

# KIC 009704384

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009704384-01 | OBS      | 1913.01 | 5.508600      | 132.297899   | 204.6       | 3.091            | 36.0 | 38.7 | 0.88                        | 5448            | 1.51                   | 180.20                 |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|------------|
| 009704384-01 | OBS      | PC   | 1.00  | 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.

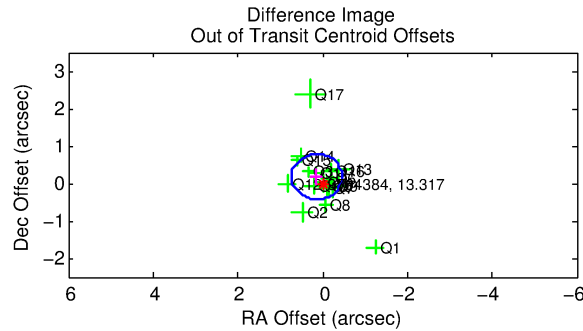
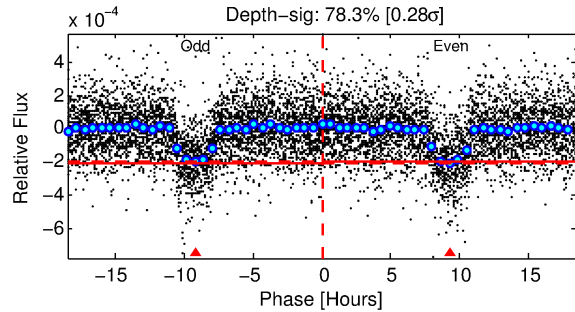
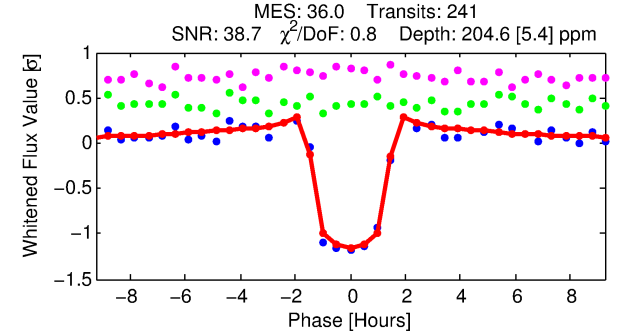
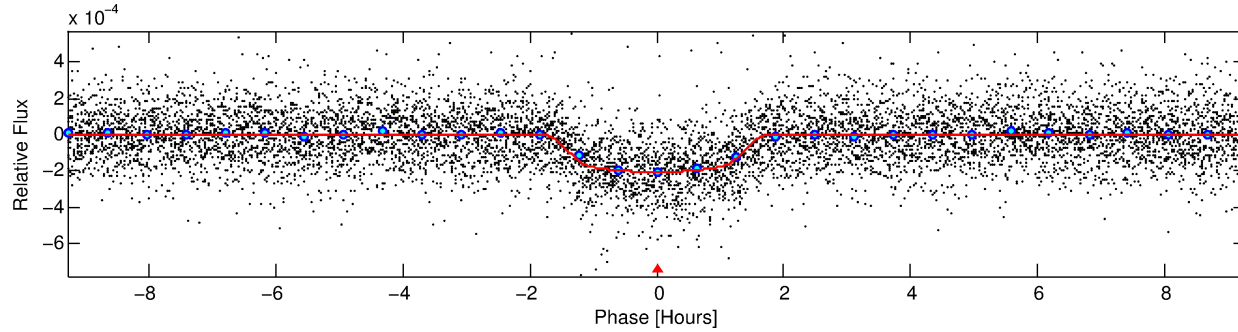
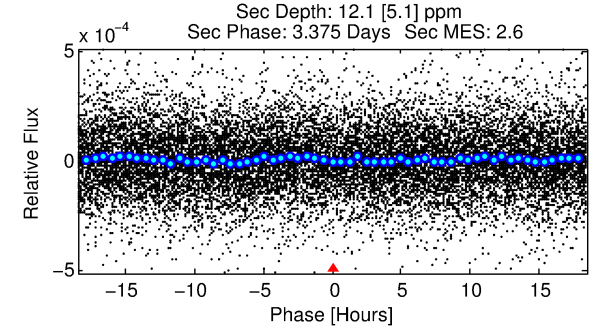
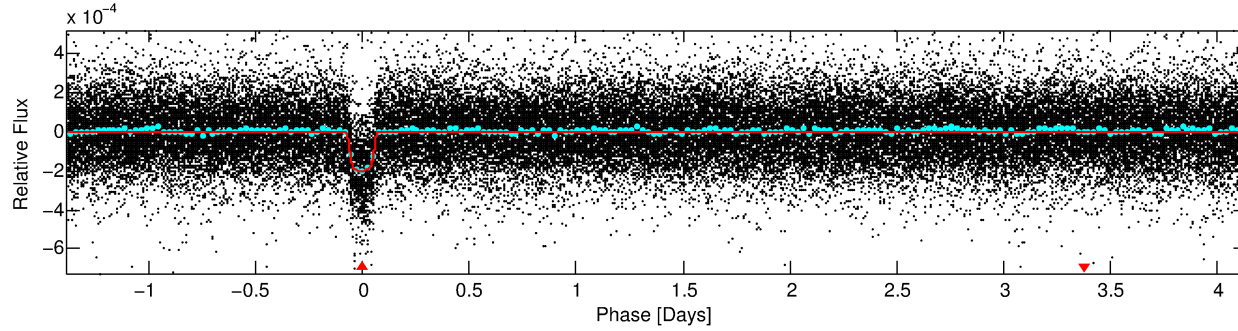
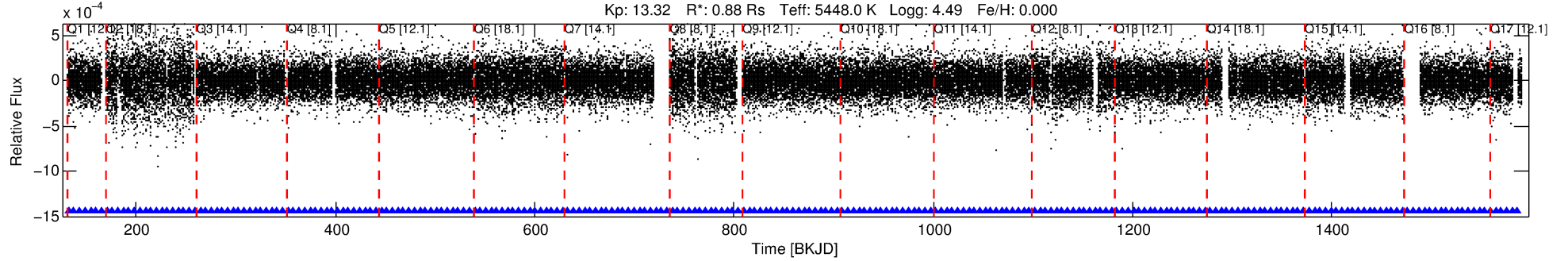
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009704384-01

No Significant Match Found

# DV One-Page Summary

KIC: 9704384 Candidate: 1 of 1 Period: 5.509 d  
KOI: K01913.01 Corr: 0.977



## DV Fit Results:

Period = 5.50860 [0.00001] d  
Epoch = 132.2979 [0.0012] BKJD  
Rp/R\* = 0.0157 [0.0020]  
a/R\* = 6.54 [3.49]  
b = 0.90 [0.12]  
Seff = 180.20 [30.08]  
Teq = 934 [39] K  
Rp = 1.51 [0.25] Re  
a = 0.0584 [0.0055] AU  
Ag = 9.89 [5.10] [1.74σ]  
Teffp = 2561 [321] K [5.03σ]

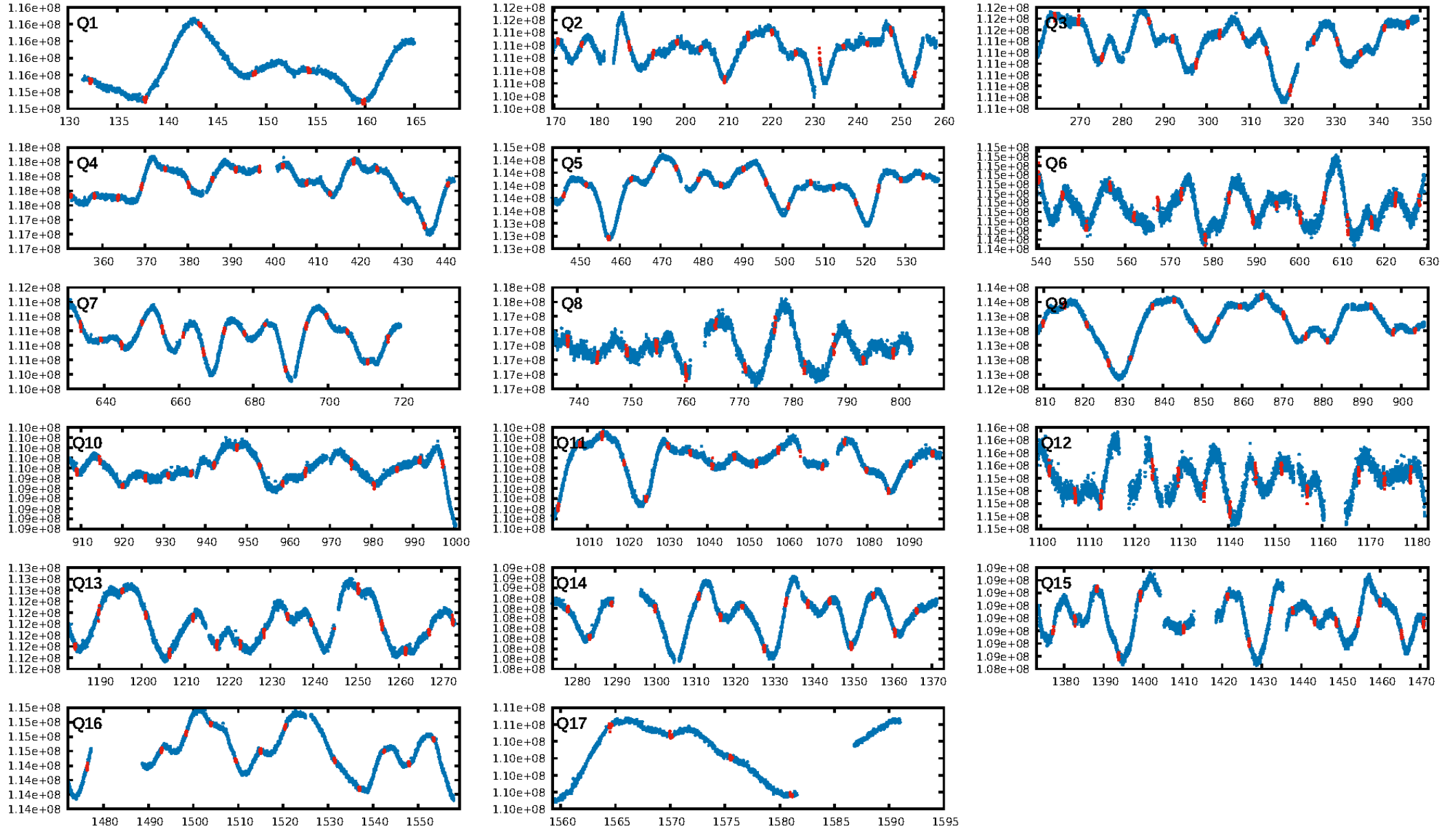
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.59e-267  
RollingBand-fgt: 1.00 [231/231]  
GhostDiagnostic-chr: 3.226  
Centroid-sig: 8.5%  
Centroid-so: 0.430 arcsec [1.73σ]  
OotOffset-rm: 0.224 arcsec [1.12σ]  
KicOffset-rm: 0.340 arcsec [1.58σ]  
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]

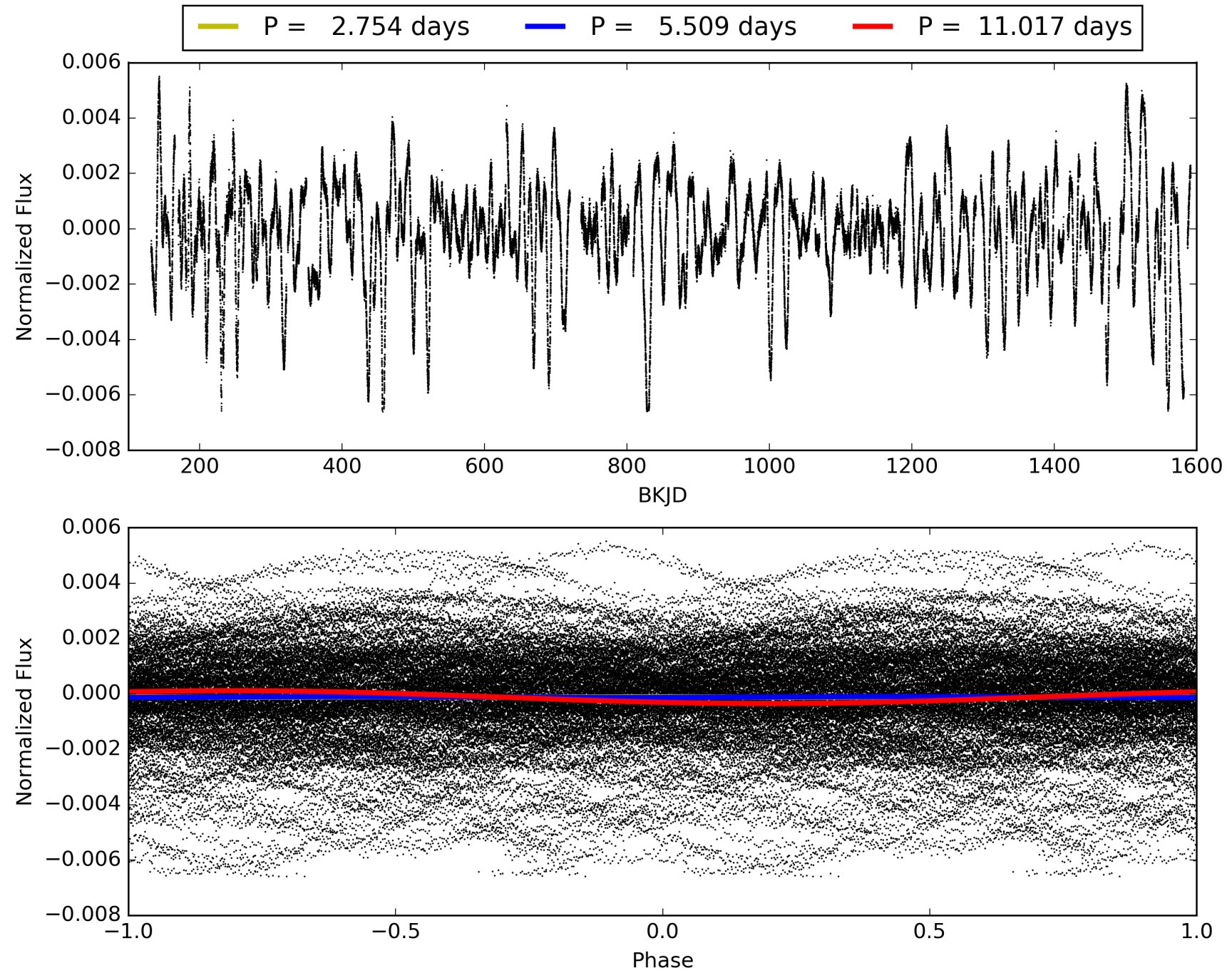
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:10:47 Z

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

# TCE 009704384-01, PDC Light Curves

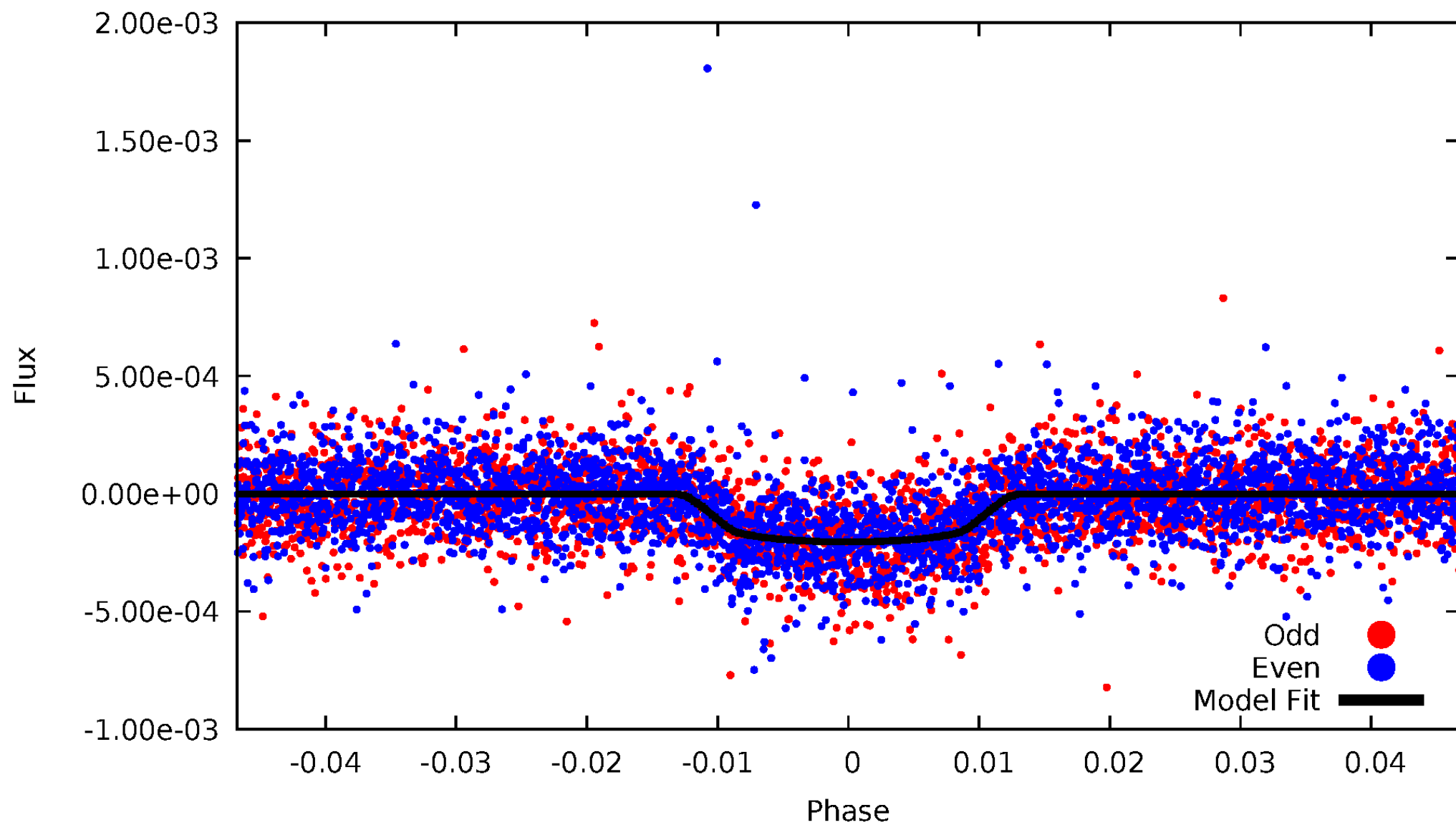


TCE 009704384-01



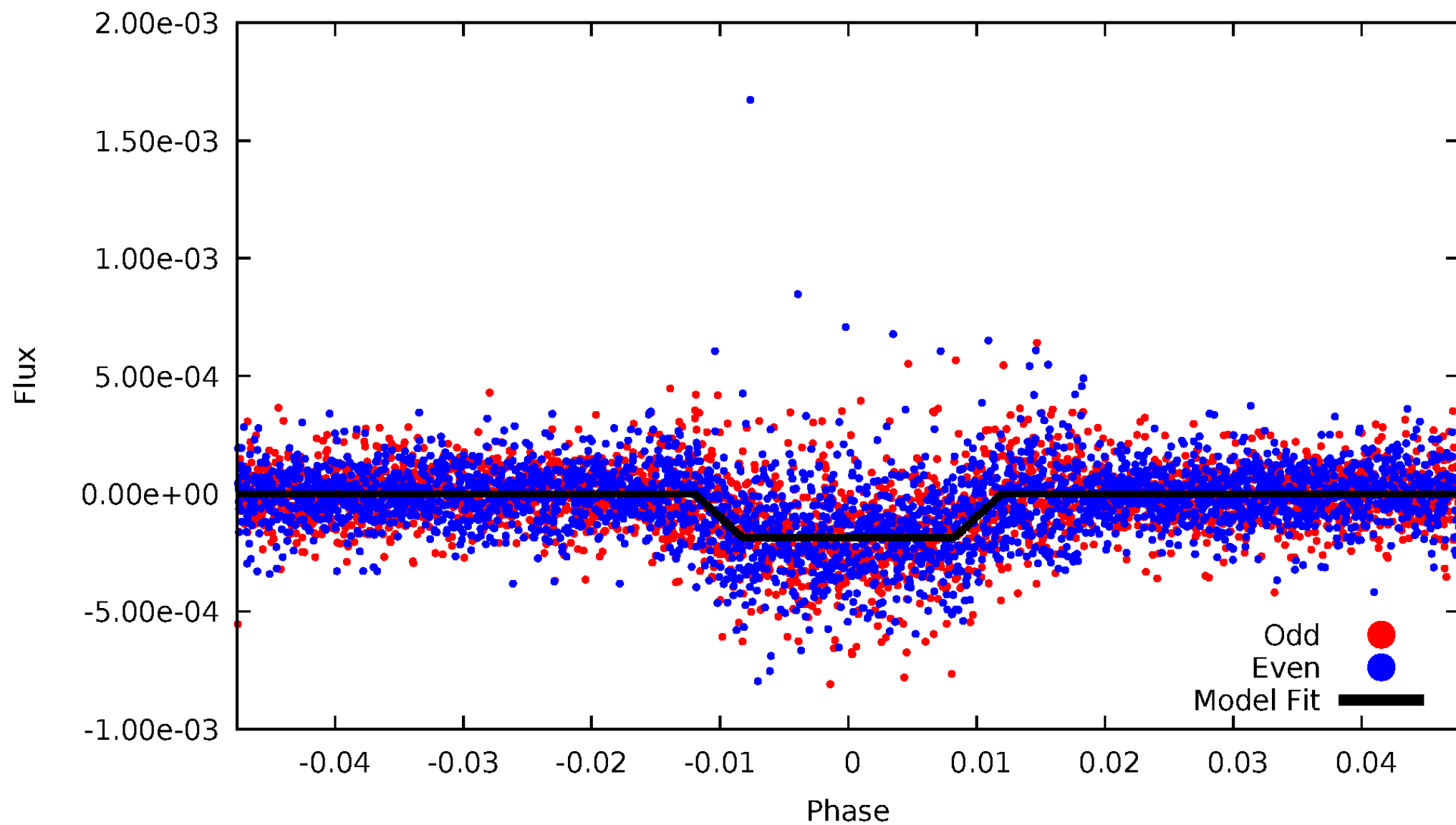
# DV Odd/Even

TCE 009704384-01



# ALT Odd/Even

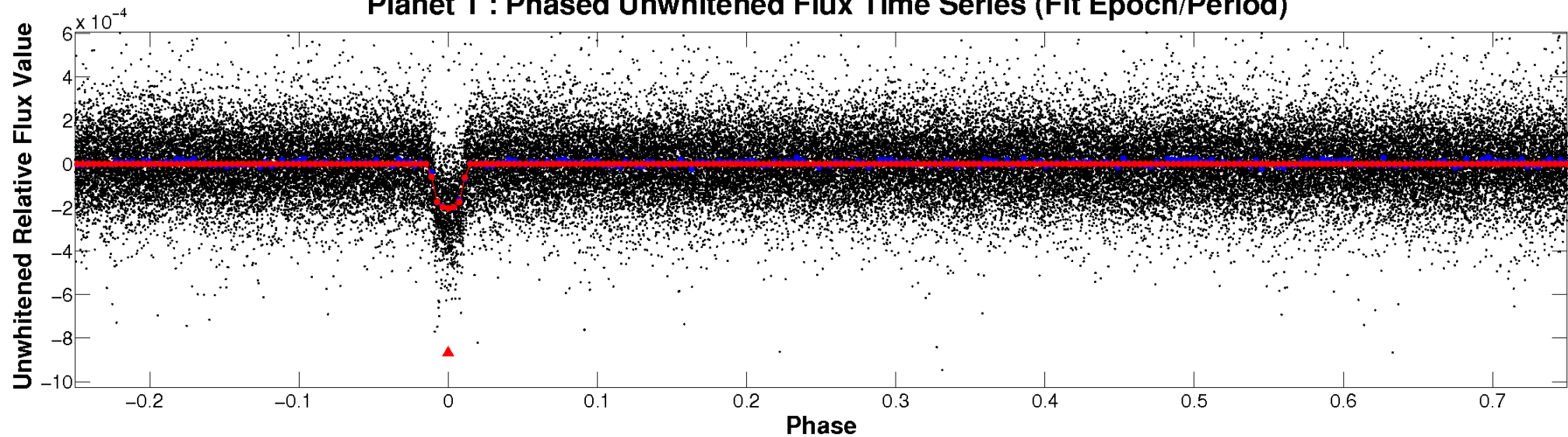
TCE 009704384-01



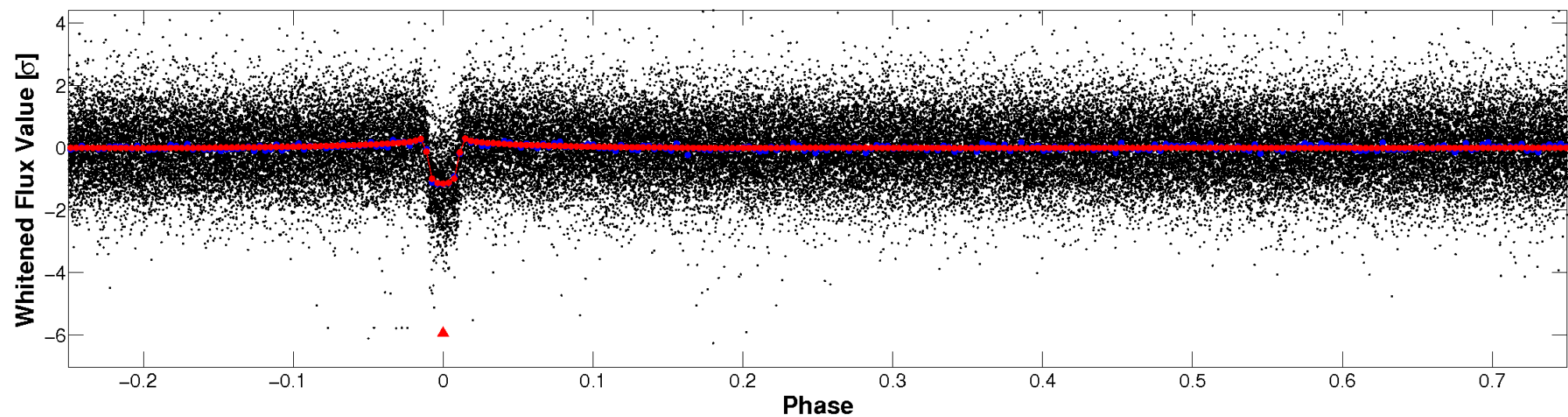


# Non-Whitened Vs. Whitened Light Curve

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

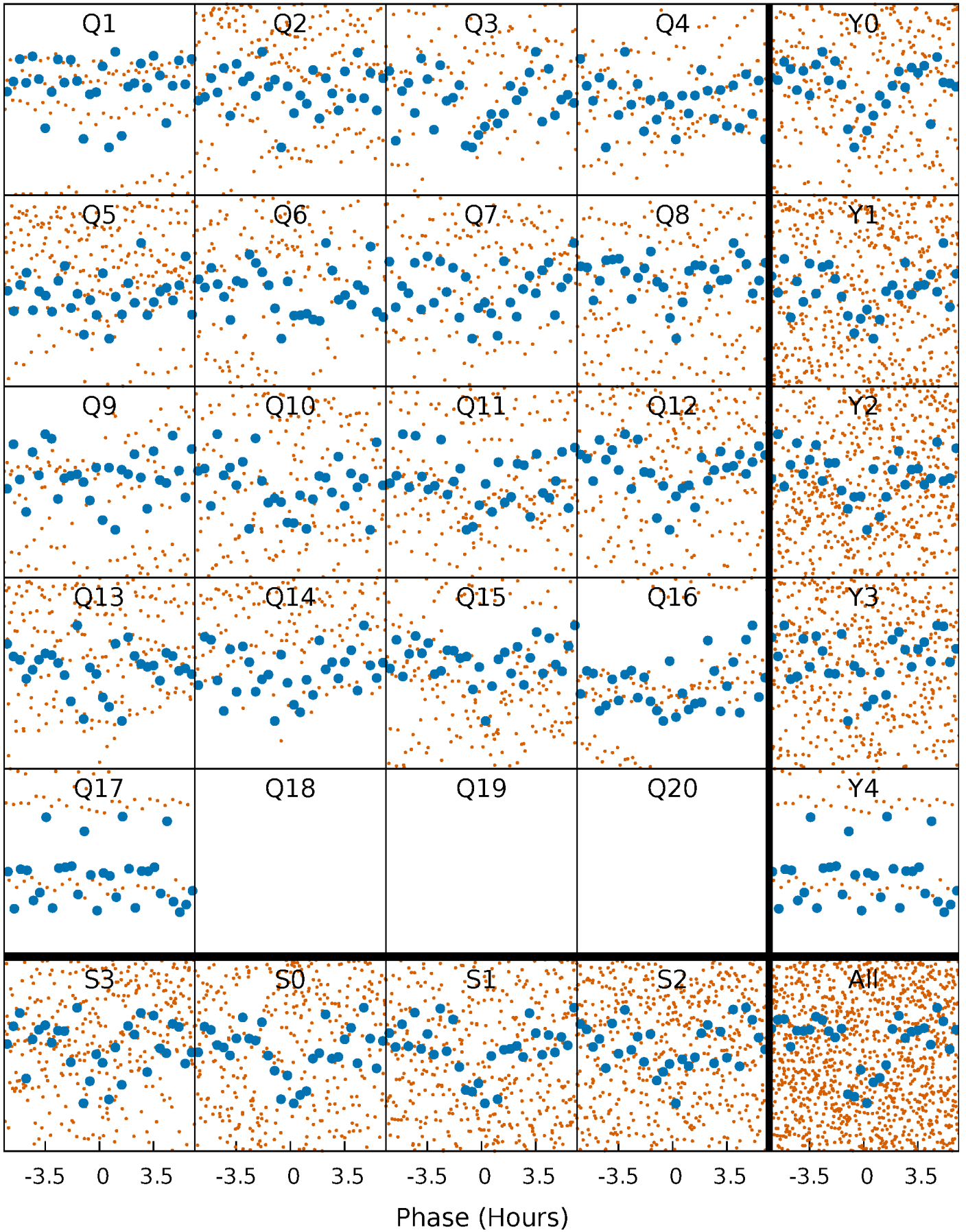


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

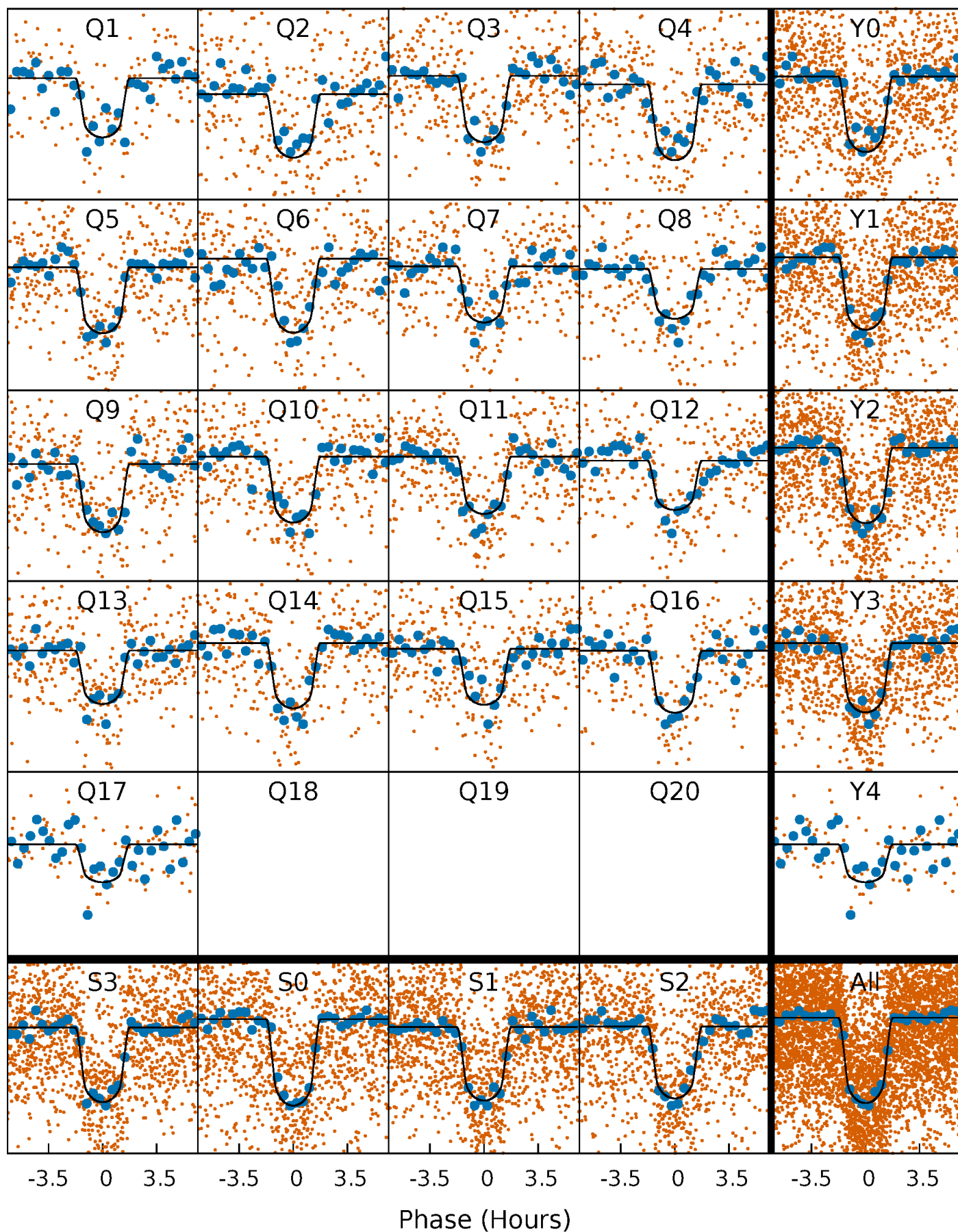
TCE 009704384-01   P= 5.508600 Days    $T_0=132.297899$  (BKJD)





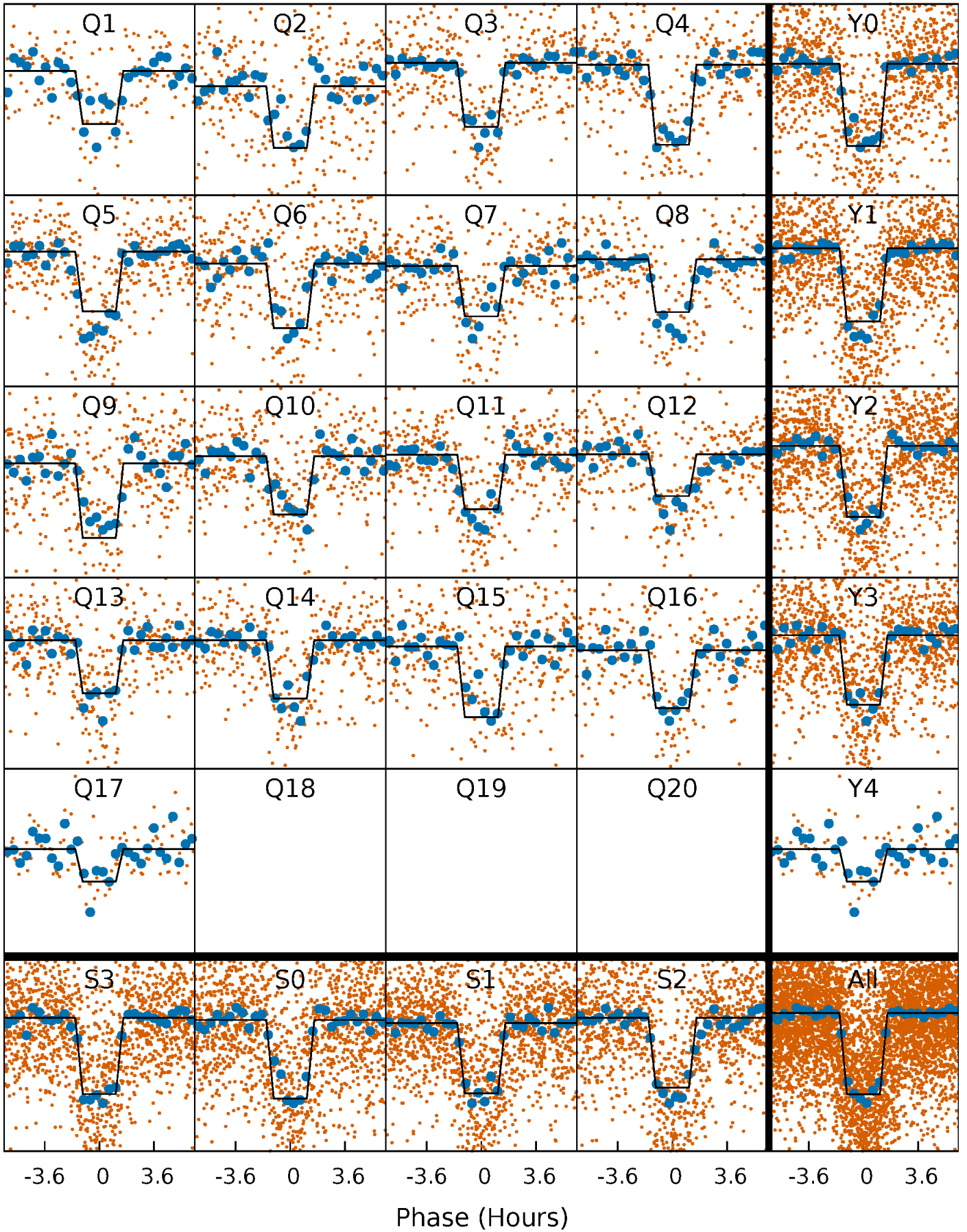
# DV Quarter-Phased Transit Curves

TCE 009704384-01 P= 5.508600 Days  $T_0=132.297899$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

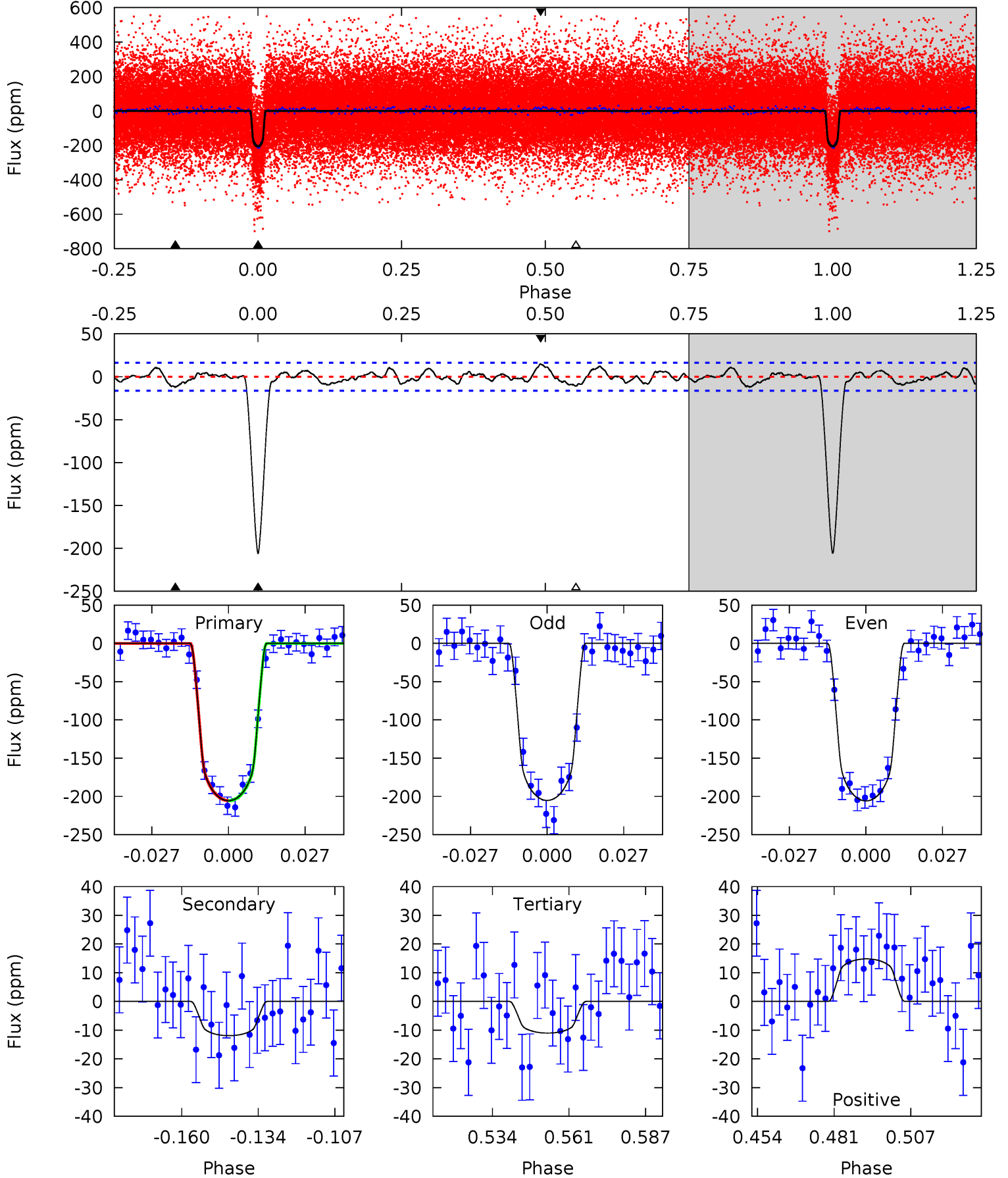
TCE 009704384-01 P= 5.508577 Days  $T_0=132.301492$  (BKJD)



# DV Model-Shift Uniqueness Test

009704384-01, P = 5.508600 Days, E = 126.789299 Days

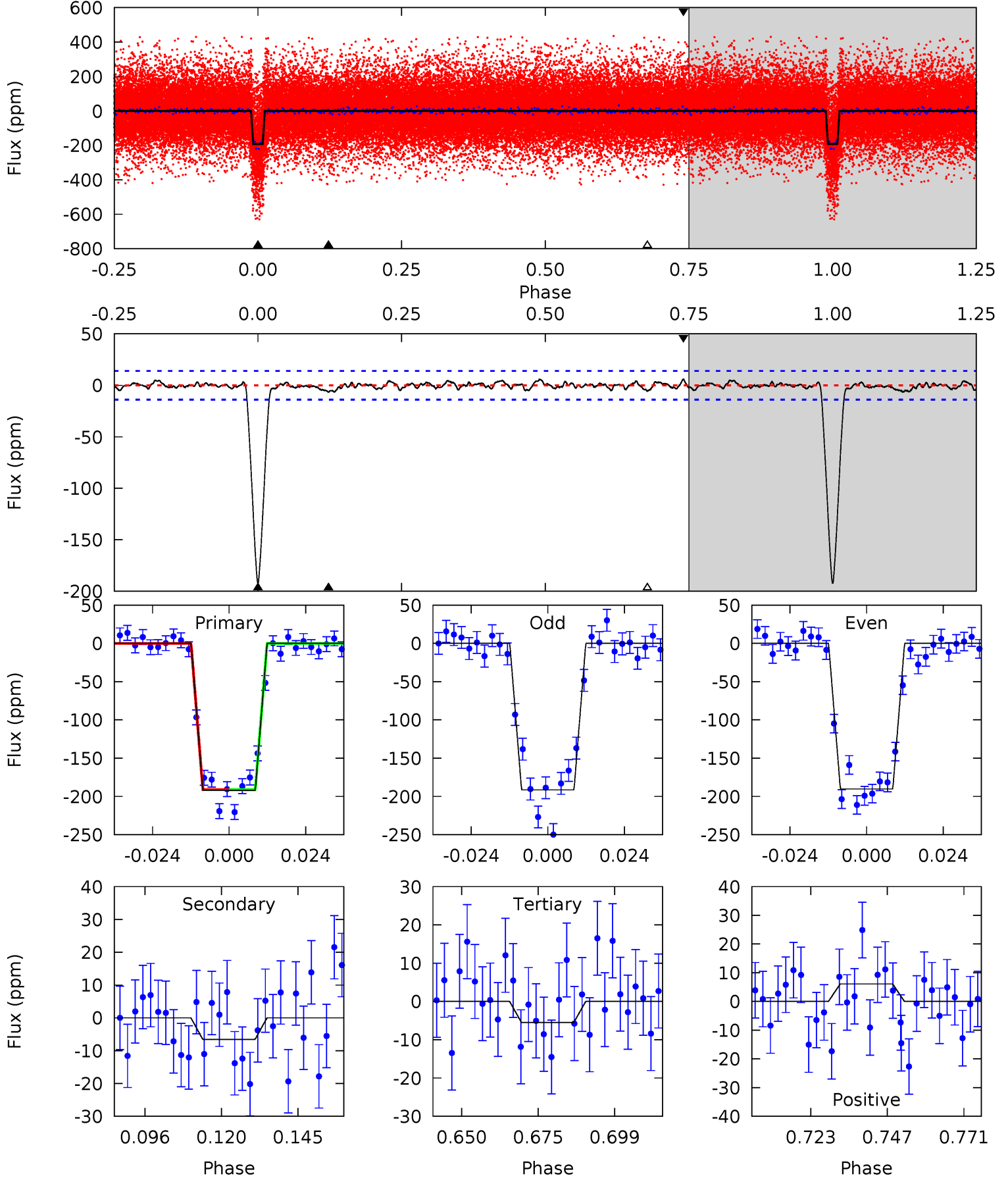
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 61.2 | 3.55 | 3.28 | 4.41 | 4.83            | 2.22            | 1.53             | 57.9    | 56.8    | 0.27    | -0.86   | 0.10    | 1.01 | 0.07  | 0.04 |



# Alt Model-Shift Uniqueness Test

009704384-01, P = 5.508577 Days, E = 126.792915 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 67.0 | 2.28 | 1.91 | 2.13 | 4.85            | 2.26            | 0.75             | 65.1    | 64.8    | 0.36    | 0.15    | 0.21    | 0.92 | 0.03  | 0.02 |



### Stellar Parameters For KIC 009704384

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $5448^{+109}_{-109}$ | $4.489^{+0.063}_{-0.084}$ | $0.000^{+0.150}_{-0.150}$ | $0.883^{+0.092}_{-0.067}$ | $0.877^{+0.055}_{-0.050}$ | $1.792^{+0.435}_{-0.451}$                 |
|        | +2%/-2%              | +1%/-2%                   | +inf%/-inf%               | +10%/-8%                  | +6%/-6%                   | +24%/-25%                                 |
| Source | SPE57                | SPE57                     | SPE57                     | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 009704384-01 / KOI 1913.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$          |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-12 \pm 3$ | $1.50^{+0.22}_{-0.19}$ | $1309^{+44}_{-39}$   | $3136^{+204}_{-179}$ | $9.747^{+4.925}_{-3.330}$ |
| Alt.    | $-7 \pm 3$  | $1.32^{+0.21}_{-0.20}$ | $1309^{+43}_{-40}$   | $2981^{+238}_{-268}$ | $6.647^{+4.835}_{-3.201}$ |

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



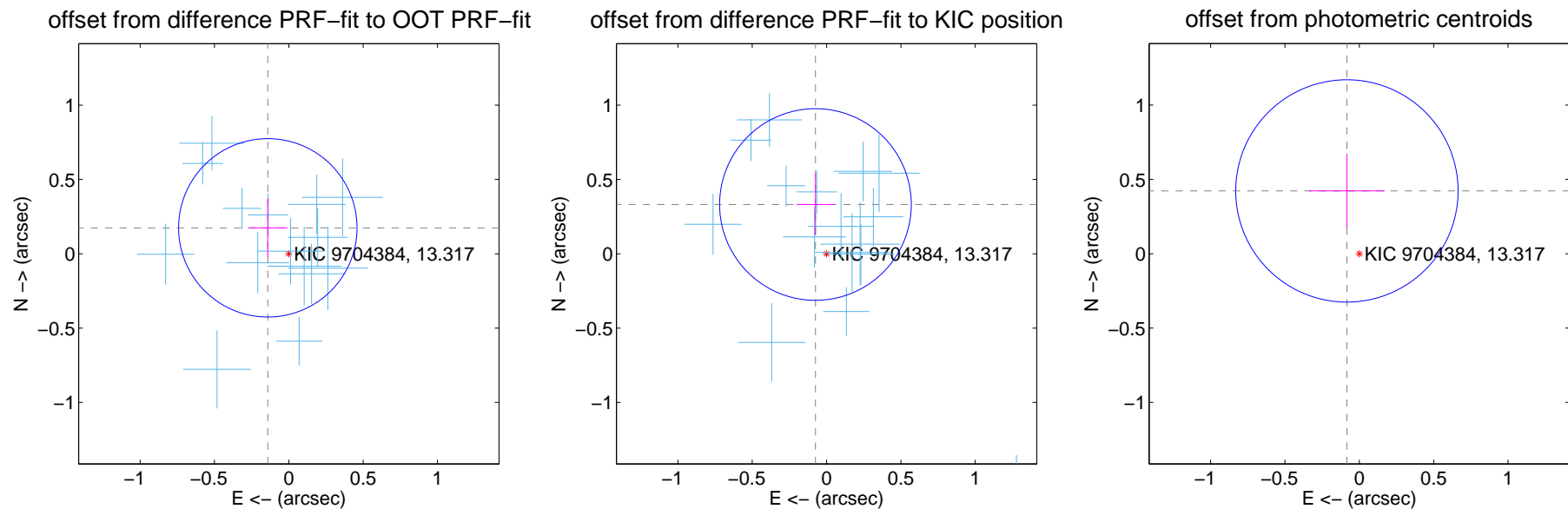
## DV Centroid Data

Supplemental centroid analysis for 009704384-01. Kepler magnitude: 13.32. Transit SNR 38.69

There are 17 quarters with good PRF difference image offsets

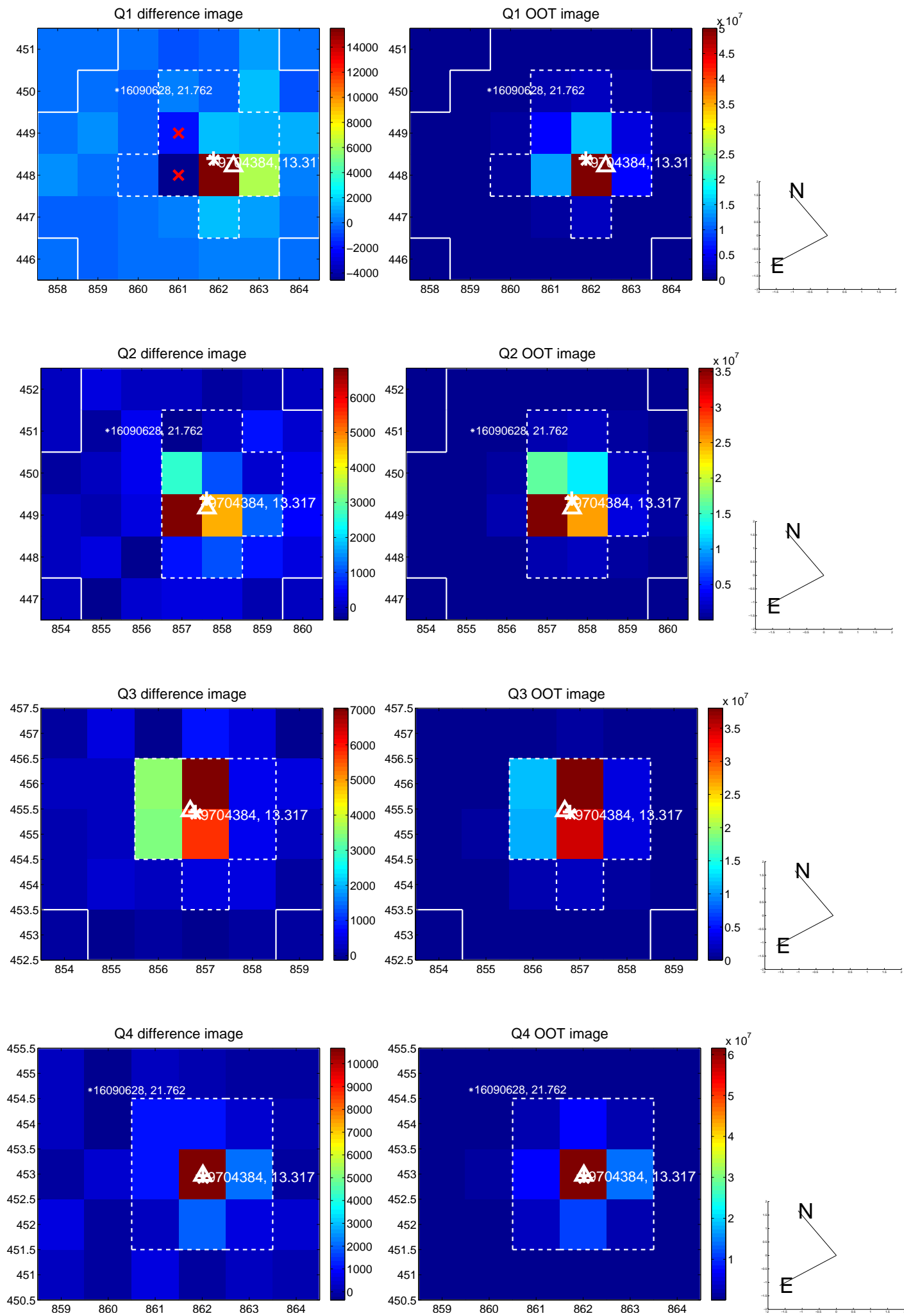
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.224 \pm 0.200$  | 1.12                | $0.141 \pm 0.132$ | $0.174 \pm 0.198$ |
| PRF-fit source offset from KIC position | $0.340 \pm 0.215$  | 1.58                | $0.075 \pm 0.127$ | $0.331 \pm 0.207$ |
| photometric centroid source offset      | $0.43 \pm 0.25$    | 1.73                | $0.08 \pm 0.25$   | $0.42 \pm 0.25$   |

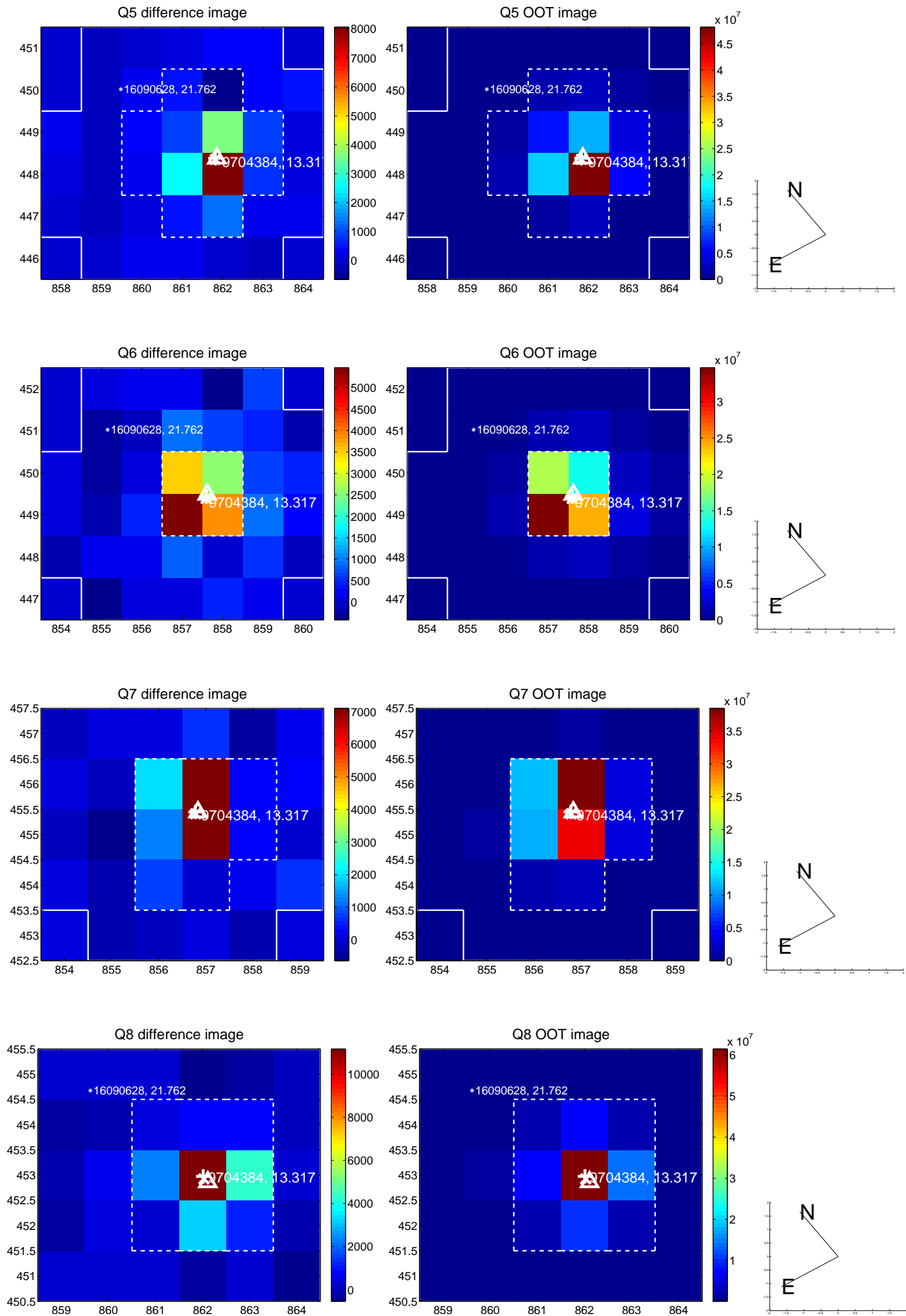


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

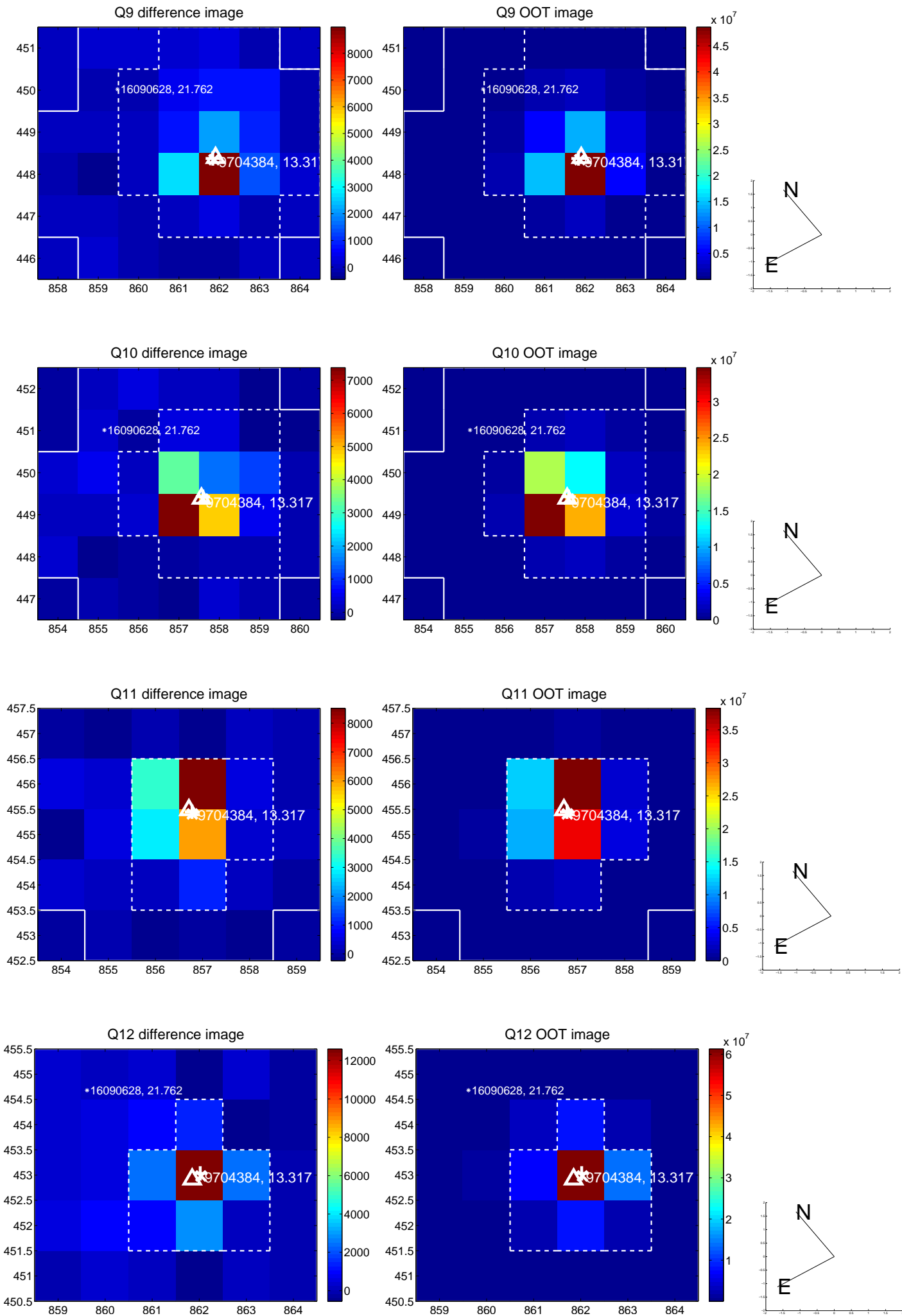
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



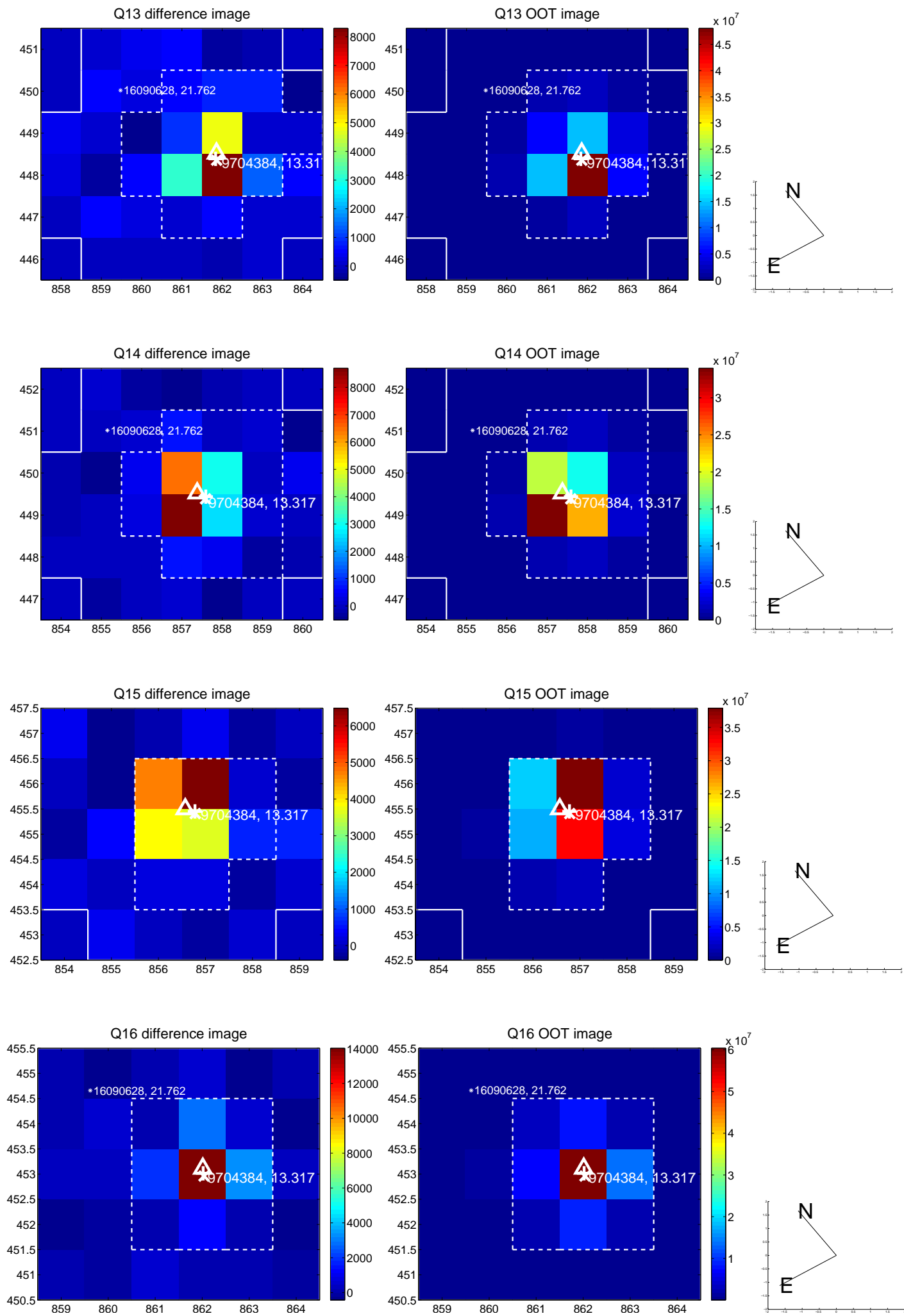
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

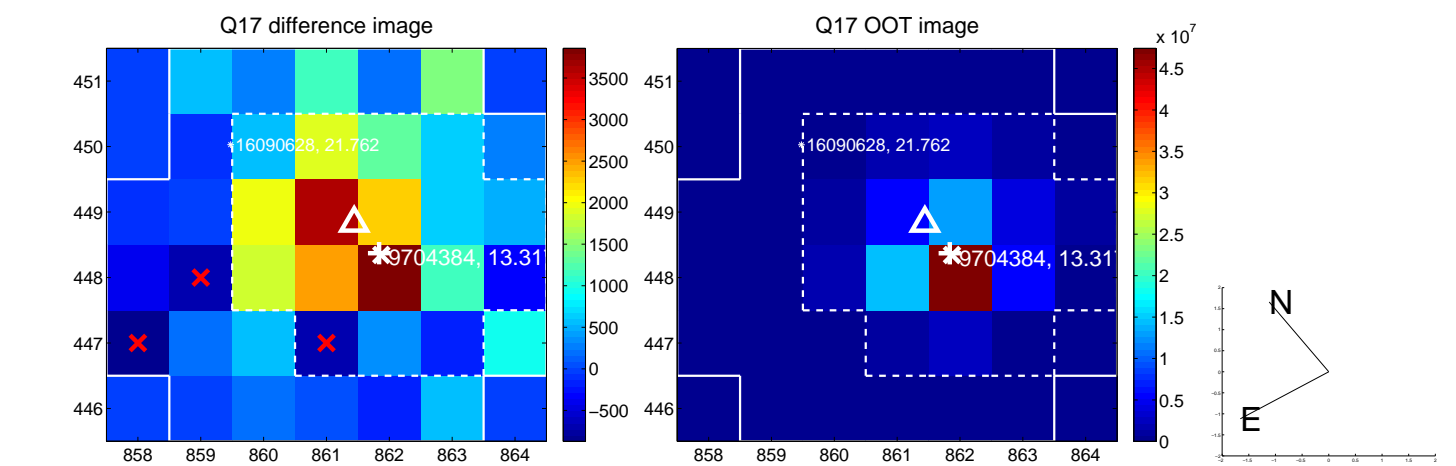


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

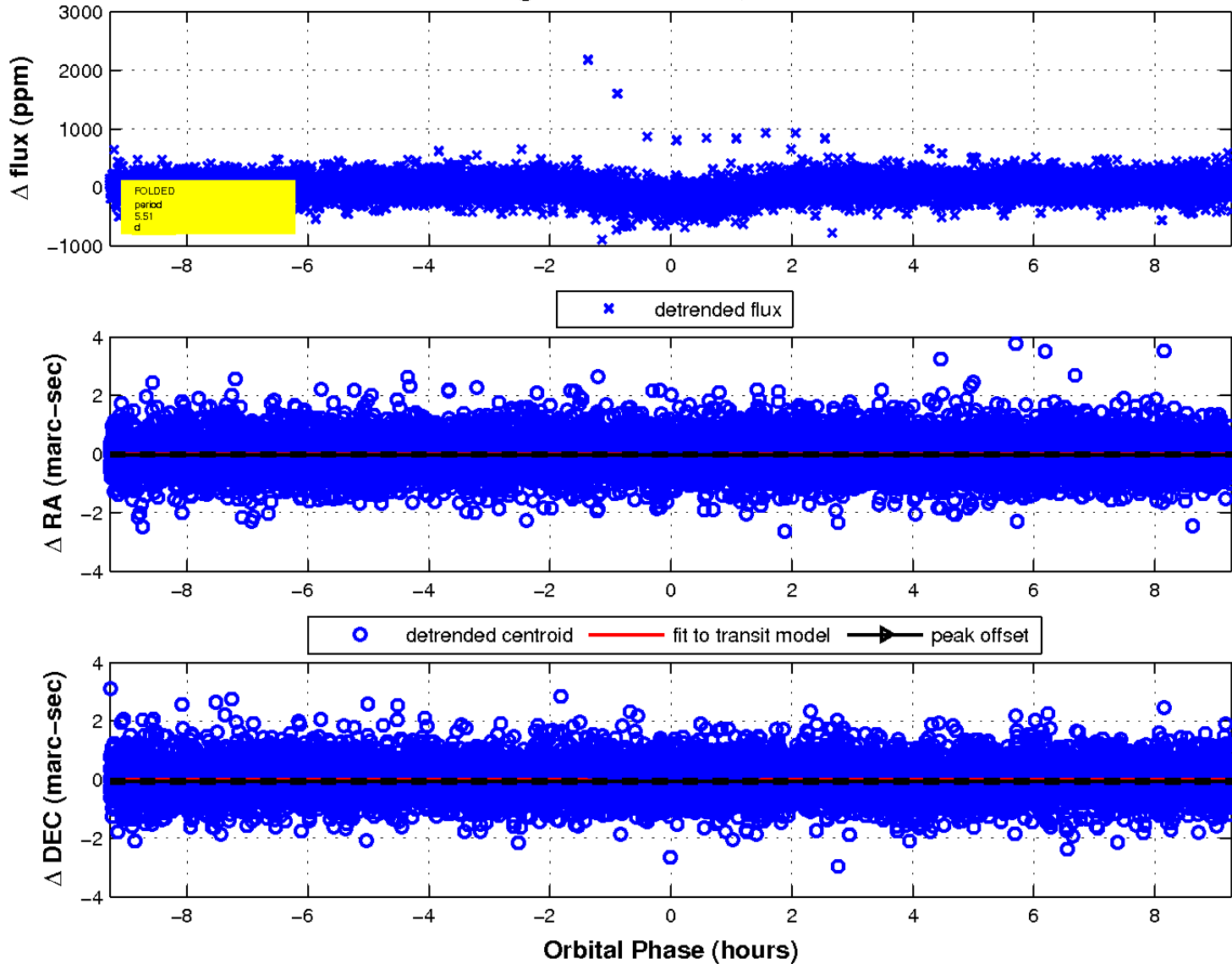




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

