

KIC 012016243

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 012016243-01 | OBS | 7506.01 | 11.843151 | 138.038804 | 191.4 | 6.916 | 8.4 | 9.9 | 1.00 | 6077 | 1.58 | 112.22 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---------------|
| 012016243-01 | OBS | PC | 1.00 | 0 | 0 | 0 | 0 | CENT_FEW_MEAS |

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

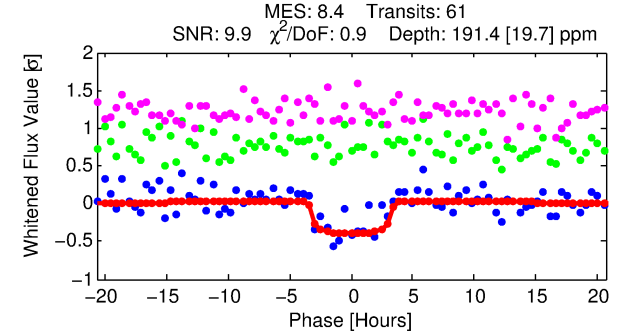
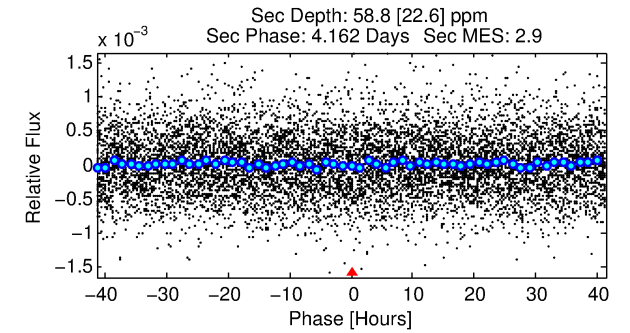
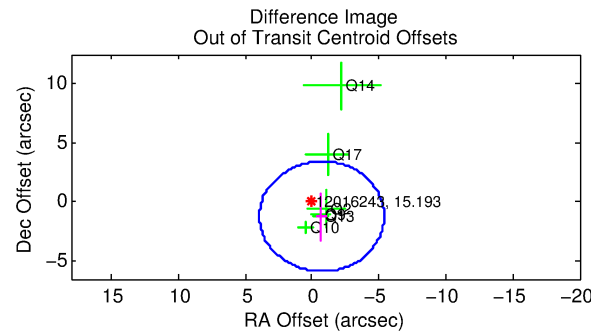
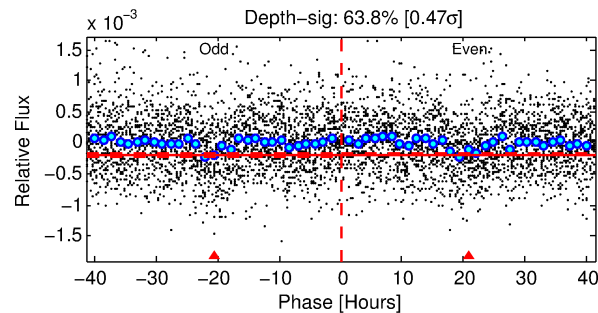
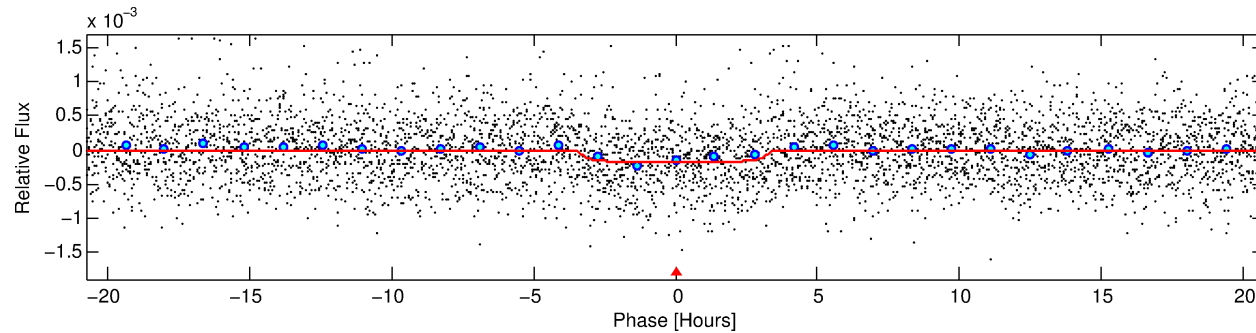
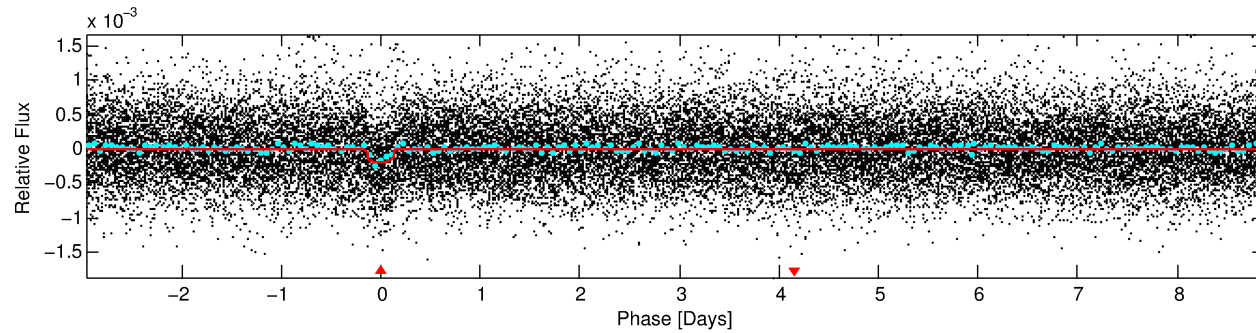
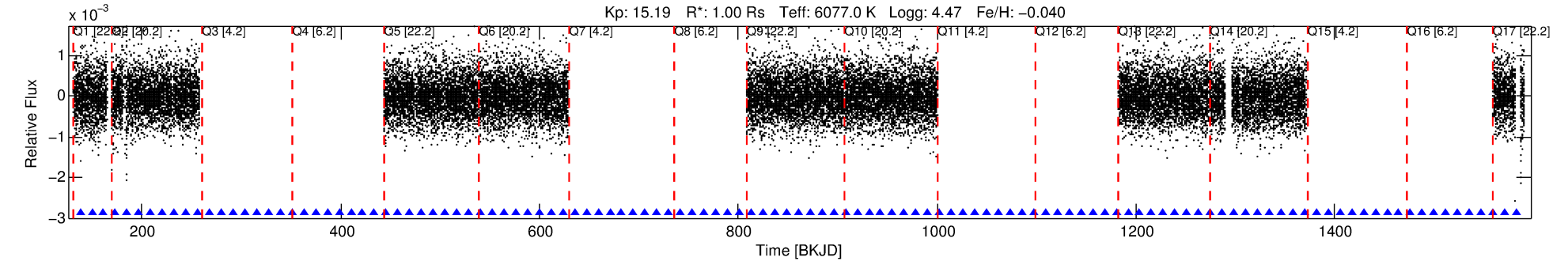
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012016243-01

No Significant Match Found

DV One-Page Summary

KIC: 12016243 Candidate: 1 of 1 Period: 11.843 d
KOI: K07506.01 Corr: 0.942



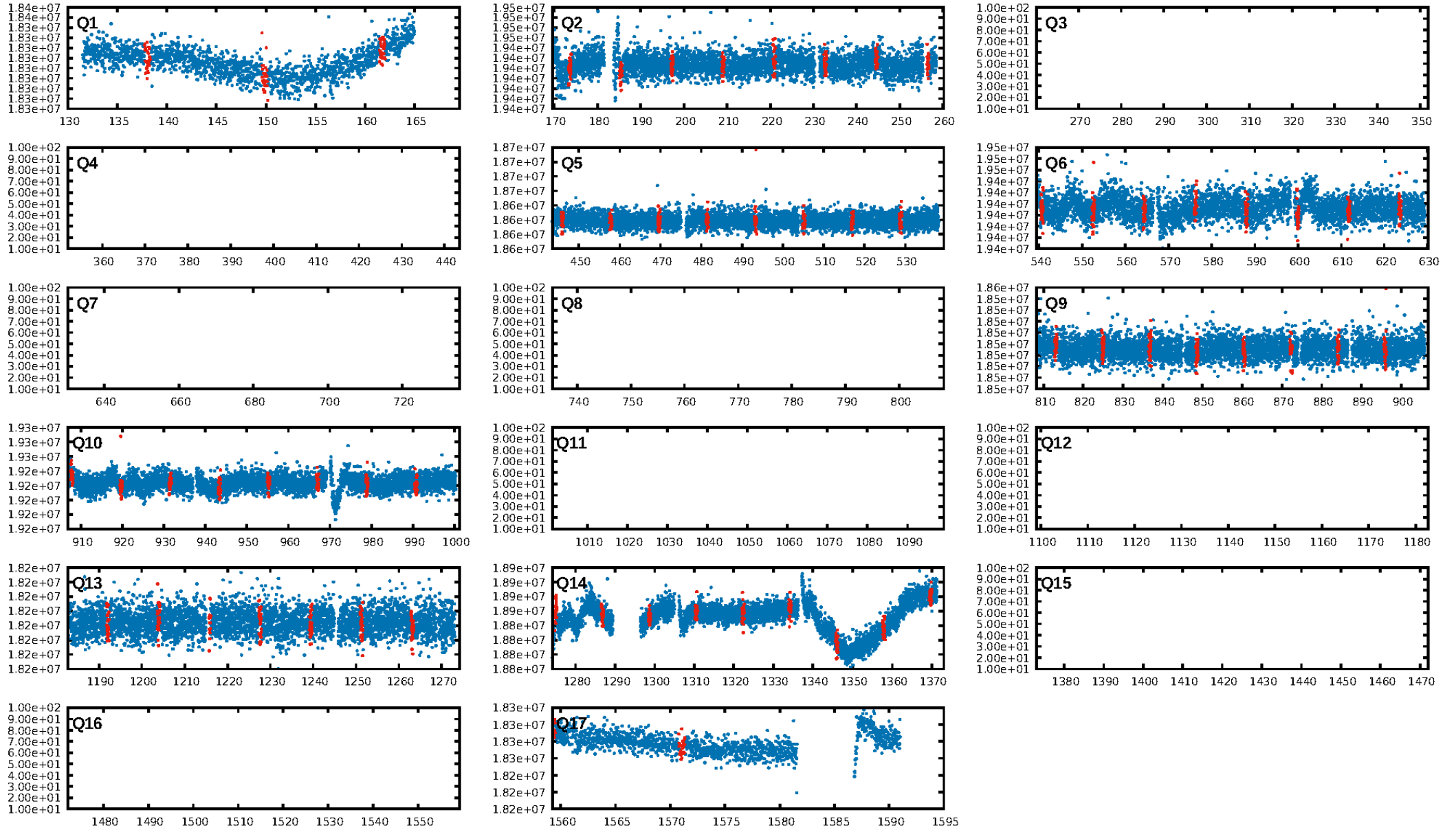
DV Fit Results:

Period = 11.84315 [0.00019] d
Epoch = 138.0388 [0.0121] BKJD
Rp/R* = 0.0145 [0.0051]
a/R* = 7.03 [12.01]
b = 0.86 [0.52]
Seff = 112.22 [48.66]
Teq = 830 [90] K
Rp = 1.58 [0.76] Re
a = 0.1042 [0.0293] AU
Ag = 140.07 [125.27] [1.11 σ]
Teffp = 4414 [892] K [4.00 σ]

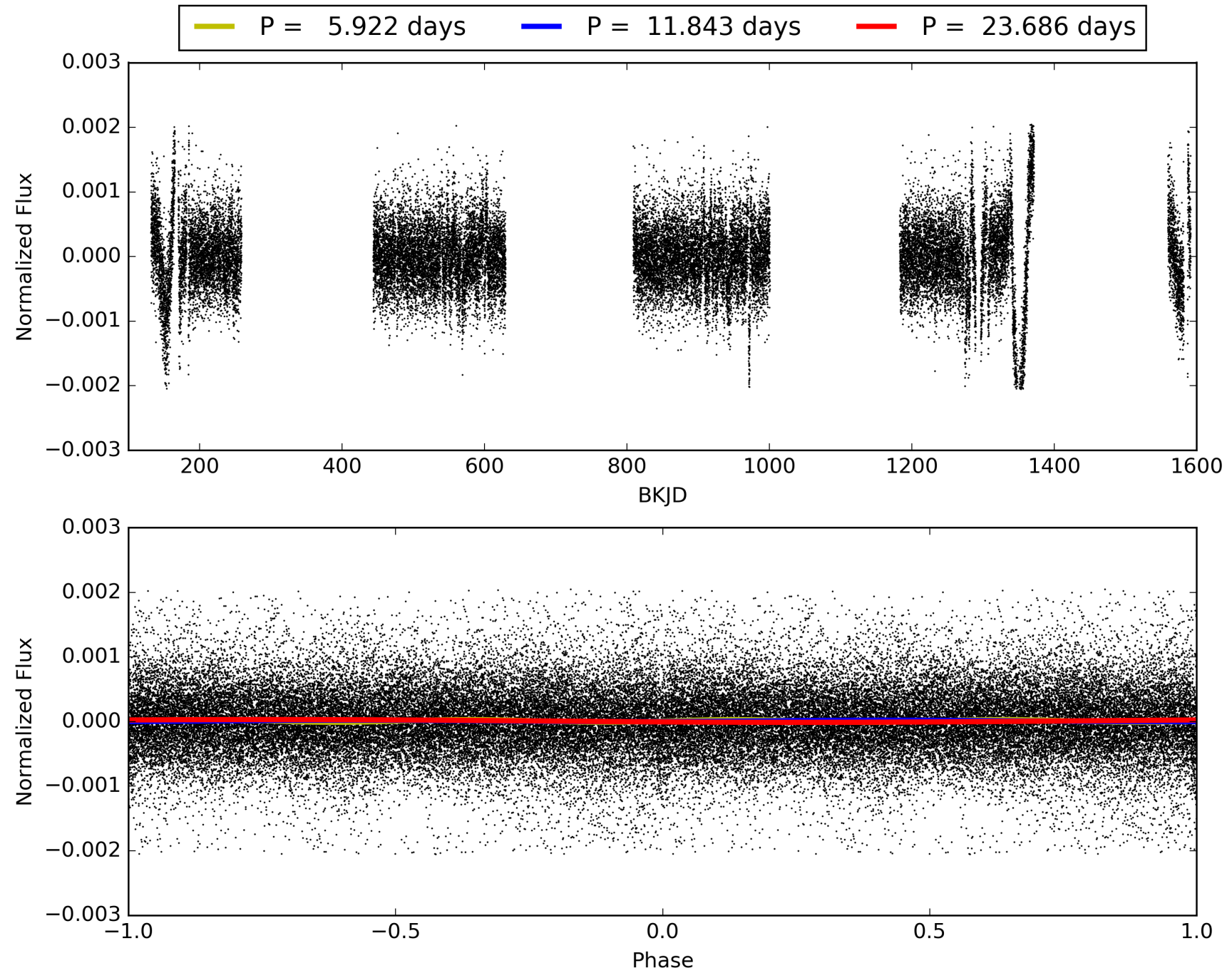
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 28.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.03e-15
RollingBand-fgt: 1.00 [56/56]
GhostDiagnostic-chr: -16.42
Centroid-sig: 6.5%
Centroid-so: 2.380 arcsec [1.73 σ]
OotOffset-rm: 1.407 arcsec [0.91 σ]
KicOffset-rm: 1.370 arcsec [1.12 σ]
OotOffset-st: 3/0/0/3 [6]
KicOffset-st: 3/0/0/3 [6]
DiffImageQuality-fgm: 0.50 [3/6]
DiffImageOverlap-fno: 1.00 [9/9]

TCE 012016243-01, PDC Light Curves

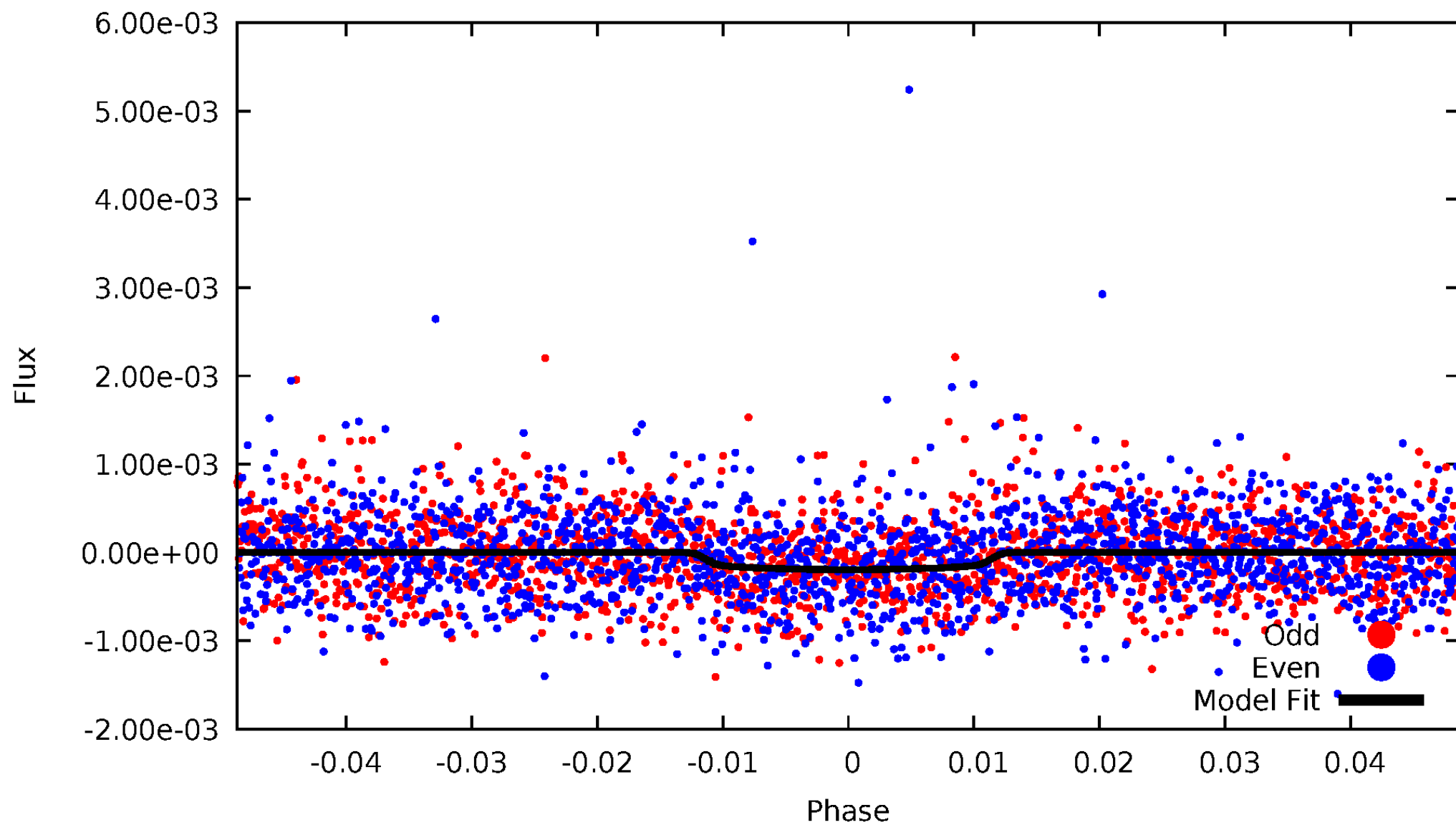


TCE 012016243-01



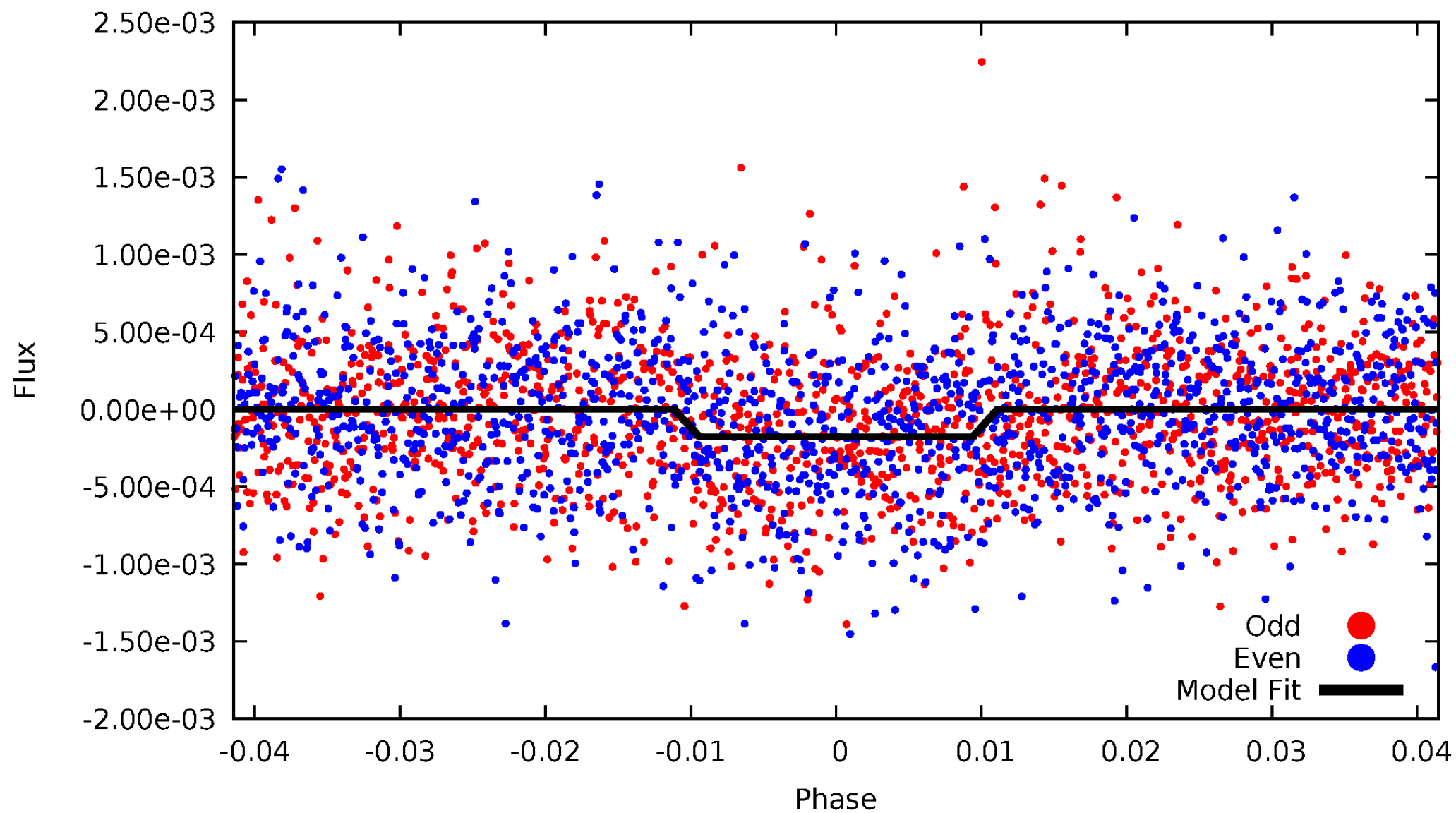
DV Odd/Even

TCE 012016243-01



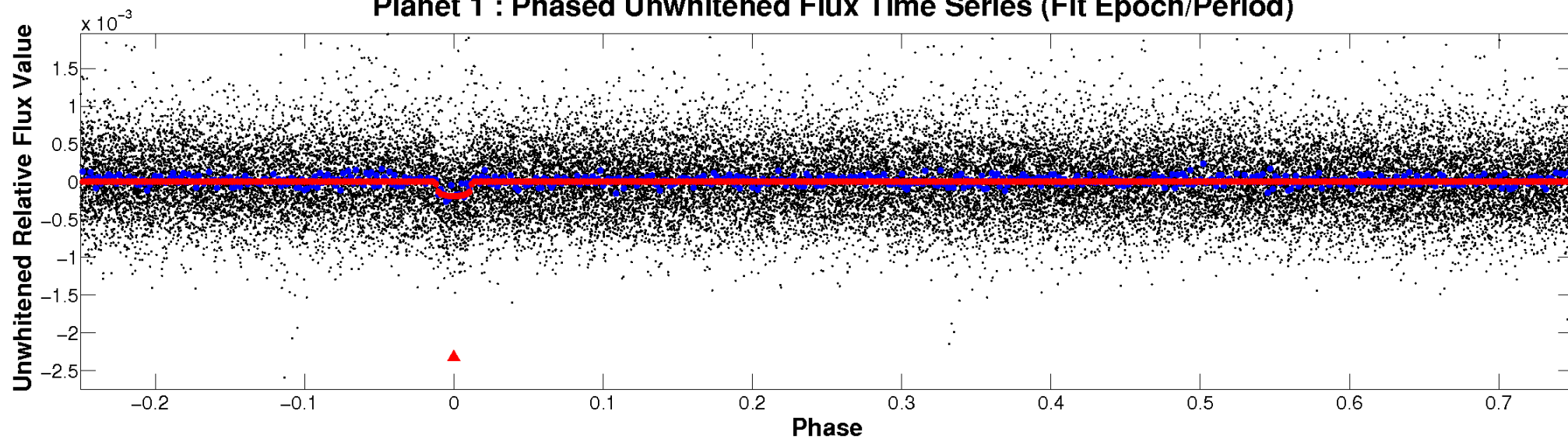
ALT Odd/Even

TCE 012016243-01

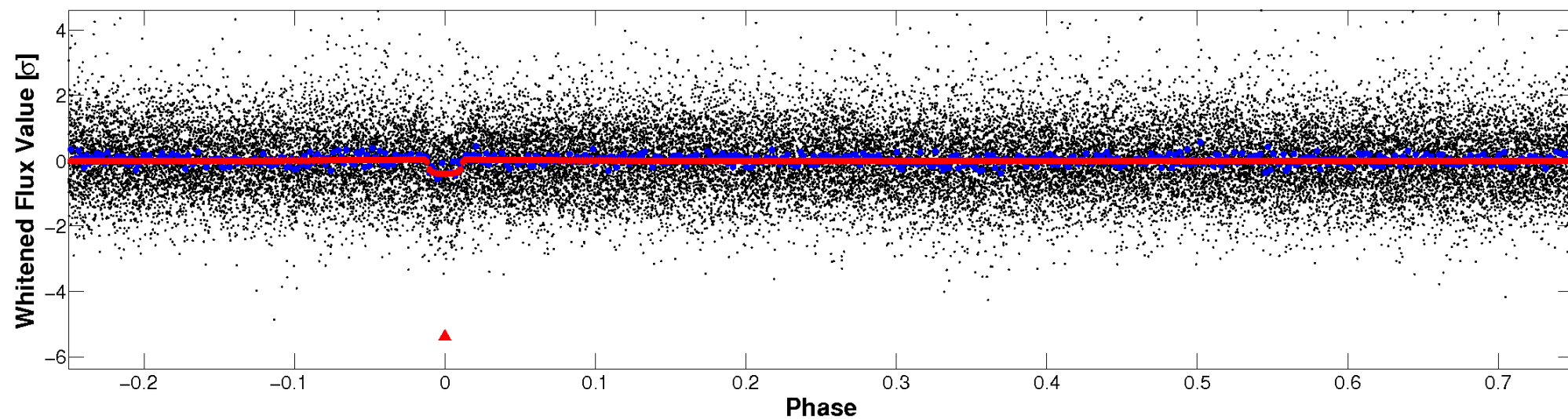


Non-Whitened Vs. Whitened Light Curve

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

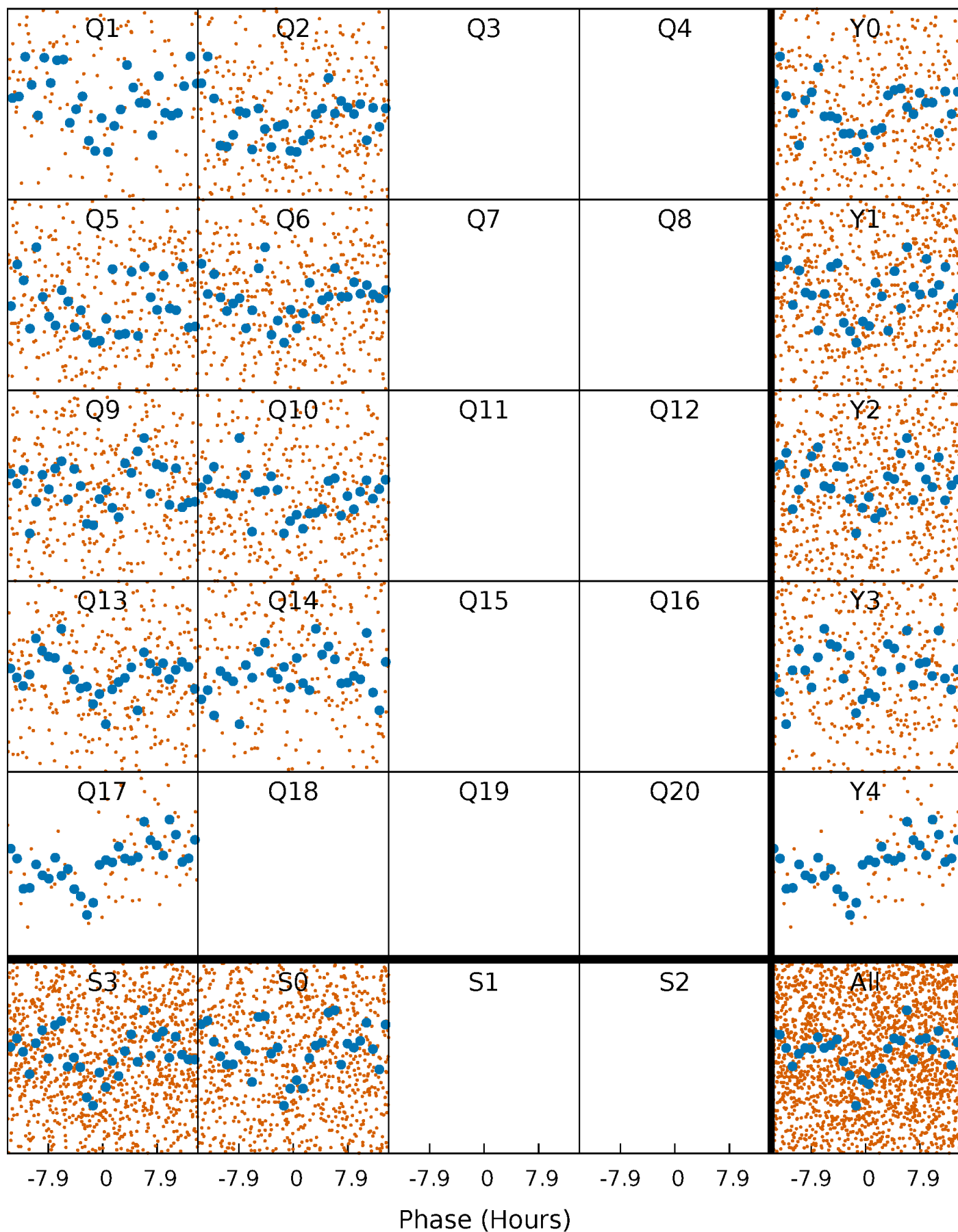


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



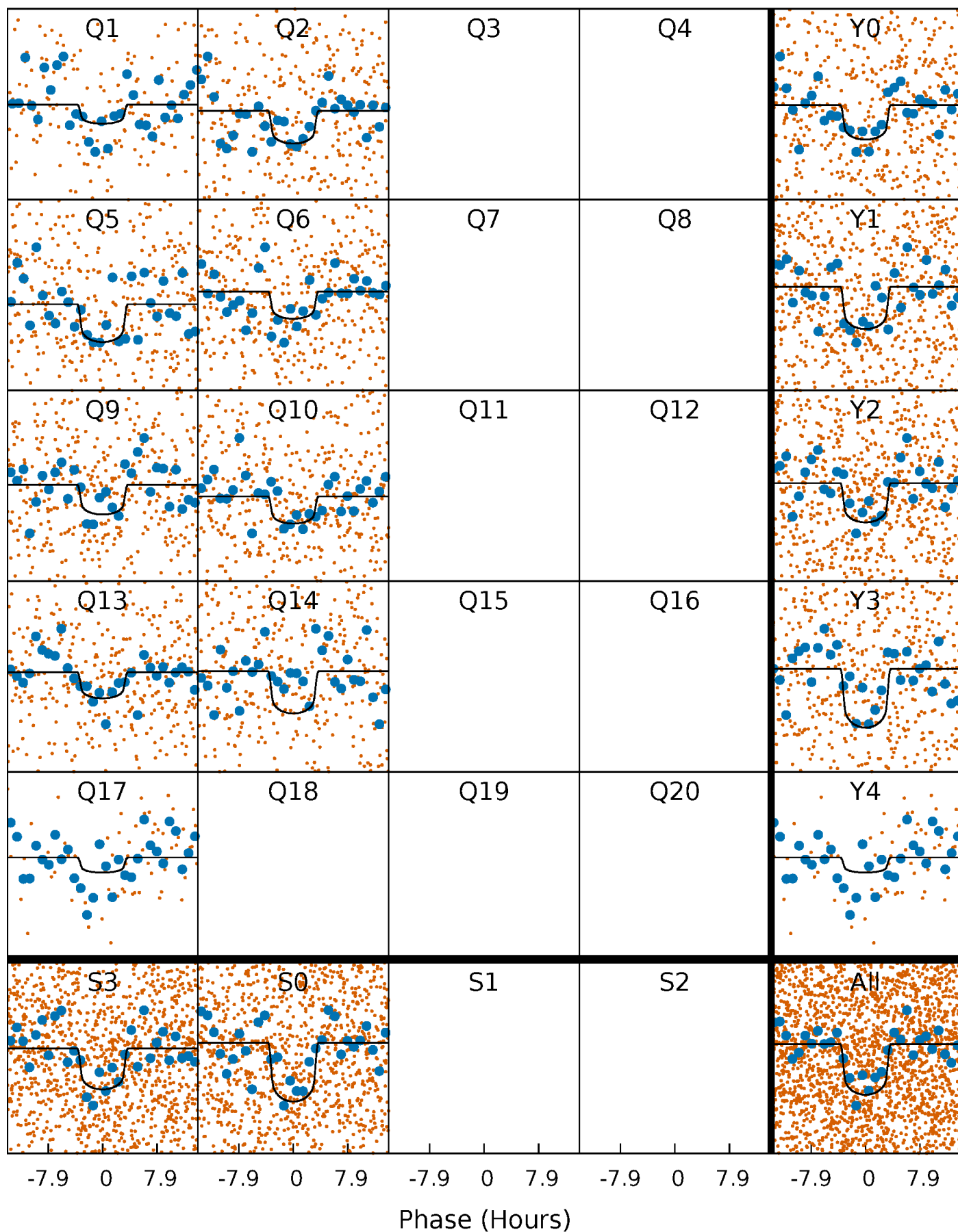
PDC Quarter-Phased Transit Curves

TCE 012016243-01 P= 11.843151 Days $T_0=138.038804$ (BKJD)



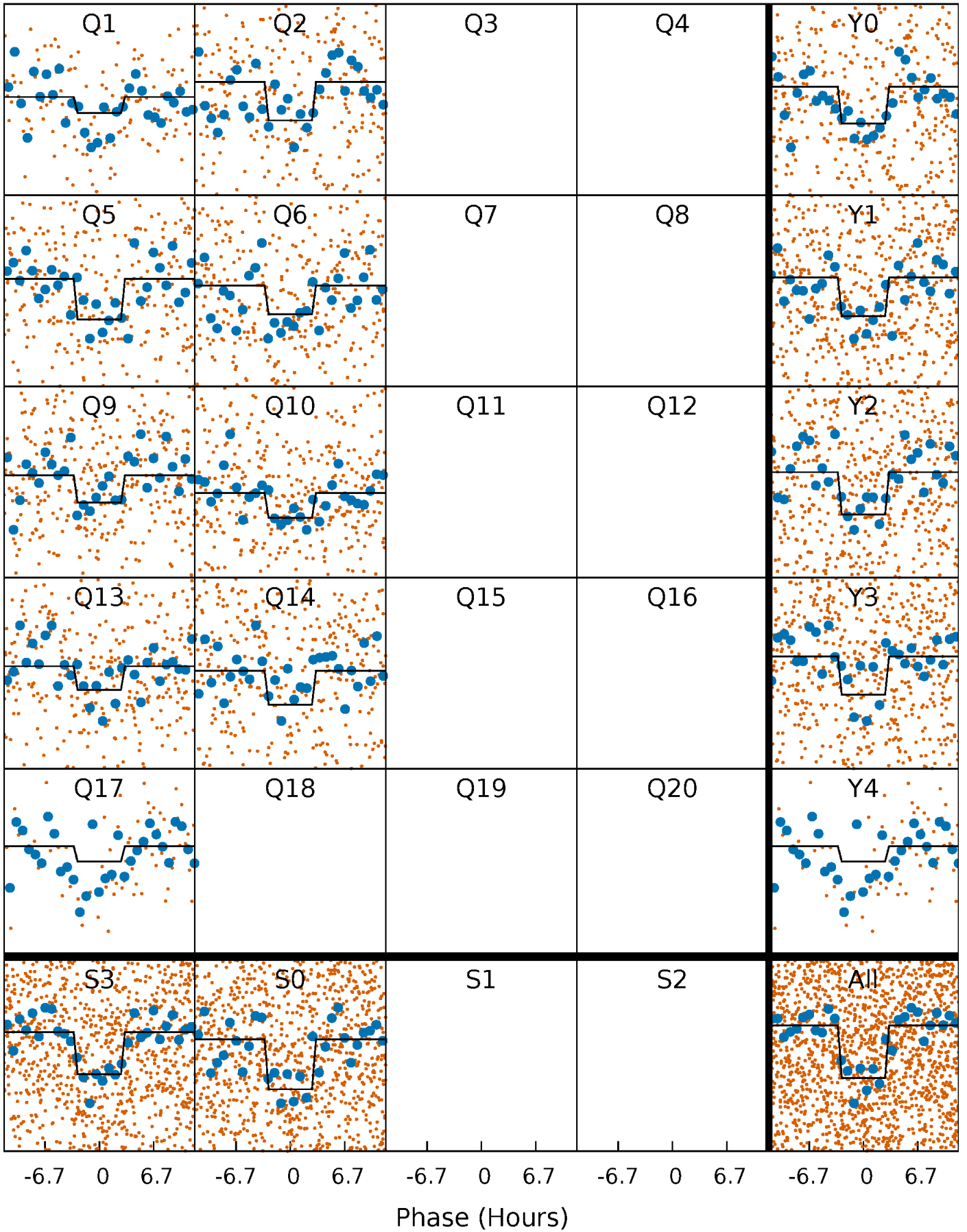
DV Quarter-Phased Transit Curves

TCE 012016243-01 P= 11.843151 Days $T_0=138.038804$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

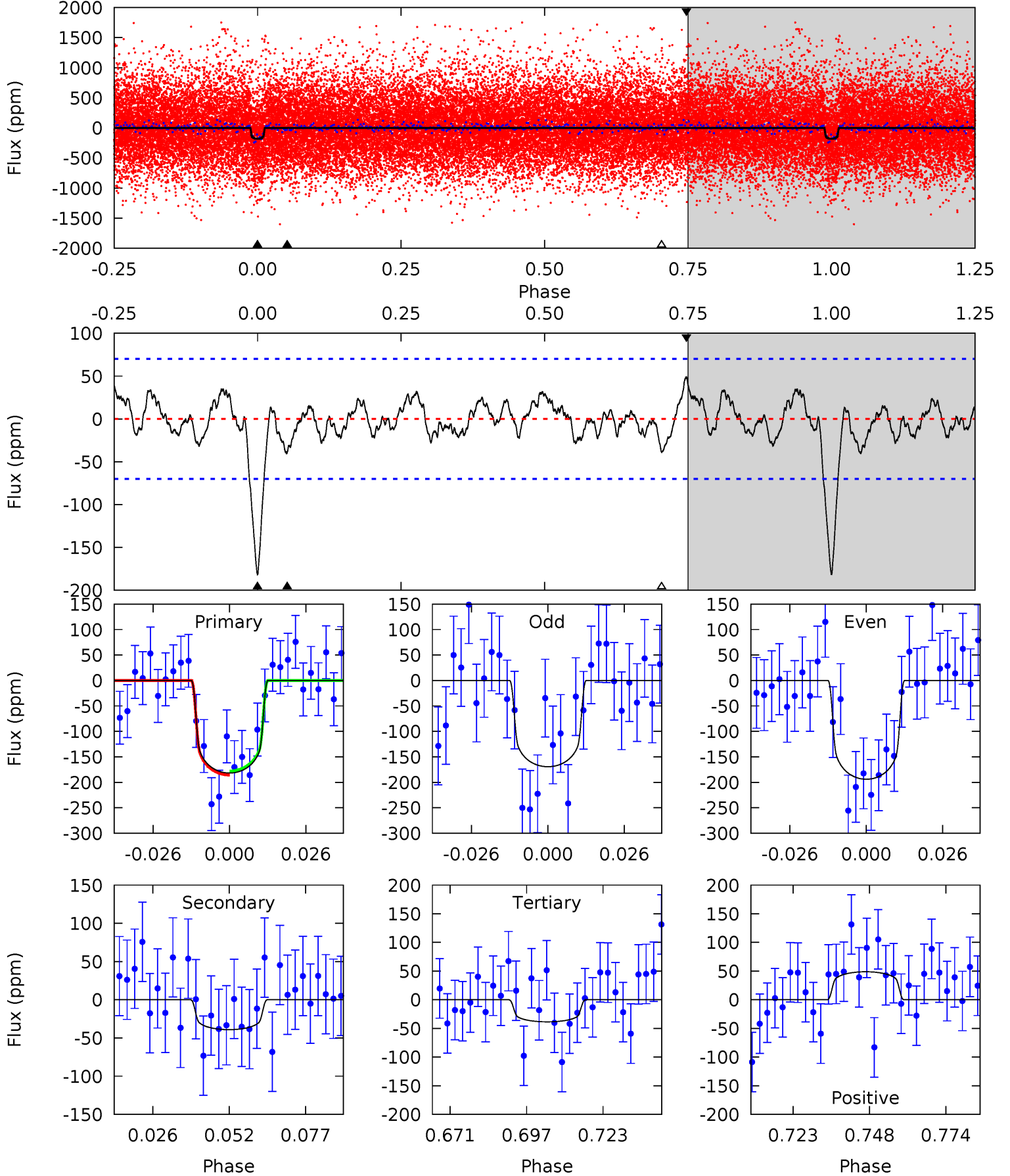
TCE 012016243-01 P= 11.843402 Days $T_0=138.011781$ (BKJD)



DV Model-Shift Uniqueness Test

012016243-01, P = 11.843151 Days, E = 126.195653 Days

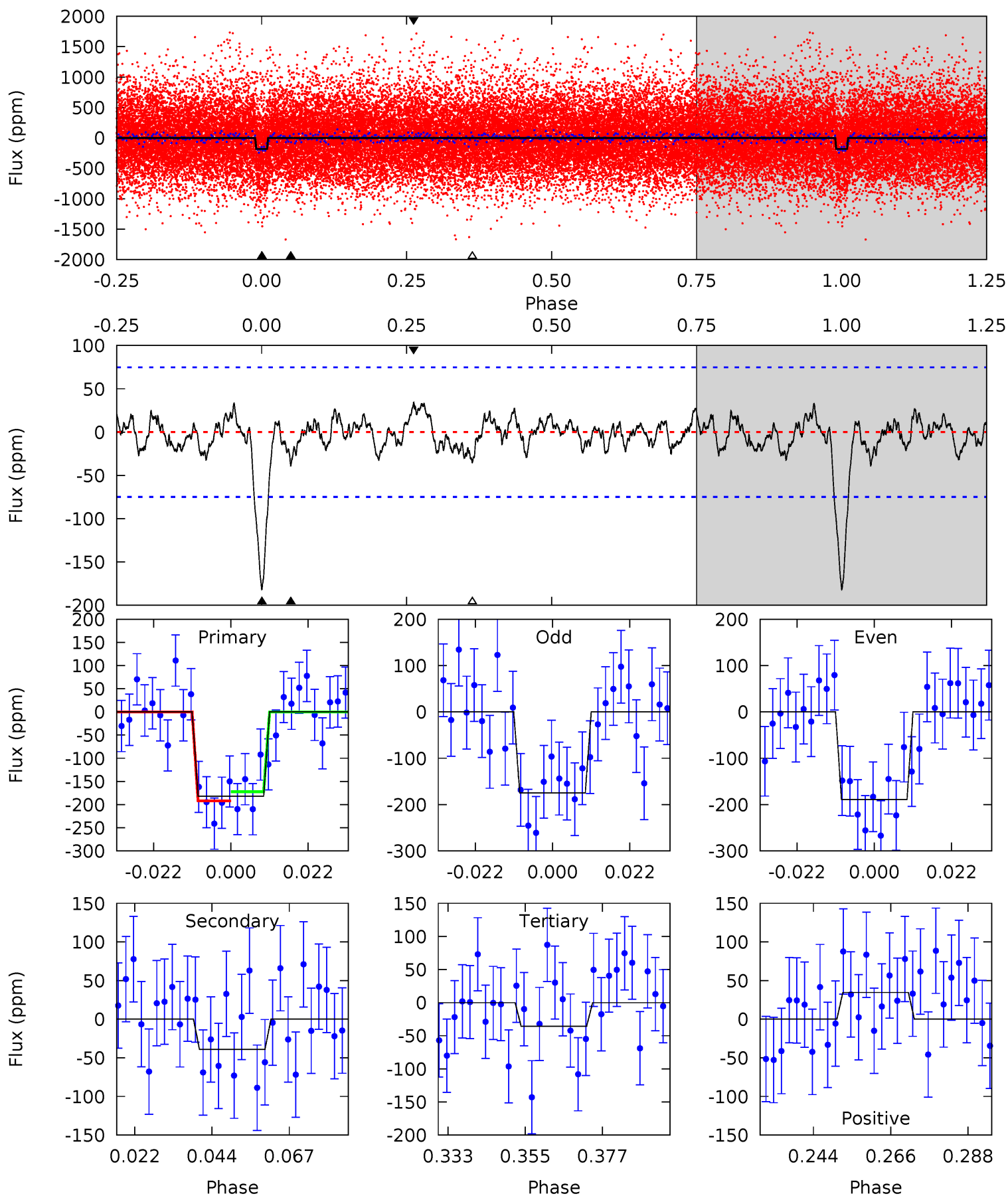
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.6 | 2.70 | 2.66 | 3.37 | 4.84 | 2.23 | 1.15 | 9.89 | 9.18 | 0.04 | -0.67 | 0.85 | 0.79 | 0.21 | 0.27 |



Alt Model-Shift Uniqueness Test

012016243-01, P = 11.843402 Days, E = 126.168379 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.8 | 2.54 | 2.32 | 2.25 | 4.87 | 2.29 | 0.91 | 9.51 | 9.59 | 0.22 | 0.30 | 0.46 | 0.98 | 0.16 | 0.63 |



Stellar Parameters For KIC 012016243

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6077^{+181}_{-217} | $4.471^{+0.056}_{-0.224}$ | $-0.040^{+0.250}_{-0.300}$ | $0.999^{+0.333}_{-0.111}$ | $1.077^{+0.145}_{-0.145}$ | $1.519^{+0.356}_{-0.871}$ |
| | +3%/-4% | +1%/-5% | +625%/-750% | +33%/-11% | +13%/-13% | +23%/-57% |
| 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 012016243-01 / KOI 7506.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|----------------------|-------------------|
| DV | -39 ± 14 | $1.68^{+0.65}_{-0.63}$ | 1189^{+90}_{-64} | 4196^{+930}_{-518} | 78^{+138}_{-44} |
| Alt. | -39 ± 15 | $1.54^{+0.63}_{-0.60}$ | 1190^{+88}_{-66} | 4326^{+949}_{-592} | 92^{+160}_{-53} |

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 $A_{\text{obs}} \gg 1.0$

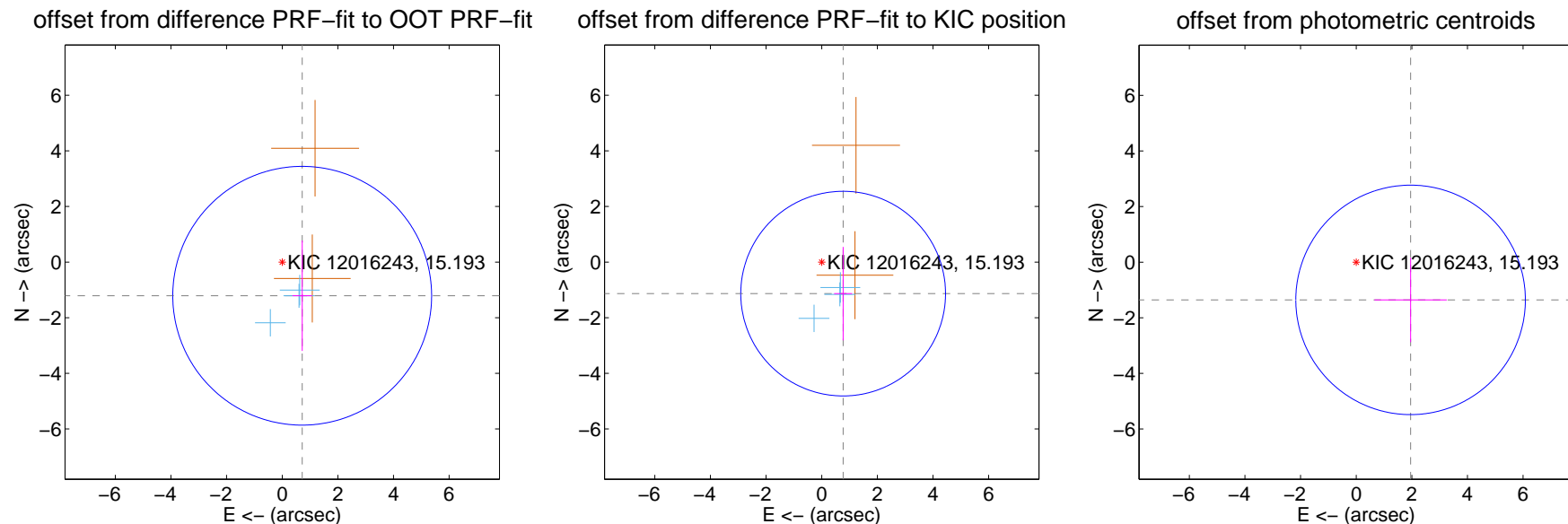
DV Centroid Data

Supplemental centroid analysis for 012016243-01. Kepler magnitude: 15.19. Transit SNR 9.91

There are 3 quarters with good PRF difference image offsets

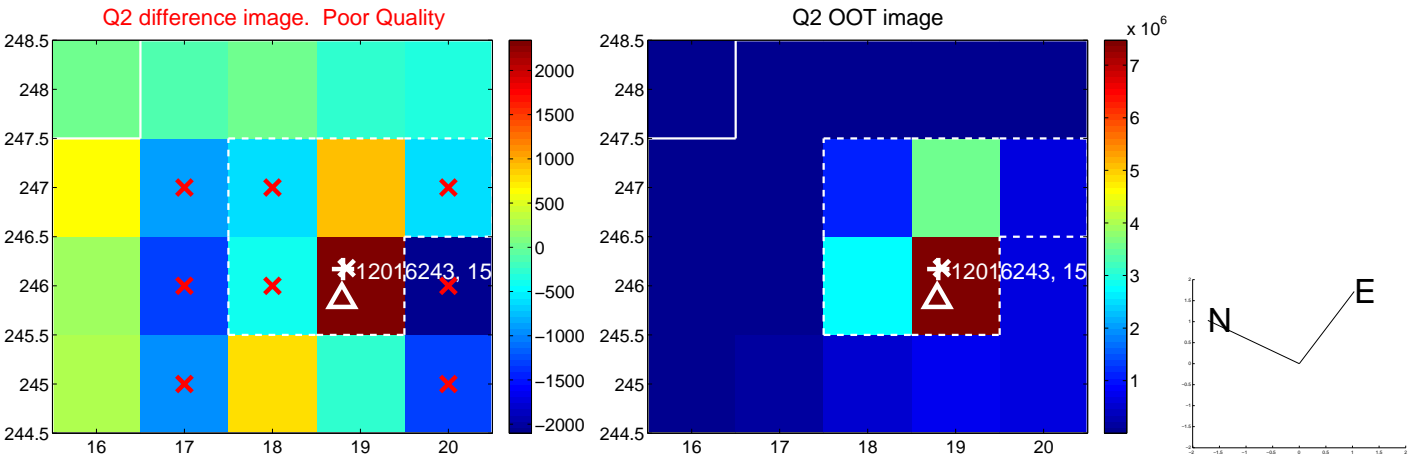
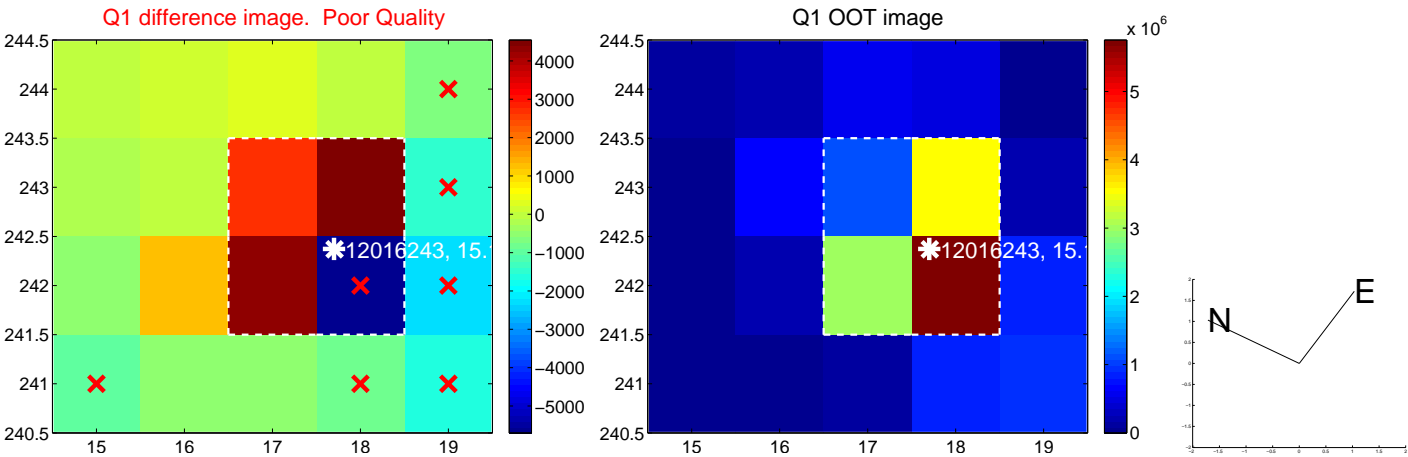
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.407 ± 1.551 | 0.91 | -0.718 ± 0.351 | -1.210 ± 1.986 |
| PRF-fit source offset from KIC position | 1.370 ± 1.227 | 1.12 | -0.770 ± 0.324 | -1.134 ± 1.679 |
| photometric centroid source offset | 2.38 ± 1.38 | 1.73 | -1.96 ± 1.30 | -1.36 ± 1.52 |

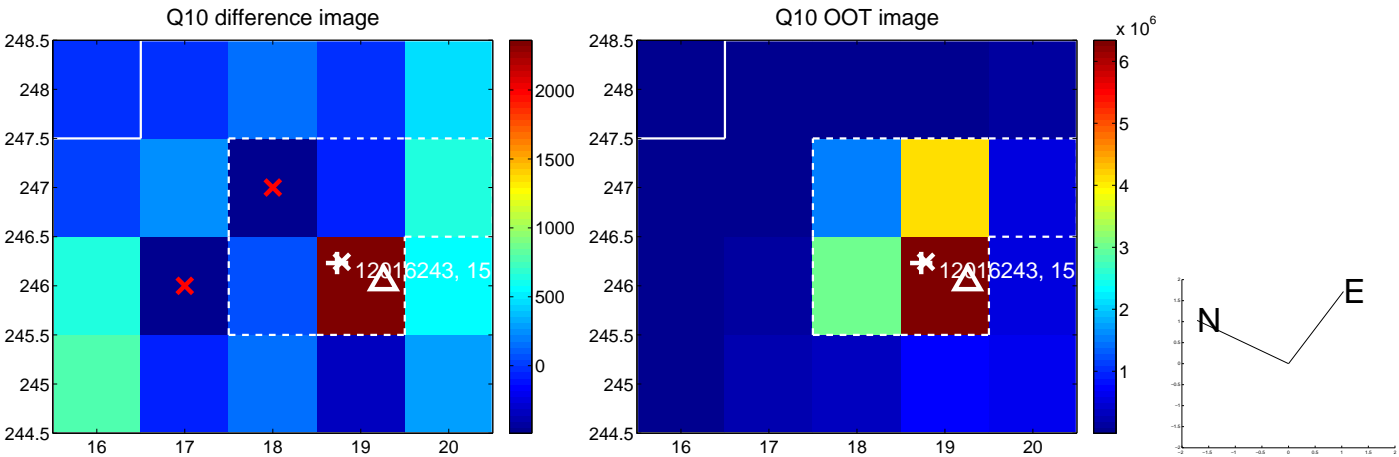
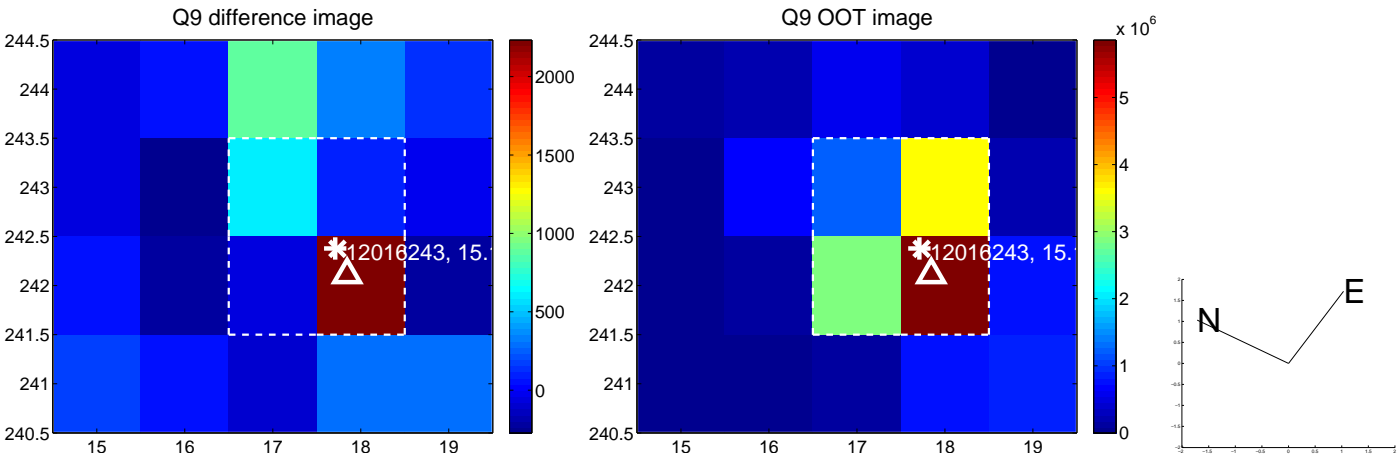


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

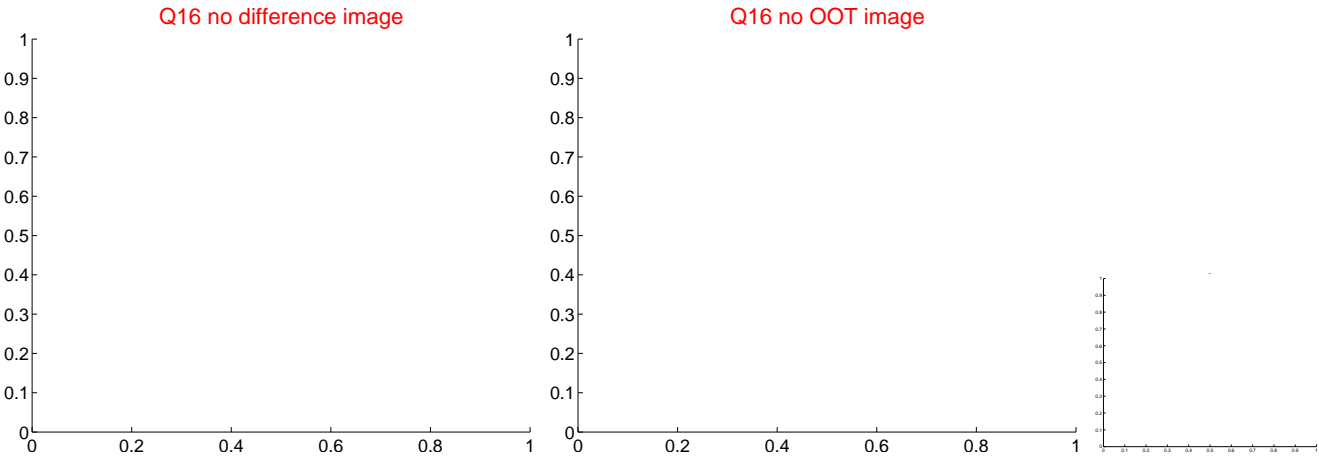
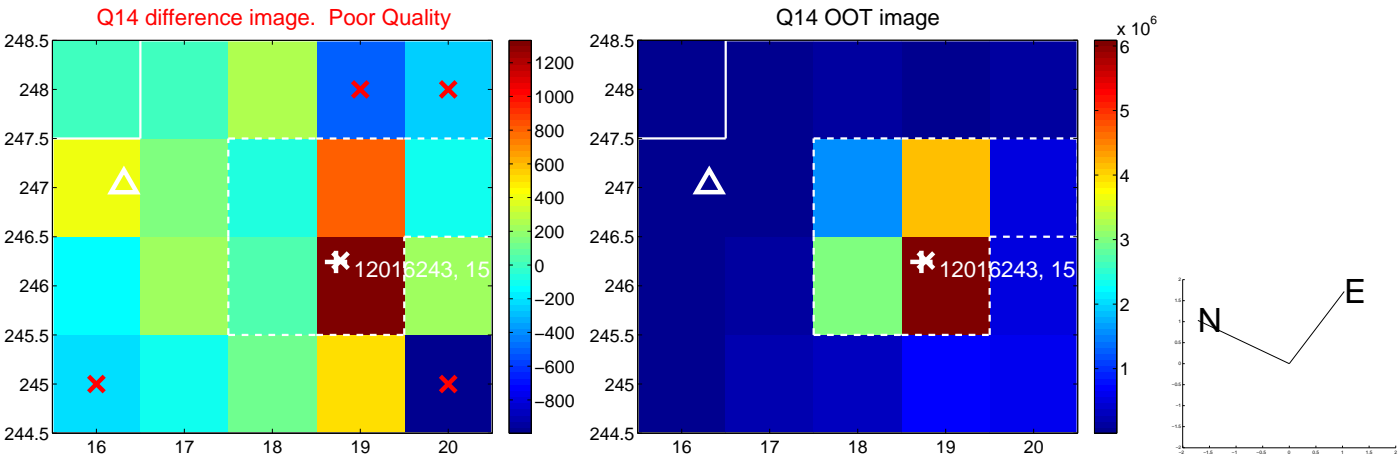
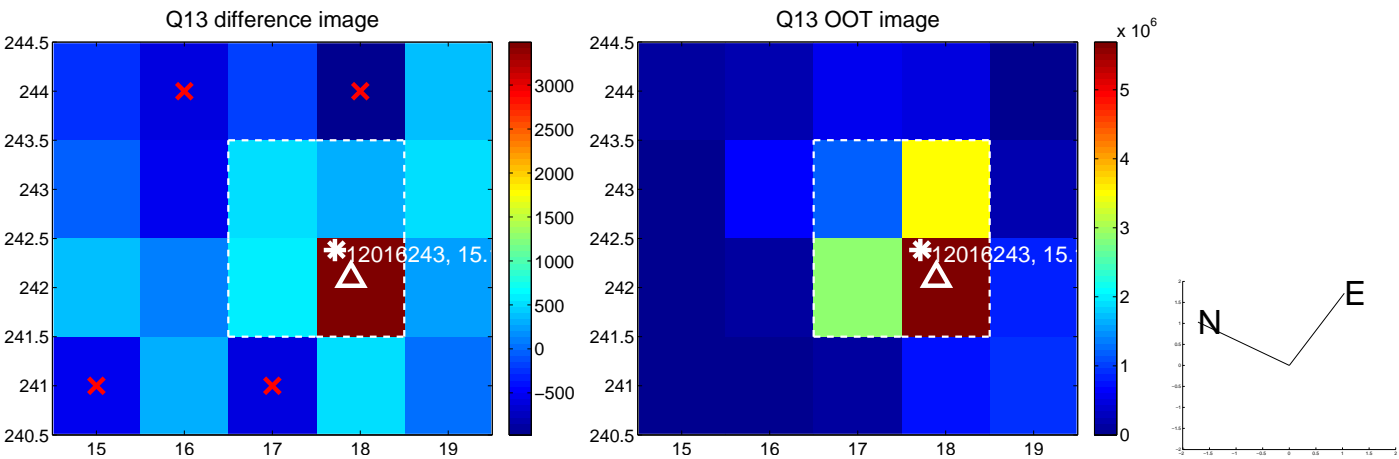
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



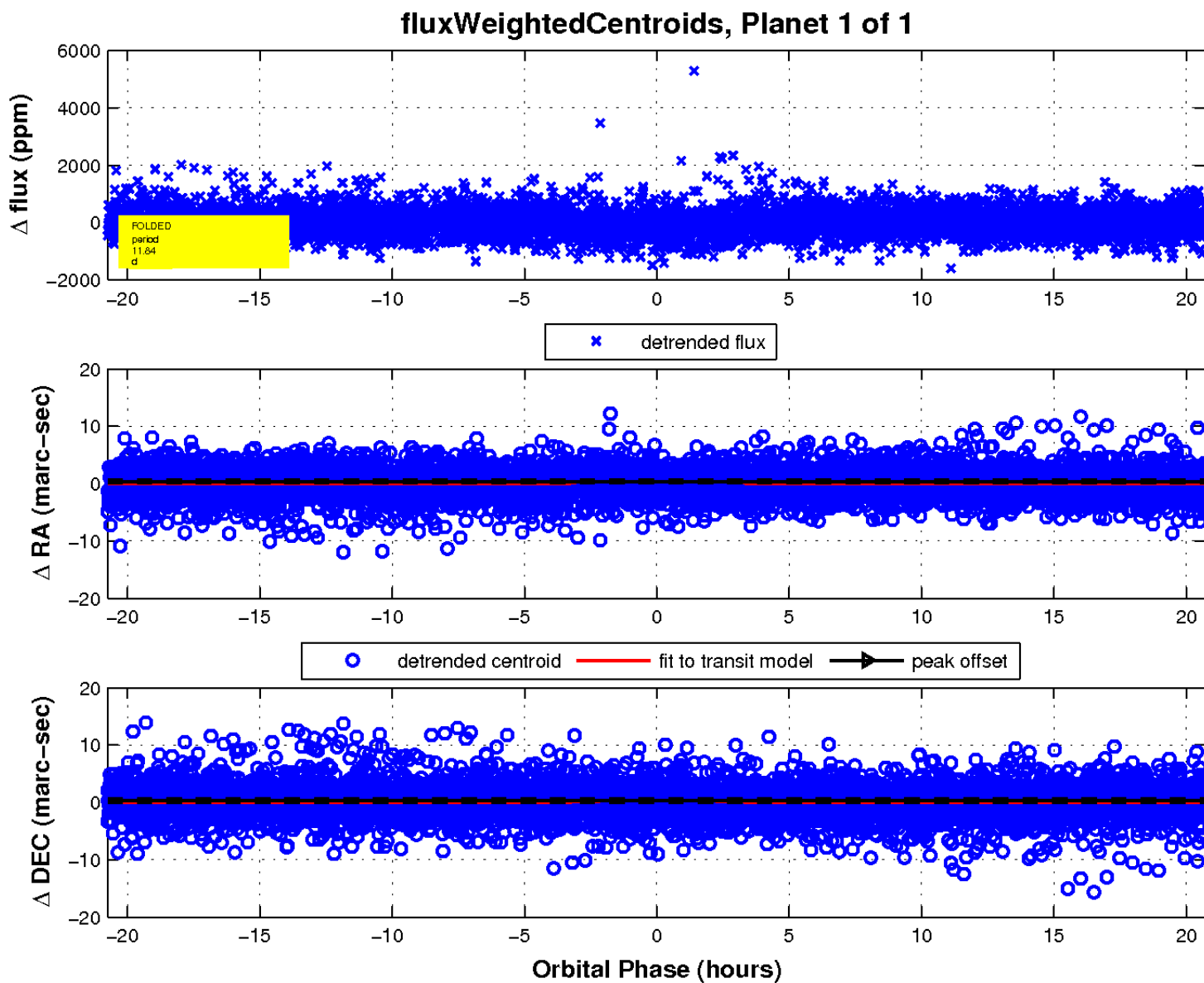
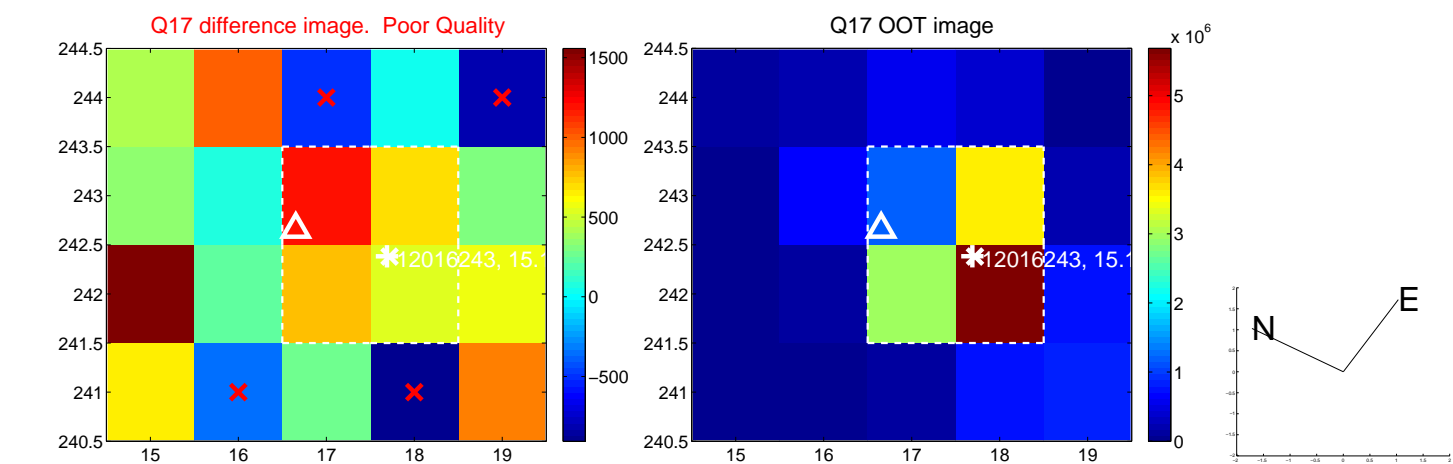
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

