

KIC 008950952

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008950952-01 | OBS | No | 365.738507 | 362.264205 | 208.3 | 15.145 | 9.5 | 8.9 | 1.46 | 5881 | 2.22 | 2.35 |
| 008950952-02 | OBS | No | 338.184139 | 238.552877 | 158.8 | 13.453 | 8.6 | 7.9 | 1.46 | 5881 | 2.10 | 2.61 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 008950952-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 008950952-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_ZUMA—ALL_TRANS_CHASES—CENT_FEW_DIFFS |

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

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

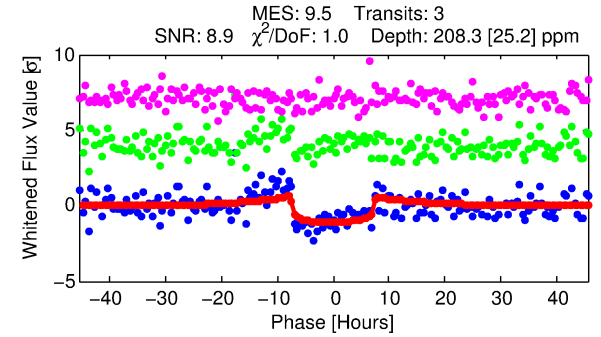
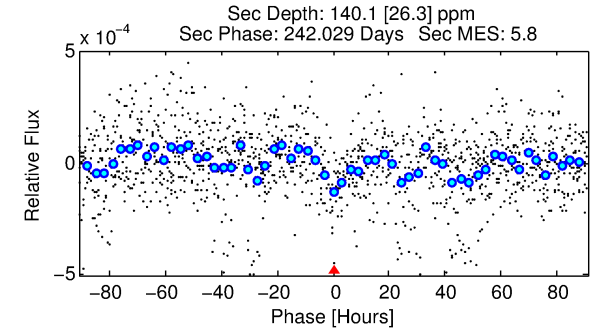
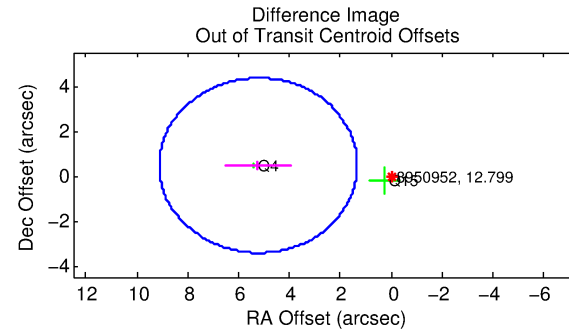
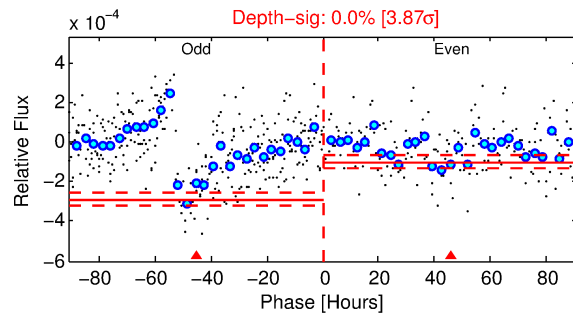
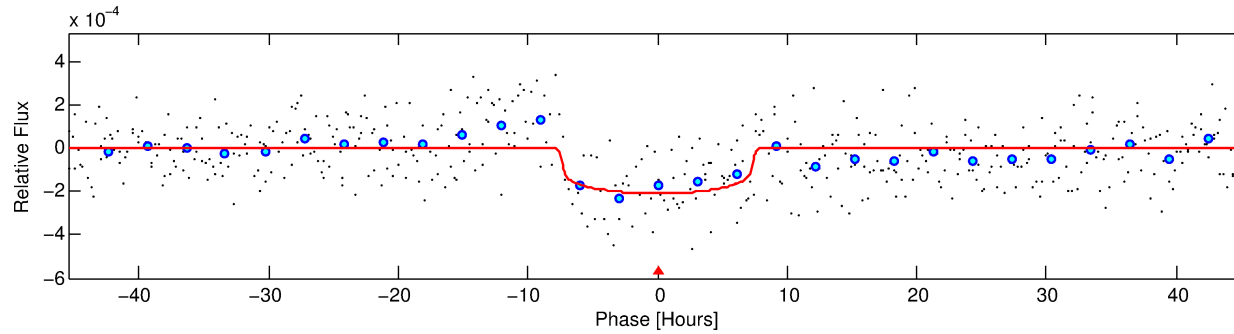
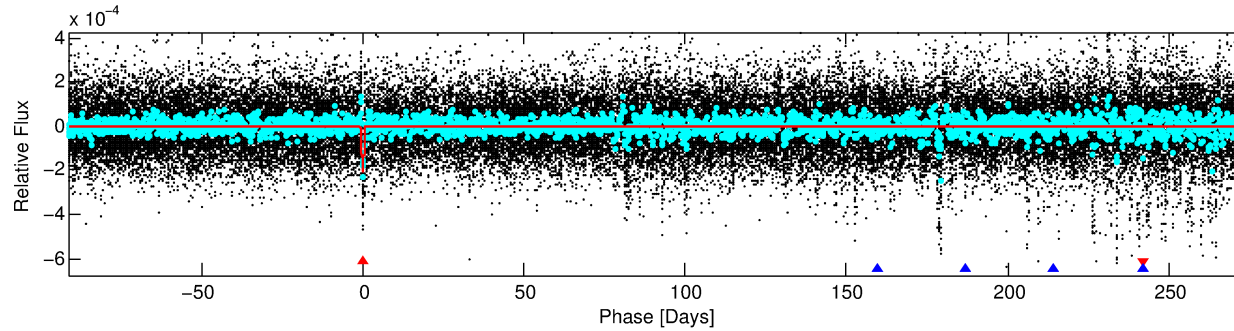
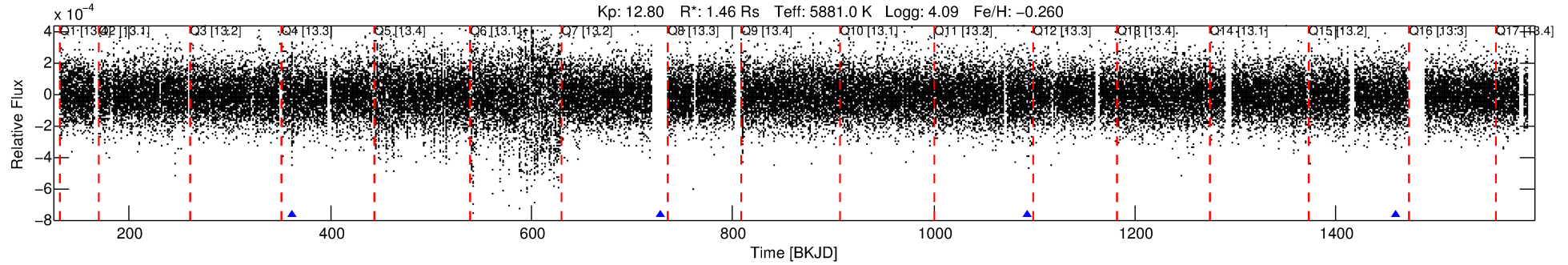
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008950952-01

No Significant Match Found

DV One-Page Summary

KIC: 8950952 Candidate: 1 of 2 Period: 365.739 d



DV Fit Results:

Period = 365.73851 [0.00720] d
Epoch = 362.2642 [0.0138] BKJD
Rp/R* = 0.0140 [0.0061]
a/R* = 142.88 [293.80]
b = 0.65 [1.81]
Seff = 2.35 [1.10]
Teq = 316 [37] K
Rp = 2.22 [1.15] Re
a = 0.9847 [0.2733] AU
Ag = 15150.27 [15270.74] [0.99 σ]
Teffp = 5415 [1225] K [4.16 σ]

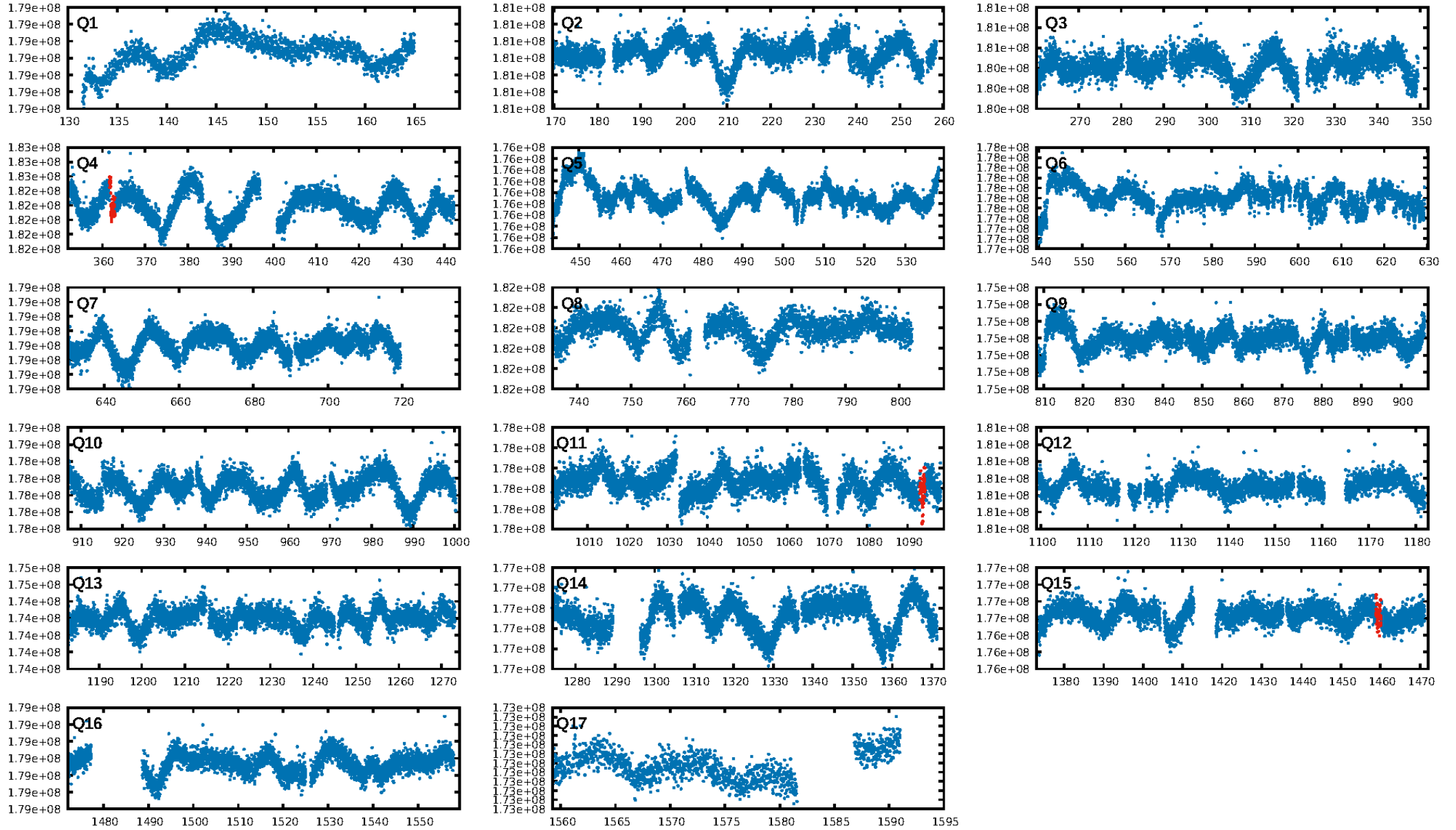
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.65 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 2.0%
ModelChiSquareGof-sig: 97.9%
Bootstrap-pfa: 2.35e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.4281
Centroid-sig: 4.9%
Centroid-so: 1.718 arcsec [1.33 σ]
OotOffset-rm: 5.244 arcsec [4.04 σ]
KicOffset-rm: 5.155 arcsec [3.96 σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

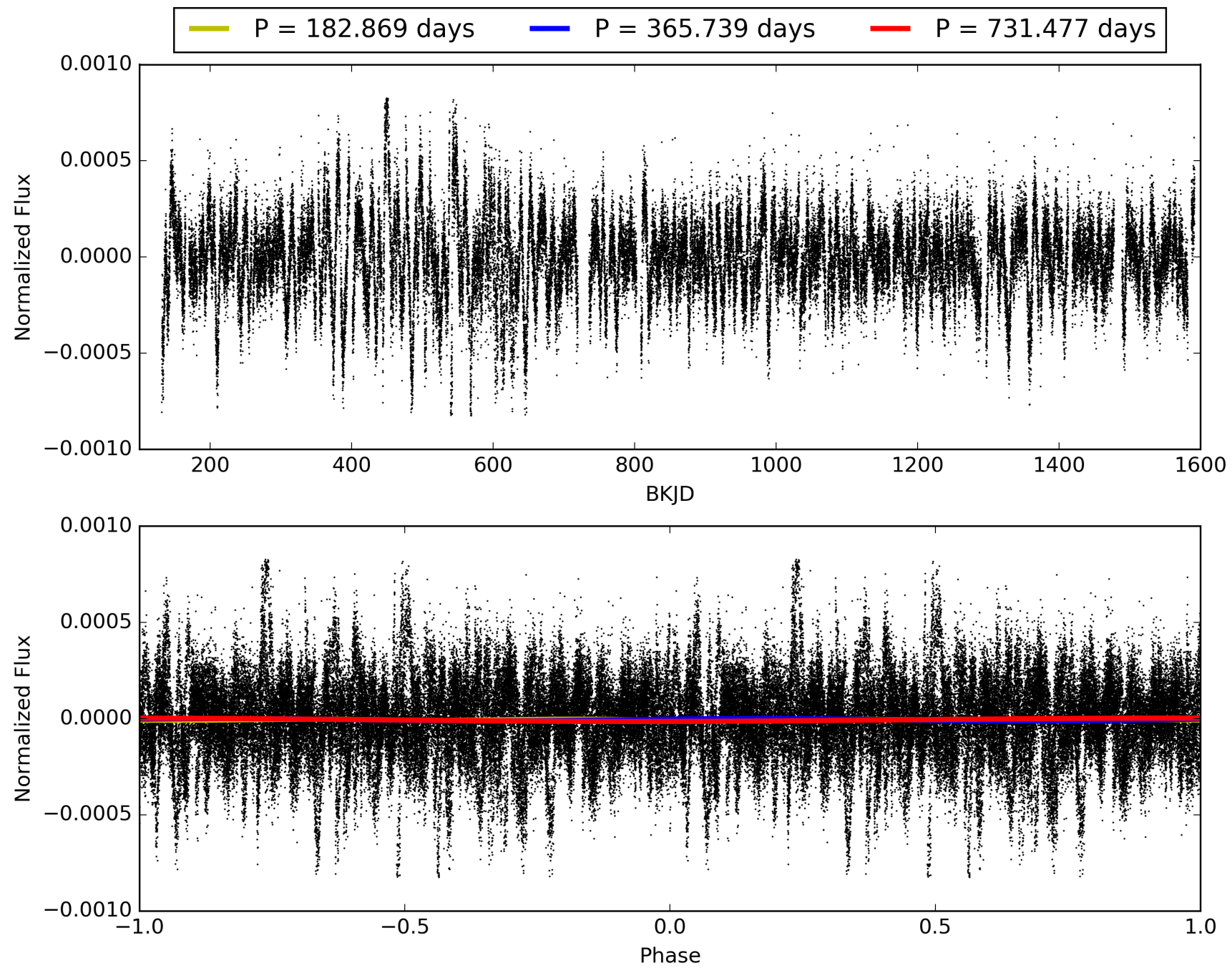
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:03:28 Z

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

TCE 008950952-01, PDC Light Curves

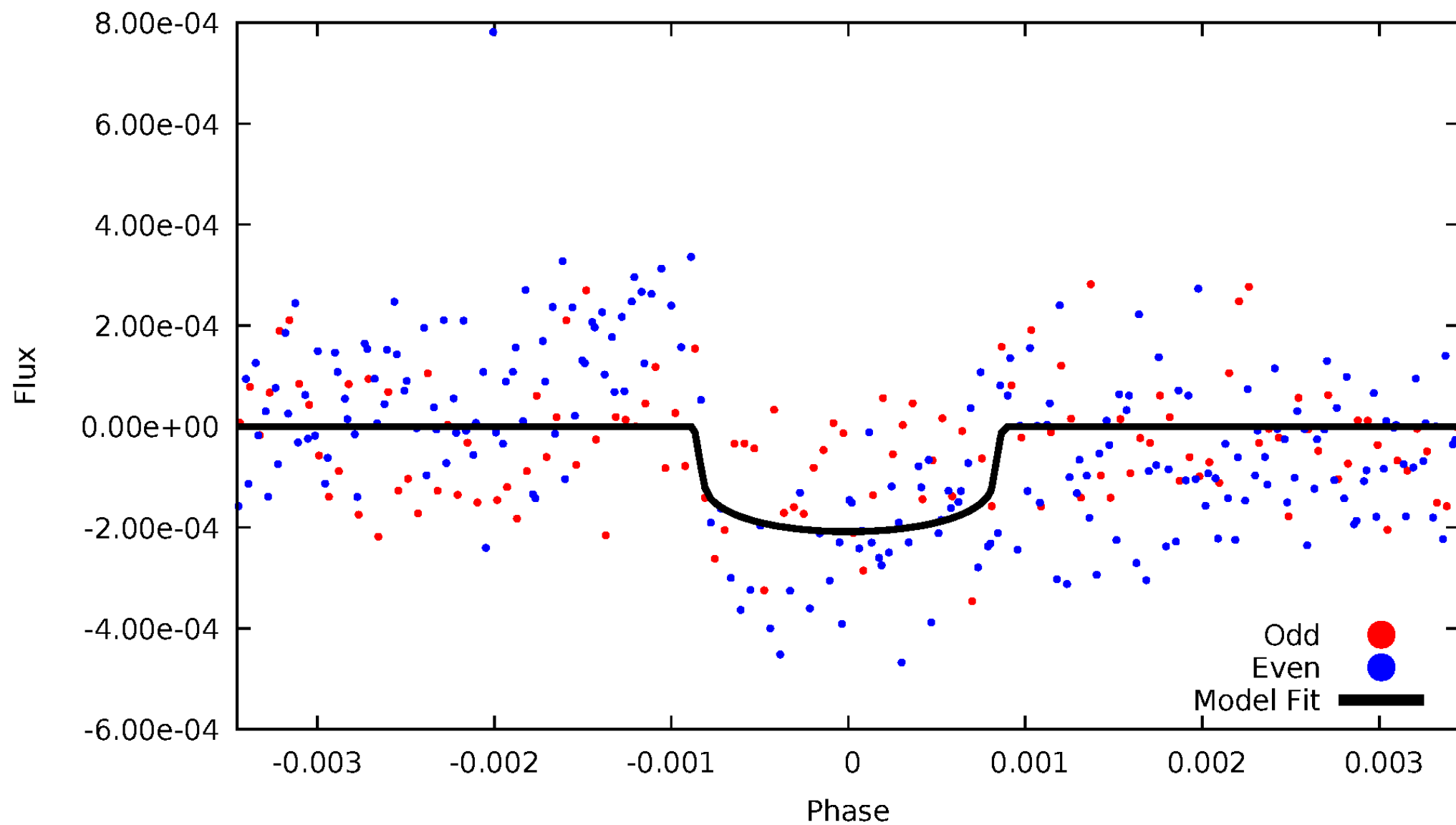


TCE 008950952-01



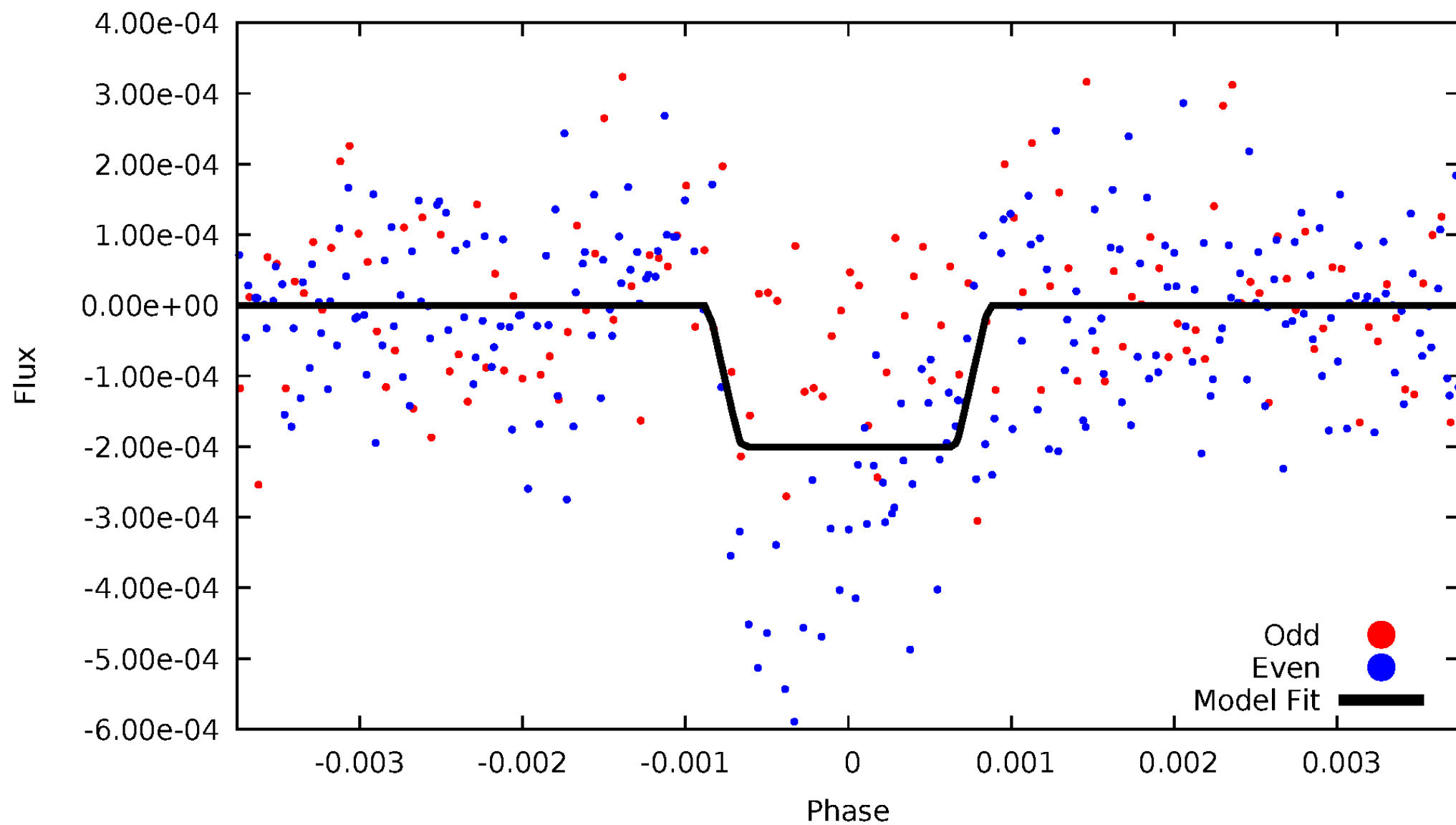
DV Odd/Even

TCE 008950952-01

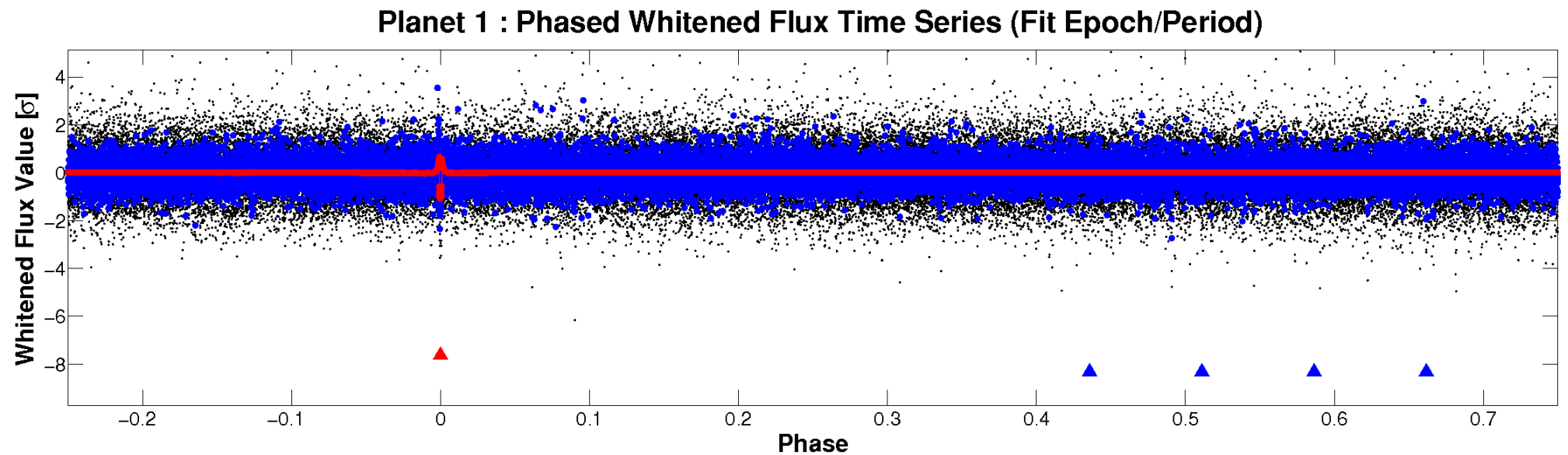
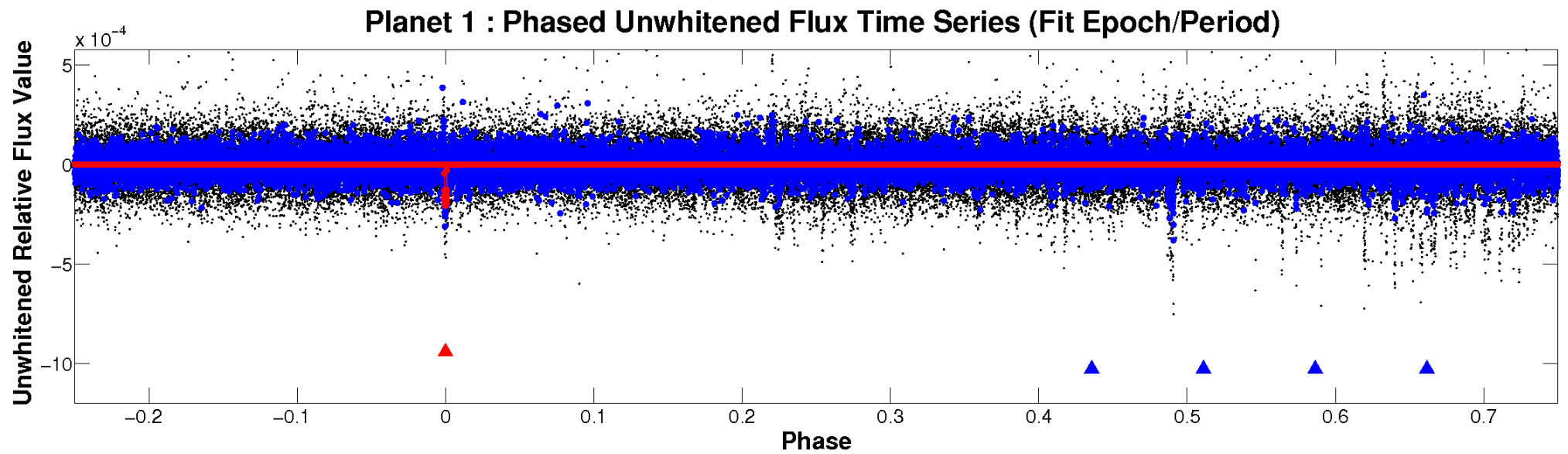


ALT Odd/Even

TCE 008950952-01

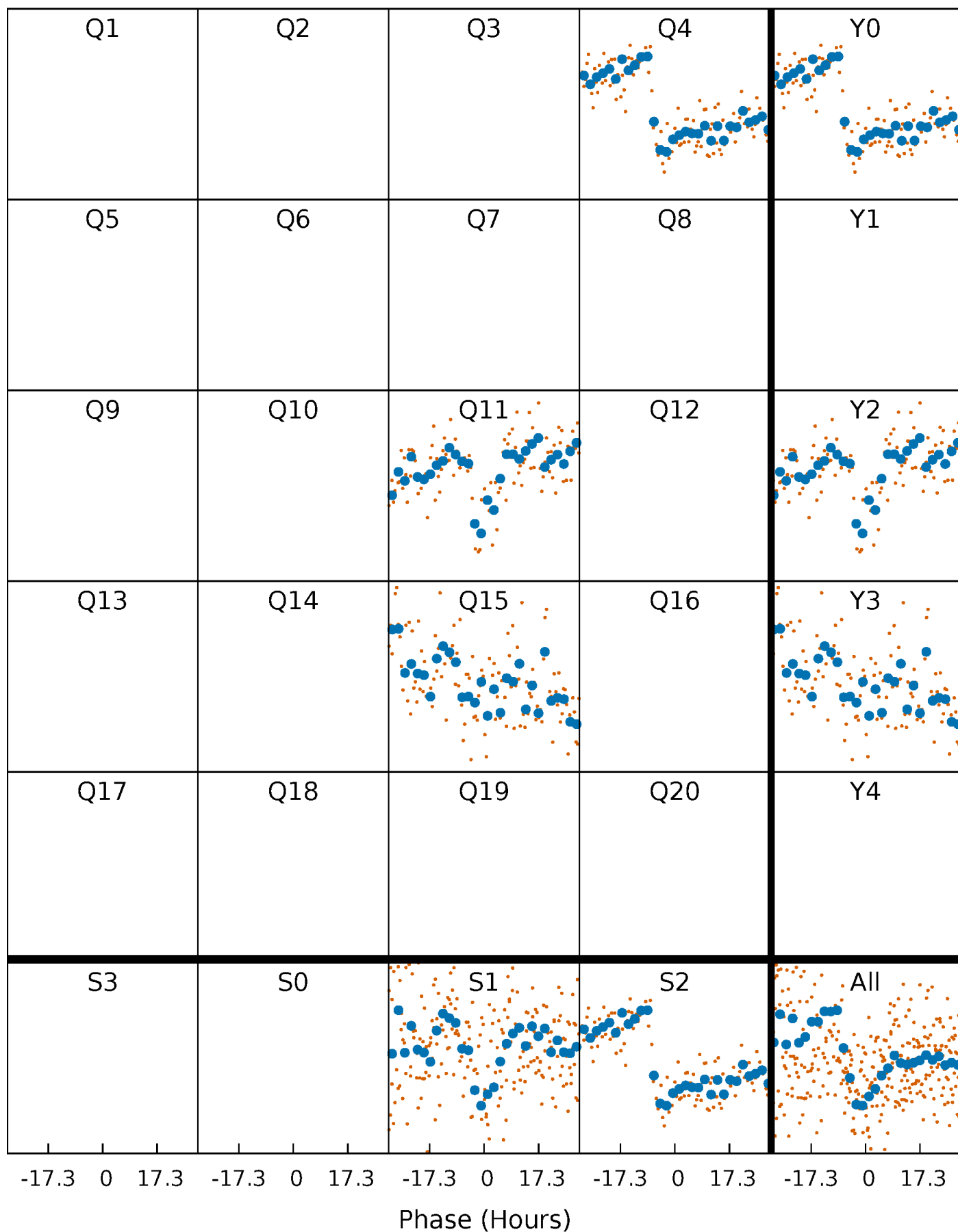


Non-Whitened Vs. Whitened Light Curve



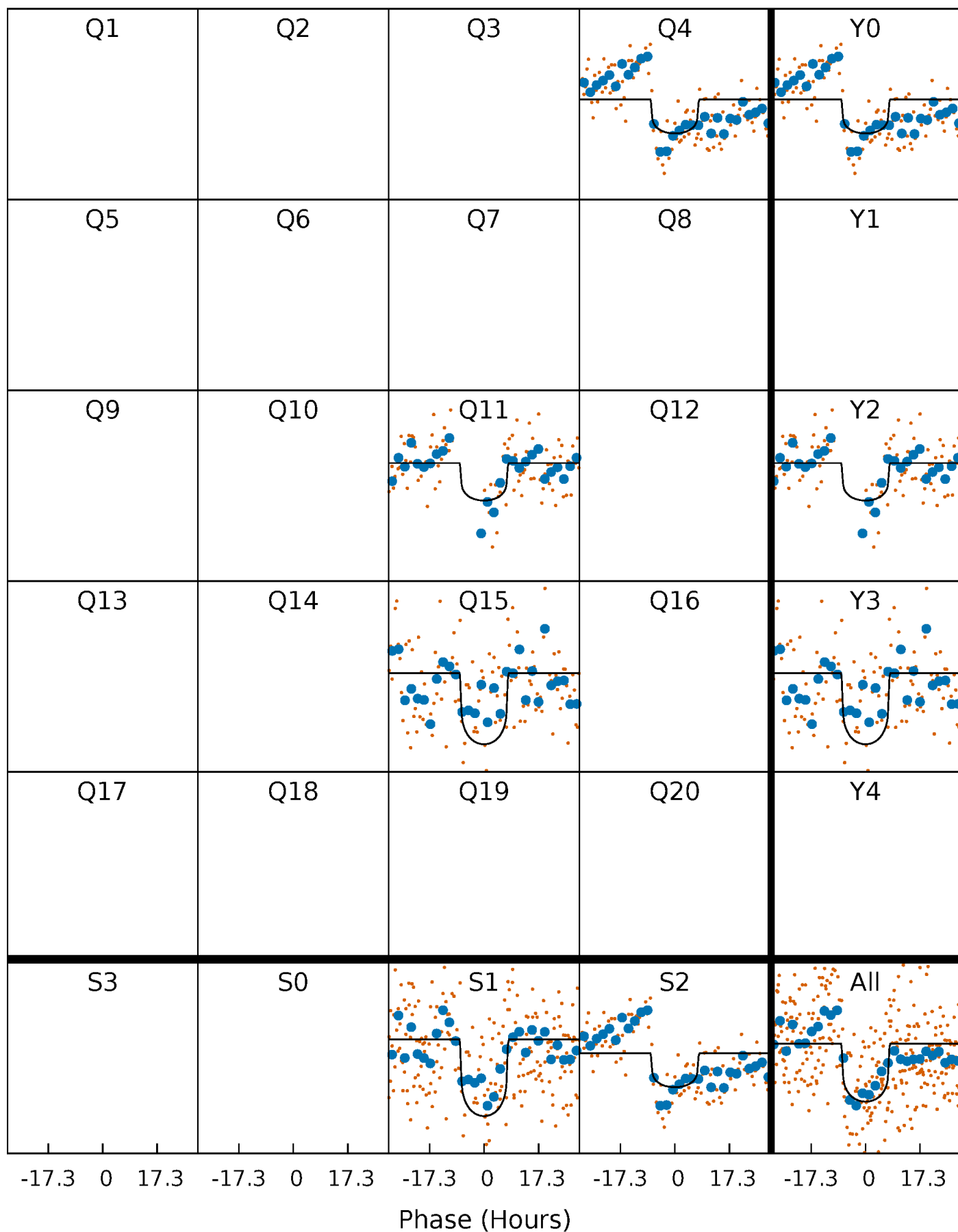
PDC Quarter-Phased Transit Curves

TCE 008950952-01 P=365.738507 Days $T_0=362.264205$ (BKJD)



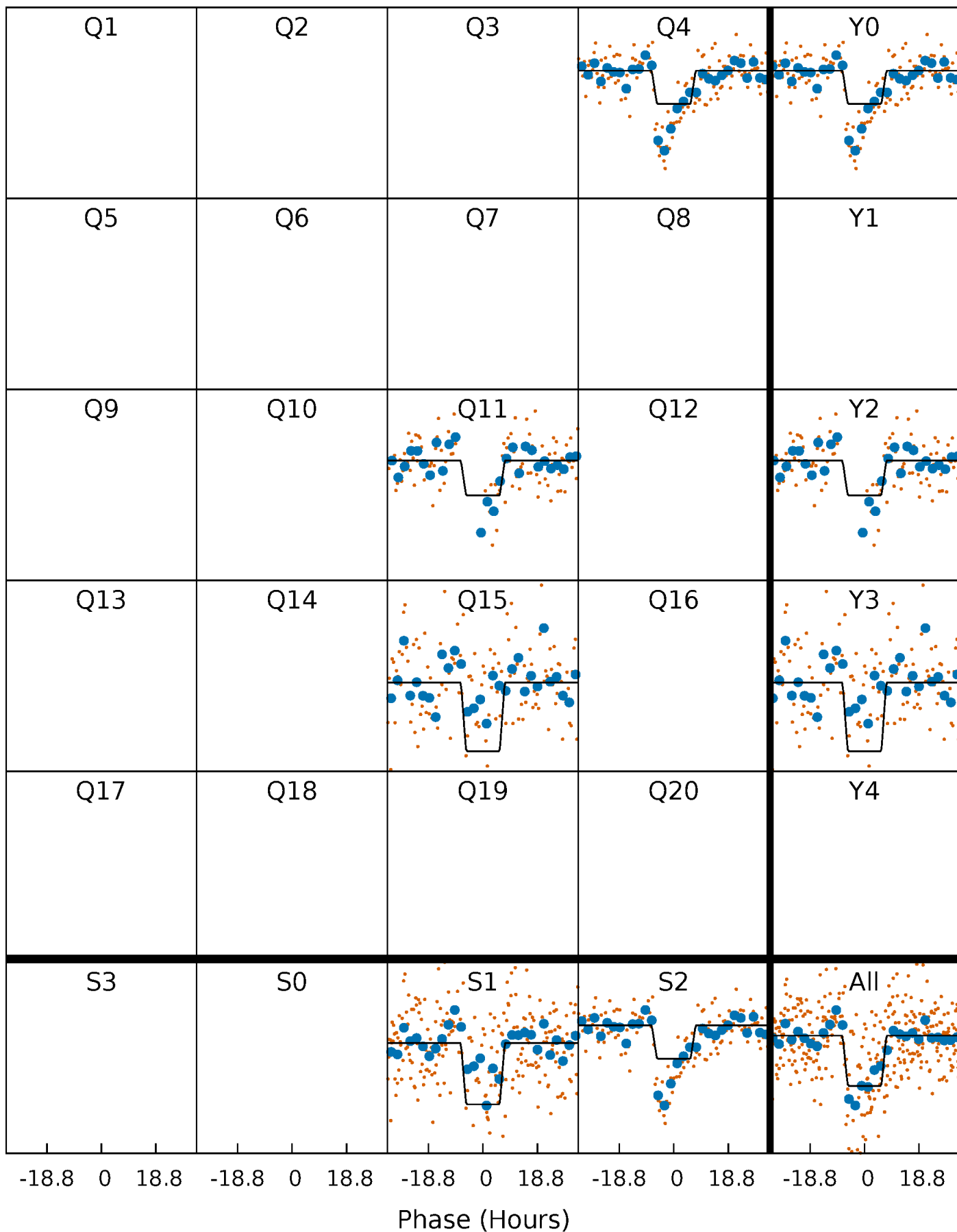
DV Quarter-Phased Transit Curves

TCE 008950952-01 P=365.738507 Days $T_0=362.264205$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

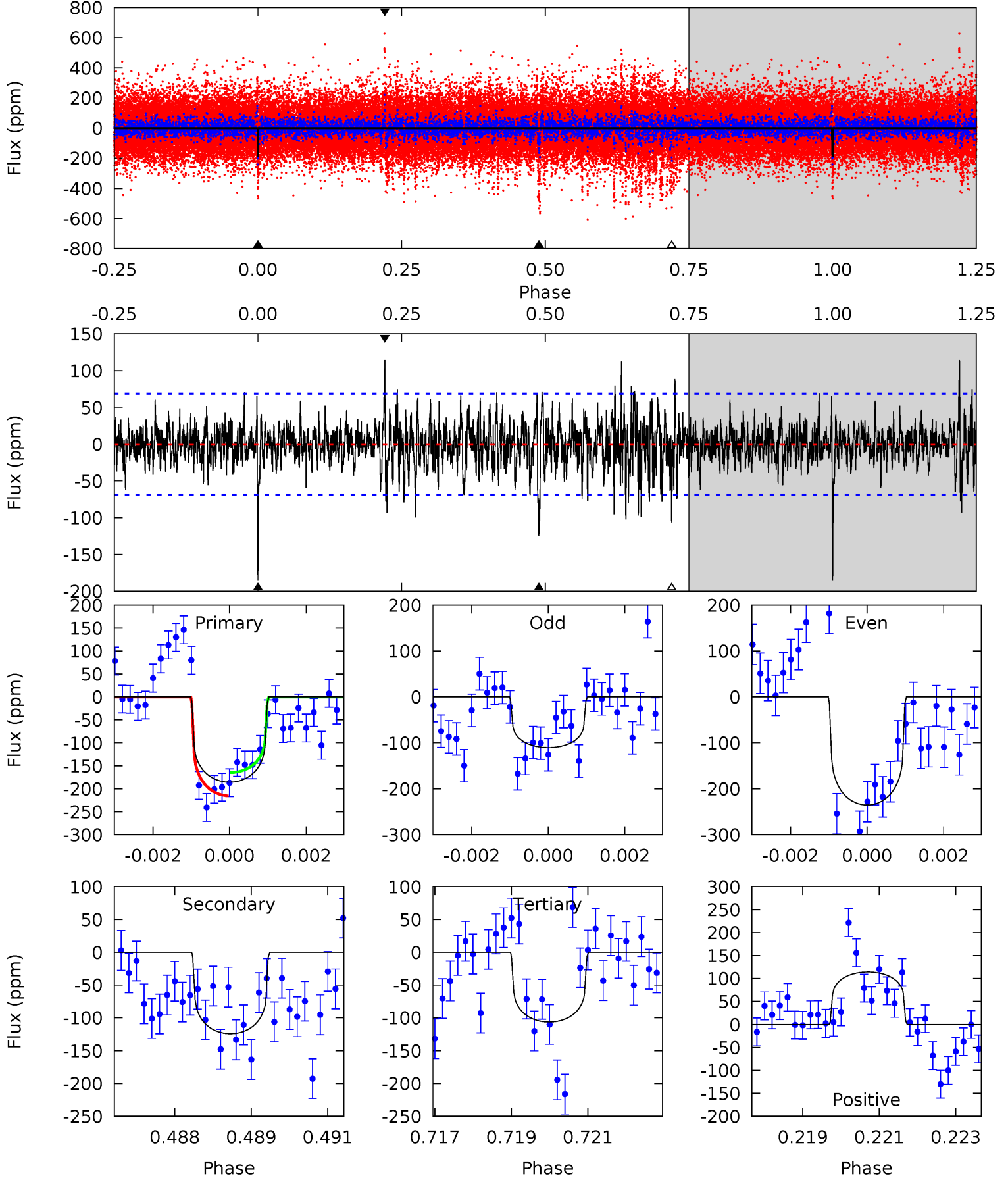
TCE 008950952-01 P=365.733479 Days $T_0=362.244893$ (BKJD)



DV Model-Shift Uniqueness Test

008950952-01, P = 365.738507 Days, E = 362.264205 Days

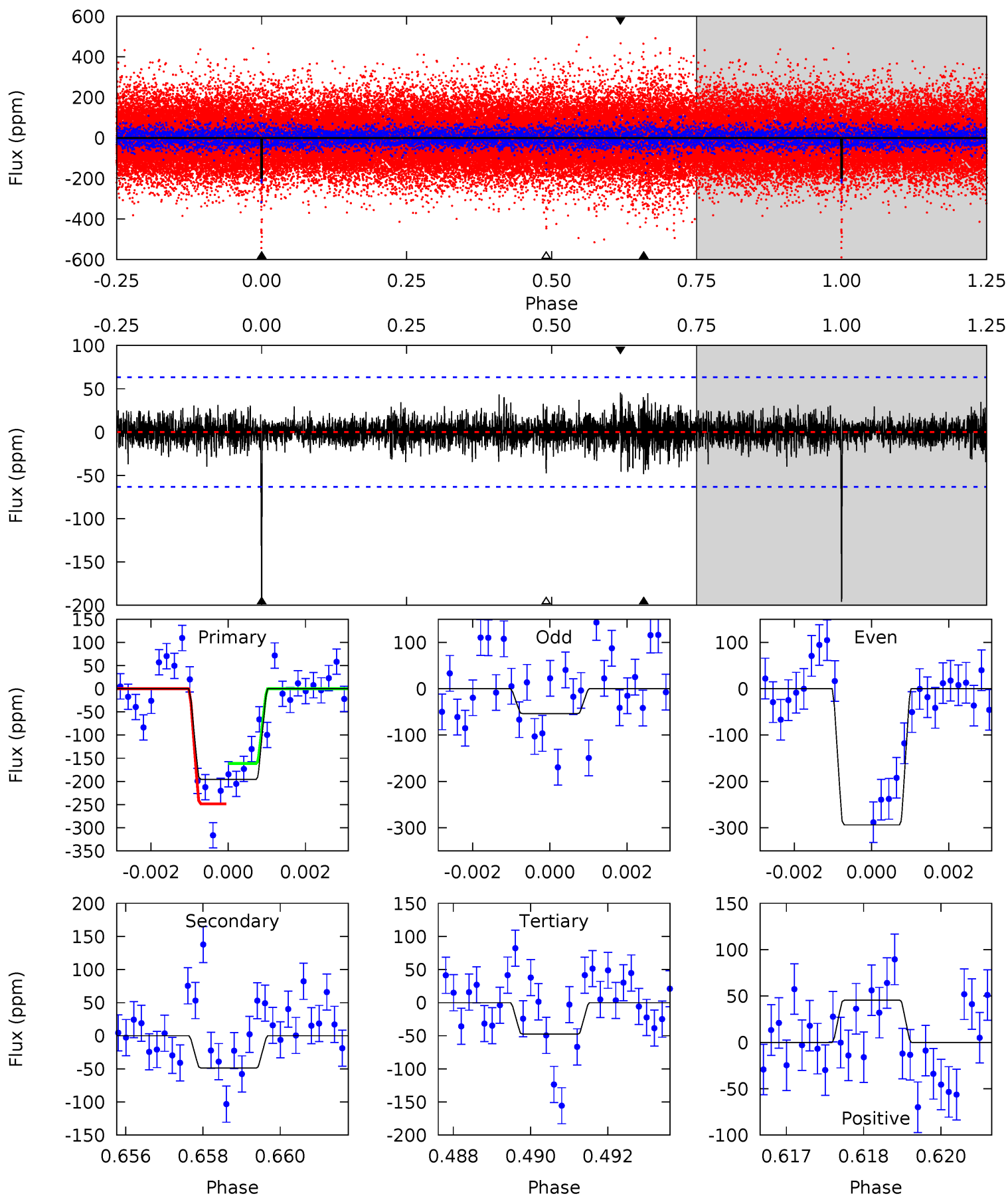
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.5 | 9.70 | 8.30 | 8.92 | 5.35 | 3.13 | 1.99 | 6.18 | 5.57 | 1.40 | 0.78 | 4.74 | 0.87 | 0.38 | 1.93 |



Alt Model-Shift Uniqueness Test

008950952-01, P = 365.733479 Days, E = 362.244893 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.6 | 4.12 | 4.02 | 3.85 | 5.35 | 3.13 | 0.94 | 12.5 | 12.7 | 0.10 | 0.27 | 9.95 | 0.82 | 0.19 | 3.57 |



Stellar Parameters For KIC 008950952

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5881^{+161}_{-146} | $4.089^{+0.273}_{-0.117}$ | $-0.260^{+0.350}_{-0.250}$ | $1.458^{+0.290}_{-0.398}$ | $0.951^{+0.147}_{-0.107}$ | $0.432^{+0.665}_{-0.171}$ |
| | +3%/-2% | +7%/-3% | +135%/-96% | +20%/-27% | +15%/-11% | +154%/-40% |
| Source | PHO1 | FLK73 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 008950952-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|--------------------------|
| DV | -124 ± 13 | $2.11^{+1.07}_{-0.90}$ | 437^{+26}_{-34} | 5301^{+1665}_{-800} | 15069^{+31162}_{-8472} |
| Alt. | -49 ± 12 | $2.25^{+0.97}_{-0.94}$ | 436^{+28}_{-34} | 4292^{+1028}_{-547} | 5096^{+10158}_{-2778} |

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 $A_{obs} \gg 1.0$

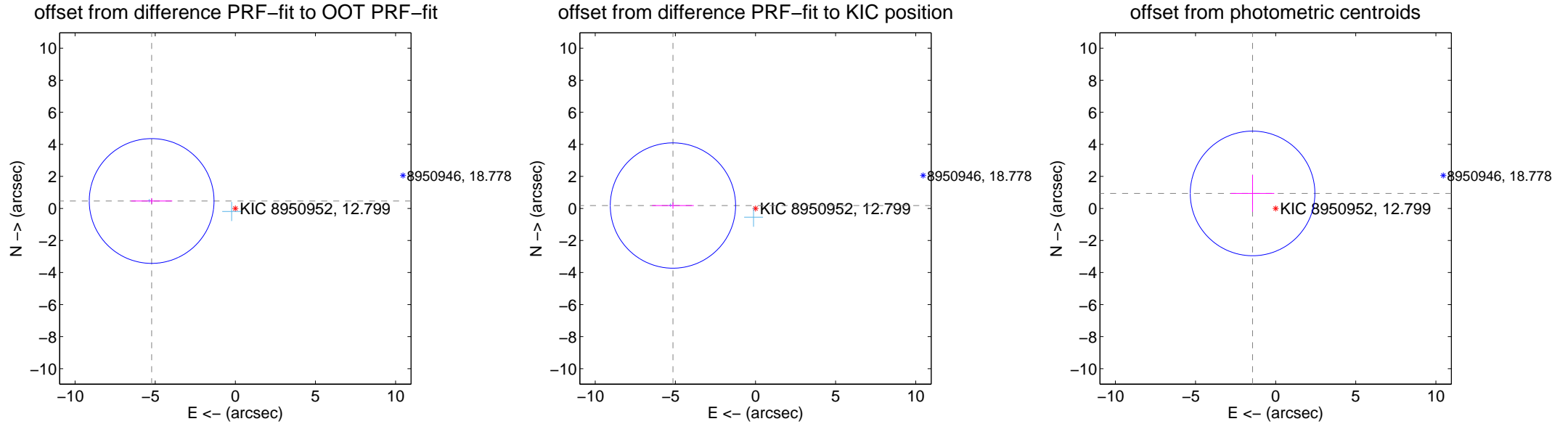
DV Centroid Data

Supplemental centroid analysis for 008950952-01. Kepler magnitude: 12.80. Transit SNR 8.94

There are 2 quarters with good PRF difference image offsets

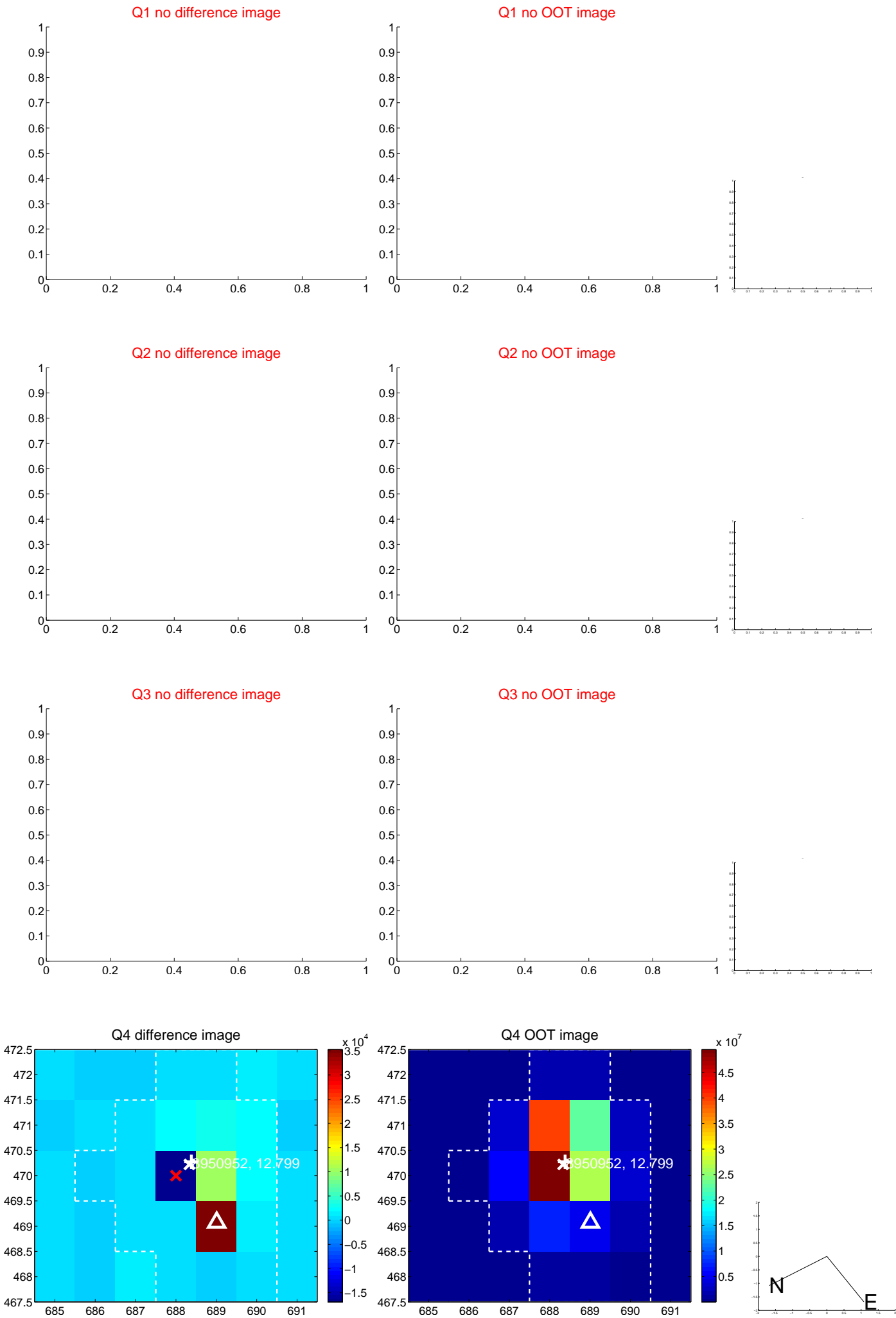
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 5.244 \pm 1.298 | 4.04 | 5.223 \pm 1.288 | 0.465 \pm 0.181 |
| PRF-fit source offset from KIC position | 5.155 \pm 1.303 | 3.96 | 5.152 \pm 1.297 | 0.181 \pm 0.199 |
| photometric centroid source offset | 1.72 \pm 1.30 | 1.33 | 1.44 \pm 1.36 | 0.94 \pm 1.15 |



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.



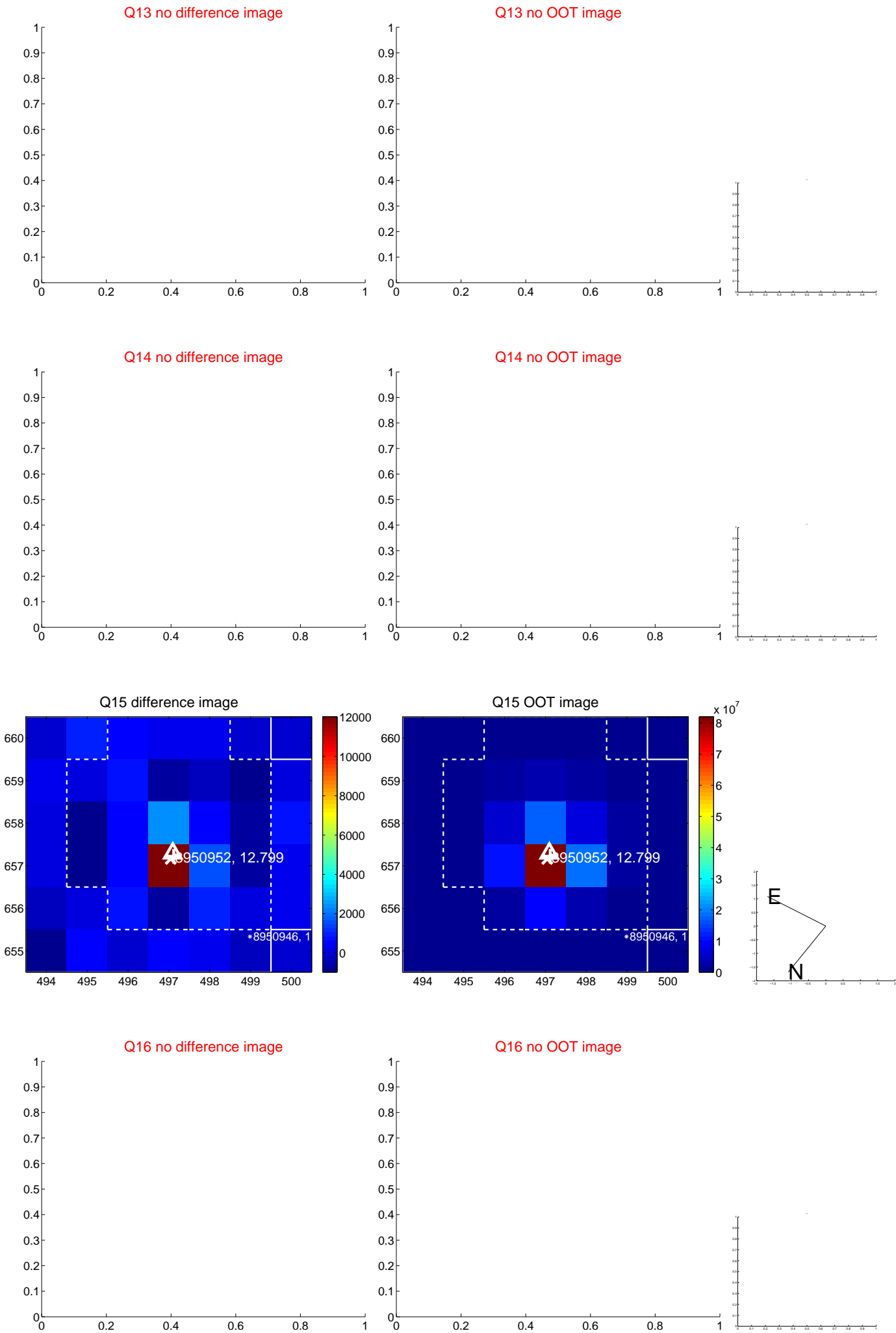
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



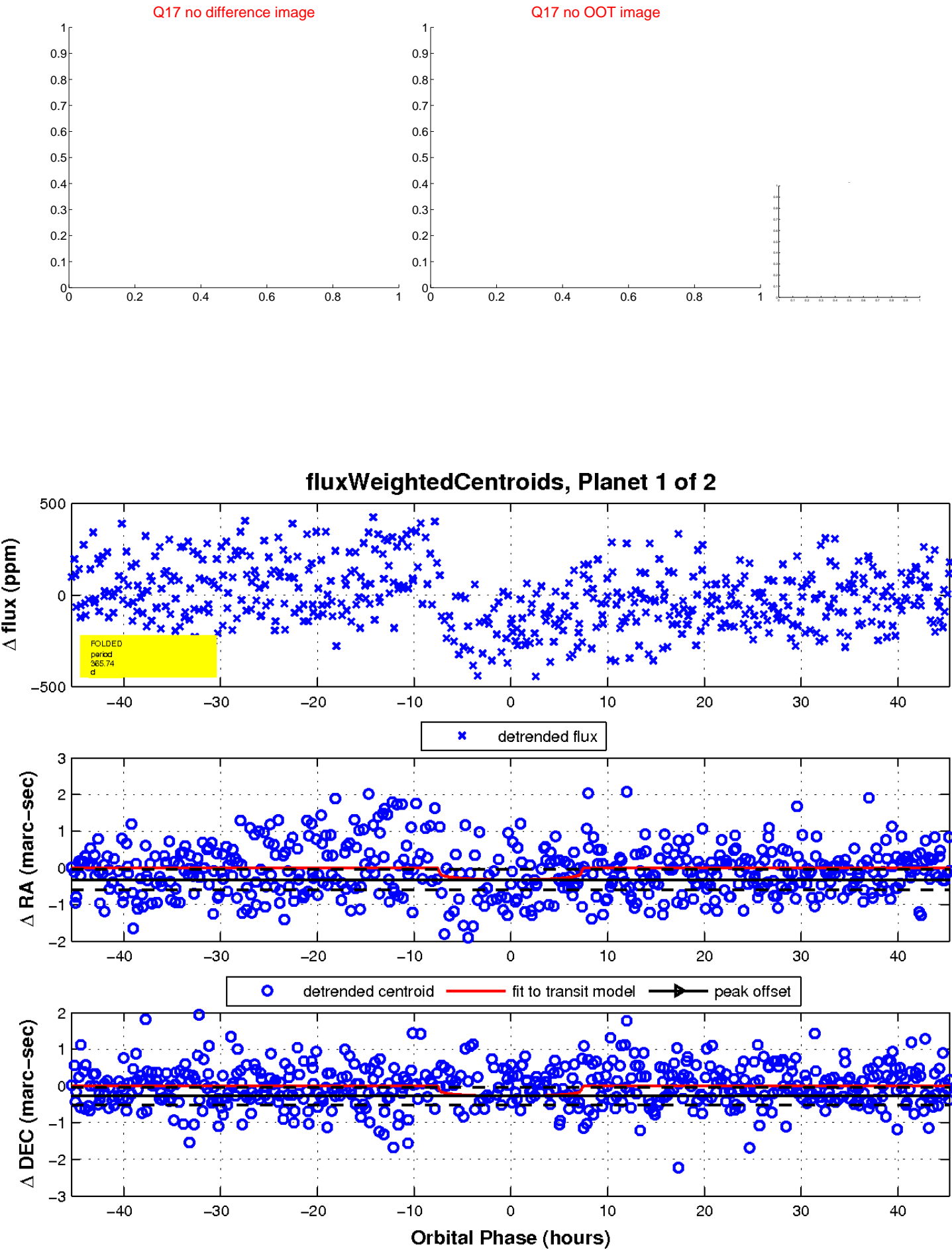
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

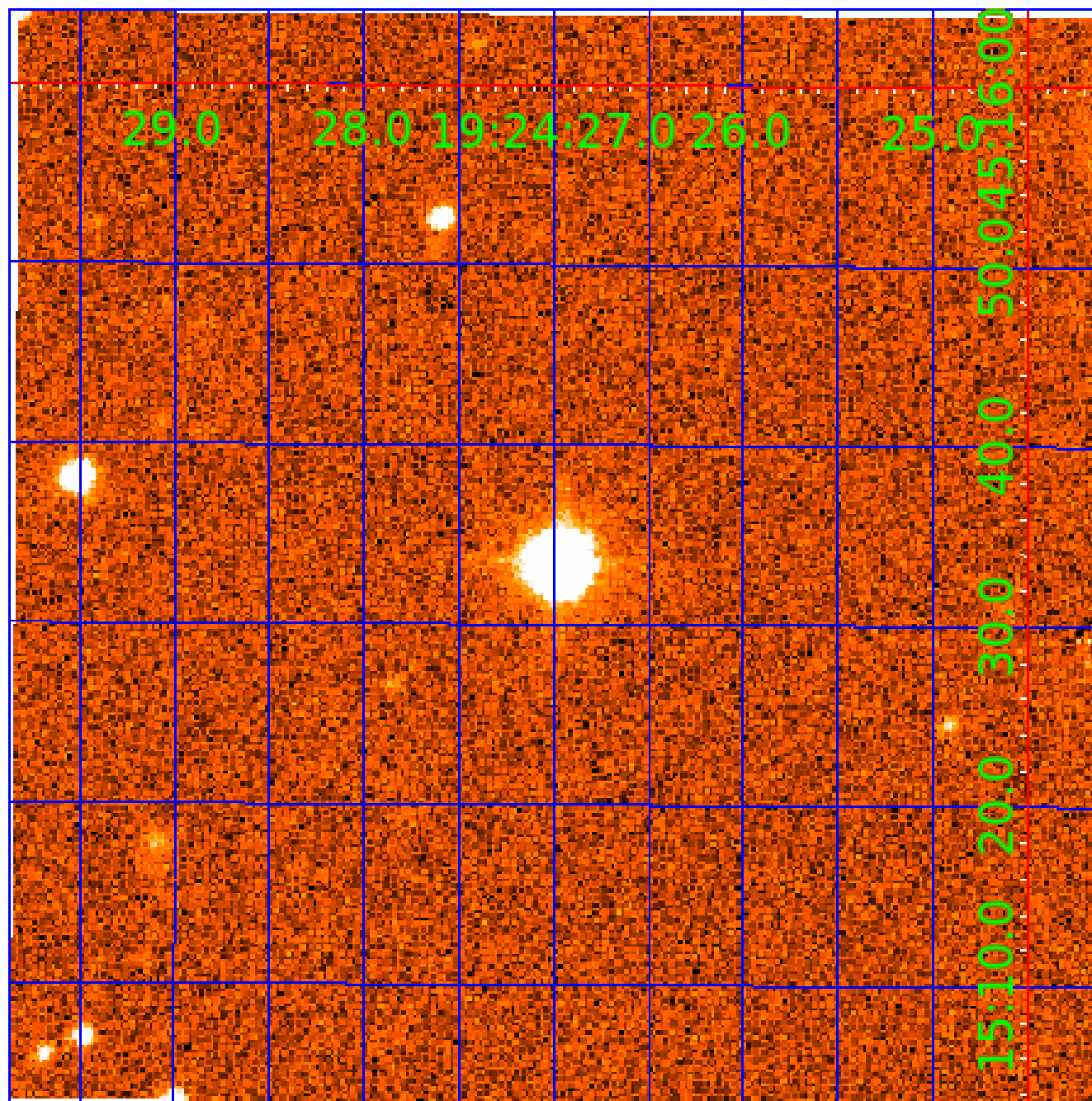


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008950952

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008950952-01 | OBS | No | 365.738507 | 362.264205 | 208.3 | 15.145 | 9.5 | 8.9 | 1.46 | 5881 | 2.22 | 2.35 |
| 008950952-02 | OBS | No | 338.184139 | 238.552877 | 158.8 | 13.453 | 8.6 | 7.9 | 1.46 | 5881 | 2.10 | 2.61 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 008950952-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 008950952-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_ZUMA—ALL_TRANS_CHASES—CENT_FEW_DIFFS |

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

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

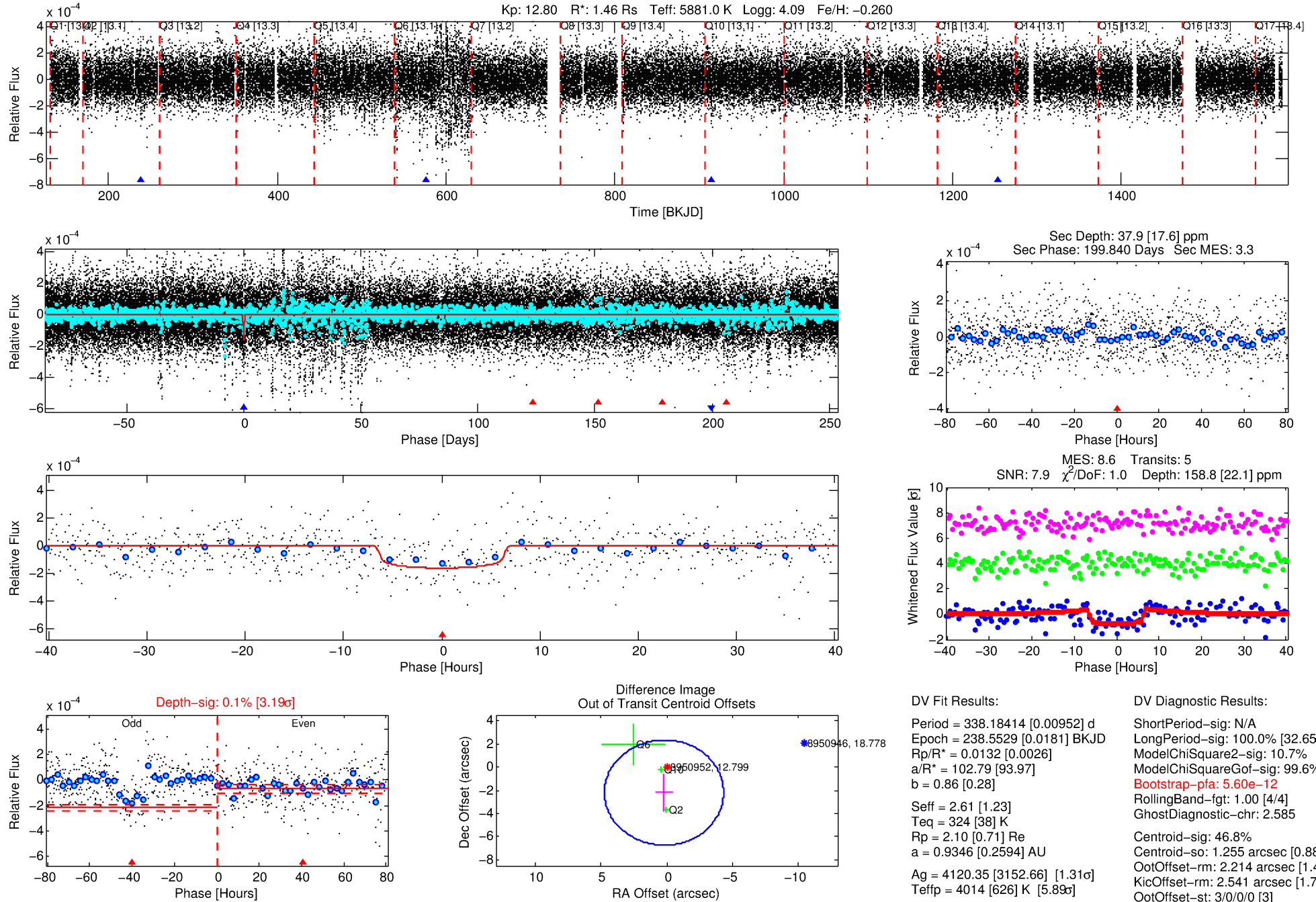
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008950952-02

No Significant Match Found

DV One-Page Summary

KIC: 8950952 Candidate: 2 of 2 Period: 338.184 d



DV Fit Results:

Period = 338.18414 [0.00952] d
Epoch = 238.5529 [0.0181] BKJD
Rp/R* = 0.0132 [0.0026]
a/R* = 102.79 [93.97]
b = 0.86 [0.28]
Seff = 2.61 [1.23]
Teq = 324 [38] K
Rp = 2.10 [0.71] Re
a = 0.9346 [0.2594] AU
Ag = 4120.35 [3152.66] [1.31 σ]
Teffp = 4014 [626] K [5.89 σ]

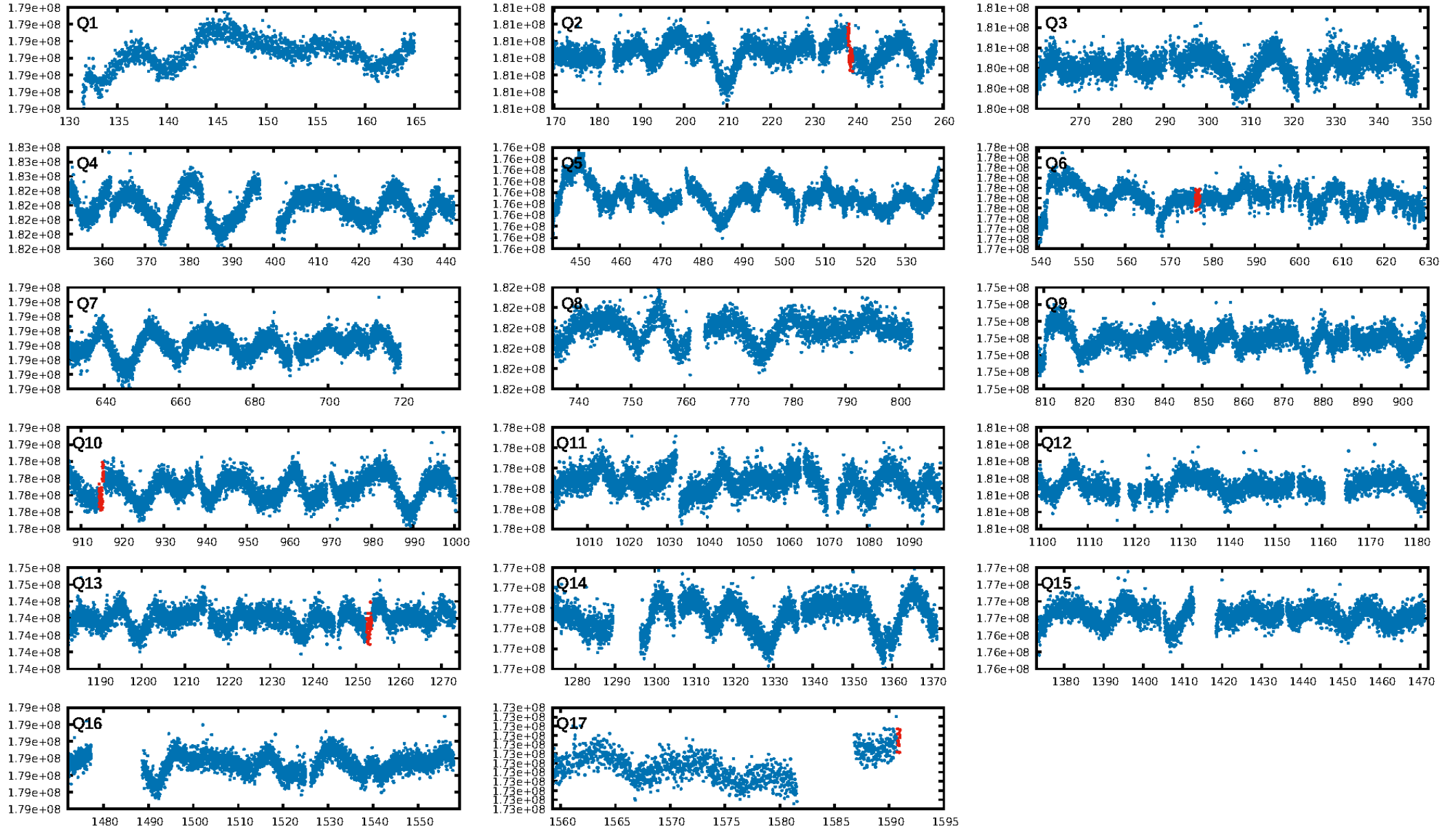
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [32.65 σ]
ModelChiSquare2-sig: 10.7%
ModelChiSquareGof-sig: 99.6%
Bootstrap-pfa: 5.60e-12
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 2.585
Centroid-sig: 46.8%
Centroid-so: 1.255 arcsec [0.88 σ]
OotOffset-rm: 2.214 arcsec [1.47 σ]
KicOffset-rm: 2.541 arcsec [1.74 σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [4/4]

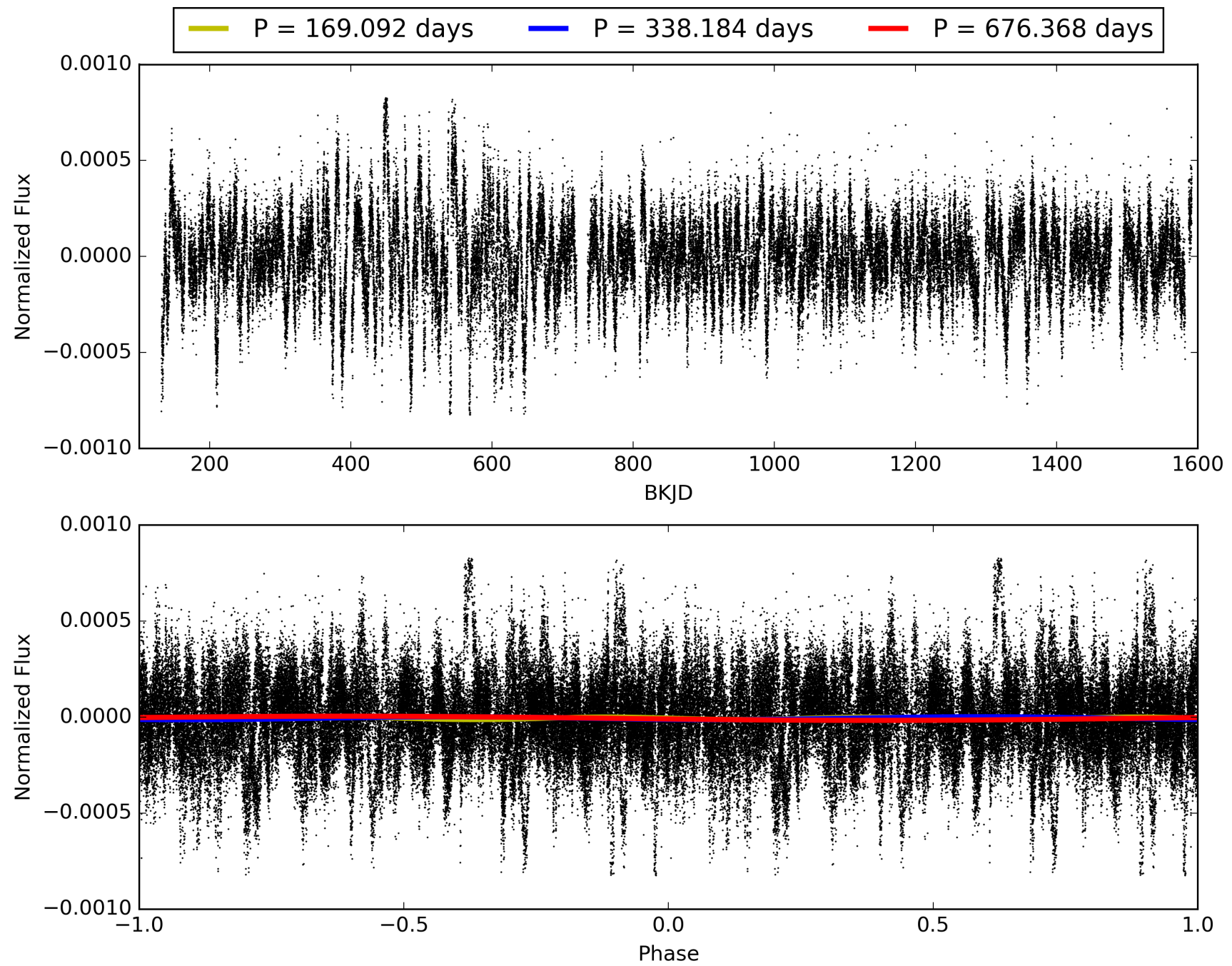
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:03:36 Z

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

TCE 008950952-02, PDC Light Curves

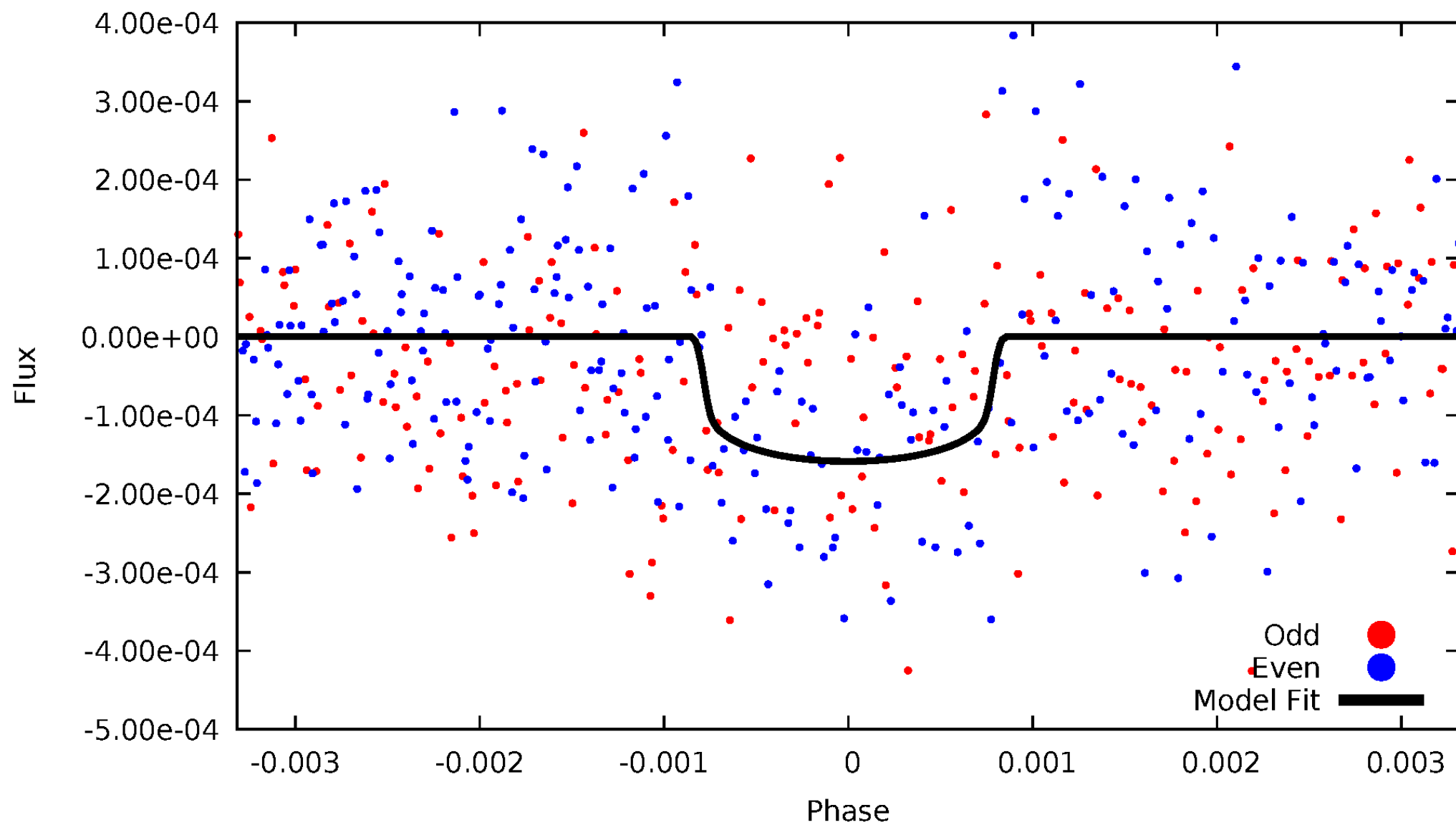


TCE 008950952-02



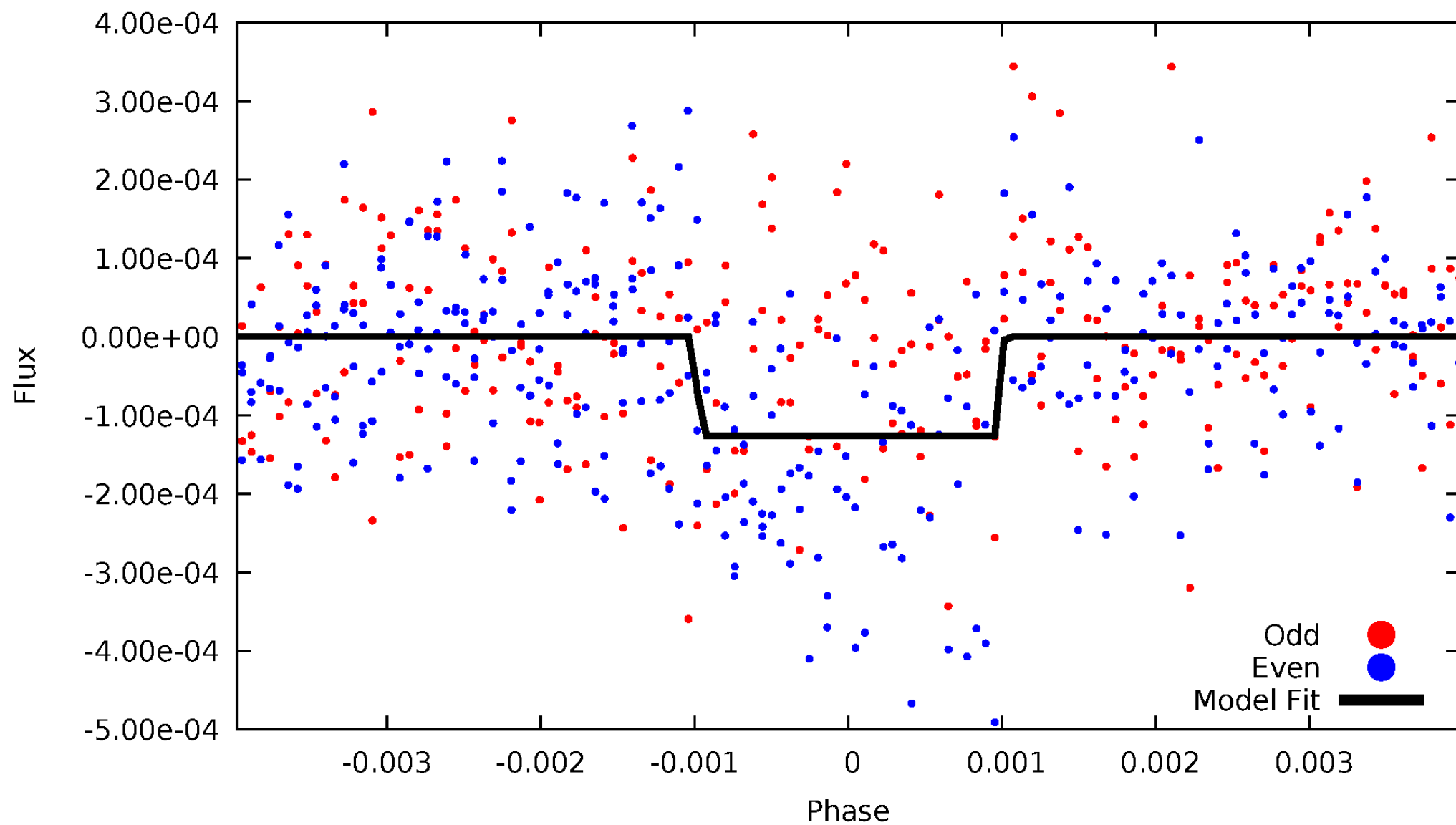
DV Odd/Even

TCE 008950952-02



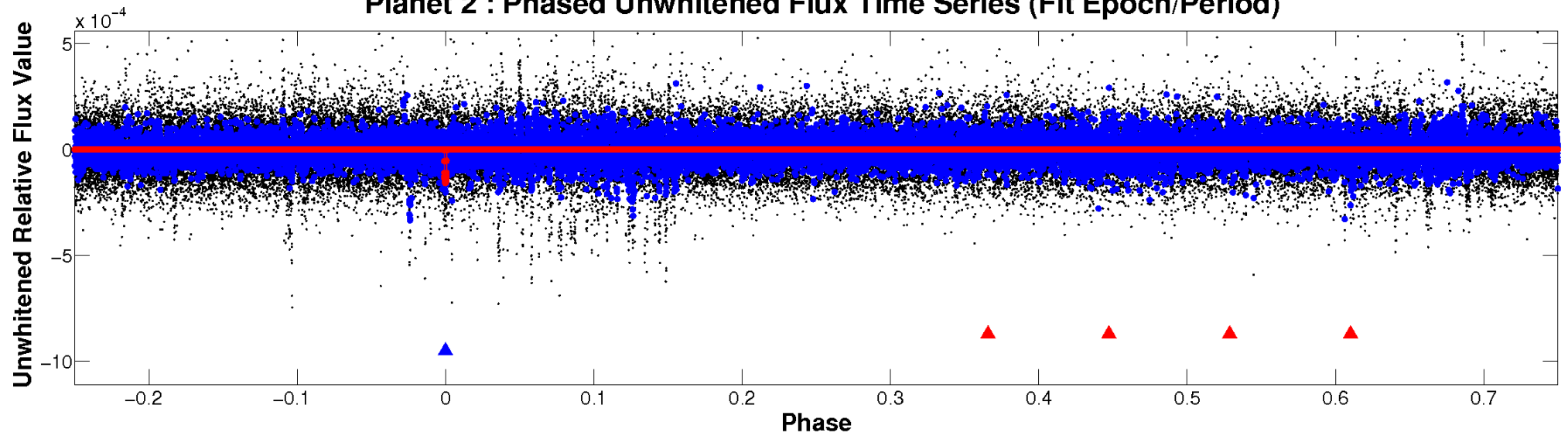
ALT Odd/Even

TCE 008950952-02

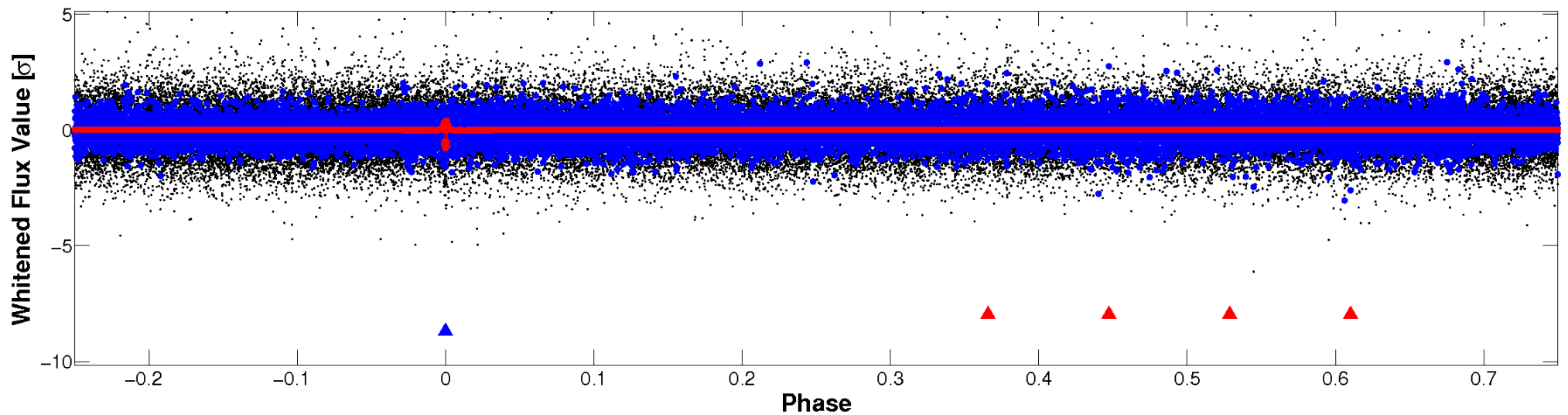


Non-Whitened Vs. Whitened Light Curve

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

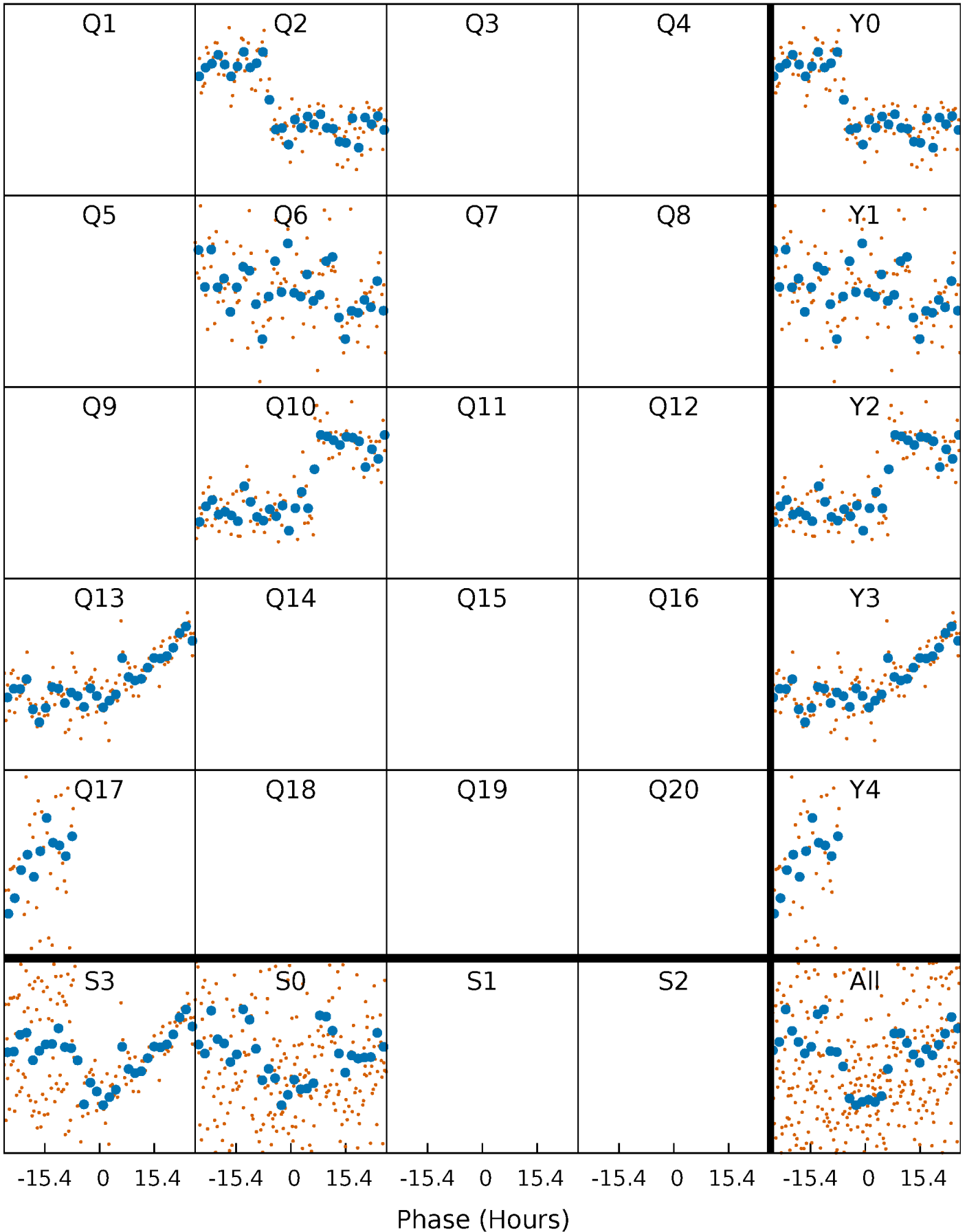


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



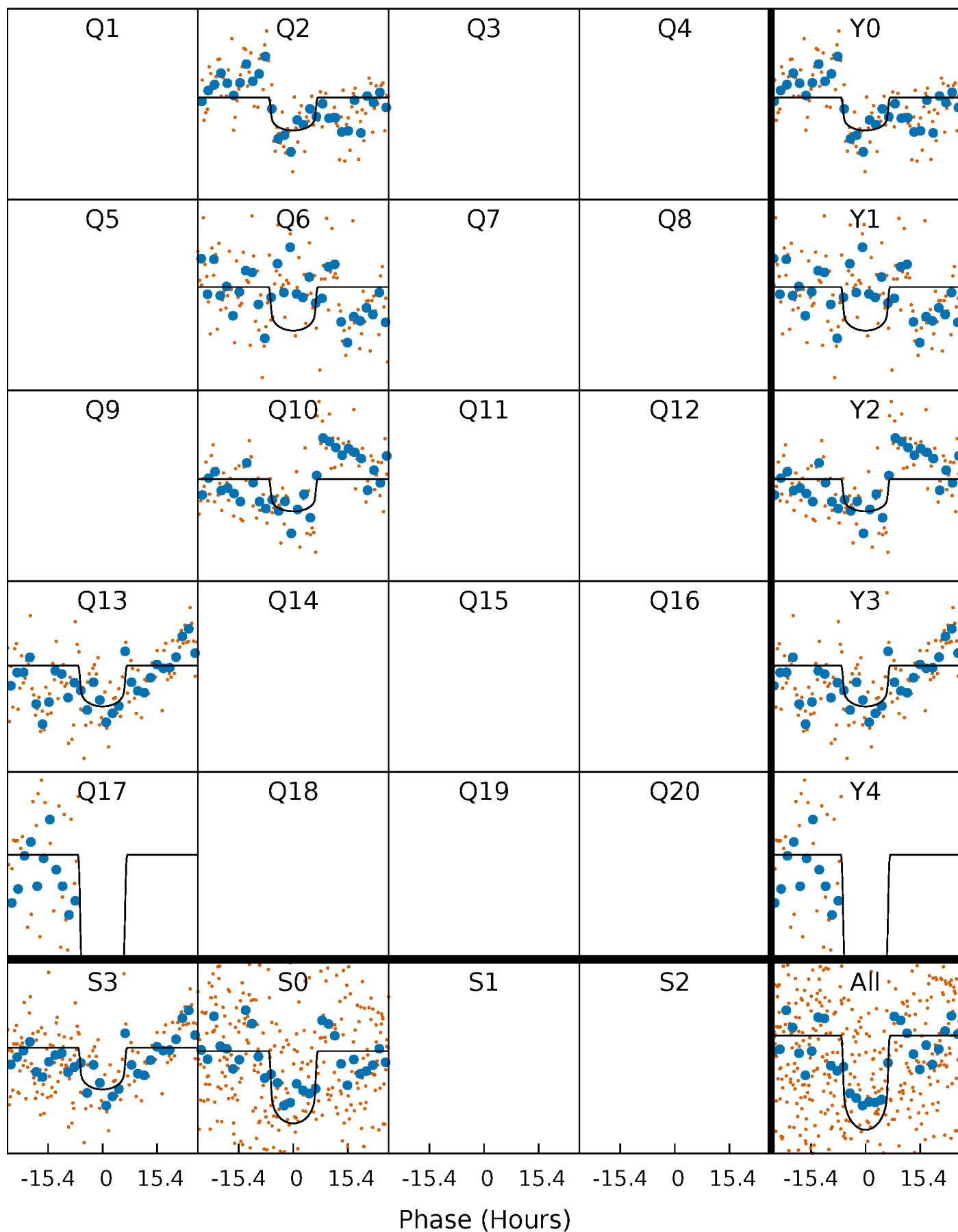
PDC Quarter-Phased Transit Curves

TCE 008950952-02 $P=338.184139$ Days $T_0=238.552877$ (BKJD)



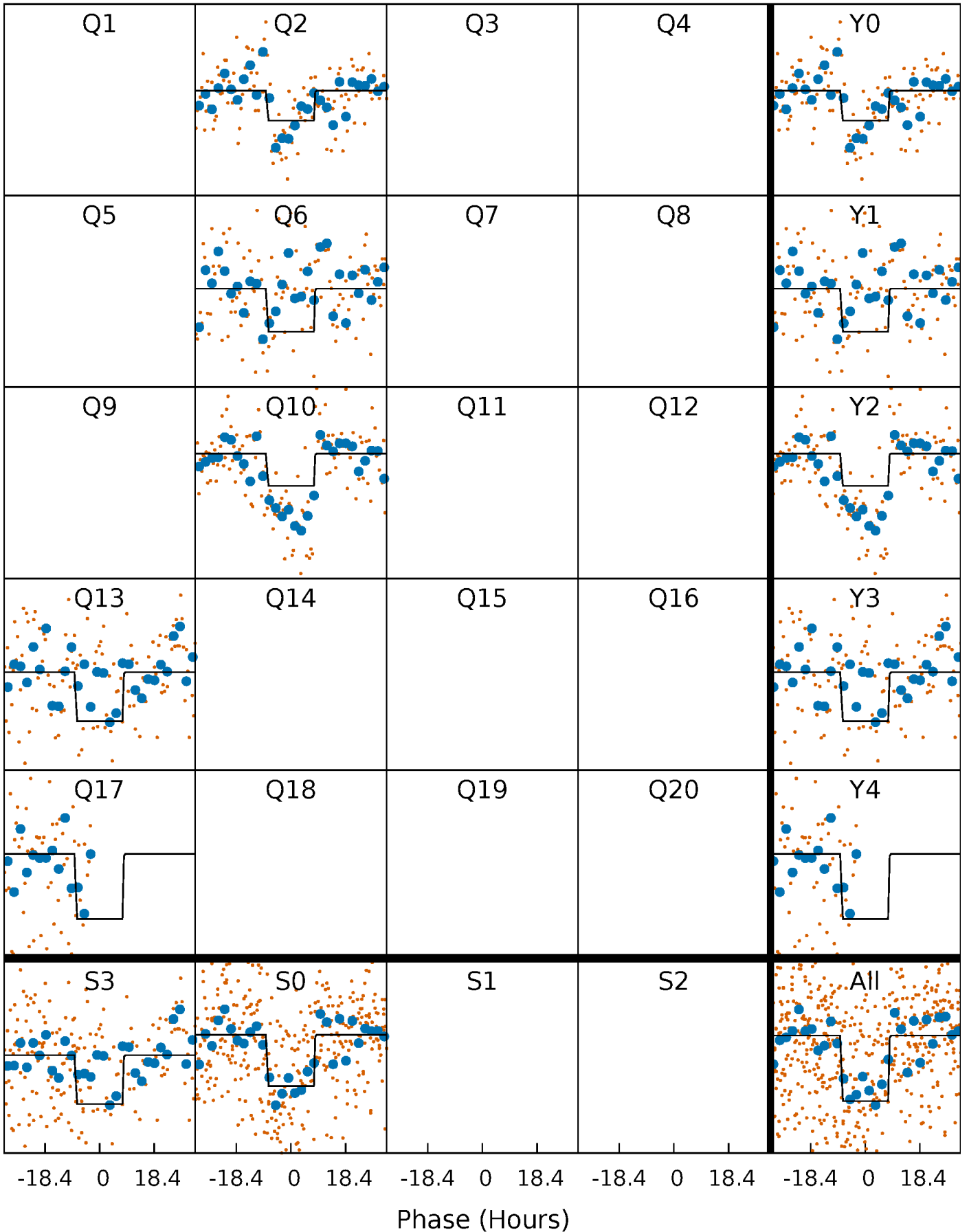
DV Quarter-Phased Transit Curves

TCE 008950952-02 $P=338.184139$ Days $T_0=238.552877$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

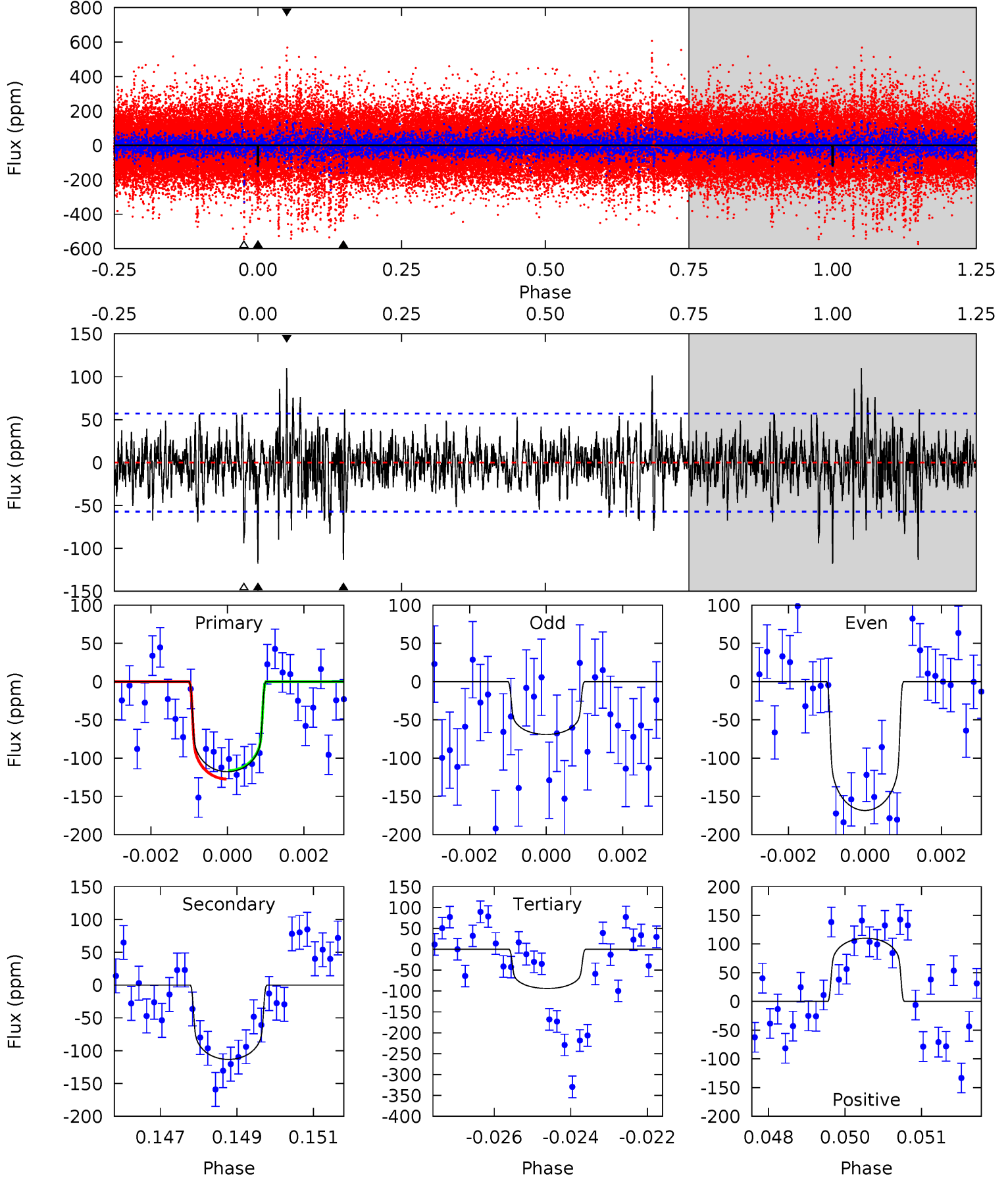
TCE 008950952-02 $P=338.134551$ Days $T_0=238.591450$ (BKJD)



DV Model-Shift Uniqueness Test

008950952-02, P = 338.184139 Days, E = 238.552877 Days

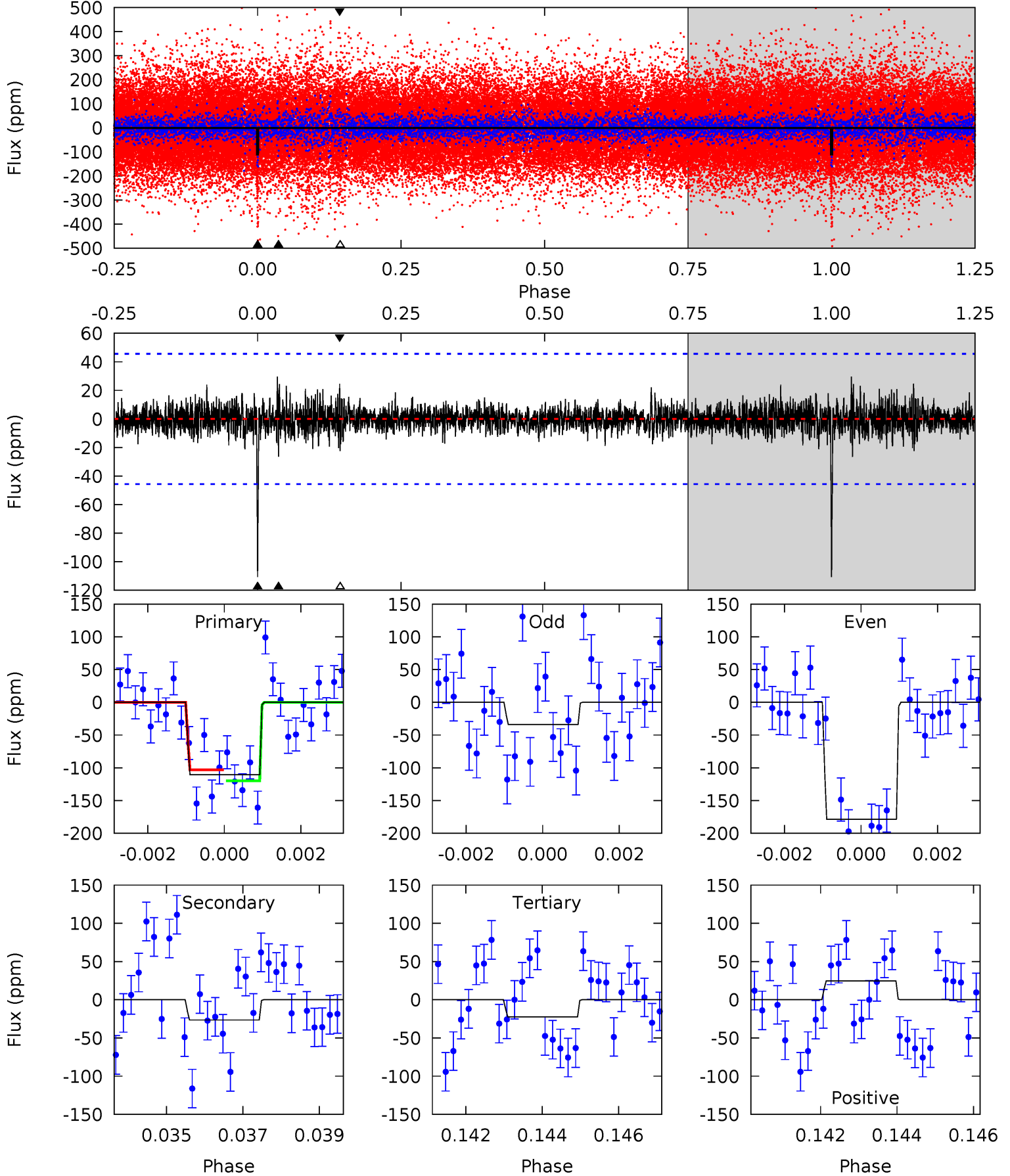
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.0 | 10.6 | 8.81 | 10.3 | 5.35 | 3.14 | 2.03 | 2.23 | 0.71 | 1.82 | 0.30 | 4.62 | 0.74 | 0.48 | 0.51 |



Alt Model-Shift Uniqueness Test

008950952-02, P = 338.134551 Days, E = 238.591450 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.9 | 3.08 | 2.62 | 2.88 | 5.32 | 3.08 | 0.66 | 10.3 | 10.0 | 0.47 | 0.20 | 8.40 | 1.23 | 0.21 | 0.96 |



Stellar Parameters For KIC 008950952

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5881^{+161}_{-146} | $4.089^{+0.273}_{-0.117}$ | $-0.260^{+0.350}_{-0.250}$ | $1.458^{+0.290}_{-0.398}$ | $0.951^{+0.147}_{-0.107}$ | $0.432^{+0.665}_{-0.171}$ |
| | +3%/-2% | +7%/-3% | +135%/-96% | +20%/-27% | +15%/-11% | +154%/-40% |
| Source | PHO1 | FLK73 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 008950952-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|-------------------------|
| DV | -113 ± 11 | $2.02^{+0.50}_{-0.49}$ | 446^{+29}_{-37} | 5359^{+560}_{-453} | 13649^{+9628}_{-4919} |
| Alt. | -26 ± 9 | $1.71^{+0.48}_{-0.47}$ | 447^{+28}_{-35} | 4268^{+531}_{-439} | 4409^{+4160}_{-2059} |

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

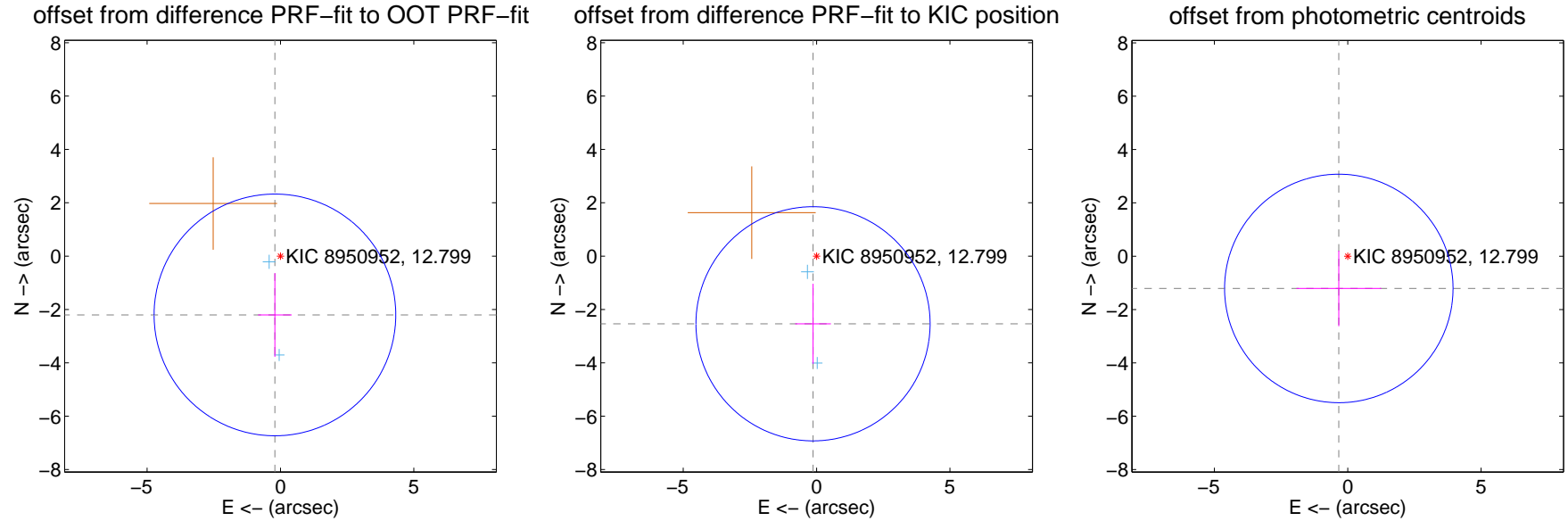
DV Centroid Data

Supplemental centroid analysis for 008950952-02. Kepler magnitude: 12.80. Transit SNR 7.91

There are 2 quarters with good PRF difference image offsets

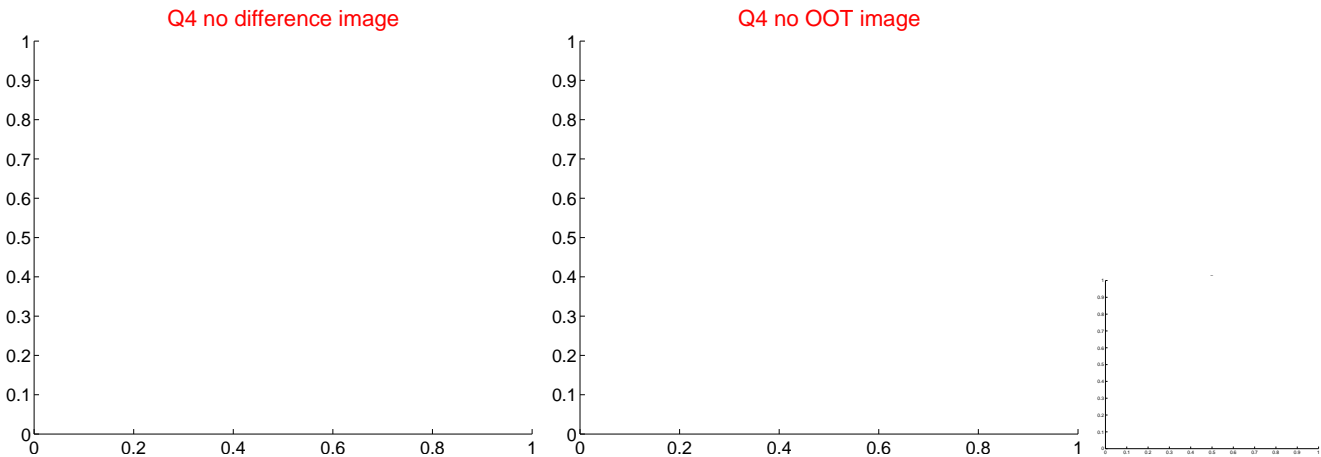
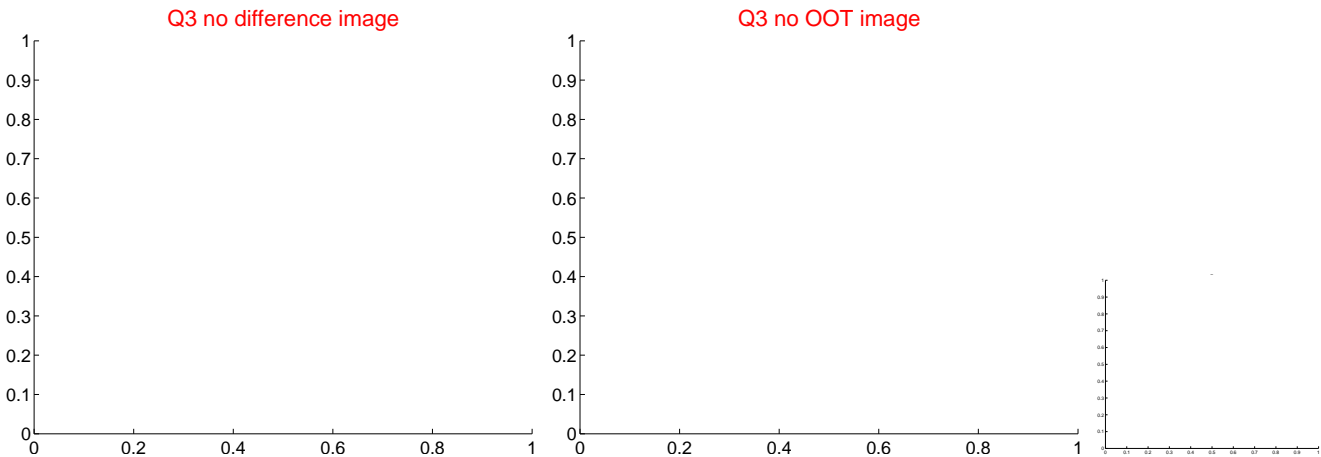
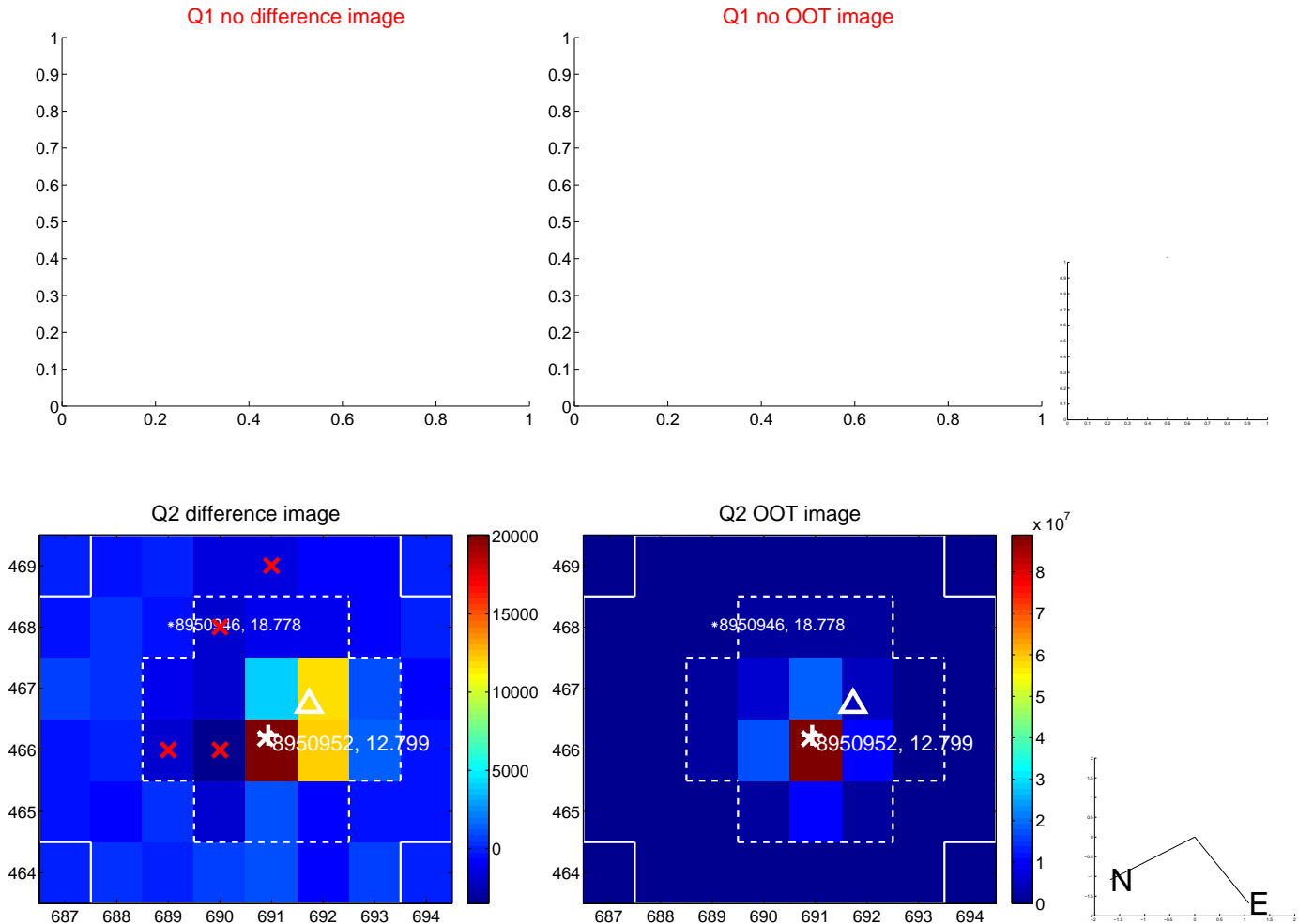
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 2.214 ± 1.511 | 1.47 | 0.208 ± 0.632 | -2.205 ± 1.569 |
| PRF-fit source offset from KIC position | 2.541 ± 1.464 | 1.74 | 0.133 ± 0.670 | -2.537 ± 1.499 |
| photometric centroid source offset | 1.26 ± 1.43 | 0.88 | 0.33 ± 1.59 | -1.21 ± 1.41 |

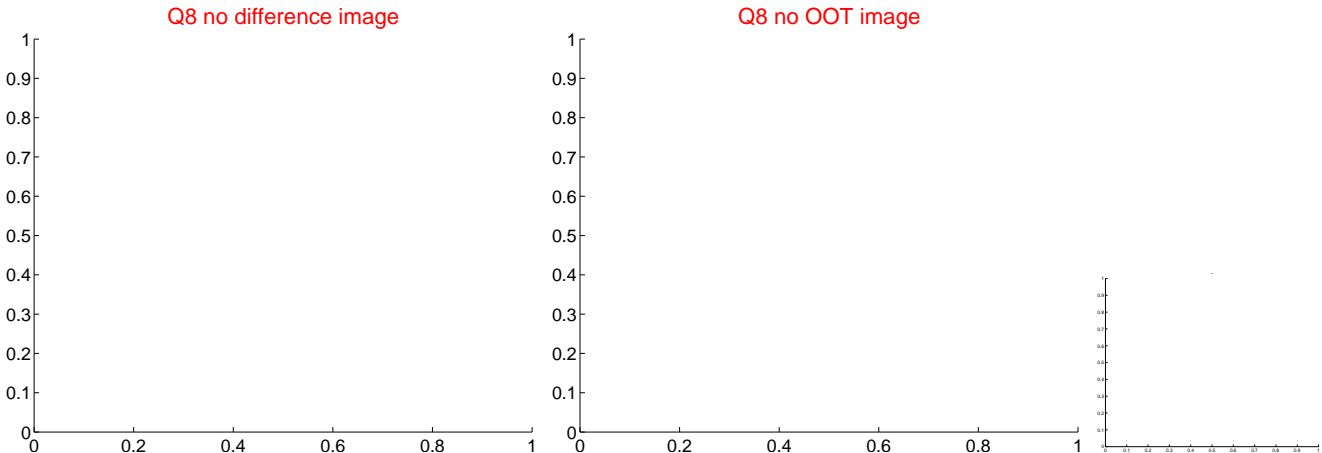
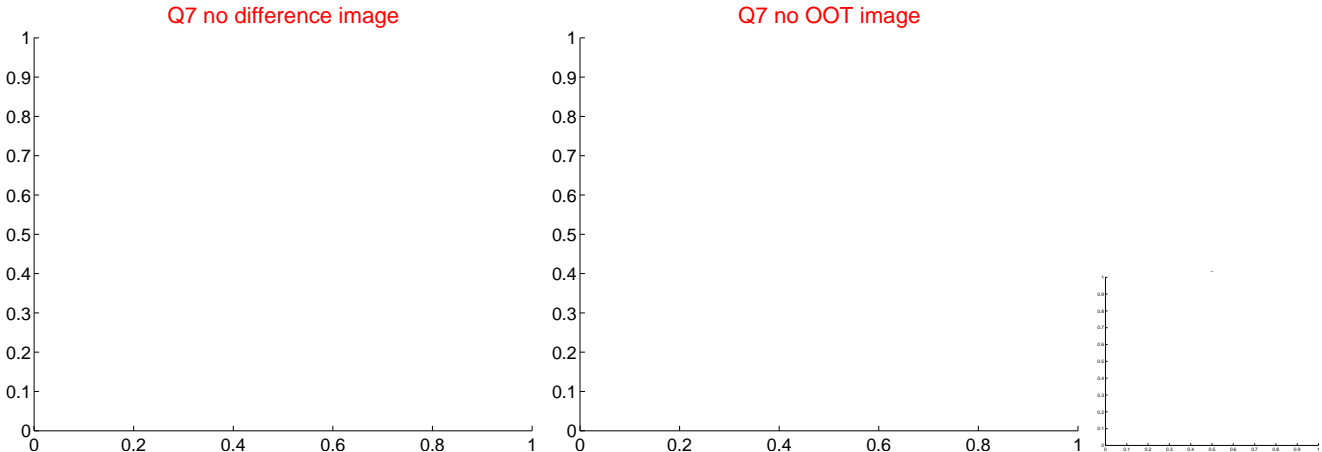
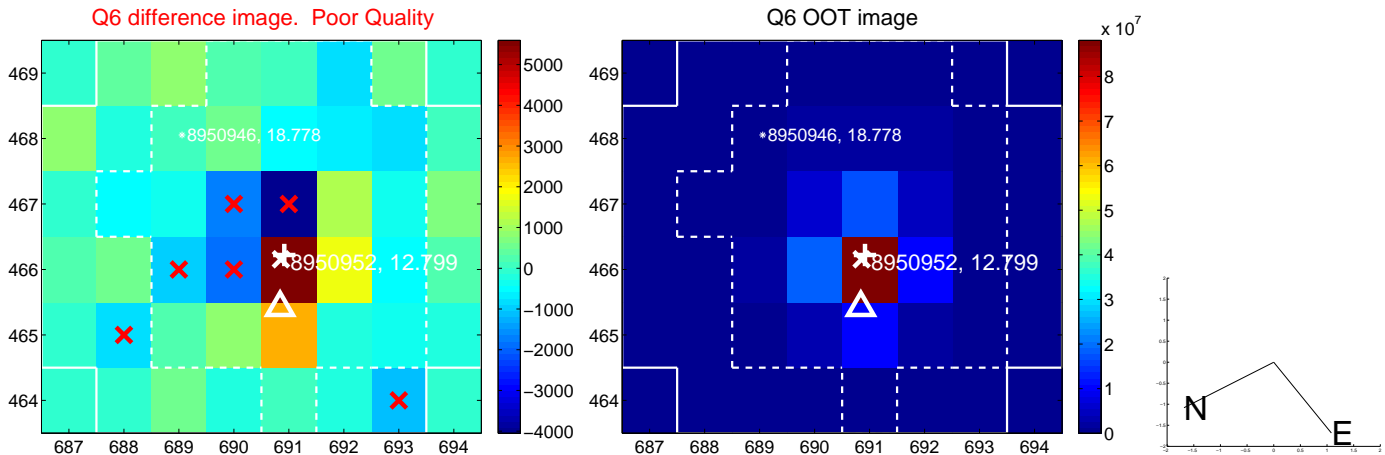
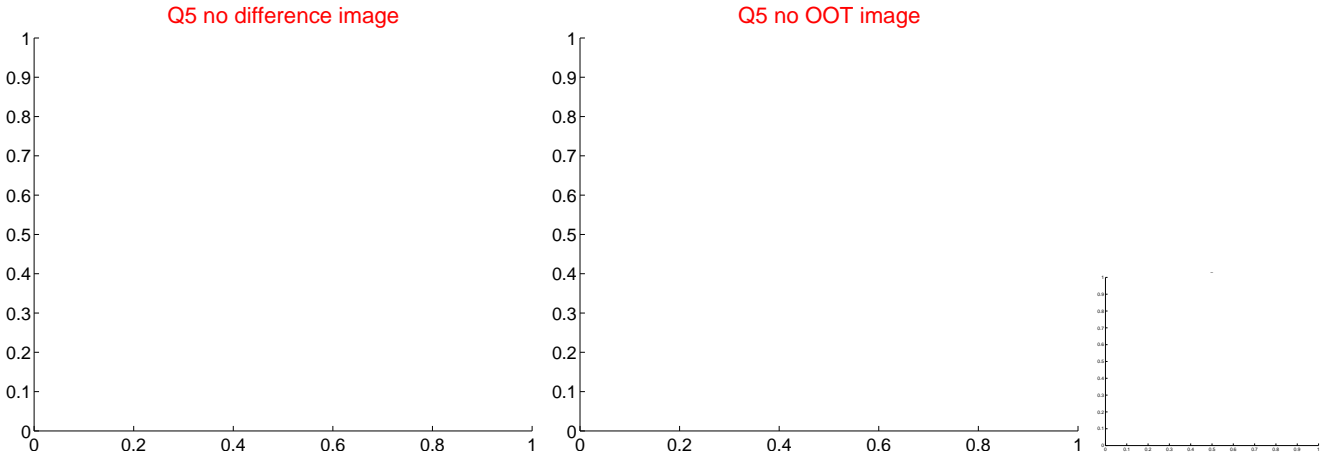


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

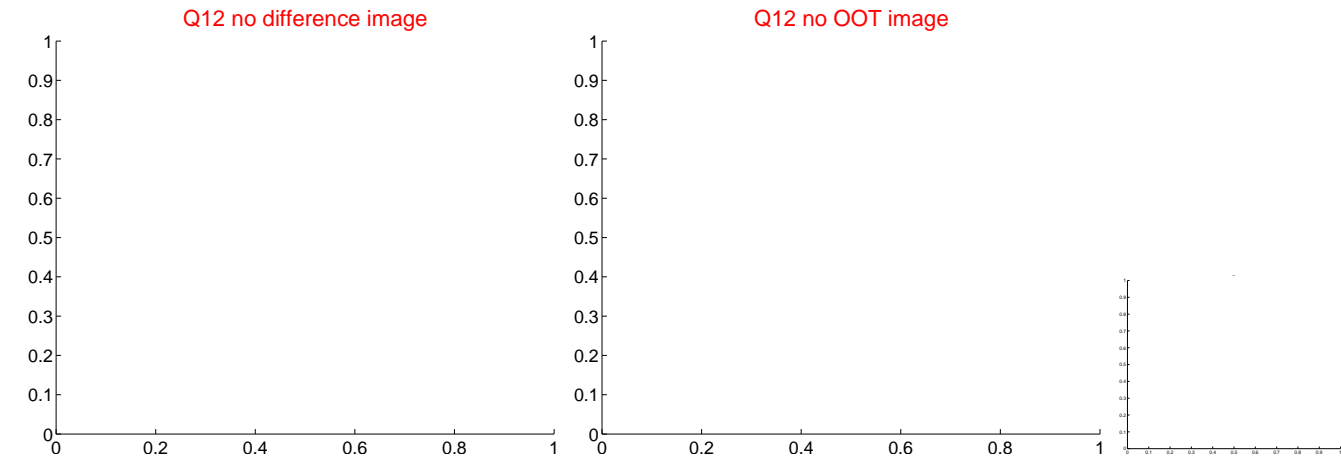
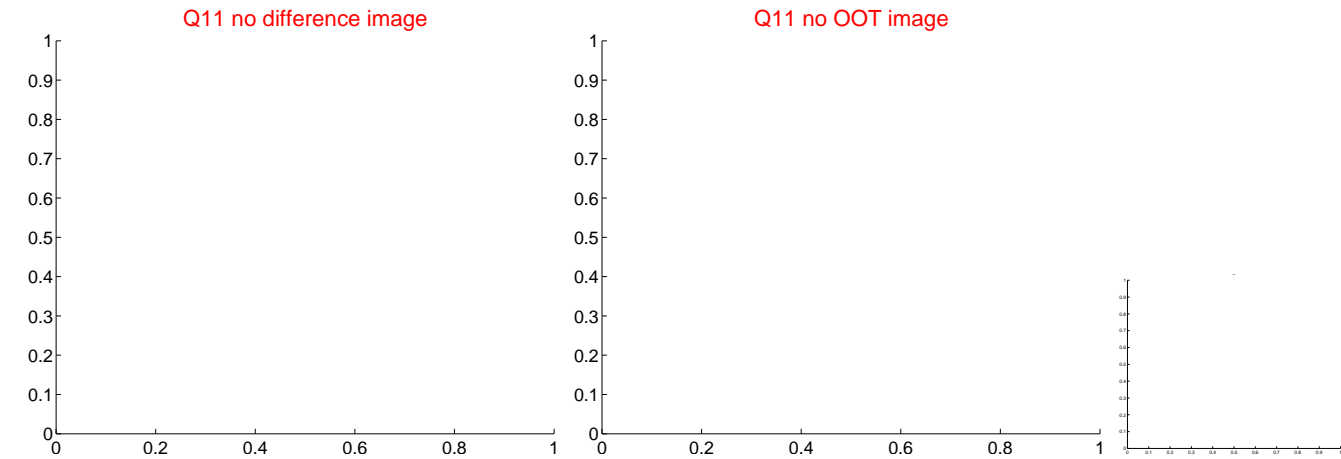
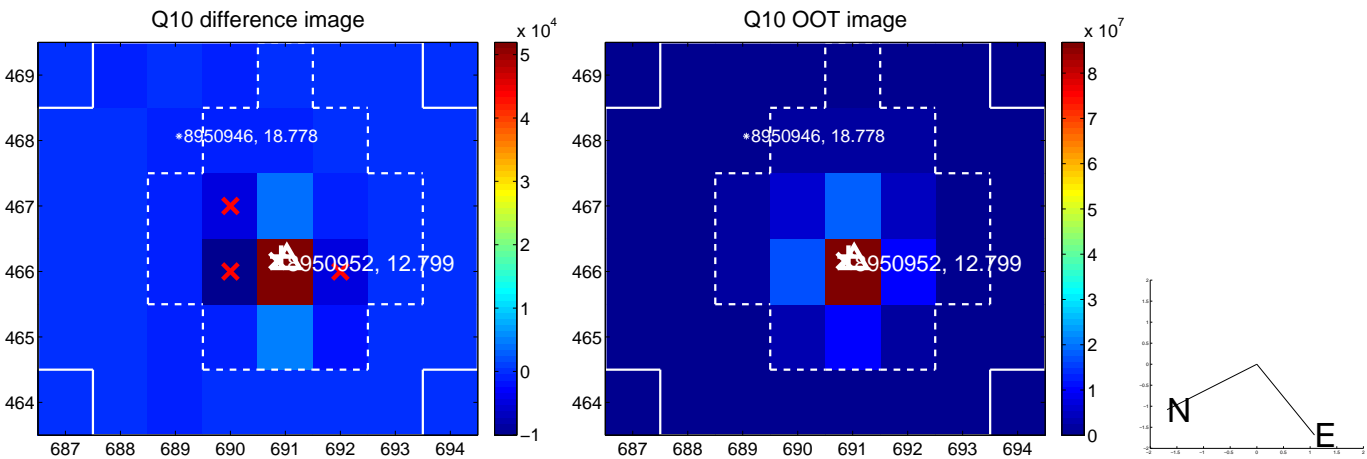
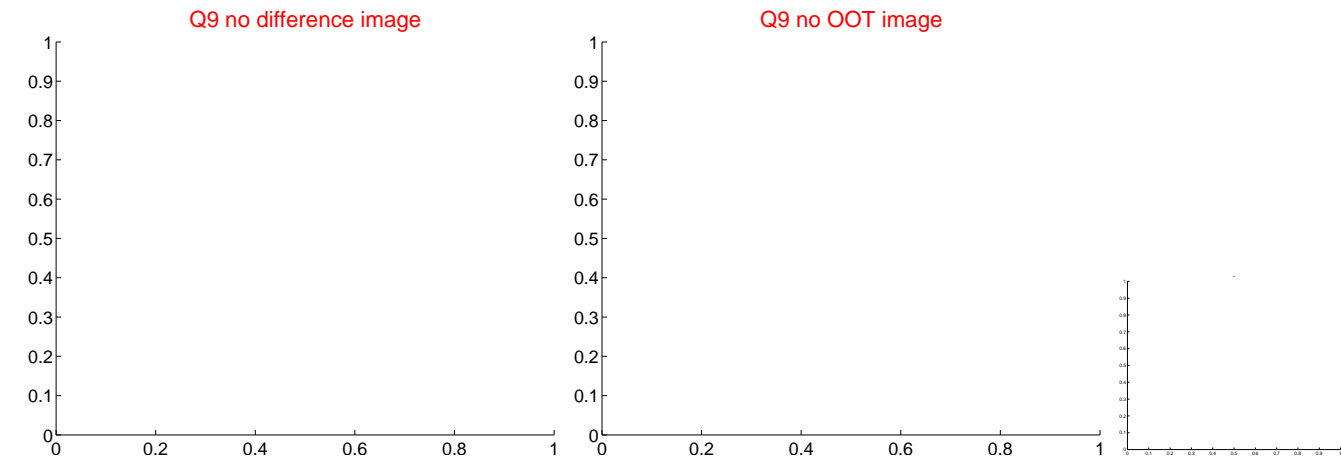
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



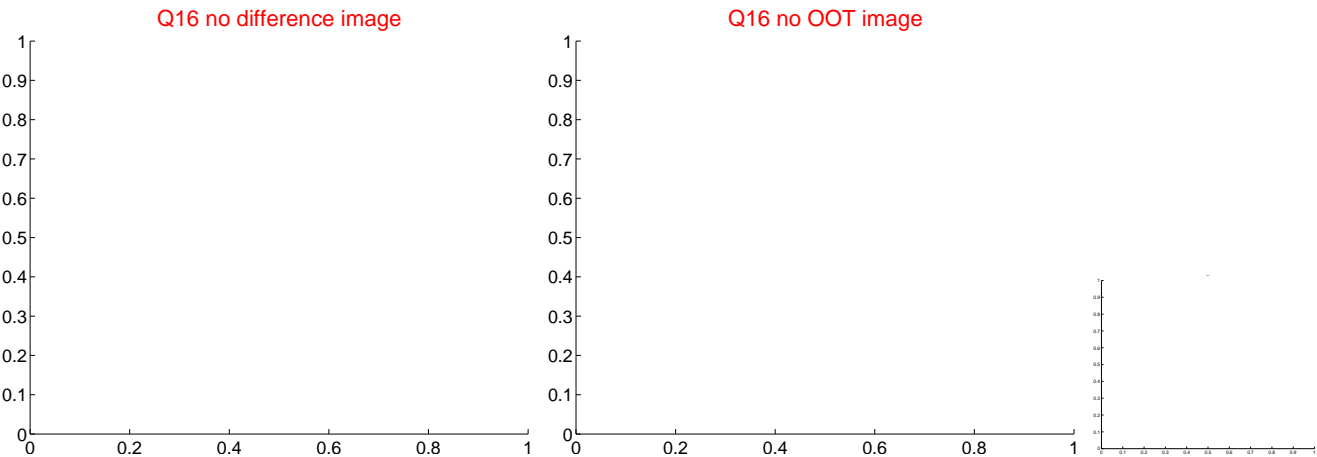
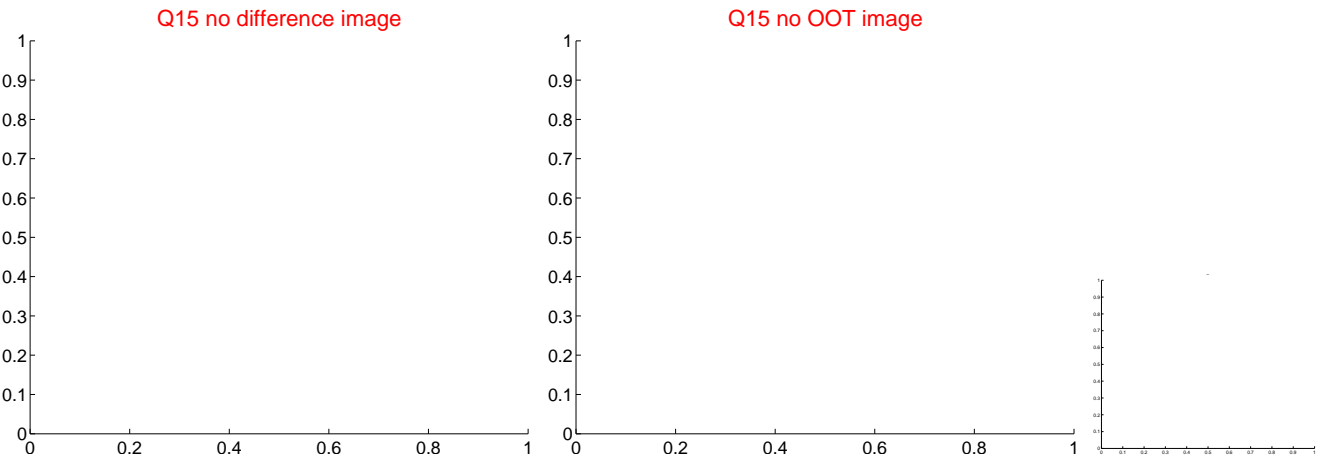
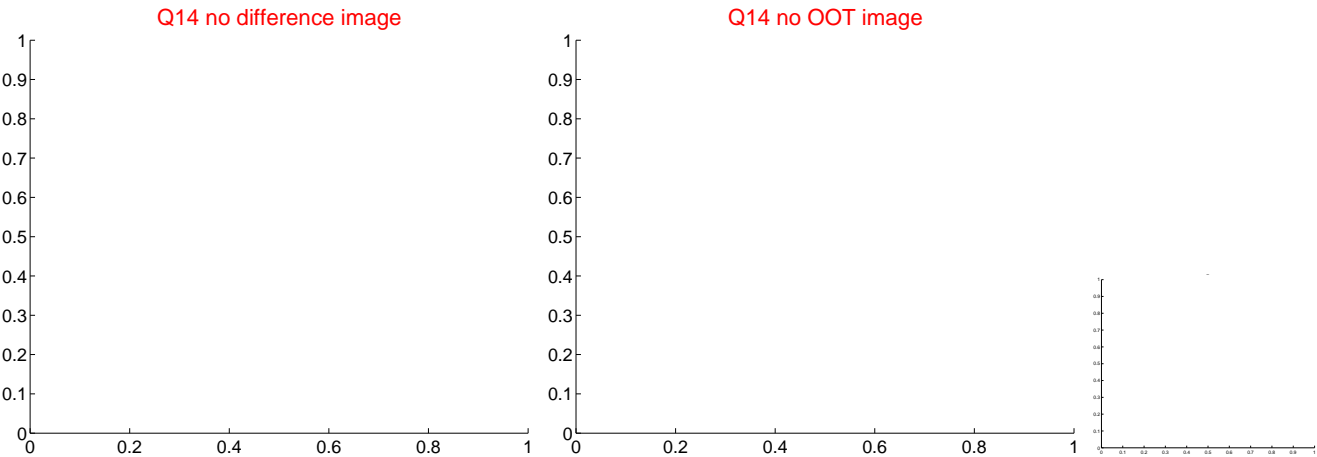
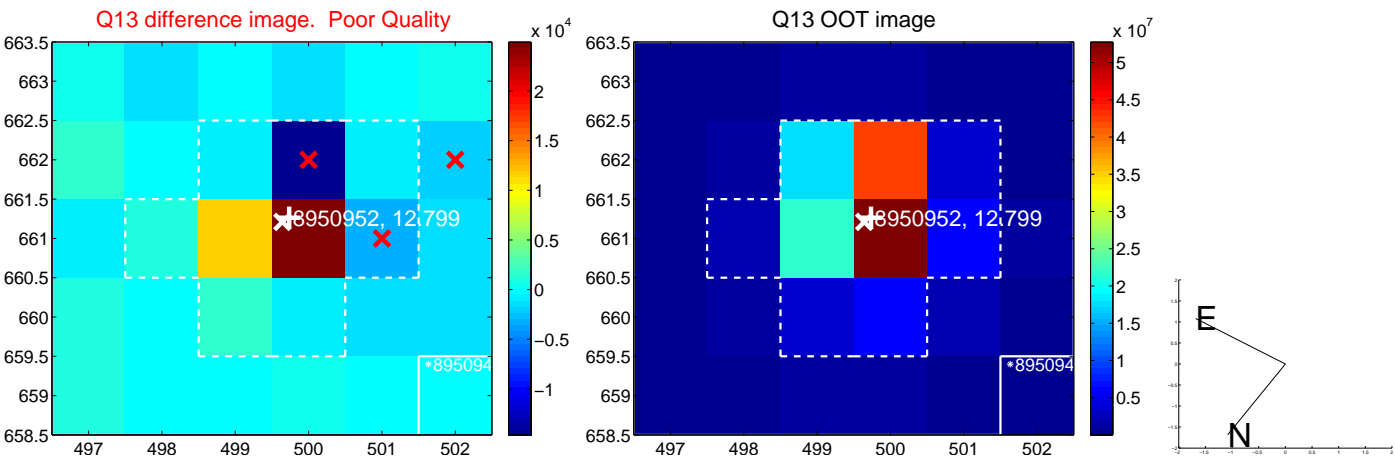
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



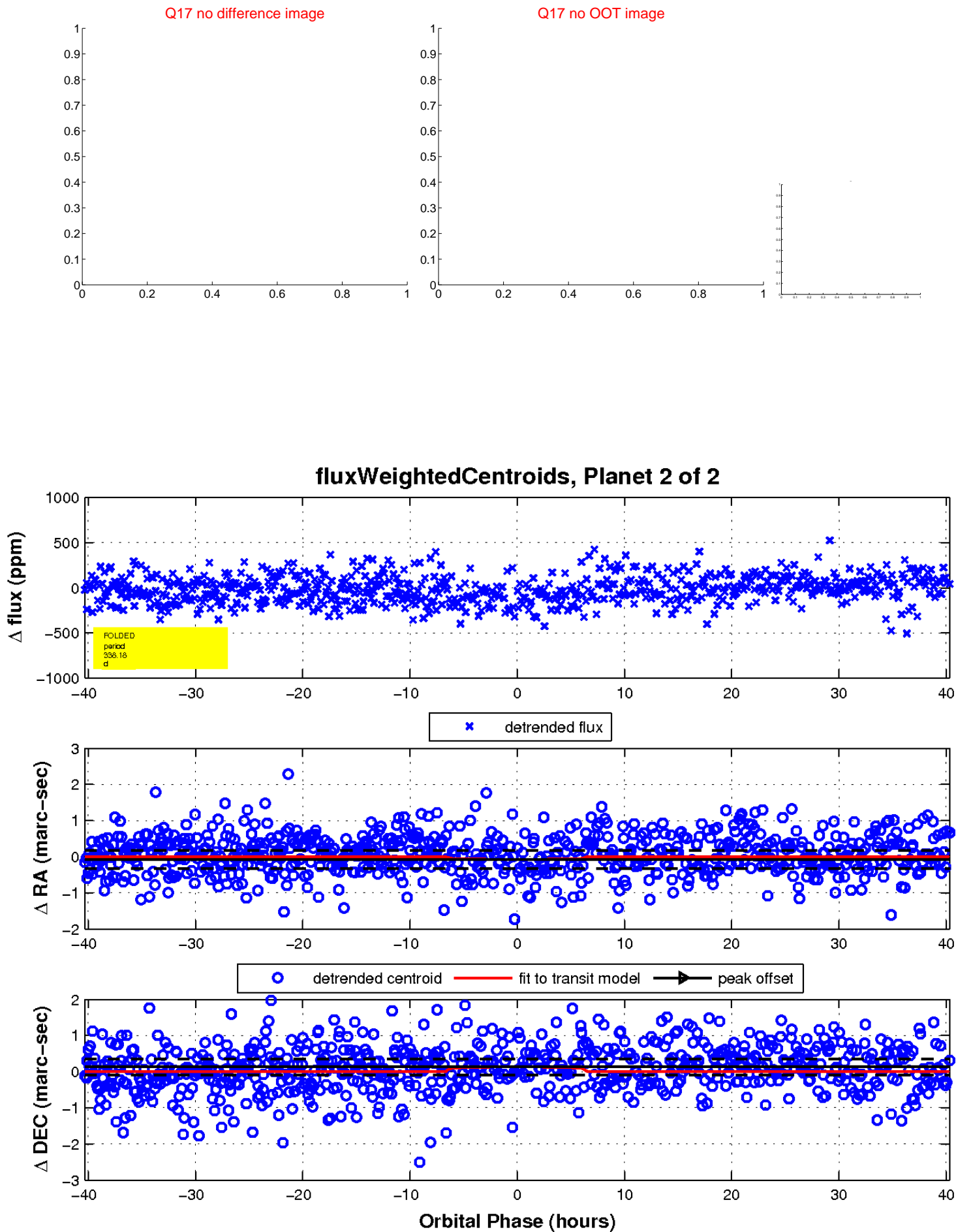
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

