

KIC 009171954

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009171954-01 | OBS | No | 0.554746 | 131.637783 | 330.0 | 1.733 | 17.3 | 17.6 | 3.63 | 7694 | 7.68 | 0.00 |
| 009171954-02 | OBS | No | 0.554743 | 131.915668 | 355.2 | 1.320 | 17.7 | 19.5 | 3.63 | 7694 | 6.98 | 0.00 |
| 009171954-03 | OBS | No | 1.693989 | 131.824728 | 836.4 | 3.471 | 11.7 | 13.9 | 3.63 | 7694 | 12.22 | 33061.37 |
| 009171954-04 | OBS | No | 0.846969 | 131.609952 | 220.6 | 2.500 | 9.5 | -1.0 | 3.63 | 7694 | 5.45 | 83312.72 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009171954-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD |
| 009171954-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS |

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

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

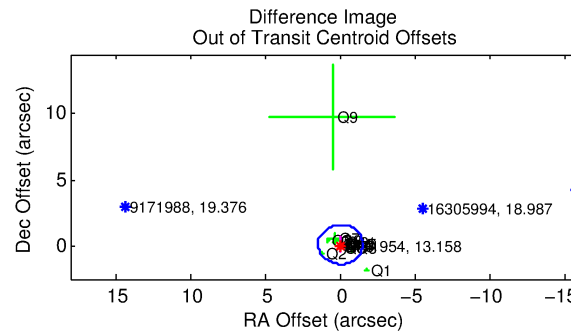
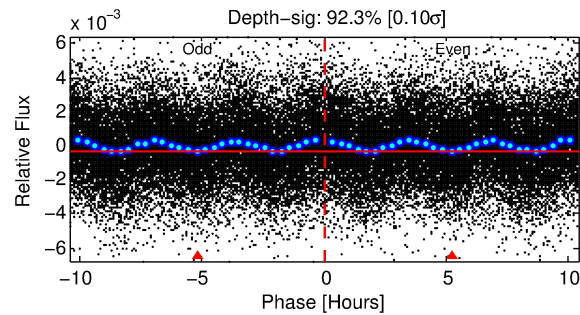
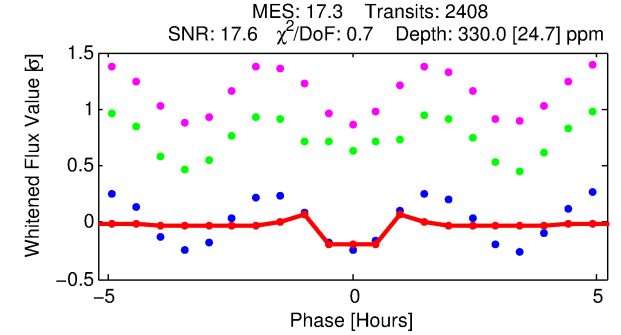
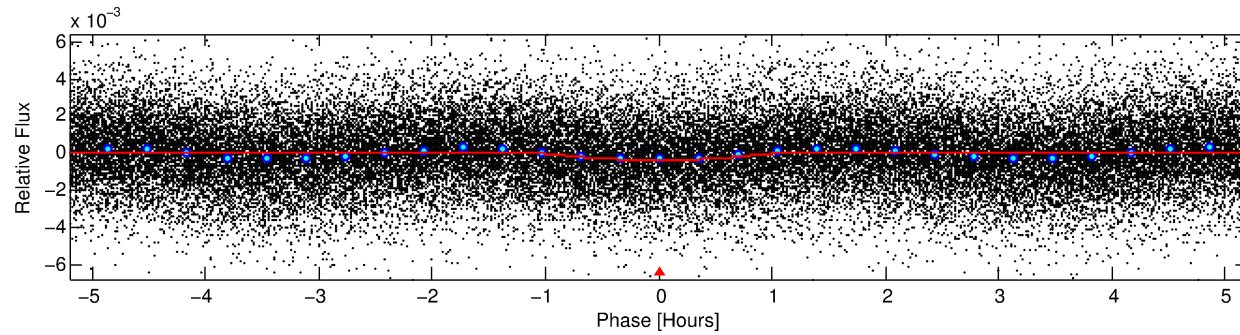
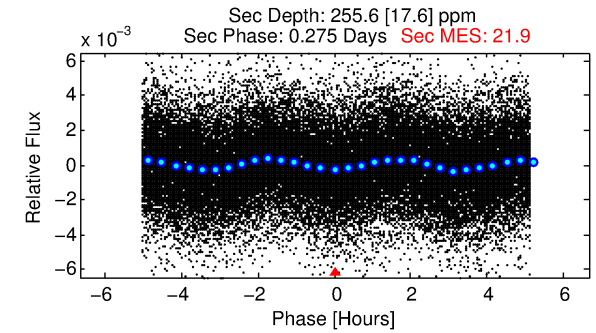
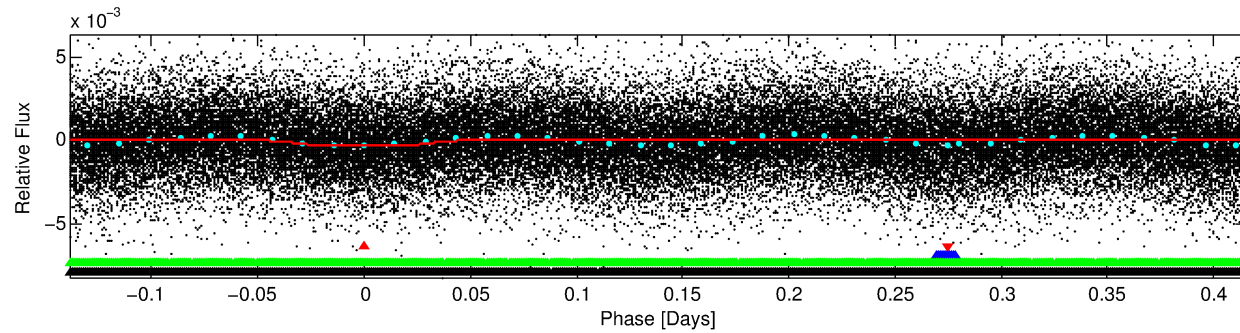
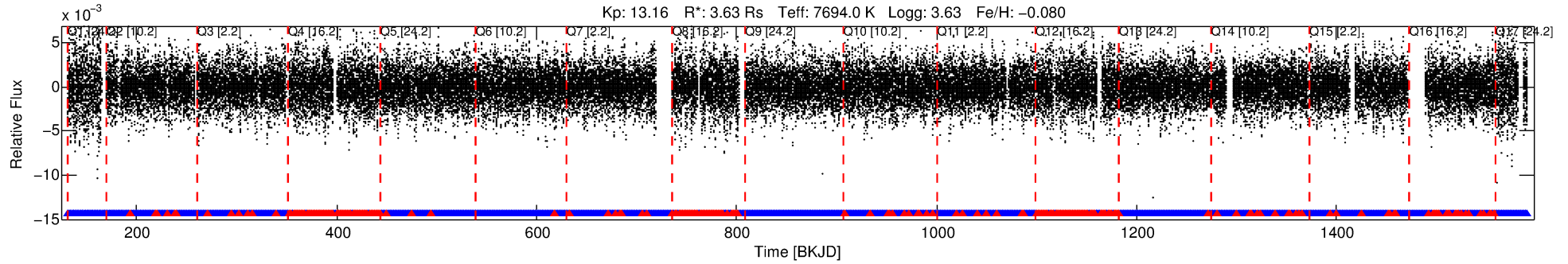
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009171954-01

No Significant Match Found

DV One-Page Summary

KIC: 9171954 Candidate: 1 of 4 Period: 0.555 d



DV Fit Results:

Period = 0.55475 [0.00001] d
Epoch = 131.6378 [0.0007] BKJD
Rp/R* = 0.0194 [0.0024]
a/R* = 1.50 [0.57]
b = 0.90 [0.15]
S_{eff} = N/A
Teq = N/A
Rp = 7.68 [4.02] Re
a = N/A
Ag = N/A
Teffp = N/A

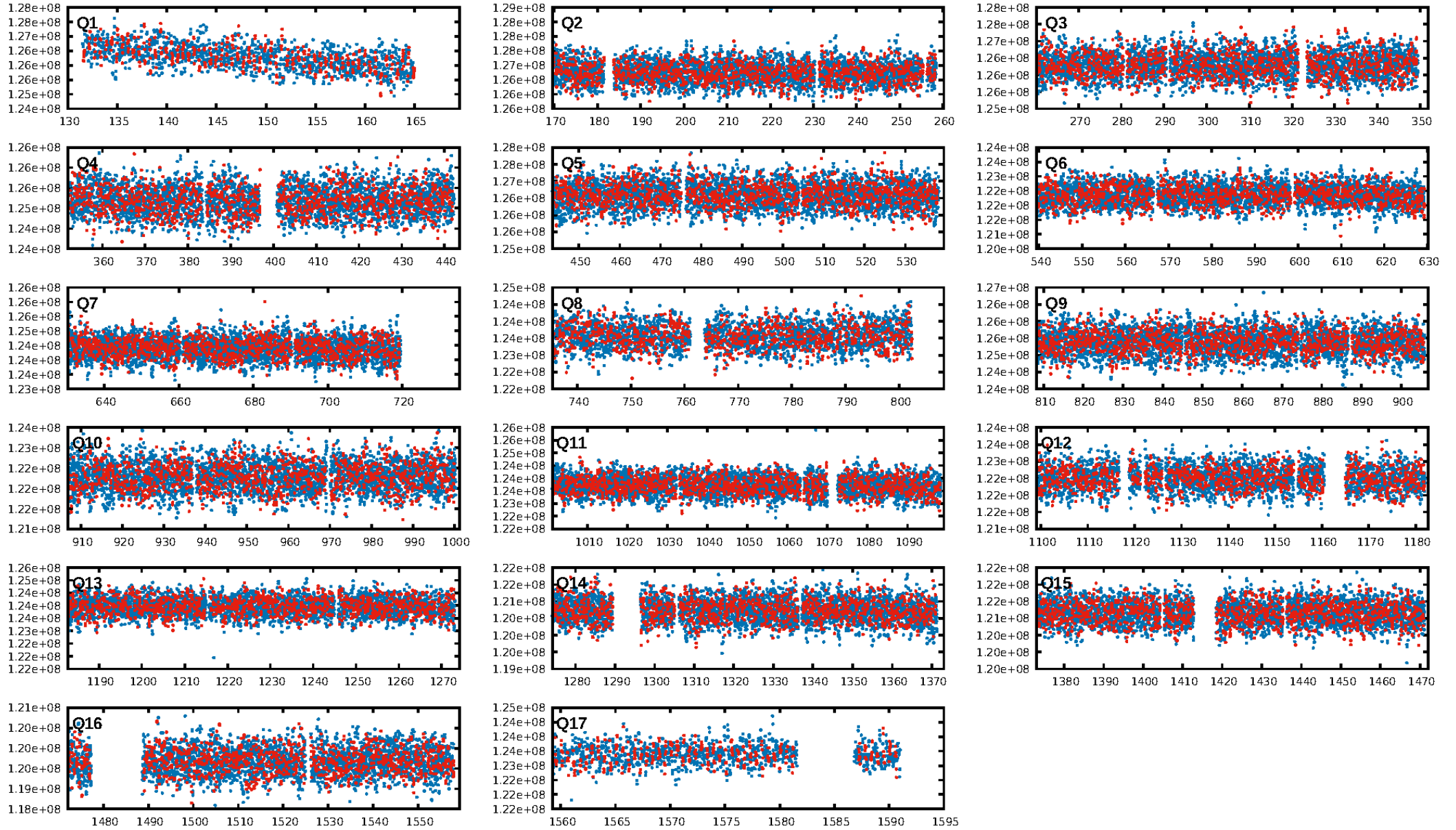
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 97.9% [2.31σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.86 [1969/2300]
GhostDiagnostic-chr: 1.527
Centroid-sig: 0.0%
Centroid-so: 0.419 arcsec [4.55σ]
OotOffset-rm: 0.114 arcsec [0.23σ]
KicOffset-rm: 0.066 arcsec [0.26σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.76 [13/17]
DiffImageOverlap-fno: 1.00 [17/17]

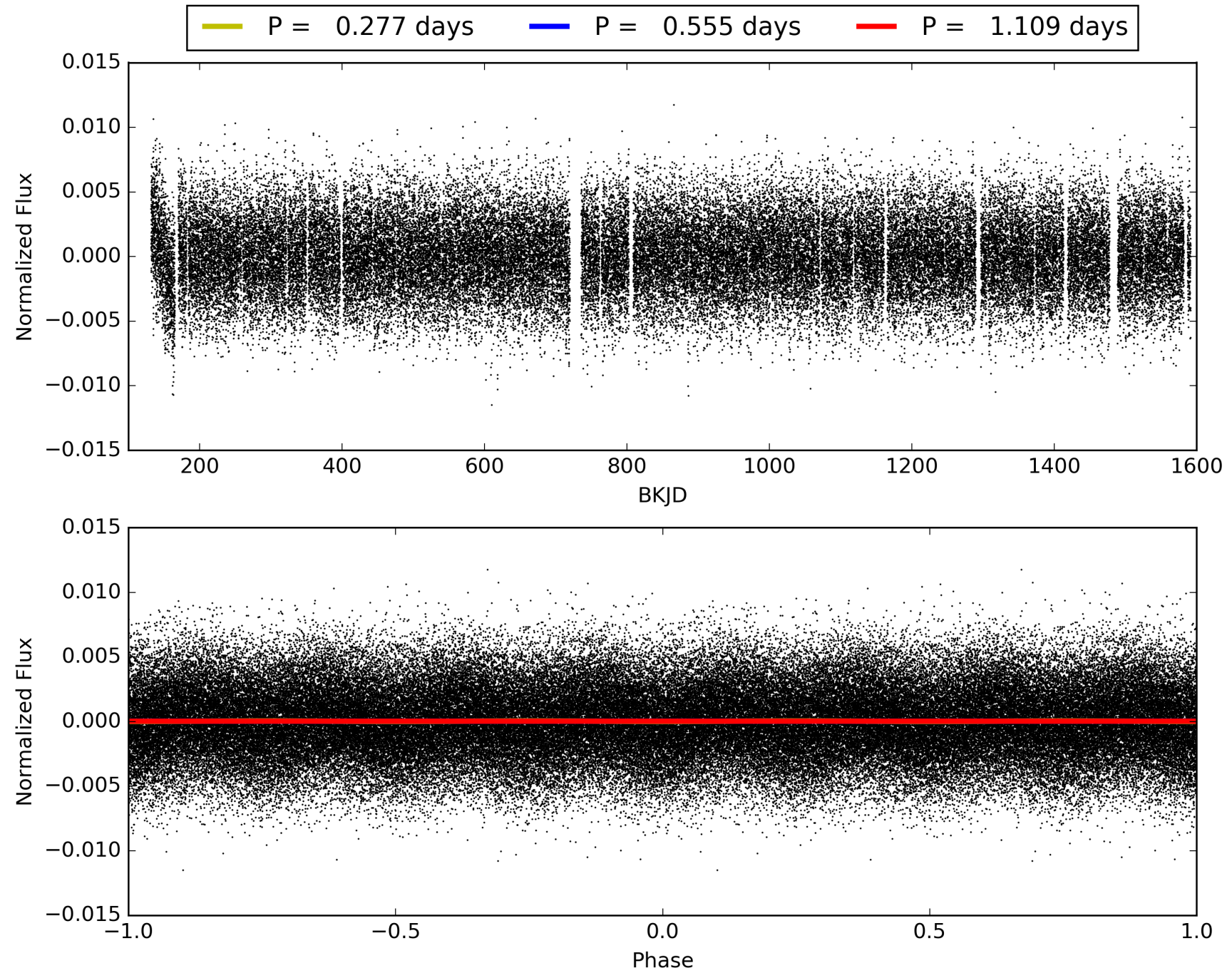
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:42:34 Z

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

TCE 009171954-01, PDC Light Curves

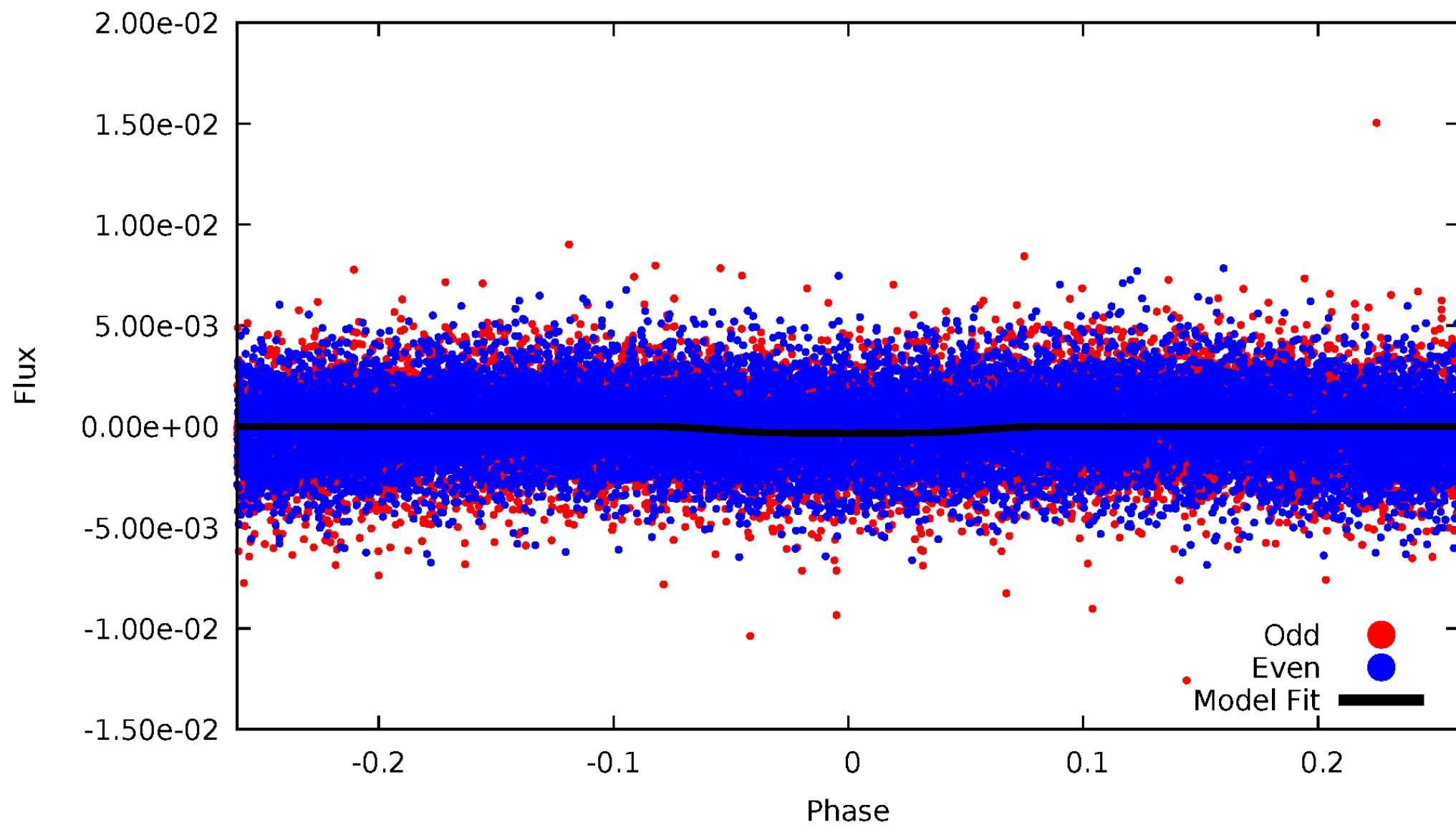


TCE 009171954-01



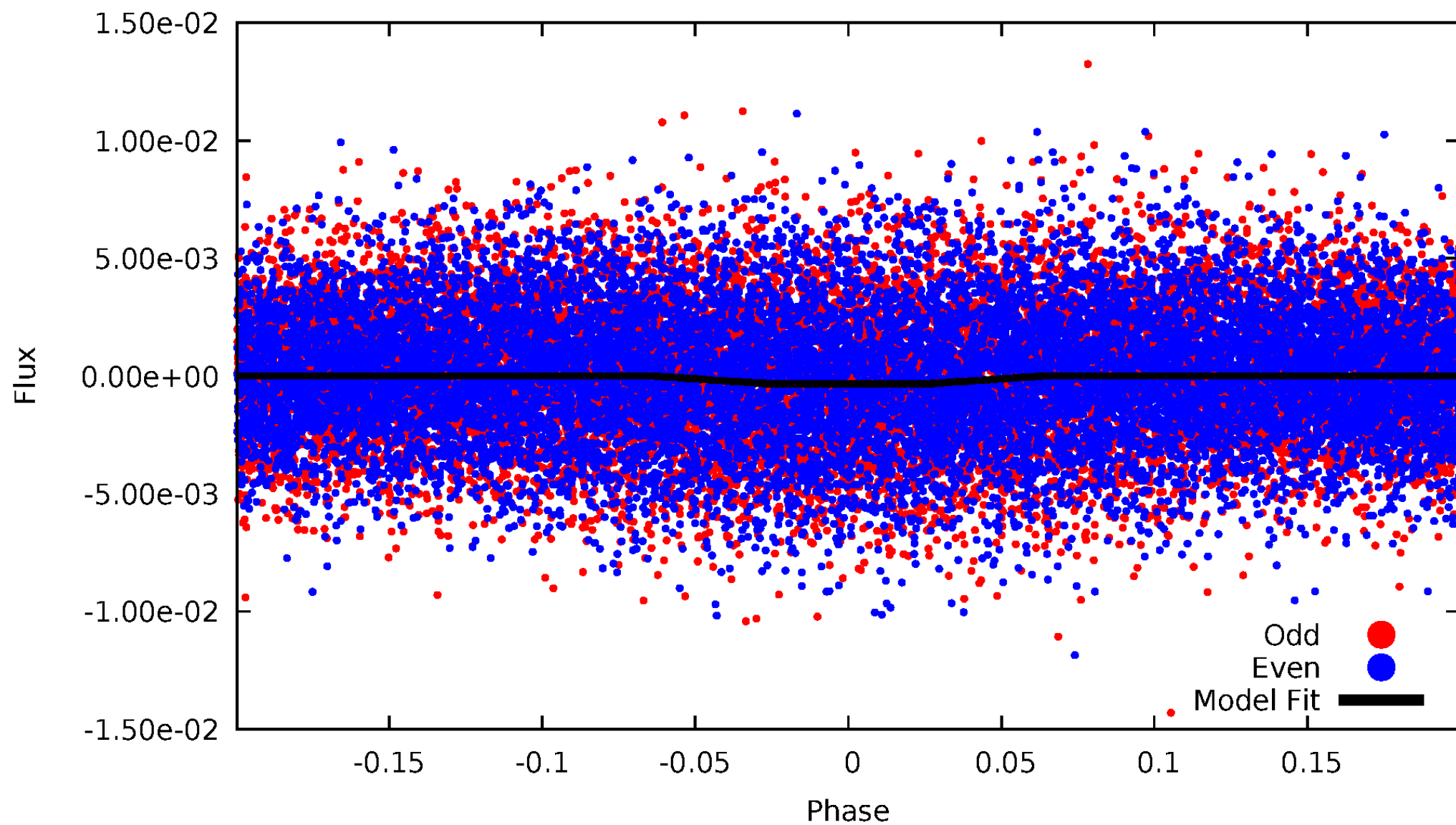
DV Odd/Even

TCE 009171954-01

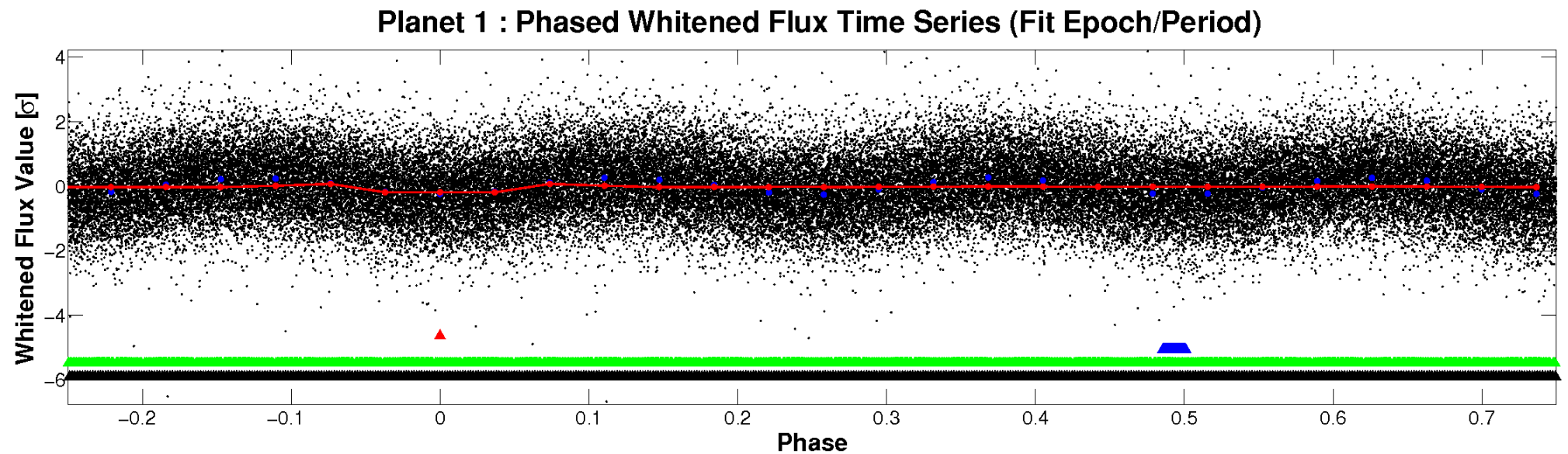
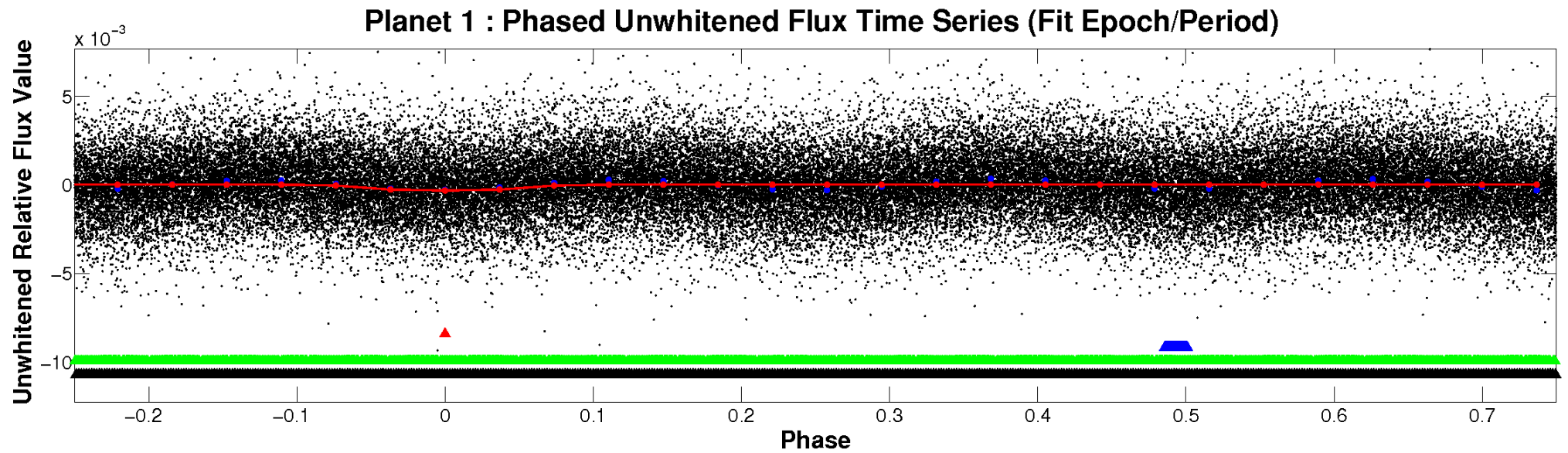


ALT Odd/Even

TCE 009171954-01

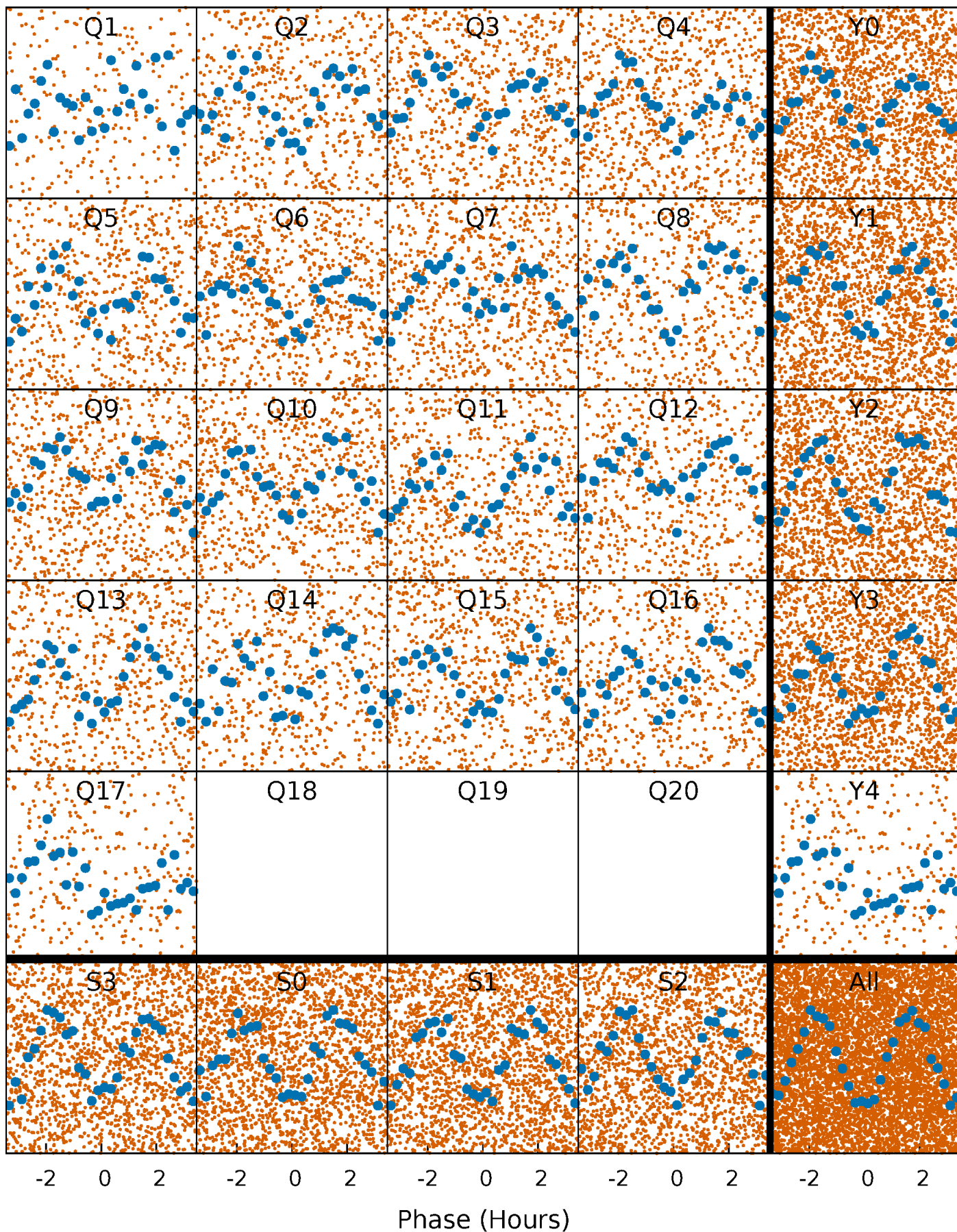


Non-Whitened Vs. Whitened Light Curve



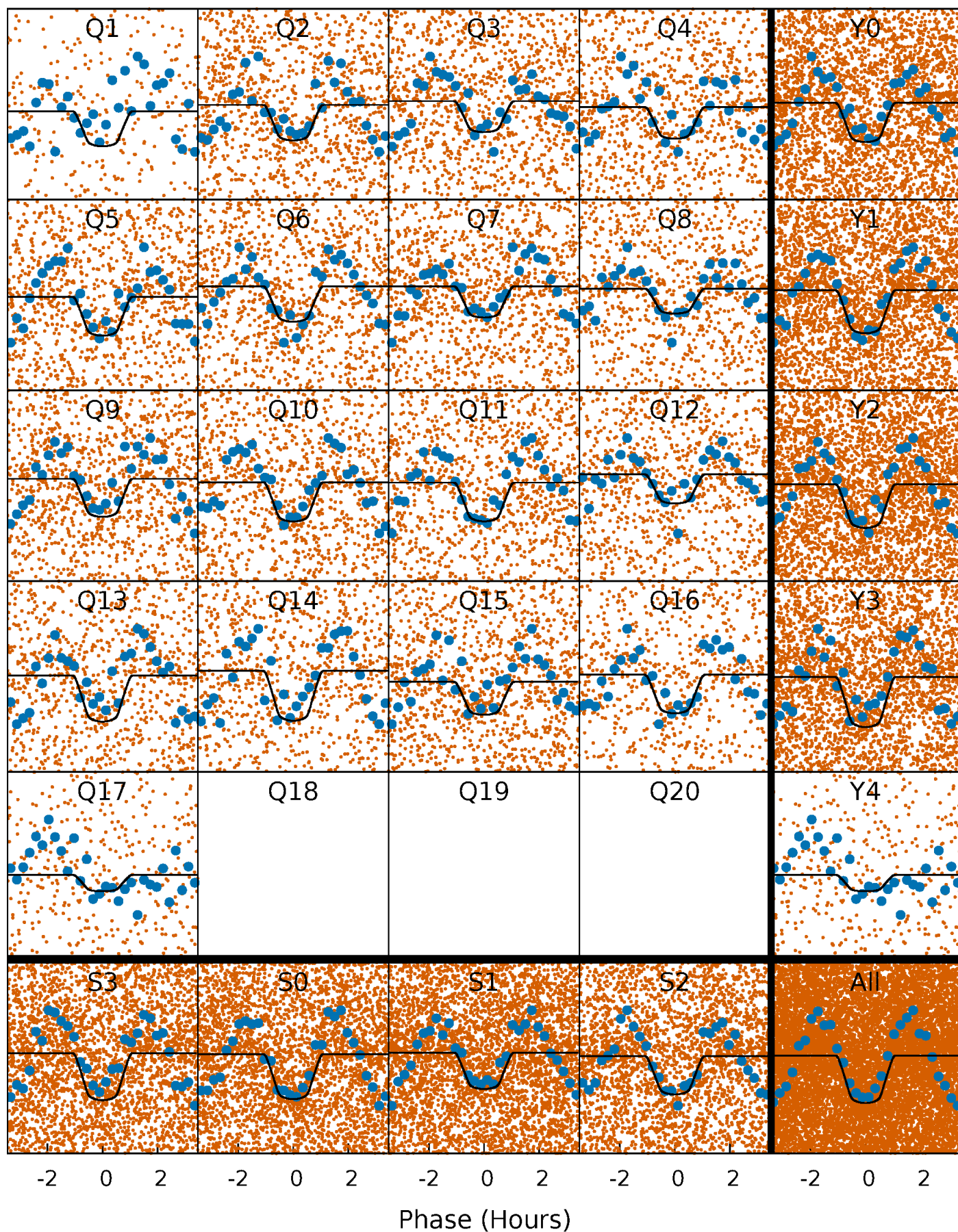
PDC Quarter-Phased Transit Curves

TCE 009171954-01 P= 0.554746 Days $T_0=131.637783$ (BKJD)



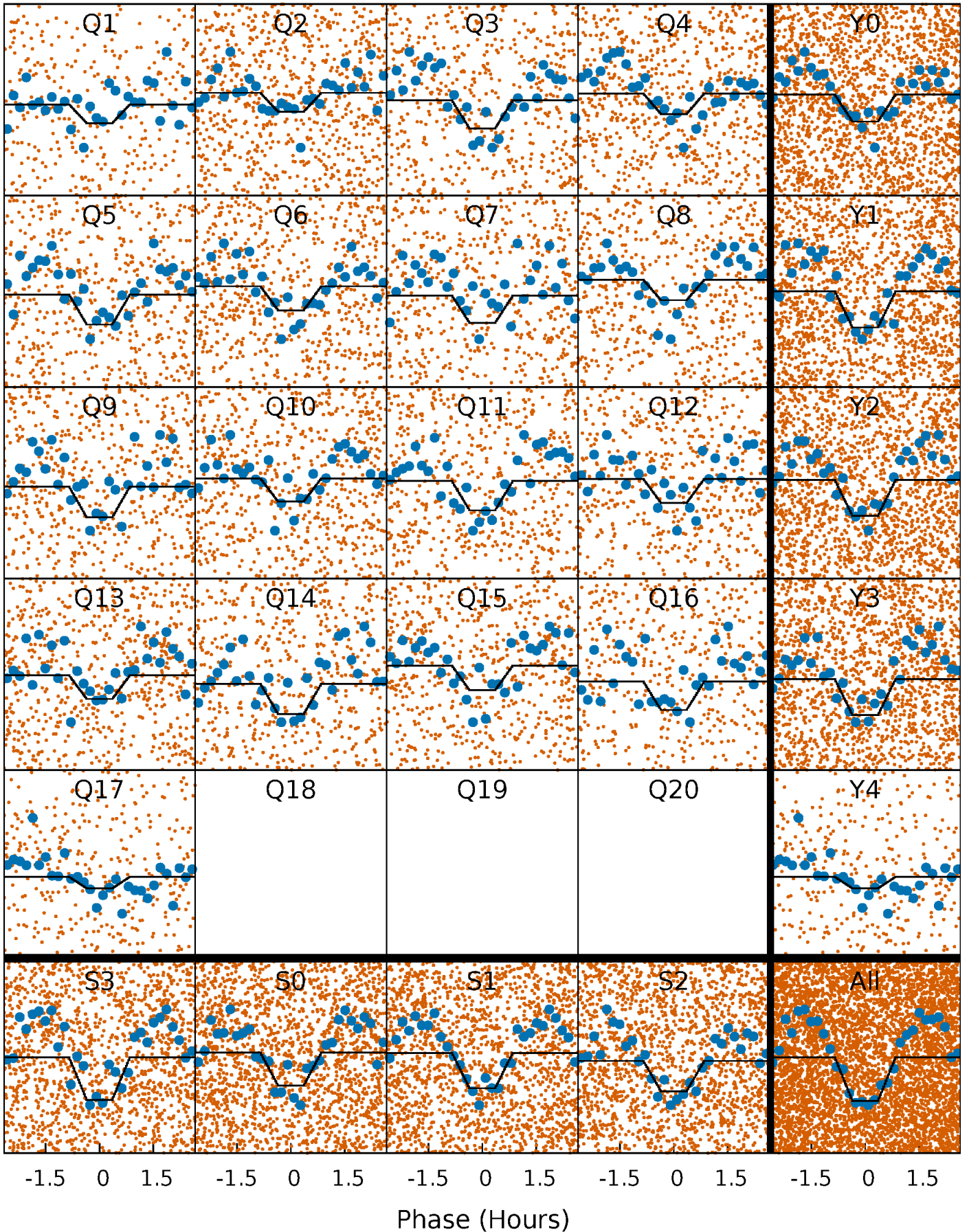
DV Quarter-Phased Transit Curves

TCE 009171954-01 P= 0.554746 Days $T_0=131.637783$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

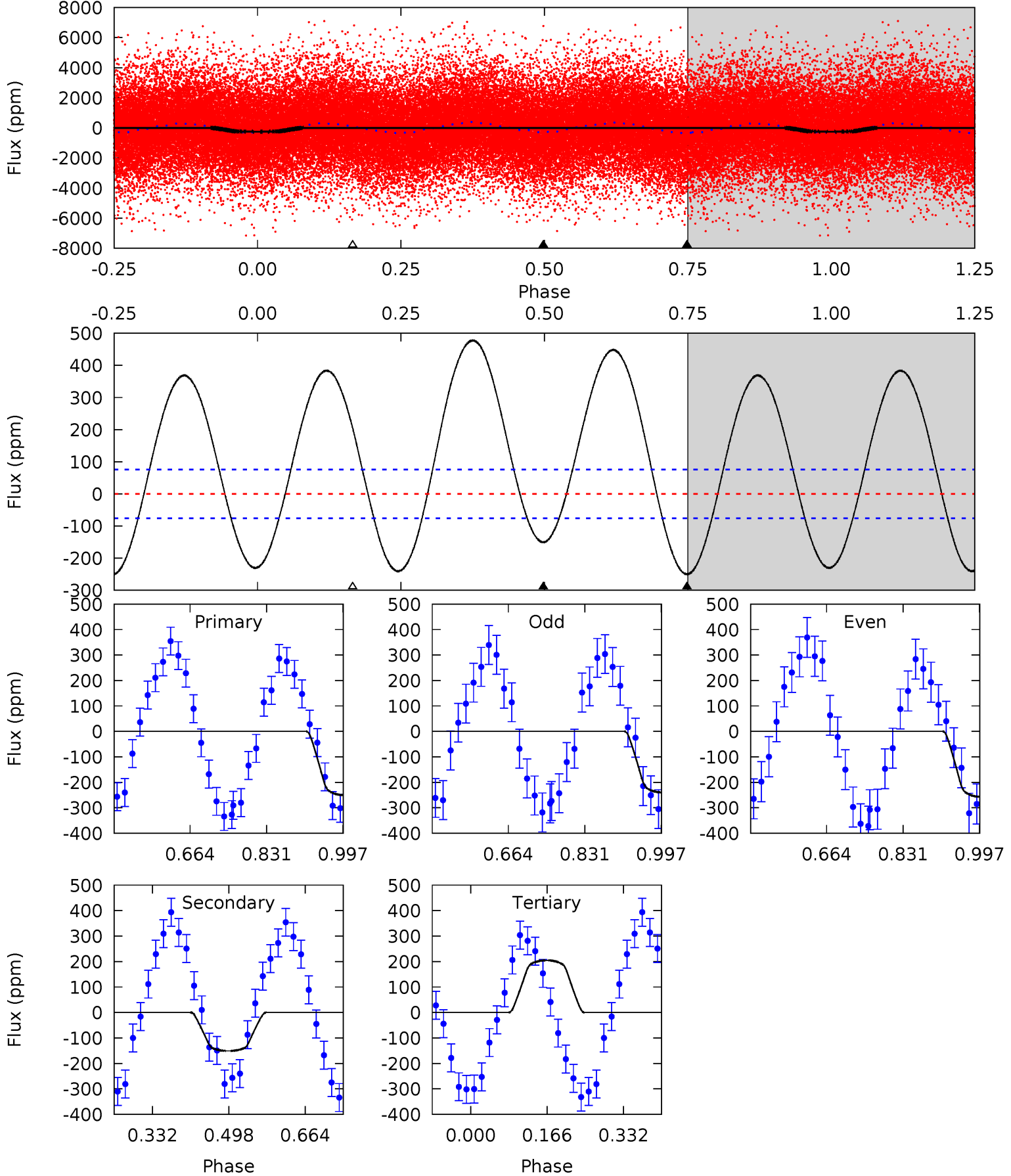
TCE 009171954-01 P= 0.554746 Days $T_0=131.635762$ (BKJD)



DV Model-Shift Uniqueness Test

009171954-01, P = 0.554746 Days, E = 131.083037 Days

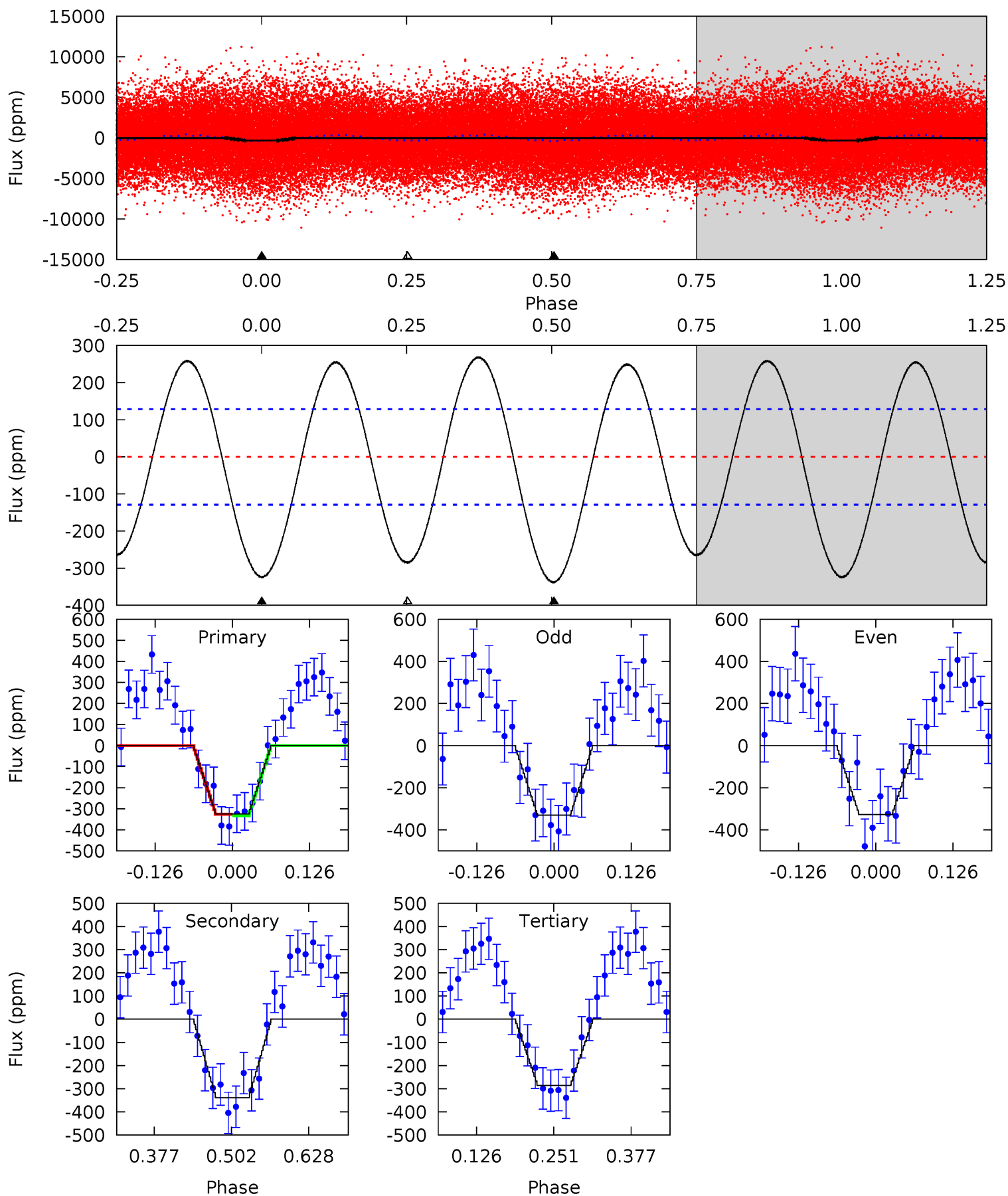
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.7 | 8.87 | -12.0 | 0 | 4.46 | 1.38 | 12.0 | 26.7 | 14.7 | 20.9 | 8.87 | 0.51 | 1.02 | 0.66 | 1.01 |



Alt Model-Shift Uniqueness Test

009171954-01, P = 0.554746 Days, E = 131.081016 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.4 | 11.9 | 10.0 | 0 | 4.52 | 1.53 | 6.67 | 1.39 | 11.4 | 1.87 | 11.9 | 0.05 | 0.91 | 0.44 | 0.11 |



Stellar Parameters For KIC 009171954

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 7694^{+213}_{-347} | $3.631^{+0.484}_{-0.085}$ | $-0.080^{+0.200}_{-0.350}$ | $3.627^{+0.615}_{-1.846}$ | $2.054^{+0.279}_{-0.557}$ | $0.061^{+0.338}_{-0.018}$ |
| | +3%/-5% | +13%/-2% | +250%/-438% | +17%/-51% | +14%/-27% | +558%/-29% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009171954-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|----------------------|-----------------------|---------------------------|
| DV | -151 ± 17 | $7.14^{+1.52}_{-1.96}$ | 6741^{+446}_{-897} | 4768^{+831}_{-1469} | $0.456^{+0.378}_{-0.138}$ |
| Alt. | -339 ± 29 | $6.43^{+1.58}_{-1.70}$ | 6666^{+510}_{-844} | 7162^{+883}_{-781} | $1.267^{+1.021}_{-0.436}$ |

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

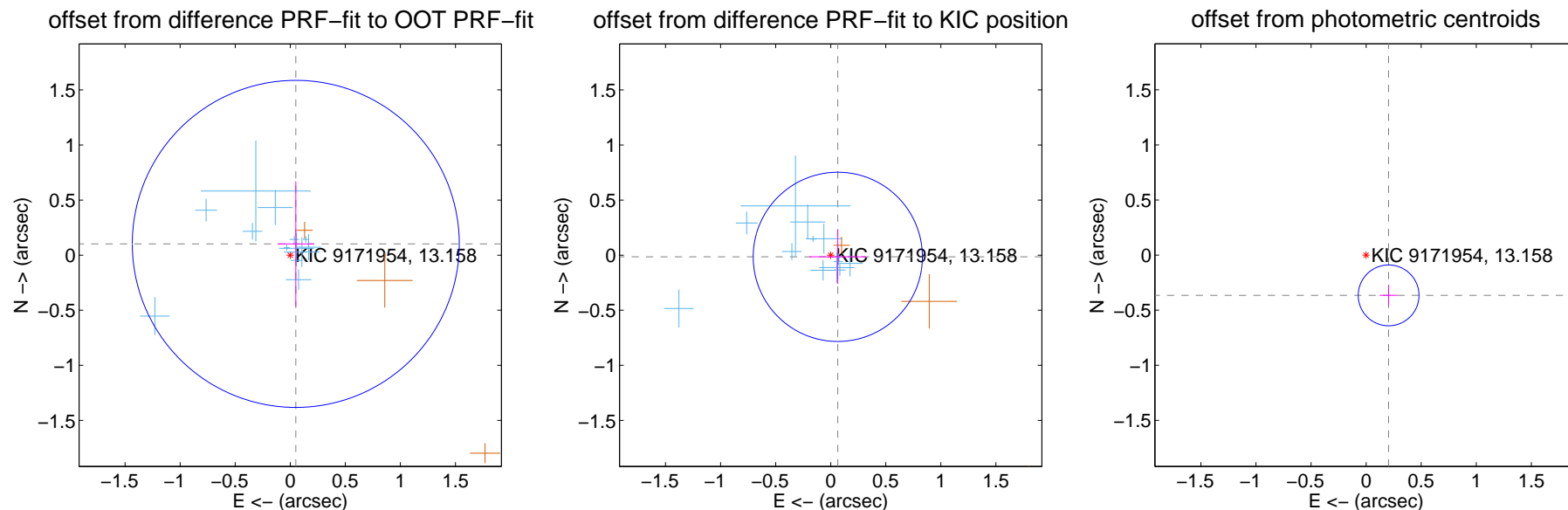
DV Centroid Data

Supplemental centroid analysis for 009171954-01. Kepler magnitude: 13.16. Transit SNR 17.64

There are 13 quarters with good PRF difference image offsets

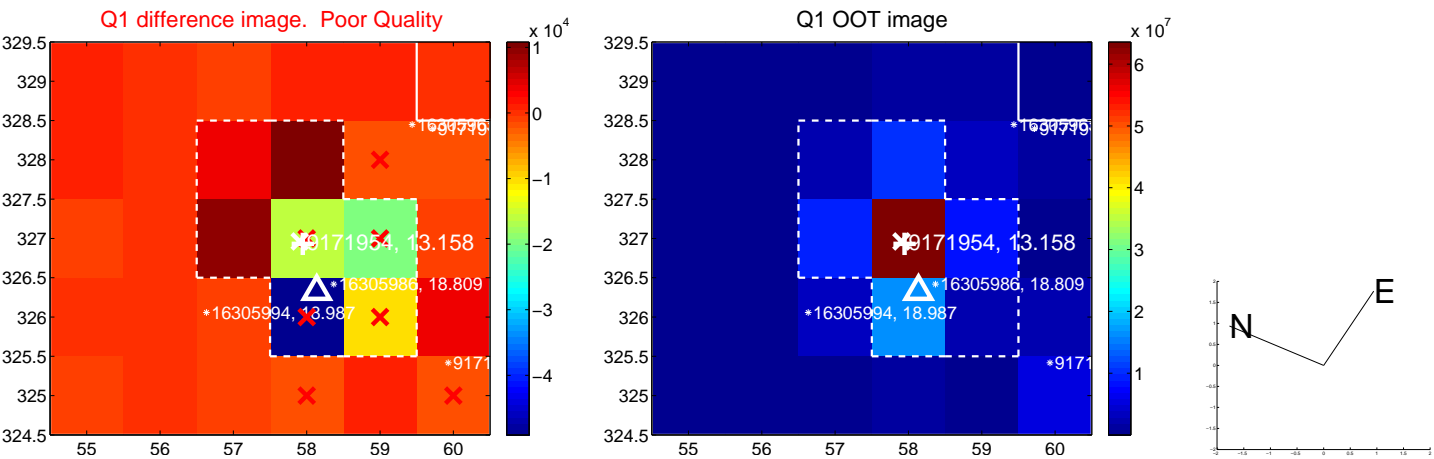
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.114 ± 0.495 | 0.23 | -0.050 ± 0.166 | 0.102 ± 0.568 |
| PRF-fit source offset from KIC position | 0.066 ± 0.256 | 0.26 | -0.064 ± 0.257 | -0.015 ± 0.245 |
| photometric centroid source offset | 0.42 ± 0.09 | 4.55 | -0.20 ± 0.08 | -0.37 ± 0.10 |

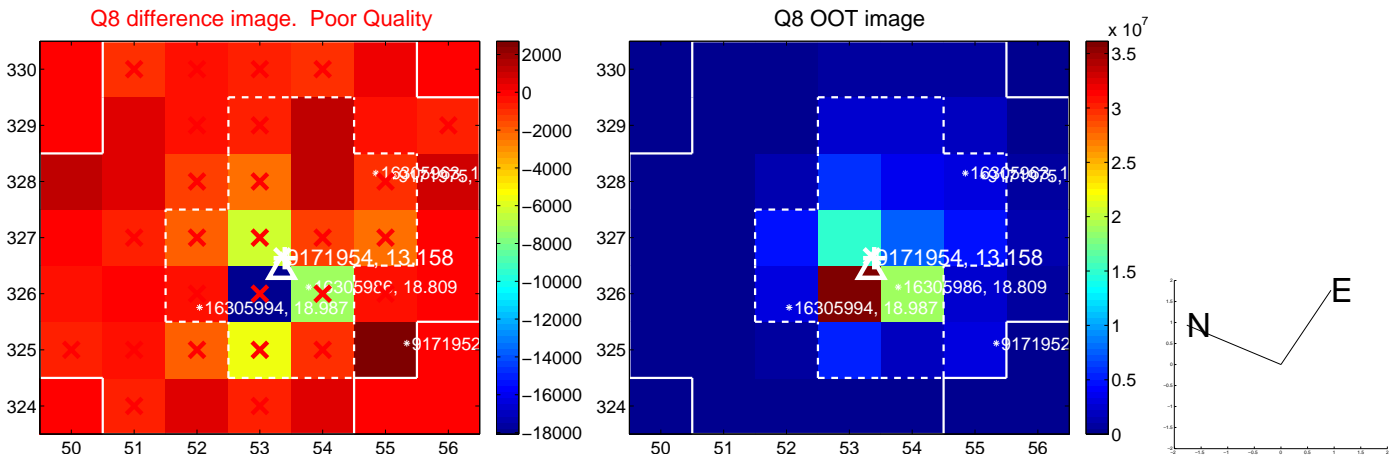
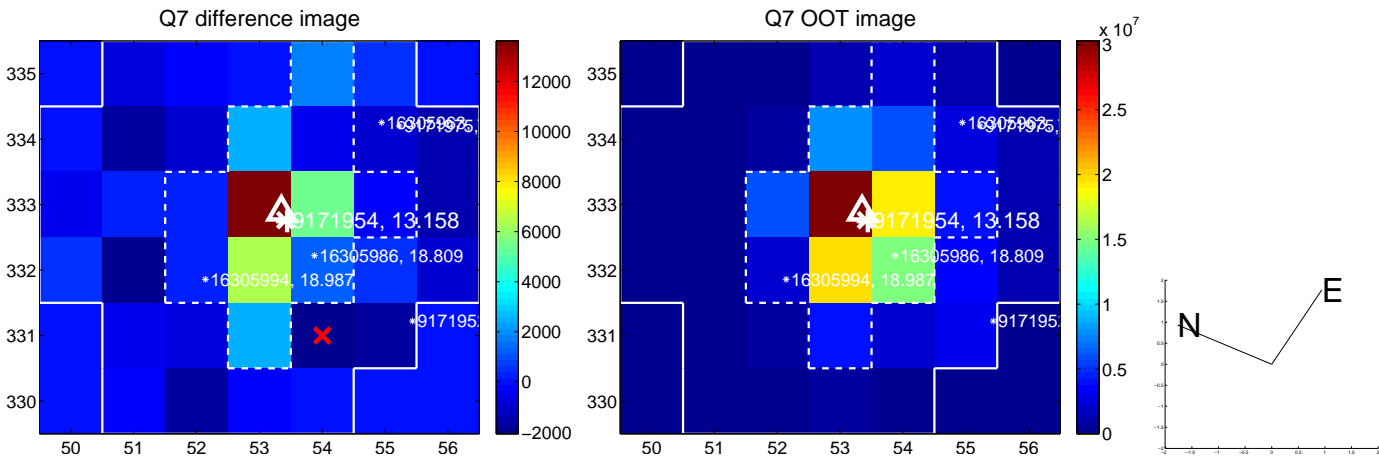
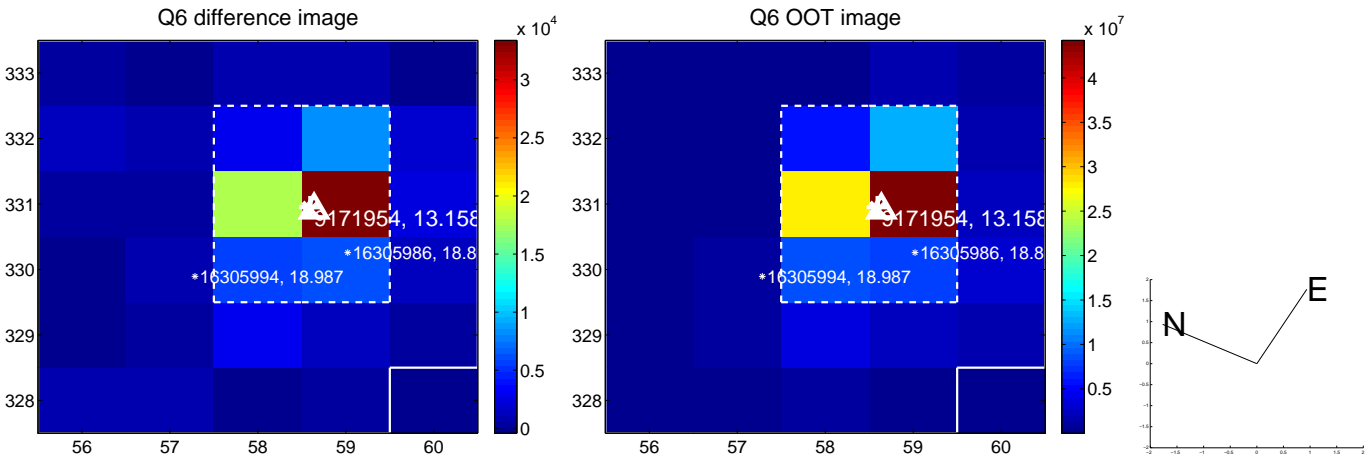
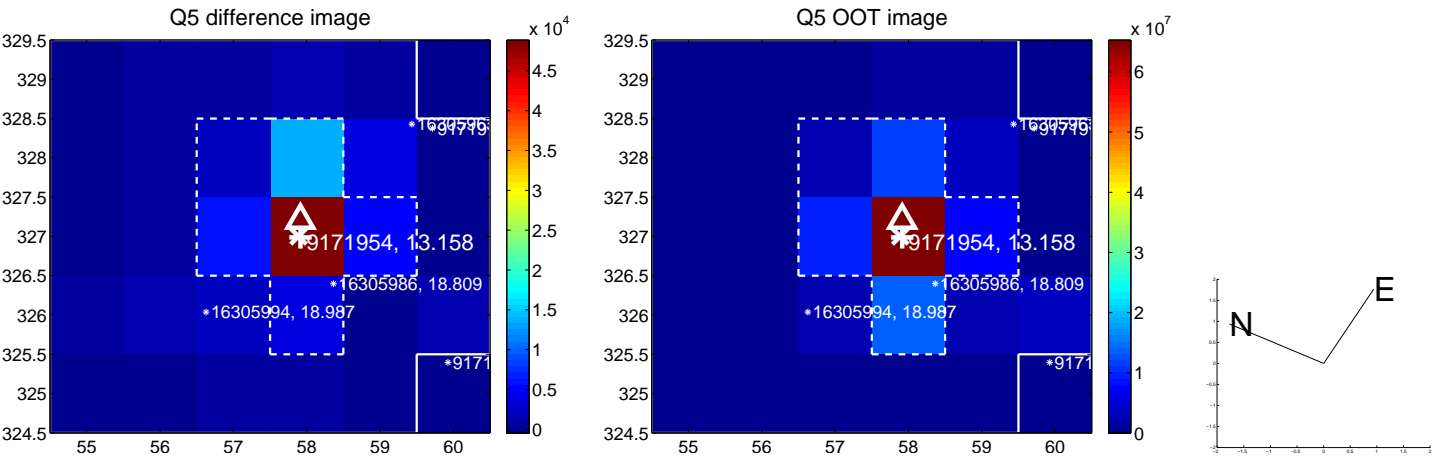


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

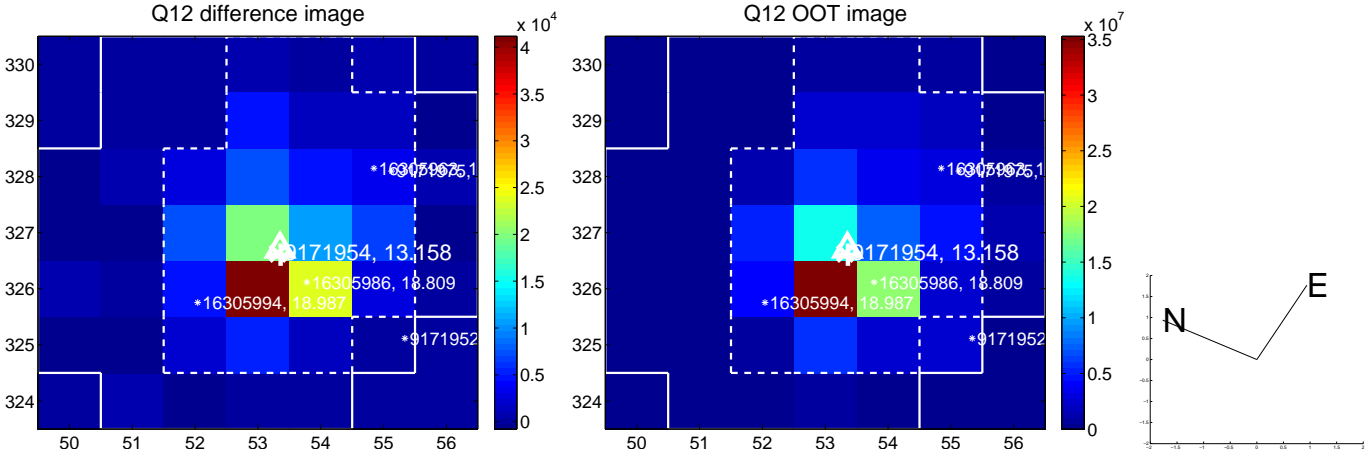
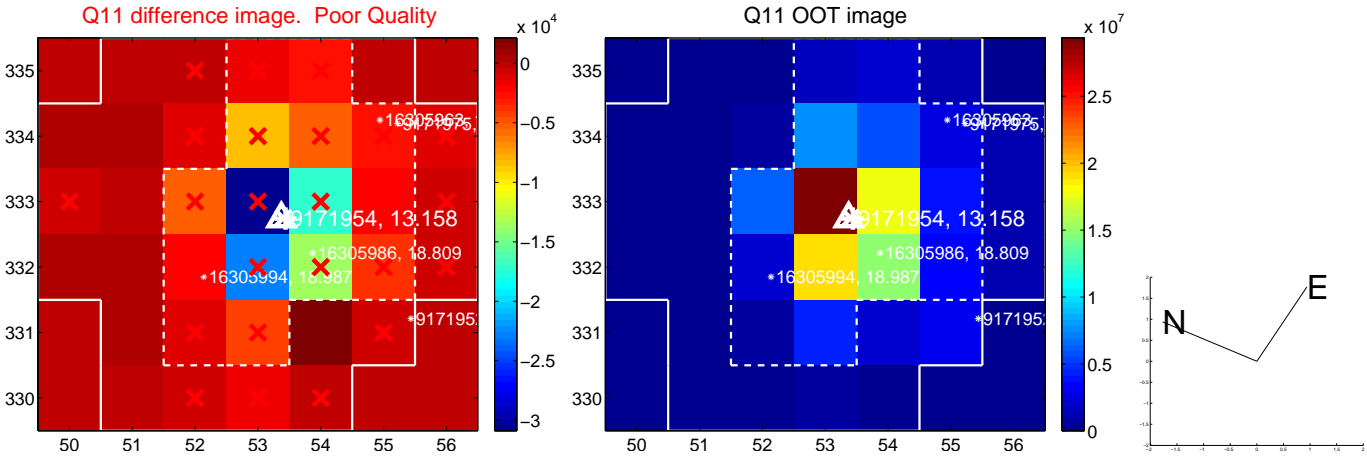
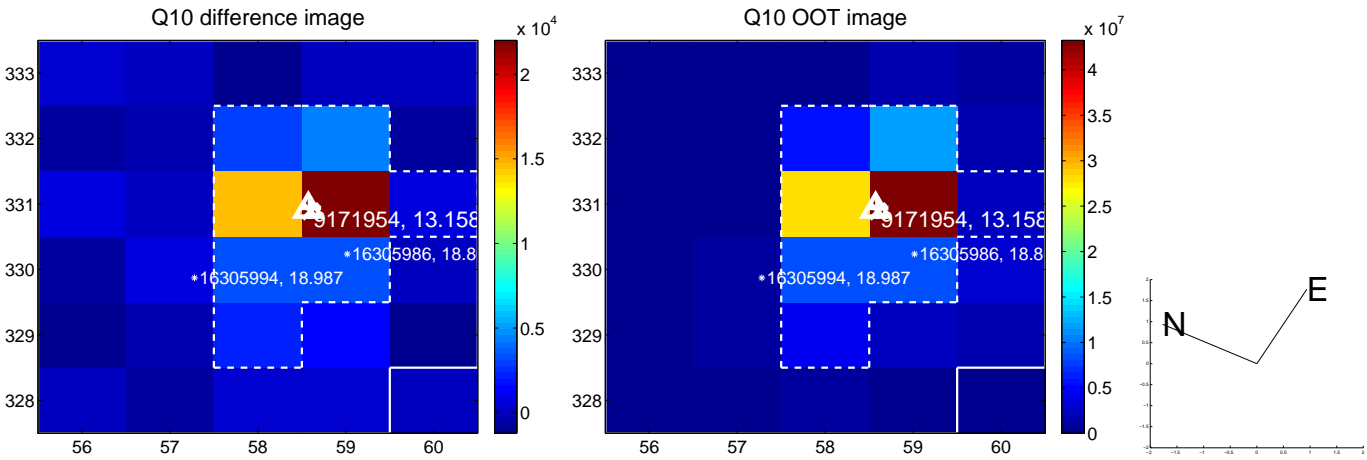
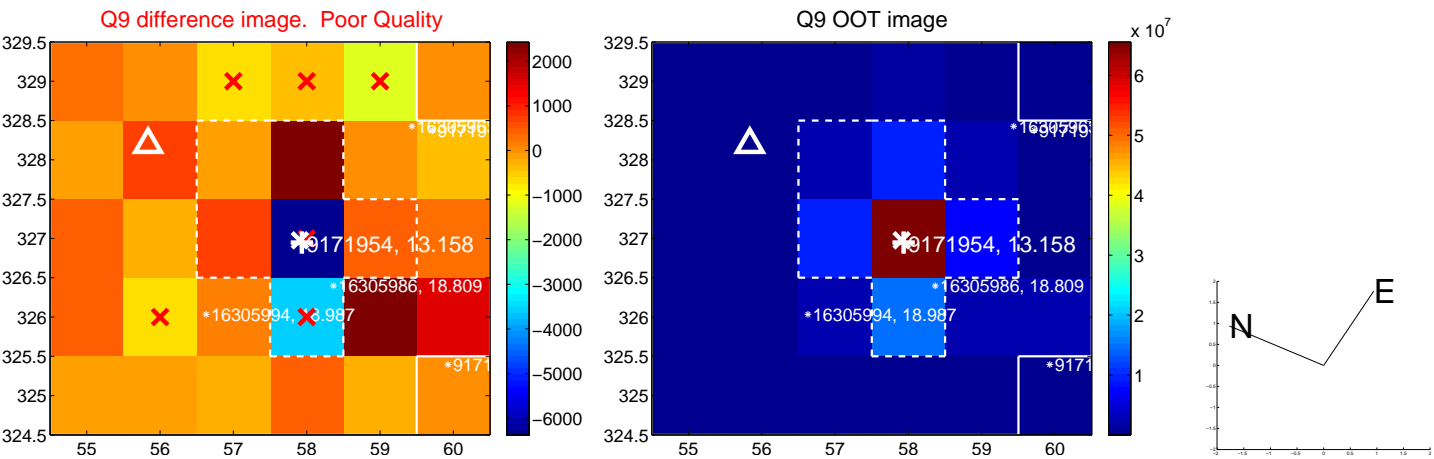
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



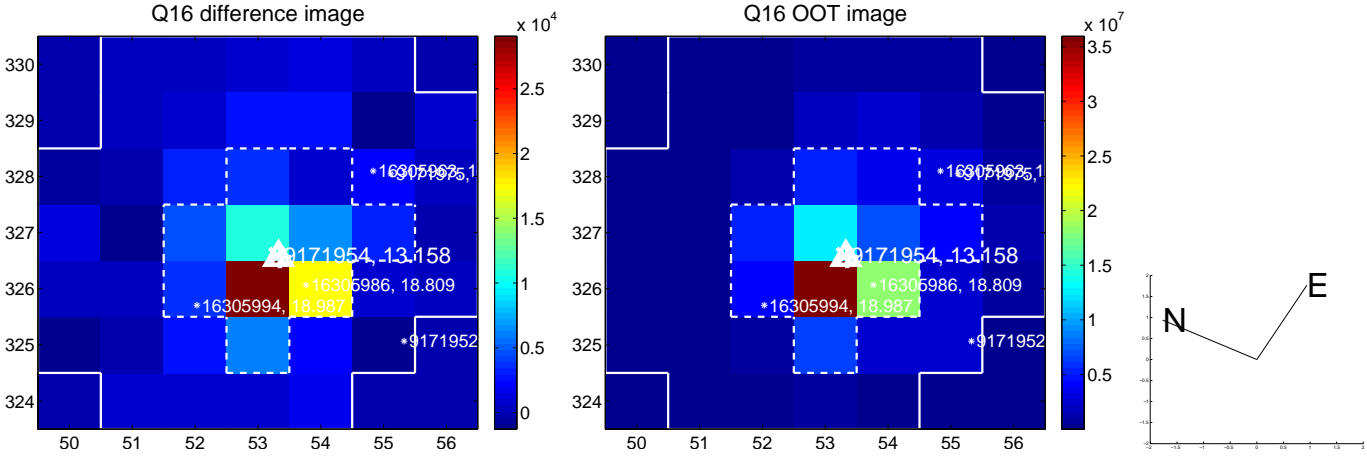
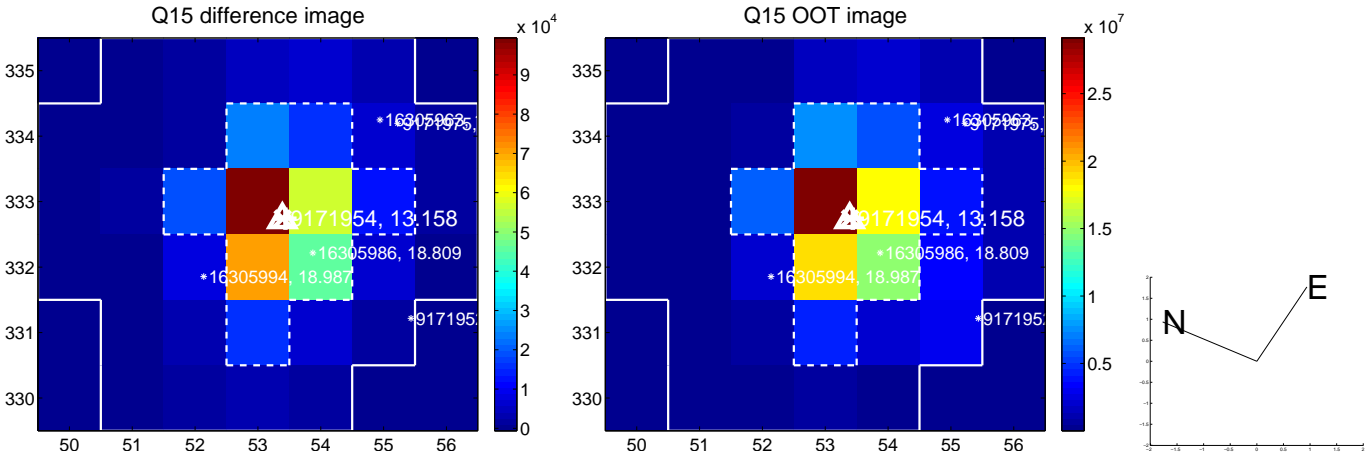
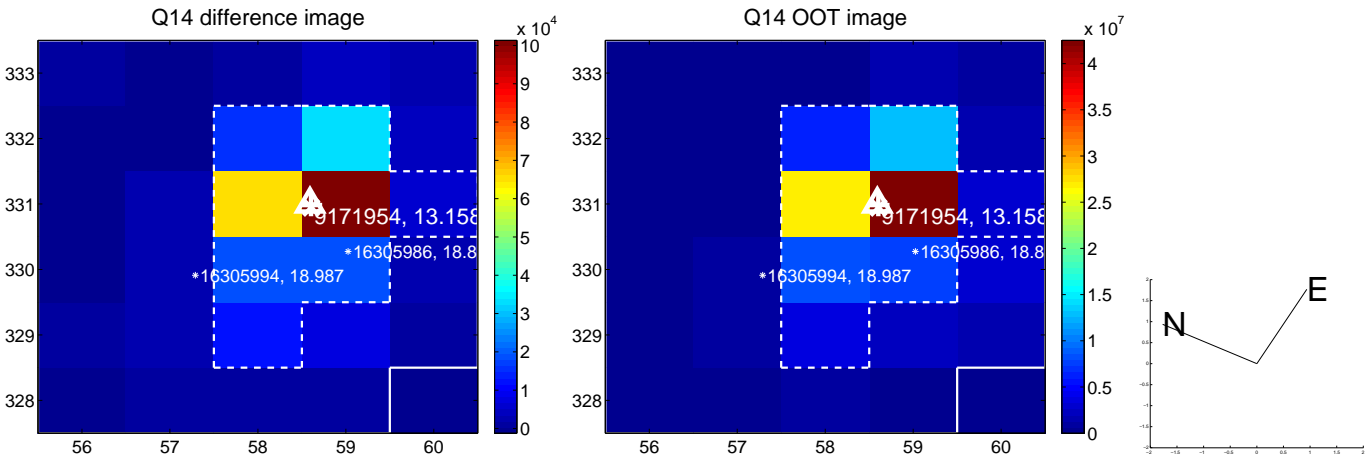
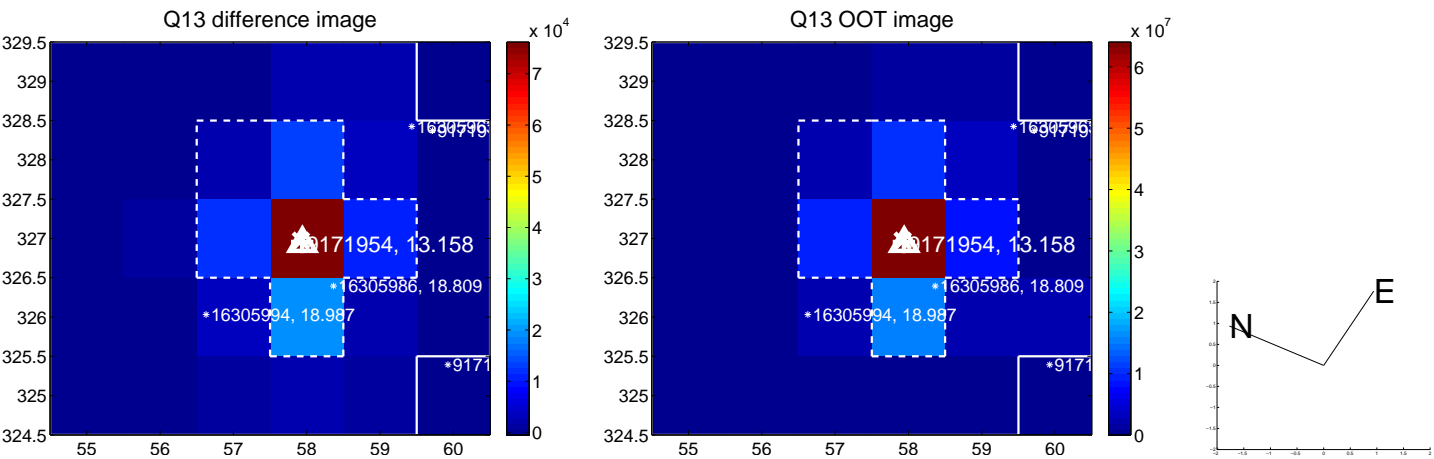
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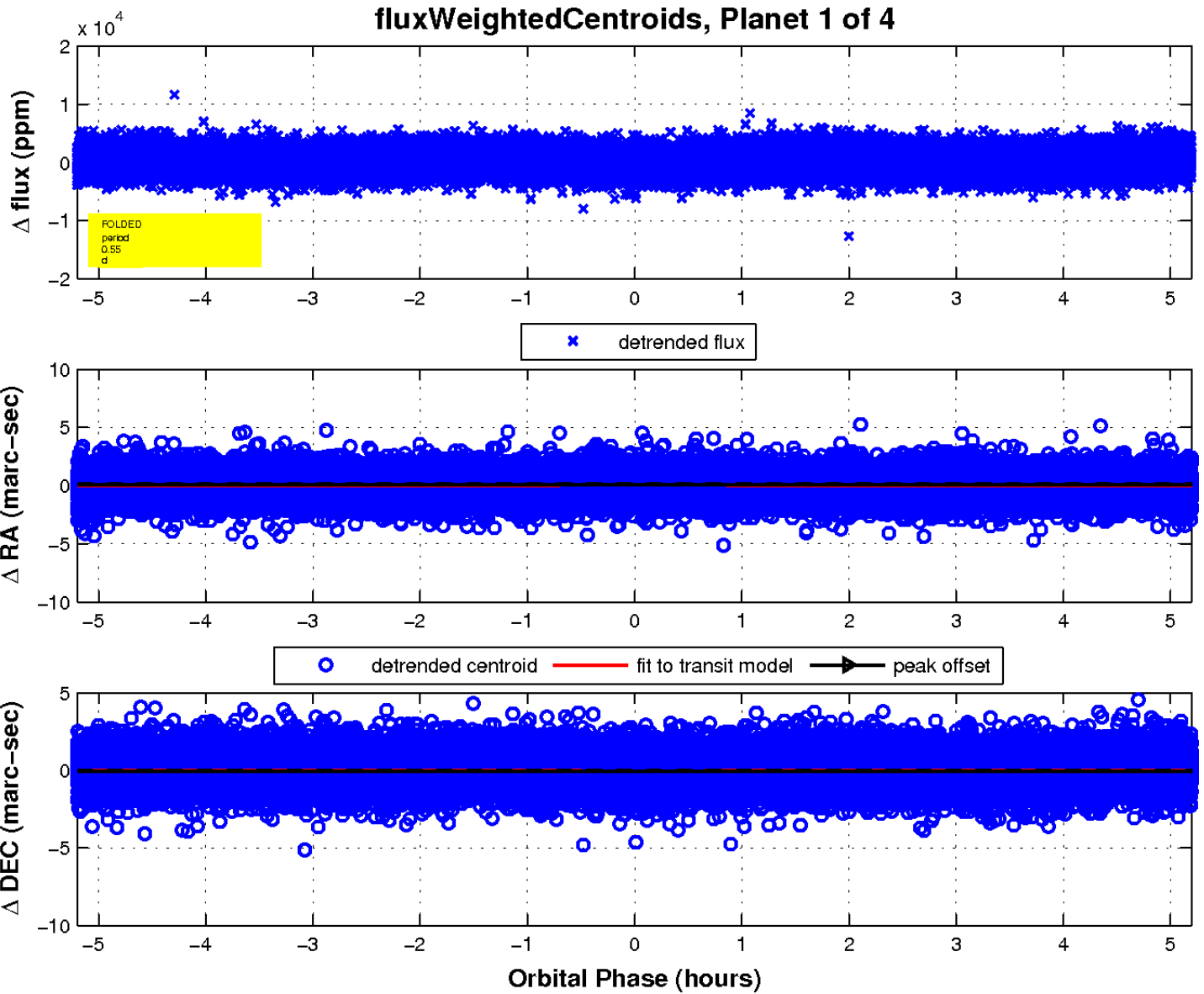
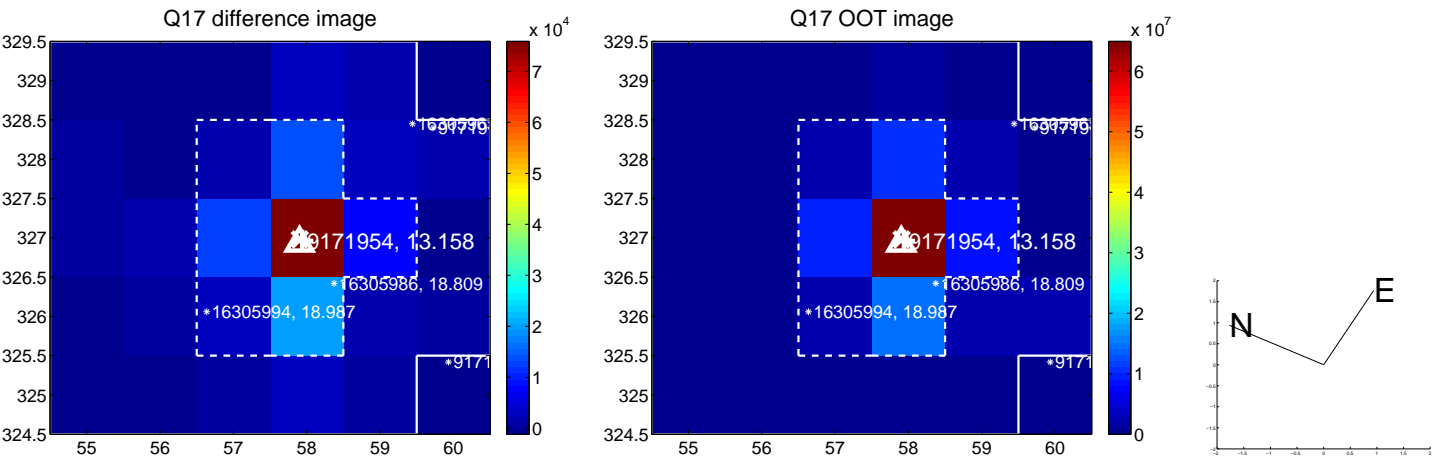
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

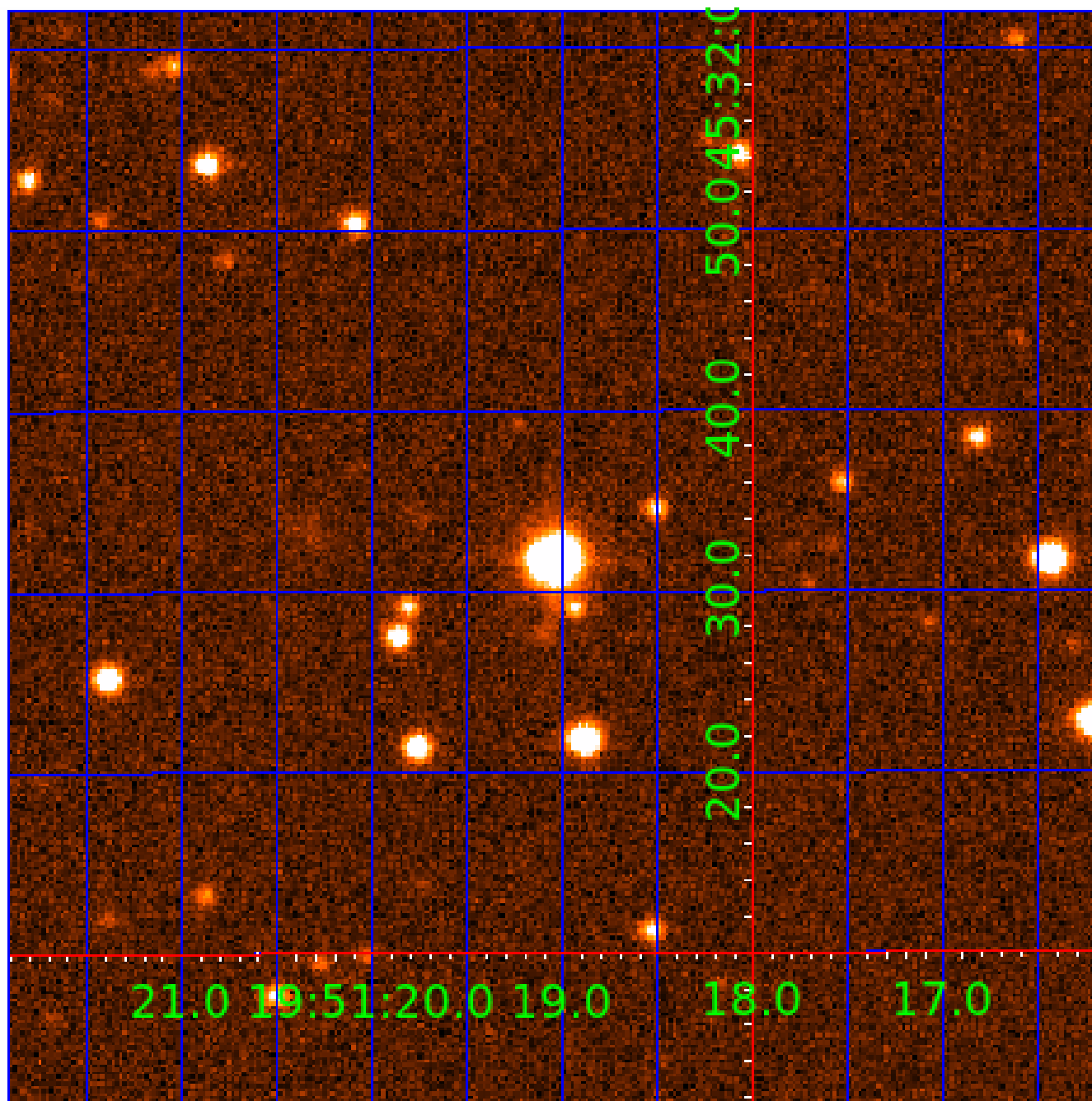


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009171954

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009171954-01 | OBS | No | 0.554746 | 131.637783 | 330.0 | 1.733 | 17.3 | 17.6 | 3.63 | 7694 | 7.68 | 0.00 |
| 009171954-02 | OBS | No | 0.554743 | 131.915668 | 355.2 | 1.320 | 17.7 | 19.5 | 3.63 | 7694 | 6.98 | 0.00 |
| 009171954-03 | OBS | No | 1.693989 | 131.824728 | 836.4 | 3.471 | 11.7 | 13.9 | 3.63 | 7694 | 12.22 | 33061.37 |
| 009171954-04 | OBS | No | 0.846969 | 131.609952 | 220.6 | 2.500 | 9.5 | -1.0 | 3.63 | 7694 | 5.45 | 83312.72 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009171954-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD |
| 009171954-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS |

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

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

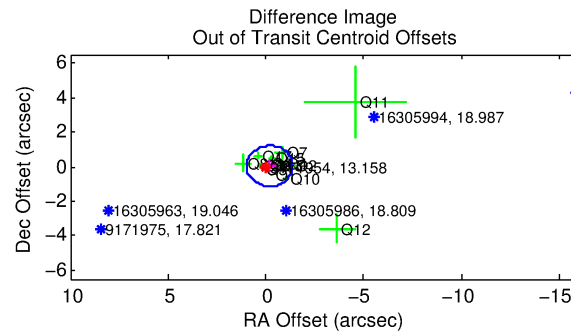
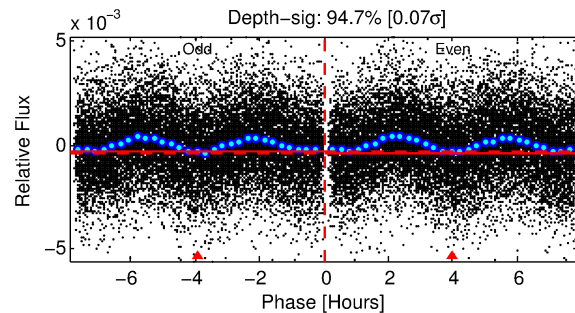
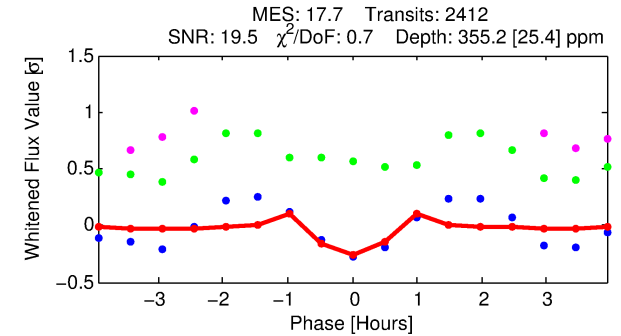
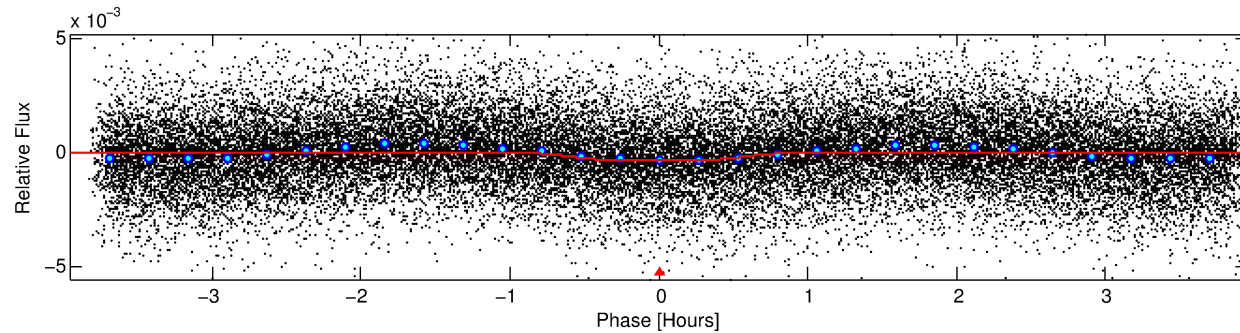
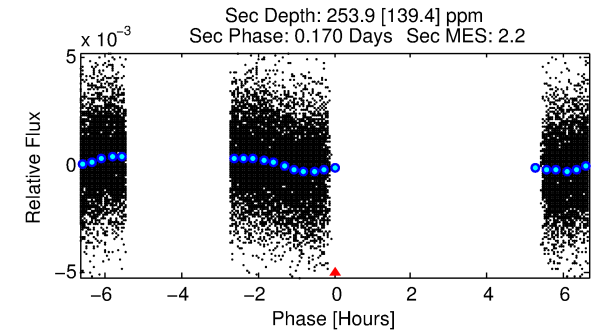
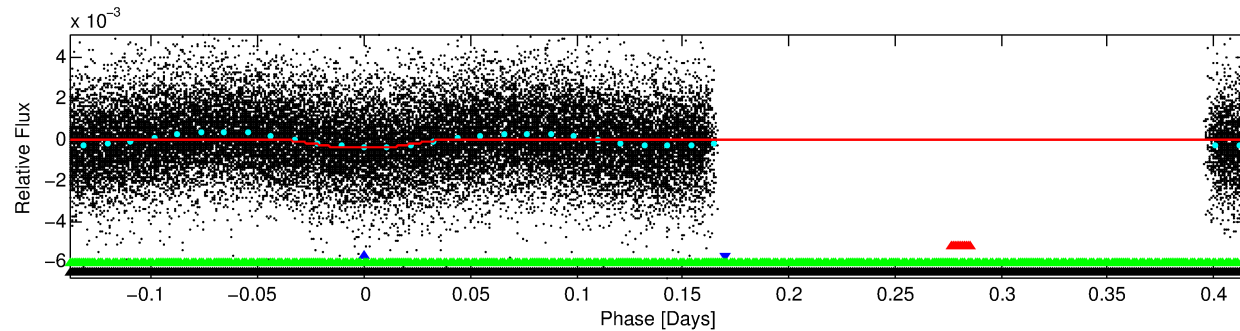
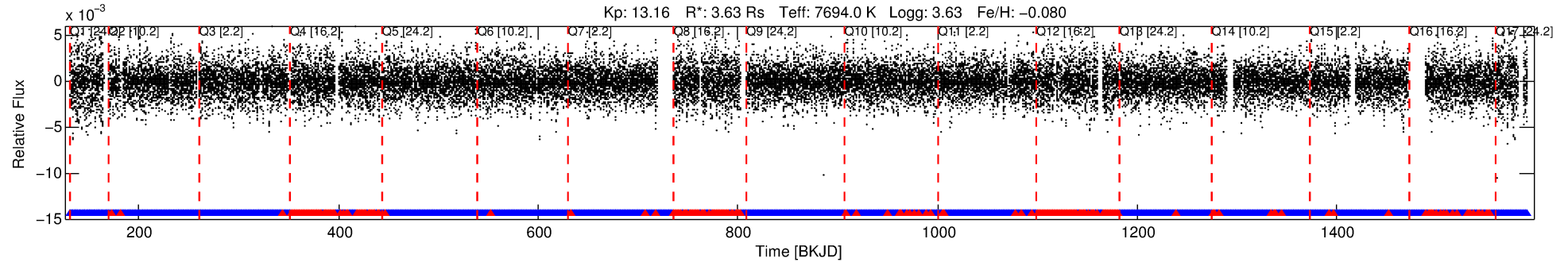
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009171954-02

No Significant Match Found

DV One-Page Summary

KIC: 9171954 Candidate: 2 of 4 Period: 0.555 d



DV Fit Results:

Period = 0.55474 [0.00001] d
Epoch = 131.9157 [0.0007] BKJD
Rp/R* = 0.0176 [0.0043]
a/R* = 3.21 [3.95]
b = 0.27 [4.63]
Seff = N/A
Teq = N/A
Rp = 6.98 [3.94] Re
a = N/A
Ag = N/A
Teffp = N/A

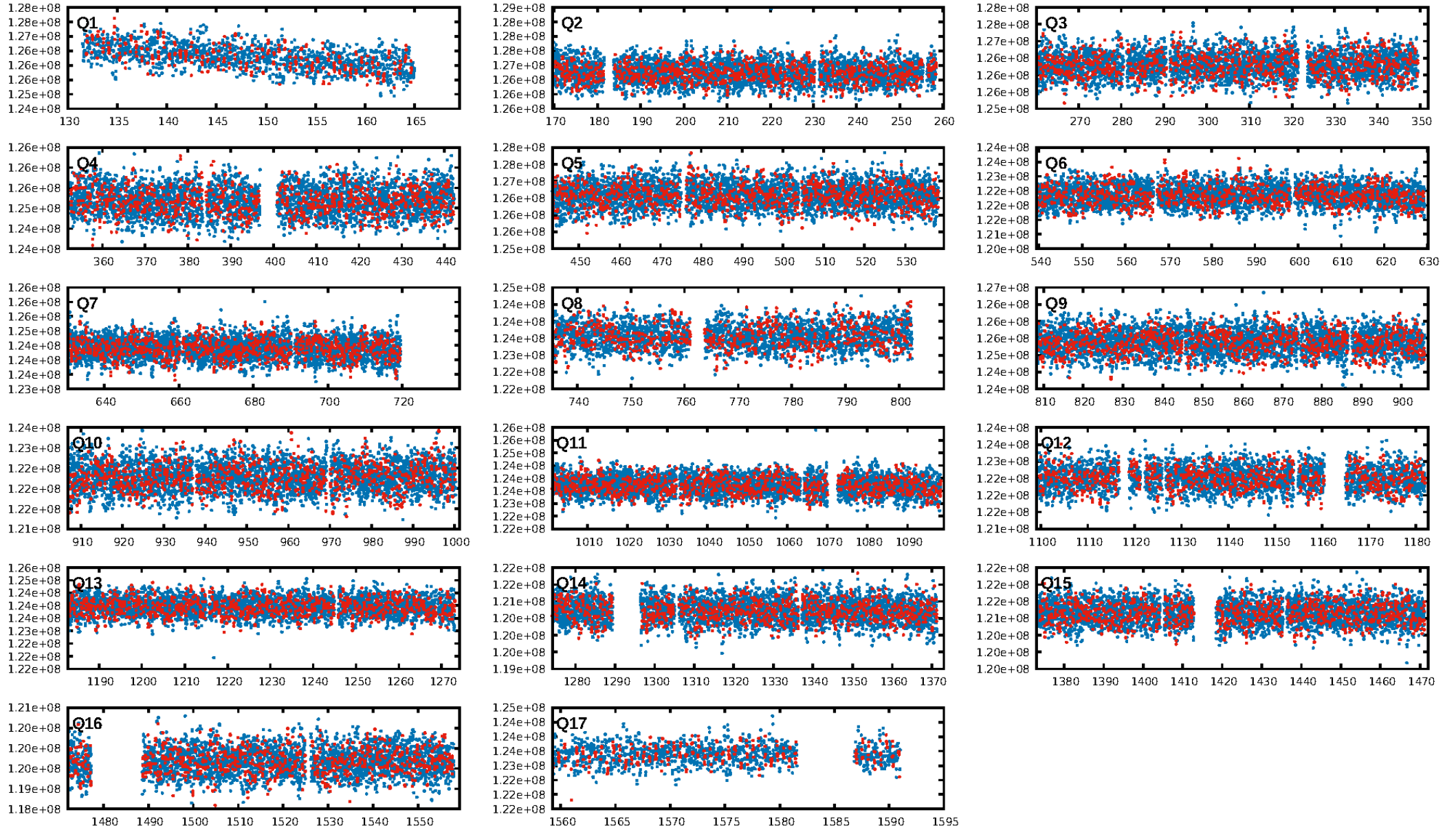
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.88 [2019/2303]
GhostDiagnostic-chr: 4.918
Centroid-sig: 2.2%
Centroid-so: 0.426 arcsec [4.47σ]
OotOffset-rm: 0.187 arcsec [0.48σ]
KicOffset-rm: 0.175 arcsec [0.50σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.69 [11/16]
DiffImageOverlap-fno: 1.00 [17/17]

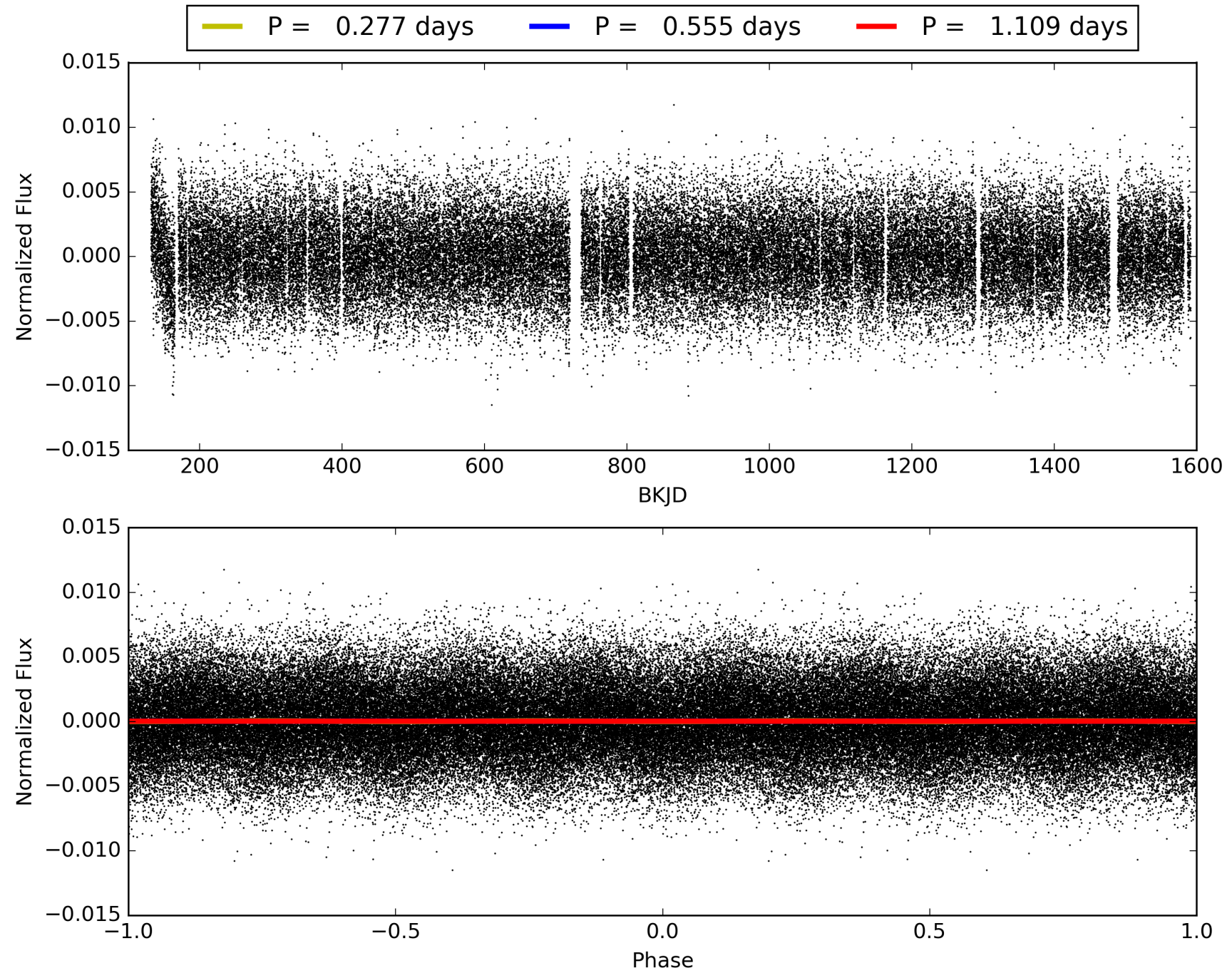
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009171954-02, PDC Light Curves

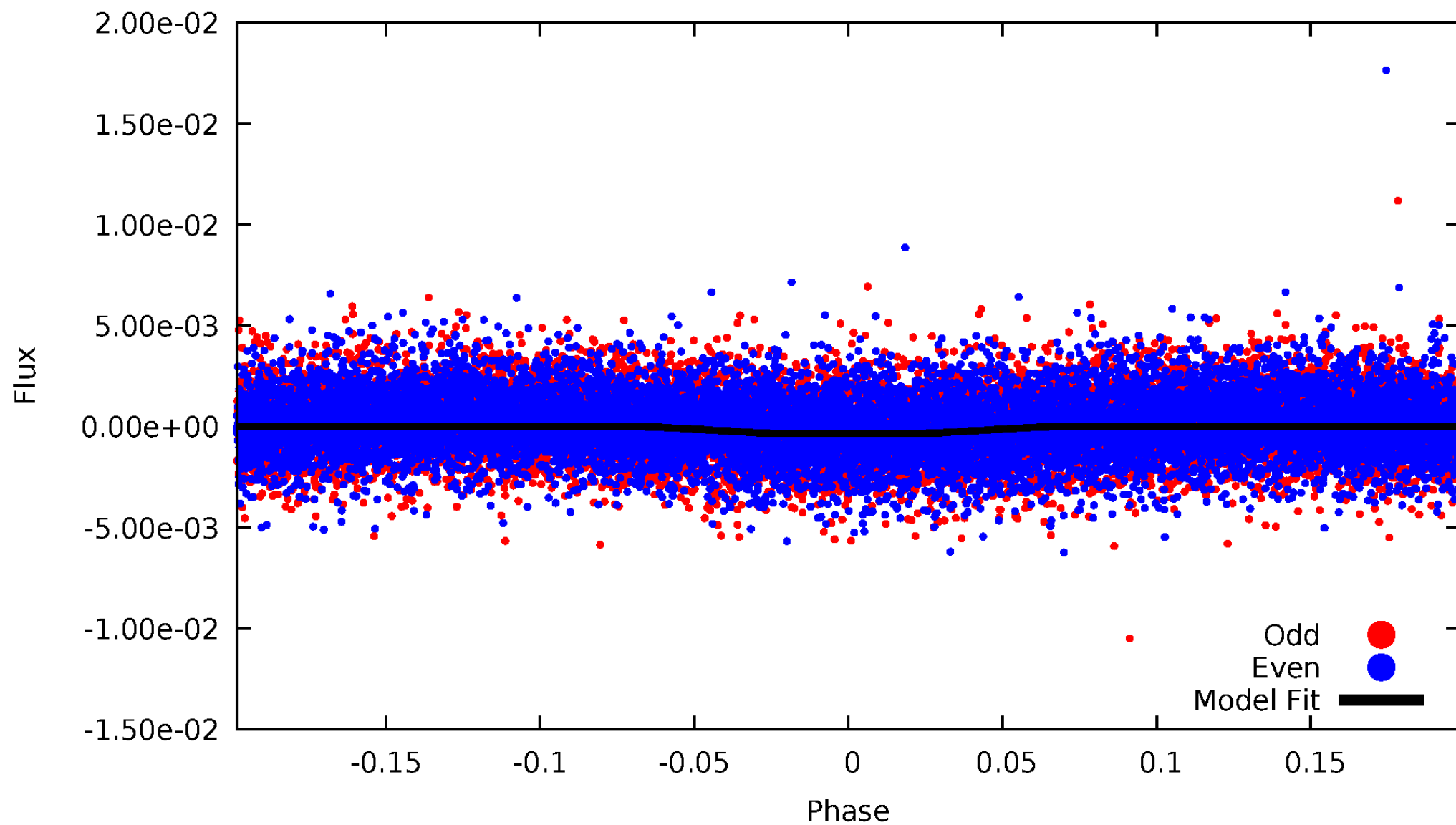


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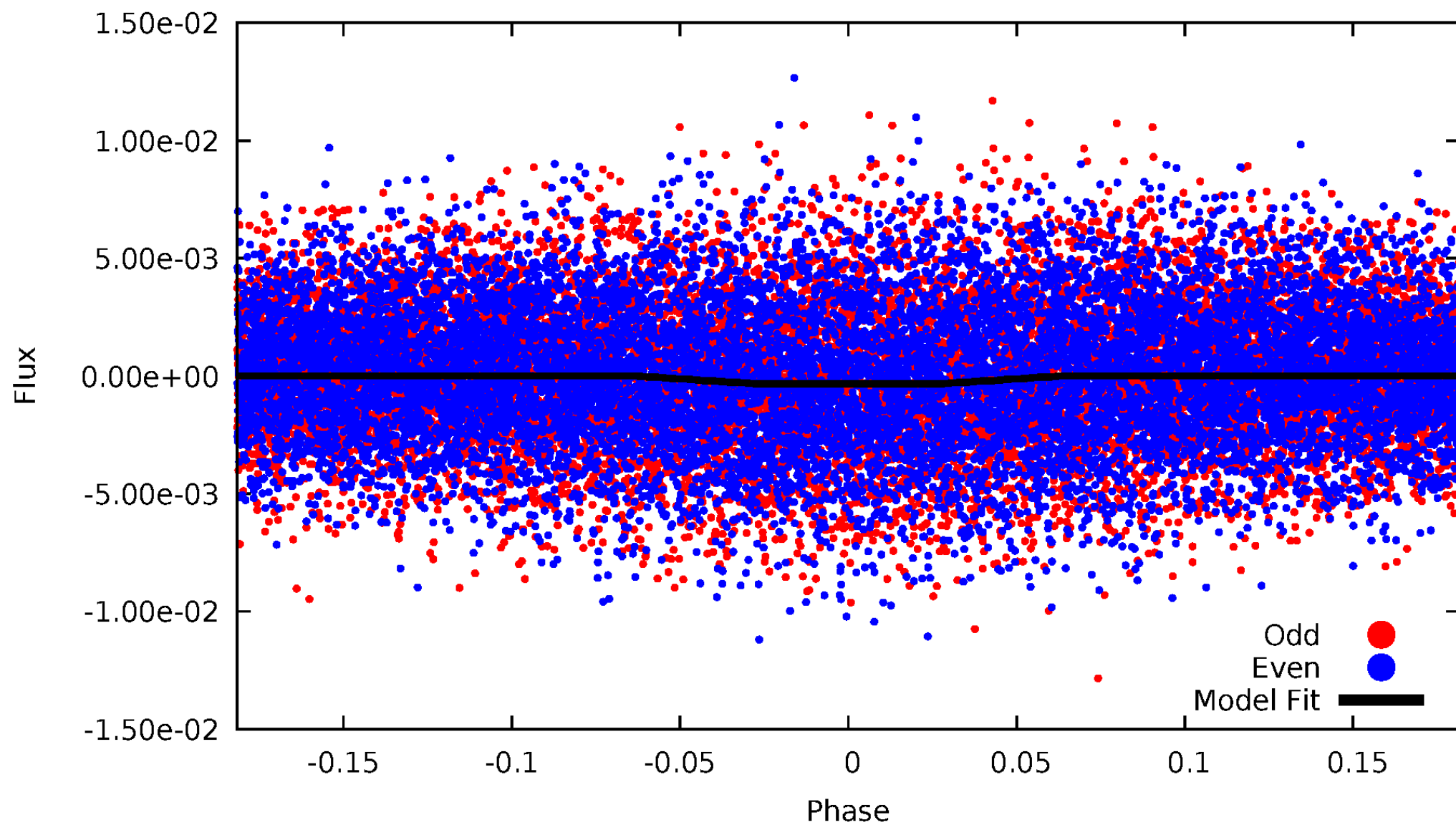
DV Odd/Even

TCE 009171954-02



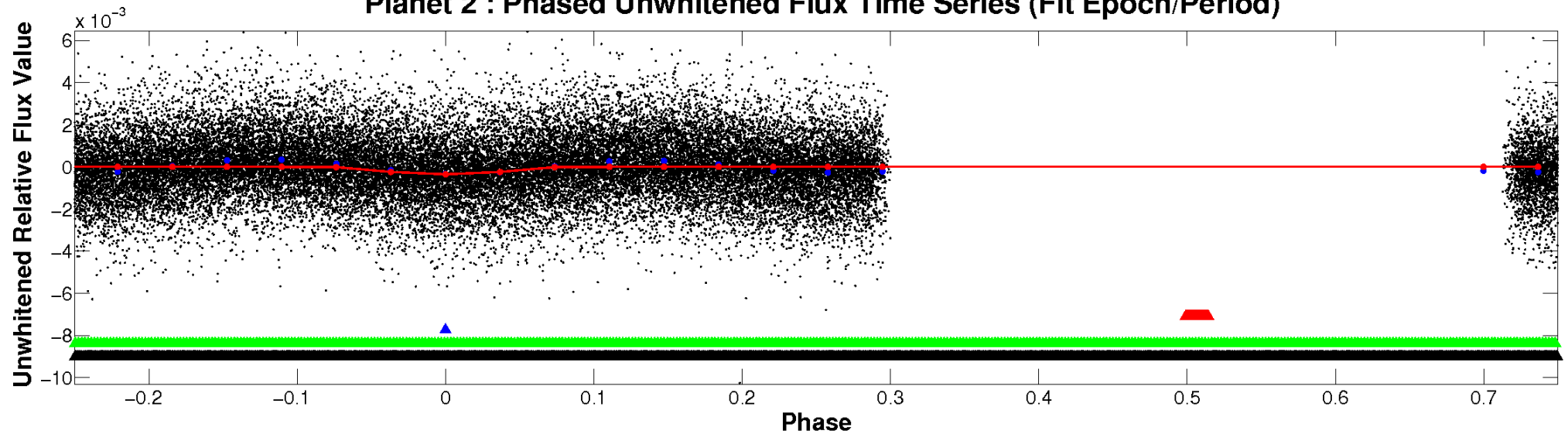
ALT Odd/Even

TCE 009171954-02

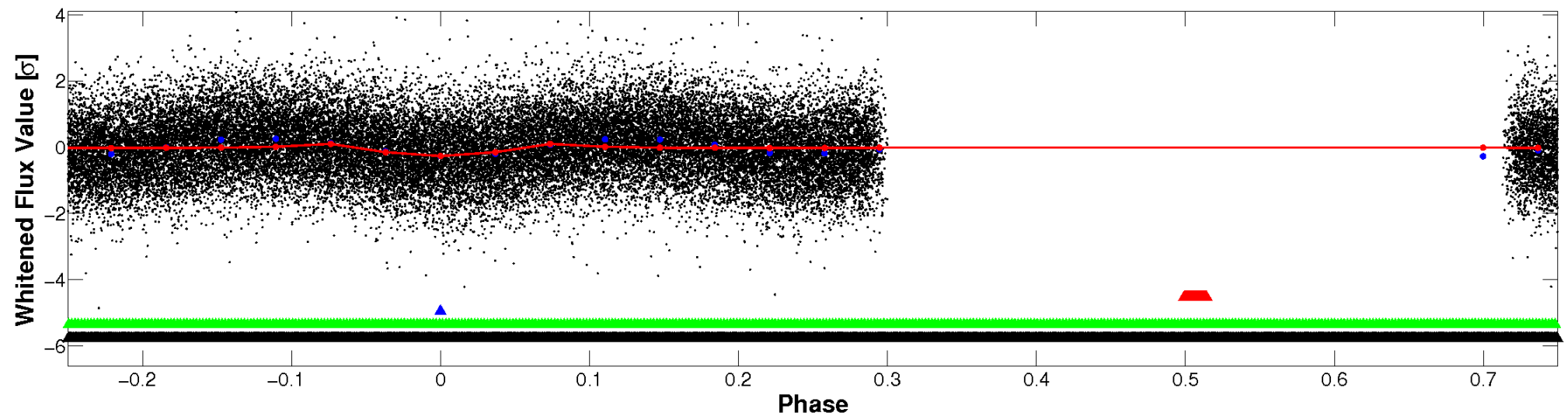


Non-Whitened Vs. Whitened Light Curve

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

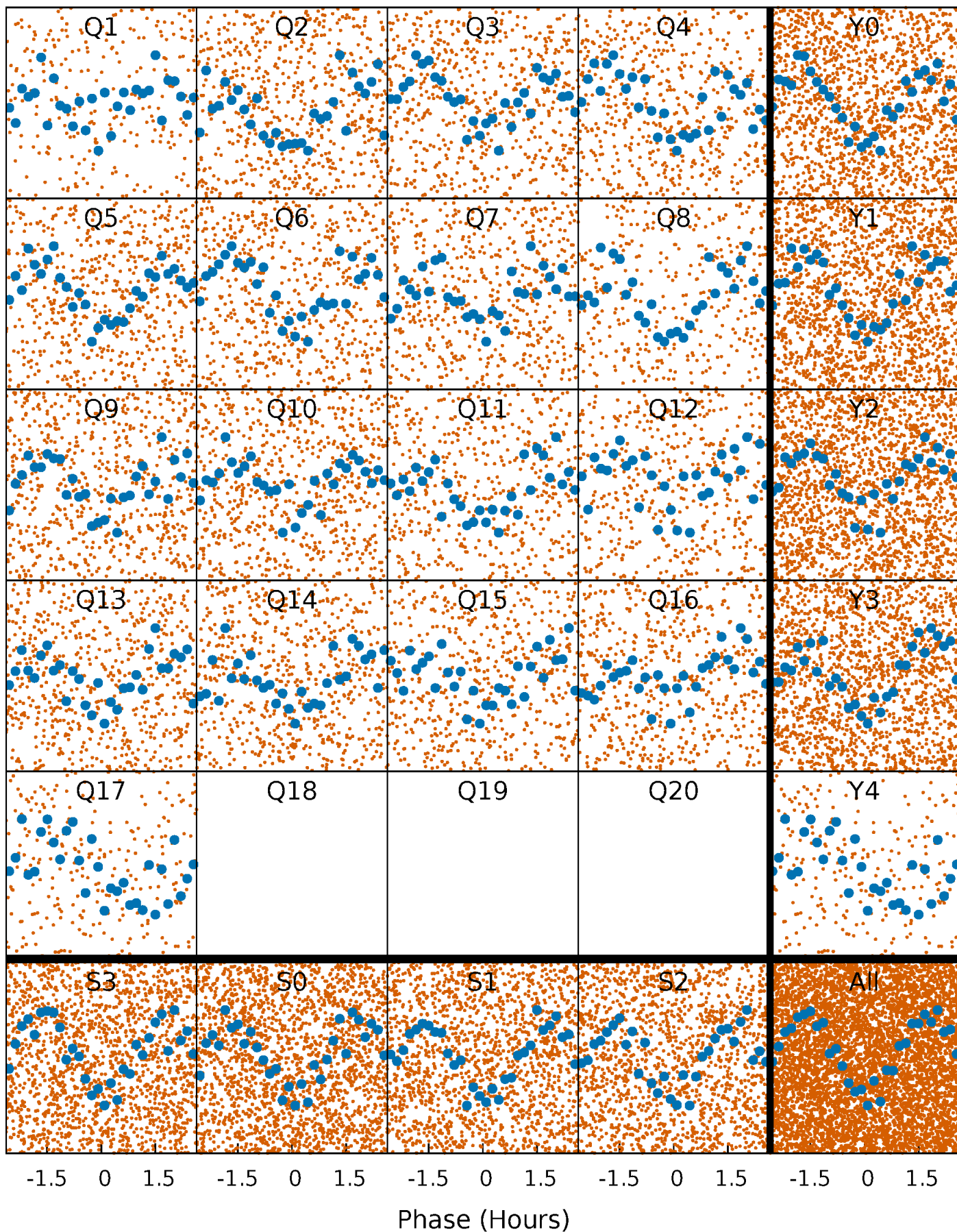


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



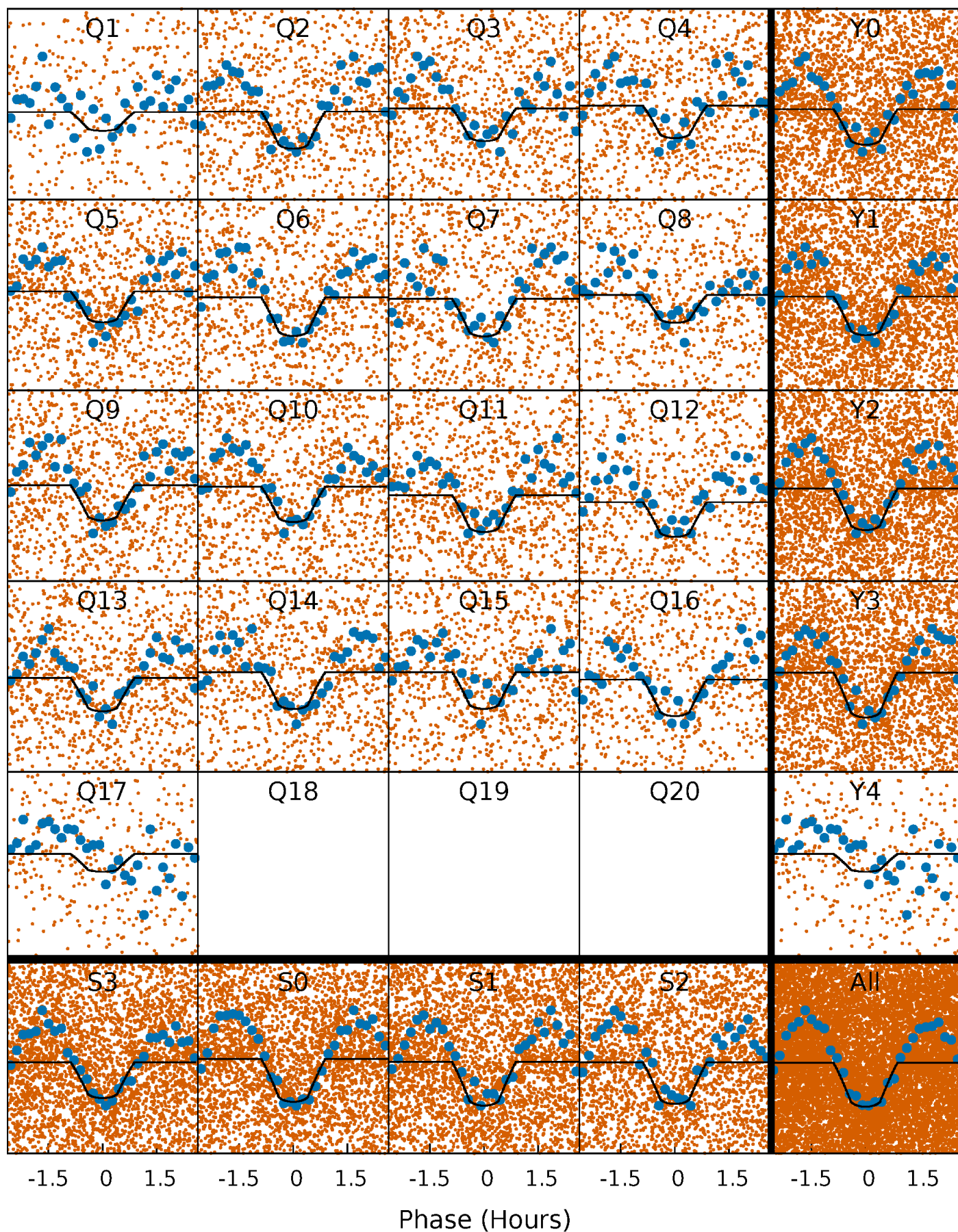
PDC Quarter-Phased Transit Curves

TCE 009171954-02 P= 0.554742 Days $T_0=131.915668$ (BKJD)



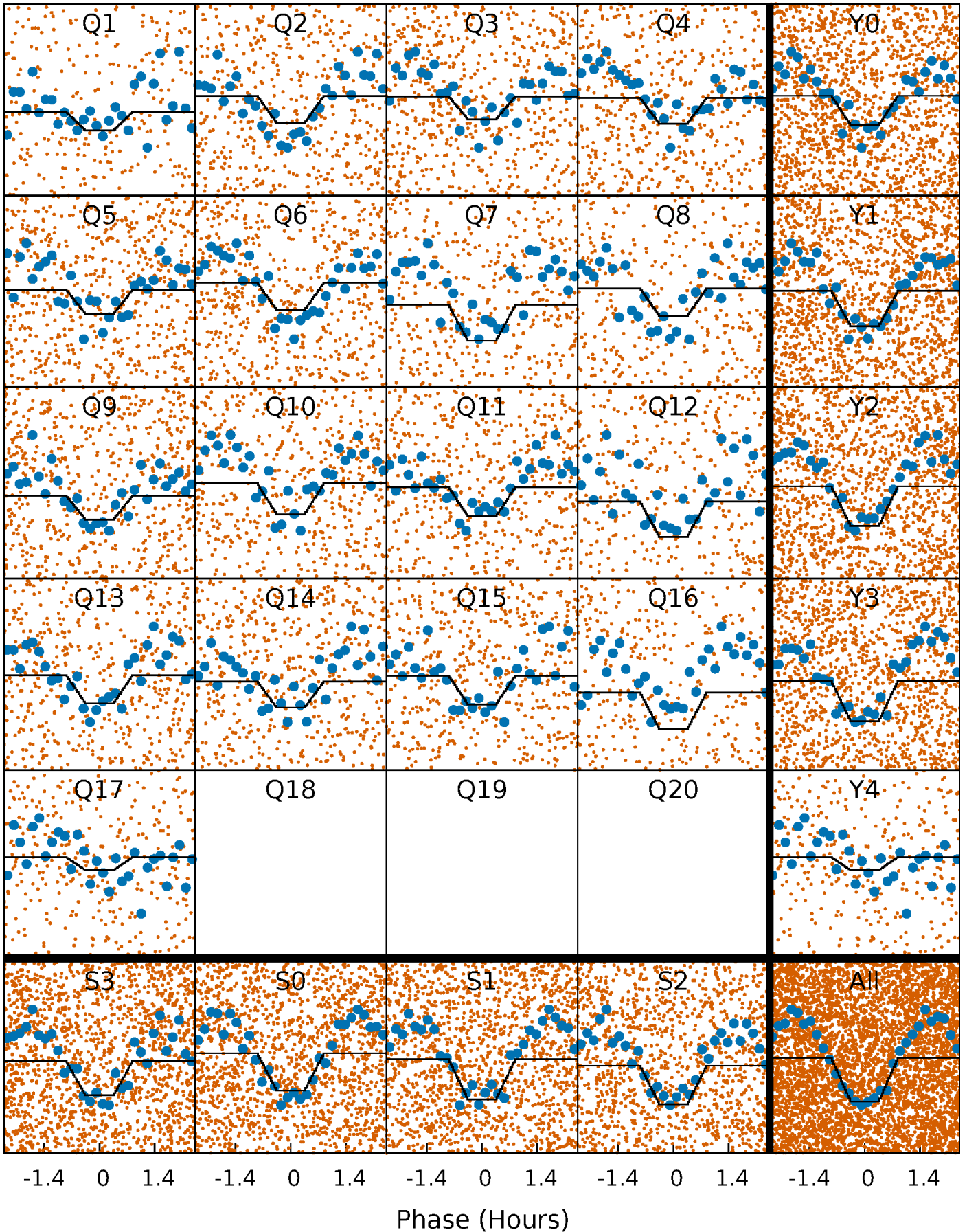
DV Quarter-Phased Transit Curves

TCE 009171954-02 P= 0.554742 Days $T_0=131.915668$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

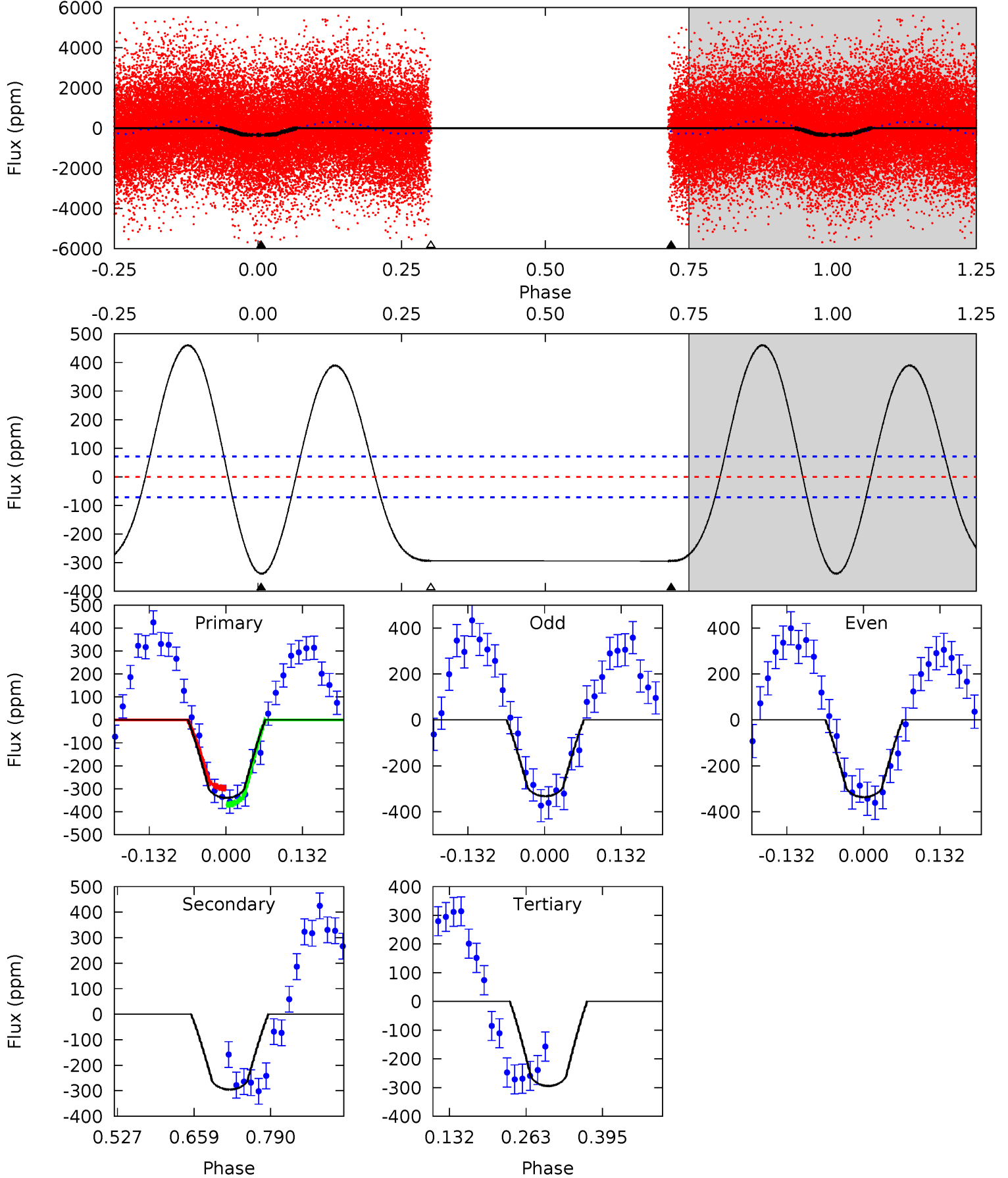
TCE 009171954-02 P= 0.554746 Days $T_0=131.915227$ (BKJD)



DV Model-Shift Uniqueness Test

009171954-02, P = 0.554742 Days, E = 131.360926 Days

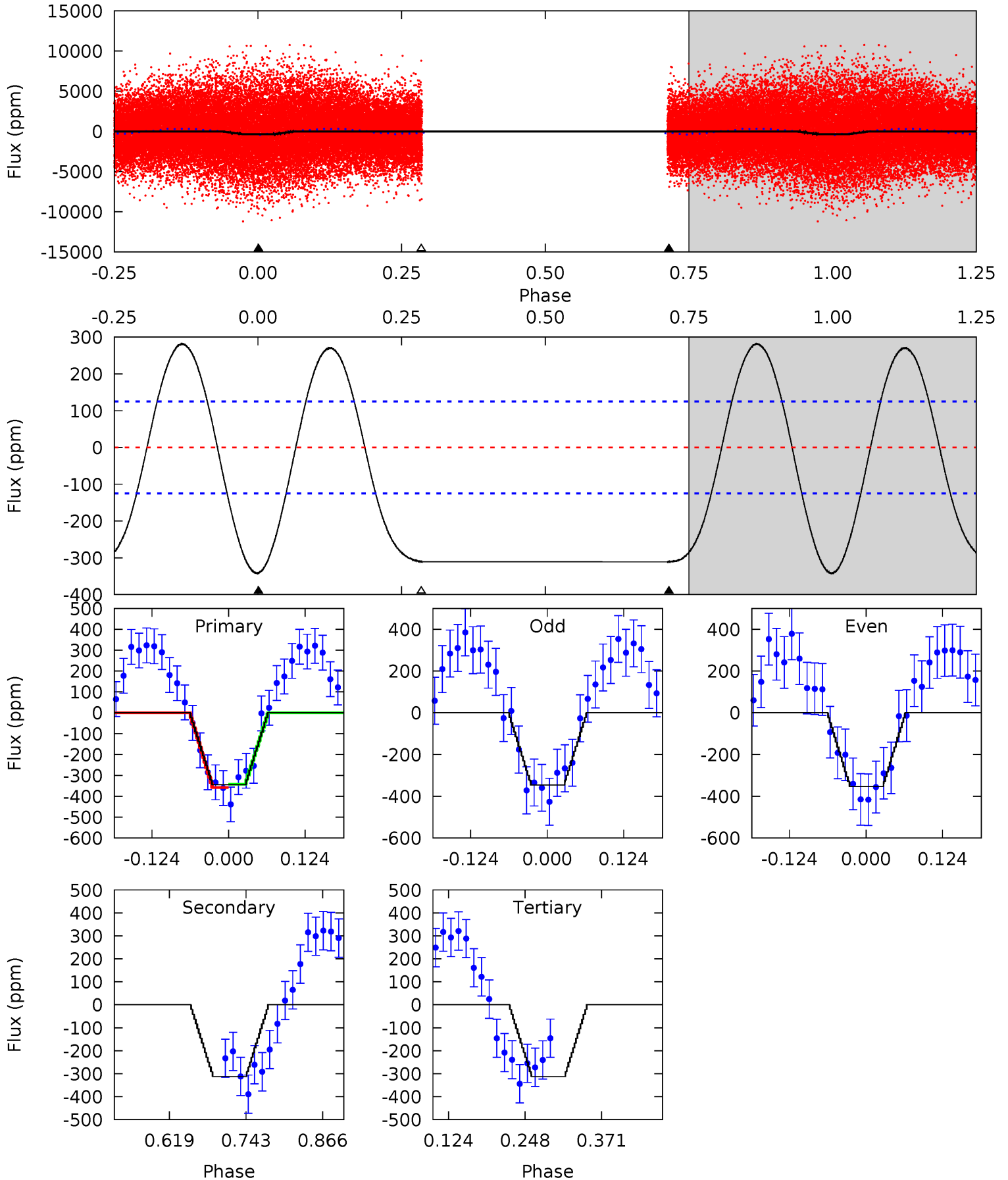
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 21.4 | 18.6 | 18.6 | 0 | 4.51 | 1.51 | 17.2 | 2.85 | 21.4 | 0.05 | 18.6 | 0.14 | 1.04 | 0.58 | 2.26 |



Alt Model-Shift Uniqueness Test

009171954-02, P = 0.554746 Days, E = 131.360481 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.5 | 11.3 | 11.3 | 0 | 4.52 | 1.54 | 8.35 | 1.16 | 12.5 | 0.00 | 11.3 | 0.13 | 0.77 | 0.45 | 0.25 |



Stellar Parameters For KIC 009171954

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 7694^{+213}_{-347} | $3.631^{+0.484}_{-0.085}$ | $-0.080^{+0.200}_{-0.350}$ | $3.627^{+0.615}_{-1.846}$ | $2.054^{+0.279}_{-0.557}$ | $0.061^{+0.338}_{-0.018}$ |
| | +3%/-5% | +13%/-2% | +250%/-438% | +17%/-51% | +14%/-27% | +558%/-29% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009171954-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|----------------------|------------------------|---------------------------|
| DV | -295 ± 16 | $6.08^{+2.20}_{-2.03}$ | 6679^{+525}_{-909} | 6961^{+1557}_{-1167} | $1.245^{+1.477}_{-0.562}$ |
| Alt. | -312 ± 28 | $6.52^{+2.11}_{-2.10}$ | 6714^{+523}_{-852} | 6823^{+1487}_{-1065} | $1.145^{+1.174}_{-0.487}$ |

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 $A_{obs} \gg 1.0$

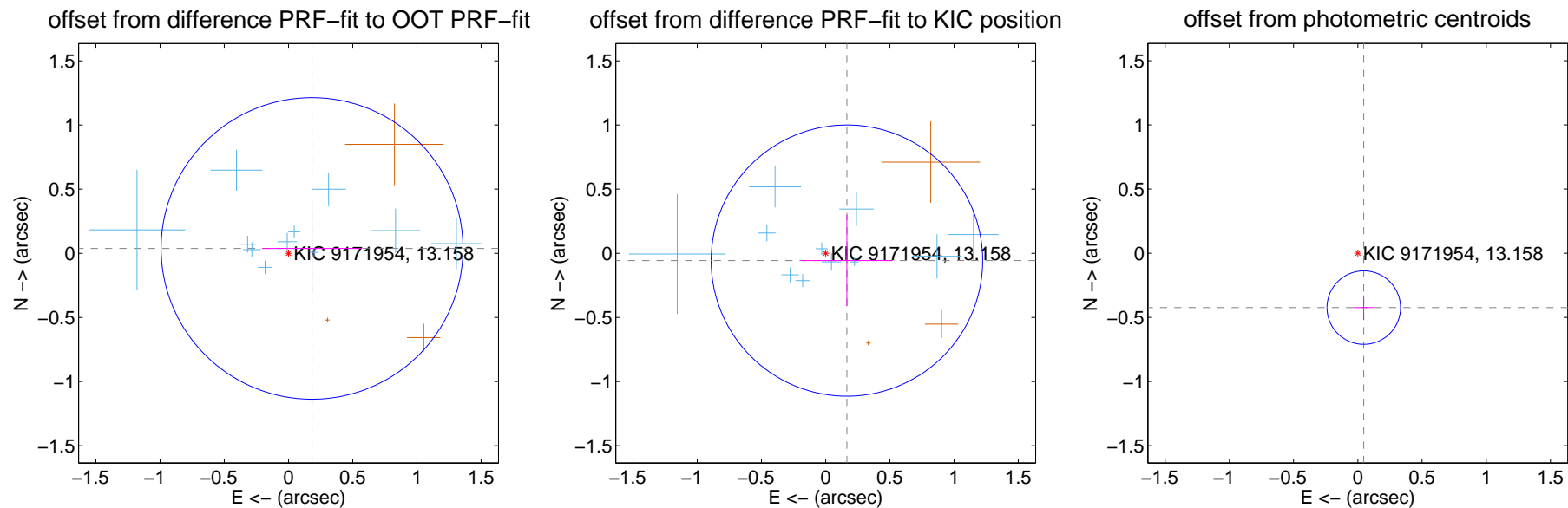
DV Centroid Data

Supplemental centroid analysis for 009171954-02. Kepler magnitude: 13.16. Transit SNR 19.46

There are 11 quarters with good PRF difference image offsets

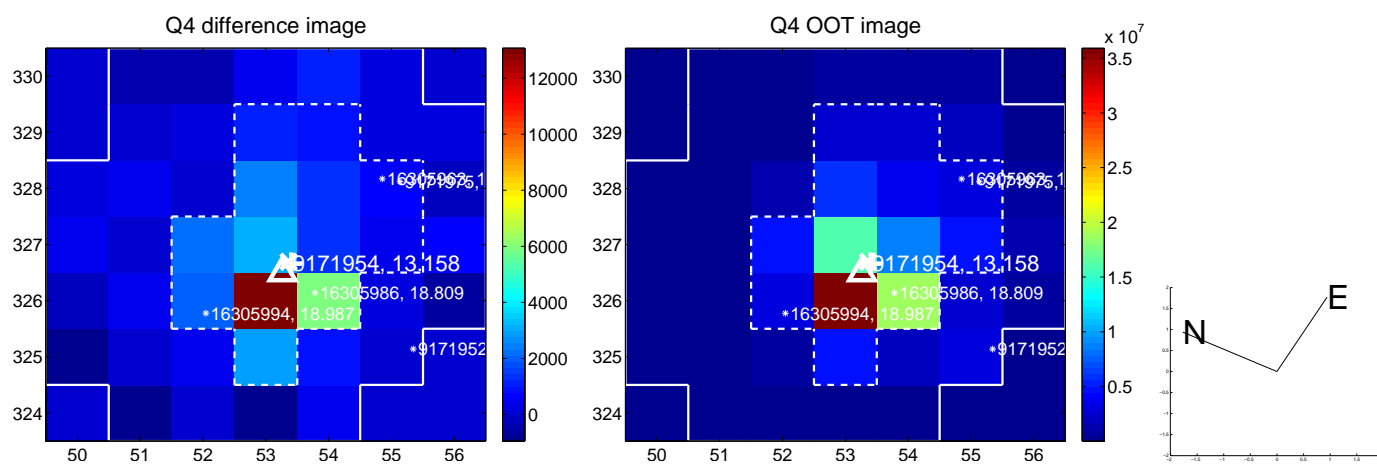
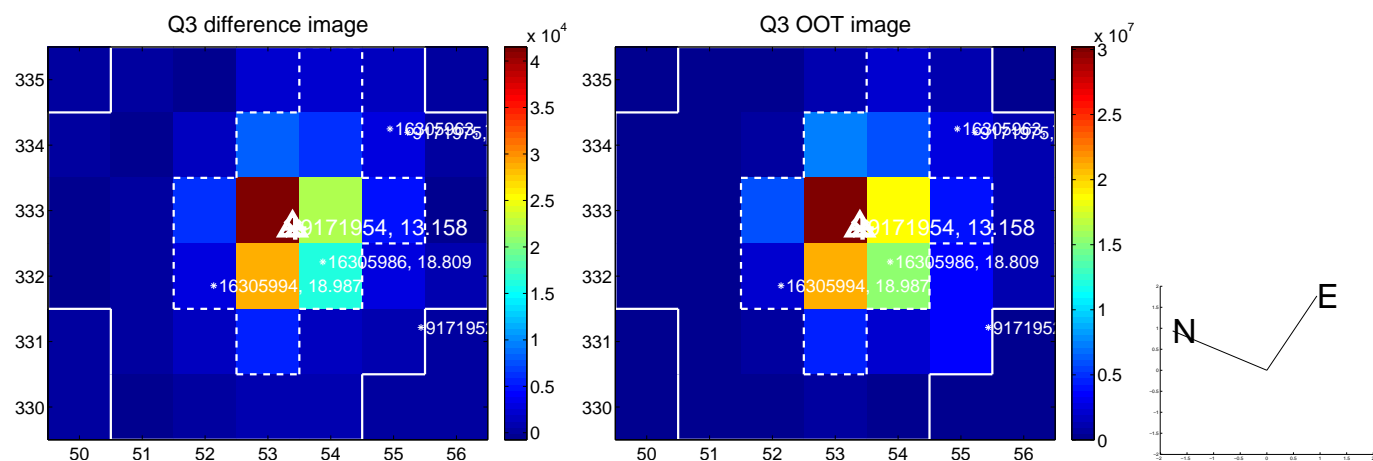
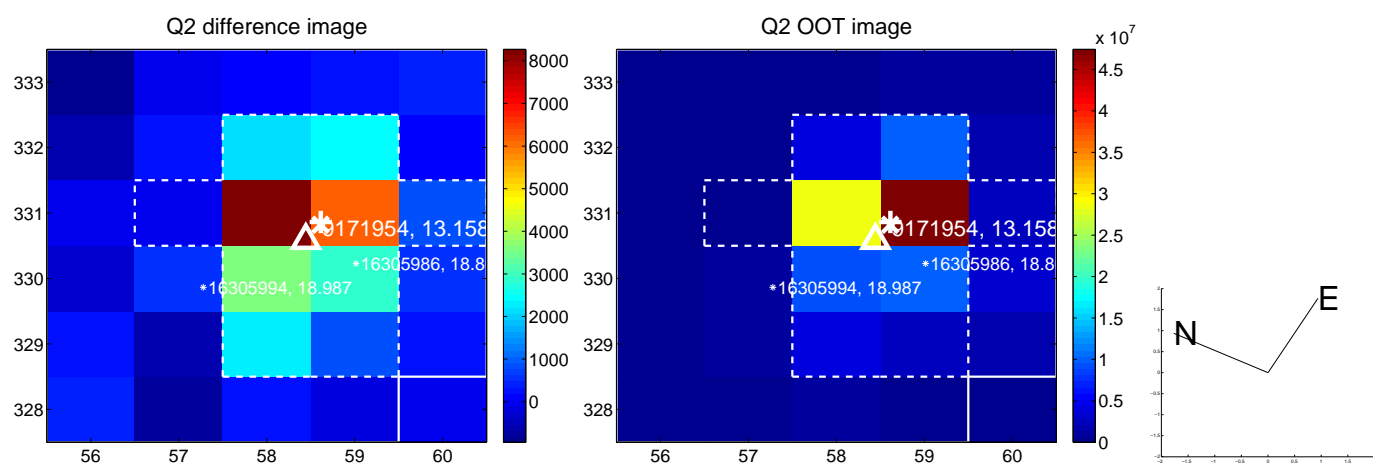
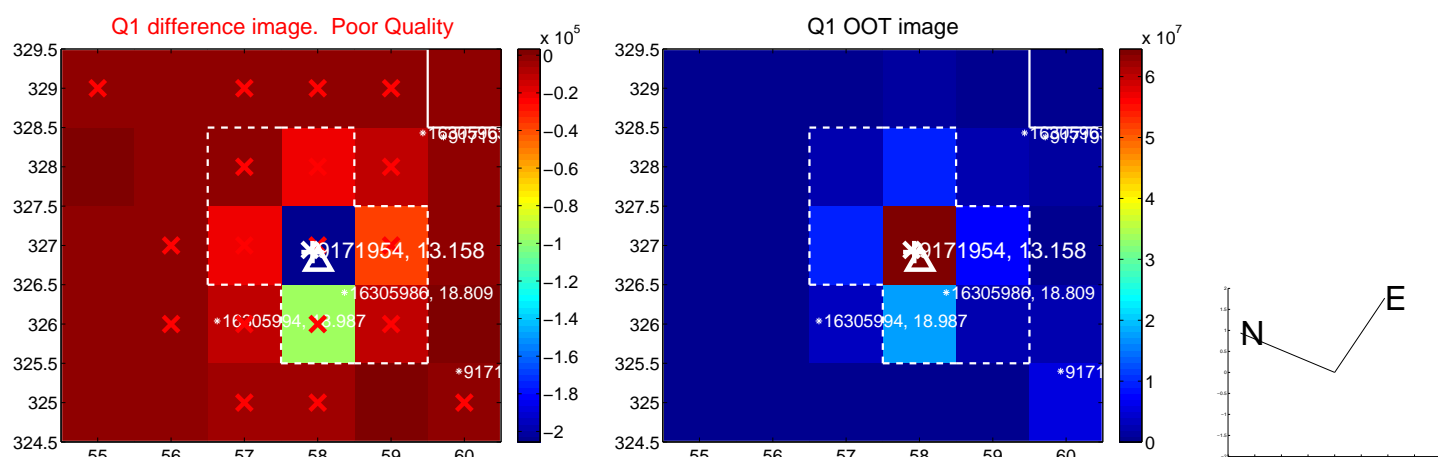
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.187 ± 0.392 | 0.48 | -0.183 ± 0.388 | 0.038 ± 0.356 |
| PRF-fit source offset from KIC position | 0.175 ± 0.352 | 0.50 | -0.165 ± 0.355 | -0.057 ± 0.355 |
| photometric centroid source offset | 0.43 ± 0.10 | 4.47 | -0.05 ± 0.08 | -0.42 ± 0.10 |

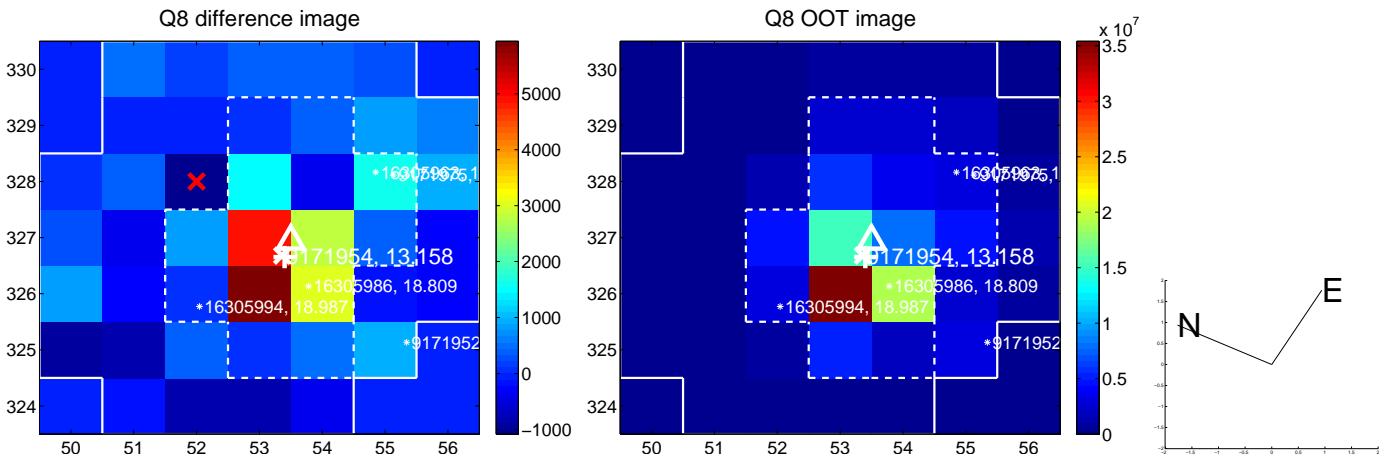
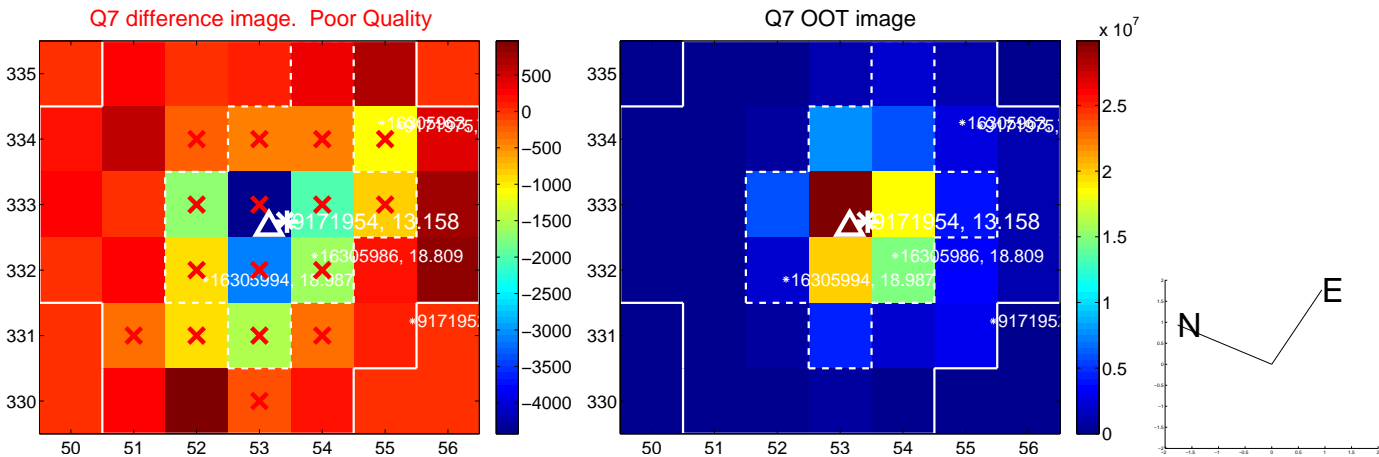
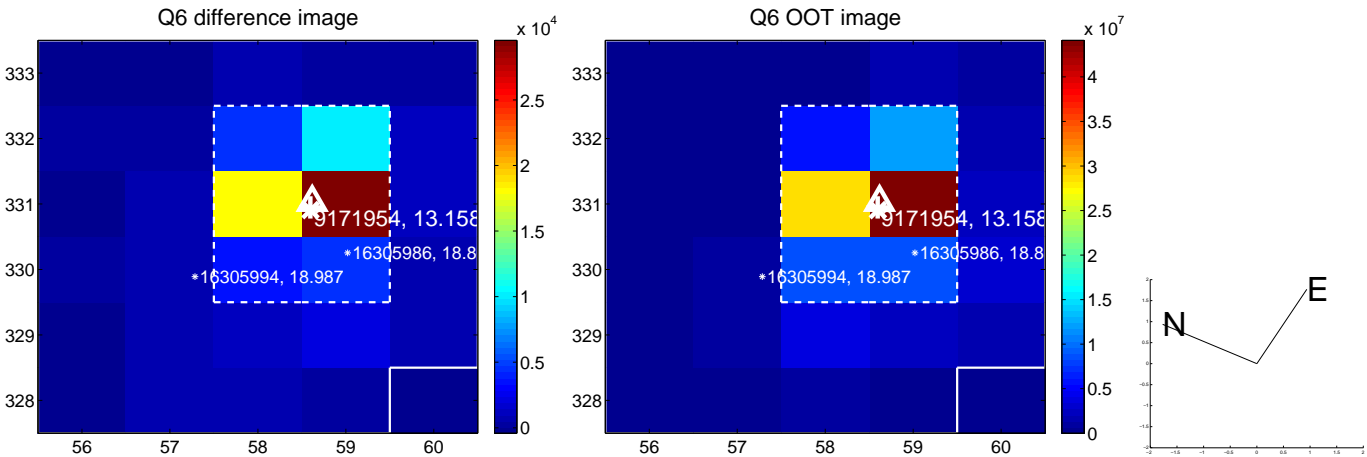
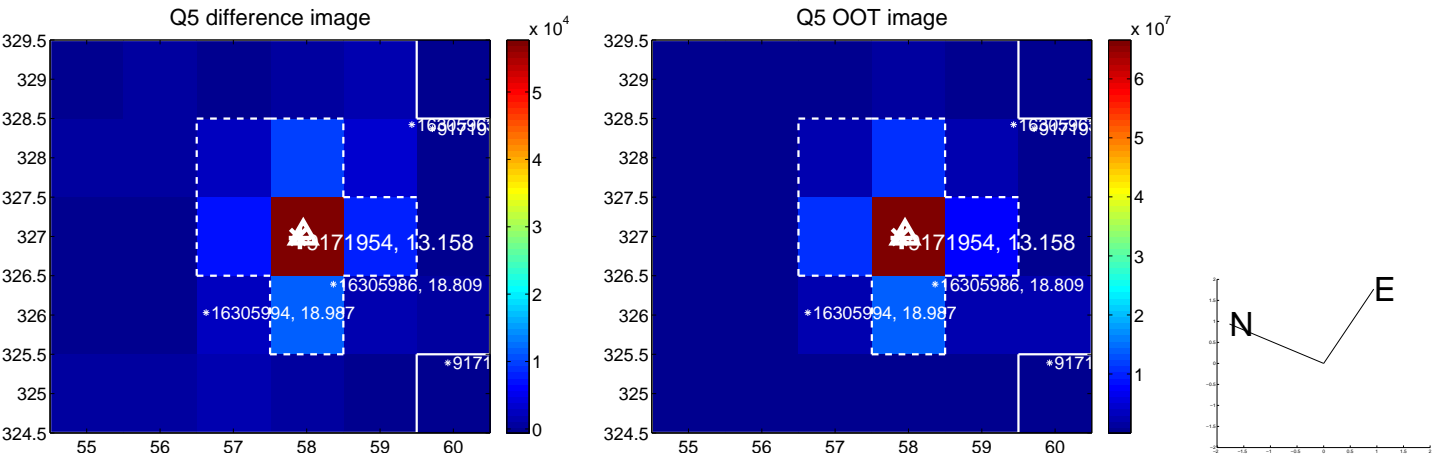


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

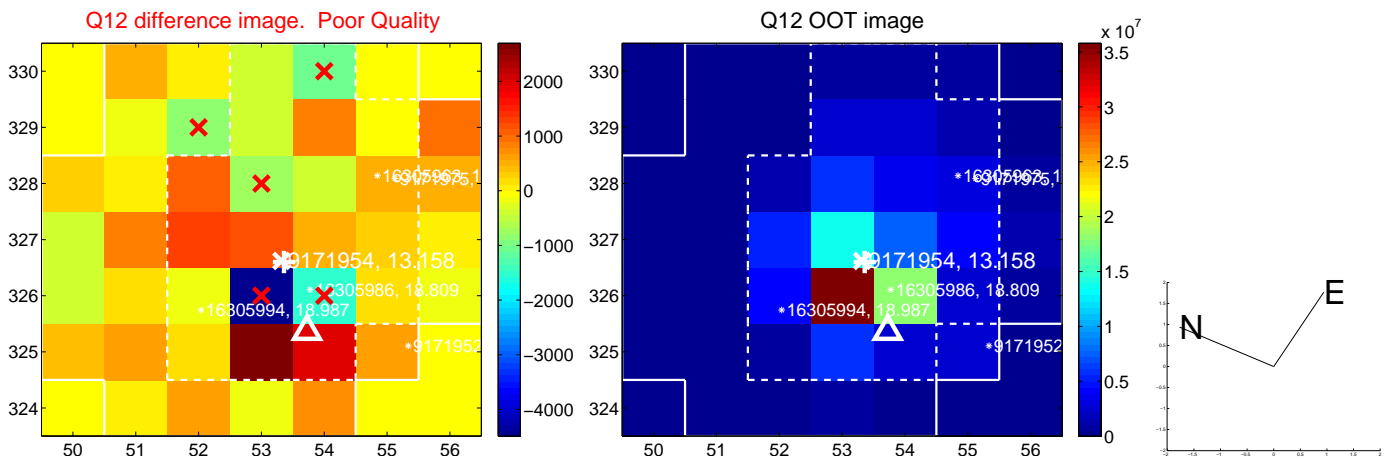
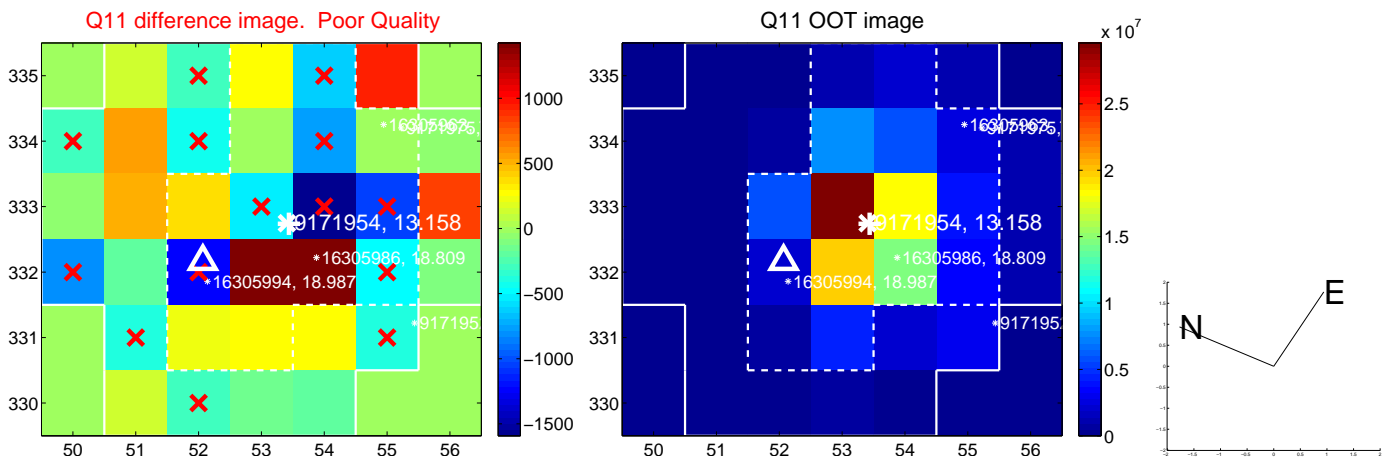
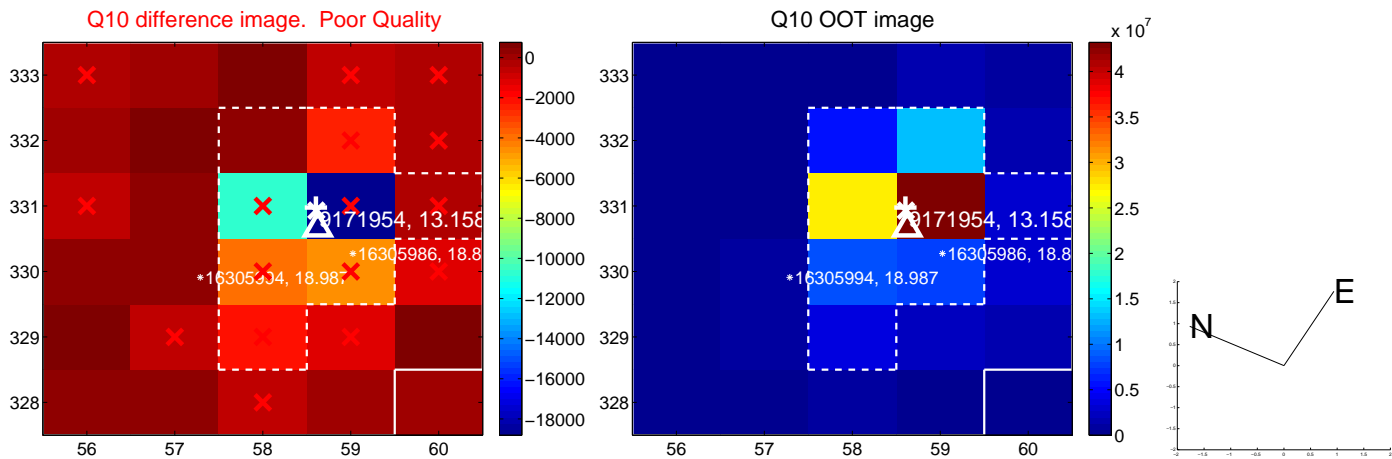
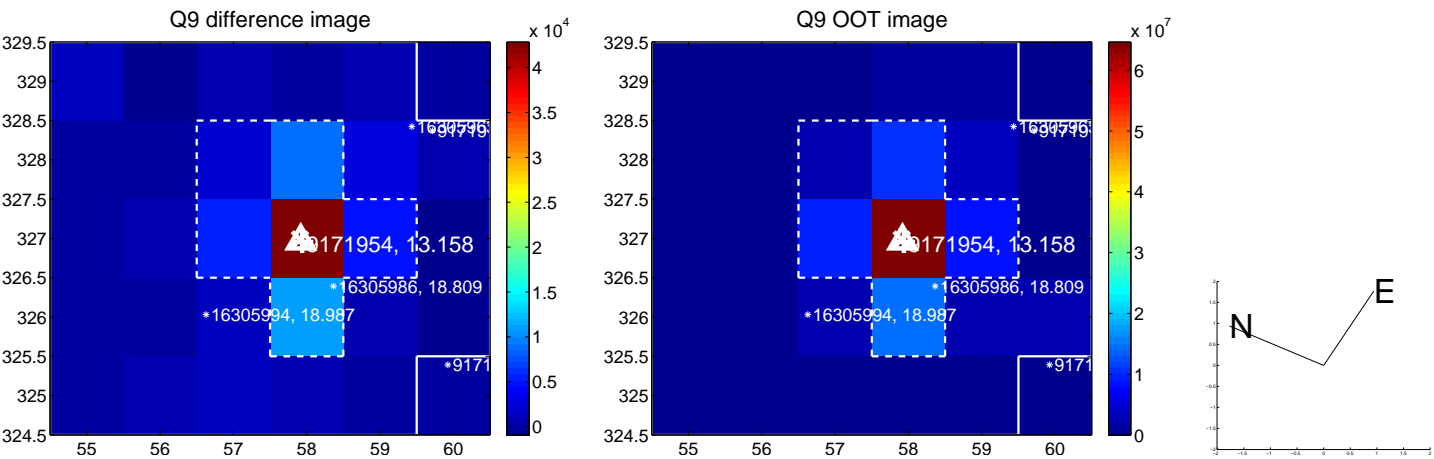
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



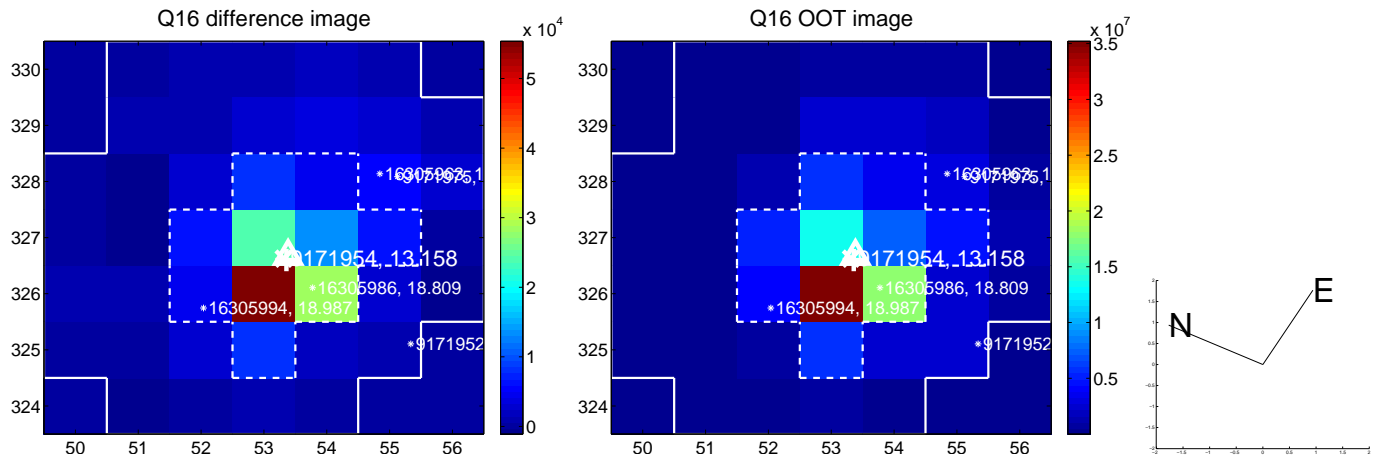
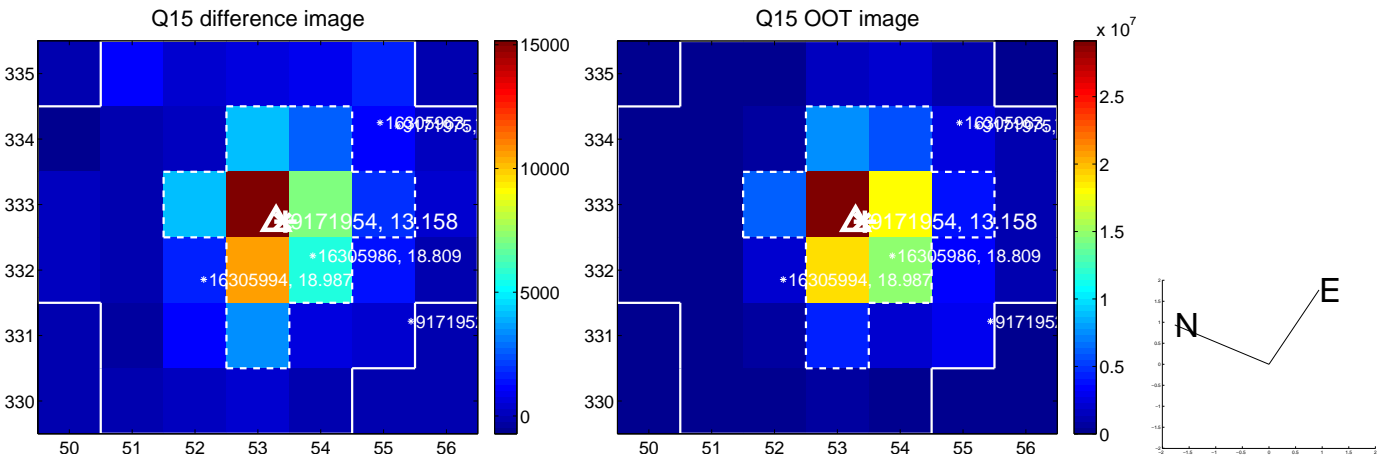
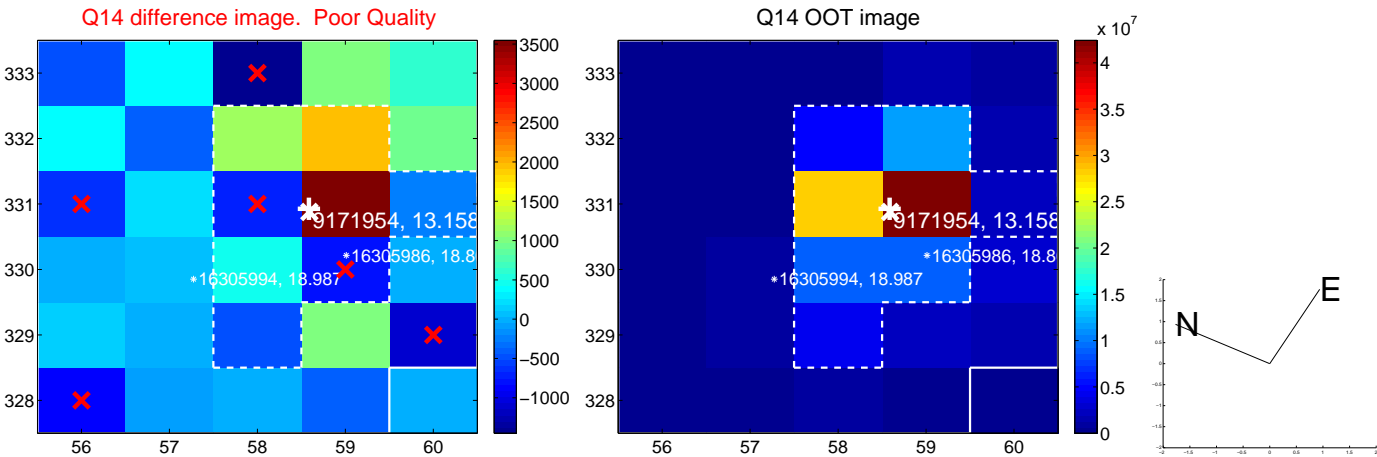
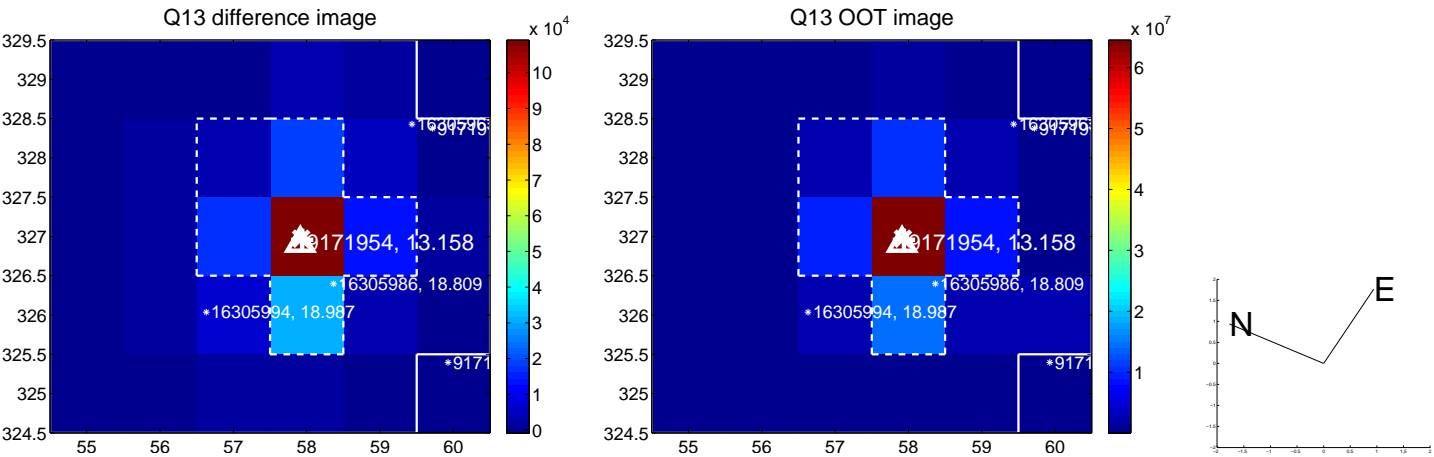
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



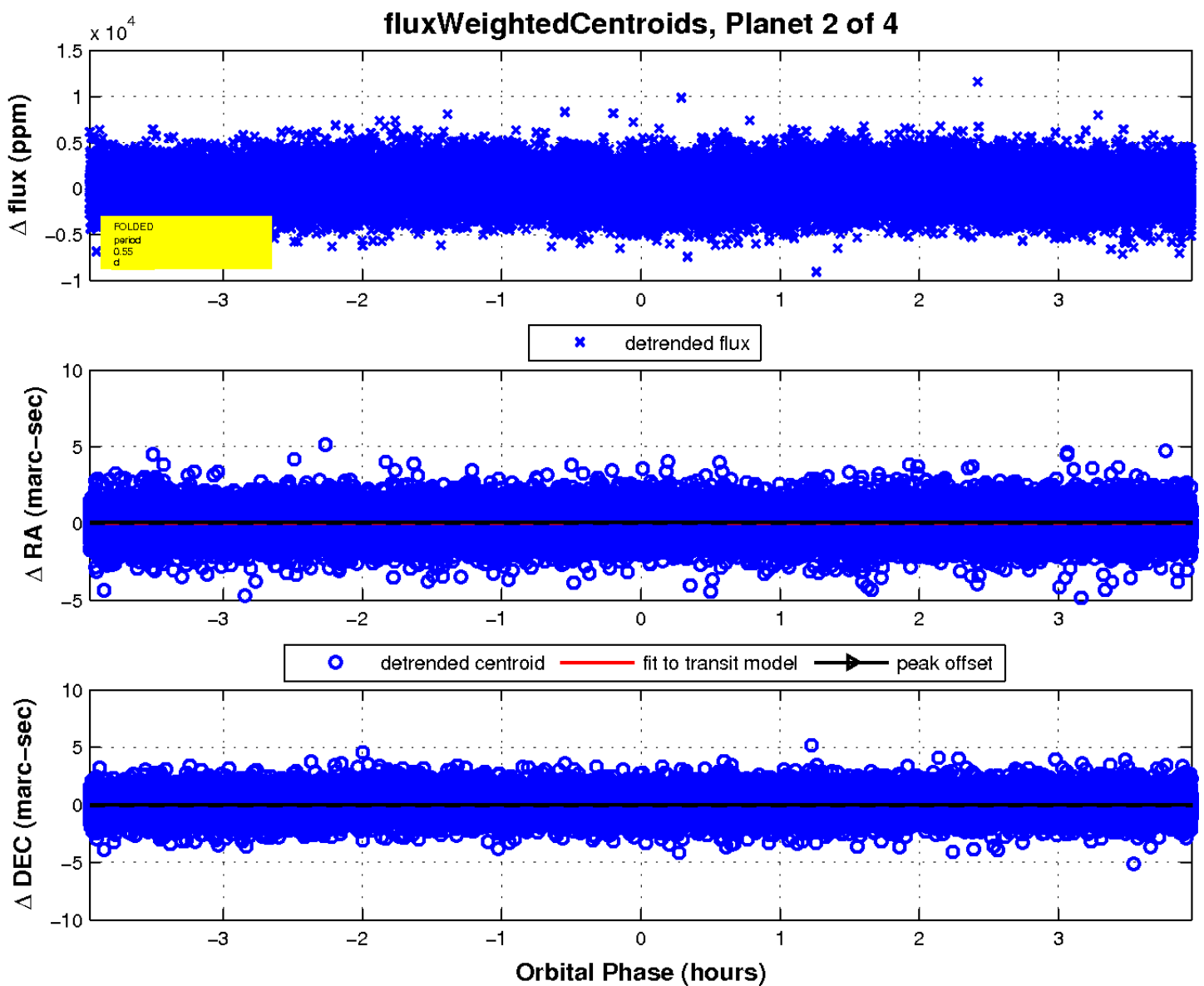
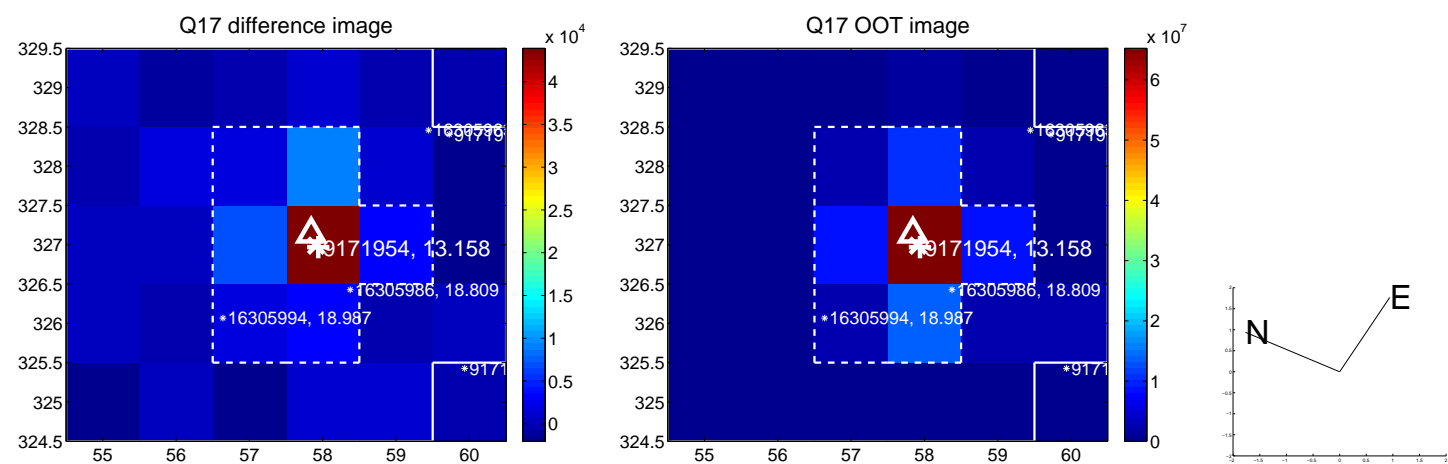
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

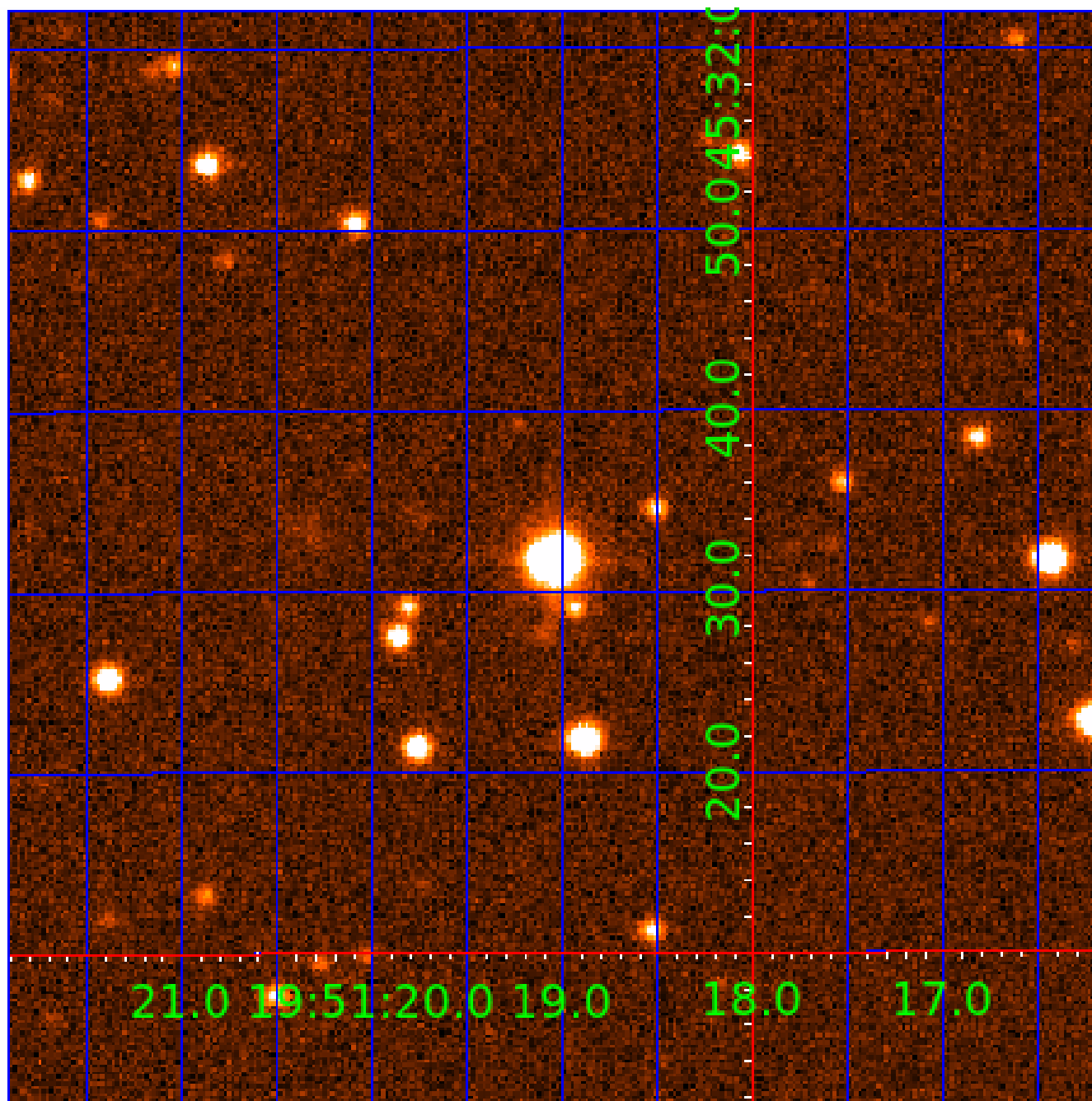


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009171954

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009171954-01 | OBS | No | 0.554746 | 131.637783 | 330.0 | 1.733 | 17.3 | 17.6 | 3.63 | 7694 | 7.68 | 0.00 |
| 009171954-02 | OBS | No | 0.554743 | 131.915668 | 355.2 | 1.320 | 17.7 | 19.5 | 3.63 | 7694 | 6.98 | 0.00 |
| 009171954-03 | OBS | No | 1.693989 | 131.824728 | 836.4 | 3.471 | 11.7 | 13.9 | 3.63 | 7694 | 12.22 | 33061.37 |
| 009171954-04 | OBS | No | 0.846969 | 131.609952 | 220.6 | 2.500 | 9.5 | -1.0 | 3.63 | 7694 | 5.45 | 83312.72 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009171954-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD |
| 009171954-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS |

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

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

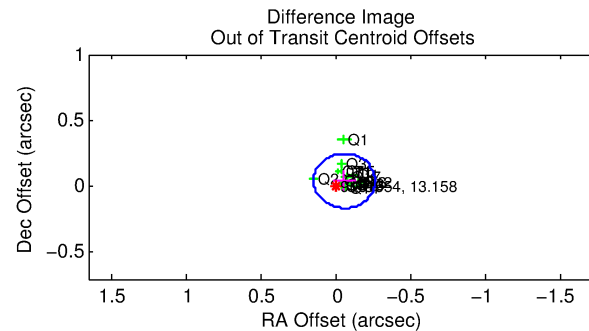
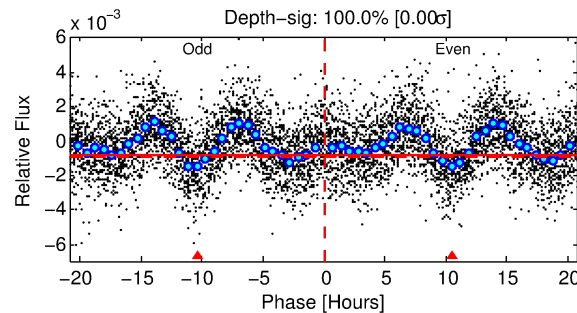
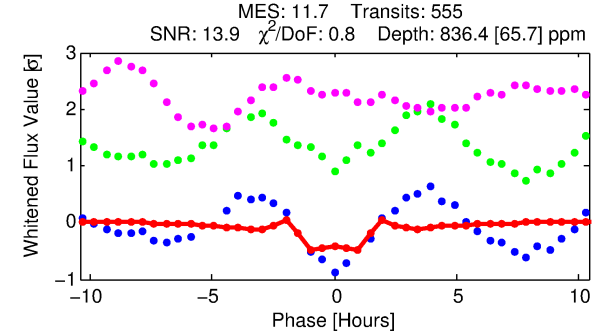
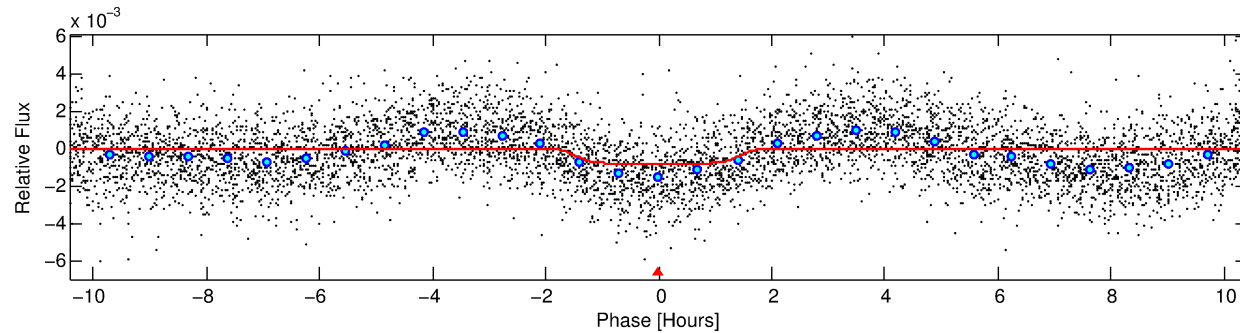
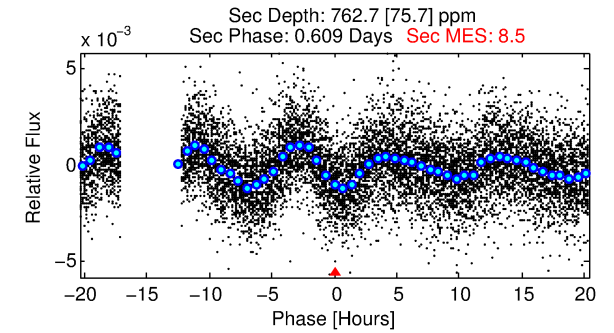
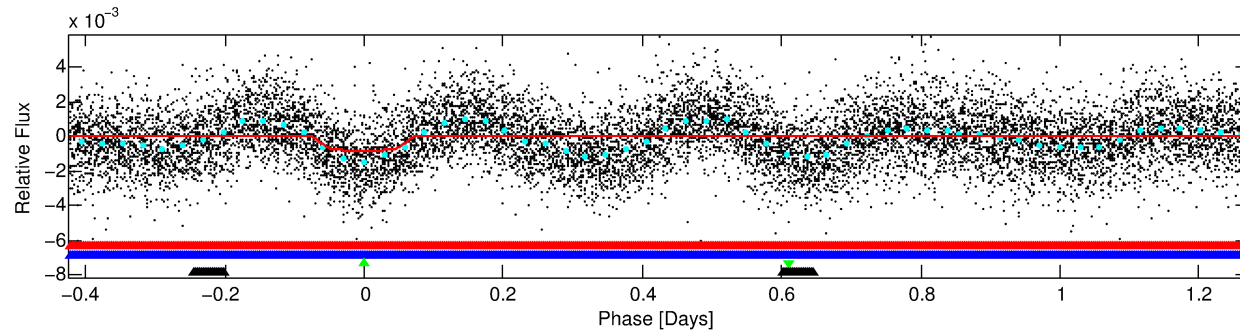
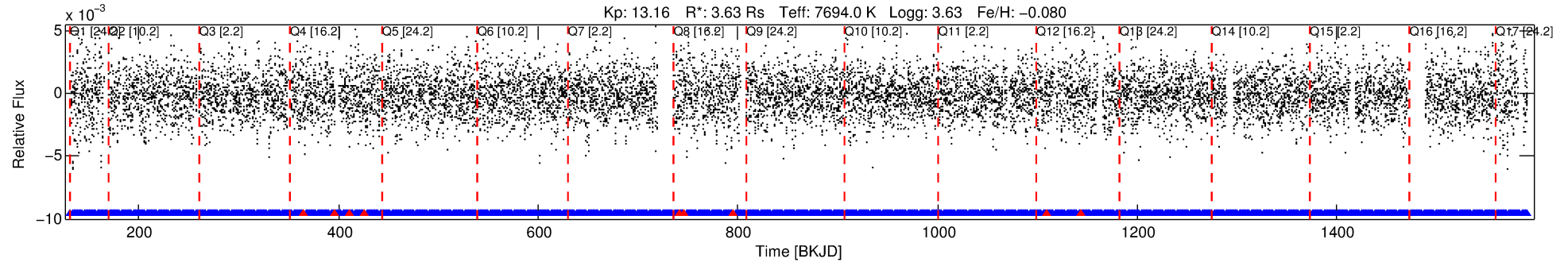
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009171954-03

No Significant Match Found

DV One-Page Summary

KIC: 9171954 Candidate: 3 of 4 Period: 1.694 d



DV Fit Results:

Period = 1.69399 [0.00001] d
Epoch = 131.8247 [0.0022] BKJD
Rp/R* = 0.0309 [0.0022]
a/R* = 2.10 [0.54]
b = 0.90 [0.07]
Seff = 33061.37 [27654.69]
Teq = 3438 [719] K
Rp = 12.22 [6.28] Re
a = 0.0353 [0.0178] AU
Ag = 3.51 [2.93] [0.86σ]
Teffp = 7276 [456] K [4.51σ]

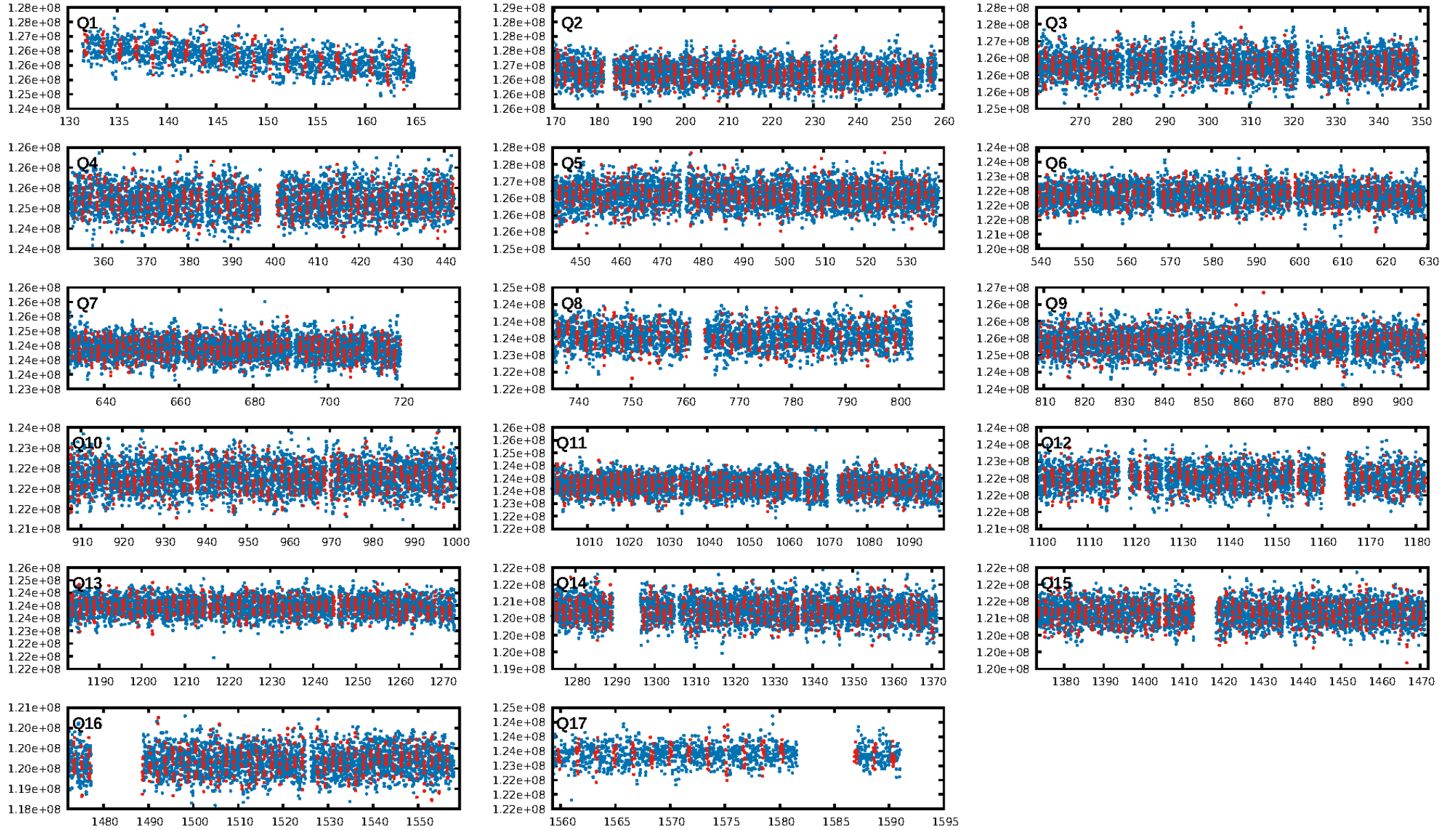
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.75σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [525/534]
GhostDiagnostic-chr: -14.64
Centroid-sig: 0.0%
Centroid-so: 0.593 arcsec [11.76σ]
OotOffset-rm: 0.073 arcsec [1.07σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.014 arcsec [0.18σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

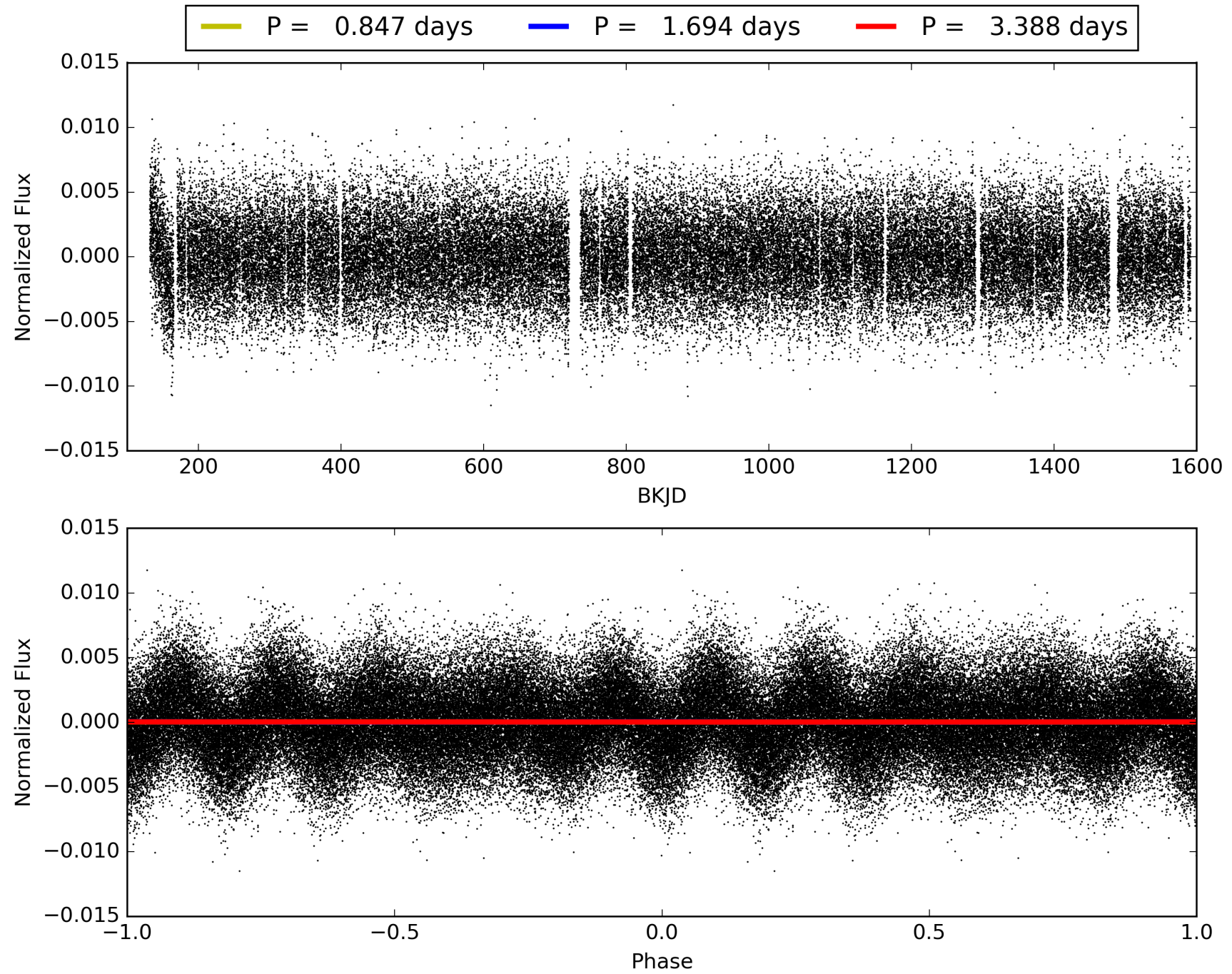
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:42:53 Z

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

TCE 009171954-03, PDC Light Curves

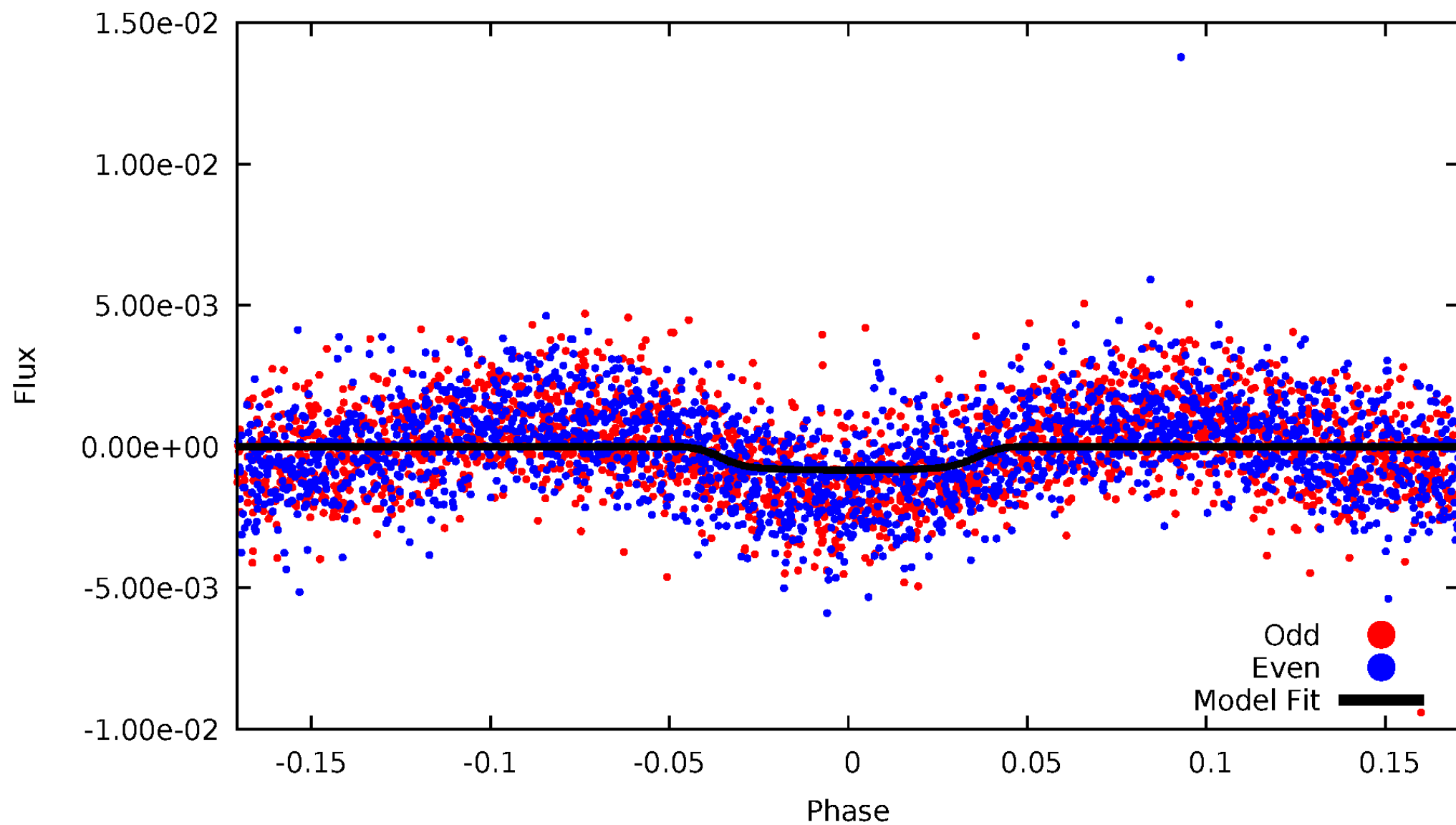


TCE 009171954-03



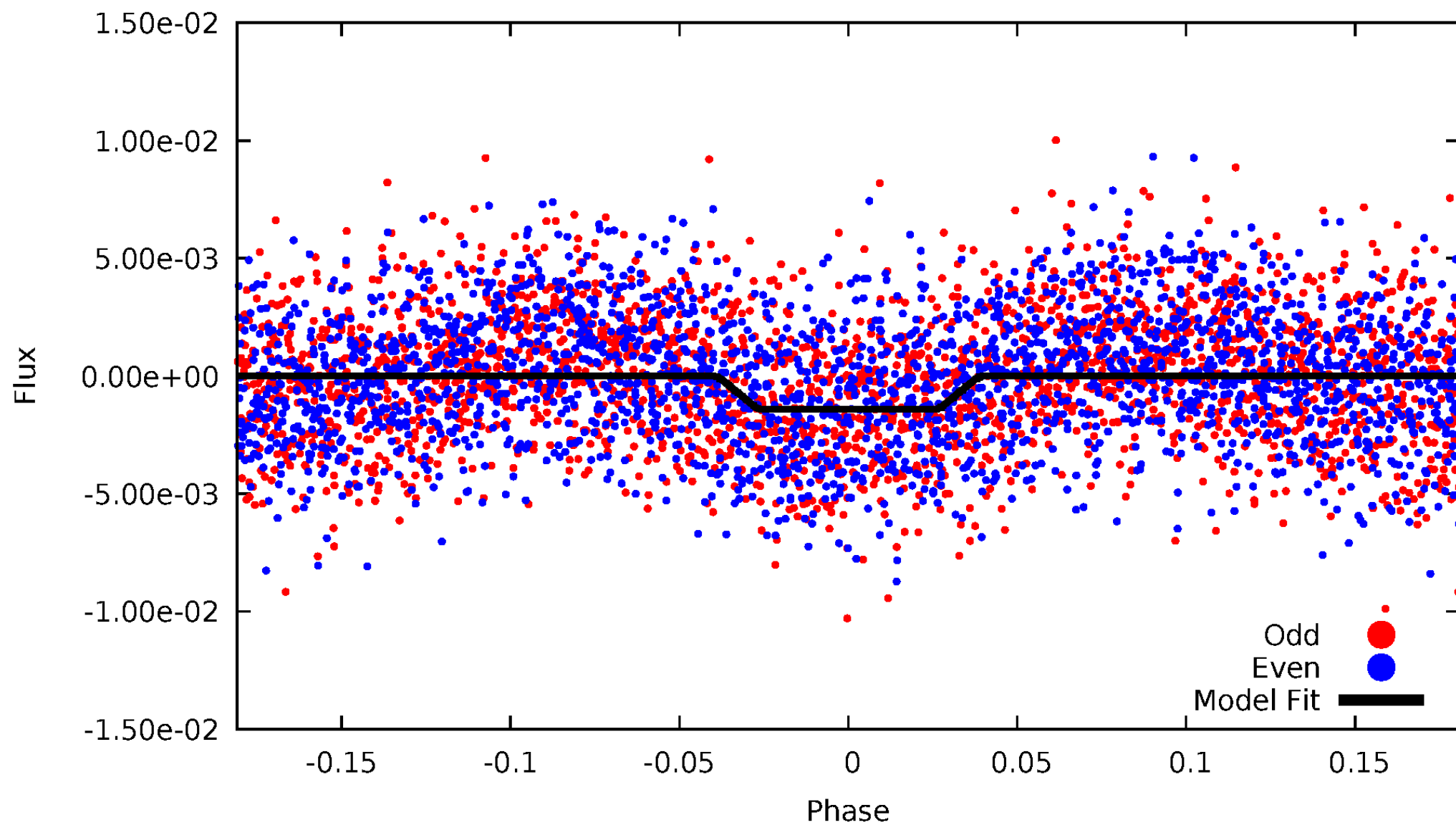
DV Odd/Even

TCE 009171954-03

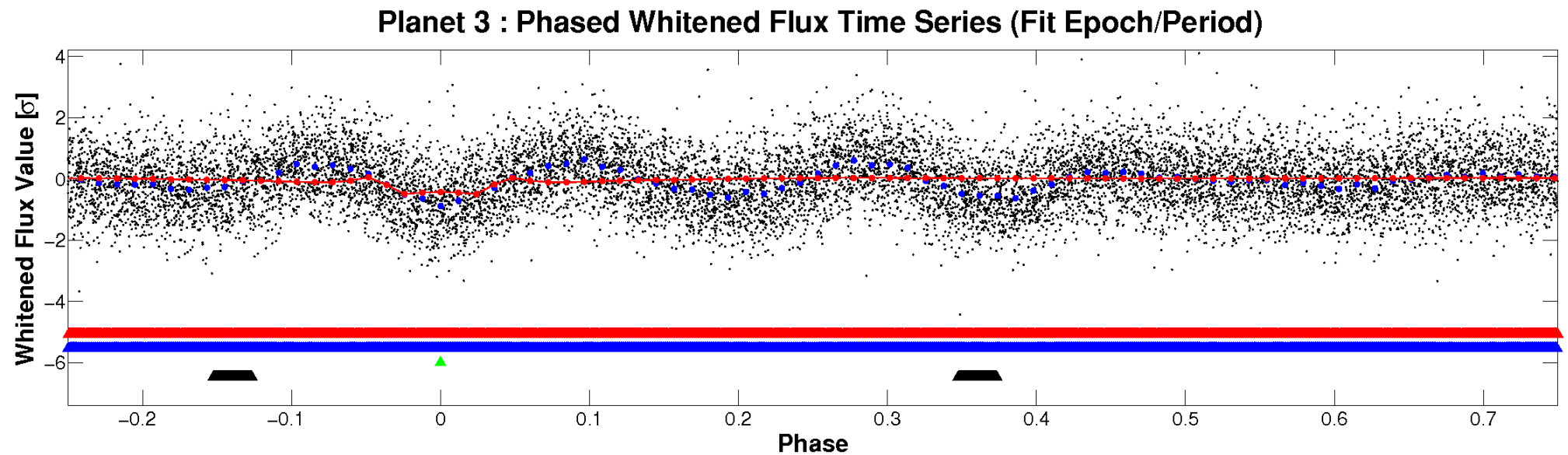
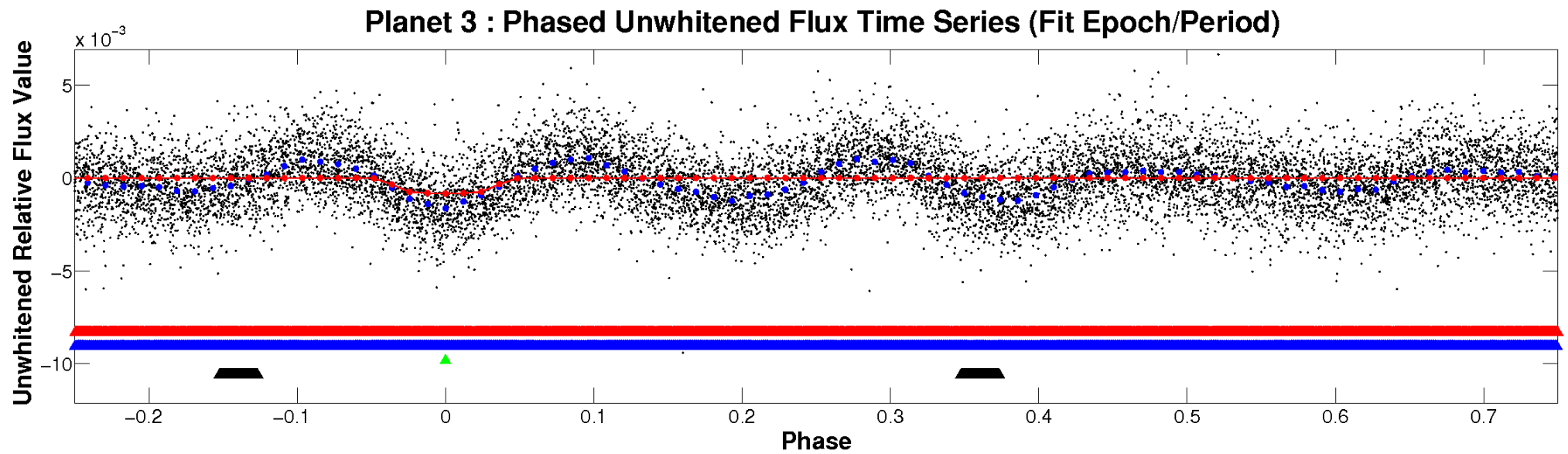


ALT Odd/Even

TCE 009171954-03

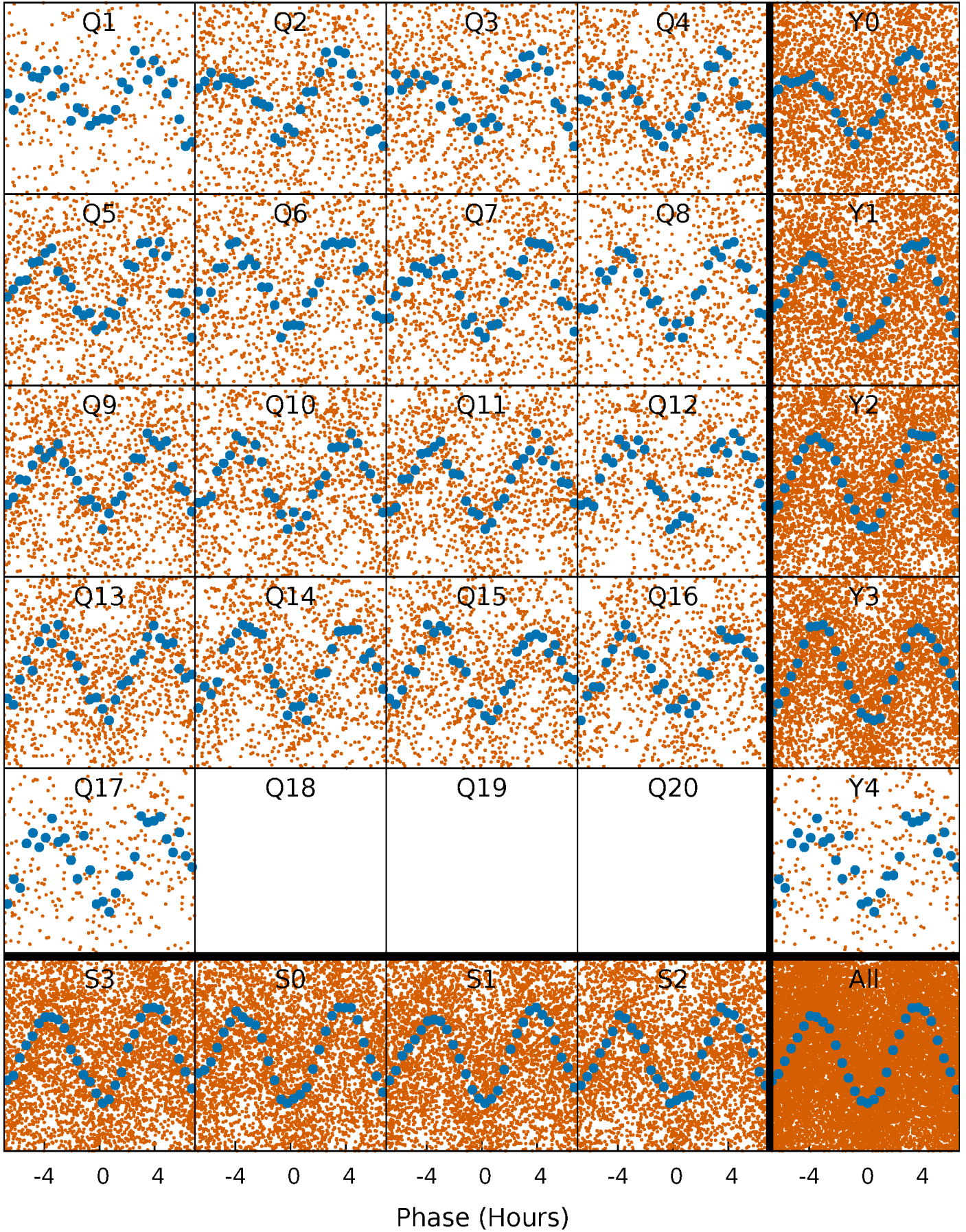


Non-Whitened Vs. Whitened Light Curve



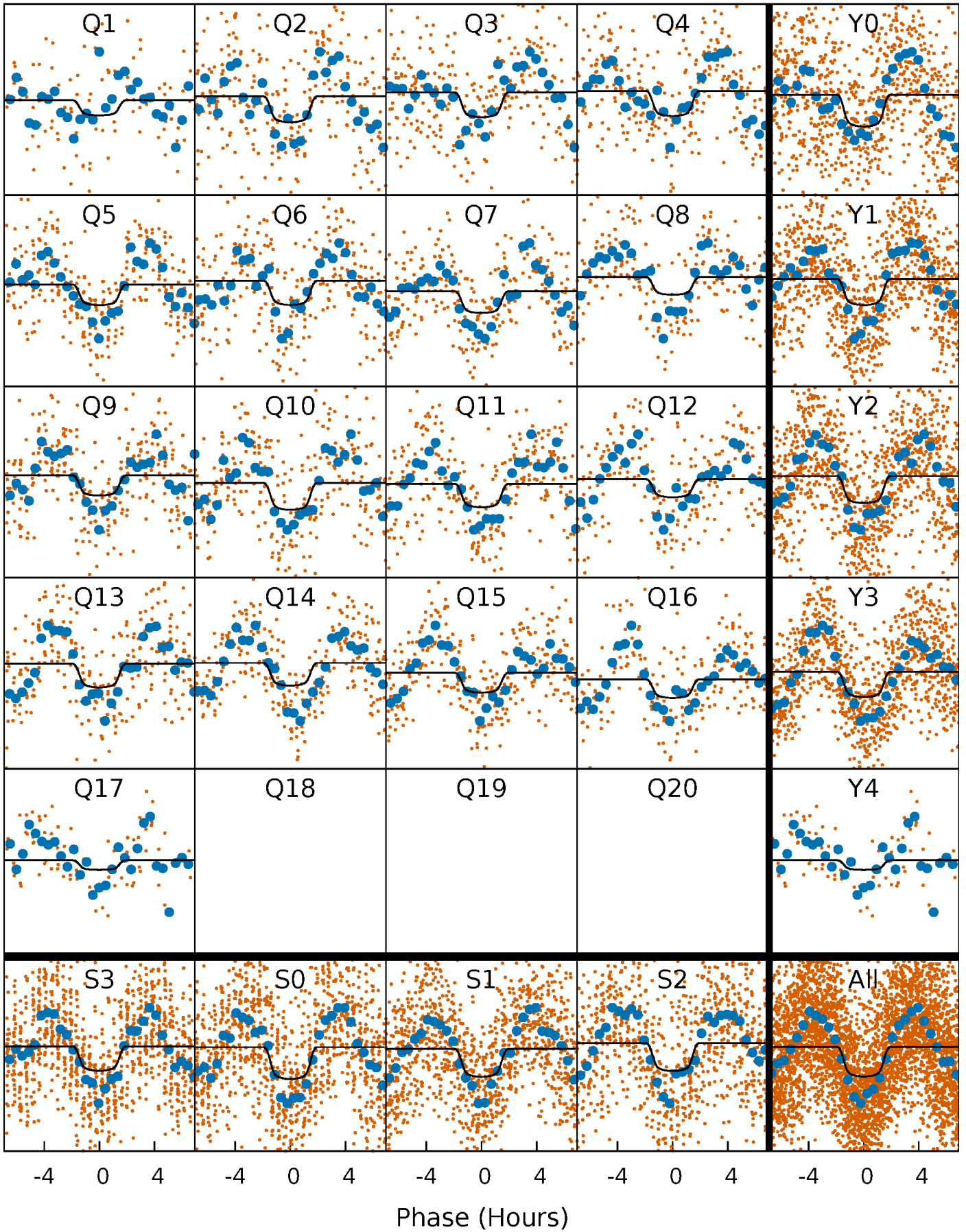
PDC Quarter-Phased Transit Curves

TCE 009171954-03 P= 1.693989 Days $T_0=131.824728$ (BKJD)



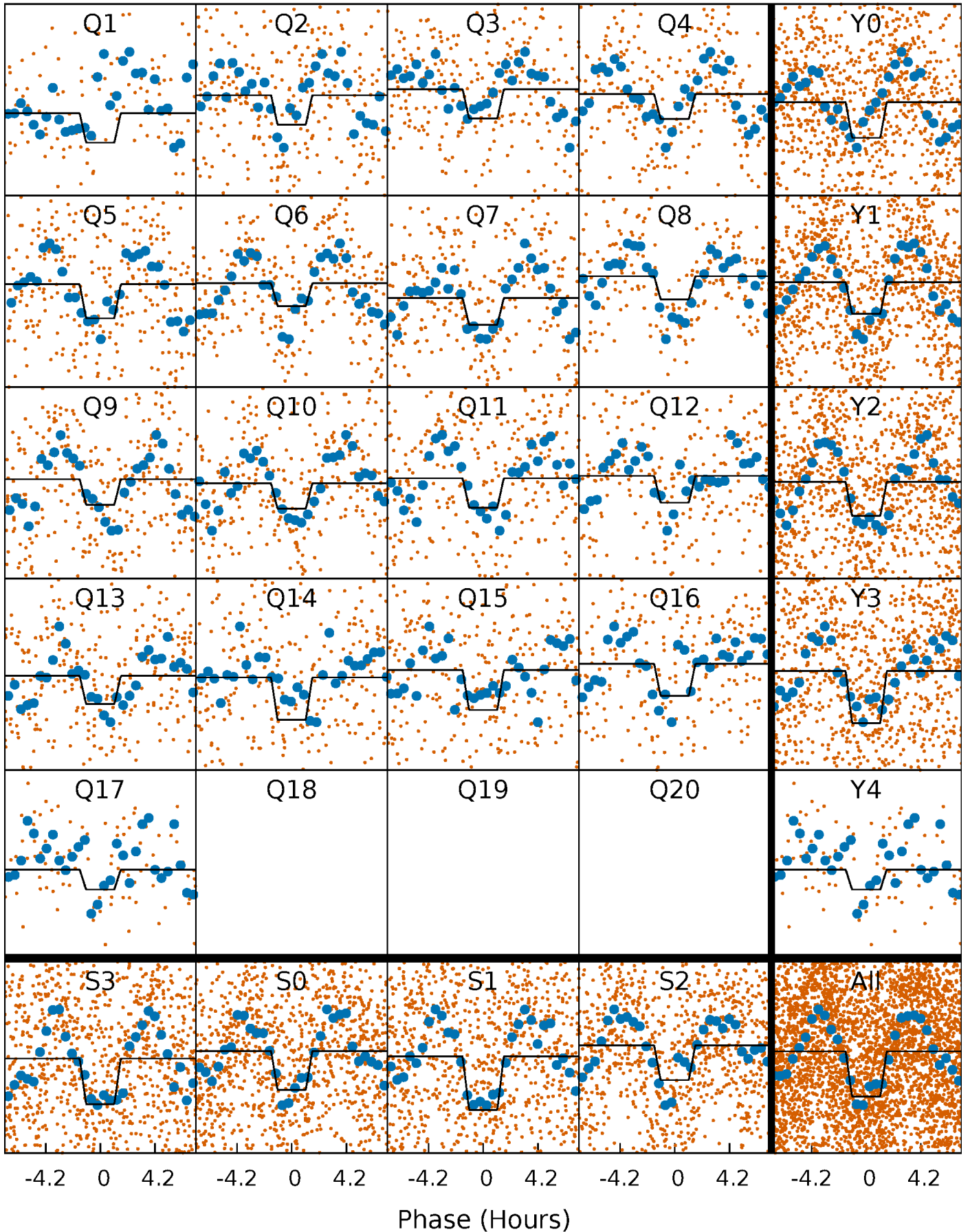
DV Quarter-Phased Transit Curves

TCE 009171954-03 P= 1.693989 Days $T_0=131.824728$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

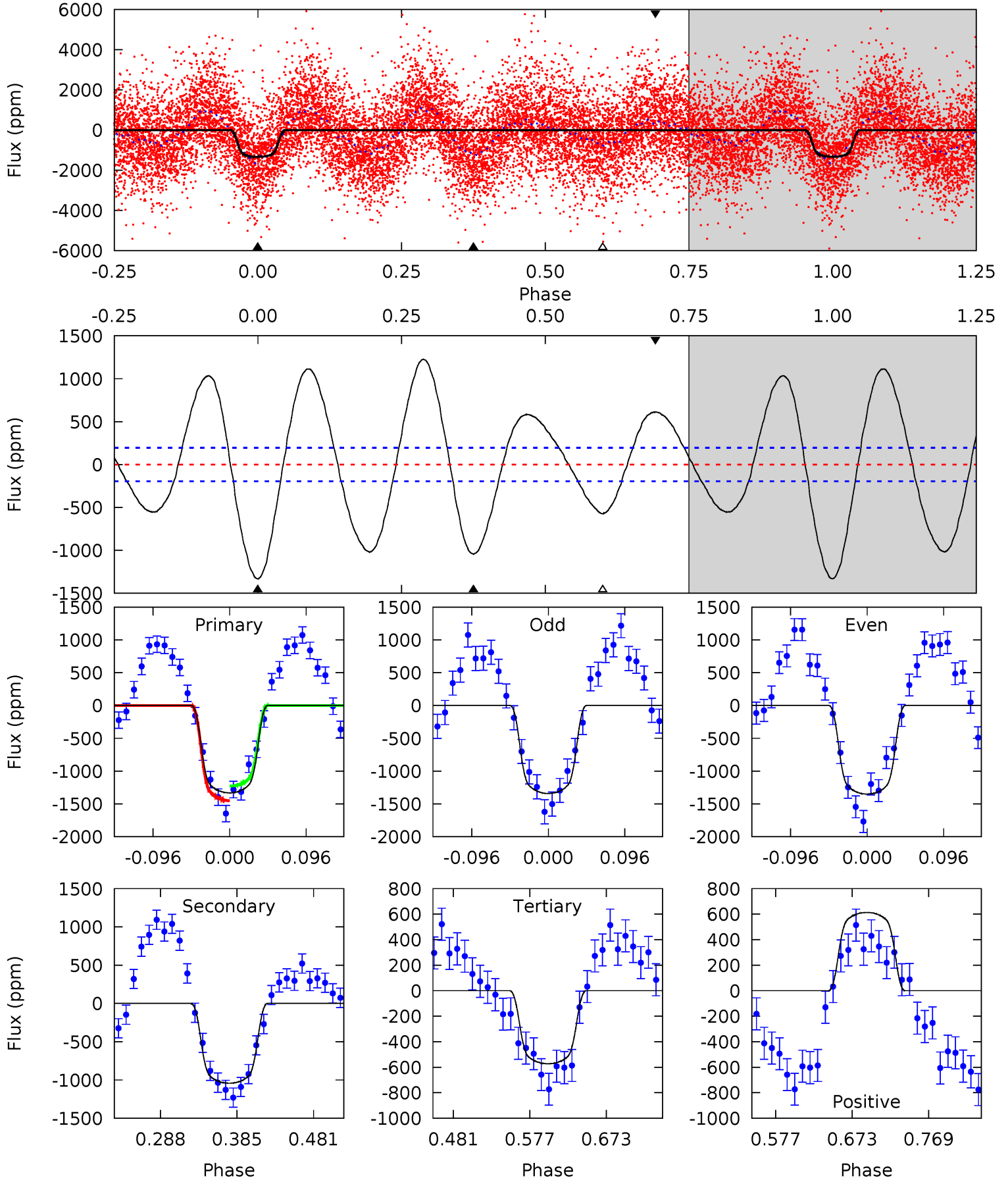
TCE 009171954-03 P= 1.694010 Days $T_0=131.816965$ (BKJD)



DV Model-Shift Uniqueness Test

009171954-03, P = 1.693989 Days, E = 130.130739 Days

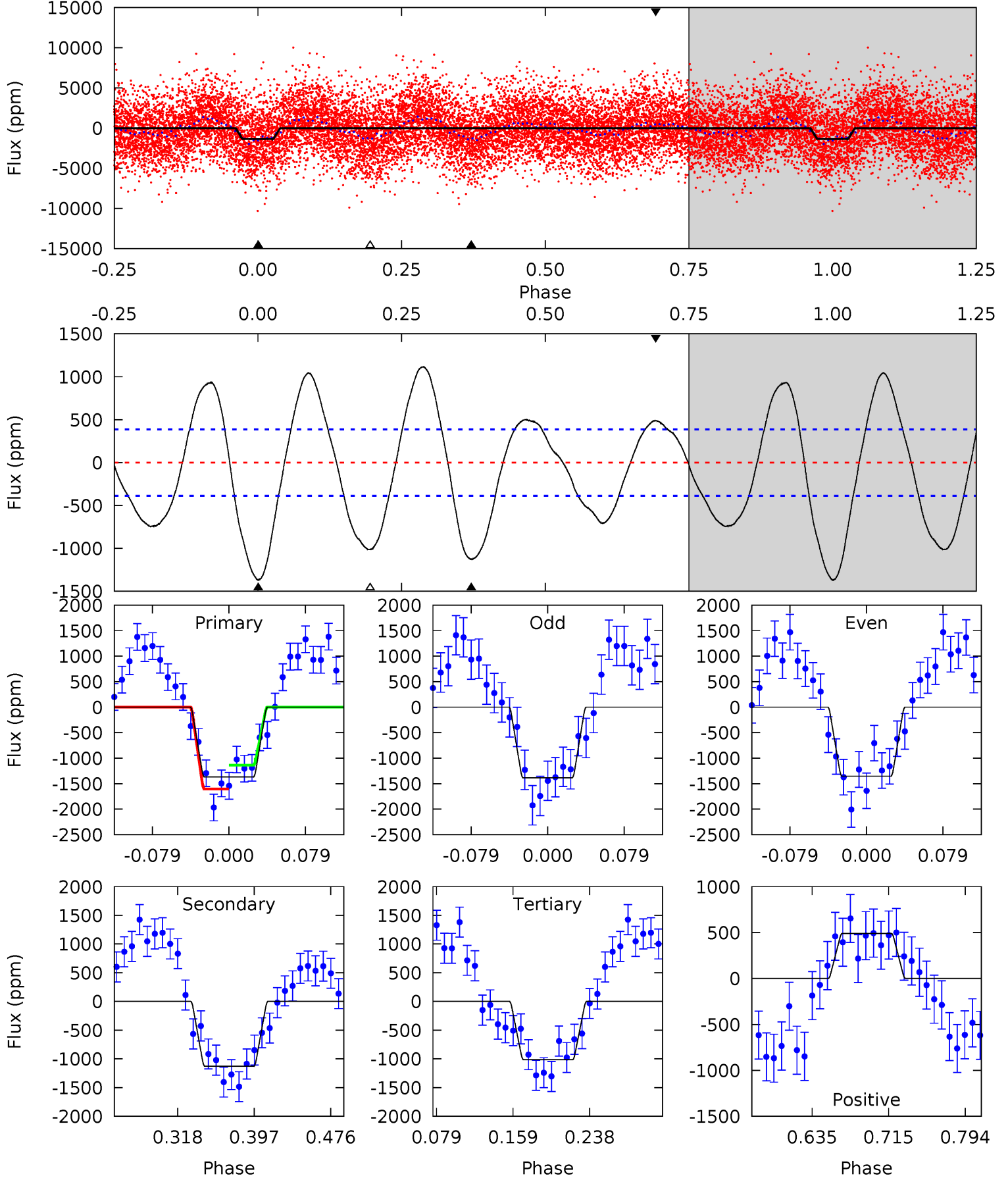
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 31.3 | 24.5 | 13.4 | 14.4 | 4.57 | 1.66 | 12.5 | 17.8 | 16.9 | 11.0 | 10.1 | 0.11 | 0.94 | 0.48 | 2.71 |



Alt Model-Shift Uniqueness Test

009171954-03, P = 1.694010 Days, E = 130.122955 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.3 | 13.5 | 12.1 | 5.86 | 4.61 | 1.75 | 6.92 | 4.22 | 10.5 | 1.35 | 7.61 | 0.19 | 0.96 | 0.45 | 2.77 |



Stellar Parameters For KIC 009171954

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 7694^{+213}_{-347} | $3.631^{+0.484}_{-0.085}$ | $-0.080^{+0.200}_{-0.350}$ | $3.627^{+0.615}_{-1.846}$ | $2.054^{+0.279}_{-0.557}$ | $0.061^{+0.338}_{-0.018}$ |
| | +3%/-5% | +13%/-2% | +250%/-438% | +17%/-51% | +14%/-27% | +558%/-29% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009171954-03 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|----------------|-------------------------|----------------------|----------------------|---------------------------|
| DV | -1042 ± 43 | $11.46^{+2.04}_{-3.12}$ | 4595^{+351}_{-599} | 7745^{+480}_{-474} | $5.631^{+4.035}_{-1.477}$ |
| Alt. | -1128 ± 84 | $13.67^{+2.56}_{-3.80}$ | 4581^{+375}_{-627} | 7009^{+412}_{-376} | $4.107^{+3.128}_{-1.059}$ |

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

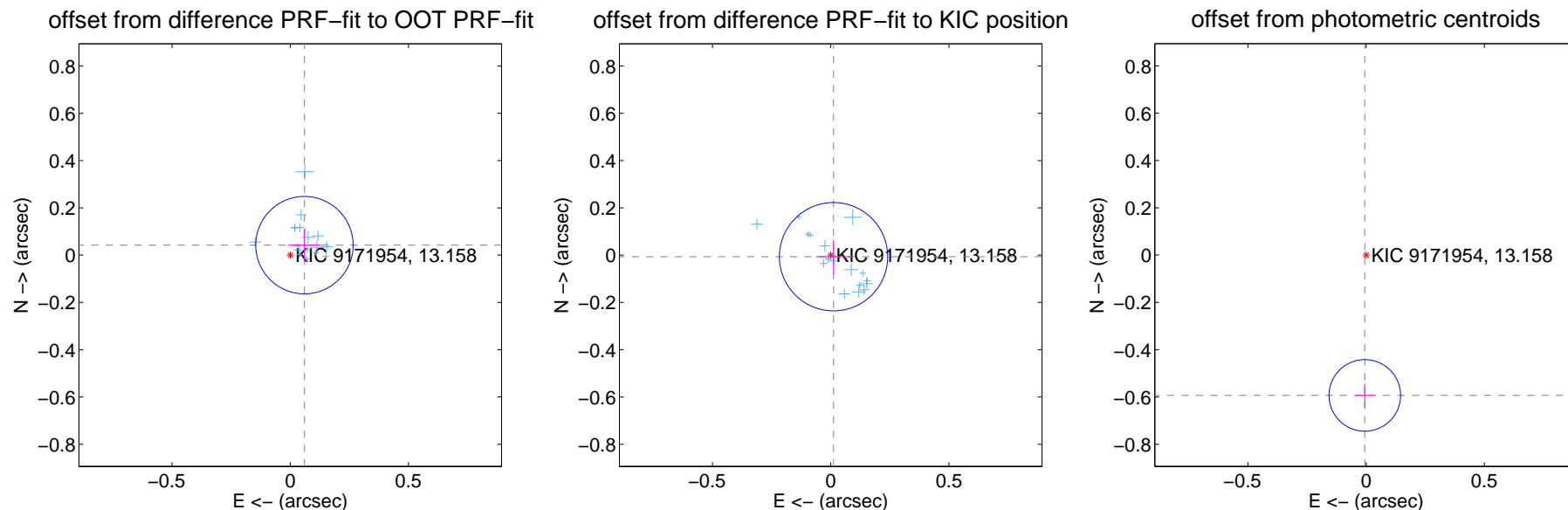
DV Centroid Data

Supplemental centroid analysis for 009171954-03. Kepler magnitude: 13.16. Transit SNR 13.86

There are 17 quarters with good PRF difference image offsets

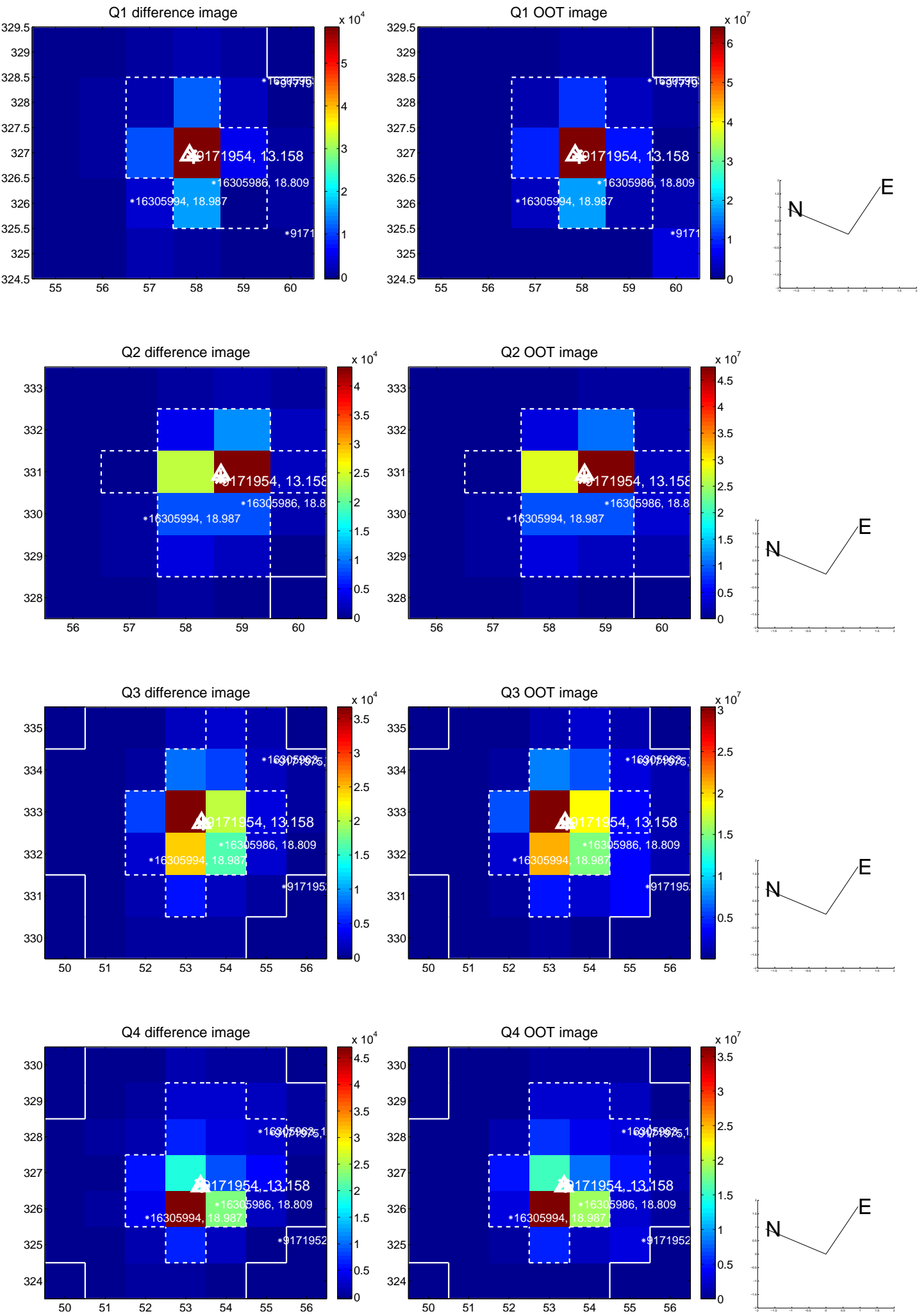
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.073 ± 0.069 | 1.07 | -0.060 ± 0.069 | 0.042 ± 0.069 |
| PRF-fit source offset from KIC position | 0.014 ± 0.076 | 0.18 | -0.012 ± 0.073 | -0.006 ± 0.072 |
| photometric centroid source offset | 0.59 ± 0.05 | 11.76 | 0.01 ± 0.04 | -0.59 ± 0.05 |

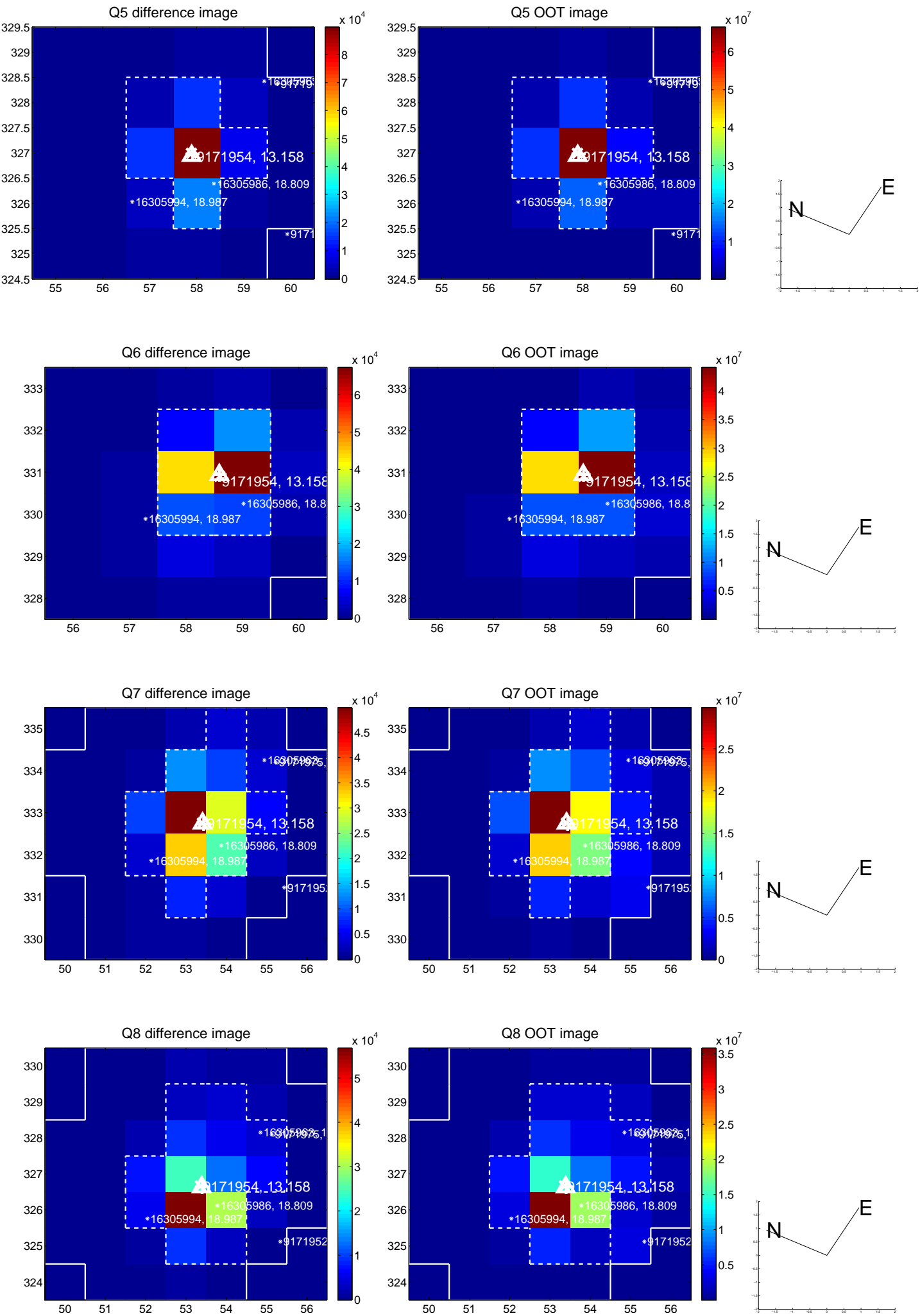


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

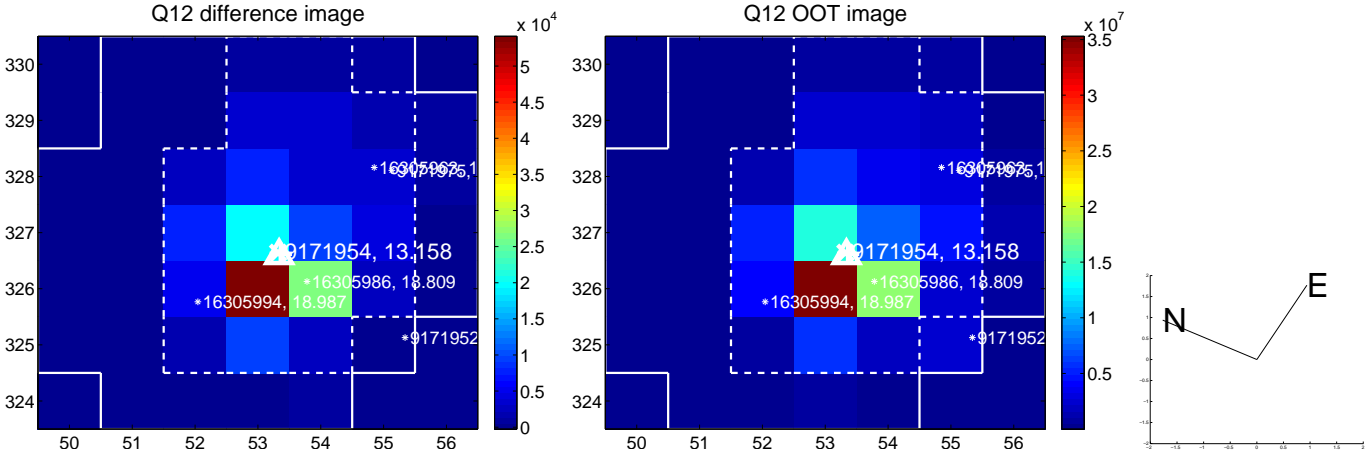
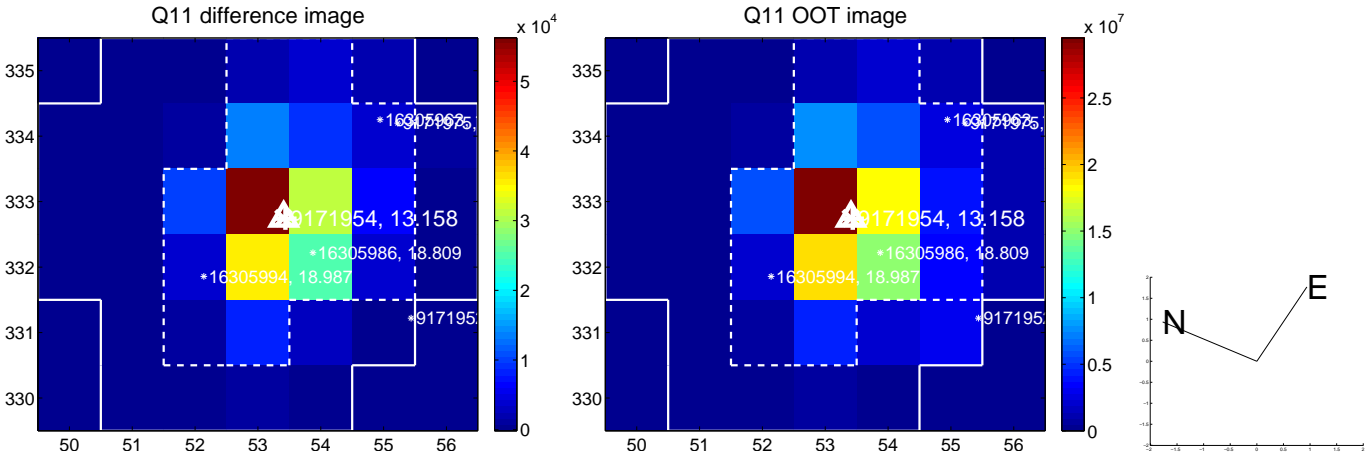
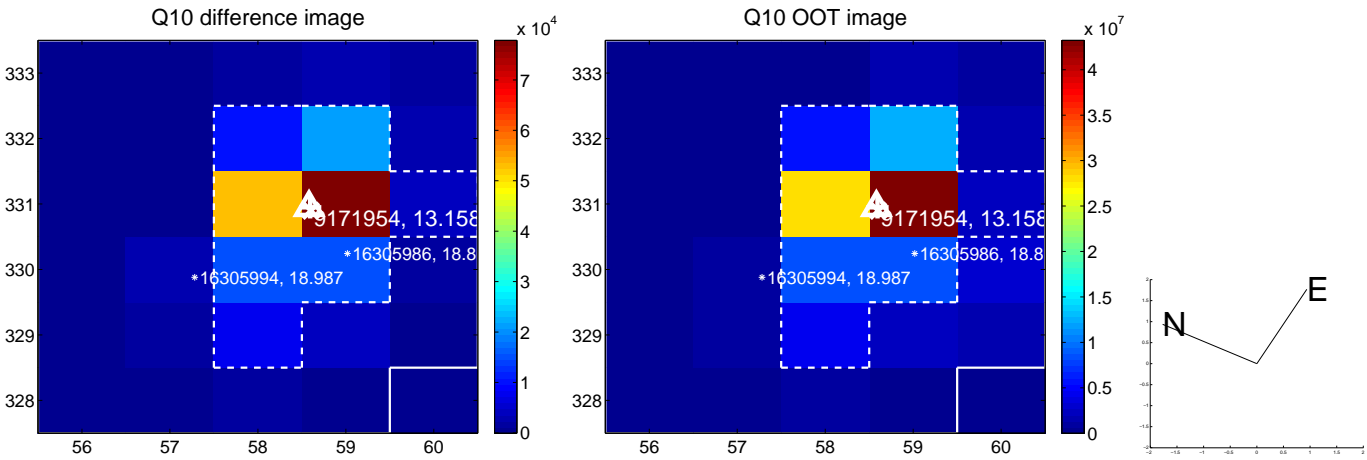
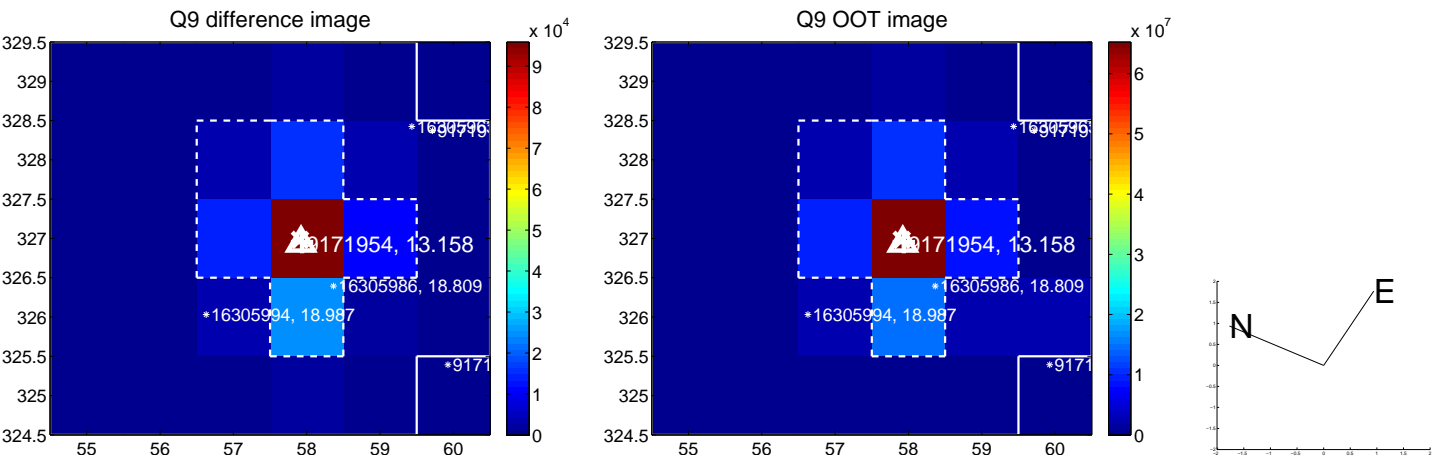
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



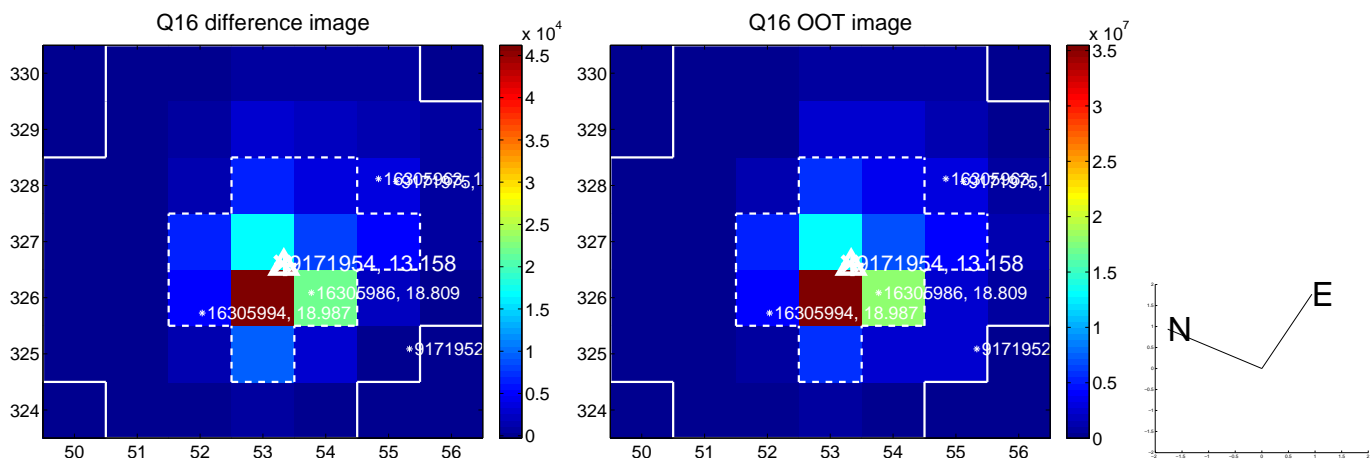
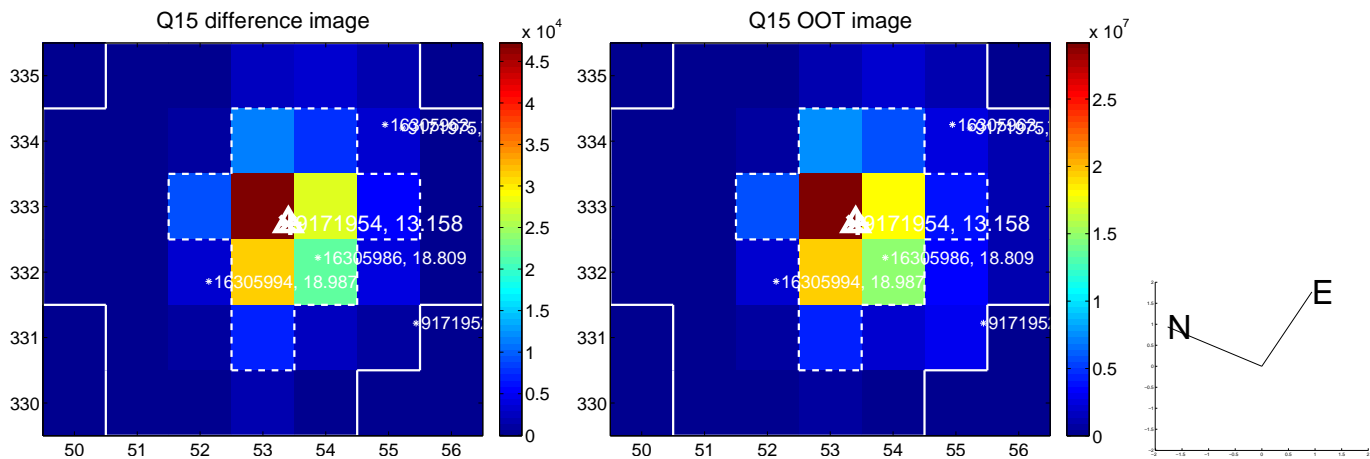
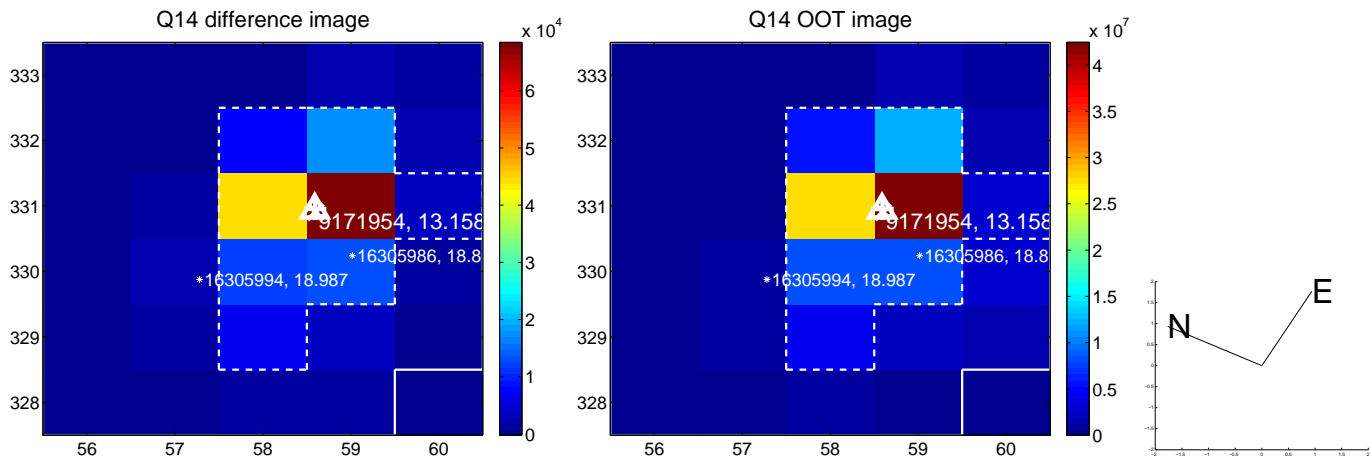
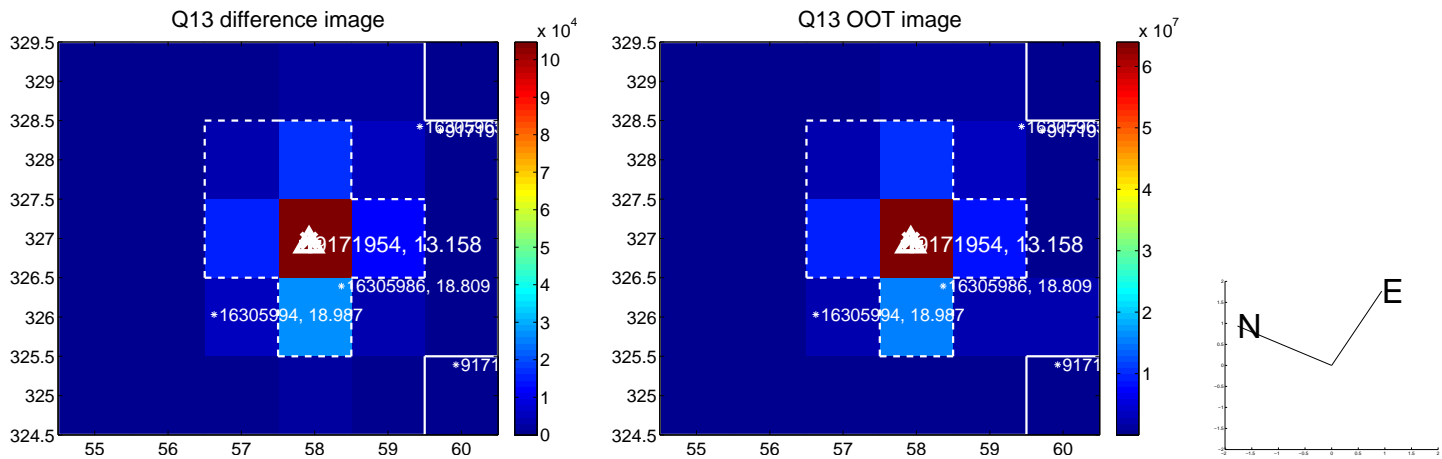
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



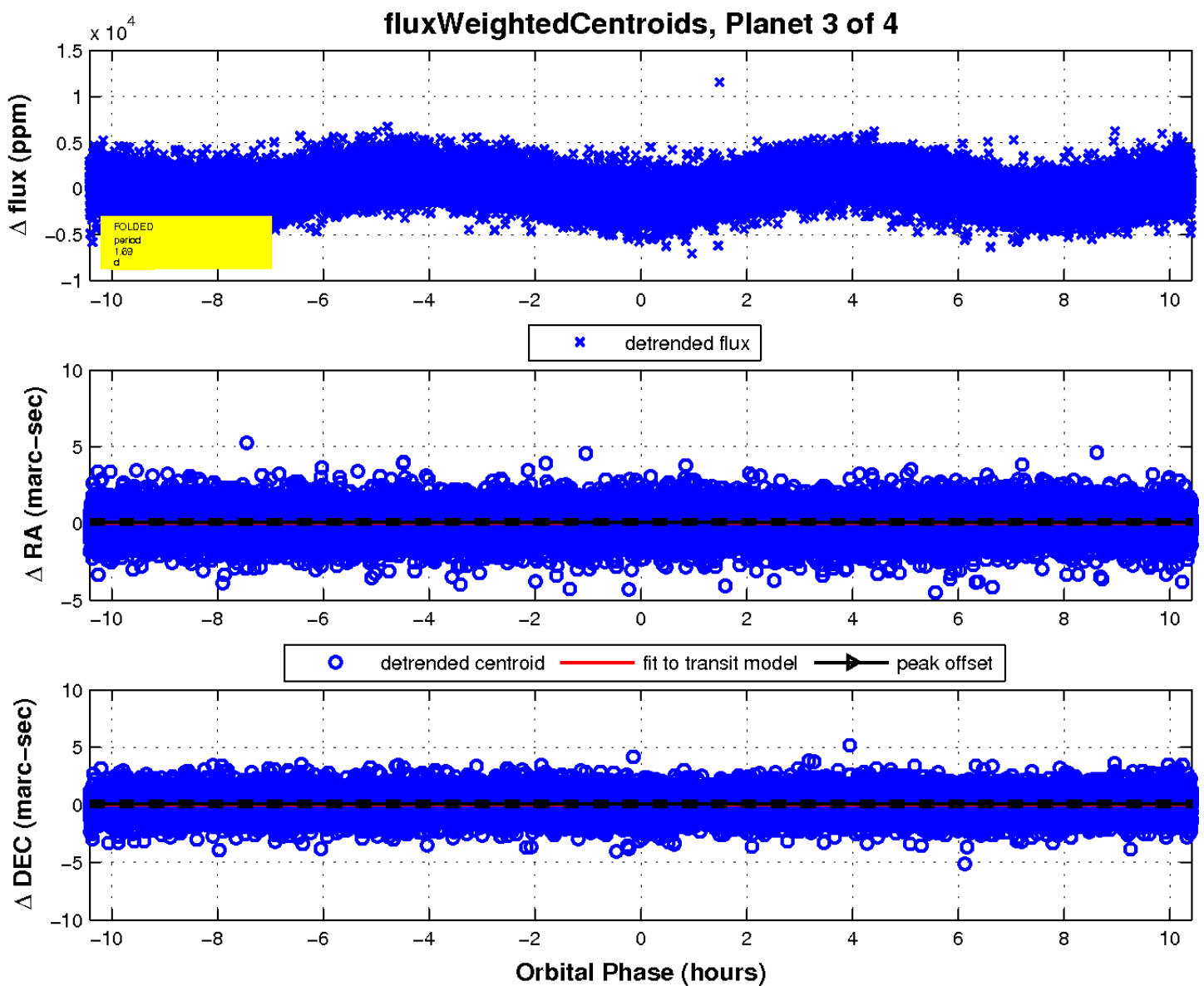
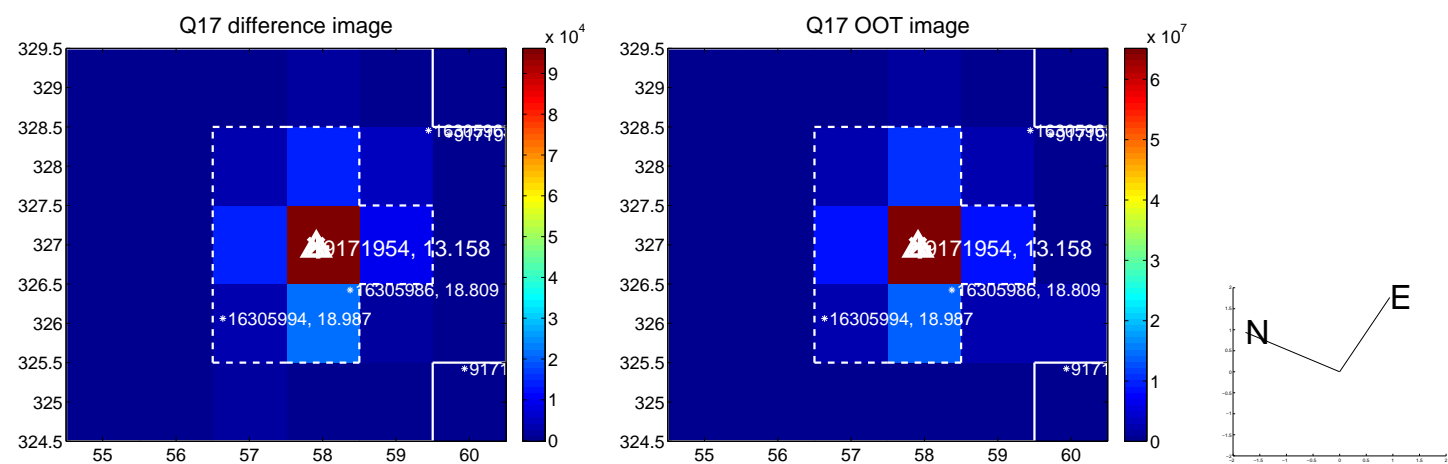
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

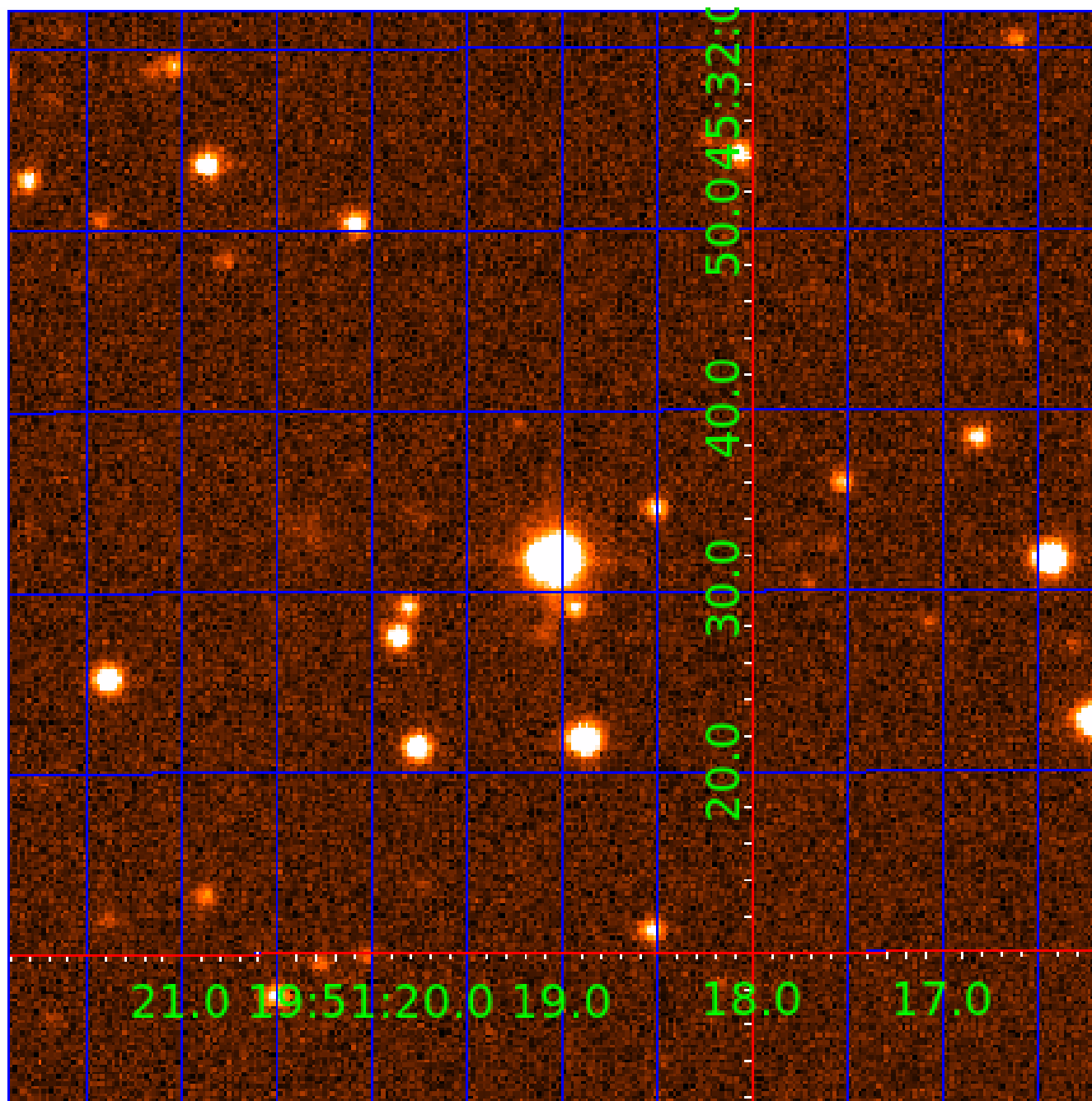


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009171954

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009171954-01 | OBS | No | 0.554746 | 131.637783 | 330.0 | 1.733 | 17.3 | 17.6 | 3.63 | 7694 | 7.68 | 0.00 |
| 009171954-02 | OBS | No | 0.554743 | 131.915668 | 355.2 | 1.320 | 17.7 | 19.5 | 3.63 | 7694 | 6.98 | 0.00 |
| 009171954-03 | OBS | No | 1.693989 | 131.824728 | 836.4 | 3.471 | 11.7 | 13.9 | 3.63 | 7694 | 12.22 | 33061.37 |
| 009171954-04 | OBS | No | 0.846969 | 131.609952 | 220.6 | 2.500 | 9.5 | -1.0 | 3.63 | 7694 | 5.45 | 83312.72 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 009171954-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD |
| 009171954-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 009171954-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS |

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

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

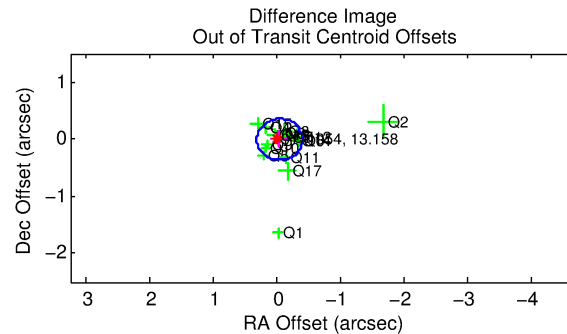
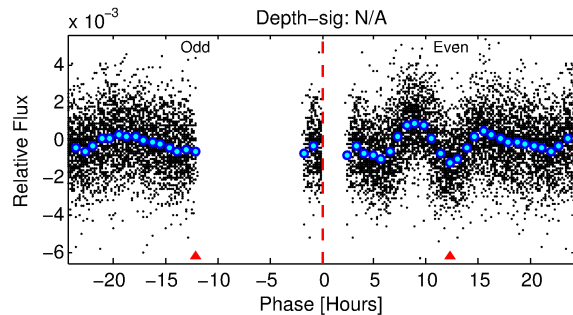
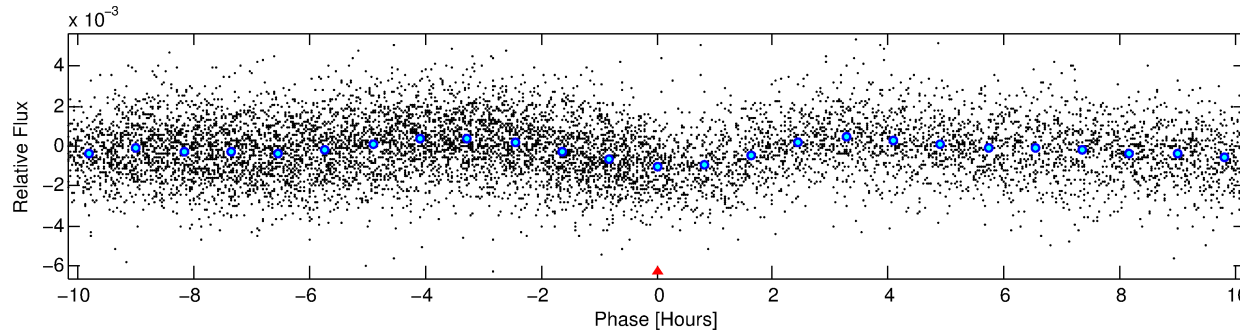
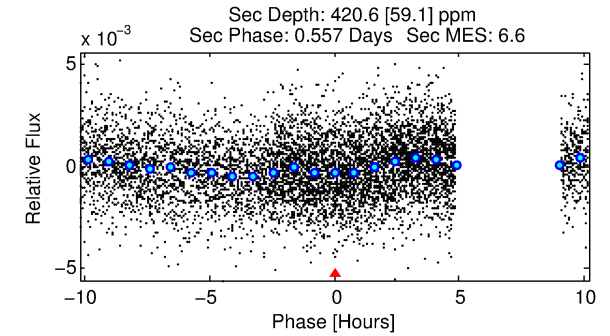
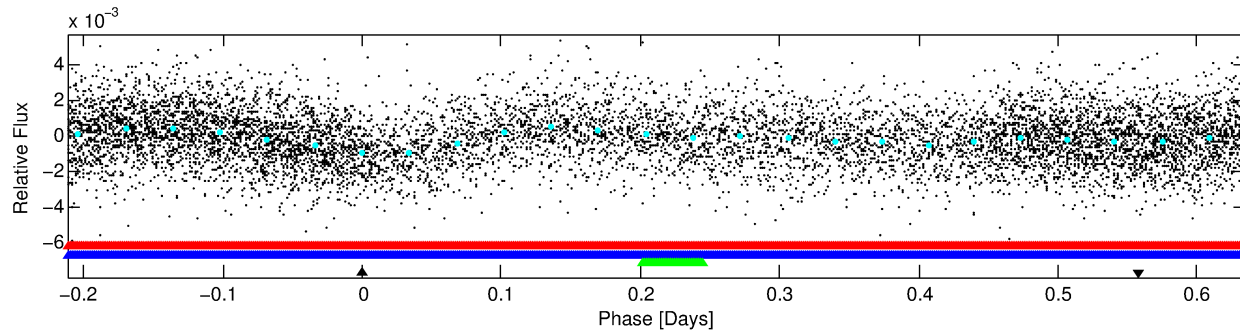
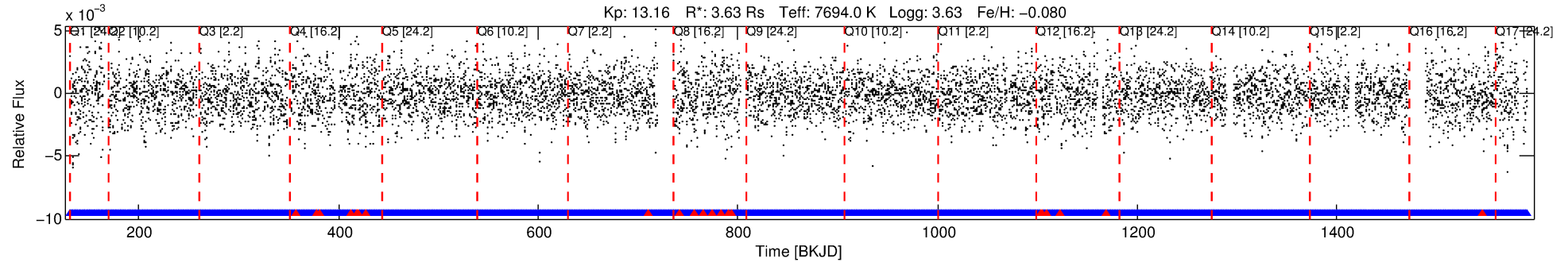
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009171954-04

No Significant Match Found

DV One-Page Summary

KIC: 9171954 Candidate: 4 of 4 Period: 0.847 d



TPS TCE Results:

Period = 0.84697 d
Epoch = 131.6100 BKJD

DV fit results are unavailable

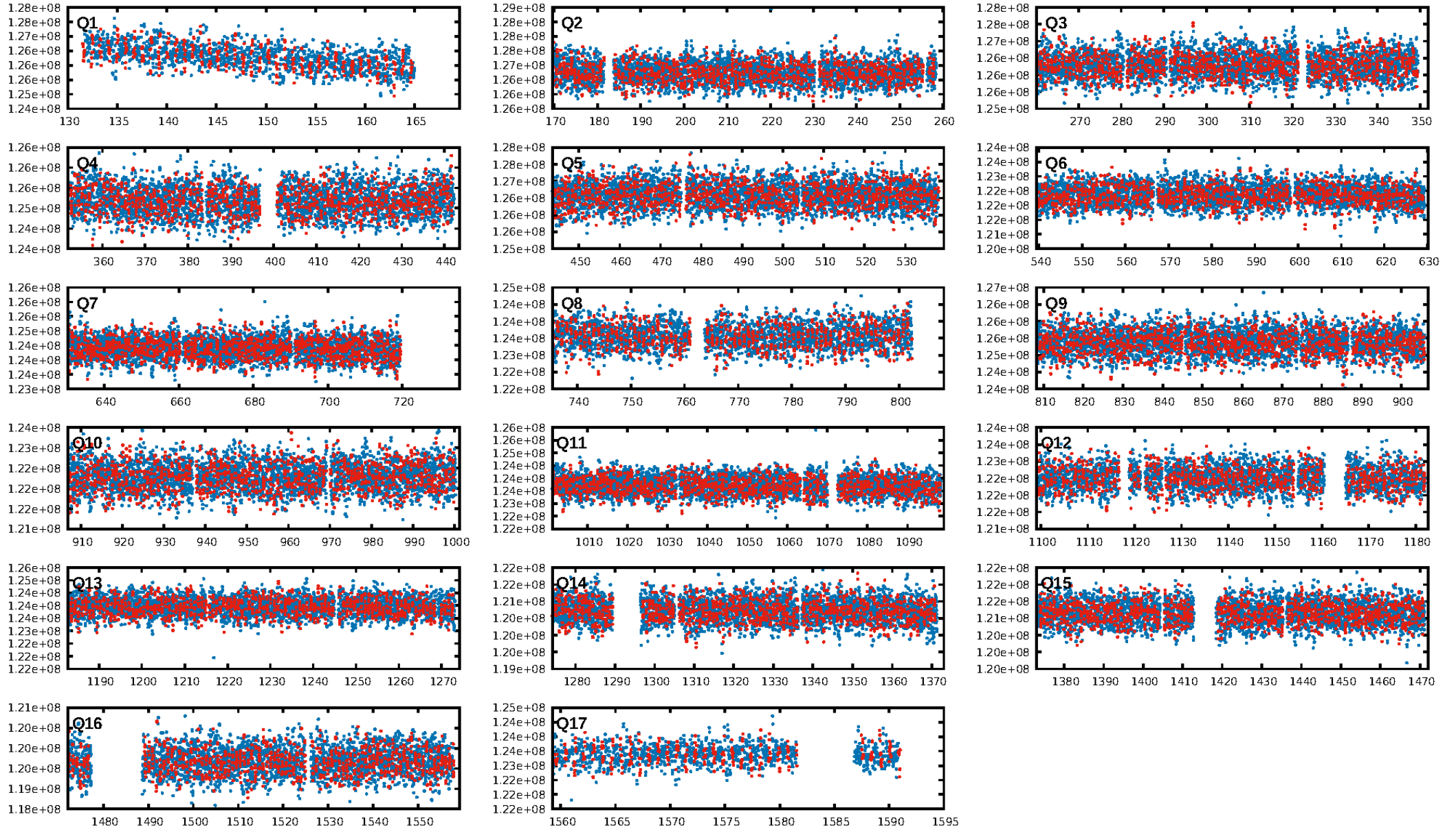
DV Diagnostic Results:

ShortPeriod-sig: 97.9% [2.31 σ]
LongPeriod-sig: 100.0% [4.75 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [936/957]
GhostDiagnostic-chr: 1.616
Centroid-sig: 1.8%
Centroid-so: 0.548 arcsec [17.51 σ]
OotOffset-rm: 0.042 arcsec [0.35 σ]
KicOffset-rm: 0.076 arcsec [0.65 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

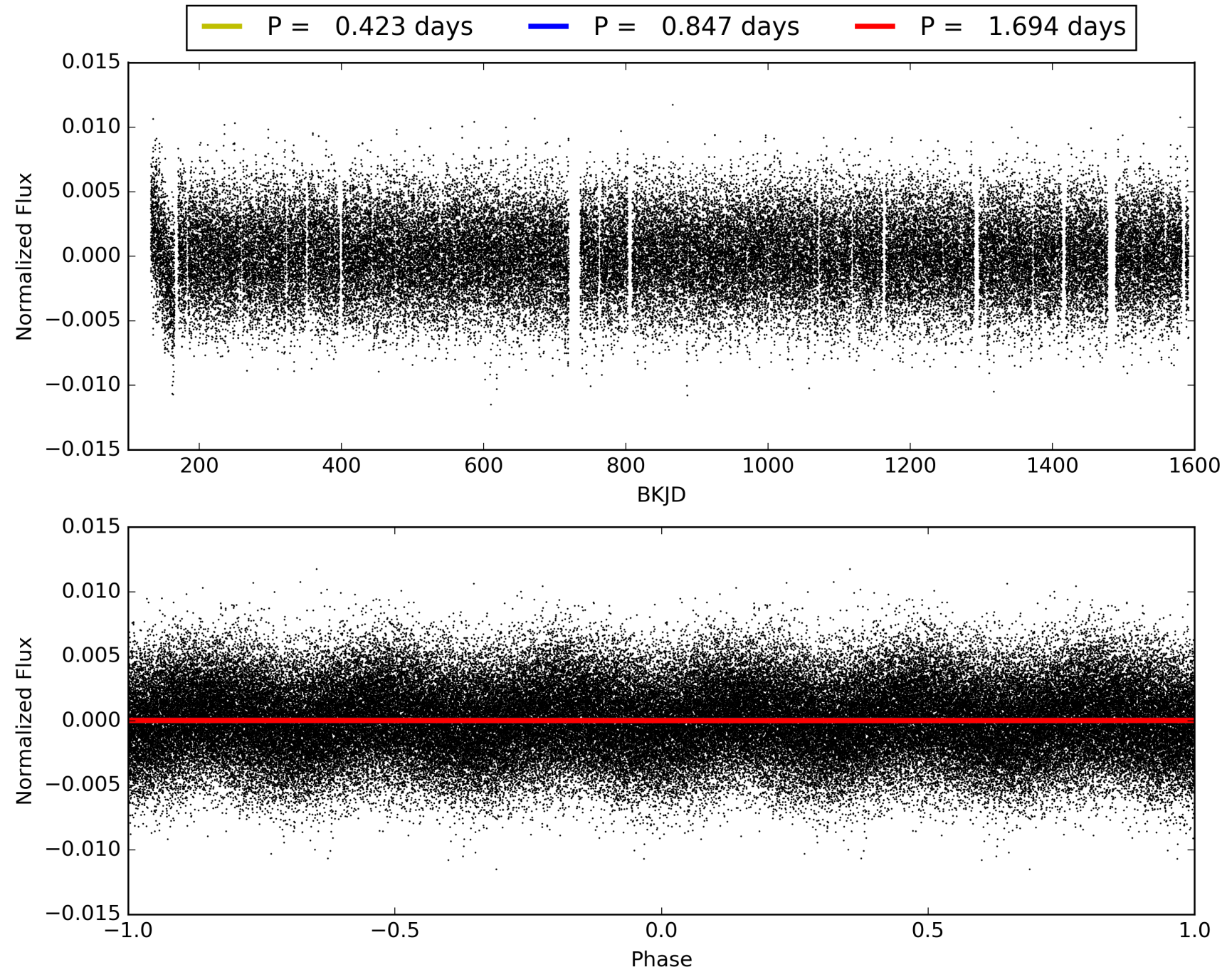
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:43:00 Z

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

TCE 009171954-04, PDC Light Curves

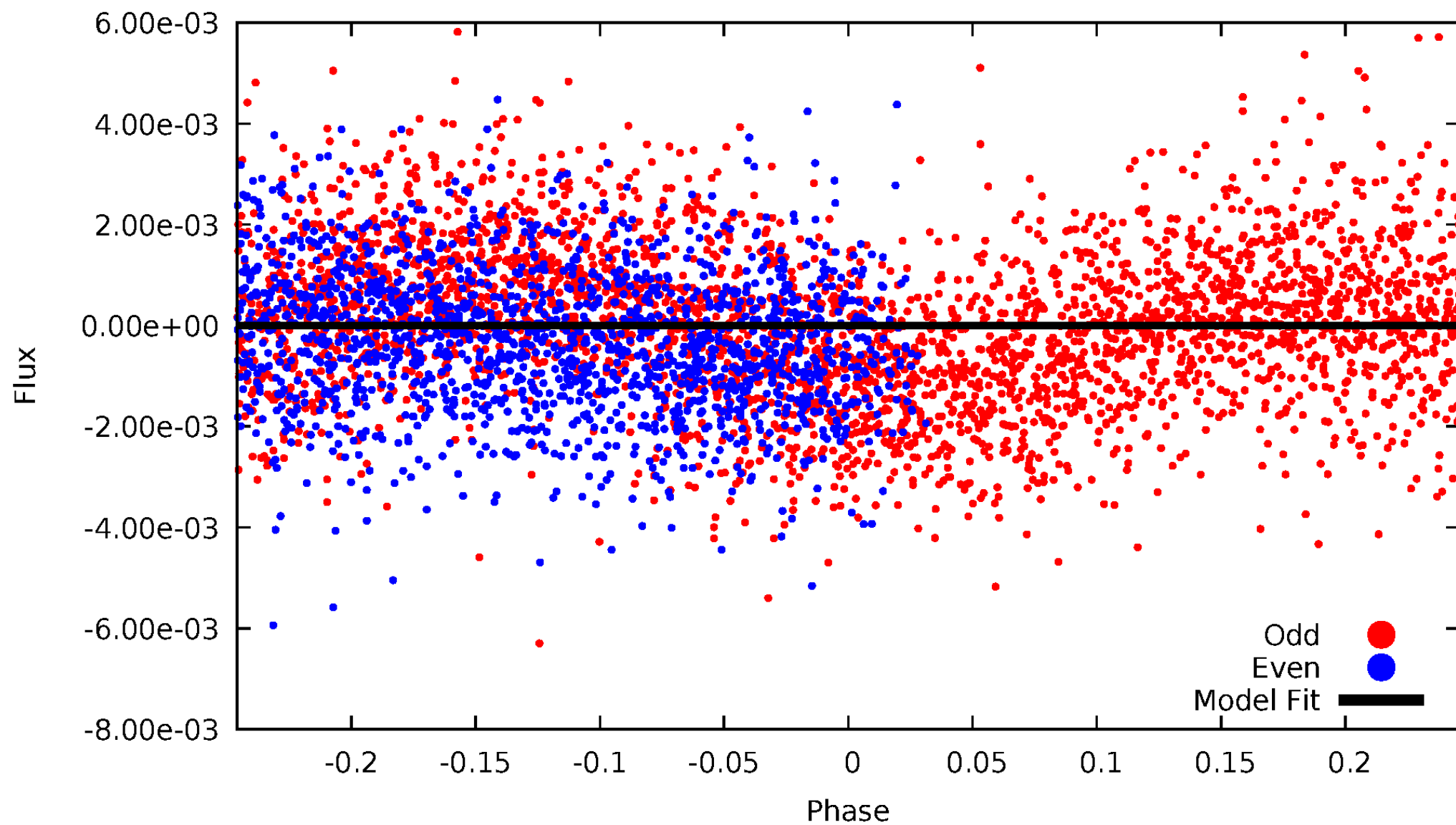


TCE 009171954-04



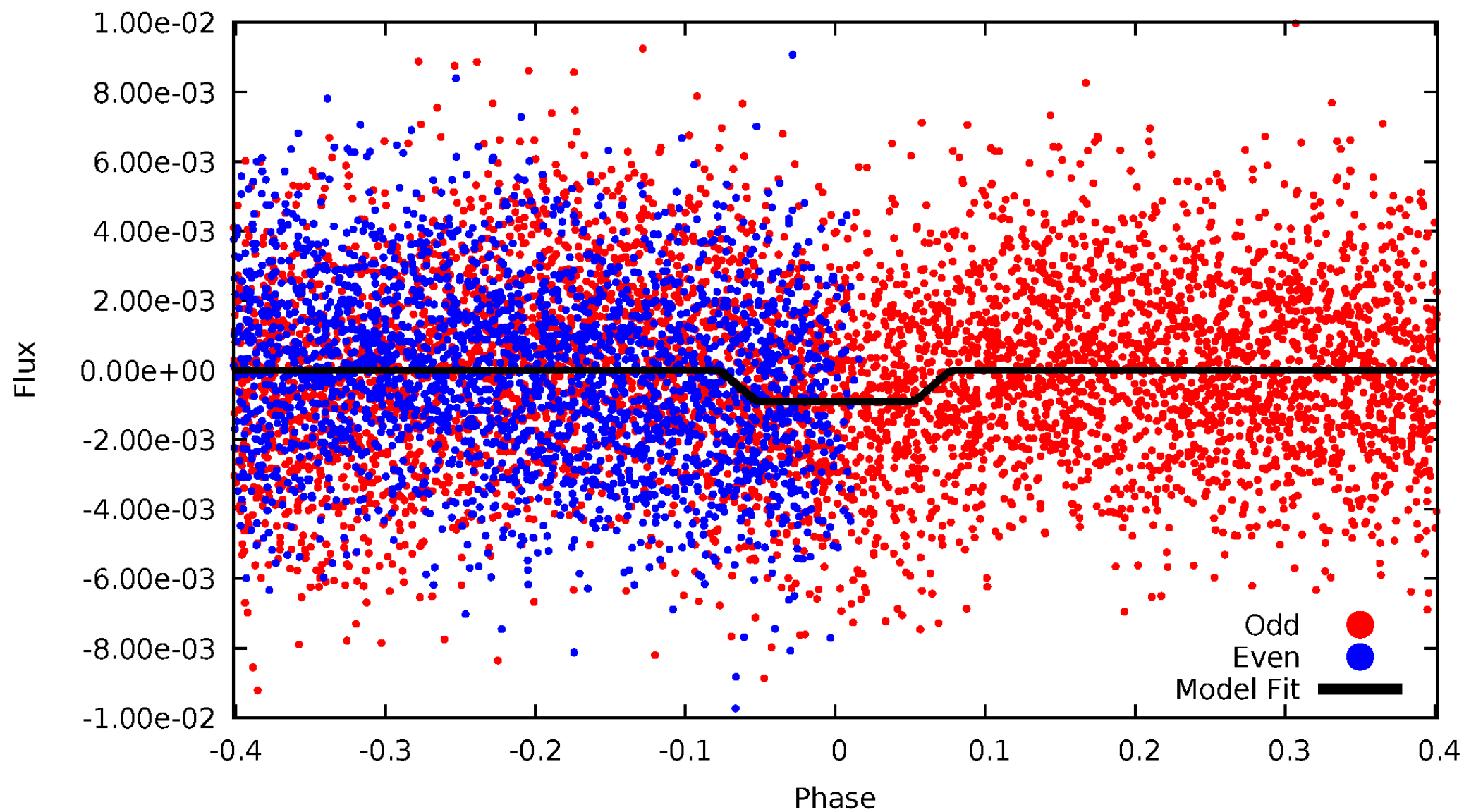
DV Odd/Even

TCE 009171954-04



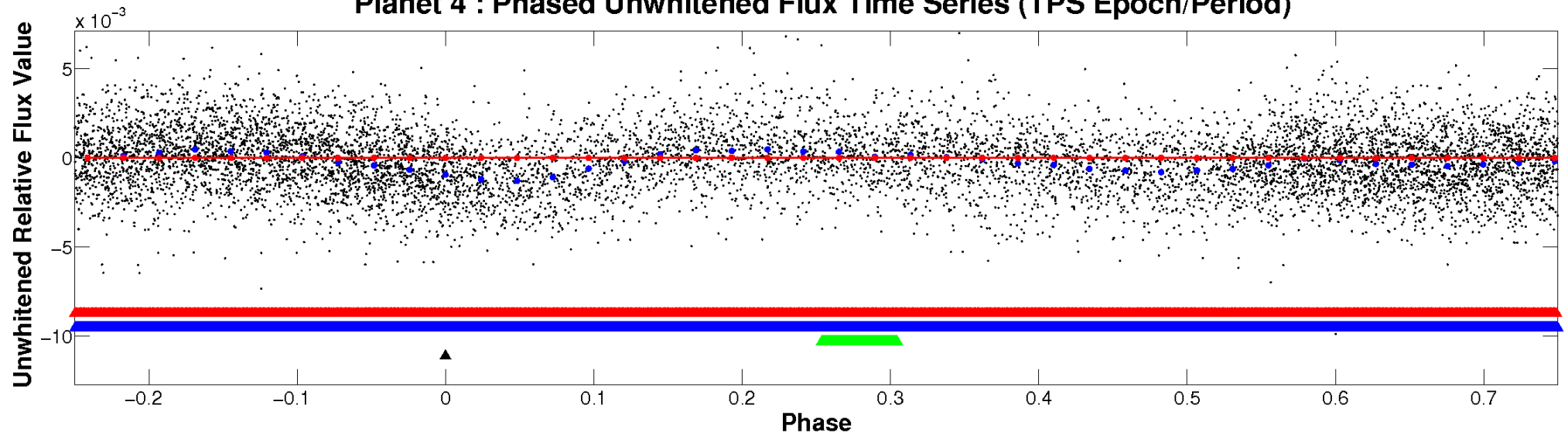
ALT Odd/Even

TCE 009171954-04

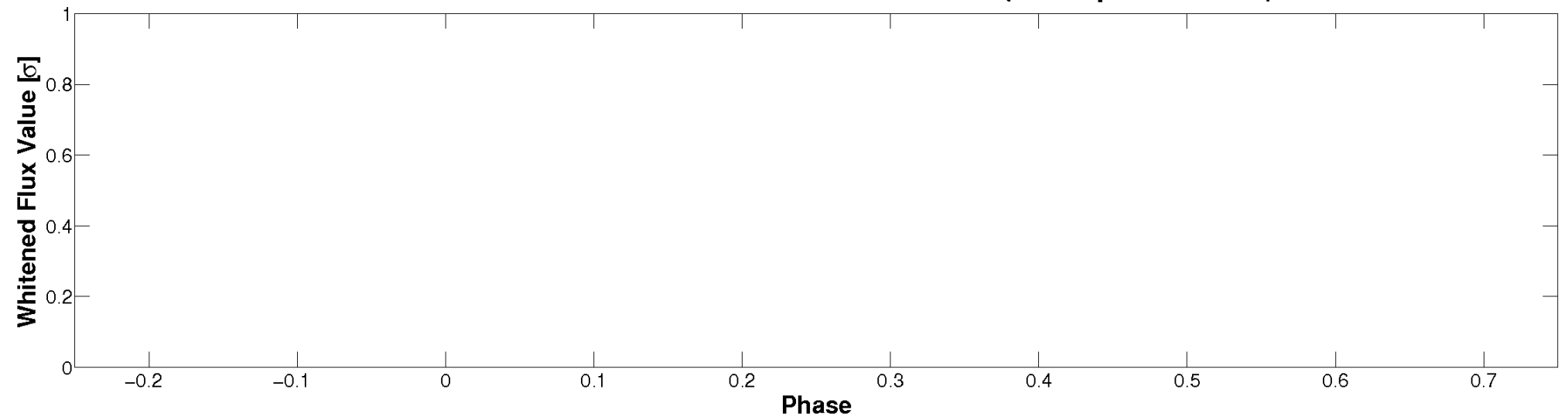


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

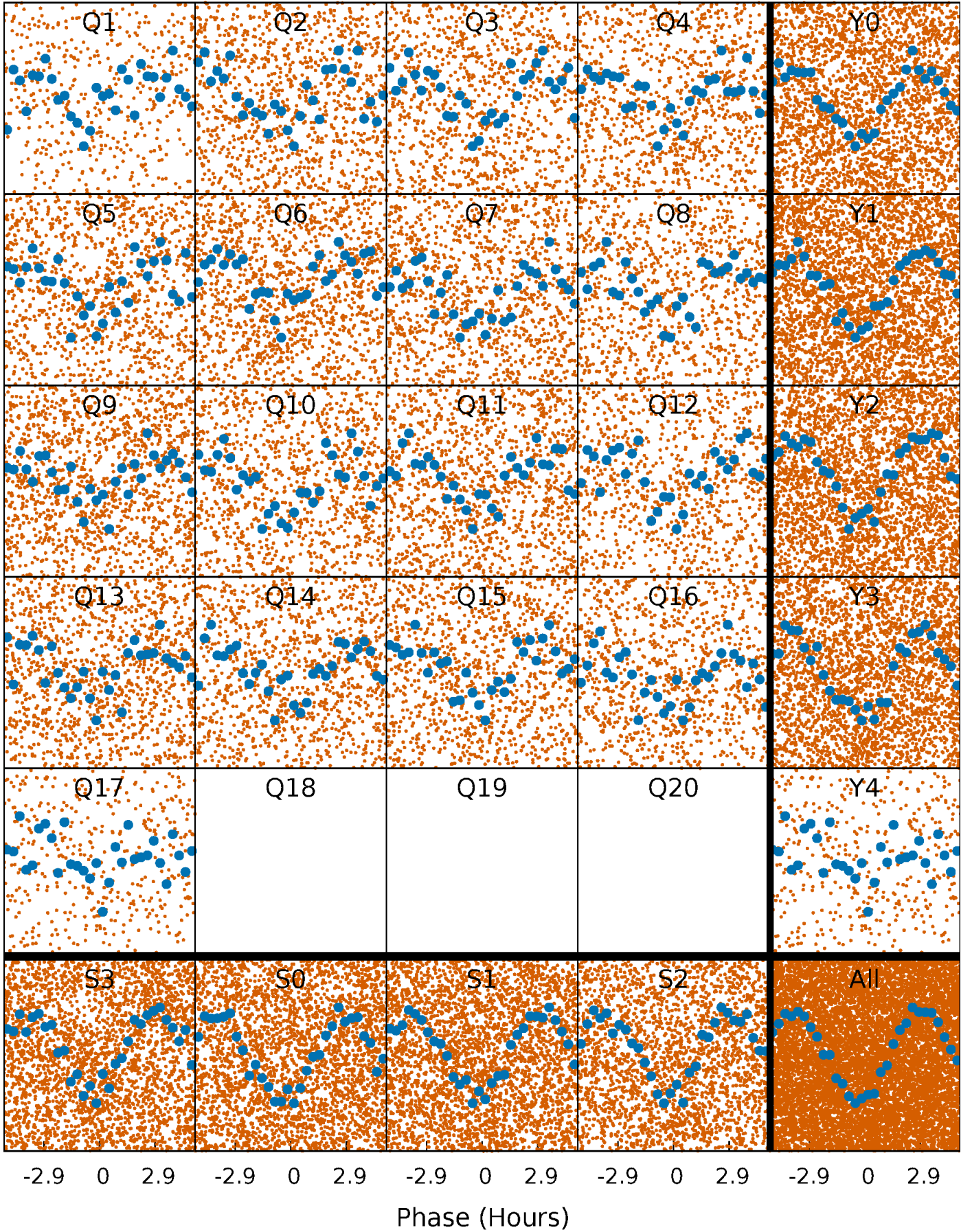


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



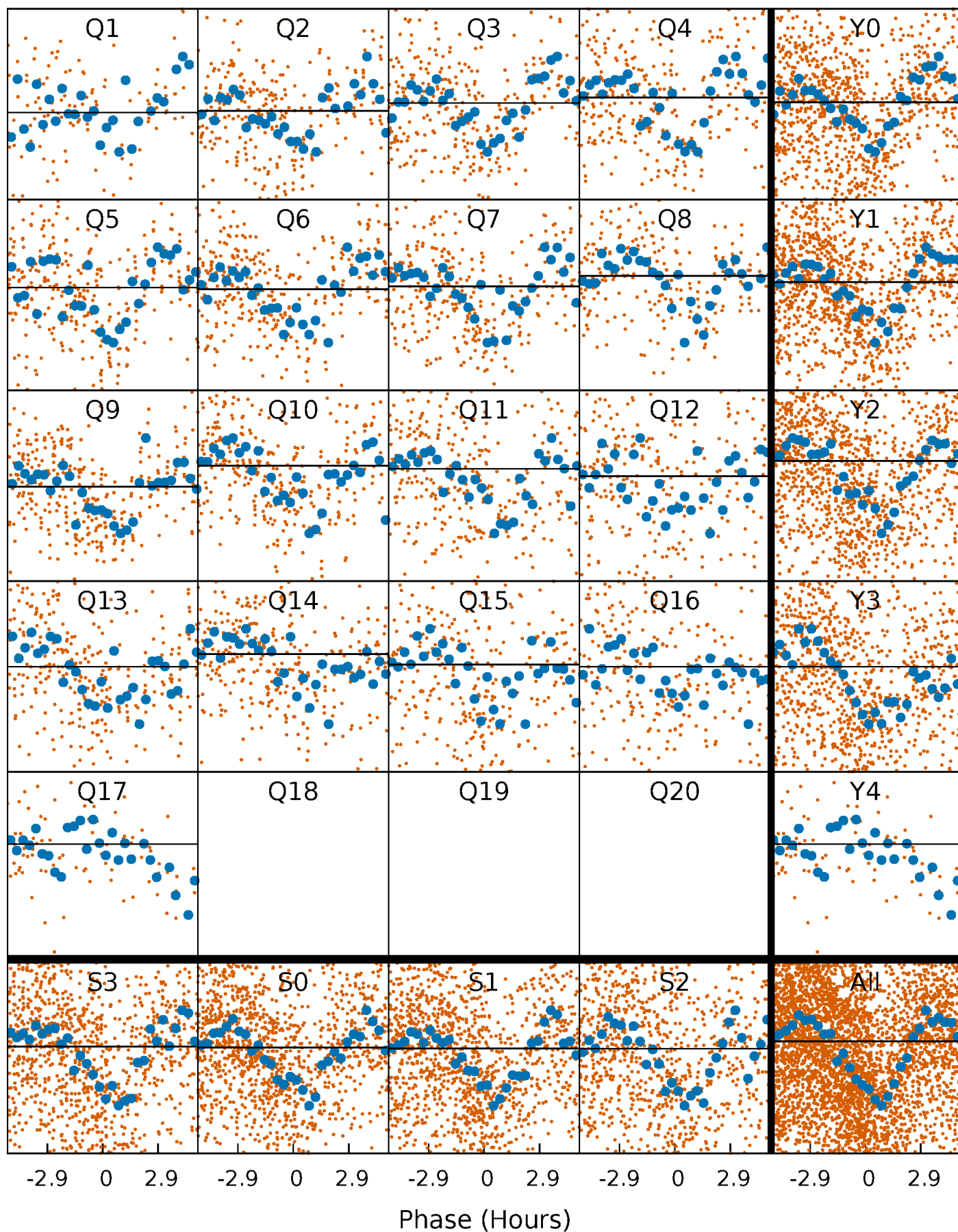
PDC Quarter-Phased Transit Curves

TCE 009171954-04 P= 0.846969 Days $T_0=131.609952$ (BKJD)



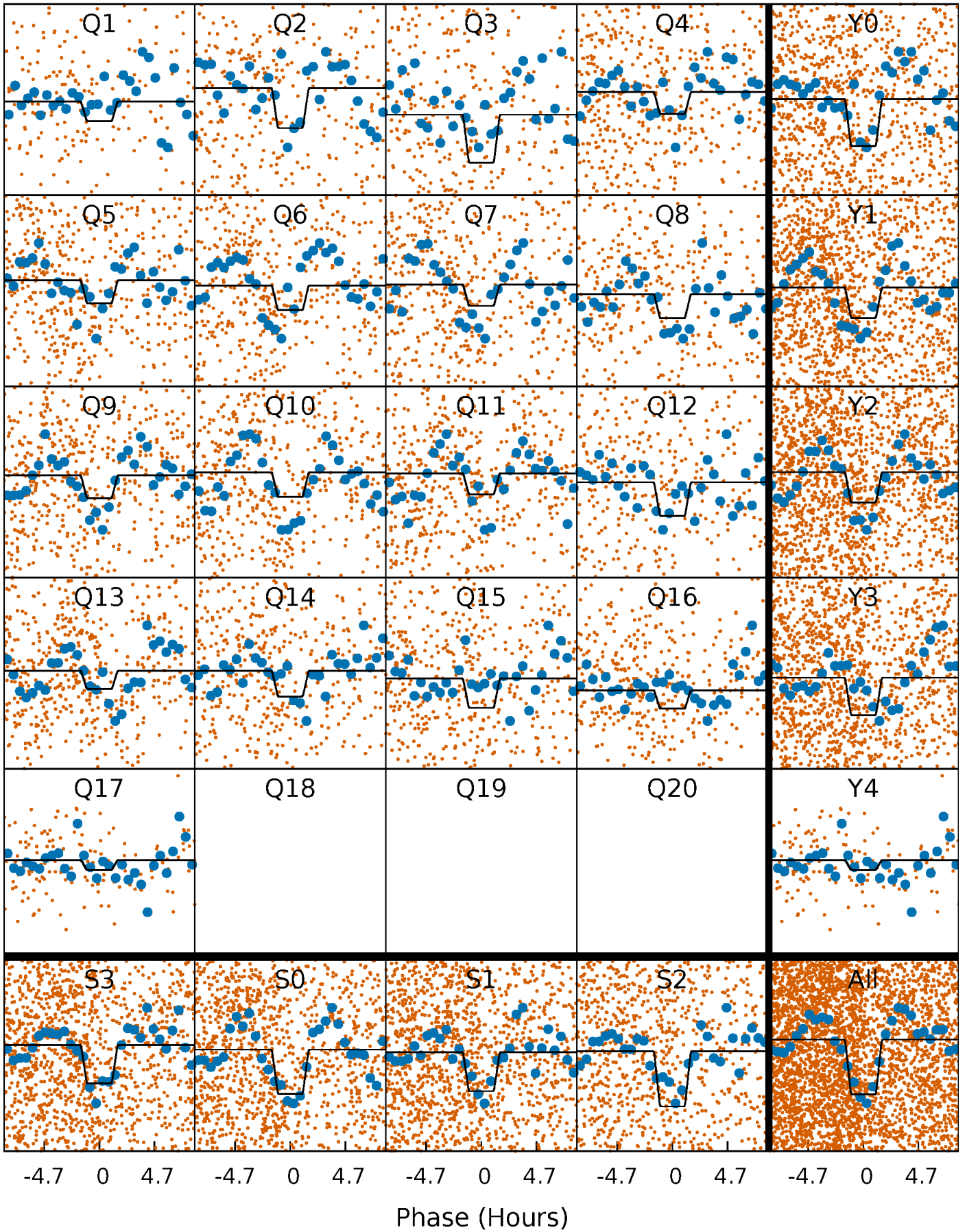
DV Quarter-Phased Transit Curves

TCE 009171954-04 P= 0.846969 Days $T_0=131.609952$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

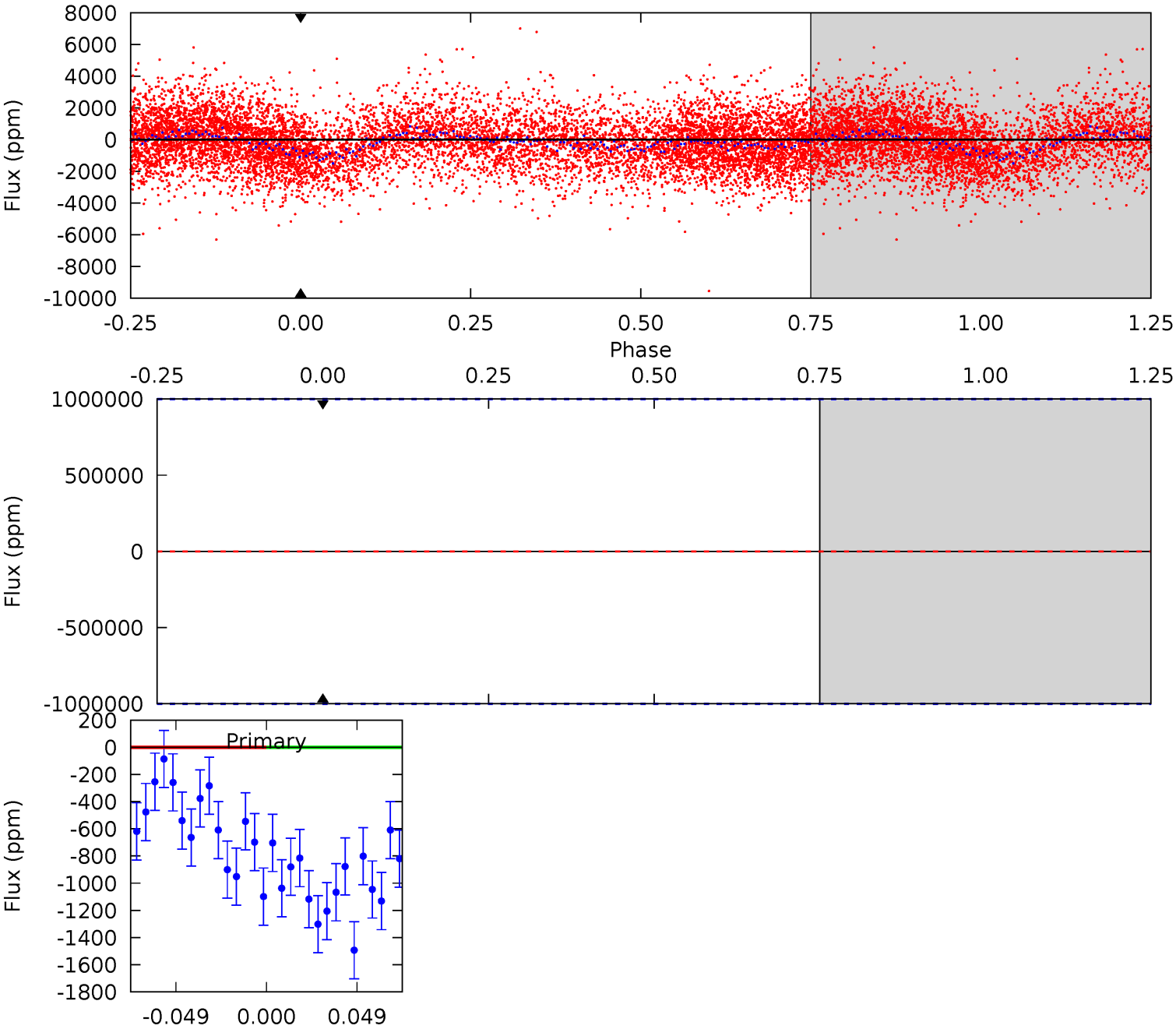
TCE 009171954-04 P= 0.846969 Days $T_0=131.622889$ (BKJD)



DV Model-Shift Uniqueness Test

009171954-04, P = 0.846969 Days, E = 130.762983 Days

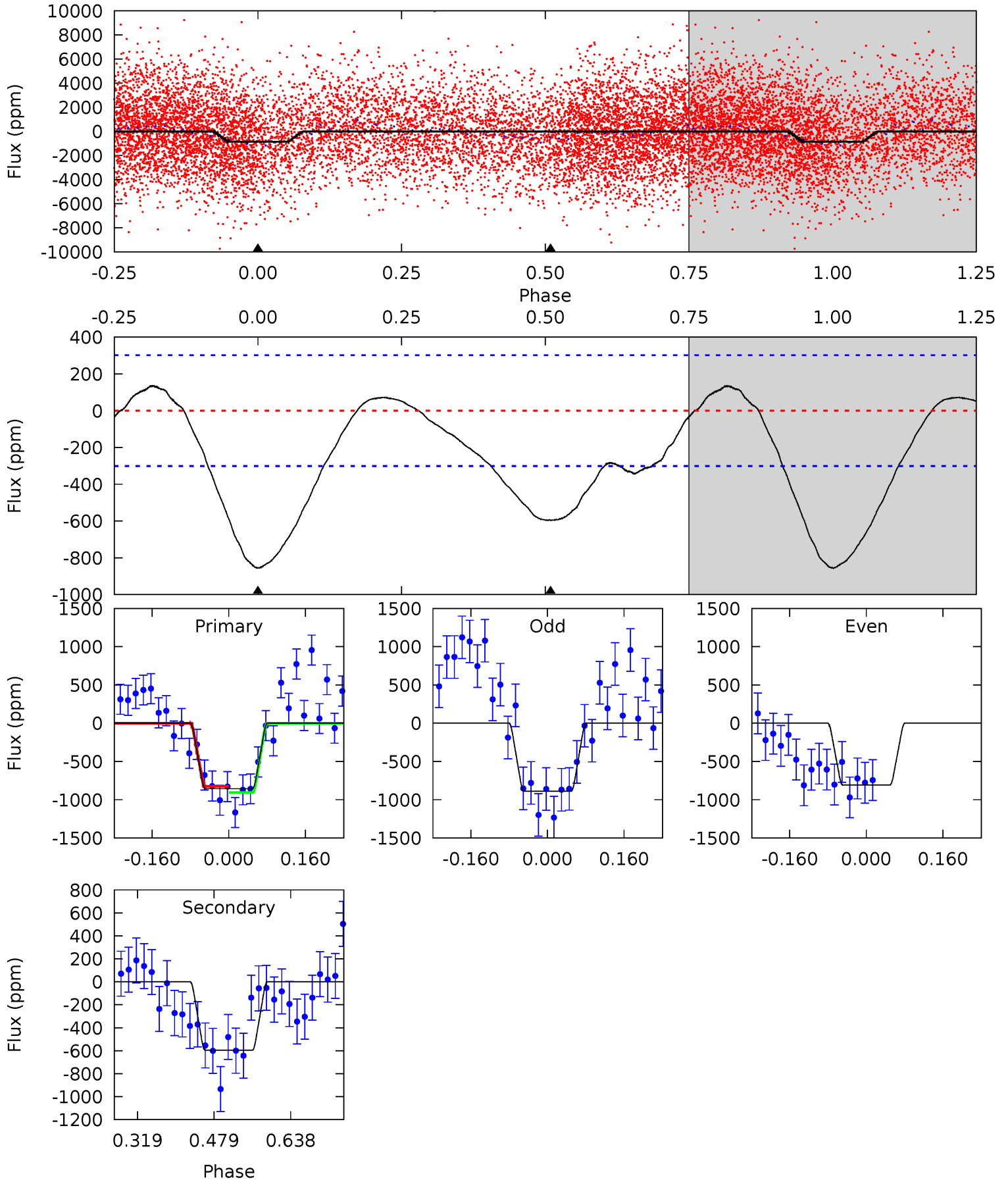
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Alt Model-Shift Uniqueness Test

009171954-04, P = 0.846969 Days, E = 130.775920 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.7 | 8.82 | 0 | 0 | 4.47 | 1.41 | 2.05 | 12.7 | 12.7 | 8.82 | 8.82 | 0.59 | 1.09 | 0.14 | 0.58 |



Stellar Parameters For KIC 009171954

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 7694^{+213}_{-347} | $3.631^{+0.484}_{-0.085}$ | $-0.080^{+0.200}_{-0.350}$ | $3.627^{+0.615}_{-1.846}$ | $2.054^{+0.279}_{-0.557}$ | $0.061^{+0.338}_{-0.018}$ |
| | +3%/-5% | +13%/-2% | +250%/-438% | +17%/-51% | +14%/-27% | +558%/-29% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009171954-04 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-----------------|---------------------------|----------------------|--------------------------|-----------------------------|
| DV | 0 ± 1000000 | $25.70^{+27.75}_{-17.95}$ | 5811^{+417}_{-801} | 5581^{+41709}_{-43952} | $1.197^{+86.223}_{-67.240}$ |
| Alt. | -595 ± 67 | $25.96^{+28.05}_{-17.90}$ | 5825^{+443}_{-735} | -3436^{+11189}_{-1229} | $0.240^{+2.312}_{-0.183}$ |

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

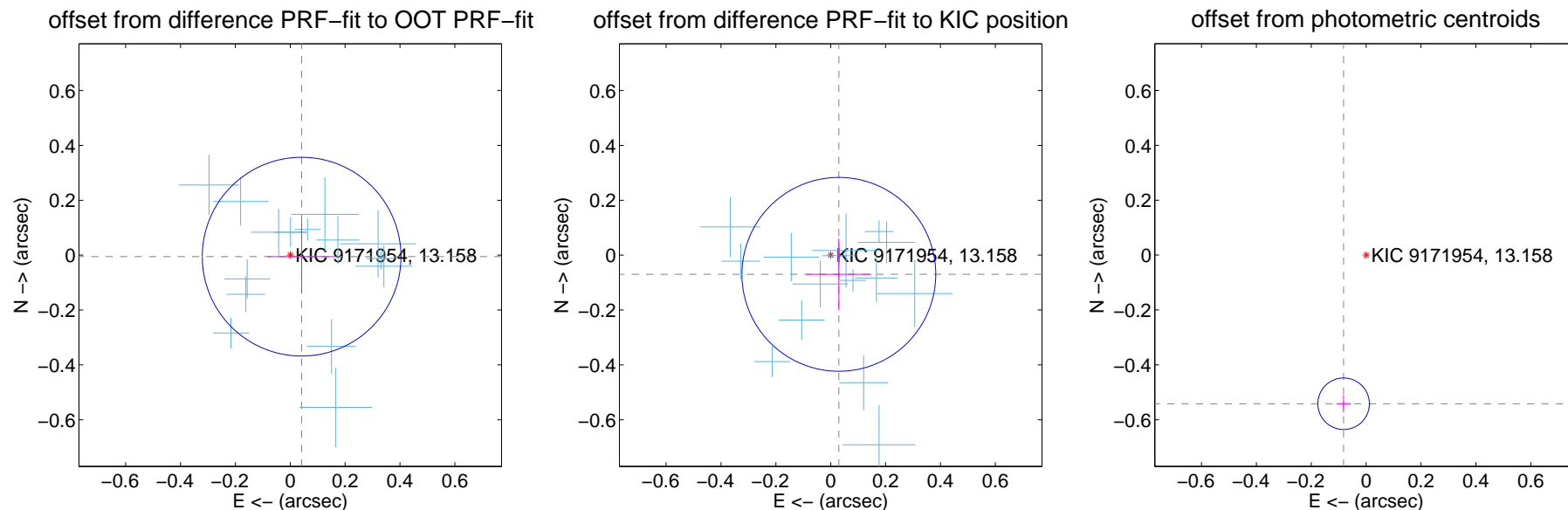
DV Centroid Data

Supplemental centroid analysis for 009171954-04. Kepler magnitude: 13.16. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

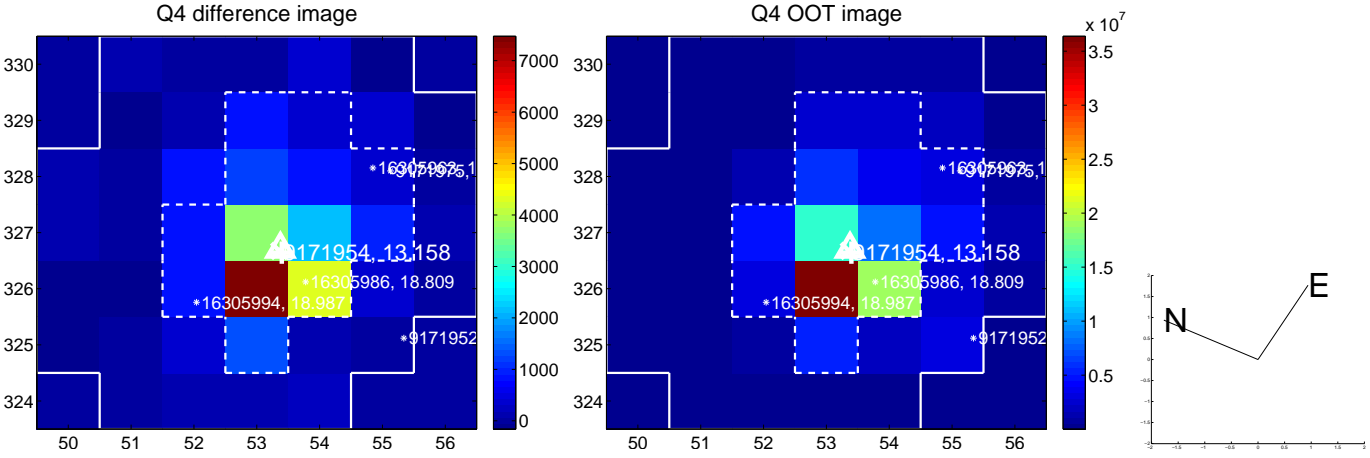
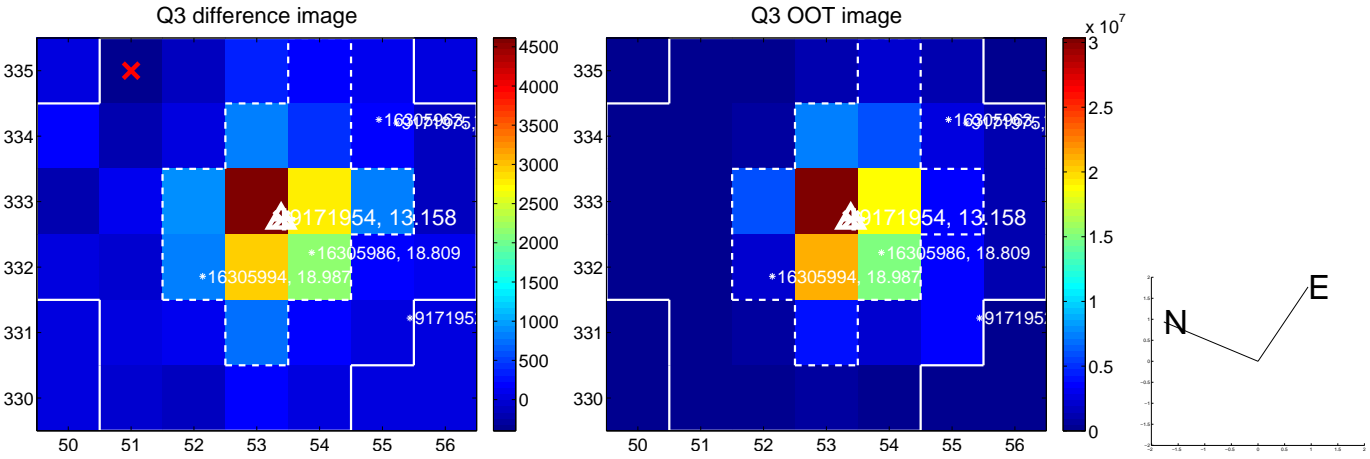
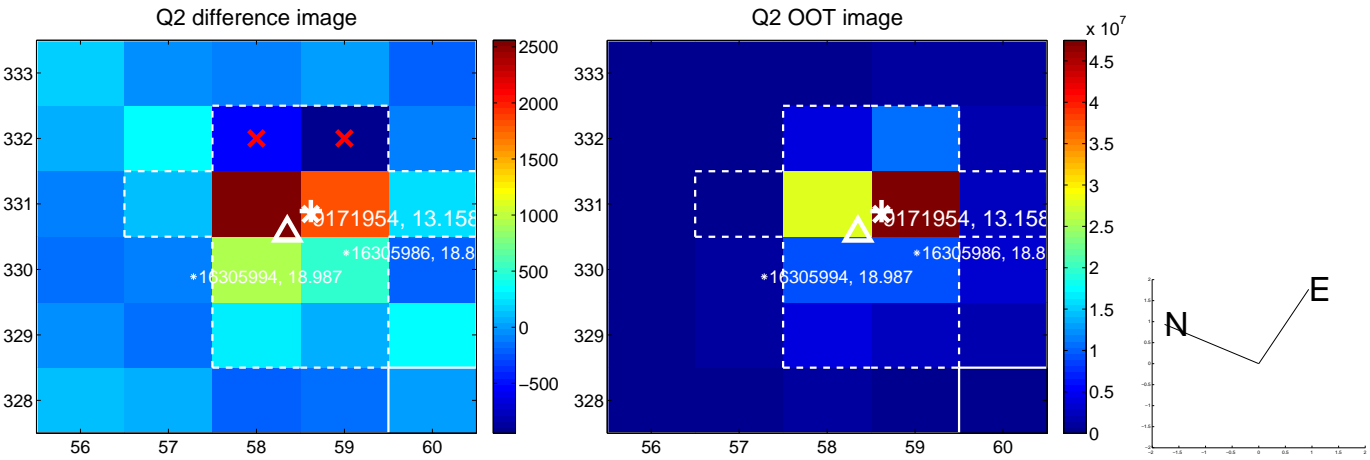
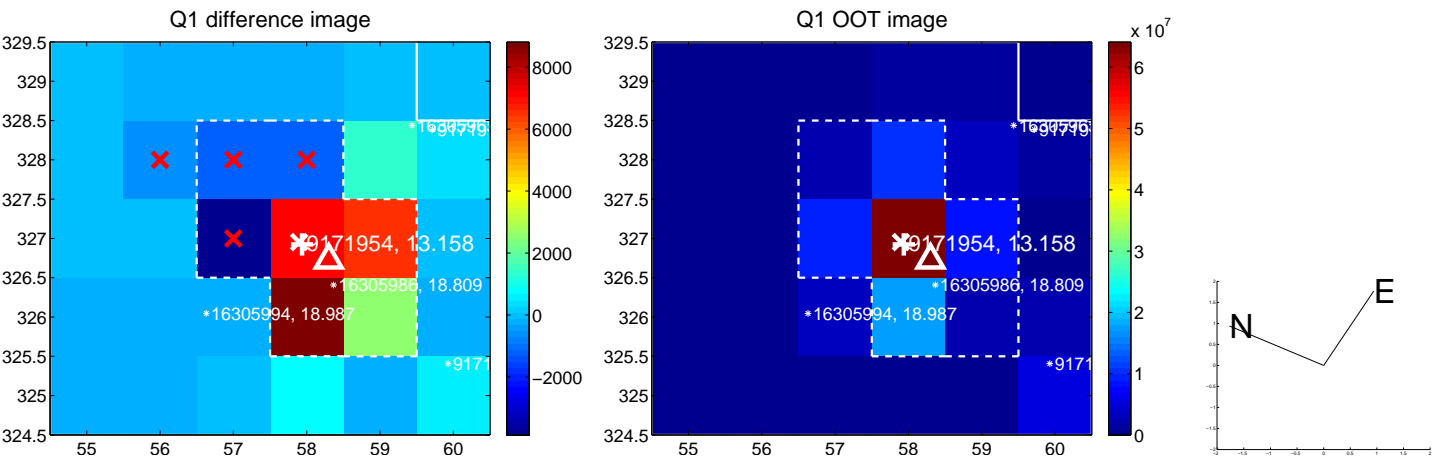
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.042 ± 0.121 | 0.35 | -0.041 ± 0.124 | -0.005 ± 0.129 |
| PRF-fit source offset from KIC position | 0.076 ± 0.118 | 0.65 | -0.030 ± 0.119 | -0.070 ± 0.130 |
| photometric centroid source offset | 0.55 ± 0.03 | 17.51 | 0.08 ± 0.03 | -0.54 ± 0.03 |

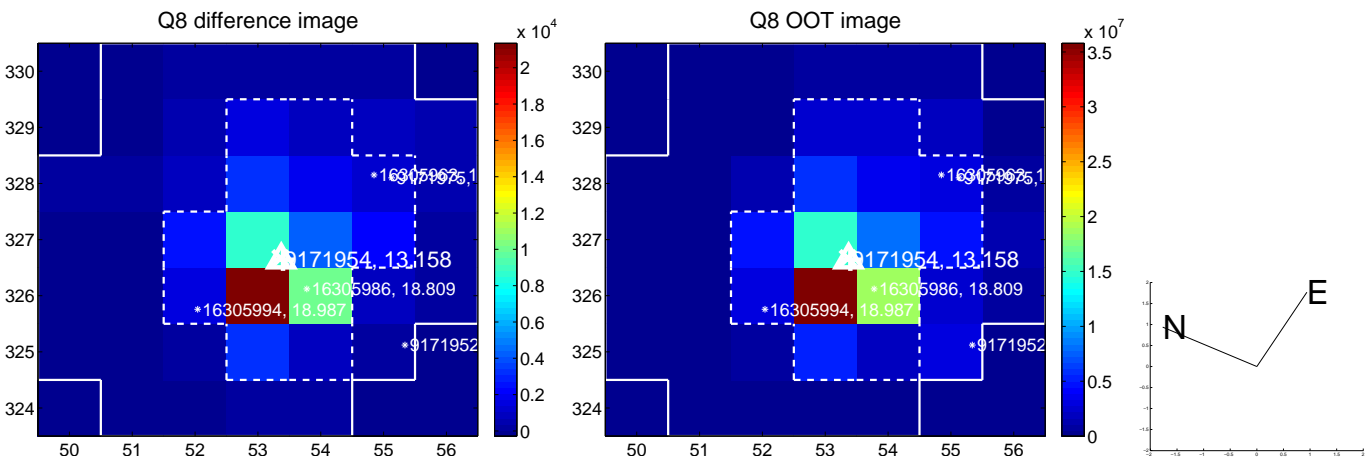
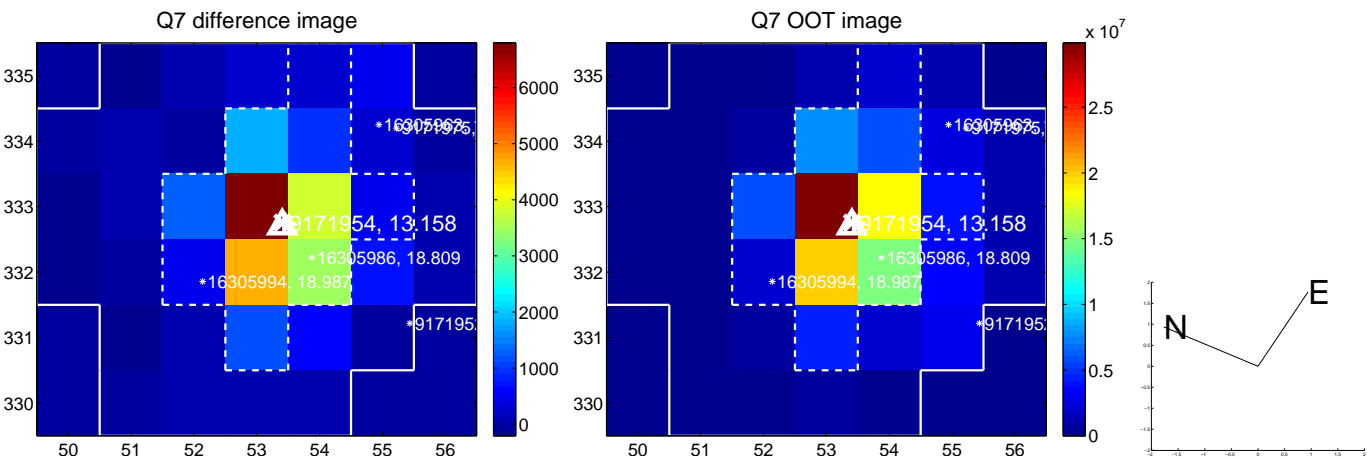
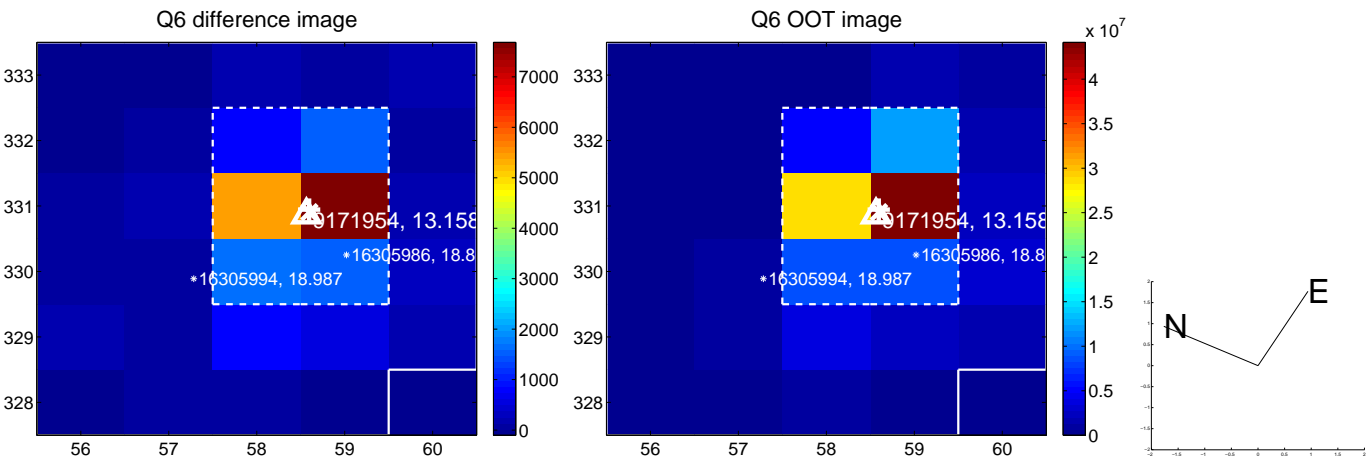
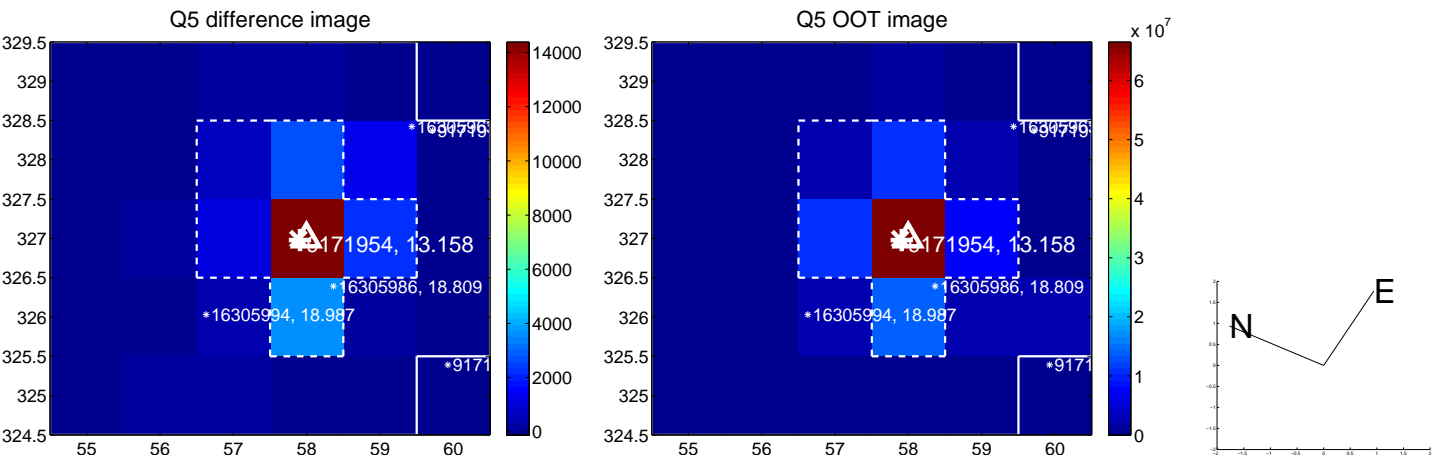


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

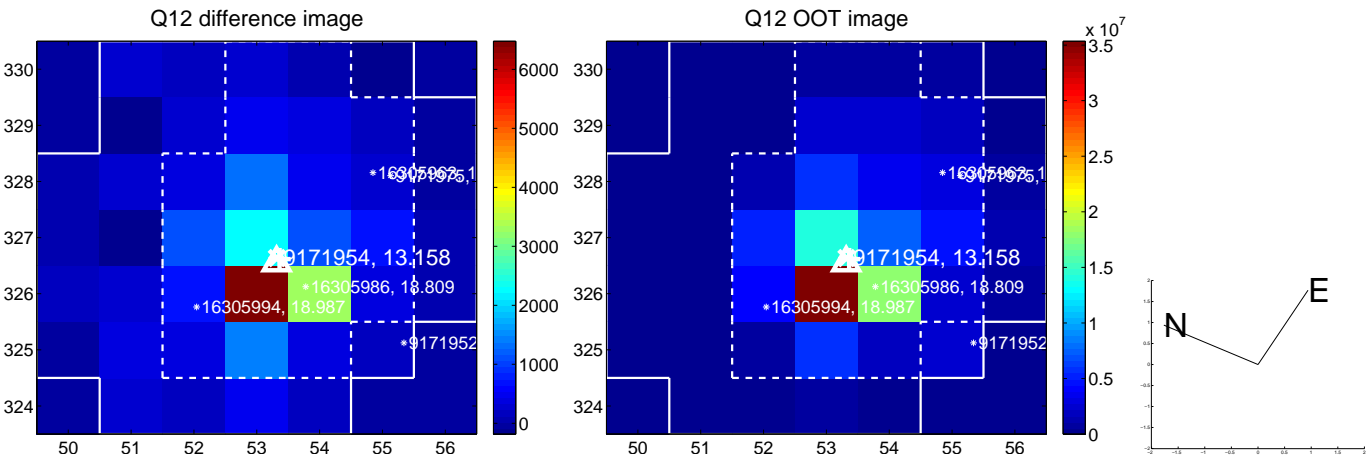
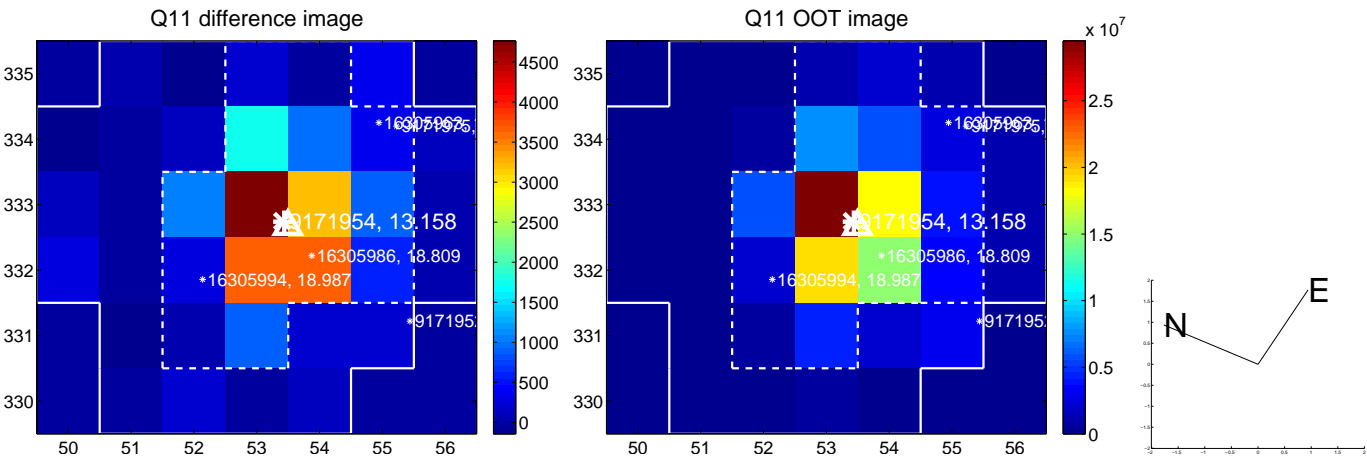
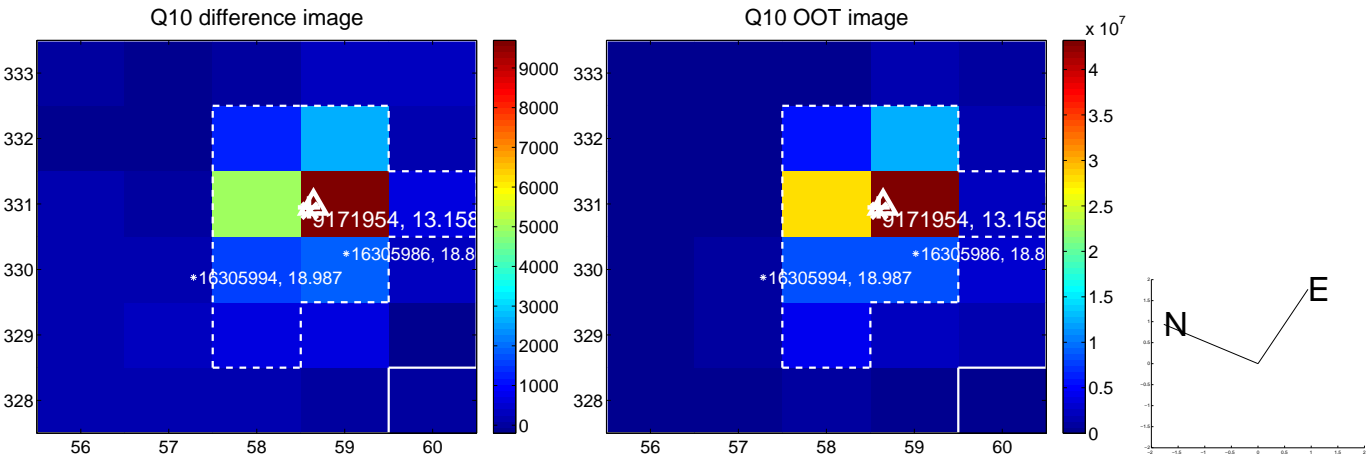
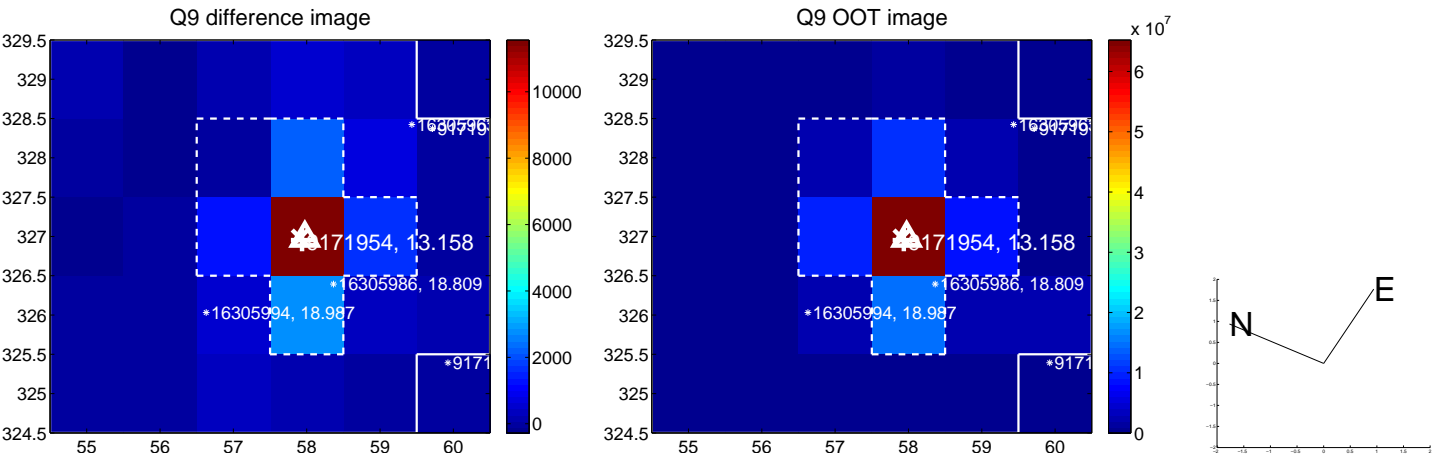
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



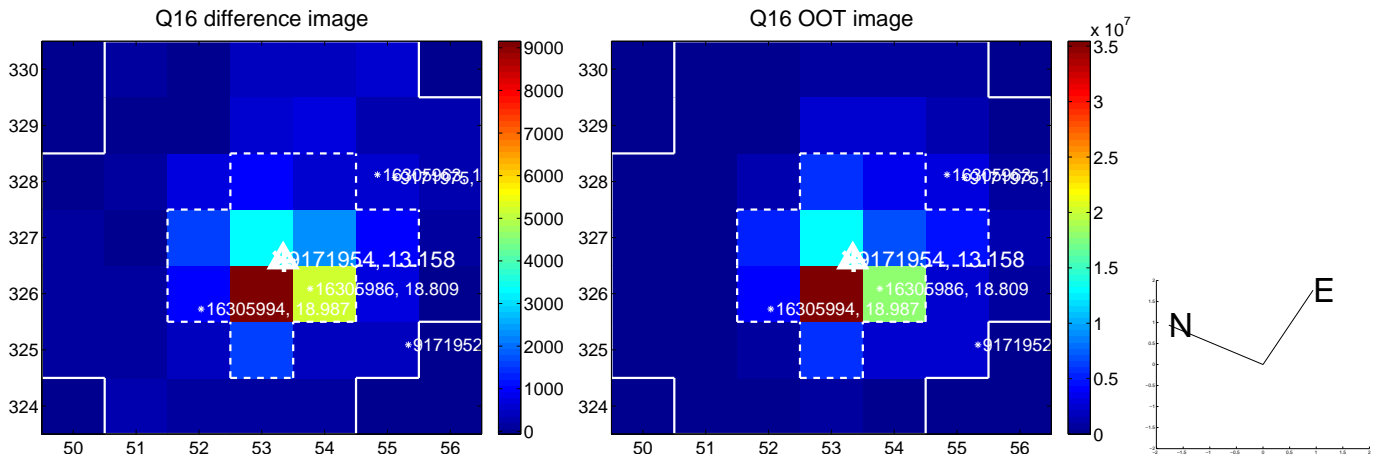
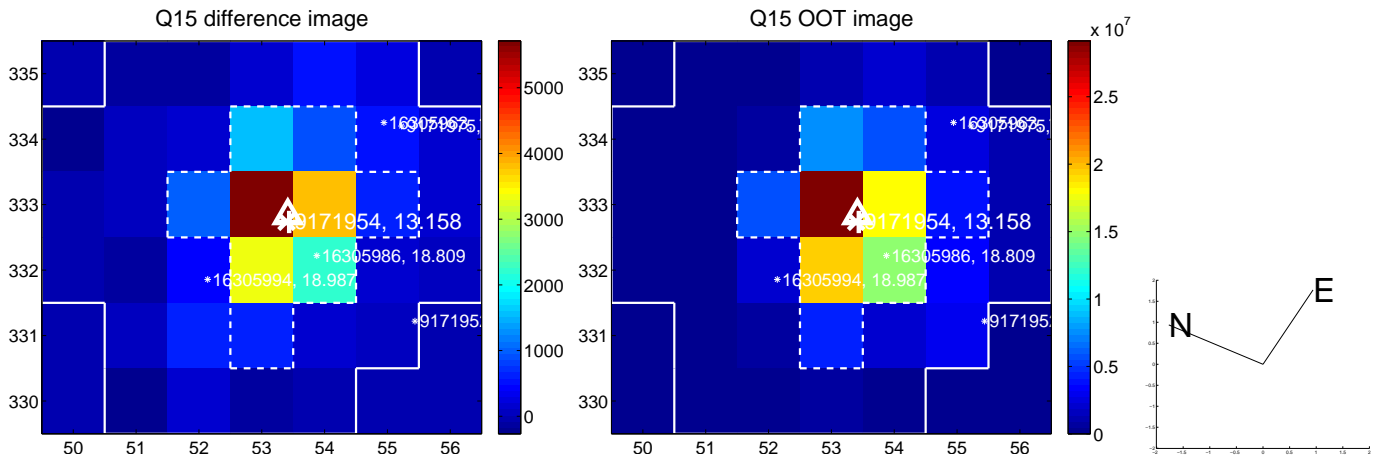
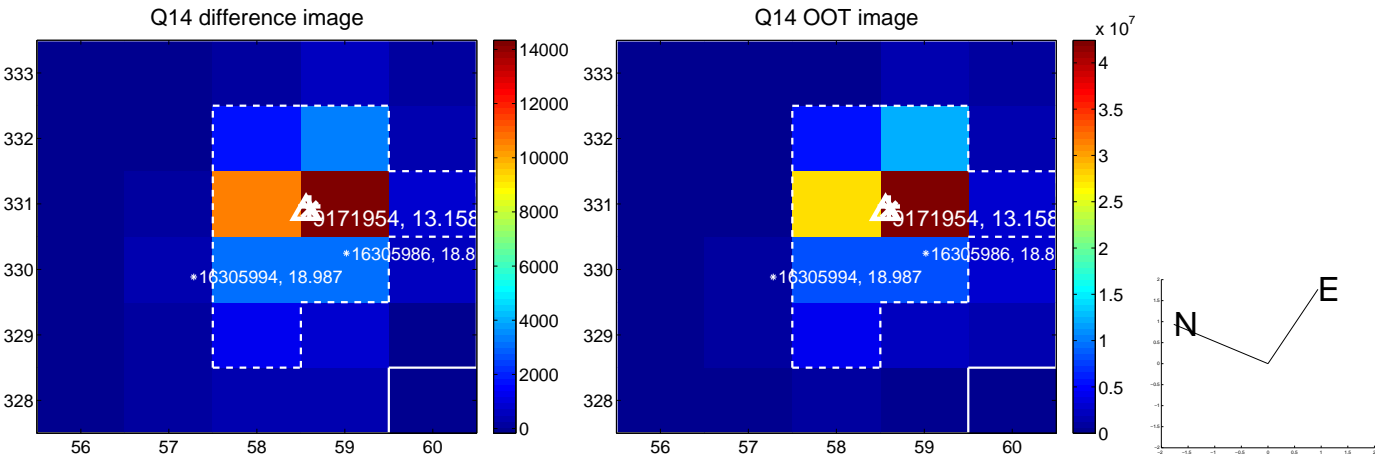
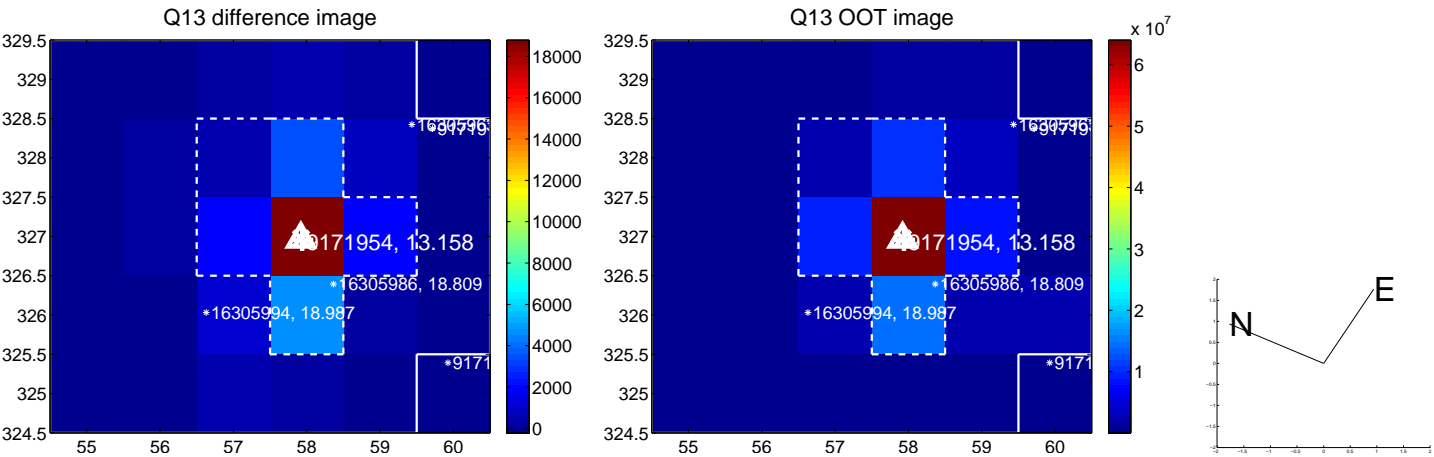
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



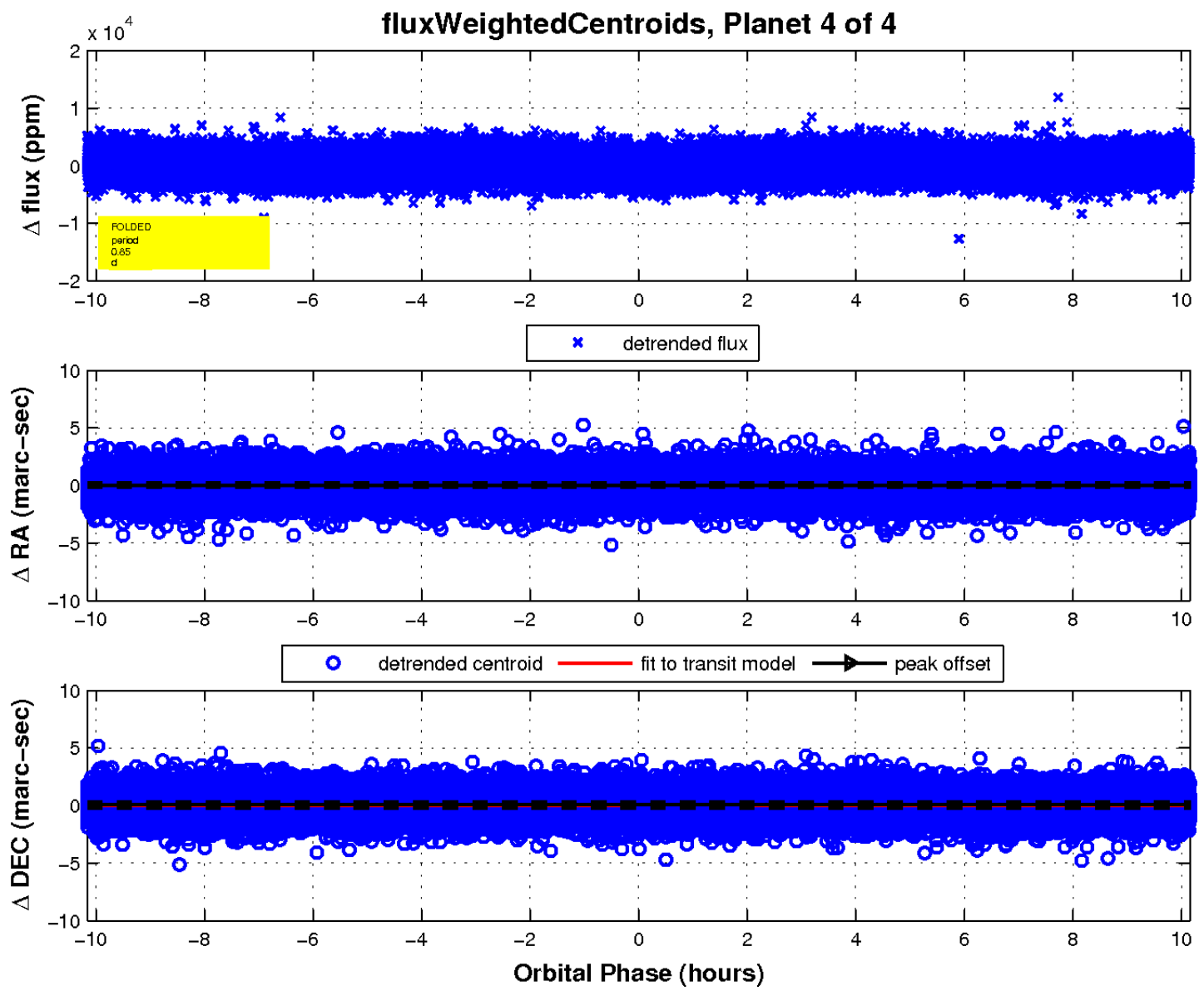
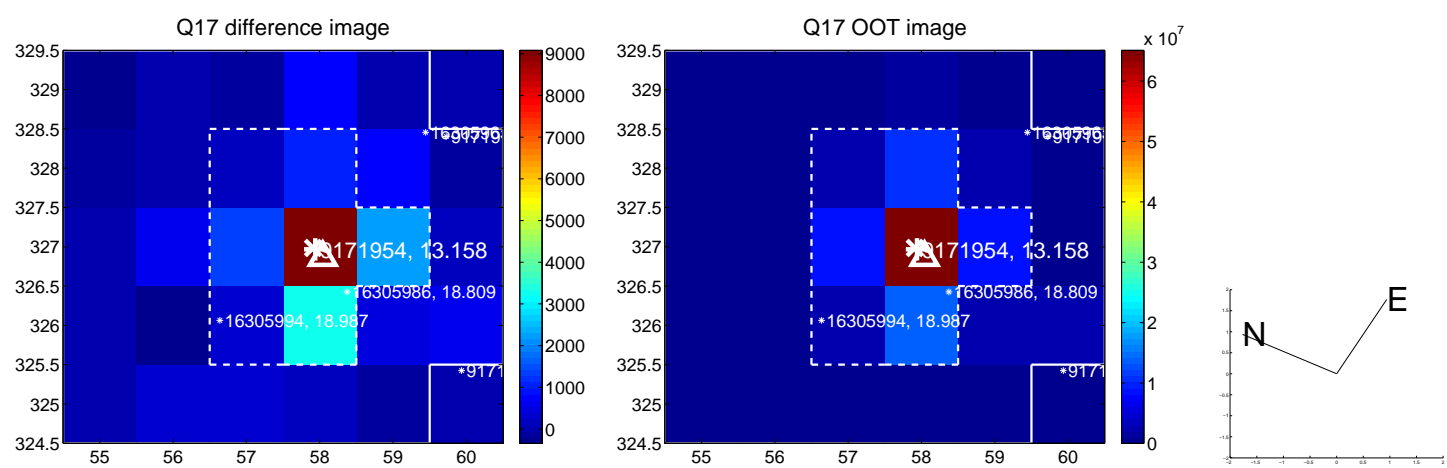
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

