

KIC 010384962

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 010384962-01 | OBS | 0619.01 | 2.879245 | 133.280130 | 48414.6 | 2.658 | 3256.0 | 2291.0 | 0.89 | 5941 | 21.25 | 566.57 |
| 010384962-02 | OBS | No | 2.879216 | 131.846567 | 743.1 | 2.029 | 47.9 | 49.1 | 0.89 | 5941 | 2.86 | 566.58 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010384962-01 | OBS | PC | 0.69 | 0 | 1 | 0 | 0 | MOD_SEC_DV—PLANET_OCCULT_DV—MOD_SEC_ALT—HAS_SEC_TCE |
| 010384962-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE |

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.

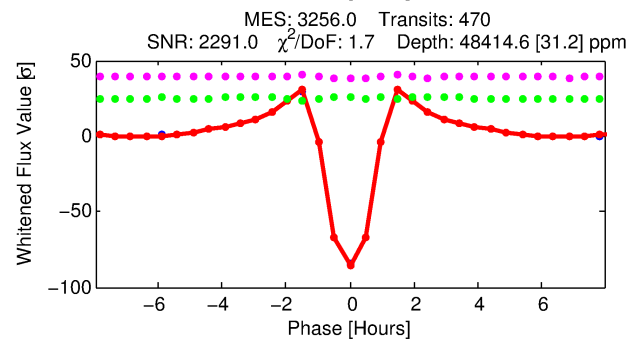
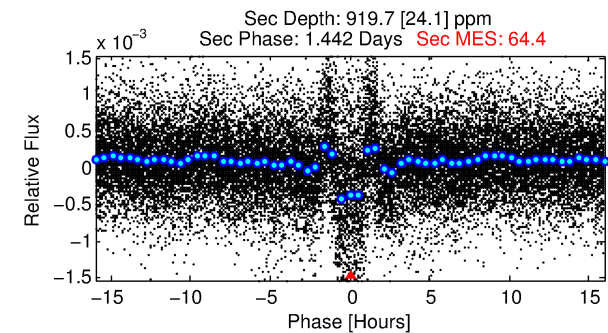
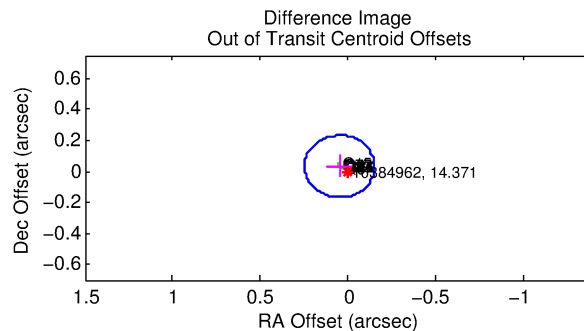
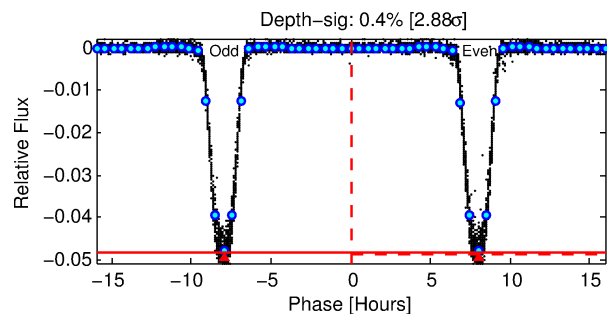
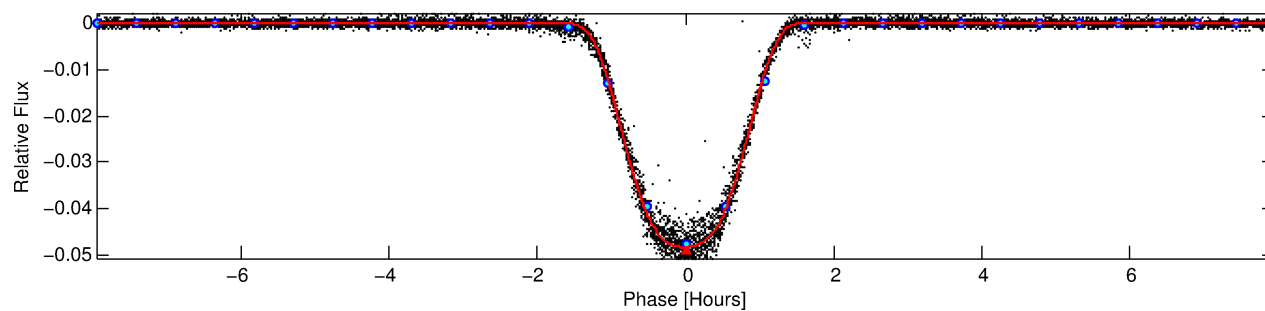
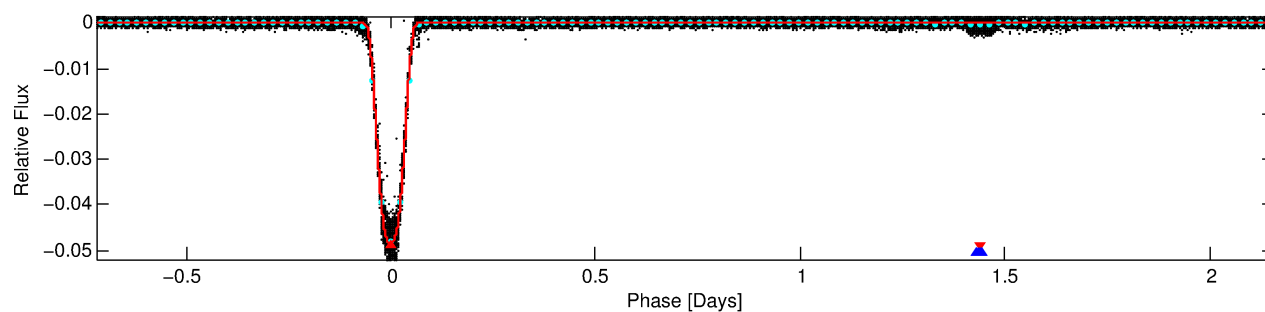
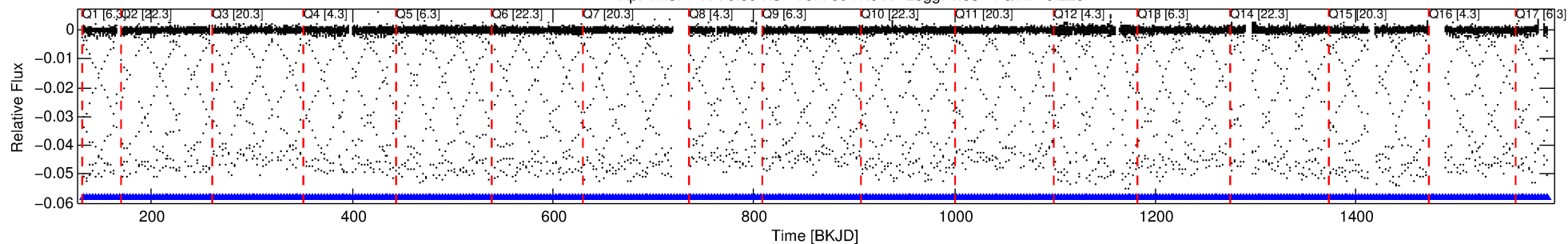
Ephemeris Match Information For 010384962-01

No Significant Match Found

DV One-Page Summary

KIC: 10384962 Candidate: 1 of 2 Period: 2.879 d
KOI: K00619.01 Corr: 0.996

Kp: 14.37 R*: 0.89 Rs Teff: 5941.0 K Logg: 4.53 Fe/H: -0.220



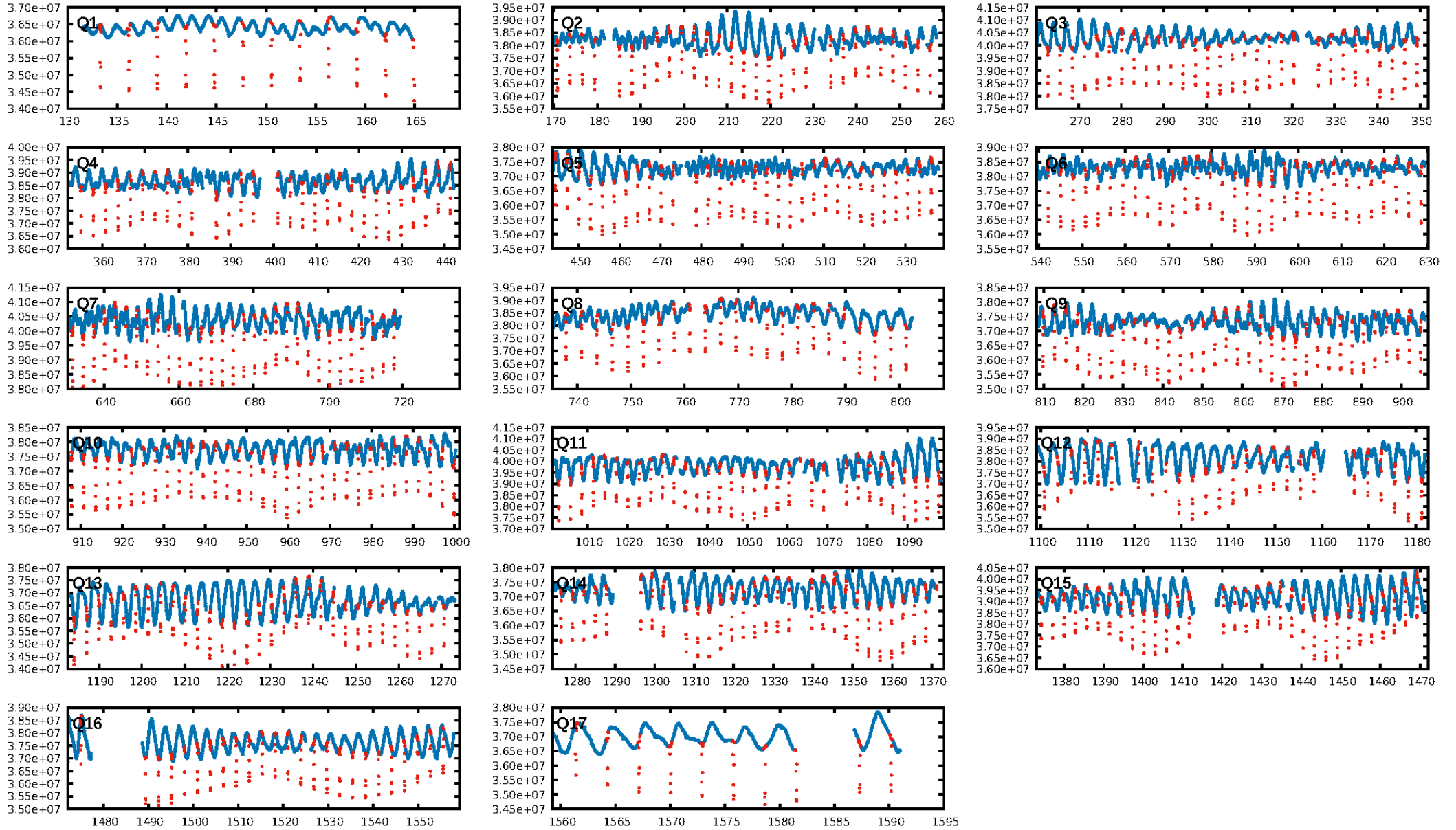
DV Fit Results:

Period = 2.87924 [0.00000] d
Epoch = 133.2801 [0.0000] BKJD
Rp/R* = 0.2201 [0.0001]
a/R* = 8.17 [0.01]
b = 0.73 [0.00]
Seff = 566.57 [219.58]
Teq = 1244 [121] K
Rp = 21.25 [6.20] Re
a = 0.0393 [0.0098] AU
Ag = 1.73 [0.64] [1.14σ]
Teffp = 2205 [68] K [6.96σ]

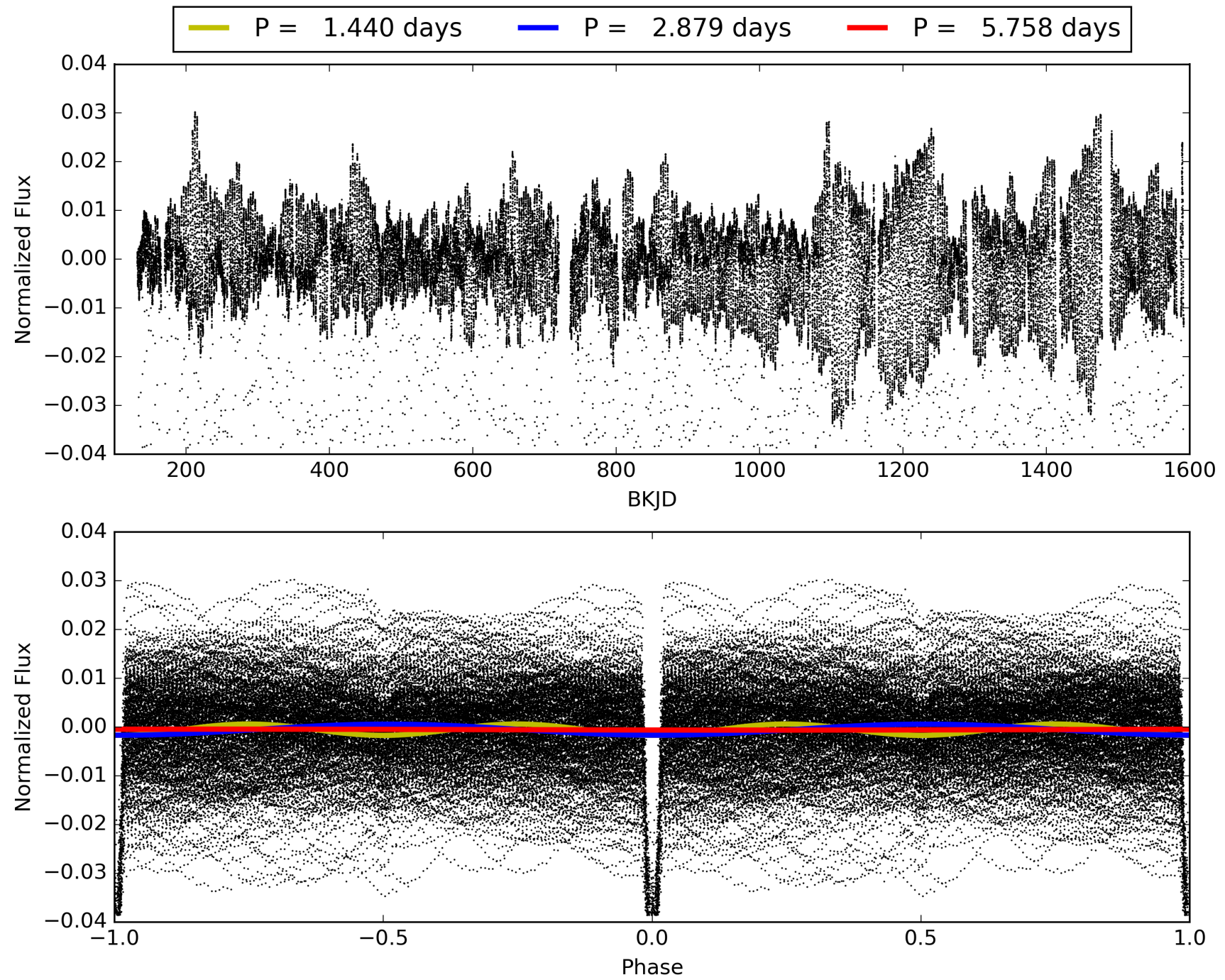
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [448/448]
GhostDiagnostic-chr: 1.968
Centroid-sig: 0.0%
Centroid-so: 0.341 arcsec [129.16σ]
OotOffset-rm: 0.059 arcsec [0.88σ]
KicOffset-rm: 0.217 arcsec [3.23σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 010384962-01, PDC Light Curves

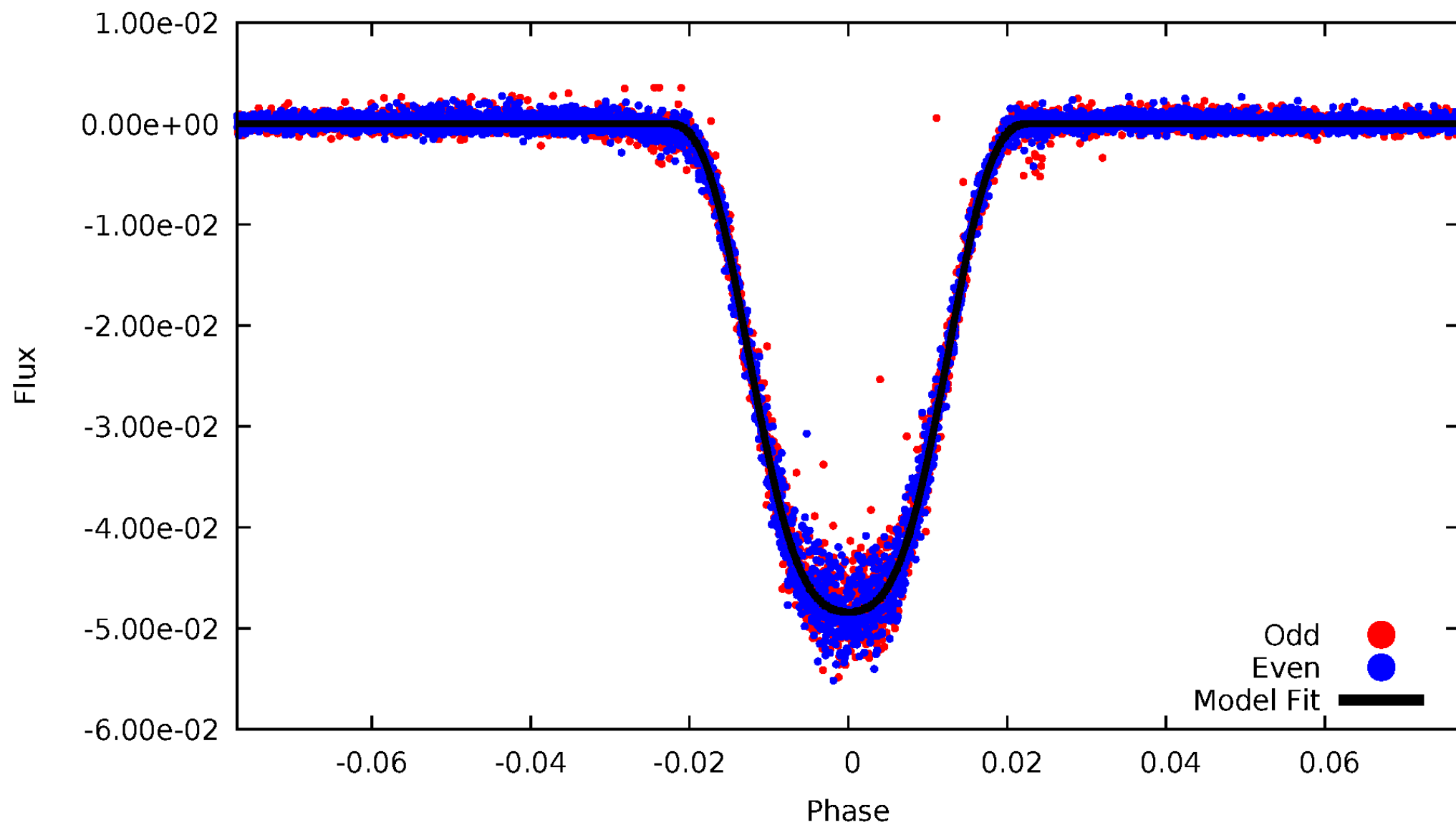


TCE 010384962-01



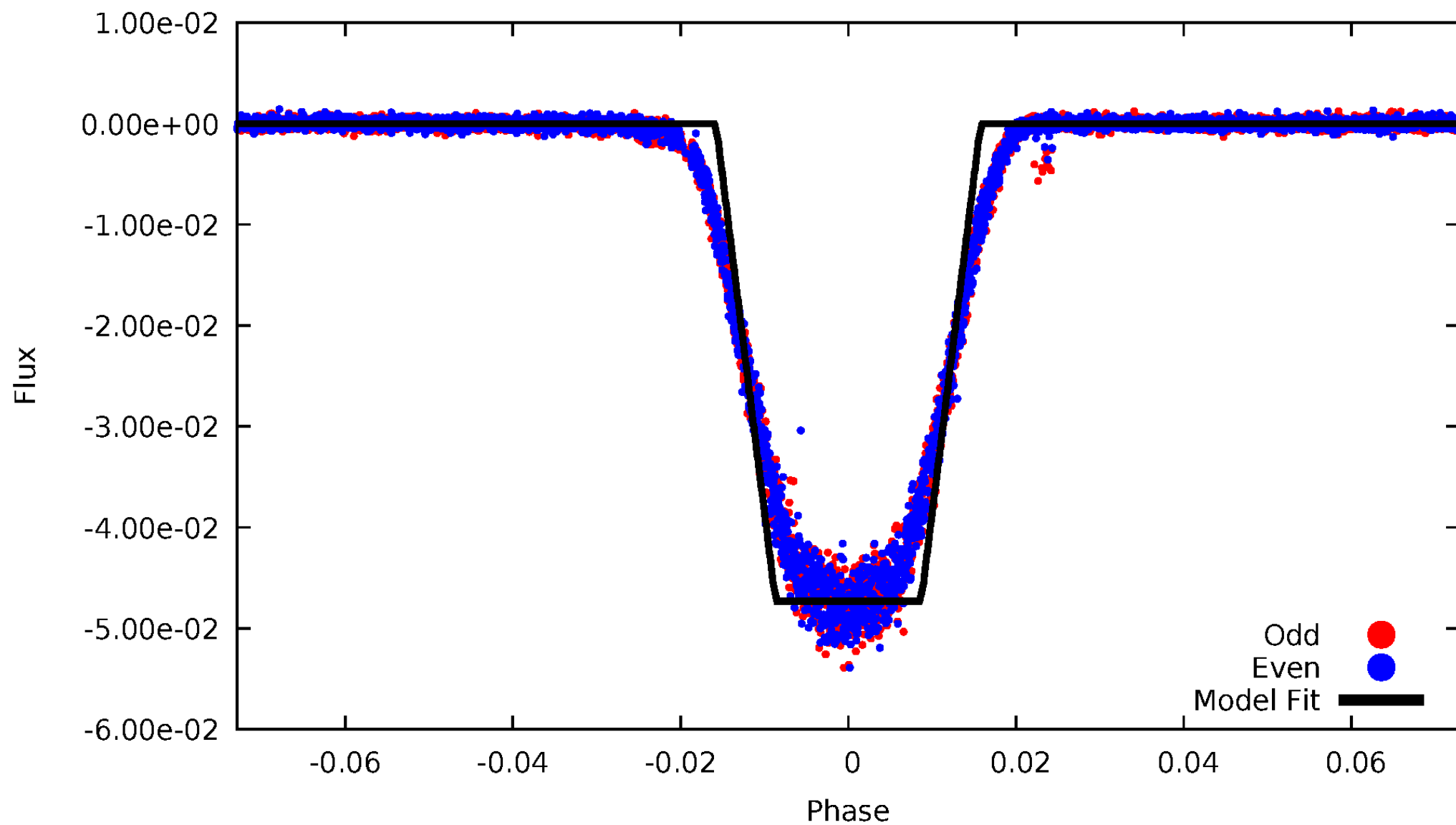
DV Odd/Even

TCE 010384962-01



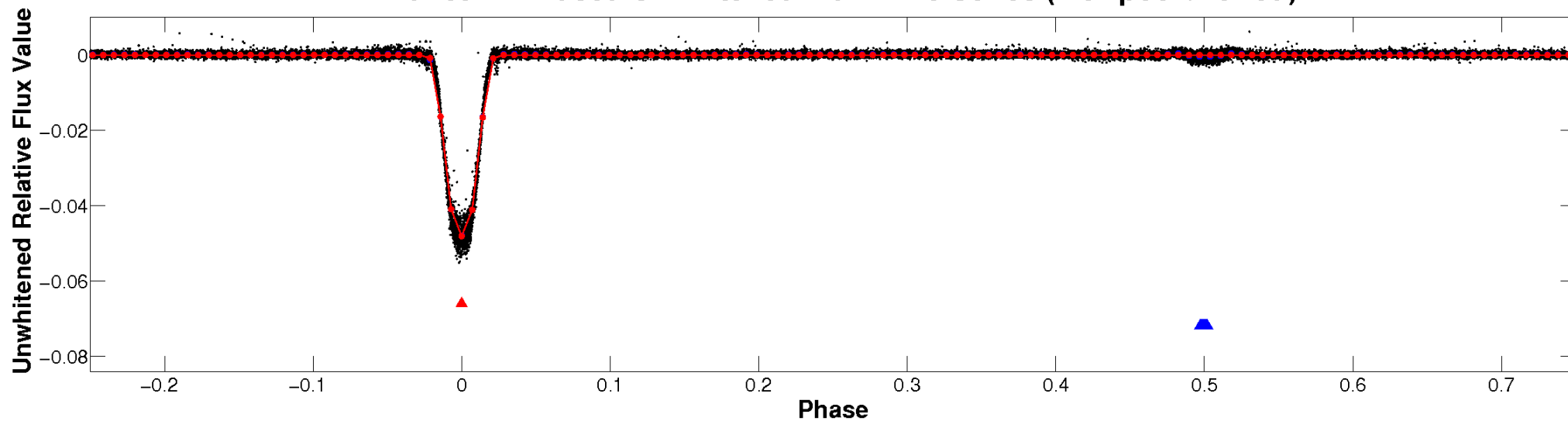
ALT Odd/Even

TCE 010384962-01

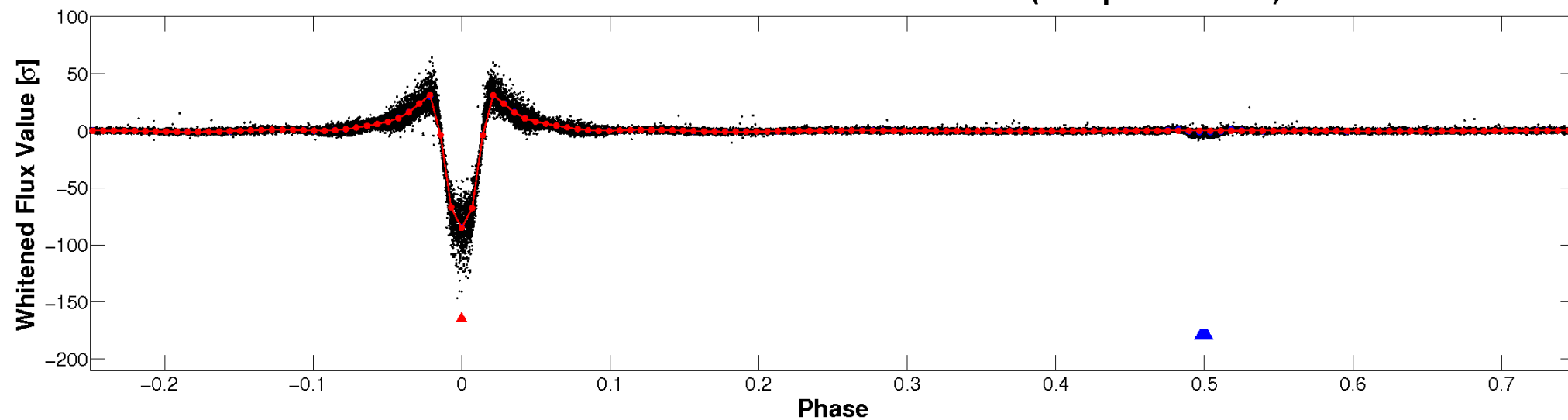


Non-Whitened Vs. Whitened Light Curve

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

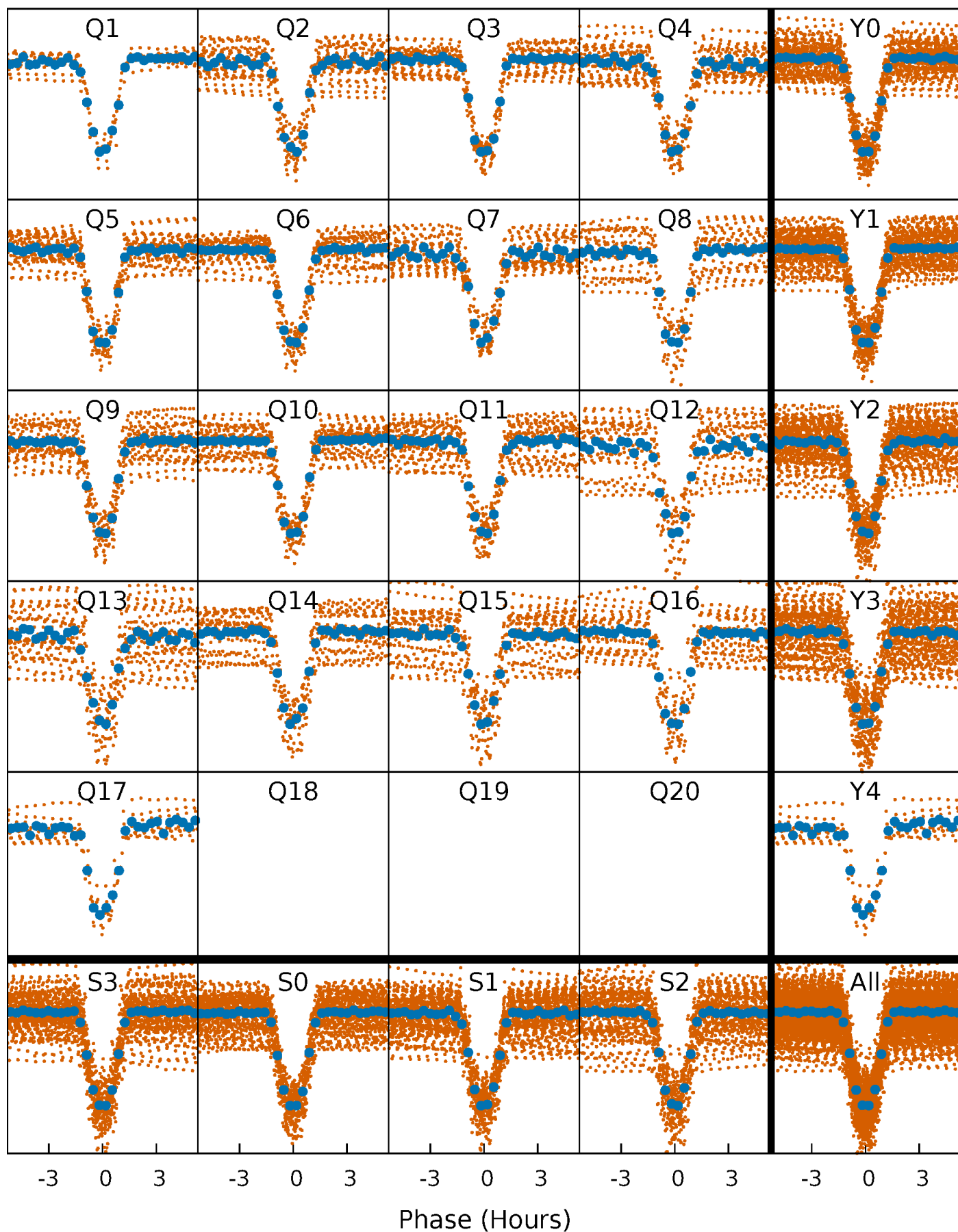


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



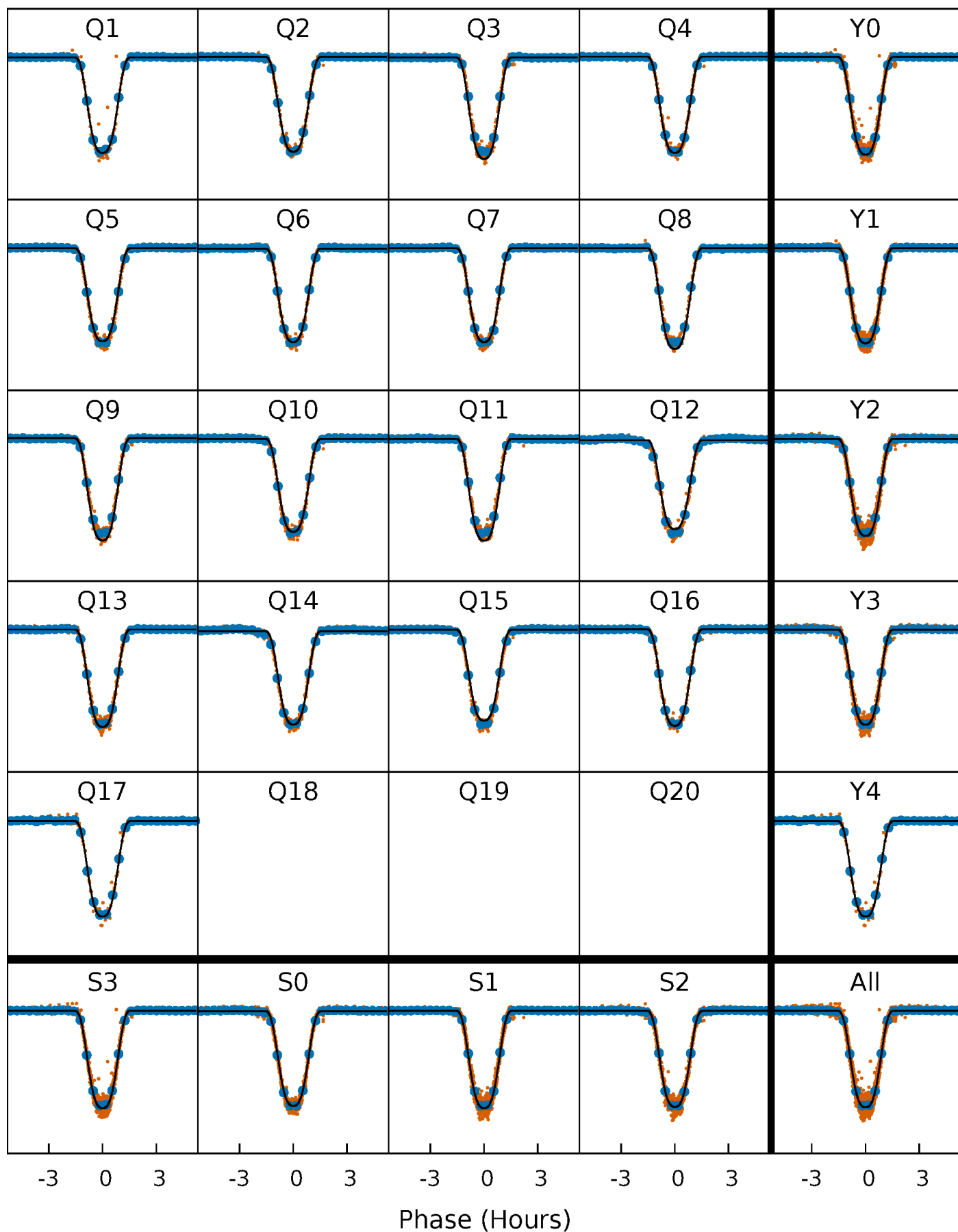
PDC Quarter-Phased Transit Curves

TCE 010384962-01 P= 2.879245 Days $T_0=133.280130$ (BKJD)



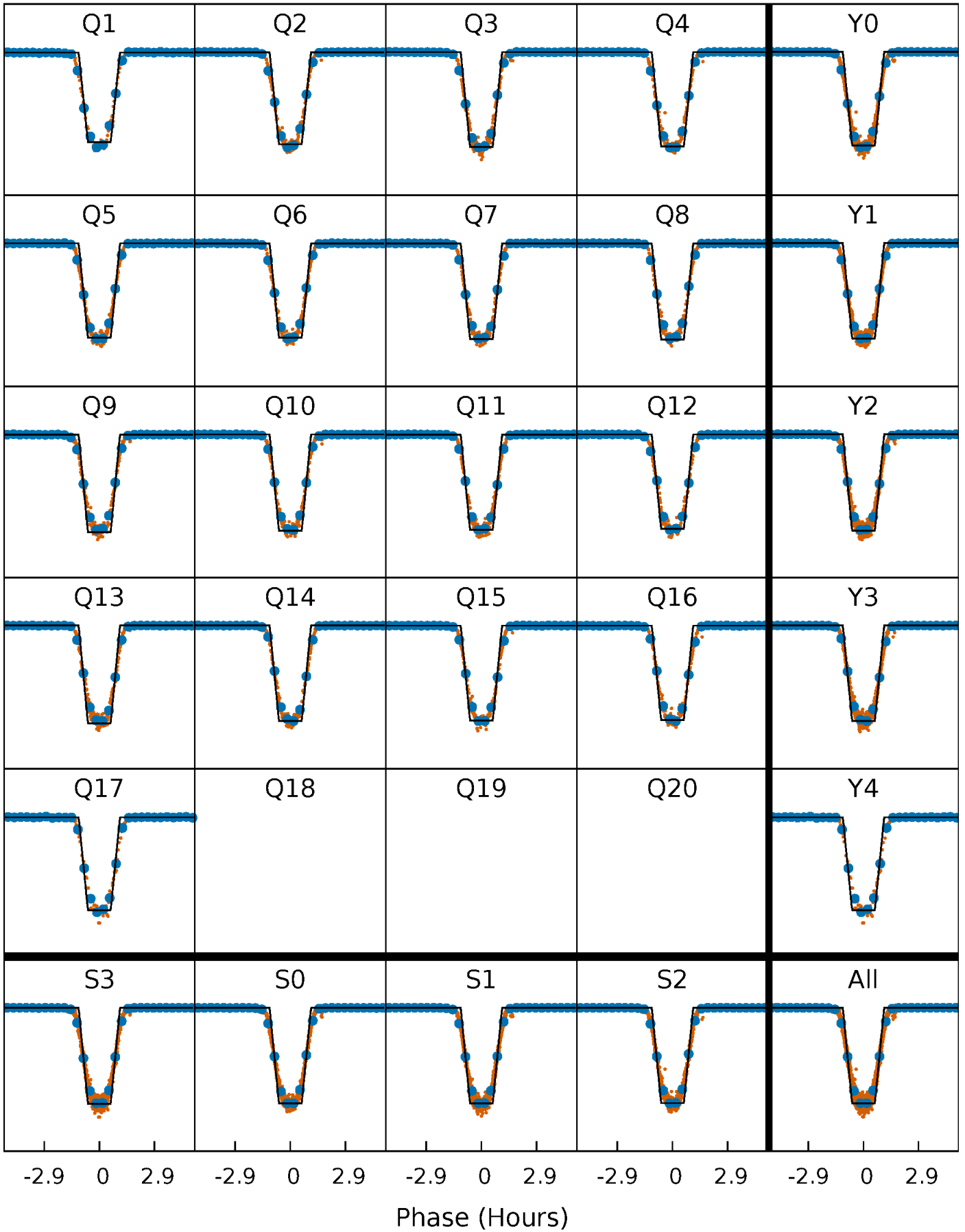
DV Quarter-Phased Transit Curves

TCE 010384962-01 P= 2.879245 Days $T_0=133.280130$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

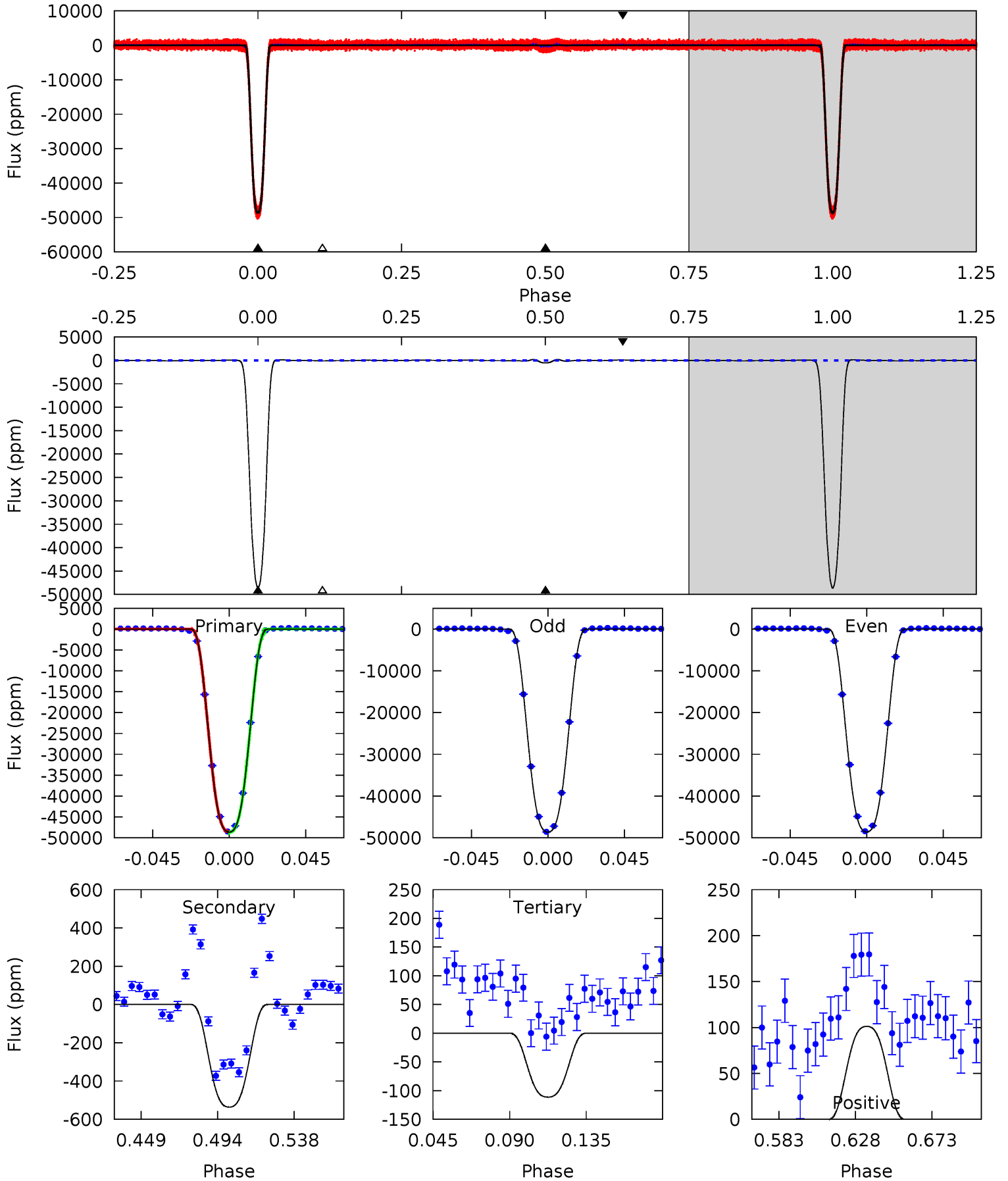
TCE 010384962-01 $P = 2.879237$ Days $T_0 = 133.282064$ (BKJD)



DV Model-Shift Uniqueness Test

010384962-01, P = 2.879245 Days, E = 130.400885 Days

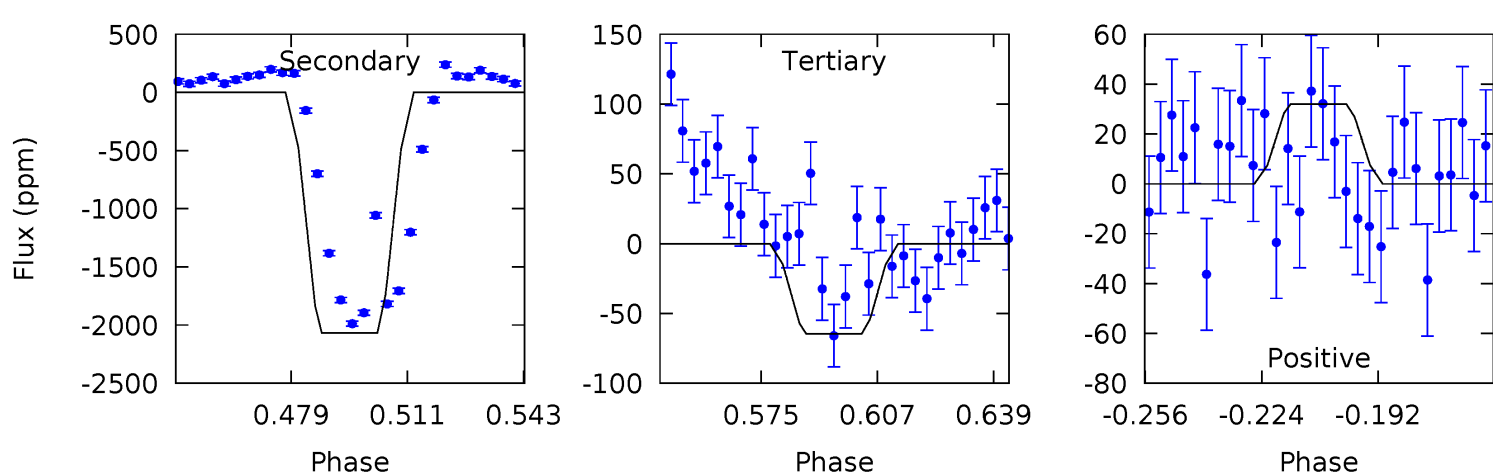
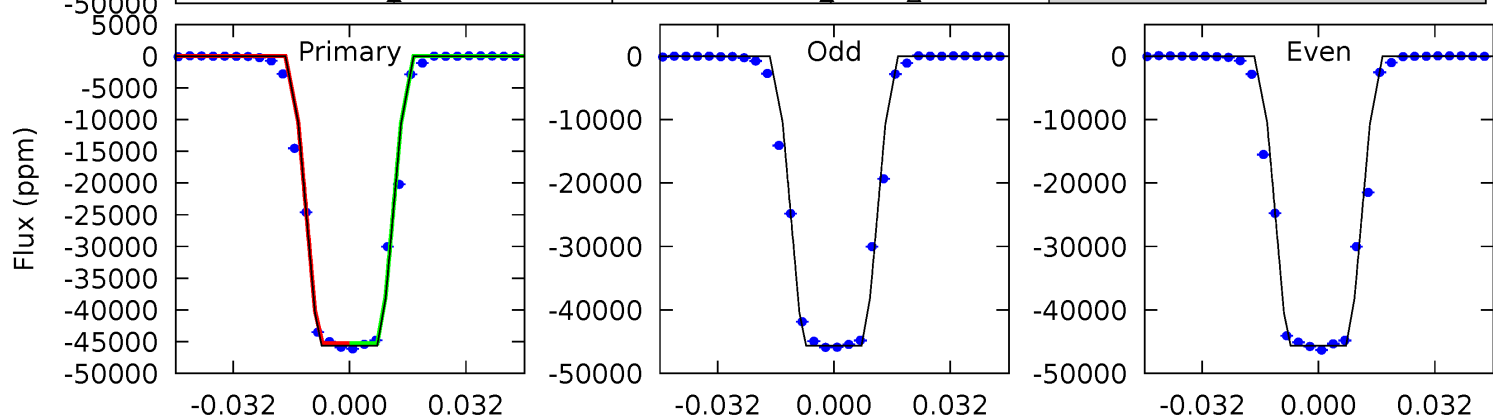
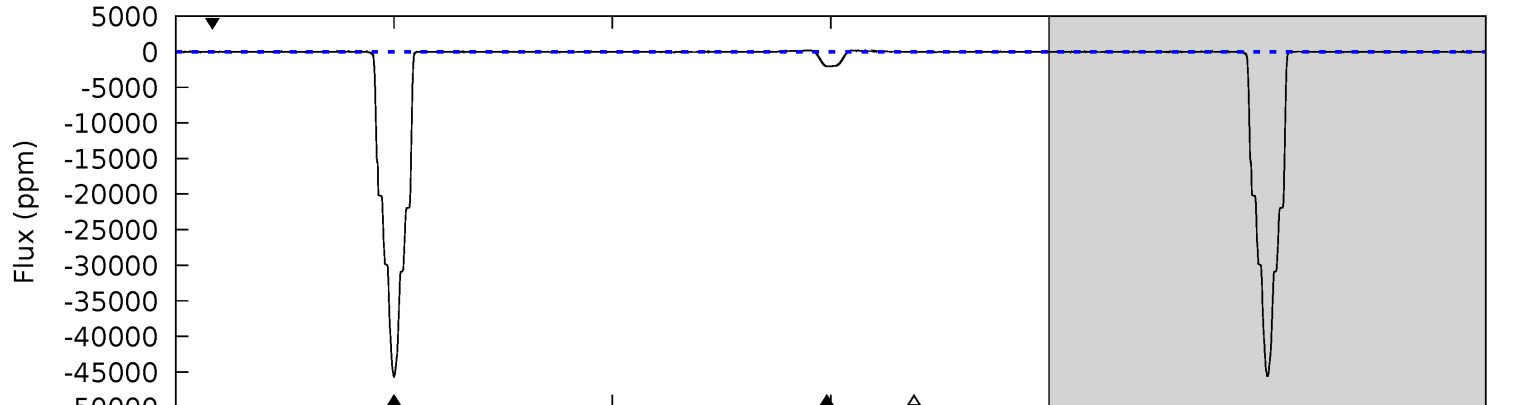
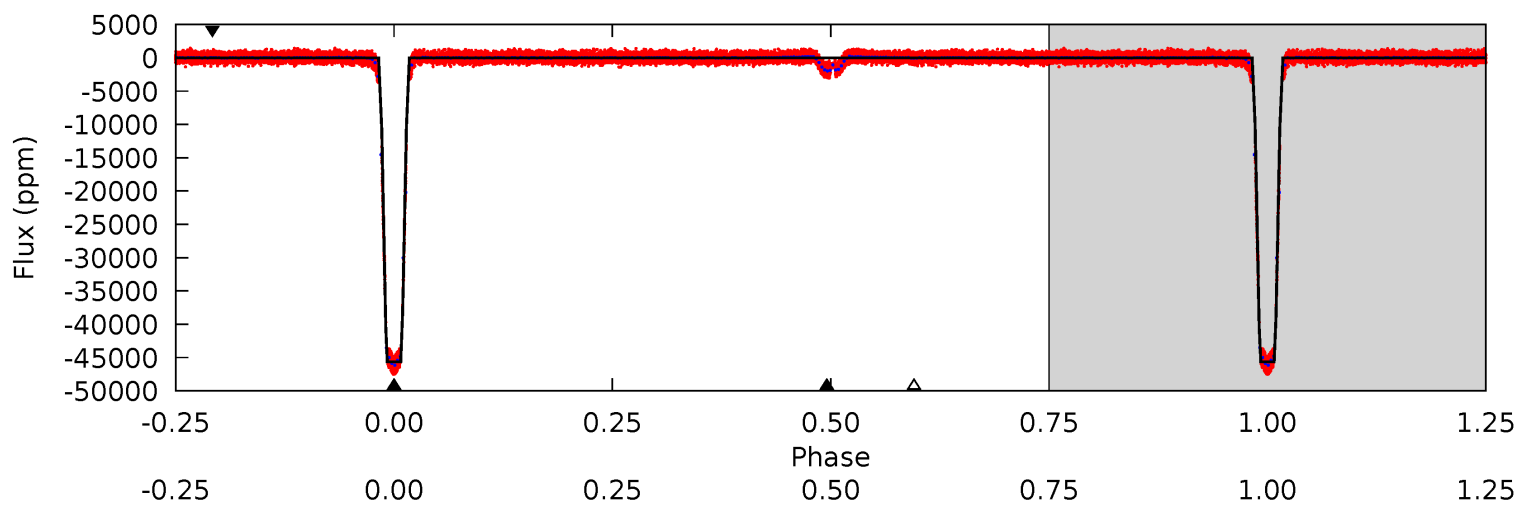
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5119 | 56.5 | 11.7 | 10.6 | 4.73 | 2.01 | 4.54 | 5107 | 5108 | 44.7 | 45.8 | 2.90 | 0.99 | 0.00 | 4.44 |



Alt Model-Shift Uniqueness Test

010384962-01, P = 2.879237 Days, E = 130.402827 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 3419 | 155.0 | 4.84 | 2.40 | 4.80 | 2.14 | 2.30 | 3414 | 3416 | 150.2 | 152.6 | 0.12 | 1.00 | 0.00 | 0 |



Stellar Parameters For KIC 010384962

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5941^{+142}_{-178} | $4.533^{+0.048}_{-0.204}$ | $-0.220^{+0.300}_{-0.300}$ | $0.885^{+0.258}_{-0.086}$ | $0.975^{+0.107}_{-0.131}$ | $1.980^{+0.394}_{-1.027}$ |
| | +2%/-3% | +1%/-5% | +136%/-136% | +29%/-10% | +11%/-13% | +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 010384962-01 / KOI 0619.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|----------------|-------------------------|---------------------|--------------------|---------------------------|
| DV | -536 ± 10 | $21.98^{+3.45}_{-1.70}$ | 1780^{+117}_{-83} | 2568^{+44}_{-57} | $0.930^{+0.129}_{-0.213}$ |
| Alt. | -2069 ± 13 | $21.61^{+3.54}_{-1.55}$ | 1774^{+132}_{-77} | 3240^{+48}_{-55} | $3.705^{+0.507}_{-0.871}$ |

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 $A_{obs} \gg 1.0$

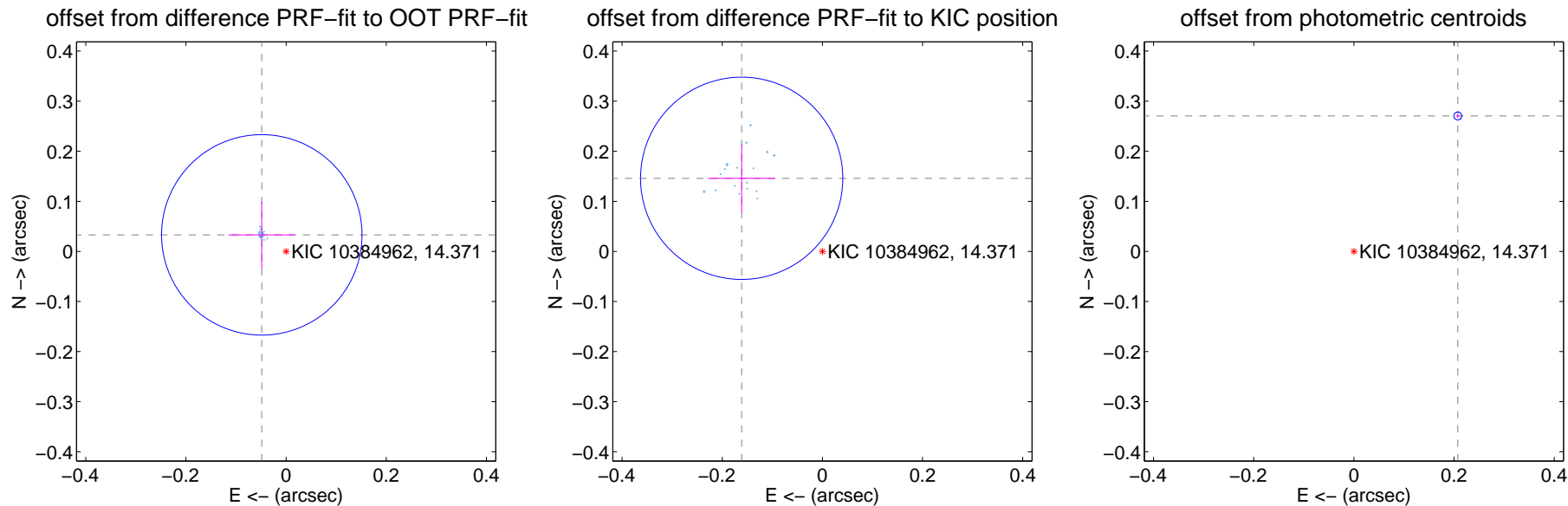
DV Centroid Data

Supplemental centroid analysis for 010384962-01. Kepler magnitude: 14.37. Transit SNR 2290.97

There are 17 quarters with good PRF difference image offsets

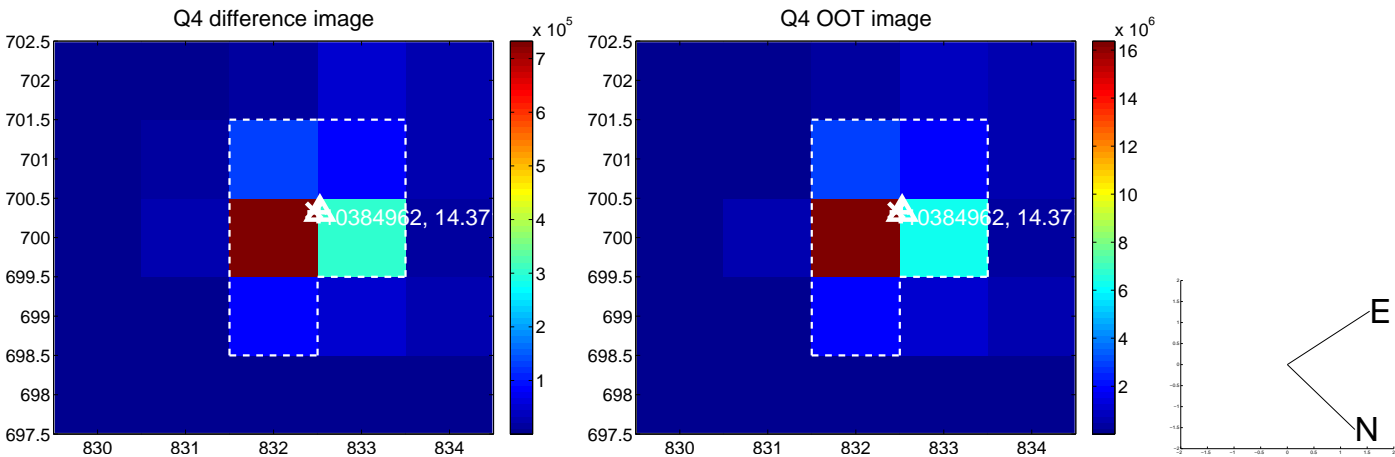
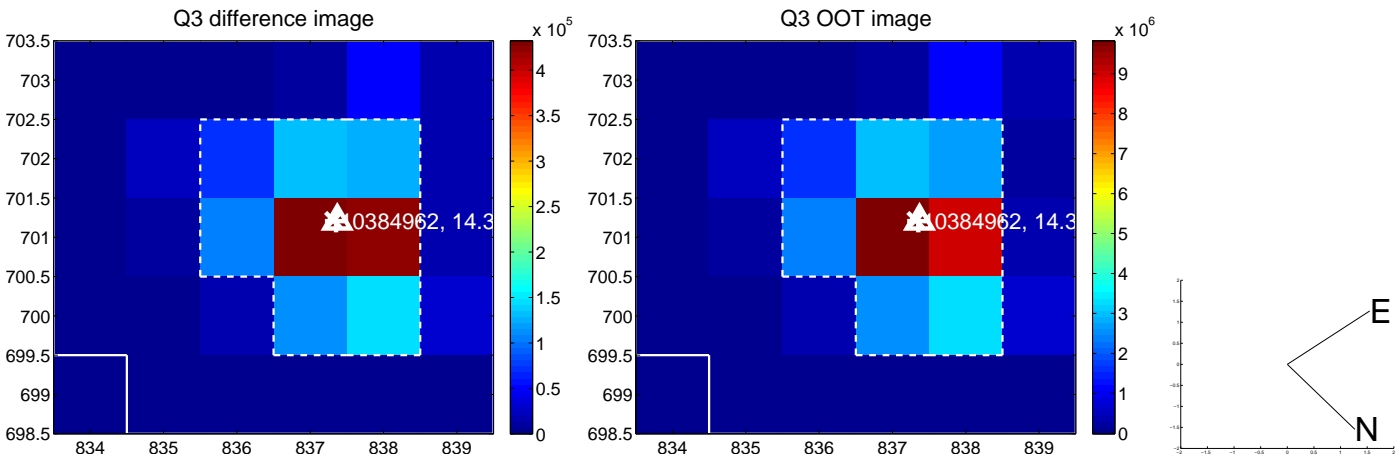
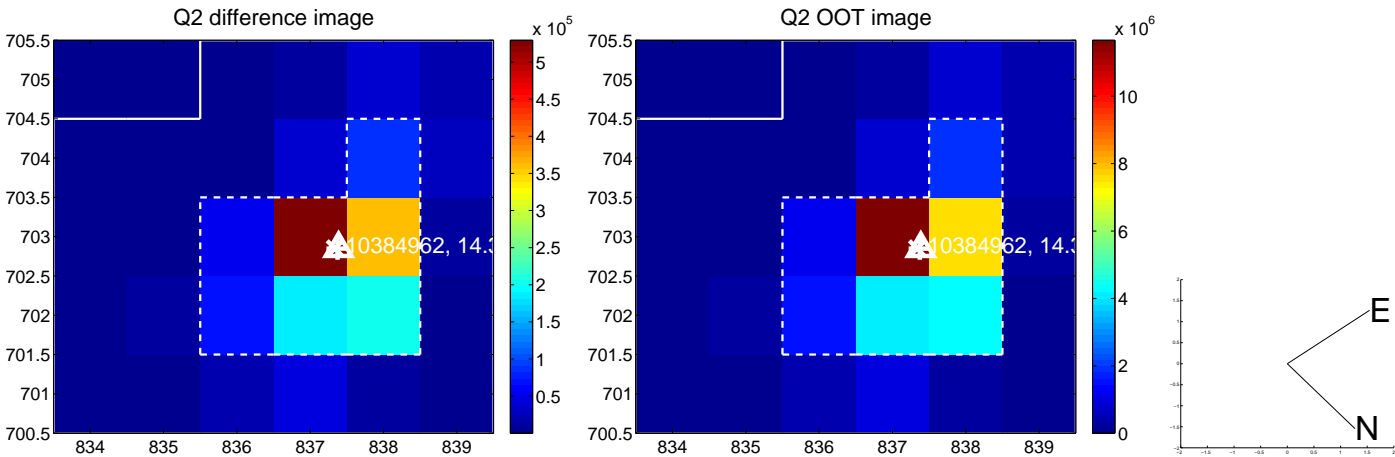
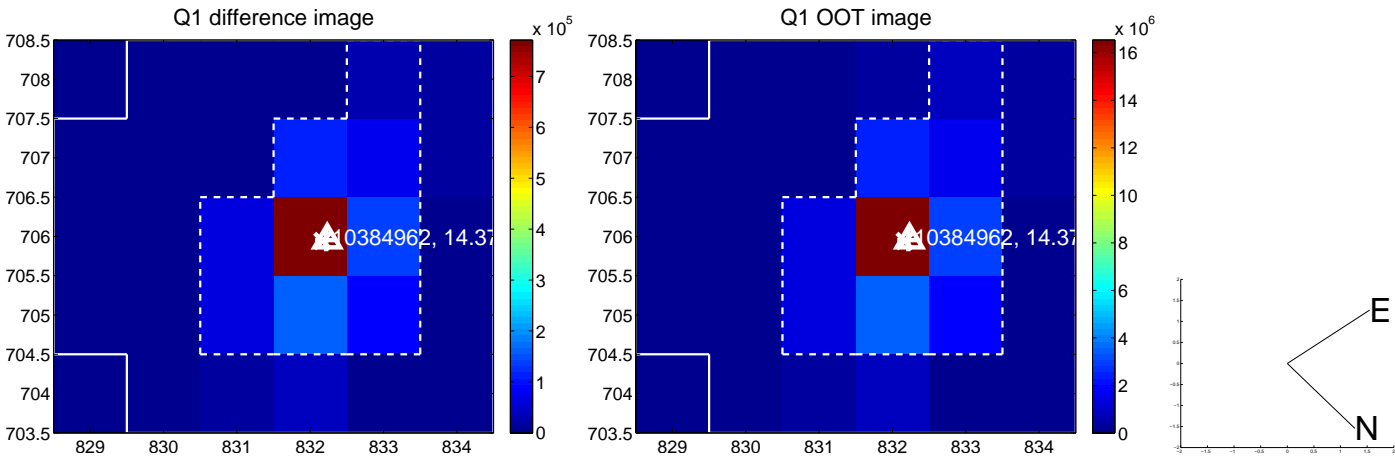
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.059 ± 0.067 | 0.88 | 0.049 ± 0.067 | 0.033 ± 0.067 |
| PRF-fit source offset from KIC position | 0.217 ± 0.067 | 3.23 | 0.161 ± 0.067 | 0.146 ± 0.067 |
| photometric centroid source offset | 0.34 ± 0.00 | 129.16 | -0.21 ± 0.00 | 0.27 ± 0.00 |

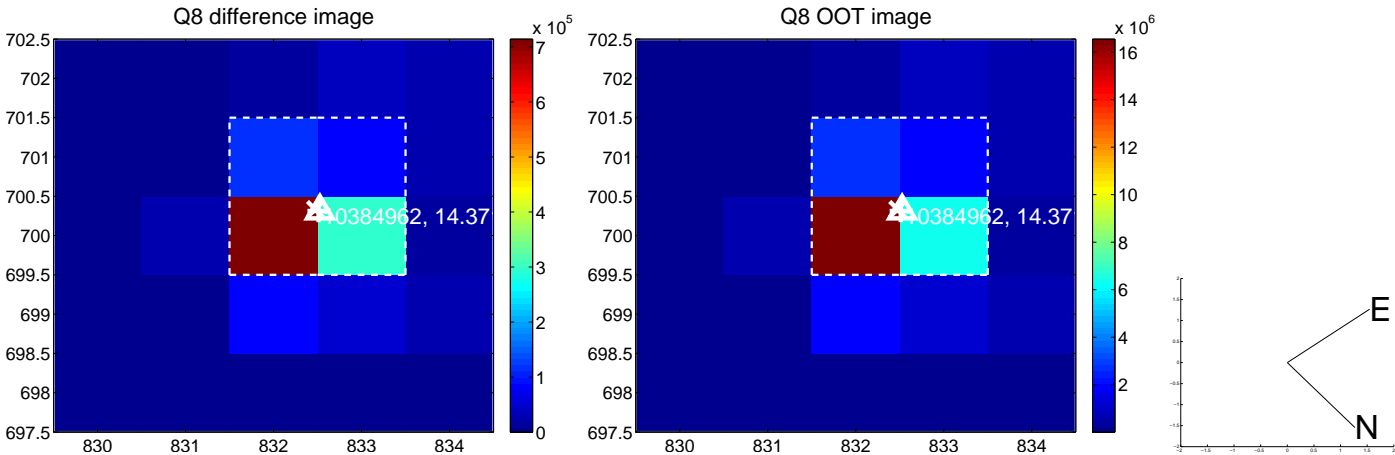
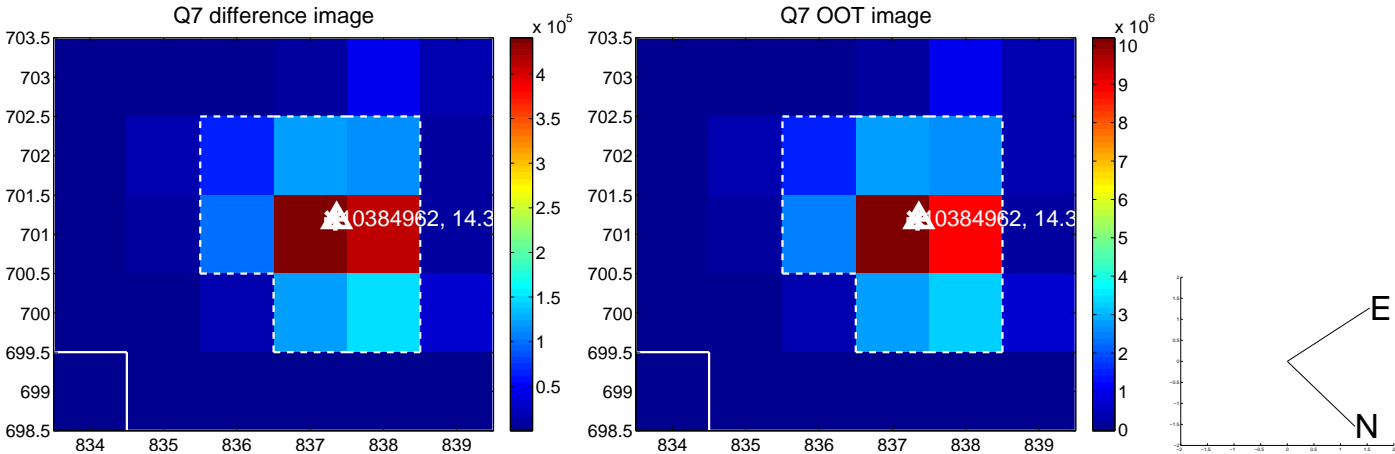
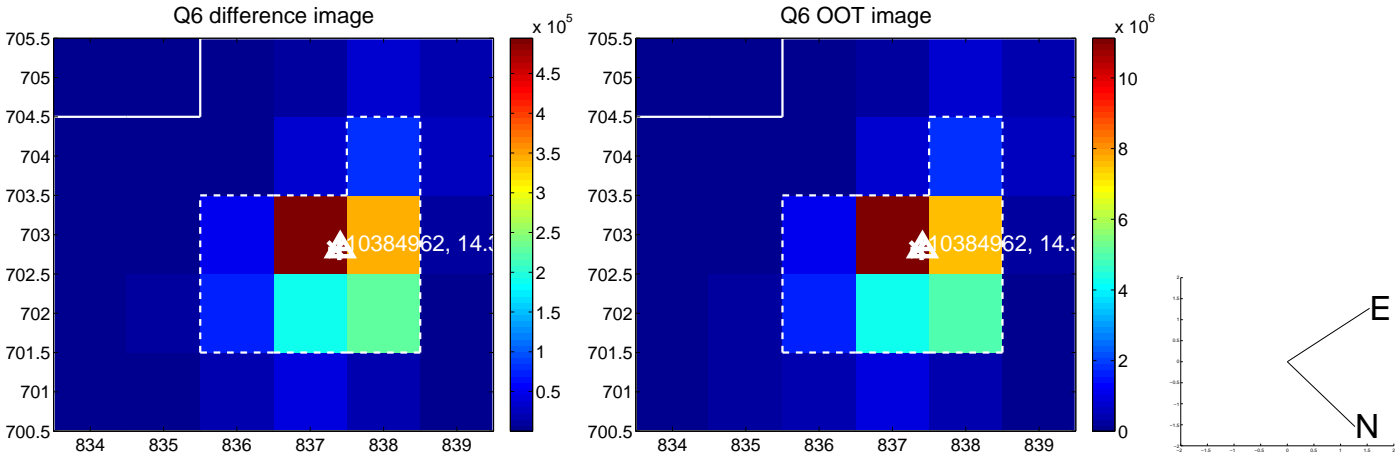
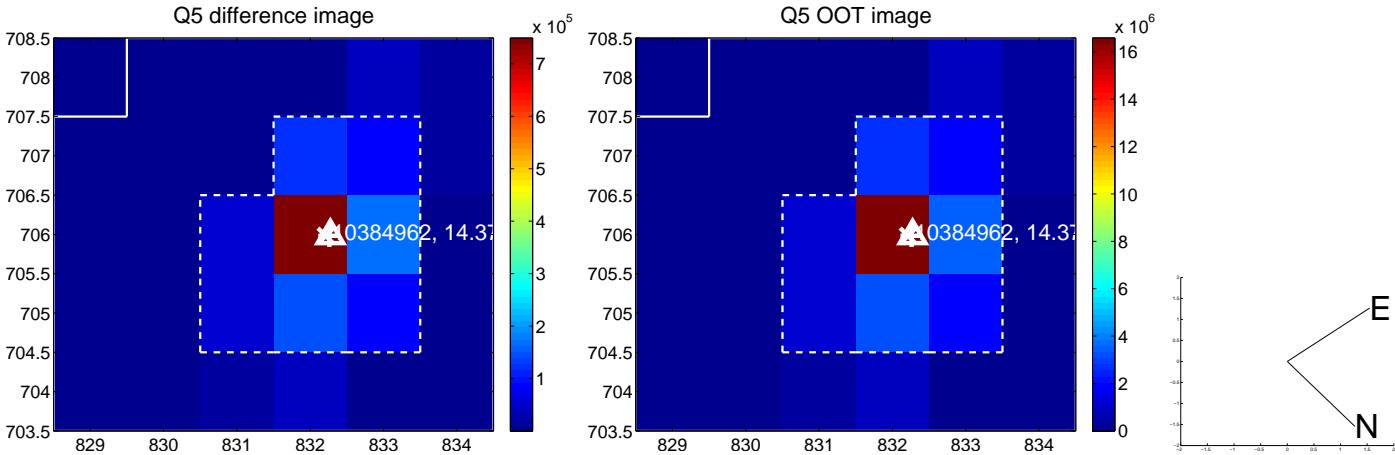


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

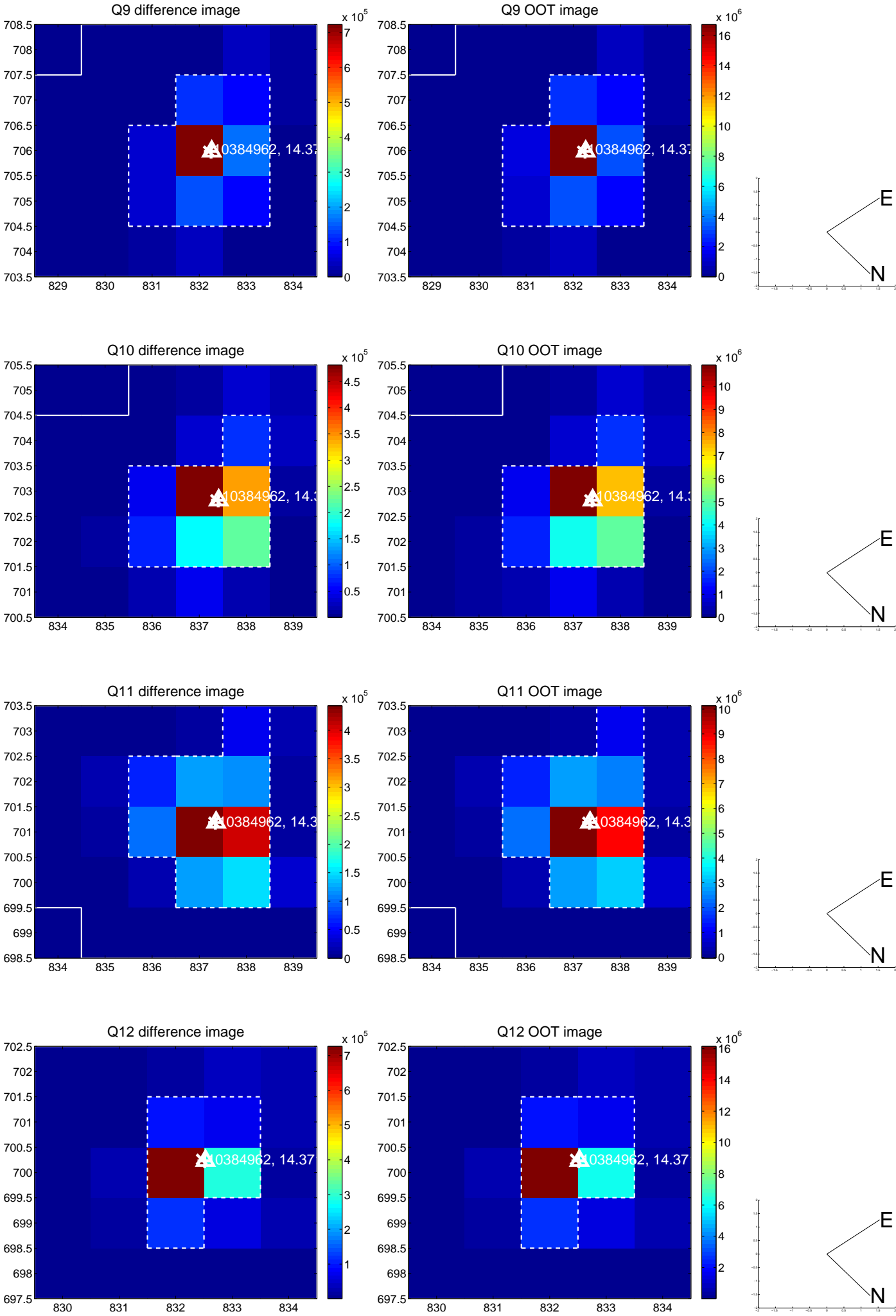
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



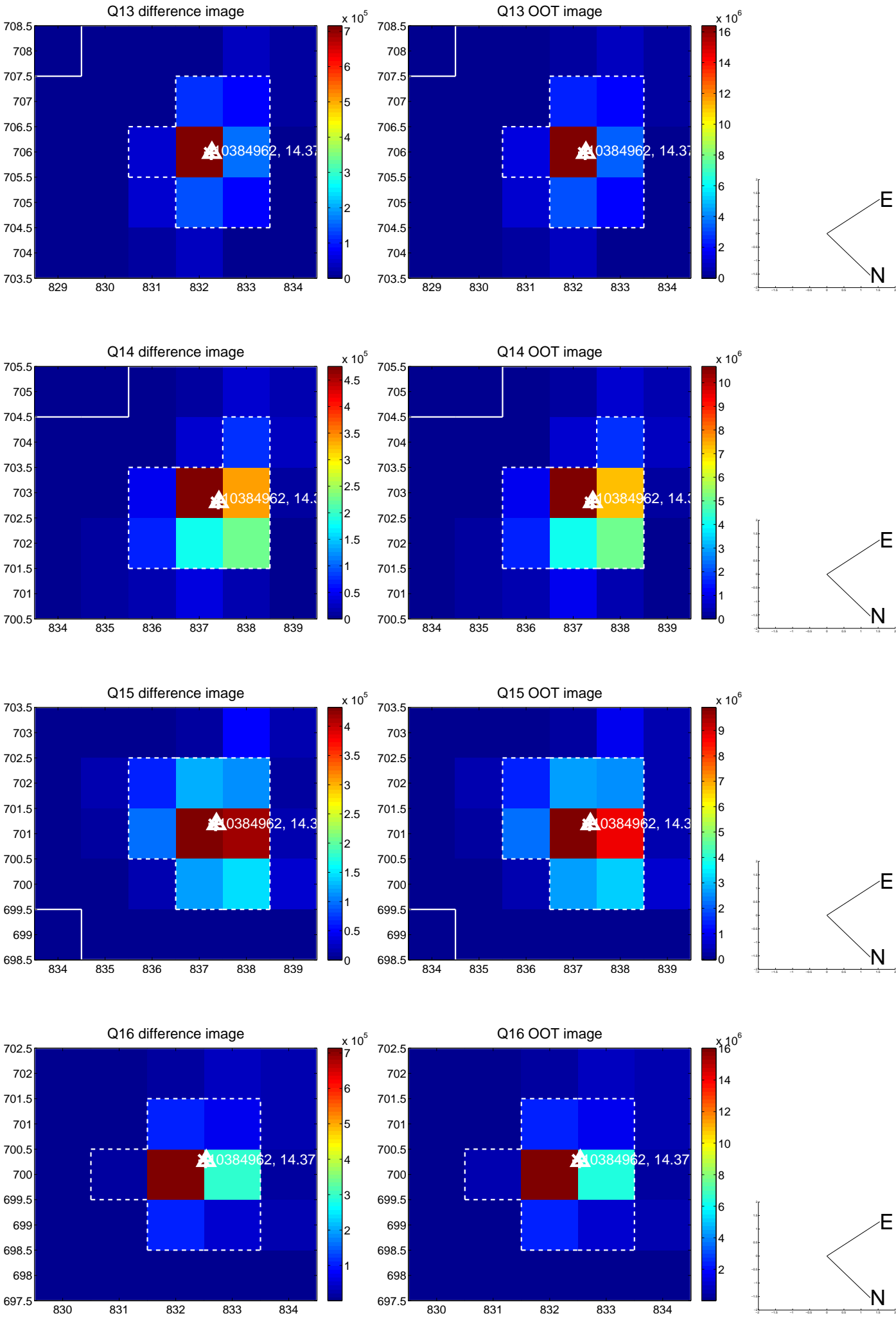
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



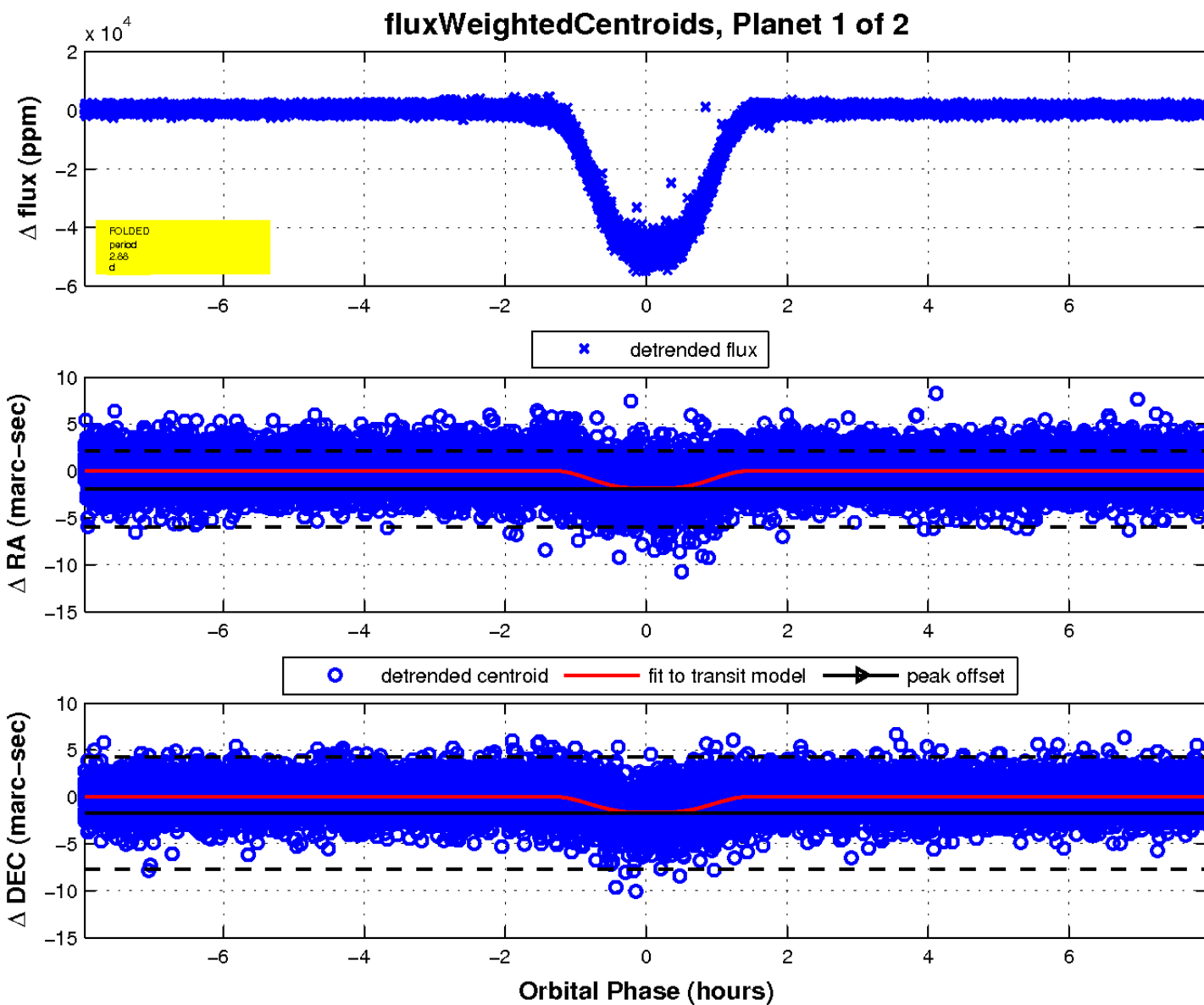
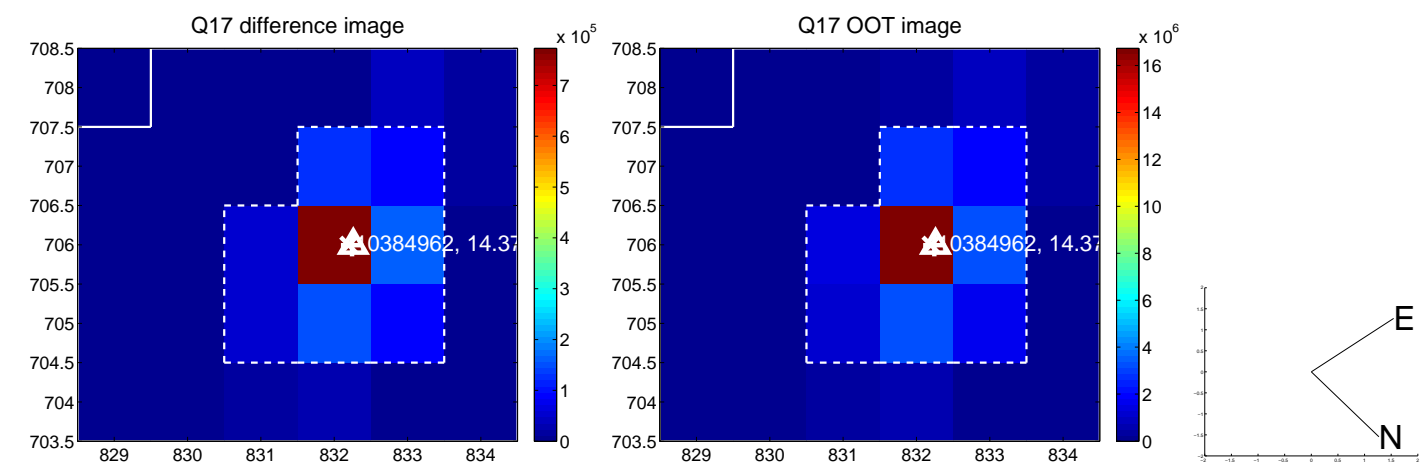
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

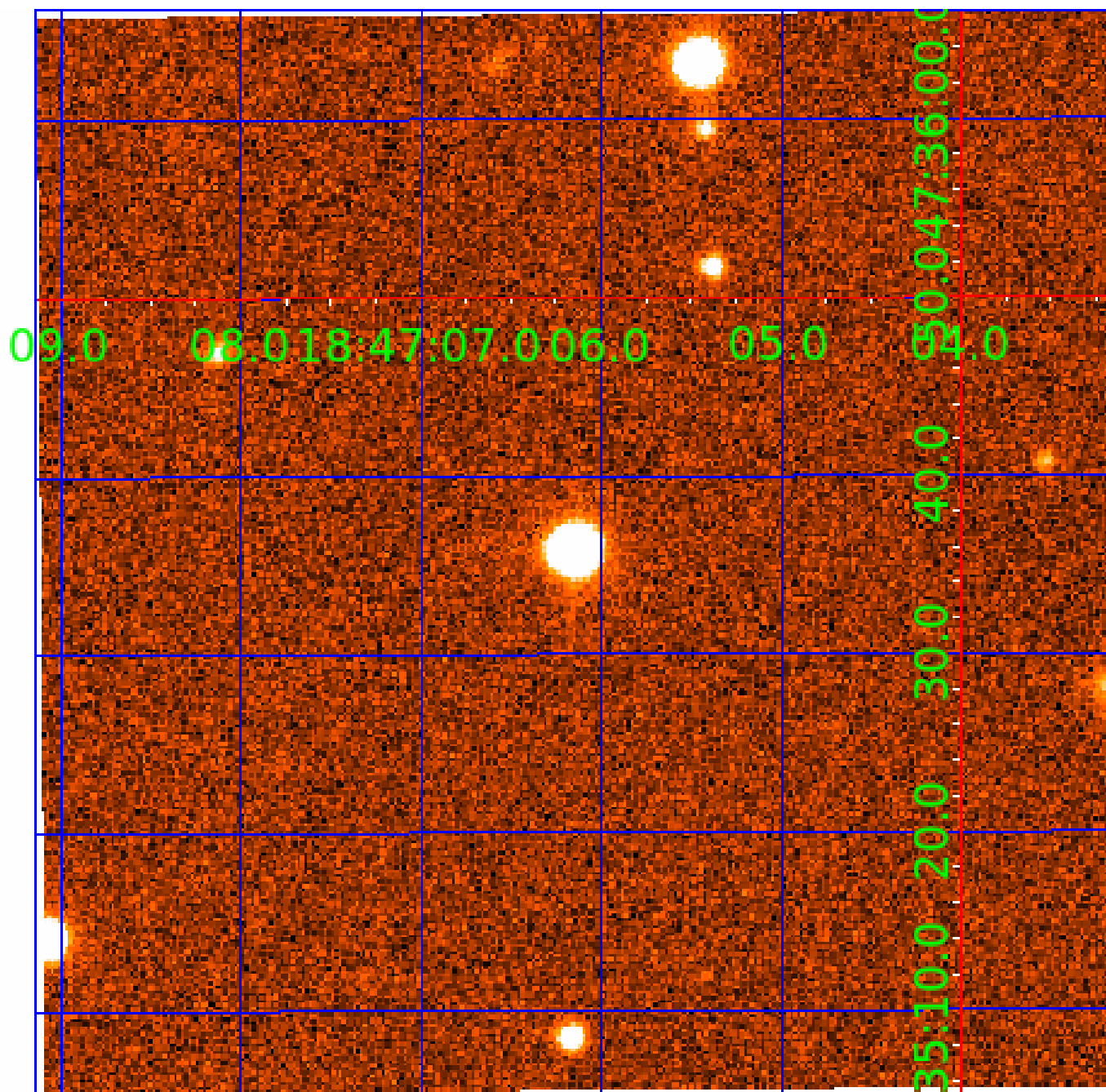


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010384962

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 010384962-01 | OBS | 0619.01 | 2.879245 | 133.280130 | 48414.6 | 2.658 | 3256.0 | 2291.0 | 0.89 | 5941 | 21.25 | 566.57 |
| 010384962-02 | OBS | No | 2.879216 | 131.846567 | 743.1 | 2.029 | 47.9 | 49.1 | 0.89 | 5941 | 2.86 | 566.58 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010384962-01 | OBS | PC | 0.69 | 0 | 1 | 0 | 0 | MOD_SEC_DV—PLANET_OCCULT_DV—MOD_SEC_ALT—HAS_SEC_TCE |
| 010384962-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE |

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 010384962-02

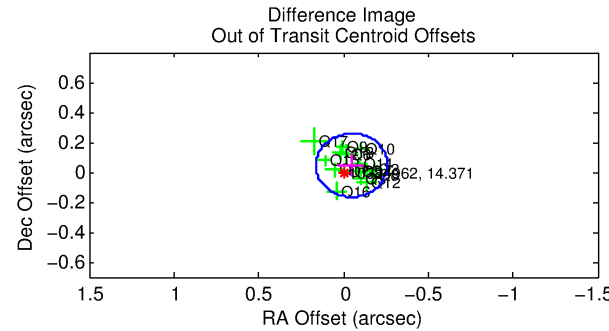
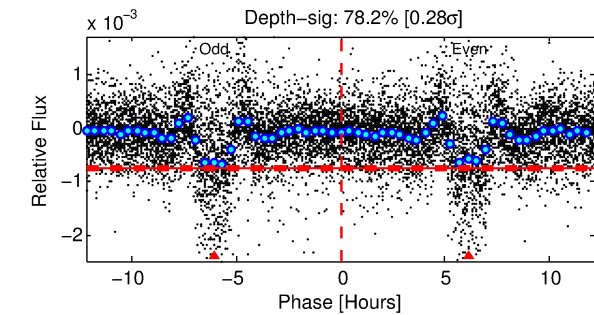
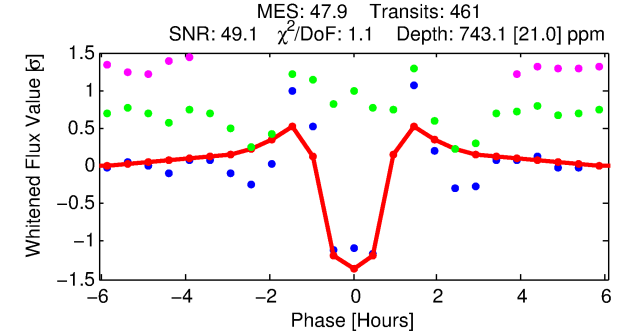
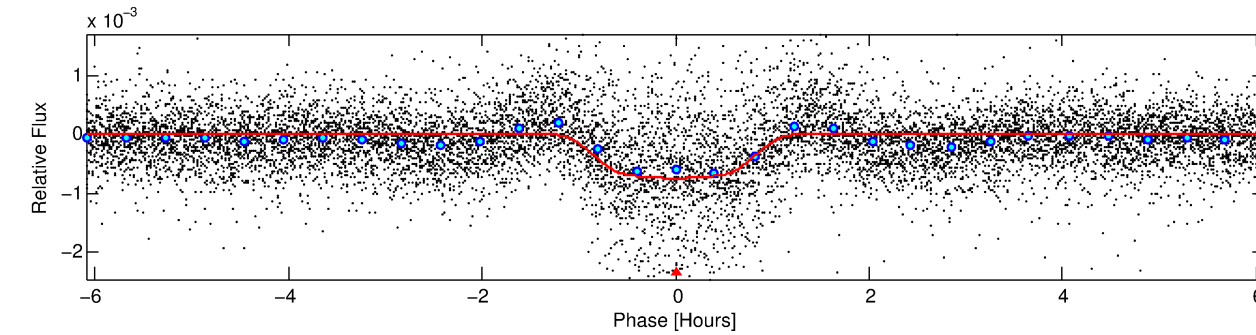
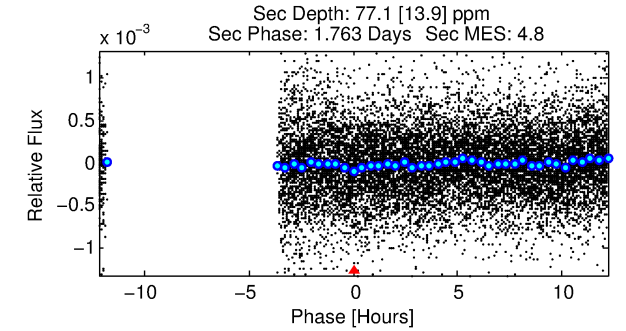
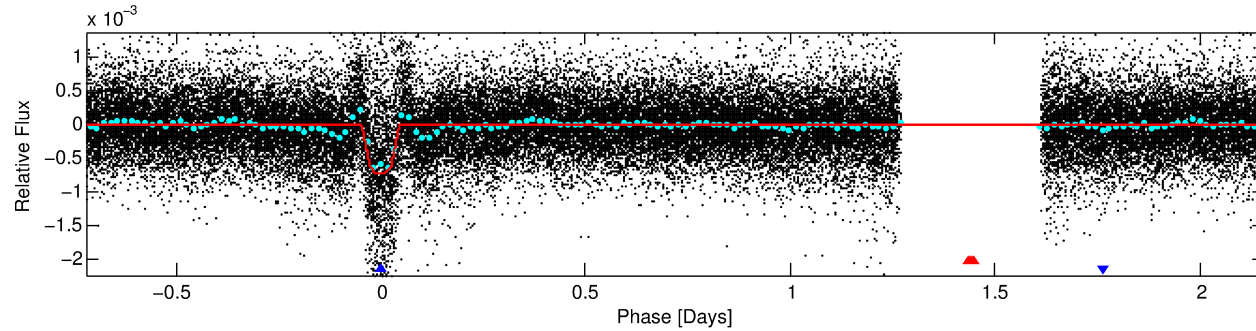
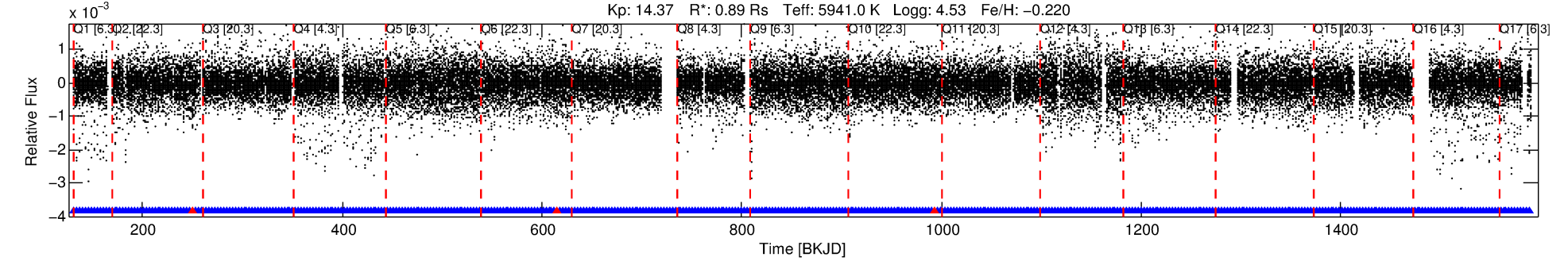
No Significant Match Found

DV One-Page Summary

KIC: 10384962 Candidate: 2 of 2 Period: 2.879 d

KOI: K00619 Corr: No Ephemeris Match

Kp: 14.37 R*: 0.89 Rs Teff: 5941.0 K Logg: 4.53 Fe/H: -0.220



DV Fit Results:

Period = 2.87922 [0.00000] d
Epoch = 131.8466 [0.0006] BKJD
Rp/R* = 0.0296 [0.0016]
a/R* = 5.45 [1.30]
b = 0.90 [0.05]
Seff = 566.58 [219.58]
Teff = 1244 [121] K
Rp = 2.86 [0.85] Re
a = 0.0393 [0.0098] AU
Ag = 7.99 [3.39] [2.06σ]
Teffp = 3234 [196] K [8.65σ]

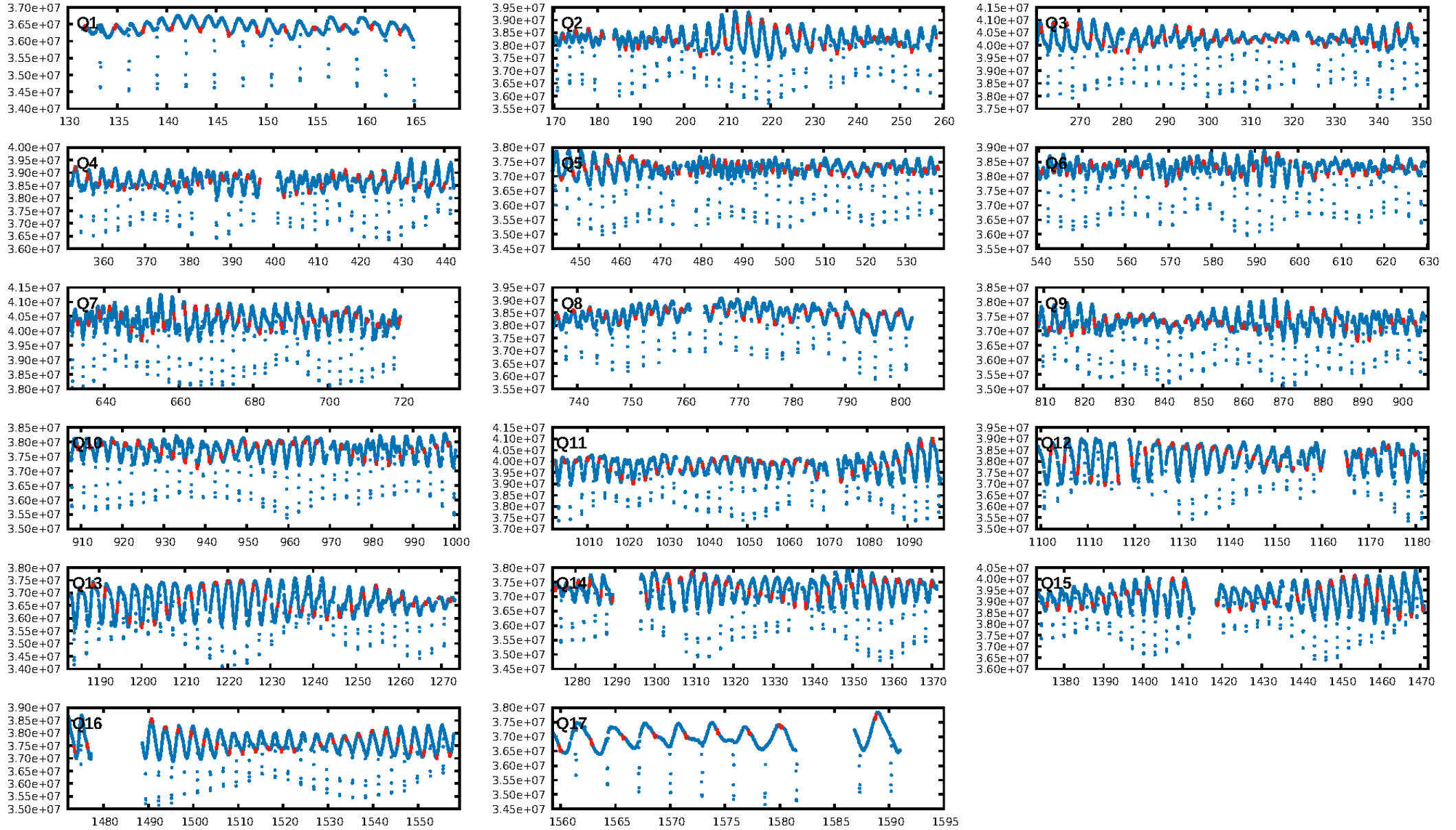
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.99 [437/440]
GhostDiagnostic-chr: 2.603
Centroid-sig: 91.5%
Centroid-so: 0.389 arcsec [2.27σ]
OotOffset-rm: 0.066 arcsec [0.93σ]
KicOffset-rm: 0.172 arcsec [2.41σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

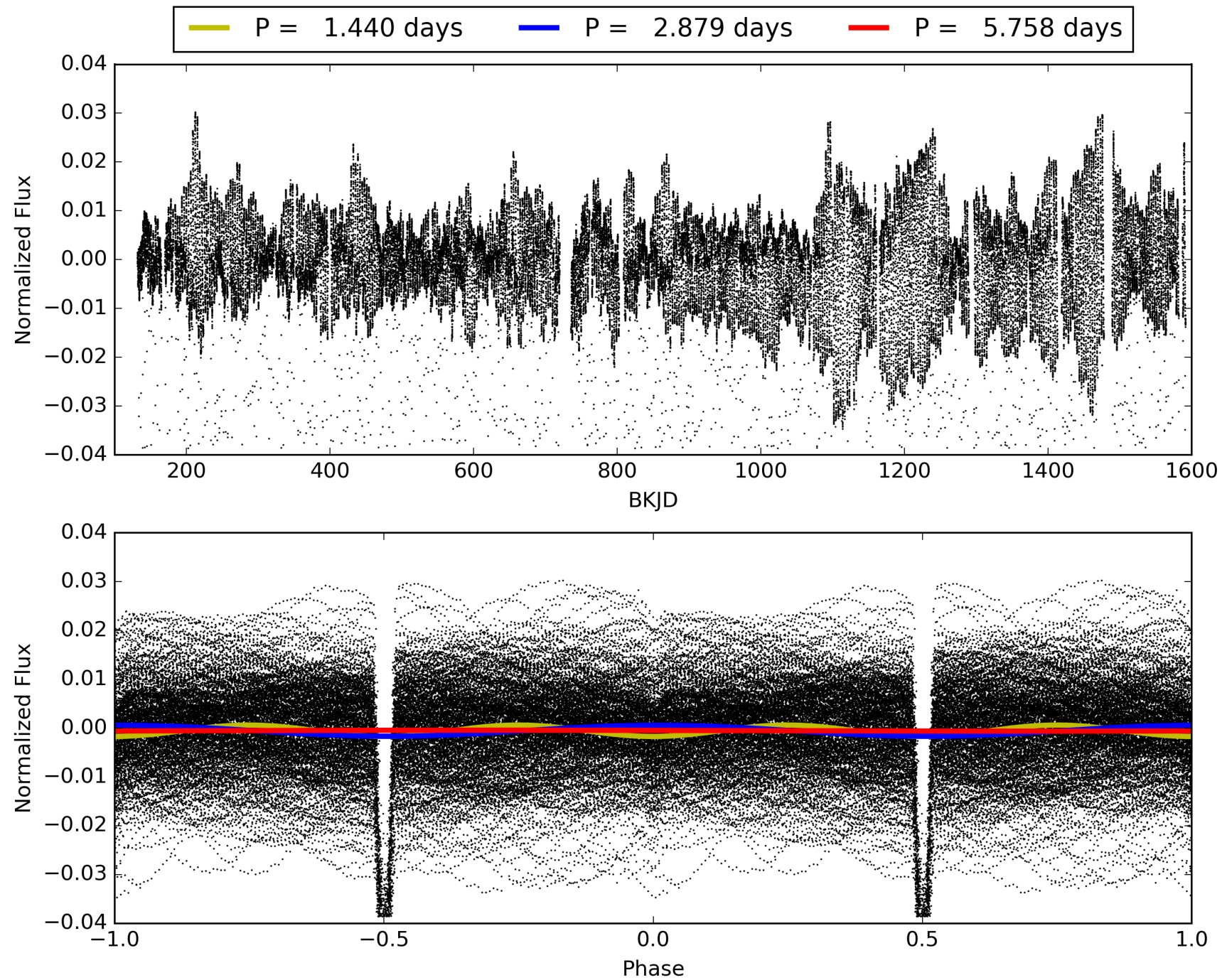
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:44:15 Z

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

TCE 010384962-02, PDC Light Curves

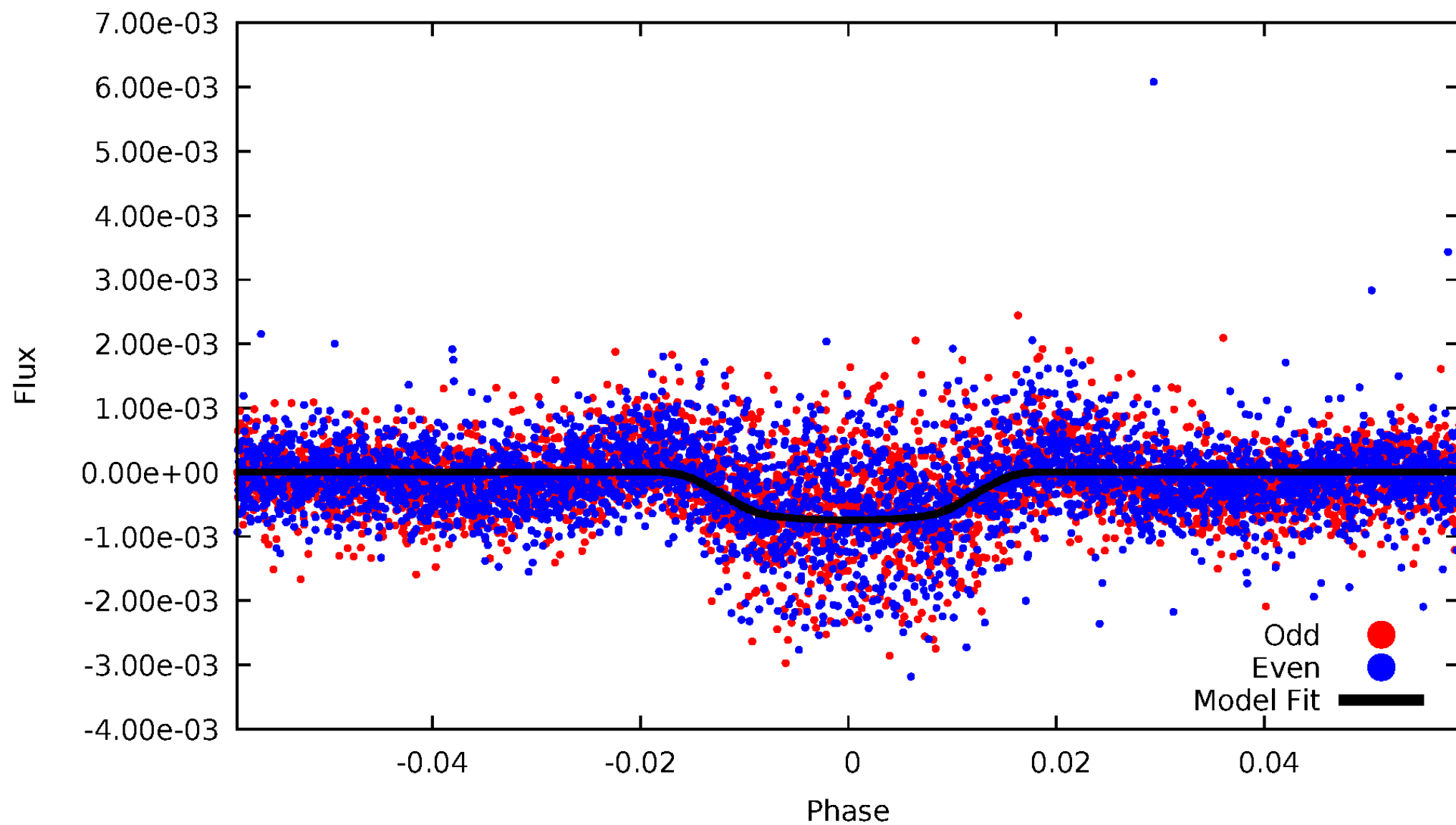


TCE 010384962-02



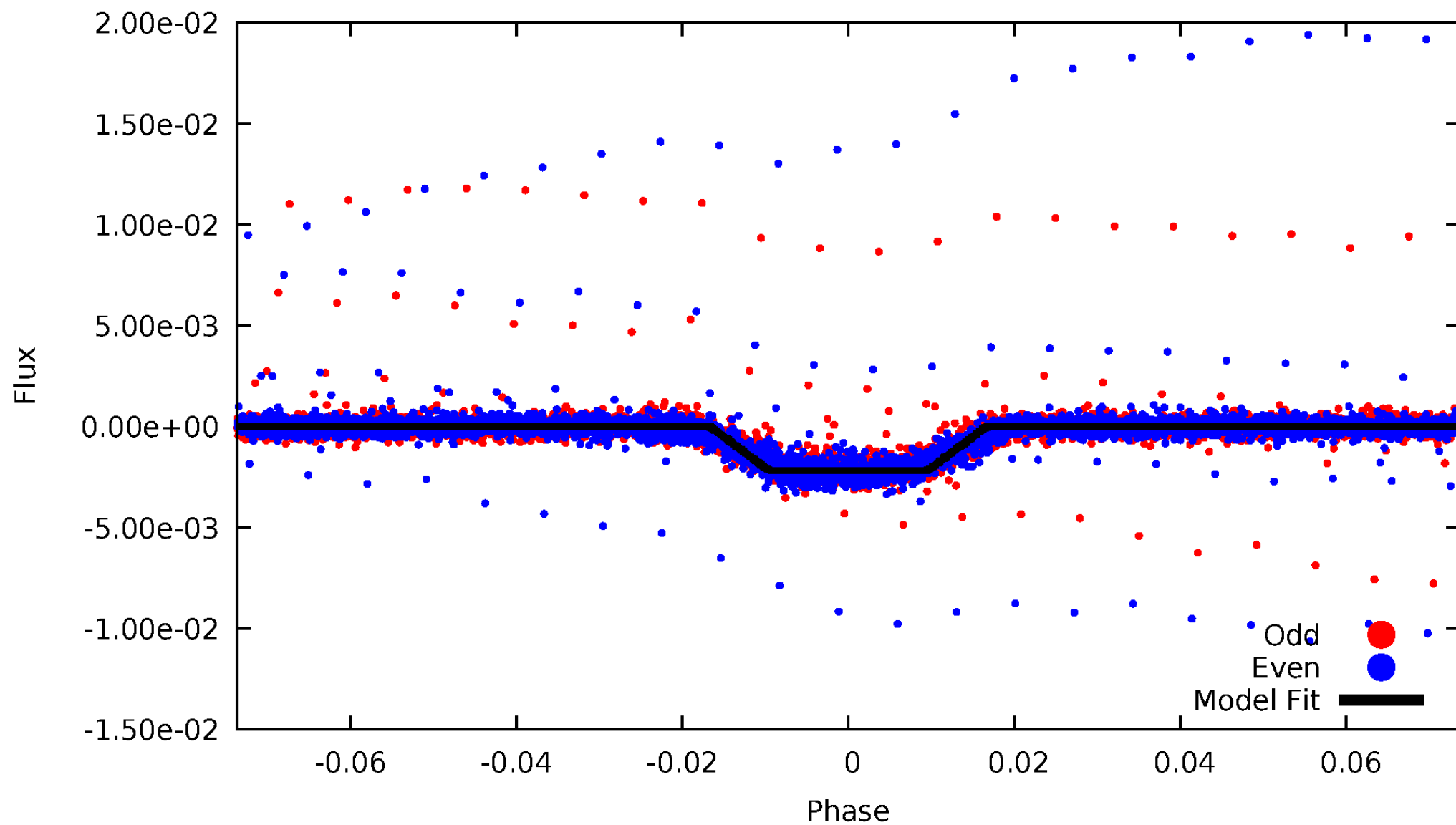
DV Odd/Even

TCE 010384962-02



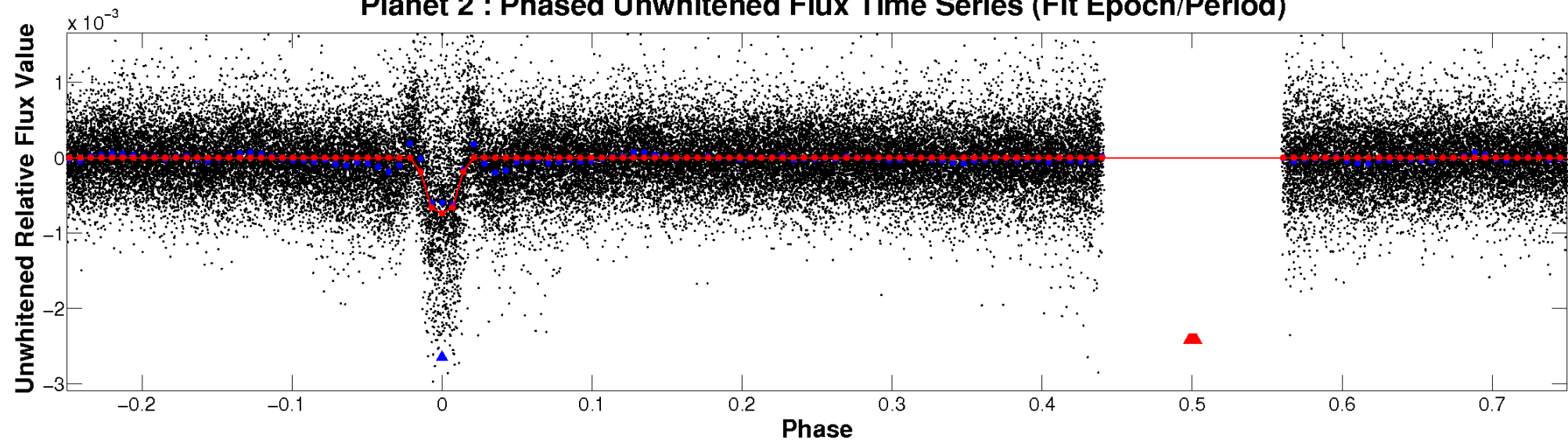
ALT Odd/Even

TCE 010384962-02

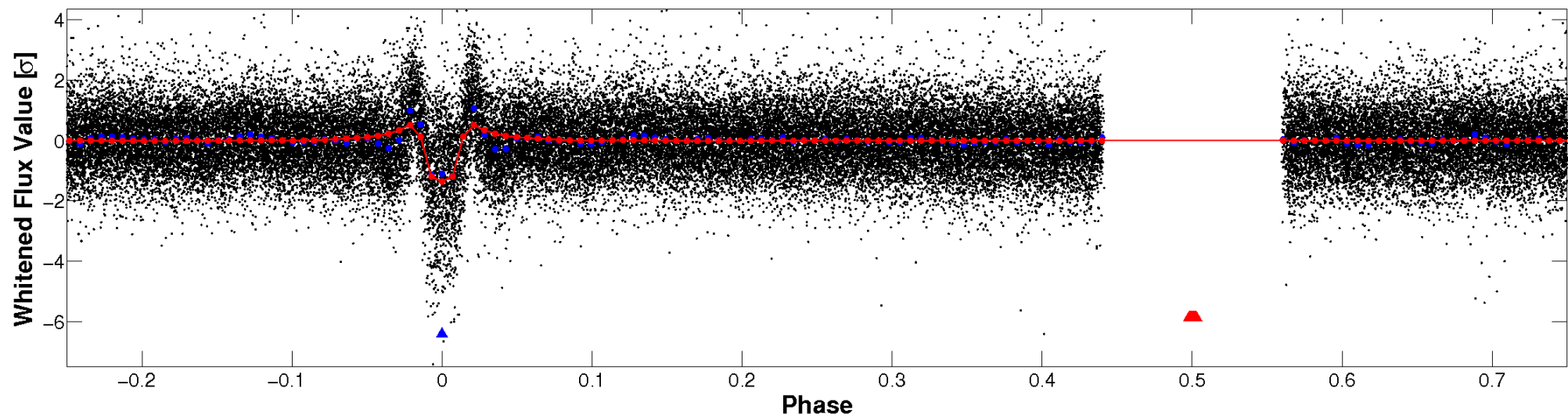


Non-Whitened Vs. Whitened Light Curve

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

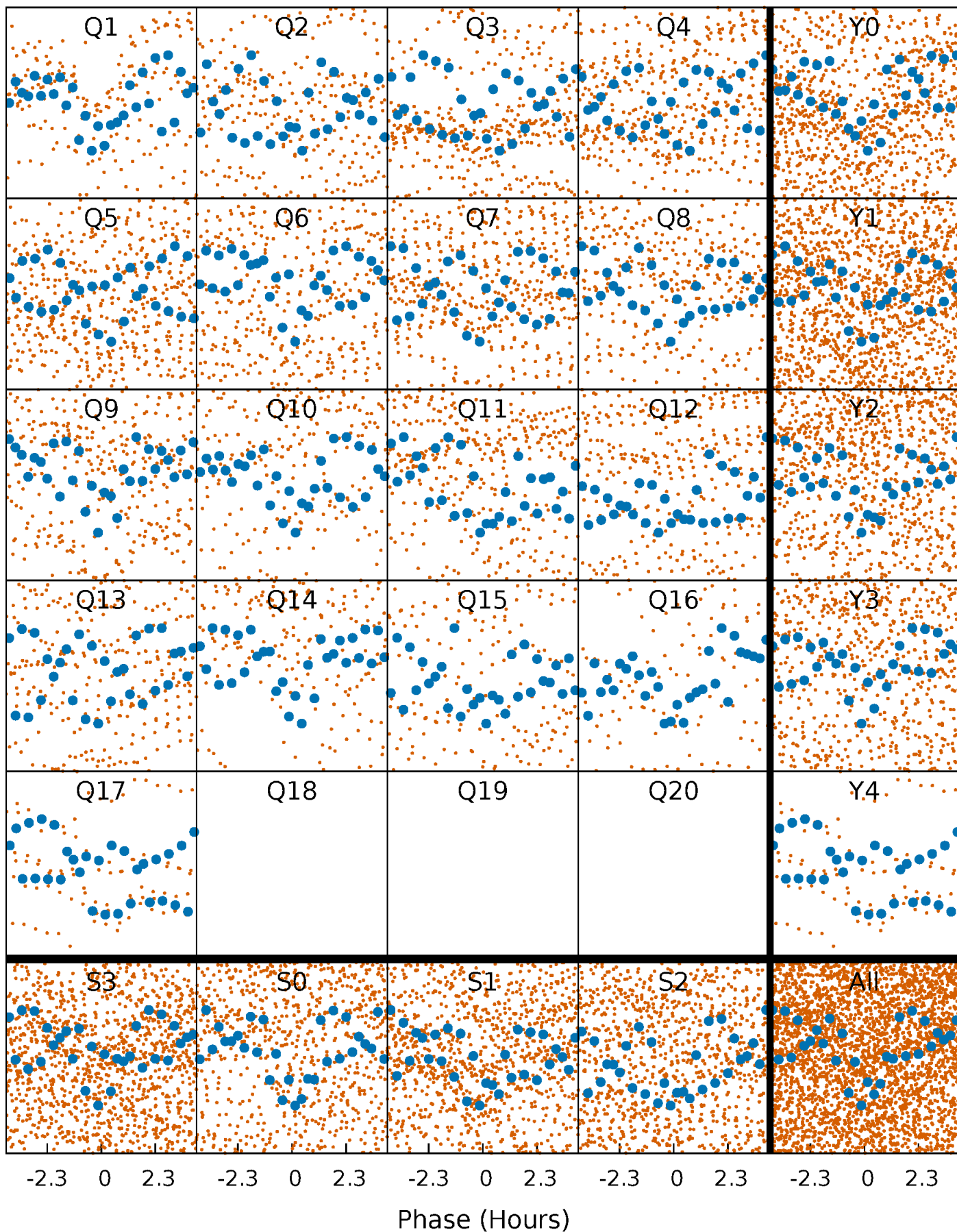


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



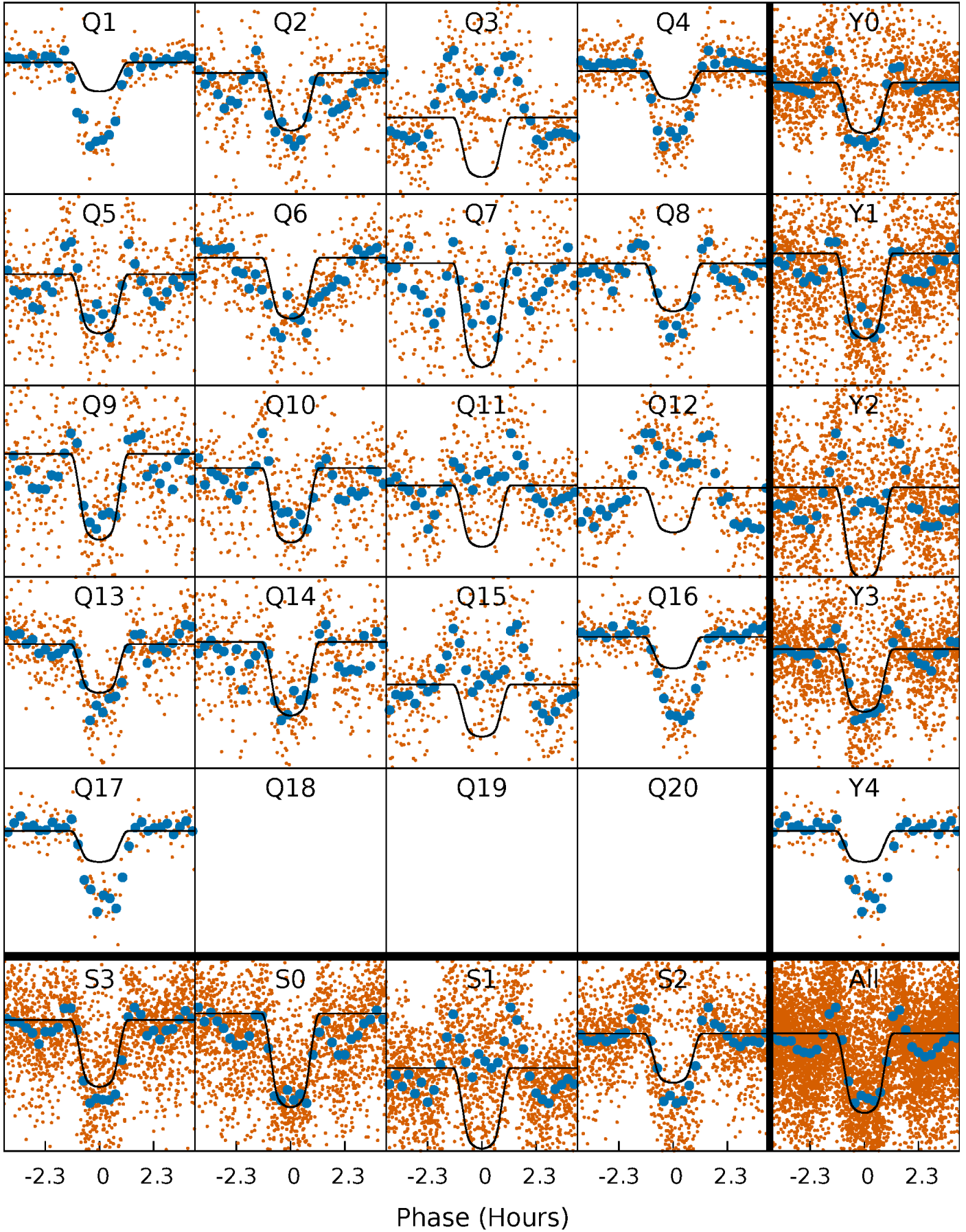
PDC Quarter-Phased Transit Curves

TCE 010384962-02 P= 2.879216 Days $T_0=131.846567$ (BKJD)



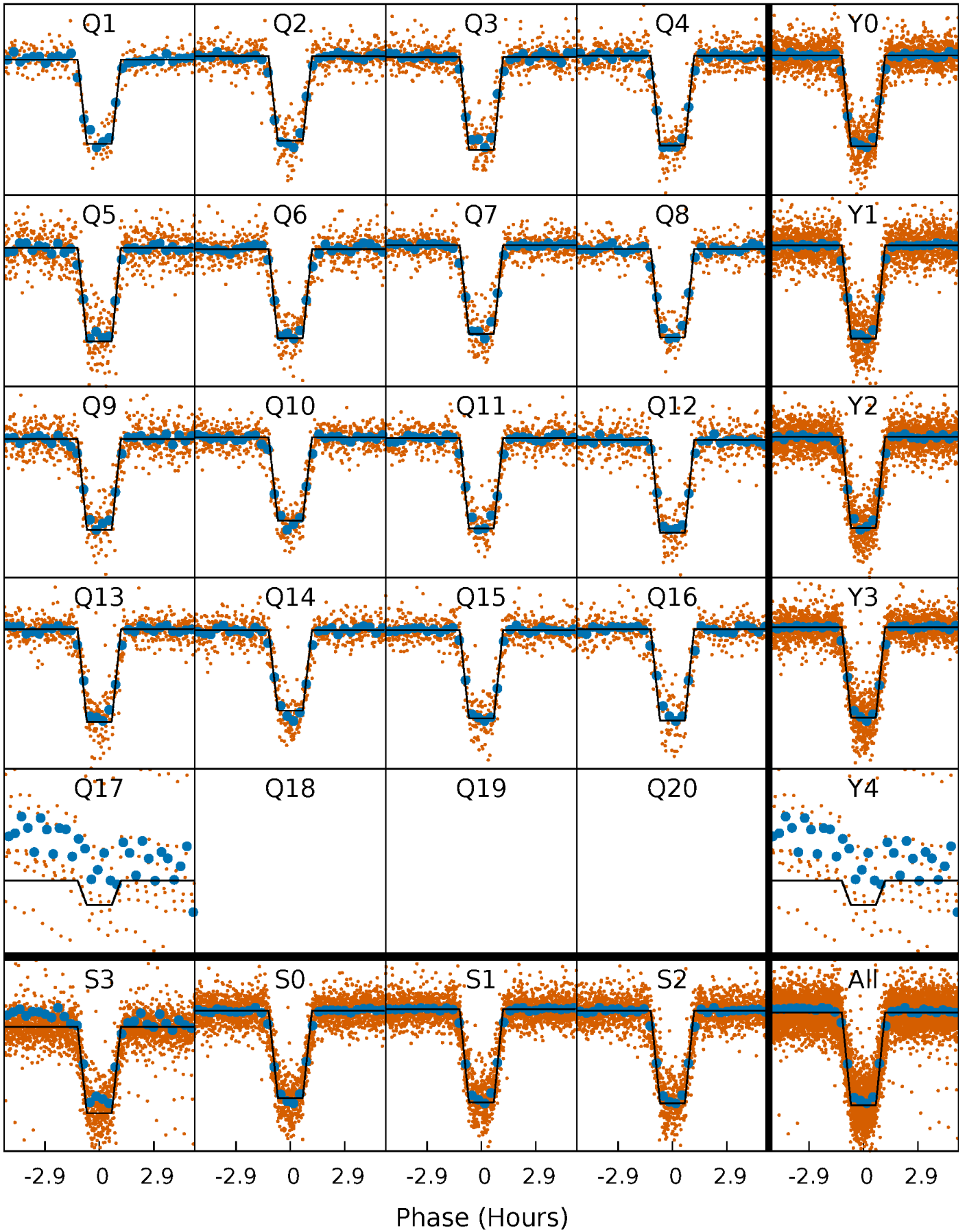
DV Quarter-Phased Transit Curves

TCE 010384962-02 P= 2.879216 Days $T_0=131.846567$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

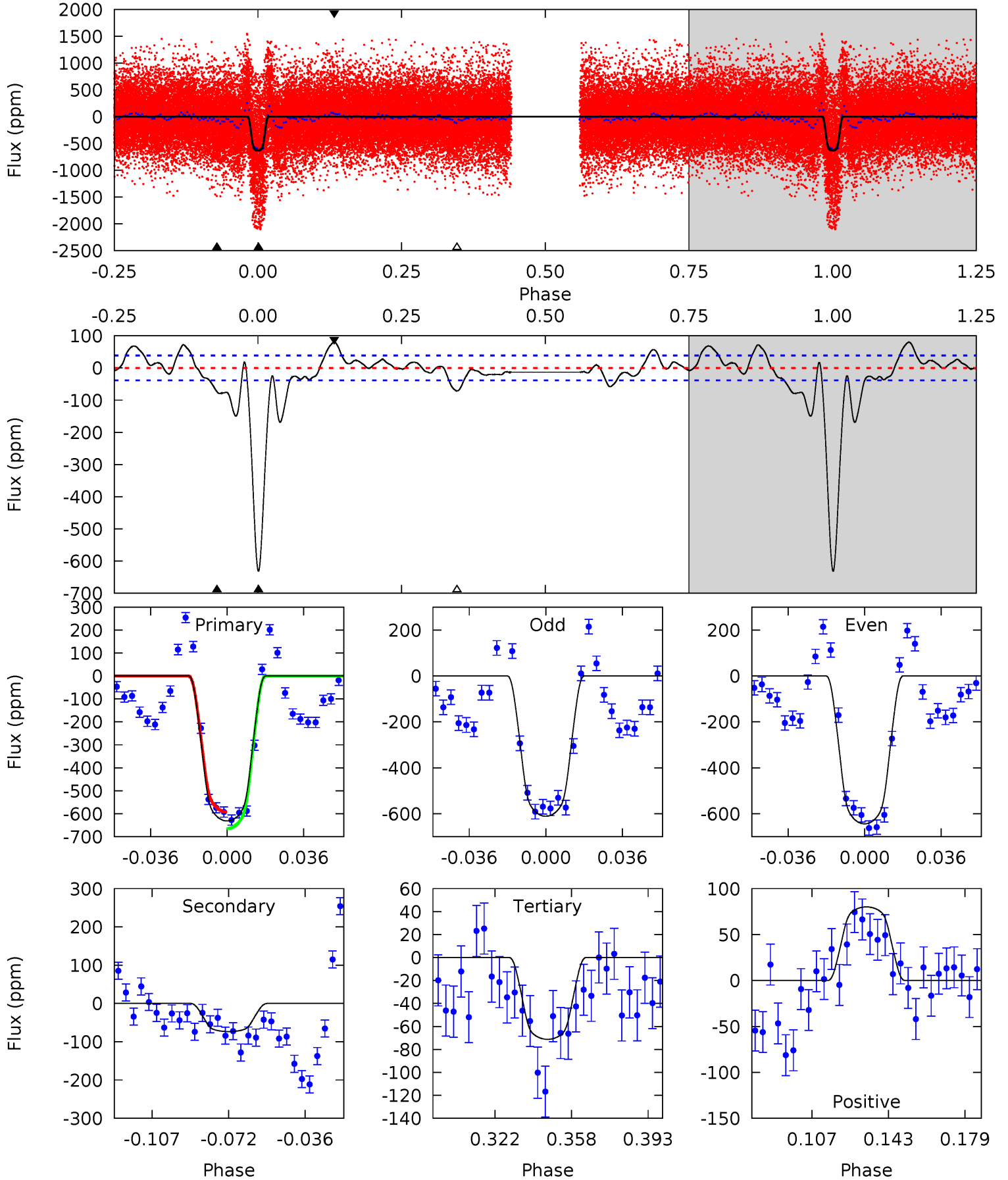
TCE 010384962-02 $P = 2.879237$ Days $T_0 = 131.843611$ (BKJD)



DV Model-Shift Uniqueness Test

010384962-02, P = 2.879216 Days, E = 128.967351 Days

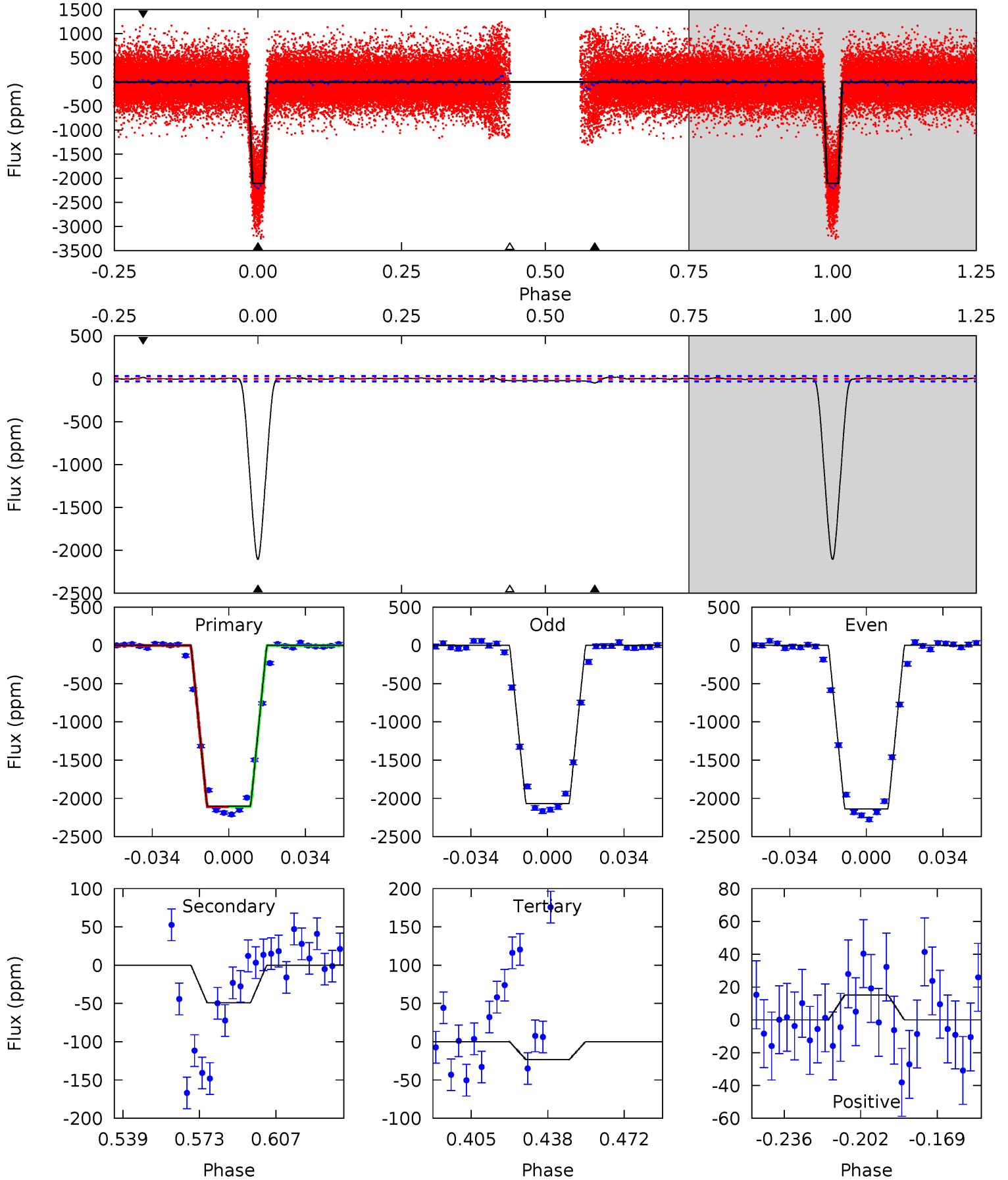
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 78.2 | 9.10 | 8.82 | 9.91 | 4.78 | 2.10 | 4.55 | 69.3 | 68.2 | 0.28 | -0.82 | 2.03 | 0.99 | 0.11 | 4.49 |



Alt Model-Shift Uniqueness Test

010384962-02, P = 2.879237 Days, E = 128.964374 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 329.4 | 7.69 | 3.65 | 2.36 | 4.79 | 2.12 | 0.81 | 325.8 | 327.1 | 4.04 | 5.33 | 5.62 | 0.96 | 0.01 | 0.41 |



Stellar Parameters For KIC 010384962

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5941^{+142}_{-178} | $4.533^{+0.048}_{-0.204}$ | $-0.220^{+0.300}_{-0.300}$ | $0.885^{+0.258}_{-0.086}$ | $0.975^{+0.107}_{-0.131}$ | $1.980^{+0.394}_{-1.027}$ |
| | +2%/-3% | +1%/-5% | +136%/-136% | +29%/-10% | +11%/-13% | +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 010384962-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-------------|------------------------|---------------------|----------------------|---------------------------|
| DV | -73 ± 8 | $2.93^{+0.45}_{-0.28}$ | 1769^{+112}_{-77} | 3603^{+125}_{-120} | $6.970^{+1.687}_{-1.661}$ |
| Alt. | -49 ± 6 | $4.62^{+0.67}_{-0.39}$ | 1772^{+122}_{-78} | 2904^{+88}_{-81} | $1.891^{+0.427}_{-0.480}$ |

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 $A_{obs} \gg 1.0$

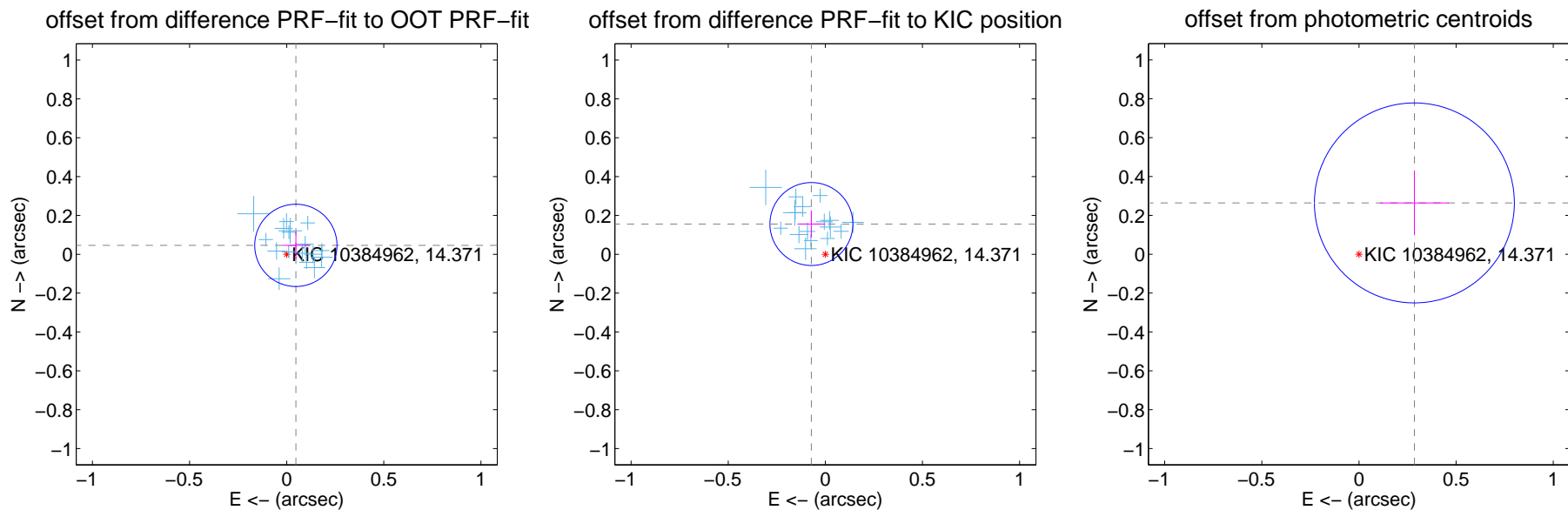
DV Centroid Data

Supplemental centroid analysis for 010384962-02. Kepler magnitude: 14.37. Transit SNR 49.15

There are 17 quarters with good PRF difference image offsets

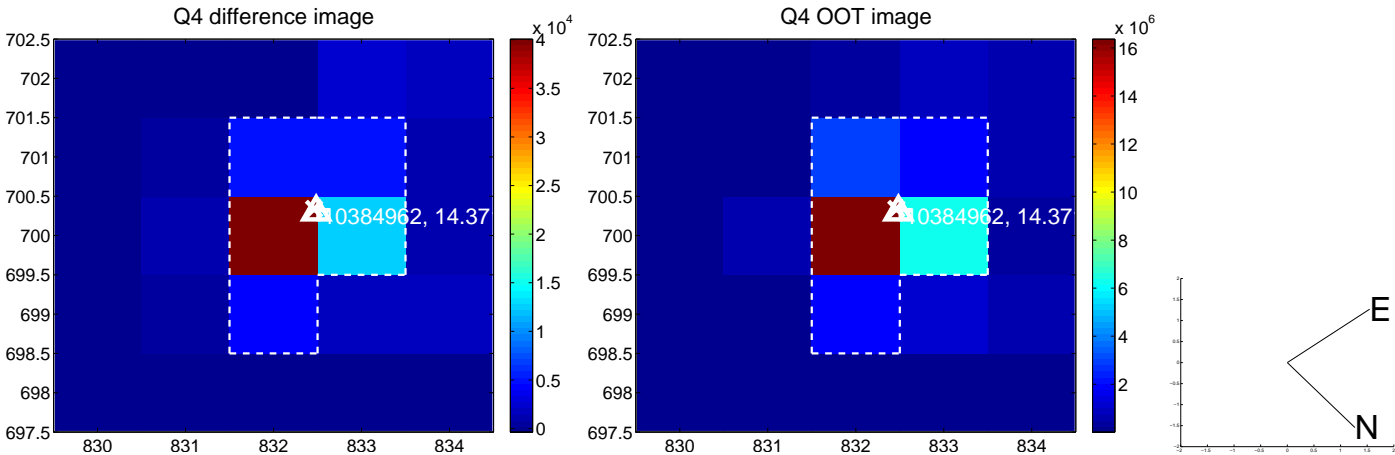
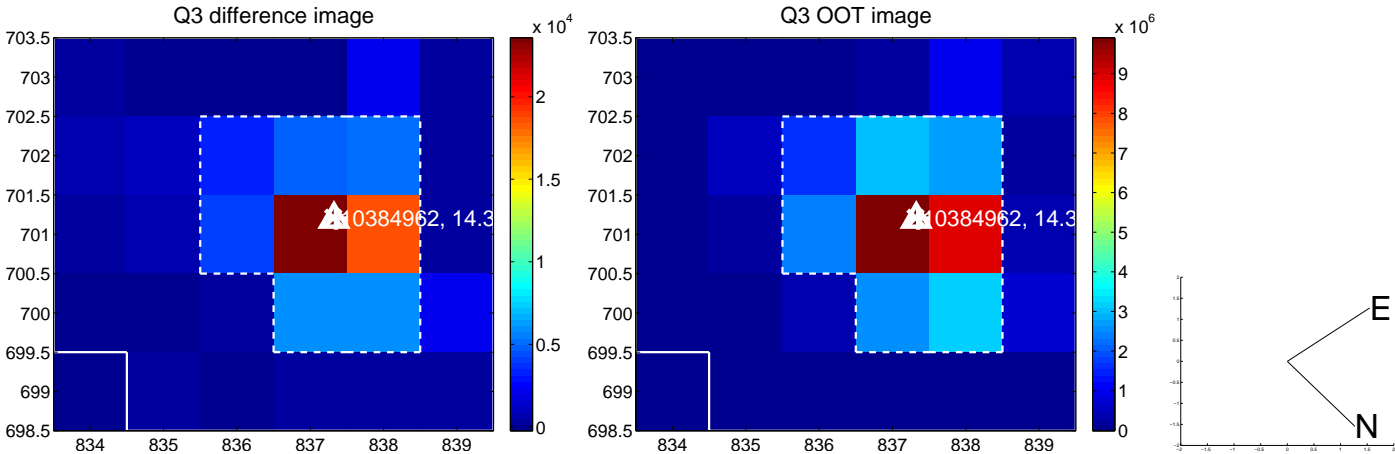
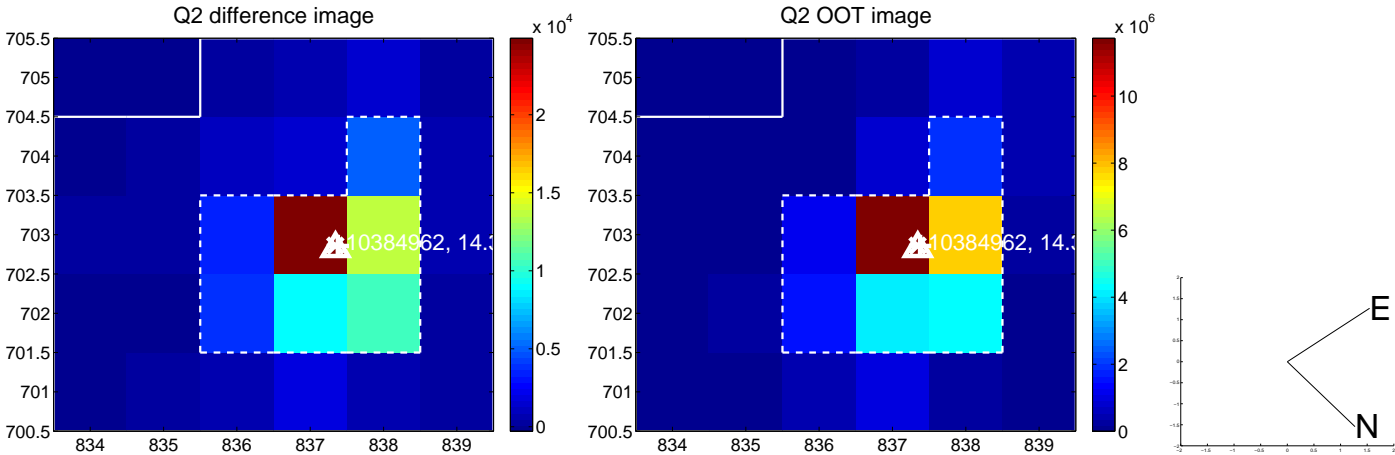
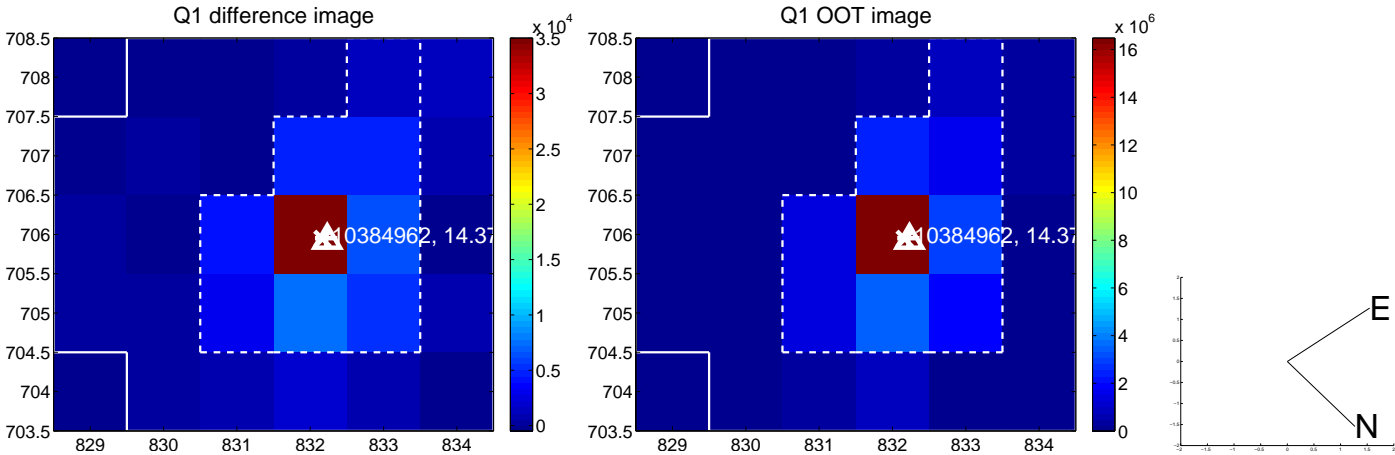
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.066 ± 0.071 | 0.93 | -0.047 ± 0.071 | 0.046 ± 0.070 |
| PRF-fit source offset from KIC position | 0.172 ± 0.071 | 2.41 | 0.072 ± 0.072 | 0.156 ± 0.070 |
| photometric centroid source offset | 0.39 ± 0.17 | 2.27 | -0.29 ± 0.18 | 0.26 ± 0.17 |

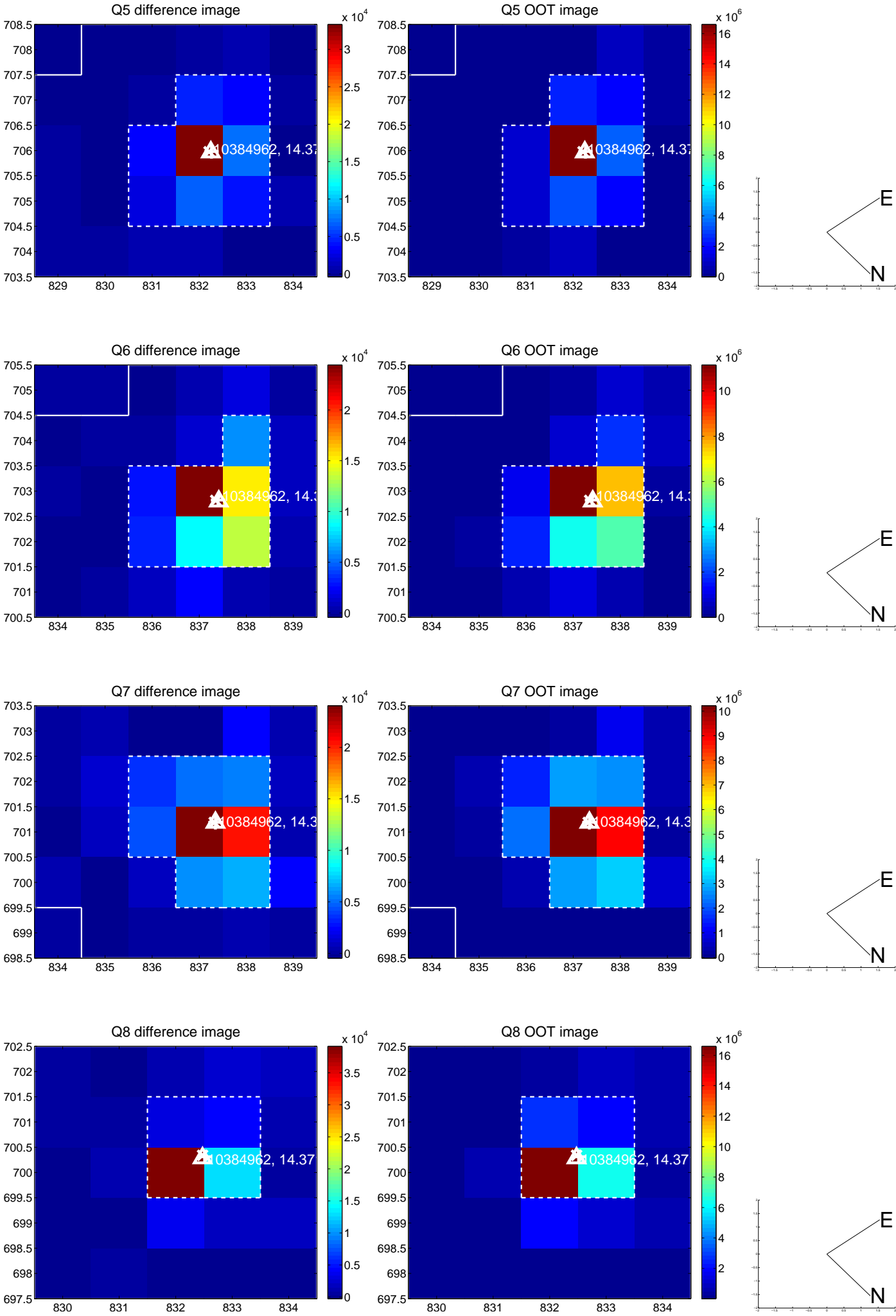


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

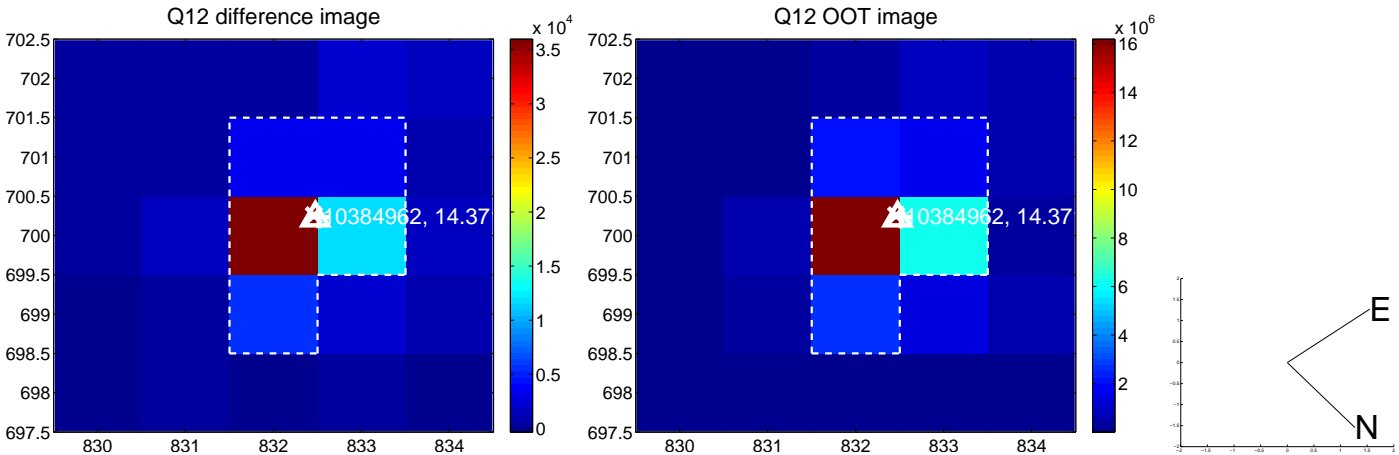
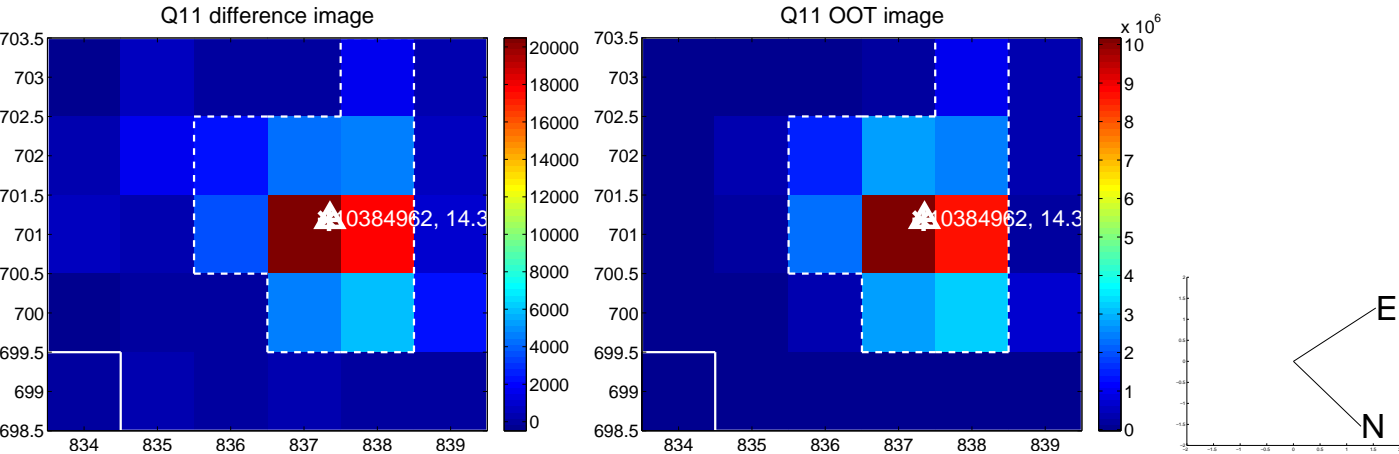
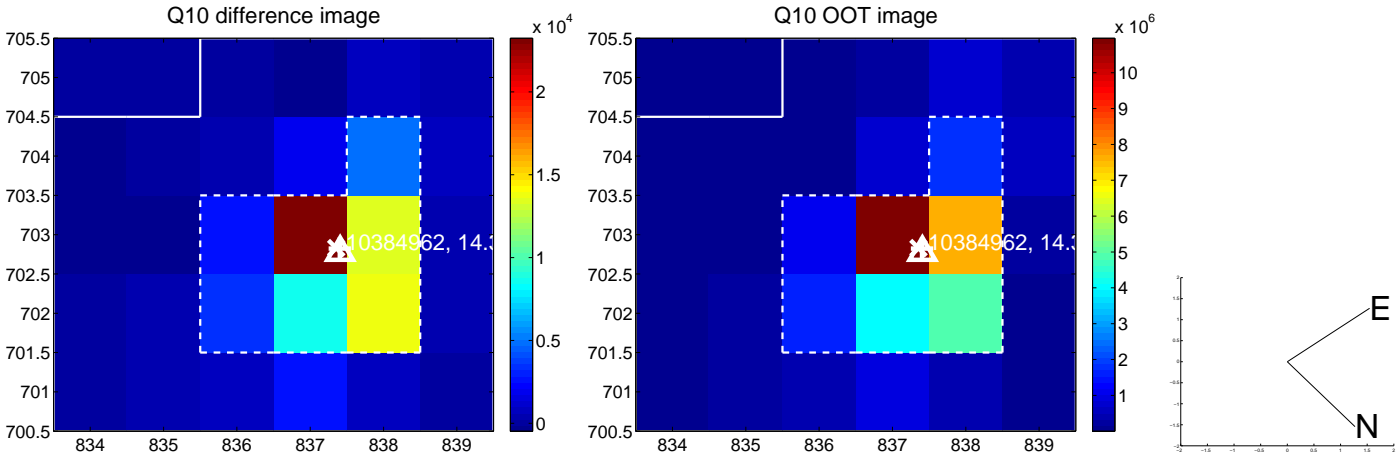
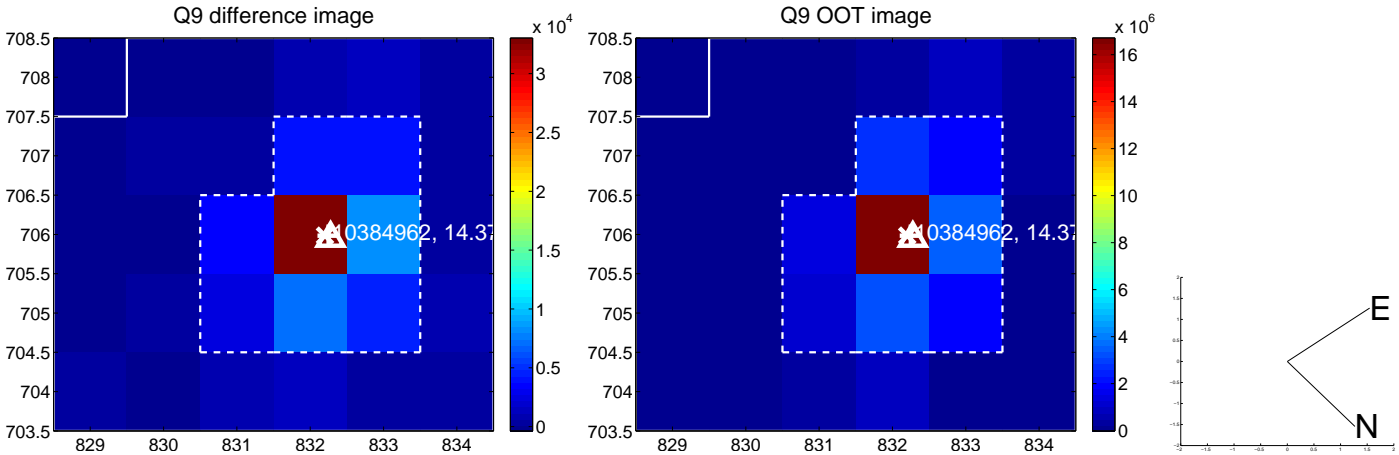
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



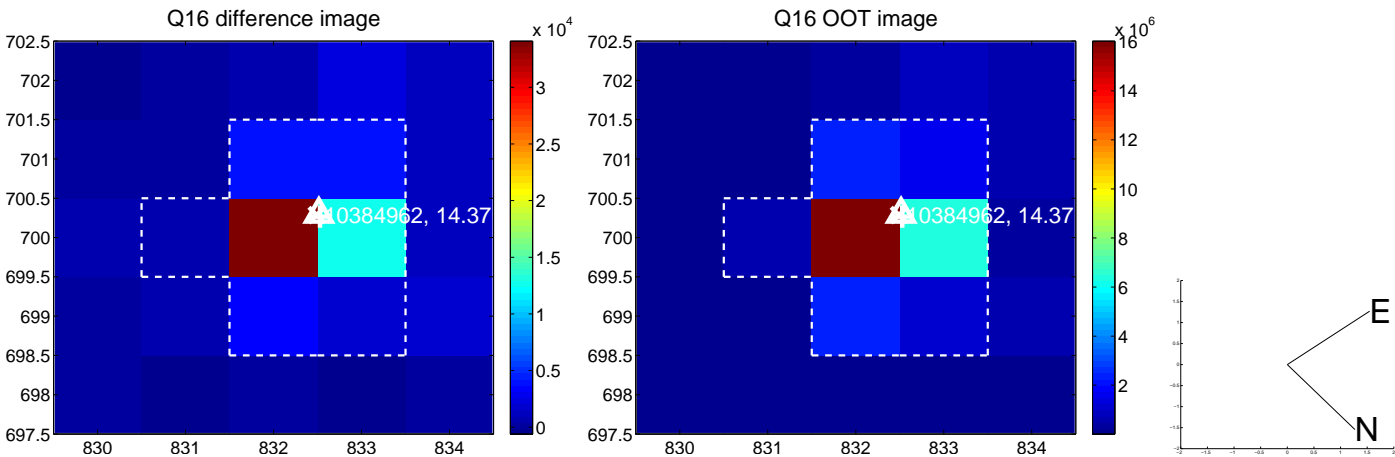
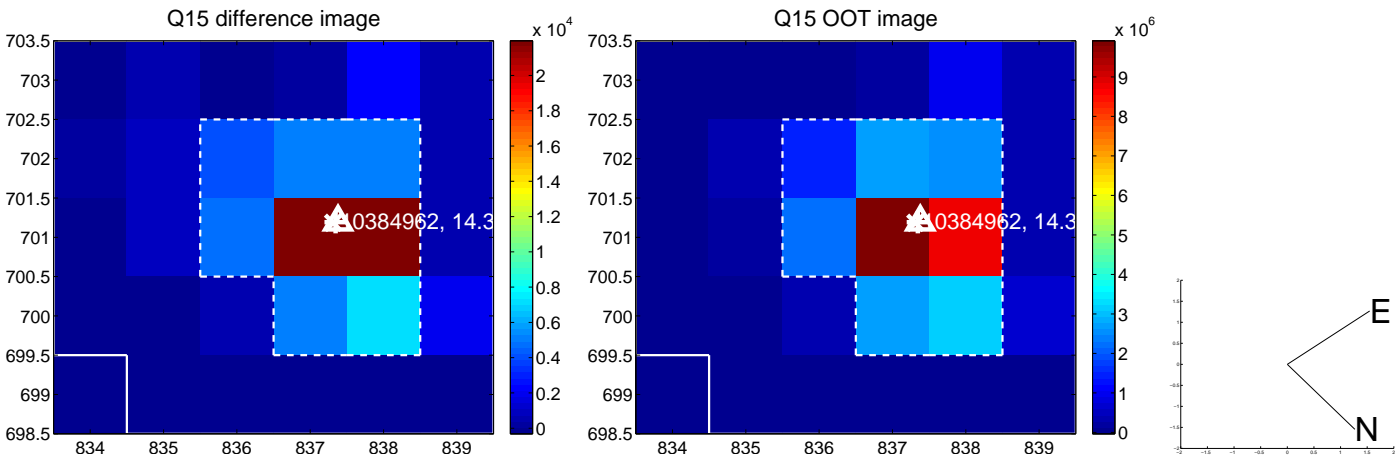
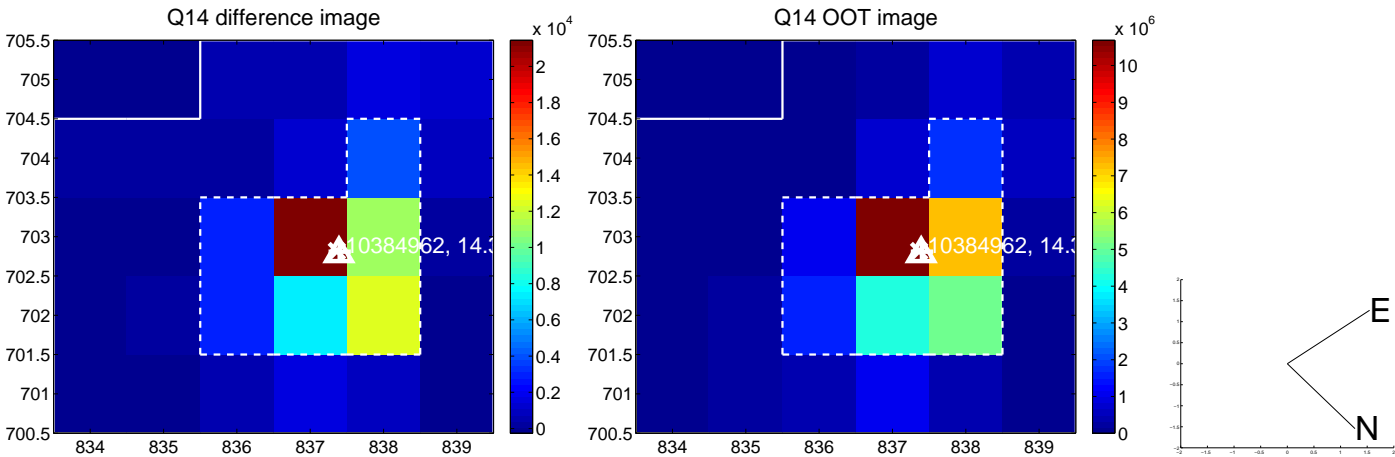
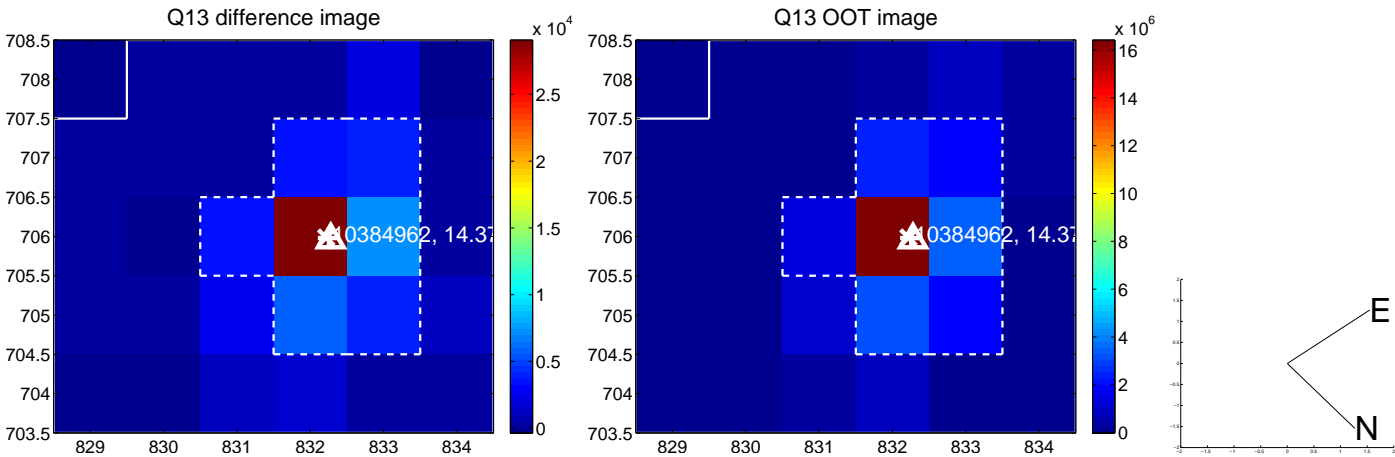
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



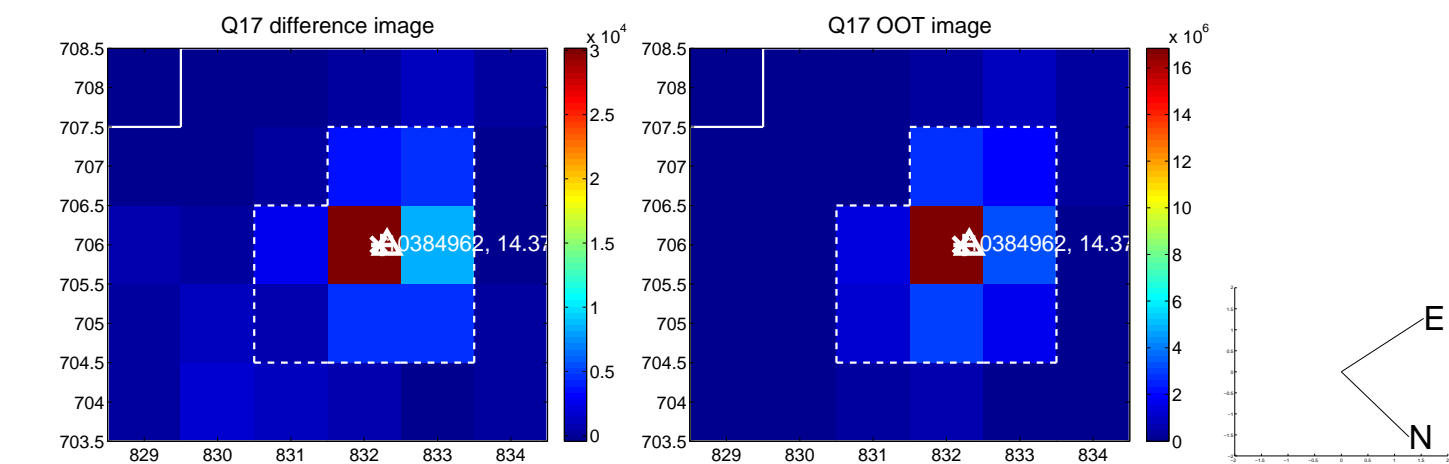
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



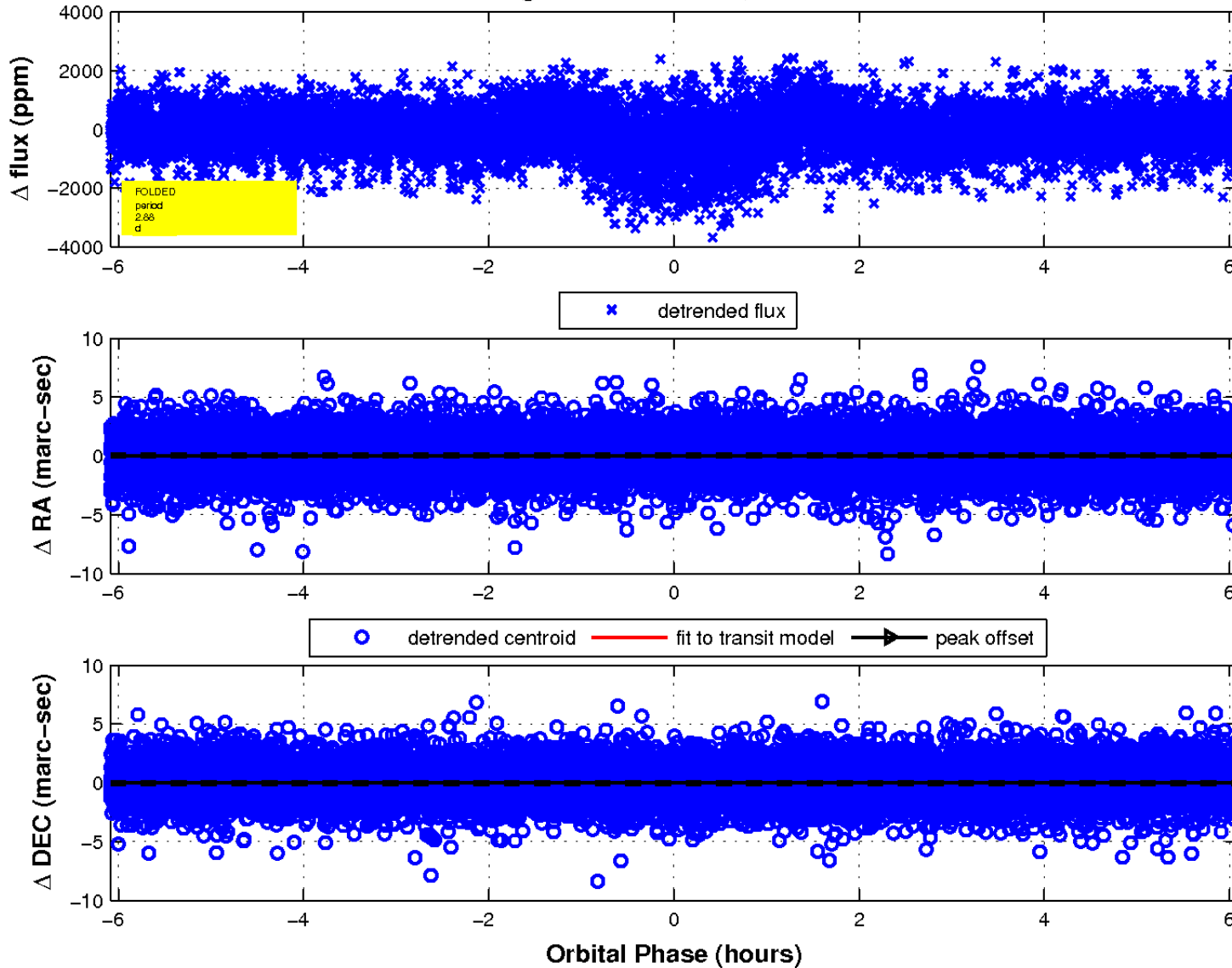
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

