

KIC 005437206

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005437206-01 | OBS | No | 0.879732 | 132.308964 | 48.4 | 3.852 | 11.2 | 10.2 | 3.42 | 7915 | 2.77 | 78086.47 |
| 005437206-02 | OBS | No | 1.763567 | 132.215027 | 104.6 | 5.428 | 8.6 | 11.0 | 3.42 | 7915 | 4.07 | 30892.56 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005437206-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED |
| 005437206-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED |

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

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

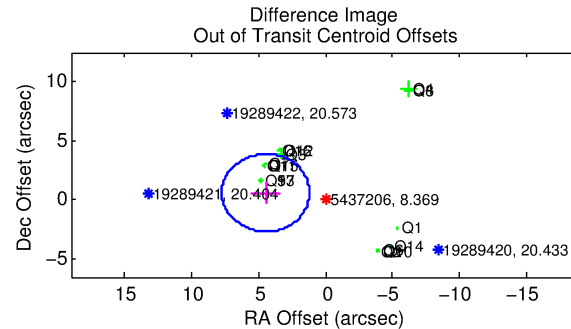
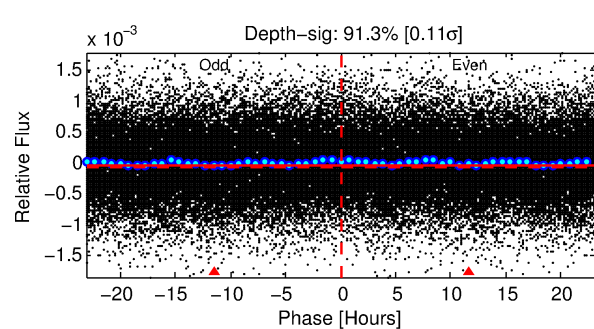
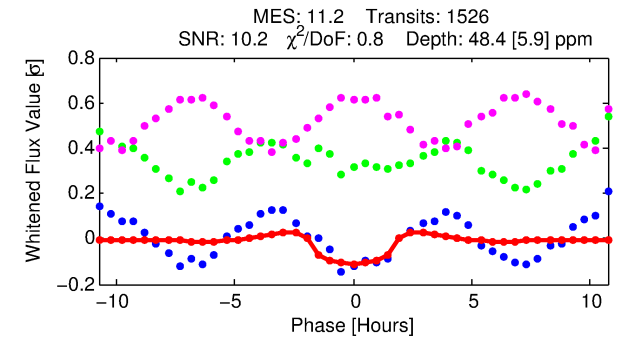
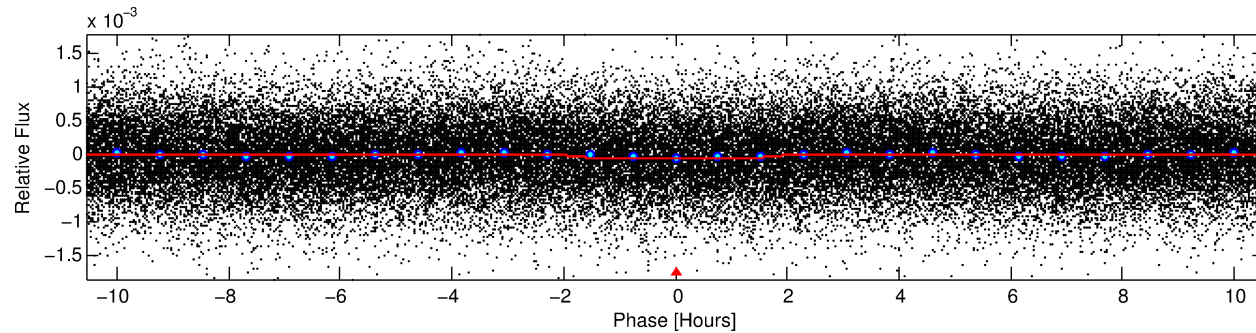
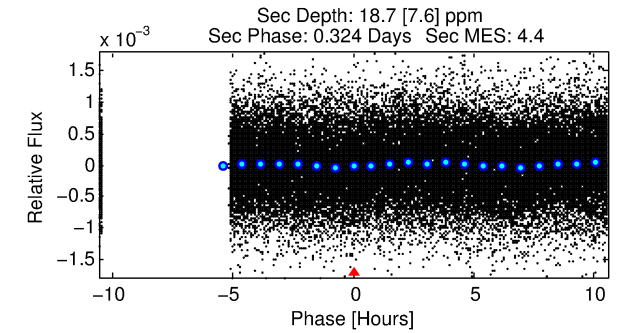
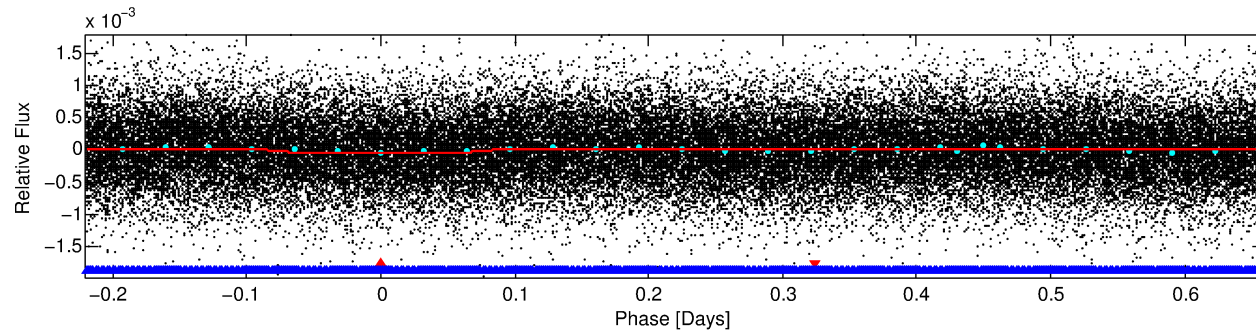
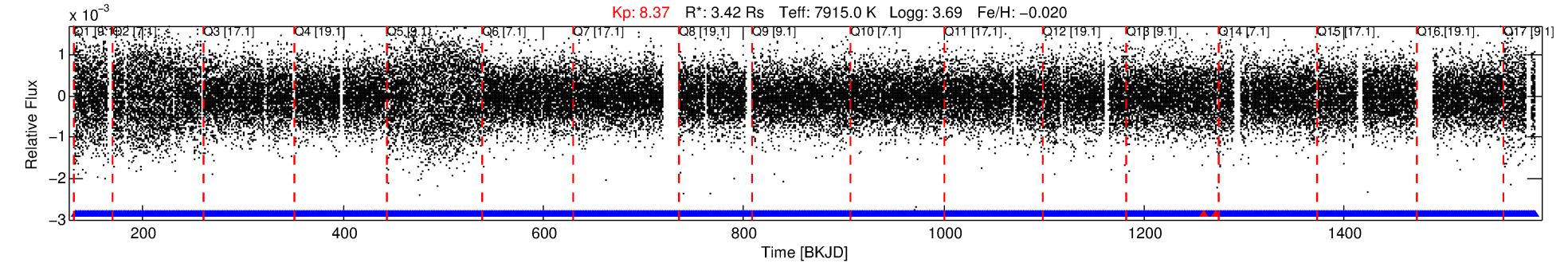
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005437206-01

No Significant Match Found

DV One-Page Summary

KIC: 5437206 Candidate: 1 of 2 Period: 0.880 d



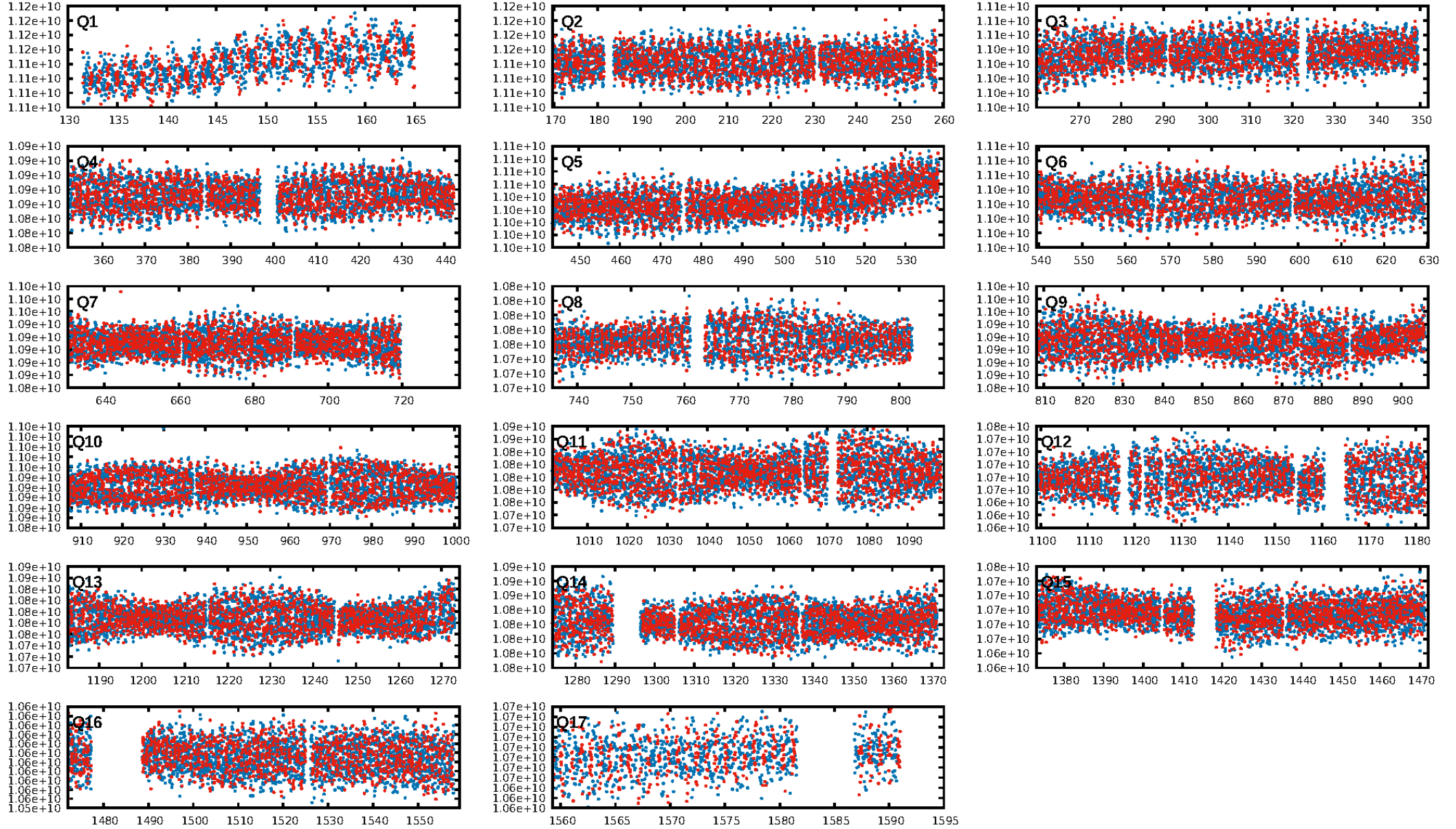
DV Fit Results:

Period = 0.87973 [0.00001] d
Epoch = 132.3090 [0.0038] BKJD
 $R_p/R^* = 0.0074$ [0.0040]
 $a/R^* = 1.23$ [1.35]
 $b = 0.90$ [0.70]
 $\text{Seff} = 78086.47$ [59283.80]
 $T_{\text{eq}} = 4263$ [809] K
 $R_p = 2.77$ [1.94] R_e
 $a = 0.0229$ [0.0104] AU
 $A_g = 0.71$ [0.96] $[-0.31\sigma]$
 $T_{\text{eff}} = 6042$ [1742] K $[0.93\sigma]$

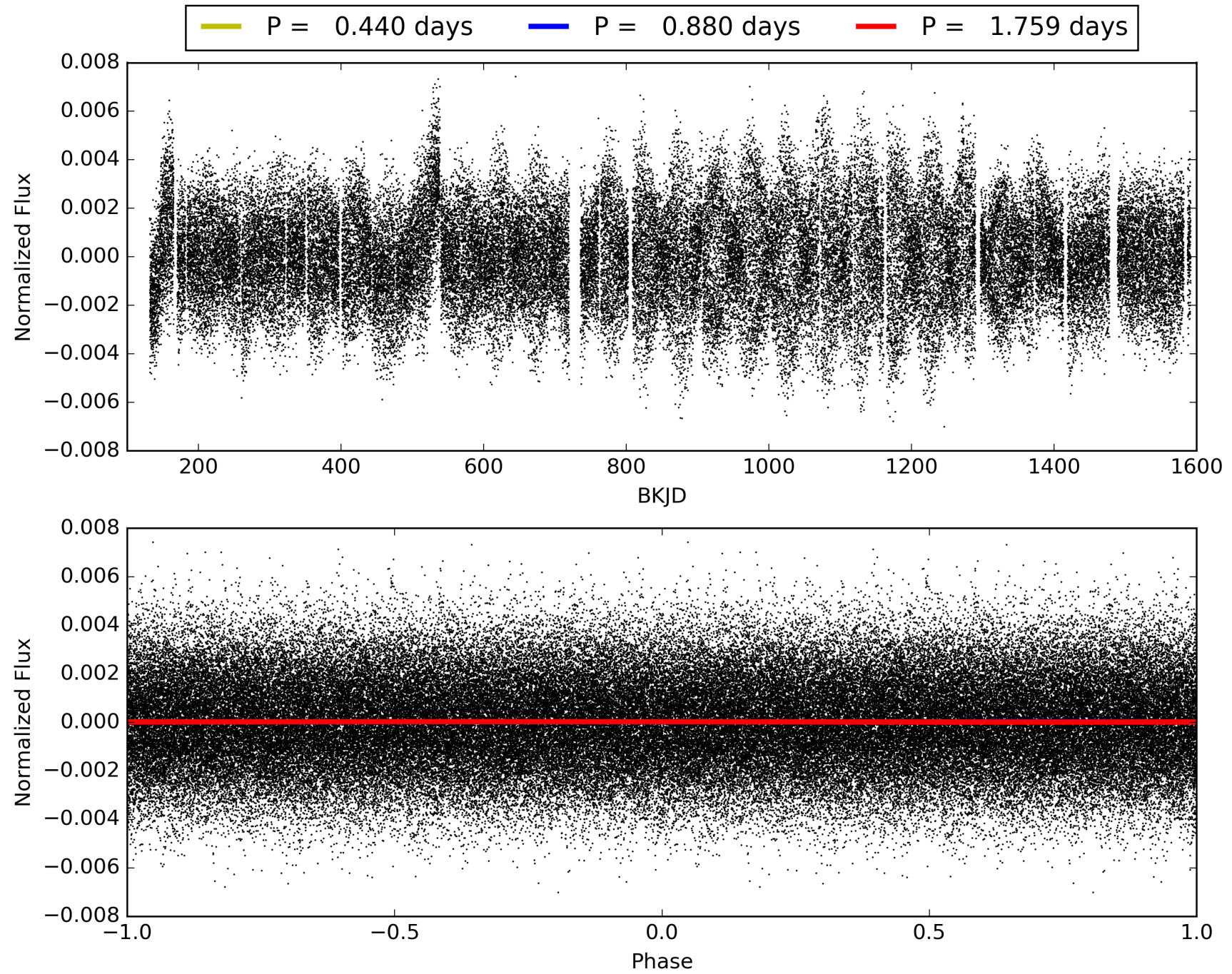
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 99.9% [3.19σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.01e-29
RollingBand-fgt: 1.00 [1454/1456]
GhostDiagnostic-chr: N/A
Centroid-sig: 5.1%
Centroid-so: 1.444 arcsec [1.85σ]
OotOffset-rm: 4.512 arcsec [4.14σ]
KicOffset-rm: 2.815 arcsec [1.82σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 005437206-01, PDC Light Curves

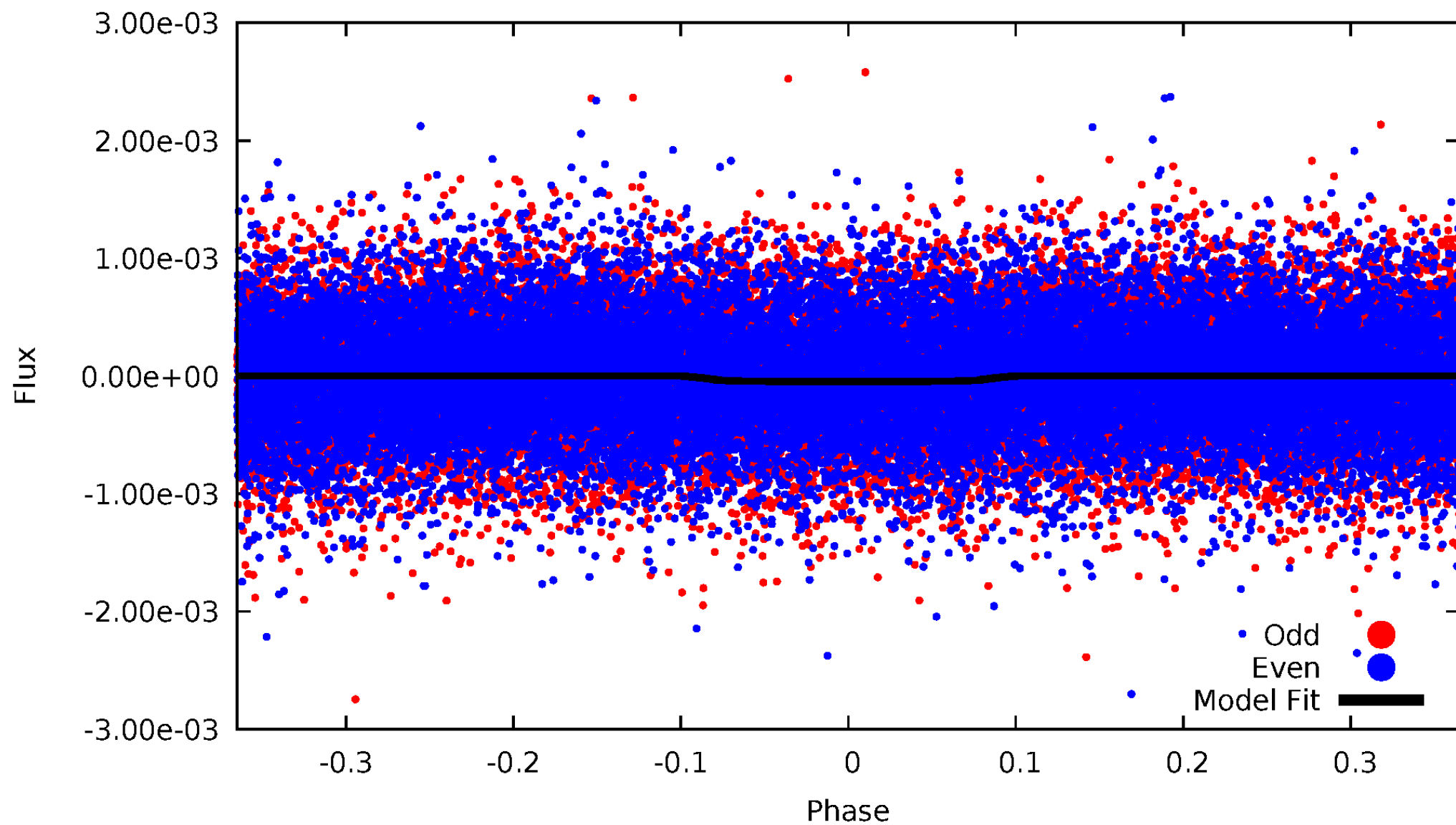


TCE 005437206-01



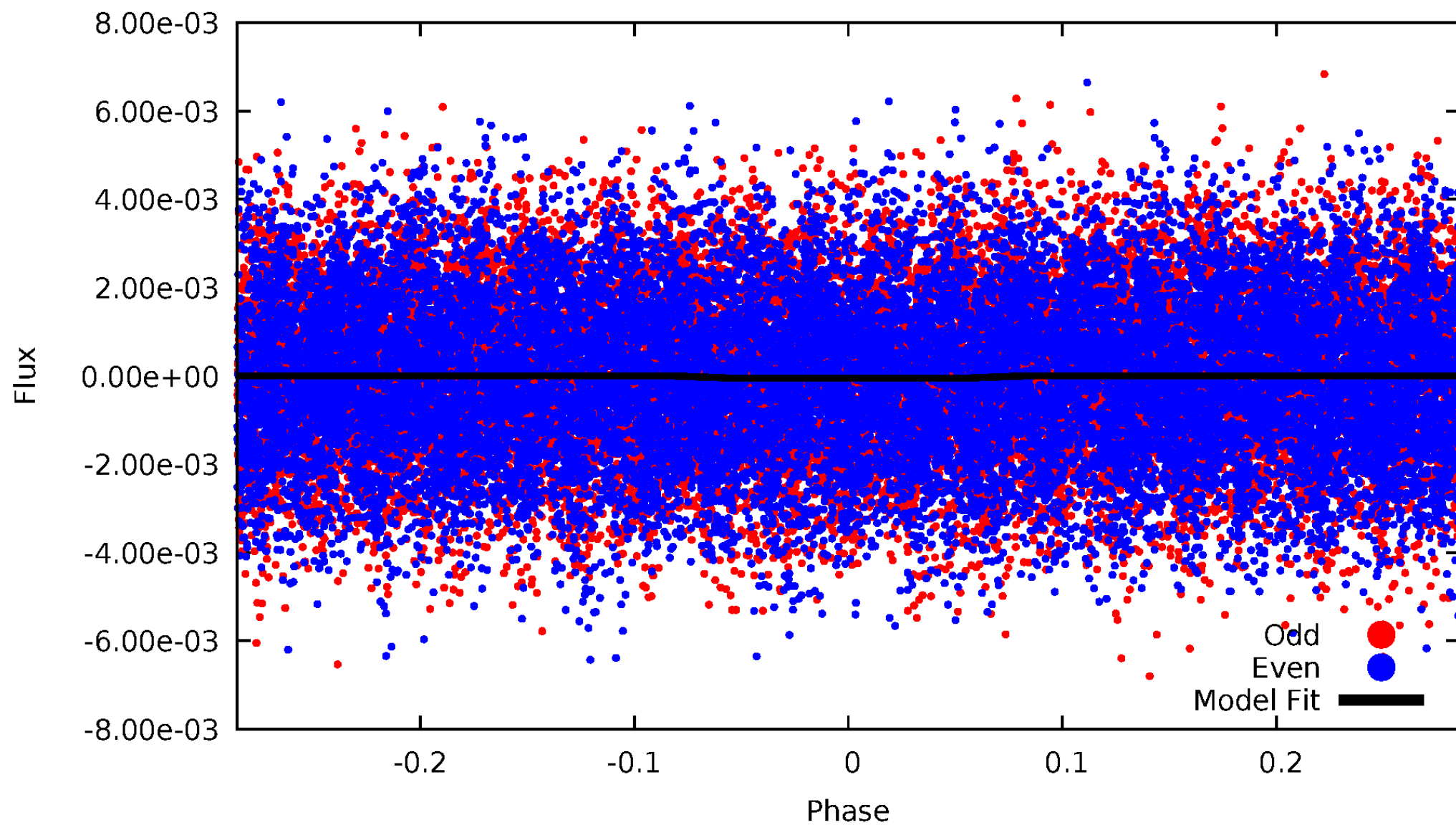
DV Odd/Even

TCE 005437206-01



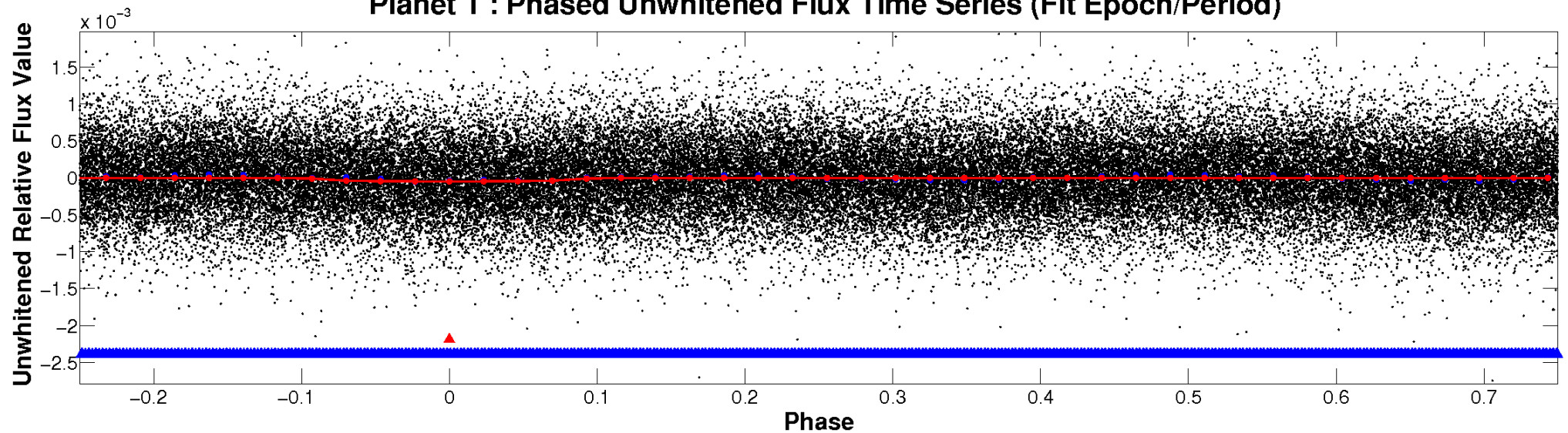
ALT Odd/Even

TCE 005437206-01

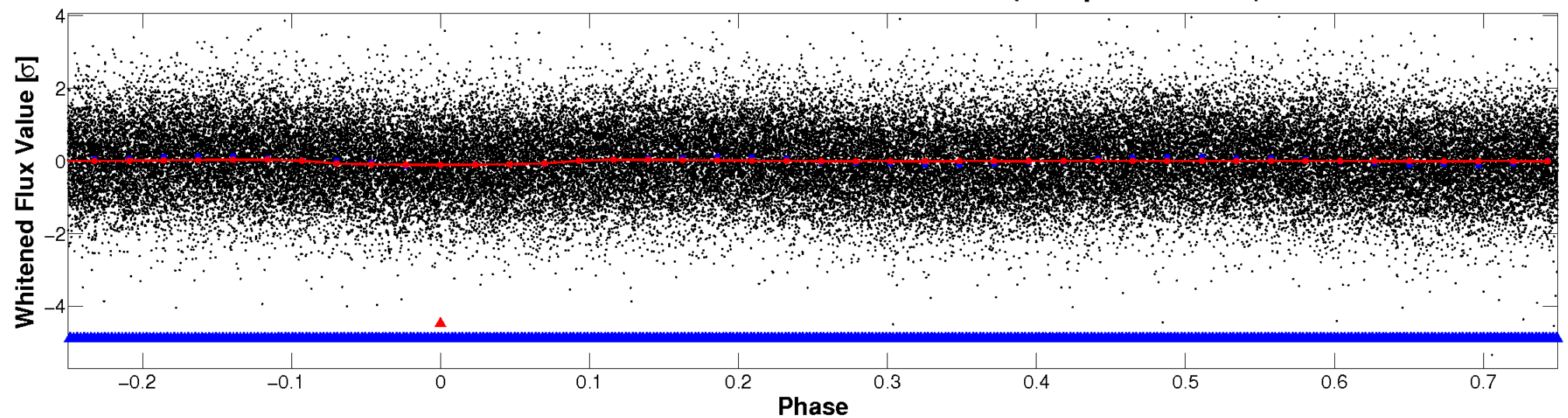


Non-Whitened Vs. Whitened Light Curve

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

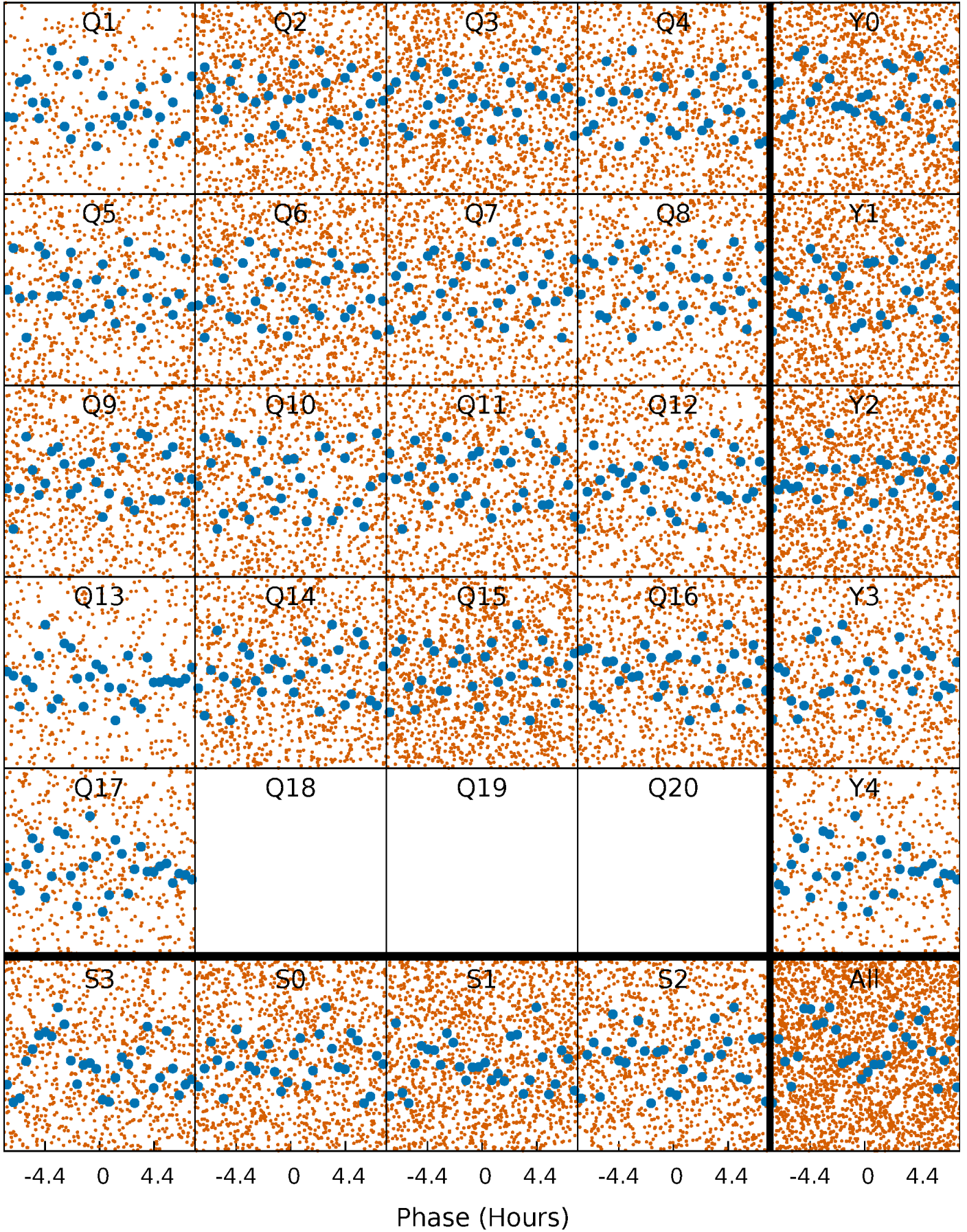


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



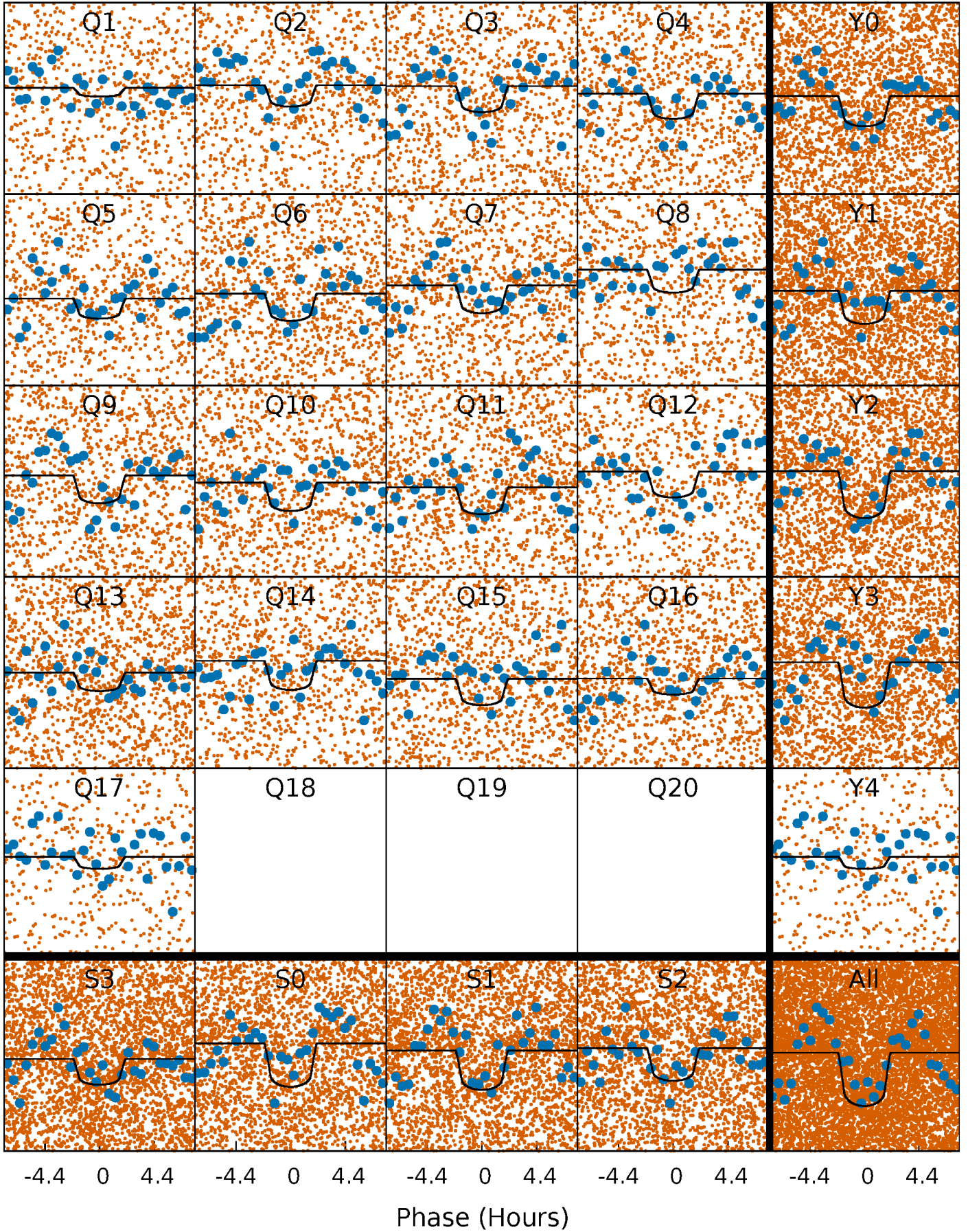
PDC Quarter-Phased Transit Curves

TCE 005437206-01 P= 0.879732 Days $T_0=132.308964$ (BKJD)



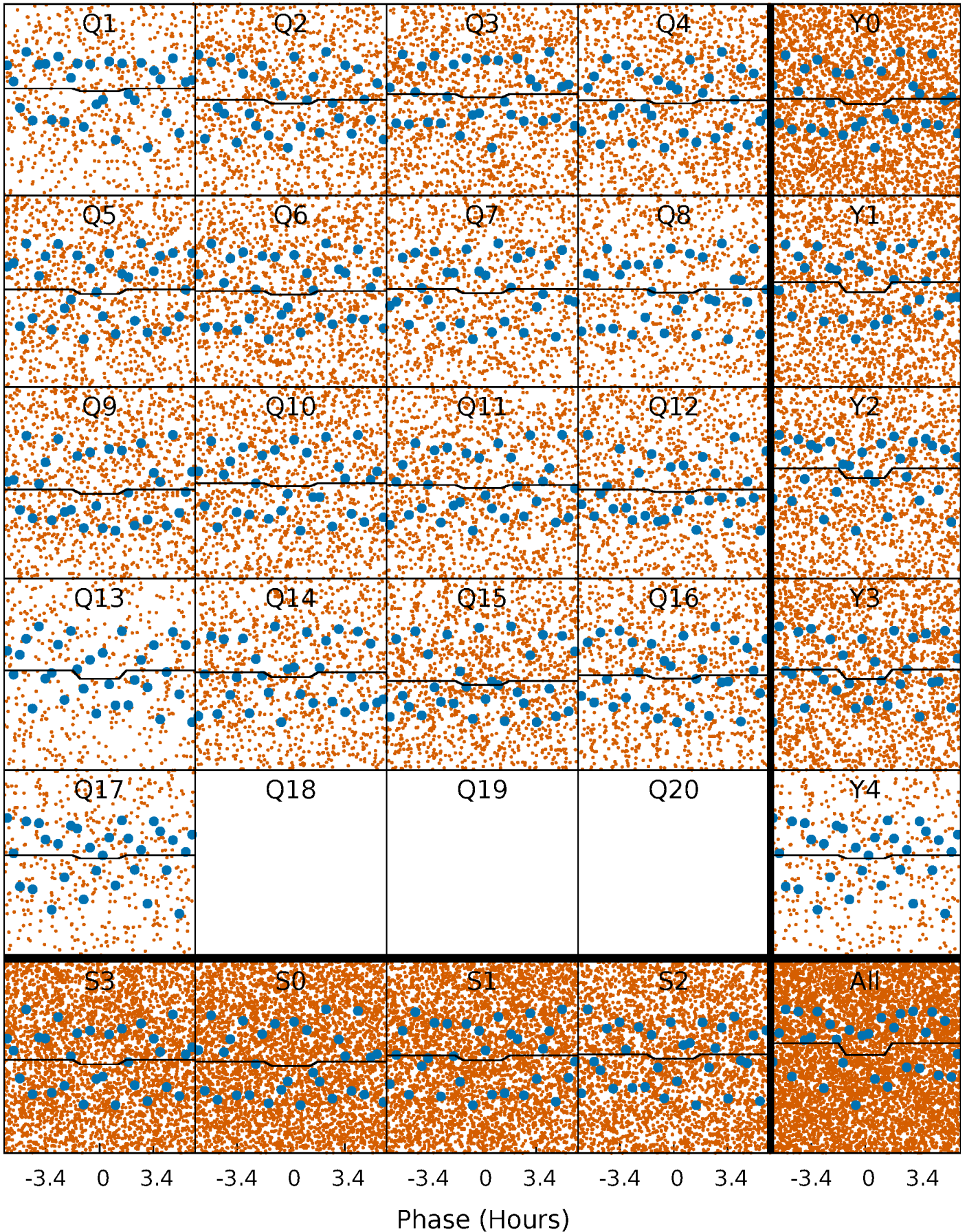
DV Quarter-Phased Transit Curves

TCE 005437206-01 P= 0.879732 Days $T_0=132.308964$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

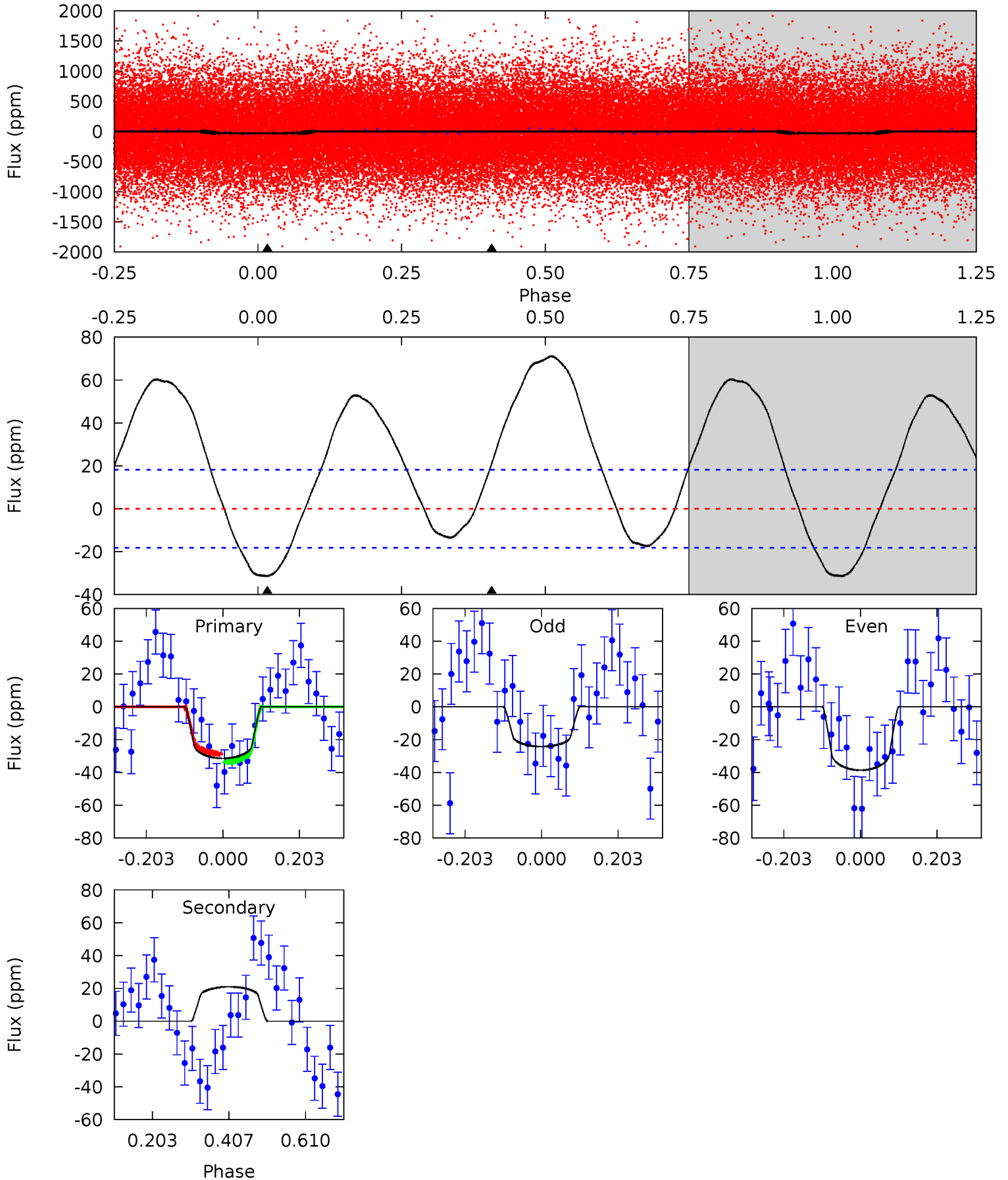
TCE 005437206-01 P= 0.879761 Days $T_0=132.311691$ (BKJD)



DV Model-Shift Uniqueness Test

005437206-01, P = 0.879732 Days, E = 131.429232 Days

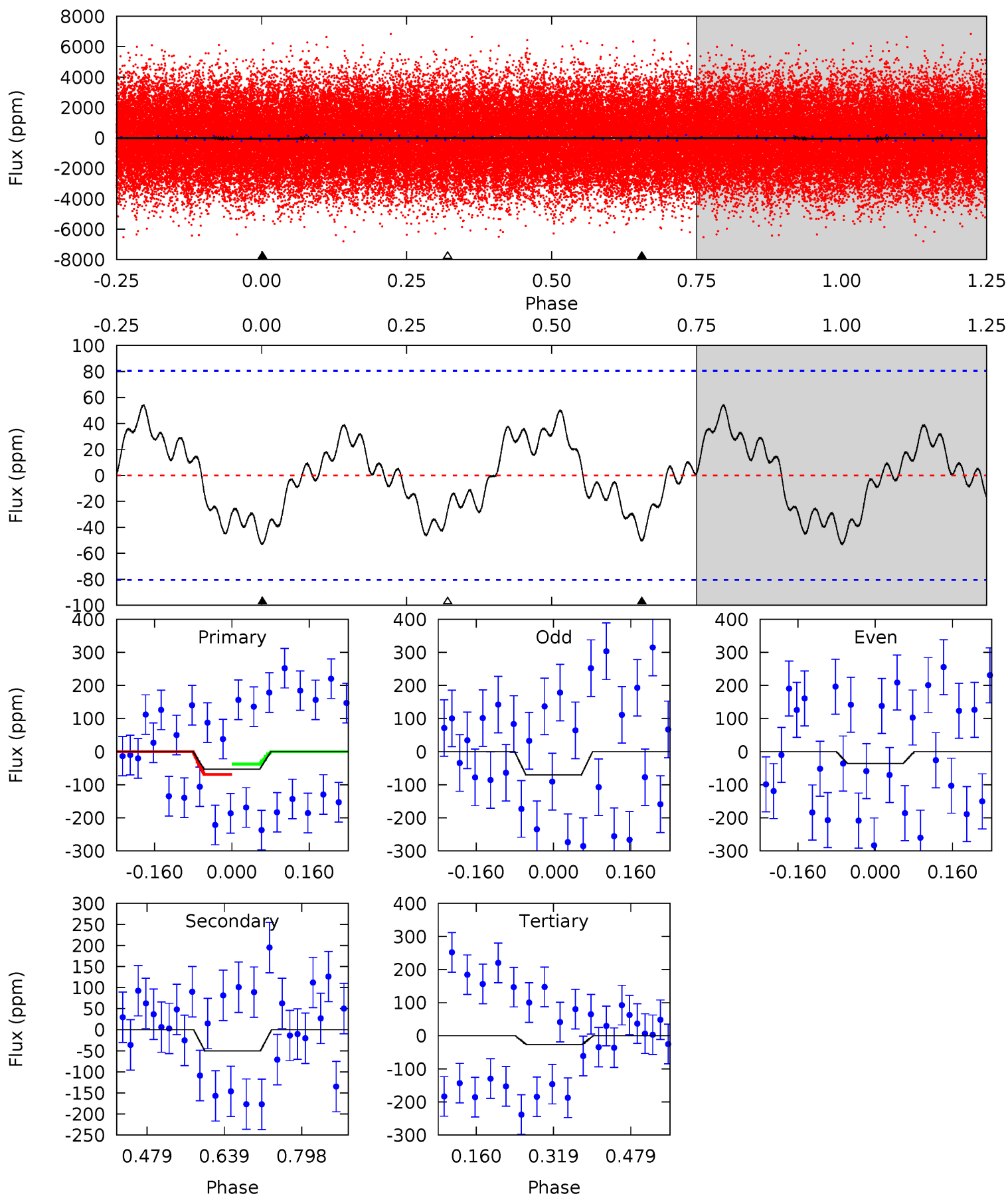
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.63 | -5.08 | 0 | 0 | 4.41 | 1.27 | 5.99 | 7.63 | 7.63 | -5.08 | -5.08 | 1.74 | 1.07 | 0.69 | 0.62 |



Alt Model-Shift Uniqueness Test

005437206-01, P = 0.879761 Days, E = 131.431930 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 2.95 | 2.79 | 1.49 | 0 | 4.47 | 1.41 | 1.36 | 1.46 | 2.95 | 1.31 | 2.79 | 0.95 | 1.28 | 0.51 | 0.87 |



Stellar Parameters For KIC 005437206

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 7915^{+221}_{-331} | $3.688^{+0.440}_{-0.110}$ | $-0.020^{+0.200}_{-0.350}$ | $3.416^{+0.838}_{-1.556}$ | $2.074^{+0.338}_{-0.508}$ | $0.073^{+0.321}_{-0.025}$ |
| | +3%/-4% | +12%/-3% | +1000%/-1750% | +25%/-46% | +16%/-24% | +438%/-34% |
| 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 005437206-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|------------------------|----------------------------|
| DV | 21 ± 4 | $2.53^{+1.45}_{-1.30}$ | 5765^{+423}_{-725} | -6457^{+846}_{-2568} | $-0.920^{+0.544}_{-2.827}$ |
| Alt. | -50 ± 18 | $2.31^{+1.50}_{-1.22}$ | 5739^{+459}_{-660} | 7627^{+6123}_{-2116} | $2.682^{+9.653}_{-1.770}$ |

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 $A_{obs} \gg 1.0$

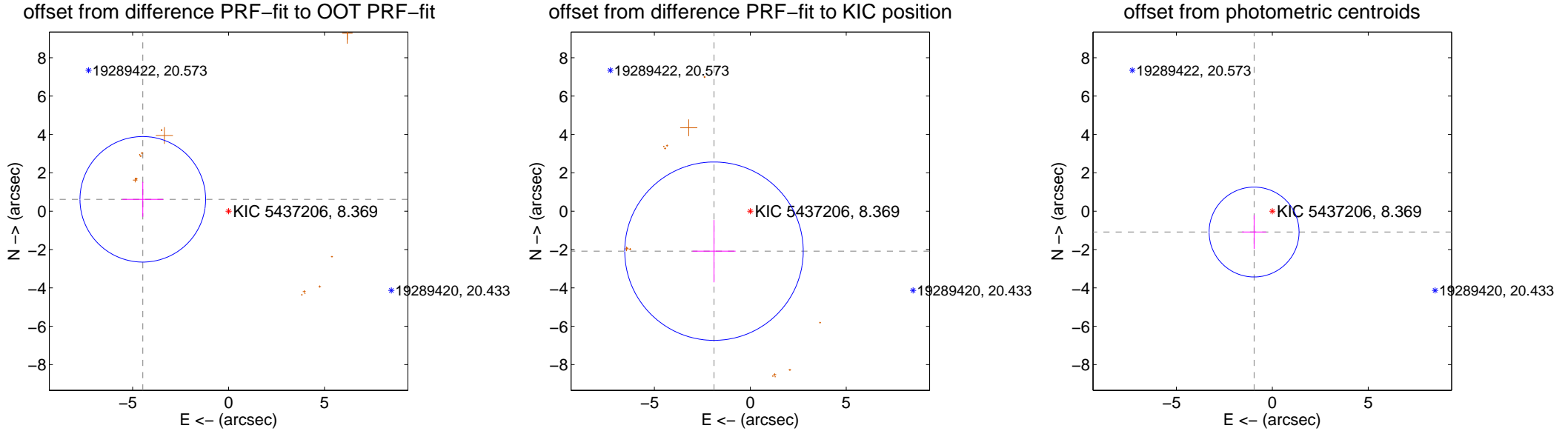
DV Centroid Data

Supplemental centroid analysis for 005437206-01. **Kepler magnitude: 8.37.** Transit SNR 10.18

There are 0 quarters with good PRF difference image offsets

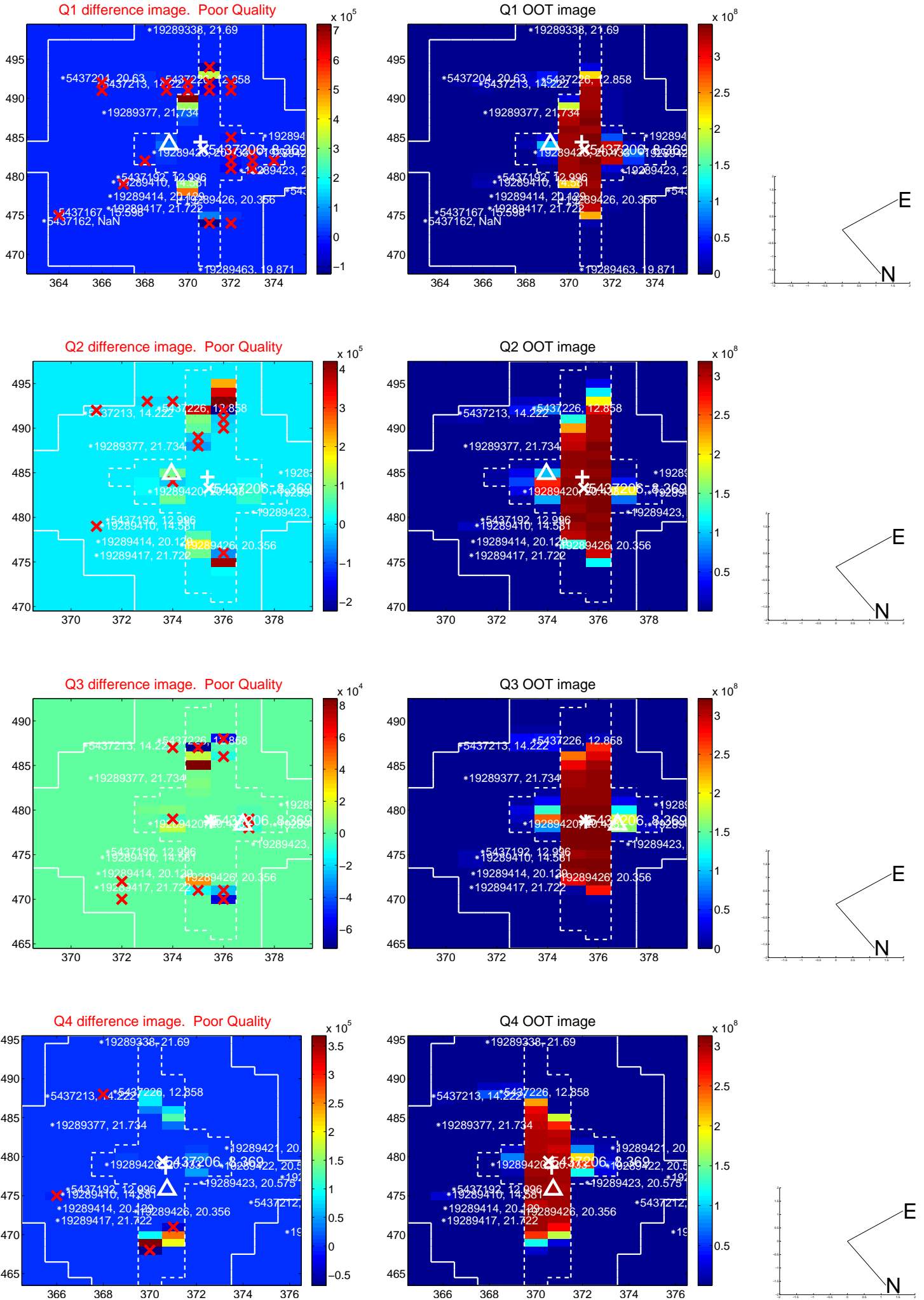
The OOT PRF centroid is offset from the target star catalog position by about 3.96 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 4.512 ± 1.091 | 4.14 | 4.469 ± 1.064 | 0.619 ± 0.910 |
| PRF-fit source offset from KIC position | 2.815 ± 1.550 | 1.82 | 1.891 ± 1.124 | -2.085 ± 1.625 |
| photometric centroid source offset | 1.44 ± 0.78 | 1.85 | 0.95 ± 0.63 | -1.09 ± 0.88 |

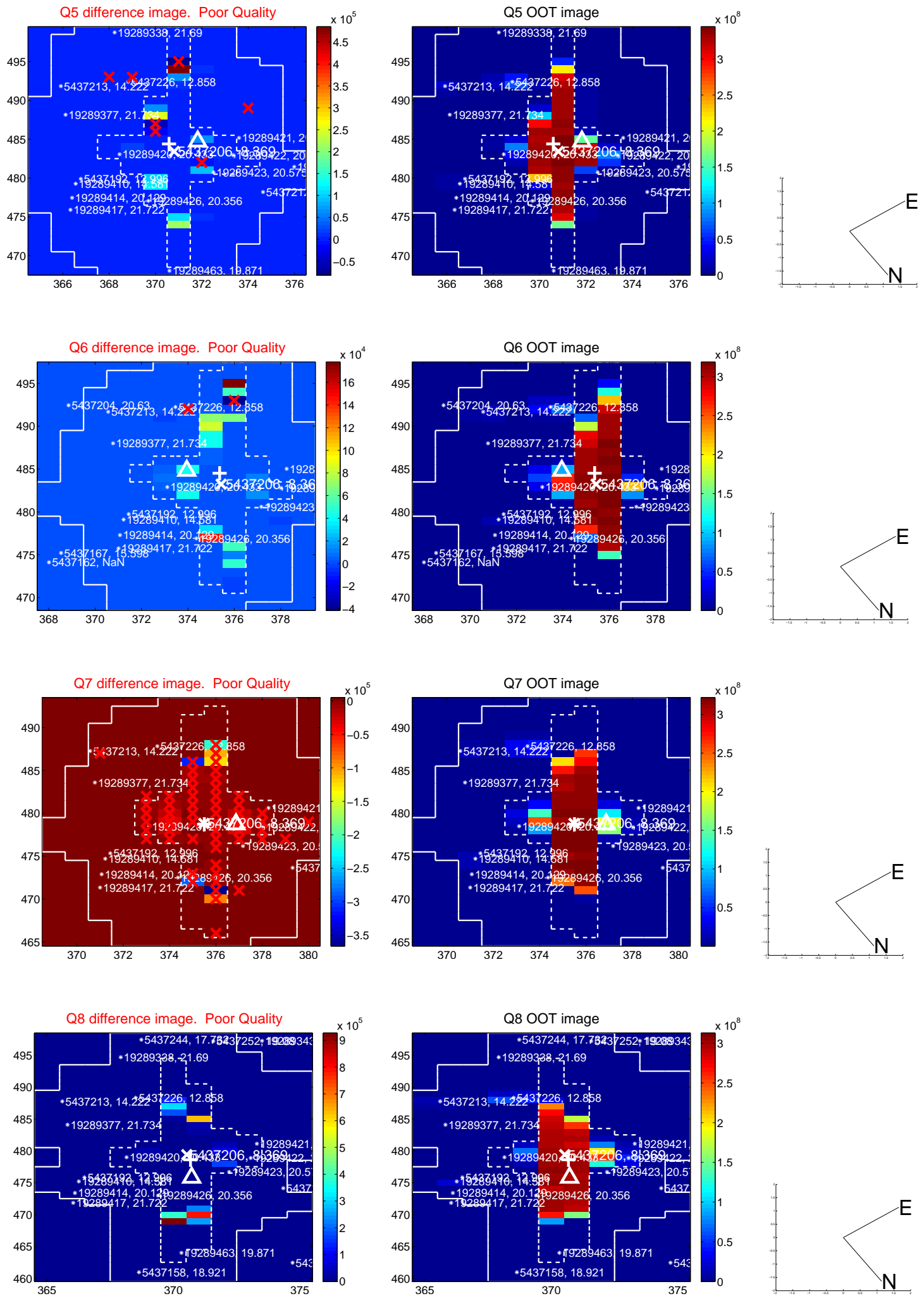


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

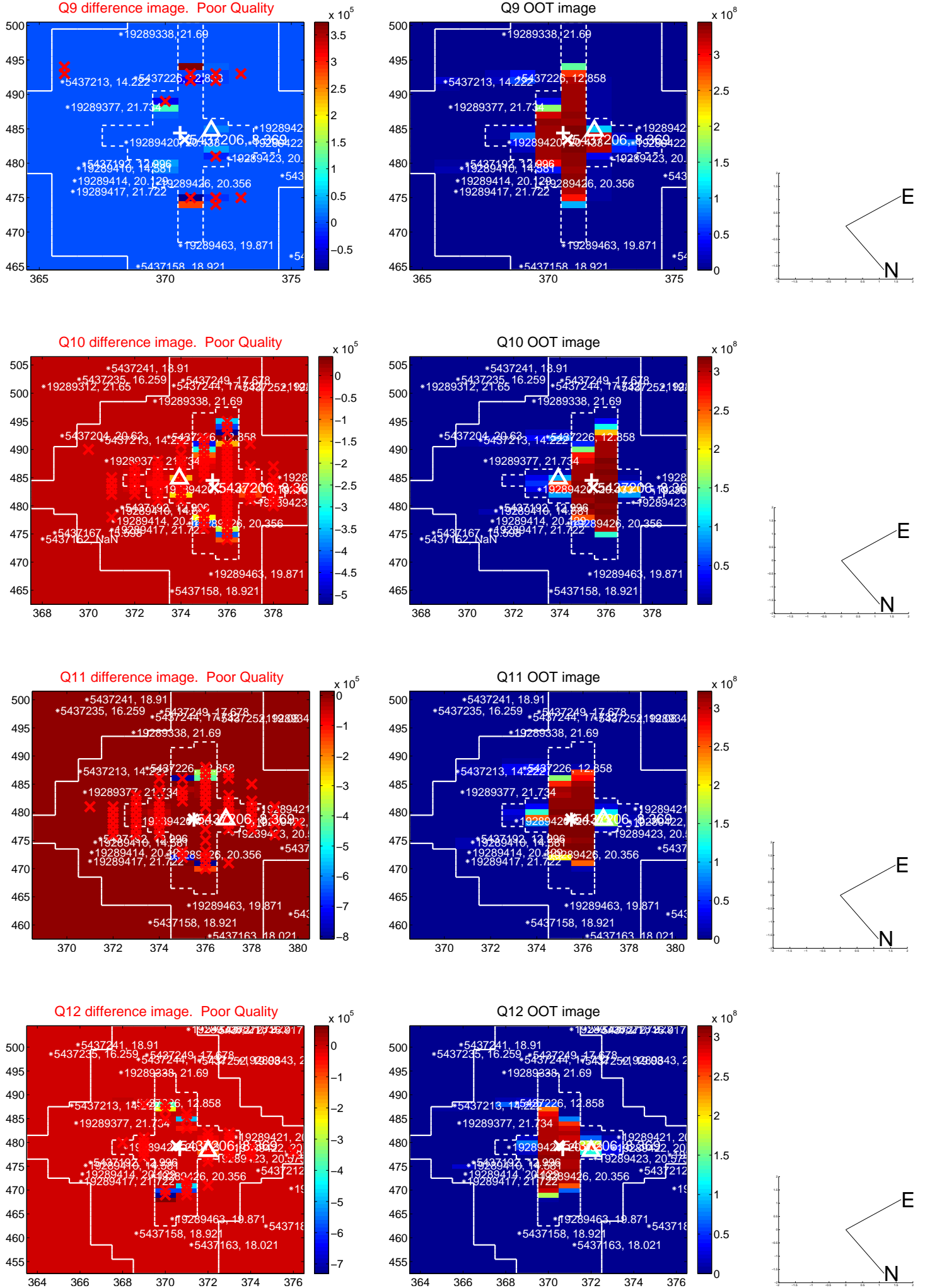
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



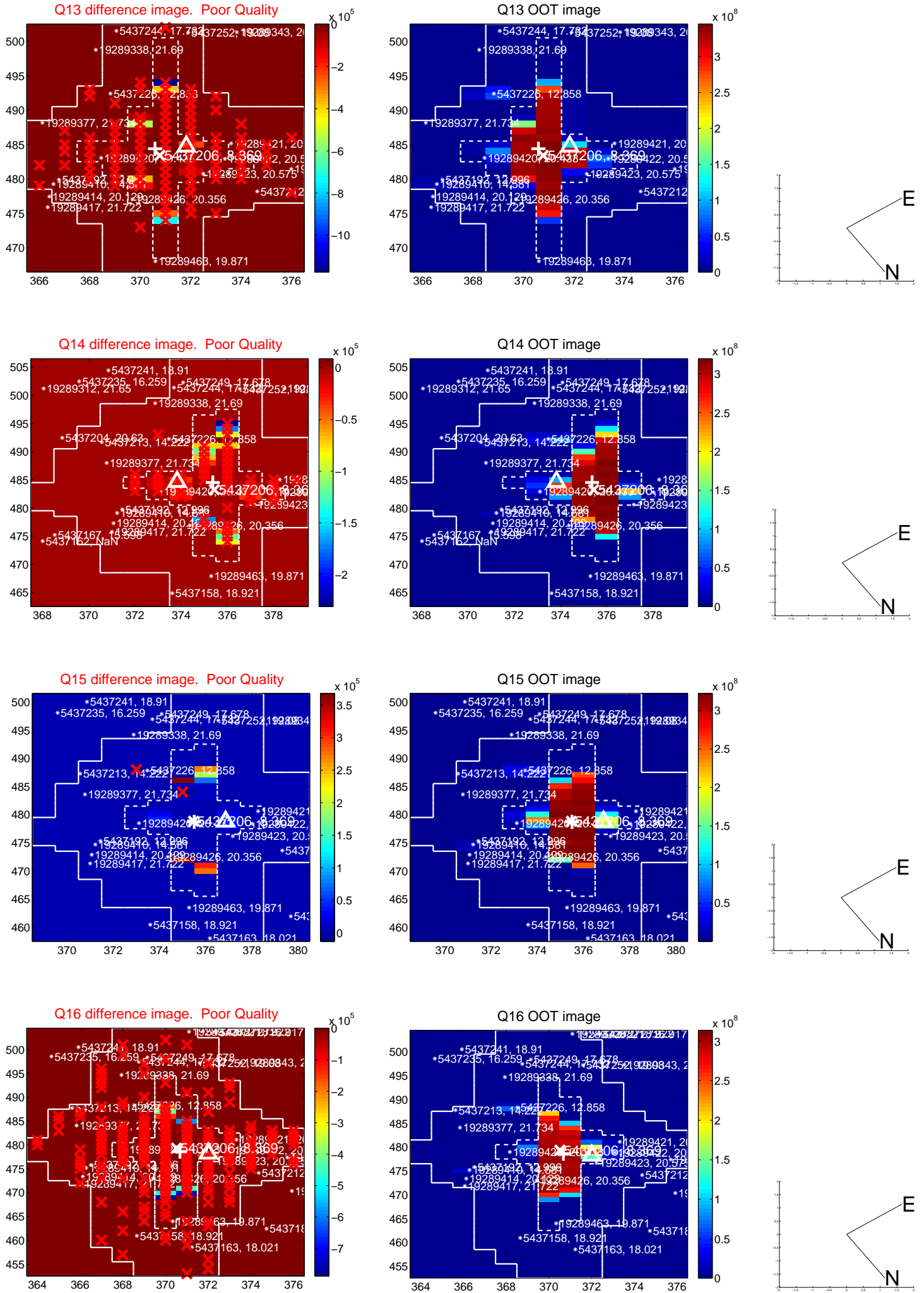
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



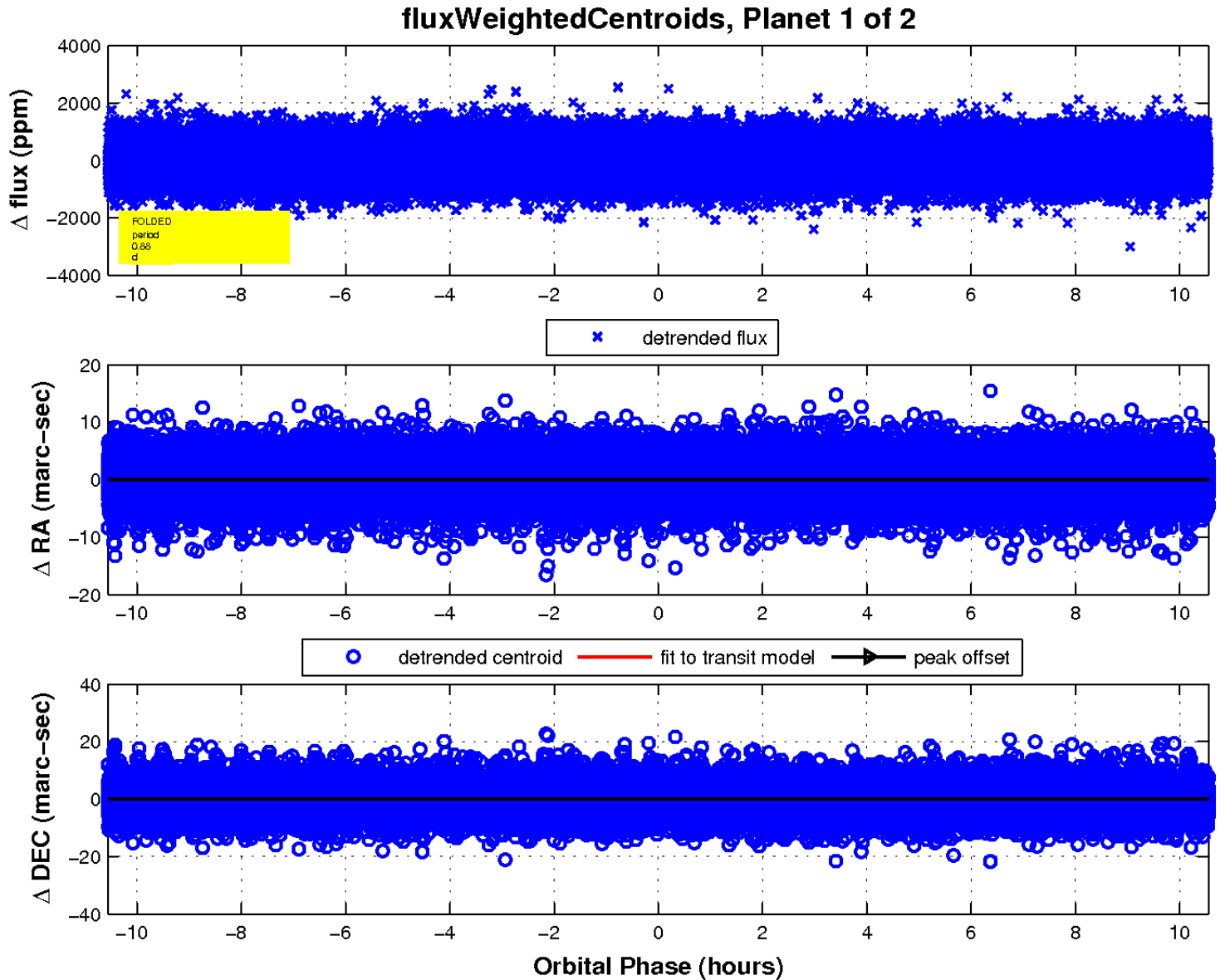
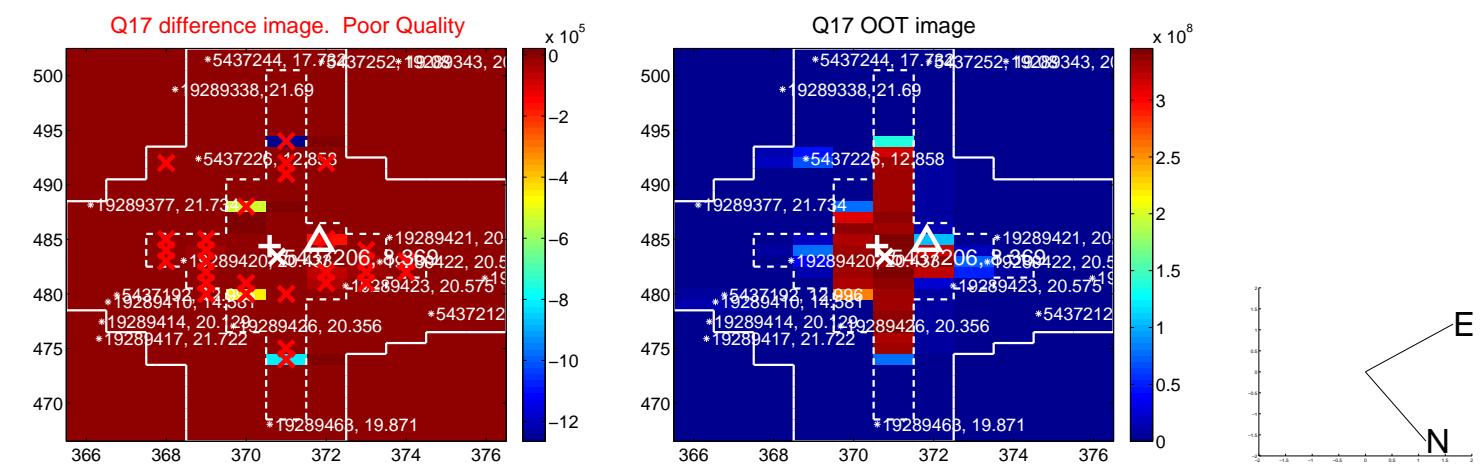
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



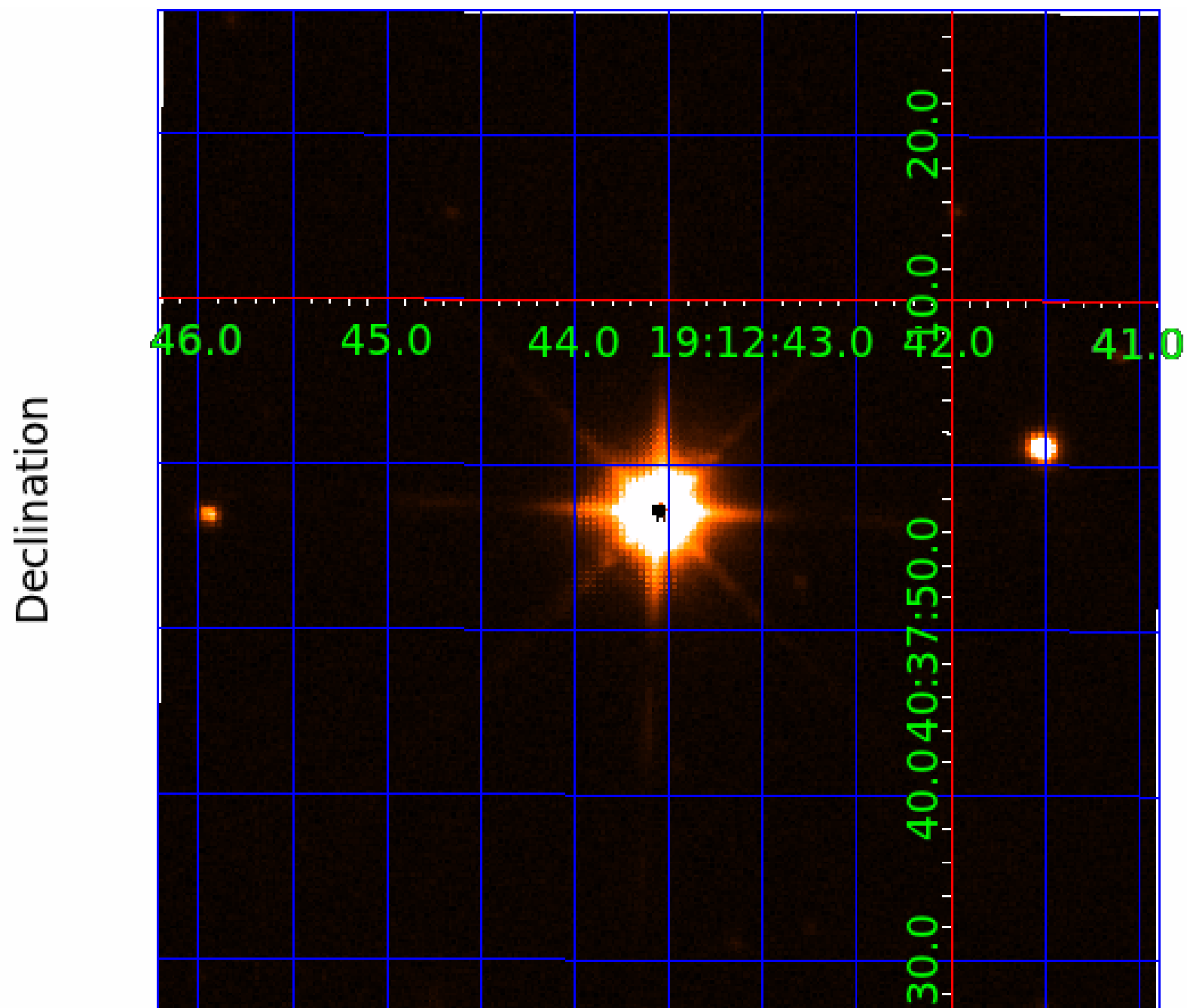
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 005437206

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005437206-01 | OBS | No | 0.879732 | 132.308964 | 48.4 | 3.852 | 11.2 | 10.2 | 3.42 | 7915 | 2.77 | 78086.47 |
| 005437206-02 | OBS | No | 1.763567 | 132.215027 | 104.6 | 5.428 | 8.6 | 11.0 | 3.42 | 7915 | 4.07 | 30892.56 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005437206-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED |
| 005437206-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED |

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

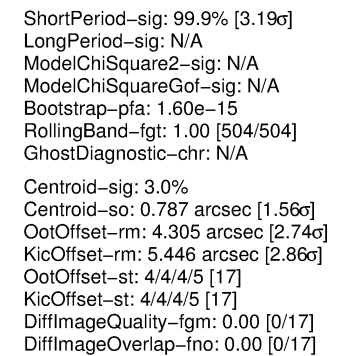
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

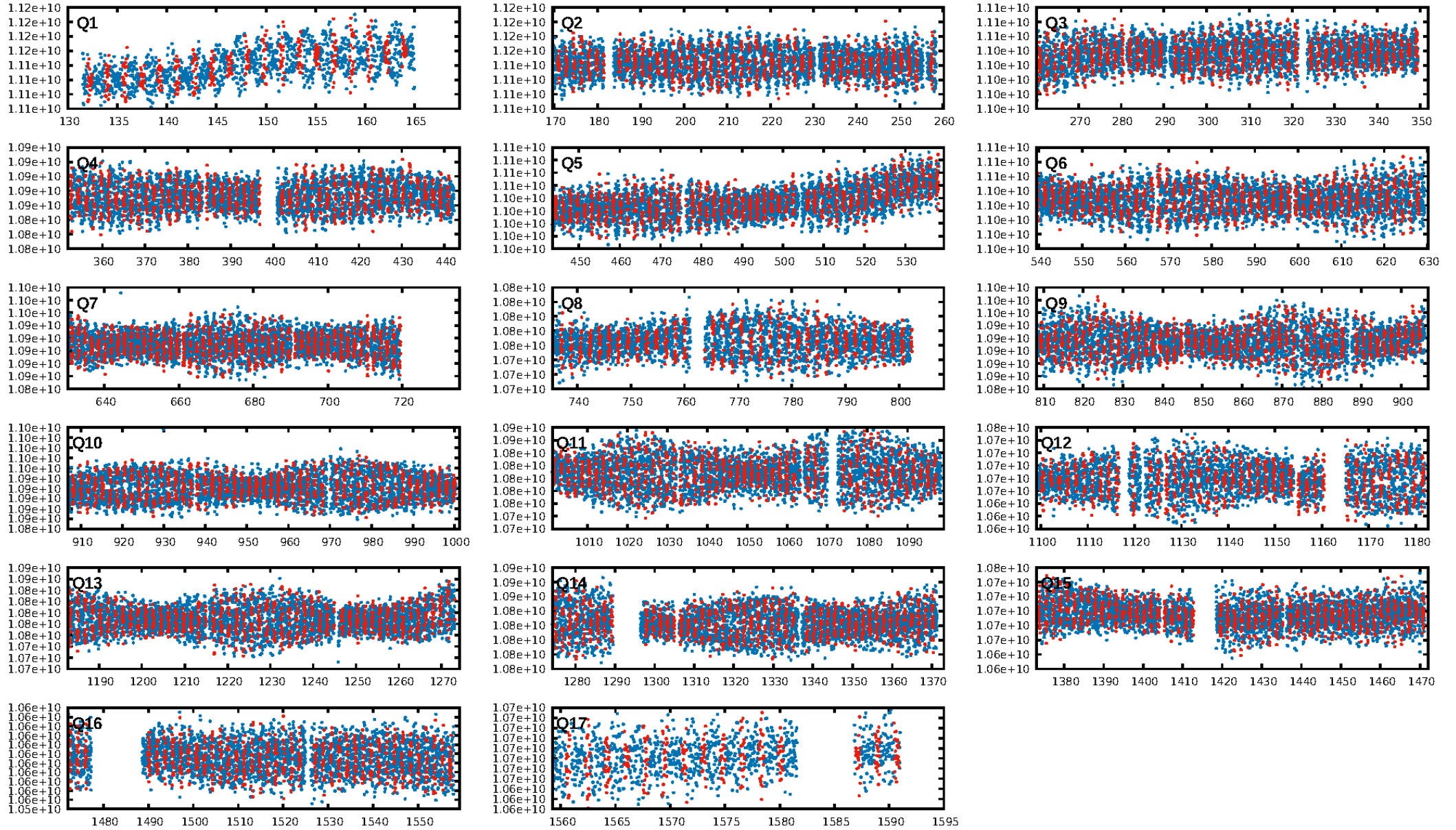
Ephemeris Match Information For 005437206-02

No Significant Match Found

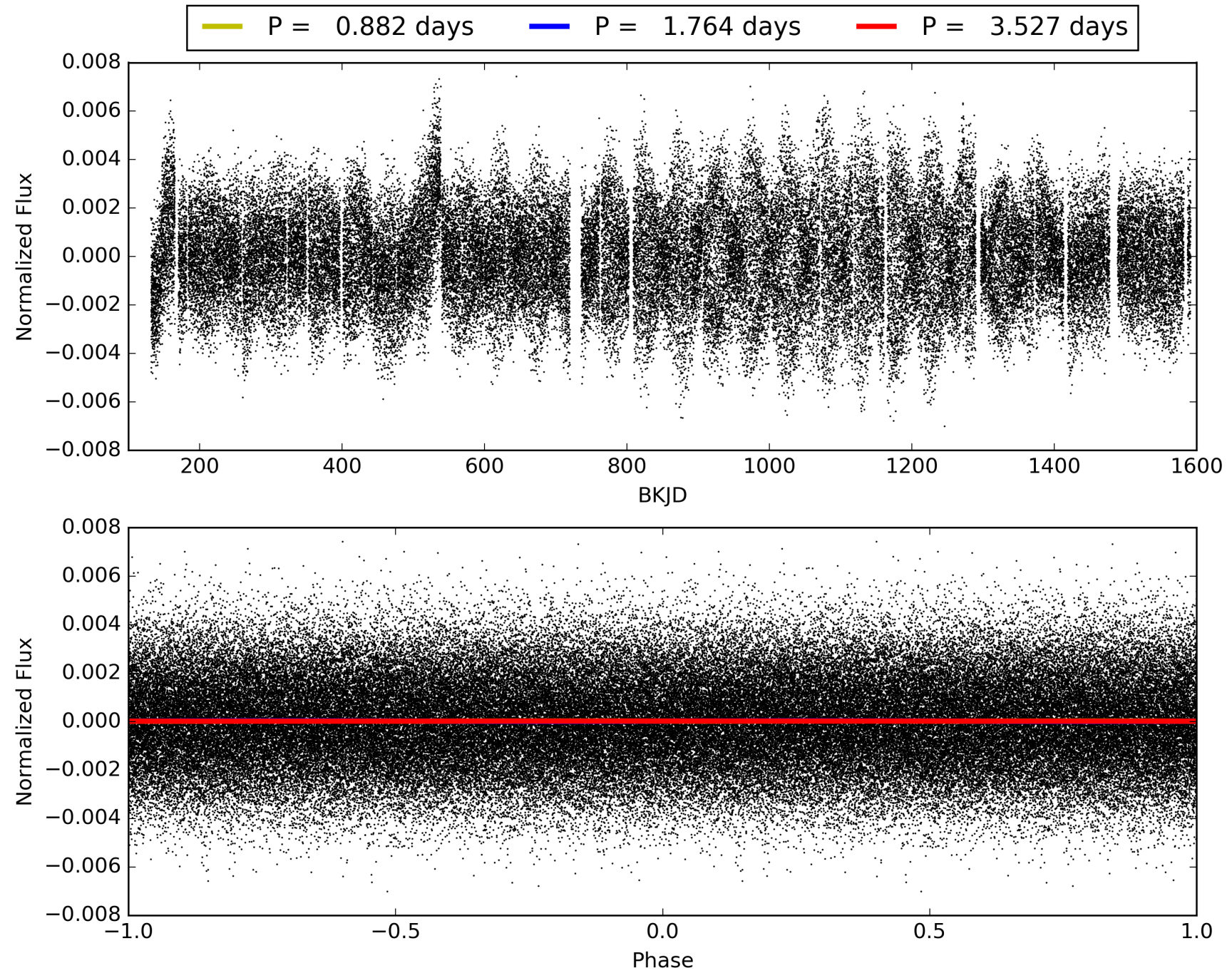
KIC: 5437206 Candidate: 2 of 2 Period: 1.764 d



TCE 005437206-02, PDC Light Curves

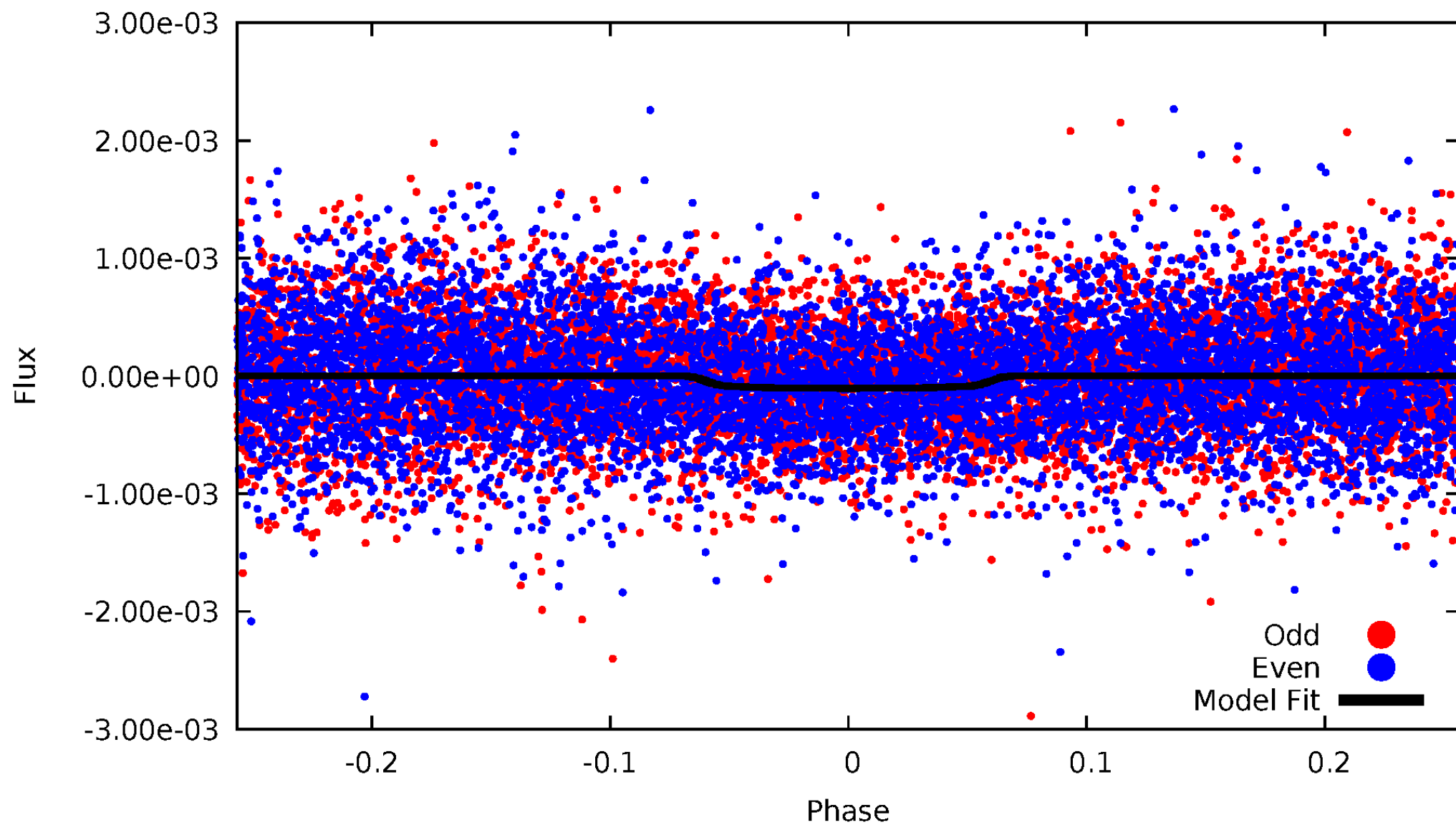


TCE 005437206-02



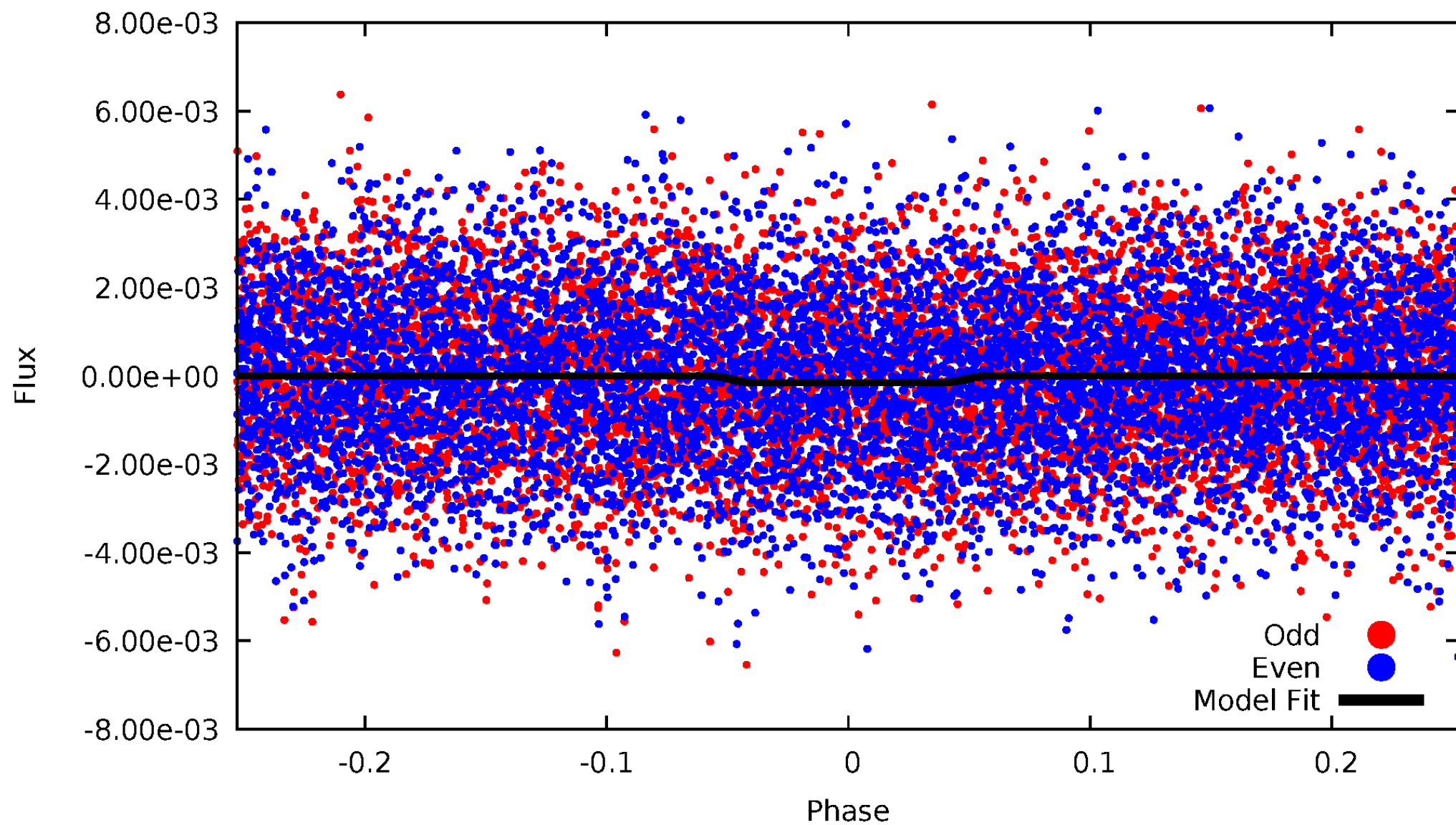
DV Odd/Even

TCE 005437206-02



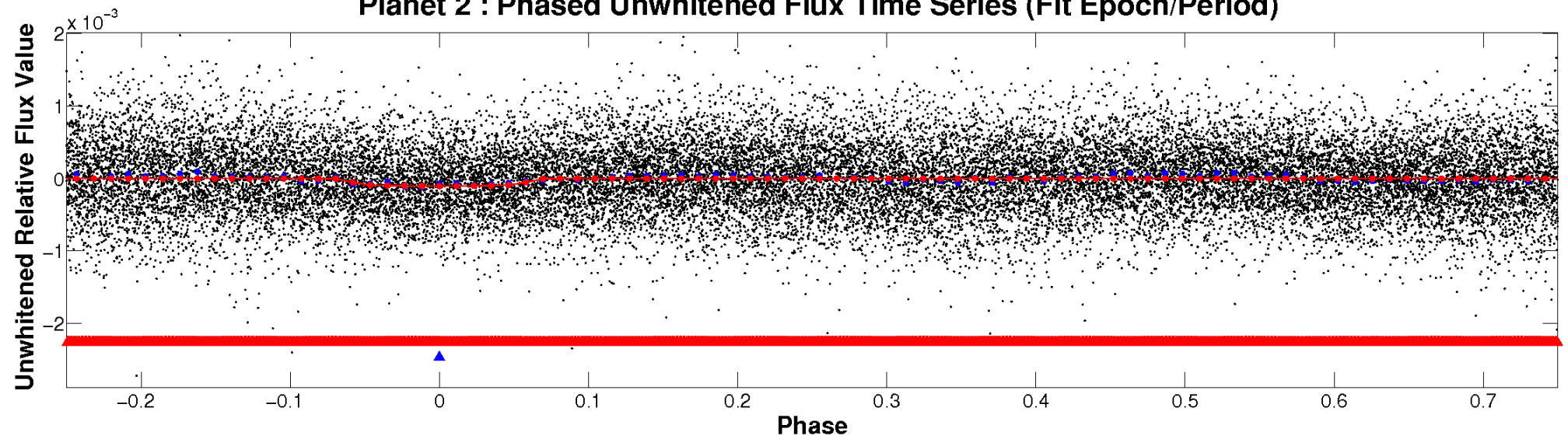
ALT Odd/Even

TCE 005437206-02

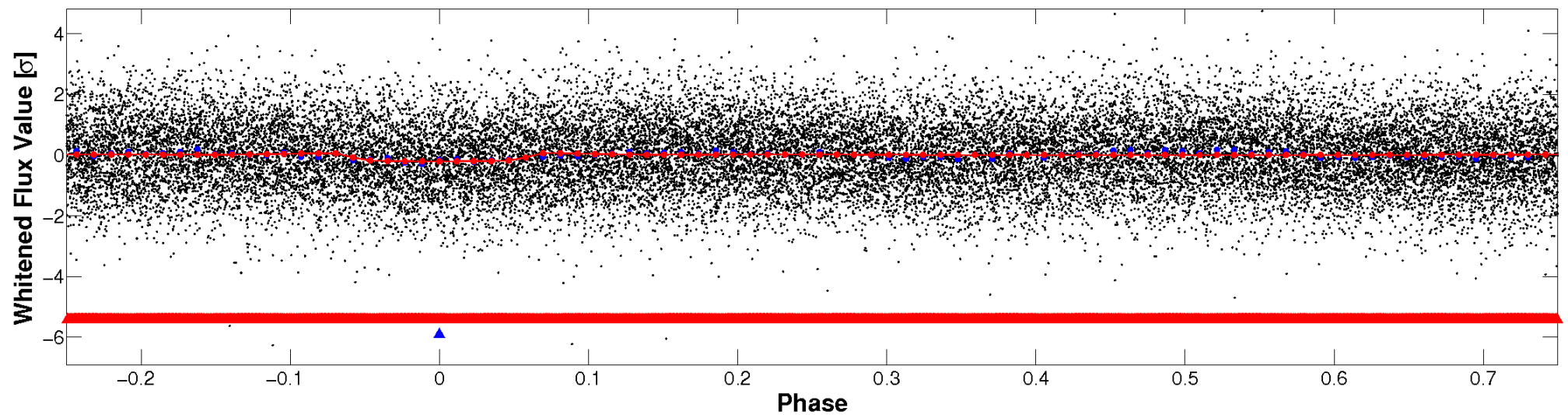


Non-Whitened Vs. Whitened Light Curve

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

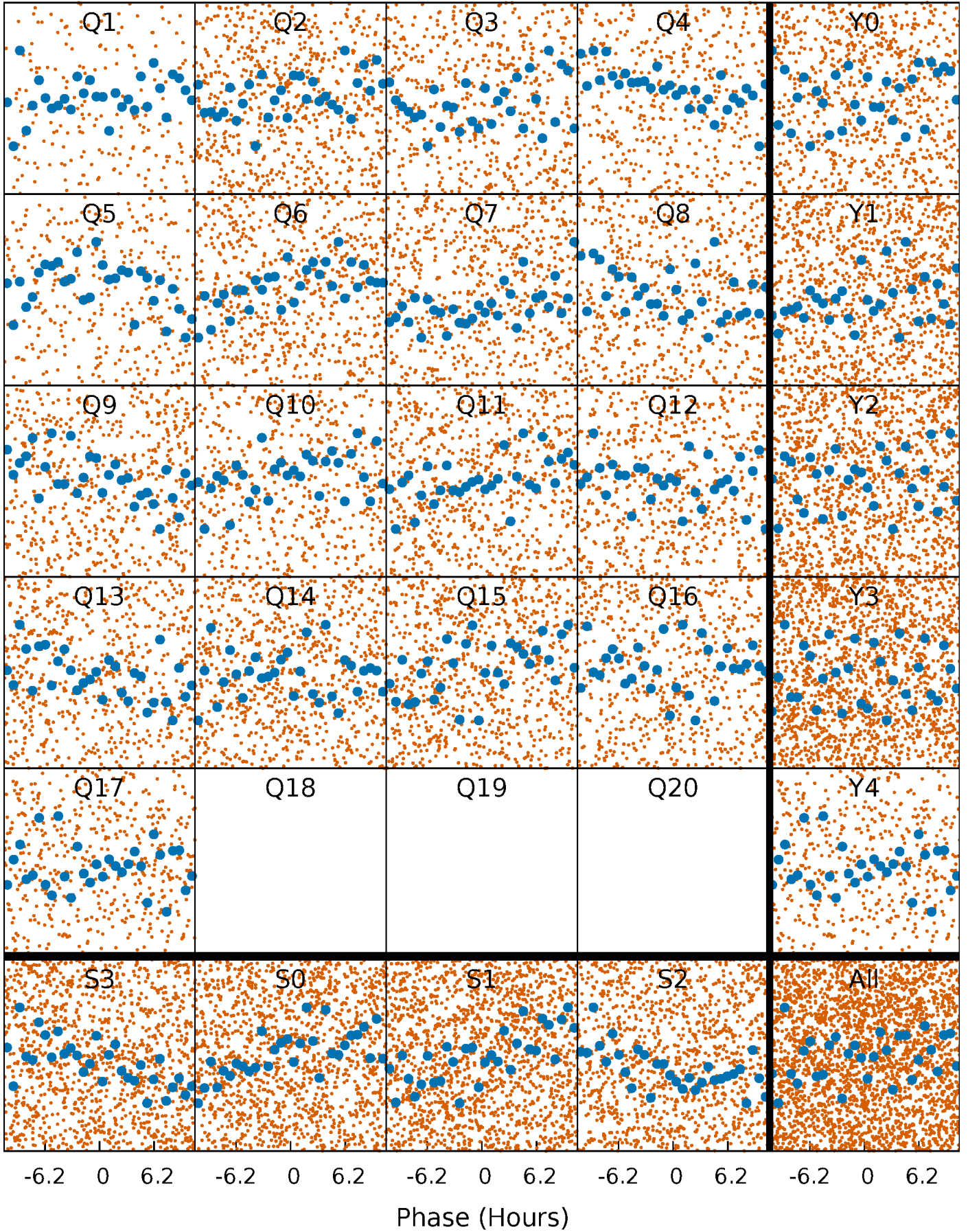


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



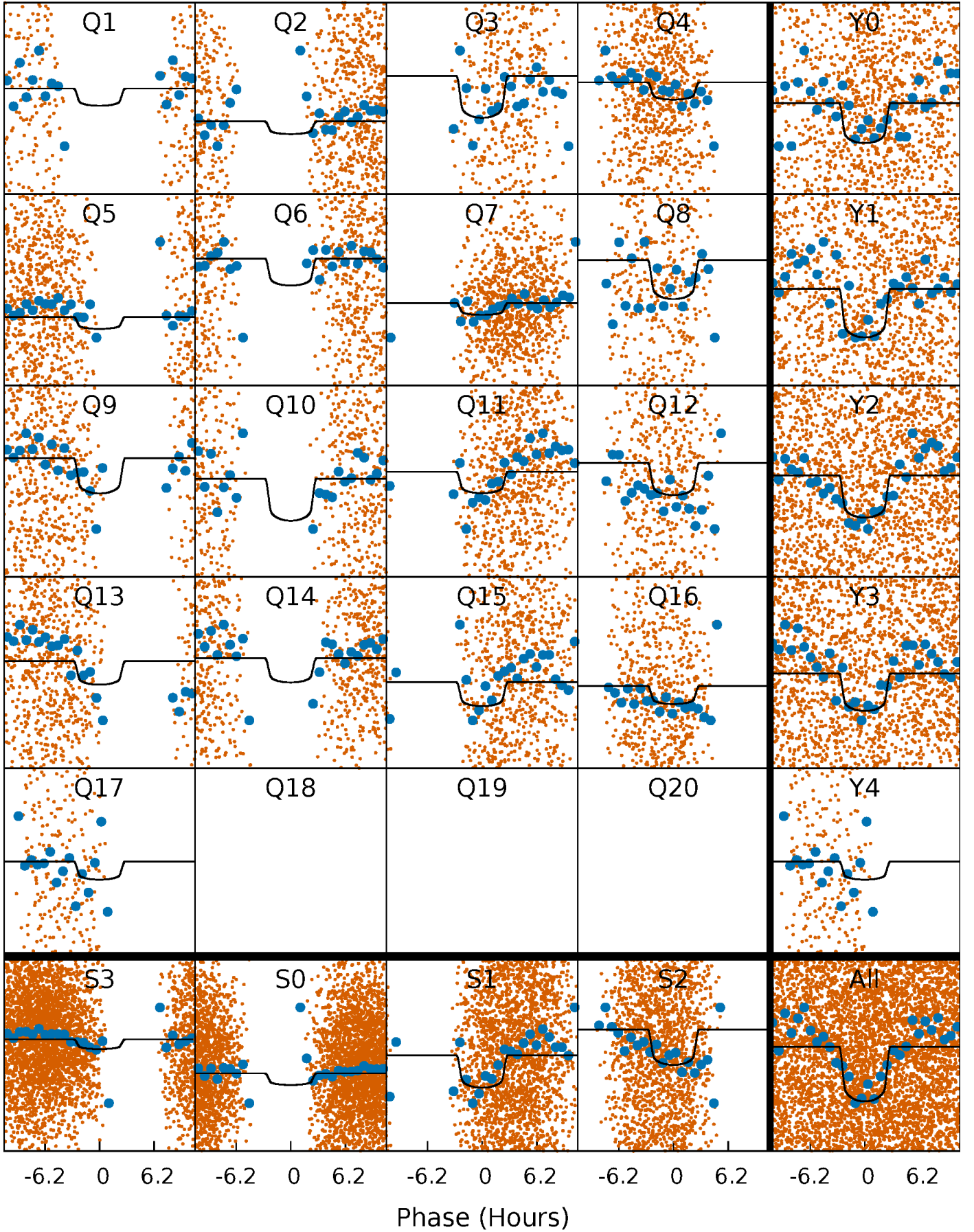
PDC Quarter-Phased Transit Curves

TCE 005437206-02 $P = 1.763567$ Days $T_0 = 132.215027$ (BKJD)



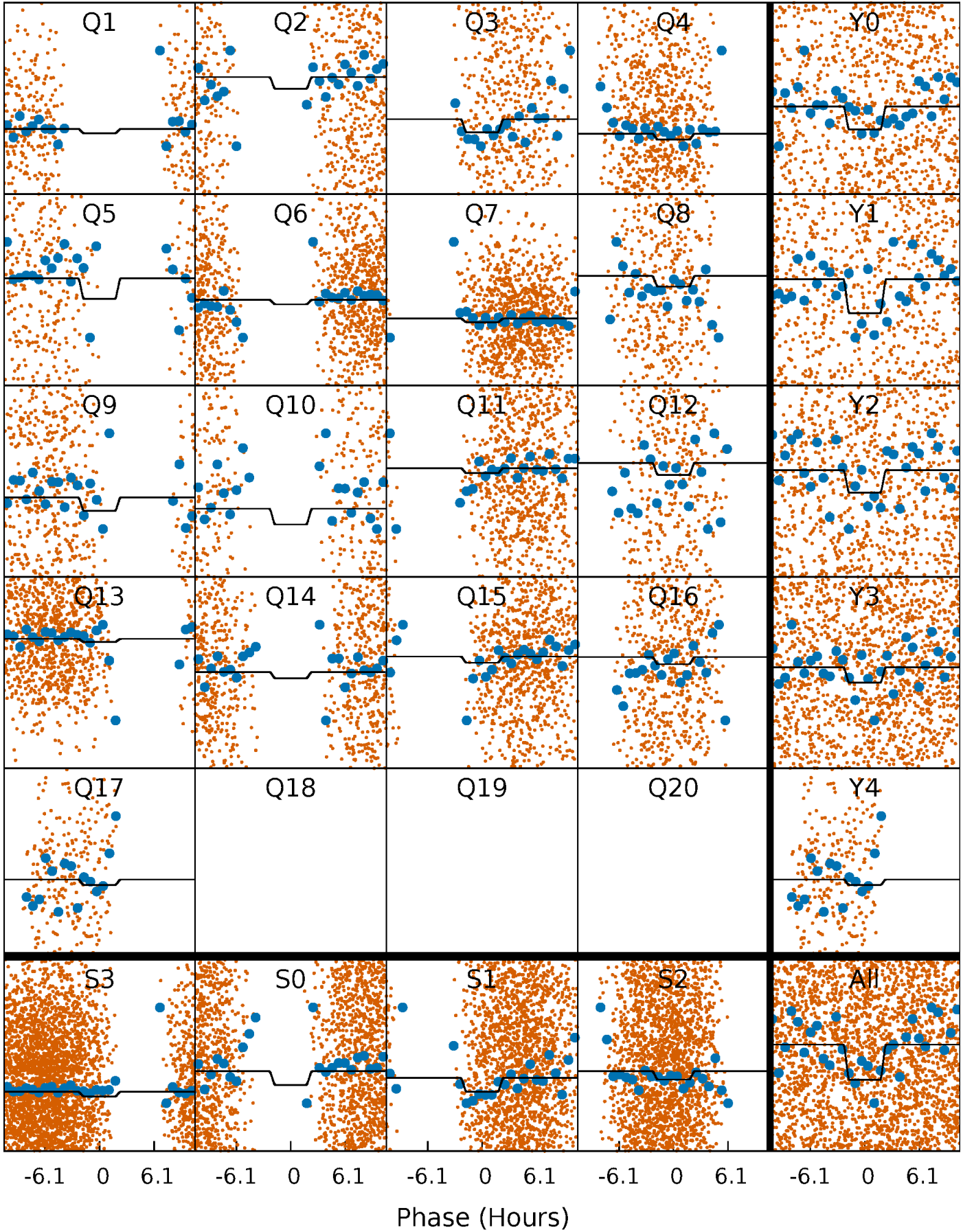
DV Quarter-Phased Transit Curves

TCE 005437206-02 P= 1.763567 Days $T_0=132.215027$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

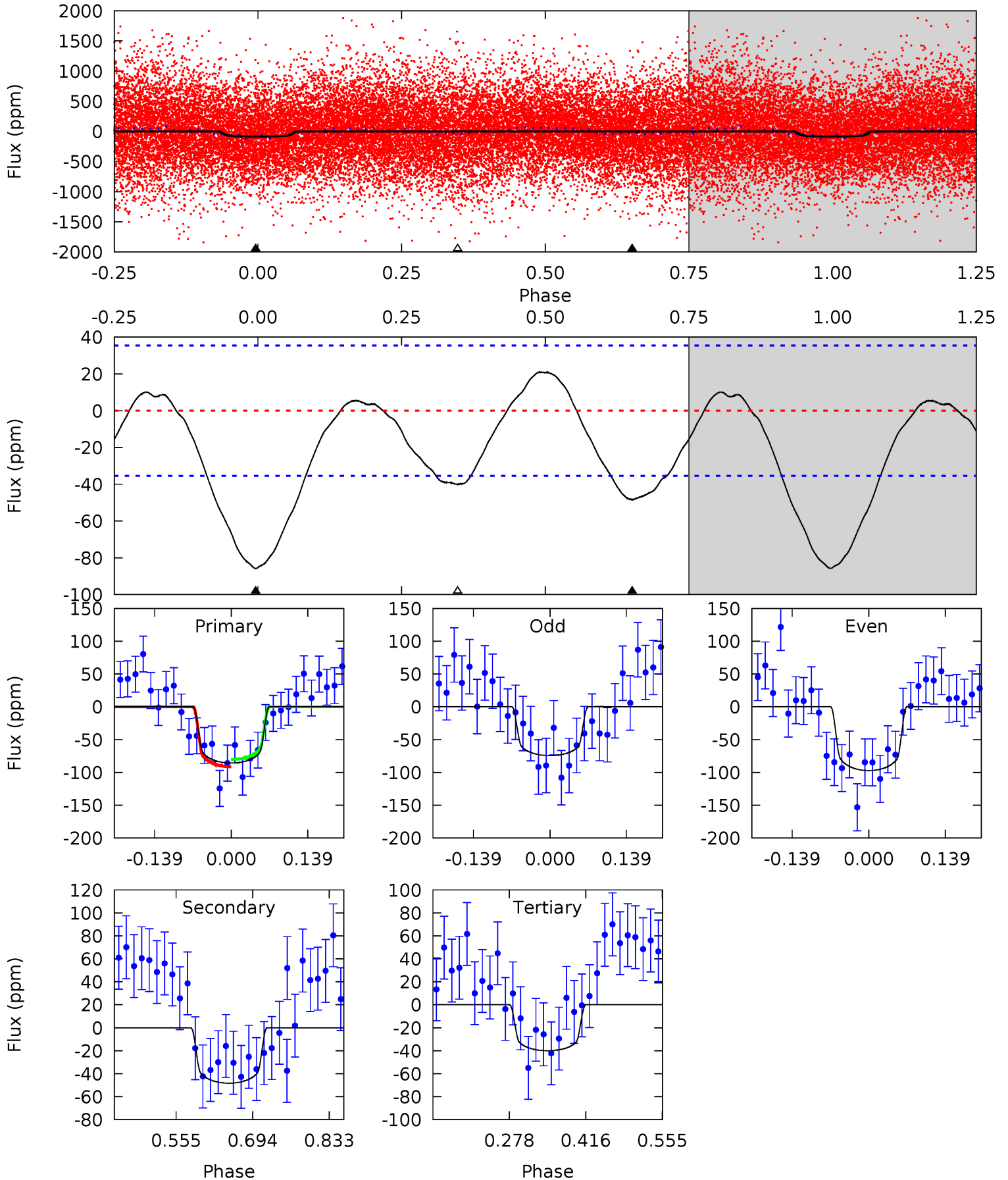
TCE 005437206-02 P= 1.763518 Days $T_0=132.211662$ (BKJD)



DV Model-Shift Uniqueness Test

005437206-02, P = 1.763567 Days, E = 130.451460 Days

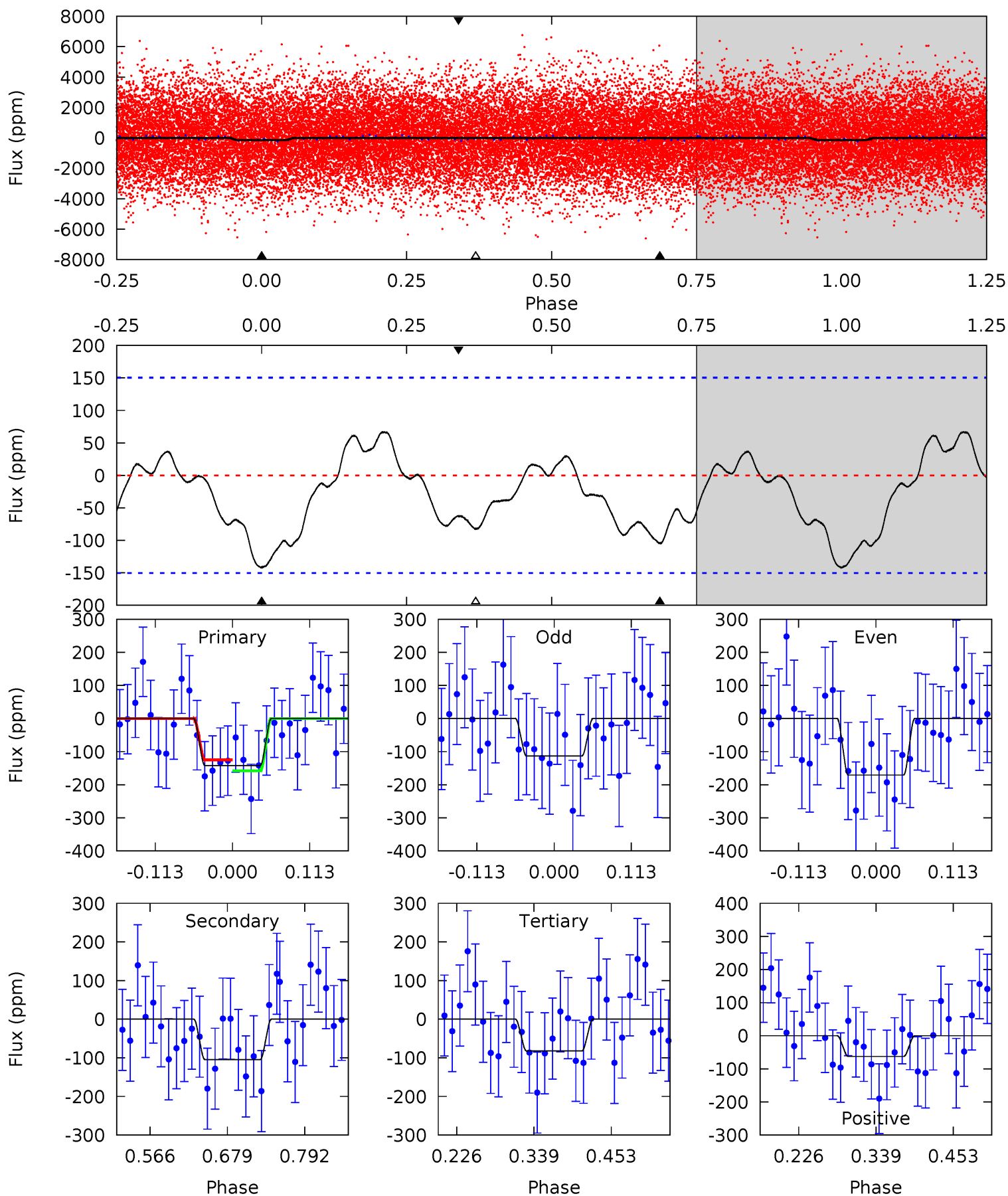
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.9 | 6.12 | 5.07 | 0 | 4.50 | 1.48 | 2.37 | 5.79 | 10.9 | 1.05 | 6.12 | 1.48 | 0.65 | 0.20 | 0.71 |



Alt Model-Shift Uniqueness Test

005437206-02, P = 1.763518 Days, E = 130.448144 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.28 | 3.15 | 2.48 | -1.89 | 4.54 | 1.58 | 1.21 | 1.80 | 6.17 | 0.67 | 5.04 | 0.87 | 0.66 | 0.32 | 0.50 |



Stellar Parameters For KIC 005437206

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 7915^{+221}_{-331} | $3.688^{+0.440}_{-0.110}$ | $-0.020^{+0.200}_{-0.350}$ | $3.416^{+0.838}_{-1.556}$ | $2.074^{+0.338}_{-0.508}$ | $0.073^{+0.321}_{-0.025}$ |
| | +3%/-4% | +12%/-3% | +1000%/-1750% | +25%/-46% | +16%/-24% | +438%/-34% |
| 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 005437206-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|------------------------|---------------------------|
| DV | -48 ± 8 | $3.74^{+1.45}_{-1.33}$ | 4571^{+367}_{-552} | 5915^{+1277}_{-784} | $2.507^{+3.405}_{-1.174}$ |
| Alt. | -105 ± 33 | $4.08^{+1.64}_{-1.30}$ | 4585^{+346}_{-577} | 7011^{+1718}_{-1160} | $4.589^{+5.954}_{-2.342}$ |

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

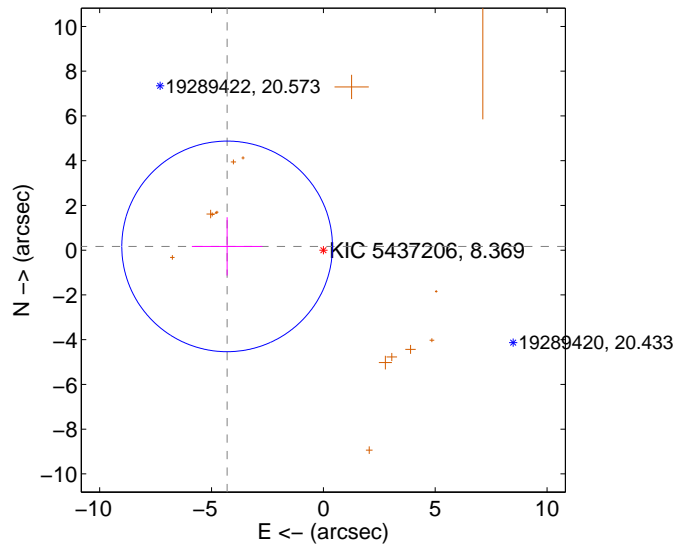
Supplemental centroid analysis for 005437206-02. **Kepler magnitude: 8.37.** Transit SNR 11.02

There are 0 quarters with good PRF difference image offsets

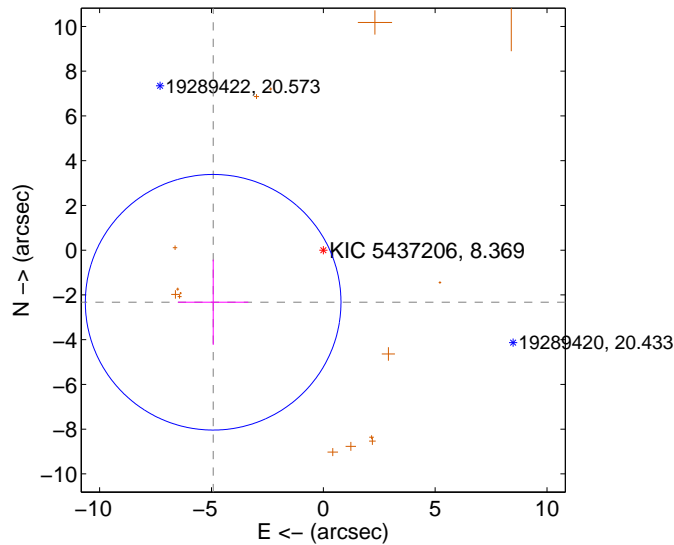
The OOT PRF centroid is offset from the target star catalog position by about 3.96 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 4.305 ± 1.569 | 2.74 | 4.302 ± 1.575 | 0.169 ± 1.304 |
| PRF-fit source offset from KIC position | 5.446 ± 1.904 | 2.86 | 4.923 ± 1.575 | -2.328 ± 1.904 |
| photometric centroid source offset | 0.79 ± 0.51 | 1.56 | 0.49 ± 0.40 | 0.62 ± 0.56 |

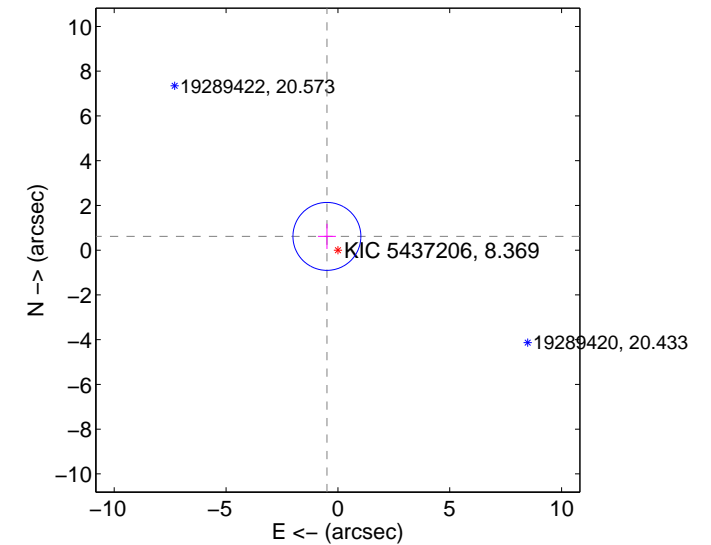
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

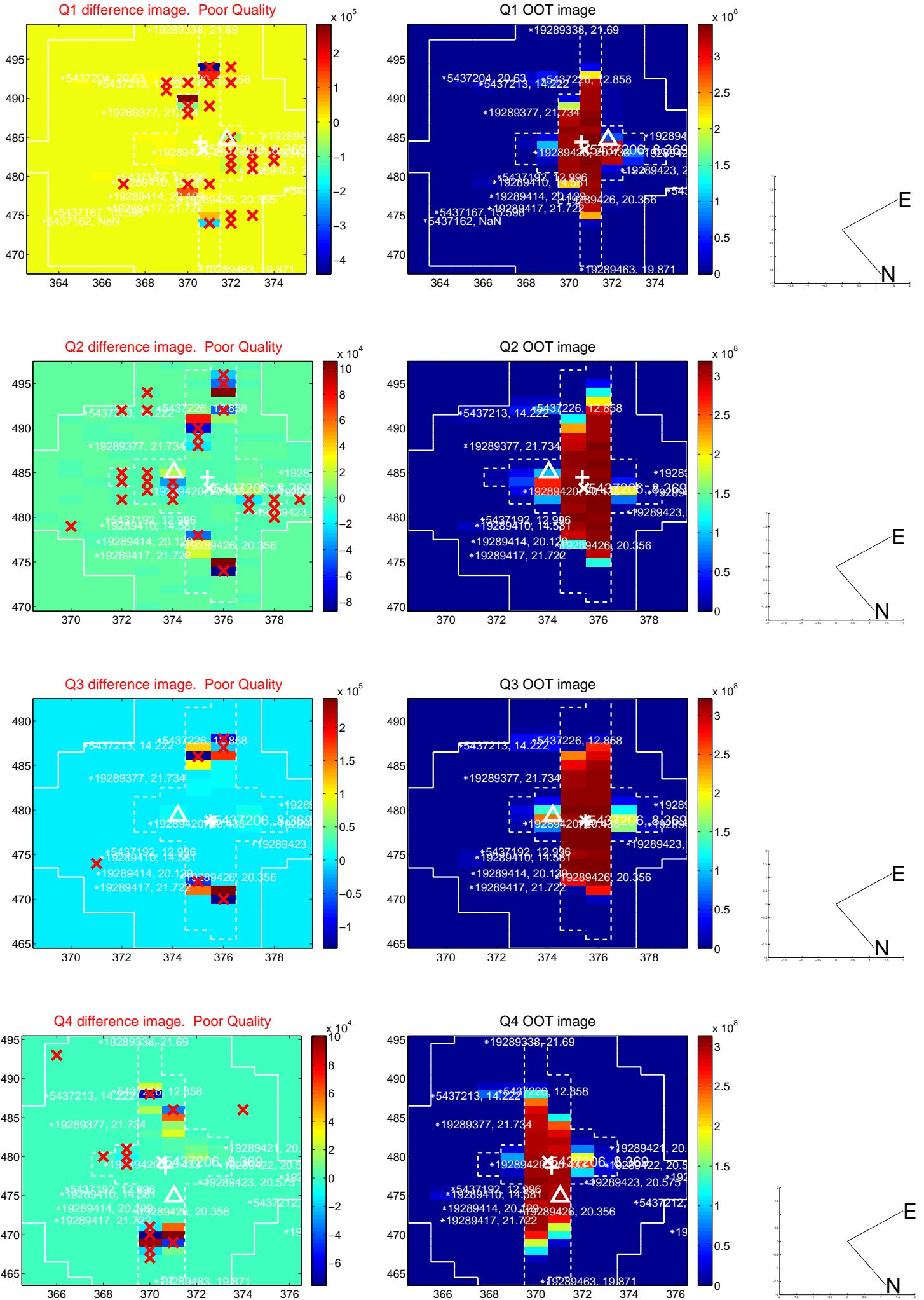


offset from photometric centroids

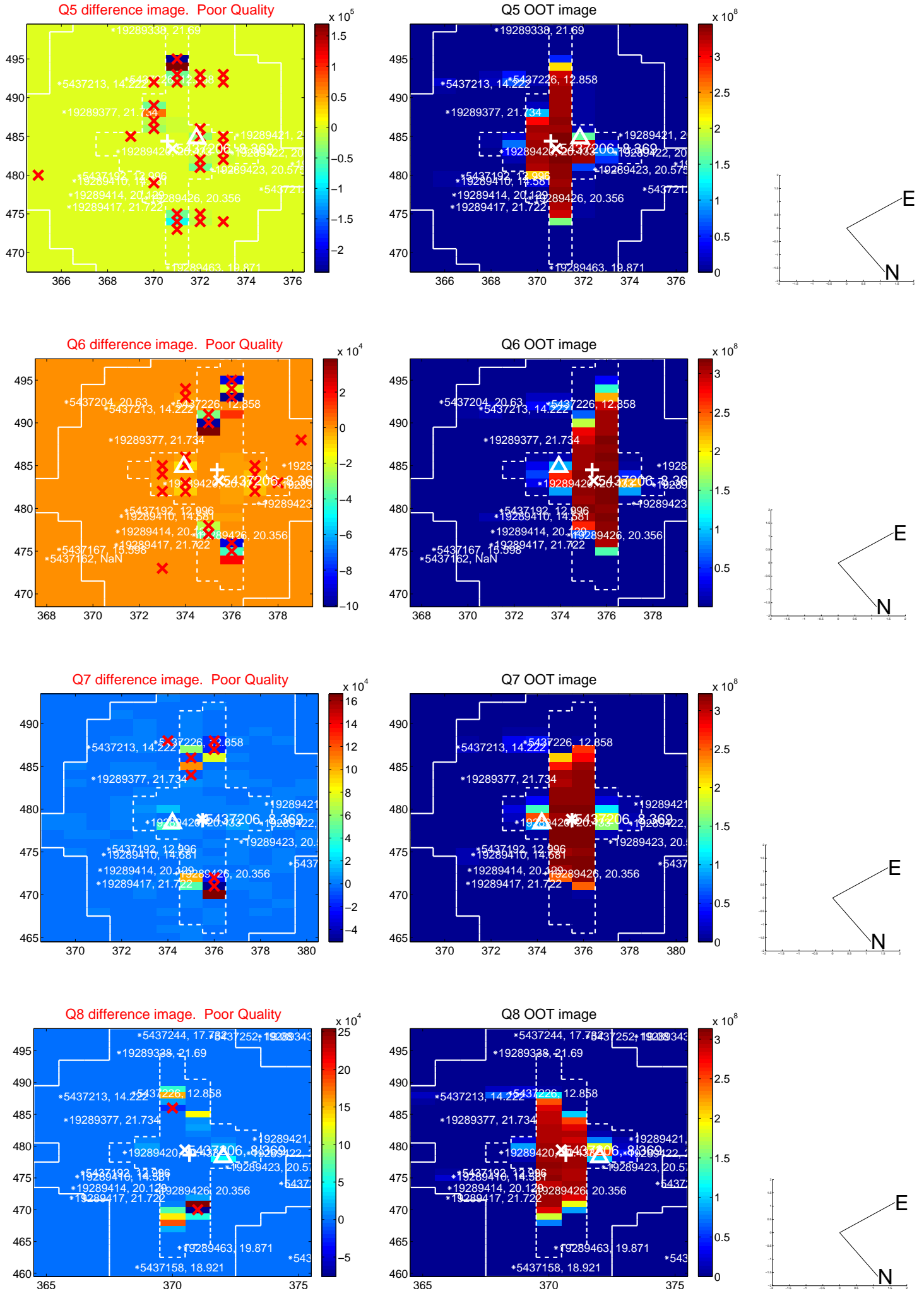


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

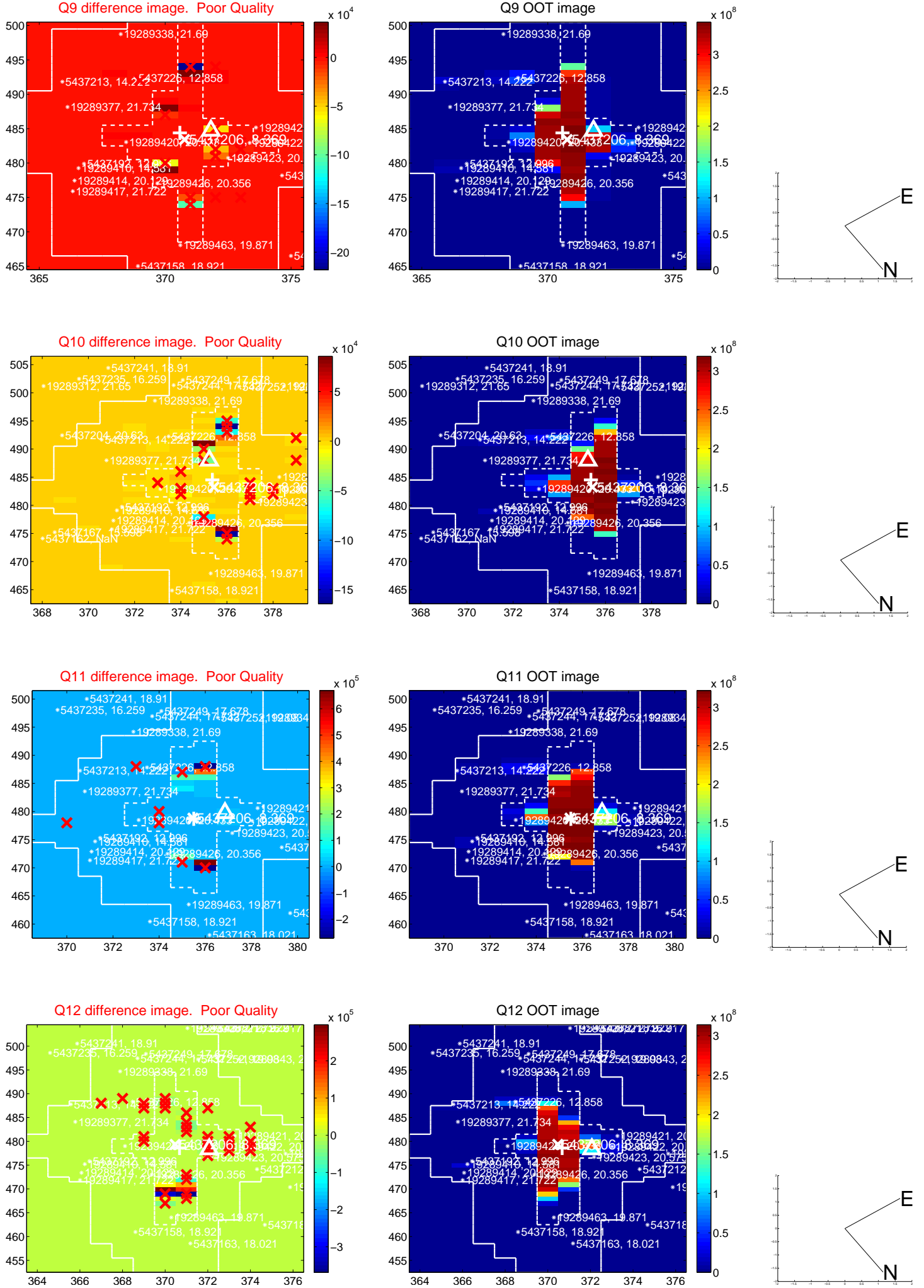
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



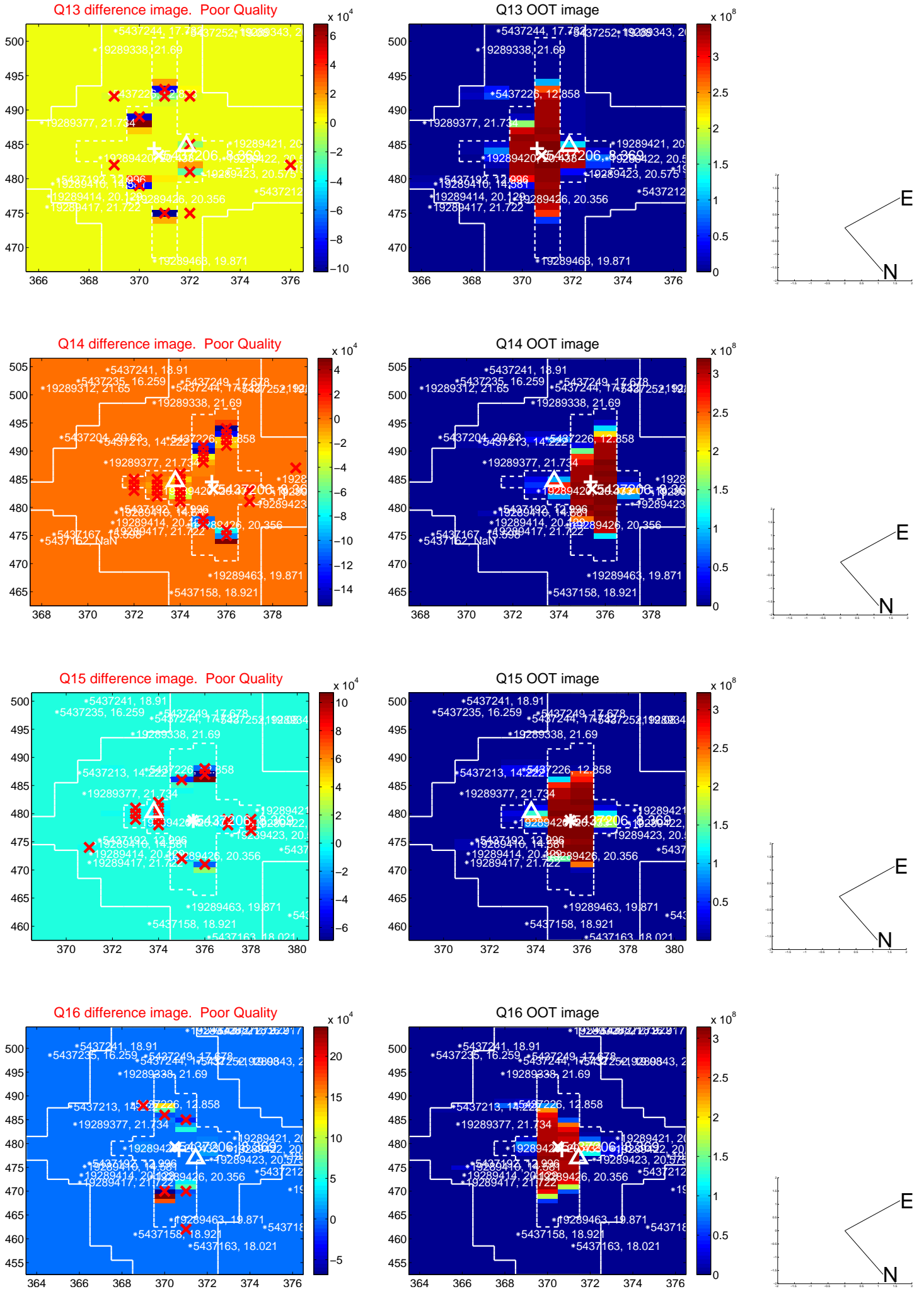
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



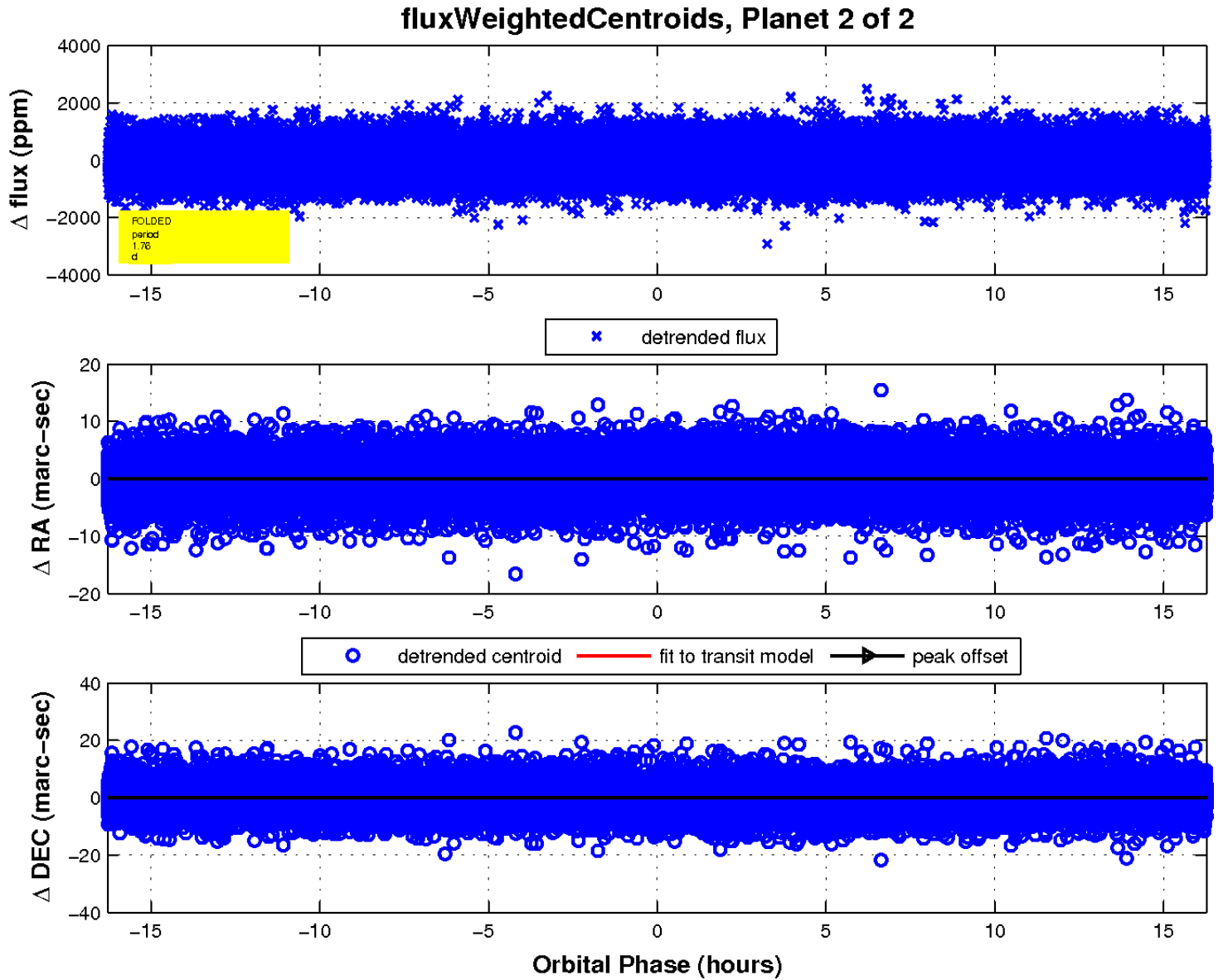
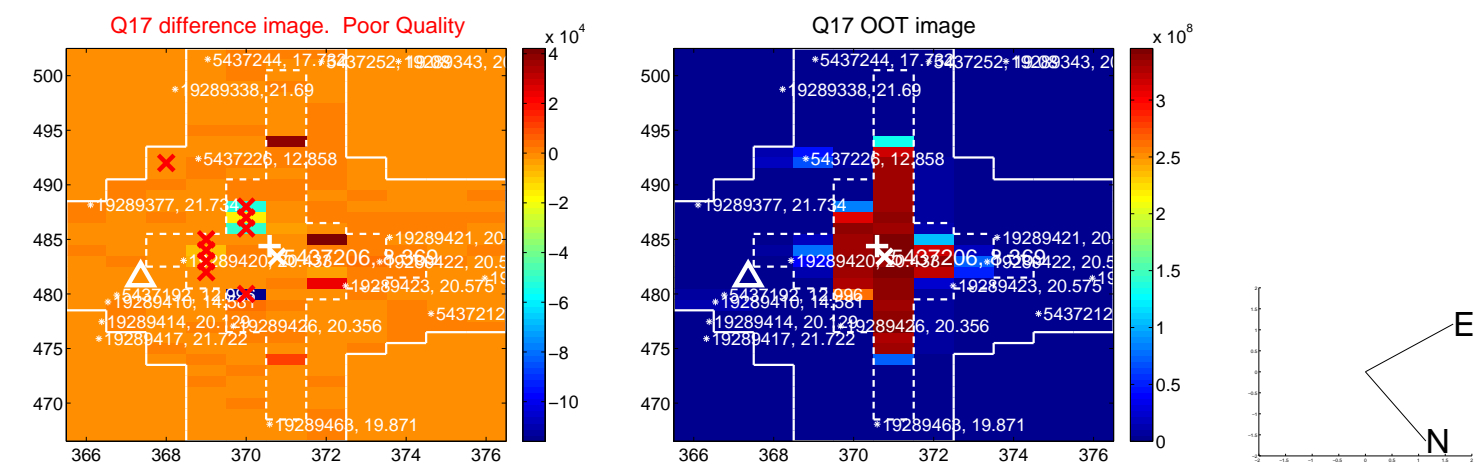
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

