

KIC 007954104

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007954104-01 | OBS | No | 0.538465 | 131.771021 | 66.2 | 3.335 | 7.9 | 8.0 | 0.91 | 5925 | 0.75 | 5463.43 |
| 007954104-02 | OBS | No | 41.538743 | 155.425656 | 1661.4 | 2.013 | 10.7 | 6.4 | 0.91 | 5925 | 4.20 | 16.64 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---------------------------------------------------------------------------------------------------|
| 007954104-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | LPP_DV—CENT_RESOLVED_OFFSET |
| 007954104-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET |

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

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

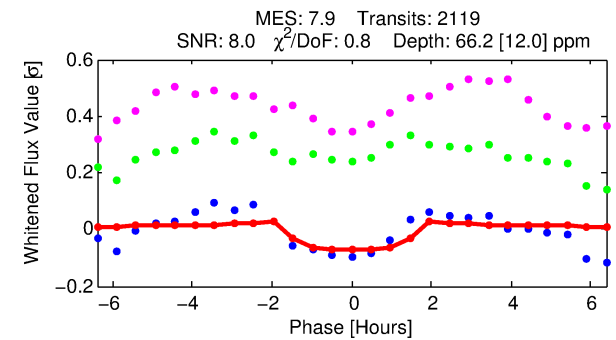
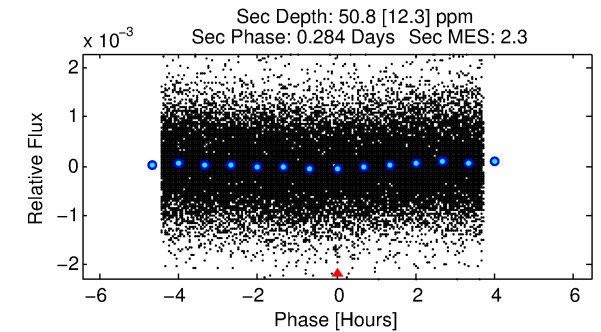
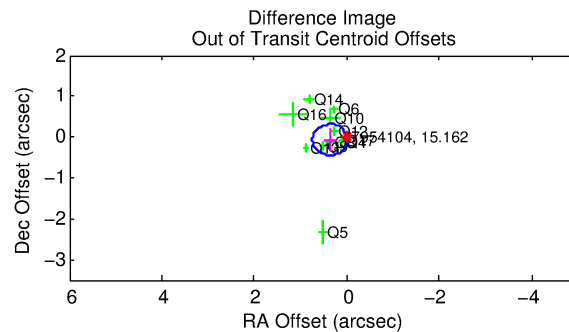
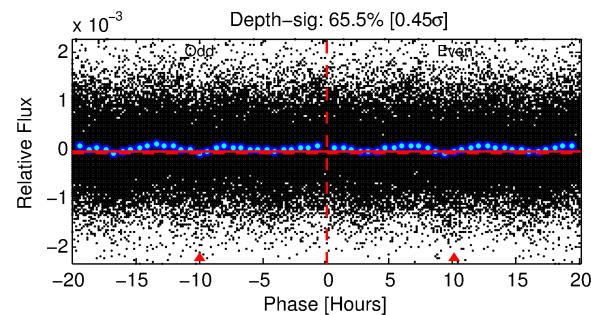
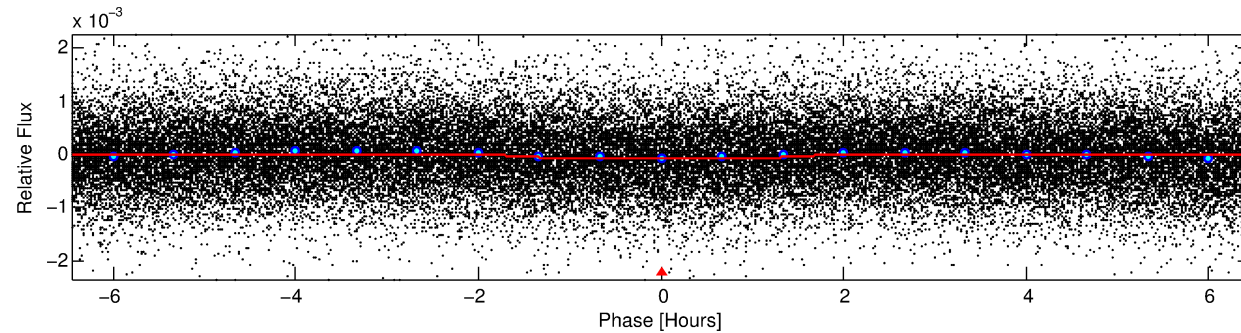
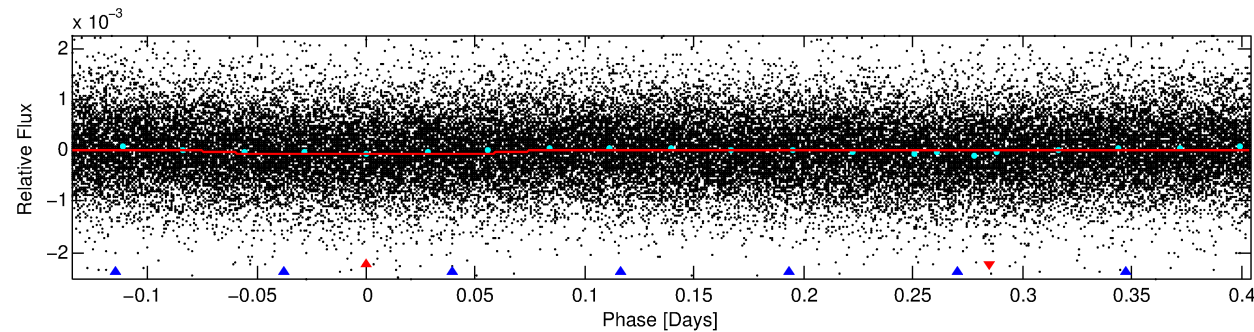
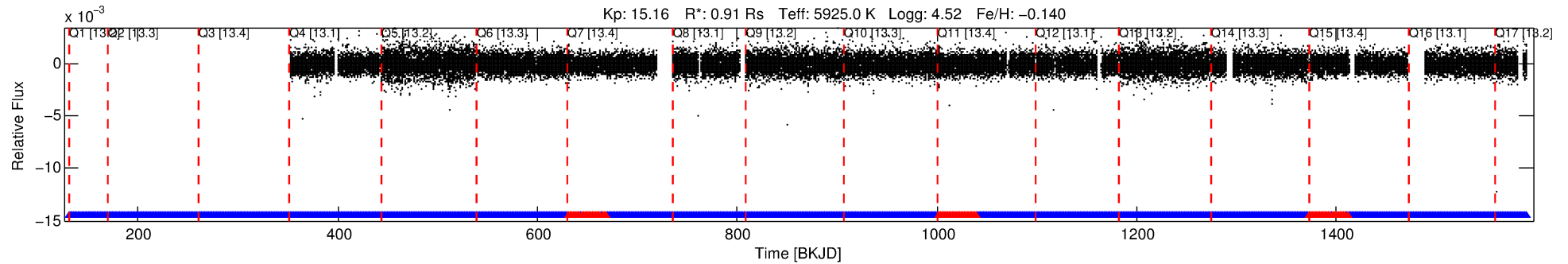
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007954104-01

No Significant Match Found

DV One-Page Summary

KIC: 7954104 Candidate: 1 of 2 Period: 0.538 d



DV Fit Results:

Period = 0.53847 [0.00001] d
Epoch = 131.7710 [0.0037] BKJD
Rp/R* = 0.0076 [0.0078]
a/R* = 1.34 [2.82]
b = 0.40 [10.30]
Seff = 5463.43 [2196.15]
Teq = 2192 [220] K
Rp = 0.75 [0.80] Re
a = 0.0129 [0.0033] AU
Ag = 8.31 [17.52] [0.42 σ]
Teffp = 5755 [2991] K [1.19 σ]

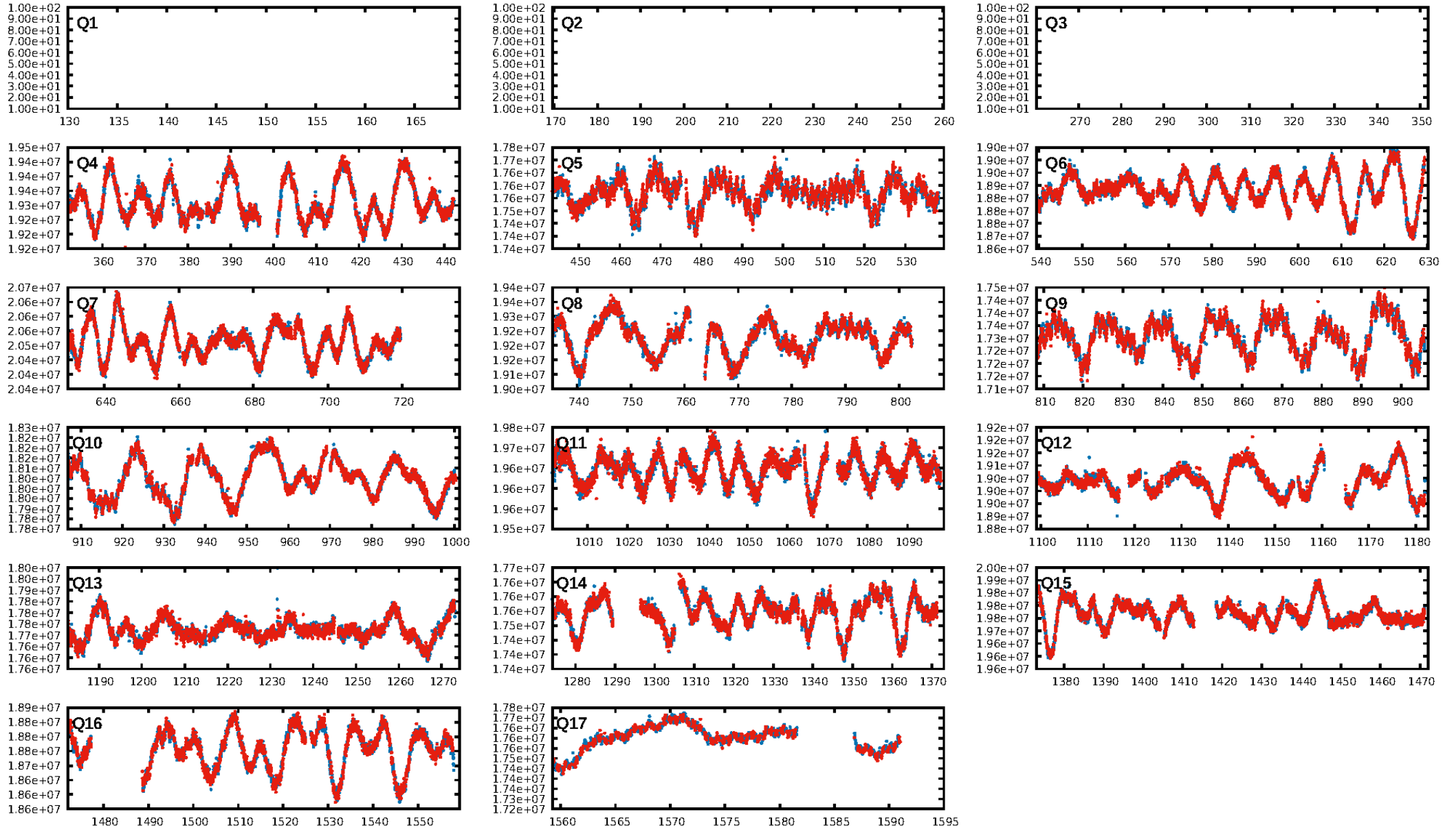
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [252.62 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.60e-10
RollingBand-fgt: 0.92 [1902/2069]
GhostDiagnostic-chr: -1.247
Centroid-sig: 0.0%
Centroid-so: 4.820 arcsec [19.22 σ]
OotOffset-rm: 0.373 arcsec [2.95 σ]
KicOffset-rm: 6.748 arcsec [51.43 σ]
OotOffset-st: 3/0/4/4 [11]
KicOffset-st: 3/0/4/4 [11]
DiffImageQuality-fgm: 0.91 [10/11]
DiffImageOverlap-fno: 1.00 [14/14]

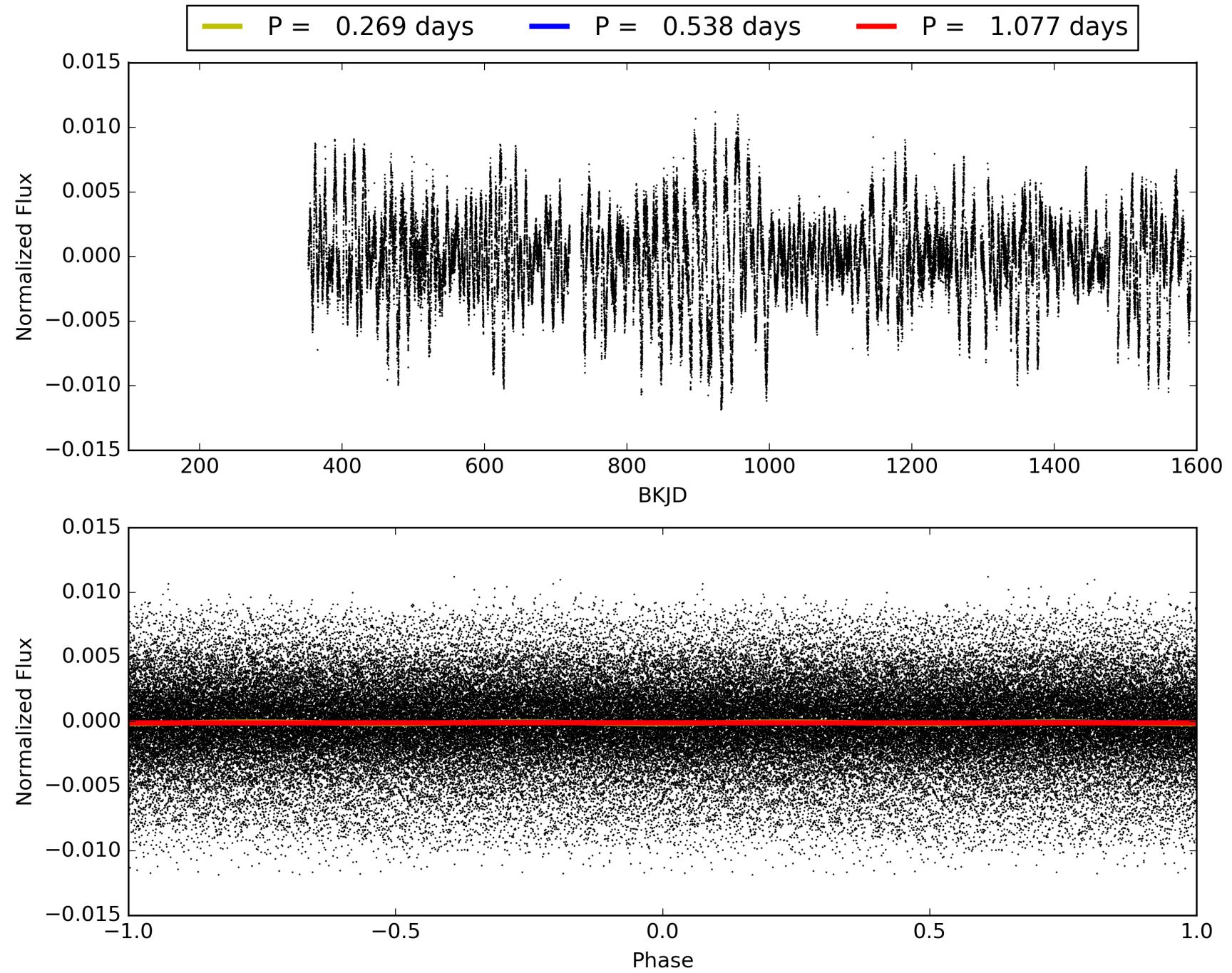
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 007954104-01, PDC Light Curves

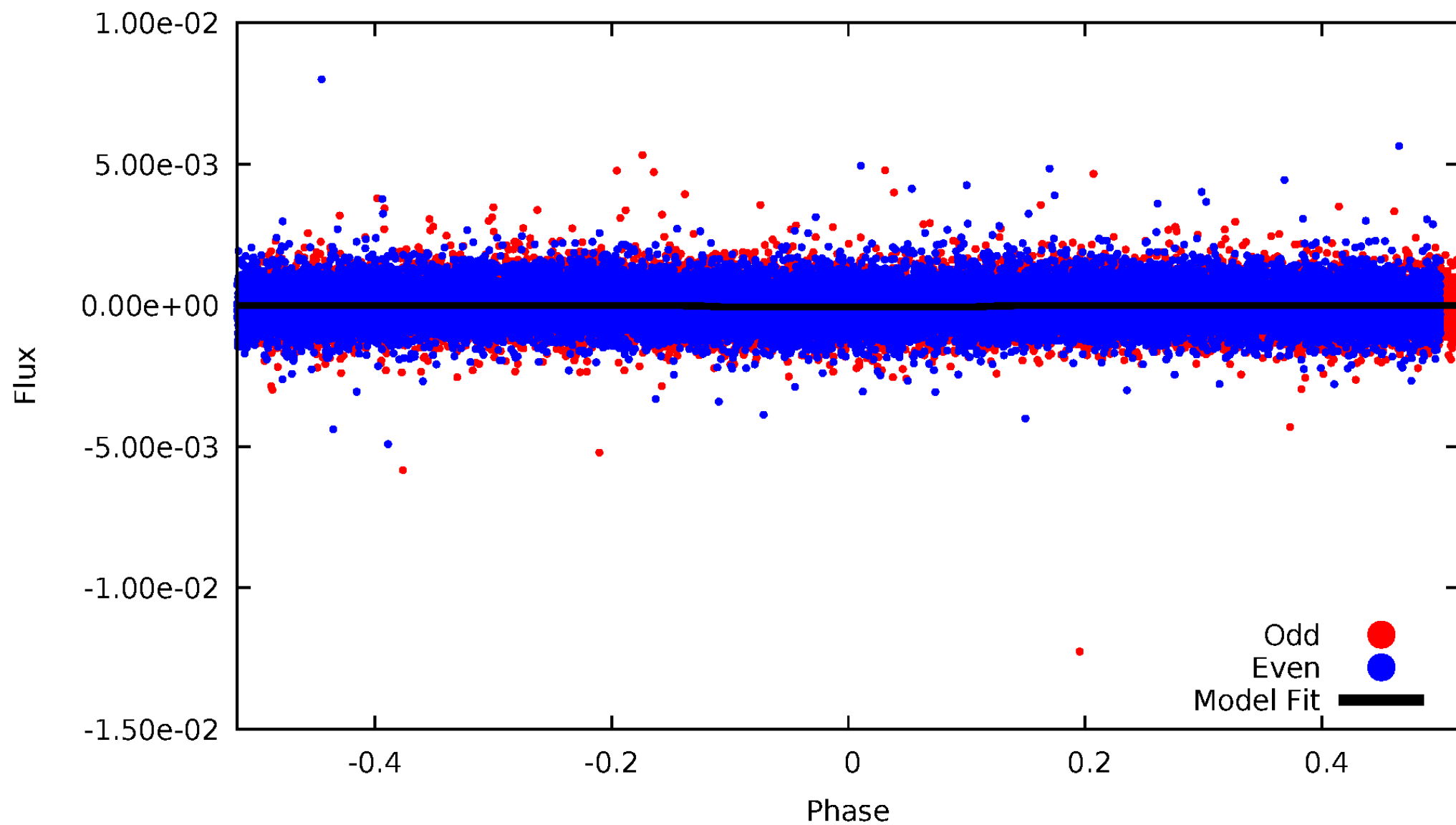


TCE 007954104-01



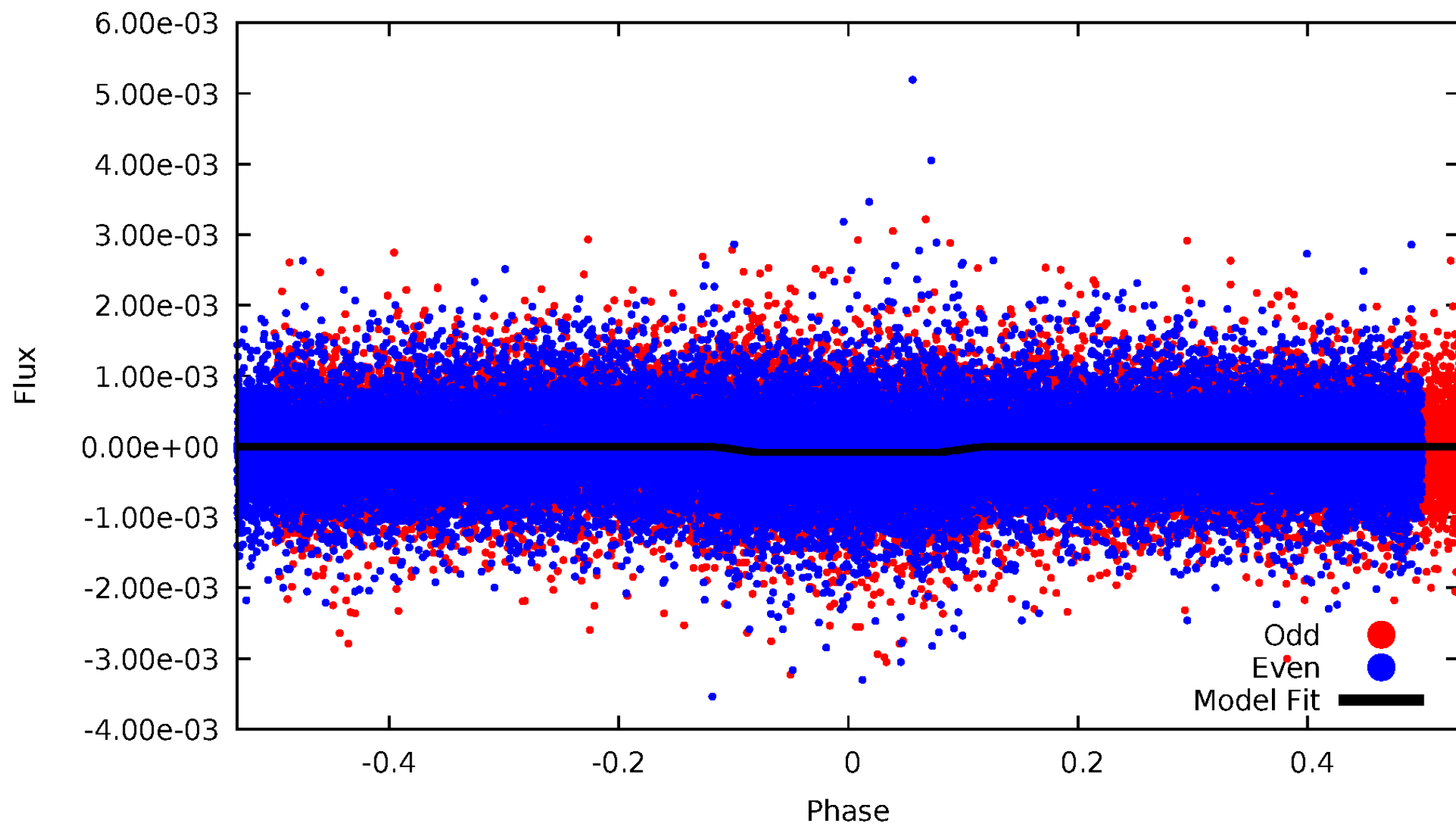
DV Odd/Even

TCE 007954104-01



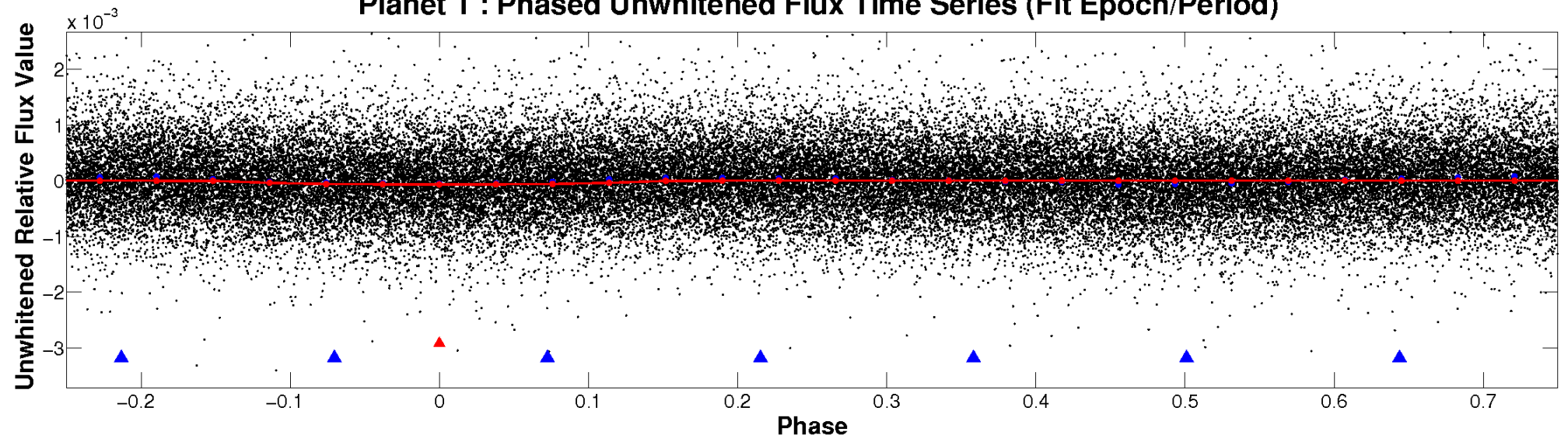
ALT Odd/Even

TCE 007954104-01

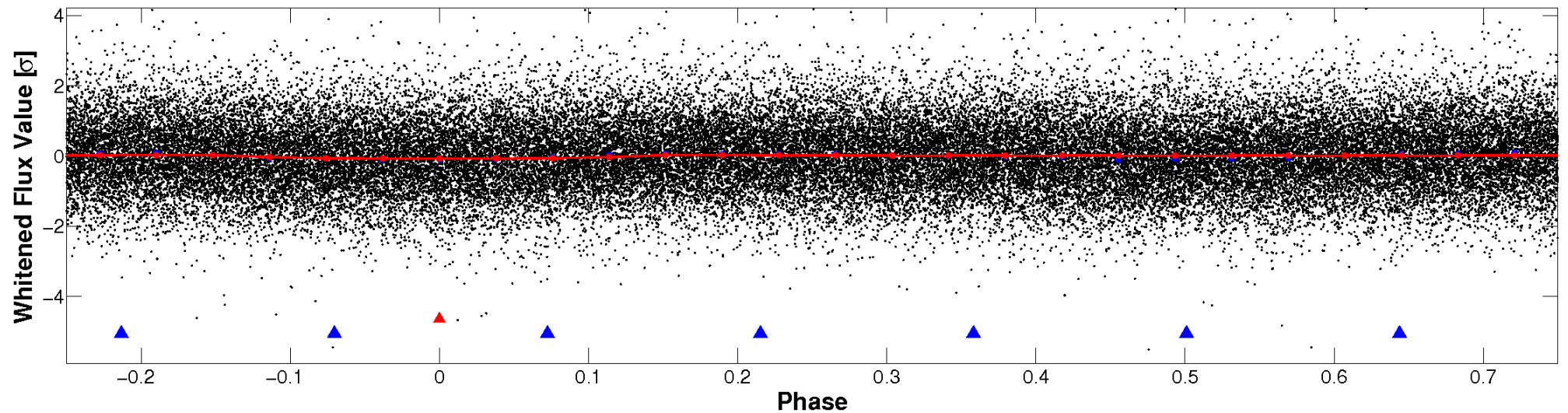


Non-Whitened Vs. Whitened Light Curve

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

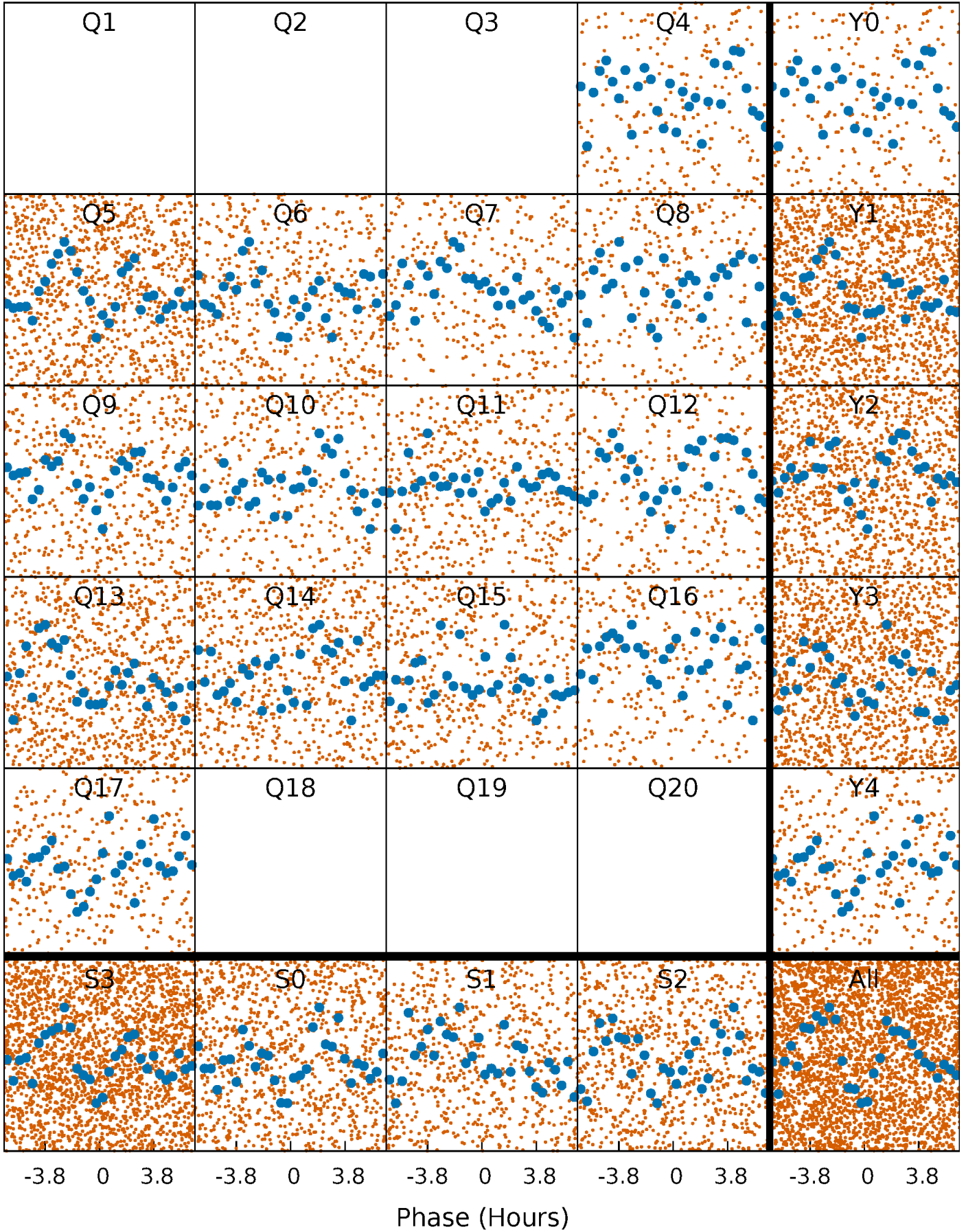


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



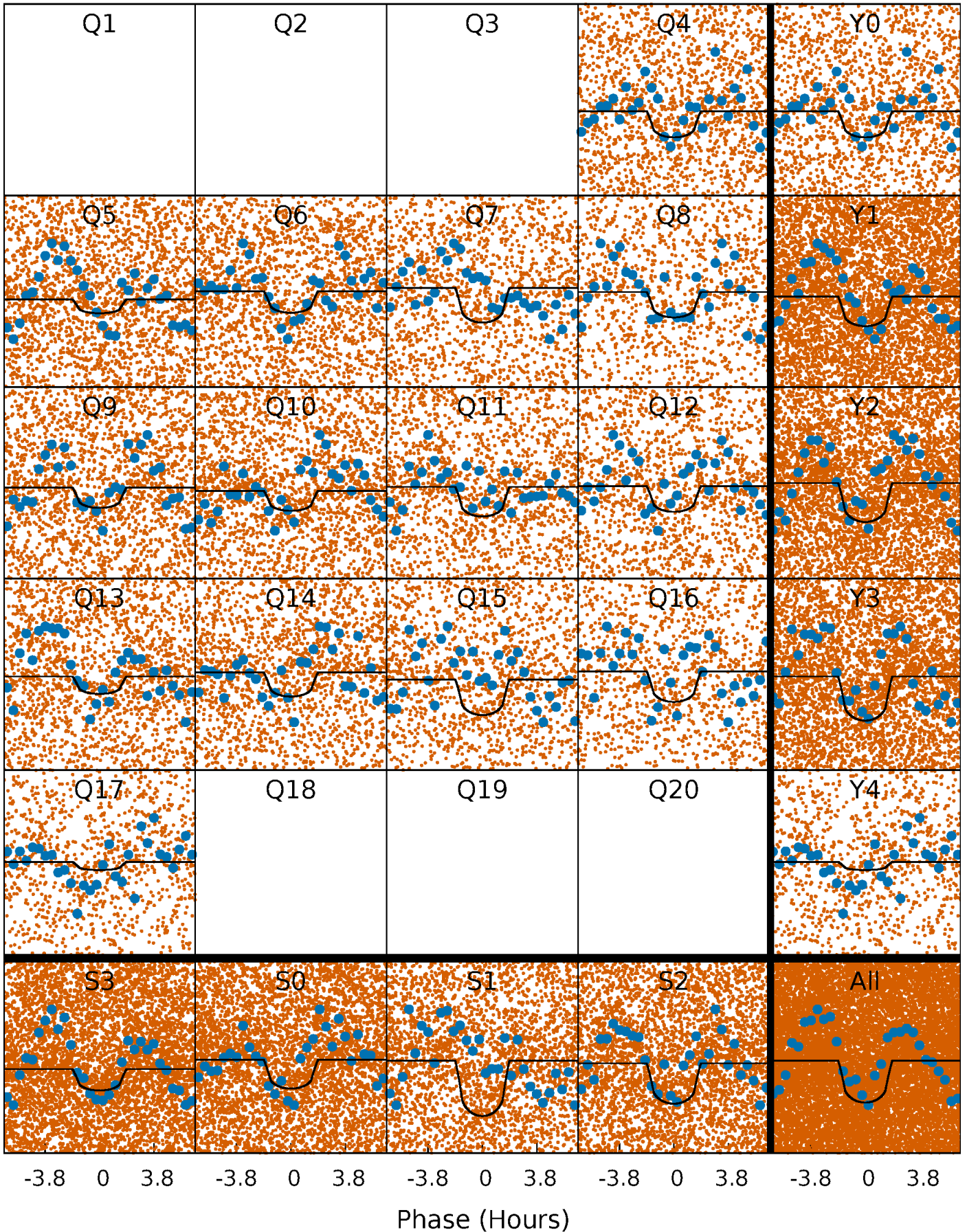
PDC Quarter-Phased Transit Curves

TCE 007954104-01 P= 0.538465 Days $T_0=131.771021$ (BKJD)



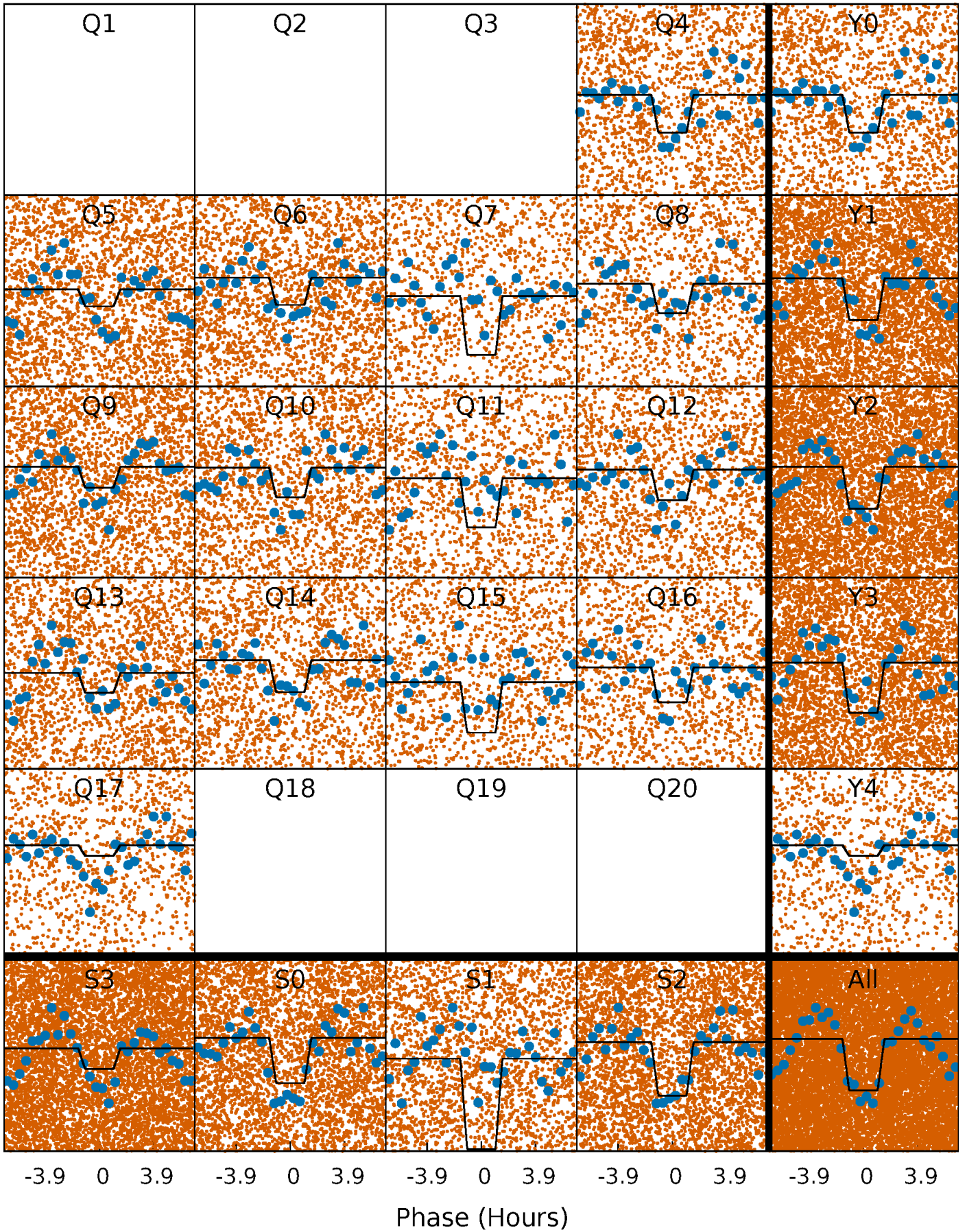
DV Quarter-Phased Transit Curves

TCE 007954104-01 P= 0.538465 Days $T_0=131.771021$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

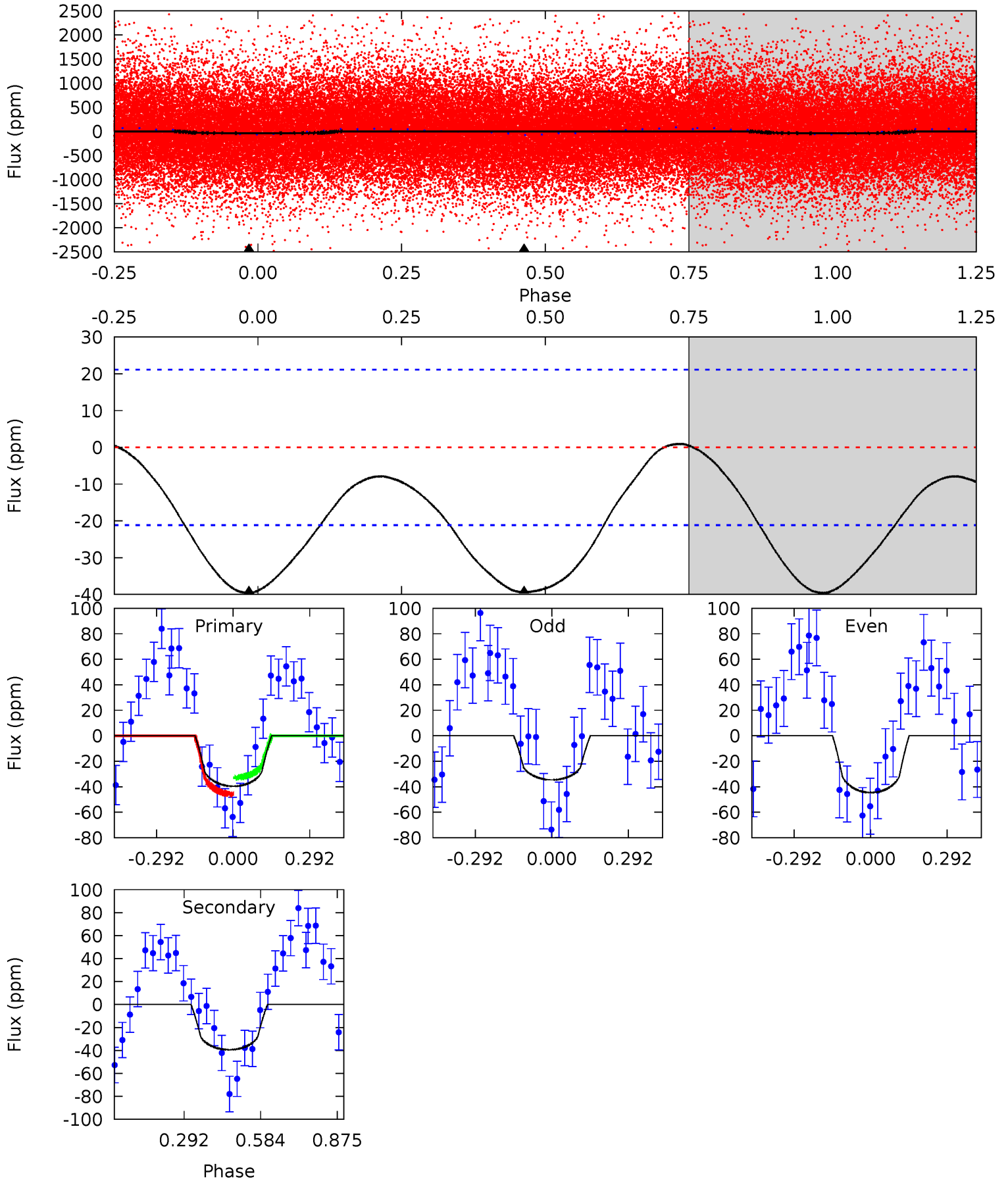
TCE 007954104-01 P= 0.538447 Days $T_0=131.784295$ (BKJD)



DV Model-Shift Uniqueness Test

007954104-01, P = 0.538465 Days, E = 131.771021 Days

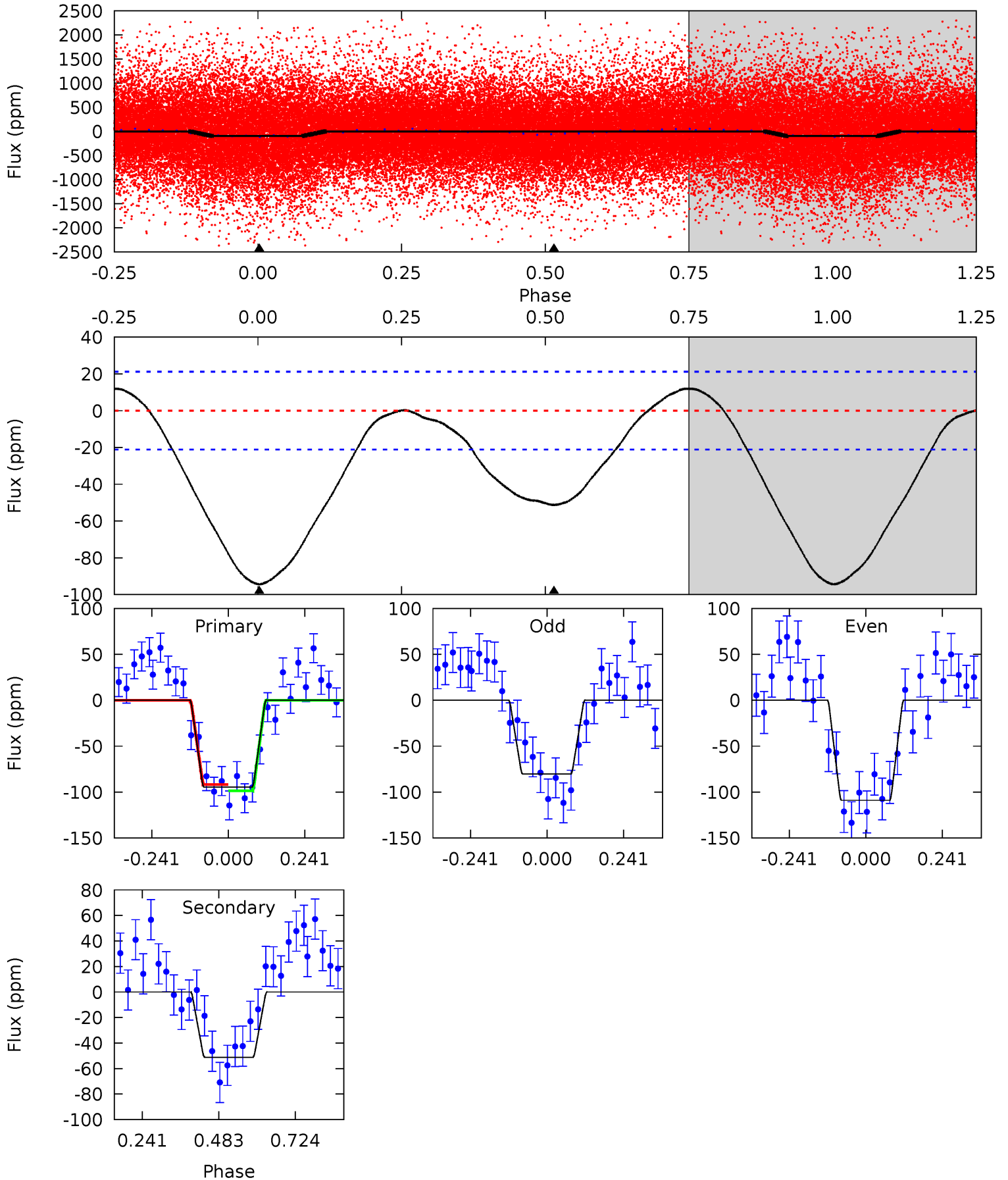
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.13 | 8.09 | 0 | 0 | 4.33 | 1.05 | 0.79 | 8.13 | 8.13 | 8.09 | 8.09 | 1.04 | 1.08 | 0.02 | 1.35 |



Alt Model-Shift Uniqueness Test

007954104-01, P = 0.538447 Days, E = 131.784295 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 19.5 | 10.6 | 0 | 0 | 4.38 | 1.17 | 1.27 | 19.5 | 19.5 | 10.6 | 10.6 | 2.98 | 1.12 | 0.11 | 0.72 |



Stellar Parameters For KIC 007954104

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|-------------------------------------------|
| | 5925^{+186}_{-206} | $4.518^{+0.052}_{-0.208}$ | $-0.140^{+0.300}_{-0.300}$ | $0.910^{+0.274}_{-0.091}$ | $0.995^{+0.117}_{-0.130}$ | $1.858^{+0.494}_{-0.983}$ |
| | +3%/-3% | +1%/-5% | +214%/-214% | +30%/-10% | +12%/-13% | +27%/-53% |
| 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 007954104-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|------------------------|----------------------------|
| DV | -39 ± 5 | $0.97^{+0.73}_{-0.58}$ | 3128^{+208}_{-163} | 4875^{+2950}_{-1057} | $3.811^{+19.230}_{-2.550}$ |
| Alt. | -51 ± 5 | $1.07^{+0.77}_{-0.64}$ | 3129^{+204}_{-157} | 4905^{+2910}_{-1001} | $3.927^{+21.346}_{-2.598}$ |

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 $A_{obs} \gg 1.0$

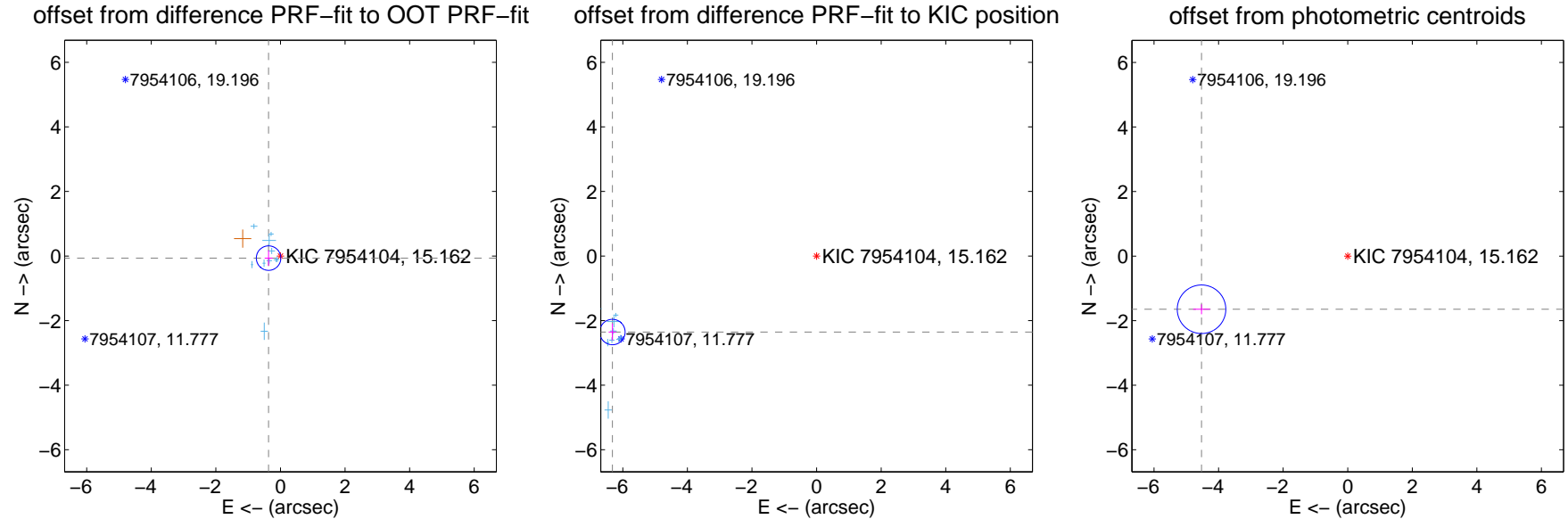
DV Centroid Data

Supplemental centroid analysis for 007954104-01. Kepler magnitude: 15.16. Transit SNR 8.02

There are 10 quarters with good PRF difference image offsets

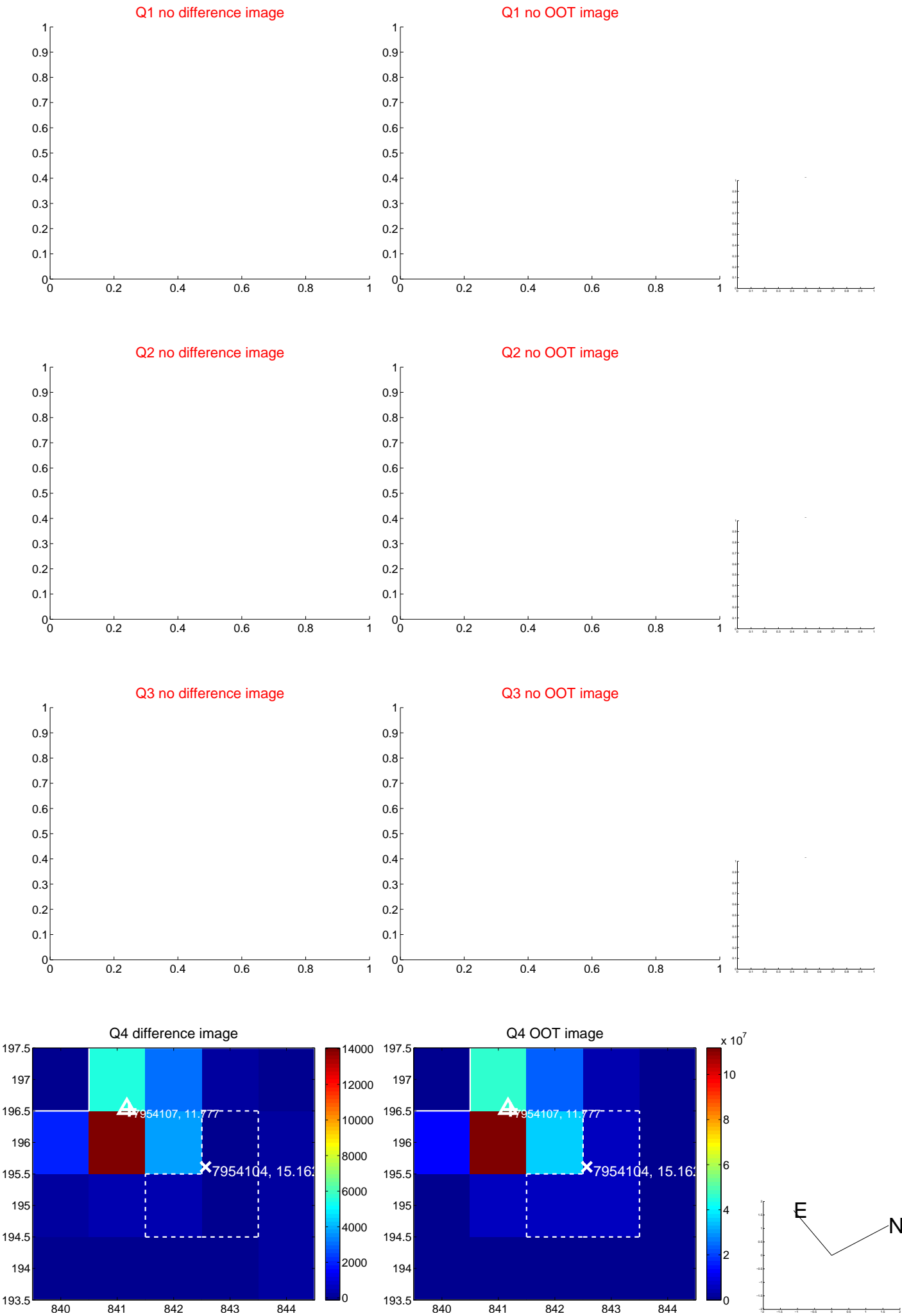
The OOT PRF centroid is offset from the target star catalog position by about 6.45 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|-----------------------------------------|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.373 ± 0.126 | 2.95 | 0.368 ± 0.121 | -0.064 ± 0.242 |
| PRF-fit source offset from KIC position | 6.748 ± 0.131 | 51.43 | 6.324 ± 0.115 | -2.355 ± 0.262 |
| photometric centroid source offset | 4.82 ± 0.25 | 19.22 | 4.53 ± 0.26 | -1.65 ± 0.15 |

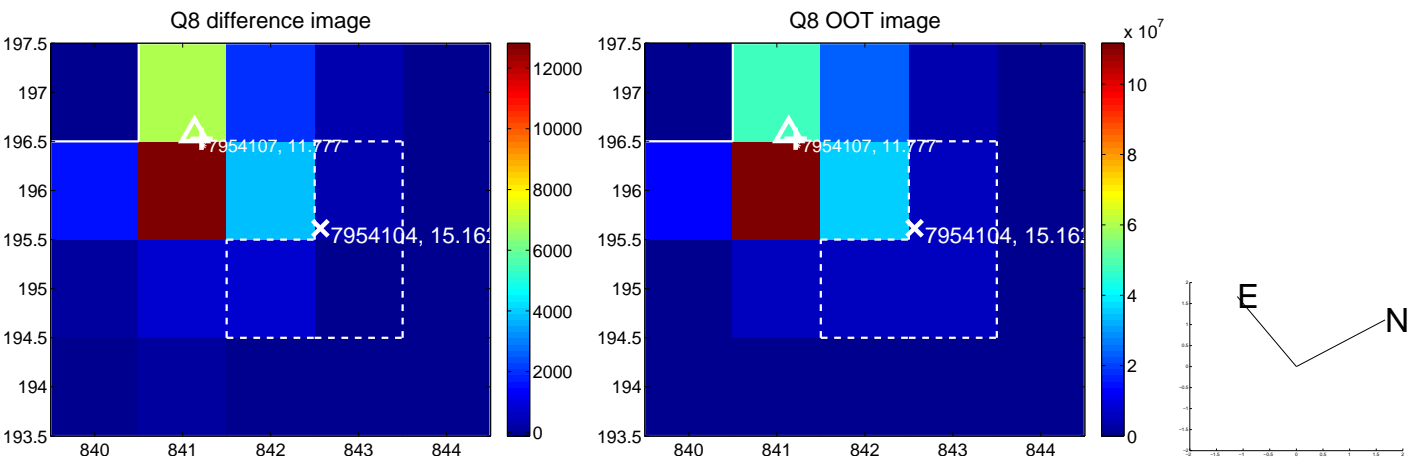
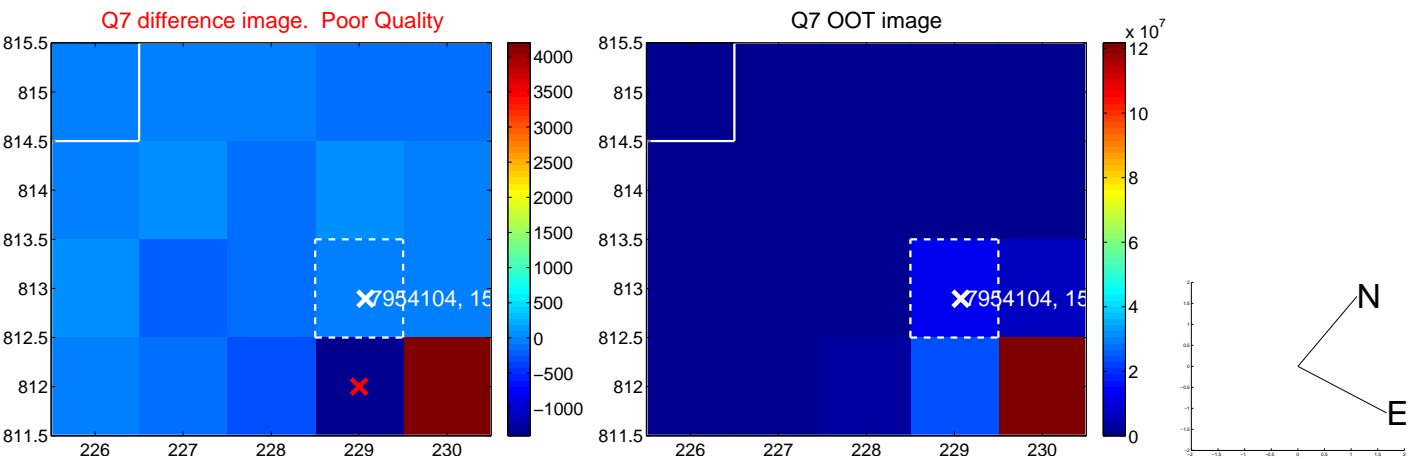
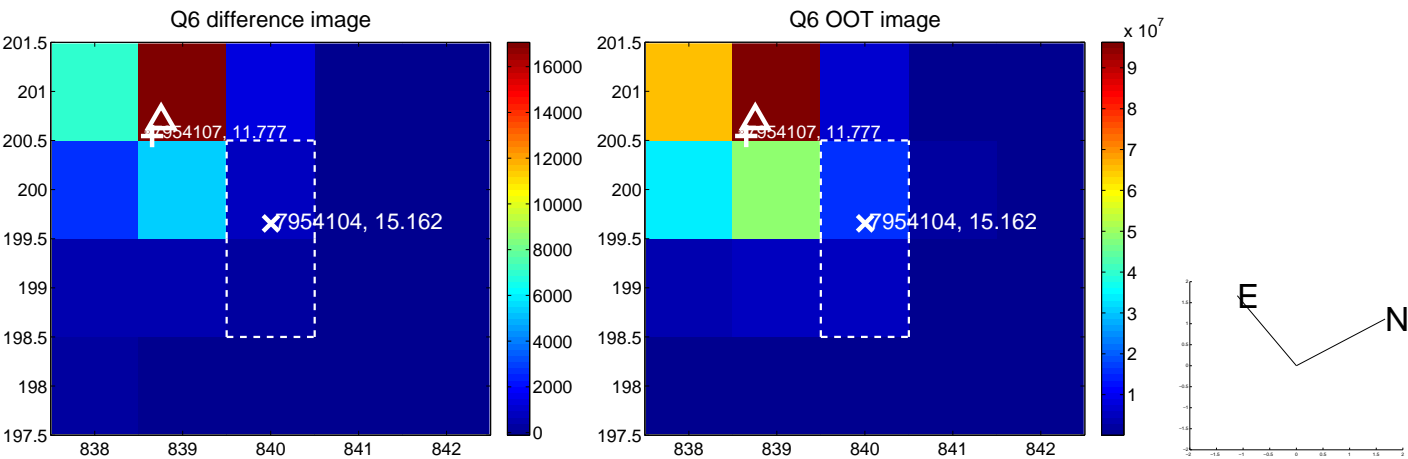
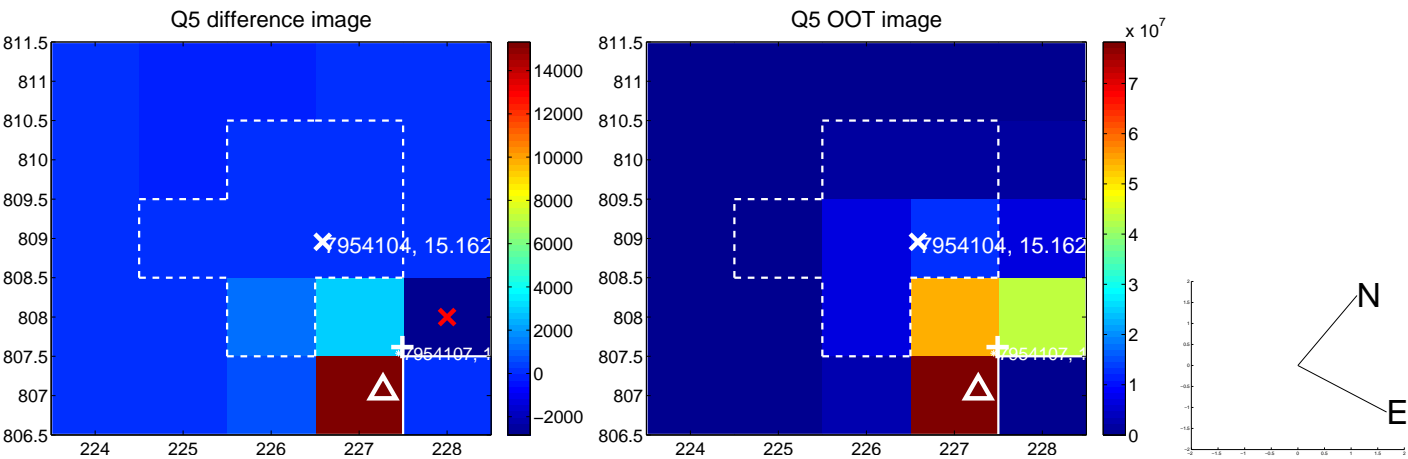


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

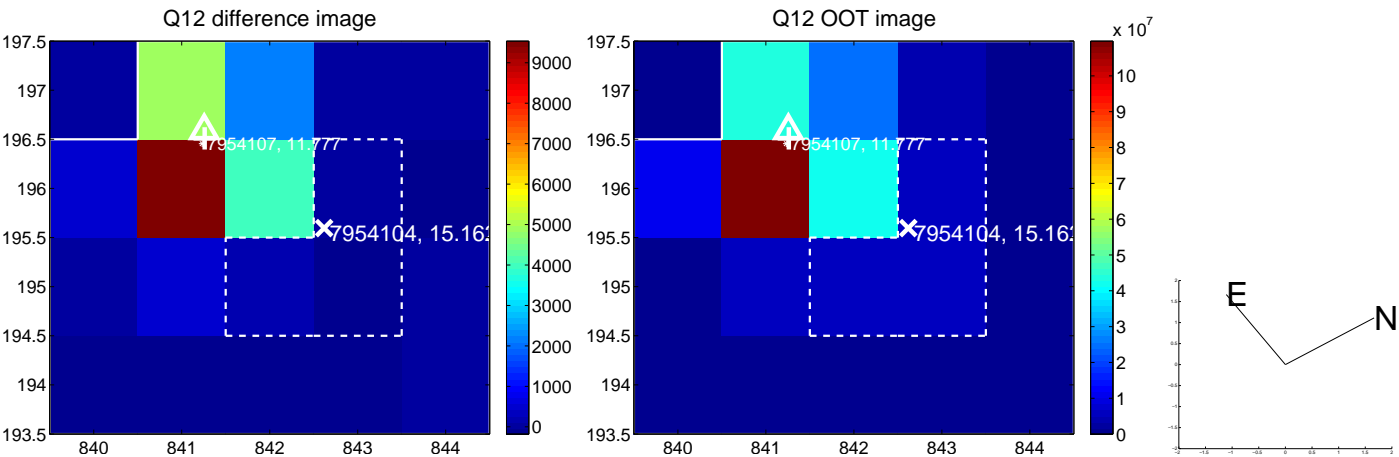
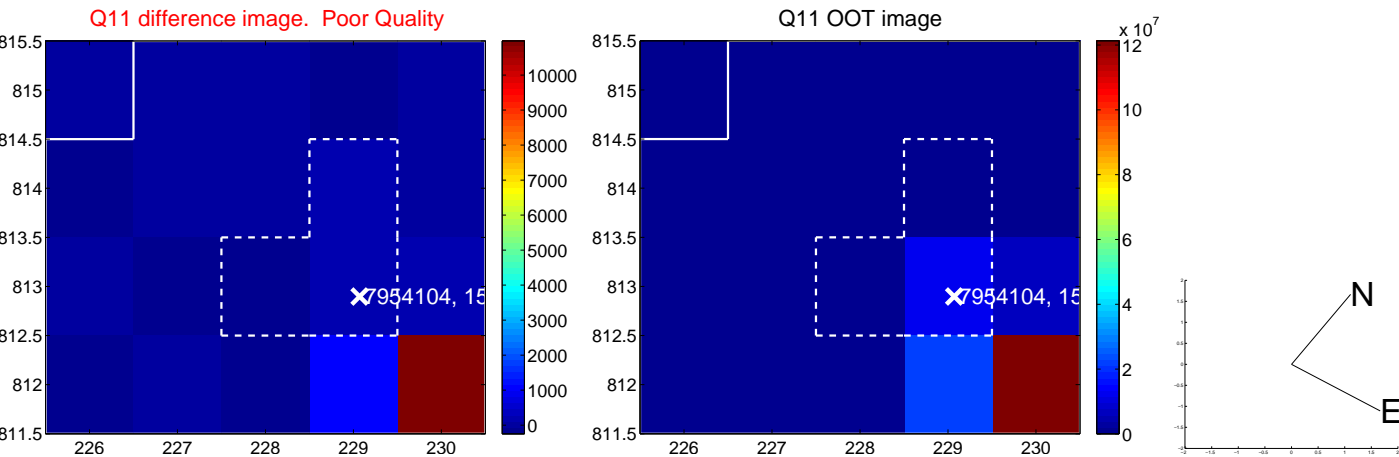
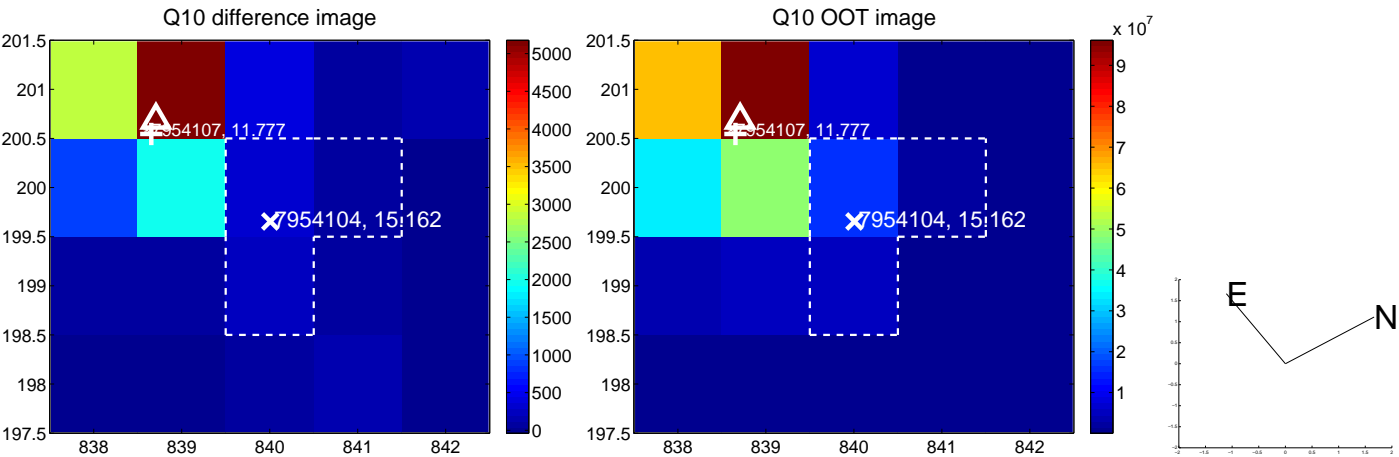
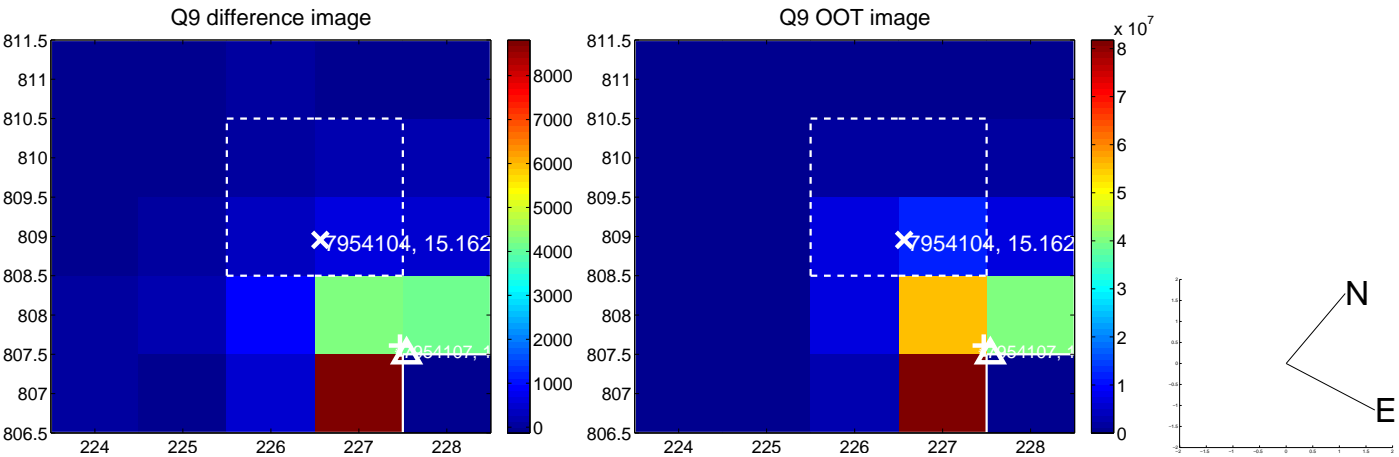
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



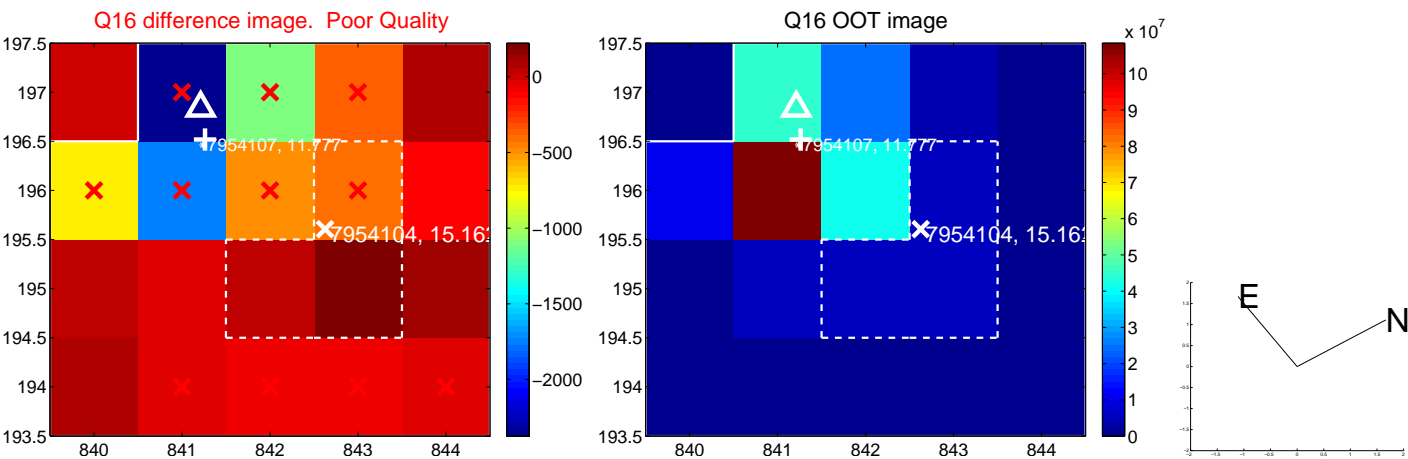
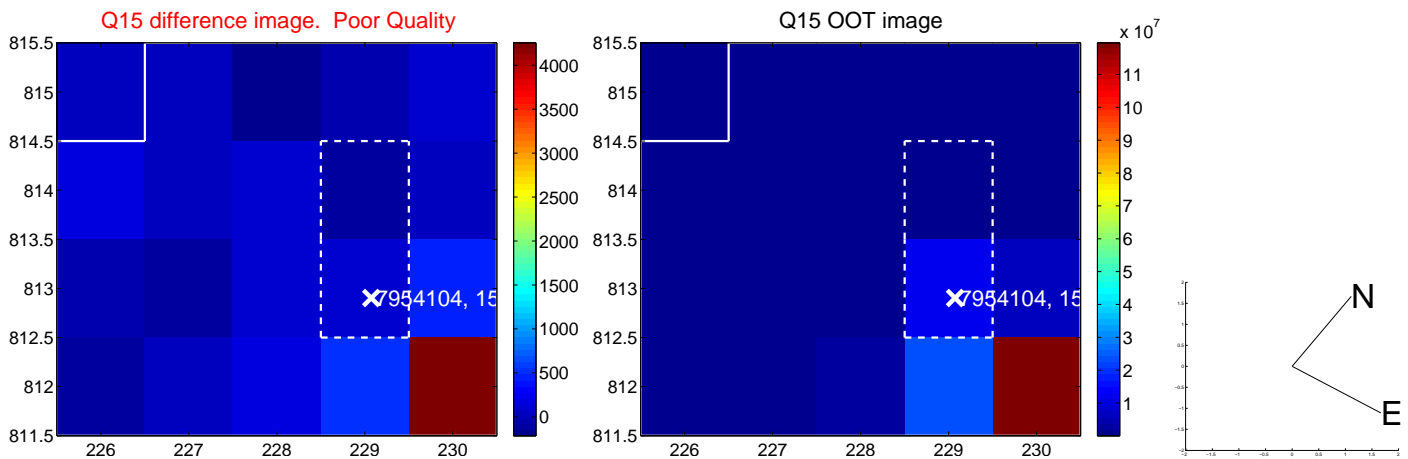
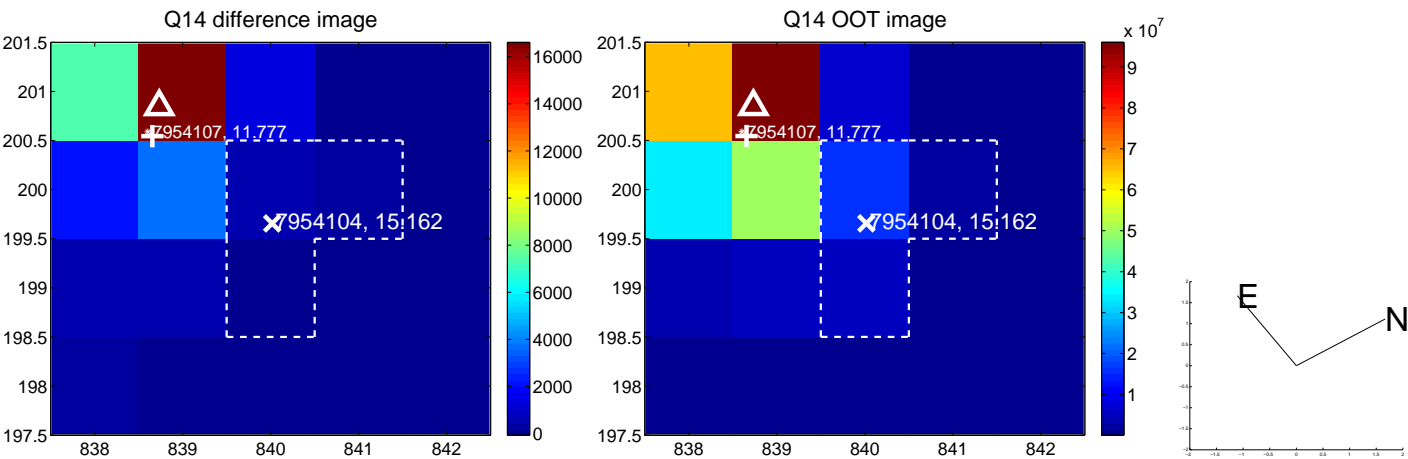
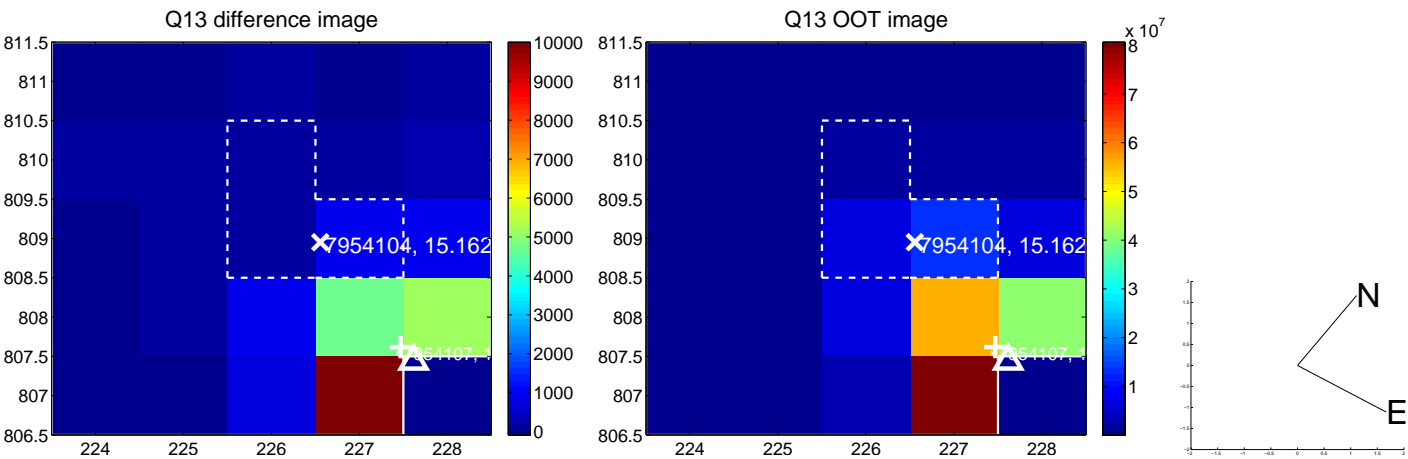
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



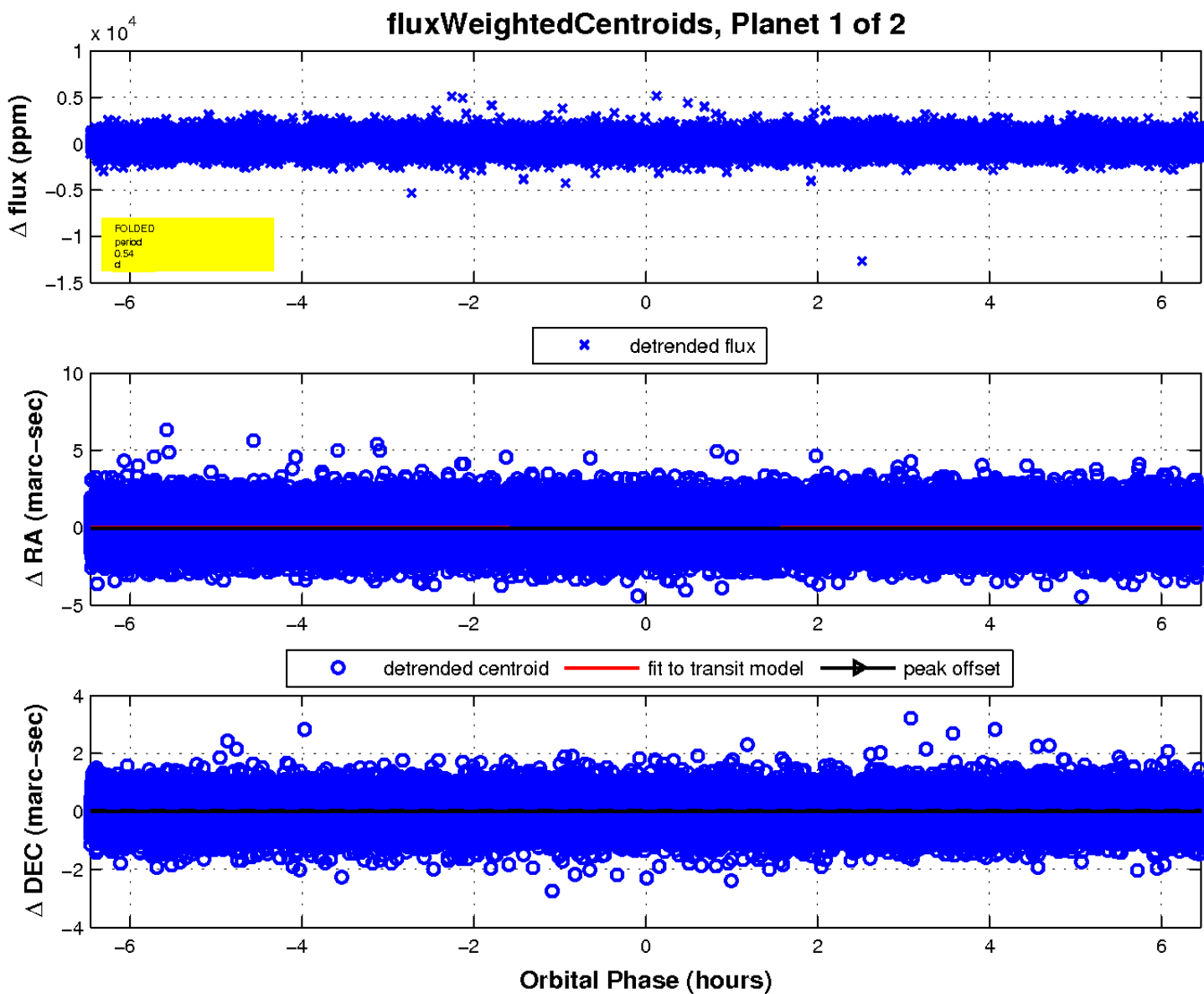
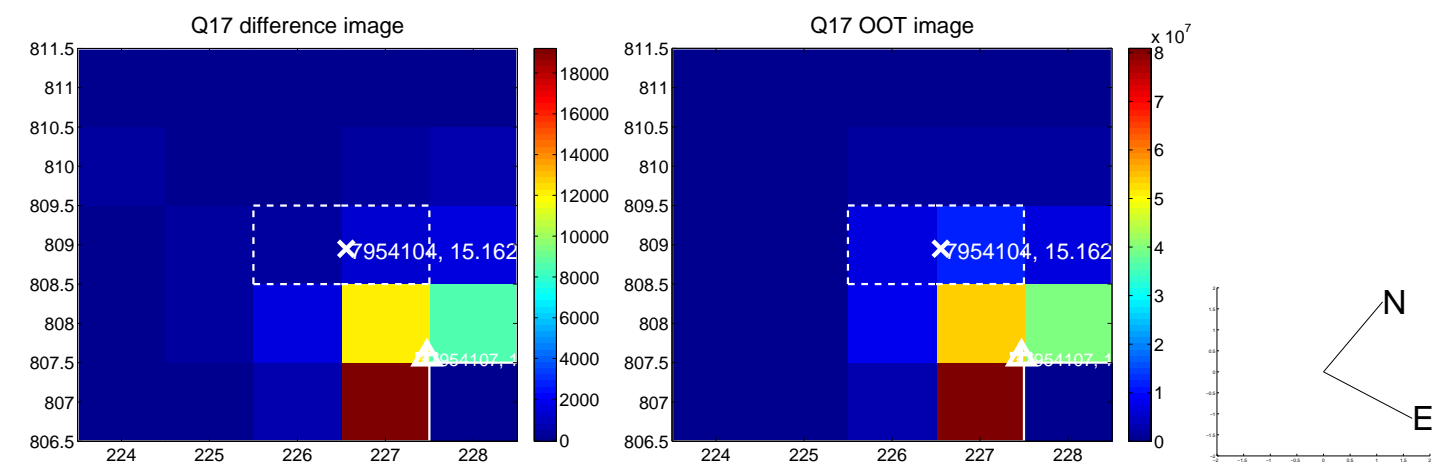
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



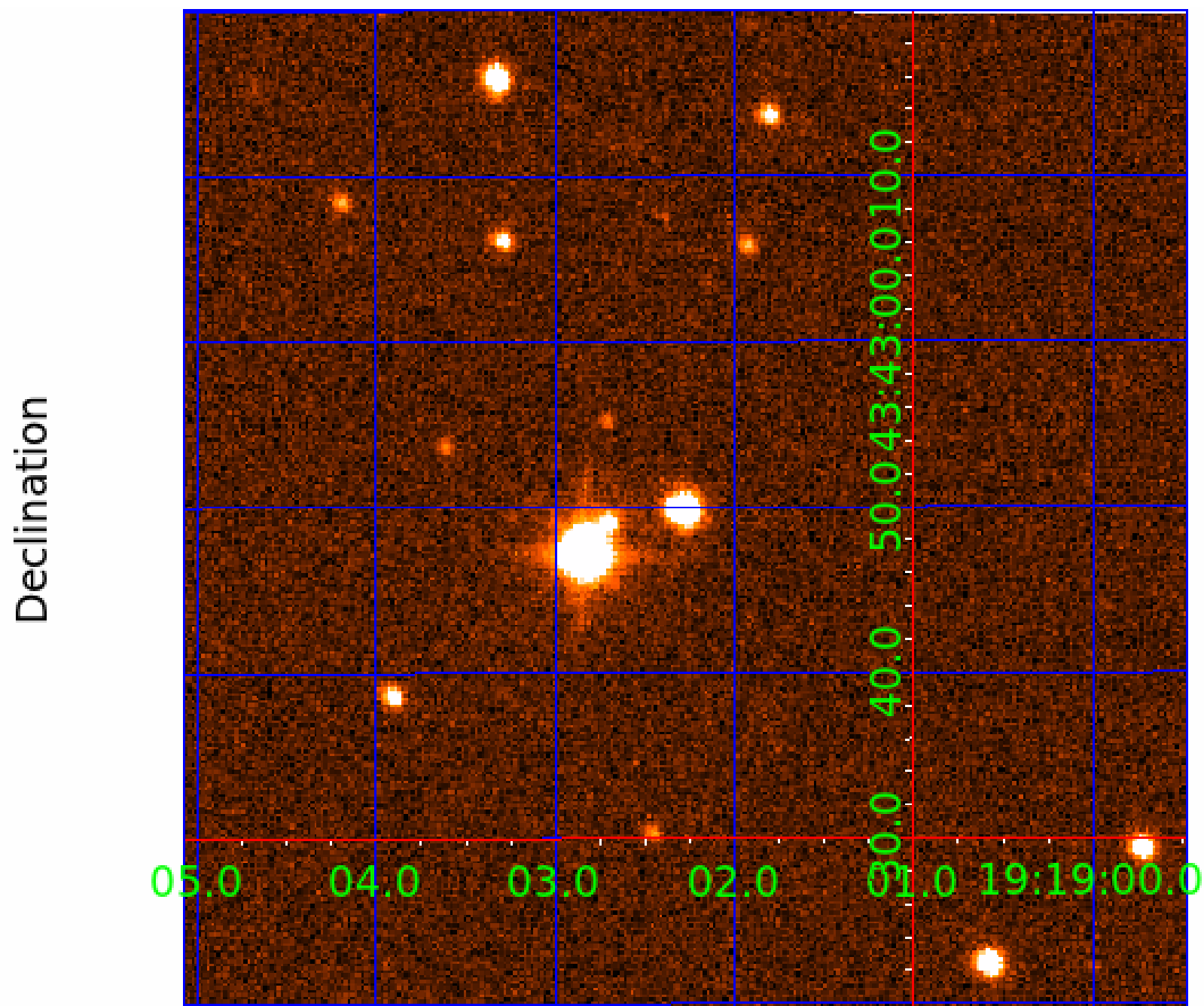
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007954104

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007954104-01 | OBS | No | 0.538465 | 131.771021 | 66.2 | 3.335 | 7.9 | 8.0 | 0.91 | 5925 | 0.75 | 5463.43 |
| 007954104-02 | OBS | No | 41.538743 | 155.425656 | 1661.4 | 2.013 | 10.7 | 6.4 | 0.91 | 5925 | 4.20 | 16.64 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---------------------------------------------------------------------------------------------------|
| 007954104-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | LPP_DV—CENT_RESOLVED_OFFSET |
| 007954104-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET |

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

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

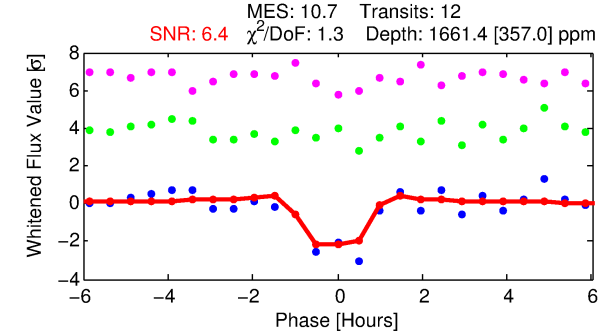
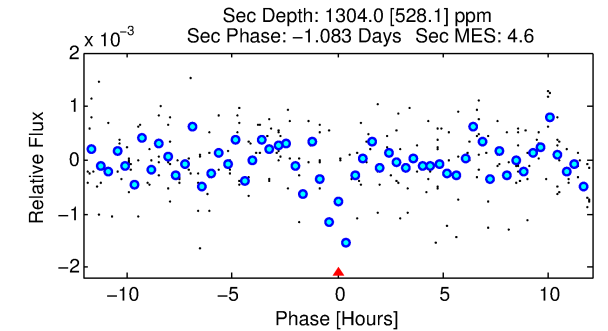
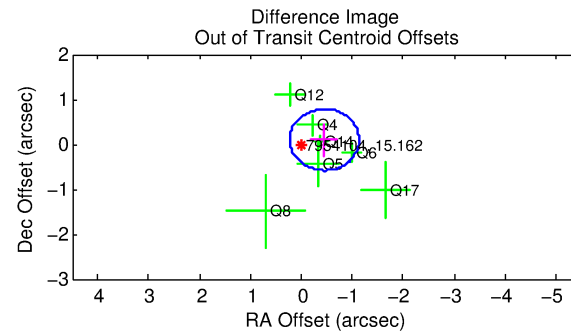
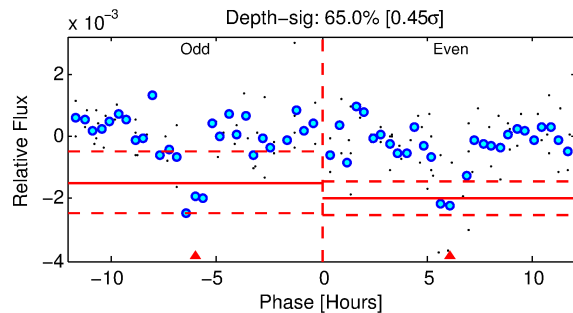
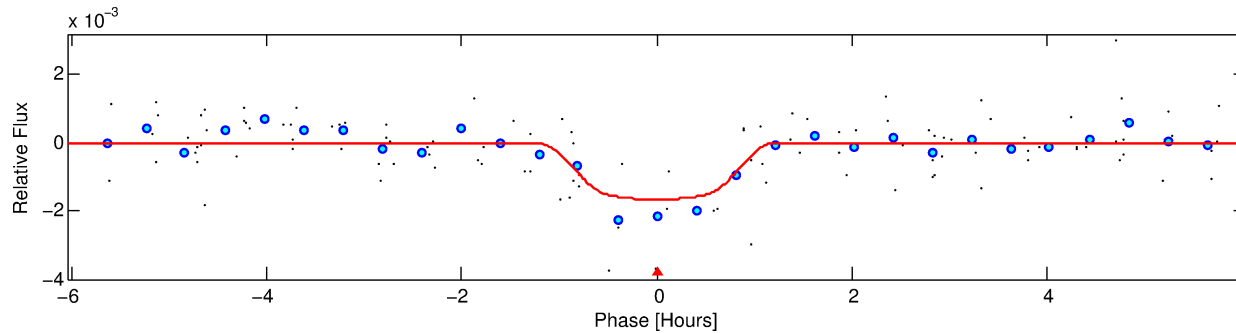
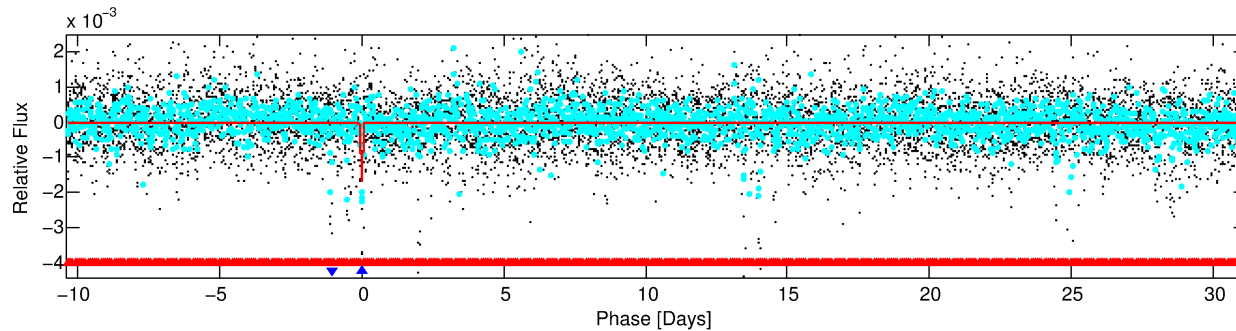
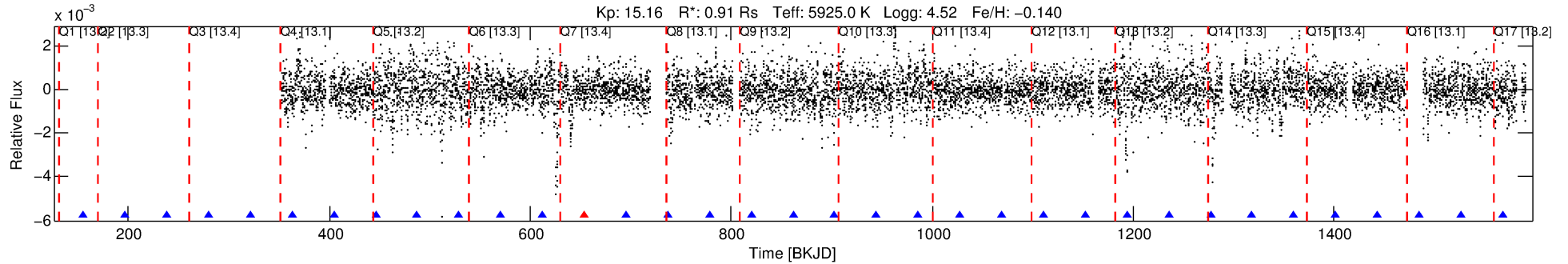
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007954104-02

No Significant Match Found

DV One-Page Summary

KIC: 7954104 Candidate: 2 of 2 Period: 41.539 d



DV Fit Results:

Period = 41.53874 [0.00033] d
Epoch = 155.4257 [0.0070] BKJD
Rp/R* = 0.0423 [0.0228]
a/R* = 98.10 [230.10]
b = 0.84 [0.87]
Seff = 16.64 [6.69]
Teq = 515 [52] K
Rp = 4.20 [2.59] Re
a = 0.2344 [0.0601] AU
Ag = 2236.17 [2712.21] [0.82 σ]
Teff = 5475 [1589] K [3.12 σ]

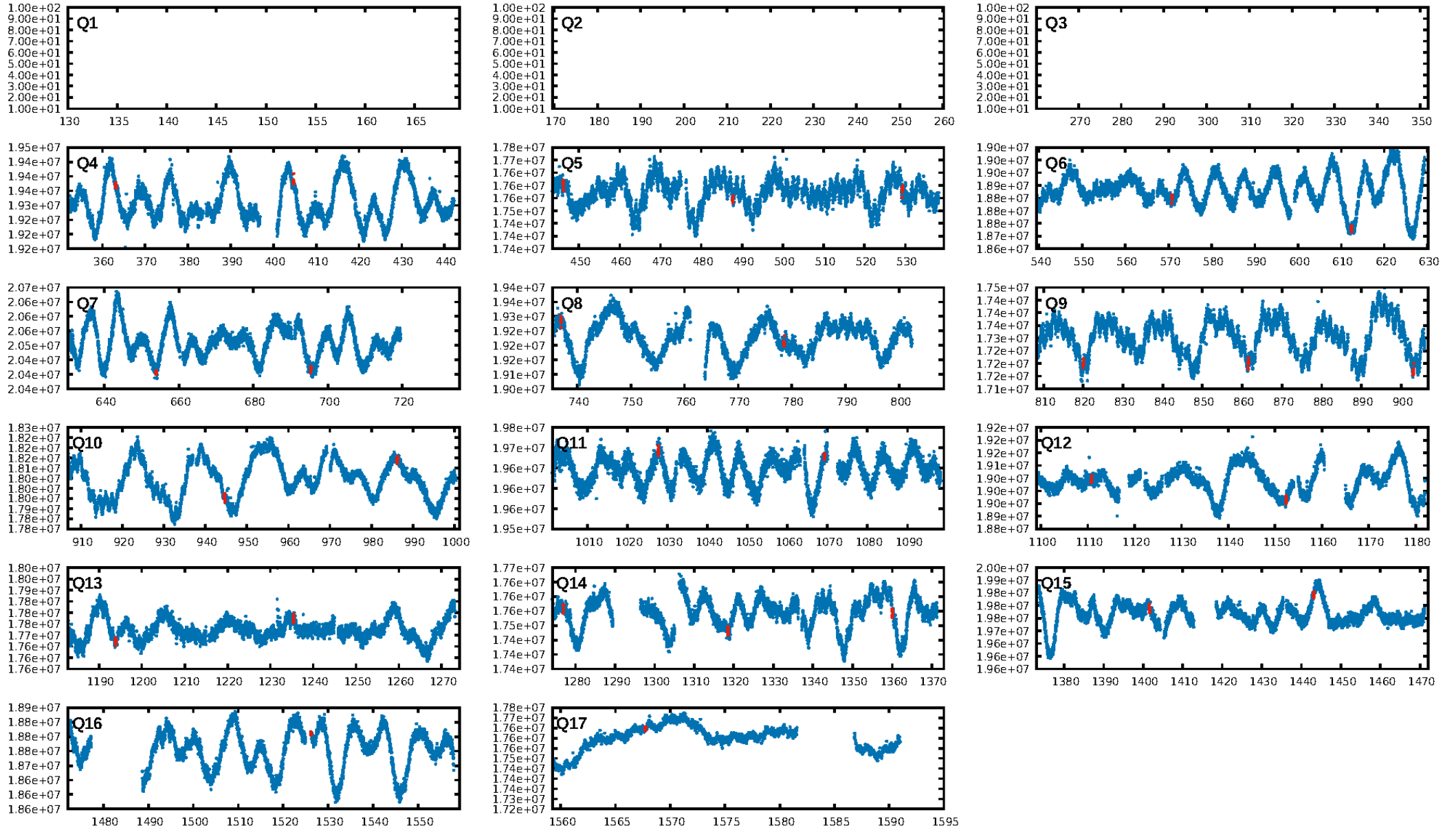
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [252.62 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 50.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.91e-17
RollingBand-fgt: 0.92 [11/12]
GhostDiagnostic-chr: -1.698
Centroid-sig: 3.3%
Centroid-so: 4.036 arcsec [39.99 σ]
OotOffset-rm: 0.461 arcsec [2.03 σ]
KicOffset-rm: 6.014 arcsec [22.10 σ]
OotOffset-st: 2/0/3/2 [7]
KicOffset-st: 2/0/3/2 [7]
DiffImageQuality-fgm: 0.43 [3/7]
DiffImageOverlap-fno: 0.00 [0/13]

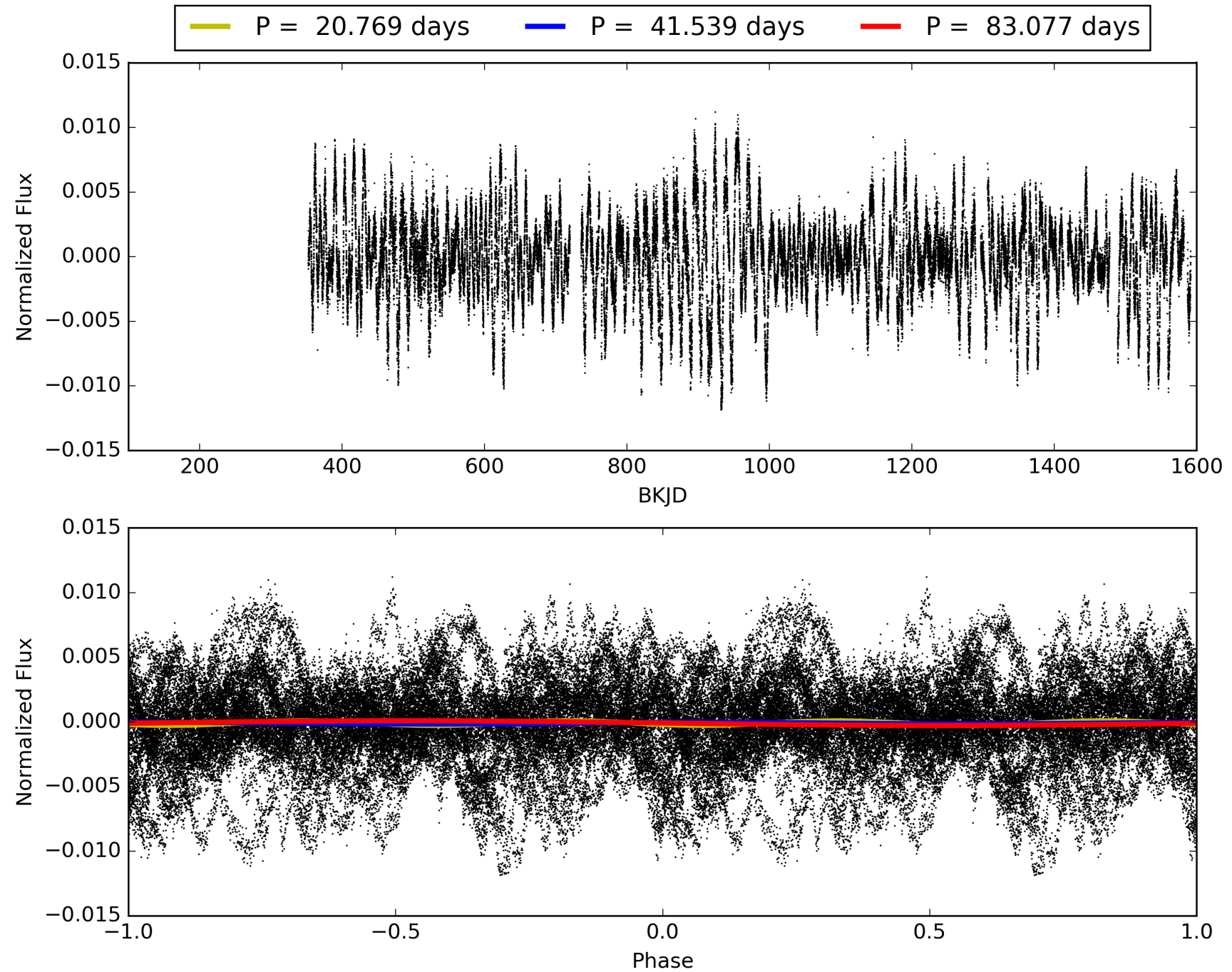
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:04:59 Z

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

TCE 007954104-02, PDC Light Curves

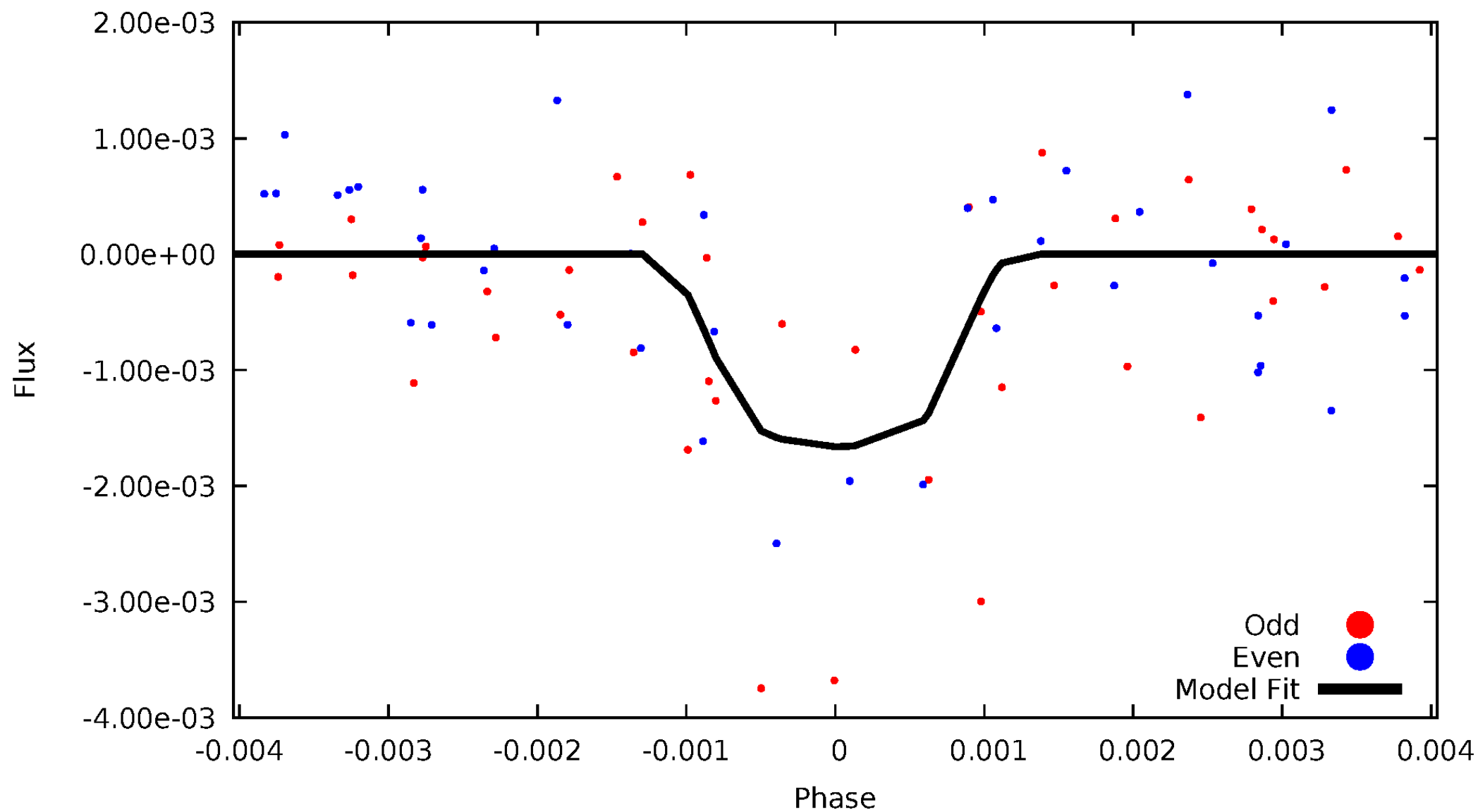


TCE 007954104-02



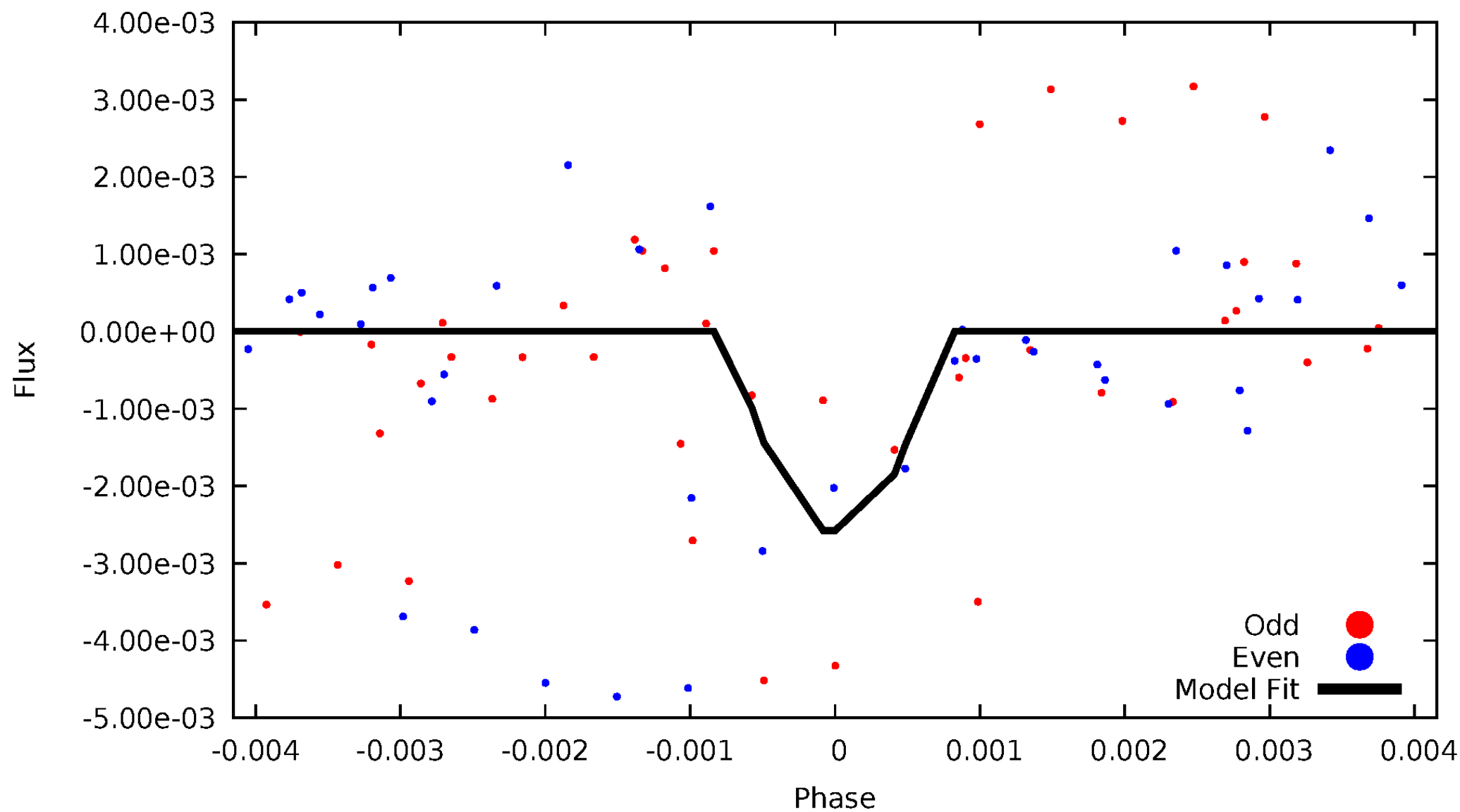
DV Odd/Even

TCE 007954104-02



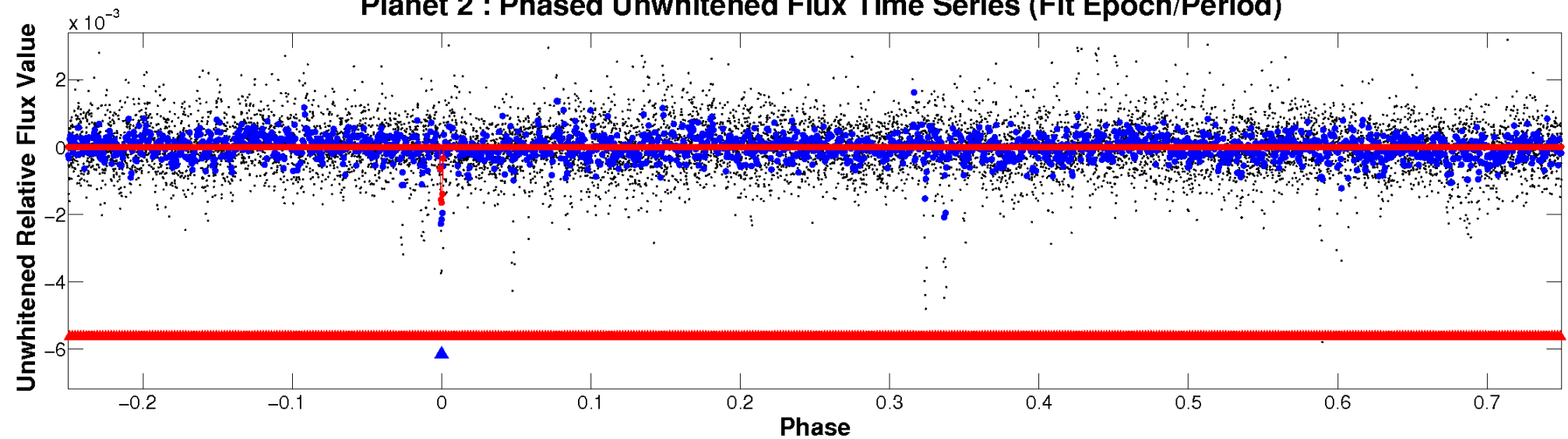
ALT Odd/Even

TCE 007954104-02

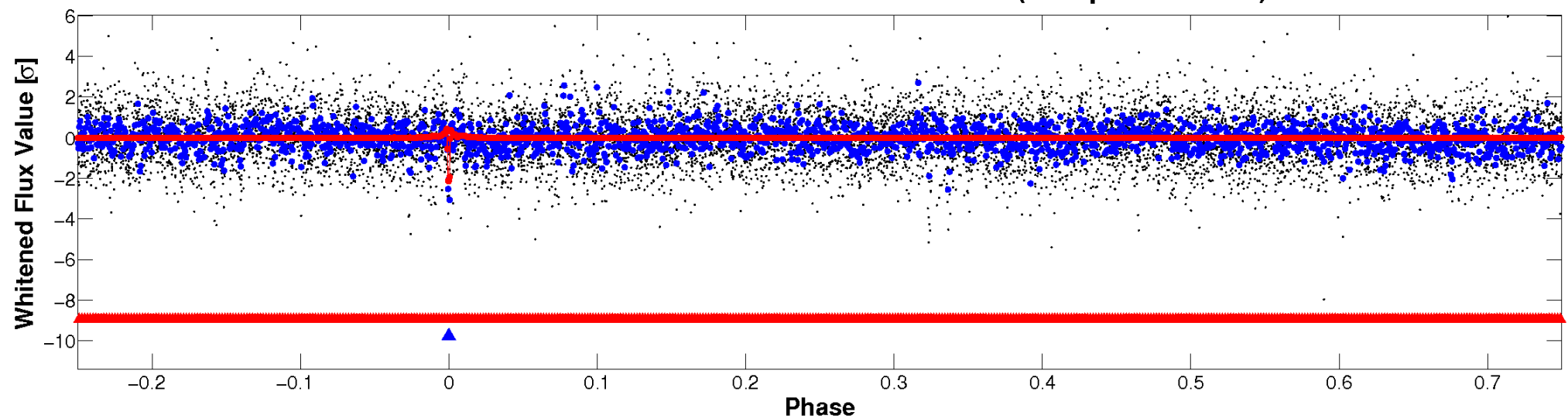


Non-Whitened Vs. Whitened Light Curve

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

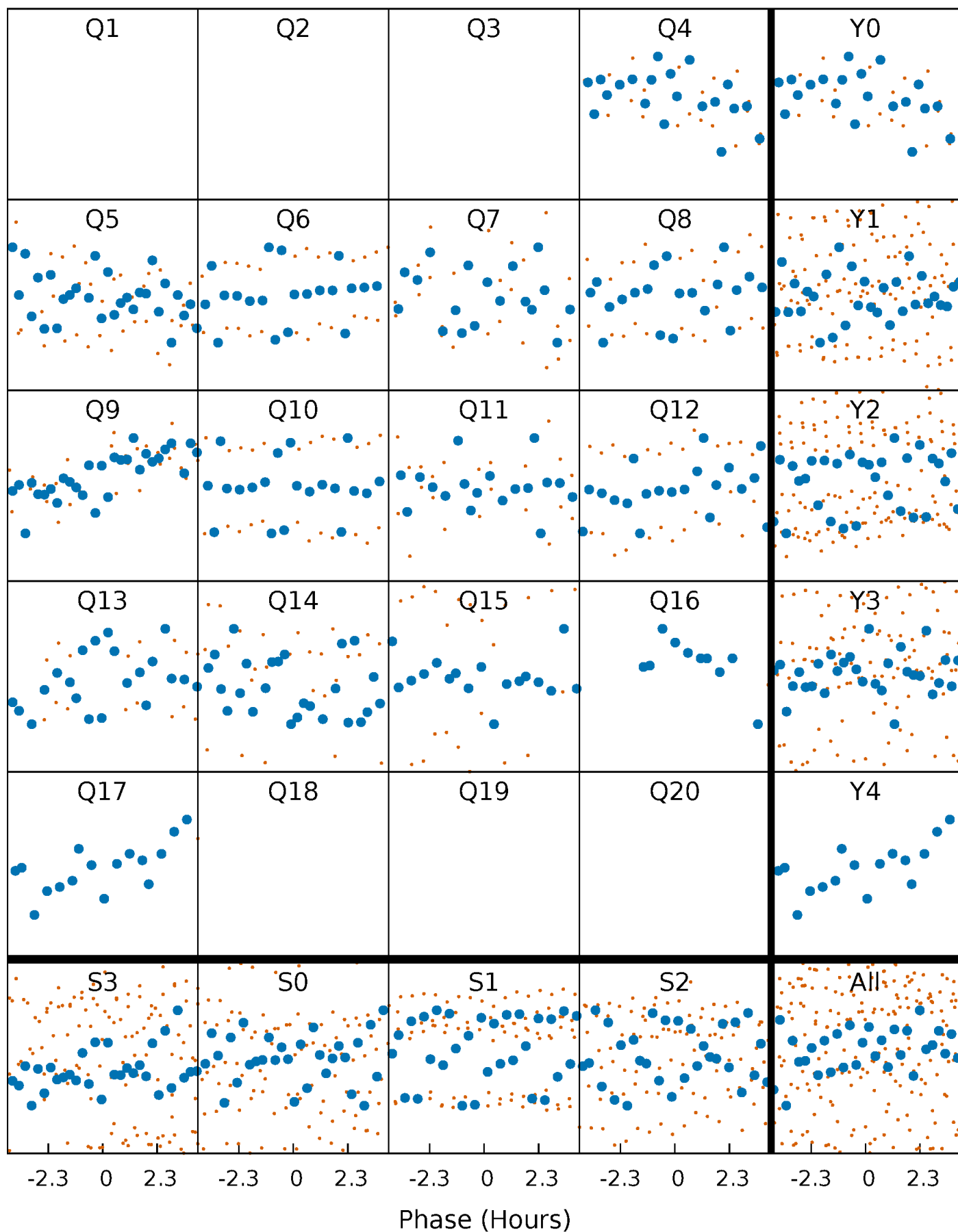


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



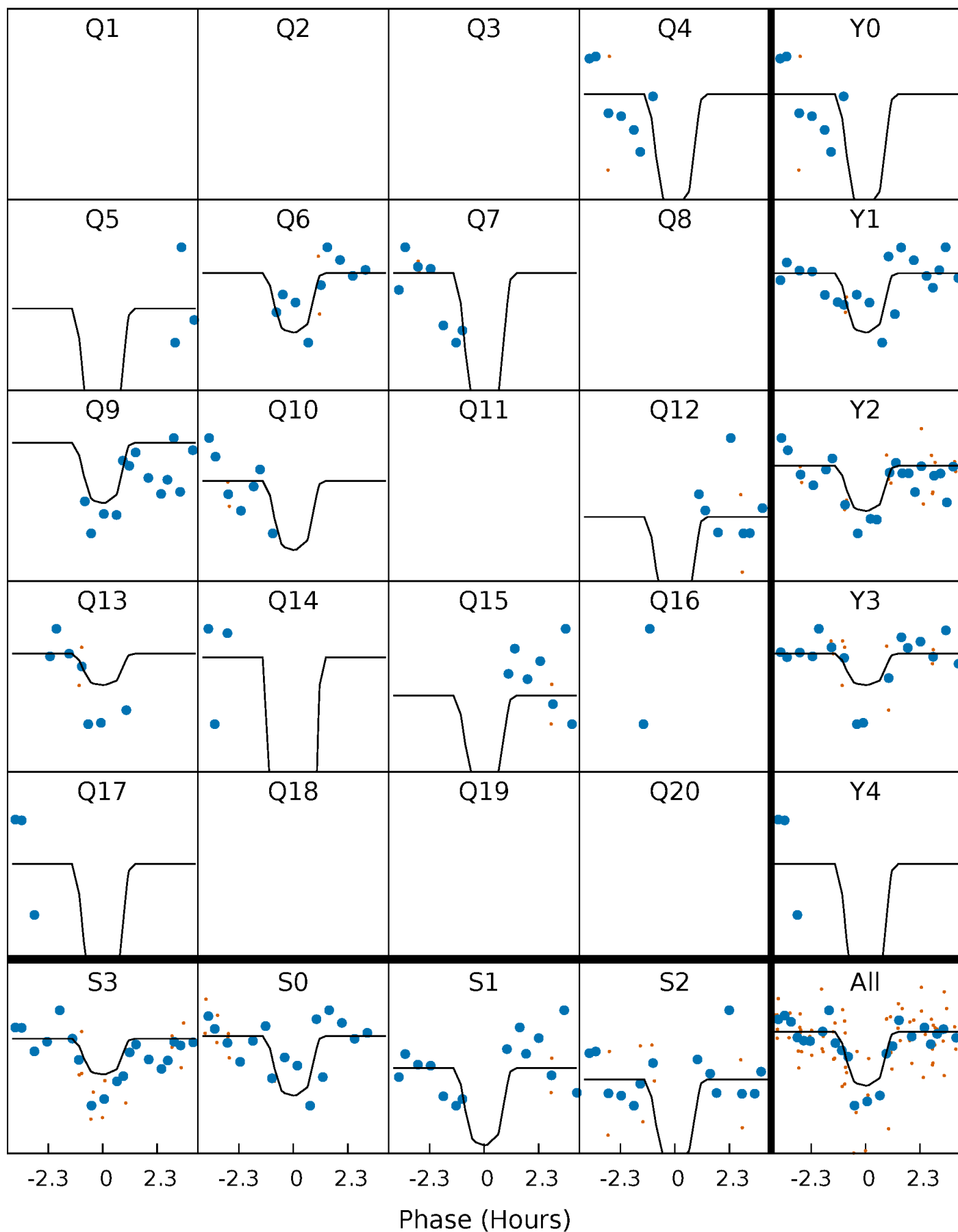
PDC Quarter-Phased Transit Curves

TCE 007954104-02 $P = 41.538743$ Days $T_0 = 155.425656$ (BKJD)



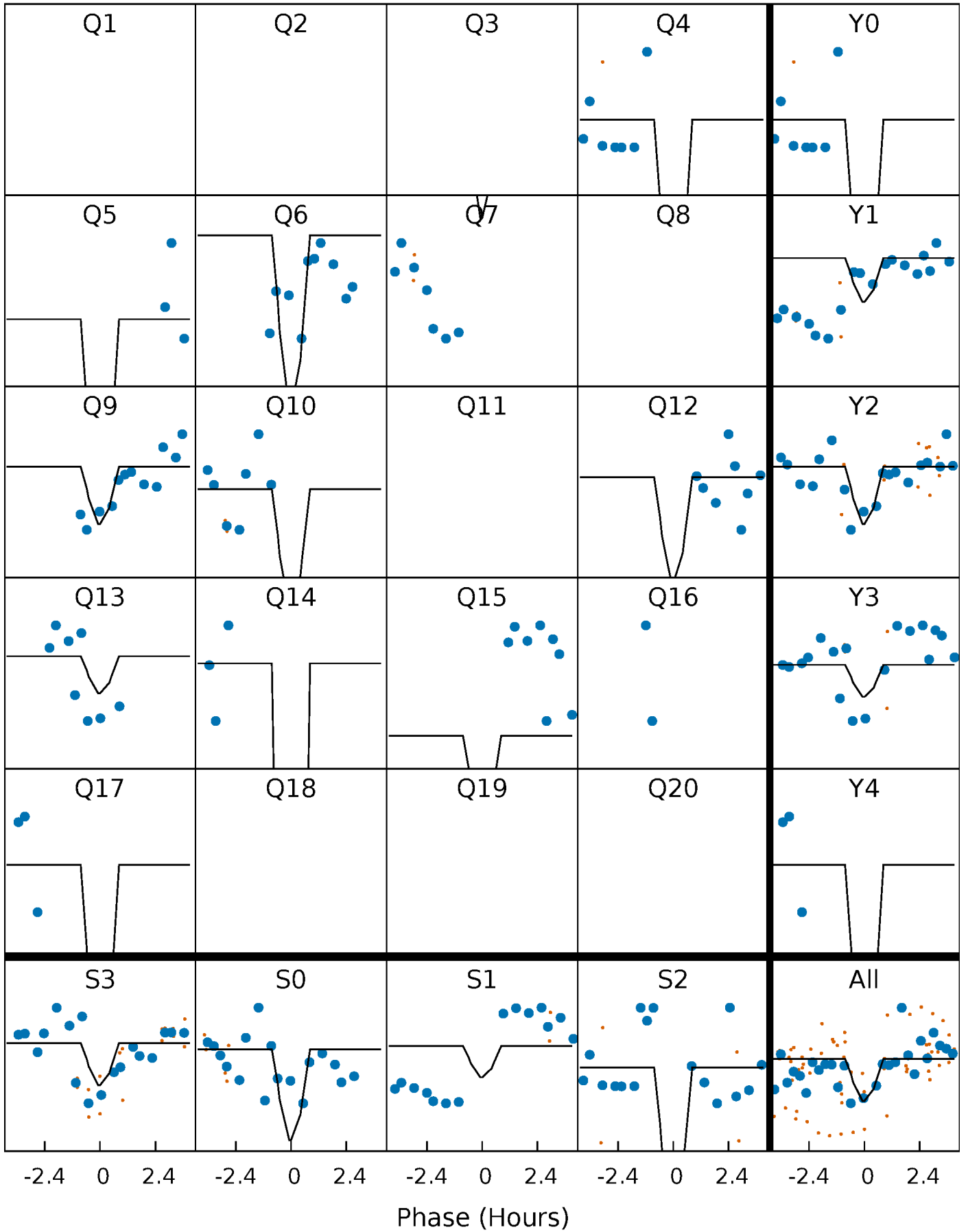
DV Quarter-Phased Transit Curves

TCE 007954104-02 P= 41.538743 Days $T_0=155.425656$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

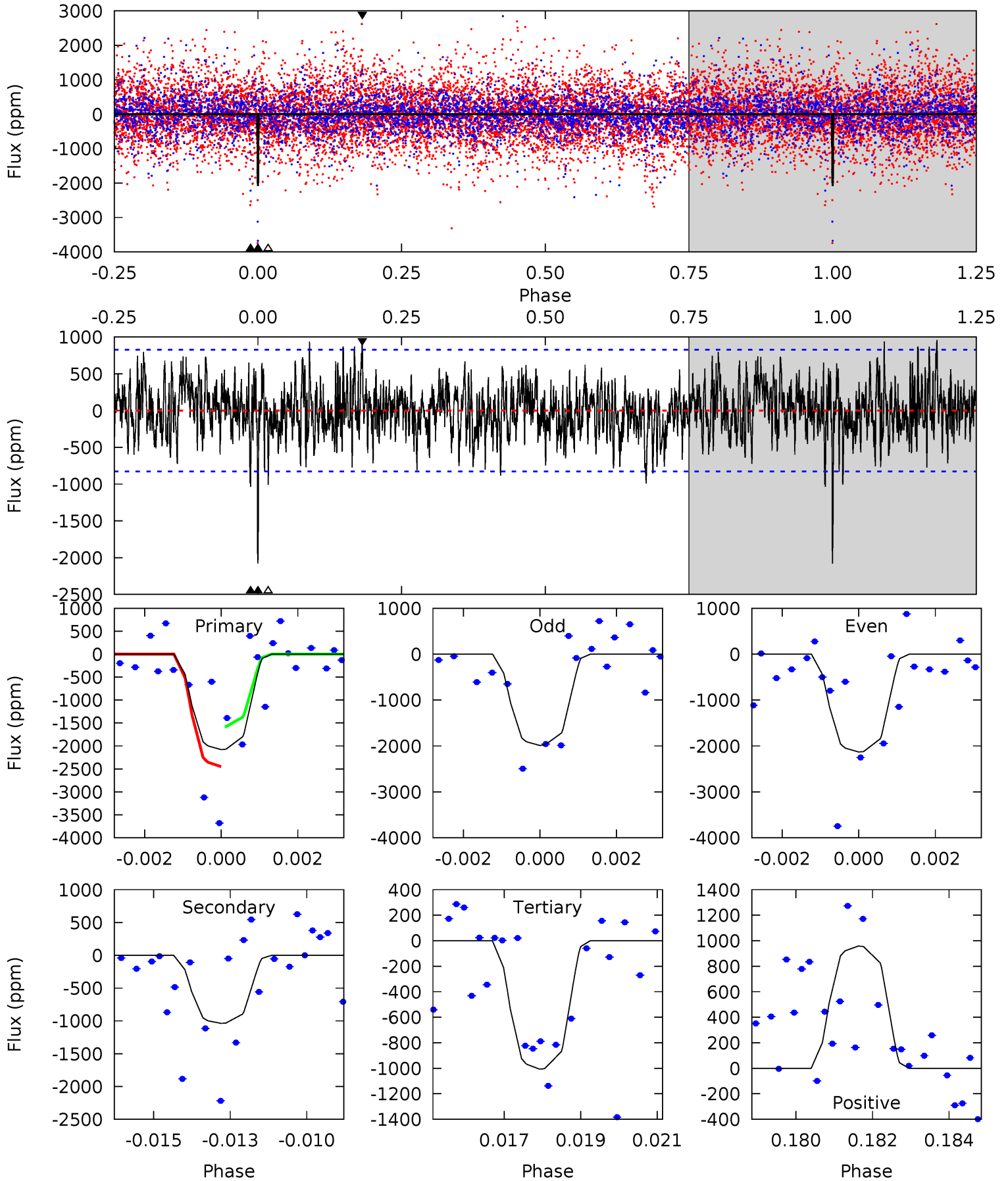
TCE 007954104-02 P= 41.538080 Days $T_0=155.441958$ (BKJD)



DV Model-Shift Uniqueness Test

007954104-02, P = 41.538743 Days, E = 155.425656 Days

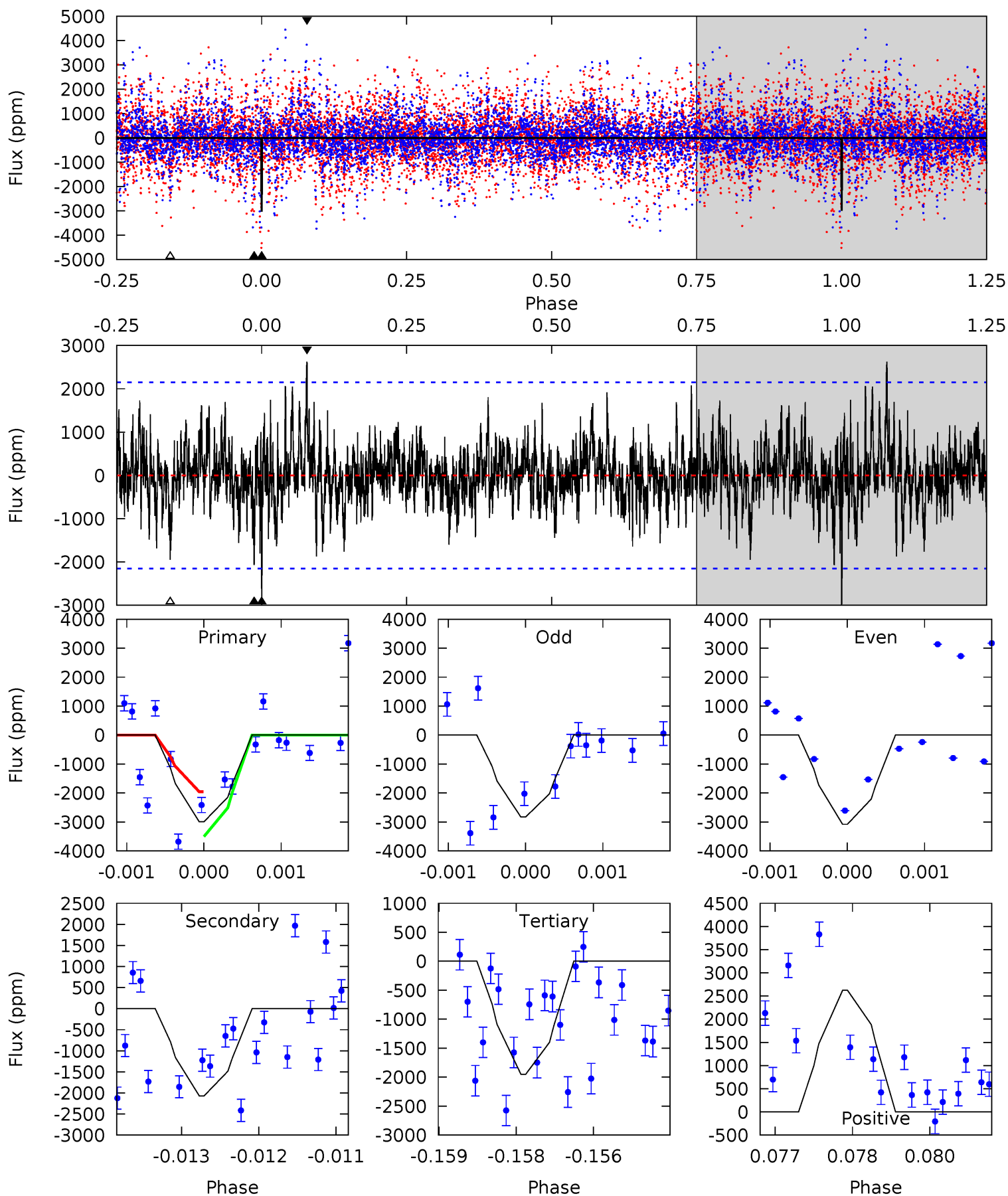
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.4 | 6.66 | 6.47 | 6.16 | 5.32 | 3.08 | 1.85 | 6.88 | 7.20 | 0.20 | 0.51 | 0.46 | 1.09 | 0.32 | 2.81 |



Alt Model-Shift Uniqueness Test

007954104-02, P = 41.538080 Days, E = 155.441958 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.51 | 5.20 | 4.90 | 6.59 | 5.40 | 3.21 | 1.39 | 2.62 | 0.92 | 0.30 | -1.39 | 0.29 | 1.11 | 0.47 | 1.76 |



Stellar Parameters For KIC 007954104

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|-------------------------------------------|
| | 5925^{+186}_{-206} | $4.518^{+0.052}_{-0.208}$ | $-0.140^{+0.300}_{-0.300}$ | $0.910^{+0.274}_{-0.091}$ | $0.995^{+0.117}_{-0.130}$ | $1.858^{+0.494}_{-0.983}$ |
| | +3%/-3% | +1%/-5% | +214%/-214% | +30%/-10% | +12%/-13% | +27%/-53% |
| 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 007954104-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-----------------|------------------------|----------------------|-----------------------|------------------------|
| DV | -1037 ± 156 | $4.62^{+2.34}_{-2.27}$ | 735^{+56}_{-39} | 5077^{+2121}_{-776} | 1421^{+3913}_{-828} |
| Alt. | -2070 ± 398 | $5.40^{+2.53}_{-2.32}$ | 739^{+53}_{-39} | 5640^{+1889}_{-925} | 2167^{+4845}_{-1221} |

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

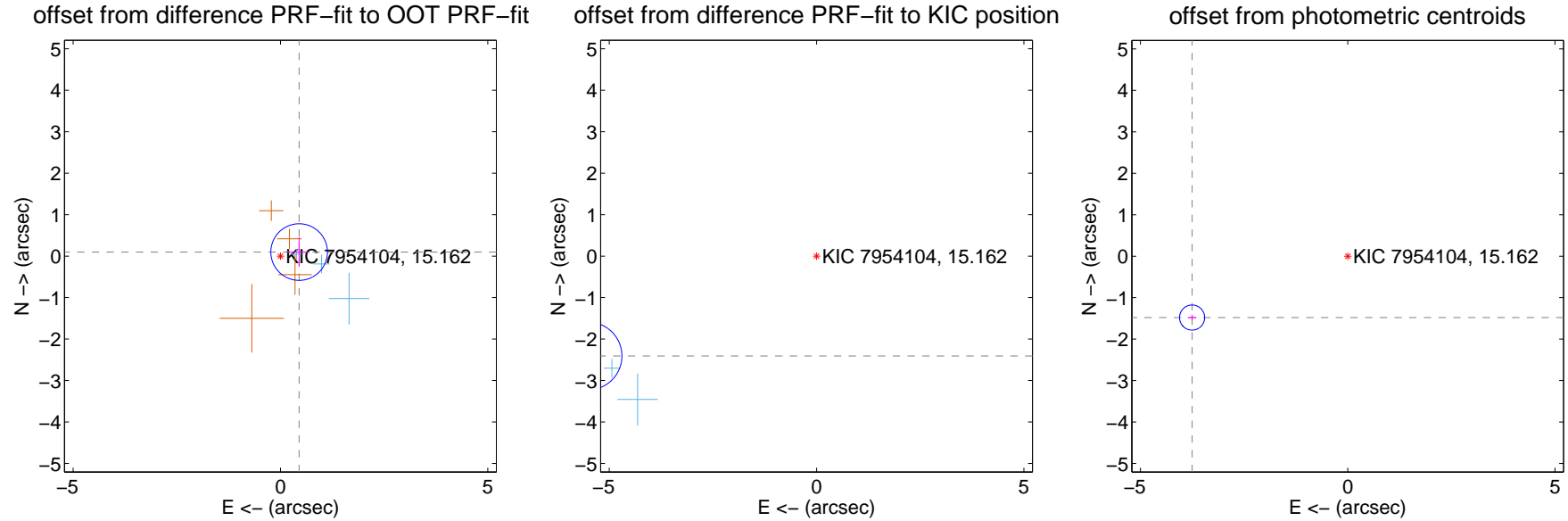
DV Centroid Data

Supplemental centroid analysis for 007954104-02. Kepler magnitude: 15.16. Transit SNR 6.36

There are 3 quarters with good PRF difference image offsets

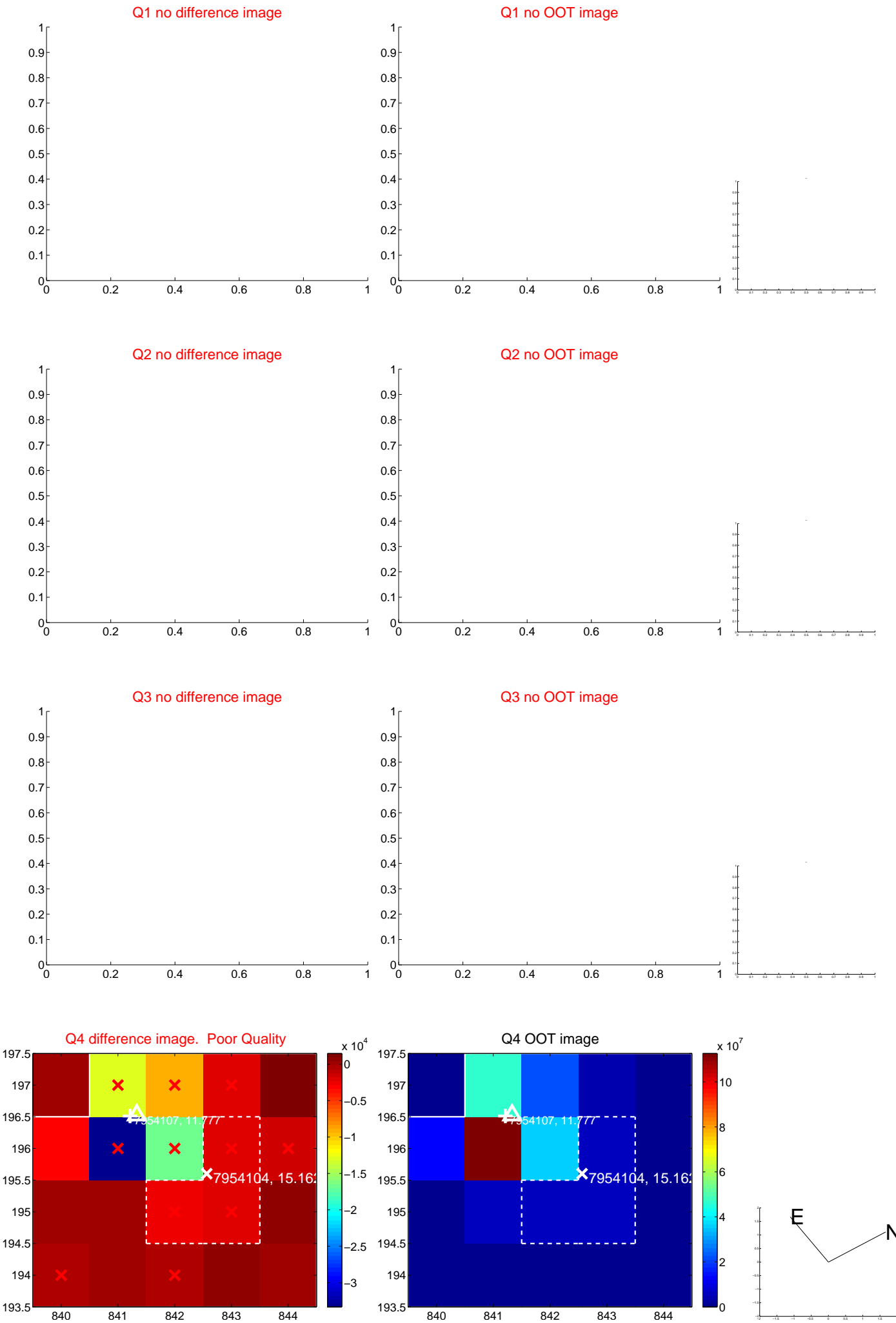
The OOT PRF centroid is offset from the target star catalog position by about 6.45 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|-----------------------------------------|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.461 ± 0.227 | 2.03 | -0.450 ± 0.252 | 0.098 ± 0.359 |
| PRF-fit source offset from KIC position | 6.014 ± 0.272 | 22.10 | 5.511 ± 0.310 | -2.408 ± 0.319 |
| photometric centroid source offset | 4.04 ± 0.10 | 39.99 | 3.75 ± 0.11 | -1.48 ± 0.07 |

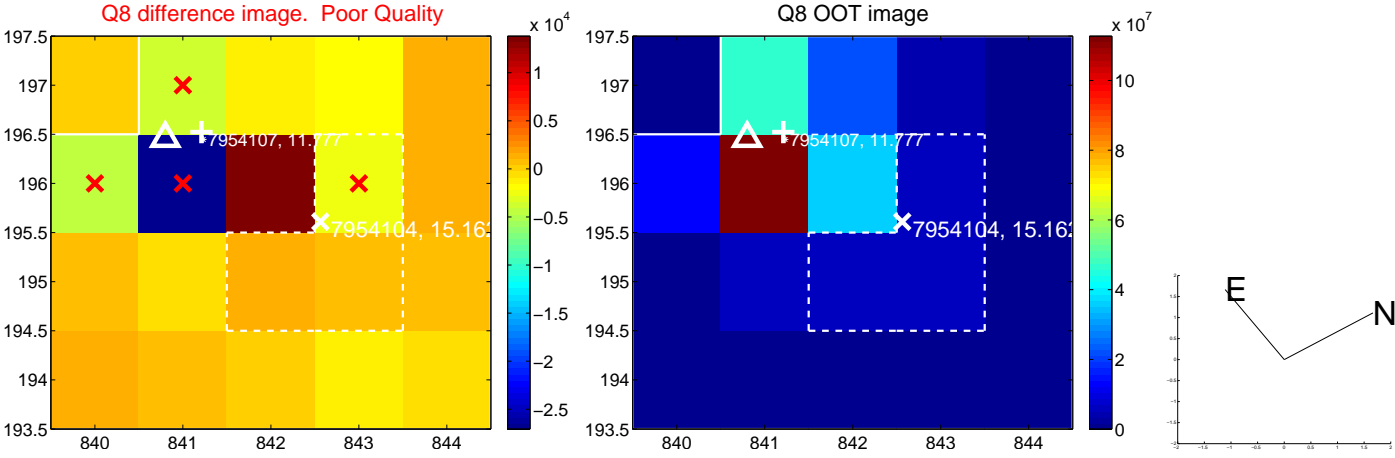
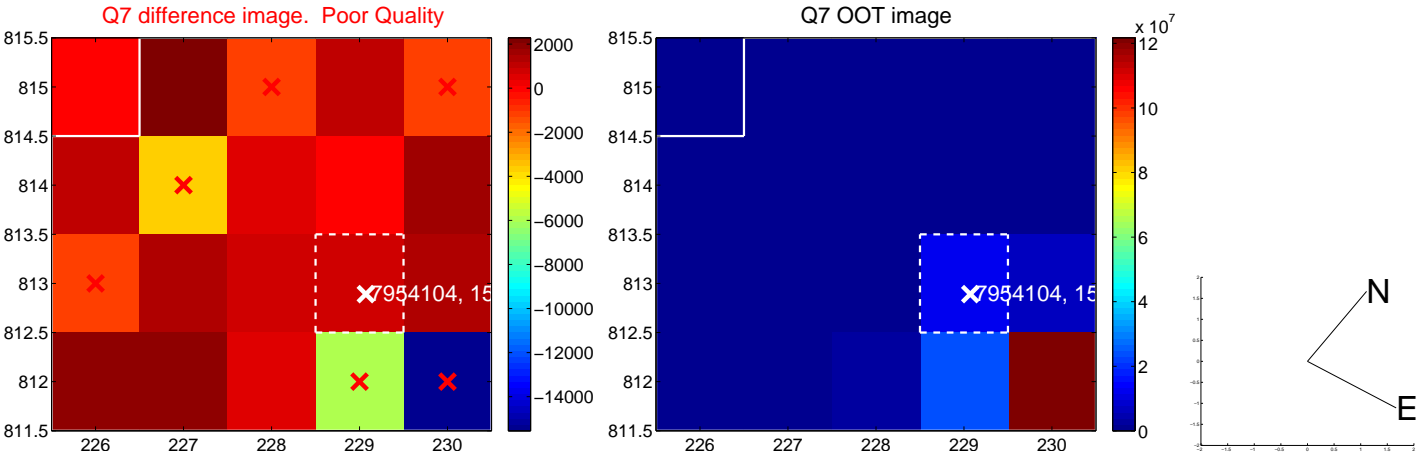
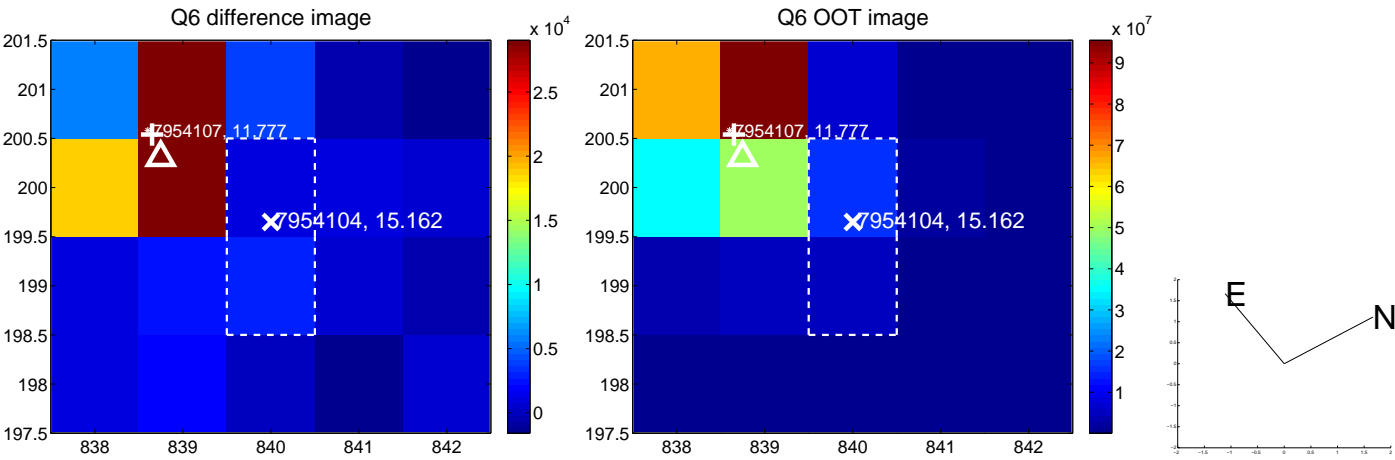
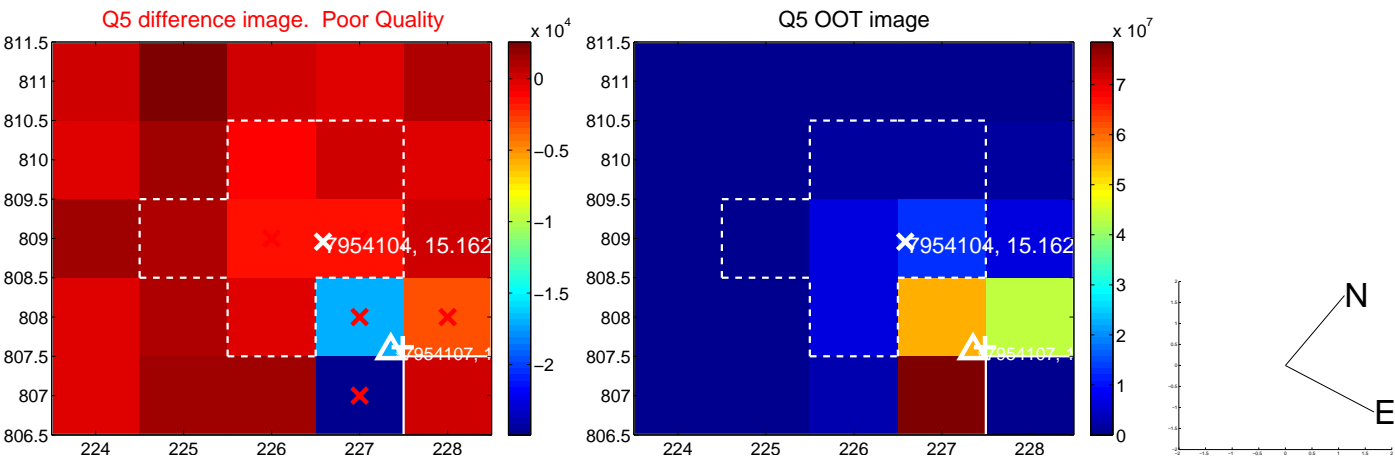


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

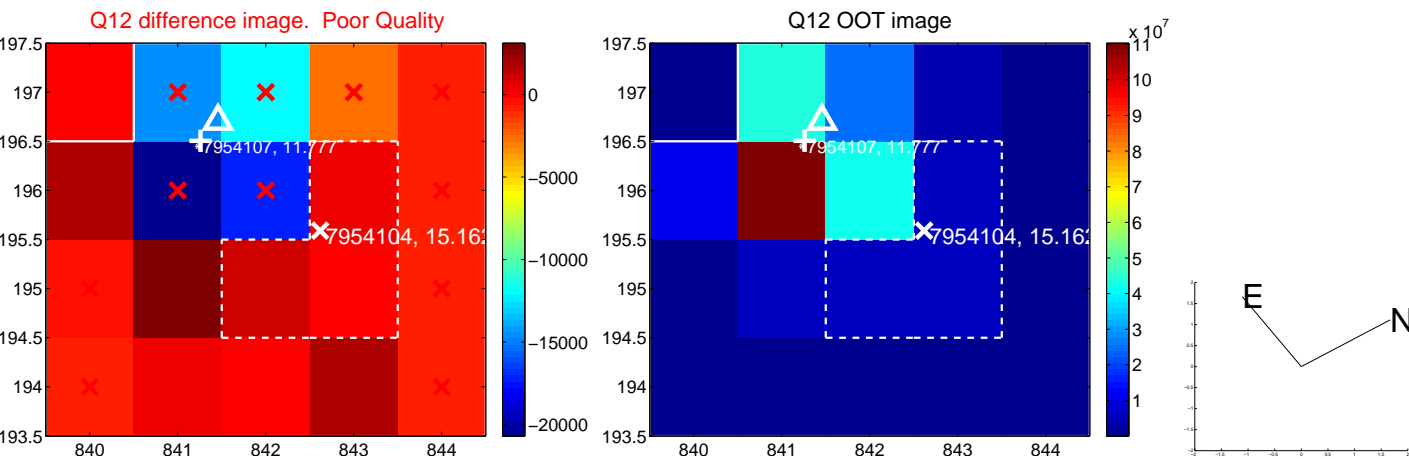
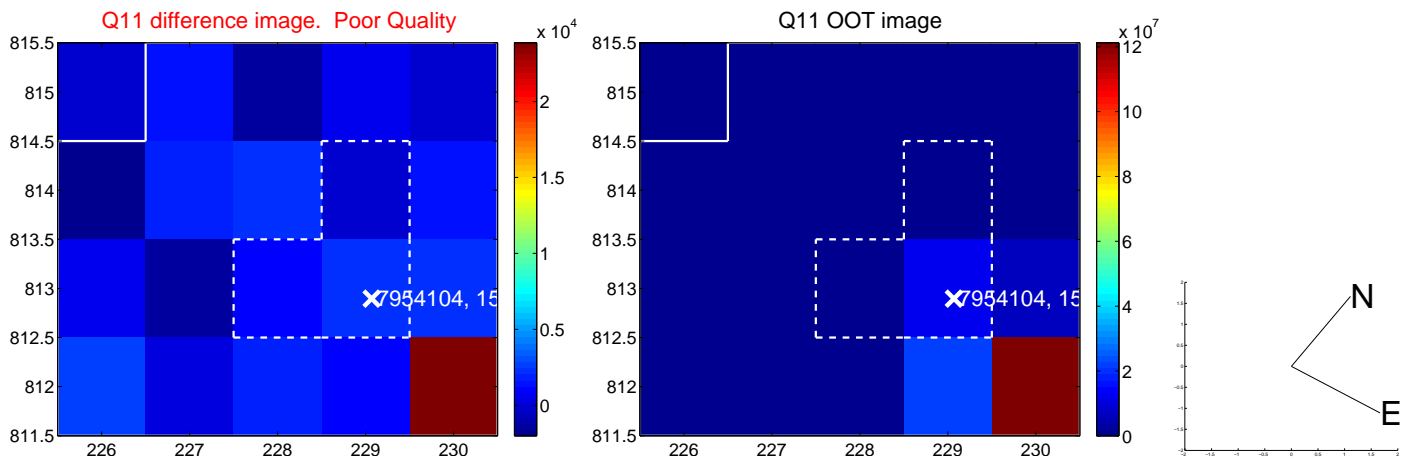
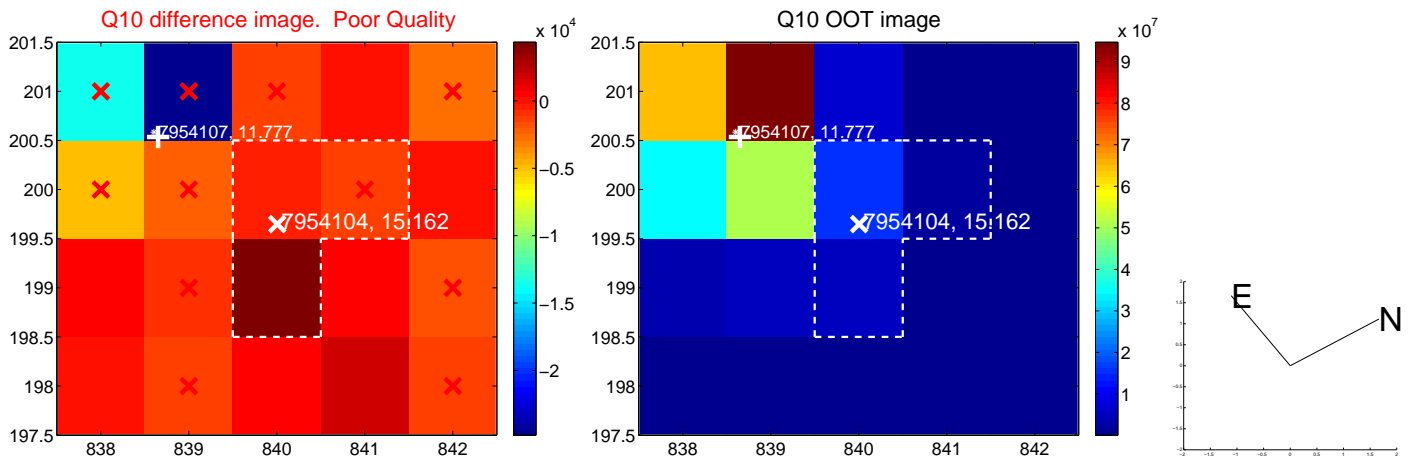
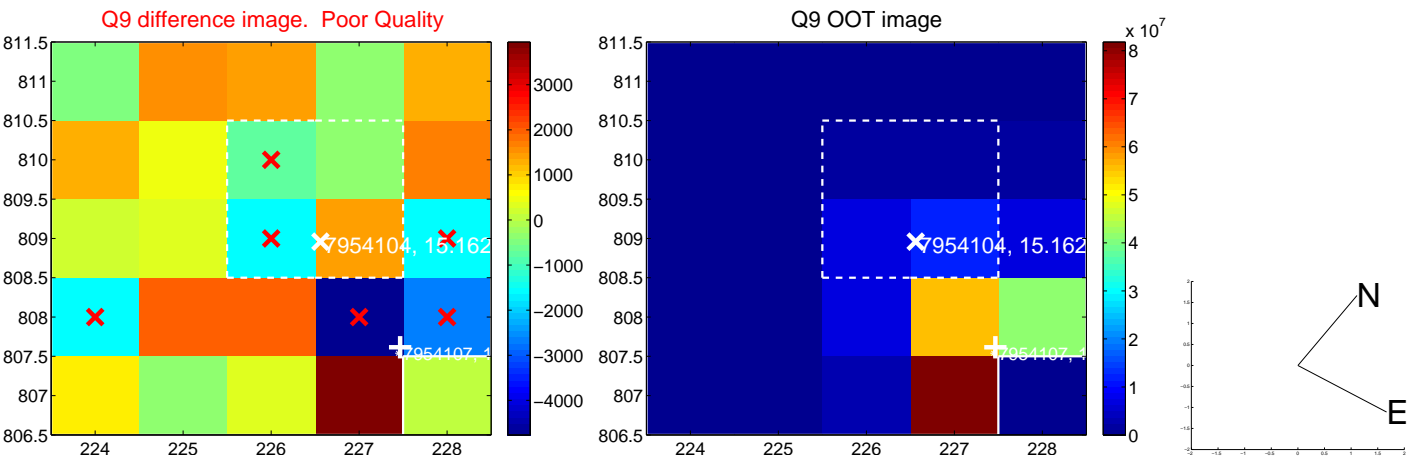
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



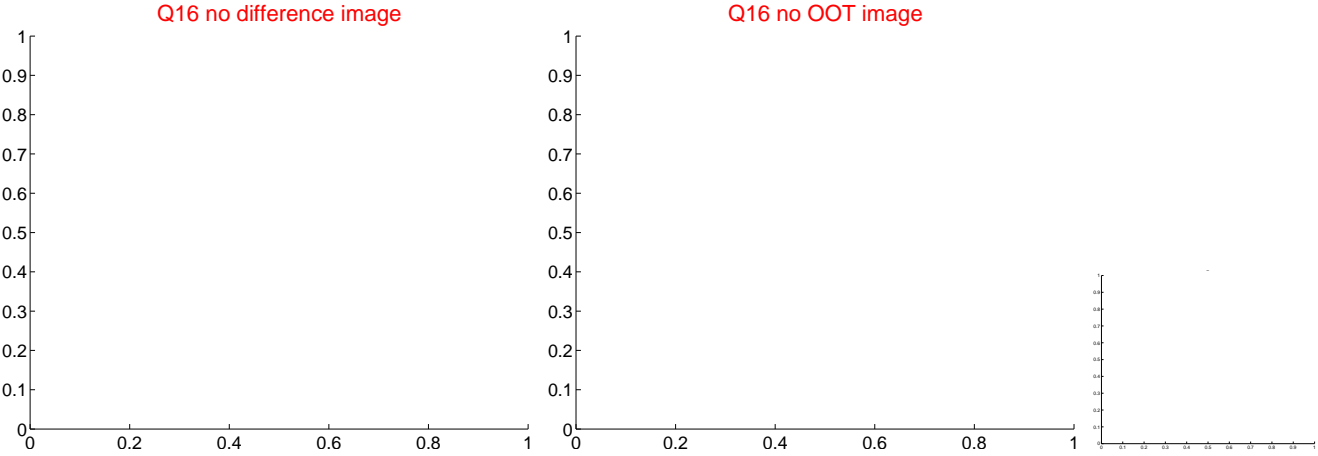
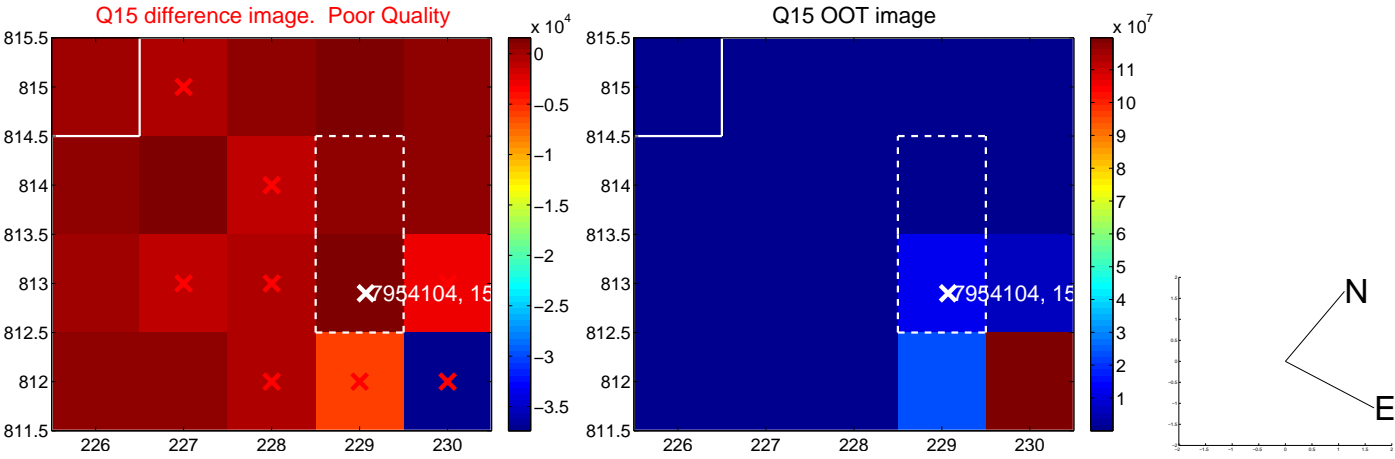
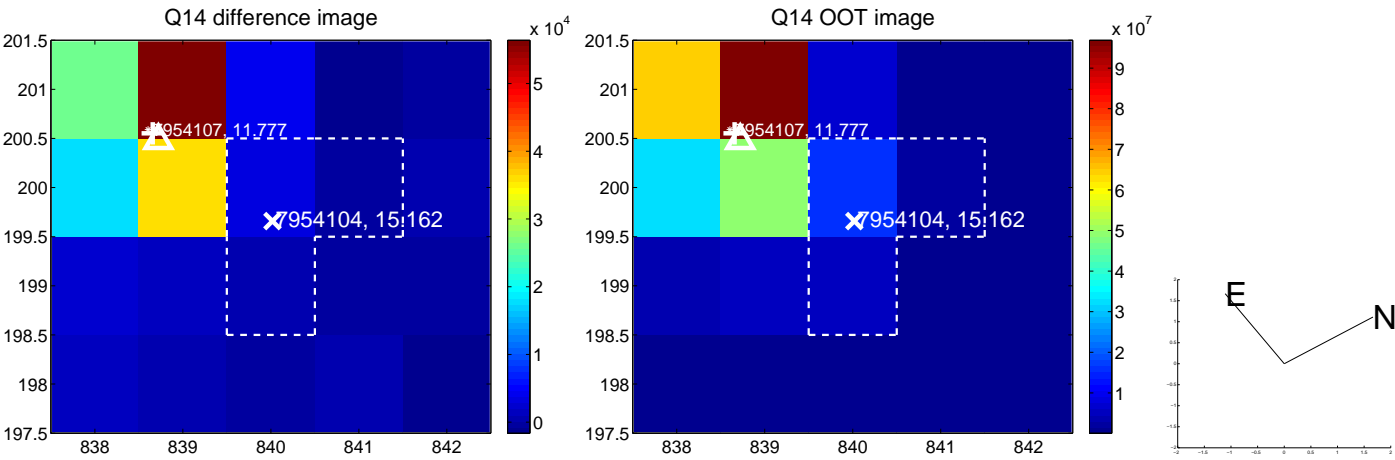
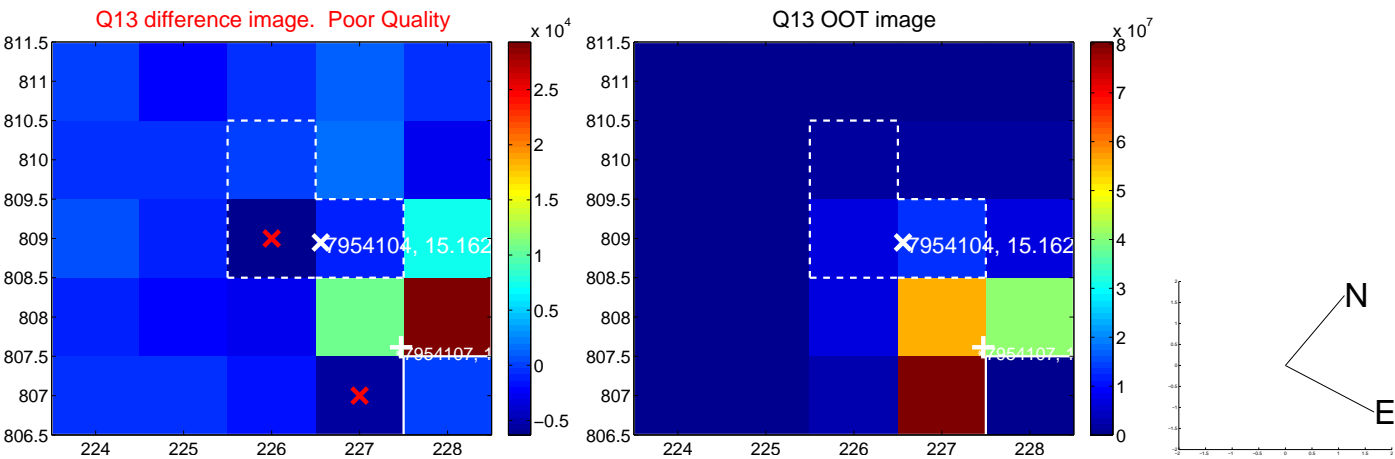
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



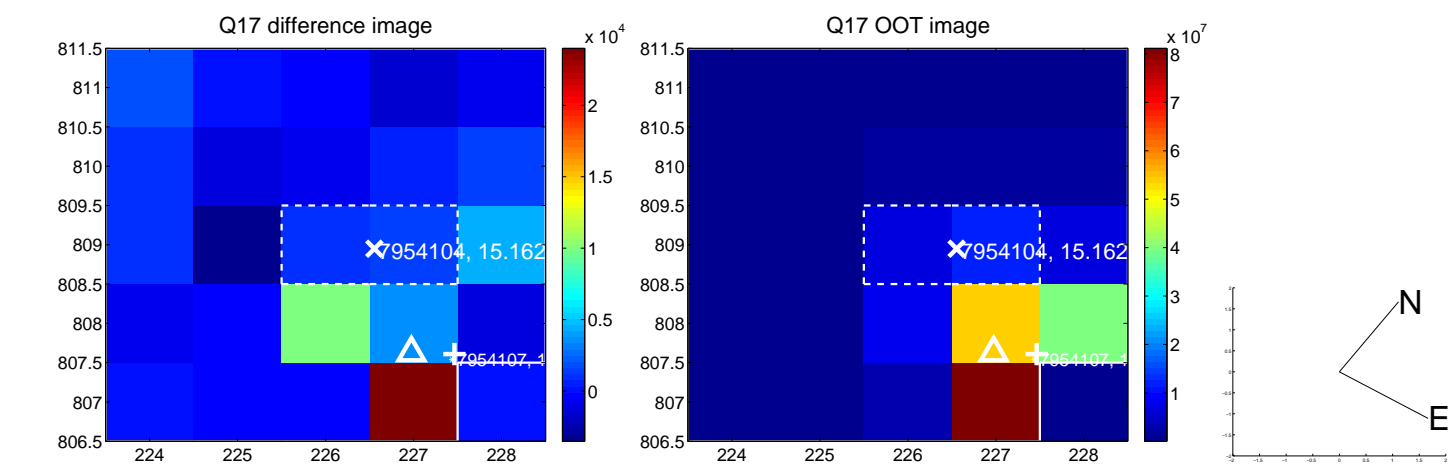
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



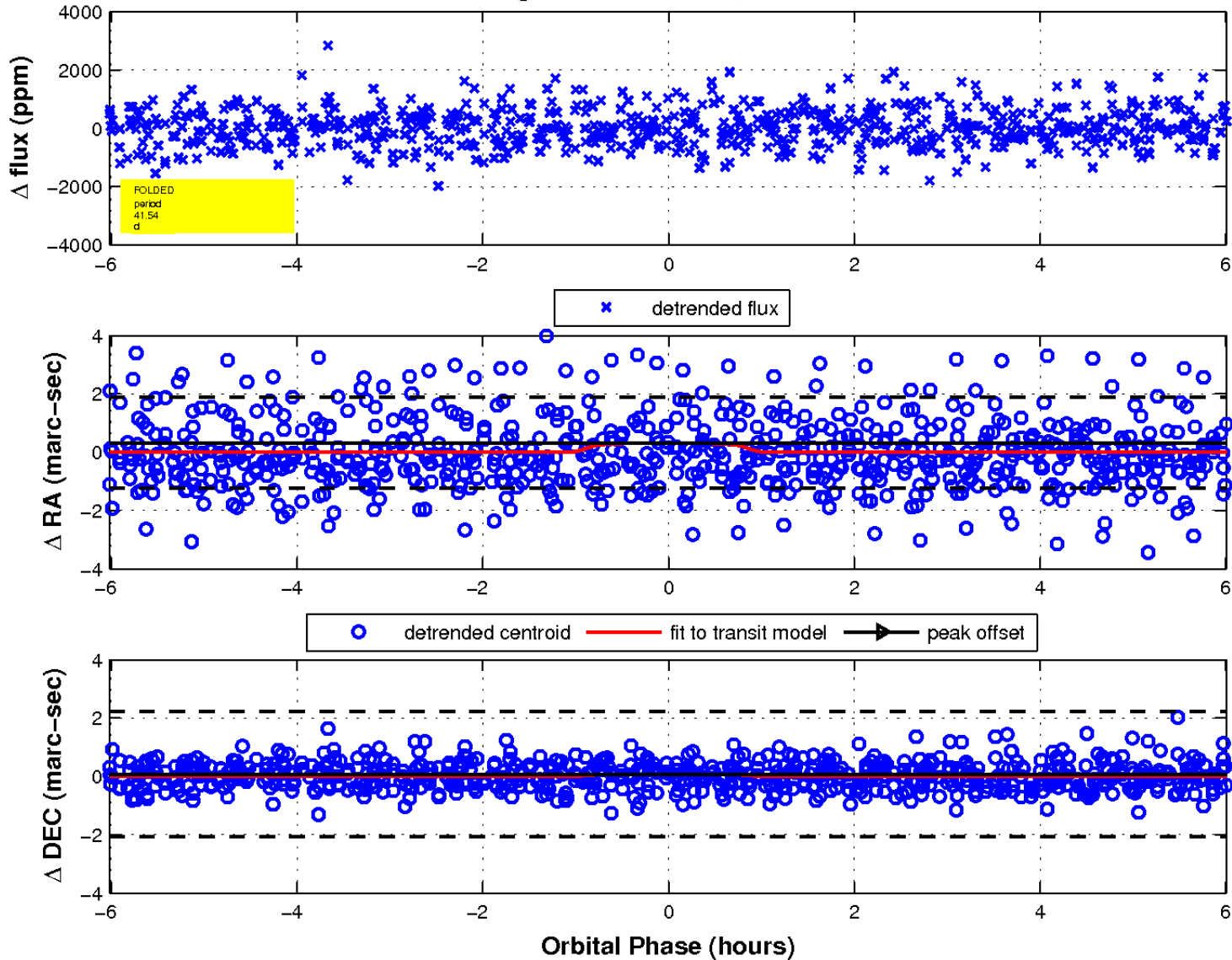
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

