

KIC 004144231

Q1-17 DR25 TCE Parameters

| TCE | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES | SNR | R _★ (R _☉) | T _★ (K) | R _p (R _⊕) | S _p (S _⊕) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|----------------------------------|--------------------|----------------------------------|----------------------------------|
| 004144231-01 | OBS | 1791.01 | 22.913356 | 140.649957 | 5825.2 | 3.817 | 161.1 | 103.3 | 0.60 | 5451 | 8.21 | 15.97 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004144231-01 | OBS | FP | 0.00 | 0 | 1 | 1 | 1 | DEEP_V_SHAPED—CENT_RESOLVED_OFFSET—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 004144231-01

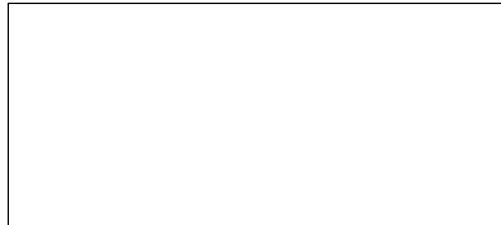
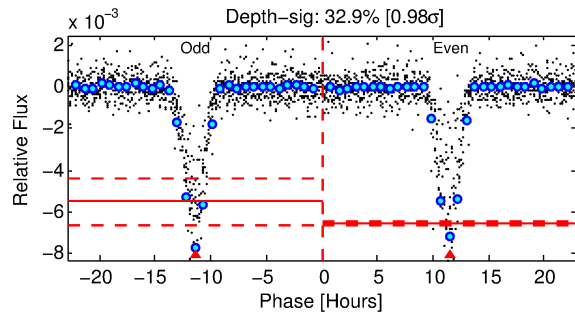
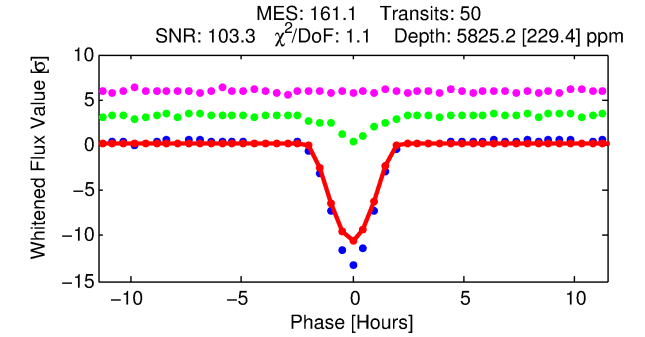
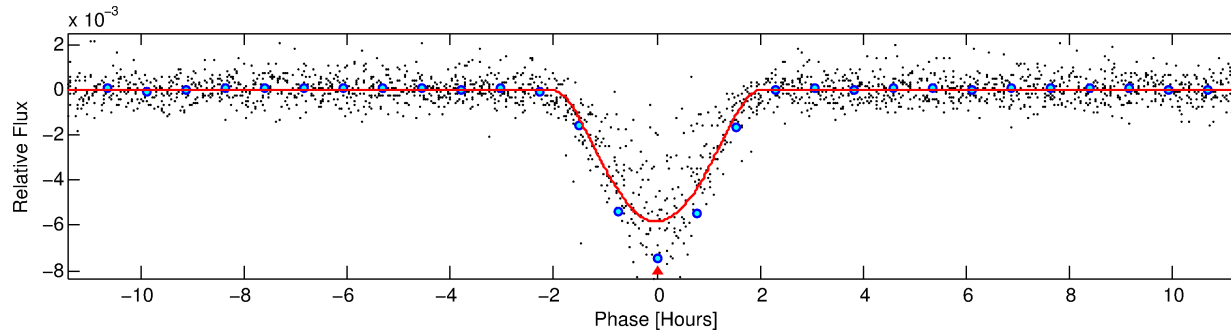
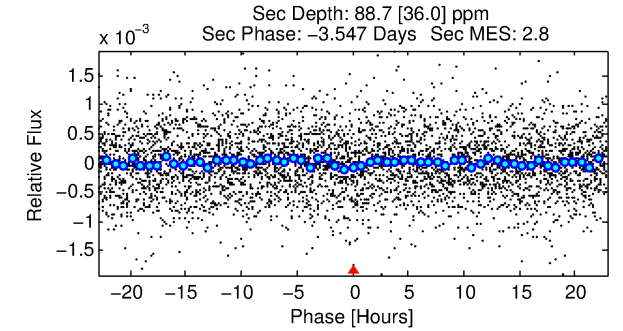
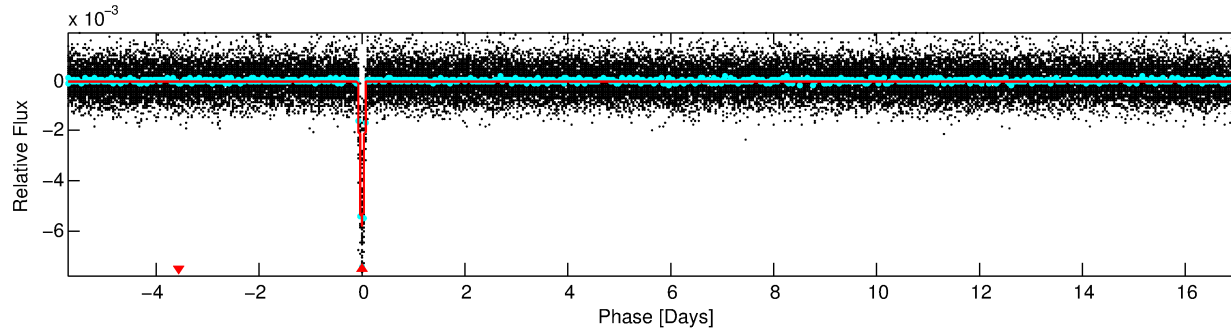
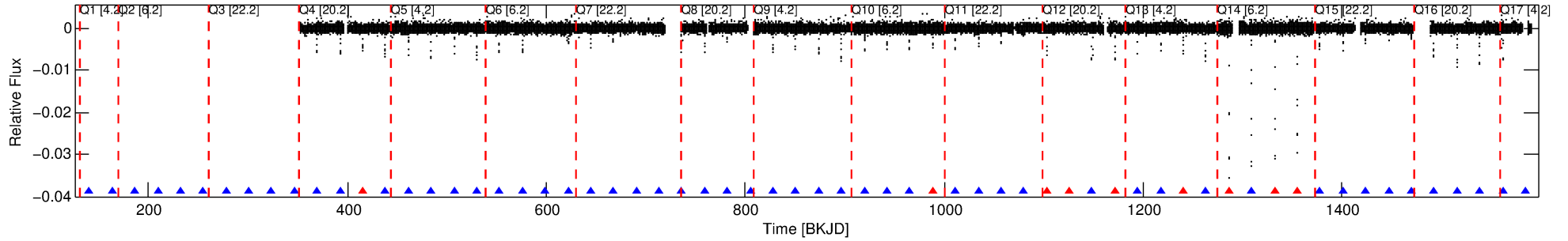
| TCE (1) | KIC | Parent (2) | Parent KIC | P ₁ :P ₂ | Dist (″) | ΔRow | ΔCol | m ₂ | m ₁ | D ₂ /D ₁ | Mechanism | Flag | σ _P | σ _T |
|--------------|---------|------------|------------|--------------------------------|----------|------|------|----------------|----------------|--------------------------------|------------|------|----------------|----------------|
| 004144231-01 | 4144231 | 6109.01 | 4144236 | 1:1 | 15.7 | -2 | 3 | 11.86 | 15.47 | 43.38 | Direct-PRF | 0 | 0.11 | 0.08 |

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol 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 σ_P < 5.0 and σ_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: 4144231 Candidate: 1 of 1 Period: 22.913 d
KOI: K01791.01 Corr: 0.996

Kp: 15.47 R*: 0.60 Rs Teff: 5451.0 K Logg: 4.66 Fe/H: -1.980



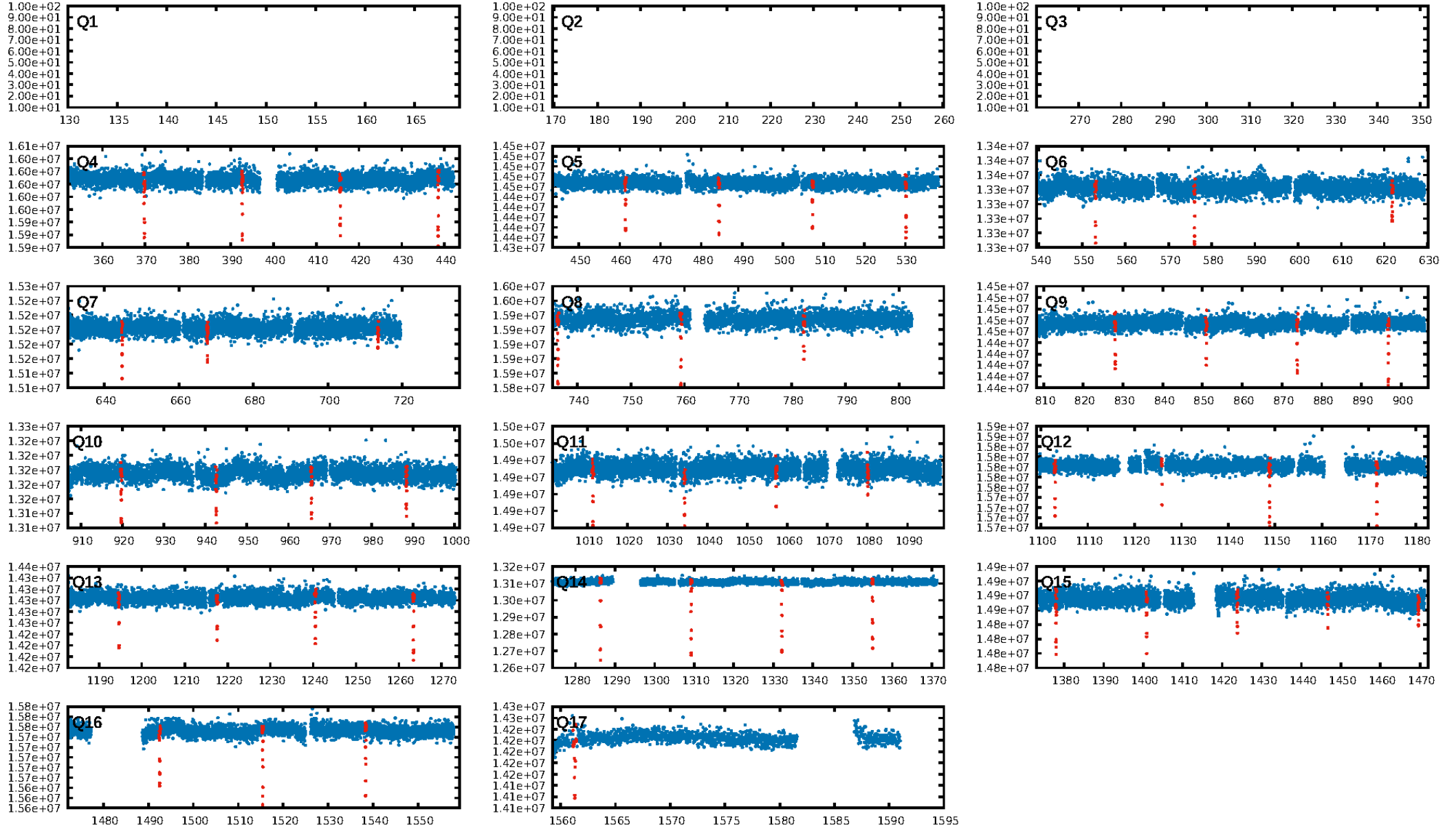
DV Fit Results:

Period = 22.91336 [0.00003] d
Epoch = 140.6500 [0.0011] BKJD
Rp/R* = 0.1253 [0.0594]
a/R* = 23.72 [2.04]
b = 1.00 [0.09]
Seff = 15.98 [2.88]
Teq = 510 [23] K
Rp = 8.20 [3.93] Re
a = 0.1335 [0.0092] AU
Ag = 12.91 [13.40] [0.89σ]
Teffp = 1494 [389] K [2.53σ]

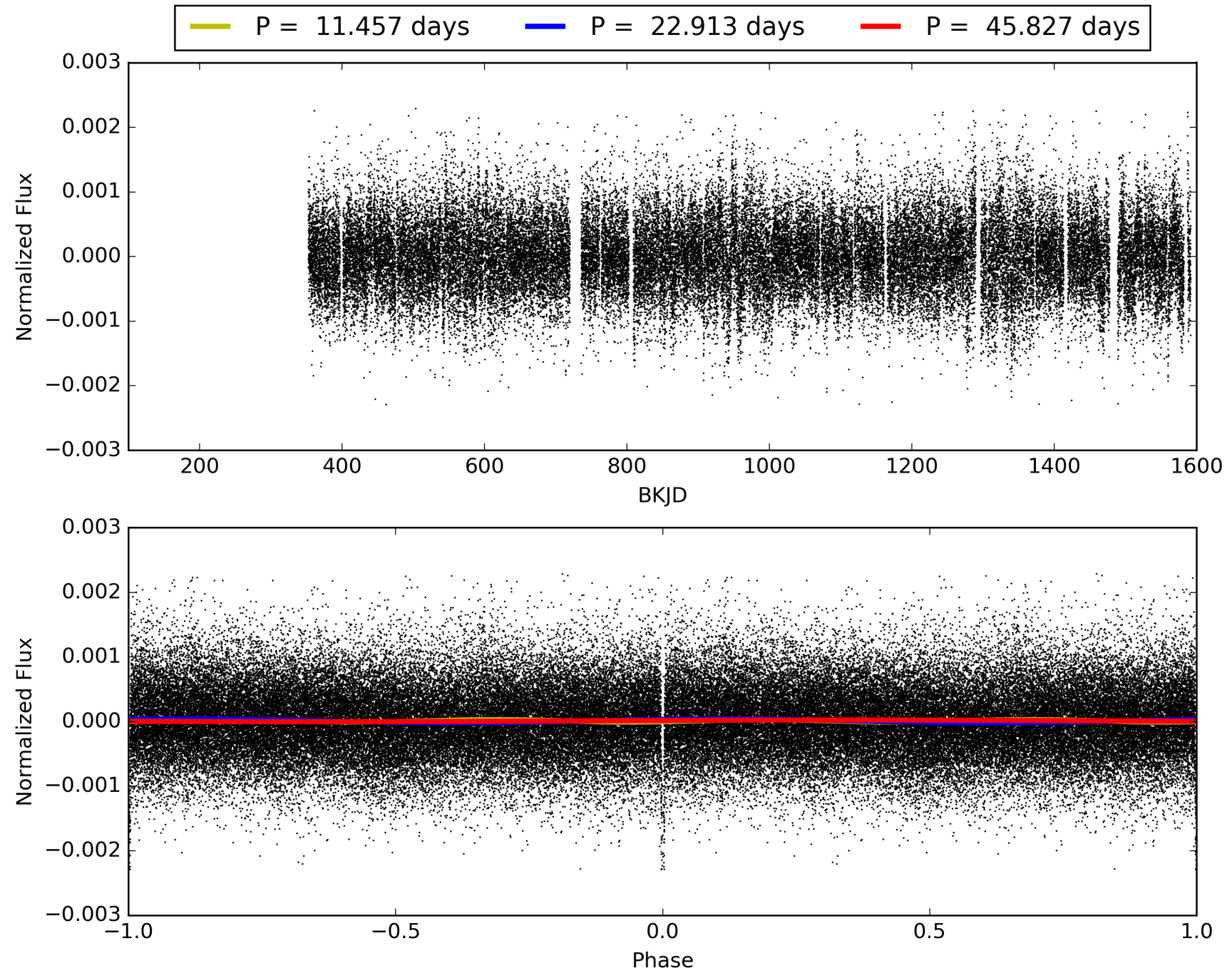
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 98.8%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.82 [40/49]
GhostDiagnostic-chr: -0.5985
Centroid-sig: 0.0%
Centroid-so: 34.509 arcsec [426.47σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0 [0]
KicOffset-st: 0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 1.00 [14/14]

TCE 004144231-01, PDC Light Curves

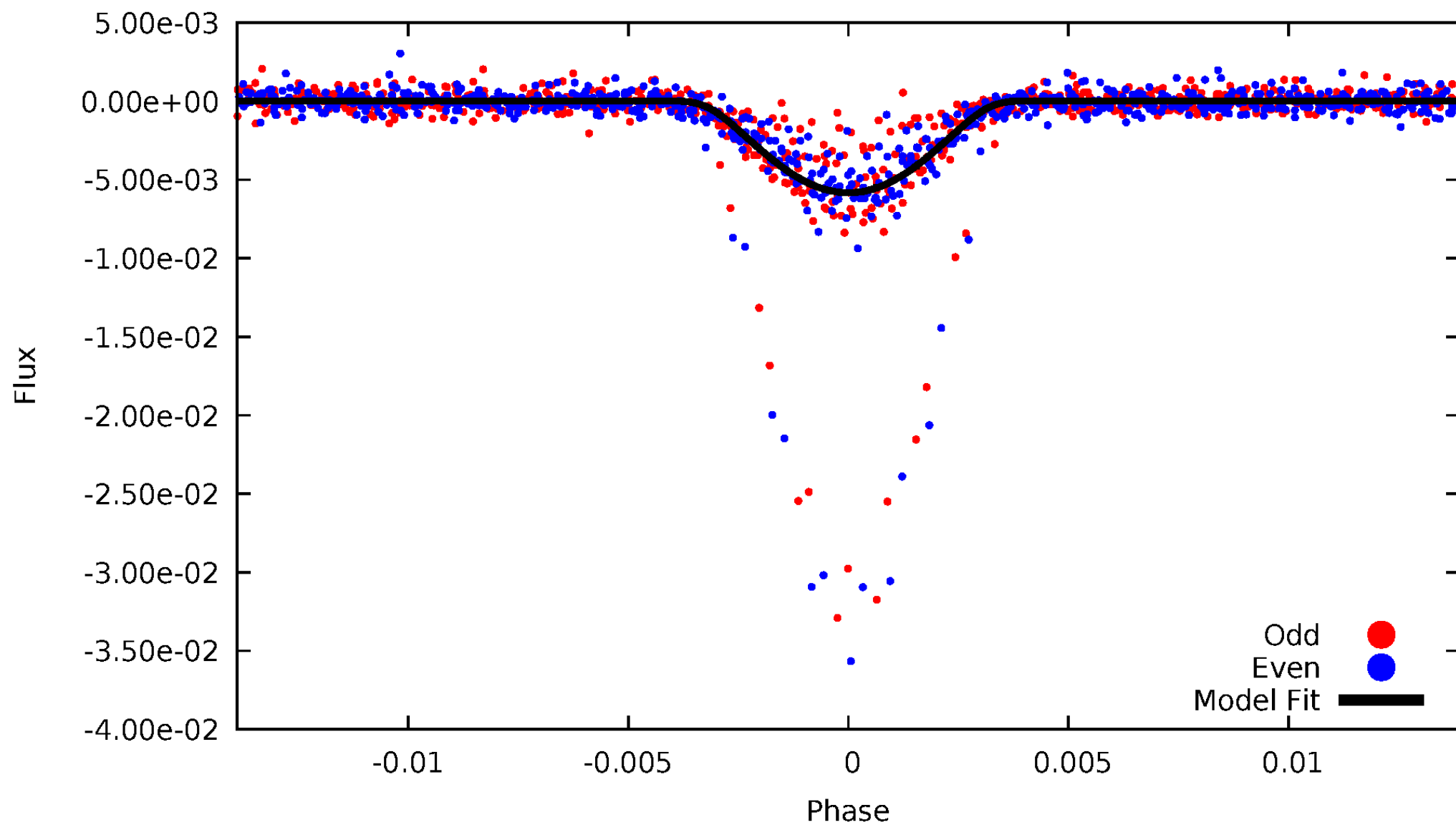


TCE 004144231-01



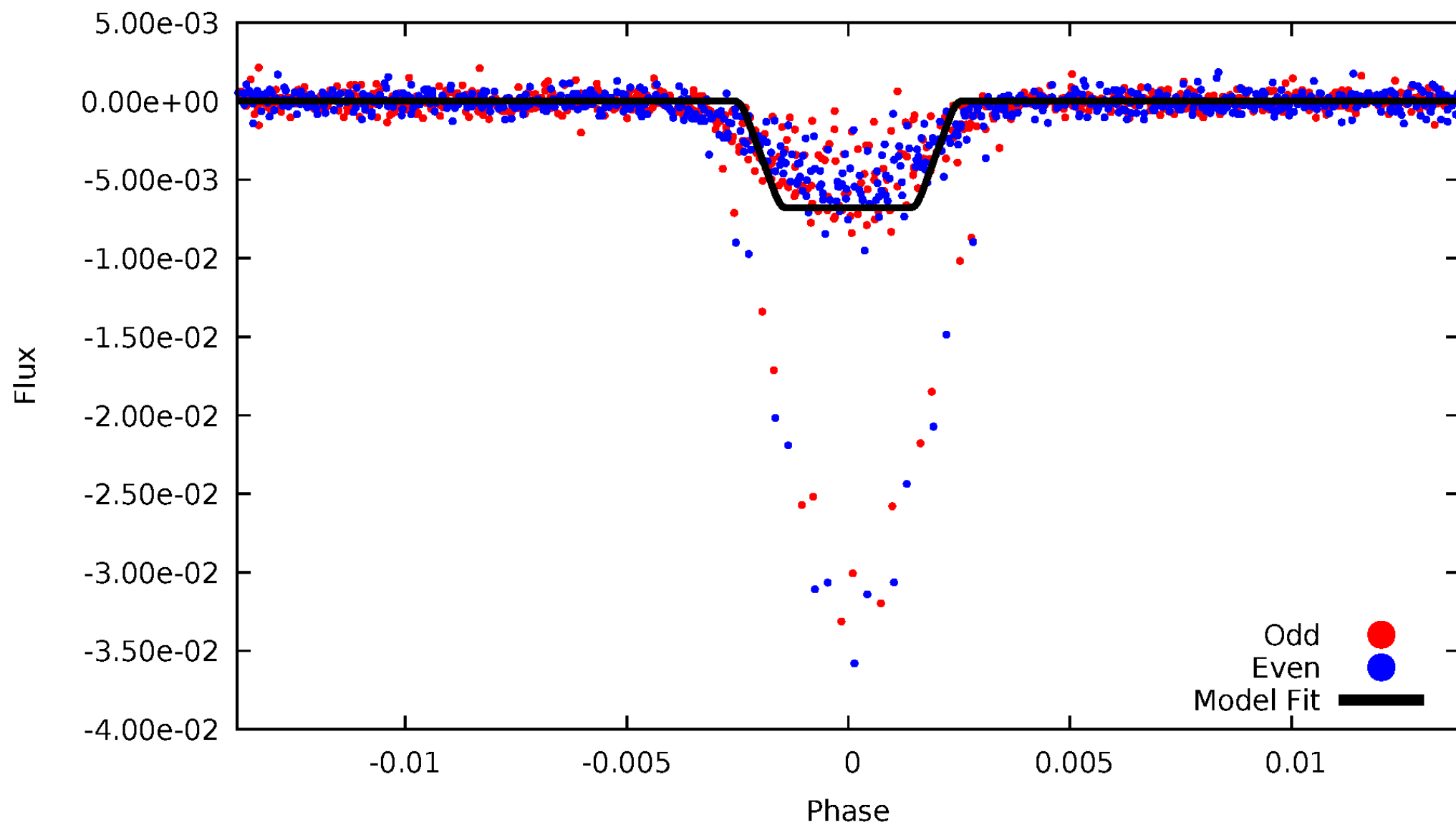
DV Odd/Even

TCE 004144231-01

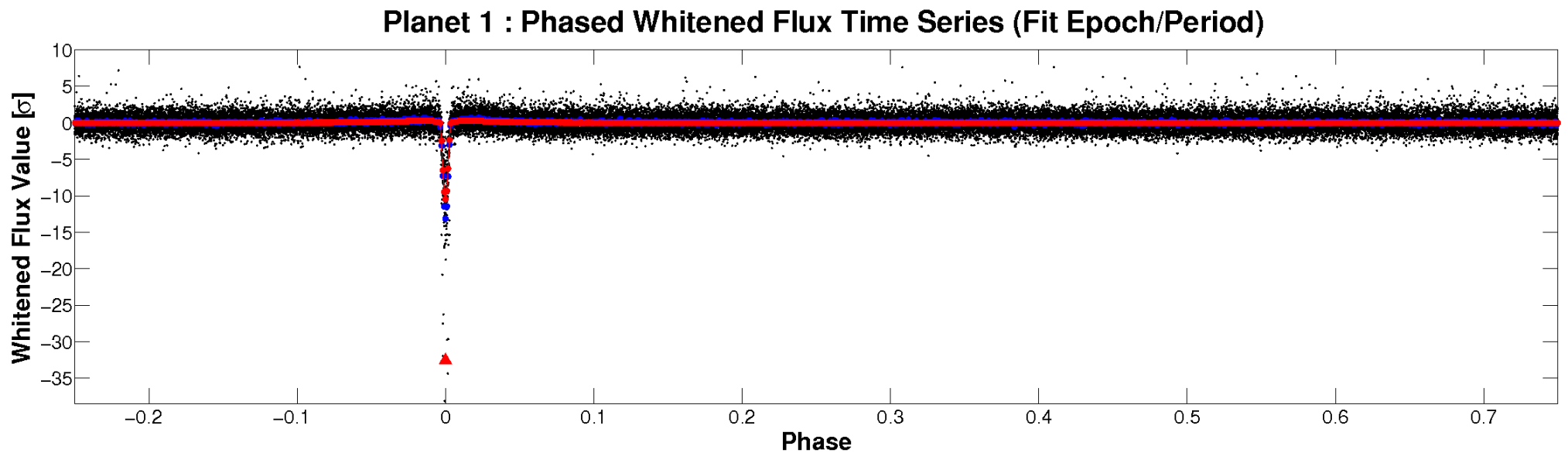
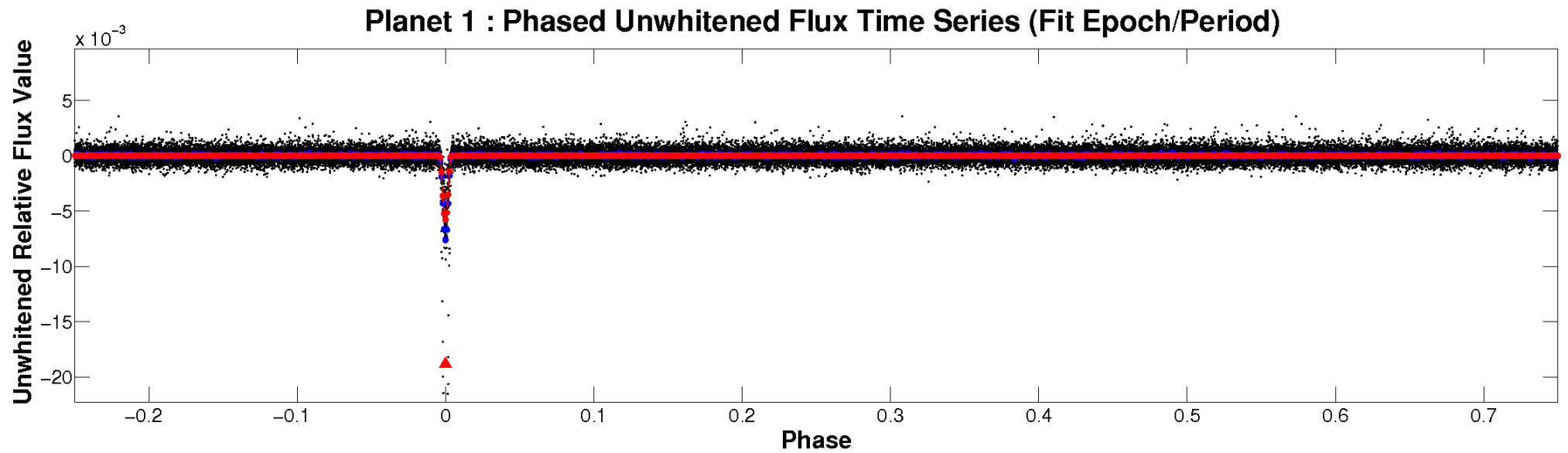


ALT Odd/Even

TCE 004144231-01

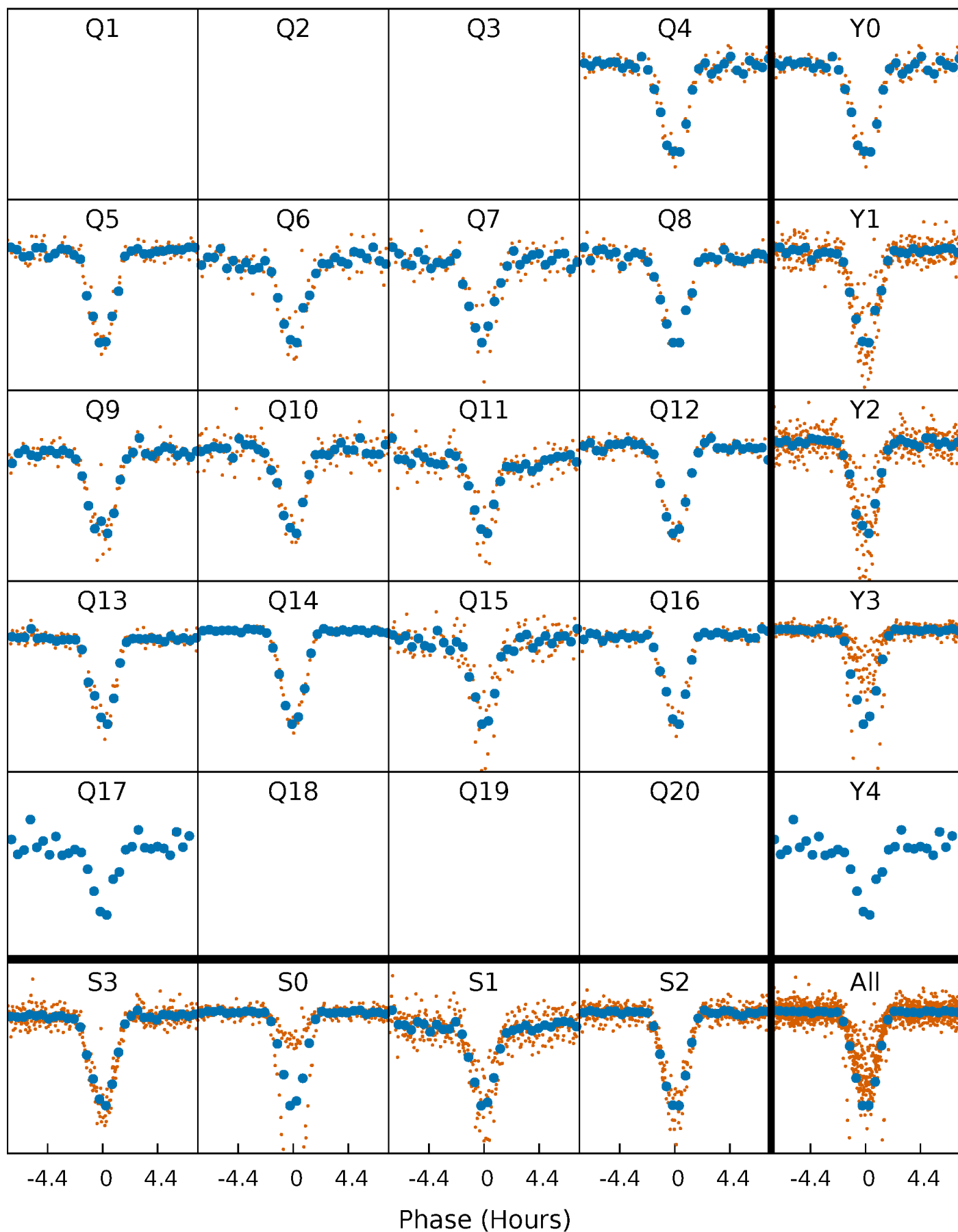


Non-Whitened Vs. Whitened Light Curve



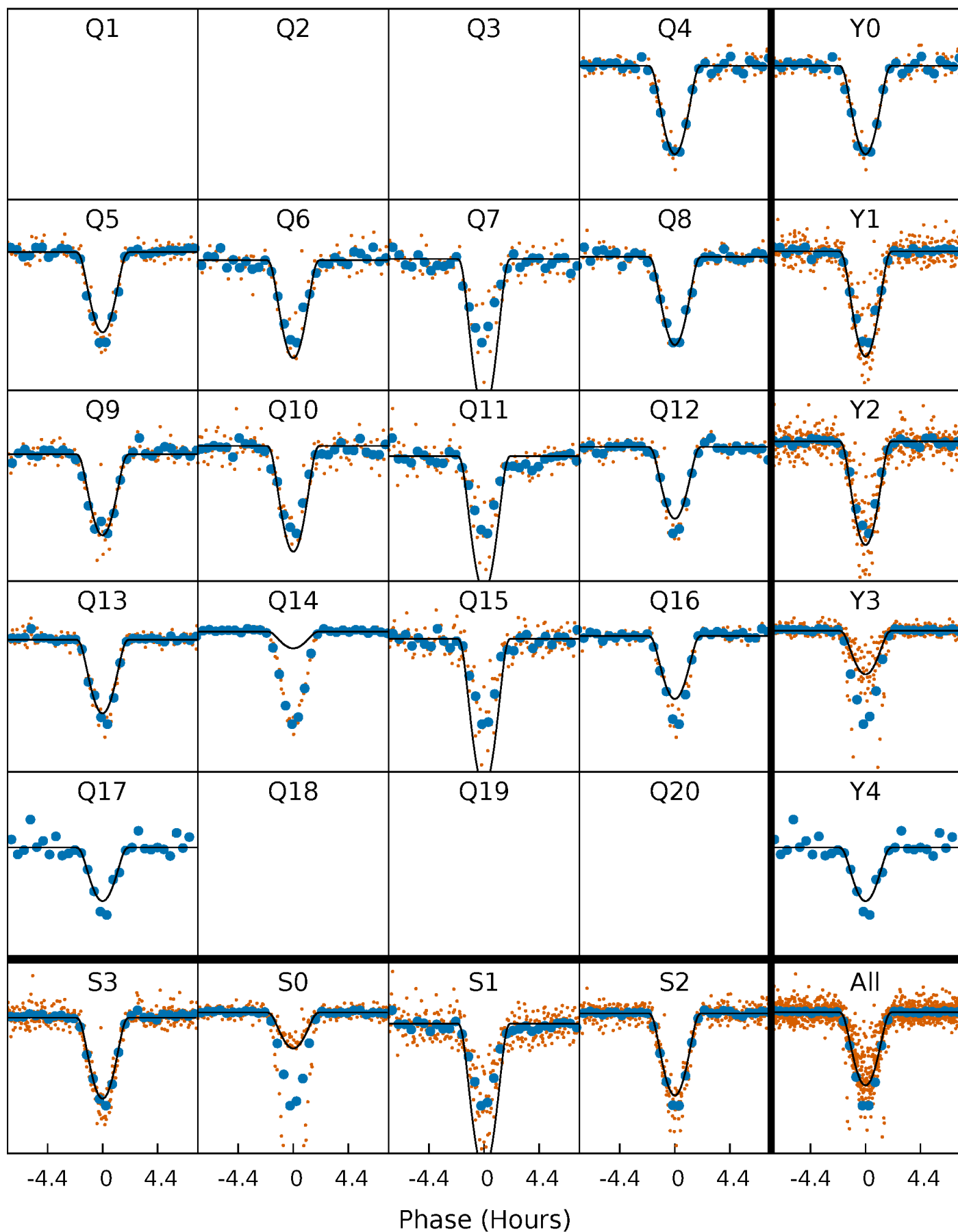
PDC Quarter-Phased Transit Curves

TCE 004144231-01 P= 22.913356 Days $T_0=140.649957$ (BKJD)



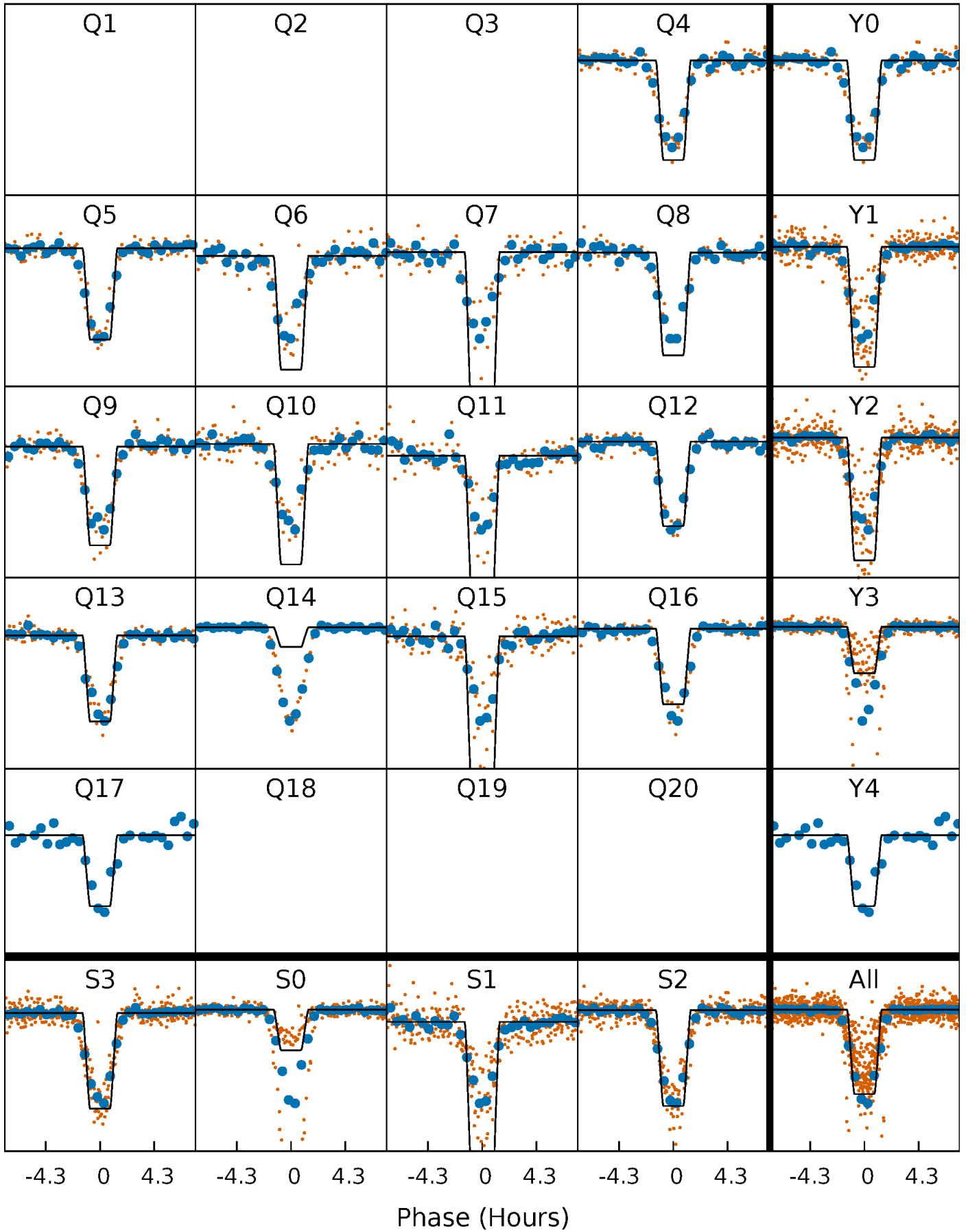
DV Quarter-Phased Transit Curves

TCE 004144231-01 P= 22.913356 Days $T_0=140.649957$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

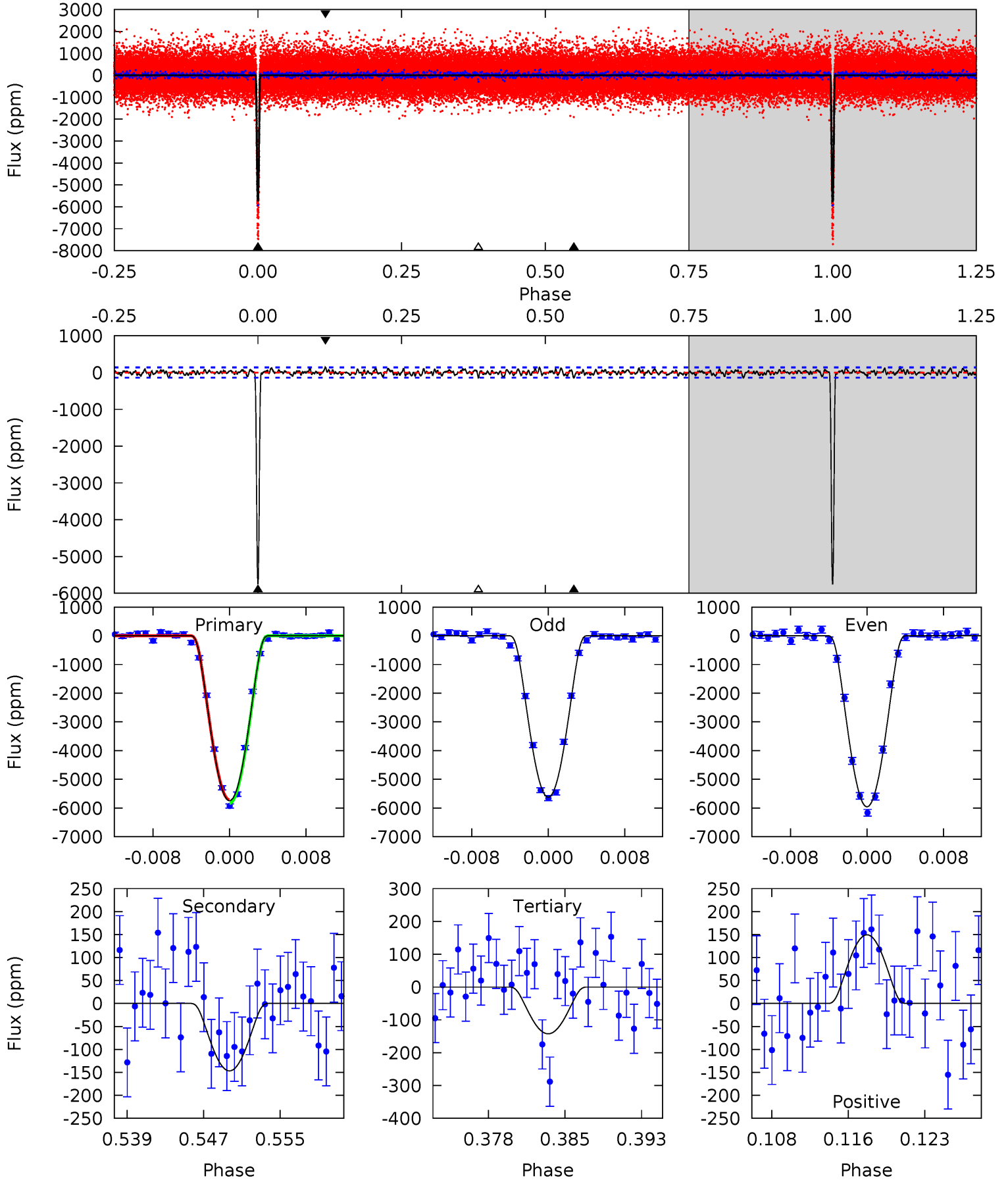
TCE 004144231-01 P= 22.913184 Days $T_0=140.656692$ (BKJD)



DV Model-Shift Uniqueness Test

004144231-01, P = 22.913356 Days, E = 140.649957 Days

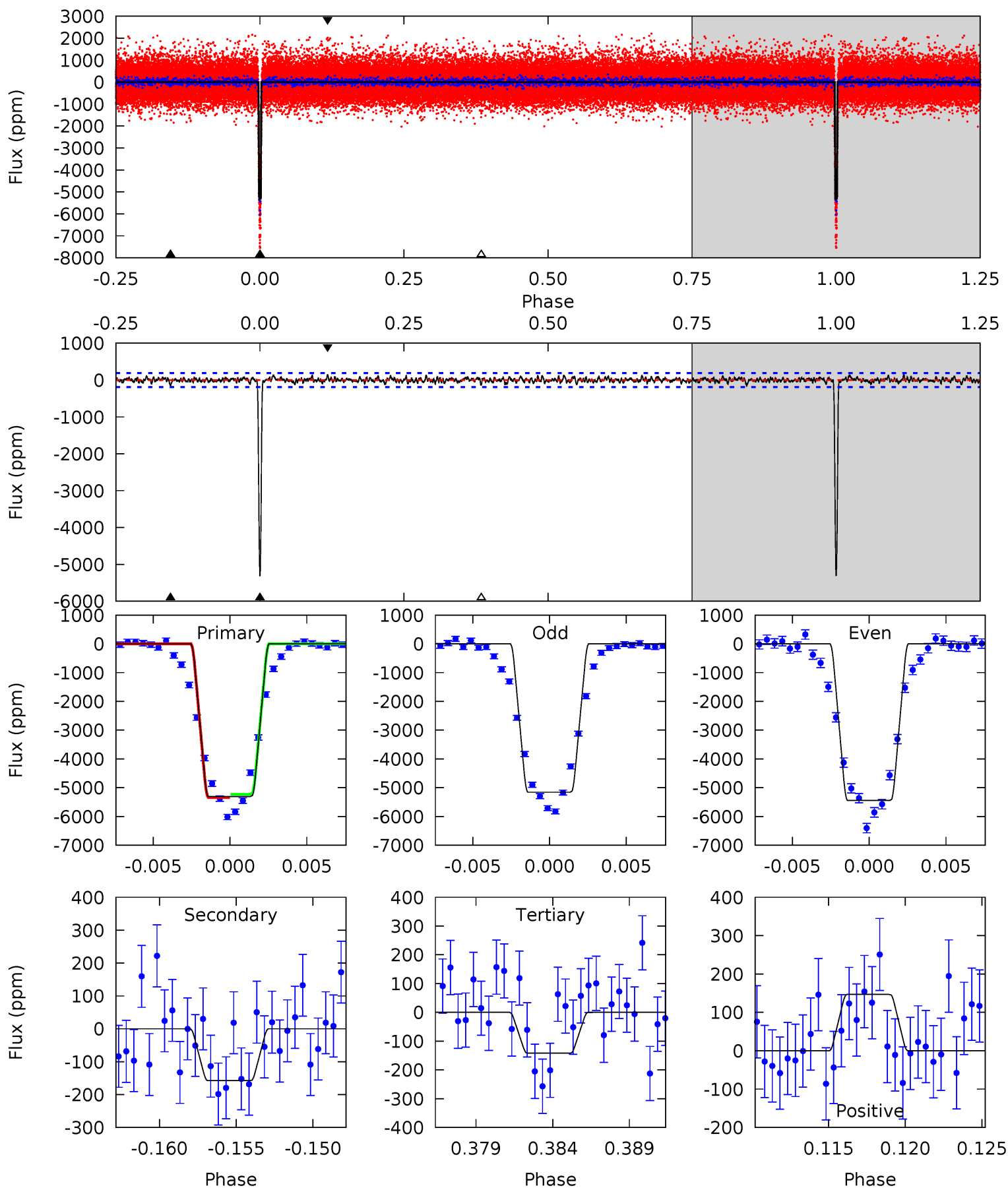
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 207.7 | 5.30 | 5.15 | 5.40 | 5.08 | 2.66 | 1.60 | 202.5 | 202.3 | 0.16 | -0.10 | 5.97 | 1.27 | 0.03 | 2.29 |



Alt Model-Shift Uniqueness Test

004144231-01, $P = 22.913184$ Days, $E = 140.656692$ Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 142.8 | 4.24 | 3.82 | 3.94 | 5.16 | 2.81 | 1.16 | 139.0 | 138.8 | 0.42 | 0.30 | 3.87 | 1.25 | 0.03 | 1.51 |



Stellar Parameters For KIC 004144231

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5451^{+190}_{-190} | $4.663^{+0.068}_{-0.032}$ | $-1.980^{+0.150}_{-0.050}$ | $0.600^{+0.032}_{-0.041}$ | $0.604^{+0.045}_{-0.019}$ | $3.936^{+0.922}_{-0.479}$ |
| | +3%/-3% | +1%/-1% | +8%/-3% | +5%/-7% | +7%/-3% | +23%/-12% |
| Source | KIC0 | 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 004144231-01 / KOI 1791.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|-------------------|
| DV | -147 ± 28 | $8.33^{+3.71}_{-3.70}$ | 707^{+29}_{-27} | 2518^{+416}_{-234} | 21^{+47}_{-11} |
| Alt. | -158 ± 37 | $5.91^{+3.44}_{-3.44}$ | 709^{+28}_{-28} | 2753^{+830}_{-313} | 41^{+213}_{-24} |

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

DV Centroid Data

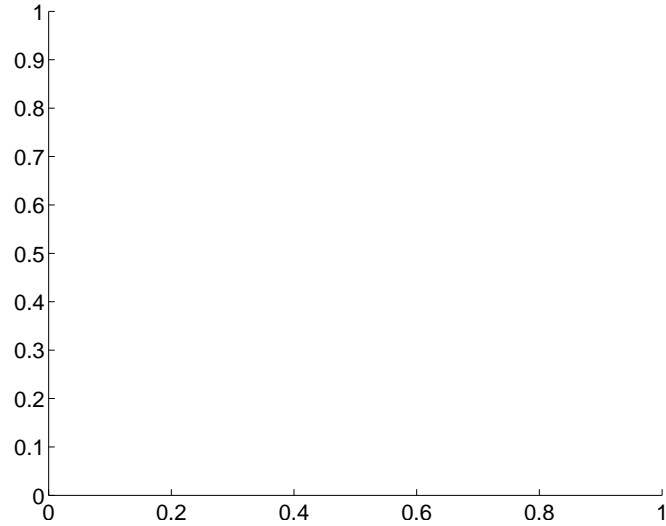
Supplemental centroid analysis for 004144231-01. Kepler magnitude: 15.47. Transit SNR 103.33

There are 0 quarters with good PRF difference image offsets

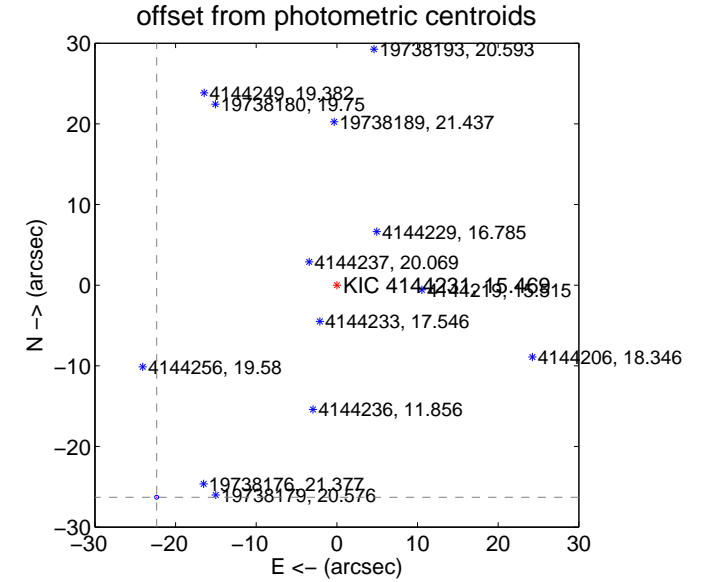
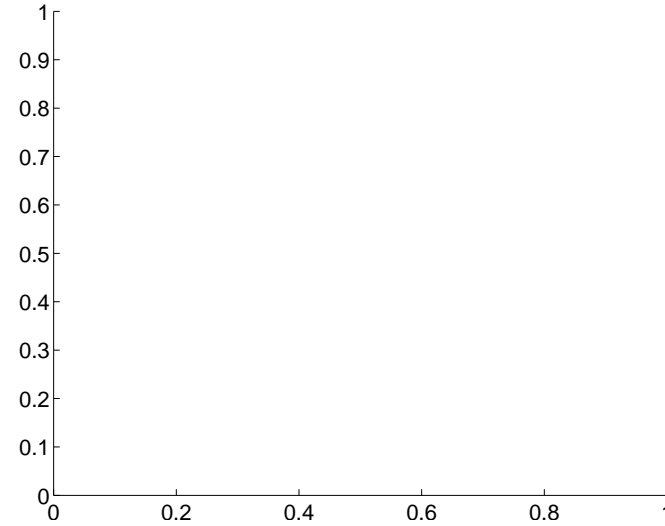
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|------------------|-------------------|
| PRF-fit source offset from OOT | — | — | — | — |
| PRF-fit source offset from KIC position | — | — | — | — |
| photometric centroid source offset | 34.51 ± 0.08 | 426.47 | 22.35 ± 0.08 | -26.30 ± 0.08 |

There is no PRF-fit offset from OOT-fit

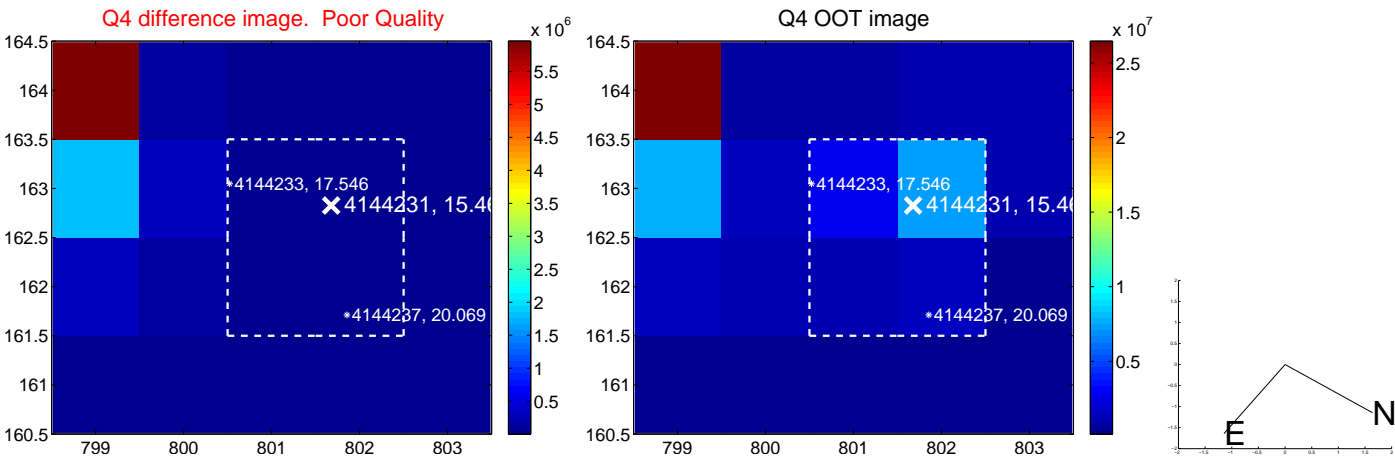
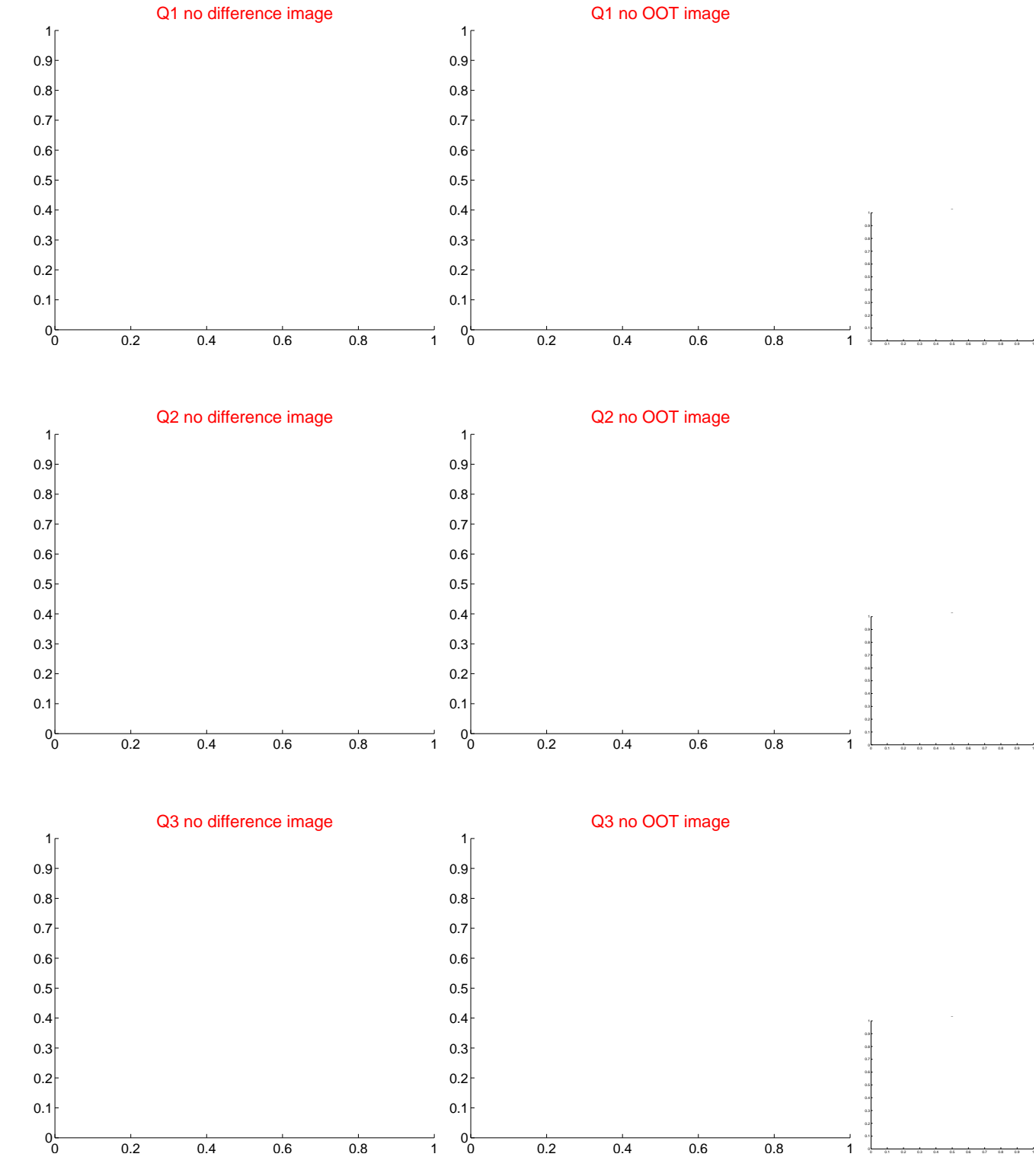


There is no PRF-fit offset from KIC

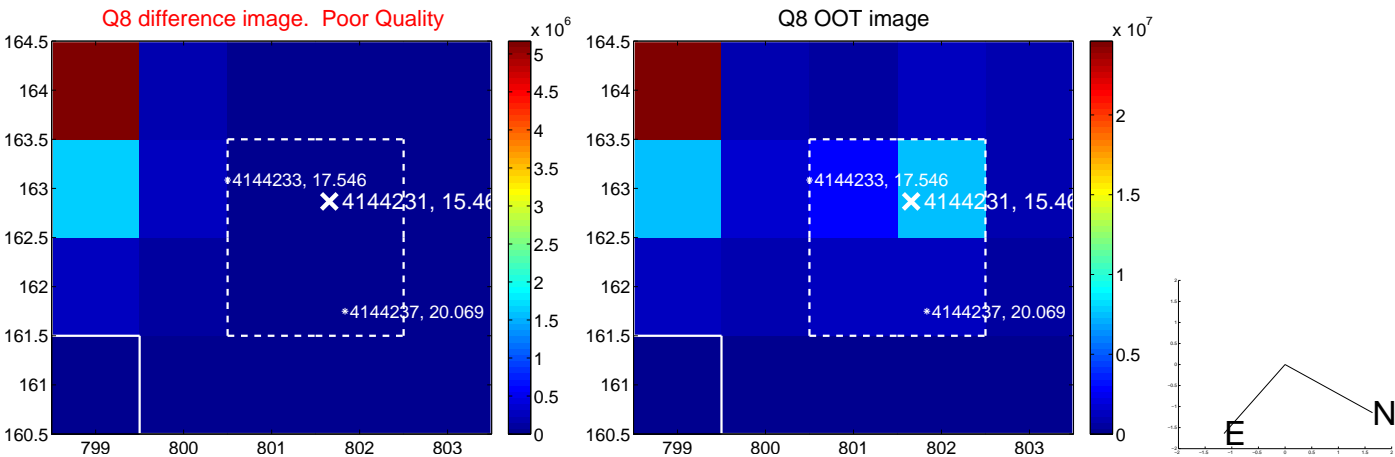
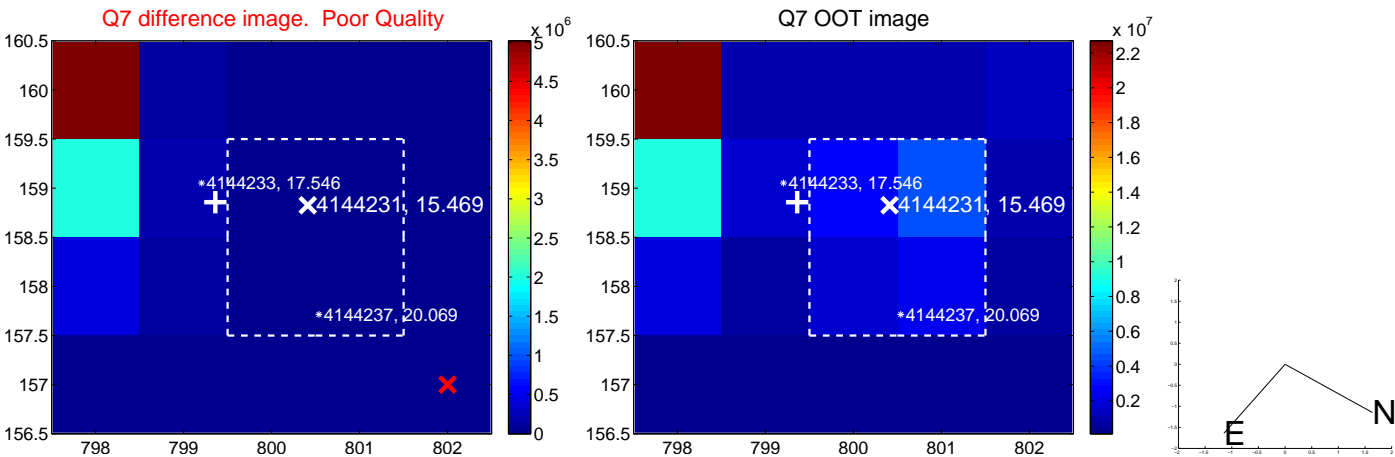
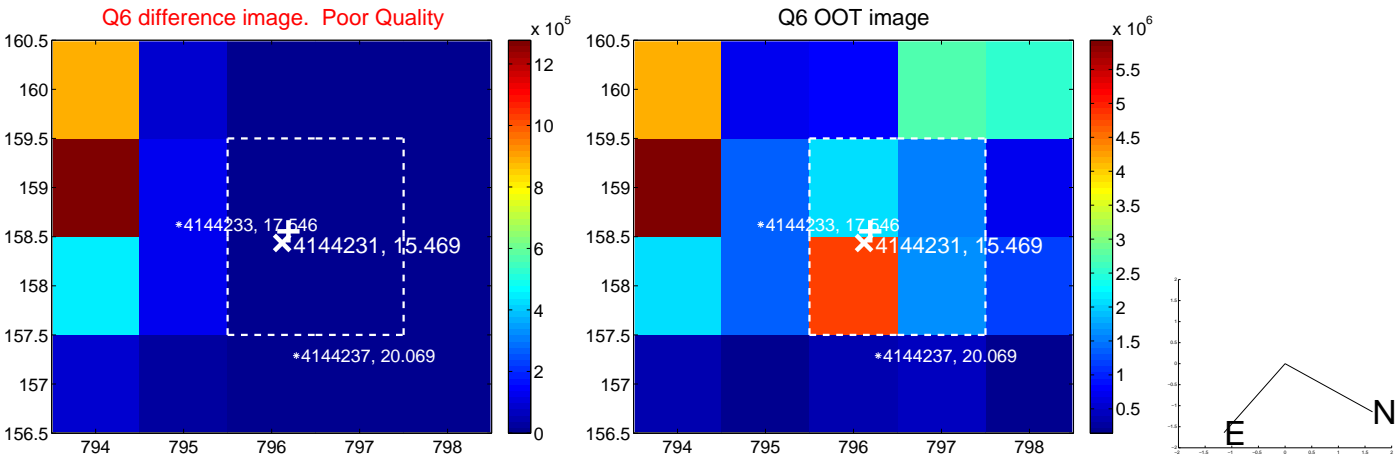
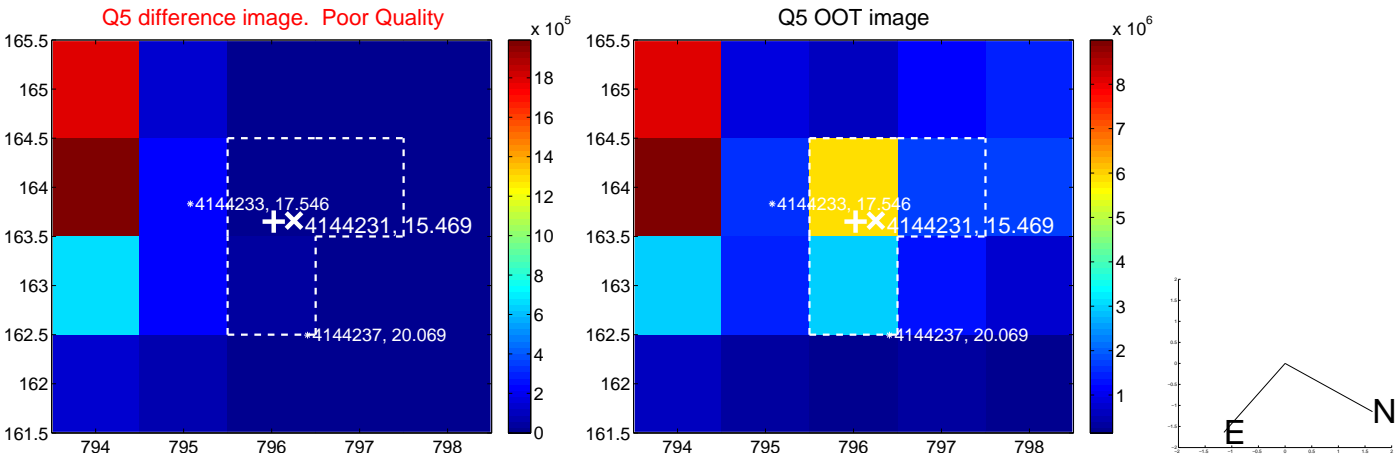


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

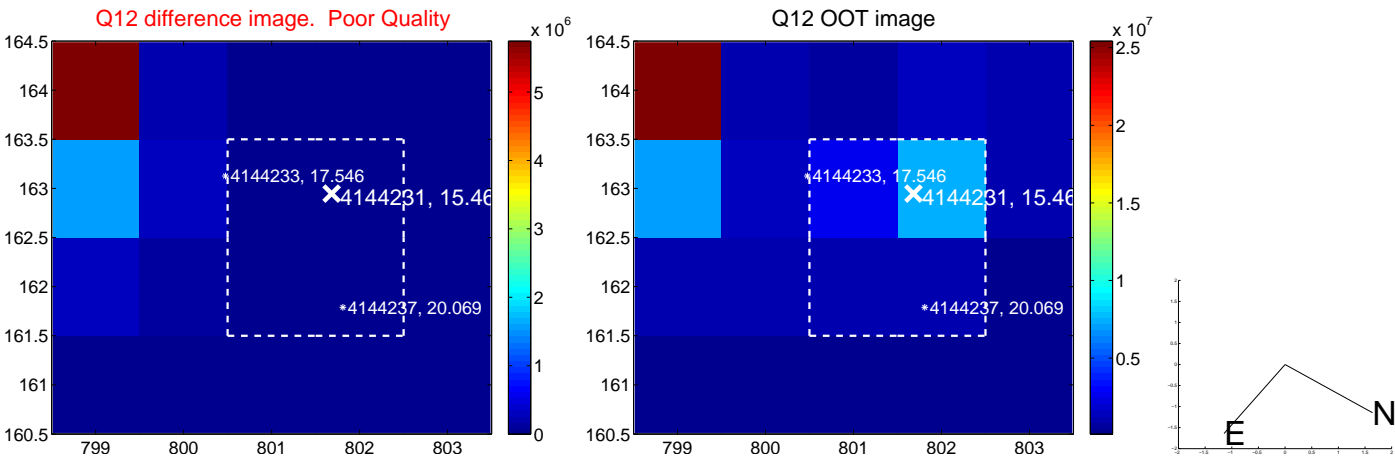
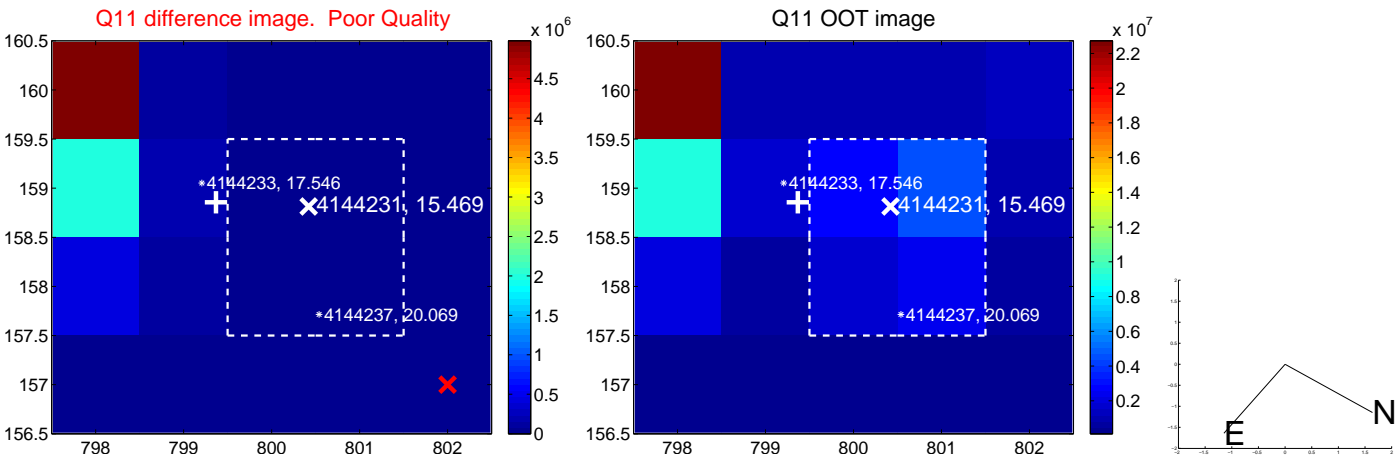
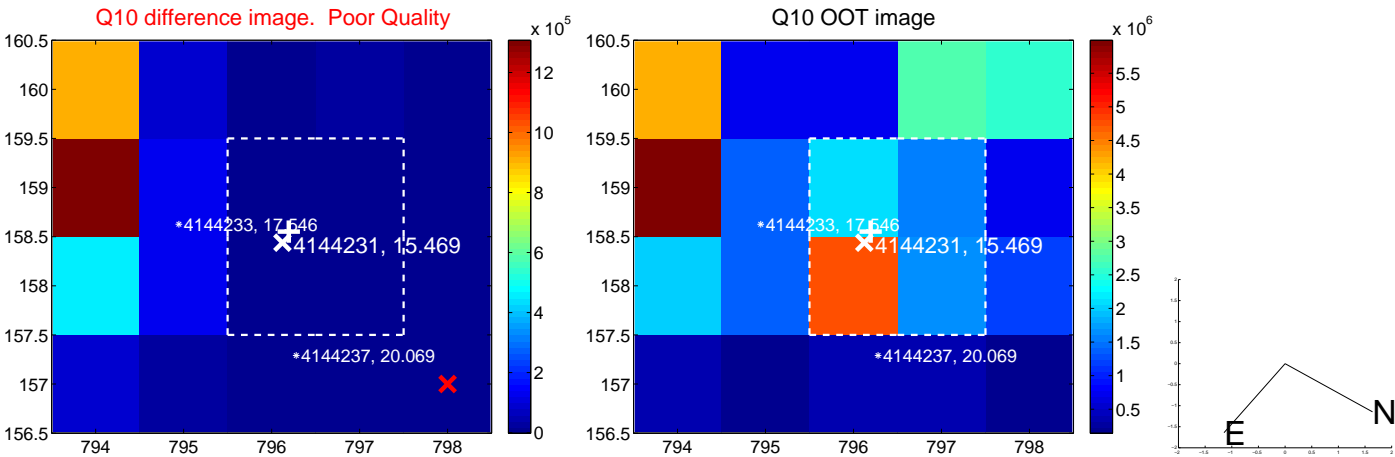
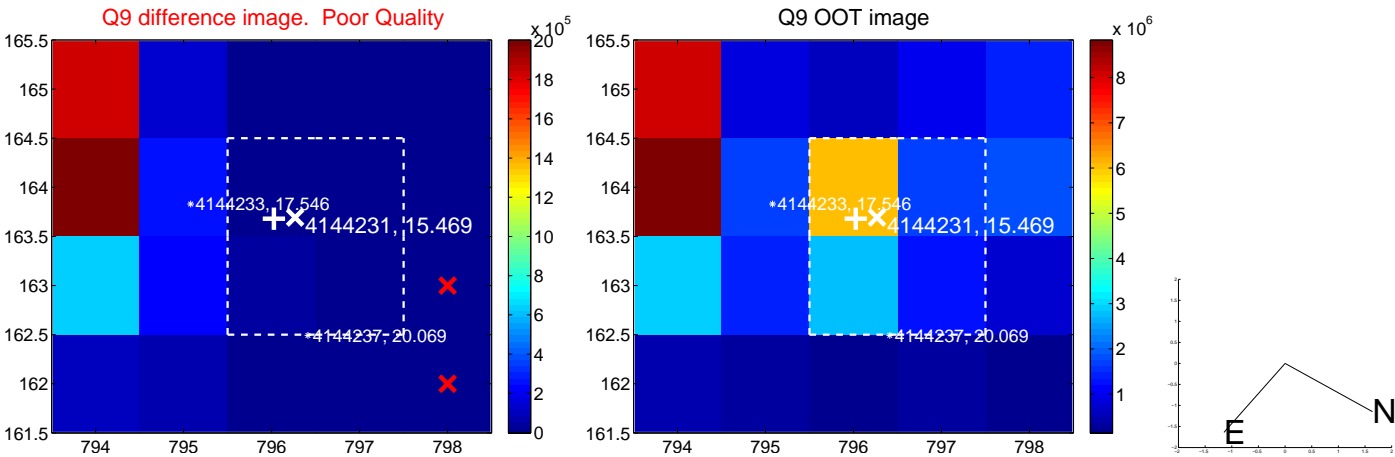
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



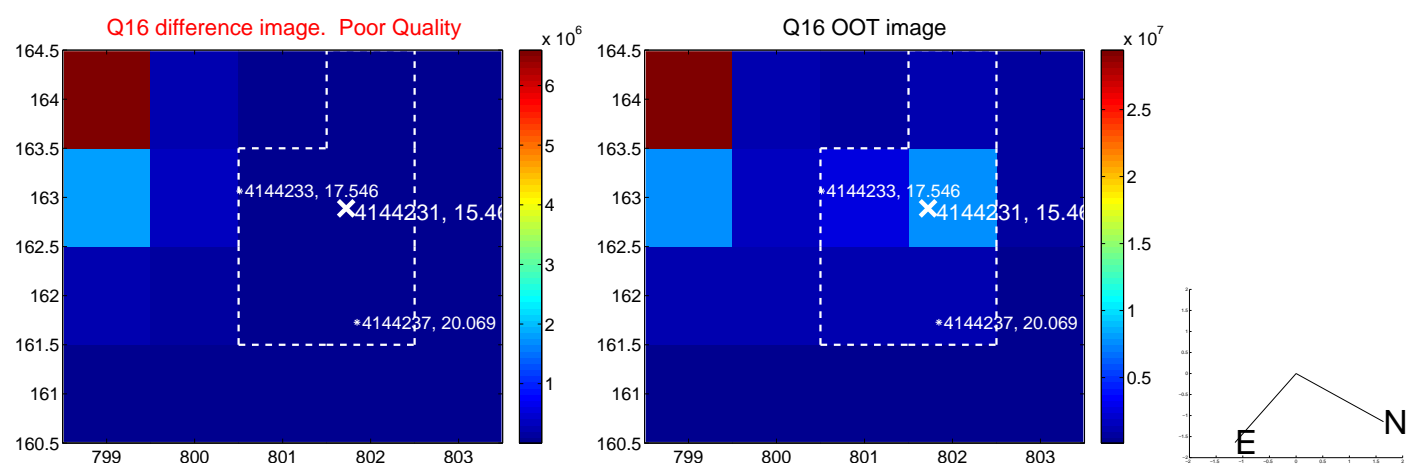
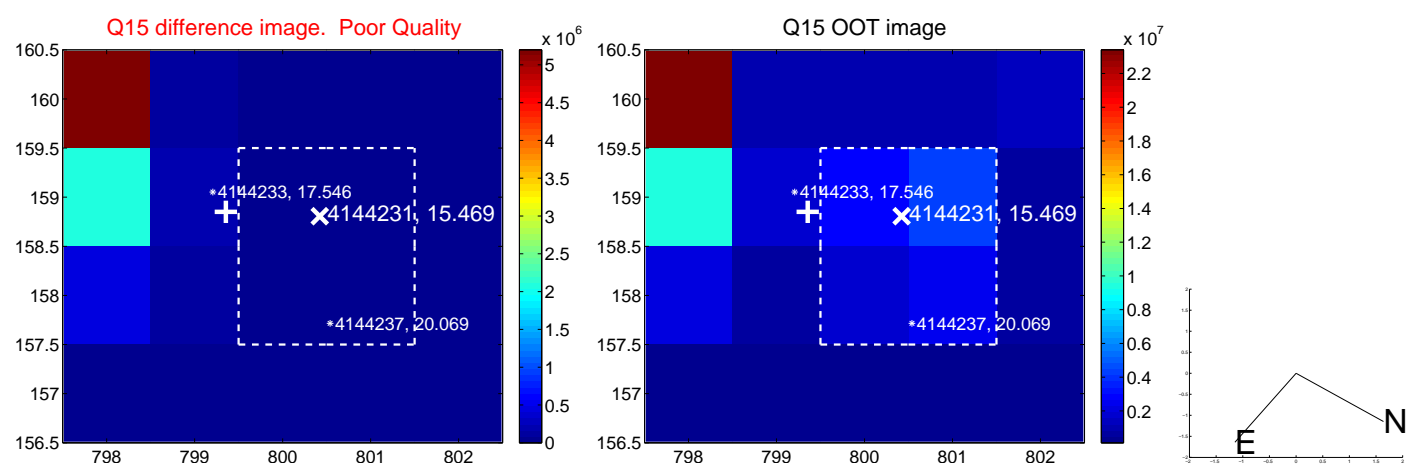
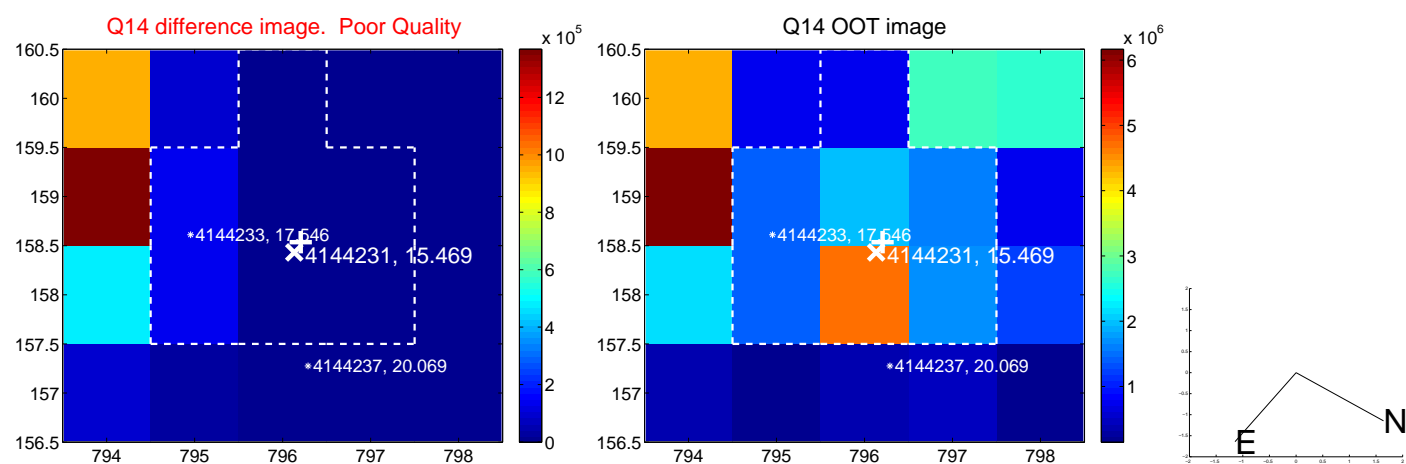
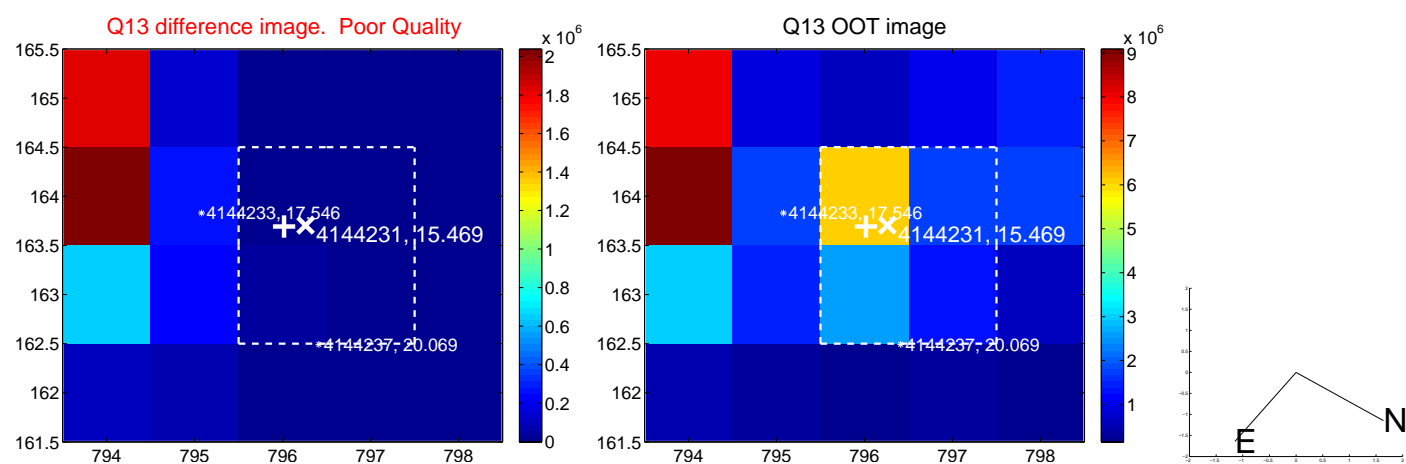
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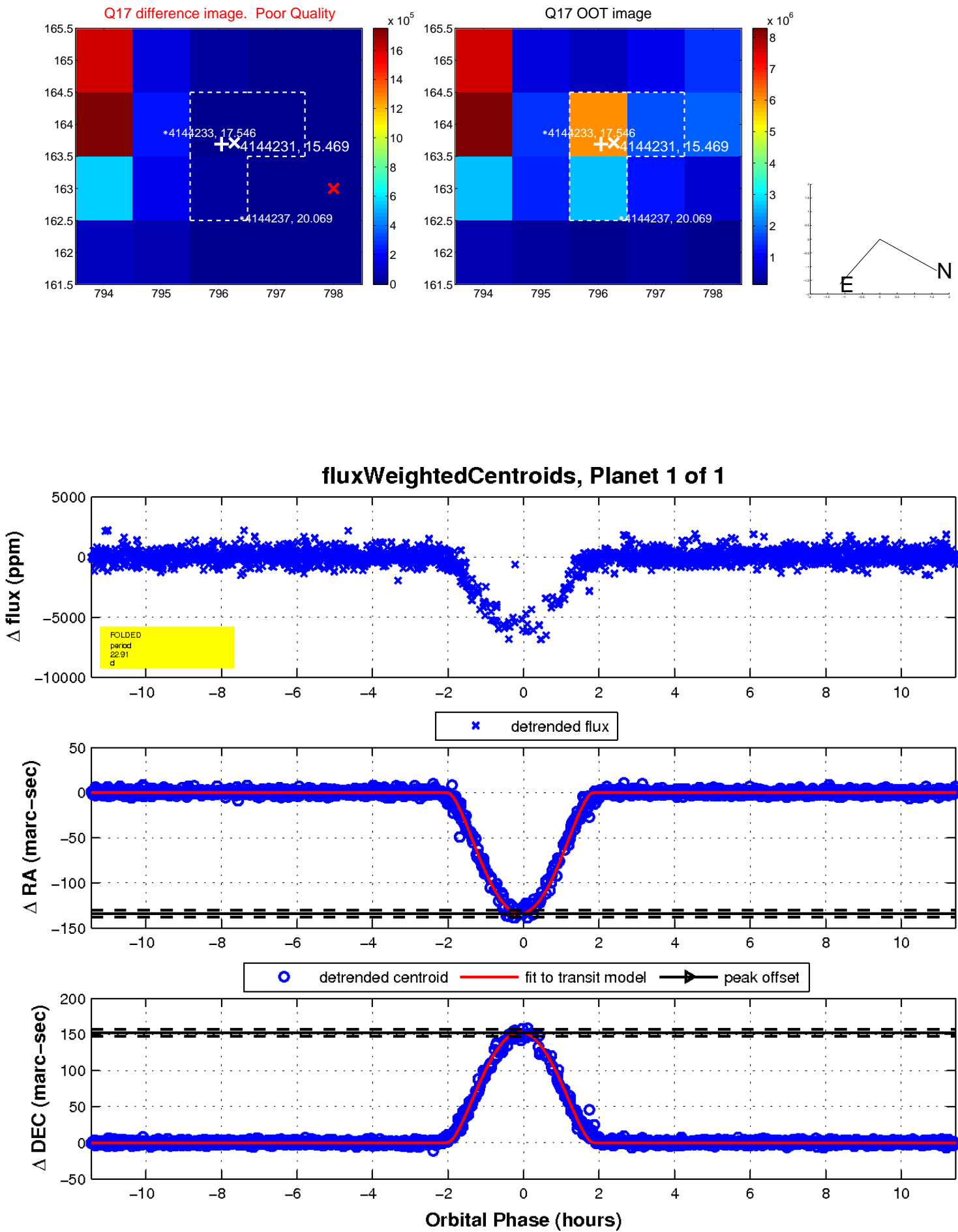
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image

