

# KIC 008692861

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008692861-01	OBS	0172.01	13.722359	137.841523	561.2	5.244	82.3	88.4	0.94	5637	2.43	73.37
008692861-02	OBS	0172.02	242.467679	150.858763	336.0	13.579	18.0	19.7	0.94	5637	1.99	1.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008692861-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008692861-02	OBS	PC	0.69	0	0	0	0	NO_COMMENT

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

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

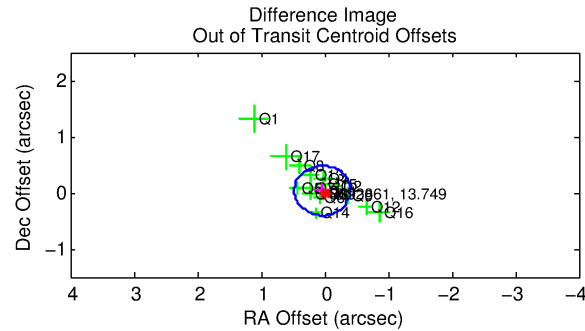
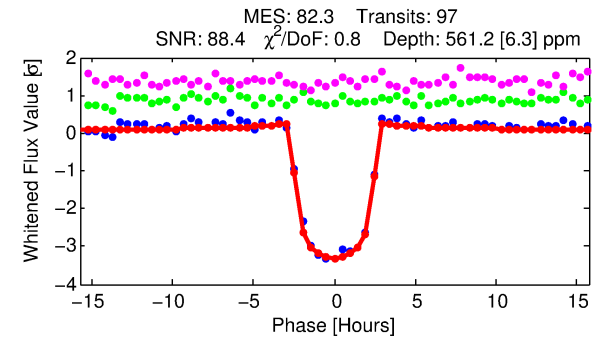
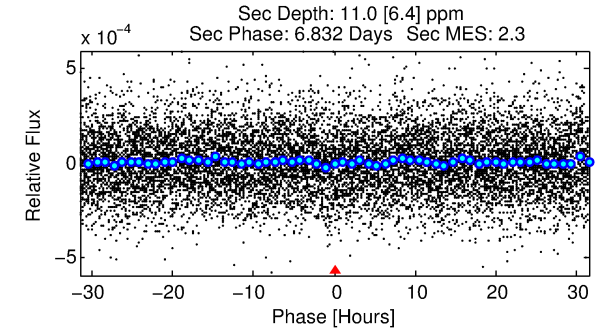
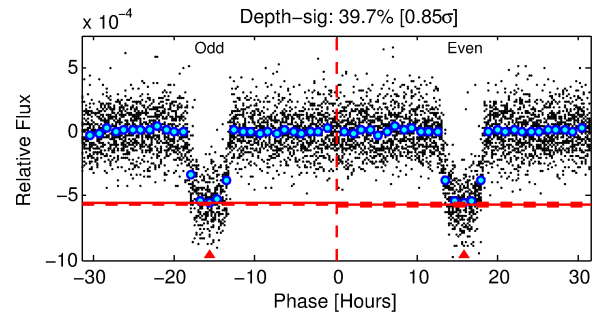
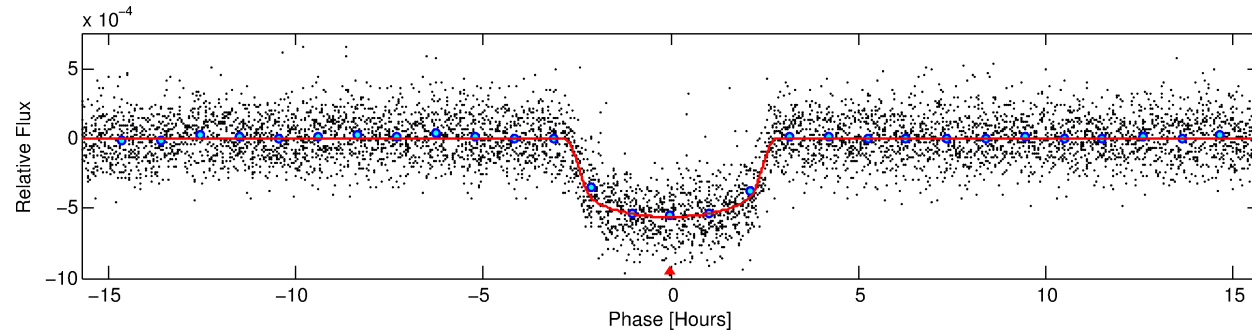
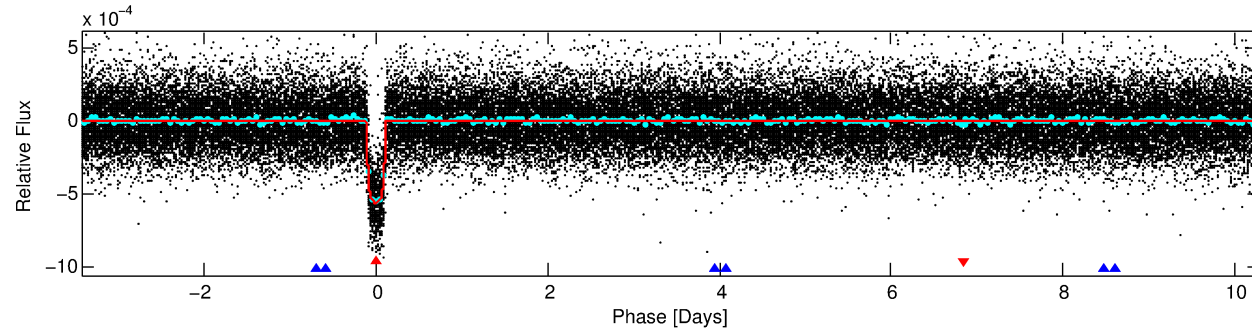
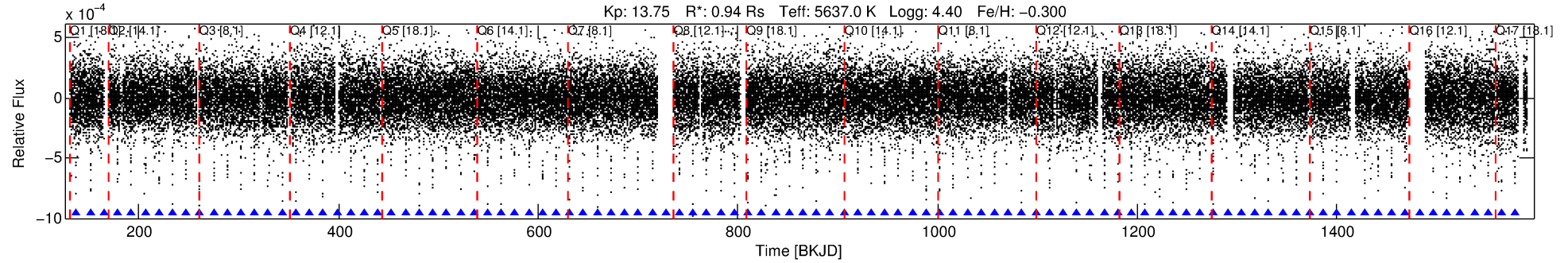
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008692861-01

No Significant Match Found

# DV One-Page Summary

KIC: 8692861 Candidate: 1 of 2 Period: 13.722 d  
KOI: K00172.01 Name: Kepler-69b Corr: 0.991



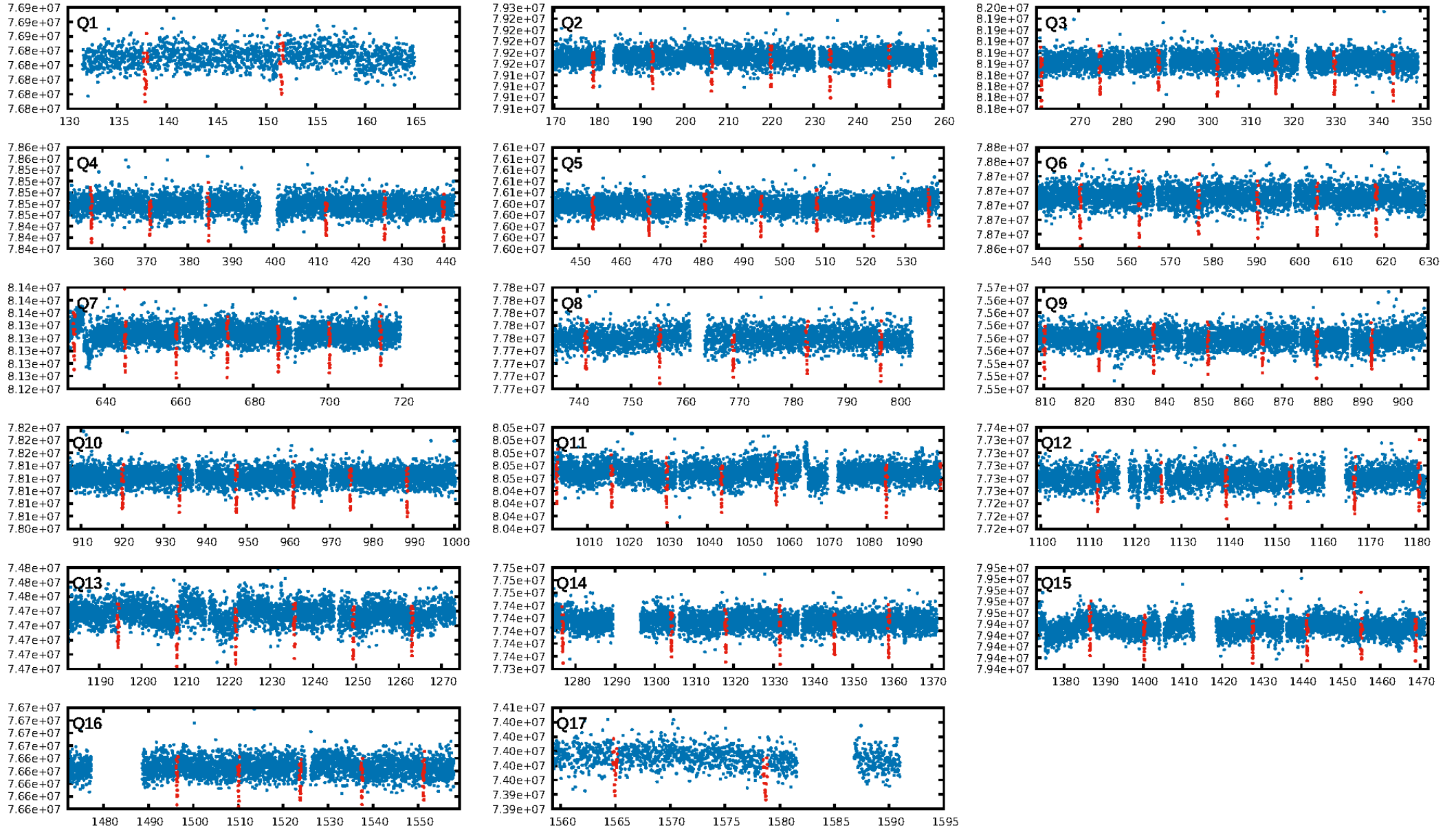
## DV Fit Results:

Period = 13.72236 [0.00002] d  
Epoch = 137.8415 [0.0012] BKJD  
Rp/R\* = 0.0236 [0.0018]  
a/R\* = 13.83 [4.60]  
b = 0.76 [0.19]  
Seff = 73.37 [17.10]  
Teq = 746 [43] K  
Rp = 2.43 [0.35] Re  
a = 0.1047 [0.0137] AU  
Ag = 11.21 [7.13] [1.43 $\sigma$ ]  
Teffp = 2111 [318] K [4.25 $\sigma$ ]

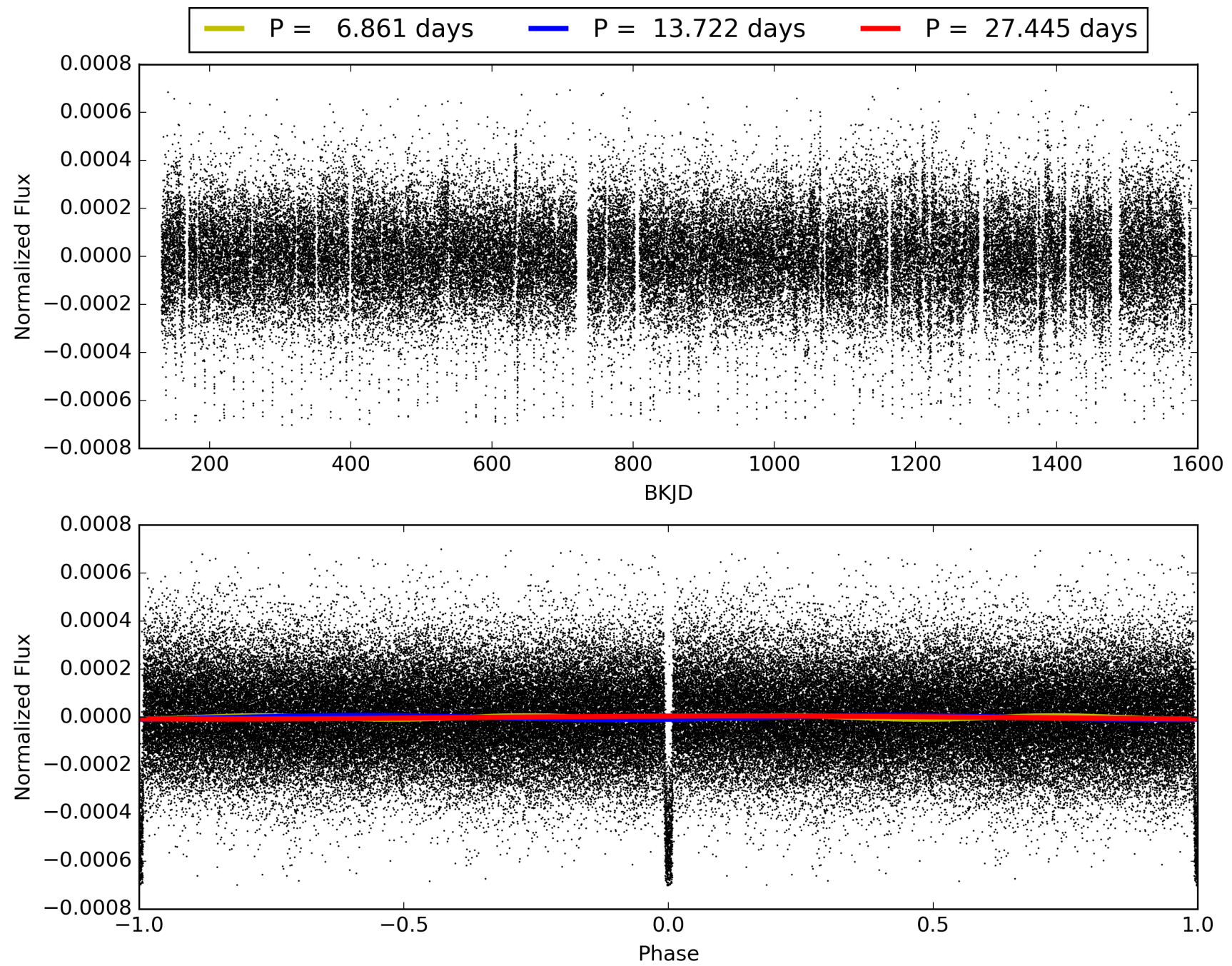
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [377.15 $\sigma$ ]  
ModelChiSquare2-sig: 97.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [93/93]  
GhostDiagnostic-chr: 7.595  
Centroid-sig: 25.7%  
Centroid-so: 0.183 arcsec [1.27 $\sigma$ ]  
OotOffset-rm: 0.053 arcsec [0.36 $\sigma$ ]  
KicOffset-rm: 0.074 arcsec [0.70 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008692861-01, PDC Light Curves



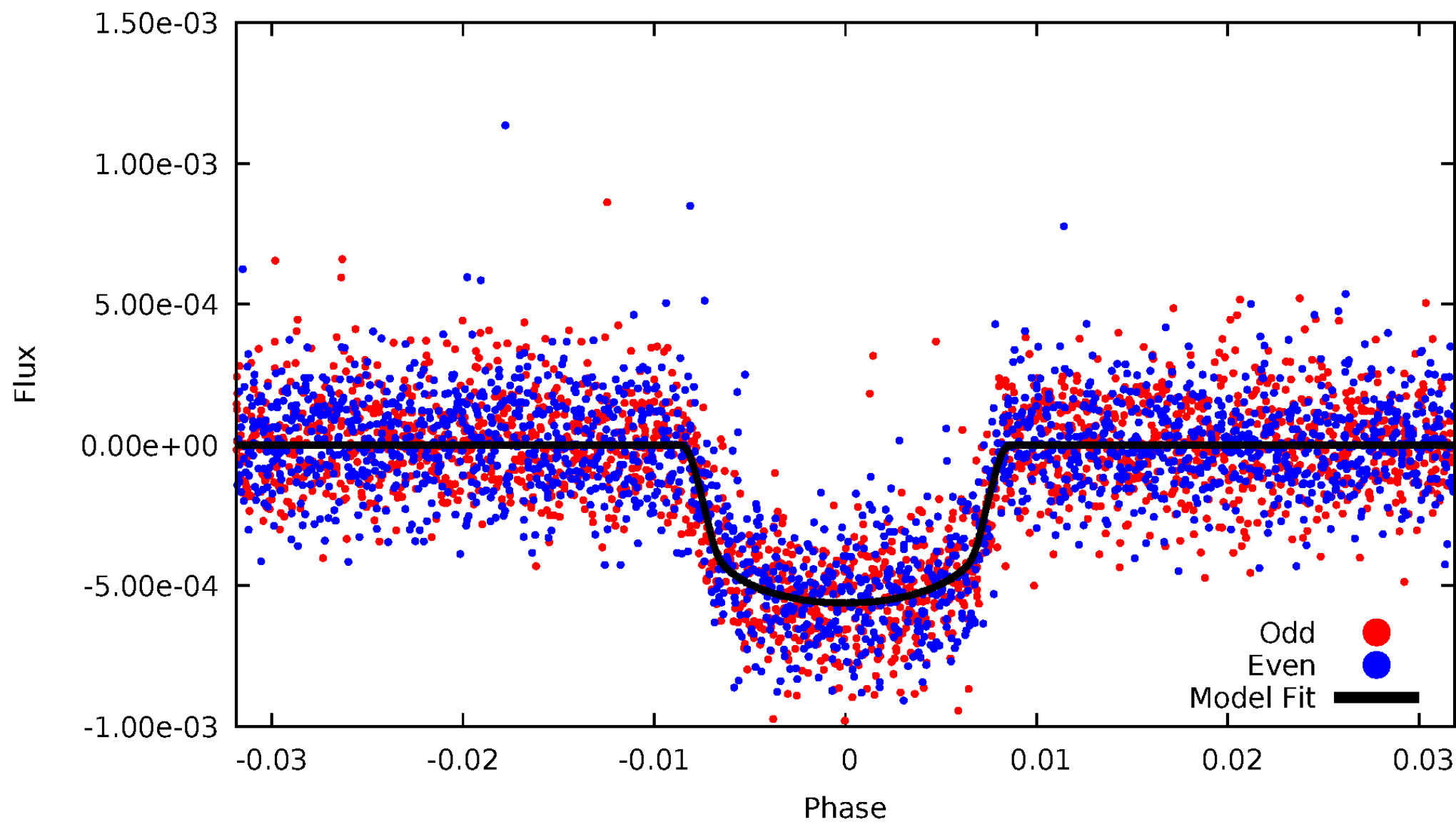
TCE 008692861-01





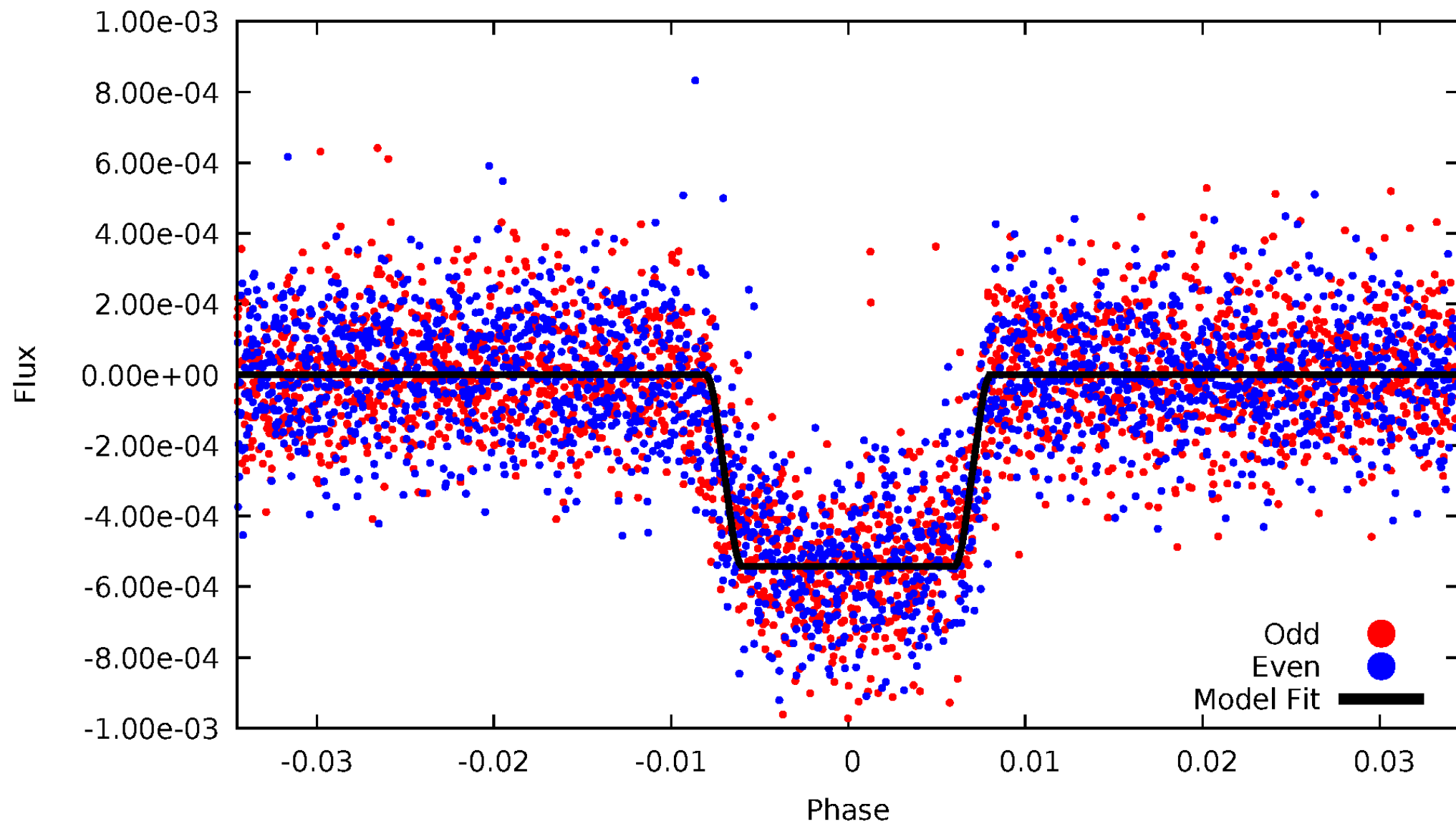
# DV Odd/Even

TCE 008692861-01

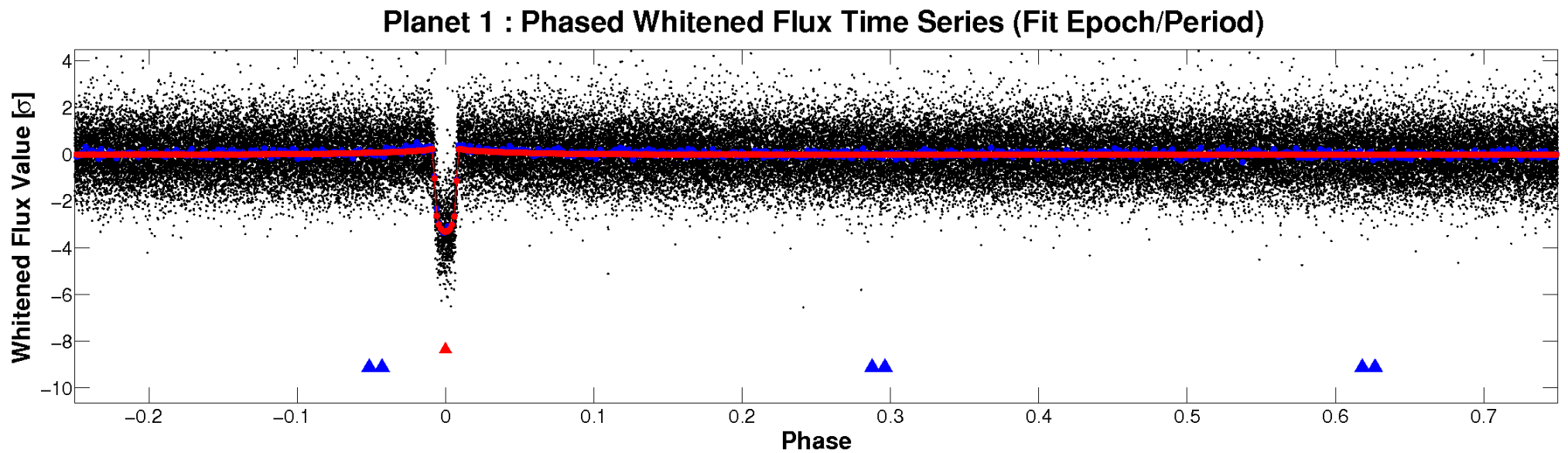
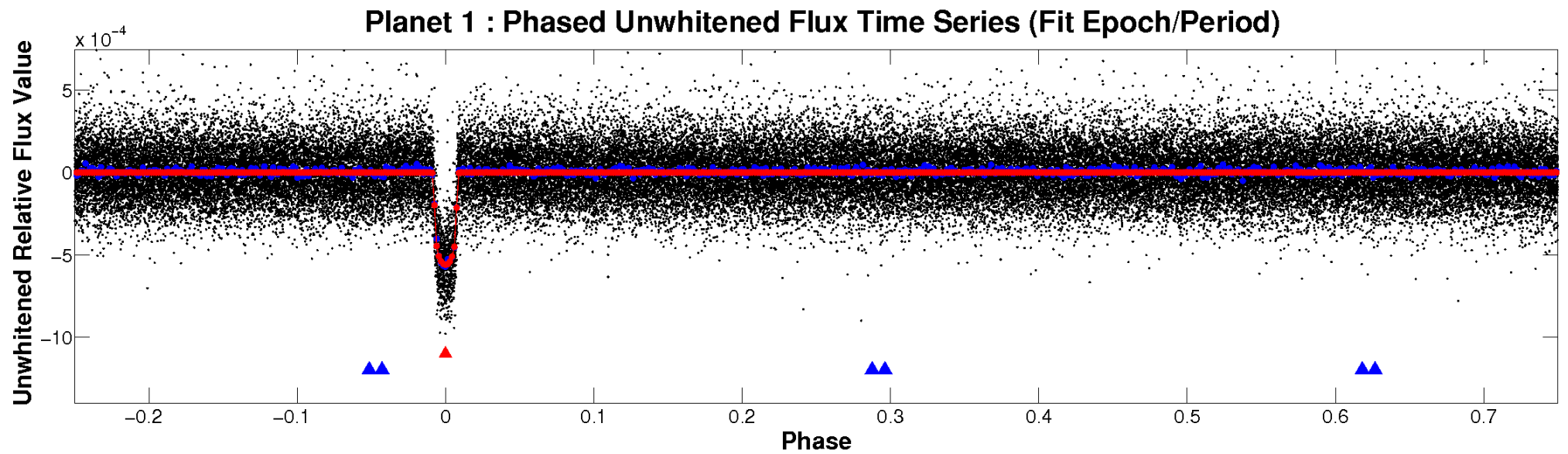


# ALT Odd/Even

TCE 008692861-01

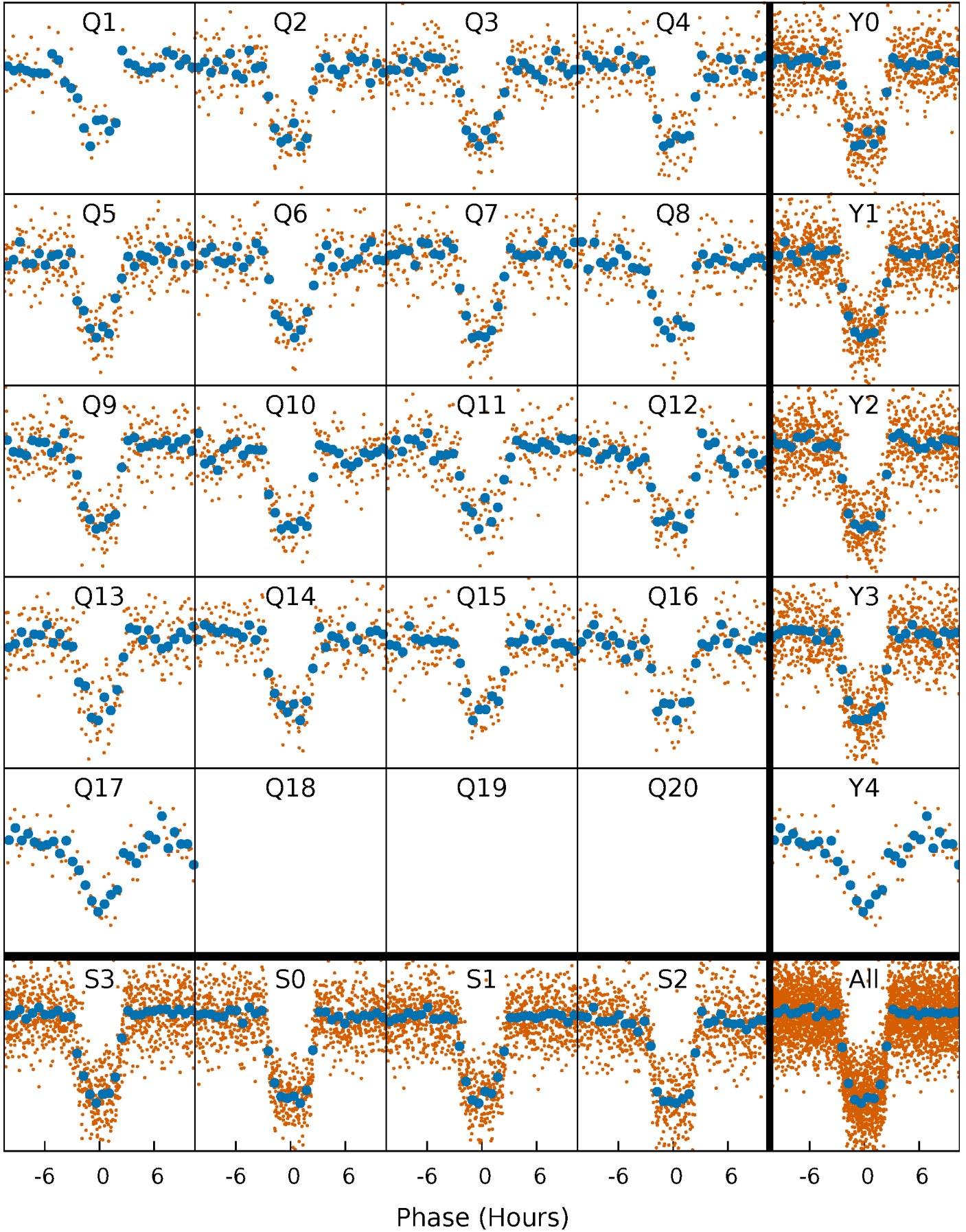


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

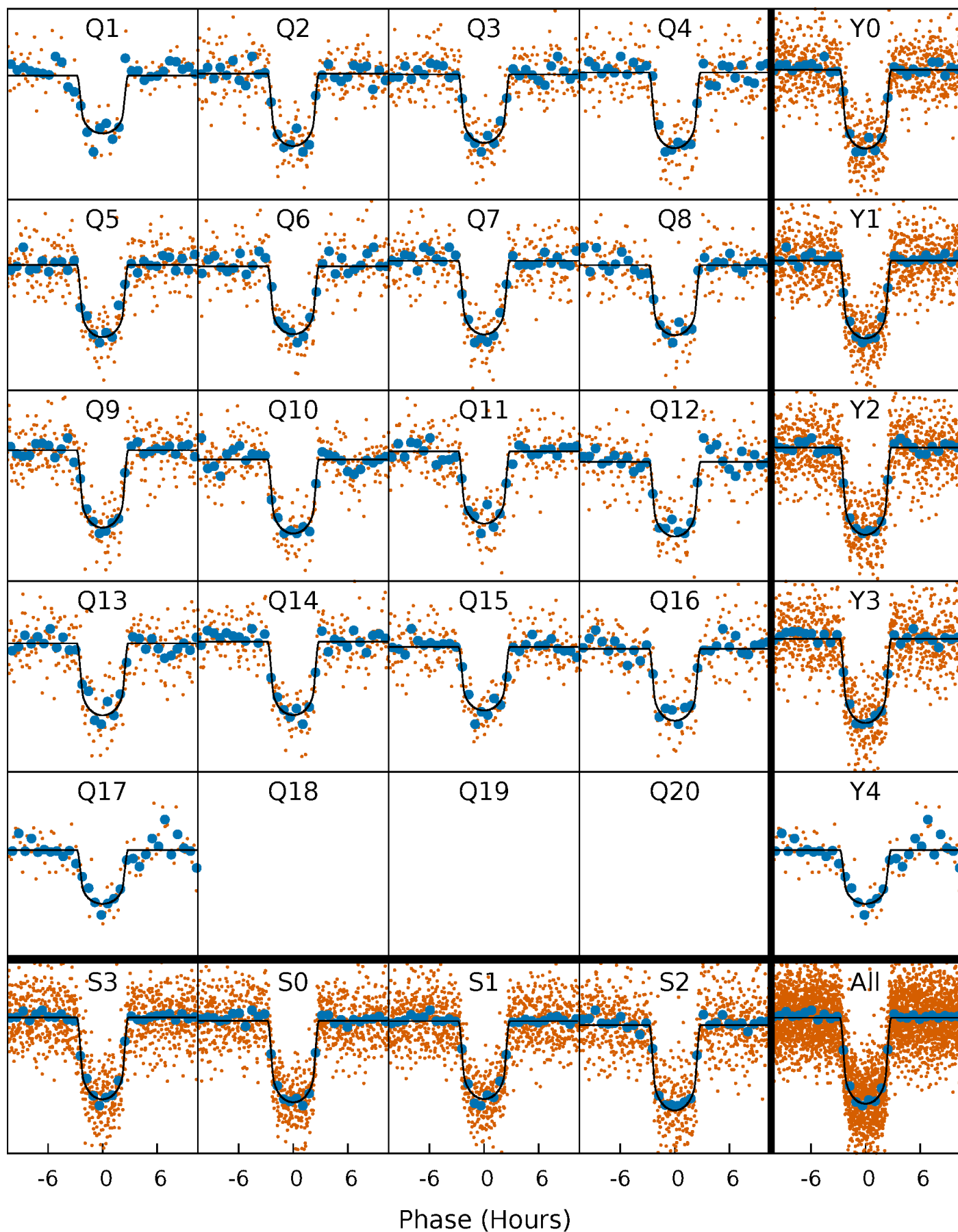
TCE 008692861-01 P= 13.722359 Days  $T_0=137.841523$  (BKJD)





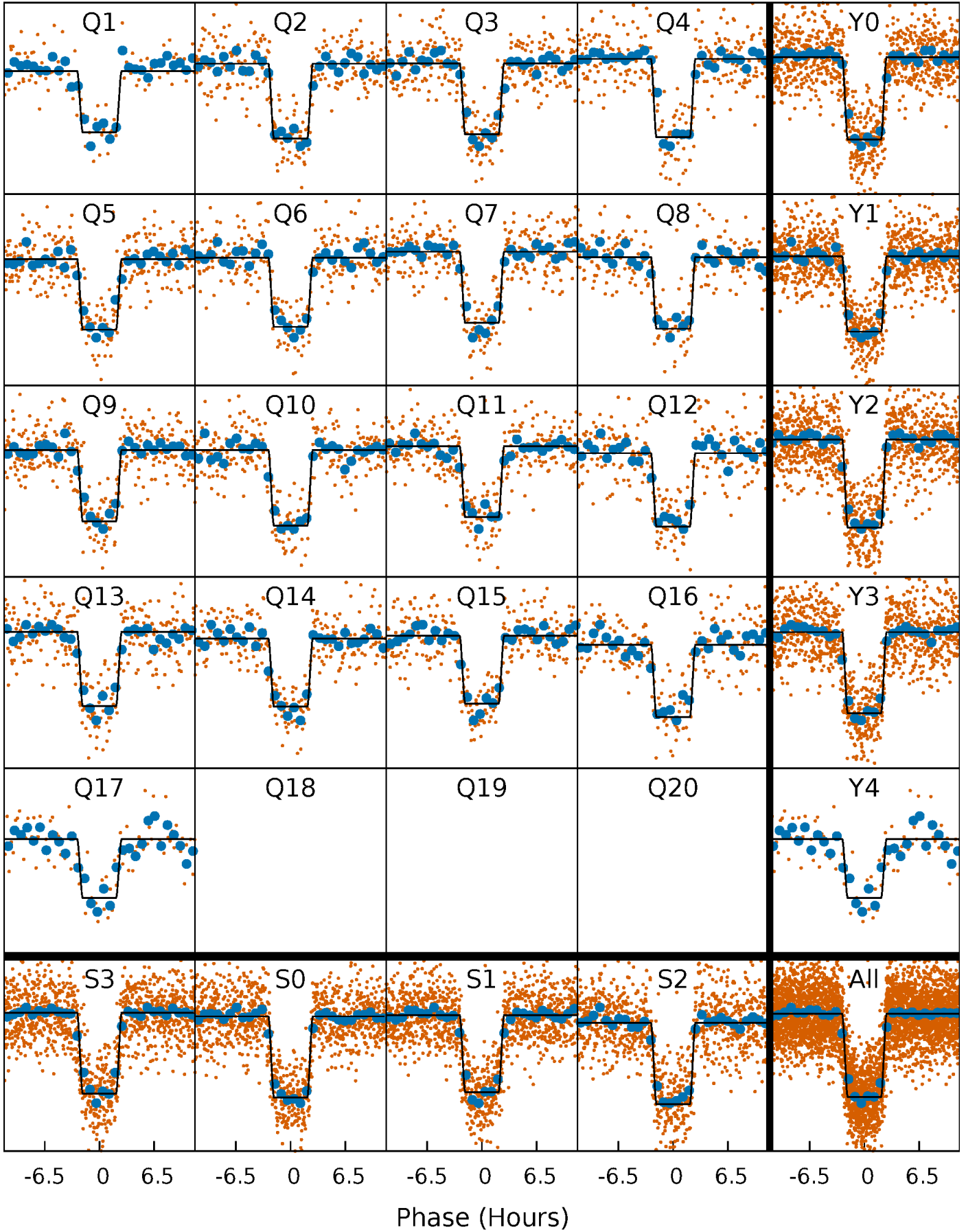
# DV Quarter-Phased Transit Curves

TCE 008692861-01 P= 13.722359 Days  $T_0=137.841523$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

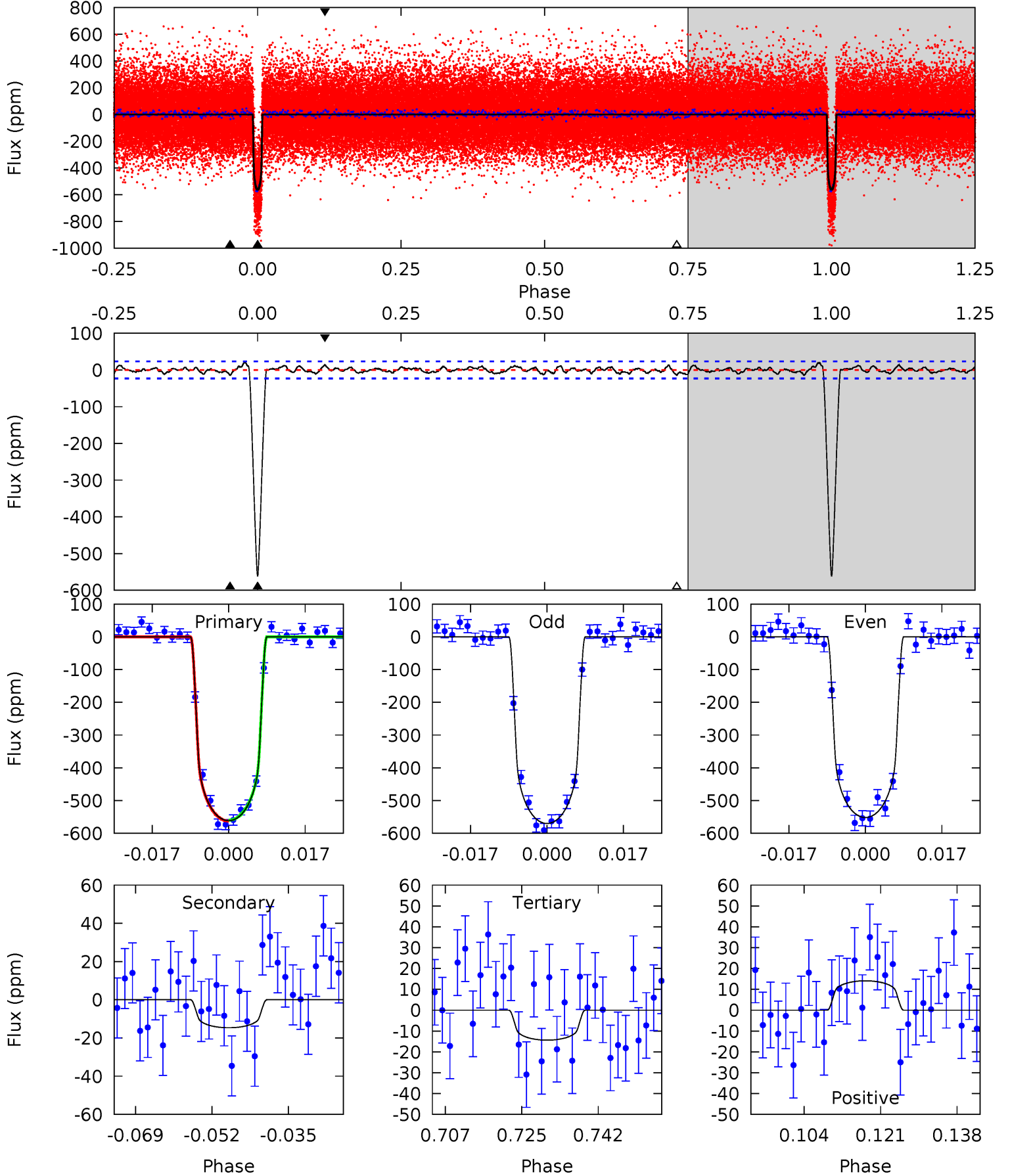
TCE 008692861-01 P= 13.722503 Days  $T_0=137.834785$  (BKJD)



# DV Model-Shift Uniqueness Test

008692861-01, P = 13.722359 Days, E = 124.119164 Days

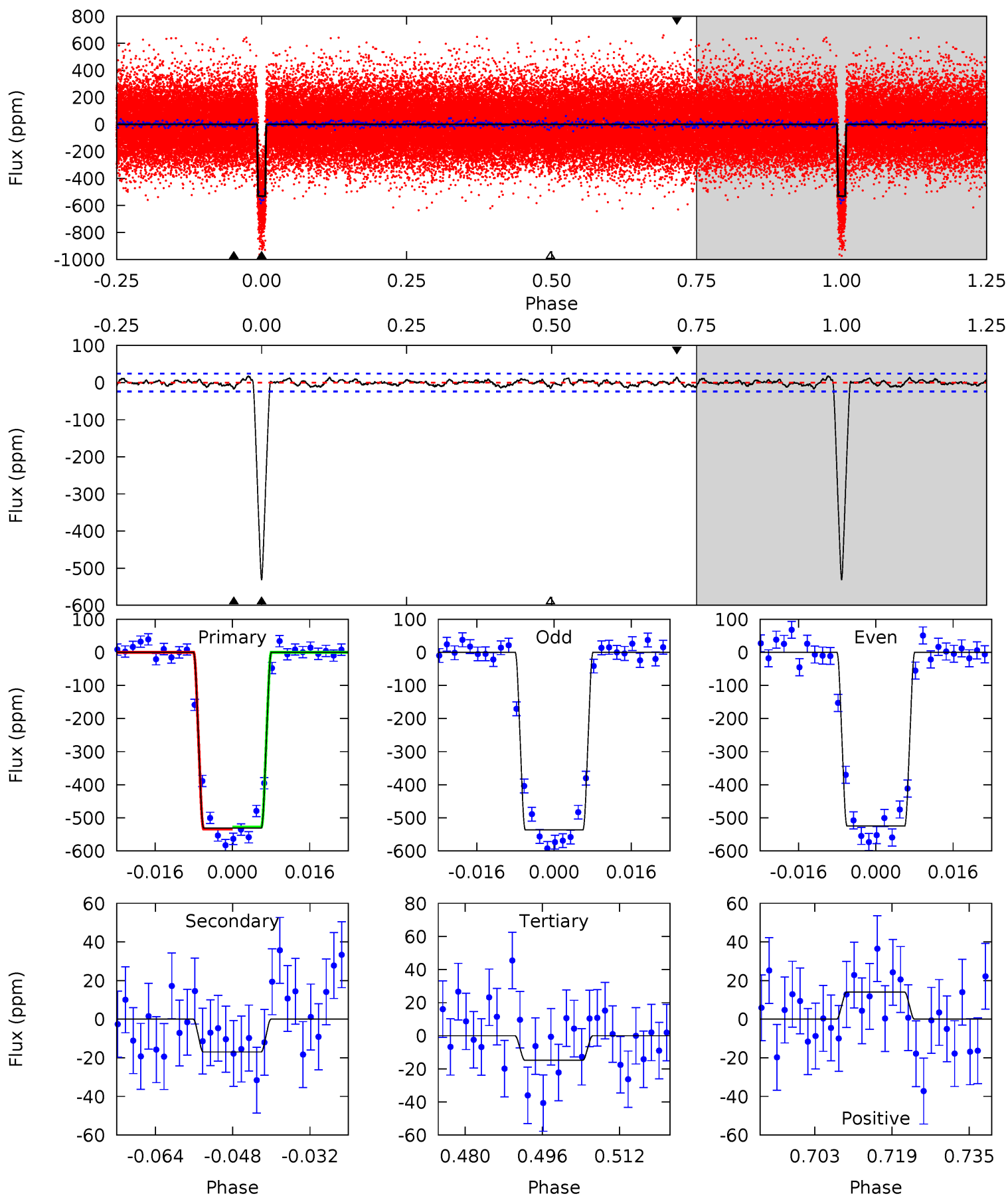
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
118.8	3.10	3.04	2.98	4.92	2.38	1.24	115.8	115.8	0.06	0.12	1.93	0.98	0.03	0.27



# Alt Model-Shift Uniqueness Test

008692861-01,  $P = 13.722503$  Days,  $E = 124.112282$  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
108.3	3.47	3.02	2.87	4.94	2.41	1.17	105.2	105.4	0.44	0.60	1.17	0.97	0.03	0.59



### Stellar Parameters For KIC 008692861

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5637^{+113}_{-101}$	$4.399^{+0.132}_{-0.088}$	$-0.300^{+0.150}_{-0.150}$	$0.943^{+0.117}_{-0.117}$	$0.813^{+0.072}_{-0.036}$	$1.365^{+0.774}_{-0.351}$
	+2%/-2%	+3%/-2%	+50%/-50%	+12%/-12%	+9%/-4%	+57%/-26%
Source	SPE48	SPE48	SPE48	DSEP		

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

### Secondary Eclipse Parameters for KIC 008692861-01 / KOI 0172.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-15 \pm 5$	$2.41^{+0.26}_{-0.25}$	$1040^{+43}_{-45}$	$2947^{+145}_{-163}$	$15^{+7}_{-5}$
Alt.	$-17 \pm 5$	$2.39^{+0.26}_{-0.25}$	$1041^{+41}_{-40}$	$3020^{+141}_{-155}$	$18^{+8}_{-6}$

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



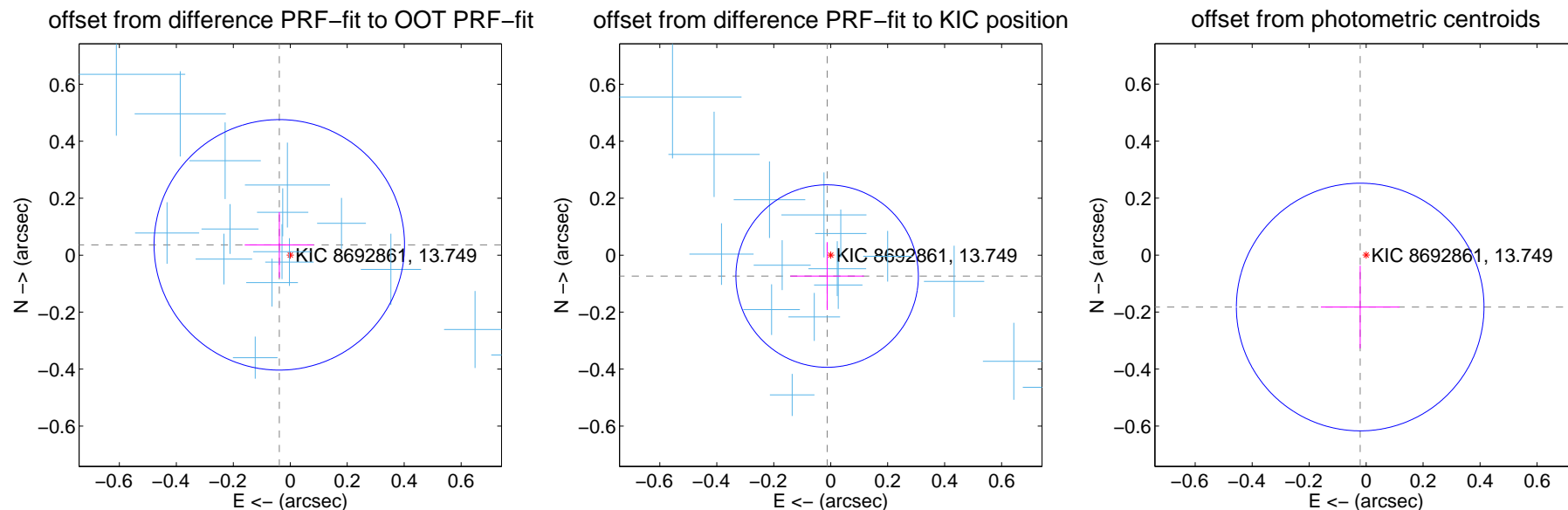
## DV Centroid Data

Supplemental centroid analysis for 008692861-01. Kepler magnitude: 13.75. Transit SNR 88.37

There are 17 quarters with good PRF difference image offsets

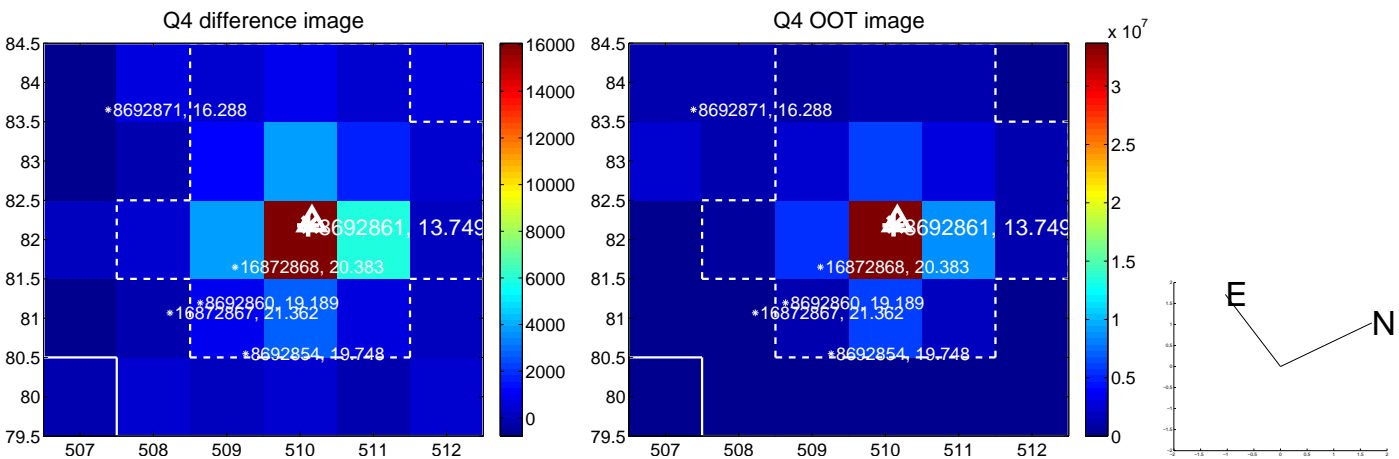
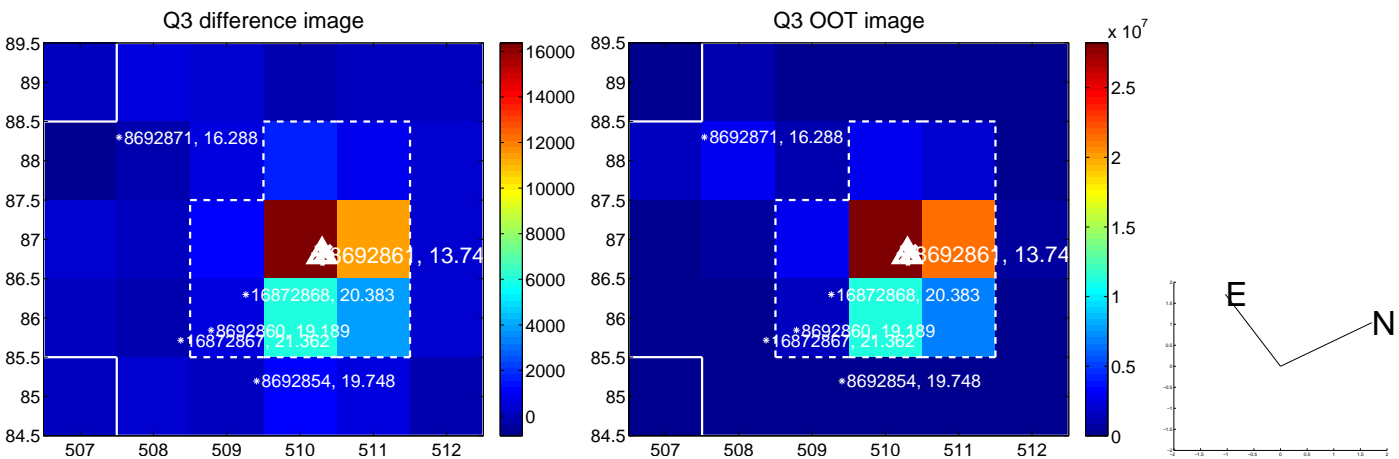
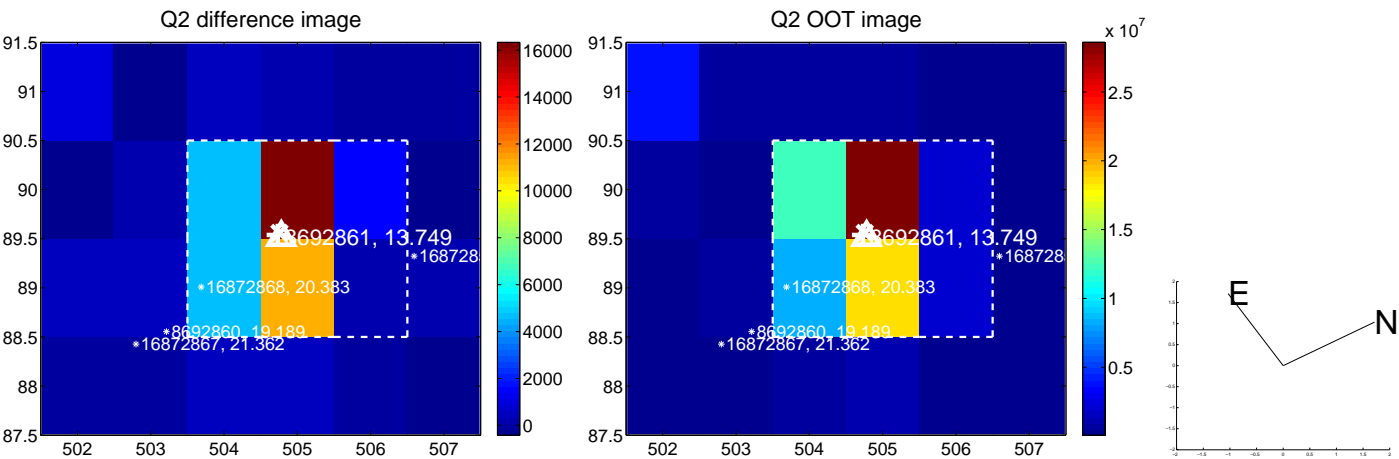
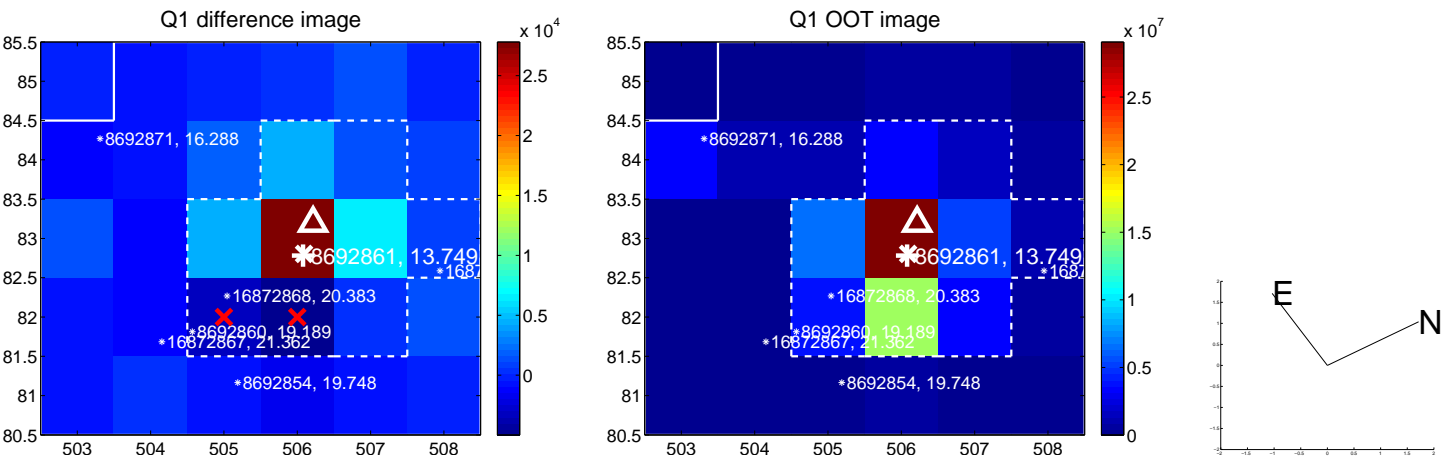
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.053 \pm 0.147$	0.36	$0.039 \pm 0.121$	$0.036 \pm 0.115$
PRF-fit source offset from KIC position	$0.074 \pm 0.107$	0.70	$0.013 \pm 0.129$	$-0.073 \pm 0.119$
photometric centroid source offset	$0.18 \pm 0.14$	1.27	$0.02 \pm 0.14$	$-0.18 \pm 0.14$

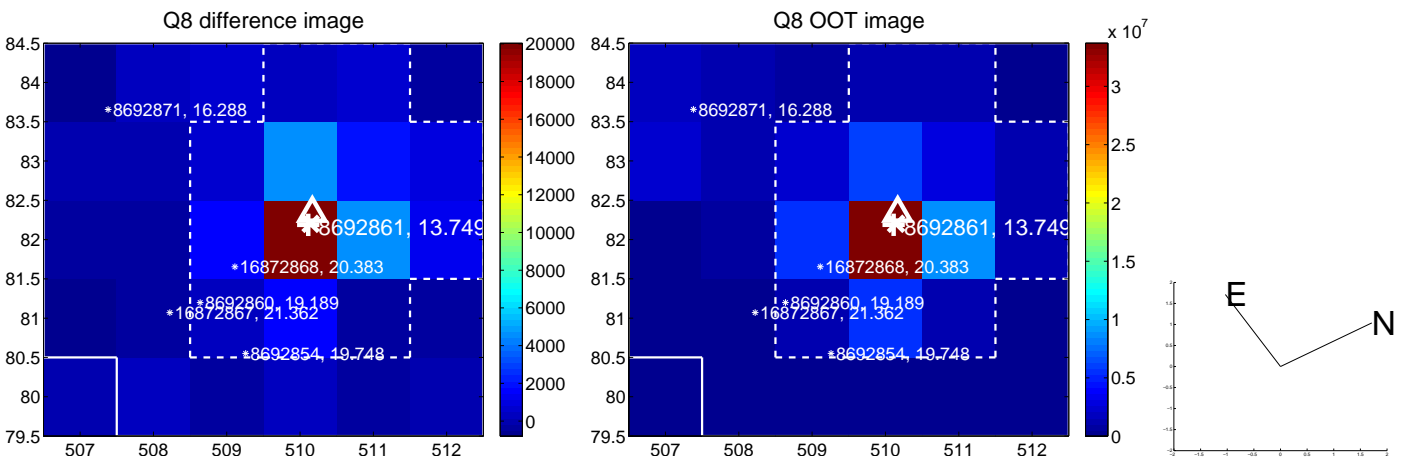
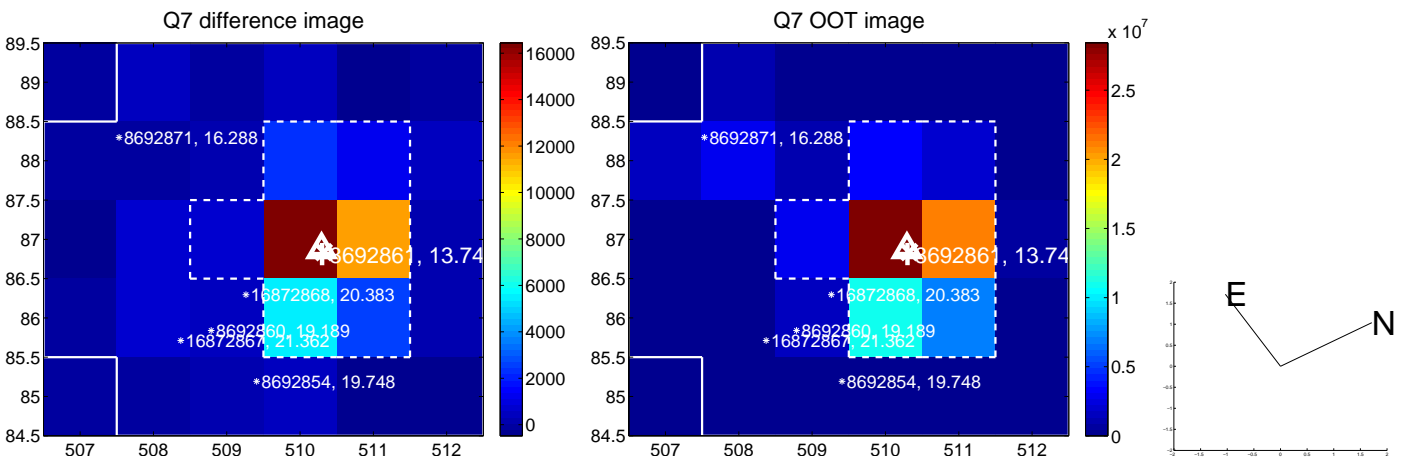
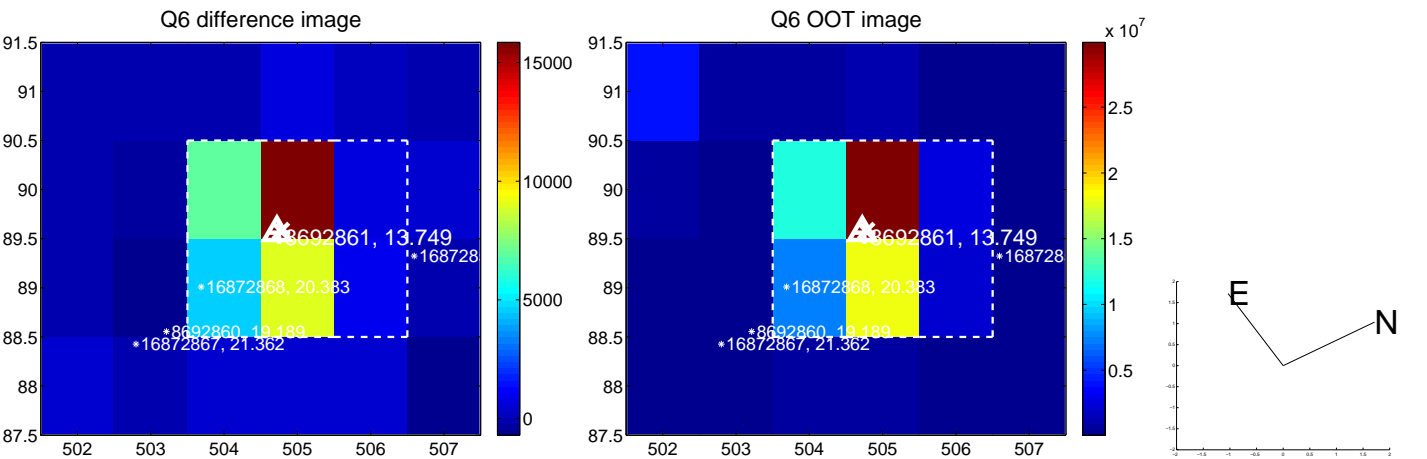
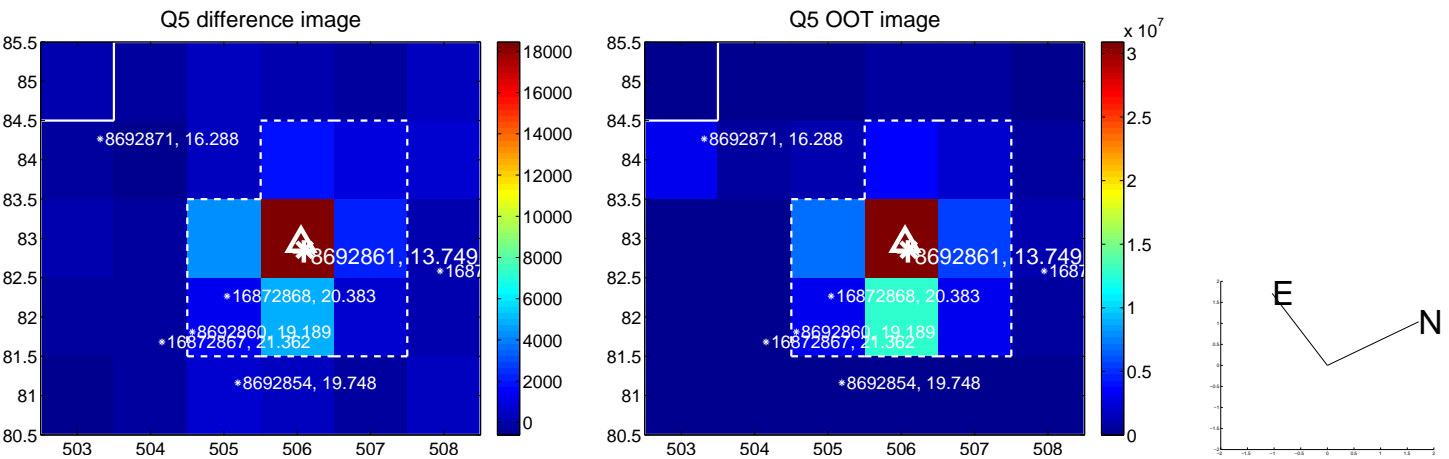


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

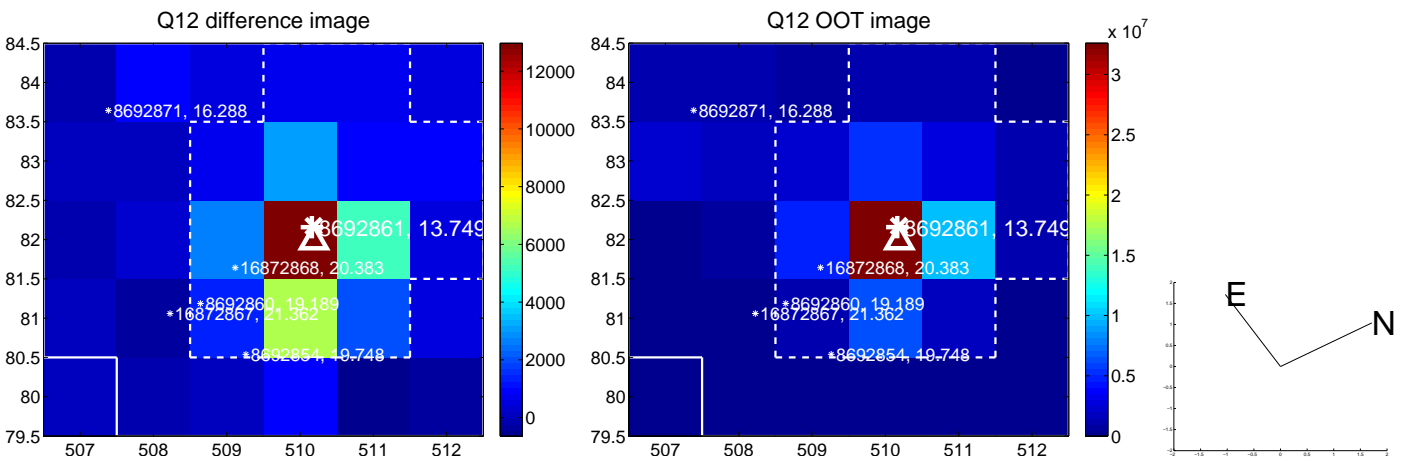
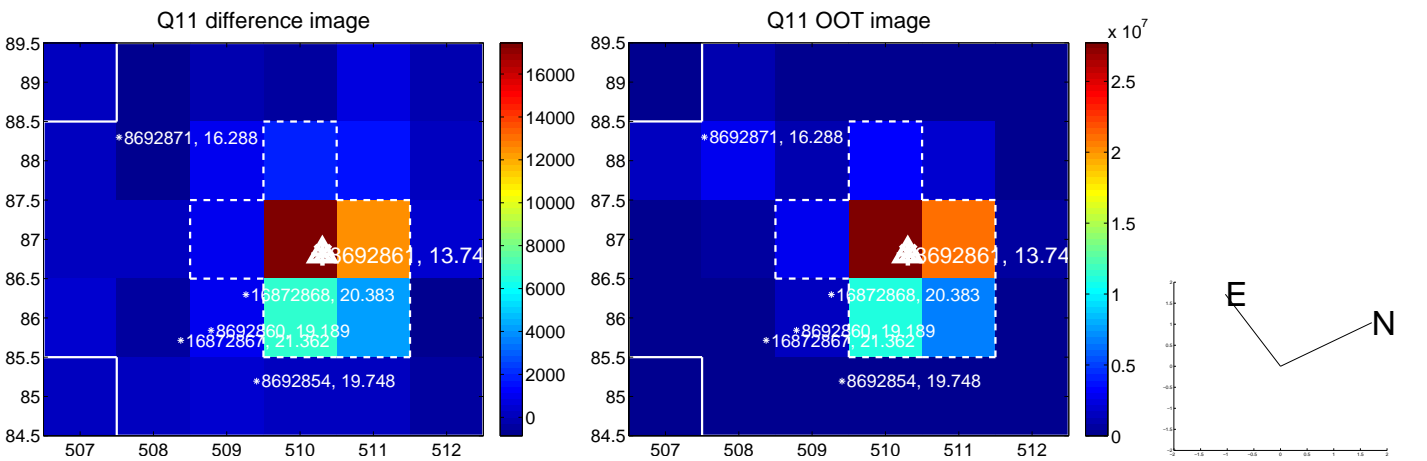
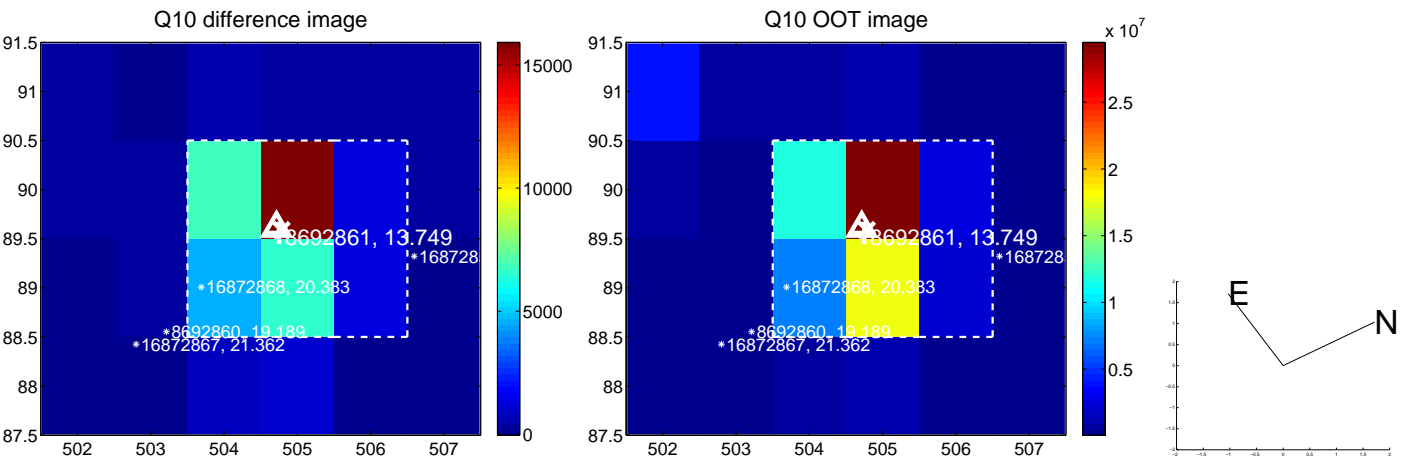
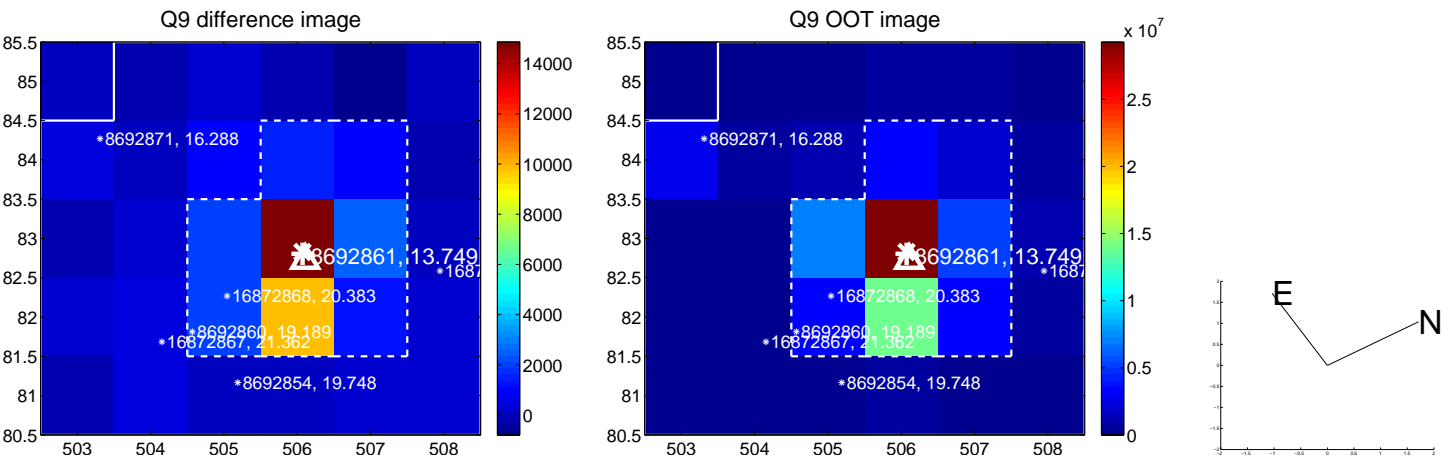
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



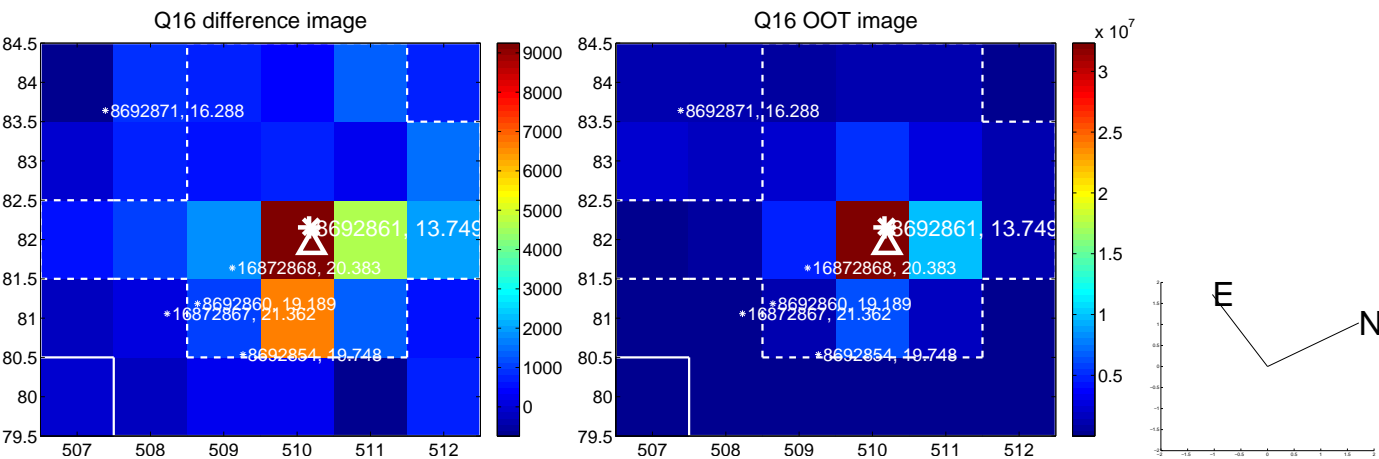
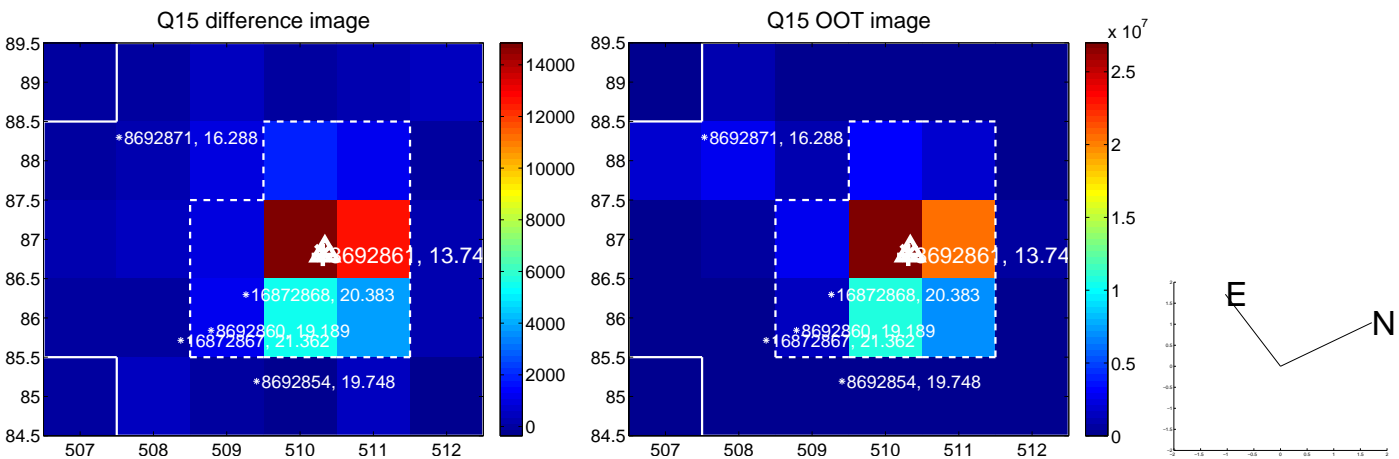
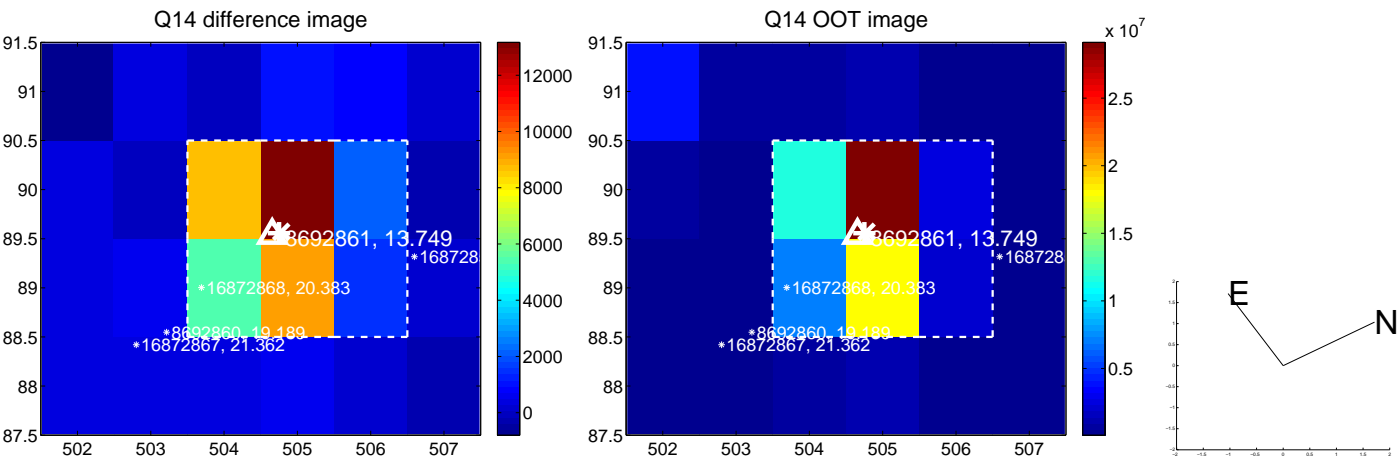
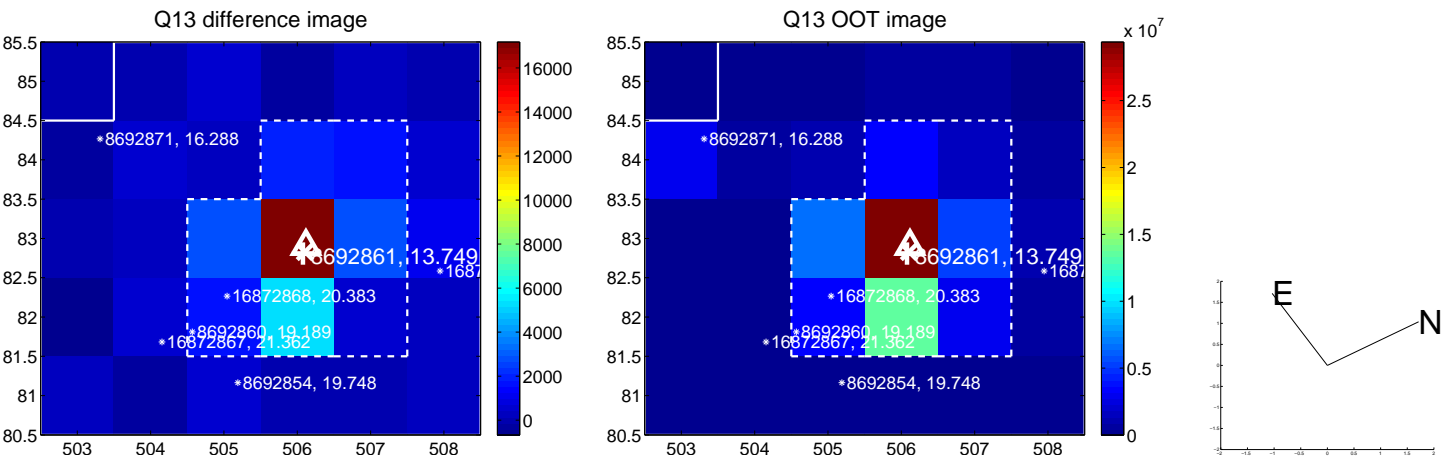
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

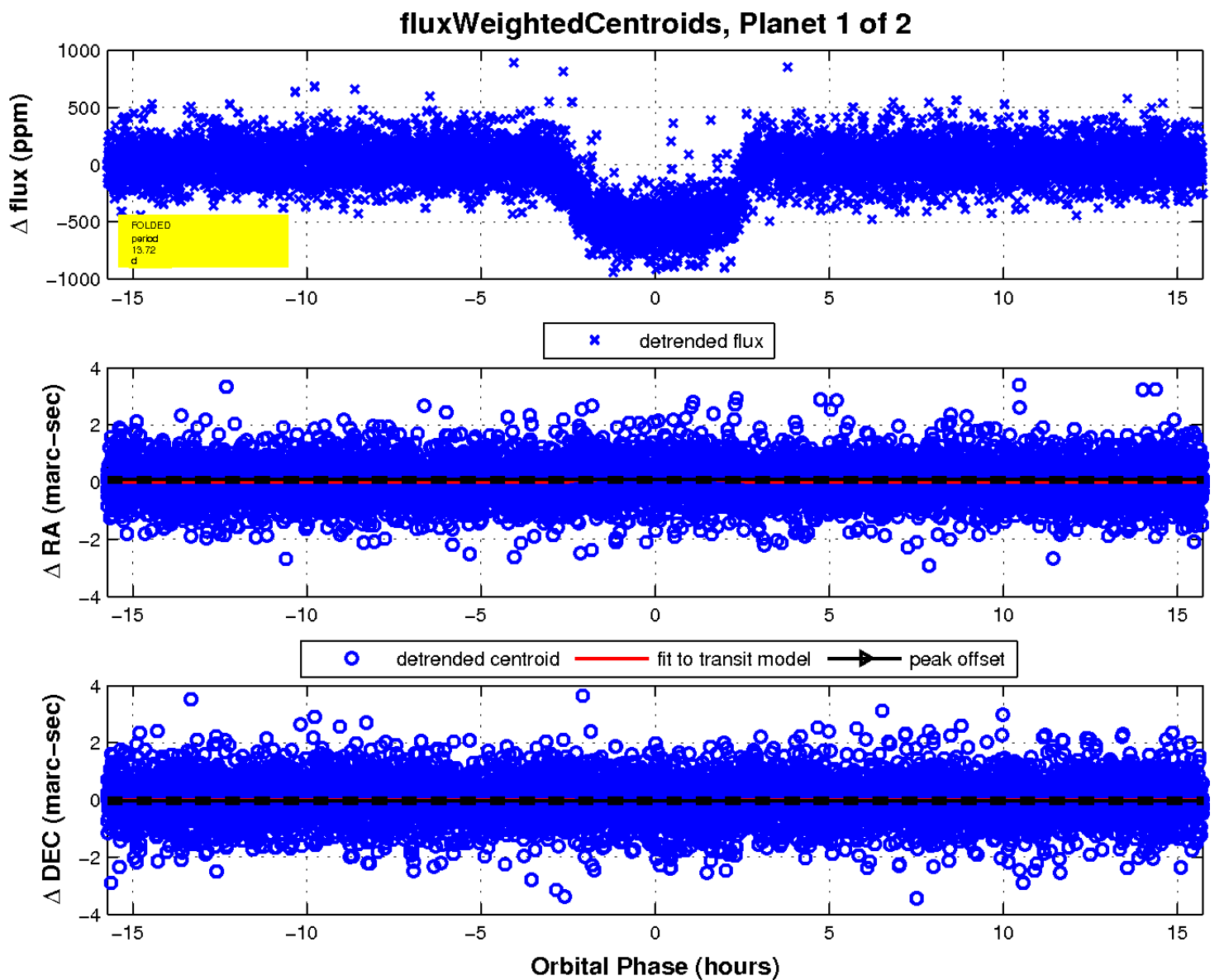
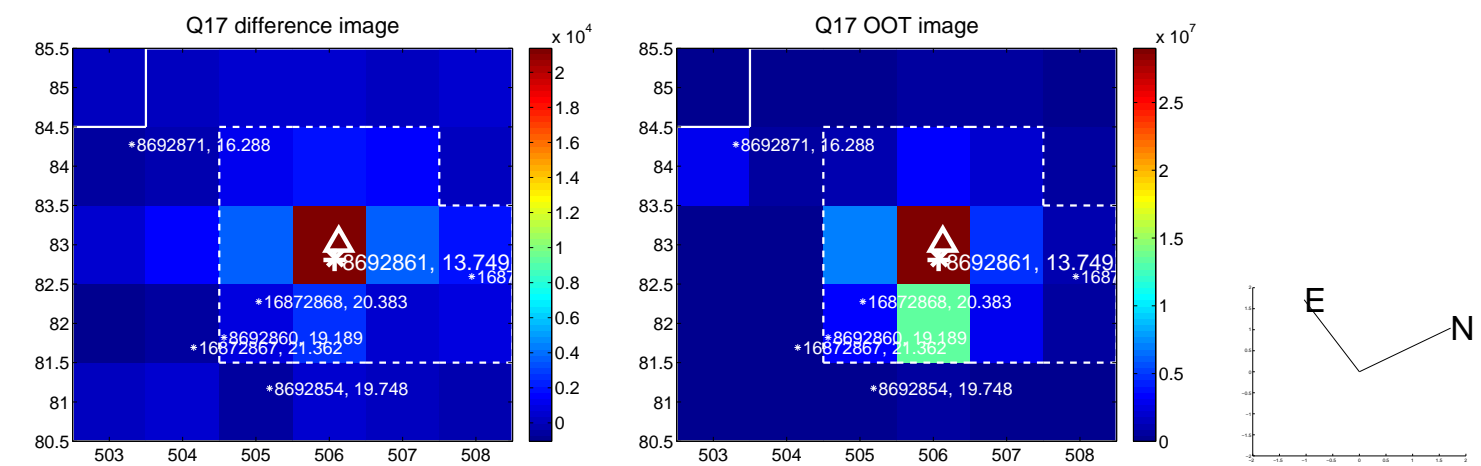


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



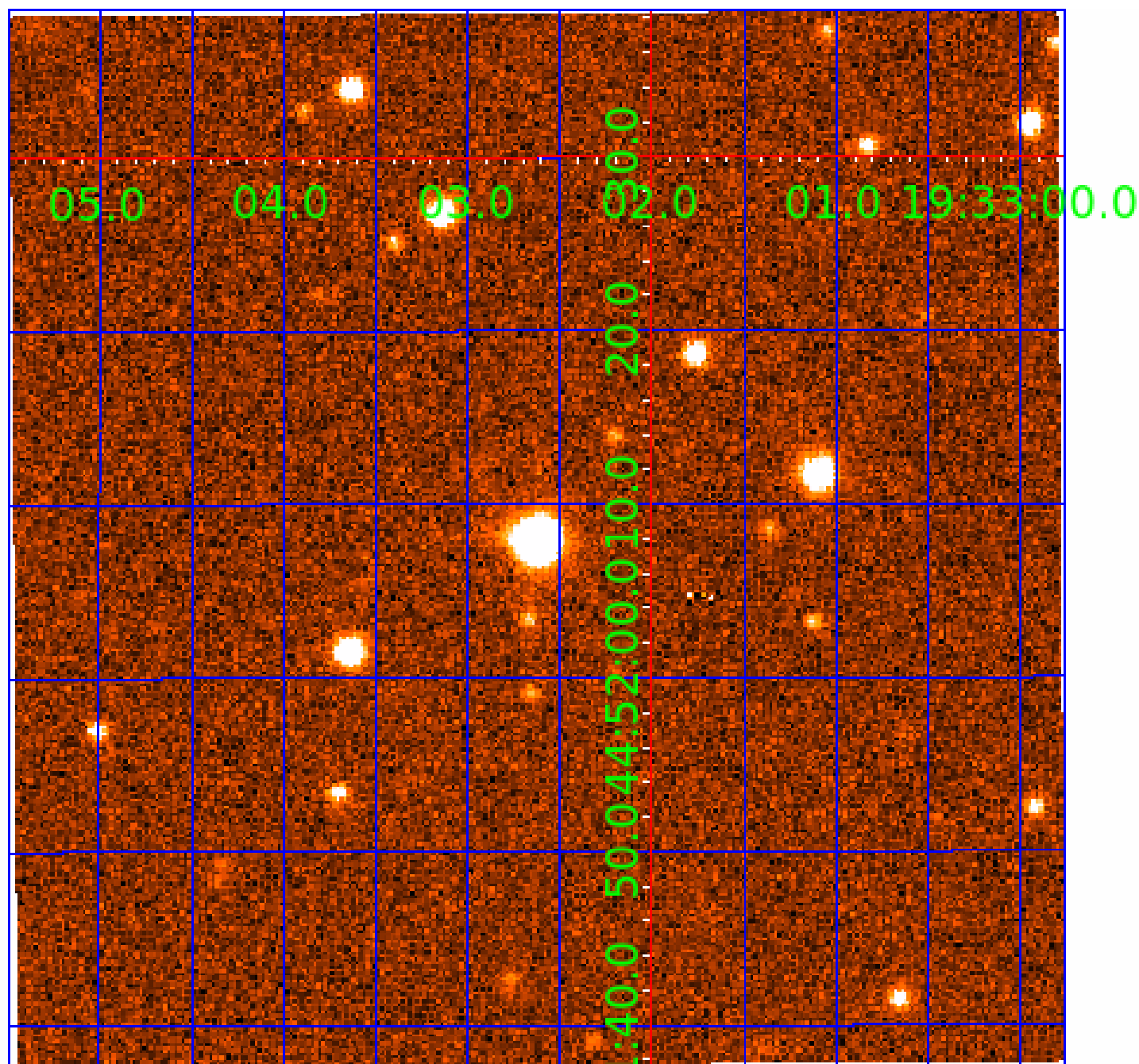


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008692861

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008692861-01	OBS	0172.01	13.722359	137.841523	561.2	5.244	82.3	88.4	0.94	5637	2.43	73.37
008692861-02	OBS	0172.02	242.467679	150.858763	336.0	13.579	18.0	19.7	0.94	5637	1.99	1.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008692861-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008692861-02	OBS	PC	0.69	0	0	0	0	NO_COMMENT

**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.

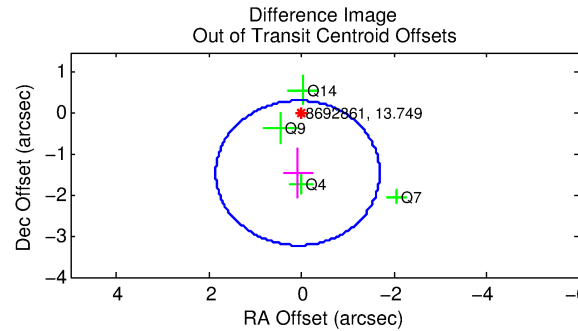
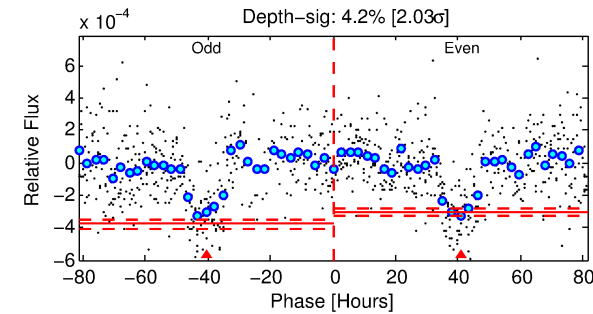
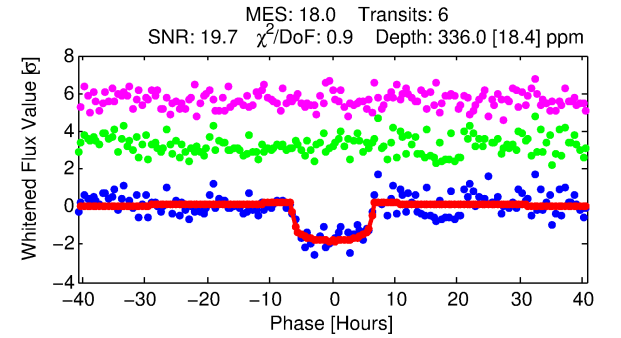
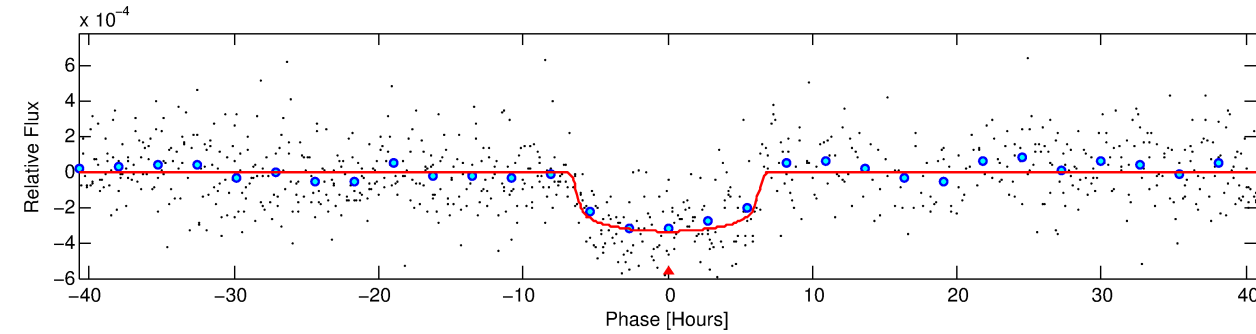
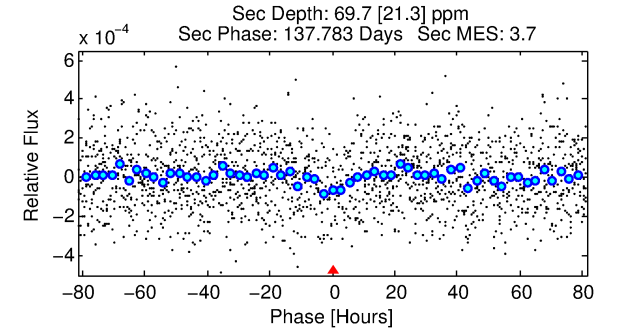
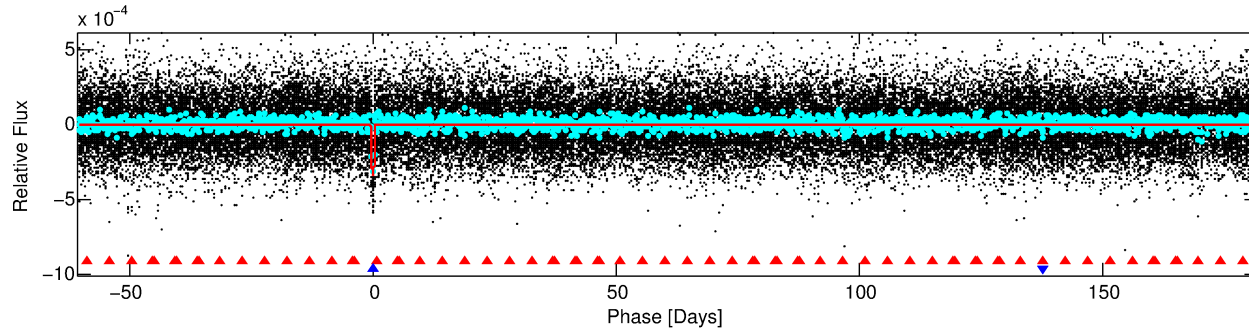
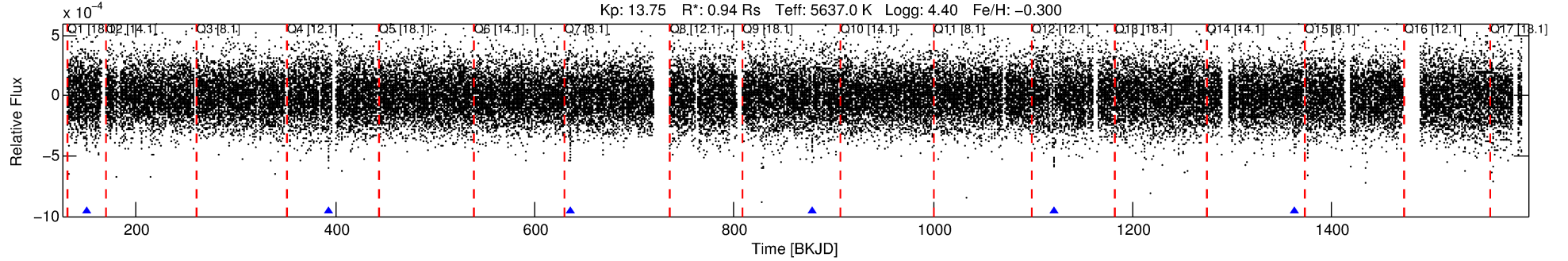
## Ephemeris Match Information For 008692861-02

No Significant Match Found

# DV One-Page Summary

KIC: 8692861 Candidate: 2 of 2 Period: 242.468 d  
KOI: K00172.02 Name: Kepler-69c Corr: 0.962

Kp: 13.75 R\*: 0.94 Rs Teff: 5637.0 K Logg: 4.40 Fe/H: -0.300



## DV Fit Results:

Period = 242.46768 [0.00357] d  
Epoch = 150.8588 [0.0110] BKJD  
Rp/R\* = 0.0193 [0.0019]  
a/R\* = 74.74 [33.13]  
b = 0.86 [0.14]  
Seff = 1.59 [0.37]  
Teq = 287 [17] K  
Rp = 1.99 [0.32] Re  
a = 0.7104 [0.0929] AU  
Ag = 4905.65 [2090.03] [2.35σ]  
Teffp = 3707 [347] K [9.85σ]

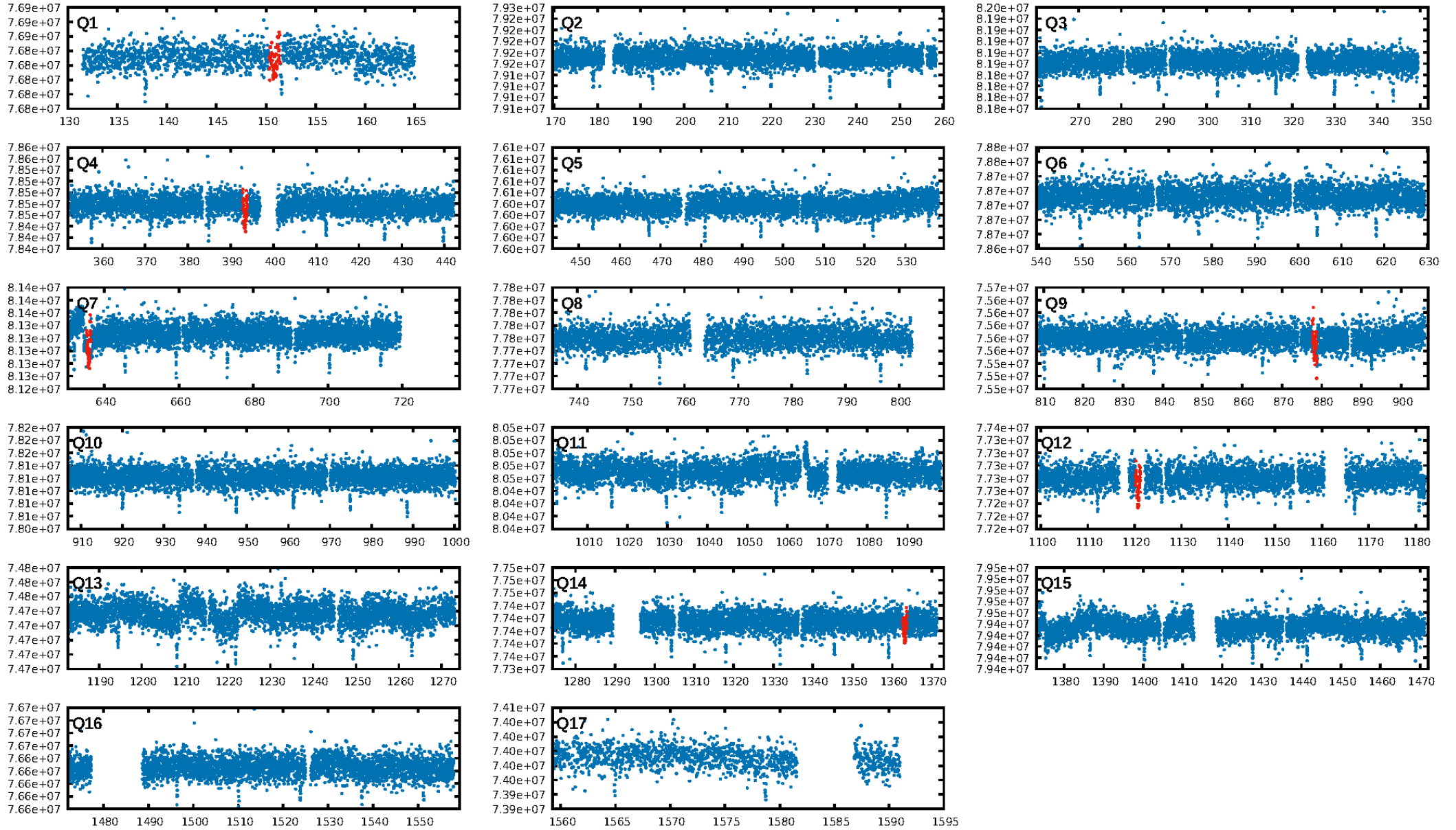
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [377.15σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.87e-66  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -15.21  
Centroid-sig: 13.3%  
Centroid-so: 0.508 arcsec [0.78σ]  
OotOffset-rm: 1.457 arcsec [2.47σ]  
KicOffset-rm: 1.574 arcsec [2.55σ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 0.60 [3/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:26:59 Z

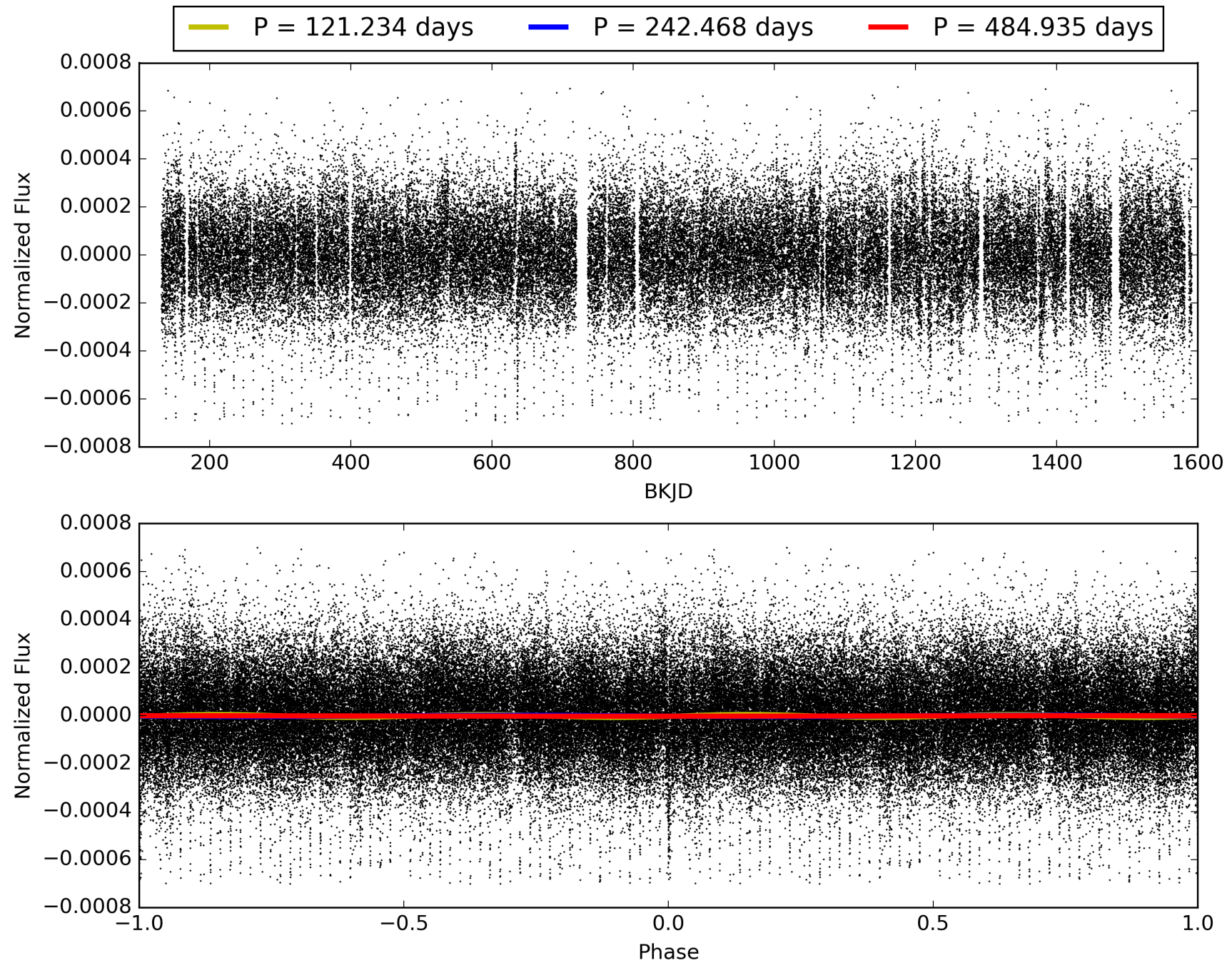
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008692861-02, PDC Light Curves



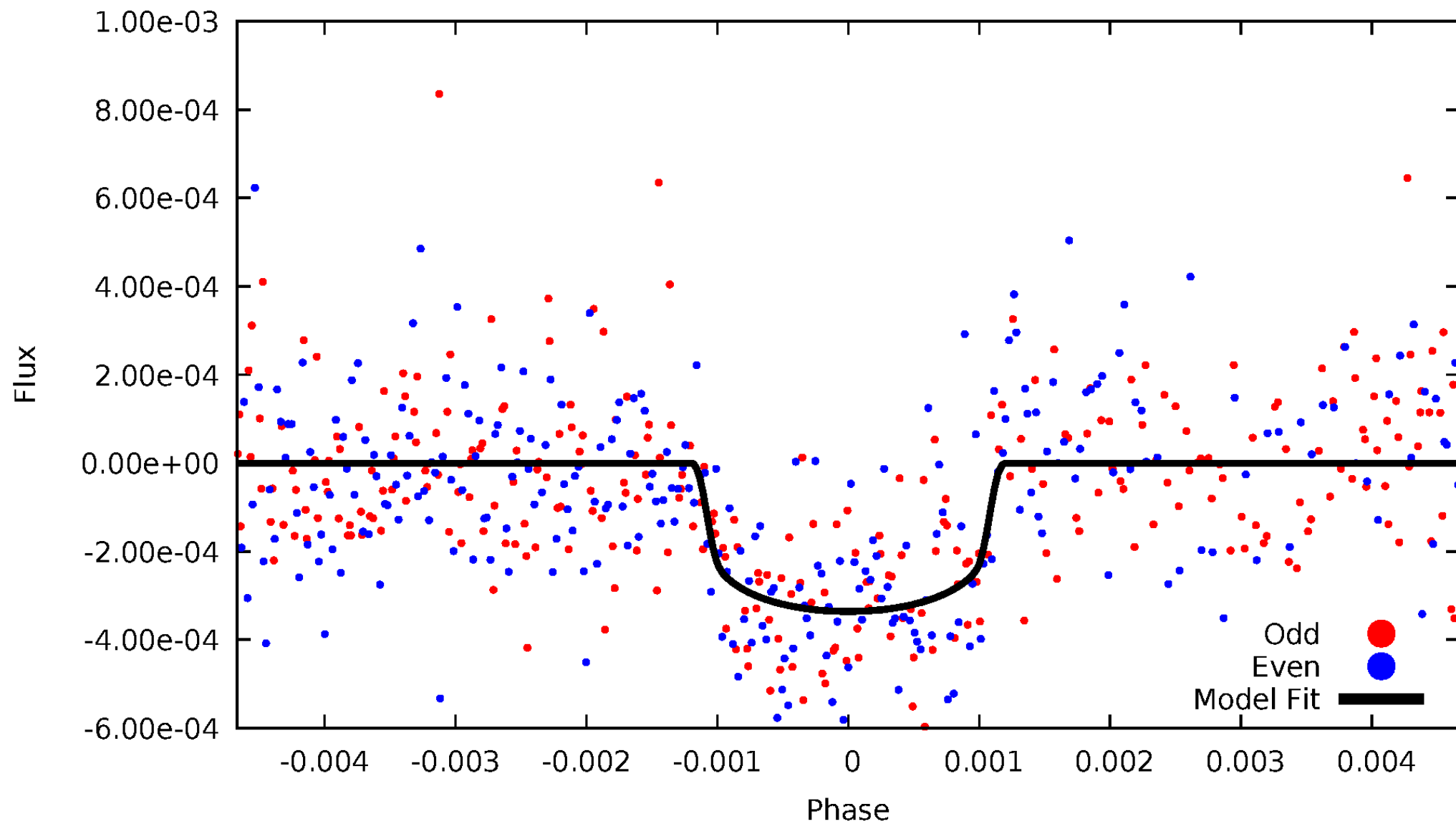


TCE 008692861-02



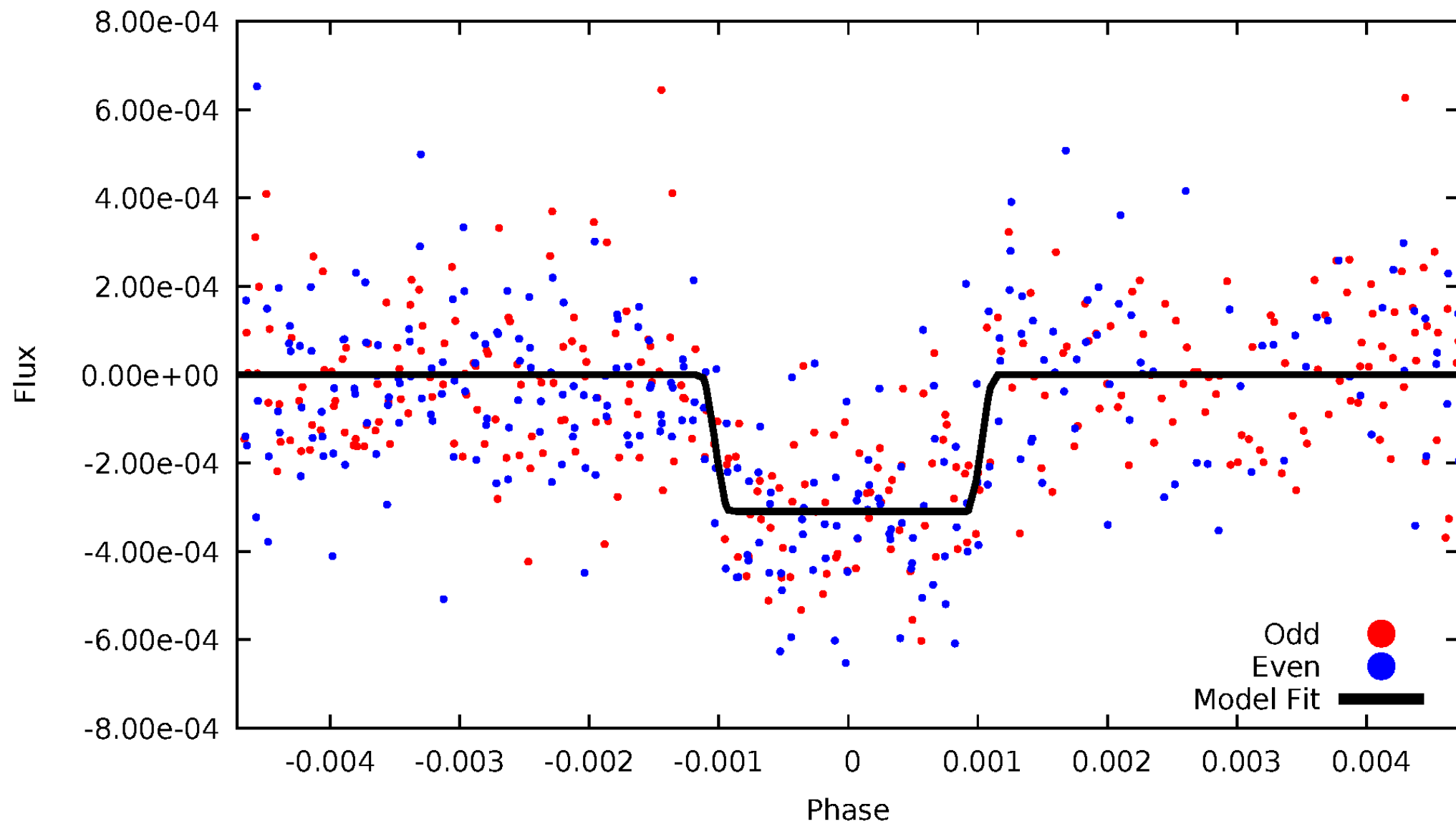
# DV Odd/Even

TCE 008692861-02



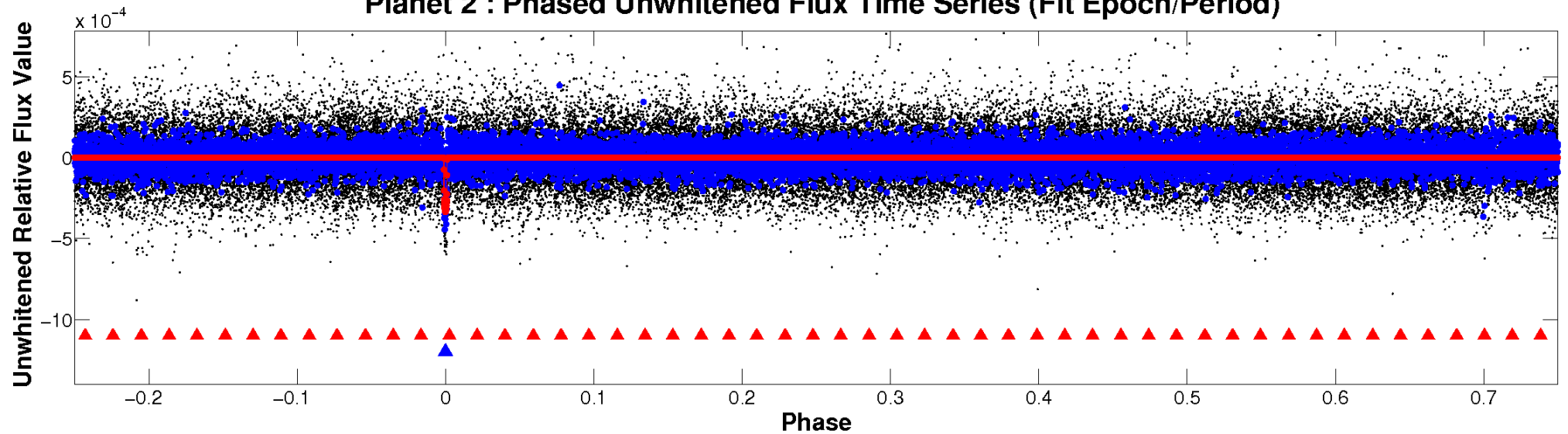
# ALT Odd/Even

TCE 008692861-02

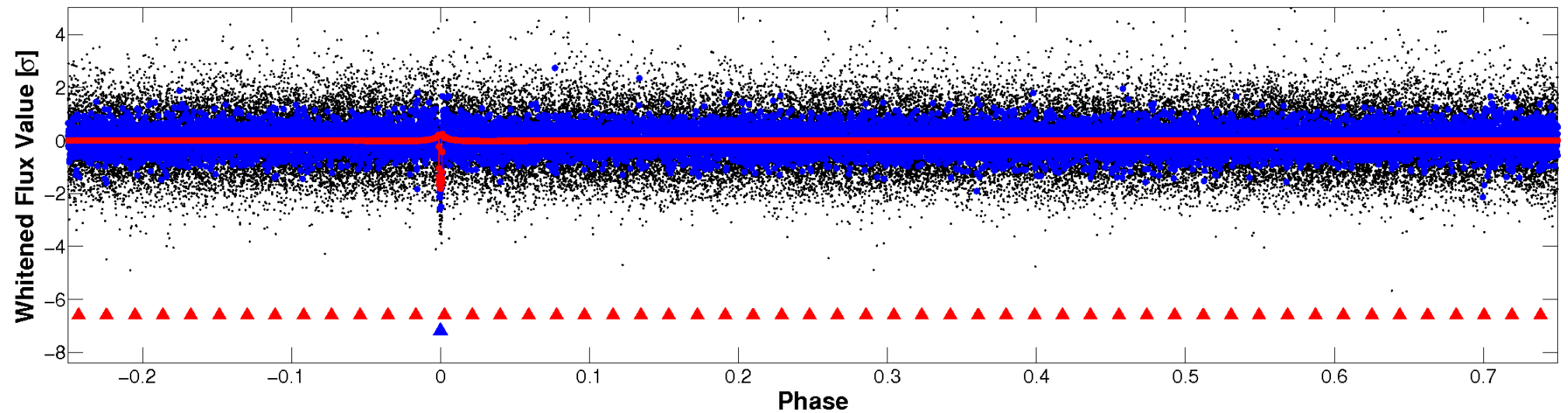


# Non-Whitened Vs. Whitened Light Curve

## 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

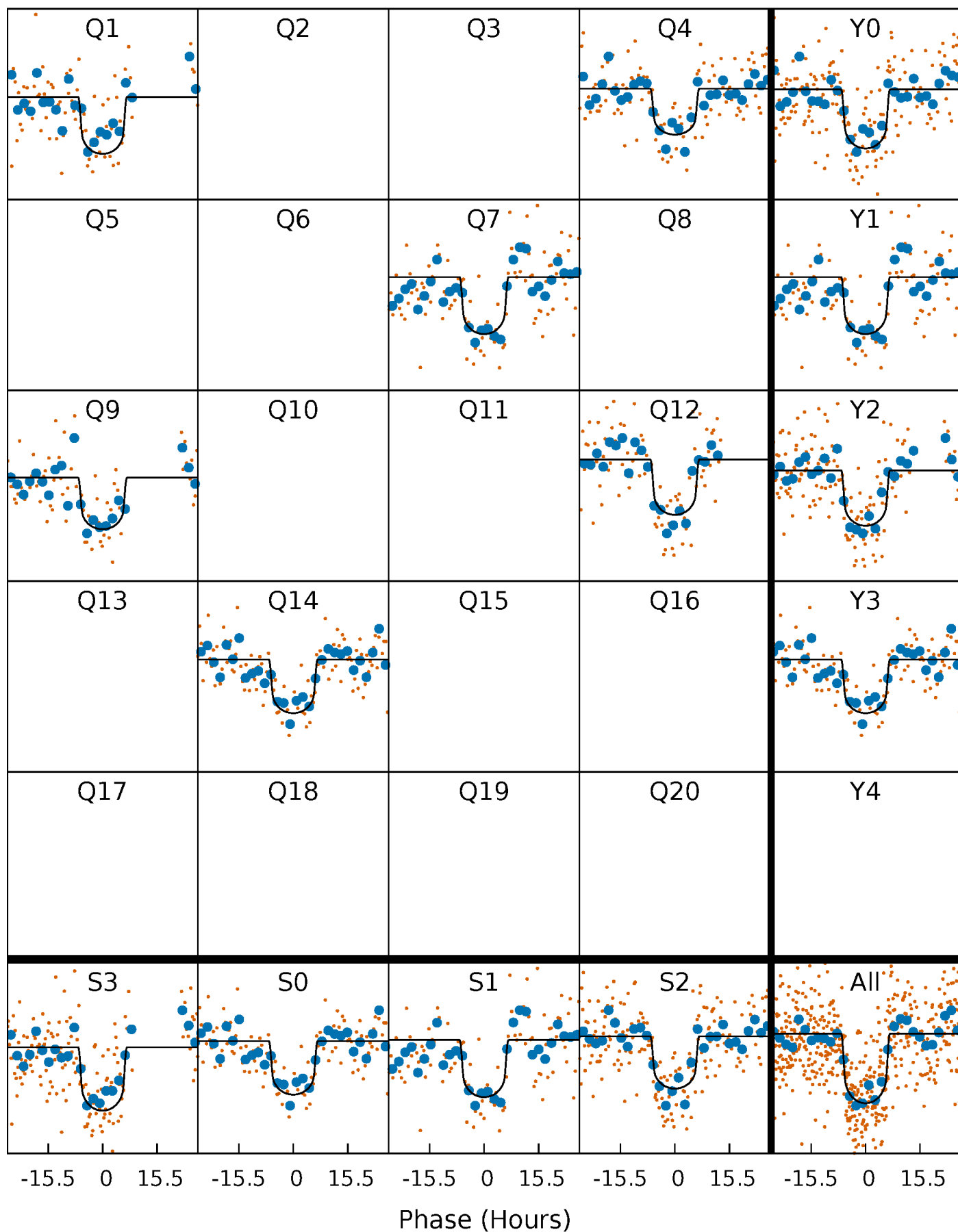
TCE 008692861-02   P=242.467679 Days    $T_0=150.858763$  (BKJD)





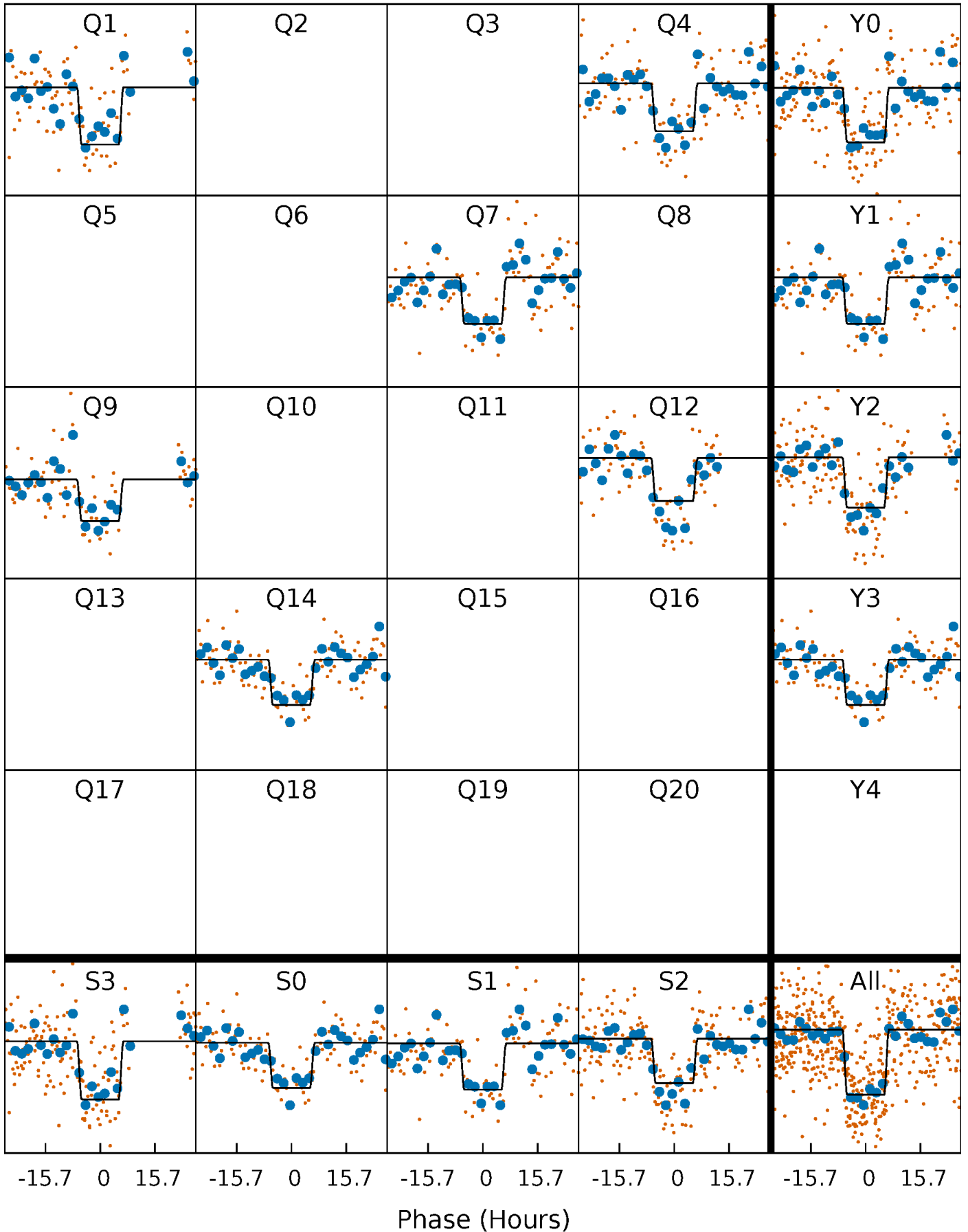
# DV Quarter-Phased Transit Curves

TCE 008692861-02     $P=242.467679$  Days     $T_0=150.858763$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

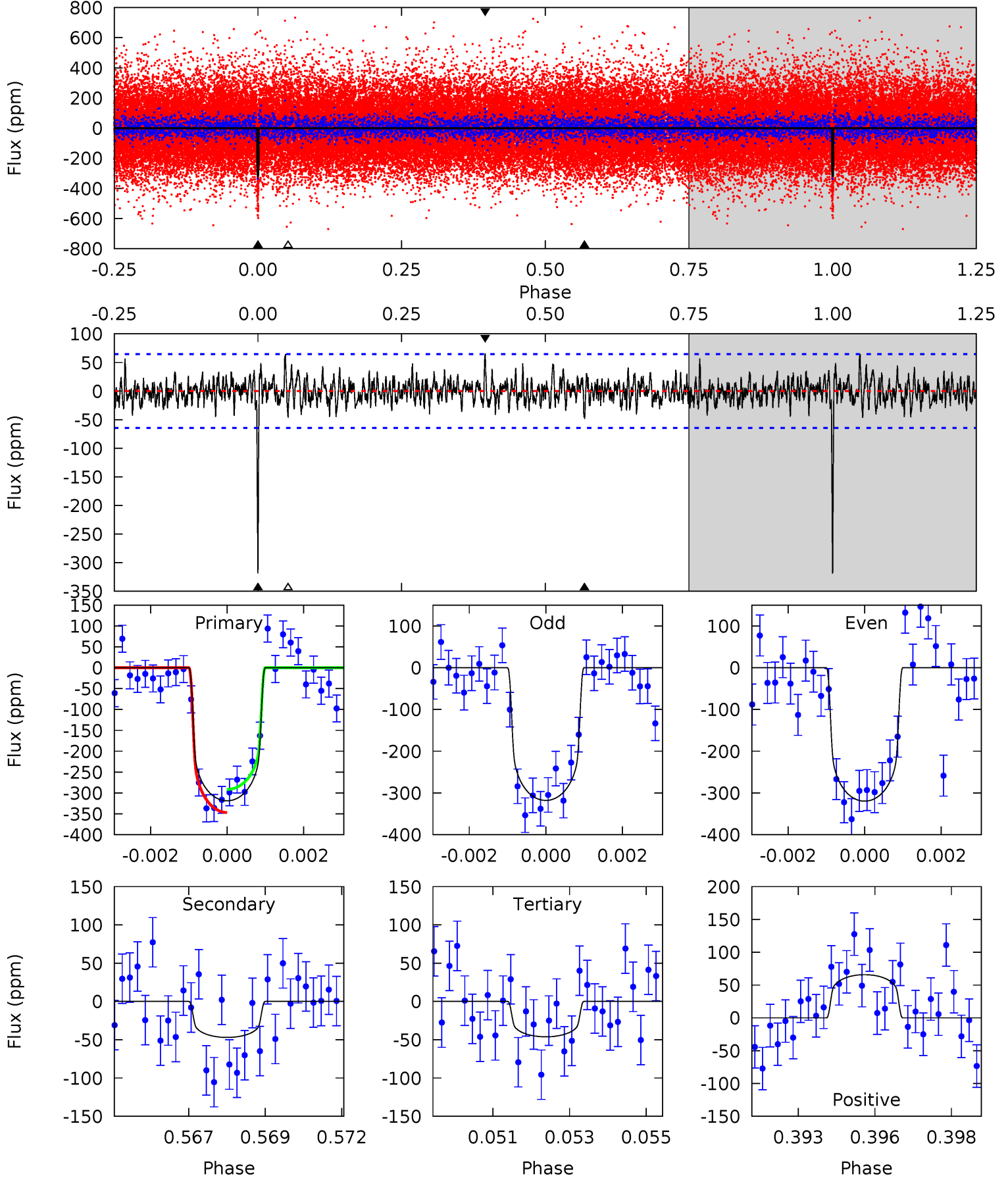
TCE 008692861-02     $P=242.464623$  Days     $T_0=150.866736$  (BKJD)



# DV Model-Shift Uniqueness Test

008692861-02,  $P = 242.467679$  Days,  $E = 150.858763$  Days

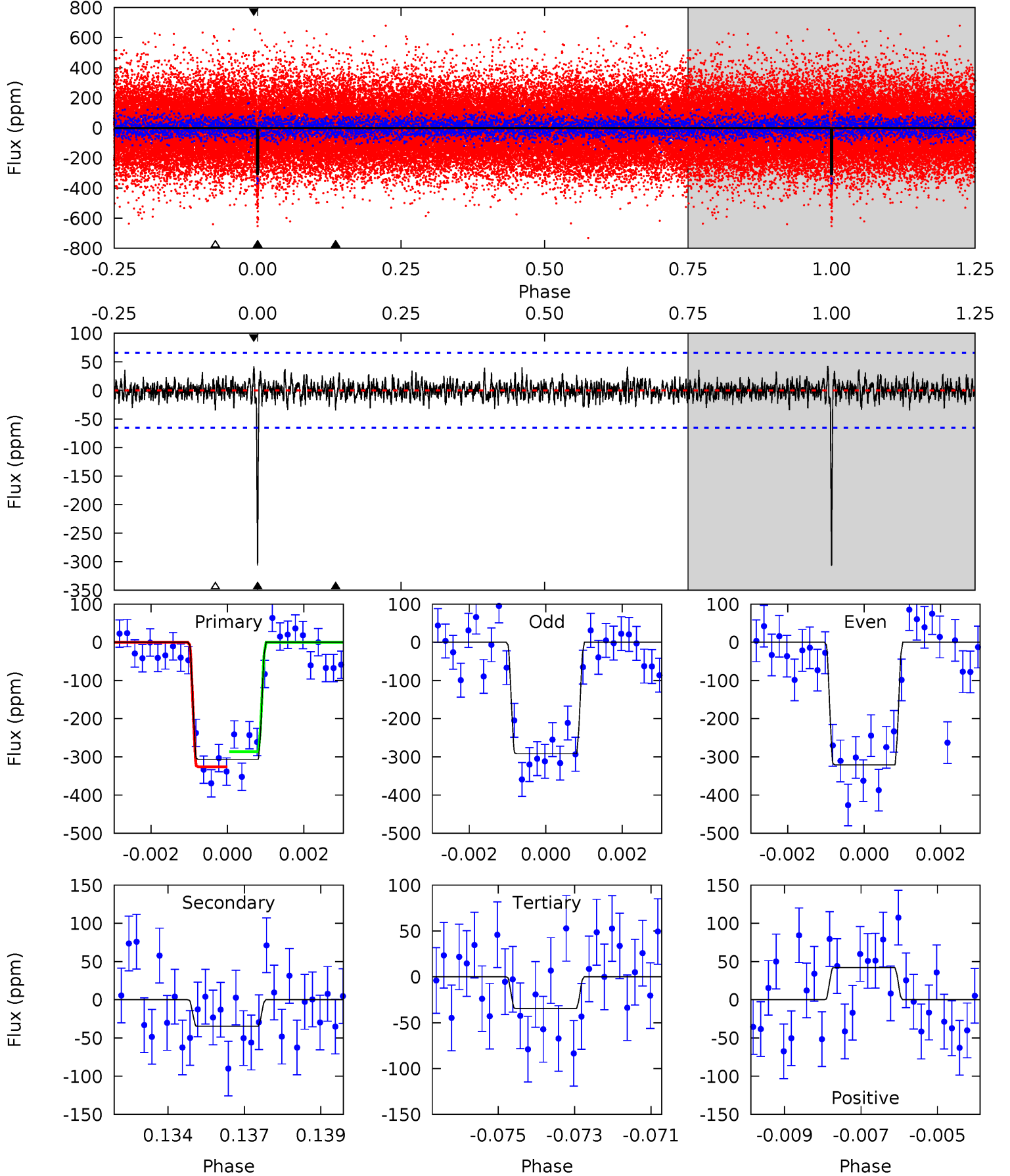
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.1	3.85	3.78	5.39	5.29	3.03	1.31	22.3	20.7	0.07	-1.54	0.07	0.97	0.17	2.27



# Alt Model-Shift Uniqueness Test

008692861-02, P = 242.464623 Days, E = 150.866736 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
24.9	2.81	2.80	3.41	5.30	3.05	0.88	22.1	21.4	0.01	-0.60	1.18	1.04	0.12	1.61



### Stellar Parameters For KIC 008692861

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5637^{+113}_{-101}$	$4.399^{+0.132}_{-0.088}$	$-0.300^{+0.150}_{-0.150}$	$0.943^{+0.117}_{-0.117}$	$0.813^{+0.072}_{-0.036}$	$1.365^{+0.774}_{-0.351}$
	+2%/-2%	+3%/-2%	+50%/-50%	+12%/-12%	+9%/-4%	+57%/-26%
Source	SPE48	SPE48	SPE48	DSEP		

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

### Secondary Eclipse Parameters for KIC 008692861-02 / KOI 0172.02

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-47 \pm 12$	$1.97^{+0.25}_{-0.24}$	$399^{+16}_{-17}$	$3748^{+224}_{-201}$	$3398^{+1412}_{-1063}$
Alt.	$-35 \pm 12$	$1.79^{+0.25}_{-0.23}$	$399^{+16}_{-16}$	$3684^{+249}_{-291}$	$2978^{+1530}_{-1229}$

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

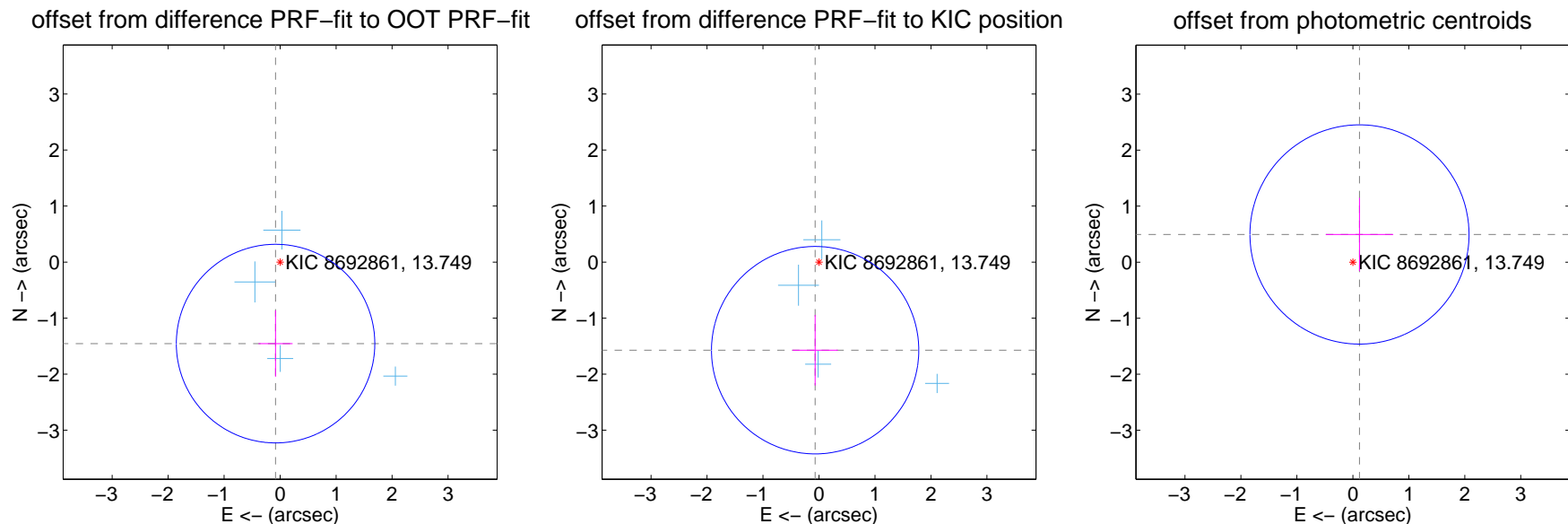
## DV Centroid Data

Supplemental centroid analysis for 008692861-02. Kepler magnitude: 13.75. Transit SNR 19.69

There are 4 quarters with good PRF difference image offsets

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

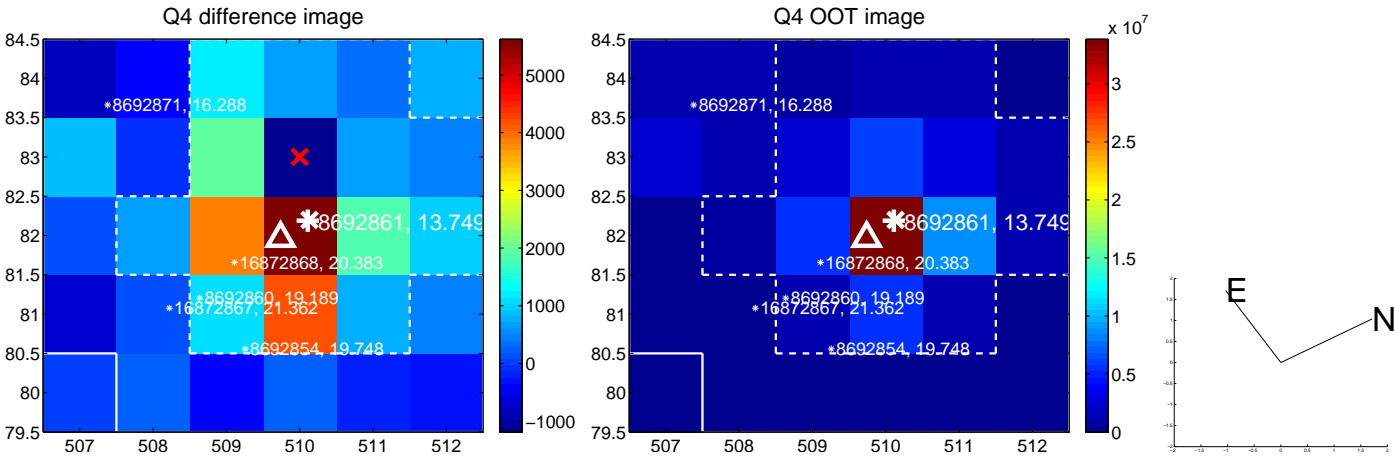
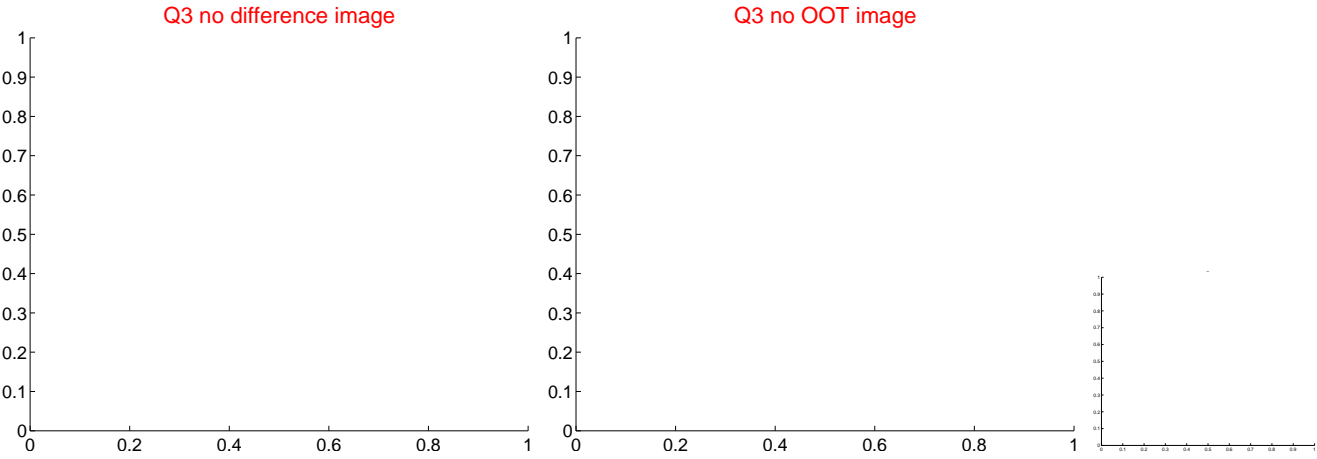
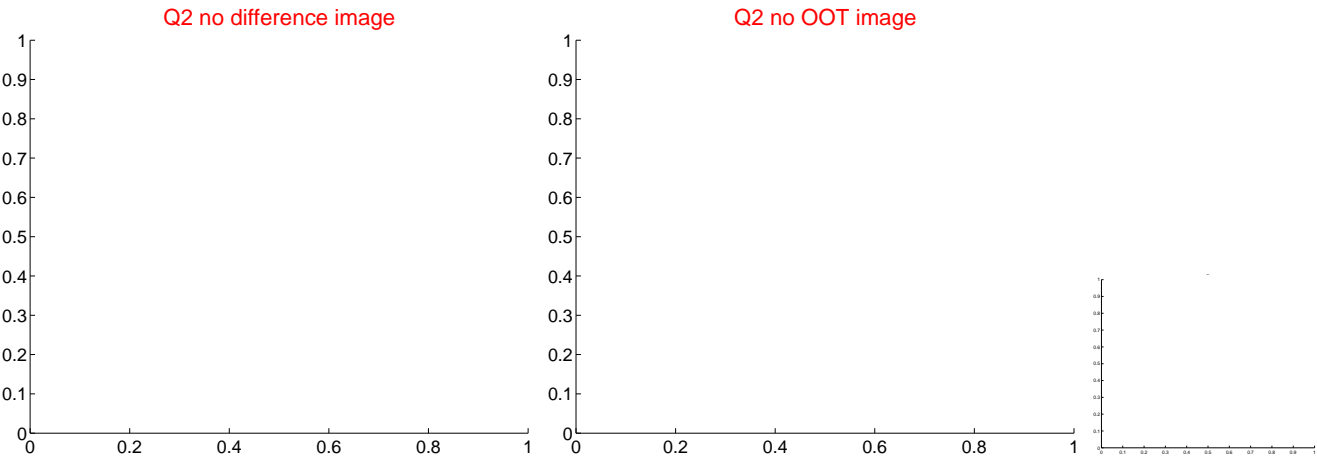
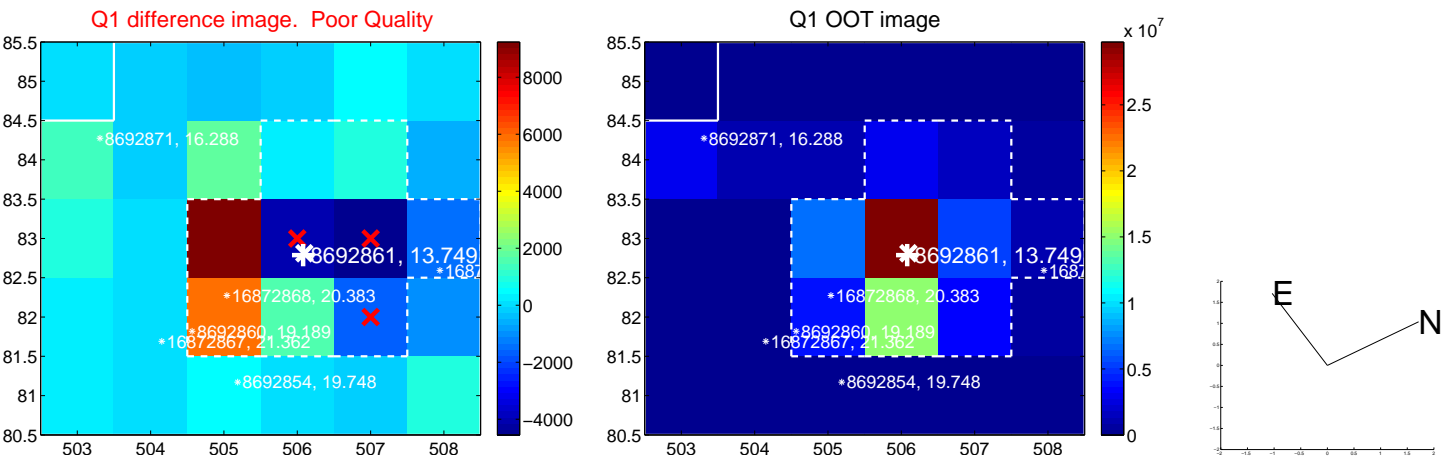
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.457 \pm 0.591$	2.47	$0.081 \pm 0.305$	$-1.455 \pm 0.591$
PRF-fit source offset from KIC position	$1.574 \pm 0.617$	2.55	$0.069 \pm 0.405$	$-1.572 \pm 0.629$
photometric centroid source offset	$0.51 \pm 0.65$	0.78	$-0.12 \pm 0.60$	$0.49 \pm 0.66$



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.

Q5 no difference image



Q5 no OOT image



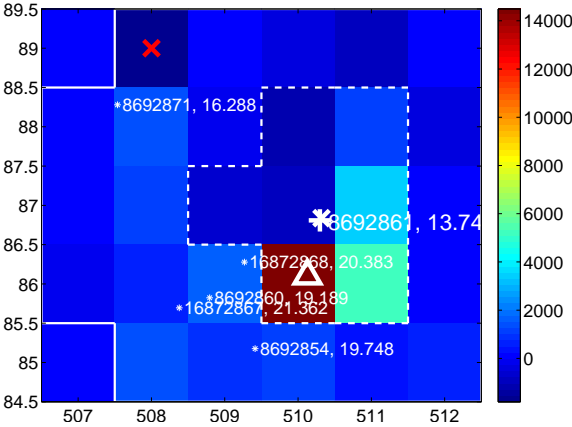
Q6 no difference image



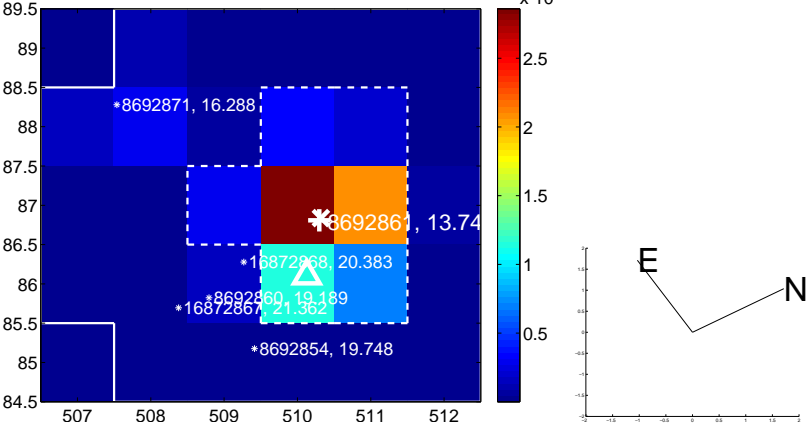
Q6 no OOT image



Q7 difference image



Q7 OOT image



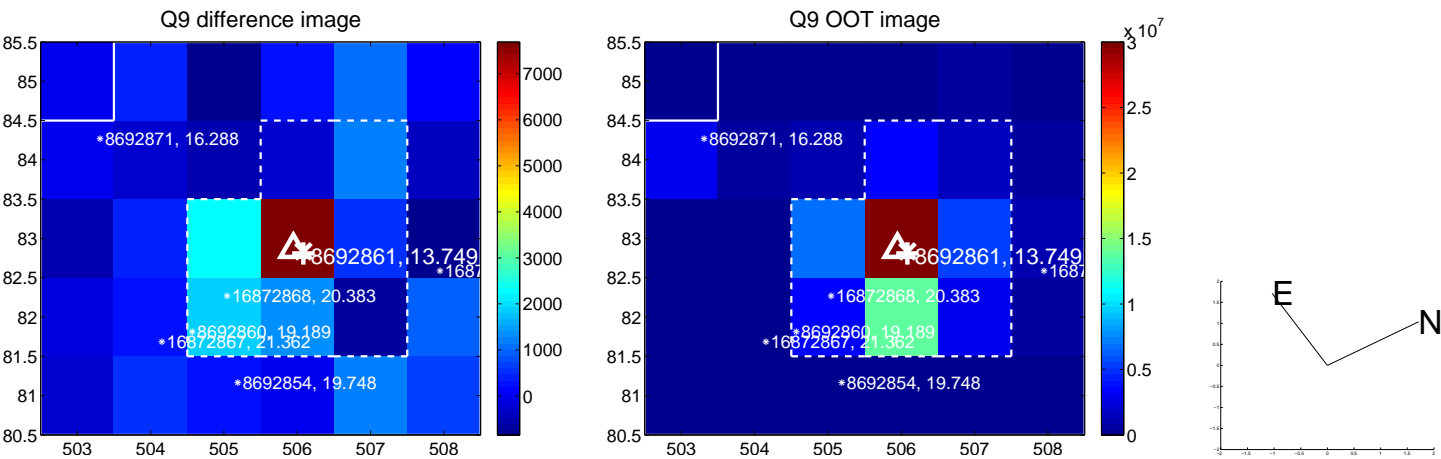
Q8 no difference image



Q8 no OOT image



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



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

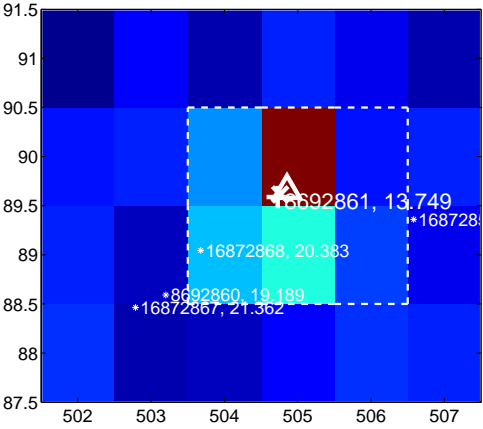
Q13 no difference image



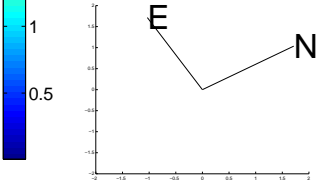
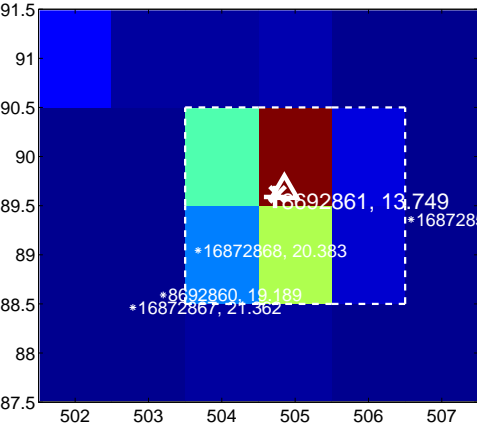
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



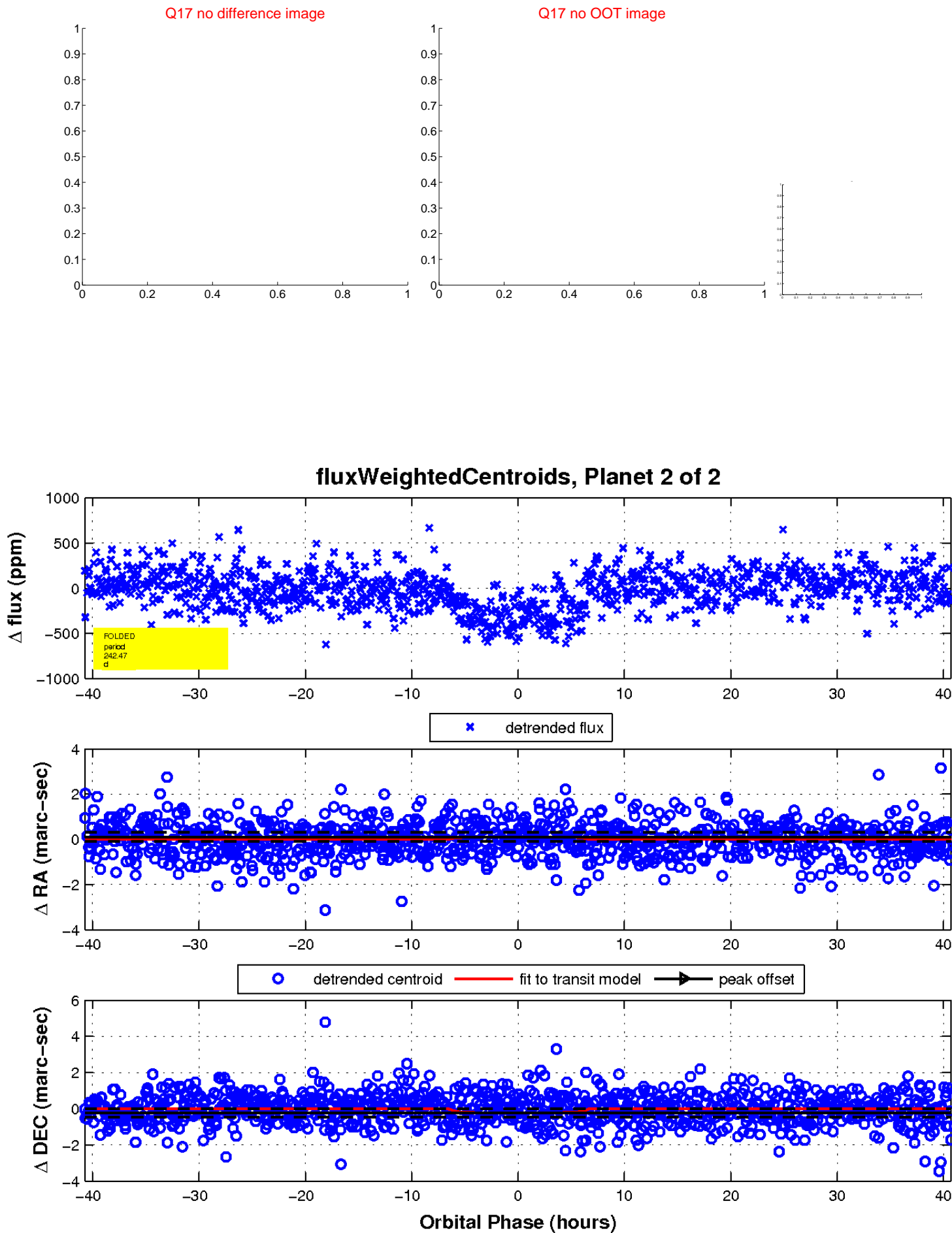
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

