

KIC 004678873

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 004678873-01 | OBS | 5075.01 | 1.878878 | 133.073740 | 83453.8 | 5.854 | 2923.2 | 1217.9 | 2.00 | 7542 | 97.91 | 9598.08 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 004678873-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 1 | MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—CENT_KIC_POS—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 for comment definitions.

Ephemeris Match Information For 004678873-01

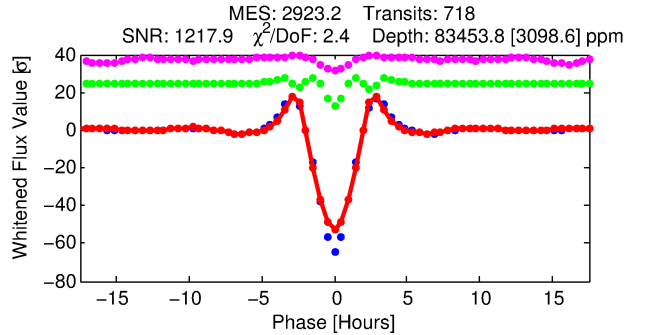
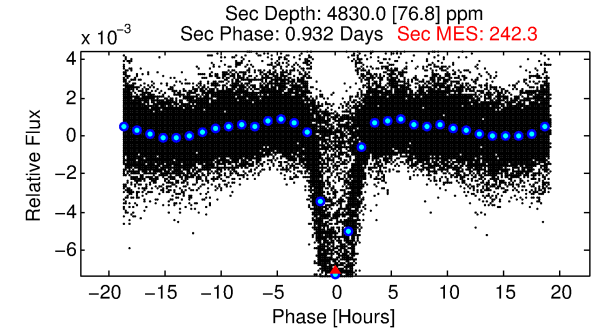
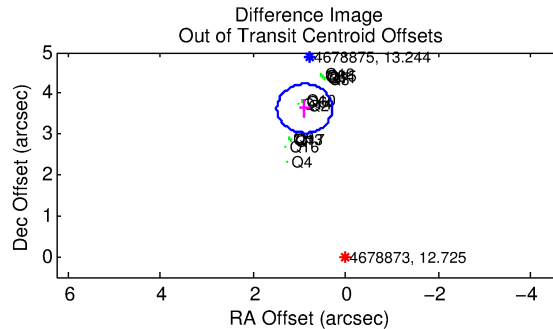
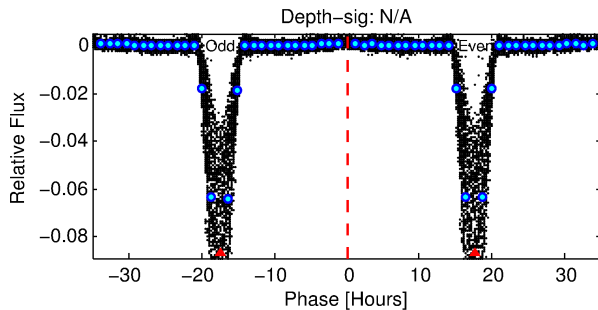
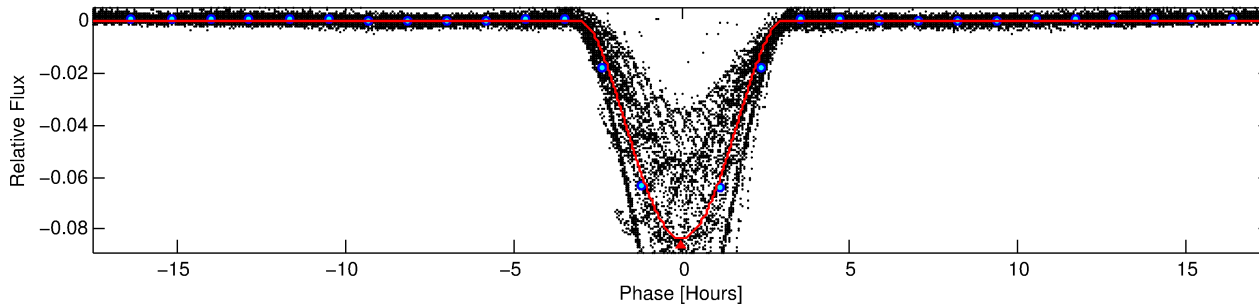
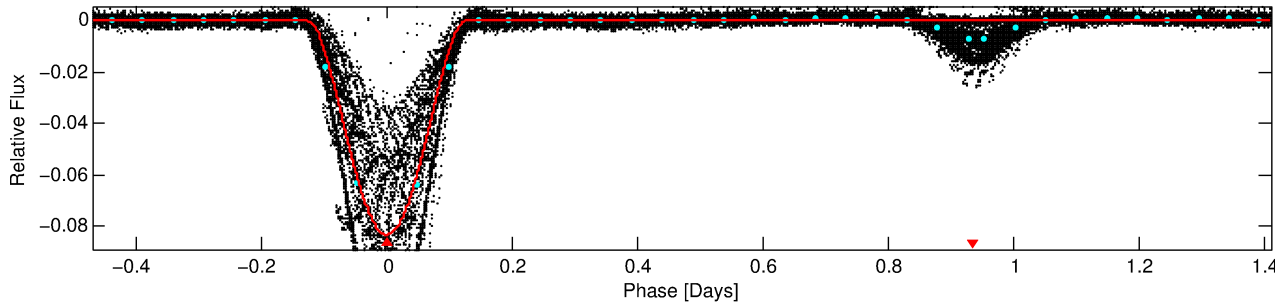
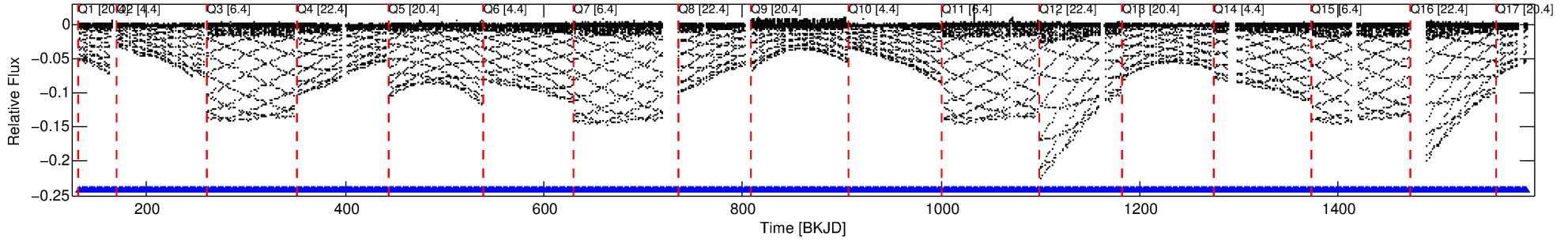
| TCE (1) | KIC | Parent (2) | Parent KIC | P ₁ :P ₂ | Dist (″) | Δ Row | Δ Col | m ₂ | m ₁ | D ₂ /D ₁ | Mechanism | Flag | σ_P | σ_T |
|--------------|---------|--------------|------------|--------------------------------|----------|--------------|--------------|----------------|----------------|--------------------------------|------------|------|------------|------------|
| 004678873-01 | 4678873 | 004678875-01 | 4678875 | 1:1 | 4.9 | -1 | -1 | 13.24 | 12.72 | 9.60 | Direct-PRF | 0 | 0.43 | 0.22 |

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 4678873 Candidate: 1 of 1 Period: 1.879 d
KOI: K05075.01 Corr: 0.955

Kp: 12.73 R*: 2.00 Rs Teff: 7542.0 K Logg: 4.04 Fe/H: -0.220



DV Fit Results:

Period = 1.87888 [0.00000] d
Epoch = 133.0737 [0.0000] BKJD
Rp/R* = 0.4488 [0.0372]
a/R* = 2.83 [0.03]
b = 1.00 [0.04]
Seff = 9598.08 [2363.93]
Teq = 2524 [155] K
Rp = 97.91 [19.46] Re
a = 0.0347 [0.0056] AU
Ag = 0.33 [0.10] [-6.76σ]
Teffp = 2968 [128] K [2.21σ]

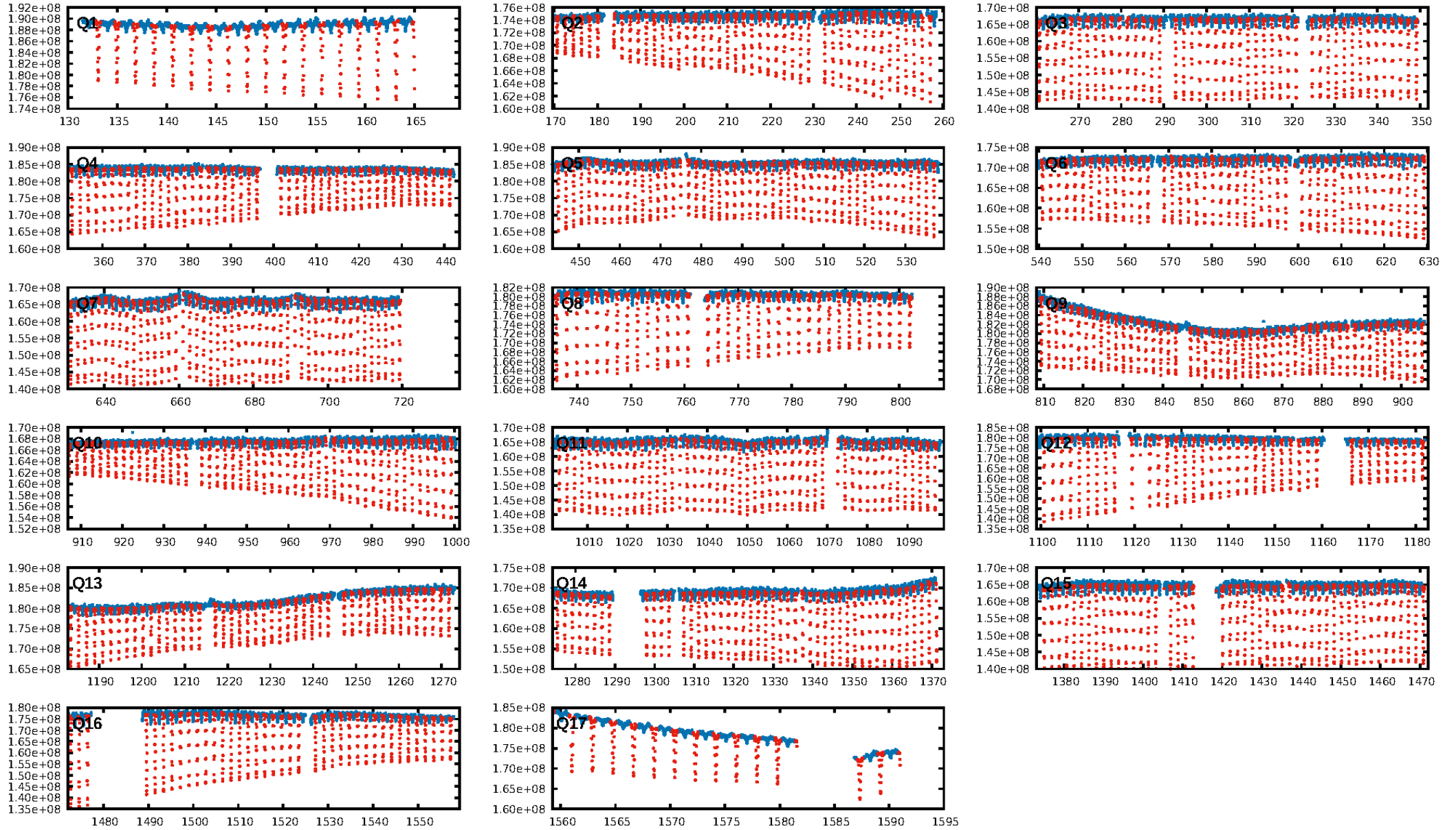
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [684/684]
GhostDiagnostic-chr: -0.4124
Centroid-sig: N/A
Centroid-so: 13.274 arcsec [3069.96σ]
OotOffset-rm: 3.731 arcsec [18.65σ]
KicOffset-rm: 5.153 arcsec [75.34σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

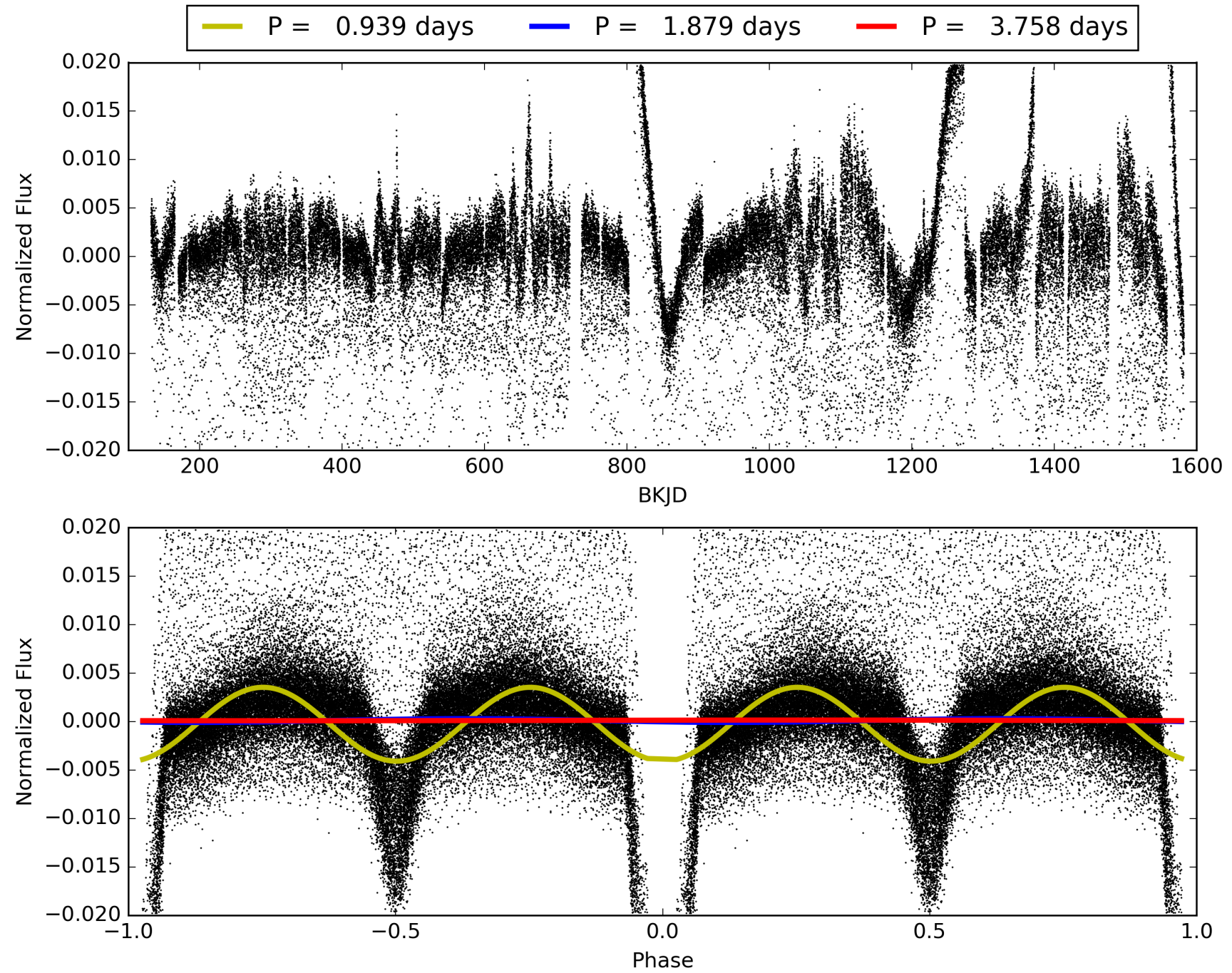
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:20:47 Z

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

TCE 004678873-01, PDC Light Curves

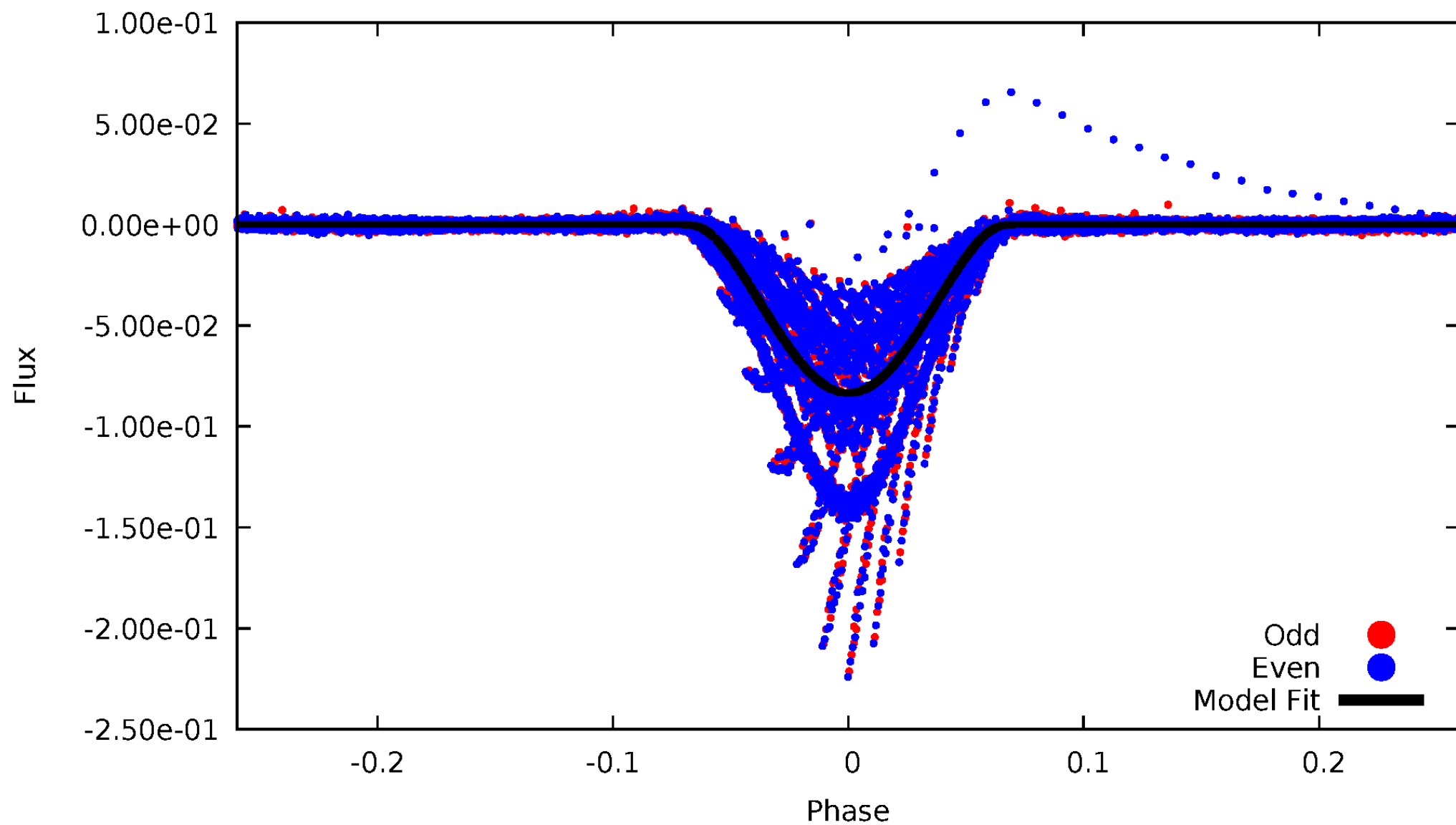


TCE 004678873-01



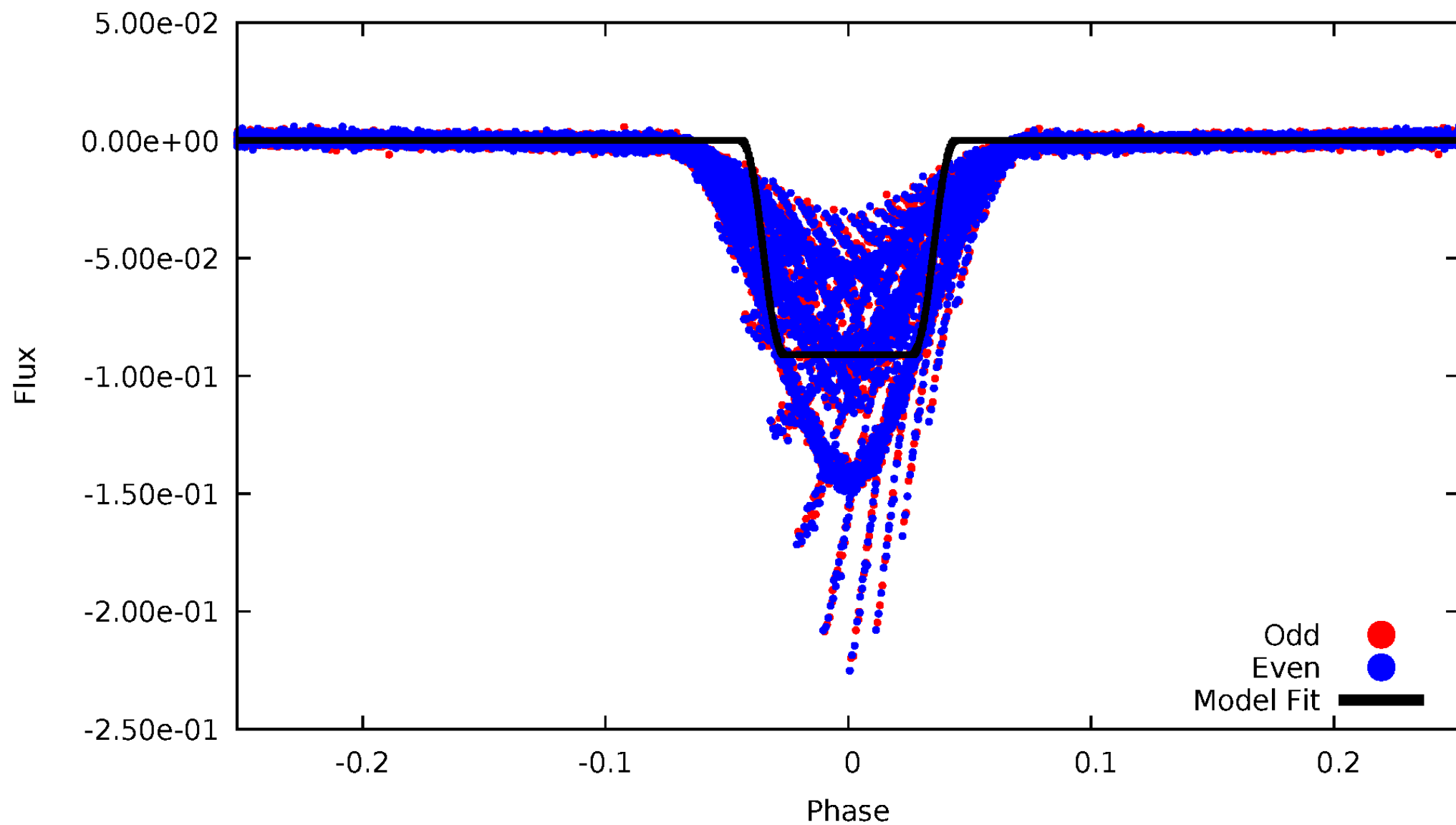
DV Odd/Even

TCE 004678873-01



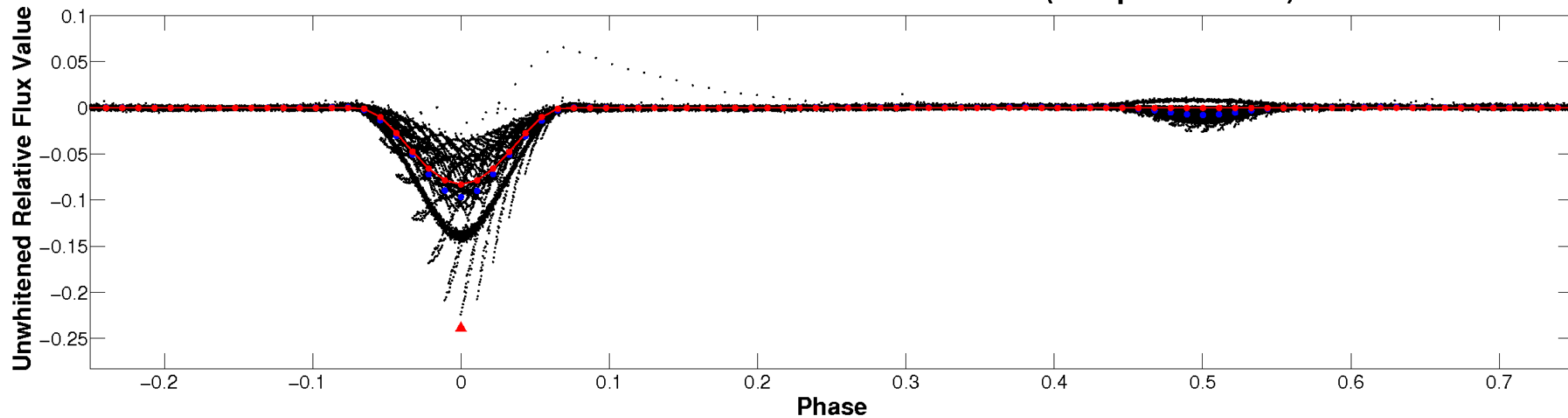
ALT Odd/Even

TCE 004678873-01

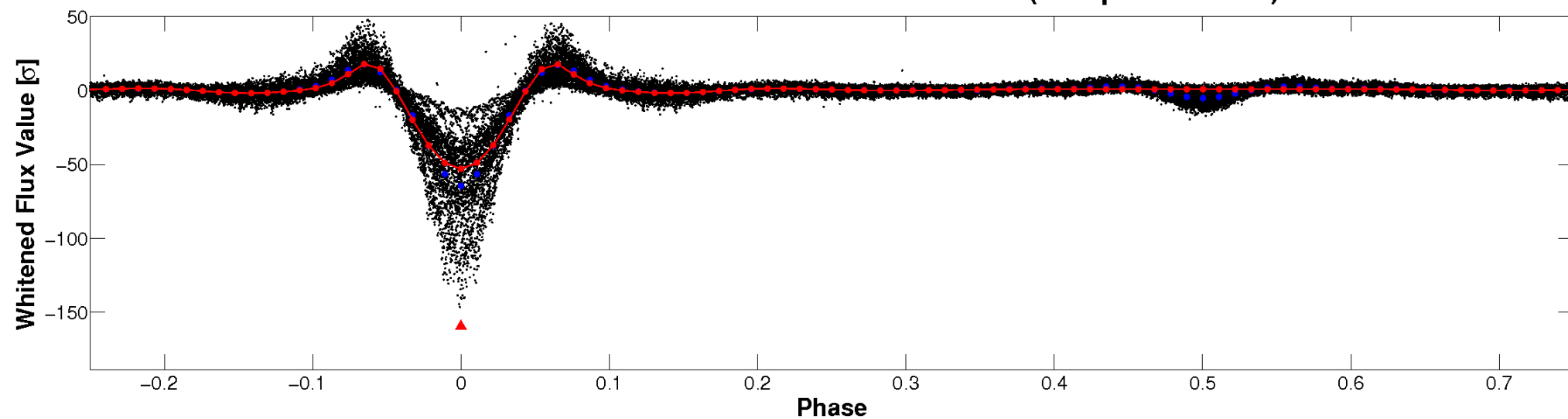


Non-Whitened Vs. Whitened Light Curve

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

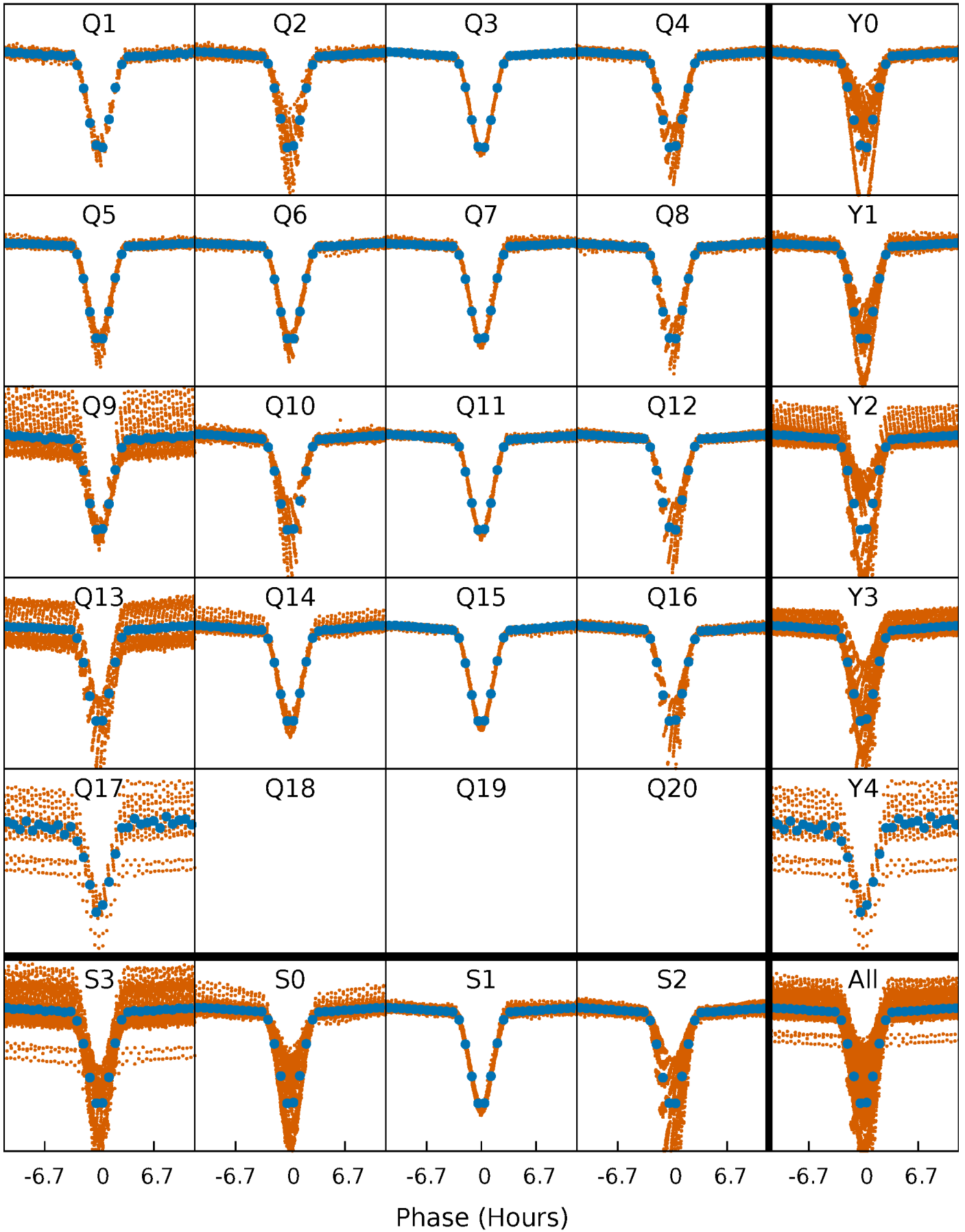


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



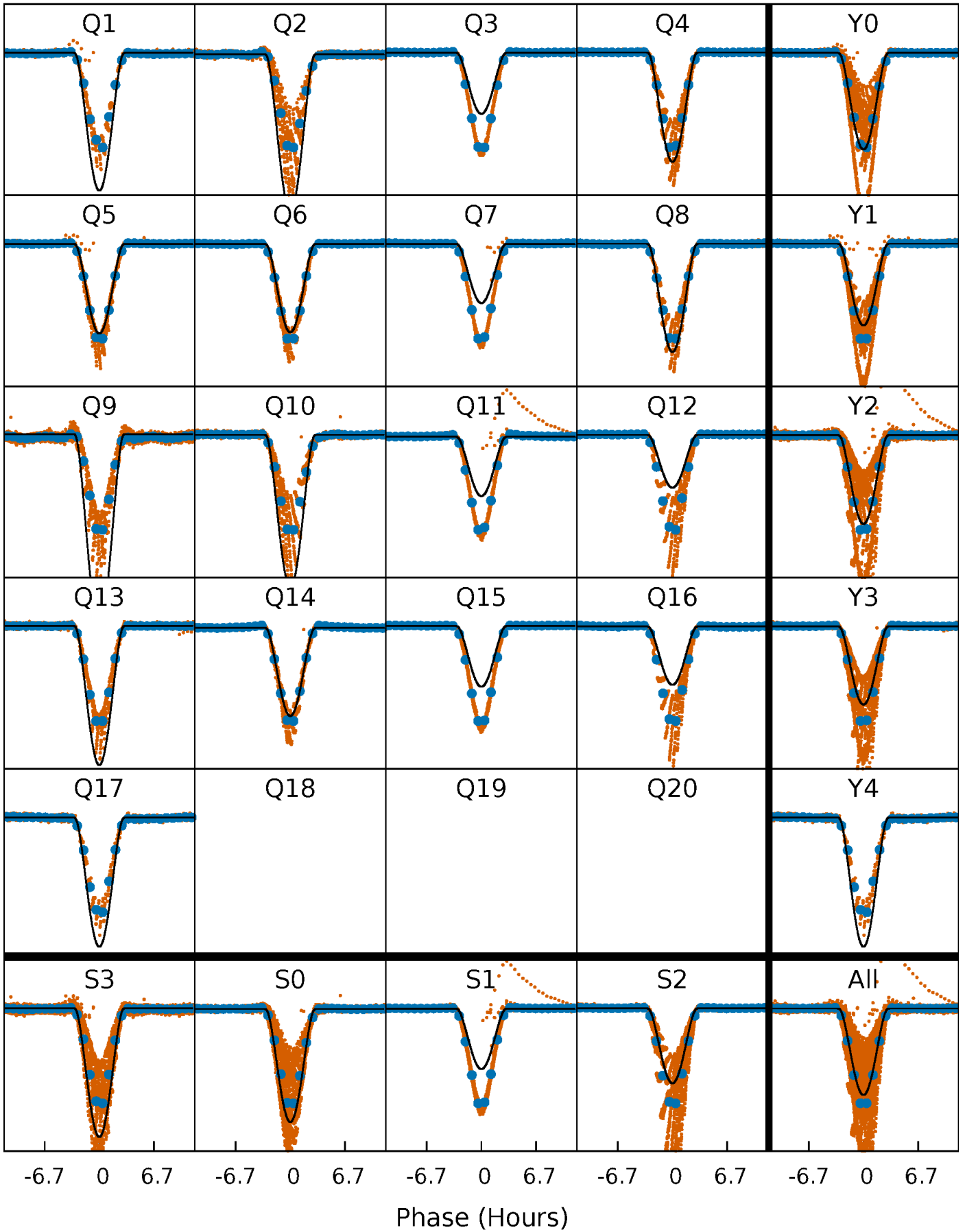
PDC Quarter-Phased Transit Curves

TCE 004678873-01 P= 1.878878 Days $T_0=133.073740$ (BKJD)



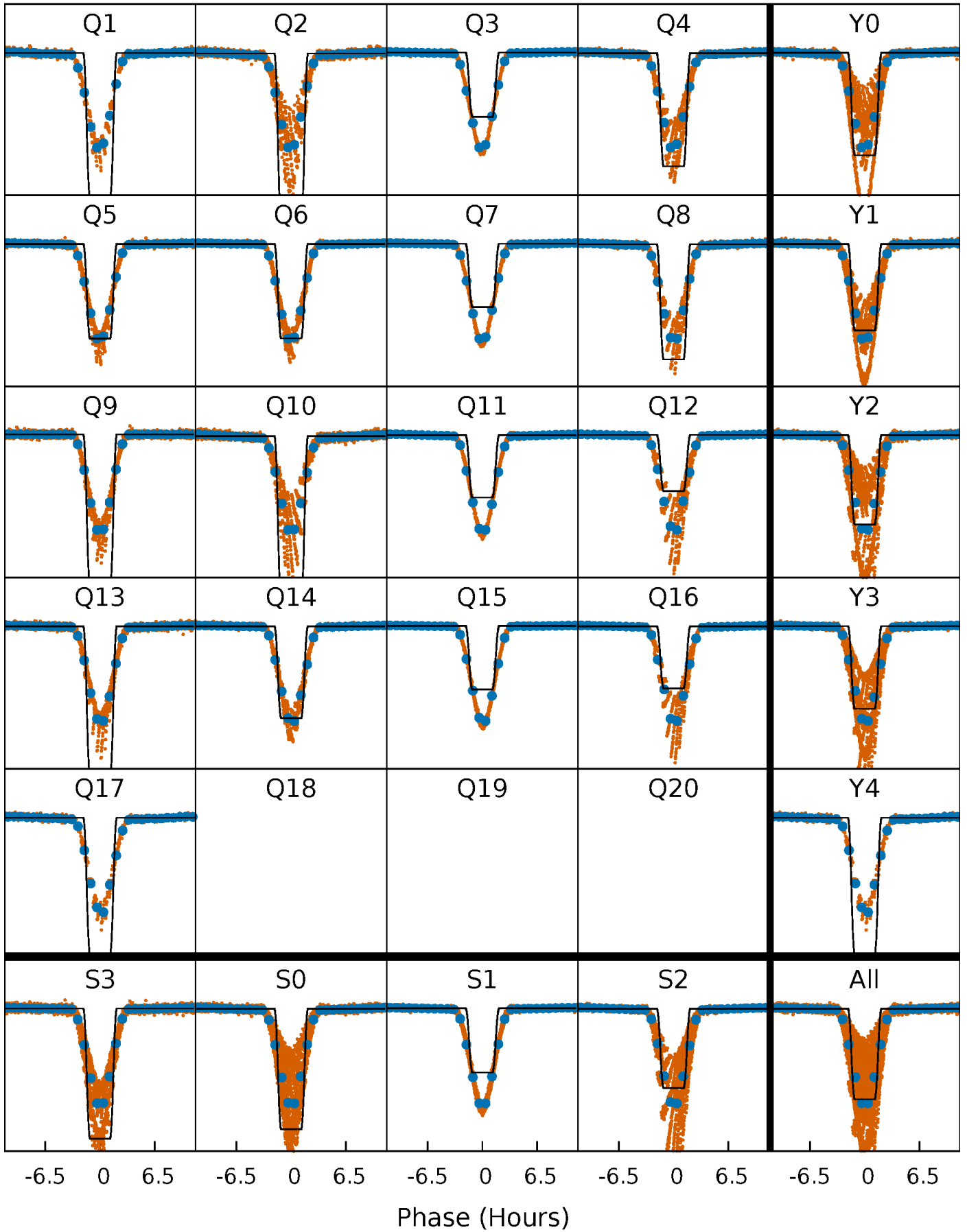
DV Quarter-Phased Transit Curves

TCE 004678873-01 P= 1.878878 Days $T_0=133.073740$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

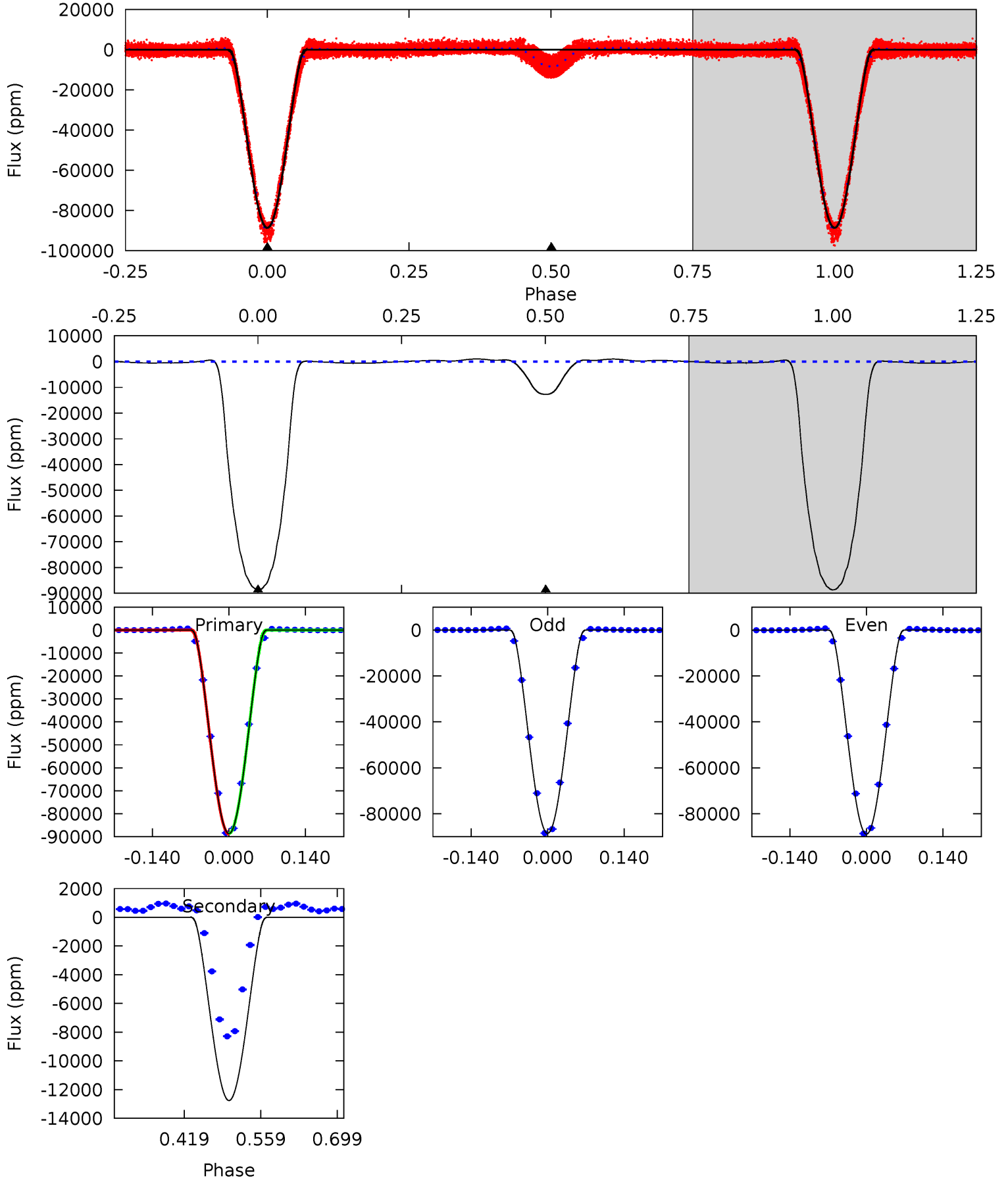
TCE 004678873-01 P= 1.878867 Days $T_0=133.078062$ (BKJD)



DV Model-Shift Uniqueness Test

004678873-01, P = 1.878878 Days, E = 131.194862 Days

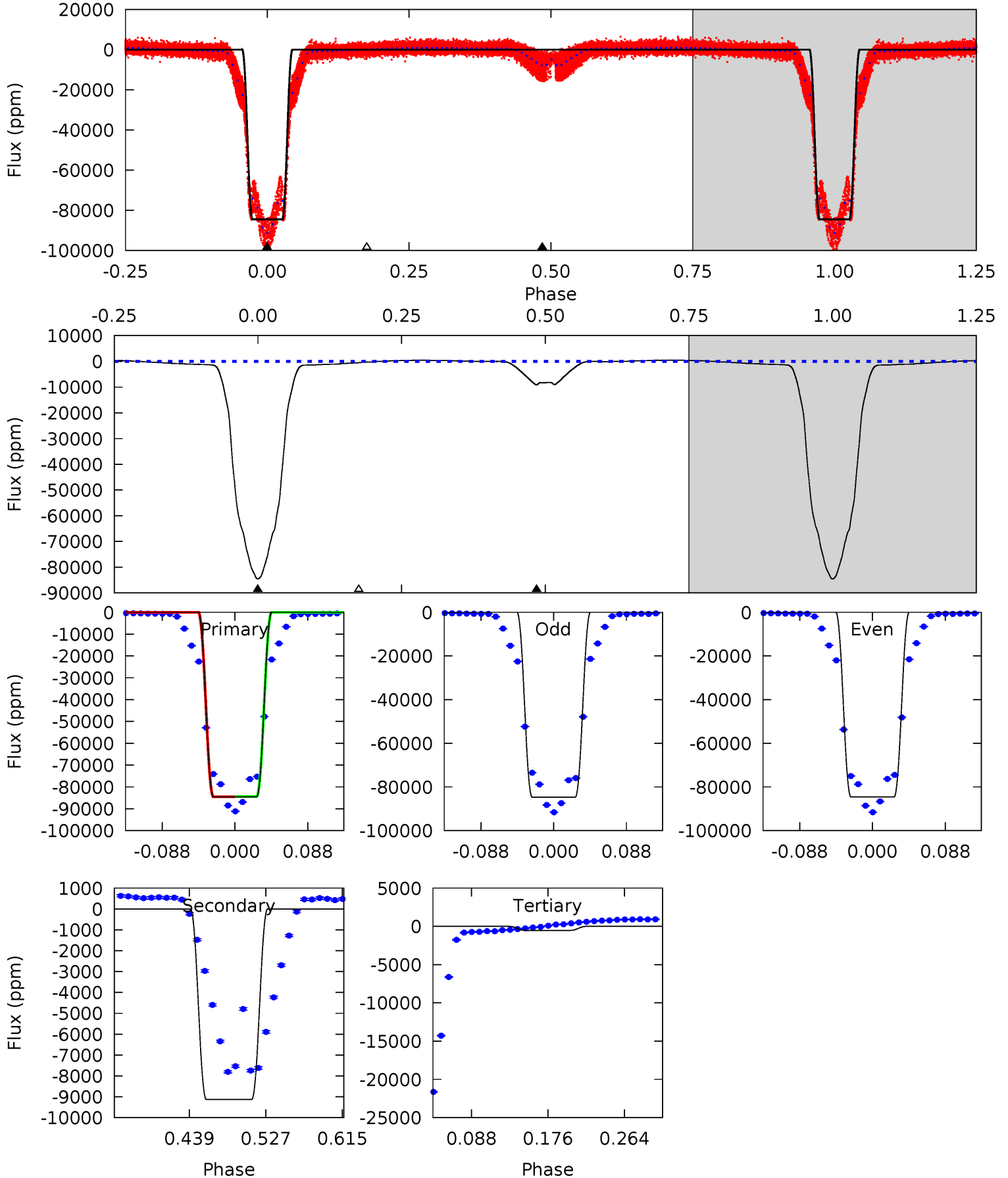
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 4670 | 672.4 | 0 | 0 | 4.49 | 1.48 | 20.9 | 4670 | 4670 | 672.4 | 672.4 | 9.81 | 1.05 | 0.01 | 0 |



Alt Model-Shift Uniqueness Test

004678873-01, P = 1.878867 Days, E = 131.199195 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 2025 | 218.6 | 12.6 | 0 | 4.59 | 1.71 | 13.1 | 2012 | 2025 | 206.1 | 218.6 | 1.06 | 1.06 | 0.01 | 0 |



Stellar Parameters For KIC 004678873

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 7542^{+75}_{-83} | $4.036^{+0.137}_{-0.112}$ | $-0.220^{+0.150}_{-0.150}$ | $1.999^{+0.361}_{-0.325}$ | $1.582^{+0.158}_{-0.118}$ | $0.279^{+0.181}_{-0.094}$ |
| | +1%/-1% | +3%/-3% | +68%/-68% | +18%/-16% | +10%/-7% | +65%/-34% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 004678873-01 / KOI 5075.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-----------------|---------------------------|----------------------|----------------------|---------------------------|
| DV | -12765 ± 19 | $97.68^{+13.21}_{-11.64}$ | 3516^{+186}_{-148} | 3764^{+182}_{-171} | $0.900^{+0.263}_{-0.192}$ |
| Alt. | -9127 ± 42 | $66.68^{+10.29}_{-10.39}$ | 3527^{+154}_{-166} | 4182^{+273}_{-222} | $1.383^{+0.532}_{-0.329}$ |

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 $A_{obs} \gg 1.0$

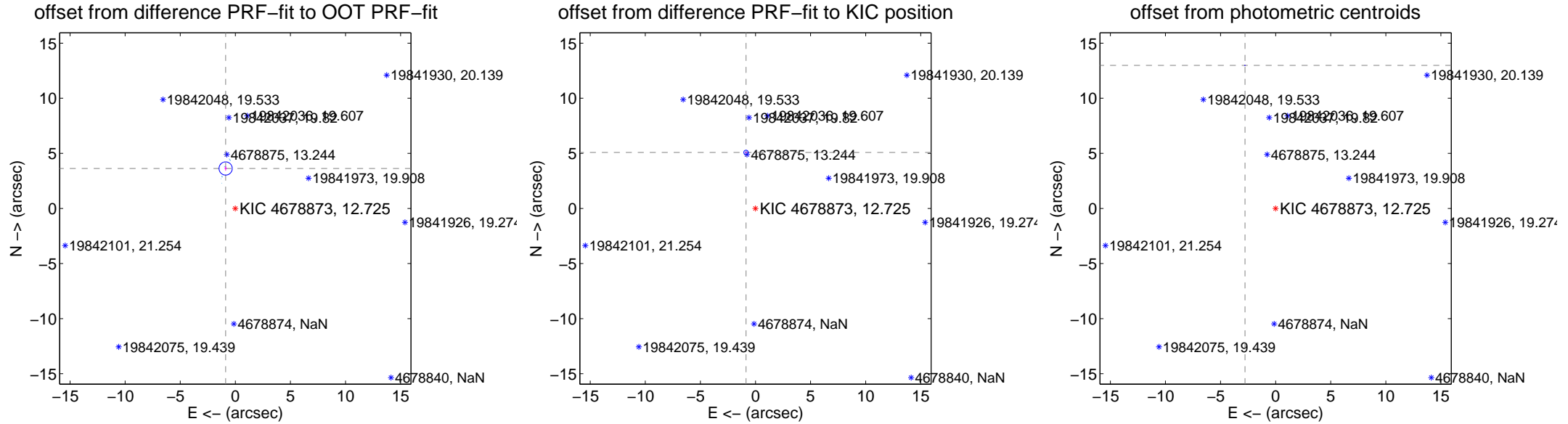
DV Centroid Data

Supplemental centroid analysis for 004678873-01. Kepler magnitude: 12.72. Transit SNR 1217.92

There are 17 quarters with good PRF difference image offsets

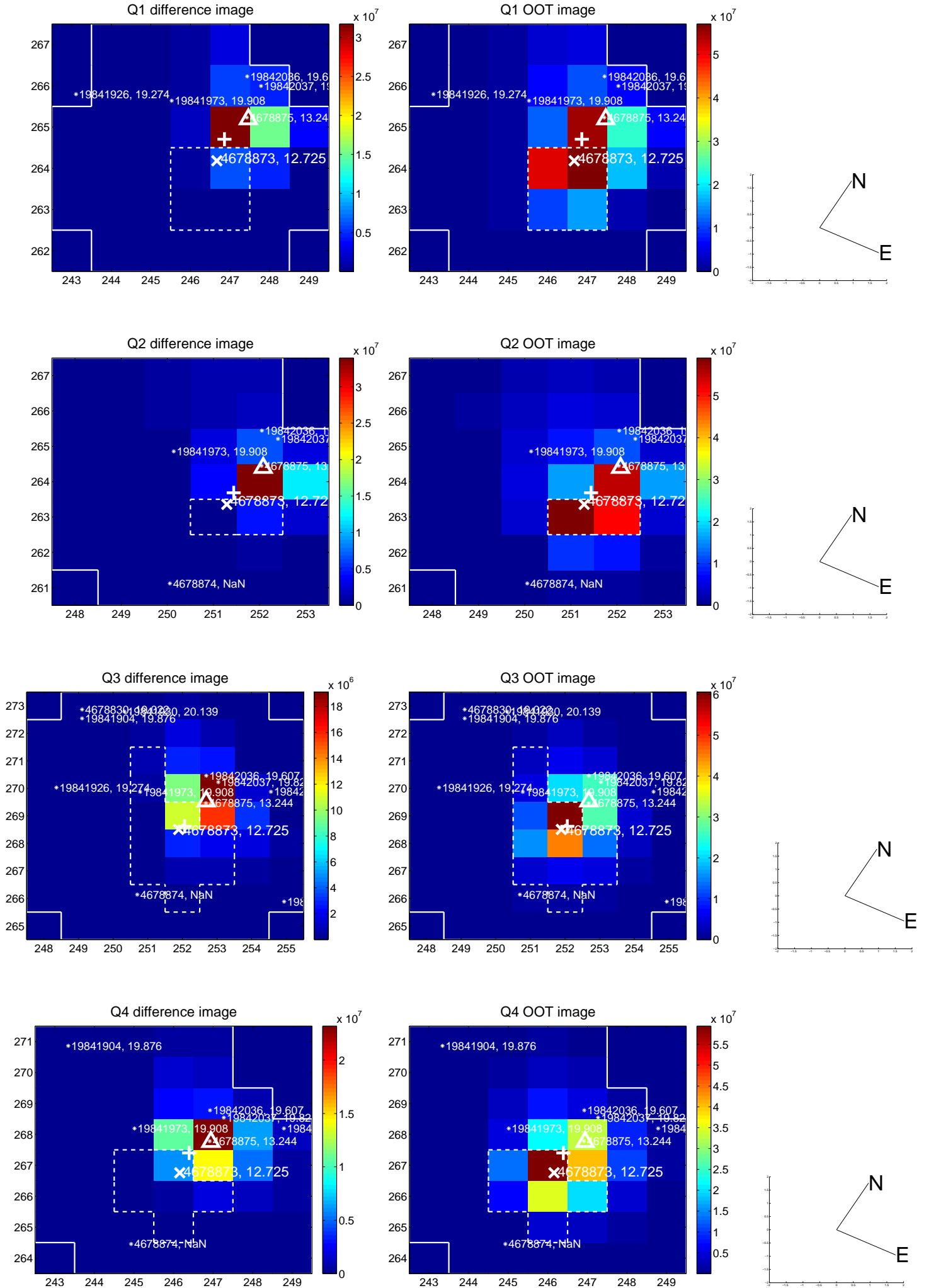
The OOT PRF centroid is offset from the target star catalog position by about 2.23 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 3.731 \pm 0.200 | 18.65 | 0.880 \pm 0.108 | 3.625 \pm 0.204 |
| PRF-fit source offset from KIC position | 5.153 \pm 0.068 | 75.34 | 0.858 \pm 0.067 | 5.081 \pm 0.068 |
| photometric centroid source offset | 13.27 \pm 0.00 | 3069.95 | 2.78 \pm 0.00 | 12.98 \pm 0.00 |

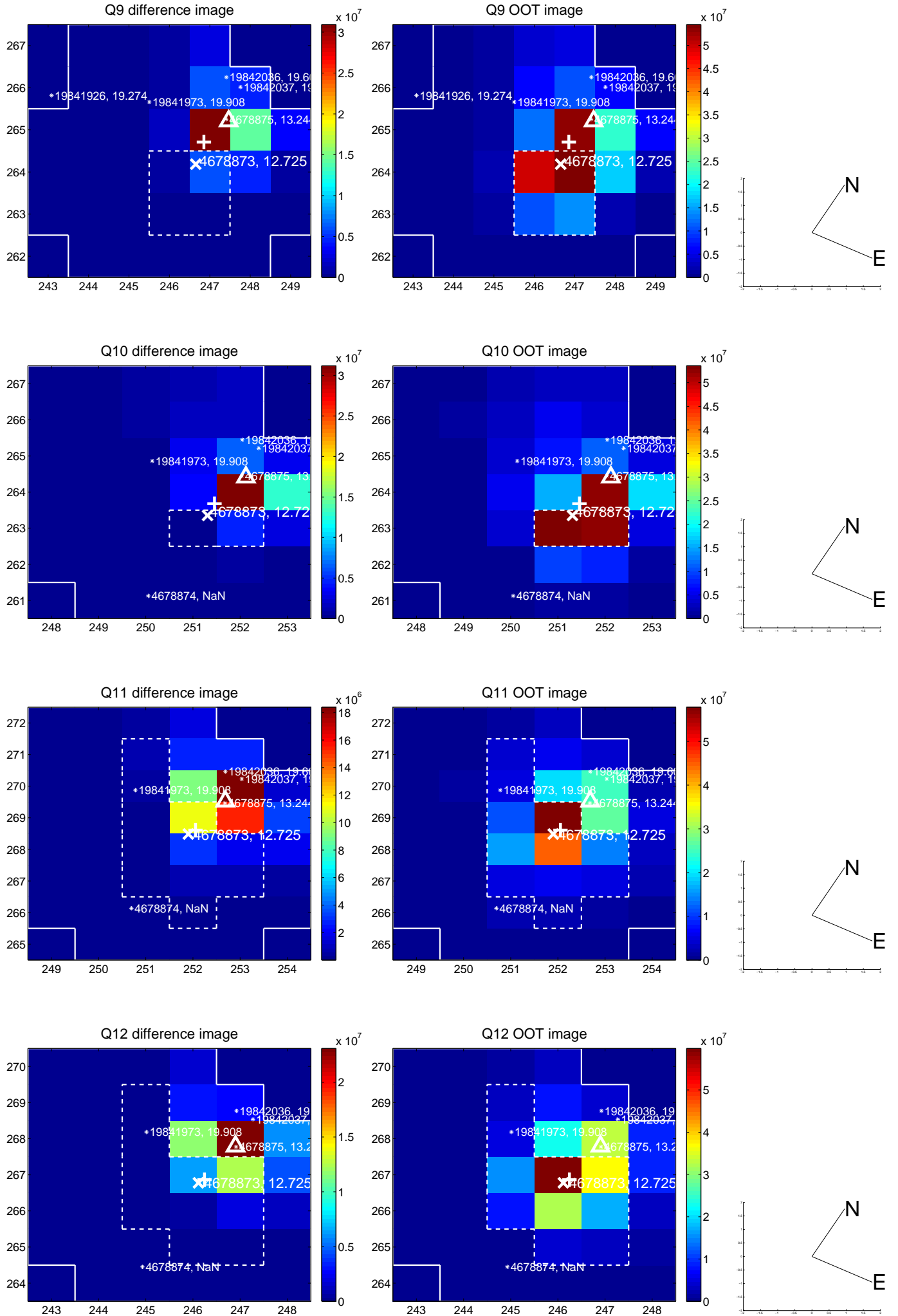


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

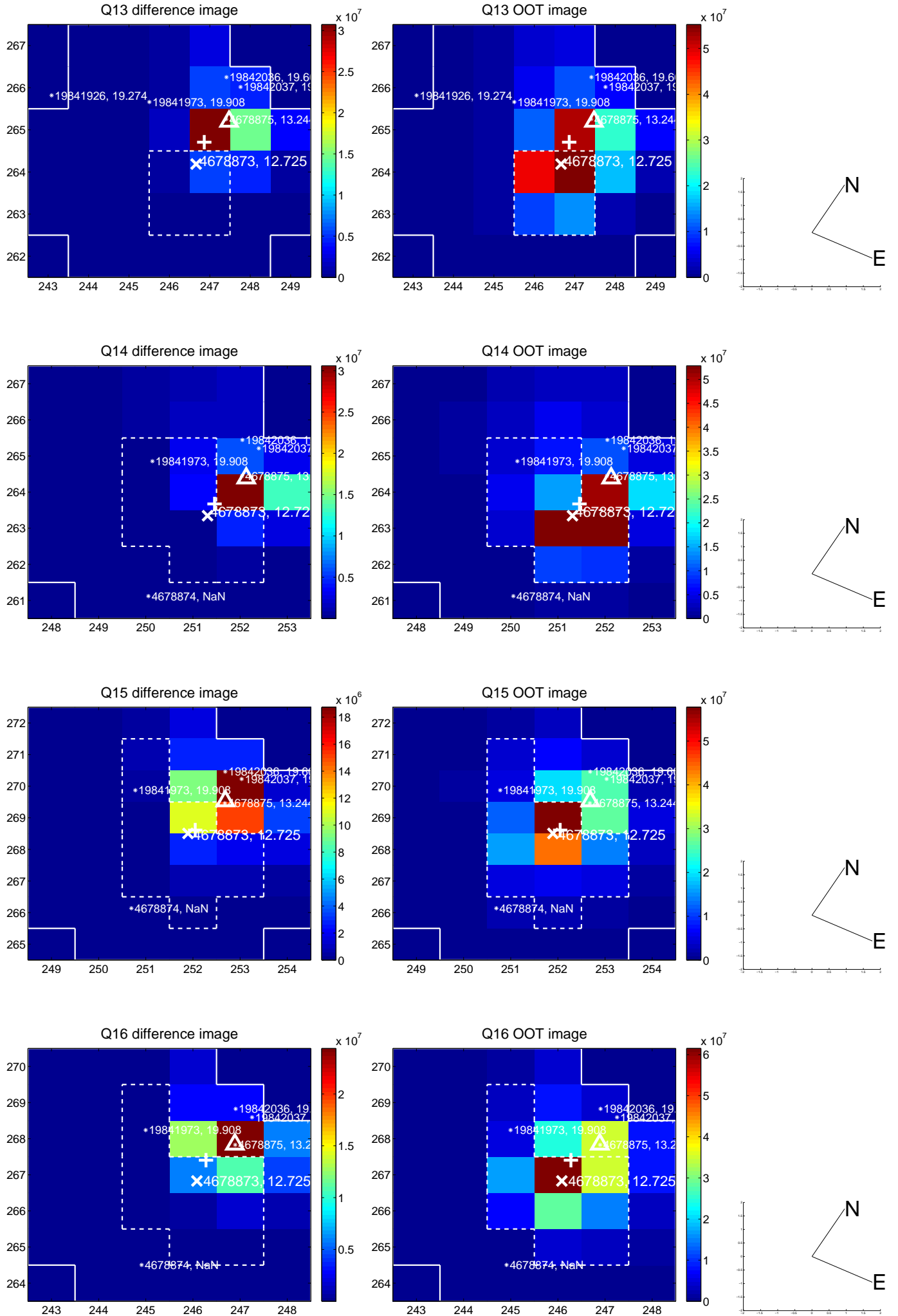
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



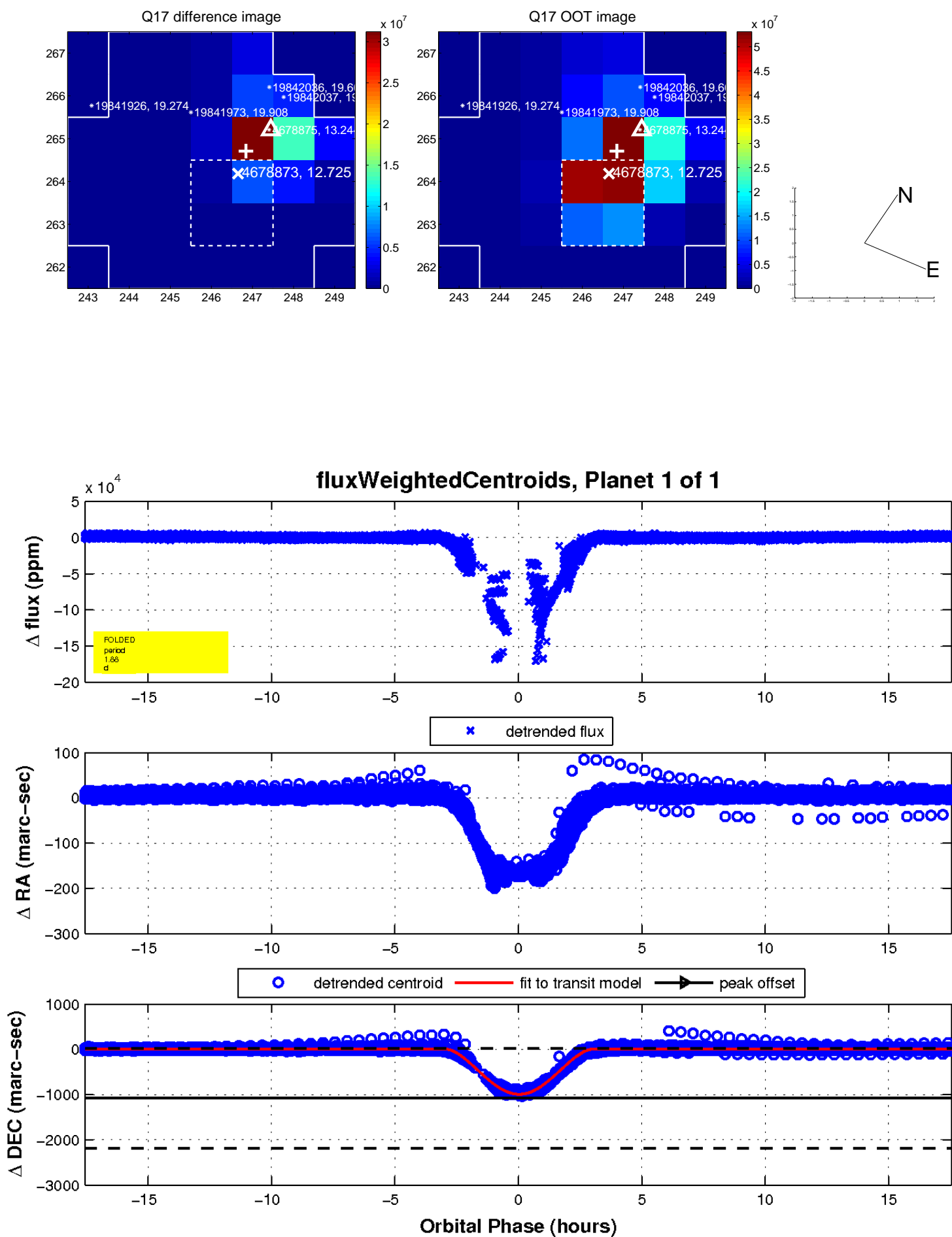
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

