

# KIC 008432535

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008432535-01 | OBS      | No   | 408.765269    | 275.545130   | 686.1       | 5.106            | 7.3 | 5.1 | 0.79                        | 5066            | 2.15                   | 0.35                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008432535-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS |

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

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

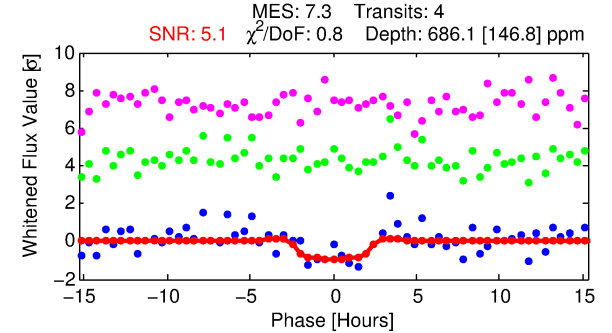
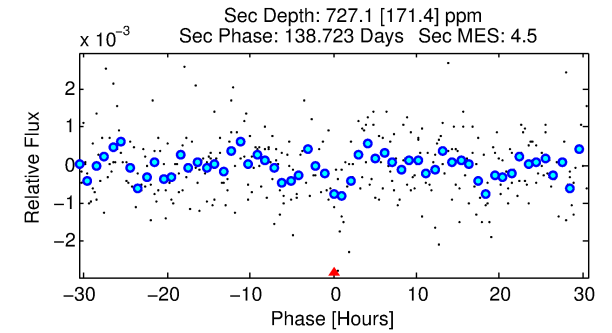
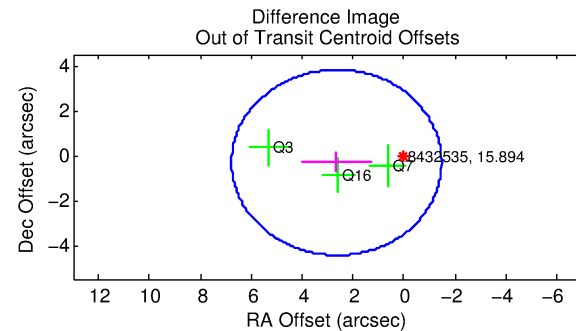
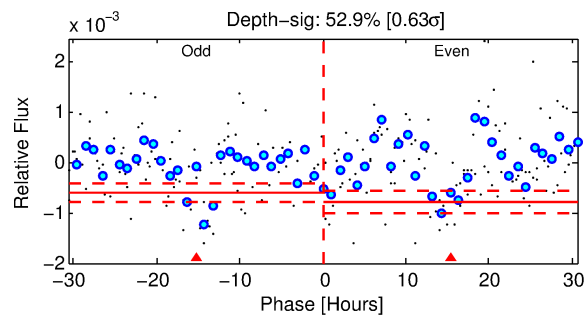
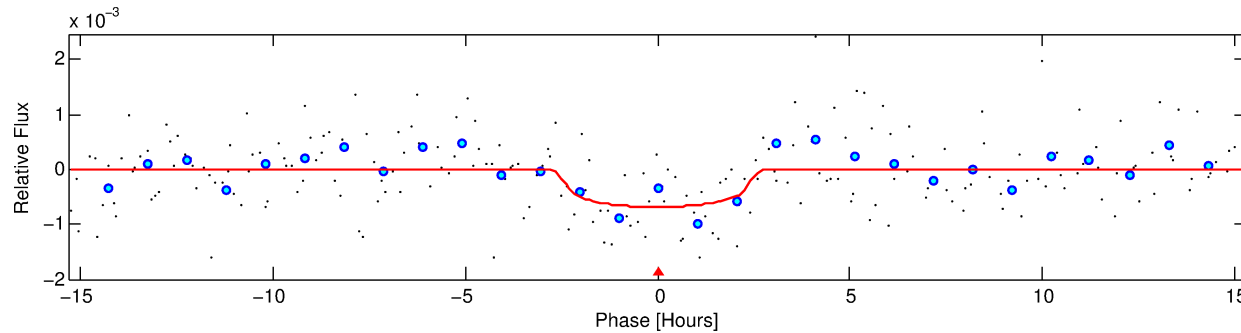
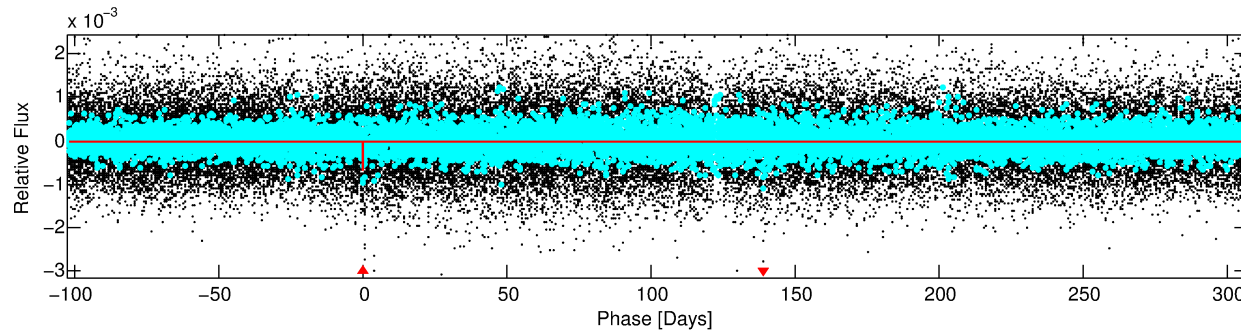
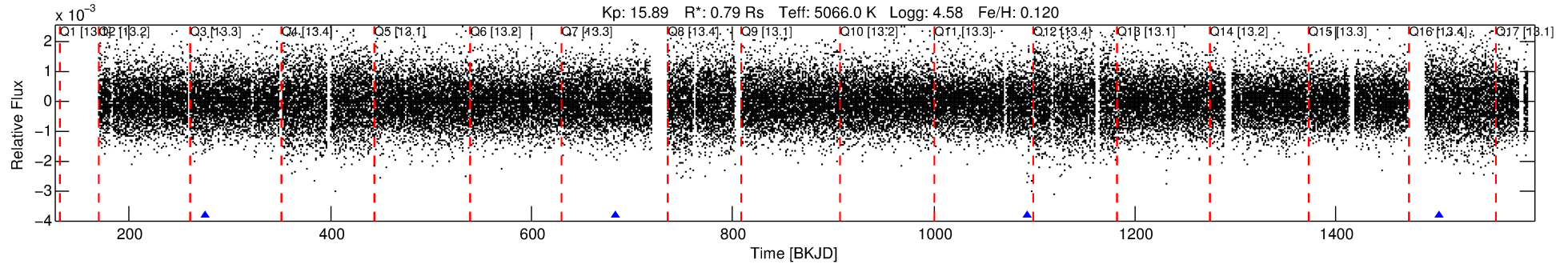
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008432535-01

No Significant Match Found

# DV One-Page Summary

KIC: 8432535 Candidate: 1 of 1 Period: 408.765 d



## DV Fit Results:

Period = 408.76527 [0.00960] d  
Epoch = 275.5451 [0.0165] BKJD  
Rp/R\* = 0.0251 [0.0590]  
a/R\* = 489.36 [3987.42]  
b = 0.64 [7.64]  
Seff = 0.35 [0.07]  
Teq = 196 [9] K  
Rp = 2.15 [5.06] Re  
a = 1.0192 [0.0941] AU  
Ag = 90043.15 [424052.24] [0.21 $\sigma$ ]  
Teffp = 5253 [6185] K [0.82 $\sigma$ ]

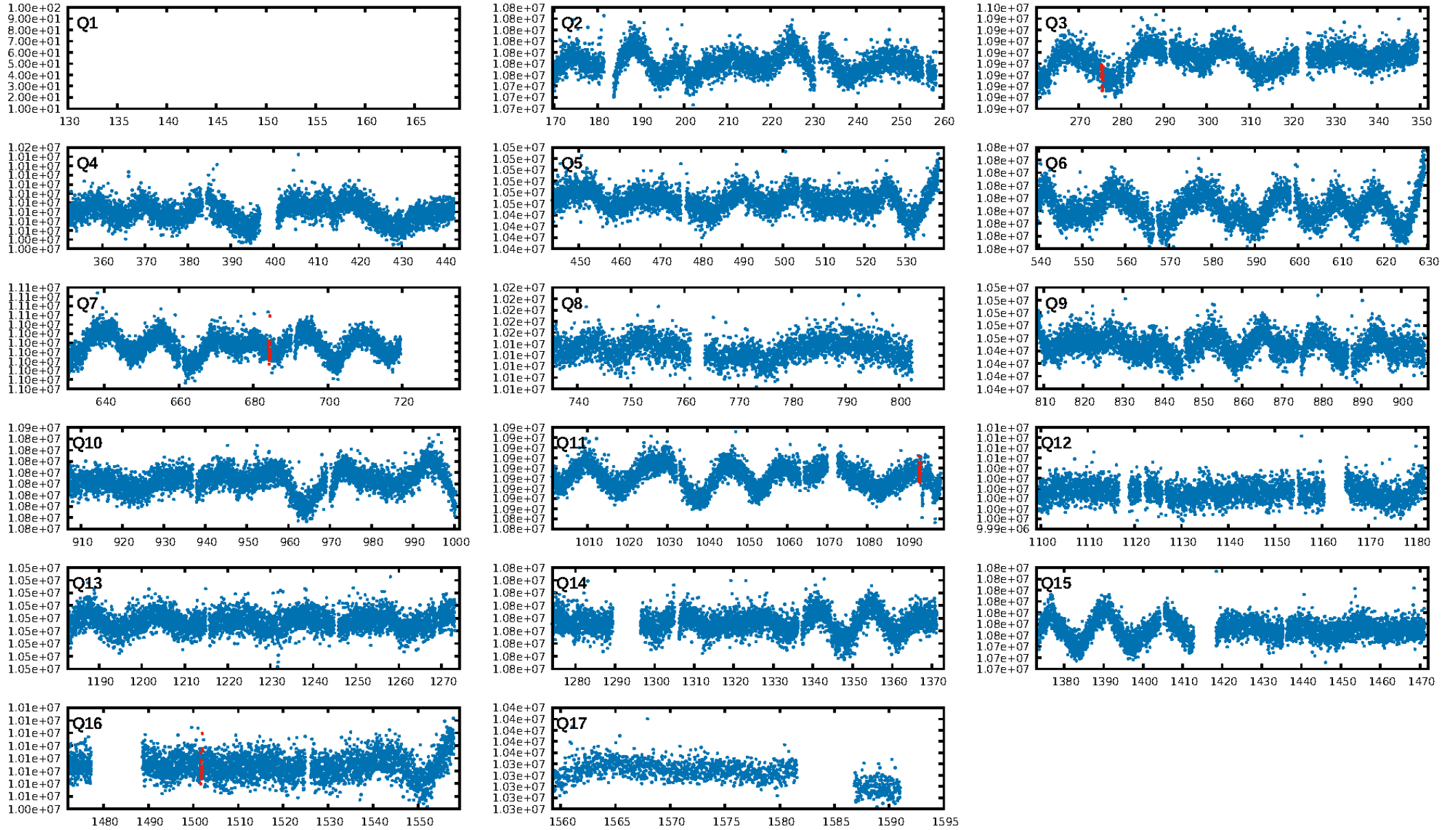
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 52.5%  
ModelChiSquareGof-sig: 99.4%  
**Bootstrap-pfa: 2.06e-12**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -75.85  
Centroid-sig: 97.8%  
Centroid-so: 0.381 arcsec [0.17 $\sigma$ ]  
OotOffset-rm: 2.661 arcsec [1.93 $\sigma$ ]  
KicOffset-rm: 2.775 arcsec [2.03 $\sigma$ ]  
OotOffset-st: 0/2/1/0 [3]  
KicOffset-st: 0/2/1/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

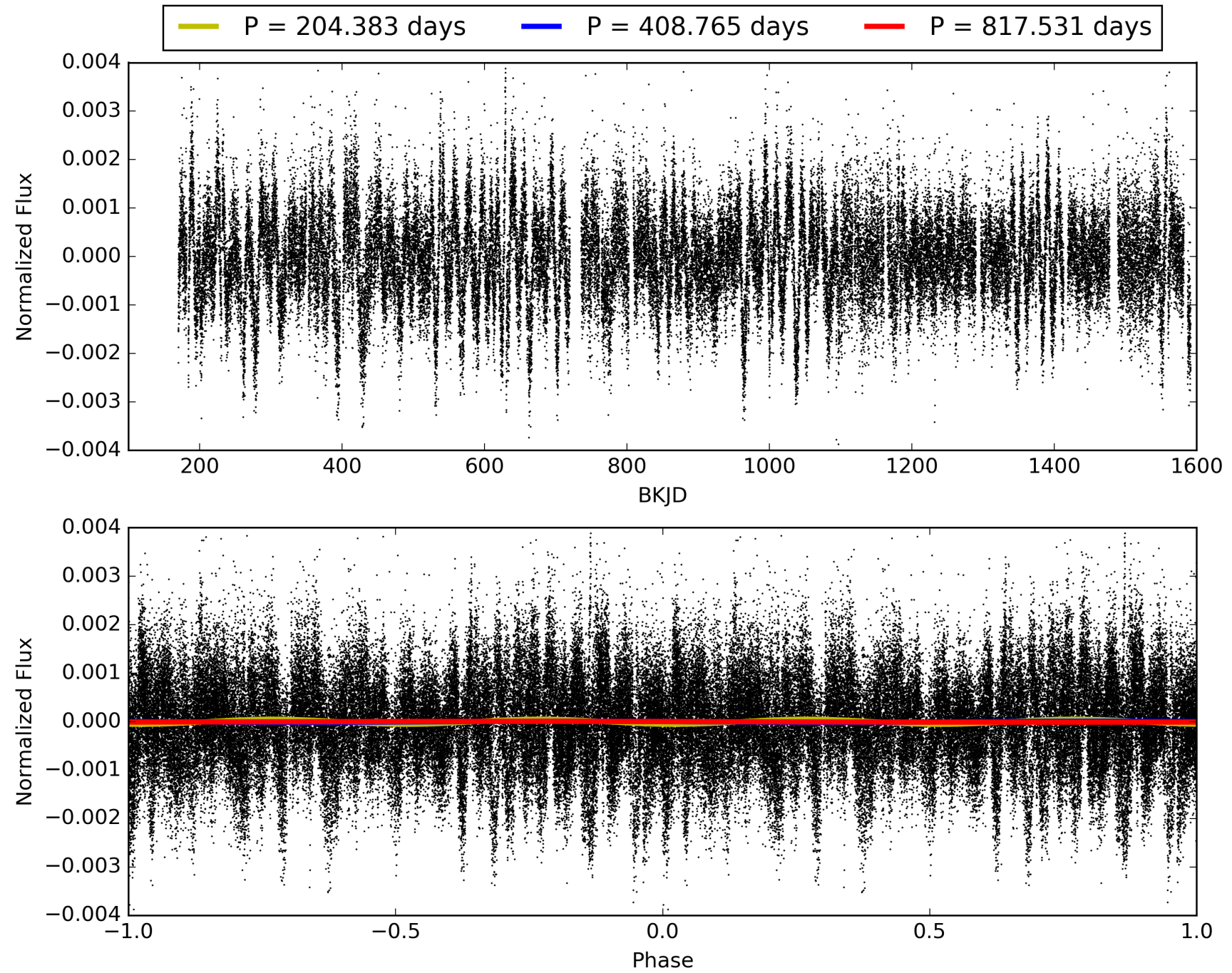
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:20:12 Z

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

# TCE 008432535-01, PDC Light Curves

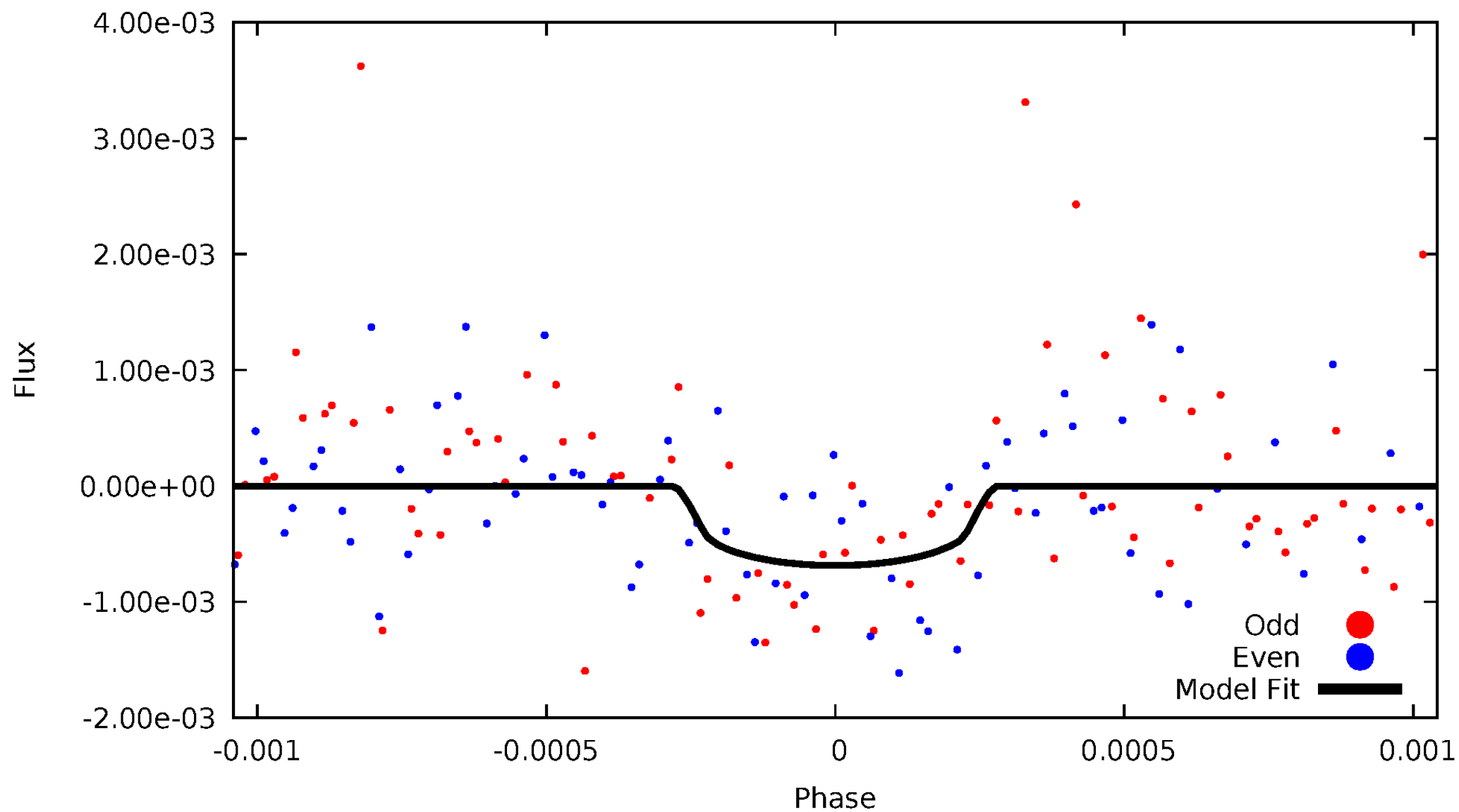


TCE 008432535-01



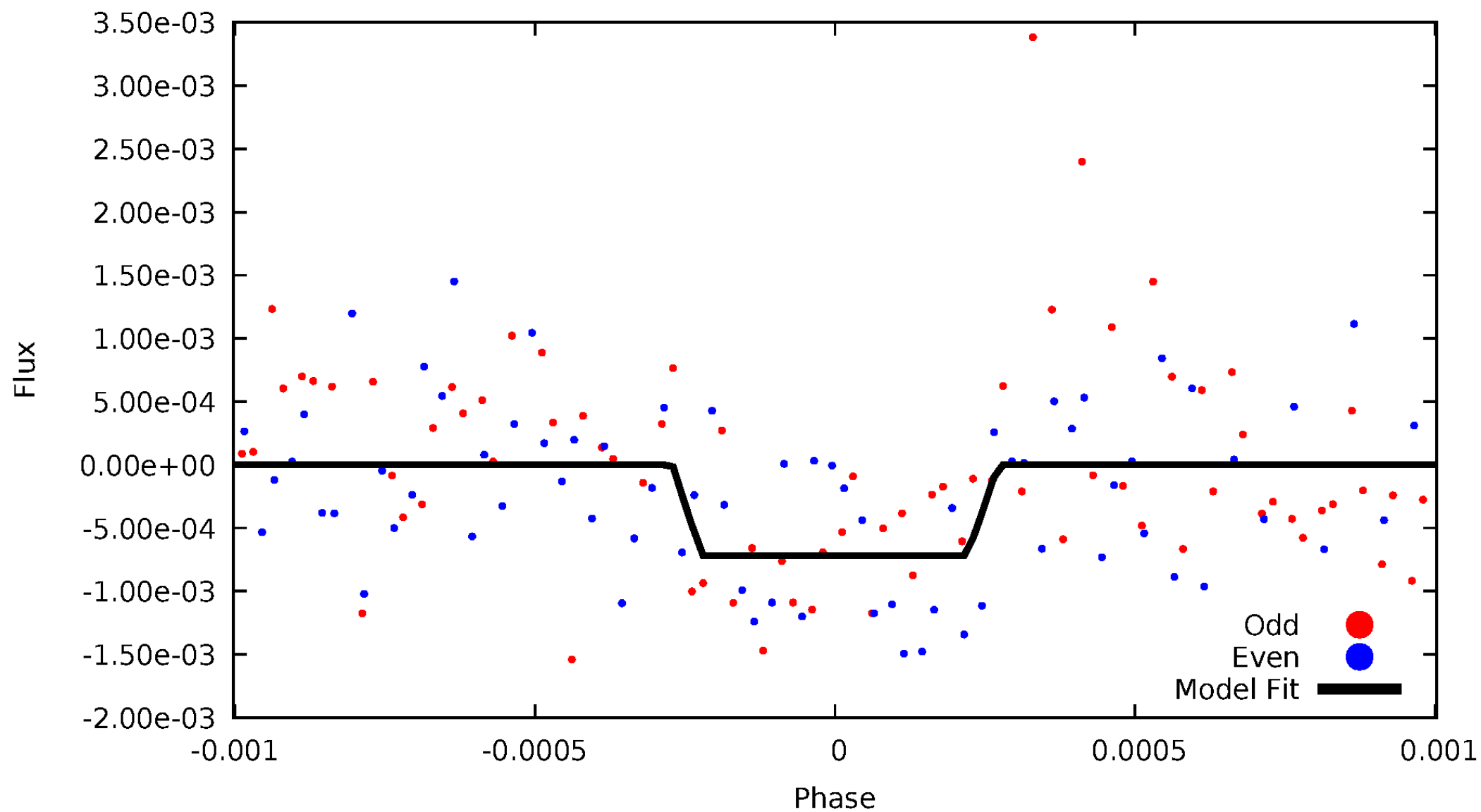
# DV Odd/Even

TCE 008432535-01



# ALT Odd/Even

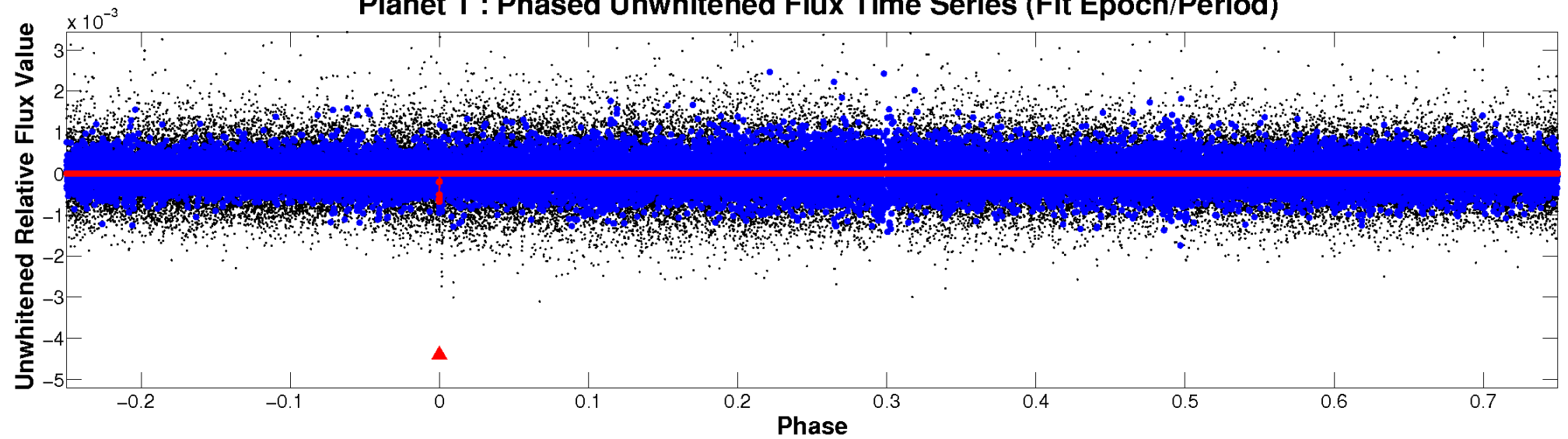
TCE 008432535-01



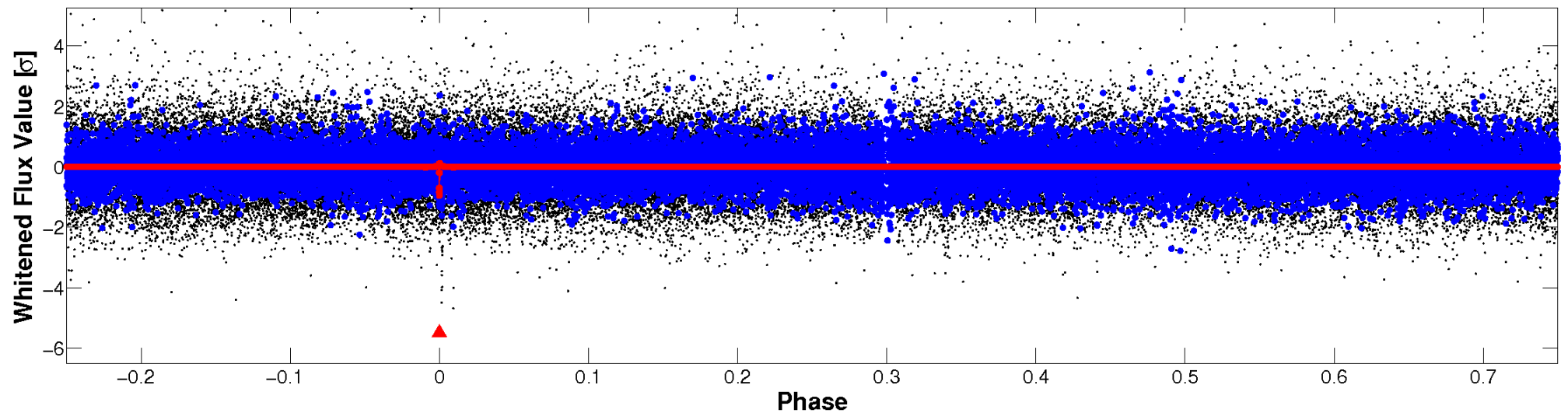


# Non-Whitened Vs. Whitened Light Curve

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

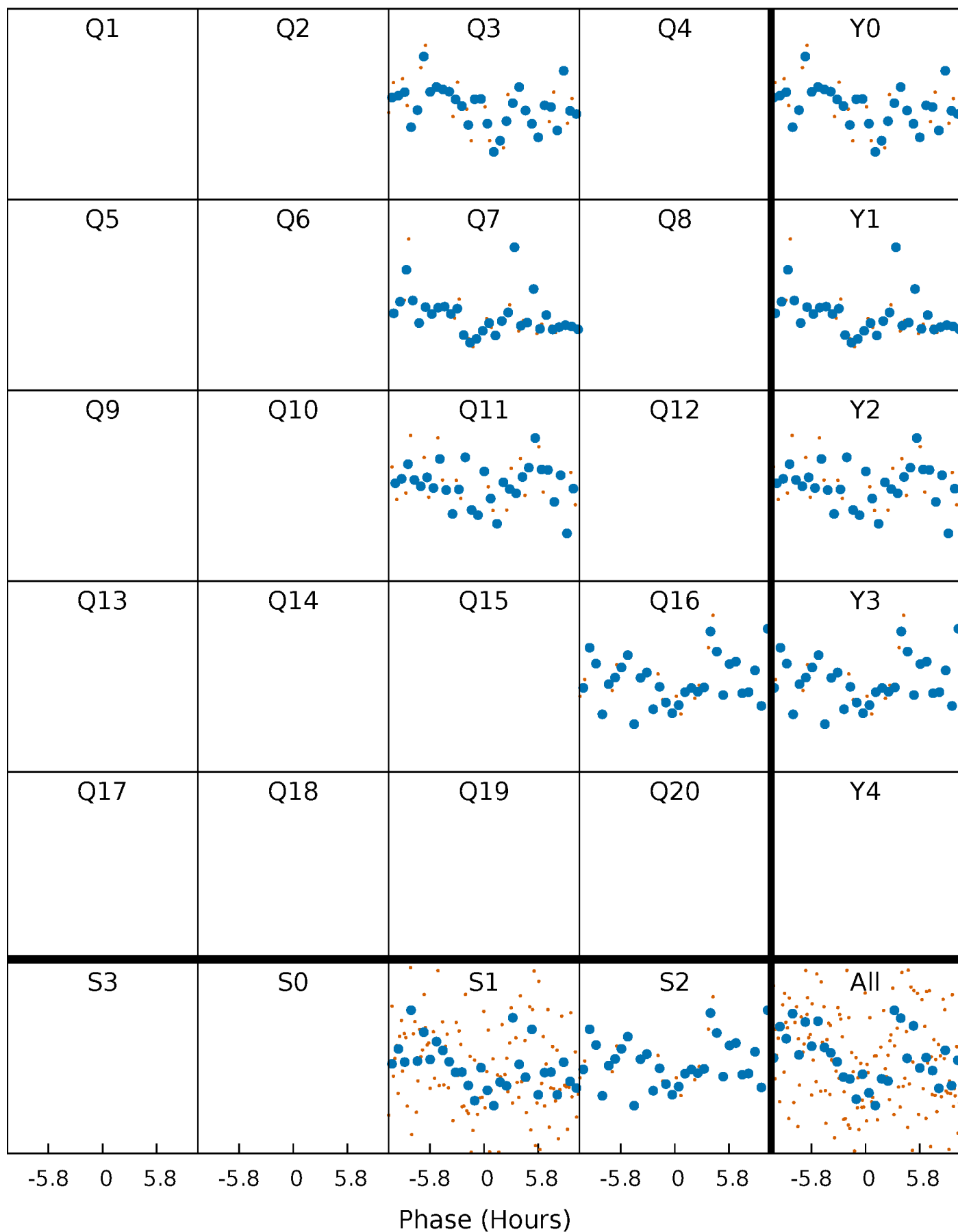


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

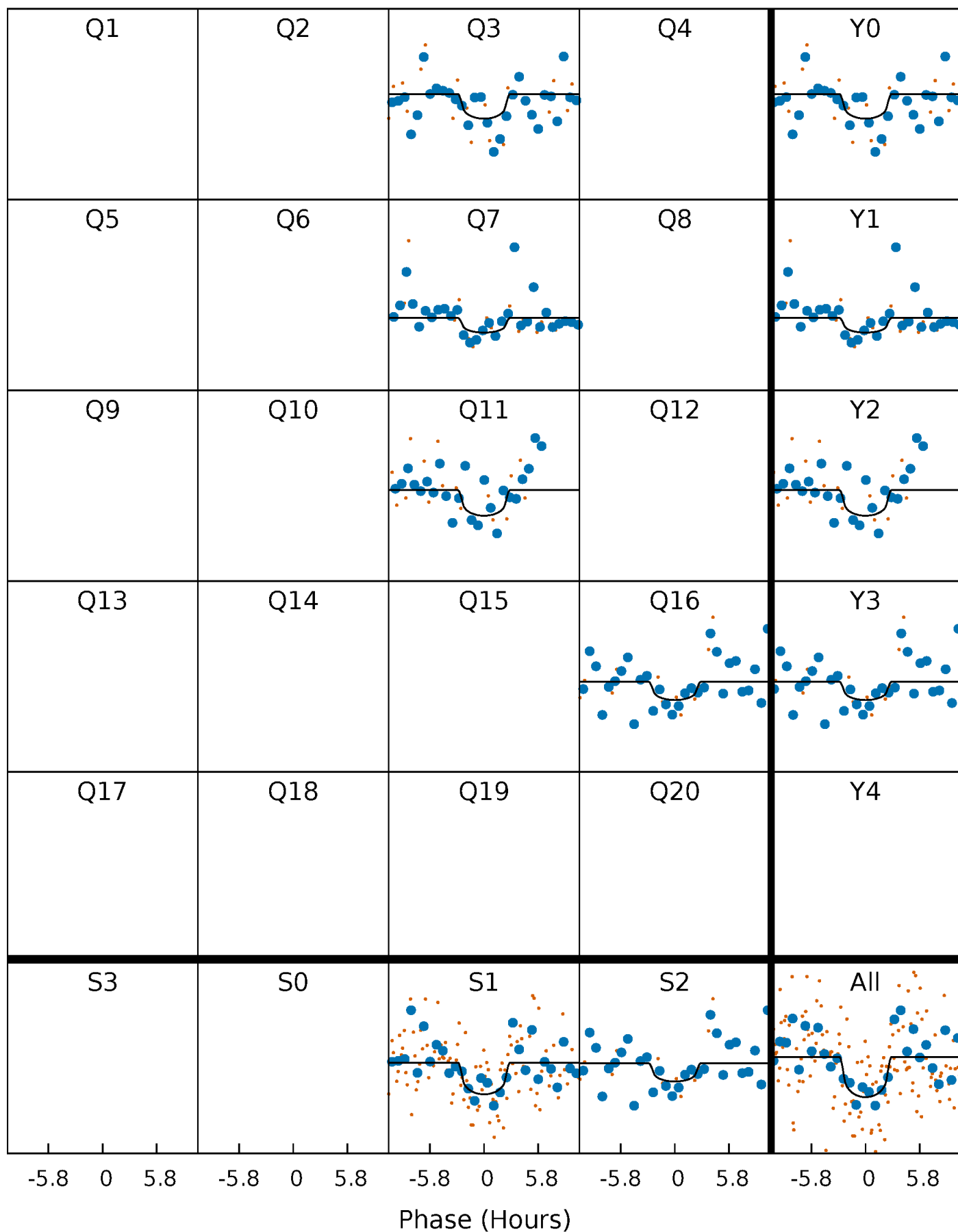
TCE 008432535-01 P=408.765269 Days  $T_0=275.545129$  (BKJD)





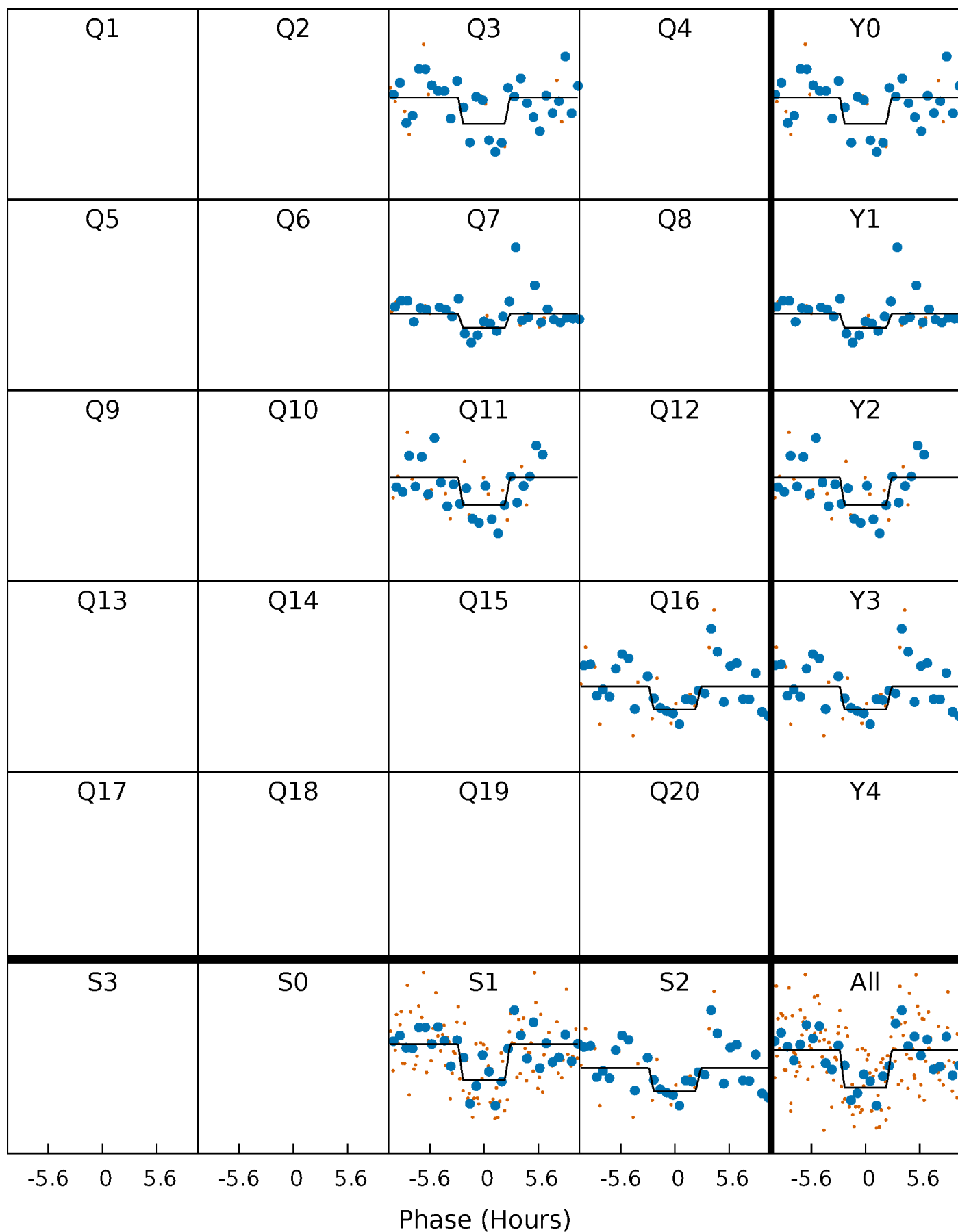
# DV Quarter-Phased Transit Curves

TCE 008432535-01 P=408.765269 Days  $T_0=275.545129$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

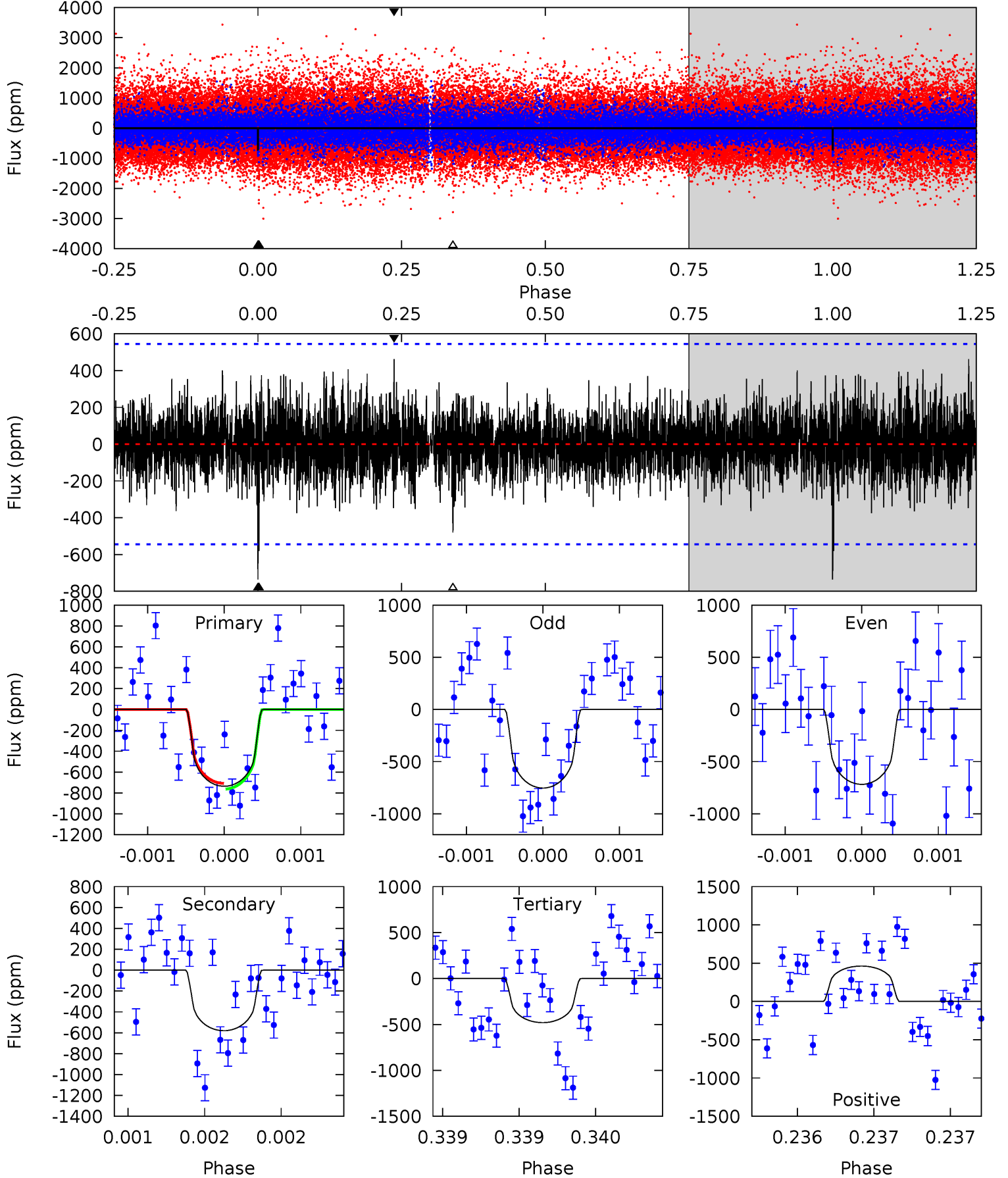
TCE 008432535-01 P=408.766557 Days  $T_0=275.543318$  (BKJD)



# DV Model-Shift Uniqueness Test

008432535-01, P = 408.765269 Days, E = 275.545129 Days

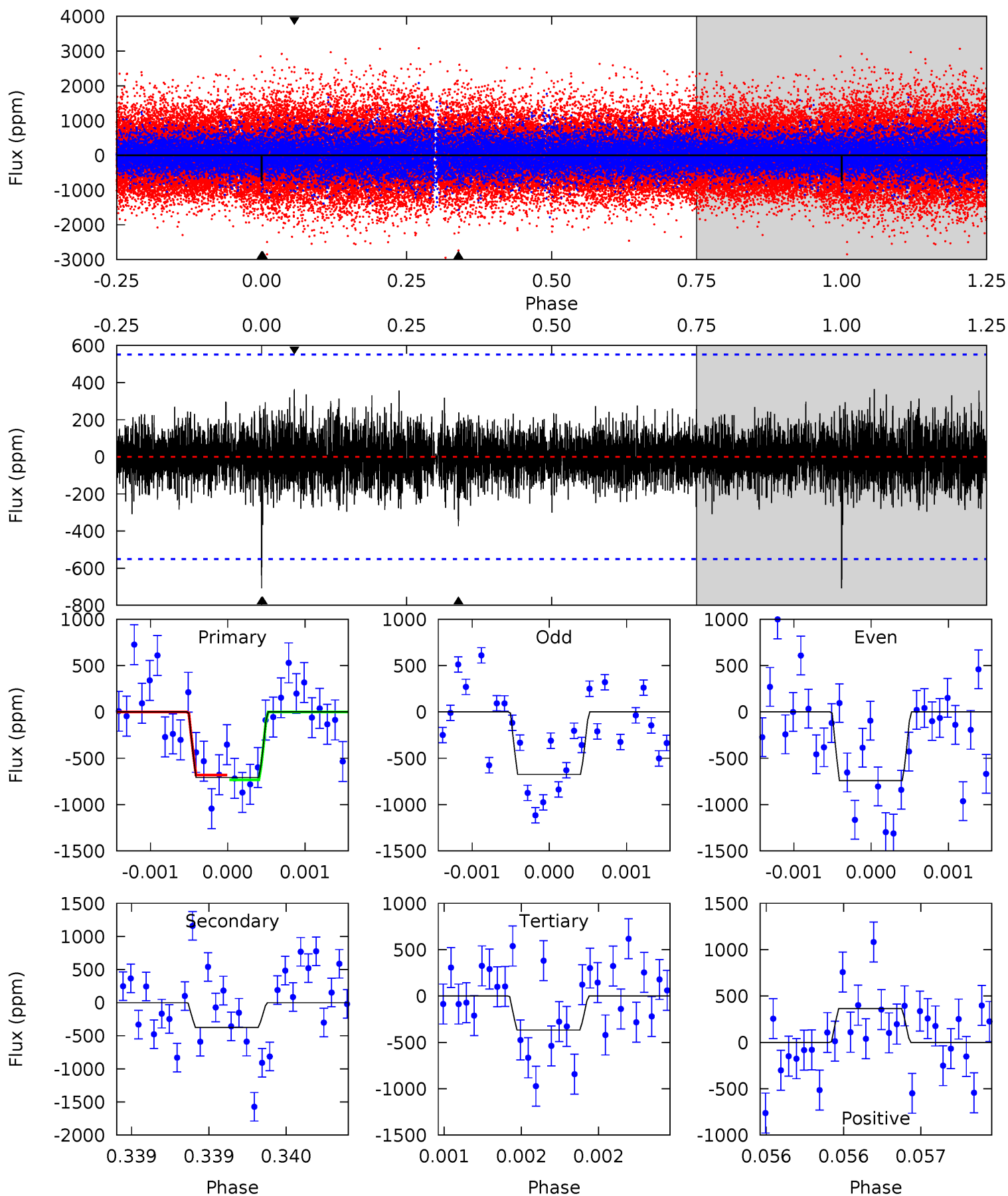
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.50 | 5.91 | 4.90 | 4.71 | 5.55            | 3.45            | 1.19             | 2.60    | 2.79    | 1.01    | 1.20    | 0.18    | 0.98 | 0.39  | 0.28 |



# Alt Model-Shift Uniqueness Test

008432535-01, P = 408.766557 Days, E = 275.543318 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.13 | 3.76 | 3.70 | 3.68 | 5.56            | 3.46            | 0.93             | 3.43    | 3.45    | 0.06    | 0.08    | 0.34    | 0.97 | 0.34  | 0.27 |



### Stellar Parameters For KIC 008432535

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (g \cdot \text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------------------|
|        | $5066^{+166}_{-151}$ | $4.575^{+0.035}_{-0.075}$ | $0.120^{+0.250}_{-0.300}$ | $0.785^{+0.085}_{-0.057}$ | $0.845^{+0.056}_{-0.074}$ | $2.460^{+0.446}_{-0.584}$            |
|        | +3%/-3%              | +1%/-2%                   | +208%/-250%               | +11%/-7%                  | +7%/-9%                   | +18%/-24%                            |
| 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 008432535-01 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$         | $A_{obs}$                  |
|---------|---------------|------------------------|-------------------|-----------------------|----------------------------|
| DV      | $-580 \pm 98$ | $4.58^{+3.93}_{-2.97}$ | $276^{+11}_{-11}$ | $3776^{+1902}_{-661}$ | $15625^{+115915}_{-11218}$ |
| Alt.    | $-373 \pm 99$ | $4.29^{+4.15}_{-2.87}$ | $276^{+11}_{-10}$ | $3555^{+1936}_{-648}$ | $11067^{+94900}_{-8265}$   |

$T_{max}$  = 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

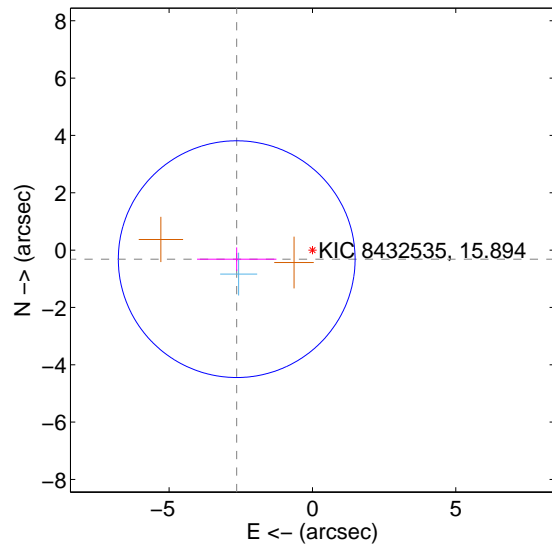
Supplemental centroid analysis for 008432535-01. Kepler magnitude: 15.89. Transit SNR 5.09

There are 1 quarters with good PRF difference image offsets

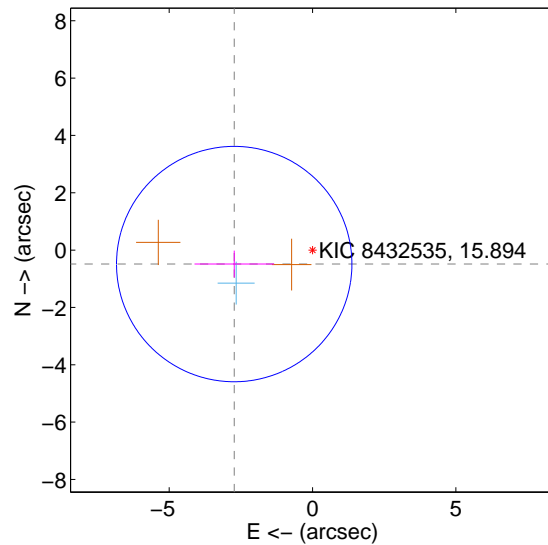
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $2.661 \pm 1.377$  | 1.93                | $2.642 \pm 1.385$ | $-0.316 \pm 0.410$ |
| PRF-fit source offset from KIC position | $2.775 \pm 1.369$  | 2.03                | $2.732 \pm 1.388$ | $-0.487 \pm 0.468$ |
| photometric centroid source offset      | $0.38 \pm 2.22$    | 0.17                | $-0.09 \pm 2.39$  | $-0.37 \pm 2.21$   |

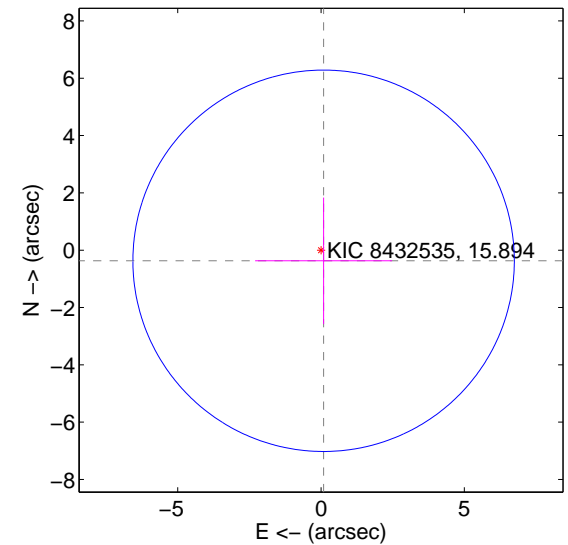
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

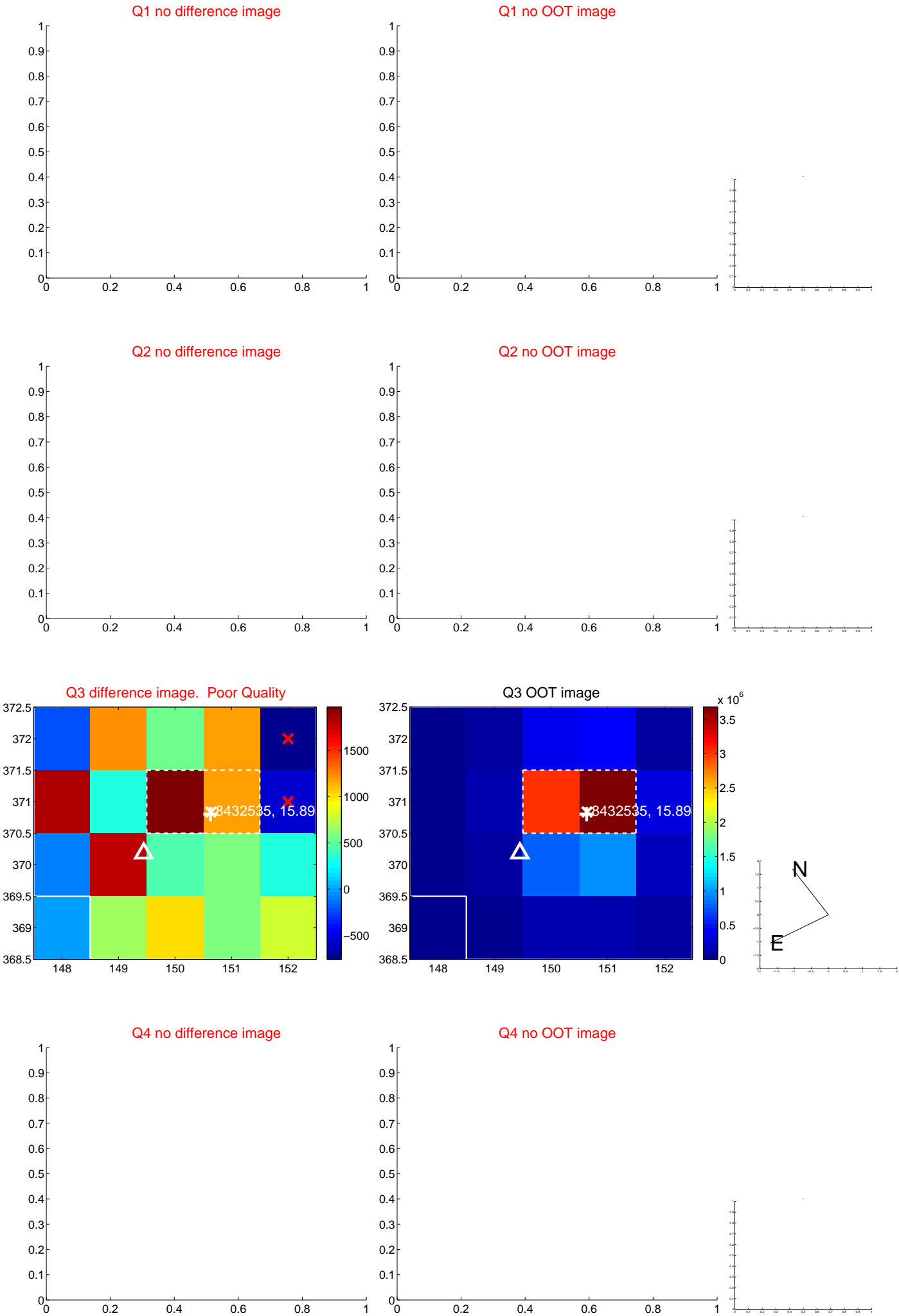


offset from photometric centroids



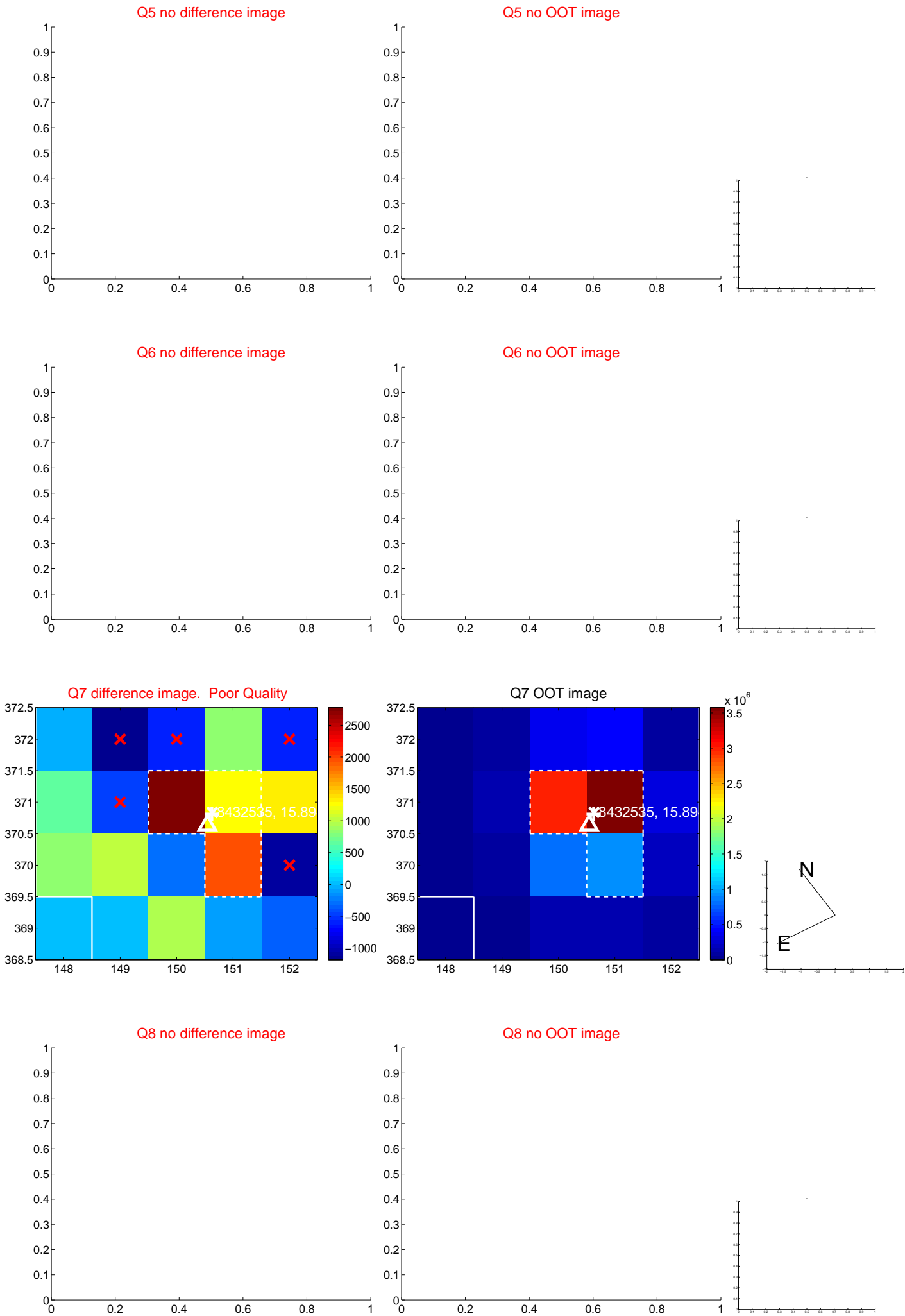
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





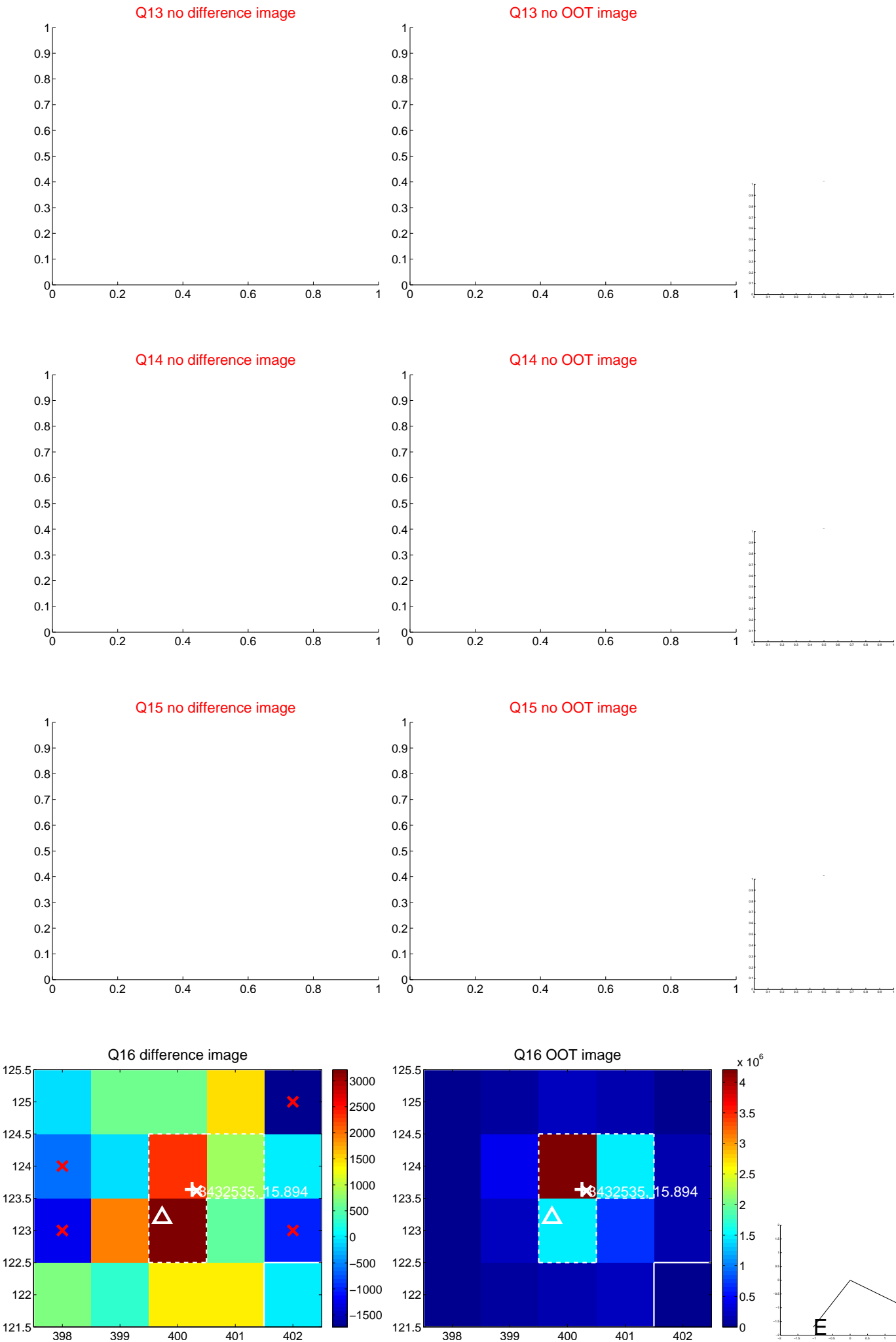
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



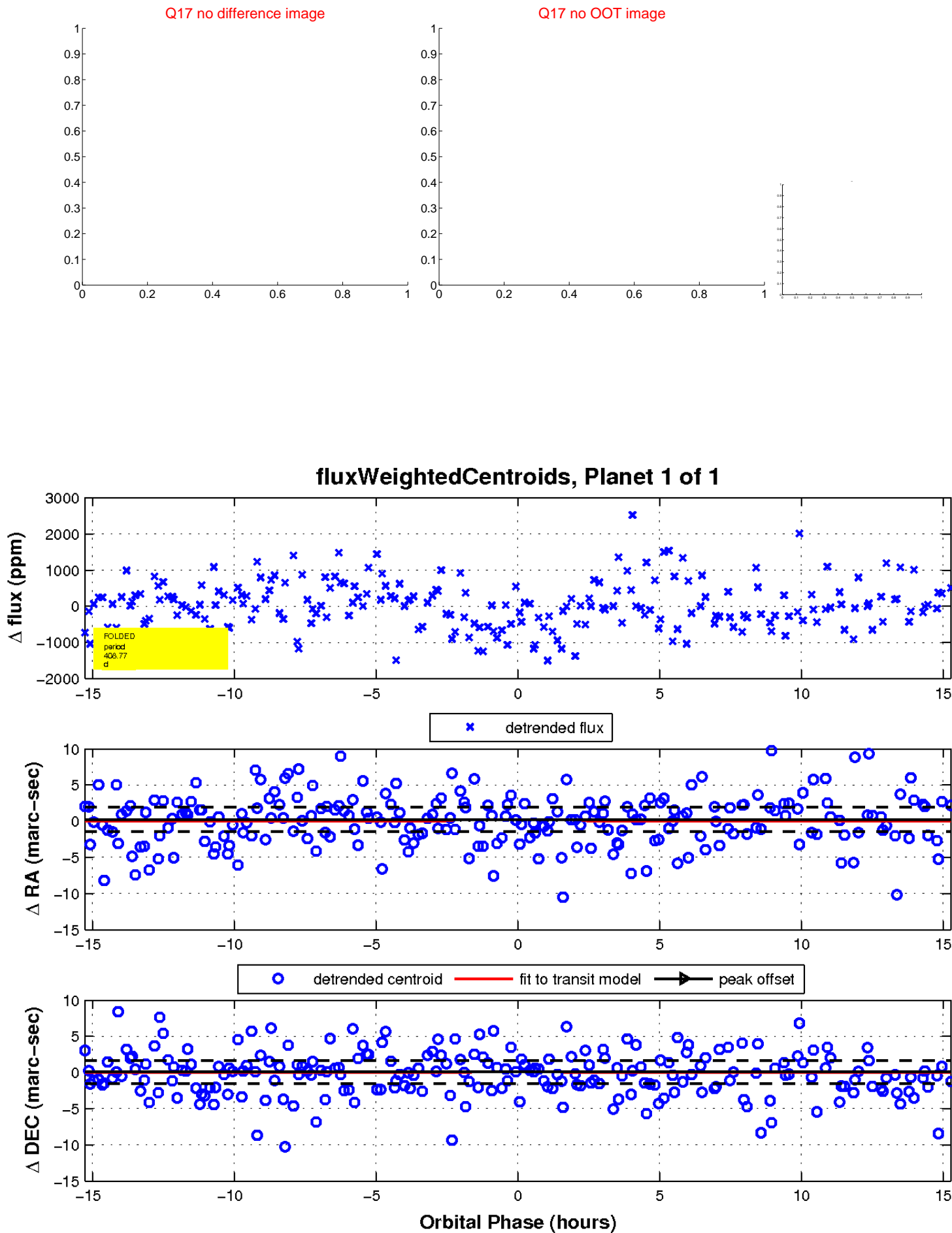
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: 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.



UKIRT Image

Declination

