

# KIC 008023238

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008023238-01 | OBS      | No   | 374.954443    | 264.050712   | 810.8       | 27.491           | 10.3 | 10.4 | 0.79                        | 5392            | 2.27                   | 0.57                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008023238-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

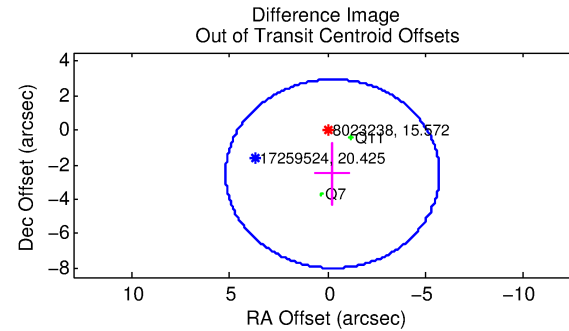
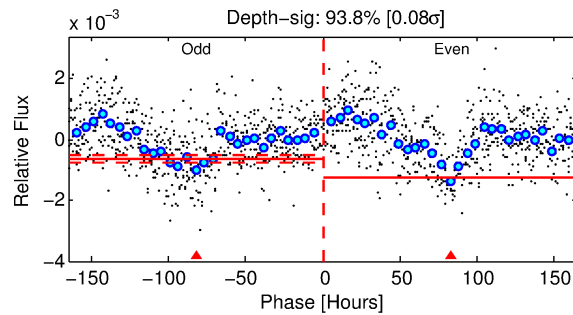
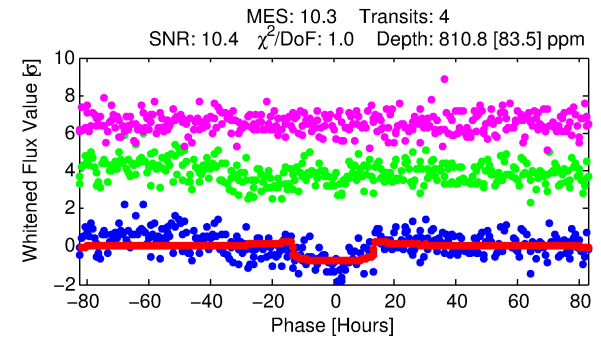
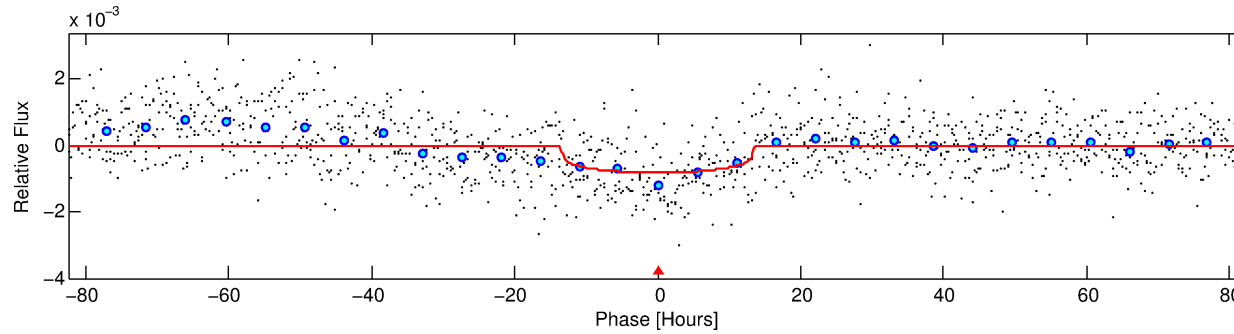
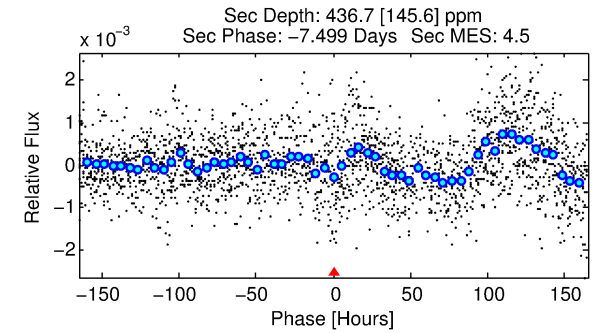
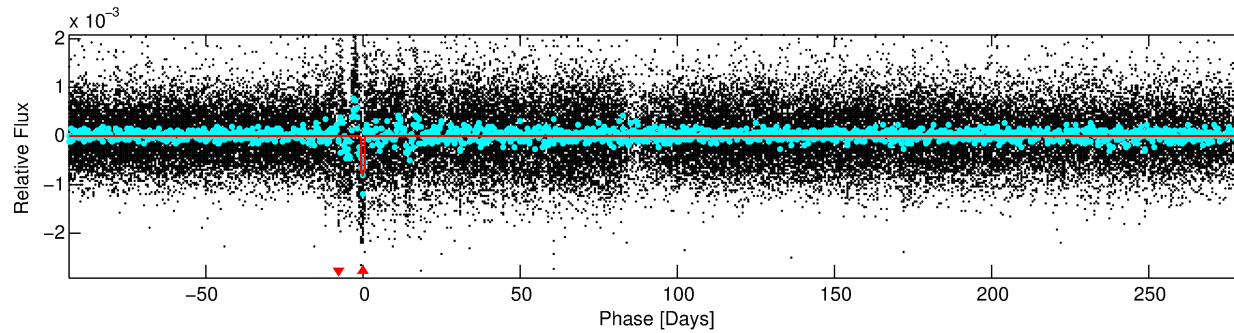
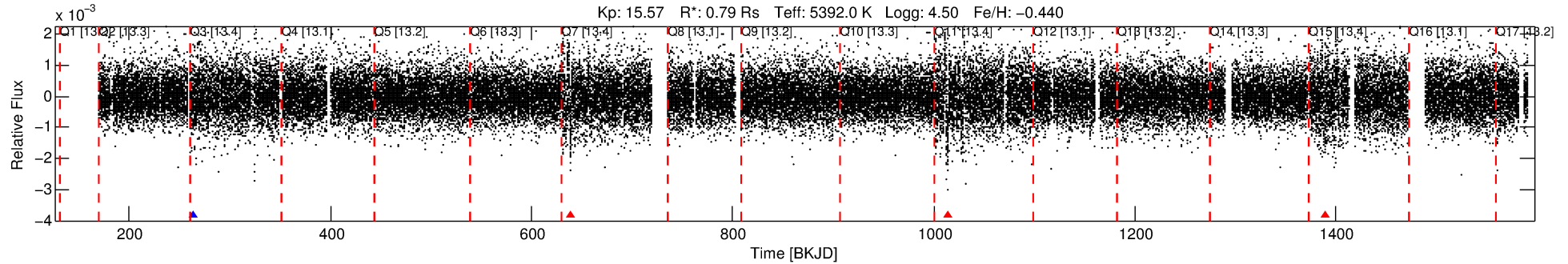
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008023238-01

No Significant Match Found

# DV One-Page Summary

KIC: 8023238 Candidate: 1 of 1 Period: 374.954 d



## DV Fit Results:

Period = 374.95444 [0.01405] d  
Epoch = 264.0507 [0.0258] BKJD  
Rp/R\* = 0.0262 [0.0104]  
a/R\* = 98.99 [161.94]  
b = 0.39 [3.60]  
Seff = 0.57 [0.13]  
Teq = 222 [12] K  
Rp = 2.27 [0.96] Re  
a = 0.9145 [0.1176] AU  
Ag = 39122.52 [34379.58] [1.14σ]  
Teffp = 4817 [1043] K [4.40σ]

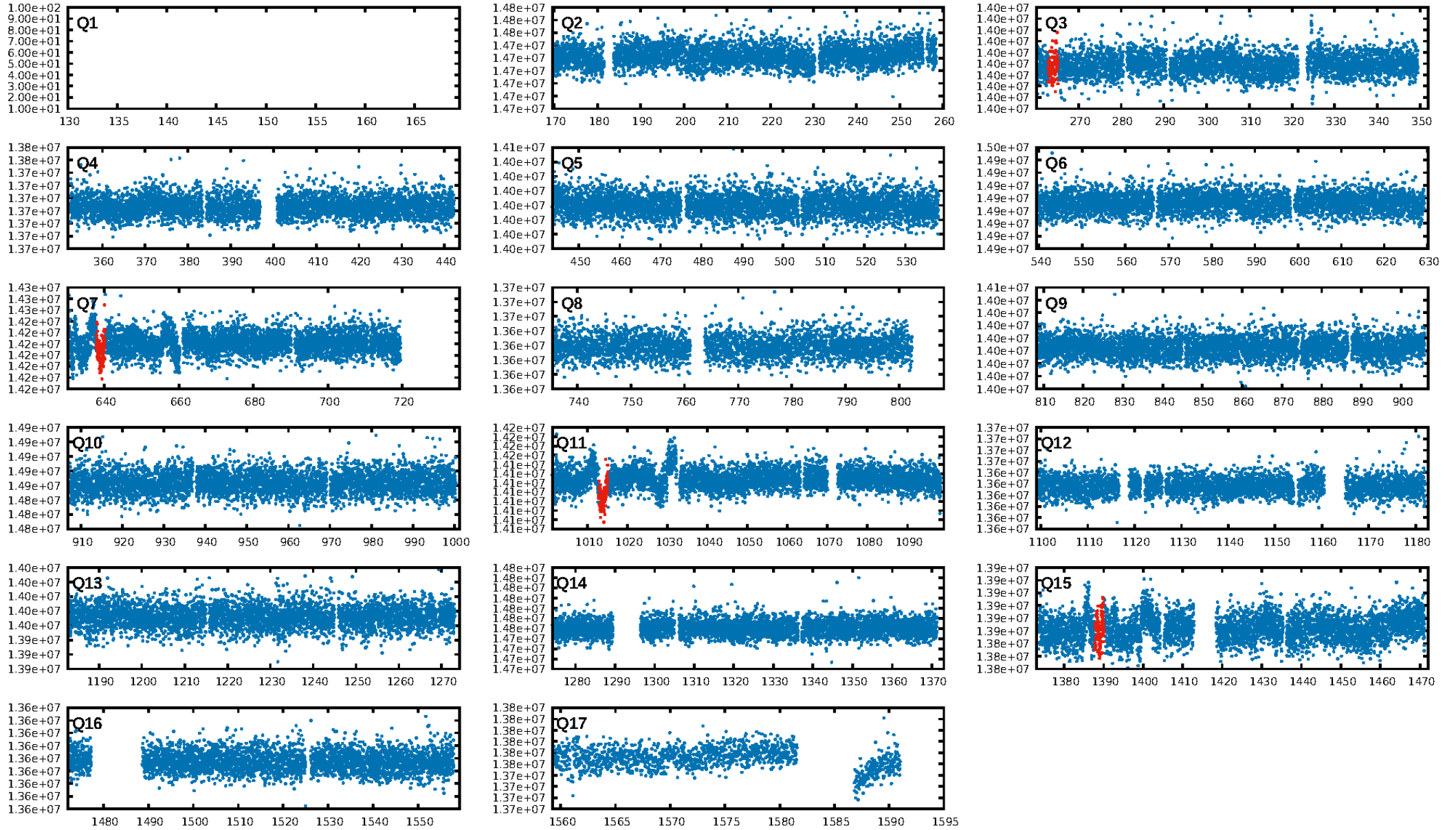
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.77e-11  
RollingBand-fgt: 0.25 [1/4]  
GhostDiagnostic-chr: 0.2676  
Centroid-sig: 73.2%  
Centroid-so: 1.025 arcsec [0.66σ]  
OotOffset-rm: 2.543 arcsec [1.40σ]  
OotOffset-st: 0/2/0/0 [2]  
KicOffset-rm: 2.601 arcsec [1.43σ]  
KicOffset-st: 0/2/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [3/3]

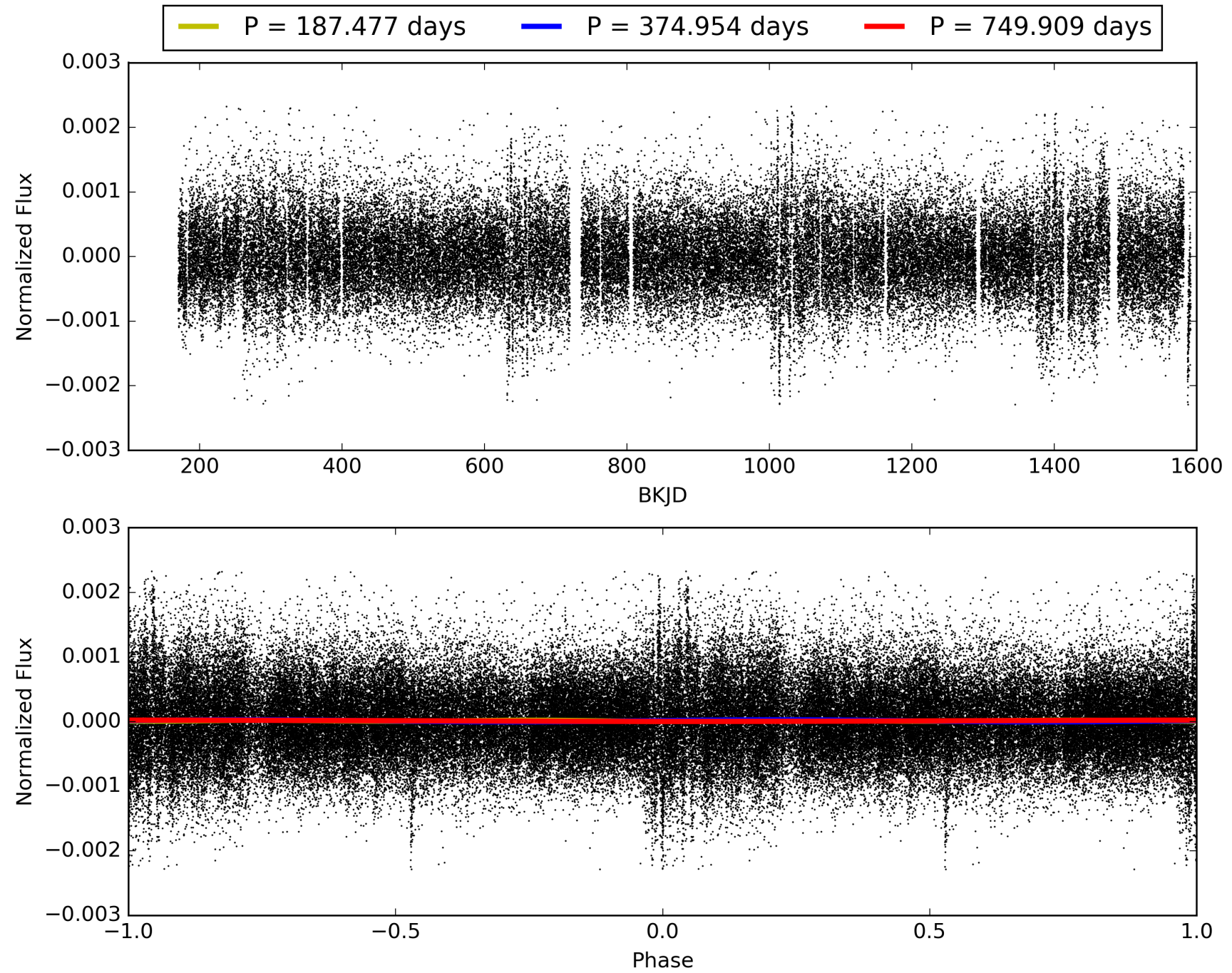
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:00:31 Z

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

# TCE 008023238-01, PDC Light Curves

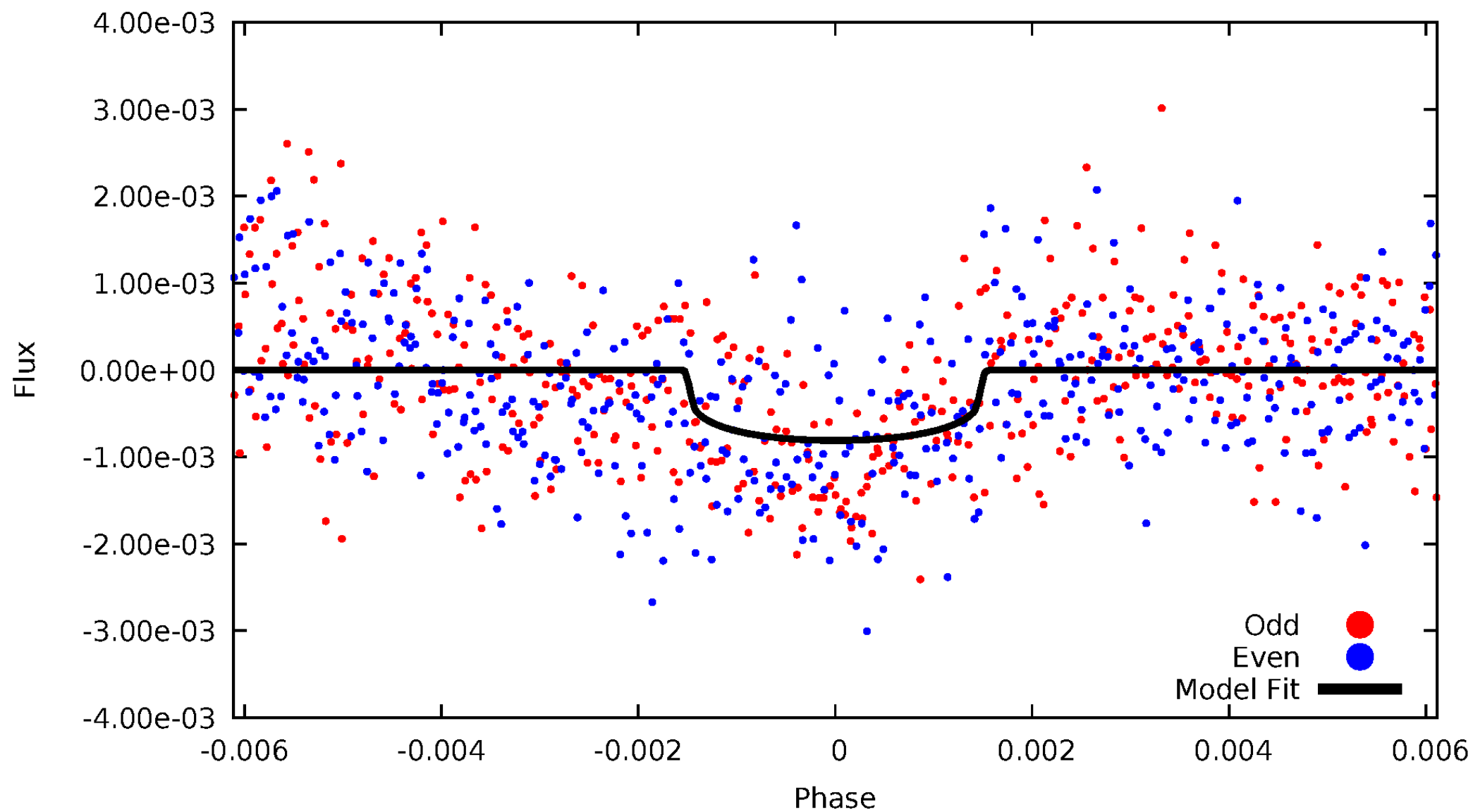


TCE 008023238-01



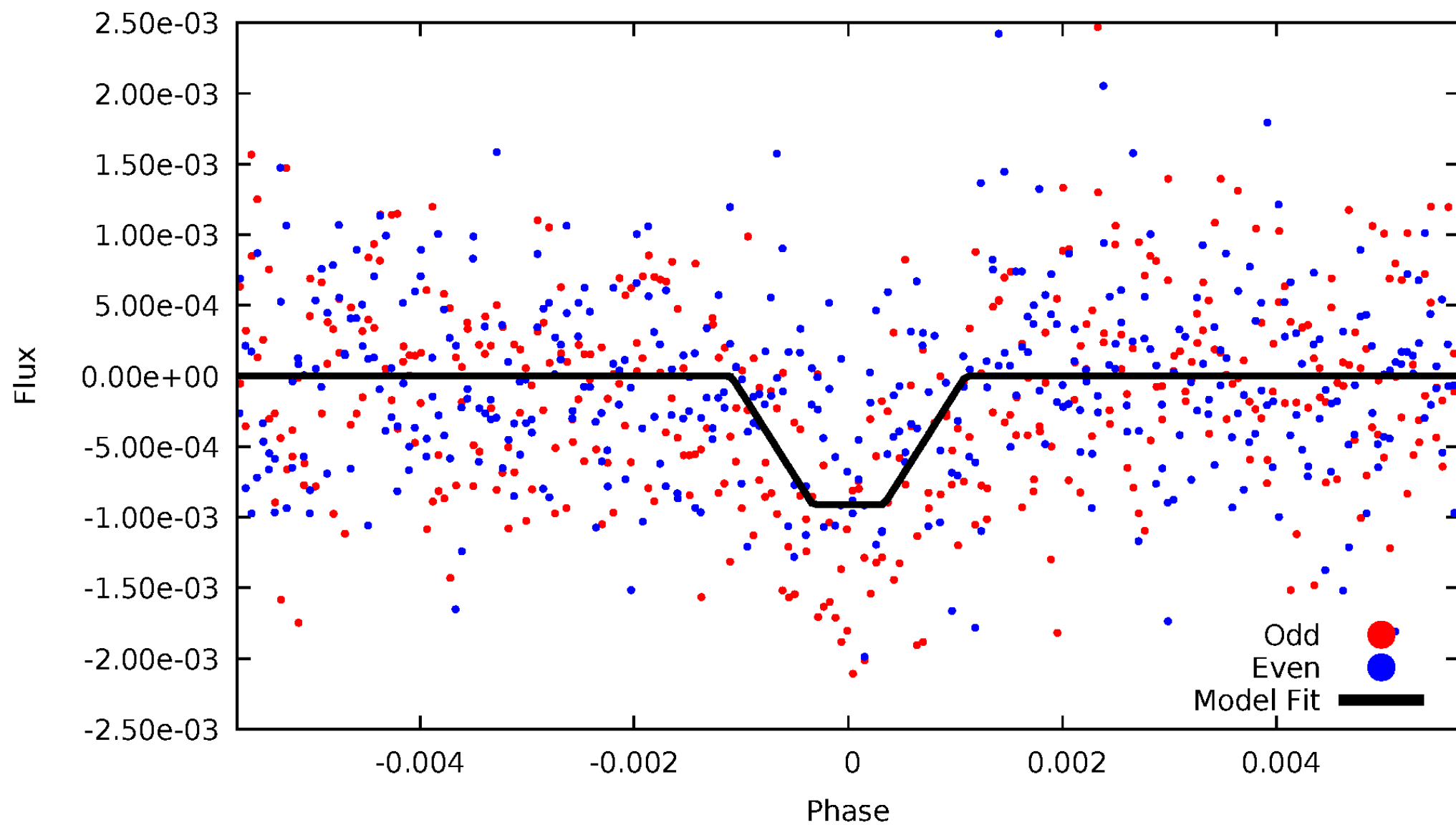
# DV Odd/Even

TCE 008023238-01



# ALT Odd/Even

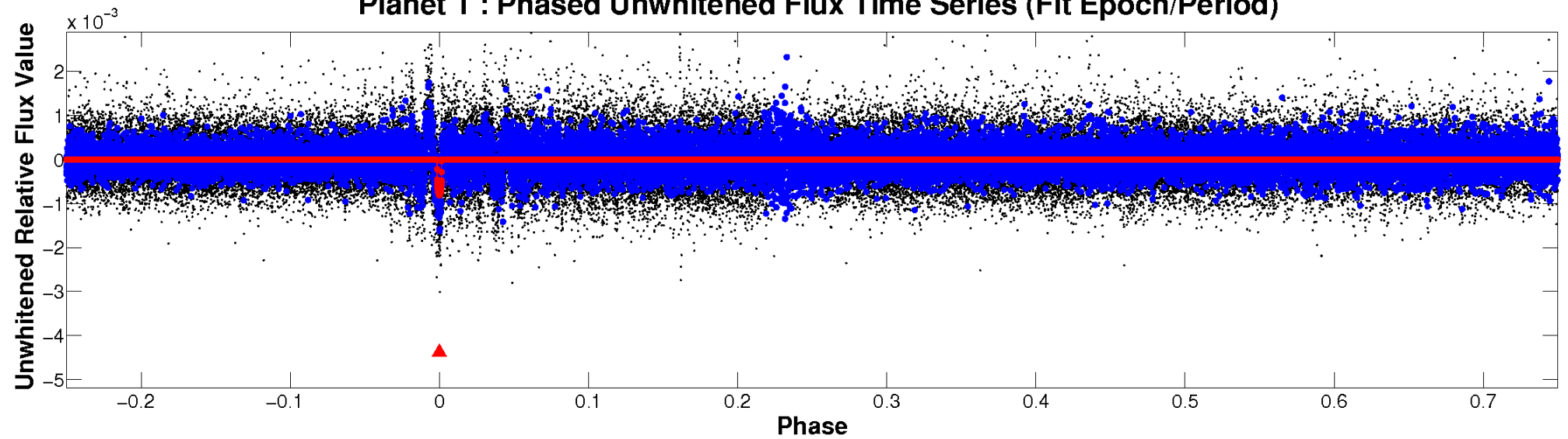
TCE 008023238-01



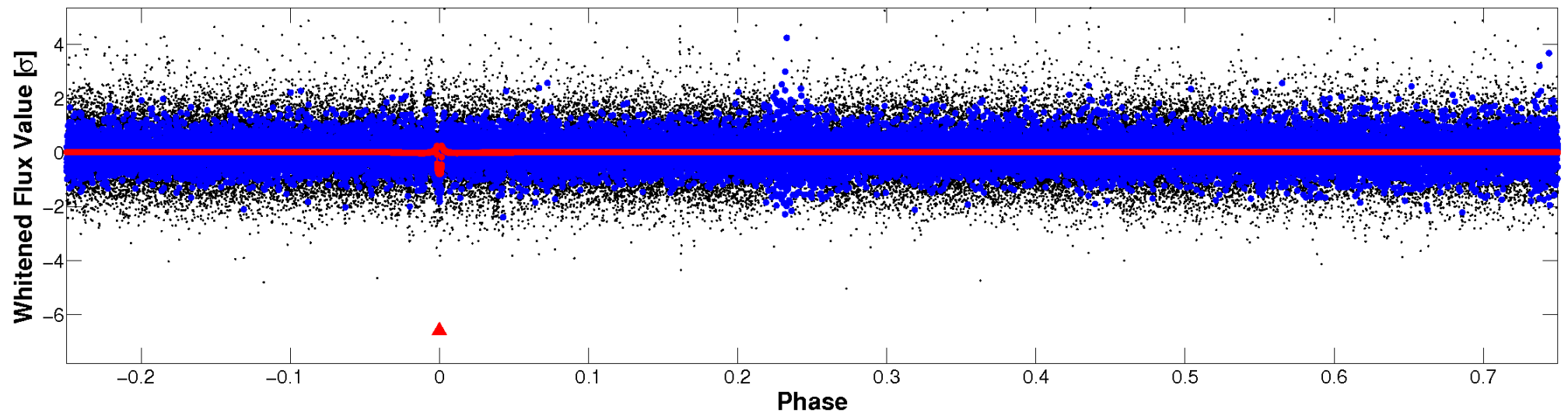


# Non-Whitened Vs. Whitened Light Curve

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

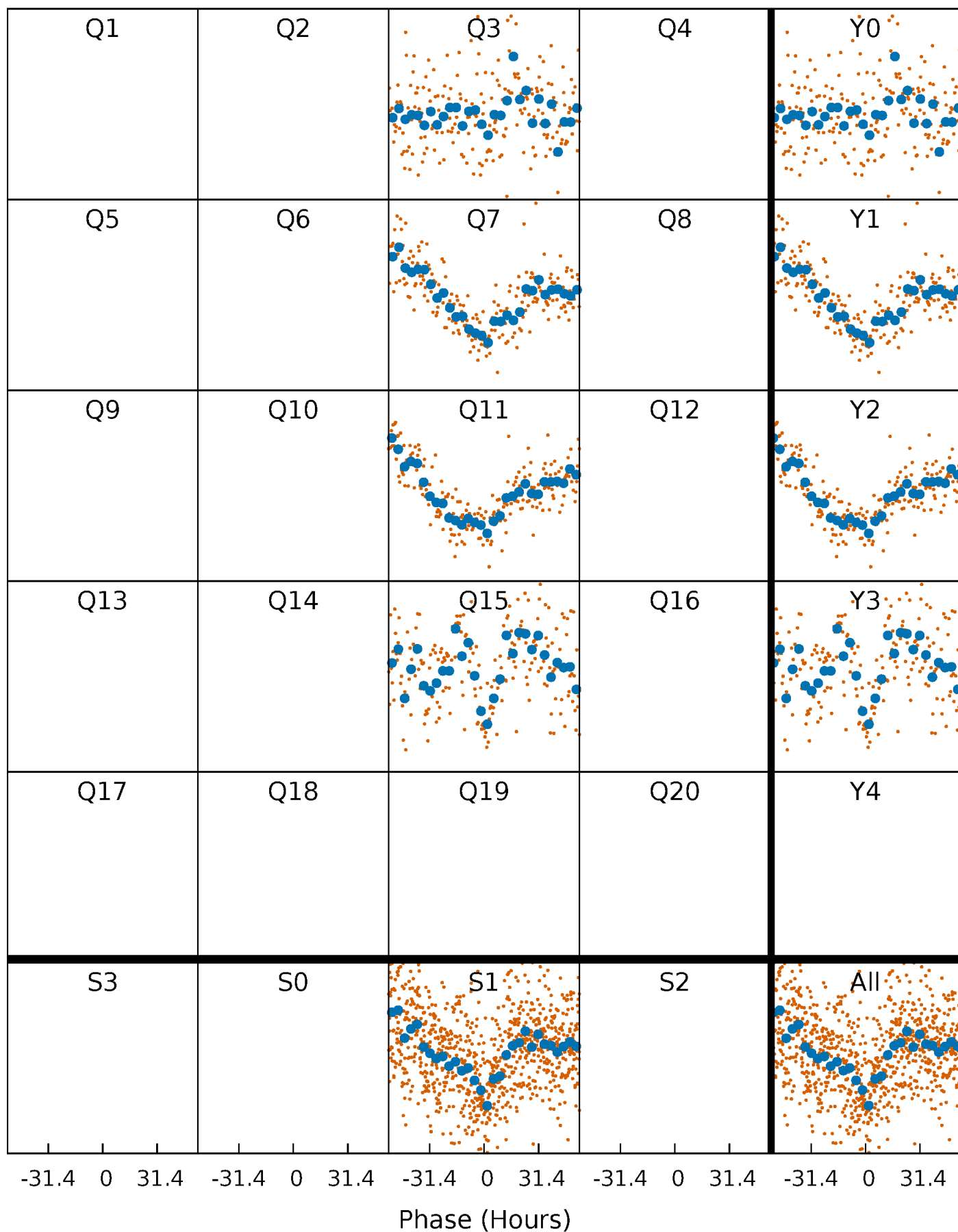


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

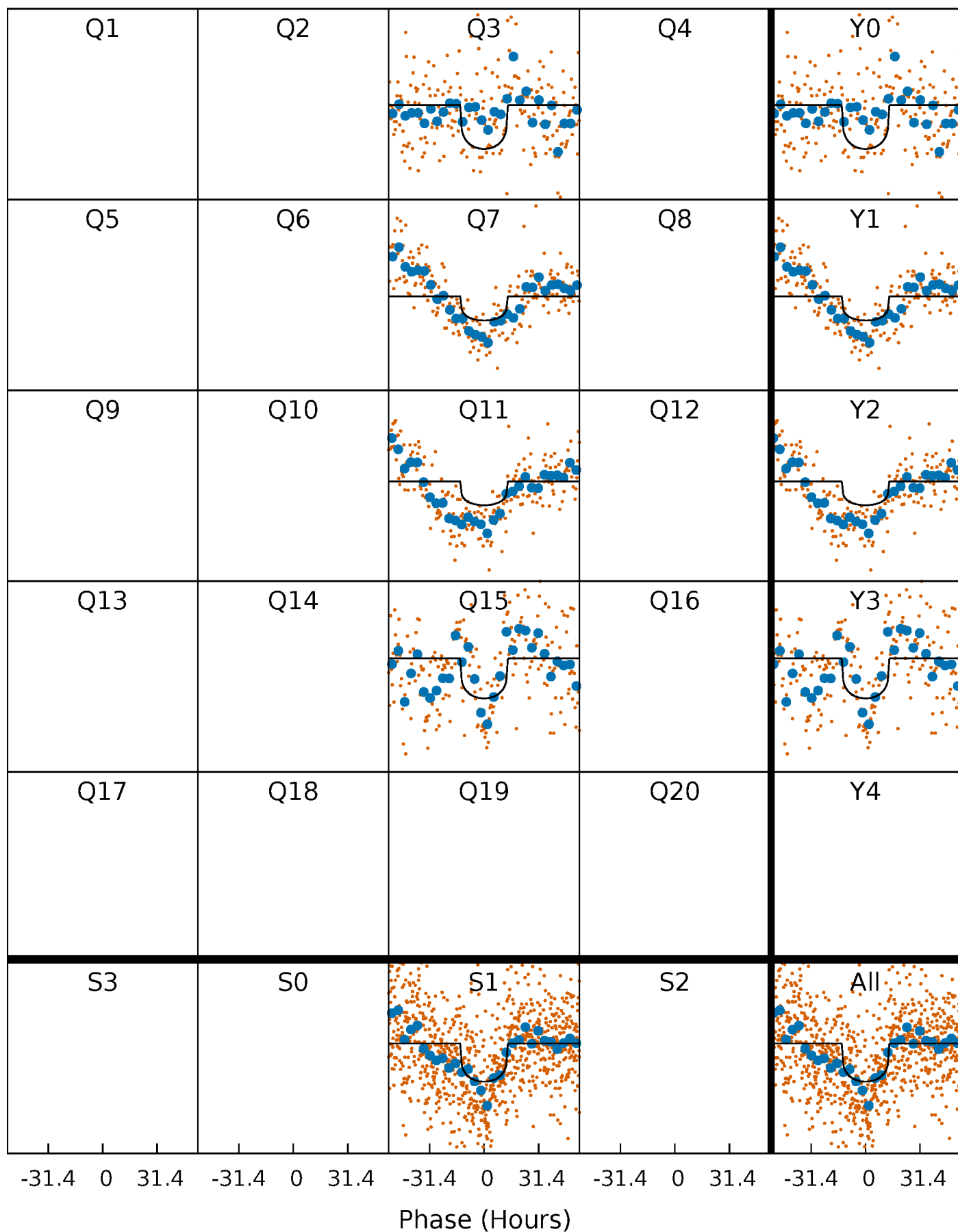
TCE 008023238-01 P=374.954443 Days  $T_0=264.050712$  (BKJD)





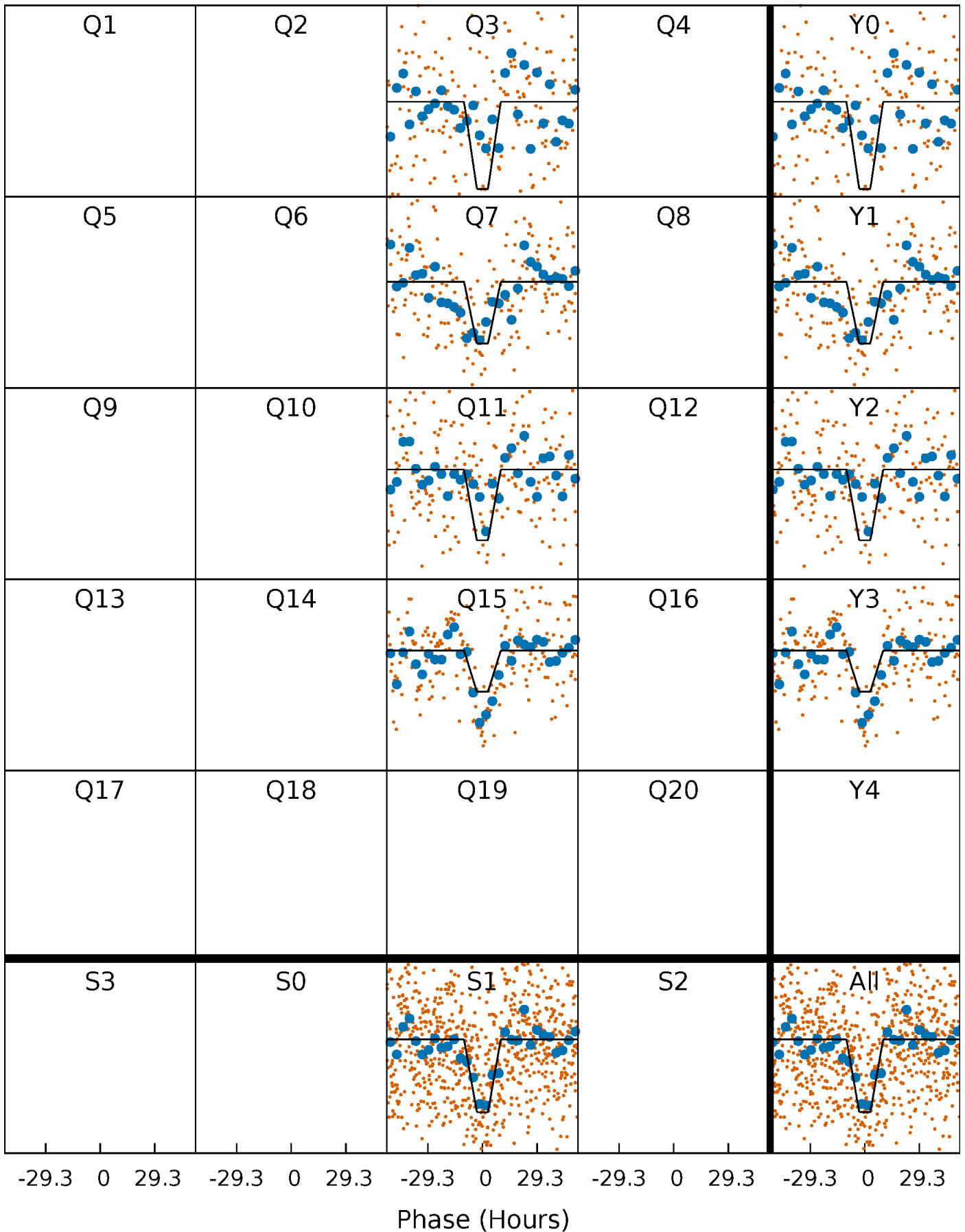
# DV Quarter-Phased Transit Curves

TCE 008023238-01 P=374.954443 Days  $T_0=264.050712$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

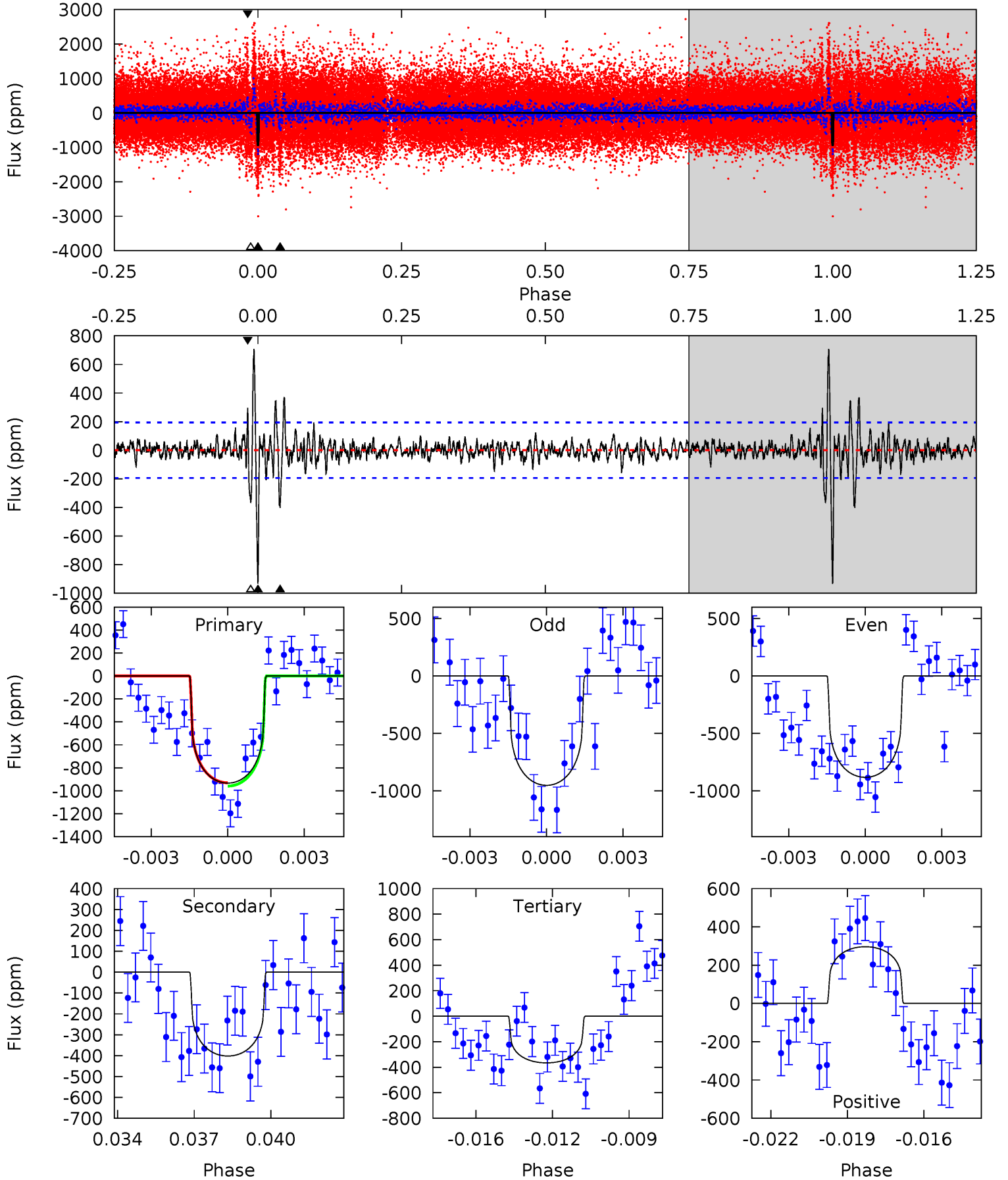
TCE 008023238-01     $P=374.935392$  Days     $T_0=264.153722$  (BKJD)



# DV Model-Shift Uniqueness Test

008023238-01,  $P = 374.954443$  Days,  $E = 264.050712$  Days

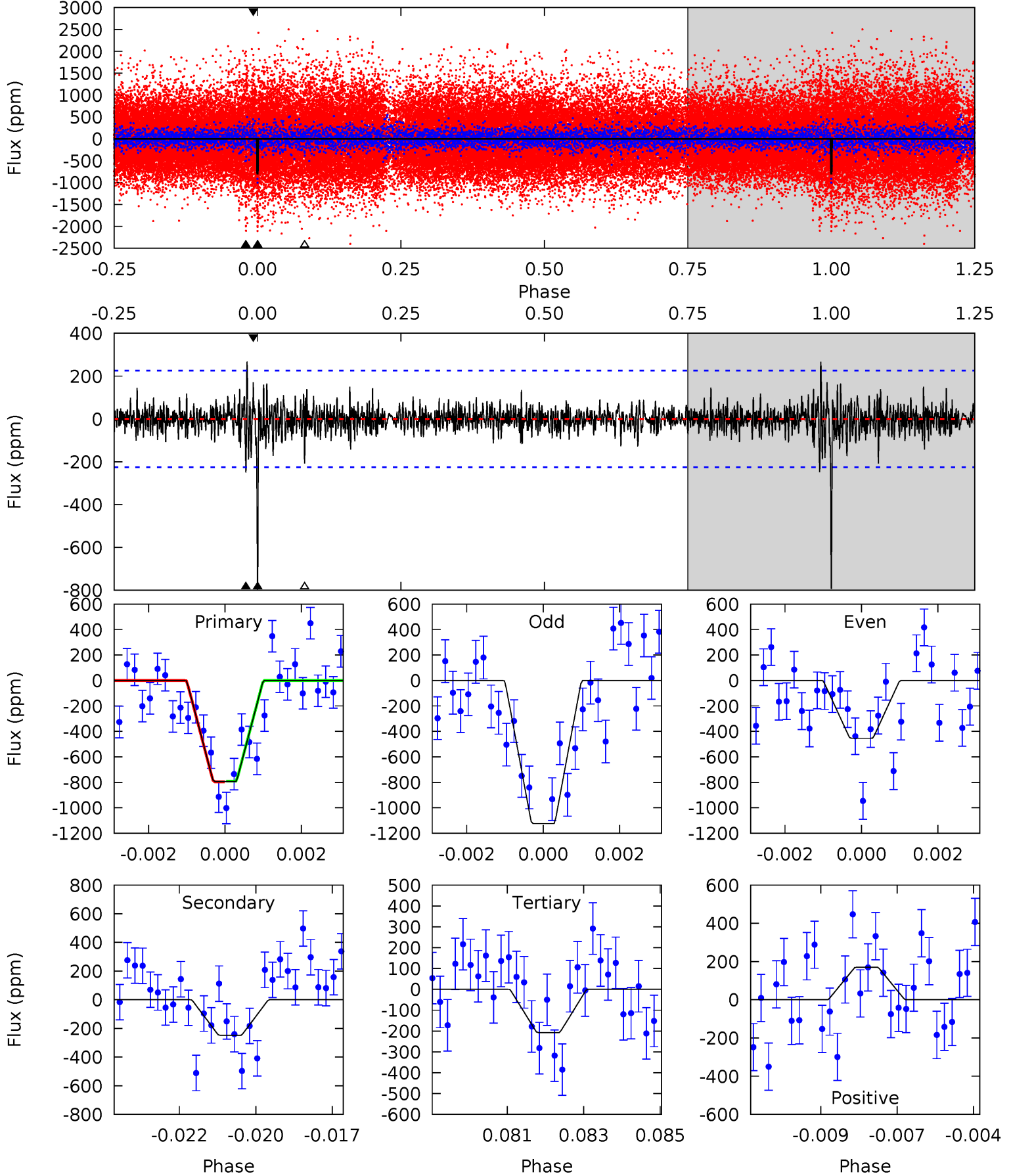
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 25.2 | 10.9 | 9.89 | 8.02 | 5.25            | 2.96            | 1.93             | 15.3    | 17.2    | 0.97    | 2.85    | 0.95    | 0.96 | 0.43  | 0.38 |



# Alt Model-Shift Uniqueness Test

008023238-01, P = 374.935392 Days, E = 264.153722 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 18.7 | 5.84 | 4.88 | 4.01 | 5.31            | 3.06            | 1.06             | 13.8    | 14.7    | 0.96    | 1.82    | 7.91    | 1.25 | 0.25  | 0.07 |



### Stellar Parameters For KIC 008023238

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5392^{+160}_{-160}$ | $4.500^{+0.104}_{-0.104}$ | $-0.440^{+0.350}_{-0.300}$ | $0.793^{+0.120}_{-0.109}$ | $0.726^{+0.107}_{-0.046}$ | $2.048^{+1.051}_{-0.640}$                     |
|        | +3%/-3%              | +2%/-2%                   | +80%/-68%                  | +15%/-14%                 | +15%/-6%                  | +51%/-31%                                     |
| 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 008023238-01 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{\text{max}}$ (K) | $T_{\text{obs}}$ (K)  | $A_{\text{obs}}$          |
|---------|---------------|------------------------|----------------------|-----------------------|---------------------------|
| DV      | $-402 \pm 37$ | $2.28^{+0.89}_{-0.87}$ | $309^{+15}_{-15}$    | $4807^{+1167}_{-569}$ | $36766^{+57903}_{-17668}$ |
| Alt.    | $-248 \pm 42$ | $2.67^{+0.95}_{-0.88}$ | $310^{+15}_{-14}$    | $4116^{+744}_{-420}$  | $16062^{+20447}_{-7622}$  |

$T_{\text{max}}$  = 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

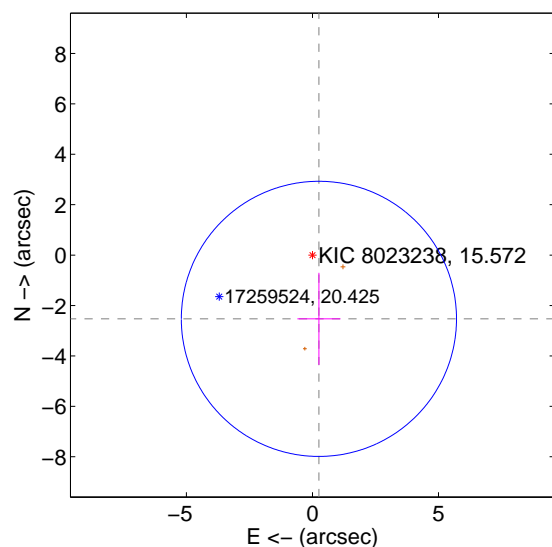
Supplemental centroid analysis for 008023238-01. Kepler magnitude: 15.57. Transit SNR 10.44

There are 0 quarters with good PRF difference image offsets

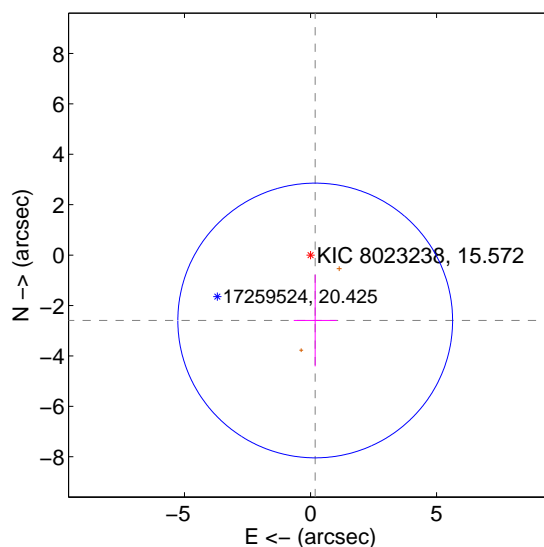
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $2.543 \pm 1.820$  | 1.40                | $-0.257 \pm 0.855$ | $-2.530 \pm 1.827$ |
| PRF-fit source offset from KIC position | $2.601 \pm 1.817$  | 1.43                | $-0.186 \pm 0.851$ | $-2.594 \pm 1.820$ |
| photometric centroid source offset      | $1.02 \pm 1.55$    | 0.66                | $-0.85 \pm 1.32$   | $-0.58 \pm 1.95$   |

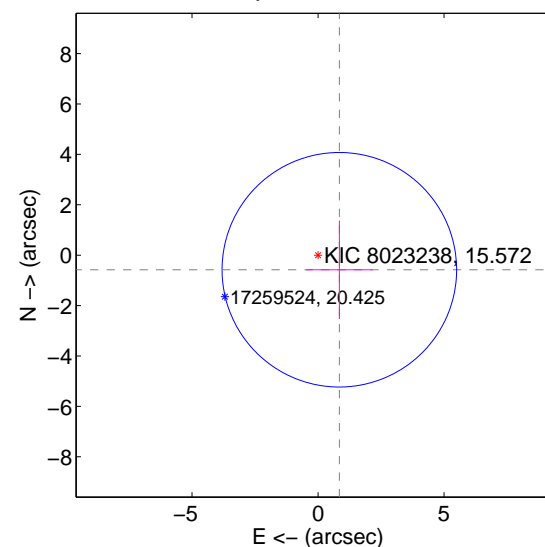
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



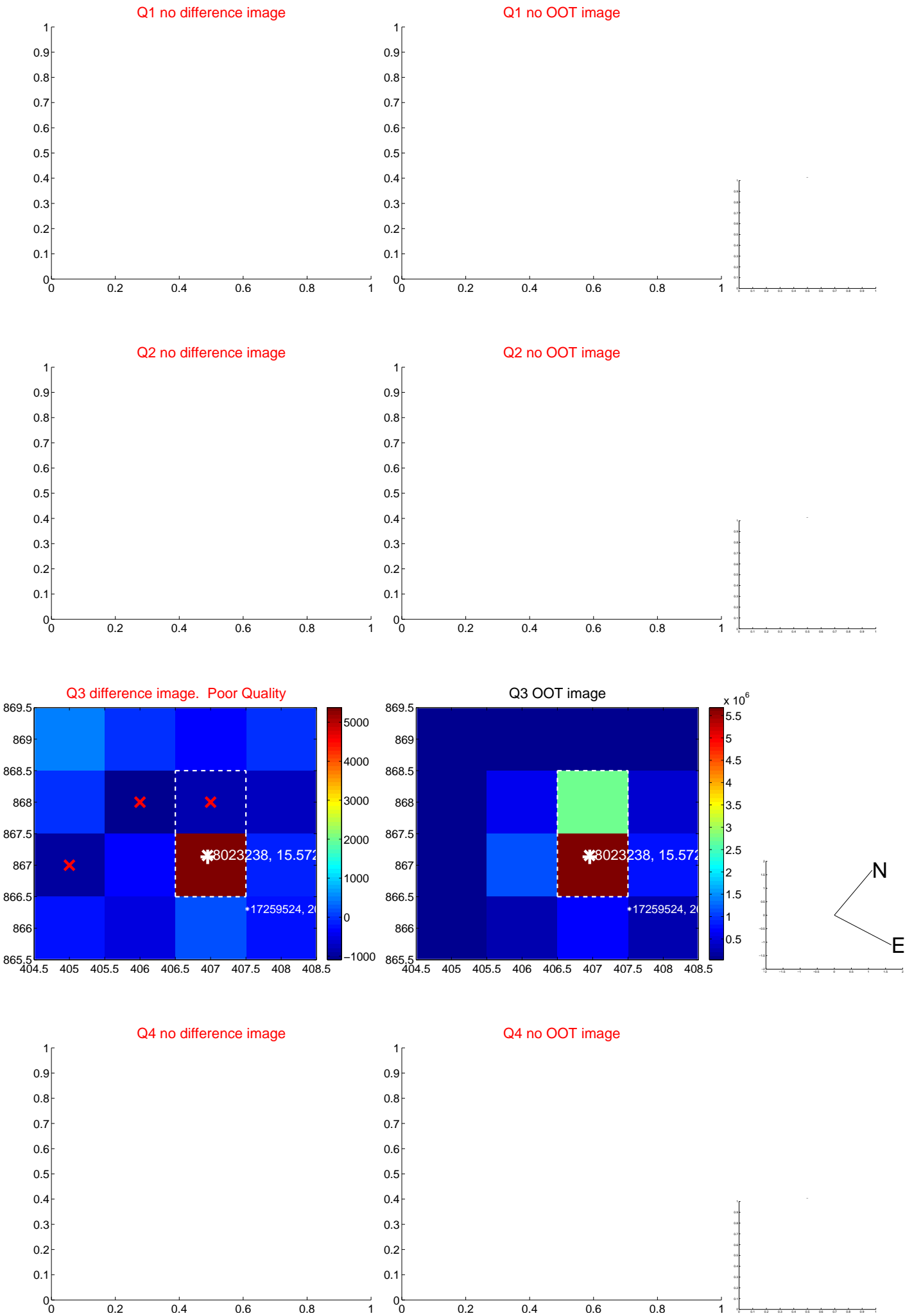
offset from photometric centroids



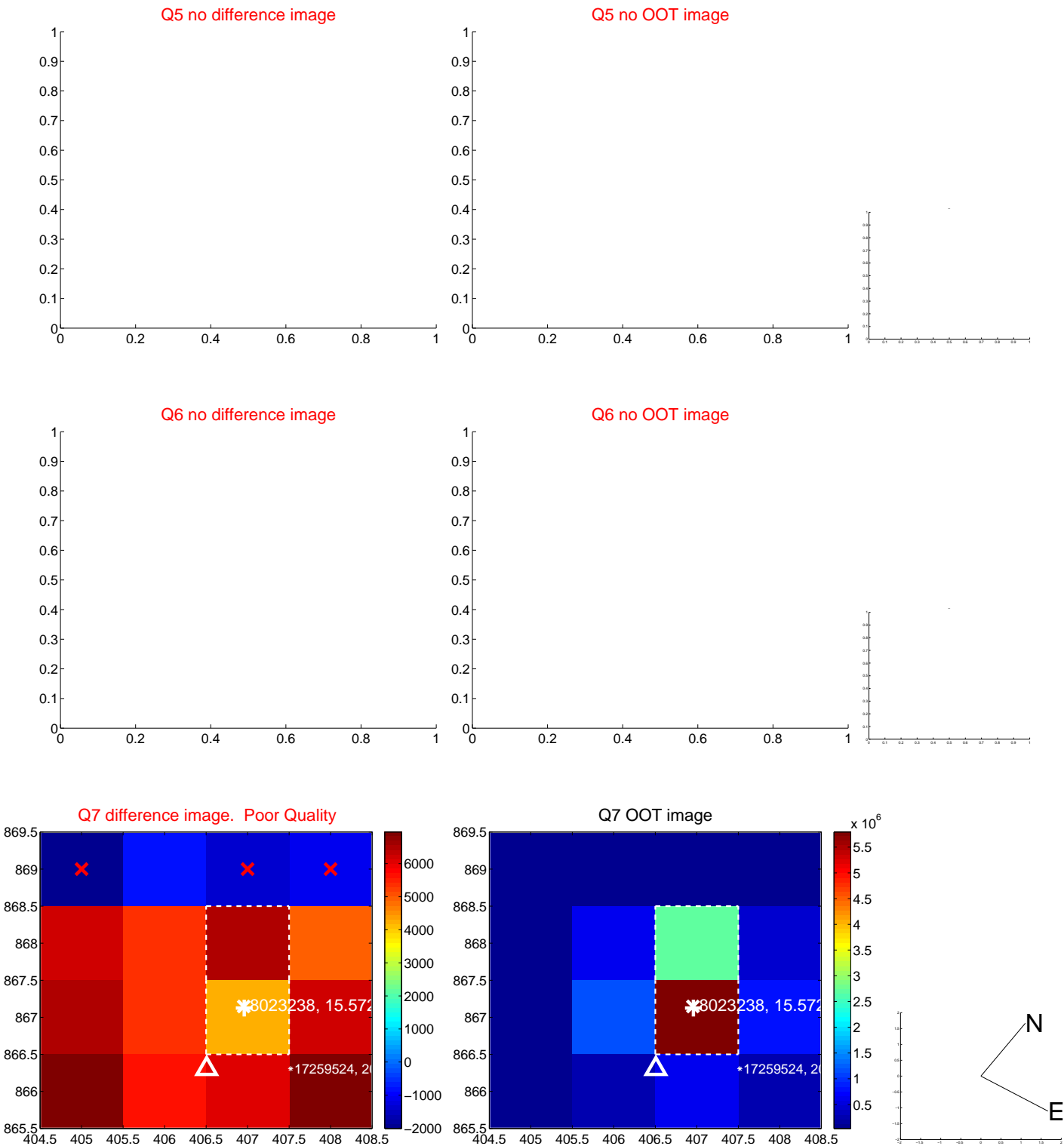
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



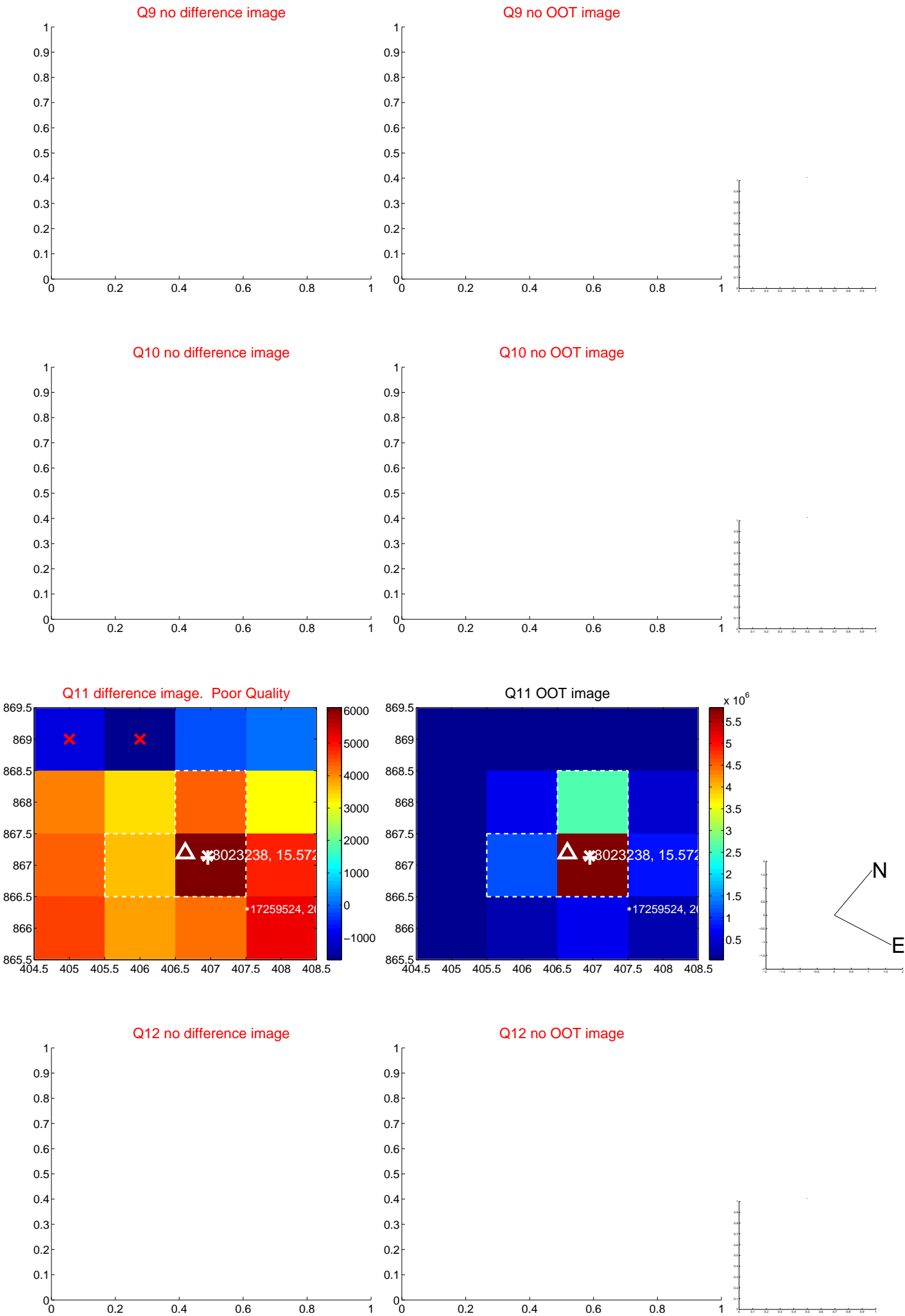
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



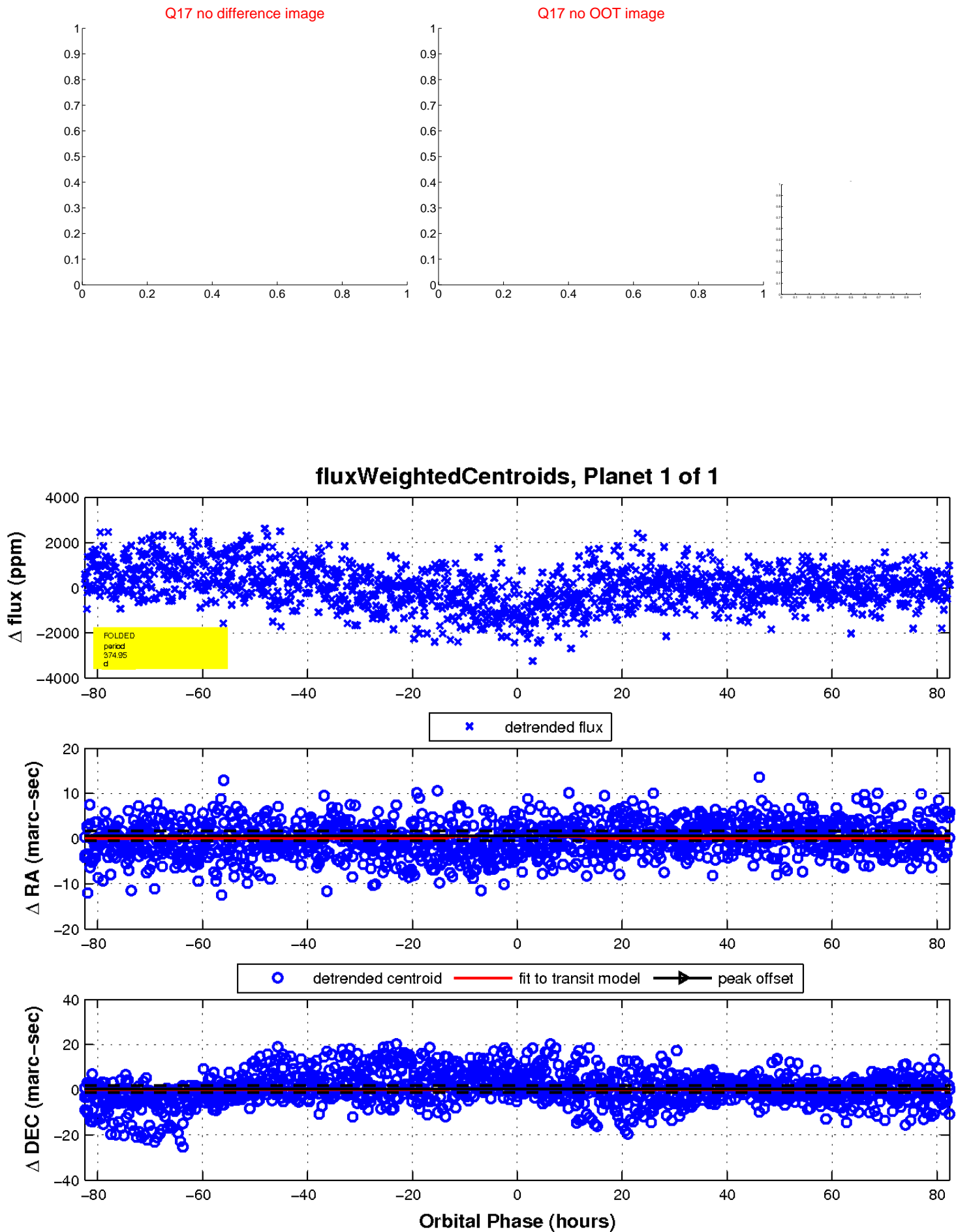
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : 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

