

# KIC 011076276

## Q1-17 DR25 TCE Parameters

| TCE          | Run Type | KOI?    | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES  | SNR  | R <sub>★</sub> (R <sub>☉</sub> ) | T <sub>★</sub> (K) | R <sub>p</sub> (R <sub>⊕</sub> ) | S <sub>p</sub> (S <sub>⊕</sub> ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|----------------------------------|--------------------|----------------------------------|----------------------------------|
| 011076276-01 | OBS      | 4645.01 | 1.472540      | 132.946488   | 69.7        | 3.033            | 11.2 | 10.8 | 1.00                             | 6077               | 0.97                             | 1808.31                          |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                   |
|--------------|----------|------|-------|---|---|---|---|----------------------------|
| 011076276-01 | OBS      | FP   | 0.00  | 0 | 0 | 0 | 1 | CENT_UNCERTAIN—EPHEM_MATCH |

**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.

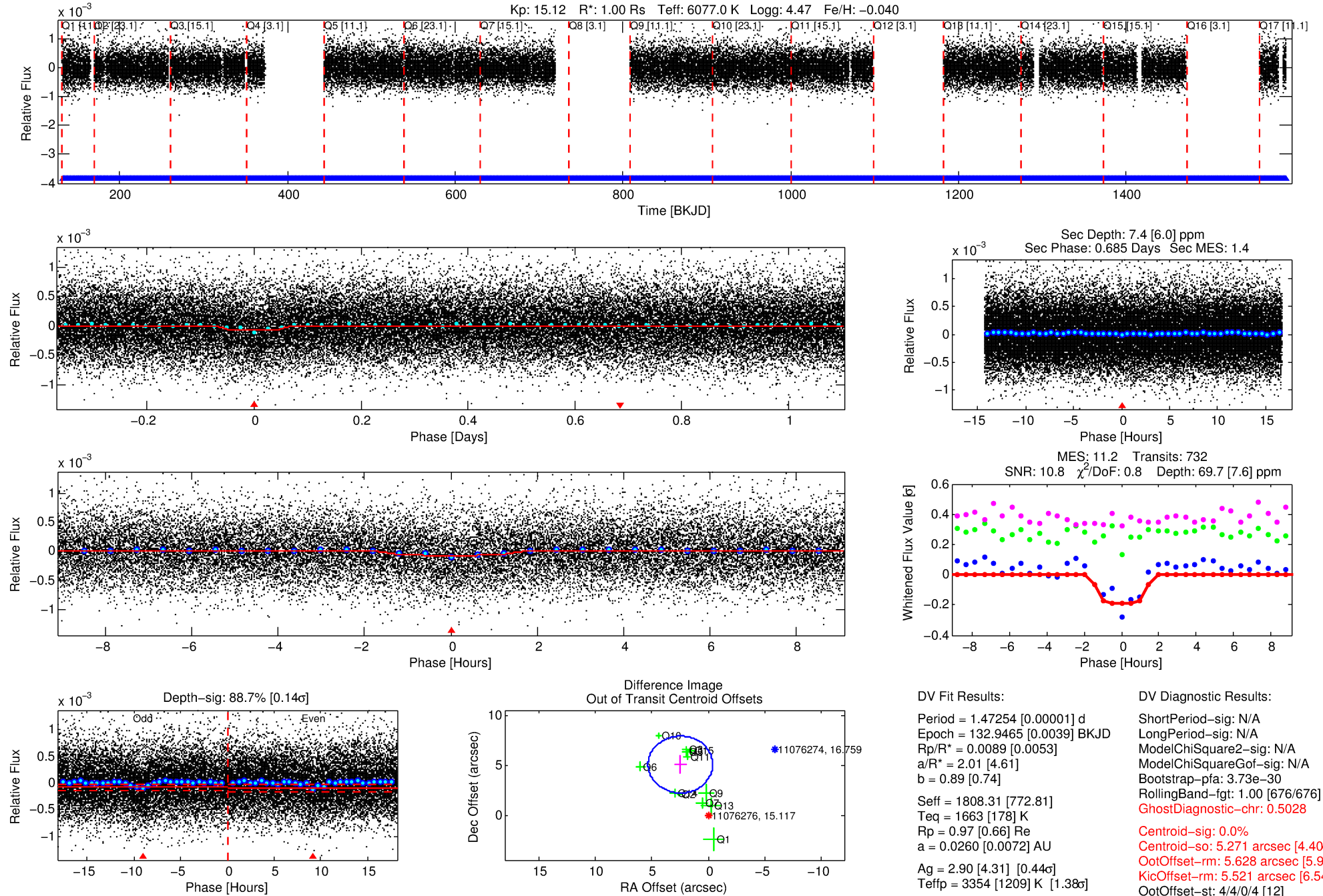
## Ephemeris Match Information For 011076276-01

| TCE (1)      | KIC      | Parent (2) | Parent KIC | P <sub>1</sub> :P <sub>2</sub> | Dist (″) | ΔRow | ΔCol | m <sub>2</sub> | m <sub>1</sub> | D <sub>2</sub> /D <sub>1</sub> | Mechanism  | Flag | σ <sub>P</sub> | σ <sub>T</sub> |
|--------------|----------|------------|------------|--------------------------------|----------|------|------|----------------|----------------|--------------------------------|------------|------|----------------|----------------|
| 011076276-01 | 11076276 | 7407.01    | 11076279   | 1:1                            | 28.5     | -6   | 5    | 14.21          | 15.12          | 3256.30                        | Direct-PRF | 0    | 2.45           | 1.19           |

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's. σ<sub>P</sub> and σ<sub>T</sub> are the significance of the match in period and epoch. For a match to be considered significant σ<sub>P</sub> < 5.0 and σ<sub>T</sub> < 5.0. Matches which have σ<sub>P</sub> and σ<sub>T</sub> very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 11076276 Candidate: 1 of 1 Period: 1.473 d  
KOI: K04645.01 Corr: 0.917



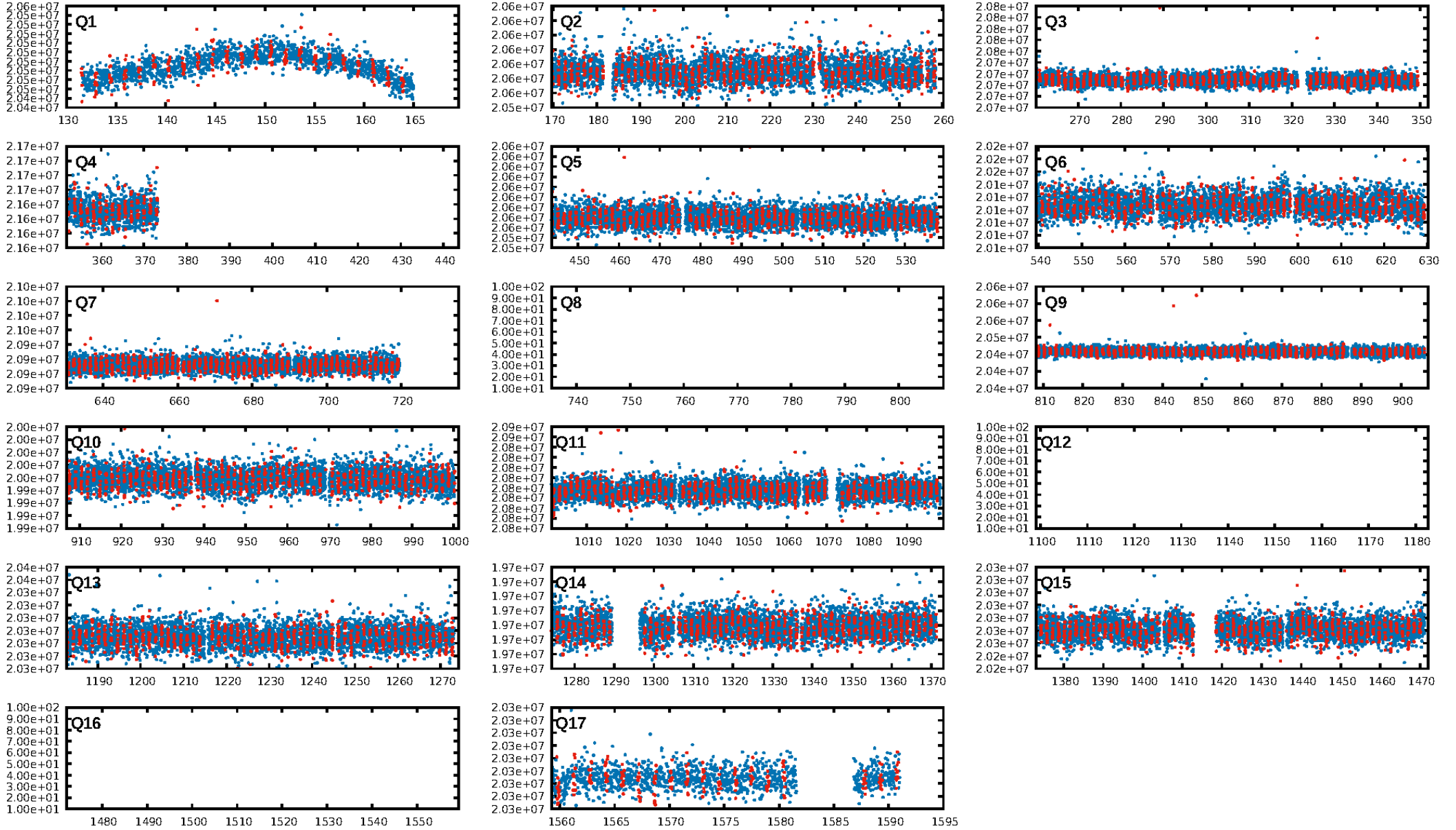
## DV Fit Results:

Period = 1.47254 [0.00001] d  
Epoch = 132.9465 [0.0039] BKJD  
Rp/R\* = 0.0089 [0.0053]  
a/R\* = 2.01 [4.61]  
b = 0.89 [0.74]  
Seff = 1808.31 [772.81]  
Teq = 1663 [178] K  
Rp = 0.97 [0.66] Re  
a = 0.0260 [0.0072] AU  
Ag = 2.90 [4.31] [0.44 $\sigma$ ]  
Teffp = 3354 [1209] K [1.38 $\sigma$ ]

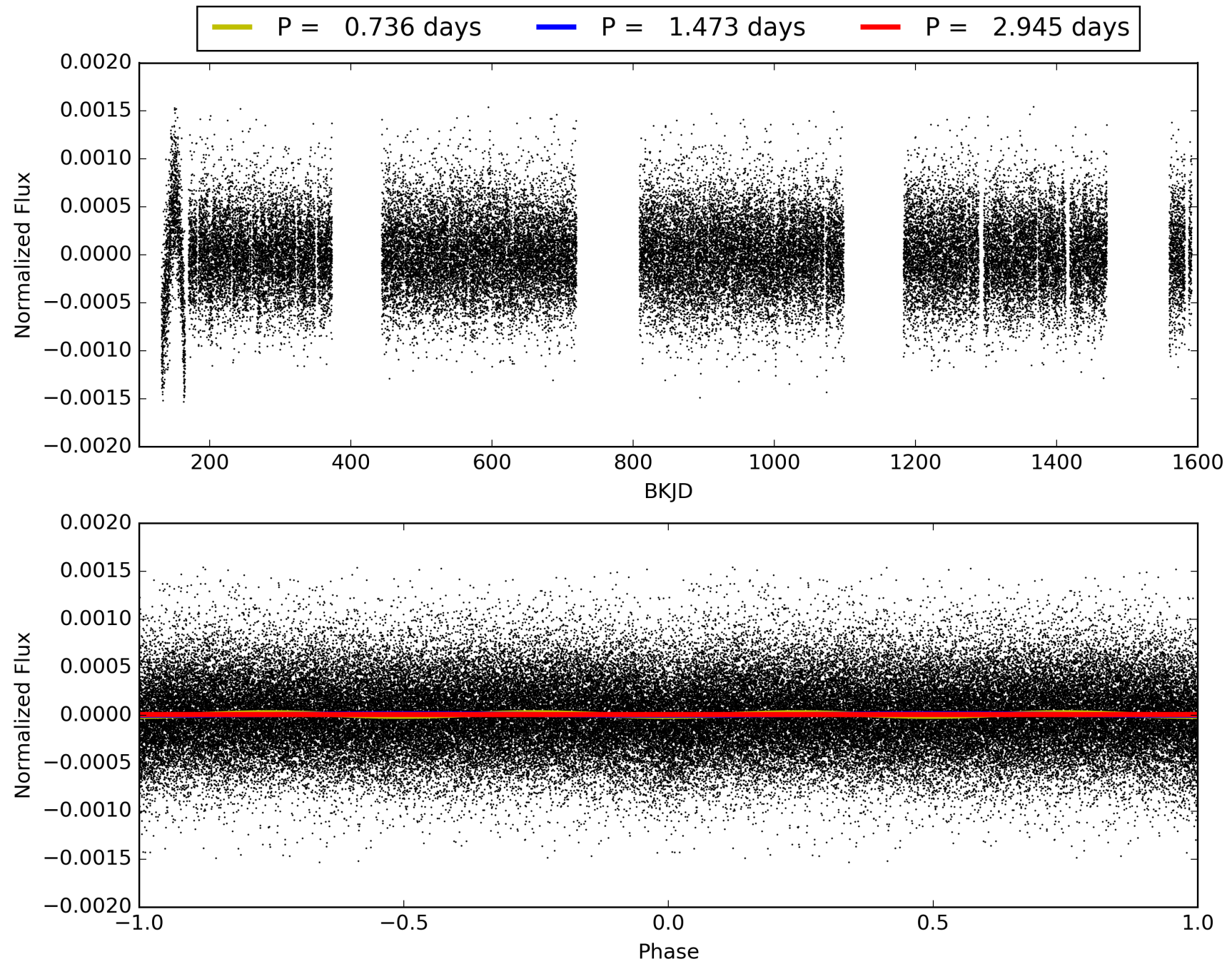
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.73e-30  
RollingBand-fgt: 1.00 [676/676]  
GhostDiagnostic-chr: 0.5028  
Centroid-sig: 0.0%  
Centroid-so: 5.271 arcsec [4.40 $\sigma$ ]  
OotOffset-rm: 5.628 arcsec [5.93 $\sigma$ ]  
KicOffset-rm: 5.521 arcsec [6.54 $\sigma$ ]  
OotOffset-st: 4/4/0/4 [12]  
KicOffset-st: 4/4/0/4 [12]  
DiffImageQuality-fgm: 0.17 [2/12]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 011076276-01, PDC Light Curves

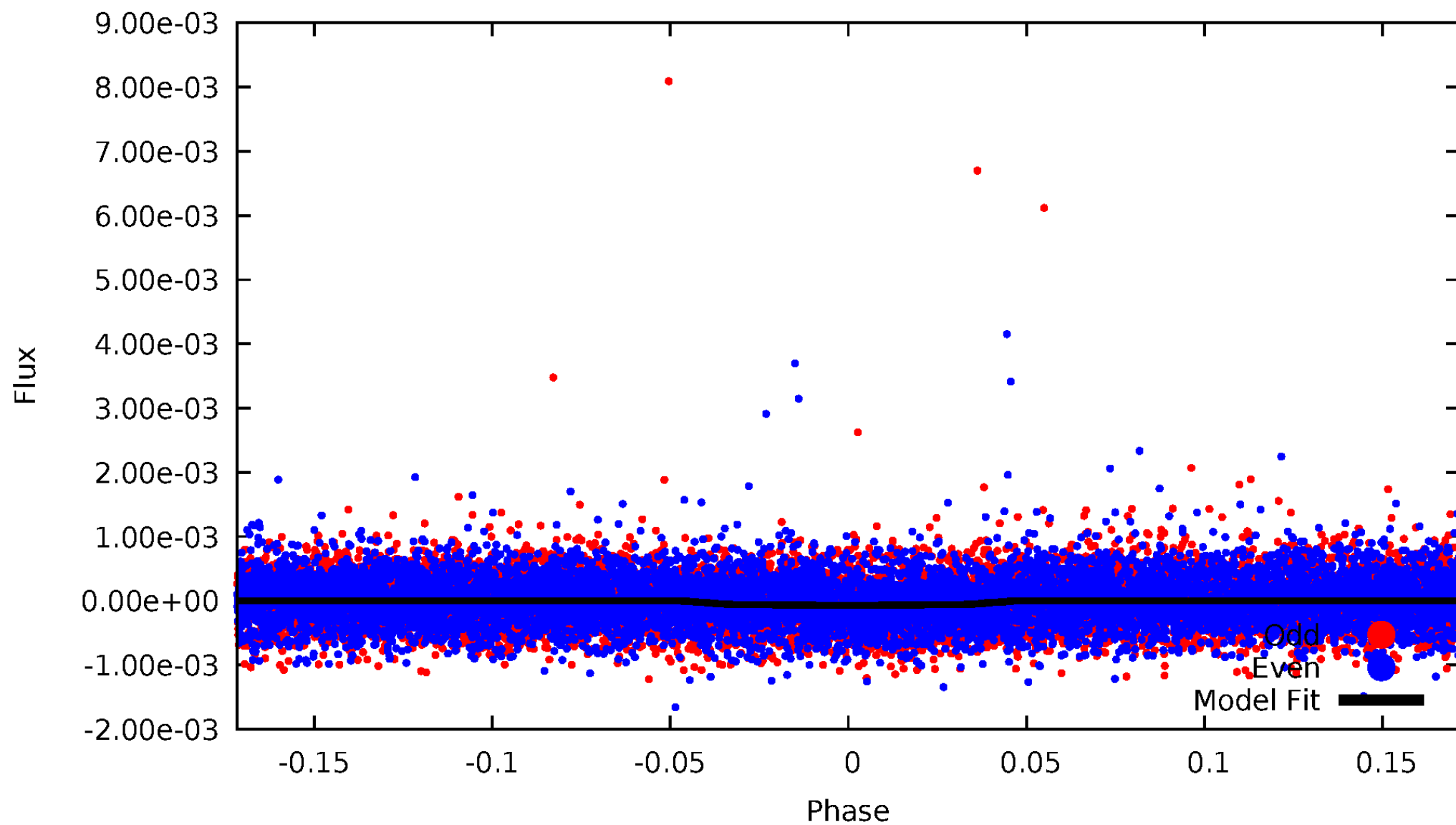


TCE 011076276-01



# DV Odd/Even

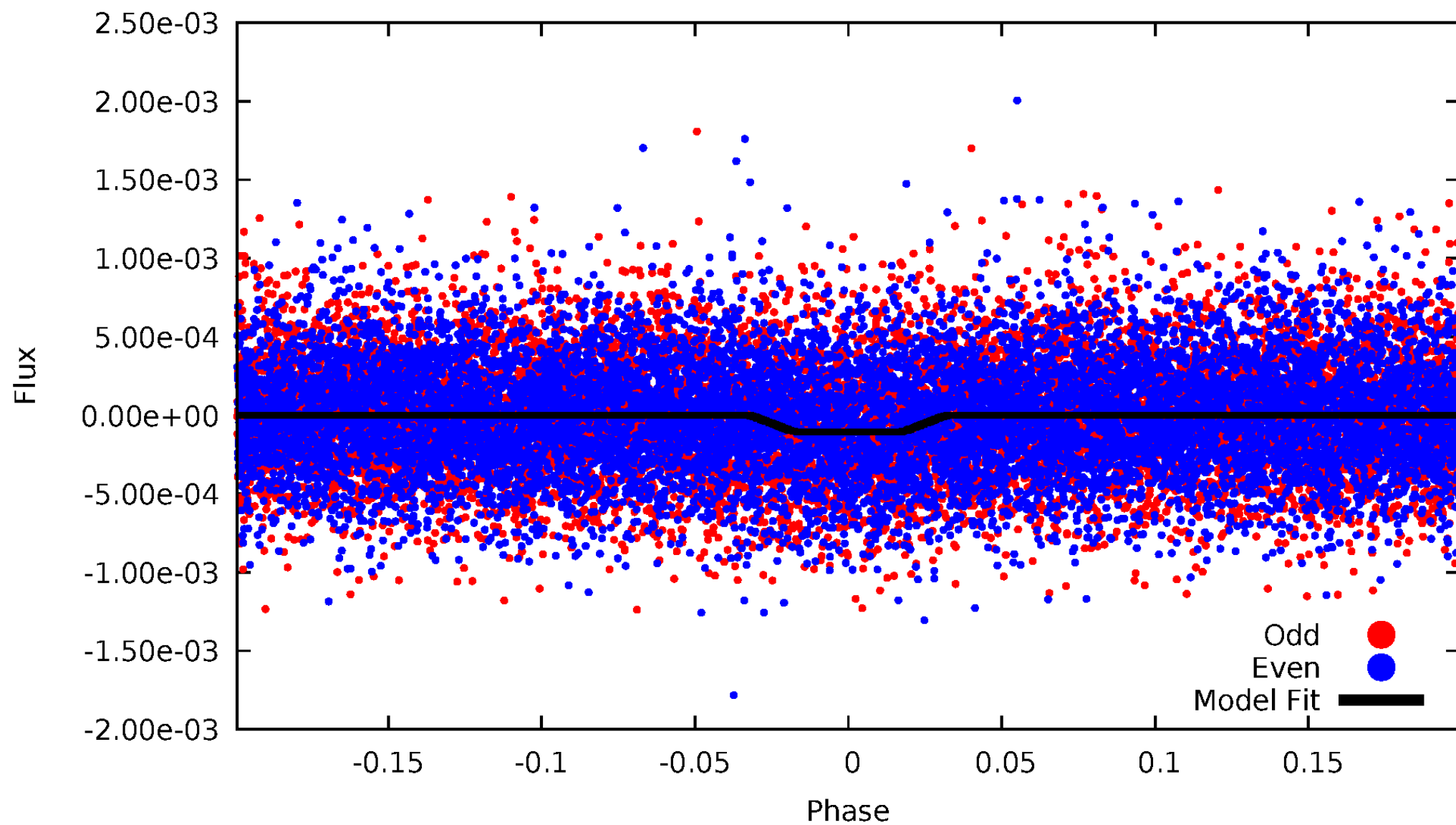
TCE 011076276-01





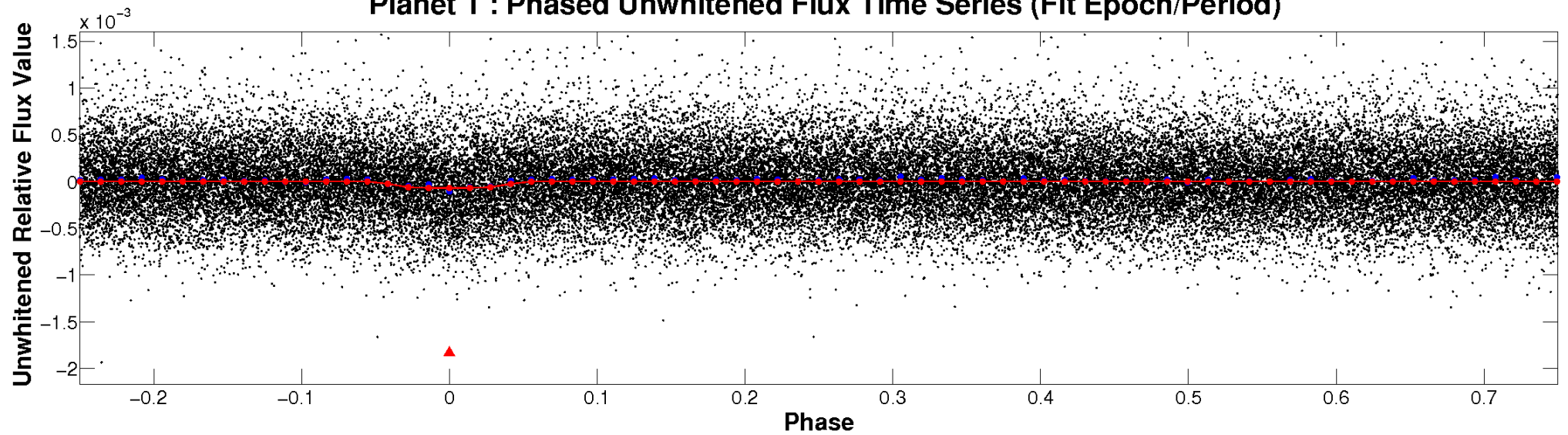
# ALT Odd/Even

TCE 011076276-01

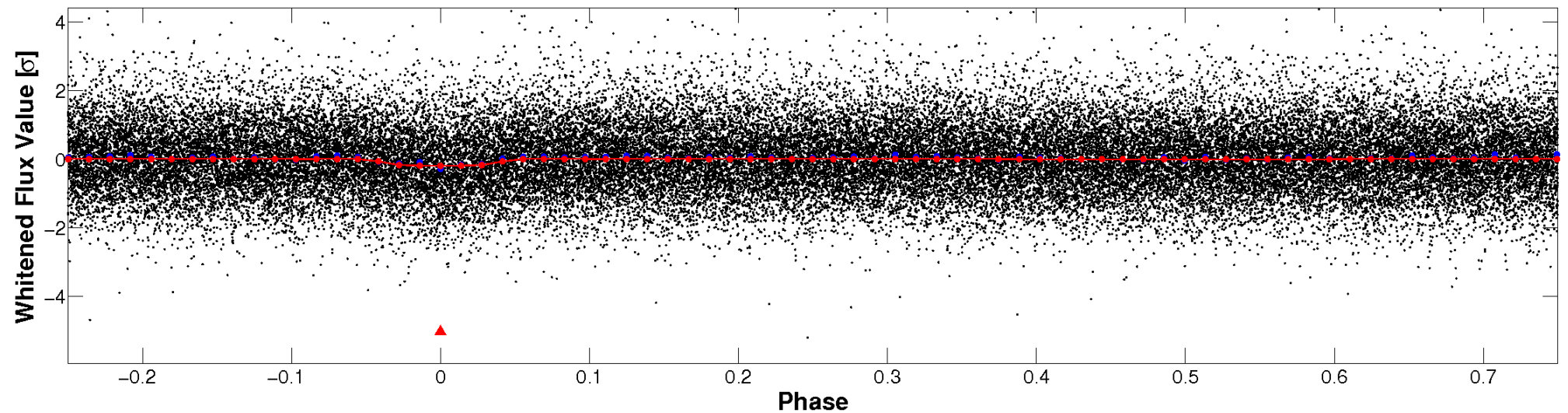


# Non-Whitened Vs. Whitened Light Curve

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

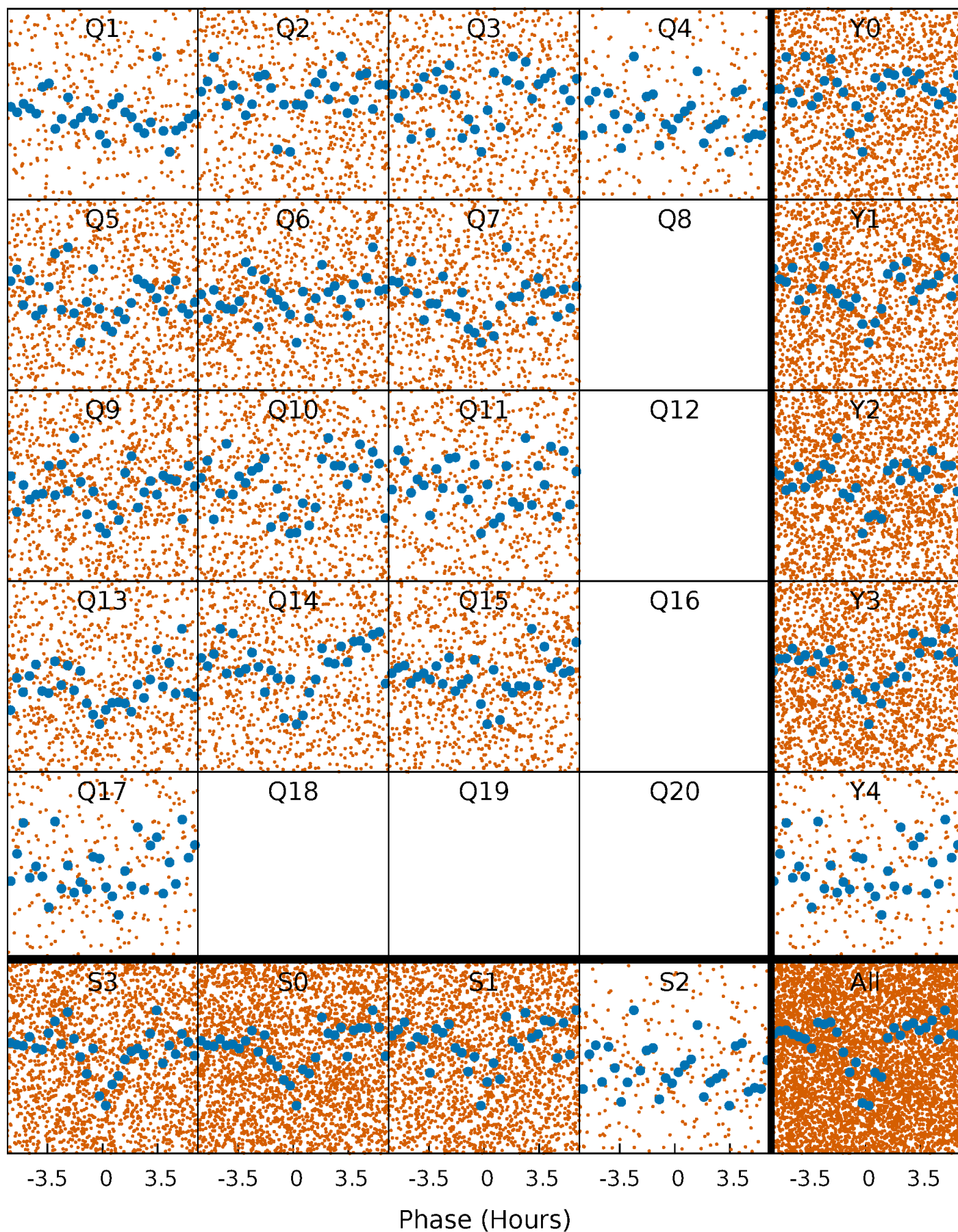


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

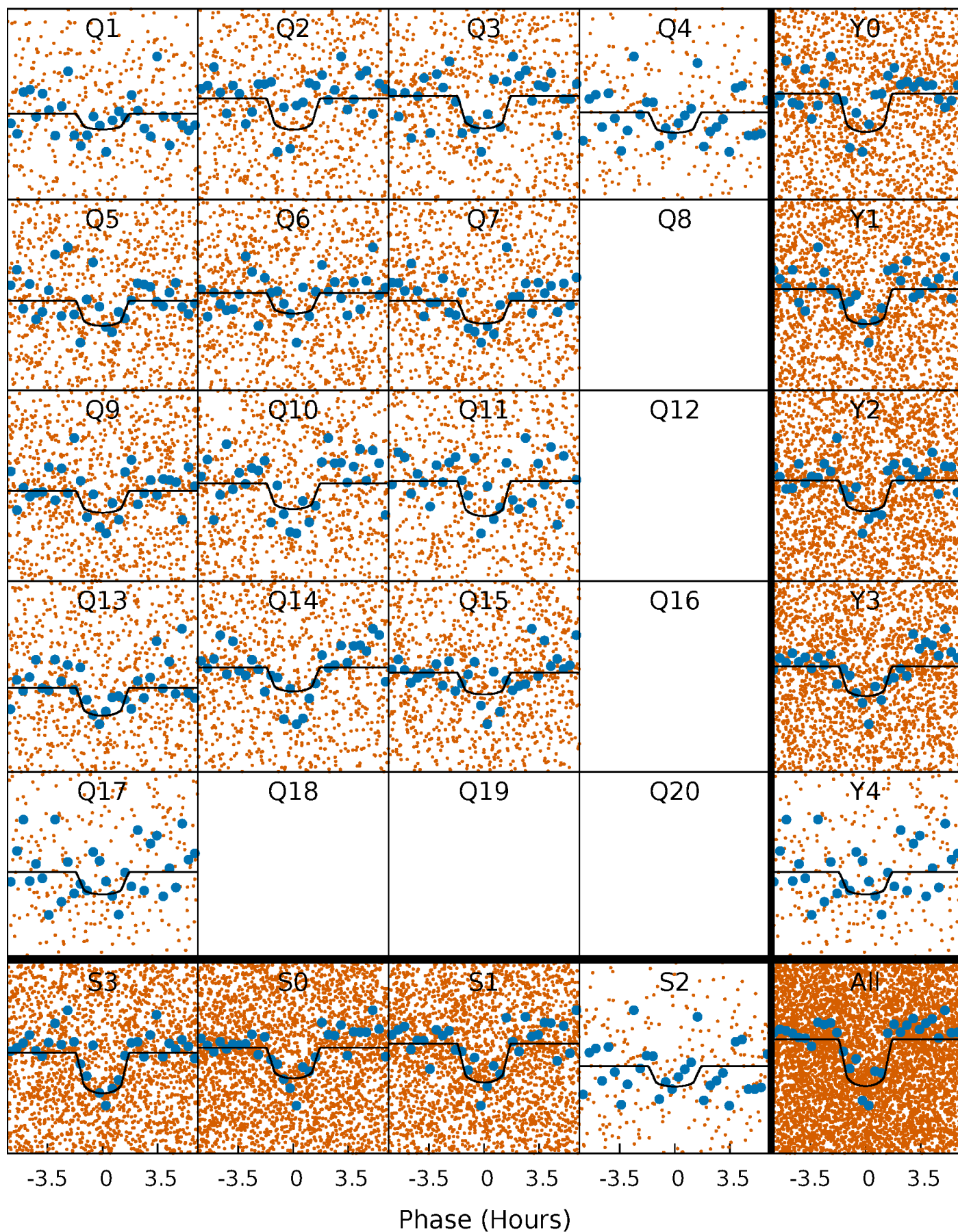
TCE 011076276-01 P= 1.472540 Days  $T_0=132.946488$  (BKJD)





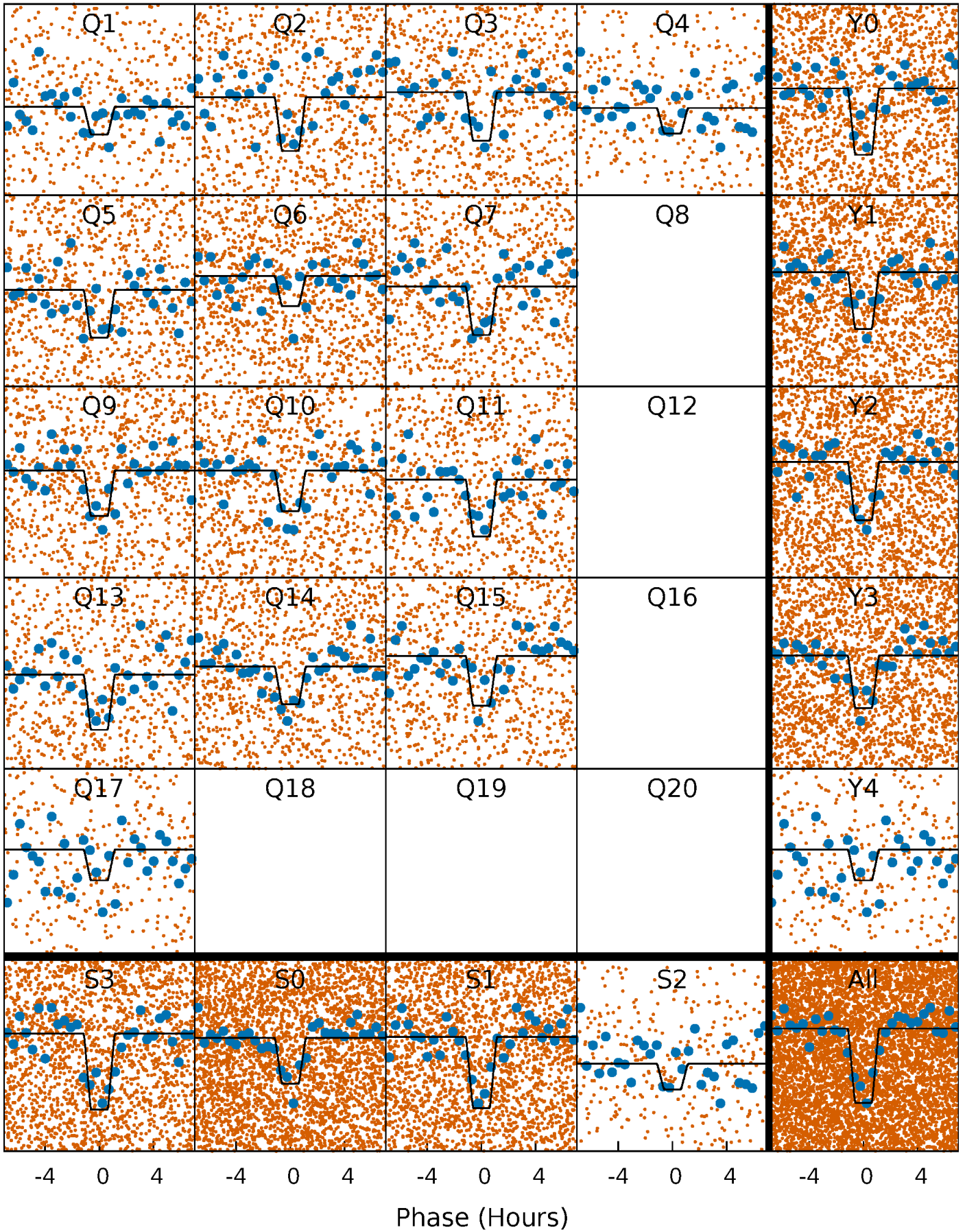
# DV Quarter-Phased Transit Curves

TCE 011076276-01 P= 1.472540 Days  $T_0=132.946488$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

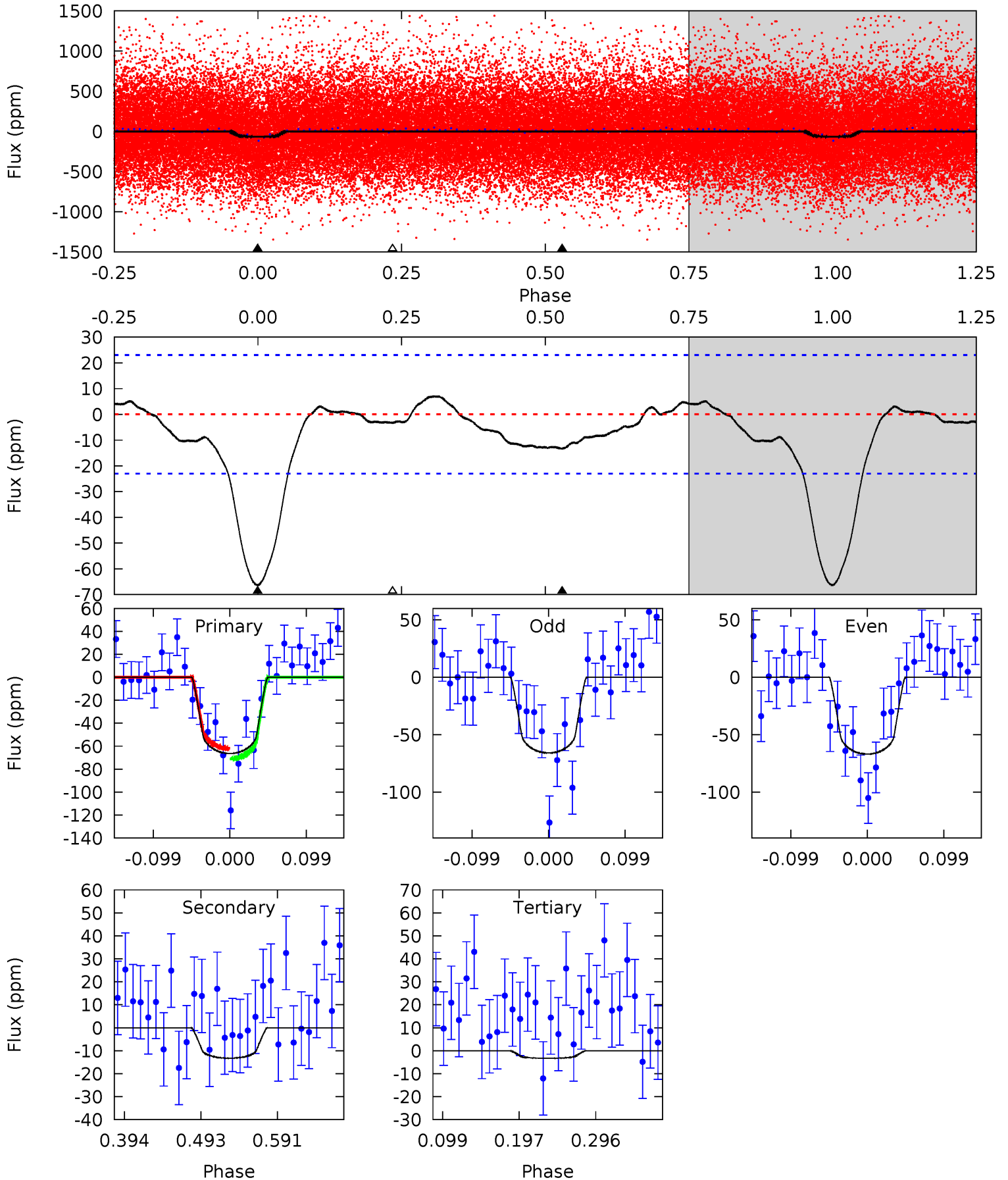
TCE 011076276-01 P= 1.472579 Days  $T_0=132.929858$  (BKJD)



# DV Model-Shift Uniqueness Test

011076276-01, P = 1.472540 Days, E = 131.473948 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  |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.2 | 2.63 | 0.66 | 0   | 4.57            | 1.65            | 0.90             | 12.5    | 13.2    | 1.98    | 2.63    | 0.10    | 0.94 | 0.10  | 0.92 |

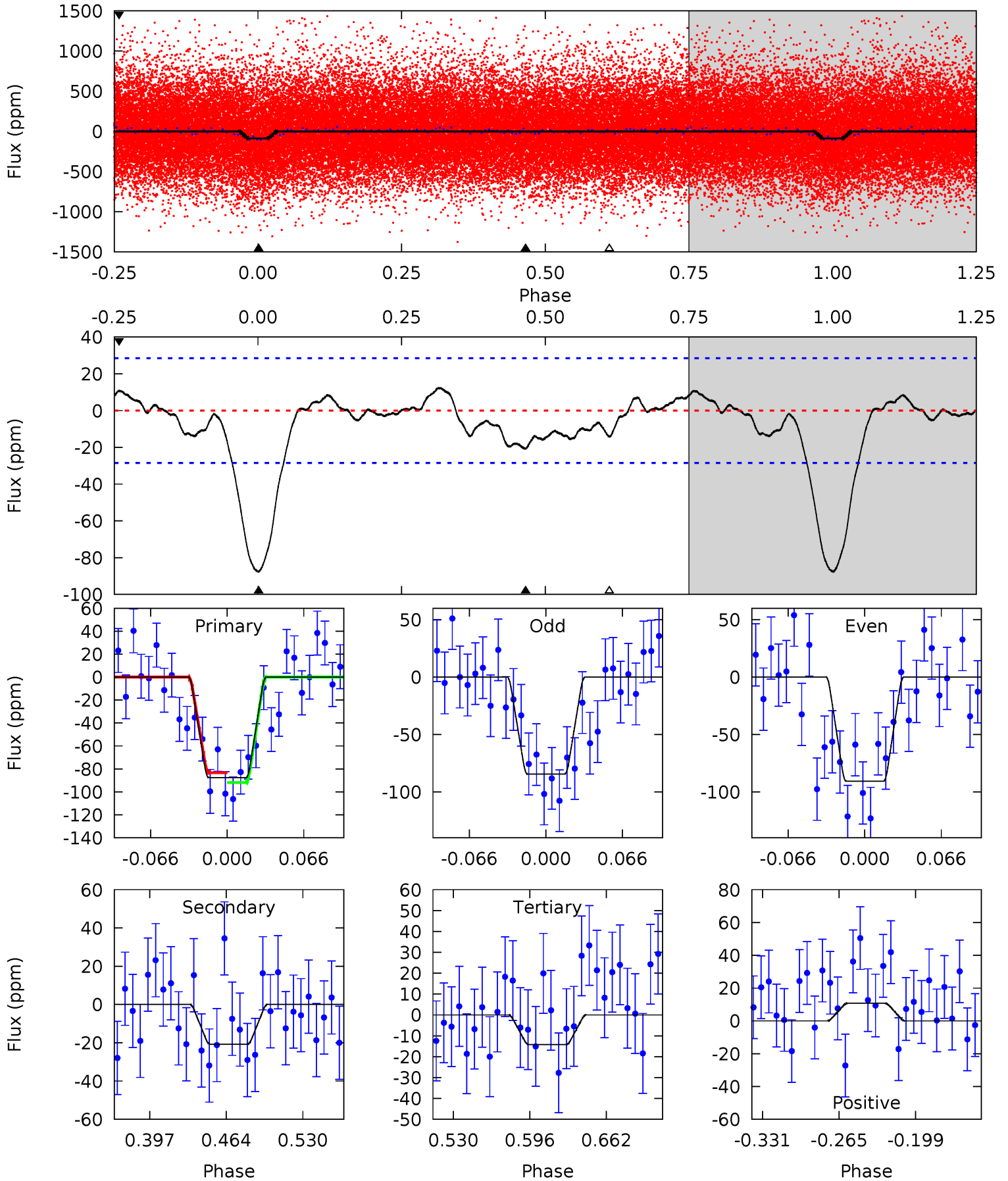




# Alt Model-Shift Uniqueness Test

011076276-01, P = 1.472579 Days, E = 131.457279 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.3 | 3.39 | 2.32 | 1.76 | 4.65            | 1.84            | 1.14             | 12.0    | 12.6    | 1.07    | 1.63    | 0.51    | 0.98 | 0.12  | 0.71 |





### Stellar Parameters For KIC 011076276

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6077^{+190}_{-232}$ | $4.471^{+0.054}_{-0.216}$ | $-0.040^{+0.250}_{-0.300}$ | $0.999^{+0.333}_{-0.111}$ | $1.077^{+0.145}_{-0.145}$ | $1.519^{+0.444}_{-0.856}$                 |
|        | +3%/-4%              | +1%/-5%                   | +625%/-750%                | +33%/-11%                 | +13%/-13%                 | +29%/-56%                                 |
| 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 011076276-01 / KOI 4645.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{max} (K)$        | $T_{obs} (K)$         | $A_{obs}$                  |
|---------|-------------|------------------------|----------------------|-----------------------|----------------------------|
| DV      | $-13 \pm 5$ | $1.08^{+0.62}_{-0.57}$ | $2388^{+187}_{-142}$ | $3966^{+1567}_{-640}$ | $4.050^{+14.571}_{-2.630}$ |
| Alt.    | $-21 \pm 6$ | $1.22^{+0.65}_{-0.55}$ | $2376^{+184}_{-125}$ | $4169^{+1309}_{-653}$ | $4.940^{+13.012}_{-2.957}$ |

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

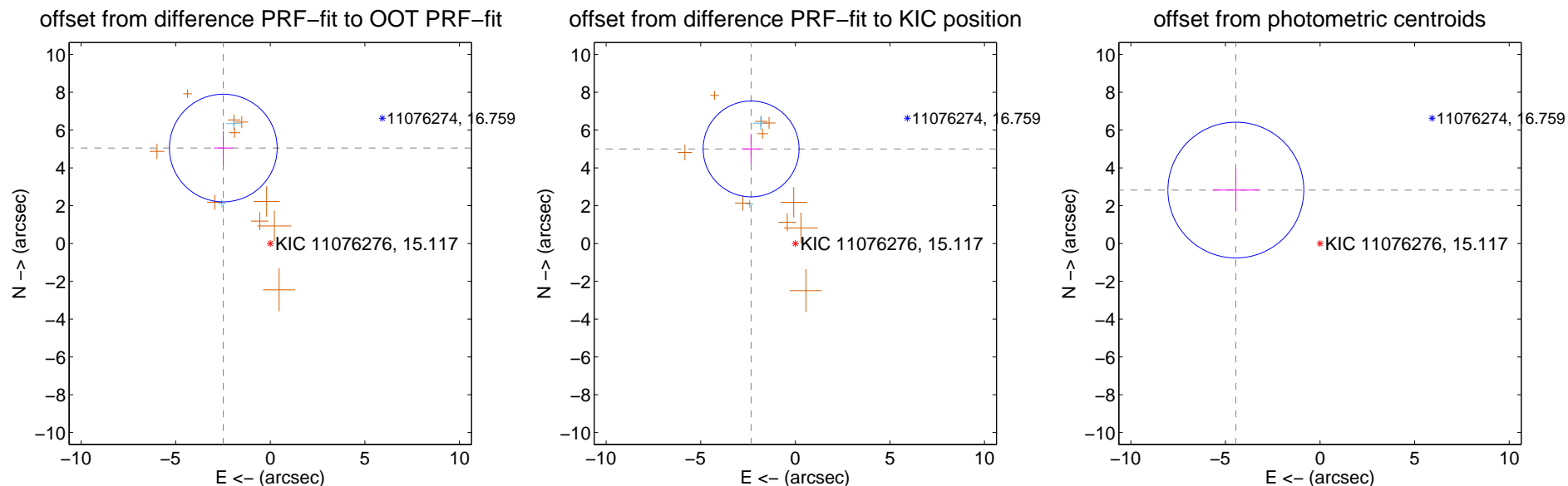
## DV Centroid Data

Supplemental centroid analysis for 011076276-01. Kepler magnitude: 15.12. Transit SNR 10.83

There are 2 quarters with good PRF difference image offsets

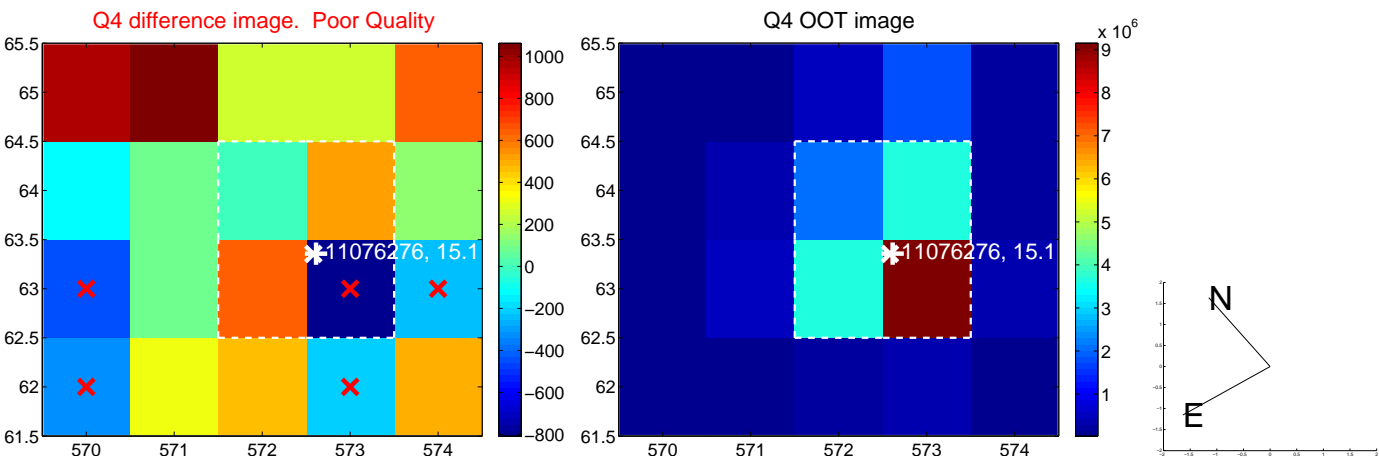
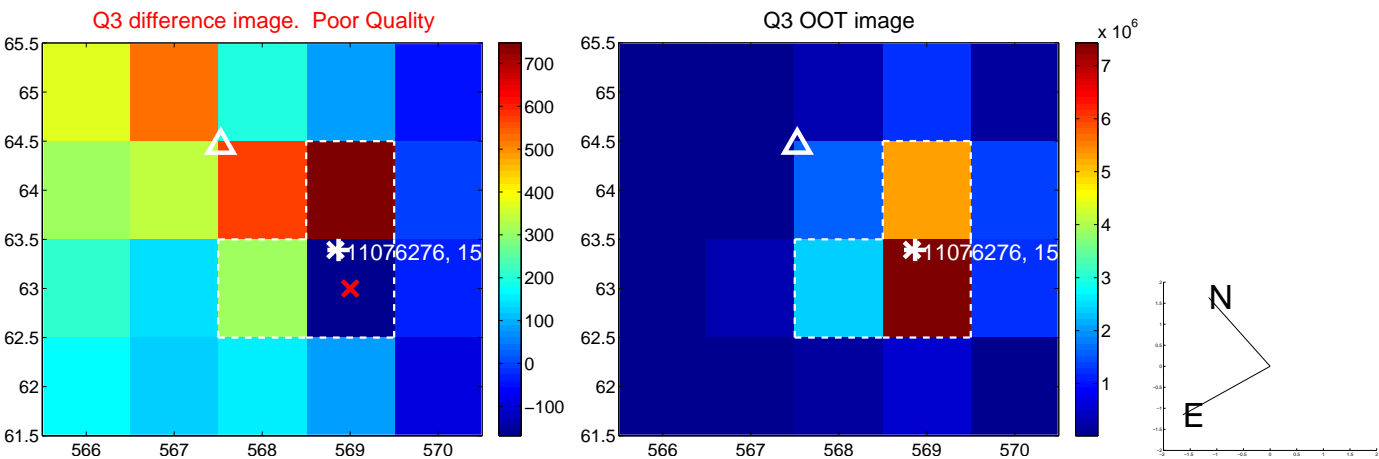
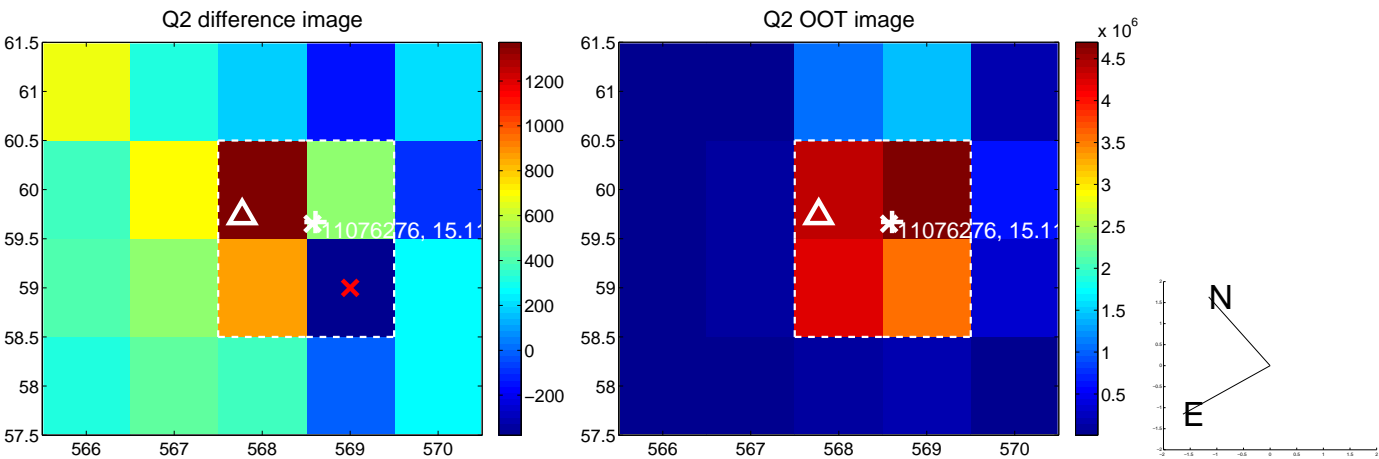
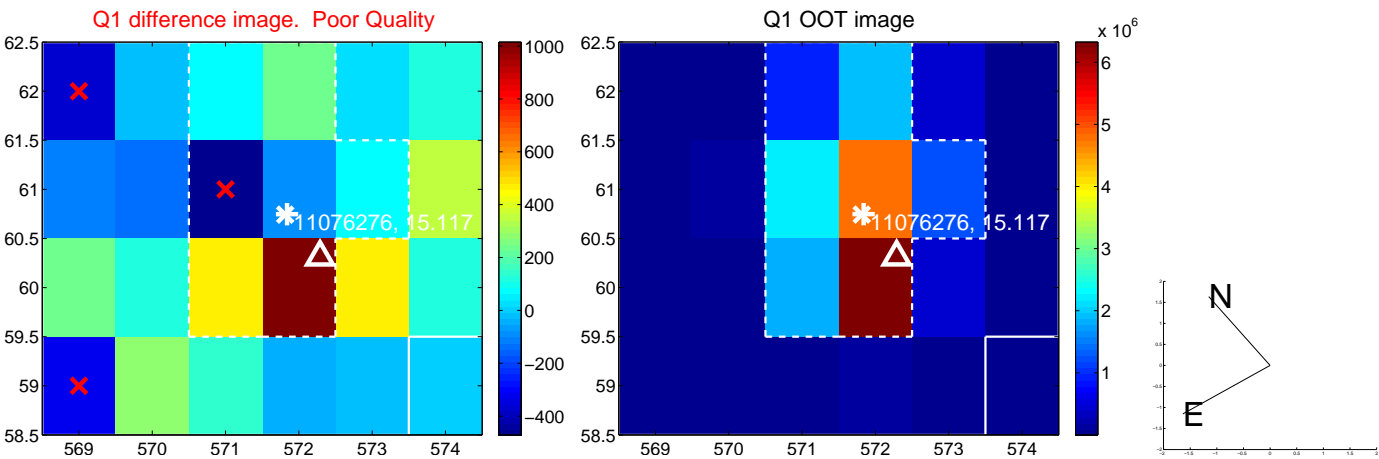
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $5.628 \pm 0.949$  | 5.93                | $2.483 \pm 0.492$ | $5.050 \pm 0.898$ |
| PRF-fit source offset from KIC position | $5.521 \pm 0.845$  | 6.54                | $2.336 \pm 0.486$ | $5.002 \pm 0.793$ |
| photometric centroid source offset      | $5.27 \pm 1.20$    | 4.40                | $4.45 \pm 1.23$   | $2.83 \pm 1.12$   |

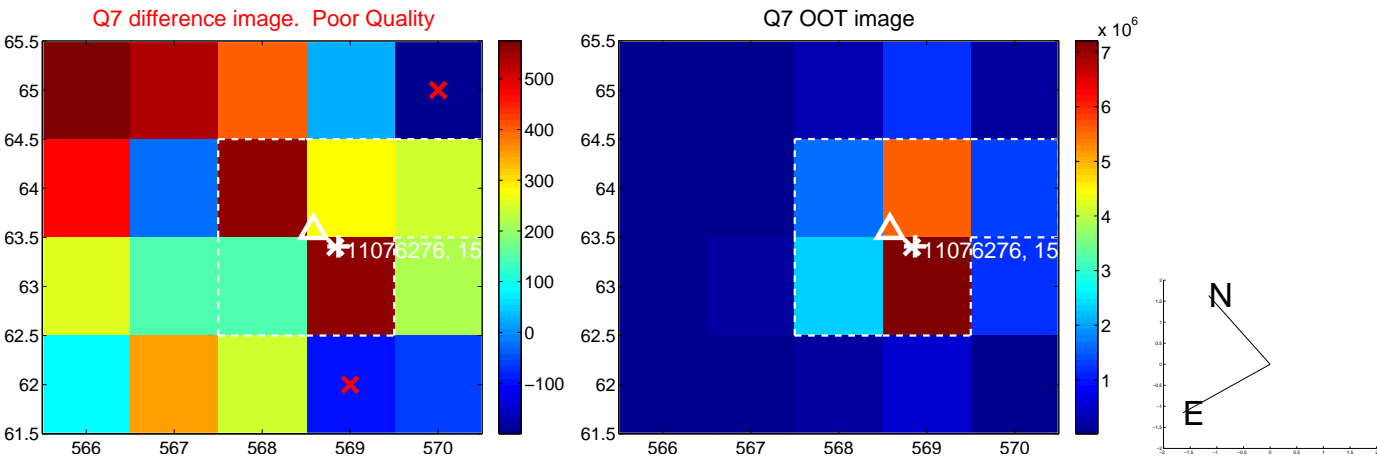
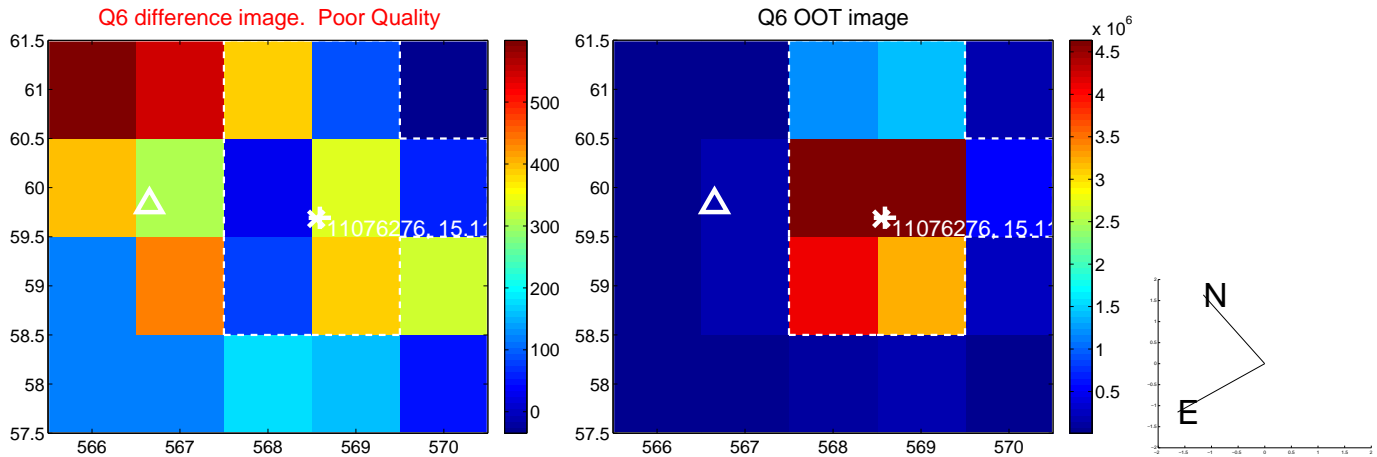
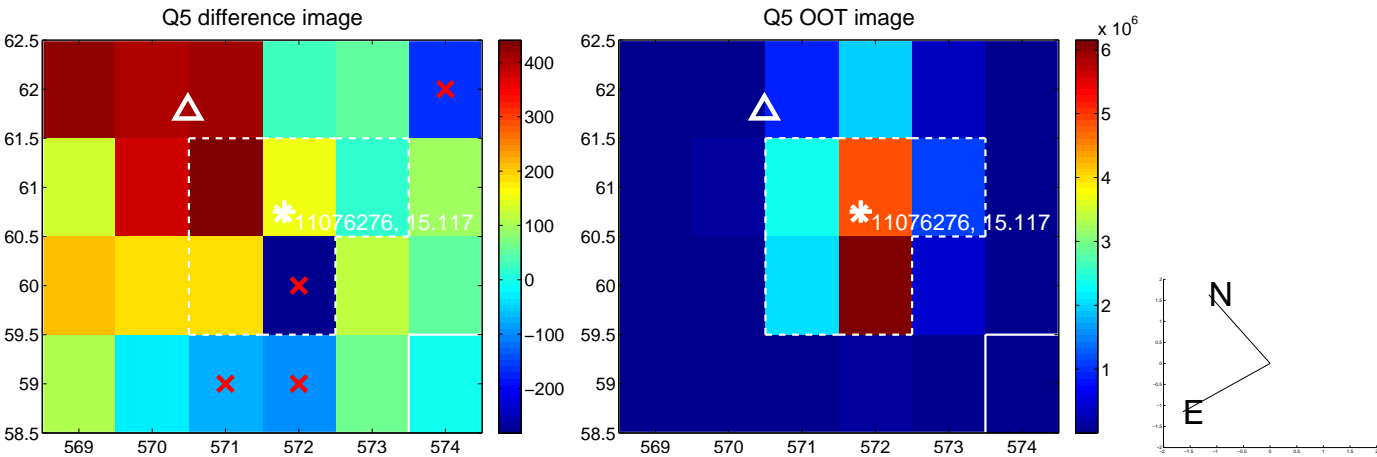


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

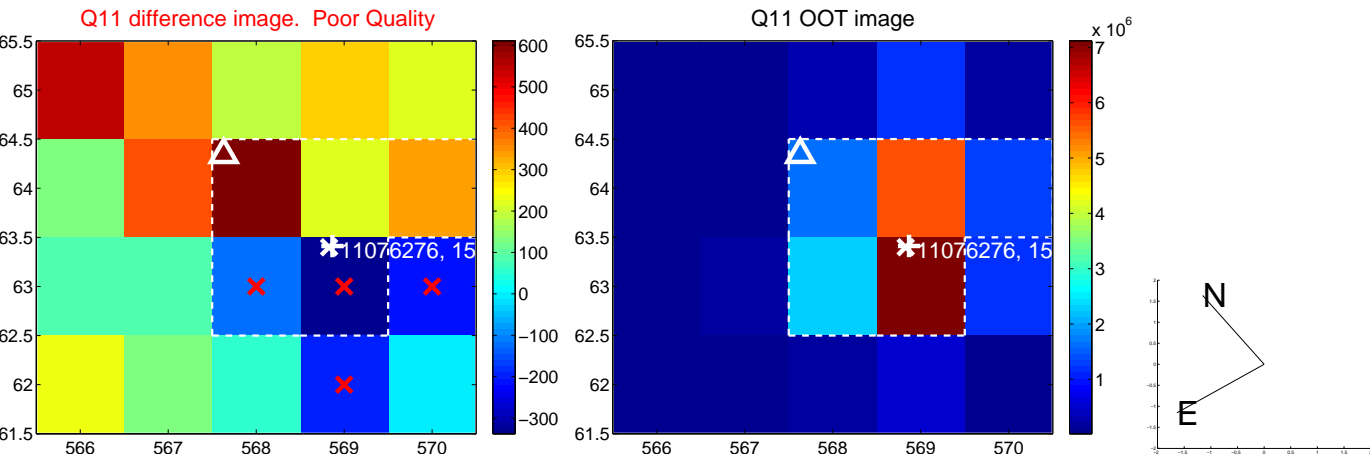
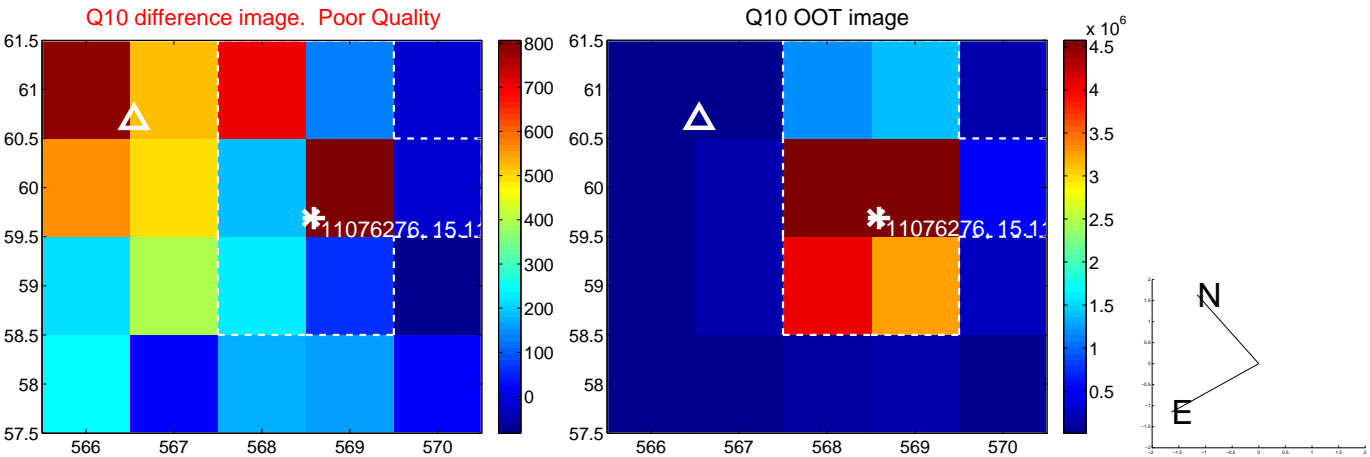
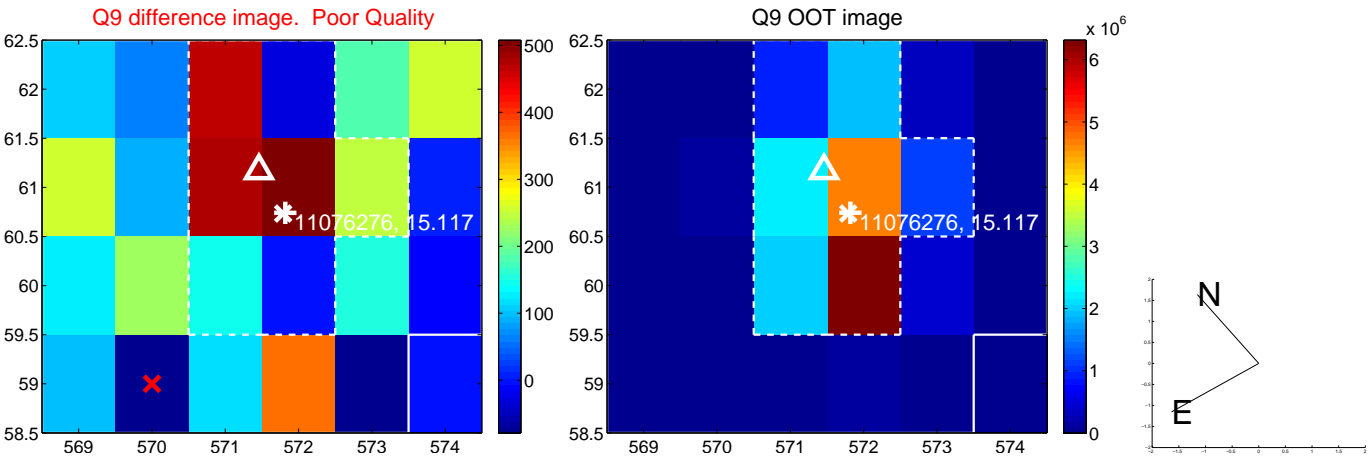


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

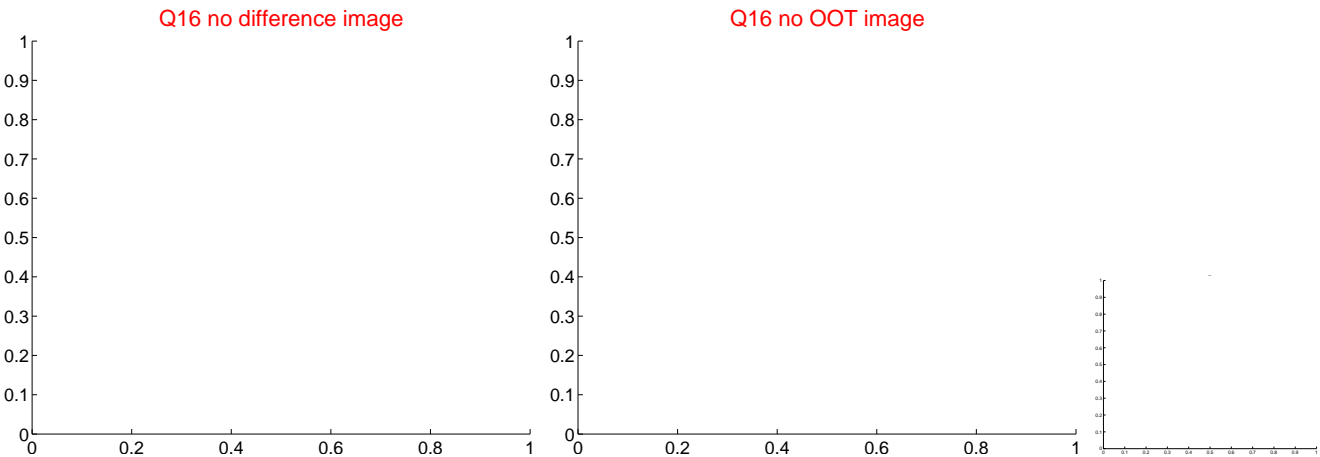
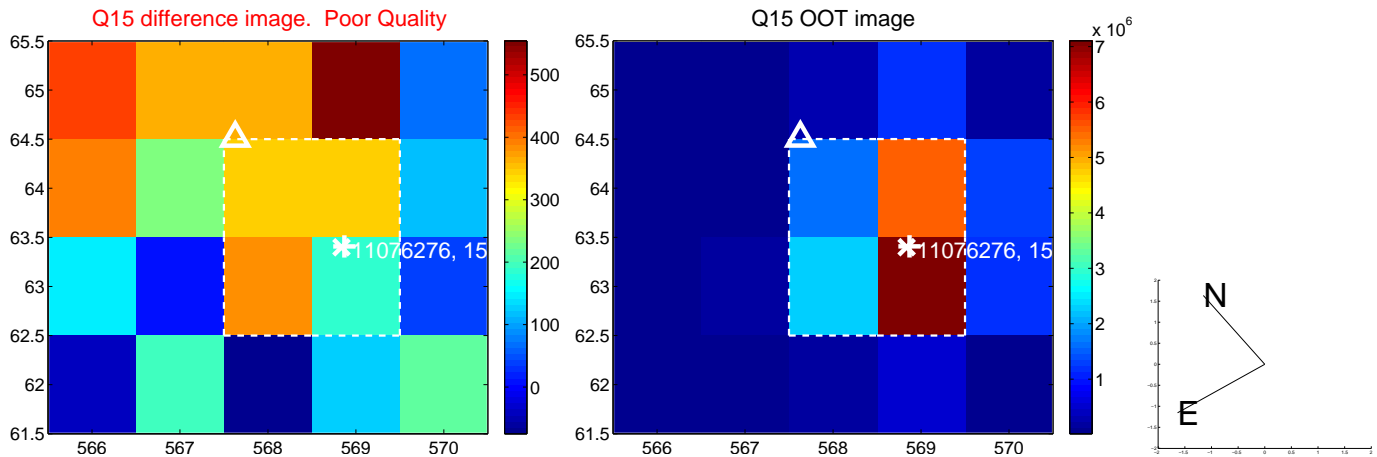
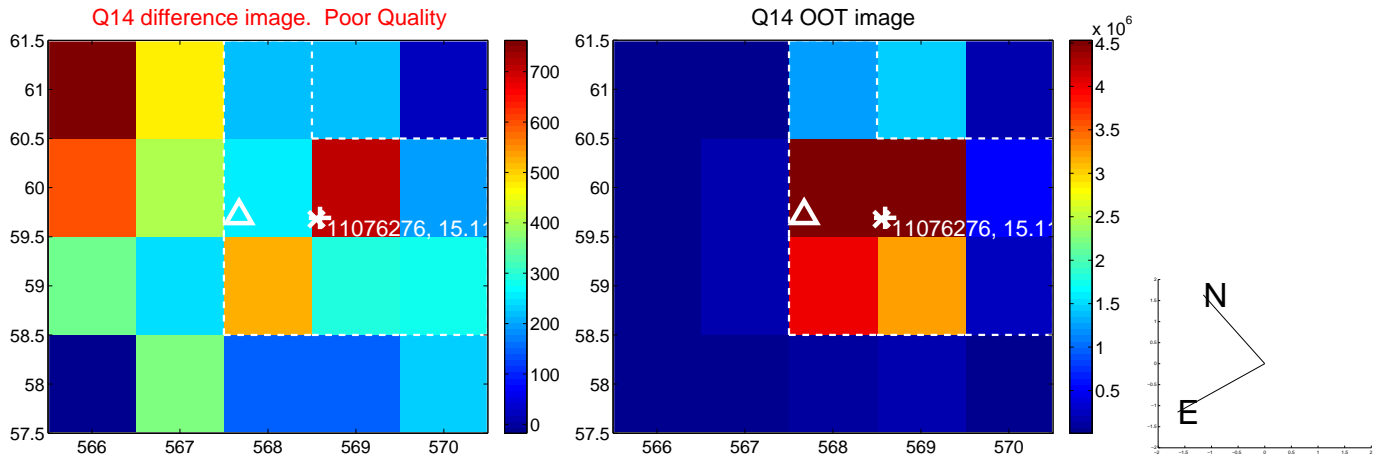
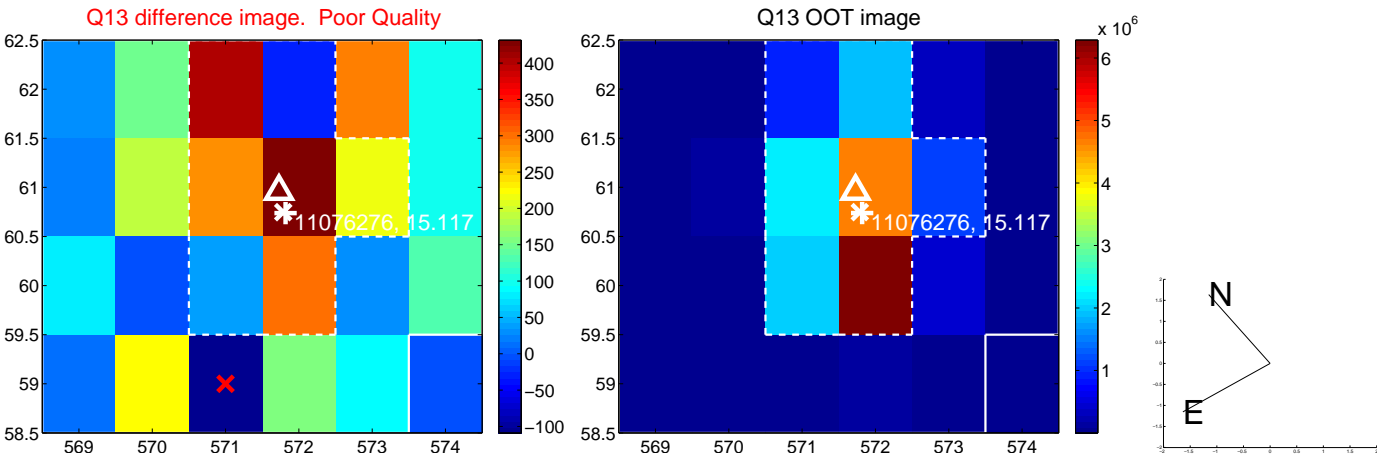




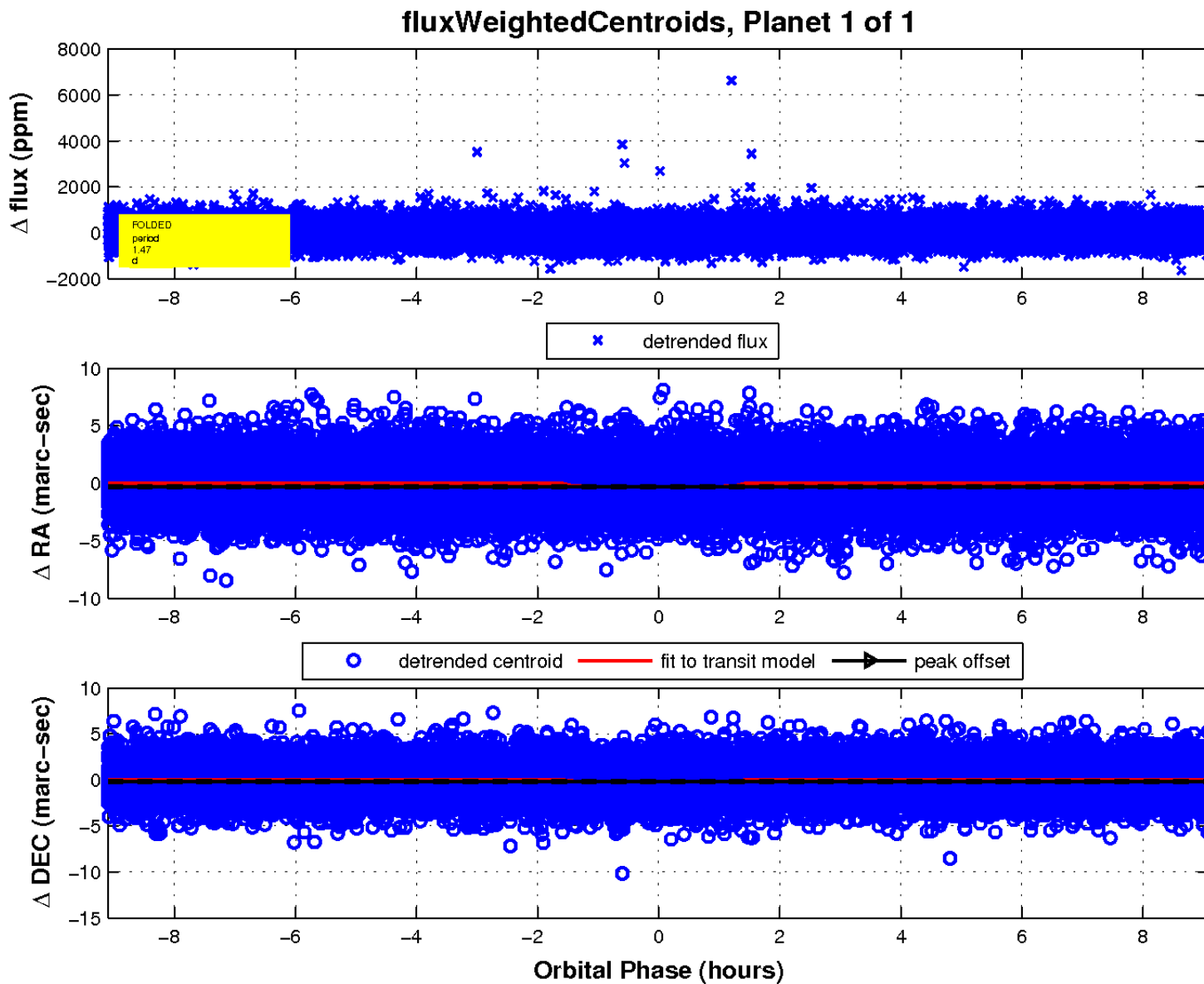
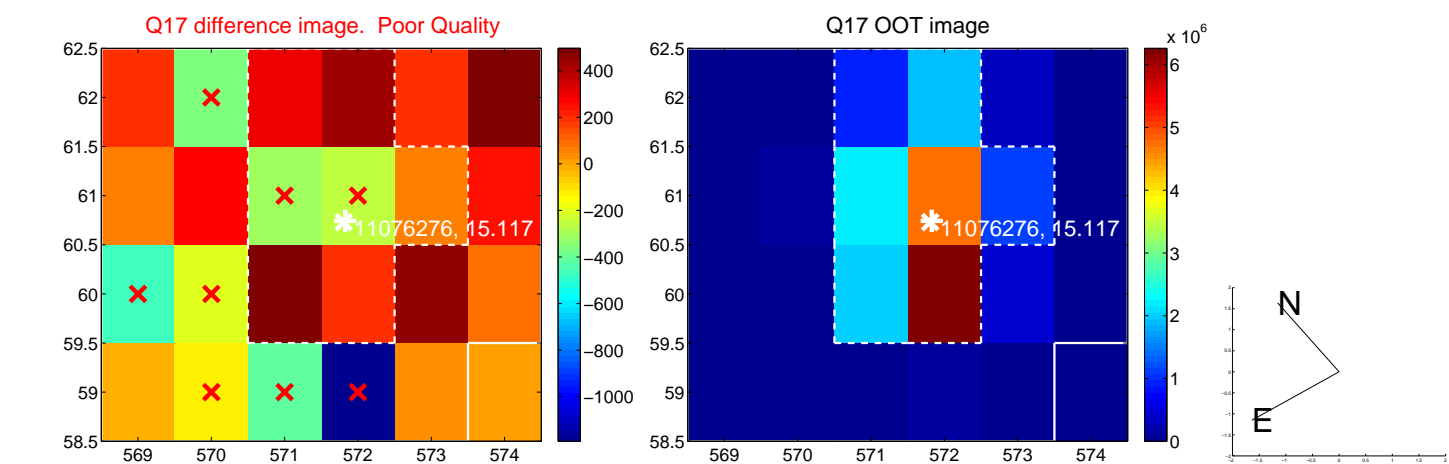
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

