

KIC 010747445

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 010747445-01 | OBS | 2673.01 | 4.593590 | 134.890898 | 44778.8 | 2.709 | 524.0 | 439.3 | 0.88 | 5717 | 26.13 | 258.42 |
| 010747445-02 | OBS | No | 4.593601 | 132.599381 | 1627.2 | 2.339 | 18.1 | 19.4 | 0.88 | 5717 | 4.60 | 258.42 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010747445-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS |
| 010747445-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_KIC_POS |

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.

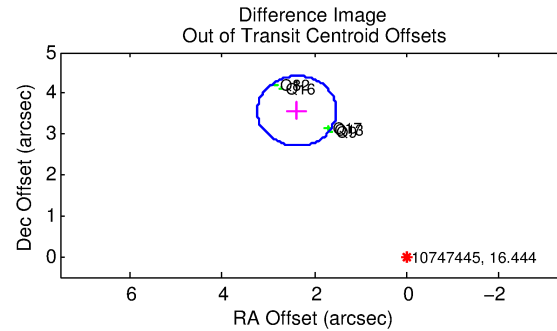
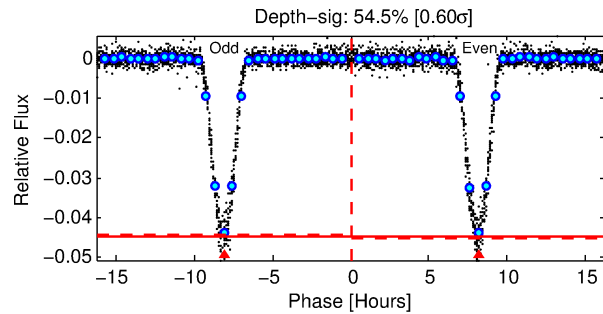
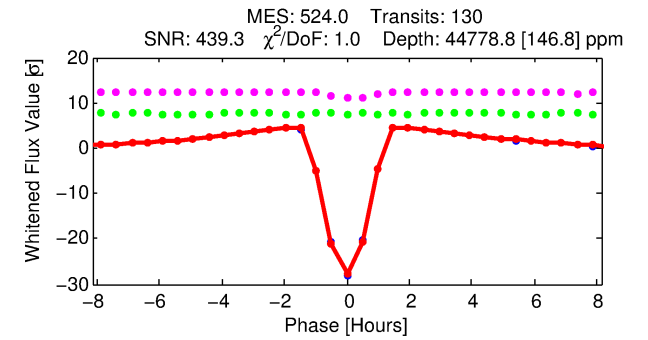
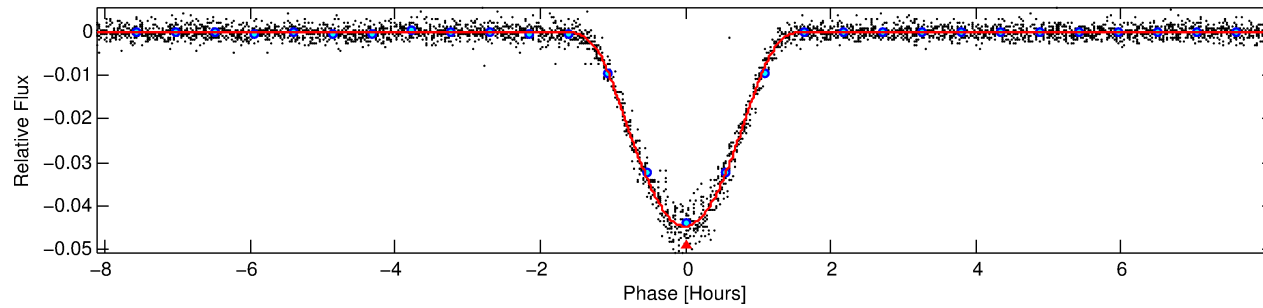
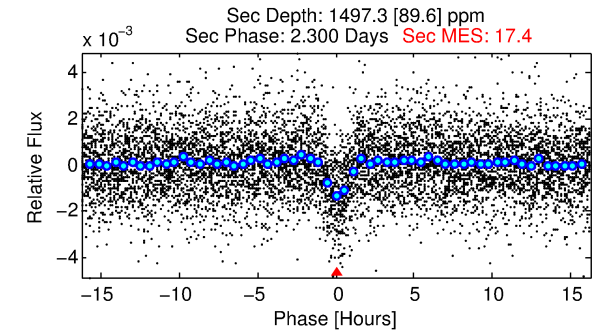
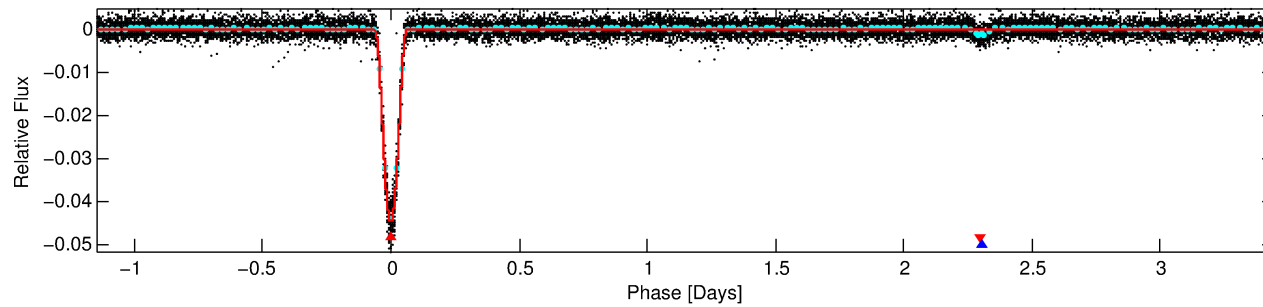
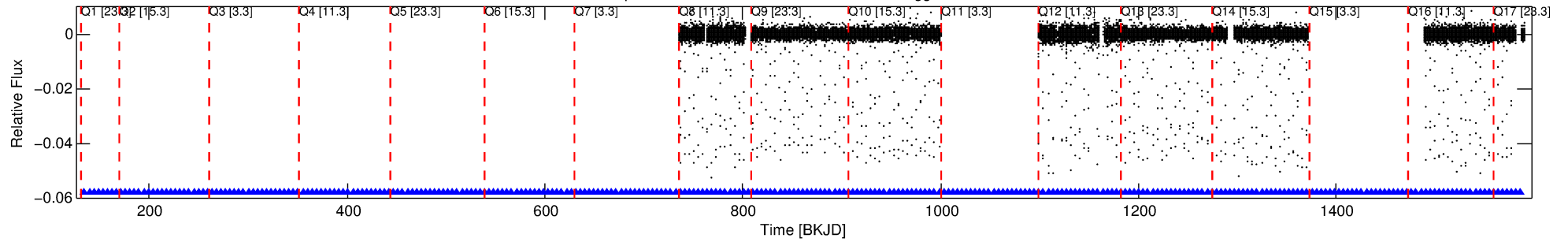
Ephemeris Match Information For 010747445-01

No Significant Match Found

DV One-Page Summary

KIC: 10747445 Candidate: 1 of 2 Period: 4.594 d
KOI: K02673.01 Corr: 0.997

Kp: 16.44 R*: 0.88 Rs Teff: 5717.0 K Logg: 4.54 Fe/H: 0.000



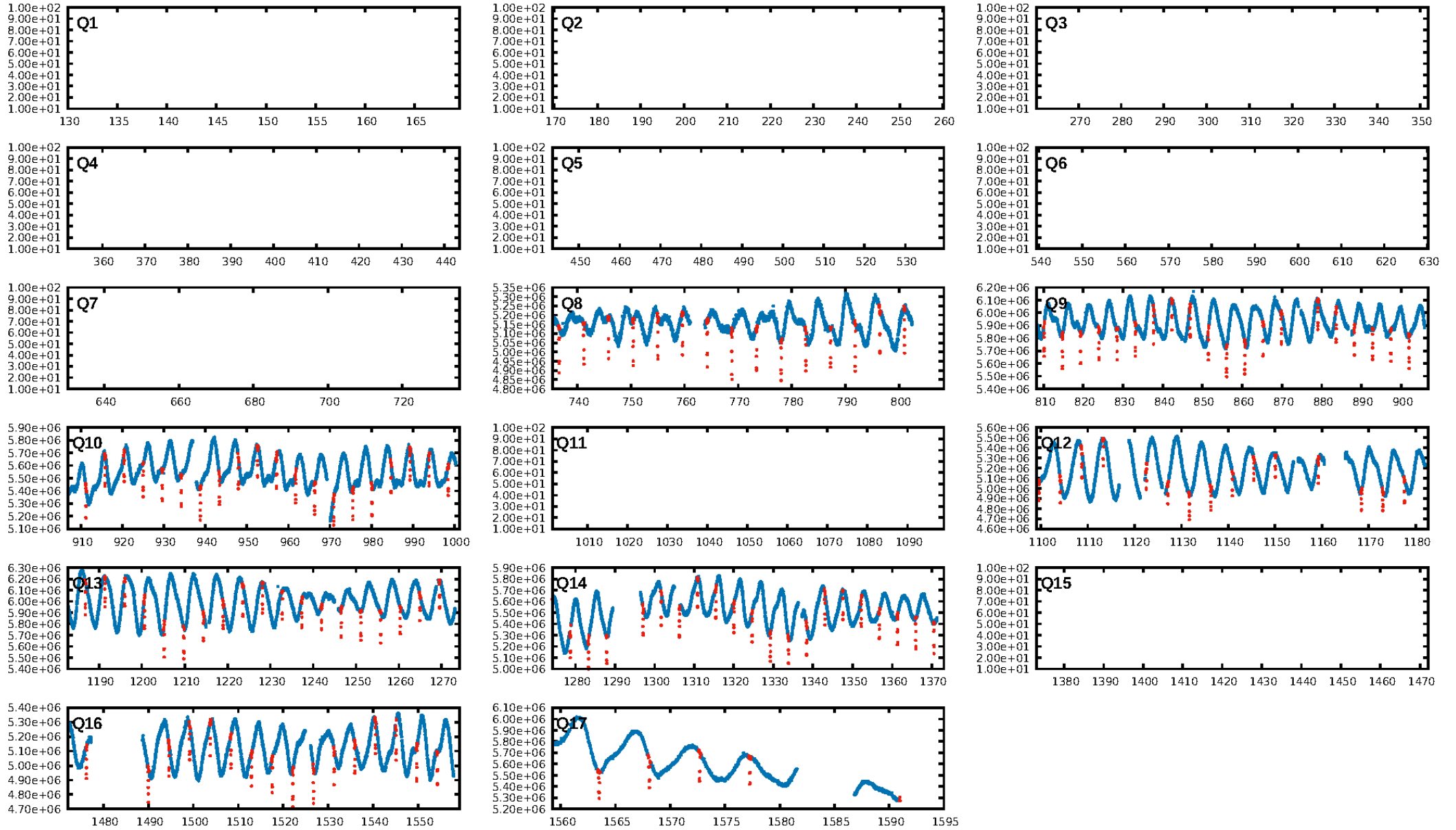
DV Fit Results:

Period = 4.59359 [0.00000] d
Epoch = 134.8909 [0.0002] BKJD
Rp/R* = 0.2708 [0.0188]
a/R* = 11.67 [0.11]
b = 0.90 [0.03]
Seff = 258.42 [101.28]
Teq = 1022 [100] K
Rp = 26.13 [7.84] Re
a = 0.0538 [0.0134] AU
Ag = 3.49 [1.39] [1.79σ]
Teffp = 2161 [109] K [7.70σ]

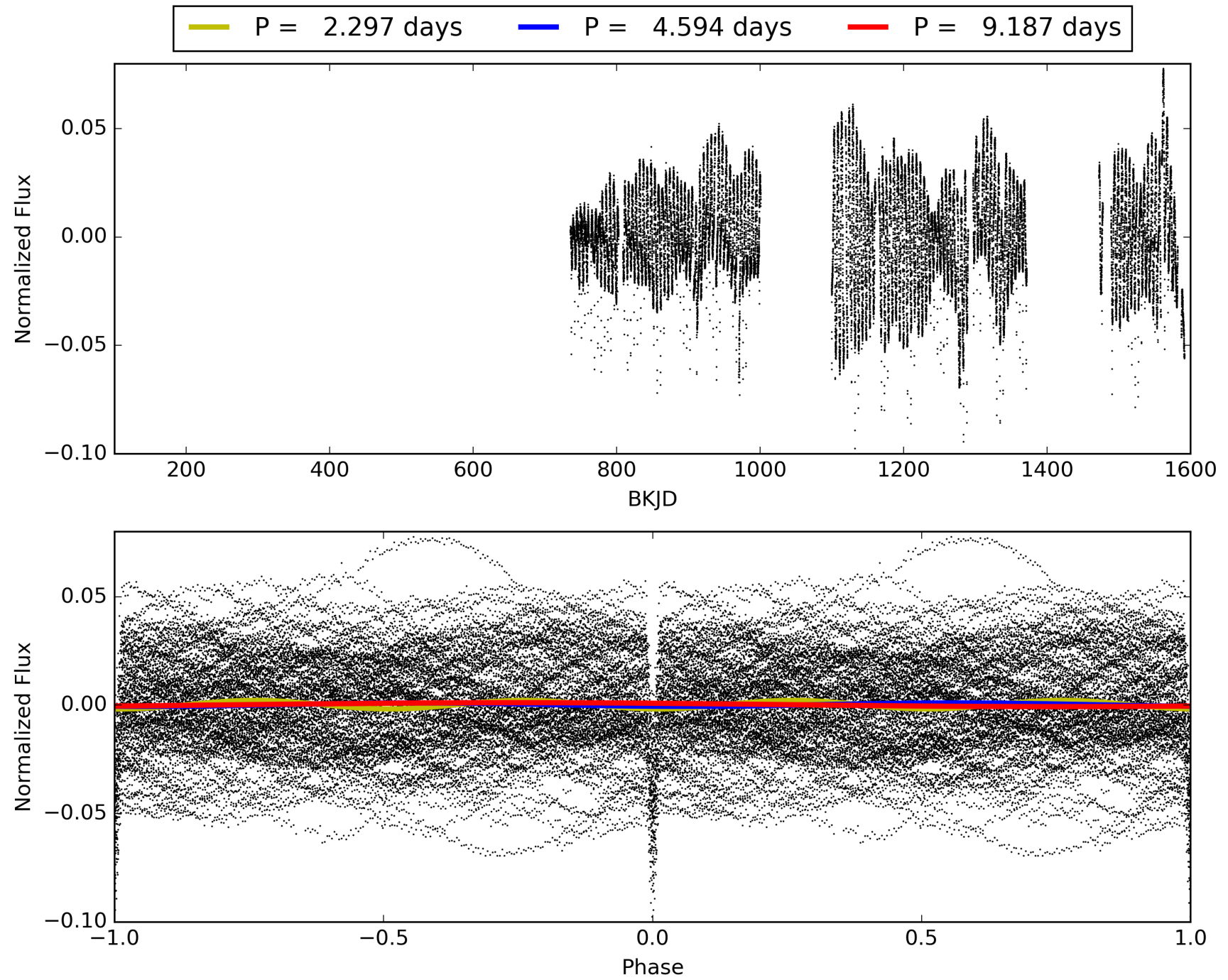
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [125/125]
GhostDiagnostic-chr: 2.614
Centroid-sig: 0.0%
Centroid-so: 3.229 arcsec [393.29σ]
OotOffset-rm: 4.285 arcsec [15.02σ]
KicOffset-rm: 0.214 arcsec [3.16σ]
OotOffset-st: 0/0/3/3 [6]
KicOffset-st: 2/0/3/3 [8]
DiffImageQuality-fgm: 1.00 [8/8]
DiffImageOverlap-fno: 1.00 [8/8]

TCE 010747445-01, PDC Light Curves

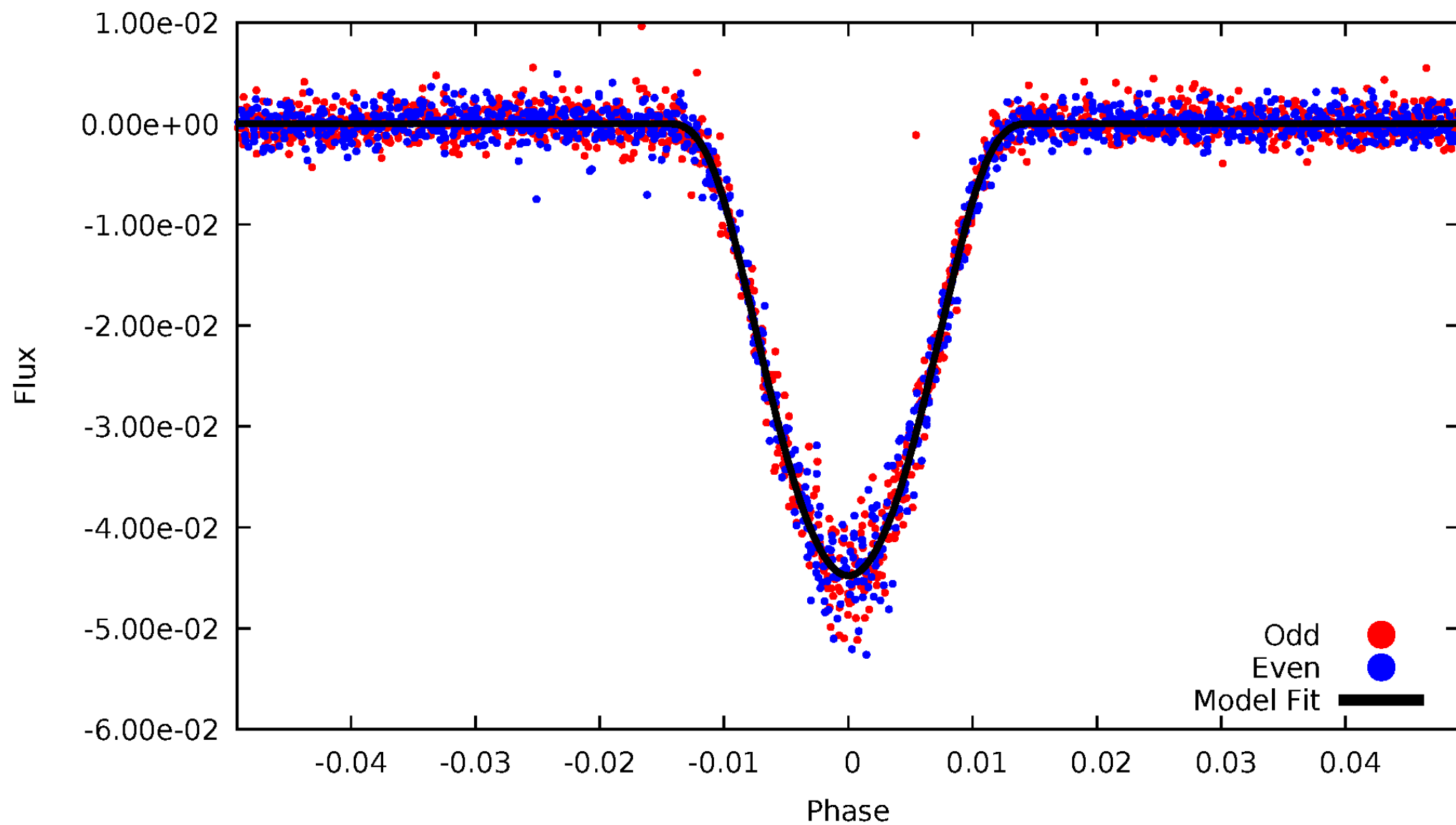


TCE 010747445-01



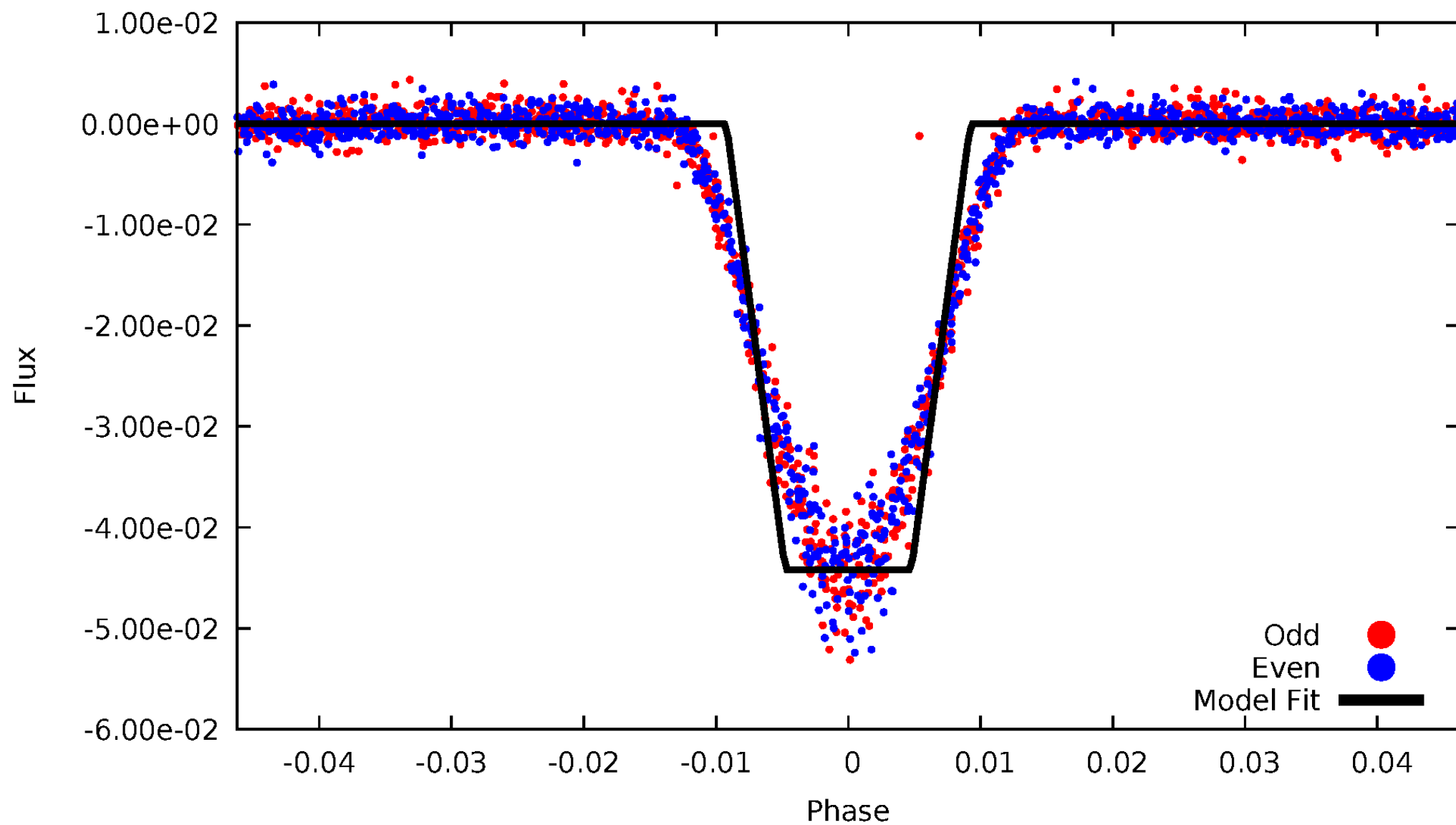
DV Odd/Even

TCE 010747445-01



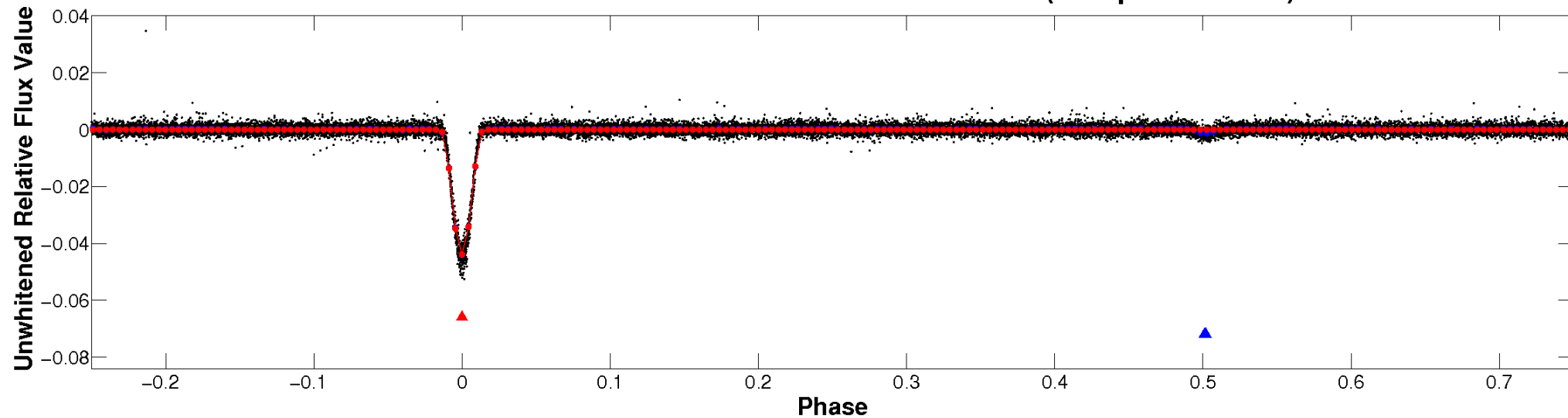
ALT Odd/Even

TCE 010747445-01

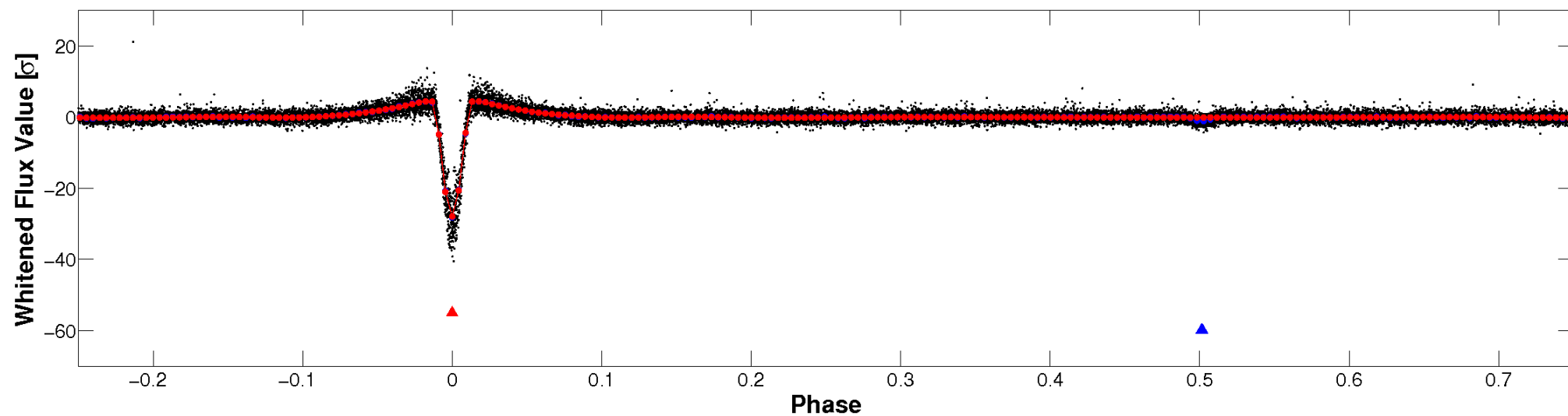


Non-Whitened Vs. Whitened Light Curve

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

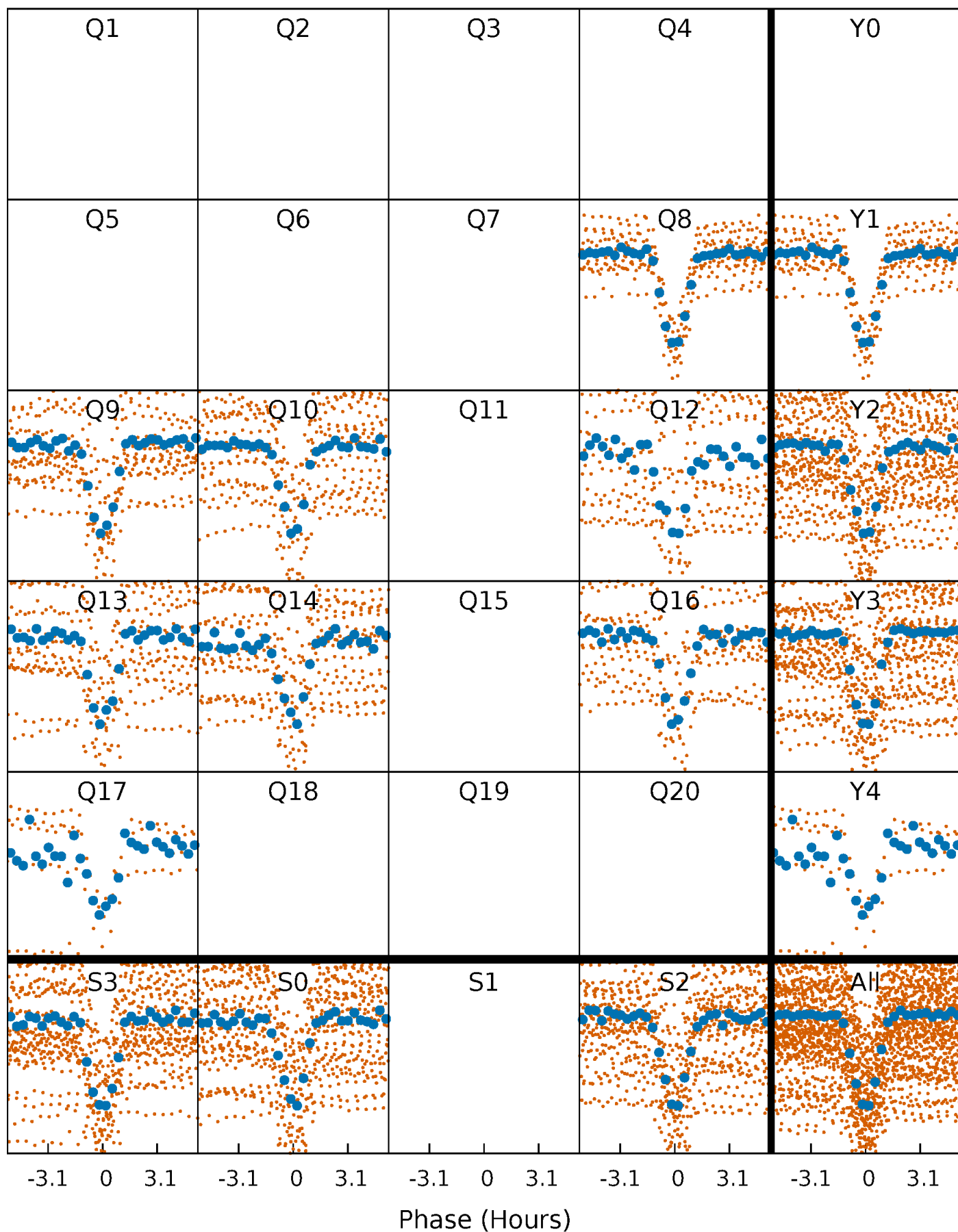


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



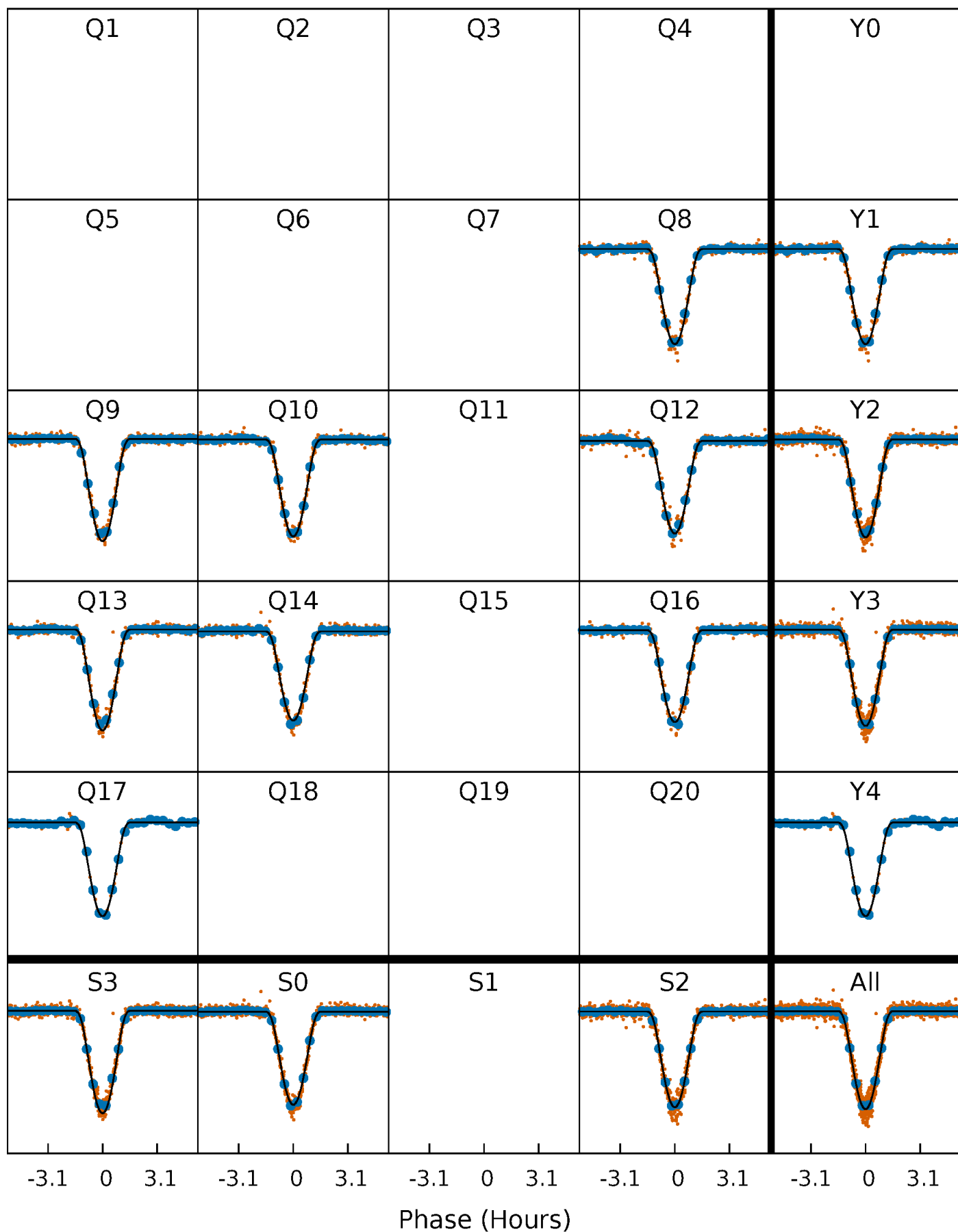
PDC Quarter-Phased Transit Curves

TCE 010747445-01 P= 4.593590 Days $T_0=134.890897$ (BKJD)



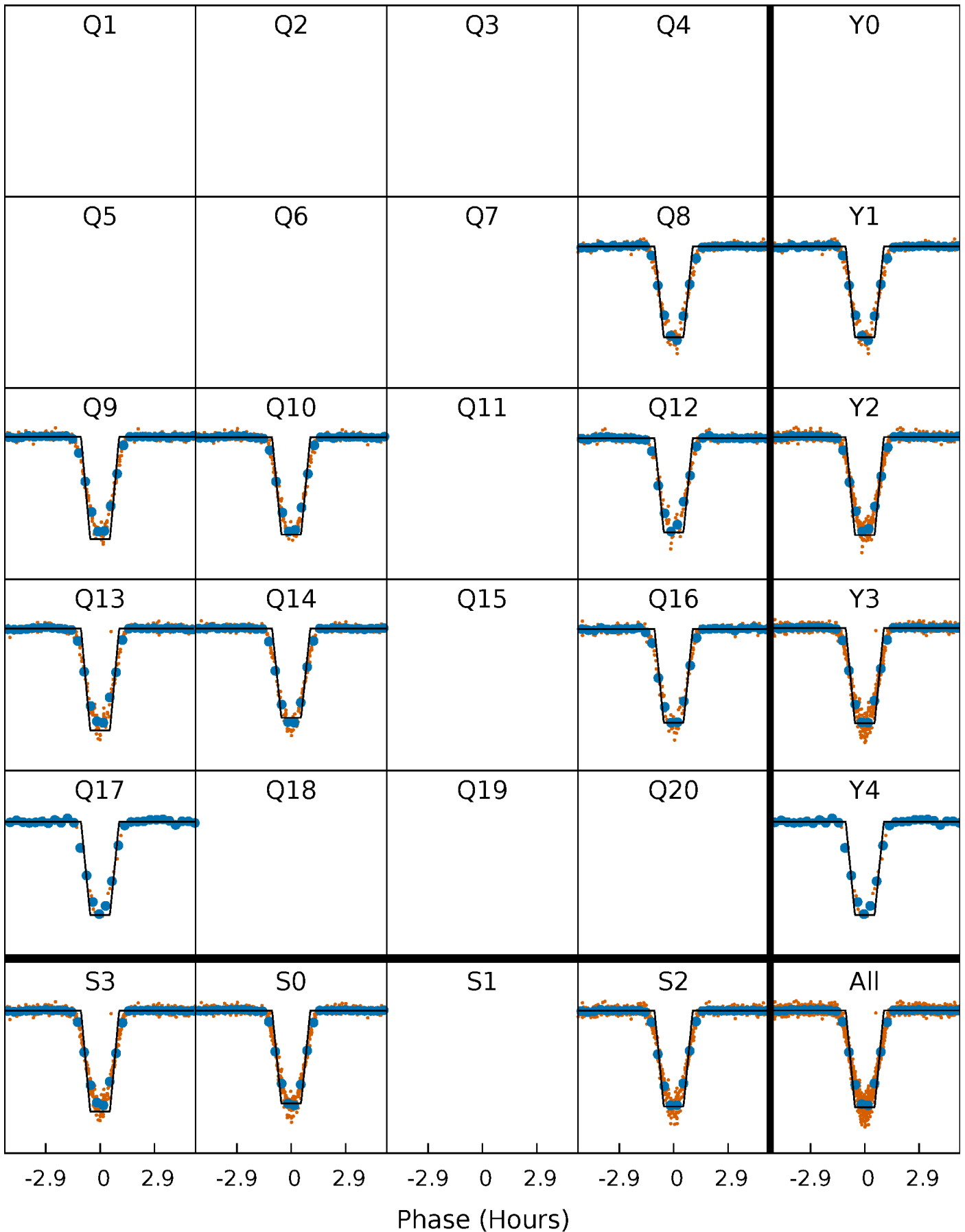
DV Quarter-Phased Transit Curves

TCE 010747445-01 P= 4.593590 Days $T_0=134.890897$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

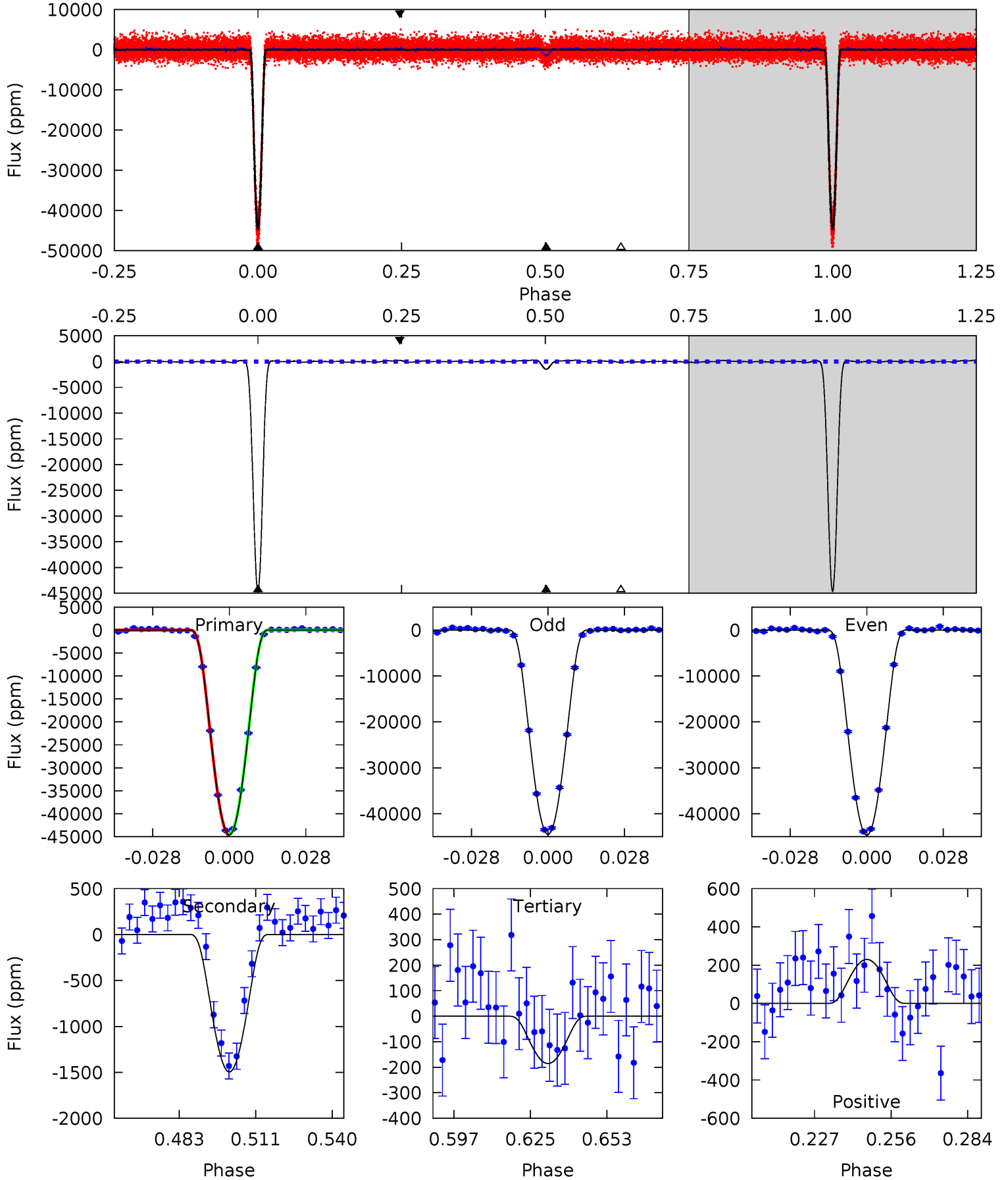
TCE 010747445-01 P= 4.593607 Days $T_0=134.887208$ (BKJD)



DV Model-Shift Uniqueness Test

010747445-01, P = 4.593590 Days, E = 134.890897 Days

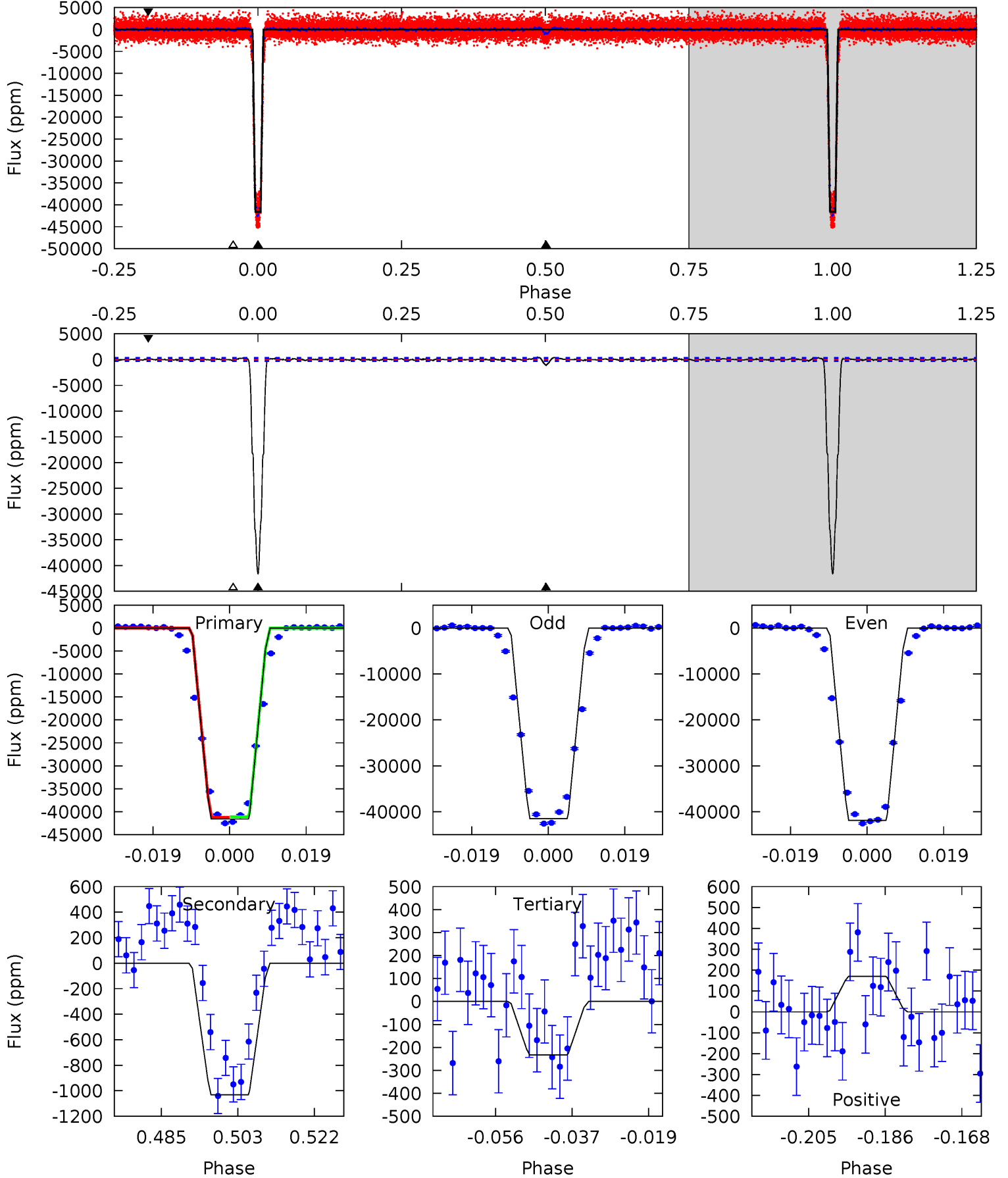
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 982.1 | 32.9 | 4.08 | 5.07 | 4.82 | 2.19 | 1.84 | 978.0 | 977.0 | 28.8 | 27.8 | 2.11 | 1.00 | 0.01 | 3.02 |



Alt Model-Shift Uniqueness Test

010747445-01, P = 4.593607 Days, E = 134.887208 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 669.0 | 16.6 | 3.75 | 2.73 | 4.91 | 2.35 | 1.25 | 665.3 | 666.3 | 12.8 | 13.9 | 3.13 | 1.01 | 0.01 | 1.18 |



Stellar Parameters For KIC 010747445

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5717^{+173}_{-190} | $4.538^{+0.036}_{-0.204}$ | $0.000^{+0.250}_{-0.300}$ | $0.884^{+0.258}_{-0.086}$ | $0.984^{+0.102}_{-0.125}$ | $2.006^{+0.415}_{-1.070}$ |
| | +3%/-3% | +1%/-4% | +inf%/-inf% | +29%/-10% | +10%/-13% | +21%/-53% |
| Source | KIC0 | 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 010747445-01 / KOI 2673.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|----------------|-------------------------|----------------------|----------------------|---------------------------|
| DV | -1495 ± 45 | $27.13^{+4.08}_{-2.88}$ | 1468^{+109}_{-74} | 2841^{+75}_{-79} | $3.140^{+0.737}_{-0.692}$ |
| Alt. | -1031 ± 62 | $21.20^{+3.56}_{-2.51}$ | 1462^{+108}_{-69} | 2886^{+99}_{-98} | $3.541^{+0.941}_{-0.893}$ |

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

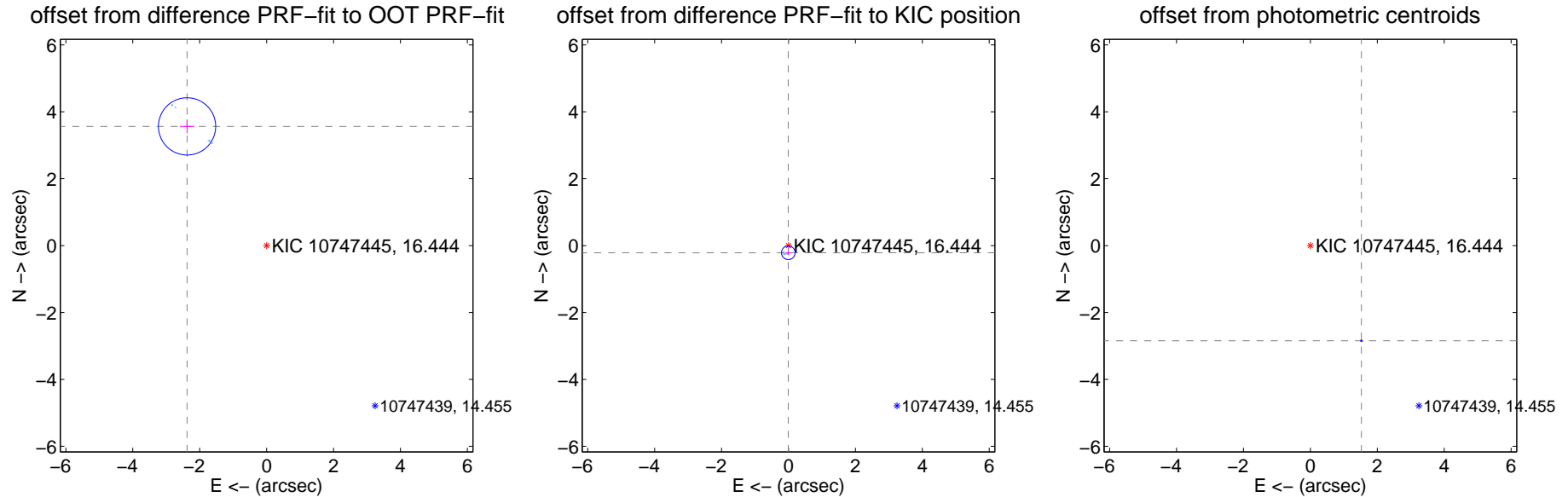
DV Centroid Data

Supplemental centroid analysis for 010747445-01. Kepler magnitude: 16.44. Transit SNR 439.28

There are 8 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 3.74 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 4.285 ± 0.285 | 15.02 | 2.378 ± 0.216 | 3.564 ± 0.208 |
| PRF-fit source offset from KIC position | 0.214 ± 0.068 | 3.16 | 0.006 ± 0.079 | -0.214 ± 0.068 |
| photometric centroid source offset | 3.23 ± 0.01 | 393.29 | -1.53 ± 0.01 | -2.85 ± 0.01 |

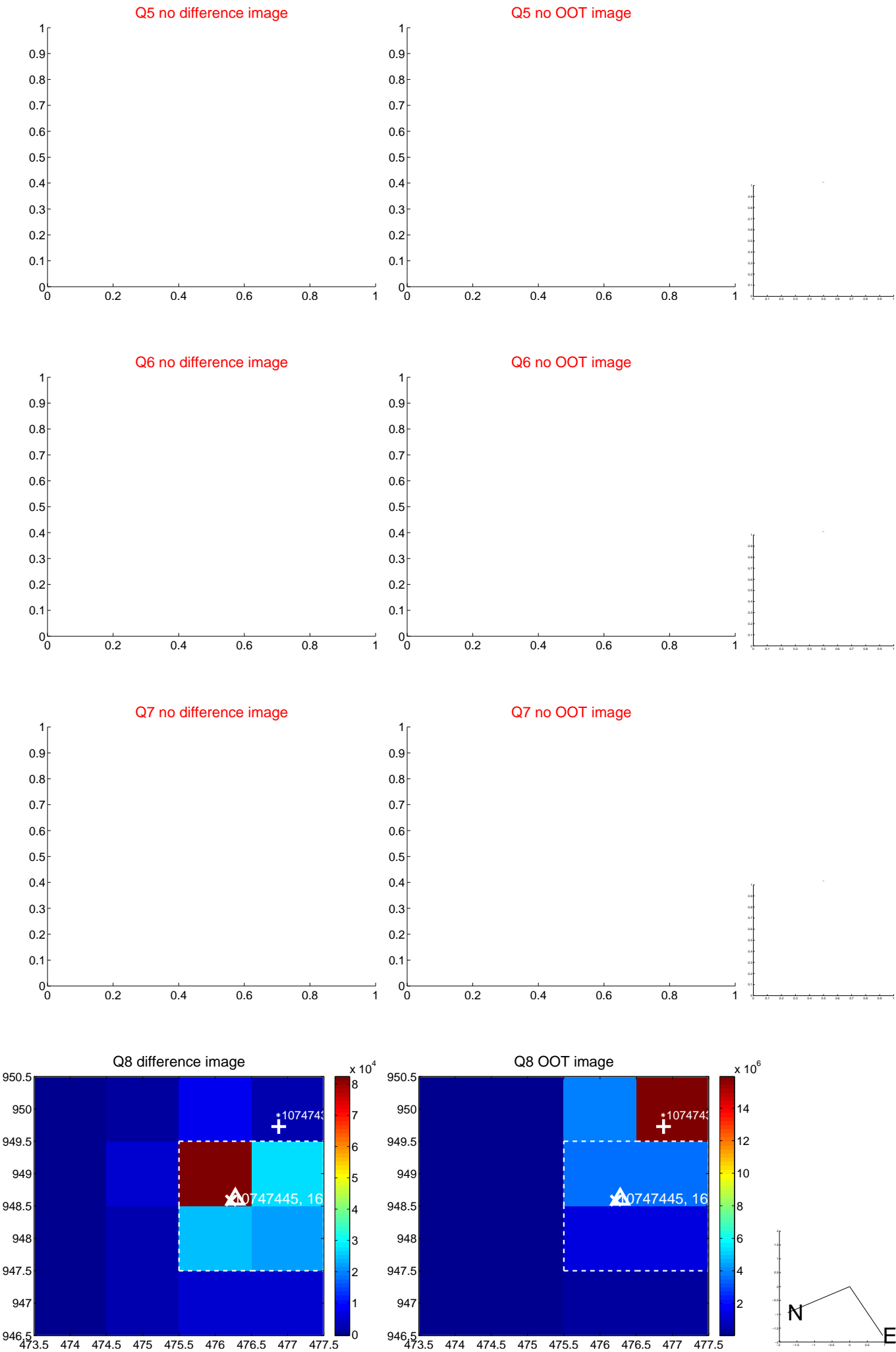


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

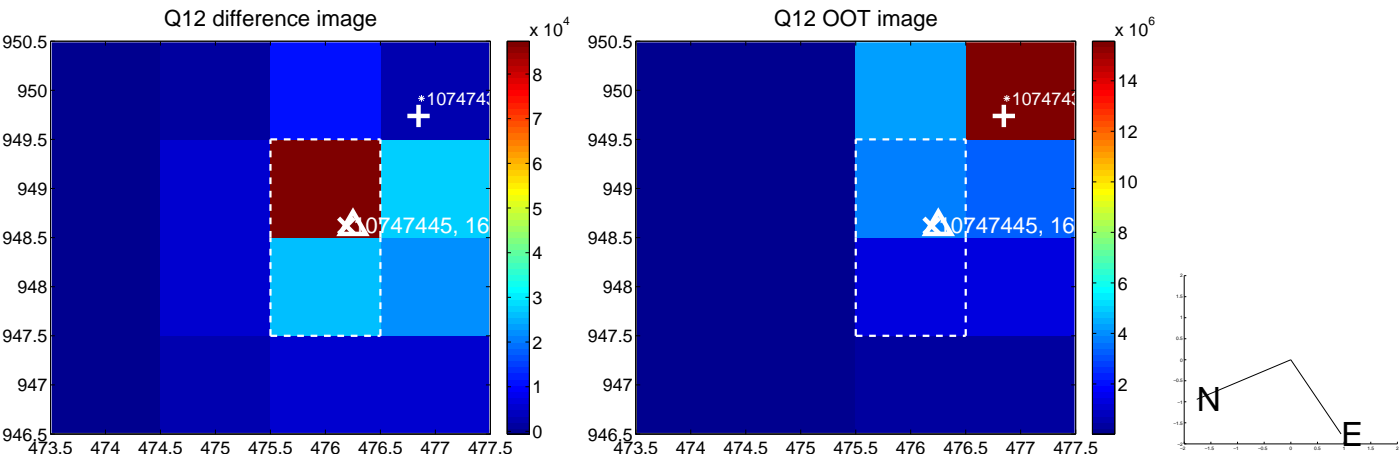
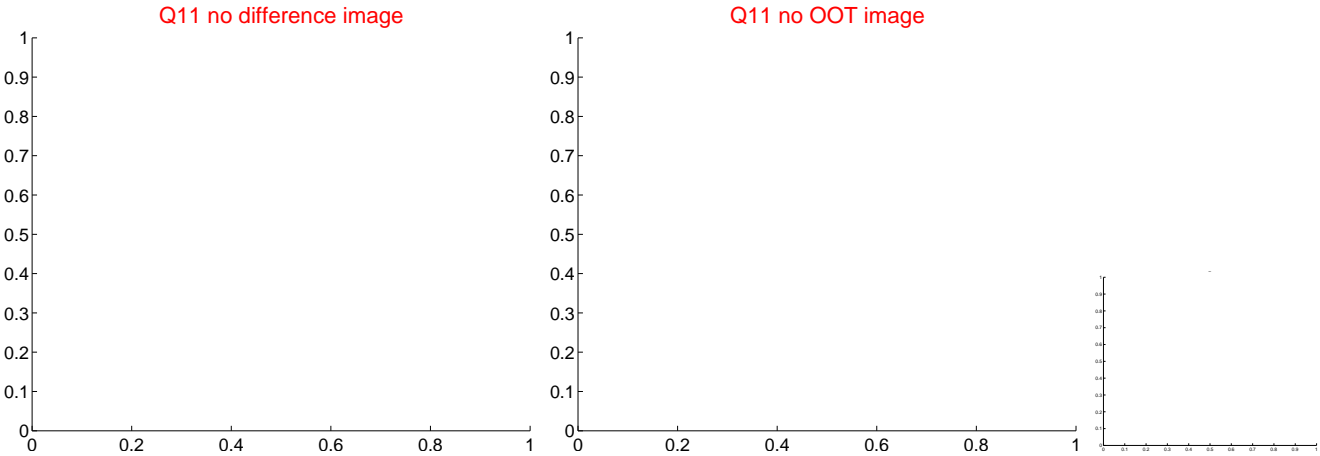
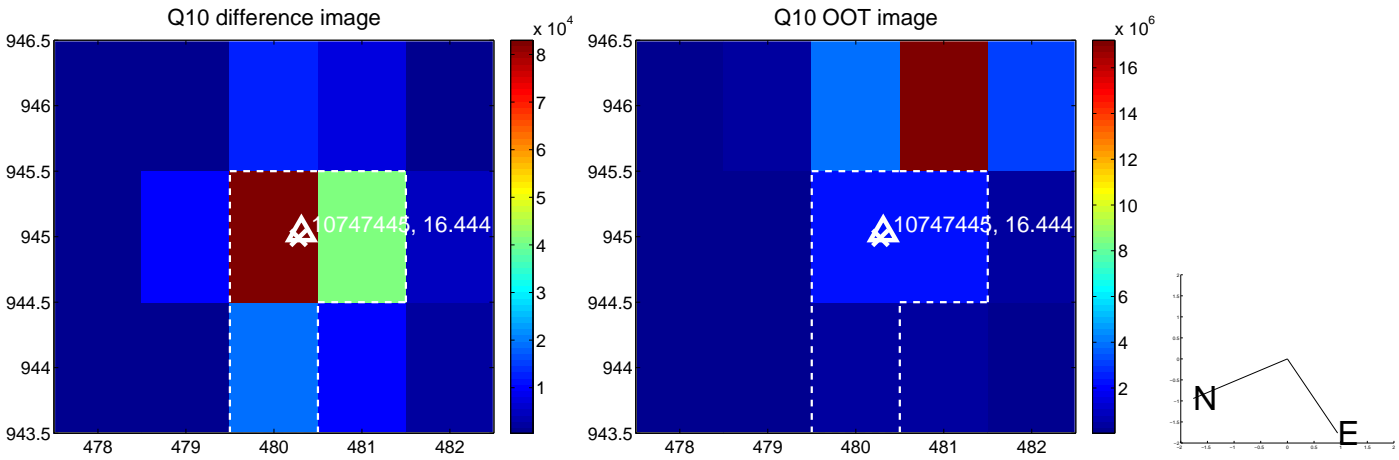
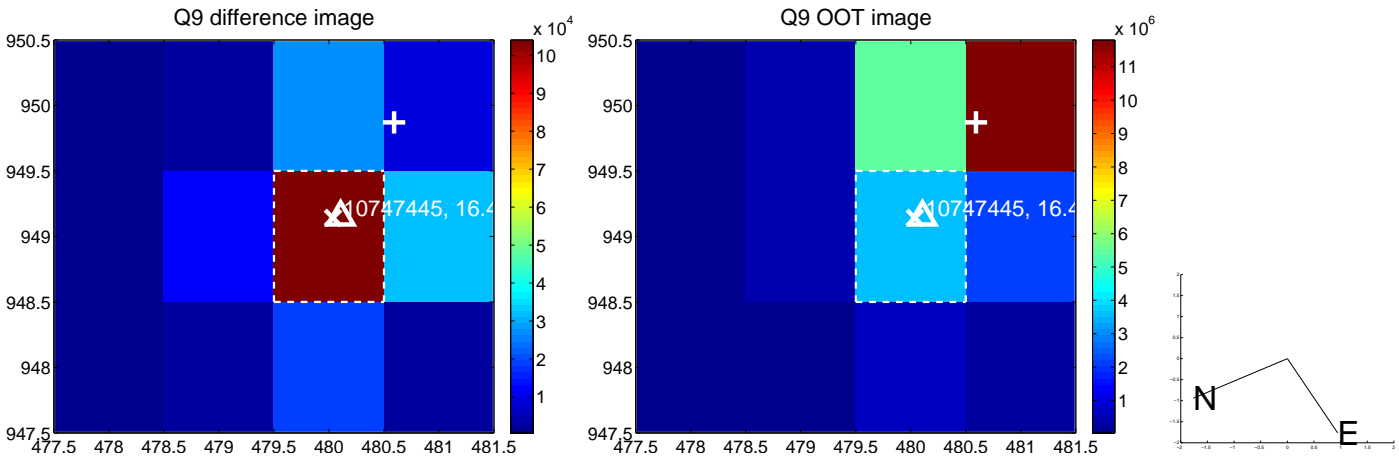
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



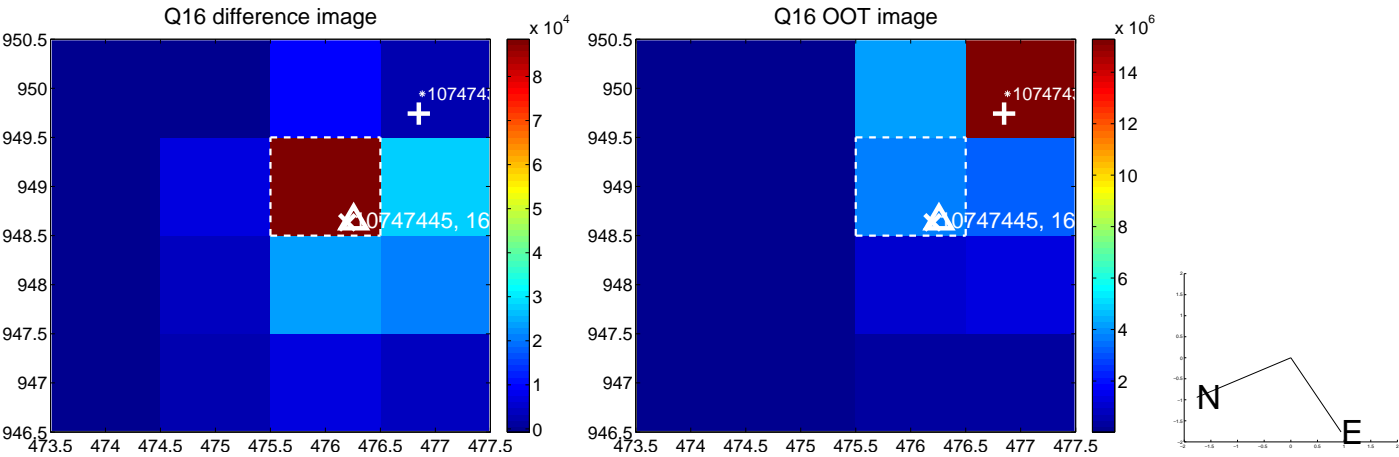
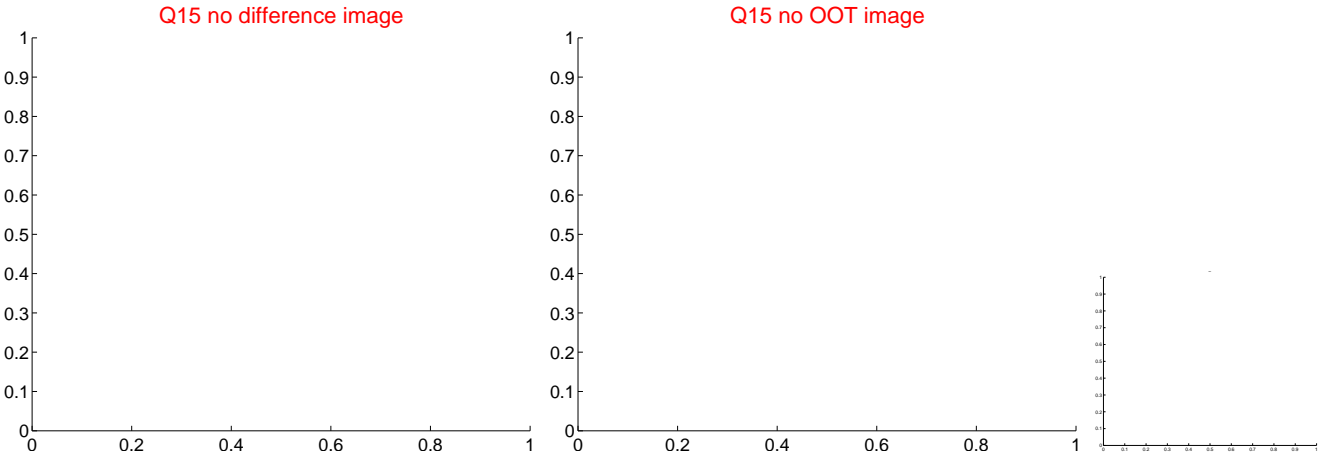
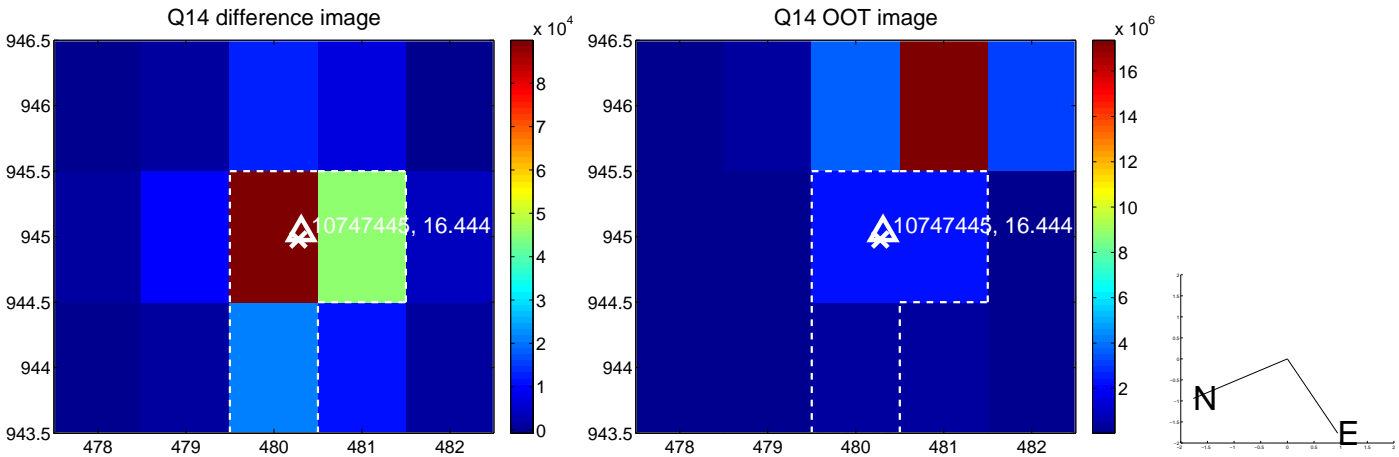
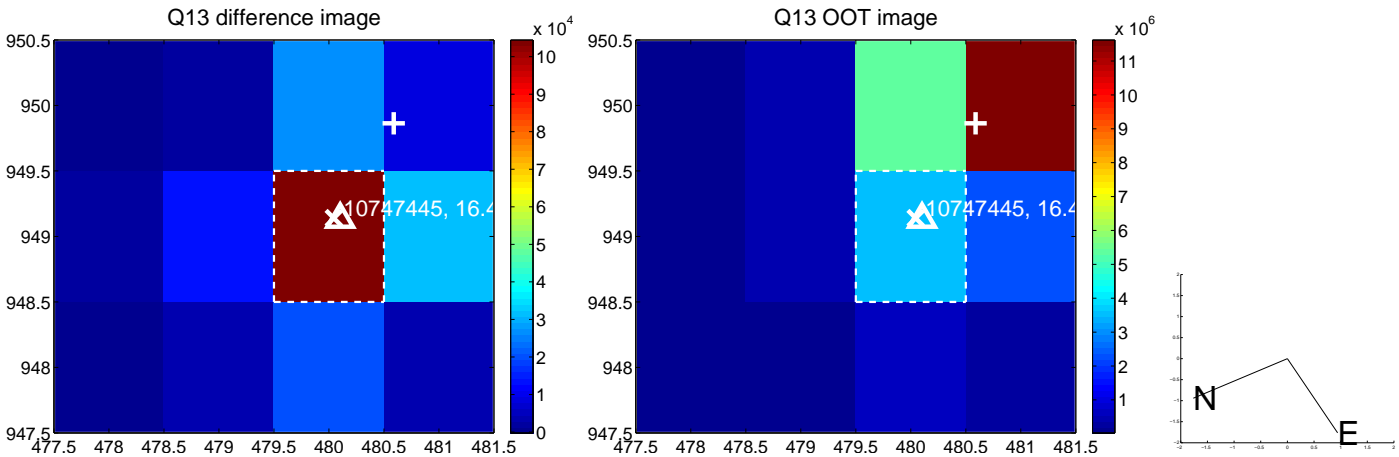
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



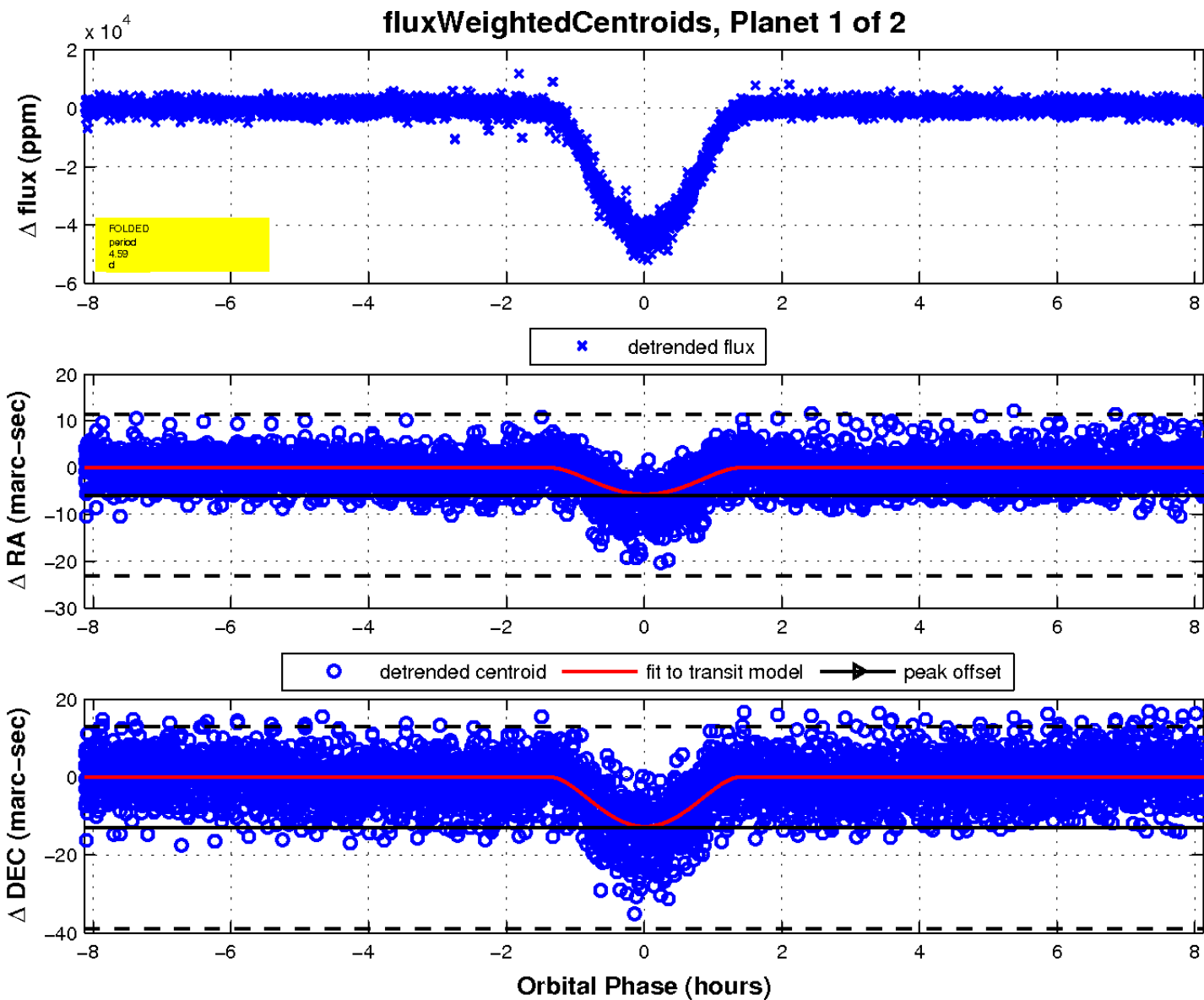
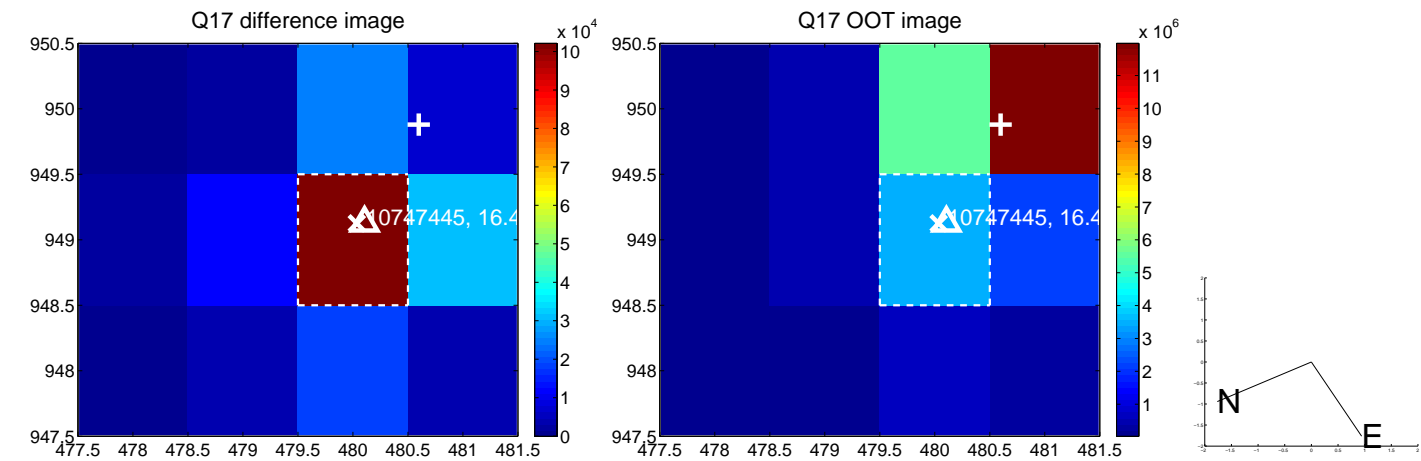
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

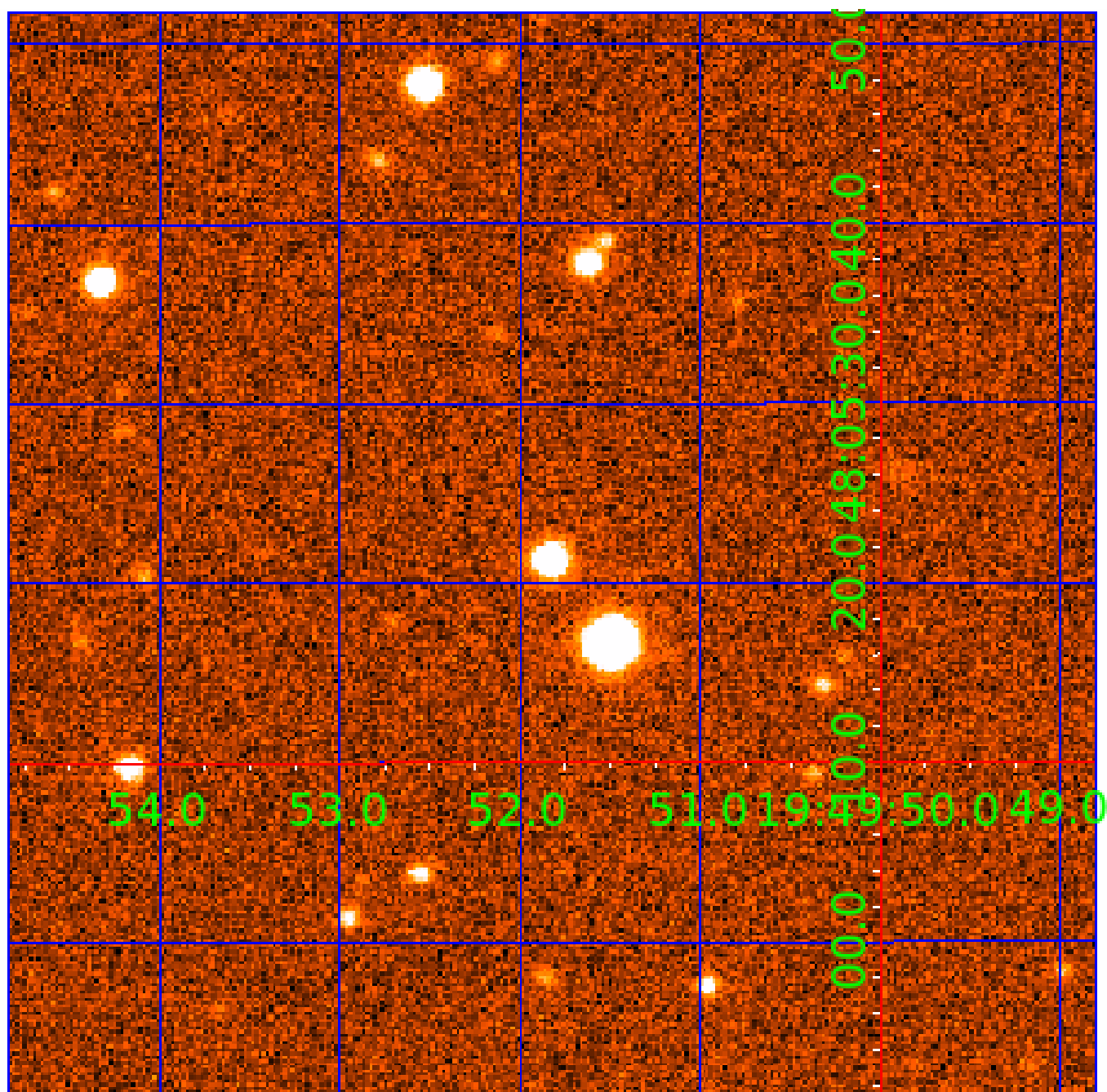


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010747445

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 010747445-01 | OBS | 2673.01 | 4.593590 | 134.890898 | 44778.8 | 2.709 | 524.0 | 439.3 | 0.88 | 5717 | 26.13 | 258.42 |
| 010747445-02 | OBS | No | 4.593601 | 132.599381 | 1627.2 | 2.339 | 18.1 | 19.4 | 0.88 | 5717 | 4.60 | 258.42 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010747445-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS |
| 010747445-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_KIC_POS |

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.

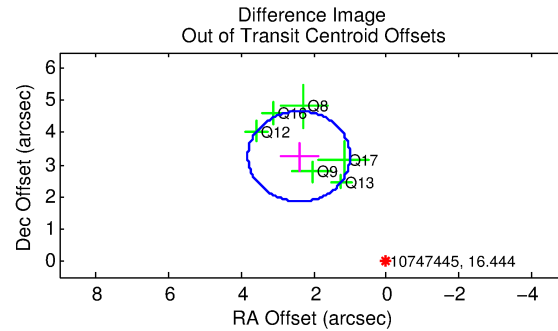
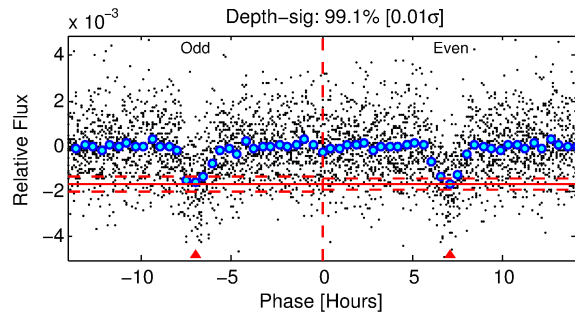
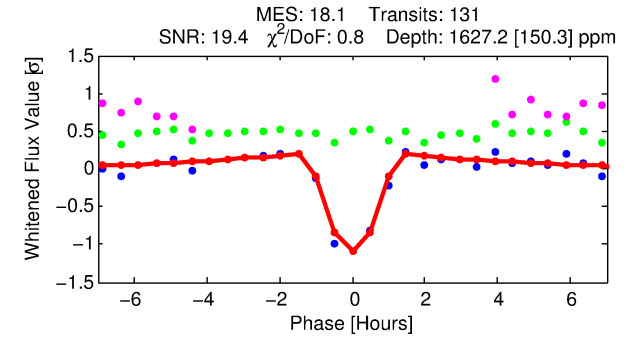
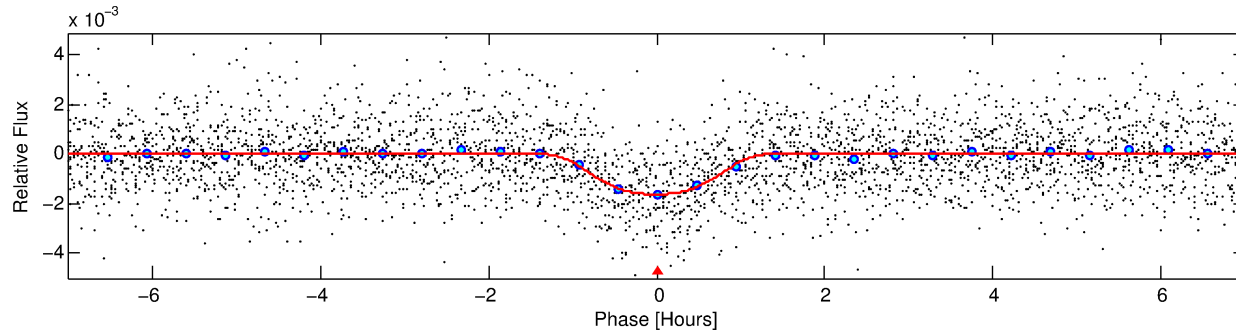
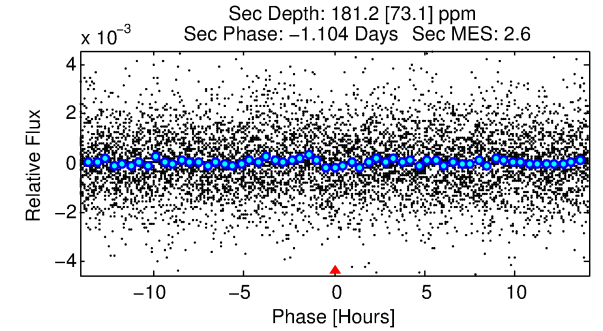
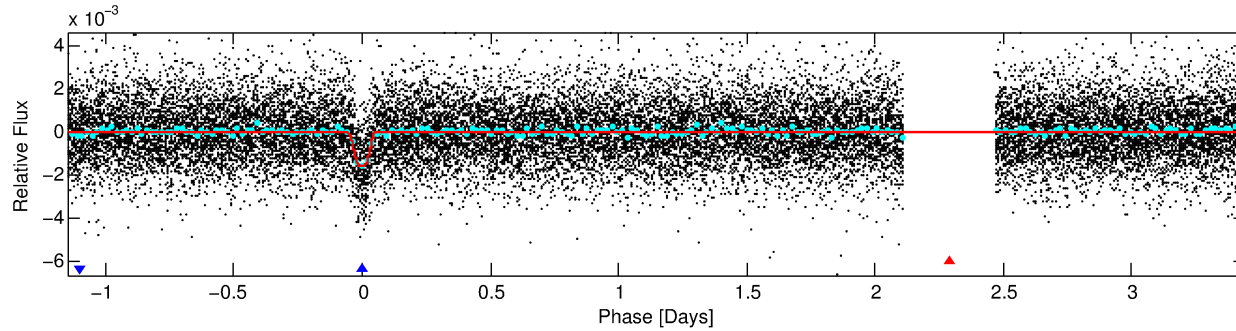
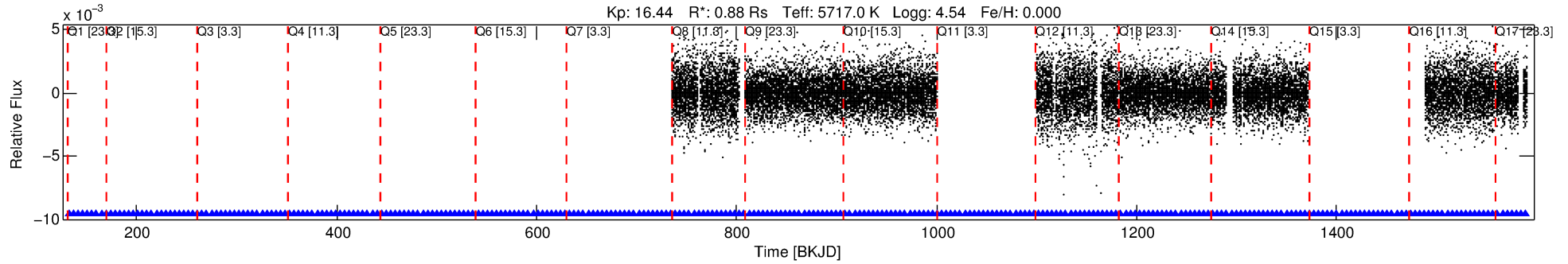
Ephemeris Match Information For 010747445-02

No Significant Match Found

DV One-Page Summary

KIC: 10747445 Candidate: 2 of 2 Period: 4.594 d

KOI: K02673 Corr: No Ephemeris Match



DV Fit Results:

Period = 4.59360 [0.00002] d
Epoch = 132.5994 [0.0031] BKJD
Rp/R* = 0.0477 [0.0038]
a/R* = 6.69 [0.96]
b = 0.95 [0.02]
Seff = 258.42 [101.28]
Teq = 1022 [100] K
Rp = 4.60 [1.39] Re
a = 0.0538 [0.0134] AU
Ag = 13.64 [7.77] [1.63σ]
Teffp = 3038 [345] K [5.61σ]

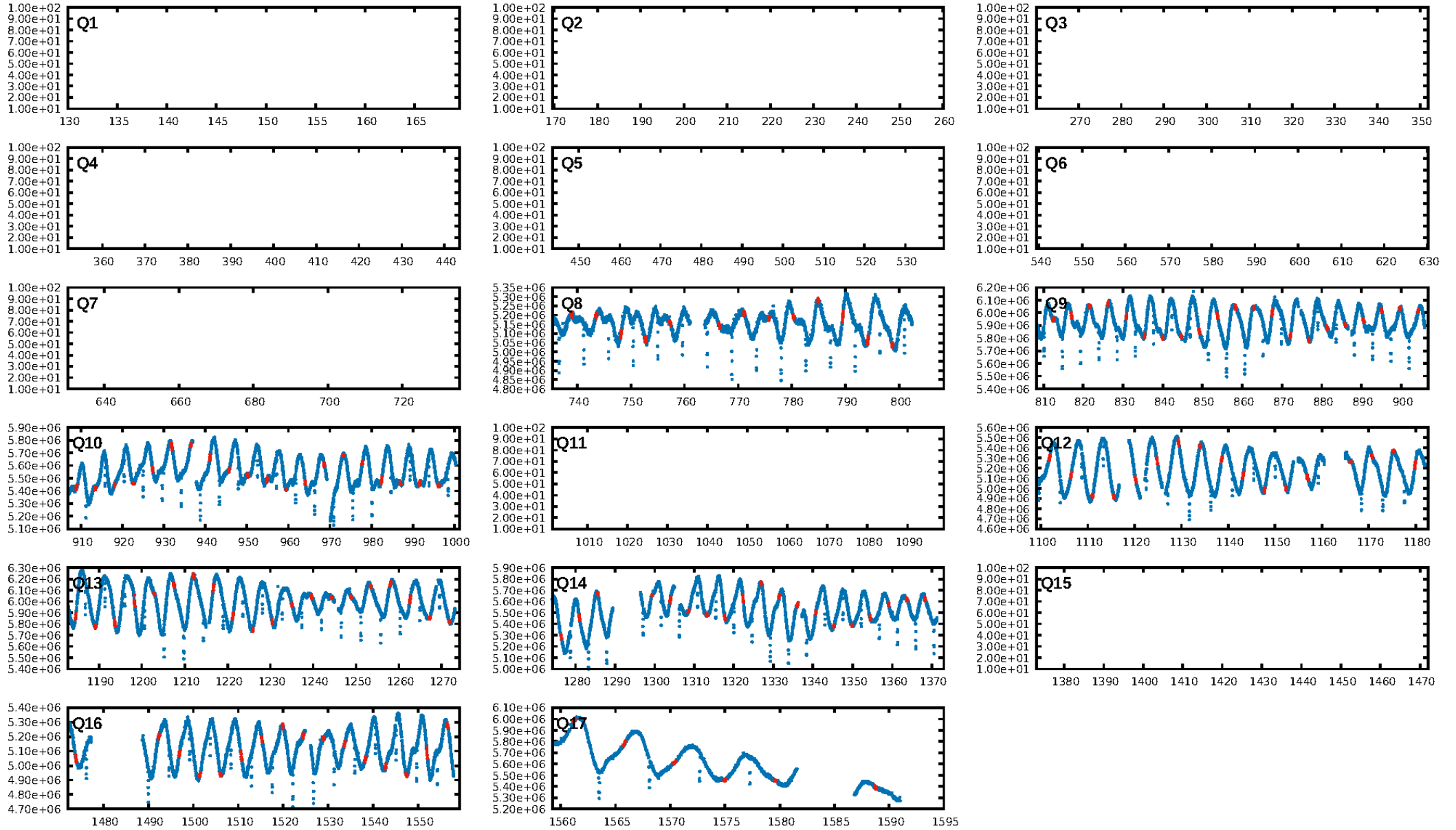
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 96.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.34e-68
RollingBand-fgt: 1.00 [125/125]
GhostDiagnostic-chr: -2.755
Centroid-sig: 0.0%
Centroid-so: 4.252 arcsec [20.32σ]
OotOffset-rm: 4.049 arcsec [8.64σ]
KicOffset-rm: 0.365 arcsec [2.21σ]
OotOffset-st: 0/0/3/3 [6]
KicOffset-st: 2/0/3/3 [8]
DiffImageQuality-fgm: 1.00 [8/8]
DiffImageOverlap-fno: 1.00 [8/8]

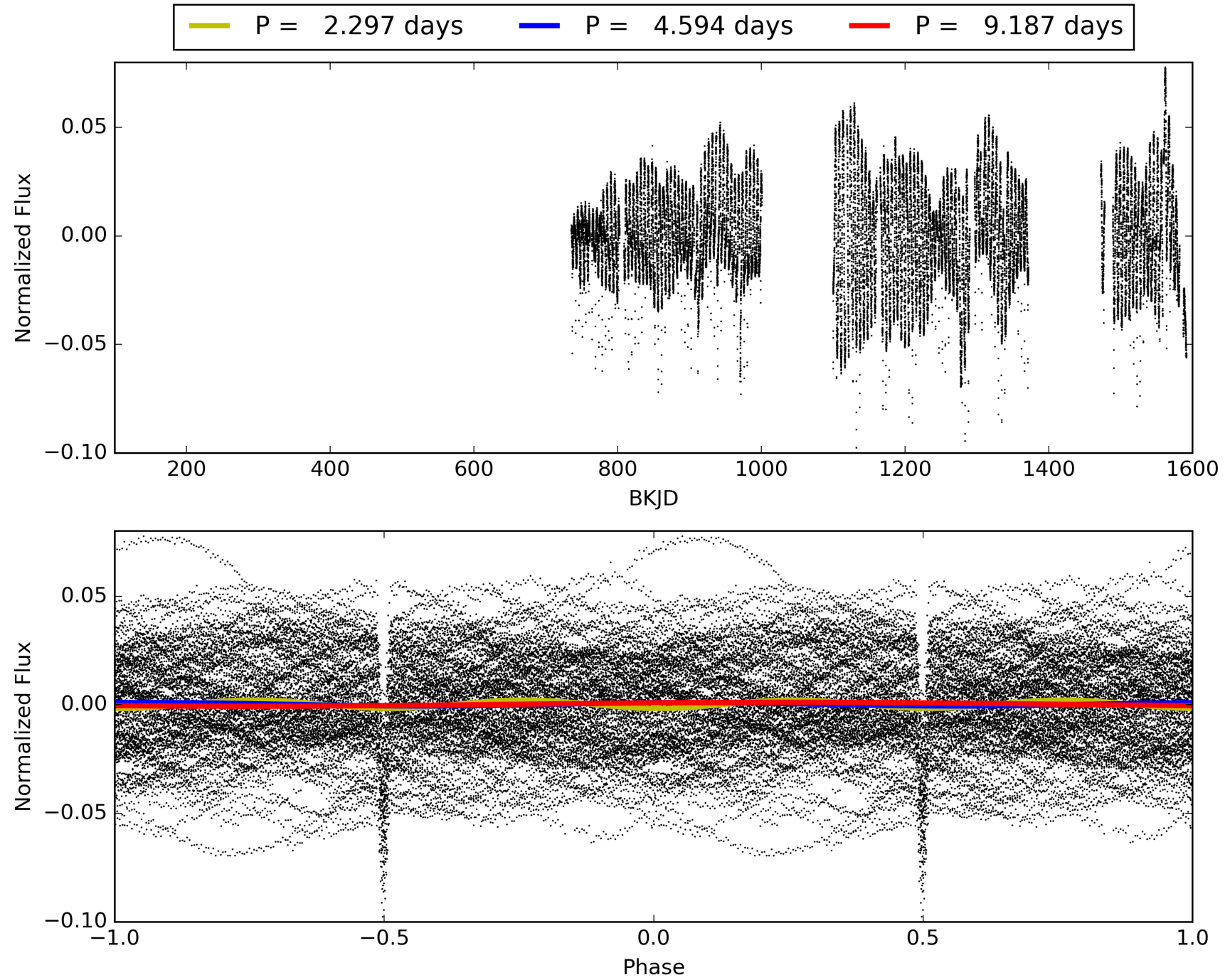
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:37:32 Z

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

TCE 010747445-02, PDC Light Curves

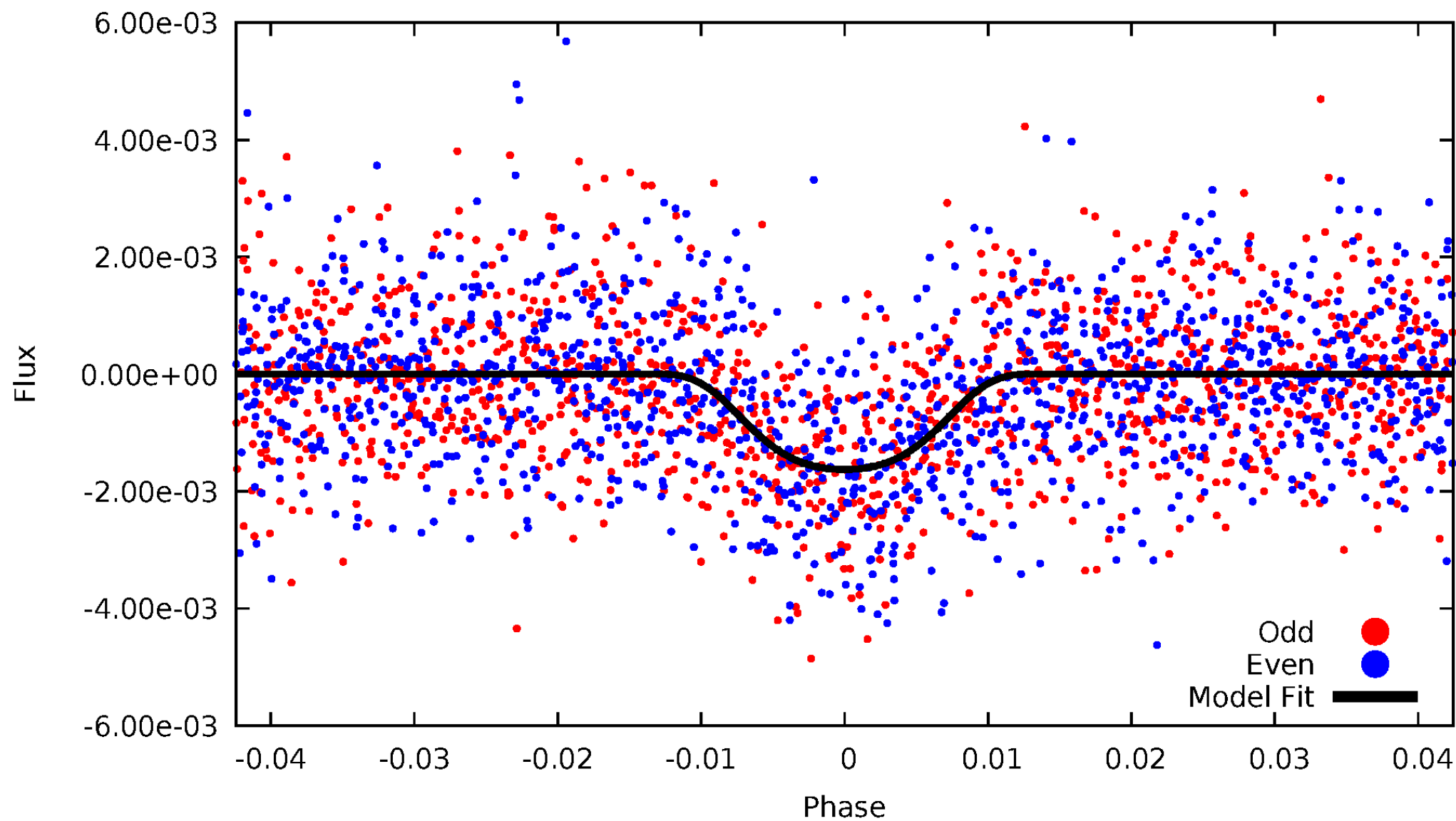


TCE 010747445-02



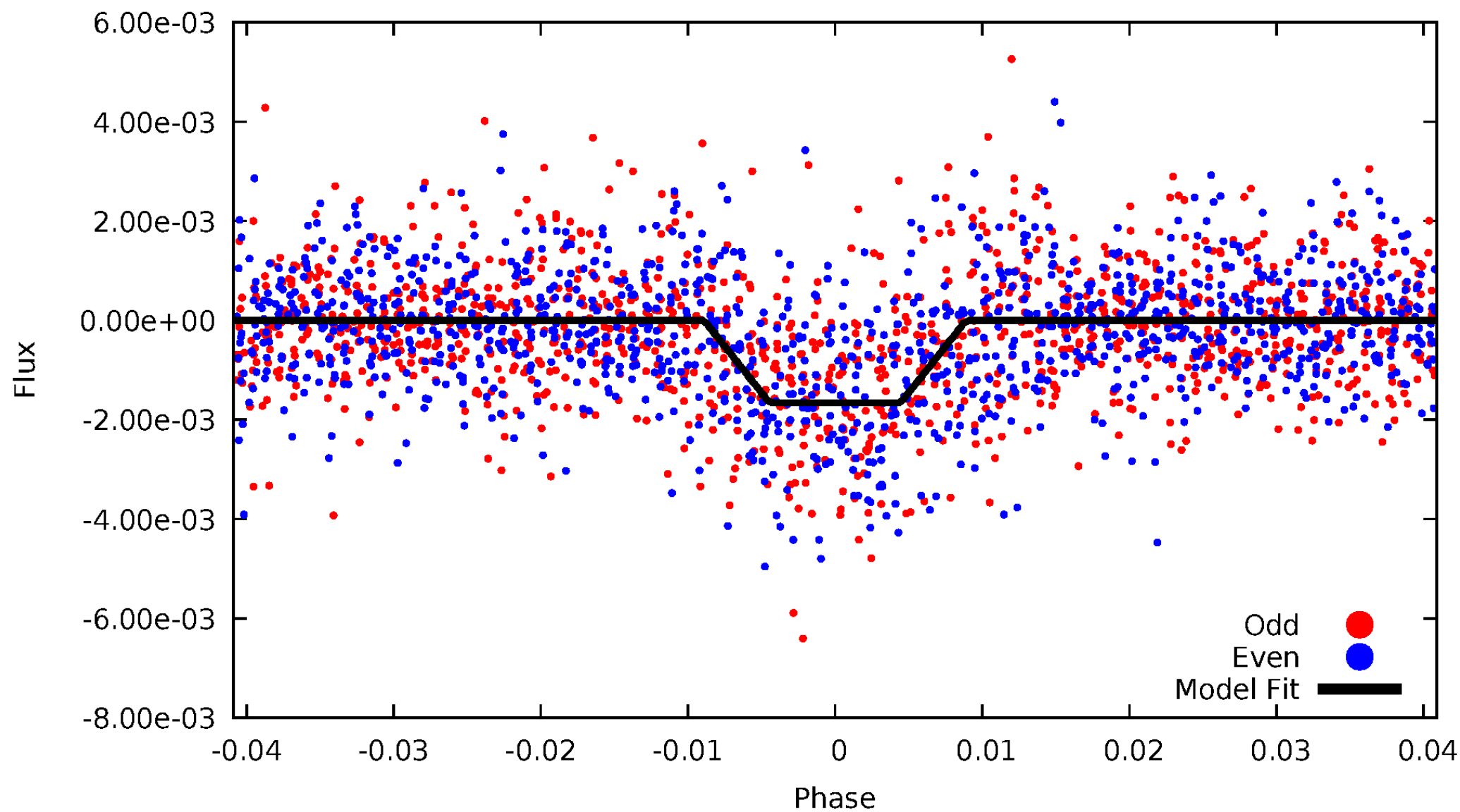
DV Odd/Even

TCE 010747445-02



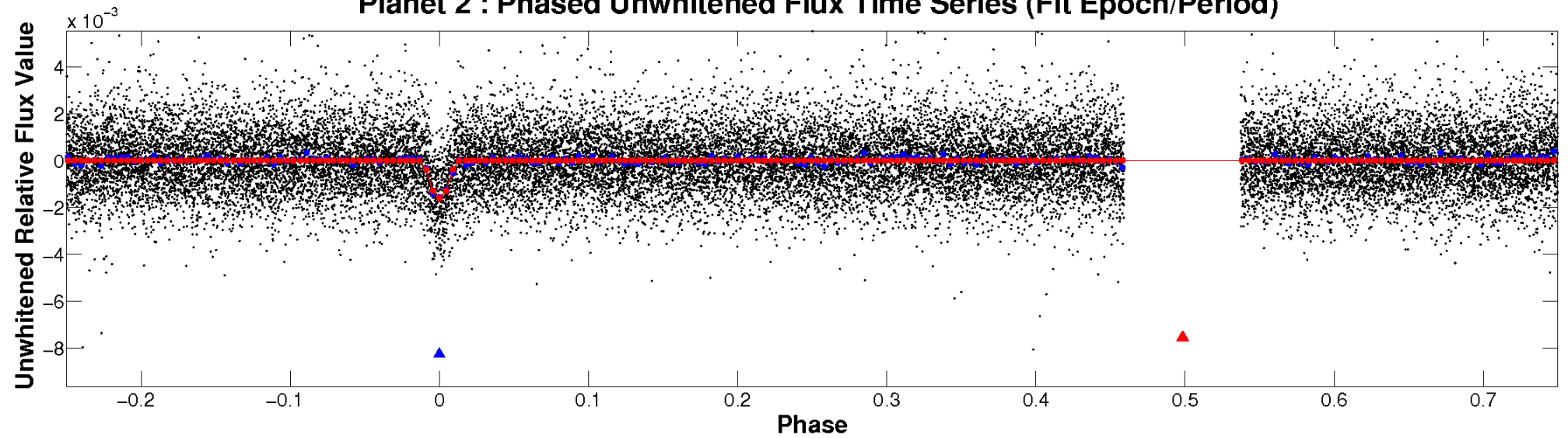
ALT Odd/Even

TCE 010747445-02

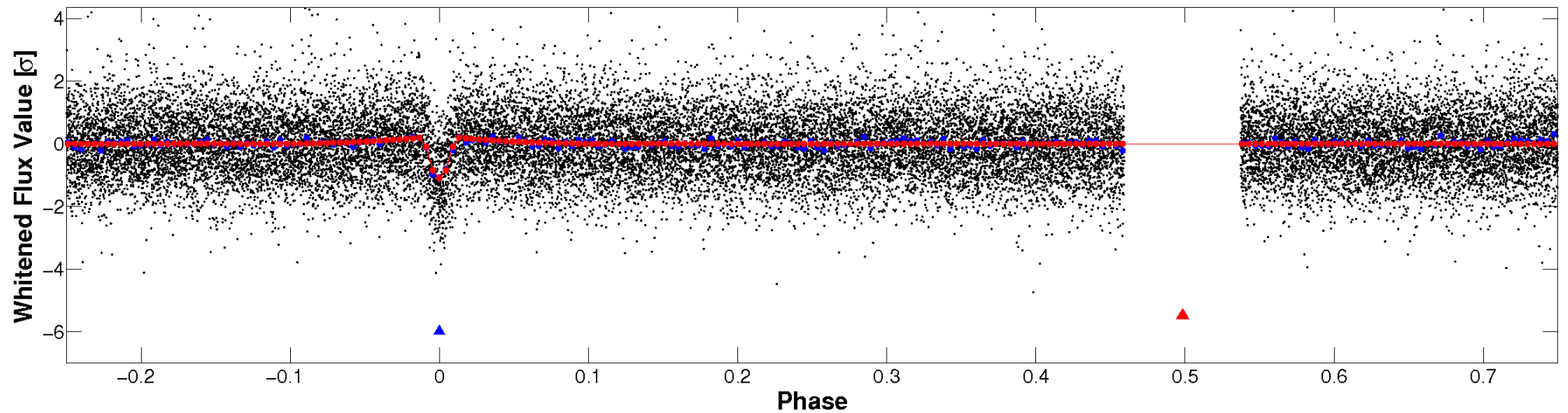


Non-Whitened Vs. Whitened Light Curve

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

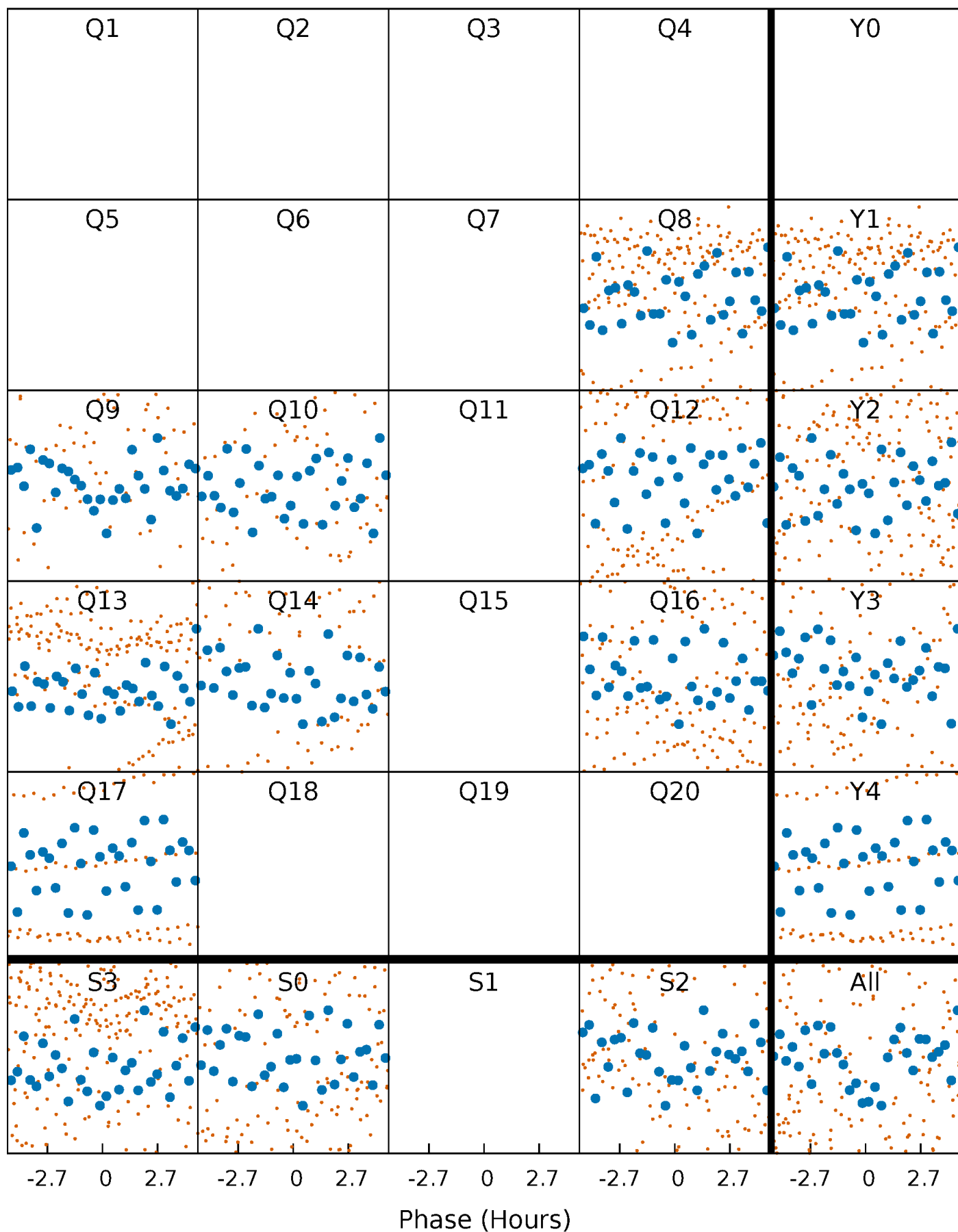


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



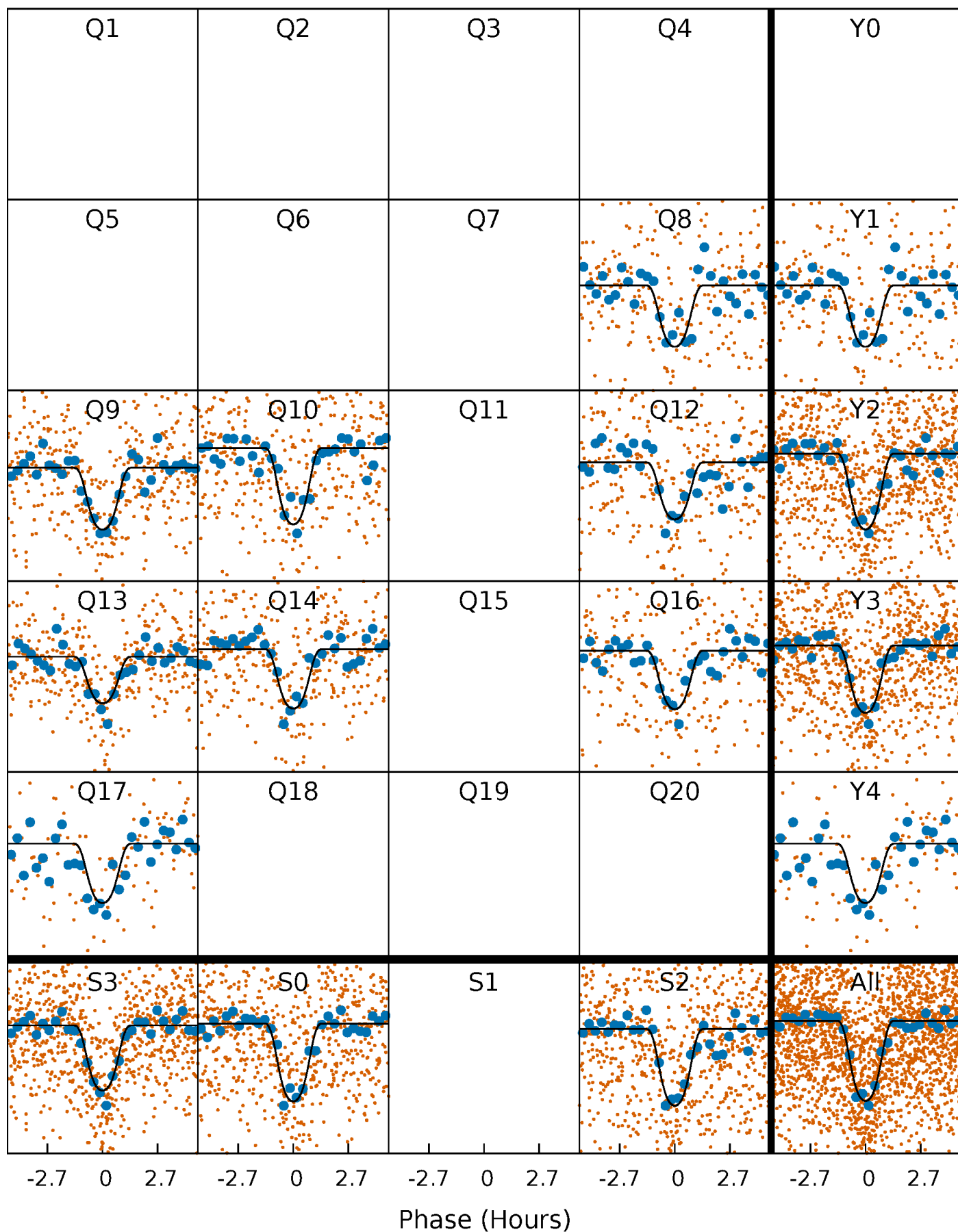
PDC Quarter-Phased Transit Curves

TCE 010747445-02 P= 4.593601 Days $T_0=132.599381$ (BKJD)



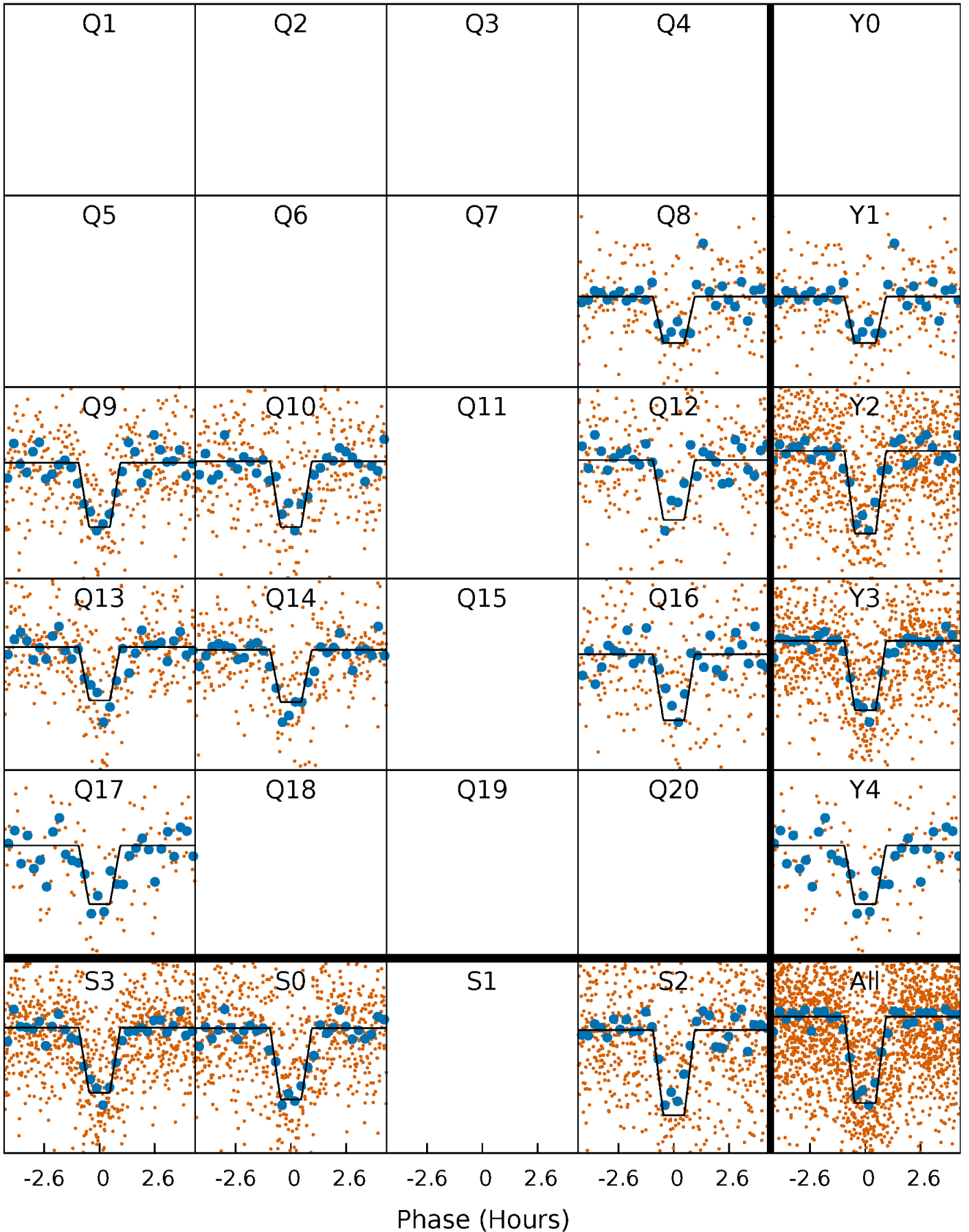
DV Quarter-Phased Transit Curves

TCE 010747445-02 P= 4.593601 Days $T_0=132.599381$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

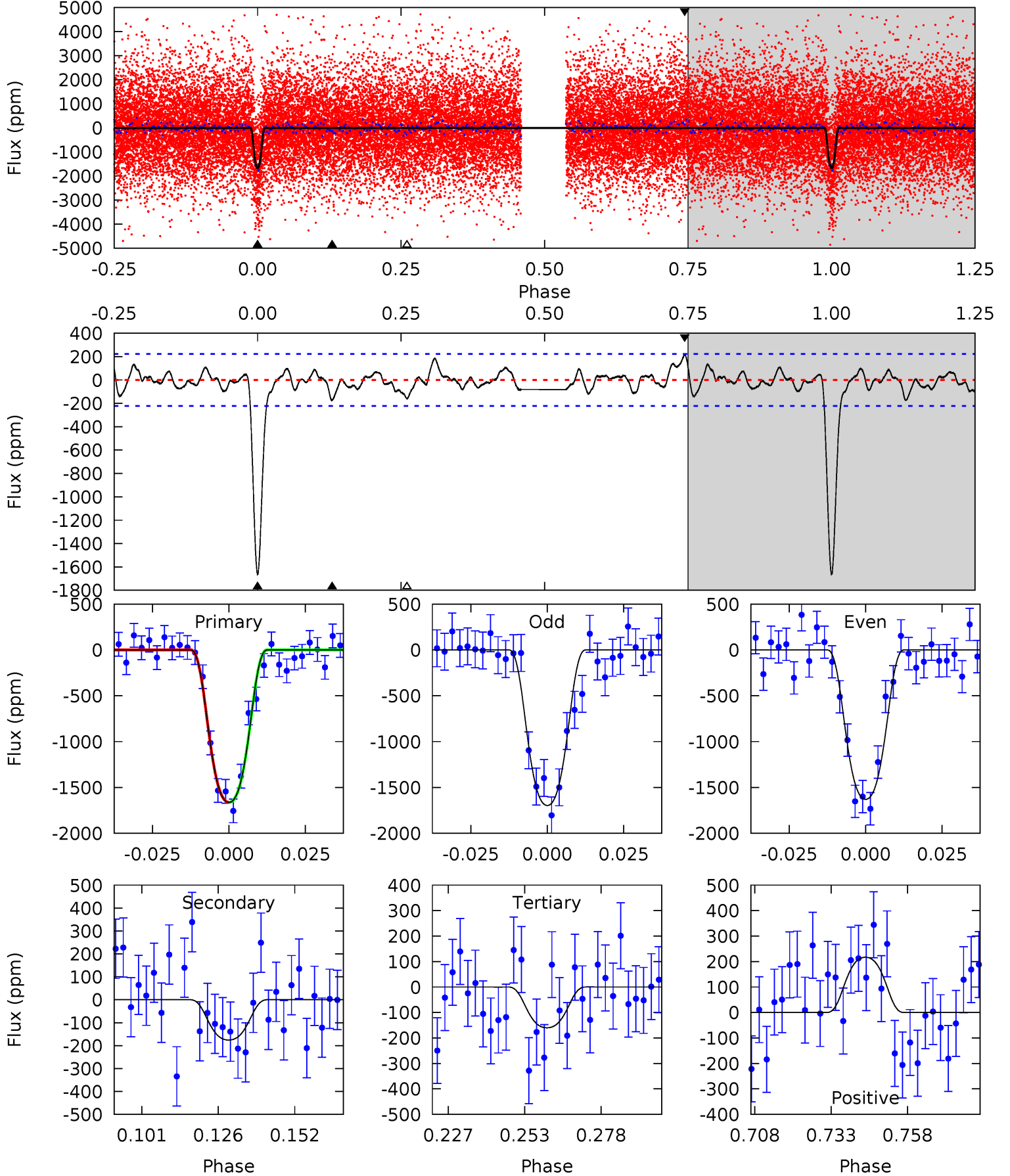
TCE 010747445-02 P= 4.593562 Days $T_0=132.607234$ (BKJD)



DV Model-Shift Uniqueness Test

010747445-02, P = 4.593601 Days, E = 132.599381 Days

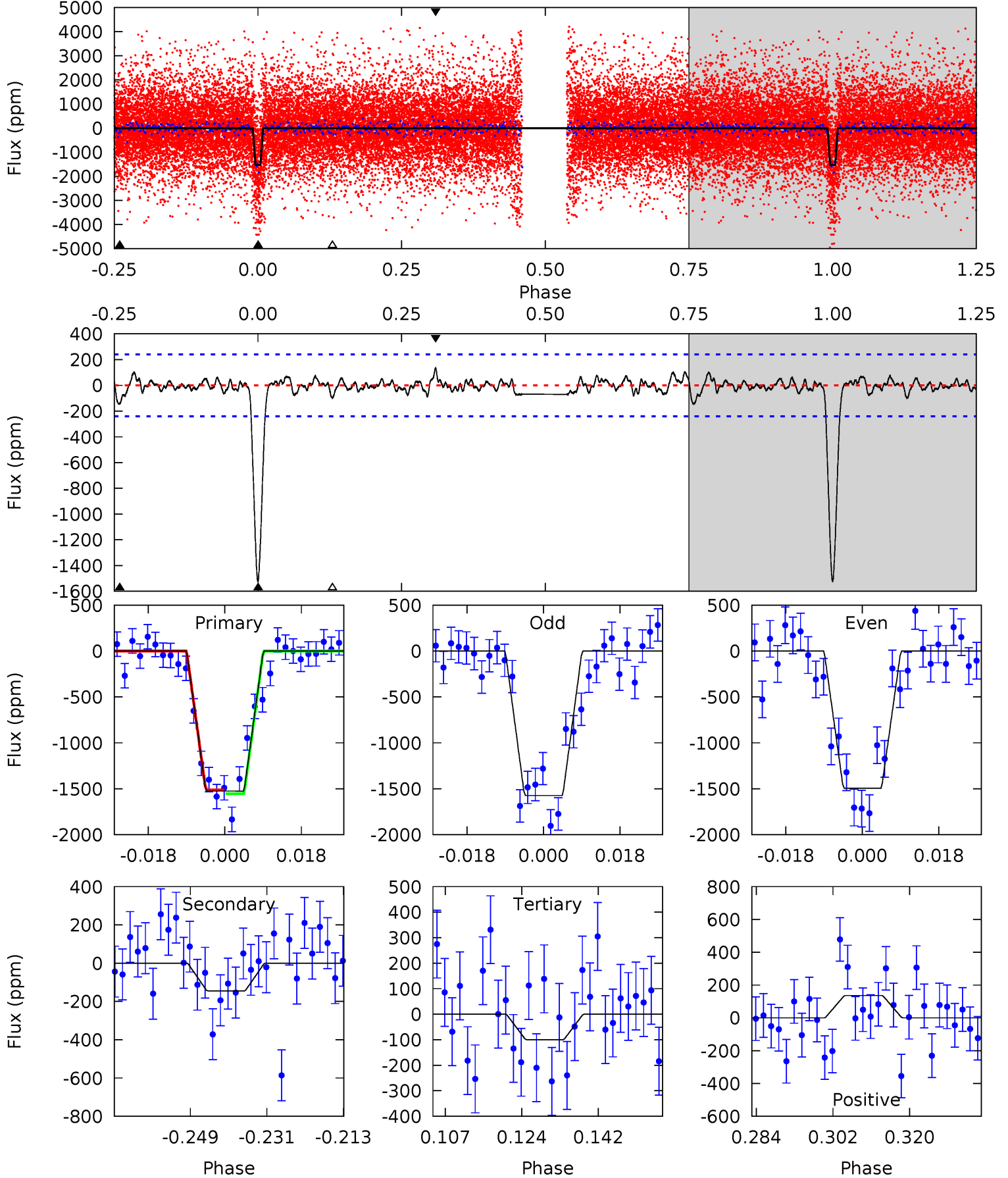
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 36.2 | 3.82 | 3.48 | 4.72 | 4.85 | 2.24 | 1.42 | 32.7 | 31.5 | 0.34 | -0.90 | 0.73 | 0.96 | 0.12 | 0.01 |



Alt Model-Shift Uniqueness Test

010747445-02, P = 4.593562 Days, E = 132.607234 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 31.1 | 2.96 | 2.04 | 2.79 | 4.91 | 2.37 | 0.76 | 29.1 | 28.4 | 0.92 | 0.17 | 0.82 | 1.04 | 0.08 | 0.45 |



Stellar Parameters For KIC 010747445

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5717^{+173}_{-190} | $4.538^{+0.036}_{-0.204}$ | $0.000^{+0.250}_{-0.300}$ | $0.884^{+0.258}_{-0.086}$ | $0.984^{+0.102}_{-0.125}$ | $2.006^{+0.415}_{-1.070}$ |
| | +3%/-3% | +1%/-4% | +inf%/-inf% | +29%/-10% | +10%/-13% | +21%/-53% |
| Source | KIC0 | 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 010747445-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|---------------------|----------------------|----------------|
| DV | -176 ± 46 | $4.83^{+0.76}_{-0.59}$ | 1466^{+107}_{-69} | 3473^{+182}_{-202} | 11^{+5}_{-4} |
| Alt. | -145 ± 49 | $4.09^{+0.73}_{-0.48}$ | 1464^{+101}_{-69} | 3546^{+236}_{-246} | 13^{+6}_{-5} |

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 $A_{obs} \gg 1.0$

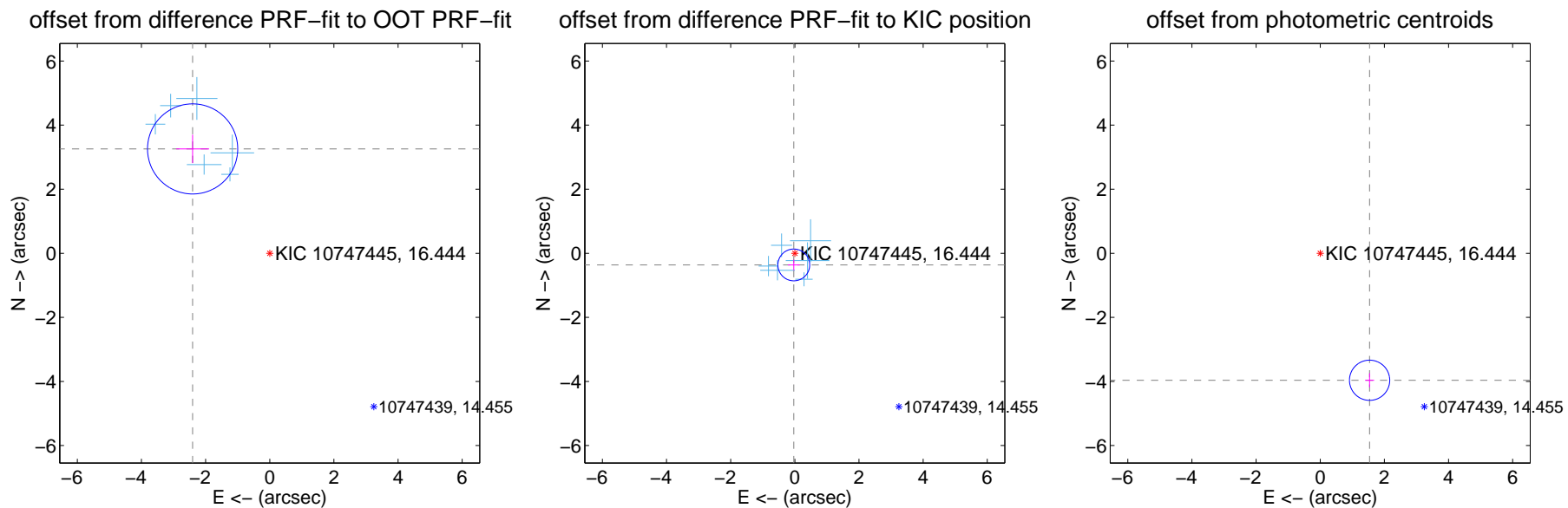
DV Centroid Data

Supplemental centroid analysis for 010747445-02. Kepler magnitude: 16.44. Transit SNR 19.39

There are 8 quarters with good PRF difference image offsets

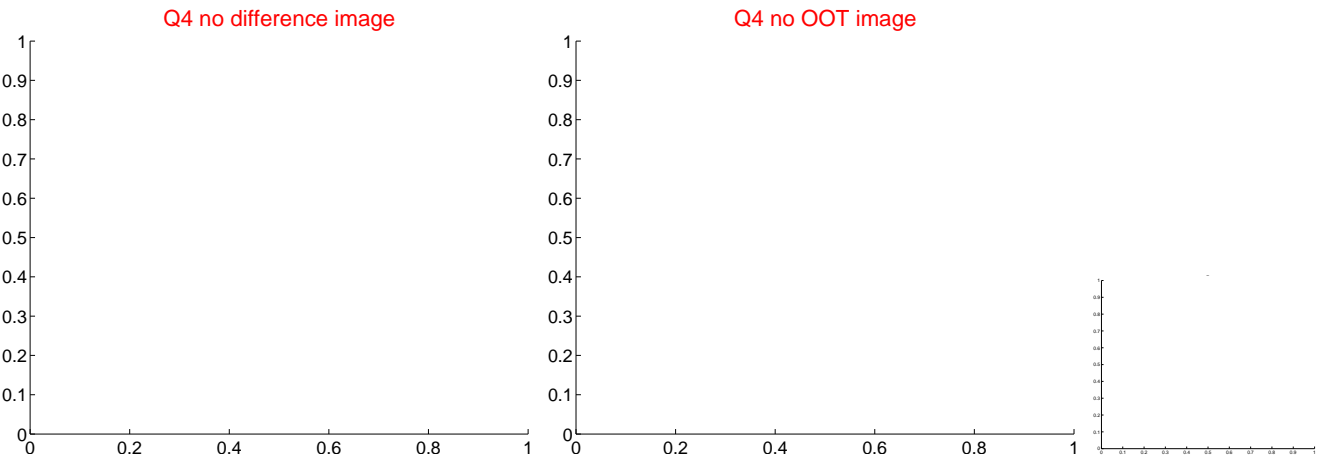
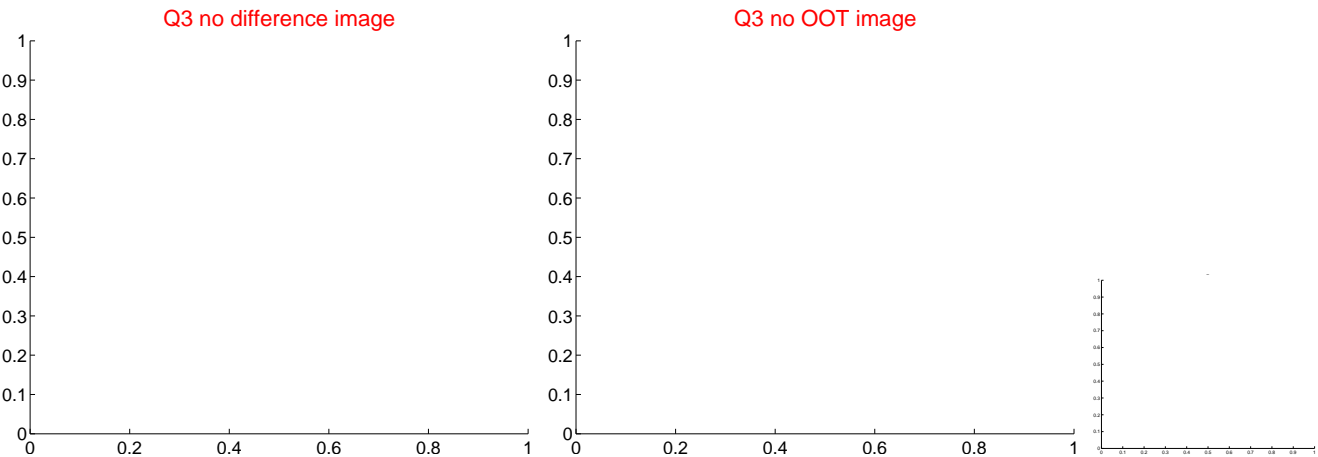
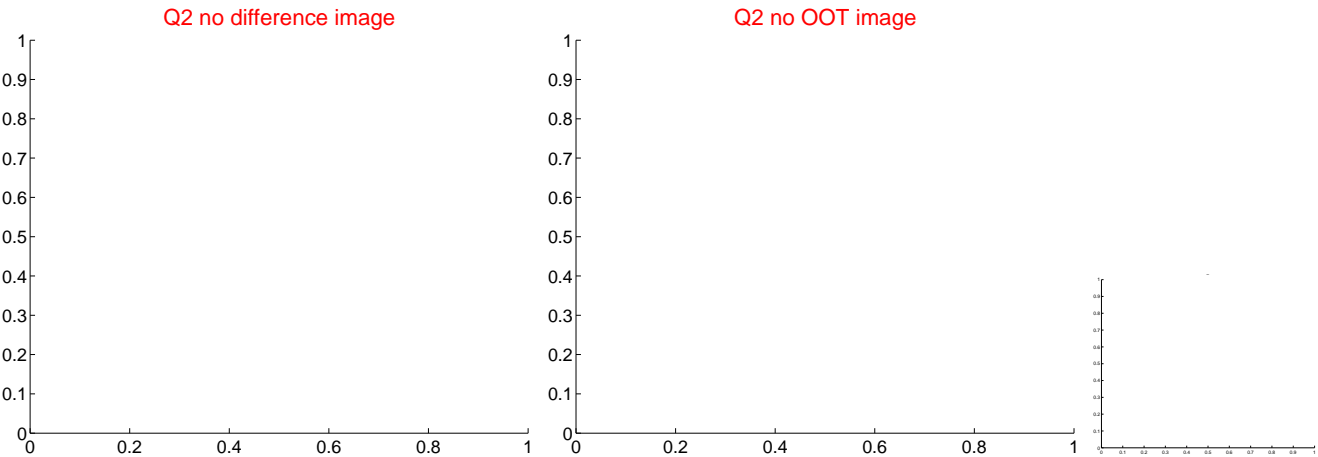
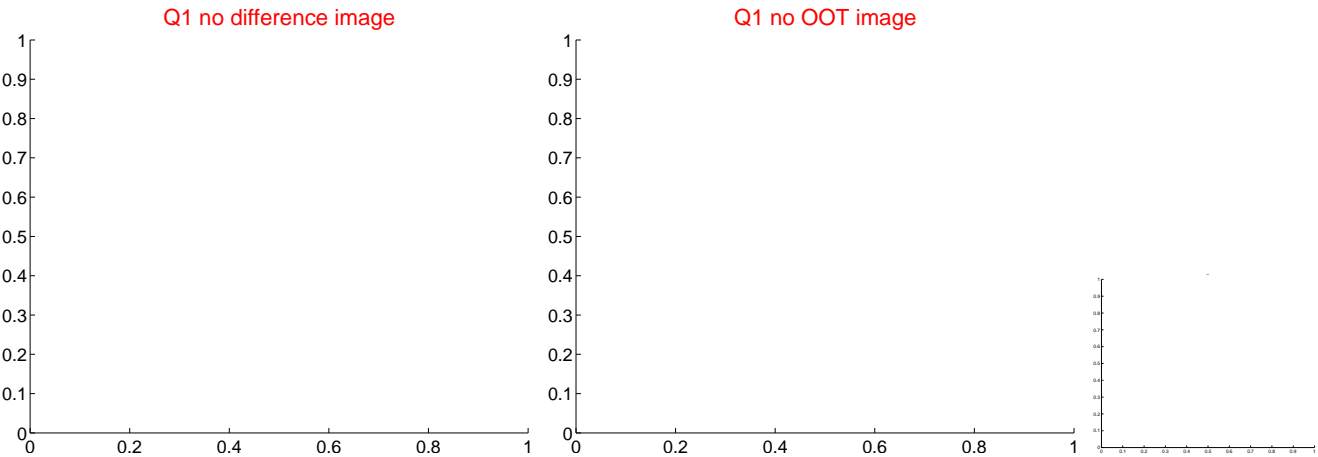
The OOT PRF centroid is offset from the target star catalog position by about 3.71 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 4.049 ± 0.469 | 8.64 | 2.405 ± 0.513 | 3.257 ± 0.443 |
| PRF-fit source offset from KIC position | 0.365 ± 0.165 | 2.21 | 0.033 ± 0.185 | -0.363 ± 0.165 |
| photometric centroid source offset | 4.25 ± 0.21 | 20.32 | -1.54 ± 0.14 | -3.96 ± 0.22 |

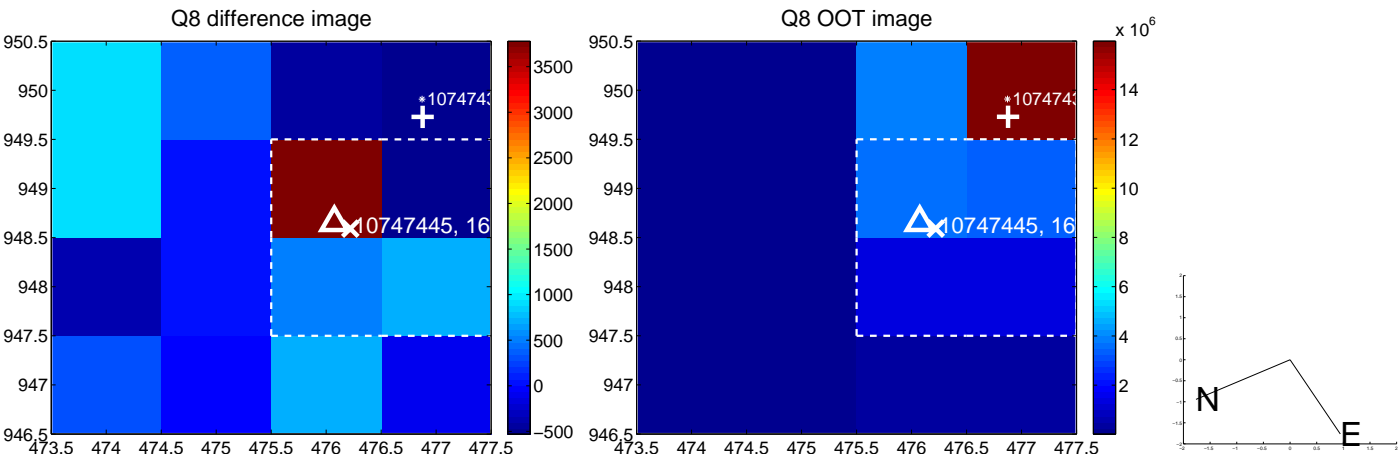
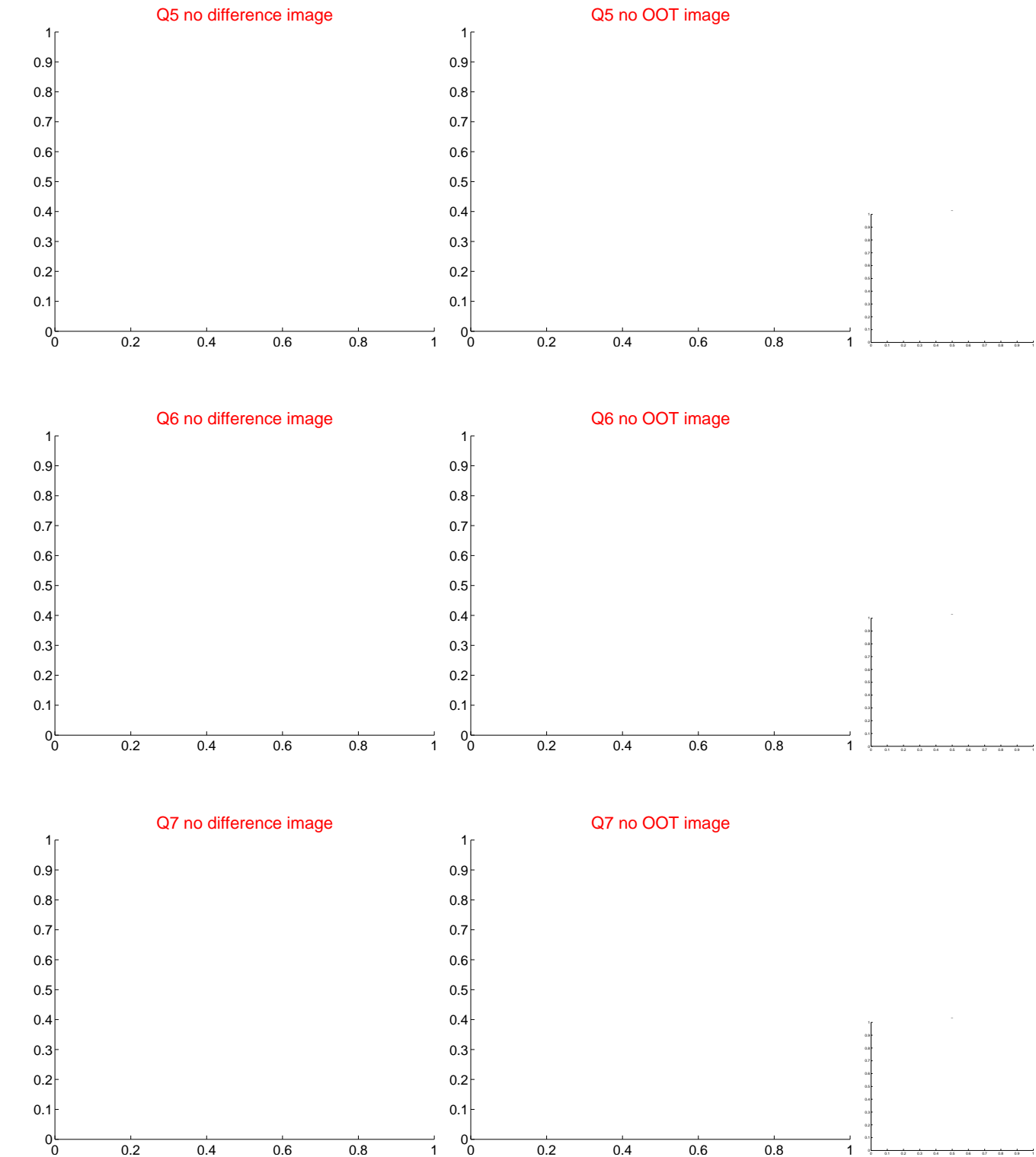


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

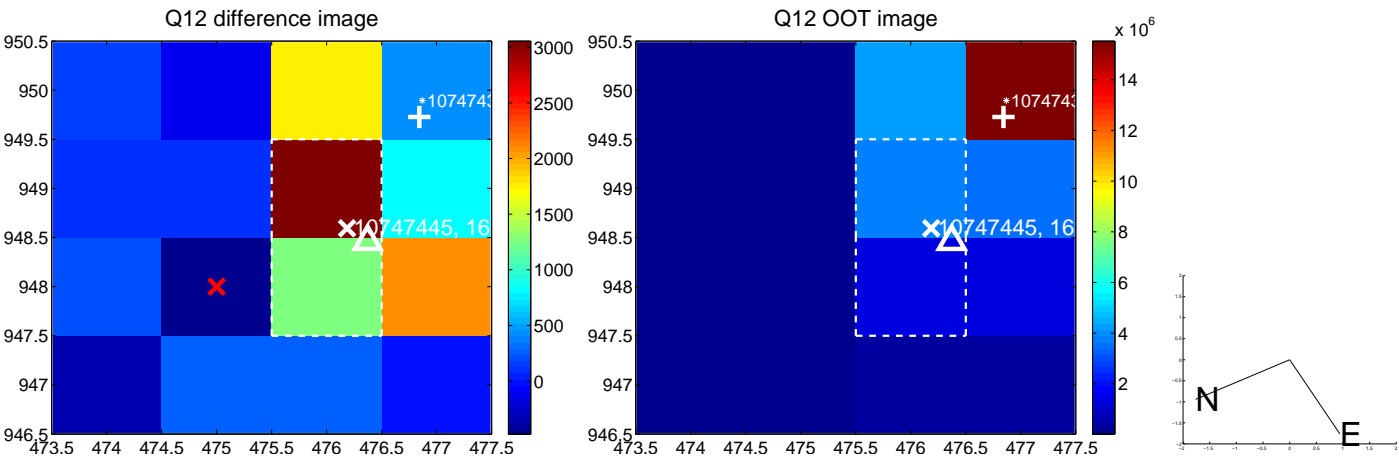
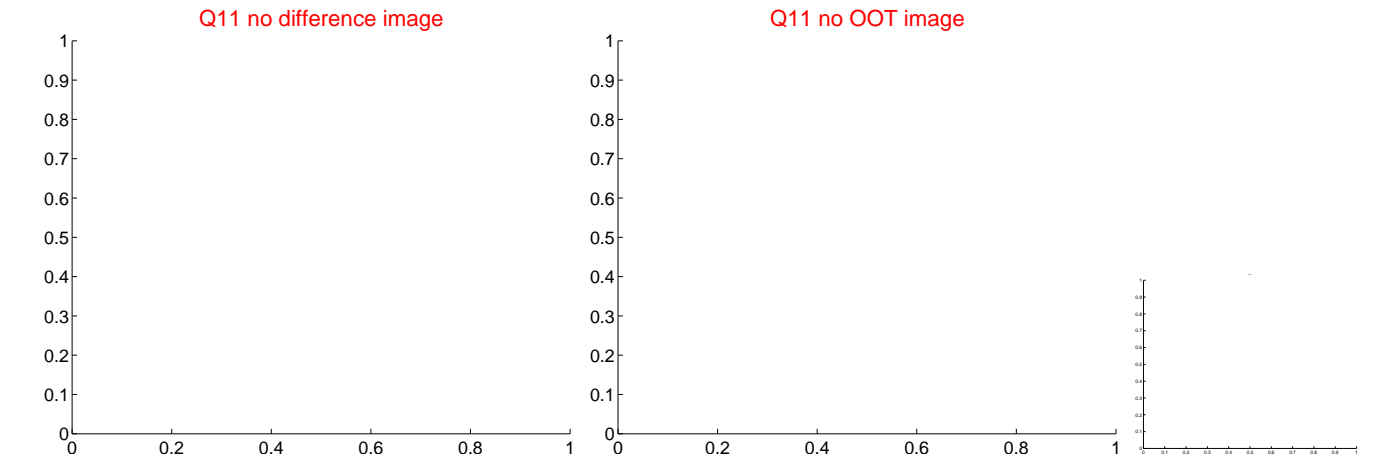
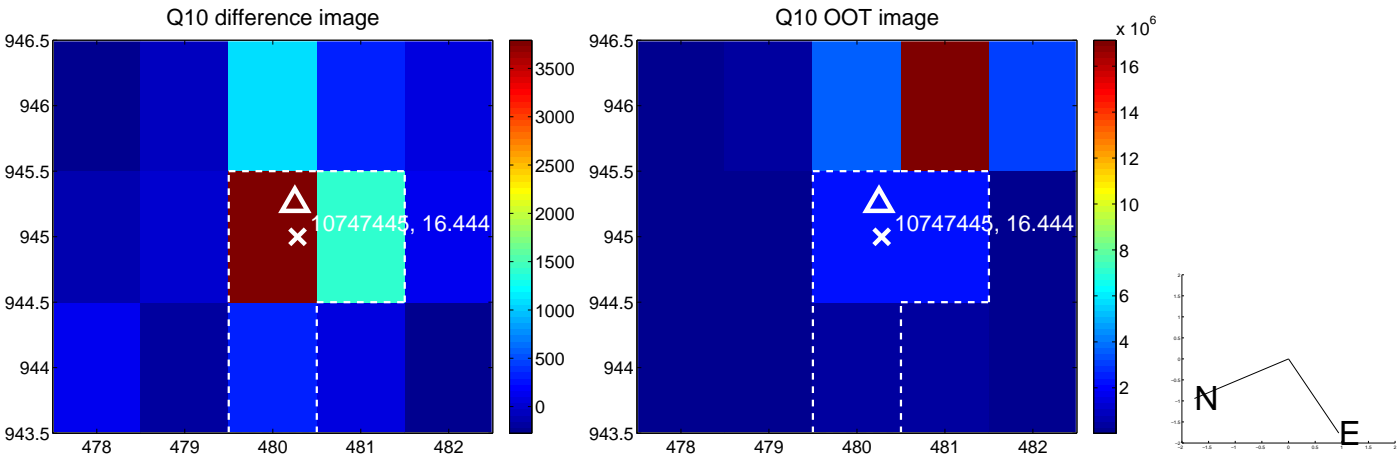
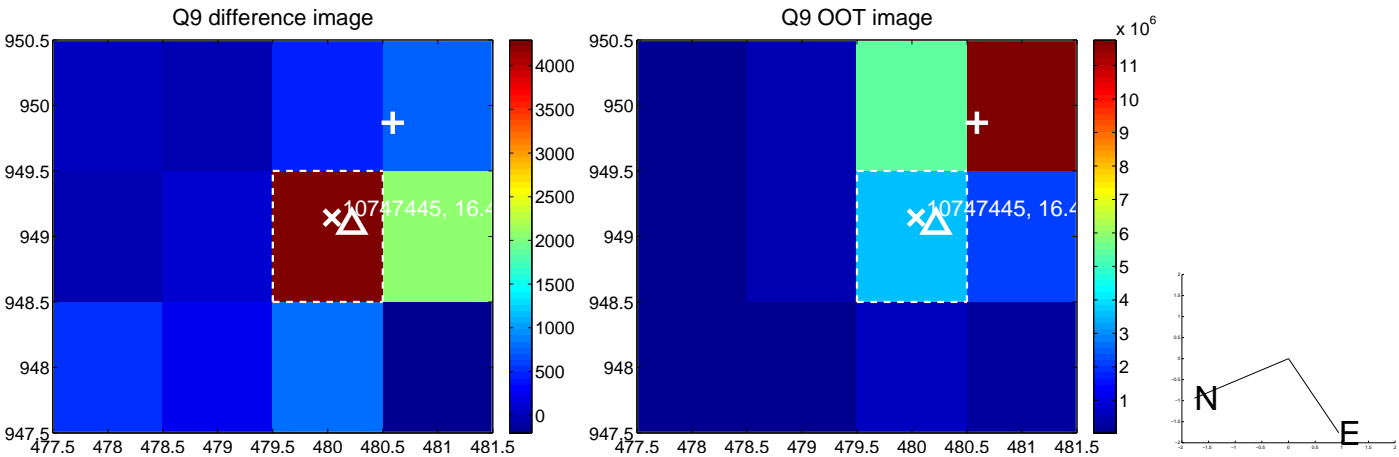
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



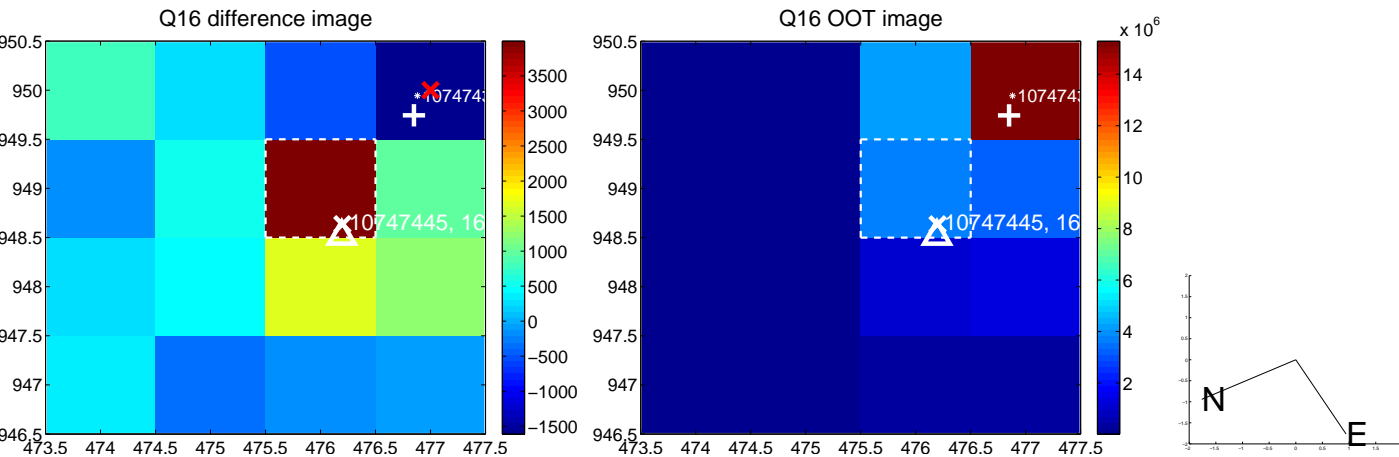
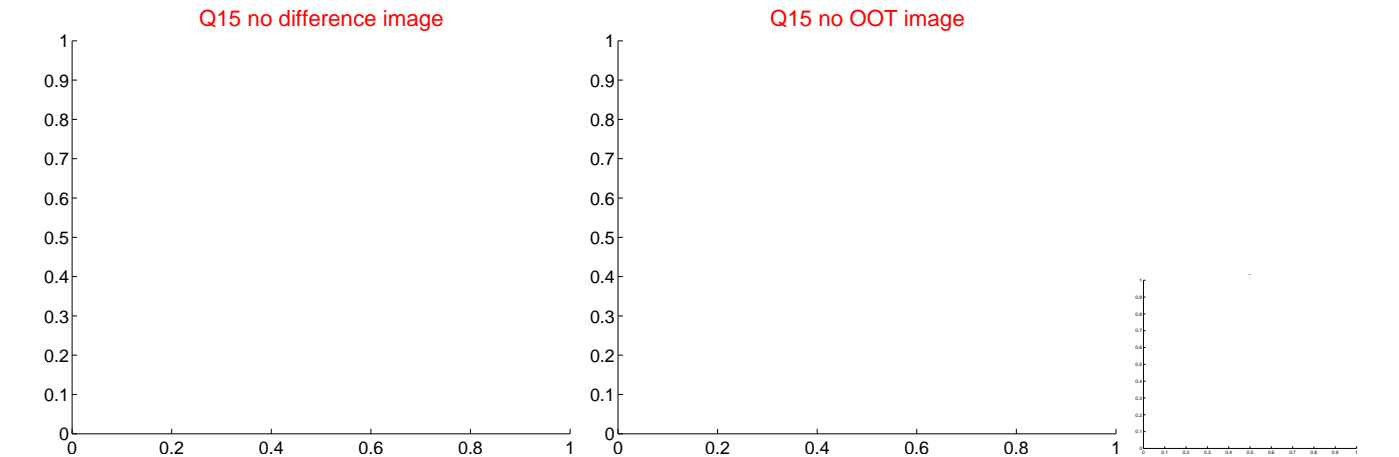
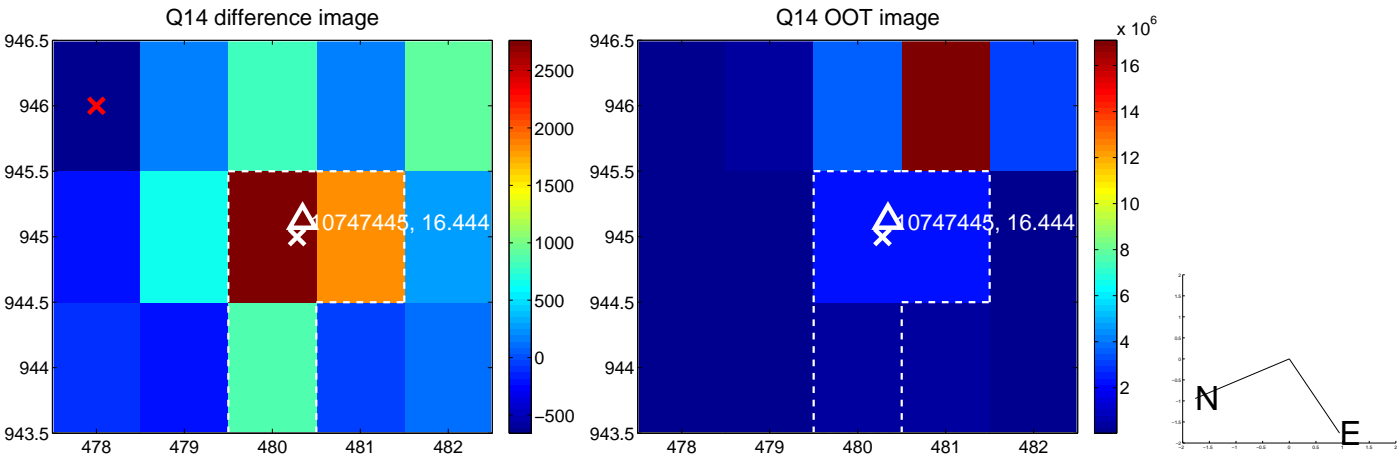
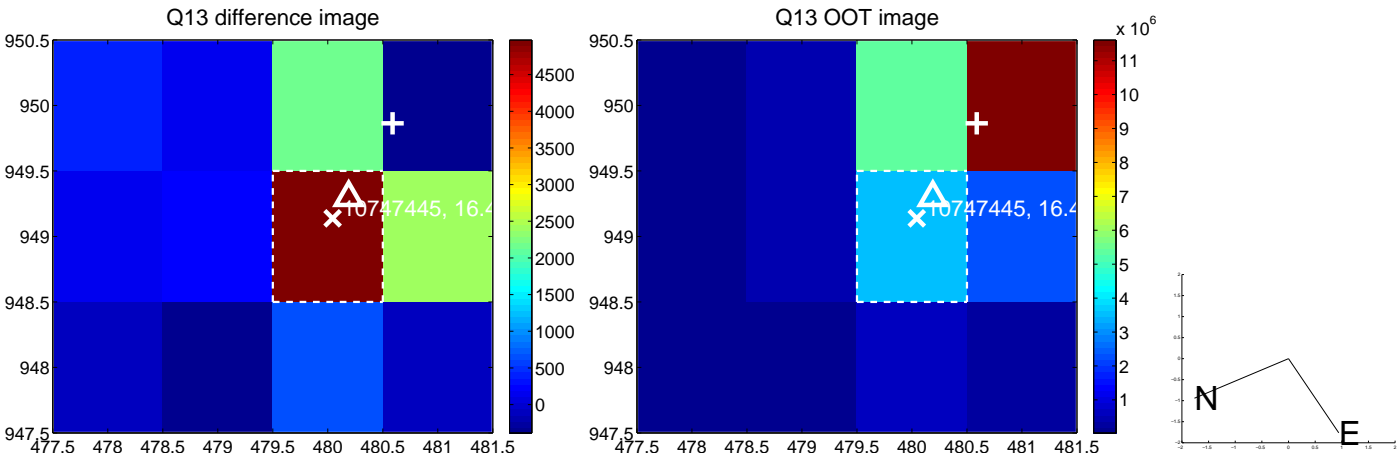
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



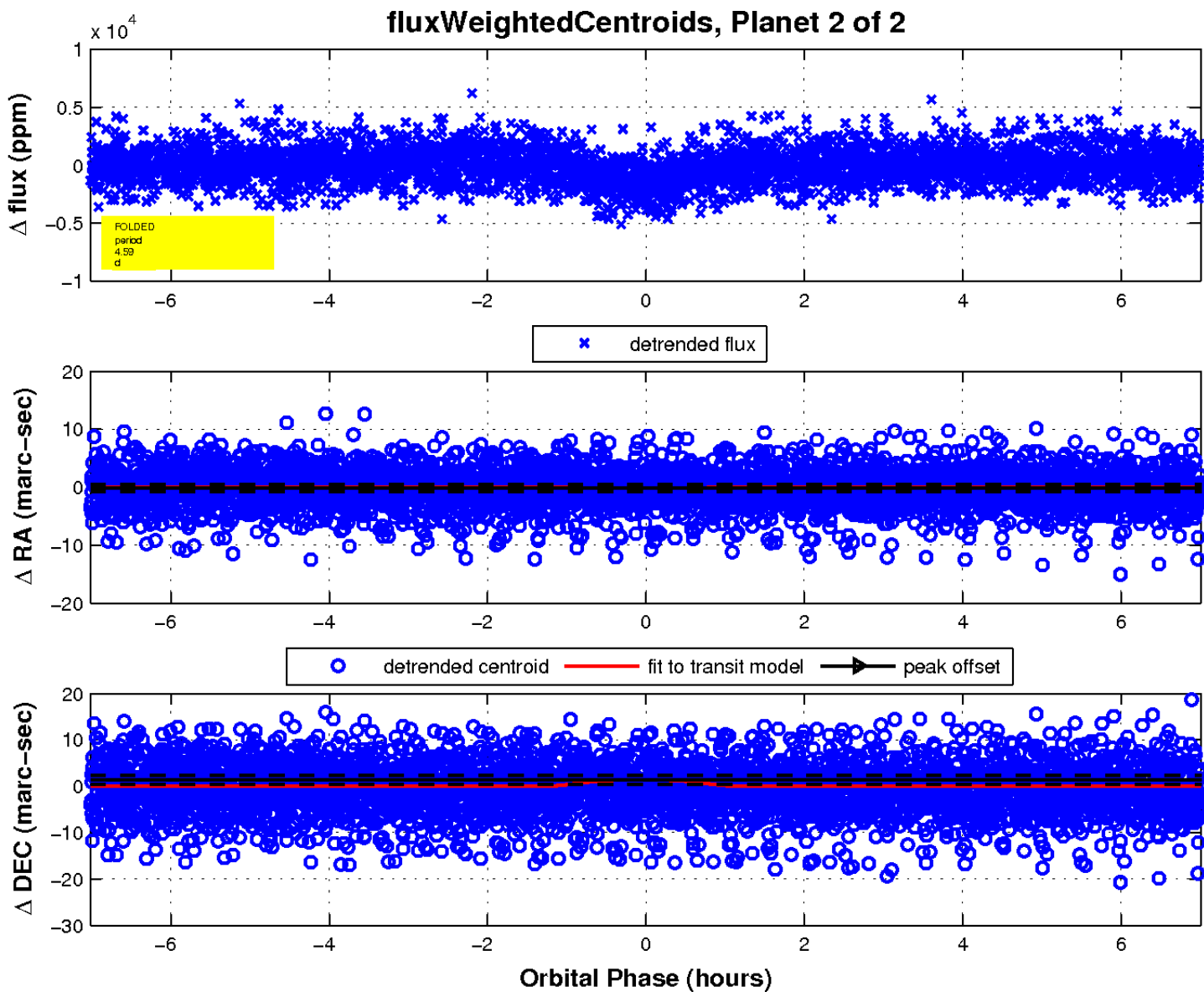
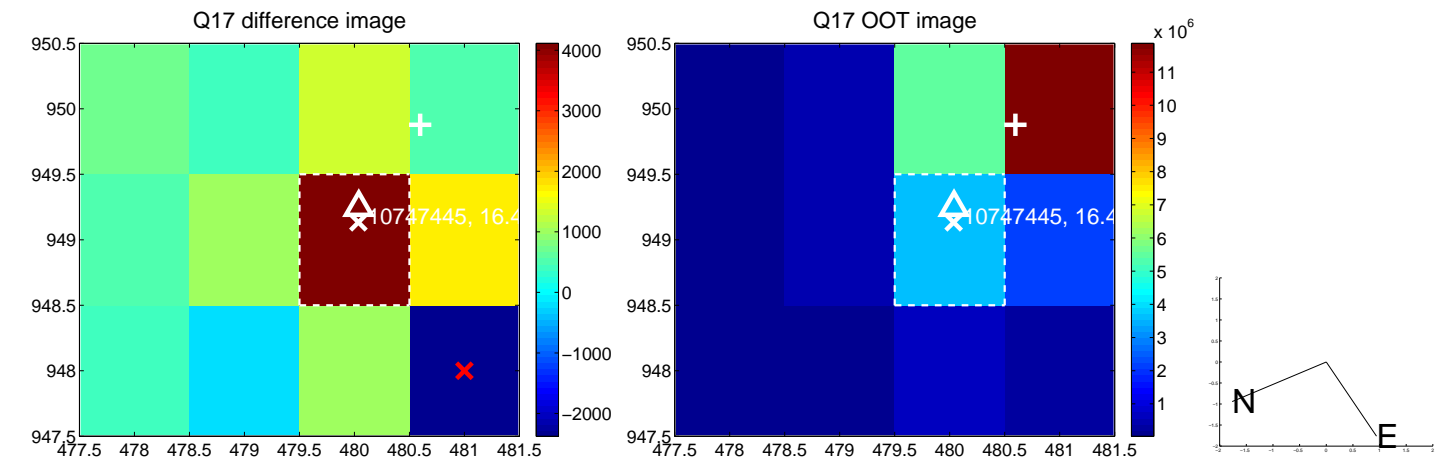
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

