

KIC 009827087

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009827087-01 | OBS | No | 520.630147 | 340.627837 | 1256.3 | 6.765 | 10.5 | 7.7 | 0.72 | 5546 | 2.62 | 0.32 |
| 009827087-02 | OBS | No | 315.401323 | 196.800926 | 966.8 | 3.647 | 10.0 | 6.9 | 0.72 | 5546 | 2.41 | 0.63 |
| 009827087-03 | OBS | No | 201.283999 | 330.097650 | 1069.5 | 5.625 | 8.6 | 6.4 | 0.72 | 5546 | 4.58 | 1.14 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009827087-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS |
| 009827087-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 009827087-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

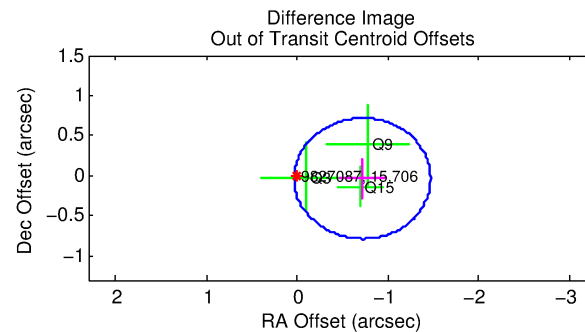
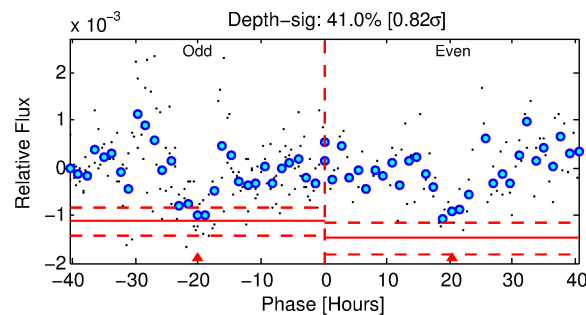
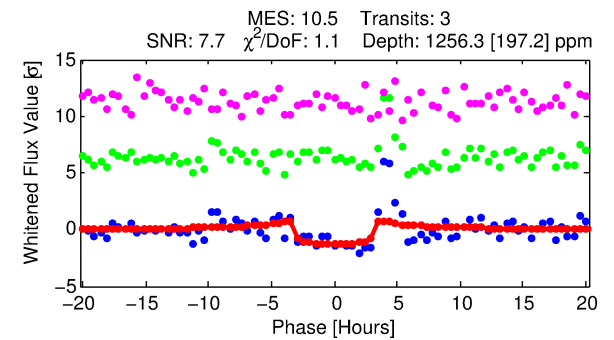
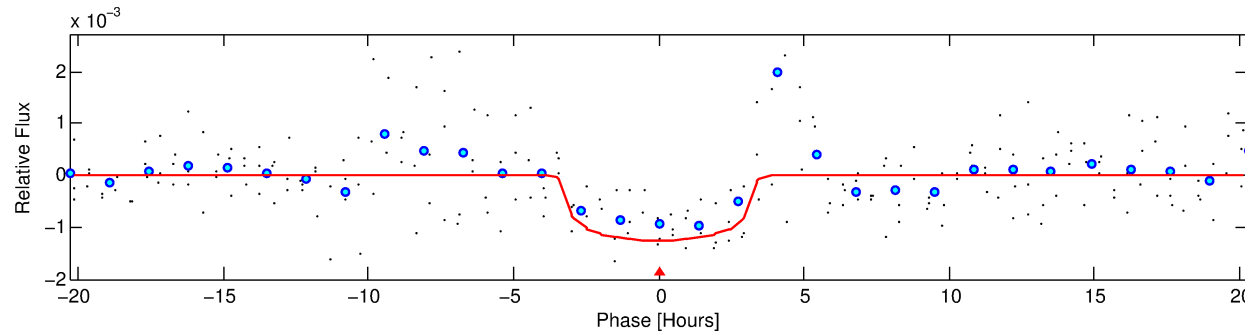
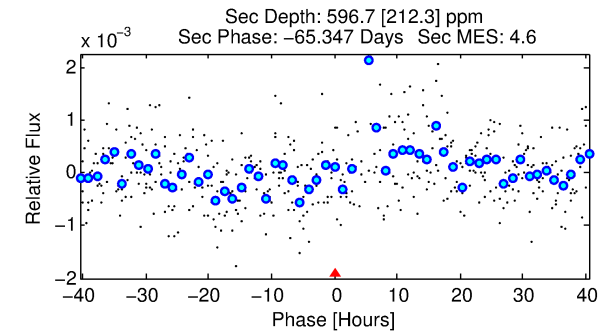
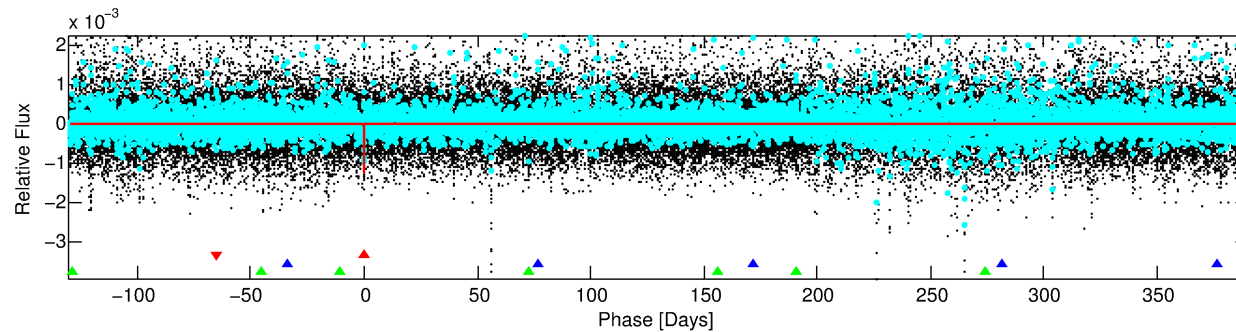
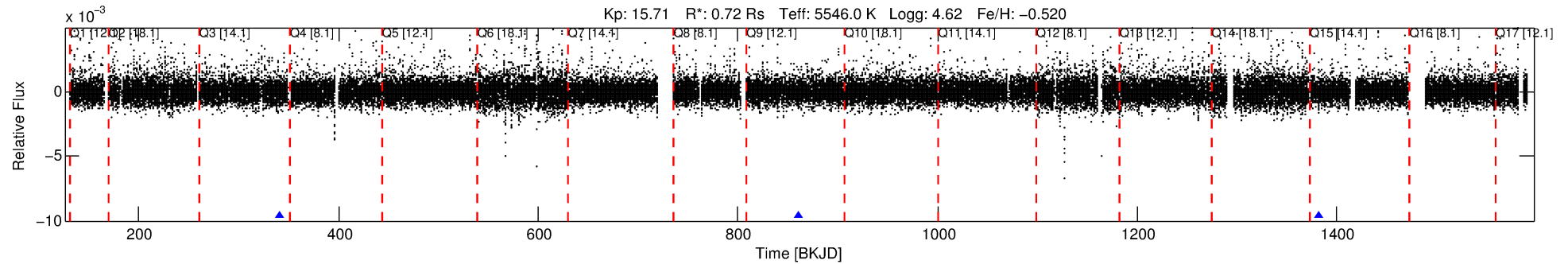
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009827087-01

No Significant Match Found

DV One-Page Summary

KIC: 9827087 Candidate: 1 of 3 Period: 520.630 d



DV Fit Results:

Period = 520.63015 [0.00991] d
Epoch = 340.6278 [0.0137] BKJD
Rp/R* = 0.0333 [0.0206]
a/R* = 527.00 [1393.68]
b = 0.51 [3.83]
Seff = 0.32 [0.08]
Teq = 192 [12] K
Rp = 2.62 [1.69] Re
a = 1.1704 [0.1756] AU
Ag = 65565.13 [85636.14] [0.77σ]
Teffp = 4751 [1537] K [2.97σ]

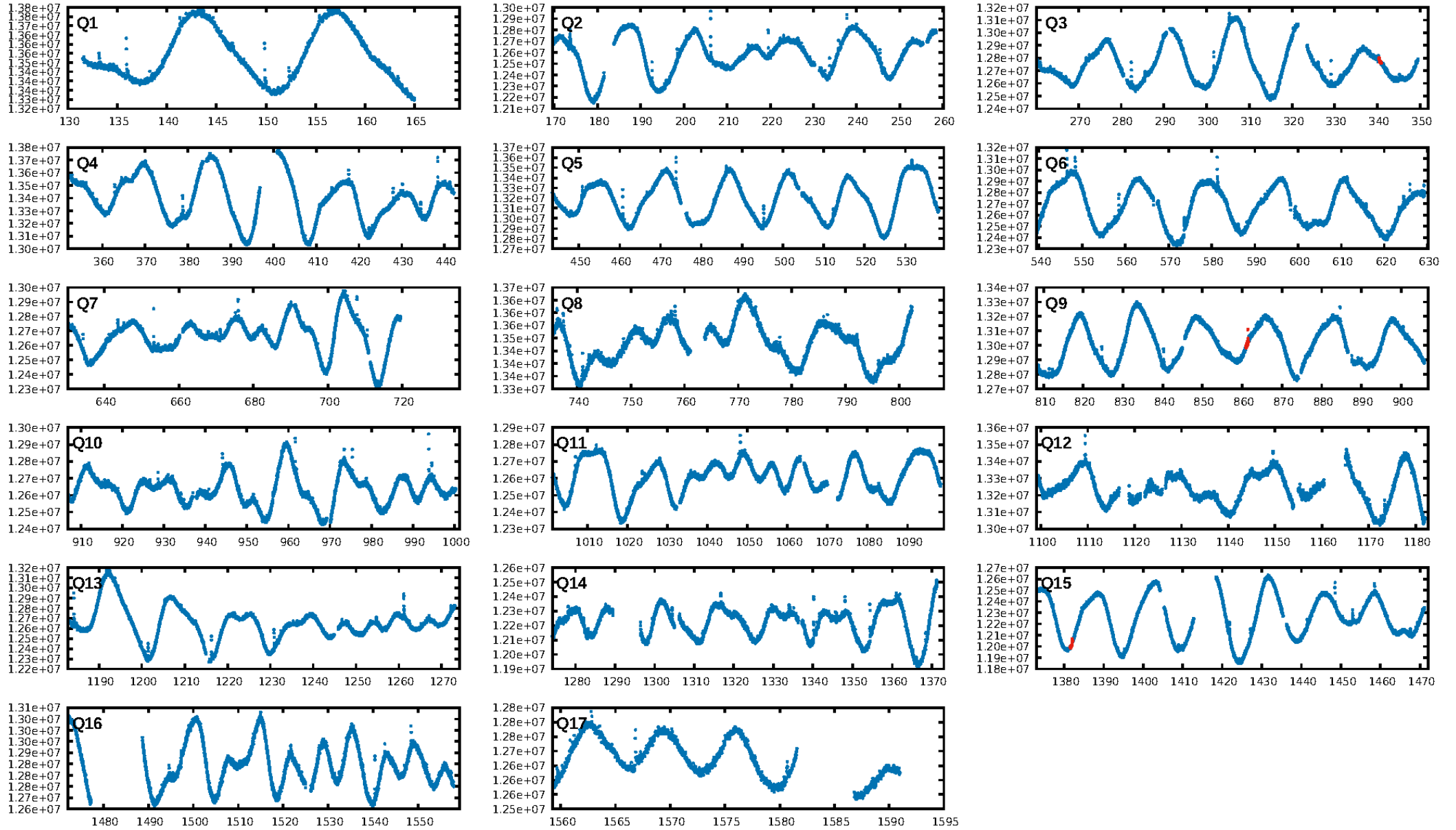
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [640.88σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 11.9%
ModelChiSquareGof-sig: 99.3%
Bootstrap-pfa: 3.29e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.701
Centroid-sig: 5.7%
Centroid-so: 1.574 arcsec [1.51σ]
OotOffset-rm: 0.718 arcsec [2.87σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-rm: 0.869 arcsec [3.48σ]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

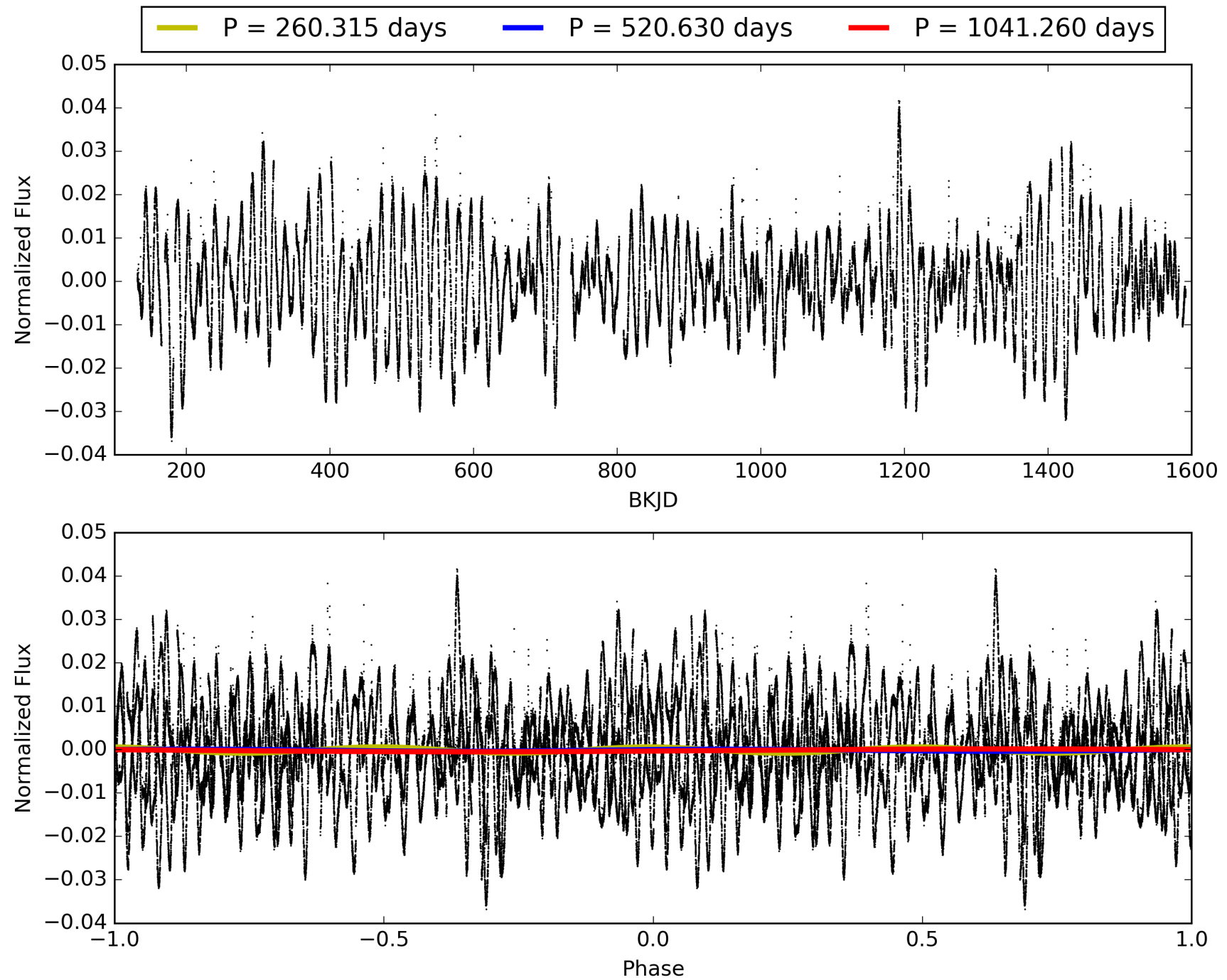
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009827087-01, PDC Light Curves

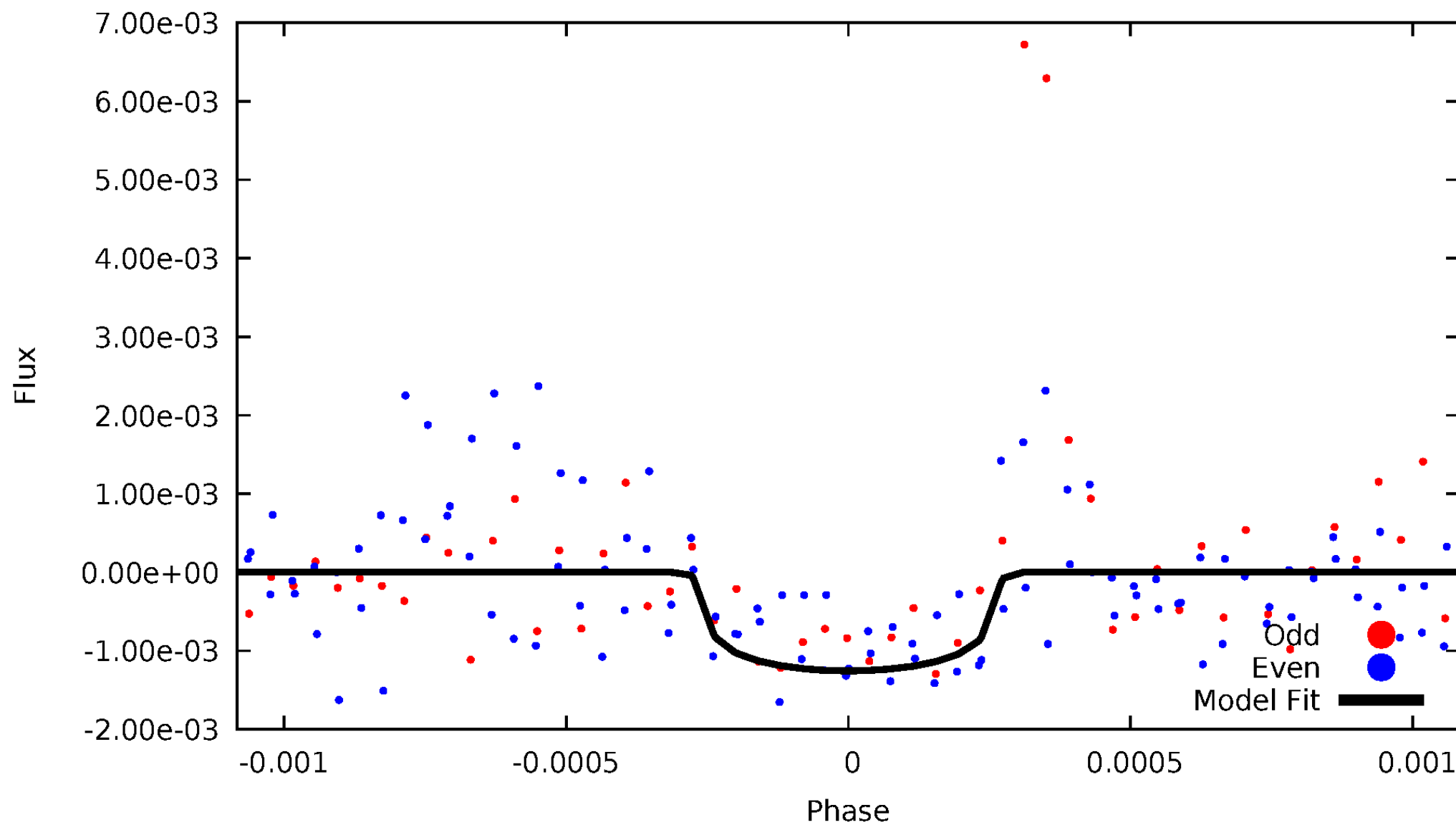


TCE 009827087-01



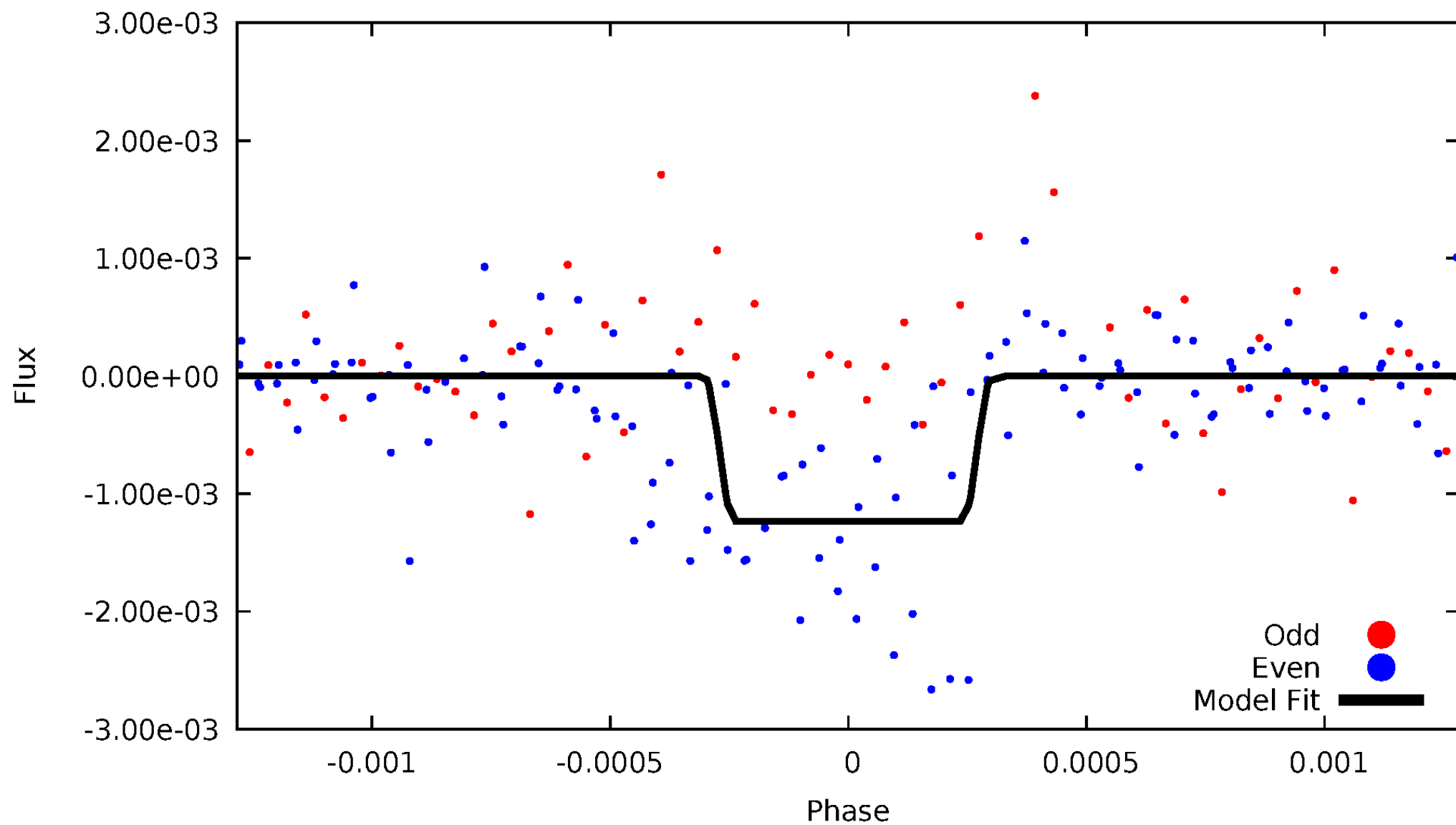
DV Odd/Even

TCE 009827087-01

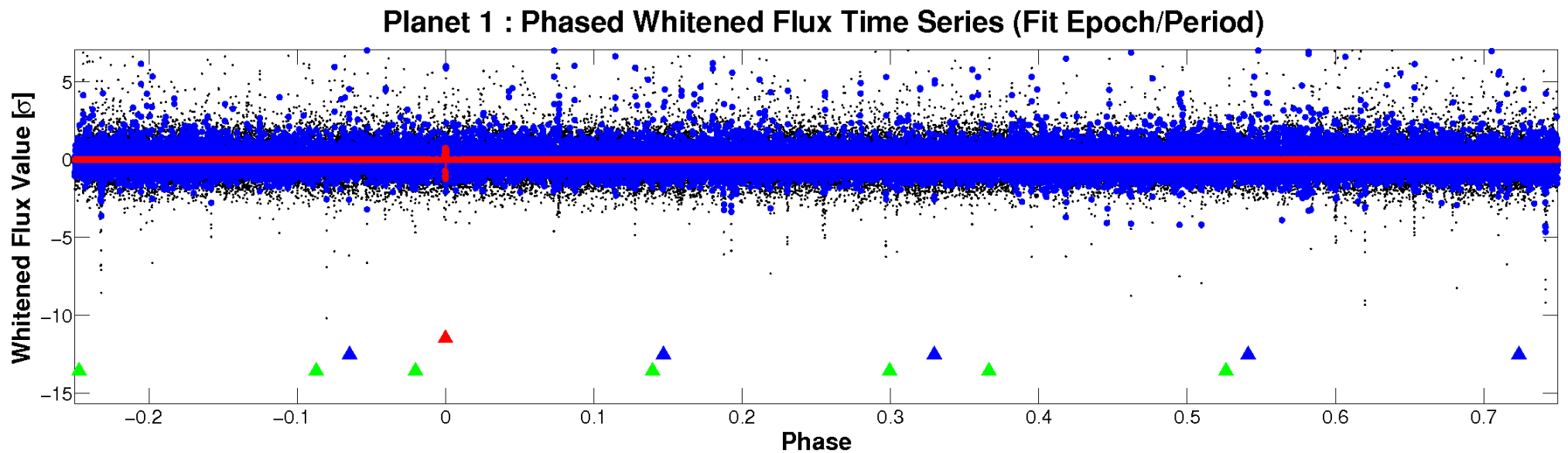
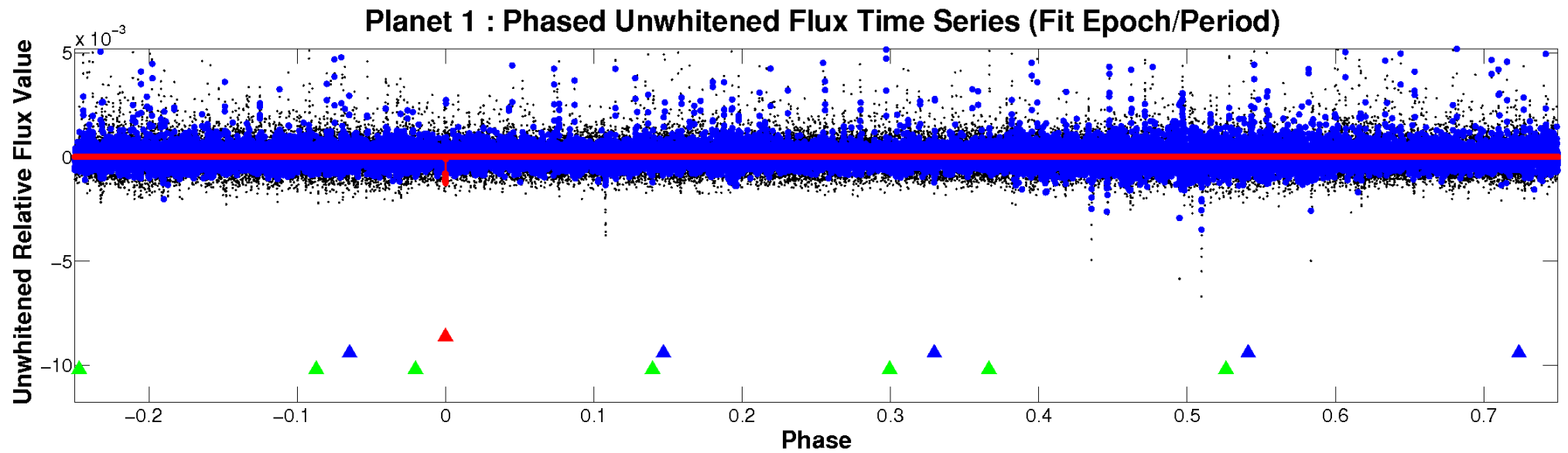


ALT Odd/Even

TCE 009827087-01

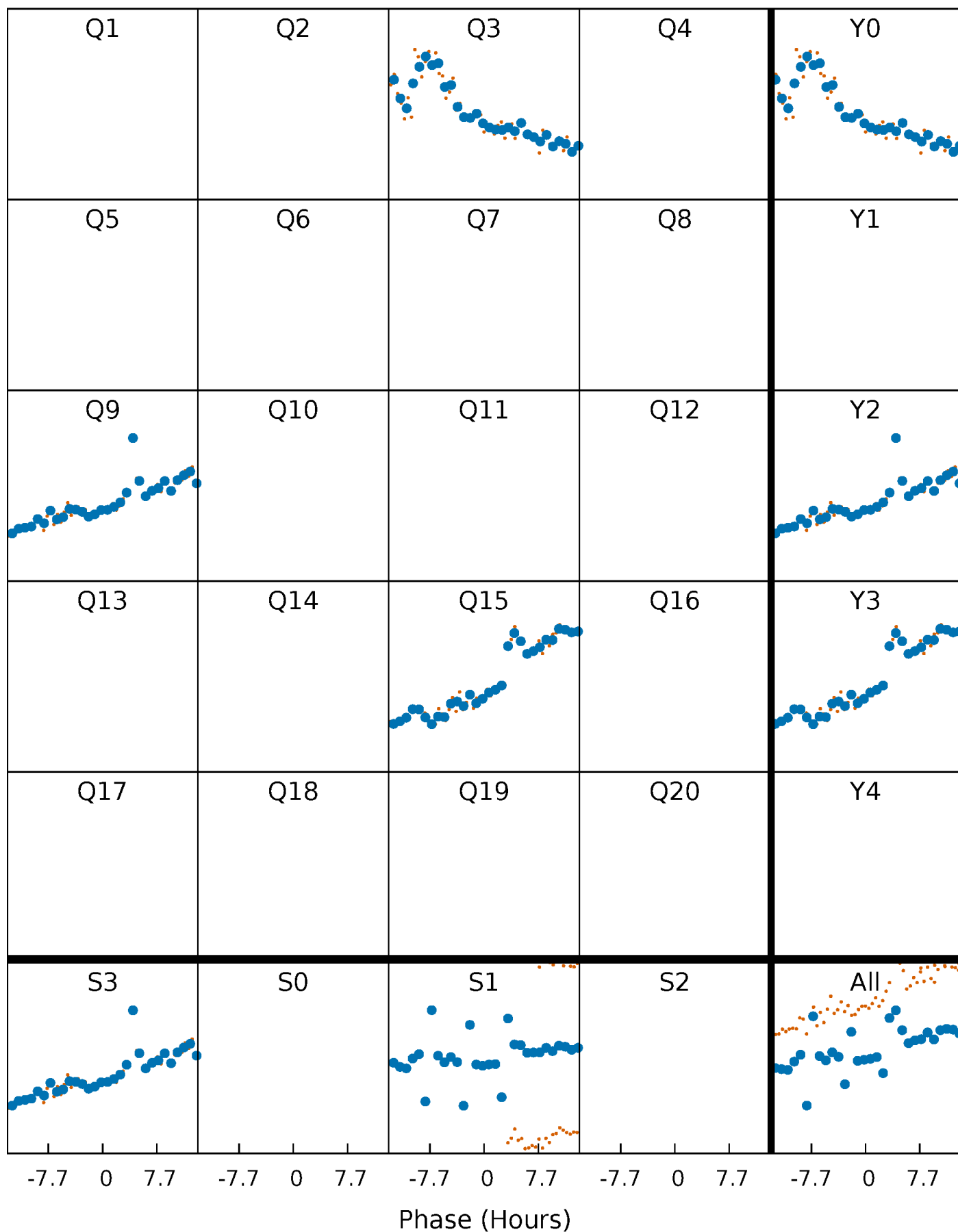


Non-Whitened Vs. Whitened Light Curve



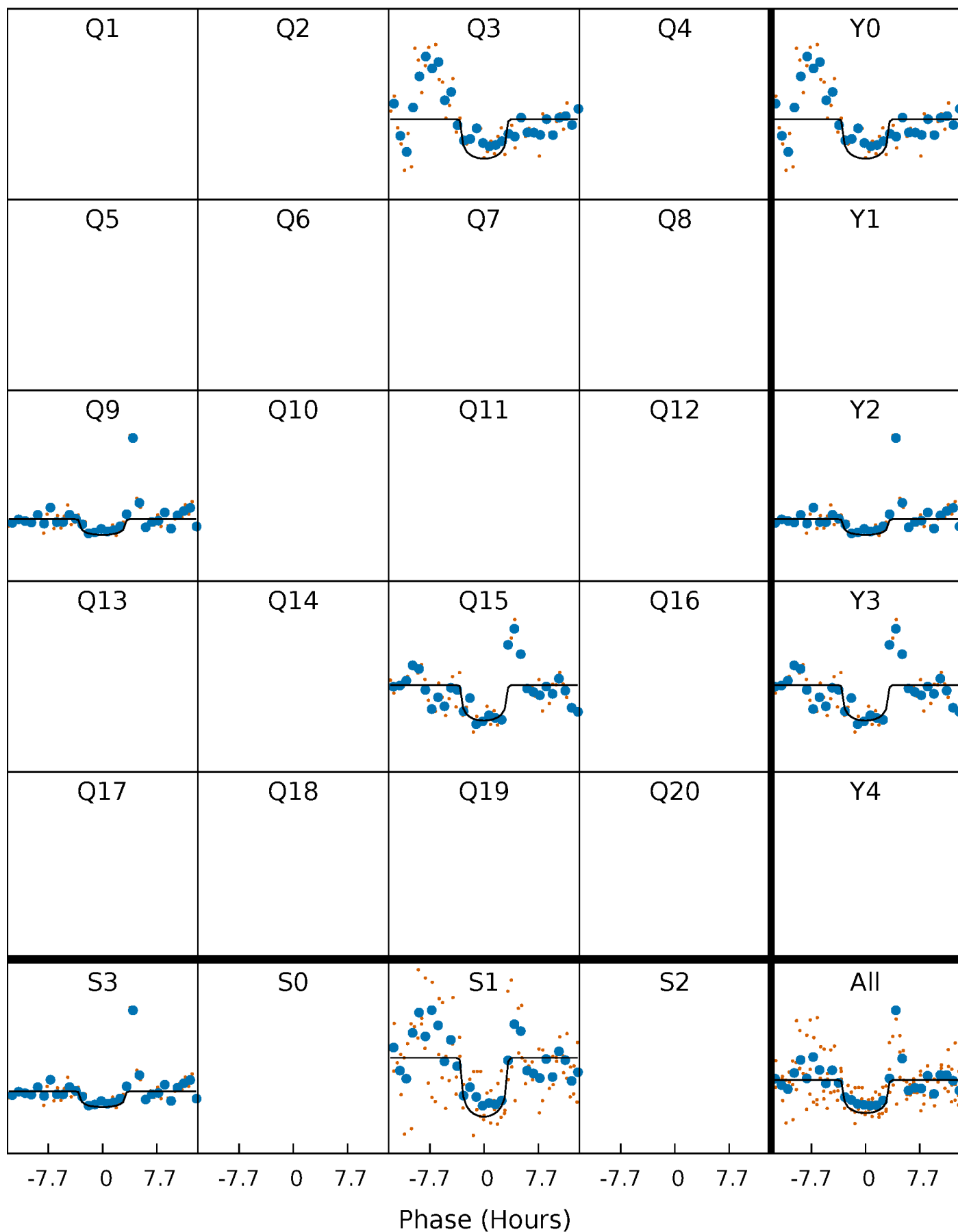
PDC Quarter-Phased Transit Curves

TCE 009827087-01 P=520.630147 Days $T_0=340.627837$ (BKJD)



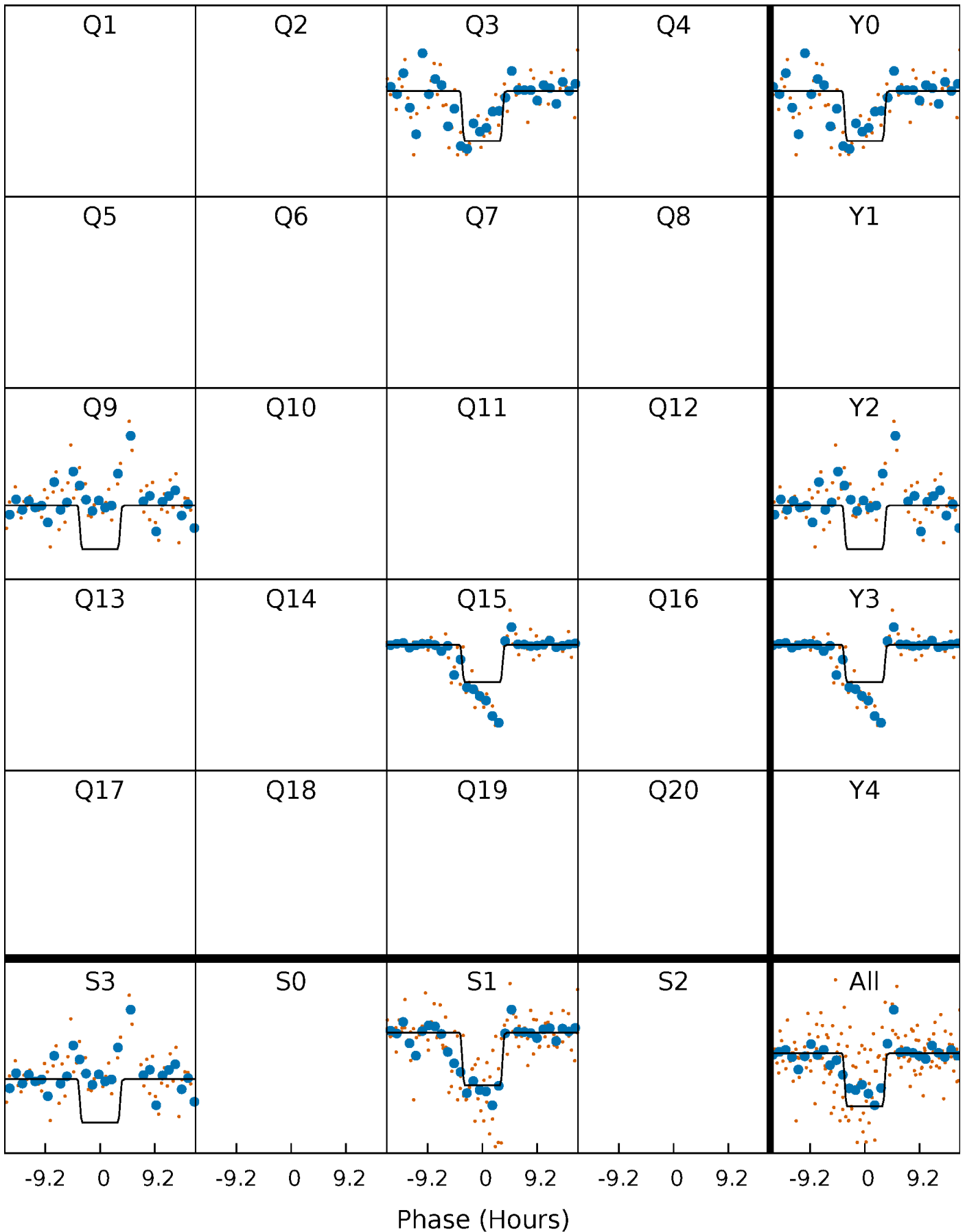
DV Quarter-Phased Transit Curves

TCE 009827087-01 P=520.630147 Days $T_0=340.627837$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

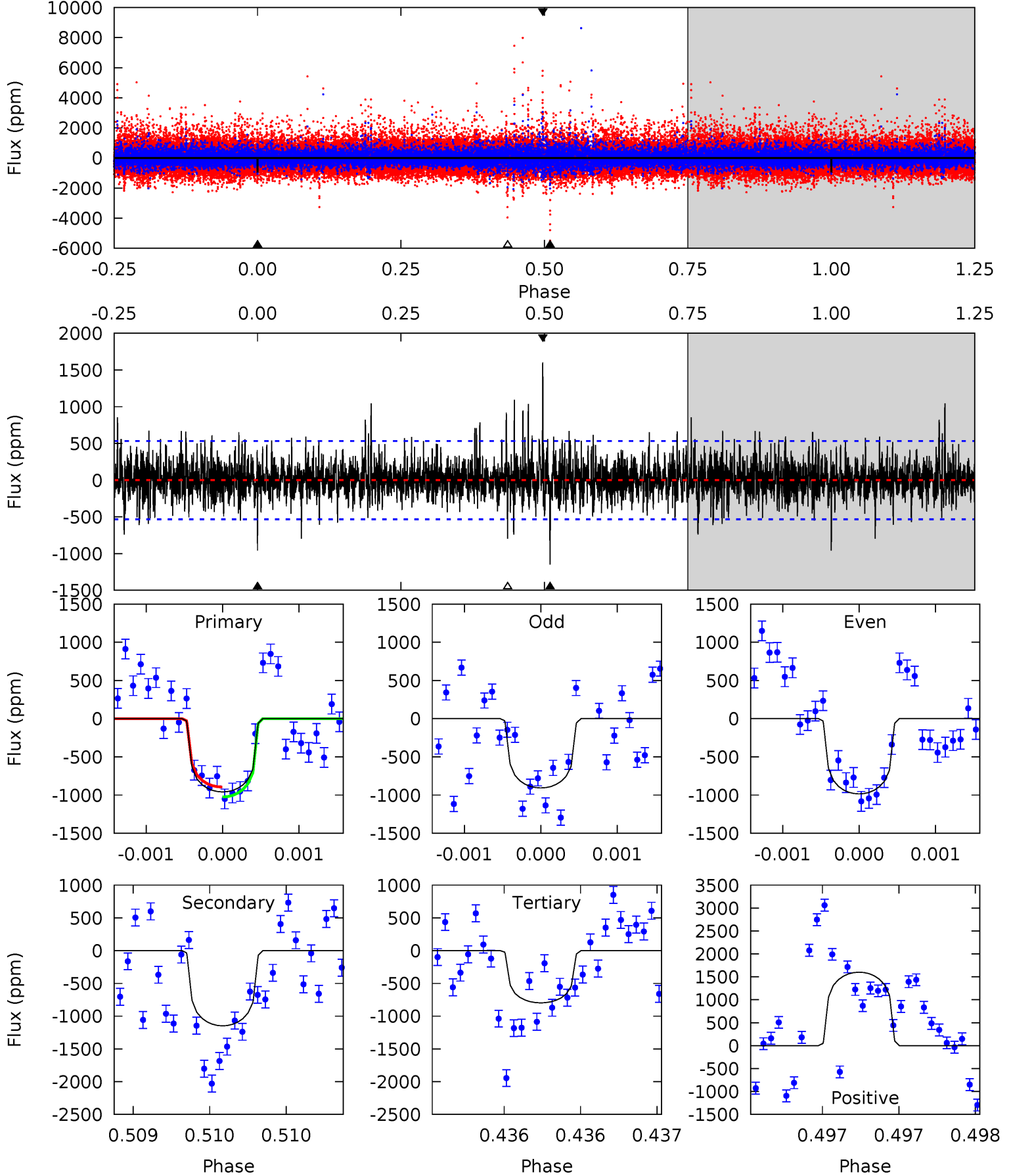
TCE 009827087-01 P=520.619864 Days $T_0=340.637313$ (BKJD)



DV Model-Shift Uniqueness Test

009827087-01, P = 520.630147 Days, E = 340.627837 Days

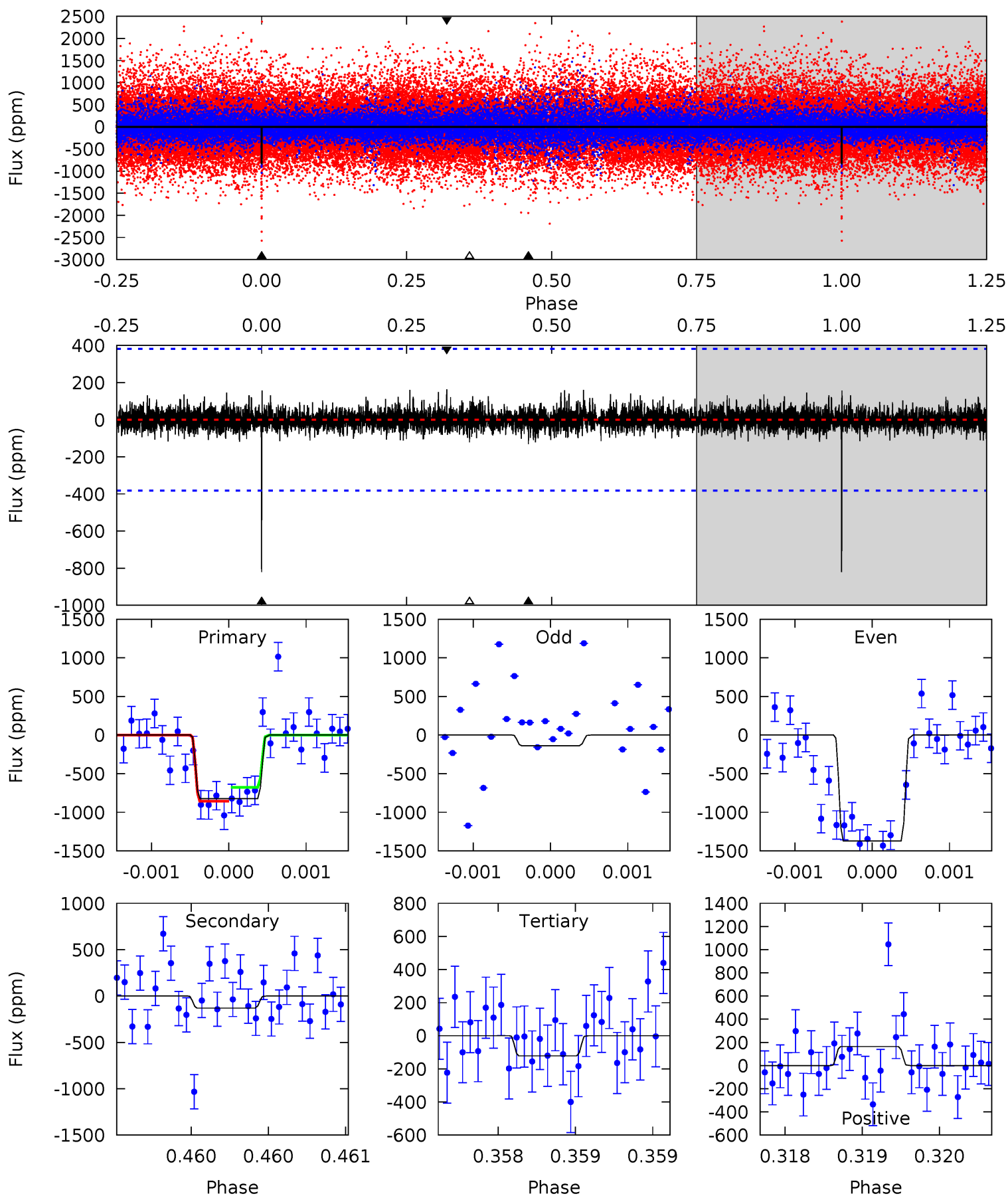
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.96 | 11.9 | 8.28 | 16.6 | 5.54 | 3.44 | 1.99 | 1.68 | -6.67 | 3.64 | -4.70 | 0.34 | 1.06 | 0.58 | 0.67 |



Alt Model-Shift Uniqueness Test

009827087-01, P = 520.619864 Days, E = 340.637313 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.9 | 1.89 | 1.76 | 2.37 | 5.53 | 3.42 | 0.47 | 10.1 | 9.52 | 0.13 | -0.48 | 8.72 | 0.96 | 0.17 | 1.28 |



Stellar Parameters For KIC 009827087

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5546^{+166}_{-166} | $4.619^{+0.037}_{-0.112}$ | $-0.520^{+0.300}_{-0.300}$ | $0.721^{+0.133}_{-0.053}$ | $0.791^{+0.085}_{-0.077}$ | $2.969^{+0.474}_{-1.006}$ |
| | +3%/-3% | +1%/-2% | +58%/-58% | +18%/-7% | +11%/-10% | +16%/-34% |
| 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 009827087-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|----------------|------------------------|----------------------|-----------------------|-----------------------------|
| DV | -1148 ± 96 | $2.75^{+1.58}_{-1.44}$ | 272^{+11}_{-10} | 5549^{+2622}_{-991} | $113841^{+359944}_{-68254}$ |
| Alt. | -130 ± 69 | $2.91^{+1.55}_{-1.56}$ | 271^{+12}_{-10} | 3543^{+1155}_{-596} | 10571^{+41525}_{-7369} |

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

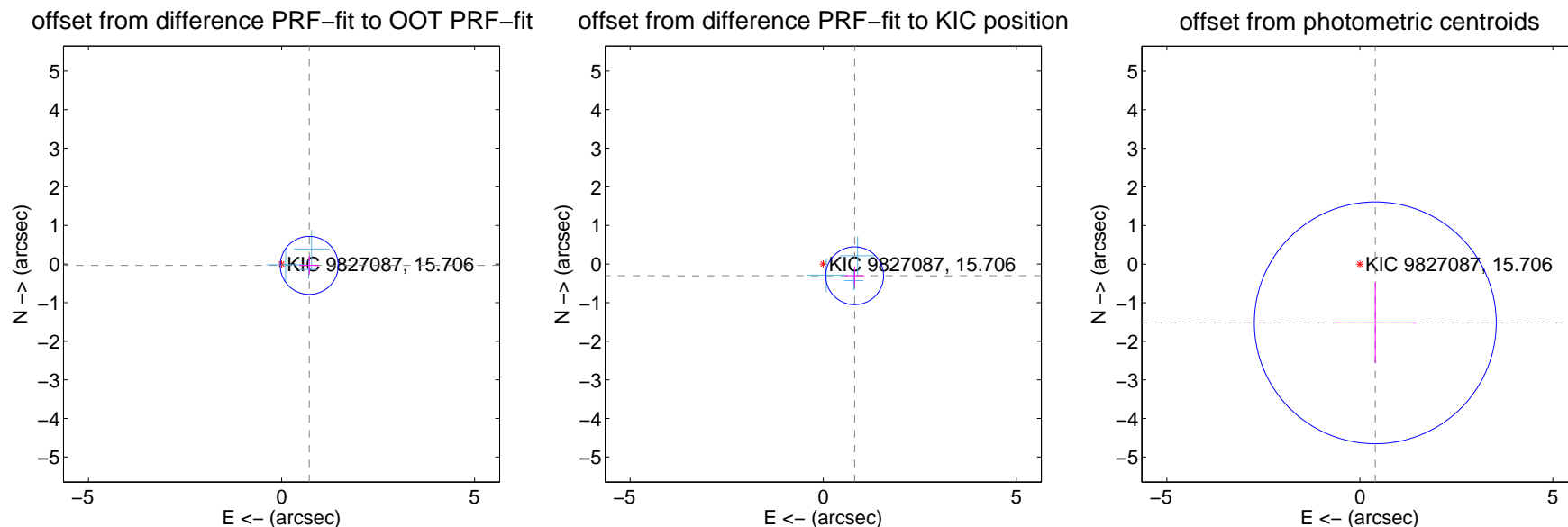
DV Centroid Data

Supplemental centroid analysis for 009827087-01. Kepler magnitude: 15.71. Transit SNR 7.66

There are 3 quarters with good PRF difference image offsets

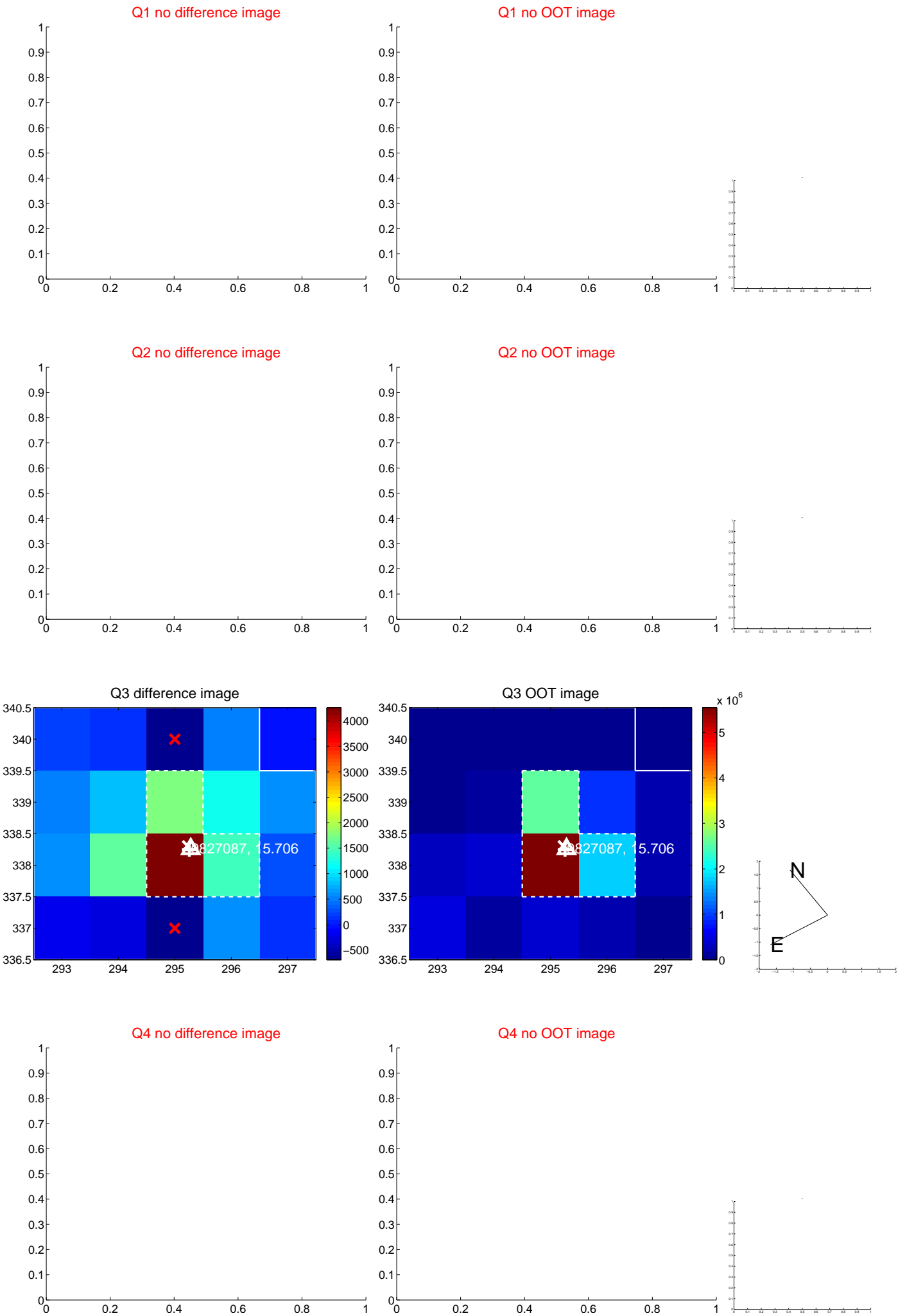
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.718 ± 0.250 | 2.87 | -0.717 ± 0.250 | -0.036 ± 0.245 |
| PRF-fit source offset from KIC position | 0.869 ± 0.250 | 3.48 | -0.814 ± 0.250 | -0.304 ± 0.245 |
| photometric centroid source offset | 1.57 ± 1.04 | 1.51 | -0.40 ± 1.06 | -1.52 ± 1.04 |



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.

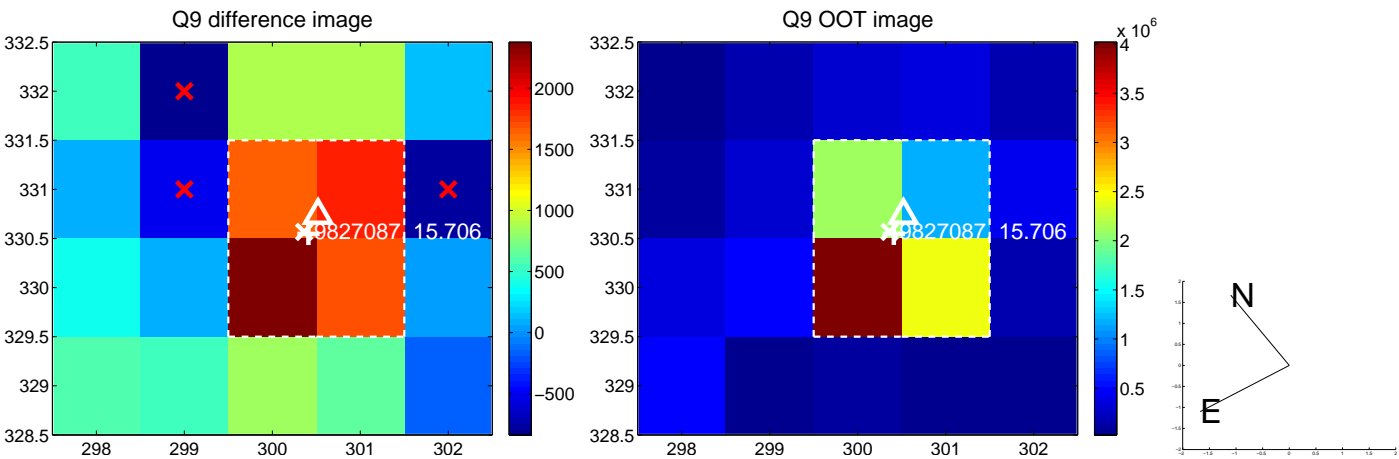
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



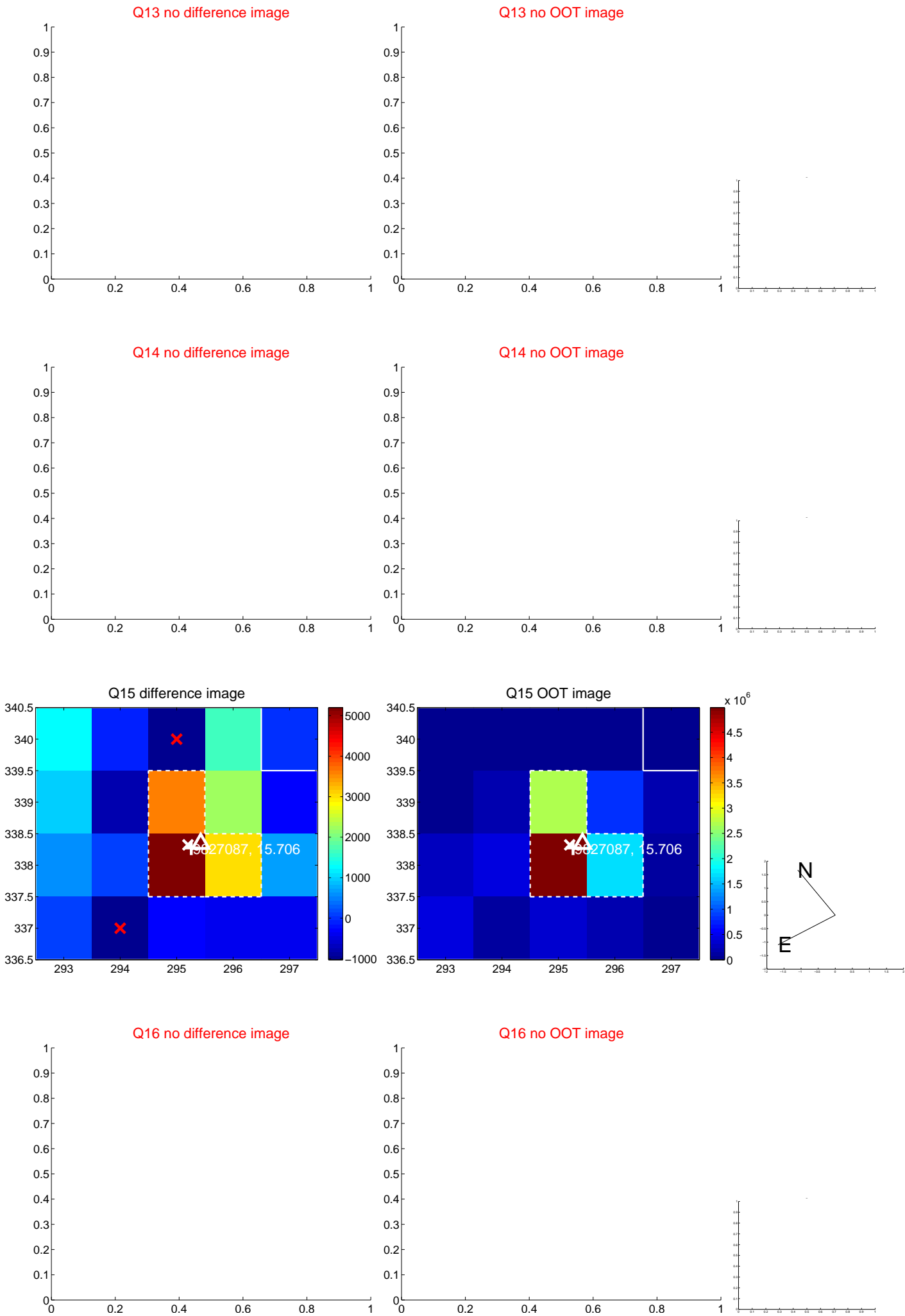
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



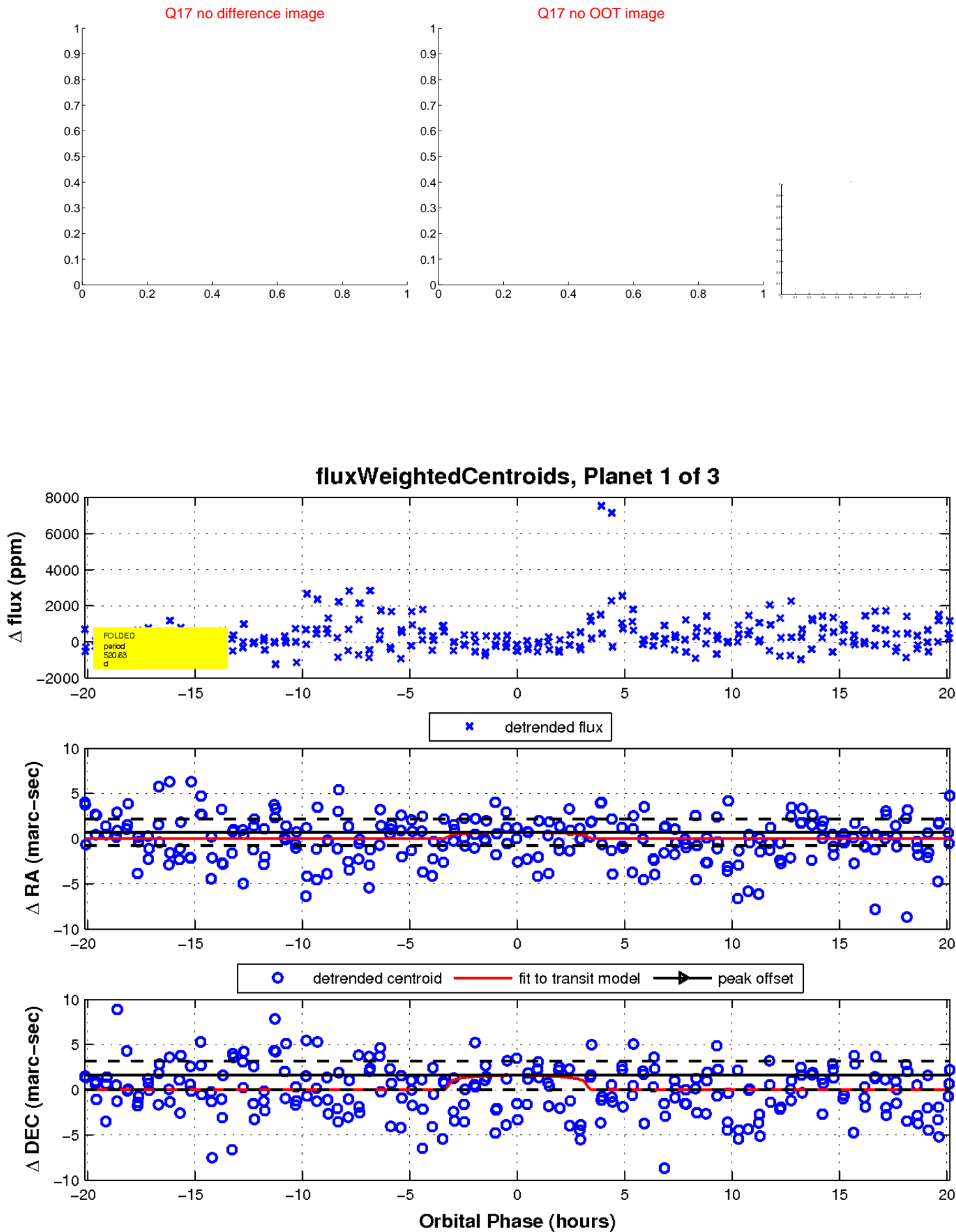
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

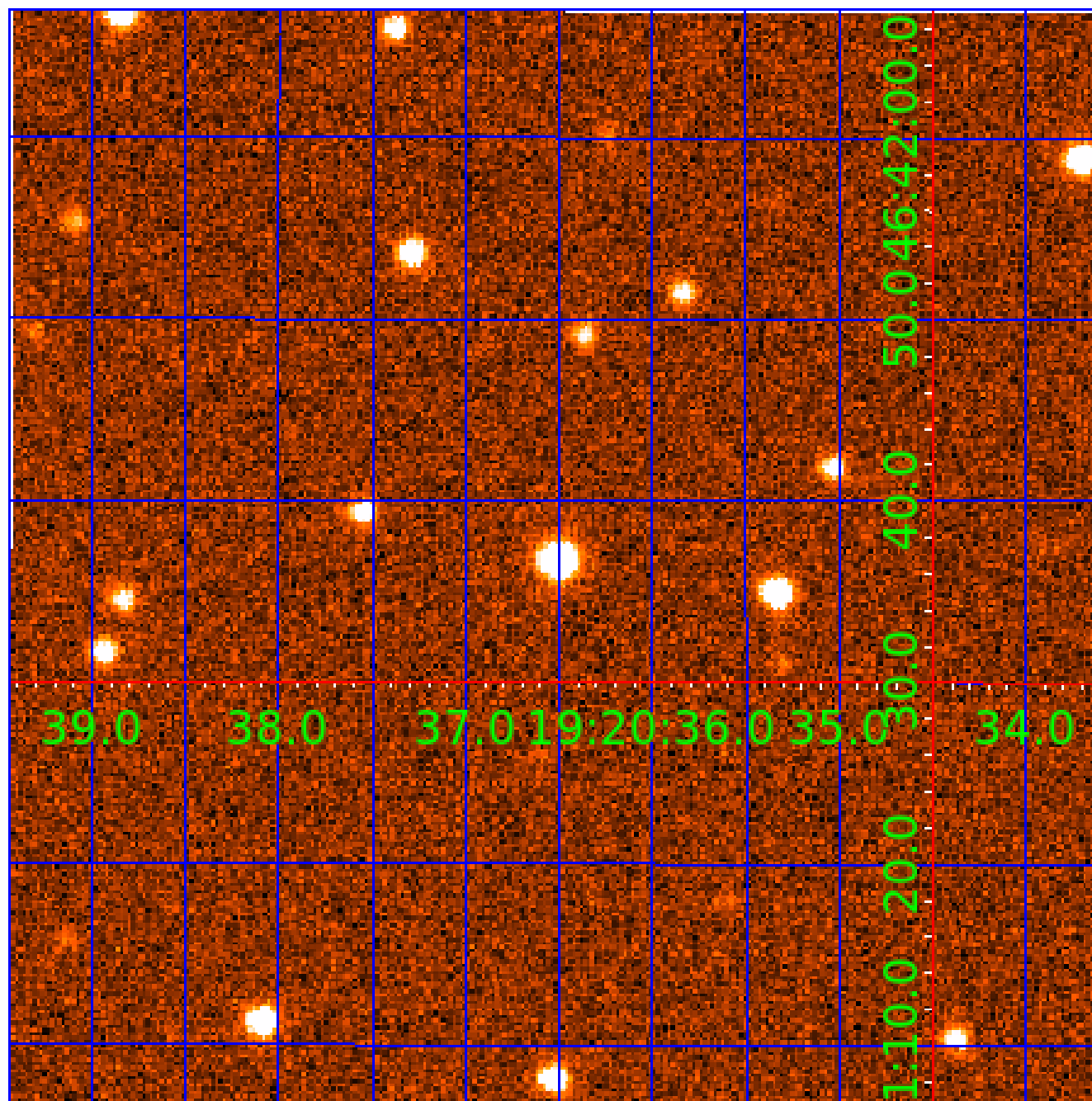


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009827087

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009827087-01 | OBS | No | 520.630147 | 340.627837 | 1256.3 | 6.765 | 10.5 | 7.7 | 0.72 | 5546 | 2.62 | 0.32 |
| 009827087-02 | OBS | No | 315.401323 | 196.800926 | 966.8 | 3.647 | 10.0 | 6.9 | 0.72 | 5546 | 2.41 | 0.63 |
| 009827087-03 | OBS | No | 201.283999 | 330.097650 | 1069.5 | 5.625 | 8.6 | 6.4 | 0.72 | 5546 | 4.58 | 1.14 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009827087-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS |
| 009827087-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 009827087-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

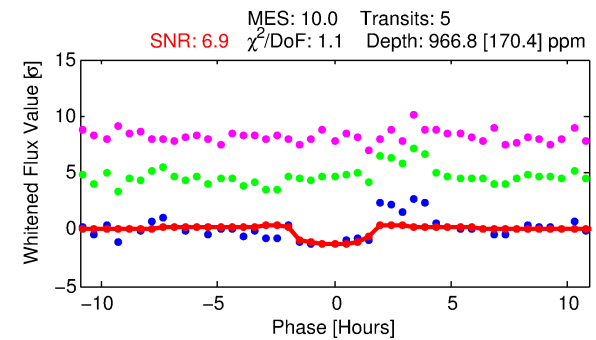
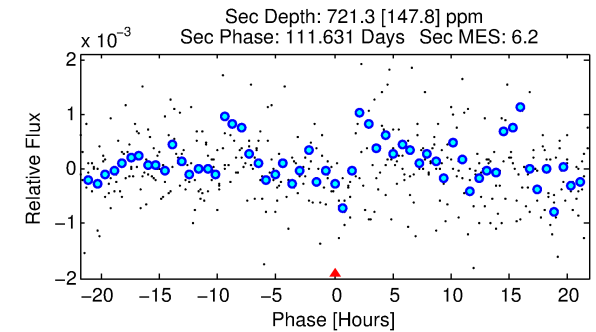
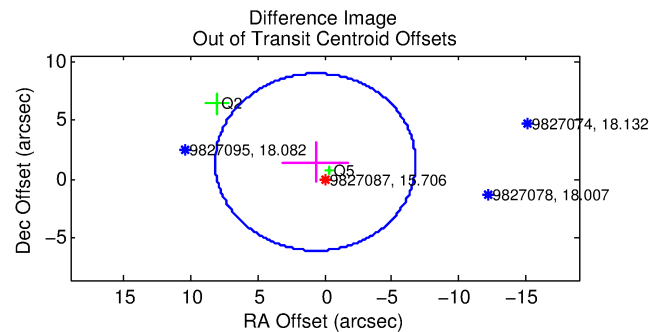
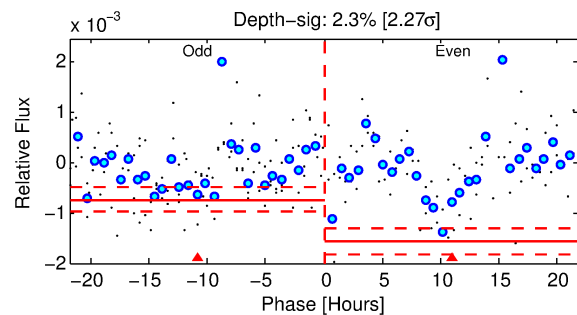
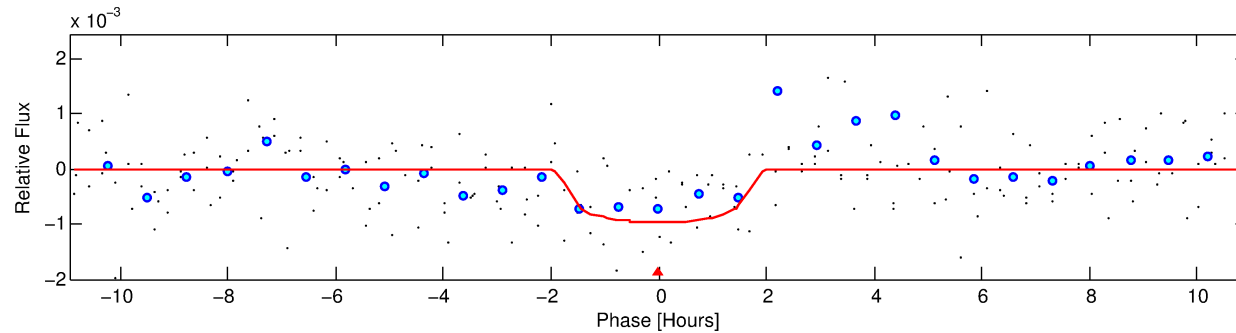
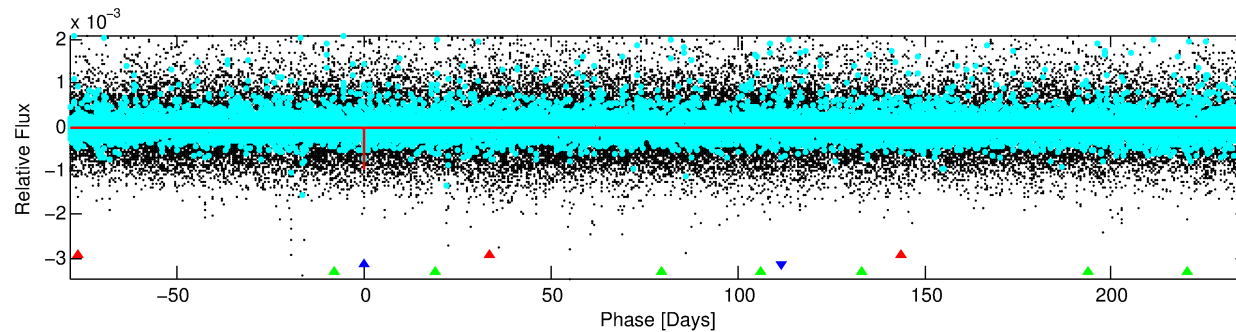
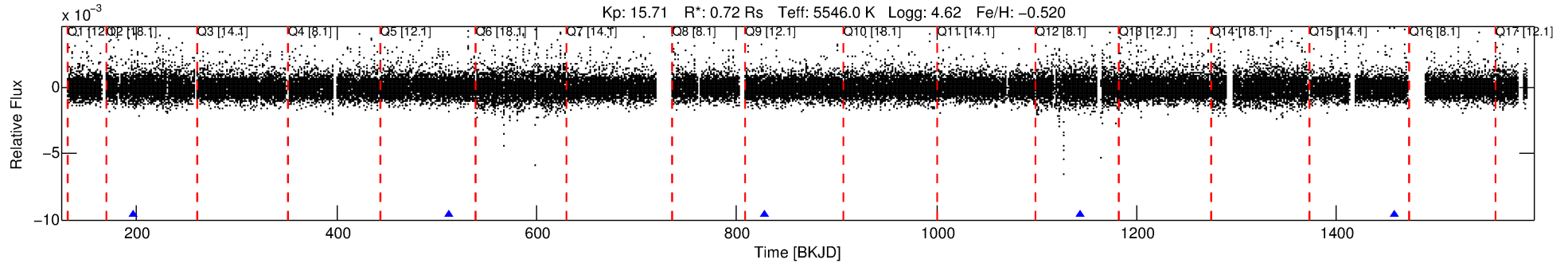
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009827087-02

No Significant Match Found

DV One-Page Summary

KIC: 9827087 Candidate: 2 of 3 Period: 315.401 d



DV Fit Results:

Period = 315.40132 [0.00449] d
Epoch = 196.8009 [0.0111] BKJD
Rp/R* = 0.0306 [0.0307]
a/R* = 486.63 [2138.35]
b = 0.72 [2.96]
Seff = 0.63 [0.15]
Teq = 227 [14] K
Rp = 2.41 [2.46] Re
a = 0.8380 [0.1257] AU
Ag = 47952.64 [97204.60] [0.49 σ]
Teffp = 5192 [2622] K [1.89 σ]

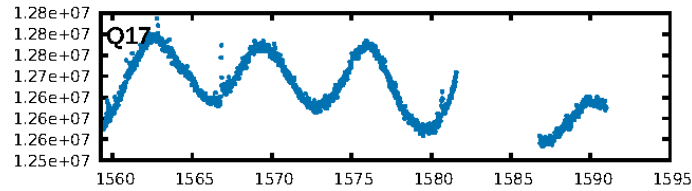
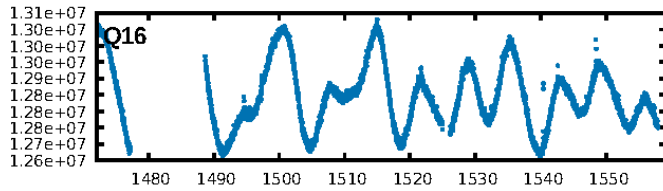
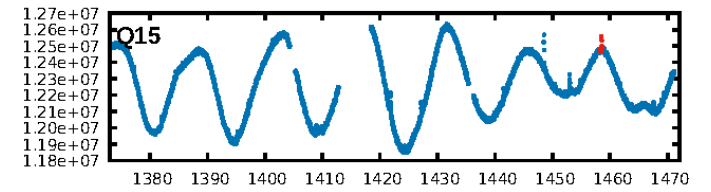
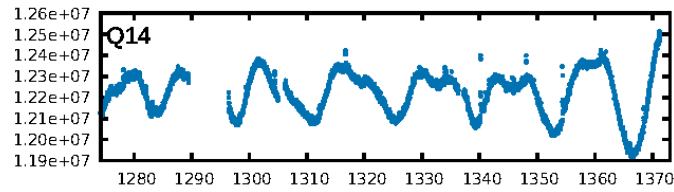
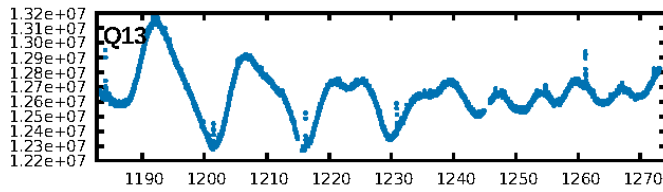
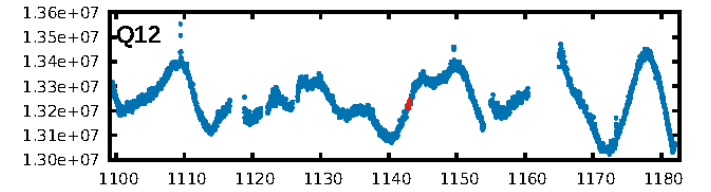
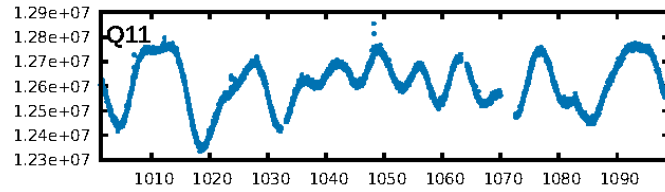
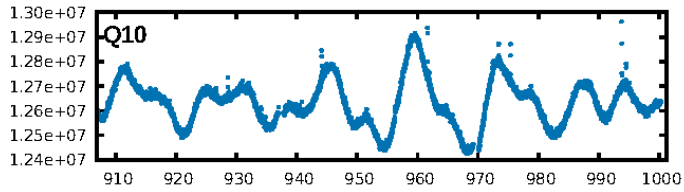
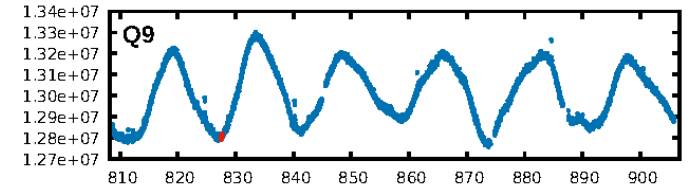
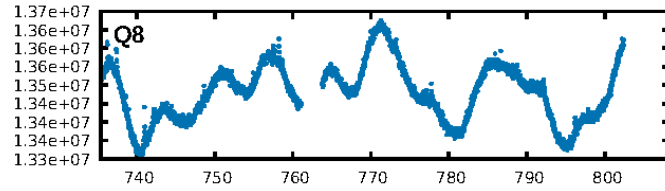
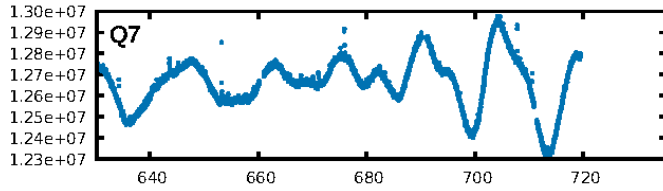
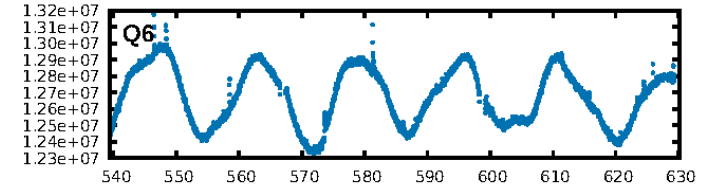
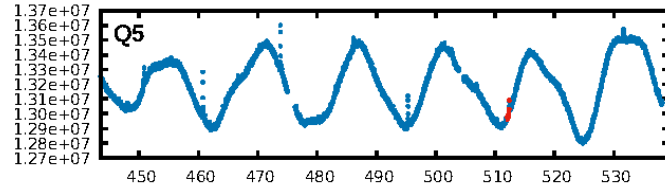
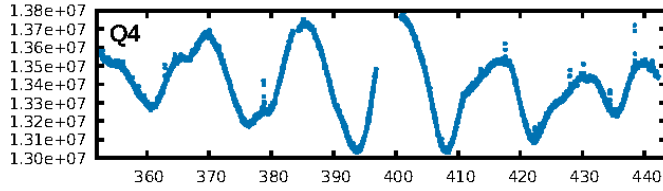
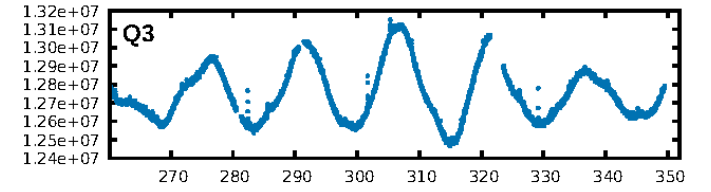
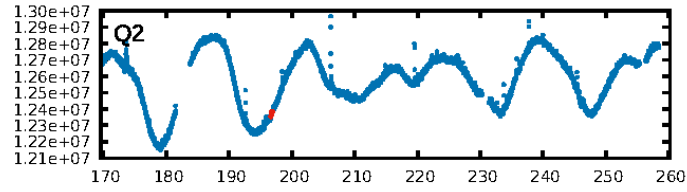
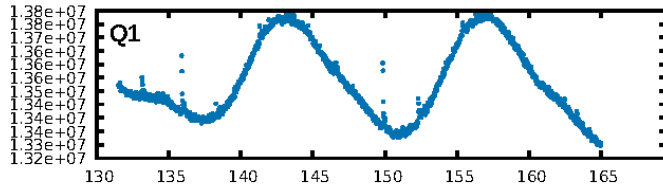
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [408.53 σ]
LongPeriod-sig: 100.0% [640.88 σ]
ModelChiSquare2-sig: 8.3%
ModelChiSquareGof-sig: 87.8%
Bootstrap-pfa: 6.98e-12
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -0.9035
Centroid-sig: 84.0%
Centroid-so: 0.617 arcsec [0.41 σ]
OotOffset-rm: 1.618 arcsec [0.65 σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-rm: 1.489 arcsec [0.41 σ]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [5/5]

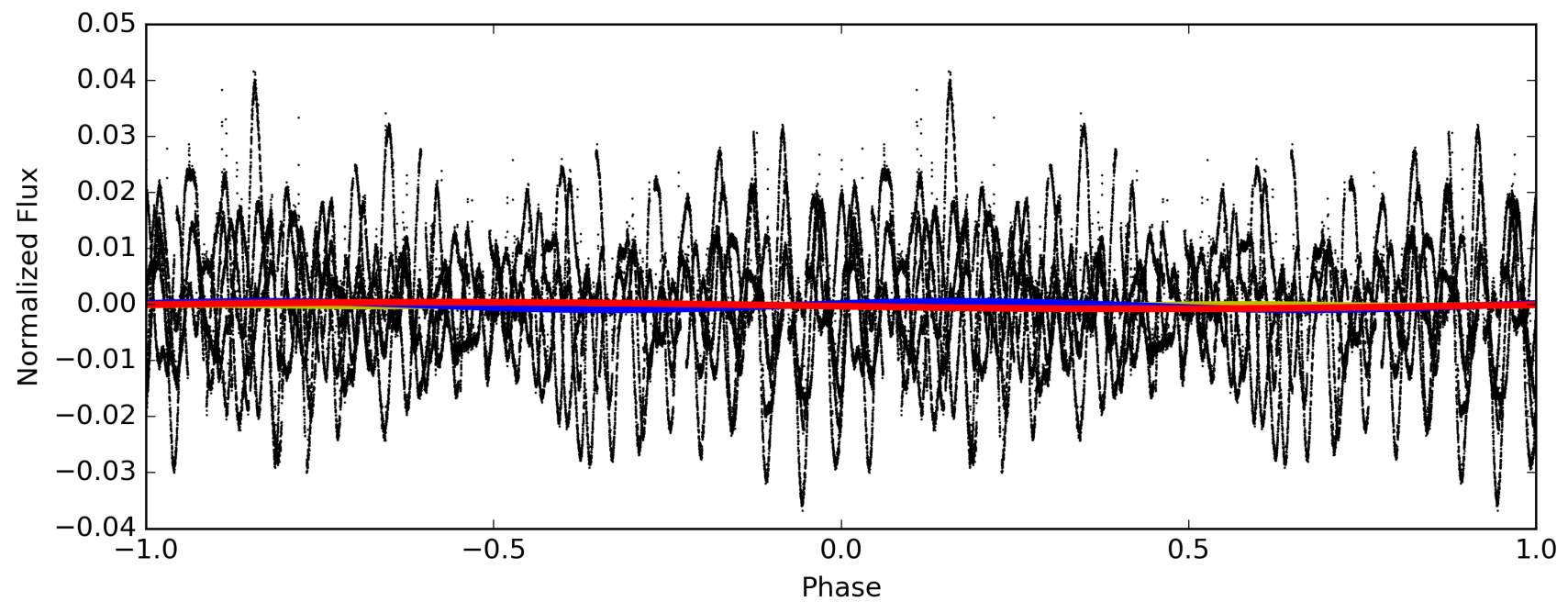
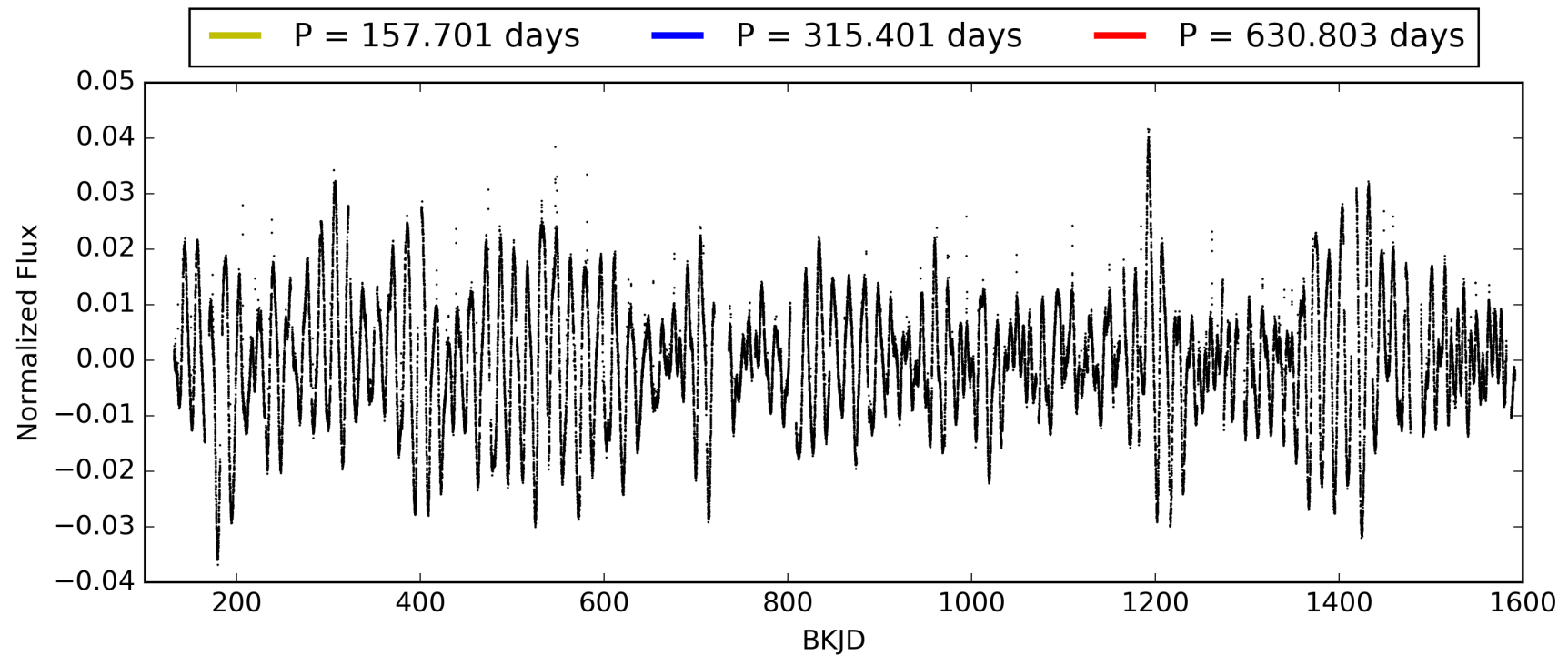
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009827087-02, PDC Light Curves

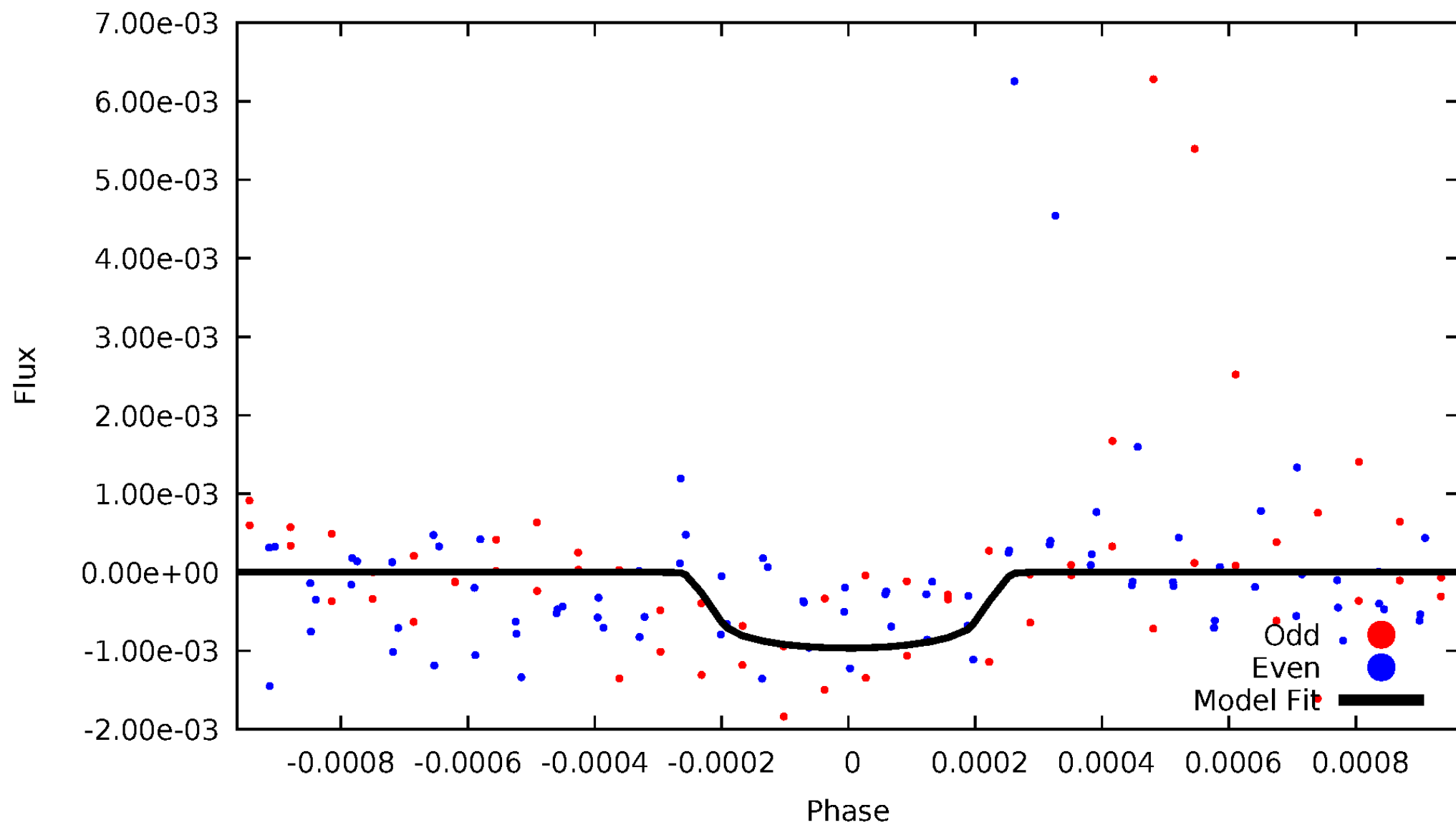


TCE 009827087-02



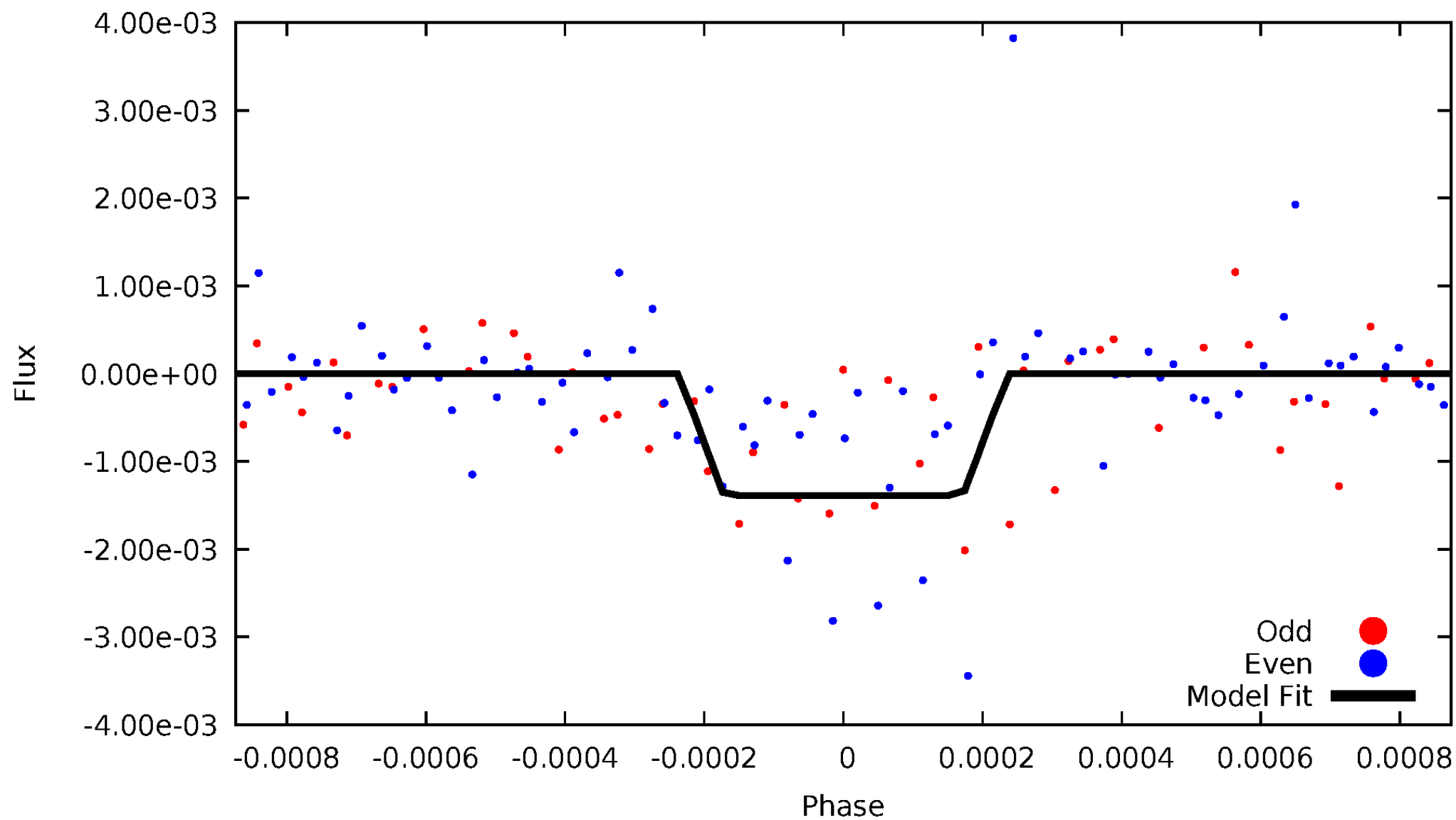
DV Odd/Even

TCE 009827087-02



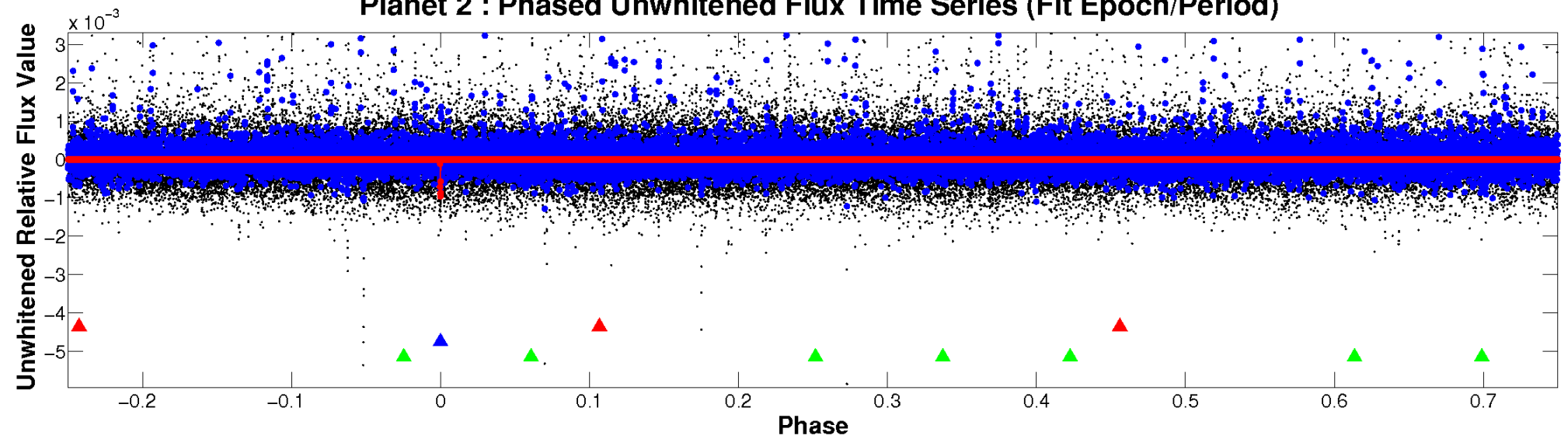
ALT Odd/Even

TCE 009827087-02

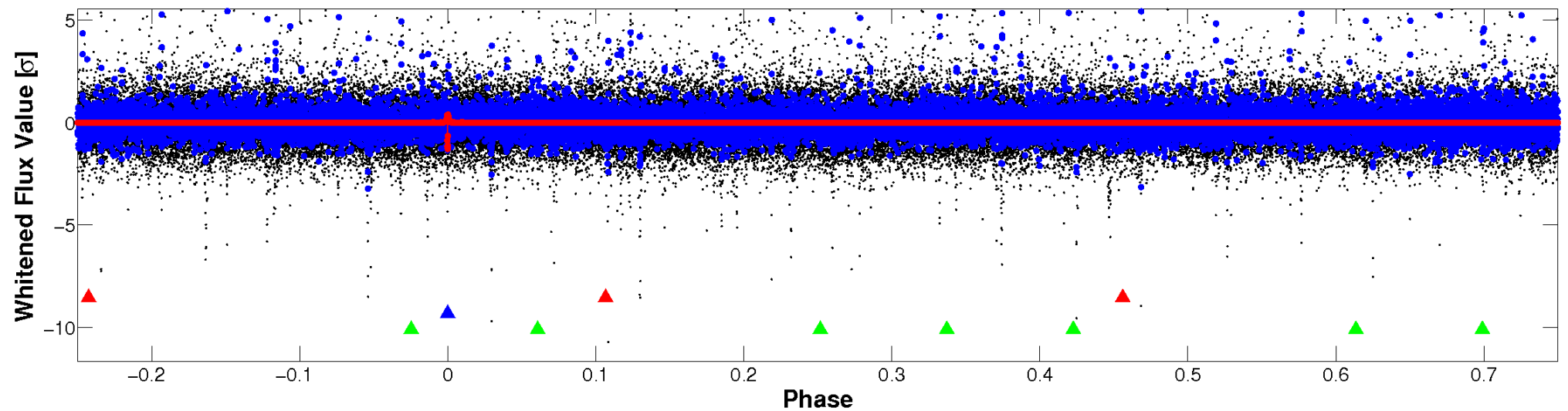


Non-Whitened Vs. Whitened Light Curve

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

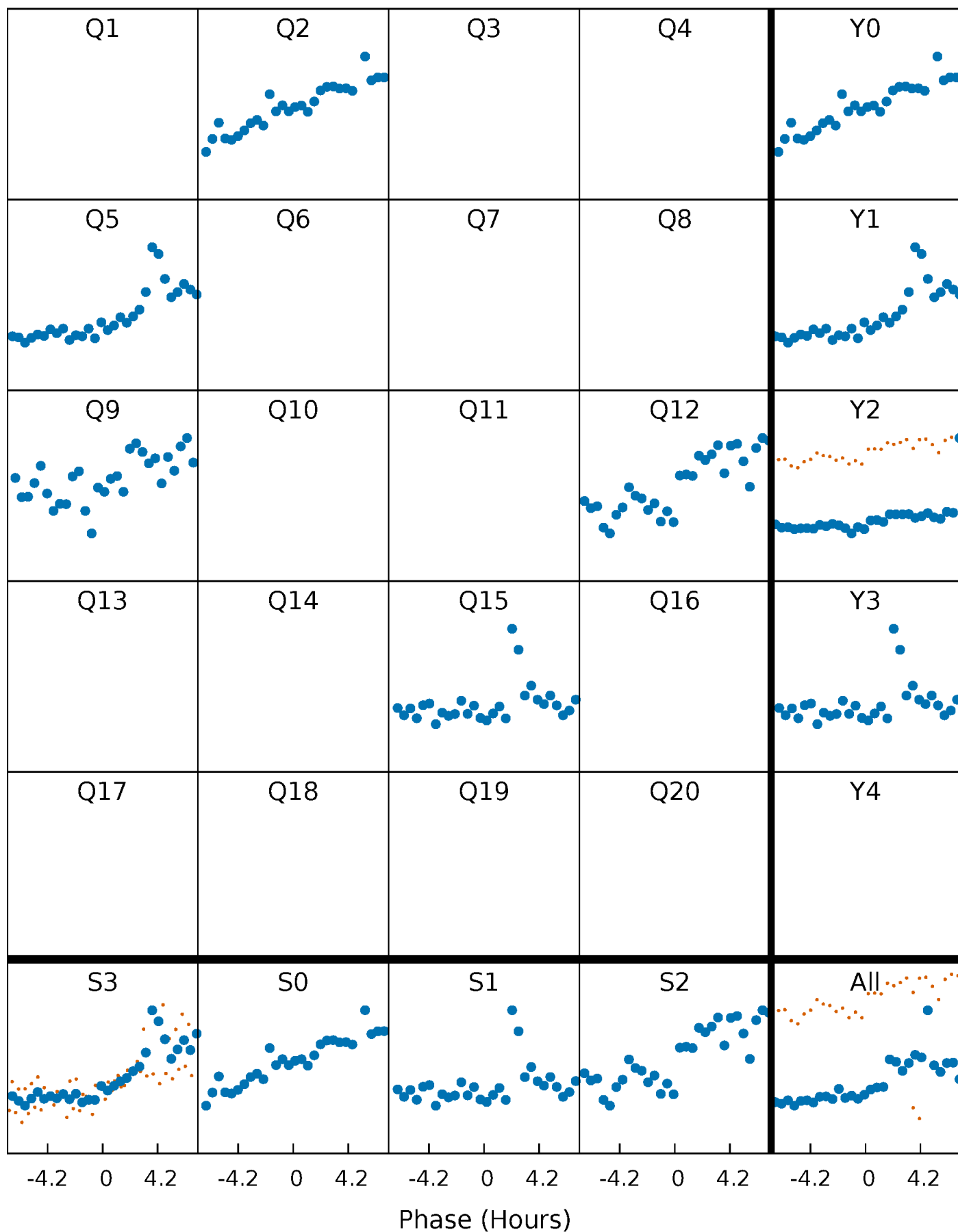


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



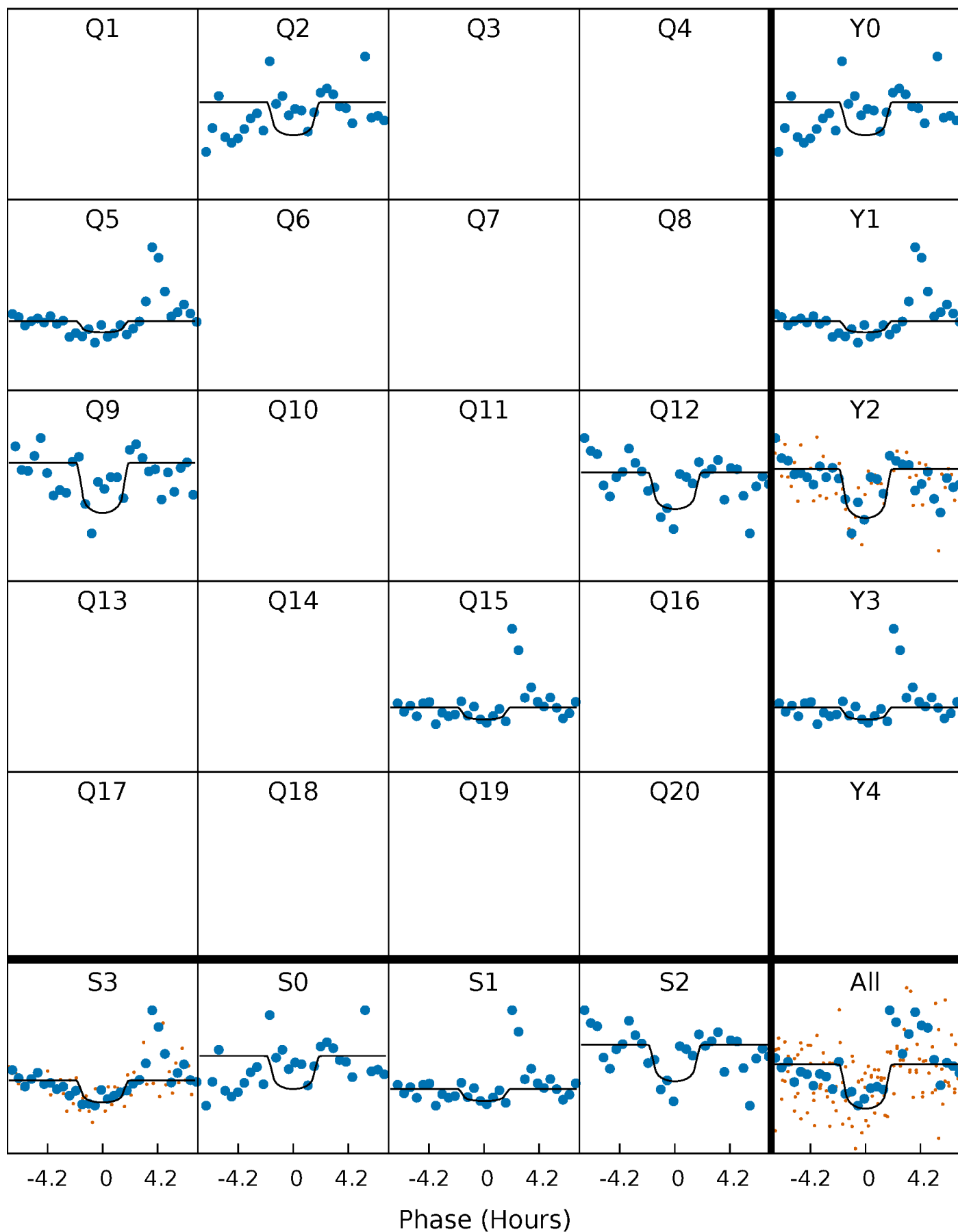
PDC Quarter-Phased Transit Curves

TCE 009827087-02 P=315.401323 Days $T_0=196.800926$ (BKJD)



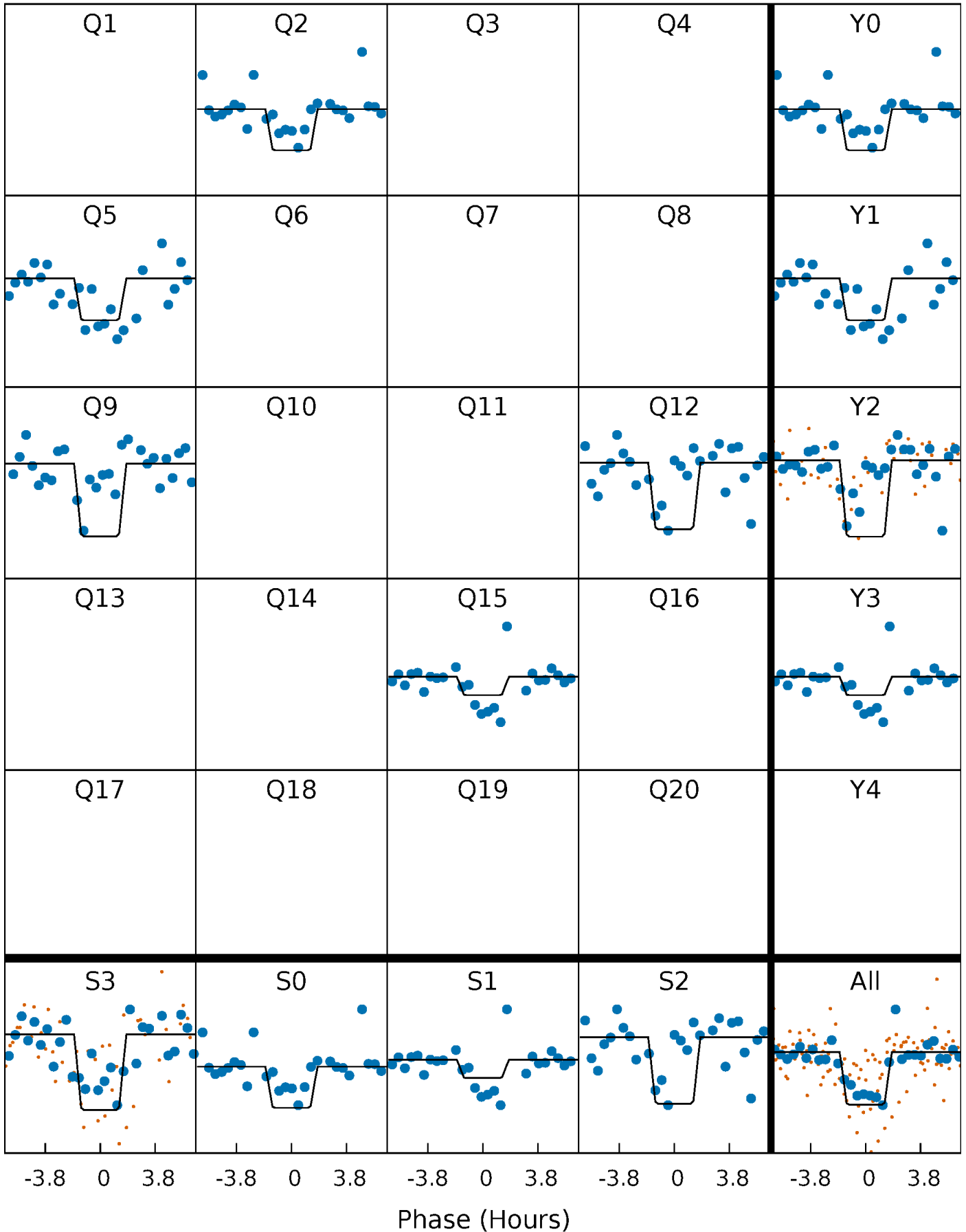
DV Quarter-Phased Transit Curves

TCE 009827087-02 P=315.401323 Days $T_0=196.800926$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

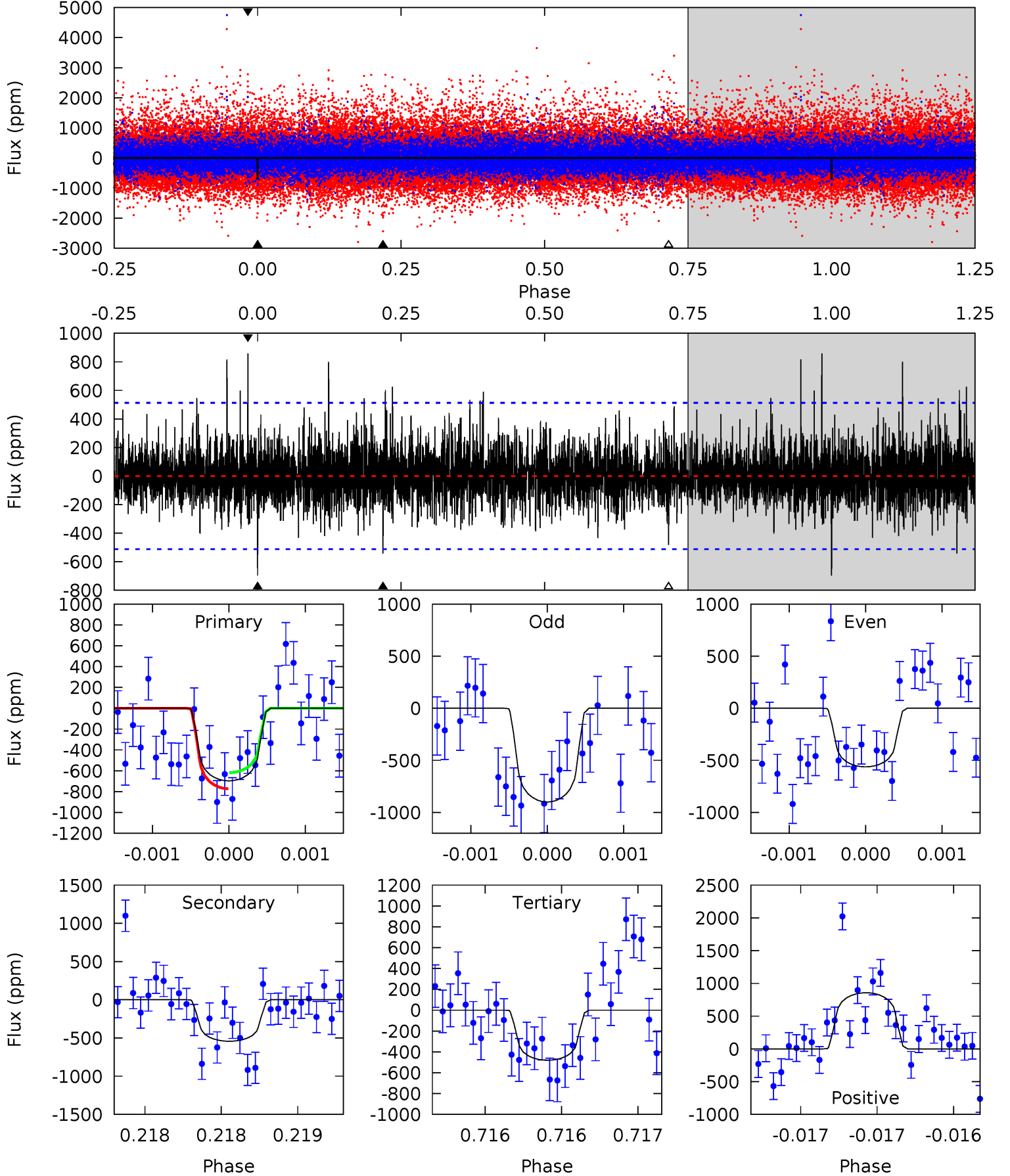
TCE 009827087-02 P=315.398175 Days $T_0=196.819104$ (BKJD)



DV Model-Shift Uniqueness Test

009827087-02, P = 315.401323 Days, E = 196.800926 Days

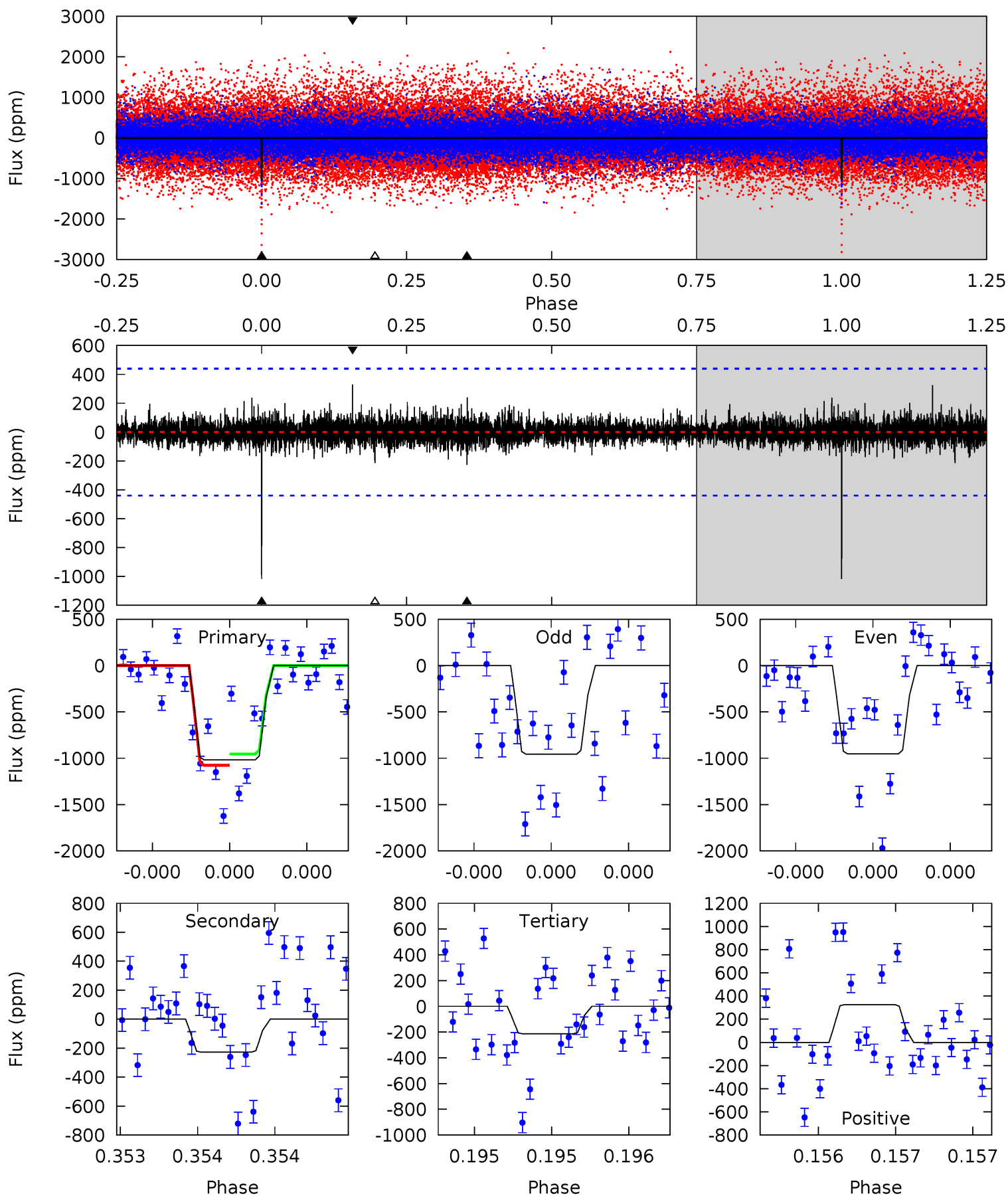
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.57 | 5.90 | 5.22 | 9.31 | 5.56 | 3.47 | 1.53 | 2.35 | -1.74 | 0.68 | -3.41 | 1.66 | 1.01 | 0.55 | 0.84 |



Alt Model-Shift Uniqueness Test

009827087-02, P = 315.398175 Days, E = 196.819104 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 | 2.89 | 2.71 | 4.13 | 5.59 | 3.51 | 0.63 | 10.2 | 8.80 | 0.18 | -1.25 | 0.02 | 1.46 | 0.24 | 0.78 |



Stellar Parameters For KIC 009827087

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5546^{+166}_{-166} | $4.619^{+0.037}_{-0.112}$ | $-0.520^{+0.300}_{-0.300}$ | $0.721^{+0.133}_{-0.053}$ | $0.791^{+0.085}_{-0.077}$ | $2.969^{+0.474}_{-1.006}$ |
| | +3%/-3% | +1%/-2% | +58%/-58% | +18%/-7% | +11%/-10% | +16%/-34% |
| 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 009827087-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|----------------------------|
| DV | -543 ± 92 | $2.82^{+2.37}_{-1.77}$ | 321^{+15}_{-12} | 4657^{+2789}_{-930} | $25827^{+166887}_{-18422}$ |
| Alt. | -227 ± 79 | $3.43^{+2.44}_{-1.93}$ | 321^{+16}_{-13} | 3645^{+1355}_{-551} | 7060^{+28657}_{-4757} |

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

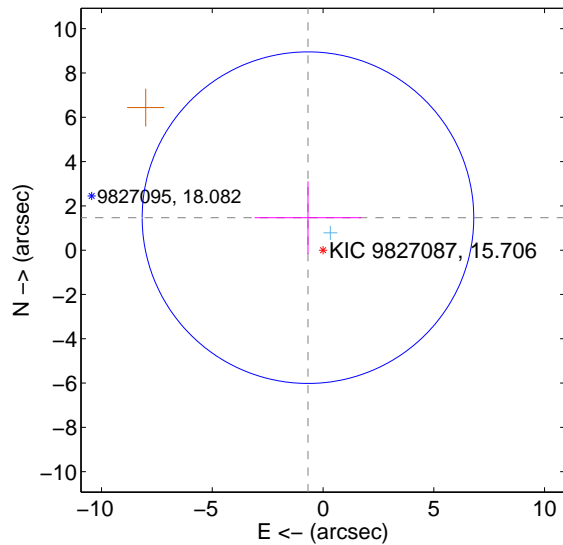
Supplemental centroid analysis for 009827087-02. Kepler magnitude: 15.71. Transit SNR 6.87

There are 1 quarters with good PRF difference image offsets

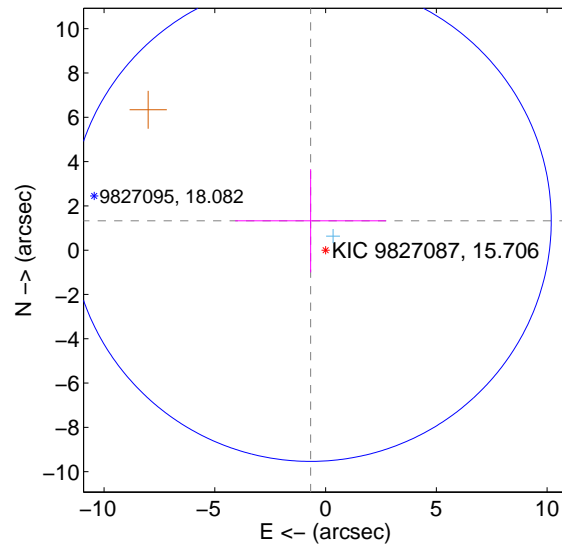
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 1.618 ± 2.495 | 0.65 | 0.681 ± 2.408 | 1.468 ± 1.634 |
| PRF-fit source offset from KIC position | 1.489 ± 3.621 | 0.41 | 0.675 ± 3.408 | 1.327 ± 2.330 |
| photometric centroid source offset | 0.62 ± 1.51 | 0.41 | -0.51 ± 1.53 | -0.35 ± 1.46 |

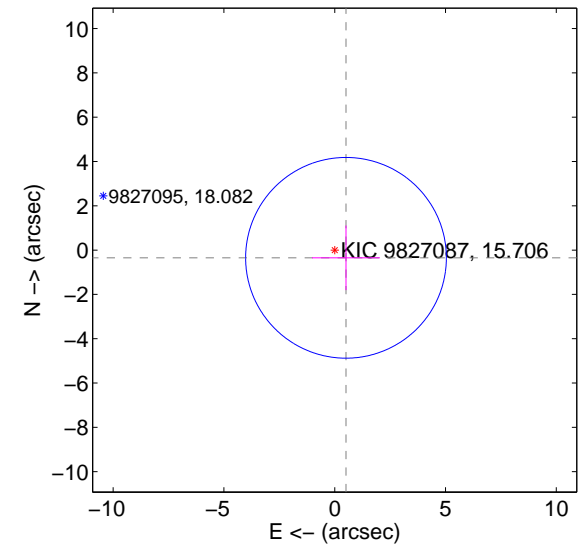
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

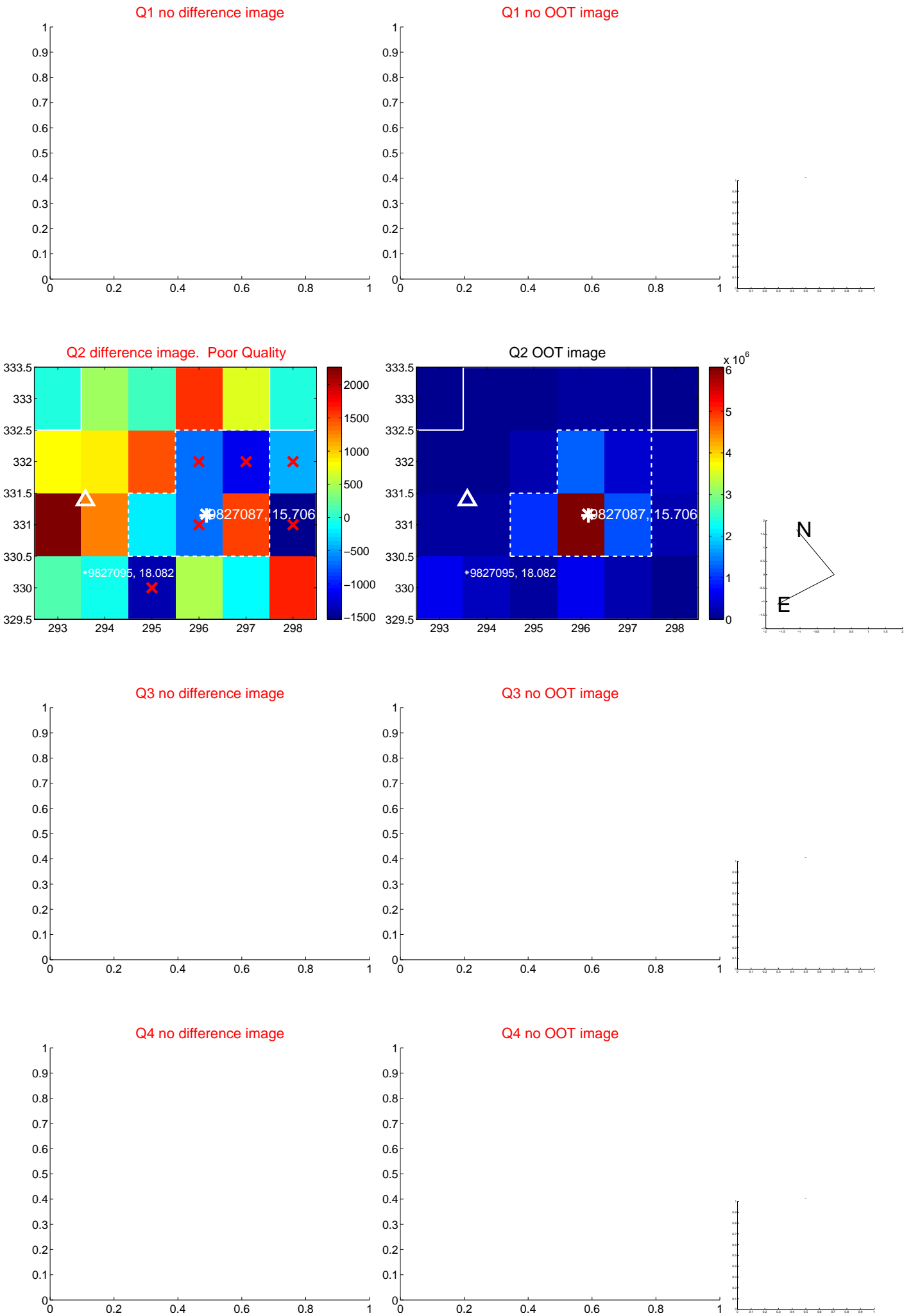


offset from photometric centroids

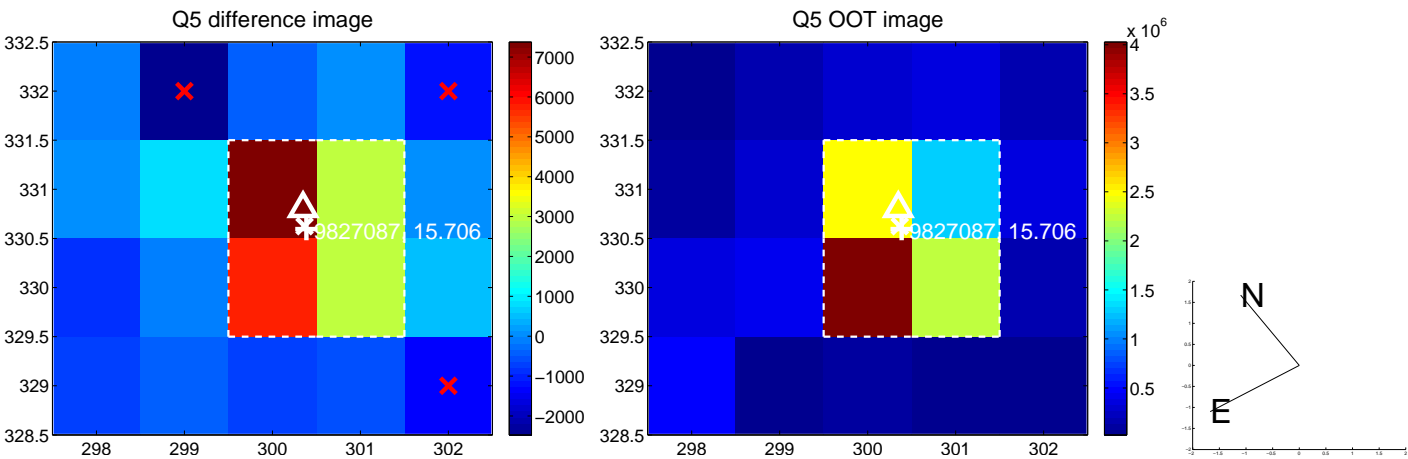


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

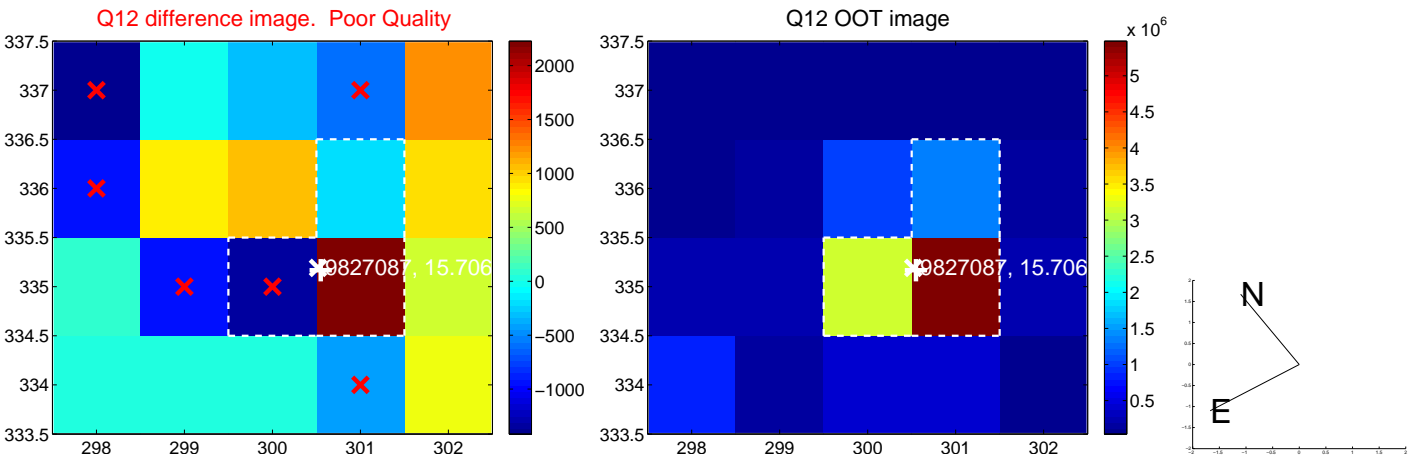
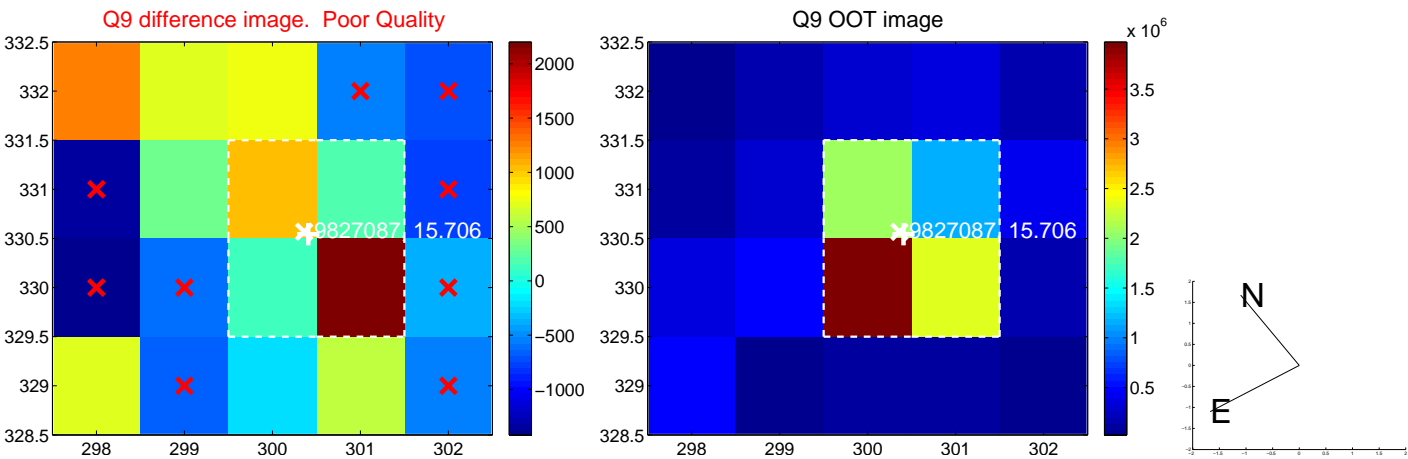
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



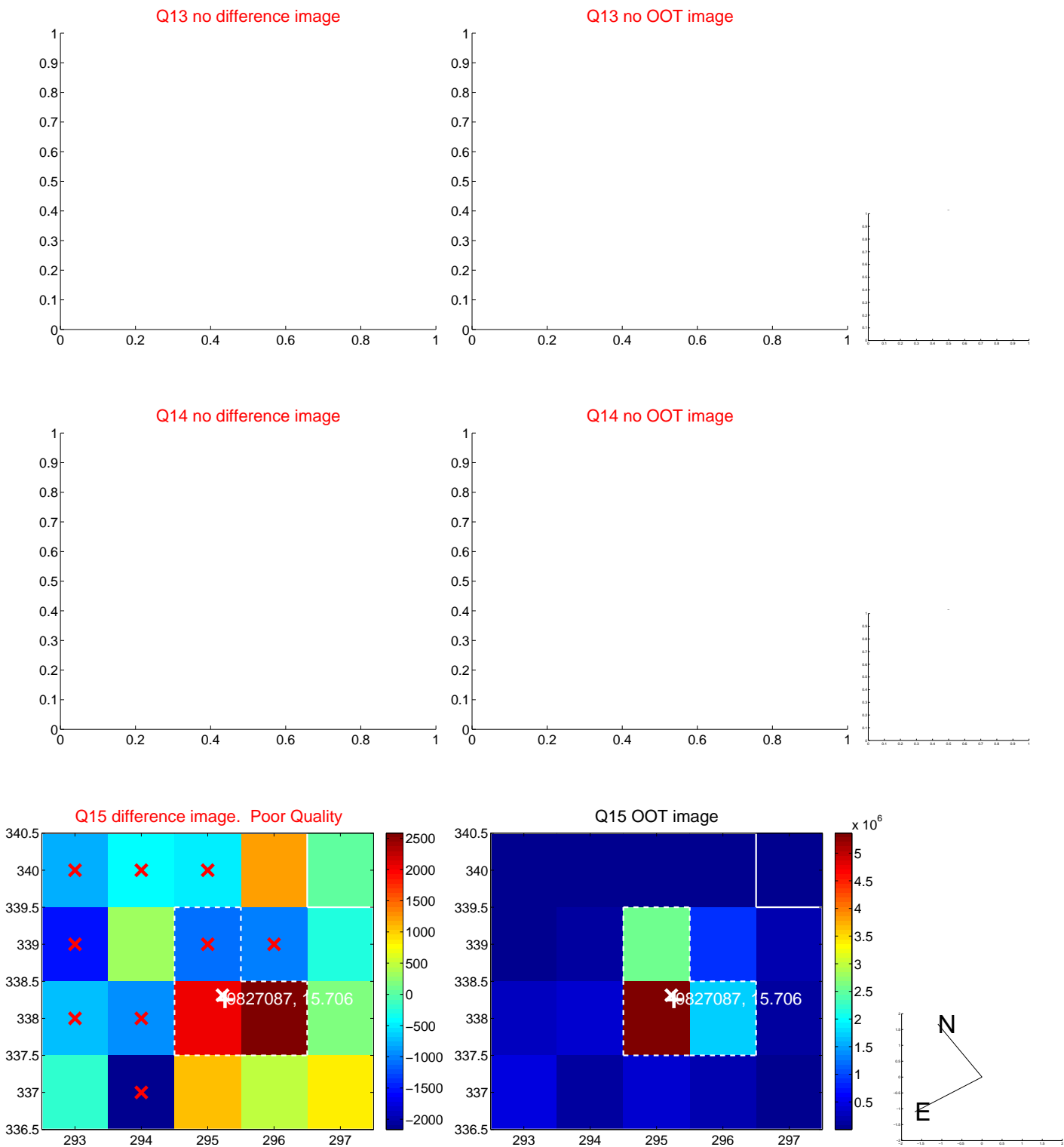
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



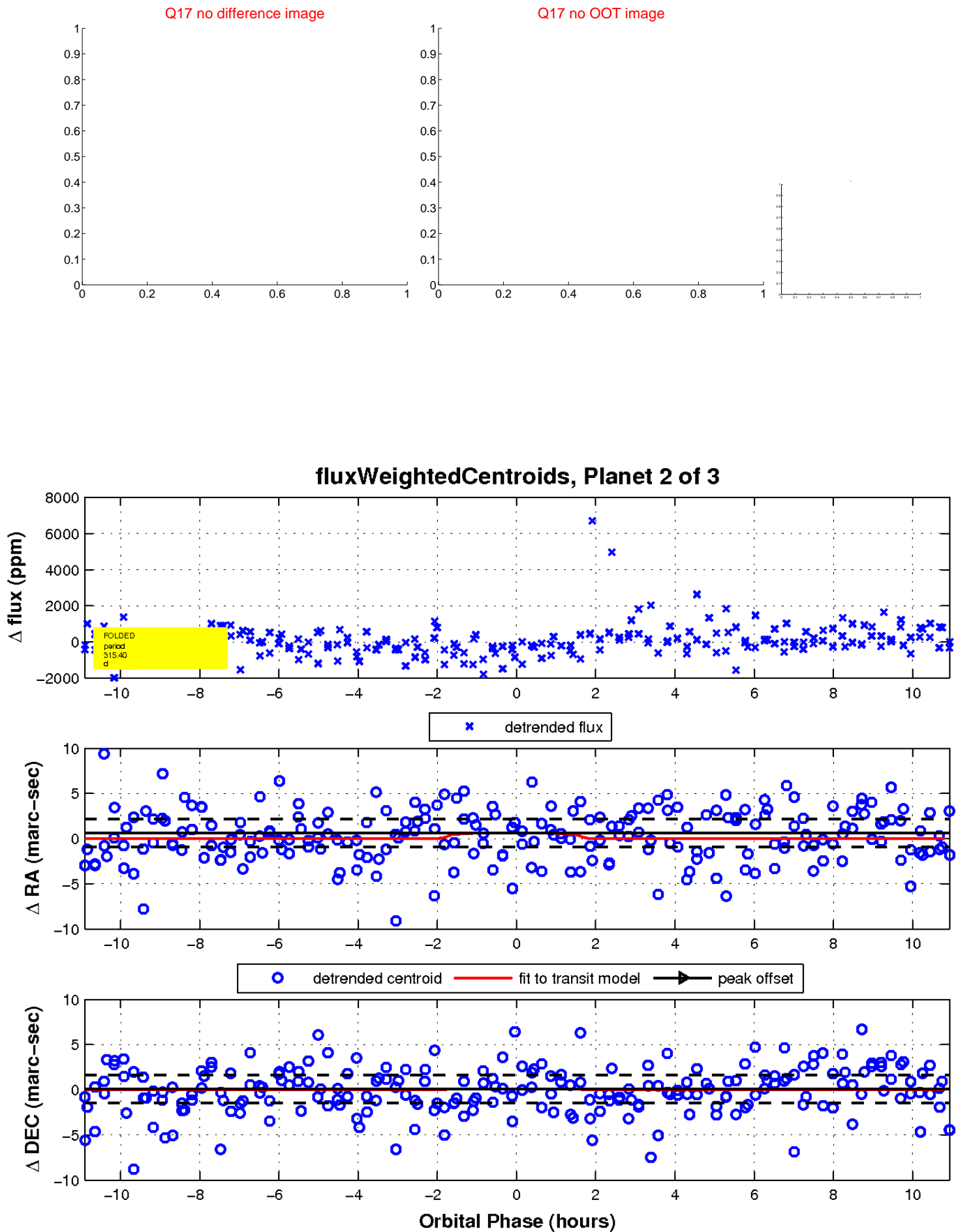
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

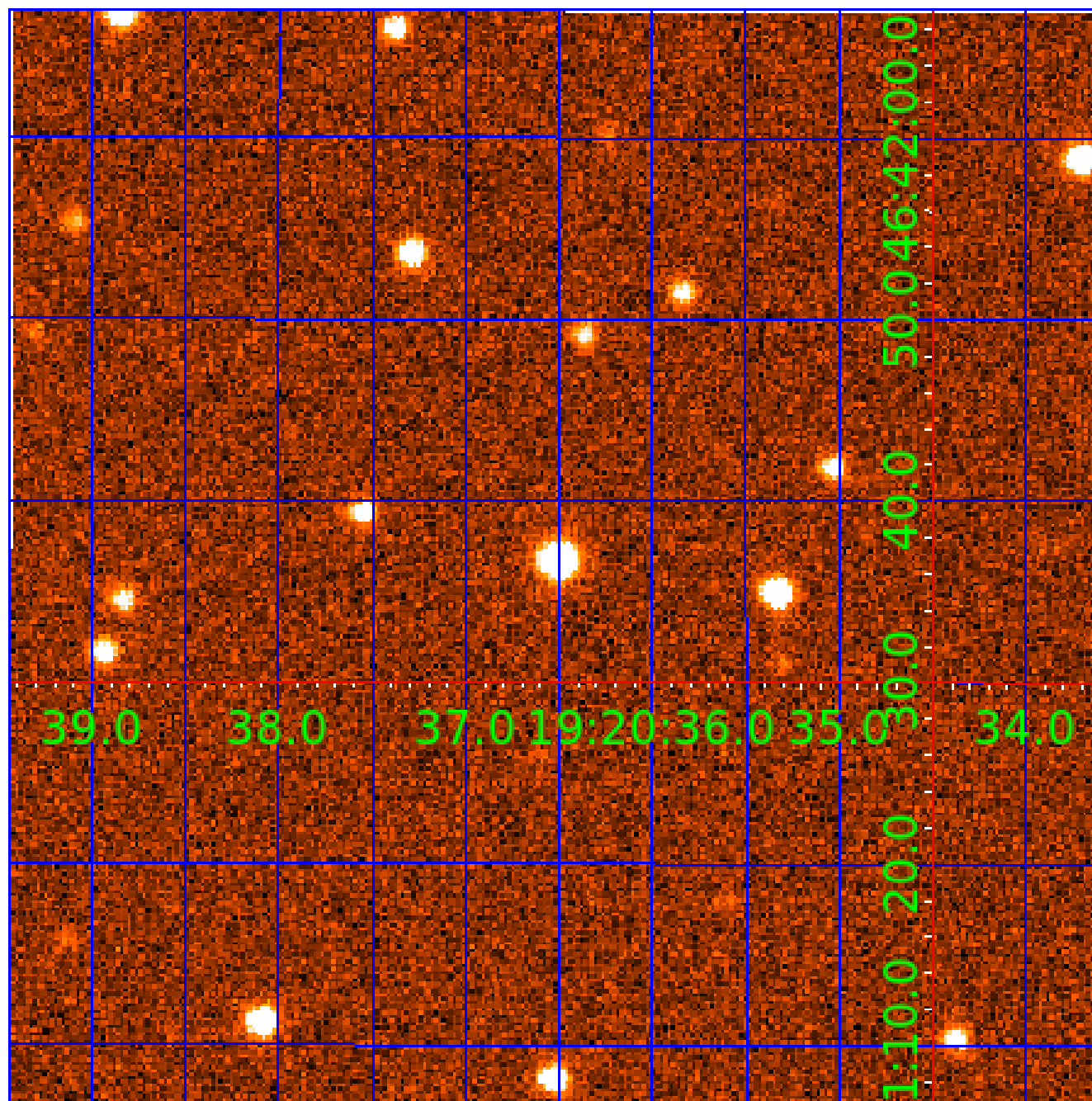


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009827087

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009827087-01 | OBS | No | 520.630147 | 340.627837 | 1256.3 | 6.765 | 10.5 | 7.7 | 0.72 | 5546 | 2.62 | 0.32 |
| 009827087-02 | OBS | No | 315.401323 | 196.800926 | 966.8 | 3.647 | 10.0 | 6.9 | 0.72 | 5546 | 2.41 | 0.63 |
| 009827087-03 | OBS | No | 201.283999 | 330.097650 | 1069.5 | 5.625 | 8.6 | 6.4 | 0.72 | 5546 | 4.58 | 1.14 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009827087-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_POS_DV—INCONSISTENT_TRANS |
| 009827087-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 009827087-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

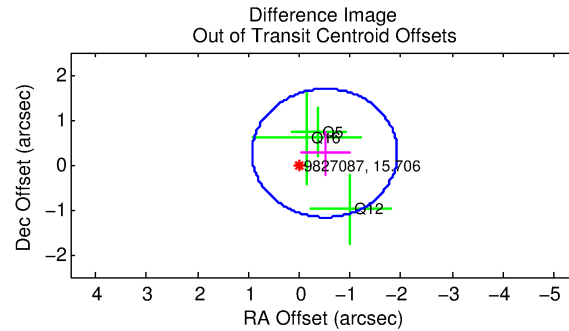
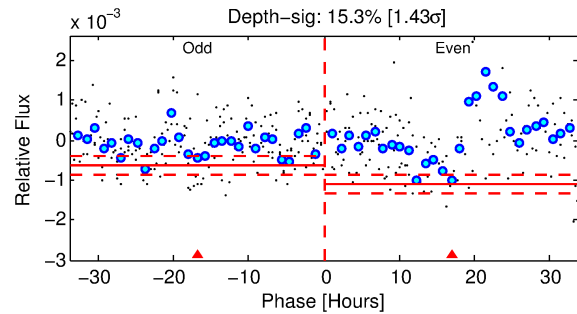
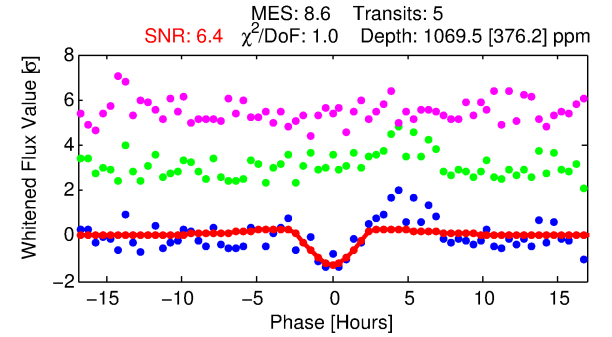
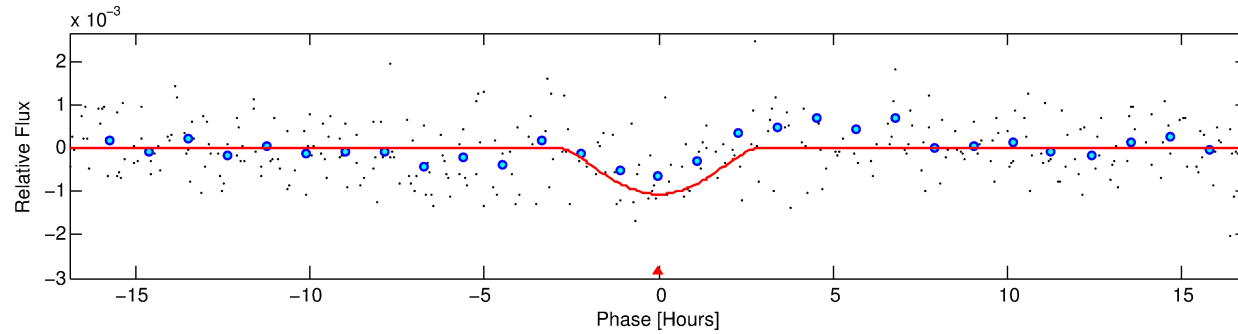
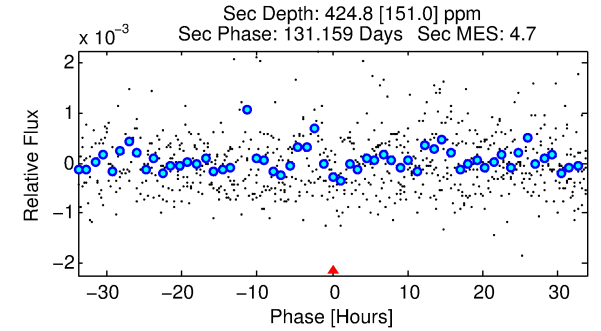
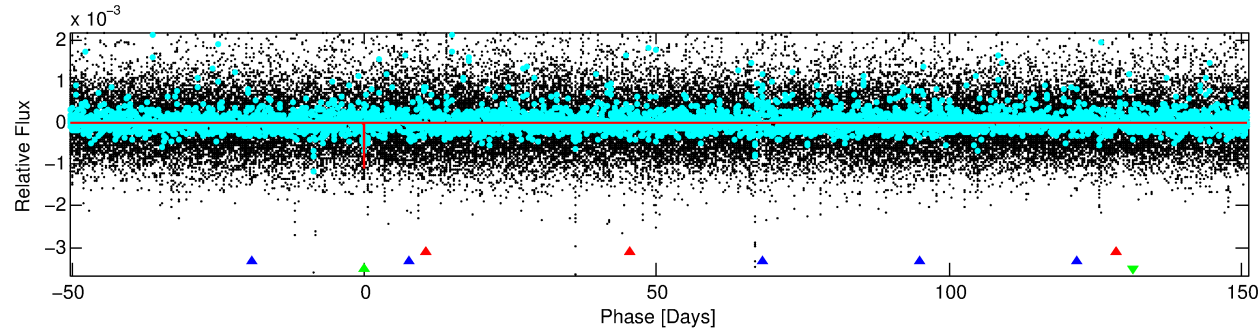
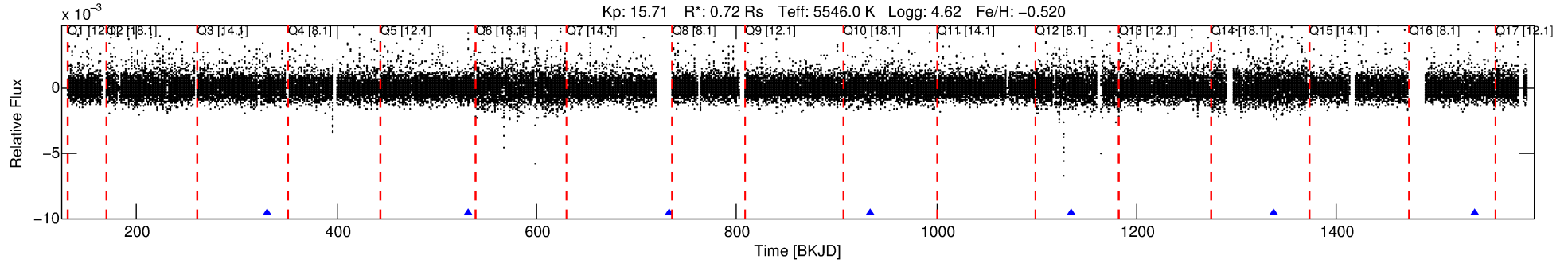
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009827087-03

No Significant Match Found

DV One-Page Summary

KIC: 9827087 Candidate: 3 of 3 Period: 201.284 d



DV Fit Results:

Period = 201.28400 [0.00447] d
Epoch = 330.0976 [0.0148] BKJD
Rp/R* = 0.0582 [0.3349]
a/R* = 94.80 [127.93]
b = 1.00 [0.47]
Seff = 1.14 [0.28]
Teq = 264 [16] K
Rp = 4.58 [26.36] Re
a = 0.6211 [0.0932] AU
Ag = 4293.39 [49404.06] [0.09σ]
Teffp = 3299 [9489] K [0.32σ]

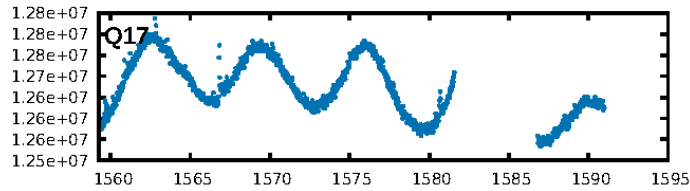
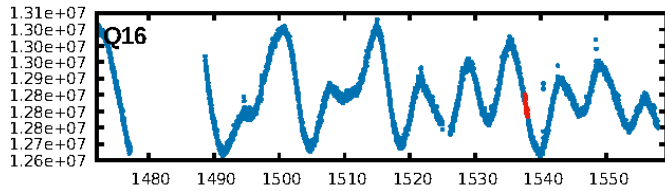
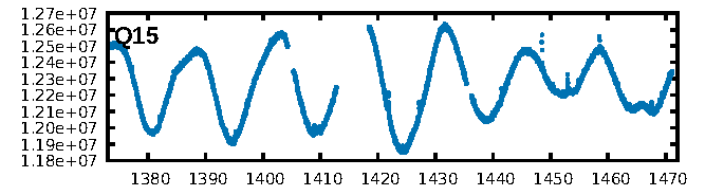
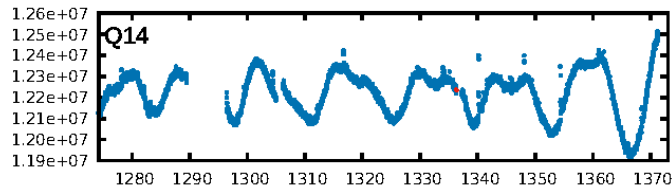
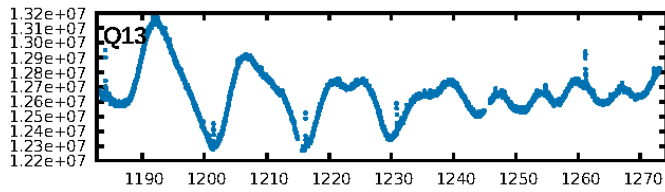
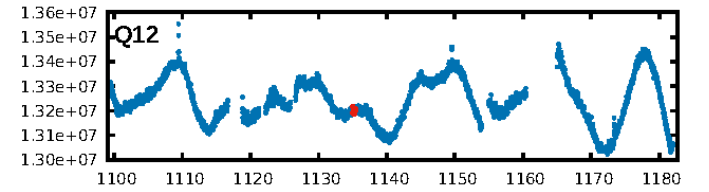
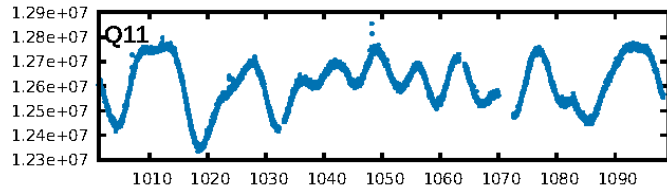
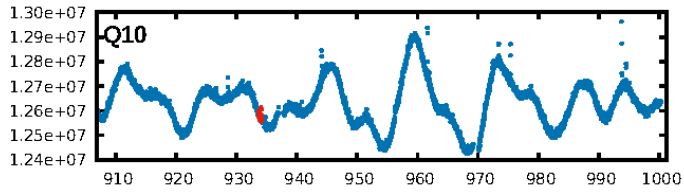
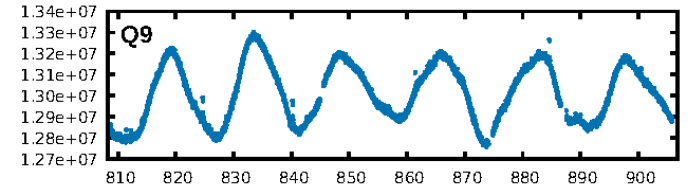
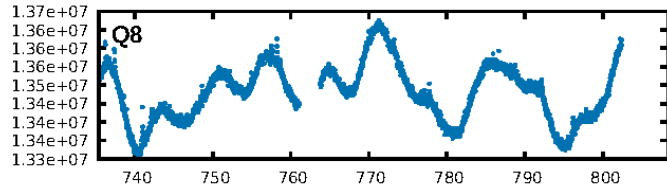
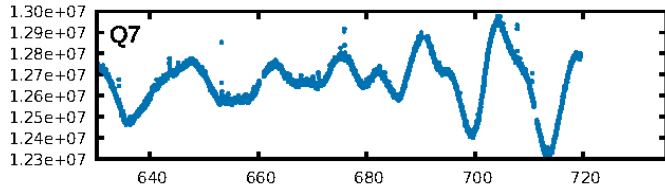
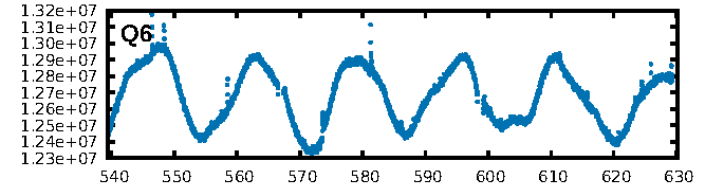
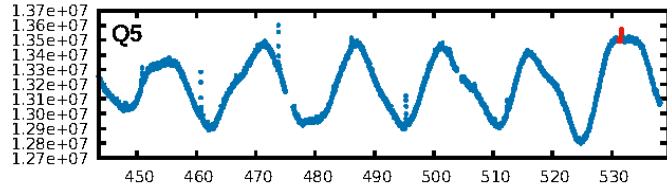
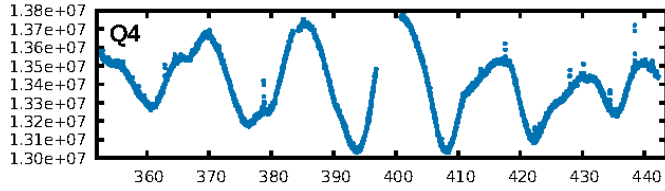
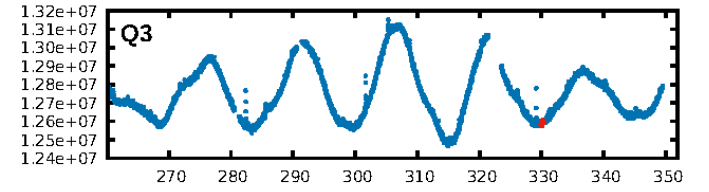
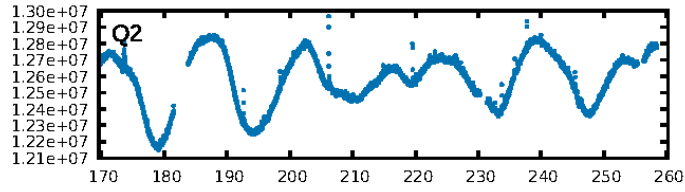
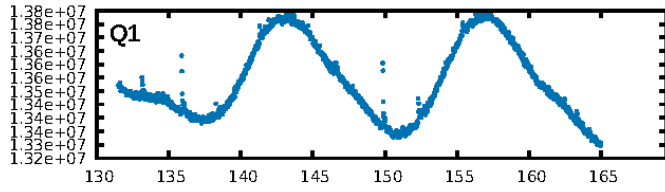
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [408.53σ]
ModelChiSquare2-sig: 62.7%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 3.52e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 10.61
Centroid-sig: 70.8%
Centroid-so: 0.953 arcsec [0.66σ]
OotOffset-rm: 0.565 arcsec [1.19σ]
OotOffset-st: 0/0/2/1 [3]
KicOffset-rm: 0.536 arcsec [1.13σ]
KicOffset-st: 0/0/2/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [5/5]

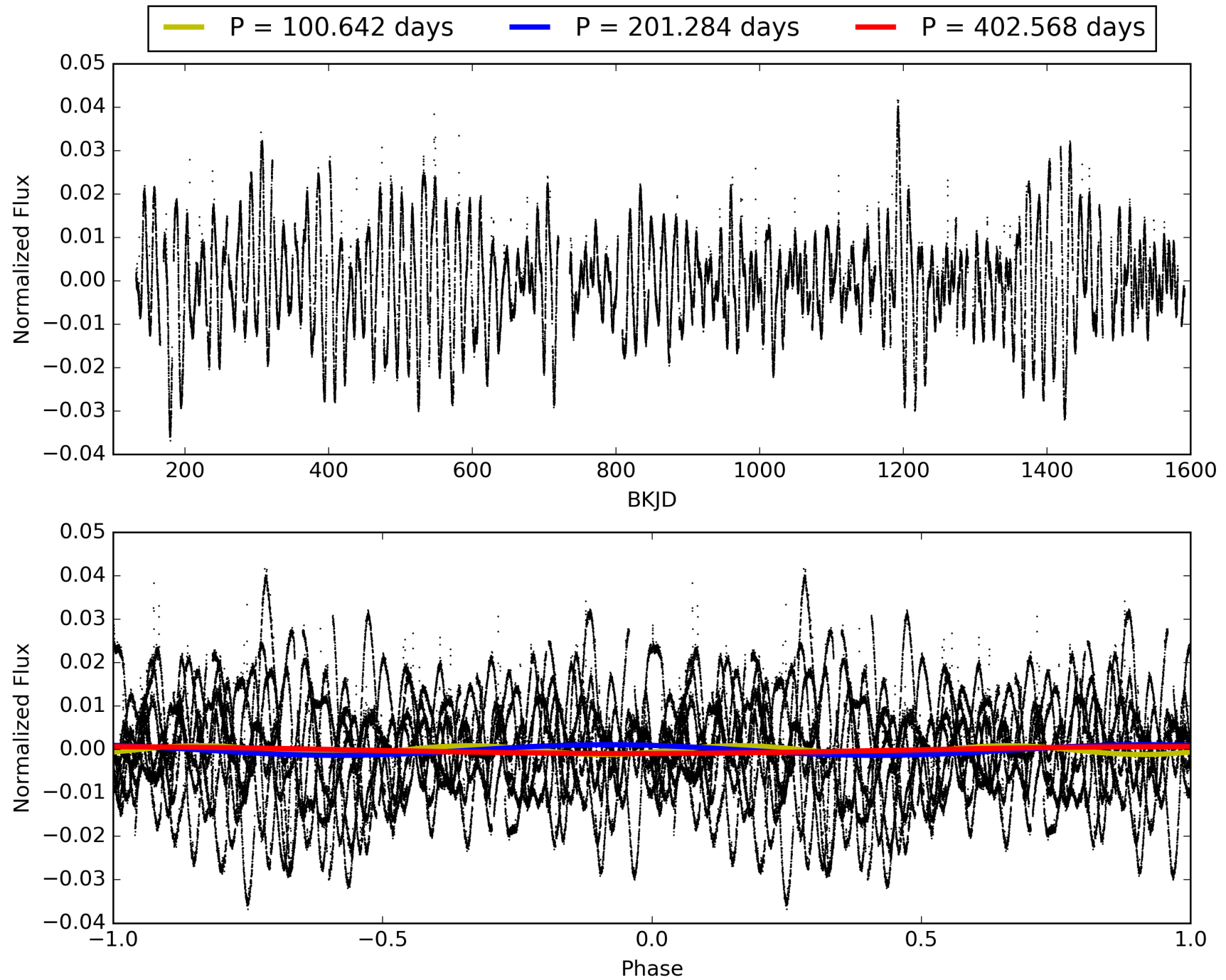
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 17:27:09 Z

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TCE 009827087-03, PDC Light Curves

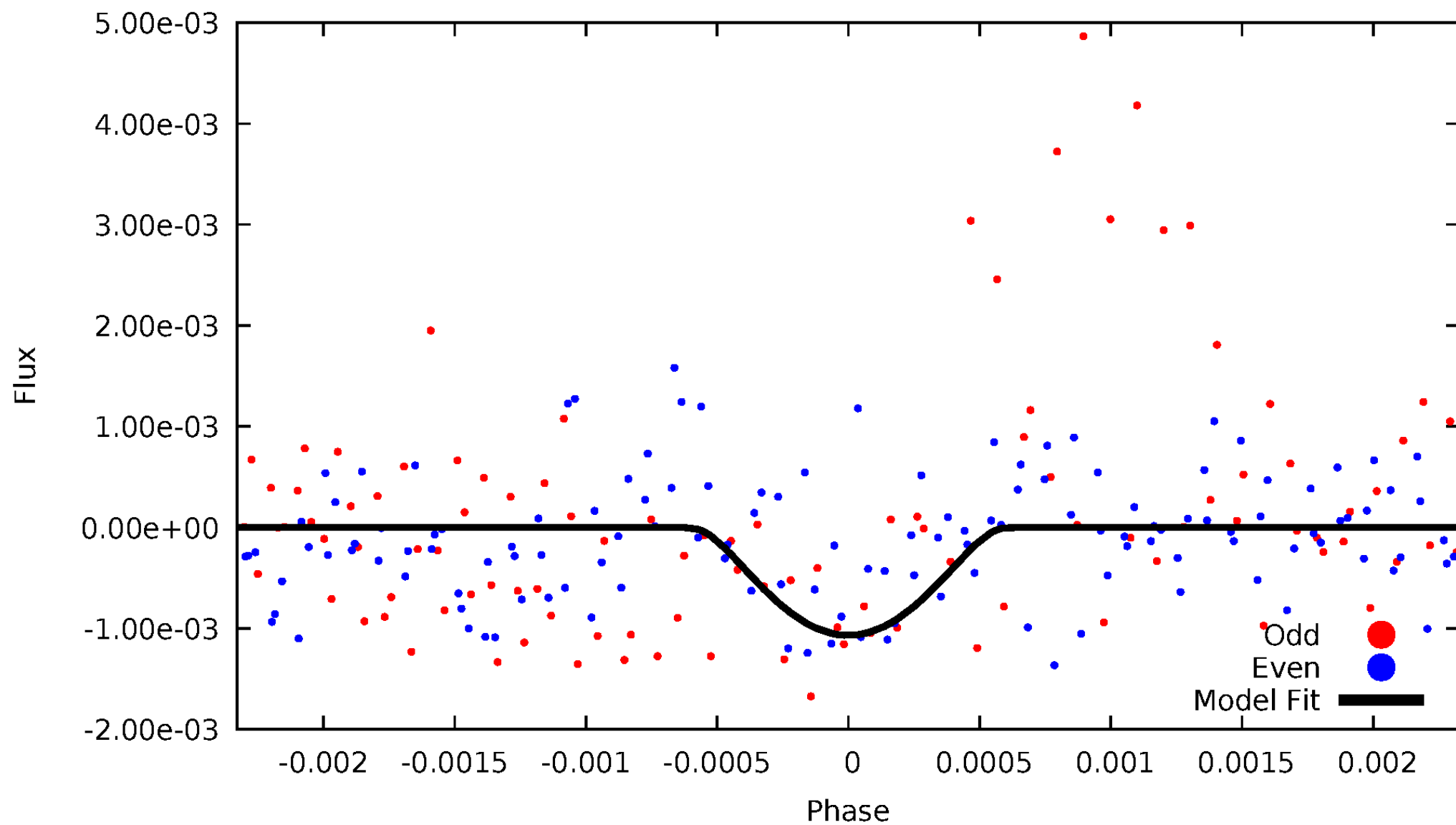


TCE 009827087-03



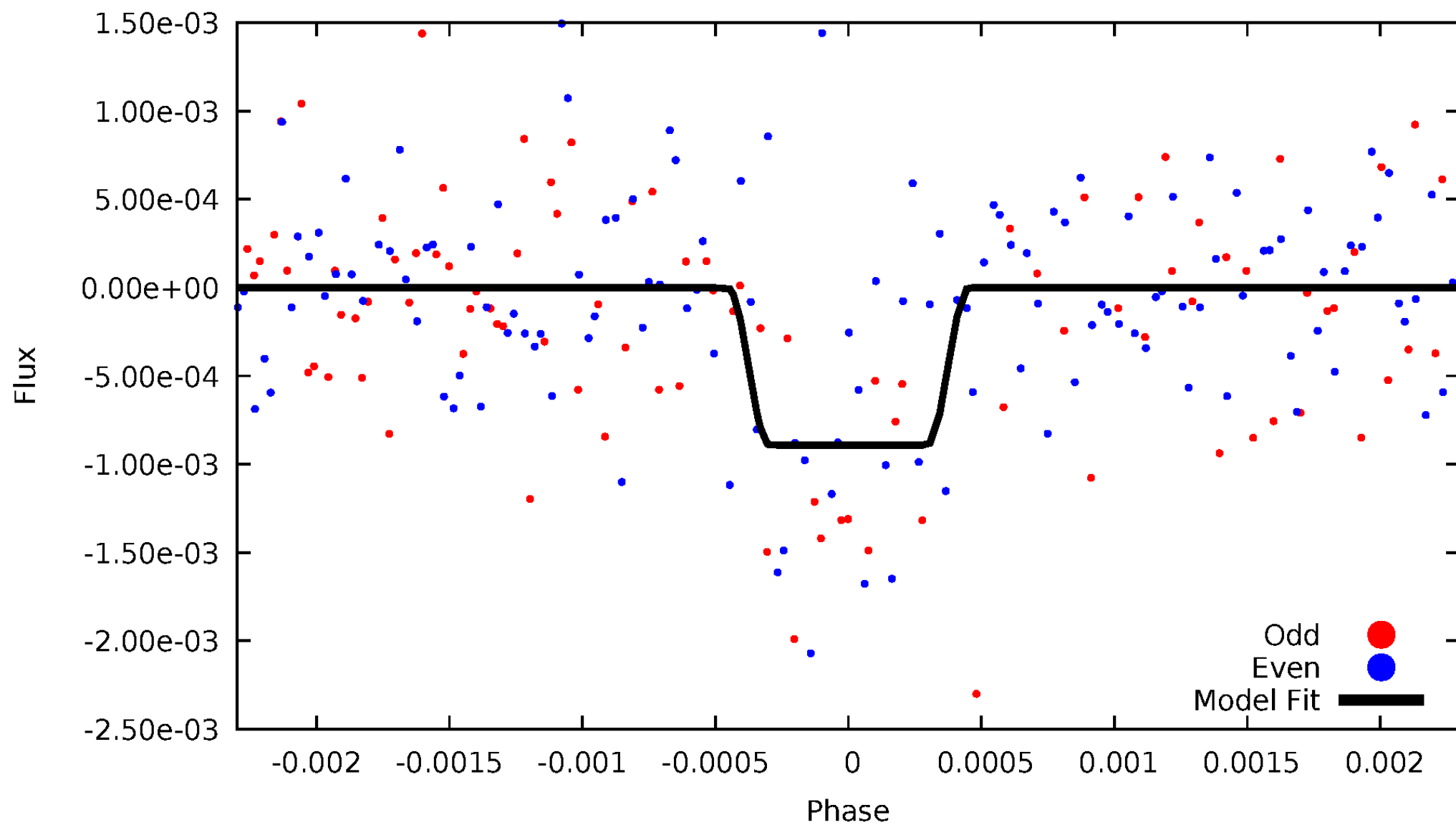
DV Odd/Even

TCE 009827087-03



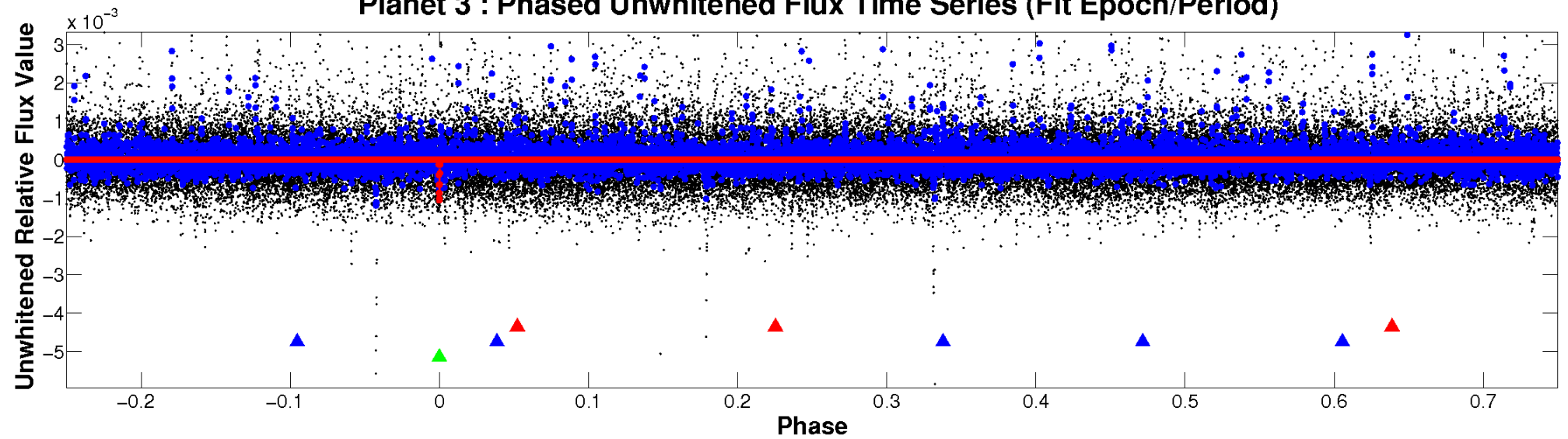
ALT Odd/Even

TCE 009827087-03

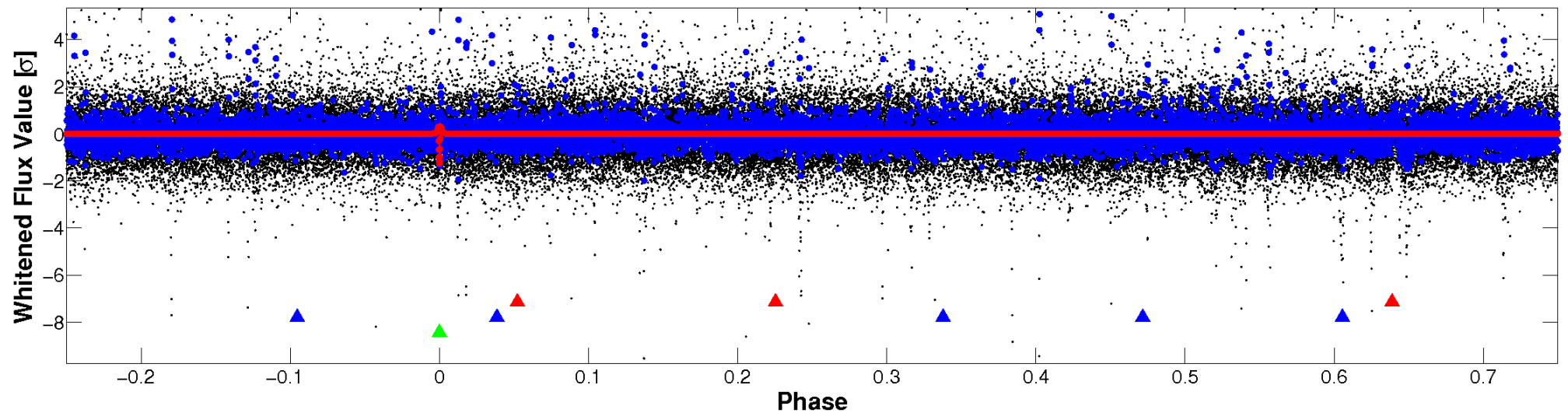


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

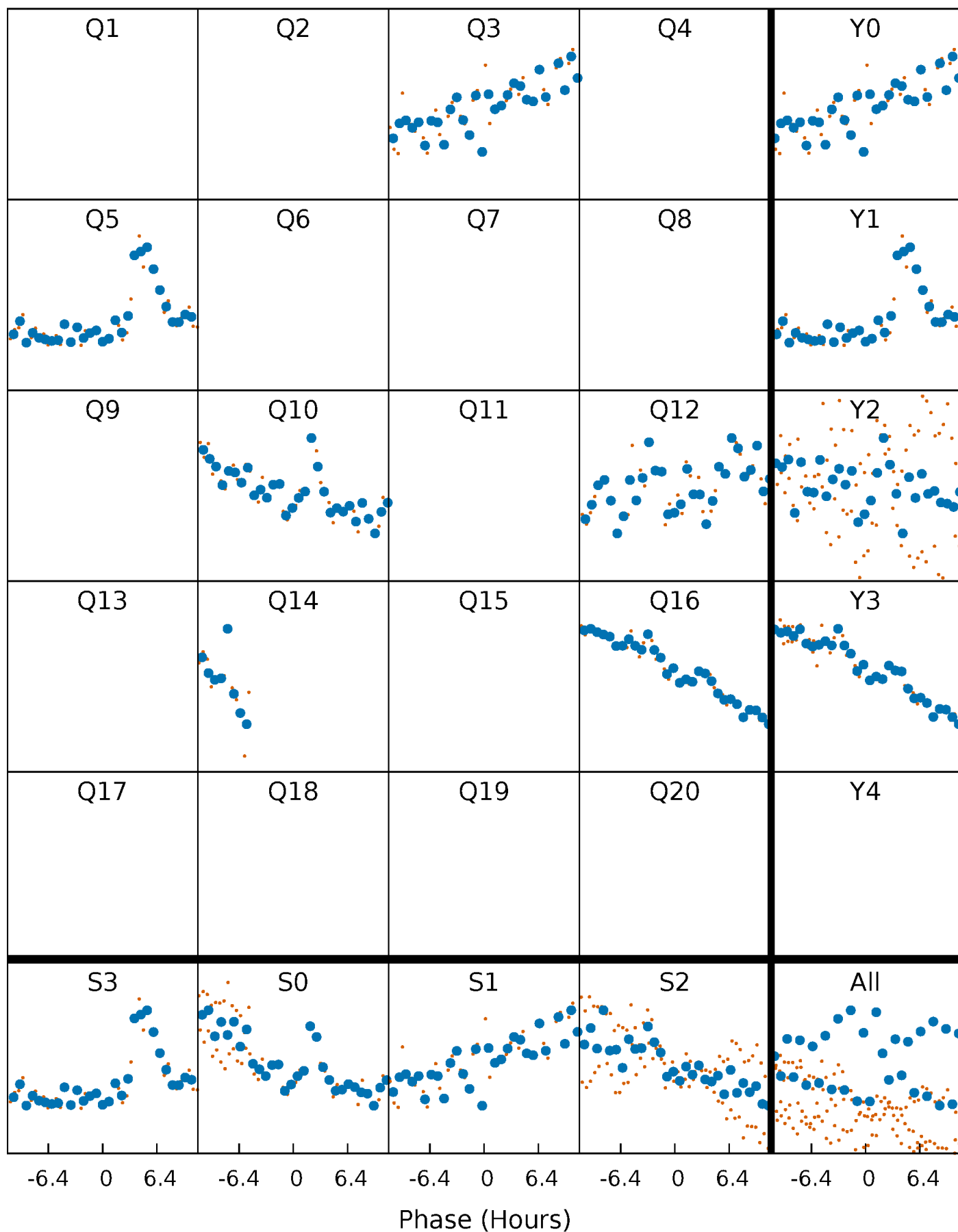


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



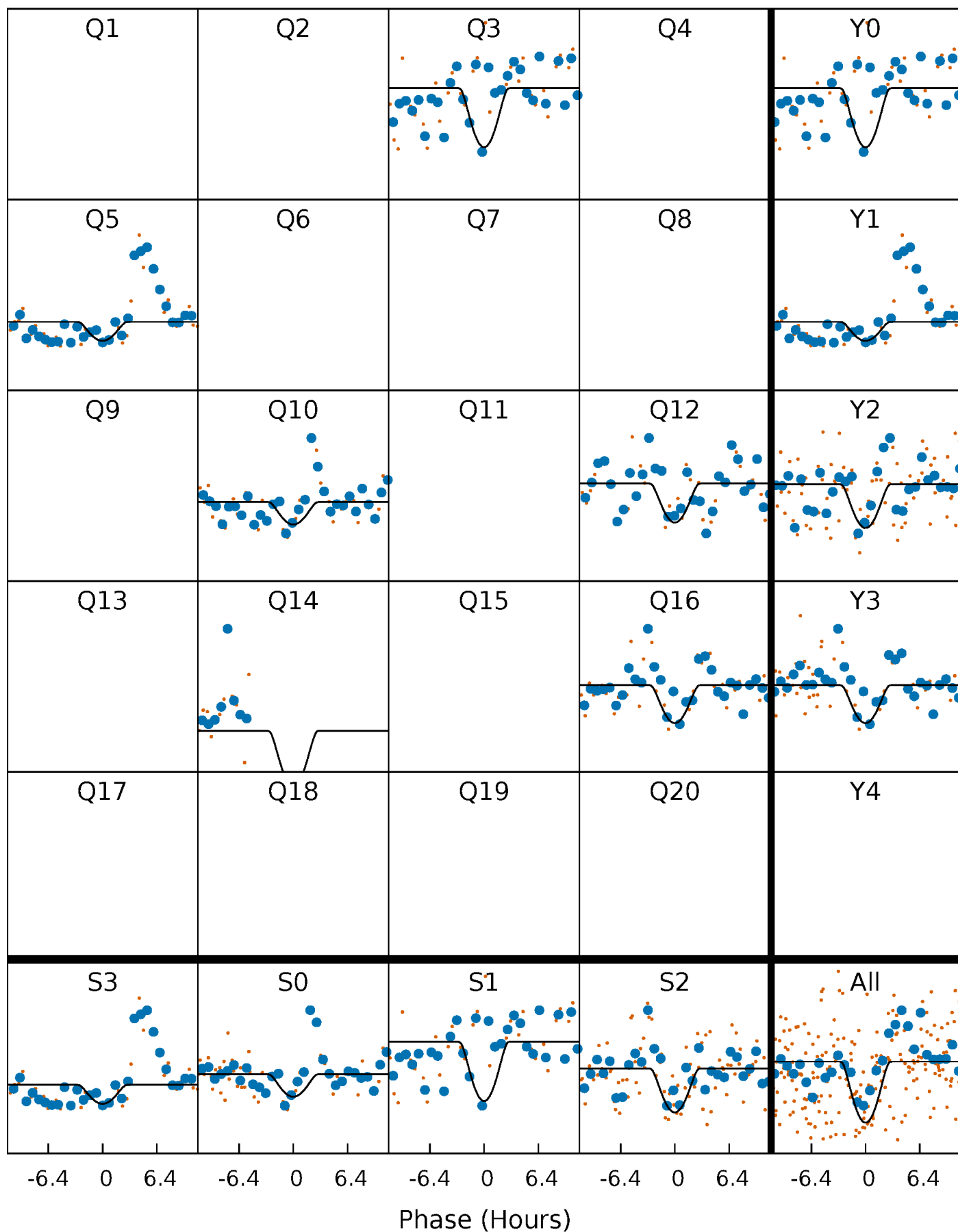
PDC Quarter-Phased Transit Curves

TCE 009827087-03 $P=201.283999$ Days $T_0=330.097650$ (BKJD)



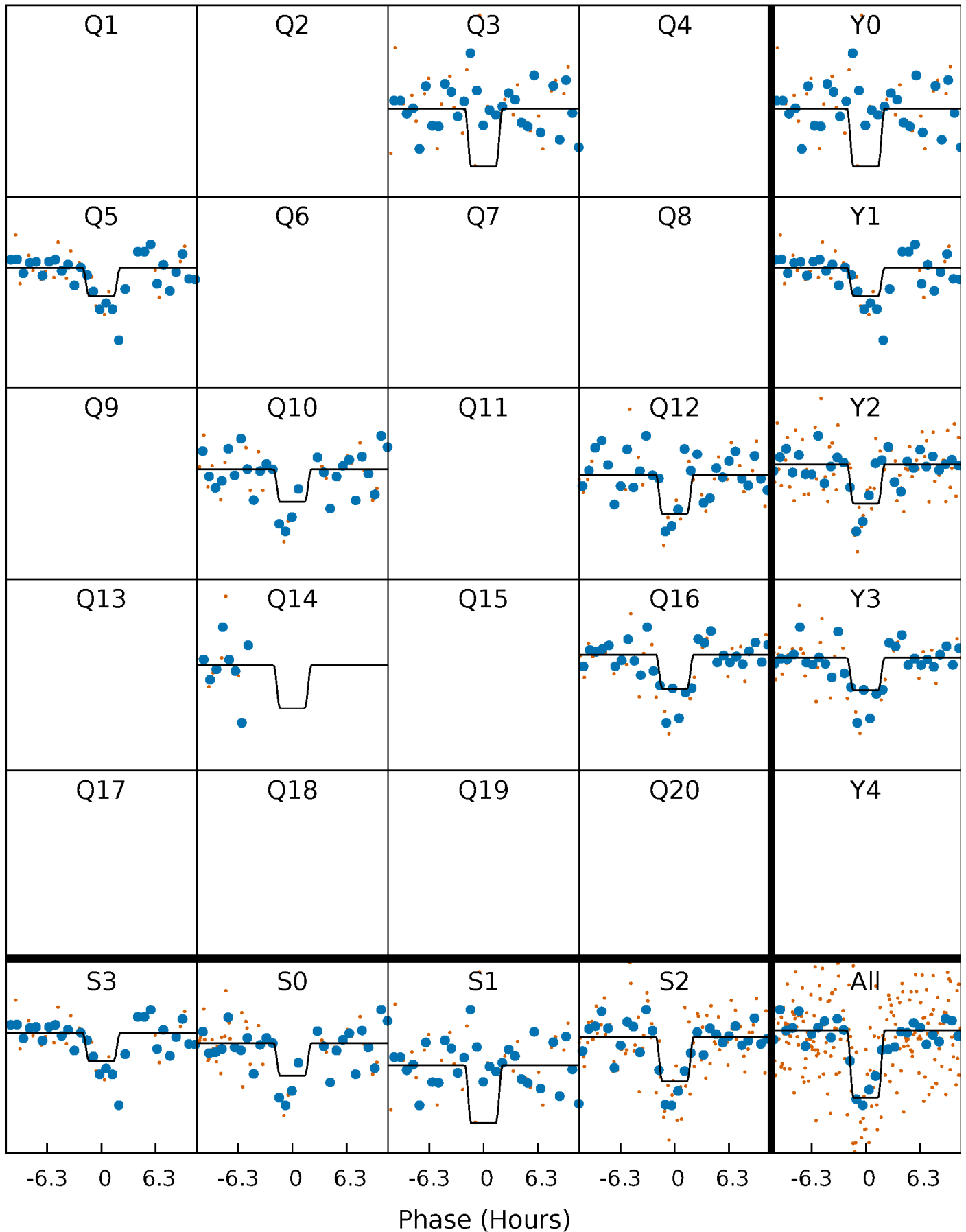
DV Quarter-Phased Transit Curves

TCE 009827087-03 $P=201.283999$ Days $T_0=330.097650$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

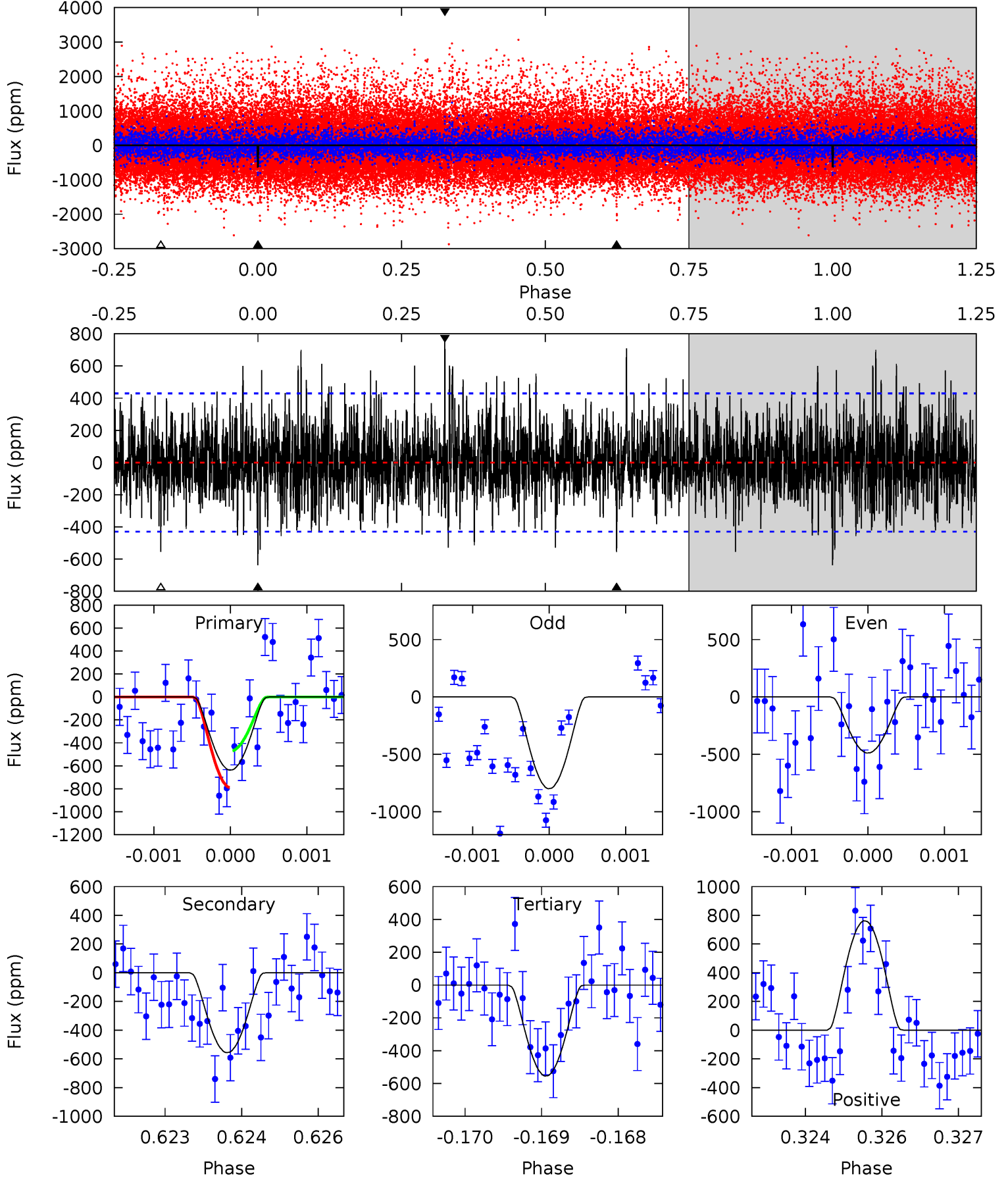
TCE 009827087-03 P=201.278971 Days $T_0=330.125008$ (BKJD)



DV Model-Shift Uniqueness Test

009827087-03, P = 201.283999 Days, E = 128.813651 Days

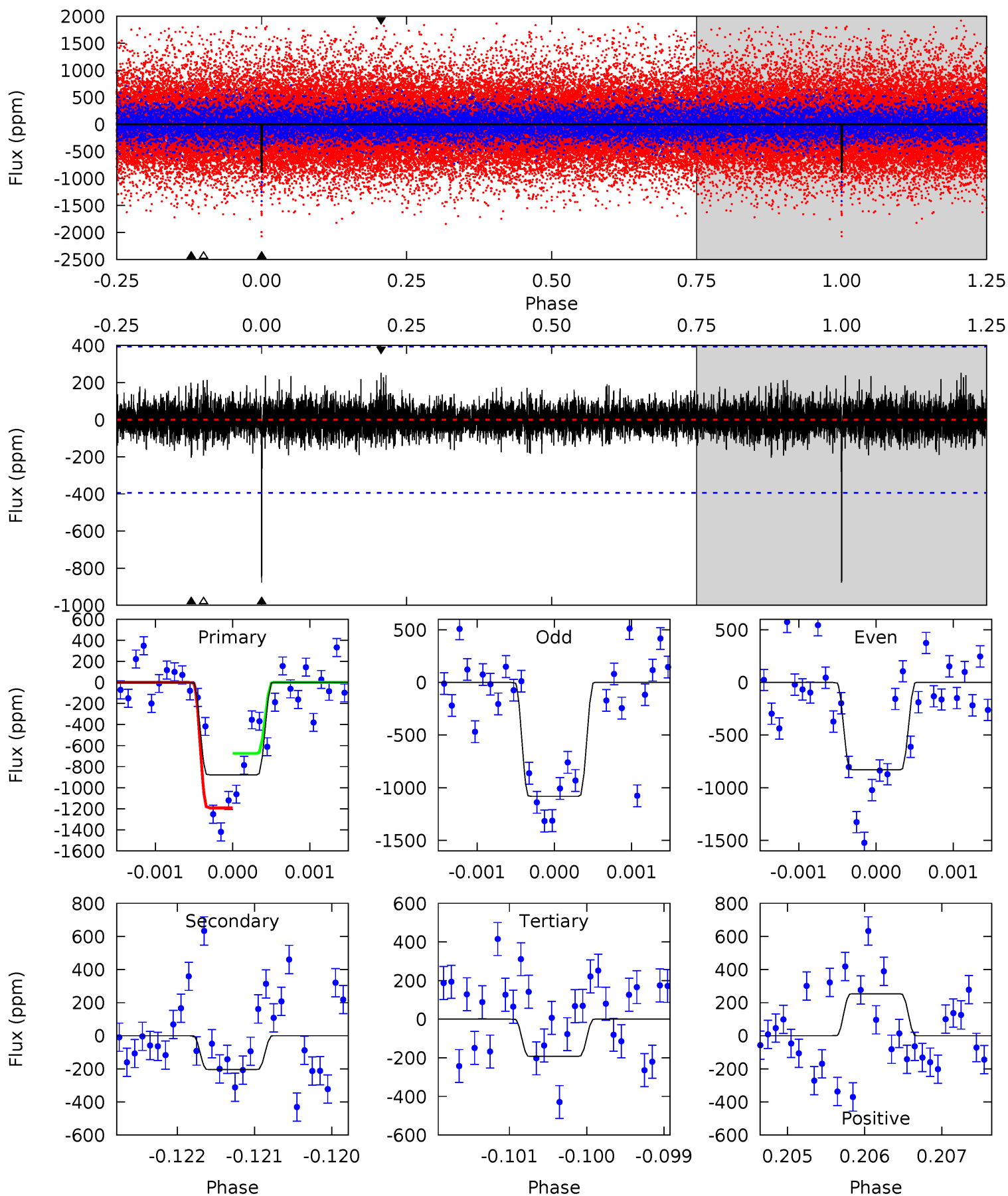
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.03 | 7.01 | 6.98 | 9.59 | 5.41 | 3.22 | 2.06 | 1.05 | -1.57 | 0.02 | -2.59 | 1.90 | 0.89 | 0.54 | 2.02 |



Alt Model-Shift Uniqueness Test

009827087-03, P = 201.278971 Days, E = 128.846037 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.2 | 2.83 | 2.67 | 3.51 | 5.47 | 3.32 | 0.75 | 9.50 | 8.66 | 0.16 | -0.68 | 1.69 | 0.85 | 0.22 | 3.55 |



Stellar Parameters For KIC 009827087

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5546^{+166}_{-166} | $4.619^{+0.037}_{-0.112}$ | $-0.520^{+0.300}_{-0.300}$ | $0.721^{+0.133}_{-0.053}$ | $0.791^{+0.085}_{-0.077}$ | $2.969^{+0.474}_{-1.006}$ |
| | +3%/-3% | +1%/-2% | +58%/-58% | +18%/-7% | +11%/-10% | +16%/-34% |
| 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 009827087-03 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|---------------------------|----------------------|----------------------|----------------------|
| DV | -556 ± 79 | $20.38^{+21.95}_{-13.89}$ | 374^{+17}_{-14} | 2535^{+942}_{-403} | 285^{+2296}_{-219} |
| Alt. | -204 ± 72 | $18.64^{+22.24}_{-12.80}$ | 373^{+17}_{-15} | 2278^{+800}_{-351} | 120^{+1070}_{-97} |

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

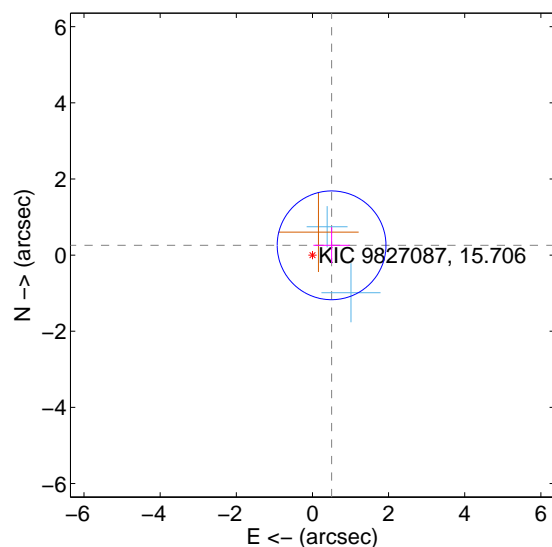
Supplemental centroid analysis for 009827087-03. Kepler magnitude: 15.71. Transit SNR 6.36

There are 2 quarters with good PRF difference image offsets

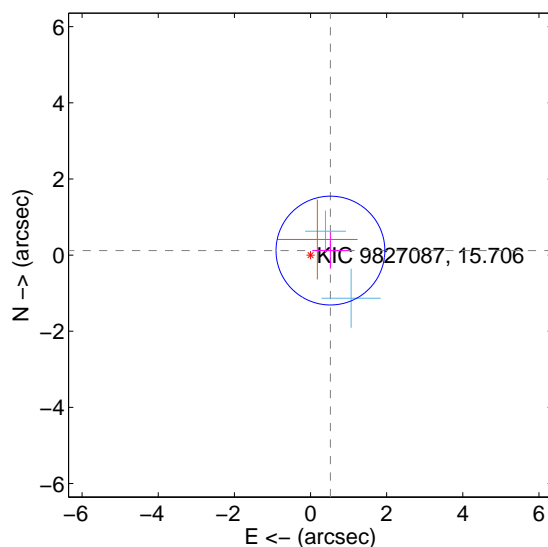
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.565 ± 0.476 | 1.19 | -0.503 ± 0.476 | 0.257 ± 0.475 |
| PRF-fit source offset from KIC position | 0.536 ± 0.476 | 1.13 | -0.523 ± 0.476 | 0.119 ± 0.475 |
| photometric centroid source offset | 0.95 ± 1.45 | 0.66 | 0.95 ± 1.45 | 0.04 ± 1.43 |

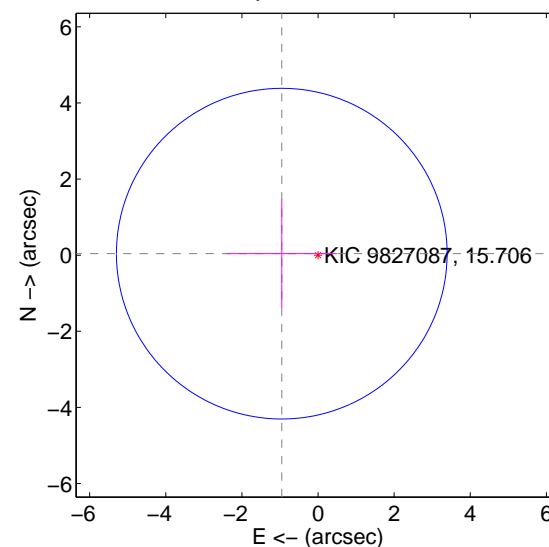
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

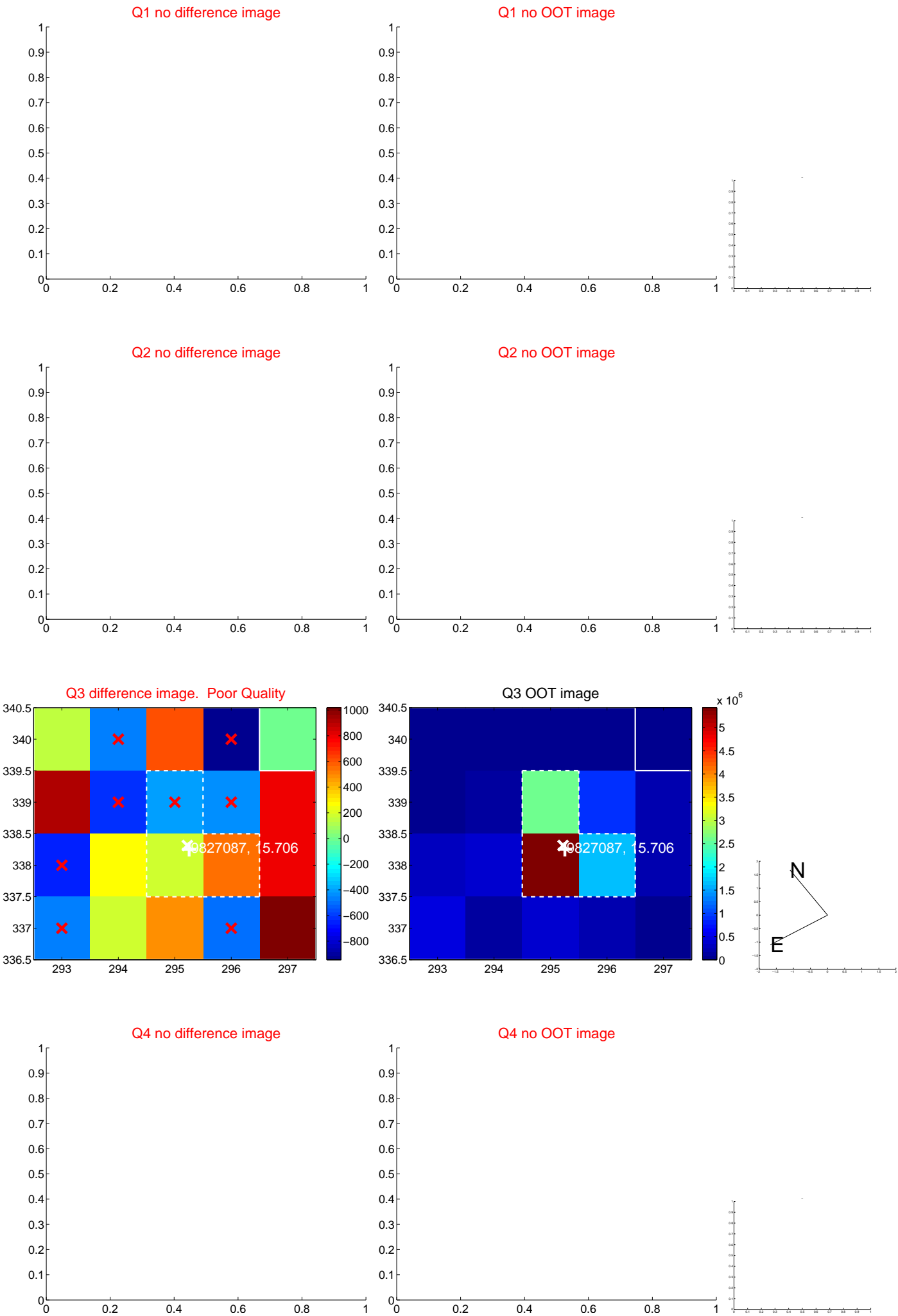


offset from photometric centroids

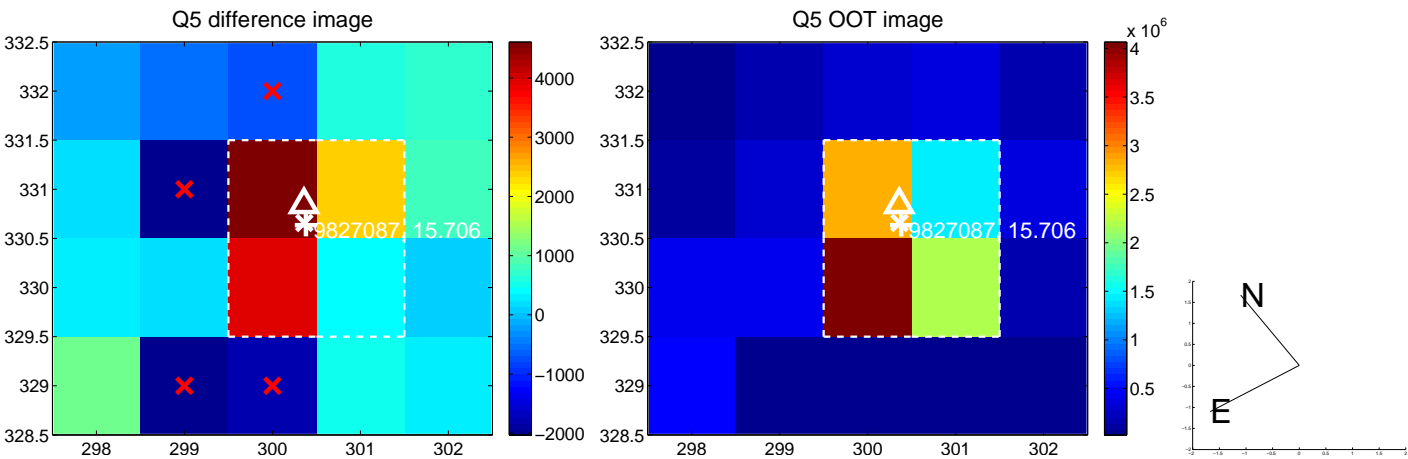


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

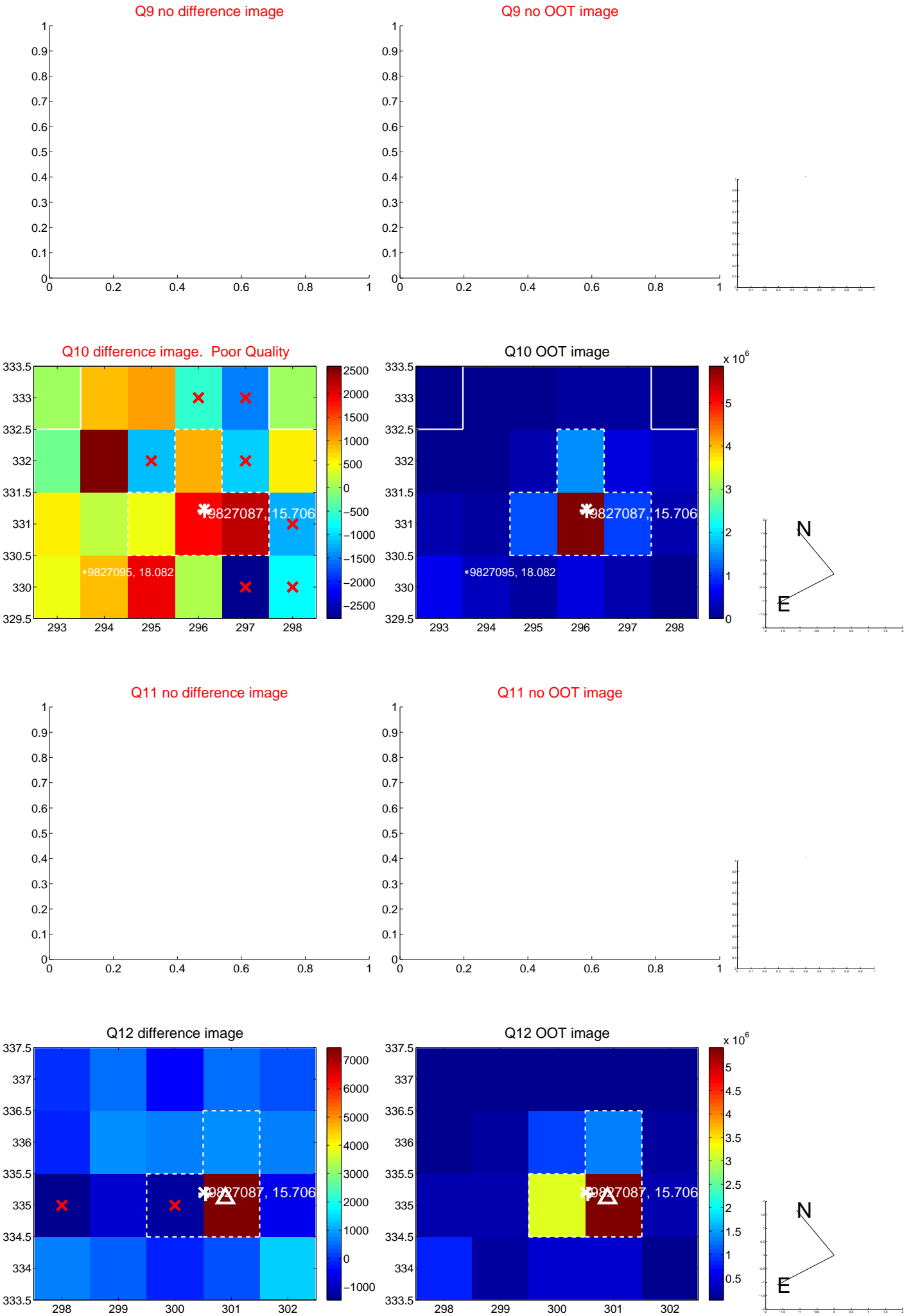
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



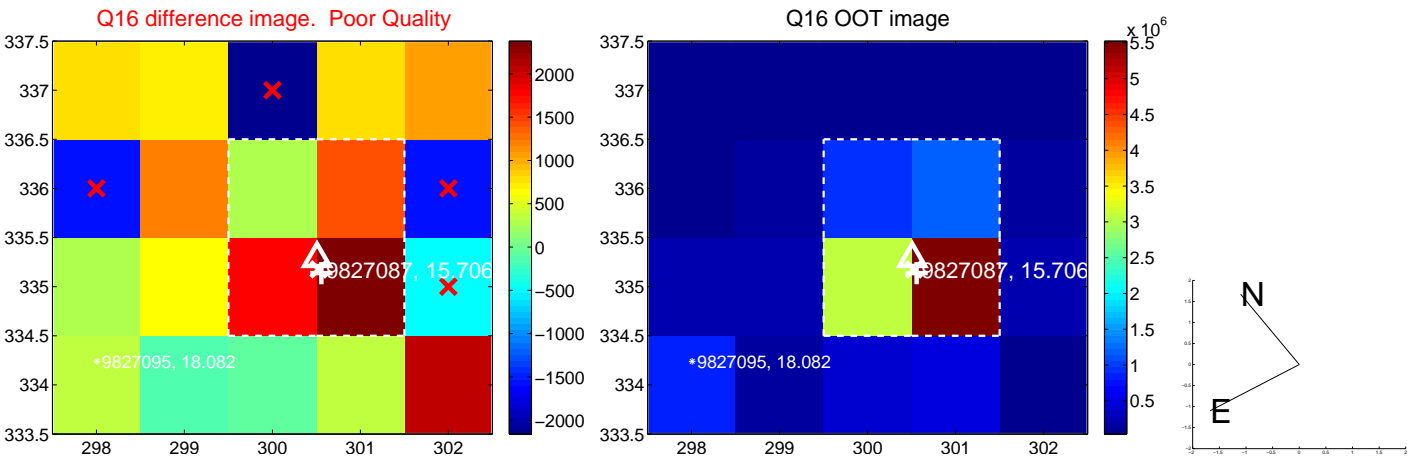
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



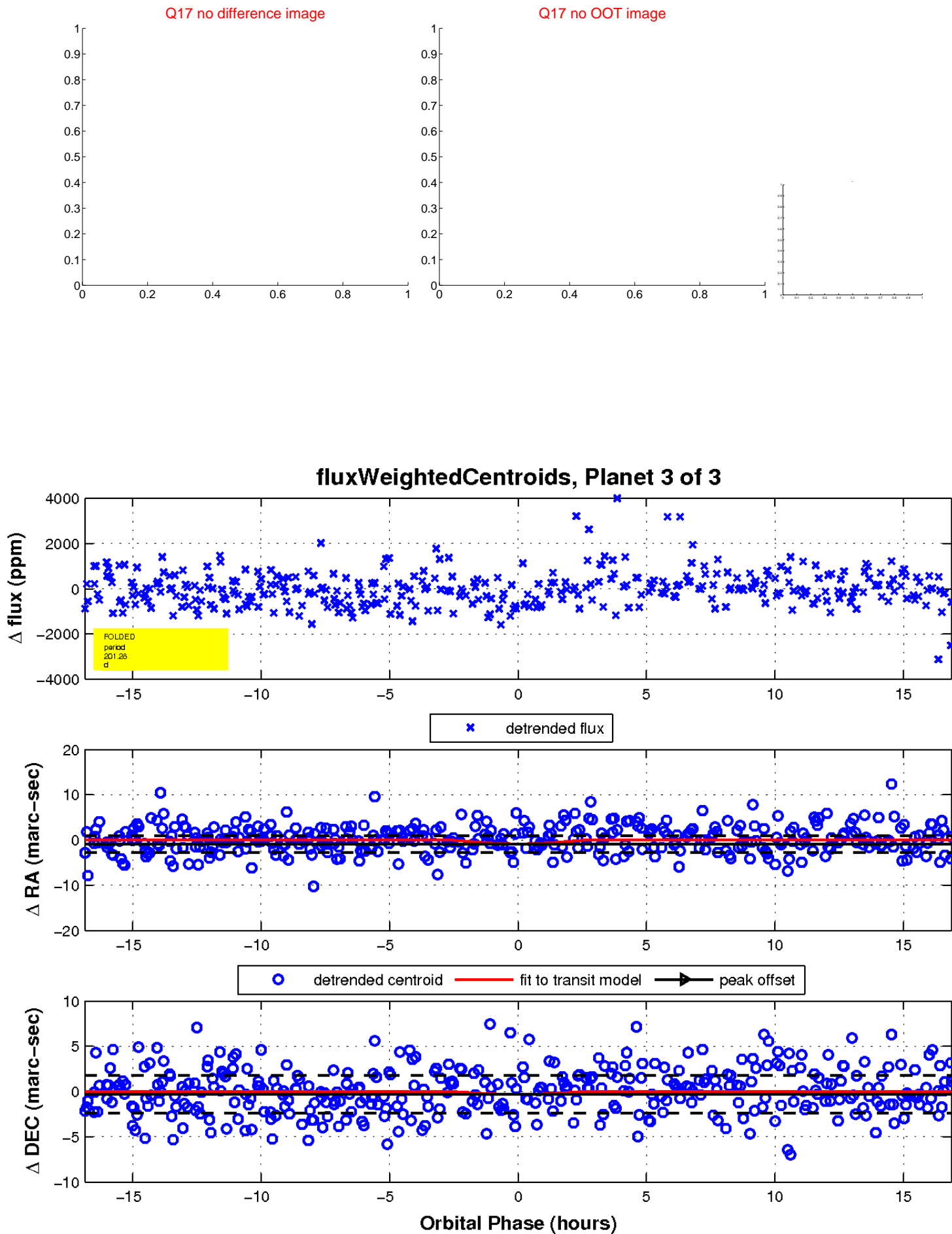
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

