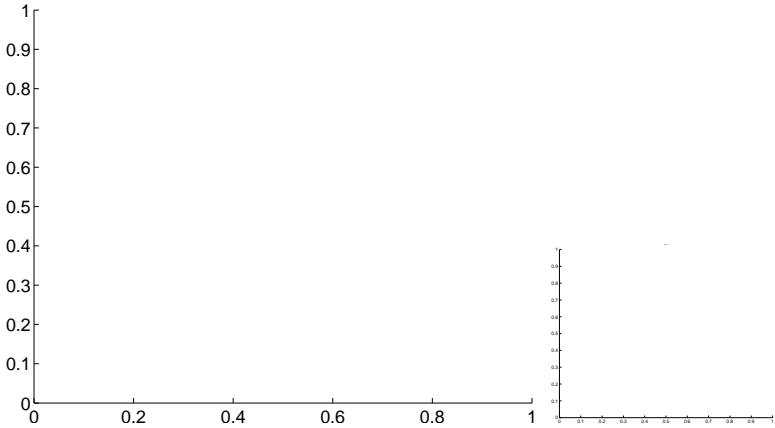
Q3 OOT image



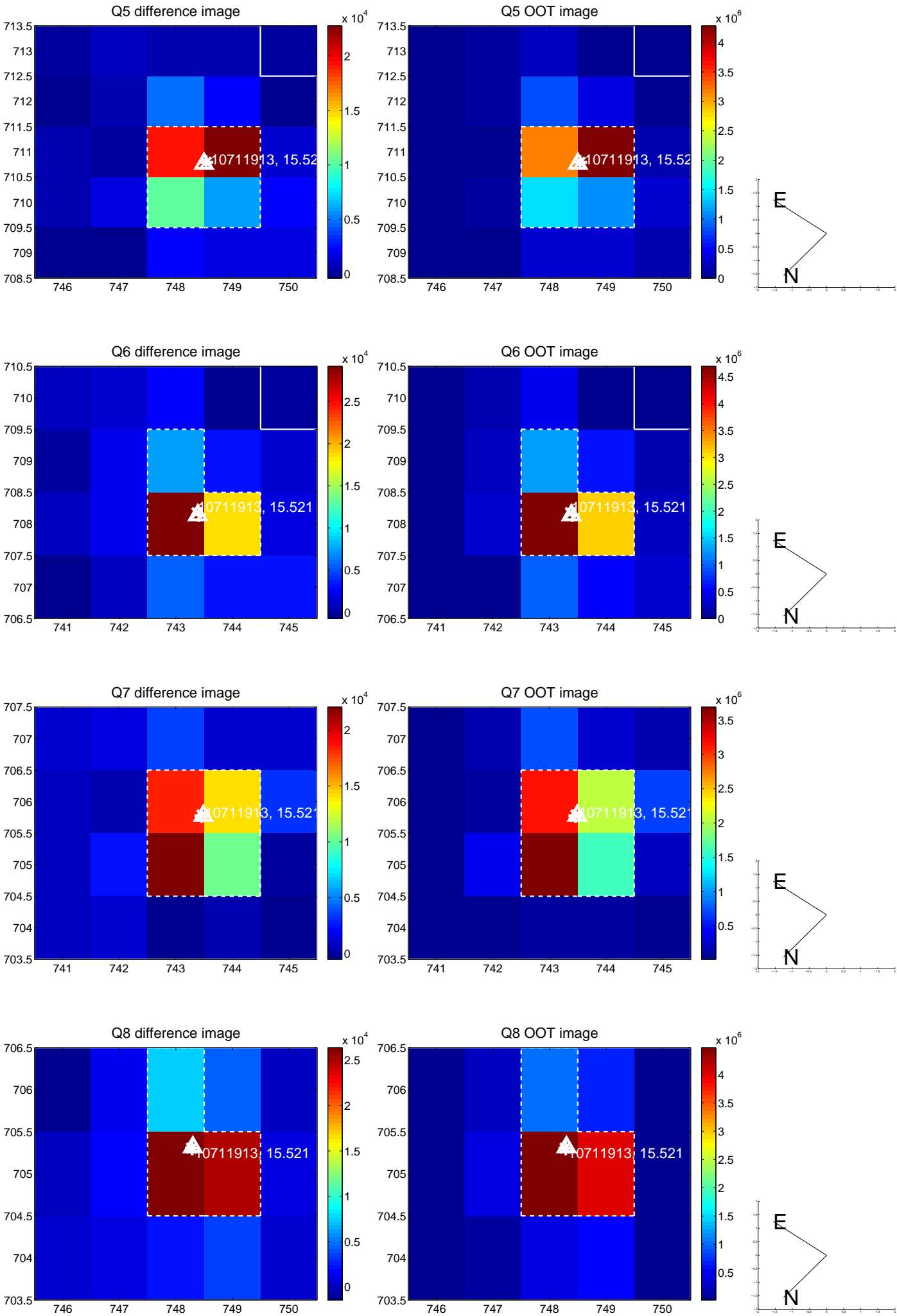
Q4 no difference image



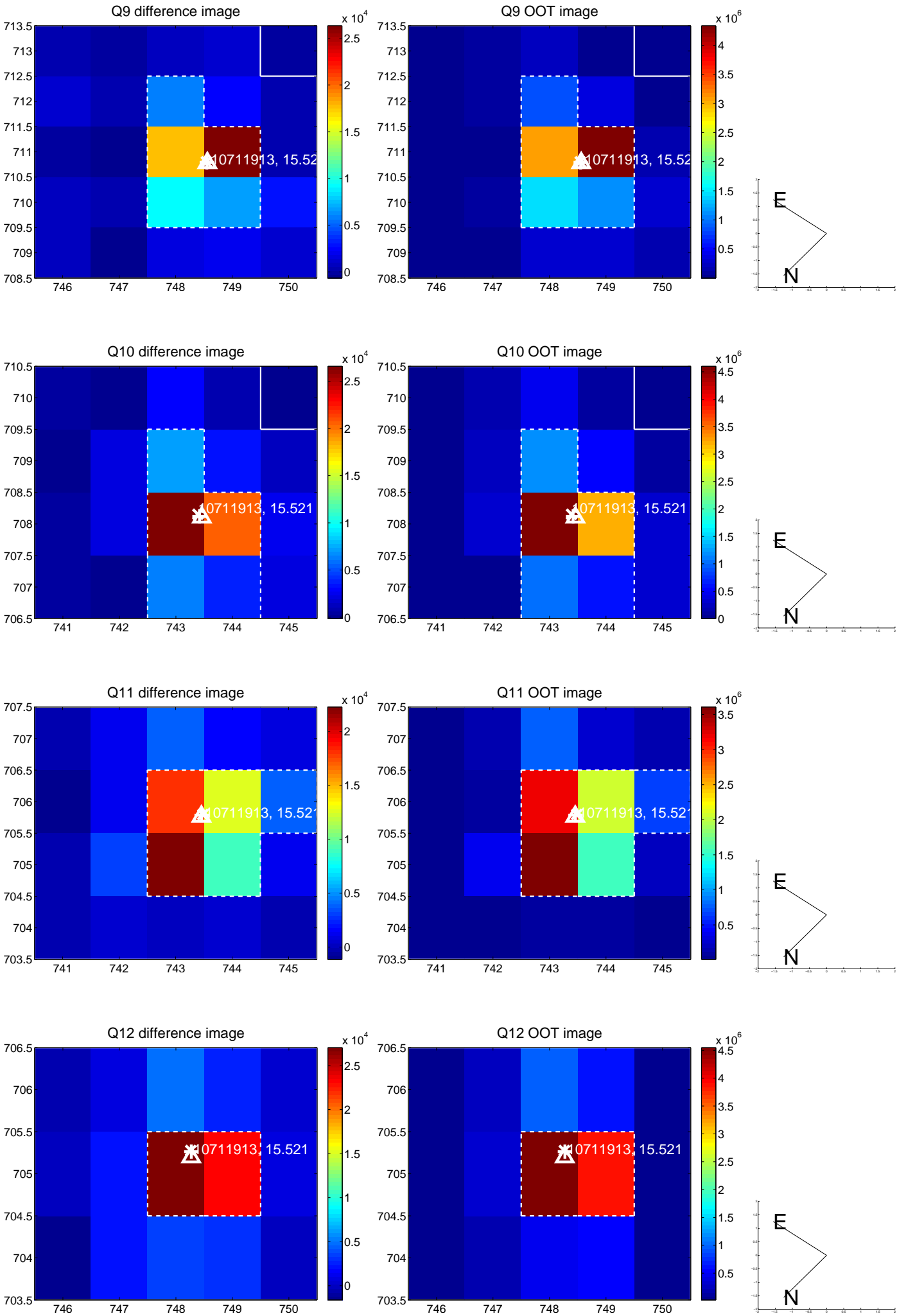
Q4 no OOT image



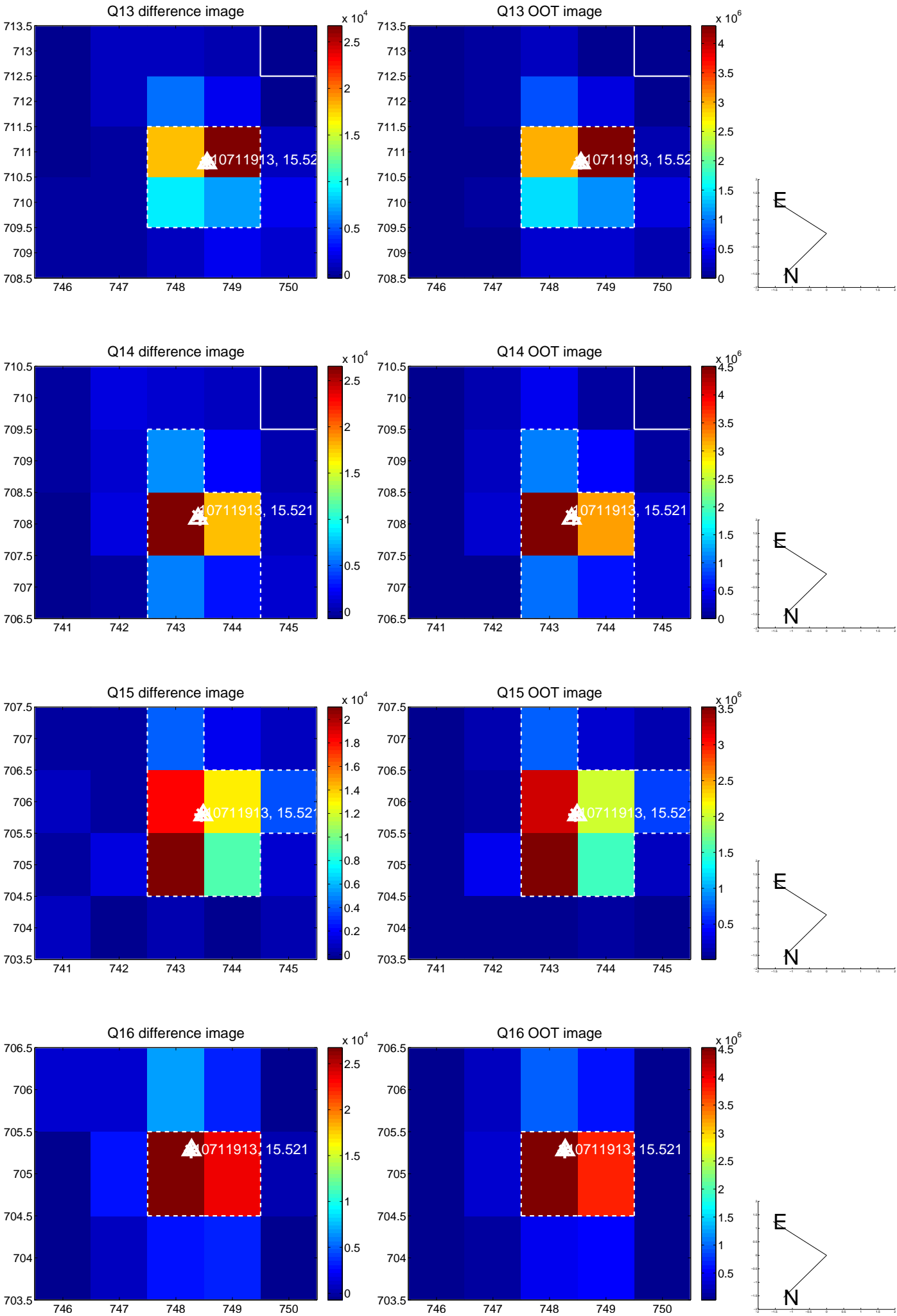
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



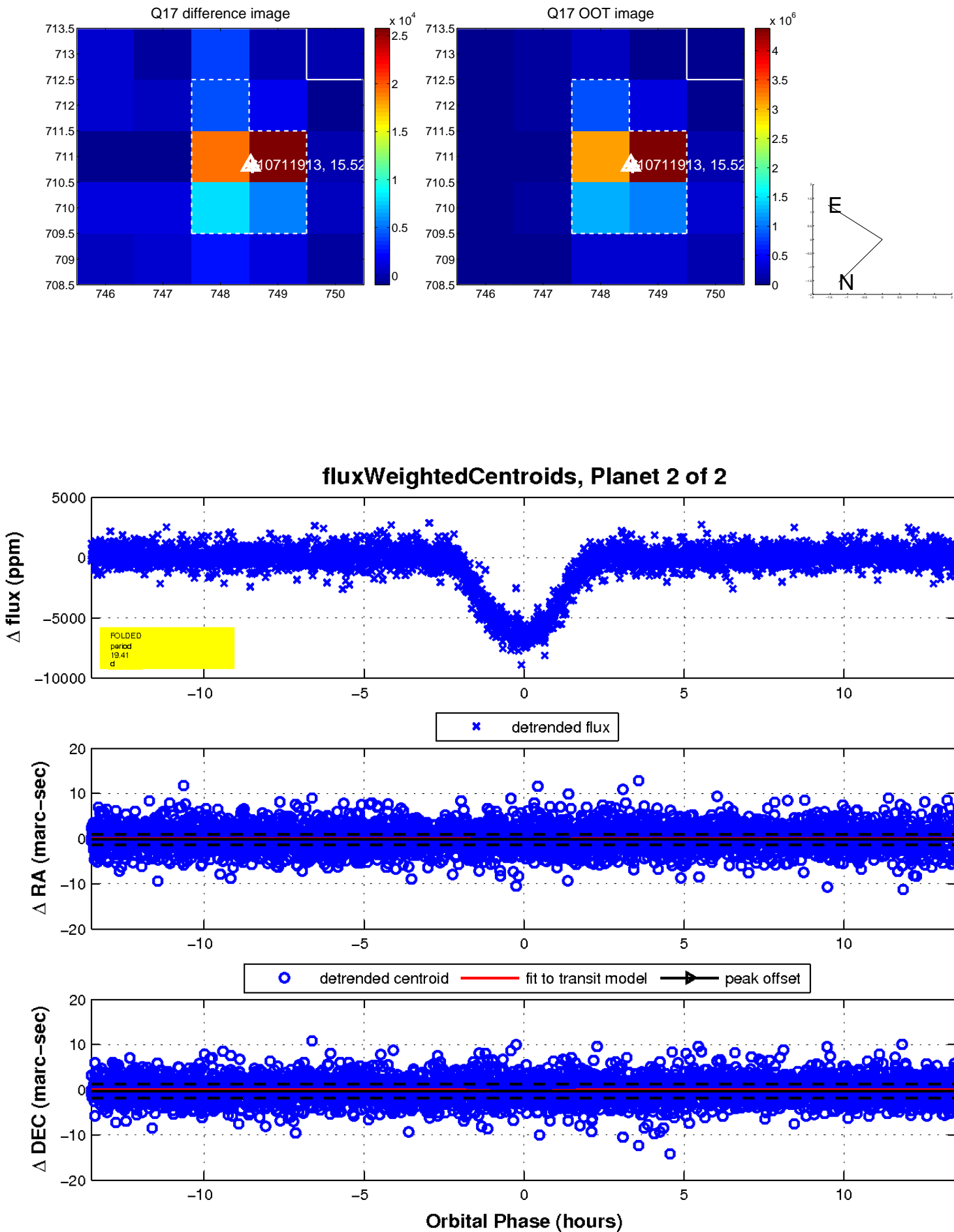
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

