

KIC 010860156

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 010860156-01 | OBS | No | 348.881926 | 181.863142 | 119.3 | 15.836 | 9.3 | 5.5 | 0.90 | 6225 | 1.10 | 1.29 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 010860156-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

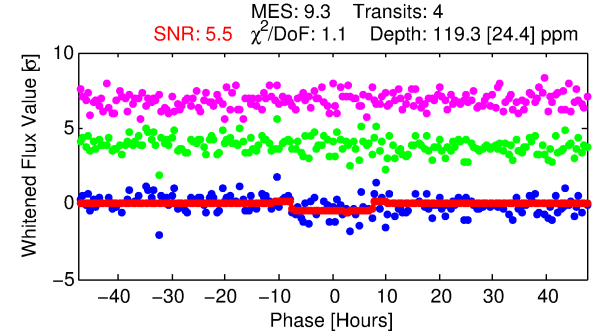
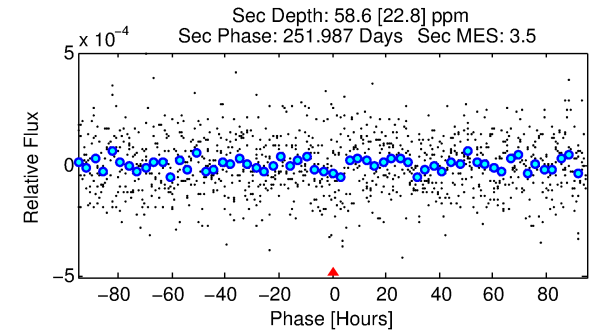
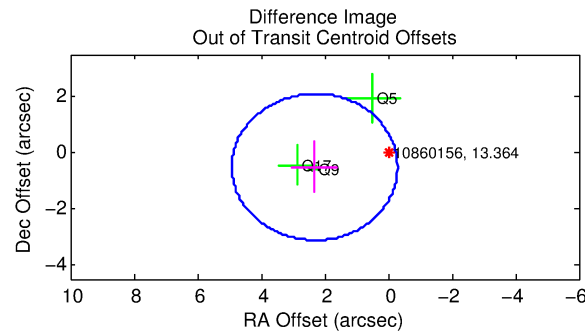
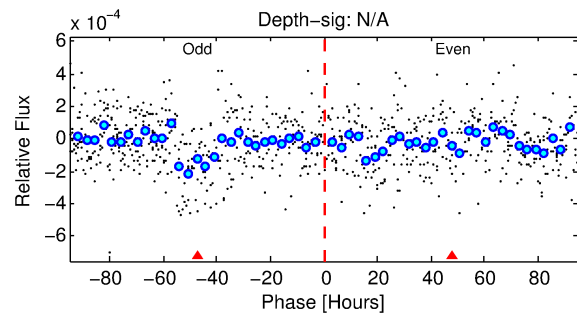
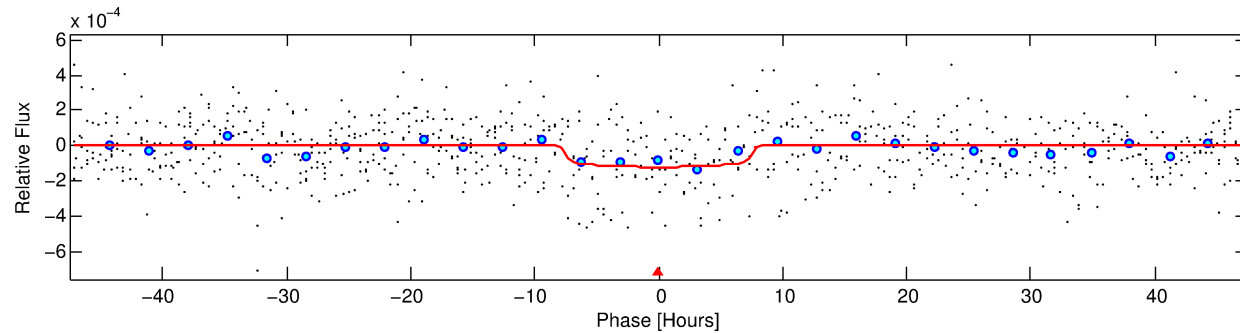
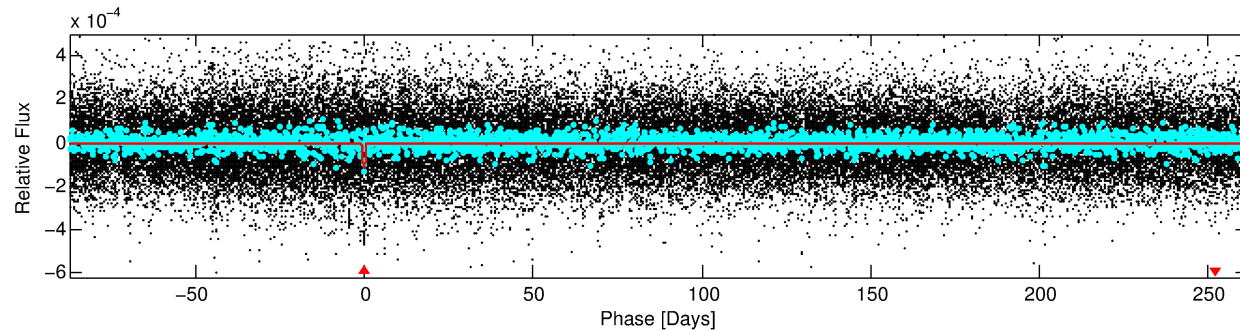
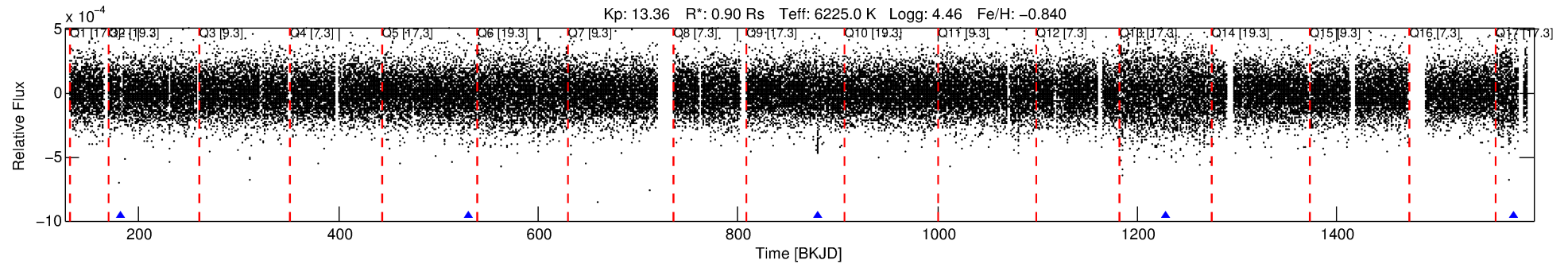
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010860156-01

No Significant Match Found

DV One-Page Summary

KIC: 10860156 Candidate: 1 of 1 Period: 348.882 d



DV Fit Results:

Period = 348.88193 [0.01815] d
Epoch = 181.8631 [0.0469] BKJD
Rp/R* = 0.0113 [0.0029]
a/R* = 94.63 [125.29]
b = 0.84 [0.46]
Seff = 1.29 [0.34]
Teq = 272 [18] K
Rp = 1.11 [0.34] Re
a = 0.9176 [0.1400] AU
Ag = 22211.22 [15336.90] [1.45 σ]
Teffp = 5134 [849] K [5.73 σ]

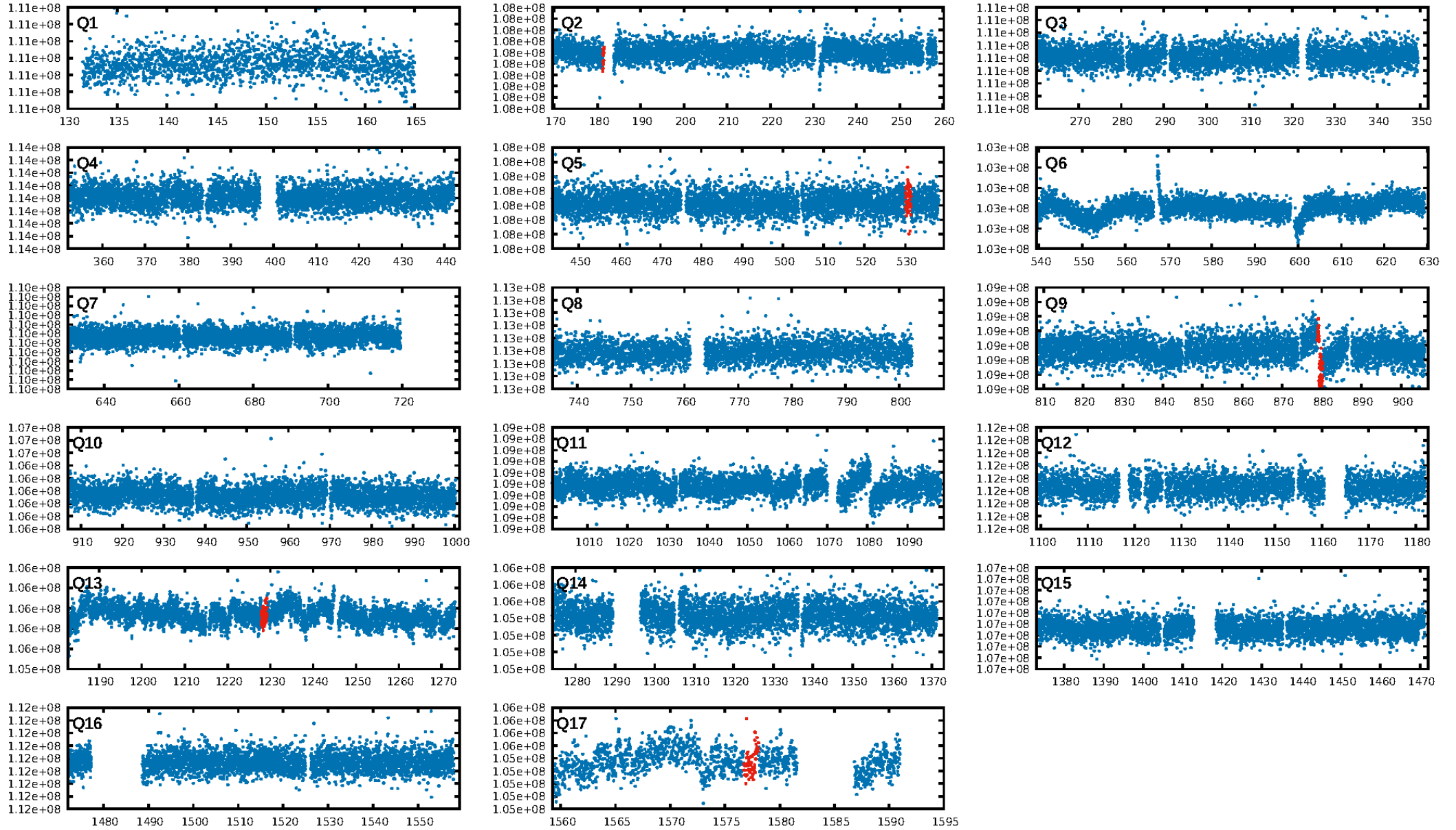
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 68.1%
Bootstrap-pfa: 5.71e-21
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.6785
Centroid-sig: 8.5%
Centroid-so: 2.027 arcsec [1.52 σ]
OotOffset-rm: 2.366 arcsec [2.72 σ]
KicOffset-rm: 2.288 arcsec [3.91 σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

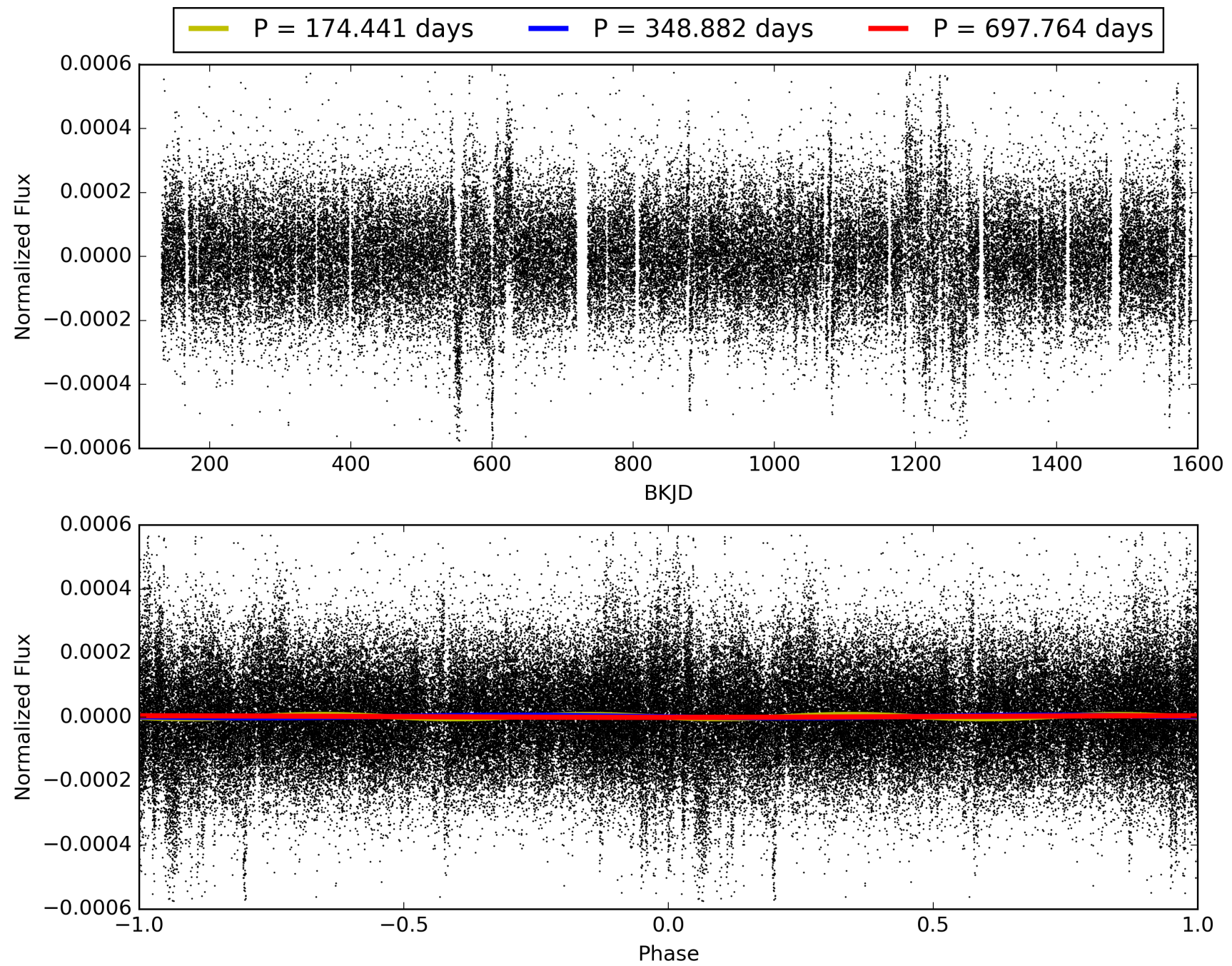
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:00:46 Z

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

TCE 010860156-01, PDC Light Curves

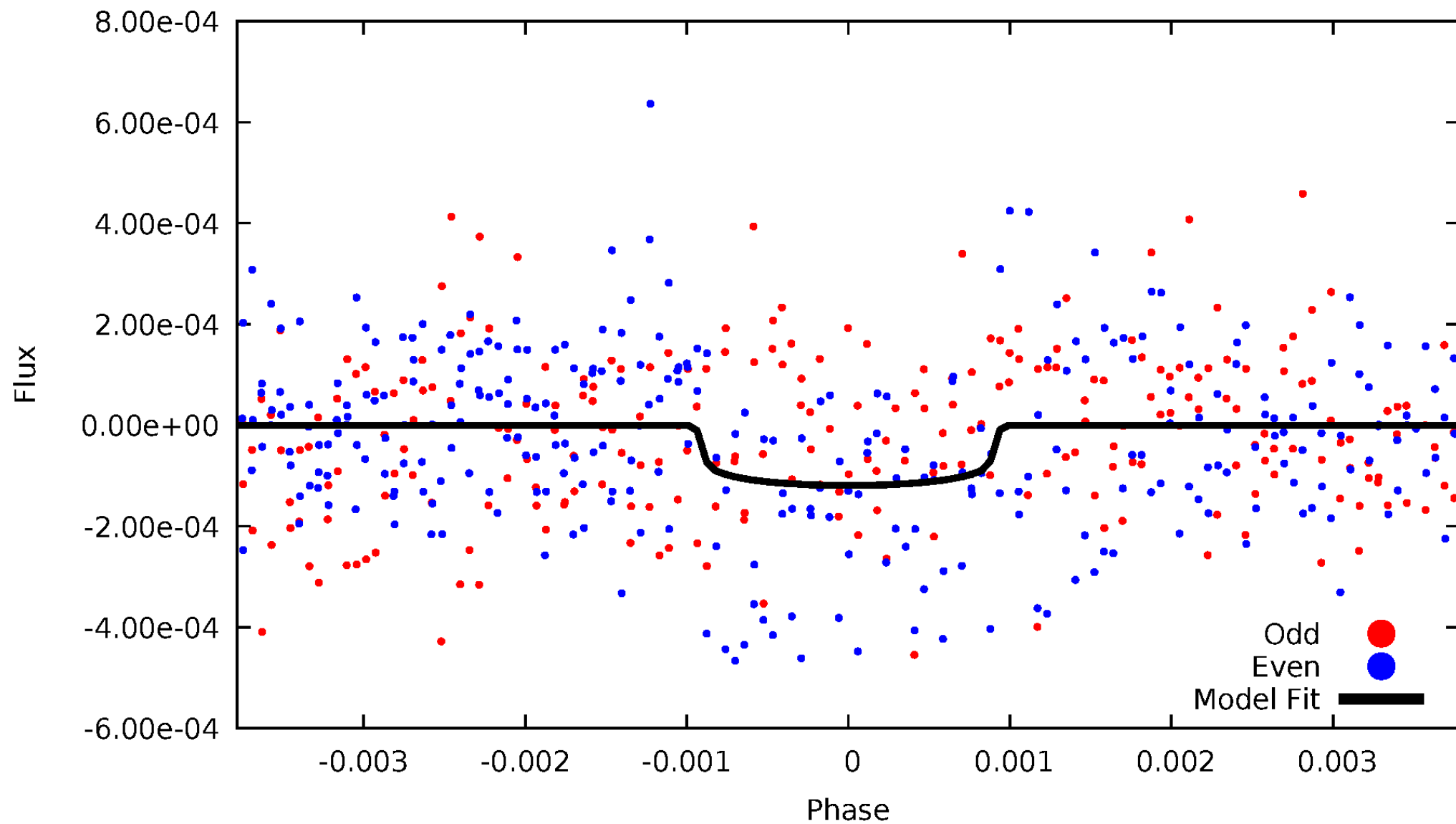


TCE 010860156-01



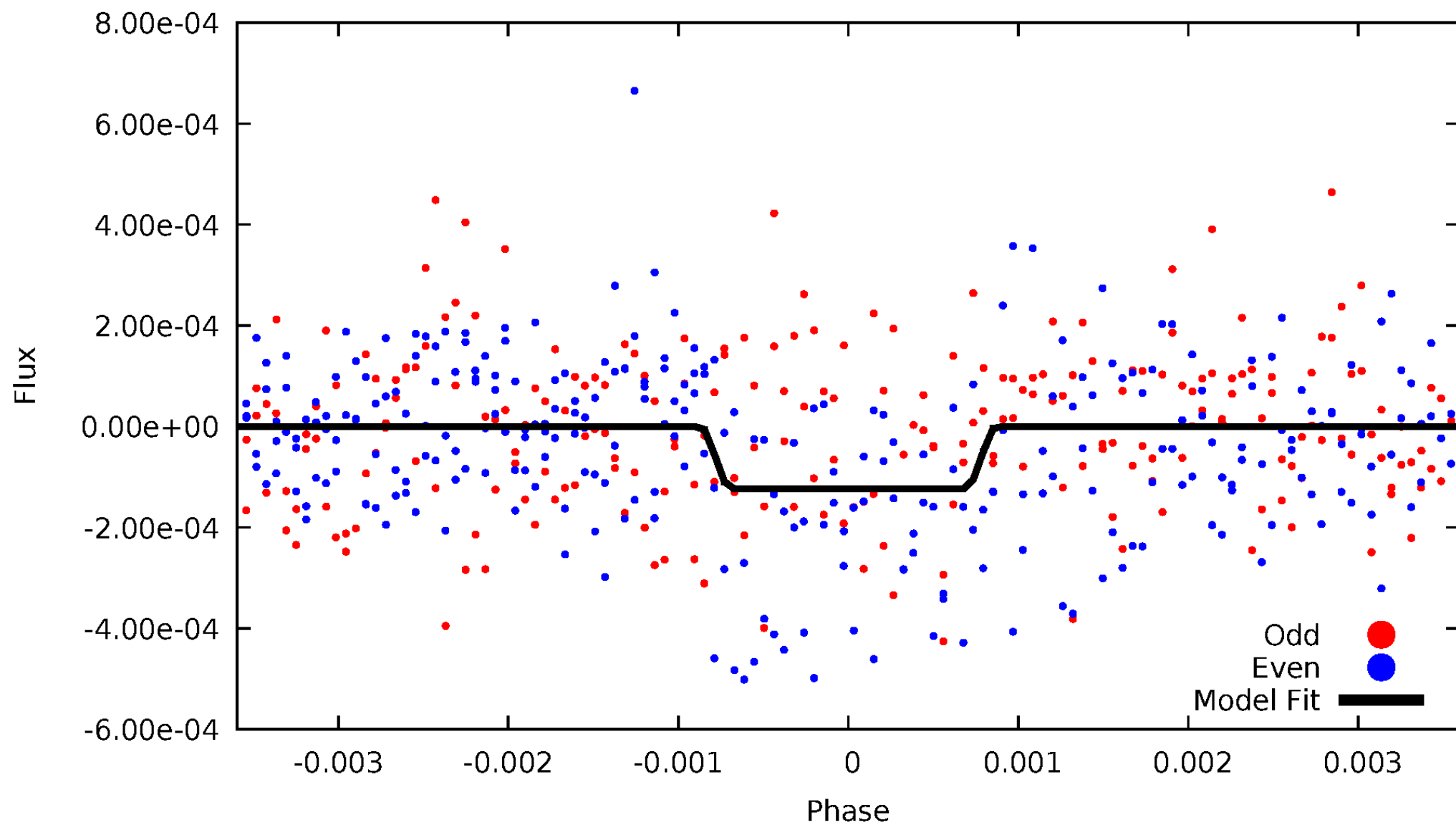
DV Odd/Even

TCE 010860156-01



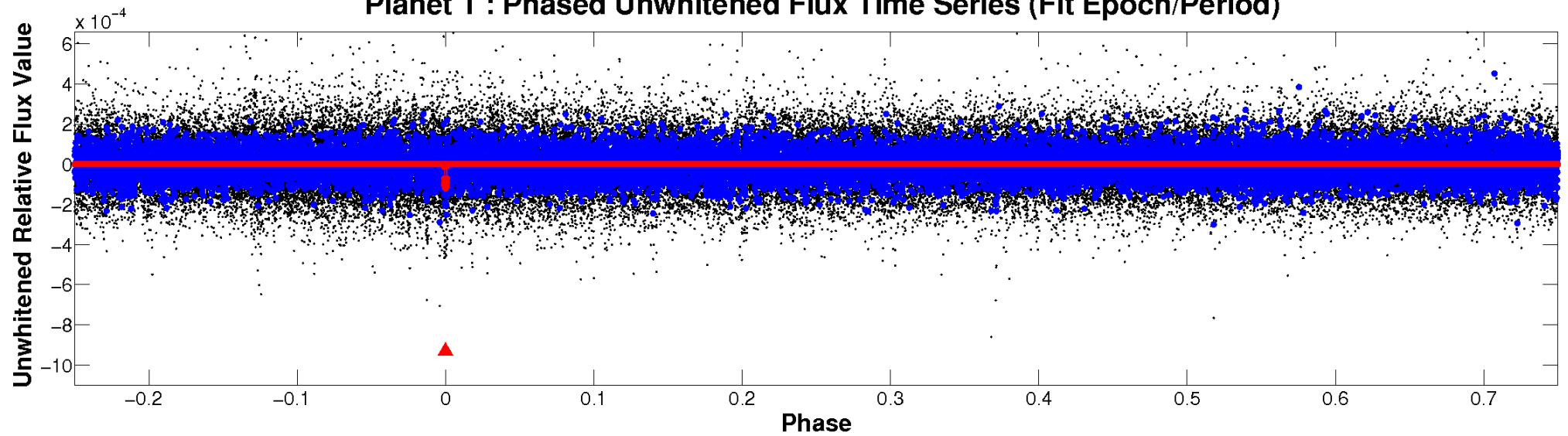
ALT Odd/Even

TCE 010860156-01

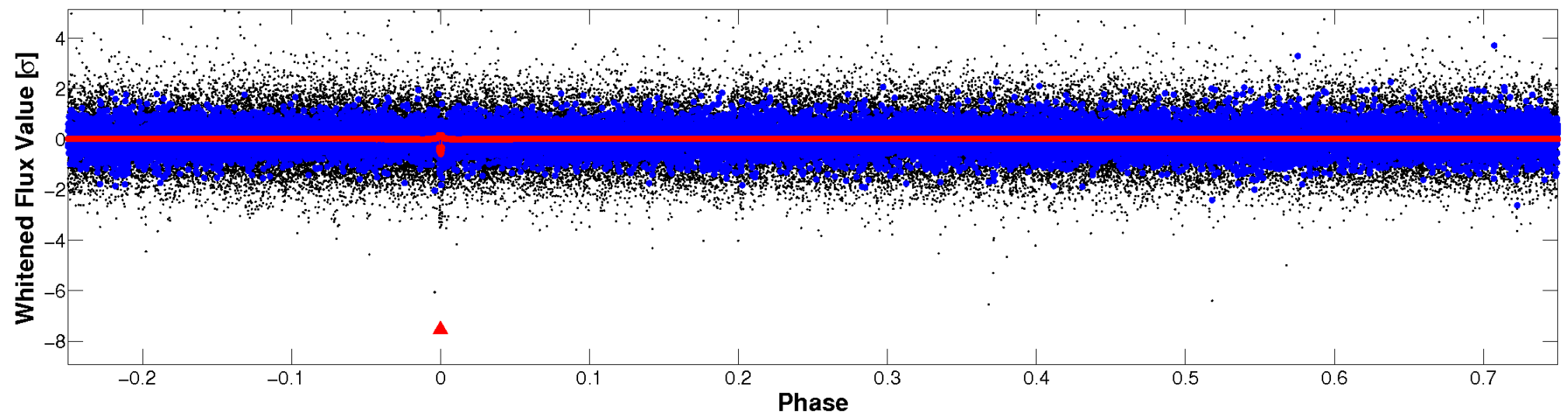


Non-Whitened Vs. Whitened Light Curve

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

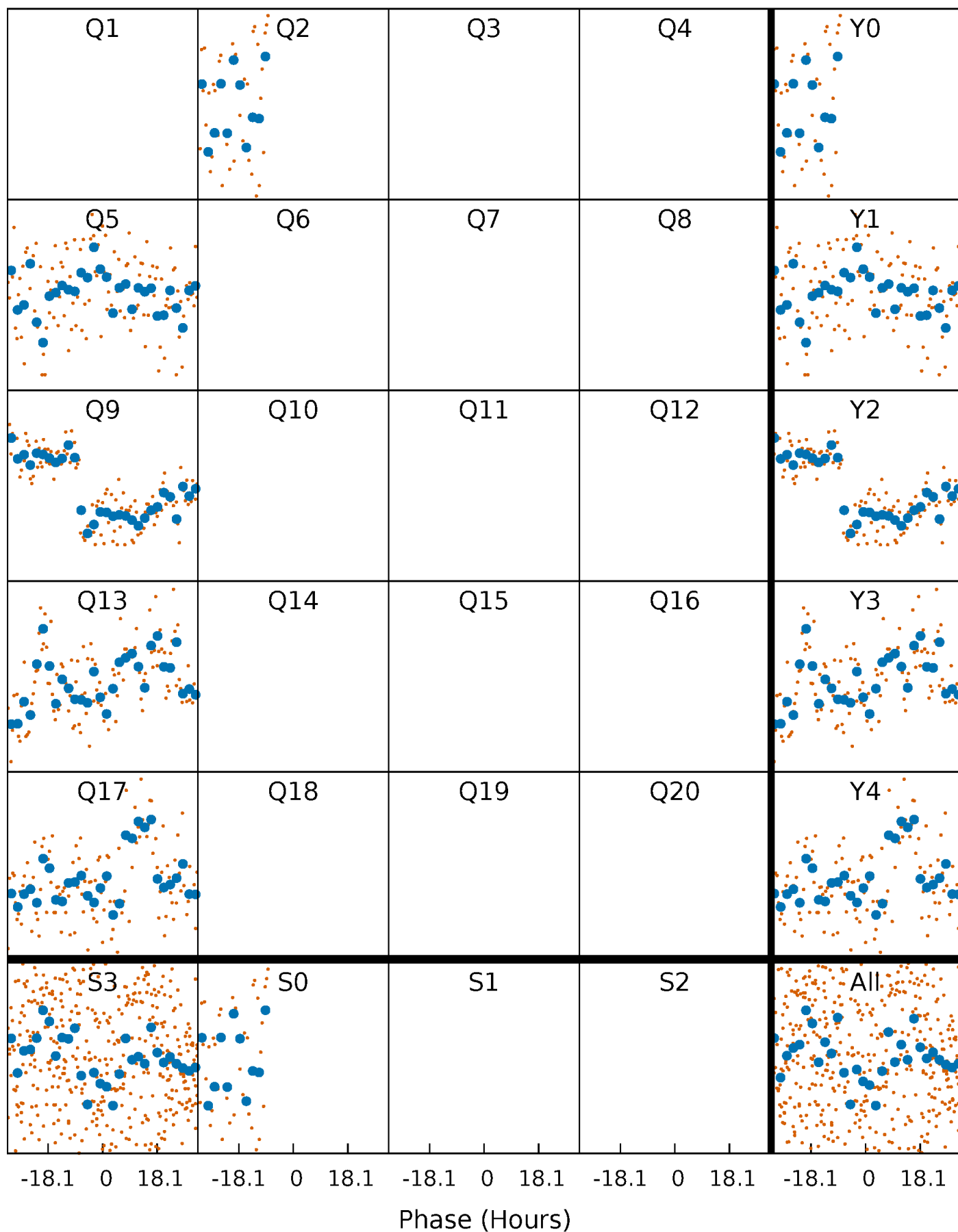


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



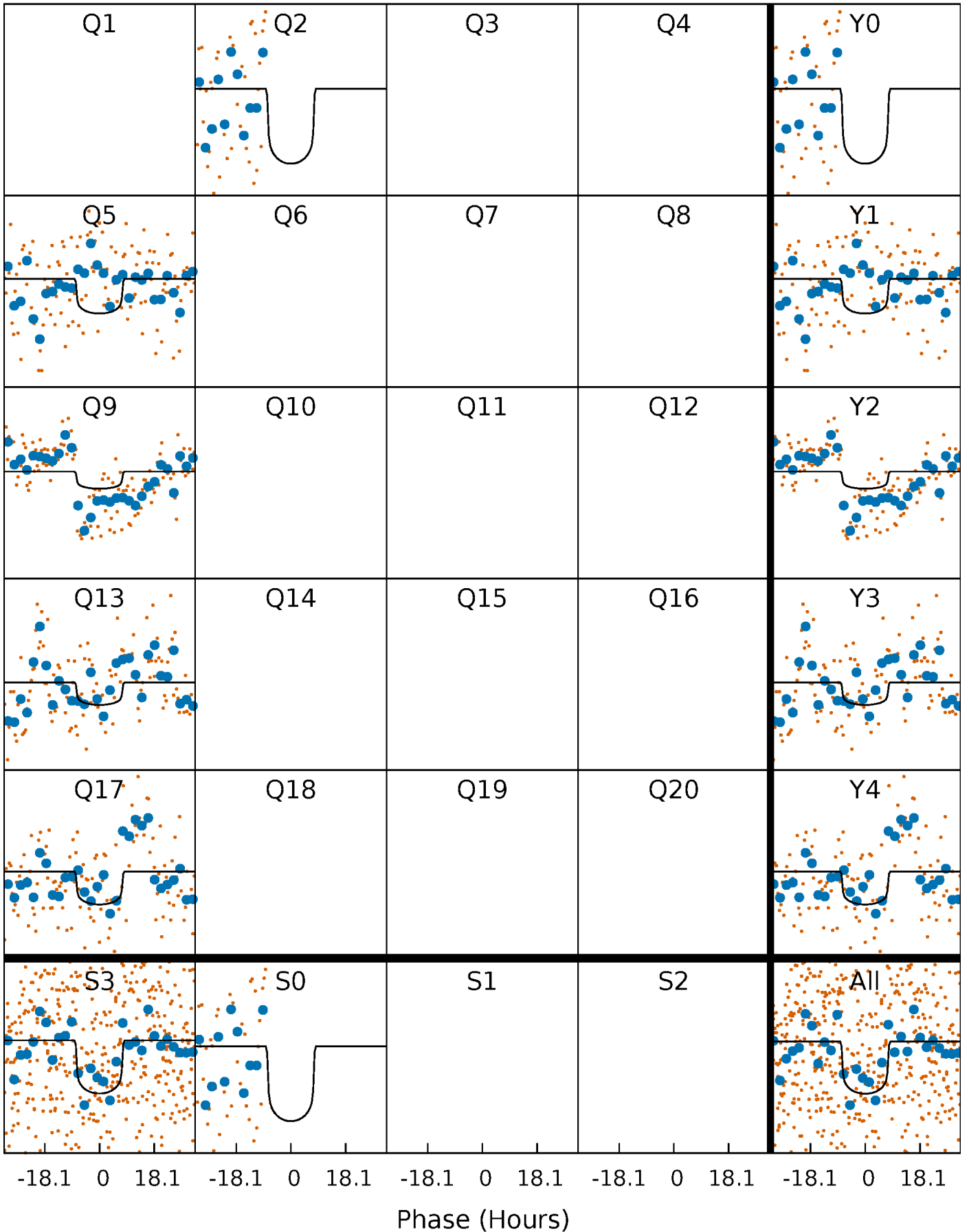
PDC Quarter-Phased Transit Curves

TCE 010860156-01 P=348.881926 Days $T_0=181.863142$ (BKJD)



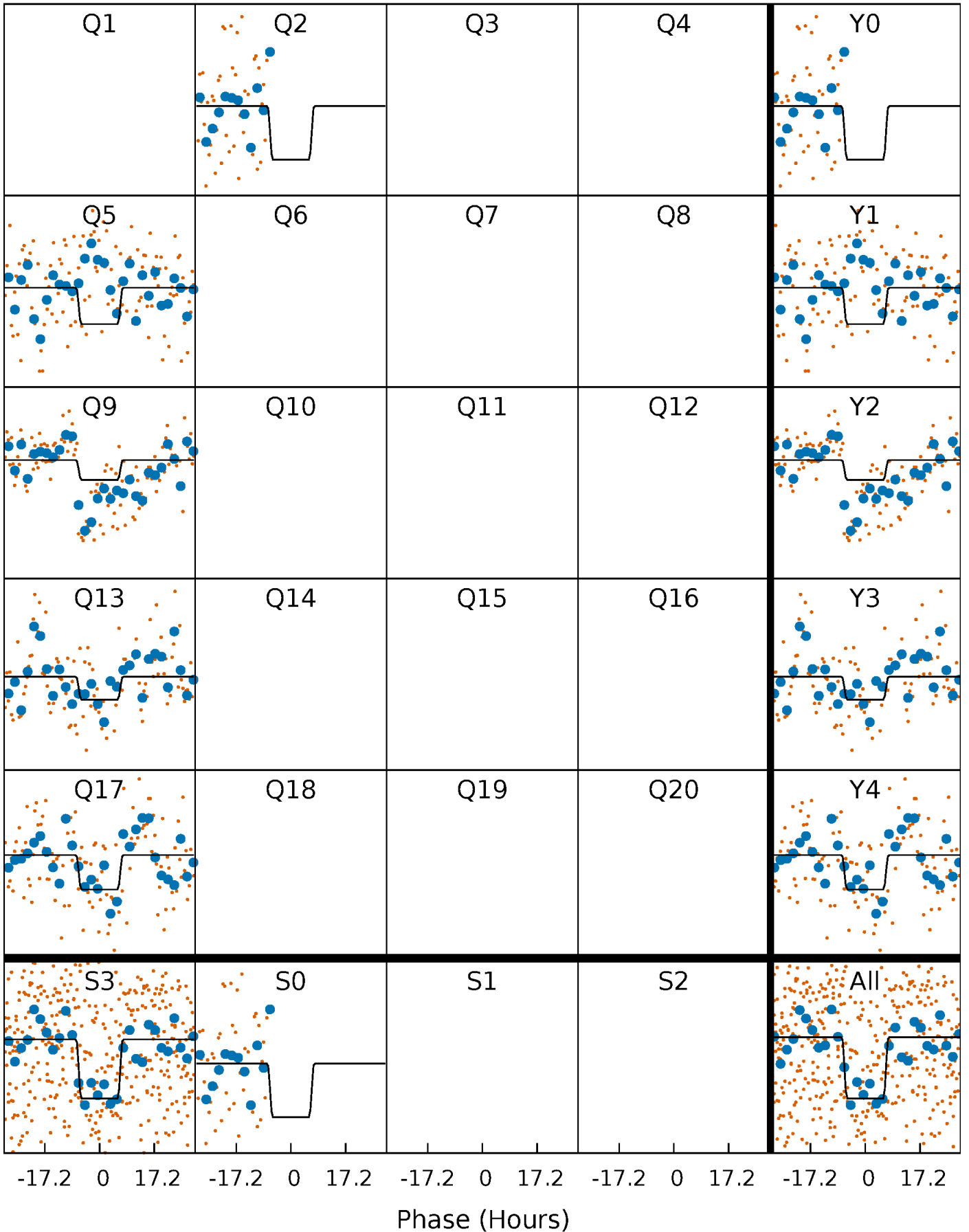
DV Quarter-Phased Transit Curves

TCE 010860156-01 P=348.881926 Days $T_0=181.863142$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

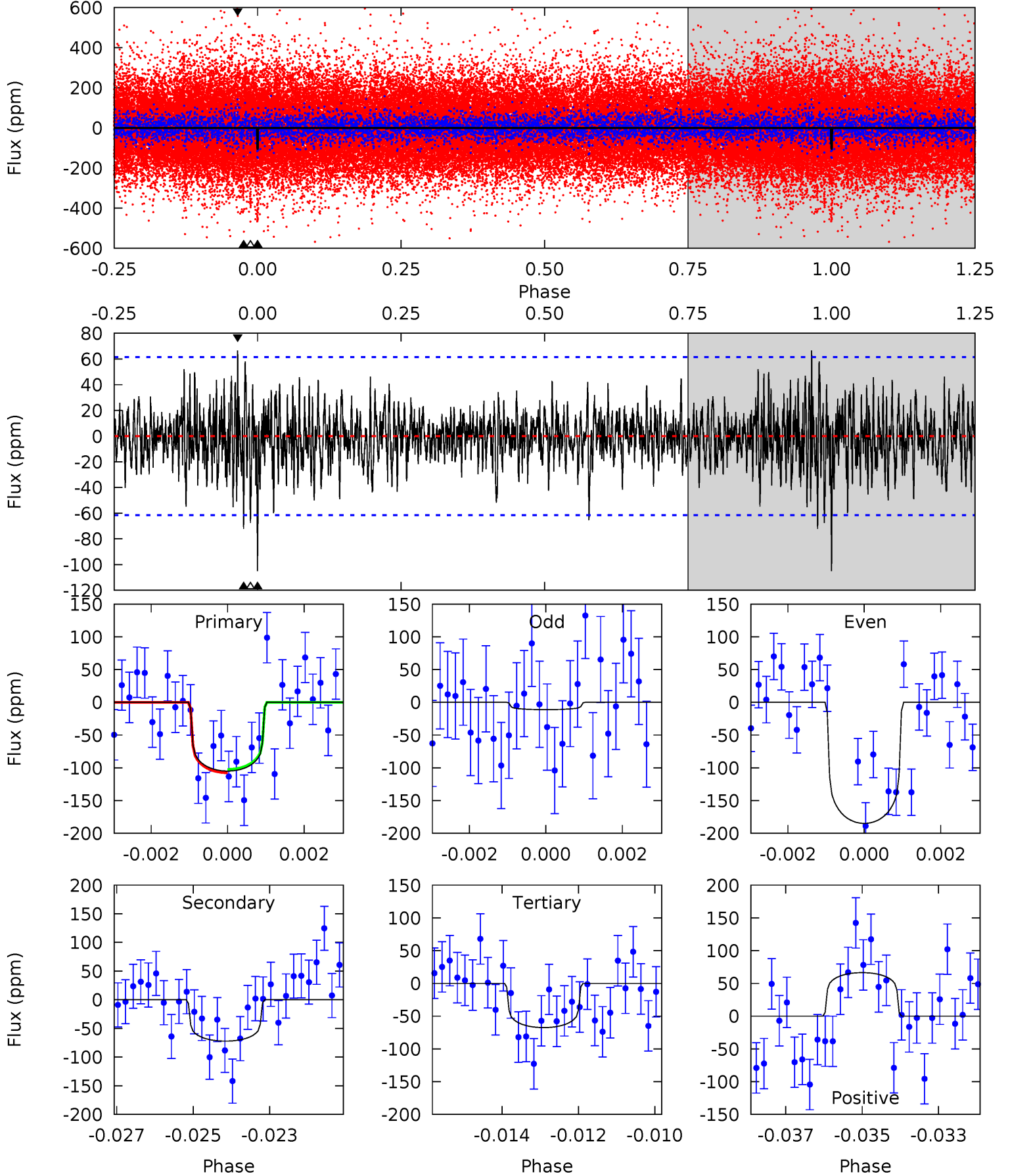
TCE 010860156-01 P=348.903037 Days $T_0=181.789528$ (BKJD)



DV Model-Shift Uniqueness Test

010860156-01, $P = 348.881926$ Days, $E = 181.863142$ Days

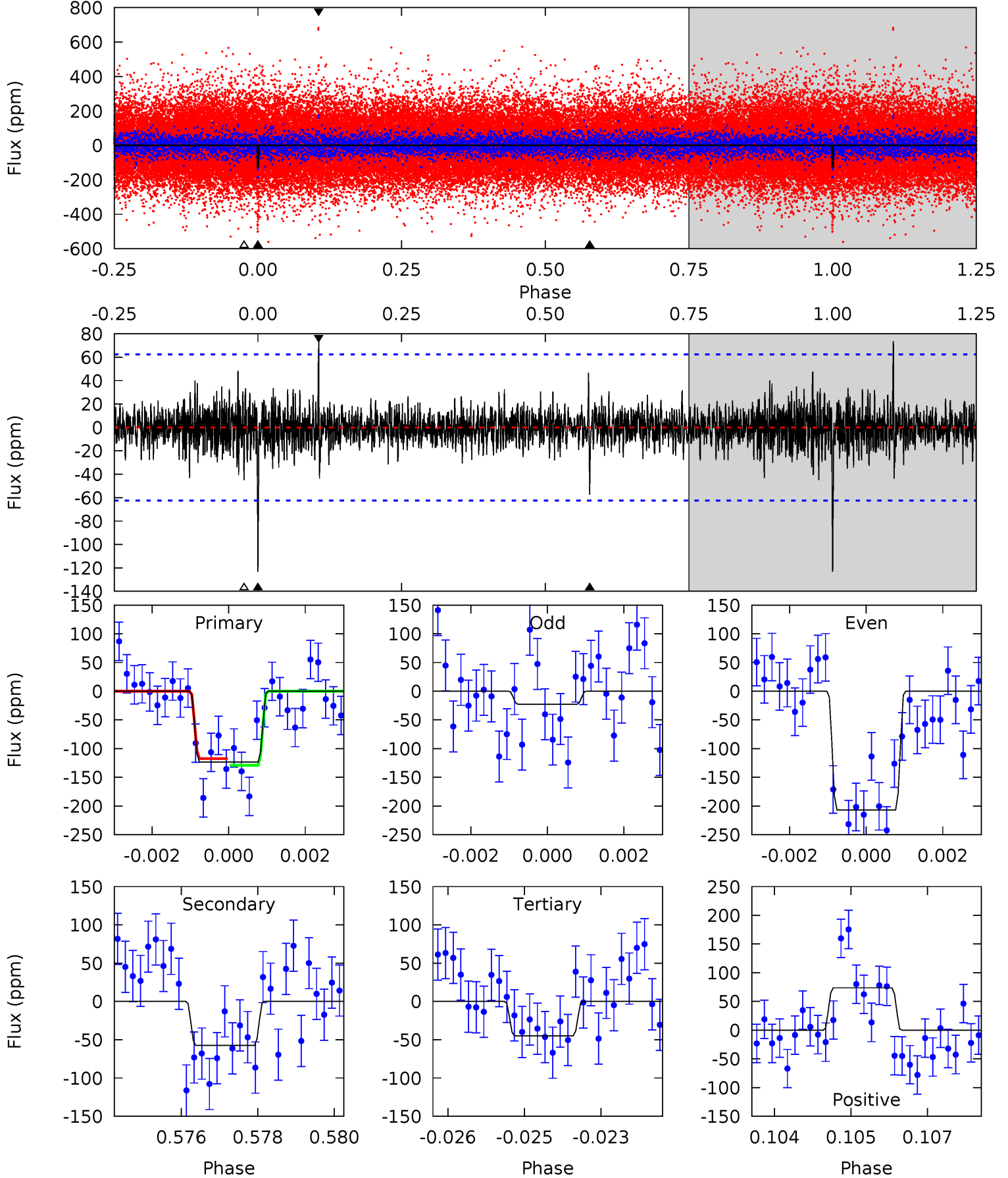
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.11 | 6.26 | 5.86 | 5.76 | 5.33 | 3.10 | 1.45 | 3.25 | 3.34 | 0.40 | 0.50 | 7.57 | 1.52 | 0.39 | 0.21 |



Alt Model-Shift Uniqueness Test

010860156-01, P = 348.903037 Days, E = 181.789528 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.6 | 4.93 | 3.86 | 6.32 | 5.35 | 3.13 | 0.95 | 6.71 | 4.24 | 1.07 | -1.40 | 7.94 | 0.28 | 0.37 | 0.50 |



Stellar Parameters For KIC 010860156

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6225^{+169}_{-188} | $4.457^{+0.099}_{-0.132}$ | $-0.840^{+0.300}_{-0.300}$ | $0.900^{+0.154}_{-0.103}$ | $0.845^{+0.081}_{-0.067}$ | $1.635^{+0.608}_{-0.620}$ |
| | +3%/-3% | +2%/-3% | +36%/-36% | +17%/-11% | +10%/-8% | +37%/-38% |
| Source | PHO1 | FLK73 | 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 010860156-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|--------------|------------------------|----------------------|----------------------|---------------------------|
| DV | -72 ± 12 | $1.11^{+0.32}_{-0.31}$ | 381^{+21}_{-18} | 5456^{+904}_{-597} | 27430^{+25652}_{-11596} |
| Alt. | -57 ± 12 | $1.10^{+0.30}_{-0.29}$ | 380^{+18}_{-18} | 5188^{+778}_{-535} | 21827^{+18998}_{-8801} |

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

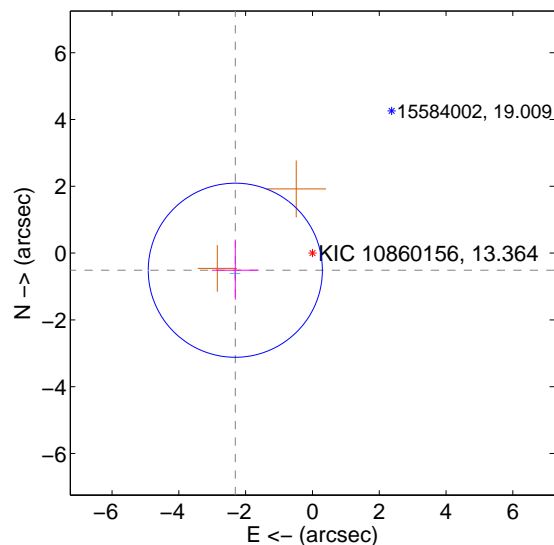
Supplemental centroid analysis for 010860156-01. Kepler magnitude: 13.36. Transit SNR 5.49

There are 1 quarters with good PRF difference image offsets

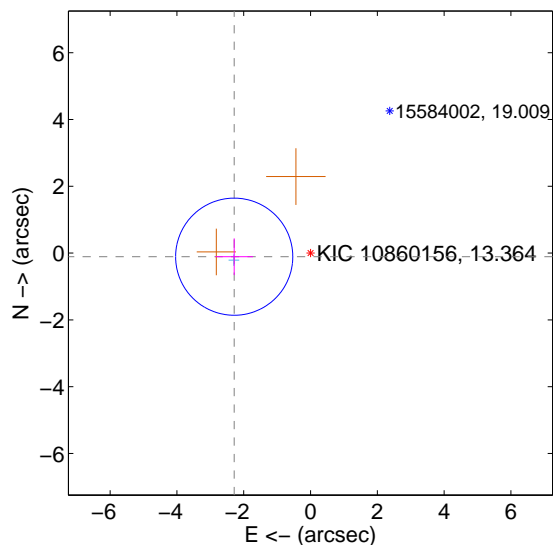
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 2.366 ± 0.869 | 2.72 | 2.310 ± 0.699 | -0.513 ± 0.881 |
| PRF-fit source offset from KIC position | 2.288 ± 0.585 | 3.91 | 2.286 ± 0.561 | -0.108 ± 0.549 |
| photometric centroid source offset | 2.03 ± 1.34 | 1.52 | 1.89 ± 1.30 | -0.73 ± 1.55 |

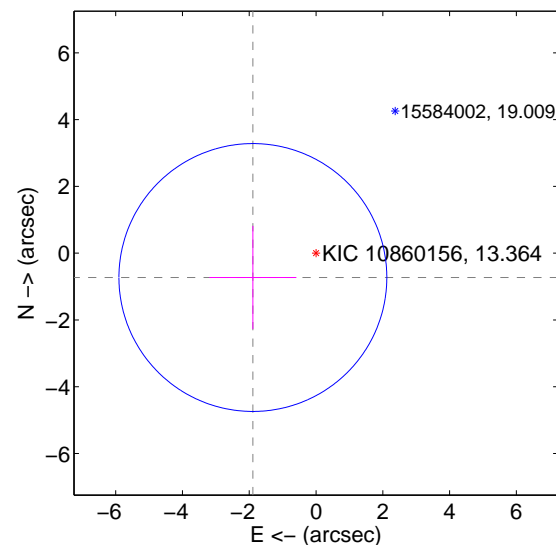
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

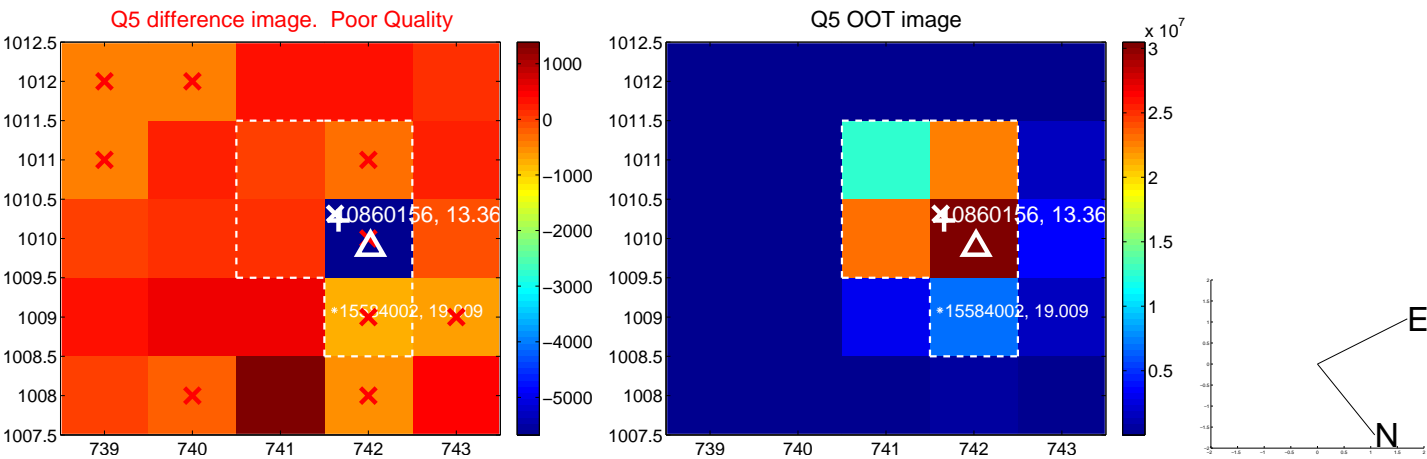


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



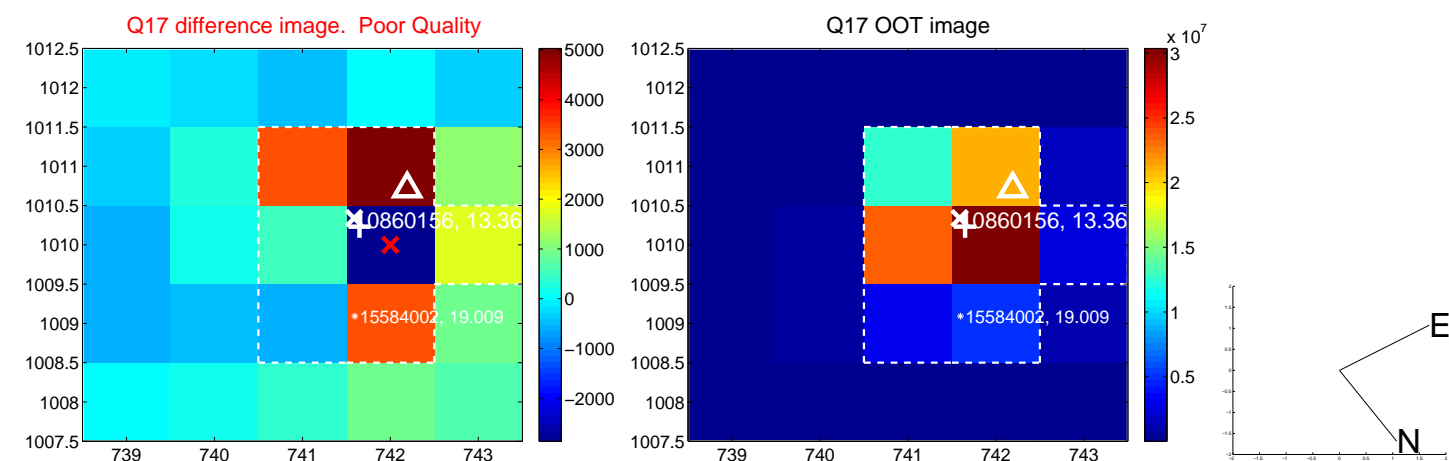
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



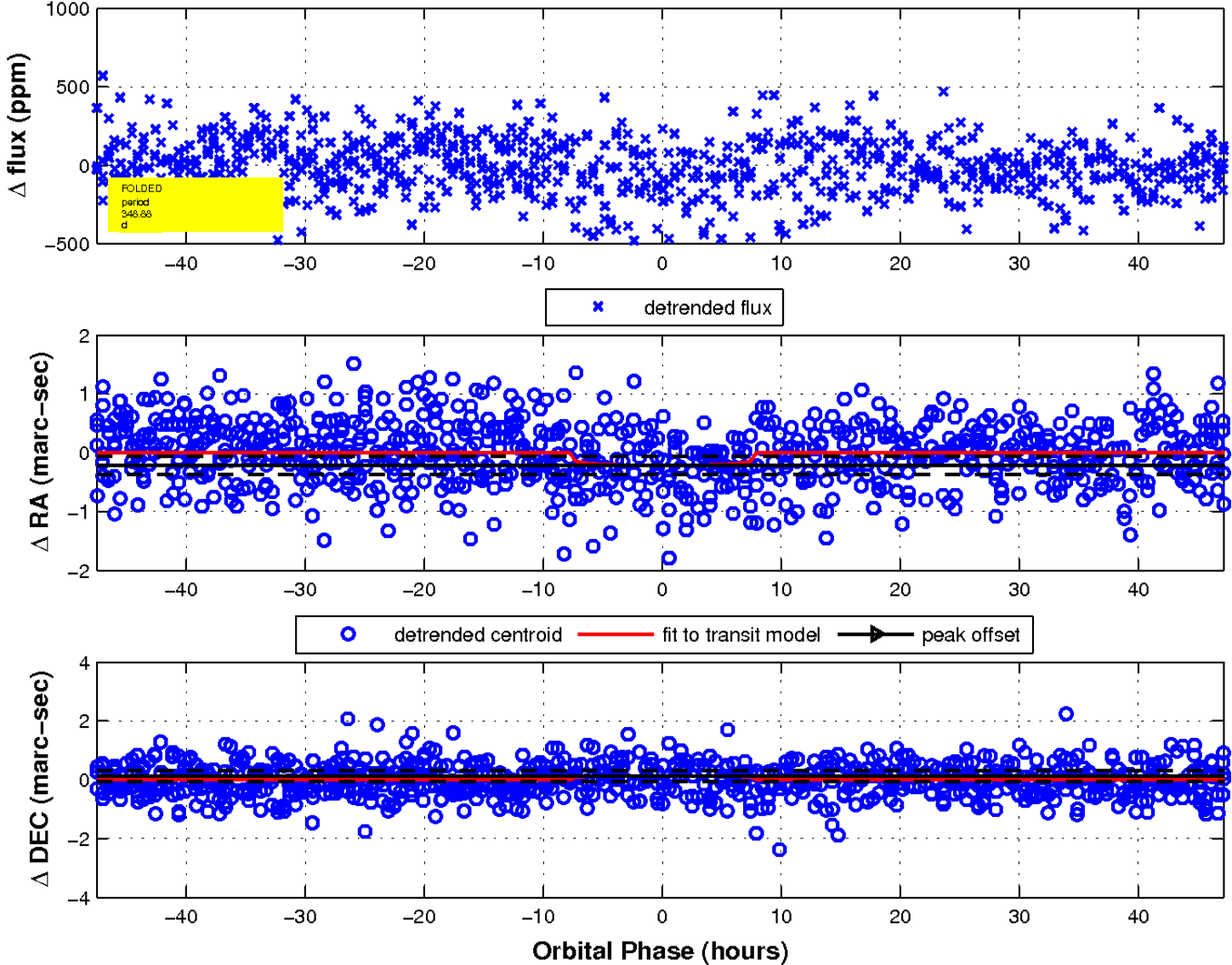
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

