

KIC 008228624

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008228624-01 | OBS | No | 374.161086 | 259.685019 | 535.3 | 35.403 | 7.8 | 8.4 | 0.95 | 6117 | 2.75 | 1.07 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 008228624-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 1 | INDIV_TRANS_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS—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.

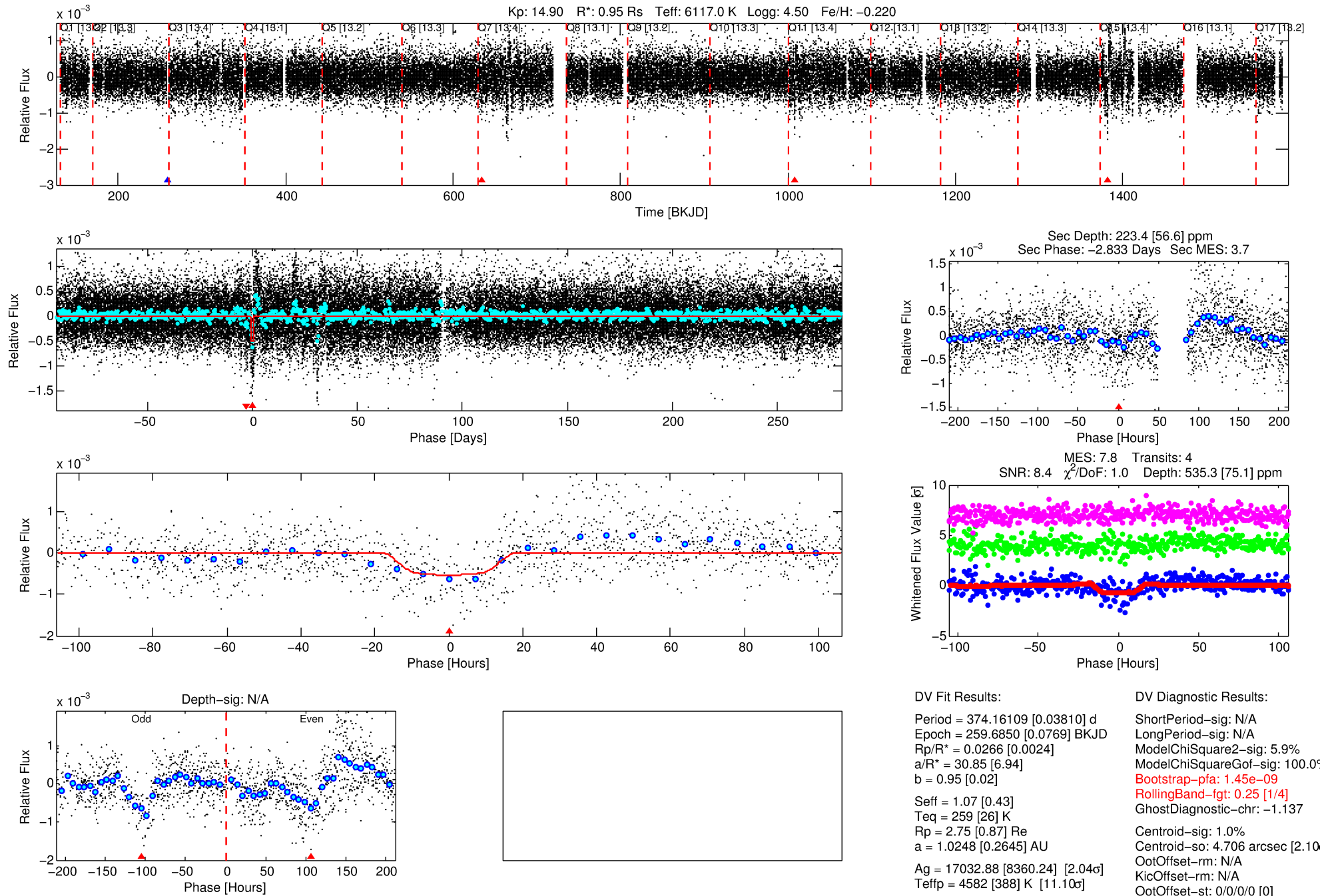
Ephemeris Match Information For 008228624-01

| 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 |
|--------------|---------|--------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|------------|------|------------|------------|
| 008228624-01 | 8228624 | 008228620-01 | 8228620 | 1:1 | 63.6 | -8 | -14 | 14.89 | 14.89 | 2.13 | Direct-PRF | 1 | 1.49 | 1.21 |

Notes: $P_1:P_2$ 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. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 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: 8228624 Candidate: 1 of 1 Period: 374.161 d



DV Fit Results:

Period = 374.16109 [0.03810] d
 Epoch = 259.6850 [0.0769] BKJD
 Rp/R* = 0.0266 [0.0024]
 a/R* = 30.85 [6.94]
 b = 0.95 [0.02]
 Seff = 1.07 [0.43]
 Teq = 259 [26] K
 Rp = 2.75 [0.87] Re
 a = 1.0248 [0.2645] AU
 Ag = 17032.88 [8360.24] [2.04σ]
 Tefp = 4582 [388] K [11.10σ]

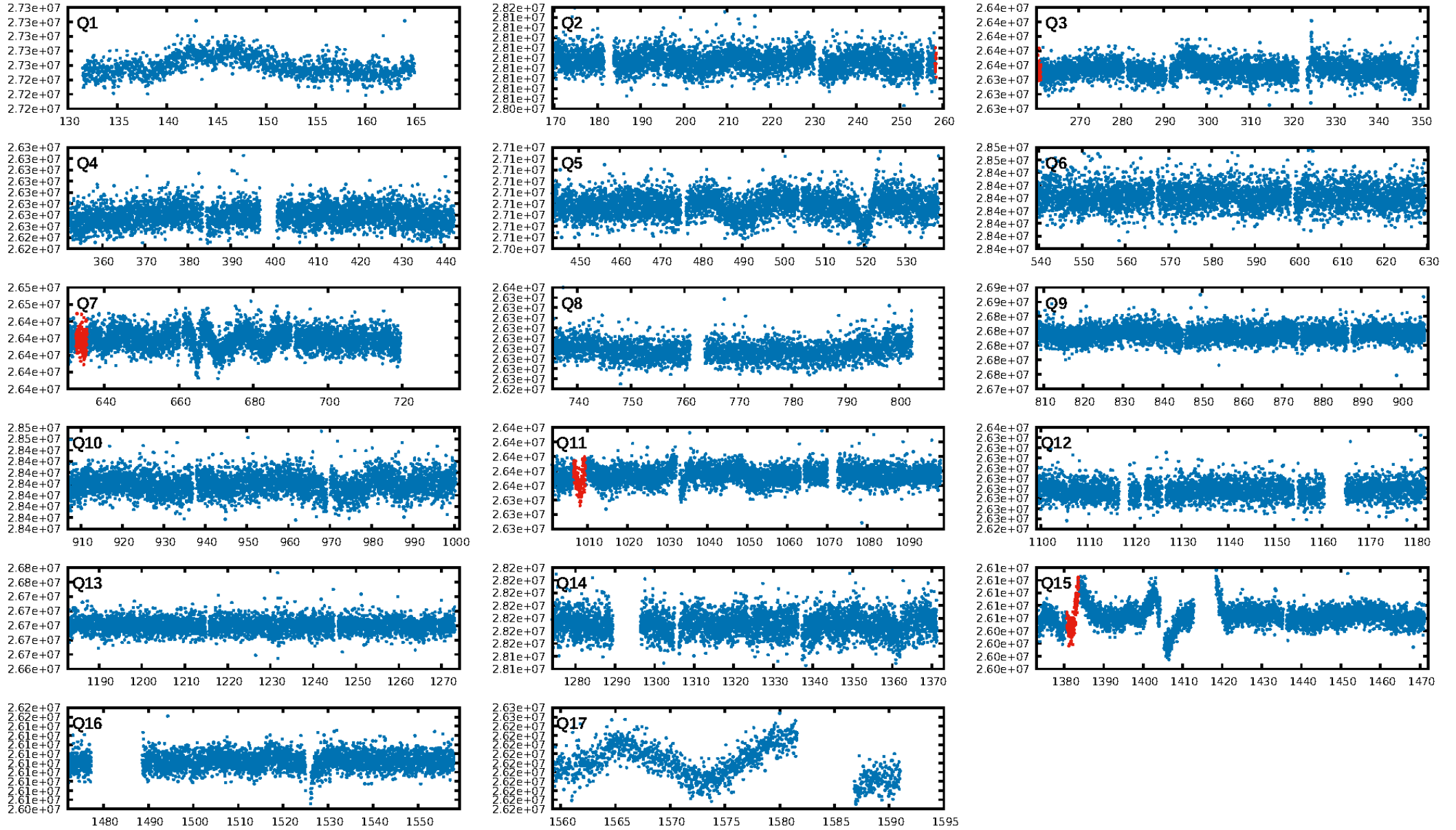
DV Diagnostic Results:

ShortPeriod-sig: N/A
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 5.9%
 ModelChiSquareGof-sig: 100.0%
 Bootstrap-pfa: 1.45e-09
 RollingBand-fgt: 0.25 [1/4]
 GhostDiagnostic-chr: -1.137
 Centroid-sig: 1.0%
 Centroid-so: 4.706 arcsec [2.10σ]
 OotOffset-rm: N/A
 KicOffset-rm: N/A
 OotOffset-st: 0/0/0/0 [0]
 KicOffset-st: 0/0/0/0 [0]
 DiffImageQuality-fgm: N/A
 DiffImageOverlap-fno: 1.00 [1/1]

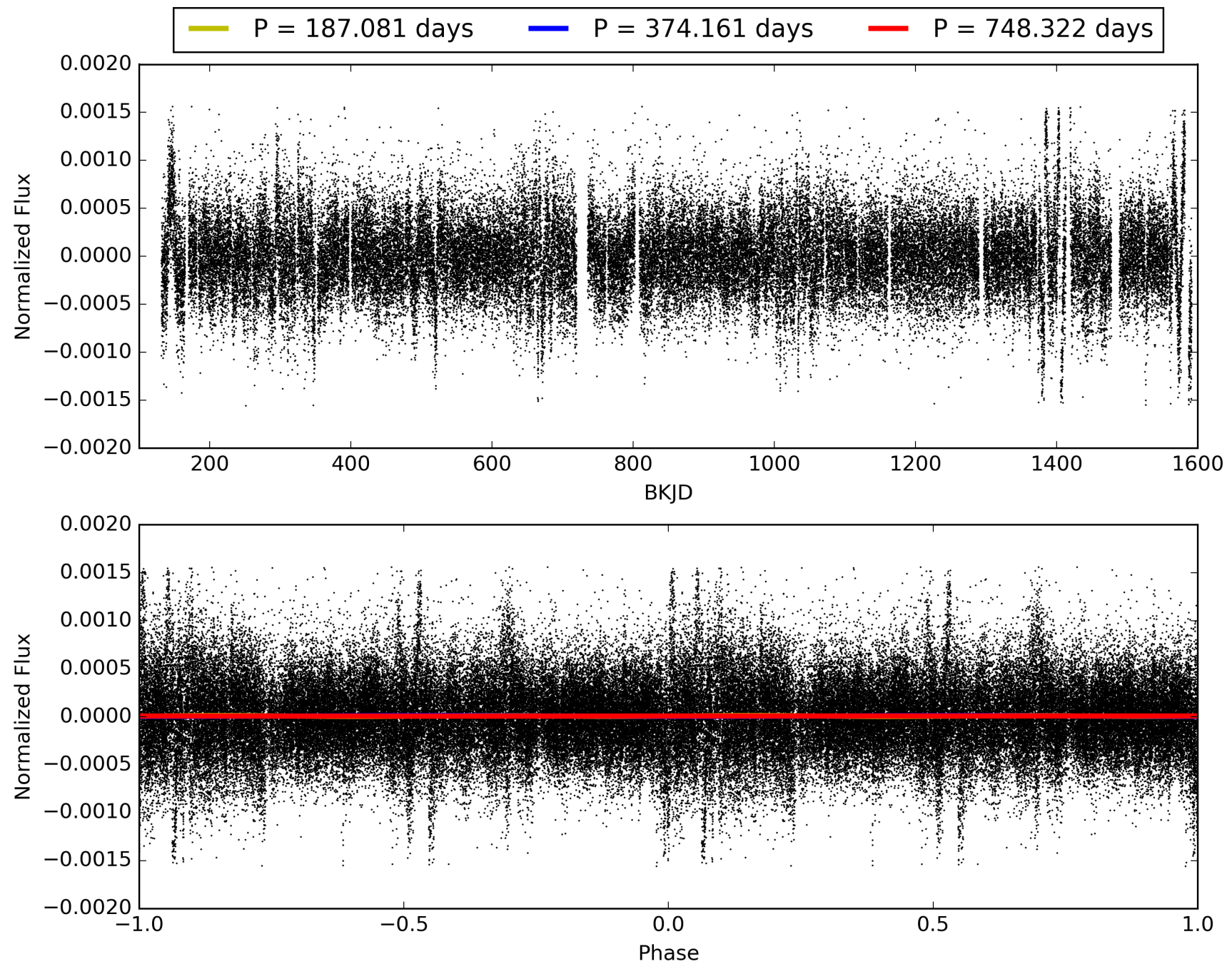
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:59:38 Z

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

TCE 008228624-01, PDC Light Curves

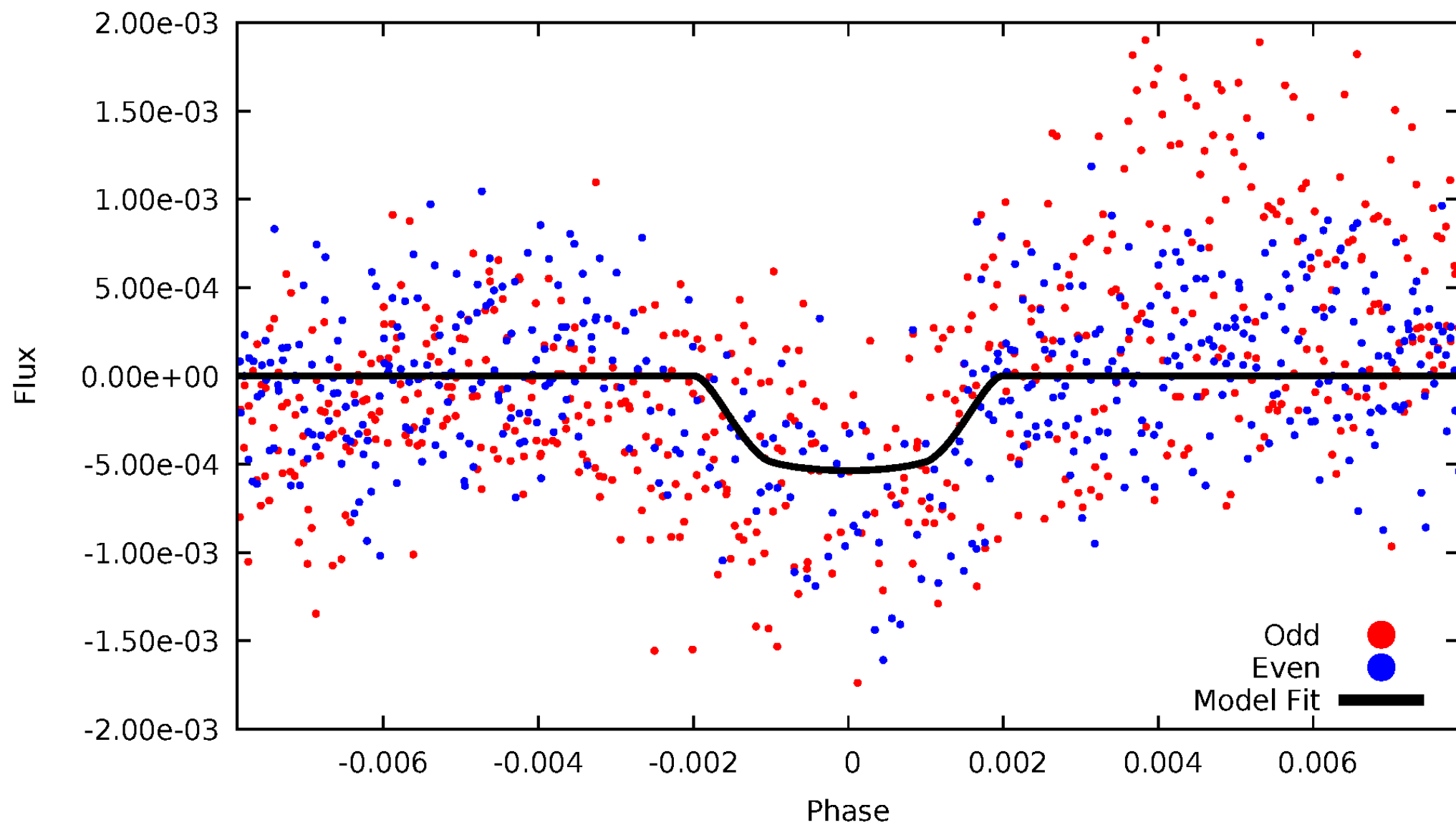


TCE 008228624-01



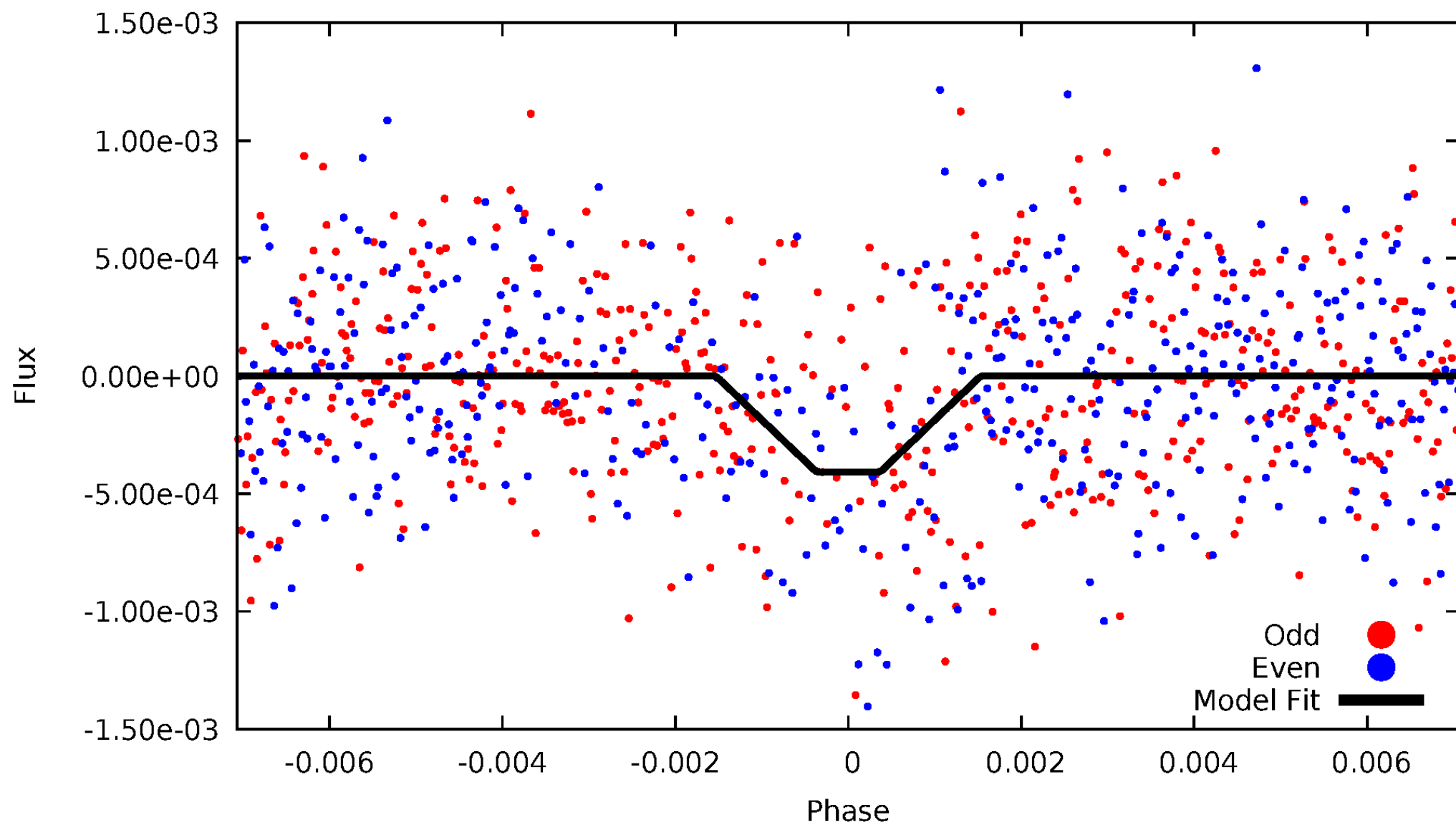
DV Odd/Even

TCE 008228624-01



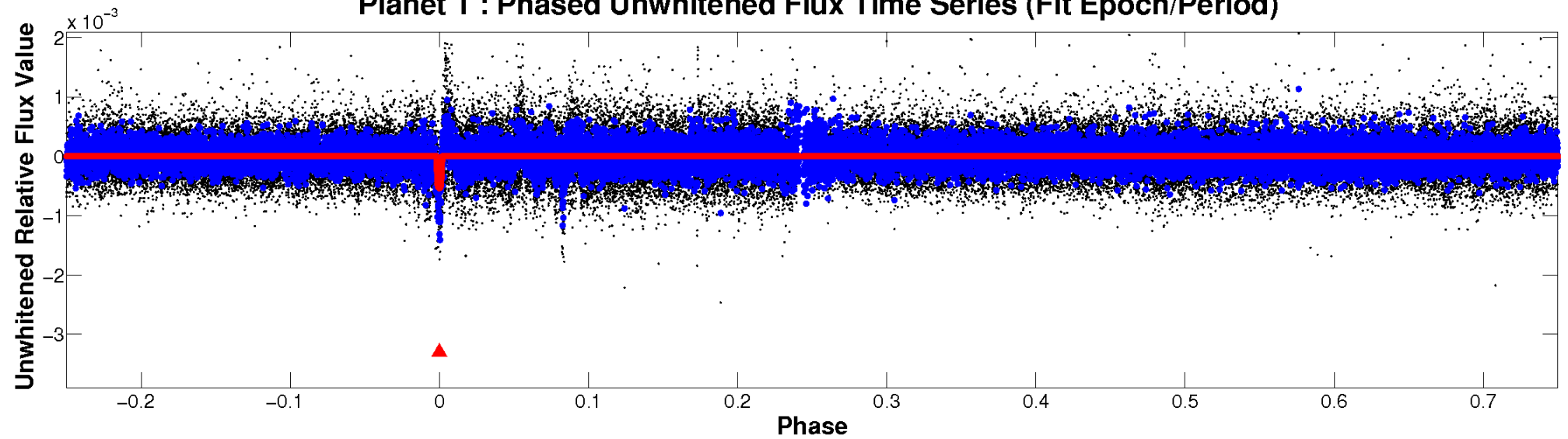
ALT Odd/Even

TCE 008228624-01

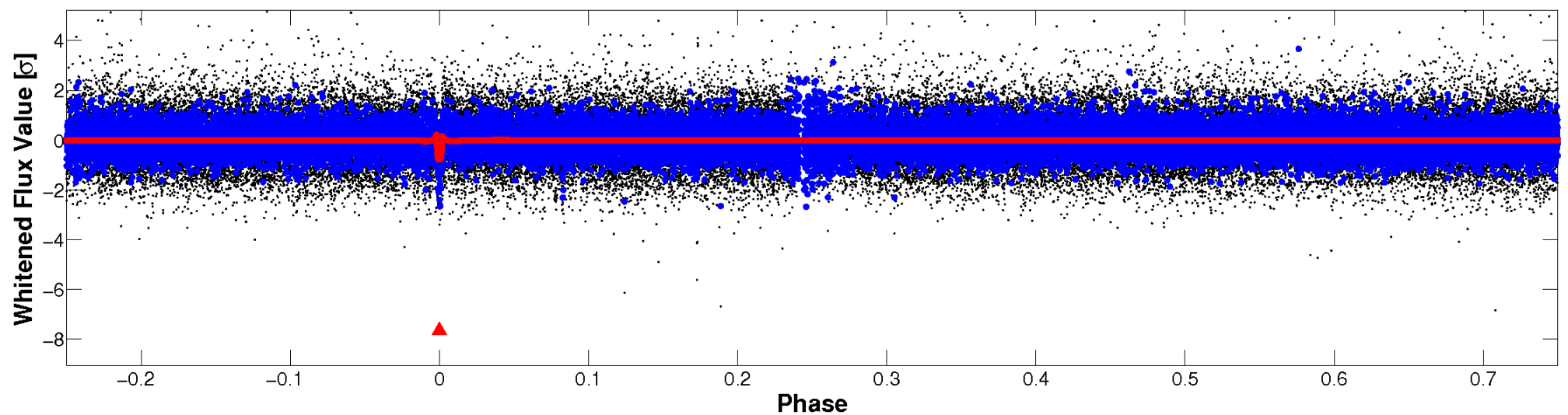


Non-Whitened Vs. Whitened Light Curve

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



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



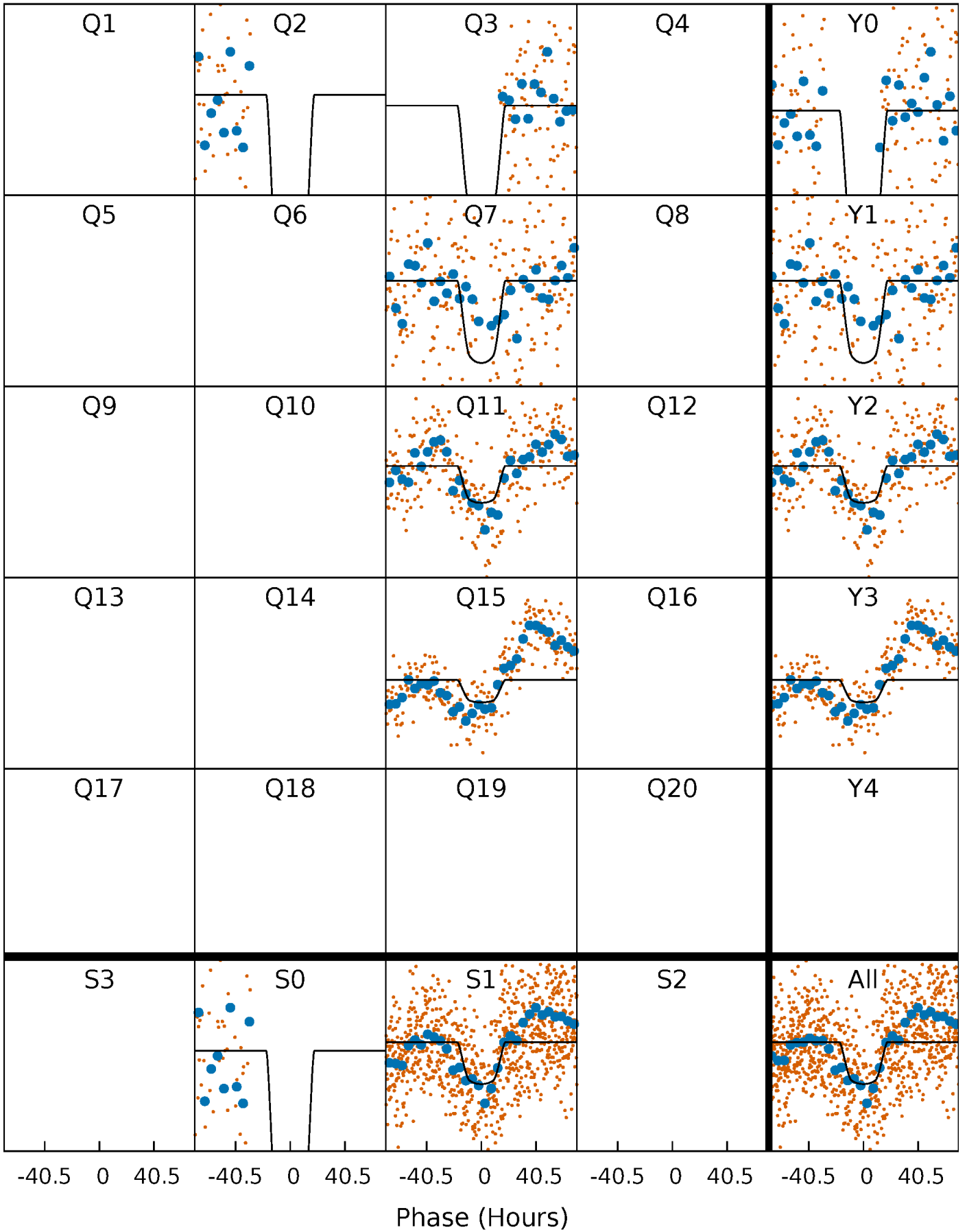
PDC Quarter-Phased Transit Curves

TCE 008228624-01 P=374.161086 Days $T_0=259.685019$ (BKJD)



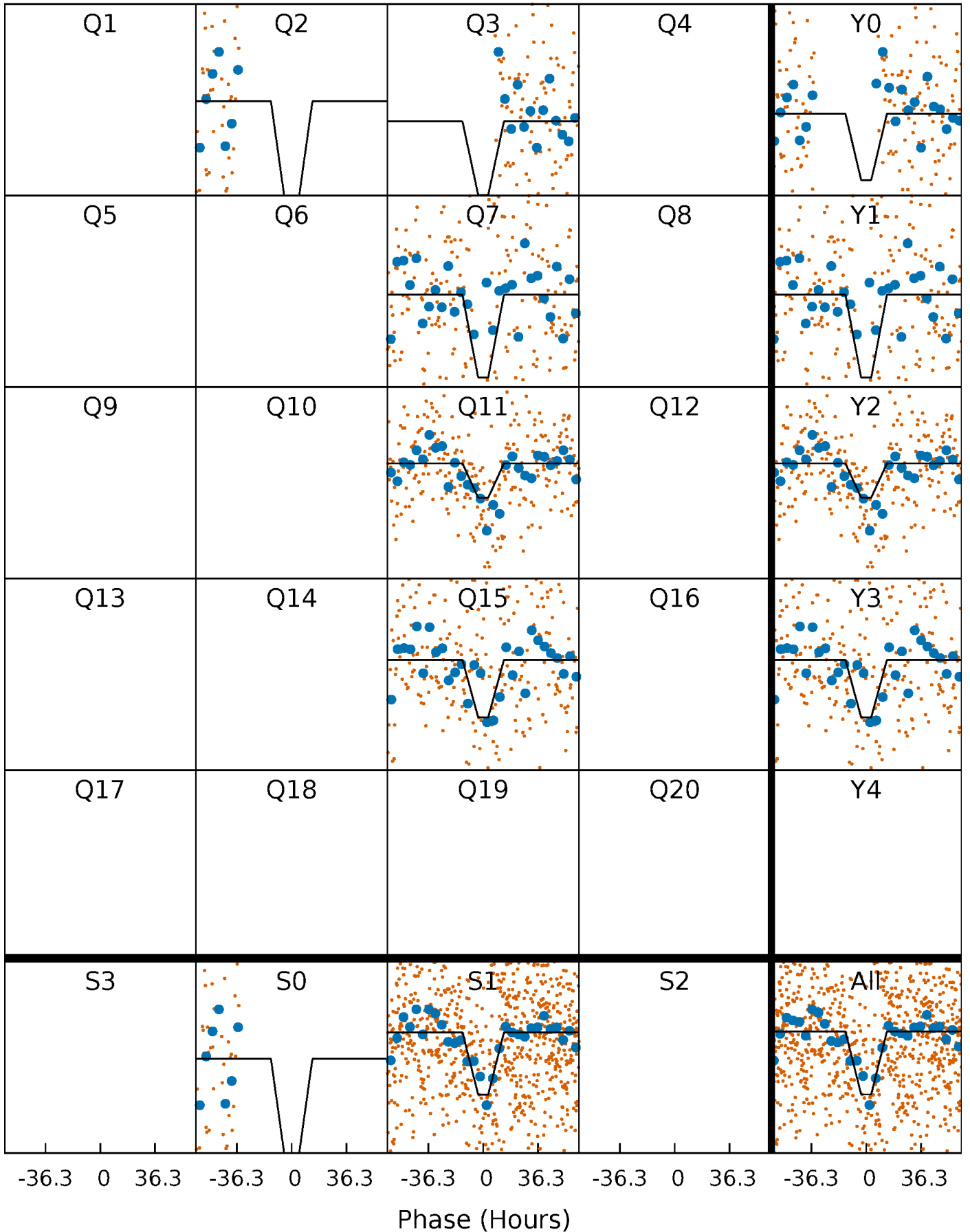
DV Quarter-Phased Transit Curves

TCE 008228624-01 P=374.161086 Days $T_0=259.685019$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

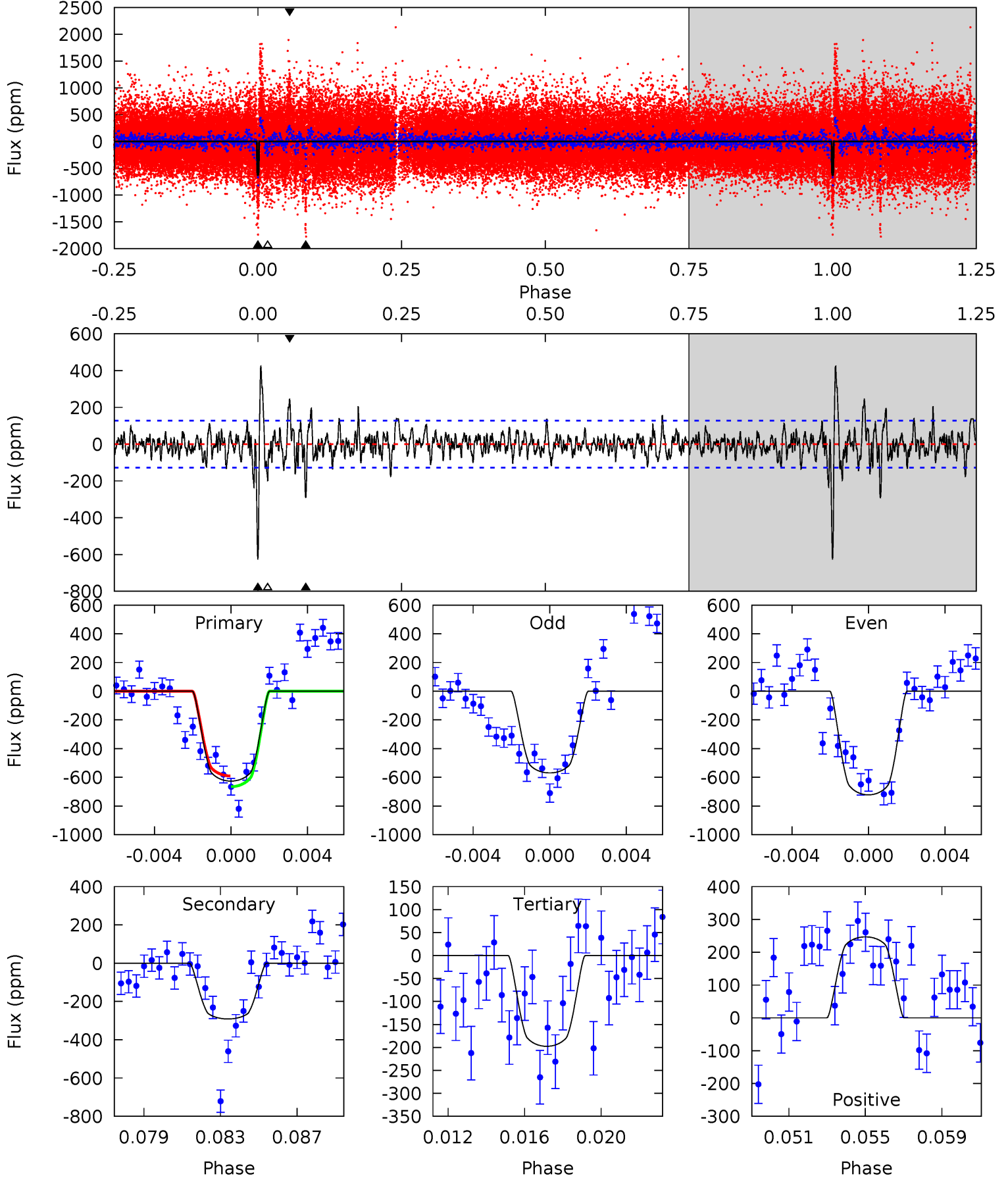
TCE 008228624-01 P=374.090805 Days $T_0=259.909638$ (BKJD)



DV Model-Shift Uniqueness Test

008228624-01, P = 374.161086 Days, E = 259.685019 Days

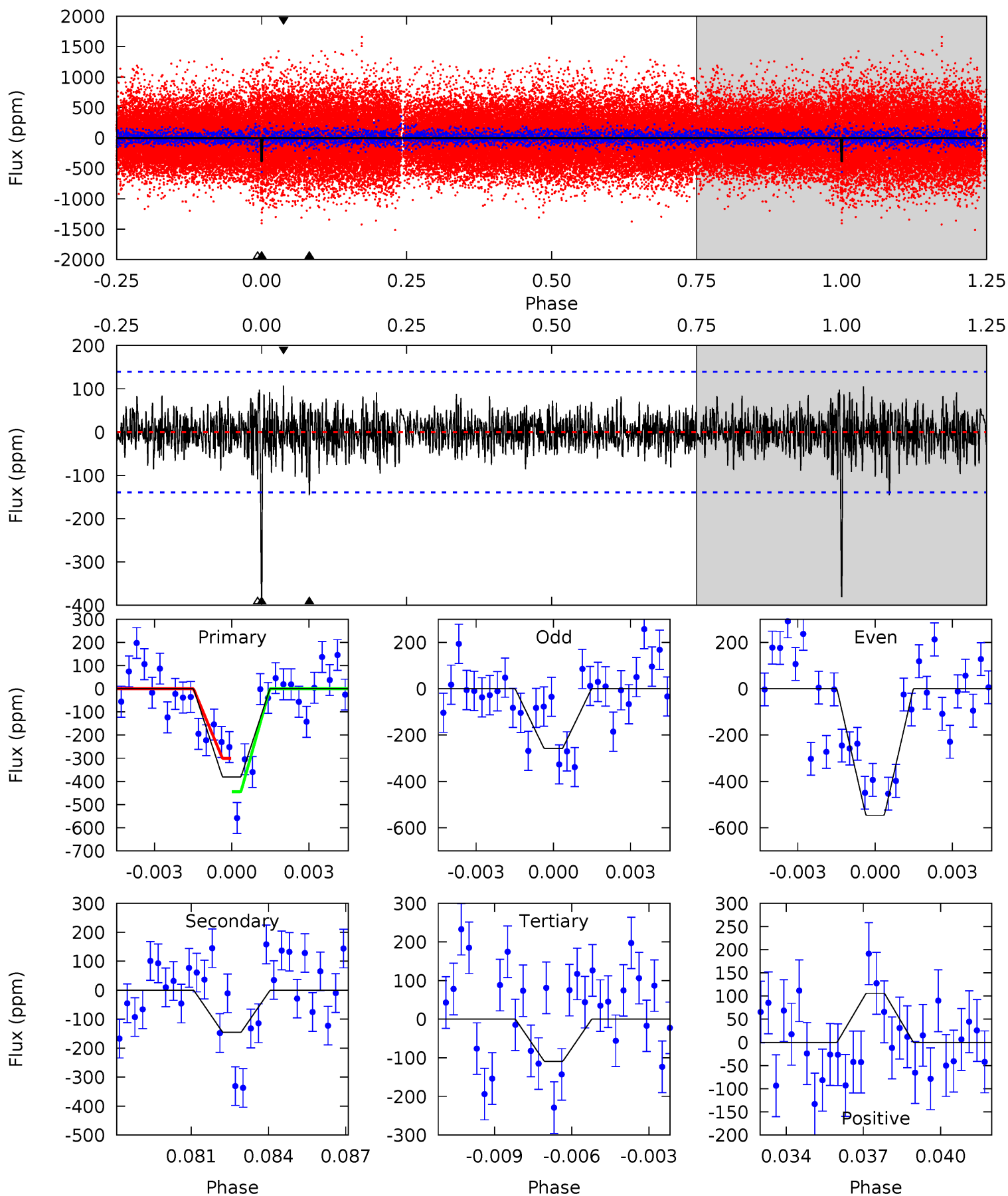
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 25.5 | 11.9 | 8.04 | 10.0 | 5.20 | 2.88 | 2.41 | 17.4 | 15.4 | 3.82 | 1.81 | 3.03 | 0.77 | 0.40 | 1.52 |



Alt Model-Shift Uniqueness Test

008228624-01, P = 374.090805 Days, E = 259.909638 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.4 | 5.47 | 4.11 | 3.98 | 5.25 | 2.96 | 1.18 | 10.2 | 10.4 | 1.36 | 1.49 | 5.37 | 0.04 | 0.22 | 2.70 |



Stellar Parameters For KIC 008228624

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6117^{+164}_{-200} | $4.496^{+0.052}_{-0.208}$ | $-0.220^{+0.250}_{-0.350}$ | $0.947^{+0.288}_{-0.096}$ | $1.025^{+0.139}_{-0.139}$ | $1.702^{+0.456}_{-0.859}$ |
| | +3%/-3% | +1%/-5% | +114%/-159% | +30%/-10% | +14%/-14% | +27%/-50% |
| 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 008228624-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|----------------------|-------------------------|
| DV | -291 ± 25 | $2.87^{+0.56}_{-0.38}$ | 370^{+27}_{-18} | 4978^{+268}_{-238} | 19970^{+6126}_{-5716} |
| Alt. | -145 ± 27 | $2.16^{+0.40}_{-0.32}$ | 371^{+26}_{-18} | 4813^{+344}_{-293} | 16950^{+7188}_{-5257} |

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

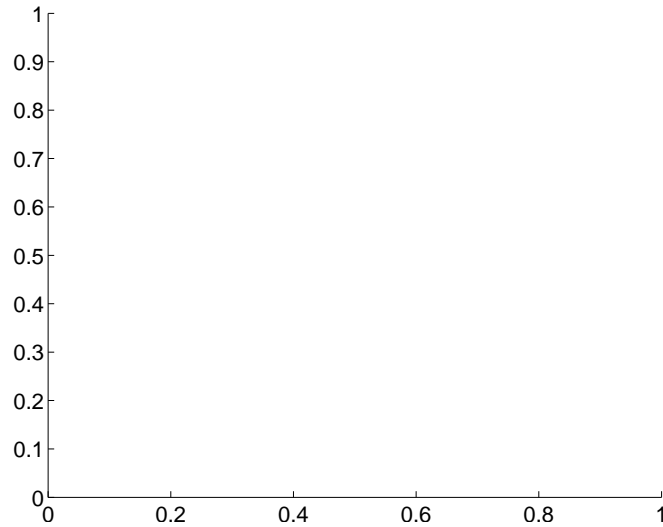
Supplemental centroid analysis for 008228624-01. Kepler magnitude: 14.89. Transit SNR 8.40

There are 0 quarters with good PRF difference image offsets

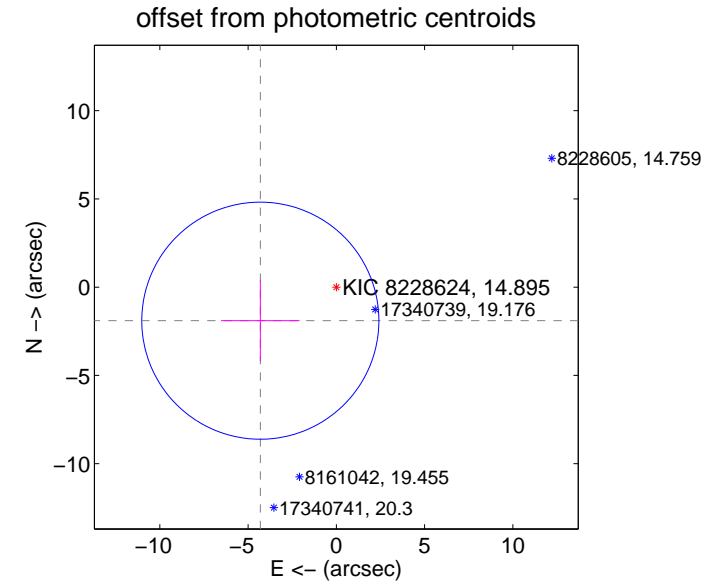
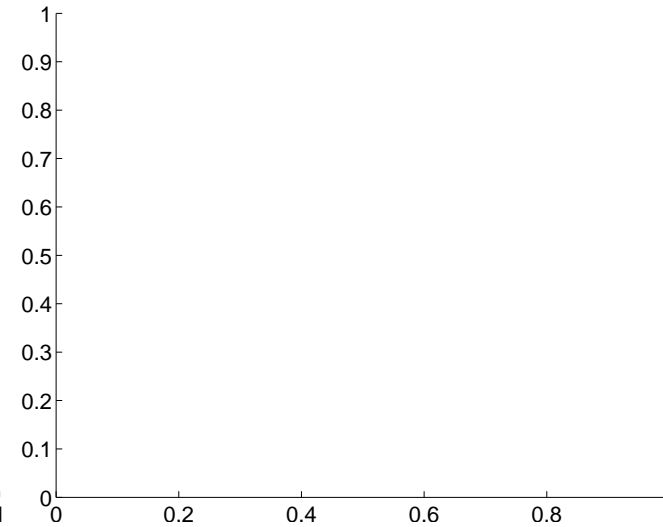
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

| | 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 | 4.71 ± 2.24 | 2.10 | 4.31 ± 2.23 | -1.90 ± 2.30 |

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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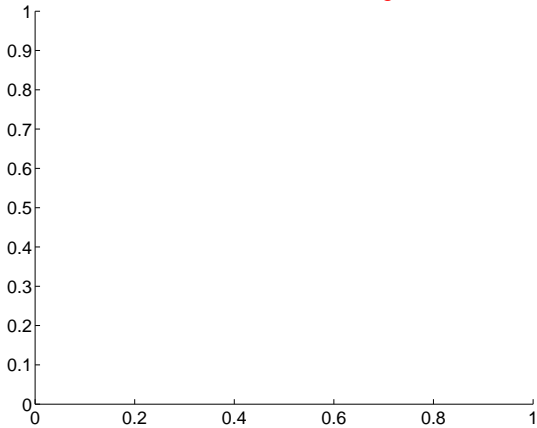
Q13 no difference image



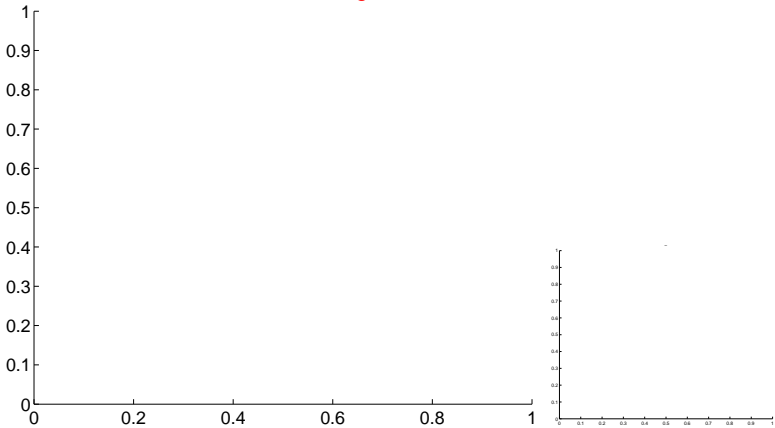
Q13 no OOT image



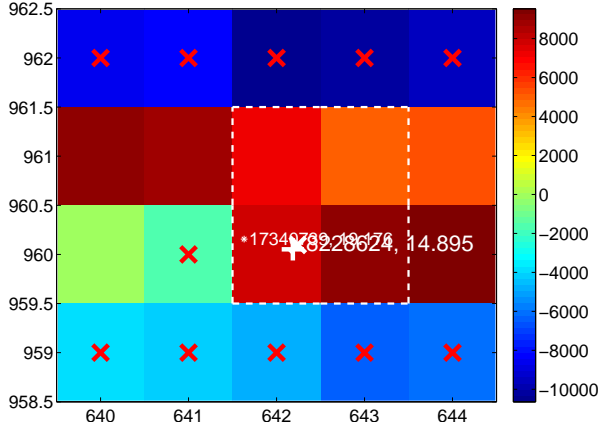
Q14 no difference image



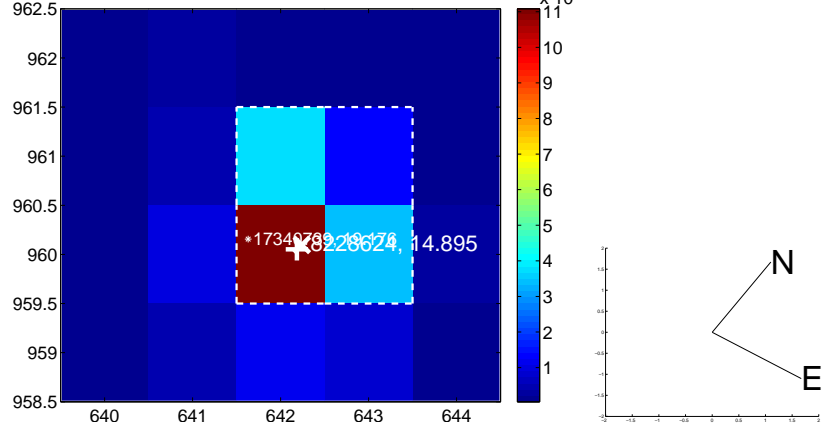
Q14 no OOT image



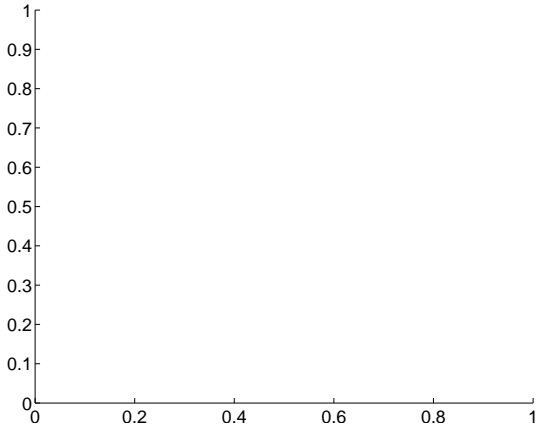
Q15 difference image. Poor Quality



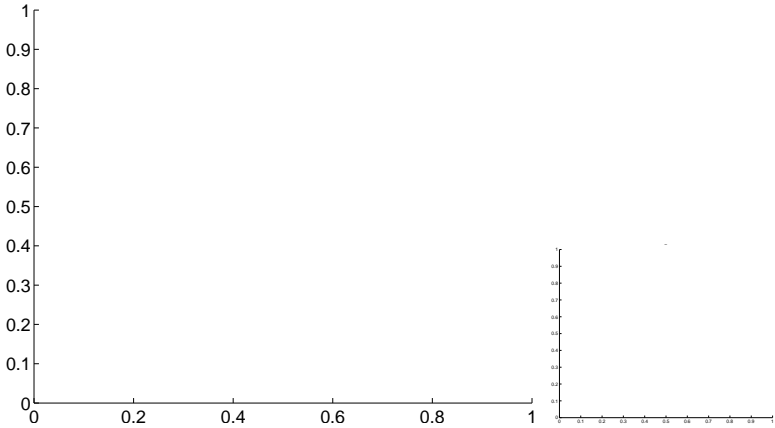
Q15 OOT image



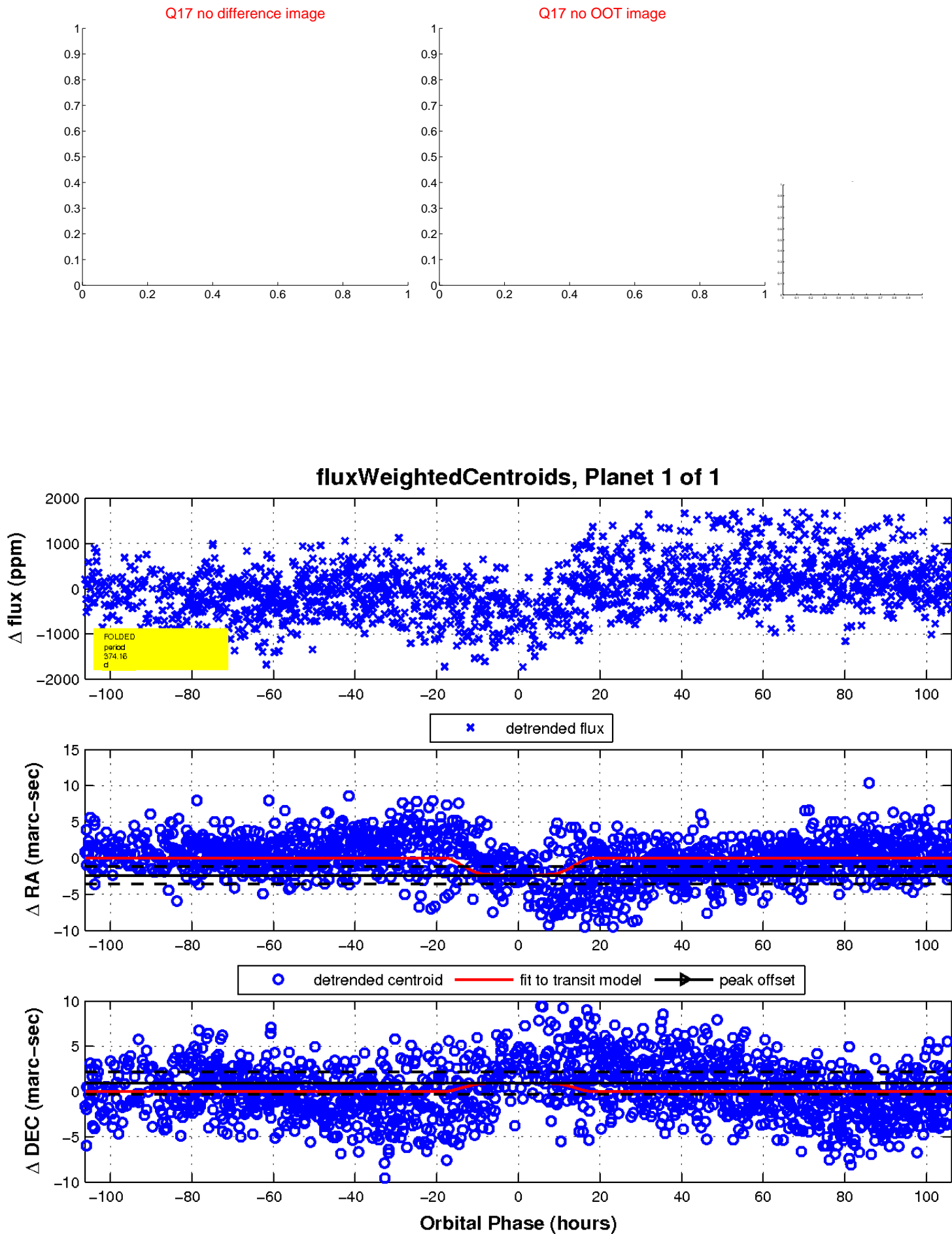
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

