

# KIC 010122255

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010122255-01 | OBS      | 1086.01 | 27.665409     | 144.867578   | 473.5       | 6.882            | 32.0 | 34.0 | 1.02                        | 6036            | 2.48                   | 40.01                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|------------|
| 010122255-01 | 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.

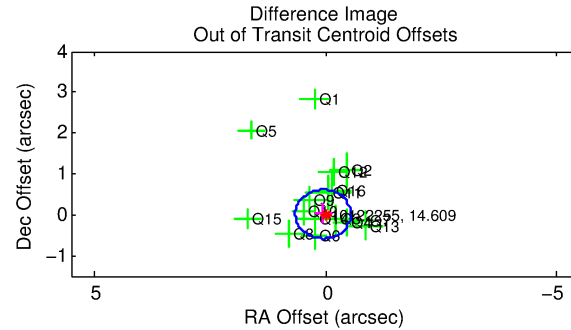
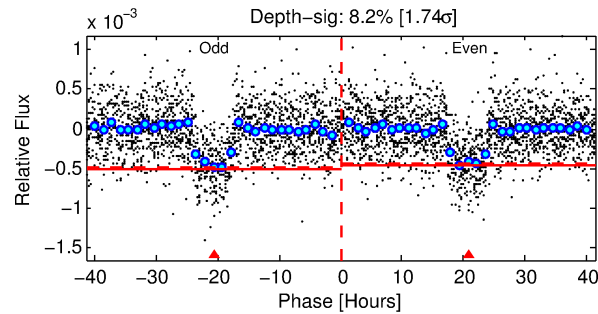
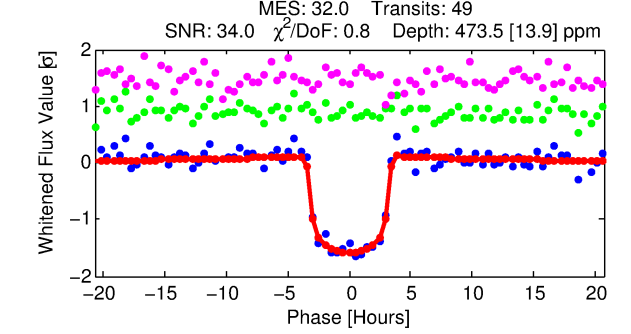
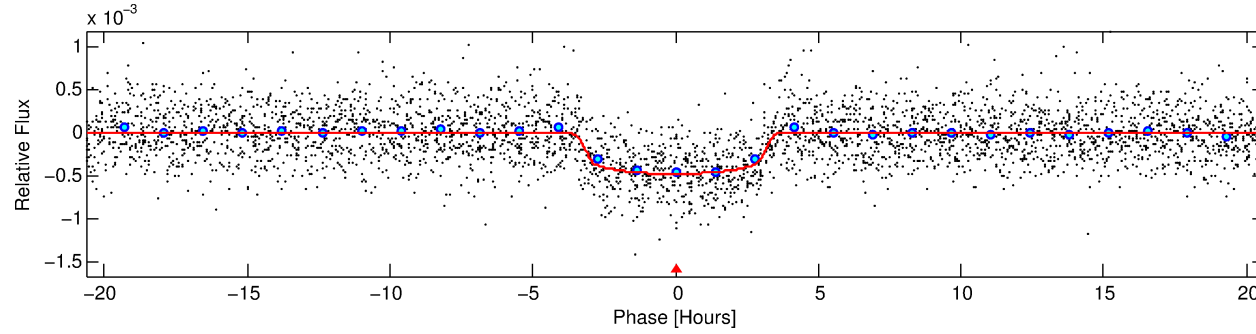
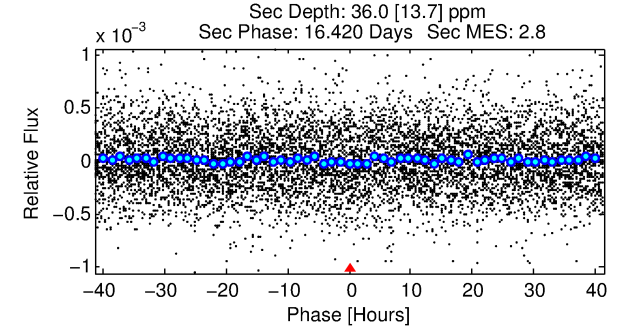
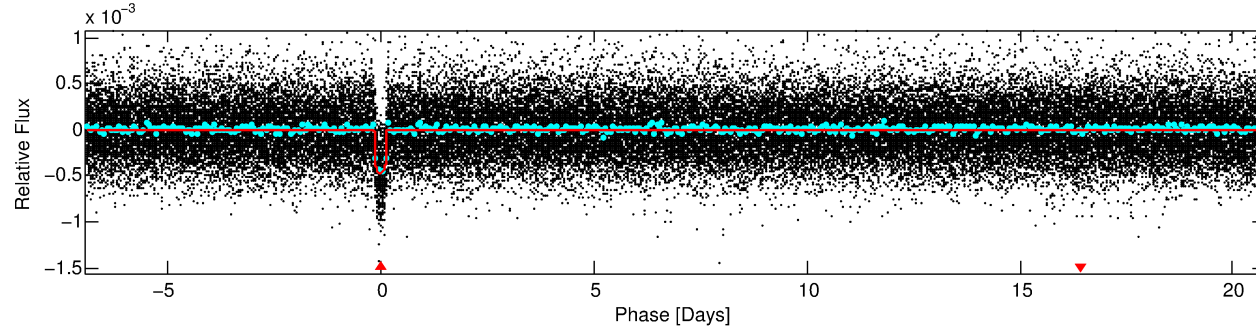
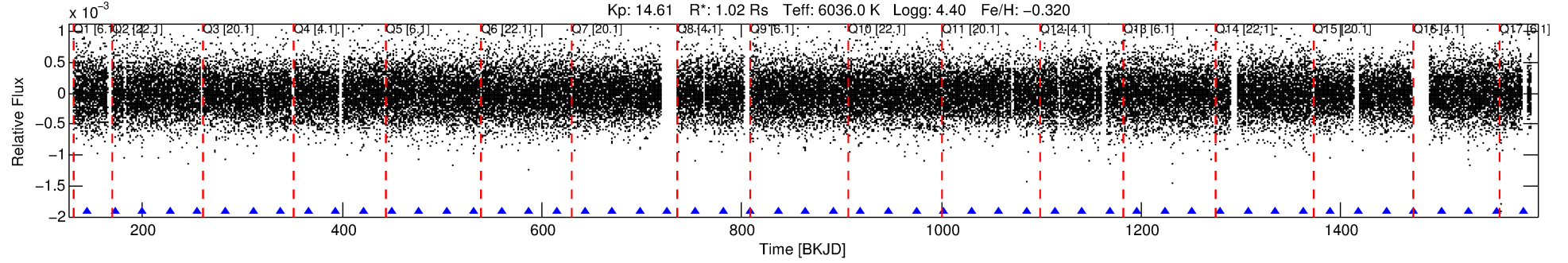
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010122255-01

No Significant Match Found

# DV One-Page Summary

KIC: 10122255 Candidate: 1 of 1 Period: 27.665 d  
KOI: K01086.01 Corr: 0.973



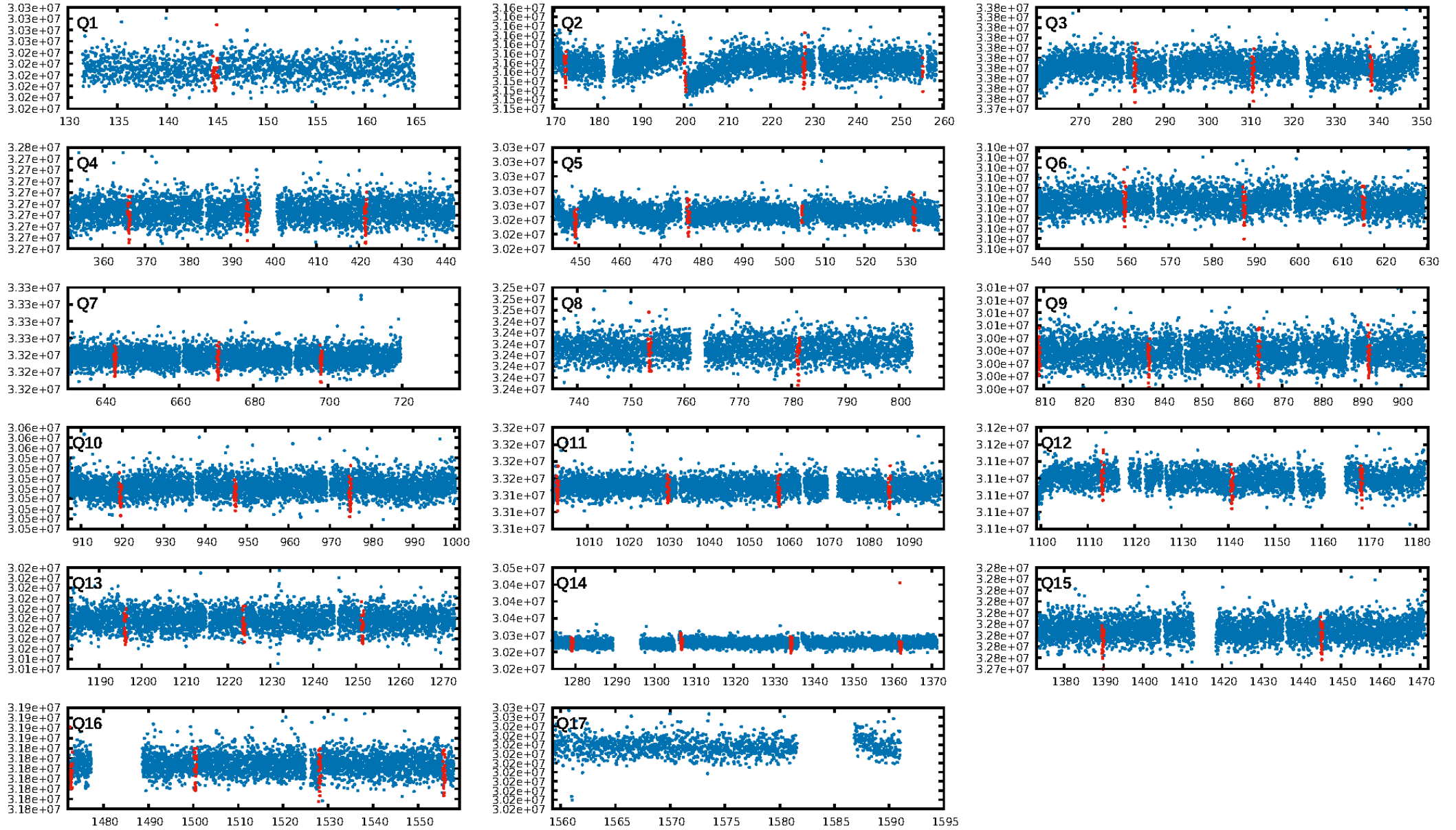
## DV Fit Results:

Period = 27.66541 [0.00013] d  
Epoch = 144.8676 [0.0038] BKJD  
Rp/R\* = 0.0223 [0.0018]  
a/R\* = 18.56 [7.42]  
b = 0.83 [0.16]  
Seff = 40.01 [15.09]  
T<sub>eq</sub> = 641 [60] K  
Rp = 2.48 [0.75] R<sub>e</sub>  
a = 0.1753 [0.0431] AU  
Ag = 99.22 [54.26] [1.81σ]  
T<sub>eff</sub> = 3129 [337] K [7.26σ]

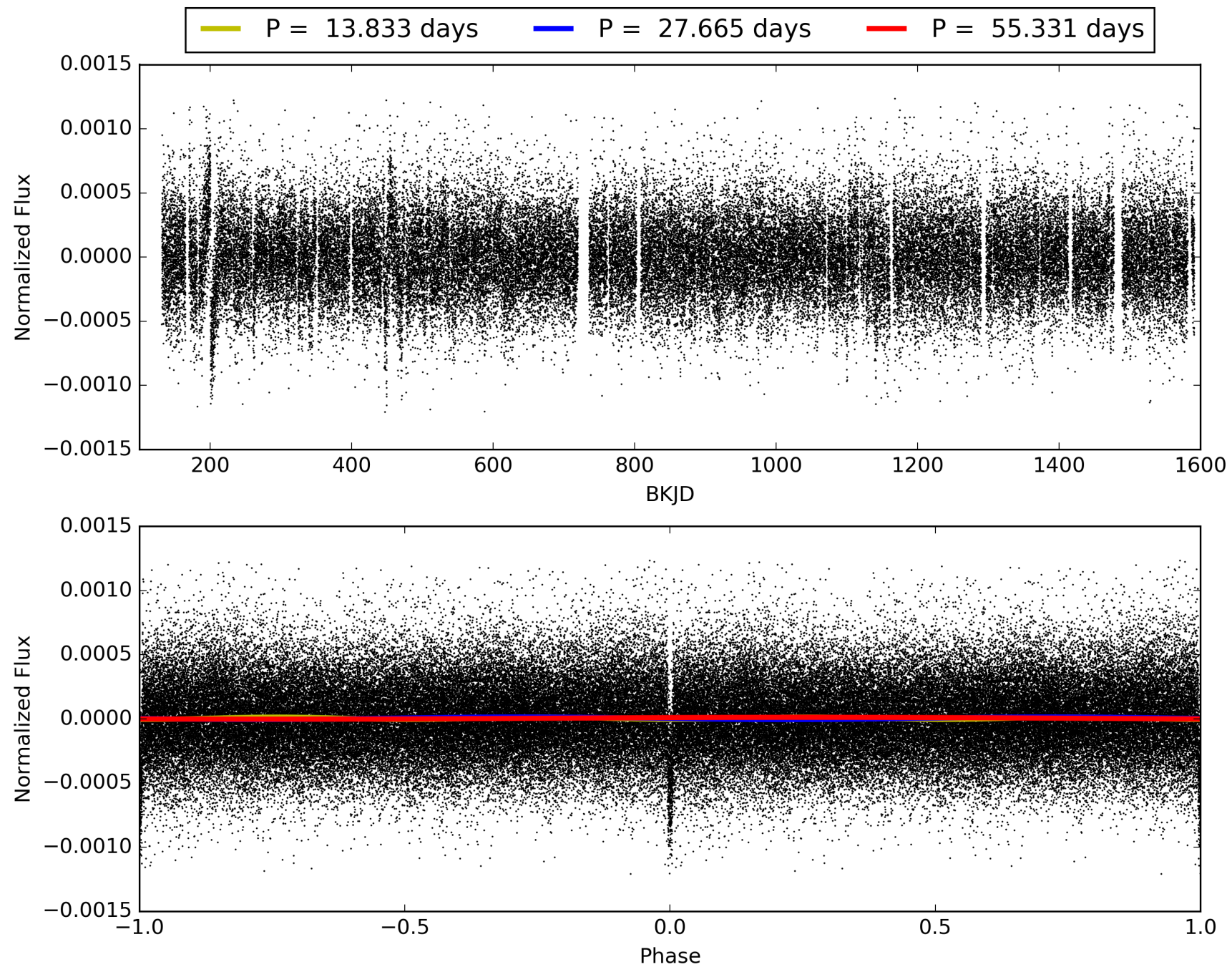
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.34e-205  
RollingBand-fgt: 1.00 [48/48]  
GhostDiagnostic-chr: 4.124  
Centroid-sig: 42.3%  
Centroid-so: 0.386 arcsec [0.96σ]  
OotOffset-rm: 0.055 arcsec [0.27σ]  
KicOffset-rm: 0.227 arcsec [0.90σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [16/16]

# TCE 010122255-01, PDC Light Curves

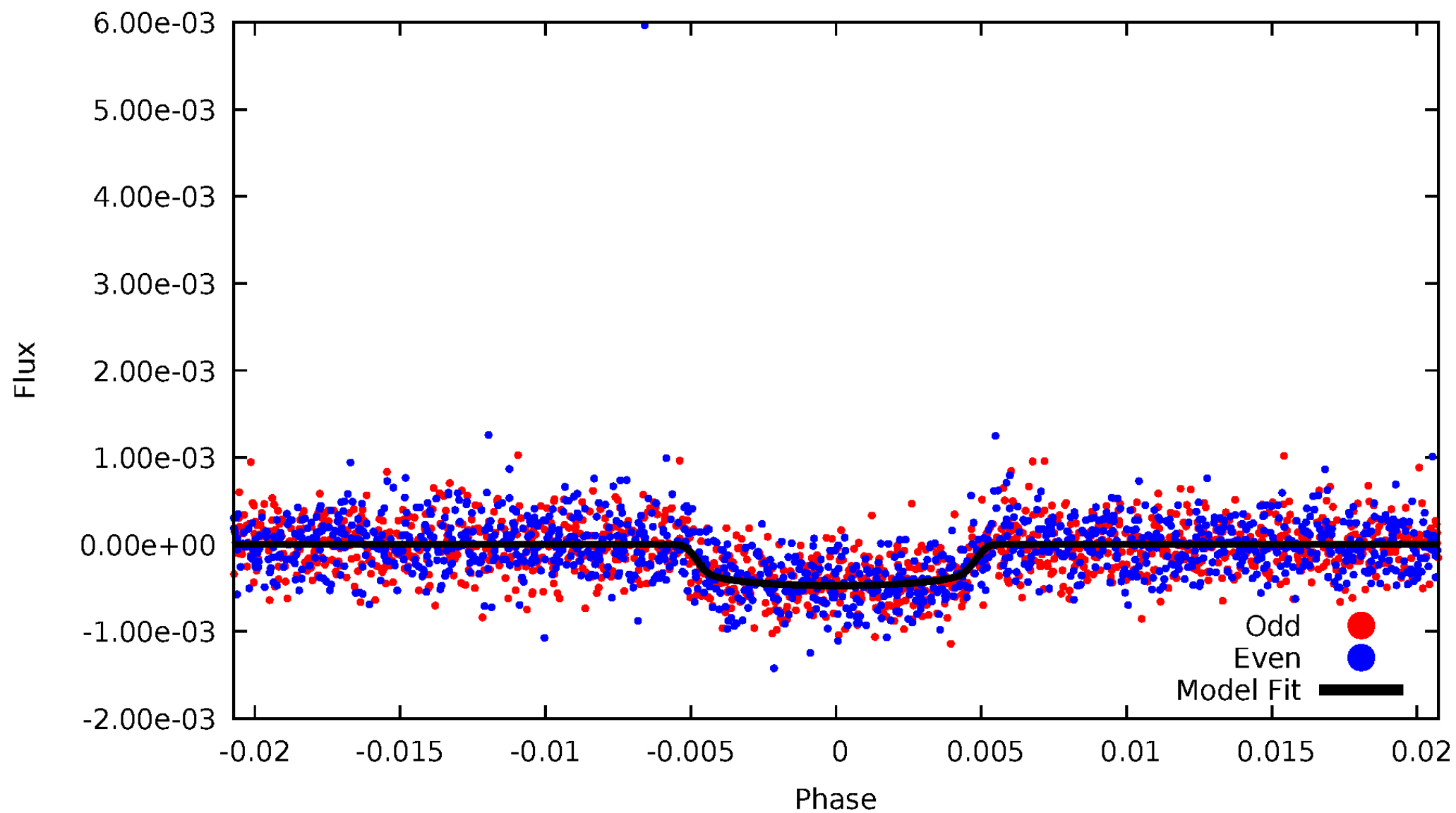


# TCE 010122255-01



# DV Odd/Even

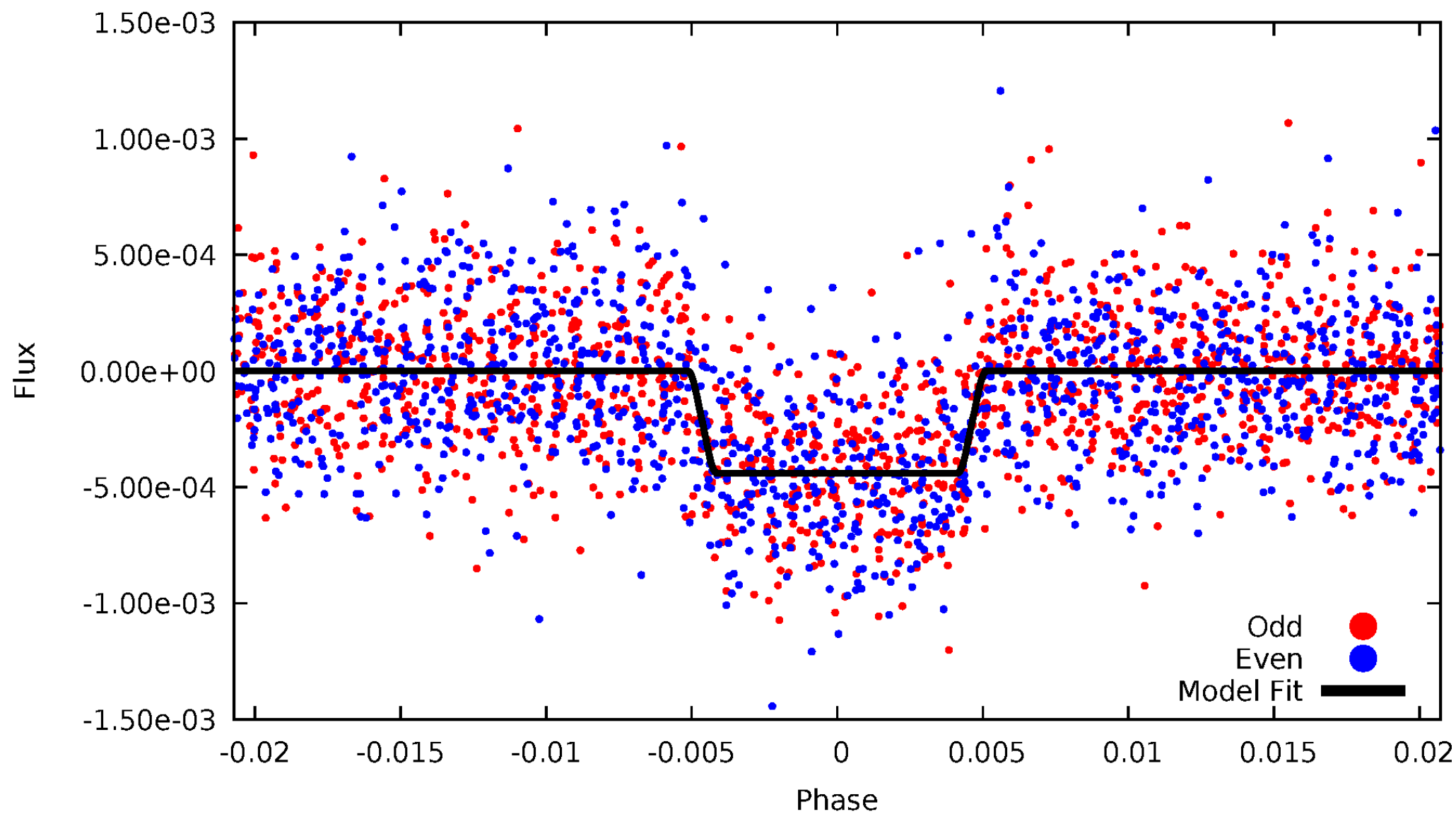
TCE 010122255-01





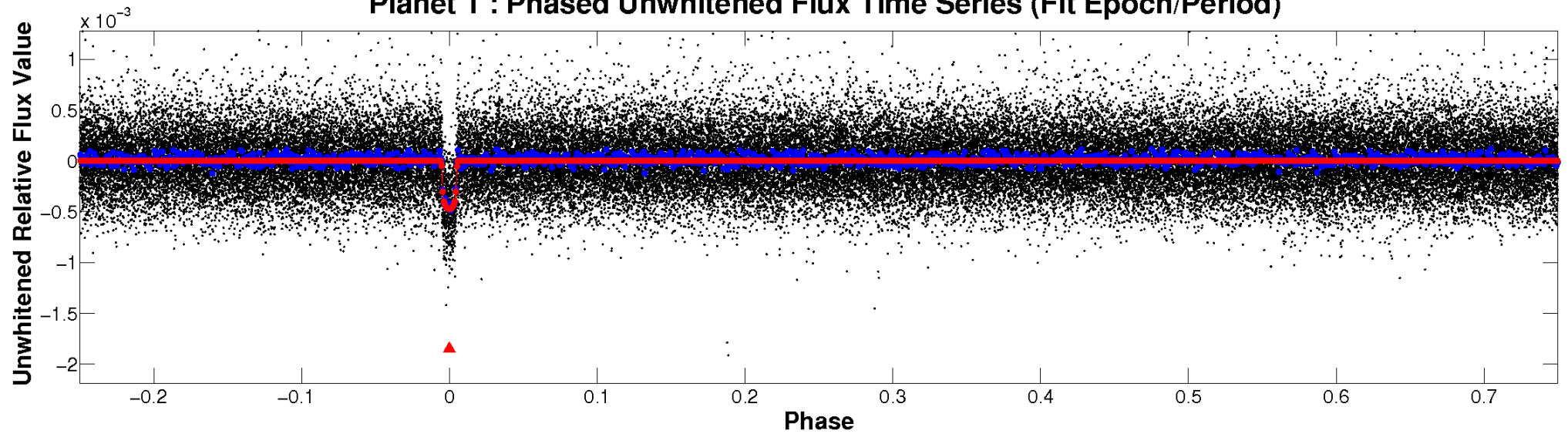
# ALT Odd/Even

TCE 010122255-01

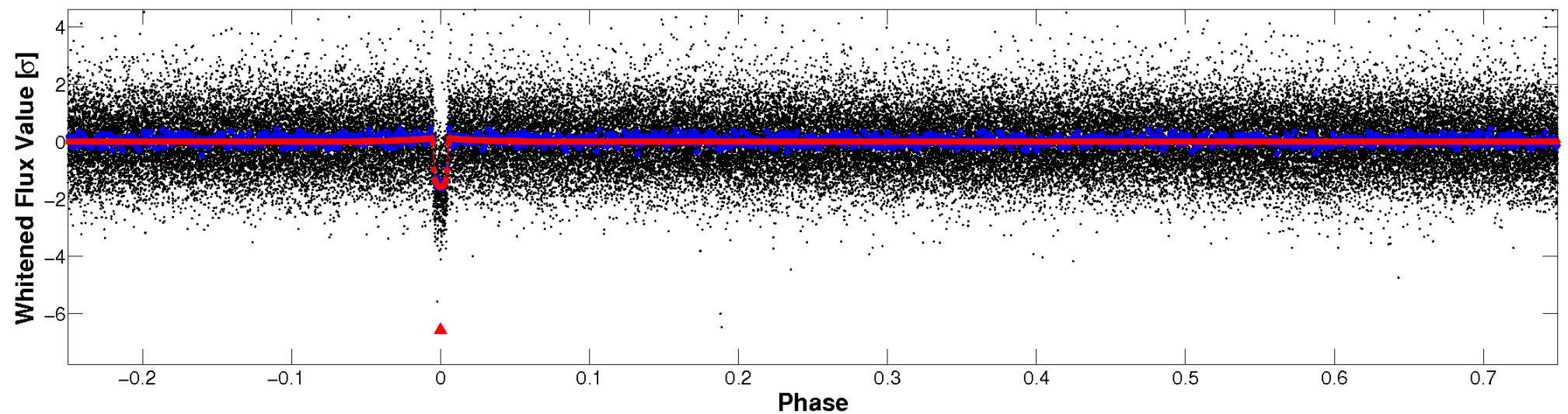


# Non-Whitened Vs. Whitened Light Curve

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

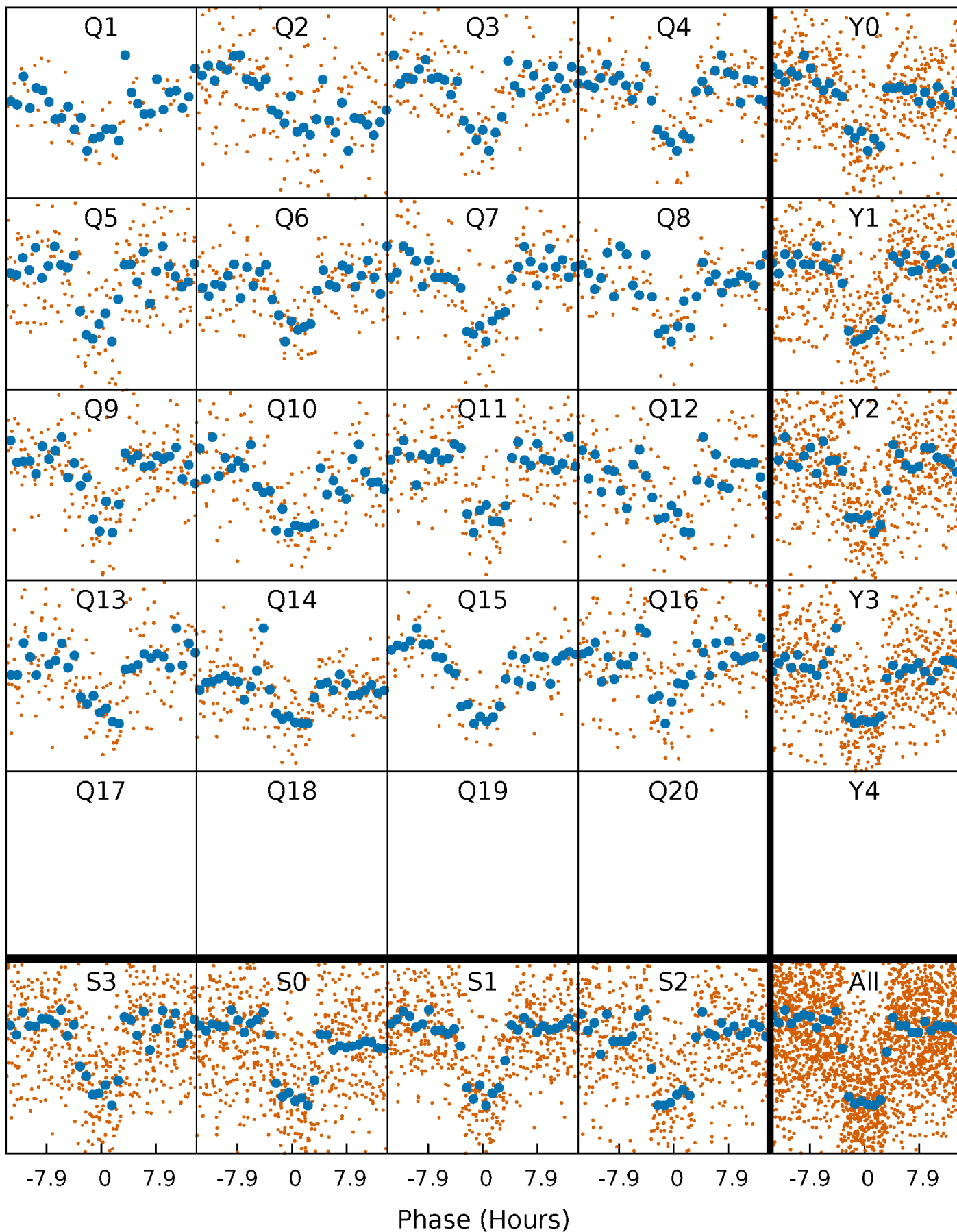


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

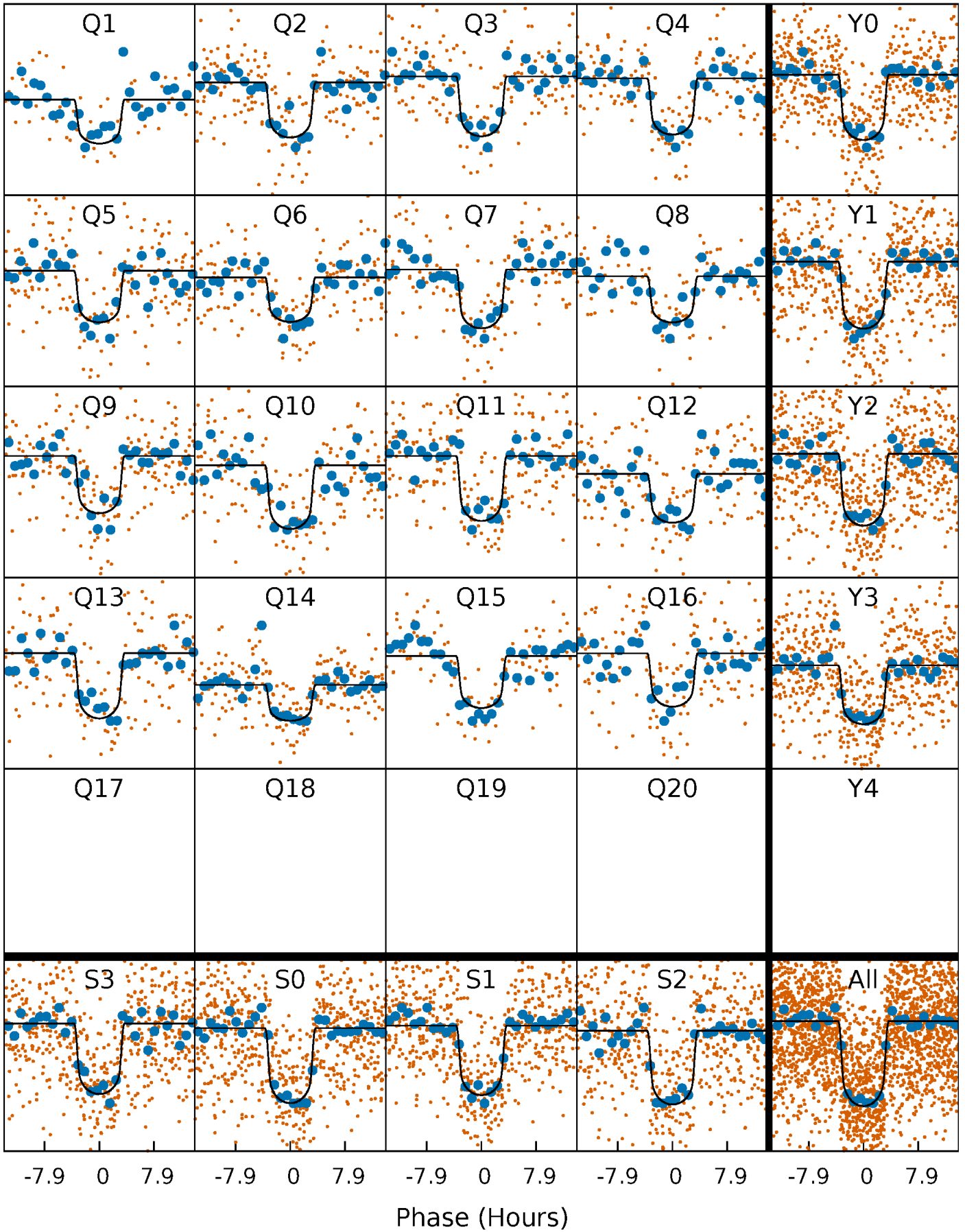
TCE 010122255-01 P= 27.665409 Days  $T_0=144.867578$  (BKJD)





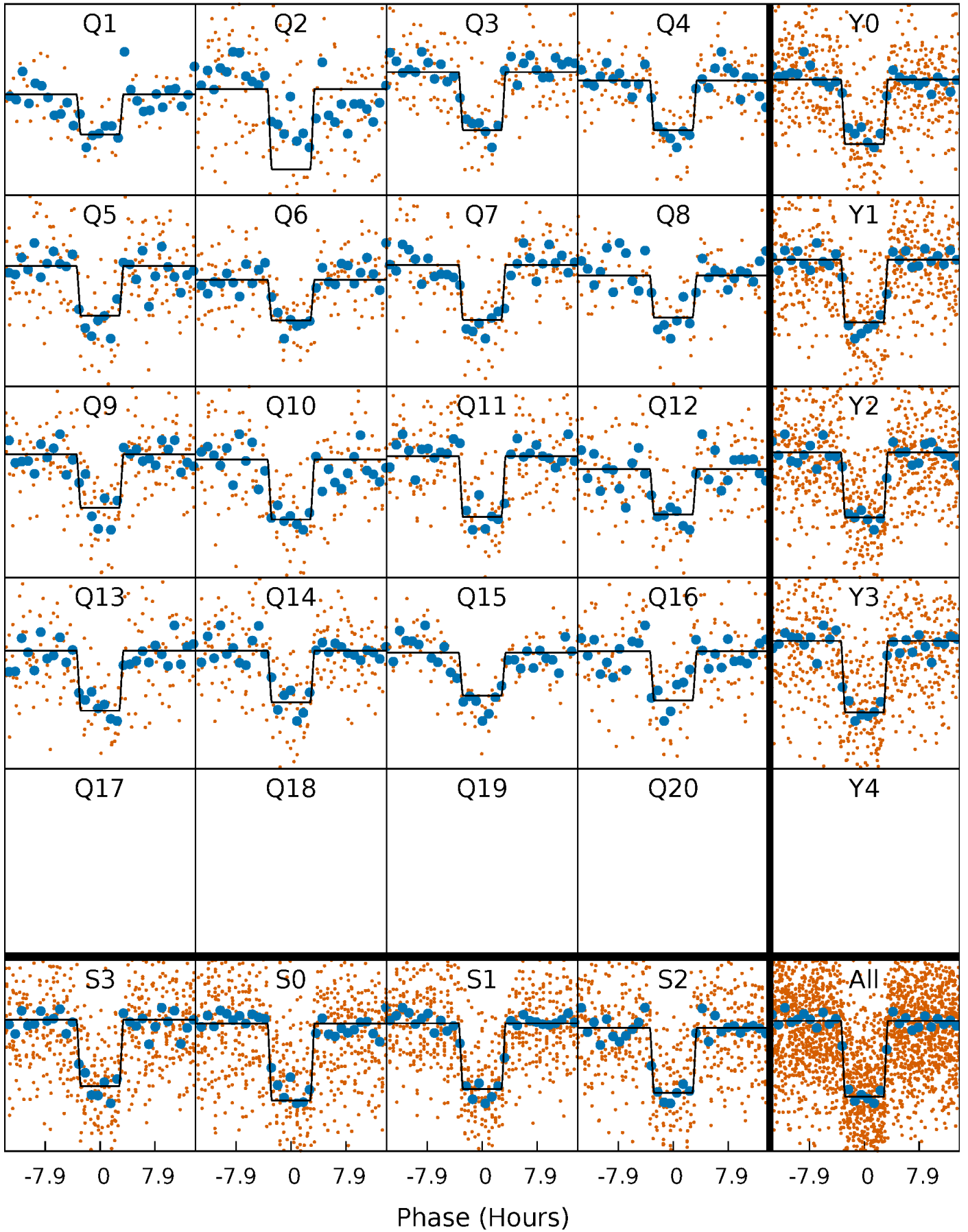
# DV Quarter-Phased Transit Curves

TCE 010122255-01 P= 27.665409 Days  $T_0=144.867578$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

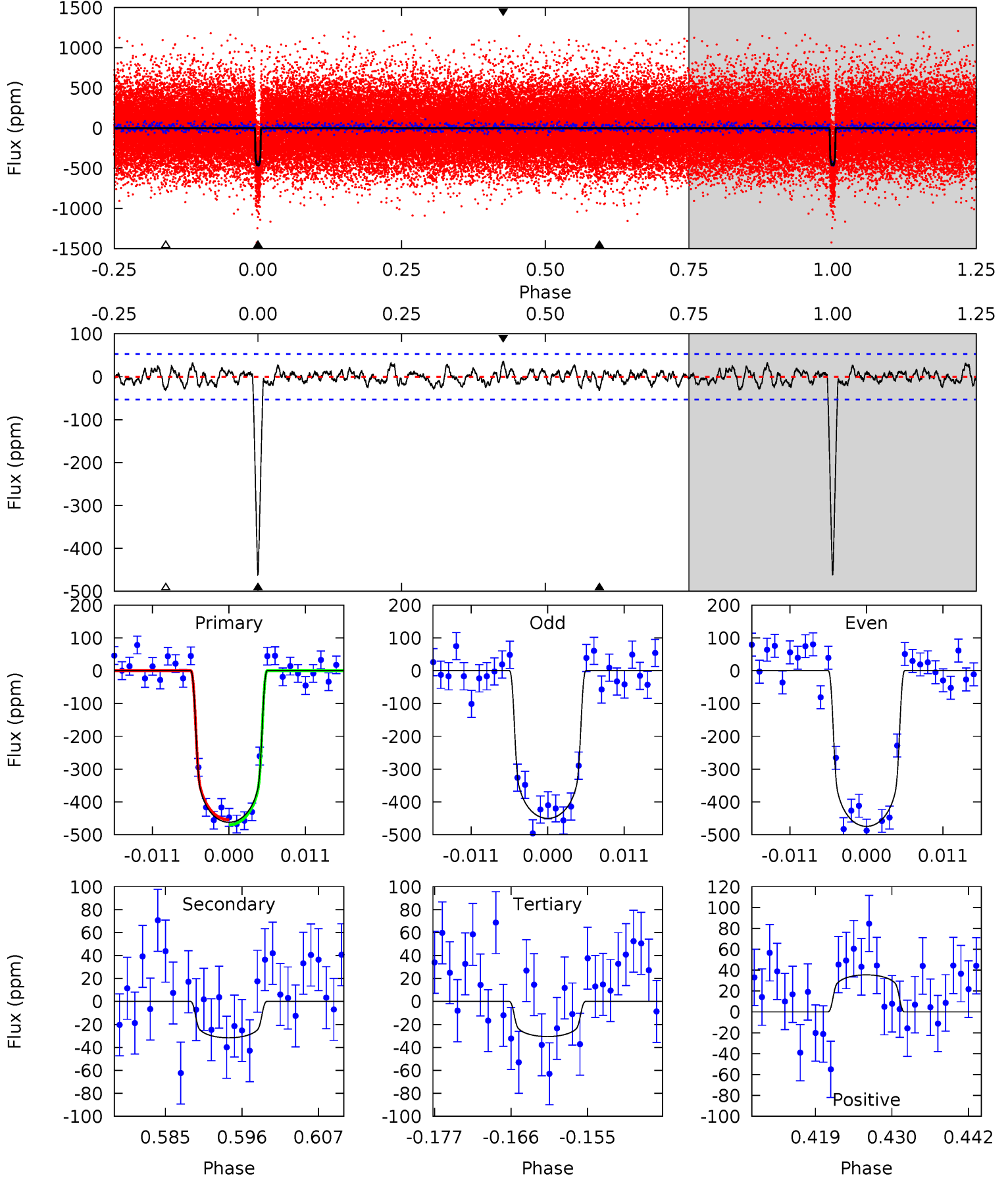
TCE 010122255-01 P= 27.665581 Days  $T_0=144.864428$  (BKJD)



# DV Model-Shift Uniqueness Test

010122255-01, P = 27.665409 Days, E = 117.202169 Days

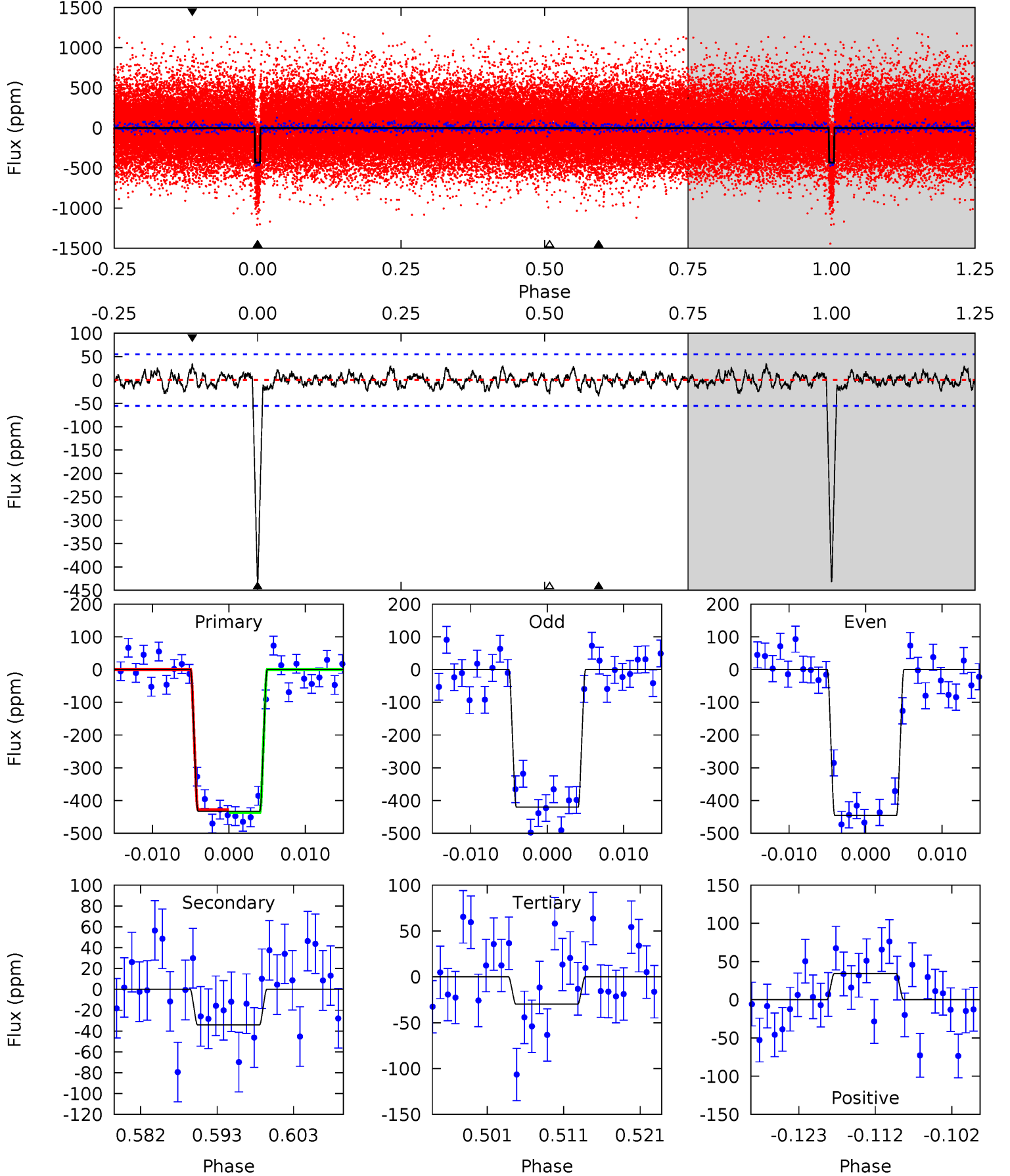
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 43.6 | 2.98 | 2.88 | 3.34 | 5.01            | 2.54            | 1.14             | 40.7    | 40.2    | 0.10    | -0.36   | 1.15    | 1.00 | 0.07  | 0.73 |



# Alt Model-Shift Uniqueness Test

010122255-01,  $P = 27.665581$  Days,  $E = 117.198847$  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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 39.4 | 3.10 | 2.71 | 3.12 | 5.02            | 2.57            | 0.99             | 36.6    | 36.2    | 0.39    | -0.02   | 1.14    | 0.96 | 0.07  | 0.41 |



### Stellar Parameters For KIC 010122255

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6036^{+163}_{-181}$ | $4.396^{+0.105}_{-0.195}$ | $-0.320^{+0.300}_{-0.300}$ | $1.017^{+0.298}_{-0.161}$ | $0.939^{+0.131}_{-0.095}$ | $1.259^{+0.688}_{-0.600}$                 |
|        | +3%/-3%              | +2%/-4%                   | +94%/-94%                  | +29%/-16%                 | +14%/-10%                 | +55%/-48%                                 |
| 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 010122255-01 / KOI 1086.01

| Detrend | Depth (ppm)  | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$  |
|---------|--------------|------------------------|----------------------|----------------------|-------------------|
| DV      | $-32 \pm 11$ | $2.56^{+0.41}_{-0.33}$ | $908^{+67}_{-50}$    | $3505^{+204}_{-228}$ | $80^{+38}_{-29}$  |
| Alt.    | $-34 \pm 11$ | $2.39^{+0.41}_{-0.32}$ | $908^{+64}_{-52}$    | $3625^{+231}_{-244}$ | $100^{+48}_{-41}$ |

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



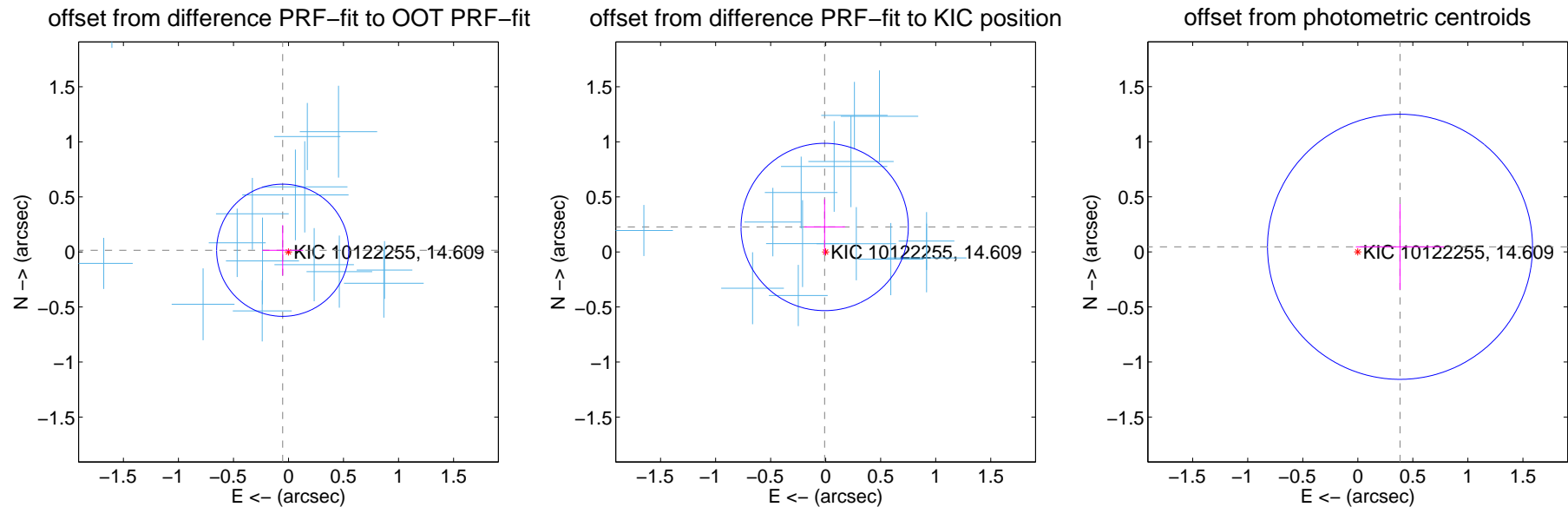
## DV Centroid Data

Supplemental centroid analysis for 010122255-01. Kepler magnitude: 14.61. Transit SNR 33.98

There are 16 quarters with good PRF difference image offsets

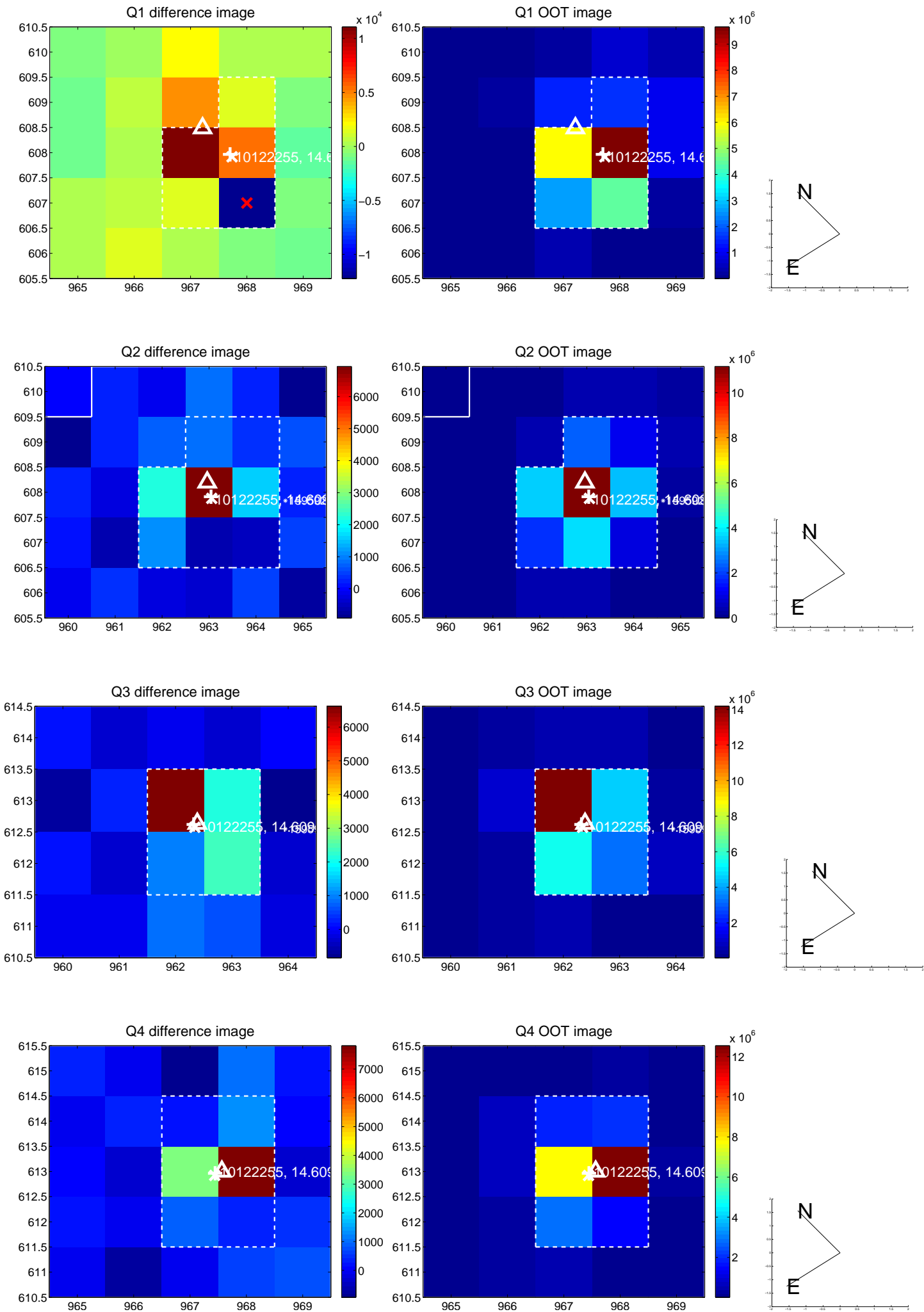
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.055 \pm 0.200$  | 0.27                | $0.053 \pm 0.186$ | $0.015 \pm 0.228$ |
| PRF-fit source offset from KIC position | $0.227 \pm 0.253$  | 0.90                | $0.009 \pm 0.185$ | $0.227 \pm 0.252$ |
| photometric centroid source offset      | $0.39 \pm 0.40$    | 0.96                | $-0.38 \pm 0.40$  | $0.05 \pm 0.39$   |

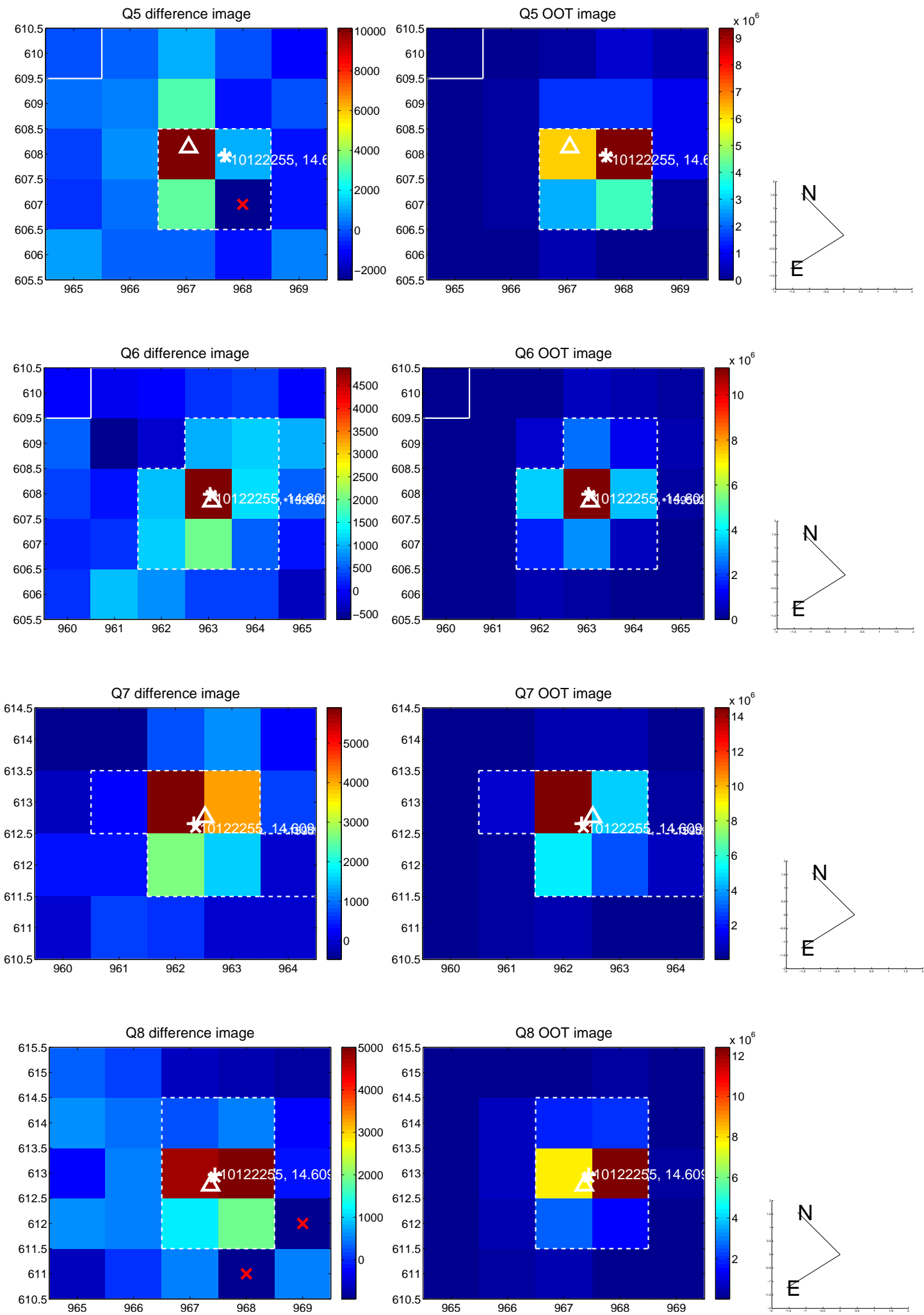


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

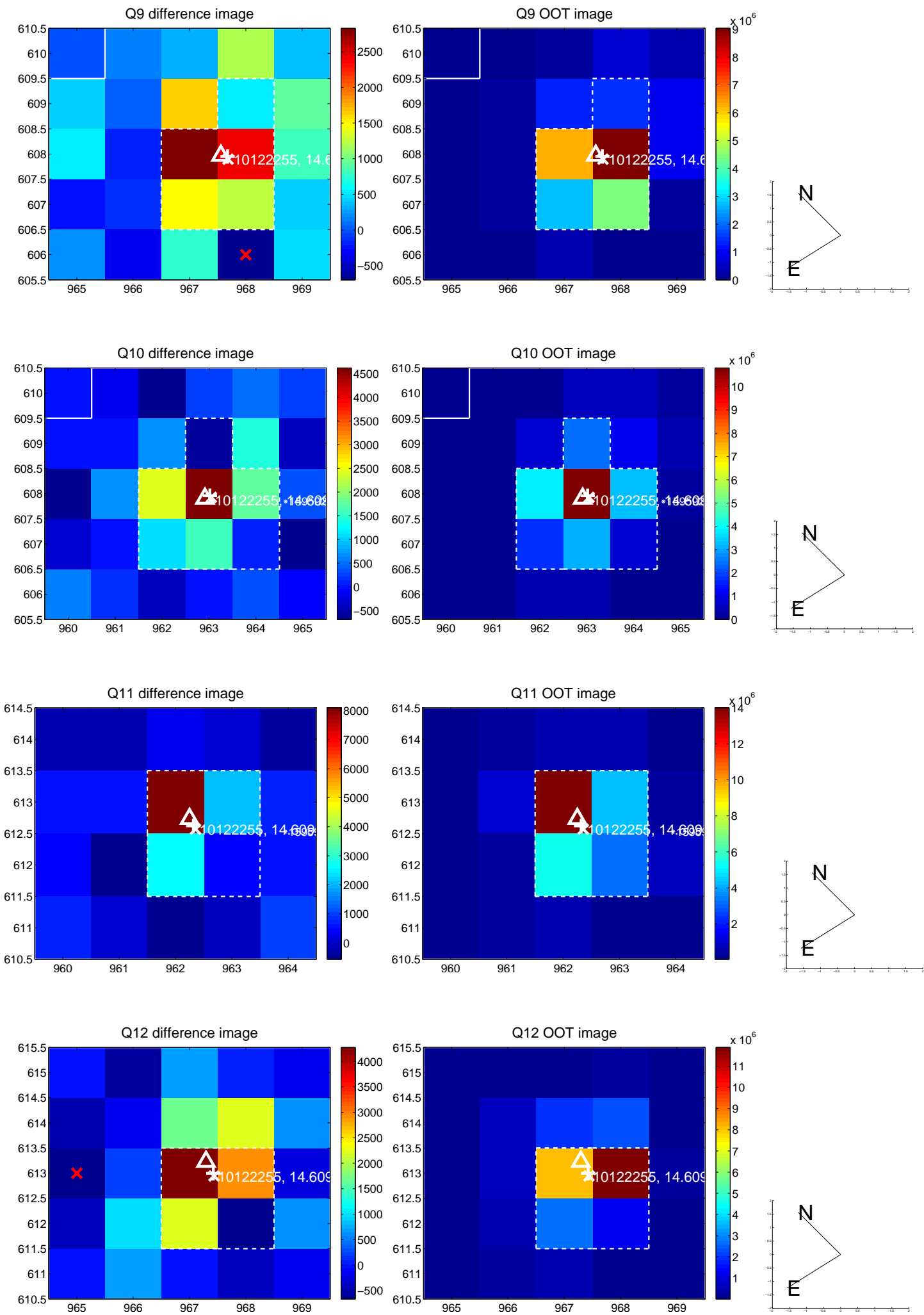
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



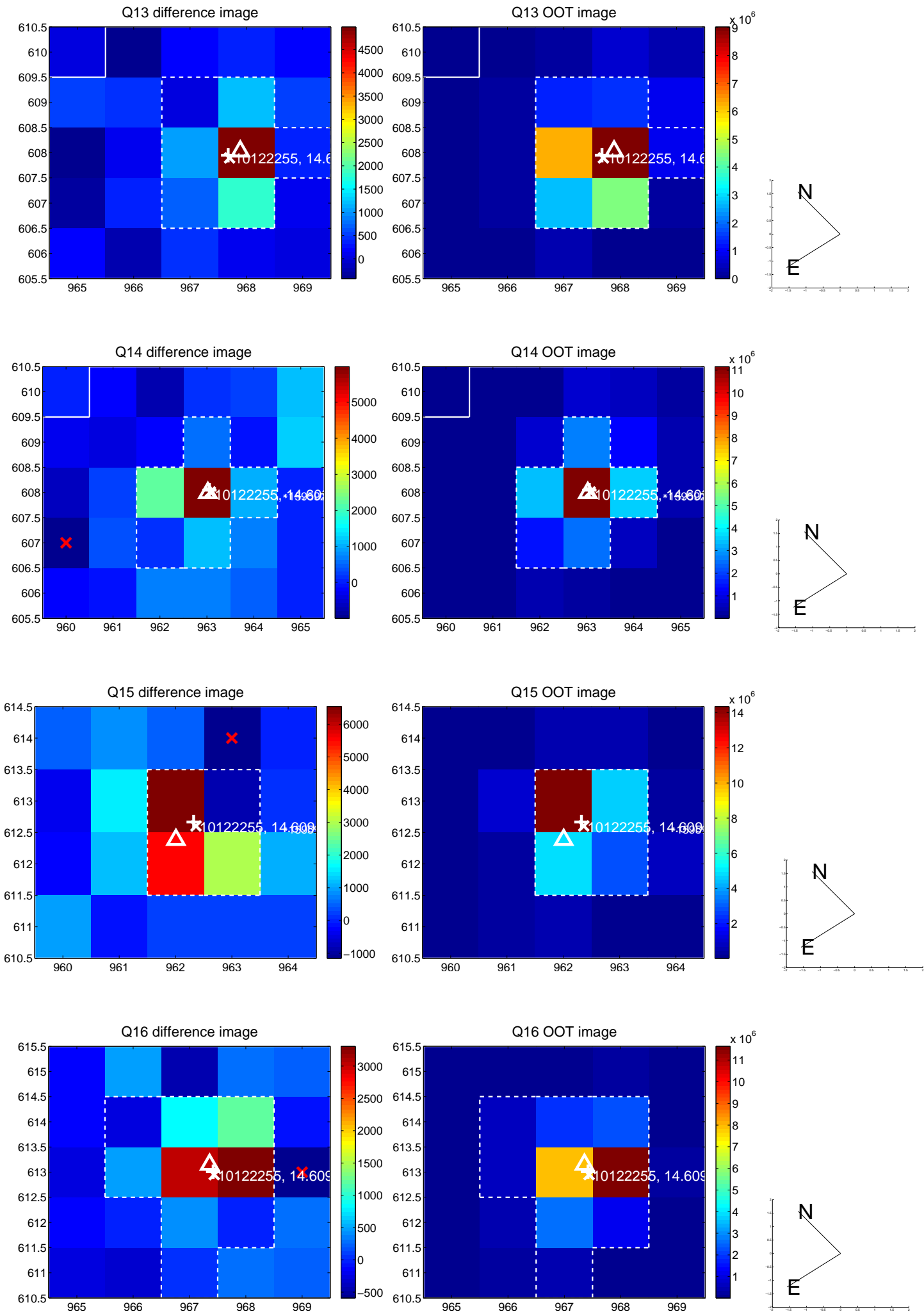
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

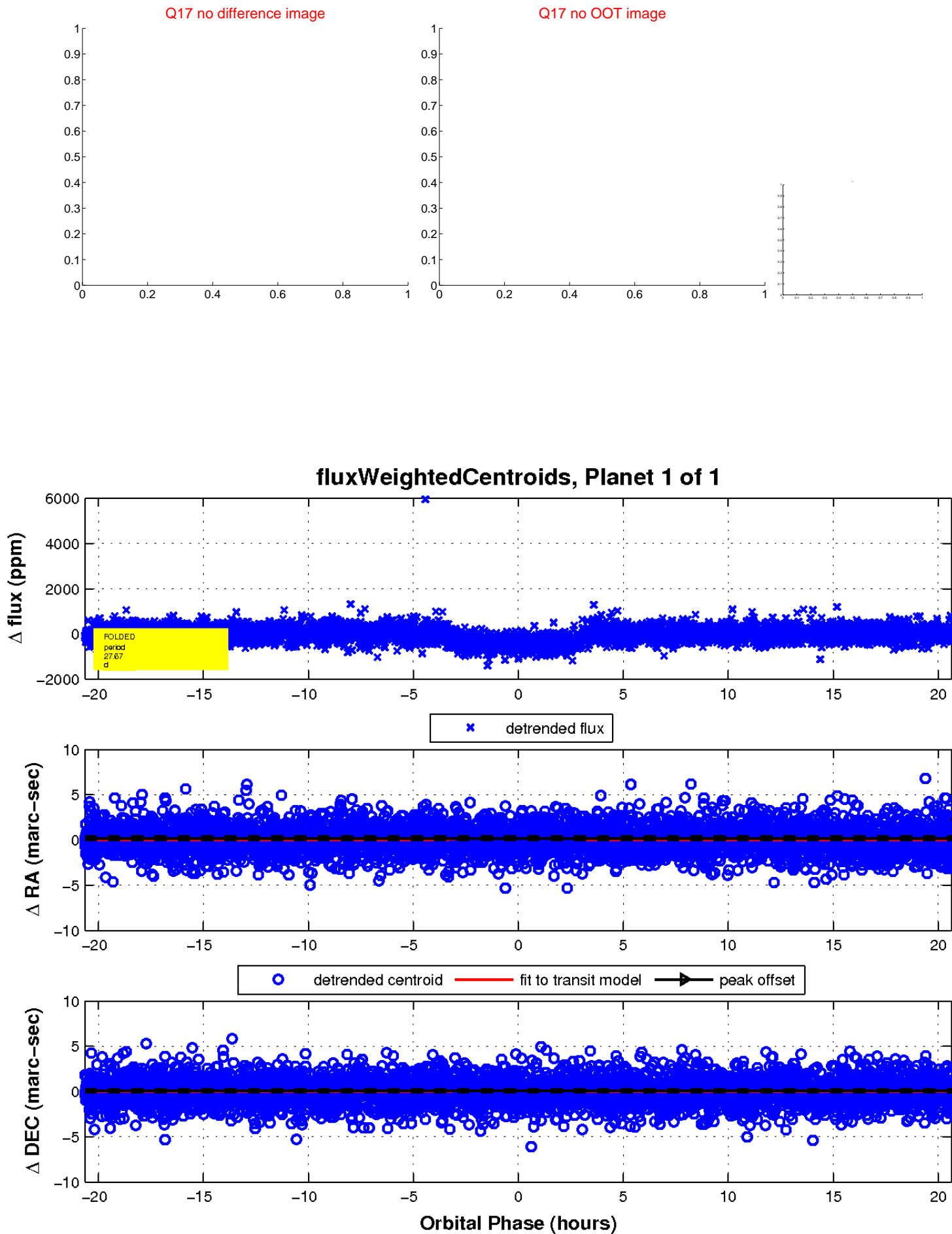


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



# UKIRT Image

Declination

