

KIC 012165113

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 012165113-01 | OBS | No | 0.557592 | 131.737338 | 69.4 | 1.993 | 11.2 | 11.2 | 2.41 | 7466 | 2.32 | 60028.15 |
| 012165113-02 | OBS | No | 0.953324 | 132.295725 | 98.3 | 3.628 | 10.2 | 11.1 | 2.41 | 7466 | 2.76 | 29362.26 |
| 012165113-03 | OBS | No | 0.738807 | 131.933145 | 93.6 | 8.866 | 8.7 | 12.0 | 2.41 | 7466 | 2.80 | 41247.91 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 012165113-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 012165113-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 012165113-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT |

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

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

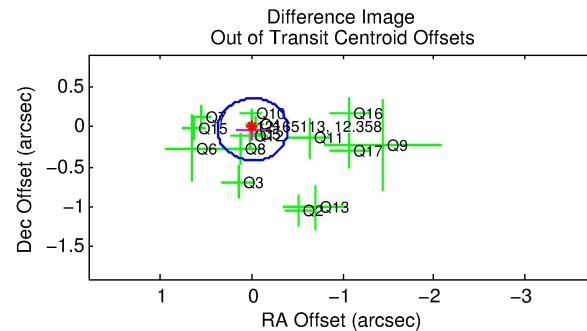
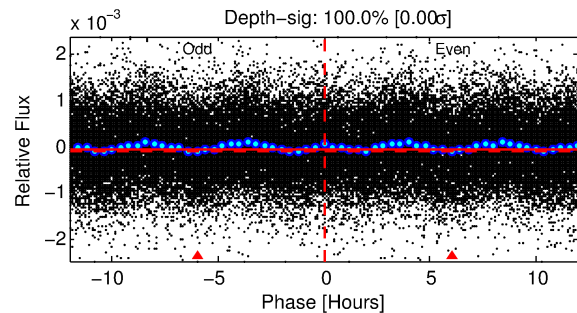
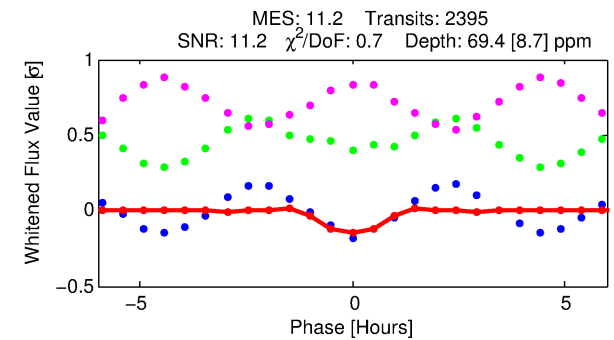
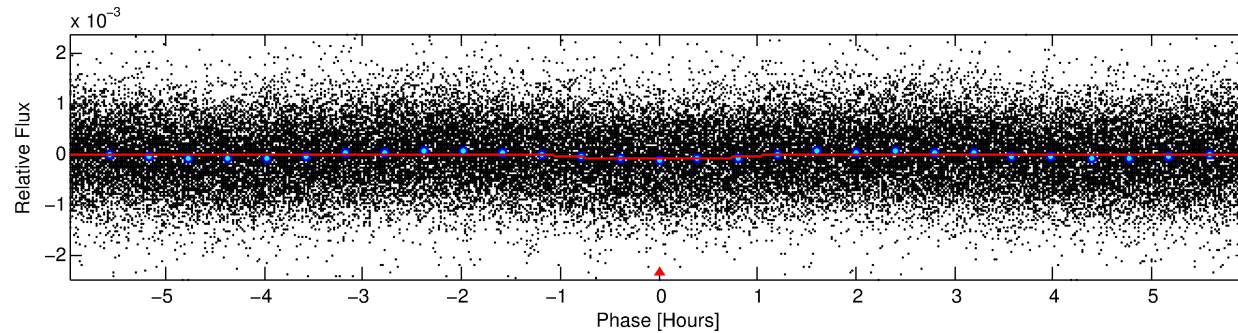
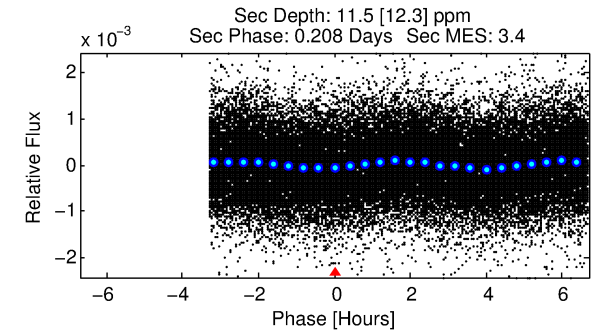
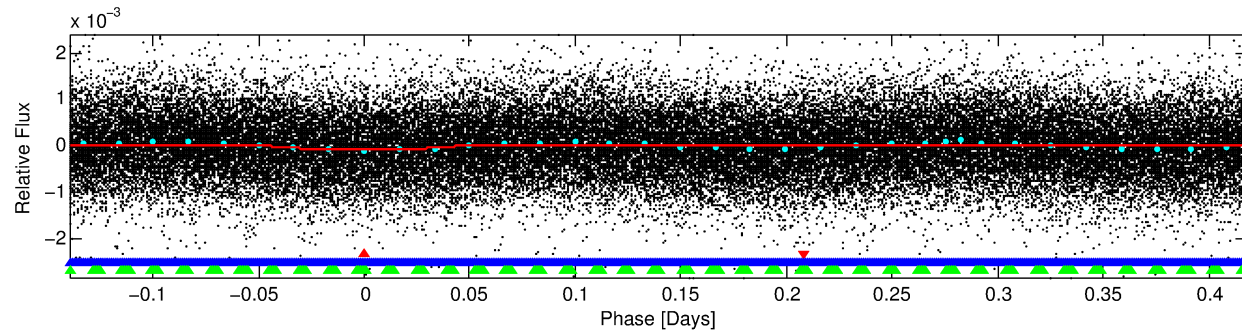
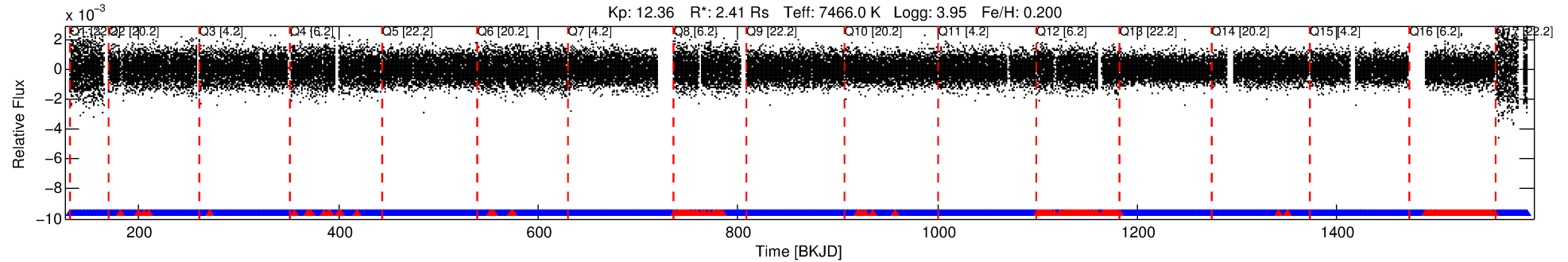
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012165113-01

No Significant Match Found

DV One-Page Summary

KIC: 12165113 Candidate: 1 of 3 Period: 0.558 d



DV Fit Results:

Period = 0.55759 [0.00001] d
Epoch = 131.7373 [0.0024] BKJD
Rp/R* = 0.0088 [0.0047]
a/R* = 1.35 [2.16]
b = 0.90 [0.75]
Seff = 60028.15 [24145.56]
Teq = 3991 [401] K
Rp = 2.32 [1.39] Re
a = 0.0164 [0.0039] AU
Ag = 0.31 [0.49] [-1.41σ]
Teffp = 4621 [1756] K [0.35σ]

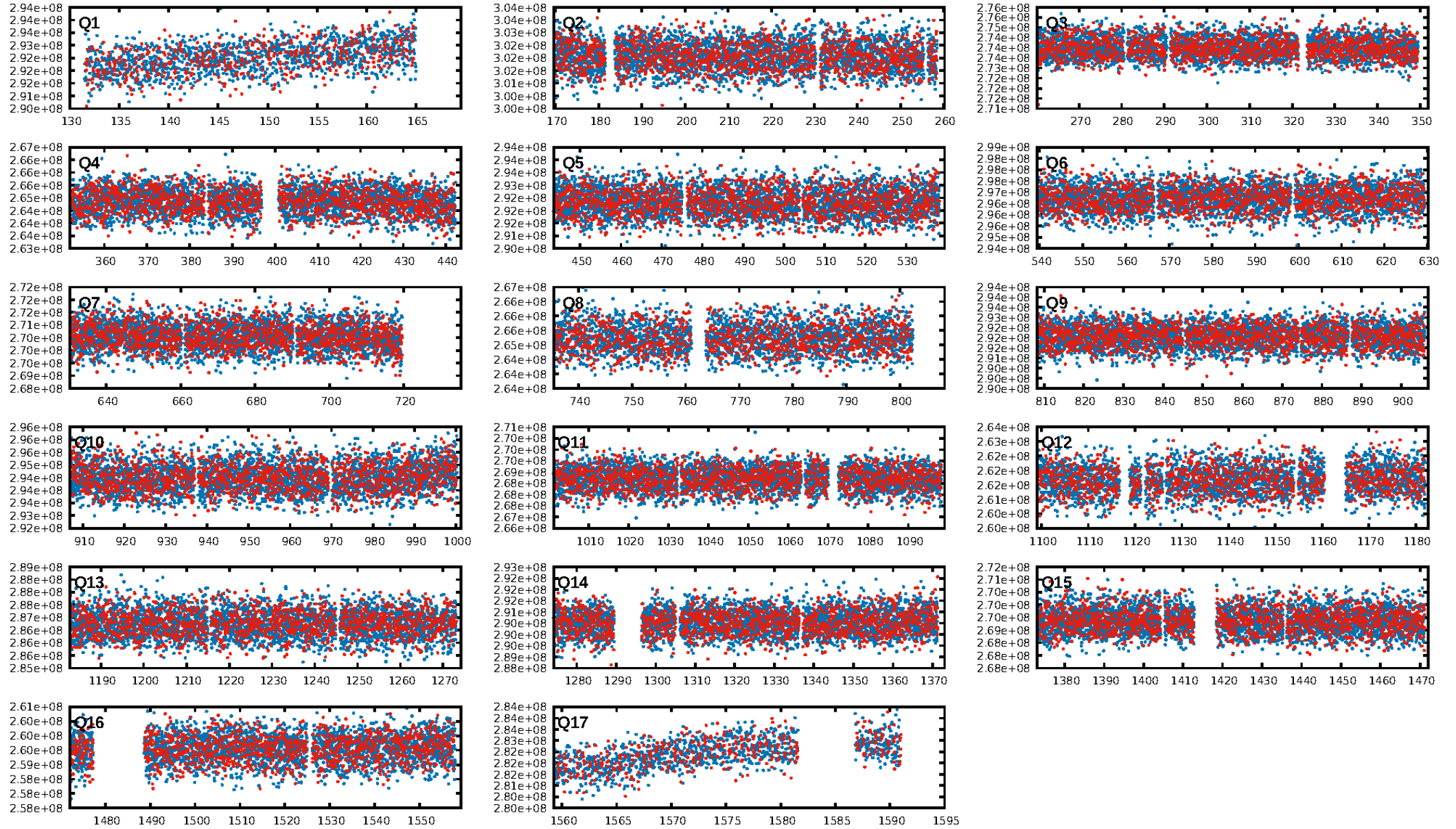
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 36.8% [0.48σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.90 [2061/2287]
GhostDiagnostic-chr: 1.347
Centroid-sig: 0.6%
Centroid-so: 0.660 arcsec [2.92σ]
OotOffset-rm: 0.036 arcsec [0.28σ]
KicOffset-rm: 0.161 arcsec [1.27σ]
OotOffset-st: 3/4/4/4 [15]
KicOffset-st: 3/4/4/4 [15]
DiffImageQuality-fgm: 0.80 [12/15]
DiffImageOverlap-fno: 0.00 [0/17]

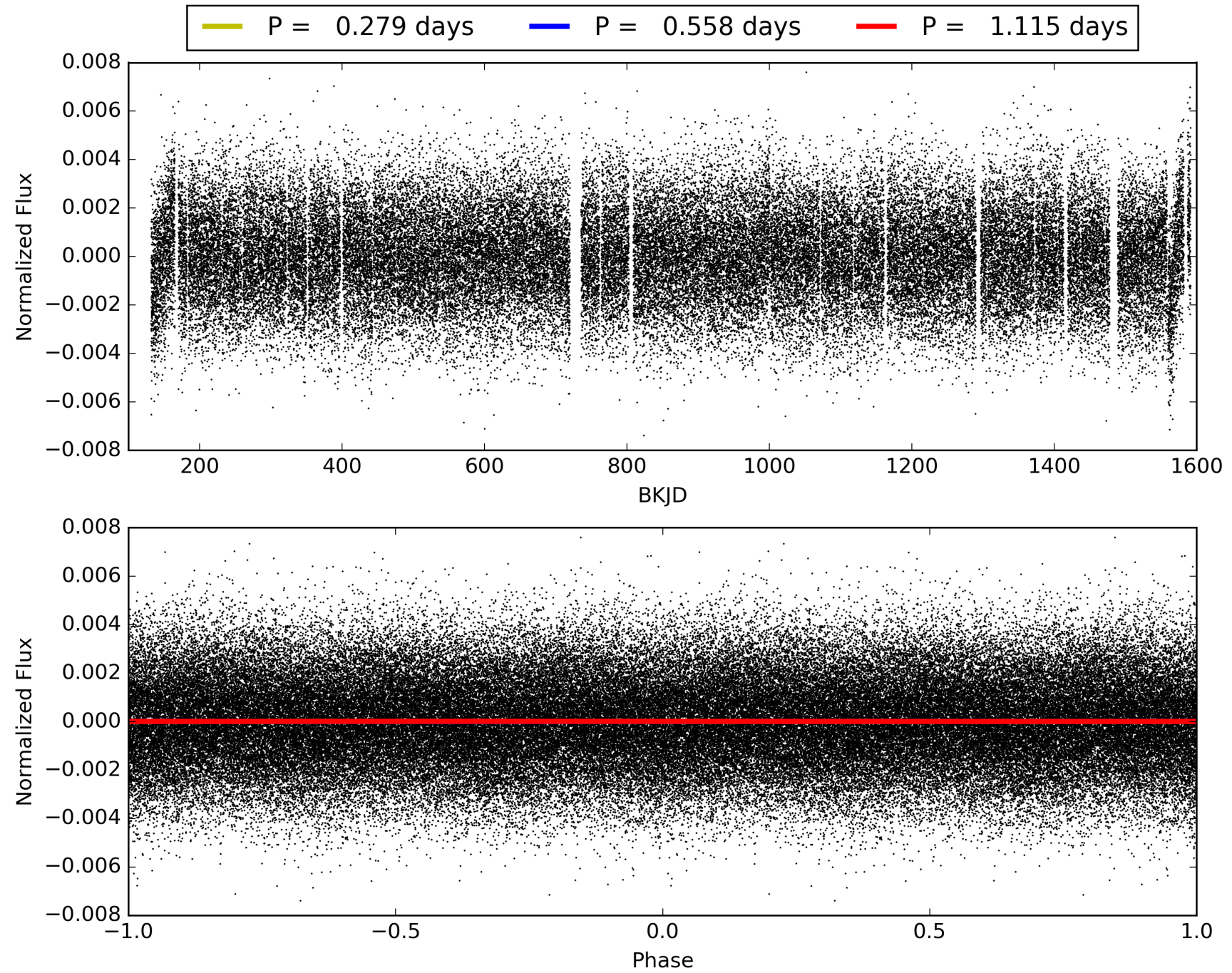
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:38:40 Z

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

TCE 012165113-01, PDC Light Curves

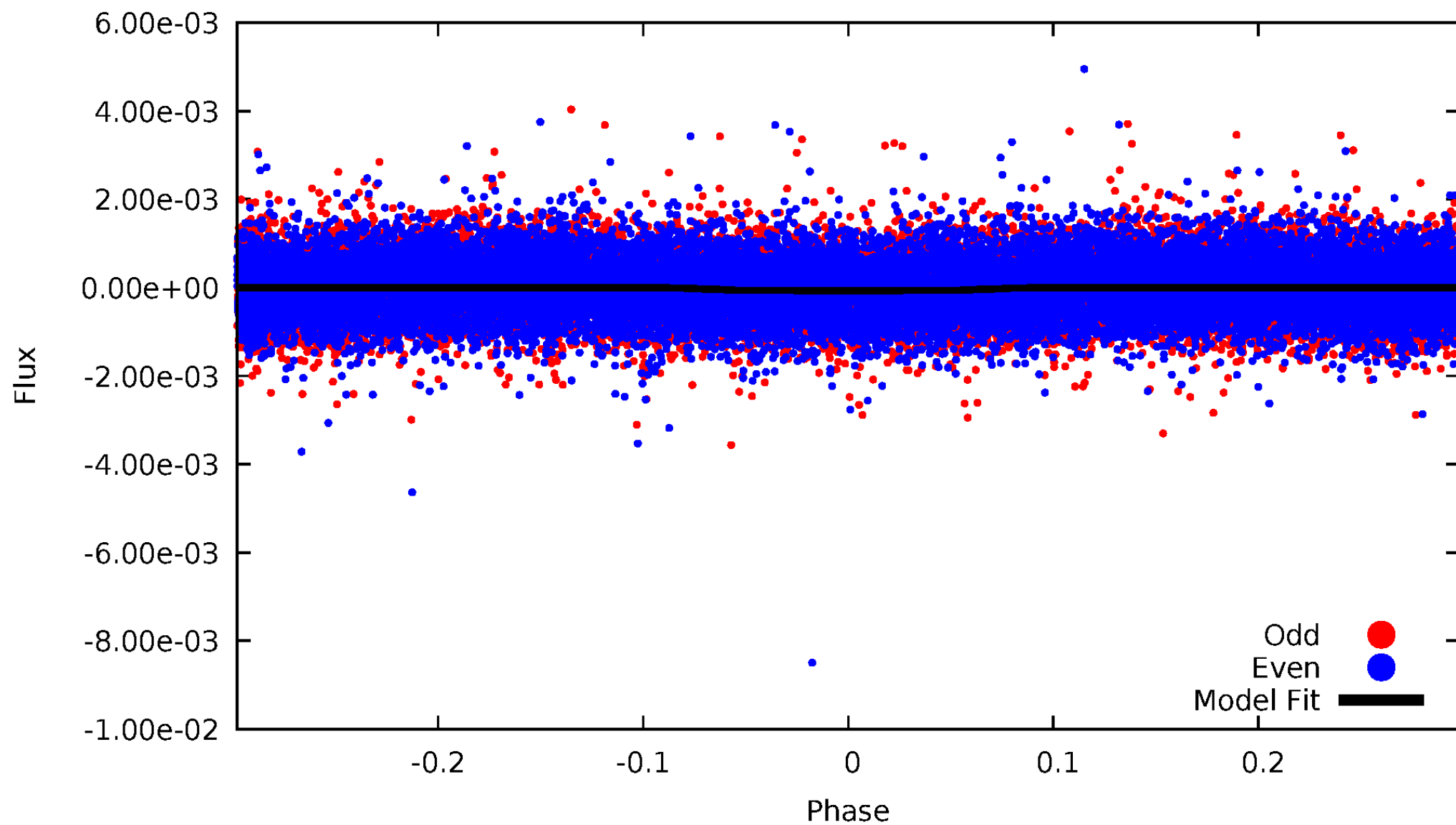


TCE 012165113-01



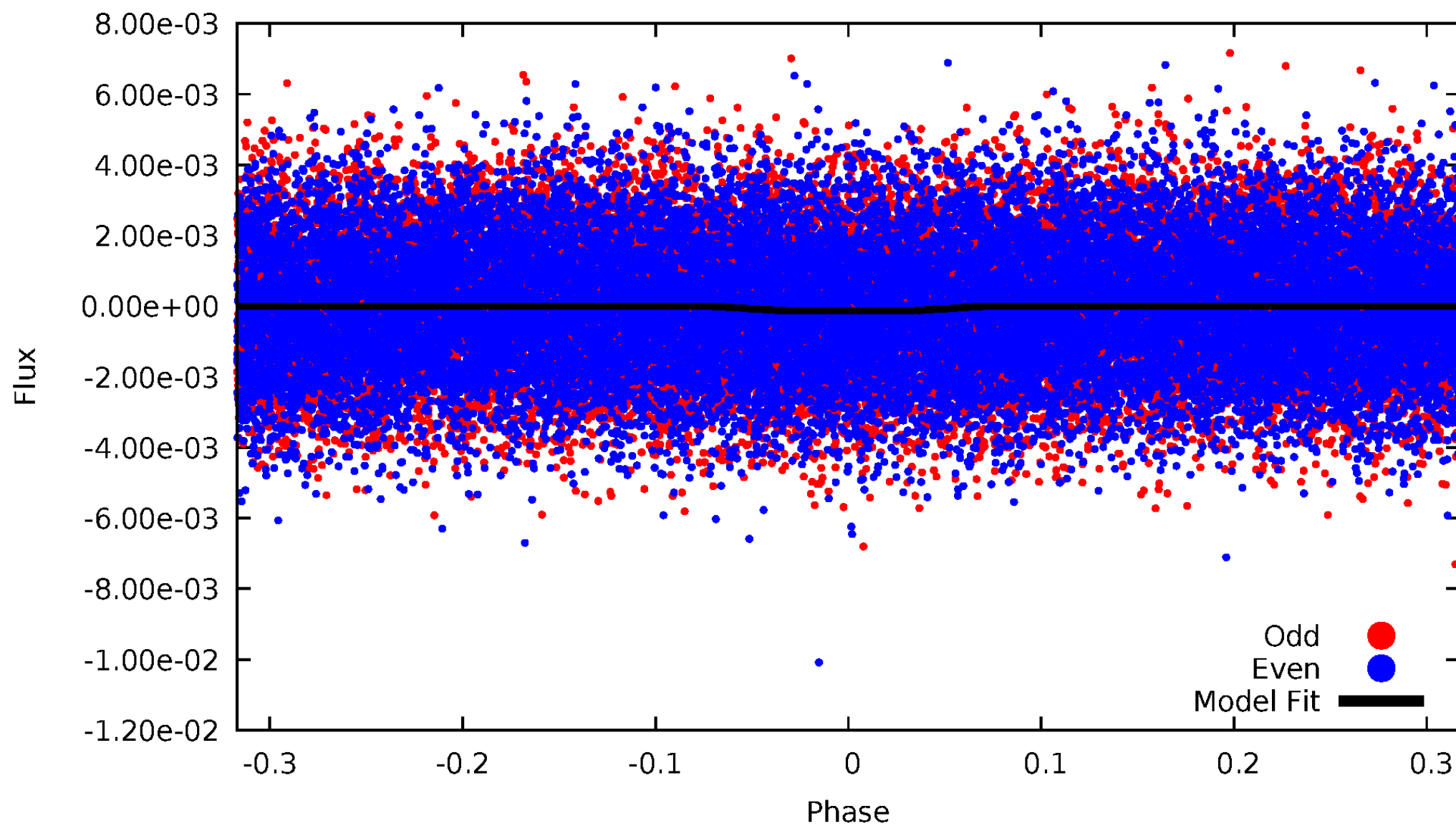
DV Odd/Even

TCE 012165113-01

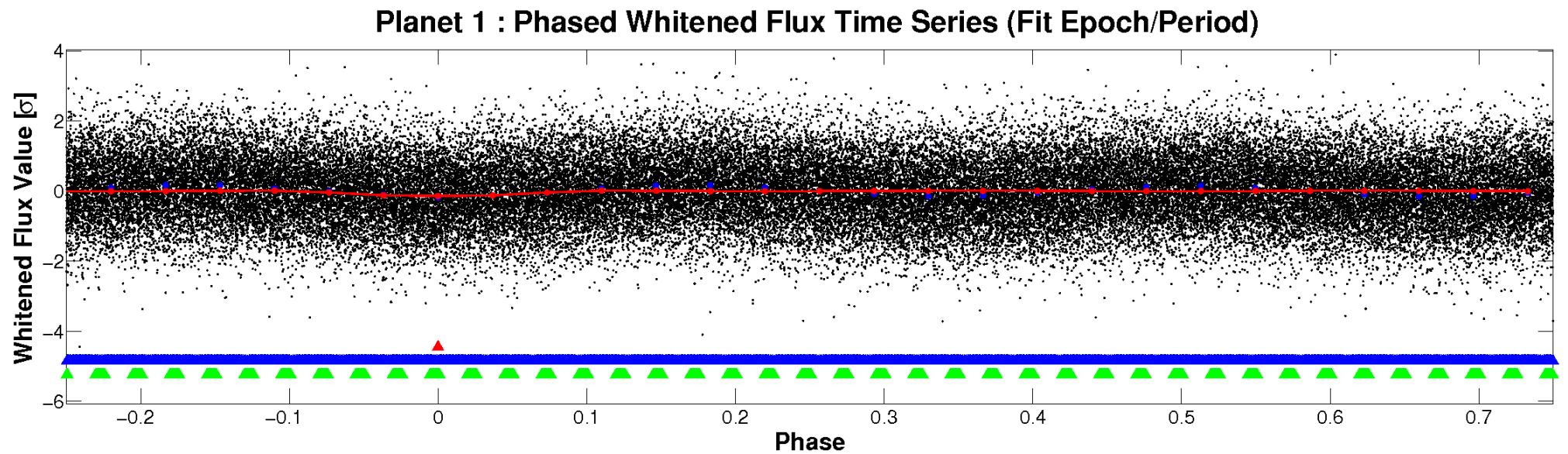
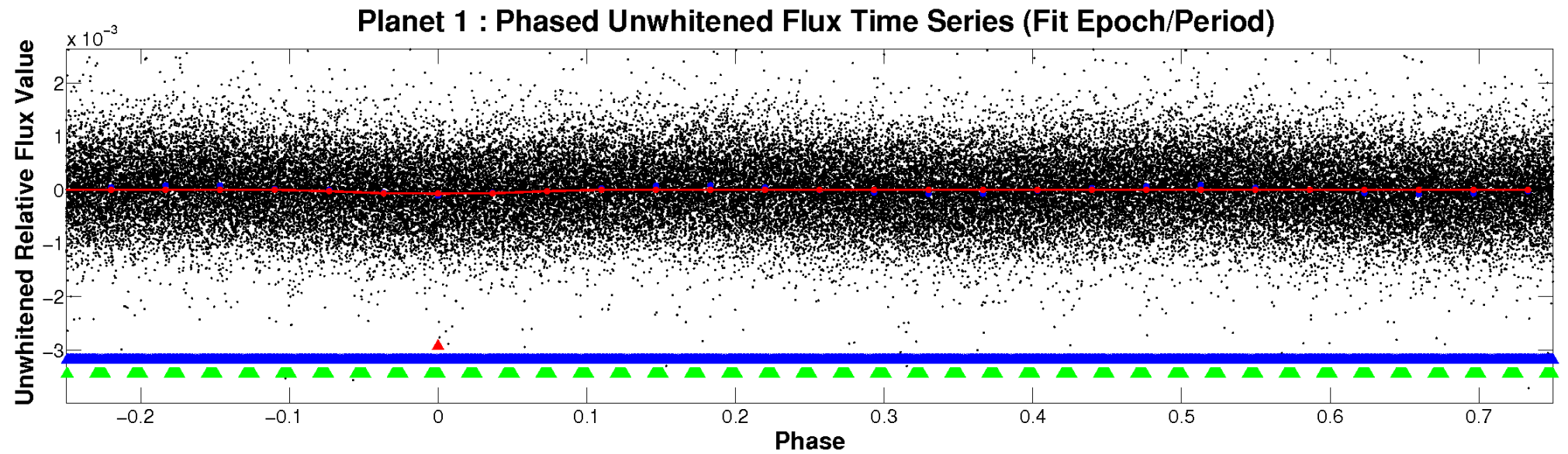


ALT Odd/Even

TCE 012165113-01

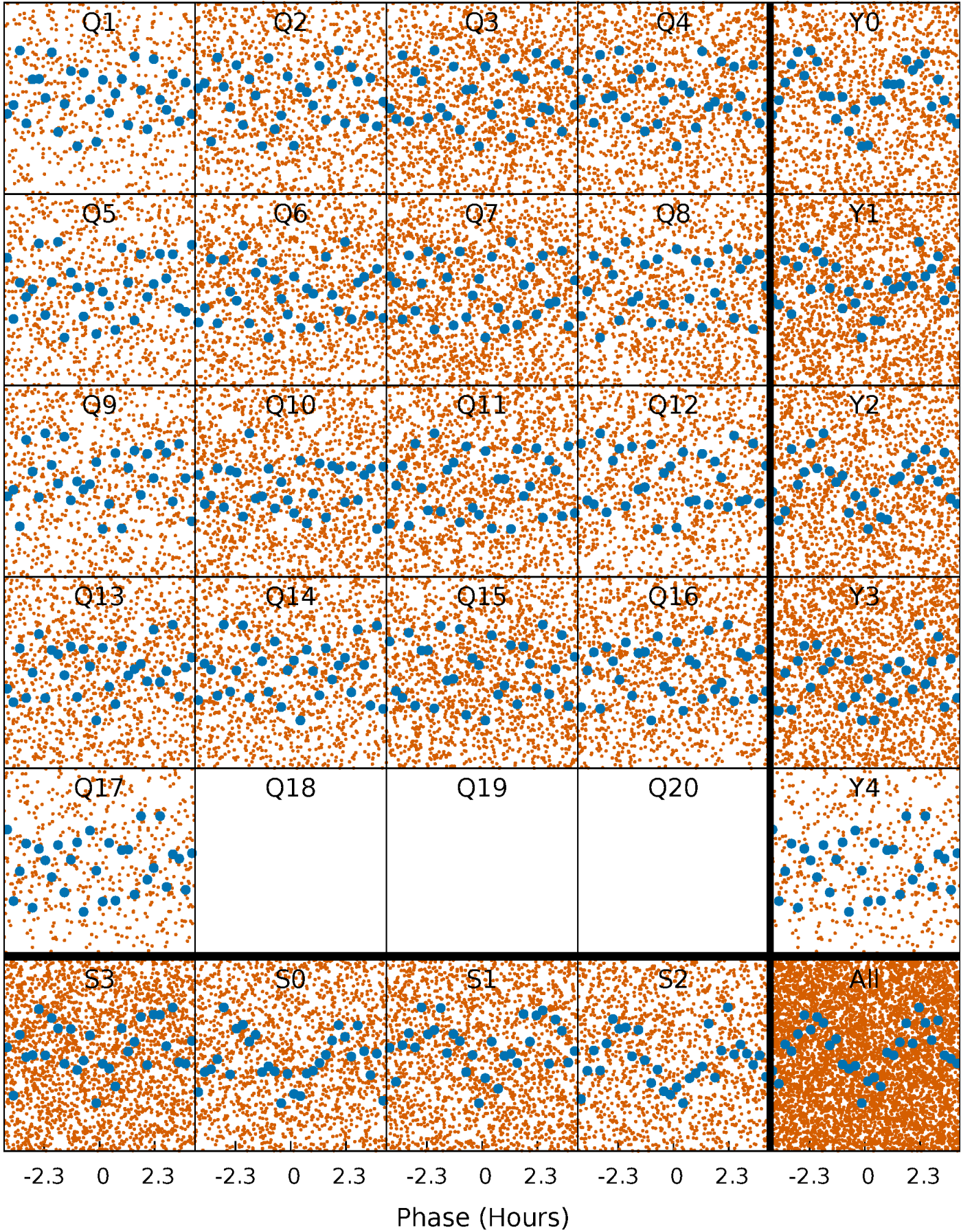


Non-Whitened Vs. Whitened Light Curve



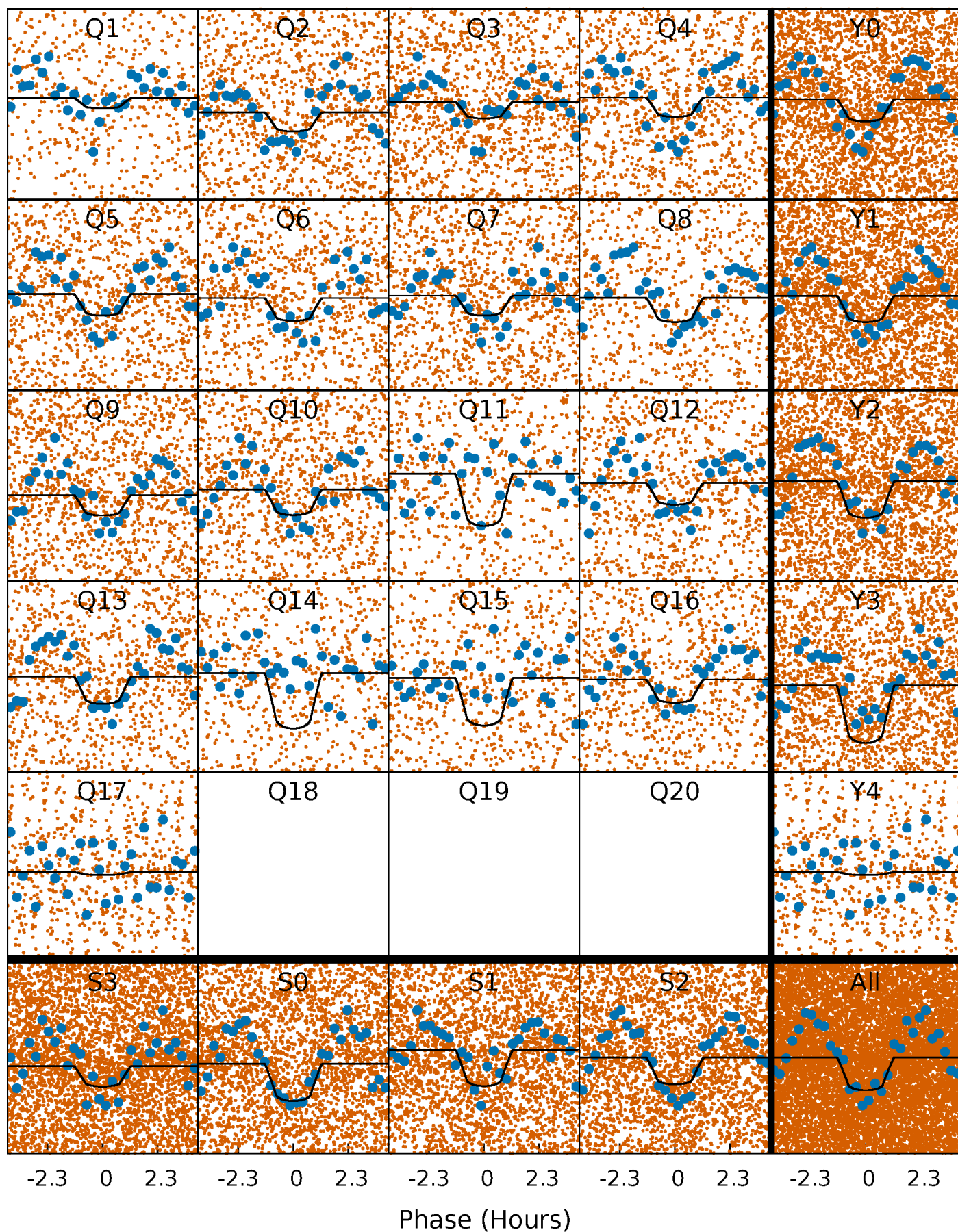
PDC Quarter-Phased Transit Curves

TCE 012165113-01 P= 0.557592 Days $T_0=131.737338$ (BKJD)



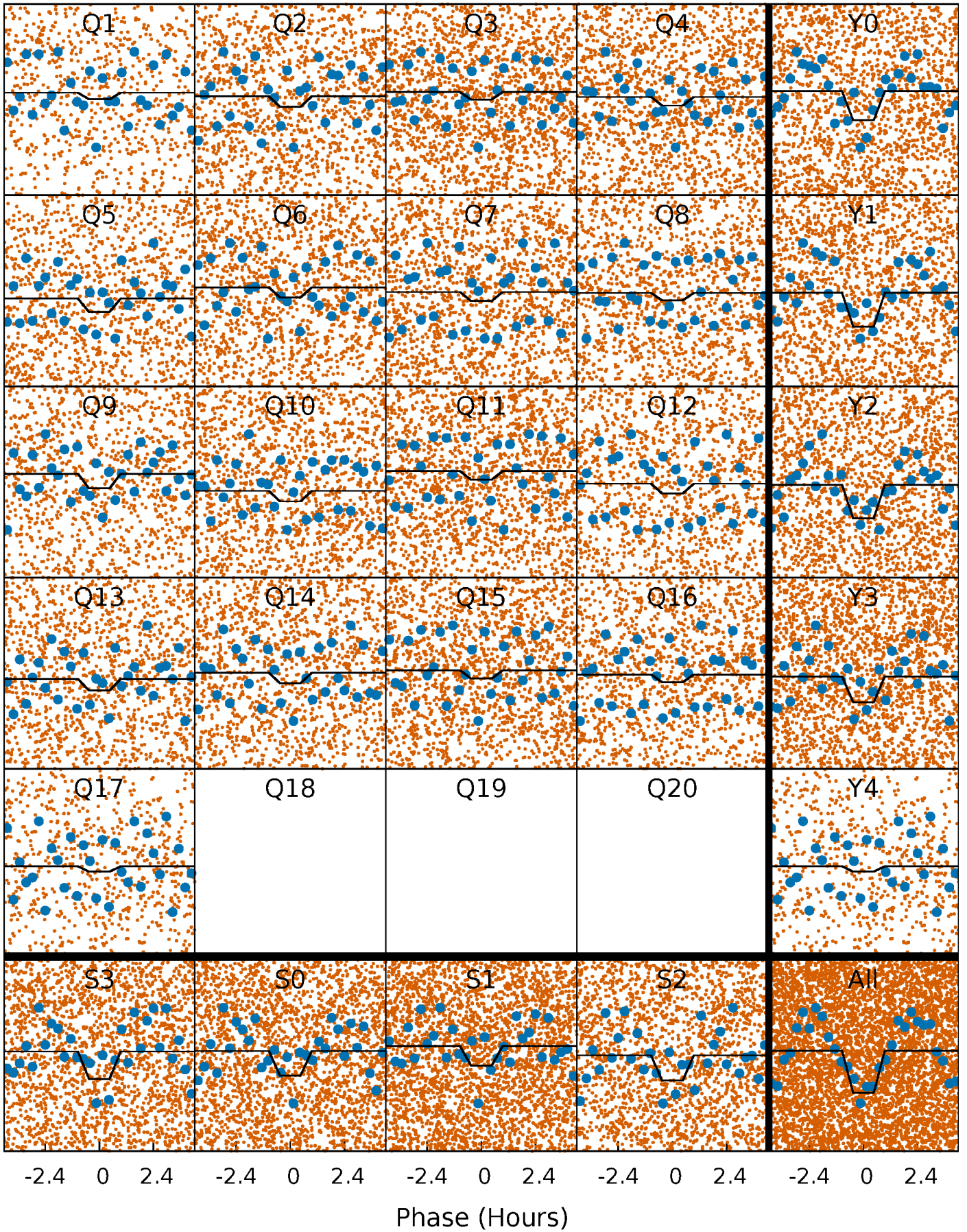
DV Quarter-Phased Transit Curves

TCE 012165113-01 P= 0.557592 Days $T_0=131.737338$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

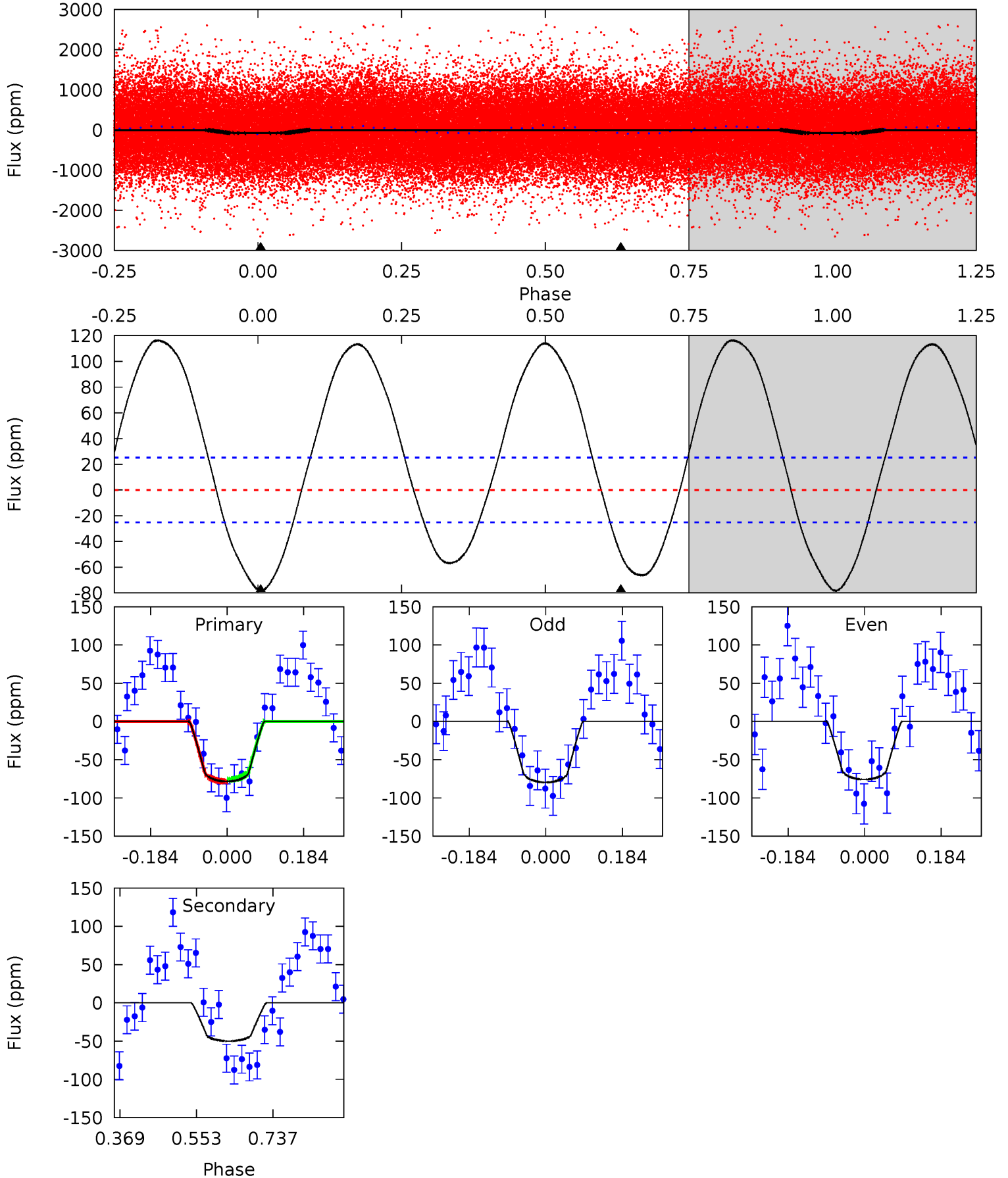
TCE 012165113-01 P= 0.557597 Days $T_0=131.734809$ (BKJD)



DV Model-Shift Uniqueness Test

012165113-01, P = 0.557592 Days, E = 131.179746 Days

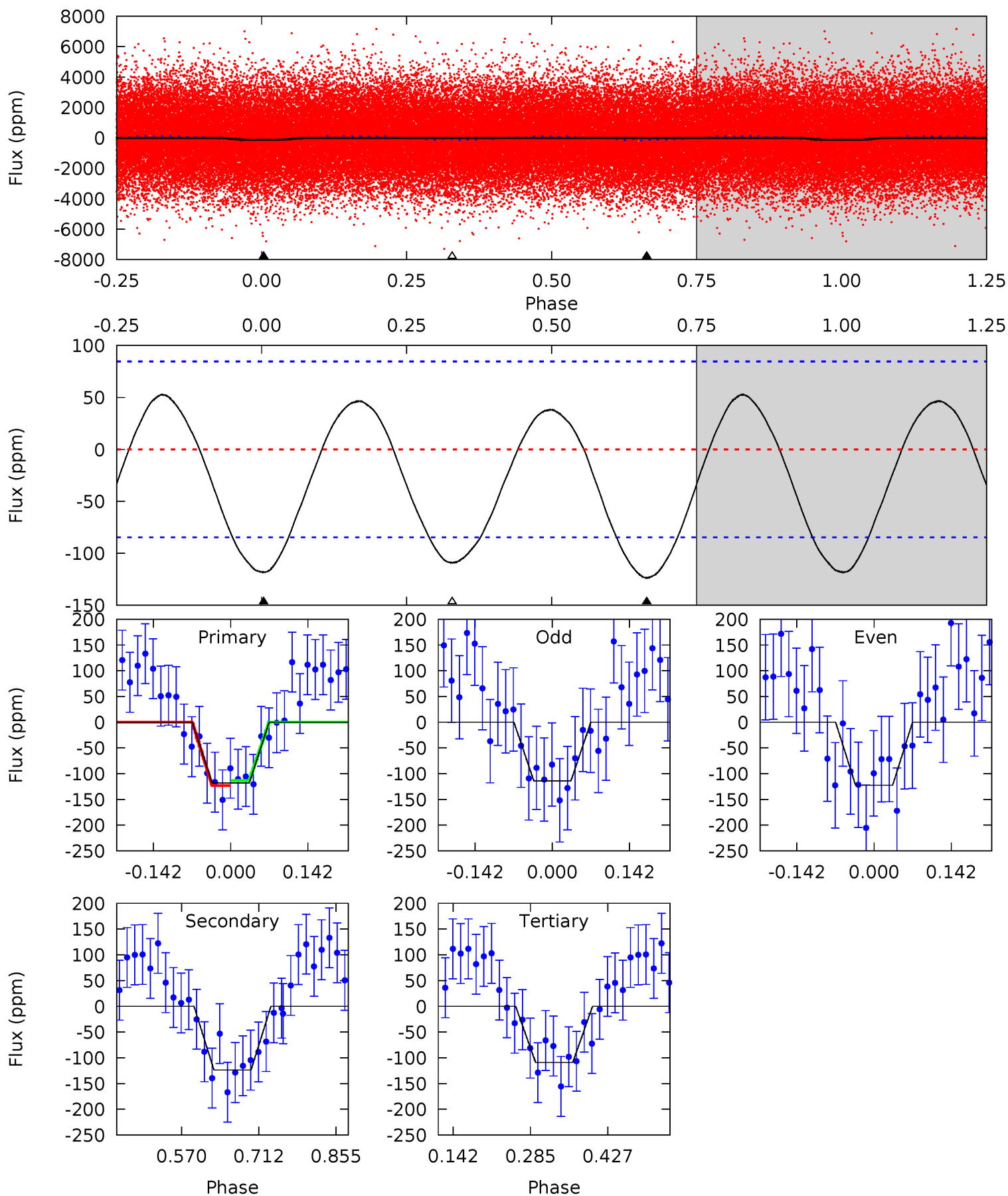
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.8 | 8.80 | 0 | 0 | 4.43 | 1.33 | 9.39 | 13.8 | 13.8 | 8.80 | 8.80 | 0.34 | 1.01 | 0.60 | 0.21 |



Alt Model-Shift Uniqueness Test

012165113-01, P = 0.557597 Days, E = 131.177212 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.28 | 6.57 | 5.79 | 0 | 4.49 | 1.47 | 3.05 | 0.48 | 6.28 | 0.77 | 6.57 | 0.22 | 0.75 | 0.30 | 0.25 |



Stellar Parameters For KIC 012165113

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (g \cdot \text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------------------|
| | 7466^{+206}_{-353} | $3.951^{+0.198}_{-0.144}$ | $0.200^{+0.150}_{-0.350}$ | $2.406^{+0.542}_{-0.662}$ | $1.886^{+0.148}_{-0.346}$ | $0.191^{+0.233}_{-0.079}$ |
| | +3%/-5% | +5%/-4% | +75%/-175% | +23%/-28% | +8%/-18% | +122%/-41% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 012165113-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|------------------------|---------------------------|
| DV | -50 ± 6 | $2.30^{+1.29}_{-1.12}$ | 5538^{+373}_{-413} | 6060^{+3379}_{-1597} | $1.365^{+3.917}_{-0.817}$ |
| Alt. | -124 ± 19 | $2.87^{+1.34}_{-1.27}$ | 5551^{+394}_{-425} | 7113^{+3775}_{-1551} | $2.160^{+4.714}_{-1.171}$ |

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 $A_{obs} \gg 1.0$

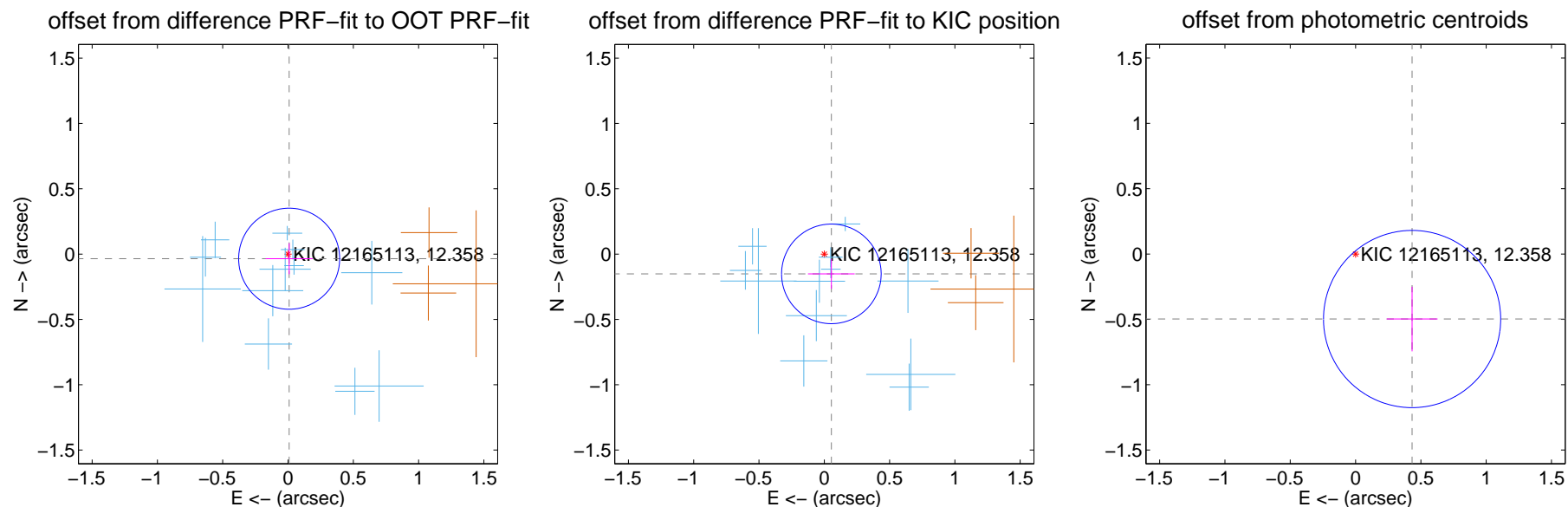
DV Centroid Data

Supplemental centroid analysis for 012165113-01. Kepler magnitude: 12.36. Transit SNR 11.20

There are 12 quarters with good PRF difference image offsets

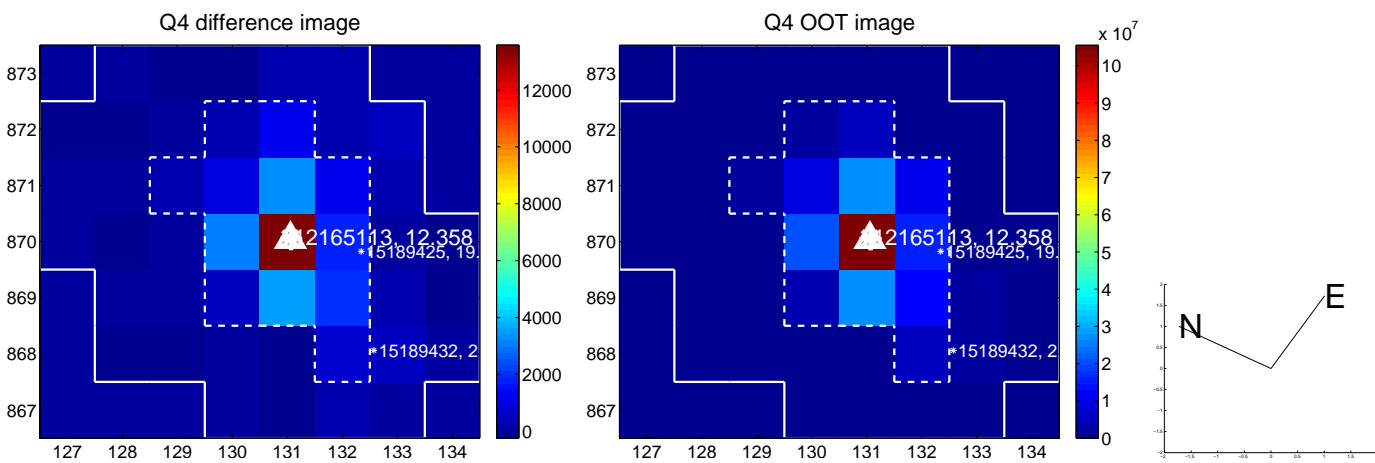
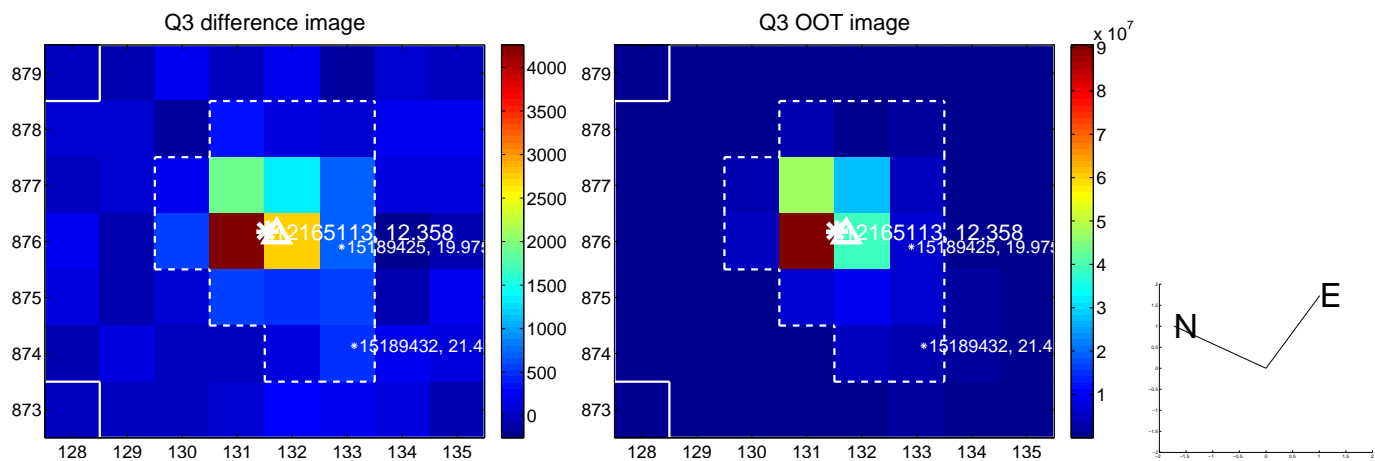
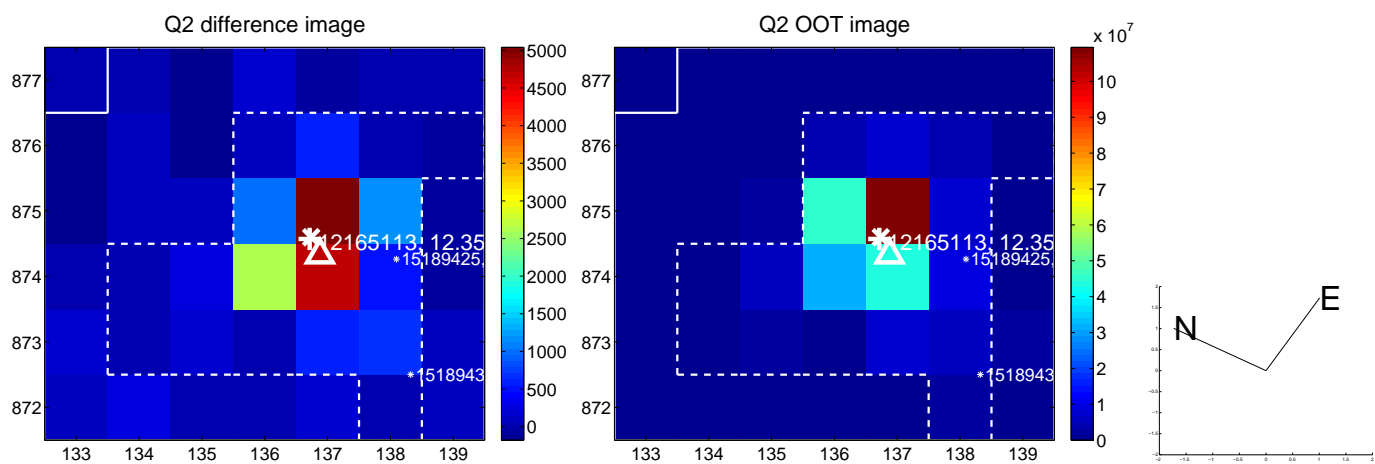
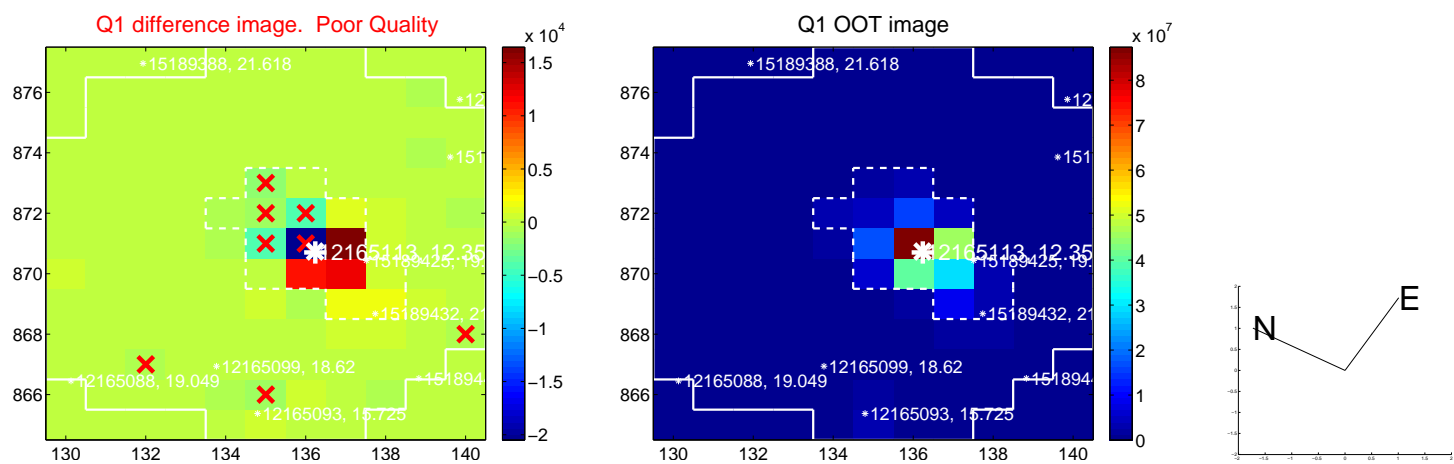
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.036 ± 0.129 | 0.28 | -0.009 ± 0.180 | -0.035 ± 0.119 |
| PRF-fit source offset from KIC position | 0.161 ± 0.127 | 1.27 | -0.054 ± 0.179 | -0.151 ± 0.114 |
| photometric centroid source offset | 0.66 ± 0.23 | 2.92 | -0.43 ± 0.20 | -0.50 ± 0.25 |

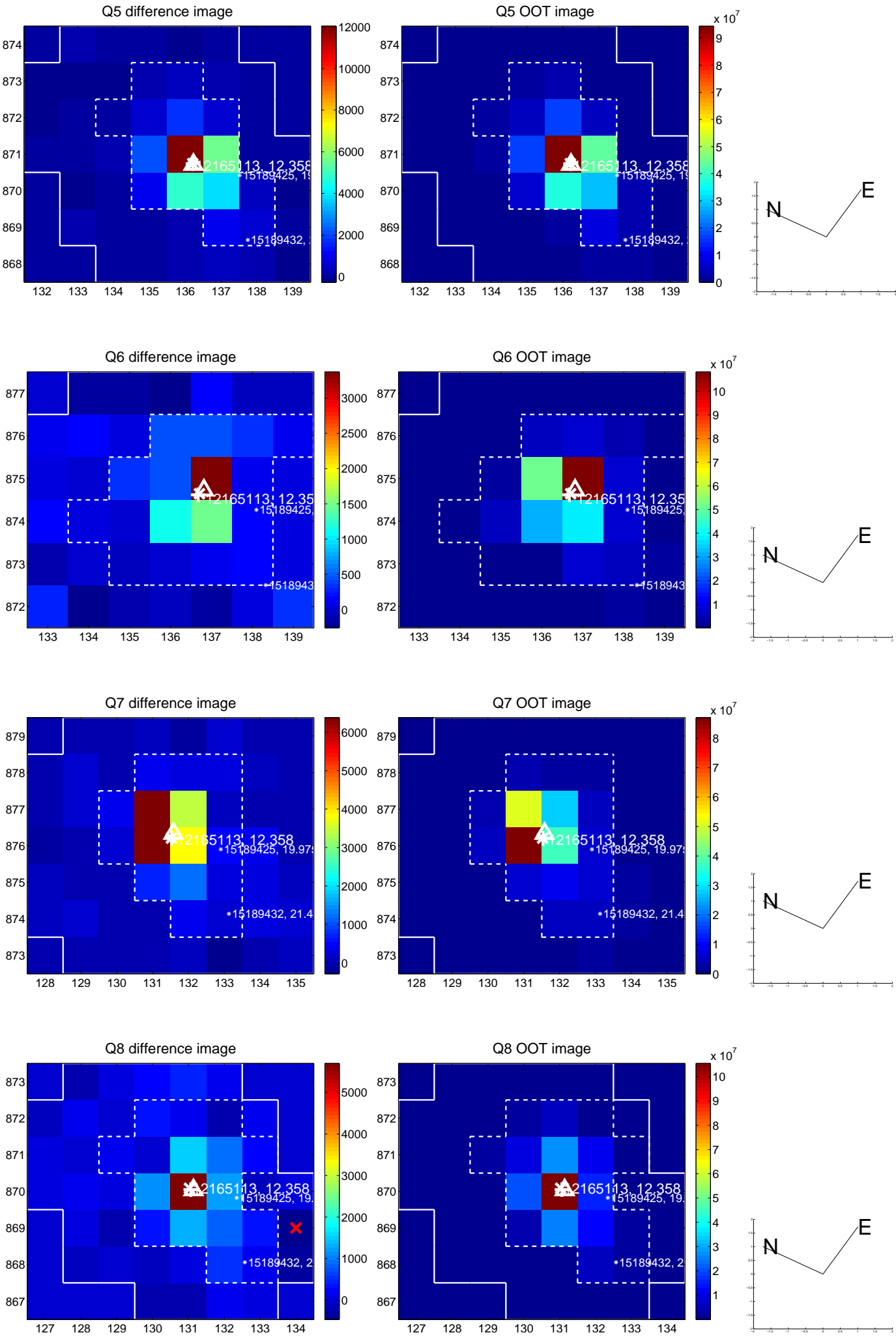


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

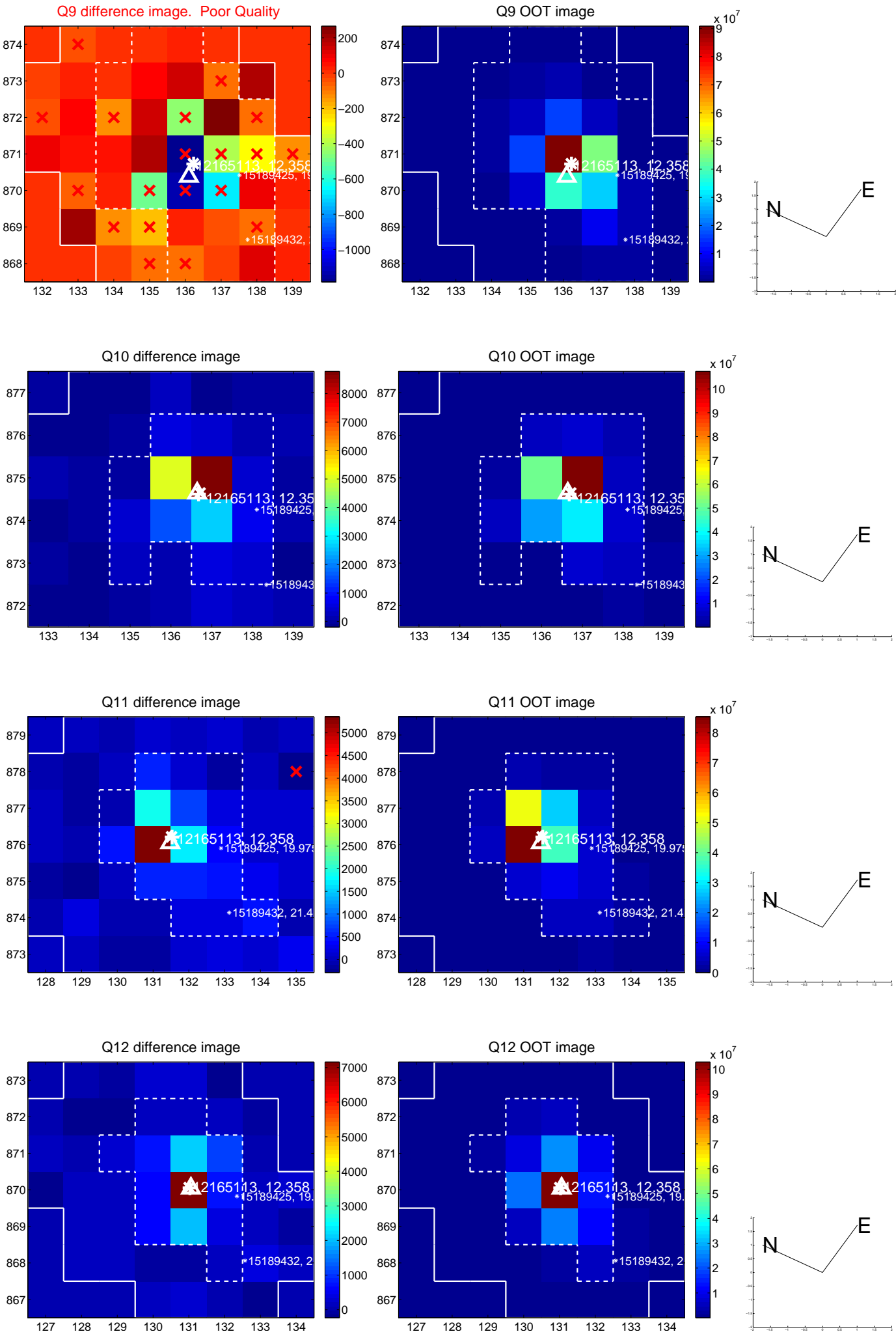
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



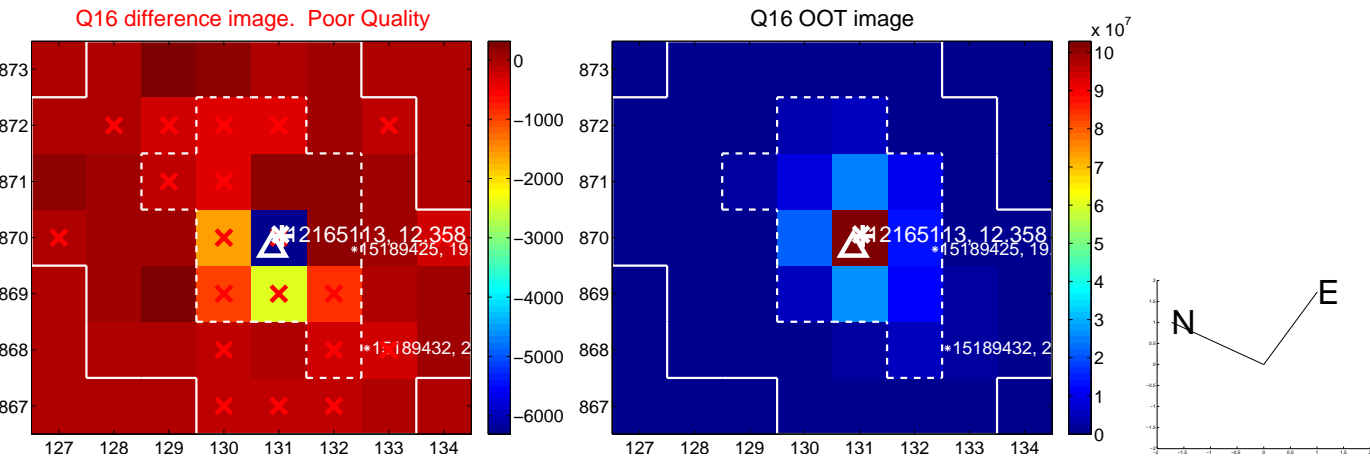
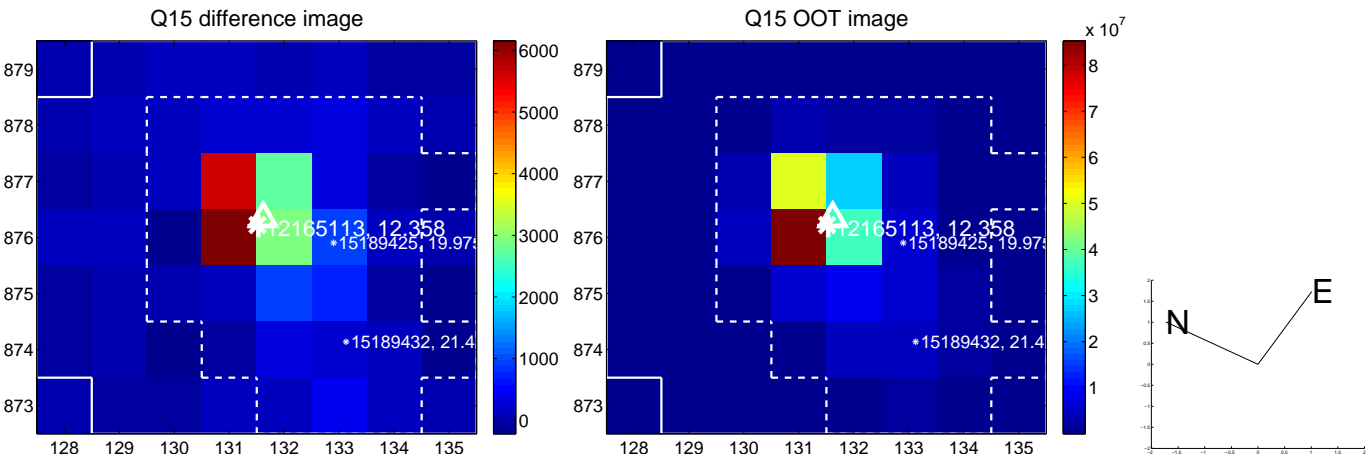
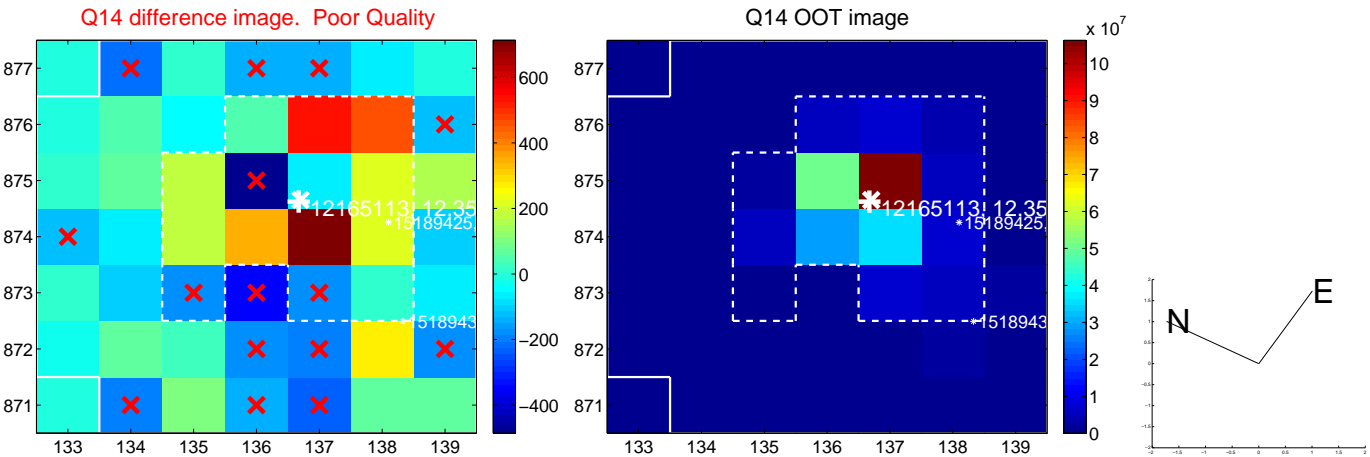
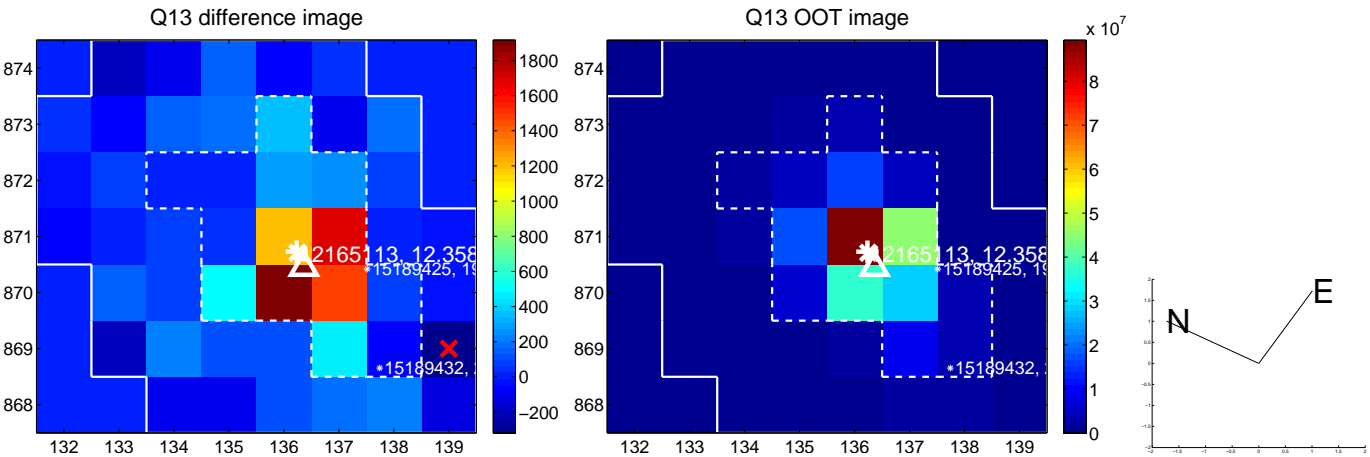
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



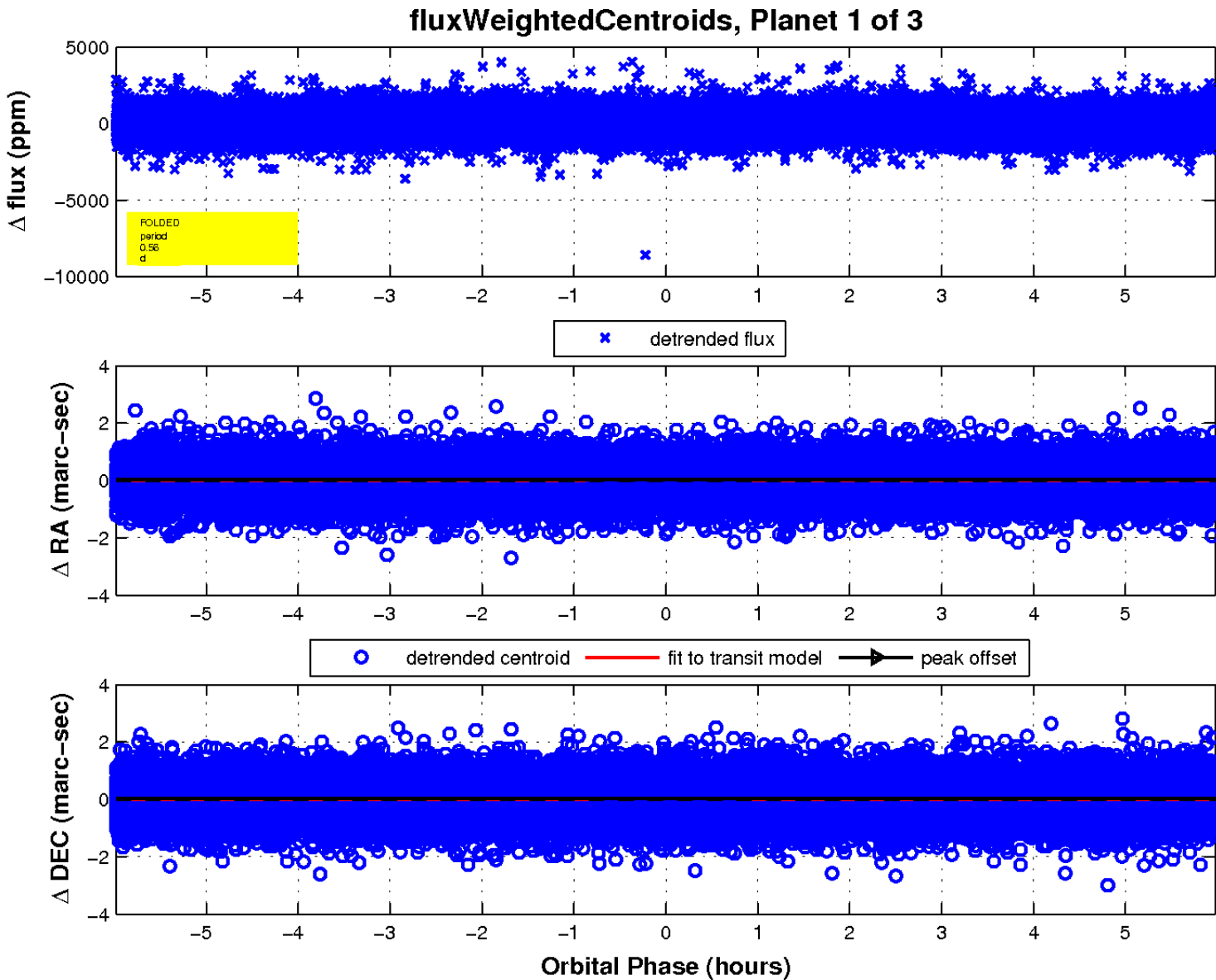
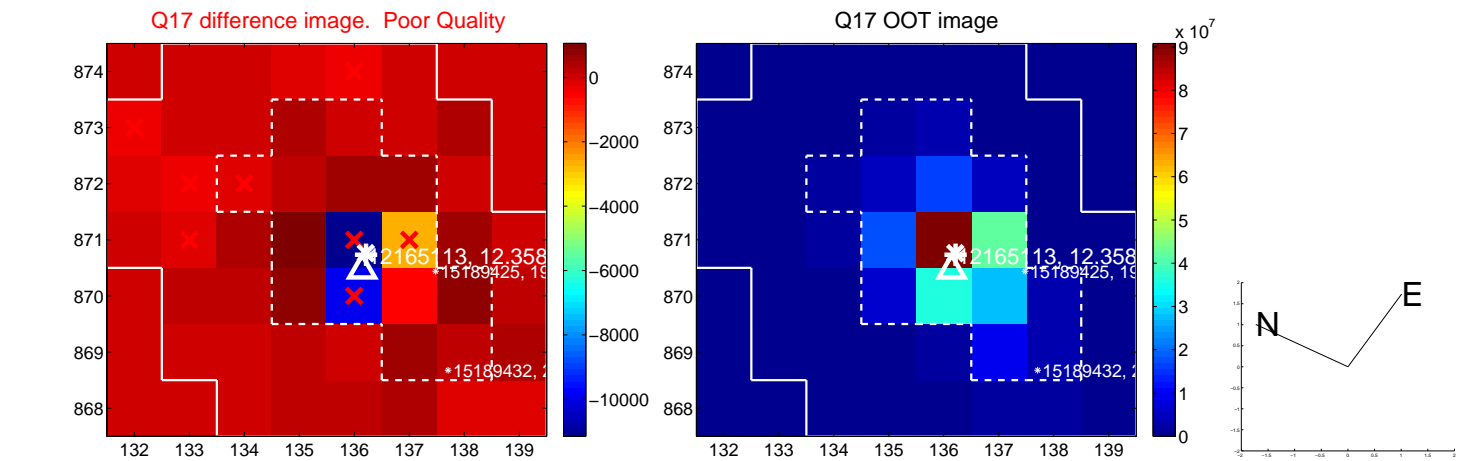
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

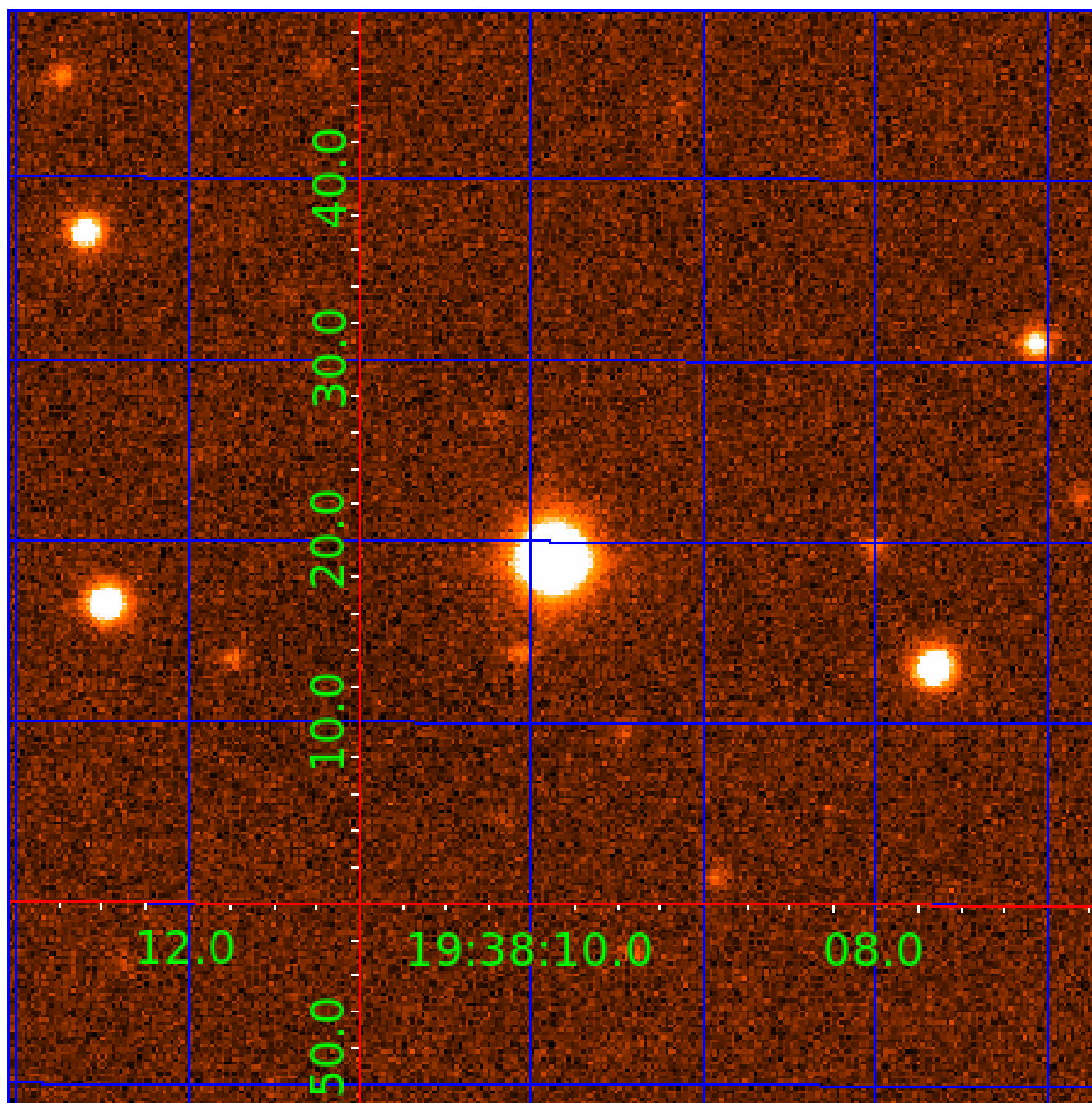


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012165113

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 012165113-01 | OBS | No | 0.557592 | 131.737338 | 69.4 | 1.993 | 11.2 | 11.2 | 2.41 | 7466 | 2.32 | 60028.15 |
| 012165113-02 | OBS | No | 0.953324 | 132.295725 | 98.3 | 3.628 | 10.2 | 11.1 | 2.41 | 7466 | 2.76 | 29362.26 |
| 012165113-03 | OBS | No | 0.738807 | 131.933145 | 93.6 | 8.866 | 8.7 | 12.0 | 2.41 | 7466 | 2.80 | 41247.91 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 012165113-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 012165113-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 012165113-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT |

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

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

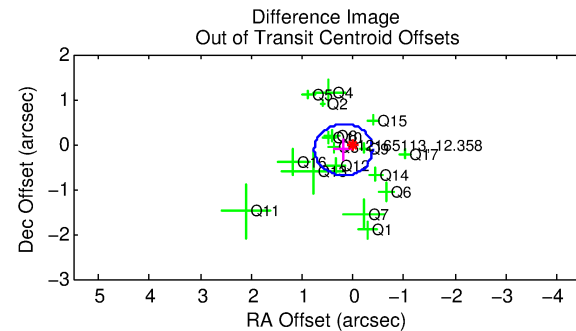
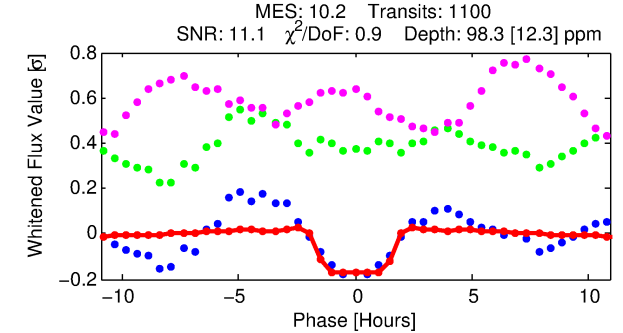
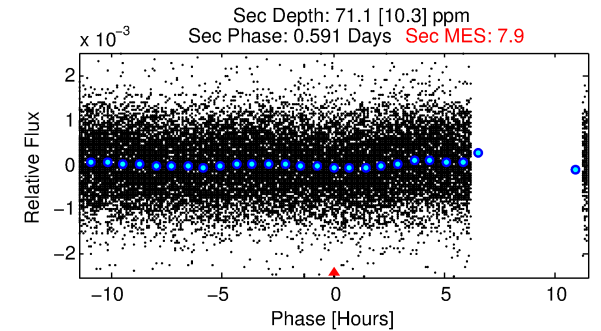
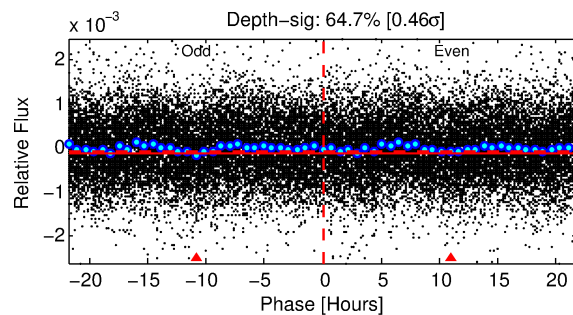
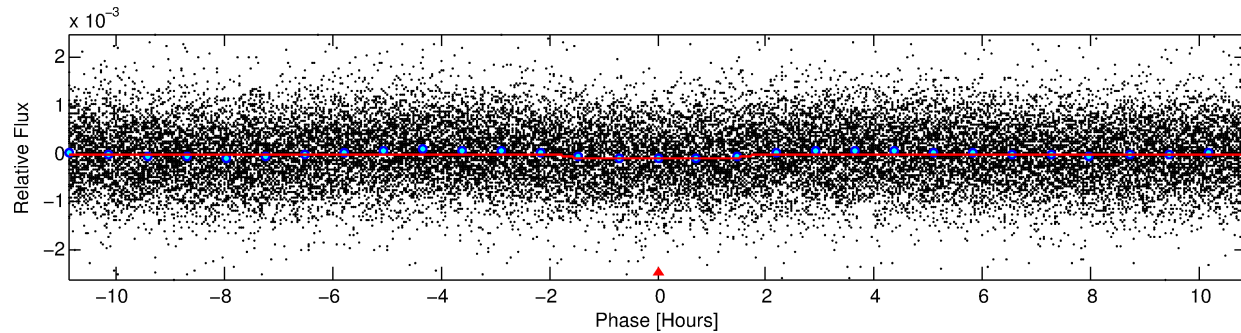
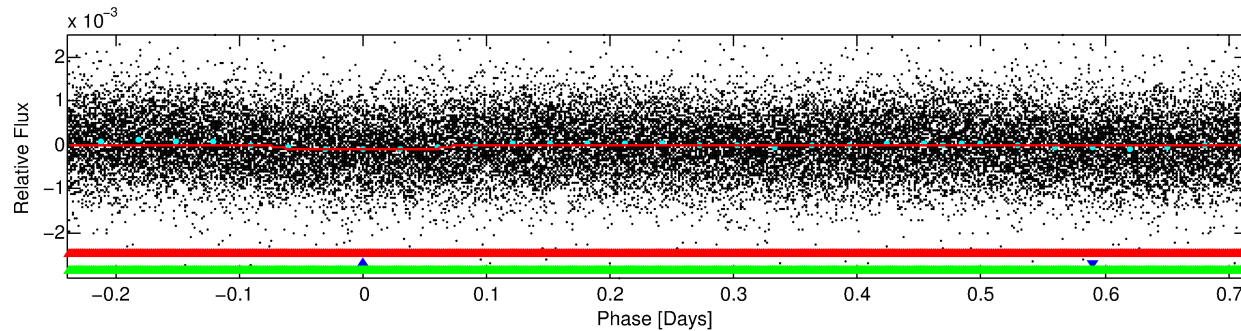
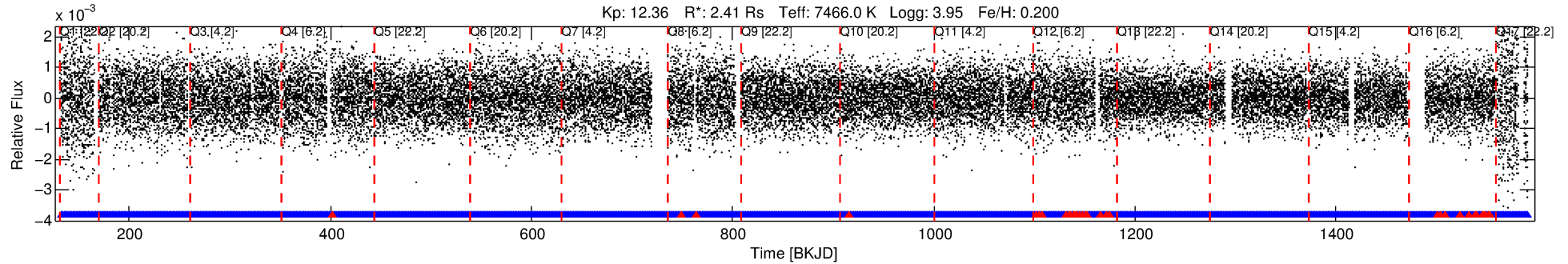
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012165113-02

No Significant Match Found

DV One-Page Summary

KIC: 12165113 Candidate: 2 of 3 Period: 0.953 d



DV Fit Results:

Period = 0.95332 [0.00001] d
Epoch = 132.2957 [0.0041] BKJD
Rp/R* = 0.0105 [0.0051]
a/R* = 1.32 [1.80]
b = 0.90 [0.69]
Seff = 29362.26 [11810.60]
Teq = 3338 [336] K
Rp = 2.76 [1.53] Re
a = 0.0234 [0.0056] AU
Ag = 2.83 [2.94] [0.62 σ]
Teffp = 6691 [1667] K [1.97 σ]

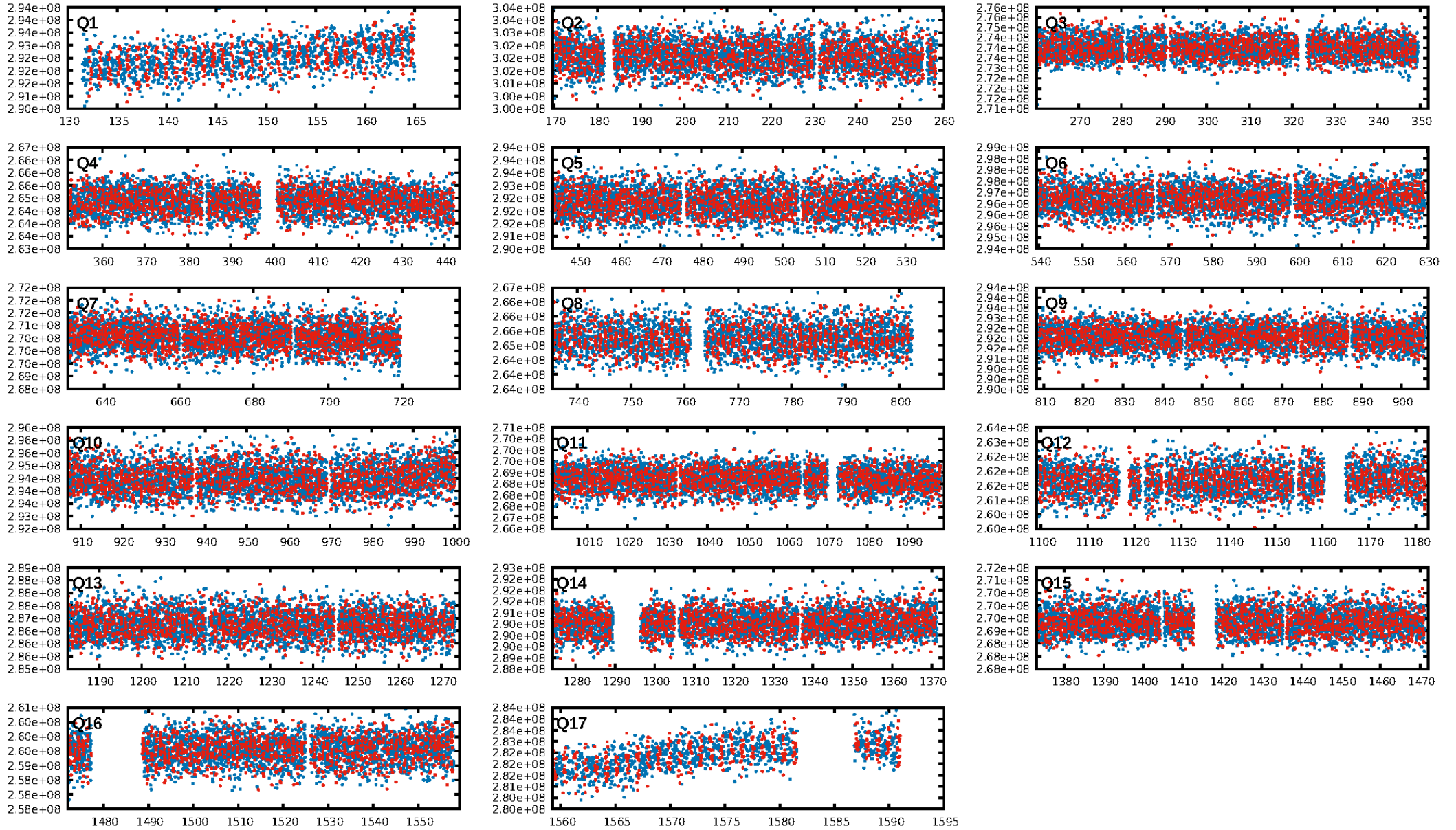
DV Diagnostic Results:

ShortPeriod-sig: 40.9% [0.54 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.97 [1013/1048]
GhostDiagnostic-chr: 2.218
Centroid-sig: 8.4%
Centroid-so: 0.206 arcsec [1.38 σ]
OotOffset-rm: 0.224 arcsec [1.17 σ]
KicOffset-rm: 0.210 arcsec [1.00 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.88 [15/17]
DiffImageOverlap-fno: 0.00 [0/17]

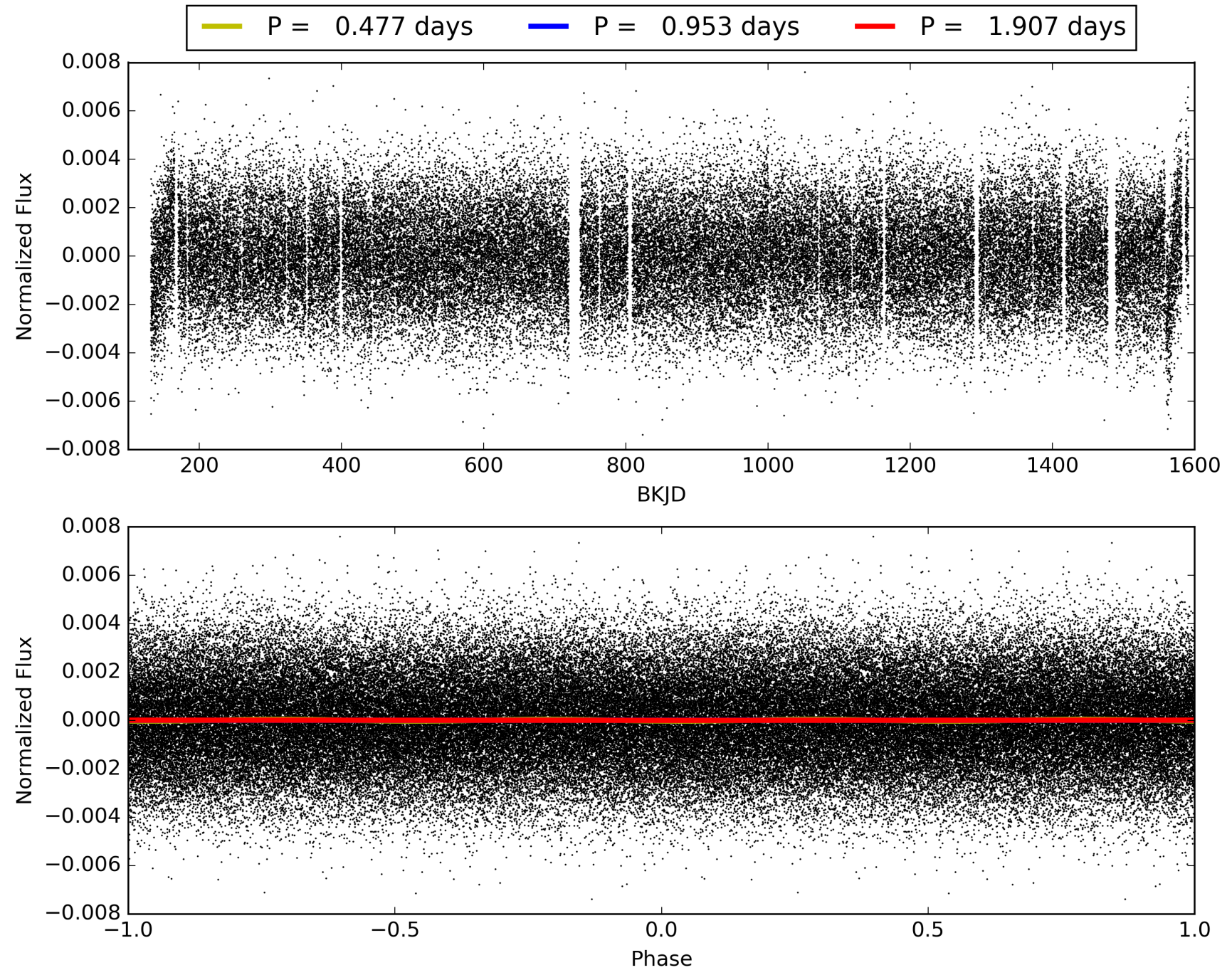
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:38:53 Z

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

TCE 012165113-02, PDC Light Curves

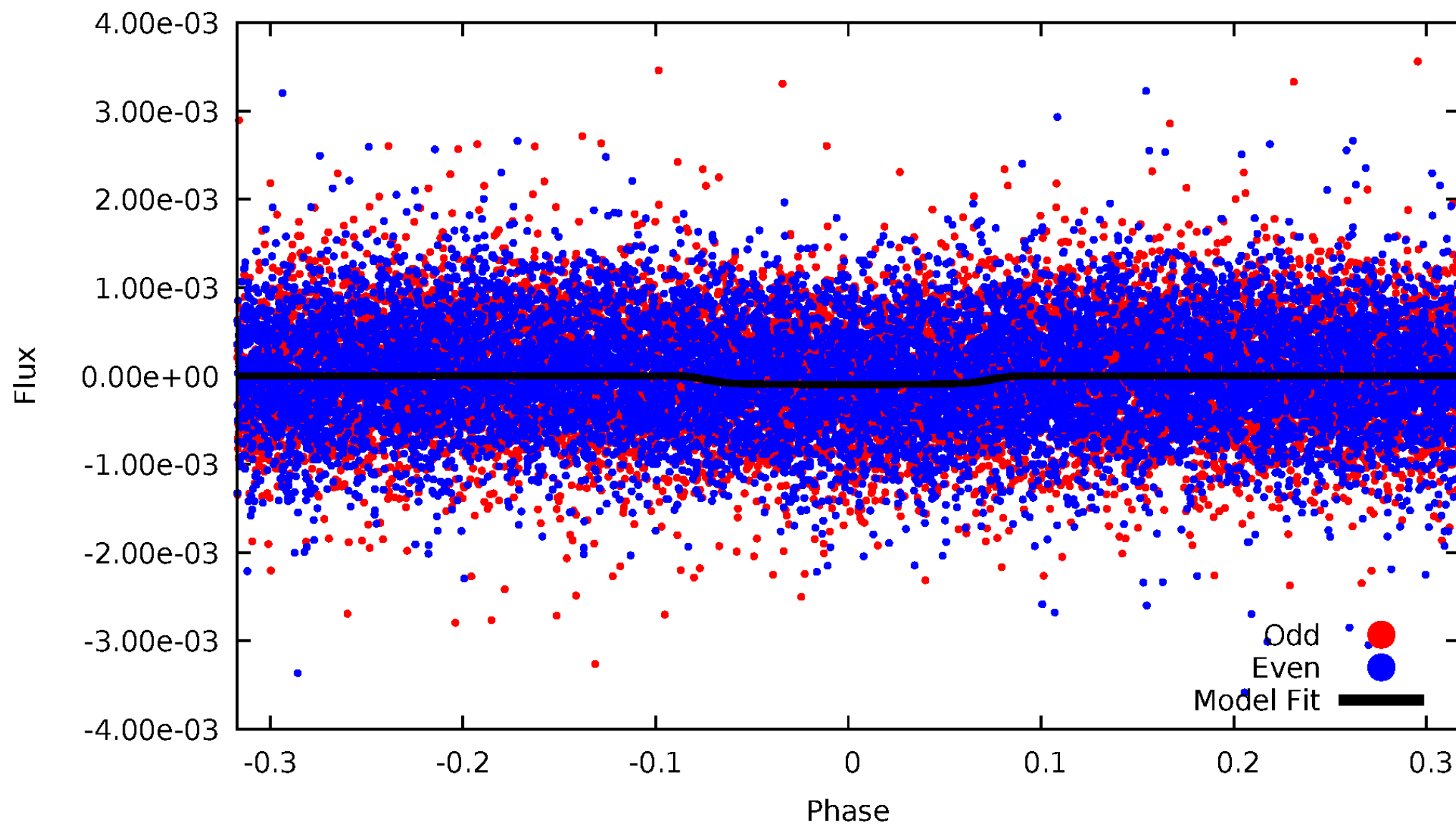


TCE 012165113-02



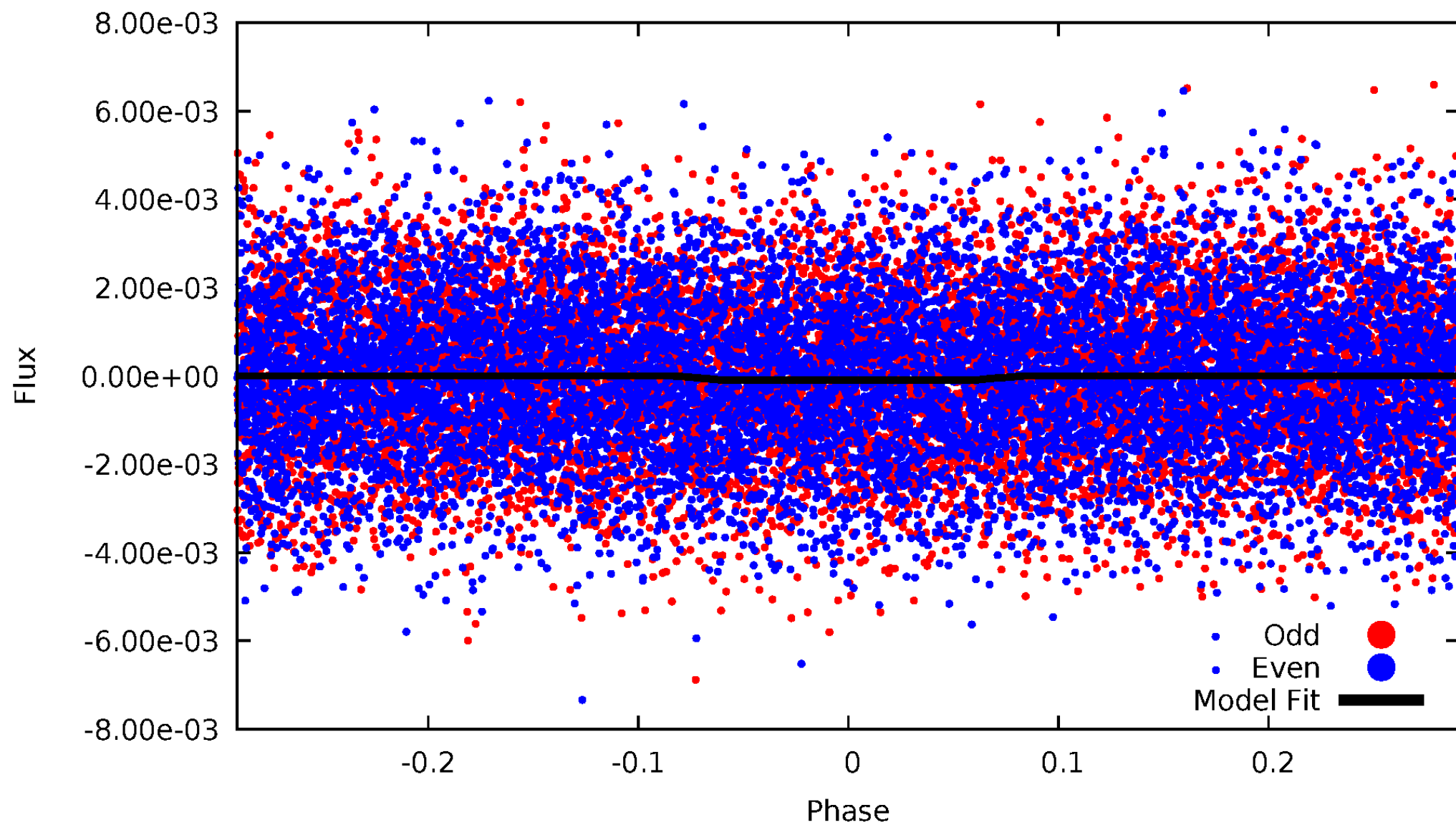
DV Odd/Even

TCE 012165113-02



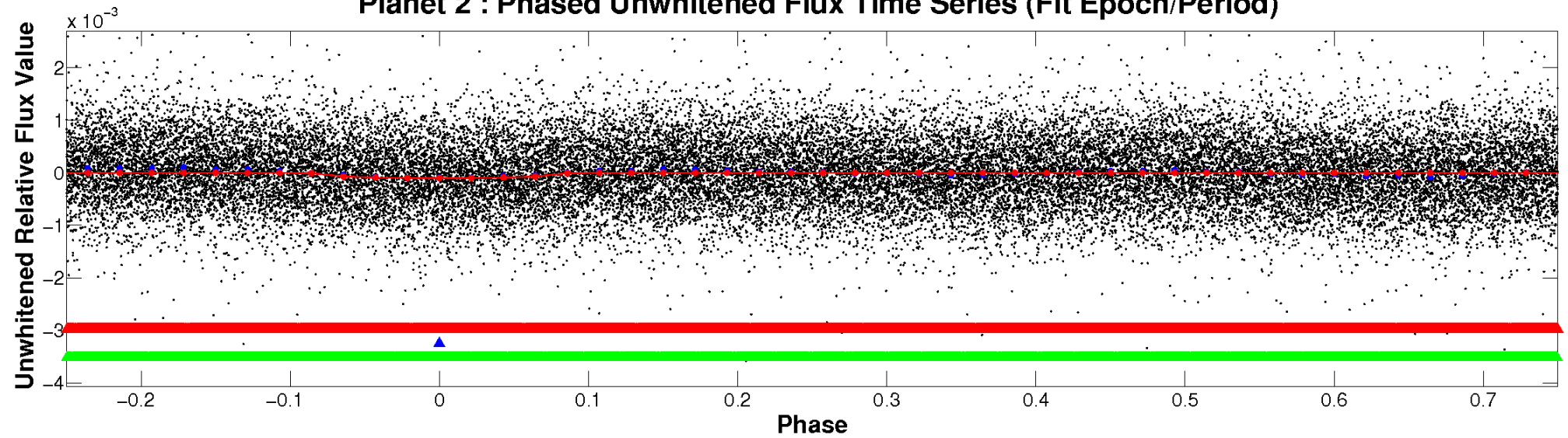
ALT Odd/Even

TCE 012165113-02

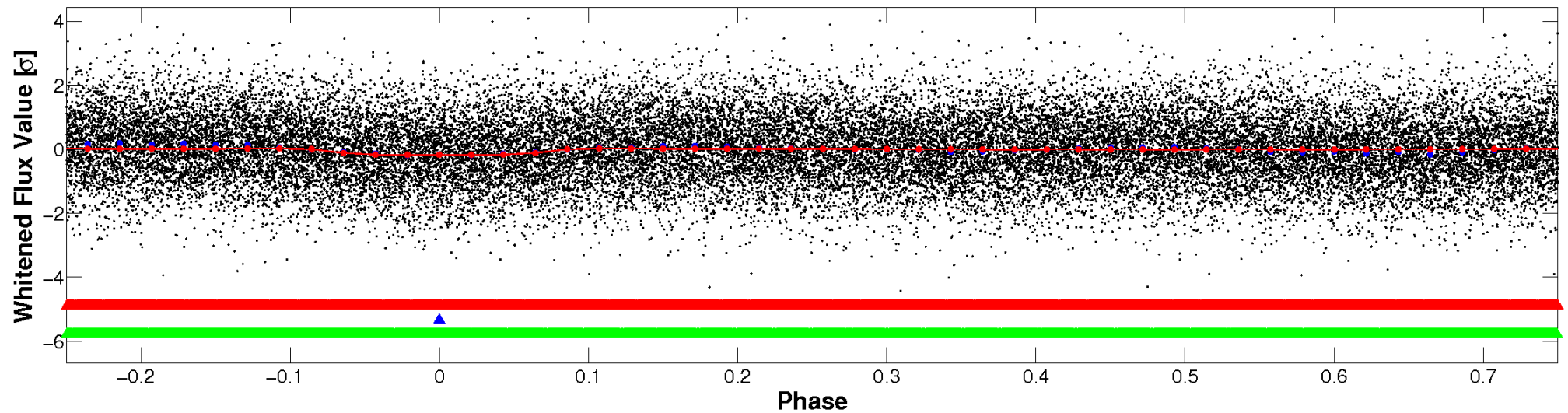


Non-Whitened Vs. Whitened Light Curve

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

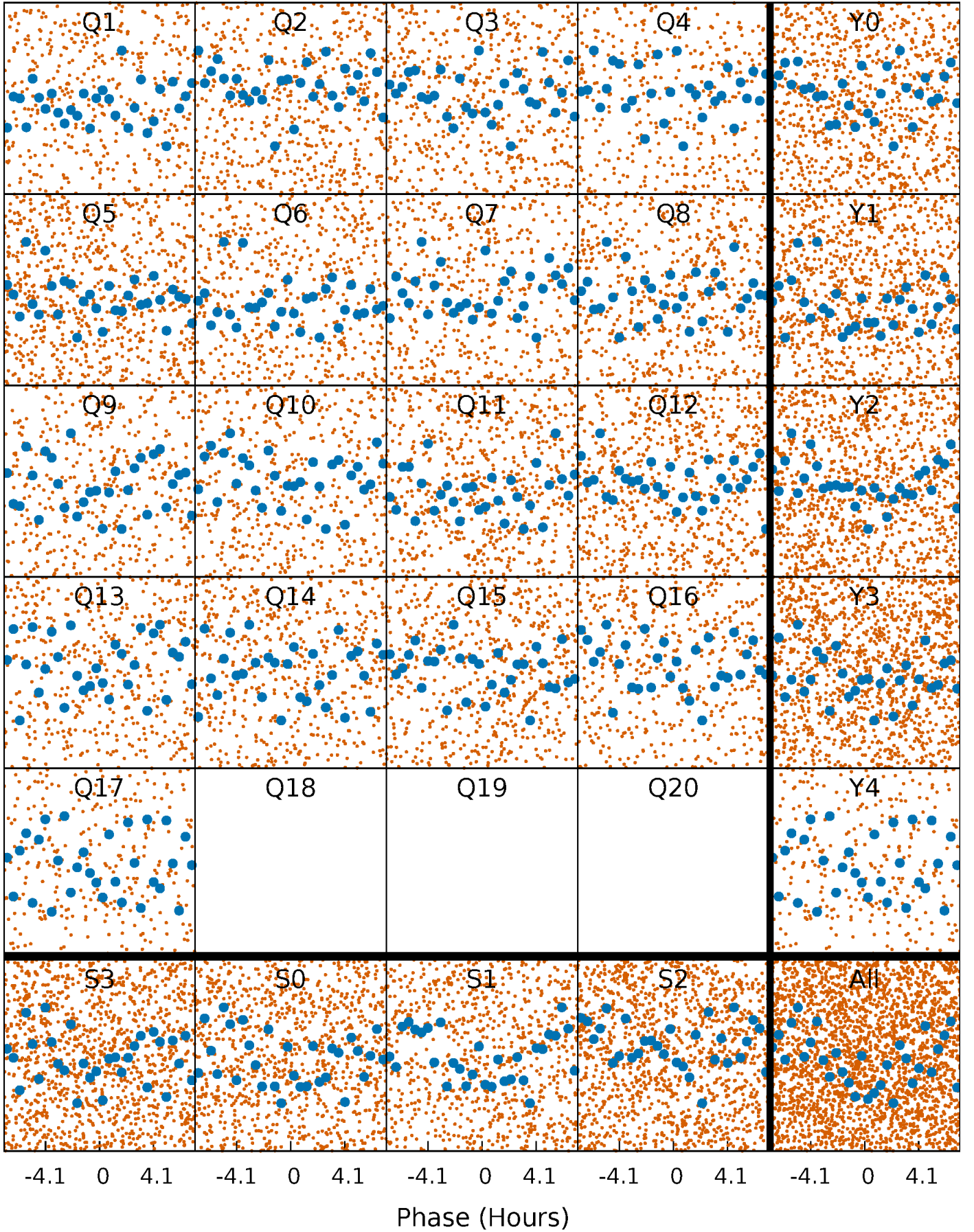


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



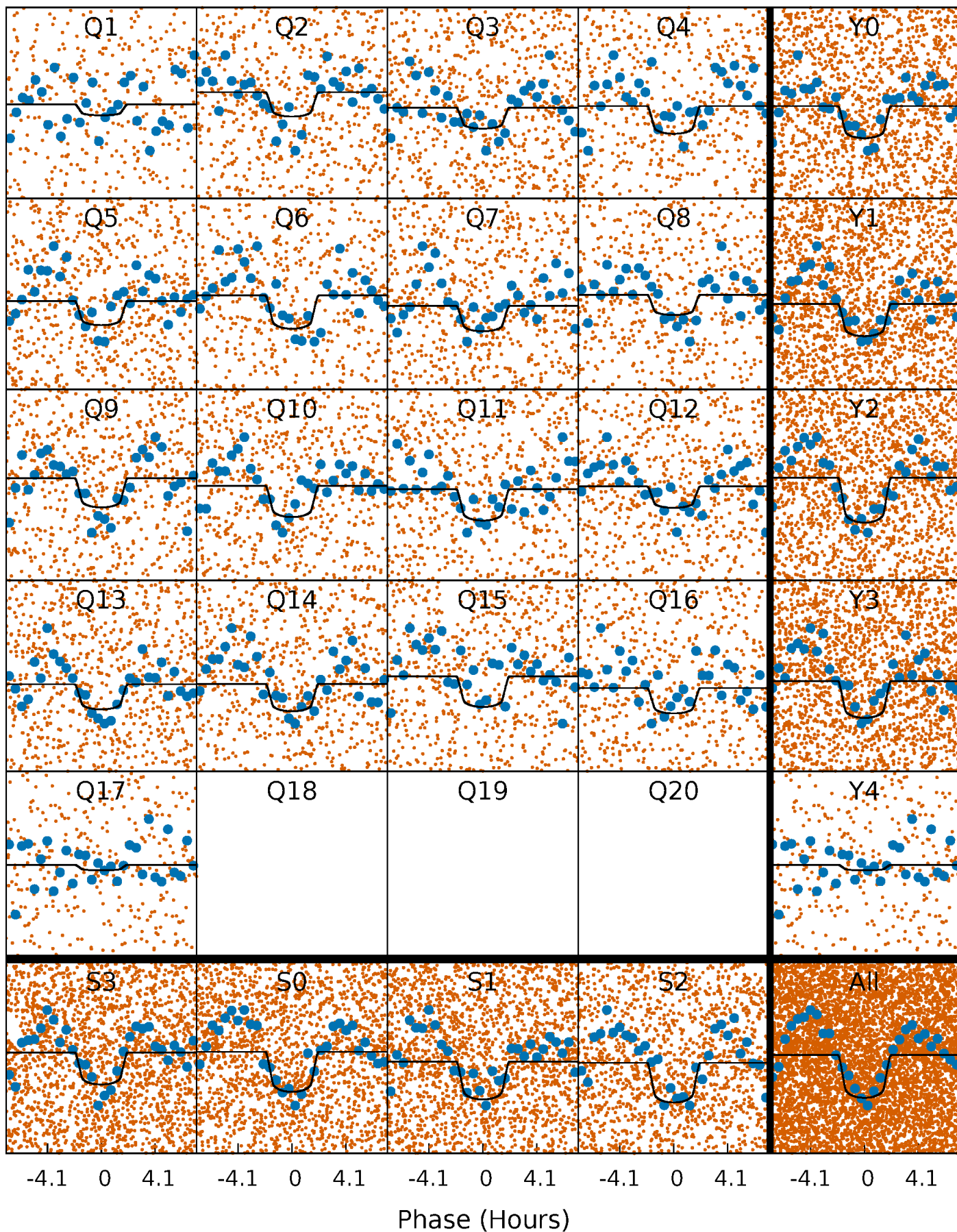
PDC Quarter-Phased Transit Curves

TCE 012165113-02 P= 0.953324 Days $T_0=132.295725$ (BKJD)



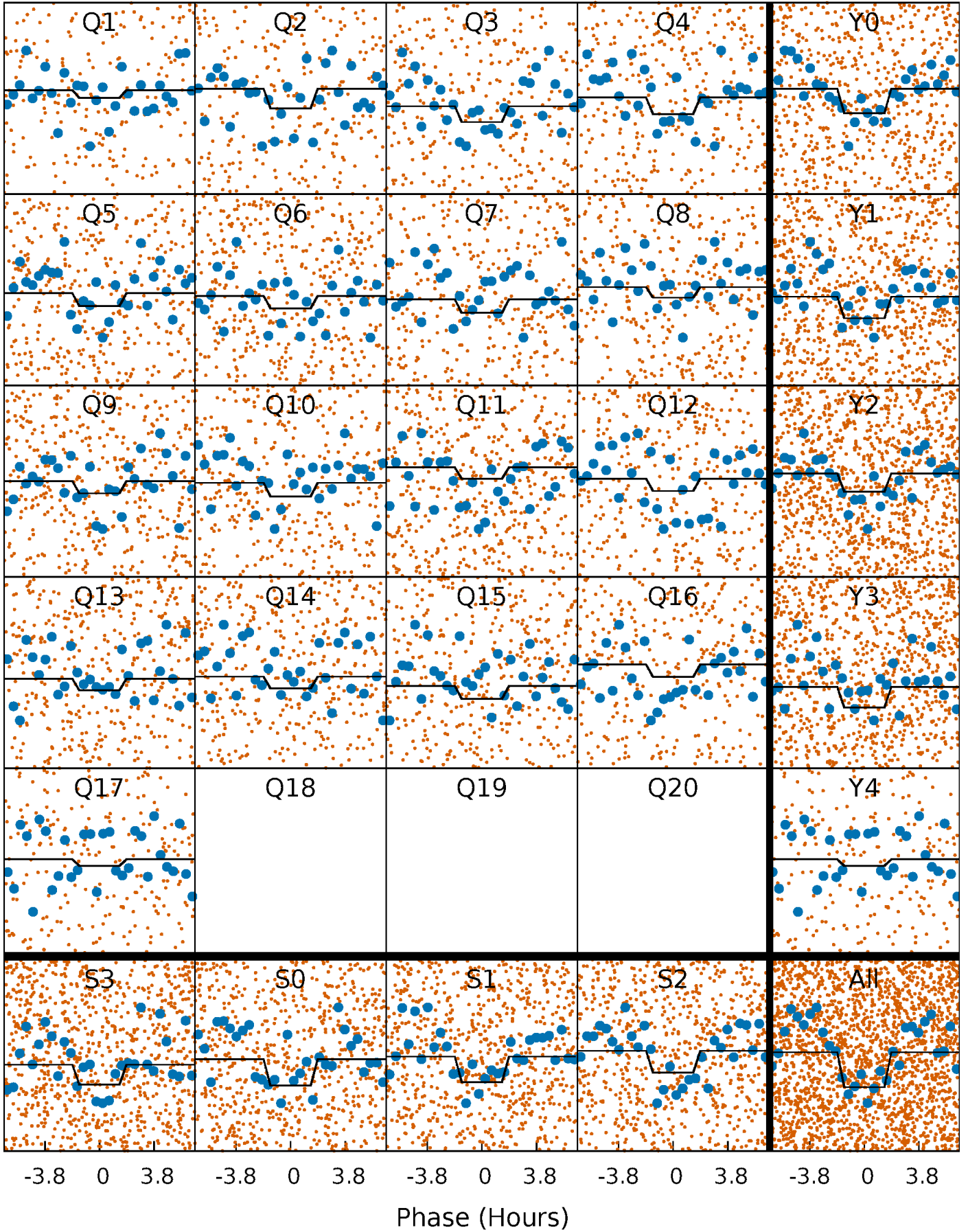
DV Quarter-Phased Transit Curves

TCE 012165113-02 P= 0.953324 Days $T_0=132.295725$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

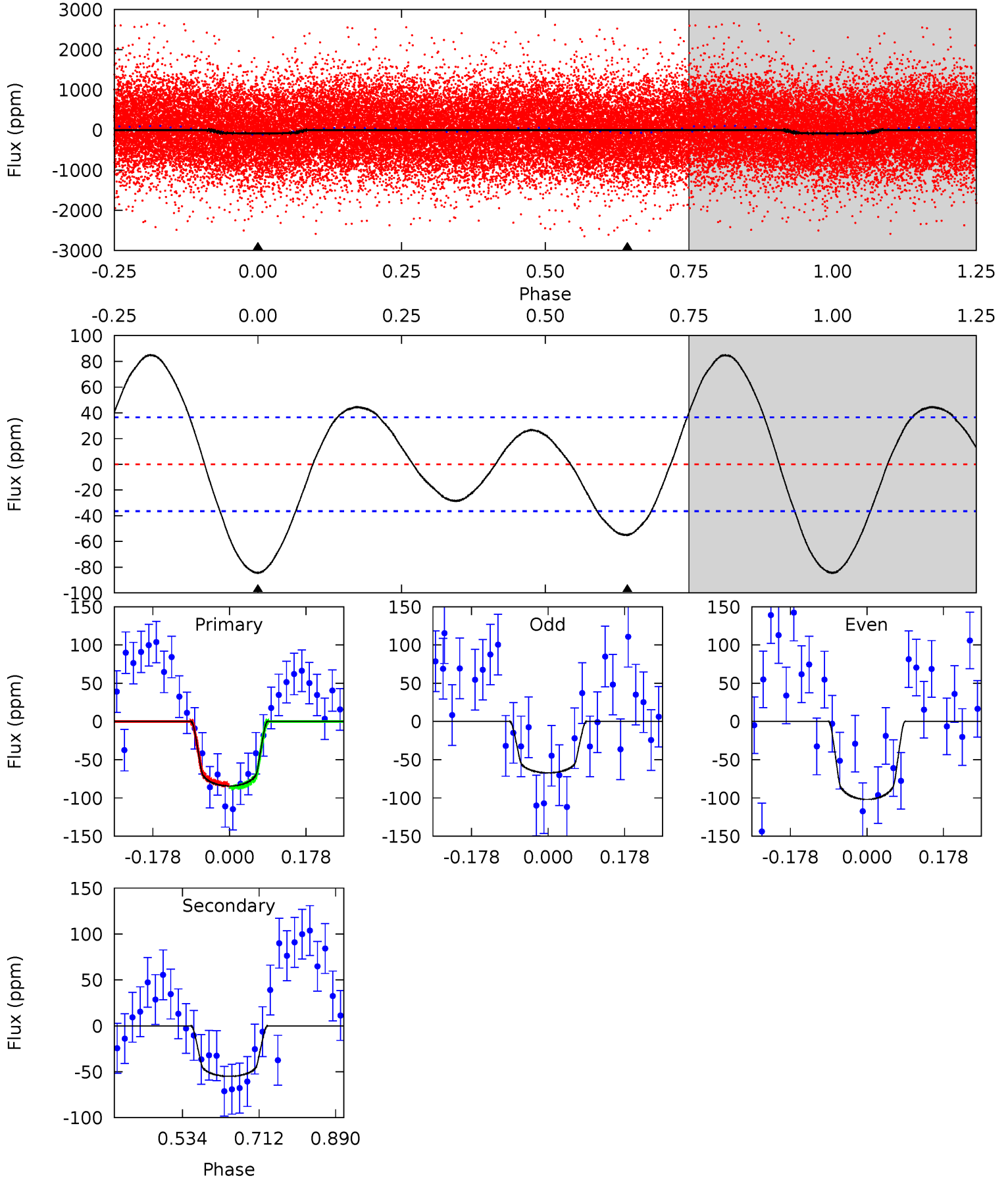
TCE 012165113-02 P= 0.953313 Days $T_0=132.299759$ (BKJD)



DV Model-Shift Uniqueness Test

012165113-02, P = 0.953324 Days, E = 131.342401 Days

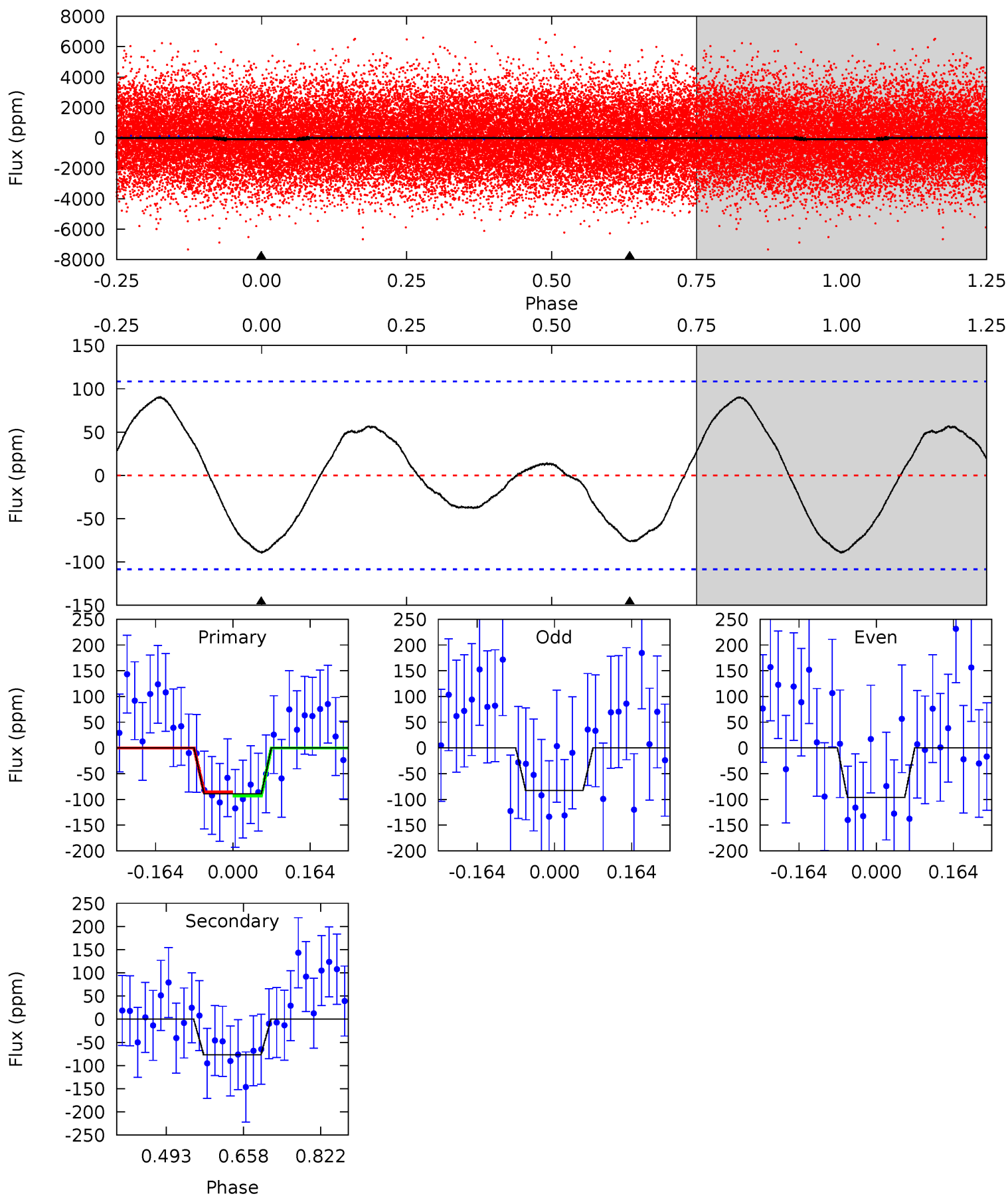
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.3 | 6.70 | 0 | 0 | 4.44 | 1.35 | 2.89 | 10.3 | 10.3 | 6.70 | 6.70 | 2.12 | 0.78 | 0.50 | 0.25 |



Alt Model-Shift Uniqueness Test

012165113-02, P = 0.953313 Days, E = 131.346446 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.67 | 3.16 | 0 | 0 | 4.46 | 1.39 | 1.65 | 3.67 | 3.67 | 3.16 | 3.16 | 0.27 | 0.88 | 0.50 | 0.16 |



Stellar Parameters For KIC 012165113

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (g \cdot \text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------------------|
| | 7466^{+206}_{-353} | $3.951^{+0.198}_{-0.144}$ | $0.200^{+0.150}_{-0.350}$ | $2.406^{+0.542}_{-0.662}$ | $1.886^{+0.148}_{-0.346}$ | $0.191^{+0.233}_{-0.079}$ |
| | +3%/-5% | +5%/-4% | +75%/-175% | +23%/-28% | +8%/-18% | +122%/-41% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 012165113-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|------------------------|----------------------------|
| DV | -55 ± 8 | $2.70^{+1.42}_{-1.28}$ | 4598^{+313}_{-345} | 5814^{+2933}_{-1141} | $2.216^{+5.849}_{-1.254}$ |
| Alt. | -77 ± 24 | $2.34^{+1.49}_{-1.23}$ | 4611^{+300}_{-356} | 6971^{+4836}_{-1711} | $4.023^{+14.494}_{-2.563}$ |

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 $A_{obs} \gg 1.0$

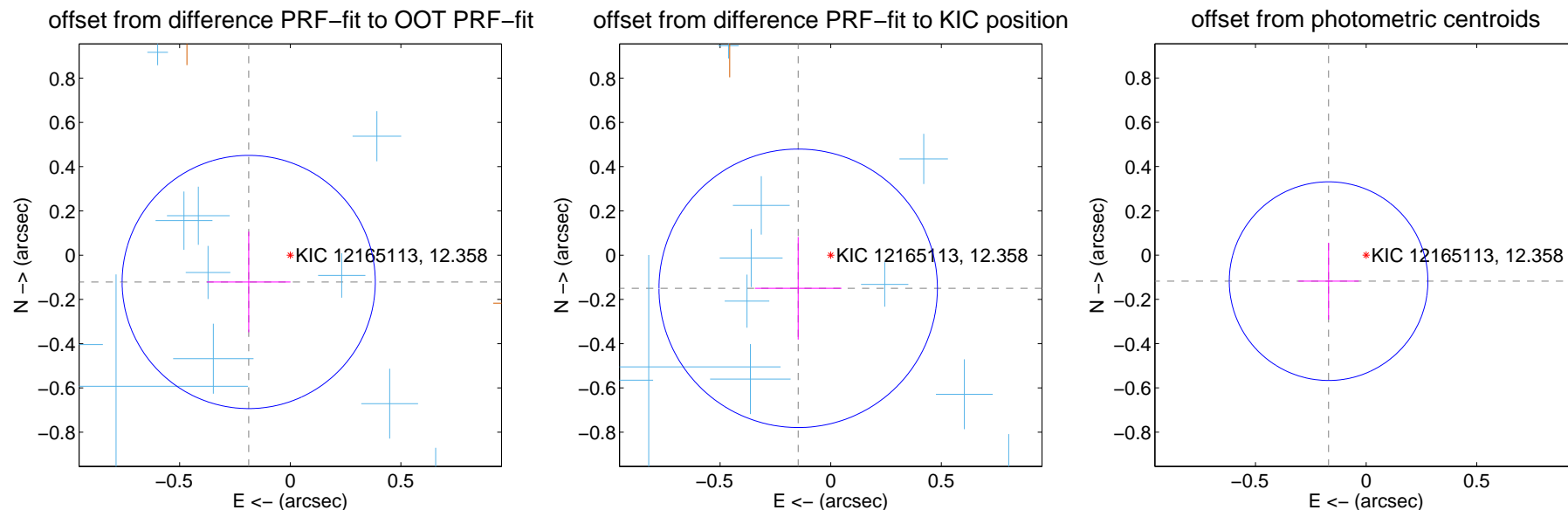
DV Centroid Data

Supplemental centroid analysis for 012165113-02. Kepler magnitude: 12.36. Transit SNR 11.12

There are 15 quarters with good PRF difference image offsets

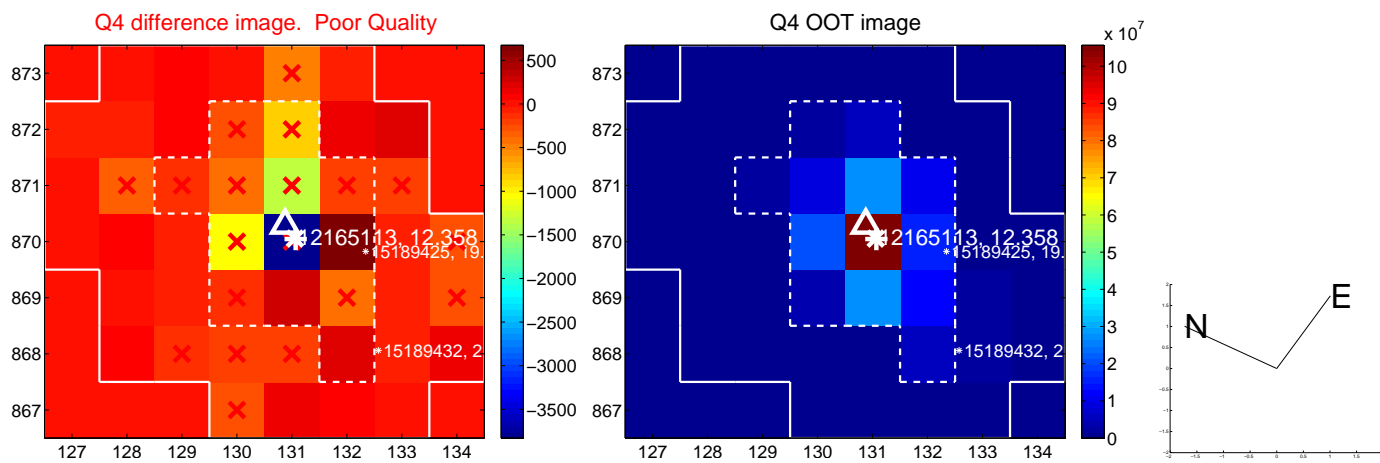
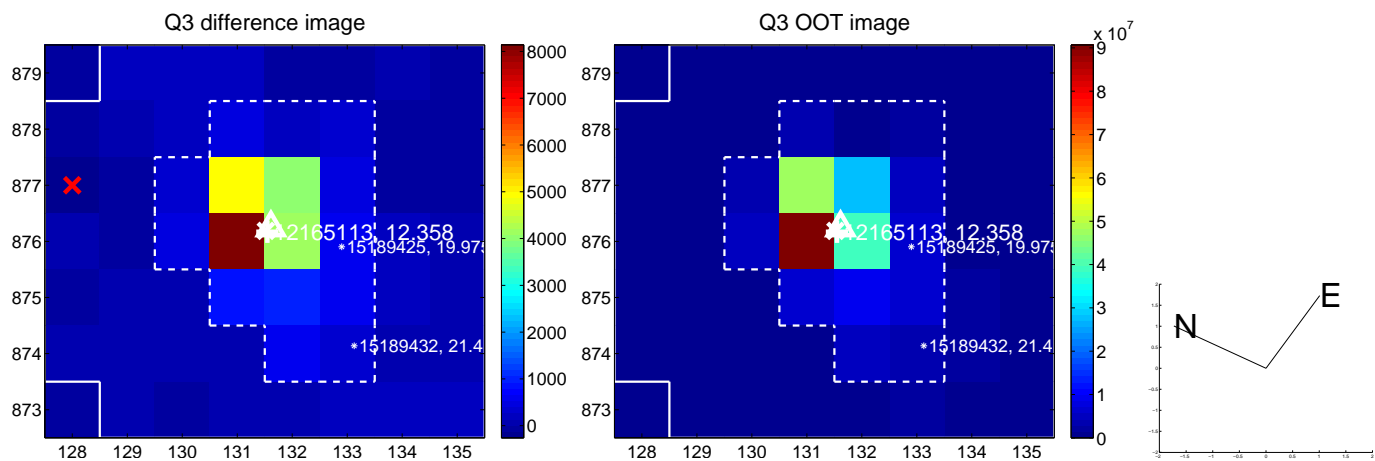
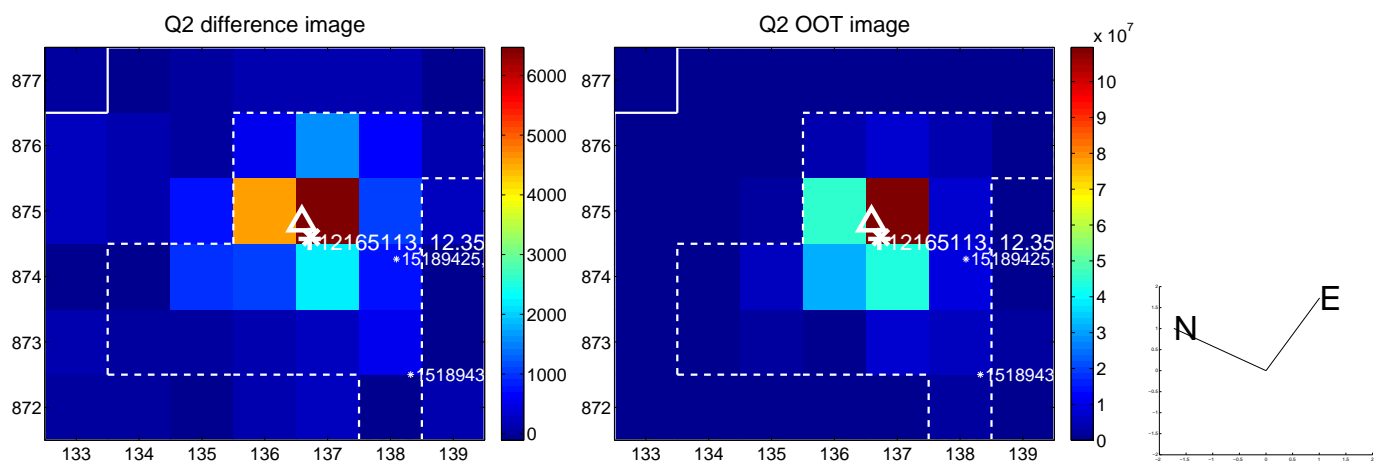
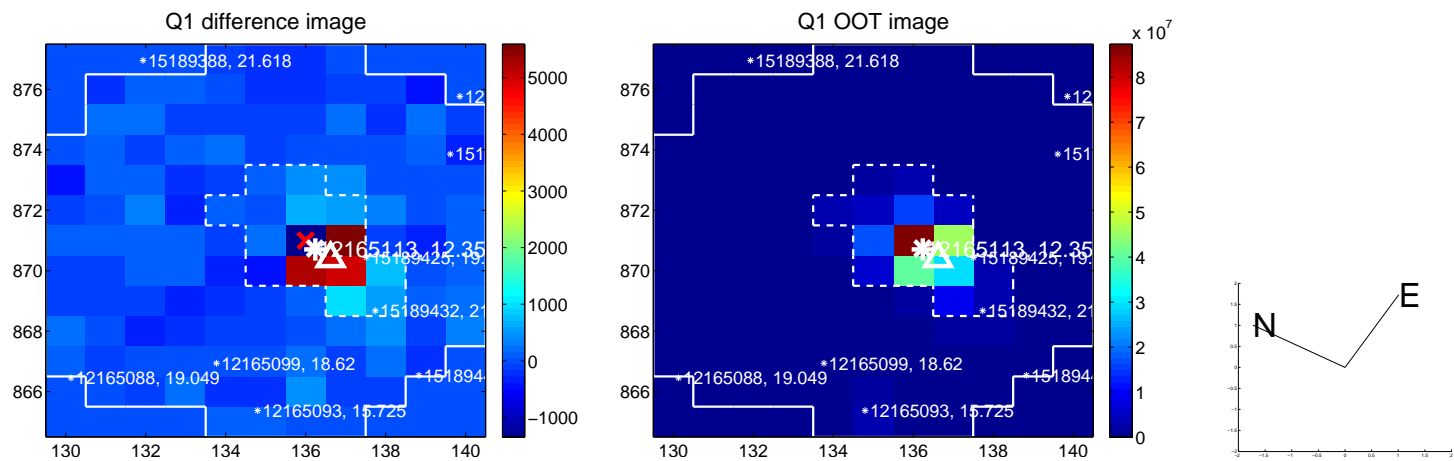
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.224 ± 0.191 | 1.17 | 0.188 ± 0.189 | -0.121 ± 0.227 |
| PRF-fit source offset from KIC position | 0.210 ± 0.210 | 1.00 | 0.147 ± 0.195 | -0.150 ± 0.232 |
| photometric centroid source offset | 0.21 ± 0.15 | 1.38 | 0.17 ± 0.14 | -0.12 ± 0.17 |

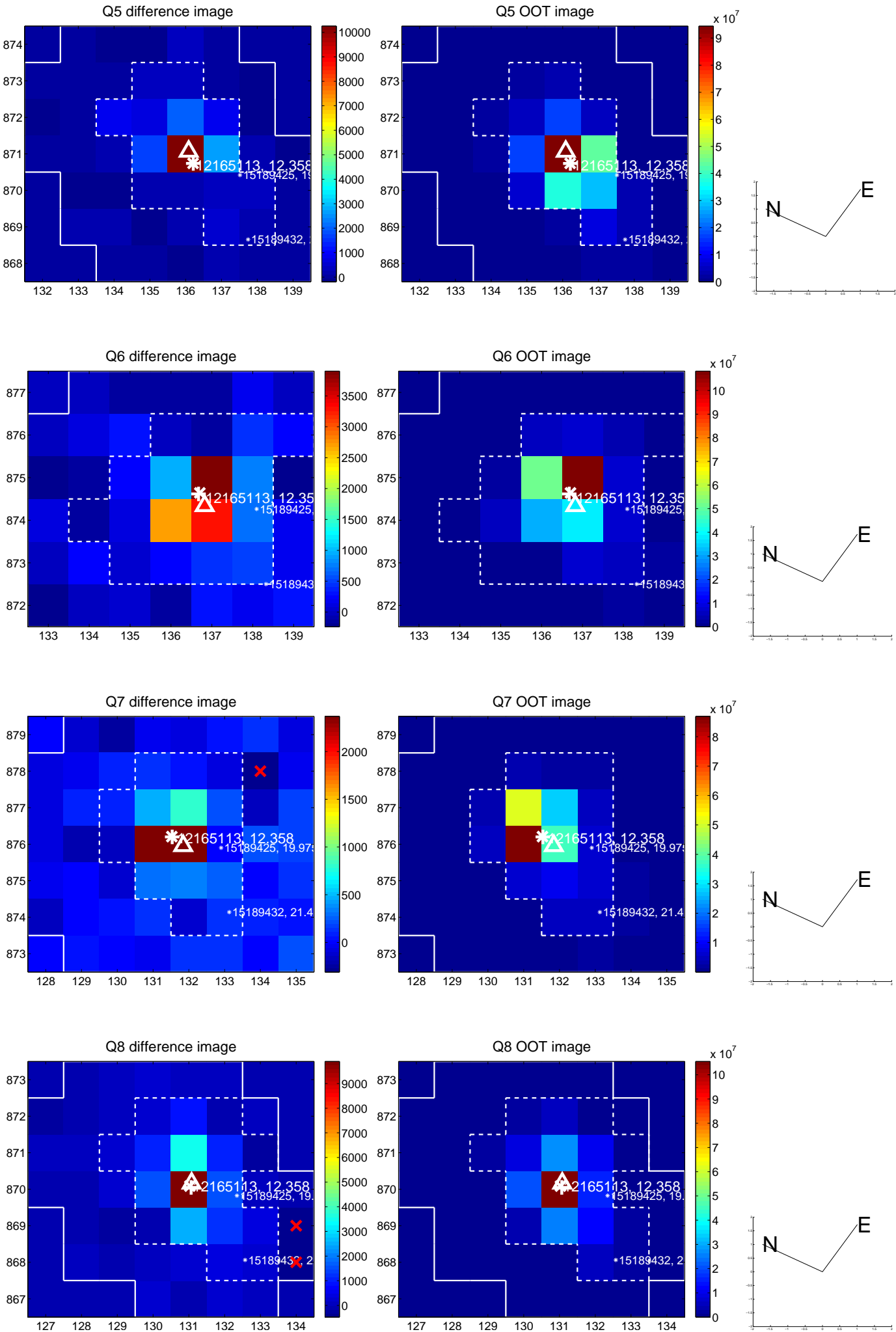


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

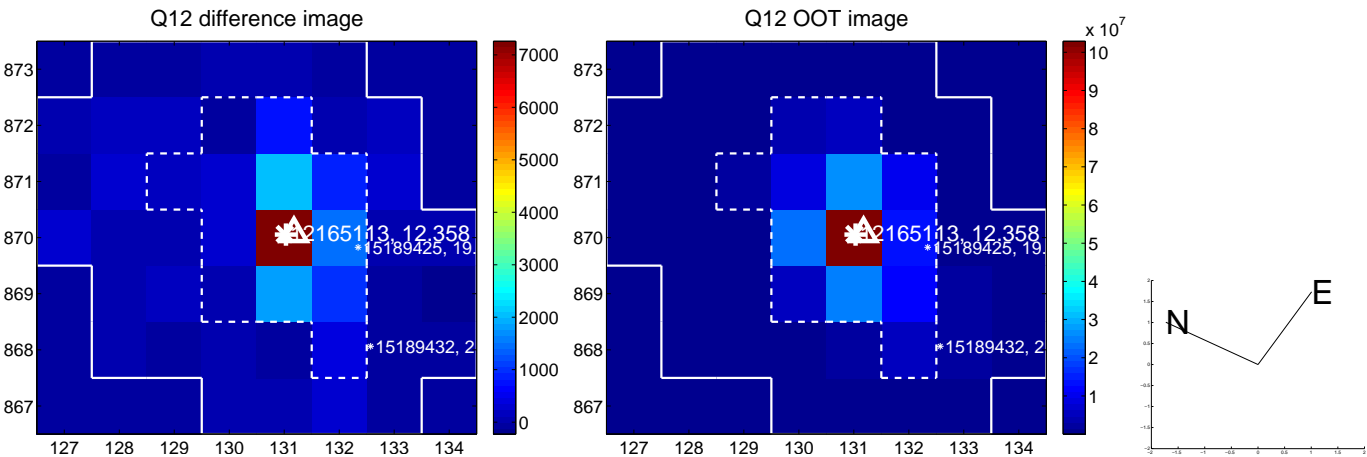
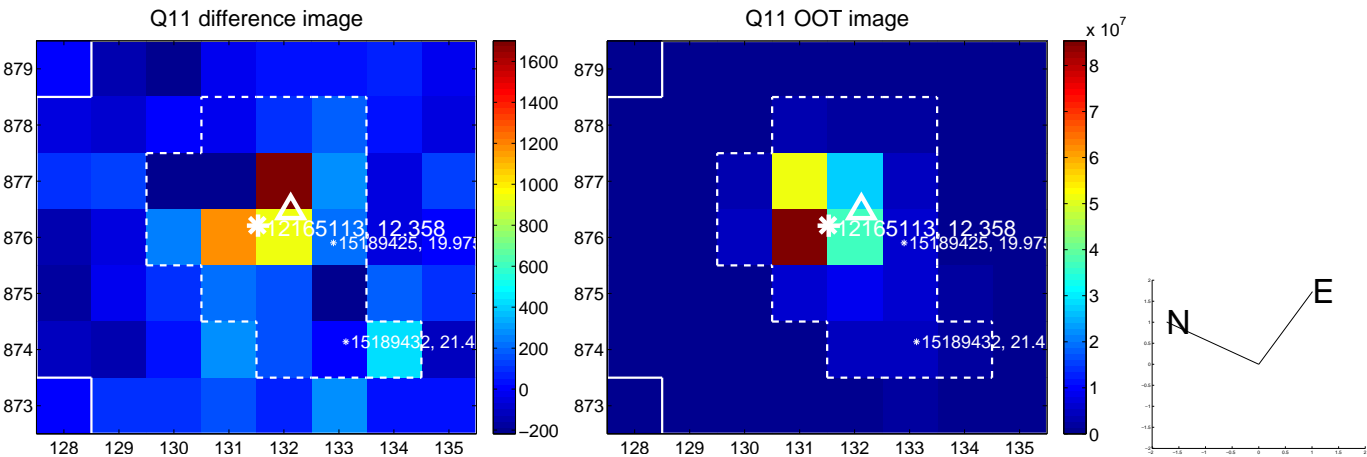
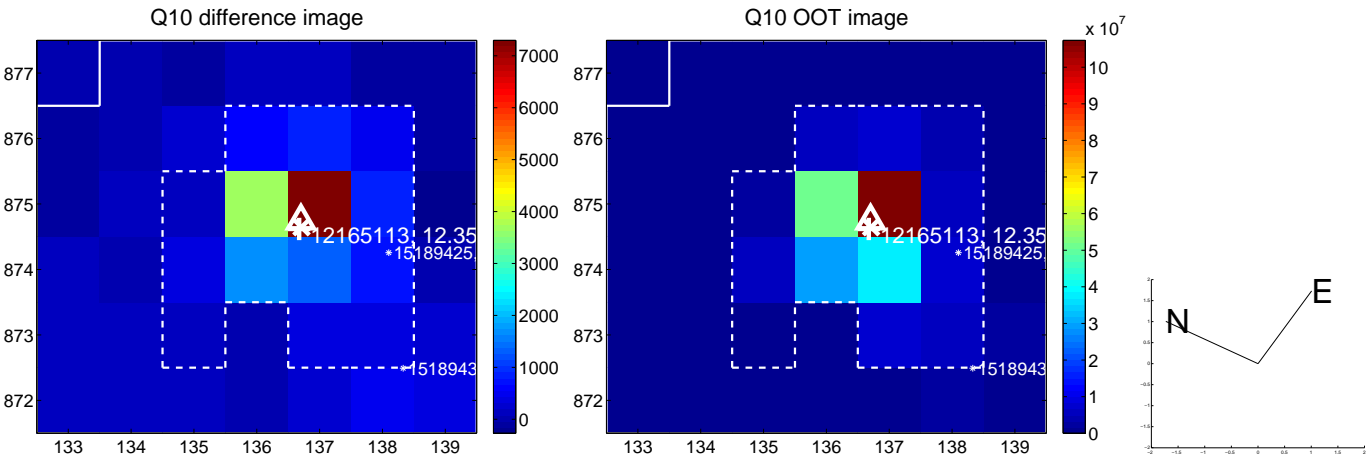
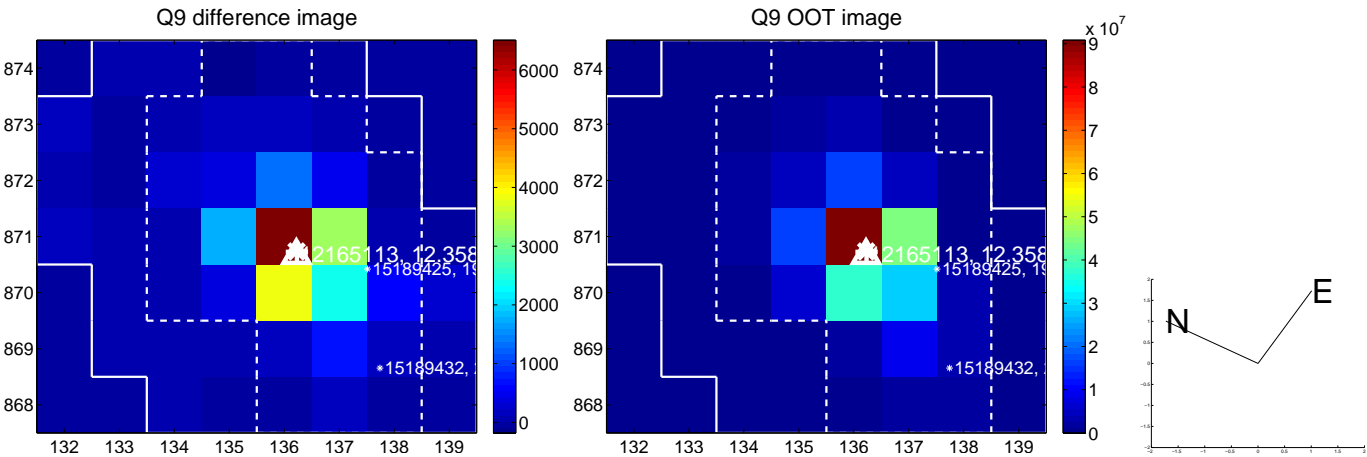
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



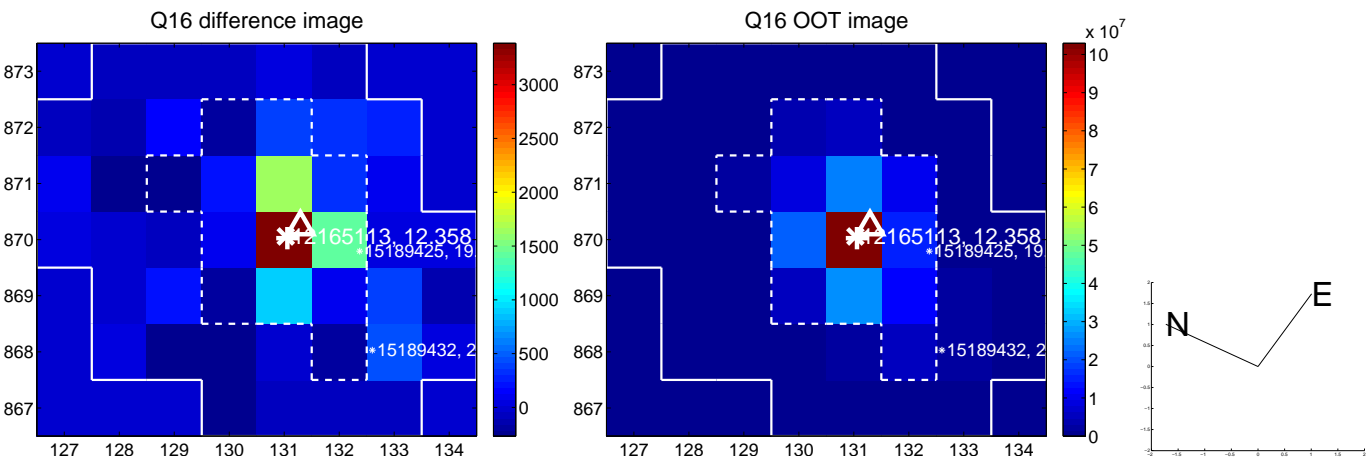
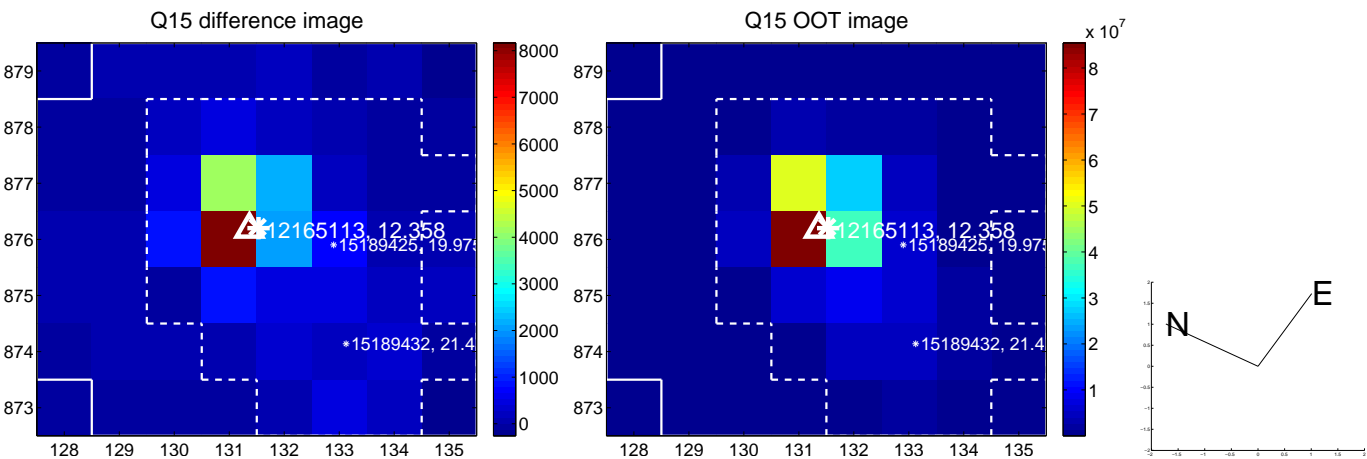
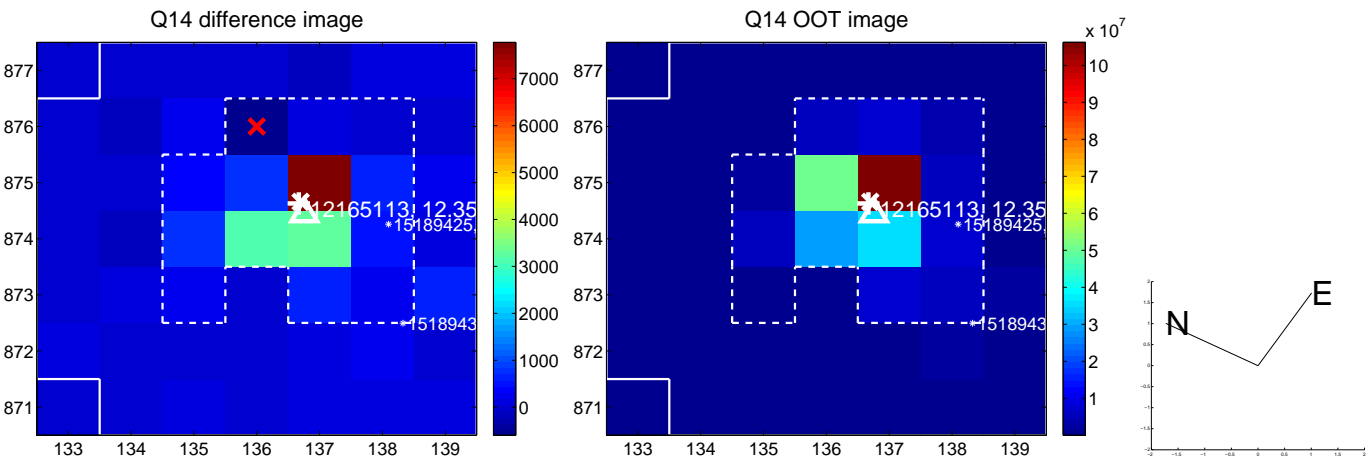
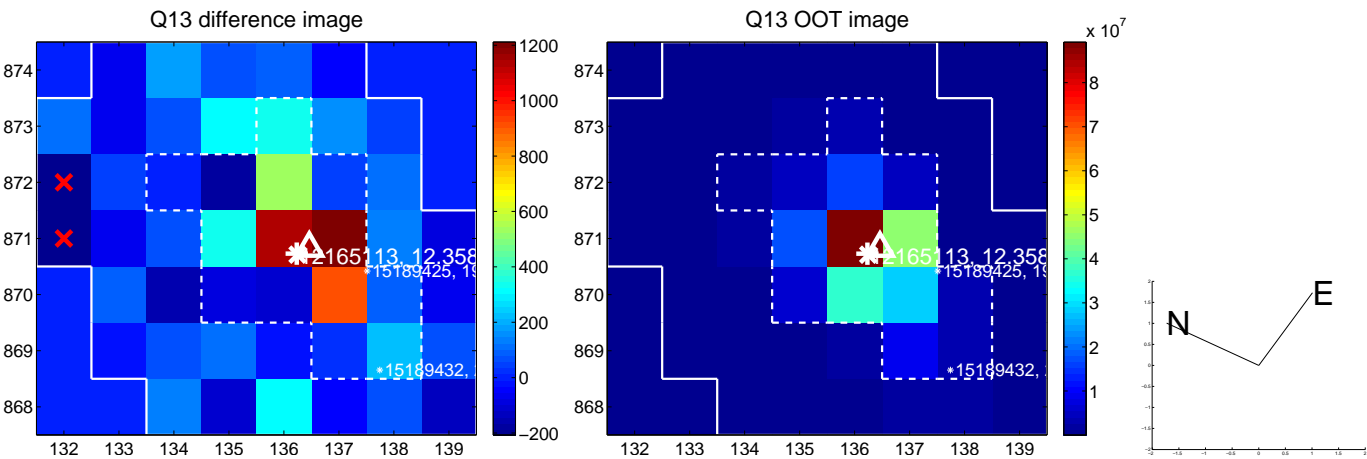
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



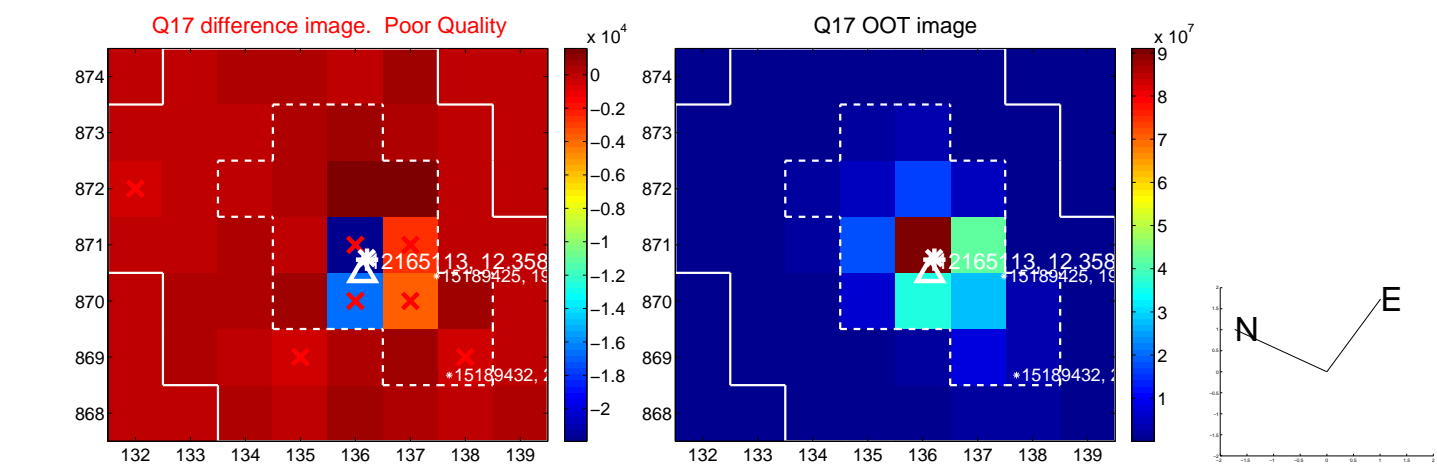
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



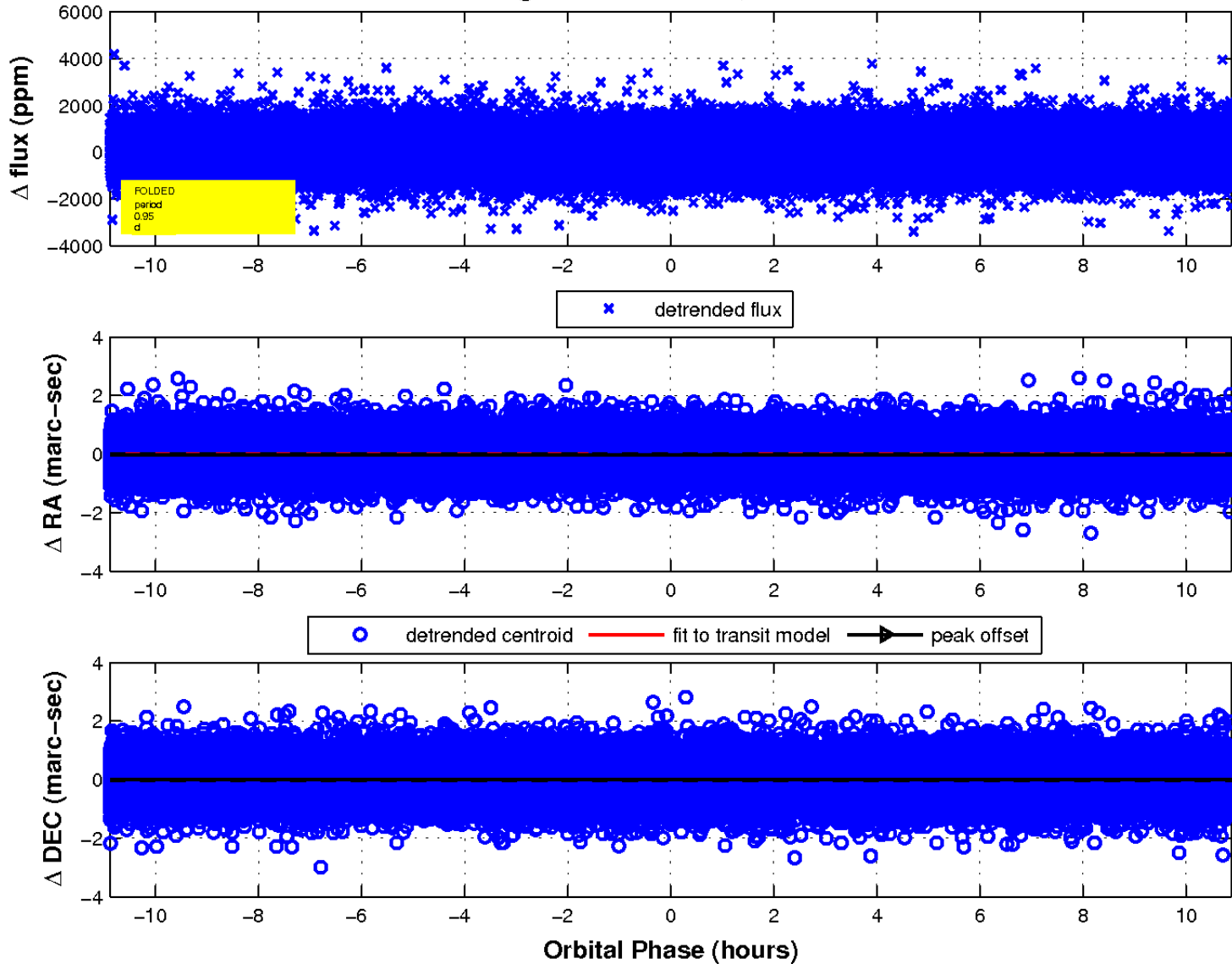
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

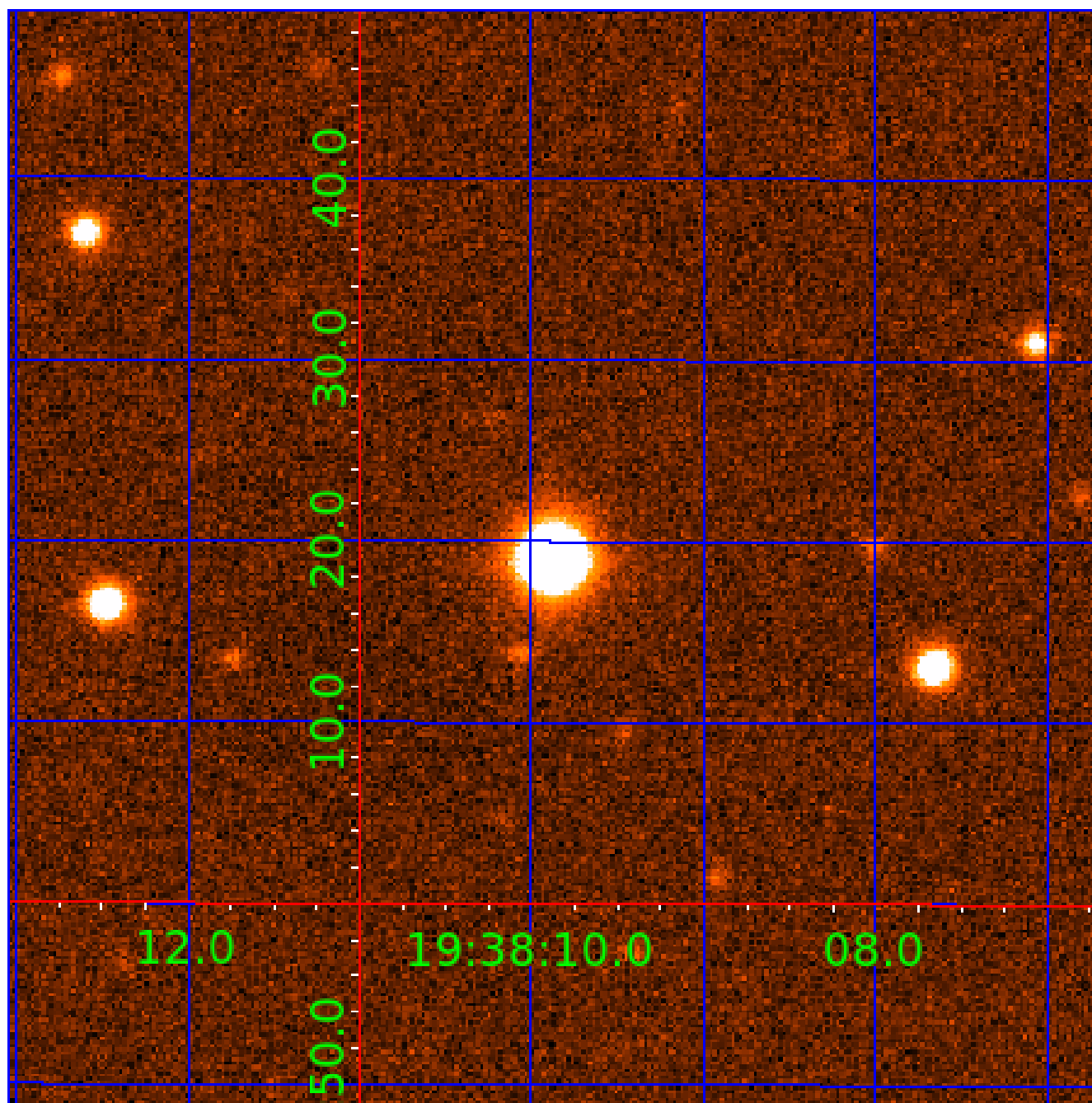


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 012165113

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 012165113-01 | OBS | No | 0.557592 | 131.737338 | 69.4 | 1.993 | 11.2 | 11.2 | 2.41 | 7466 | 2.32 | 60028.15 |
| 012165113-02 | OBS | No | 0.953324 | 132.295725 | 98.3 | 3.628 | 10.2 | 11.1 | 2.41 | 7466 | 2.76 | 29362.26 |
| 012165113-03 | OBS | No | 0.738807 | 131.933145 | 93.6 | 8.866 | 8.7 | 12.0 | 2.41 | 7466 | 2.80 | 41247.91 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 012165113-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 012165113-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |
| 012165113-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT |

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

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

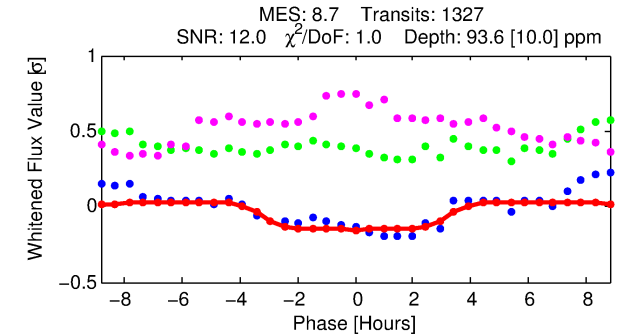
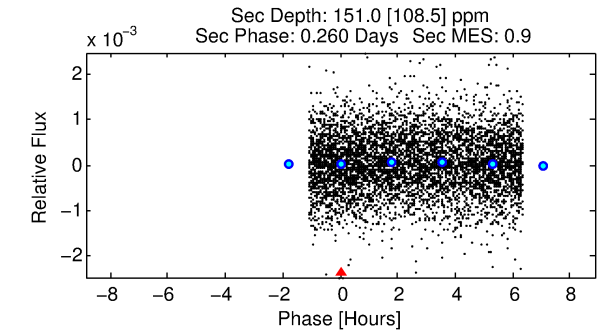
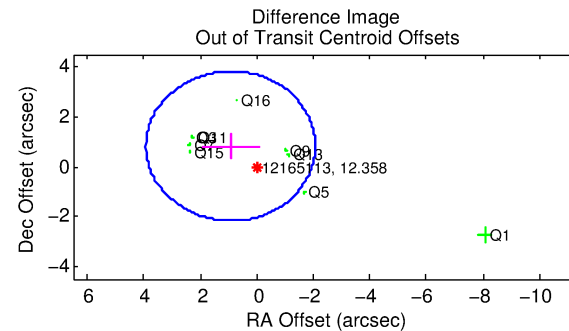
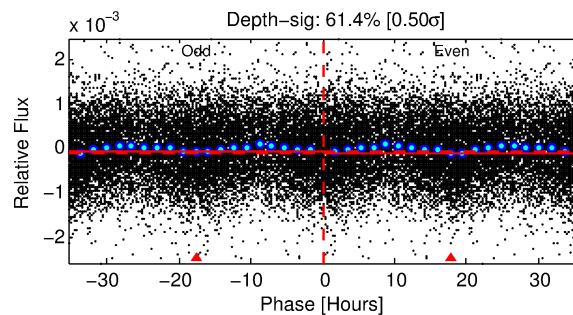
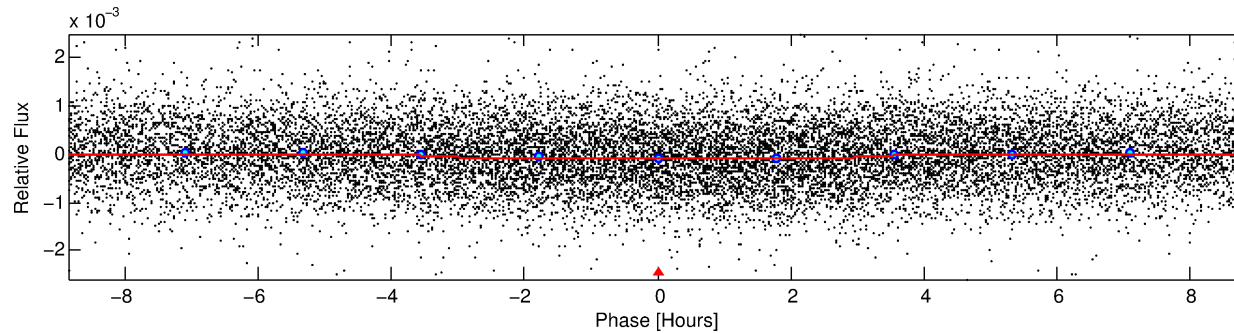
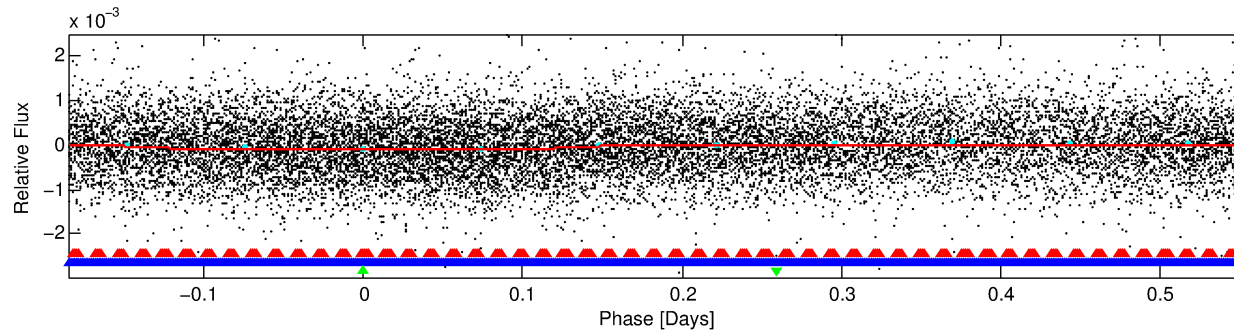
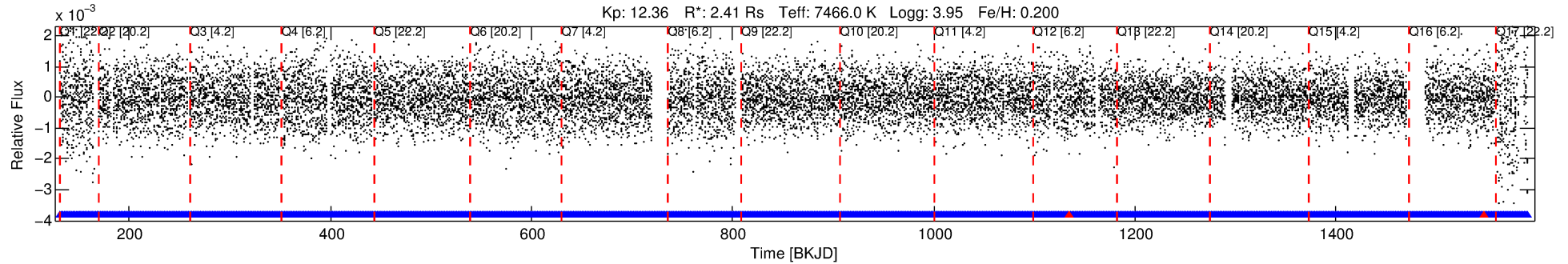
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012165113-03

No Significant Match Found

DV One-Page Summary

KIC: 12165113 Candidate: 3 of 3 Period: 0.739 d



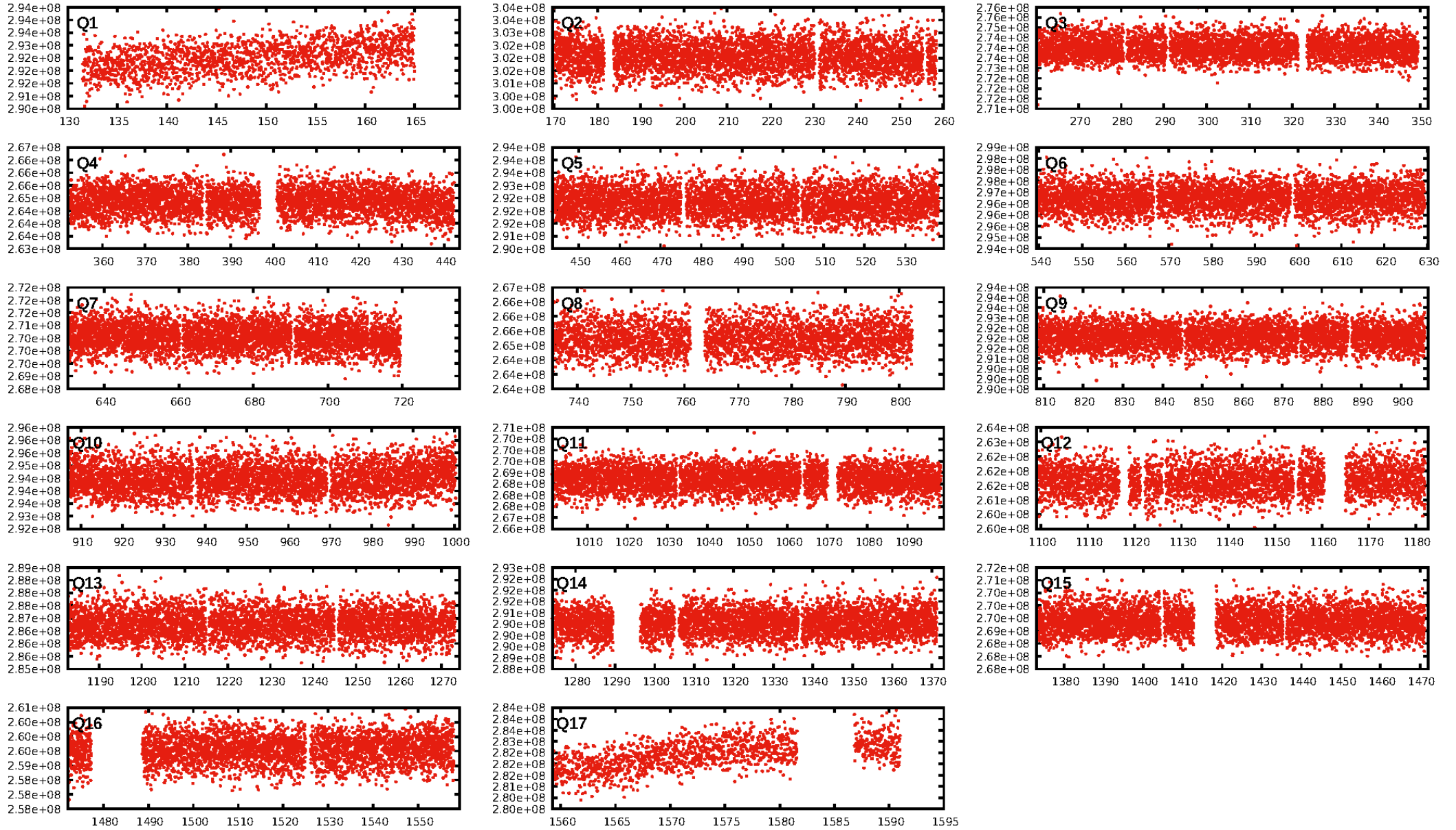
DV Fit Results:

Period = 0.73881 [0.00001] d
Epoch = 131.9331 [0.0090] BKJD
Rp/R* = 0.0107 [0.0008]
a/R* = 1.01 [0.00]
b = 0.94 [0.04]
Seff = 41247.91 [16591.45]
Teq = 3634 [365] K
Rp = 2.80 [0.80] Re
a = 0.0198 [0.0047] AU
Ag = 4.15 [3.38] [0.93 σ]
Teffp = 8018 [1520] K [2.80 σ]

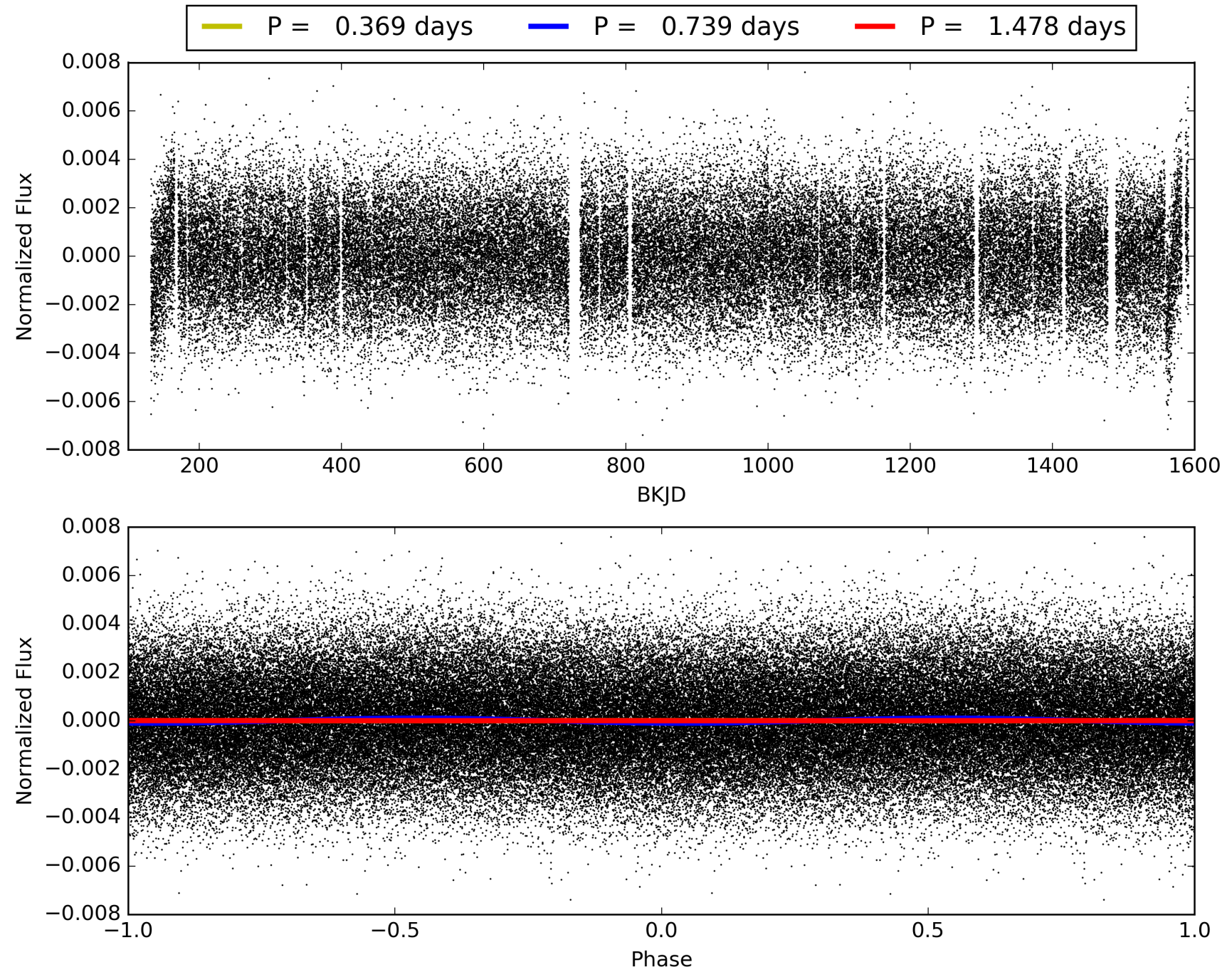
DV Diagnostic Results:

ShortPeriod-sig: 36.8% [0.48 σ]
LongPeriod-sig: 40.9% [0.54 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1267/1269]
GhostDiagnostic-chr: 1.861
Centroid-sig: 8.6%
Centroid-so: 0.347 arcsec [3.09 σ]
OotOffset-rm: 1.239 arcsec [1.24 σ]
KicOffset-rm: 1.189 arcsec [1.09 σ]
OotOffset-st: 0/4/1/4 [9]
KicOffset-st: 0/4/1/4 [9]
DiffImageQuality-fgm: 0.89 [8/9]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 012165113-03, PDC Light Curves

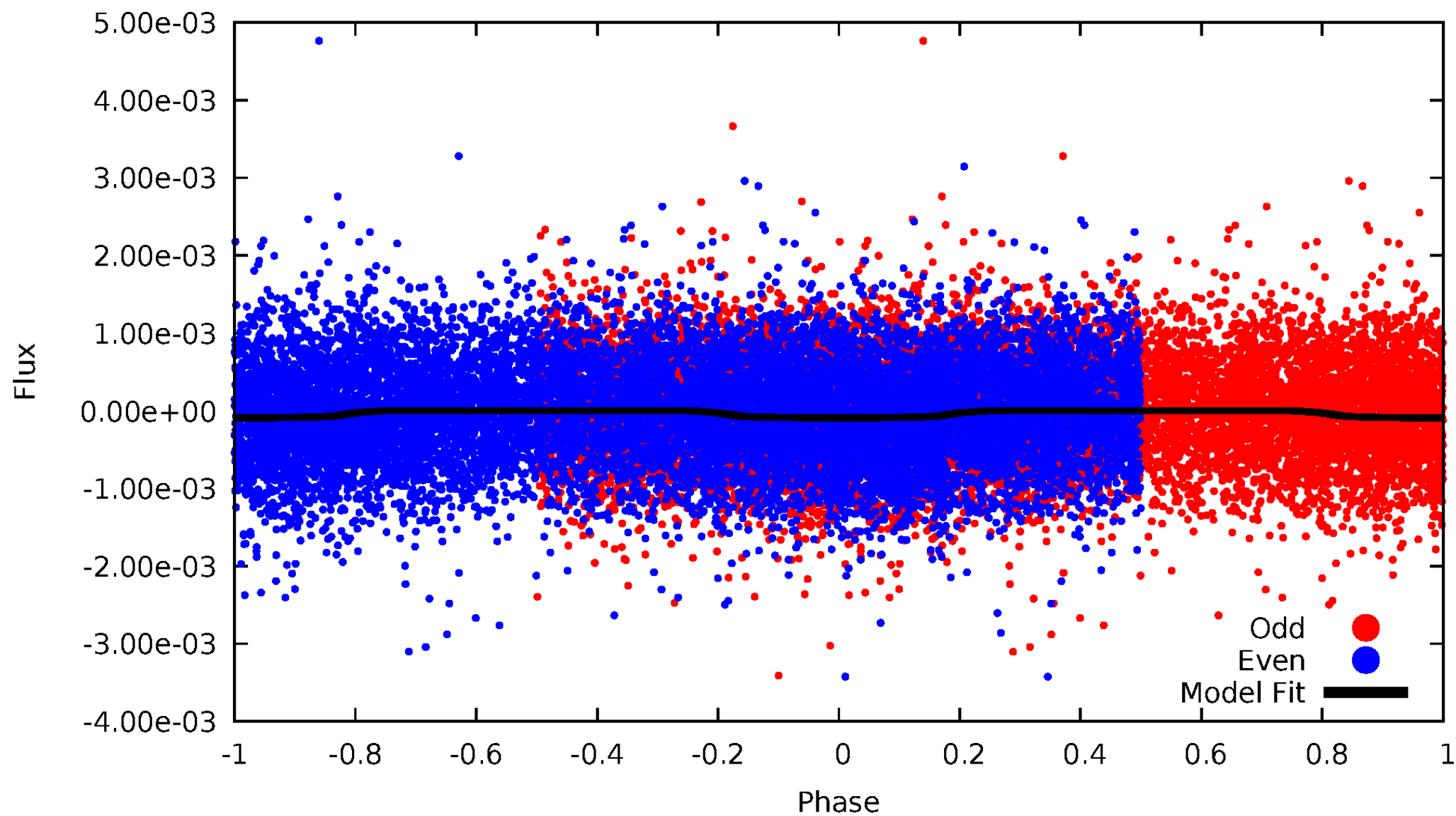


TCE 012165113-03



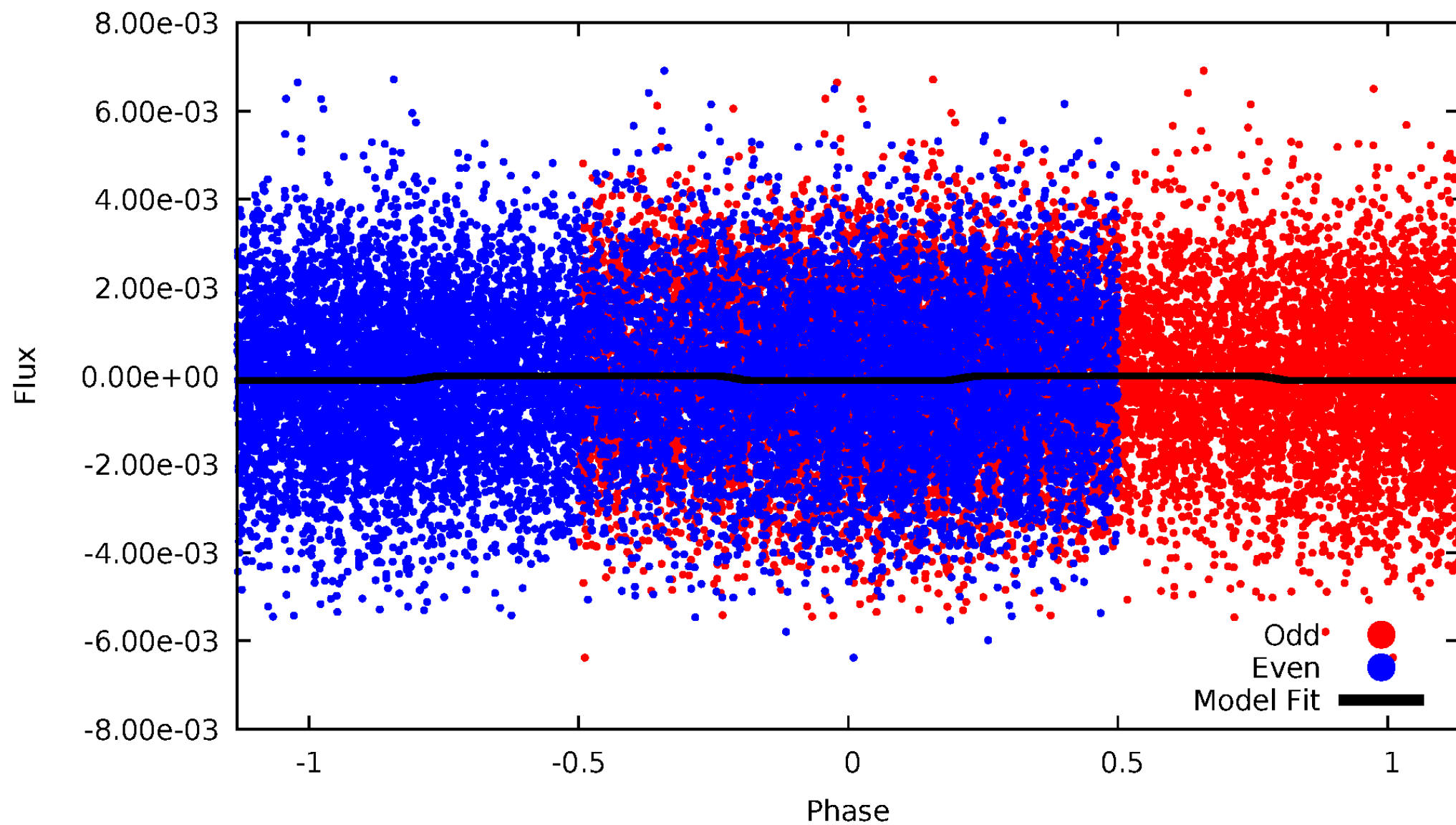
DV Odd/Even

TCE 012165113-03



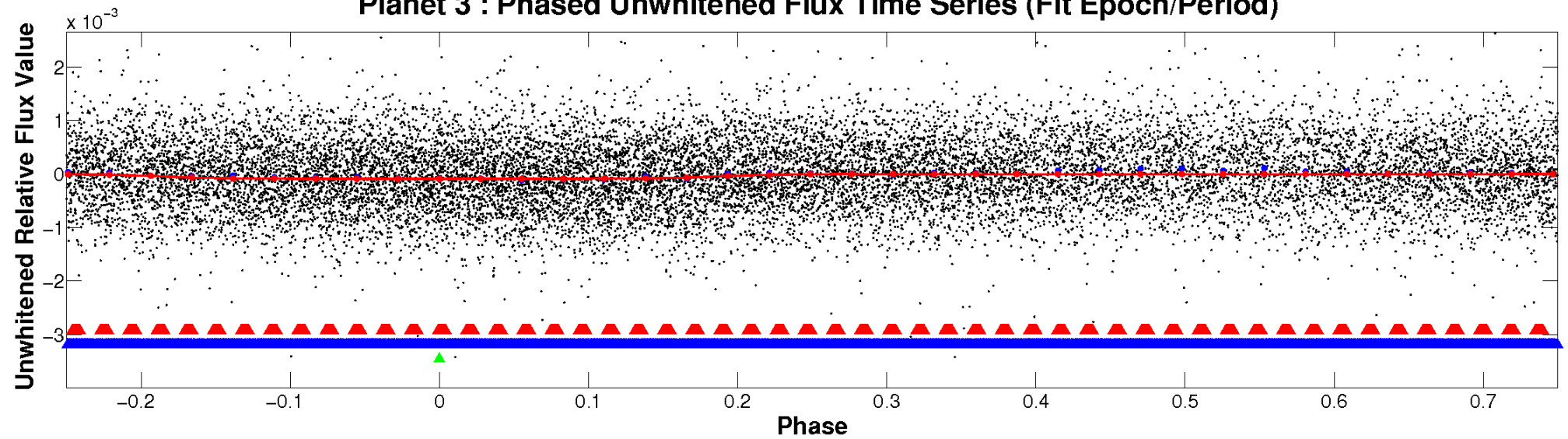
ALT Odd/Even

TCE 012165113-03

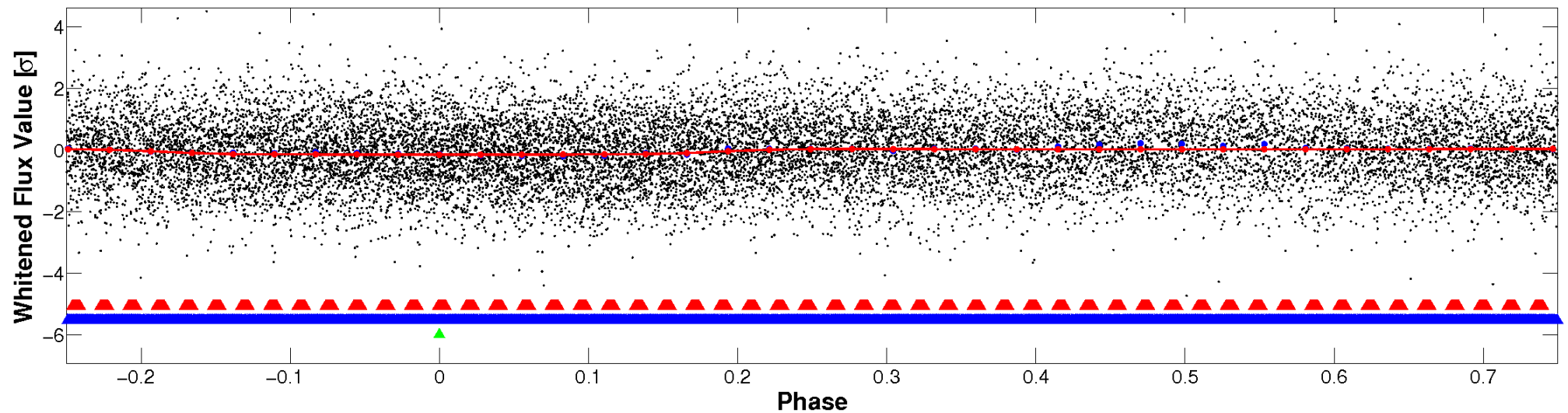


Non-Whitened Vs. Whitened Light Curve

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

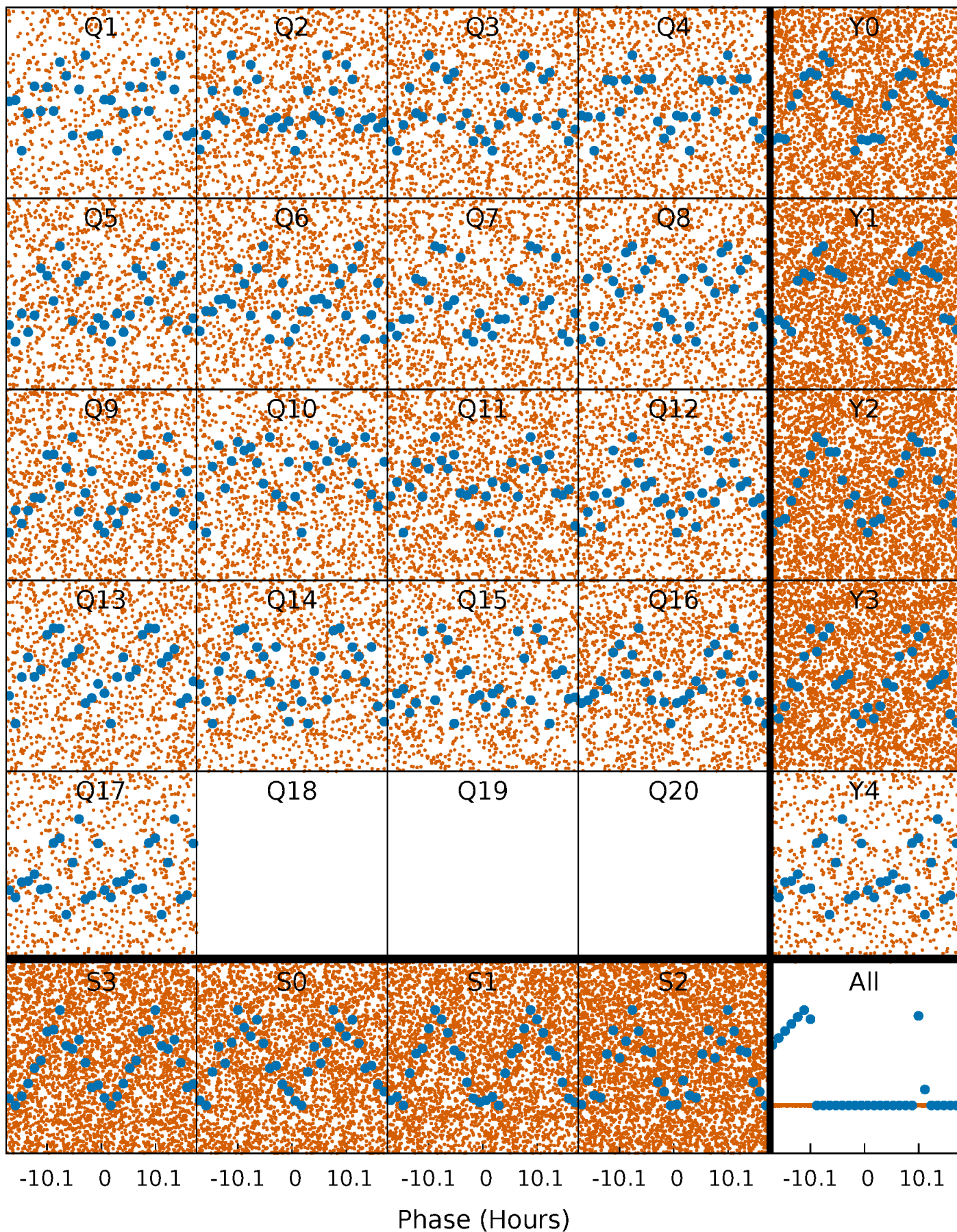


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



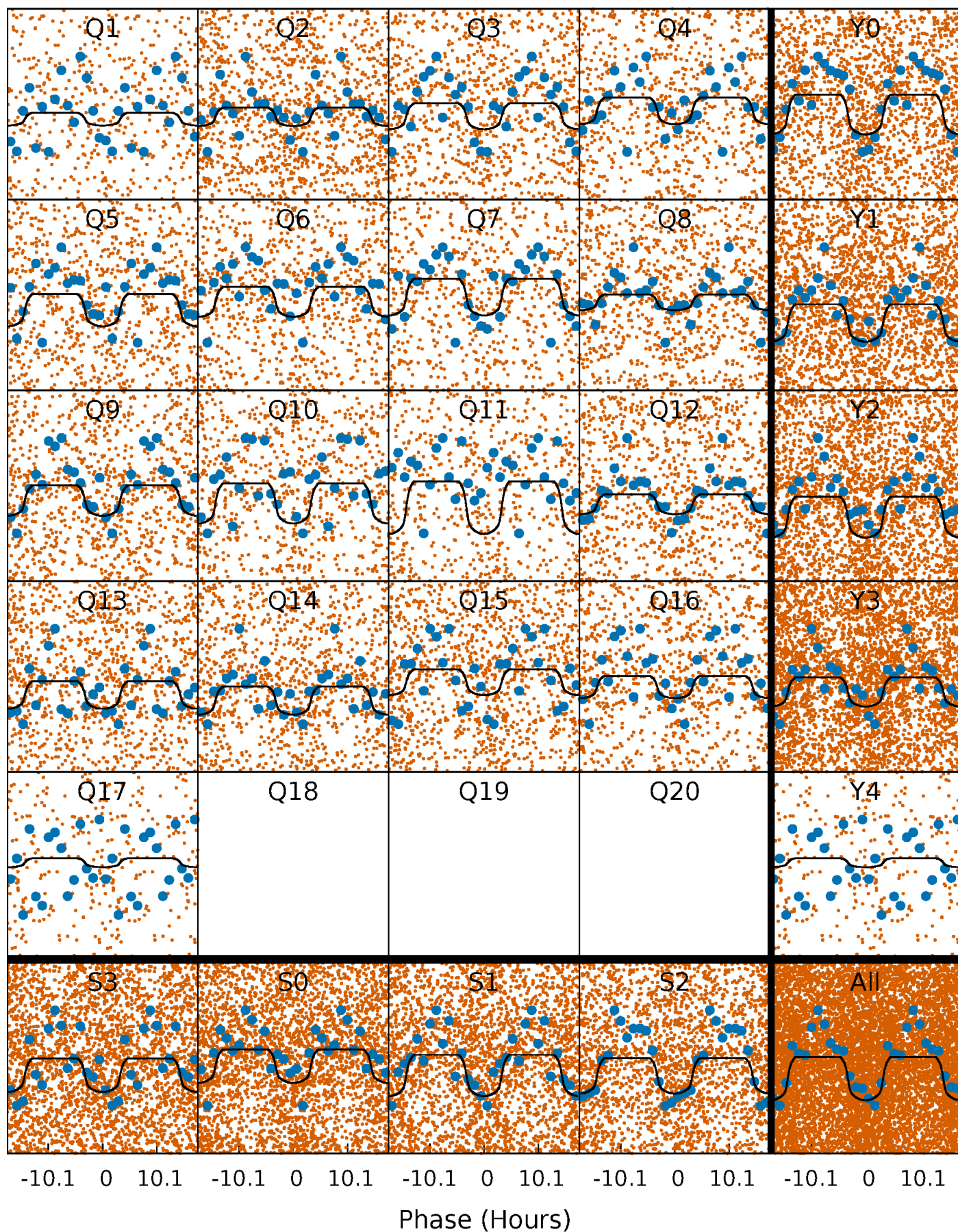
PDC Quarter-Phased Transit Curves

TCE 012165113-03 P= 0.738807 Days $T_0=131.933145$ (BKJD)



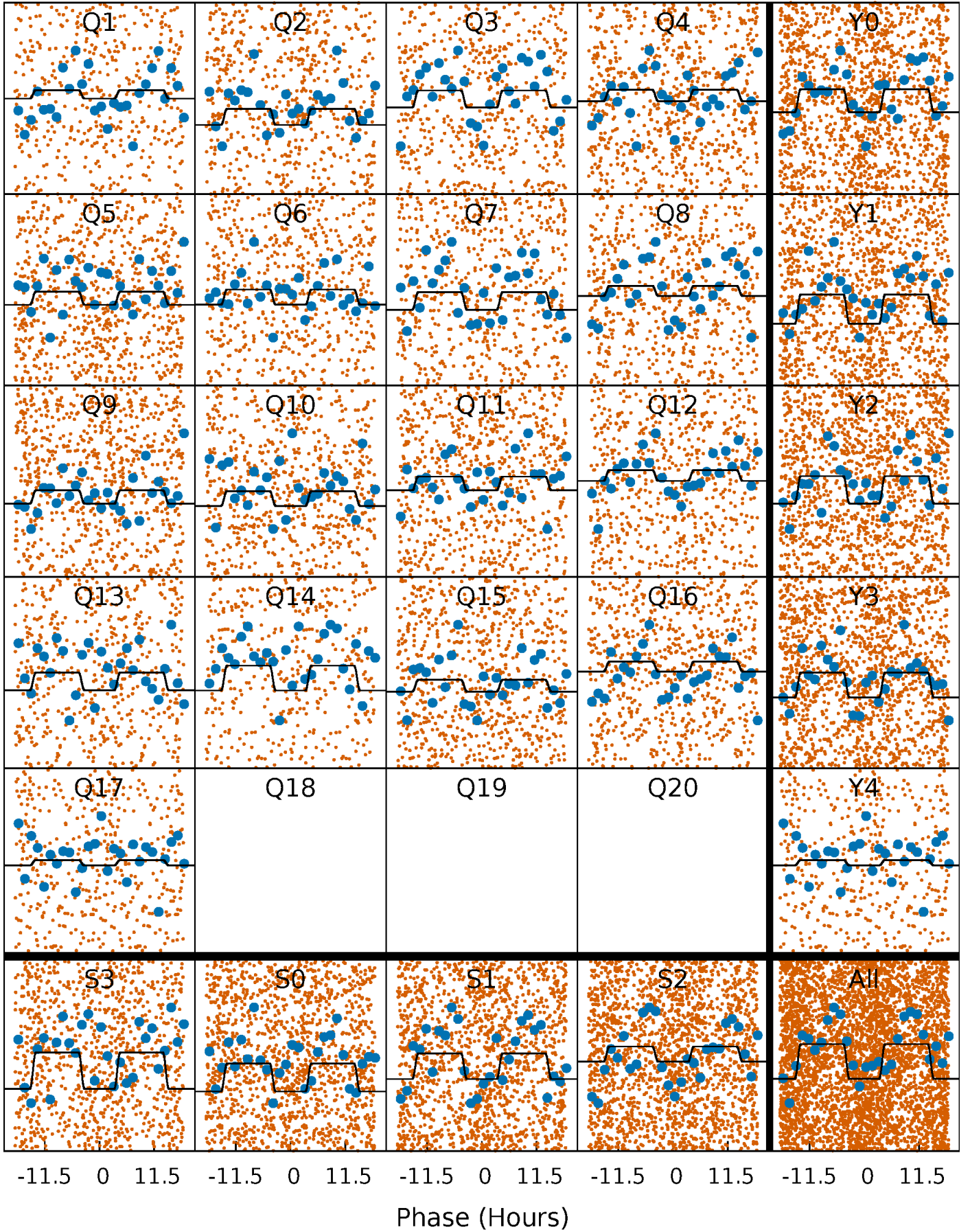
DV Quarter-Phased Transit Curves

TCE 012165113-03 P= 0.738807 Days $T_0=131.933145$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

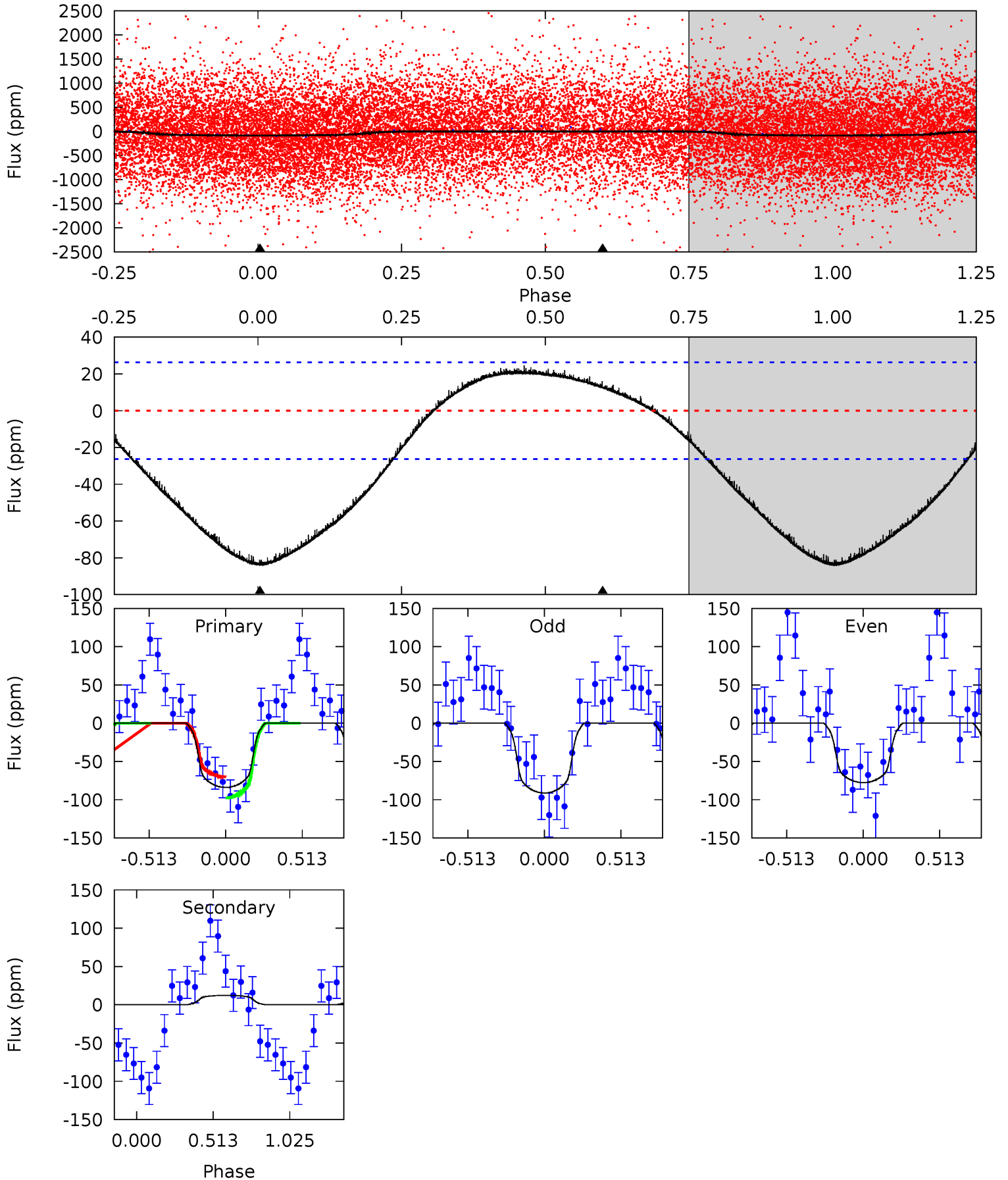
TCE 012165113-03 P= 0.738800 Days $T_0=131.891971$ (BKJD)



DV Model-Shift Uniqueness Test

012165113-03, P = 0.738807 Days, E = 131.194338 Days

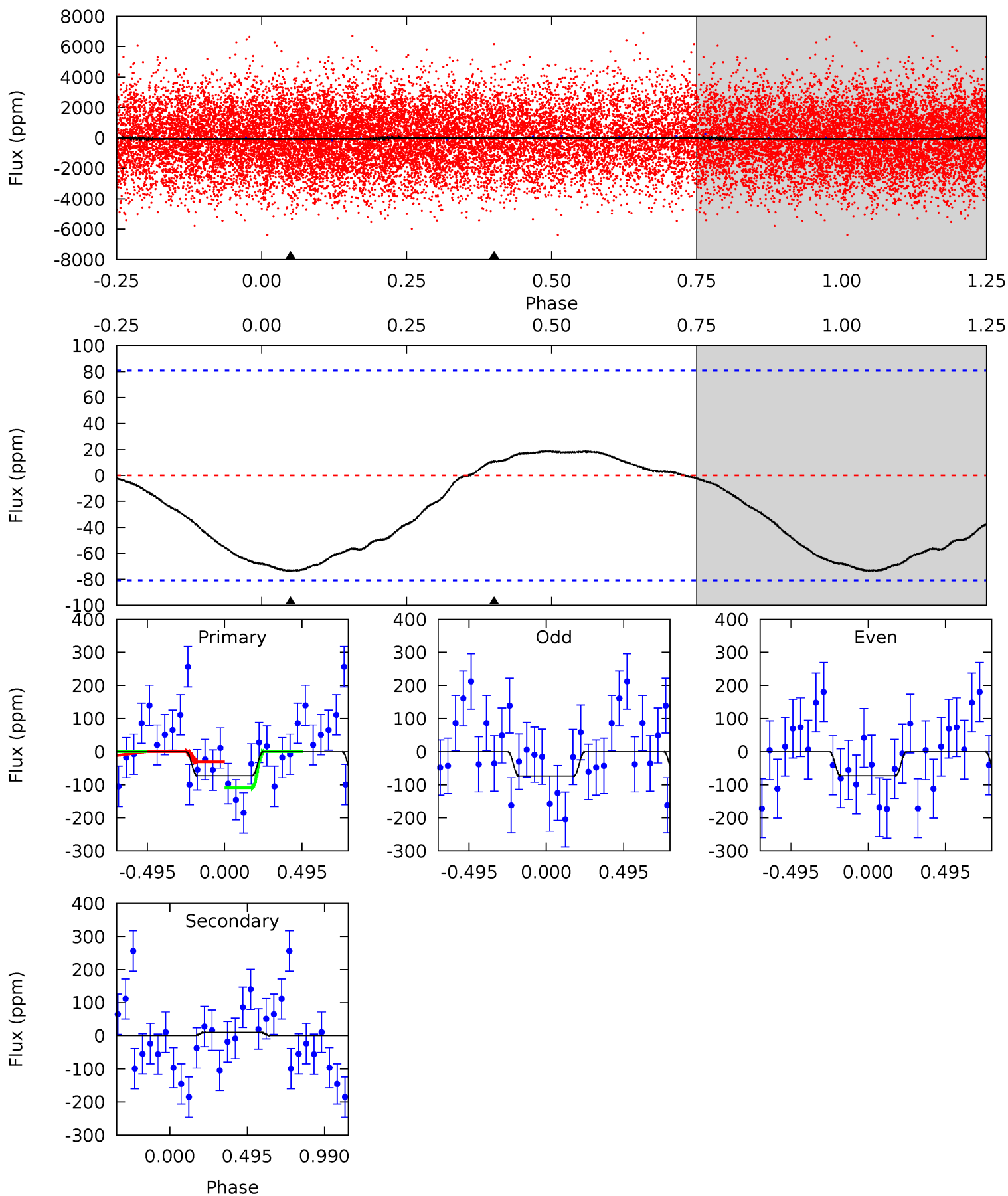
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-------|-------|------|
| 13.4 | -1.98 | 0 | 0 | 4.21 | 0.65 | 1.44 | 13.4 | 13.4 | -1.98 | -1.98 | 1.09 | -0.36 | 0.23 | 2.23 |



Alt Model-Shift Uniqueness Test

012165113-03, P = 0.738800 Days, E = 131.153171 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.84 | -0.55 | 0 | 0 | 4.22 | 0.68 | 0.19 | 3.84 | 3.84 | -0.55 | -0.55 | 0.02 | 0.91 | 0.20 | 2.08 |



Stellar Parameters For KIC 012165113

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 7466^{+206}_{-353} | $3.951^{+0.198}_{-0.144}$ | $0.200^{+0.150}_{-0.350}$ | $2.406^{+0.542}_{-0.662}$ | $1.886^{+0.148}_{-0.346}$ | $0.191^{+0.233}_{-0.079}$ |
| | +3%/-5% | +5%/-4% | +75%/-175% | +23%/-28% | +8%/-18% | +122%/-41% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 012165113-03 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|----------------------|------------------------|----------------------------|
| DV | 12 ± 6 | $2.71^{+0.47}_{-0.42}$ | 5032^{+332}_{-363} | -5020^{+362}_{-372} | $-0.344^{+0.183}_{-0.274}$ |
| Alt. | 11 ± 19 | $2.60^{+0.39}_{-0.39}$ | 5029^{+334}_{-379} | -4932^{+7256}_{-873} | $-0.311^{+0.615}_{-0.655}$ |

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 $A_{obs} \gg 1.0$

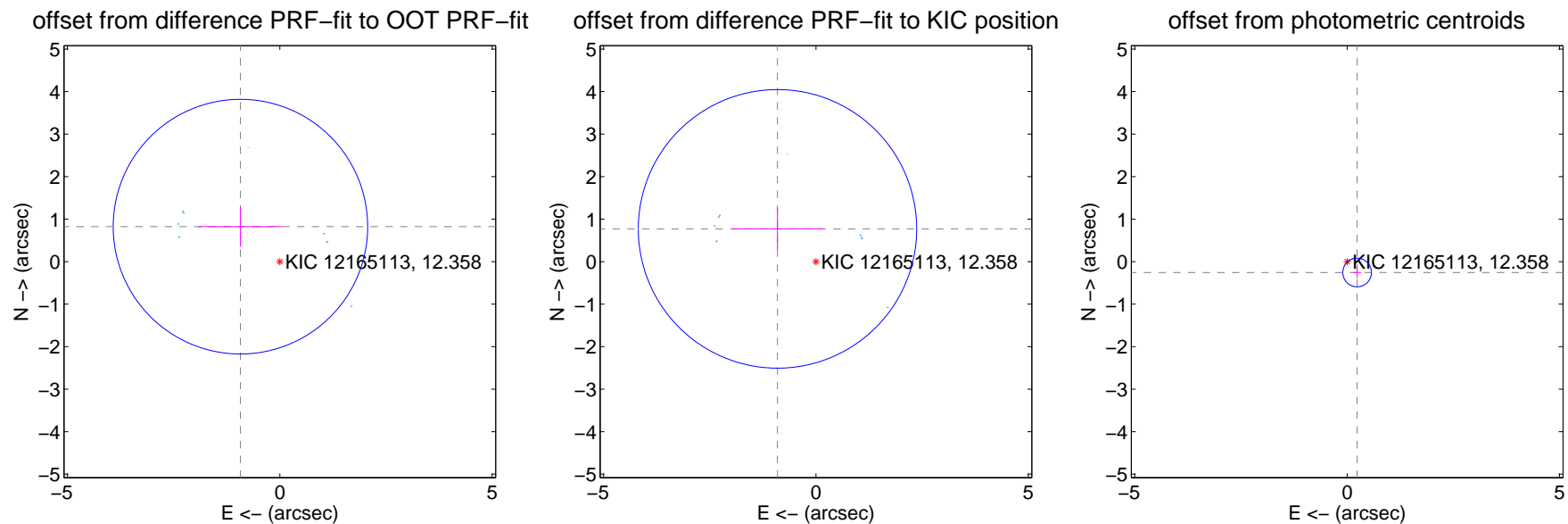
DV Centroid Data

Supplemental centroid analysis for 012165113-03. Kepler magnitude: 12.36. Transit SNR 12.01

There are 8 quarters with good PRF difference image offsets

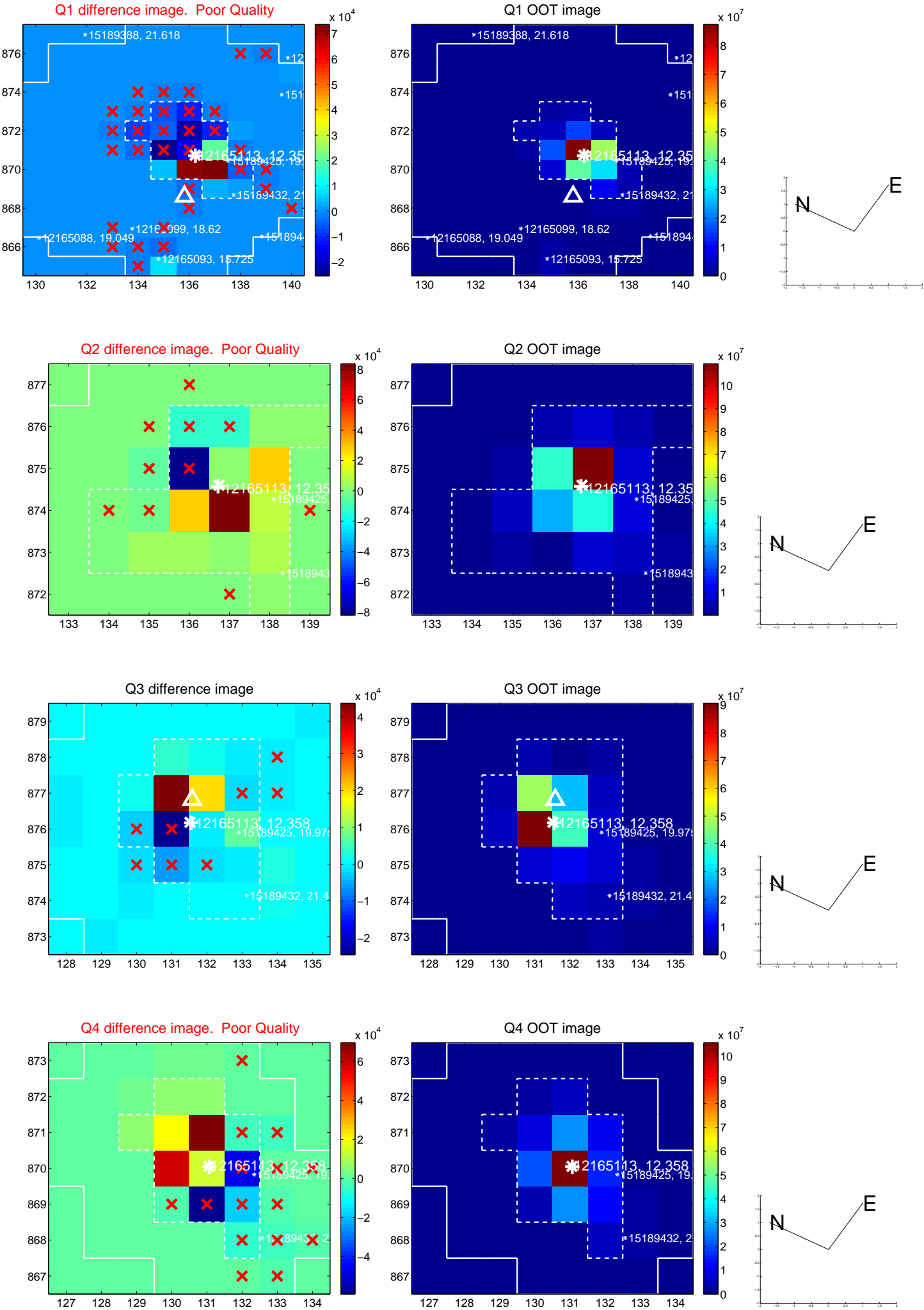
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 1.239 ± 0.999 | 1.24 | 0.927 ± 0.987 | 0.823 ± 0.475 |
| PRF-fit source offset from KIC position | 1.189 ± 1.092 | 1.09 | 0.905 ± 1.078 | 0.771 ± 0.495 |
| photometric centroid source offset | 0.35 ± 0.11 | 3.09 | -0.24 ± 0.10 | -0.26 ± 0.12 |

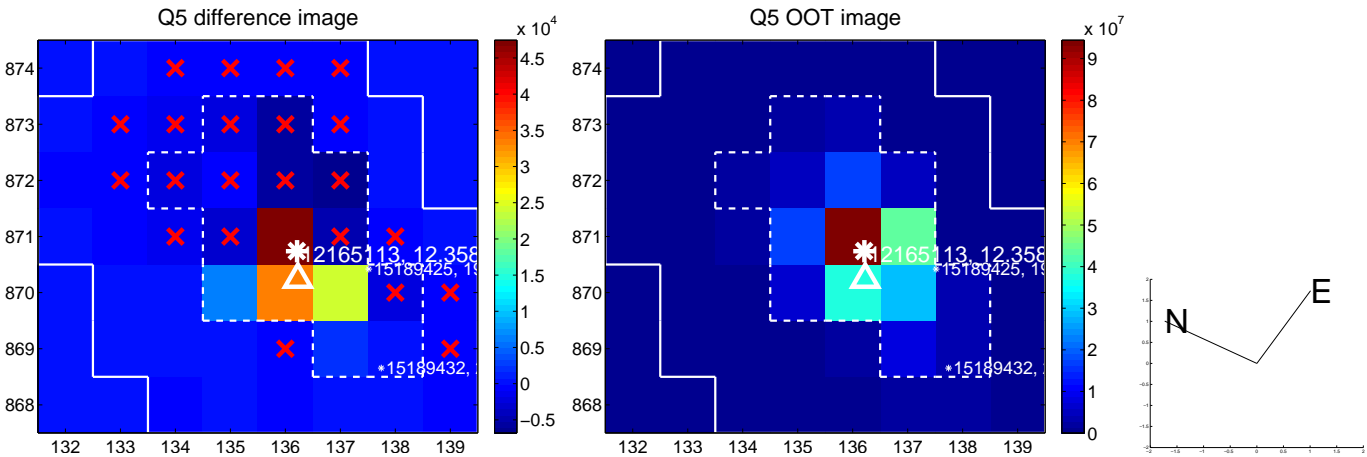


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

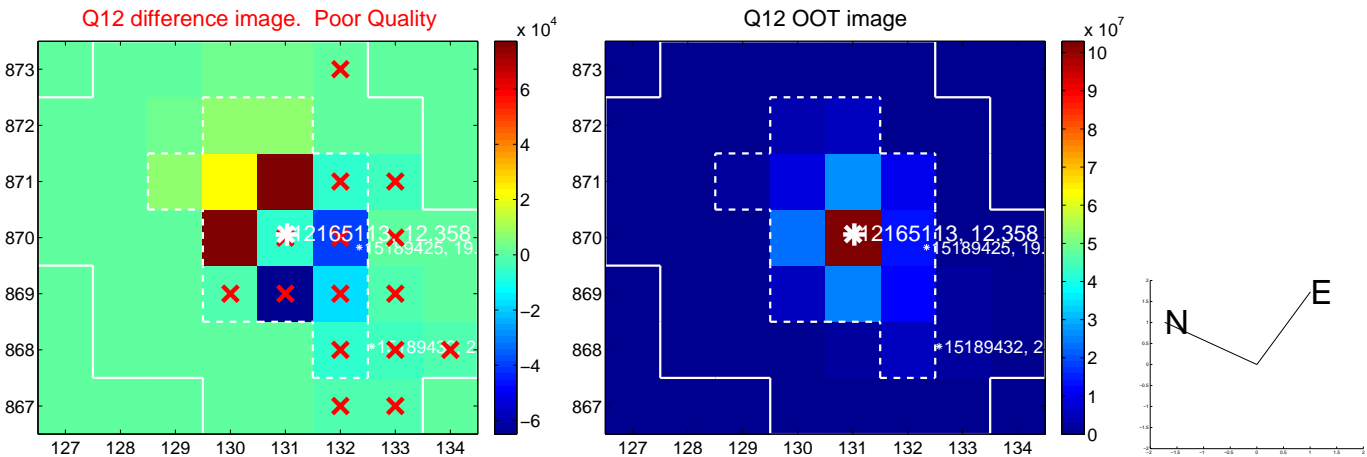
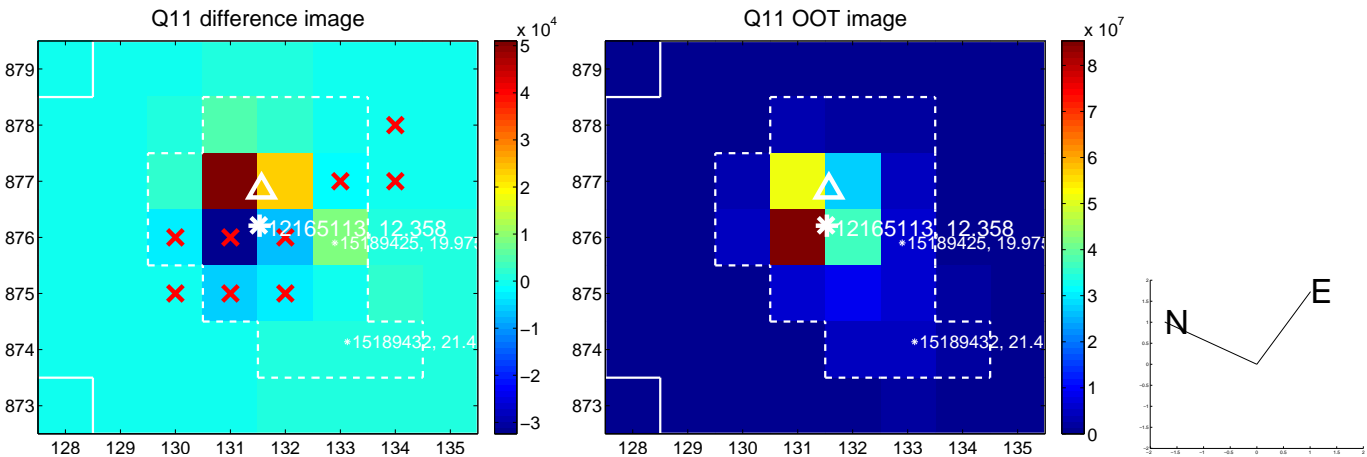
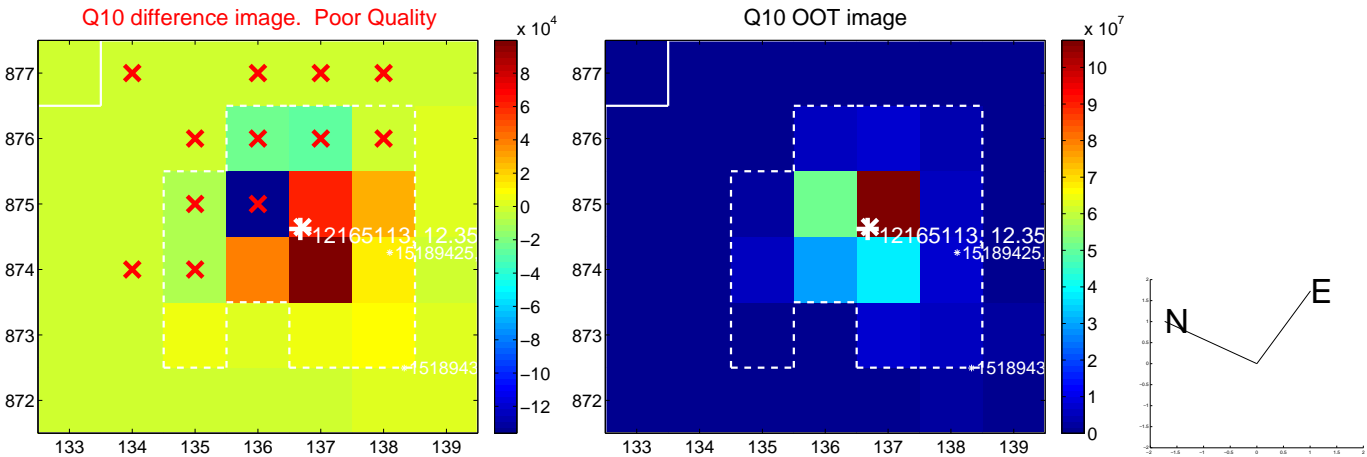
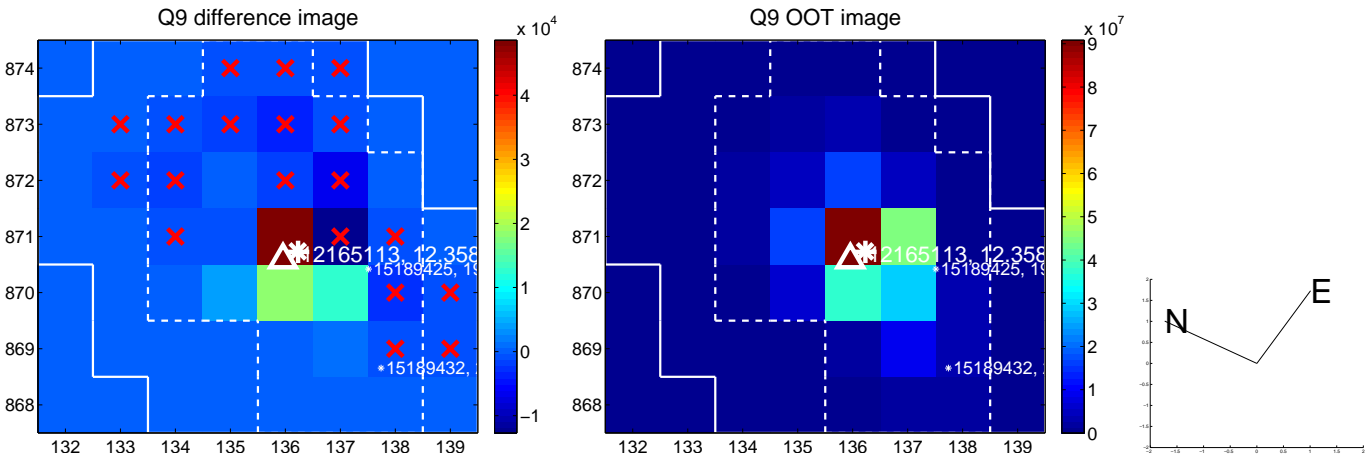
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



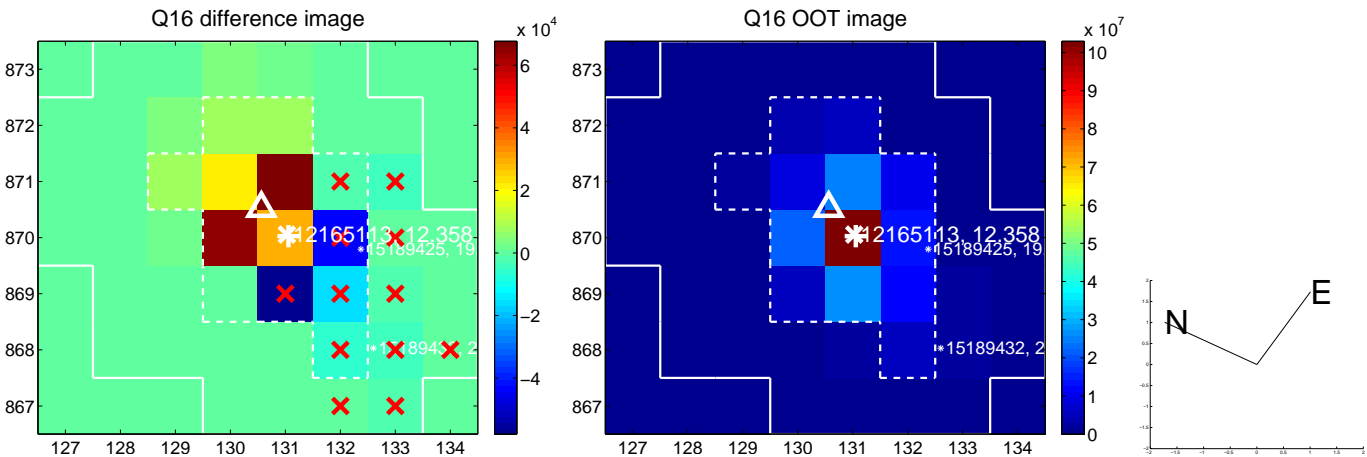
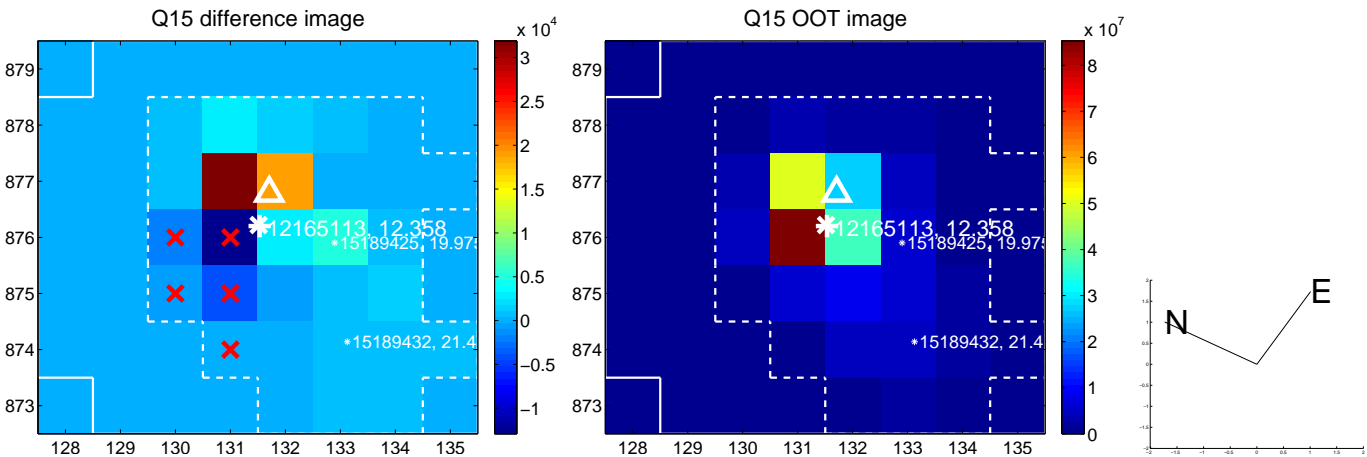
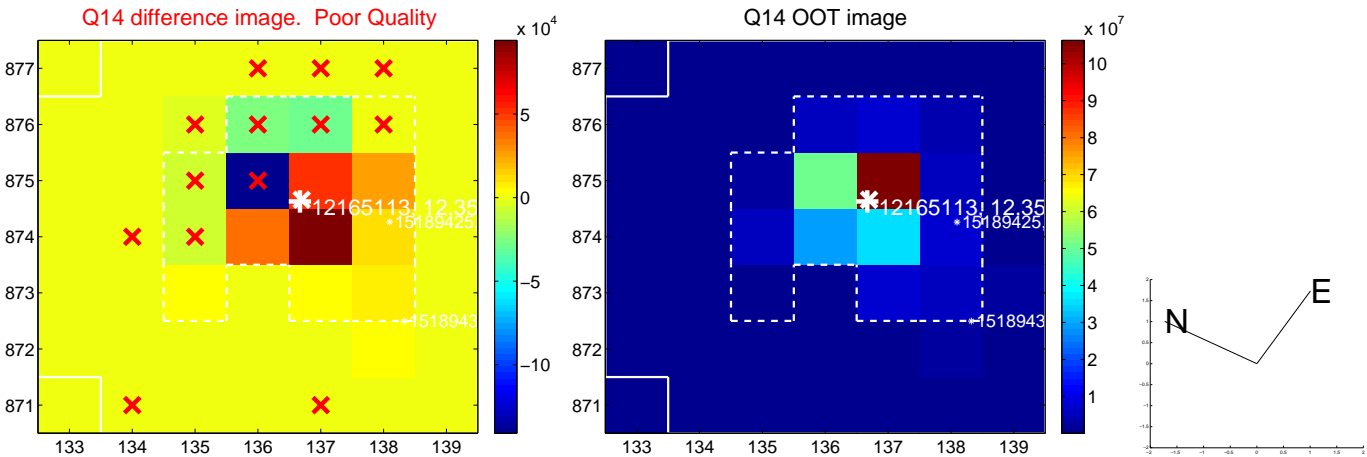
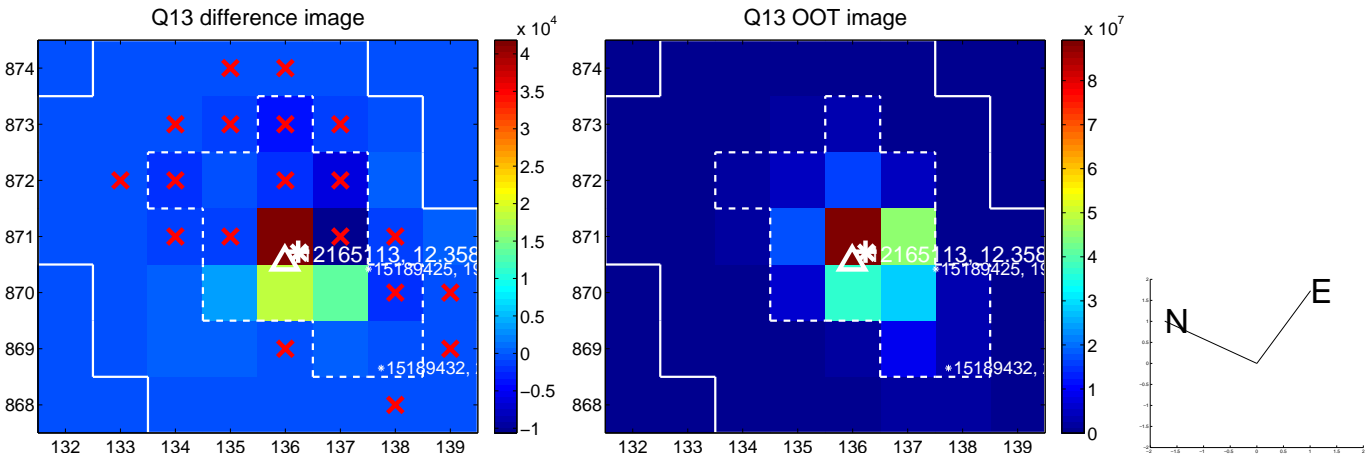
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



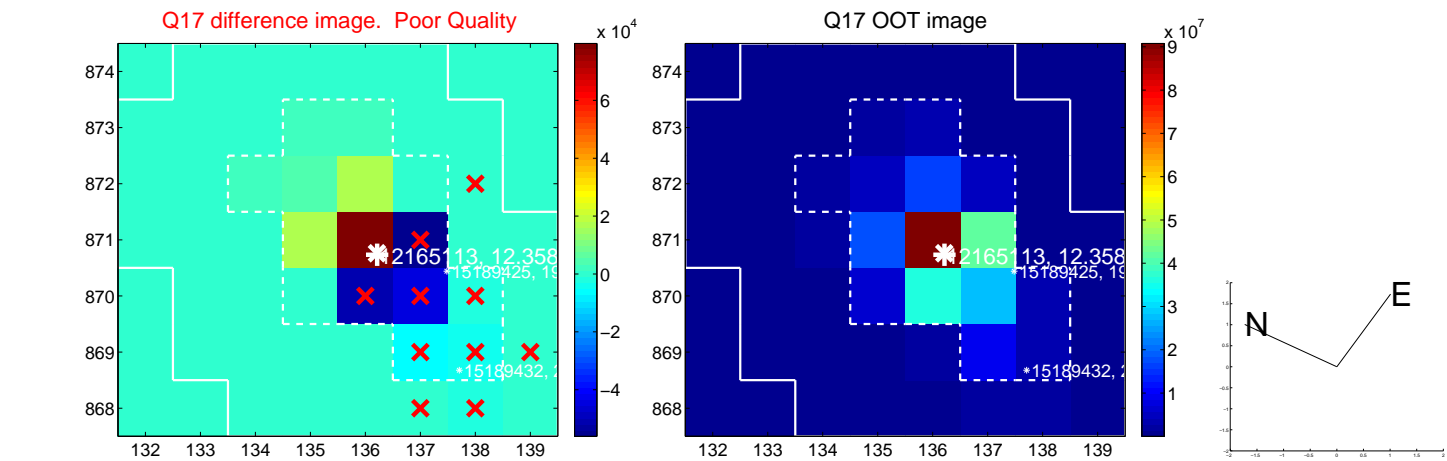
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



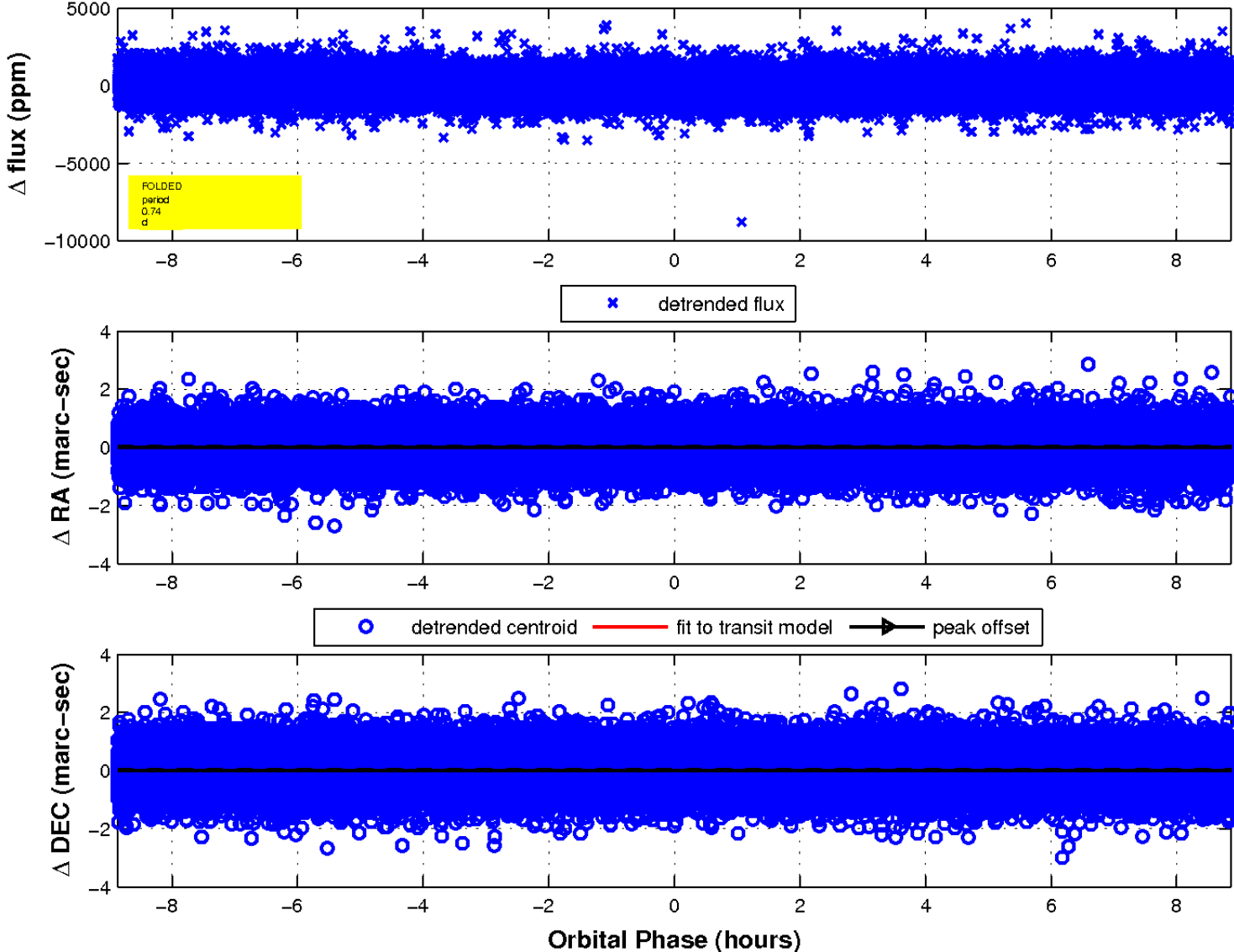
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

