

KIC 008959839

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008959839-01 | OBS | 2253.01 | 22.708258 | 133.718830 | 293.3 | 3.578 | 18.9 | 20.7 | 0.99 | 6170 | 1.93 | 49.75 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------|
| 008959839-01 | 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 for comment definitions.

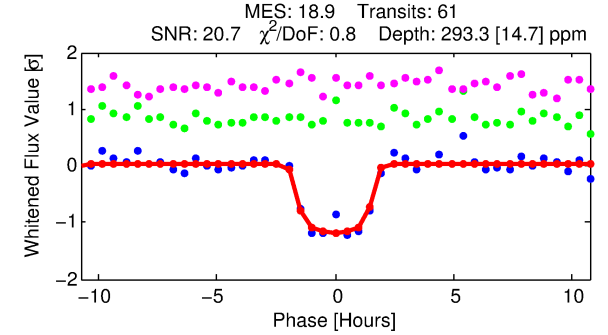
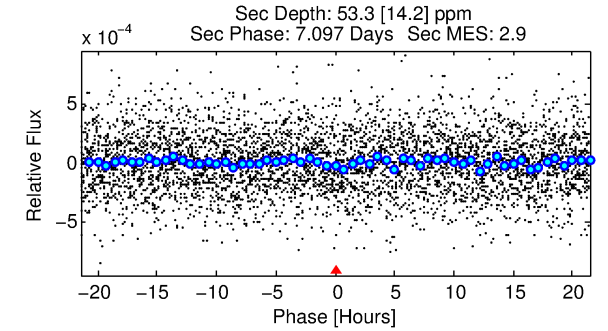
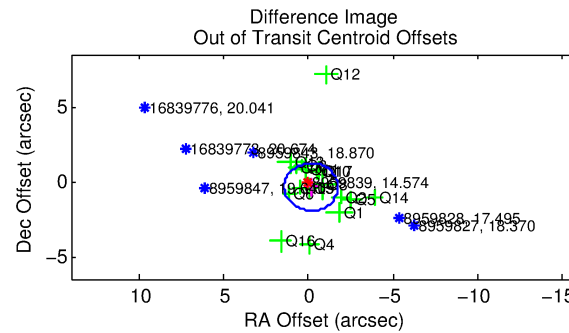
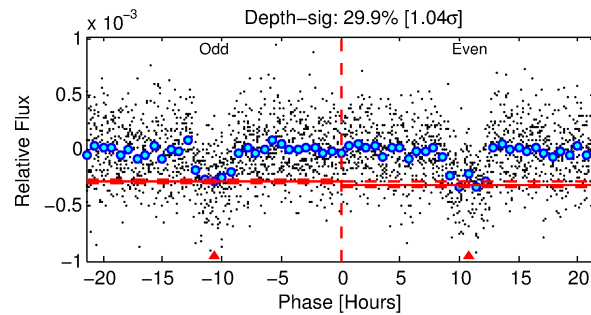
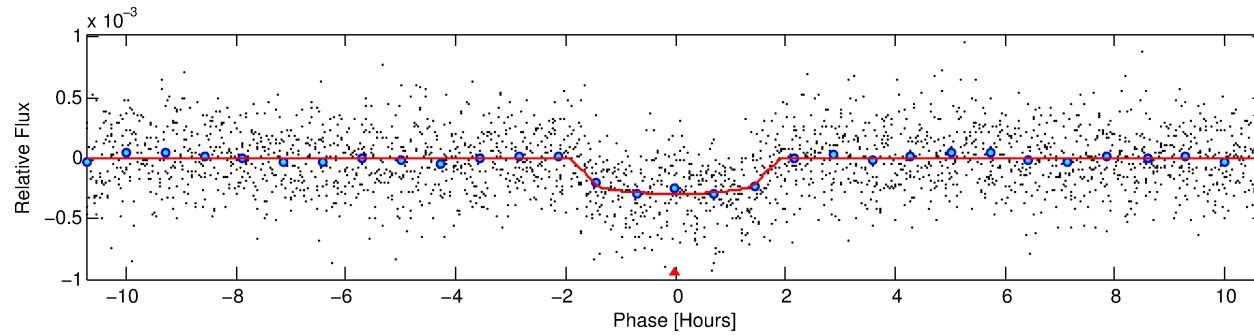
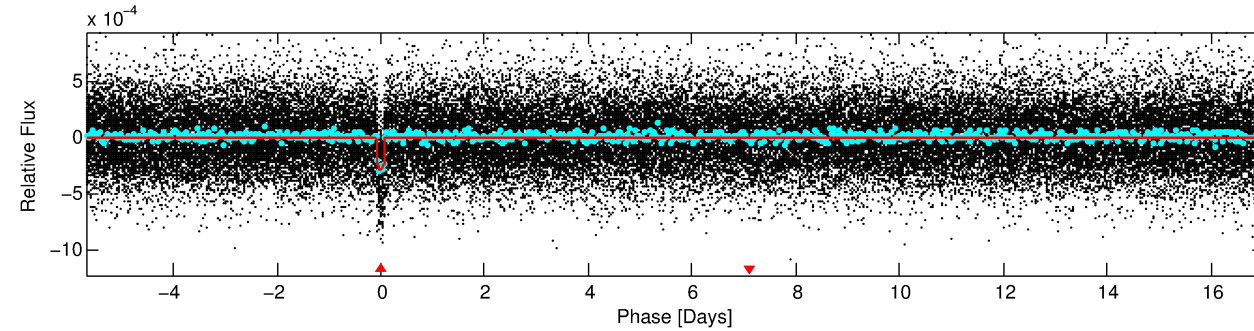
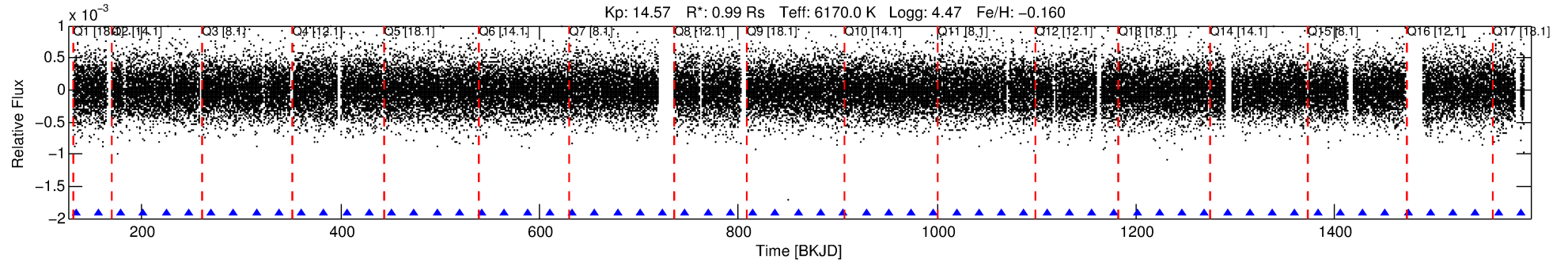
Ephemeris Match Information For 008959839-01

No Significant Match Found

DV One-Page Summary

KIC: 8959839 Candidate: 1 of 1 Period: 22.708 d

KOI: K02253.01 Corr: 0.989



DV Fit Results:

Period = 22.70826 [0.00011] d
Epoch = 133.7188 [0.0041] BKJD
Rp/R* = 0.0178 [0.0051]
a/R* = 27.23 [40.23]
b = 0.85 [0.49]
Seff = 49.75 [20.55]
Teff = 677 [70] K
Rp = 1.93 [0.82] Re
a = 0.1603 [0.0430] AU
Ag = 202.94 [150.44] [1.34 σ]
Teffp = 3952 [634] K [5.14 σ]

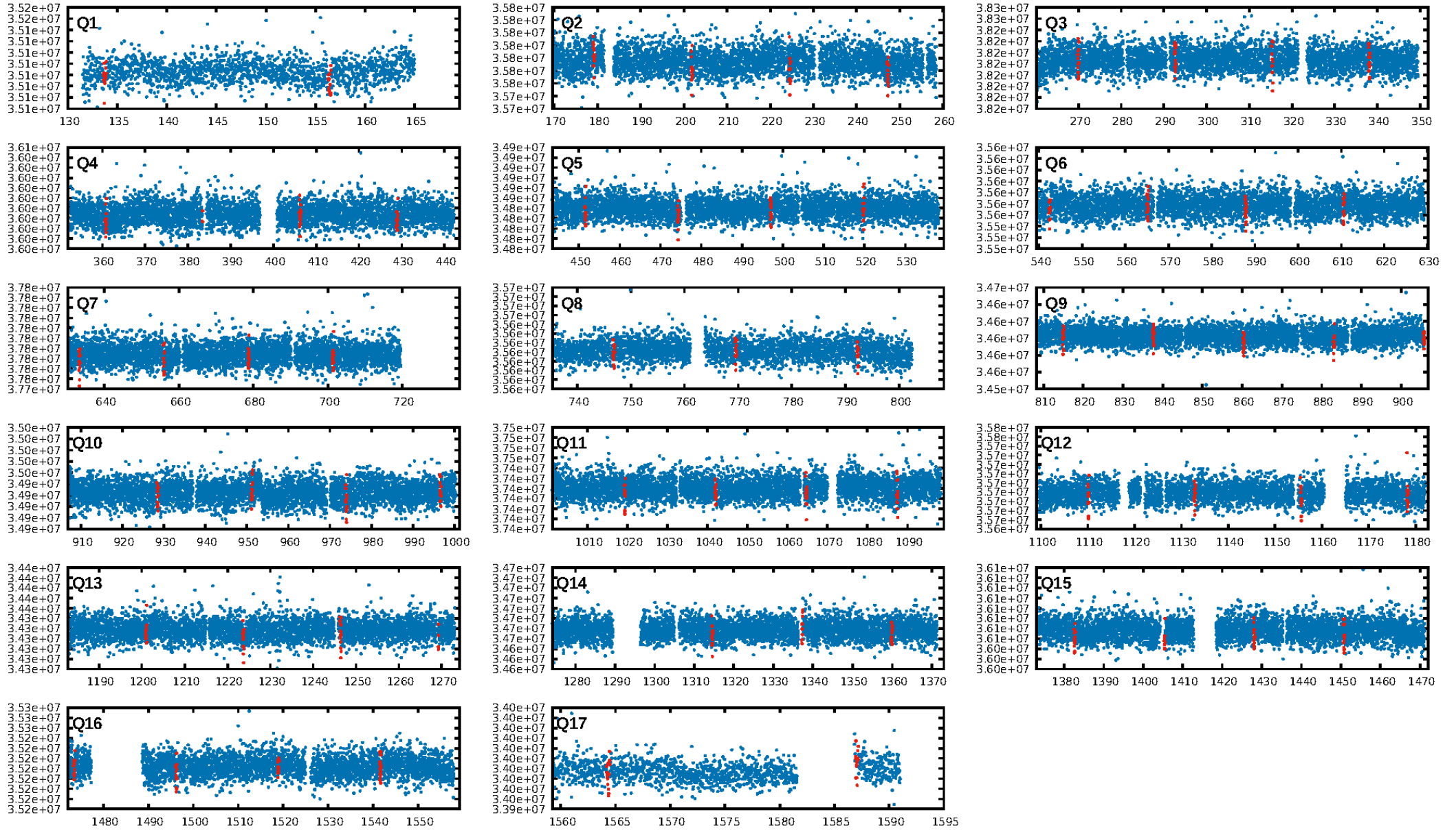
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 86.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.05e-78
RollingBand-fgt: 1.00 [57/57]
GhostDiagnostic-chr: 3.024
Centroid-sig: 1.3%
Centroid-so: 1.295 arcsec [2.03 σ]
OotOffset-rm: 0.386 arcsec [0.73 σ]
KicOffset-rm: 0.518 arcsec [0.84 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.82 [14/17]
DiffImageOverlap-fno: 1.00 [17/17]

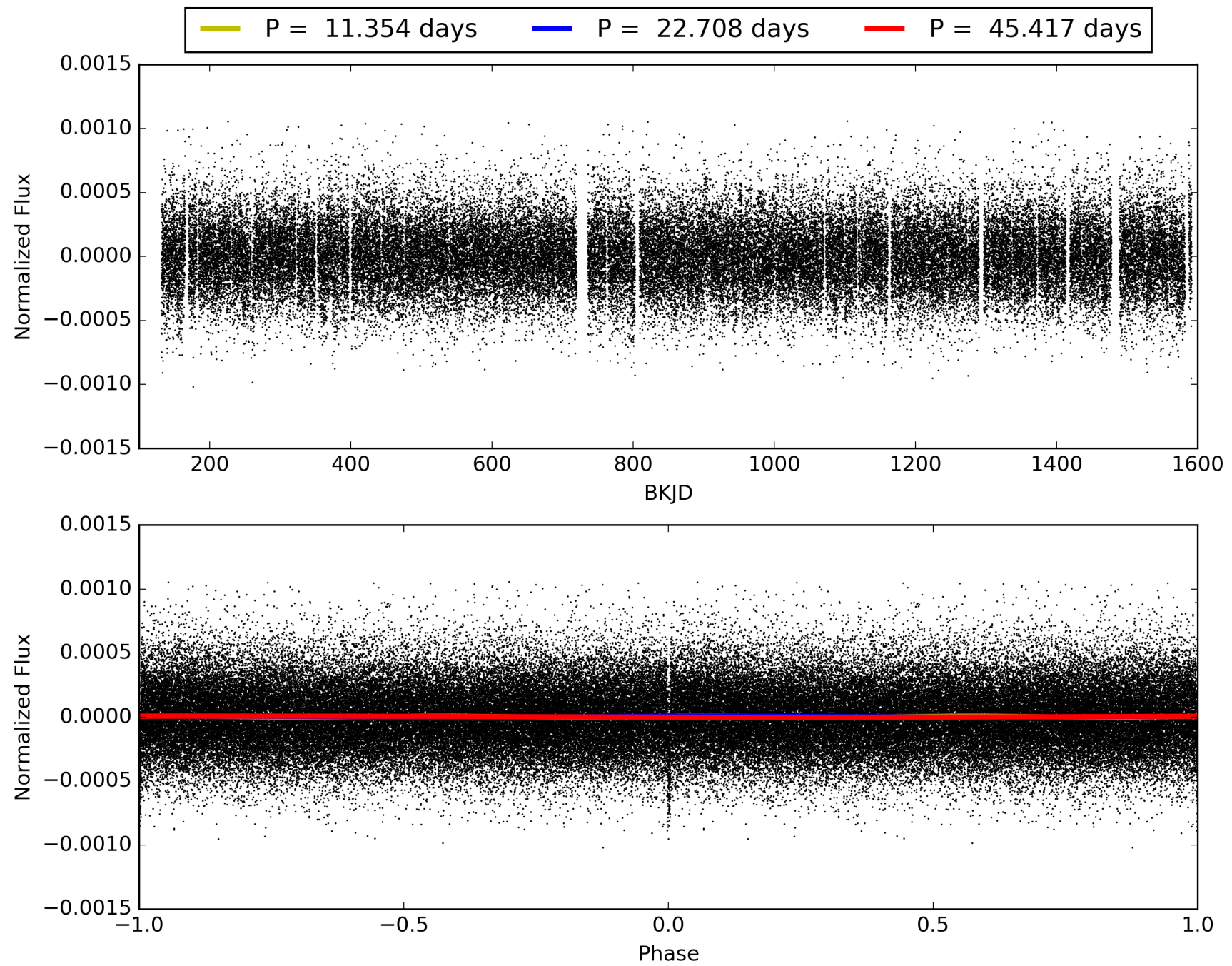
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:54:54 Z

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

TCE 008959839-01, PDC Light Curves

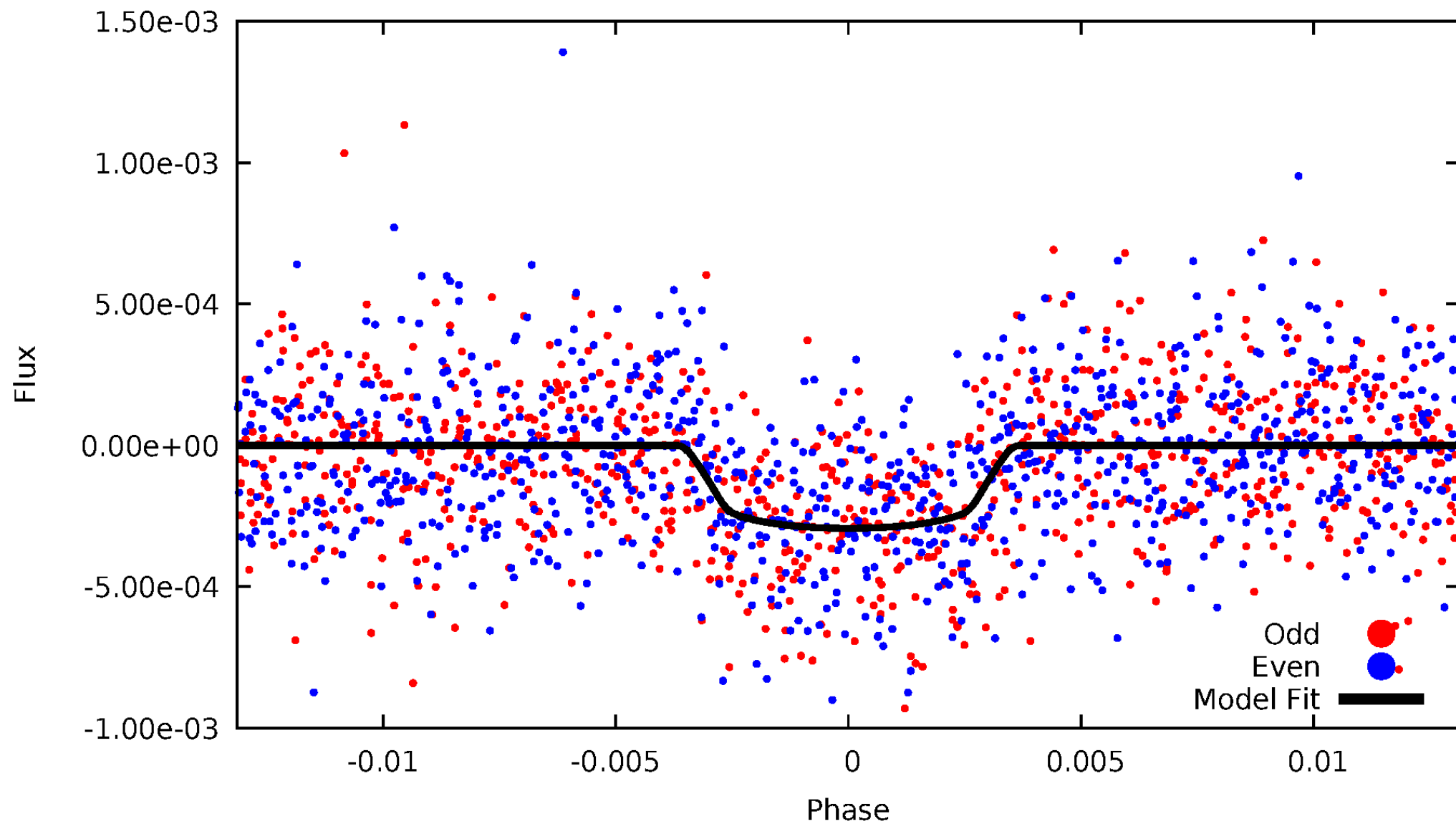


TCE 008959839-01



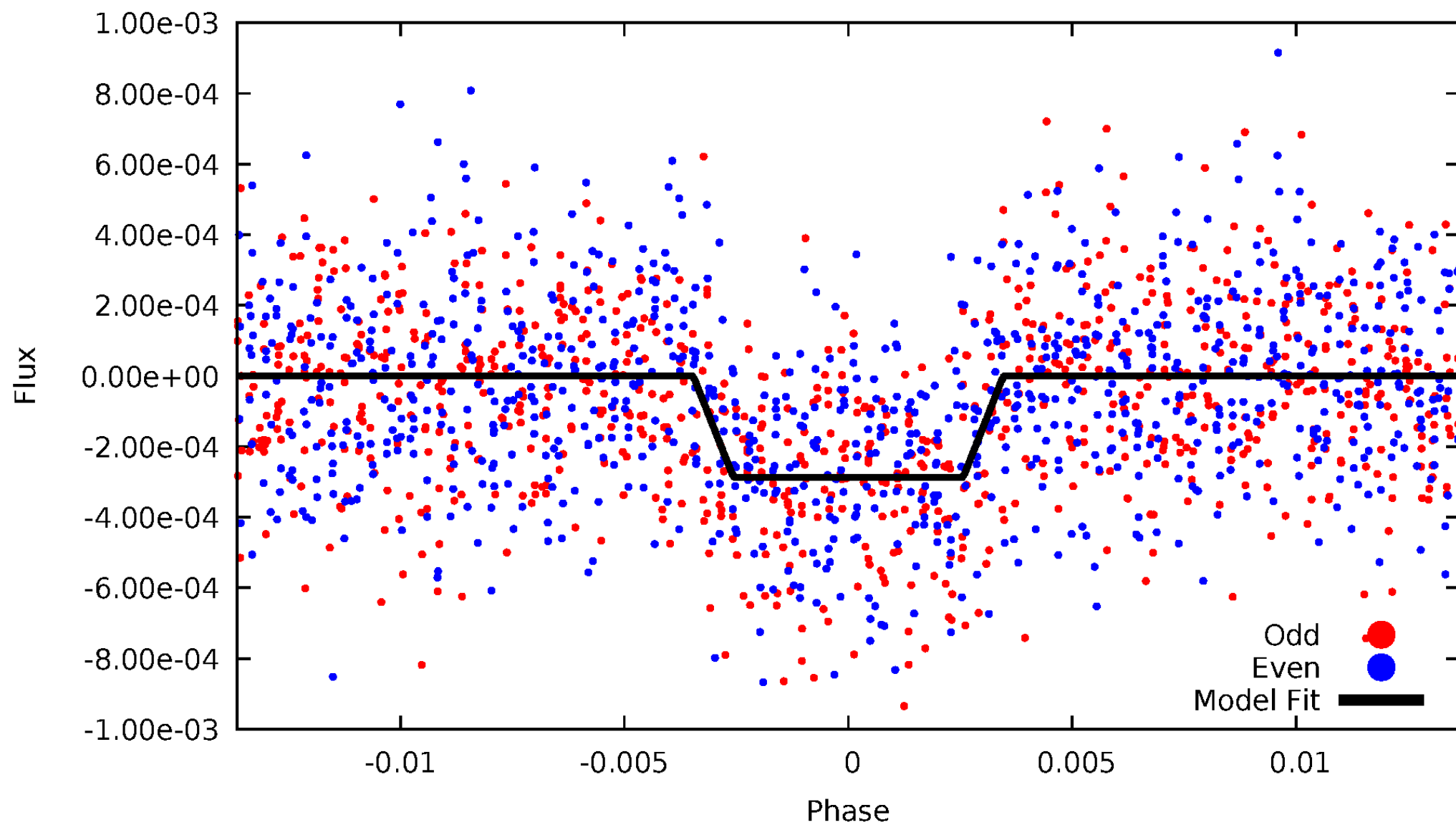
DV Odd/Even

TCE 008959839-01



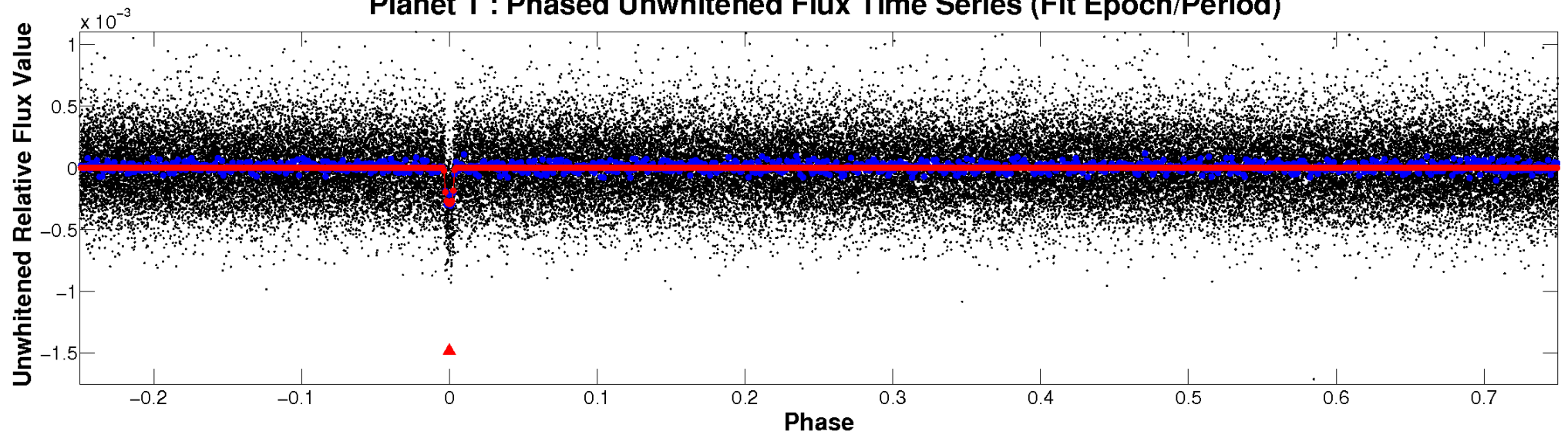
ALT Odd/Even

TCE 008959839-01

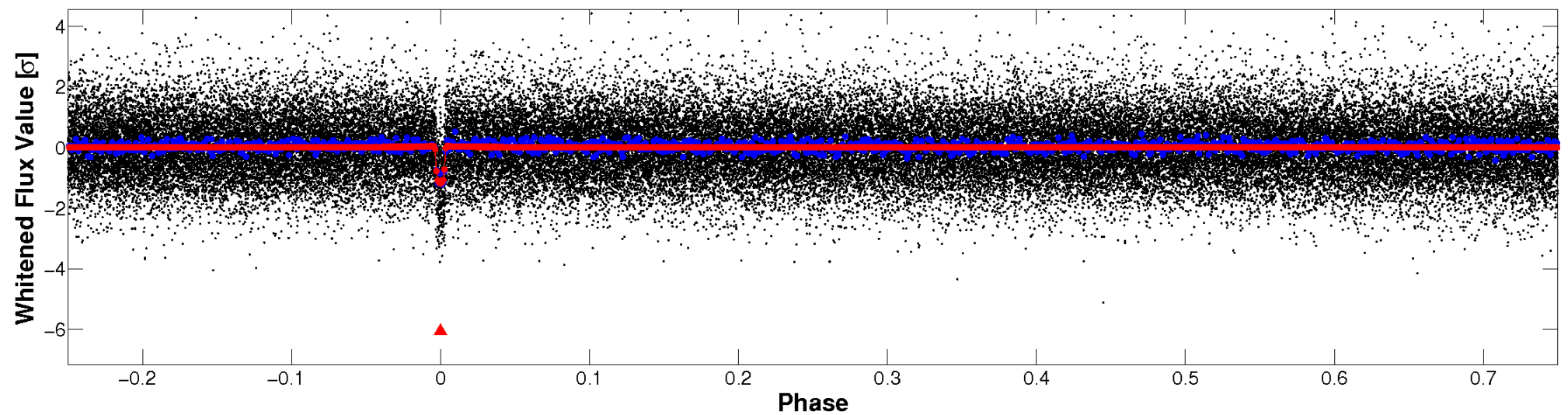


Non-Whitened Vs. Whitened Light Curve

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

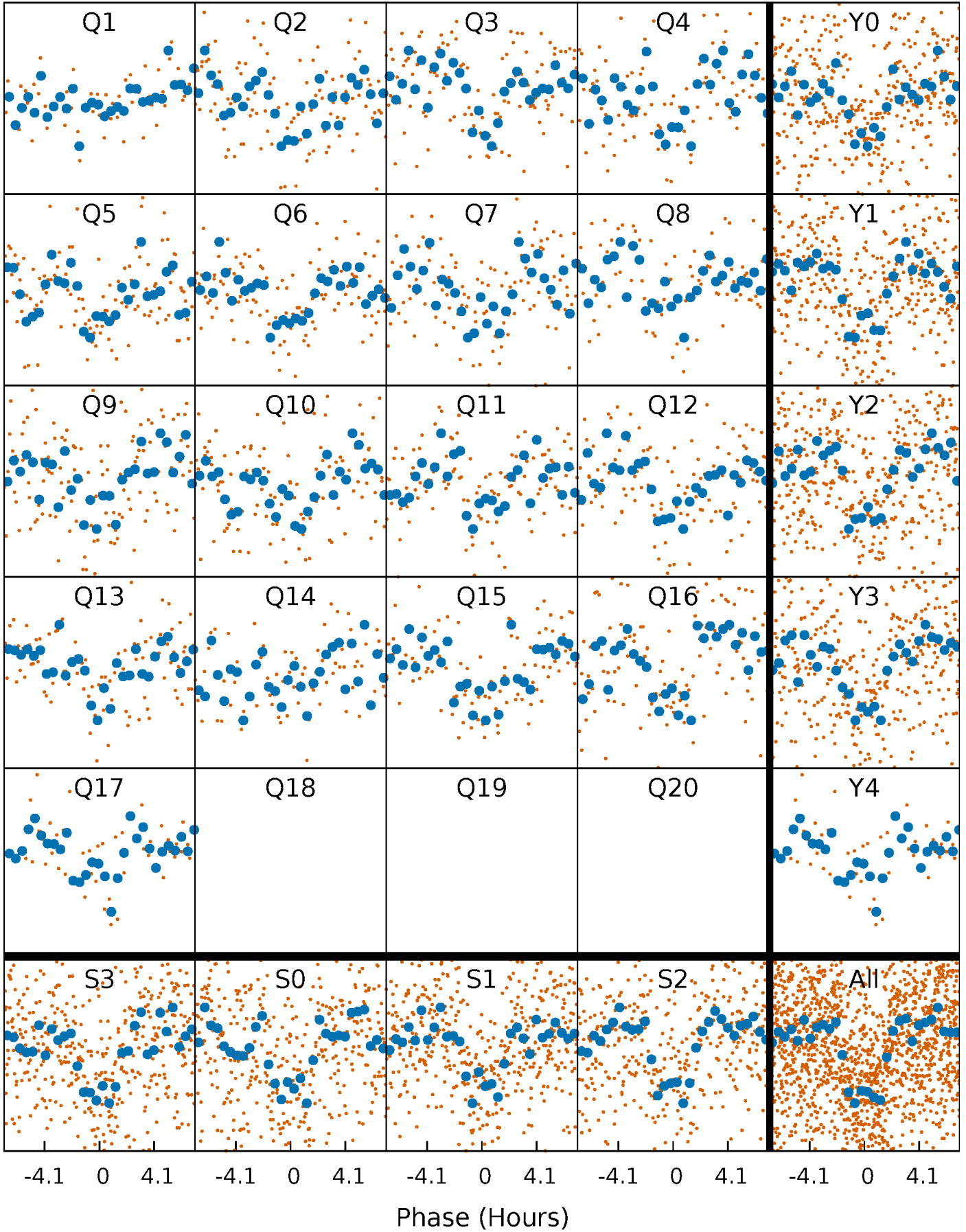


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



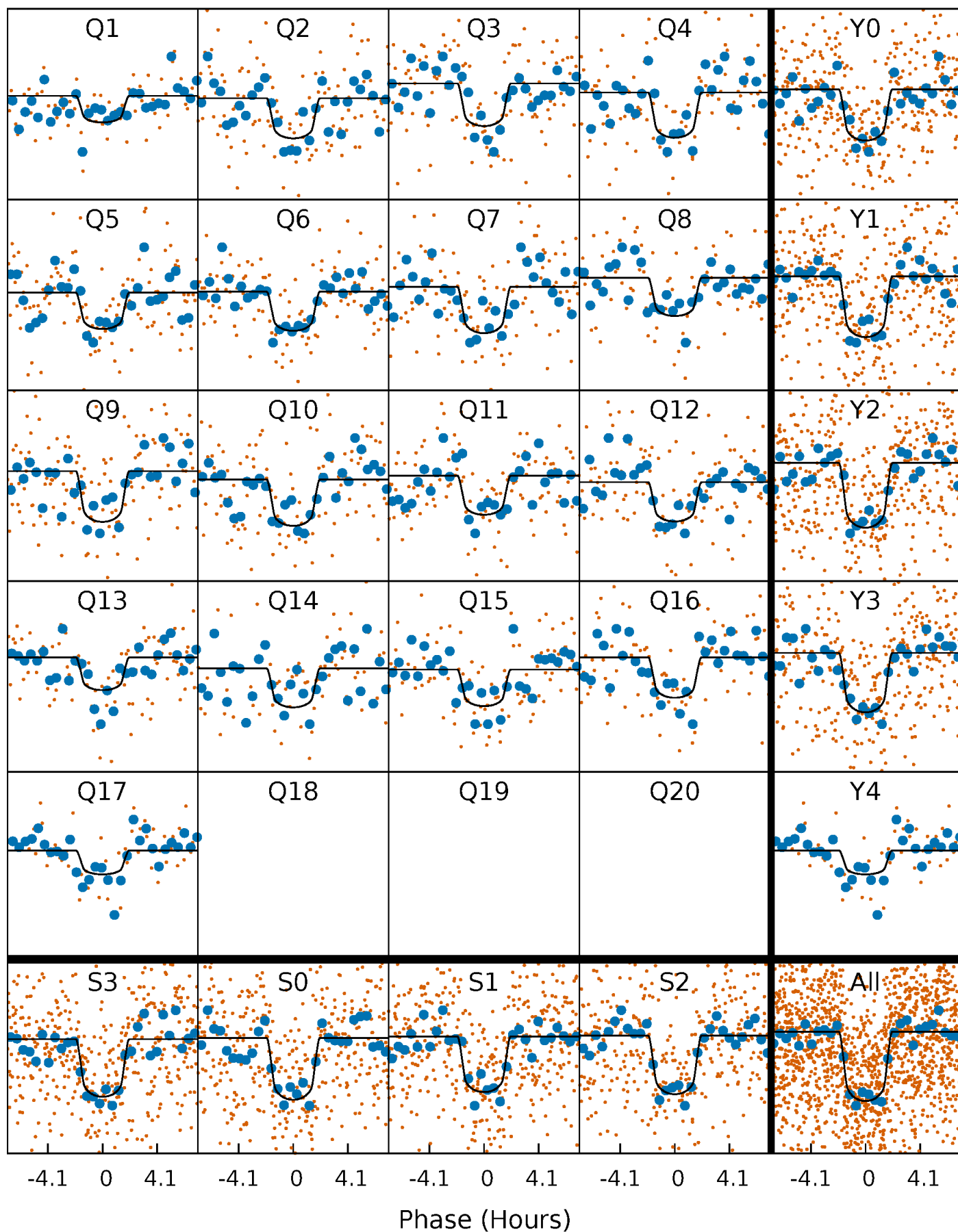
PDC Quarter-Phased Transit Curves

TCE 008959839-01 P= 22.708258 Days $T_0=133.718830$ (BKJD)



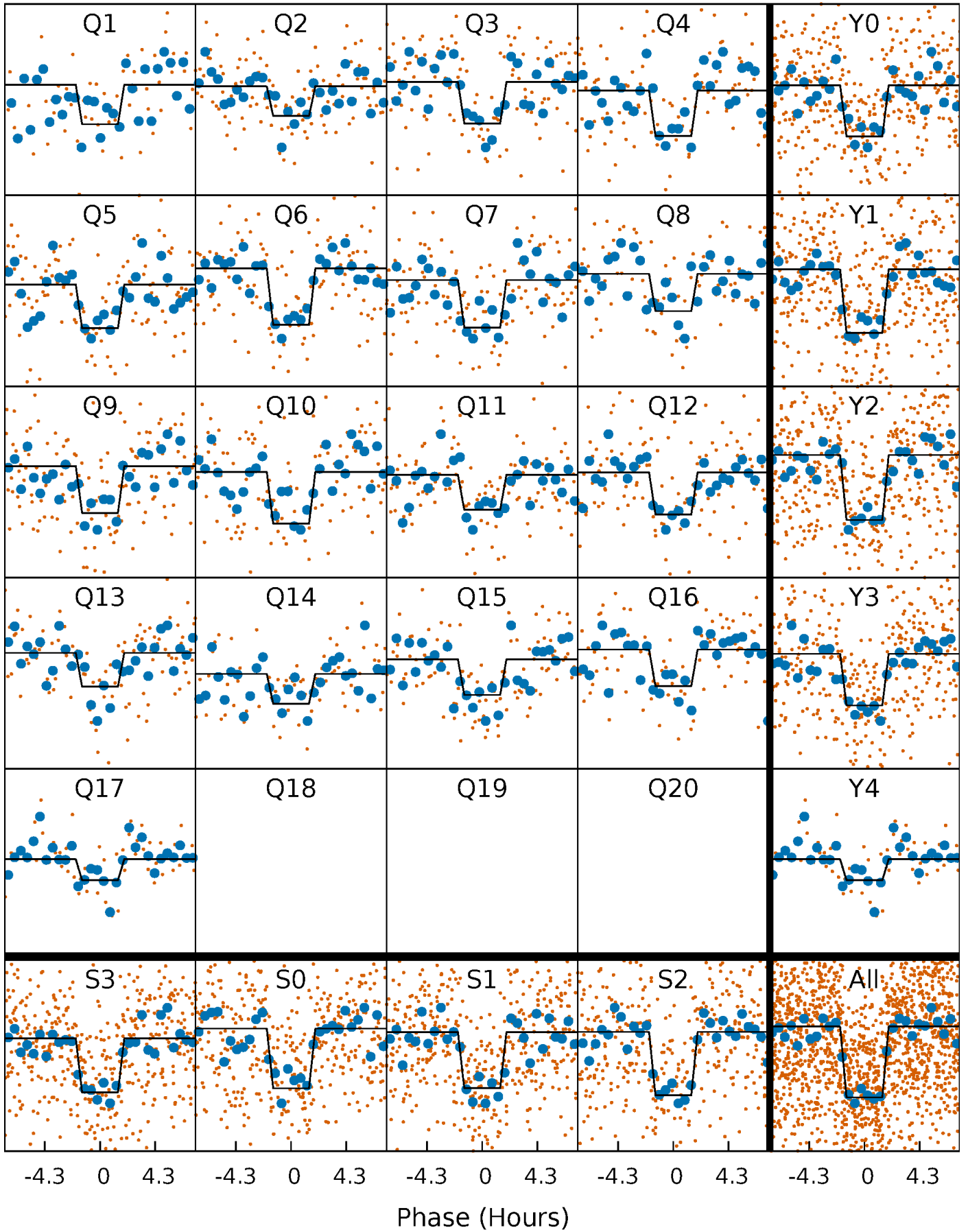
DV Quarter-Phased Transit Curves

TCE 008959839-01 P= 22.708258 Days $T_0=133.718830$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

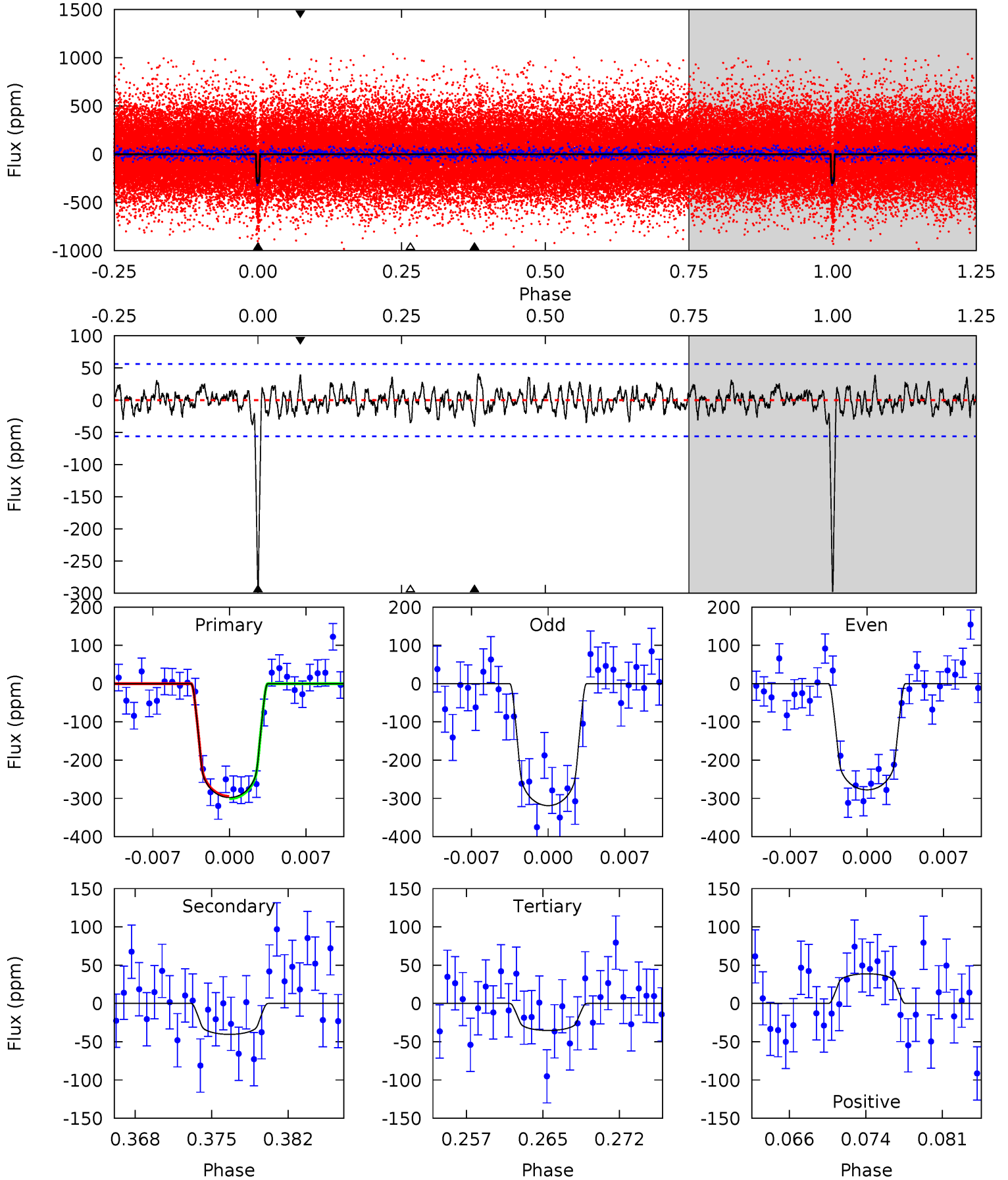
TCE 008959839-01 P= 22.708110 Days $T_0=133.725308$ (BKJD)



DV Model-Shift Uniqueness Test

008959839-01, $P = 22.708258$ Days, $E = 111.010572$ Days

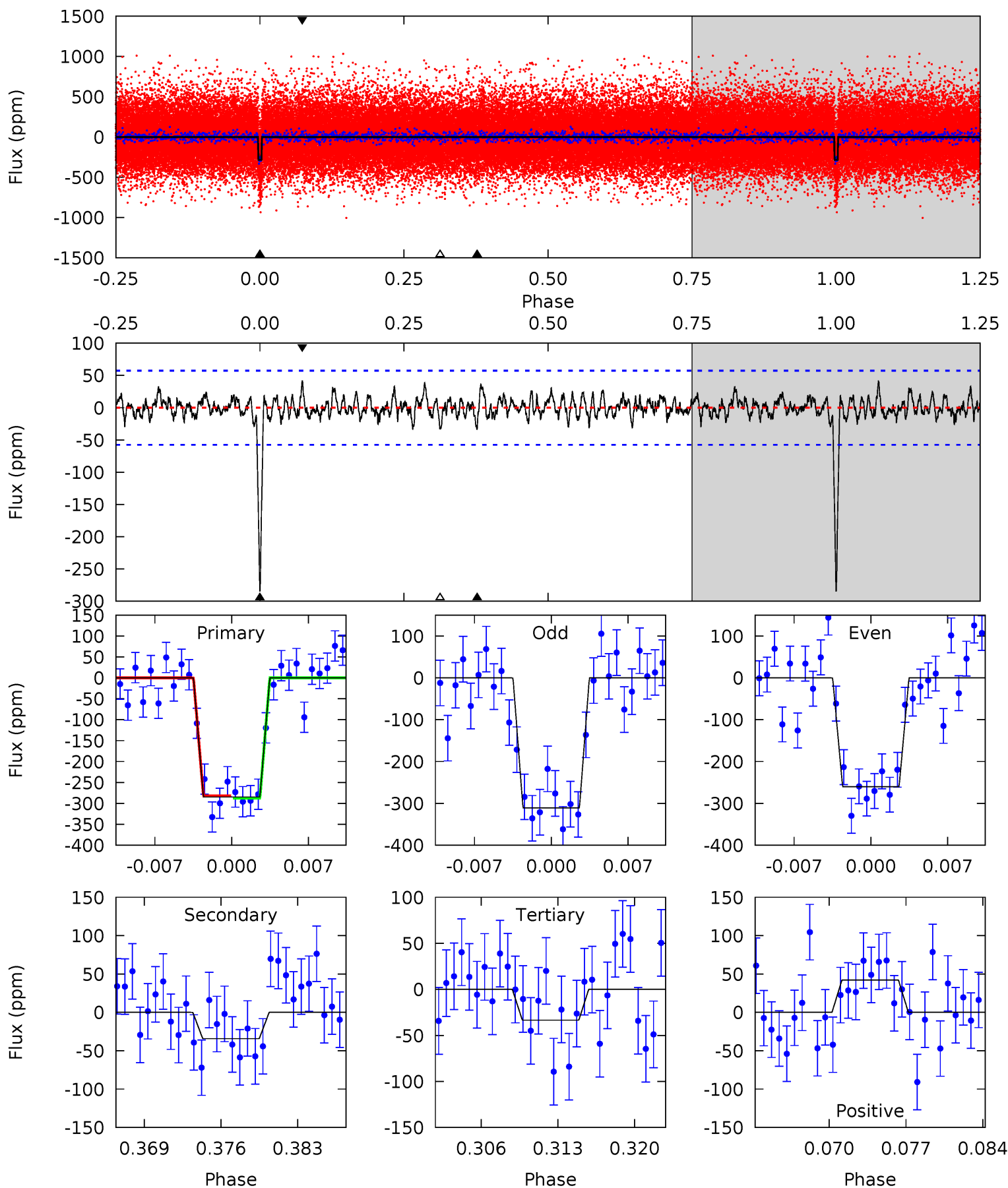
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 27.0 | 3.66 | 3.20 | 3.51 | 5.08 | 2.68 | 1.19 | 23.8 | 23.4 | 0.46 | 0.14 | 1.87 | 0.98 | 0.12 | 0.27 |



Alt Model-Shift Uniqueness Test

008959839-01, P = 22.708110 Days, E = 111.017198 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 25.3 | 3.04 | 2.97 | 3.75 | 5.10 | 2.70 | 1.07 | 22.3 | 21.5 | 0.07 | -0.71 | 2.24 | 0.98 | 0.13 | 0.24 |



Stellar Parameters For KIC 008959839

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6170^{+174}_{-196} | $4.472^{+0.054}_{-0.216}$ | $-0.160^{+0.250}_{-0.350}$ | $0.992^{+0.314}_{-0.112}$ | $1.063^{+0.145}_{-0.145}$ | $1.535^{+0.442}_{-0.816}$ |
| | +3%/-3% | +1%/-5% | +156%/-219% | +32%/-11% | +14%/-14% | +29%/-53% |
| 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 008959839-01 / KOI 2253.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|--------------|------------------------|-------------------|----------------------|--------------------|
| DV | -40 ± 11 | $2.09^{+0.59}_{-0.63}$ | 967^{+72}_{-44} | 3964^{+592}_{-380} | 131^{+143}_{-63} |
| Alt. | -34 ± 11 | $1.96^{+0.67}_{-0.63}$ | 966^{+68}_{-47} | 3932^{+560}_{-423} | 122^{+136}_{-60} |

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 $A_{obs} \gg 1.0$

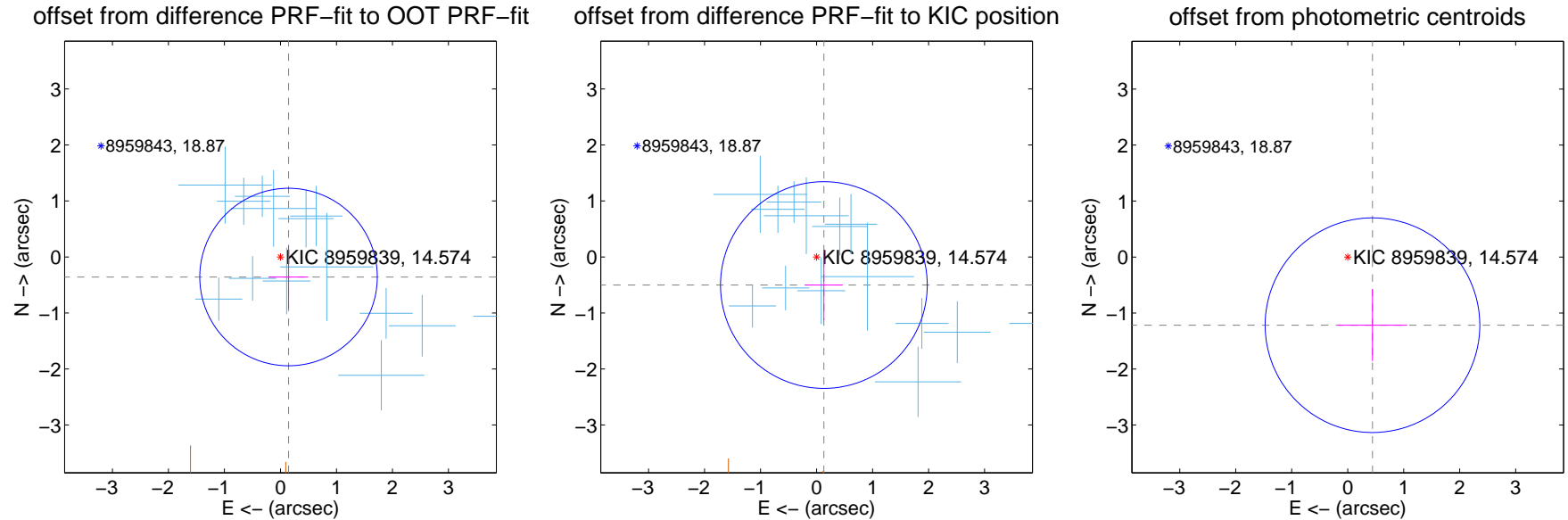
DV Centroid Data

Supplemental centroid analysis for 008959839-01. Kepler magnitude: 14.57. Transit SNR 20.69

There are 14 quarters with good PRF difference image offsets

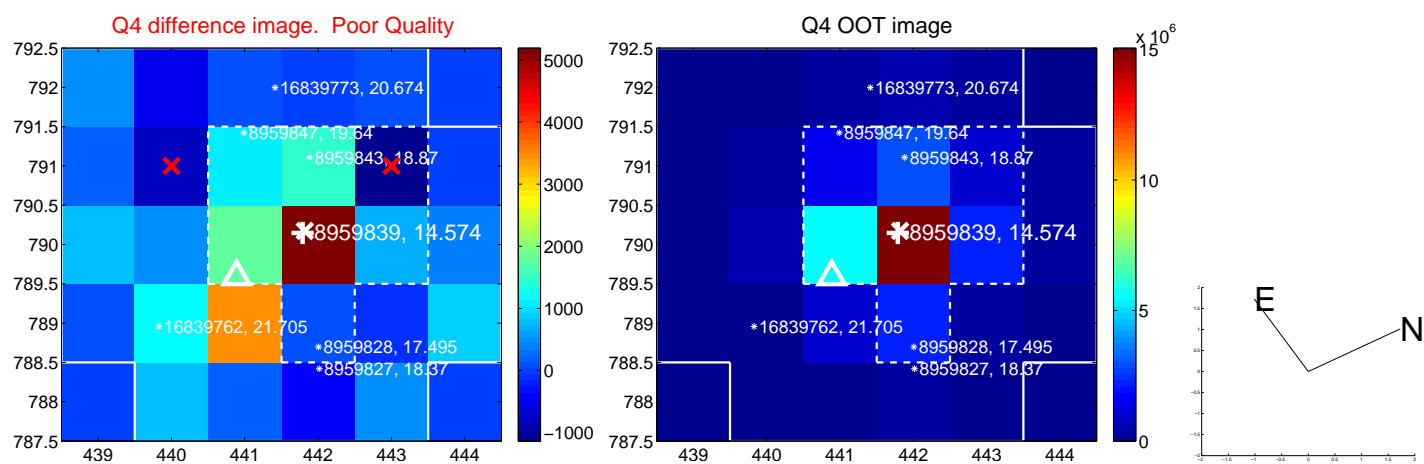
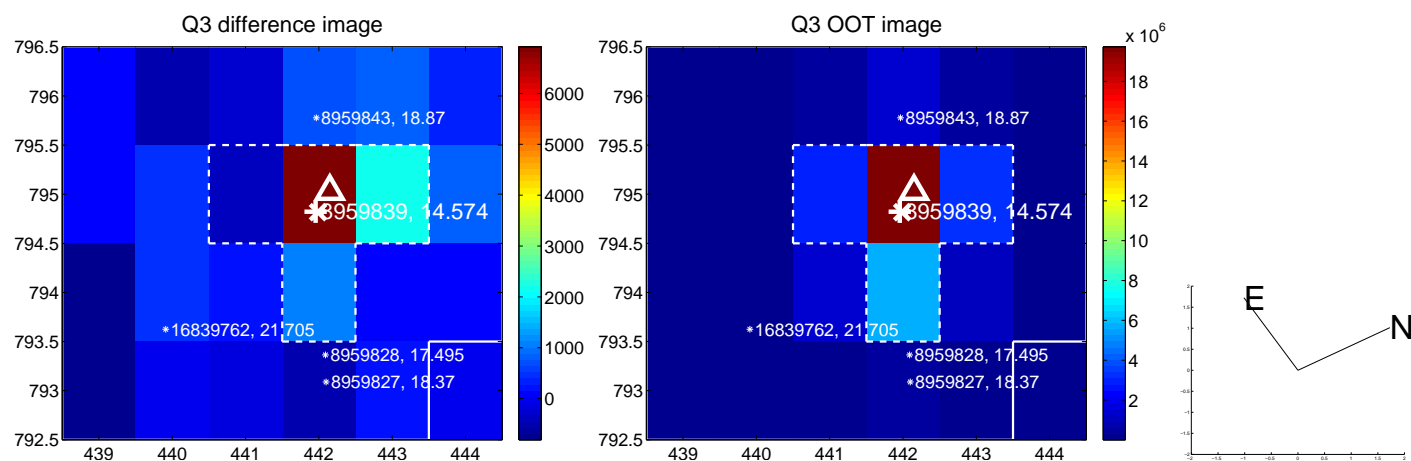
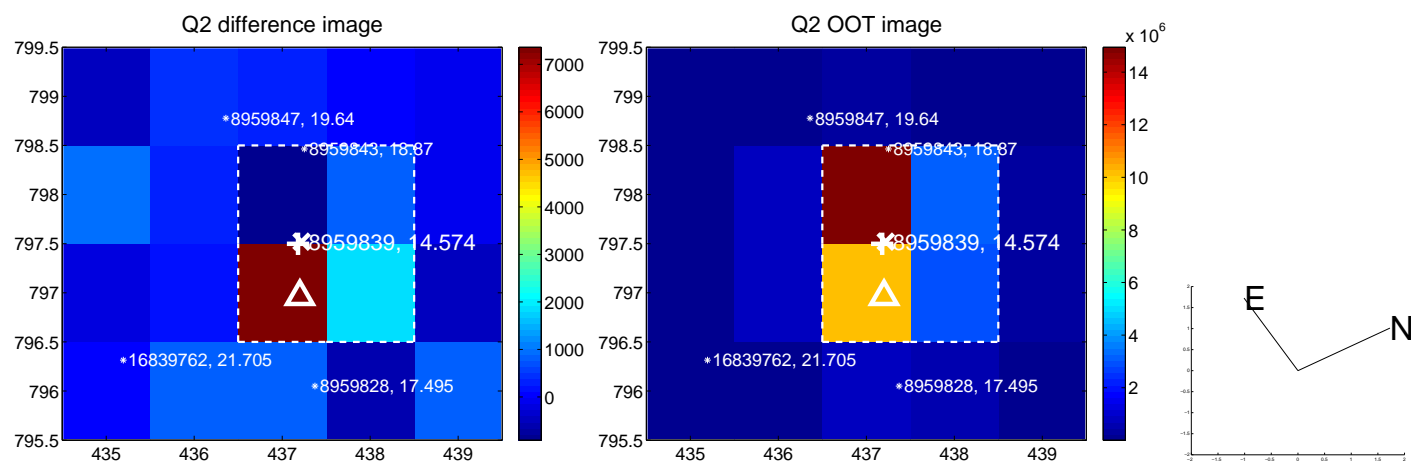
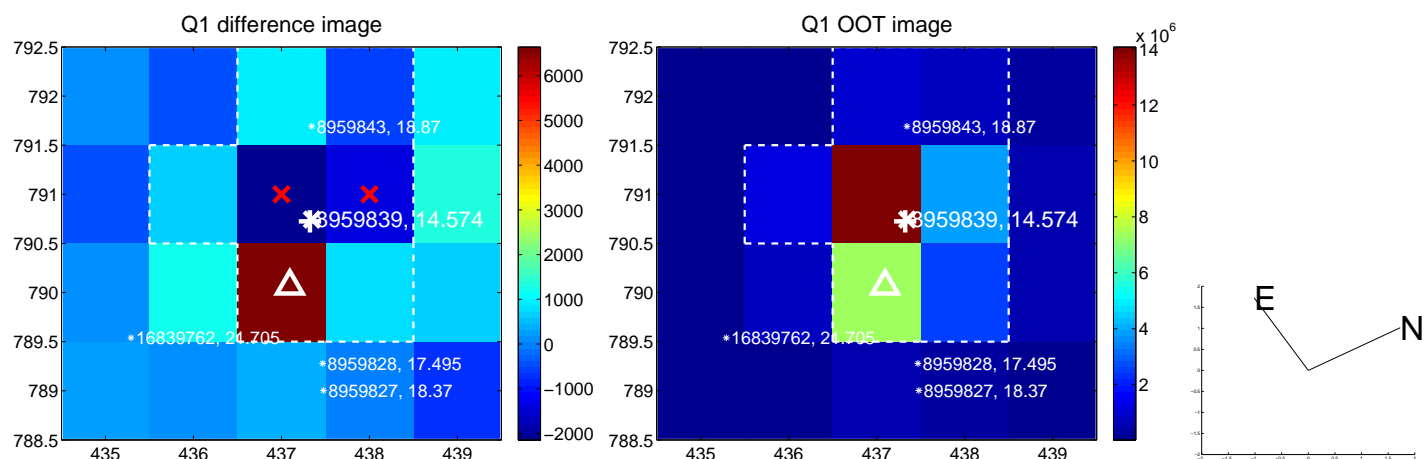
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.386 ± 0.528 | 0.73 | -0.144 ± 0.352 | -0.358 ± 0.566 |
| PRF-fit source offset from KIC position | 0.518 ± 0.615 | 0.84 | -0.130 ± 0.336 | -0.501 ± 0.627 |
| photometric centroid source offset | 1.29 ± 0.64 | 2.03 | -0.44 ± 0.62 | -1.22 ± 0.64 |

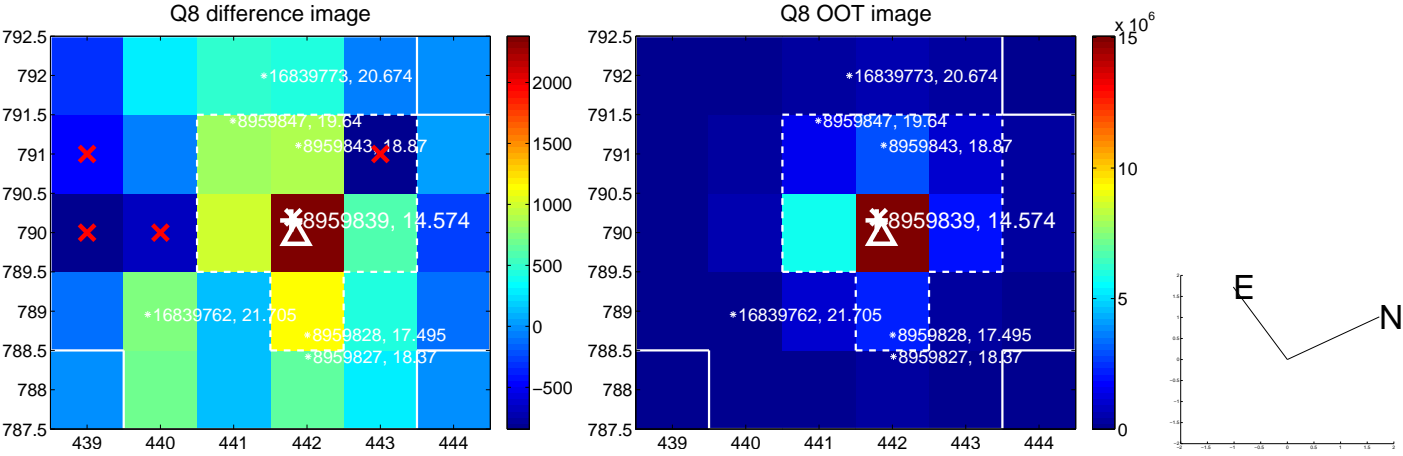
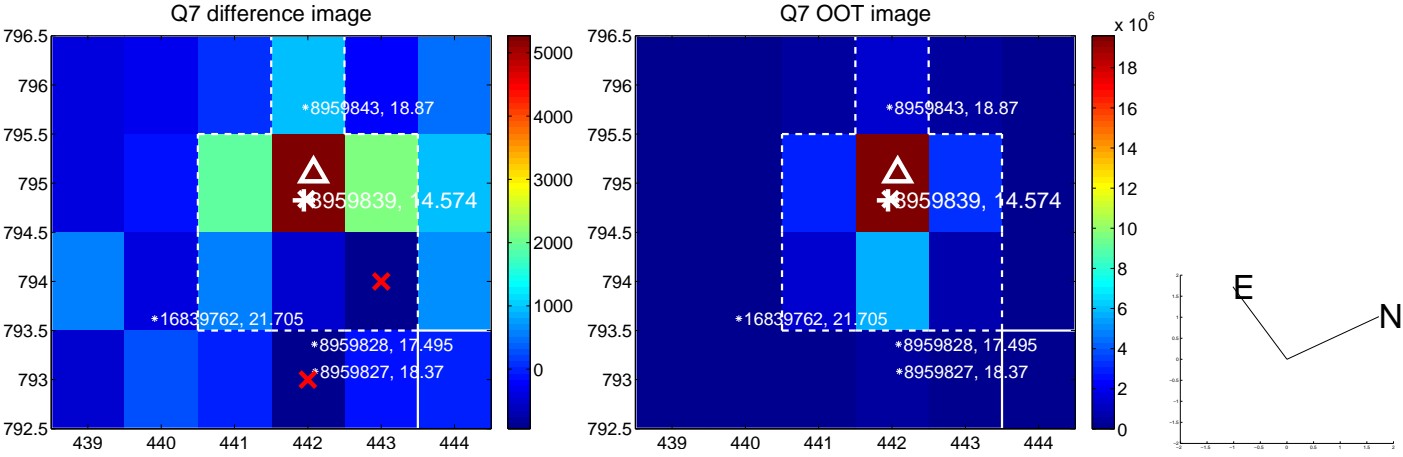
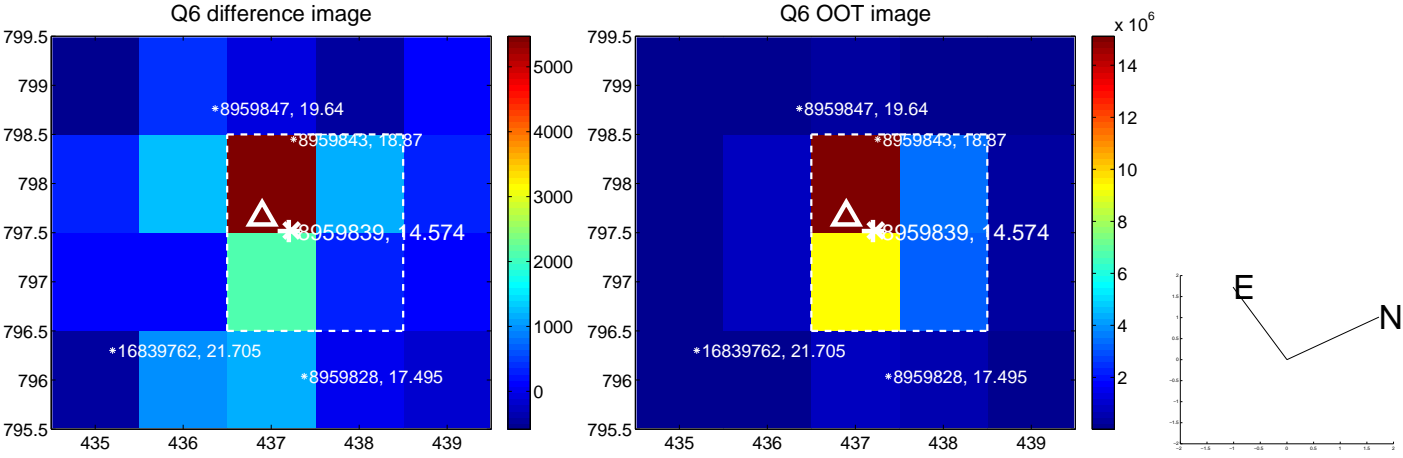
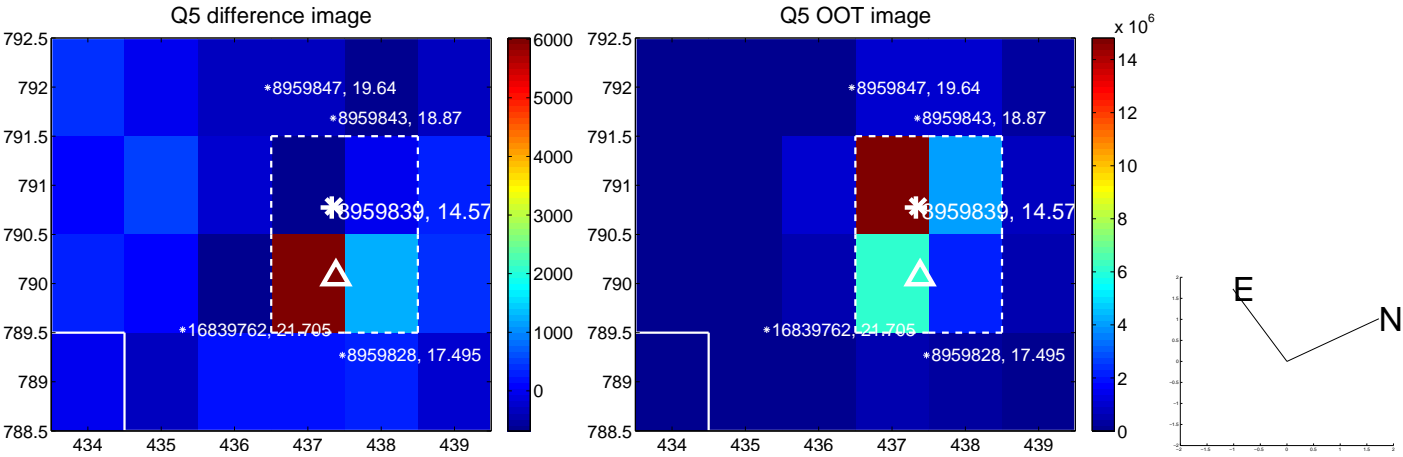


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

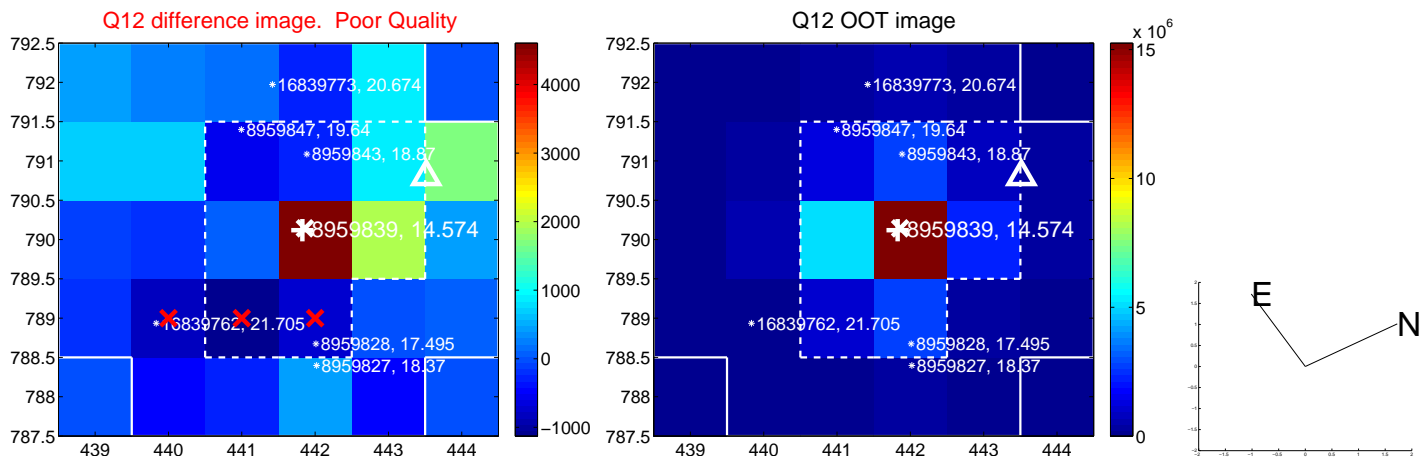
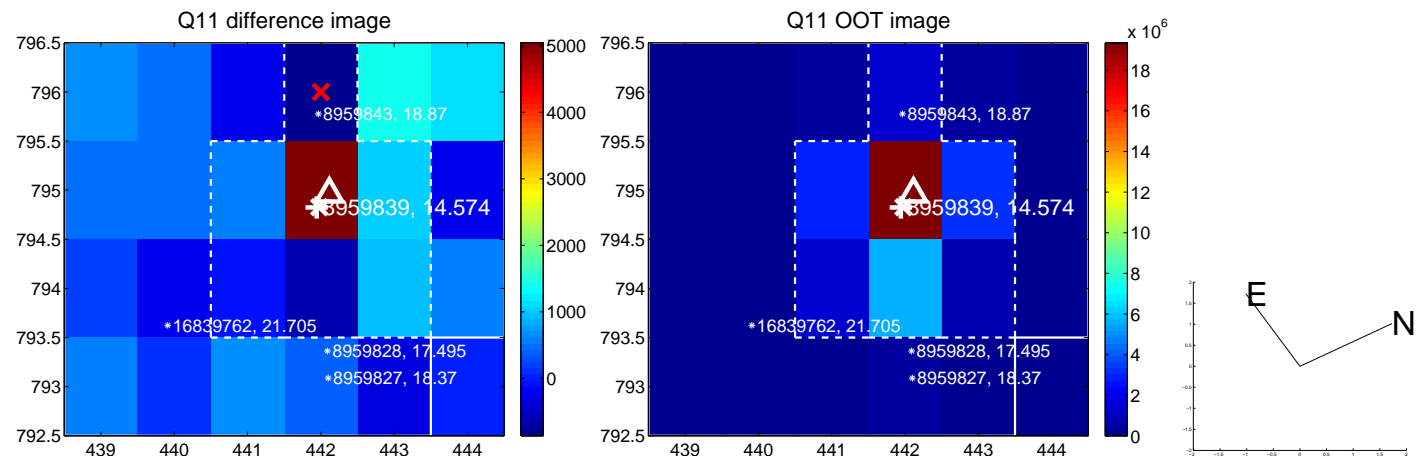
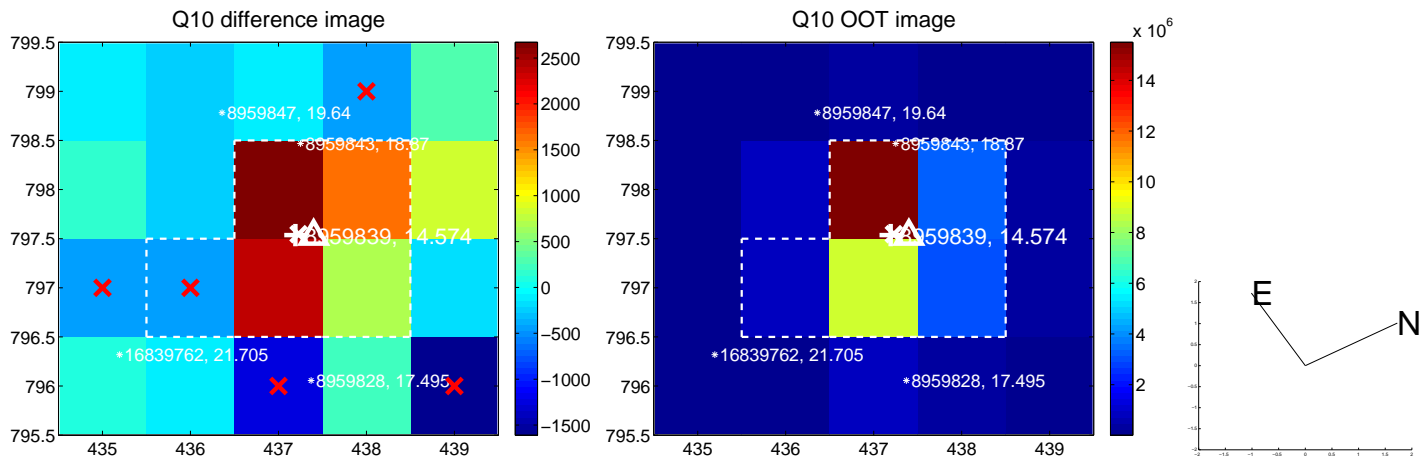
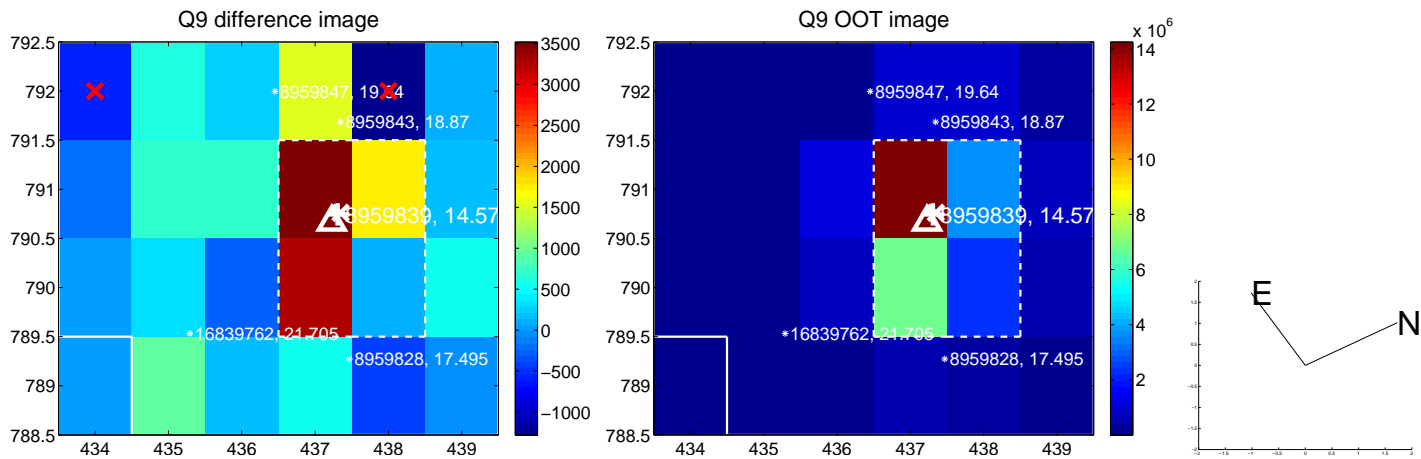
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



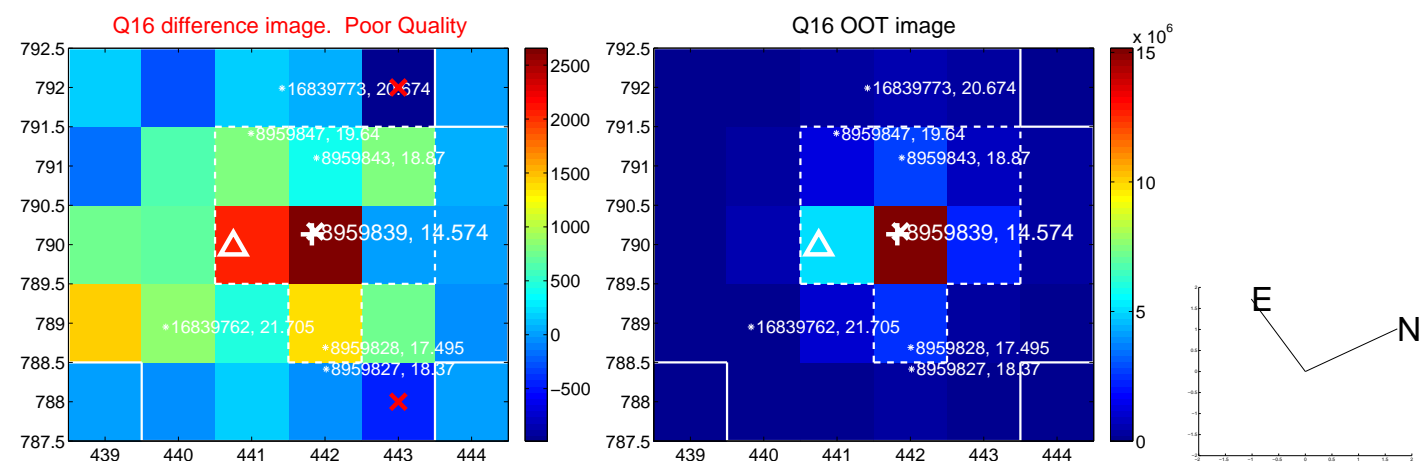
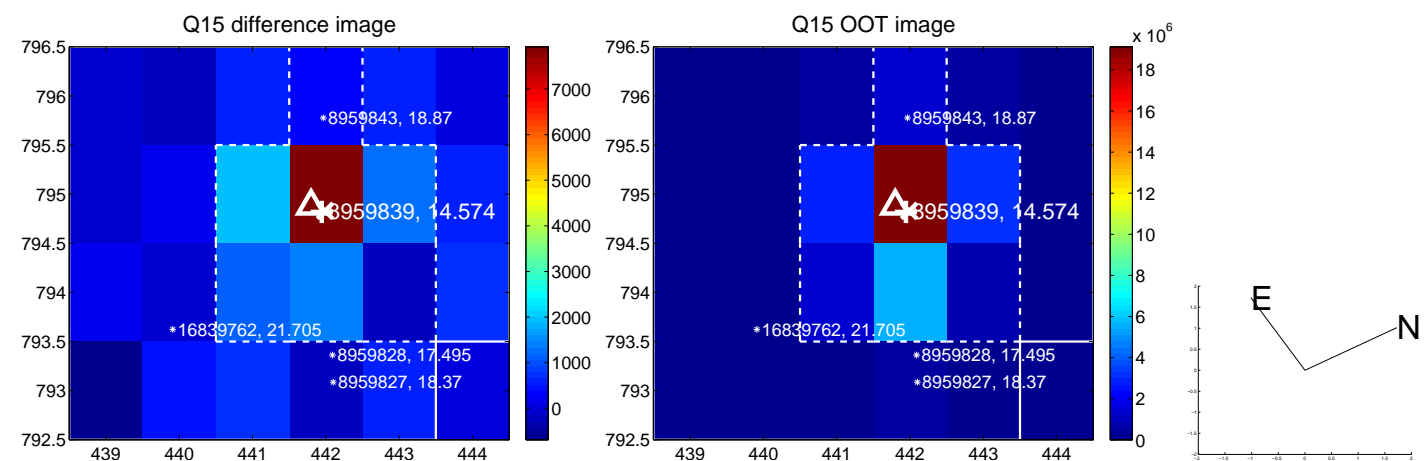
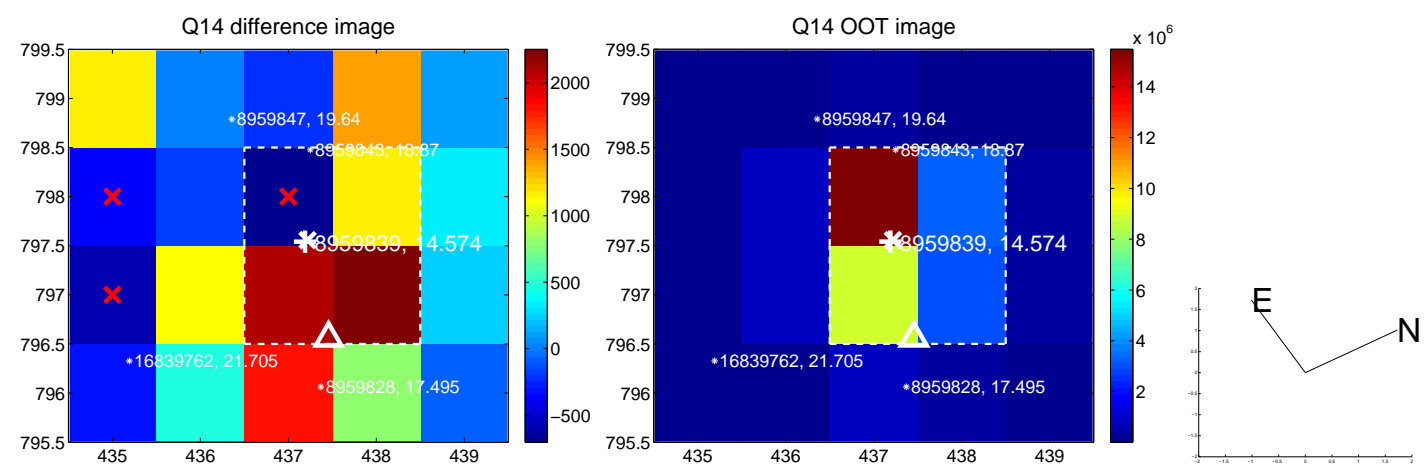
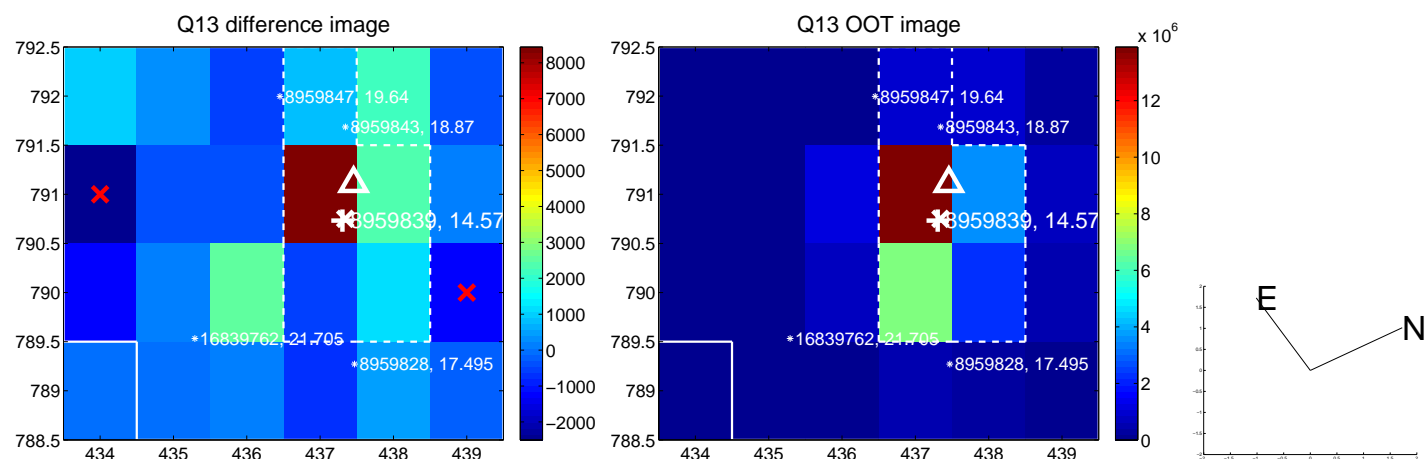
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



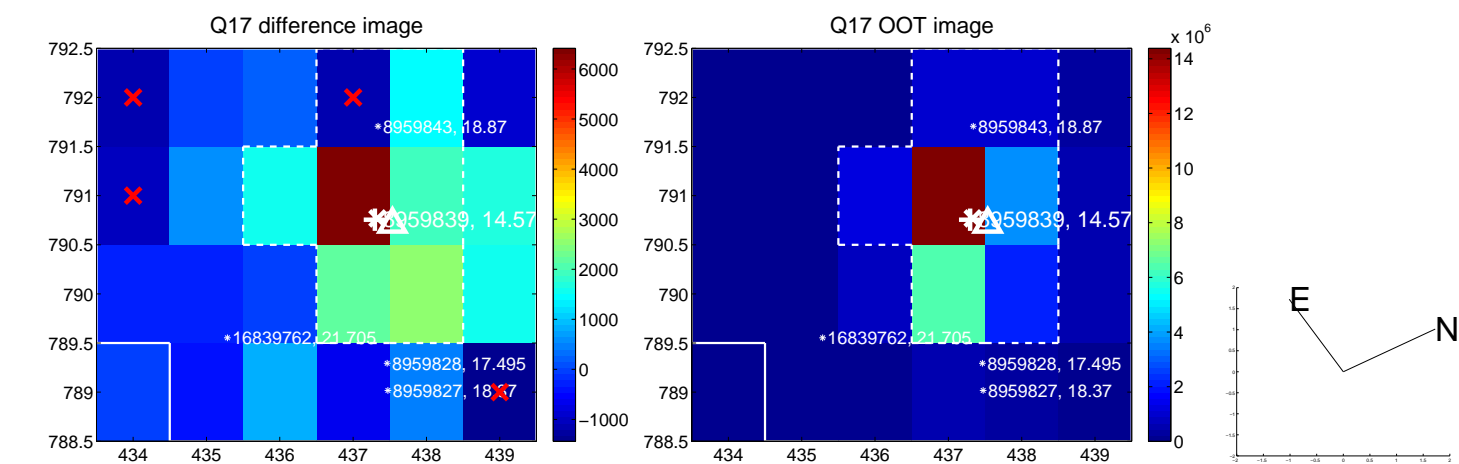
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



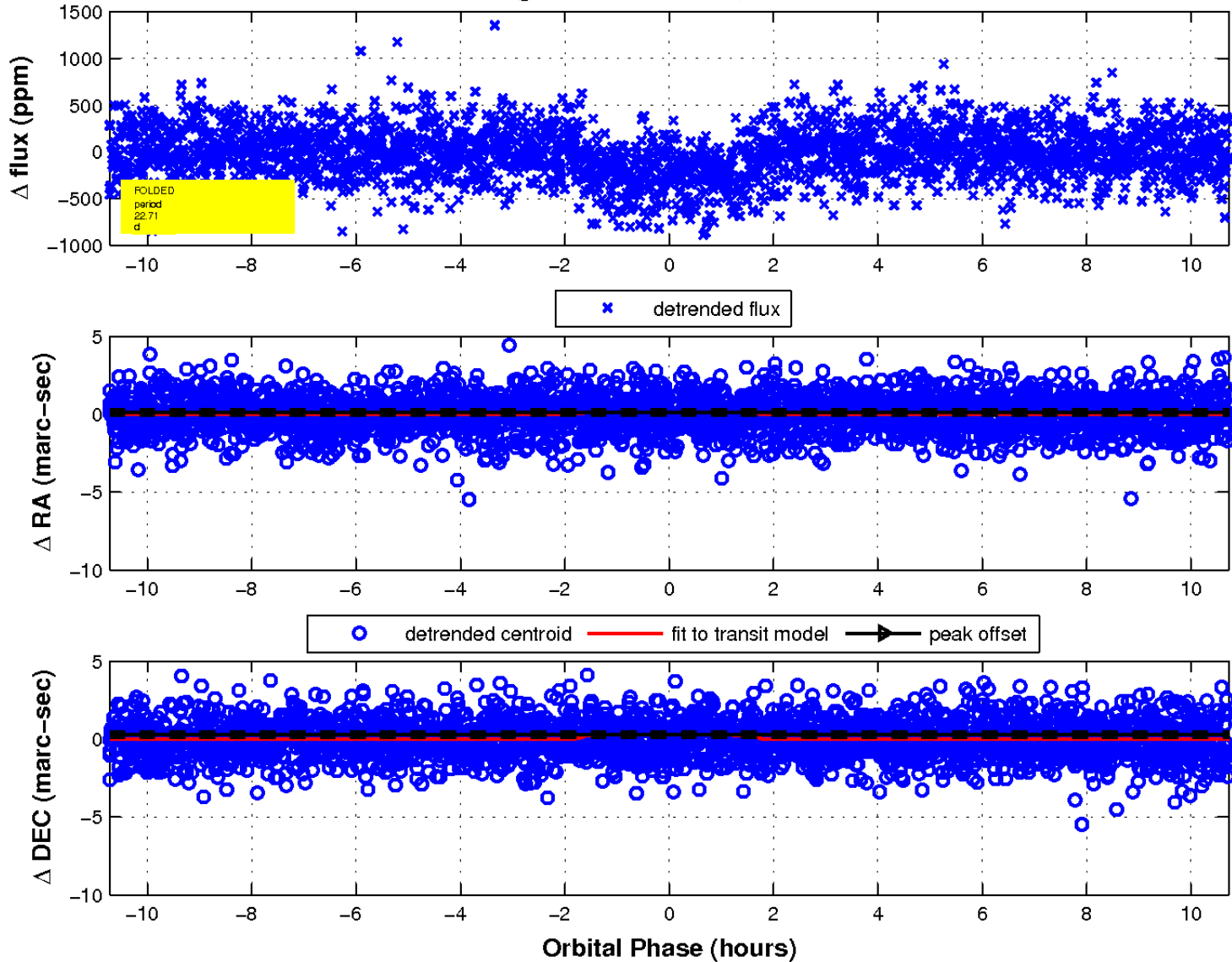
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

