

KIC 005122112

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 005122112-01 | OBS | 0552.01 | 3.055172 | 134.436749 | 8513.5 | 1.668 | 534.3 | 546.9 | 0.99 | 6237 | 15.24 | 805.92 |
| 005122112-02 | OBS | No | 3.055163 | 132.932018 | 270.4 | 1.107 | 14.8 | 18.2 | 0.99 | 6237 | 1.91 | 805.93 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005122112-01 | OBS | FP | 0.06 | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE |
| 005122112-02 | 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.

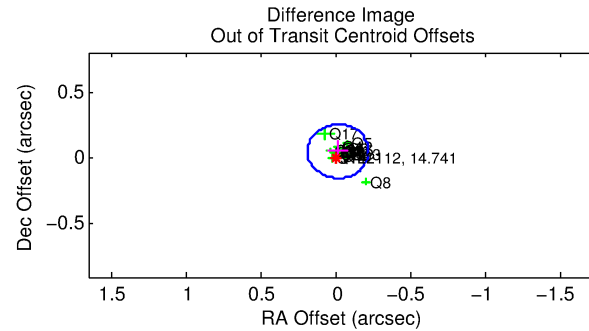
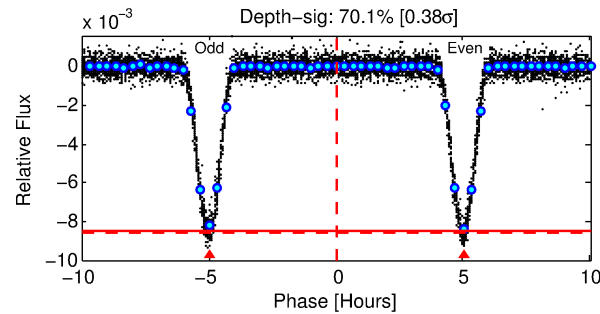
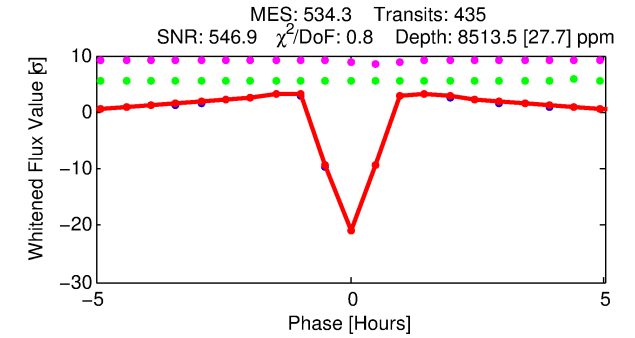
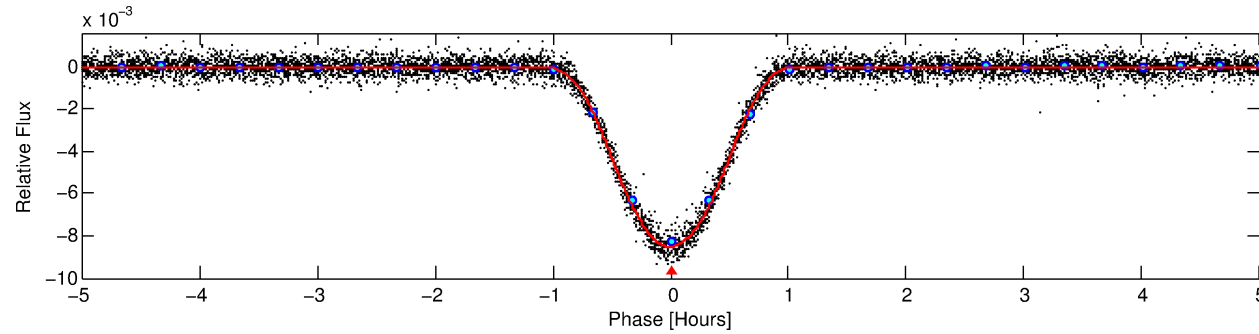
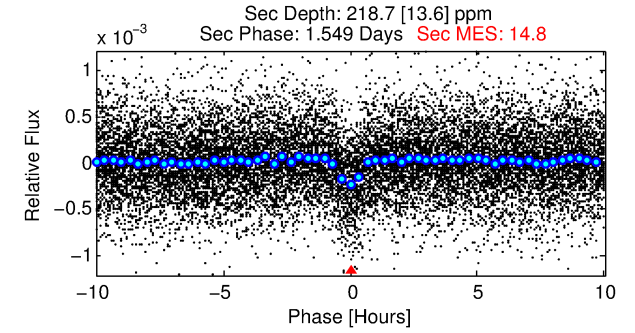
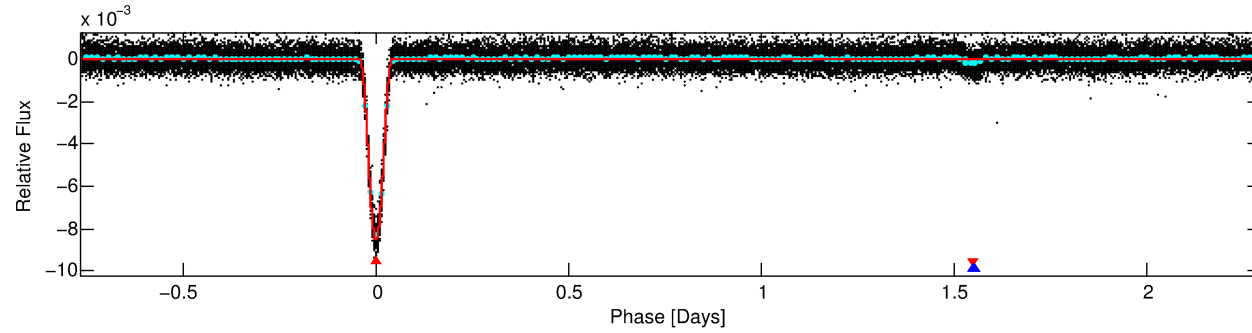
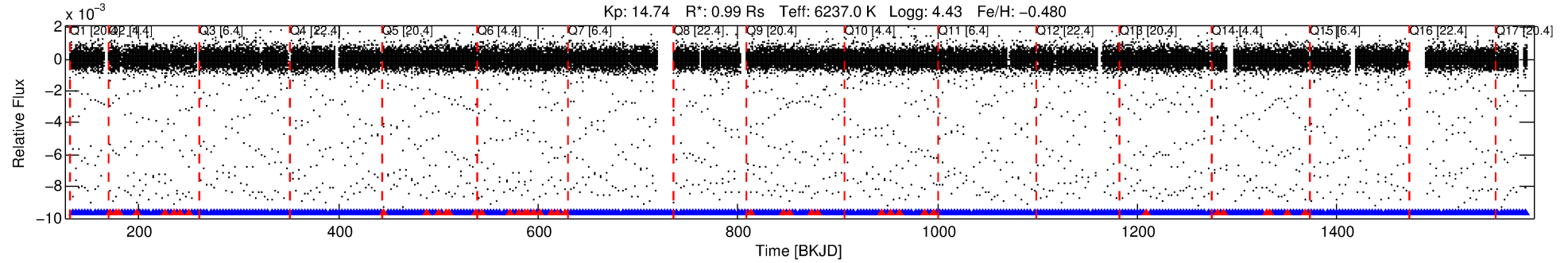
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005122112-01

No Significant Match Found

DV One-Page Summary

KIC: 5122112 Candidate: 1 of 2 Period: 3.055 d
KOI: K00552.01 Corr: 0.998



DV Fit Results:

Period = 3.05517 [0.00000] d
Epoch = 134.4367 [0.0000] BKJD
Rp/R* = 0.1415 [0.0160]
a/R* = 8.20 [0.17]
b = 0.98 [0.02]
Seff = 805.92 [307.08]
Teq = 1359 [129] K
Rp = 15.24 [4.60] Re
a = 0.0405 [0.0097] AU
Ag = 0.85 [0.36] [-0.42 σ]
Teffp = 2017 [138] K [3.48 σ]

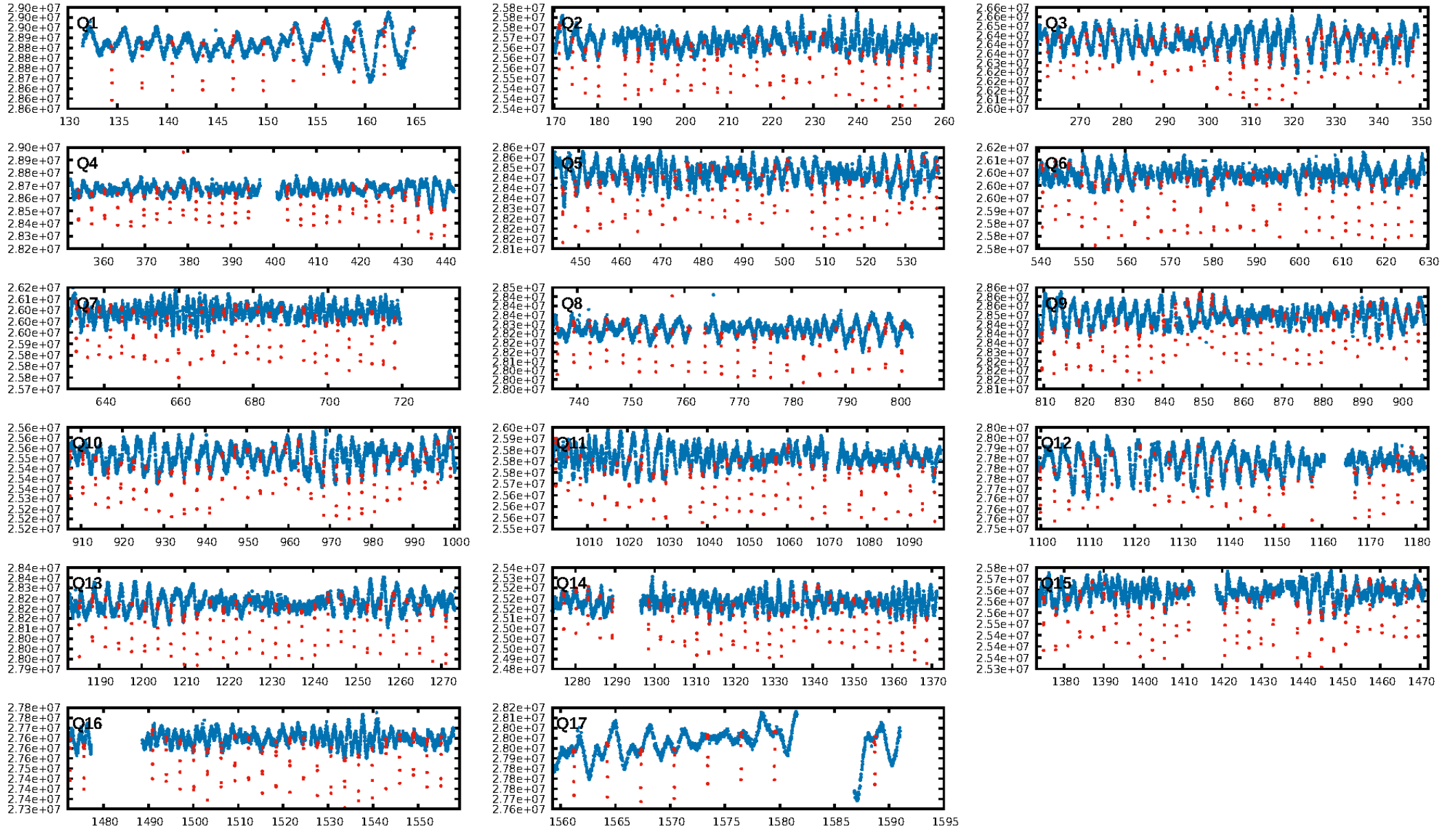
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.90 [375/416]
GhostDiagnostic-chr: 2.802
Centroid-sig: 23.7%
Centroid-so: 0.171 arcsec [8.80 σ]
OotOffset-rm: 0.055 arcsec [0.81 σ]
KicOffset-rm: 0.088 arcsec [1.28 σ]
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]

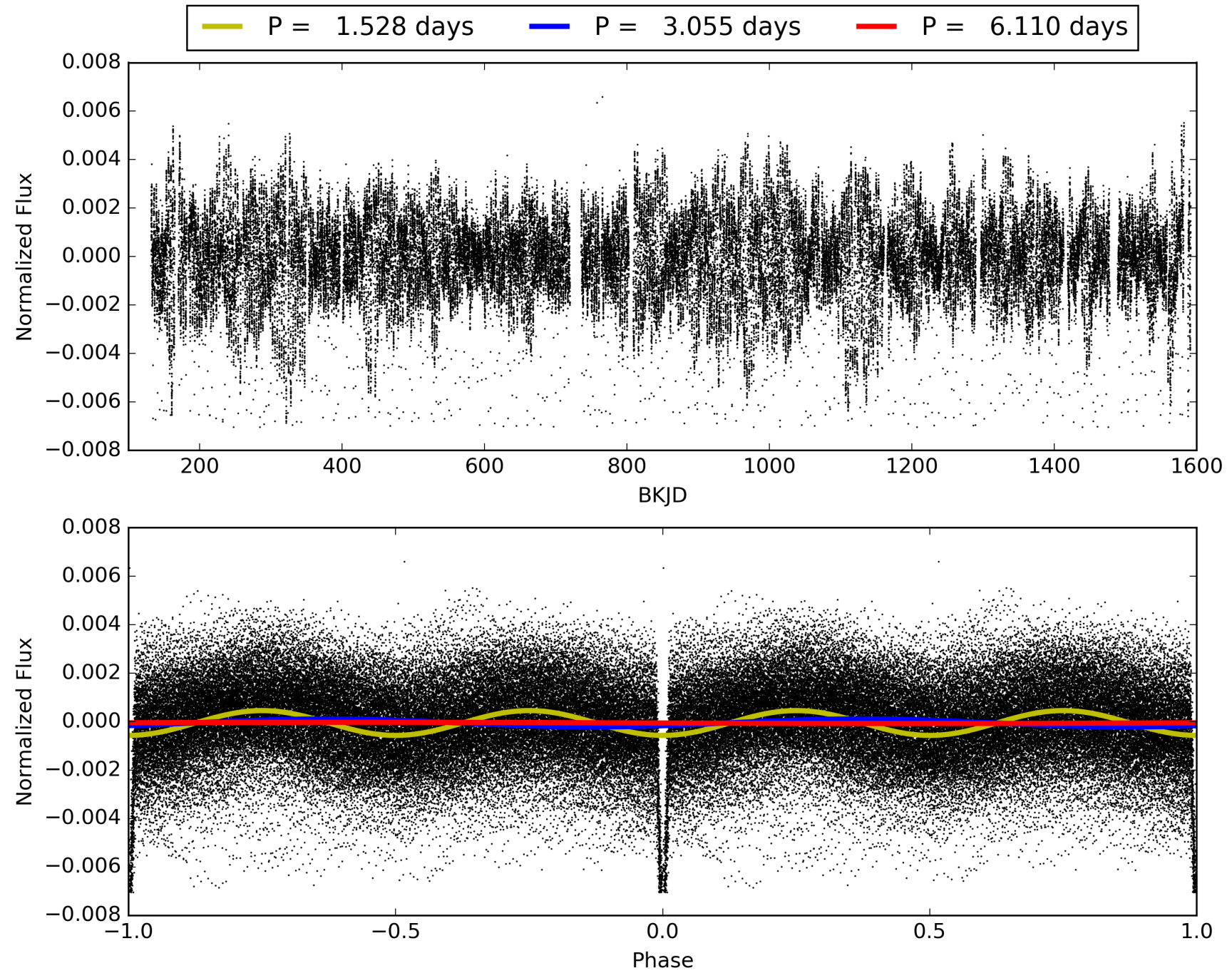
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:39:18 Z

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

TCE 005122112-01, PDC Light Curves

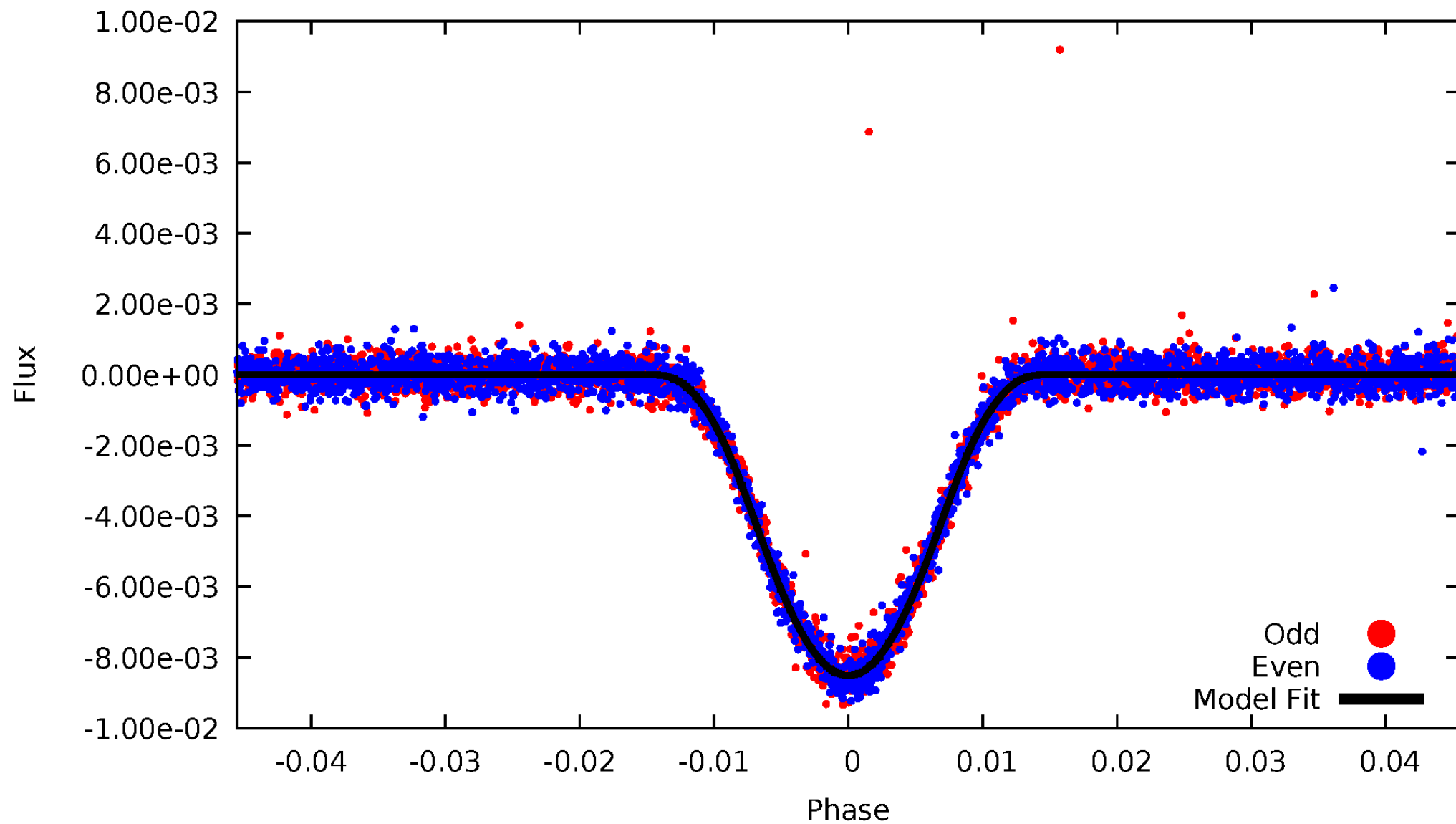


TCE 005122112-01



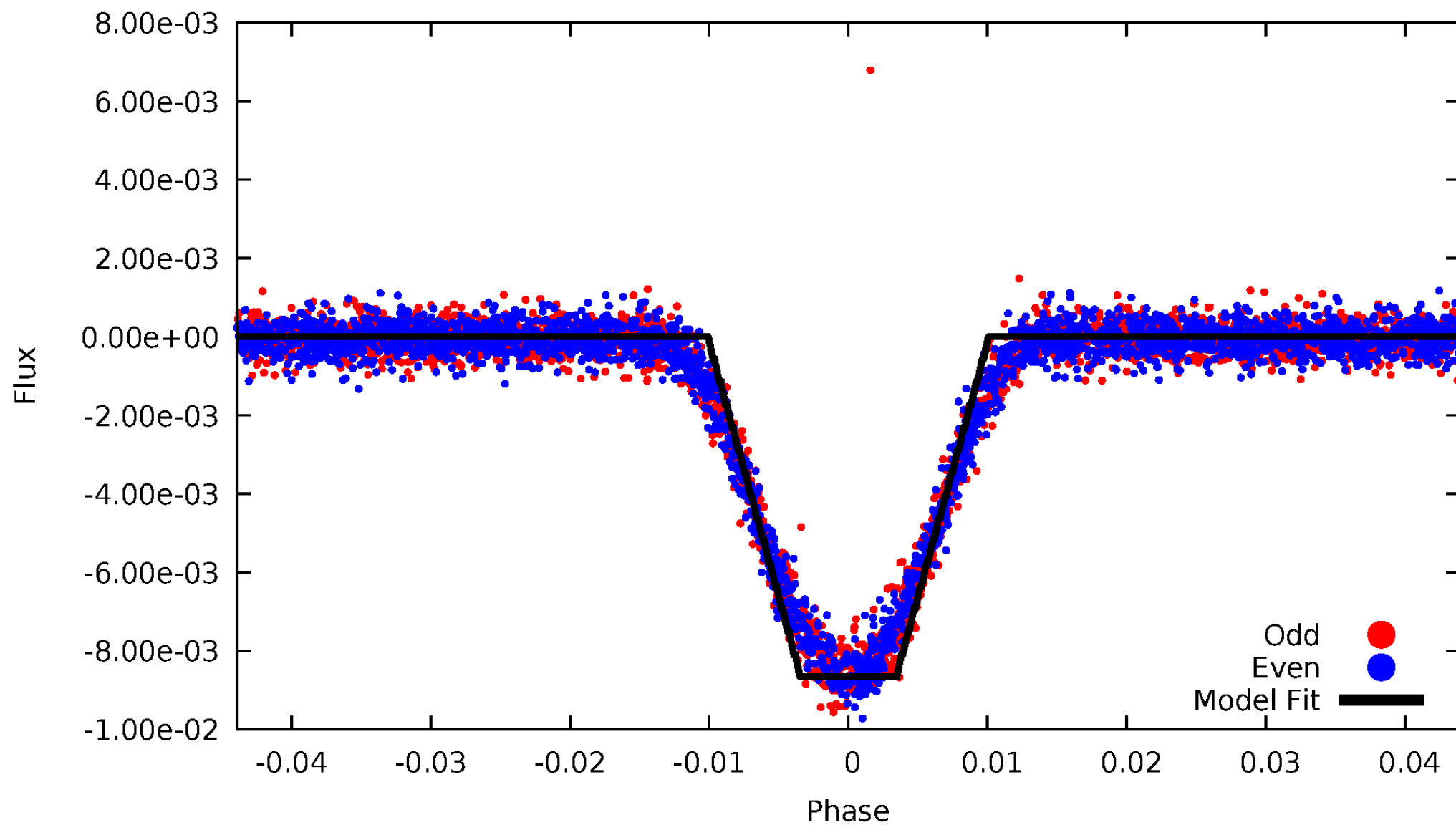
DV Odd/Even

TCE 005122112-01



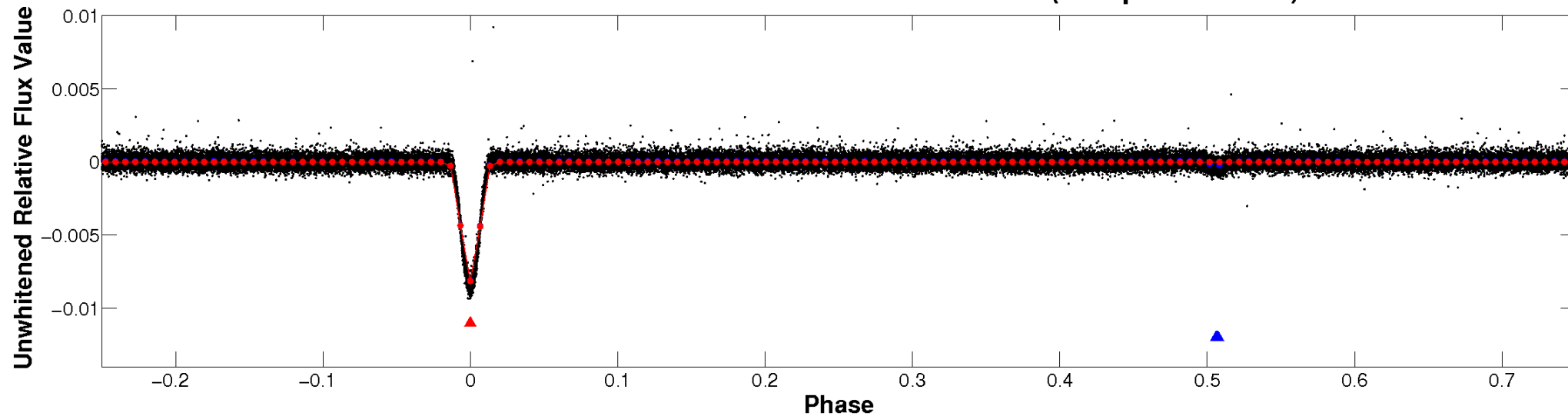
ALT Odd/Even

TCE 005122112-01

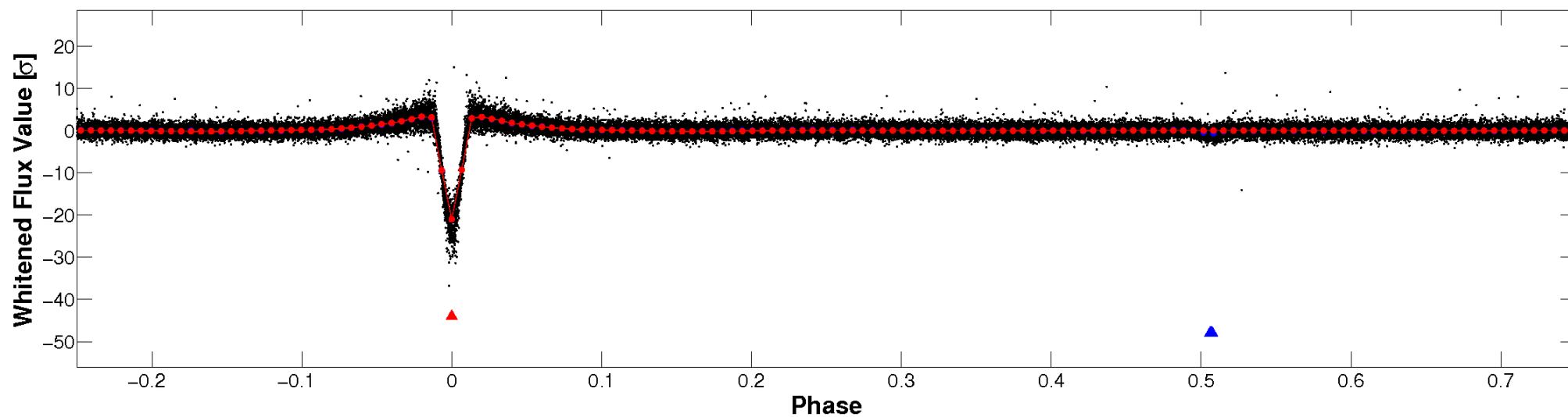


Non-Whitened Vs. Whitened Light Curve

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

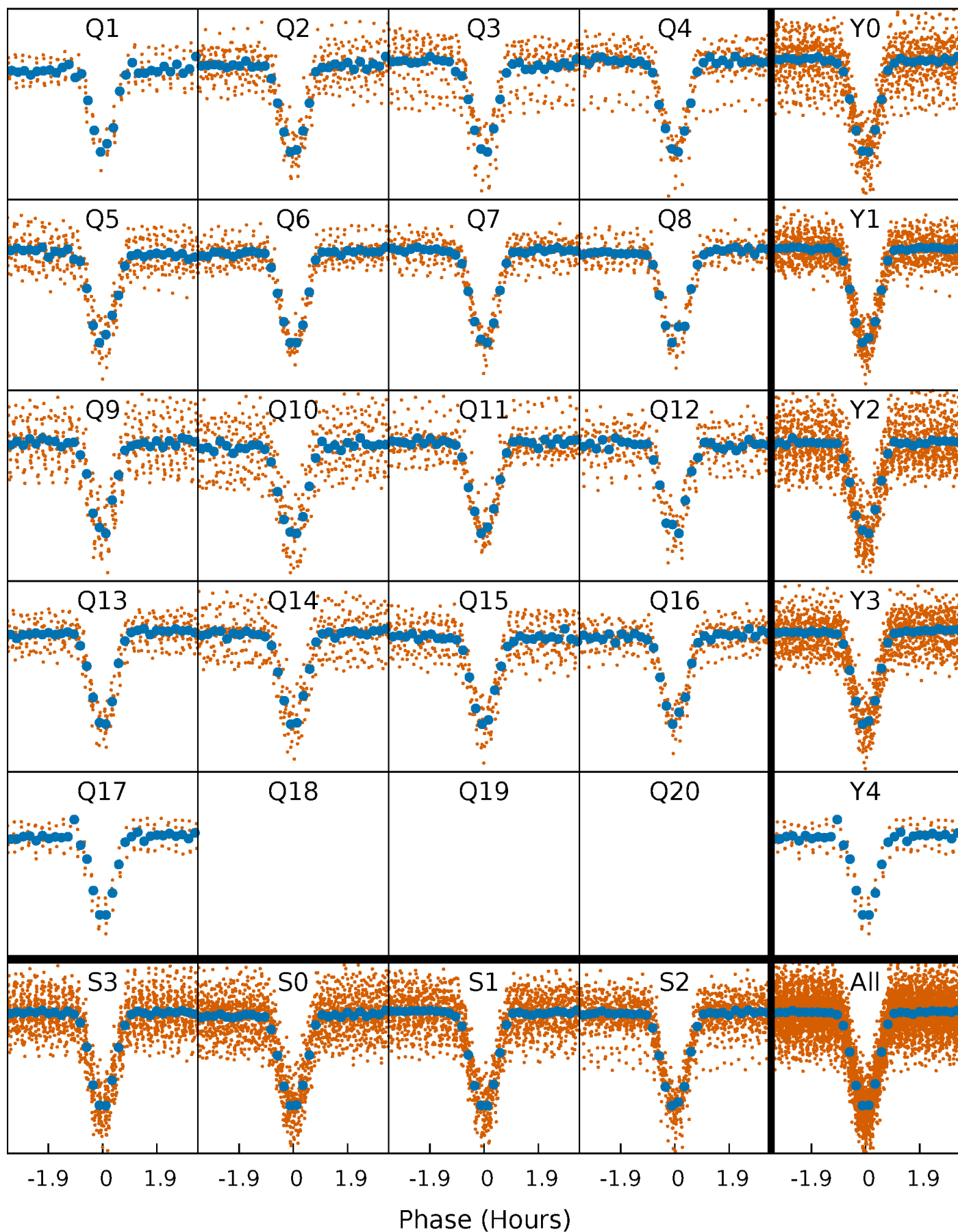


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



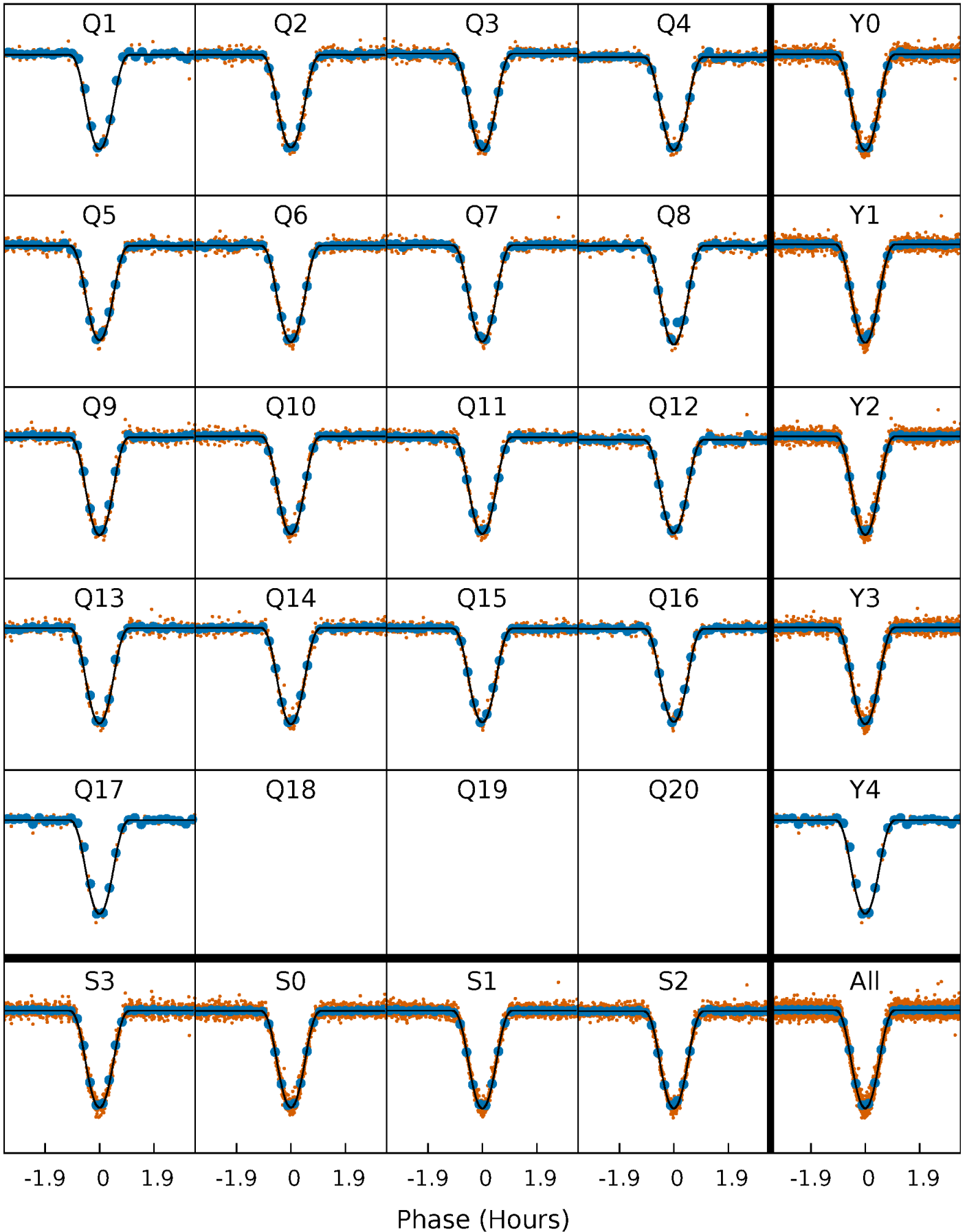
PDC Quarter-Phased Transit Curves

TCE 005122112-01 P= 3.055172 Days $T_0=134.436749$ (BKJD)



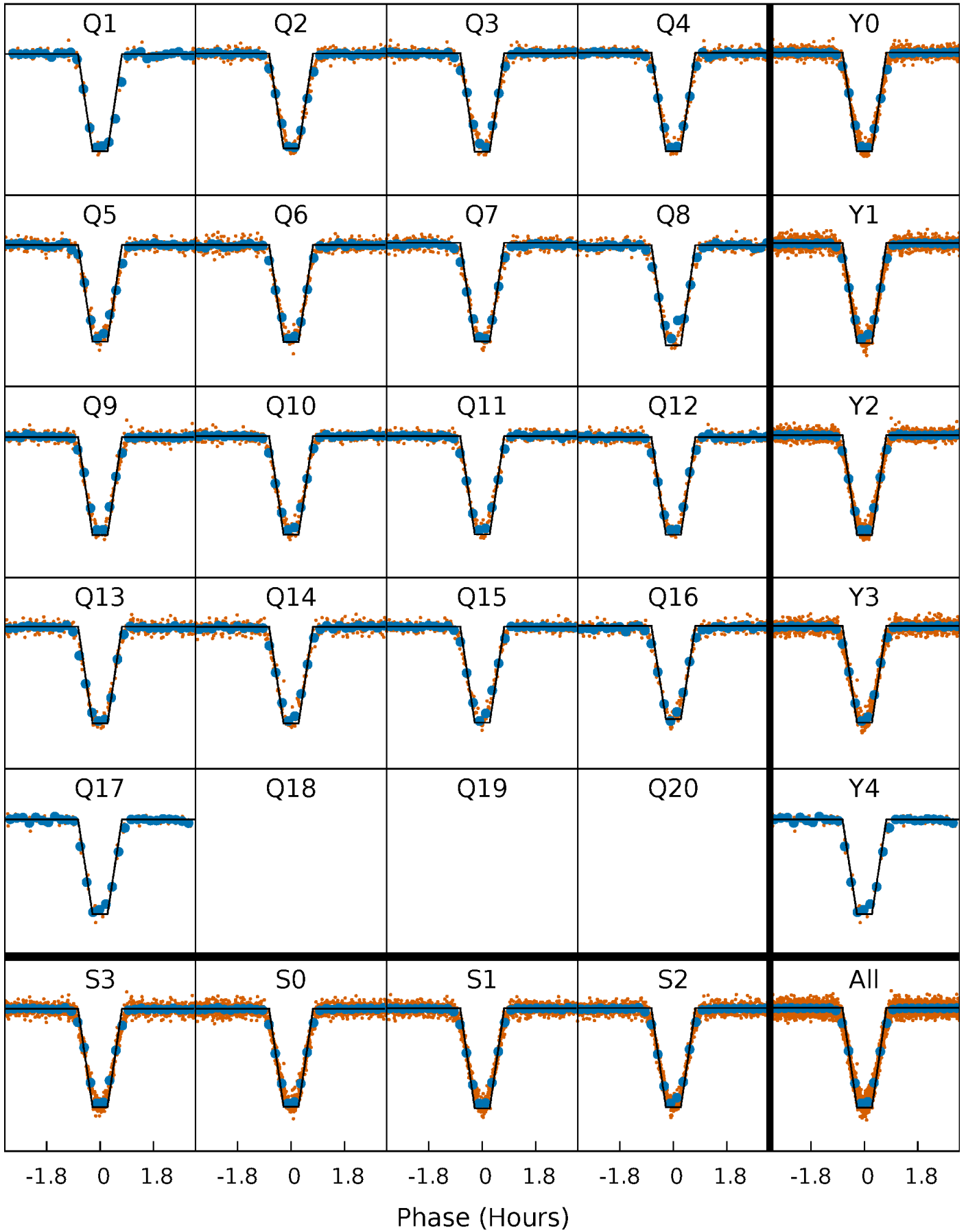
DV Quarter-Phased Transit Curves

TCE 005122112-01 P= 3.055172 Days $T_0=134.436749$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

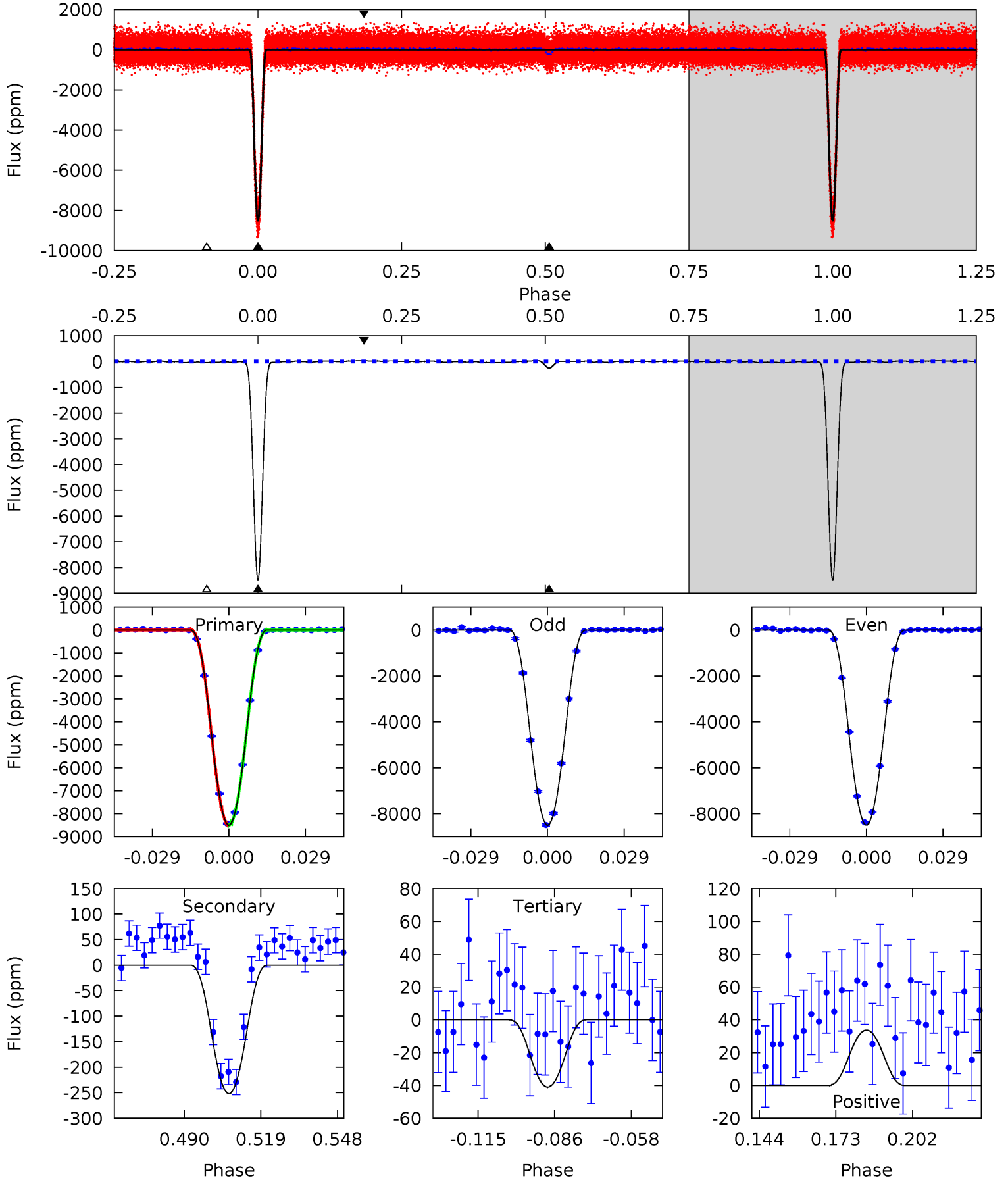
TCE 005122112-01 P= 3.055177 Days $T_0=134.435670$ (BKJD)



DV Model-Shift Uniqueness Test

005122112-01, P = 3.055172 Days, E = 131.381577 Days

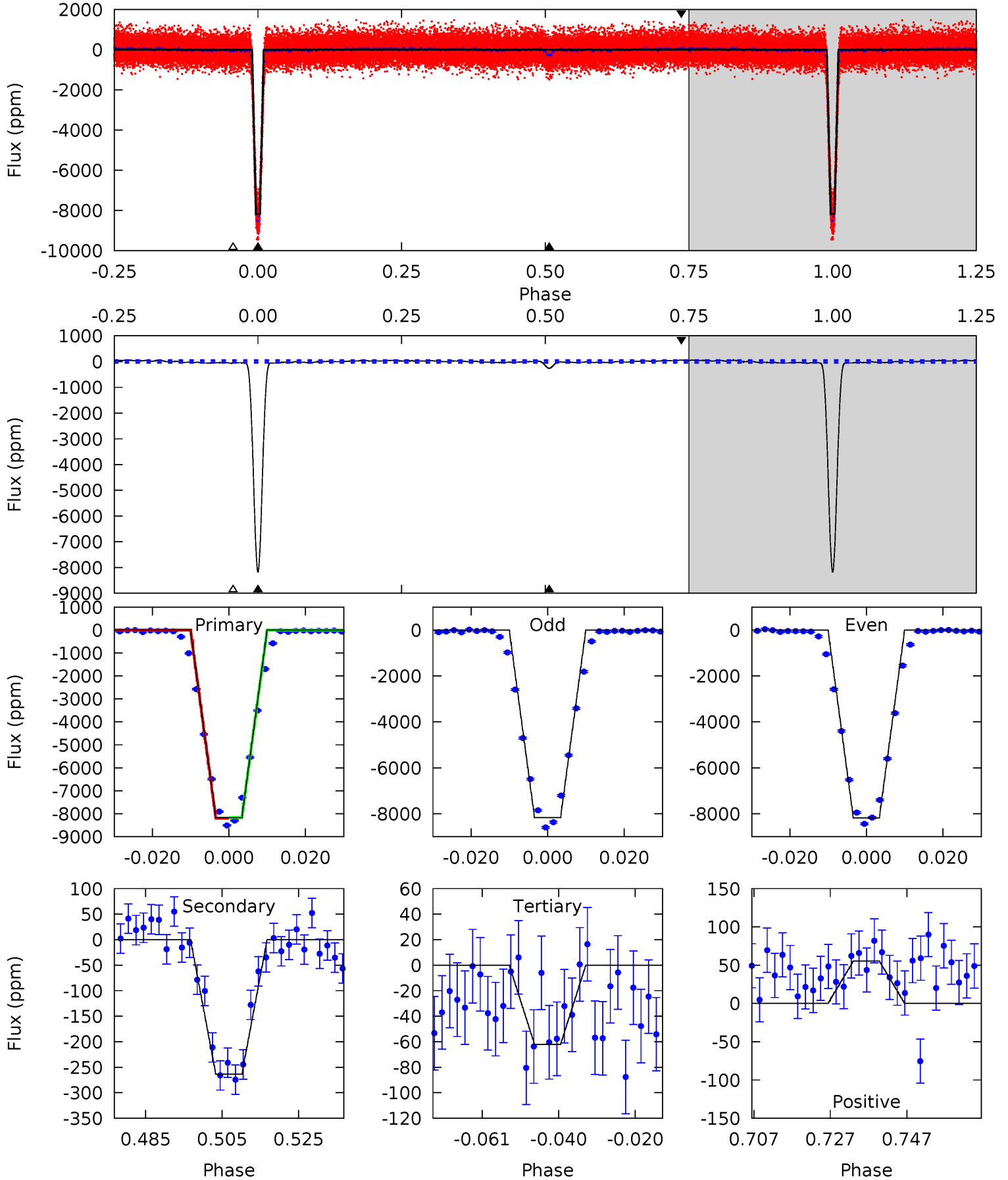
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1082 | 32.1 | 5.22 | 4.31 | 4.82 | 2.19 | 2.27 | 1077 | 1078 | 26.9 | 27.8 | 0.09 | 1.00 | 0.00 | 0.81 |



Alt Model-Shift Uniqueness Test

005122112-01, P = 3.055177 Days, E = 131.380493 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 825.7 | 26.6 | 6.28 | 5.59 | 4.89 | 2.32 | 3.05 | 819.4 | 820.1 | 20.4 | 21.0 | 0.59 | 0.99 | 0.01 | 1.36 |



Stellar Parameters For KIC 005122112

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6237^{+176}_{-220} | $4.426^{+0.098}_{-0.196}$ | $-0.480^{+0.300}_{-0.300}$ | $0.987^{+0.276}_{-0.128}$ | $0.948^{+0.135}_{-0.101}$ | $1.387^{+0.604}_{-0.677}$ |
| | +3%/-4% | +2%/-4% | +62%/-62% | +28%/-13% | +14%/-11% | +44%/-49% |
| 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 005122112-01 / KOI 0552.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|-------------------------|----------------------|----------------------|---------------------------|
| DV | -252 ± 8 | $15.47^{+2.75}_{-2.15}$ | 1918^{+129}_{-109} | 2682^{+127}_{-129} | $0.945^{+0.315}_{-0.248}$ |
| Alt. | -264 ± 10 | $10.32^{+2.15}_{-1.97}$ | 1911^{+147}_{-108} | 3125^{+217}_{-173} | $2.226^{+1.171}_{-0.714}$ |

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

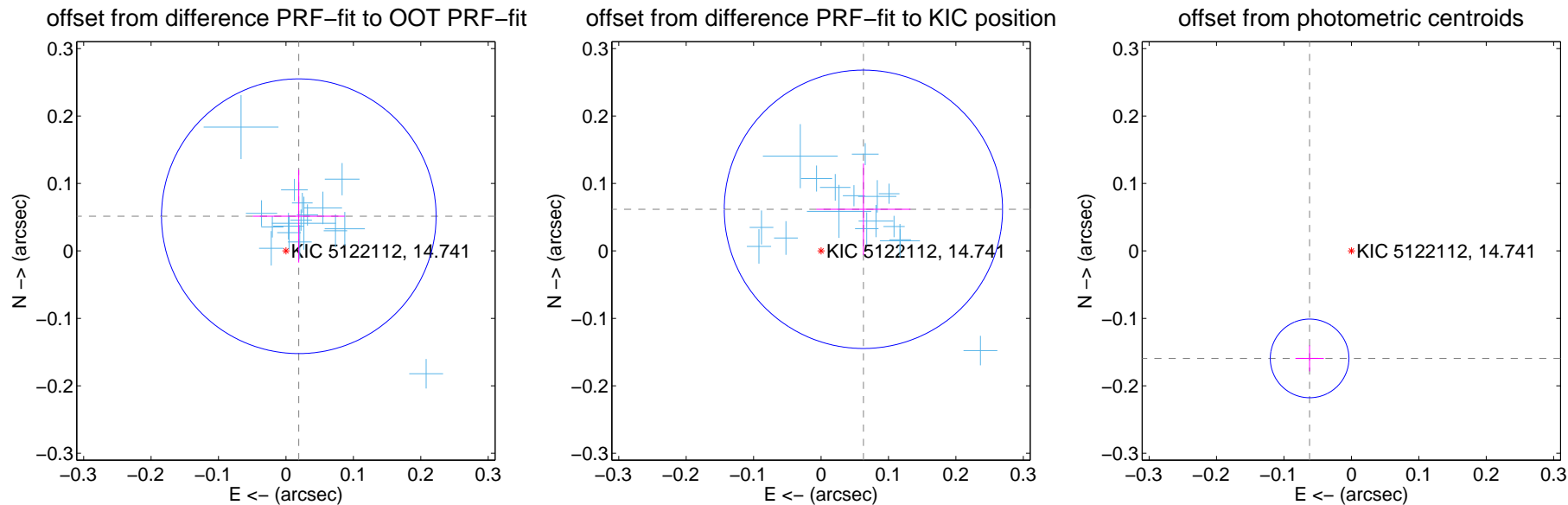
DV Centroid Data

Supplemental centroid analysis for 005122112-01. Kepler magnitude: 14.74. Transit SNR 546.90

There are 17 quarters with good PRF difference image offsets

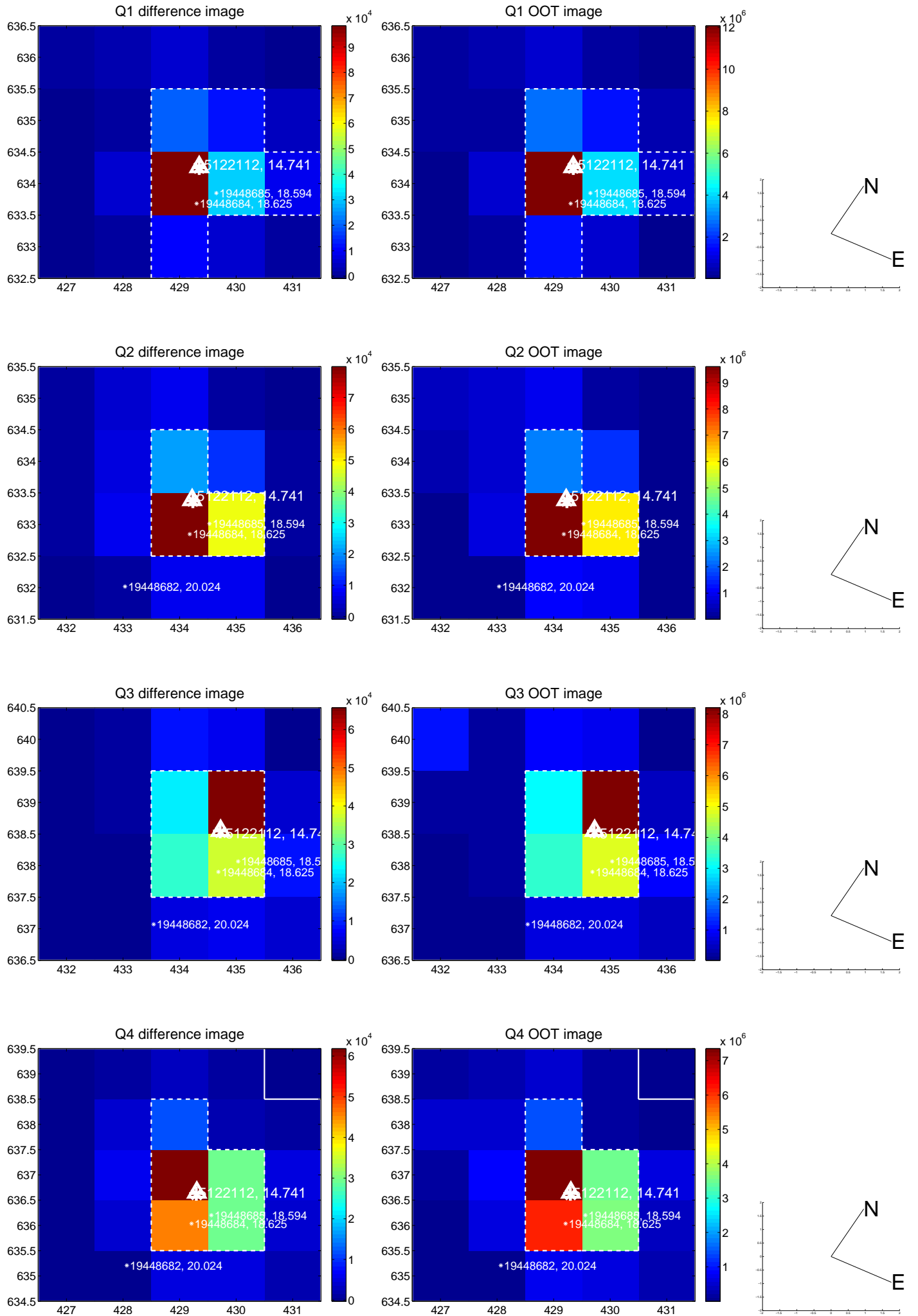
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.055 ± 0.068 | 0.81 | -0.019 ± 0.068 | 0.051 ± 0.069 |
| PRF-fit source offset from KIC position | 0.088 ± 0.069 | 1.28 | -0.063 ± 0.070 | 0.062 ± 0.068 |
| photometric centroid source offset | 0.17 ± 0.02 | 8.80 | 0.06 ± 0.02 | -0.16 ± 0.02 |

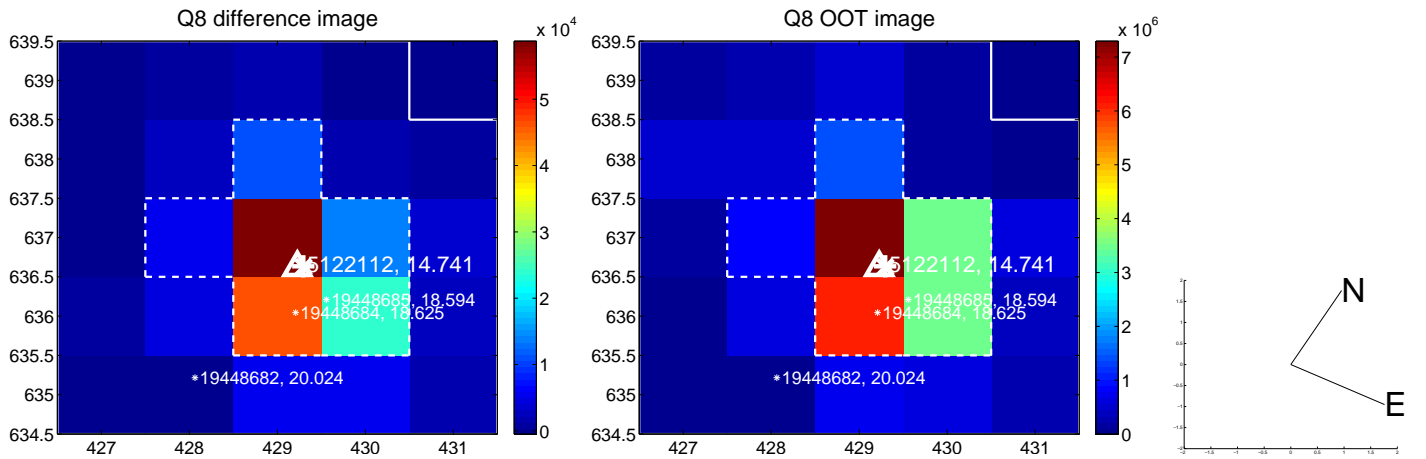
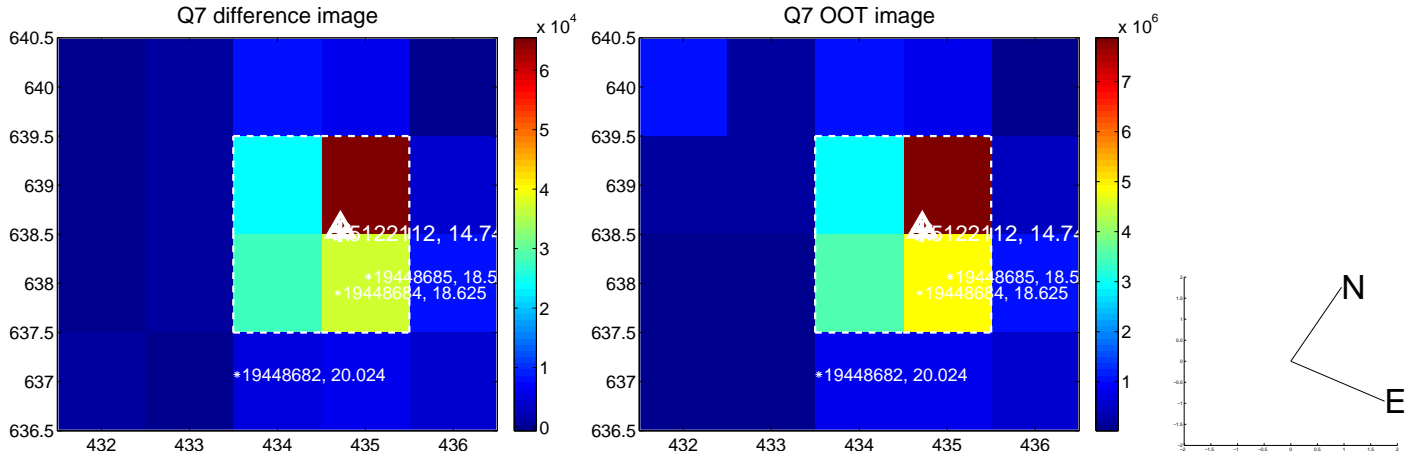
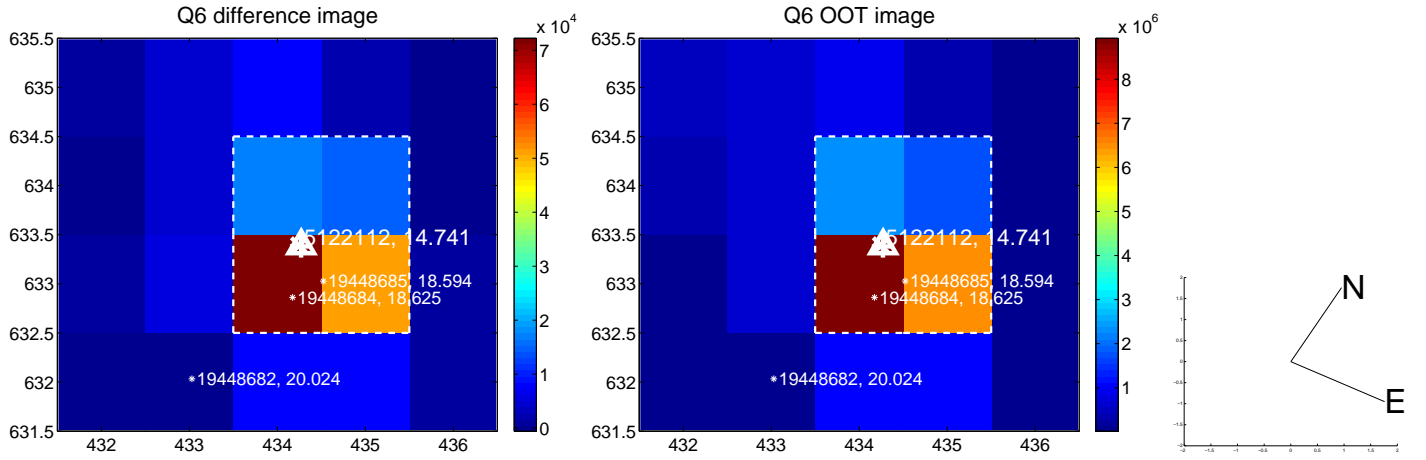
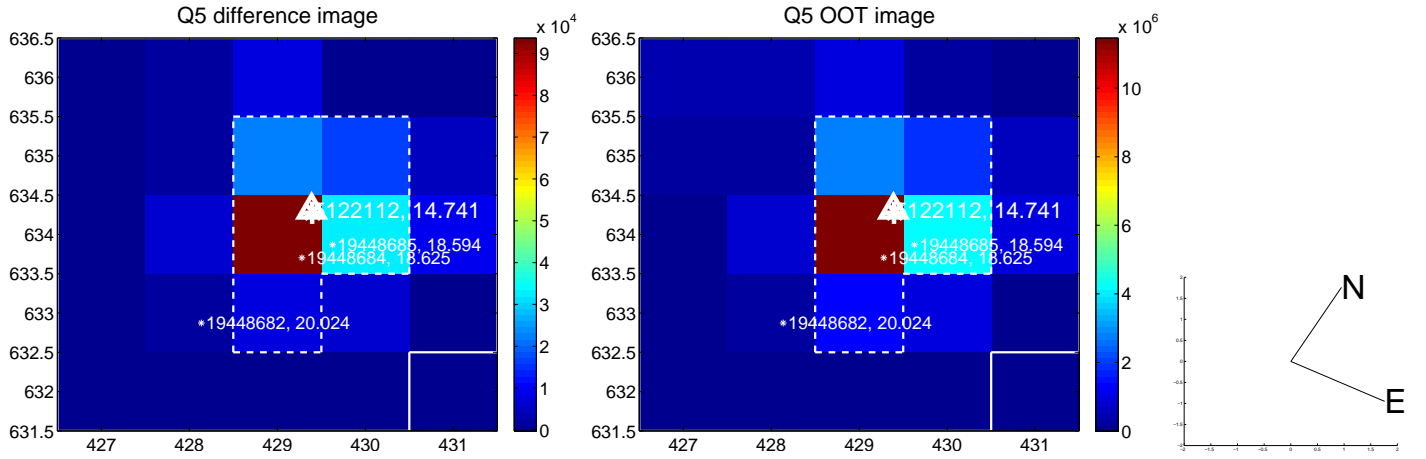


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

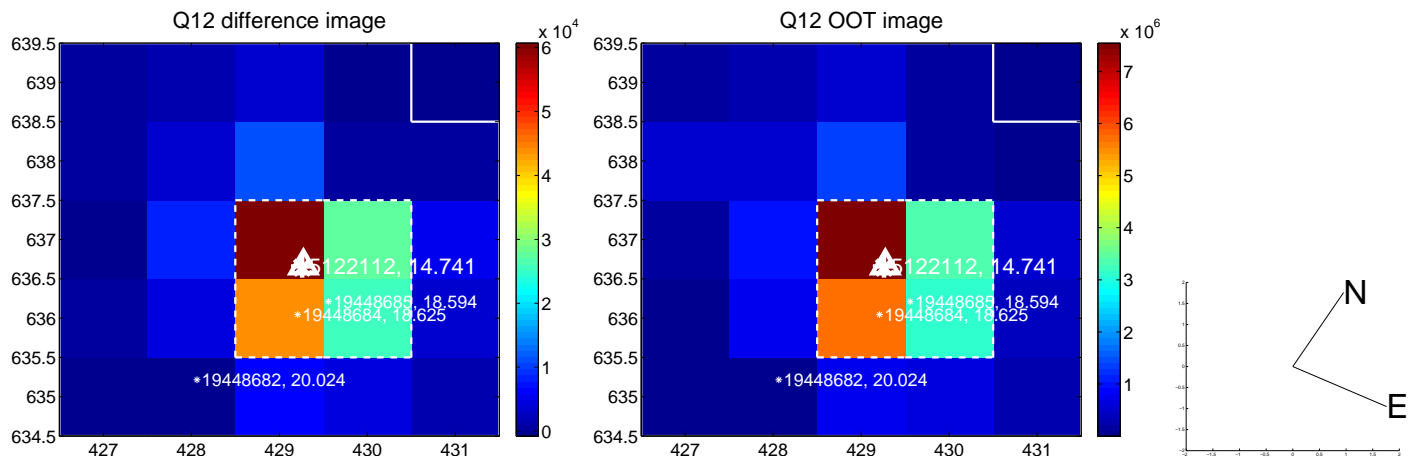
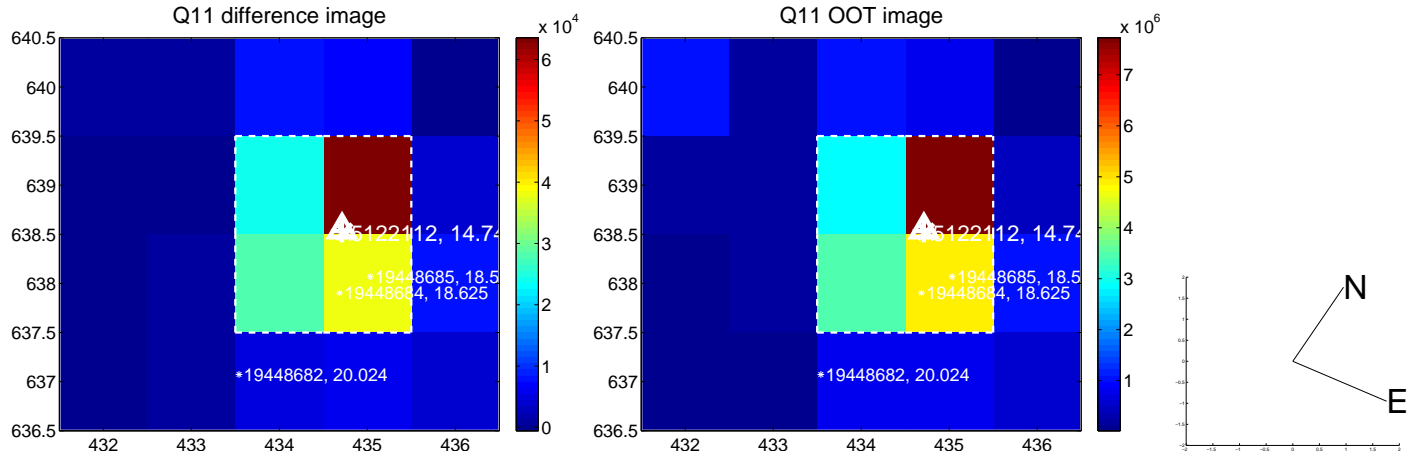
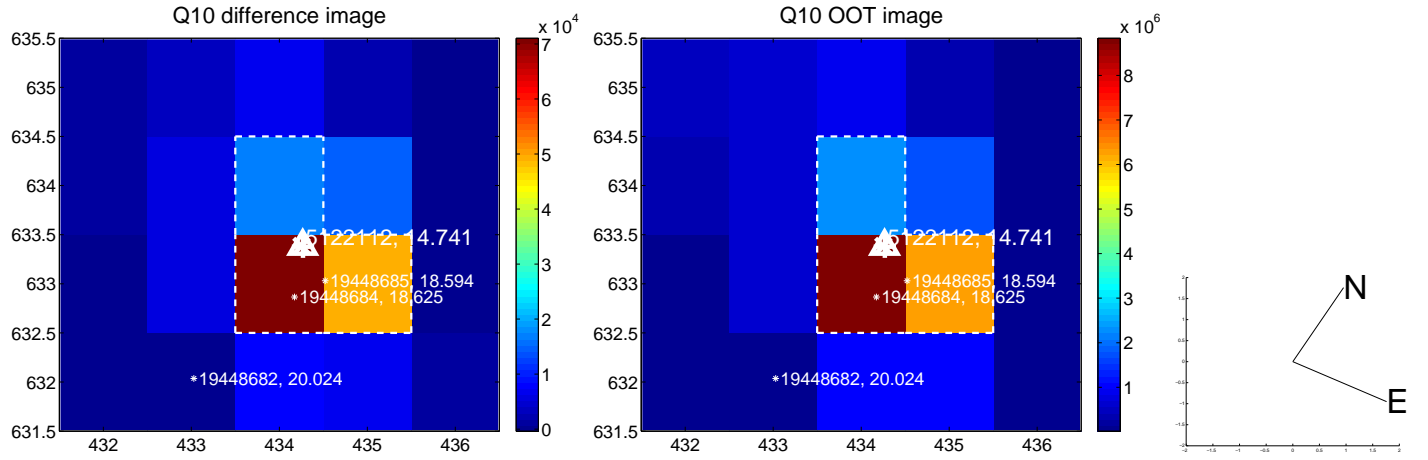
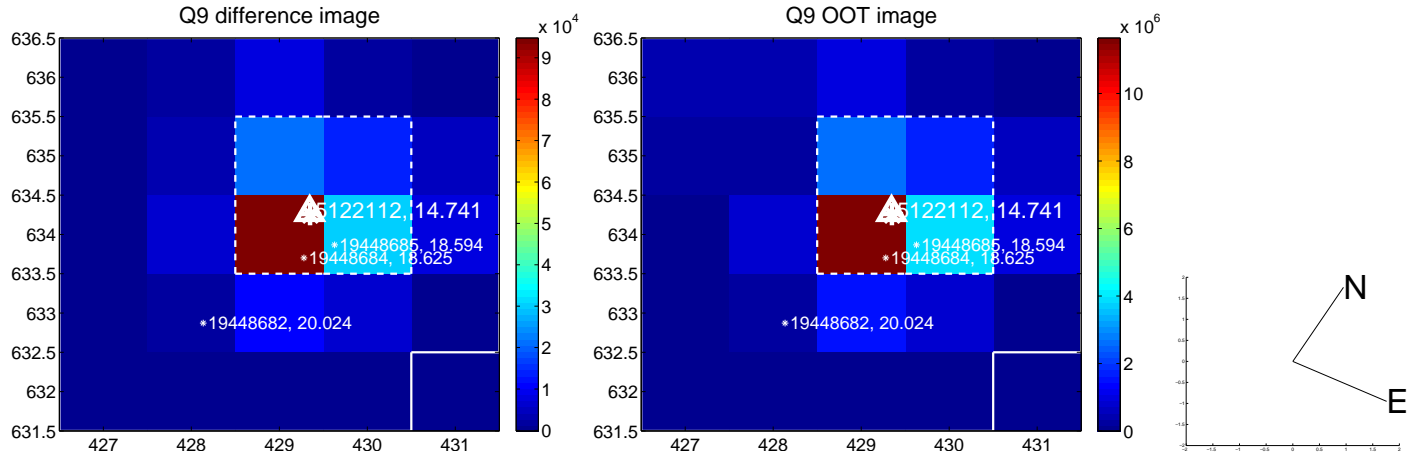
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



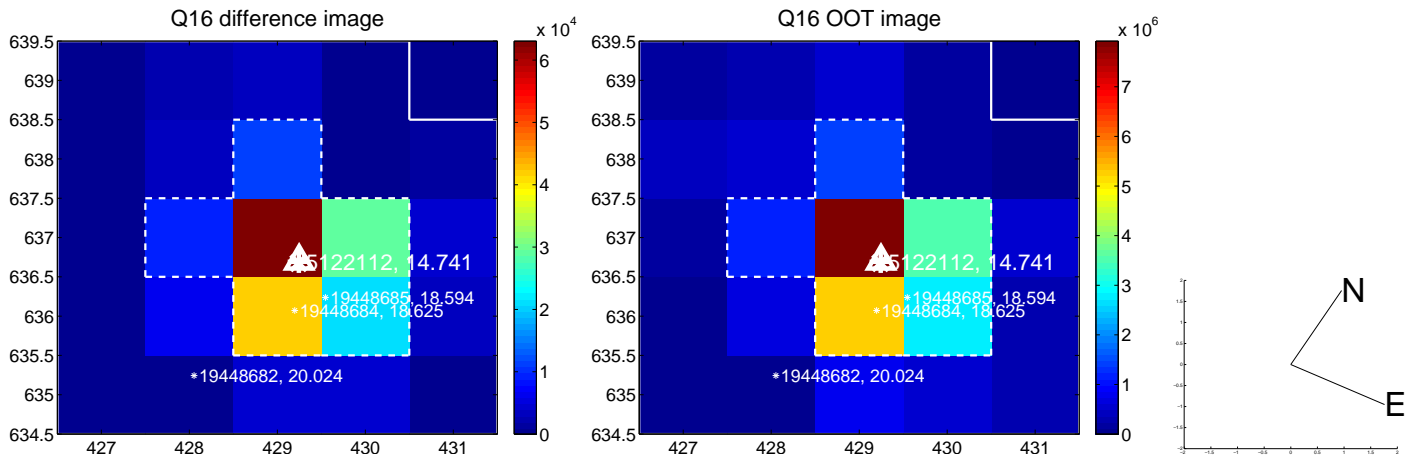
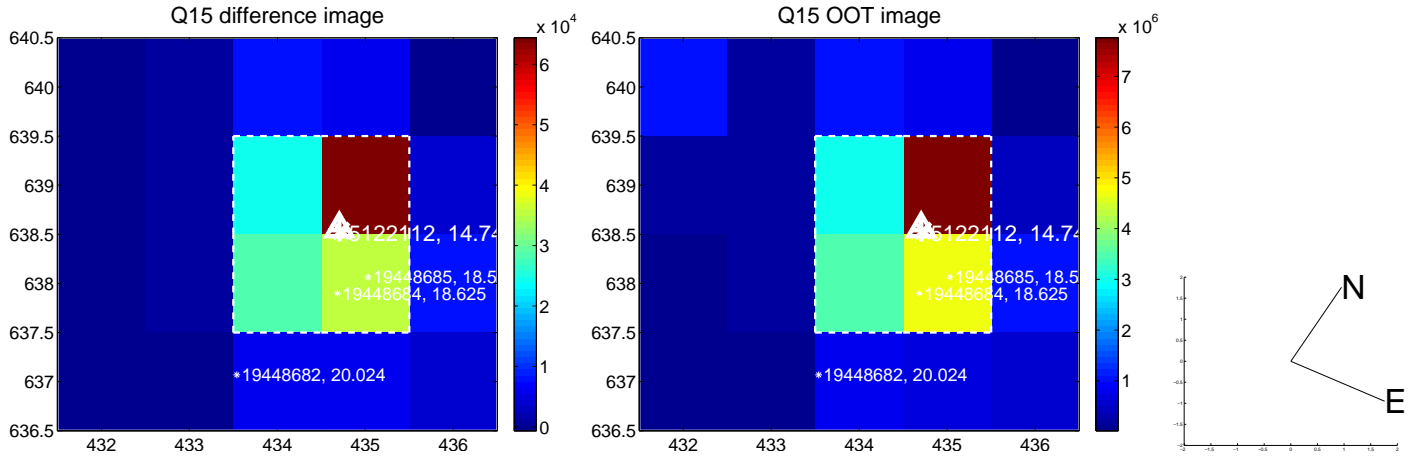
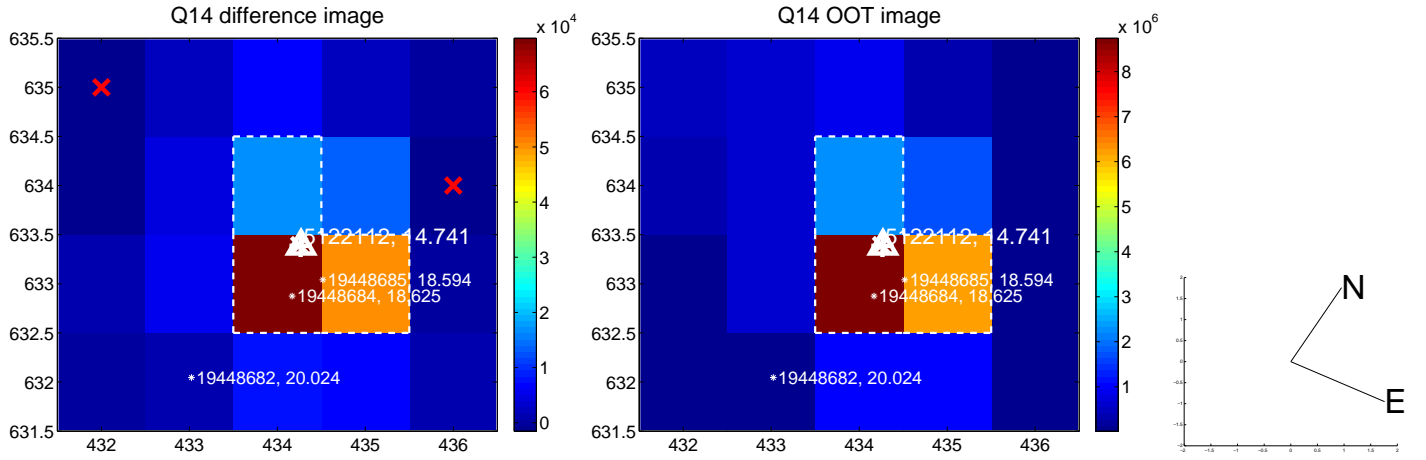
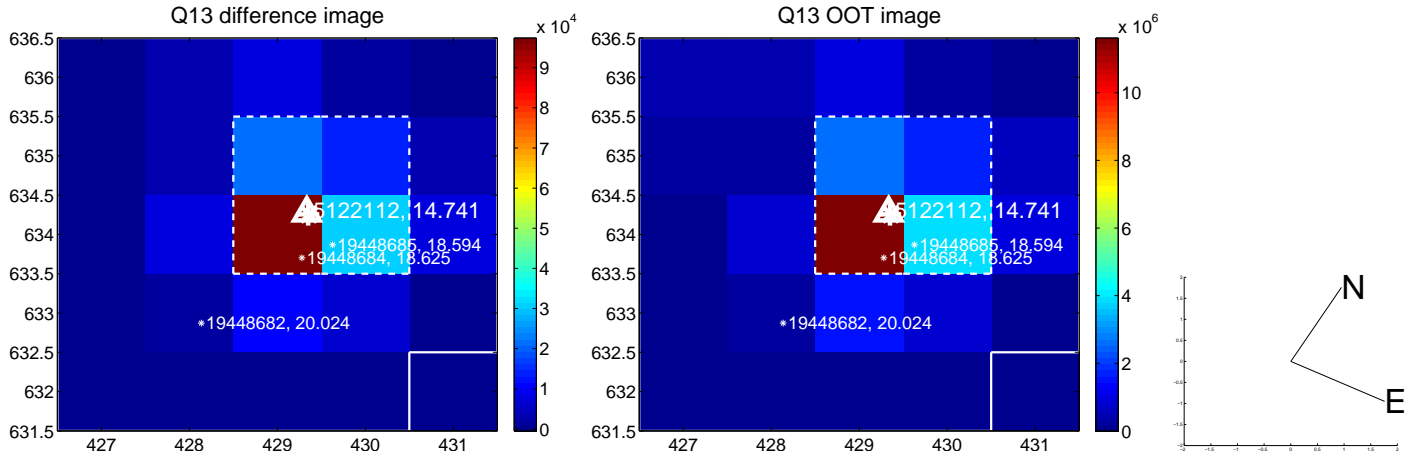
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



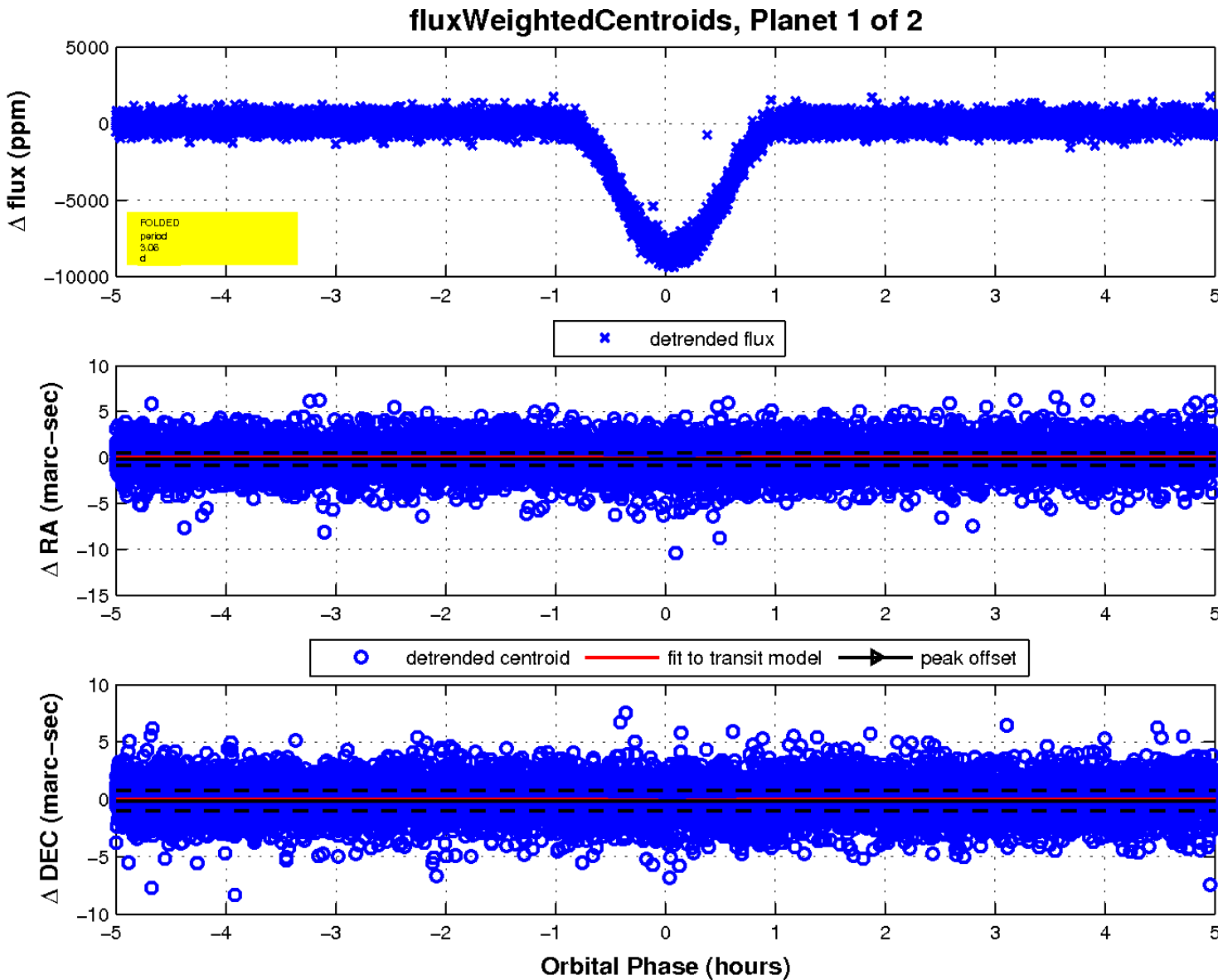
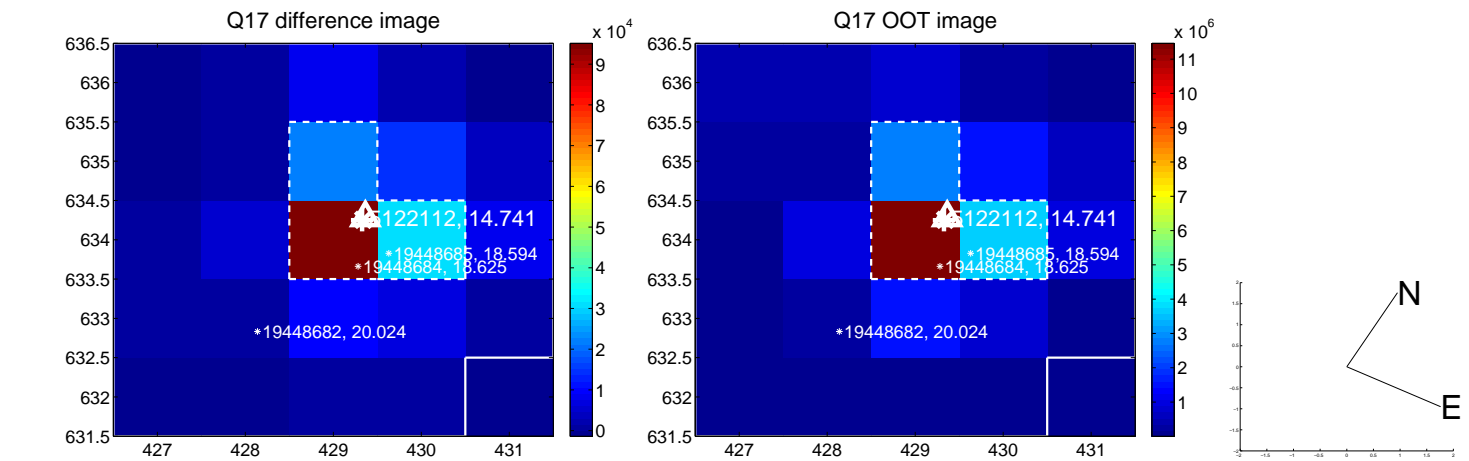
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

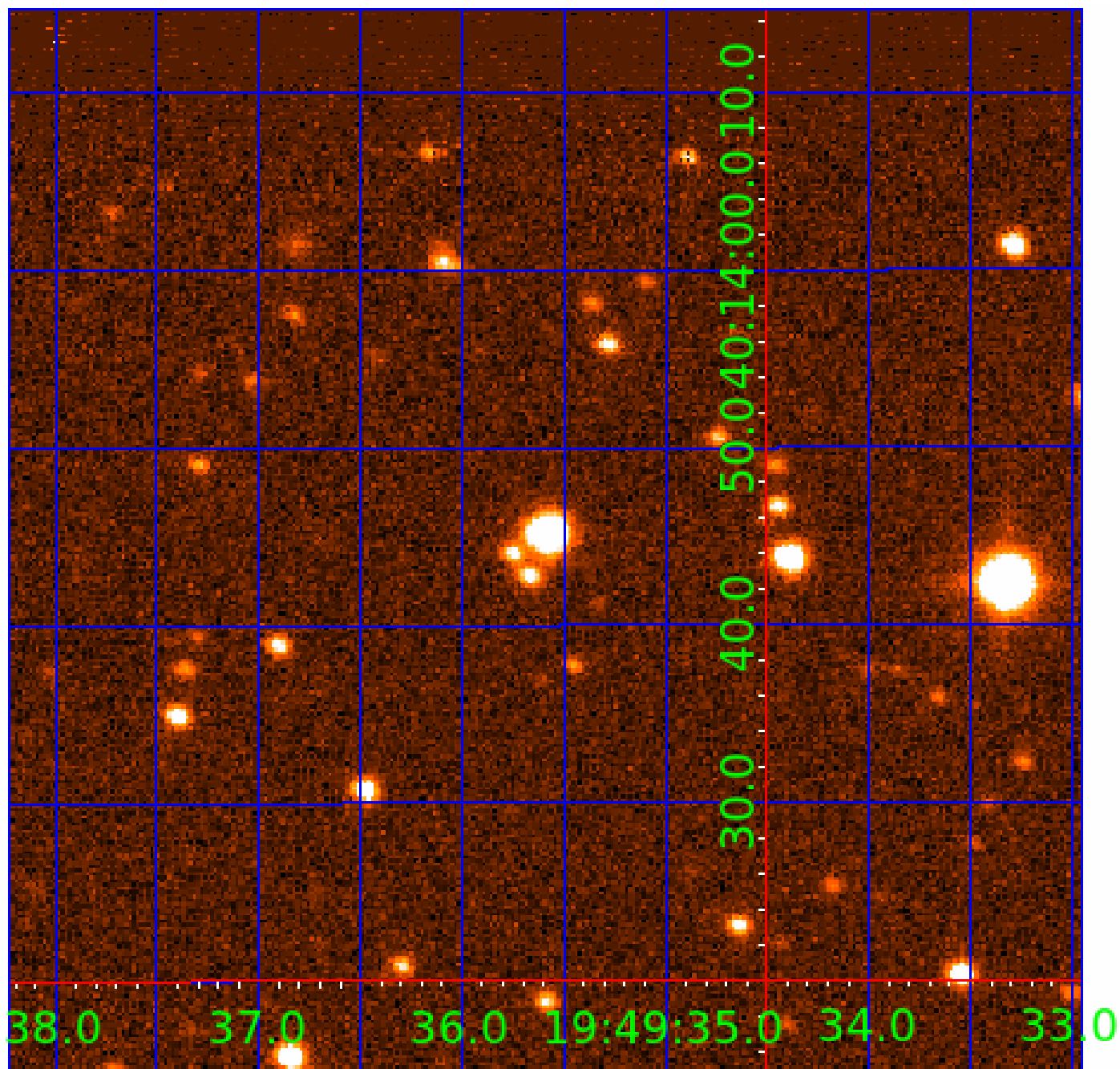


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005122112

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 005122112-01 | OBS | 0552.01 | 3.055172 | 134.436749 | 8513.5 | 1.668 | 534.3 | 546.9 | 0.99 | 6237 | 15.24 | 805.92 |
| 005122112-02 | OBS | No | 3.055163 | 132.932018 | 270.4 | 1.107 | 14.8 | 18.2 | 0.99 | 6237 | 1.91 | 805.93 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005122112-01 | OBS | FP | 0.06 | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE |
| 005122112-02 | 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 005122112-02

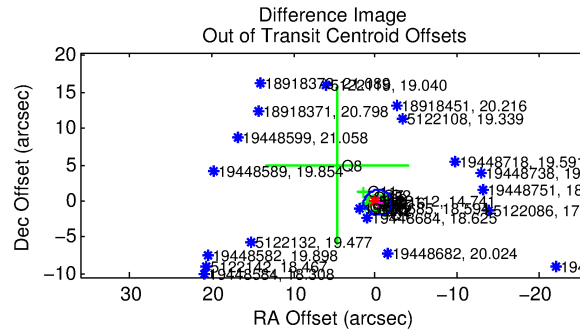
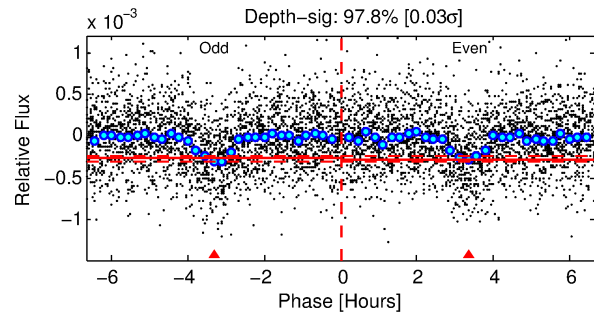
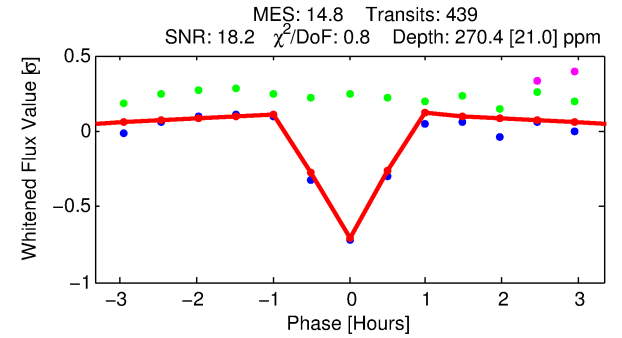
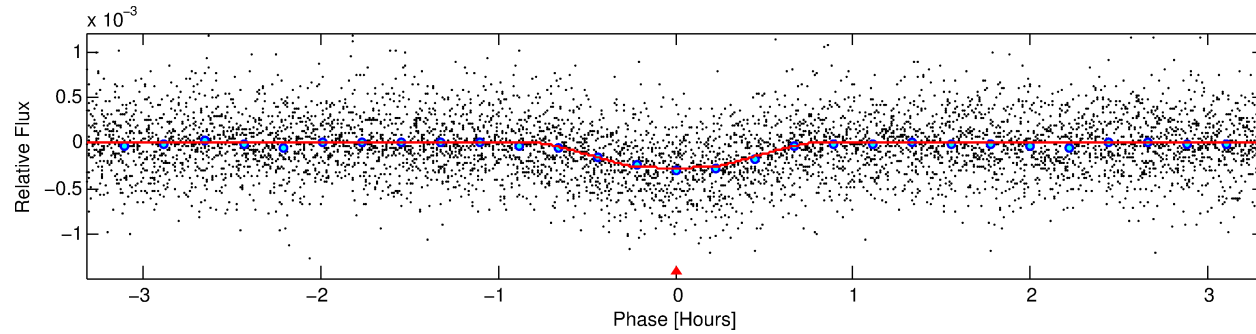
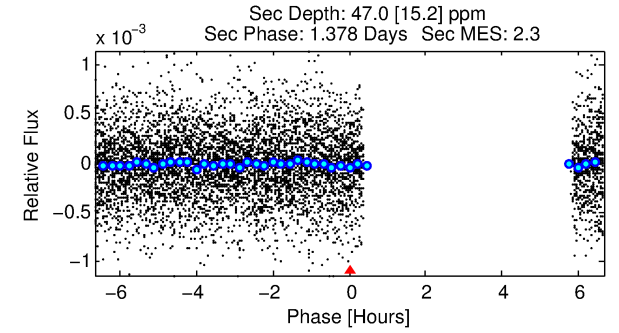
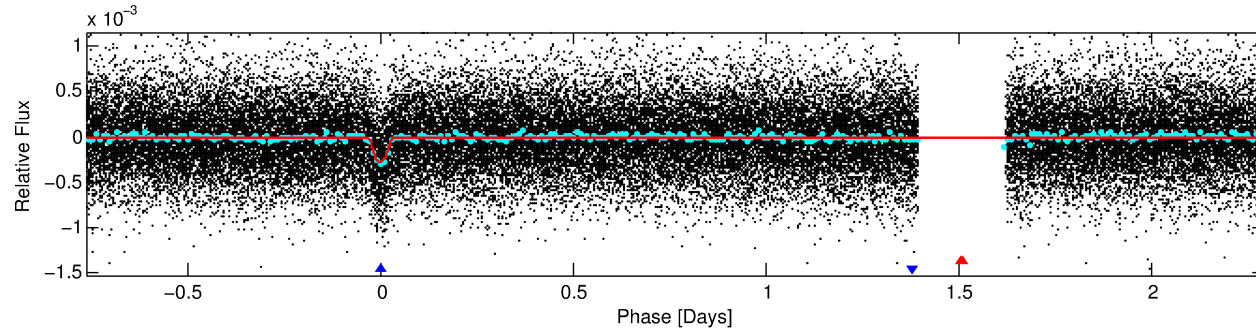
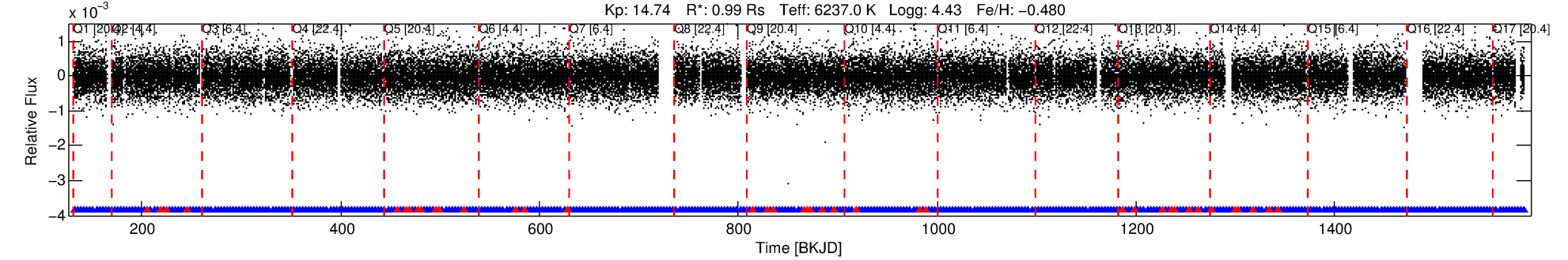
No Significant Match Found

DV One-Page Summary

KIC: 5122112 Candidate: 2 of 2 Period: 3.055 d

KOI: K00552 Corr: No Ephemeris Match

Kp: 14.74 R*: 0.99 Rs Teff: 6237.0 K Logg: 4.43 Fe/H: -0.480



DV Fit Results:

Period = 3.05516 [0.00001] d
Epoch = 132.9320 [0.0010] BKJD
Rp/R* = 0.0178 [0.0052]
a/R* = 10.04 [16.06]
b = 0.90 [0.35]
Seff = 805.93 [307.08]
Teq = 1359 [129] K
Rp = 1.91 [0.78] Re
a = 0.0405 [0.0097] AU
Ag = 11.57 [8.80] [1.20σ]
Teffp = 3874 [666] K [3.71σ]

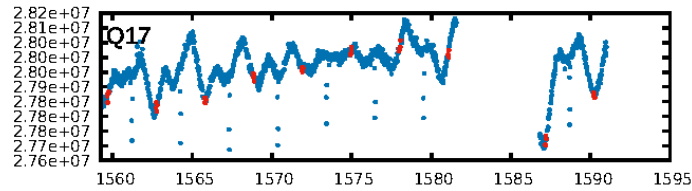
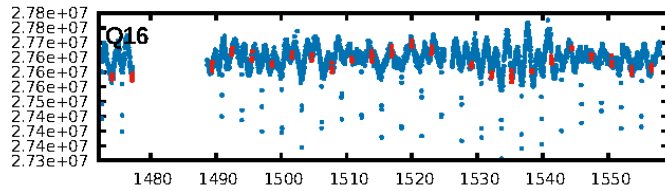
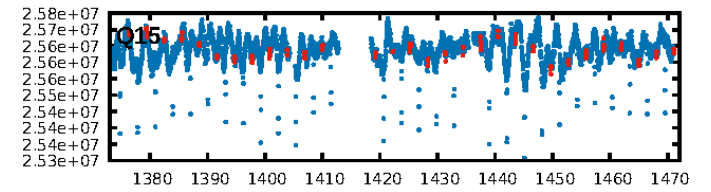
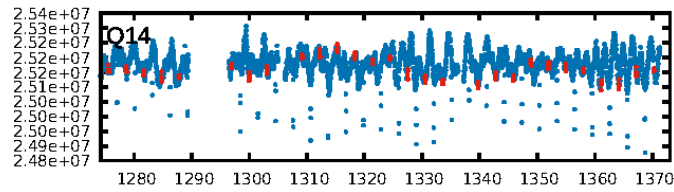
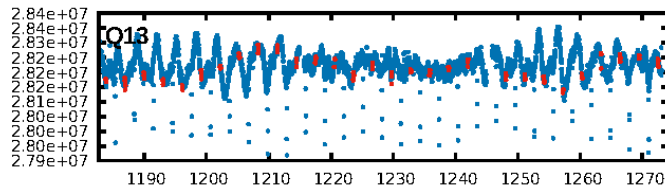
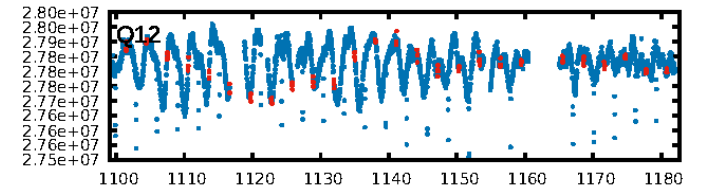
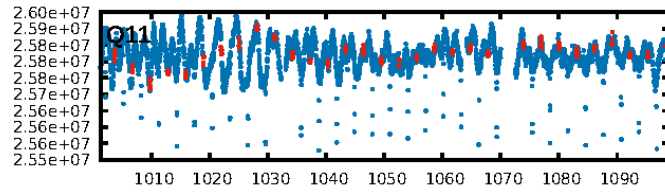
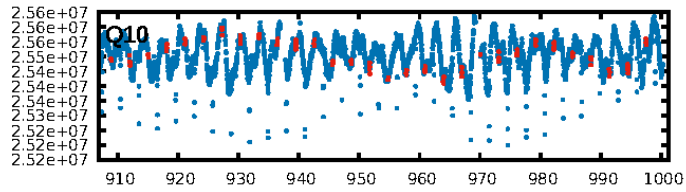
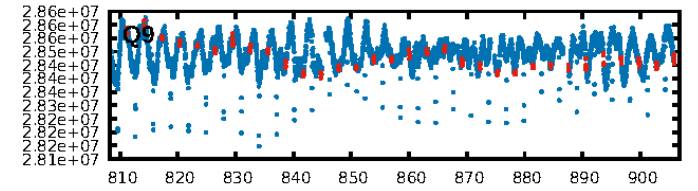
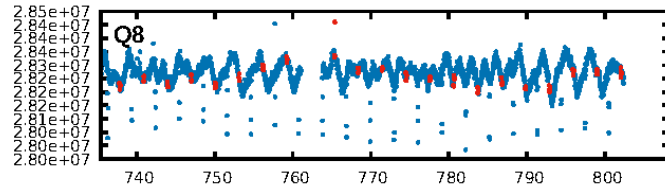
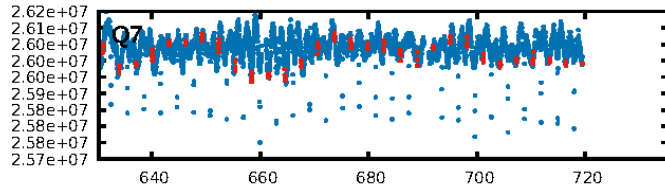
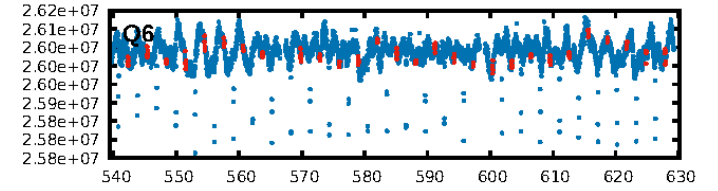
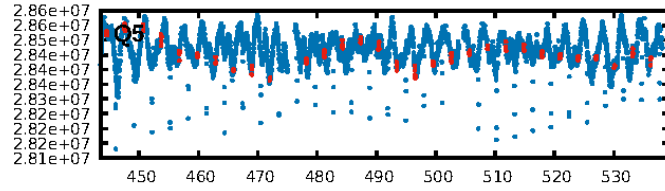
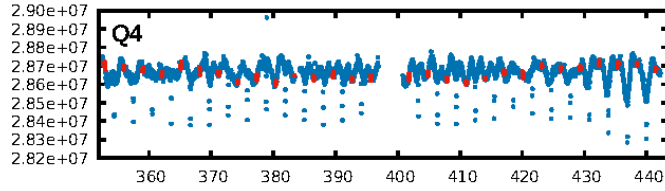
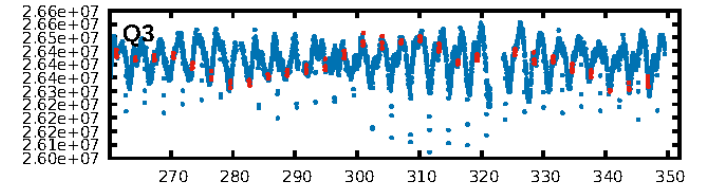
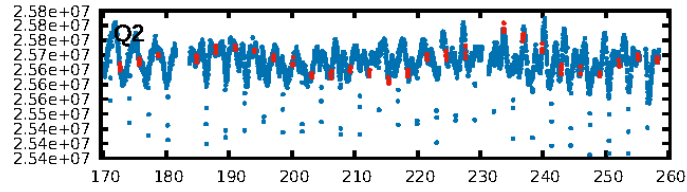
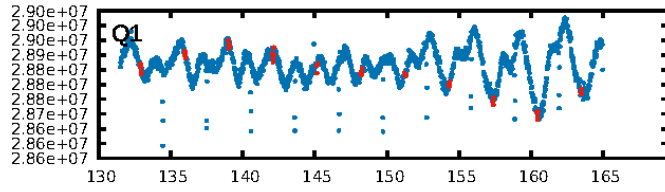
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.91 [379/418]
GhostDiagnostic-chr: 2.732
Centroid-sig: 1.1%
Centroid-so: 0.840 arcsec [1.40σ]
OotOffset-rm: 0.404 arcsec [0.71σ]
KicOffset-rm: 0.413 arcsec [0.73σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

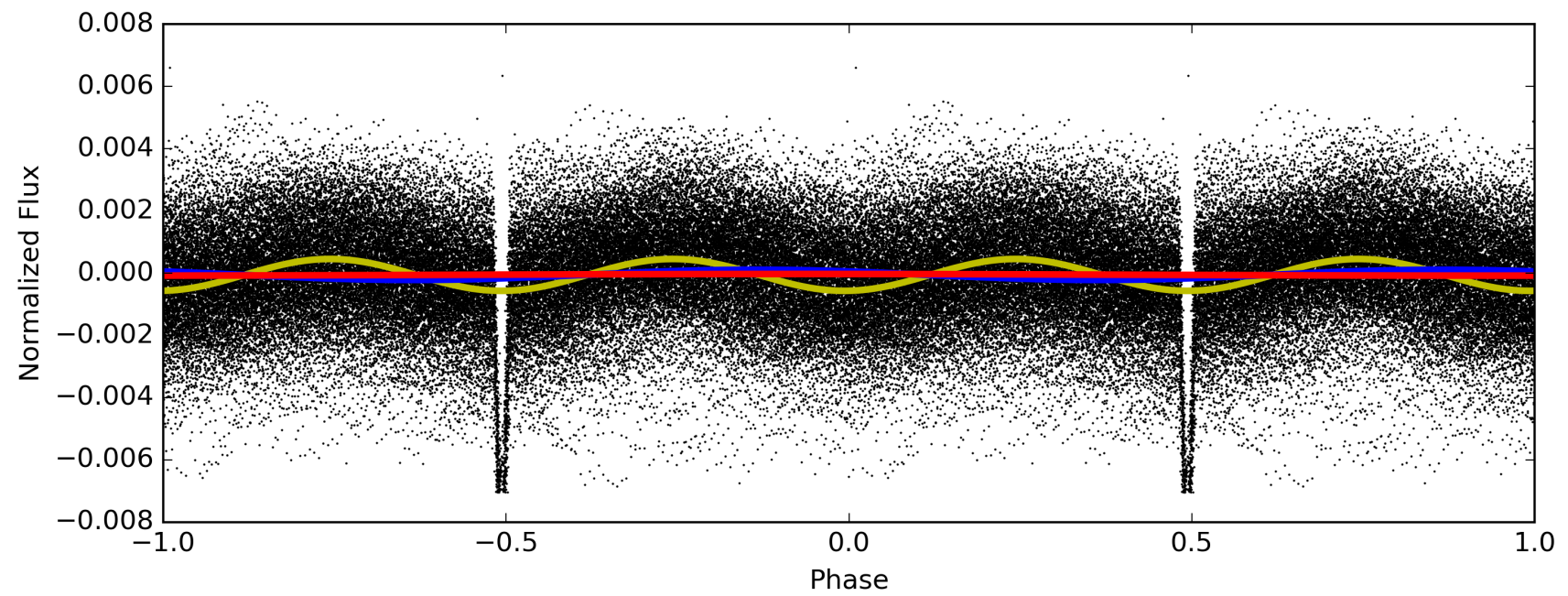
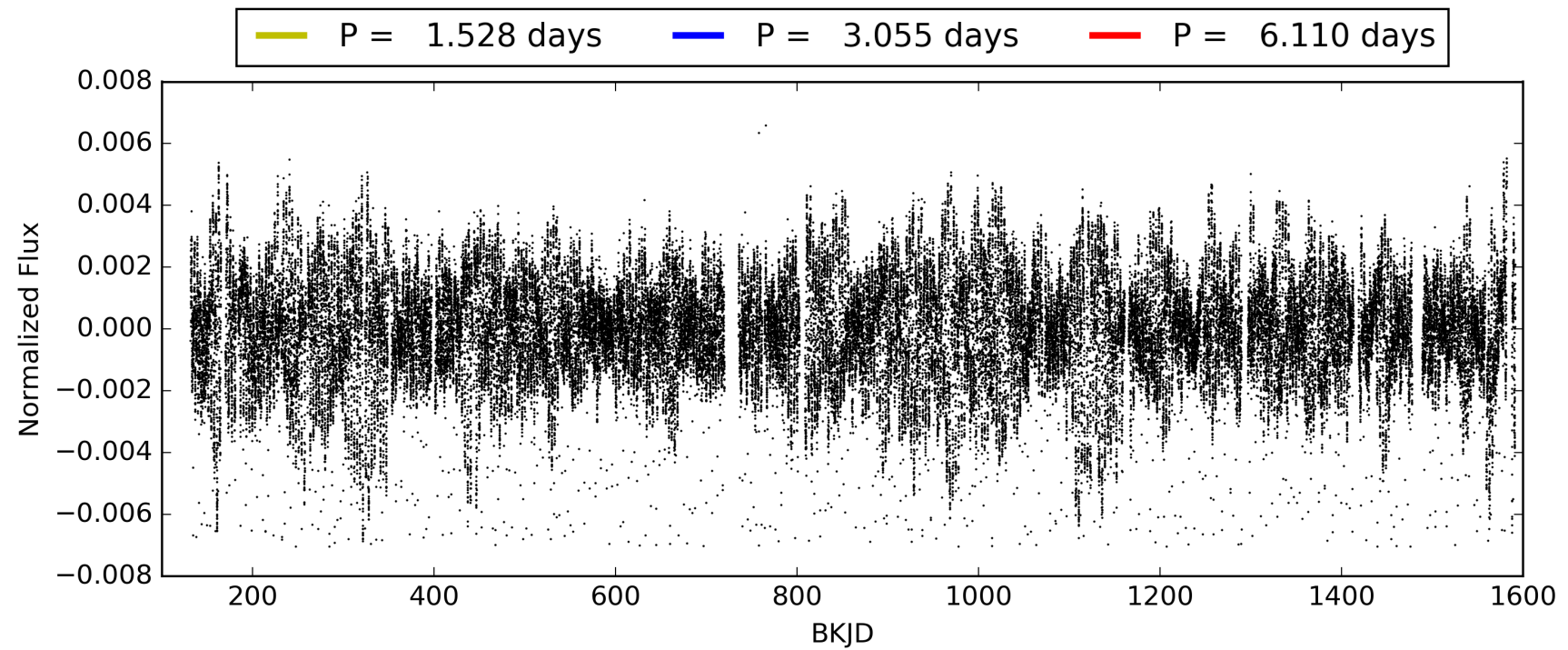
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:39:25 Z

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

TCE 005122112-02, PDC Light Curves

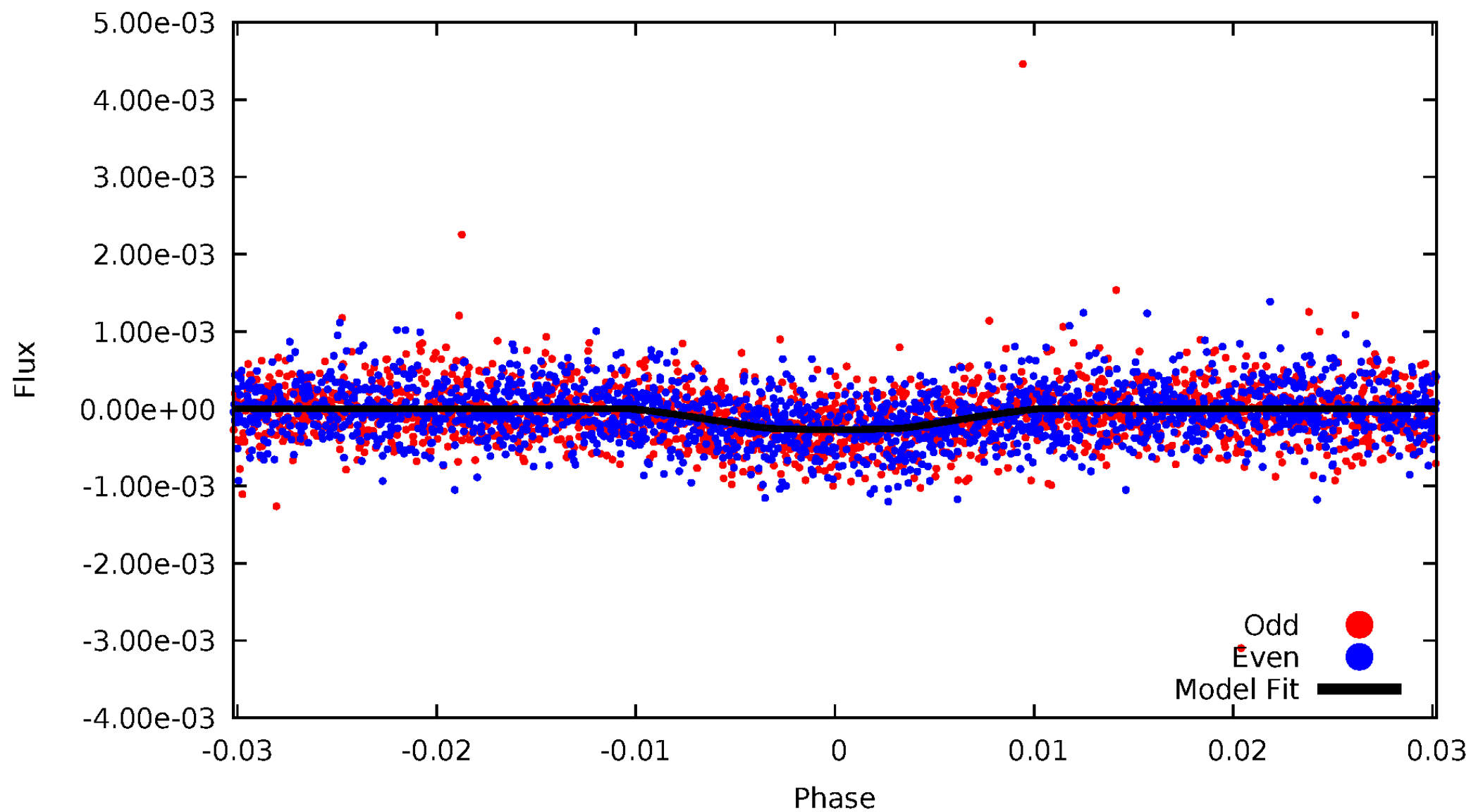


TCE 005122112-02



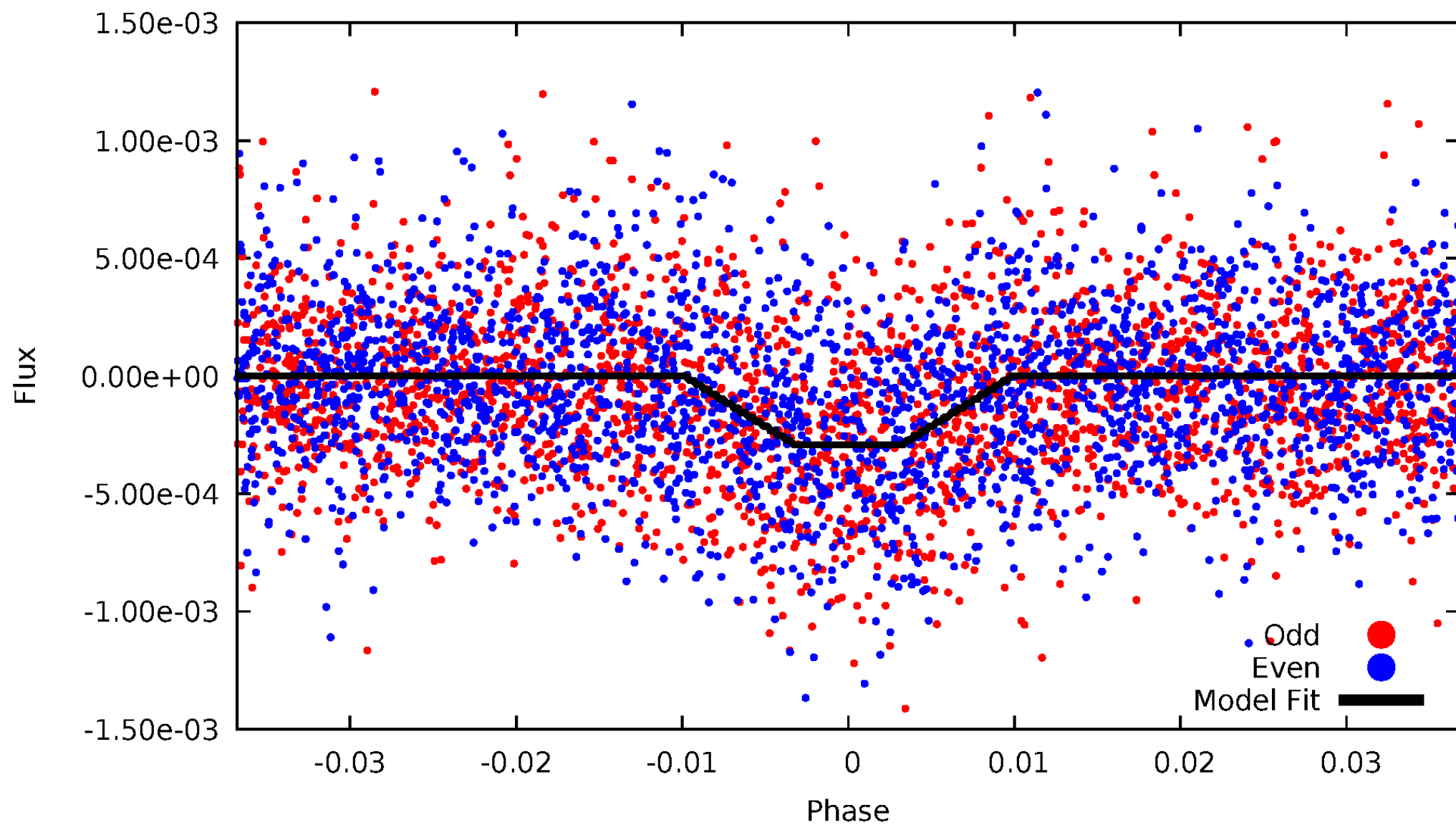
DV Odd/Even

TCE 005122112-02



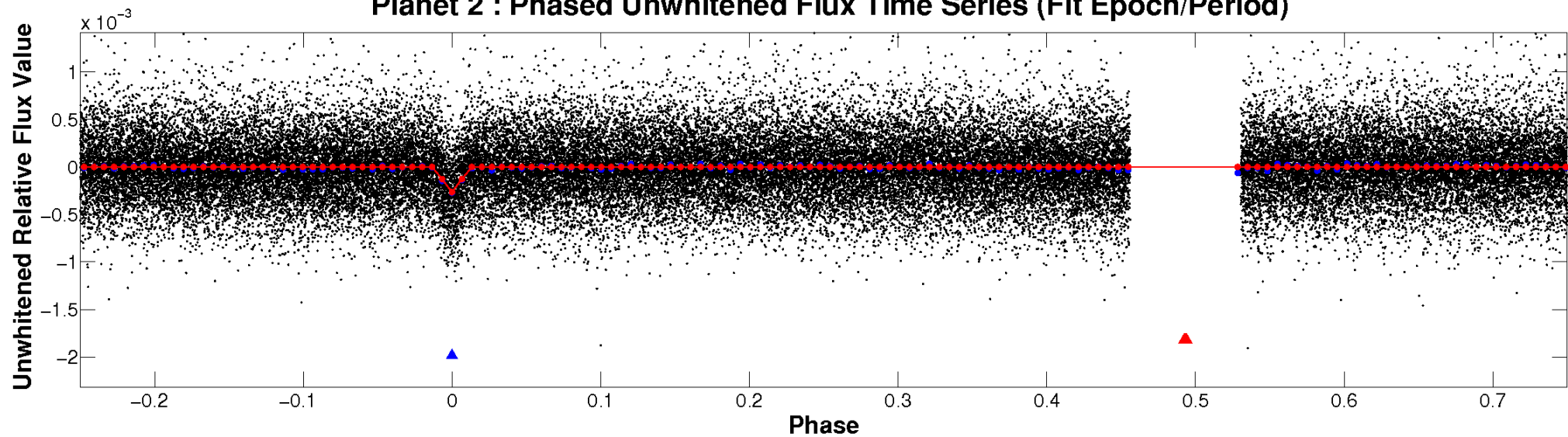
ALT Odd/Even

TCE 005122112-02

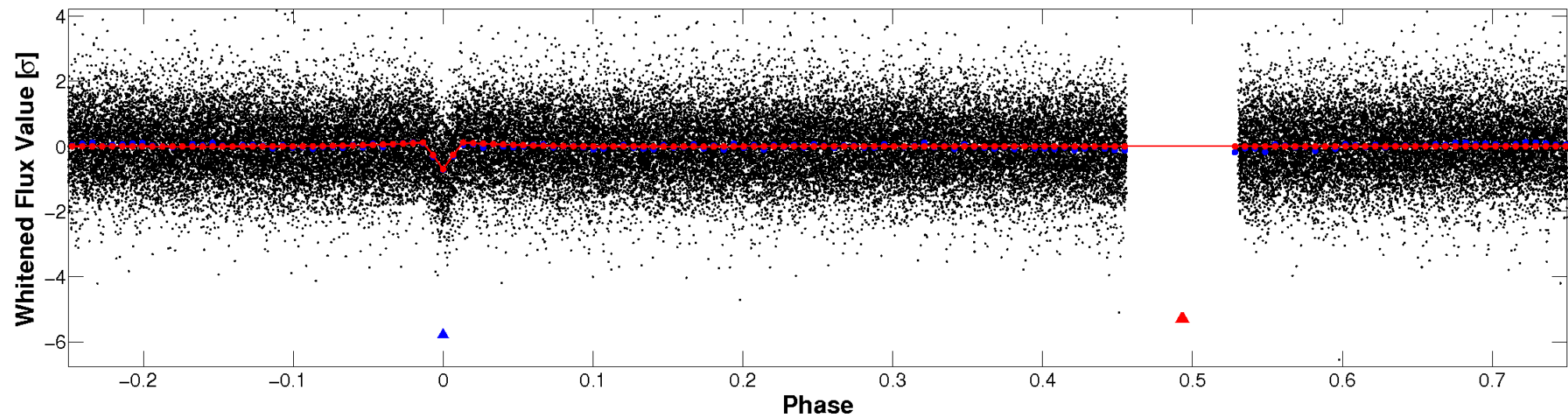


Non-Whitened Vs. Whitened Light Curve

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

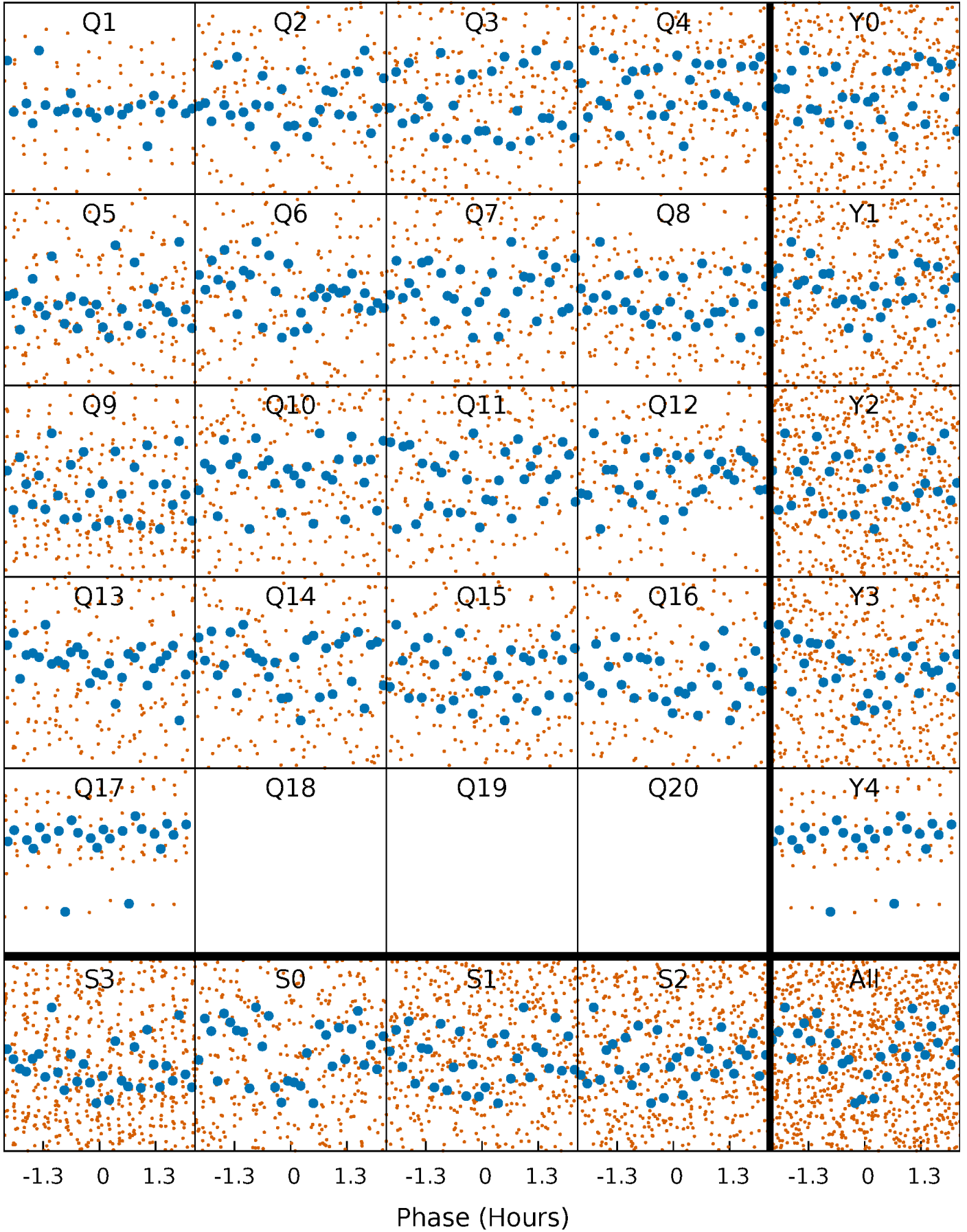


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



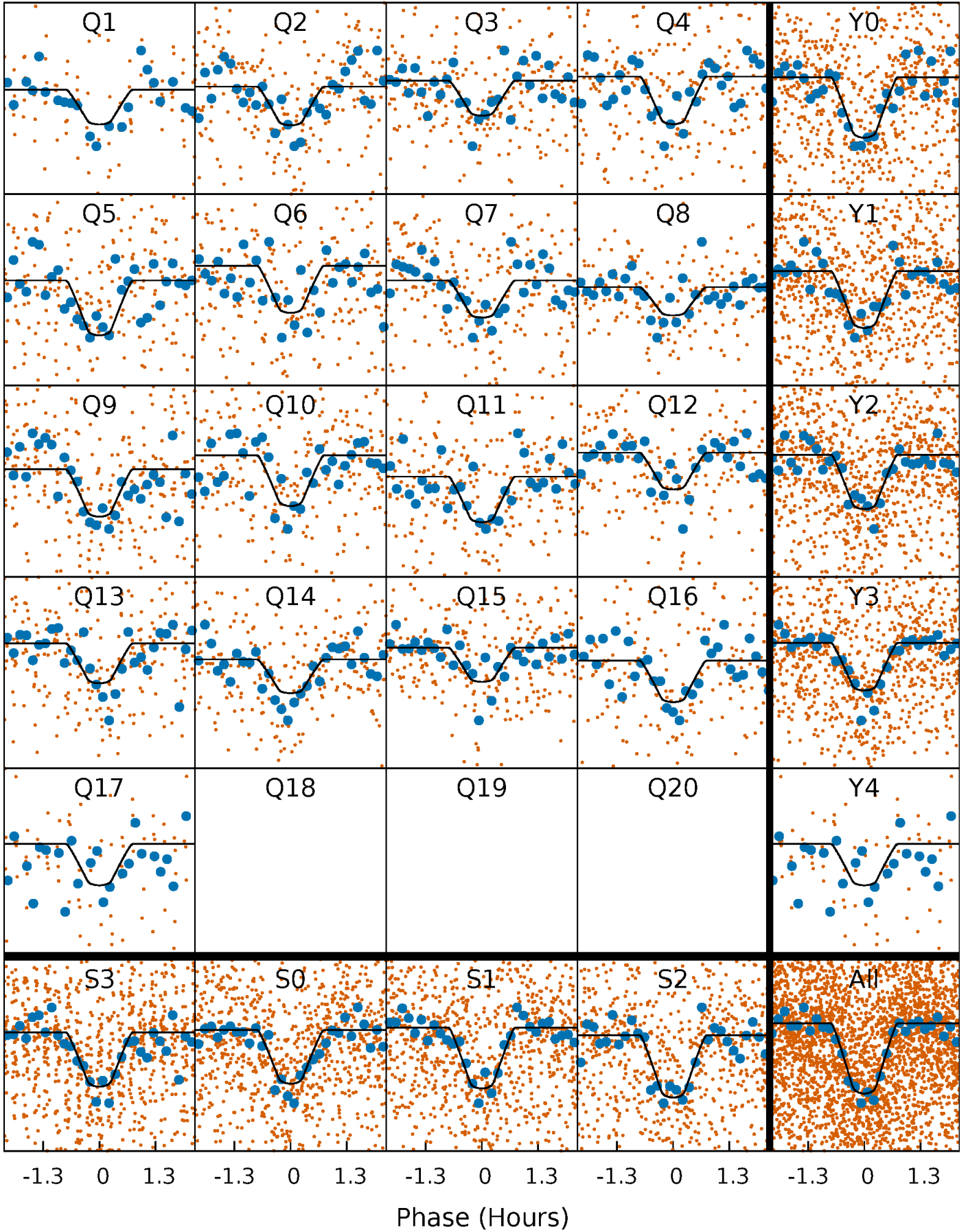
PDC Quarter-Phased Transit Curves

TCE 005122112-02 P= 3.055163 Days $T_0=132.932018$ (BKJD)



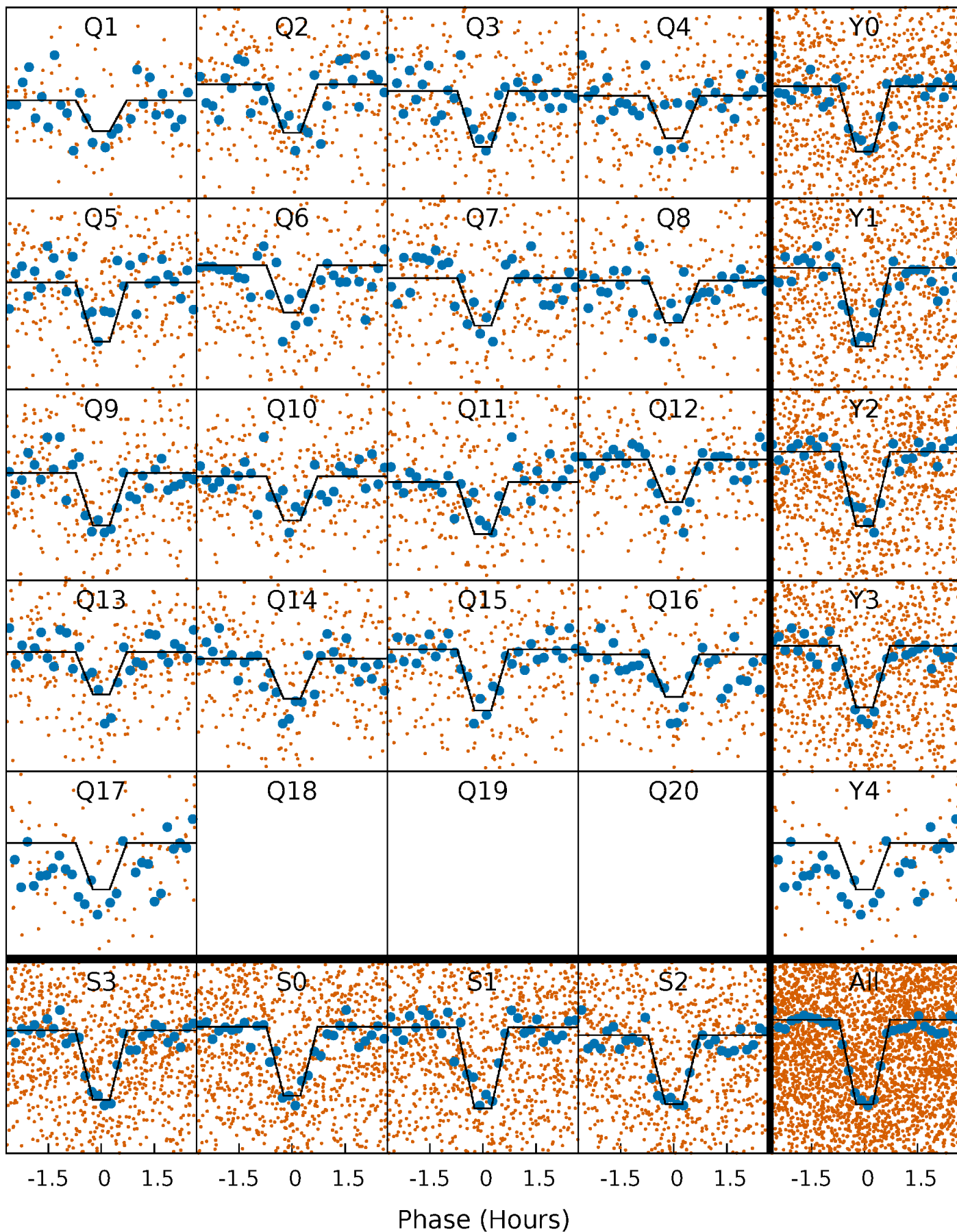
DV Quarter-Phased Transit Curves

TCE 005122112-02 P= 3.055163 Days $T_0=132.932018$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

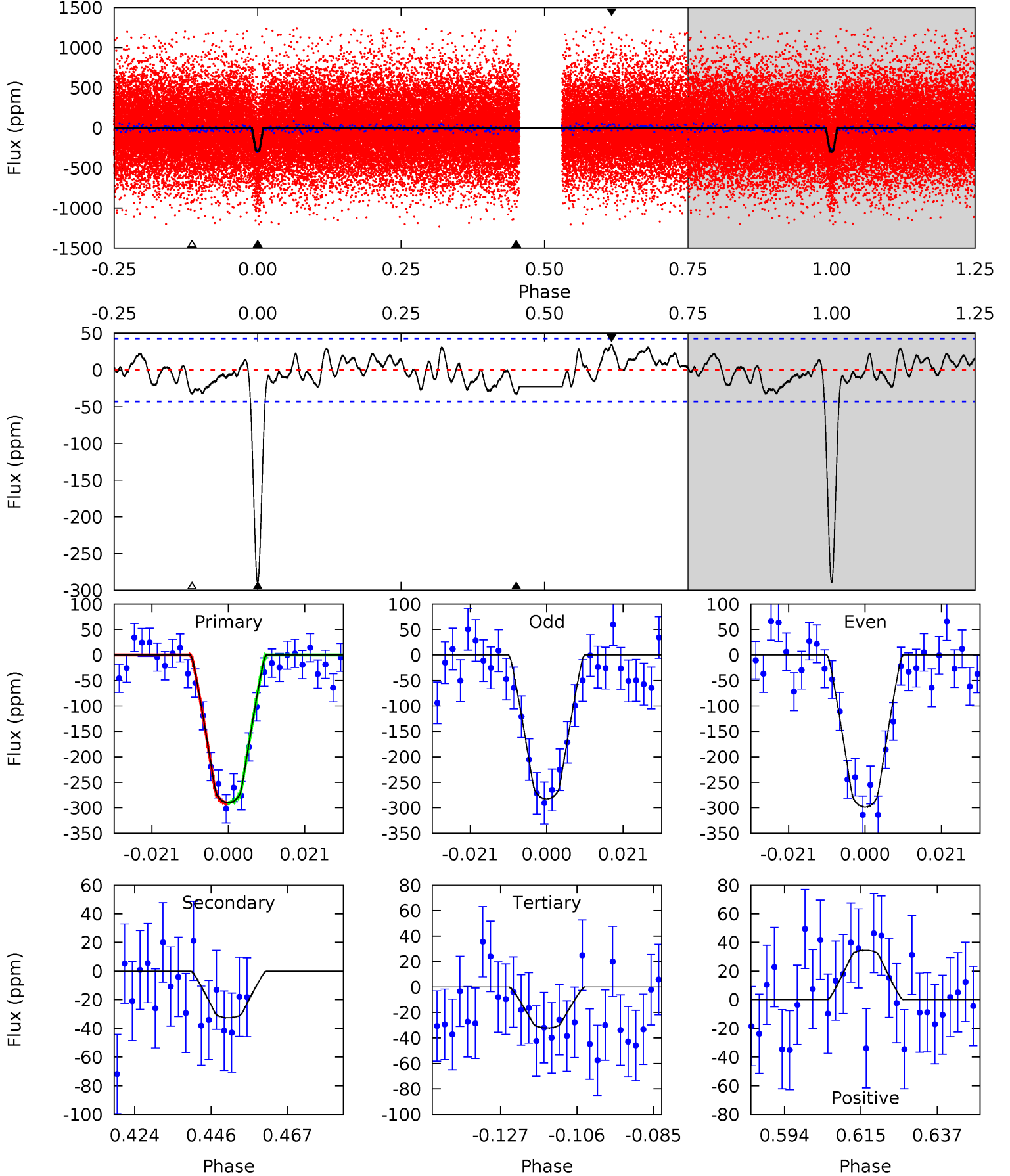
TCE 005122112-02 P= 3.055177 Days $T_0=132.929126$ (BKJD)



DV Model-Shift Uniqueness Test

005122112-02, P = 3.055163 Days, E = 129.876855 Days

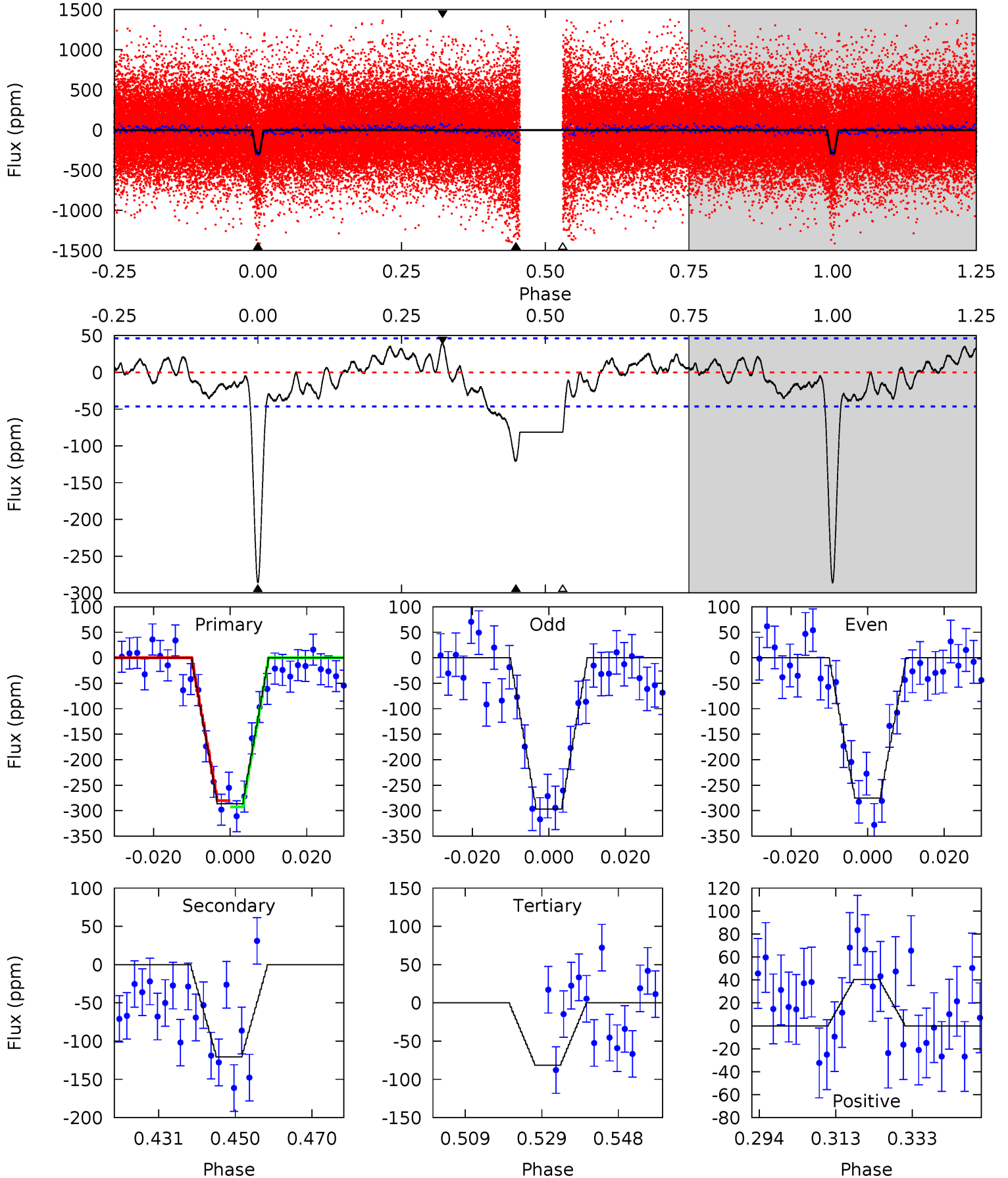
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 32.9 | 3.70 | 3.65 | 3.93 | 4.88 | 2.30 | 1.71 | 29.3 | 29.0 | 0.05 | -0.23 | 0.90 | 1.09 | 0.11 | 0.07 |



Alt Model-Shift Uniqueness Test

005122112-02, P = 3.055177 Days, E = 129.873949 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 30.2 | 12.7 | 8.58 | 4.25 | 4.90 | 2.33 | 2.21 | 21.6 | 25.9 | 4.13 | 8.46 | 1.13 | 1.01 | 0.12 | 0.65 |



Stellar Parameters For KIC 005122112

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6237^{+176}_{-220} | $4.426^{+0.098}_{-0.196}$ | $-0.480^{+0.300}_{-0.300}$ | $0.987^{+0.276}_{-0.128}$ | $0.948^{+0.135}_{-0.101}$ | $1.387^{+0.604}_{-0.677}$ |
| | +3%/-4% | +2%/-4% | +62%/-62% | +28%/-13% | +14%/-11% | +44%/-49% |
| 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 005122112-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|-----------------------|---------------------------|
| DV | -33 ± 9 | $1.99^{+0.70}_{-0.63}$ | 1919^{+133}_{-106} | 3843^{+579}_{-388} | $7.284^{+8.947}_{-3.409}$ |
| Alt. | -121 ± 9 | $1.89^{+0.71}_{-0.62}$ | 1920^{+143}_{-102} | 5049^{+1065}_{-572} | 30^{+38}_{-14} |

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

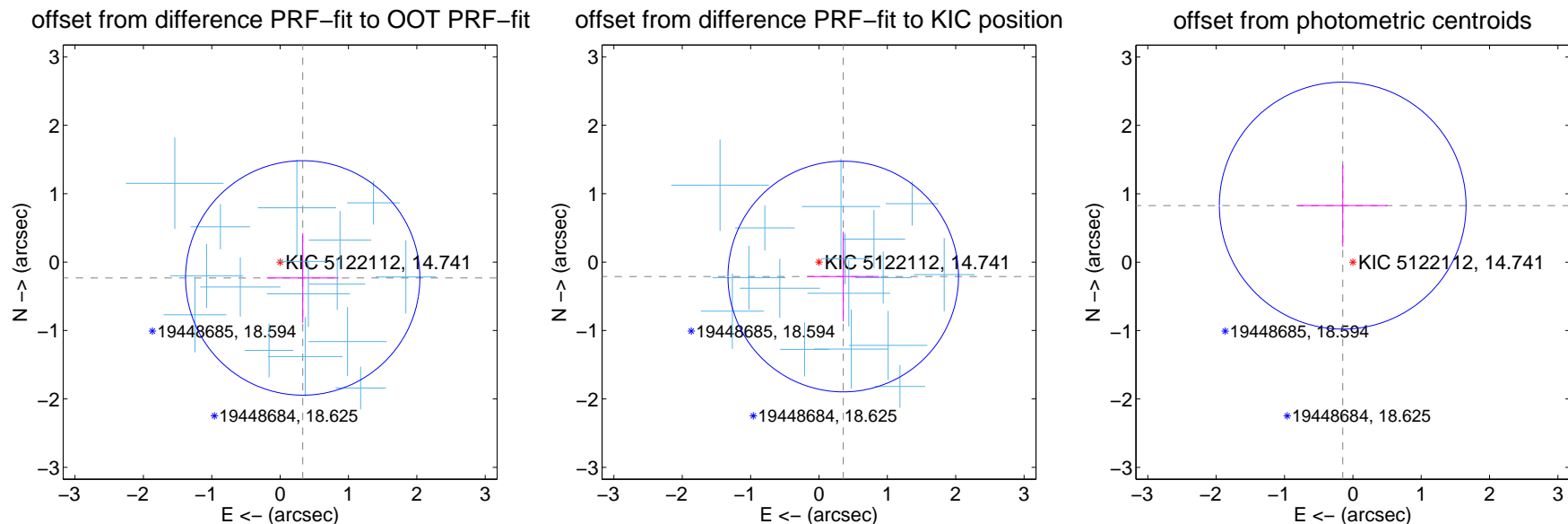
DV Centroid Data

Supplemental centroid analysis for 005122112-02. Kepler magnitude: 14.74. Transit SNR 18.15

There are 16 quarters with good PRF difference image offsets

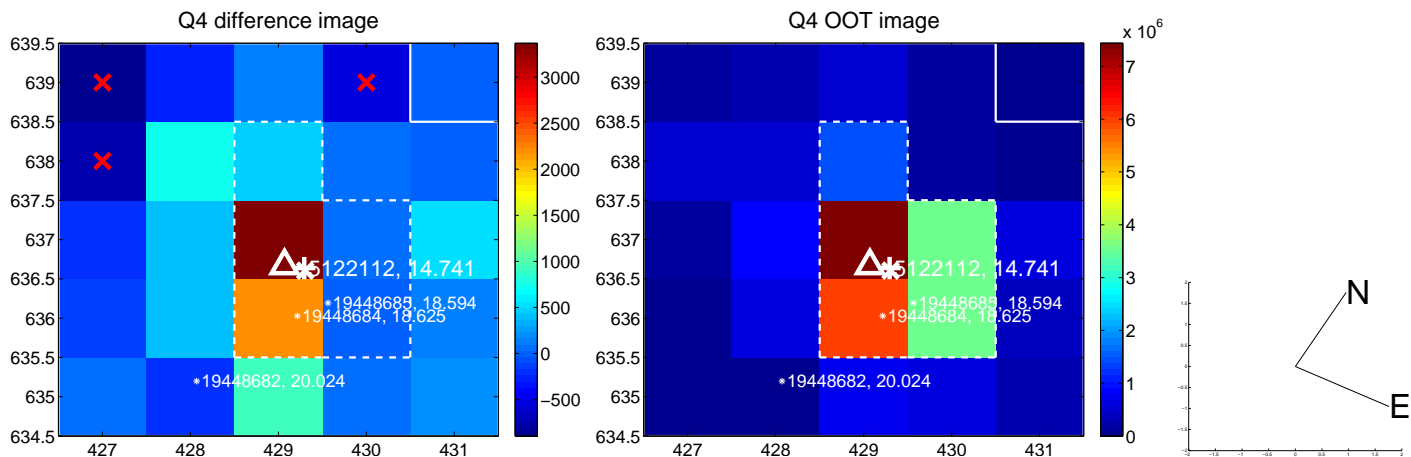
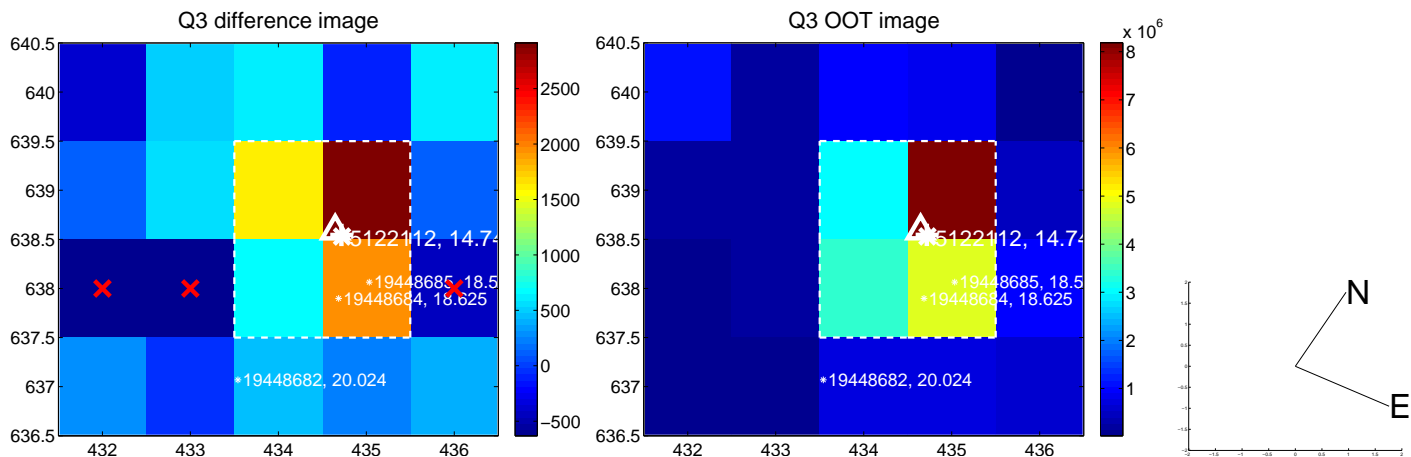
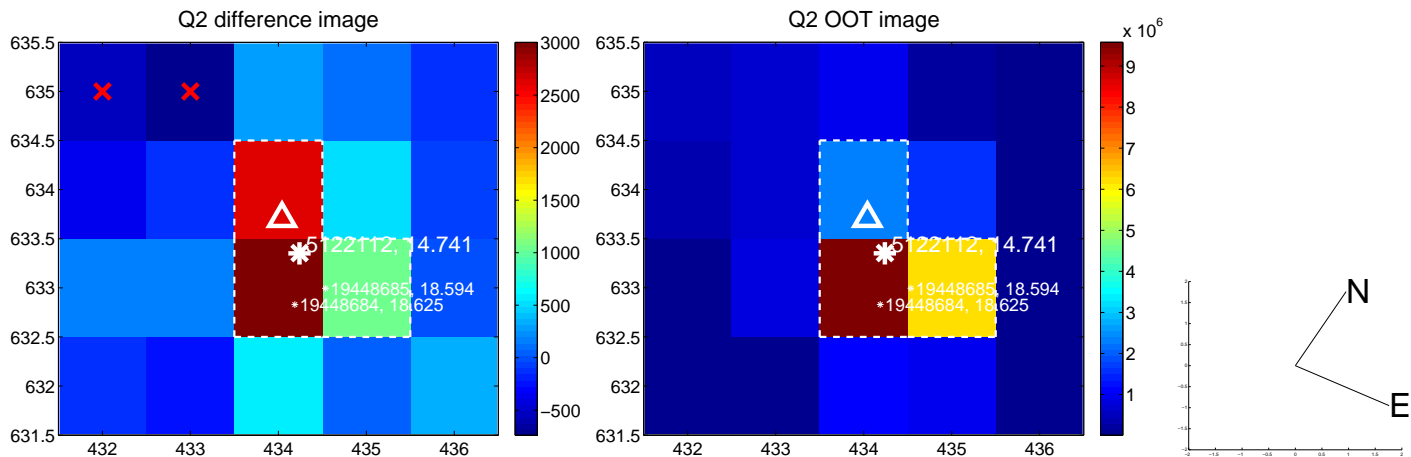
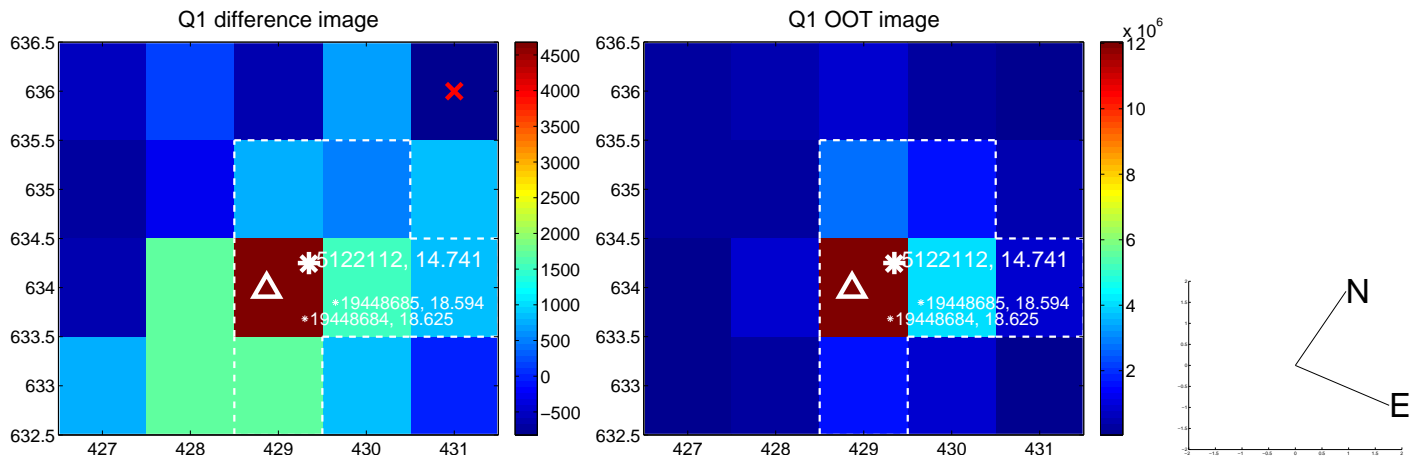
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.404 ± 0.571 | 0.71 | -0.331 ± 0.524 | -0.232 ± 0.656 |
| PRF-fit source offset from KIC position | 0.413 ± 0.562 | 0.73 | -0.355 ± 0.524 | -0.211 ± 0.656 |
| photometric centroid source offset | 0.84 ± 0.60 | 1.40 | 0.15 ± 0.66 | 0.83 ± 0.60 |

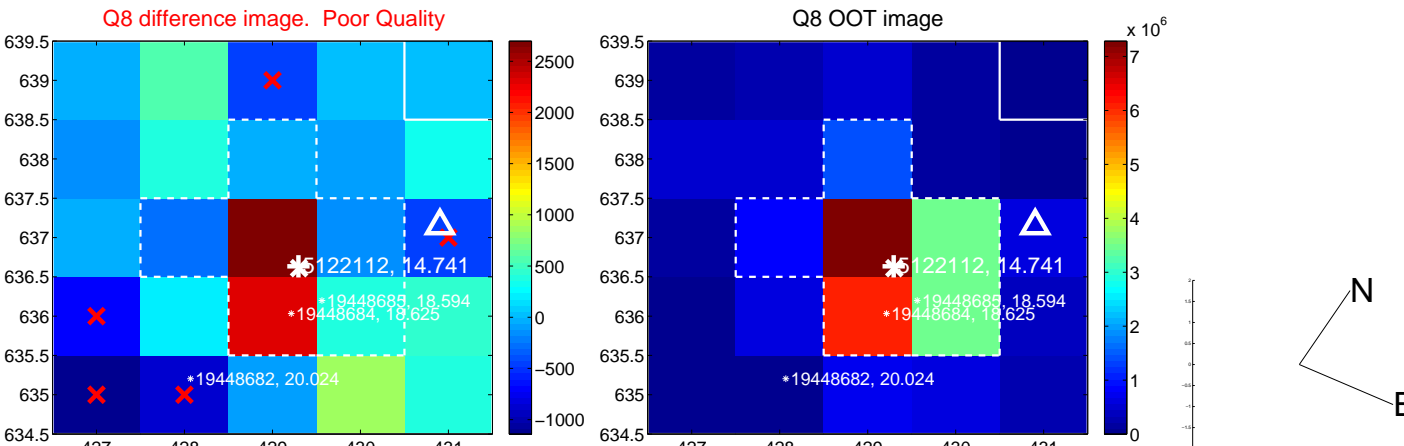
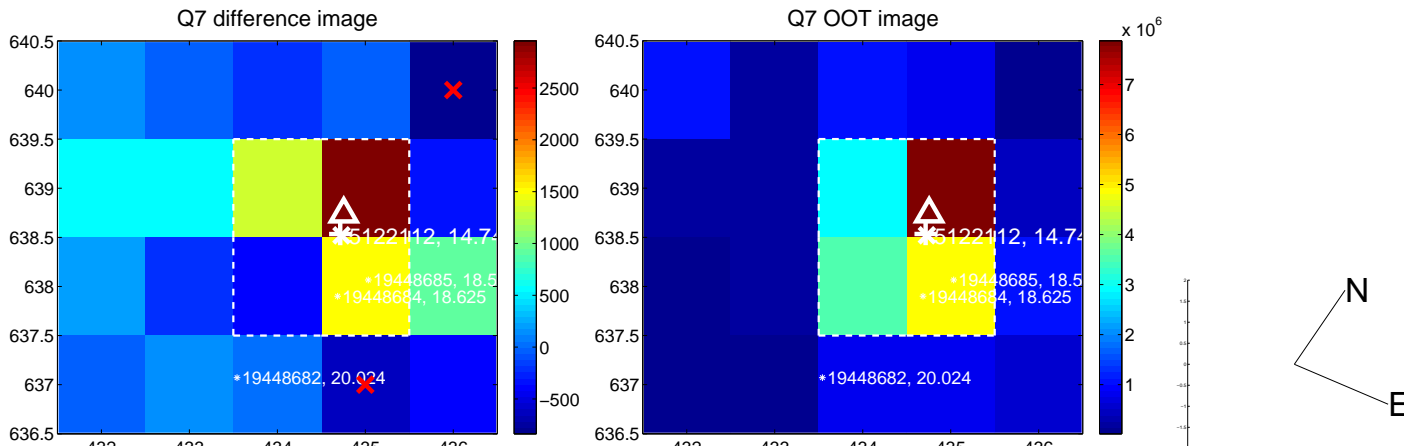
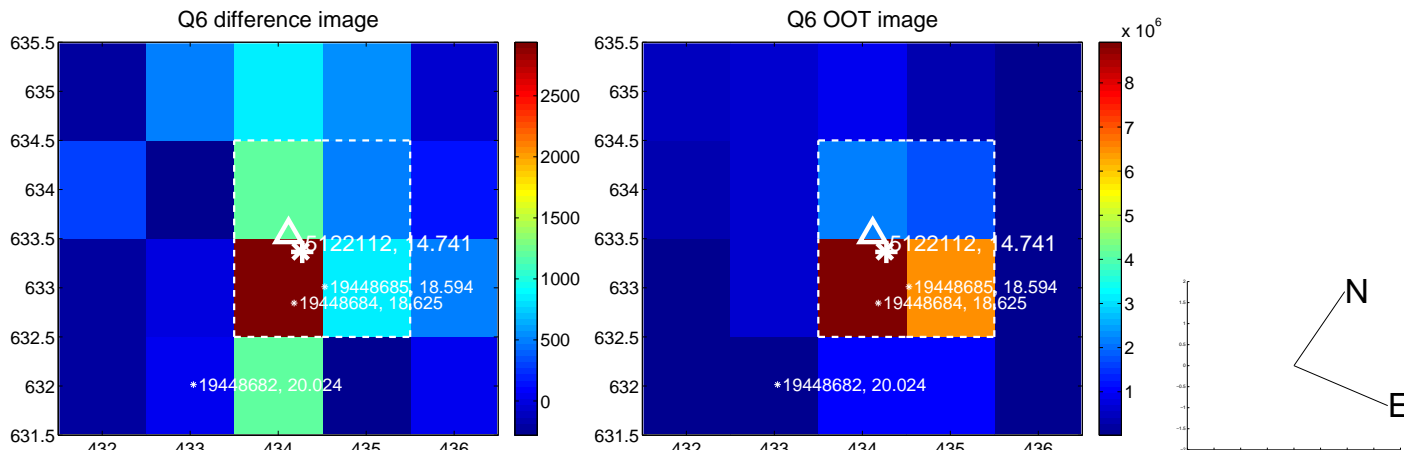
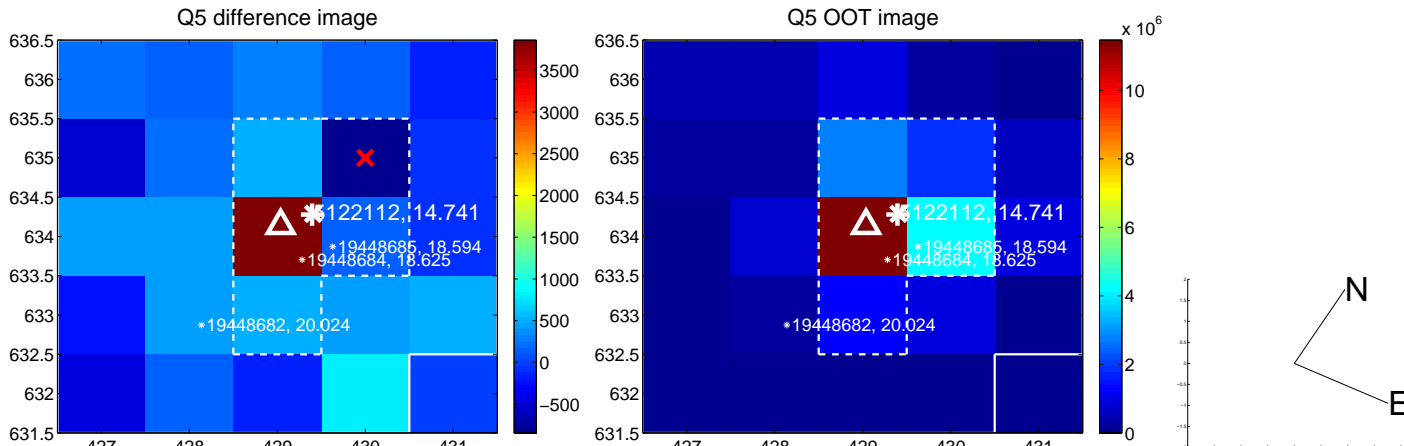


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

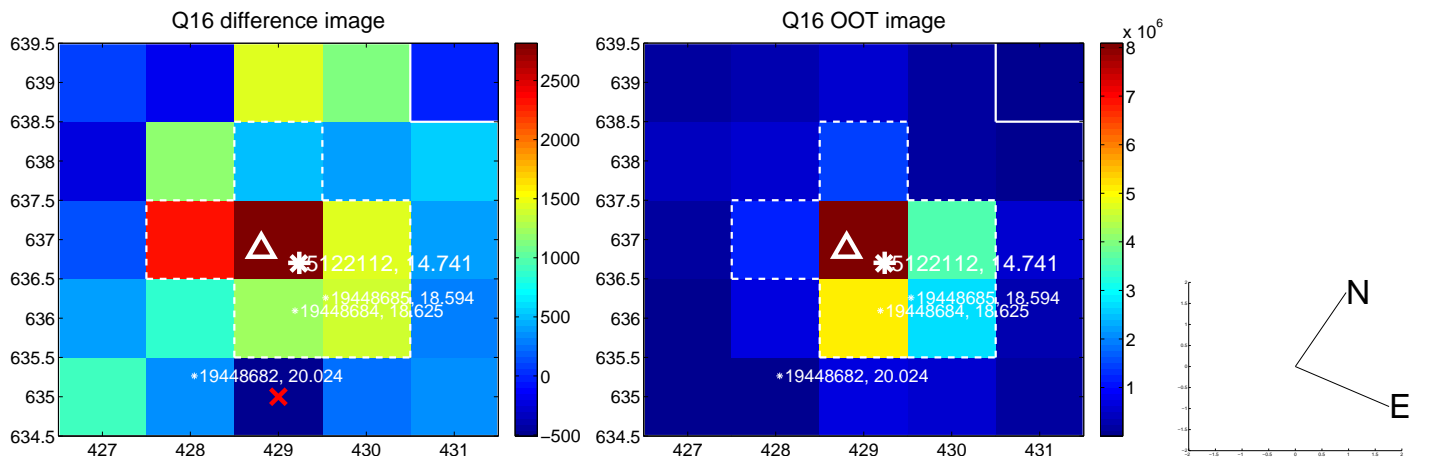
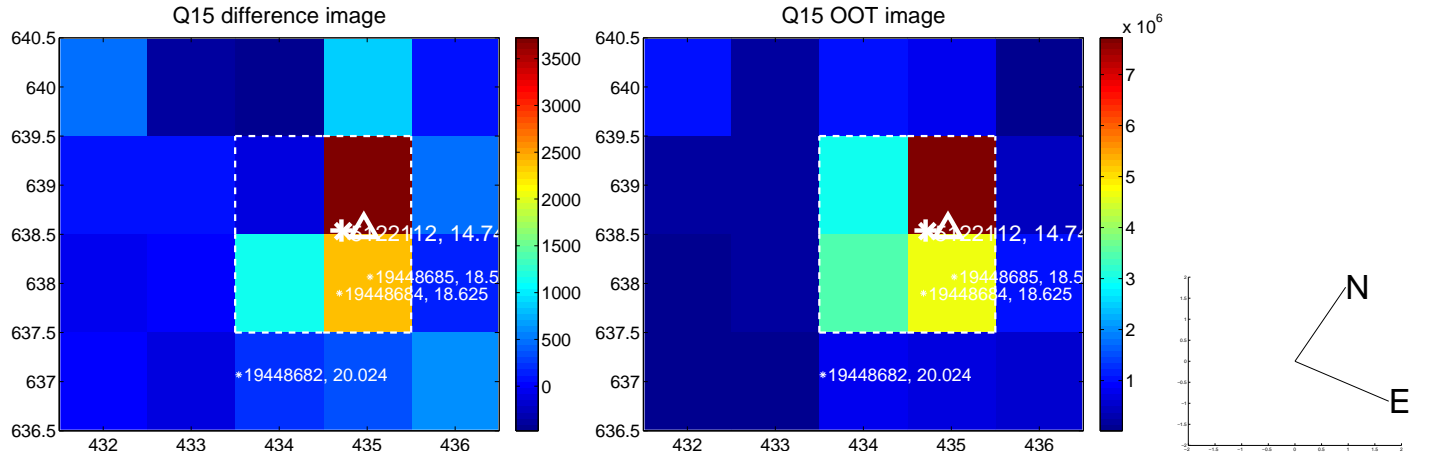
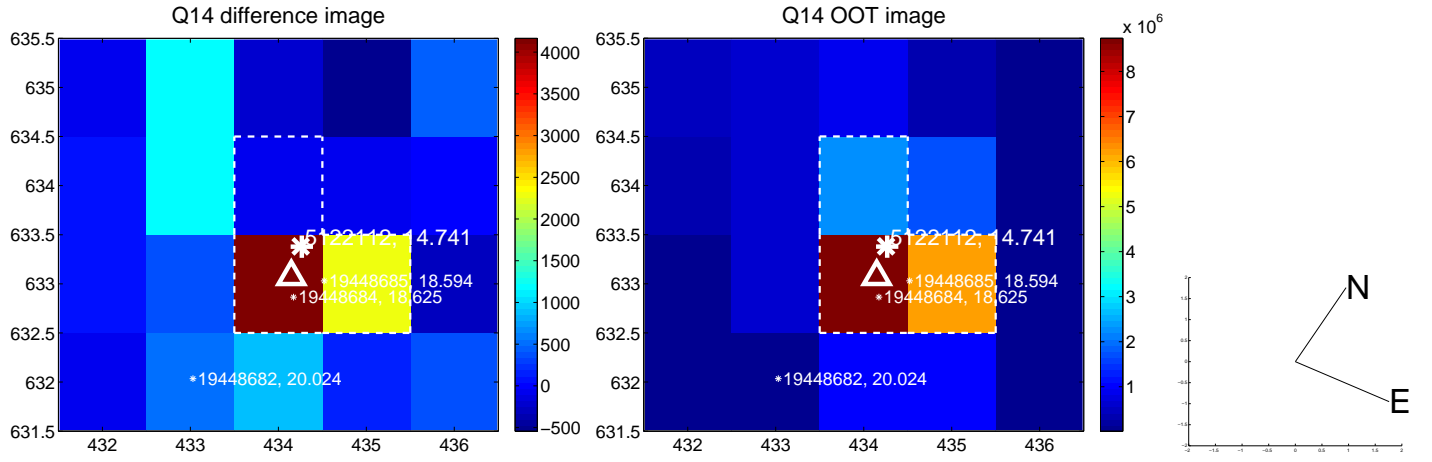
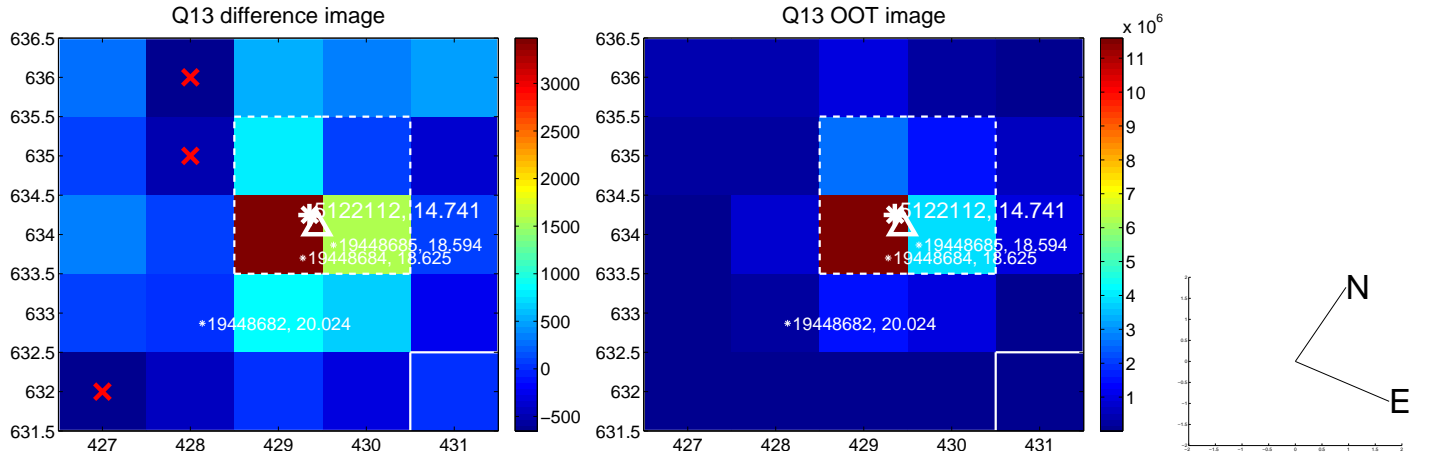
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



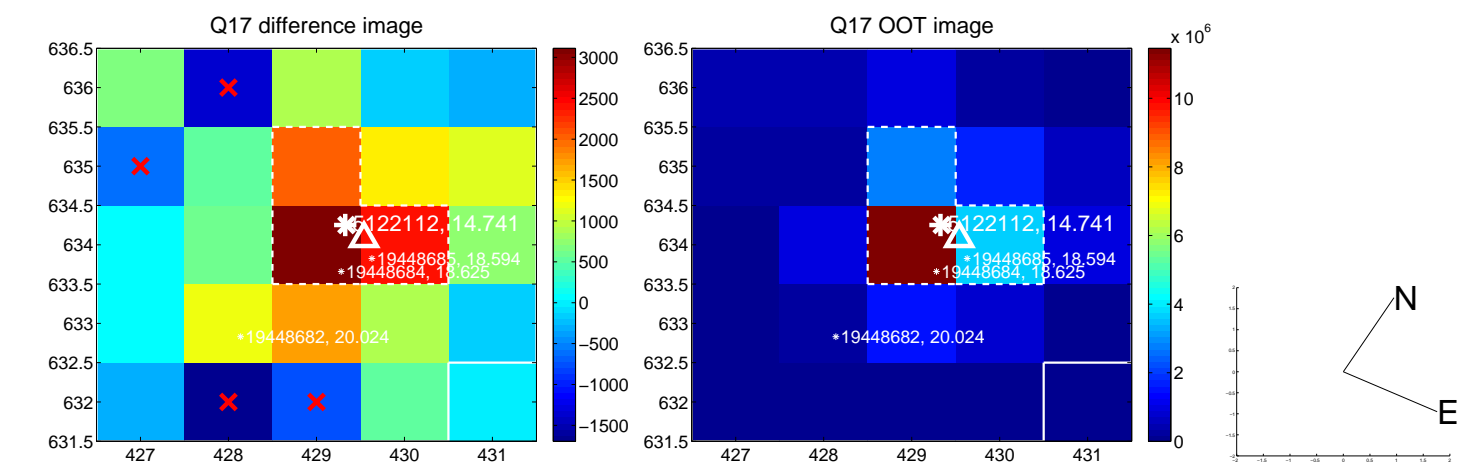
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



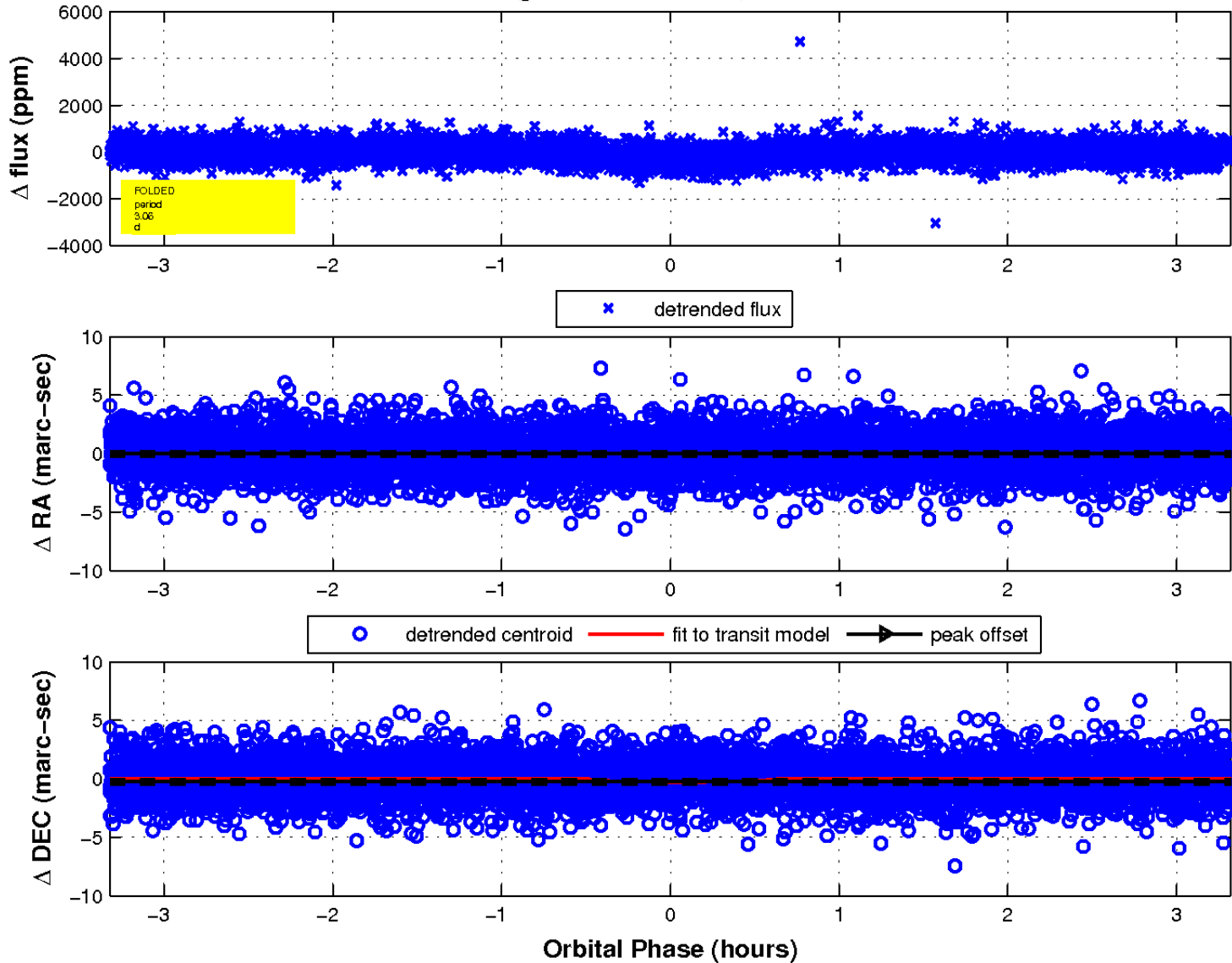
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

