

# KIC 004814502

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004814502-01 | OBS      | 4004.01 | 4.943294      | 135.577081   | 127.6       | 2.793            | 18.5 | 20.0 | 1.01                        | 5661            | 1.36                   | 297.00                 |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|------------|
| 004814502-01 | 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.

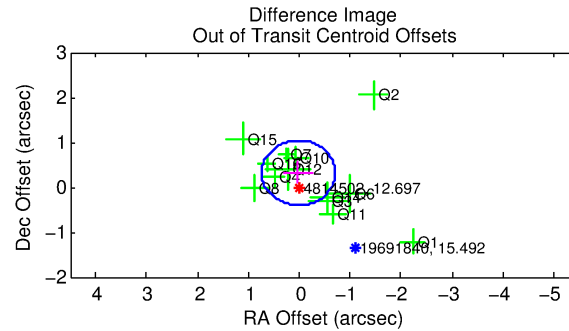
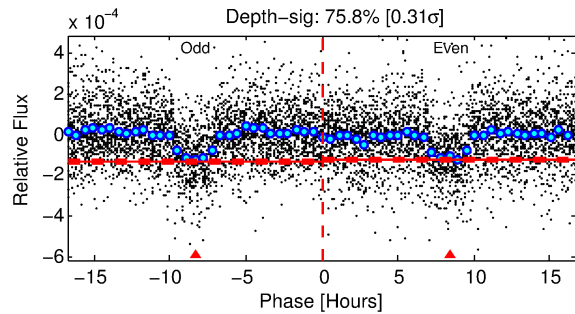
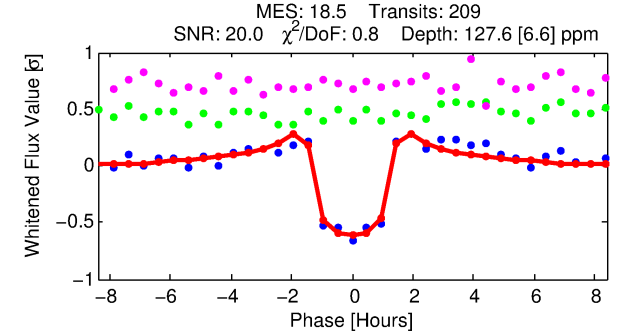
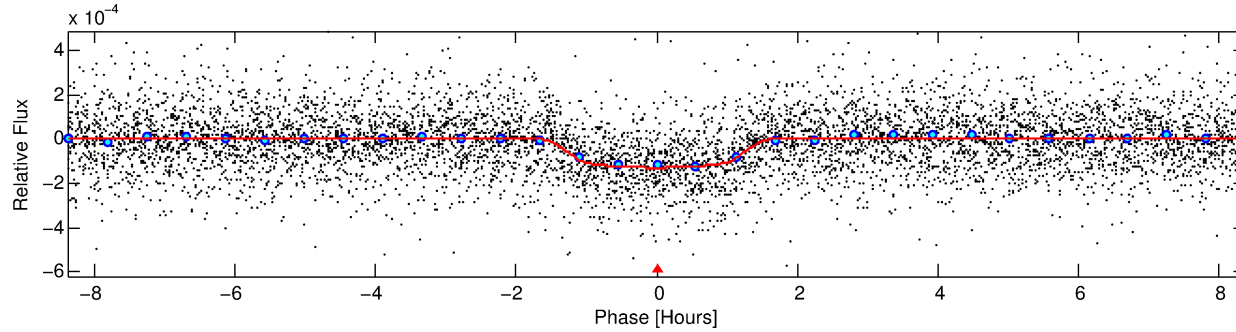
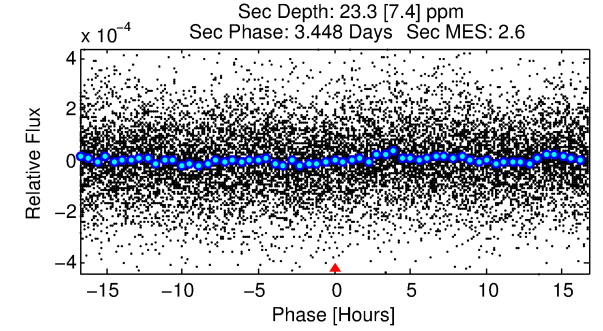
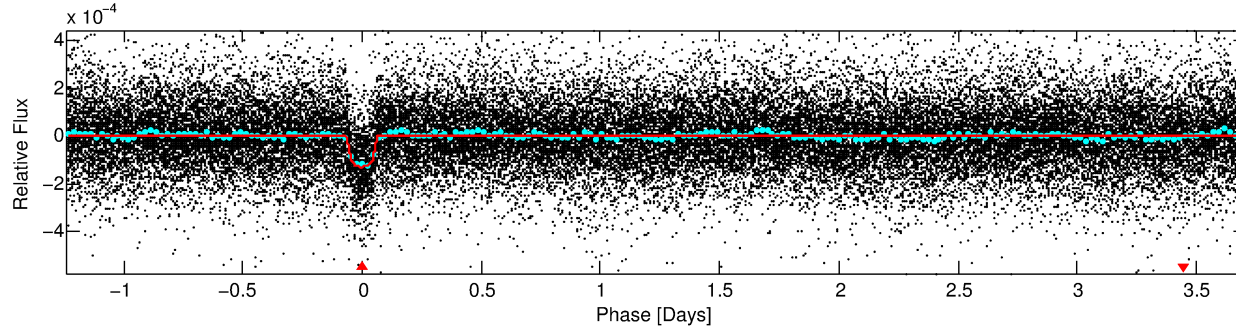
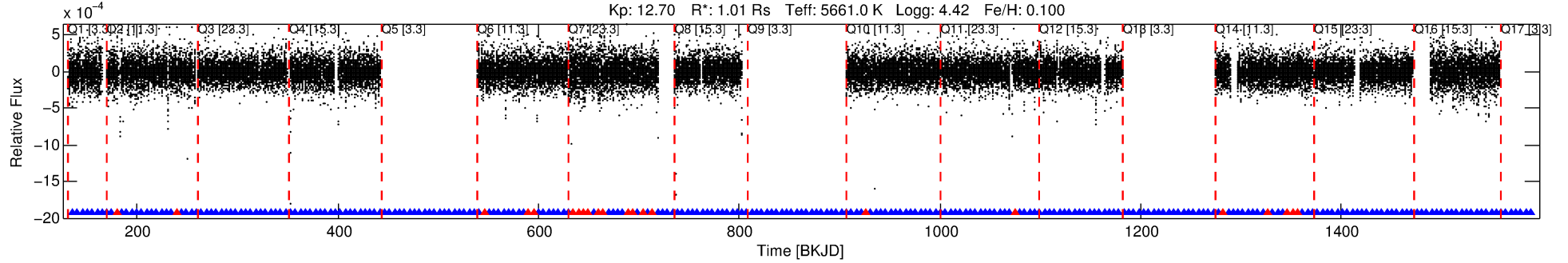
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004814502-01

No Significant Match Found

# DV One-Page Summary

KIC: 4814502 Candidate: 1 of 1 Period: 4.943 d  
KOI: K04004.01 Corr: 0.985



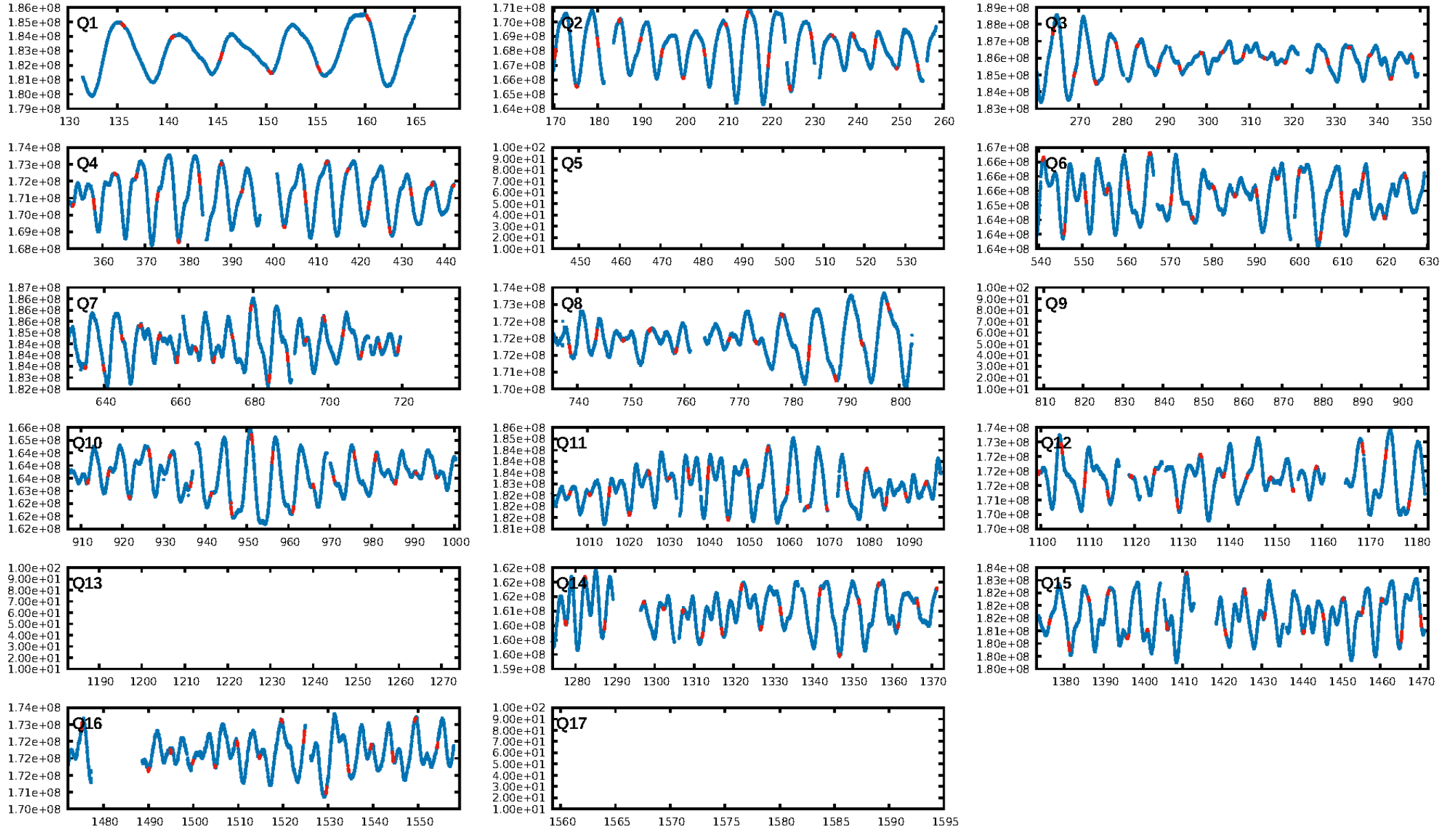
## DV Fit Results:

Period = 4.94329 [0.00001] d  
Epoch = 135.5771 [0.0016] BKJD  
Rp/R\* = 0.0124 [0.0027]  
a/R\* = 6.32 [6.08]  
b = 0.90 [0.21]  
Seff = 297.00 [61.47]  
Teq = 1059 [55] K  
Rp = 1.36 [0.35] Re  
a = 0.0561 [0.0072] AU  
Ag = 21.80 [12.44] [1.67σ]  
Teffp = 3536 [476] K [5.17σ]

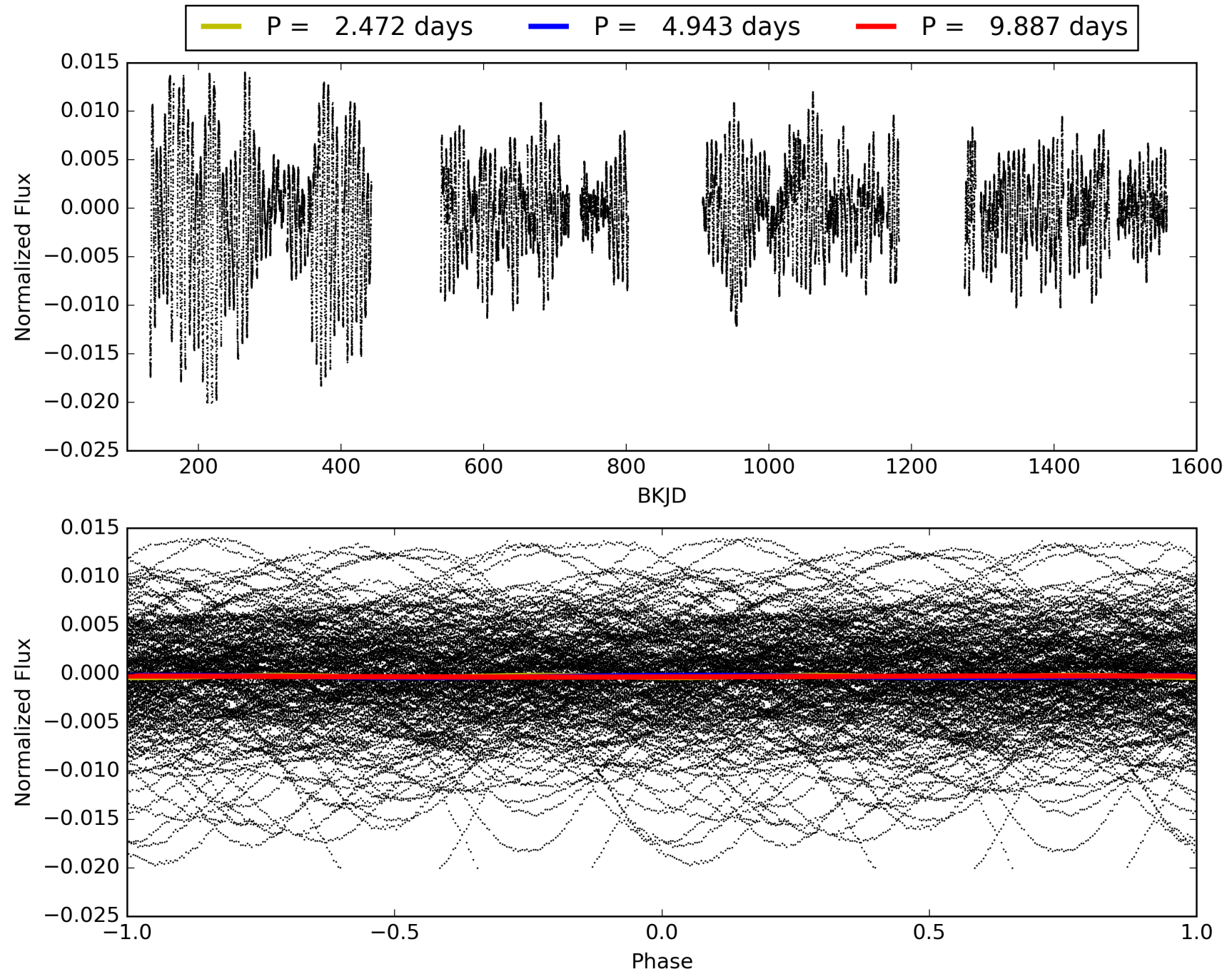
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.31e-72  
RollingBand-fgt: 0.89 [181/203]  
GhostDiagnostic-chr: 1.135  
Centroid-sig: 73.2%  
Centroid-so: 0.287 arcsec [0.57σ]  
OotOffset-rm: 0.319 arcsec [1.32σ]  
KicOffset-rm: 0.401 arcsec [1.79σ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

# TCE 004814502-01, PDC Light Curves

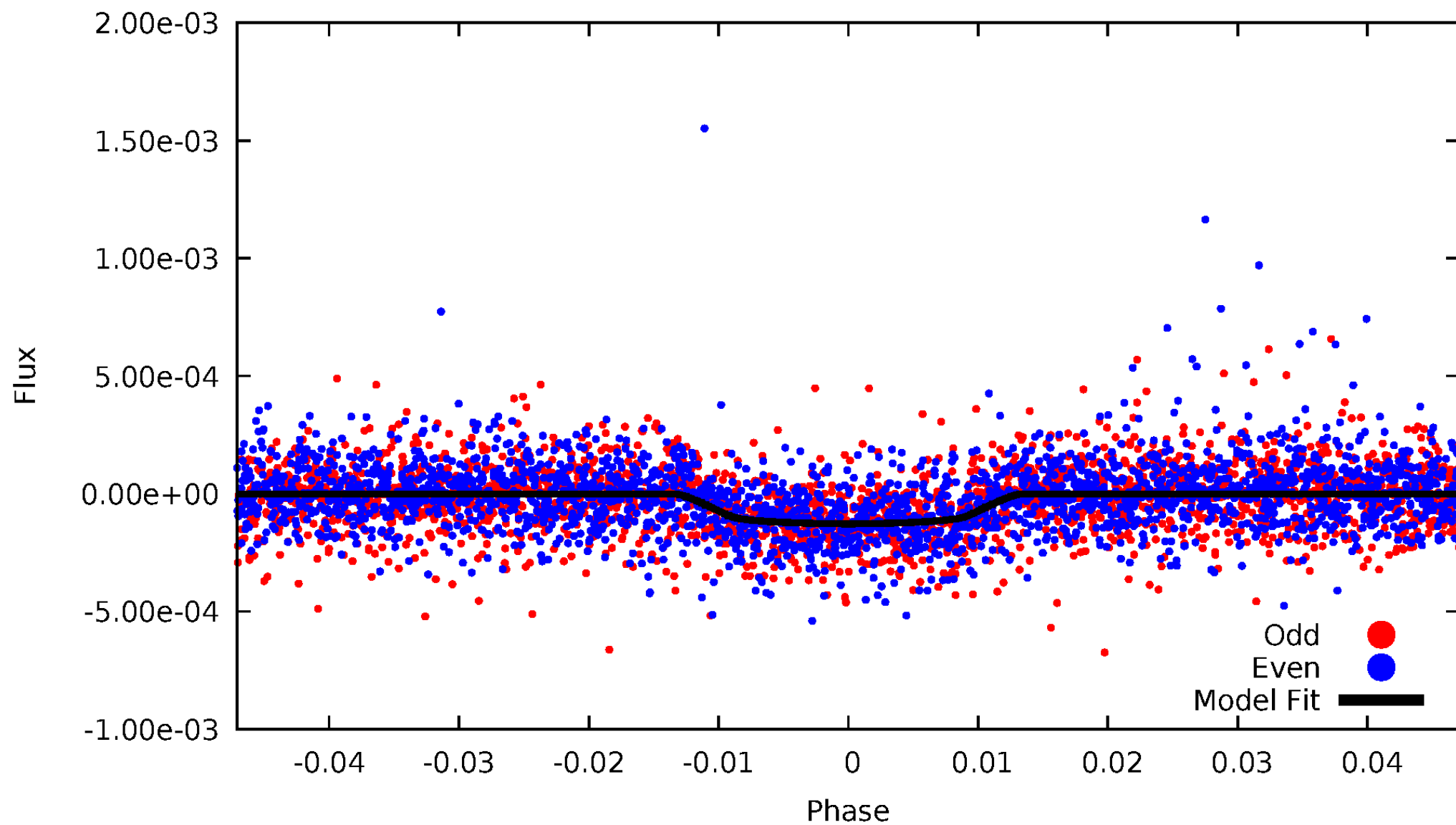


TCE 004814502-01



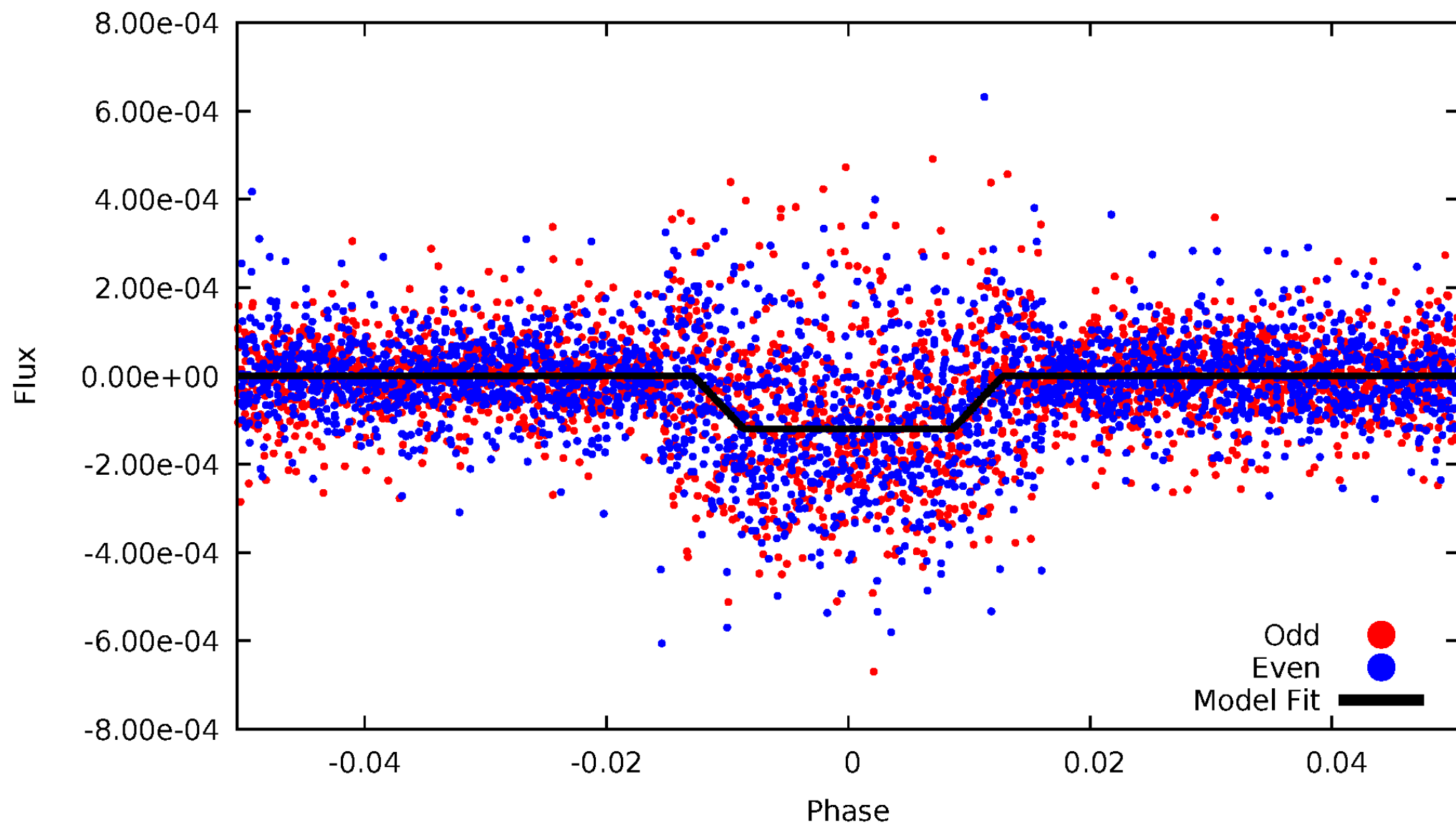
# DV Odd/Even

TCE 004814502-01



# ALT Odd/Even

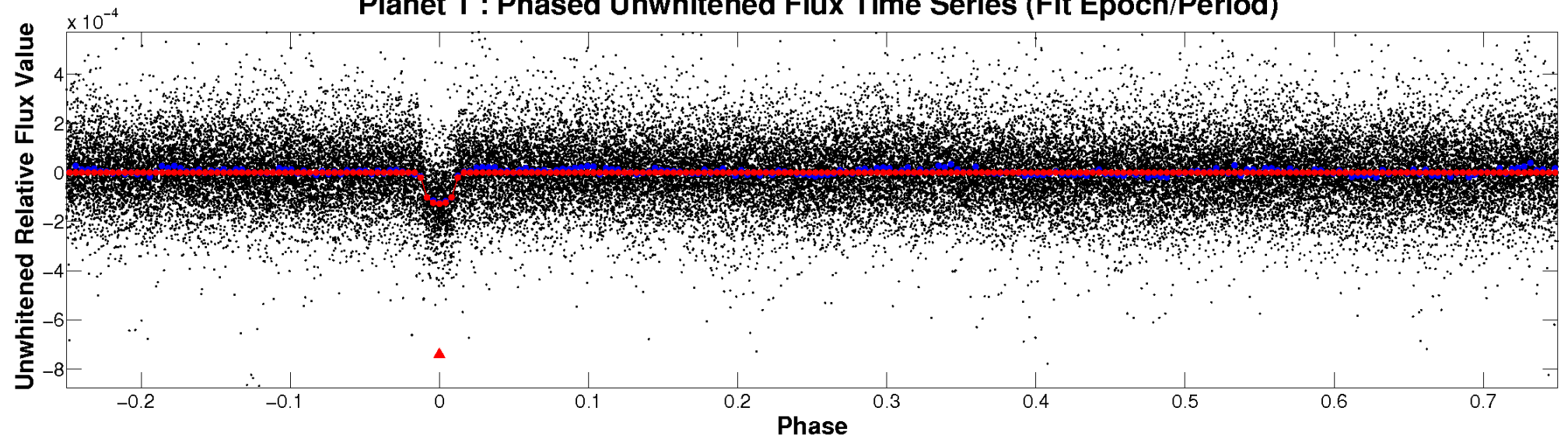
TCE 004814502-01



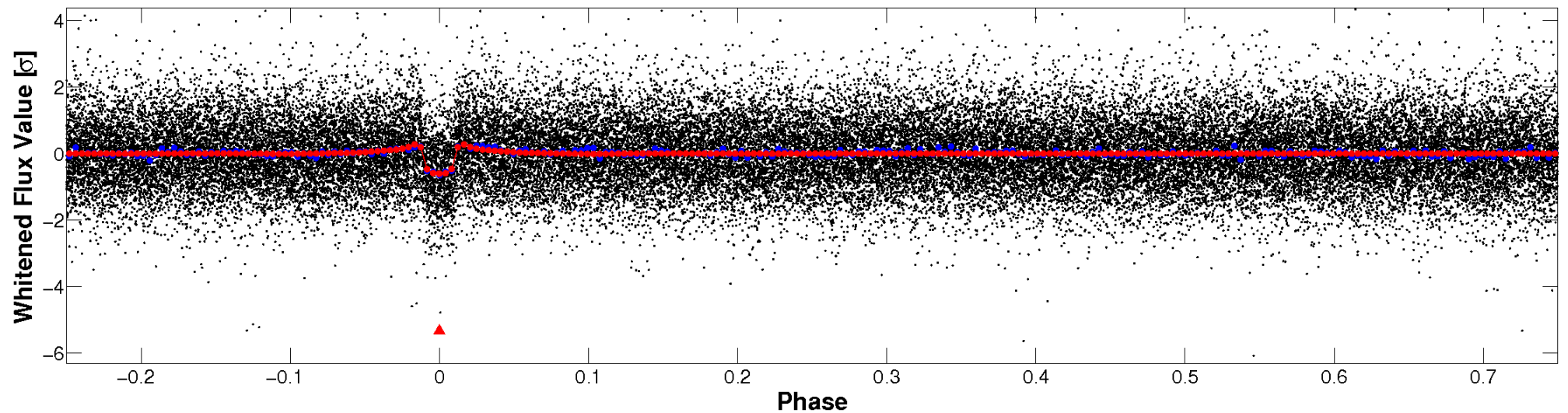


# Non-Whitened Vs. Whitened Light Curve

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

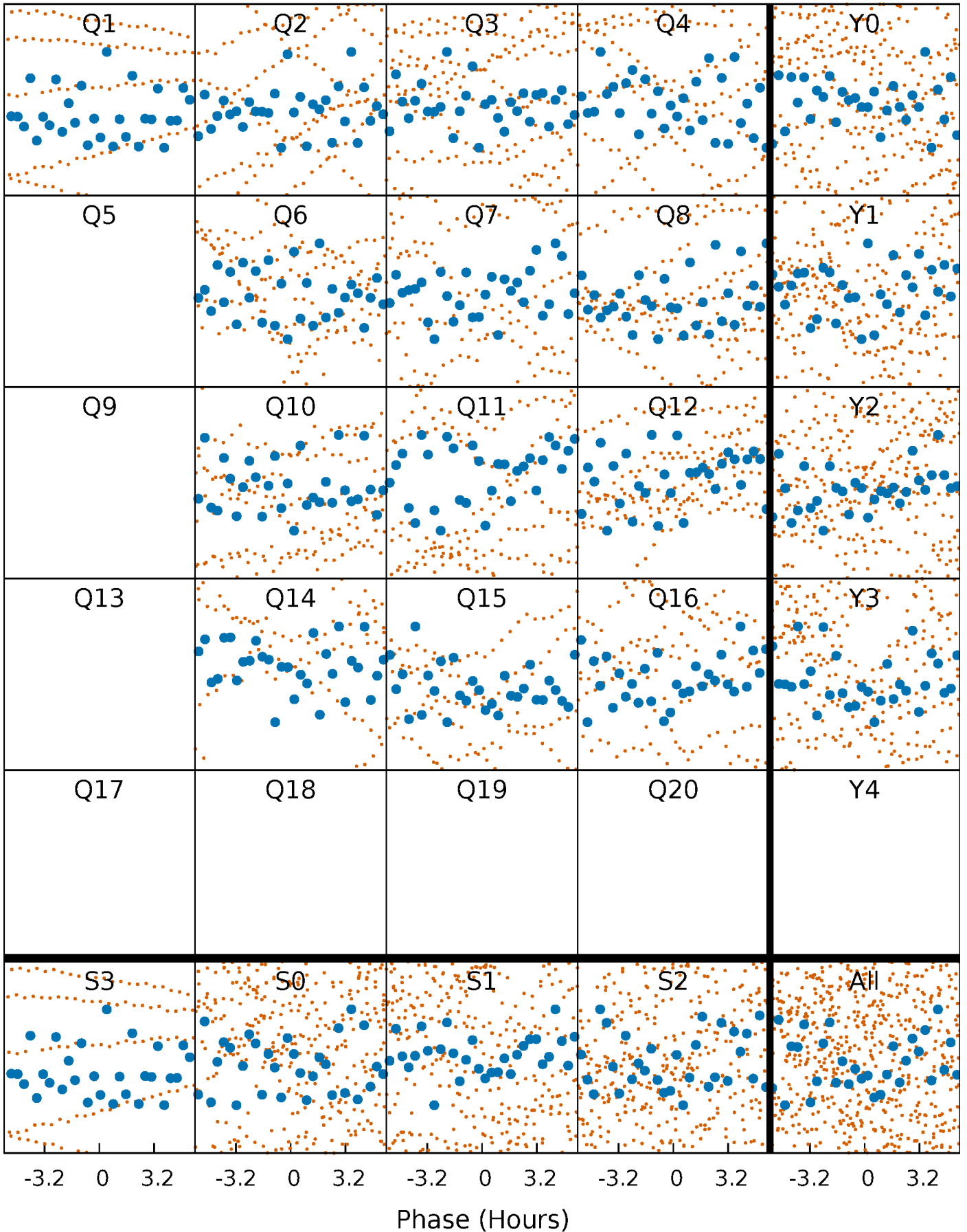


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

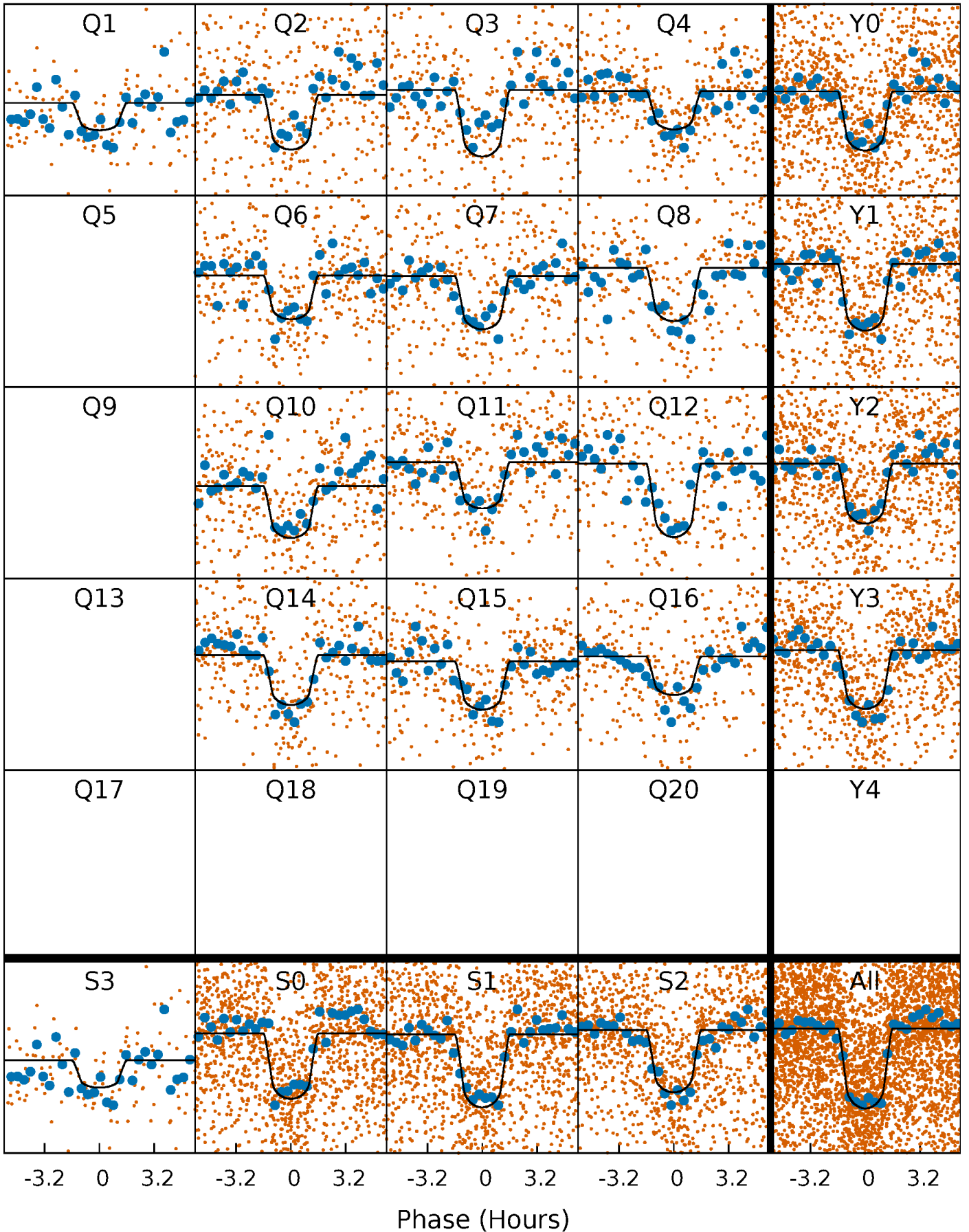
TCE 004814502-01   P= 4.943294 Days    $T_0=135.577081$  (BKJD)





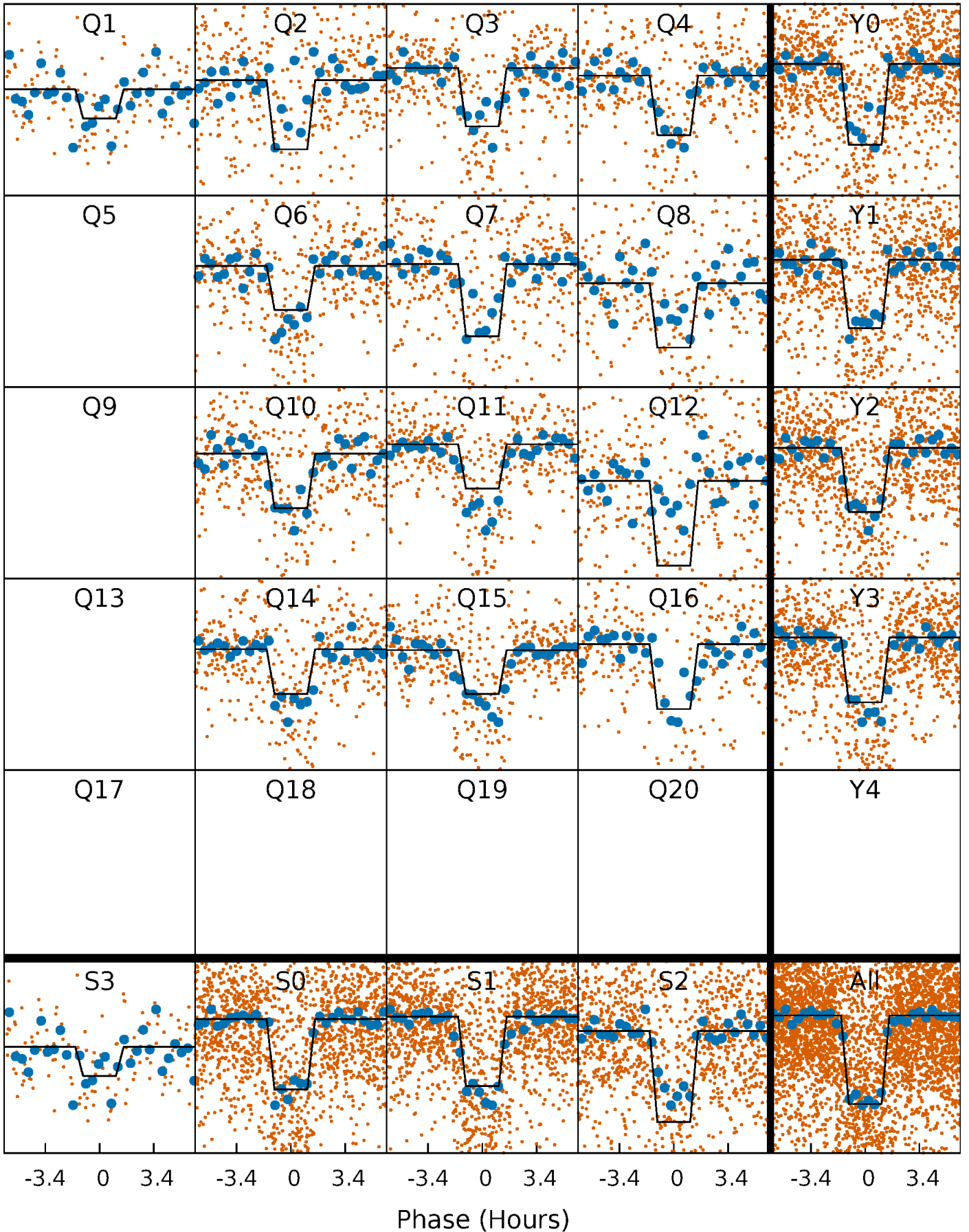
# DV Quarter-Phased Transit Curves

TCE 004814502-01   P= 4.943294 Days    $T_0=135.577081$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

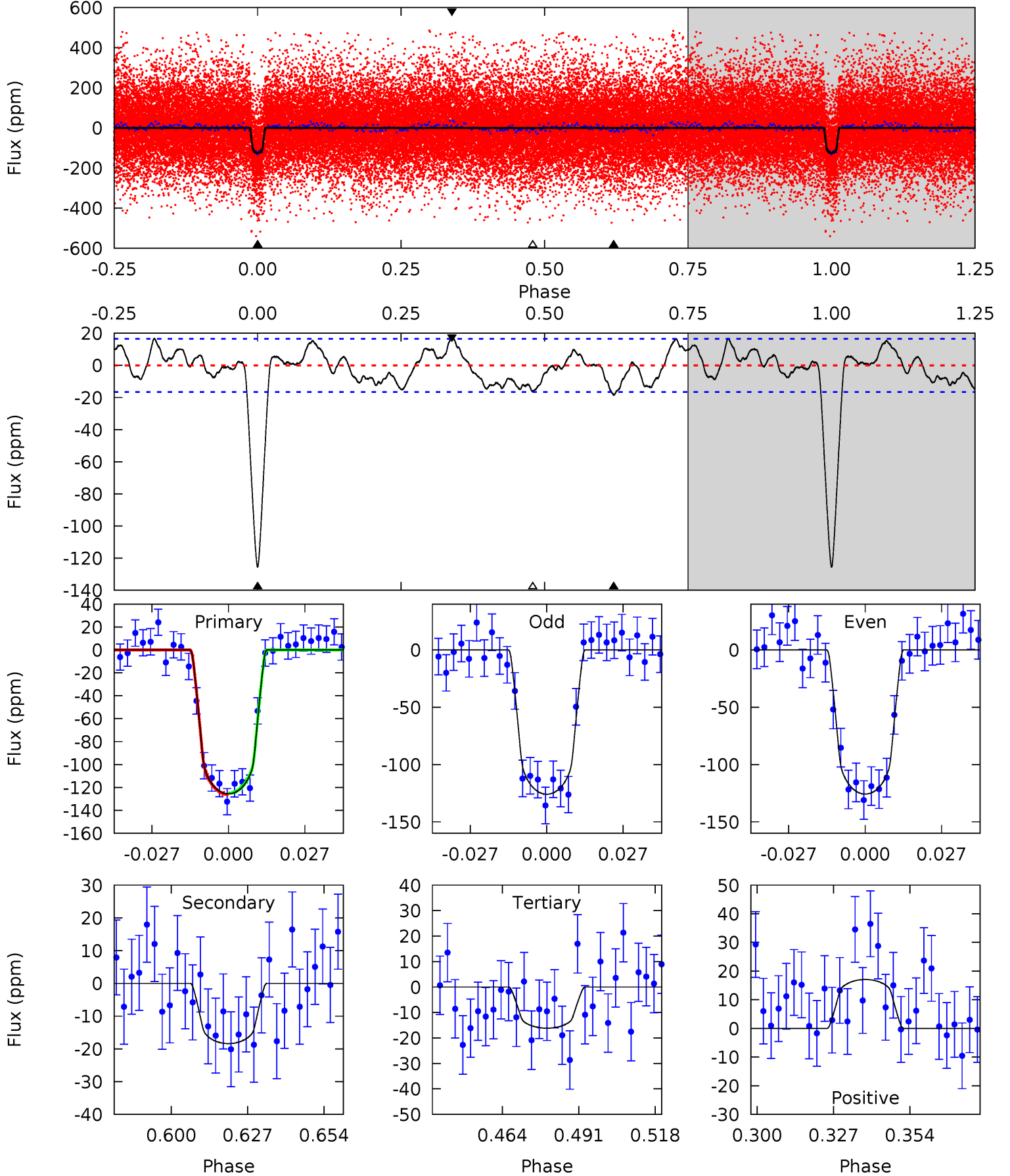
TCE 004814502-01   P= 4.943279 Days    $T_0=135.578087$  (BKJD)



# DV Model-Shift Uniqueness Test

004814502-01, P = 4.943294 Days, E = 130.633787 Days

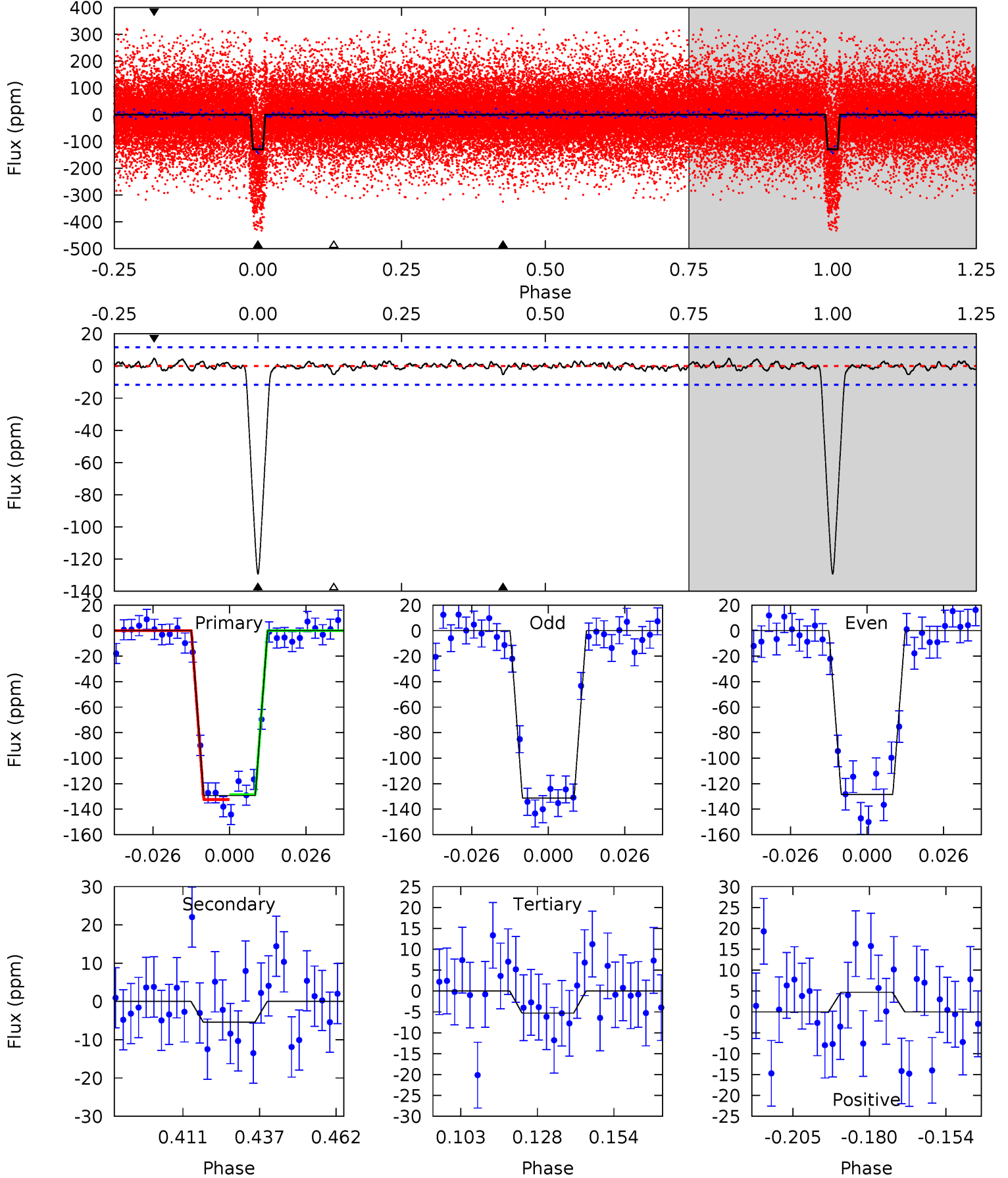
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 36.6 | 5.36 | 4.70 | 4.97 | 4.83            | 2.21            | 2.43             | 31.9    | 31.6    | 0.65    | 0.39    | 0.02    | 1.02 | 0.12  | 0.16 |



# Alt Model-Shift Uniqueness Test

004814502-01, P = 4.943279 Days, E = 130.634808 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 53.6 | 2.24 | 2.20 | 1.95 | 4.84            | 2.23            | 0.63             | 51.4    | 51.7    | 0.05    | 0.30    | 0.59    | 0.91 | 0.04  | 0.80 |



### Stellar Parameters For KIC 004814502

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $5661^{+76}_{-84}$  | $4.415^{+0.076}_{-0.114}$ | $0.100^{+0.150}_{-0.150}$ | $1.008^{+0.141}_{-0.094}$ | $0.964^{+0.060}_{-0.054}$ | $1.325^{+0.460}_{-0.433}$                 |
|        | +1%/-1%             | +2%/-3%                   | +150%/-150%               | +14%/-9%                  | +6%/-6%                   | +35%/-33%                                 |
| Source | SPE90               | SPE90                     | SPE90                     | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 004814502-01 / KOI 4004.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$          |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-18 \pm 3$ | $1.38^{+0.30}_{-0.32}$ | $1489^{+58}_{-47}$   | $3721^{+354}_{-240}$ | $17^{+11}_{-6}$           |
| Alt.    | $-5 \pm 2$  | $1.20^{+0.32}_{-0.30}$ | $1483^{+60}_{-46}$   | $3168^{+348}_{-324}$ | $6.291^{+5.806}_{-3.311}$ |

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



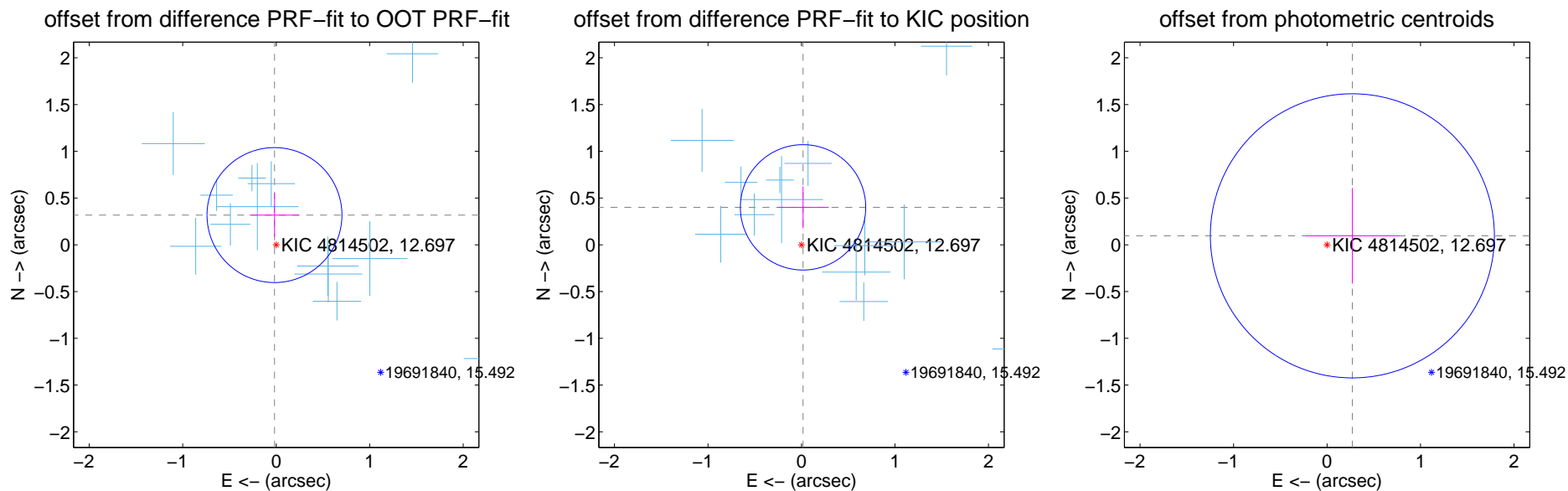
## DV Centroid Data

Supplemental centroid analysis for 004814502-01. Kepler magnitude: 12.70. Transit SNR 19.98

There are 13 quarters with good PRF difference image offsets

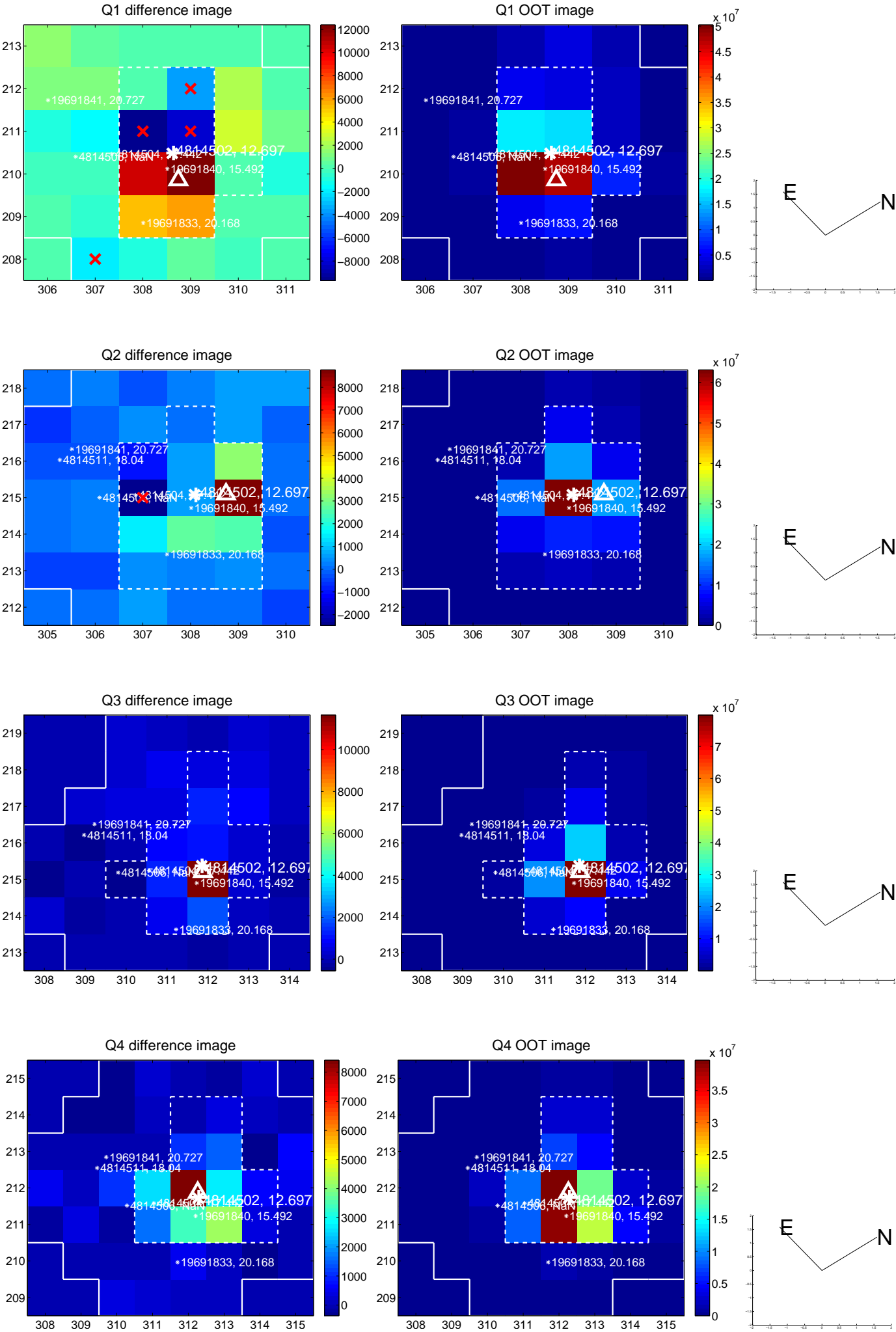
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $0.319 \pm 0.241$  | 1.32                | $0.018 \pm 0.265$  | $0.318 \pm 0.234$ |
| PRF-fit source offset from KIC position | $0.401 \pm 0.224$  | 1.79                | $-0.017 \pm 0.275$ | $0.401 \pm 0.223$ |
| photometric centroid source offset      | $0.29 \pm 0.51$    | 0.57                | $-0.27 \pm 0.51$   | $0.10 \pm 0.51$   |

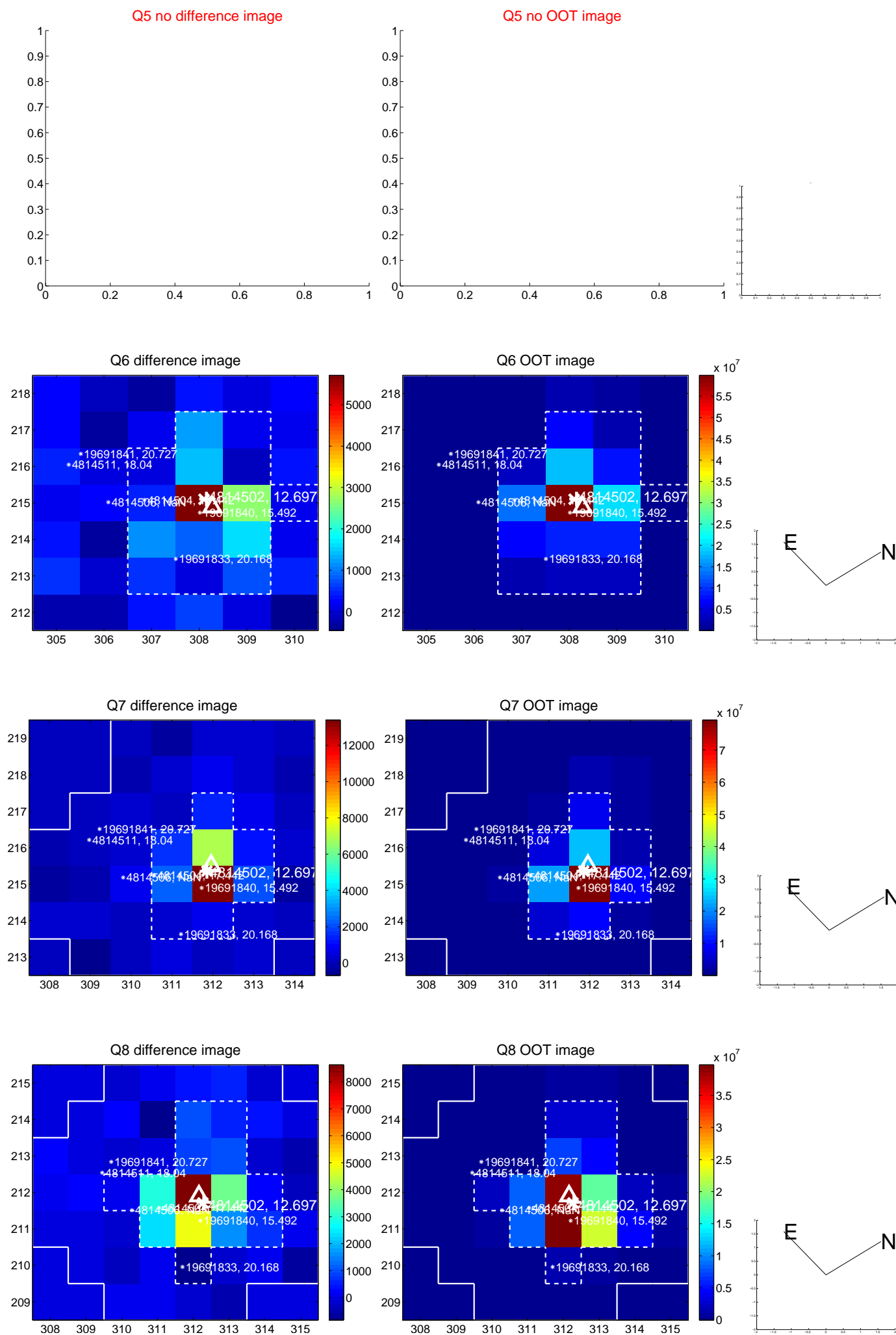


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

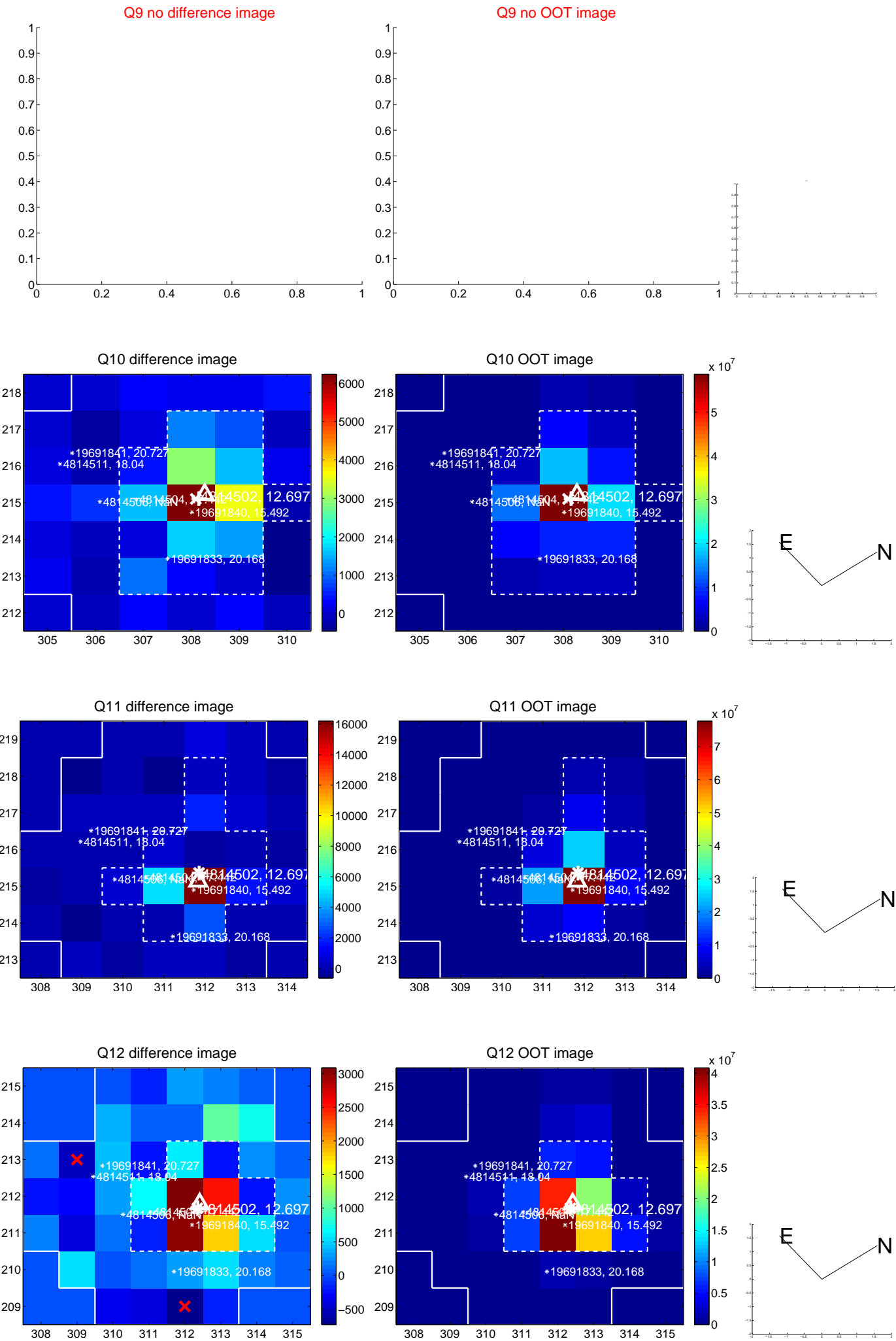
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



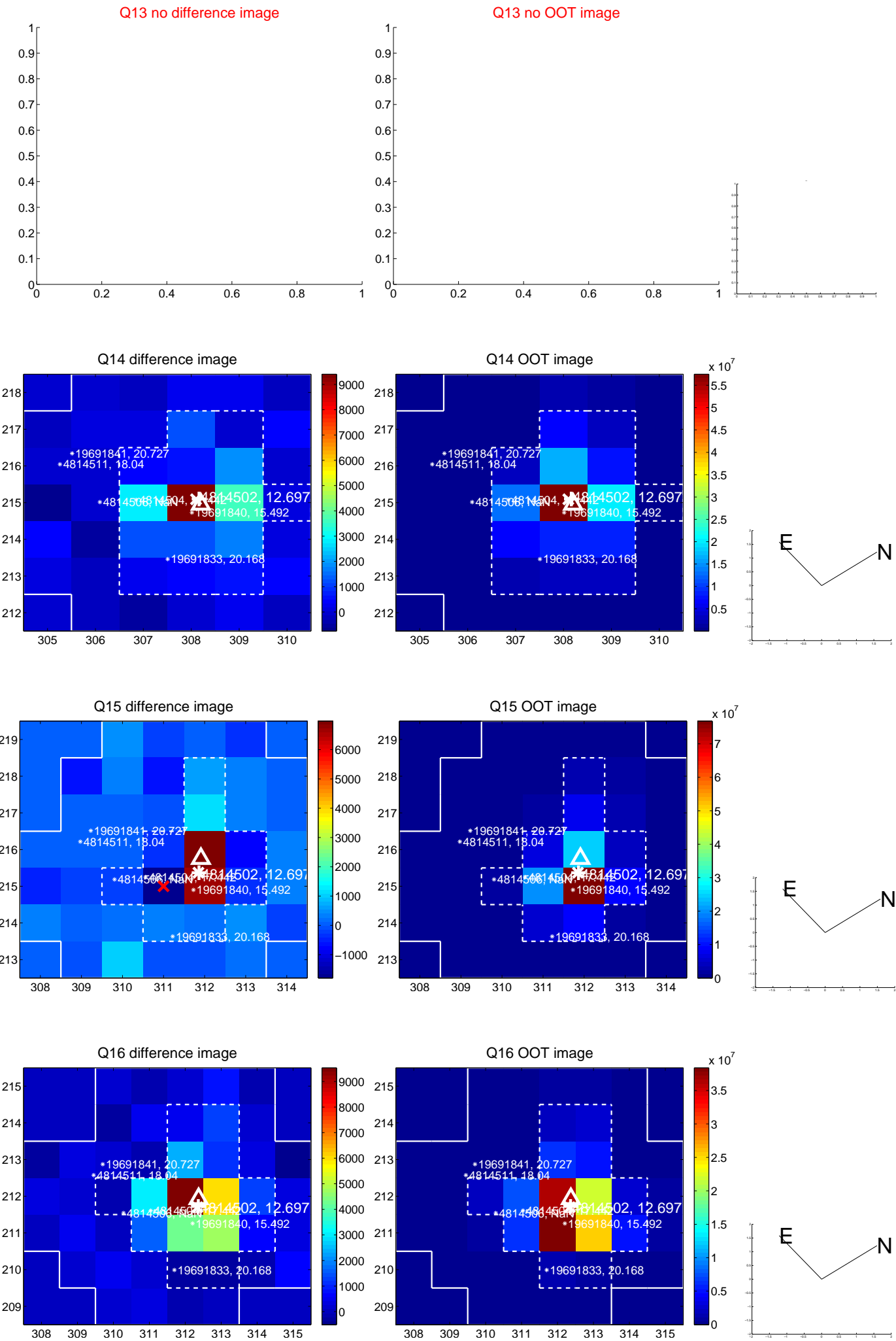
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

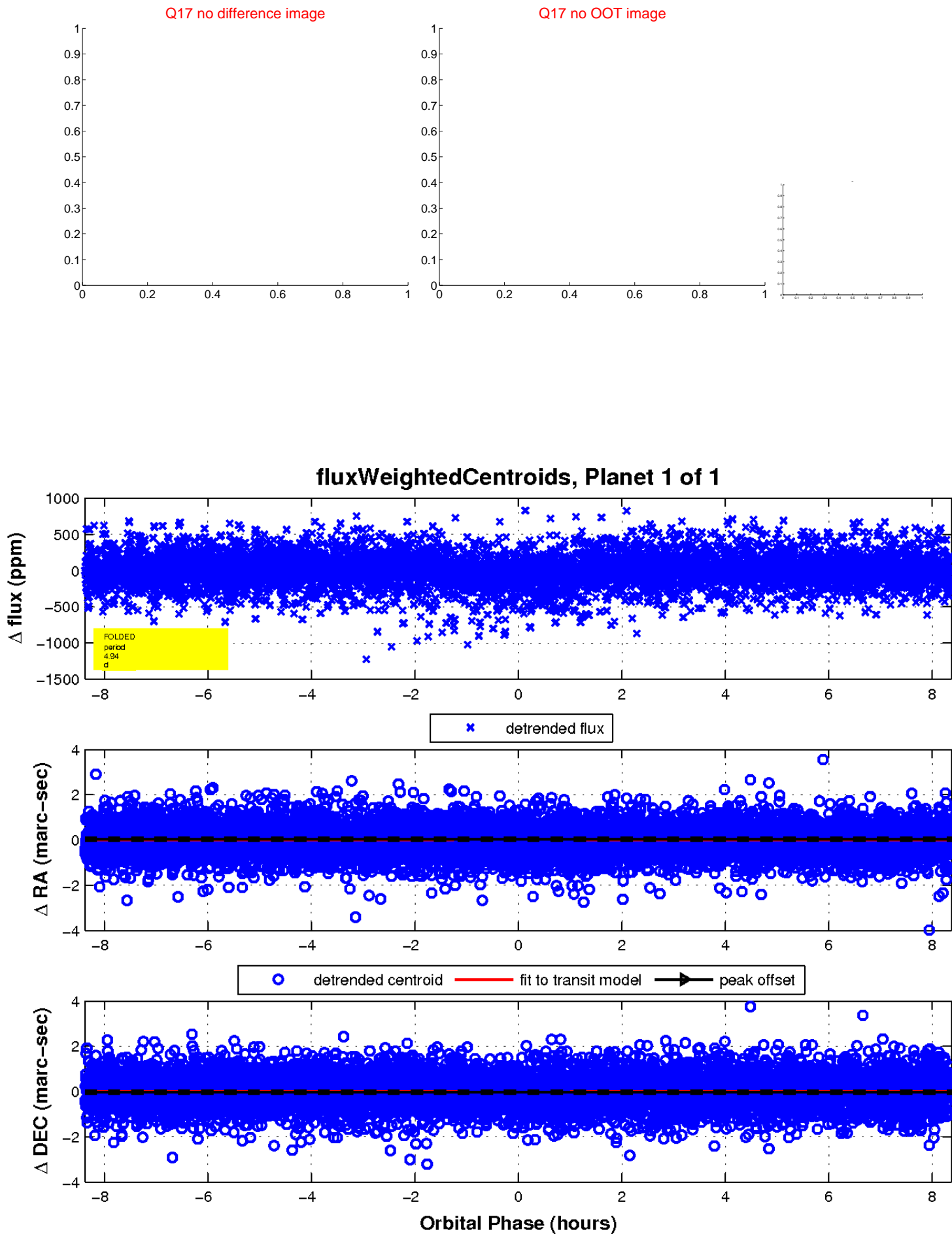


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

