

KIC 006042191

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 006042191-01 | OBS | No | 43.403494 | 146.813996 | 174.5 | 20.564 | 9.9 | 9.3 | 4.38 | 5190 | 6.19 | 143.74 |
| 006042191-02 | OBS | No | 43.397845 | 150.114563 | 315.9 | 68.235 | 8.4 | 15.9 | 4.38 | 5190 | 11.09 | 143.77 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------------------|
| 006042191-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_DV |
| 006042191-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—SAME_NTL_PERIOD |

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

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

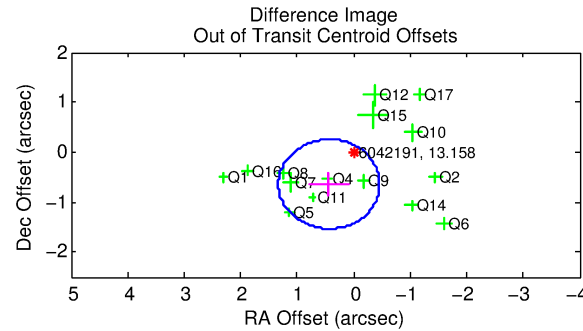
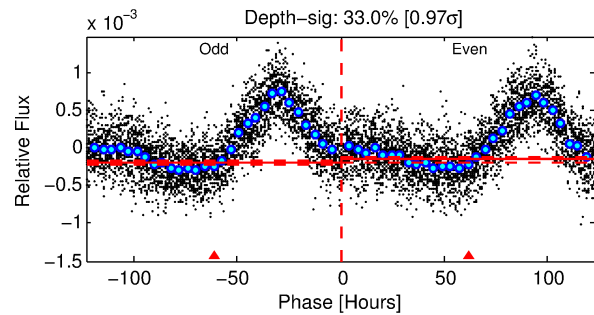
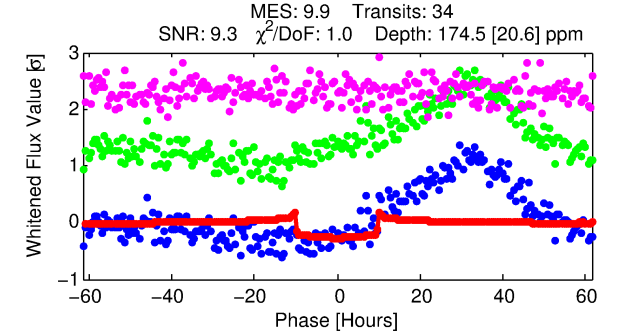
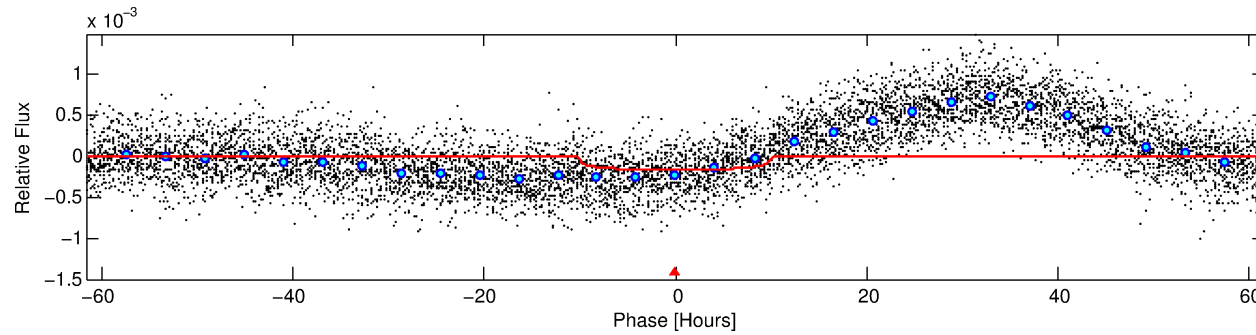
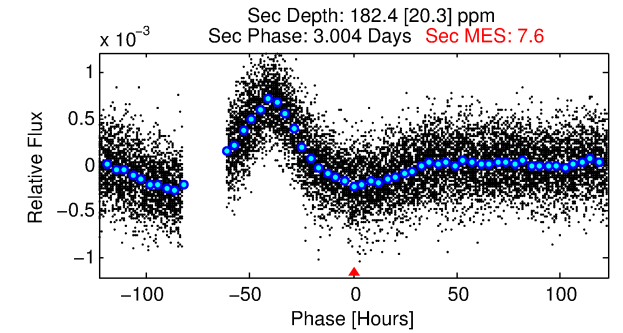
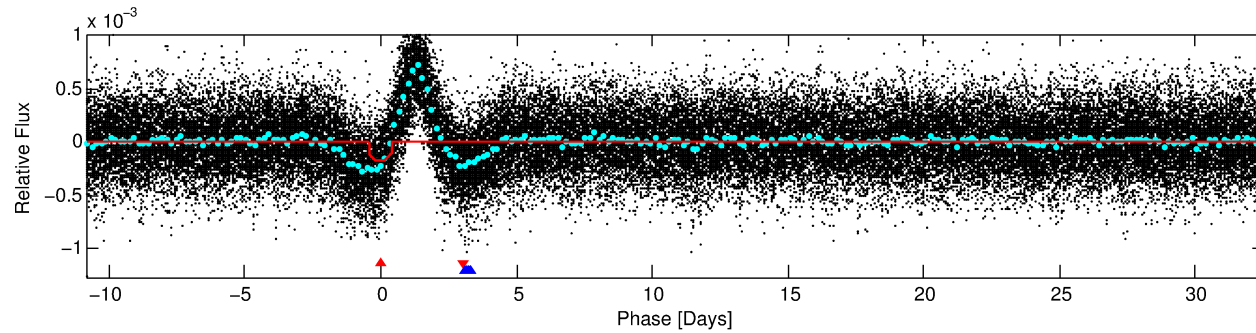
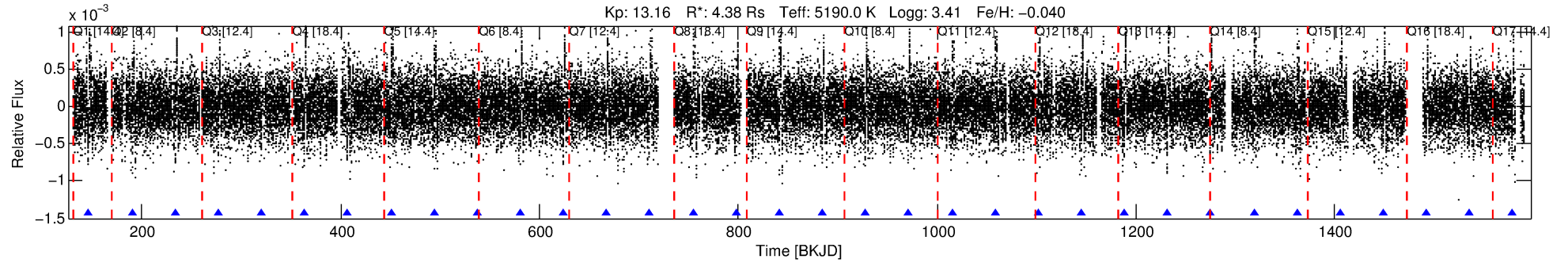
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006042191-01

No Significant Match Found

DV One-Page Summary

KIC: 6042191 Candidate: 1 of 2 Period: 43.403 d



DV Fit Results:

Period = 43.40349 [0.00081] d
Epoch = 146.8140 [0.0158] BKJD
Rp/R* = 0.0130 [0.0021]
a/R* = 11.66 [6.68]
b = 0.71 [0.40]
Seff = 143.74 [139.32]
Teff = 883 [214] K
Rp = 6.19 [3.81] Re
a = 0.2943 [0.1736] AU
Ag = 226.93 [231.63] [0.98σ]
Teffp = 5298 [491] K [8.25σ]

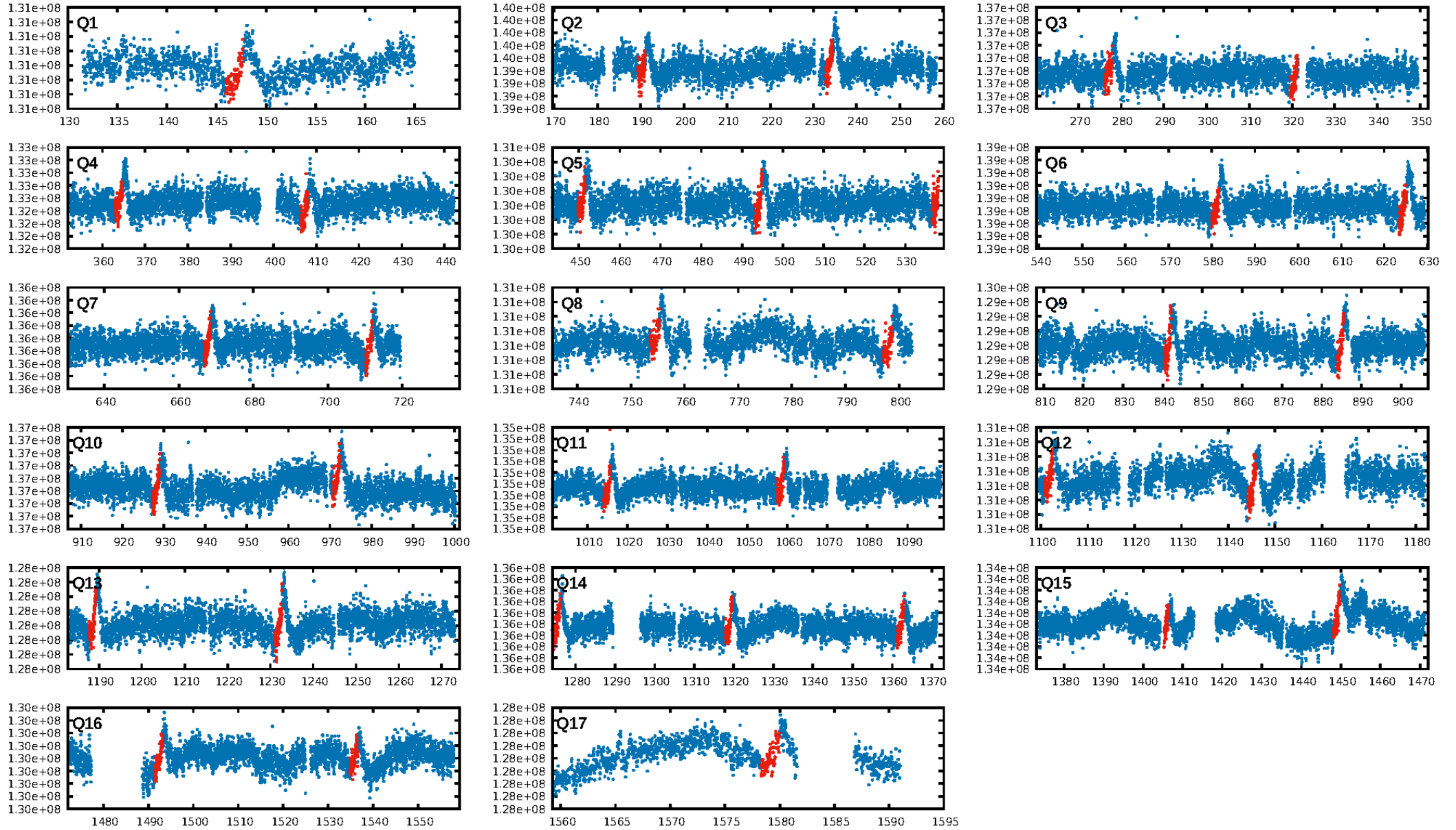
DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 98.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.11e-20
RollingBand-fgt: 1.00 [32/32]
GhostDiagnostic-chr: 3.703
Centroid-sig: 6.4%
Centroid-so: 0.499 arcsec [1.54σ]
OotOffset-rm: 0.776 arcsec [2.60σ]
KicOffset-rm: 0.810 arcsec [2.98σ]
OotOffset-st: 4/3/4/4 [15]
KicOffset-st: 4/3/4/4 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [16/16]

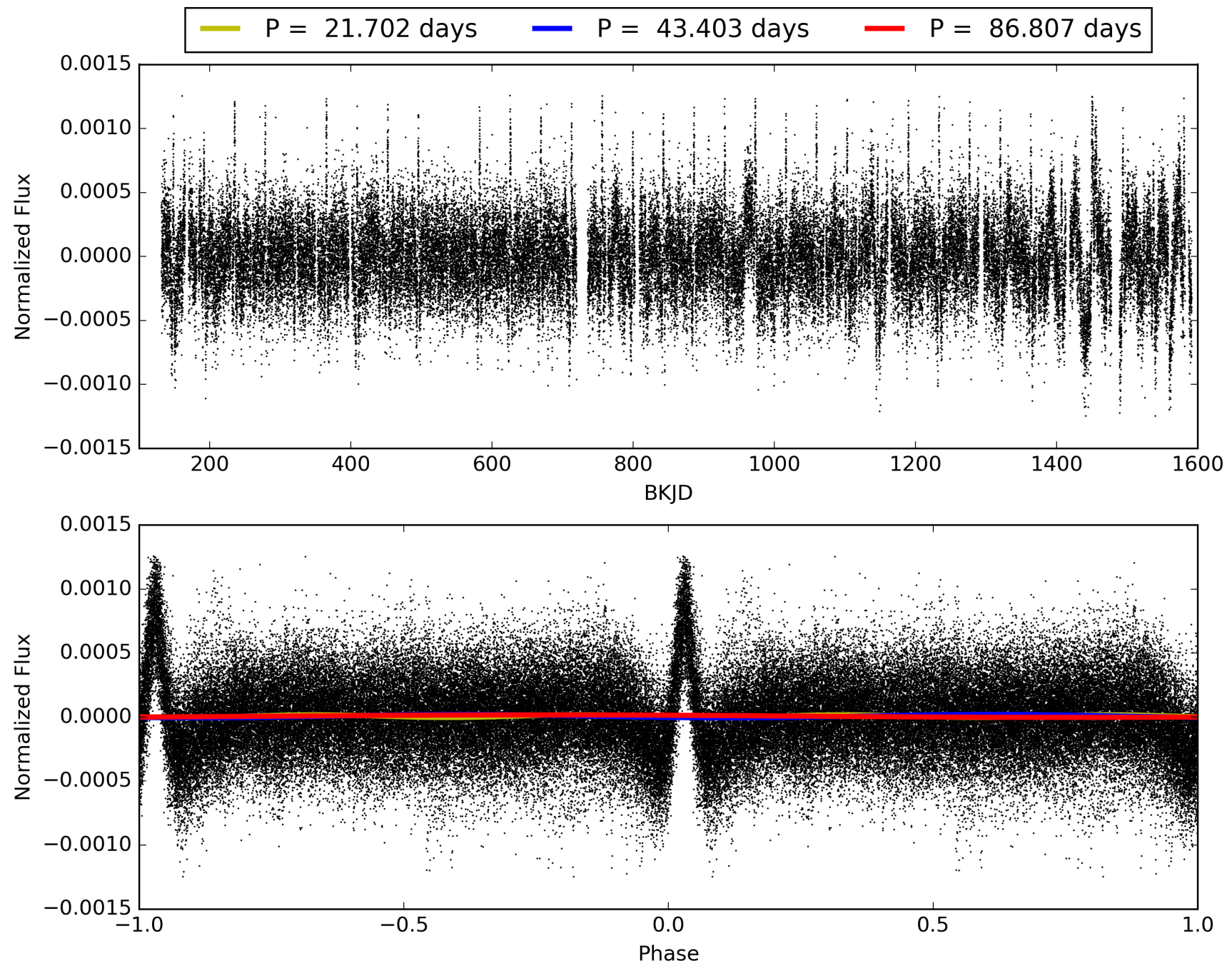
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:47:01 Z

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

TCE 006042191-01, PDC Light Curves

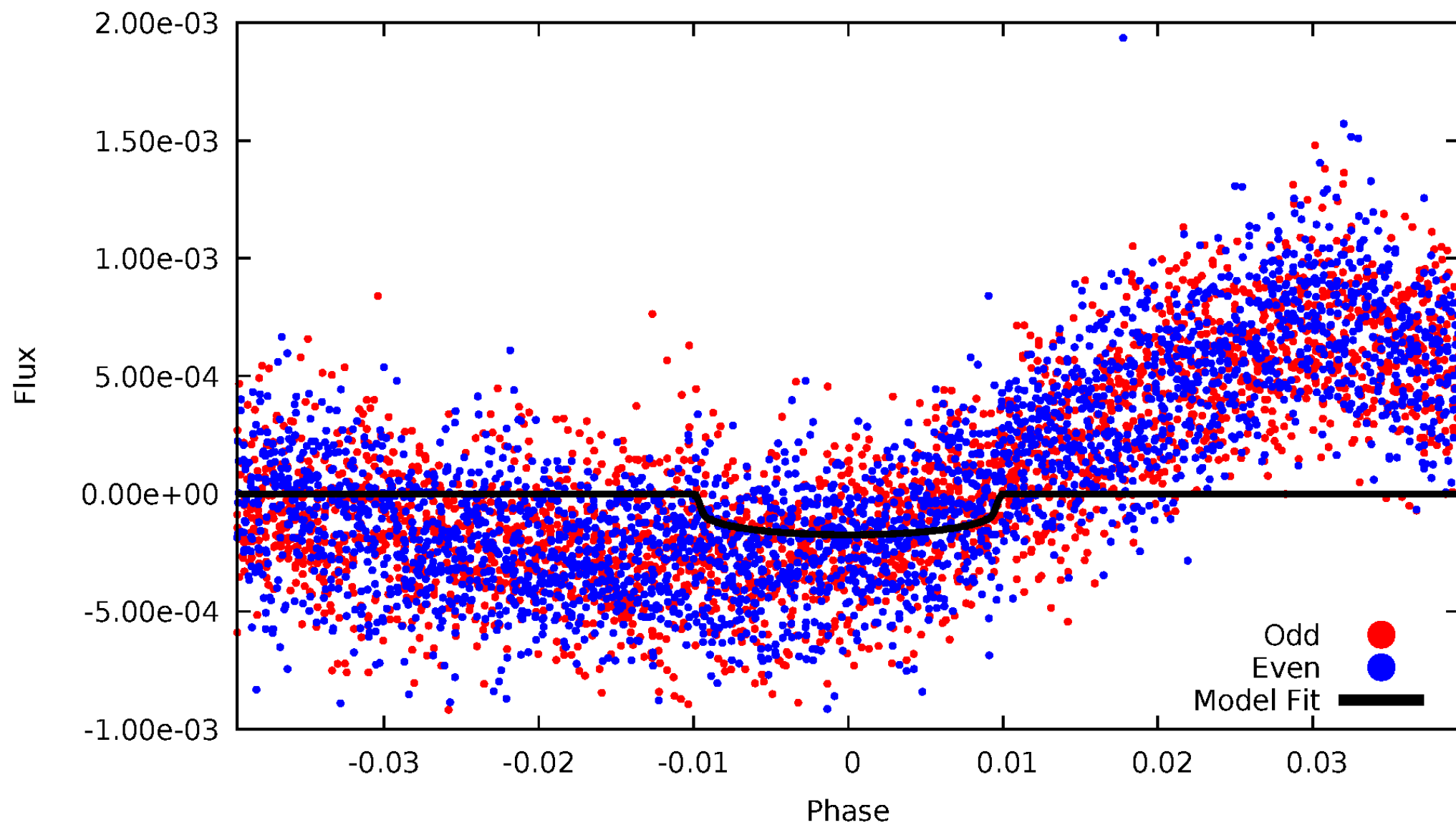


TCE 006042191-01



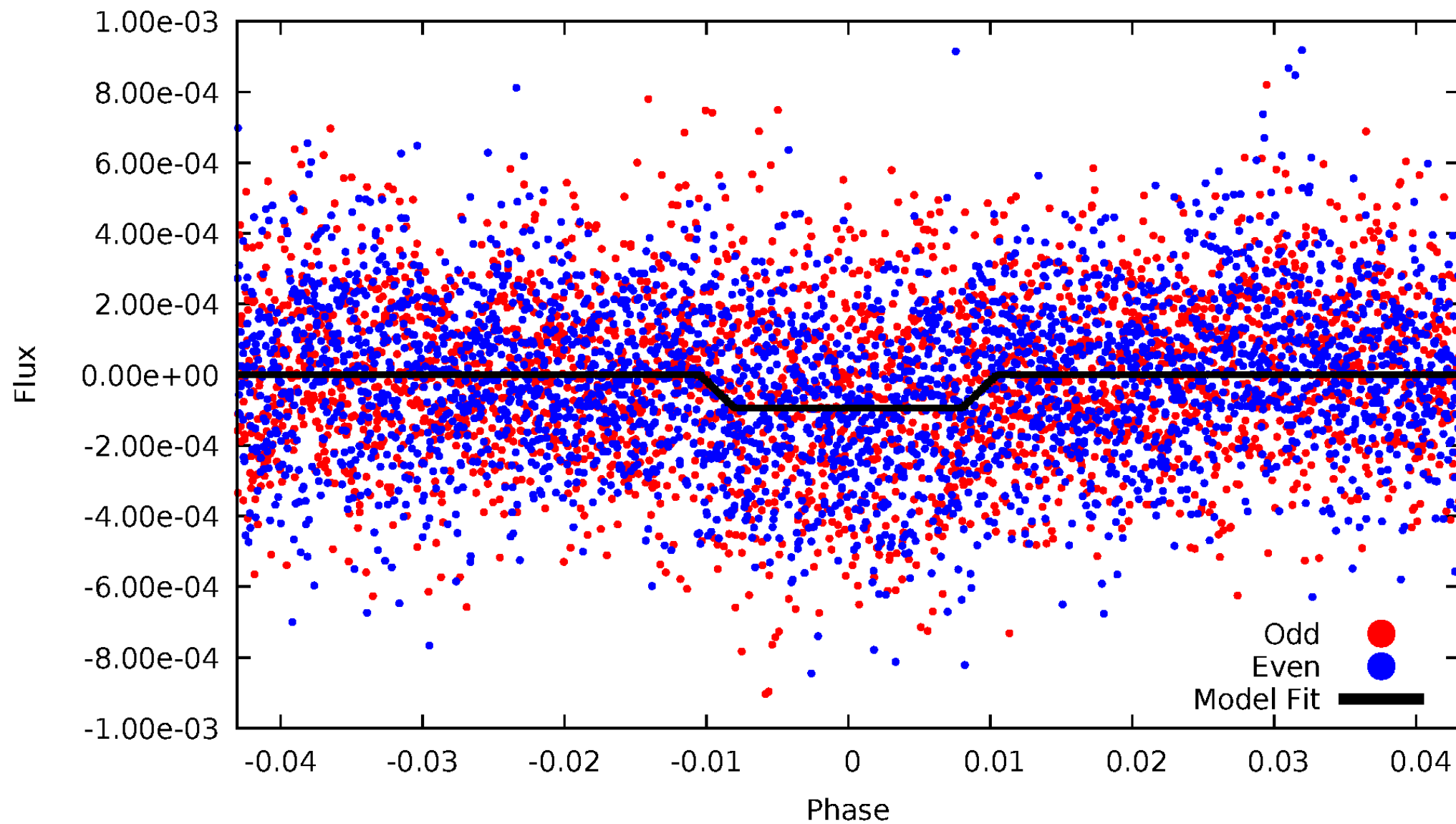
DV Odd/Even

TCE 006042191-01

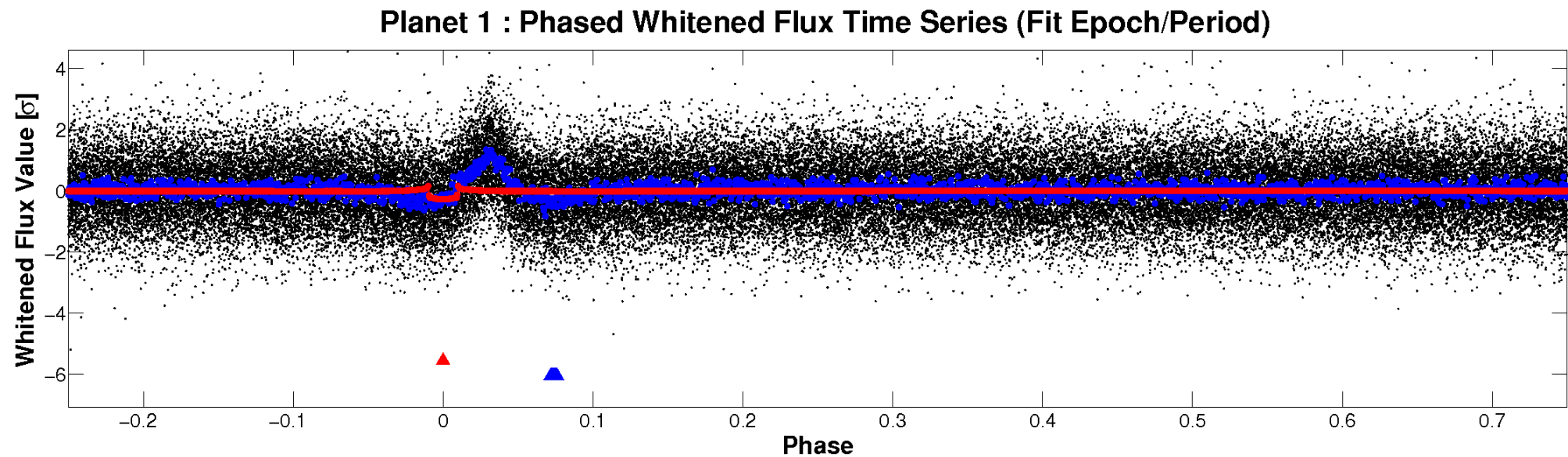
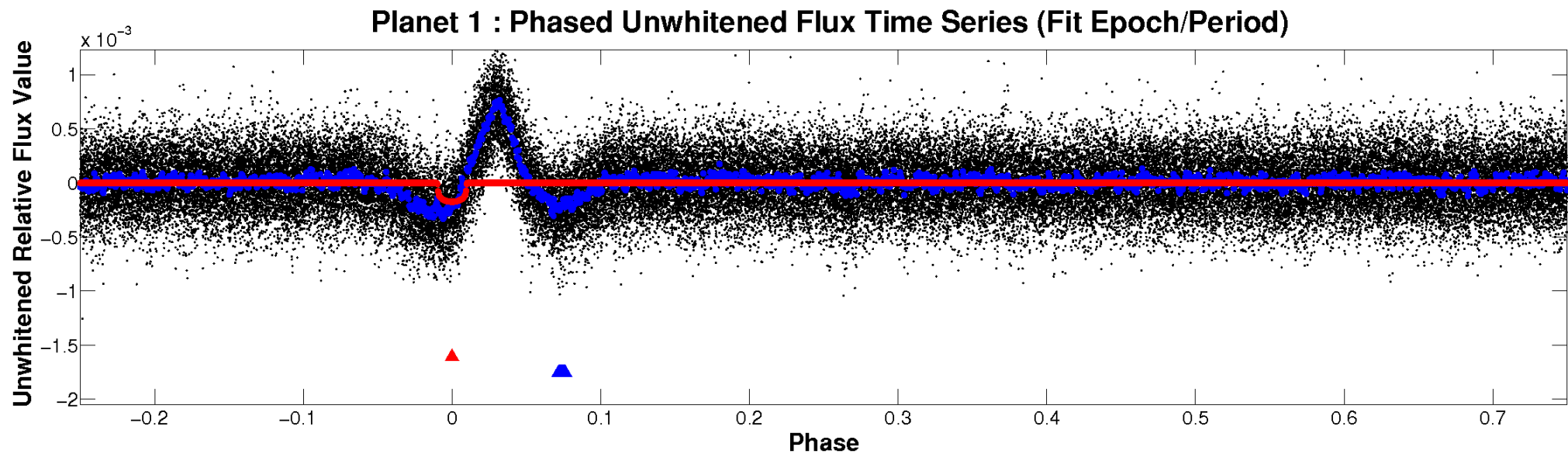


ALT Odd/Even

TCE 006042191-01

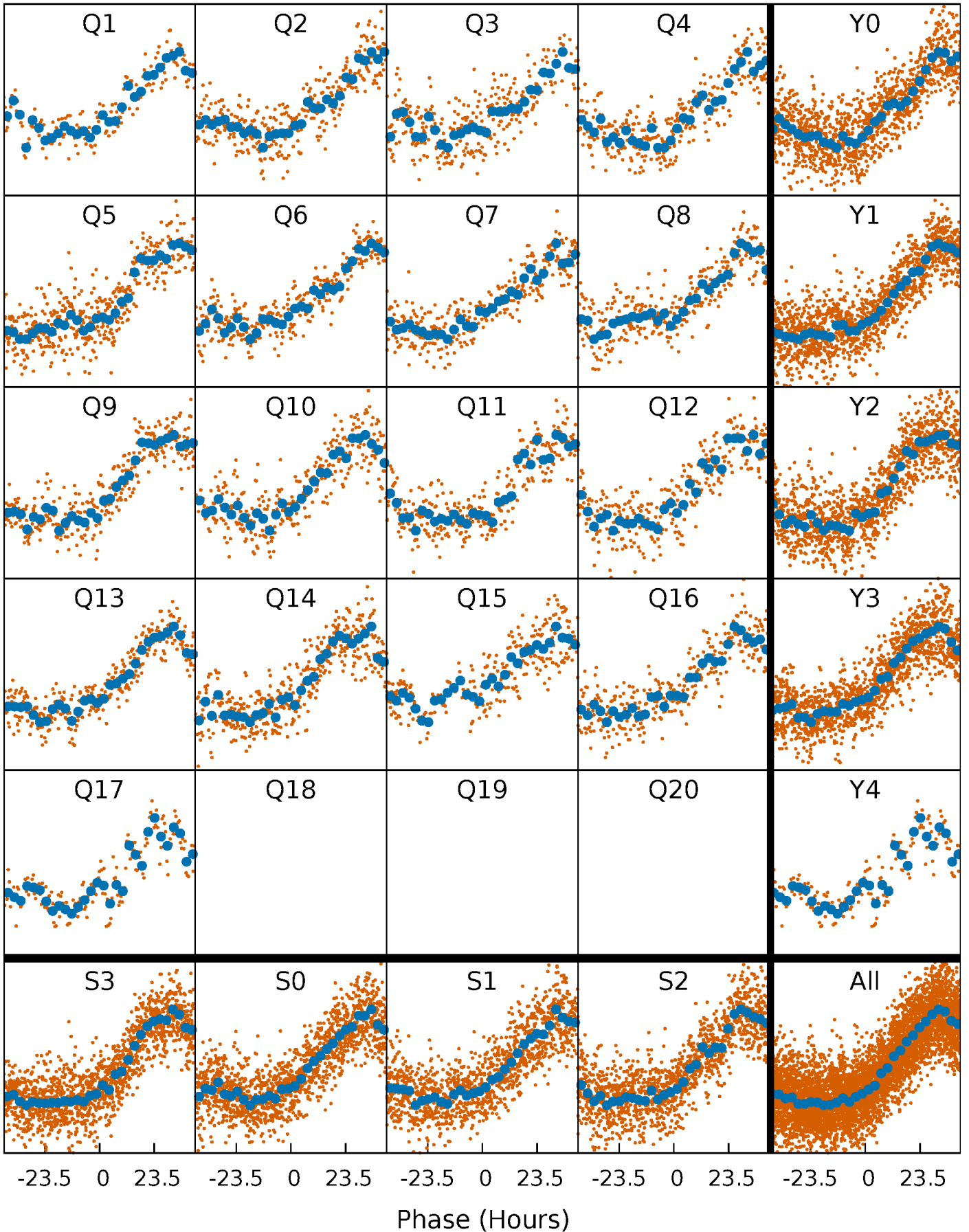


Non-Whitened Vs. Whitened Light Curve



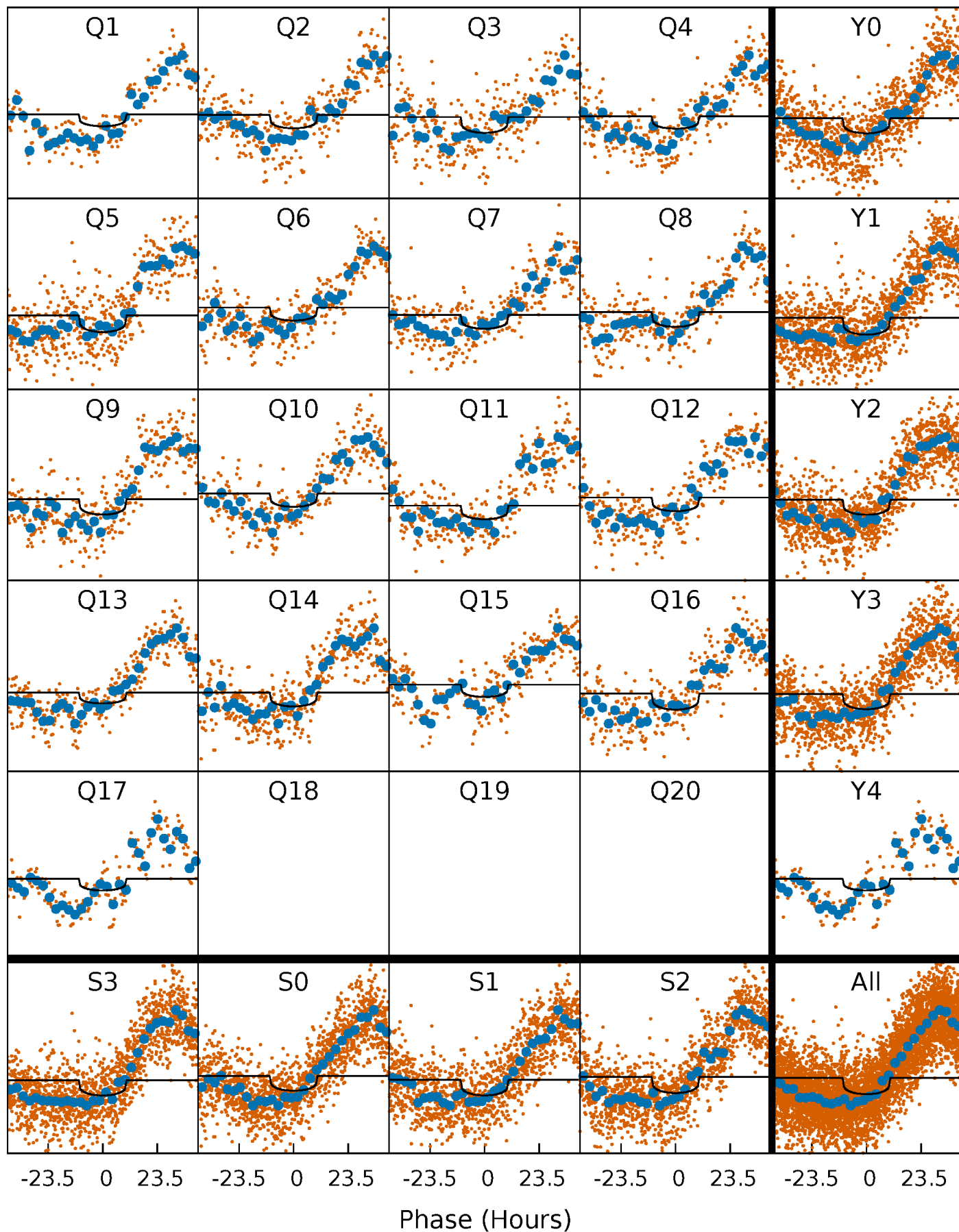
PDC Quarter-Phased Transit Curves

TCE 006042191-01 P= 43.403494 Days $T_0=146.813996$ (BKJD)



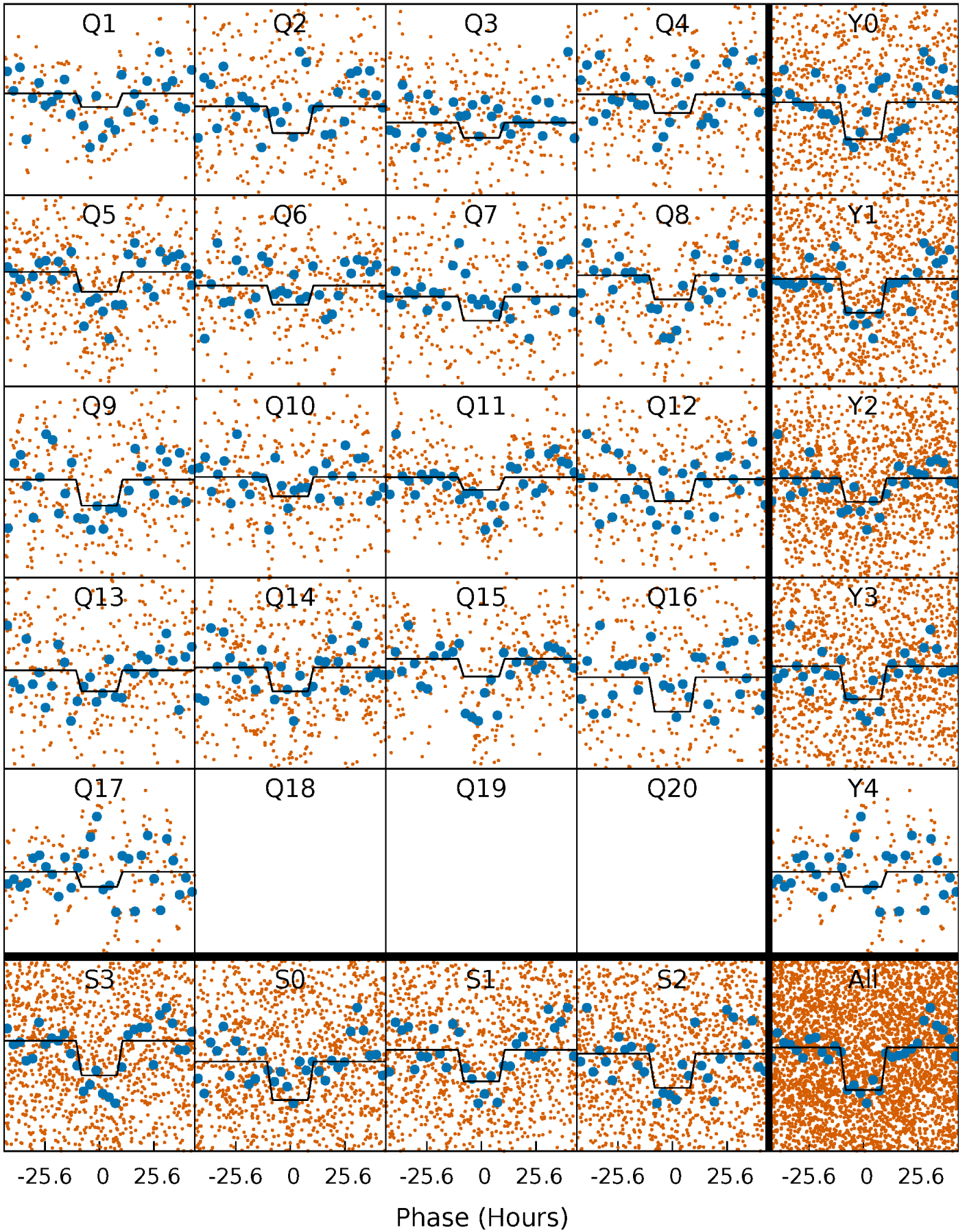
DV Quarter-Phased Transit Curves

TCE 006042191-01 P= 43.403494 Days $T_0=146.813996$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

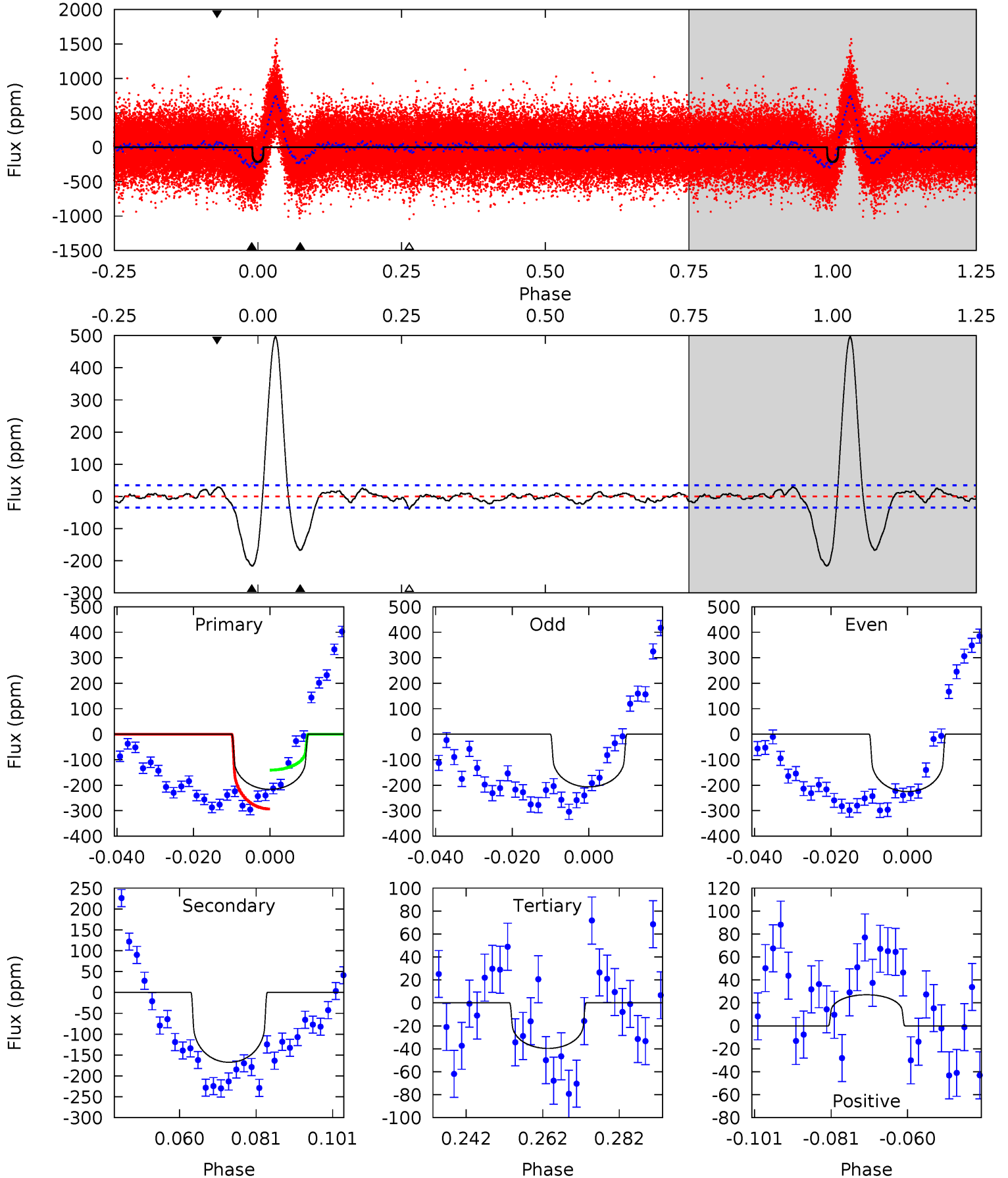
TCE 006042191-01 P= 43.402401 Days $T_0=146.885586$ (BKJD)



DV Model-Shift Uniqueness Test

006042191-01, P = 43.403494 Days, E = 103.410502 Days

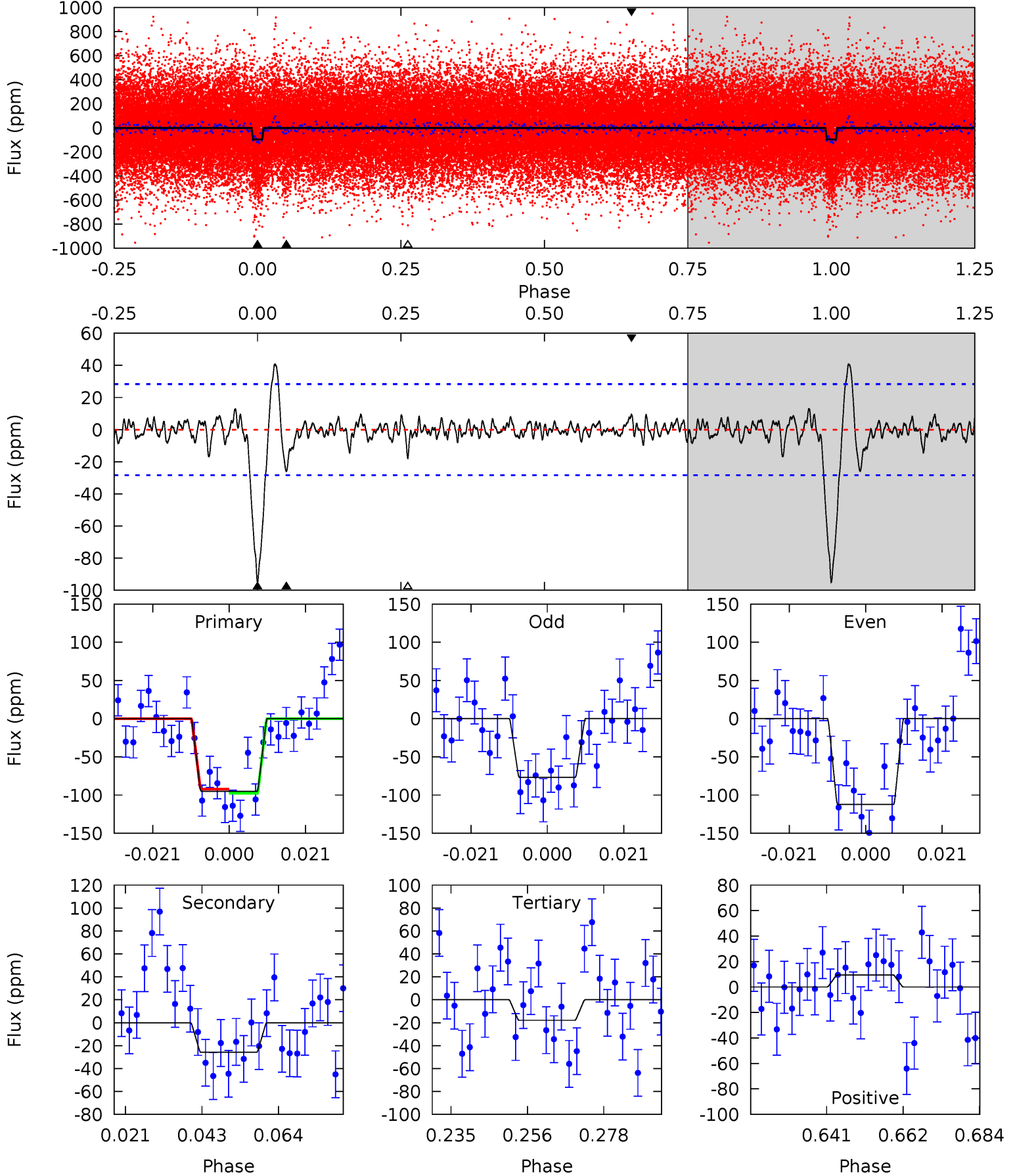
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 30.6 | 23.7 | 5.62 | 3.83 | 4.89 | 2.32 | 10.7 | 25.0 | 26.8 | 18.1 | 19.9 | 1.32 | 0.88 | 0.70 | 10.9 |



Alt Model-Shift Uniqueness Test

006042191-01, P = 43.402401 Days, E = 103.483185 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.4 | 4.45 | 3.09 | 1.63 | 4.88 | 2.30 | 0.86 | 13.3 | 14.8 | 1.37 | 2.82 | 3.07 | 1.04 | 0.30 | 0.47 |



Stellar Parameters For KIC 006042191

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5190^{+171}_{-171} | $3.412^{+0.570}_{-0.228}$ | $-0.040^{+0.300}_{-0.300}$ | $4.376^{+1.112}_{-2.596}$ | $1.802^{+0.211}_{-0.843}$ | $0.030^{+0.209}_{-0.015}$ |
| | +3%/-3% | +17%/-7% | +750%/-750% | +25%/-59% | +12%/-47% | +691%/-48% |
| 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 006042191-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|--------------|------------------------|----------------------|----------------------|--------------------|
| DV | -167 ± 7 | $5.87^{+1.79}_{-1.83}$ | 1232^{+114}_{-175} | 5203^{+476}_{-382} | 225^{+208}_{-90} |
| Alt. | -26 ± 6 | $4.20^{+1.64}_{-1.51}$ | 1223^{+119}_{-192} | 4005^{+501}_{-331} | 66^{+84}_{-33} |

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 $A_{obs} \gg 1.0$

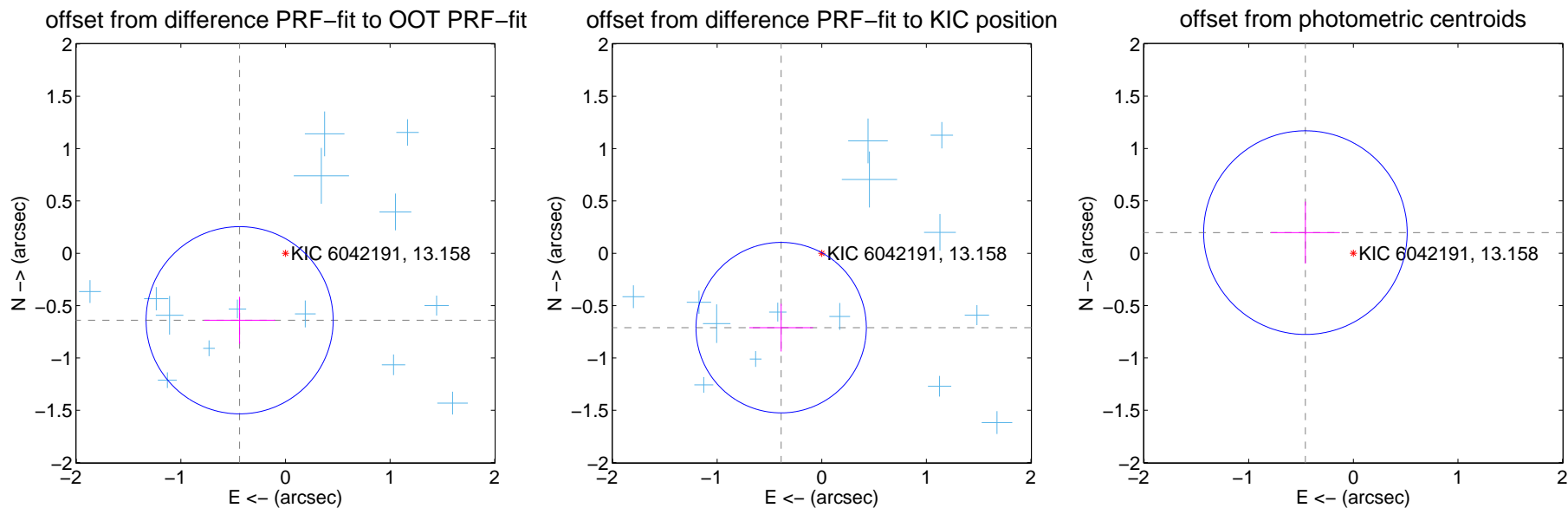
DV Centroid Data

Supplemental centroid analysis for 006042191-01. Kepler magnitude: 13.16. Transit SNR 9.25

There are 15 quarters with good PRF difference image offsets

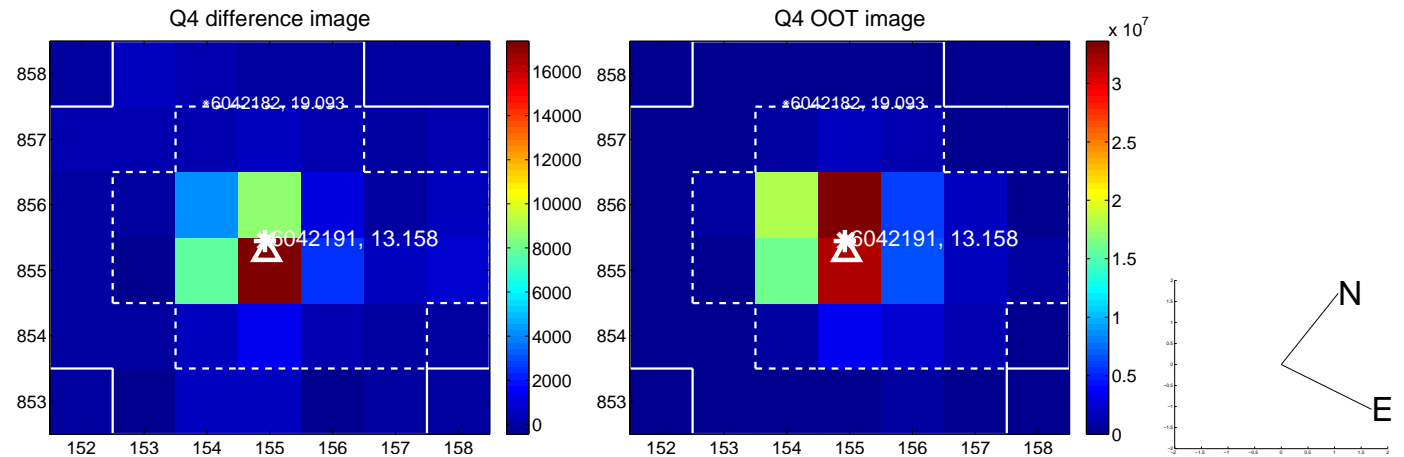
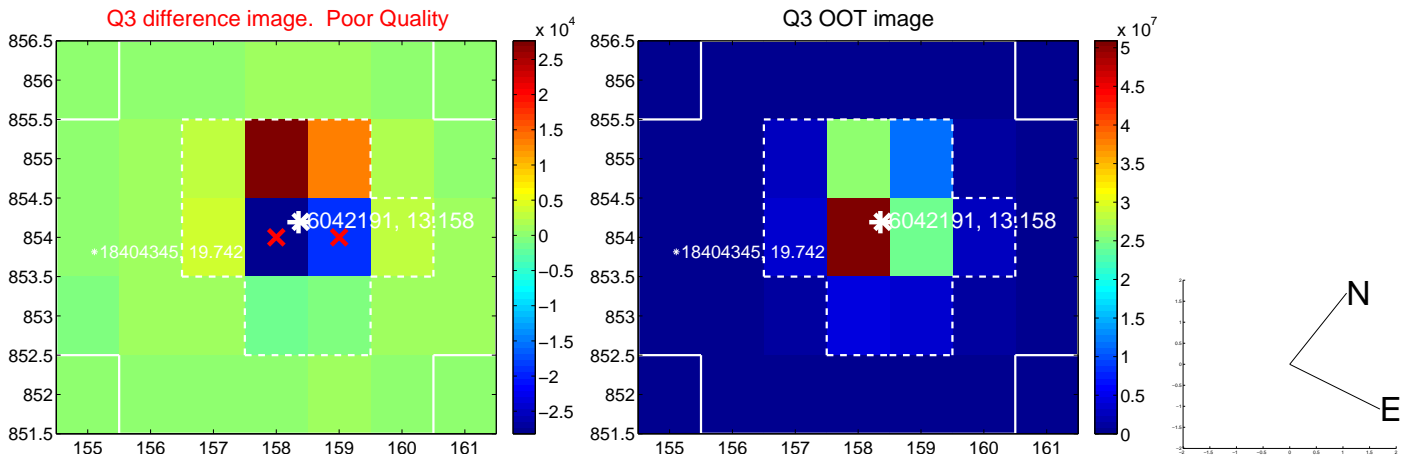
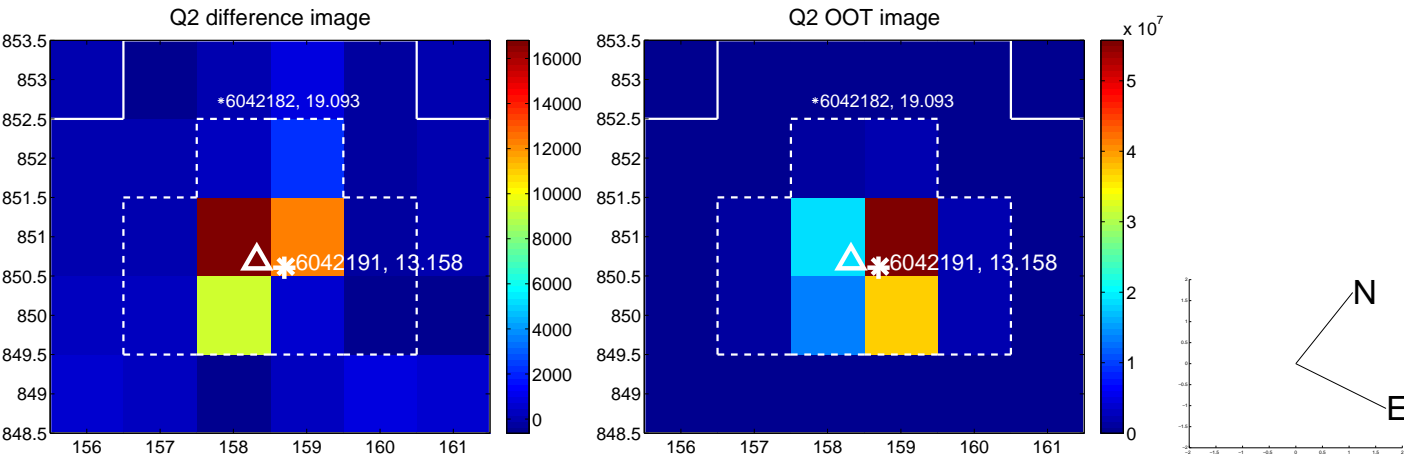
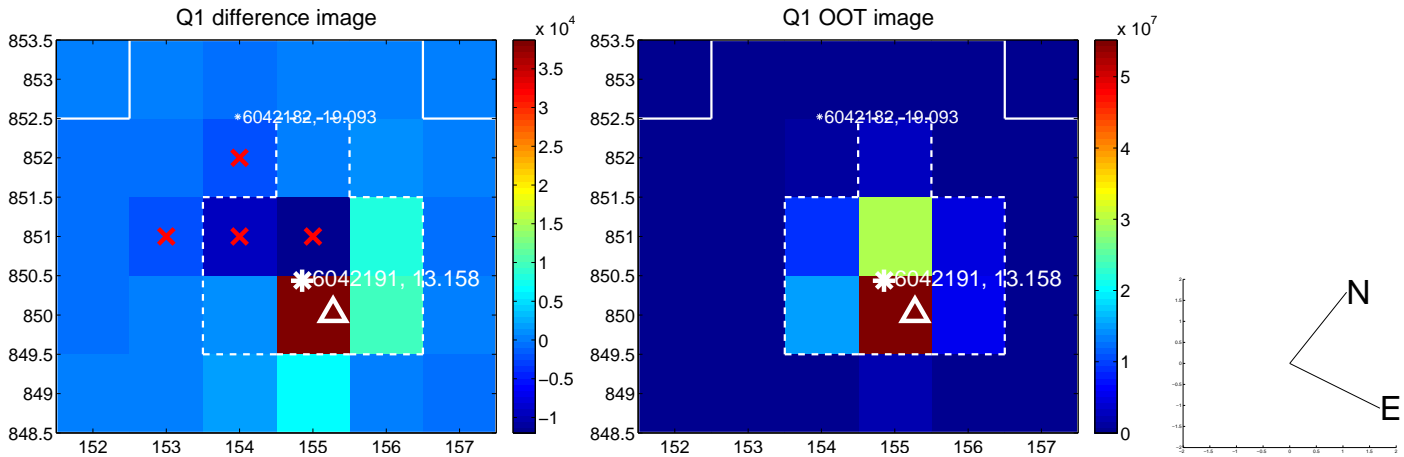
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.776 ± 0.298 | 2.60 | 0.438 ± 0.339 | -0.640 ± 0.224 |
| PRF-fit source offset from KIC position | 0.810 ± 0.272 | 2.98 | 0.388 ± 0.304 | -0.711 ± 0.228 |
| photometric centroid source offset | 0.50 ± 0.32 | 1.54 | 0.46 ± 0.33 | 0.20 ± 0.30 |

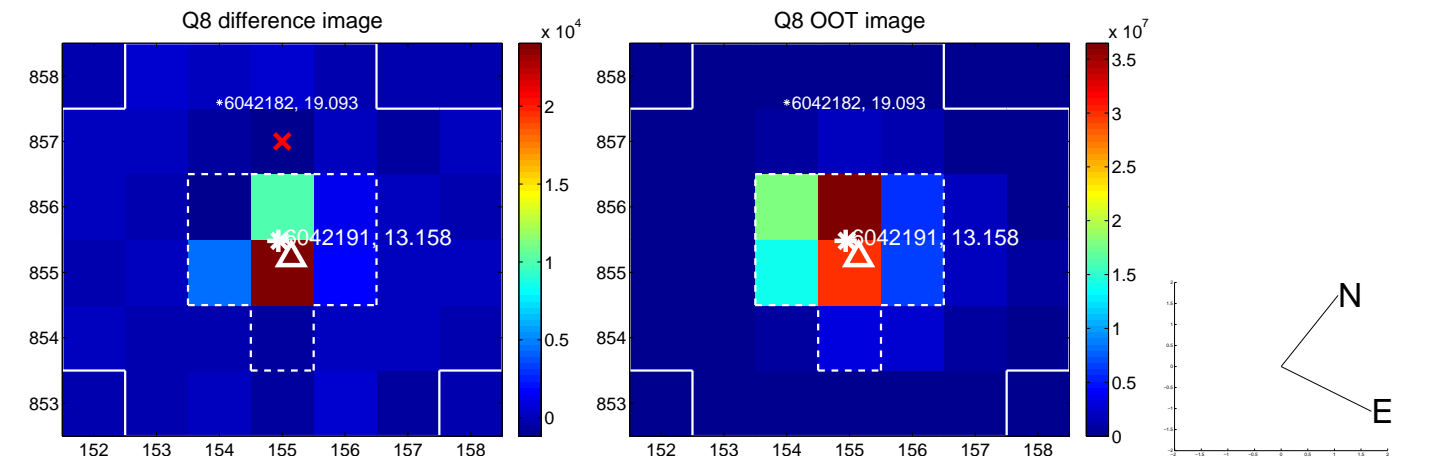
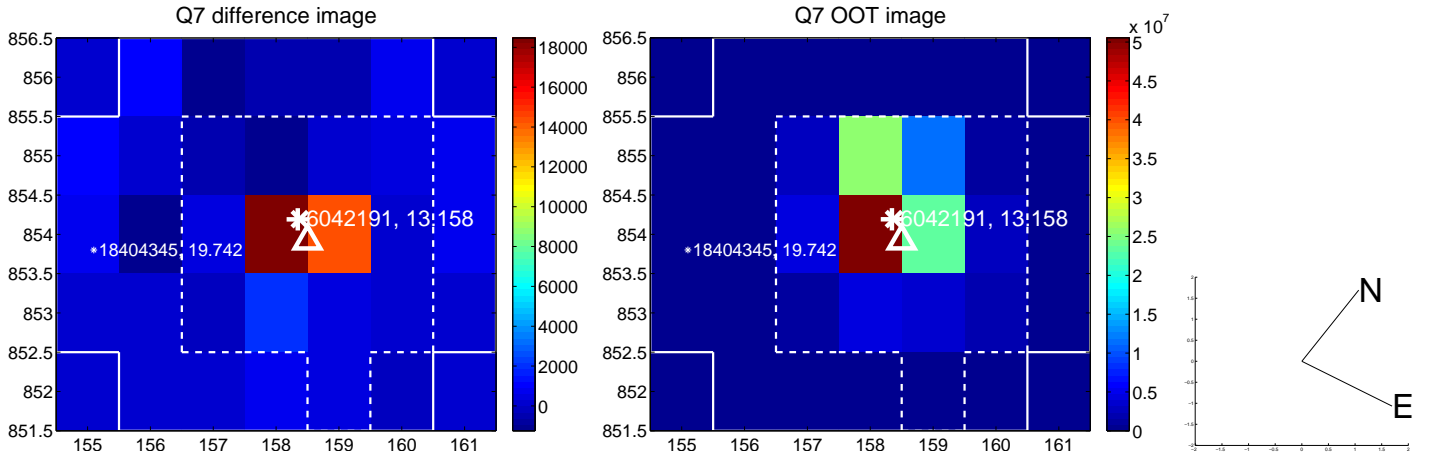
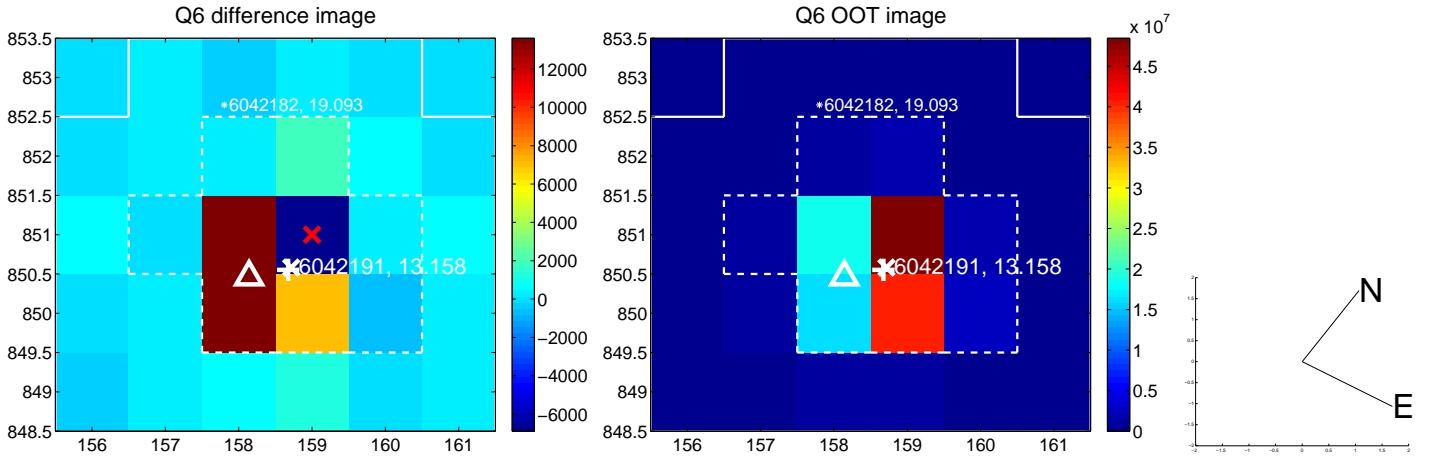
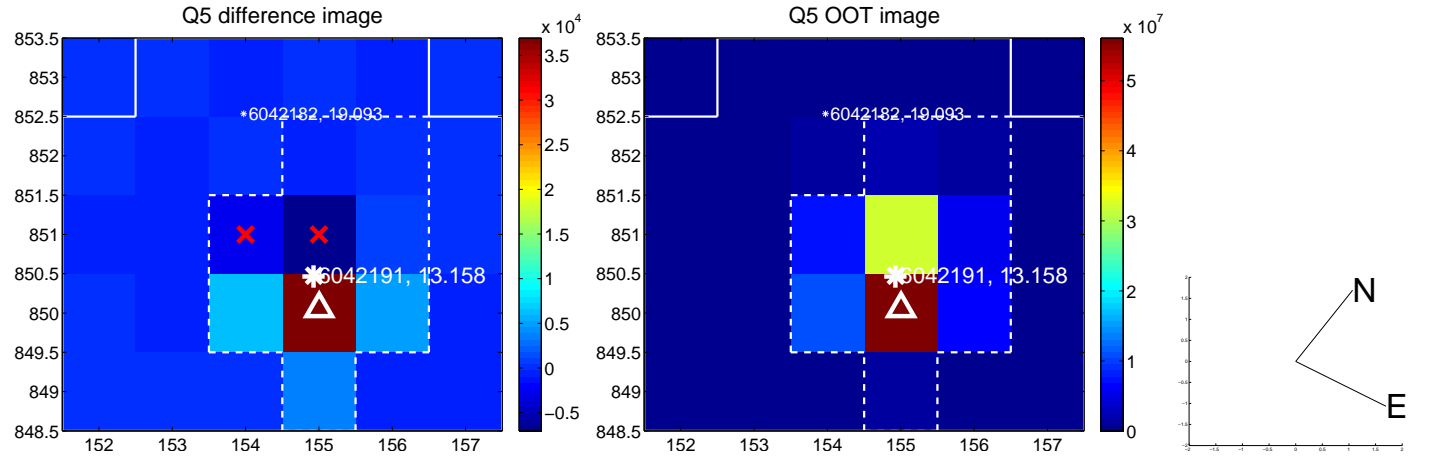


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

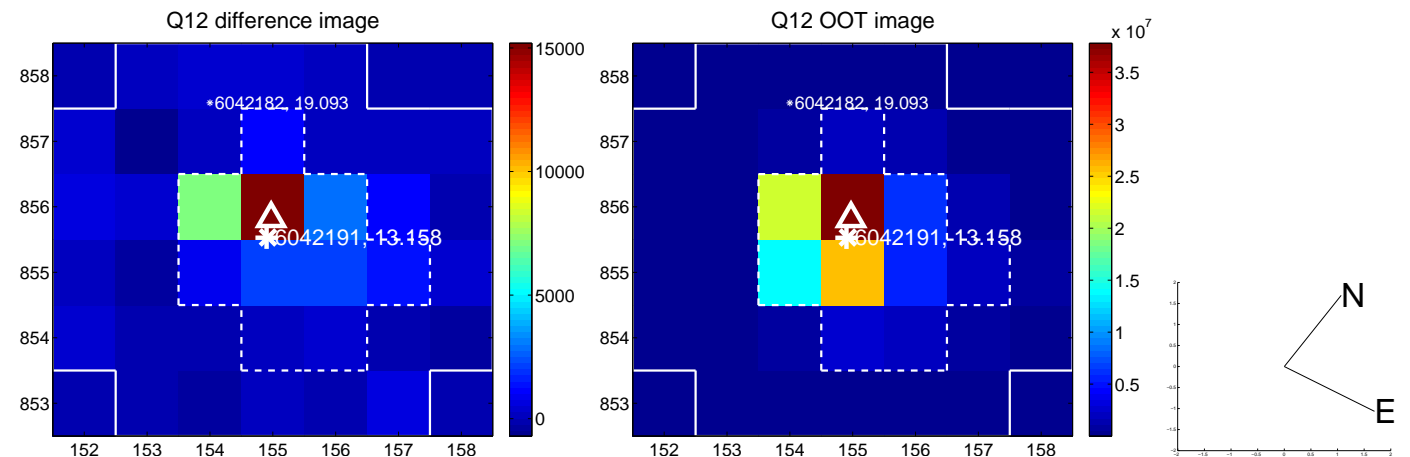
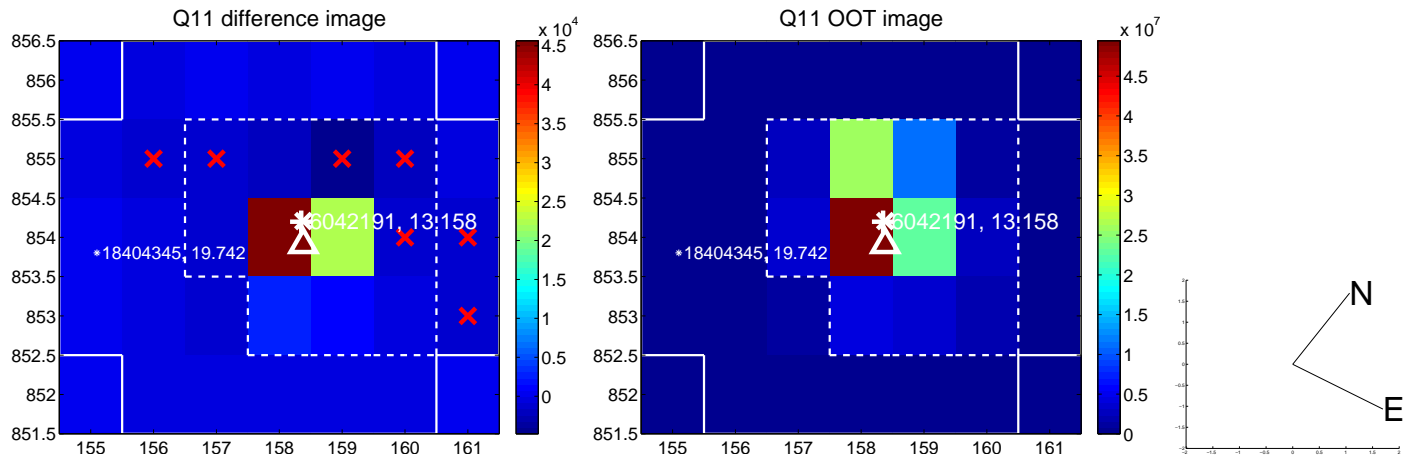
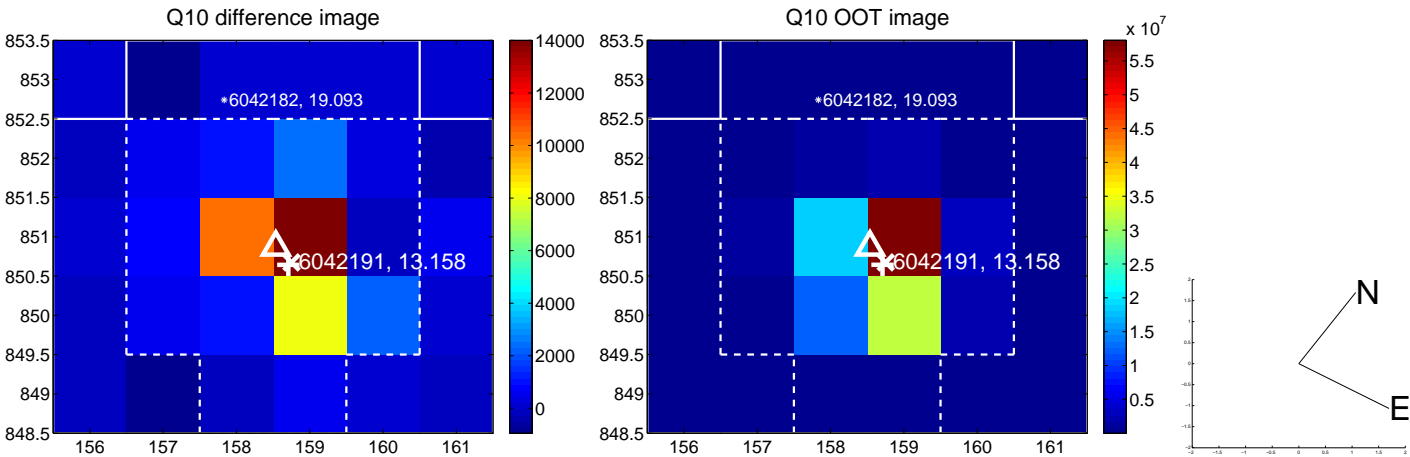
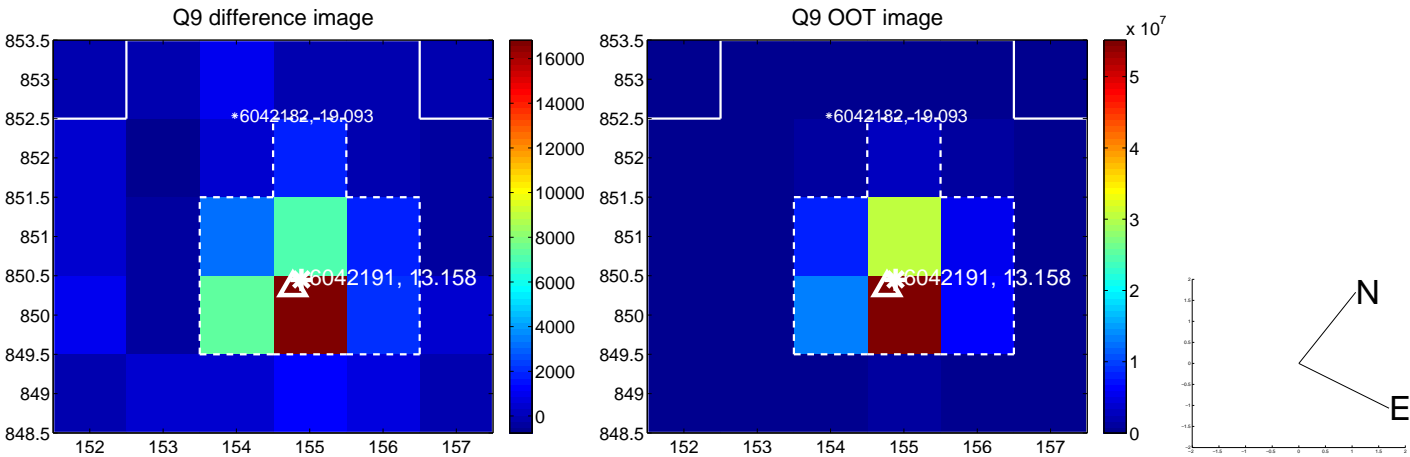
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



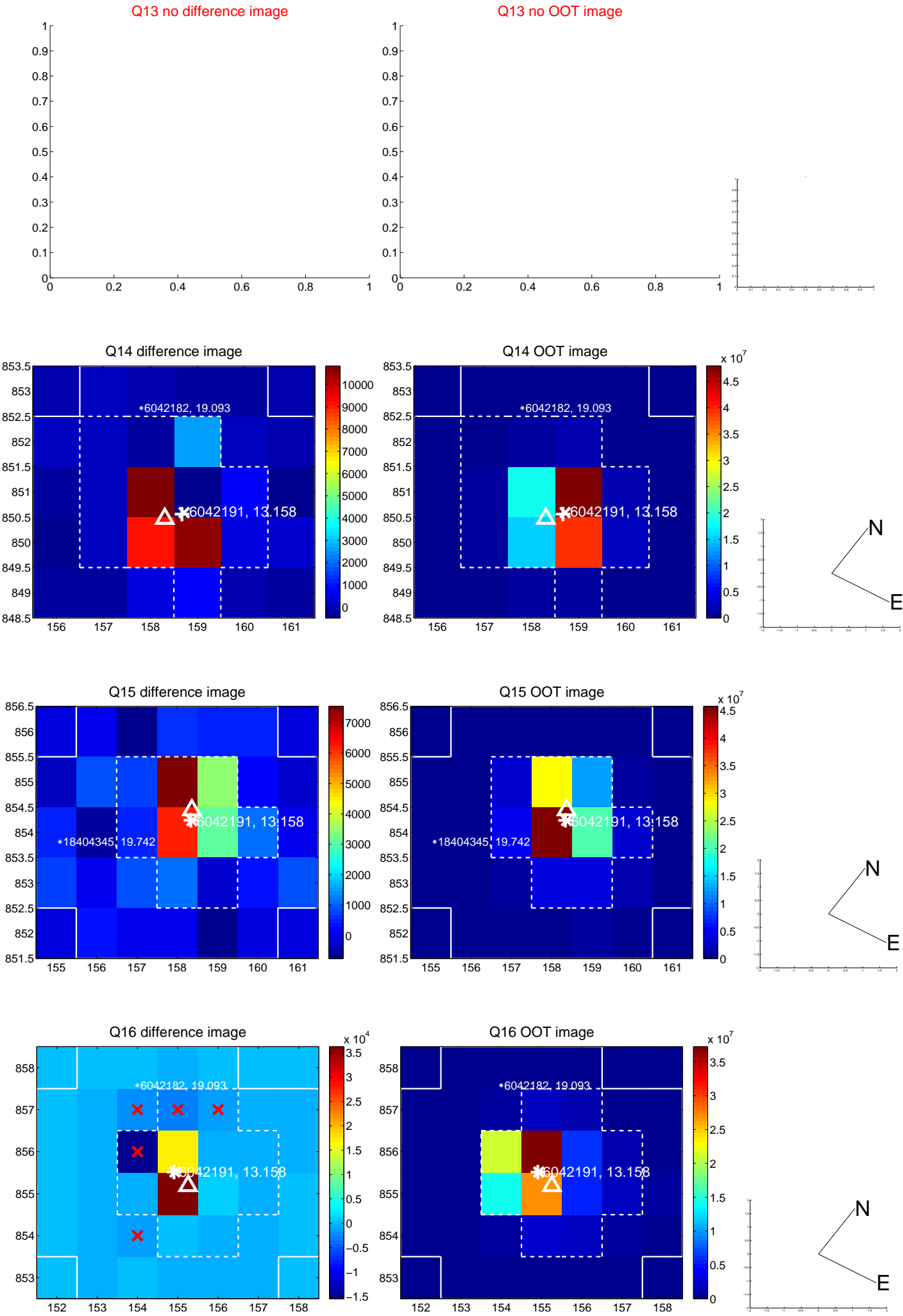
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



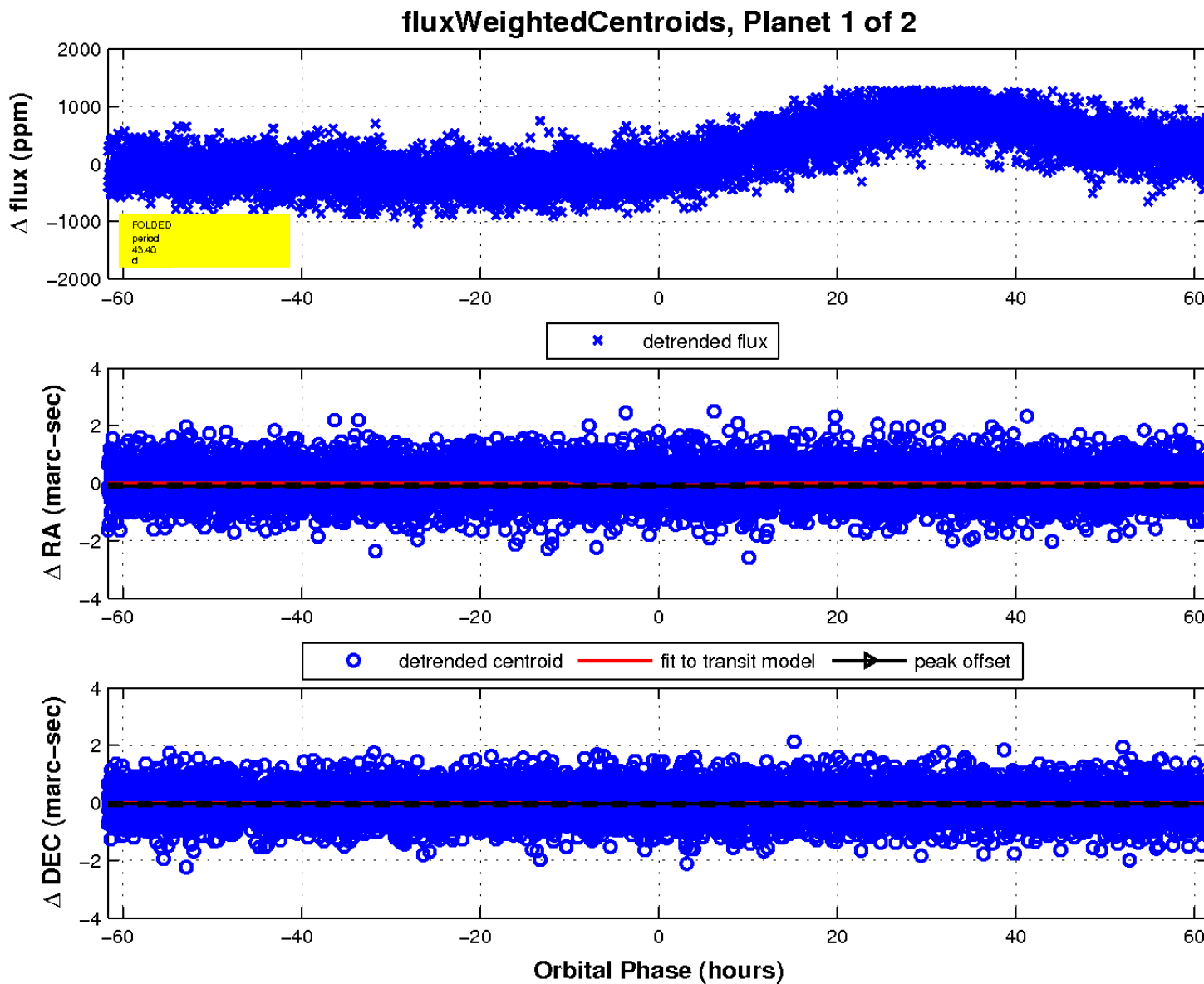
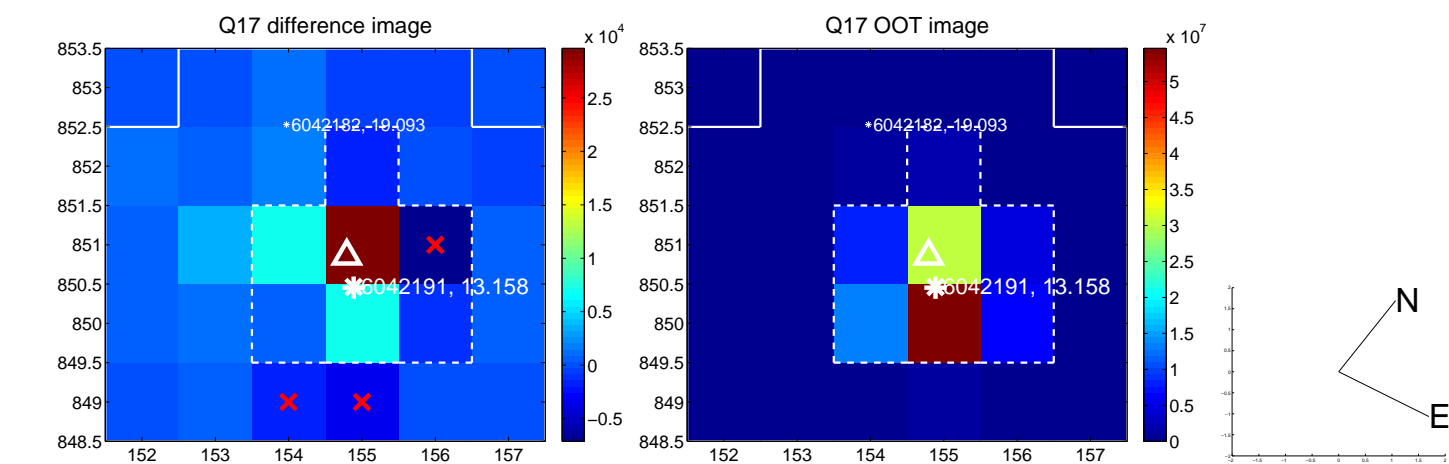
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

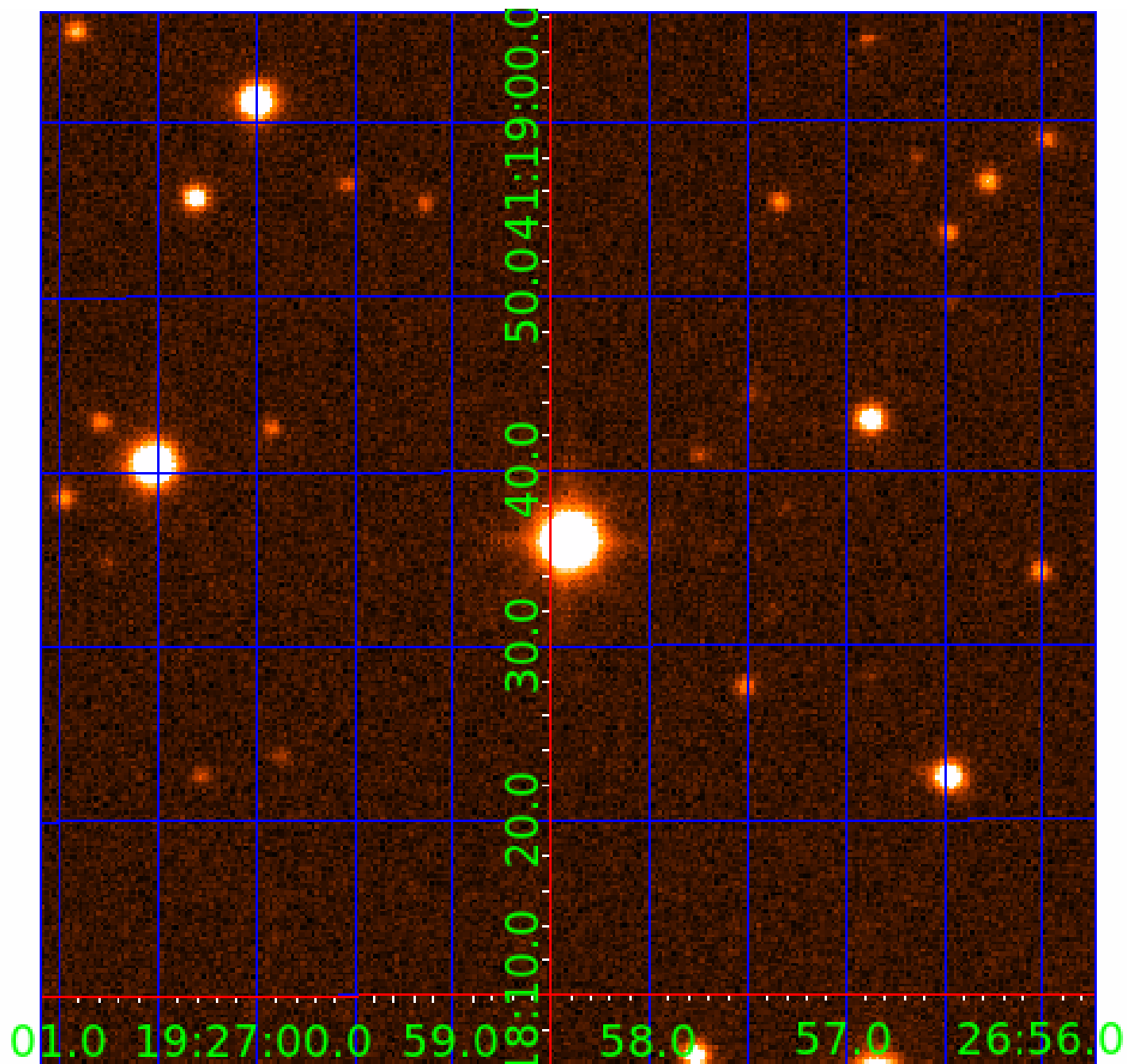


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006042191

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 006042191-01 | OBS | No | 43.403494 | 146.813996 | 174.5 | 20.564 | 9.9 | 9.3 | 4.38 | 5190 | 6.19 | 143.74 |
| 006042191-02 | OBS | No | 43.397845 | 150.114563 | 315.9 | 68.235 | 8.4 | 15.9 | 4.38 | 5190 | 11.09 | 143.77 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------------------|
| 006042191-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_DV |
| 006042191-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—SAME_NTL_PERIOD |

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

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

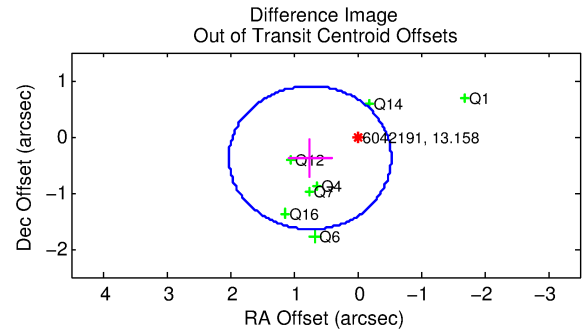
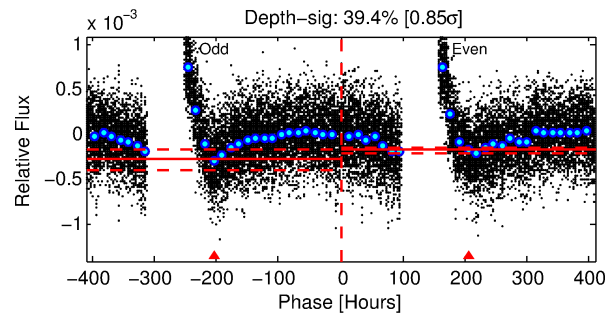
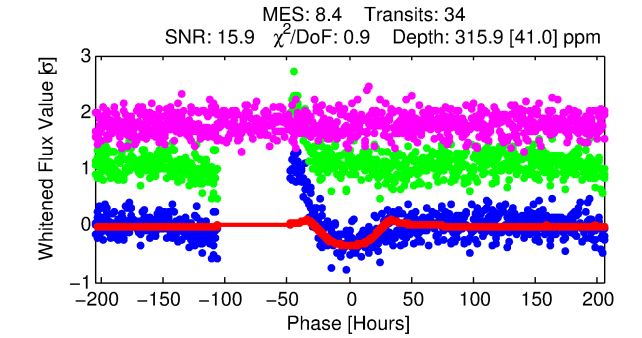
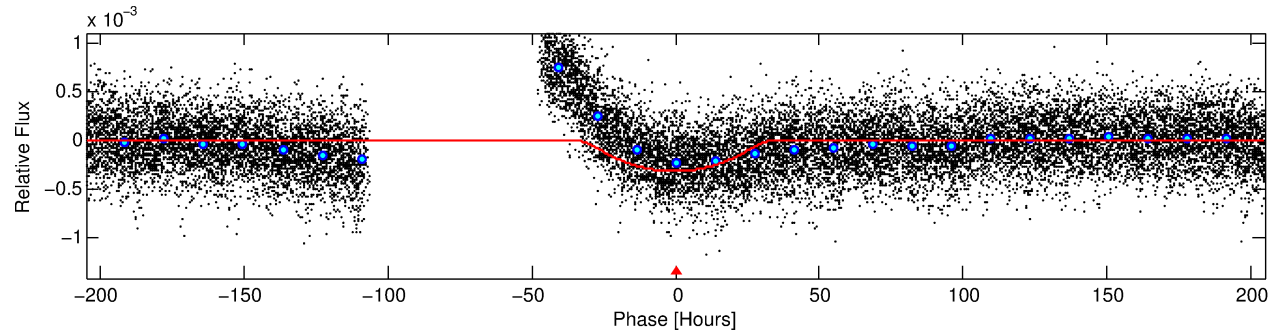
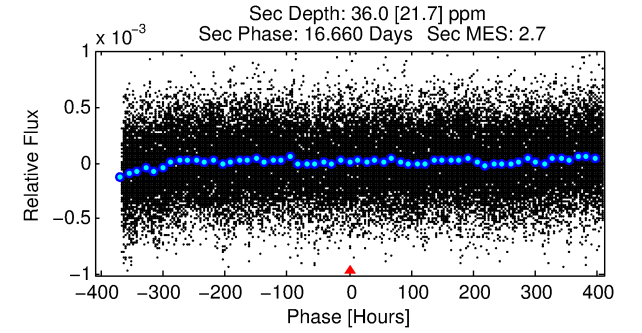
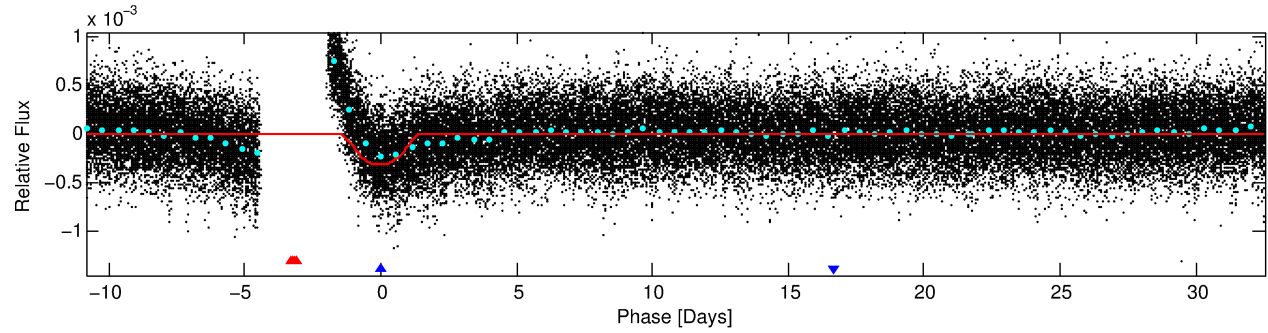
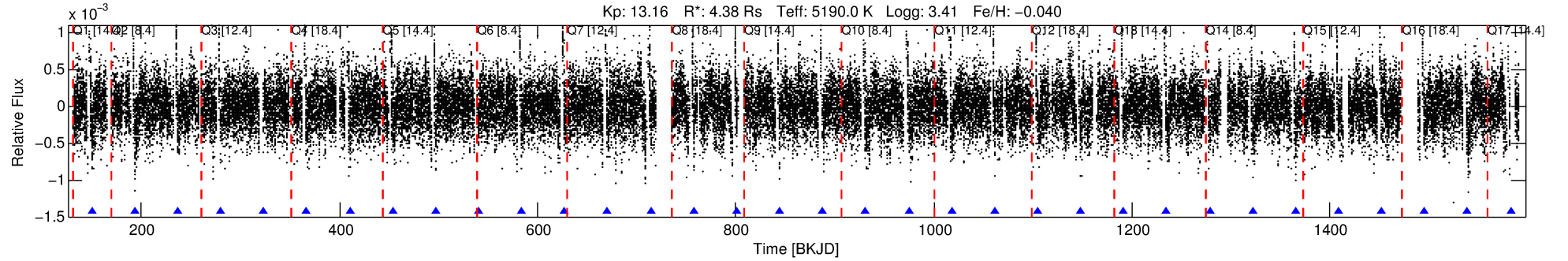
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006042191-02

No Significant Match Found

DV One-Page Summary

KIC: 6042191 Candidate: 2 of 2 Period: 43.398 d



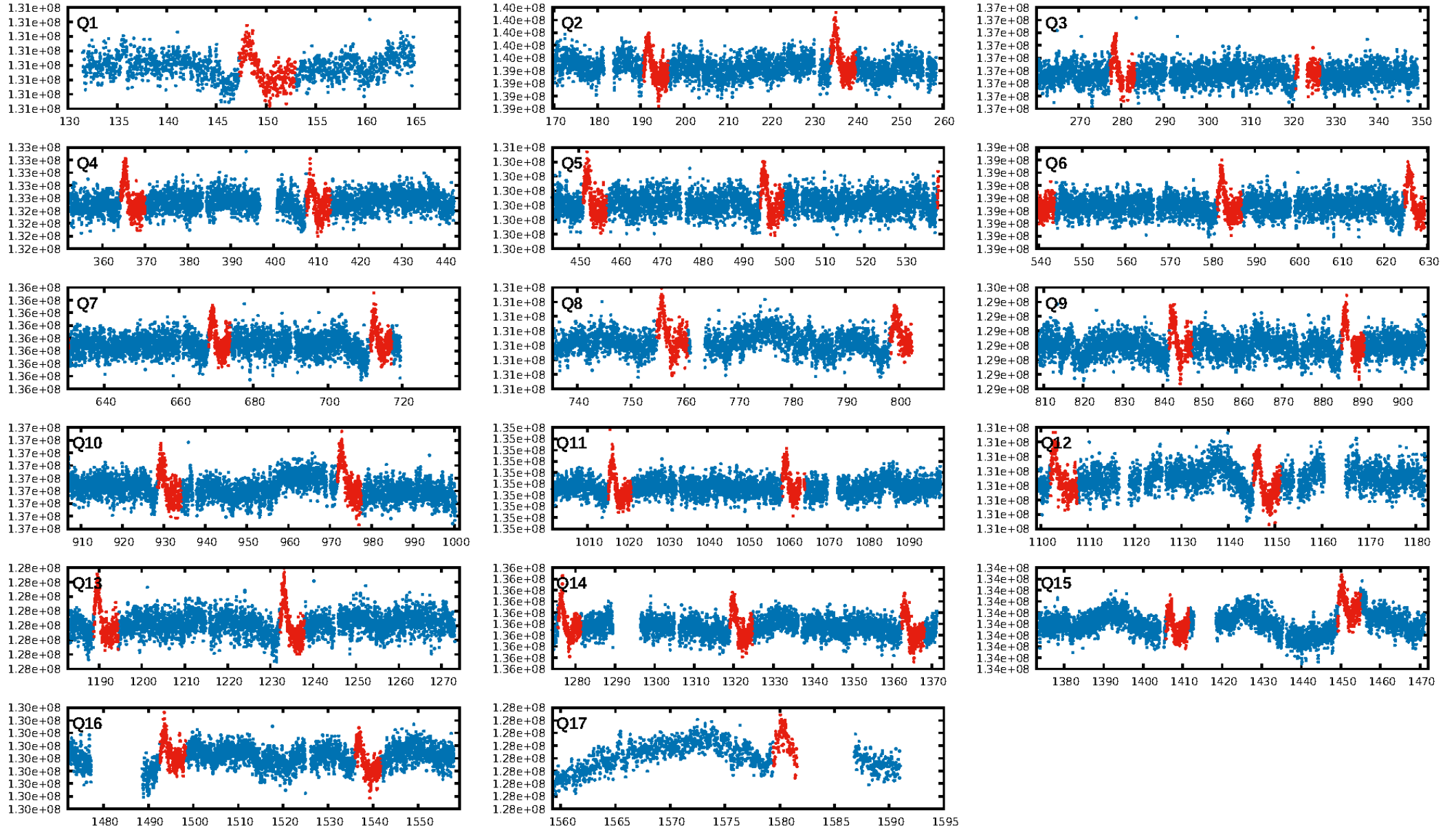
DV Fit Results:

Period = 43.39784 [0.00433] d
Epoch = 150.1146 [0.0803] BKJD
Rp/R* = 0.0232 [0.0026]
a/R* = 1.76 [0.12]
b = 0.98 [0.01]
Seff = 143.77 [139.34]
Teff = 883 [214] K
Rp = 11.09 [6.70] Re
a = 0.2943 [0.1735] AU
Ag = 13.93 [16.11] [0.80 σ]
Teffp = 2637 [434] K [3.63 σ]

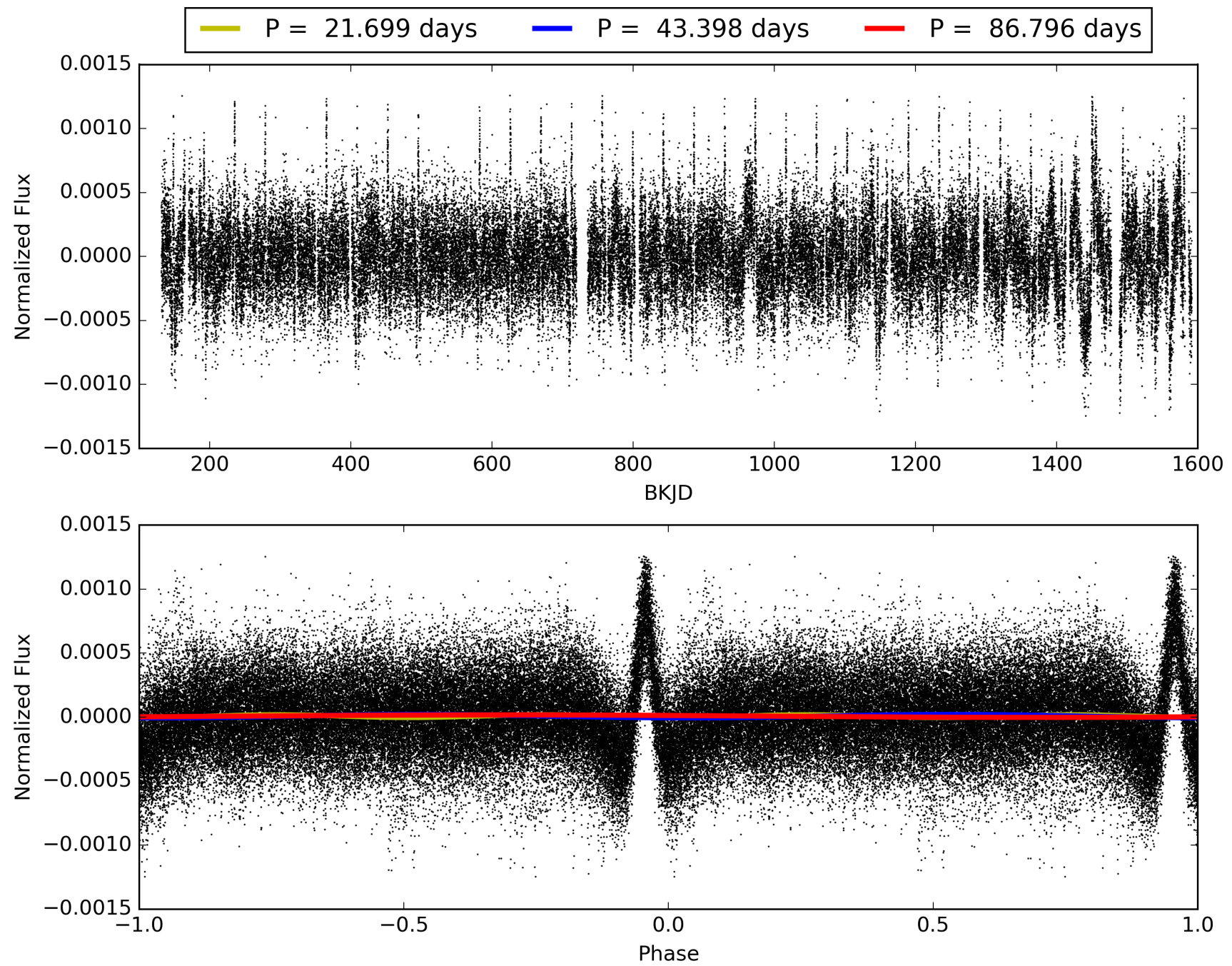
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.2% [0.00 σ]
ModelChiSquare2-sig: 96.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.08e-15
RollingBand-fgt: 1.00 [32/32]
GhostDiagnostic-chr: 1.863
Centroid-sig: 2.8%
Centroid-so: 0.206 arcsec [1.57 σ]
OotOffset-rm: 0.831 arcsec [1.95 σ]
KicOffset-rm: 0.801 arcsec [1.62 σ]
OotOffset-st: 2/1/3/1 [7]
KicOffset-st: 2/1/3/1 [7]
DiffImageQuality-fgm: 0.86 [6/7]
DiffImageOverlap-fno: 0.00 [0/9]

TCE 006042191-02, PDC Light Curves

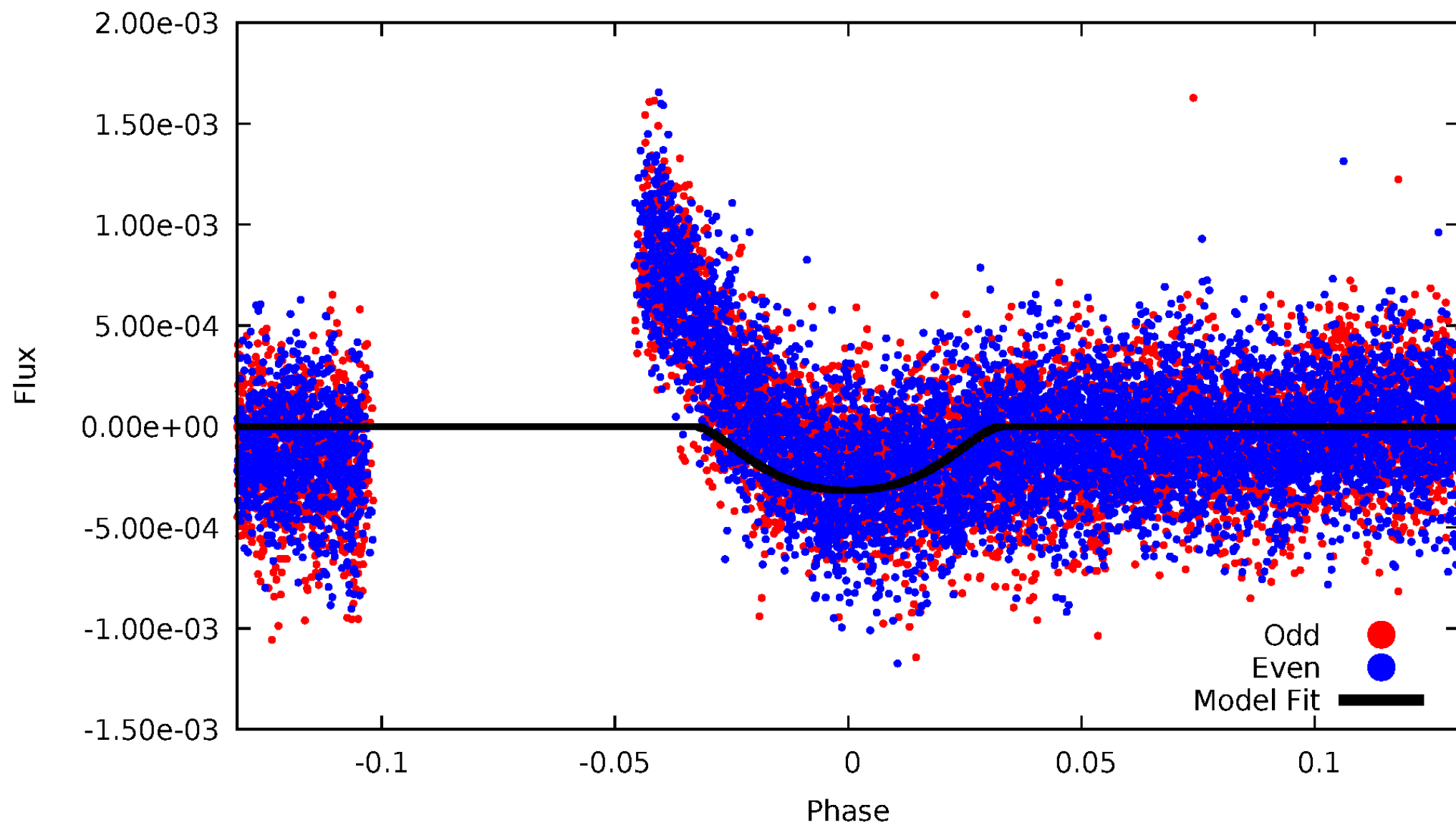


TCE 006042191-02



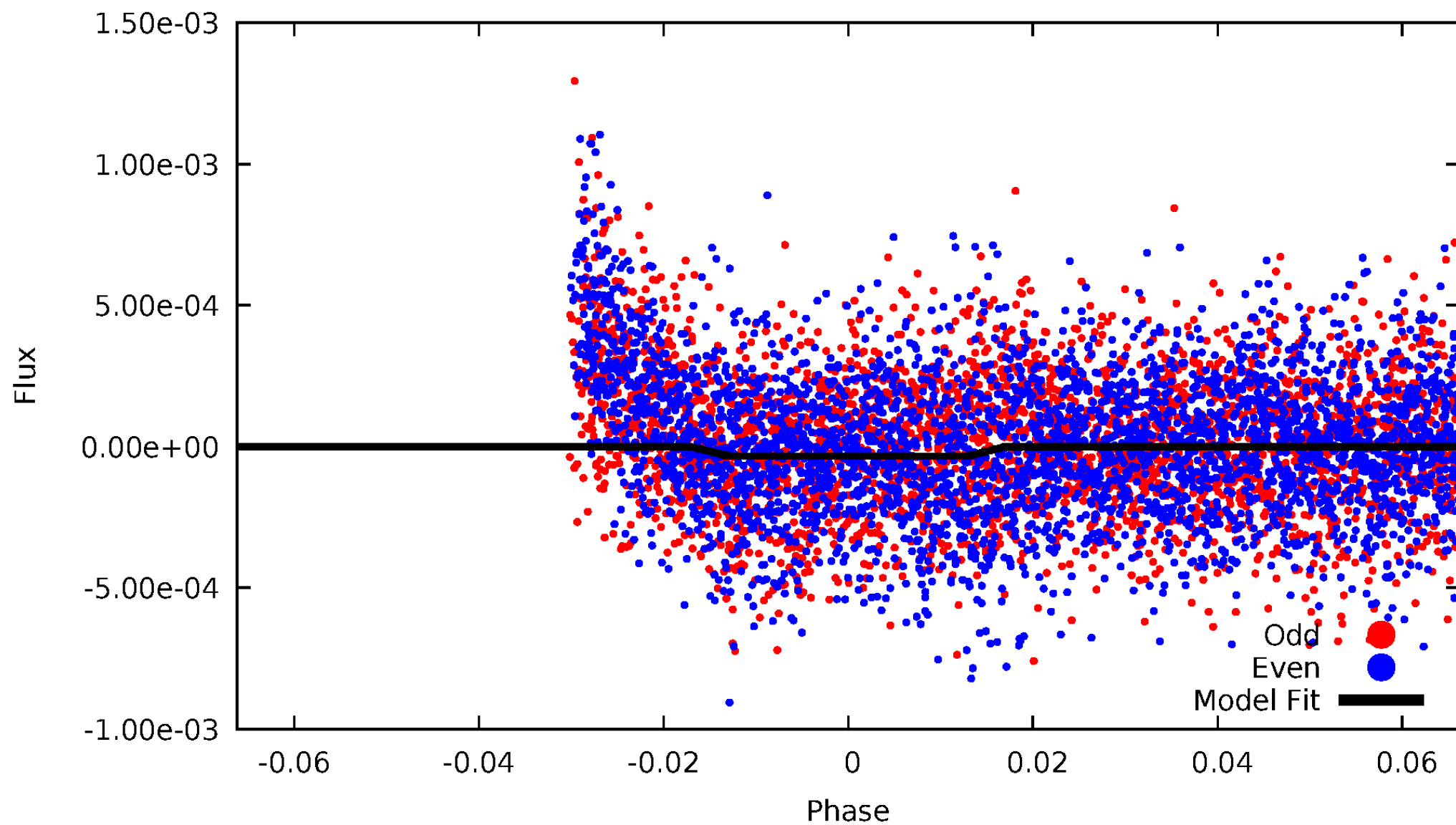
DV Odd/Even

TCE 006042191-02



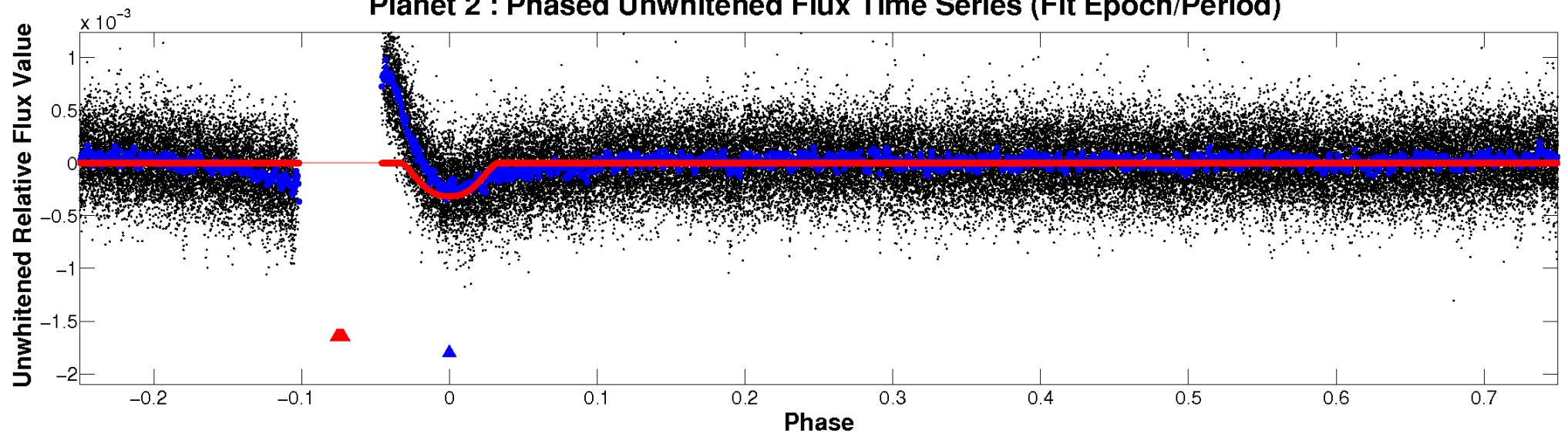
ALT Odd/Even

TCE 006042191-02

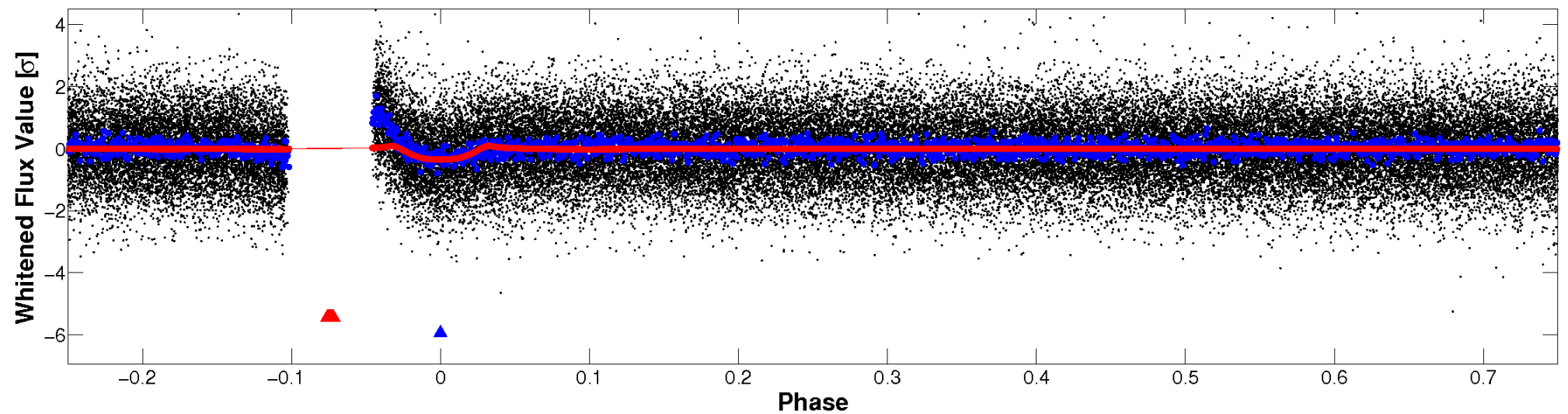


Non-Whitened Vs. Whitened Light Curve

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

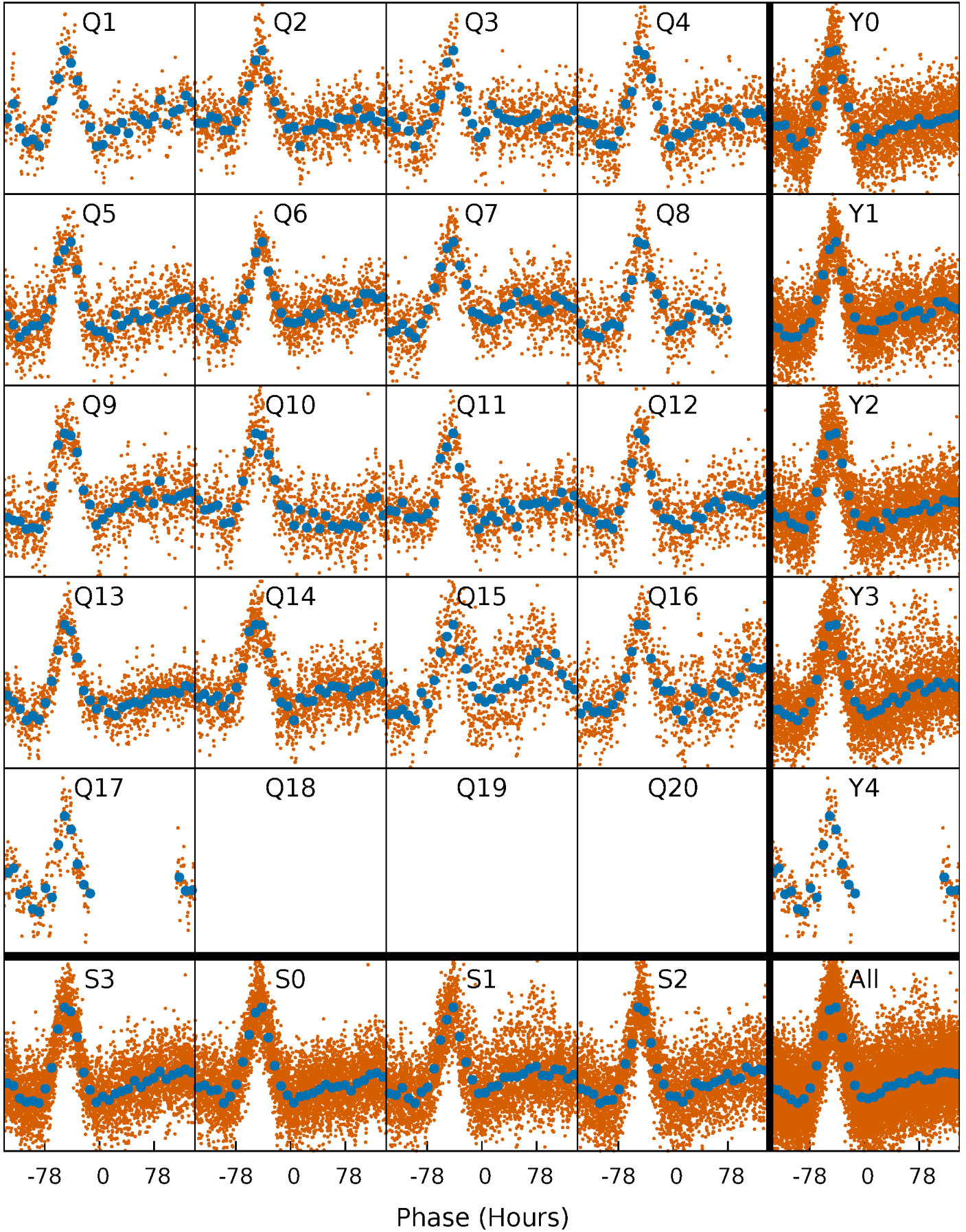


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



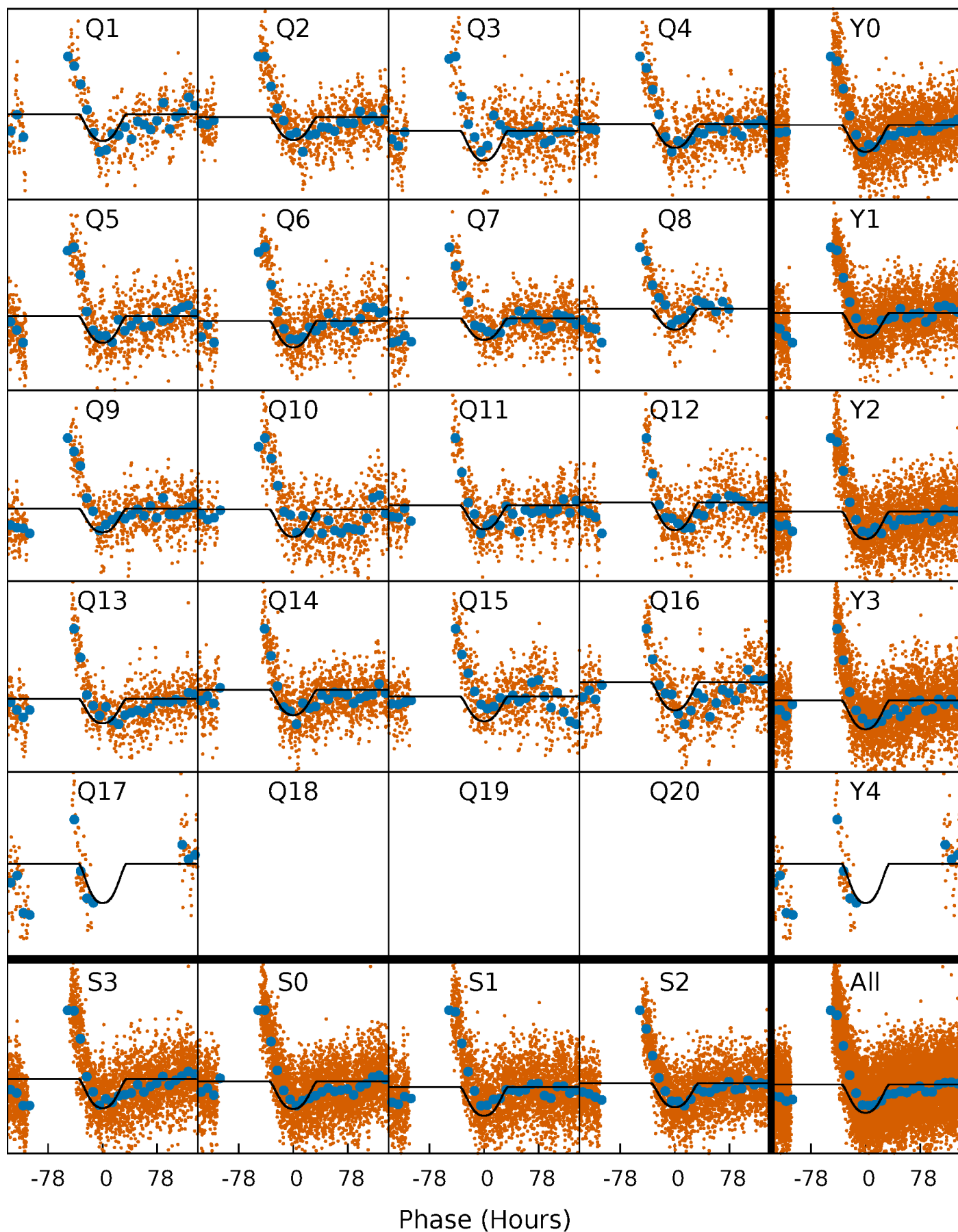
PDC Quarter-Phased Transit Curves

TCE 006042191-02 P= 43.397845 Days $T_0=150.114563$ (BKJD)



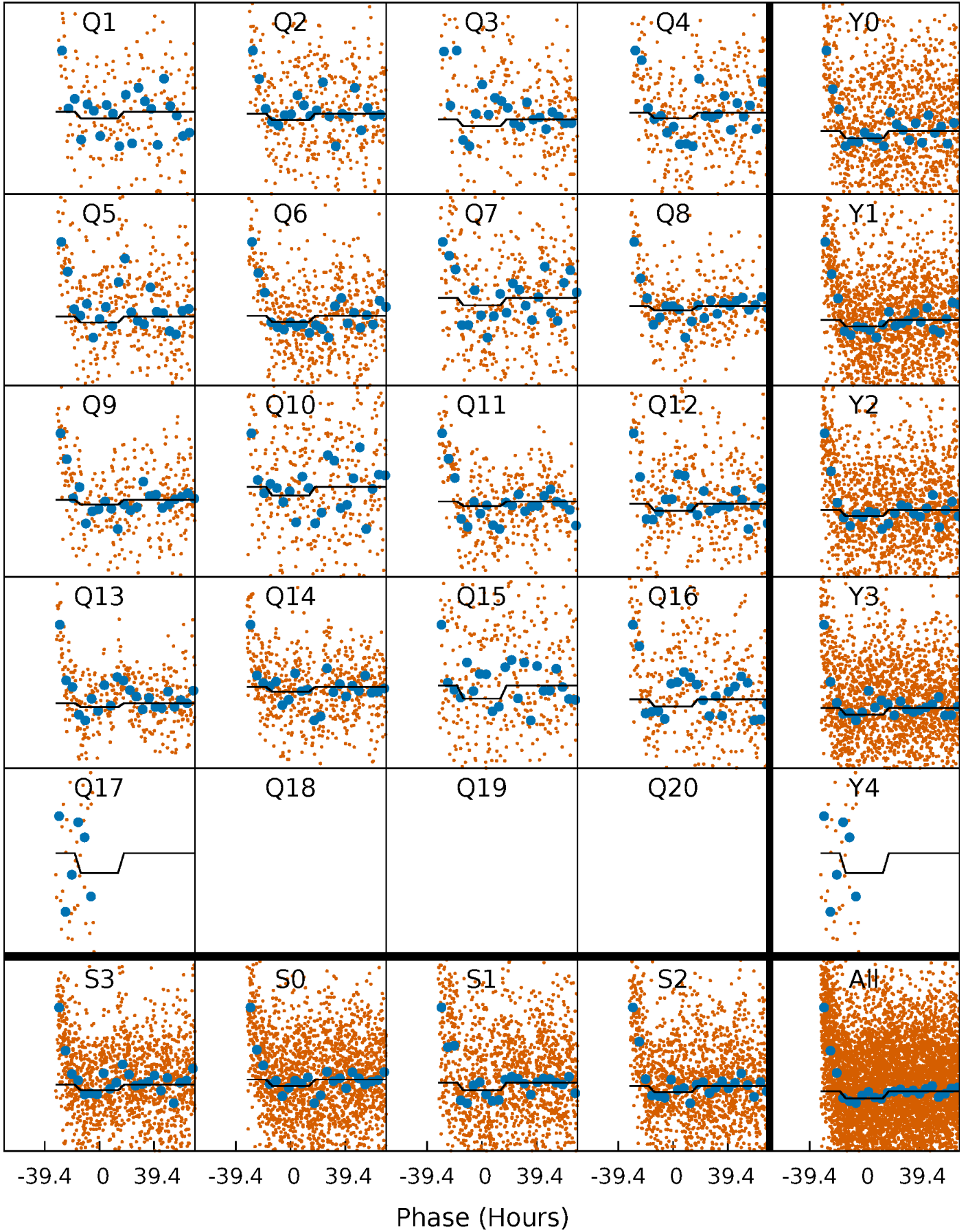
DV Quarter-Phased Transit Curves

TCE 006042191-02 P= 43.397845 Days $T_0=150.114563$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

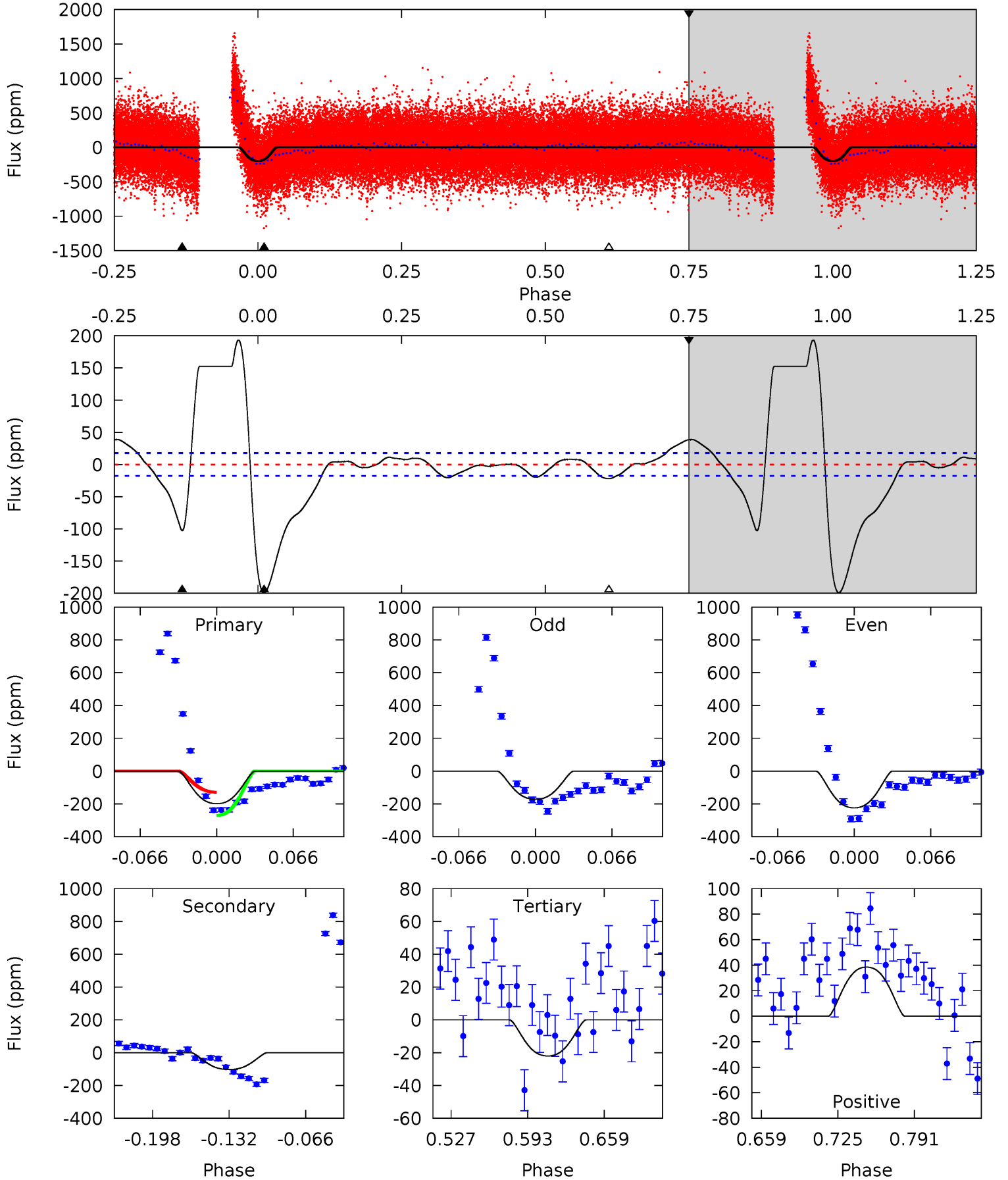
TCE 006042191-02 $P = 43.406078$ Days $T_0 = 149.344664$ (BKJD)



DV Model-Shift Uniqueness Test

006042191-02, P = 43.397845 Days, E = 106.716718 Days

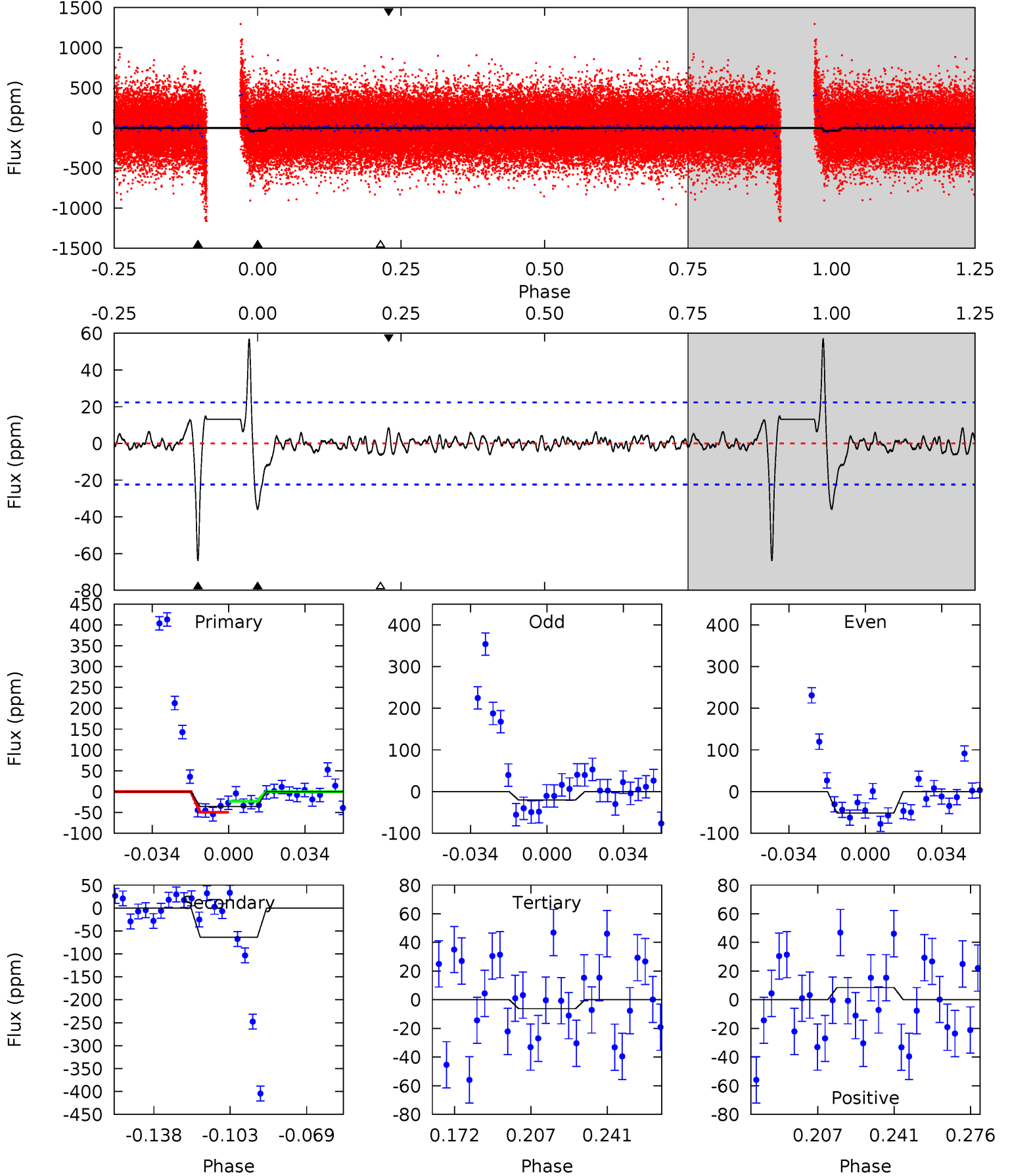
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 52.1 | 26.9 | 5.77 | 10.1 | 4.65 | 1.84 | 4.54 | 46.4 | 42.0 | 21.1 | 16.8 | 6.84 | 0.99 | 0.49 | 17.6 |



Alt Model-Shift Uniqueness Test

006042191-02, P = 43.406078 Days, E = 105.938586 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.68 | 13.6 | 1.33 | 1.82 | 4.78 | 2.11 | 0.54 | 6.35 | 5.86 | 12.3 | 11.8 | 3.34 | 1.09 | 0.47 | 2.83 |



Stellar Parameters For KIC 006042191

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5190^{+171}_{-171} | $3.412^{+0.570}_{-0.228}$ | $-0.040^{+0.300}_{-0.300}$ | $4.376^{+1.112}_{-2.596}$ | $1.802^{+0.211}_{-0.843}$ | $0.030^{+0.209}_{-0.015}$ |
| | +3%/-3% | +17%/-7% | +750%/-750% | +25%/-59% | +12%/-47% | +691%/-48% |
| 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 006042191-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|--------------|-------------------------|----------------------|------------------------|----------------------|
| DV | -103 ± 4 | $10.50^{+2.88}_{-3.35}$ | 1221^{+119}_{-177} | 3781^{+185}_{-168} | 44^{+37}_{-17} |
| Alt. | -64 ± 5 | $2.48^{+1.59}_{-1.25}$ | 1230^{+116}_{-170} | 6074^{+2718}_{-1032} | 464^{+1404}_{-280} |

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

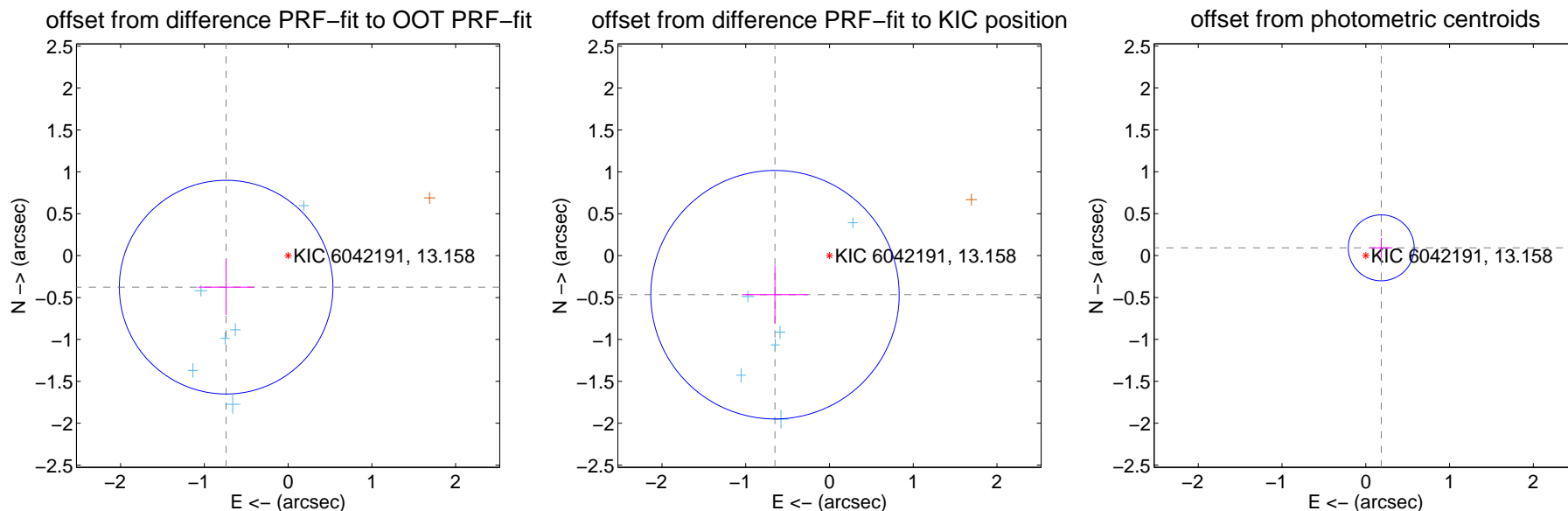
DV Centroid Data

Supplemental centroid analysis for 006042191-02. Kepler magnitude: 13.16. Transit SNR 15.89

There are 6 quarters with good PRF difference image offsets

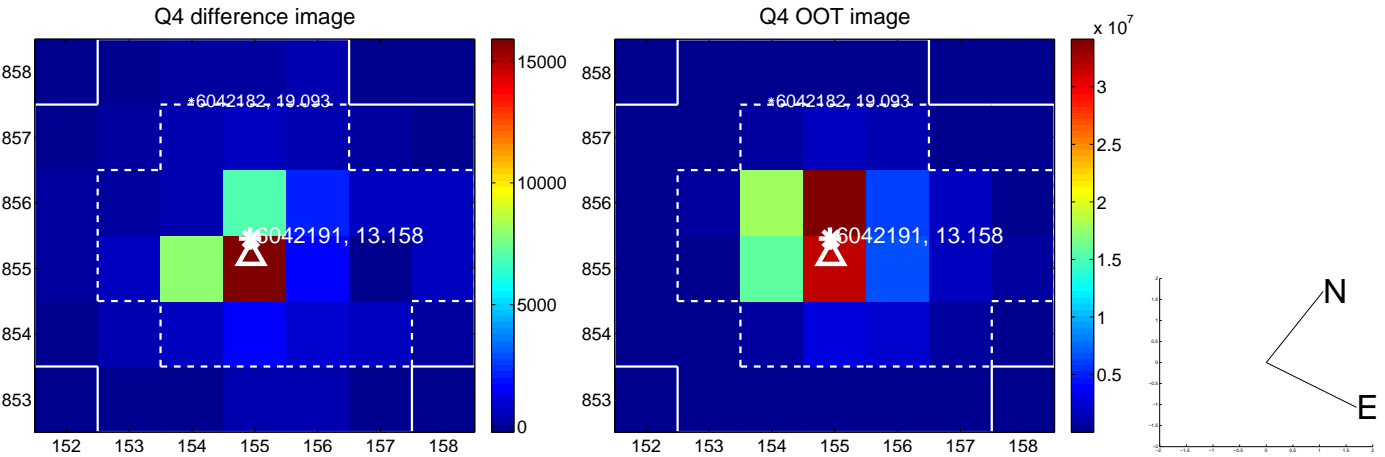
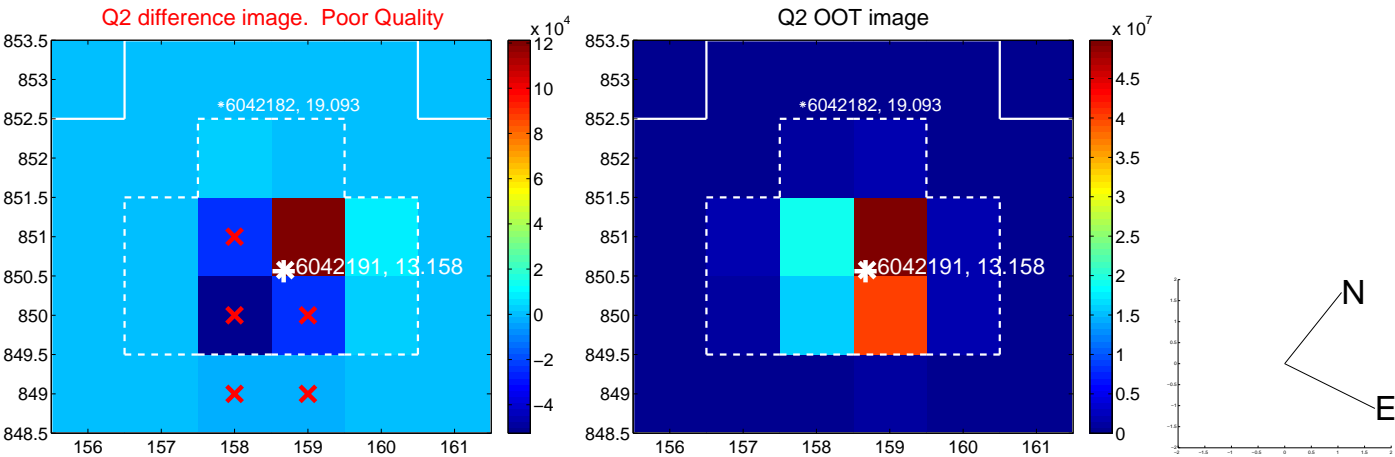
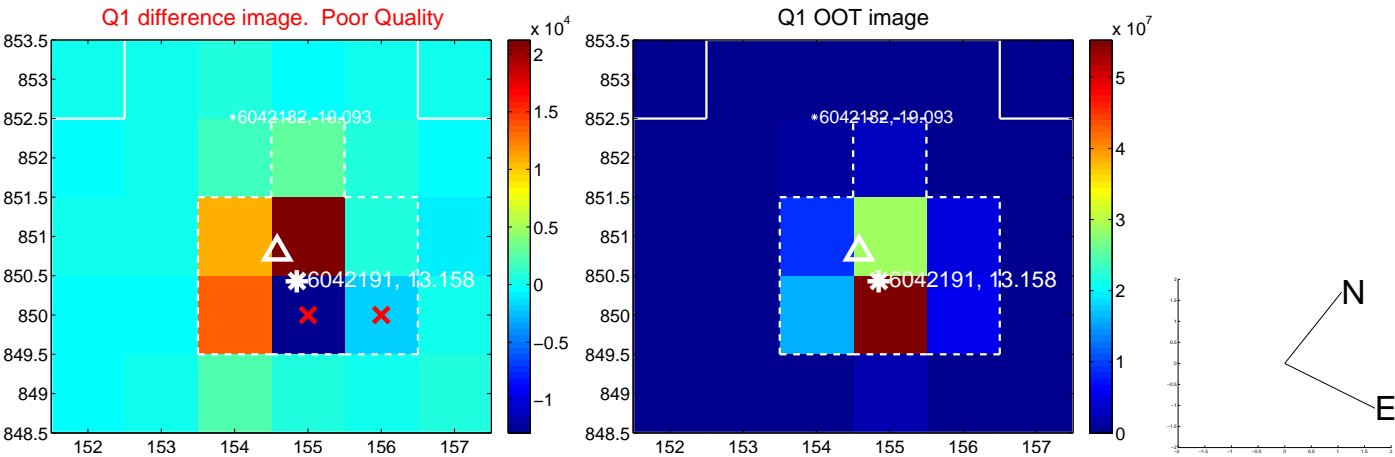
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.831 ± 0.425 | 1.95 | 0.741 ± 0.334 | -0.376 ± 0.334 |
| PRF-fit source offset from KIC position | 0.801 ± 0.494 | 1.62 | 0.651 ± 0.395 | -0.466 ± 0.347 |
| photometric centroid source offset | 0.21 ± 0.13 | 1.57 | -0.18 ± 0.13 | 0.09 ± 0.12 |

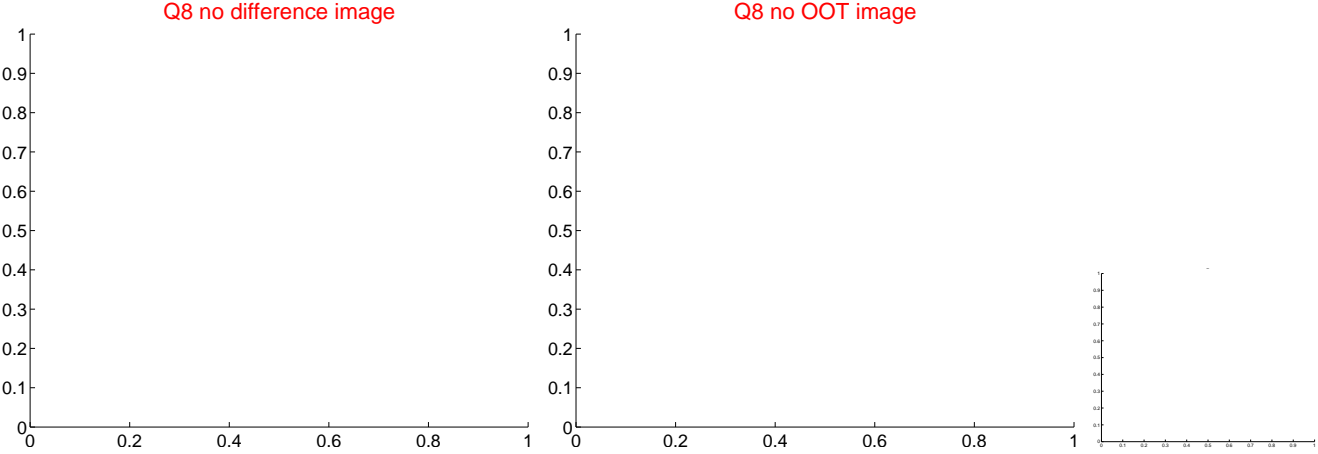
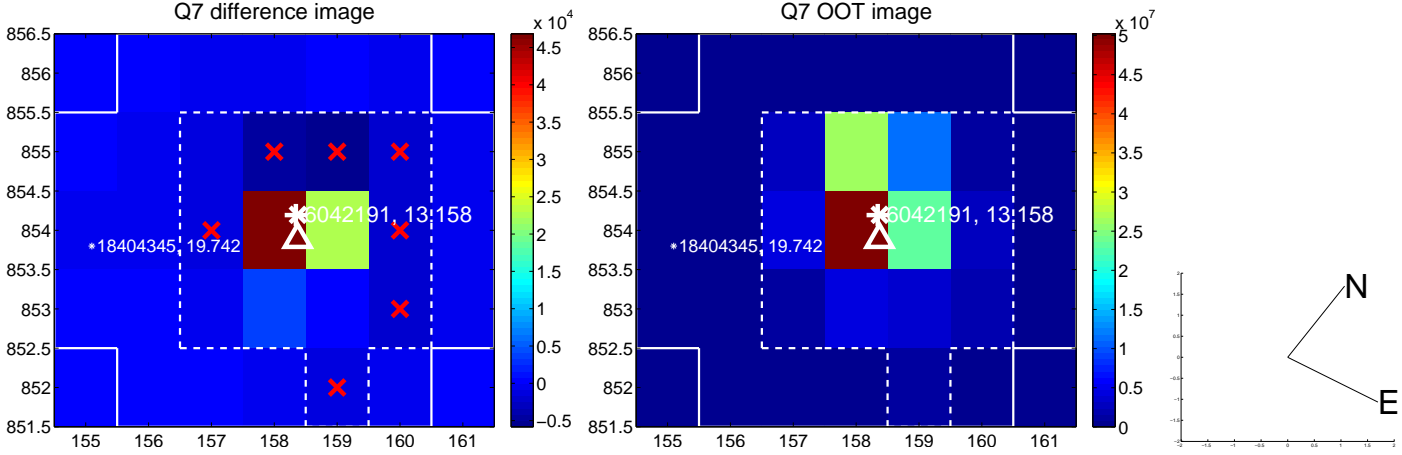
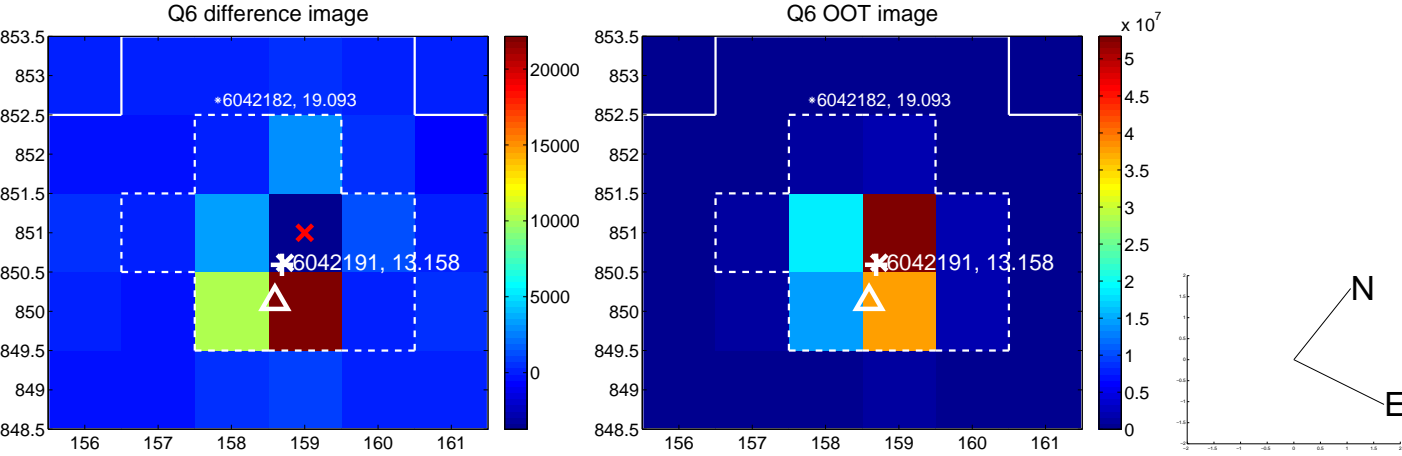
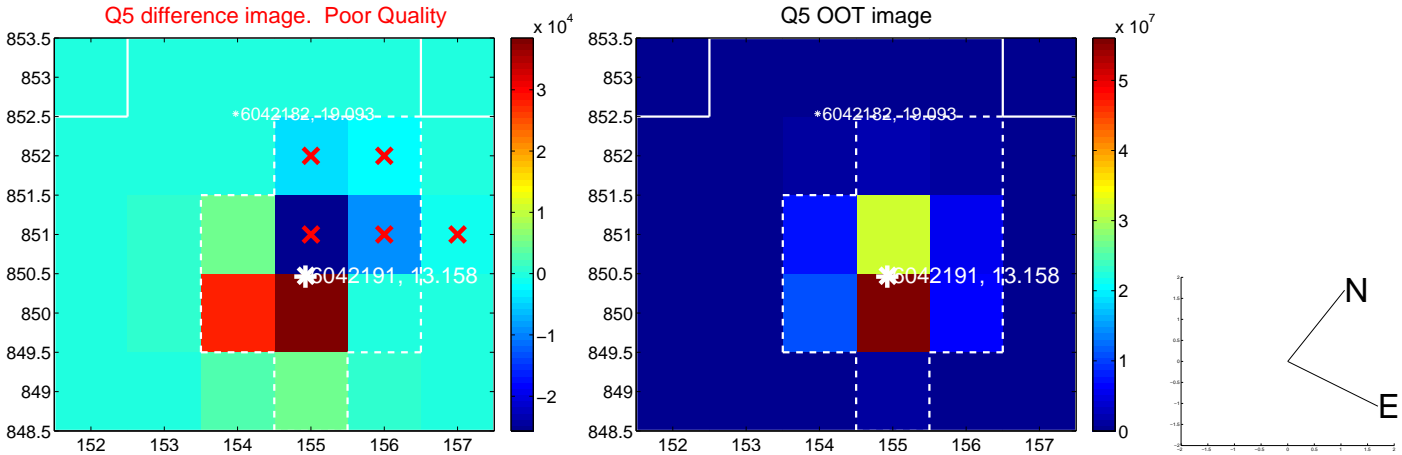


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

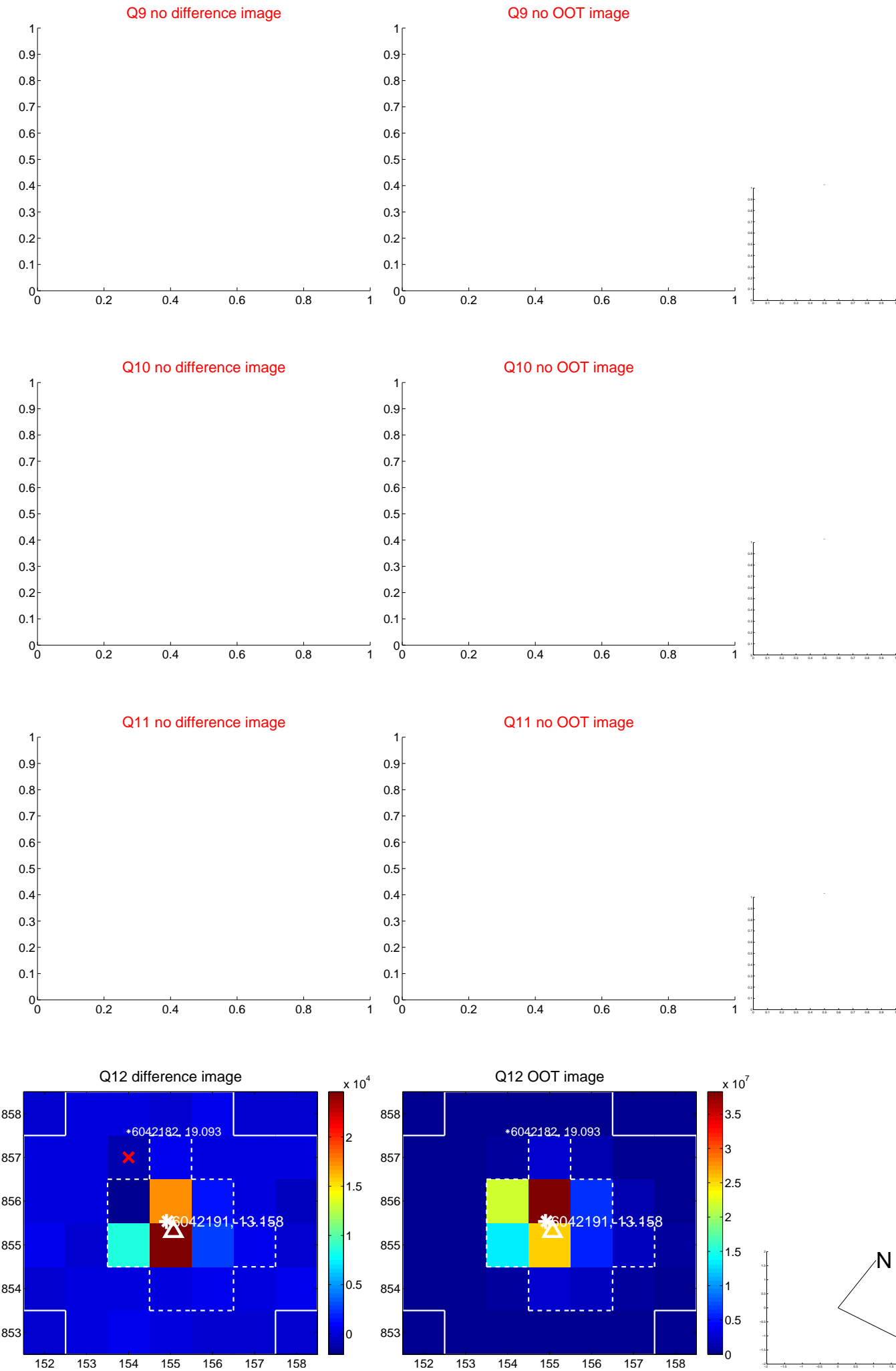
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

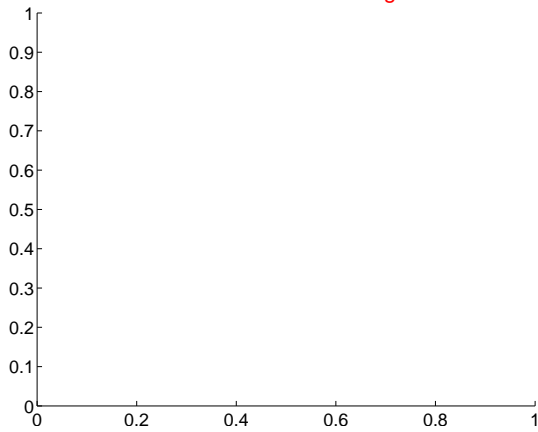


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

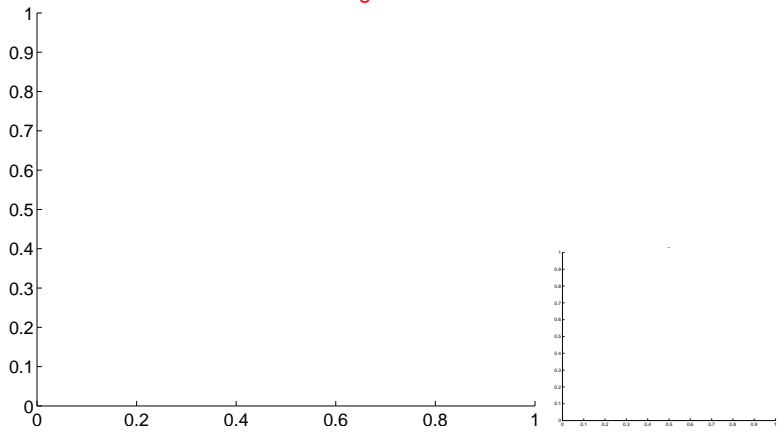


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

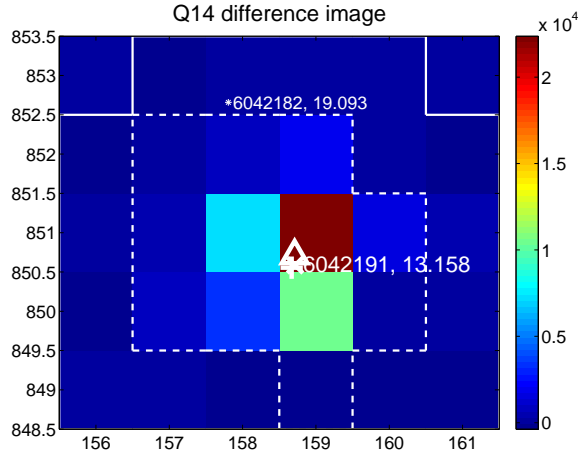
Q13 no difference image



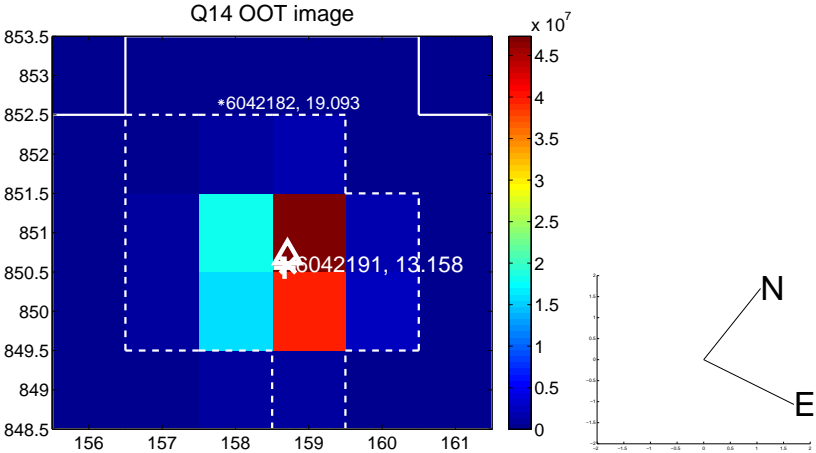
Q13 no OOT image



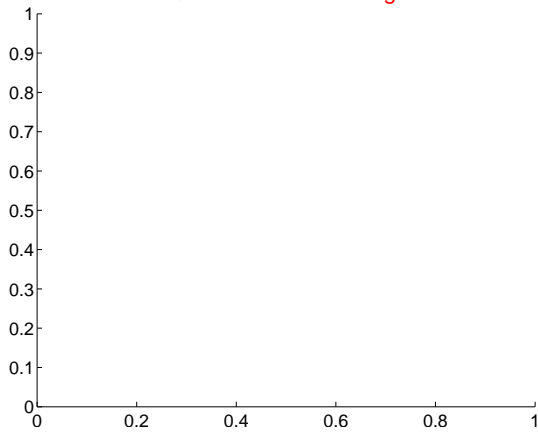
Q14 difference image



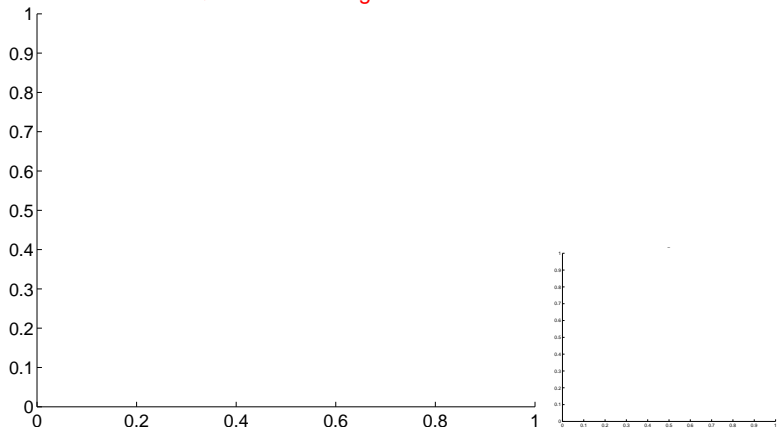
Q14 OOT image



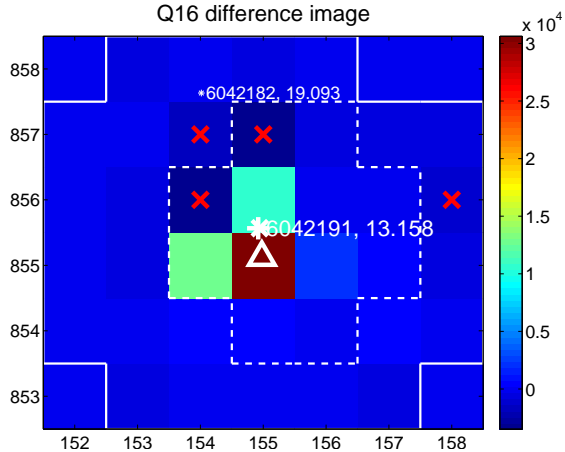
Q15 no difference image



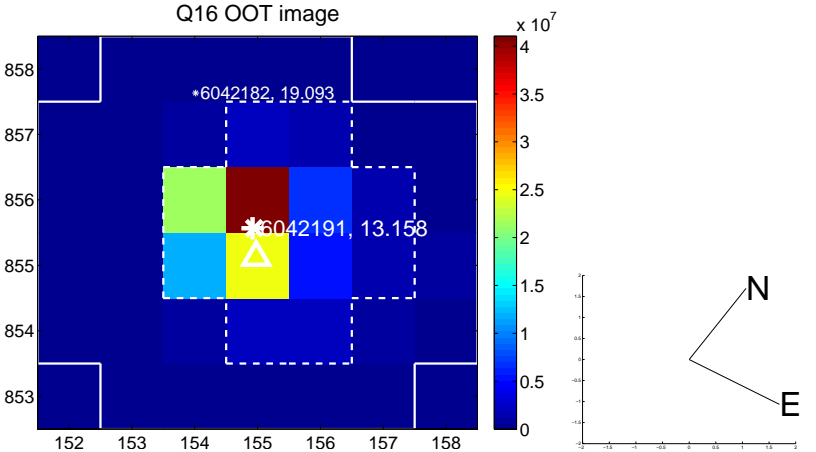
Q15 no OOT image



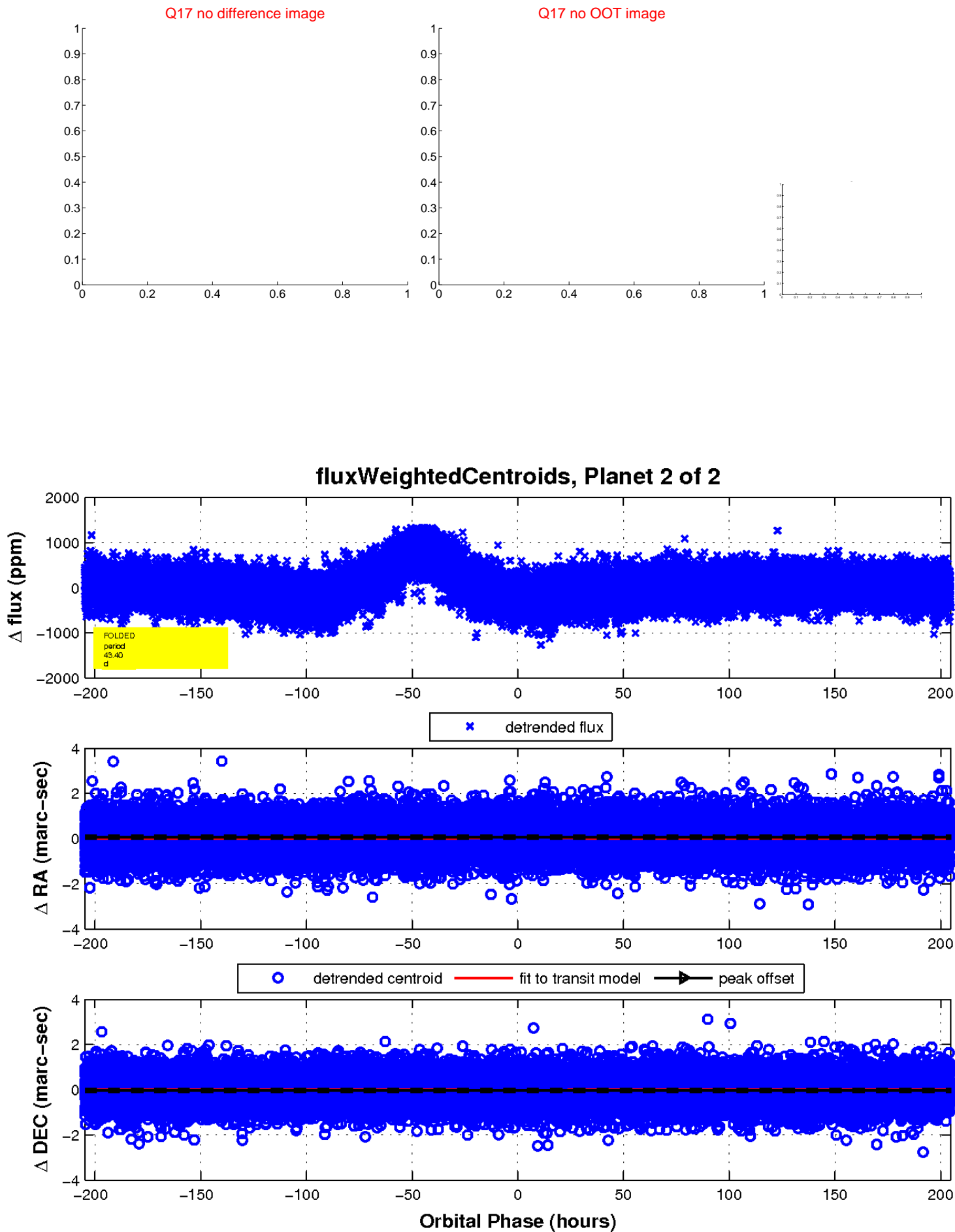
Q16 difference image



Q16 OOT image



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



UKIRT Image

Declination

