

KIC 010403228

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010403228-01 | OBS | No | 128.668420 | 230.181370 | 3193.8 | 34.459 | 42.2 | 10.8 | 0.31 | 3391 | 1.93 | 0.10 |
| 010403228-02 | OBS | No | 119.804456 | 184.736070 | 2540.9 | 4.978 | 7.9 | 8.1 | 0.31 | 3391 | 2.75 | 0.11 |
| 010403228-03 | OBS | 8007.01 | 67.175921 | 144.104697 | 1541.8 | 3.671 | 9.1 | 7.5 | 0.31 | 3391 | 1.27 | 0.24 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 010403228-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 010403228-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | ALL_TRANS_CHASES |
| 010403228-03 | OBS | PC | 0.80 | 0 | 0 | 0 | 0 | NO_COMMENT |

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

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

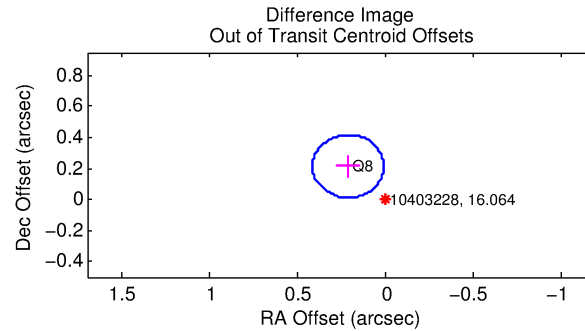
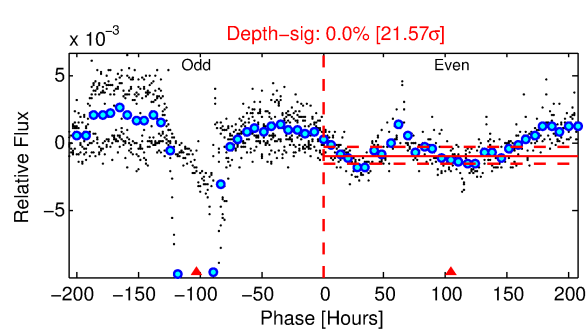
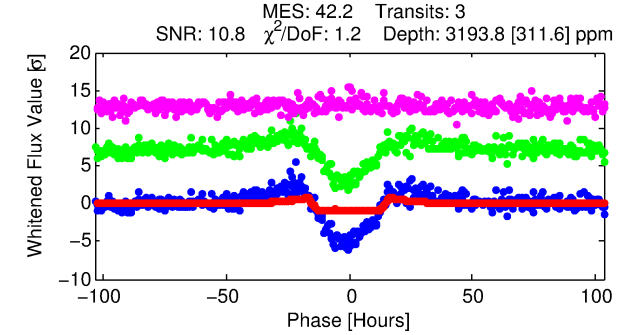
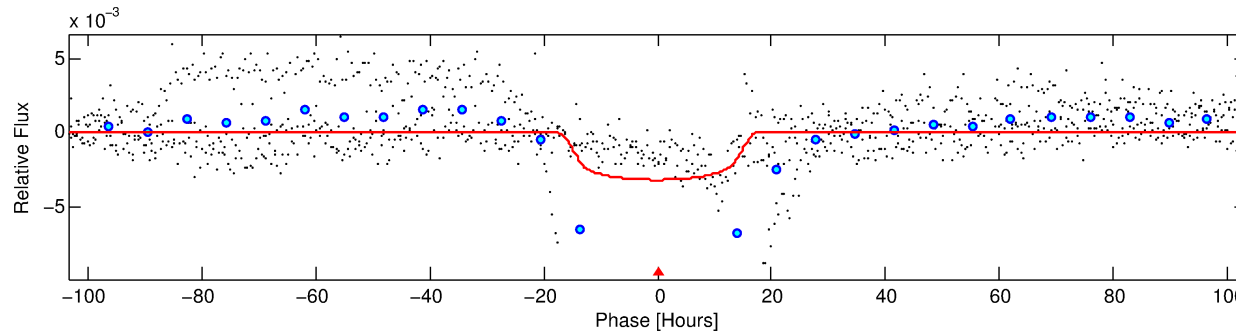
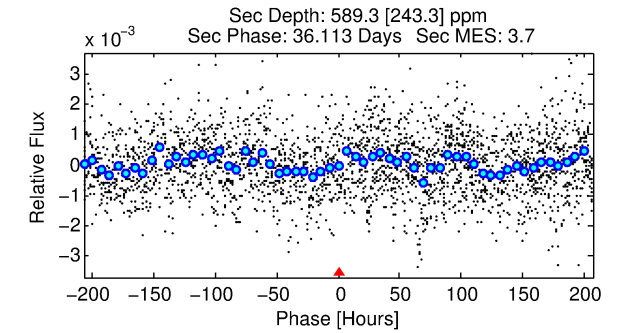
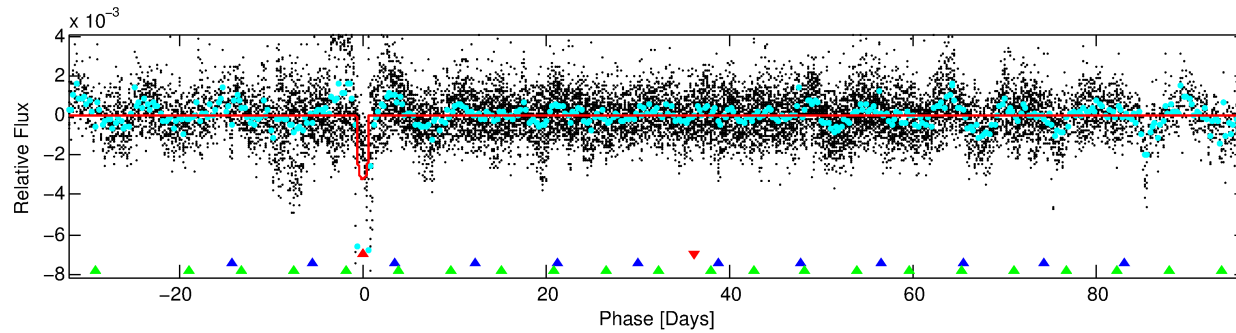
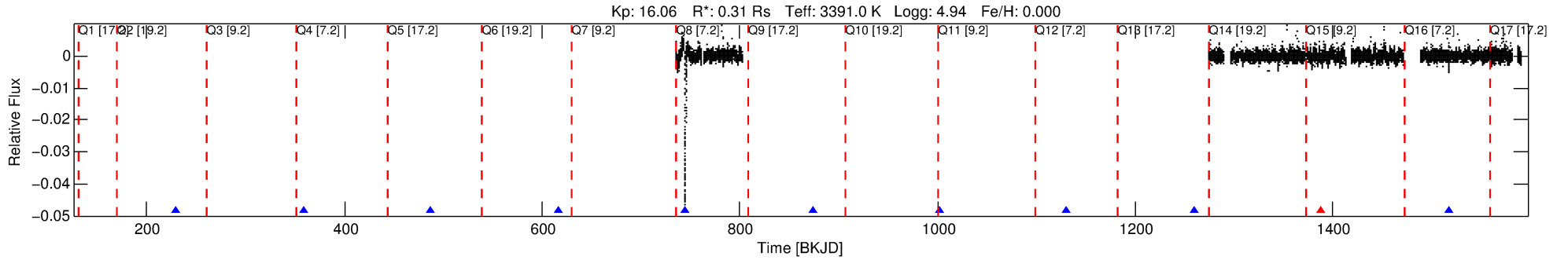
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010403228-01

No Significant Match Found

DV One-Page Summary

KIC: 10403228 Candidate: 1 of 3 Period: 128.668 d



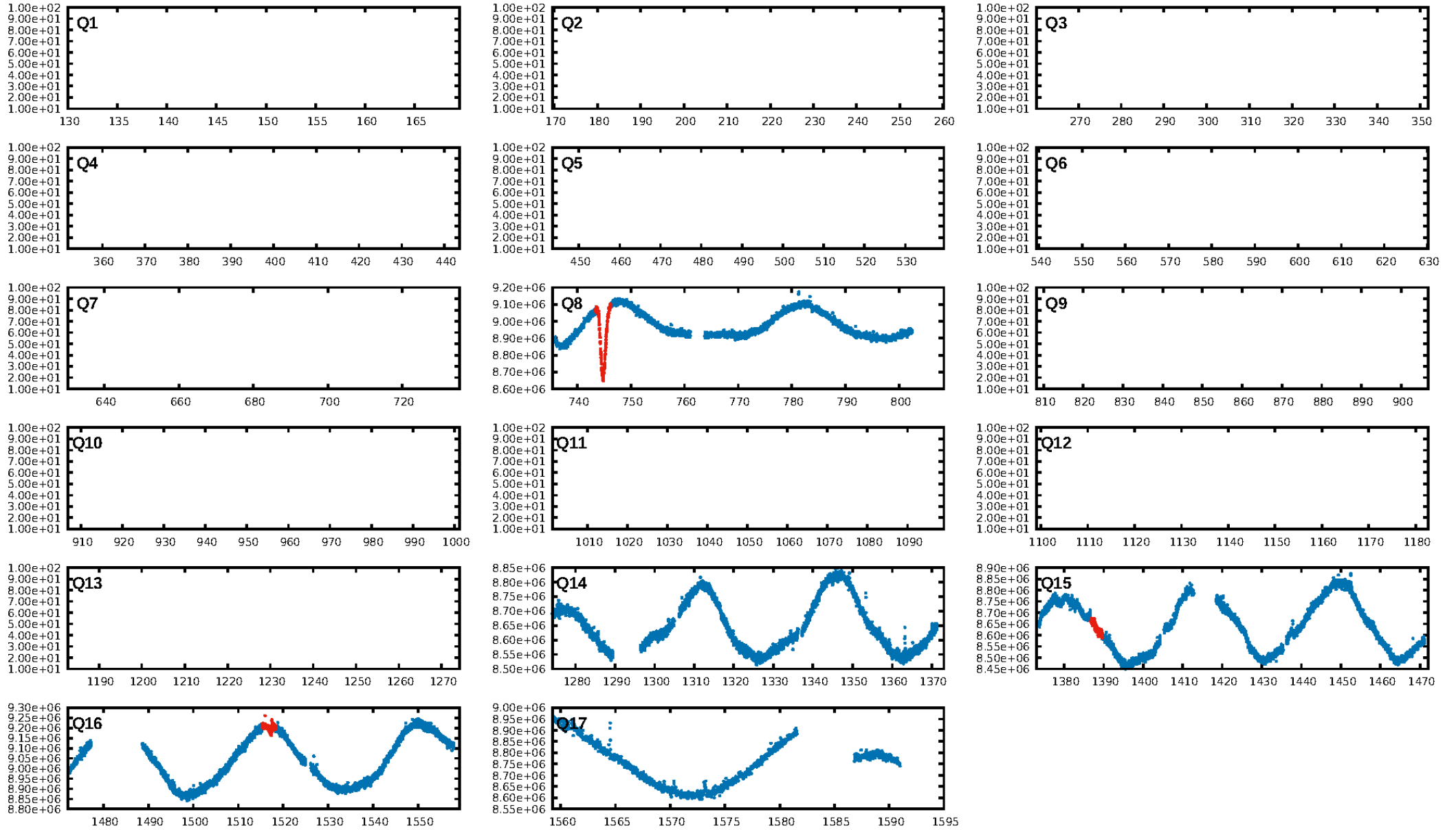
DV Fit Results:

Period = 128.66842 [0.00661] d
Epoch = 230.1814 [0.0538] BKJD
Rp/R* = 0.0569 [0.0040]
a/R* = 20.34 [3.70]
b = 0.78 [0.09]
Seff = 0.10 [0.01]
Teq = 144 [4] K
Rp = 1.93 [0.27] Re
a = 0.3356 [0.0300] AU
Ag = 9788.64 [4400.09] [2.22σ]
Teffp = 2215 [243] K [8.52σ]

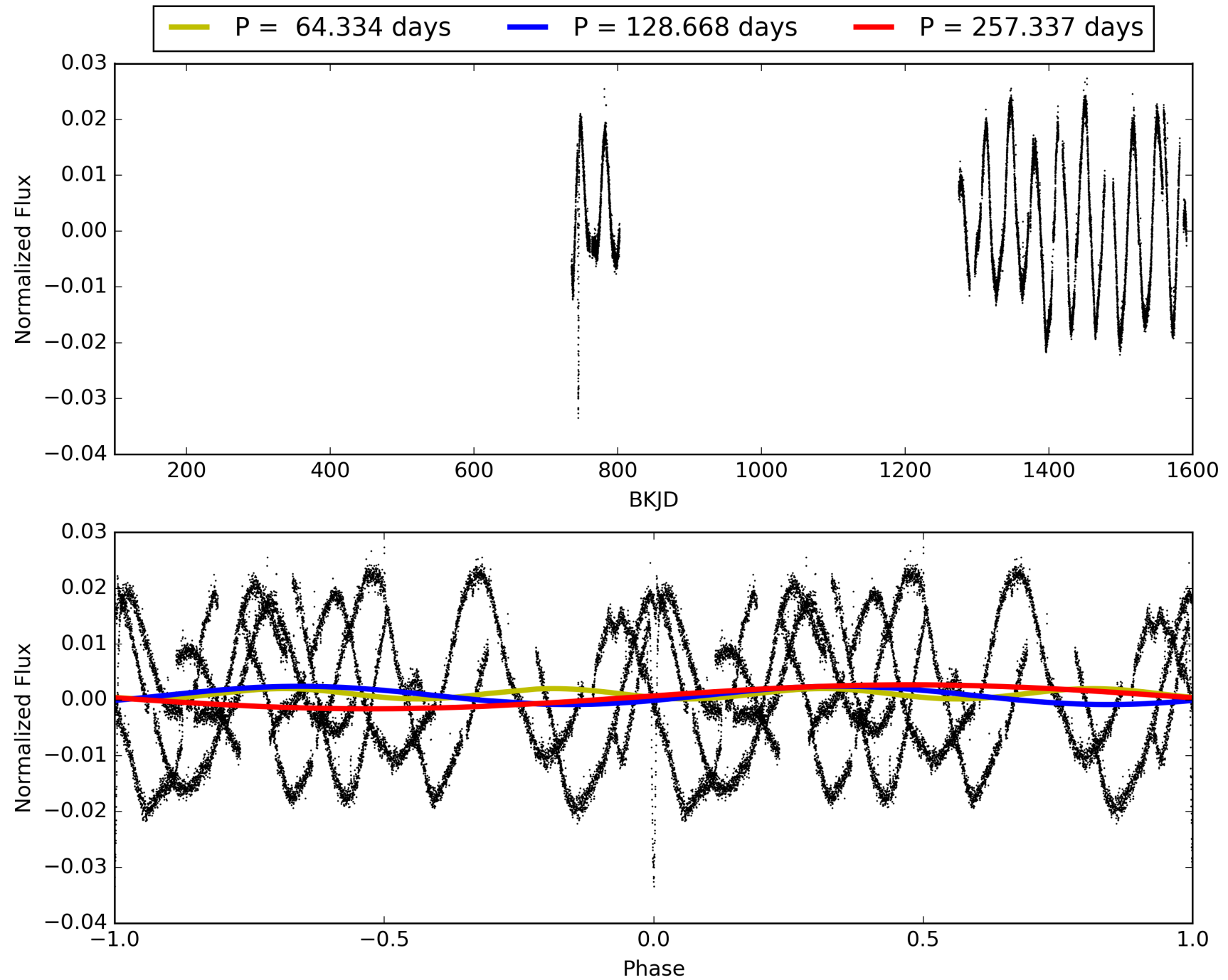
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.11σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.39e-240
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 0.7655
Centroid-sig: 13.4%
Centroid-so: 0.607 arcsec [1.15σ]
OotOffset-rm: 0.302 arcsec [4.47σ]
KicOffset-rm: 0.192 arcsec [2.84σ]
OotOffset-st: 0/0/1/0 [1]
KicOffset-st: 0/0/1/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [1/1]

TCE 010403228-01, PDC Light Curves

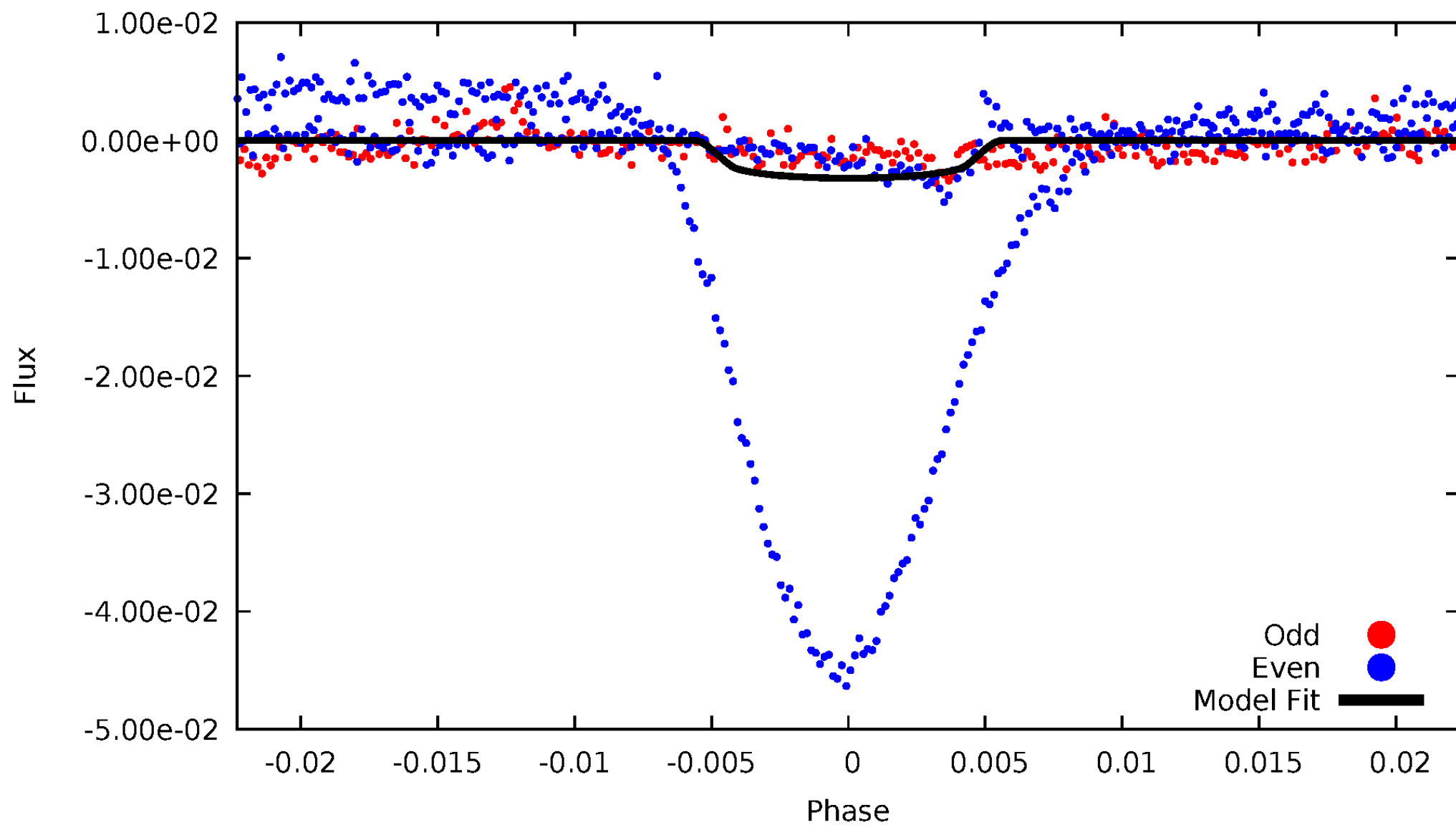


TCE 010403228-01



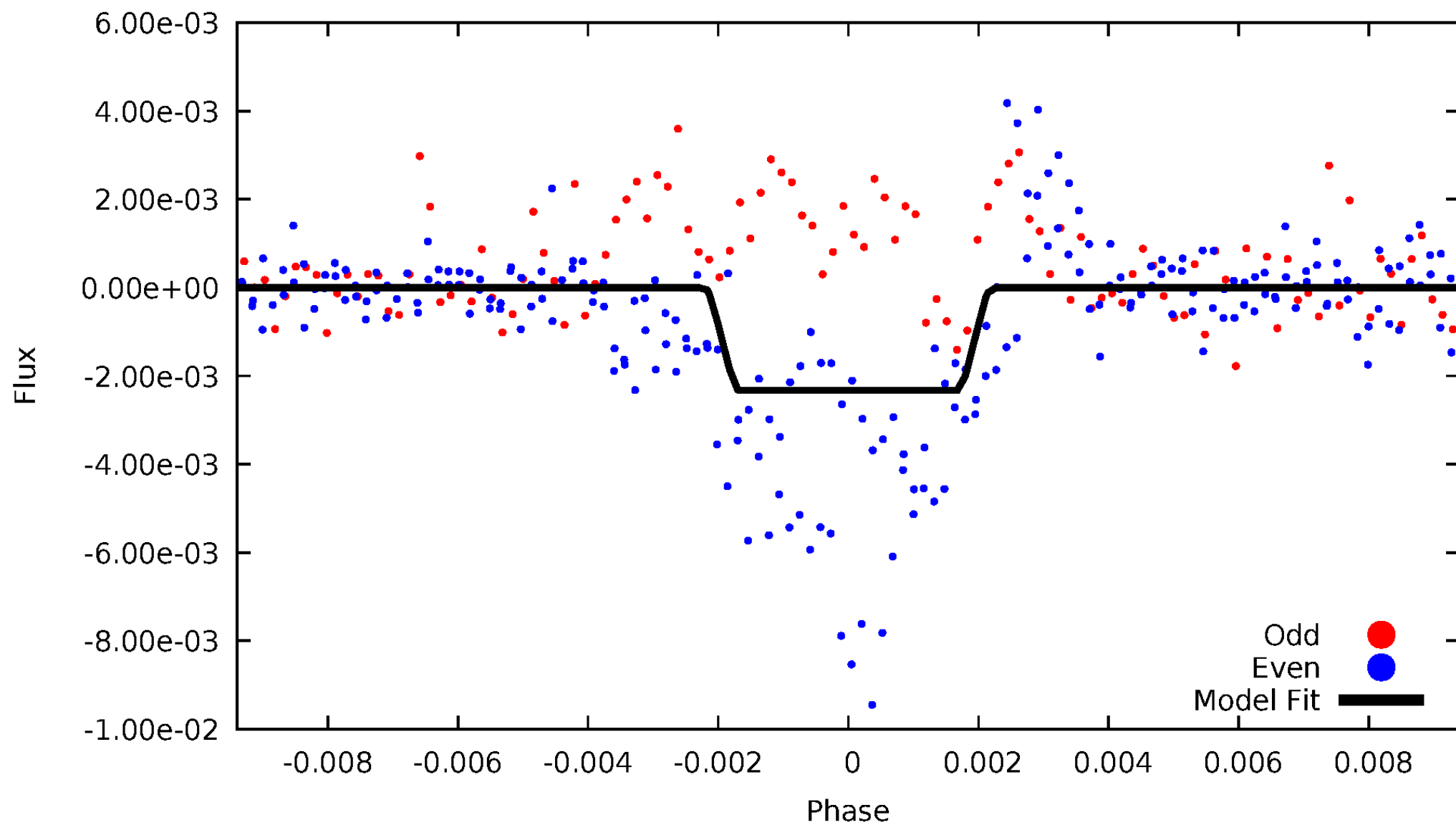
DV Odd/Even

TCE 010403228-01



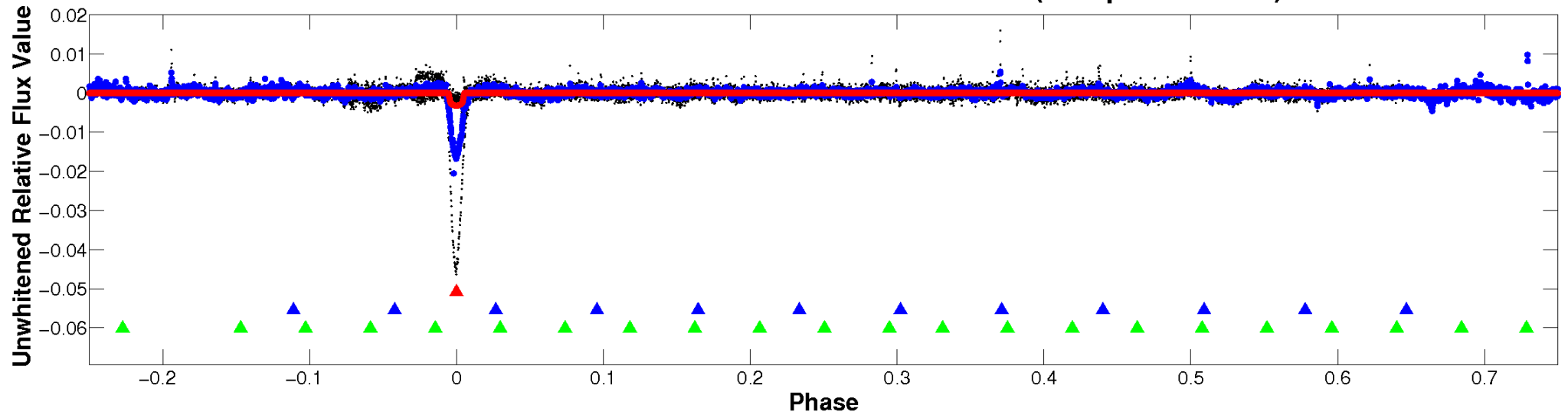
ALT Odd/Even

TCE 010403228-01

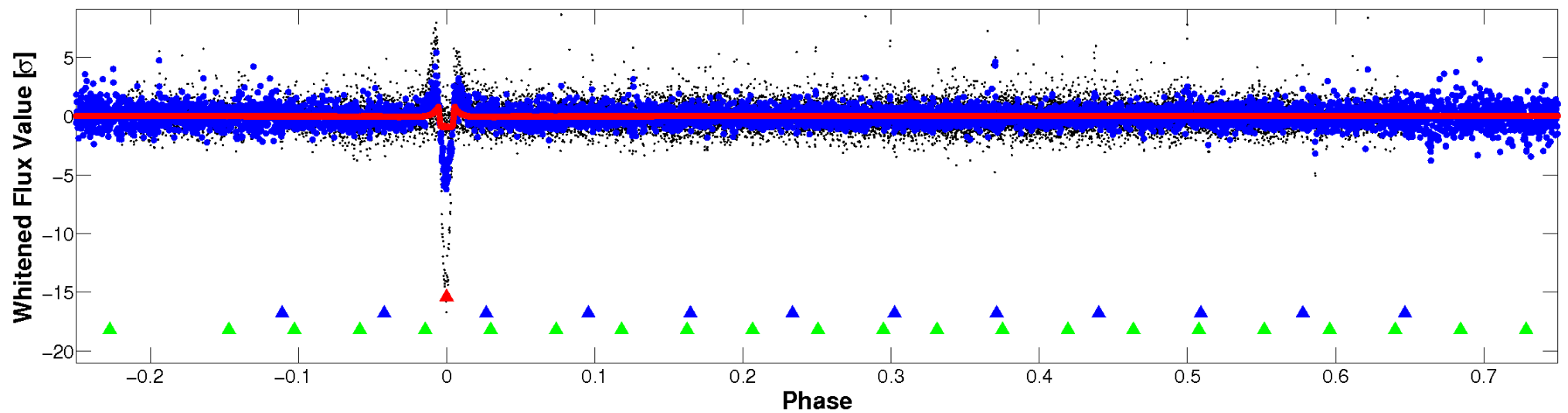


Non-Whitened Vs. Whitened Light Curve

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

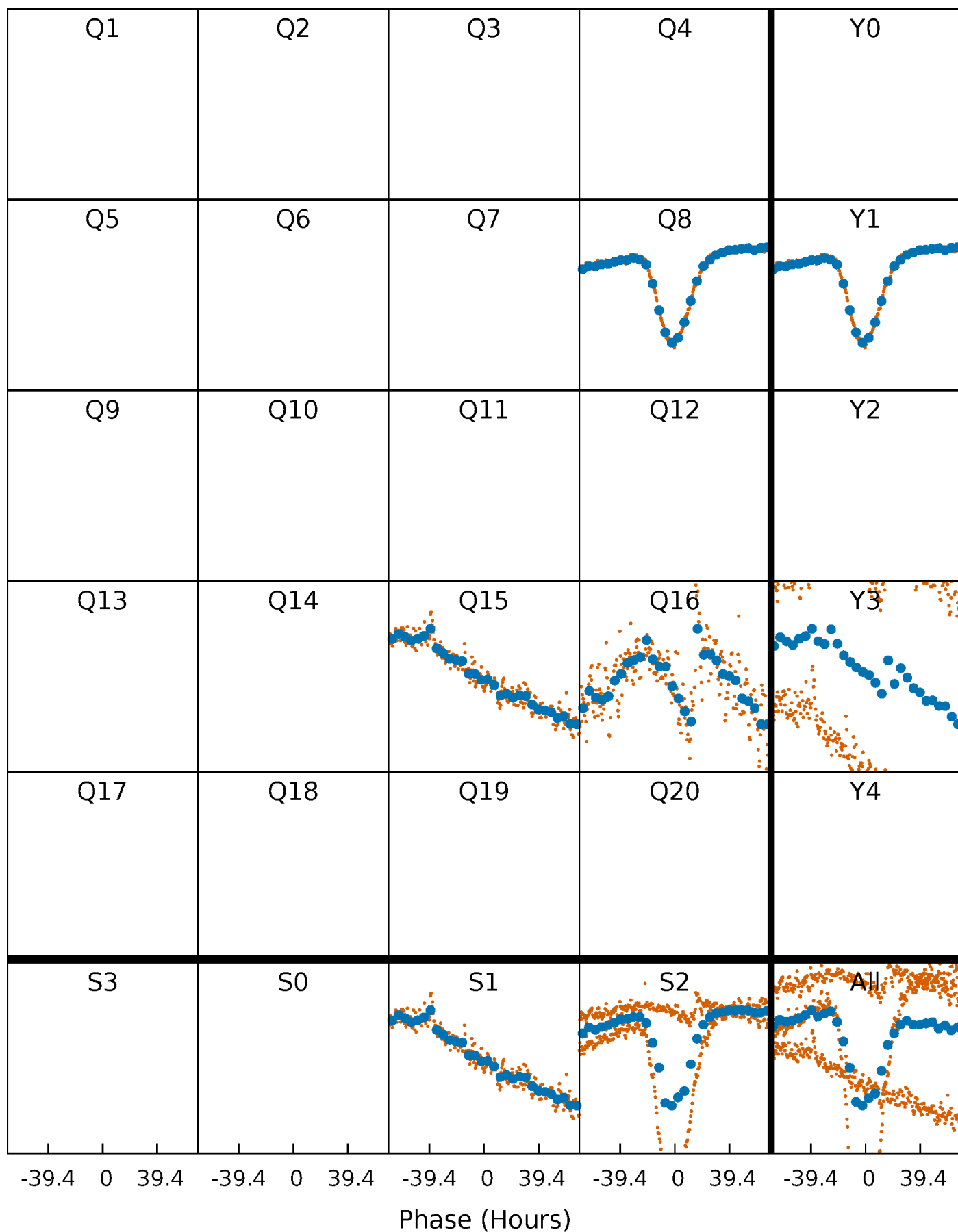


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



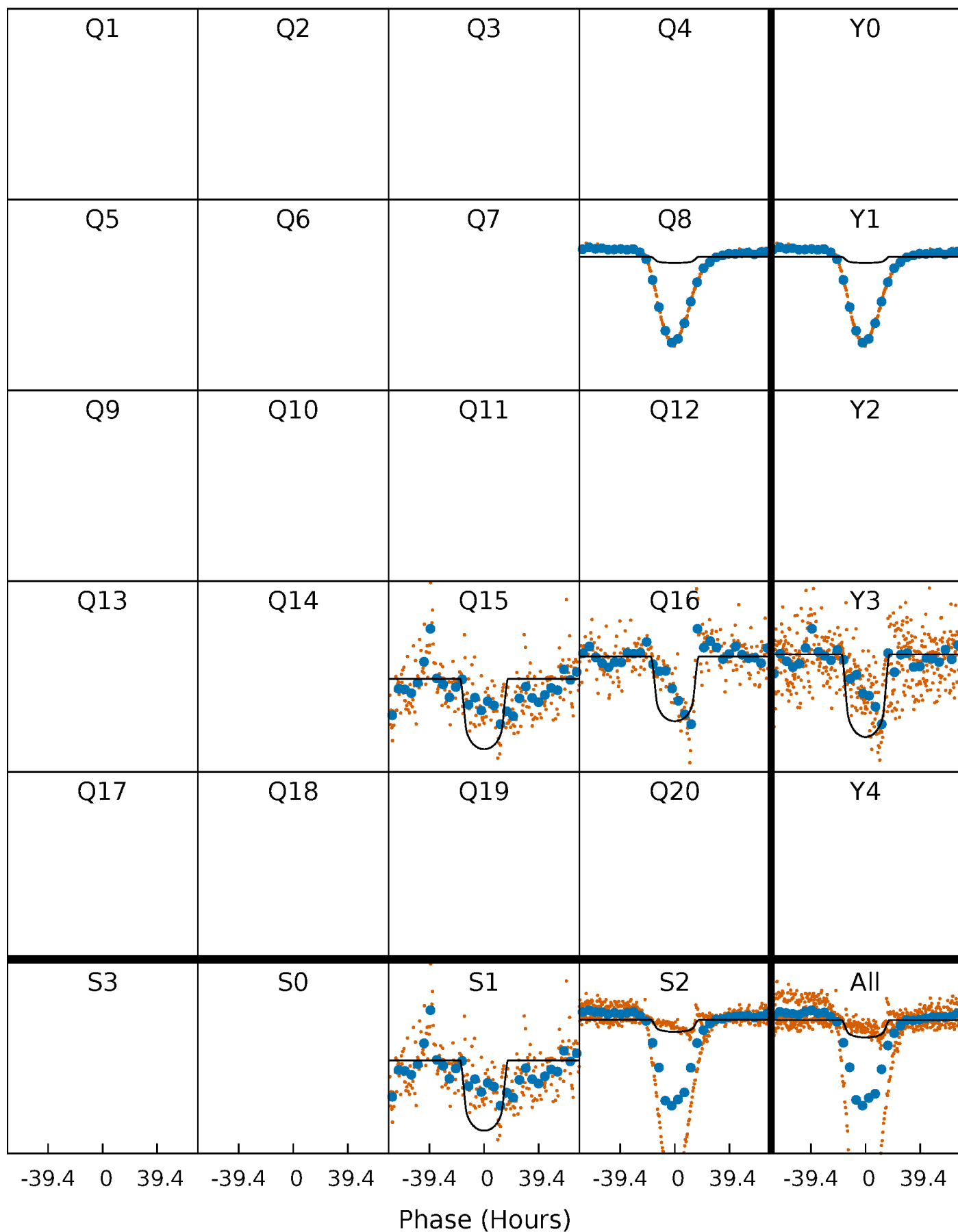
PDC Quarter-Phased Transit Curves

TCE 010403228-01 P=128.668420 Days $T_0=230.181370$ (BKJD)



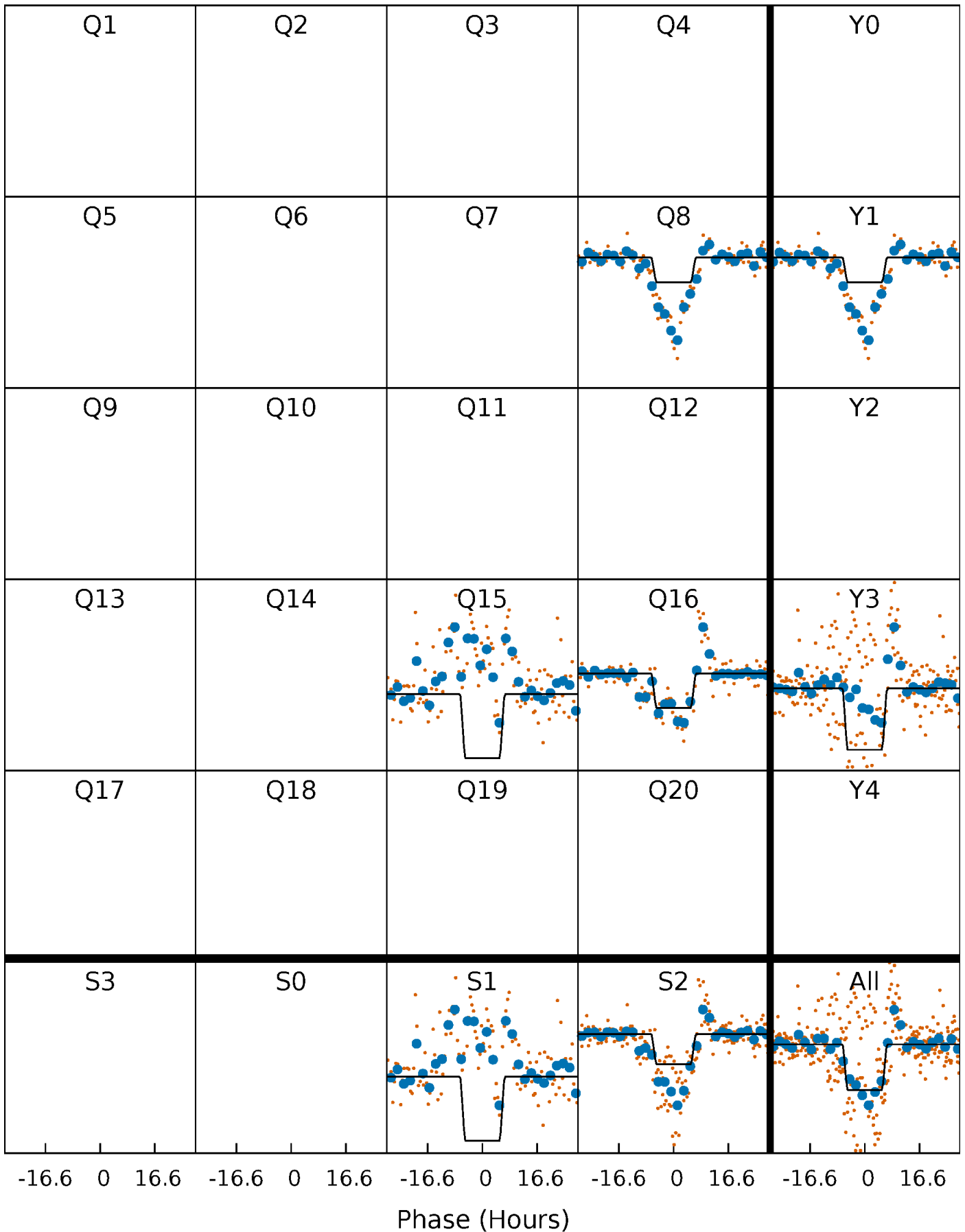
DV Quarter-Phased Transit Curves

TCE 010403228-01 $P=128.668420$ Days $T_0=230.181370$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

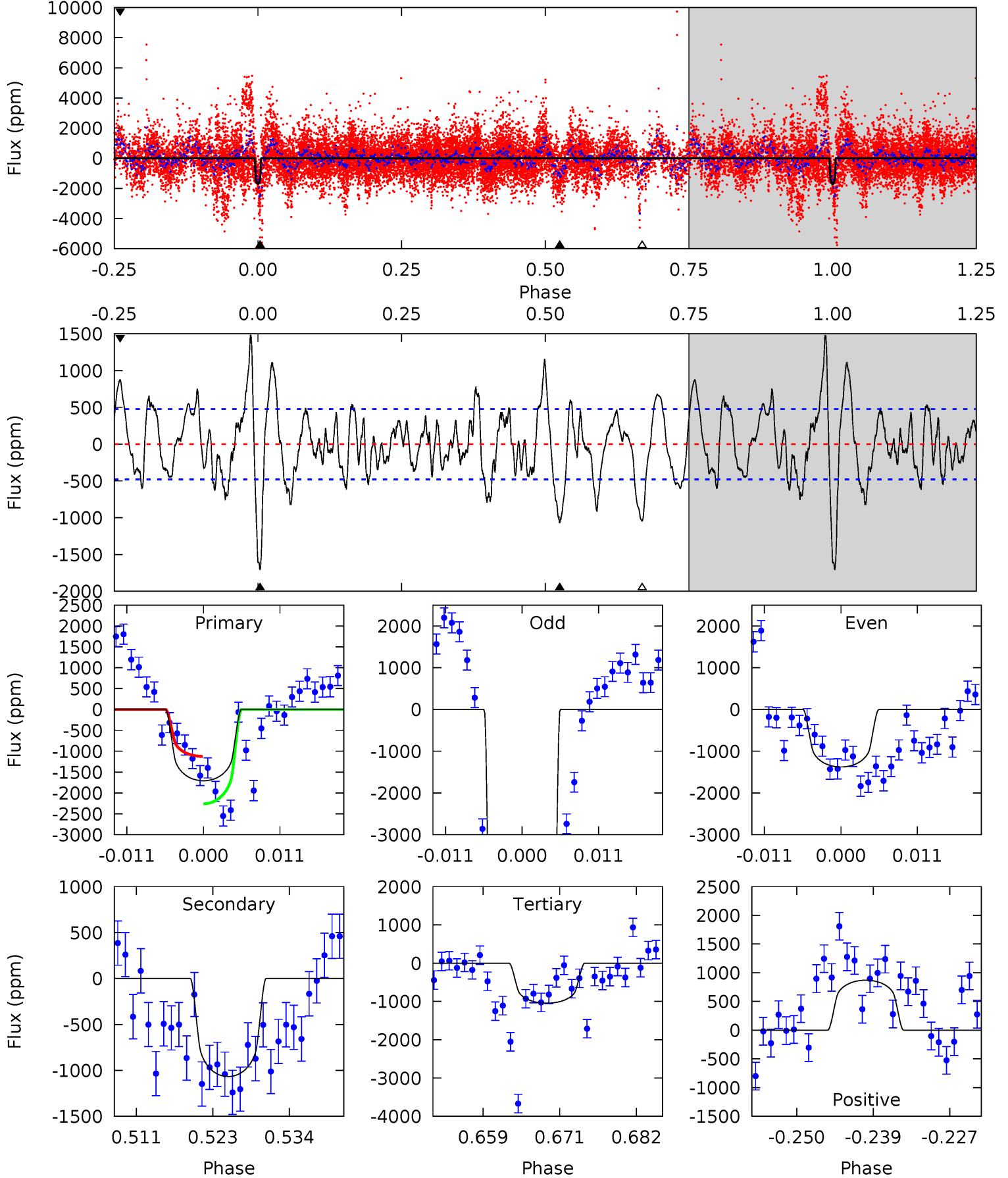
TCE 010403228-01 $P=128.731428$ Days $T_0=229.872002$ (BKJD)



DV Model-Shift Uniqueness Test

010403228-01, P = 128.668420 Days, E = 230.181370 Days

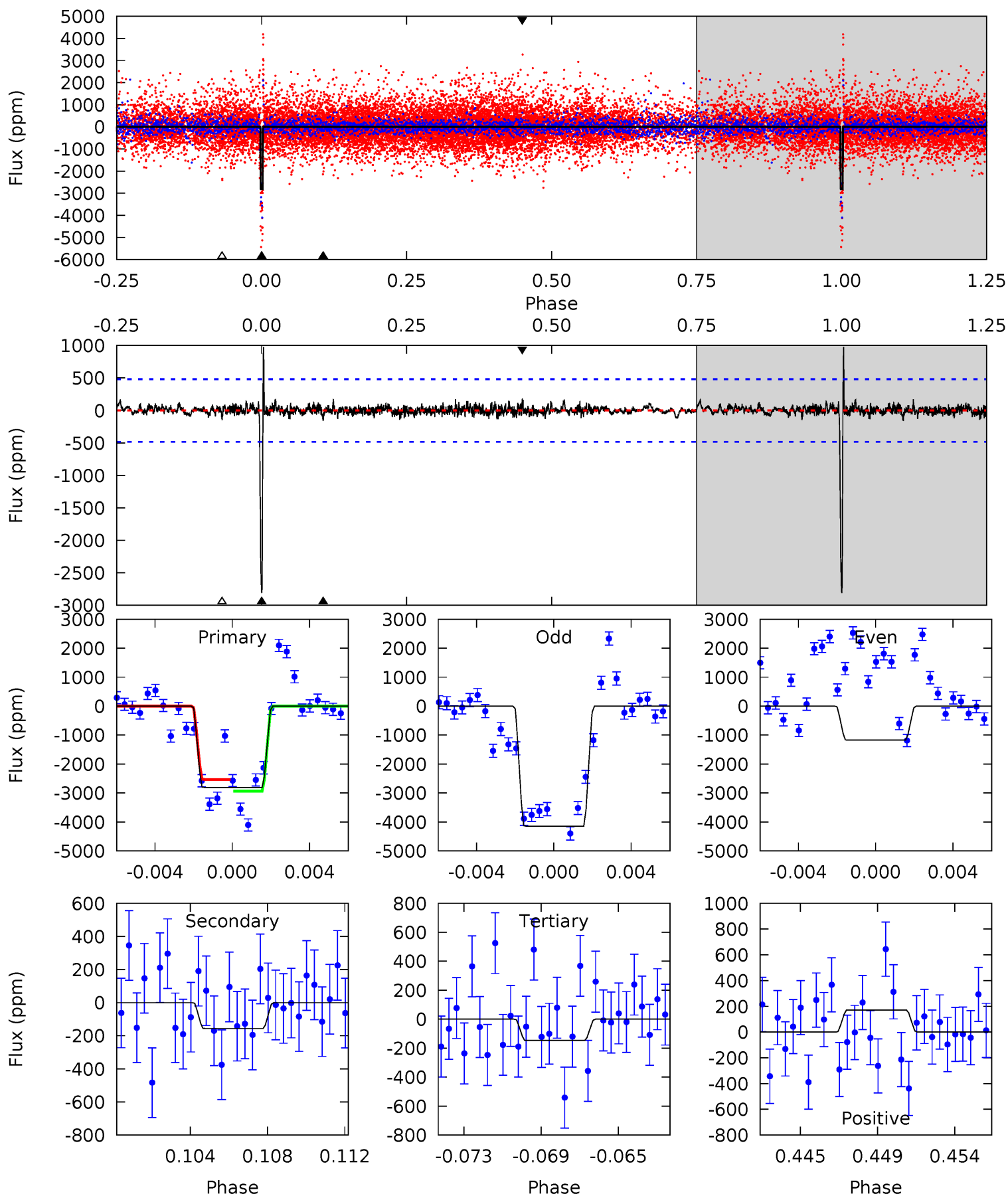
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 17.8 | 11.1 | 10.9 | 9.09 | 5.00 | 2.53 | 4.20 | 6.93 | 8.75 | 0.24 | 2.06 | 115.7 | 6.98 | 0.46 | 0 |



Alt Model-Shift Uniqueness Test

010403228-01, P = 128.731428 Days, E = 229.872002 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 30.3 | 1.68 | 1.58 | 1.84 | 5.18 | 2.85 | 0.48 | 28.7 | 28.4 | 0.10 | -0.16 | 18.9 | 0.91 | 0.26 | 0 |



Stellar Parameters For KIC 010403228

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3391^{+44}_{-40} | $4.936^{+0.048}_{-0.032}$ | $0.000^{+0.100}_{-0.100}$ | $0.311^{+0.038}_{-0.034}$ | $0.304^{+0.048}_{-0.039}$ | $14.250^{+3.651}_{-2.426}$ |
| | +1%/-1% | +1%/-1% | +inf%/-inf% | +12%/-11% | +16%/-13% | +26%/-17% |
| Source | PHO2 | PHO2 | PHO2 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010403228-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|----------------|------------------------|----------------------|----------------------|-------------------------|
| DV | -1067 ± 96 | $1.92^{+0.19}_{-0.18}$ | 201^{+4}_{-4} | 2888^{+77}_{-72} | 17906^{+3996}_{-2955} |
| Alt. | -156 ± 93 | $1.63^{+0.18}_{-0.16}$ | 201^{+4}_{-5} | 2363^{+150}_{-226} | 3691^{+2464}_{-2190} |

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

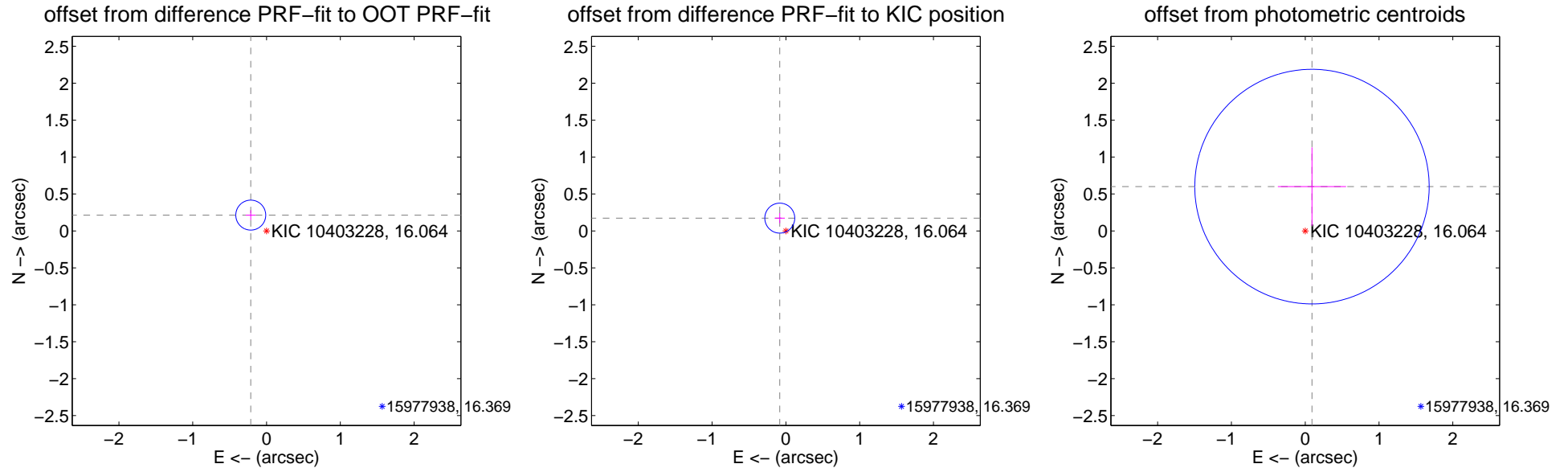
DV Centroid Data

Supplemental centroid analysis for 010403228-01. Kepler magnitude: 16.06. Transit SNR 10.84

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.302 \pm 0.068 | 4.47 | 0.214 \pm 0.068 | 0.214 \pm 0.068 |
| PRF-fit source offset from KIC position | 0.192 \pm 0.068 | 2.84 | 0.083 \pm 0.068 | 0.173 \pm 0.068 |
| photometric centroid source offset | 0.61 \pm 0.53 | 1.15 | -0.09 \pm 0.46 | 0.60 \pm 0.53 |

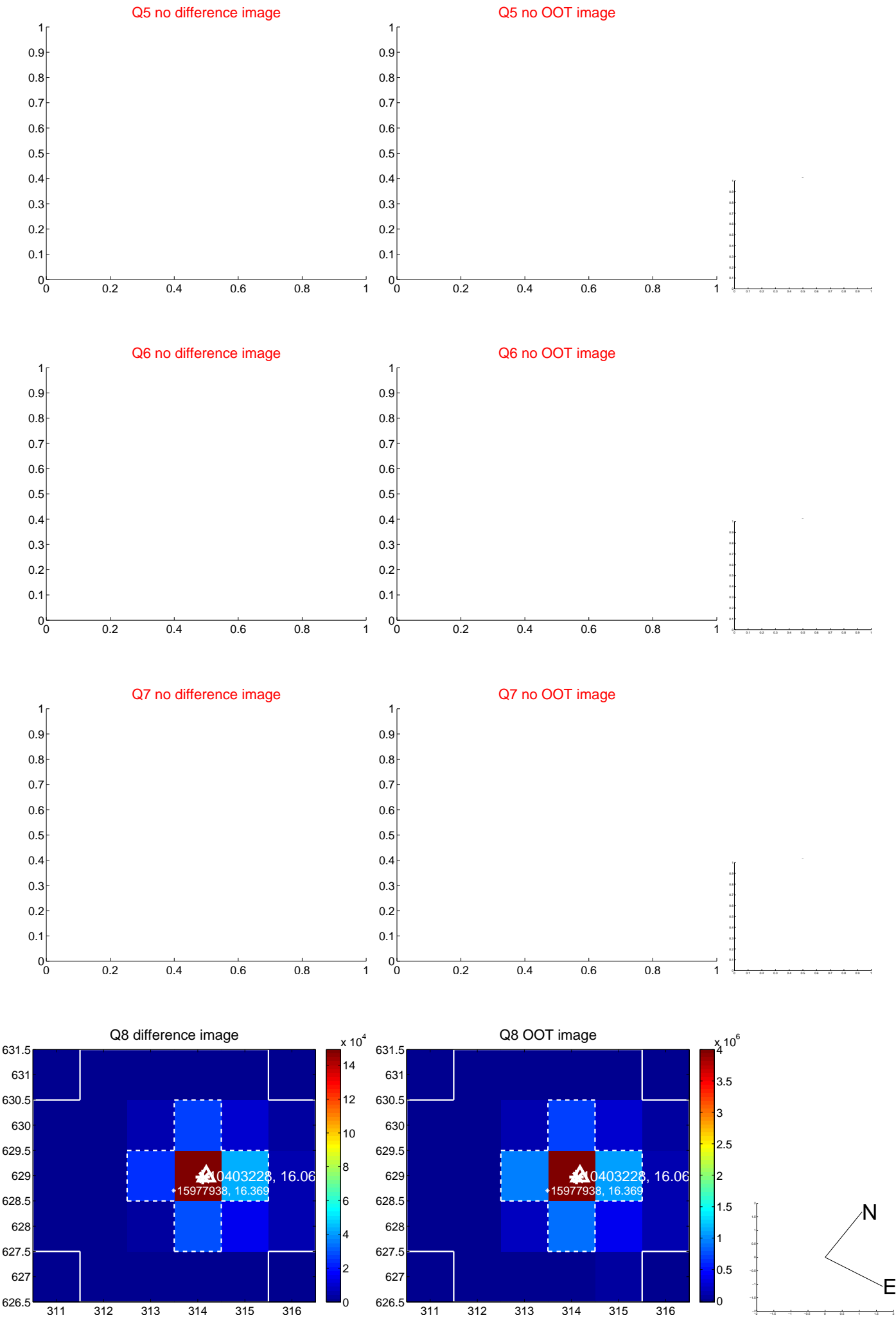


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



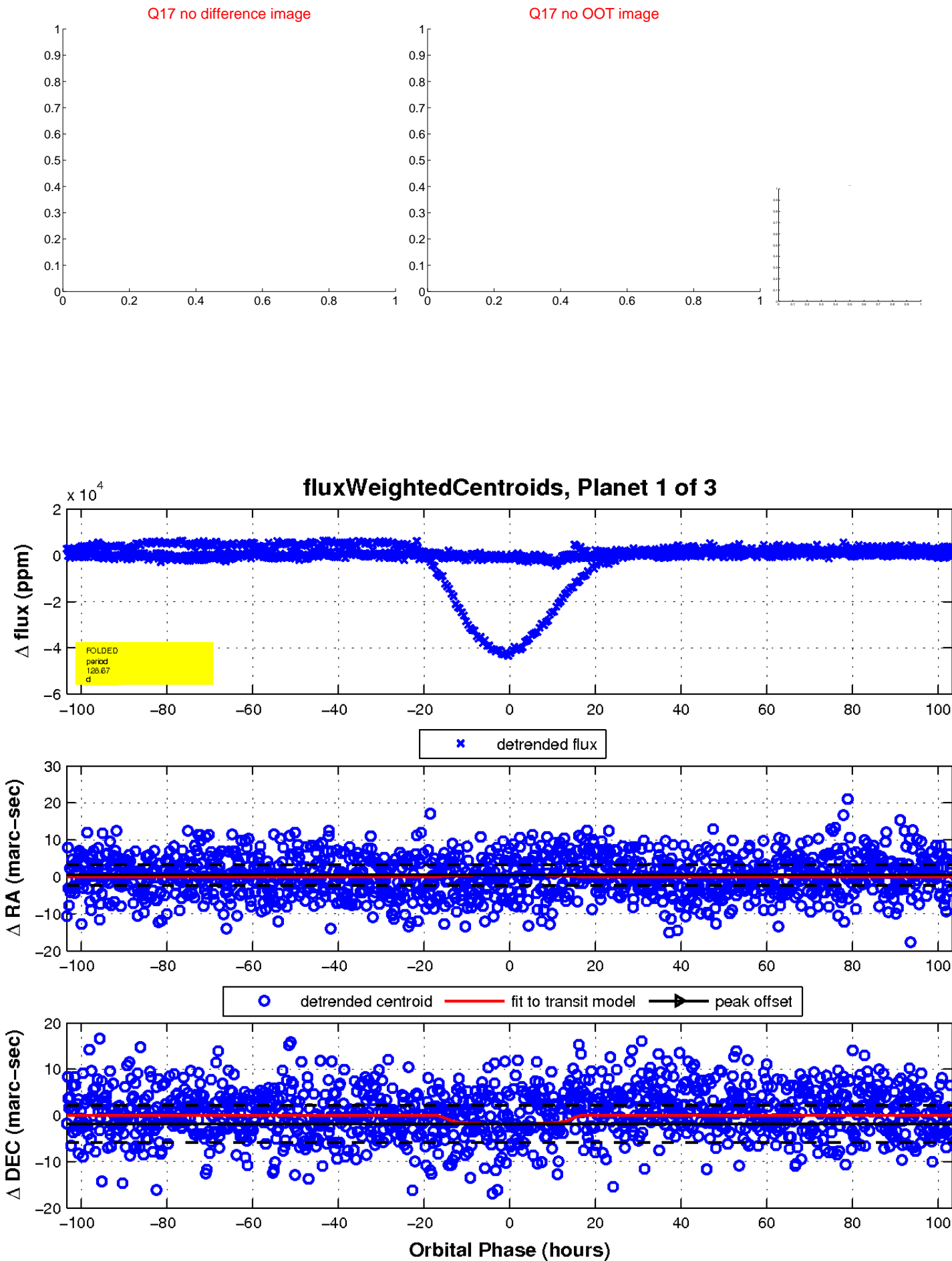
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

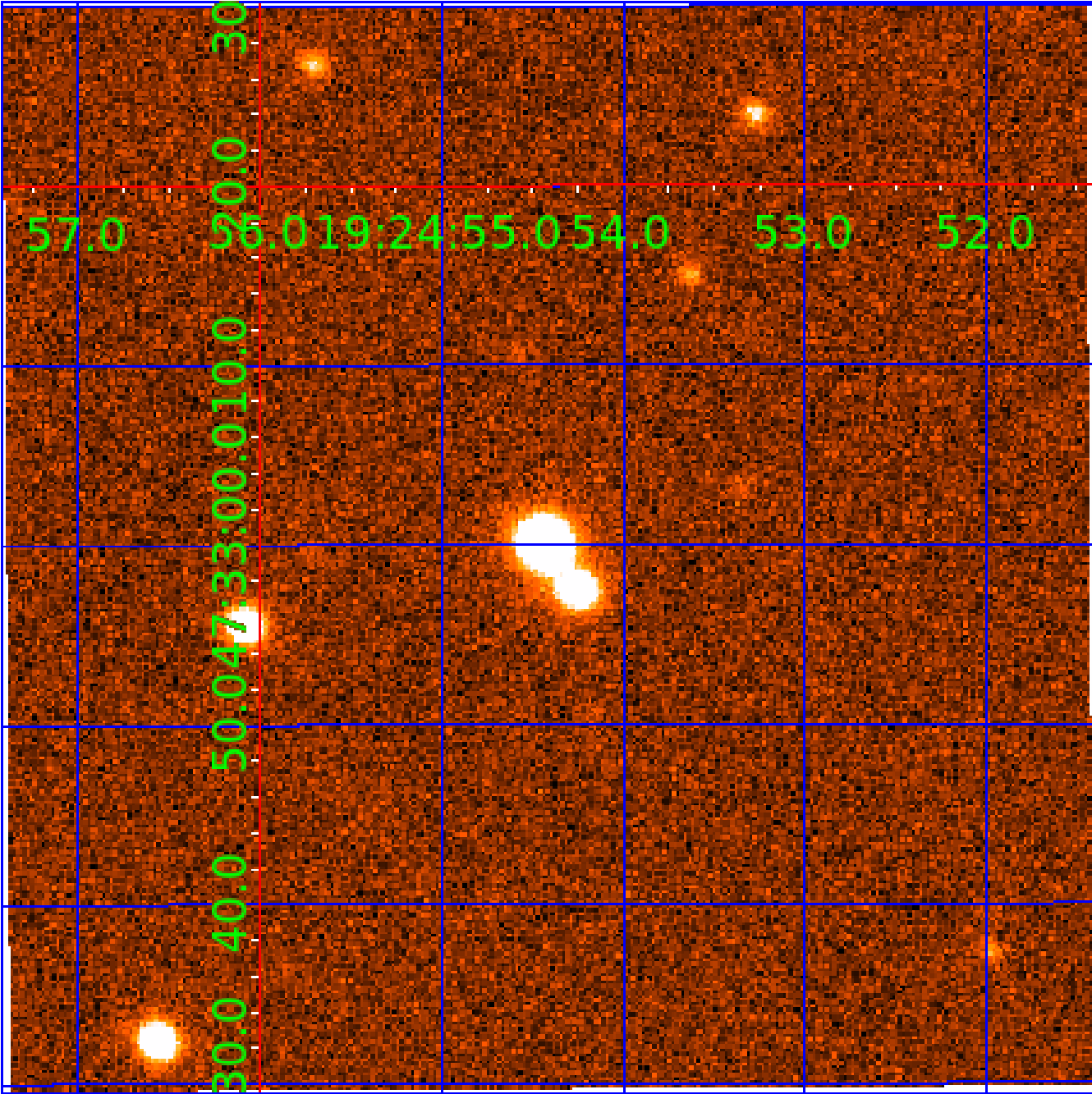


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010403228

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010403228-01 | OBS | No | 128.668420 | 230.181370 | 3193.8 | 34.459 | 42.2 | 10.8 | 0.31 | 3391 | 1.93 | 0.10 |
| 010403228-02 | OBS | No | 119.804456 | 184.736070 | 2540.9 | 4.978 | 7.9 | 8.1 | 0.31 | 3391 | 2.75 | 0.11 |
| 010403228-03 | OBS | 8007.01 | 67.175921 | 144.104697 | 1541.8 | 3.671 | 9.1 | 7.5 | 0.31 | 3391 | 1.27 | 0.24 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 010403228-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 010403228-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | ALL_TRANS_CHASES |
| 010403228-03 | OBS | PC | 0.80 | 0 | 0 | 0 | 0 | NO_COMMENT |

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

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

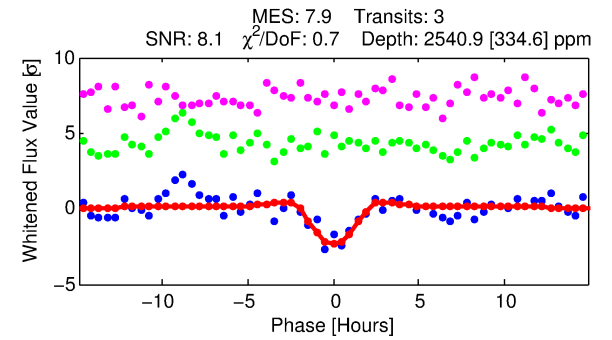
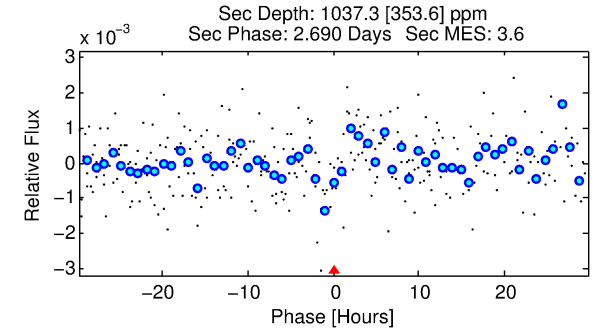
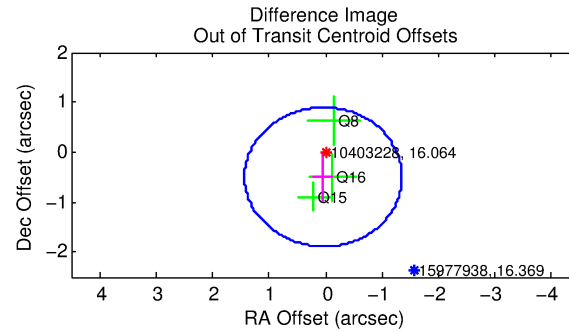
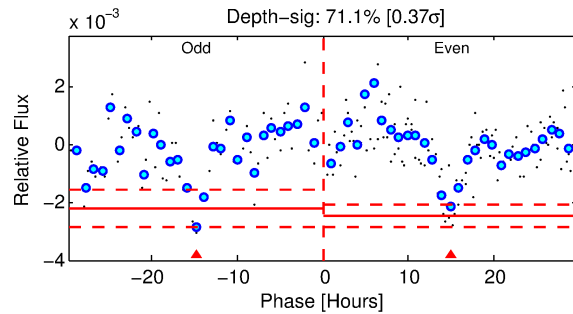
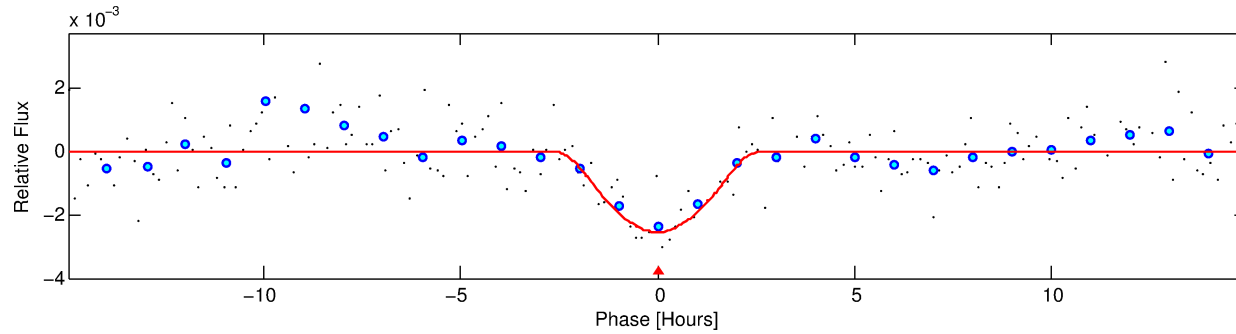
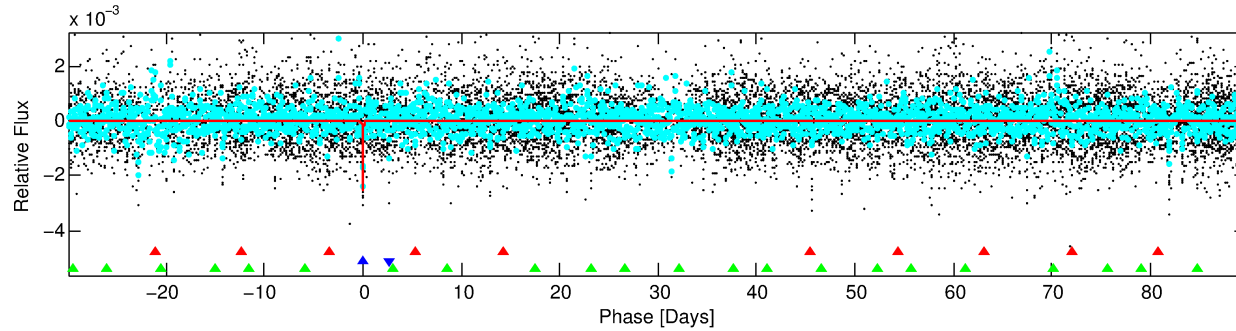
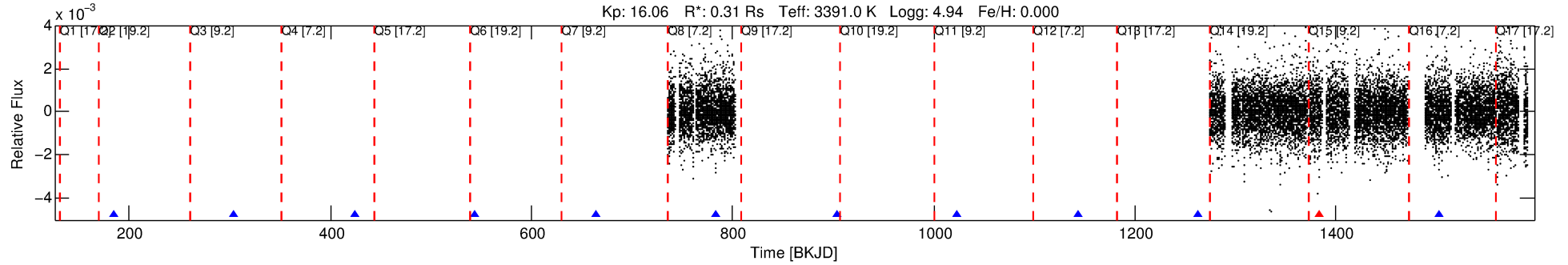
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010403228-02

No Significant Match Found

DV One-Page Summary

KIC: 10403228 Candidate: 2 of 3 Period: 119.804 d



DV Fit Results:

Period = 119.80446 [0.00235] d
Epoch = 184.7361 [0.0214] BKJD
Rp/R* = 0.0811 [0.2745]
a/R* = 80.74 [64.54]
b = 0.99 [0.42]
Seff = 0.11 [0.01]
Teq = 147 [4] K
Rp = 2.75 [9.32] Re
a = 0.3200 [0.0286] AU
Ag = 7716.06 [52304.51] [0.15 σ]
Teffp = 2137 [3621] K [0.55 σ]

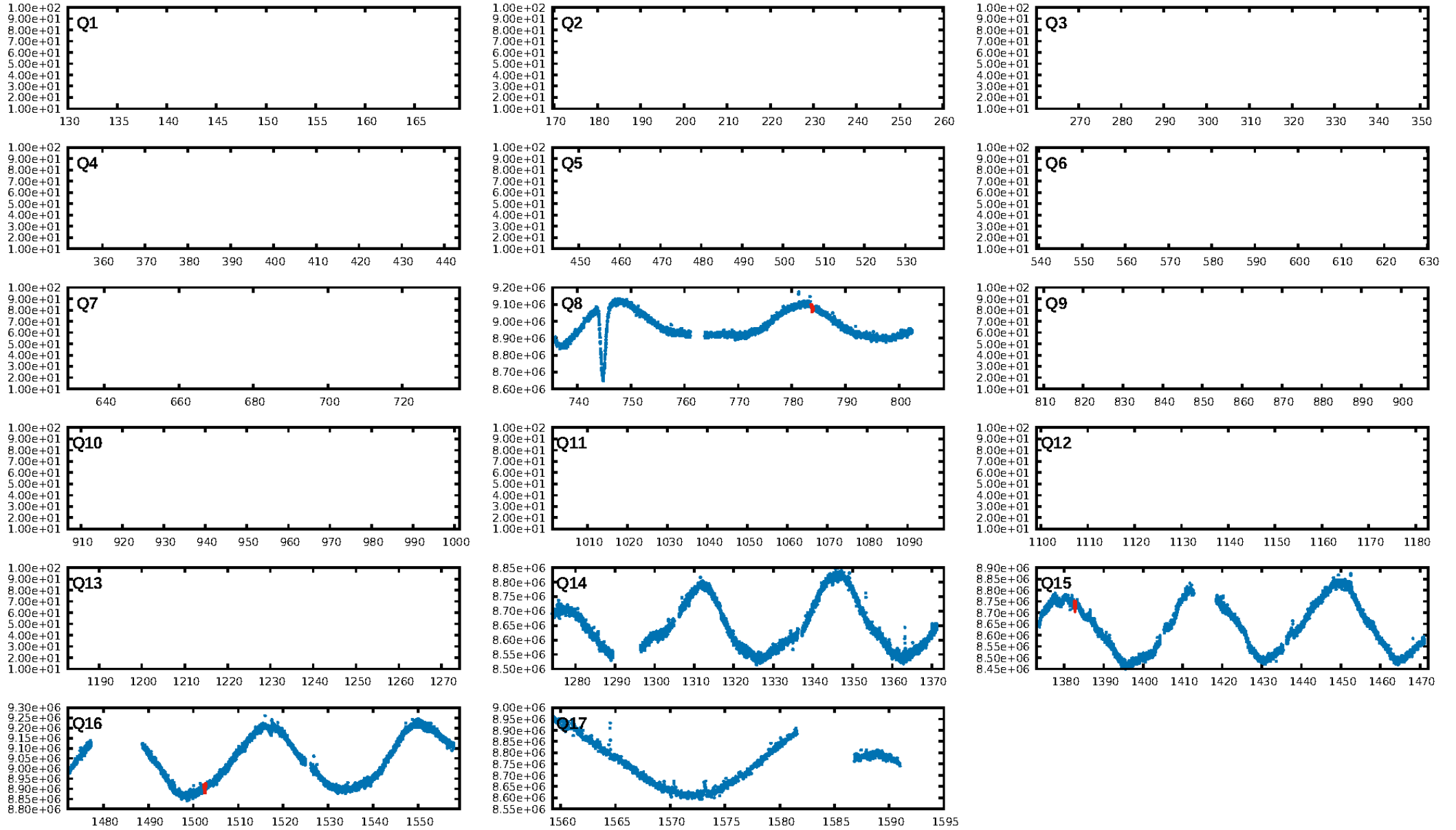
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [204.21 σ]
LongPeriod-sig: 100.0% [6.11 σ]
ModelChiSquare2-sig: 89.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.09e-11
RollingBand-fgm: 0.67 [2/3]
GhostDiagnostic-chr: 0.4278
Centroid-sig: 39.2%
Centroid-so: 1.451 arcsec [0.81 σ]
OotOffset-rm: 0.499 arcsec [1.08 σ]
OotOffset-st: 0/1/2/0 [3]
KicOffset-rm: 0.588 arcsec [1.20 σ]
KicOffset-st: 0/1/2/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

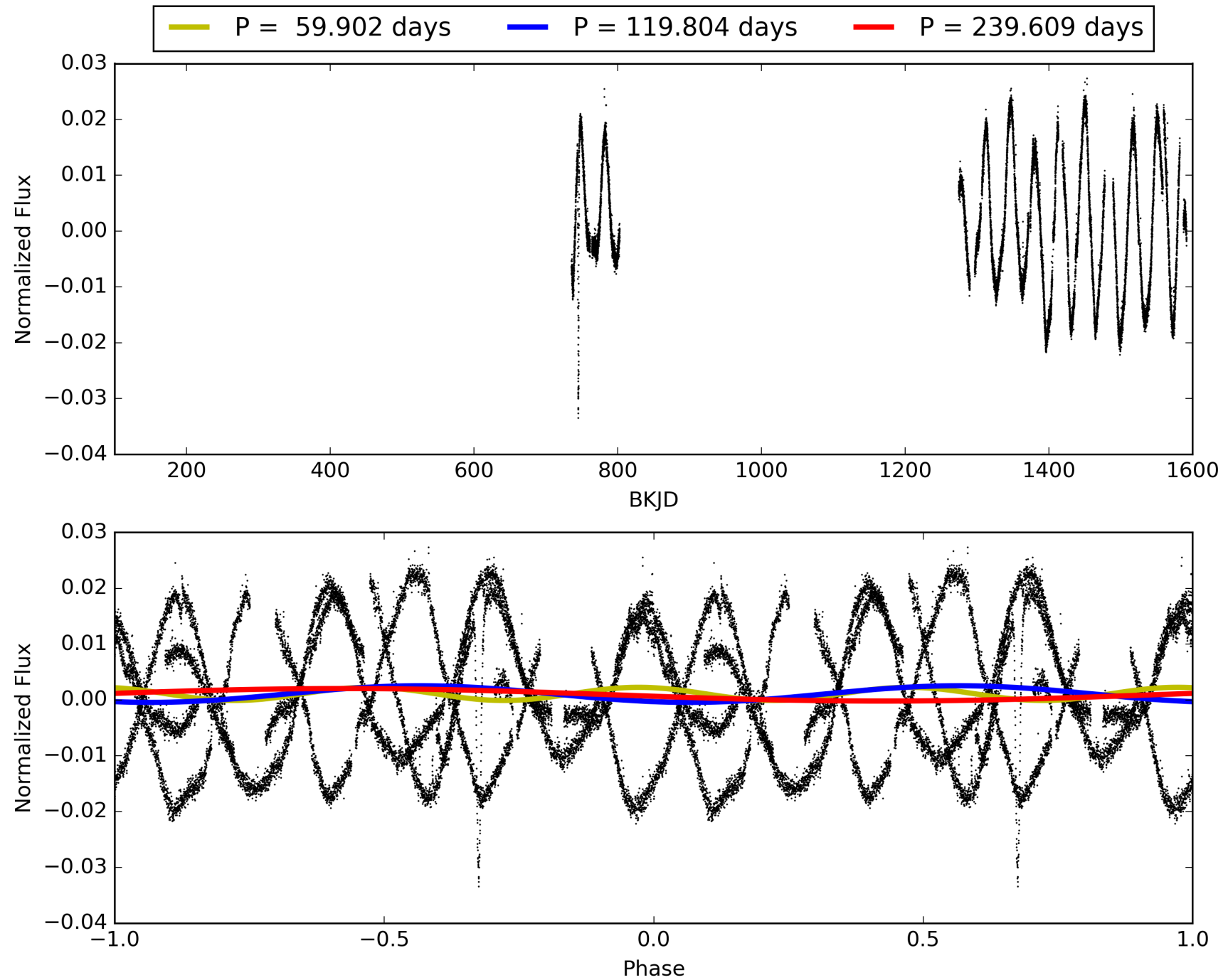
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 05:56:56 Z

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

TCE 010403228-02, PDC Light Curves

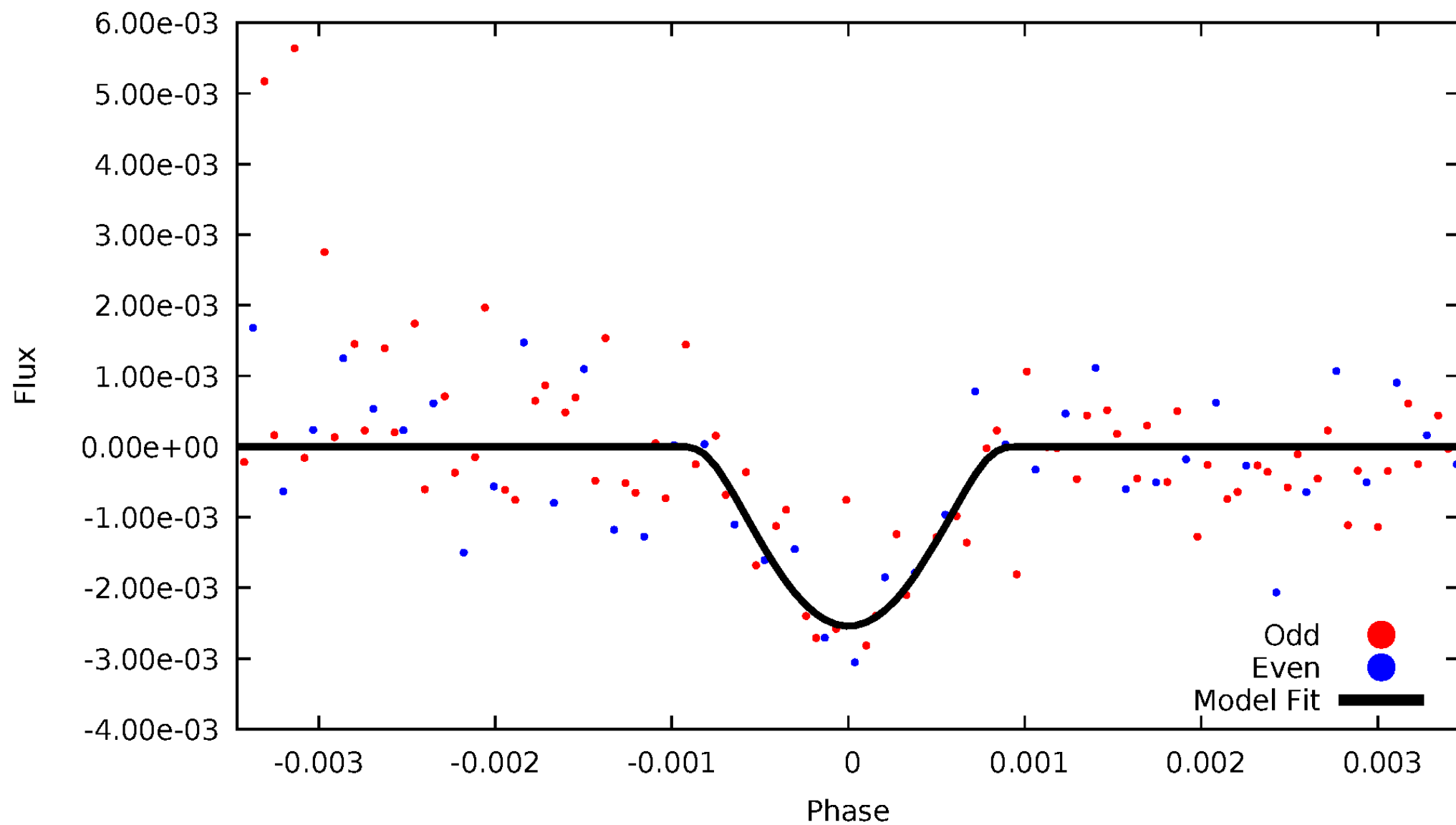


TCE 010403228-02



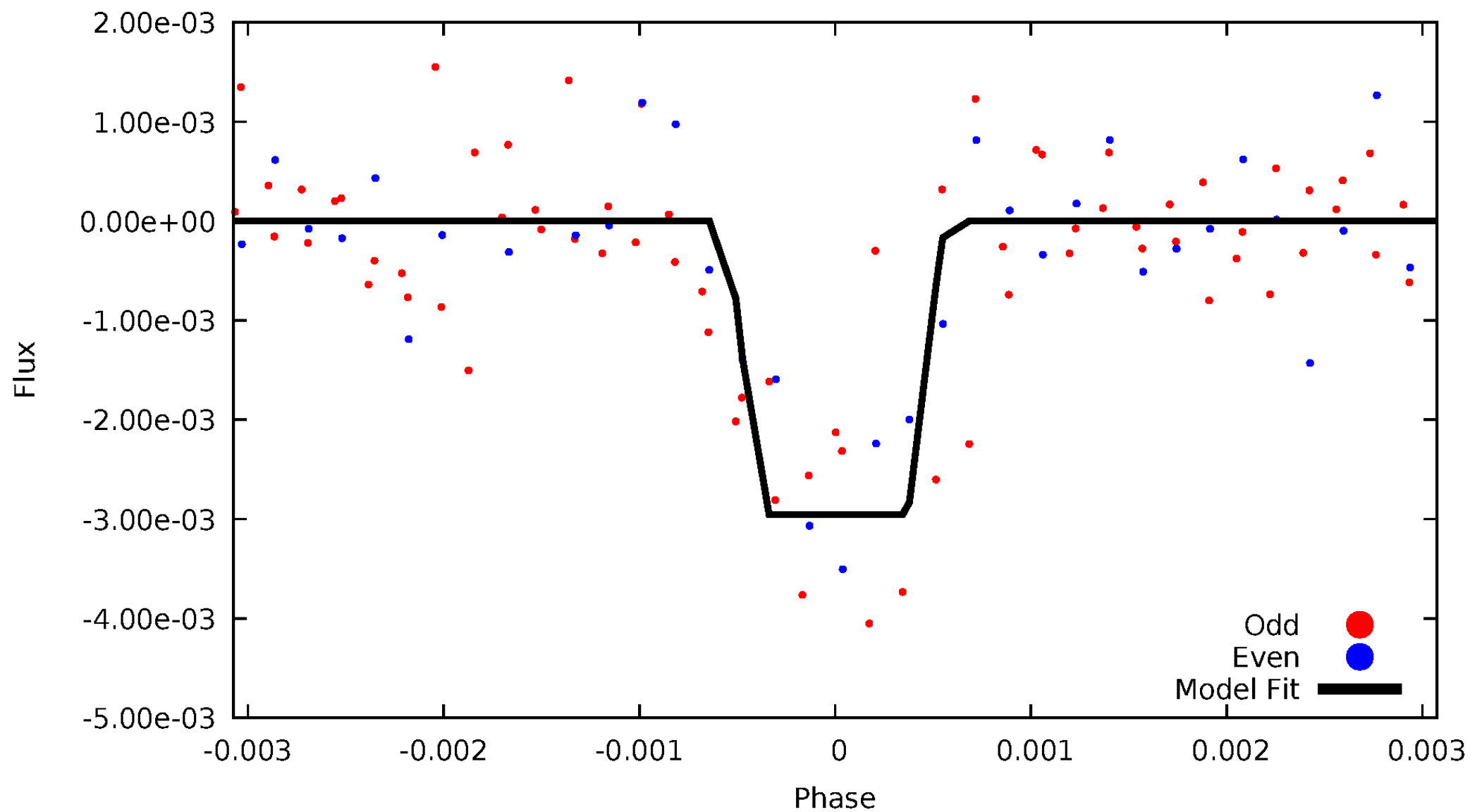
DV Odd/Even

TCE 010403228-02



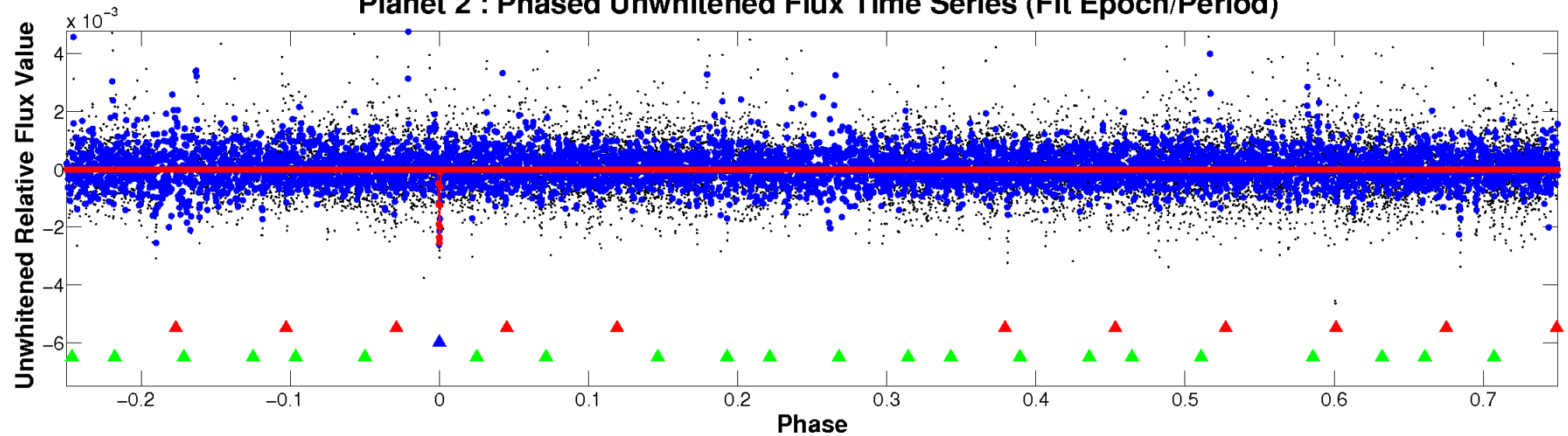
ALT Odd/Even

TCE 010403228-02

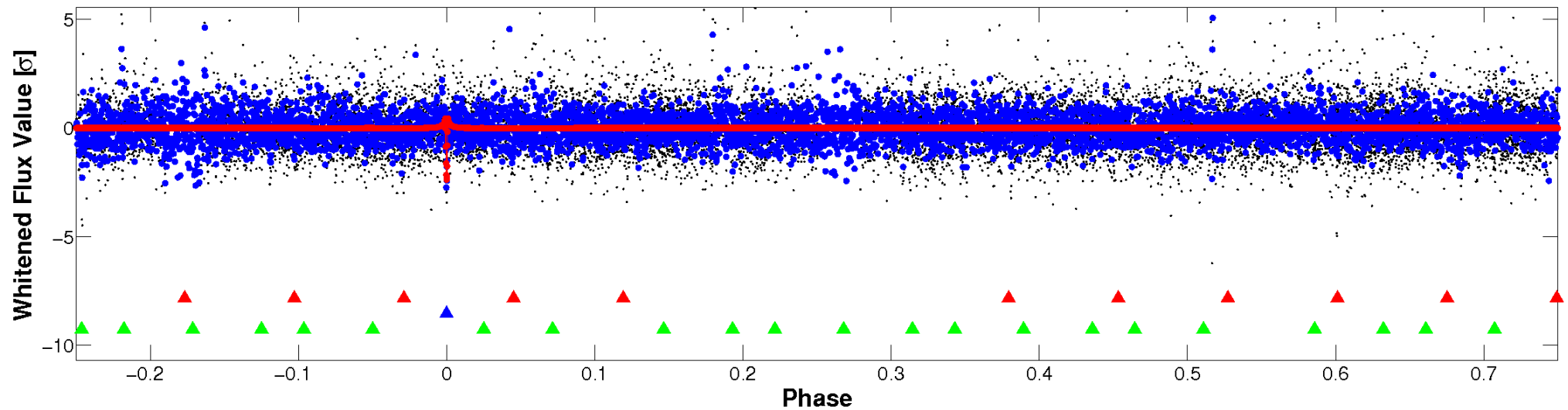


Non-Whitened Vs. Whitened Light Curve

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

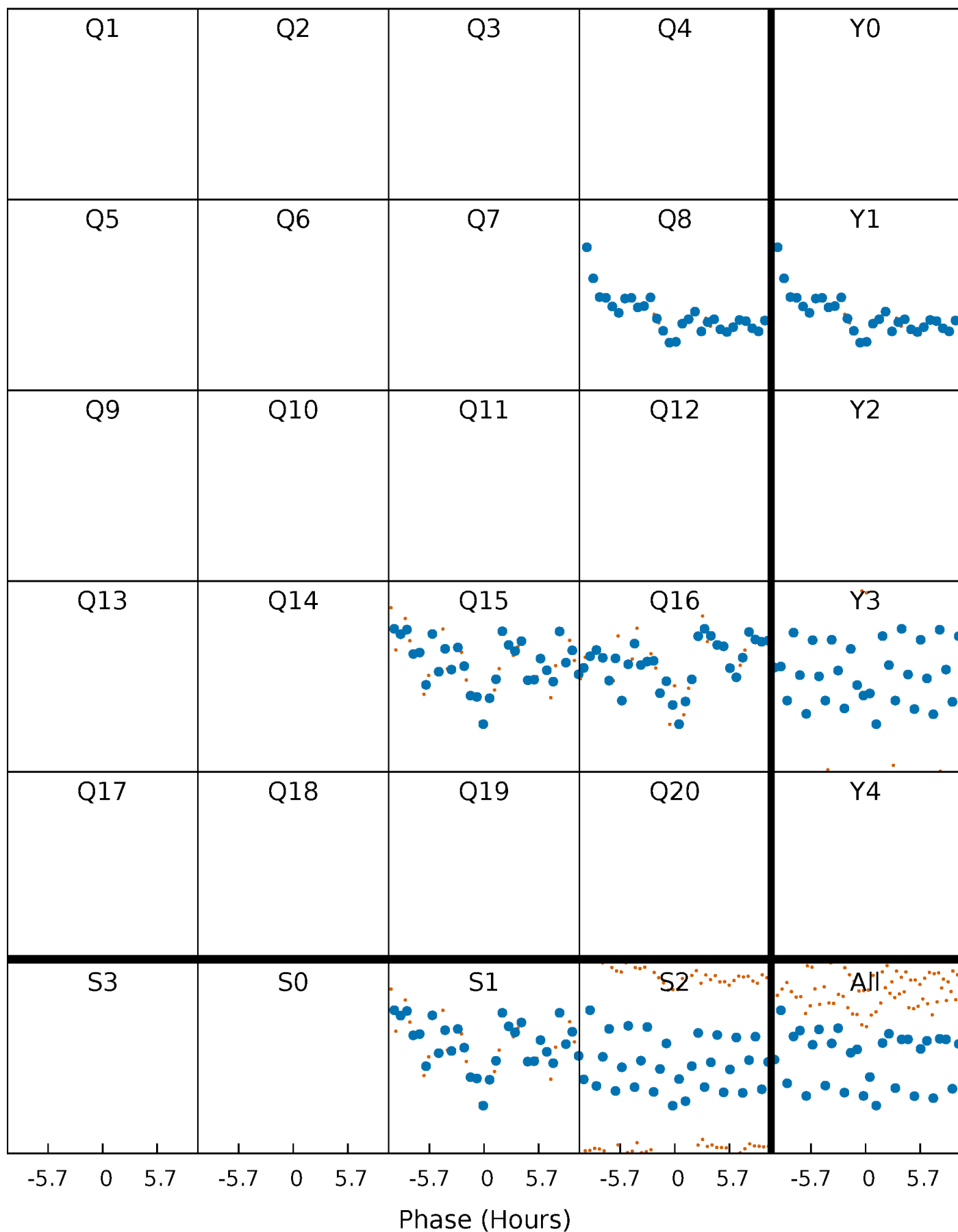


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



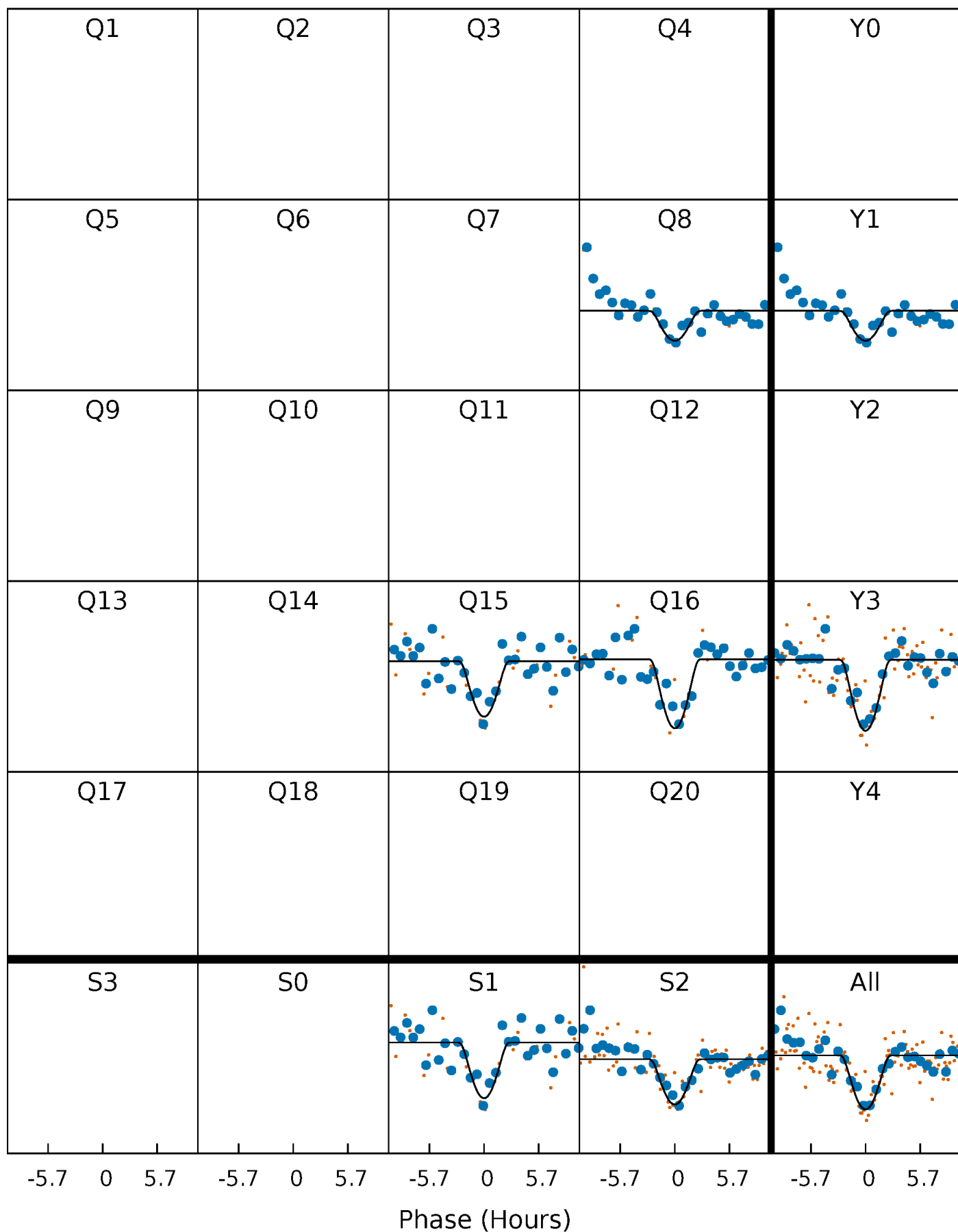
PDC Quarter-Phased Transit Curves

TCE 010403228-02 $P=119.804456$ Days $T_0=184.736070$ (BKJD)



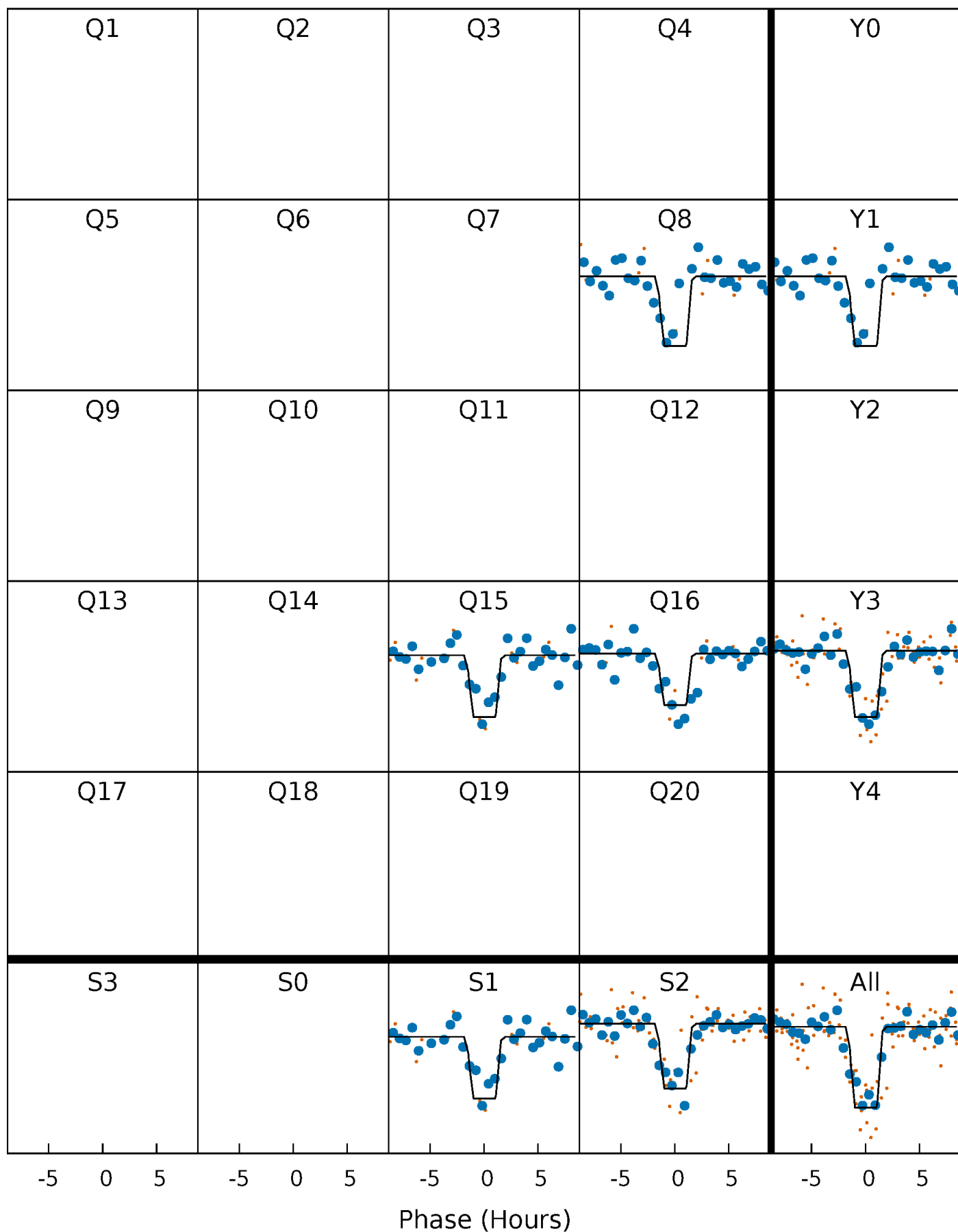
DV Quarter-Phased Transit Curves

TCE 010403228-02 $P=119.804456$ Days $T_0=184.736070$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

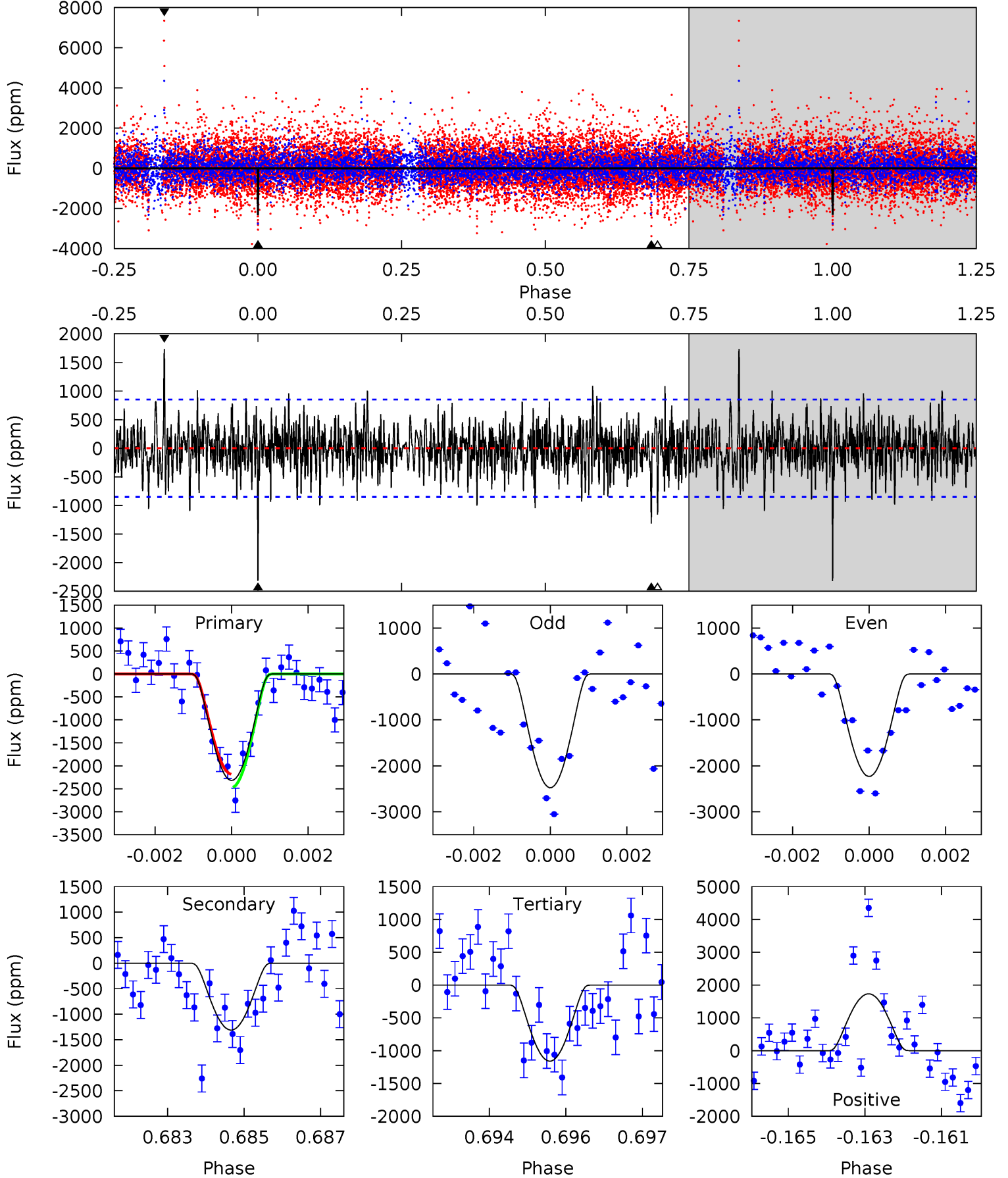
TCE 010403228-02 $P=119.802808$ Days $T_0=184.752340$ (BKJD)



DV Model-Shift Uniqueness Test

010403228-02, P = 119.804456 Days, E = 184.736070 Days

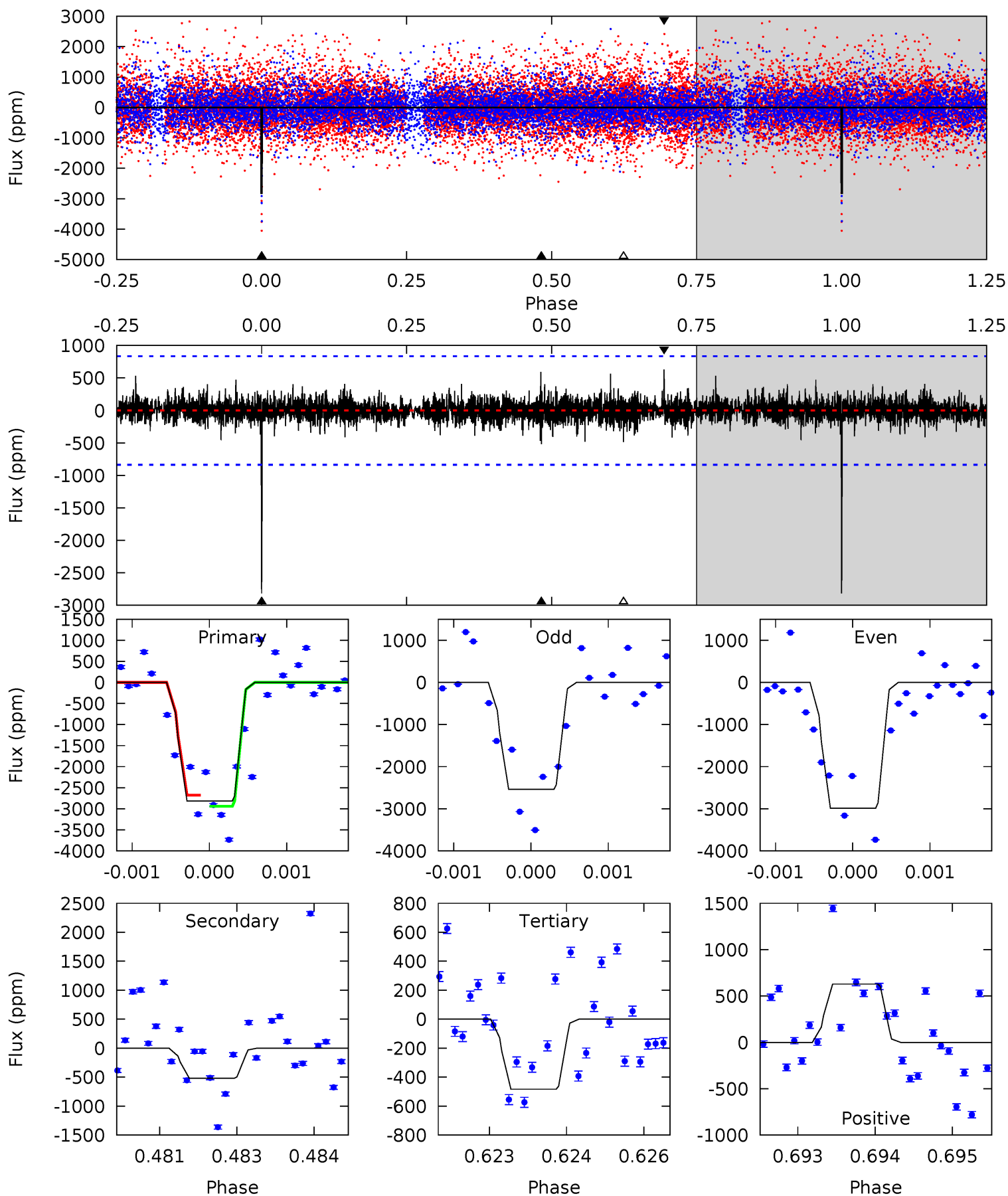
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.5 | 8.23 | 7.28 | 10.9 | 5.34 | 3.12 | 2.00 | 7.27 | 3.67 | 0.95 | -2.64 | 0.69 | 1.00 | 0.43 | 0.90 |



Alt Model-Shift Uniqueness Test

010403228-02, P = 119.802808 Days, E = 184.752340 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 18.3 | 3.36 | 3.13 | 4.08 | 5.42 | 3.25 | 0.79 | 15.1 | 14.2 | 0.22 | -0.72 | 1.46 | 1.03 | 0.18 | 0.83 |



Stellar Parameters For KIC 010403228

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3391^{+44}_{-40} | $4.936^{+0.048}_{-0.032}$ | $0.000^{+0.100}_{-0.100}$ | $0.311^{+0.038}_{-0.034}$ | $0.304^{+0.048}_{-0.039}$ | $14.250^{+3.651}_{-2.426}$ |
| | +1%/-1% | +1%/-1% | +inf%/-inf% | +12%/-11% | +16%/-13% | +26%/-17% |
| Source | PHO2 | PHO2 | PHO2 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010403228-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-----------------|------------------------|-----------------|----------------------|-------------------------|
| DV | -1312 ± 159 | $7.27^{+7.52}_{-5.03}$ | 206^{+5}_{-5} | 2143^{+676}_{-287} | 1417^{+12777}_{-1081} |
| Alt. | -517 ± 154 | $7.16^{+7.02}_{-5.12}$ | 205^{+5}_{-4} | 1957^{+626}_{-248} | 571^{+6456}_{-432} |

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 $A_{obs} \gg 1.0$

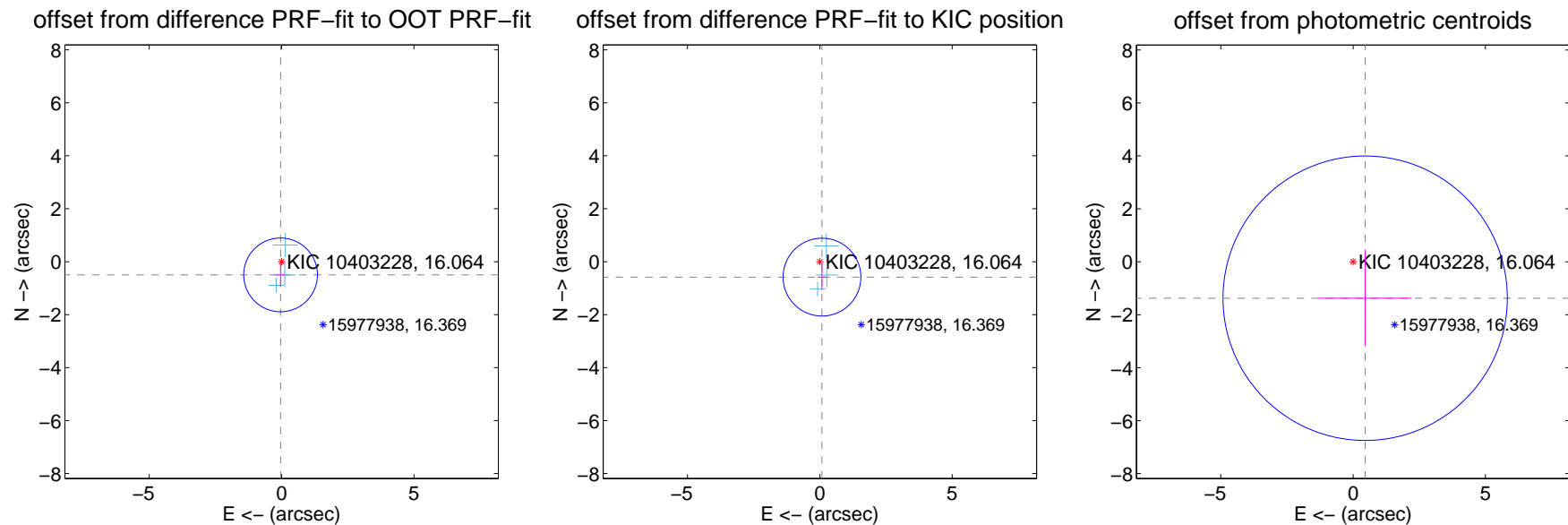
DV Centroid Data

Supplemental centroid analysis for 010403228-02. Kepler magnitude: 16.06. Transit SNR 8.06

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.499 ± 0.464 | 1.08 | 0.039 ± 0.160 | -0.498 ± 0.465 |
| PRF-fit source offset from KIC position | 0.588 ± 0.490 | 1.20 | -0.081 ± 0.159 | -0.582 ± 0.494 |
| photometric centroid source offset | 1.45 ± 1.79 | 0.81 | -0.46 ± 1.76 | -1.38 ± 1.79 |

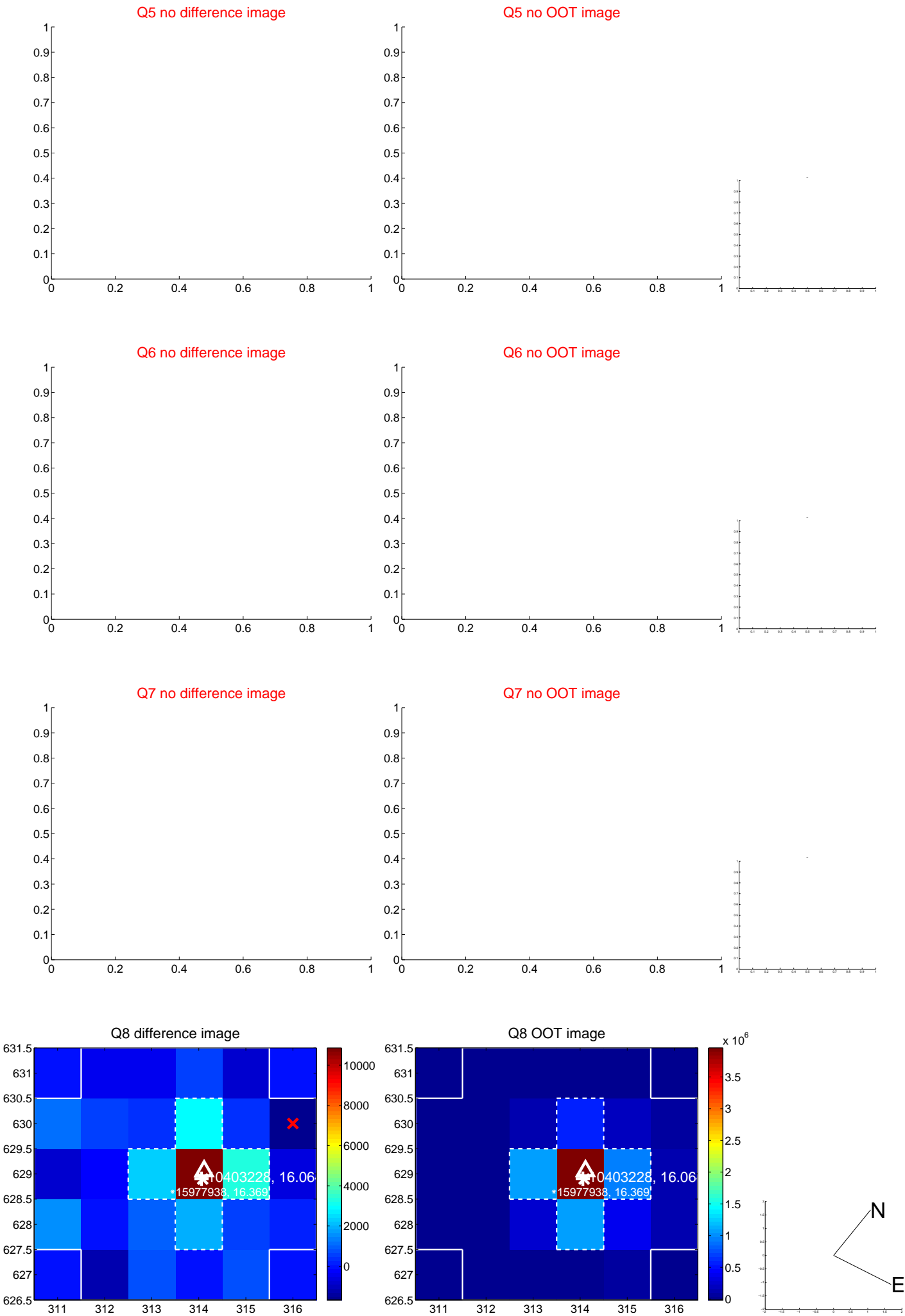


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



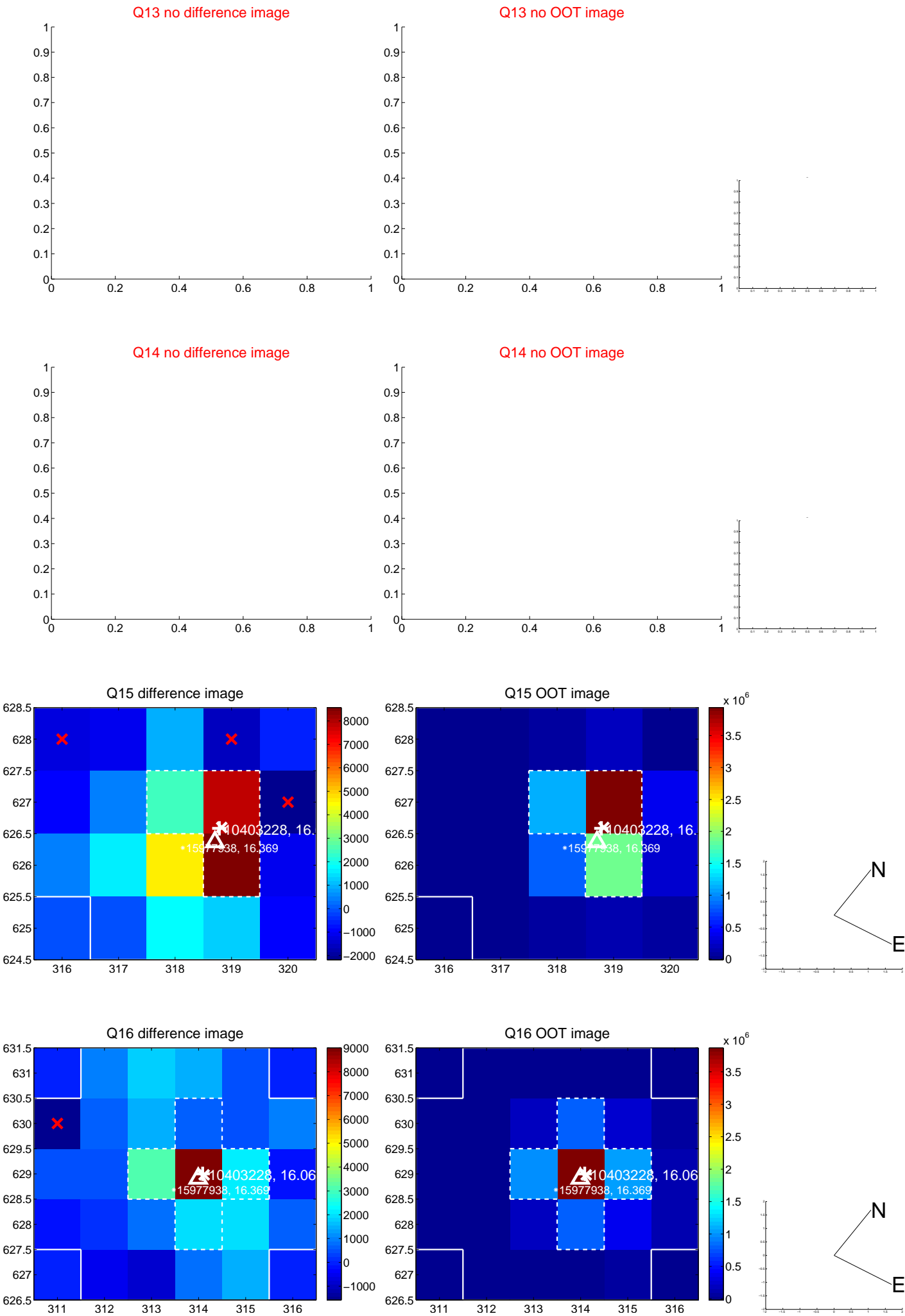
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



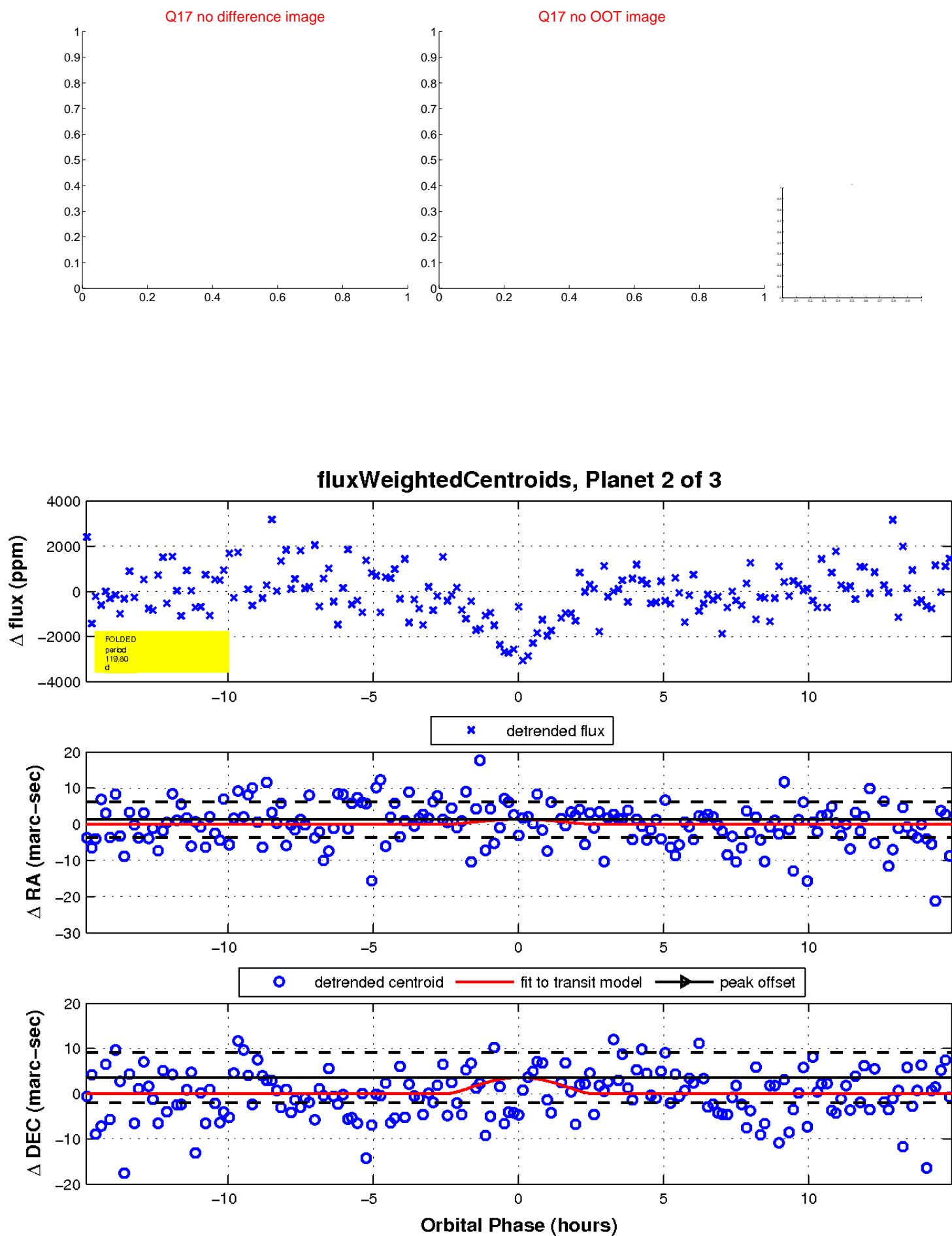
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

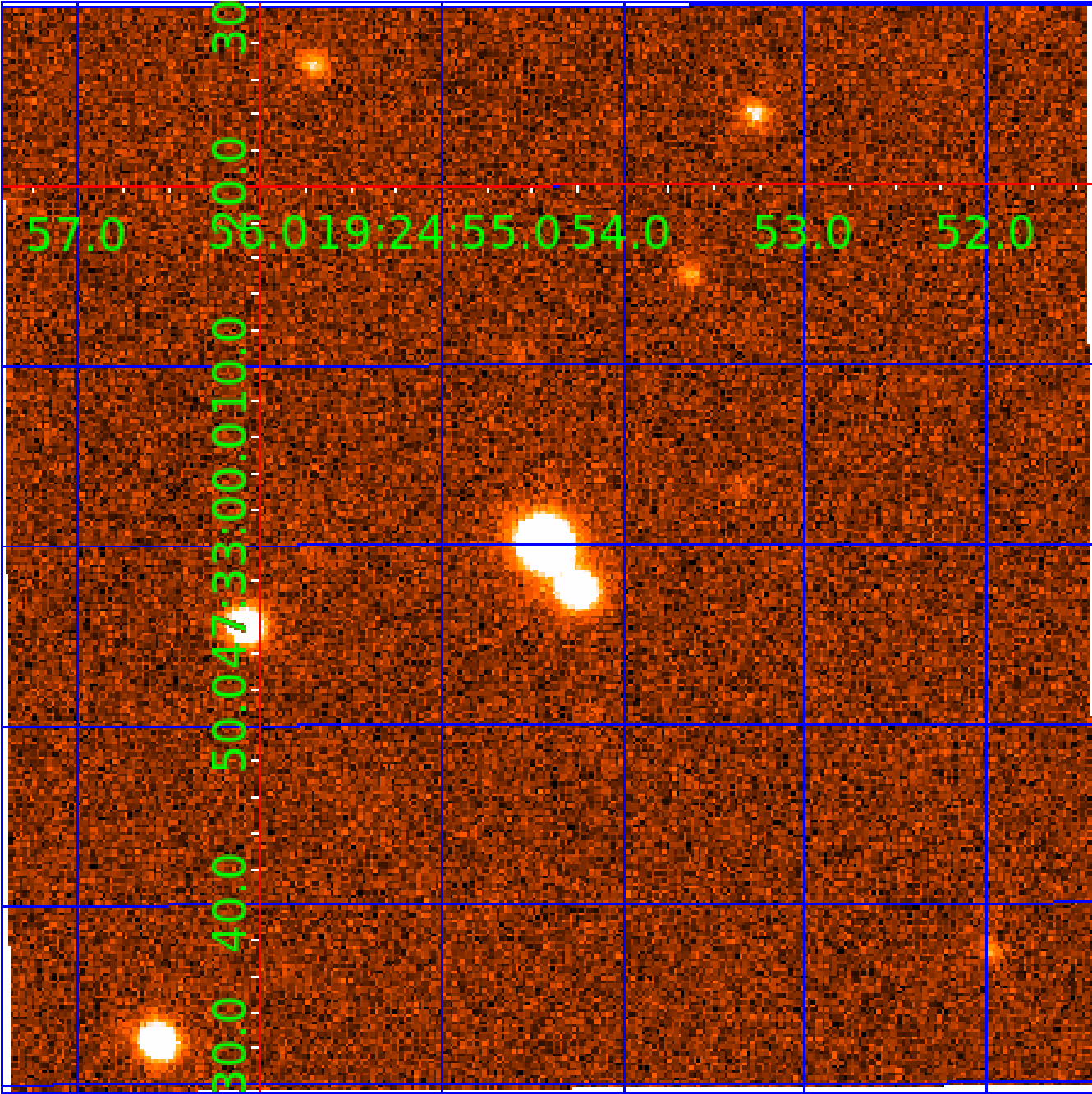


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010403228

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010403228-01 | OBS | No | 128.668420 | 230.181370 | 3193.8 | 34.459 | 42.2 | 10.8 | 0.31 | 3391 | 1.93 | 0.10 |
| 010403228-02 | OBS | No | 119.804456 | 184.736070 | 2540.9 | 4.978 | 7.9 | 8.1 | 0.31 | 3391 | 2.75 | 0.11 |
| 010403228-03 | OBS | 8007.01 | 67.175921 | 144.104697 | 1541.8 | 3.671 | 9.1 | 7.5 | 0.31 | 3391 | 1.27 | 0.24 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 010403228-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 010403228-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | ALL_TRANS_CHASES |
| 010403228-03 | OBS | PC | 0.80 | 0 | 0 | 0 | 0 | NO_COMMENT |

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

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

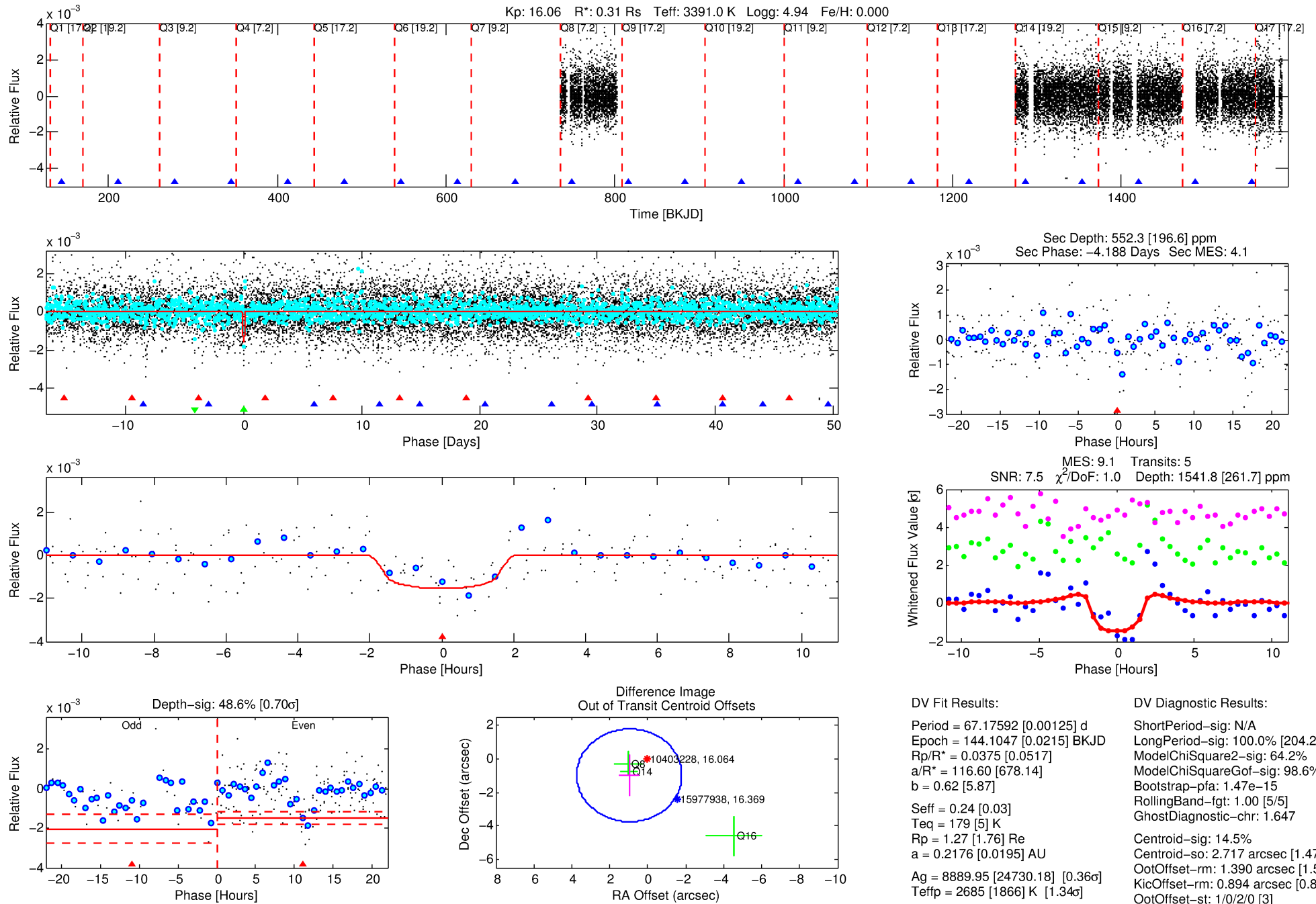
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010403228-03

No Significant Match Found

DV One-Page Summary

KIC: 10403228 Candidate: 3 of 3 Period: 67.176 d



DV Fit Results:

Period = 67.17592 [0.00125] d
Epoch = 144.1047 [0.0215] BKJD
Rp/R* = 0.0375 [0.0517]
a/R* = 116.60 [678.14]
b = 0.62 [5.87]
Seff = 0.24 [0.03]
Teq = 179 [5] K
Rp = 1.27 [1.76] Re
a = 0.2176 [0.0195] AU
Ag = 8889.95 [24730.18] [0.36 σ]
Teff = 2685 [1866] K [1.34 σ]

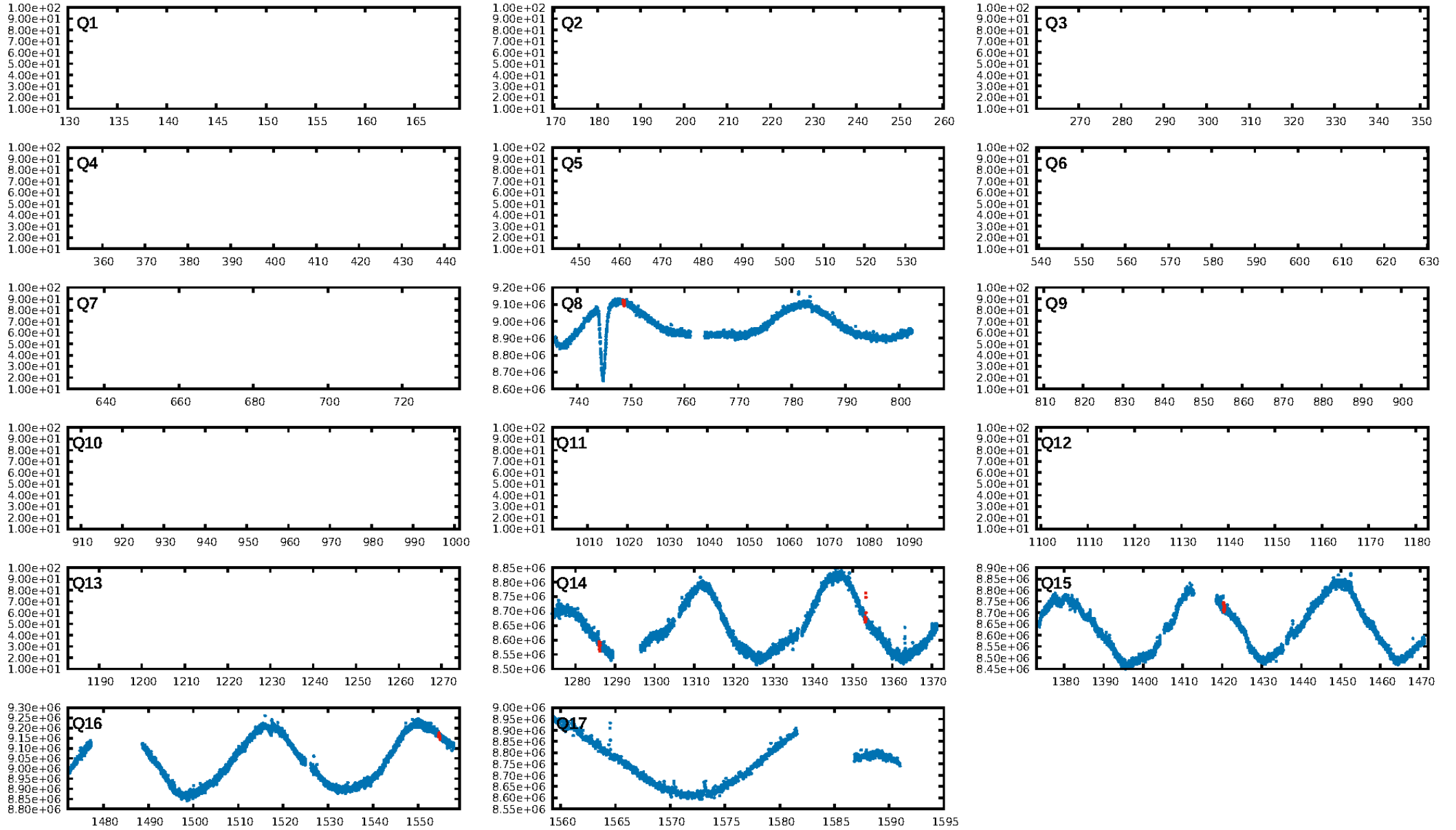
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [204.21 σ]
ModelChiSquare2-sig: 64.2%
ModelChiSquareGof-sig: 98.6%
Bootstrap-pfa: 1.47e-15
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.647
Centroid-sig: 14.5%
Centroid-so: 2.717 arcsec [1.47 σ]
OotOffset-rm: 1.390 arcsec [1.51 σ]
KicOffset-rm: 0.894 arcsec [0.81 σ]
OotOffset-st: 1/0/2/0 [3]
KicOffset-st: 1/0/2/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [4/4]

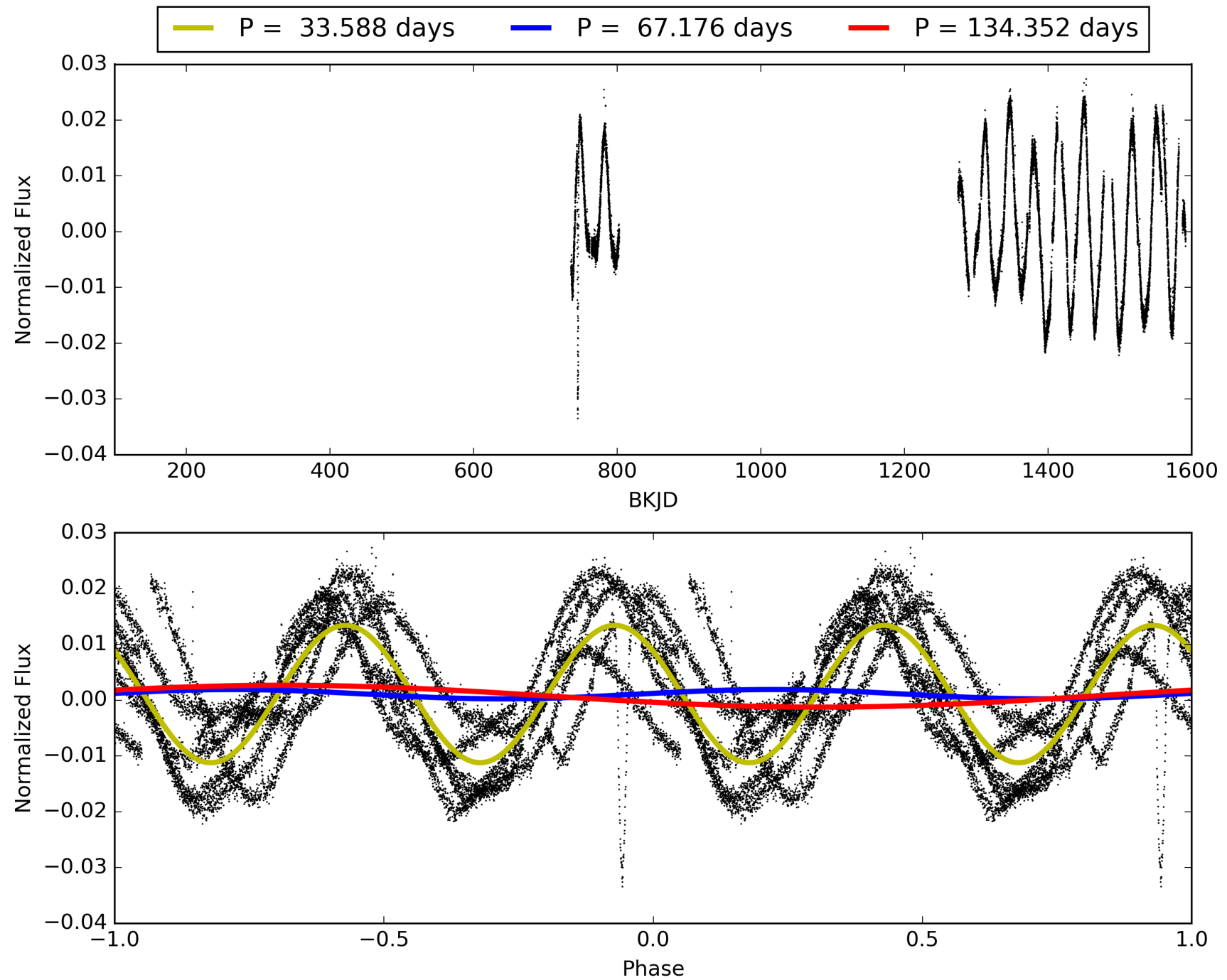
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 05:57:00 Z

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

TCE 010403228-03, PDC Light Curves

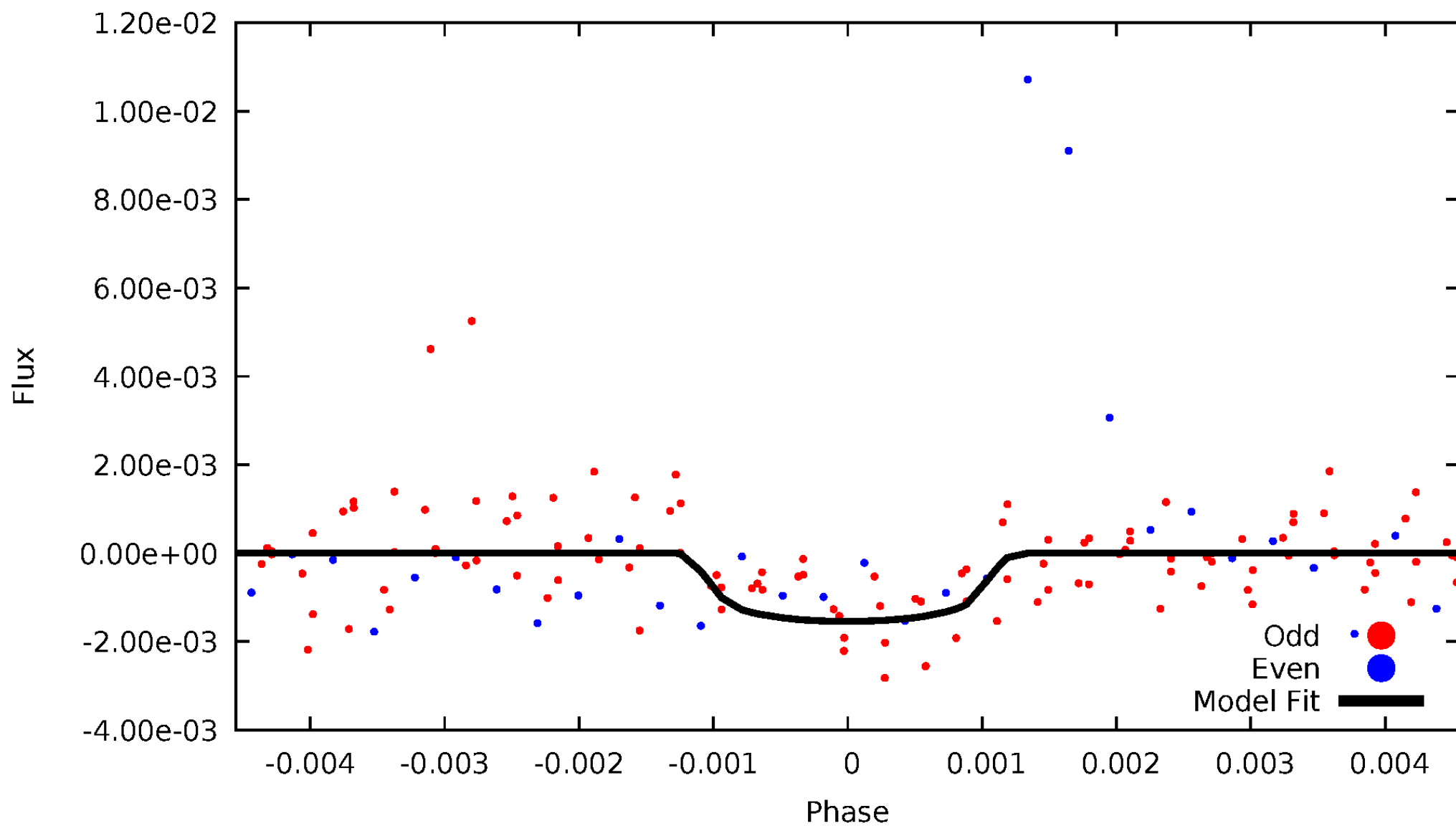


TCE 010403228-03



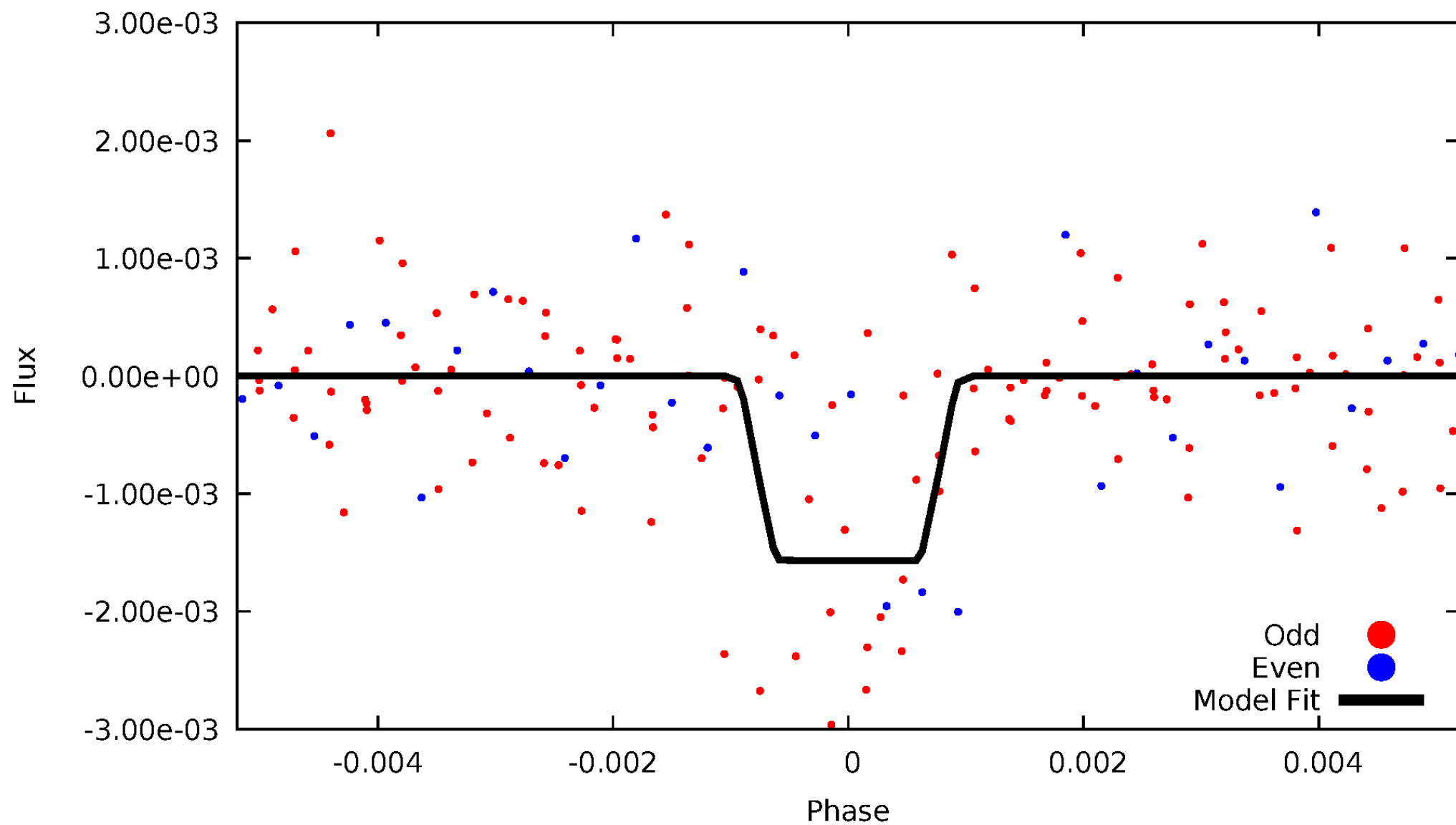
DV Odd/Even

TCE 010403228-03



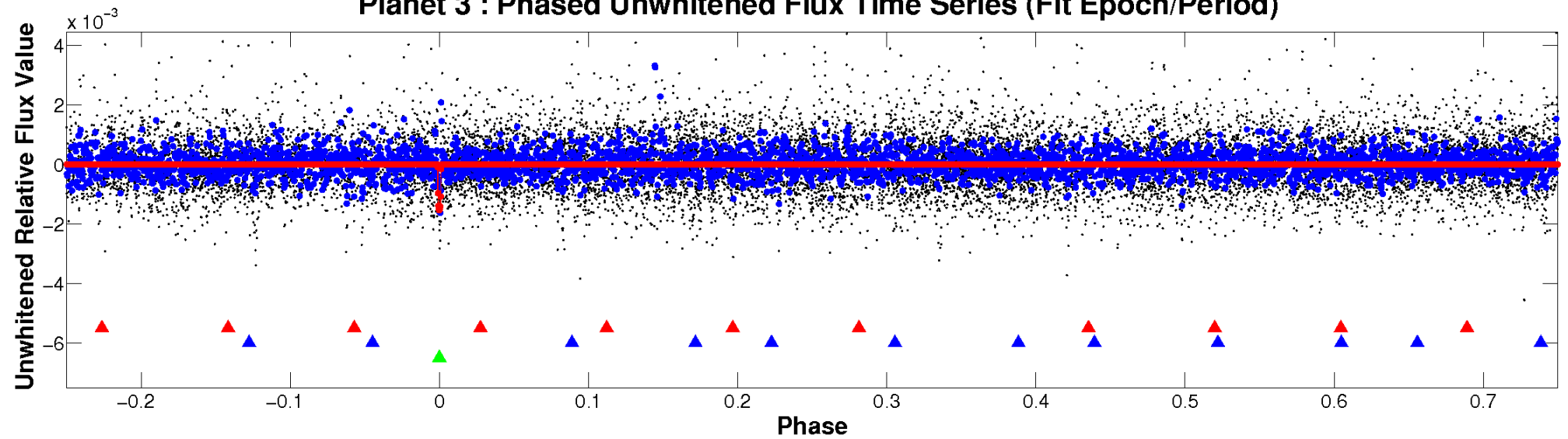
ALT Odd/Even

TCE 010403228-03

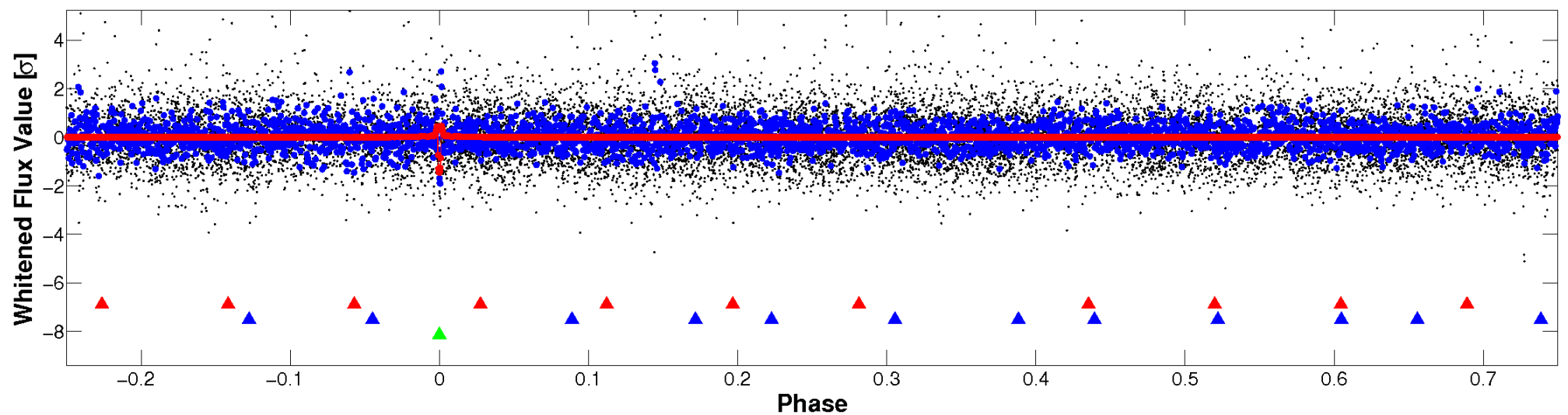


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

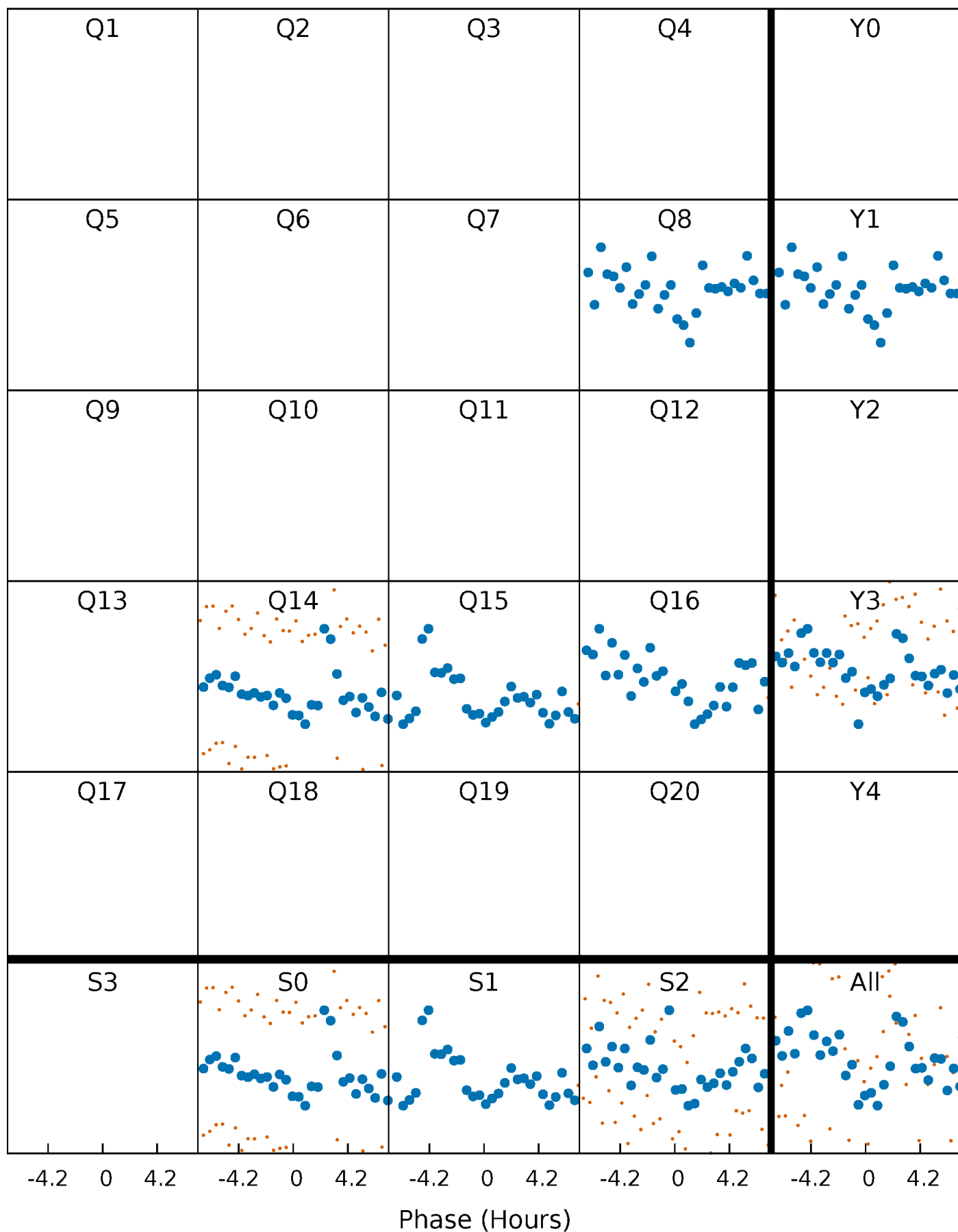


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



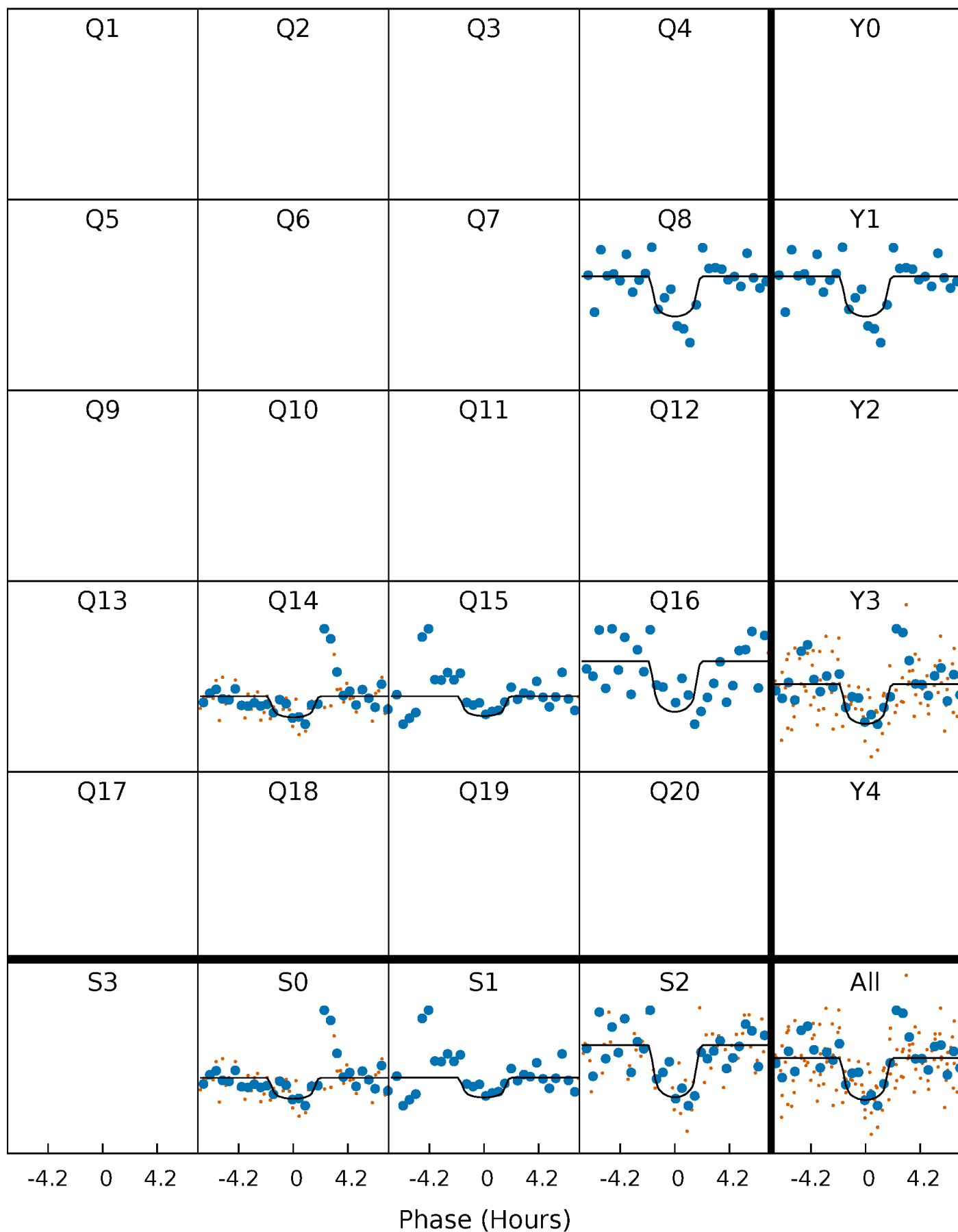
PDC Quarter-Phased Transit Curves

TCE 010403228-03 P= 67.175921 Days $T_0=144.104697$ (BKJD)



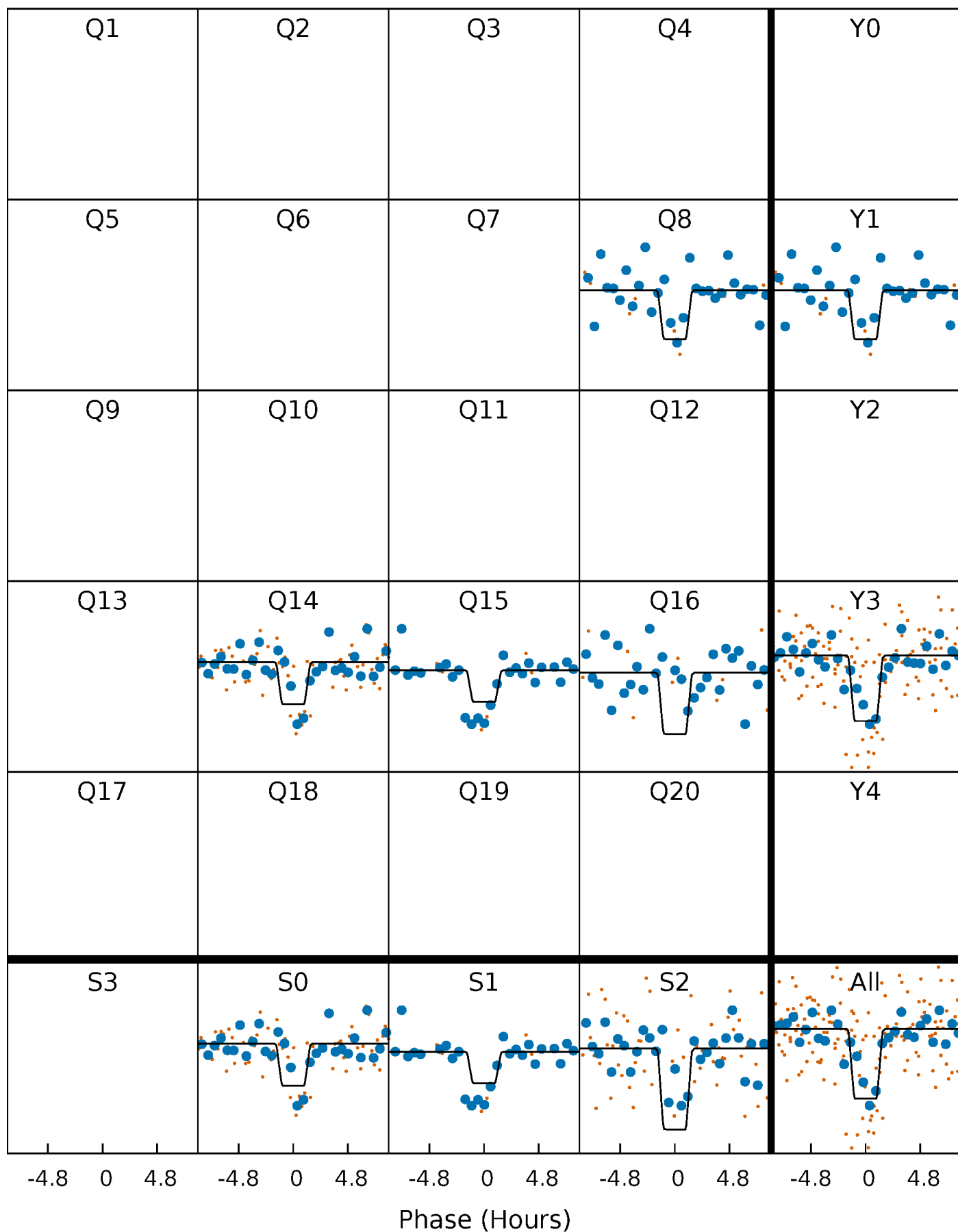
DV Quarter-Phased Transit Curves

TCE 010403228-03 P= 67.175921 Days $T_0=144.104697$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

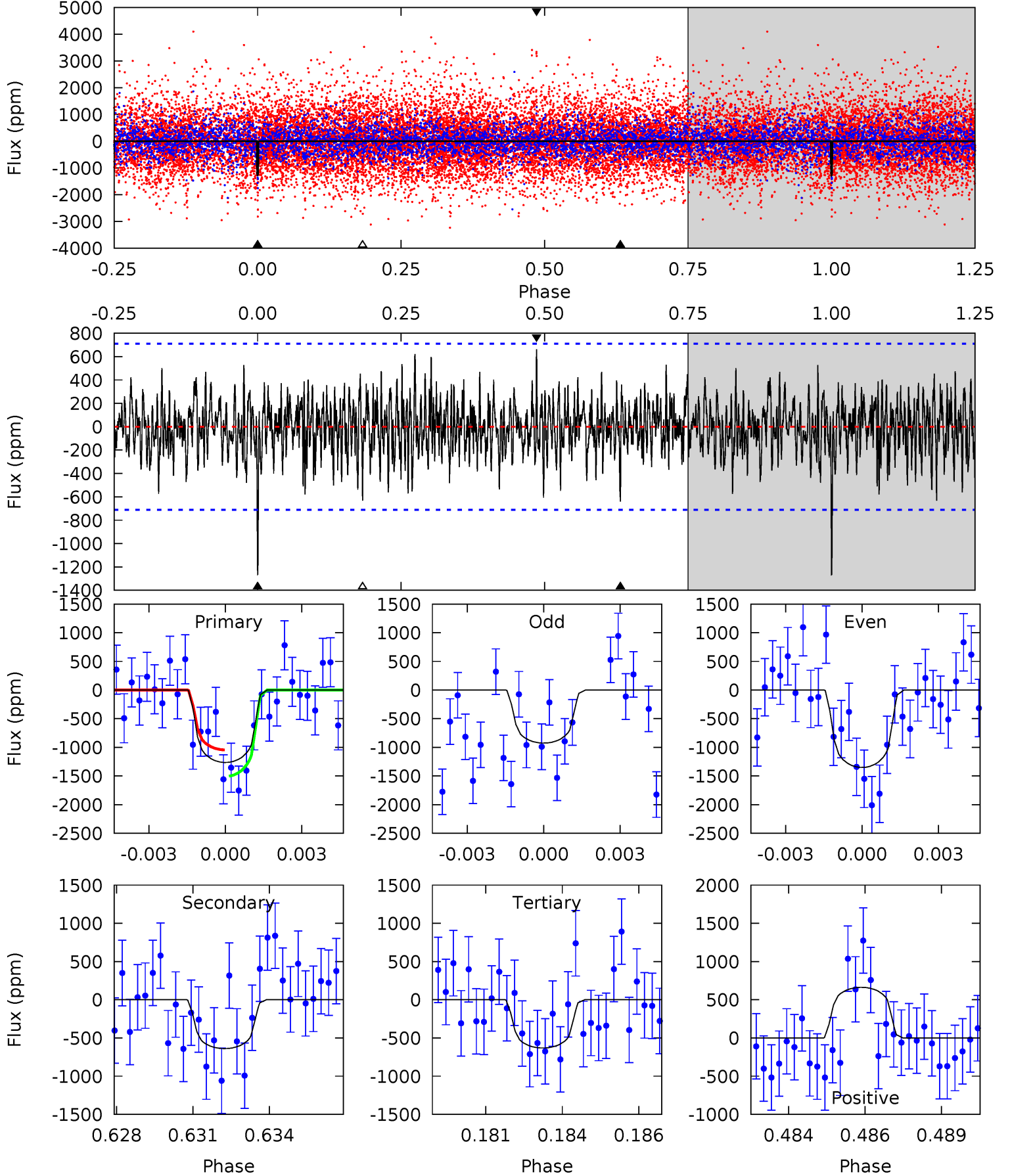
TCE 010403228-03 $P = 67.174387$ Days $T_0 = 144.139164$ (BKJD)



DV Model-Shift Uniqueness Test

010403228-03, P = 67.175921 Days, E = 144.104697 Days

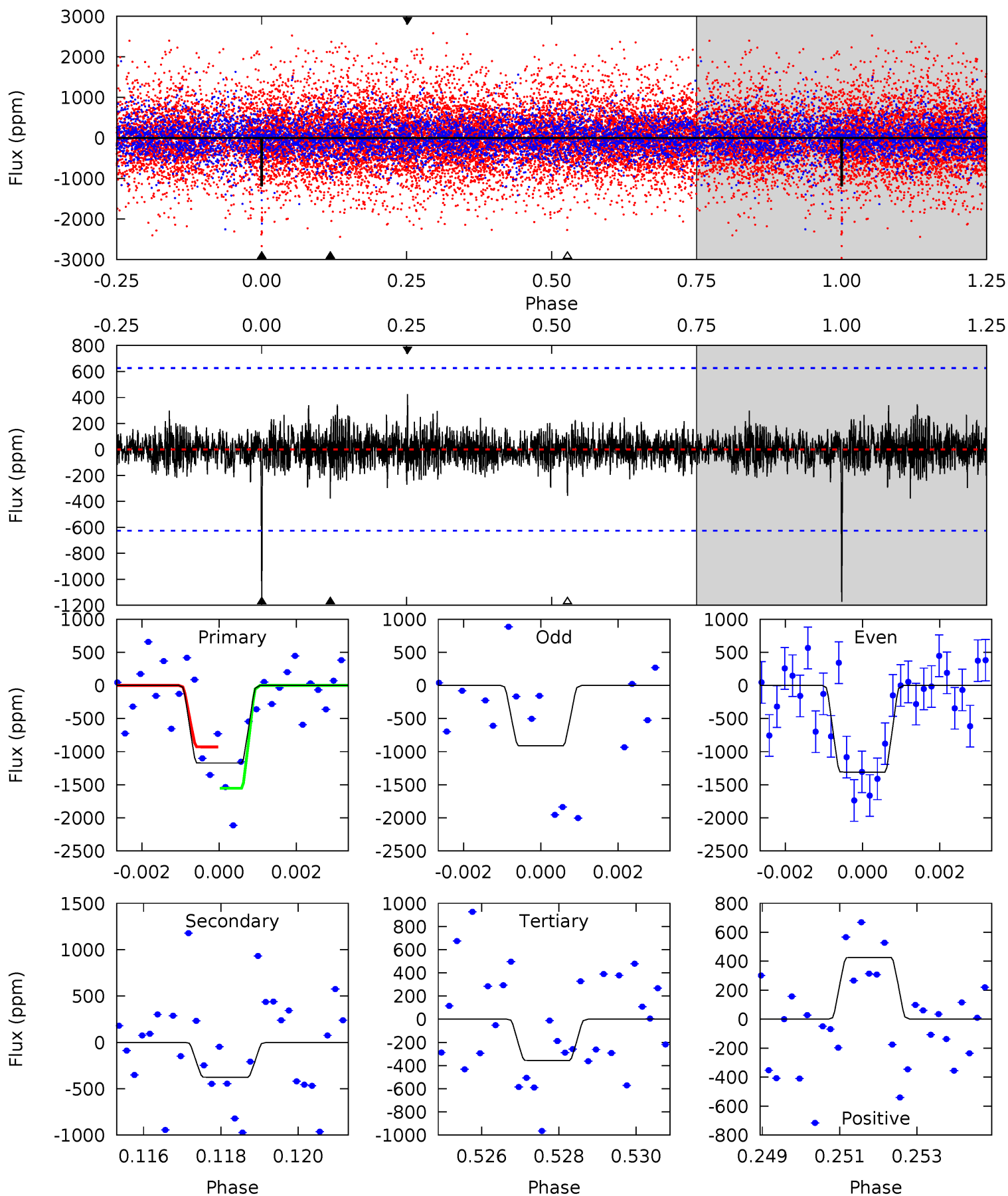
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.39 | 4.75 | 4.69 | 4.92 | 5.28 | 3.01 | 1.43 | 4.70 | 4.47 | 0.06 | -0.17 | 1.24 | 1.01 | 0.34 | 1.71 |



Alt Model-Shift Uniqueness Test

010403228-03, $P = 67.174387$ Days, $E = 144.139164$ Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.98 | 3.20 | 3.03 | 3.63 | 5.33 | 3.09 | 0.74 | 6.95 | 6.35 | 0.17 | -0.42 | 1.48 | 1.20 | 0.27 | 2.65 |



Stellar Parameters For KIC 010403228

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3391^{+44}_{-40} | $4.936^{+0.048}_{-0.032}$ | $0.000^{+0.100}_{-0.100}$ | $0.311^{+0.038}_{-0.034}$ | $0.304^{+0.048}_{-0.039}$ | $14.250^{+3.651}_{-2.426}$ |
| | +1%/-1% | +1%/-1% | +inf%/-inf% | +12%/-11% | +16%/-13% | +26%/-17% |
| Source | PHO2 | PHO2 | PHO2 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010403228-03 / KOI 8007.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|----------------|------------------------|----------------------|----------------------|-------------------------|
| DV | -639 ± 135 | $1.83^{+1.54}_{-1.16}$ | 249^{+6}_{-5} | 2733^{+947}_{-381} | 4969^{+33634}_{-3493} |
| Alt. | -377 ± 118 | $1.85^{+1.46}_{-1.16}$ | 249^{+5}_{-6} | 2506^{+861}_{-320} | 2527^{+19339}_{-1756} |

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

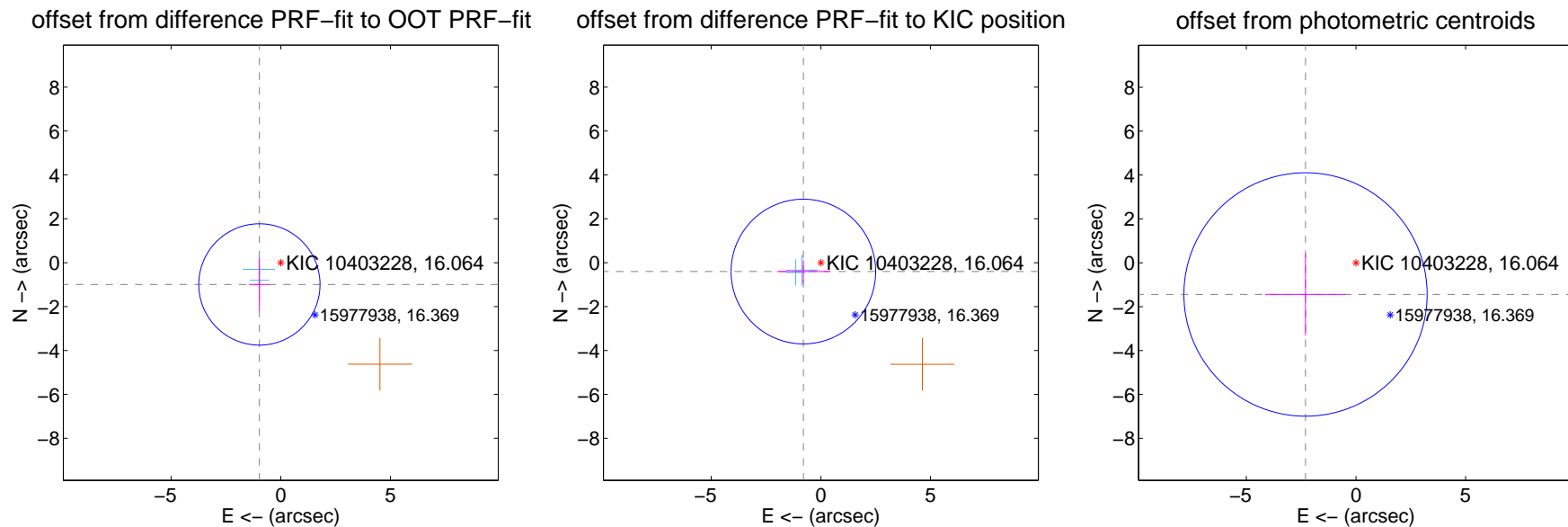
DV Centroid Data

Supplemental centroid analysis for 010403228-03. Kepler magnitude: 16.06. Transit SNR 7.49

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 1.390 ± 0.922 | 1.51 | 0.974 ± 0.479 | -0.991 ± 1.203 |
| PRF-fit source offset from KIC position | 0.894 ± 1.099 | 0.81 | 0.798 ± 1.205 | -0.403 ± 0.507 |
| photometric centroid source offset | 2.72 ± 1.85 | 1.47 | 2.30 ± 1.84 | -1.45 ± 1.87 |

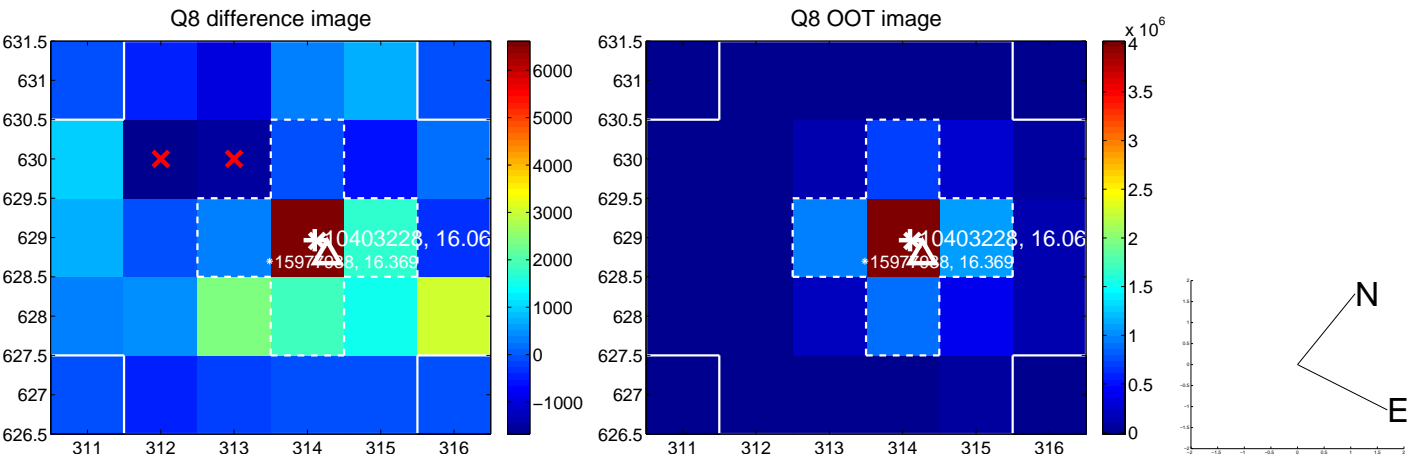


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



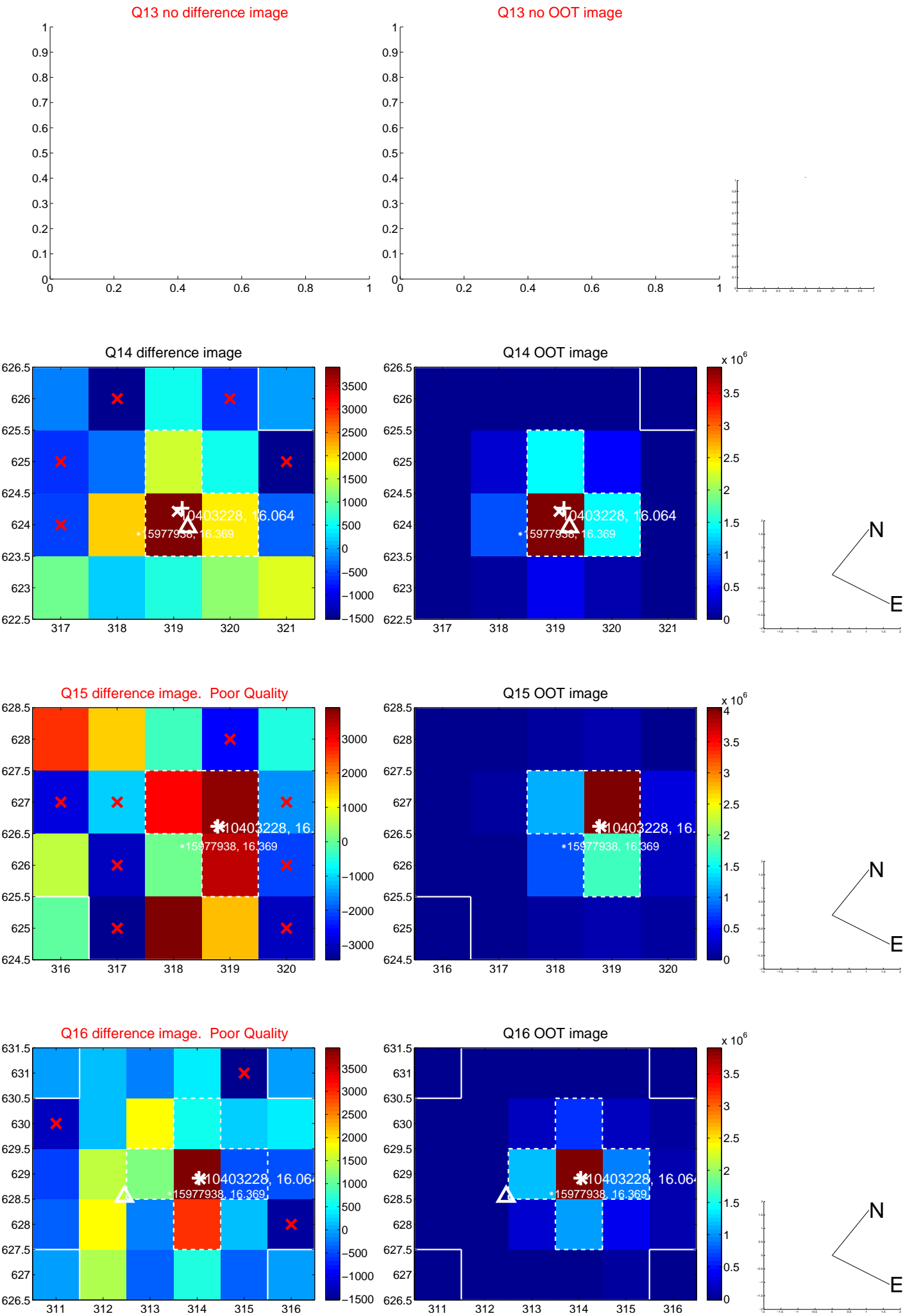
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



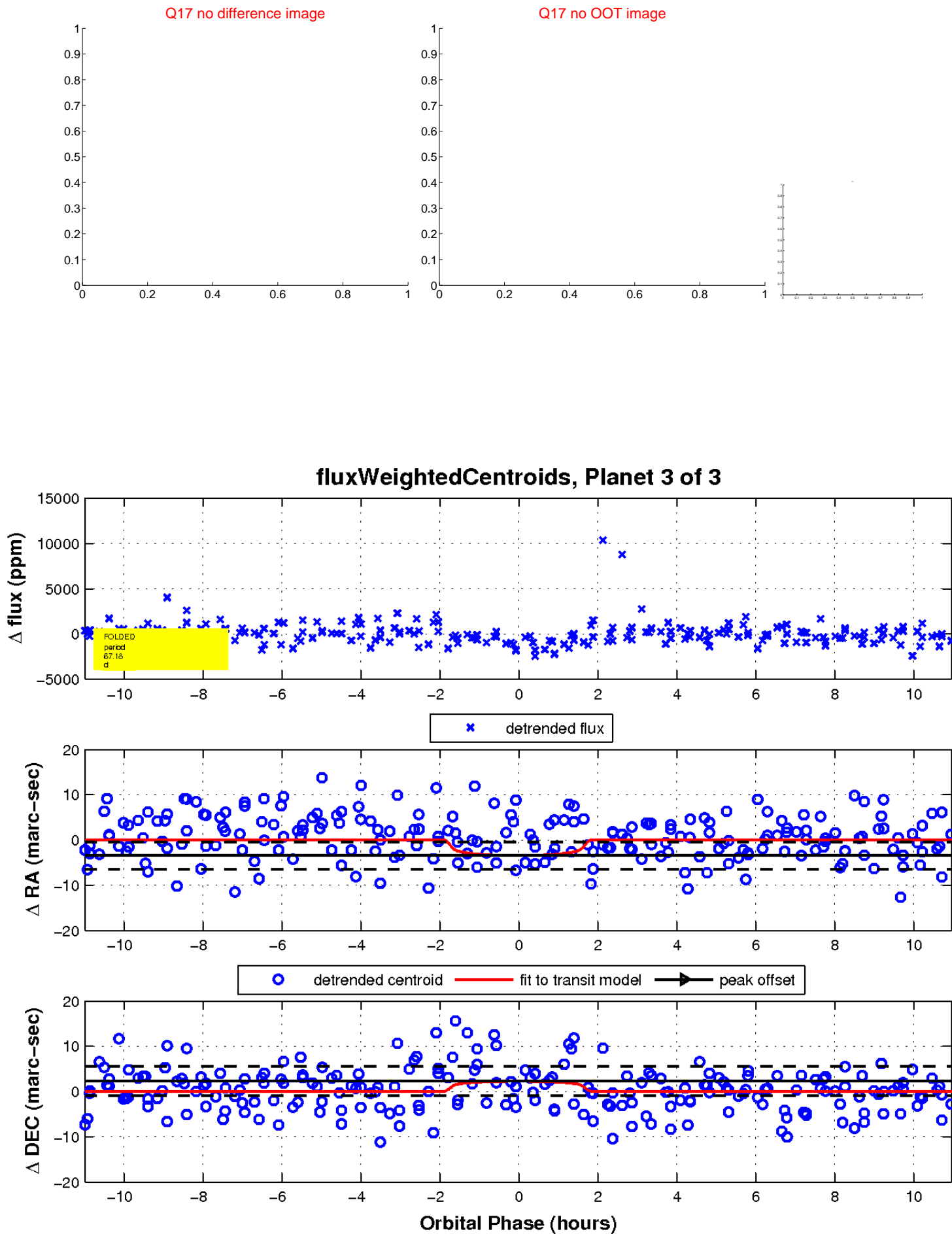
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

