

KIC 007798670

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007798670-01 | OBS | No | 384.761572 | 450.839107 | 195.7 | 5.083 | 7.3 | 7.3 | 1.87 | 6247 | 2.90 | 4.06 |
| 007798670-02 | OBS | No | 537.556898 | 372.145231 | 169.4 | 9.835 | 8.0 | 7.7 | 1.87 | 6247 | 3.15 | 2.60 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 007798670-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 007798670-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

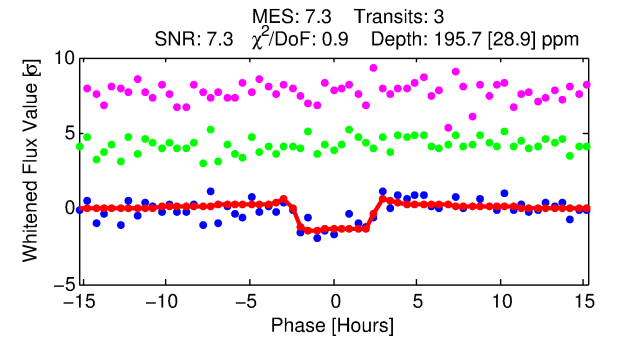
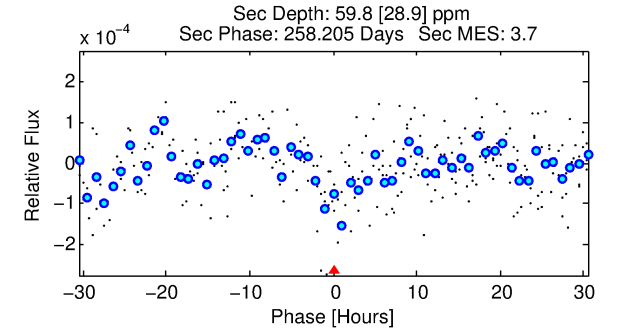
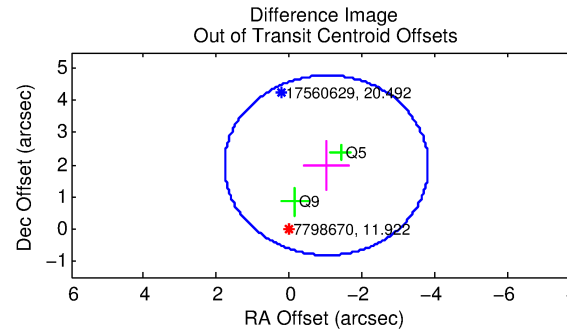
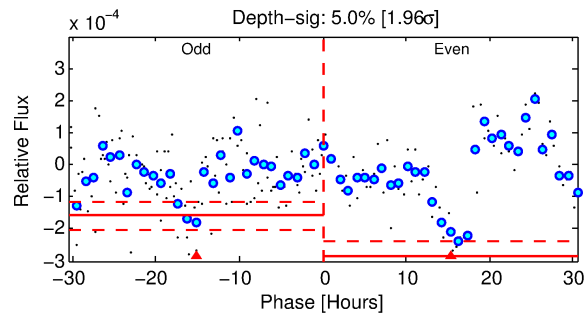
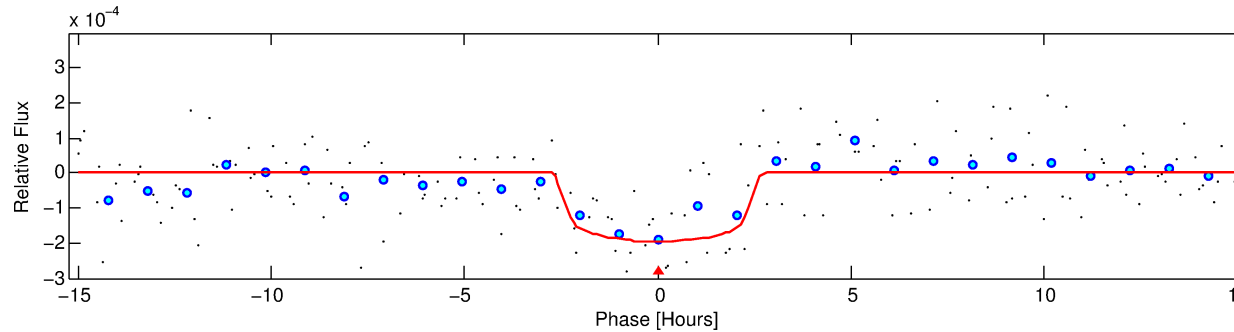
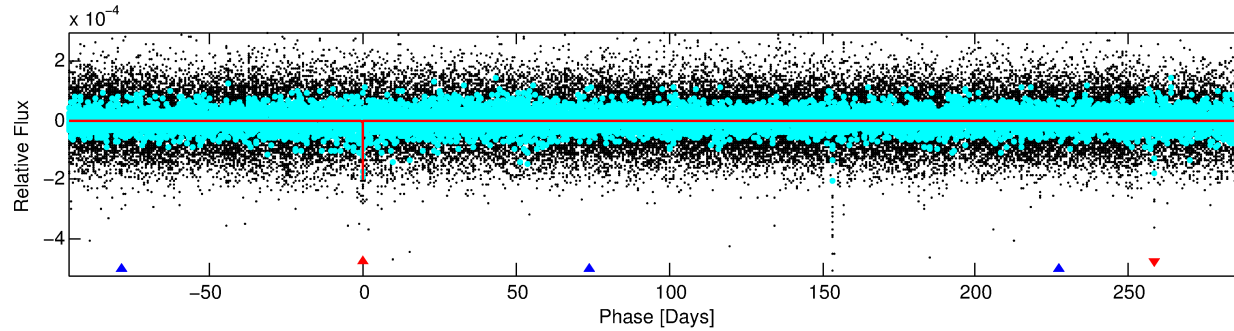
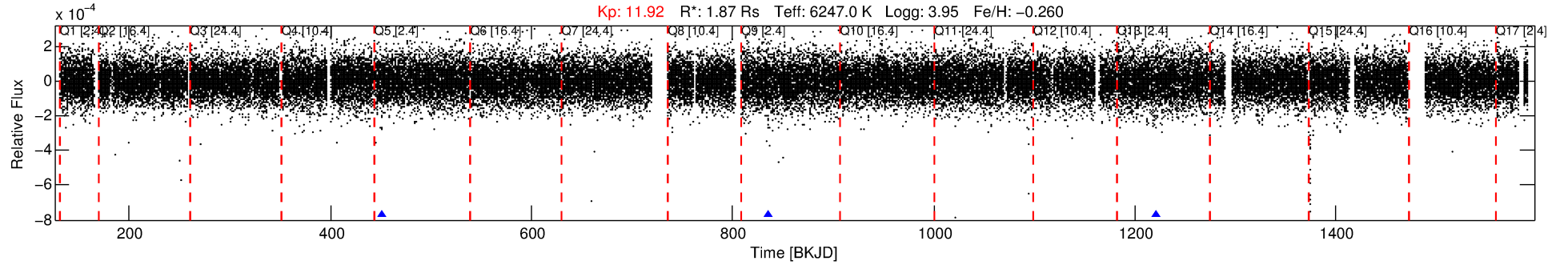
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007798670-01

No Significant Match Found

DV One-Page Summary

KIC: 7798670 Candidate: 1 of 2 Period: 384.762 d



DV Fit Results:

Period = 384.76157 [0.00711] d
Epoch = 450.8391 [0.0100] BKJD
Rp/R* = 0.0142 [0.0086]
a/R* = 354.67 [1123.64]
b = 0.81 [1.37]
Seff = 4.06 [1.92]
Teq = 362 [43] K
Rp = 2.90 [1.98] Re
a = 1.0841 [0.3178] AU
Ag = 4588.06 [6333.00] [0.72 σ]
Teffp = 4606 [1504] K [2.82 σ]

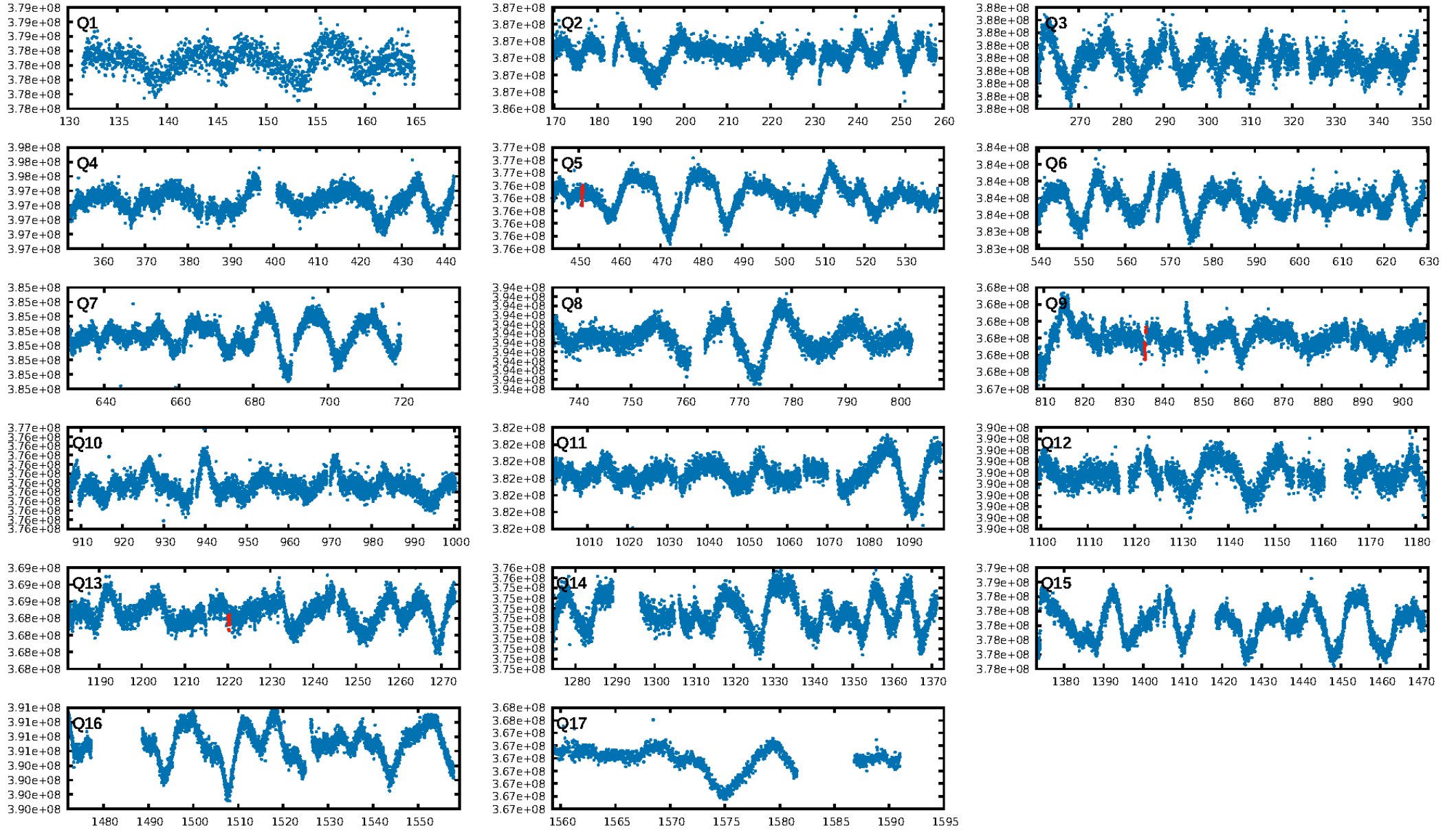
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [331.24 σ]
ModelChiSquare2-sig: 17.1%
ModelChiSquareGof-sig: 89.9%
Bootstrap-pfa: 2.37e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -10.86
Centroid-sig: 52.0%
Centroid-so: 0.984 arcsec [0.66 σ]
OotOffset-rm: 2.228 arcsec [2.38 σ]
KicOffset-rm: 2.146 arcsec [2.35 σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

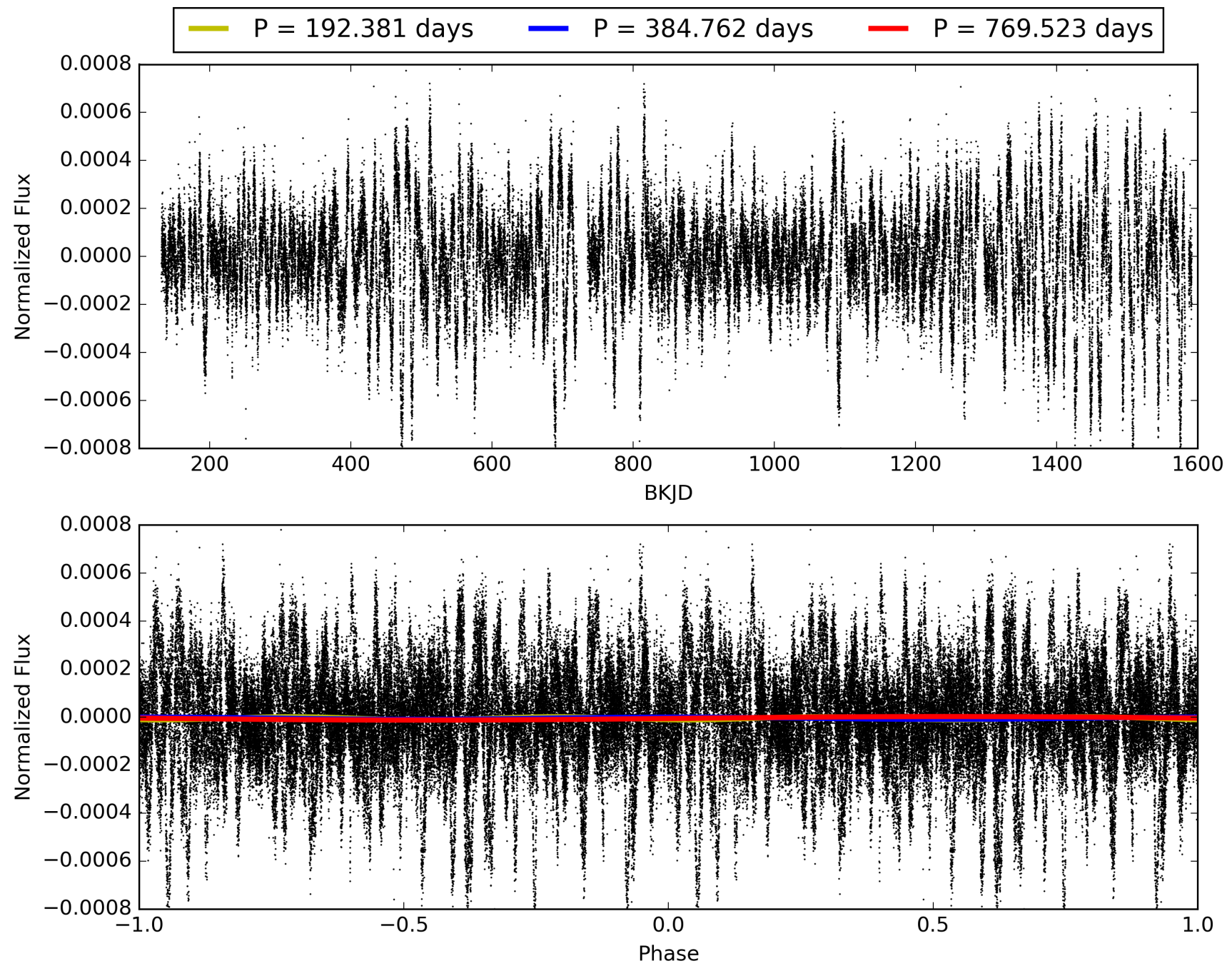
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:12:44 Z

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

TCE 007798670-01, PDC Light Curves

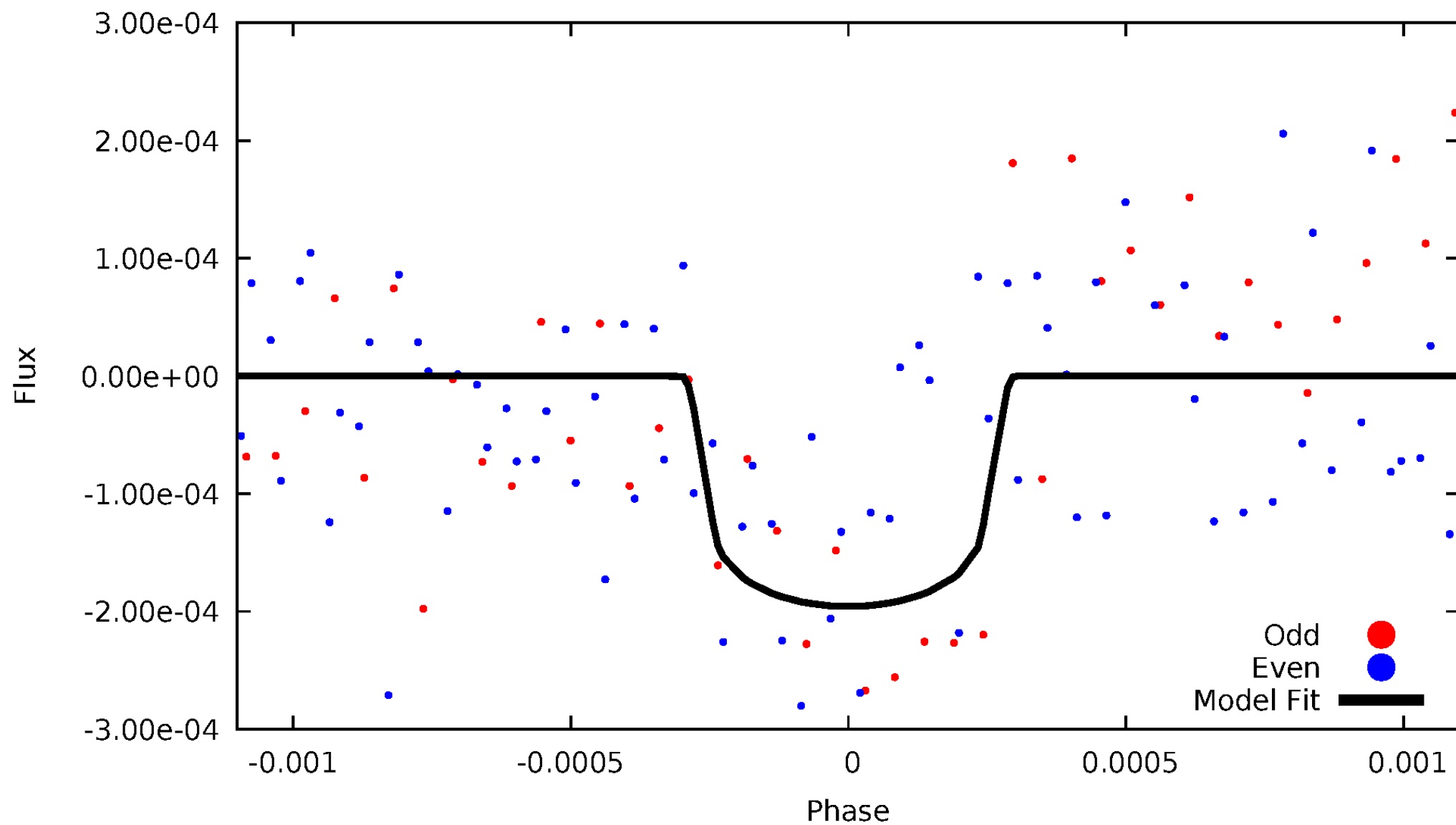


TCE 007798670-01



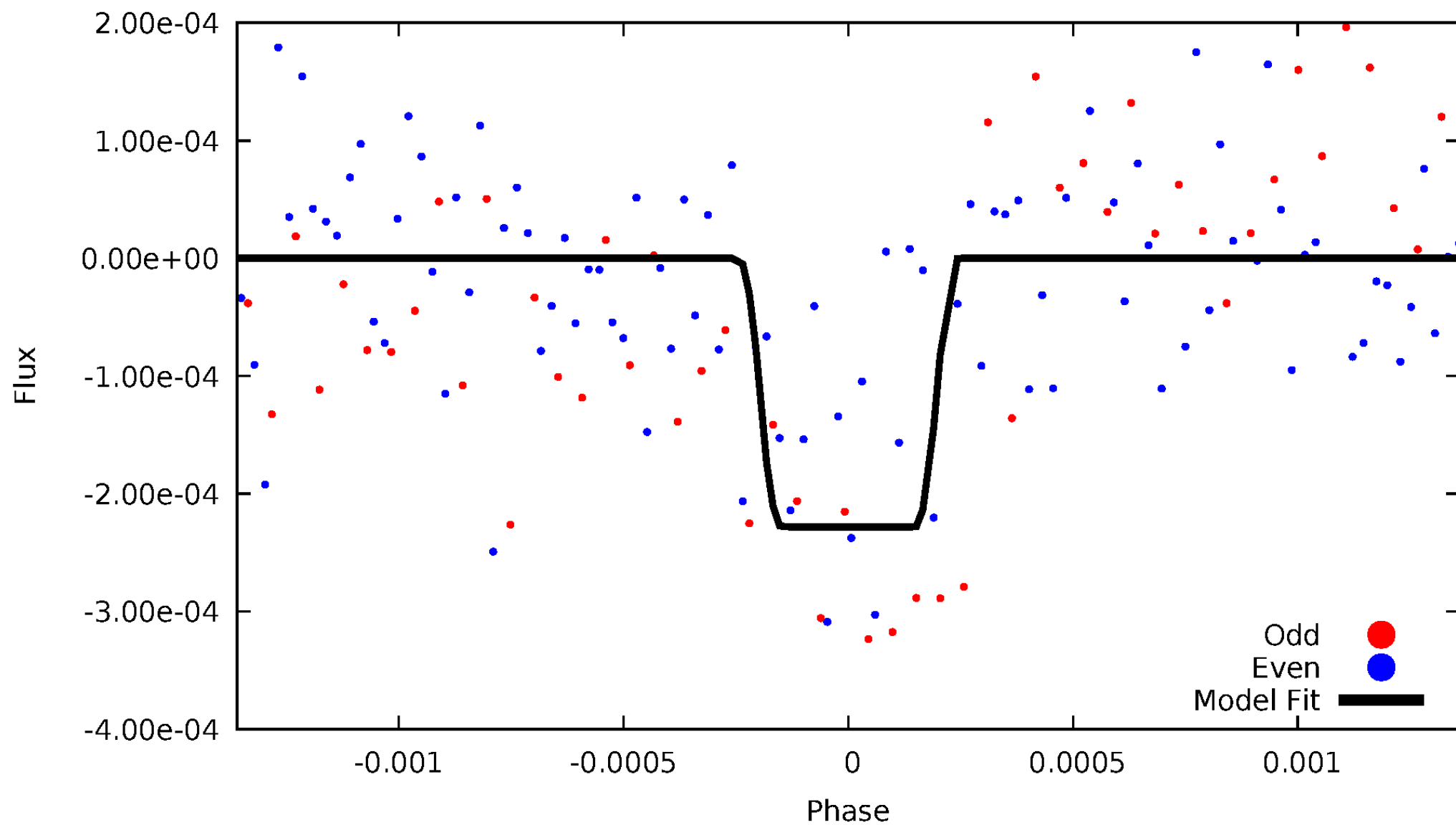
DV Odd/Even

TCE 007798670-01



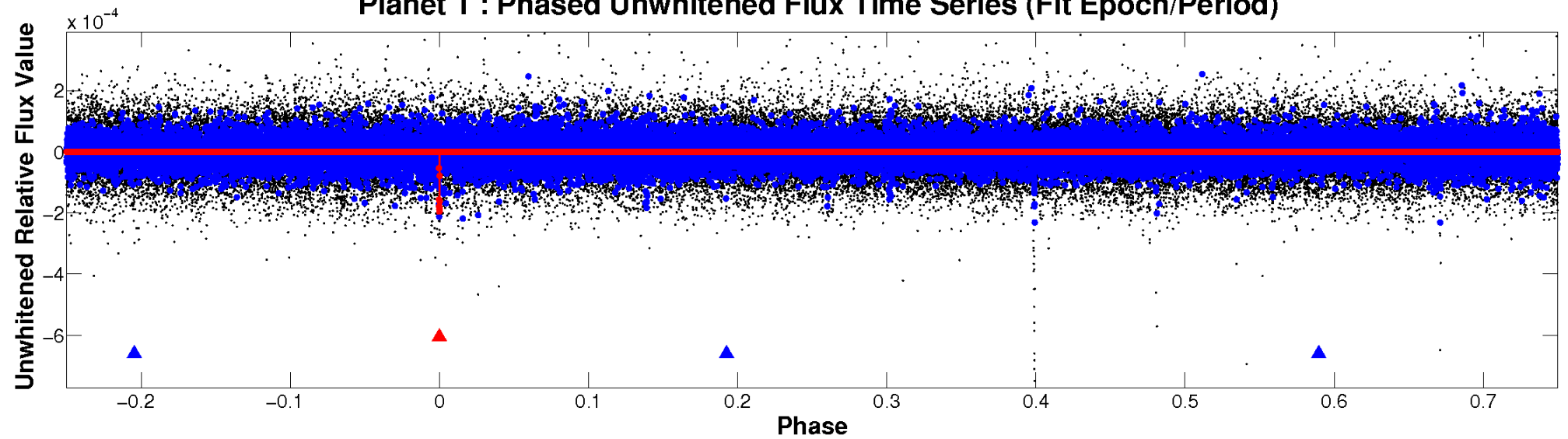
ALT Odd/Even

TCE 007798670-01

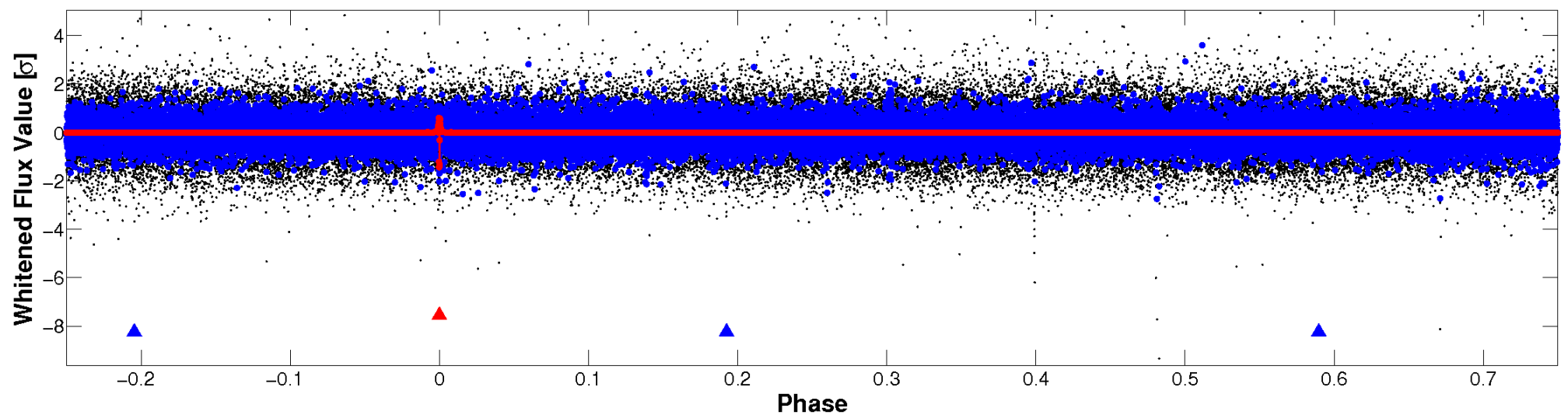


Non-Whitened Vs. Whitened Light Curve

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

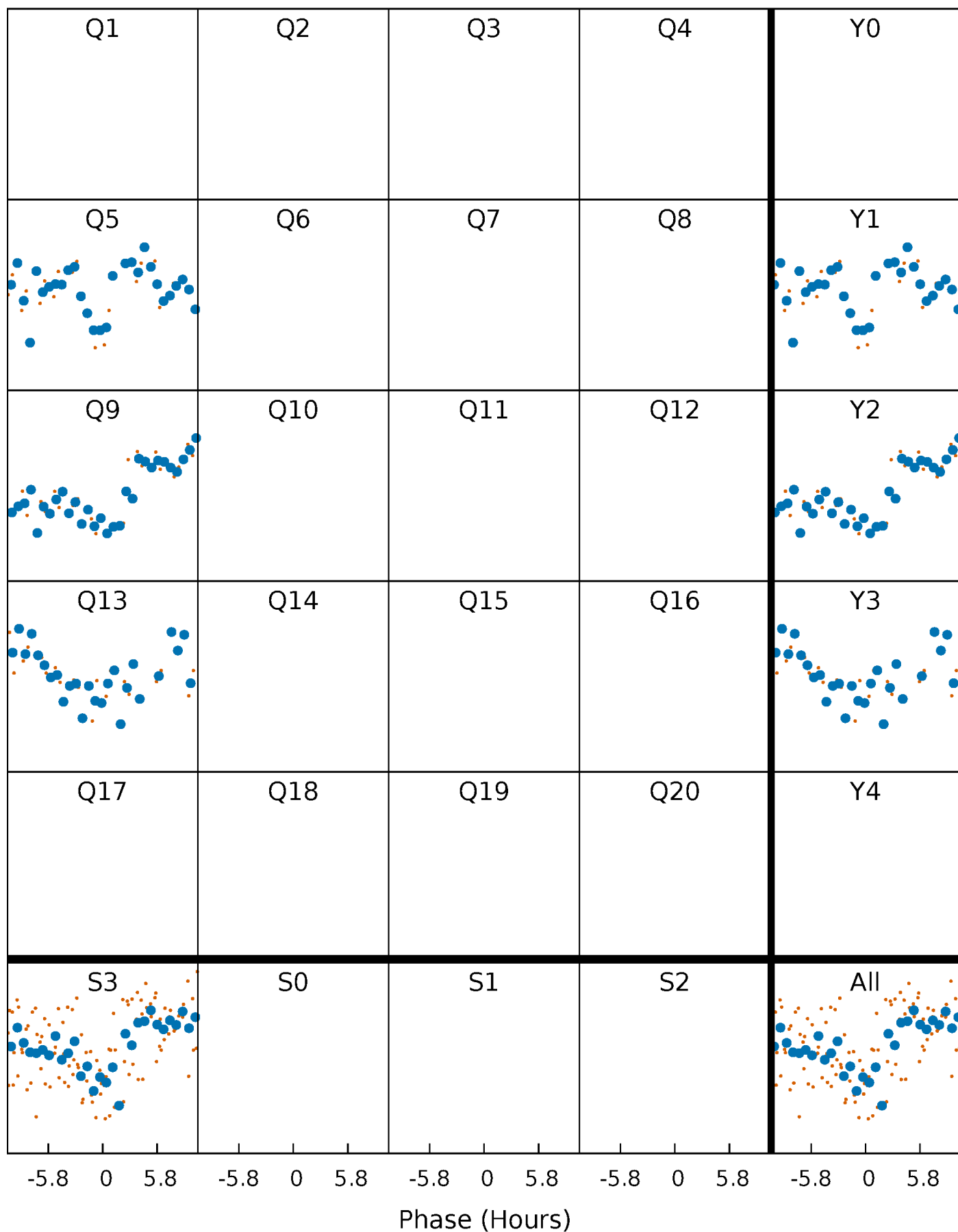


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



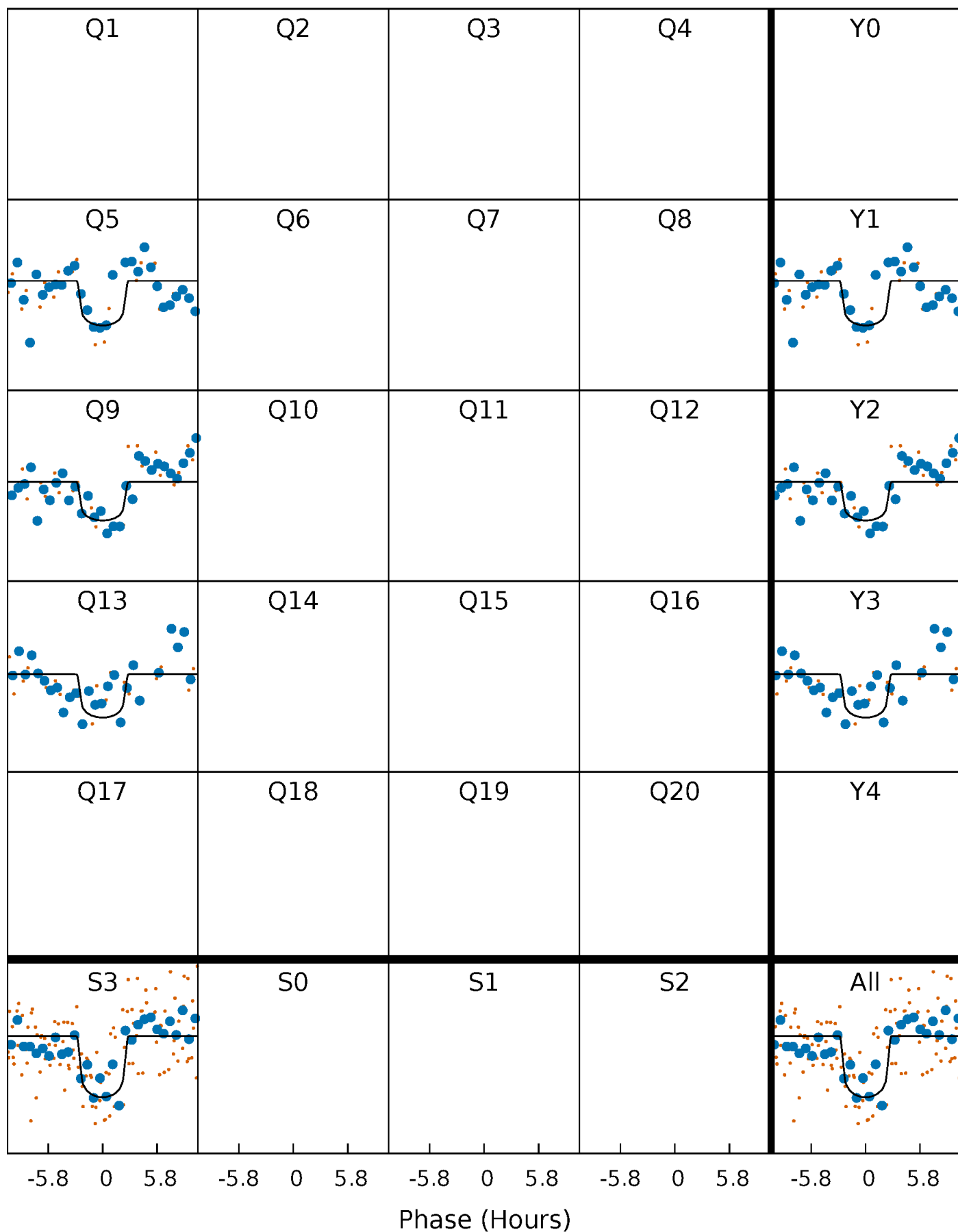
PDC Quarter-Phased Transit Curves

TCE 007798670-01 P=384.761572 Days $T_0=450.839107$ (BKJD)



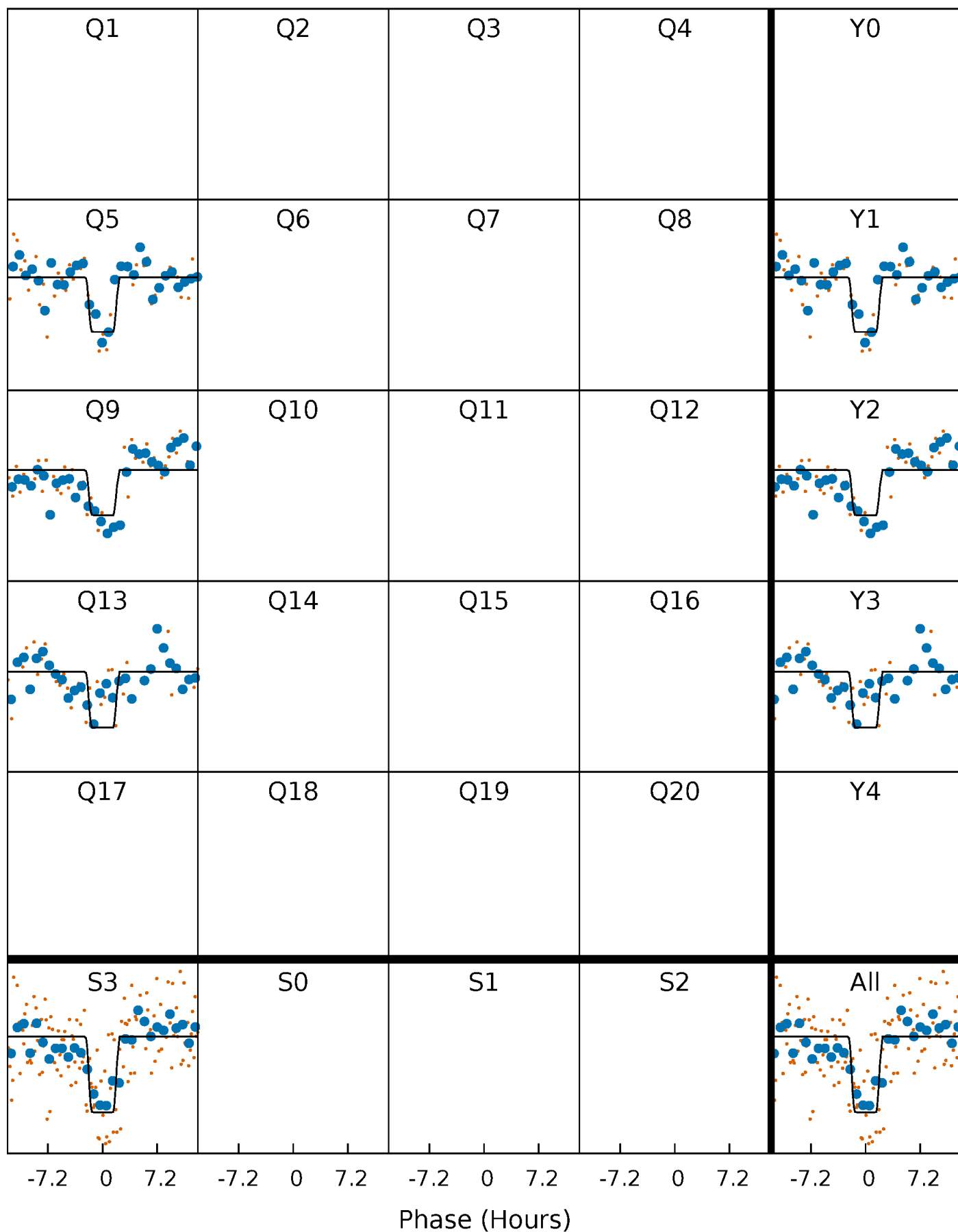
DV Quarter-Phased Transit Curves

TCE 007798670-01 P=384.761572 Days $T_0=450.839107$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

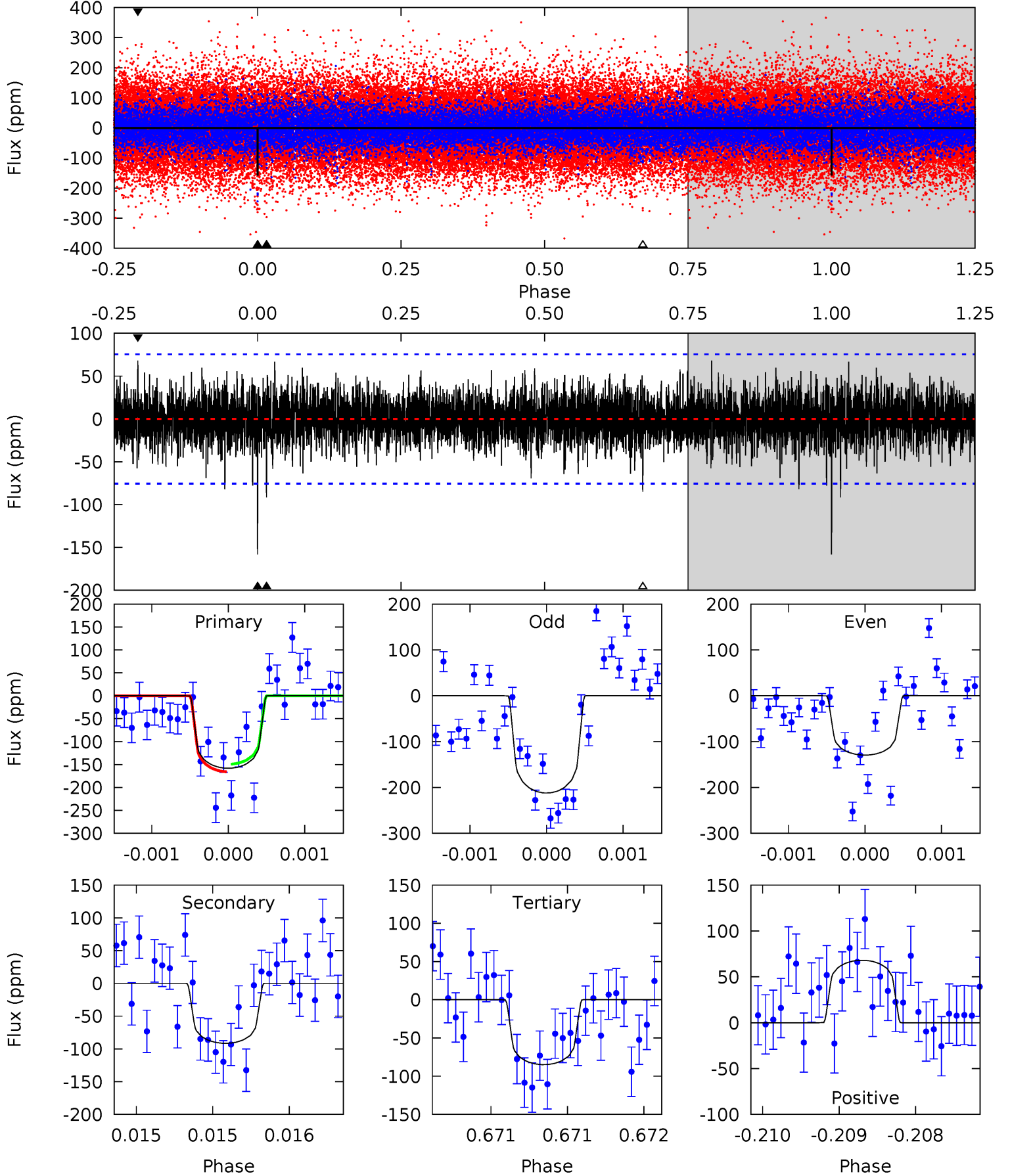
TCE 007798670-01 P=384.770746 Days $T_0=450.824428$ (BKJD)



DV Model-Shift Uniqueness Test

007798670-01, $P = 384.761572$ Days, $E = 66.077535$ Days

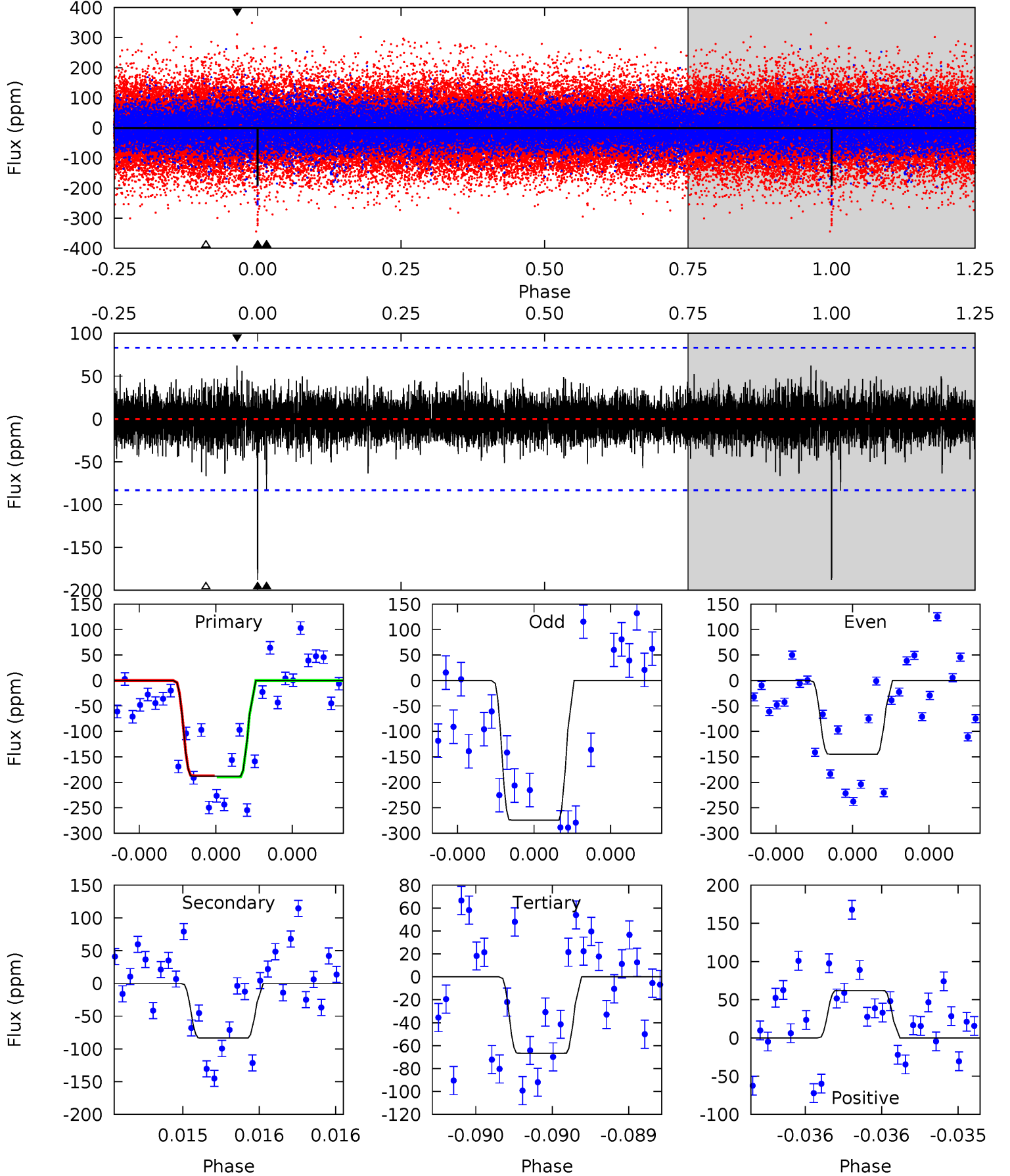
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.6 | 6.71 | 6.23 | 4.99 | 5.54 | 3.43 | 1.38 | 5.37 | 6.61 | 0.49 | 1.72 | 2.92 | 1.12 | 0.30 | 0.61 |



Alt Model-Shift Uniqueness Test

007798670-01, $P = 384.770746$ Days, $E = 66.053682$ 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 | 5.61 | 4.48 | 4.16 | 5.59 | 3.50 | 1.01 | 8.15 | 8.47 | 1.13 | 1.44 | 4.11 | 0.97 | 0.25 | 0.08 |



Stellar Parameters For KIC 007798670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6247^{+160}_{-176} | $3.954^{+0.266}_{-0.114}$ | $-0.260^{+0.300}_{-0.300}$ | $1.870^{+0.394}_{-0.590}$ | $1.146^{+0.213}_{-0.175}$ | $0.247^{+0.422}_{-0.086}$ |
| | +3%/-3% | +7%/-3% | +115%/-115% | +21%/-32% | +19%/-15% | +171%/-35% |
| 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 007798670-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|--------------|------------------------|-------------------|-----------------------|-------------------------|
| DV | -91 ± 14 | $2.80^{+1.78}_{-1.48}$ | 498^{+33}_{-42} | 5111^{+2407}_{-820} | 7646^{+26670}_{-4880} |
| Alt. | -83 ± 15 | $2.91^{+1.85}_{-1.53}$ | 498^{+32}_{-44} | 4975^{+2028}_{-864} | 6152^{+20901}_{-3745} |

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 $A_{obs} \gg 1.0$

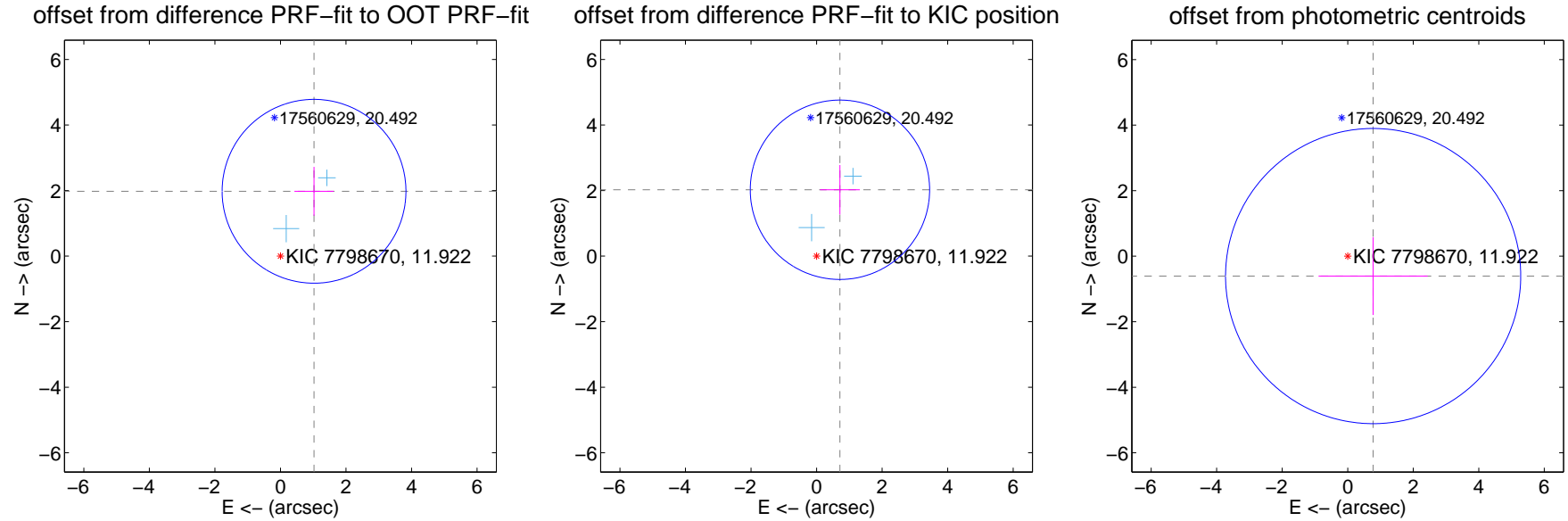
DV Centroid Data

Supplemental centroid analysis for 007798670-01. **Kepler magnitude: 11.92.** Transit SNR 7.26

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 2.228 ± 0.935 | 2.38 | -1.025 ± 0.598 | 1.978 ± 0.745 |
| PRF-fit source offset from KIC position | 2.146 ± 0.912 | 2.35 | -0.713 ± 0.607 | 2.024 ± 0.755 |
| photometric centroid source offset | 0.98 ± 1.50 | 0.66 | -0.78 ± 1.66 | -0.61 ± 1.19 |

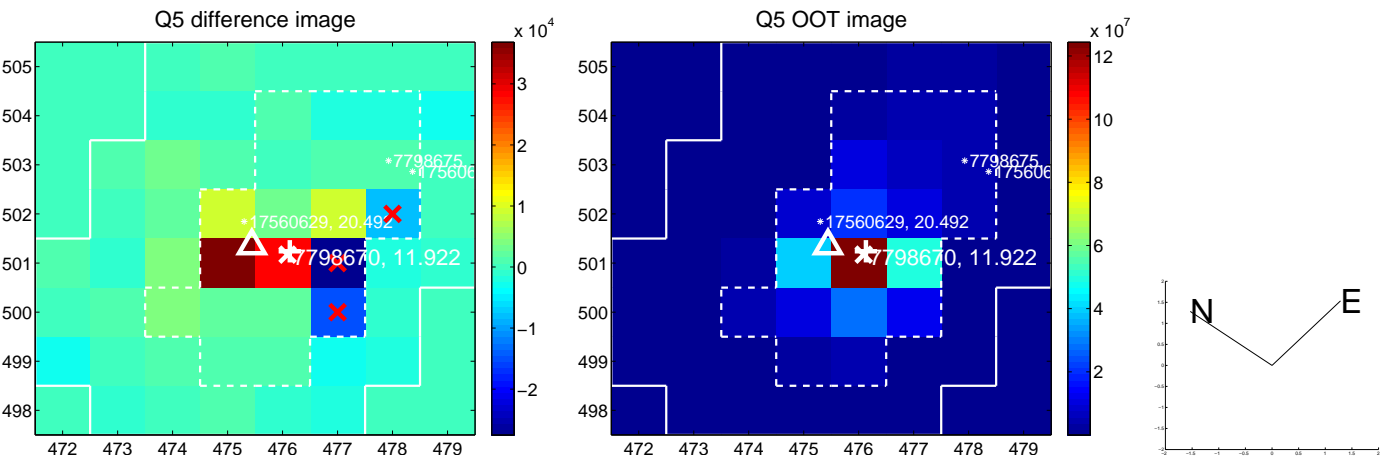


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

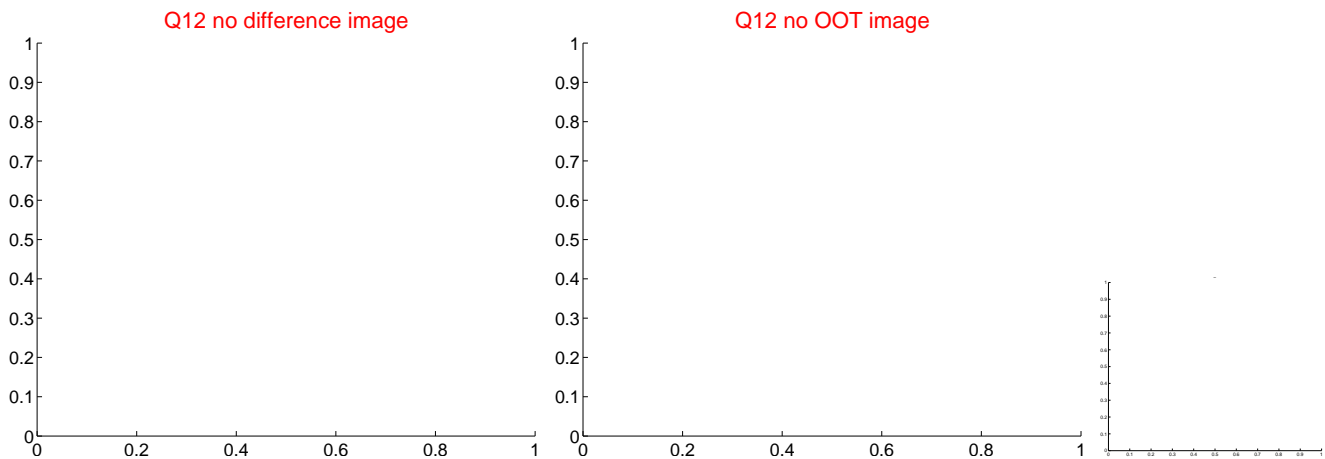
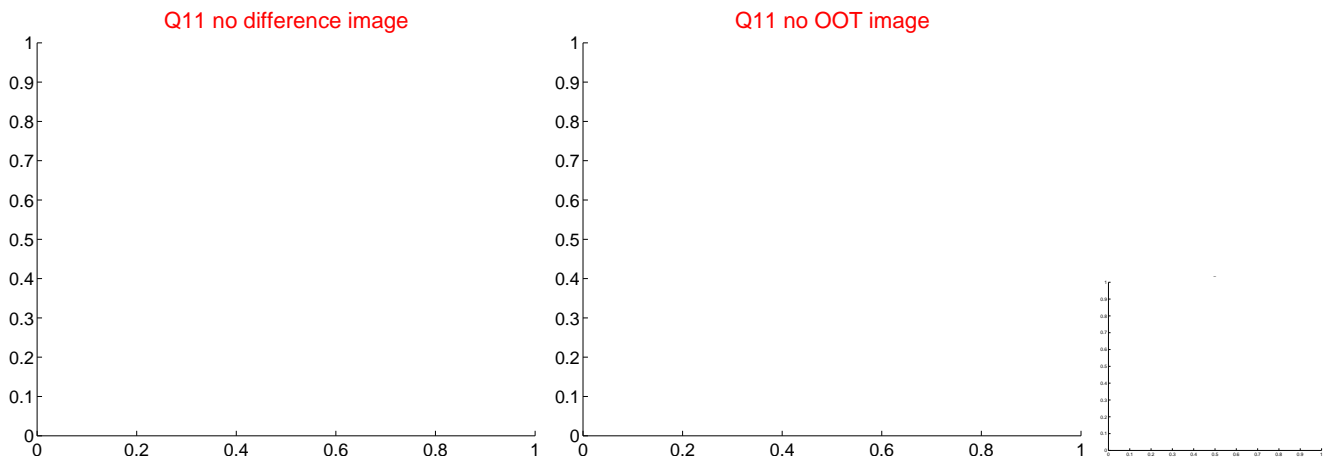
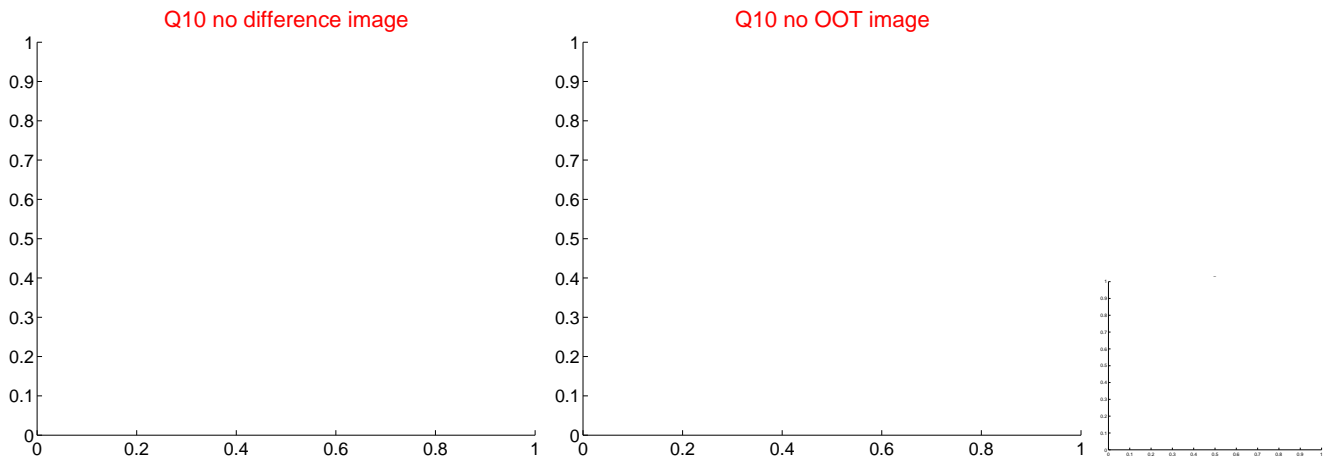
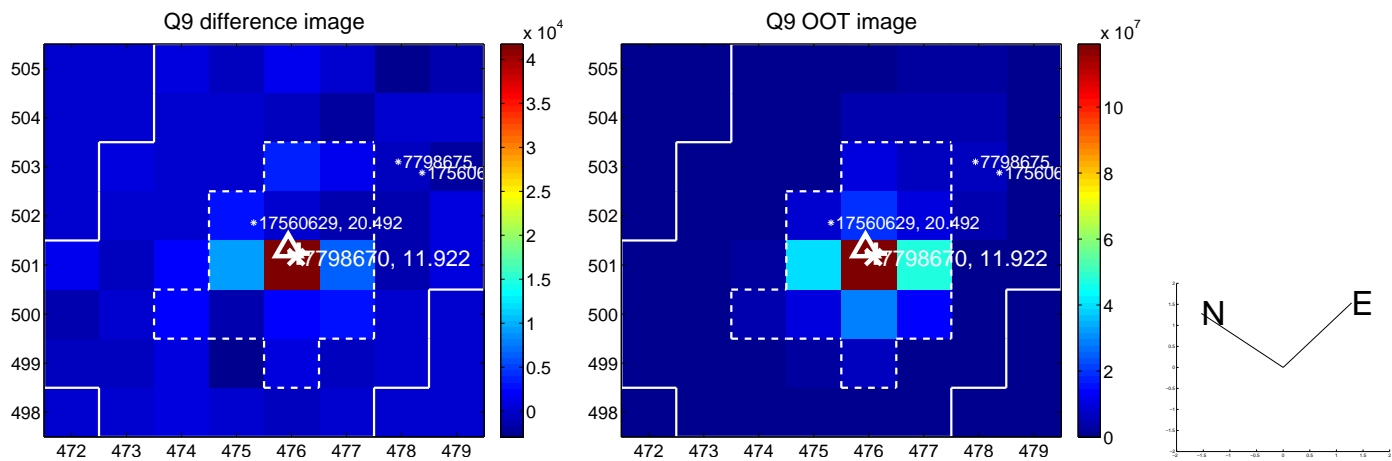
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



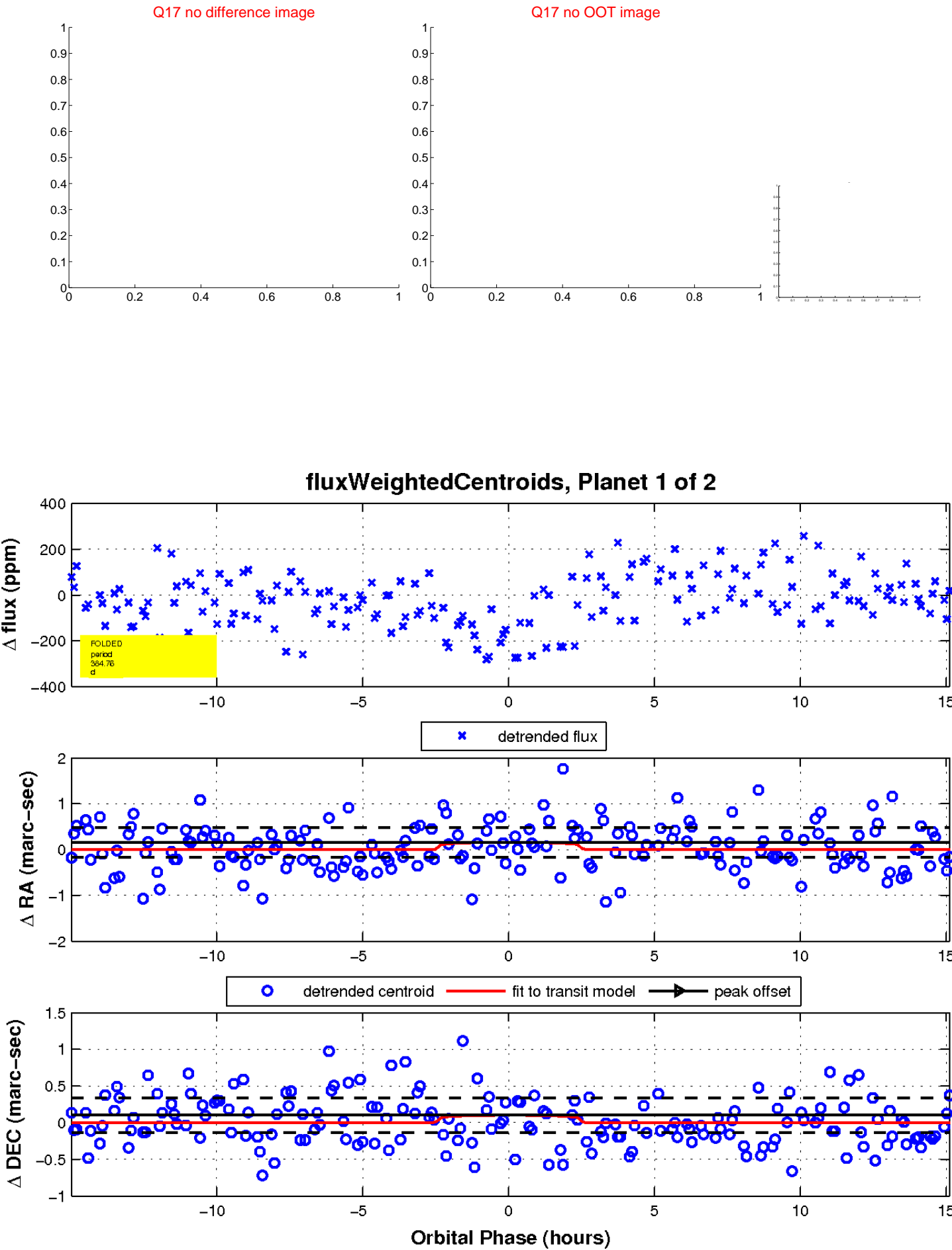
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



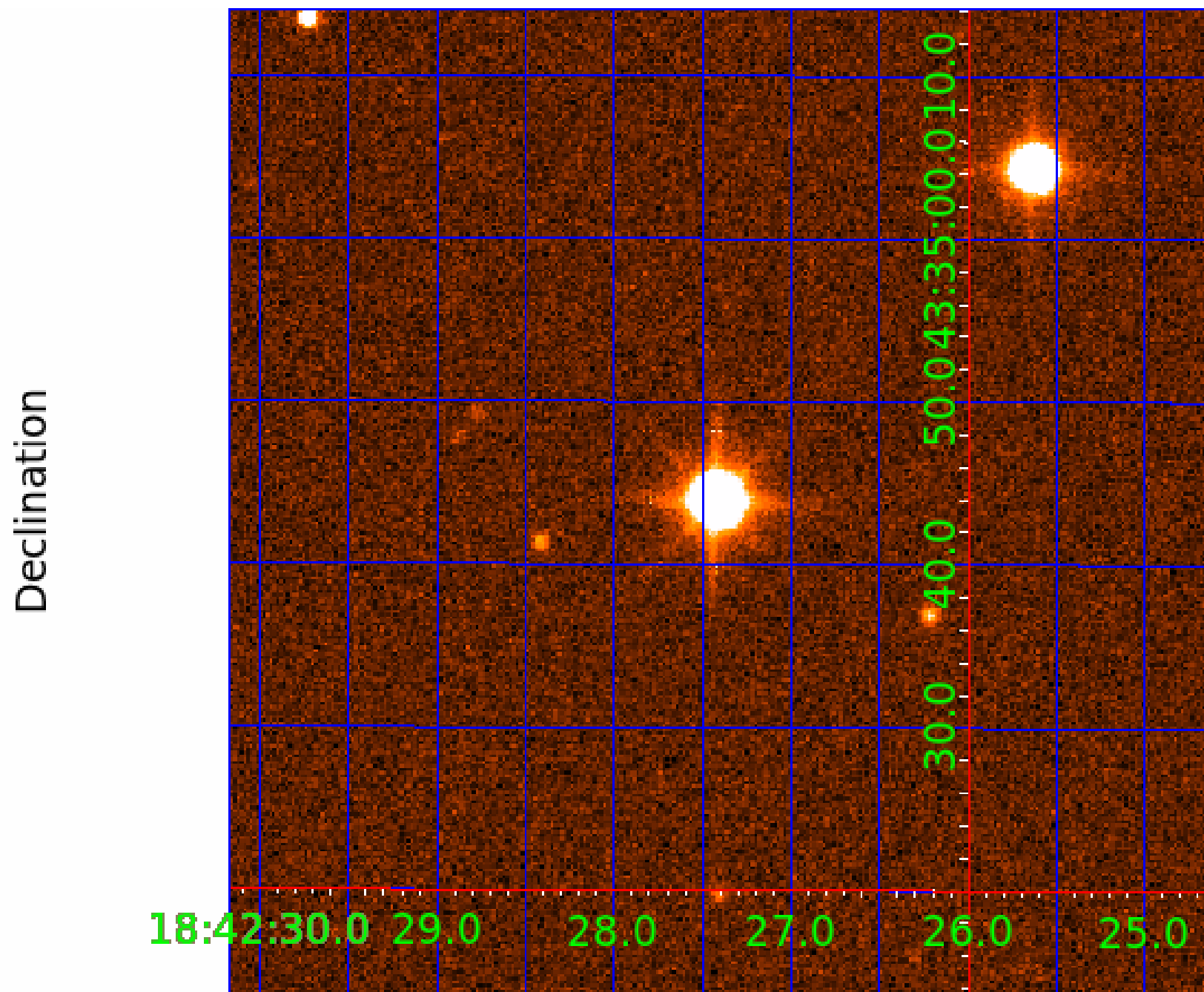
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007798670

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007798670-01 | OBS | No | 384.761572 | 450.839107 | 195.7 | 5.083 | 7.3 | 7.3 | 1.87 | 6247 | 2.90 | 4.06 |
| 007798670-02 | OBS | No | 537.556898 | 372.145231 | 169.4 | 9.835 | 8.0 | 7.7 | 1.87 | 6247 | 3.15 | 2.60 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 007798670-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 007798670-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

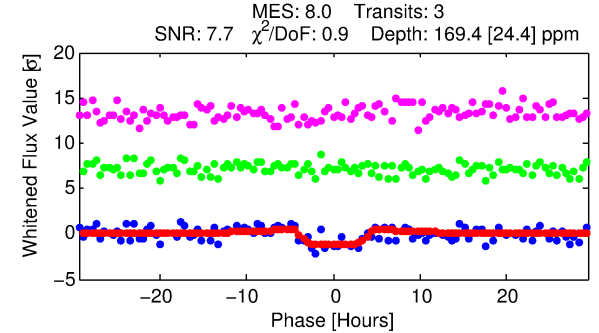
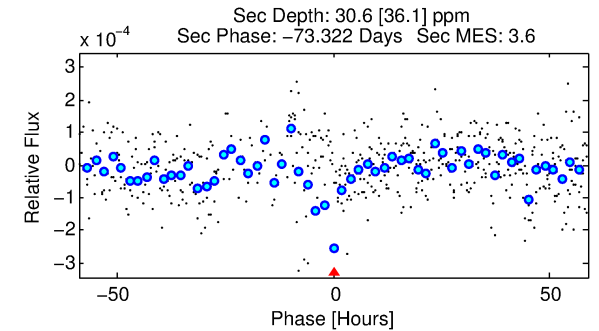
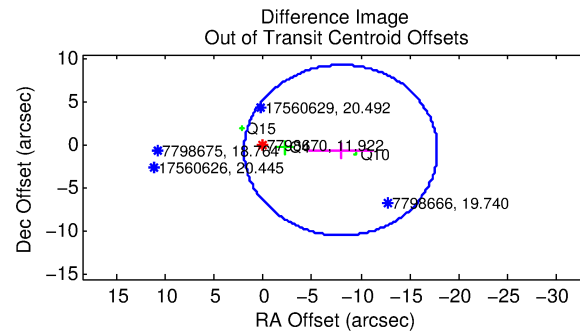
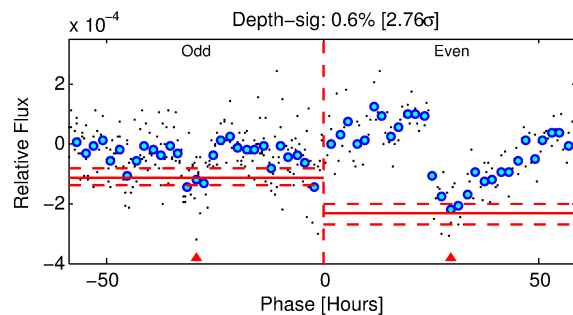
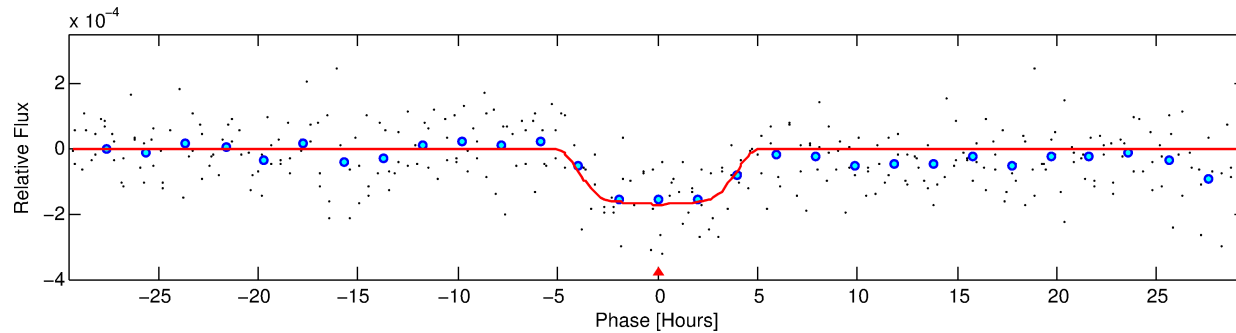
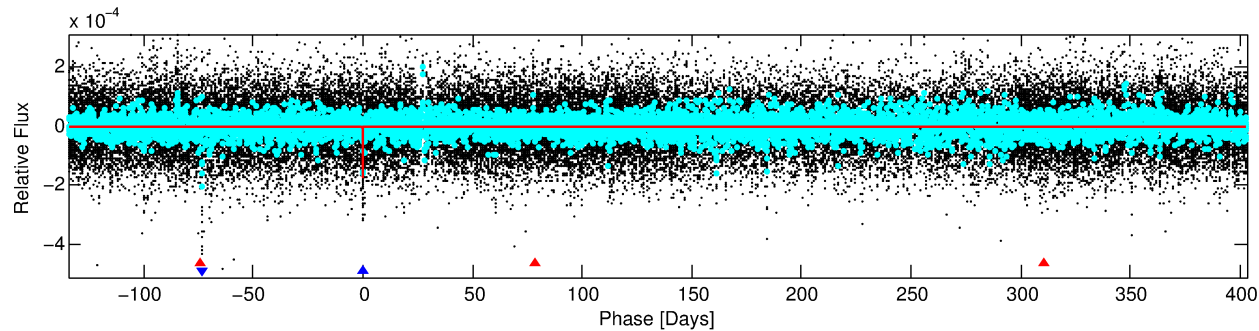
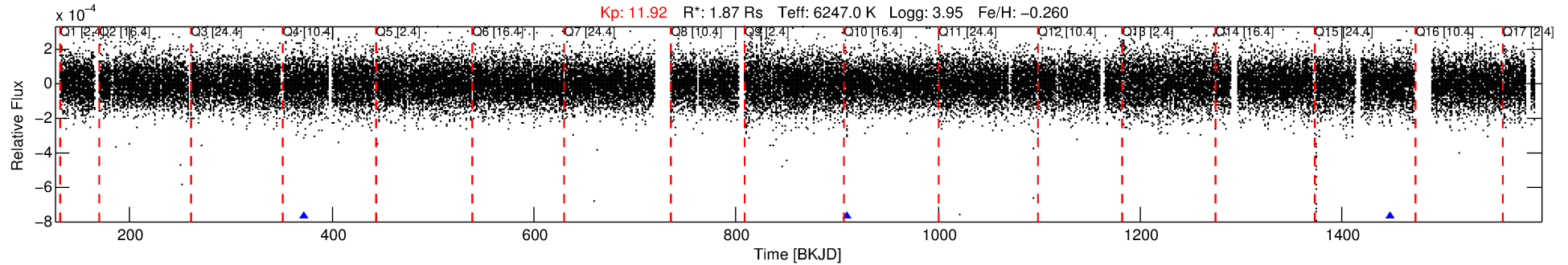
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007798670-02

No Significant Match Found

DV One-Page Summary

KIC: 7798670 Candidate: 2 of 2 Period: 537.557 d



DV Fit Results:

Period = 537.55690 [0.01411] d
 Epoch = 372.1452 [0.0185] BKJD
 Rp/R* = 0.0154 [0.0014]
 a/R* = 125.23 [32.84]
 b = 0.97 [0.02]
 Seff = 2.60 [1.23]
 Teq = 324 [38] K
 Rp = 3.15 [1.03] Re
 a = 1.3548 [0.3971] AU
 Ag = 3113.28 [3989.41] [0.78 σ]
 Teffp = 3739 [1123] K [3.04 σ]

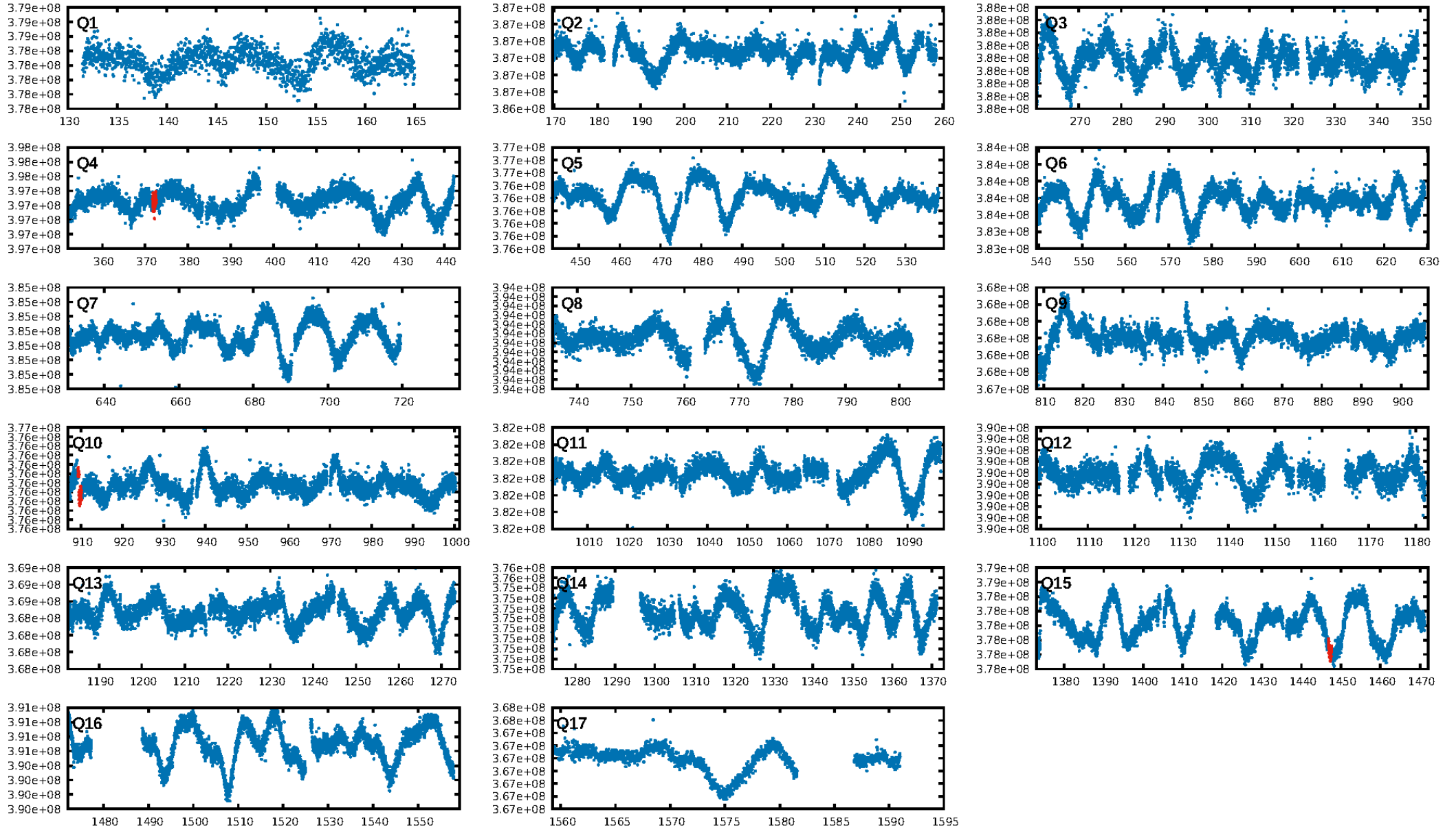
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [331.24 σ]
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 16.8%
 ModelChiSquareGof-sig: 99.0%
 Bootstrap-pfa: 3.21e-11
 RollingBand-fgt: 1.00 [3/3]
 GhostDiagnostic-chr: -11.09
 Centroid-sig: 5.6%
 Centroid-so: 1.934 arcsec [1.37 σ]
 OotOffset-rm: 7.964 arcsec [2.42 σ]
 KicOffset-rm: 7.616 arcsec [2.30 σ]
 OotOffset-st: 1/1/1/0 [3]
 KicOffset-st: 1/1/1/0 [3]
 DiffImageQuality-fgm: 1.00 [3/3]
 DiffImageOverlap-fno: 1.00 [3/3]

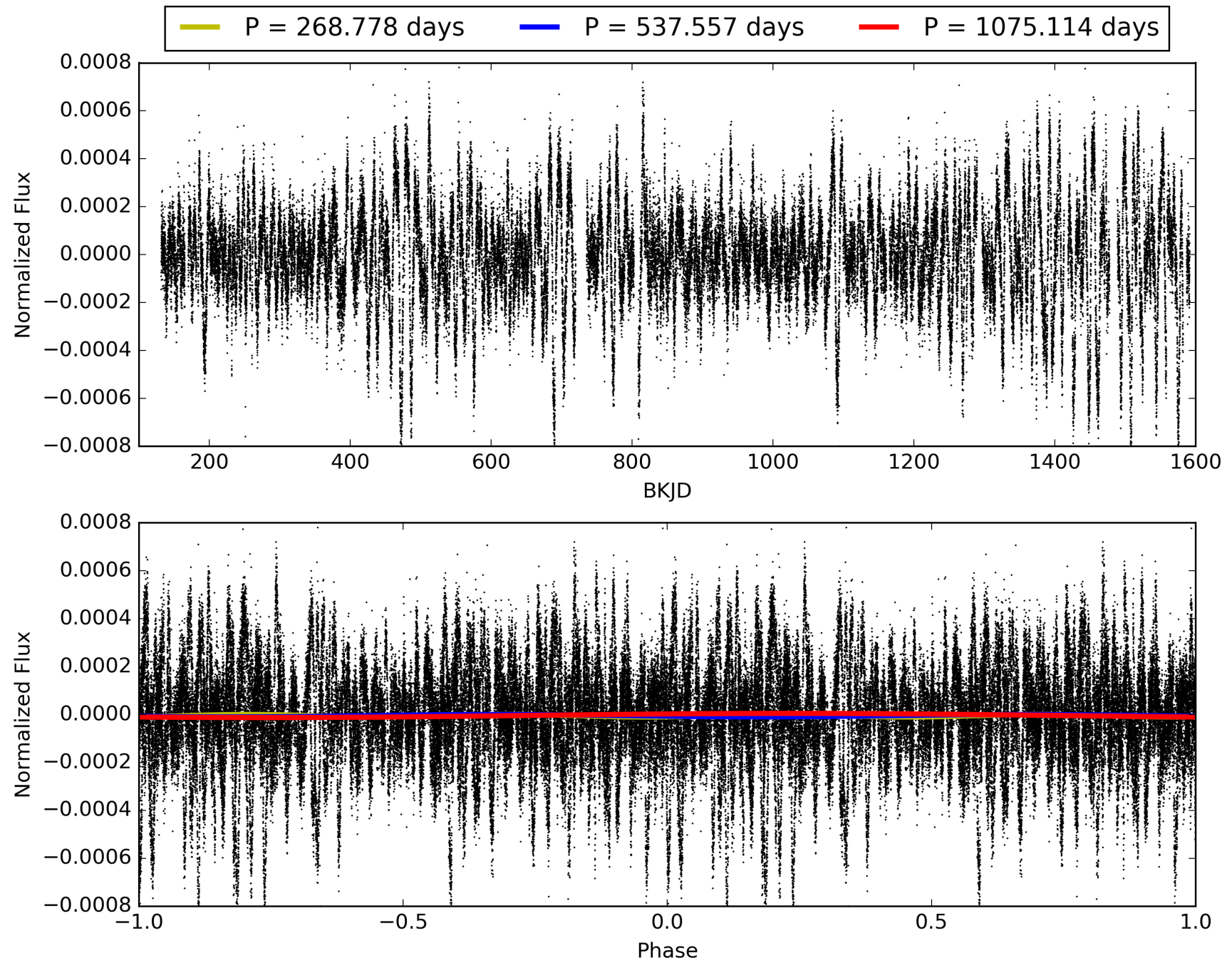
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:12:56 Z

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

TCE 007798670-02, PDC Light Curves

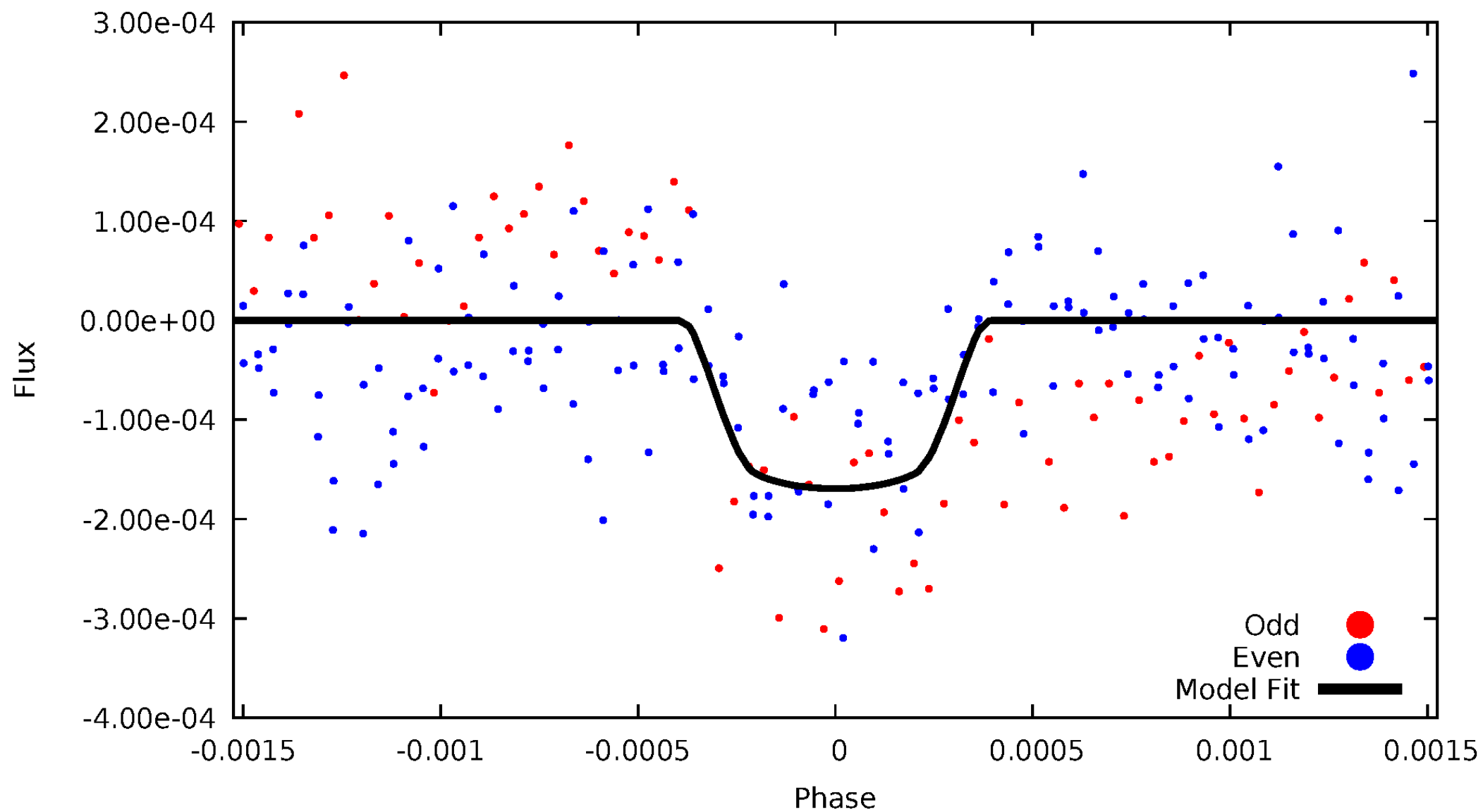


TCE 007798670-02



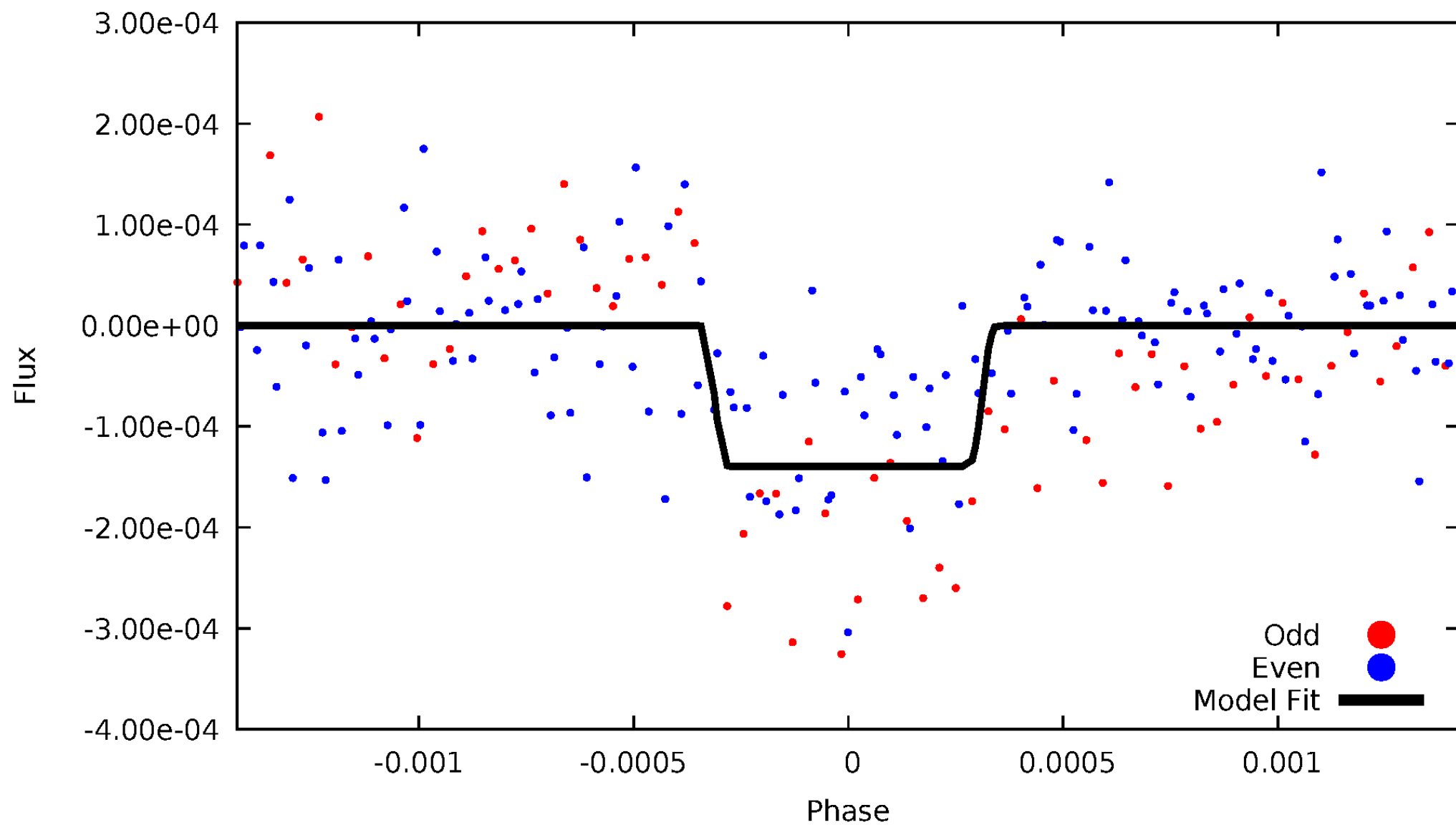
DV Odd/Even

TCE 007798670-02



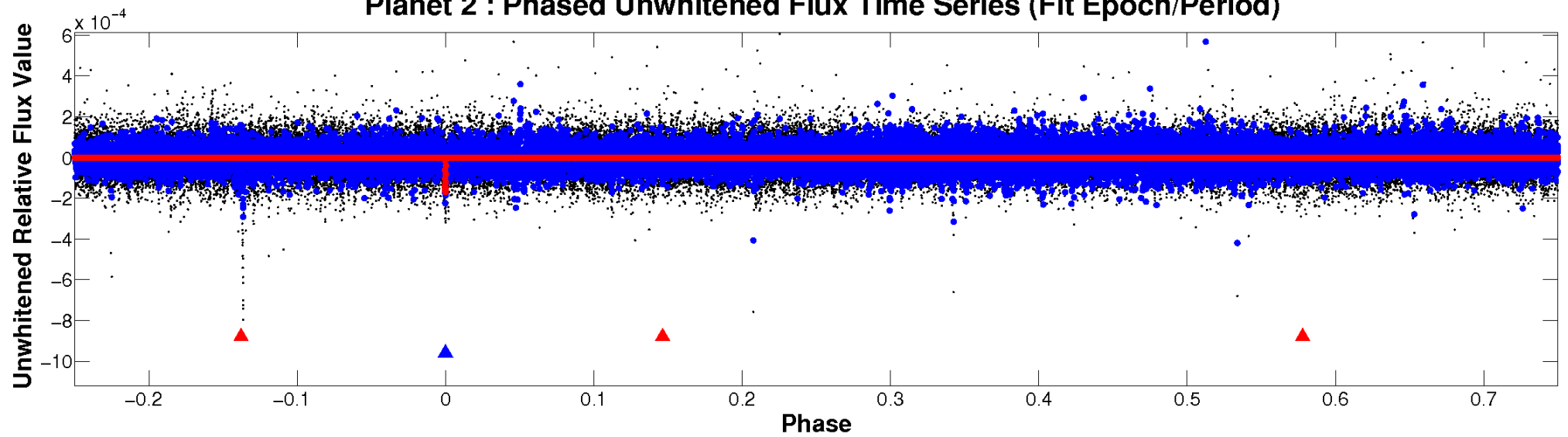
ALT Odd/Even

TCE 007798670-02

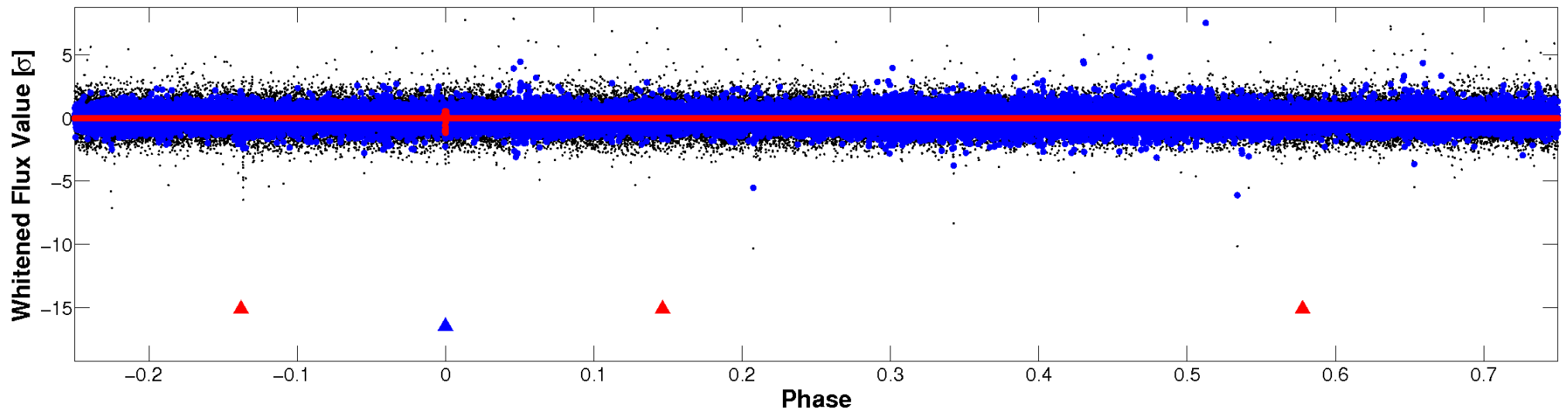


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 007798670-02 $P=537.556898$ Days $T_0=372.145231$ (BKJD)



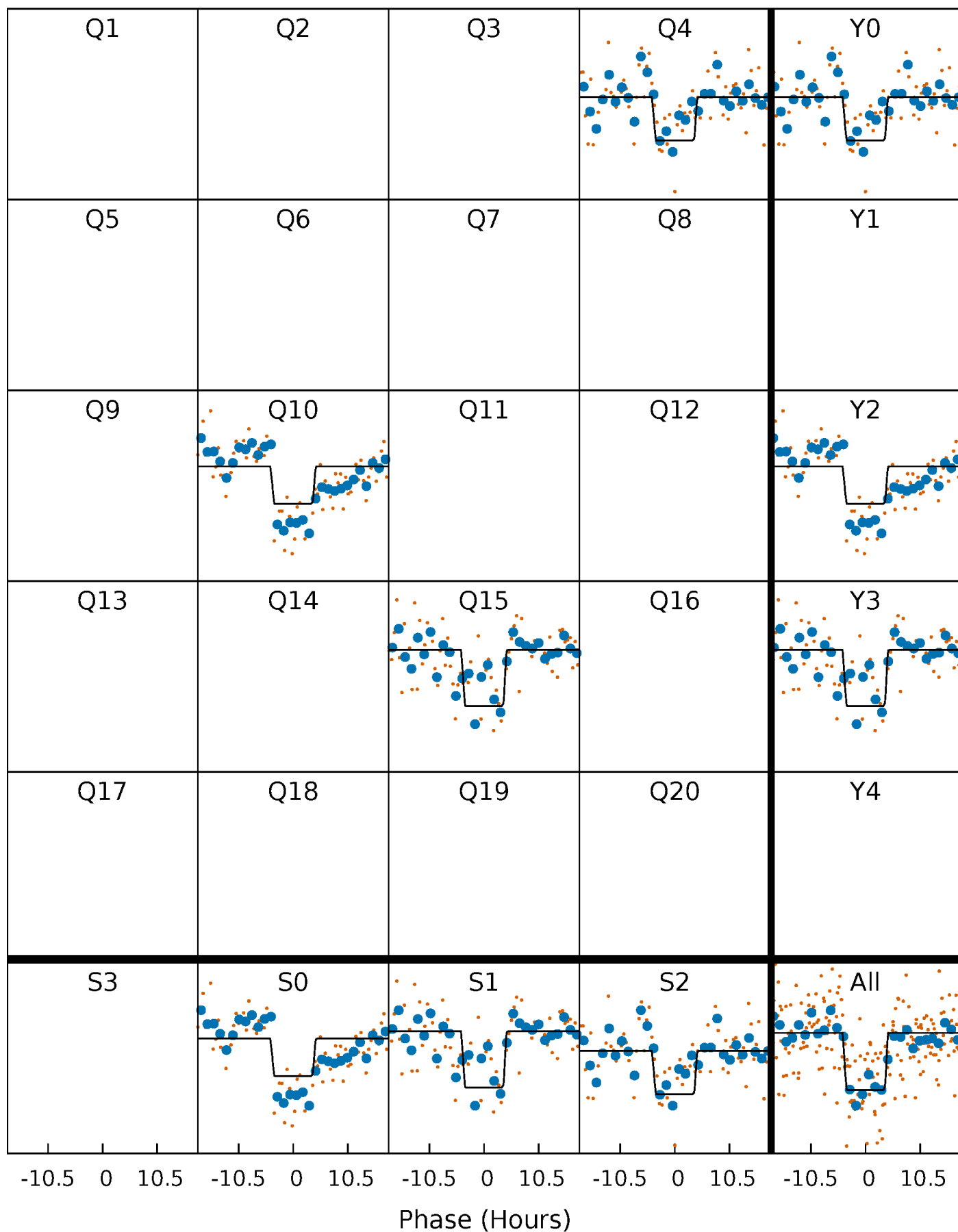
DV Quarter-Phased Transit Curves

TCE 007798670-02 P=537.556898 Days $T_0=372.145231$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

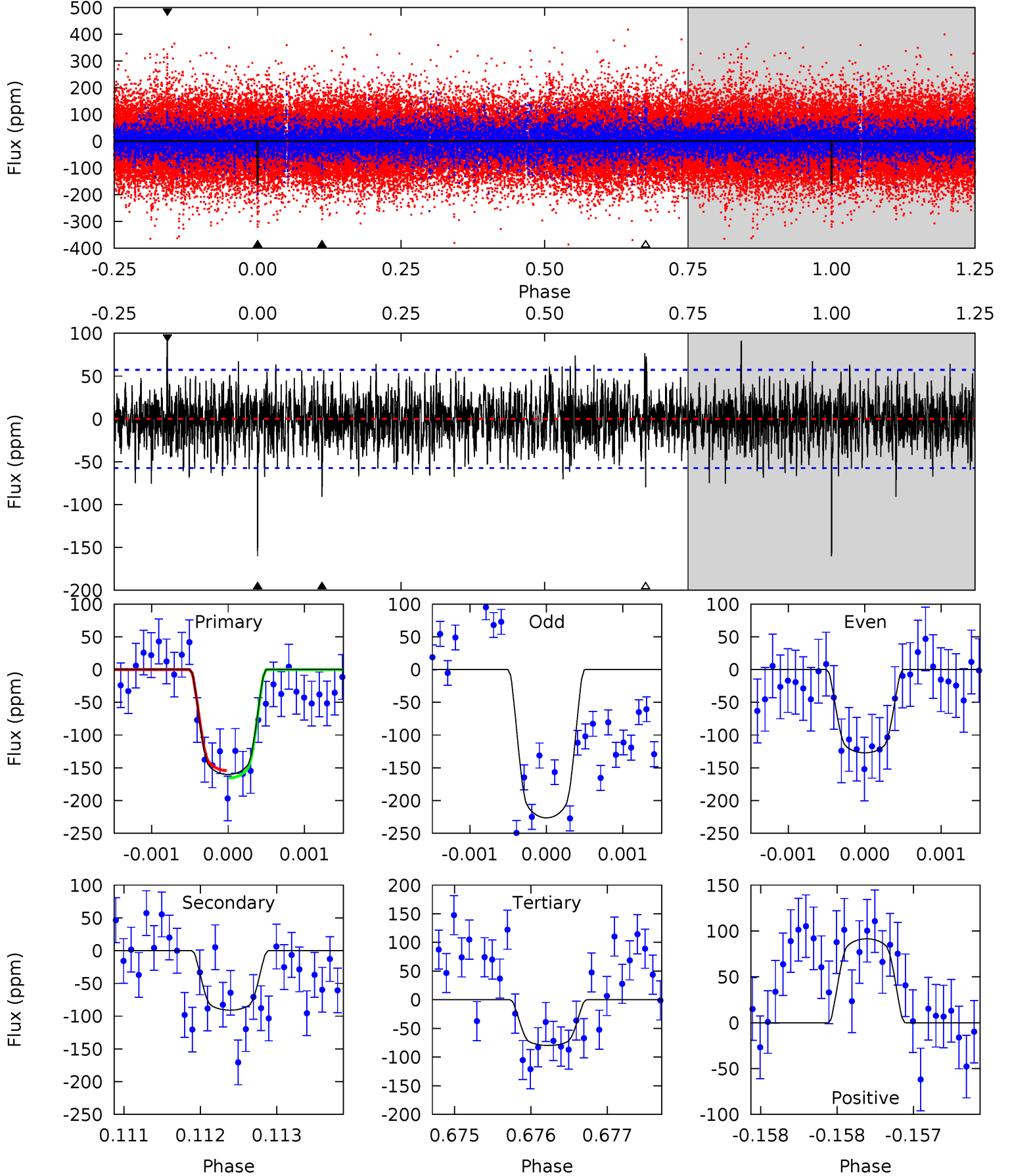
TCE 007798670-02 P=537.538852 Days $T_0=372.156400$ (BKJD)



DV Model-Shift Uniqueness Test

007798670-02, $P = 537.556898$ Days, $E = 372.145231$ Days

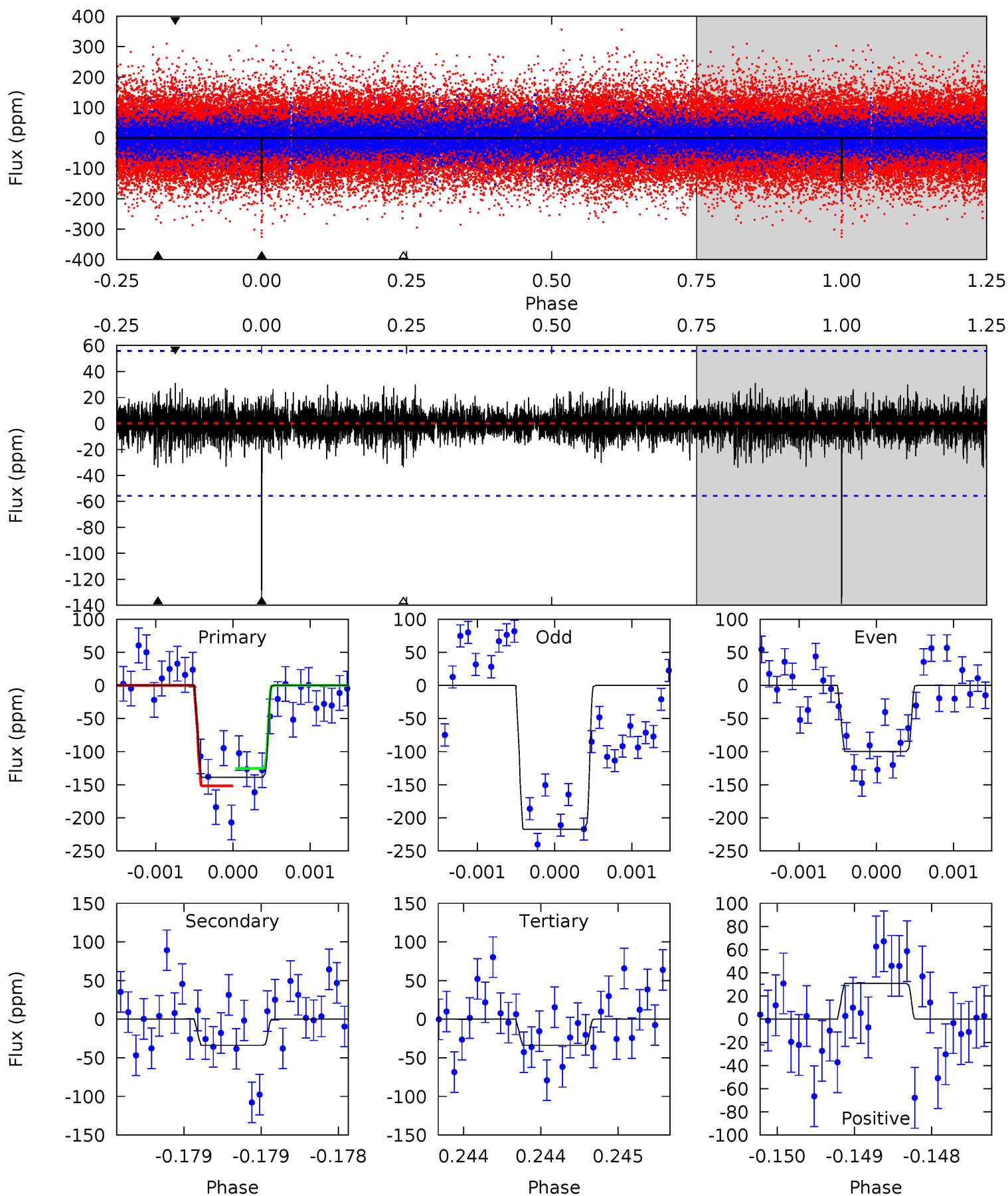
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.4 | 8.71 | 7.65 | 8.77 | 5.49 | 3.36 | 2.06 | 7.71 | 6.59 | 1.06 | -0.06 | 4.47 | 1.21 | 0.36 | 0.55 |



Alt Model-Shift Uniqueness Test

007798670-02, P = 537.538852 Days, E = 372.156400 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.7 | 3.35 | 3.35 | 3.06 | 5.52 | 3.40 | 0.78 | 10.4 | 10.7 | 0.00 | 0.29 | 5.45 | 1.38 | 0.18 | 1.30 |



Stellar Parameters For KIC 007798670

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6247^{+160}_{-176} | $3.954^{+0.266}_{-0.114}$ | $-0.260^{+0.300}_{-0.300}$ | $1.870^{+0.394}_{-0.590}$ | $1.146^{+0.213}_{-0.175}$ | $0.247^{+0.422}_{-0.086}$ |
| | +3%/-3% | +7%/-3% | +115%/-115% | +21%/-32% | +19%/-15% | +171%/-35% |
| 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 007798670-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|--------------|------------------------|-------------------|----------------------|------------------------|
| DV | -91 ± 10 | $3.13^{+0.49}_{-0.60}$ | 449^{+27}_{-36} | 5009^{+250}_{-252} | 9520^{+5096}_{-2350} |
| Alt. | -34 ± 10 | $2.36^{+0.44}_{-0.46}$ | 448^{+27}_{-36} | 4557^{+375}_{-346} | 6404^{+3678}_{-2601} |

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 $A_{obs} \gg 1.0$

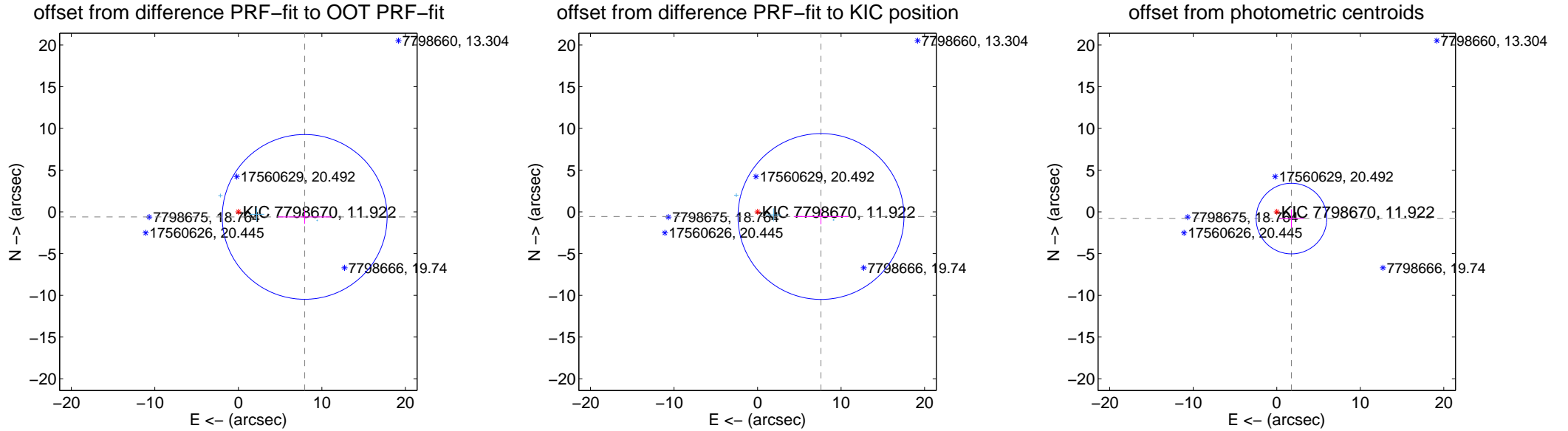
DV Centroid Data

Supplemental centroid analysis for 007798670-02. **Kepler magnitude: 11.92.** Transit SNR 7.71

There are 3 quarters with good PRF difference image offsets

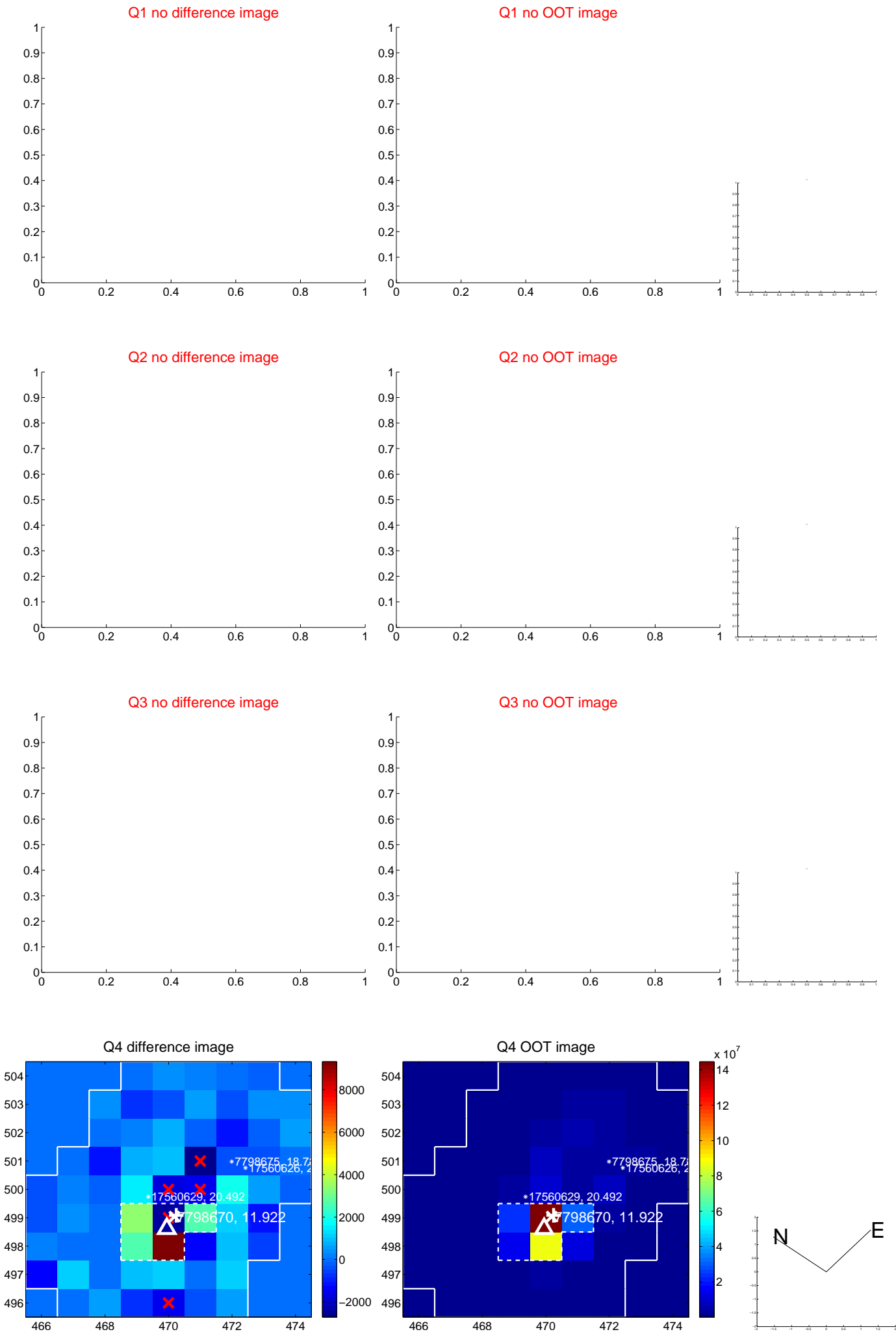
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 7.964 ± 3.290 | 2.42 | -7.941 ± 3.238 | -0.601 ± 0.836 |
| PRF-fit source offset from KIC position | 7.616 ± 3.312 | 2.30 | -7.596 ± 3.256 | -0.553 ± 0.931 |
| photometric centroid source offset | 1.93 ± 1.41 | 1.37 | -1.76 ± 1.47 | -0.80 ± 1.10 |



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.

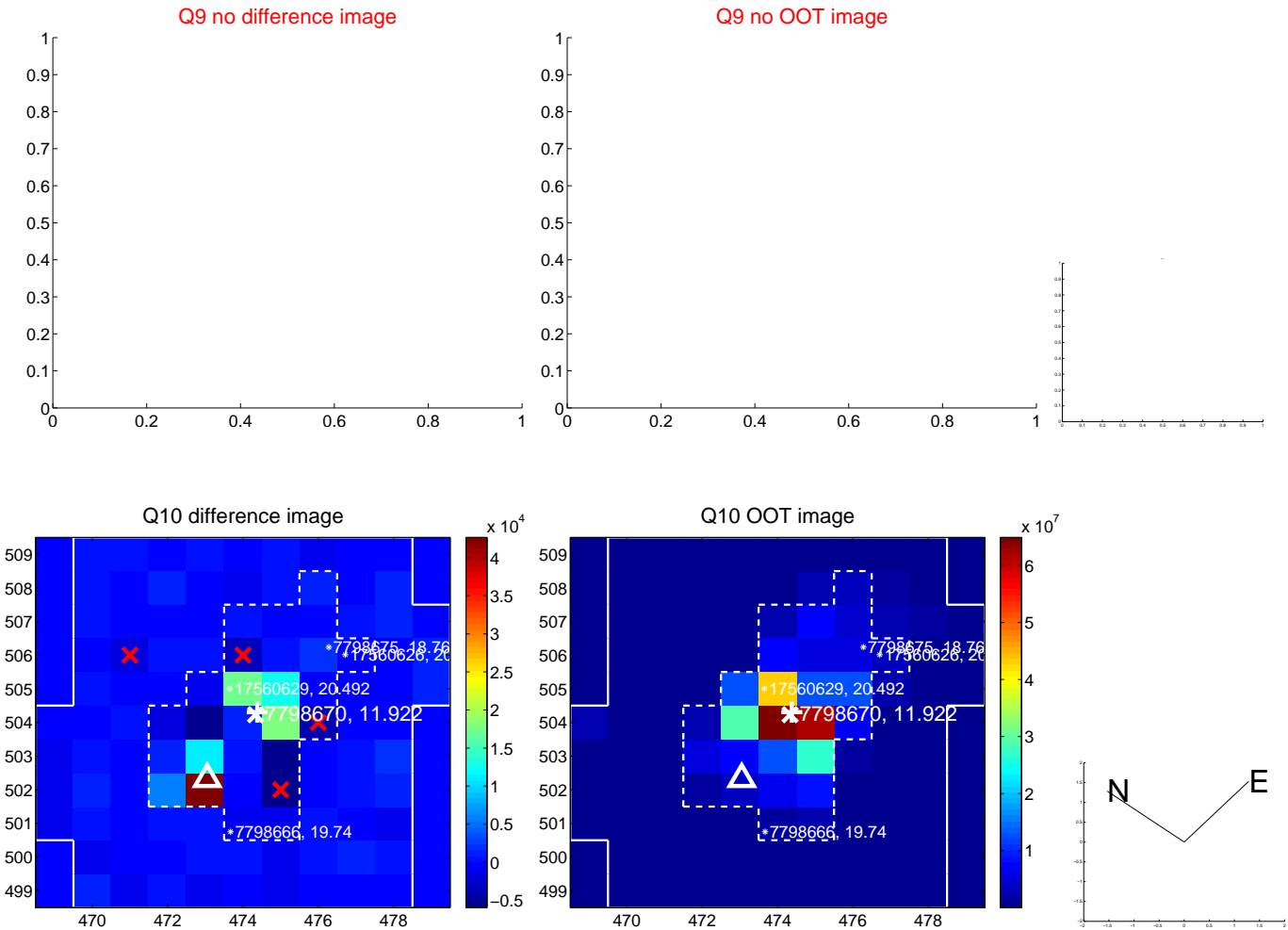
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



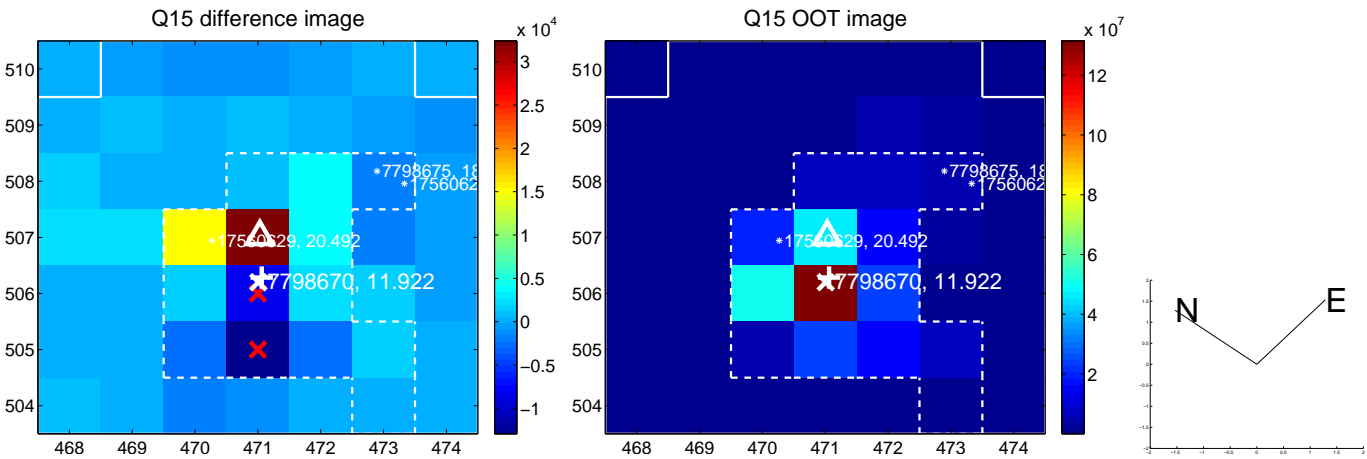
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



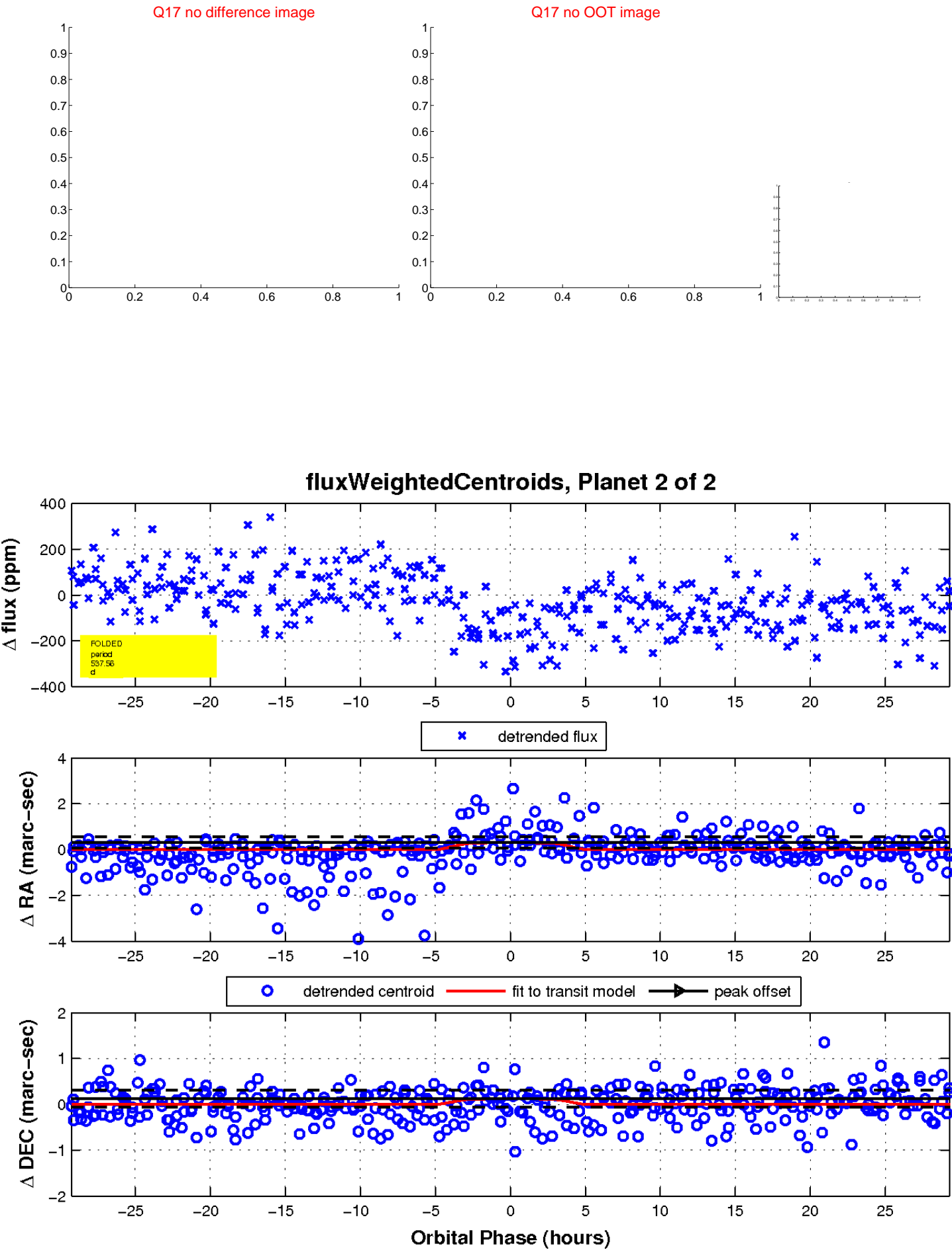
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

