

KIC 009715631

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009715631-01 | OBS | 5706.01 | 425.484303 | 149.041530 | 872.7 | 17.759 | 12.4 | 13.5 | 1.02 | 5977 | 3.01 | 0.90 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|----------------|
| 009715631-01 | OBS | PC | 0.90 | 0 | 0 | 0 | 0 | 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.

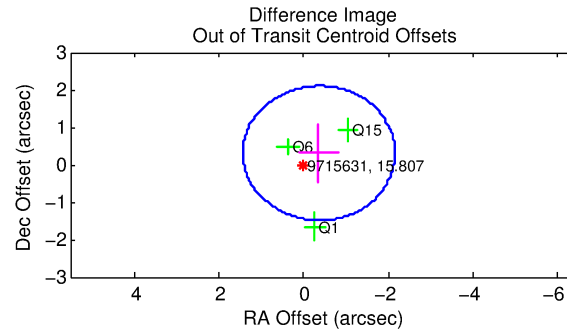
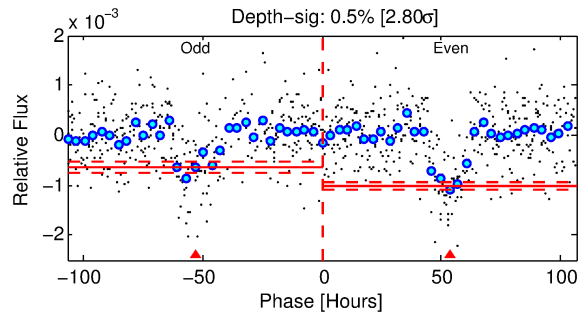
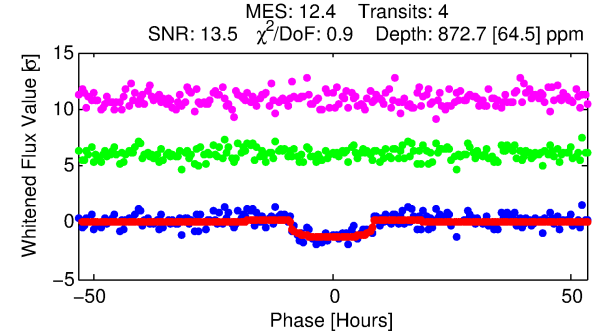
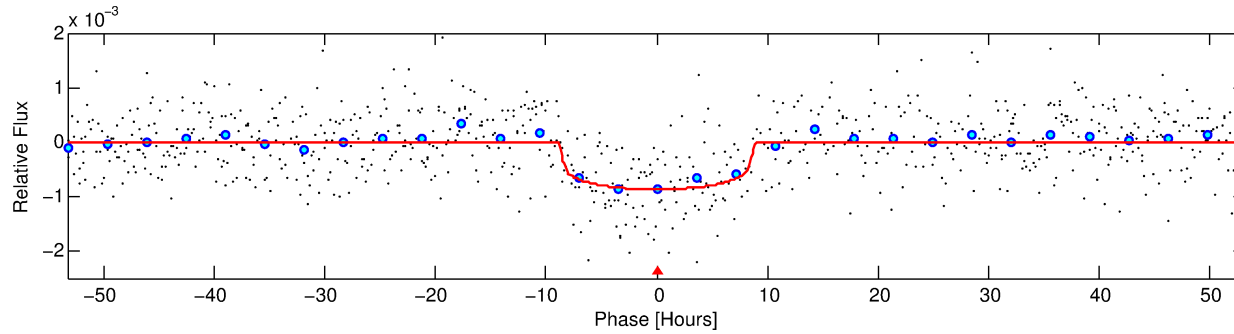
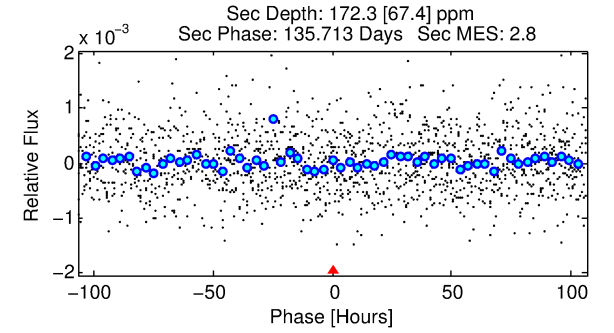
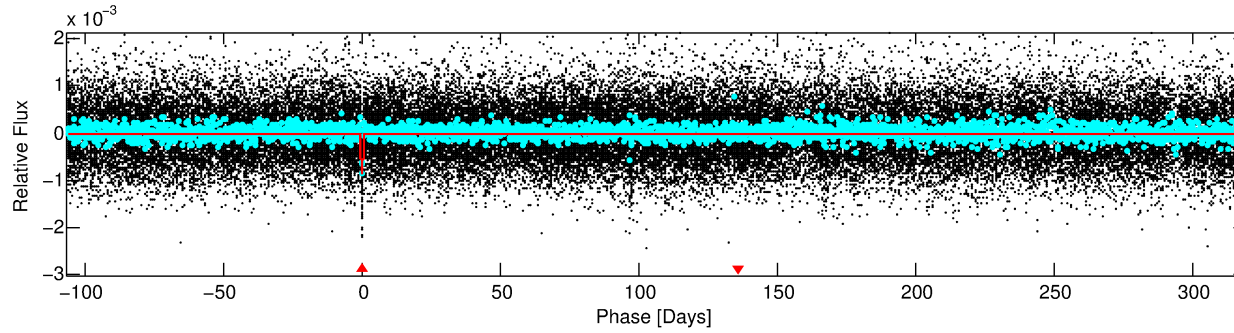
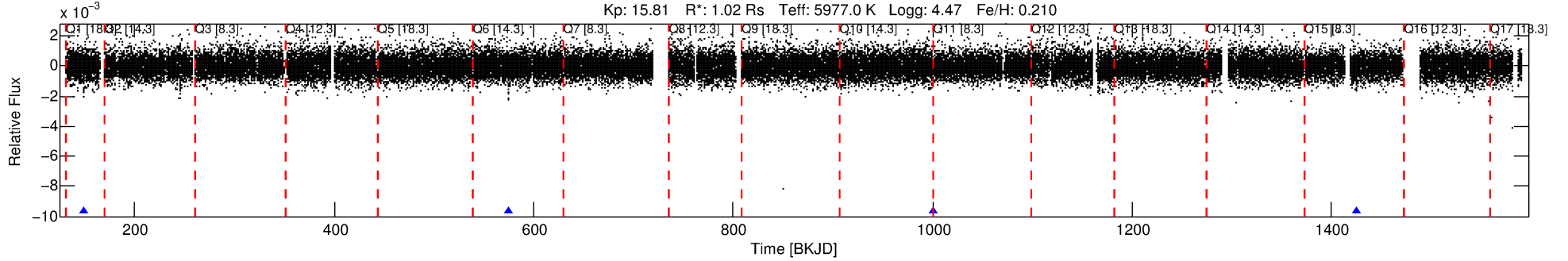
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009715631-01

No Significant Match Found

DV One-Page Summary

KIC: 9715631 Candidate: 1 of 1 Period: 425.484 d
KOI: K05706.01 Corr: 0.982



DV Fit Results:

Period = 425.48430 [0.00868] d
Epoch = 149.0415 [0.0164] BKJD
Rp/R* = 0.0270 [0.0156]
a/R* = 184.40 [481.23]
b = 0.20 [12.65]
Seff = 0.90 [0.35]
Teq = 248 [24] K
Rp = 3.01 [1.94] Re
a = 1.1541 [0.2846] AU
Ag = 13975.53 [17861.19] [0.78σ]
Teffp = 4171 [1285] K [3.05σ]

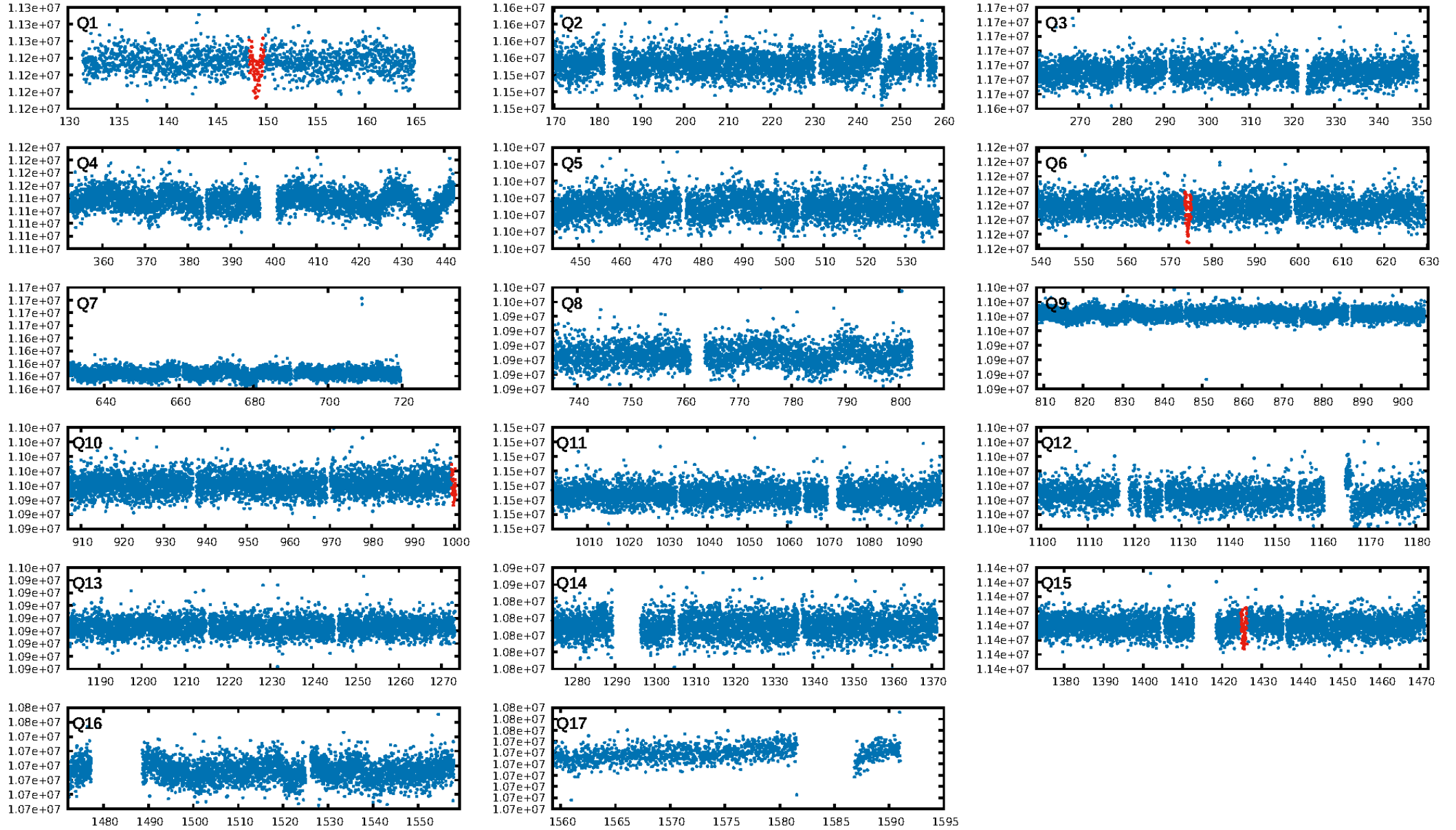
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.97e-17
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.907
Centroid-sig: 0.4%
Centroid-so: 1.467 arcsec [1.72σ]
OotOffset-rm: 0.477 arcsec [0.80σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-rm: 0.520 arcsec [1.02σ]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

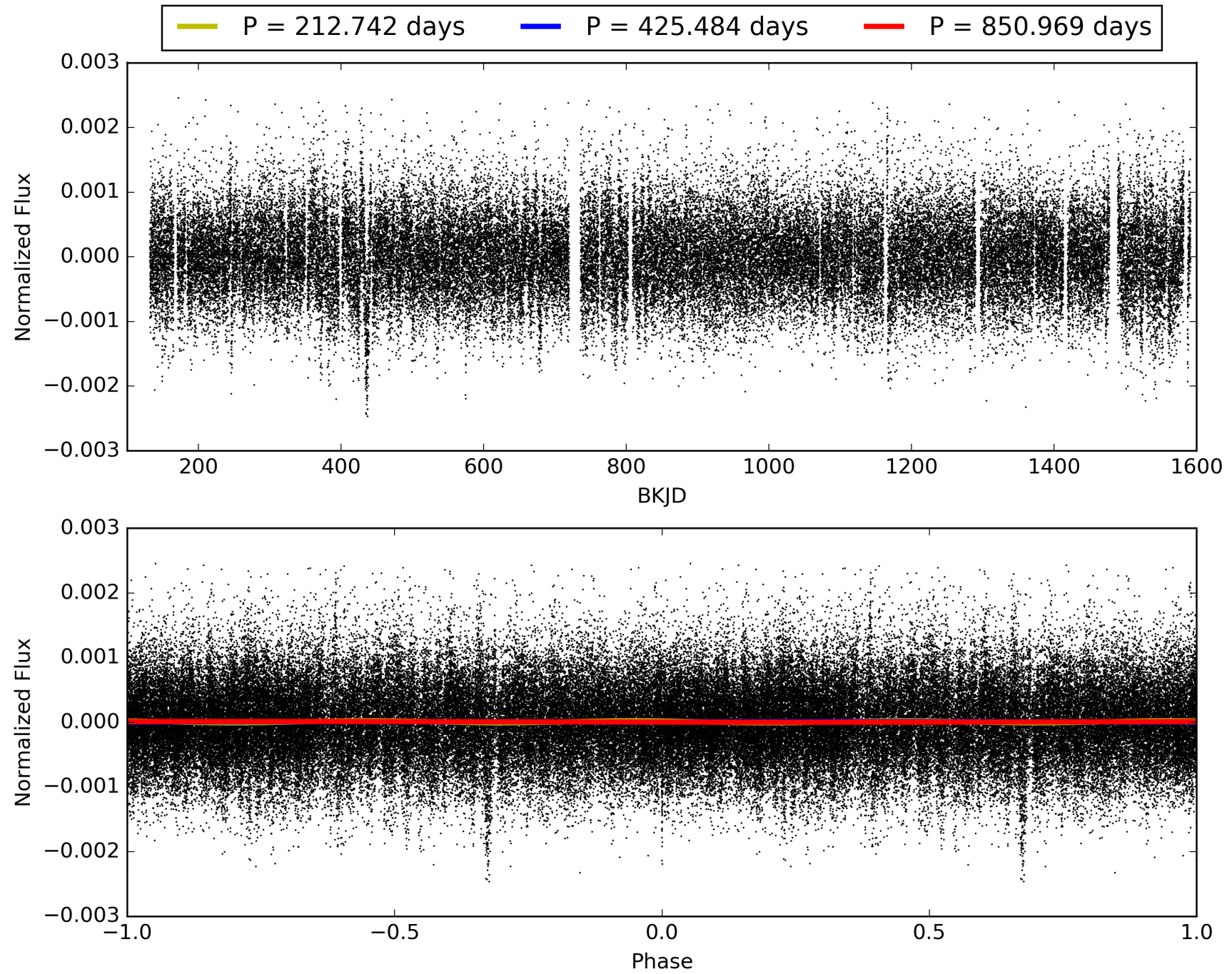
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:52:55 Z

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

TCE 009715631-01, PDC Light Curves

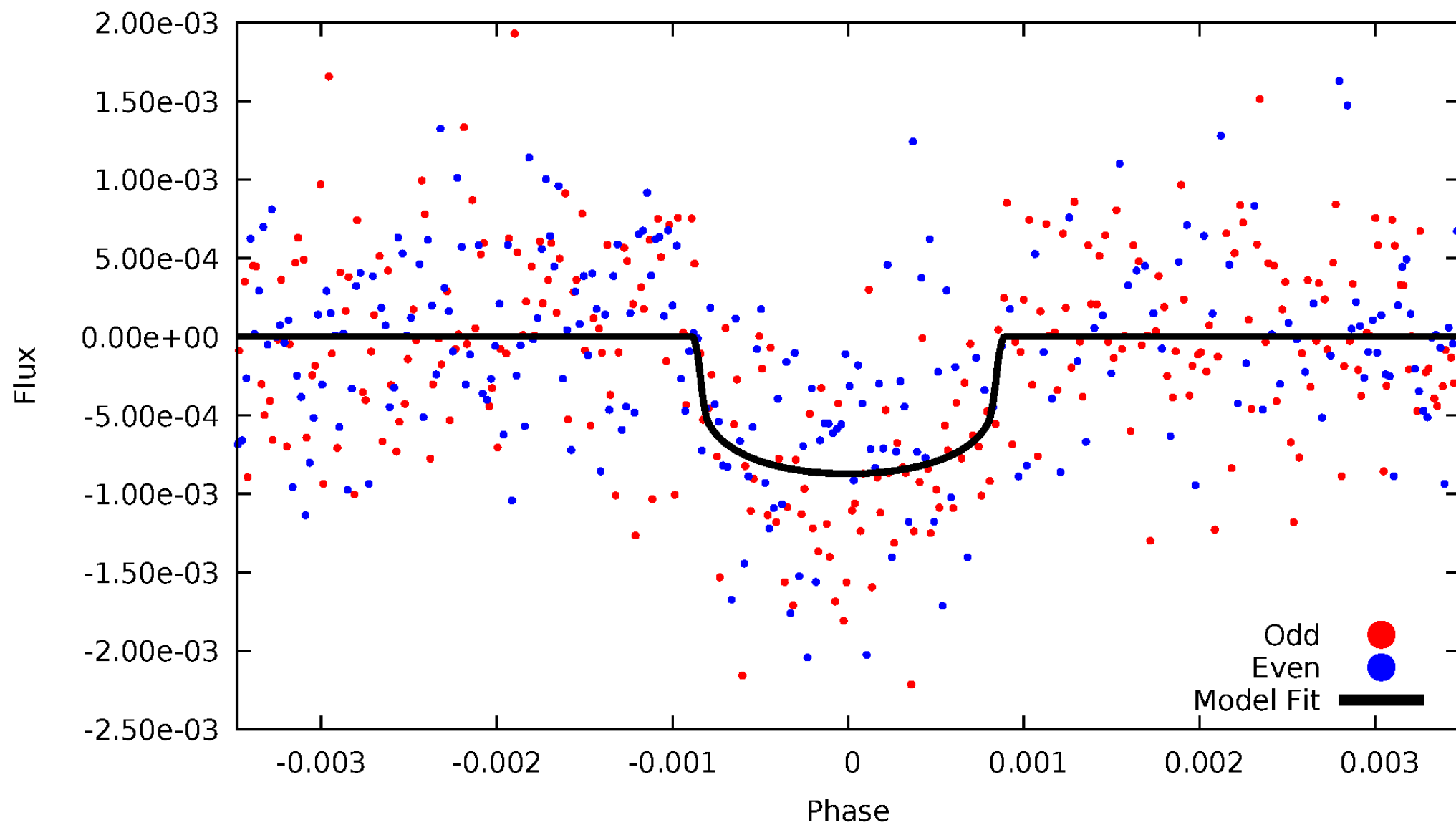


TCE 009715631-01



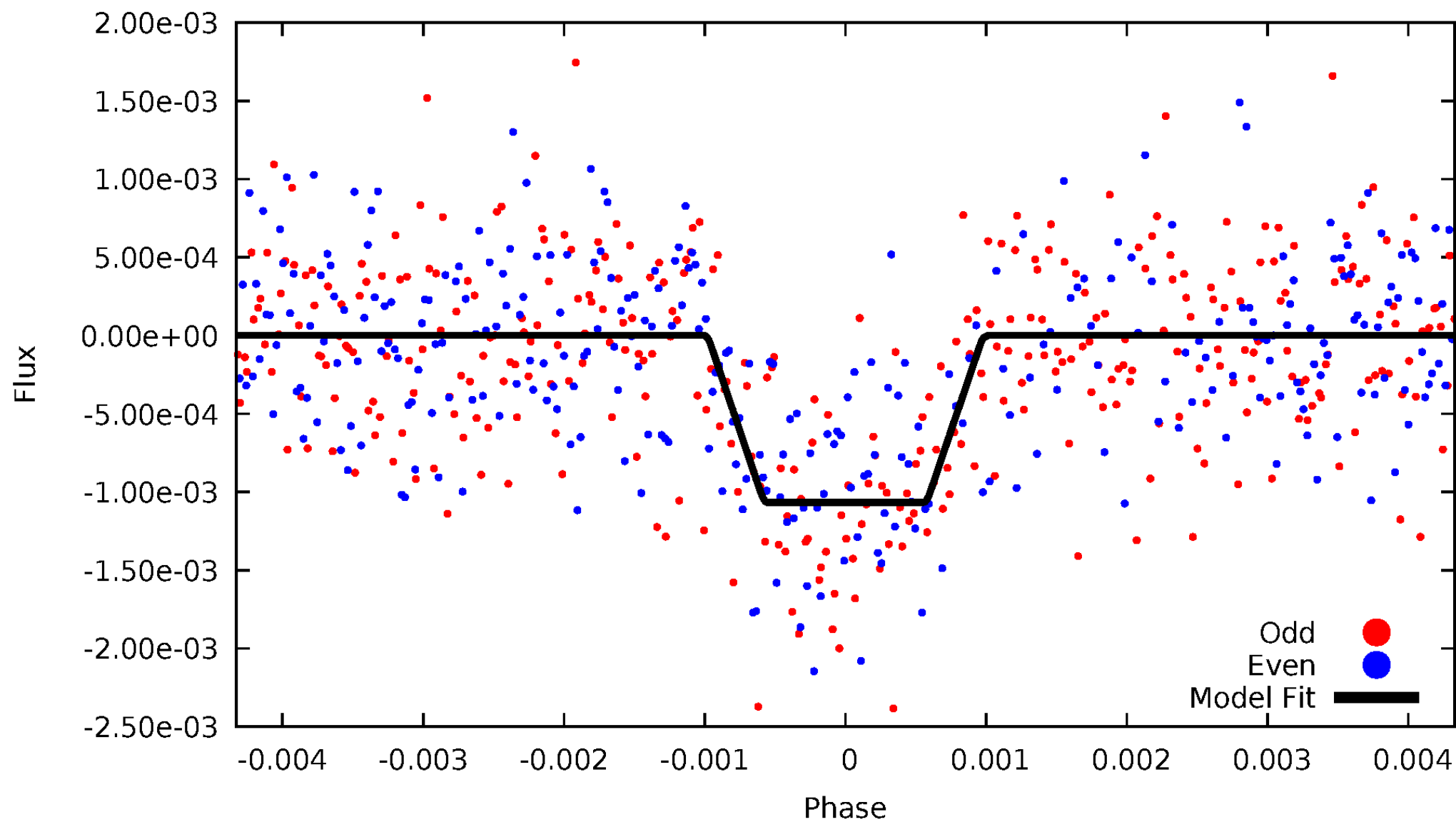
DV Odd/Even

TCE 009715631-01



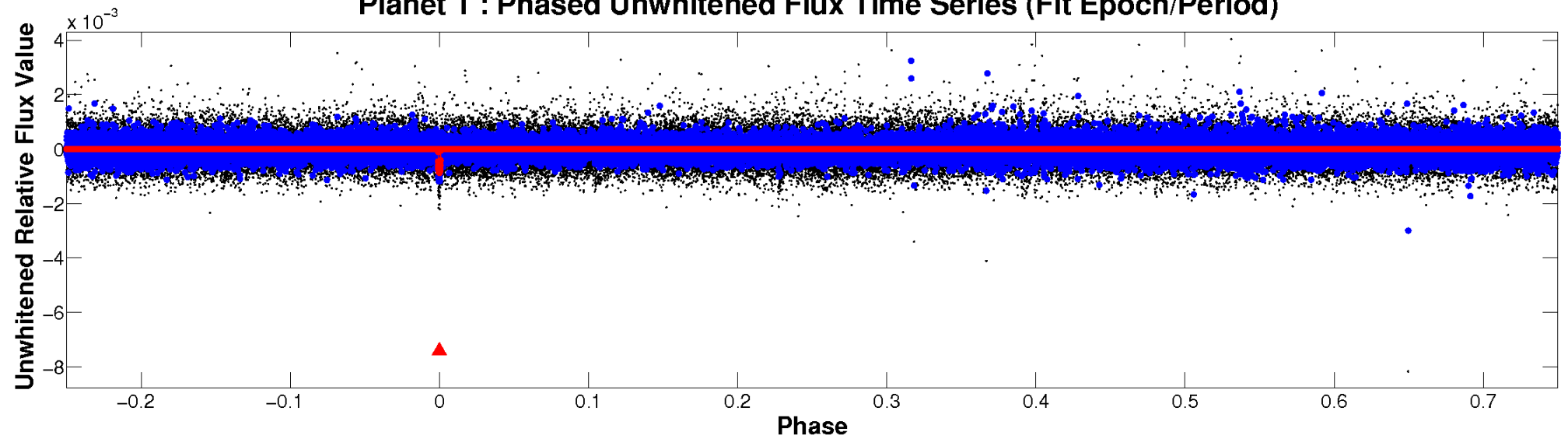
ALT Odd/Even

TCE 009715631-01

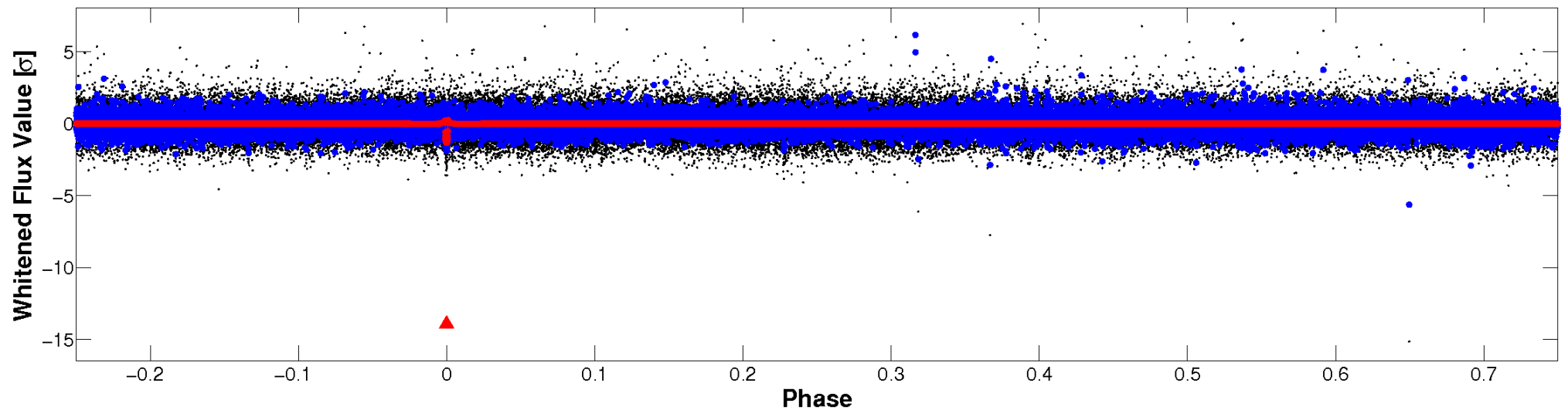


Non-Whitened Vs. Whitened Light Curve

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

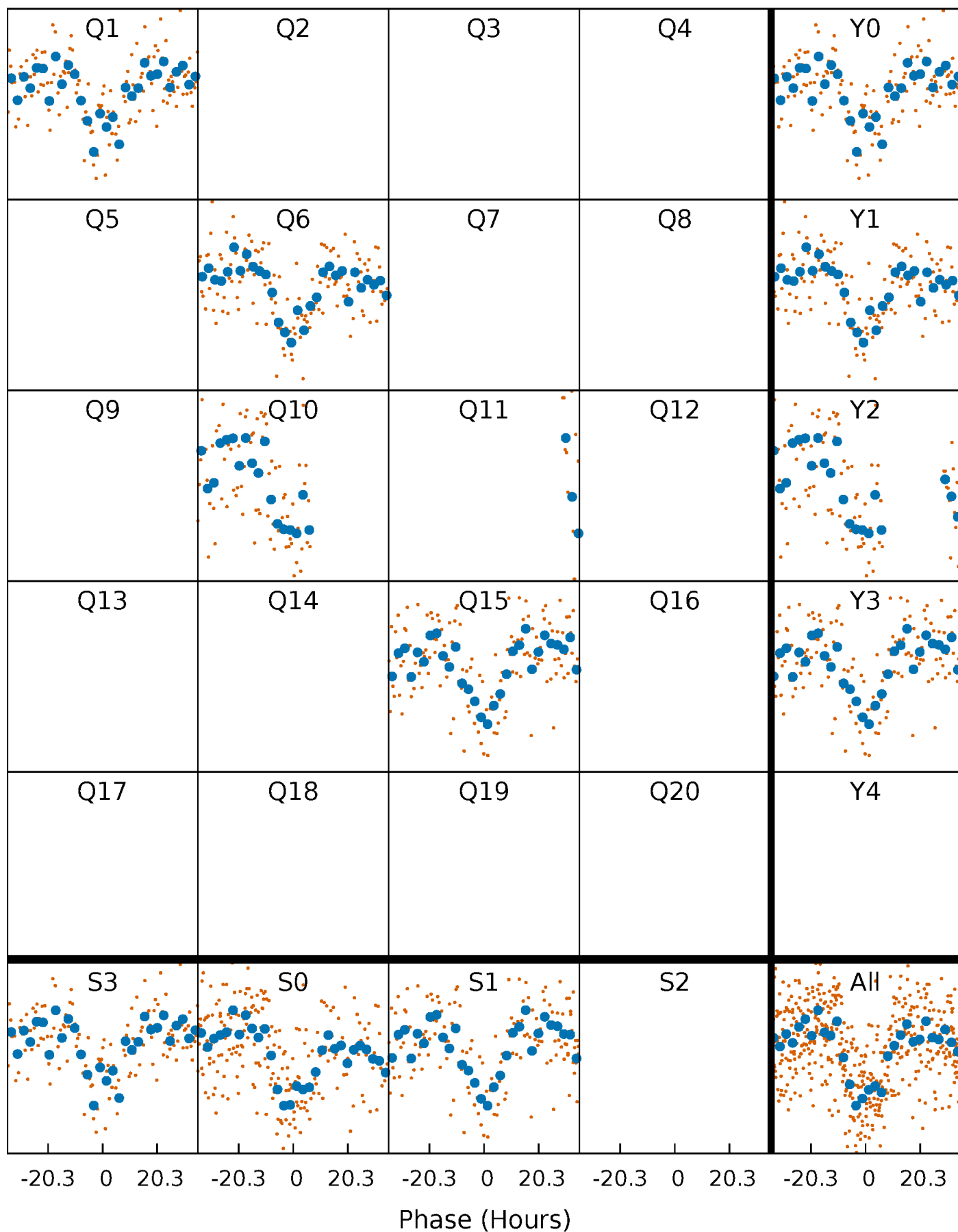


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



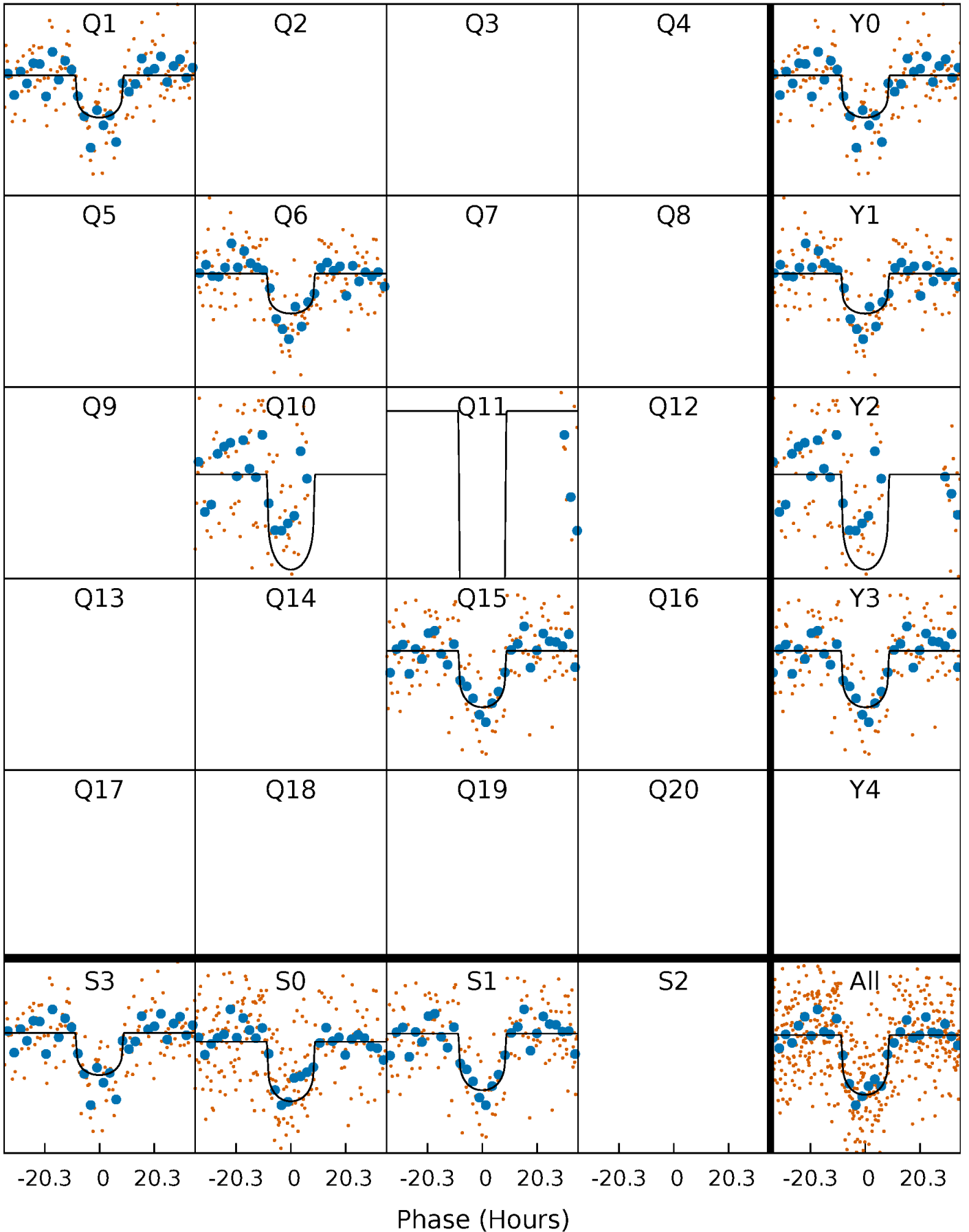
PDC Quarter-Phased Transit Curves

TCE 009715631-01 P=425.484303 Days $T_0=149.041530$ (BKJD)



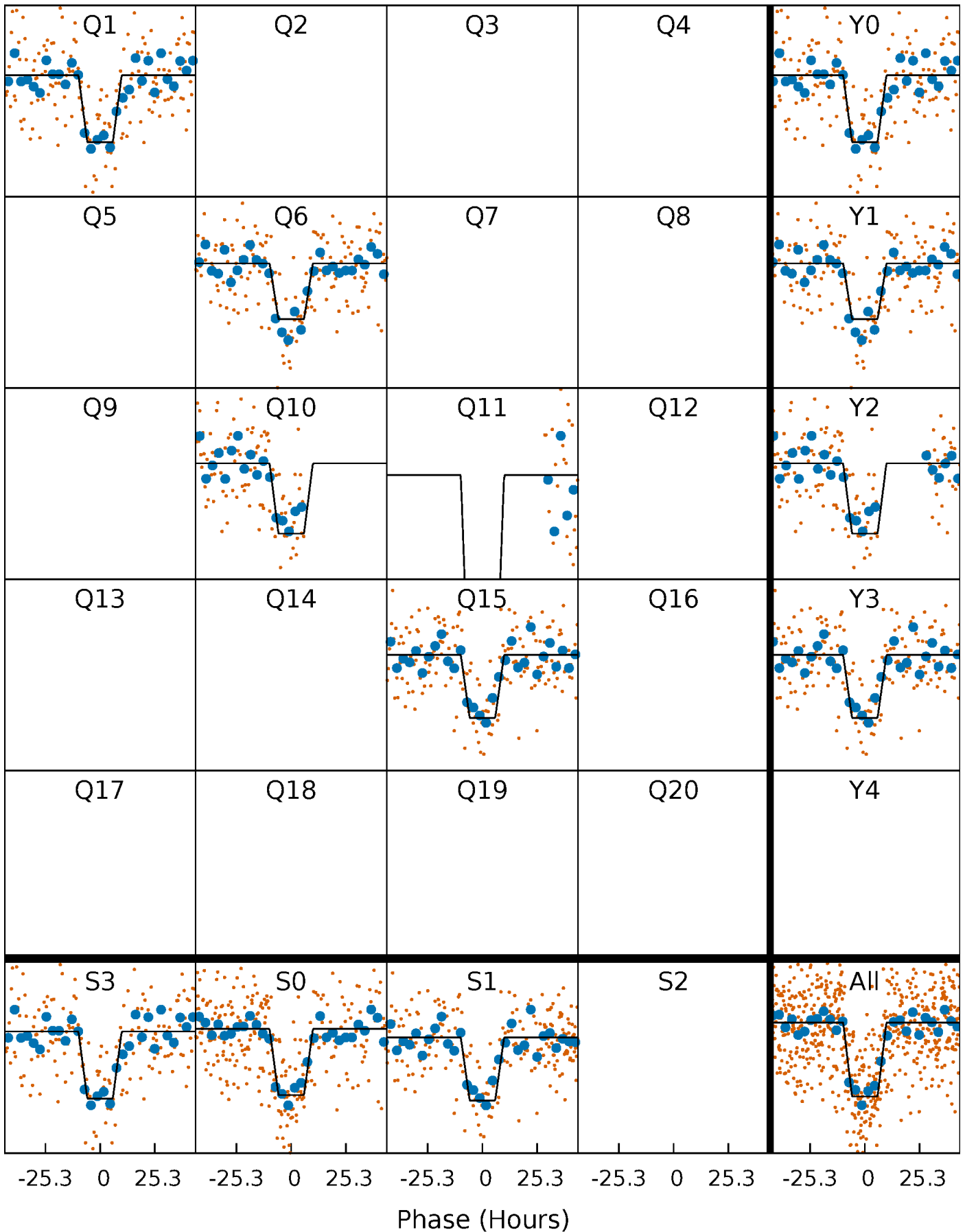
DV Quarter-Phased Transit Curves

TCE 009715631-01 P=425.484303 Days $T_0=149.041530$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

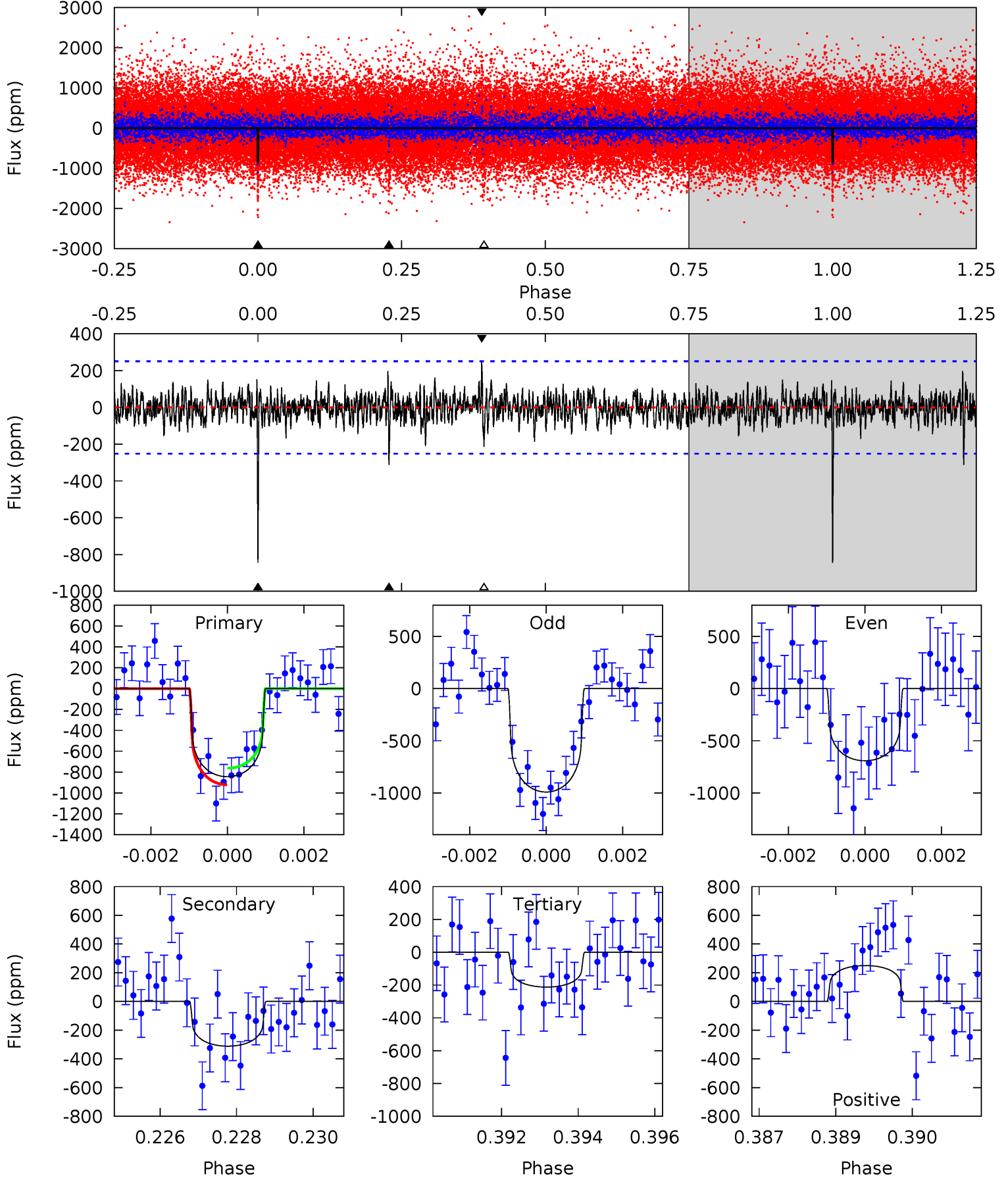
TCE 009715631-01 P=425.494831 Days $T_0=149.037844$ (BKJD)



DV Model-Shift Uniqueness Test

009715631-01, P = 425.484303 Days, E = 149.041530 Days

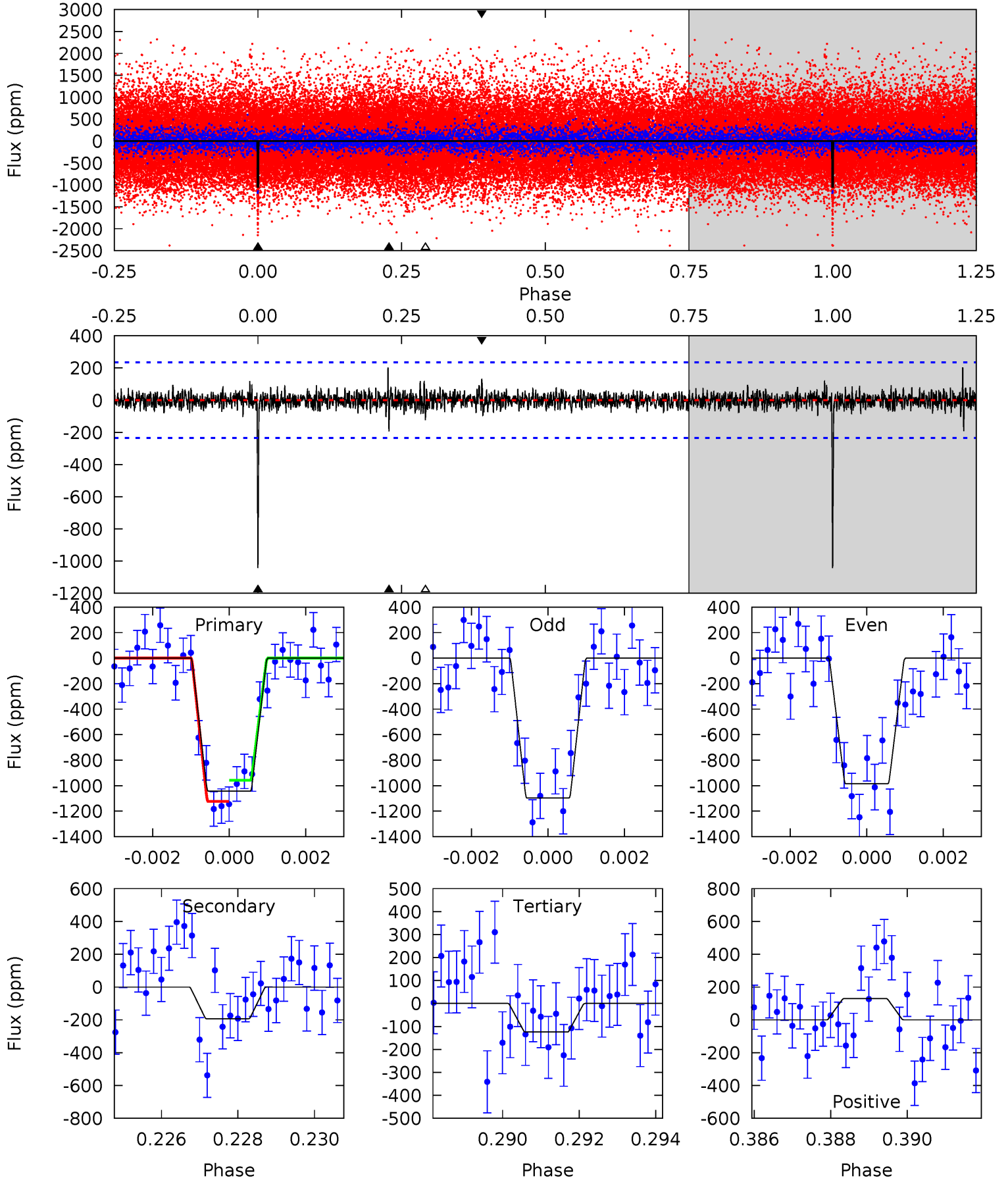
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 18.0 | 6.63 | 4.52 | 5.33 | 5.35 | 3.12 | 1.15 | 13.5 | 12.6 | 2.11 | 1.30 | 3.20 | 0.86 | 0.23 | 1.69 |



Alt Model-Shift Uniqueness Test

009715631-01, P = 425.494831 Days, E = 149.037844 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 23.6 | 4.38 | 2.81 | 2.94 | 5.33 | 3.09 | 0.73 | 20.8 | 20.7 | 1.56 | 1.43 | 1.26 | 1.02 | 0.16 | 1.88 |



Stellar Parameters For KIC 009715631

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5977^{+190}_{-211} | $4.473^{+0.048}_{-0.204}$ | $0.210^{+0.200}_{-0.300}$ | $1.022^{+0.292}_{-0.097}$ | $1.133^{+0.125}_{-0.138}$ | $1.493^{+0.298}_{-0.777}$ |
| | +3%/-4% | +1%/-5% | +95%/-143% | +29%/-9% | +11%/-12% | +20%/-52% |
| 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 009715631-01 / KOI 5706.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|---------------------------|
| DV | -311 ± 47 | $3.12^{+1.91}_{-1.57}$ | 354^{+24}_{-17} | 4886^{+2004}_{-797} | 22178^{+72454}_{-13666} |
| Alt. | -193 ± 44 | $3.89^{+1.92}_{-1.78}$ | 354^{+24}_{-17} | 4133^{+1147}_{-516} | 8849^{+21624}_{-4836} |

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 $A_{obs} \gg 1.0$

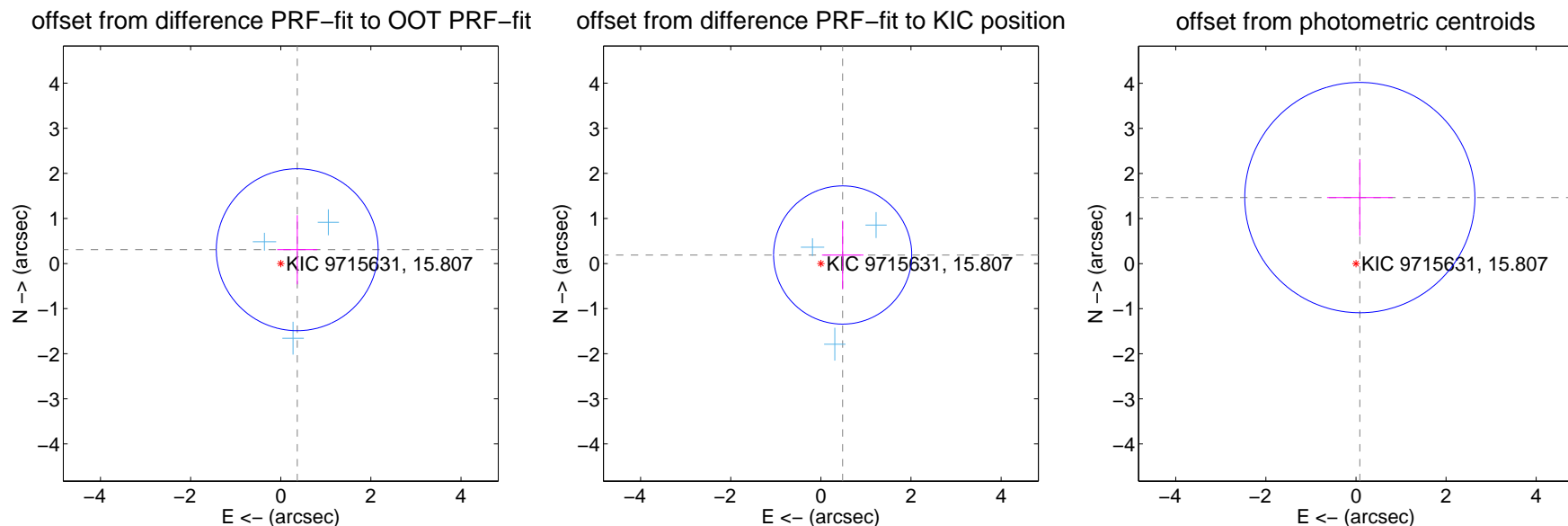
DV Centroid Data

Supplemental centroid analysis for 009715631-01. Kepler magnitude: 15.81. Transit SNR 13.54

There are 3 quarters with good PRF difference image offsets

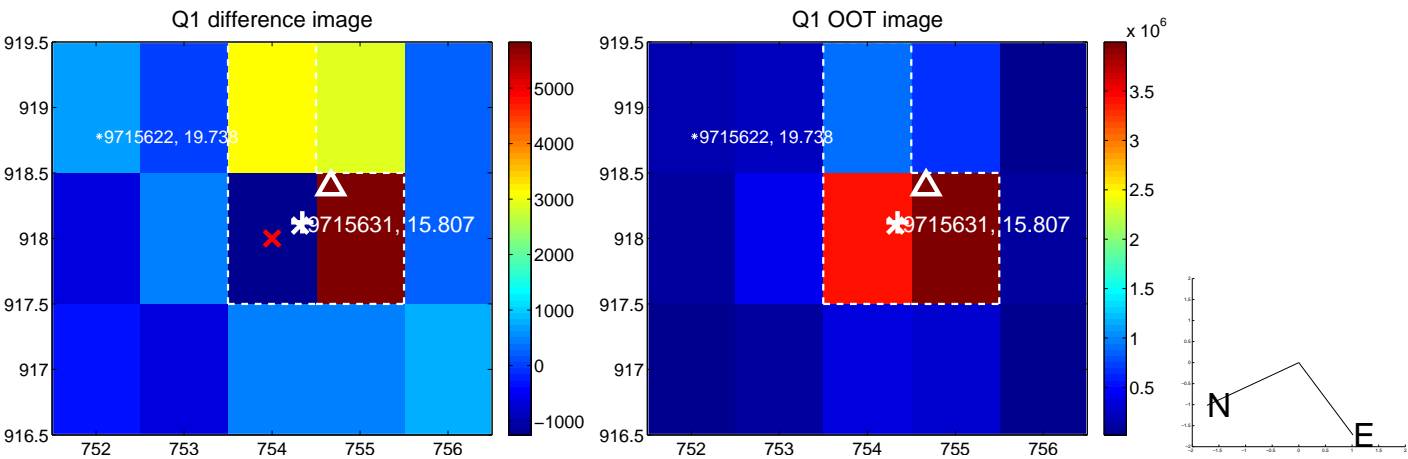
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.477 ± 0.599 | 0.80 | -0.366 ± 0.445 | 0.307 ± 0.766 |
| PRF-fit source offset from KIC position | 0.520 ± 0.511 | 1.02 | -0.484 ± 0.461 | 0.190 ± 0.762 |
| photometric centroid source offset | 1.47 ± 0.85 | 1.72 | -0.09 ± 0.73 | 1.46 ± 0.85 |

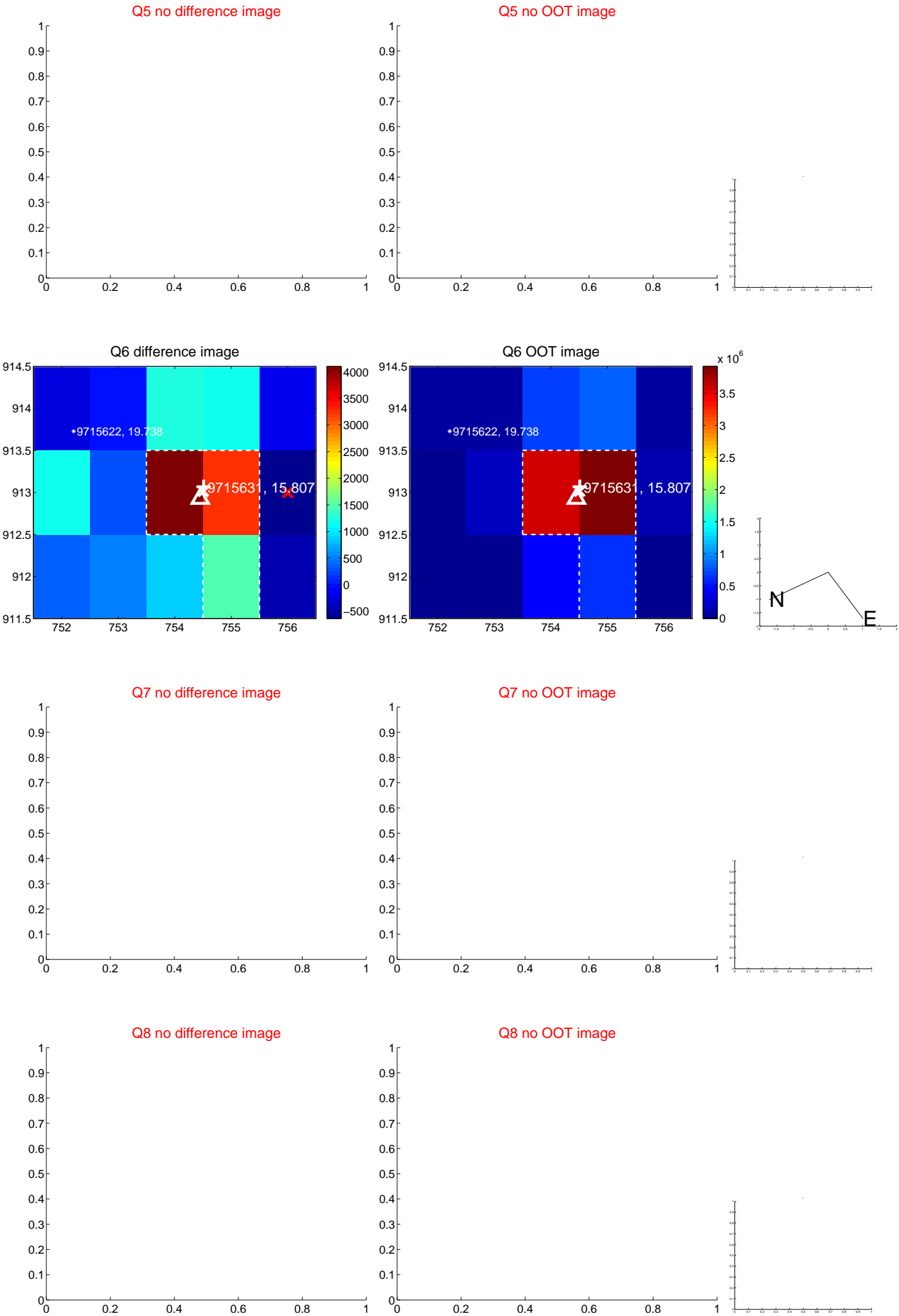


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



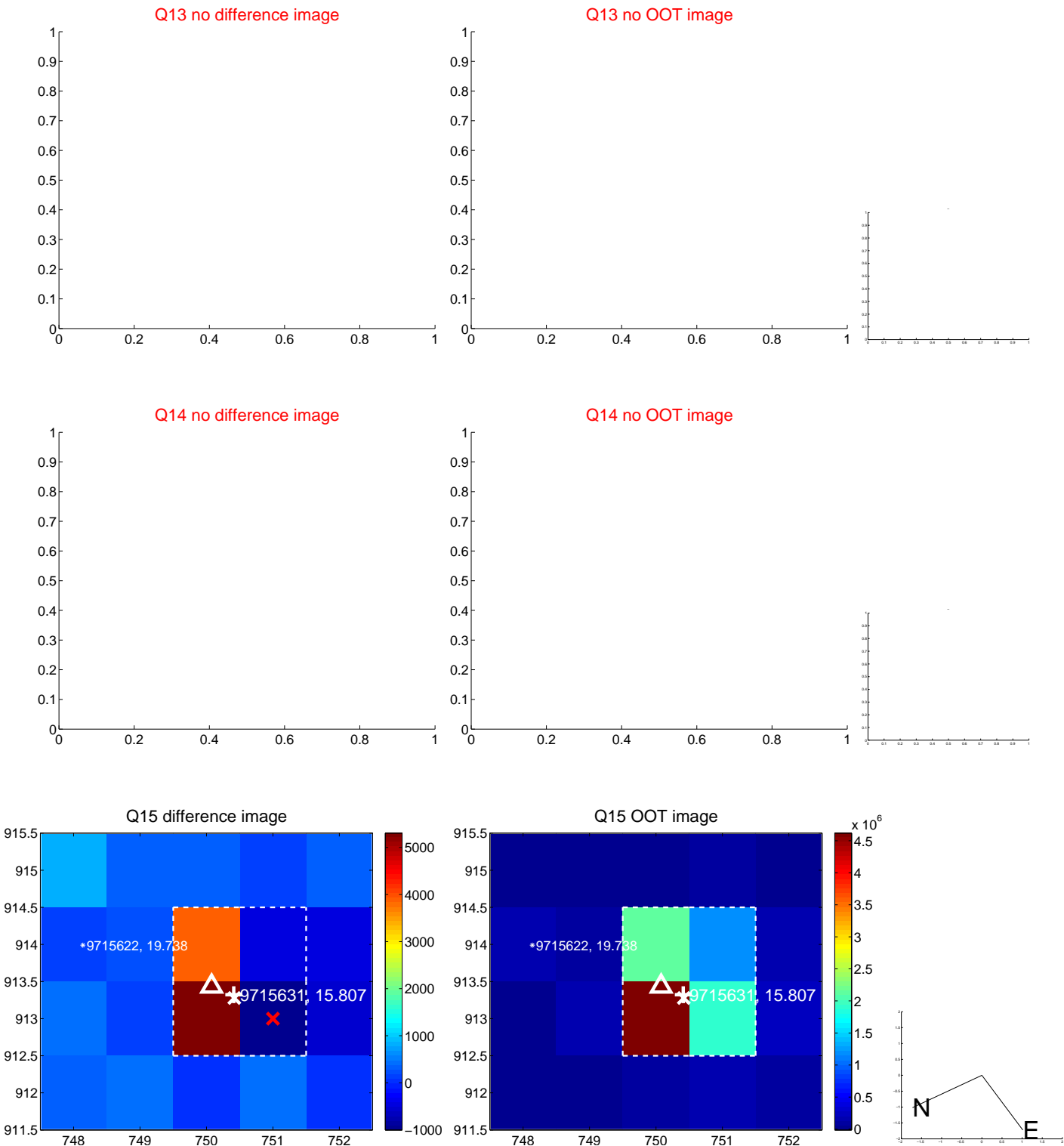
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



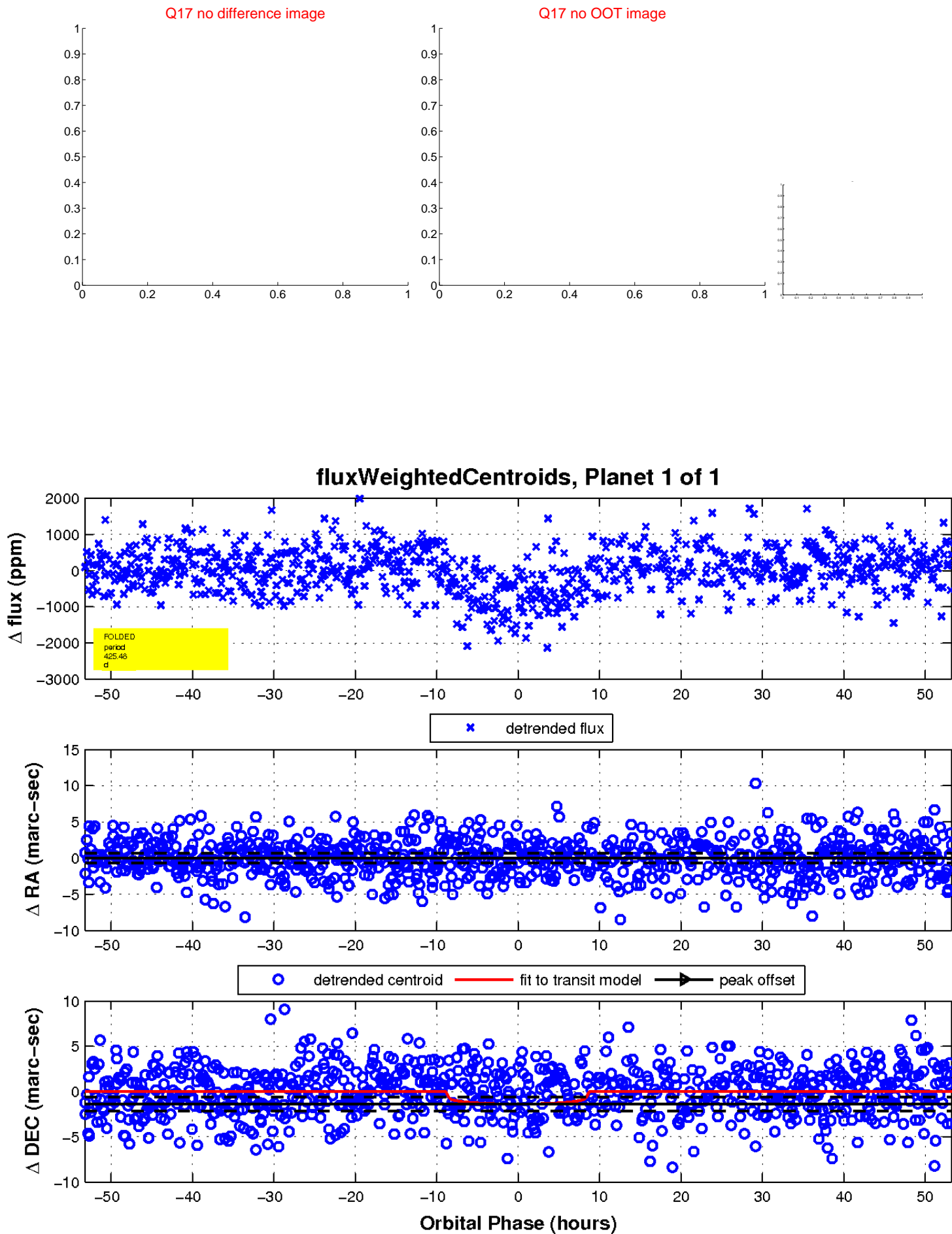
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

